

TEST REPORT

FCC SAR Test for certification of IML-C6400W FCC ID: YCO-IML-C6400W

APPLICANT

Infomark Co.,Ltd.

REPORT NO.

HCT-SR-2301-FC004

DATE OF ISSUE

Feb. 01, 2023

Tested byJung-hun Park

(signature)

Technical Manager

Yun-Jeang, Heo

(signal/le)

HCT Co., Ltd.



HCT Co., Ltd.

74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383 KOREA Tel. +82 31 634 6300 Fax. +82 31 645 6401

TEST REPORT

FCC SAR Test for certification

REPORT NO.

HCT-SR-2301-FC004

DATE OF ISSUE

Feb. 01, 2023

FCC ID

YCO-IML-C6400W

Applicant Infomark Co.,Ltd.

8F, 321, Hwangsaeul-ro, Bundang-gu, Seongnam-Si, Gyonggi-Do,

13590, Korea

Equipment Type

LTE Mobile WiFi

Model Name IML-C6400W

FCC Rule Part(s) CFR §2.1093

Test Results

Date of Test

Refer to the present document

Dec. 23, 2022 ~ Jan. 20, 2023

Manufacturer

Infomark Co.,Ltd.

The result shown in this test report refer only to the sample(s) tested unless otherwise stated.

This test results were applied only to the test methods required by the standard.

F-TP22-03 (Rev. 04) Page 2 of 131





REVISION HISTORY

The revision history for this test report is shown in table.

Revision No.	Date of Issue	Description
0	Feb. 01, 2023	Initial Release

If this report is required to confirmation of authenticity, please contact to www.hct.co.kr

F-TP22-03 (Rev. 04) Page 3 of 131





CONTENTS

1. Test Regulations	5
2. Test Location	6
3. Information of the EUT	6
4. Device Under Test Description	7
5. Introduction	10
6. Description of test equipment	11
7. SAR Measurement Procedure	12
8. Description of Test Position	14
9. RF Exposure Limits	15
10. FCC SAR General Measurement Procedures	16
11. Output Power Specifications	20
12. System Verification	25
13. SAR Test Data Summary	27
14. SAR Simultaneous Transmission Analysis	30
15. SAR Measurement Variability and Uncertainty	31
16. Device Holder Perturbation Verification.	32
17. Measurement Uncertainty	33
18. SAR Test Equipment	34
Attachment 1. – SAR Test Plots	35
Attachment 2. – Dipole Verification Plots	40
Attachment 3. – SAR Tissue Characterization	45
Attachment 4. – SAR System Validation	46
Attachment 5. – Probe Calibration Data	47
Attachment 6. – Dipole Calibration Data	113





1. Test Regulations

The tests were performed according to the following regulations:

Manufacturer's s	pecification:
Test Method	 IEEE 1528-2013 FCC KDB Publication 941225 D07 UMPC Mini Tablet v01r02 FCC KDB Publication 941225 D06 Hotspot Mode v02r01 FCC KDB Publication 447498 D01 General SAR Guidance v06 FCC KDB Publication 648474 D04 Handset SAR v01r03 FCC KDB Publication 941225 D05 SAR for LTE Devices v02r05 FCC KDB Publication 248227 D01 802.11 Wi-Fi SAR v02r02 FCC KDB Publication 865664 D01 SAR measurement 100 MHz to 6 GHz v01r04 FCC KDB Publication 865664 D02 SAR Reporting v01r02

In Addition to the above, the following information was used.

- April 2015 TCB Workshop Notes (Simultaneous transmission summation clarified)
- October 2016 TCB Workshop Notes (DUT Holder Perturbations)

F-TP22-03 (Rev. 04) Page 5 of 131





2. Test Location

2.1 Test Laboratory

Company Name	HCT Co., Ltd.
Address	74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383 KOREA
Telephone	031-645-6300
Fax.	031-645-6401

3. Information of the EUT

3.1 SAR Test General Information

Model Name	IML-C6400W
Equipment Type	LTE Mobile WiFi
Manufacturer	Infomark Co.,Ltd

3.2 Attestation of test result of device under test

The Highest Reported SAR (W/kg)					
Band	Tx. Frequency	Equipment Class	Reported SAR (W/kg)		
			1 g SAR Body		
LoRa (125 kHz US)	902.3 MHz ~ 914.9 MHz	DSS	1.472		
LoRa (125 kHz AU)	915.2 MHz ~ 927.5 MHz	DSS	1.440		
LTE Band 26	814 MHz ~ 849 MHz	TNB	0.305		
2.4 GHz WLAN	2 412 MHz ~ 2 472 MHz DTS		< 0.10		
Simultaneous SAR per KDB 690783 D01v01r03			1.481		
Date(s) of Tests Dec. 23, 2022 ~ Jan. 20, 2023					

F-TP22-03 (Rev. 04) Page 6 of 131





4. Device Under Test Description

4.1 DUT specification

Device Wireless specification overview				
Band & Mode				
LoRa (125 kHz US)	Data	902.3 MHz ~ 914.9 MHz		
LoRa (125 kHz AU)	Data	915.2 MHz ~ 927.5 MHz		
LTE Band 26	Data	814 MHz ~ 849 MHz		
2.4 GHz WLAN	Data	2 412 MHz ~ 2 472 MHz		

Device Description		
Device Dimension	93 mm × 61 mm × 15 mm	
Battery Information	FT736551 (3 300 mAh, 3.8 V)	
HW Version	Rev.D	
SW Version	V1.2.0	
Device Serial Numbers	980086, 980087, 980089	

F-TP22-03 (Rev. 04) Page 7 of 131



4.2 Nominal and Maximum Output Power Specifications

This device operates using the following maximum output power specifications. SAR values were scaled to the maximum allowed power to determine compliance per KDB publication 447498 D01v06.

4.2.1 Maximum Power

Mode / Band		Modulated Average (dBm)		
L - D - (125 III-)	Maximum	22.0		
LoRa (125 kHz)	Nominal	21.0		

(Tolerance -1.5dBm ~ +1dBm)

Mode / Band		Modulated Average (dBm)		
LTC Dand 20	Maximum	24.0		
LTE Band 26	Nominal	23.0		

(Tolerance -1.5dBm ~ +1dBm)

Mode / Band		Modulated Average (dBm)		
VA/I ANI 2 4CII-	Maximum	10.0		
WLAN 2.4GHz	Nominal	8.0		

(Tolerance -2dBm \sim +2dBm)

F-TP22-03 (Rev. 04) Page 8 of 131





4.3 DUT Antenna Locations

This device is also operating at hand-held use near body. So, FCC KDB Publication 941225 D07 is apply to this condition. 1g SAR test is evaluated to some position (distance from to the edge/side is within 2.5 cm) at 0 mm. So 10g SAR is not required.

Mode	Rear	Front	Left	Right	Bottom	Тор
LoRa (125 kHz)	Yes	Yes	Yes	Yes	No	Yes
LTE Band 26	Yes	Yes	Yes	Yes	Yes	No
2.4GHz WLAN	Yes	Yes	No	Yes	No	No

Particular EUT edges were not required to be evaluated for Wireless router SAR or phablet SAR if the edges were greater than 2.5 cm from the transmitting antenna according to FCC KDB 941225 D07 and October 2016 TCBC Workshop Note.

The distance between the transmit antennas and the edges of the device are included in the filing.

- Note: All test configurations are based on front view position.

4.4 SAR Summation Scenario

According to FCC KDB 447498 D01v06, transmitters are considered to be transmitting simultaneously when there is overlapping transmission, with the exception of transmissions during network hand-offs with maximum hand-off duration less than 30 seconds. Possible transmission paths for the EUT are shown below paths and are mode in same rectangle to indicate communication modes which share the same path. Modes which share the same transmission path cannot transmit simultaneously with one another.

This device contains multiple transmitters that may operate simultaneously, and therefore requires a simultaneous transmission analysis according to FCC KDB 447498 D01v06.

Simultaneous Transmission Scenarios										
Applicable Combination	Body									
LTE + 2.4 GHz WI-FI	Yes									
LoRA + 2.4 GHz WI-FI	Yes									

The LoRA mode was evaluated for simultaneous transmission analysis with the WLAN mode as the more conservatively evaluated measured SAR result.

F-TP22-03 (Rev. 04) Page 9 of 131

SECRET





5. Introduction

The FCC has adopted the guidelines for evaluating the environmental effects of radio frequency radiation in ET Docket 93-62 on Aug. 6, 1996 to protect the public and workers from the potential hazards of RF emissions due to FCC-regulated portable devices.

The safety limits used for the environmental evaluation measurements are based on the criteria published by the American National Standards Institute (ANSI) for localized specific absorption rate (SAR) in IEEE/ANSI C95.1-1992 Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz. 1992 by the Institute of Electrical and Electronics Engineers, Inc., New York 10017. The measurement procedure described in IEEE/ANSI C95.3-1992 Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields - RF and Microwave is used for guidance in measuring SAR due to the RF radiation exposure from the Equipment Under Test (EUT). These criteria for SAR evaluation are similar to those recommended by the National Council on Radiation Protection and Measurements (NCRP) in Biological Effects and Exposure Criteria for Radio Frequency Electromagnetic Fields," NCRP Report No. 86 NCRP, 1986, Bethesda, MD 20814. SAR is a measure of the rate of energy absorption due to exposure to an RF transmitting source. SAR values have been related to threshold levels for potential biological hazards.

SAR Definition

Specific Absorption Rate (SAR) is defined as the time derivative of the incremental electromagnetic energy (d W) absorbed by (dissipated in) an incremental mass (d m) contained in a volume element (d V) of a given density (r). It is also defined as the rate of RF energy absorption per unit mass at a point in an absorbing body.

$$SAR = \frac{d}{dt} \left(\frac{dU}{dm} \right)$$

Figure 1. SAR Mathematical Equation SAR is expressed in units of Watts per Kilogram (W/kg)

$$SAR = \sigma E^2 / \rho$$

Where:

 σ = conductivity of the tissue-simulant material (S/m) ρ = mass density of the tissue-simulant material (kg/m²) E = Total RMS electric field strength (V/m)

NOTE: The primary factors that control rate of energy absorption were found to be the wavelength of the incident field in relations to the dimensions and geometry of the irradiated organism, the orientation of the organism in relation to the polarity of field vectors, the presence of reflecting surfaces, and whether conductive contact is made by the organism with a ground plane.

Page 10 of 131 F-TP22-03 (Rev. 04)

SECRET





6. Description of test equipment

6.1 SAR MEASUREMENT SETUP

These measurements are performed using the DASY4 automated dosimetric assessment system. It is made by Schmid & Partner Engineering AG (SPEAG) in Zurich, Switzerland. It consists of high precision robotics system (Staubli), robot controller, Pentium III computer, near-field probe, probe alignment sensor, and the generic twin phantom containing the brain equivalent material. The robot is a six-axis industrial robot performing precise movements to position the probe to the location (points) of maximum electromagnetic field (EMF) (see Figure.2).

A cell controller system contains the power supply, robot controller, teach pendant (Joystick), and remote control, is used to drive the robot motors. The PC with Windows XP or Windows 7 is working with SAR Measurement system DASY4 & DASY5, A/D interface card, monitor, mouse, and keyboard. The Staubli Robot is connected to the cell controller to allow software manipulation of the robot. A data acquisition electronic (DAE) circuit performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. is connected to the Electro-optical coupler (EOC). The EOC performs the conversion from the optical into digital electric signal of the DAE and transfers data to the PC plug-in card.

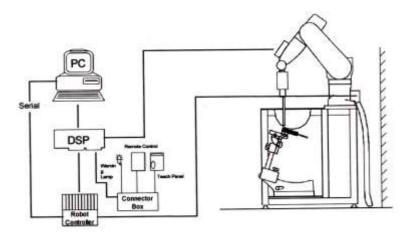


Figure 2. HCT SAR Lab. Test Measurement Set-up

The DAE consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder and control logic unit. Transmission to the PC-card is accomplished through an optical downlink for data and status information and an optical uplink for commands and clock lines. The mechanical probe mounting device includes two different sensor systems for frontal and sidewise probe contacts. They are also used for mechanical surface detection and probe collision detection. The robot uses its own controller with a built in VMEbus computer. The system is described in detail in.

F-TP22-03 (Rev. 04) Page 11 of 131

SECRET





7. SAR Measurement Procedure

The evaluation was performed using the following procedure compliant to FCC KDB Publication 865664 D01v01r04 and IEEE 1528-2013

- 1. The SAR distribution at the exposed side of the head or body was measured at a distance no more than 5.0 mm from the inner surface of the shell. The area covered the entire dimension of the DUT's head and body area and the horizontal grid resolution was depending on the FCC KDB 865664 D01v01r04 table 4-1 & IEEE 1528-2013.
- 2. Based on step, the area of the maximum absorption was determined by sophisticated interpolations routines implemented in DASY software. When an Area Scan has measured all reachable point. DASY system computes the field maximal found in the scanned are, within a range of the maximum. SAR at this fixed point was measured and used as a reference value.
- 3. Around this point, a volume was assessed according to the measurement resolution and volume size requirements of FCC KDB 865664 D01v01r04 table 4-1 and IEEE 1528-2013. On the basis of this data set, the spatial peak SAR value was evaluated with the following procedure (reference from the DASY manual.)
 - a. The data at the surface were extrapolated, since the center of the dipoles is no more than 2.7 mm away from the tip of the probe (it is different from the probe type) and the distance between the surface and the lowest measuring point is 1.2 mm. The extrapolation was based on a least square algorithm. A polynomial of the fourth order was calculated through the points in z-axes. This polynomial was then used to evaluate the points between the surface and the probe tip.
 - b. The maximum interpolated value was searched with a straight-forward algorithm. Around this maximum the SAR values averaged over the spatial volumes (1 g or 10 g) were computed using the 3D-Spline interpolation algorithm. The 3D-spline is composed of three onedimensional splines with the "Not a knot" condition (in x, y, and z directions. The volume was integrated with the trapezoidal algorithm. One thousand points (10 x 10 x 10) were interpolated to calculate the average.
 - c. All neighboring volumes were evaluated until no neighboring volume with a higher average value was found.
- 4. The SAR reference value, at the same location as step 2, was re-measured after the zoom scan. If the value changed by more than 5 %, the SAR evaluation and drift measurements were repeated.

F-TP22-03 (Rev. 04) Page 12 of 131





Area scan and zoom scan resolution setting follow KDB 865664 D01v01r04 quoted below.

			≤ 3 GHz	> 3 GHz	
Maximum distance from (geometric center of pro		measurement point ors) to phantom surface	5±1 mm	$^{1}/_{2}\cdot\delta\cdot\ln(2)\pm0.5$ mm	
Maximum probe angle surface normal at the measurer	·	·	30°±1°	20°±1°	
			≤ 2 GHz: ≤15 mm 3-4 GHz: ≤12 r 2-3 GHz: ≤12 mm 4-6 GHz: ≤10 r		
Maximum area scan Spa	atial reso	lution: Δx _{Area,} Δy _{Area}	When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, th measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.		
Maximum zoom scan S	oatial res	olution: Δx _{zoom,} Δy _{zoom}	≤ 2 GHz: ≤8mm 2-3 GHz: ≤5mm*	3-4 GHz: ≤5 mm* 4-6 GHz: ≤4 mm*	
	uniforr	m grid : Δz _{zoom} (n)	z grid: $Δz$ z z z z z z z z z		
Maximum zoom scan Spatial resolution normal to phantom surface	graded	Δz _{zoom} (1): between 1 st two Points closest to phantom surface	≤ 4 mm	3-4 GHz: ≤3 mm 4-5 GHz: ≤2.5 mm 5-6 GHz: ≤2 mm	
	grid	Δz_{zoom} (n>1): between subsequent Points	≤1.5·Δz _{zoom} (n-1)		
Minimum zoom scan volume	x, y, z		≥ 30 mm	3-4 GHz: ≥28 mm 4-5 GHz: ≥25 mm 5-6 GHz: ≥22 mm	

Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details.

Page 13 of 131 F-TP22-03 (Rev. 04)

^{*} When zoom scan is required and the reported SAR from the area scan based 1-g SAR estimation procedures of KDB 447498 is \leq 1.4 W/kg, \leq 8 mm, \leq 7 mm and \leq 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.

SECRET





8. Description of Test Position

8.1 Device Holder

The device holder is made out of low-loss POM material having the following dielectric parameters: relative permittivity ϵ and loss tangent δ =0.02.

8.2 Positioning for Testing

The SAR test separation distance for hotspot mode is determined according to device form factor. When the overall length and width of a device is > 9 cm x 5 cm (~ 3.5 " x 2"), a test separation distance of 10 mm is required for hotspot mode SAR measurements. A test separation distance of 5 mm or less is required for smaller devices. The smaller test distance is established by the operating configurations and exposure conditions of a device in next to body use configurations. The combination of test distance and 1-g SAR measurements required for near-body exposure also supports hand-held exposure; therefore, separate 10-g extremity SAR evaluation is not necessary.

F-TP22-03 (Rev. 04) Page 14 of 131

SECRET





9. RF Exposure Limits

HUMAN EXPOSURE	UNCONTROLLED ENVIRONMENT General Population (W/kg) or (mW/g)	CONTROLLED ENVIRONMENT Occupational (W/kg) or (mW/g)		
SPATIAL PEAK SAR * (Brain)	1.60	8.00		
SPATIAL AVERAGE SAR ** (Whole Body)	0.08	0.40		
SPATIAL PEAK SAR *** (Hands / Feet / Ankle / Wrist)	4.00	20.00		

NOTES:

- * The Spatial Peak value of the SAR averaged over any 1 g of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.
- ** The Spatial Average value of the SAR averaged over the whole-body.
- *** The Spatial Peak value of the SAR averaged over any 10 g of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

Uncontrolled Environments are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure. The general population/uncontrolled exposure limits are applicable to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be mad fully aware of the potential for exposure or cannot exercise control over their exposure. Members of the general public would come under this category when exposure is not employment-related; for example, in the case of a wireless transmitter that exposes persons in its vicinity.

Controlled Environments are defined as locations where there is exposure that may be incurred by persons who are aware of the potential for exposure, (i.e.as a result of employment or occupation). In general, occupational/controlled exposure limits are applicable to situations in which persons are exposed as a consequence of their employment, who have been made fully aware of the potential for exposure and can exercise control over their exposure. This exposure category is also applicable when the exposure is of a transient nature due to incidental passage through a location where the exposure levels may be higher than the general population/uncontrolled limits, but the exposed person is fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Page 15 of 131 F-TP22-03 (Rev. 04)





10. FCC SAR General Measurement Procedures

Power Measurements for licensed transmitters are performed using a base simulator under digital average power.

10.1 Measured and Reported SAR

Per FCC KDB Publication 447498 D01v06, when SAR is not measured at the maximum power level allowed for production units, the results must be scaled to the maximum tune-up tolerance limit according to the power applied to the individual channels tested to determine compliance. For simultaneous transmission, the measured aggregate SAR must be scaled according to the sum of the differences between the maximum tune-up tolerance and actual power used to test each transmitter. When SAR is measured at or scaled to the maximum tune-up tolerance limit, the results are referred to as Reported SAR. The highest reported SAR results are identified on the grant of equipment authorization according to procedures in KDB 690783 D01v01r03.

10.2 SAR Measurement Conditions for LTE

LTE modes are tested according to FCC KDB 941225 D05v02r05publication. Establishing connections with base station simulators ensure a consistent means for testing SAR and are recommended for evaluation SAR [4]. The R&S CMW500 or Anritsu MT8820C simulators are used for LTE output power measurements and SAR testing. Closed loop power control was used so the UE transmits with maximum output power during SAR testing. SAR tests were performed with the same number of RB and RB offsets transmitting on all TTI frames (maximum TTI).

10.2.1 Spectrum Plots for RB Configurations

A properly configured base station simulator was used for SAR tests and power measurements. Therefore, spectrum plots for RB configurations were not required to be included in this report.

10.2.2 MPR

MPR is permanently implemented for this device by the manufacturer. The specific manufacturer target MPR is indicated alongside the SAR results. MPR is enabled for this device, according to 3GPP TS36. 101 Section 6.2.3 - 6.2.5 under Table 6.2.3-1.

10.2.3 A-MPR

A-MPR (Additional MPR) has been disabled for all SAR tests by setting NS=01 on the base station simulator.

10.2.4 Required RB Size and RB offsets for SAR testing

According to FCC KDB 941225 D05v02r05

- a. Per sec 4.2.1, SAR is required for QPSK 1 RB Allocation for the largest bandwidth
 - The required channel and offset combination with the highest maximum output power is required for SAR.
 - ii. When the reported SAR is ≤ 0.8 W/kg, testing of the remaining RB offset configurations and required test channels is not required. Otherwise, SAR is required for the remaining required test channels using the RB offset configuration with highest output power for that channel.

F-TP22-03 (Rev. 04) Page 16 of 131





- iii. When the reported SAR for a required test channel is > 1.45 W/kg, SAR is required for all RB offset configurations for that channel.
- b. Per Sec 4.2.2, SAR is required for 50% RB allocation using the largest bandwidth following the same procedures outlined in Sec 4.2.1.
- c. Per Sec. 4.2.3, QPSK SAR is not required for the 100% allocation when the highest maximum output power for the 100% allocation is less than the highest maximum output power of the 1 RB and 50% RB allocations and the reported SAR for the 1 RB and 50% RB allocations is < 0.8 W/kg.
- d. Per Sec. 4.2.4 and 4.3, SAR test for higher order modulations and lower bandwidths configurations are not required when the conducted power of the required test configurations determined by Sec. 4.2.1 through 4.2.3 is less than or equal to 1/2 dB higher than the equivalent configuration using QPSK modulation and when the QPSK SAR for those configurations is < 1.45 W/kg.

10.3 SAR Testing with 802.11 Transmitters

The normal network operating configurations of 802.11 transmitters are not suitable for SAR measurements. Unpredictable fluctuations in network traffic and antenna diversity conditions can introduce undesirable variations in SAR results. The SAR for these devices should be measured using chipset based test mode software to ensure the results are consistent and reliable. See KDB Publication 248227 D01v02r02 for more details.

10.3.1 General Device Setup

Chipset based test mode software is hardware dependent and generally varies among manufacturers. The device operating parameters established in test mode for SAR measurements must be identical to those programmed in production units, including output power levels, amplifier gain settings and other RF performance tuning parameters.

A periodic duty factor is required for current generation SAR system to measure SAR. When 802.11 frame gaps are accounted for in the transmission, a maximum transmission duty factor of 92-96% is typically achievable in most test mode configurations. A minimum transmission duty factor of 85% is required to avoid certain hardware and device implementation issues related to wide range SAR scaling. The reported SAR is scaled to 100% transmission duty factor to determine compliance at the maximum tune-up tolerance limit.

10.3.2 2.4 GHz SAR test Requirements

SAR is measured for 2.4 GHz 802.11b DSSS using either the fixed test position or, when applicable, the initial test position procedure. SAR test reduction is determined according to the following:

- 1) When the reported SAR of the highest measured maximum output power channel for the exposure configuration is ≤ 0.8 W/kg, no further SAR testing is required for 802.11b DSSS is that exposure configuration.
- 2) When the reported SAR is > 0.8 W/kg, SAR is required for that position using the next highest measured output power channel. When any reported SAR is > 1.2 W/kg, SAR is required for the third channel; i.e., all channels require testing.

2.4 GHz 802.11 g/n OFDM are additionally evaluated for SAR if the highest reported SAR for 802.11b, adjusted by the ratio of the OFDM to DSSS specified maximum output power, is > 1.2 W/kg. When SAR is required for OFDM modes in 2.4 GHz band, the Initial Test Configuration Procedures should be followed.

F-TP22-03 (Rev. 04) Page 17 of 131



고 객 비 밀 CUSTOMER SECRET



Report No. HCT-SR-2301-FC004

F-TP22-03 (Rev. 04) Page 18 of 131





10.3.3 Initial Test Position Procedure

For exposure conditions with multiple test positions, such as handset operating nest to the ear, devices with hotspot mode or UMPC mini-tablet, procedures for initial test position can be applied. Using the transmission mode determined by the DSSS procedure or initial test configuration, area scans are measured for all positions in an exposure condition. The test position with the highest extrapolated (peak) SAR is used as the initial test position. When reported SAR for the initial test position is ≤ 0.4 W/kg for 1g SAR and ≤ 1.0 W/kg for 10g SAR, no additional testing for the remaining test position is required. Otherwise, SAR is evaluated at the subsequent highest peak SAR positions until the reported SAR result is ≤ 0.8 W/kg for 1g SAR and \leq 2.0 W/kg for 10g SAR or all test positions are measured.

F-TP22-03 (Rev. 04) Page 19 of 131





11. Output Power Specifications

11.1 LoRa Maximum Conducted Output Power

LoRa 125 kHz US										
channel	Fraguena (Mz)	Output P	ower(SF7)	Output Po	ower(SF10)					
	Frequency (MHz)	(dBm)	(mW)	(dBm)	(mW)					
Low	902.3	20.45	110.92	20.27	106.41					
Mid	908.5	20.31	107.40	20.32	107.65					
High	914.9	20.39	109.40	20.41	109.90					

LoRa 125 kHz AU										
channel	Fraguency (IIII)	Output P	ower(SF7)	Output Power(SF10)						
Channel	Frequency (MHz)	(dBm)	(mW)	(dBm)	(mW)					
Low	915.2	20.32	107.65	20.31	107.40					
Mid	921.4 20.3		109.14	20.37	108.89					
High	927.8	20.30	107.15	20.31	107.40					

Page 20 of 131 F-TP22-03 (Rev. 04)



11.2 LoRa 125 kHz Transmission Plot



F-TP22-03 (Rev. 04) Page 21 of 131





11.3 LTE Maximum Conducted Output Power

LTE B26 at Max Bandwidth does not support three non-overlapping channels. Per KDB 941225 D05v02r05, when a device supports overlapping channel assignment in a channel Bandwidth configuration, the mid channel of the group of overlapping channels should be selected for testing.

[LTE Band 26 Conducted Power]

LTE Band 26 _ 5 MHz Bandwidth

		DD	RB	Max. A	verage Power	r [dBm]	MPR Allowed	MDD
Bandwidth	Modulation	RB Size	Offset	26715 Ch. 816.5 MHz	26865 Ch. 831.5MHz	27015 Ch. 846.5 MHz	Per 3GPP [dB]	MPR [dB]
		1	0	22.41	22.55	22.42	0	0
		1	12	22.60	22.64	22.86	0	0
		1	24	23.02	22.97	22.87	0	0
	QPSK	12	0	21.74	21.79	21.59	0-1	1
		12	6	22.01	22.03	21.94	0-1	1
		12	11	22.13	22.12	22.08	0-1	1
5 MHz		25	0	22.10	22.14	22.15	0-1	1
3 MIL		1	0	21.87	21.98	21.87	0-1	1
		1	12	21.89	21.94	22.18	0-1	1
		1	24	22.35	22.31	22.23	0-1	1
	16QAM	12	0	20.90	20.90	20.53	0-2	2
		12	6	21.03	21.07	20.99	0-2	2
		12	11	21.22	21.30	21.12	0-2	2
		25	0	21.28	21.23	21.19	0-2	2

LTE Band 26 _ 10 MHz Bandwidth

		RB	RB	Max. A	verage Power	r [dBm]	MPR Allowed	MPR
Bandwidth	Modulation	Size Offset		26740 Ch. 819 MHz	26865 Ch. 831.5 MHz	26990 Ch. 844 MHz	Per 3GPP [dB]	[dB]
		1	0	22.27	22.46	22.21	0	0
		1	24	22.88	22.76	22.26	0	0
		1	49	22.40	22.78	22.49	0	0
	QPSK	25	0	21.97	21.84	21.47	0-1	1
		25	12	22.03	21.98	21.51	0-1	1
		25	24	22.14	22.17	21.73	0-1	1
10 MHz		50	0	22.15	22.11	21.73	0-1	1
I O MHZ		1	0	21.57	21.73	21.66	0-1	1
		1	24	22.31	22.11	21.52	0-1	1
		1	49	21.62	22.14	21.77	0-1	1
	16QAM	25	0	21.13	20.91	20.65	0-2	2
		25	12	21.18	20.98	20.58	0-2	2
		25	24	21.16	21.28	20.72	0-2	2
		50	0	21.24	21.12	20.74	0-2	2

Page 22 of 131 F-TP22-03 (Rev. 04)

고 객 비 밀 CUSTOMER SECRET





LTE Band 26 _ 15 MHz Bandwidth

		RB	RB	Max. Average Power [dBm]	MPR Allowed	MPR
Bandwidth	Modulation	Size Offset		26865 Ch. 831.5 Mtz	Per 3GPP [dB]	[dB]
		1	0	22.06	0	0
		1	36	22.87	0	0
		1	74	22.18	0	0
	QPSK	36	0	21.50	0-1	1
		36	18	21.99	0-1	1
		36	39	21.89	0-1	1
15 MHz		75	0	21.86	0-1	1
I D MHZ		1	0	21.34	0-1	1
		1	36	22.03	0-1	1
		1	74	21.69	0-1	1
	16QAM	36	0	20.56	0-2	2
		36	18	21.04	0-2	2
		36	39	21.07	0-2	2
		75	0	20.86	0-2	2

Page 23 of 131 F-TP22-03 (Rev. 04)





11.4 WIFI Conducted Power Measurement Method

Mode	Frequency [MHz]	Channel	IEEE 802.11 (2.4 배) Average Conducted Output Power [dBm]
	2 412	1	8.08
	2 437	6	8.26
802.11b	2 462	11	7.72
	2 467	12	7.68
	2 472	13	7.73
	2 412	1	8.06
	2 437	6	8.20
802.11g	2 462	11	7.71
	2 467	12	7.67
	2 472	13	7.70
	2 412	1	8.22
802.11n	2 437	6	8.37
(HT20)	2 462	11	7.90
(1120)	2 467	12	7.86
	2 472	13	7.82
002.11.	2 422	3	8.66
802.11n	2 437	6	7.97
(HT40)	2 452	9	8.46

F-TP22-03 (Rev. 04) Page 24 of 131





12. System Verification

12.1 Tissue Verification

The Head /body simulating material is calibrated by HCT using the DAKS 3.5 to determine the conductivity and permittivity.

				Table for He	ad Tissue Ve	erification			
Date of Tests	Tissue Temp. (°C)	Tissue Type	Freq. (MHz)	Measured Conductivit y σ (S/m)	Measured Dielectric Constant, ε	Target Conductivit y σ (S/m)	Target Dielectric Constant, ε	% dev σ	% dev ε
12/22/2022	20.7	HSL835	831.5	0.888	41.662	0.900	41.518	-1.33	0.35
12/23/2022	20.7	ПЗГОЭЭ	835	0.891	41.614	0.900	41.500	-1.00	0.27
	23.3		900	0.951	41.553	0.970	41.500	-1.96	0.13
01/10/2022		HSL900	902.3	0.952	41.525	0.972	41.500	-2.06	0.06
01/19/2023		H3L900	908.5	0.955	41.452	0.976	41.500	-2.15	-0.12
			914.9	0.960	41.438	0.980	41.500	-2.04	-0.15
			900	0.966	40.691	0.970	41.500	-0.41	-1.95
01 (20 (2022	21.0	1101000	915.2	0.983	40.668	0.980	41.500	0.31	-2.00
01/20/2023	21.0	HSL900	921.4	0.990	40.618	0.983	41.487	0.71	-2.09
			927.8	0.993	40.530	0.985	41.474	0.81	-2.28
12/26/2022	23.5	11013450	2437	1.800	39.800	1.789	39.223	0.61	1.47
12/26/2022	23.3	HSL2450	2450	1.820	39.800	1.800	39.200	1.11	1.53

F-TP22-03 (Rev. 04) Page 25 of 131





12.2 System Verification

System Verification Results - 1 g SAR

* Input Power: 50 mW

Freq.	Date	Probe (S/N)	Dipole (S/N)	Liquid	Amb. Temp. [°C]	Liquid Temp. [°C]	1 W Target SAR _{1g} (SPEAG) [W/kg]		1 W Normalized SAR _{1g} [W/kg]	Deviation [%]	Limit [%]
835	12/23/2022	3972	441	Head	20.8	20.7	9.73	0.499	9.98	+ 2.57	± 10
900	01/19/2023	7751	130	Head	23.3	23.3	10.8	0.508	10.16	- 5.93	± 10
900	01/20/2023	7751	130	Head	21.0	21.0	10.8	0.537	10.74	- 0.56	± 10
2 450	12/26/2022	3968	743	Head	23.7	23.5	53.2	2.73	54.6	+ 2.63	± 10

12.3 System Verification Procedure

SAR measurement was prior to assessment, the system is verified to the ± 10 % of the specifications at each frequency band by using the system verification kit. (Graphic Plots Attached)

- Cabling the system, using the verification kit equipment.
- Generate about 50 mW Input level from the signal generator to the Dipole Antenna.
- Dipole antenna was placed below the flat phantom.
- The measured one-gram SAR at the surface of the phantom above the dipole feed-point should be within 10 % of the target reference value.
- The results are normalized to 1 W input power.

Note;

SAR Verification was performed according to the FCC KDB 865664 D01v01r04.

Page 26 of 131 F-TP22-03 (Rev. 04)





13. SAR Test Data Summary

						LoRa I	Body SAR	(125 kHz l	US)					
Frequ	iency	Mode		Tune- Up Limit	Meas. Power			Test Position	Duty Cycle	Distance	Measured SAR 1g	Scaling Factor	Reported SAR 1g	Plot No.
MHz	Ch.		(kHz)	(dB)	(dB)	(dB)				(mm)	(W/kg)		(W/kg)	
902.3	0	LoRa	125	22.0	20.45	-0.06	SF7	Rear	1:1	0	1.030	1.429	1.472	1
902.3	0	LoRa	125	22.0	20.45	-0.05	SF7	Front	1:1	0	0.806	1.429	1.152	
902.3	0	LoRa	125	22.0	20.45	0.00	SF7	Left	1:1	0	0.472	1.429	0.674	
902.3	0	LoRa	125	22.0	20.45	-0.03	SF7	Right	1:1	0	0.675	1.429	0.965	
902.3	0	LoRa	125	22.0	20.45	-0.01	SF7	Тор	1:1	0	0.310	1.429	0.443	
908.5	31	LoRa	125	22.0	20.31	0.01	SF7	Rear	1:1	0	0.944	1.476	1.393	
914.9	63	LoRa	125	22.0	20.39	0.01	SF7	Rear	1:1	0	0.849	1.449	1.230	
908.5	31	LoRa	125	22.0	20.31	-0.11	SF7	Front	1:1	0	0.816	1.476	1.204	
914.9	63	LoRa	125	22.0	20.39	-0.03	SF7	Front	1:1	0	0.747	1.449	1.082	
908.5	31	LoRa	125	22.0	20.31	-0.04	SF7	Right	1:1	0	0.584	1.476	0.862	
914.9	63	LoRa	125	22.0	20.39	-0.04	SF7	Right	1:1	0	0.536	1.449	0.777	
902.3	0	LoRa	125	22.0	20.45	0.01	SF7	Rear	1:1	0	0.984	1.429	1.406	*
902.3	0	LoRa	125	22.0	20.45	-0.01	SF7	Rear	1:1	0	1.000	1.429	1.429	**
	ANSI/ IEEE C95.1 - 2005— Safety Limit Spatial Peak Uncontrolled Exposure/ General Population									Δνα	Body 1.6 W/I	kg		
908.5 914.9 908.5 914.9 908.5 914.9 902.3	63 31 63 31 63 0	LoRa LoRa LoRa LoRa LoRa LoRa LoRa LoRa	125 125 125 125 125 125 125 125 125 SI/ IEEE C9	22.0 22.0 22.0 22.0 22.0 22.0 22.0 22.0	20.31 20.39 20.31 20.39 20.31 20.39 20.45 20.45 05– Safe	0.01 0.01 -0.11 -0.03 -0.04 -0.04 0.01 -0.01 ty Limit	SF7 SF7 SF7 SF7 SF7 SF7 SF7 SF7	Rear Rear Front Front Right Right Rear	1:1 1:1 1:1 1:1 1:1 1:1 1:1	0 0 0 0 0 0	0.944 0.849 0.816 0.747 0.584 0.536 0.984 1.000 Body	1.476 1.449 1.476 1.476 1.476 1.476 1.429 1.429		1.393 1.230 1.204 1.082 0.862 0.777 1.406

Note: * Data entry indicate Variability measurement.

^{**} Data entry indicate Device holder perturbation measurement.

	LoRa Body SAR (125 kHz Al													
Frequency		Mode		Tune- Up Limit	Meas. Power	Power Drift	SF	Test Position	Duty Cycle	Distance	Measured SAR 1g	Scaling Factor	Reported SAR 1g	Plot No.
MHz	Ch.		(kHz)	(dB)	(dB)	(dB)				(mm)	(W/kg)		(W/kg)	
921.4	31	LoRa	125	22.0	20.38	0.14	SF7	Rear	1:1	0	0.814	1.452	1.182	
921.4	31	LoRa	125	22.0	20.38	0.05	SF7	Front	1:1	0	0.753	1.452	1.093	
921.4	31	LoRa	125	22.0	20.38	-0.07	SF7	Left	1:1	0	0.257	1.452	0.373	
921.4	31	LoRa	125	22.0	20.38	-0.07	SF7	Right	1:1	0	0.518	1.452	0.752	
921.4	31	LoRa	125	22.0	20.38	0.02	SF7	Тор	1:1	0	0.549	1.452	0.797	
915.2	0	LoRa	125	22.0	20.32	0.06	SF7	Rear	1:1	0	0.978	1.472	1.440	2
927.8	63	LoRa	125	22.0	20.30	0.00	SF7	Rear	1:1	0	0.676	1.479	1.000	
915.2	0	LoRa	125	22.0	20.32	-0.07	SF7	Front	1:1	0	0.707	1.472	1.041	
927.8	63	LoRa	125	22.0	20.30	0.18	SF7	Front	1:1	0	0.657	1.479	0.972	
915.2	0	LoRa	125	22.0	20.32	-0.03	SF7	Rear	1:1	0	0.941	1.472	1.385	*
915.2	0	LoRa	125	22.0	20.32	-0.04	SF7	Rear	1:1	0	0.959	1.472	1.412	**
	ANSI/ IEEE C95.1 - 2005– Safety Limit Spatial Peak									Body 1.6 W/				
	Uncontrolled Exposure/ General Population							Averaged over 1 gram						

Note: * Data entry indicate Variability measurement.

F-TP22-03 (Rev. 04) Page 27 of 131

^{**} Data entry indicate Device holder perturbation measurement.

고 객 비 밀 CUSTOMER SECRET





							LTE Band	nd 26 Body SAR								
Frequ	iency	Mode	Band width (kHz)	Tune- Up Limit	Meas. Power	Power Drift	Test Position	MPR	RB Size	RB Offset	_	Distance	Measure d SAR 1g	Scaling Factor	Reported SAR 1g	Plot No.
MHz	Ch.		(KIIZ)	(dB)	(dB)	(dB)		(dB)				(mm)	(W/kg)		(W/kg)	
831.5	26865	QPSK	15	24	22.87	0.02	Rear	0	1	36	1:1	10	0.235	1.297	0.305	3
831.5	26865	QPSK	15	23	21.99	-0.04	Rear	1	36	18	1:1	10	0.200	1.262	0.252	
831.5	26865	QPSK	15	24	22.87	-0.03	Front	0	1	36	1:1	10	0.158	1.297	0.205	
831.5	26865	QPSK	15	23	21.99	0.09	Front	1	36	18	1:1	10	0.140	1.262	0.177	
831.5	26865	QPSK	15	24	22.87	-0.04	Left	0	1	36	1:1	10	0.066	1.297	0.086	
831.5	26865	QPSK	15	23	21.99	-0.02	Left	1	36	18	1:1	10	0.056	1.262	0.071	
831.5	26865	QPSK	15	24	22.87	0.01	Right	0	1	36	1:1	10	0.081	1.297	0.105	
831.5	26865	QPSK	15	23	21.99	-0.02	Right	1	36	18	1:1	10	0.068	1.262	0.086	
831.5	26865	QPSK	15	24	22.87	-0.02	Bottom	0	1	36	1:1	10	0.078	1.297	0.101	
831.5	26865	QPSK	15	23	21.99	-0.09	Bottom	1	36	18	1:1	10	0.067	1.262	0.085	
	ANSI/ IEEE C95.1 - 2005– Safety Limit					Body										
	Spatial Peak						1.6 W/kg									
	Uncontrolled Exposure/ General Population							Averaged over 1 gram								

	2.4 GHz WLAN Body SAR															
Freque	ncy	Mode	Band width		Up	Meas. Power (dBm)		Test Position	Duty Cycle		Area Scan Peak SAR	Meas. SAR	Scaling Factor	Scaling Factor (Duty)	Reported SAR	Plot No.
MHz	Ch.		(MHz)	(*****	(dB)	(dB)	(dB)			(mm)	(W/kg)	(W/kg)		(= 2.5)	(W/kg)	
2 437	6	802.11b	20	1	10	8.26	0.17	Rear	100	10	0.031	0.006	1.493	1.000	0.009	
2 437	6	802.11b	20	1	10	8.26	-0.16	Front	100	10	0.014	0.014	1.493	1.000	0.021	
2 437	6	802.11b	20	1	10	8.26	0.17	Right	100	10	0.064	0.030	1.493	1.000	0.045	4
		Α	NSI/ II	EE C95.	1 - 200	5– Safe	ty Limi	t	•				Во	dy	•	
Spatial Peak												1.6 V	V/kg			
	Uncontrolled Exposure/ General Population											Ave	eraged o	ver 1 gr	am	

Page 28 of 131 F-TP22-03 (Rev. 04)

SECRET





13.1 SAR Test Notes

General Notes:

- The test data reported are the worst-case SAR values according to test procedures specified in IEEE 1528-2013, FCC KDB Procedure.
- Batteries are fully charged at the beginning of the SAR measurements. A standard battery was used for all SAR measurements.
- 3. Liquid tissue depth was at least 15.0 cm for all frequencies.
- 4. The manufacturer has confirmed that the device(s) tested have the same physical, mechanical and thermal characteristics and are within operational tolerances expected for production units.
- 5. SAR results were scaled to the maximum allowed power to demonstrate compliance per FCC KDB 447498 D01v06.
- Per FCC KDB 648474 D04v01r03, SAR was evaluated without a headset connected to the device. Since the standalone reported SAR was 1.2 W/kg, no additional SAR evaluation using a headset cable were required.
- Per FCC KDB 865664 D01v01r04, variability SAR measurement were performed when the measured SAR results for a frequency band were greater than or equal to 0.8 W/kg for 1g SAR and >2 for 10g SAR Please see Section 15 for variability analysis.

LTE Notes:

- 1. LTE Considerations: LTE test configurations are determined according to SAR Evaluation Consideration for LTE Devices in FCC KDB 941225 D05v02r05.
- According to FCC KDB 941225 D05v02r05: When the reported SAR is 0.8 W/kg, testing of the 100% RB allocation and required test channels is not required. Otherwise, SAR is required for the remaining required test channels using the 1RB, 50%RB and 100%RB allocation with highest output power for that channel. Only one channel, and as reported SAR values for 1RB allocation and 50%RB allocation were less than 1.45W/kg only the highest power RB offset for each allocation was required.
- MPR is permanently implemented for this device by the manufacturer. The specific manufacturer target MPR is indicated alongside the SAR results. MPR is enabled for this device, according to target MPR is indicated alongside the SAR results.
- When Power reduction is applied, MPR is 0 for some modes.
- A-MPR was disabled for all SAR tests by setting NS=01 on the base station simulator.

WLAN Notes:

- 1. For held-to-ear and hotspot operations, the initial test position procedures were applied. For initial test position, the highest extrapolated peak SAR will be used. When reported SAR for the initial test position is ≤ 0.4 W/kg for 1g SAR and ≤ 1.0 W/kg for 10g SAR, no additional testing for the remaining test positions was required. Otherwise, SAR is evaluated at the subsequent highest peak SAR positions until the reported SAR results is ≤ 0.8 W/kg for 1g SAR and ≤ 2.0 W/kg for 10g SAR or all test position are measured.
- 2. Per KDB 2482227 D01v02r02 justification for test configurations of 2.4 6th WiFi Single transmission chain operations, the highest measured maximum output power channel for DSSS was selected for SAR measurement. SAR for OFDM modes (2.4 6Hz 802.11 g/n) was not required due to the maximum allowed powers and the highest reported DSSS SAR
- 3. When the maximum reported 1g averaged SAR is ≤ 0.8 W/kg, SAR testing on additional channels was not required. Otherwise, SAR for the next highest output power channel was required until the reported SAR result was ≤ 1.20 W/kg or all test channels were measured.

F-TP22-03 (Rev. 04) Page 29 of 131





14. SAR Simultaneous Transmission Analysis.

Band	Configuration	Main	2.4 GHz SISO Ant.1	Σ
buna	Comiguration	(W/kg)	(W/kg)	(W/kg)
		1	2	1+2
	Rear	0.305	0.009	0.314
	Front	0.205	0.021	0.226
LTE Band 26	Left	0.086		0.086
LIE DANG 20	Right	0.105	0.045	0.150
	Тор			0.000
	Bottom	0.101		0.101
	Rear	1.472	0.009	1.481
	Front	1.204	0.021	1.225
LoRA	Left	0.674		0.674
(125 kHz US)	Right	0.965	0.045	1.010
	Тор	0.443		0.443
	Bottom			0.000
	Rear	1.440	0.009	1.449
	Front	1.093	0.021	1.114
LoRA	Left	0.373		0.373
(125 kHz AU)	Right	0.752	0.045	0.797
	Тор	0.797		0.797
	Bottom			0.000

Note:

The LoRA mode was evaluated for simultaneous transmission analysis with the WLAN mode as the more conservatively evaluated measured SAR result.

F-TP22-03 (Rev. 04) Page 30 of 131



15. SAR Measurement Variability and Uncertainty

Per FCC KDB Publication 865664 D01v04, SAR measurement variability is assessed when measured 1g SAR is >0.8W/kg or 10g SAR is >2.0 W/kg. Since Highest measured SAR for this device was below these limits, measurement variability was not assessed

In accordance with KDB procedure 865664 D01v01r04 SAR measurement 100 MHz to 6 GHz, SAR additional measurements are repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device should be returned to ambient conditions (normal room temperature) with the battery fully charged before it is re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

SAR Measurement variability was assessed using the following procedures for each frequency band:

- 1) Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg for 1g SAR or < 2.0 W/kg for 10g SAR; steps 2) through 4) do not apply.
- 2) When the original highest measured 1g SAR is \geq 0.80 W/kg or 10g SAR \geq 2.0W/kg, repeat that measurement once.
- 3) Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20 or when the original or repeated measurement is \geq 1.45 W/kg for 1g SAR or \geq 3.625 W/kg for 10g SAR (\sim 10% from the 1-g SAR limit).
- 4) Perform a third repeated measurement only if the original, first or second repeated measurement is ≥ 1.5 W/kg for 1g SAR or ≥ 3.75 W/kg for 10g SAR and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.

SAR measurement variability Results

Frequency		Mode/Band	Configuration	Measured SAR	Repeated SAR	SAR Ratio	
MHz	Channel	Wode/ Ballu	Configuration	(W/kg)	(W/kg)	SAK KALIO	
902.3	0	LoRa Body SAR (125 kHz US)	Rear	1.030	0.984	0.96	
915.2	0	LoRa Body SAR (125 kHz AU)	Rear	0.978	0.941	0.96	

F-TP22-03 (Rev. 04) Page 31 of 131





16. Device Holder Perturbation Verification.

In accordance with published DUT Holder Perturbations in Oct.2016 TCB Workshop. When Highest reported SAR is over 1.2 W/kg, Holder Perturbation Verification is required for each antenna, using the highest configuration among all applicable frequency bands.

Frequency				Highest Rep			
		Mode/Band	Configuration	(without Device Holder)	(with Device Holder)	Deviation (%)	
MHz	Channel			(W/kg)	(W/kg)		
902.3	0	LoRa Body SAR (125 kHz US)	Rear	1.472	1.429	-2.92	
915.2	0	LoRa Body SAR (125 kHz AU)	Rear	1.440	1.412	-1.94	

F-TP22-03 (Rev. 04) Page 32 of 131





17. Measurement Uncertainty

The measured SAR was <1.5 W/kg for 1g SAR and <3.75 W/kg For 10g SAR for all frequency bands. Therefore, per KDB Publication 865664 D01v01r04,the extended measurement uncertainty analysis per IEEE1528-2013 was not required.

F-TP22-03 (Rev. 04) Page 33 of 131





18. SAR Test Equipment

Manufacturer	Type / Model	S/N	Calib. Date	Calib.Interval	Calib.Due
SPEAG	SAM Phantom	-	N/A	N/A	N/A
Staubli	CS8Cspeag-TX60L	F10/5D1CA1/C/01	N/A	N/A	N/A
Staubli	CS9spe-TX2-60	F/21/0029002/C/001	N/A	N/A	N/A
Staubli	TX60 XIspeag	F10/5D1CA1/A/01	N/A	N/A	N/A
Staubli	TX2-60 Lspe	F/21/0029002/A/001	N/A	N/A	N/A
Staubli	Teach Pendant (Joystick)	S-0123	N/A	N/A	N/A
Staubli	Teach Pendant (Joystick)	D21144507C	N/A	N/A	N/A
Staubli	Light Alignment Sensor	SE UKS 030 AA	N/A	N/A	N/A
Staubli	Light Alignment Sensor	2007	N/A	N/A	N/A
Staubli	Light Alignment Sensor	SE UKS 030 AA	N/A	N/A	N/A
TESTO	175-H1/Thermometer	44606611906	04/15/2022	Annual	04/15/2023
TESTO	608-H1/Thermometer	83239085	10/26/2022	Annual	10/26/2023
SPEAG	DAE4	1225	11/24/2022	Annual	11/24/2023
SPEAG	DAE4	652	01/24/2022	Annual	01/24/2023
SPEAG	DAE4	1464	06/15/2022	Annual	06/15/2023
SPEAG	DAE4	1422	08/18/2022	Annual	08/18/2023
SPEAG	E-Field Probe EX3DV4	3968	09/28/2022	Annual	09/28/2023
SPEAG	E-Field Probe EX3DV4	3972	08/19/2022	Annual	08/19/2023
SPEAG	E-Field Probe EX3DV4	7751	10/07/2022	Annual	10/07/2023
SPEAG	Dipole D835V2	441	07/15/2022	Annual	07/15/2023
SPEAG	Dipole D900V2	130	01/21/2022	Annual	01/21/2023
SPEAG	Dipole D2450V2	743	05/31/2022	Annual	05/31/2023
SPEAG	DAKS 3.5	1038	03/28/2022	Annual	03/28/2023
SPEAG	DAKS_VNA R140	0141013	03/25/2022	Annual	03/25/2023
Agilent	Power Meter N1911A	MY45101406	06/27/2022	Annual	06/27/2023
Agilent	Power Sensor N1921A	MY55220026	08/02/2022	Annual	08/02/2023
Agilent	Power Meter E4419B	MY41291386	09/27/2022	Annual	09/27/2023
Agilent	Power Sensor 8481A	SG1091286	09/27/2022	Annual	09/27/2023
Agilent	Power Sensor 8481A	MY41090873	02/07/2022	Annual	02/07/2023
Agilent	Signal Generator N5182A	MY47070230	04/28/2022	Annual	04/28/2023
EMPOWER	RF Power Amplifier	1084	06/20/2022	Annual	06/20/2023
MICRO LAB	LP Filter / LA-15N	10453	09/27/2022	Annual	09/27/2023
MICRO LAB	LP Filter / LA-30N	-	09/27/2022	Annual	09/27/2023
Agilent	Attenuator (3dB)	MY39260298	08/25/2022	Annual	08/25/2023
Agilent	Directional Bridge	3140A04581	05/26/2022	Annual	05/26/2023
Agilent	MXA Signal Analyzer	MY50510407	06/07/2022	Annual	06/07/2023
WEINSCHEL	30dB Attenuator	CE6106	11/15/2022	Annual	11/15/2023
HP	Attenuator (20dB)	09271	08/25/2022	Annual	08/25/2023
ANRTISU	Radio Communication Tester MT8820C	6200695605	04/15/2022	Annual	04/15/2023
ANRTISU	Radio Communication Tester MT8821C	6262287674	05/09/2022	Annual	05/09/2023

^{1.} The E-field probe was calibrated by SPEAG, by the waveguide technique procedure. Dipole Verification measurement is performed by HCT Lab. before each test. The brain/body simulating material is calibrated by HCT using the DAKS 3.5 to determine the conductivity and permittivity (dielectric constant) of the brain/body-equivalent material.

F-TP22-03 (Rev. 04) Page 34 of 131

고 객 비 밀 CUSTOMER SECRET





Attachment 1. – SAR Test Plots

Page 35 of 131 F-TP22-03 (Rev. 04)





Test Laboratory: HCT CO., LTD EUT Type: LTE Mobile WiFi

 $\begin{array}{lll} \mbox{Liquid Temperature:} & 23.3 \ ^{\circ} \mbox{C} \\ \mbox{Ambient Temperature:} & 23.3 \ ^{\circ} \mbox{C} \\ \mbox{Test Date:} & 01/19/2023 \end{array}$

Plot No.:

Communication System: UID 0, LoRa 125 kHz (0); Frequency: 902.3 MHz; Duty Cycle: 1:1 Medium parameters used (interpolated): f = 902.3 MHz; σ = 0.952 S/m; ϵ_r = 41.525; ρ = 1000 kg/m³ Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 SN7751; ConvF(9.37, 9.37, 9.37) @ 902.3 MHz; Calibrated: 2022-10-07
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1464; Calibrated: 2022-06-15
- Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD; Serial: TP:xxxxx
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.13 (7474)

900MHz LoRa Body Rear 125 kHz SF7 Och/Area Scan (6x9x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 1.61 W/kg

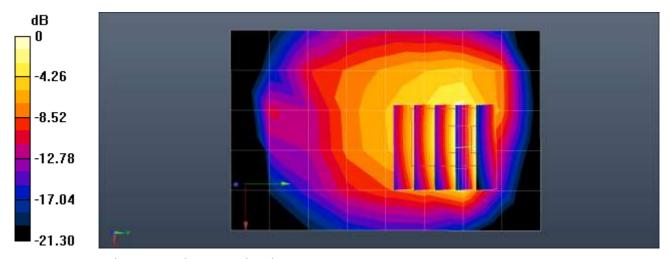
900MHz LoRa Body Rear 125 kHz SF7 Och/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm,

dy=8mm, dz=5mm

Reference Value = 24.21 V/m; Power Drift = -0.06 dB

Peak SAR (extrapolated) = 2.88 W/kg

SAR(1 g) = 1.03 W/kg; SAR(10 g) = 0.529 W/kg Maximum value of SAR (measured) = 1.76 W/kg



0 dB = 1.76 W/kg = 2.46 dBW/kg

F-TP22-03 (Rev. 04) Page 36 of 131

Ш

CUSTOMER SECRET





HCT CO., LTD Test Laboratory: EUT Type: LTE Mobile WiFi

Liquid Temperature: 21.0 °C 21.0 °C Ambient Temperature: Test Date: 01/20/2023

Plot No.:

Communication System: UID 0, LoRa 125 kHz (AU) (0); Frequency: 915.2 MHz;Duty Cycle: 1:1 Medium parameters used (interpolated): f = 915.2 MHz; $\sigma = 0.983 \text{ S/m}$; $\epsilon_r = 40.668$; $\rho = 1000 \text{ kg/m}^3$ Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 SN7751; ConvF(9.37, 9.37, 9.37) @ 915.2 MHz; Calibrated: 2022-10-07
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1422; Calibrated: 2022-08-18
- Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD; Serial: TP:xxxx
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.13 (7474)

900MHz LoRa Body Rear 125 ktz SF7 0ch/Area Scan (6x9x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 1.18 W/kg

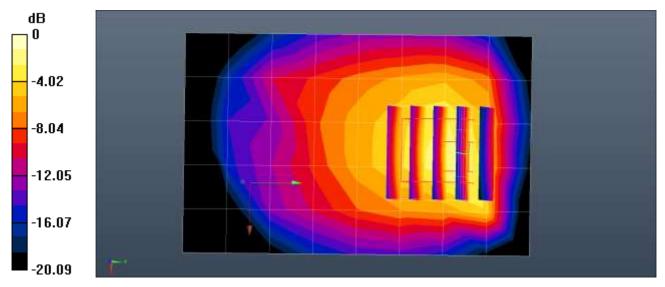
900MHz LoRa Body Rear 125 kHz SF7 Och/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm,

dy=8mm, dz=5mm

Reference Value = 22.42 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 2.70 W/kg

SAR(1 g) = 0.978 W/kg; SAR(10 g) = 0.505 W/kgMaximum value of SAR (measured) = 1.68 W/kg



0 dB = 1.68 W/kg = 2.25 dBW/kg

F-TP22-03 (Rev. 04) Page 37 of 131

ы

CUSTOMER SECRET





HCT CO., LTD Test Laboratory: EUT Type: LTE Mobile WiFi

Liquid Temperature: 20.7 °C 20.8 ℃ Ambient Temperature: Test Date: 12/23/2022

Plot No.:

Communication System: UID 0, LTE Band 26 (0); Frequency: 831.5 MHz; Duty Cycle: 1:1 Medium parameters used (interpolated): f = 831.5 MHz; $\sigma = 0.888$ S/m; $\epsilon_r = 41.662$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 SN3972; ConvF(9.59, 9.59, 9.59) @ 831.5 MHz; Calibrated: 2022-08-19
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1225; Calibrated: 2022-11-24
- Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD; Serial: TP:xxxx
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.13 (7474)

LTE Band 26 Body Rear QPSK 15 Mtz 1RB 36offset 26865ch/Area Scan (6x9x1): Measurement grid:

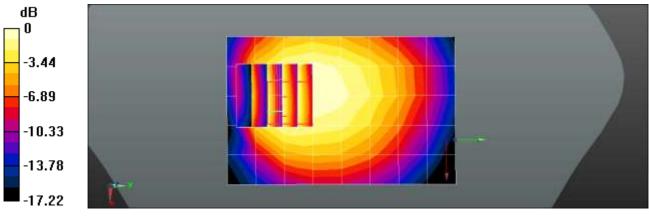
dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.321 W/kg

LTE Band 26 Body Rear QPSK 15 WHz 1RB 36offset 26865ch/Zoom Scan (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm Reference Value = 18.00 V/m; Power Drift = 0.02 dB Peak SAR (extrapolated) = 0.432 W/kg

SAR(1 g) = 0.235 W/kg; SAR(10 g) = 0.151 W/kgMaximum value of SAR (measured) = 0.333 W/kg



0 dB = 0.333 W/kg = -4.78 dBW/kg

F-TP22-03 (Rev. 04) Page 38 of 131





Test Laboratory: HCT CO., LTD EUT Type: LTE Mobile WiFi

Liquid Temperature: 23.5 $^{\circ}$ C Ambient Temperature: 23.7 $^{\circ}$ C Test Date: 12/26/2022

Plot No.: 4

Measurement Report for IML-C6400W, EDGE RIGHT, WLAN 2.4GHz, IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 96pc duty cycle), Channel 6 (2437.0 MHz)

Exposure Conditions

Phantom Section, TSL	Position, Test Distance [mm]	Band	Frequency [배ː], Channel Number	Conversion Factor	TSL Conductivity [S/m]	y TSL Permittivity
Flat, HSL	EDGE RIGHT, 10.00	WLAN 2.4GHz	2437.0, 6	7.64	1.80	39.8

Hardware Setup

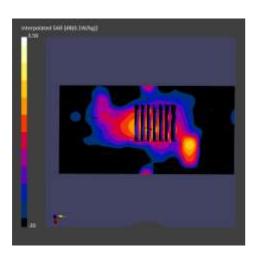
Phantom	Probe, Calibration Date	DAE, Calibration Date
Twin-SAM V8.0 (30deg probe tilt) - 2047	EX3DV4 - SN3968, 2022-09-28	DAE4 Sn652, 2022-01-24

Scans Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	72.0 x 144.0	30.0 x 30.0 x 30.0
Grid Steps [mm]	12.0 x 12.0	5.0 x 5.0 x 1.5
Sensor Surface [mm]	3.0	1.4
Graded Grid	Yes	Yes
Grading Ratio	1.5	1.5

Measurement Results

	Area Scan	Zoom Scan
psSAR1g [W/kg]	0.064	0.030
psSAR10g [W/kg]	0.022	0.014
Power Drift [dB]	-0.06	0.17



F-TP22-03 (Rev. 04) Page 39 of 131

고 객 비 밀 CUSTOMER SECRET





Attachment 2. – Dipole Verification Plots

Page 40 of 131 F-TP22-03 (Rev. 04)



■ Verification Data (835 MHz Head)

Test Laboratory: HCT CO., LTD Input Power 0.05 W
Liquid Temp: 20.7 ℃
Test Date: 12/23/2022

DUT: Dipole 835 MHz D835V2; Type: D835V2

Communication System: UID 0, CW (0); Frequency: 835 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): f = 835 MHz; $\sigma = 0.891$ S/m; $\epsilon_r = 41.614$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 SN3972; ConvF(9.59, 9.59, 9.59) @ 835 MHz; Calibrated: 2022-08-19
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1225; Calibrated: 2022-11-24
- Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD; Serial: TP:xxxx
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.13 (7474)

Dipole/835 MHz **Head Verification/Area Scan (7x13x1):** Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.667 W/kg

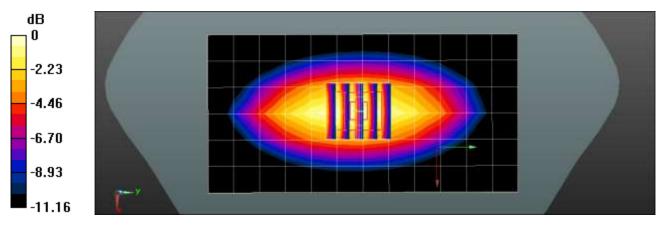
Dipole/835 MHz Head Verification/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm,

dy=8mm, dz=5mm

Reference Value = 28.75 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 0.776 W/kg

SAR(1 g) = 0.499 W/kg; SAR(10 g) = 0.323 W/kgMaximum value of SAR (measured) = 0.681 W/kg



0 dB = 0.681 W/kg = -1.67 dBW/kg

F-TP22-03 (Rev. 04) Page 41 of 131





■ Verification Data (900 MHz Head)

Test Laboratory: HCT CO., LTD Input Power 0.05 W Liquid Temp: 23.3 ℃ Test Date: 01/19/2023

DUT: D900V2; Type: D900V2; Serial: SN130

Communication System: UID 0, CW (0); Frequency: 900 MHz; Duty Cycle: 1:1

Medium parameters used: f = 900 MHz; σ = 0.951 S/m; ϵ_r = 41.553; ρ = 1000 kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 SN7751; ConvF(9.37, 9.37, 9.37) @ 900 MHz; Calibrated: 2022-10-07
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1464; Calibrated: 2022-06-15
- Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD; Serial: TP:xxxx
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.13 (7474)

Dipole/900MHz Head Verification/Area Scan (7x13x1): Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.671 W/kg

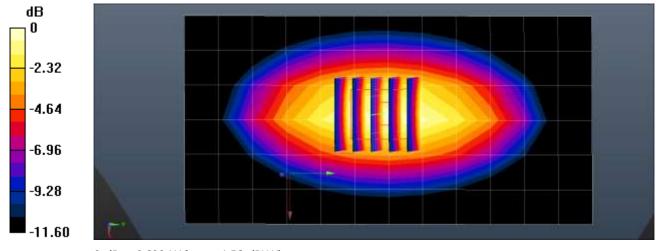
Dipole/900MHz Head Verification/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm,

dy=8mm, dz=5mm

Reference Value = 28.08 V/m; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 0.799 W/kg

SAR(1 g) = 0.508 W/kg; SAR(10 g) = 0.324 W/kg Maximum value of SAR (measured) = 0.699 W/kg



0 dB = 0.699 W/kg = -1.56 dBW/kg

F-TP22-03 (Rev. 04) Page 42 of 131



■ Verification Data (900 MHz Head)

Test Laboratory: HCT CO., LTD Input Power 0.05 W
Liquid Temp: 21.0 °C
Test Date: 01/20/2023

DUT: D900V2; Type: D900V2; Serial: SN130

Communication System: UID 0, CW (0); Frequency: 900 MHz; Duty Cycle: 1:1

Medium parameters used: f = 900 MHz; $\sigma = 0.966$ S/m; $\varepsilon_r = 40.691$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 SN7751; ConvF(9.37, 9.37, 9.37) @ 900 MHz; Calibrated: 2022-10-07
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1422; Calibrated: 2022-08-18
- Phantom: SAM (20deg probe tilt) with CRP v5.0; Type: QD000P40CD; Serial: TP:xxxx
- Measurement SW: DASY52, Version 52.10 (3); SEMCAD X Version 14.6.13 (7474)

Dipole/900MHz Head Verification/Area Scan (7x13x1): Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.731 W/kg

Dipole/900MHz Head Verification/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm,

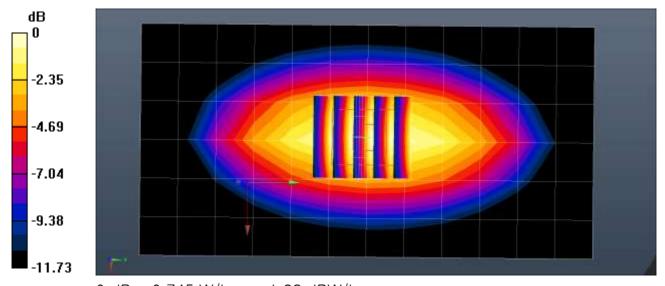
dy=8mm, dz=5mm

Reference Value = 29.19 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 0.858 W/kg

SAR(1 g) = 0.537 W/kg; SAR(10 g) = 0.341 W/kg

Maximum value of SAR (measured) = 0.745 W/kg



0 dB = 0.745 W/kg = -1.28 dBW/kg

F-TP22-03 (Rev. 04) Page 43 of 131

CUSTOMER SECRET





■ Verification Data (2 450 MHz Head)

Test Laboratory: HCT CO., LTD Input Power 0.05 W Liquid Temp: 23.5 °C Test Date: 12/26/2022

Measurement Report for Device, CW, Channel 0 (2450.0 MHz)

Exposure Conditions

Phantom Section, TSL	Position, Test Distance [mm]	Band Group, UID	Frequency [Mlz], Channel Number	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	,	, 0	2450.0, 0	7.64	1.82	39.8

Hardware Setup

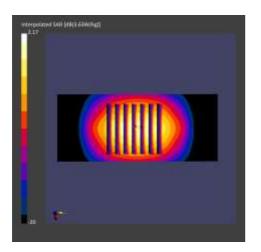
Phantom Probe, Calibration Date DAE, Calibration Date
Twin-SAM V8.0 (30deg probe tilt) - 2047 EX3DV4 - SN3968, 2022-09-28 DAE4 Sn652, 2022-01-24

Scans Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	40.0 x 96.0	30.0 x 30.0 x 30.0
Grid Steps [mm]	10.0 x 12.0	5.0 x 5.0 x 1.5
Sensor Surface [mm]	3.0	1.4
Graded Grid	Yes	Yes
Grading Ratio	1.5	1.5
_		

Measurement Results

	Area Scan	Zoom Scan
psSAR1g [W/kg]	2.76	2.73
psSAR10g [W/kg]	1.26	1.22
Power Drift [dB]	0.01	-0.01



F-TP22-03 (Rev. 04) Page 44 of 131





Attachment 3. – SAR Tissue Characterization

The brain and muscle mixtures consist of a viscous gel using hydrox-ethyl cellulose (HEC) gelling agent and saline solution (see Table 3.1). Preservation with a bacteriacide is added and visual inspection is made to make sure air bubbles are not trapped during the mixing process. The mixture is calibrated to obtain proper dielectric constant (permittivity) and conductivity of the desired tissue. The mixture characterizations used for the brain and muscle tissue simulating liquids are according to the data by C. Gabriel and G. Harts grove.

Freq.(MHz)	300	45	50	835		900		1 450		1.8	300		1 9	900	1 950	2 000	2 1	00	2 4	50	3 000
Recipe No.	1	1	3	1	1	2	3	1	1	2	2	3	1	2	4	1	1	2	2	3	2
								Ingre	edients	s (% b	y weig	ght)									
1,2-						64,81															
Propanediol						04,01															
Diacetin			48.9				49,2					49,43								49.75	
Bactericide	0,19	0,19	0,5	0,10	0,10		0,5					0,50								0,50	
DGBE								45,51	47,00	13,84	44,92		44,92	13,84	45,0	50,0	50,0	7,99	7,99		7,99
HEC	0,98	0,98		1,00	1,00																
NaCl	5,95	3,95	1,7	1,45	1,48	0,79	1,1	0,67	0,36	0,35	0,18	0,64	0,18	0,35				0,16	0,16		0,16
Sucrose	55,32	56,32		57,00	56,50																
Triton X-100										30,45				30,45				19,97	19,97		19,97
Water	37,56	38,56	48,9	40,45	40,92	34,40	49,2	53,82	52,64	55,36	54,90	49,43	54,90	55,36	55,0	50,0	50,0	71,88	71,88	49,75	71,88
							М	easur	ed die	lectric	parar	neters	;								
13	46,0	43,4	44,3	41,6	41,2	41,8	42,7	40,9	39,3	41,0	40,4	39,2	39,9	41,0	40,1	37,0	36,8	41,1	40,3	39,2	37,9
σ(S/m)	0,86	0,85	0,90	0,90	0,98	0,97	0,99	1,21	1,39	1,38	1,40	1,40	1,42	1,38	1,41	1,40	1,51	1,55	1,88	1,82	2,46
Temp. [°C]	22	22	20	22	22	22	20	22	22	21	22	20	21	21	20	22	22	20	20	20	20
								Targe	t value	es (fro	m Tab	le 1)									
r 3	45.3	43	,5	41,5		41,5		40,5				40),0				39	9,8	39),2	38,5
σ(S/m)	0,87	0,8	87	0,90		0,97		1,20				1,	40				1,	49	1,	80	2,40

Composition of the Tissue Equivalent Matter

F-TP22-03 (Rev. 04) Page 45 of 131

CUSTOMER SECRET





Attachment 4. – SAR System Validation

Per FCC KCB 865664 D02v01r02, SAR system validation status should be document to confirm measurement accuracy. The SAR systems (including SAR probes, system components and software versions) used for this device were validated against its performance specifications prior to the SAR measurements. Reference dipoles were used with the required tissue- equivalent media for system validation, according to the procedures outlined in IEEE 1528-2013 and FCC KDB 865664 D01v01r04. Since SAR probe calibrations are frequency dependent, each probe calibration point was validated at a frequency within the valid frequency range of the probe calibration point, using the system that normally operates with the probe for routine SAR measurements and according to the required tissue-equivalent media.

A tabulated summary of the system validation status including the validation date(s), measurement frequencies, SAR probes and tissue dielectric parameters has been included.

SAR			Dre	be			Dielectric	Parameters	CW	/ Validatio	n	Modula	ation Val	lidation
System No.	Probe	Probe Type	Calib	ration pint	Dipole	Date	Measured Permittivity	Measured Conductivity	Sensitivity	Probe Linearity	Probe Isotropy	MOD. Type	Duty Factor	PAR
17	EX3DV4	3972	Head	835	441	2022-09-16	41.5	0.90	PASS	PASS	PASS	N/A	N/A	N/A
21	EX3DV4	7751	Head	900	130	2022-10-17	41.5	0.97	PASS	PASS	PASS	N/A	N/A	N/A
4	EX3DV4	3968	Head	2 450	743	2022-10-06	39.2	1.80	PASS	PASS	PASS	OFDM	N/A	PASS

SAR System Validation Summary 1g

Note;

All measurement were performed using probes calibrated for CW signal only. Modulations in the table above represent test configurations for which the measurement system has been validated per FCC KDB Publication 865664 D01v01r04. SAR system were validated for modulated signals with a periodic duty cycle, such as GMSK, or with a high peak to average ratio (>5 dB), such as OFDM according to KDB 865664 D01v01r04.

F-TP22-03 (Rev. 04) Page 46 of 131

CUSTOMER SECRET





Attachment 5. – Probe Calibration Data

Page 47 of 131 F-TP22-03 (Rev. 04)



Report No. HCT-SR-2301-FC004

Calibration Laboratory of Schmid & Partner Engineering AG Zeughausstrasse 43, 8004 Zurich, Switzerland.





S Schweizerischer Kalibrierdienst Service suisse d'étalonnage C Servizio svizzero di taratura Swiss Calibration Service

Accreditation No.: SCS 0108

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

KTL (Dymstec)

Certificate No

EX-3972_Aug22

CALIBRATION CERTIFICATE

EX3DV4 - SN:3972

QA CAL-01.v9, QA CAL-12.v9, QA CAL-14.v6, QA CAL-23.v5. Calibration procedure(s)

QA CAL-25.V7

Calibration procedure for dosimetric E-field probes

August 19, 2022 Calibration date

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3) °C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID:	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	04-Apr-22 (No. 217-03525/03524)	Apr-23
Power sensor NRP-Z91	SN: 103244	04-Apr-22 (No. 217-03524)	Apr-23
OCP DAK-3.5 (weighted)	SN: 1249	20-Oct-21 (OCP-DAK3.5-1249_Oct21)	Oct-22
DCP DAK-12	SN: 1016	20-Oct-21 (OCP-DAK12-1016_Oct21)	Oct-22
Reference 20 dB Attenuator	SN: CC2552 (20x)	04-Apr-22 (No. 217-03527)	Apr-23
DAE4	SN: 660	13-Oct-21 (No. DAE4-660, Oct21)	Oct-22
Reference Probe ES3DV2	SN: 3013	27-Dec-21 (No. ES3-3013 Dec21)	Dec-22

Secondary Standards	ID	Check Date (In house)	Scheduled Check
Power meter E4419B	SN: G841293874	06-Apr-16 (in house check Jun-22)	In house check: Jun-24
Power sensor E4412A.	SN: MY41498087	06-Apr-16 (in house check Jun-22)	In house check: Jun-24
Power sensor E4412A	SN: 000110210	08-Apr-16 (in house check Jun-22)	in house check: Jun-24
RF generator HP 8848C	SN: US3642U01700	04-Aug-99 (in house check Jun-22)	In house check: Jun-24
Network Analyzer E8358A	SN: US41080477	31-Mar-14 (in house check Oct-20)	In house check: Oct-22

Calibrated by Jaton Kastrati Laboratory Technician Approved by Sven Kühn Technical Manager Issued: August 19, 2022 This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

Certificate No: EX-3972_Aug22

Page 1 of 21

담 당 자 확 인 결 カレノ おれるな 3/ 400% 재 2071.09.00

F-TP22-03 (Rev. 04) Page 48 of 131



Report No. HCT-SR-2301-FC004

Calibration Laboratory of

Schmid & Partner Engineering AG

Zeoghausstrasse 43, 8004 Zurich, Switzerland

IIac MRA



S Schwelzenischer Kallibrierdienst
C Service suisse d'étalonnage
Servizio svizzero di taratura
S Swiss Calibration Service

Accreditation No.: SCS 0108

Accredited by the Swiss Accreditation Service (SAS)

The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Glossary

TSL flasue simulating liquid NORMx,y,z sensitivity in free space ConvF sensitivity in TSL / NORMx,y,z DCP diode compression point.

CF crest factor (1/duty_cycle) of the RF signal A, B, C, D modulation dependent linearization parameters

Polarization φ φ rotation around probe axis

Polarization θ = θ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., θ = 0 is

normal to probe axis

Connector Angle Information used in DASY system to align probe sensor X to the robot coordinate system

Calibration is Performed According to the Following Standards:

- a) IEC/IEEE 62209-1528, "Measurement Procedure For The Assessment Of Specific Absorption Rate Of Human Exposure To Radio Frequency Fields From Hand-Held And Body-Worn Wireless Communication Devices – Part 1528; Human Models, Instrumentation And Procedures (Frequency Range of 4 MHz to 10 GHz)", October 2020.
- b) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Methods Applied and Interpretation of Parameters:

- WORMx.y.z: Assessed for E-field polarization # = 0 (f ≤ 900MHz in TEM-cell; f > 1800MHz: R22 waveguide). NORMx.y.z are only intermediate values, i.e., the uncertainties of NORMx.y.z does not affect the E²-field uncertainty inside TSL (see below ConvF).
- NORM(f)x,y,z = NORMx,y,z * frequency_response (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of ConvF.
- DCPx,y,z: DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal, DCP does not depend on frequency nor media.
- · PAR: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- Ax,y,z; Bx,y,z; Cx,y,z; Dx,y,z; VRx,y,z; A, B, C, D are numerical linearization parameters assessed based on the data of
 power sweep for specific modulation signal. The parameters do not depend on frequency nor media. VR is the maximum
 calibration range expressed in RMS voltage across the diode.
- ConvF and Boundary Effect Parameters: Assessed in flat phantom using E-field (or Temperature Transfer Standard for f ≤ 800 MHz) and inside waveguide using analytical field distributions based on power measurements for f > 800 MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORMx,y,z * ConvF whereby the uncertainty corresponds to that given for ConvF. A frequency dependent ConvF is used in QASY version 4.4 and higher which allows extending the validity from ±50 MHz to ±100 MHz.
- Spherical isotropy (3D deviation from isotropy); in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- Sensor Offset: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis).
 No tolerance required.
- Connector Angle: The angle is assessed using the information gained by determining the NORMx (no uncertainty required).

Certificate No: EX-3972_Aug22

Page 2 of 21

CUSTOMER SECRET





EX3DV4 - SN:3972 August 19, 2022

Parameters of Probe: EX3DV4 - SN:3972

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc $(k=2)$
Norm (µV/(V/m) ²) ^A	0.47	0.48	0.47	±10.1%
DCP (mV) ^S	103.1	100.6	103.7	±4.7%

Calibration Results for Modulation Response

UID	Communication System Name		dΒ	8 dB√μV	C	D dB	VR mV	Max dev.	Max Unc ^E k = 2		
O.	CW	X	0.00	0.00	1.00	0.00	133.8	±3.5%	±4.7%		
		Y	0.00	0.00	1.00		143.4				
		72	0.00	0.00	1.00		132.2				
10352	Pulse Waveform (200Hz, 10%)	X	20.00	91.15	20.94	10.00	60.0	±3.6%	±9.6%		
		Y	20.00	89.97	20.24		60.0				
		Z	20.00	90.62	20.74		60.0	1			
10353	Pulse Waveform (200Hz, 20%)	X	20.00	91.80	20.06	6.99	80.0	±1.6%	±9.6%		
		Y	20.00	89.77	19.33		80,0				
		- Z	20.00	91.10	19.73		80.0	1			
0354	Pulse Waveform (200Hz, 40%)	X.	20.00	93.43	19.34	3.98	95.0	±1.0%	±9.6%		
		Y	20.00	91.40	18.98	0.757	95.0	120000			
		Z	20.00	91.20	18.24	1	95.0				
0355	Pulse Waveform (200Hz, 60%)	X	20.00	93.23	17.82	2.22	120.0	±0.9%	±0.9%	±0.9%	±9.8%
		Y	20.00	94.01	19.03	4000		120.0	120.0	100000	
		2	20.00	90.50	16.57		120.0				
10387	QPSK Waveform, 1 MHz	X	1.62	65.39	14.41	1.00	150.0	±2.5%	±2.5%	±9.6%	
		Y	1.70	65.91	14.97	10000	150.0	-E1100.00			
		Z	1.56	65.21	14.15		150.0				
10388	QPSK Waveform, 10 MHz	X	2.18	67.57	15.20	0.00	150.0	±0.8%	±9.6%		
		Y	2.28	68.22	15.72	9328	150.0	131111133			
		Z	2.08	67.07	14.94		150.0				
10396	54-QAM Waveform, 100 kHz	X	2.78	69.10	17,93	3.01	150.0	±0.7%	±9.6%		
		Y	3.06	71.11	19.01	2500	150.0	-5%eV00.			
		Z	2.93	70.64	18.63		150.0				
10399	64-QAM Waveform, 40 MHz	X	3.49	67.02	15.56	0.00	150.0	±2.2%	±9.6%		
		Y	3.54	67.23	15.78	1000000	150.0		20000000		
		Z	3,41	66.79	15.40		150.0				
10414	WLAN CCDF, 64-QAM, 40 MHz	X	4.93	65.77	15.50	0.00	150.0	±4.0%	±9.6%		
		Y	4.93	65.71	15.54	2076	150.0	-5-19/35%	TEAPAS.		
		1.2	4.61	65.58	15.36		150.0				

Note: For details on UID parameters see Appendix

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Certificate No: EX-3972_Aug22

Page 3 of 21

Page 50 of 131 F-TP22-03 (Rev. 04)

A The uncertainties of Norm X,Y,Z do not affact the E³-field uncertainty lineade TSL (see Page 5).

Interaction parameter uncertainty for maximum specified field strength.

Linearctation parameter uncertainty for maximum apecified field strength.

Linearctation parameter uncertainty for maximum apecified field strength.





EX3DV4 - SN:3972 August 19, 2022.

Parameters of Probe: EX3DV4 - SN:3972

Sensor Model Parameters

	C1 fF	G2 fF	ν-1	T1 msV ⁻²		T3 ms	T4 V-2	75 y-1	TG
X:	50.5	377,07	35,49	14.87	0.42	5.09	0.19	0.45	1:01
У	52.0	388.27	35.48	25.95	0.07	5.10	1,08	0.30	1.01
Z	46.2	341.02	34.78	13.98	0.51	5.07	1.03	0.28	1.01

Other Probe Parameters

-143.6° enabled
enabled
disabled
337 mm
10 mm
9 mm
2.5 mm
1.mm
1 mm
1 mm
1.4 mm

Note: Measurement distance from surface can be increased to 3-4 mm for an Area Scan job.

Certificate No: EX-3972_Aug22

Page 4 of 21

CUSTOMER SECRET





EX3DV4 - SN:3972 August 19, 2022

Parameters of Probe: EX3DV4 - SN:3972

Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) ^C	Relative Permittivity ^F	Conductivity ^F (S/m)	ConvF X	ConvF Y	ConvF Z	Alpha ^G	Depth ^Q (mm)	Unc (k = 2)
750	41.9	0.89	9.79	9.79	9.79	0.47	0.92	±12.0%
835	41.5	0.90	9.59	9.59	9.59	0.53	0.83	±12.0%
900	41.5	0.97	9.37	9.37	9.37	0.43	0.88	±12.0%
1750	40.1	1.37	8.35	8.35	8.35	0.38	0.86	±12.0%
1900	40.0	1.40	8.03	B.03	8.03	0.39	0.86	±12.0%
2450	39.2	1,80	7.56	7.56	7.56	0.39	0.90	±12.0%
2600	39.0	1.96	7.33	7.33	7.33	0.41	0.90	±12.0%
5250	35.9	4,71	5.15	5,15	5.15	0.48	1.80	±13.1%
5600	35.5	5,07	4.59	4.59	4.59	0.40	1.80	±13.1%
5750	35.4	5.22	4.70	4.70	4.70	0,40	1.80	±13.1%
5800	35,3	5.27	4.65	4.65	4.65	0.40	1.80	±13.1%

Given the Corner incentainty at calibration frequency and the uncontainty for the indicated frequency band. Frequency validity below 900 MHz is ±10, 25, 40, 50 and 70 MHz for Corner uncentainty at calibration frequency and the uncontainty for the indicated frequency band. Frequency validity below 900 MHz is ±10, 25, 40, 50 and 70 MHz for Corner assessments at 30, 64, 128, 150 and 200 MHz respectively. Validity of Corner assessments at 30, 64, 128, 150 and 200 MHz respectively. Validity of Corner assessments at 30 MHz is 4–9 MHz, and Corner assessment at 13 MHz is 9–18 MHz, Above 5 GHz frequency validity can be extended in ±110 MHz.

At frequencies below 3 GHz, the validity of tissue parameters (if and in) is restricted to ±5%. The uncontainty is the RSS of the Corner uncertainty for indicated target issue parameters.

Given the Corner and the Corner uncontainty is the RSS of the Corner uncertainty for indicated target issue parameters.

Given the Corner and the Corner uncontainty is the second of the Corner uncertainty for indicated target issue parameters.

Certificate No: EX-3972 Aug 22 Page 5 of 21

F-TP22-03 (Rev. 04) Page 52 of 131

than ±1% for frequencies below 3 GHz and below ±2% for frequencies between 3–6 GHz at any distance larger than half the probe tip diameter from the boundary.

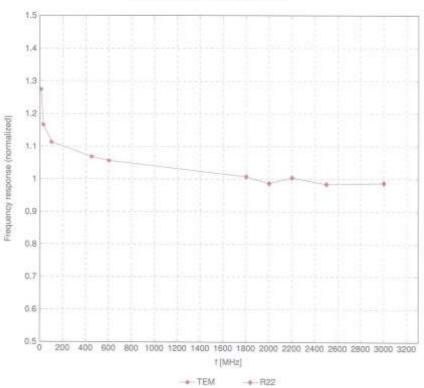
CUSTOMER SECRET



EX3DV4 - SN:3972 August 19, 2022

Frequency Response of E-Field

(TEM-Cell:ifi110 EXX, Waveguide:R22)



Uncertainty of Frequency Response of E-field: ±6.3% (k=2)

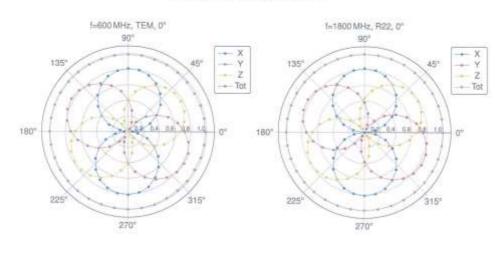
Certificate No: EX-3972_Aug22 Page 6 of 21

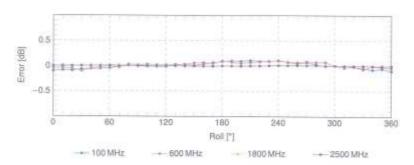
F-TP22-03 (Rev. 04) Page 53 of 131



EX3DV4 - SN:3972 August 19, 2022

Receiving Pattern (ϕ), $\theta = 0^{\circ}$





Uncertainty of Axial Isotropy Assessment: ±0.5% (k=2)

Certificate No: EX-3972_Aug22

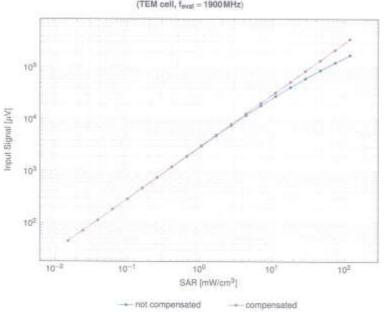
Page 7 of 21

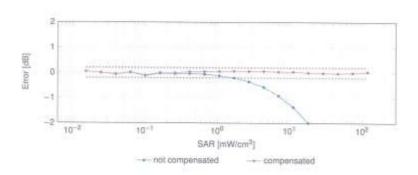


EX3DV4 - SN:3972 August 19, 2022

Dynamic Range f(SARhead)

(TEM cell, f_{aval} = 1900 MHz)





Uncertainty of Linearity Assessment: ±0.6% (k=2)

Certificate No: EX-3972_Aug22

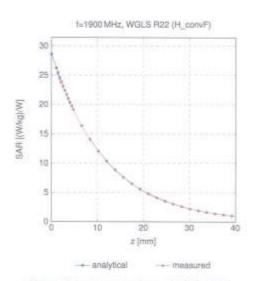
Page 8 of 21

CUSTOMER SECRET



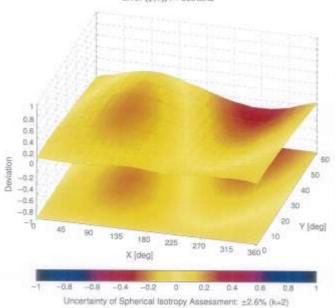
EX30V4 - SN:3972 August 19, 2022

Conversion Factor Assessment



Deviation from Isotropy in Liquid

Error (ϕ, θ) , f = 900 MHz



Certificate No: EX-3972_Aug22

Page 9 of 21

F-TP22-03 (Rev. 04) Page 56 of 131

CUSTOMER SECRET





EX3DV4 - SN:3972 August 19, 2022

Appendix: Modulation Calibration Parameters

UID	Rev	Communication System Name	Group	PAR (dB)	Unct b =
0		ĆW .	CW	0.00	±4.7
10010	CAA	SAR Validation (Square, 100 ms, 10 ms)	Test	10.00	±9.0
10011	CAB	UMTS-FDD (WCDMA)	WCDMA	2.91	±9.6
0012	CAB	IEEE 802.11b WFI 2.4 GHz (DSSS, 1 Mbps)	WLAN	1.87	±9.6
0013	CAB	IEEE 802.11g WFI 2.4 GHz (DSSS-OFDM, 8 Mbps)	WLAN	9.45	±5.6
0021	DAC	GBM-FDD (TDMA, GMSK)	GSM	9.39	±9.6
0023	DAG	GPRS-FDD (TOMA, GMSK, TN (I)	GEM	9.57	19.6
0.024	DAC	GPRS-FDD (TDMA, GMSK, TN 0-1)	GSM	6.56	+9.6
0.025	DAC	EDGE-FOD (TDMA, 8PSK, TN 0)	GSM	12.62	19.6
0026	DAG	EDGE-FDD (TDMA, BPSK, TN 0-1)	GSM	9.55	±9.6
0027	DAC	GPRS-FDD (TDMA, GMSK, TN-0-1-2)	GSM	4.80	19.6
0028	DAC	GPRS-FD0 (TDMA, GMSK, TN 0-1-2-3)	GSM	3.55	
0029	DAC	EDGE-FDD (TOMA, IPSK, TN 0-1-2)	GSM	7.78	±9.6
				3111	+8.6
0030	CAA	IEEE 802.15.1 Bluelooth (GFSK, OH1)	Bluetooth	5,30	±8.6
0031	CAA	IEEE 802.15.1 Bivelooth (GFSK, DHB)	Bluetooth	1.87	±9.6
0032	CAA	IEEE 802.15.1 Bluetooth (GFSK, DHS)	Bluetooth	1.16	±9.6
0.033	CAA	IEEE 802.15.1 Bluetooth (PV4-DQPSK, DH1)	Bluetooth	7.74	+,9,6
0034	CAA	IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH3)	Bluetooth	4.53	±9.0
0.035	CAA	IEEE 802,15,1 Bluetooth (PV4-DQPSK, DH5)	Bluetooth	3.83	±9.6
0.036	CAA	IEEE 802.15.1 Bluetooth (8-DPSK, OH1)	Bluetooth	H.01	+9.6
0.037	CAA	IEEE 802.15.1 Bluetooth (B-DPSK, DH3)	Bluetooth	4.77	±9.0
0038	CAA	EEE 802.15.1 Bluetooth (8-DPSK, DH5)	Bioglocity	4.10	±9.0
0038	CAB	CDMA2000 (1xRTT, RC1)	CDMA2000	4.57	±9.6
0042	CAB	IS-54 / IS-136 FOD (TDMA/FDM, PV4-DOPSK, Halfvala)	AMPS	7,78	±8.8
0.044	CAA	IS-81/EIA/TIA-553 FOD (FDMA, FM)	AMPS	0.00	±9.8
0048	CAA	DECT (TDD, TDMA/FDM, GFSK, Full Skit, 24)	DECT	13.80	±9.6
0048	CAA	DECT (TDD, TDMA/FDM, GFSK, Double Slot, 12)	DECT	10.79	±9.0
0056	CAA	UMTS-TOD (TD-SCDMA, 1.28 Mcps)	TD-SCDMA	11:01	±9.6
0058	DAC	EDGE-FOD (TOMA, IIPSK, TN 0-1-2-3)	GSM	H.52	±9.6
0.059	CAB	IEEE 802.11b WIFI 2.4 GHz (DSSS, 2 Mbps)	WLAN	2.12	+9.6
0080	CAB	EEE 802,116 WFI 2,4 GHz (DSSS, 5,6 Mbos)	WLAN	2.63	
0061	CAB	IEEE 802.116 WIFI 2.4 GHz (DSSS, 11 Mbos)	WLAN	3.60	±9.6
0062	CAD	IEEE 802.11a/h WFI 5 GHz (DFDM, 6 Mbgs)		1001000	±9.6
11063	CAD	IEEE 802.11ah WFI 5 GHz (DFDM, 9 Mbps)	WLAN	8.88	±8,6
D064	CAD		WLAN	8.63	±9.6
		IEEE 809.11a/h WFI 5 GHz (OFDM, 12 Mbps)	WLAN	9.00	±9.0
0008	CAD	IEEE 802:11a/h WIFI 5 GHz (OFOM, 18Mbgs)	WLAN	9,00	+9,6
0.008	GAD	IEEE 802.11a/h WFI 5 GHz (OFDM, 24 Mbps)	WLAN	9.38	±9.6
0067	CAD	IEEE 802.11a/h WIFI 5 GHz (OFDM, 36 Mbps)	WLAN	10.12	±9.0
0008	CAD	IEEE 802,11ash WFI 5 GHz (OFDM, 48 Mbps)	WLAN	10.24	±9.6
0.068	CAD	IEEE 802.11m/r WFI 5 GHz (OFDM, 54 Mbps)	WLAN	10.56	±8,6
0071	CAB	IEEE 802.11g WIFLR 4 GHz (DSSS/OFDM, 8 Mbps)	WLAN	11.83	±0.0
00711	CA8	IEEE 802,11g WFI 2.4 GHz (DSSS/OFDM, 12 Mbps)	WLAN	9.62	±9.6
0.078	CAB	IEEE 802 11g WFI 2,4 GHz (DSSS/OFDM, 18 Mbps)	WLAN	8.94	+9.6
0074	CAS	IEEE 802.11g WIFI 2.4 GHz (DSSS/OFDM, 24 Mbps)	WEAN	10.30	±9.6
0075	CAB	IEEE 802.11g WIFI 2.4 GHz (DSSB/OFDM, 38 Mbps)	WLAN	10.77	±9.6
007n	CAB	IEEE 802 11g WIFI & 4 GHz (DSSS/OFDM, 48 Mbps)	WLAN	10.94	±9.6
0077	CAB	IEEE 802.11g WIFI 2.4 GHz (DSSS/OFDM, 84 Mbps)	WLAN	11.00	±9.6
1800	CAB	CDMA2000 (1xRTT, RC3)	CDMA2000	3.97	±9.6
0082	DAH	IS-54 / IS-138 FDD (TDMA/FDM, PV4-DQPSK, Fulrate)	AMPS	4.77	±9.6
0000	DAC	GPRS-FDD (TDMA, GMSK, TN 0-4)	BSM	0.58	±9.6
0007	CAC	UMTS-FOO (HSDRA)	WCDMA	3.98	±9.6
0098	DAD	UMTS-FDD (HSUPA, Subtest 2)	WCDMA	77.10.0	
0099	CAC	EDGE FDD (TDMA, 8PSK, TN 0-4)	GSM	3.98	±9.6
5100	CAC	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPBK)		9.55	±9.6
0101	CAB		LYE-FDD	5.67	±9.6
0102	CAB	LTE-FDD (SC-FDMA, 100% RR, 20 MHz, 16-QAM)	LTE-FDD	0.42	±9.8
010E	DAC	LTE-FDD (SC-FDMA, 100%-RB, 20MHz, 64-QAM)	LTE-FDD	6.60	±9.6
		LTE-T00 (SC-F0MA, 100% RB, 20MHz, QPSK)	LTE-TDD	5.29	±9.6
0104	CAE	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM)	LTE-TOD	9,97	±9.6
0105	CAE	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 84-QAM)	LTE-TDD	10.01	±9.6
0108	CAE	LTE-FDD (SC-FDMA, 100% RB, 10MHz, QPSK)	LTE-FDD	5.80	±9.6
0108	CAG	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM)	LTE-FDD	5.43	19.6
0110	CAG	LTE-FDD (SC-FDMA, 100% RB, 5MHz, QPSK)	LTE-FDD	5.75	±5.6
0111	CAG	LTE-FD0 (SC-FDMA, 100% RB, 5MHz, 16-QAM)	LTE-FDD	6.44	±9.6

Certificate No: EX-3972_Aug22

Page 10 of 21



CUSTOMER SECRET



EX30V4 - SN:3972 August 19, 2022

UID	Rev	Communication Bystem Name	Group	PAR (dB)	Unc ^E h = 2
10112	CAG	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM)	LTE-FDD	8.59	+9.6
10113	CAG	LTE-FDD (SC-FDMA, 190% RB, 5MHz, 84-QAM)	LTE-FDO	6.62	+9.6
10114	CAG	IEEE 802 11n IHT Greenfield, 13.5 Mbps, BPSK)	WLAN	8.10	±9.6
10115	CAG	IEEE 802.11n (HT Greenfield, 81 Mbps, 16-QAM)	WLAN	H.48	±9.8
0116	CAG	IEEE 802,11n (HT Greenfield, 135 Mbps, 64-QAM)	WLAN	8.15	±9.6
10117	CAG	IEEE 802,11n (HT Mixed, 13.5Mhps, BPSK)	WLAN	8.07	±9.6
10118	CAD	IEEE 802,11n (HT Mixed, H1 Mbps, 16-QAM)	WLAN	8.50	+8.6
10119	CAD	IEEE 802.11n (HT Mixed, 135 Mbps, 84-QAM)	WLAN	IL13	±9.6
0 140	CAD	LTE-FOD (SC-FDMA, 100% RB, 15MHz, 16-GAM)	LTE-FDD	11.49	±8.6
10141	CAD	LTE-FOO (SC-FDMA, 100% RB, 15MHz, 84-QAM)	LTE-FDD	6.53	±8.6
10142	CAD	LTE-FDD (SC-FDMA, 100% RB, 3MHz, QPSK)	LTE-FDD	5.73	±9.6
0148	CAD	LTE-FOD (SC-FOMA, 100% RB, 3MHz, 16-QAM)	LTE-FDD	6.35	+9.6
10144	CAC	LTE-FOD (SC-FDMA, 100% RB, 3MHz, 64-QAM)	LTE-FD0	6.65	±9.6
10145	CAC		LTE-FDD	5.76	
10/146	CAC	LTE-FDD (SC-FDMA, 100% RB, 1.4MHz, OPSK)			19.6
		LTE-FOO (9G-FDMA: 100% RB, 1.4MHz, 16-QAM)	LTE-FD0	6.41	±9.6
10147	CAC	LTE-FOD (SC-FOMA, 100% RB, 1.4MHz, 64-QAM)	LTE-FD0	6.72	+9.6
0148	CAE	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM)	LYE-FO0	6.42	±9.0
0.150	CAE	LTE-FDD (SG-FDMA, S0% RB, 20MHz, 64-QAM)	LTE-FD0	6.60	±0.8
0.151	CAE	LTE-TOD (SC-FDMA, 50% RB, 20MHz, QPSK)	LTE-TOD	5.28	19.6
0152	CAE	LTE-TDD (SC-FDMA, 50% RB, 20MHz, 16-QAM)	LTE-700	8.92	±9.6
0153	CAE	LTE-TDID (SC-FDMA, 50% RR, 20MHz, 64-QAM)	LTE-TOD	10,05	±0,8
0.154	CAF	LTE FOD (SC-FDMA, 50% RB, 10 MHz, QPSK)	LTE-FDD	5.75	±9.6
10:155	CAF	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM)	LTE-FD0	0.43	±8.6
10 158	CAF	LTE-FDD (SG-FDMA, S0% RB, 5 MHz, QPSK)	LTE-FDD	5.79	±9.6
10/157	CAE	LTE-FDD (SC-FDMA, 50% RB, 5MHz, 16-QAM)	LTE-FDD	6.49	±9.6
10 156	CAE	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM)	LTE-FDD	6.62	±9.6
10.158	CAG	LTE-FDD (8C-FDMA, 58% RB, 5 MHz, 64-QAM)	LTE-FDD	6.56	±9.6
0.160	CAB	LTE-FDD (SC-FDMA, 50% RB, 15MHz, QPSK)	LTE-FDD	5.82	±9.6
0161	CAG	LTE-FOD (SC-FDMA, 50% RB, 15 MHz, 16-QAM)	LTE-FDD	6.43	±9.6
0.162	CAG	LTE-FOD (SC-FOMA, 60% RB, 15MHz, 64-QAM)	LTE-FDD	6.58	+9.6
0.166	CAG	LTE FDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK)	LTE-FDD	5.46	±9.6
0167	CAG	LTE-FOD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM)	LTE-FDD	6.21	±9.0
0.168	CAG	LTE-FOO (SC-FOMA, 50% RB, 1.4 MHz, 64-QAM)	LTE-FDD	6.79	±9.6
0.168	CAG	LTE-FOD (SC-FDMA, 1 RB, 20 MHz, QPSK)	LTE-FDD	5.73	+9.8
10170	CAG	LTE-FOO (SC-FOMA, 1 RB, 20 MHz, 16-QAM)	LTE-FD0	8.52	±0.6
0171	CAE	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM)	LTE-FDD	6.49	+9.6
10 172	CAE	LTE-TOD (SC-FDMA 1 RB. 20MHz, QPSK)	LTE-TD0	9.21	±8.8
0.173	CAE	LTE-TOD (SC-FDMA, 1 RB, 20 MHz, 18-QAM)	LTE-TDD	9.48	19.6
0174	CAF	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM)	LTE-TDO	10.25	+9.5
0175	CAF	LTE-FOO (SC-FDMA, 1 RB, 10 MHz, CIPSK)	LTE-F00	5.72	±0.6
0176	CAF	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 18-QAM)	LTE-FDD	8.52	
0177	GAE				±9.6
0178	CAE	LTE-FDD (SC-FDMA, 1 RB, 5MHz, QPSK) LTE-FDD (SC-FDMA, 1 RB, 5MHz, 16-QAM)	LTE-F00	5.73	±9.6
	AAE		LTE-F00	8.52	3,93
0.179	4 10 10 10	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 84-QAM)	LYE-FDD	6.50	±9.6
0.180	GAG	LTE-FDD (SC-FDMA, 1 RB, SMHz, 64-QAM)	LTE-FD0	9.50	±9.0
0.181	CAG	LTE-FOO (SC-FDMA, 1 RB, 15MHz, QPSK)	LTE-FDD	5.72	+9,6
0.165	GAG	LTE-FDD (SG-FDMA, 1 RB, 15MHz, 18-QAM)	LTE-FD0	6.52	±9,6
0183	CAG	LTE-FDD (BC-FDMA, 1 RB, 15MHz, 64-QAM)	LTE-FDD	6.50	±9.0
0.184	CAG	LTE-FDD (SG-FDMA, 1 RB, 3MHz, QPSK)	LTE-FD0	5.79	±9.6
0185	CAI	LTE-FDD (SC-FDMA, 1 RB, 3MHz, 15-QAM)	LTE-FDD	0.51	±8.6
0.186	CAG	LTE-FDD (BC-FDMA, 1 RB, 3MHz, 64-QAM)	LTE-FDD	6.50	±9.0
0187	CAG	LTE-FOD (SC-FDMA, 1 RB, 1.4MHz, QPSK)	LTE-FD0	5.73	±9.6
0188	CAG	LTE-FOD (SC-FDMA, 1 RB, 1.4MHz, 15-QAM)	LTE-FDD	8.52	±9.6
0188	CAE	LTE FDD (BC-FDMA, 1 RB, 1.4 MHz, 64-QAM)	LTE-FDD	8.50	±9.0
0183	CAE	IEEE 802.11n JHT Greenfield, 6,5 Mbps, BPSK)	WLAN	8,09	±9.6
0194	AAD	IEEE 802,11n (HT Greenfield, 39 Mops, 16-QAM)	WLAN	8.12	±8.6
0195	CAE	IEEE 802.11n (HT Greenfield, 85Mbps, 84-CAM)	WLAN	8.21	±0.6
0198	CAE	IEEE 802.11n (HT Mixed, 6.5 Mbps, BPSK)	WLAN	8.10	±9.6
0197	AAE	IEEE 802.11n (HT Mixed, 39 Mbps, 16-QAM)	WLAN	8.13	±9.6
0198	CAF	IEEE 802.11n (HT Mixed, 65 Mbps, 54-QAM)	WLAN	8.27	±9.6
0219	CAF	IEEE 802 11n (HT Mixed, 7.2Mbps, BPSK)	WLAN	6.03	19.6
	AAF	IEEE 802.11n (HT Mixed, 43.3 Mbps, 16-QAM)	WLAN	8.13	±9.6
0.220		IEEE 802.11n (HT Mixed, 72.2 Mbps, 64-QAM)	WLAN	8.27	±9.6
	DAD				
0221					
0220 0221 0222 0223	CAC	EEE 802.11n (HT Mixed, 15 Mbps, 8PSK) IEEE 802.11n (HT Mixed, 90 Mbps, 16-QAM)	WLAN WLAN	8.06	±9.6 ±9.6

Certificate No: EX-3972_Aug22 Page 11 of 21

F-TP22-03 (Rev. 04) Page 58 of 131



CUSTOMER SECRET



EX3DV4 - SN:3972 August 19, 2022

UID	Bev	Communication System Name	Group	PAR (dB)	Uno* R =
10225	DAD	UMTS-FDD (HSPA+)	WCDWA	5.97	±9.8
10228	CAD	LTE-TDD (SC-FDMA, 1 RB, 1.4MHz, 16-QAM)	LTE-TOO	9.49	±9.8
10227	CAD	LTE-TDD (9C-FDMA, 1 RB, 1.4MHz, 64-QAM)	LTE-TOO	10.26	±9.6
10228	CAD	LTE-TOD (SC-FOMA, 1 AB, 1 4MHz, QPSK)	LTE-TDD	9.22	±9.6
10229	DAC	LTE-TOD (SC-FOMA, 1 RB, 3 MHz, 16-QAM)	LTE-TOO	9.48	±9,6
10230	CAC	LTE-TOD-(SC-FDMA, 1 RB, 3 MHz, 64-QAM)	T1E-100	10.25	±9.6
10231	CAC	LTE-TOD (SG-FDMA, 1 RB, 3MHz, QPSK)	LTE-TOO	8.19	±9.0
10232	CAD	LTE-TOD (SC-FDMA, 1 RB, 5MHz, 18-QAM)	12E-100	9.48	±0.8
10233	CAD	LTE-TOD (SC-FDMA, 1 RB, 5MHz, 64-QAM)	LTE-TOO	10.25	±0.6
10234	CAD	LTE-TOO (SC-FDMA, 1 RB, SMHz, QPSK)	LTE-TOO	9.21	±9.0
10539	CAD	LTE-TOD (SC-FDMA, 1 RB, 10MHz, 16-QAM)	LTE-TDO	9.48	±9.0
10235	CAD	LTE-TDD (SC-FDMA, 1 RB, 10MHz, 64-QAM)	L7E-100	10,25	±9.5
10237	GAD.	LTE-TOD (BC-FDMA, 1 RB, 10 MHz, QPSK)	LTE-TDD	9.21	±9.6
10238	CAB	LTE-TOD (SC FDMA, 1 RB, 15 MHz, 16 QAM)	LTE-TOD	9.48	±9.6
10239	CAB	LTE-TDD (SC-FDMA, 1 RB, 15MHz, 64-QAM)	LTE-TD0	10.25	49,6
0240	CAR	LTE-TOD (SC-FDMA, 1 RB, 15MHz, QPSK)	LTE-TDD	9.21	±9,6
11241	CAB	LTE-TDD (SC-FDMA, 50% RB, 1,4 MHz, 18-QAM)	LTE-TDD	9.82	±9.6
0.242	CAD	LTE-TOD (SC-FDMA, 60% RB, 1.4 MHz, 04-QAM)	LTE-TD0	9.86	±9.8
0240	CAD	LTE-TOD (SC-FDMA, 50% RB, 1.4 MHz, QPSK)	LTE-TOO	0.46	±9.0
0244	CAD	LTE-TOD (BC-FDMA, 50% RB, 3 MHz, 16-QAM)	LTE-TOD	10.06	±9.6
0.245	CAG	LTE-TOO (SC-FDMA, 50% RB, 3 MHz, 64-QAM)	LTE-YDO	10.08	±9,8
0246	CAG	LTE-TOD (SC-FDMA, 50% RB, 3 MHz, QPSK)	LTE-TDD	9.30	±0.6
0247	CAB	LTE-TOD (SC-FDMA, 56% RB, 5 MHz, 16-QAM)	LTE-TDD	31.91	±0,0
0.248	CAG	CTE-TOD (SC-FOMA, 50% RB, 5 MHz, 54-QAM)	LTE-TD0	10.99	±8.6
0.840	CAG	LTE-TOD (SC-FDMA, 58% RB, 5 MHz, QPSK)	LTE-TOD	9.29	±8,6
0.250	CAG	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM)	LTE-TOD	9.81	±9.6
0251	CAF	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM)	LTE-TDD	10.17	±9.6
0.252	CAF	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, QPSK)	LTE-TOD	9.24	±9,8
0.553	CAF	LTE-TOD (SC-FDMA, 50% FIB, 15MHJ, 16-QAM)	LTE-TDD	9,90	±9.0
0254	CAB	LTE-TOD (SC-FDMA, 50% RB, 15 MHz, 64-QAM)	LTE-TDD	10.14	±9.0
0.255	CAB	LTE-TOO (SC-FDMA, 50% RB, 15MHz, QPSK)	LTE-TDD	9.20	±9.6
0256	CAB	LTE-TOO (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM)	LTE-TDD	9.96	±9.8
0257	CAD	LTE-TOD (SC-FDMA, 180% RB, 1.4 MHz, 64-GAM)	LTE-TDD	10.08	±9.0
11258	CAD	LTE-TOD (SC-FDMA, 100% RB, 1.4 MHz, QPSK)	LTE-TOO	9.34	±9.6
0250	CAD	LTE-TDD (SC-FDMA, 100% RB, 3MHz, 18-QAM)	LTE-TDD	9.98	±9.6
0260	CAG	LTE-700 (SC-FDMA, 100% RB, 3 MHz, 64-QAM)	LTE-TDD	9.97	±9.6
0261	CAG	LTE-TOD (SC-FDMA, 100% RB, DMHz, QPSK)	LTE-TOO	9.24	±0.6
0262	CAG	LTE-TOO (SC-FDMA, 100% RB, SMHz, 18-QAM)	LTE-TDD	9.83	±9.6
0263	CAG	LTE-TOD (SC-FDMA, 100% RB, 5MHz, 64-GAM)	LTE-TDO	10.16	土9.6
0264		LTE-TOD (SC-FDMA, 100% RB, SMHs, QPSK)	LTE-TOD	8.23	±9.6
0265	CAG	LTE-T00 (SC-FDMA, 100% RB, 10 MHz, 16-QAM)	F1E-100	9.92	+9.4
0266	CAF	LTE-TOD (SC-FDMA, 100% RB, 10 MHz, 84-QAM)	LTE-TDD	10.07	±0.6
0267	CAF	LTE-TDD (BC-FDMA, 100% RB, 10 MHz, OPSK)	LTE-TOO	9.30	±9.E
0288	CAF	LTE-TOD (SC-FDMA, 100% RB, 15 MHz, 16-QAM)	LTE-TDD	10.06	#9,6
0260	CAB	LTE-TOD (SC-FDMA, 100% PB, 18 MHz, 64-QAM)	LTE-TD0	10.13	土包店
0270	CAB	LTE-TOD (BC-FDMA, 100% RB, 15 MHz, QPSK)	LIETDD	9.58	±9.6
0274	1 77 7 7 1	UMTS-FDD (HSUPA, Subtest 5, 3GPF Rel6 10)	WCDMA	4.87	±9.6
0275	CAD	UMTS-FDD (HSUPA, Subtest 5, 3GPP Rel8.4)	WCDMA.	3.86	±9.6
0277	CAD	PHS (OPSK)	PHS	11.81	±9.6
0278	CAG	PHS (QPSK, BW 884 MHz, Rolloff 0.5)	PHS	11.81	±9.6
	CAG	PHS (QPSK, BW 884 MHz, Rolloff 0.38)	PHS	12.18	±9.6
0290	CAG	CDMA2000, RC1, BOSS, Full Raile	CDMA2006	5.91	±0.6
0291	CAG	CDMA2000, RC3, SO55, Full Rate	CDMA2000	3,46	28.6
0293	CAG	CDMA2000, RC3, SC32, Full Rate CDMA2000, RC3, SC3, Full Rate	GDMA2000	3,38	±9.6
0295	CAG	COMAZORI, RCS, SCS, Pull Palls COMAZORI, RC1, BC3, 1/8th Rais 25 h.	CDMA2000	3.50	±9.6
0297	CAF		CDMA2000	12.48	±9.6
0297 0298	CAF	LTE-FDD (SC-FDMA, SON, RB, 20 MHz, GPSK)	LTE-FDD	5.01	±9.6
0.588	CAF	LTE-FDD (SC-FDMA, 50% RB, 3MHz, QPSK) LTE-FDD (SC-FDMA, 50% RB, 3MHz, 16-QAM)	LTE-FDD	5.72	±9.6
0300	CAC		LTE-FOD	5.39	±9.6
		LTE-FDD (SC-FDMA, 50% HB, 2 MHz, 64-QAM)	LTE-FDD	6.60	±9.6
0301	CAC	IEEE 902.16s WIMAX (29:18, 5 ms, 10 MHz, QPSK, PUSQ)	WMAX	12.03	±9.6
000E	CAB	EEE 802.15a WIMAX (29:18, 5-ms, 10 MHz, QPSK, PUSC, 3CTHL)	WMAX	12.57	±9.8
0303	CAB	IEEE 802,16e WIMAX (31:15, 5 ms, 10 MHz, 84QAM, PUSC)	WIMAX	12,52	±5.6
0304	CAA	IEEE 832.19a WIMAX (29:18, 5 ms, 10 MHz, 64QAM, PUSC)	WMAX	11.00	±9.6
0305	CAA	IEEE 802.16n WIMAX (31:15, 10:ms, 10 MHz, 84QAM, PUSC) IEEE 802.16e WIMAX (29:18, 10:ms, 10 MHz, 64QAM, PUSC)	WMAX	15.24	±9.6
0306			WMAX	14.67	±9.8

Certificate No: EX-3972_Aug22 Page 12 of 21

F-TP22-03 (Rev. 04) Page 59 of 131



CUSTOMER SECRET



Report No. HCT-SR-2301-FC004

EX3DV4 - SN:3972 August 19, 2022

THO	Rev	Communication System Name	Group	PAR (dB)	Unic ² N =
10307	AAB	IEEE 802.16e WIMAX (29:16, 10 ms, 10 MHz, QPSK, PUSC)	XAMW	14.49	±9.6
10308	AAB	IEEE 802,16e WIMAX (29:16, 10 ms, 10 MHz, 16QAM, PUSC)	WMAX	14.48	±9.8
0309	AAB	IEEE 802.16e WIMAX (29:18, 10 ms, 10 MHz, 19QAM, AMC 2x3)	WIMAX	14.58	±9.6
0110	AAB	IEEE 802.16e WIMAX (29:18, 10 ms, 10 MHz, QPSK, AMC 2x3	WMAX.	14.57	±9.0
0911	AAB	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, QPSK)	LTE-FDD	11.06	±0.0
0313	AAD	DEN13	IDEN	10.51	±9.6
0314	AAD	IDEN 16	IDEN	13.48	±9.8
0315	AAD	1EEE 882.11b WIFI 2.4 GHz (DSSS, 1 Mbps, 96pc dc)	WLAN	1.71	±9.6
0316	AAD	IEEE 802,11g WIFI E.4 GHz (ERP-OFDM, 6 Mbps, 96pc dc)	WLAN	8.36	±9.6
0317	AAA	IEEE 802.11a WIFI 5 GHz (OFDM, 6 Mbps, 96pc dc)	WLAN	8.36	±9.6
0352	AAA	Pulse Waveform (200 Hz, 10%)	Generic	10.00	±9,6
0953	.AAA.	Pulse Waveform (200 Hz, 20%)	Generic	6,99	±9.6
0354	AAA	Pulse Waveform (200 Hz, 40%)	Geogric	3.98	±9.6
0355	AAA	Pulse Wevelorm (200 Hz, 60%)	Generic	2.22	±9,8
0356	AAA	Pulse Waveform (200 Hz, 80%)	Generic	0.97	±9.0
0387	AAA	GPSK Waveform, 1 MHz	Generic	5.10	±9.0
0388	AAA	QPSK Waveform, 10 MHz	Generic	5.22	±9.6
0396	AAA	64-QAM Wayeform, 100 kHz	Generic	8,27	±8/6
0388	AAA	84-GAM Waveform, 407MHz	Generio	6.27	±9:0
0400	AAD	IEEE 802,11ac WiFi (20 MHz, 64-QAM, 99pc dc)	WLAN	8.37	±9.6
0401	AAA	IEEE 802.11ac WFT (40 MHz, 64-QAM, 96pc dc)	WLAN	8,60	±9.6
0.402	AAA	IEEE 802.11ac WIFI (88 MHz, 64-QAM, 89pc dc)	WLAN	11.53	±9.6
0403	AAB	CDMA2000 (1xEV-DO, Rev. 0)	CDMA2000	3,76	±9.6
0404	AAB	CDMA2000 (1xEV-DO, Rex. A)	CDMA2000	3.77	±9.6
0406	CAA	CDMA2000, RC3, SG32, SCH0, Full Rate	CDMA2000	5.22	. ±9,6
0430	AAA	LTE-TOD (SC-FDMA, 1 RB, 10 MHz, QPSK, UL Sub=2.3,4,7,8,9)	LTE-TOO	7.82	±9,6
0414	AAA	WLAN CCDF, 64-QAM, 40 MHz	Generic	0.54	±9.0
0415	AAA	IEEE 802.11b WiFl 2.4 GHz (DSSS, 1 Mbps, 99pc do)	WEAN	1.54	±9,6
0416	AAA	IEEE 802.11g WIFI 2.4 GHz (ERP-OFDM, 6 Mbps, 99pc do)	WLAN	11.23	±9.6
0457	AAA	IEEE 802.11a/h WIFI 5 GHz (OFDM, 6 Mbps. 99pc dc)	WLAN	8.23	±9.0
0438	AAA	IEEE 802.11g WIFI 2.4 GHz (DSSS-OFDM, 6 Mbps, 99pc, Long)	WLAN	R.14	±9.6
0418	AAA	IEEE 802.11g WFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 99pc, Short)	WLAN	11.19	±9,8
0422	AAA	IEEE 802.11n (HT Greenfield, 7.2 Mbps, BPSK)	WLAN	8.32	±9.0
0.420	AAA	IEEE 802.11n (HT Greenfield, 43.3 Mbps, 16-GAM)	WLAN	8.47	.±9.6
0424	AAE	IEEE 802,11n (HT Greenfield, 72.2 Mbps, 64-QAM)	WLAN	8,40	±9.6
0.425	AAE	IEEE 802,11n (HT Greenfield, 15 Mbps, BPSK)	WEAN	8.41	±9.0
0420	AAE	IEEE 802.11n (HT Greenfield, 90 Mbps, 16-QAM)	WEAN	8.45	±9.6
0427	AAH	IEEE 802,11n (HT Greenlield, 150 Mbps, 64-QAM)	WEAN	8.41	±9.E
0430	BAA	LTE-FDD (OFDMA, 5MHz, E-TM 3.1)	LTE-FD0	8.28	±9.8
0431	AAG	LTE-FDD (OFDMA, 10 MHz, E-TM 3.1)	LTE-FDD	5.38	±9.6
0.432	AAB	LTE-FDD (OFDMA, 15MHz, E-TM 3.1)	12E-100	8.94	±9.0
0433	The state of the s	LTE-FDD (OFDMA, 20 MHz, E-TM 3.1)	LTE-FD0	8.34	#9.6
0434	AAG	W-CDMA (BS Test Model 1, 84 DPCH)	WCOMA	8.60	±0.6
0435	AAA	LTE-TOD (BC-FDMA, 1 RB, 20 MHz, QPSK, UL Sub)	LTE-TOO	7.82	±9.6
0447	AAA	LTE-FDD (OFOMA, 5MHz, E-TM 3.1, Clipping 44%)	LTE-FDD	7.56	±9.6
0448	AAA	LTE-FDD (OFDMA, 10MHz, E-TM 8.1, Clippin 44%)	LTE-FDD	7,53	±9.6
0449	AAA	LTE-FDD (OFDMA, 15 MHz, E-TM 3.1, Cliping 44%)	LTE-FDD	7.51	±9:4
	AAA	LTE-FDD (OFDMA, 20 MHz, E-TM S.1, Oligping 44%)	LTE-FD0	7.48	±9,6
0451	AAG	W-CDMA (8S Test Model 1, 84 DPCH, Clipping 44%)	WCDMA	7.56	±8.6
1456	AAC	Validation (Square, 10 ms, 1 ms) IEEE 802-11ac WFI (150 MHz, 64-QAM, 90pc do)	Test	10.00	±9.6
0457	AAC	LIMTS-FDD (DC-HSDPA)	WLAN	8.63	±9.6
0458	AAC	PRIMATION (ACTION DO DE PARTICIO	WCOMA	53.0	±9.6
0458	AAC	CDMA2000 (1xEV-DD, Rev. B, 2 centers) CDMA2000 (1xEV-DD, Rev. B, 3 centers)	GDMA2000	8.55	±9.8
0460	AAG	UMTS-FDD (WCDMA, AMR)	CDMA2000	8.25 2.38	±9.6
0461	AAC	LTE-TDD (BC-FDMA, 1 RB, 1.4MHz, QPSK, UL Sub)	WCDMA	7.82	±9.6
0462	AAC	LTE-TUD (SC-FDMA, 1 RB, 1.4MHz, GPSK, UL S(6))	LTE-TOD		±0.0
796E 1483	AAD	LTE-TOD (SC-FDMA, 1 RB, 1.4MHz, 54-GAM, UL Sub)	LTE-TOD	8.30	±9.6
1464	AAD		LTE-TOO	8,56	±9.6
0465	AAC	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, QPSK, UL Sub) LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 18 CAM, UL Sub)	LTE-TDD	7.82	±9.6
0488	AAC	LTE-TDD (SC-FDMA, 1 RB, 3MHz, 64-DAM, UL Sub)	LTE-TOD	8.32	±9.6
0467	AAA	LTE-TOD (SC-FDMA, 1 RB, SMHz, 64-GMM, UL SUB)	LTE-TOD	8.67	±9.8
7465 7465	AAF	LTE-TOD (SC-FDMA, 1 RB, 5MHz, 0PSK, UL Sub)	LTE-TOD	7.82	±9.6
V-9100	AAD	LTE-TOD (SC-FDMA, 1 RB, 5MHz, 18-GAM, UL Sub)	LTE-TOD	6,32	#9.6
0.650		LET THE GOLD CORN, 1 MM, DWINZ, BY CANN, UL SUII)	LTE-TOD	15.56	±9.6
0459	AAD	LTE-TOD (SC-FDMA, 1 RR, 10 MHz, QPSK, UL Sub)	LTE-TDD	7.82	+9.6

Certificate No: EX-3972_Aug22 Page 13 of 21

F-TP22-03 (Rev. 04) Page 60 of 131



CUSTOMER SECRET



EX3DV4 - SN:3972

August 19, 2022

UID	Rigy	Communication System Name	Group	PAR (dB)	Unoff k = 1
10472	AAC	LTE-TOD (SC-FOMA, 1 RB, 10 MHz, 64-QAM, UL Sub)	LTE-TDD	8.97	±0.6
10473	AAA.	LTE-TDD (SC-FOMA, 1 RB, 15 MHz, QPSK, UL Sub)	LTE-TOO	7.82	±9.6
10474	AAC	LTE-7DO (SC-FDMA, 1 RB, 15MHz, 16-QAM, UL Sub)	LTE-TDD	8.32	±9.6
10475	AAD	LTE-TDO (SC-FDMA, 1 RB, 15MHz, 64-QAM, UL Sub)	LTE-TOD	8.57	±9.6
10477	AAC-	LTE-TOD (SC-FDMA, 1 RB, 20 MHz, 16-QAM, UL Sub)	LTE-TOD	8.32	±0.6
10478	AAC	LTE-TOD (SC-FDMA, 1 RB, 20MHz, 64-QAM, UL Sub)	LTE-TOO	8.57	19.6
10479	AAC	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK, UL Sueri	LTE-TDO	7.74	+9.6
10480	AAA	LTE-TOD (SC-FOMA, 50% RB, 1.4MHz, 18-QAM, UL Sub)	LYE-TOD	8.18	±9.8
10481	AAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM, UL Sub)	LTE-700	8.45	±9.0
10482	AAA	LTE-TOD (SC-FDMA, BOYL RB, 3 MHz, OPSK, UL Sub)	LTE-TEO	7.71	39.6
10483	AAA	LTE-TOD (SC-FDMA, 50% RB, 3MHz, 16-QAM, Sub)	LTE-TOO	8.39	±9.8
10484	AAB	LTE-TDD (SC-FDMA, 50% RB, 3MHz, 64-QAM, UL Sub)	LTE-TOO	8.47	±9.6
10485	AAB:	LTE-TDD (SC-FDMA, 50% RB, 5MHz, QPSK, UL Sub)	LTE-TDD	7.58	±0.6
10486	AAB	LTE-TDD (SC-FDMA, 50% RB, 5MHz, 16-QAM, UL Sub)	LTE-TOO	6.38	±9.6
10487	AAC	LTE-TOD (SC-FDMA, 50% RB. SMHz, 64-QAM, UL Subi	LTE-TOD	8.60	#8.6
10488	AAC	LTE-TOD (SC-FOMA, 50% RB. 10 MHz, QPSK, UL Sub)	LTE-TOD	7.70	19.5
10489	AAC	LTE-TDD (SC-FDMA, 50% RE. 10 MHz, 16-QAM, UL Sub)	LTE-TOD	8.31	19.6
10490	AAF	LTE-TDD (SC-FDMA, 50% RB. 10 MHz, 64-QAM, UL Sub)	LTE-TDD	8.54	
10491	AAF	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, QPSK, UL Sub)	LTE-TOD	7.74	19.8
10492	AAF	LTE-TOD (SC-FDMA, 50% RE, 15MHz, 16-QAM, UL Sub)	LTE-TOD	E.41	±9.6
10483	AAF	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM, UL Bub)			±0.0
10494	AAI	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, QPSK, UL Sub)	LTE-TOD	8.55 7.74	19.6
10495	AAF	LTE-TDD (SC-FDMA, SON RB, 20 MHz, 16-QAM, UL SUS)	LTE-TOD	1,	£5.0
10498	AAE	LTE-TOD (SC-FOMA, SIN-RB, 20 MHz, 64-QAM, UL SUD)	LTE-TDD	6.37	£9.0
10407	AAE		LTE-TDD	8.54	19.8
10498	AAE	LTE-TOD (SC-FDMA, 100% RB, 1.4 MHz, QPSK, UL Sub)	LTE-TOD	7.67	70.H
10499	AAG	LTE-TDD (SC-FOMA, 100% RB, 1.4 MHz, 16-QAM, UL Sub)	LTE-TOD	8.40	£9.8
10500	AAF	LTE-TOO (SC-FOMA, 100% RB, 1.4 MHz, 64-QAM, UL Sub)	LTE-TOD	89.8	49.8
10501	AAF:	LTE TOO (SC-FOMA, 100% RB, 3 MHz, QPSK, UL Sob)	LTE-TOD	7.67	£B.B
10502	-	LTE-TOO (SC-FOMA, 100% RB, 3MHz, 18-QAM, UL Sub)	LTE-TOD	8.44	±8.6
	AAB	LTE-TOD (SC-FOMA, 100% AB, 3 MHz, 64-QAM, UL Sub)	LTE-TOO	H.52	±9.6
10500	BAA	LTE-TDD (SC-FDMA, 100% RB, 5MHz, QPSX, UL Sub)	LTE-TDD	7.72	±9.6
		LTE-TDD (SC-FDMA, 100% RB, 5MHz, 18-QAM, UL Sub)	LTE-TOO	8.25	±9.6
10505	AAC	LTE-TDD (BC-FDMA, 100% RB, SMHz, 64-QAM, UL Sub)	UE-700	8.54	±9.6
10508	AAC	LTE-TDD (SC-FDMA, 100%, RB, 10 MHz, QPSK, UL Sub)	LTE-TOO	7.74	3,9.6
10607	10.00	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 16-QAW, UL Sub)	LTE-TOD	8.36	±9.6
10508	AAF	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 54-QAM, UL Sub)	LTE-TOD	8.55	±9.6
10509	AAF	LTE-TDD (BC-FDMA, 100% RB, 15 MHz, QPSK, UL Sub)	LTE-TDD	7.99	28.6
10510	AAF	LTE-TDD (SC-FDMA, 100% RB, 15MHz, 16-QAM, UC 8u6)	TLE-LDD	8.49	#9.6
10511	AAF	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 54-QAM, UL Sub)	LTE-TOD	8,51	±8.6
10512	AAF	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, QPSK, UL Sub)	LTE-TOD	7.74	19.6
10513	AAF	LTE-TDD (SC-FDMA, 100% RE, 20MHz, 16-QAM, UL Sub)	LTE TDD	8.42	10.6
10514	AAE	LTE-TDD (SC-FDMA, 100% RB, 20MHz, 64-QAM, UL Sub)	LTE-TDD	8.45	±9.0
10515	AAE	EEE 802.11b WIFI 2.4 GHz (DSSS, 2 Mbps, 95pp dc)	WLAN	1.56	±,9.10
10516	AAE	EEE 802.116 WIFI 2.4 GHz (DSSS, 5.5 Mbps, 86pc do)	WLAN	1.57	±0.8
10517	AAF	IEEE 802.11b WIFI 2.4 GHz (DSSS, 11 Mbps, 99pc dc)	WLAN	1.58	±0.0
10518	AAF	IEEE 802.11a/h WIFLS GHz (OFDM, 9 Mbps, 99pc dc)	WLAN	8.23	49.6
10519	AAF	IEEE 802,11a/r WIFI 5 GHz (OFDM, 12 Mbps, 99pc dc)	WLAN	8.39	±0.0
10520	AAB	IEEE 802.11a/h WIFI 5 GHz (OFOM, 18 Mbps, Blipo do)	WLAN	8.12	±9.6
10521	AAB	IEEE 802.11a/h WIFI 5 GHU (OFOM, 24 Mbps, 99pc dc)	WLAN	7.97	49.6
10955	AAB	IEEE 802.11am WIFI 5 GHz (OFDM, 36 Mbps, 99pc dc)	WEAN	R.45	±9.8
105gn	AAC	IEEE 802.11a/h WIFI 5 GHz (OFOM, 48 Mbps, 99pc de)	WLAN	8.08	±9.6
10524	AAC	IEEE 802.11a/h WIFL5 GHz (OFDM, 54 Mbps, 99pc dtl)	WLAN	8.27	±9.0
10525	AAC	IEEE 802.11ac WiFi (20MHz, MCS0, 99pc dc)	WLAN	6.36	±0.6
10526	AAF	IEEE 802.11 ac WiFi (20 MHz, MCS1, 99pc dc)	WLAN	8.42	±9.6
0527	AAF	IEEE 802.11ac WIFI (20MHz, MQS2, 99pc dc)	WLAN	8.21	±9.6
10528	AAF	IEEE 802.11sc WFI (20MHz, MCS0, 99pc dc)	WLAN	8.38	±9.6
0.529	AAF	IEEE 802.11ac WiFi (20 MHz, MCS4, 99pc do)	WLAN	0.38	±9.6
0531	AAF	EEE 802.11ac WFI (20MHz, MCS6, 99pc dc)	WLAN	8.43	19.6
0532	AAF	IEEE 802.11ec WIFI (20 MHz, MCS7, 99pc dic)	WLAN	8.29	±9.8
0533	AAE	IEEE 802.11ac WIF) (20 MHz, MCS8, 99pc dc)	WLAN	8.38	±9.6
10534	AAE	IEEE 802.11ac WIFI (40 MHz, MCS0, 99pc do)	WLAN	8.45	±0.0
0535	AAE	IEEE 802.11ac WIF1 (48 MHz, MCS1, 99pc dc)	WLAN	8.45	±9.6
0530	AAF	IEEE 802,11ac WiFi (40 MHz, MCS2, 98pc dc)	WLAN	8.32	19.6
0537	AAF	IEEE 802.11ab WFI (40 MHz, MCS3, 99pc do)	WLAN	8.44	±0.6
0538	AAF	IEEE 802.11ac WiFI (40 MHz, MCS4, 99pc dc)	WEAN	8.54	±9.6
		IEEE 882.11ac WFi (40 MHz, MCSA, 99cc dc)	WEAN	35.96-7	2 65 1 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7

Certificate No: EX-3972_Aug22

Page 14 of 21



CUSTOMER SECRET



Report No. HCT-SR-2301-FC004

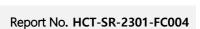
EX3DV4 - SN:3972 August 19, 2022

UID	Rev	Communication System Name	Group	PAR (dB)	Unc* k = 1
10541	AAA	IEEE 802.11ac WiFT (40 MHz, MCS7, 99pc dc)	WLAN	8.48	±9.6
10542	AAA	IEEE 802,11ac WFT (40 MHz, MGS8, 99pc dc)	WLAN	8,66	±9.6
10543	AAC	IEEE 802,11an WF) (40 MHz, MCS9, 99pc dc)	WEAN	11.65	±9.6
10544	AAC	IEEE 802,11ac WIF1 (80 MHz, MCS0, 98pc dc)	WEAN	8.47	±0.6
10545	AAC	IEEE 802.11ac WIFI (80 MHz, MCS1, 99pc dc)	WLAN	8.95	±9.6
10546	AAC	IEEE 802.11ac WIFI (80 MHz, MCS2, 99pc dc)	WLAN	8.35	3.8
10547	AAC	IEEE 802.11sc WiF (80 MHz, MCS3, 99pc dc)	WLAN	8.49	±9.6
10548	AAC	IEEE 802,11ac WiFI (80 MHz, MCS4, 99pc dc)	WLAN	8.37	±9.8
10550	AAC	IEEE 802.11ac WF1 (80 MHz, MCS8, 99pc dc)	WEAN	8,38	±9.6
10561	AAC	IEEE 802,11ac WIF1 (80 MHz, MCS7, 99pc dc)	WLAN	1.50	±9.6
10552	AAG	IEEE 802,11ac WF1 (80 MHz, MCS8, 99pc dc)	WLAN	8.42	±8.8
10563	AAC	IEEE 802,11ac WiFi (80 MHz, MCS9, 99pc do)	WEAN	8.45	±9.6
10554	AAC	IEEE 802.11ac WF1 (160 MHz, MCS0, 99pc dc)	WEAN	11.48	±9.6
10555	AAC	IEEE 802,11ac WIFI (160 MHz, MCS1, 99pc dc)	WLAN	8,47	±8.6
10556	AAC	IEEE 802,11ac WFI (160 MHz, MCS2, 99pc dc)	WLAN	8.50	3,93
10557	AAC	IEEE 802.11ac WFT (160 MHz, MCS3, 98pc dc)	WLAN	8.52	±9,6
10558	AAC	IEEE 802.11an WF1 (160 MHz, MCS4, 98pc dc)	WLAN	8.61	±9.0
10560	AAC	IEEE 802.11ap WiFi (180 MHz, MCS5, 99pc do)	WLAN	8.73	±9,6
10561	AAC	IEEE 802.11ac WiFt (160 MHz, MCS7, 99pc dc)	WEAN	8,56	±9.6
10562	AAC	IEEE 802,11ac WFI (160 MHz, MCS8, 99pc dc)	WLAN	8.09	±8.8
10569	AAC	IEEE 802.11ac WIFI (160 MHz, MCS9, 99pc dc)	WEAN	9.77	±0.0
10564	AAC	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 9 Mbps, 99po do)	WEAN	8.25	±8,6
10566	AAC	IEEE 802.11g WFI 2.4 GHz (DSSS-DFDM, 12 Mbps, 99pc dc)	WLAN	8.45	±0.0
10566	AAC	IEEE 802 11g WFI 2.4 GHz (DSSS-OFDM, 18 Mbps, 98pc dc)	WLAN	B.13	19.6
10567	AAC	IEEE 862.11g WIFI 2.4 GHz (DSSS-OFDM, 24 Mbps, 96pc dc)	WLAN	8.00	±8.6
10568	AAC	IEEE 802.11g WFI 2.4 GHz (DSSS-OFDM, 36 Mbpe, 99pc ric)	WEAN	8.37	±9.0
10569	AAC	IEEE 802,11g WFI 2.4 GHz (DSSS-DFDM, 48 Mbps, 98pc dc)	WLAN	8.10	±9.0
10570	AAC	IEEE 802.11g WIFI 2.4 OHz (DSSS-OFDM, 54 Mbps, 98pc dc)	WLAN	8.30	49.6
0571	AAC	IEEE 802.115 WIFI 2.4 GHz (DSSS, 1 Mbps, 90pc dc)	WLAN	1,98	±9.8
0572	AAG	IEEE 802,116 WiFi 2,4 GHz (DSSS, 2 Mbps, 90pc dc)	WLAN	1.99	±9:5
10573	AAC	IEEE 802.11b WIFI 2.4 GHz (DSSS, 5.5 Mbps, 90pc dc)	WLAN	1.98	±9.0
10574	AAC	IEEE 802,11b WFI 2.4 GHz (DSSS, 11 Mbps, 90pc dc)	WEAN	1,98	#9.6
	11.00	IEEE 802,11g WIFI 2.4 GHz (DSSS-OFDM, 6 Mbps, 90po do)	WS.AN	6.59	±9.6
10578	AAC	IEEE 802.11g WFI 2,4 GHz (DSSS-OFDM, 9 Mbps, 90pc dc)	WLAN	8.60	±9:6
10577 10578	AAD	IEEE 802.11g WIFI 2.4 GHz (DSSS-OFDM, 12 Mbps, 90pc dc)	WLAN	8.70	±9.6
10579	AAD	IEEE 802.11g WIFI 2.4 GHz (DSSS-OFDM, 18 Mbps, 90pc dc) IEEE 802.11g WIFI 2.4 GHz (DSSS-OFDM, 24 Mbps, 90pc dc)	WLAN	8,49	±9.6
10580	AAD	IEEE 802.11g WIFI 2.4 GHz (DSSS-OFDM, 26 Mbps, 90pc dc)	WLAN	8.36	±0.6
10581	AAD	IEEE 802.11g WIFI 2.4 GHz (DSSS-OFDM, 36 Meps, 90pc dc)	WLAN	8.76	19.6
10582	AAD	IEEE 802.11g WIFI 2.4 GHz (DSSS-OFDM, 44 Mops, 90pc dc)	WLAN	8,35	±9.6
10583	AAD	IEEE 802 11a/h WIFI 5GHz (GFDM, 6 Mbps, 90pc do)	WLAN		±9.6
10584	AAD	IEEE 802 11ah WFI 5 GHz (GFDM, 8 Mbps, 90pc do)	WLAN	8.09	±9.8
10585	AAD	IEEE 802 11ah WFI 5 GHz (OFDM, 12 Mbps, 90pc dc)	WLAN	8.70	±9.6
10586	AAD	IEEE 802.11sh WIF/5GHz (OFDM, 18 Mbps, 90pc (c)	WLAN	8.70 H.49	±9.6
0587	AAA	IEEE 802.11ah WiFi 5 GHz (OFDM, 24 Mbps, 90pc dc)	WLAN	9.35	±9.6
10588	AAA	IEEE 802,11ah WFI 5 GHz (OFDM, 36 Mbps, 90pc dc)	WLAN	77165	19.6
0.589	AAA	IEEE 802.11a/h WIFI 5 GHz (DFDM, 48 Mbps, 90pc dc)	WLAN	8:76	±9.6
0.090	AAA	IEEE 802.11ah WIFI 5 GHz (OFDM, 54 Mbps, 90pc dc)	WLAN	8.55	±9,6
0591	AAA	IEEE 802,11n (HT Mised, 20 MHz, MCS0, 90pc dc)	WLAN	8,63	±9.6 ±9.6
0500	AAA	IEEE 802.11n (HT Mised, 20 MHz, MCS1, 90pt do)	WLAN	9.63	+9.6
0560	AAA	IEEE 802,11s (HT Mixed, 20 MHz, MCS2, 90pg dc)	WLAN	8.64	19.6
0594	AAA	IEEE 802.11n (HT Mbsd, 20 MHz, MCS3, 80pc do)	WLAN	8.74	+9.6
0585	AAA	IEEE 862.11n (HT Mixed, 20 MHz, MCS4, 90pc do)	WLAN	8.74	
0000	AAA	IEEE 802.11n (HT Mixed, 20 MHz, MCS5, 90pp do)	WLAN	8.71	±8.6
0597	AAA	IEEE 802.11n (HT Mixed, 20MHz, MCS6, 90pc dc)	WLAN	8.72	#9.6
0500	AAA	IEEE 802.11n (HT Mixed, BSMHz, MCS7, 90pc do)	WLAN	8.50	=9.6
0588	AAA	IEEE 862.11n (HT Mixed, 40 MHz, MCSc, 90pc do)	WLAN	8.79	#8.6
0880	AAA	IEEE 802,11n (HT Mixed, 40 MHz, MC51, 90pc dc)	WLAN	8.88	#9.6
0801	AAA	IEEE 802.11rr (HT Mixed, 40 MHz, MCS2, 90pc dt)	WLAN	8.82	±9.6
0805	AAA	IEEE 802 11n (HT Moved, 40 MHz, MCS3, 90pc do)	WLAN	8.94	19.6
0803	AAA	IEEE 802.11n (HT Mised, 40 MHz, MCS4, 90pc do)	WLAN	8.03	19.6
0804	AAA	IEEE 802.11n (HT Mored, 40 MHz, MCS5, 90pc do)	WLAN	8.76	
0005	AAA	IEEE 802.11n (HT Mased, 40 MHz, MCS6, 90pc de)	WLAN	8.97	±9.6
0608	AAC	IEEE 802.11n (HT Mixed, 40 MHz, MCS7, 90pc dc)	WLAN:	8.82	19.6
0807	MAC	IEEE 802.11sc WIFI (20 MHz, MCS0, 90pc do)	WLAN	8.64	±9.6
		A STATE OF THE PARTY OF THE PAR	11000	41.0%	200.0

Certificate No: EX-3972_Aug22

Page 15 of 21

F-TP22-03 (Rev. 04) Page 62 of 131



CUSTOMER SECRET



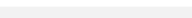
EX3DV4 - SN:3972 August 19, 2022

UID	Rev	Communication System Name	Group	PAR (dB)	Unch k =
10609	AAC	IEEE 802.11ac WFI (20 MHz, MCS2, 90pc dc)	WLAN	8.57	#9.6
0610	AAC	(EEE 802.11ac WFI (20 MHz, MCS3, 90pc do)	WLAN	8.78	#8.6
0811	AAC	IEEE 802.11ac WIFI (20 MHz, MC54, 90pc dc)	WLAN	8.70	#9.6
0812	AAG	IEEE 802.11ac WFI (20 MHz, MCS5, 90pc dc)	WLAN	8.77	#9.6
0813	AAC	IEEE 802,11ac WIFI (20 MHz, MCS6, 90pc dc)	WLAN	8.94	±0.6
0614	AAC	IEEE 802.11ac WFI (20 MHz, MCS7, 90pc dc)	WLAN	8.59	±8.5
0615	AAC	IEEE 802.11ac WIFI (20 MHz, MCS8, 90pc dc)	WLAN	8.82	±9.6
0618	AAC	IEEE 862,11ac WIFL (40 MHz, MCS0, 90pc dc)	WLAN	8.82	19.6
0617	AAC	IEEE 882 11ac WFI (40 MHz, MCS1, 90pc dc)	WLAN	8.81	+9,8
0618	AAC	IEEE 802.11ac WFI (40 MHz, MCS2, 90pc dc)	WLAN	11,58	±9.5
0619	AAG	IEEE 802.11ac WIFI (40 MHz, MCS3, 90pc dc)	WLAN	H-86	±9.6
0690	AAC	IEEE 802.11ac WFI (40 MHz, MCS4, 90pc dc)	WLAN	8.87	±9.6
19891	AAC	IEEE 802.11ac WiFi (40 MHz, MCB5, 90pc dc)	WLAN	8.77	±9.6
10622	AAC	JEEE 800;11ac WIFI (40 MHz, MCSB, 90pc do)	WLAN	83,8	±9.6
116231	AAC	IEEE 802,11se WIFI (40 MHz, MCS7, 90pc dc)	WLAN	8.82	±9.6
0624	AAC	IEEE 802,11sc WIFI (40 MHz, MCS8, 90pc dc)	WLAN	8.96	±9.6
10625	AAC	IEEE 802,11ac WiFi (40 MHz, MCS9, 90pc dc)	WLAN	8.99	±0.6
0.658	HAC	IEEE 802, 11ac WIFI (80 MHz, MC80, 90pc dc)	WLAN	8.83	+9.6
10627	AAC	IEEE 802.11ac WIF1 (80 MHz, MCB1, 90pc dc)	WLAN	11.88	±9.6
0628	AAC	IEEE 802,11ac WiFi (80 MHz, MCS2, 90pc dc)	WLAN	8.71	±6.6
0.629	AAC	IEEE 802.11ac WIFI (80 MHz, MCS3, 90pc do)	WLAN	8.85	±9.6
10630	AAC	IEEE 802.11ac WIF) (80 MHz, MC94, 90pc do)	WLAN	8.72	±9.6
10631	AAC	IEEE 802, 11ac WIFI (80 MHz, MCS5, 90pc dc)	WLAN	8.81	±9.6
10/632	AAC	IEEE 802.11ac WIFI (80 MHz, MCBit, 90pc dc)	WLAN	E.74	±9.8
10633	AAC	EEE 802.11ac WiF) (80 MHz, MCS7, 90pc dc)	WLAN	8.83	±9.8
10834	AAC	IEEE 802.11sc WiFi (80 MHz, MCS8, 90pc dc)	WLAN	8.80	±9/6
10635	AAG	IEEE 802.11ac WIFI (80 MHz, MC89, 90pc dc)	WLAN	H.H1.	±5.6
10636	AAC	IEEE 802.11ac WIFI (160 MHz, MCS0, 90pc dc)	WLAN	8,83	±8,6
10837	AAC	IEEE 802.11sc WiFi (180 MHz, MCS1, 90pc dc)	WLAN	8,79	±9.6
10638	AAG	IEEE 802.11ac WFI (160 MHz, MCS2, 90pc dc)	WLAN	8.86	±9.6
10639	AAC	EEE 802.11ac WIFI (160 MHz, MCS3, 90pc dc)	WLAN	8.85	+9.6
10640	AAC:	IEEE 802.11ac WFI (180 MHz, MCS4, 90pc do)	WLAN	88.8	±9.6
10841	AAC	IEEE 802.11ac WIFI (160 MHz, MCSS, 90pc do)	WLAN	9.08	±9.8
10642	AAC	IEEE 832,11ac WiFI (160 MHz, MOS6; 90pc dc)	WLAN	9,06	±5.6
10643	AAC	IEEE 802.11ac WFI (160 MHz, MCS7, 90pc dc)	WLAN	8.99	±9.6
10944	AAC	IEEE 802.11ac WIFI (160 MHz, MCS8, 90pc dc)	WLAN	9.05	±9.6
10645	AAC	IEEE 802.11ac WIFI (180 MHz, MCSS, 90pc dc):	WLAN	(5.11	±9.6
10846	AAC	LTE-TOD (SC-FDMA, 1 RB, 5MHz, QPSK, UL Sub-2,7)	LTE-TOD	11.99	±9.6
10647	MC	LTE-TDD (SC-FDMA, 1 RB, 26 MHz, GPSK, UL Sub=2.7)	LTE-TDD	11,96	±9.8
10648	AAC	CDMA2000 (1x Advanced)	CEMA2000	3.45	±9.6
10850	AAC	LTE-TDD (OFDMA, 5 MHz, E-TM 3.1, Clipping 44%)	LTE-TOD	6,91	+0.6
10653	AAC	LTE-TDD (OFDMA, 10 MHz, E-TM 3.1, Clipping 44%)	LTE-TDD	7.42	±9.6
10654	AAC	LTE-TOD (OFDMA, 15 MHz, E-TM 3.1, Clipping 44%)	LTE-TDD	6.99	±9.6
10655	AAC	LTE-TDD (OFDMA, 80MHz, E-TM 3.1, Clipping 44%)	LTE-TOD	7,21	±9.8
10658	ANC	Pulse Waveform (200 Hz, 10%)	Test	10.00	±9.6
10659	AAC	Pulse Waveform (200 Hz. 20%)	Tiest	6.99	±9.6
10660	AAC	Pulse Waveform (200 Hz, 40%)	-Test	3.98	.±9.8
10001	AAC	Pulse Waveform (200 Hz, 60%)	Test	2.22	
10880	AAC	Putse Waveform (200 Hz, 80%)	Test	0.97	+9.6
0670	AAC	Bluetooth Low Energy	Bumooth	2:19	+9.6
0671	AAD	IEEE B02.11ax (20MHz, MCB0, 90pc dc)	WLAN	9.09	±9,8
106731	AAD	IEEE 802.11ax (20 MHz, MCS1, 90pc dc)	WLAN	0.57	±9.6
0873	AAD	IEEE 802.11ax GIO MHz, MCS2, 90pc dc)	WLAN	8.78	±9.6
0674	AAD	IEEE 802.11ax (20 MHz, MCS3, 90pc dc)	WLAN	8.74	#9.5
0675	AAD	IEEE 802,11ax (20 MHz, MCS4, 90pc dc)	WLAN	8.90	±9.6
067H	AAD	IEEE 802.11ax (20 MHz, MC95, 90pc dc)	WLAN	8.77	(8.8)
0877	AAD	IEEE 802.11ax (20 MHz, MCS8, 90pc dc)	WLAN	8.73	±9.6
0678	AAD	IEEE 802.11ax (20 MHz, MCS7, 90pc dc)	WLAN	8,78	±11.6
0678	AAD	IEEE 802.1 hax (20 MHz, MGS8, 90pc oc)	WLAN	8.89	#9.8
10880	AAD	IEEE 802,11sx (20MHz, MC55, 90pt dc)	WLAN	8.80	#9.6
0681	AAG	IEEE 802.11sx (20 MHz, MCS10, 90pc dtt)	WLAN	8.82	±0.6
10882	AAF	IEEE 802.11ax (20 MHz, MCS11, 90pc dc)	WUAN	8.83	±8.6
10883	AAA	IEEE 802.11ex (20MHz, MCS0, 95pc dc)	WLAN	8.42	#9.6
0664	AAC	IEEE 802.11ax (20 MHz, MCS1, 99pc dc)	WLAN	8.26	#9.6
10685	AAC	IEEE 882.11ax (20 MHz, MCS2, 90pc dc)	WLAN	8.33	±9.6
10880	AAC	JEEE 882.11mx (20 MHz, MC83, 99pc (tc)	WLAN	8.28	±9.6

Certificate No: EX-3972_Aug22

Page 16 of 21

F-TP22-03 (Rev. 04) Page 63 of 131



CUSTOMER SECRET



Report No. HCT-SR-2301-FC004

EX3DV4 - SN:3972 August 19, 2022

UID	Rev	Communication System Name	Group	PAR (dB)	Unch h =
10687	AAE	IEEE 882.11ss (20 MHz, MCS4, 99pc dc)	WLAN	8.45	±9.6
10688	AAE	IEEE 802 (1 as (20 MHz, MCS6, 99pc dc)	W(AN	8,29	±9.6
10689	AAD	IEEE 802.11ax (20 MHz, MCS6, 99pc dc)	WLAN	8.55	±18.55
0890	AAE	IEEE 802.17ax (20 MHz. MCS7, 90pc dc)	WEAN	8.29	±8.6
10801	AAB	IEEE 882.11ax (20 MHz, MCS8, 99pc dc)	WLAN	8.25	±9.0
10662	AAA	IEEE 802.11ax (20 MHz, MCS8, 99pc dc)	W;AN	8.29	±9.10
10683	AAA	IEEE 802,31ax (20 MHz, MCS10, 90pc dc)	WLAN	8.25	±9,6
10694	AAA	IEEE 882,11ax (20 MHz, MCS11, 90pc dc)	WLAN	8.57	±9.0
0895	AAA	IEEE 802,11ax (40 MHz, MCS0, 90pc dc)	WLAN	8.76	±9.6
0696	AAA	IEEE 802.11mx (40 MHz, MCS1, 90pc oc)	WLAN	8.91	±9.6
0.697	AAA	IEEE 802,11ax (40 MHz, MCS2, 90pc dc)	WLAN	8.81	±8,8
10808	AAA	IEEE 802.11ax (40 MHz, MCSE, 90pc dc)	WLAN	8.89	±9.6
10666	AAA	IEEE 802.11ax (40 MHz, MCS4, 90pc dc)	WLAN	0.82	±9.8
0700	AAA	IEEE 802,11ax (40 MHz, MCSS, 90pc dc)	WLAN	8.73	±9.0
0701	AAA	IEEE 802,11ax (46 MHz, MCS6, 90pc dc)	WLAN	H.88	±9.6
0702	AAA	IEEE 802,11ax (40 MHz, MCS7, 90pc dc)	WLAN	8.70	±9.8
0700	AAA	IEEE 802.11ax (40 MHz, MCS8, 90pc dc)	WLAN	8.82	±0.6
0704	AAA	IEEE 802.11ax (40 MHz, MCS9, 90pc dc)	WLAN	8.58	±9.6
0.705	AAA	IEEE 802.11ax (40 MHz, MCS10, 90pc do)	WLAN	8.69	19.8
10706	AAC	IEEE 802.11ax (40 MHz. MCS11, 90pc do)	WLAN	8.66	±8.8
0707	AAC	IEEE 802.11ax (40 MHz, MCS0, 99pc dc)	WLAN	H.32	±9.6
0708	AAC	IEEE 802.11ax (40 MHz, MCB1, 99pc dc)	WLAN	8.55	±9.6
0708	AAC	IEEE 802.11ax (40 MHz, MCS2, 99pc dc)	WLAN	II.33	±9.6
0710	AAC	IEEE 802.11ax (40 MHz, MCS3, 98pc do)	WLAN	11,29	±9.0
0711	AAC	IEEE 802,11ax (40 MHz, MCS4, 99pc dc)	WLAN	II.39	±9.6
0712	AAC	(EEE 602.11ax (40 MHz, MCSS, 99pc dc)	WLAN	8.67	±9.6
0718	AAC	IEEE 802.11ax (40 MHz, MCS8, 99pc dc)	WLAN	11.33	±9.8
0754	AAC	IEEE 862.11ax (40 MHz, MGS7, Bloc etc)	WLAN	8.26	±0.0
0735	AAC	IEEE 802.11ax (40 MHz, MCS8, 99pc do)	WLAN	H.45	±9.6
0710	AAC.	IEEE 802.11ax (40 MHz, MCS9, 99pc dc)	WLAN	8.30	±9.6
0717	AAC	IEEE 602,11ax (40 MHz, MCS10, 99go do)	WLAN	8.48	±9.6
0718	AAC	TEEE 802.11ax (40 MHz, MCS11, 99pp dp)	WLAN	H.24	±9.6
0719	AAC	IEEE 802.11ax (80 MHz, MCS0, 90pc do)	WLAN	8.81	±8.6
0720	AAC	IEEE 802.11ax (80MHz, MCS1, 90pc dc)	WLAN	8.67	±9.6
0721	AAC.	IEEE 602.11ax (80 MHz. MCS2, 90pc dc)	WLAN	8.76	49.5
0722	AAC	IEEE 802.11ax (80 MHz, MCS3, 90pc dc)	WLAN	8.55	±9.6
0723	AAC	IEEE 802.11ax (80 MHz, MCS4, 90pg dd)	WEAN	8.70	±9.6
0724	AAC	IEEE 802.11ax (80 MHz, MCS5, 90pc dc)	WLAN	8.90	±0.0
0725	AAC	IEEE 802.11ax (80 MHz, MCS6, 90pc dc)	WLAN	8.74	±9.8
0.728	AAG	JEEE 802.11ax (80 MHz, MCB7, 90pc dc)	WLAN	8.72	+9.6
0727	AAC	IEEE 802.11nx (80 MHz, MCS8, 90pc dc)	WLAN	8.66	±8.6
0728	AAC	IEEE 802.11ax (80 MHz, MC80, 90pc dc)	WEAN	8.65	±9.6
0729	AAC	IEEE 802.11ax (80 MHz, MCS10, 90pc do)	WLAN	8.64	±9.6
0730	AAC	IEEE 802,11ax (80 MHz, MCS11, 80pc dc)	WLAN	8.67	+9.6
0731	AAG	IEEE 802.11ax (80 MHz, MCS0, 99pc dz)	WLAN	8.42	±9.6
0732	AAC	IEEE 802.11ax (80 MHz, MCS1, 99oc-do)	WLAN	8.46	±9.6
0733	AAC	IEEE 802 11 (av (80 MHz, MCS2, 98pc dz)	WLAN	8.40	±9.6
0734	AAG	IEEE 802.11ax (80 MHz, MCS3, 98pc dc)	WLAN	8.25	±9.6
0735	AAC	IEEE 802.11ax (80 MHz, MCS4, 99pc do)	WLAN	6.23	±9.6
0736	AAG	IEEE 802.11ax (80 MHz, MCS5, 99pc do)	WLAN	0.27	19.6
0737	AAC	IEEE 809.11 au (80 MHz, MCS8, 98pc do)	WLAN	6.35	+9.6
0738	AAC	IEEE 802.11ax (80 MHz, MCS7, 99pc dc)	WLAN	8.42	±9.6
0739	AAC	IEEE 802.11ax (80 MHz, MCS8, 99pc dc)	WLAN	6.29	±9.6
0740	AAC	IEEE 802,11ax (80 MHz, MCS9, 99pc dc)	WLAN	E.68	±9.6
0741	AAC	IEEE BOZ.11ax (BDMHz, MCS10, 99pc do)	WLAN	E.40	±9.6
1742	AAC	IEEE 800,11 sv (80 MHz, MCS11, 99pc dq)	WLAN	E.43	±9.6
0743	AAC	IEEE 802.11ax (180 MHz, MGS0, 90pc do)	WLAN	8.94	±9.6
0744	AAC	IEEE 802.11ax (160 MHz, MGS1, 90pc dc)	WLAN	5,16	19.5
3745	AAC	IEEE 8G2.11ax (160 MHz, MCS2, 90pc dtg)	WLAN	8.93	+9.6
0746	AAC	IEEE 802.11ax (160 MHz, MCSS, 90pc do)	WLAN	8.11	
0747	AAC	IEEE 802.11ax (160 MHz, MCS4, 90pc (to)	WLAN	9.04	±9.6
0748	AAG	IEEE 802.11ax (180 MHz, MCSS, 90pc do)	WLAN	8.93	19.6
0748	AAC	IEEE 802.11ax (160 MHz, MCSS, Supc do)	WLAN	10100	±9.6
	AAG	IEEE 802.11ax (160 MHz, MCS6, 80pc (to)		8.90	±8.6
	178094		WLAN	8.79	±9.6
0750	AAC	IEEE 802.11ax (160 MHz, MCS8, 90pc da)	WLAN	8.82	±0.6

Certificate No: EX-3972_Aug22 Page 17 of 21

F-TP22-03 (Rev. 04) Page 64 of 131



CUSTOMER SECRET



EX3DV4 - SN:3972 August 19, 2022

MID	Rev	Communication System Name	Group	PAB (dB)	Uno $^{\mathbb{R}}$ $k = 3$
10753	AAC	JEEE 802.11ax (160 MHz, MCS10, 80pc dc)	WLAN	9.00	±9.6
10754	AAC.	IEEE 802,11 ax (160 MHz, MCS11, 80pc dc)	WLAN	6.94	19.6
10755.	AAC	IEEE 802.11ax (160 MHz, MCS0, 99pc dc)	WLAN	E.54	+9.6
10756	AAC	IEEE 802.11 ex (160 MHz, MCS1, 99pc dc)	WLAN	8.77	+9.6
10757	AAC	IEEE 802.11ax (160 MHz, MCB2, 09pc dc)	WEAN	8.77	±8.6
10758	AAC	IEEE 802.11ax (160 MHz, MCS3, 99pc dt)	WLAN	8.69	±9.6
10758	AAC	IEEE 802:11 ax (180 MHz, MCS4, 99pc dc)	WLAN	8.58	#16
10780	AAC	IEEE 802,11ex (160 MHz, MCS5, 99pc dc)	WLAN	8.49	±8.6
10781	AAC	IEEE 802.11ax (160 MHz, MCS6, 990c dc)	WLAN	8.58	±9.6
10762	AAC	IEEE 802.11ax (180 MHz, MCS7, 98pc dc)	WLAN	8.40	±0.6
10763	AAC-	IEEE 802.11ax (180 MHz, MCS8, 99pc dc)	WLAN	8.53	±9.6
10784	AAC	IEEE 802.11sx (160 MHz, MCS9, 99pc dc)	WLAN	8.54	±9.6
10.765	AAC.	IEEE 802.11ax (160 MHz, MCS10, 99pc dc)	WLAN	8.54	±9.6
10.766	AAC	IEEE 802,11ax (160 MHz, MCS11, 99pc dc)	WLM	8.51	19.6
10787	AAC	5G NR (CP-OFDM, 1 RB, 5 MHz, CPSK, 15 kHz)	5G NR FR1 TDD	7.99	±9.6
10788	AAC:	93 NR (CP-OFDM, 1 RB, 10 MHz, QPSK, 15 kHz)	50 NR FR1 TDD	8.01	±8.6
10769	AAC.	5G NR (CP-OFDM, 1 RE, 15MHz, QPSK, 15 kHz)	50 NR FR1 TD0	8.01	±9.6
0770	AAC.	5G NR (CP-OFDM, 1 RB, 20 MHz, QPSK, 15 MHz)	50 NR FR1 TDD	8.02	±0.6
10771	AAC	5G NR (CP-OFDM, 1 RB, 25MHz, QPSK, 15 kHz)	50 NR FRI TDO	.8.02	±9.6
0772	AAC	5G NR (OP-OFDM, 1 RB, 30 MHz, QPSK, 15 NHz)	5G NR FR1 TDO	8.29	±9.6
0773	AAC	5G NR (CP-OFDM, 1 RB, 40 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.03	49.6
0774	AAC	93 NR (CP-QFDM, 1 RB, 50 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.02	19.6
10775	AAC	5G NR (CP OFDM, 50% RB, 5 MHz, QPSK, 15 kHz)	53 NR FR1 TD0	8.31	±9.6
0776	AAC	5G NR (CP-OFDM, 50% RB, 10MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.30	19.0
10777	AAC	5G NR (CP-OFDM, 50% RB, 15MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8,00	±9.6
1077H	AAC.	5G NR (CP-OFDM, 50% RB, 20MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.34	+9.6
0779	AAC	5G NR (CP-OFDM, 50% R8, 25 MHz, QPSK, 15 kHz)	50 NR FR1 TDD	8.42	±8.6
0780	AAC.	5G NR (CP-OFDM, 50% RB, 30MHz, QPSK, 15 kHz)	59 NR FR1 700	8.39	±8.0
0781	AAC	5G NR (CP-QFDM, 50% RB, 40 MHz, QPSK, 15 kHz)	5G NR FRI TDD	8,38	19.6
0782	AAC	5G NA (CP-OFDM, 50% RB, 50 MHz, OPSK, 15 kHz)	50 NR FRI TOD	8.43	±9.6
0783	AAC	5G NR (CP-OFDM, 100% RB, 5MHz, QPSK, 15 kHz)	50 NR FR1 TDD	8.31	±0.6
0784	AAC	5G NR (CP-OFDM, 100% RB, 10 MHz, QPSK, 15 kHz)	59 MR FR1 TDD	8.29	±9.6
0785	AAC	5G NR (CP-OFDM, 100% RB, 15 MHz, CPSK, 15 kHz)	5G NR FR1 TDD	8.40	±8.6
0.786	AAC	5G NR (CP-OFDM, 100% RB, 20 MHz, CPSK, 15 kHz)	50 NR FRI TOO	8.35	±8.8
0787	AAC	5G NR (CP-OFDM, 100% RB, 25 MHz, QPSK, 15 kHz)	5G NR FRI TOD	H.44	±9.6
0788	AAC	50 NR (CP-OFDM, 100% RB, 30 MHz, QPSK, 15 kHz)	50 NR FR1 TDD	11.39	+9.6
0788	AAC	5G NR (CP-OFDM, 100% RB, 40 MHz, QPSK, 15 kHz)	50 NR FRI TDD	B:37	±9.6
0790	AAC.	5G NR (CP-OFDM, 100% RB. 50 MHz, QPSK, 15 kHz)	5G NR FRETDD	8.39	±9.6
0.791	AAC	5G NR (CP-OFDM, 1 RB, 5MHz, QPSK, 30 kHz)	50 NR FRI TDD	7.83	±9.6
0792	AAC	5G NR (CP-OFDM, 1 RB, 10 MHz, QPSK, 30 MHz)	5G NR FR1 TDD	7.92	49.6
0793	AAC	5G NR JCP-OFOM, 1 RB. 15MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.95	±9.0
0794	AAC	5G NR (CP-0FDM, 1 RB, 20 MHz, QPSK, 30 kHz)	50 NR FR1 TDD	7.82	+9.6
0795	AAC	5G NR (CP-OFOM, 1 RB, 25 MHz, QPSK, 30 MHz)	5G NR FRI TDD	7.84	19.0
0796	AAC	5G NR (CP-OFDM, 1 RB, 30 MHz, QPSK, 30 MHz)	5G NR FR1 TDD	7.82	±8.6
0797	AAC	5G NR (CP-OFDM, 1 RB, 40 MHz, QPSK, 50 kHz)	5G NR FR1 TDD	8.01	±9.6
0798	AAC	5G NR (CP-OFDM, 1 RB, 50 MHz, QPSK, 30 kHz)	SG NR FR1 TOD	7.88	+9.6
0799	AAC	50 NR (CP-OFDM, 1 RB, 60 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	7.93	±9.6
0801	AACI	5G NR (CP-OFDM, 1 RB, 80 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.89	±9.6
0802	AAC	9G NR (CP-OFDM, 1 RB, 86 MHz, QPSK, 38 kHz)	SG NR FRI TOO	7.87	±9.6
0803	AAE	5G NH (CP-OFDM, 1 RB, 100 MHz, CPSK, 30 kHz)	5G NR FR1 TD0	7,83	19.6
0805	AAD	5G NR (CP-OFDM, 50% RB, 10MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.34	±9.6
0000	AAD	5/3 NR (CP-OFDM, 50% RB, 15 MHz, QPSK, 30 HHz)	SG NR FR1 TDD	8.37	±9.6
0.809	AAD	5G NR (CP-OFDM, 10% RB, 30MHz, OPSK, 30 kHz)	5G NR FR1 TDD	8.34	±9.6
0180	AAD	5G NR (CP-OFDM, 50% RB, 40 MHz, CIPSK, 30 kHz)	5G NR FR1 TDD	H.34	±9.6
0812	AAD	IG NR (CP-OFDM, 50% RB, 60 MHz, CPSK, 30 kHz)	50 NR FR1 TDD	8.35	+0.6
1817	AAD	50 NR (CP-OFOM, 100% RB, SMHz, QPSK, 30 kHz)	SG NR FR1 TDD	11.35	±9.8
1818	AAD	5G NR (CP-OFDM, 100% RB, 10 MHz, QPSK, 30 AHz)	50 NR FRI TDD	8.34	±9.6
	AAD	5G NR (CP-CFDM, 100% RB, 15 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.33	
	100 May 200 May 201	5G NR (CP-OFDM, 100% RB, 20 MHz, GPSK, 30 kHz)	5G NR FR1 TDD	8.30	±9.6
0819	:AAD .	The second that the territory and the second second second second	SG NR FRI TDD		±9.6
0819 0820	AAC	BG NH ICE-OFOM, 100% RB DYMAG COPICK TO LUC-			196.00
0819 0820 0821	AAC	BG NR (CP-OFDM, 100% RB, 25 MHz, QPSK, 30 kHz) SG NR (CP-OFDM, 100% RB, 30 MHz, QPSK, 30 kHz)		8.41	
0819 0820 0821 0822	AAC	5G NR (CP-OFDM, 100% RB, 30 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	£41	±8.8
0819 0820 0821 0822 0822	AAC AAD AAC	50 NR (CP-OFDM, 100% RB, 30 MHz, QPSK, 30 MHz) 50 NR (CP-OFDM, 100% RB, 40 MHz, QPSK, 30 MHz)	5G NR FR1 TDD 5G NR FR1 TDD	£41 8.30	±8.8 ±8.5
0819 0820 0821 0822 0823 0824	AAC AAD AAC AAD	5G NR (CP-OFDM, 100% RB, 30MHz, QPSK, 30 MHz) 5G NR (CP-OFDM, 100% RB, 40MHz, QPSK, 30 MHz) 5G NR (CP-OFDM, 100% RB, 50MHz, QPSK, 30 MHz)	5G NR FRI TDD 5G NR FRI TDD 5G NR FRI TDD	8.36 8.39	±8.8 ±8.5 ±8.5
0819 0820 0821 0822 0823 0824 0825	AAC AAD AAC	50 NR (CP-OFDM, 100% RB, 30 MHz, QPSK, 30 MHz) 50 NR (CP-OFDM, 100% RB, 40 MHz, QPSK, 30 MHz)	5G NR FR1 TDD 5G NR FR1 TDD	£41 8.30	±8.8 ±9.5

Certificate No: EX-3972_Aug22

Page 18 of 21





Report No. HCT-SR-2301-FC004

EX3DV4 - SN:3972

August 19, 2022

LRID	Rev	Communication System Name	Group	PAR (dB)	Unc ^E k = 2
10829	AAD	5G NR (CP-OFDM, 100% RB, 100 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	6.40	±9.0
10830	AAD	5G NR (CP-OFDM, 1 RB, 10 MHz, QPSK, 60 kHz)	50 NR FRI TOO	7.63	+9.6
10831	AAD	5G NR (CP-OFDM, 1 RB, 15MHz, QPSK, 90 kHz)	50 NR FR1 TOD	7.73	19.6
0.832	AAD	5G NR (CP-OFDM, 1 RB, 20MHz, QPSK, 60 HHz)	5G NR FR1 TOO	7,74	19.6
0.833	AAD	5G NR (CP-OFDM, 1 RB, 25MHz, QPSK, 80 kHz)	5G NR FR1 TDD	7.70	19.6
10834	AAD.	5G NR (CP-OFDM, 1 RB, 30MHz, QPSK, 60 kHz)	50 NR FR1 100	7.75	+9.8
10835	AAD	5G NR (CP-OFDM, 1 RB, 40 MHz, QPSK, 80 KHz)	5G NR FR1 TDD	7.70	±9.8
10.636	AAE	5G WR (CP-OFDM, 1 RB, 50MHz, QPSK, 85 kHz)	5G NR FR1 TDD	7.98	±0.6
10.837	AAD	SG NR (CP-OFDM, 1 RB, 80 MHz, QPSK, 80 kHz)	5G NR FRI TOD	7.88	+8.6
10839	AAD	SG NR (CP-OFDM, 1 RE, 80MHz, QPSK, 80 NHz)	50 NR FR1 TDD	7.70	±0.0
10840	AAD	8G NR (CP-OFDM, 1 RB, 90 MHz, QPSK, 60 kHz)	SG NR FR1 TDD	7.67	19.6
10841	AAD	BG NR (CP-OFDM, 1 RB, 100 MHz, CPSK, 80 kHz)	5G NR FR1 TDD	7.71	10.0
10843	AAD	SG NR (CP-OFDM, 1745, 15 MHz, QPSK, 60 WHz)	5G NA FR1 TDD	8.49	and the last of
10544	AAD	SG NR (CP-CFDM, 50% RB, 20 MHz, CPSK, 60 WHz)	50 NR FR1 TDD	7.77.77	±8,6
10.646	AAD	5G NR (GP-OFDM, 50% RB, 30 MHz, GPSK, 60 WHz)	SG NR FRI TOD	8.34	±9.0
10854	AAD			6.41	±9.6
	100	SG NR (CP-OFDM, 100% RB, 10 MHz, GPSK, 60 kHz)	5G NR FR1 TOD	8.34	+9.6
10855	AAD	5G NR (CP-OFDM, 100% RB, 15 MHz, GPSK, 50 kHz)	5G NR FR1 TDD	8.36	±9.0
10856	AAD	5G NR (CP-OFDM, 100% RB, 20 MHz, QPSK, 60 kHz)	50 NR FR1 T00	8.37	±8:0
10857	GAA	5G NF (CP-OFDM, 100% RB, 25 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.35	±9.6
10858	AAD	5G NR (CP-OFDM, 100% RB, 30 MHz, GPSK, 60 kHz)	SG NR FR1 TDD	8,36	±5.8
10859	AAD	5G NR (CP-DFDM, 100% RB, 46MHz, QPSK, 60 kHz)	SG NA FR1 TDD	8,34	±0.0
10860	AAD	58 NR (CP-OFDM, 100% RB, 50 MHz, QPSK, 60 kHz)	SG NA FRI TOO	8.41	主张者
10881	MAD	5G NR (CP-DFDM, 100% RB, 60 MHz, QPSK, 60 kHz)	6G NR FRI TOD	8.40	1,5.6
10/663	CAA	5G NR (CP-OFDM, 100% RB, 80 MHz, QPSK, 60 kHz)	50 NR FRI TDD	6.41	±0.8
10864	AAE	SG NR (CP-OFDM, 100% RB, 90 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.37	+9.5
10865	AAD	56 NR (CP-OFDM, 100% RB, 100 MHz, QPSK, 60 kHz)	SG NR FRI TOD	8.41	±9.6
10866	AAD	5G NR (DFTs-OFDM, 1 RB, 100 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.68	±9.6
10868	AAD	6G NR (DFT-s-OFDM, 100% RB, 100 MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.89	±9.6
0868	AAD	SD NR (DFT-s-OFDM, 1 RB, 100 MHz, QPSK, 120 kHz)	5G NR FR2 TDD	5.75	+9.8
0870	AAD	5G NR (DFTs-OFDM, 100% RB, 100 MHz, QPSK, 120 kHz)	5G NR FR2 TDD	5.86	±9.6
10871	AAD	5G NR (DFT-s-OFDM, 1 RB, 100 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	5.76	49.0
10872	AAD	SG NR (DFT-s-OFDM, 100% RB, 100 MHz, 16QAM, 120 NHz)	5G NR FR2 TDD	8.50	±9.0
10873	AAD	5G NR (DFT-s-OFDM, 1 R8, 100 MHz, 84QAM, 120 kHz)	SG NR FRE TOD	6.61	19.6
10874	AAD	SG NR (DFT+-OFDM, 100% RB, 100 MHz, 54QAM, 120 MHz)	50 NR FR2 TDD	8.66	±8.6
0875	AAD	BG NR (CP-CFDM, 1 RB, 100 MHz, QPSK, 120 kHz)	SG NR FR2 TDD	7.78	+9.6
10876	AAD	5G NR (CP-OFDM, 100% RB, 100MHz, CPSK, 120 kHz)	5G NR FRE TOO	8.38	±0.6
10877	AAD	5G NR (CP-OFDM, 1 RB, 190 MHz, 160 MM, 120 HHz)	50 NR FR2 TDO	7.95	#9.6
10878	AAD	5G NR (CP-OFDM, 100% RB, 100 MHz, 16QAM, 120 kHz)	5G NR FR2 TDO	8.41	
10879	AAD	5G NA (CP-OFDML 1 RB, 100 MHz, 64QAM, 120 kHz)	5G NR FR2 TDD		±8.6
10880	AAD	5G NR (CP-OFDM, 100% RB, 100 MHz, 84QAM, 120 kHz)		8.12	±9.6
10881	AAD	5G NR (DFT-6-DFDM, 1 R8, 50 MHz, QPSK, 120 MHz)	5G NR FR2 TD0	6.98	19.6
10882	AAD	SO NO POST - OFFINE STORY OF THE RESEARCH CORNEL (SOUTH)	50 NR FR2 TD0	5.75	±9.6
0883	AAD	SG NR (DFTs-OFDM, 100% RB, 50MHu, QPSK, 120 kHz)	5G NR FR2 TDD	5.96	±0.0
10883	AAD	5G NR (DFT-6-CFDM, 1 RB, 50 MHz, 16QAM, 120 kHz)	50 NR FR2 TDD	6,57	±9.6
	AAD	5G NR (DFT-s-OFDM, 100% RB, 50MHz, 18GAM, 120 kHz)	50 NR FR2 TD0	6,53	+9.6
10885	10,00,000	5G NR (OFT-s-OFDM, 1 RR, 50 MHz, 64QAM, 120 kHz)	5G NR FR2 TDD	6.61	±9.0
10886	AAD	5G NR (DFT-e-OFDM, 100% RB, 50MHz, 54GAM, 120 kHz)	5G NR FRE TOD	6.65	±9.0
0887	AAD	1G NF (CP-OFDM, 1 RB; 50 MHz, OPSK, 120 kHz)	50 NR FRE TOD	7.78	±9.6
D88E	AAD	5G NR (CP-OFOM, 100% RB, 50 MHz, QPSK, 120 kHz)	5G NR FR2 TDD	8.35	±9.6
0888	AAD	5G NR (CP-OFOM, 1 RB, 50 MHz, 15QAM, 120 kHz)	5G NR FR2 TDD	H.02	±0.6
0.890	AAD	5G NR (CP-OFDM, 100% RB, 50 MHz, 16QAM, 180 kHz)	SG NR FR2 TDD	8.40	±9.6
0.891	AAD	50 NR (CP-OFDM, 1 RB, 50 MHz, 84QAM, 120 kHz)	SG NR FRETDD	0.13	48.0
0885	AAD	58 NR (CP-OFOM, 100% RB, 50 MHz, 84QAM, 120 NHz)	5G NR FR2 TDD	8.41	±0.6
0897	AAD	5G NR (DFT-a-OFDM, 1 RB, 5MHz, QPSK, 30 kHz)	50 NR FRI TOO	5.66	±9.5
0688	AALI	5G NR (DET-s-OFDM, 1 RB, 10MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.67	±9.6
0899	AAD	5G NR (DFT-e-OFDM, 1 RB, 15MHz, OPSK, 30 kHz)	5G NR FR1 TDD	5.87	±9.6
0990	AAD	5G NR (DFT-s-OFDM, 1 RB, 20 MHz, QPSK, 30 kHz)	53 NR FR1 700	5.68	±9.6
0901	AAD	5G NR (DFT-s-OFOM, 1 RB, 25MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.88	±9.8
080E	AAD	3G NR (DFT-a-OFDM, 1 RB, 30 MHz, QPSK, 30 kHz)	5G NR FRI TOD	5.66	±9.6
0903	AAD	5G NR (DFT's OFOM, 1 RB, 40 MHz, OPSK, 30 kHz)	53 NR FR1 TDD	5.66	19.6
0904	AAD	5G NR (DFT-e-OFDM, 1 RB, 50 MHz, QPSK, 30 kHz)	50 NR FB1 T00	5.66	±9.6
0905	AAD	5G NR (DFT+-OFDM, 1 RB, 60 MHz; QPSK, 36 HHz)	5G MR FR1 TDD	5.88	
0900	AAD	5G NR (DFT-s-DFDM, 1 R8, 80 MHz, QPSK, 30 KHz)	50 NR FRI TDD		±9.6
0907	AAD	SQ NR (DFT-s-OFDM, 50% RB, SMHz, QPSK, 30 kHz)		5,88	±9.6
0908	AAD	SG NR (DFT-e-OFDM, 50% RB, 10MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.78	±9.6
0908	AAD	IG NR (DFT-e-OFDM, 50% RB, 15MHz, QPSK, 30 NHz)		5.93	±9.8
0910	AAD		5G NR FR1 TDD	5.98	±9.8
99.0	MANUAL .	5G NR (DFT= OFDM, 50% RB, 20MHz, QPSK, 30 KHz)	SG NR FR1 TDD	5.83	±9.6

Certificate No: EX-3972_Aug22

Page 19 of 21



CUSTOMER SECRET



EX30V4 - SN:3972 August 19, 2022

THO	Rev	Communication System Name	Group	PAR (dB)	Ung k = 2
10911	AAD	SG NR (DFT+-OFDM, 50% RE, 25MHz, QPSK, 35 kHz)	50 NR FRH TDD	5,93	±9.6
10912	AAD	5G NR (DFT-s-OFDM, 50% RB, 30MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.84	±9.6
10919	AAD	50 NR (DFT-e-OFDM, 50% RB, 40 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5/84	±9.6
10914	AAD	5G NR (DFT-a-OFDM, 50% RB, 50MHz, QPSK, 30 kHz)	8G NR FR1 TDD	5.85	1.9.6
10915	AAD	SG NR (DFT-s-OFDM, 50% RB, 60 MHz, QPSK, 30 kHz)	50 NR FRI TDD	5,83	±9.6
10916	CAA	5G NR (DFTs-OFDM, 50% RB, 80 MHz, QPSK, 30 HHz)	50 NR FRH TOD	5.67	±9.6
10917	AAD	5G NR (DFT-s-OFDM, 50% RB, 100MHz, GPSK, 30 kHz)	5G NR FR1 TDD	5.94	±0.6
10018	AAD	50 NR (DFT-e-OFDM, 100% RB, 5 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.88	±9.6
10018	AAD	5G NR (DFT-s-OFDM, 100% RB, 10MHz, QPSK, 30 kHz)	5G NR FR1 TDD	-5.88	±9.6
10920	AAD	SG NR (DFTs-OFDM, 100% RB, 15MHz, QPSK, 30 kHz)	5G NR FRH TDD	5.07	±9.8
10921	AAD	5G NR (DFT-s-OFDM, 100% RB, 20MHz, QPSK, 30 kHz)	56 NR FR1 TDD	5.84	±9.5
10905	AAD	5G NR (DFT-e-OFDM, 100% RB, 25MHz, QPSK, 30 kHz)	SG NR FRI TDD	5.82	19.6
10923	AAD	5G NR (DFT-s-OFDM, 100% RB, 30MHz, QPSK, 30 kHz)	-56 NR FR1 TDD	5.04	±9,6
10994	AAD	5G NR (DFTs-OFDM, 100% RB, 40MHz, DPSK, 30 kHz)	SG NR FR1 TOD	5.64	±9.0
10925	AAD	50 NR (DFT-6-OFDM, 100% RB, 50 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.95	±9.6
10926	AAD	5G NR (DFTs-OFDM, 100% RS, 60 MHz, QPSK, 30 kHz)	5G NA FRI TOD	5.84	±9.6
10997	AAD	5G NR (DFT-s-OFDM, 100% RB, 50MHz, QPSK, 30 kHz)	SG NR FR1 TDD	5.94	±9.0
10928	AAD	5G NR (DFT-s-OFDM, 1 RB, 5 MHz, QPSK, 15 kHz)	SG NR FR1 FDD	5.52	±0.0
10928	AAD	5G NR (DFT+-OFDM, 1 RB, 10 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.52	±9.6
0930	AAD	5G NR (DFT-s-OFDM, 1 RB, 15MHz, QPSK, 15 kHz)	5G NR FRI FDD	5.52	+9.6
10931	AAD	5G NR (DFT-s-OFDM, 1 RB, 20MHz, OPSK, 15 kHz)	56 NR FR1 FDD	5.51	±0.6
10930	AAB	5G NR (DFT+-OFDM, 1 RB, 25 MHz, QPSK, 15 kHz)	50 NR FR1 FDD	5.51	±9.6
10933	AAA	SG NR (DFT-s-OFDM, 1 RB, 30 MHz, QPSK, 15 kHz)	50 NR FR1 FDD	5.57	±9.8
10934	AAA	58 NR (DFT-s-OFDM, 1 RB, 40 MHz, QPSK, 15 hHz)	SO NR FR1 FDD	5.51	±8.6
10935	AAA	5G NR (DFT-s-OFDM, 1 RB, 50 MHz, QPSK, 15 kHz)	SG NR FR1 FDD	5.51	±9.5
10996	AAC	5G NR (DFT-s-OFDM, 50%, RB, 5MHz, QPSK, 15 kHz)	5G NR FRI FDD	5.90	±9.6
0937	BAA	5G NR (DFT+-OFDM, 50% RB, 10MHz, QPSK, 15 kHz)	56 NR FR1 FDD	5.77	+9.6
0938	AAB	5G NR (DFT-s-OFDM, 50% RB, 15MHz, QPSK, 15 kHz)	SO NR FR1 FDD	5.90	±0.6
0808	AAE	5G NR (DFT-a-OFDM, 50% RB, 20 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.82	19.0
0940	AAB	5G NR (DFTs-OFDM, 50% RB, 25MHz, QPSK, 15 kHz)	5G NR FRI FDD	5.89	±9.6
0941	AAB	5G NR (DFT-s-OFDM, 50% RB, 30MHz, QPSK, 15 kHz)	SG NR FR1 FDD	5.83	±9.0
0942	AAB	5S NR (DFT-a-OFDM, 50% RB, 40 MHz, QPSK, 15 kHz)	19 NR FRI FDD	5.85	±9.6
10943	AAB	5G NR (DFT-s-OFDM, 50% RB, 50MHz, QPSK, 15 kHz)	50 NR FR1 FDD	5.96	±9.6
10944	AAB	5G NR (DFT-s-OFDM, 100% RB, 5MHz, QPSK, 15 kHz)	BG NR FR1 FDD	5.81	+9:0
0945	AAB	5G NR (DFT-s-OFDM, 100% RB, 10 MHz, QPSK, 15 kHz)	6G NR FR1 FDD	5.85	±9.6
10948	AAC	5G NR (DFT+-OFDM, 100% RB, 15 MHz, GPSK, 15 kHz)	SG NR FR1 FDD	5.83	+9.6
10947	AAB	5G NR (DFT-4-OFDM, 100% RB, 20 MHz, QPSK, 15 kHz)	93 NR FR1 FDD	5.87	±0.0
10948	AAB	5G NR (DFTs-OFDM, 100% RB, 25 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.94	19.0
10949	AAE	5G NR (DFTs-OFDM, 100% RB, 30 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.87	+0.0
10950	AAB	5G NR (DFT-s-OFDM, 100% RB, 40 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.94	±9.6
10951	AAE	5G NR (DFTs-OFDM, 100% RB, 50 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.92	±9.6
10952	AAB	5G NR DL (CP-OFDM, TM 3.1, 5MHz, 64-QAM, 15 kHz)	50 NR FR1 FDD	8.25	+9.8
10953	AAB	5G NR DL (CP-OFOM, TM 3.1, 10 MHz, 64-QAM, 15 kHz)	5G NR FR1 FDD	8.15	±9.6
10854	AAB	5G NR DL (CP-DFDM, TM 3.1, 15MHz, 64-QAM, 15 kHz)	5G NR FR1 FDD	5.23	±9.6
10955	AAB	5G NR DL (CP-OFOM, TM 3.1, 20MHz, 64-QAM, 15 kHz)	5G NR FR1 FDD	8.42	19.6
10956	AAB	59 NR DL (CP-OFDM, TM 3.1, 5 MHz, 64-QAM, 30 NHz)	5G NR FR1 FD0	8.14	±9.6
10957	AAC	5G NR OL (CP-CFDM, TM 3.1, 10 MHz, 64-QAM, 30 kHz)	5G NR FR1 FCO	8.31	±9.6
10958	AAB	5G NR DL (CP-OFOM, TM 3.1, 15MHz, 64-QAM, 30 kHz)	5G NR FR1 FDD	8.61	±9.6
0959	AAB	5G NR DL (CF-OFOM, TM 3.1, 20MHz, 64-OAM, 30 kHz)	50 NR FR1 FD0	8.33	+9.6
0960	AAB	5G NR DL ICP-DFDM, TM 3.1, 5MHz, 64-QAM, 15 kHz)	9G NR FR1 TDD	9.32	±9.6
0981	AAB	50 NR DL (CP-OFOM, TM 3.1, 10 MHz, 54-QAM, 15 kHz)	5G NR FRI TDD	9.36	±9.8 ±9.8
0962	AAB	5G NP DL (CP-CFDM, TM 3.1, 15 MHz, 64-QAM, 15 kHz)	5G NR FRI TOO	9.40	±9.6
0950	AAB	5G NR DL (CP-OFDM, TM 3.1, 20 MHz, 64-QAM, 15 kHz)	SG NR FR1 TDD	9.55	±0.6
0984	AAE	50 NR DL (CP-OFDM, TM 3.1, 5MHz, 64-QAM, 30 kHz)	5G NR FRI TDD	9.35	
0965	AAB	5G NR DL (CP-OFDM, TM 3.1, 10 MHz, 54-QAM, 30 kHz)	SG NR FR1 TDD	9.37	±9.6
0968	AAB	SG NR DL (CF-OFDM, TM 3.1, 15MHz, 64-QAM, 30 kHz)	SG NR FR: TDD	9.55	+8.6
0967	AAB	50 NR DL (CP-OFDM, TM 3.1, 20 MHz, 64-QAM, 30 kHz)	SG NR FRI TOD	9.42	±9.6
0968	AAD	5G NR DL (CP-OFDM, TM 3.1, 100 MHz, 64-QAM, 30 kHz)	SG NR FRI TOD	9.42 8.48	±9.6
0972	AAB	5G NR (CP-OFOM, 1 R8, 20 MHz, CPSK, 15 kHz)	5G NR FR1 TDD	11.50	
0979	AAB	50 NR (DFT-s-OFDM, 1 RB, 100 MHz, QPSK, 30 NHz)	5G NR FRI TDD		#9.6
0974	AAB	5G NR (CF-OFDM, 100% RB, 100MHz, 256-GAM, 30 KHz)		9.06	±9.6
0978	AAA	ULLA BOR	50 NR FR1 TDD	10.28	#8.8
0979	AAA	ULLA HDB4	ULLA	2.23	#8,8
0980	AAA	ULLA HDR8	ULLA	7.02	±9.6
0981	AAA	ULLA HDRb4	ULLA	8.82	±9.6
41004	4.5	ULLA HDRoB	BLLA	1,50	#9.6 #9.6
0382	AAA				

Certificate No: EX-3972_Aug22 Page 20 of 21

F-TP22-03 (Rev. 04) Page 67 of 131





Report No. HCT-SR-2301-FC004

EX3DV4 - SN:3972 August 19, 2022

UID	Rev	Communication System Name	Group	PAR (dB)	Une $k=2$
10983	AAA.	5G NR DIL (CP-OFDM, TM 3.1, 40 MHz, 64-QAM, 15 kHz)	50 NR FR1 TDD	9.31	28.6
10964	AAA	5G NR DL (CP-DFDM, TM 3.1, 50 MHz, 64-QAM, 15 kHz)	50 NR FR1 TDD	9.42	:0.6:
10985	AAA	5G NR DL (CP-OFDM, TM 3.1, 40 MHz, 64-QAM, 30 kHz)	5G NR FR1 TDD	9.54	±9.6
10986	AAA	5G NR DL (CP-OFDM, TM 3.1, 50 MHz, 64-QAM, 30 kHz)	5G NR FR1 TDD	9.50	8,Es
10987	AAA	5G NR DL (CP-OFDM, TM 3.1, 60 MHz, 64-QAM, 30 kHz)	5G NA FRI TOD	9.83	±10.0
10988	AAA	5G NR DL (CP-OFDM, TM 5.1, 70 MHz, 64-QAM, 30 kHz)	50 NR FRI TDD	9.38	±11.6
10989.	AAA	5G NR DL (CP-OFDM, TM 3.1, 80 MHz, 64-QAM, 30 kHz)	50 NR FR1 TDD	9.33	39.8
10990	AAA.	5G NR DL (CP-OFDM, TM 3.1, 90 MHz, 64 QAM, 30 kHz)	50 NR FR1 TDD	9.52	±9.6

E Uncertainty is determined using the max, deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

Gertificate No: EX-3972_Aug22

Page 21 of 21

F-TP22-03 (Rev. 04) Page 68 of 131





Calibration Laboratory of Schmid & Partner Engineering AG

Zeughausstrasse 43, 8004 Zurich, Switzerland

Accredited by the Swiss Accreditation Service (SAS)

The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates



Schweizerischer Kalibrierdienst S Service suisse d'étalonnage C Servizio svizzero di taratura

Swiss Calibration Service

Accreditation No.: SCS 0108

Client

HCT (Dymstec)

Certificate No

EX-3968 Sep22

CALIBRATION CERTIFICATE

EX3DV4 - SN:3968 Object

QA CAL-01.v9, QA CAL-12.v9, QA CAL-14.v6, QA CAL-23.v5, Calibration procedure(s)

QA CAL-25.v7

Calibration procedure for dosimetric E-field probes

Calibration date September 28, 2022

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22±3) °C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	04-Apr-22 (No. 217-03525/03524)	Apr-23
Power sensor NRP-Z91	SN: 103244	04-Apr-22 (No. 217-03524)	Apr-23
OCP DAK-3.5 (weighted)	SN: 1249	20-Oct-21 (OCP-DAK3.5-1249_Oct21)	Oct-22
OCP DAK-12	SN: 1016	20-Oct-21 (OCP-DAK12-1016 Oct21)	Oct-22
Reference 20 dB Attenuator	SN: CC2552 (20x)	04-Apr-22 (No. 217-03527)	Apr-23
DAE4	SN: 660	13-Oct-21 (No. DAE4-860 Oct21)	Oct-22
Reference Probe ES3DV2	SN: 3013	27-Dec-21 (No. ES3-3013 Dec21)	Dec-22

ID	Check Date (in house)	Scheduled Check
SN: GB41293874	06-Apr-16 (in house check Jun-22)	In house check: Jun-24
SN: MY41498087	06-Apr-16 (in house check Jun-22)	In house check: Jun-24
SN: 000110210	06-Apr-16 (in house check Jun-22)	In house check: Jun-24
SN: U\$3642U01700	04-Aug-99 (in house check Jun-22)	In house check: Jun-24
SN: US41080477	31-Mar-14 (in house check Oct-20)	In house check: Oct-22
	SN: GB41293874 SN: MY41498087 SN: 000110210 SN: US3642U01700	SN: GB41293874 06-Apr-16 (In house check Jun-22) SN: MY41498087 06-Apr-16 (In house check Jun-22) SN: 000110210 06-Apr-16 (In house check Jun-22) SN: US3642U01700 04-Aug-99 (In house check Jun-22)

	Name	Function	Signature
Calibrated by	Jeton Kastrati	Laboratory Technician	+2lle
Approved by	Sven Kühn	Technical Manager	5.2

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

Certificate No: EX-3968_Sep22 Page 1 of 22 3213

F-TP22-03 (Rev. 04) Page 69 of 131



Report No. HCT-SR-2301-FC004

Calibration Laboratory of

Schmid & Partner Engineering AG

Zeughausstrasse 43, 8004 Zurich, Switzerland

Accredited by the Swiss Accreditation Service (SAS)





Schweizerischer Kalibrierdienst Service suisse d'étalonnage Servizio svizzero di taratura Swiss Calibration Service

Accreditation No.: SCS 0108

Glossary

TSL tissue simulating liquid NORMx,y,z sensitivity in free space ConvF sensitivity in TSL / NORMx,y,z DCP diode compression point

CE crest factor (1/duty_cycle) of the RF signal A, B, C, D modulation dependent linearization parameters

The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Polarization gr φ rotation around probe axis

Polarization @ ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., $\vartheta = 0$ is

normal to probe axis

Connector Angle information used in DASY system to align probe sensor X to the robot coordinate system

Calibration is Performed According to the Following Standards:

- a) IEC/IEEE 62209-1528, "Measurement Procedure For The Assessment Of Specific Absorption Rate Of Human Exposure To Radio Frequency Fields From Hand-Held And Body-Worn Wireless Communication Devices - Part 1528: Human Models, Instrumentation And Procedures (Frequency Range of 4 MHz to 10 GHz)", October 2020.
- b) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Methods Applied and Interpretation of Parameters:

- NORMx,y,z: Assessed for E-field polarization ⊕ = 0 (f ≤ 900 MHz in TEM-cell; f > 1800 MHz: R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not affect the E2-field uncertainty inside TSL (see below ConvF)
- NORM(f)x,y,z = NORMx,y,z * Irrequency_response (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of
- . DCPx,y,z: DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal. DCP does not depend on frequency nor media.
- PAR: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- Ax,y,z; Bx,y,z; Cx,y,z; Dx,y,z; VRx,y,z: A, B, C, D are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. VR is the maximum calibration range expressed in RMS voltage across the diode.
- ConvF and Boundary Effect Parameters: Assessed in flat phantom using E-field (or Temperature Transfer Standard for f ≤ 800 MHz) and inside waveguide using analytical field distributions based on power measurements for f > 800 MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORMx,y,z * ConvF whereby the uncertainty corresponds to that given for ConvF. A frequency dependent ConvF is used in DASY version 4.4 and higher which allows extending the validity from ±50 MHz to ±100 MHz
- Spherical isotropy (3D deviation from isotropy): in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- Sensor Offset: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.
- Connector Angle: The angle is assessed using the information gained by determining the NORMx (no uncertainty required).

Certificate No: EX-3968 Sep22 Page 2 of 22

Page 70 of 131 F-TP22-03 (Rev. 04)

CUSTOMER SECRET





EX3DV4 - SN:3968

September 28, 2022

Parameters of Probe: EX3DV4 - SN:3968

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k = 2)
Norm (μV/(V/m) ²) ^A	0.56	0.56	0.56	±10.1%
DCP (mV) B	100.0	100.0	98,0	±4.7%

Calibration Results for Modulation Response

UID	Communication System Name		dB	B dB√μV	С	dB	mV	Max dev.	Max Unc ^E k = 2
0	CW	X	0.00	0.00	1.00	0.00	172.8	±2.7%	±4.7%
		Y	0.00	0.00	1.00		179.4		
		Z	0.00	0.00	1.00		155.0		
10352	Pulse Waveform (200Hz, 10%)	X	3.40	68.14	11.38	10.00	60.0	±3.1%	±9.6%
		Y	20.00	90.06	19.90		60.0		
		Z	20.00	88,76	19.27		60.0		
10353	Pulse Waveform (200Hz, 20%)	X	3.72	70.50	11,49	6.99	80.0	±1.8%	±9.6%
Charles I Walleton Street	COMMENS OF STREET, STR	Y	20.00	91.71	19.69	1000000	80.0	111111111111111111111111111111111111111	United State
		Z	20.00	90.04	19.00		80.0		
10354 Puls	Pulse Waveform (200Hz, 40%)	X	12.37	81.33	13.92	3.98	95.0	±0.8%	±9.6%
	CONTRACTOR OF CONTRACTOR OF THE CONTRACTOR OF TH	Y	20.00	92.42	18.67		95.0		
	Communication and Communicatio	Z	20.00	92.21	18.90		95.0		
10355	Pulse Waveform (200Hz, 60%)	X	20.00	85.67	14:24	2.22	120.0	±0.9%	±9.6%
		Y	20.00	92.76	17.54		120.0		
		Z	20.00	97.33	20.19		120.0		
10387	QPSK Waveform, 1 MHz	X	1.68	66.35	15.01	1.00	150.0	+2.6%	±9.6%
		Y	1.64	65.84	14.66	167.50	150.0	STREET,	173320
		Z	1.84	67.73	16.04	E	150.0		
10388	QPSK Waveform, 10 MHz	X	2.25	68.20	15.79	0.00	150.0	±0.9%	±9.6%
	PARTIE AND CONTROL OF THE PARTIES.	Y	2.21	67.84	15.49	0.000.000	150.0		- 5740.40
	- Anna Carlotte Company	Z	2.49	69.87	16.80		150.0		
10396	64-QAM Waveform, 100 kHz	X	2.75	69.76	18.52	3.01	150.0	±0.8%	±9.6%
		Y	2.77	69.30	18.31		150.0		
		2	2.89	70.43	19.13	1	150.0		
10399	64-QAM Waveform, 40 MHz	X	3.54	67.28	15.85	0.00	150.0	±1.9%	±9.6%
		Y	3.52	67.11	15.72		150.0	CHARLES	1000000
		Z	3.69	67.97	16.34		150.0		
10414	WLAN CCDF, 64-QAM, 40 MHz	X	4.91	65.82	15.65	0.00	150.0	±3.8%	±9.6%
	LANDON CONTROL OF THE SECURITION OF THE SECURITI	Y	4.92	65.80	15.62	The same of	150.0		
		Z	4.85	65.54	15.60		150.0		

Note: For details on UID parameters see Appendix

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Certificate No: EX-3968_Sep22

Page 3 of 22

A The uncertainties of Norm X,Y,Z do not affect the E²-field uncertainty inside TSL (see Pages 5 and 5).

B Linearization parameter uncertainty for maximum specified field strength.

E Uncertainty is determined using the max, deviation from linear response applying rectangular distribution and is expressed for the equare of the field value.

CUSTOMER SECRET





EX3DV4 - SN:3968 September 28, 2022

Parameters of Probe: EX3DV4 - SN:3968

Sensor Model Parameters

	C1 fF	C2 fF	ν-1	T1 msV ⁻²	T2 ms V ⁻¹	T3 ms	T4 V ⁻²	T5 V ⁻¹	T6
X	44.7	335.99	35.90	17.69	0.00	5.02	0.80	0.27	1.01
У	46.9	356.20	36.58	15.28	0.05	5.10	0.20	0.43	1.01
2	47.1	354.33	36.05	18.96	0.00	5.06	0.42	0.35	1.01

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle	-95.1*
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	9 mm
Tip Diameter	2.5 mm
Probe Tip to Sensor X Calibration Point	1 mm
Probe Tip to Sensor Y Calibration Point	1 mm
Probe Tip to Sensor Z Calibration Point	1 mm
Recommended Measurement Distance from Surface	1.4 mm

Note: Messurement distance from surface can be increased to 3-4 mm for an Area Scan job.

Certificate No: EX-3968_Sep22

CUSTOMER SECRET





EX3DV4 - SN:3968 September 28, 2022

Parameters of Probe: EX3DV4 - SN:3968

Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) ^C	Relative Permittivity ^F	Conductivity ^F (S/m)	ConvF X	ConvF Y	ConvF Z	Alpha ^G	Depth ^G (mm)	Unc (k = 2)
750	41.9	0.89	9.88	9.88	9.88	0.57	0.88	±12.0%
835	41.5	0.90	9.61	9.61	9.61	0.59	0.80	±12.0%
900	41.5	0.97	9.37	9.37	9.37	0.50	0.87	±12.0%
1750	40.1	1.37	8.73	8.73	8.73	0.31	0.86	±12.0%
1900	40.0	1.40	8.43	8.43	8.43	0.25	0.86	±12.0%
2300	39.5	1.67	7.78	7.78	7.78	0.35	0.90	±12.0%
2450	39.2	1.80	7.64	7.64	7.64	0.38	0.90	±12.0%
2600	39.0	1.96	7.59	7.59	7,59	0.25	0.90	±12.09
3300	38.2	2.71	7.09	7.09	7.09	0.30	1.35	±13.19
3500	37,9	2,91	7.05	7.05	7.05	0.30	1.35	±13.19
3700	37.7	3.12	6.92	6.92	6.92	0.30	1.35	±13.19
3900	37.5	3.32	6.61	6.61	6.61	0.35	1.50	±13.19
4100	37.2	3.53	6,57	6.57	6.57	0.35	1.50	±13.19
4400	36.9	3.84	6.31	6.31	6.31	0.35	1.60	±13.19
4600	36.7	4.04	6.24	6.24	6,24	0.35	1.60	±13.19
4800	36.4	4.25	6.15	6.15	6.15	0.40	1.80	±13.19
4950	36.3	4.40	5.90	5.90	5.90	0.40	1.80	±13.19
5250	35.9	4.71	5.56	5.56	5.56	0.40	1.80	±13.1%
5600	35.5	5.07	4.86	4.86	4.86	0.40	1.80	±13.19
5750	35.4	5.22	5.01	5.01	5.01	0.40	1.80	±13.19
5800	35.3	5.27	4.91	4.91	4.91	0.40	1.80	±13.19

C Frequency validity above 300 MHz of ±100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ±50 MHz. The uncertainty is the RSS of the CornF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is ±10, 25, 40, 50 and 70 MHz for CornF assessments at 30, 64, 128, 150 and 220 MHz respectively. Validity of CornF assessed at 6 MHz is 4–9 MHz, and CornF assessed at 13 MHz is 9–19 MHz. Above 5 GHz frequency validity can be extended to ±110 MHz.

At frequencies below 3 GHz, the validity of tissue parameters (*c* and *d*) can be relaxed to ±10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (*c* and *d*) is restricted to ±5%. The uncertainty is the RSS of the CornF uncertainty for indicated target tissue parameters.

Certificate No: EX-3968_Sep22

Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less. than ±1% for frequencies below 3 GHz and below ±2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the

CUSTOMER SECRET





EX3DV4 - SN:3968 September 28, 2022

Parameters of Probe: EX3DV4 - SN:3968

Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) ^C	Relative Permittivity ^F	Conductivity ^F (S/m)	ConvF X	ConvF Y	ConvF Z	Alpha ^G	Depth ^G (mm)	Unc (k = 2)
6500	34.5	6.07	5.70	5.70	5.70	0.20	2.50	±18.6%

C Frequency validity at 6.5 GHz is =600/+700 MHz, and ±700 MHz at or above 7 GHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

At frequencies 6–10 GHz, the validity of tissue parameters (s and o) can be relaxed to ±10% if figuid compensation formula is applied to measured SAR values. The uncertainty is the RSS of the ConvF uncertainty for indicated target fissue parameters.

Certificate No: EX-3968_Sep22

Page 6 of 22

G Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less then ±1% for frequencies below 3 GHz; below ±2% for frequencies between 3-6 GHz; and below ±4% for frequencies between 6-10 GHz at any distance larger than half the probe tip diameter from the boundary.

CUSTOMER SECRET

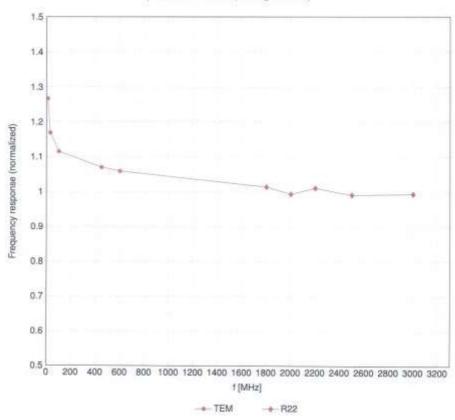




EX3DV4 - SN:3968 September 28, 2022

Frequency Response of E-Field

(TEM-Cell:ifi110 EXX, Waveguide:R22)



Uncertainty of Frequency Response of E-field: ±6.3% (k+2)

Page 7 of 22

Certificate No: EX-3968_Sep22

CUSTOMER SECRET

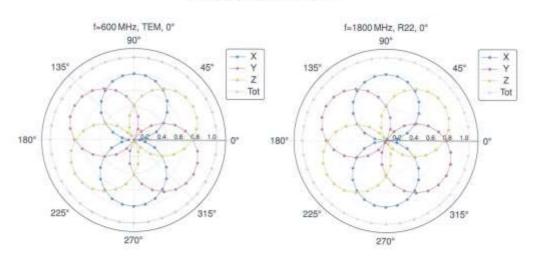
Page 76 of 131

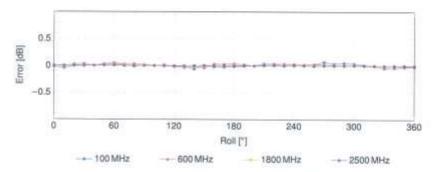


Report No. HCT-SR-2301-FC004

EX3DV4 - SN:3968 September 28, 2022

Receiving Pattern (ϕ), $\theta = 0^{\circ}$



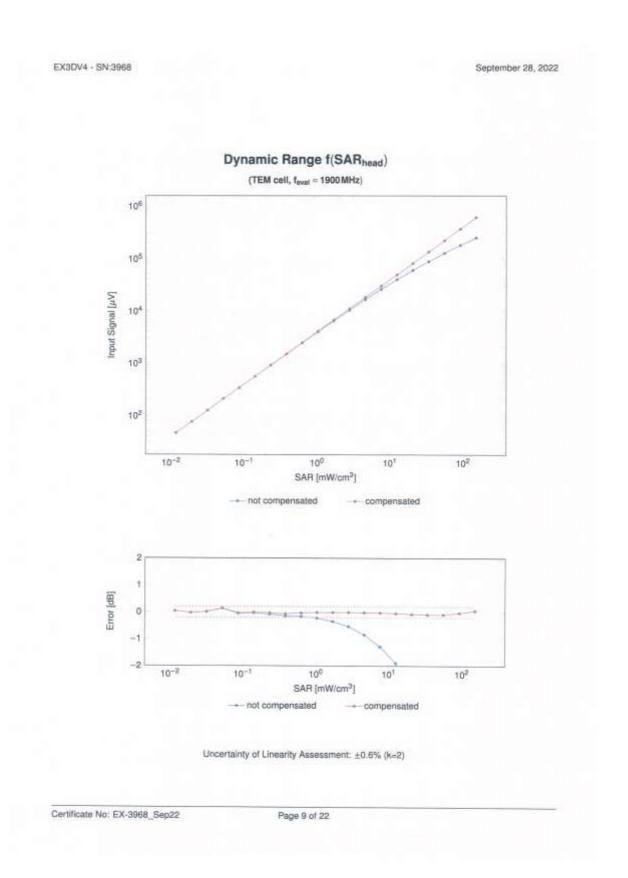


Uncertainty of Axial Isotropy Assessment: ±0.5% (k=2)

Certificate No: EX-3968_Sep22

Page 8 of 22



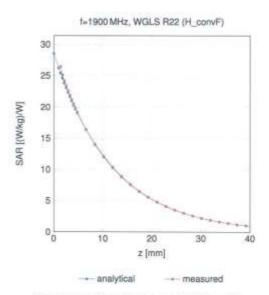


F-TP22-03 (Rev. 04) Page 77 of 131

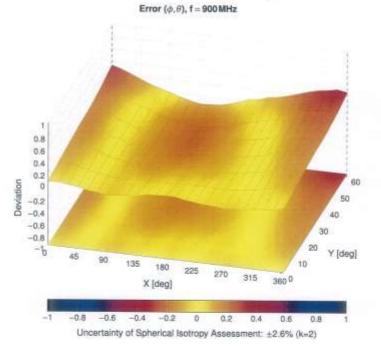


EX3DV4 - SN:3968 September 28, 2022

Conversion Factor Assessment



Deviation from Isotropy in Liquid



Certificate No: EX-3968_Sep22

Page 10 of 22

F-TP22-03 (Rev. 04) Page 78 of 131

CUSTOMER SECRET





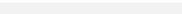
EX3DV4 - SN:3968 September 28, 2022

Appendix: Modulation Calibration Parameters

UID	Rev	Communication System Name	Group	PAR (dB)	Unc ^E k =
0		CW	CW	0.00	±4.7
10010	CAA	SAR Validation (Square, 100 ms, 10 ms)	Test	10.00	±9.6
10011	CAB	UMTS-FDD (WCDMA)	WCDMA	2.91	±9.6
0.012	CAB	IEEE 802.11b WFi 2.4 GHz (DSSS, 1 Mbps)	WLAN	1.87	±9.6
0013	CAB	IEEE 802.11g WIFI 2.4 GHz (DSSS-OFDM, 6Mbps)	WLAN	9.45	±9.6
0021	DAG	GSM-FDD (TDMA, GMSK)	GSM	9.39	±9.6
0023	DAC	GPRS-FDD (TDMA, GMSK, TN 0)	GSM	9.57	±9.6
-	DAC		1,00,000		
0024	and the second second	GPRS-FDD (TDMA, GMSK, TN 0-1)	GSM	6.55	±9.6
0025	DAC	EDGE-FDD (TDMA, 8PSK, TN 0)	GSM	12.62	±9.6
10026	DAC	EDGE-FDO (TDMA, 8PSK, TN 0-1)	GSM	9,55	±9.6
0027	DAC	GPRS-FDD (TDMA, GMSK, TN 0-1-2)	GSM	4.80	±9.6
0.058	DAC	GPRS-FDD (TDMA, GMSK, TN 0-1-2-3)	GSM	3.55	±9.6
0029	DAC	EDGE-FDD (TDMA, 8PSK, TN 0-1-2)	GSM	7.78	±9.6
0030	CAA	IEEE 802.15.1 Bluetooth (GFSK, DH1)	Bluetooth	5.30	±9.6
10031	CAA	IEEE 802.15.1 Bluetooth (GFSK, DH3)	Bluetooth	1.87	±9.0
10032	CAA	IEEE 802.15.1 Bluetooth (GFSK, DH5)	Bluetooth	1.16	±9.6
0.033	CAA	IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH1)	Bluetooth	7.74	±9.6
0034	CAA	IEEE 802.15.1 Stuetooth (PI/4-DQPSK, DH3)	Bluetooth	4.53	19.6
10035	CAA	IEEE 802.15.1 Bluetooth (PV4-DQPSK, DHS)	Bluetooth		
		A CONTRACTOR OF THE PROPERTY O	The second secon	3.83	±9.6
0036	CAA	IEEE 802.15.1 Bluetooth (8-DPSK, DH1)	Bluetooth	8.01	±9.6
0037	CAA	IEEE 802.15.1 Bluetooth (8-DPSK, DH3)	Bluetoath	4,77	±9.6
0.038	CAA	IEEE 802.15.1 Bluetooth (B-DPSK, DH5)	Bluetooth	4.10	±9.6
0039	CAB	CDMA2000 (1xRTT, RC1)	CDMA2000	4.57	±9.6
10042	CAB	IS-54 / IS-138 FDD (TDMA/FDM, PI/4-DQPSK, Halfrate)	AMPS	7.78	±9.6
10044	CAA	IS-91/EIA/TIA-553 FDD (FDMA, FM)	AMPS	0.00	±9.6
10048	CAA	DECT (TDD, TDMA/FDM, GFSK, Full Slot, 24)	DECT	13.80	±9.6
10049	CAA	DECT (TOD, TDMA/FOM, GFSK, Double Slot, 12)	DECT	10.79	±9.6
10056	CAA	UMTS-TDD (TD-SCDMA, 1.28 Mcps)	TD-SCDMA	11.01	±9.6
10-058	DAC	EDGE-FDD (TDMA, 8PSK, TN 0-1-2-3)	GSM	6.52	±9.6
10059	CAB	IEEE 802.116 WIFI 2.4 GHz (DSSS, 2 Mbps)	WLAN	2.12	
10060	CAB	IEEE 802.11b WIFI 2.4 GHz (DSSS, 5.5 Mbps)	WLAN	700000	±9.6
10000	CAB		WLAN	2.83	±9.6
-		IEEE 802.116 WIFI 2.4 GHz (DSSS, 11 Mbps)	1,17,000,000	3.60	±9.6
10062	CAD	IEEE 802.11a/h WIFI 5 GHz (OFDM, 6 Mbps)	WLAN	8.68	19.6
10063	CAD	IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps)	WLAN	8.63	±9.6
10084	GAD	IEEE 802.11a/h WIFI 5 GHz (OFDM, 12 Mbps)	WLAN	9.09	±9.6
10065	CAD	IEEE 802.11a/h WIFI 5 GHz (OFDM, 18 Mbps)	WLAN	9.00	±9.8
10055	CAD	IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps)	WLAN	9.36	±9.6
10087	CAD	IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps)	WLAN	10.12	±9.6
10068	CAD	IEEE 802.11a/h WIFI 5 GHz (OFDM, 48 Mbps)	WLAN	10.24	+9.6
10069	CAD	IEEE 802.11a/h WiFl 5 GHz (OFDM, 54 Mbps)	WLAN	10.56	±9.6
10071	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 9 Mbps)	WLAN	9.83	19.6
10072	CAB	IEEE 802.11g WIFI 2.4 GHz (DSSS/OFDM, 12 Mbps)	WLAN	9.62	19.6
10073	CAB	IEEE 802.11g WIFI 2.4 GHz (DSSS/OFDM, 18 Mbps)	WLAN	9.94	
0074	CAB	IEEE 802.11g WIFI 2.4 GHz (DSSS/OFDM, 18 Mbps)		-	±9.6
10075	CAB		WLAN	10.30	±9.6
	47,74	IEEE 802.11g WIFI 2.4 GHz (DSSS/OFDM, 38 Mbps)	WLAN	10.77	±9.8
10076	CAB	IEEE 802.11g WIFI 2.4 GHz (DSSS/OFDM, 48 Mbps)	WLAN	10.94	±9,6
10077	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 54 Mbps)	WLAN	11.00	±9.6
10081	CAB	COMA2000 (1xRTT, RC3)	CDMA2000	3.97	±9.6
10.082	CAB	IS-54 / IS-136 FDO (TOMA/FDM, PI/4-DQPSK, Fulrate)	AMPS	4.77	29.6
10090	DAG	GPR5-FDD (TDMA, GMSK, TN 0-4)	GSM	6.56	±9.6
0097	CAC	UMTS-FDD (HSDPA)	WCDMA	3.98	±9.6
0096	DAC	UMTS-FDD (HSUPA, Subtest 2)	WCDMA	3.98	±9.6
0099	CAC	EDGE-FDD (TDMA, 8PSK, TN 0-4)	GSM	9.55	±9.6
0100	CAC	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-FDD	5.87	±9.6
0101	CAB	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM)	LTE-FDD	6.42	
0102	CAB	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM)	The state of the s	30.746	±9.6
0103	DAC		LTE-FOO	6.60	±9.6
11,122,11	C. P. C. S. S.	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-TOO	9.29	±9.6
0104	CAE	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM)	LTE/TDD	9.97	±9.6
0105	CAE	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM)	LTE-TDD	10.01	±9.6
0108	CAE	LTE-FDD (SC-FDMA, 100% RB, 10MHz, QPSK)	LTE-FDD	5.80	±9.6
0.109	CAG	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM)	LTE-FDD	6.43	±9.6
0110	CAG	LTE-FDD (SC-FDMA, 100% RB, 5MHz, QPSK)	LTE-FDO	5.76	±9.6
0111	CAG	LTE-FDD (SC-FDMA, 100% RB, 5MHz, 16-QAM)	LTE-FDD	6.44	±8.6

Certificate No: EX-3968_Sep22

Page 11 of 22



CUSTOMER SECRET



Report No. HCT-SR-2301-FC004

EX3DV4 - SN:3968 September 28, 2022

UID	Rev	Communication System Name	Group	PAR (dB)	Unot k =
10112	CAG	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM)	LTE-FOD	6.59	±9.6
10113	CAG	LTE-FDD (SC-FDMA, 100% RB, 5MHz, 64-QAM)	LTE-FDD	6.62	±9.6
0114	CAG	IEEE 802.11n (HT Greenfield, 13.5Mbps, BPSK)	WLAN	8.10	±9.6
0115	CAG	IEEE 802.11n (HT Greenfield, 81 Mbps, 16-QAM)	WLAN	8.46	±9.6
0116	CAG	IEEE 802.11n (HT Greenfield, 135 Mbps, 64-QAM)	WLAN	8.15	±9.6
0117	CAG	IEEE 802.11n (HT Mixed, 13.5 Mbps, BPSK)	WLAN	8.07	±9.6
0118	CAD	IEEE 802.11n (HT Mixed, 81 Mbps, 16-QAM)	WLAN	8.59	±9.6
0119	CAD	IEEE 802.11n (HT Mixed, 135 Mbps, 64-QAM)	WLAN	8.13	±9.6
0140	CAD	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 18-QAM)	LTE-FOD	6.49	±0.6
0141	CAD	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM)	LTE-FDD	6.53	±9.6
0142	CAD	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, QPSK)	LTE-FOD	5.73	±9.6
0143	CAD	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM)	LTE-FOD	6.35	±9.6
2144	CAC	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 84-QAM)	LTE-FDD	6.65	±9.6
3145	CAC	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK)	LTE-FOD	5.78	±9.6
146	CAC	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM)	LTE-FOD	6.41	±9.6
147	CAC	LTE-FDD (SC-FDMA, 180% RB, 1.4 MHz, 64-QAM)	LTE-FOD	6.72	±9.6
149	CAE	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM)	LTE-FOD	6.42	±9.6
150	CAE	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 54-QAM)	LTE-FOD	6.60	±9.6
151	CAE	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, QPSK)	LTE-TOD	9.28	±9.6
152	CAE	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM)	LTE-TDD	9.92	±9.0
153	CAE	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM)	LTE-TOD	10.05	±9.6
154	CAF	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, QPSK)	LTE-FDD	5.75	±9.6
155	CAF	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM)	LTE-FDD	8.43	±9.6
156	CAF	LTE-FDD (SC-FDMA, 50% RB, 5 MHz, QPSK)	LTE-FDD	5.79	±9.6
157	CAE	LTE-FDD (SC-FDMA, 50% RB, 5MHz, 16-QAM)	LTE-FDD	6.49	±9.6
158	CAE	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM)	LTE-FDD	6.62	±9.6
159	CAG	LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM)	LTE-FDD	6.56	±9.6
160	CAG	LTE-FDD (SC-FDMA, 50% RB, 15MHz, QPSK)	LTE-F00	5.82	±9.6
161	CAG	LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM)	LTE-FDD	6.43	±9.6
162	CAG	LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 84-QAM)	LTE-FOD	6.58	29.6
1166	CAG	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK)	LTE-FDD	5.46	
1167	CAG	LTE-FOD (SC-FOMA, 50% RB, 1,4 MHz, 16-QAM)		- International	±9.6
168	CAG	LTE-FDD (SC-FDMA, 50% RB, 1.4MHz, 64-QAM)	LTE-FDD	6.21	#9.6
169	CAG	LTE-FDD (SC-FDMA, 1 RB, 20MHz, QPSK)	LTE-FDD	6.79	±9.6
170	CAG		LTE-FDD	5.73	±9.6
		LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM)	LTE-FDD	6.52	±9.6
171	CAE	LTE-FDD (SC-FDMA, 1 RB, 20MHz, 64-QAM)	LTE-FDD	6.49	±9.6
172	CAE	LTE-TDD (SC-FDMA, 1 R8, 20MHz, QPSK)	LTE-TOD	9.21	±9.6
174	CAF	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM)	LTE-TOD	9.48	±9.6
175	CAF.	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM)	LTE-TOD	10.25	±9.6
-	CAF	LTE-FDD (SC-FDMA, 1 RB, 10MHz, QPSK)	LTE-FOO	6.72	±9.6
176	and the latest terms in the latest terms.	LTE-FDD (SC-FDMA, 1 R8, 10 MHz, 16-QAM)	LTE-FOD	6.52	1,9.6
177	CAE	LTE-FDD (SC-FDMA, 1 RB, 5MHz, QPSK)	LTE-FOD	5.73	±9.6
178	CAE	LTE-FDD (SC-FDMA, 1 RB, 5MHz, 16-QAM)	LTE-FDD	6.52	±9.6
179	AAE	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM)	LTE-FDD	6.50	±9.6
180	CAG	LTE-FDD (SC-FDMA, 1 RB, 5MHz, 64-QAM)	LTE-FDD	6.50	±9.6
181	CAG	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, QPSK)	LTE-FDD	5,72	±9.6
182	CAG	LTE-FDD (SC-FDMA, 1 RB, 15MHz, 16-QAM)	LTE-FDD	6.52	±9.6
183	CAG	LTE-FDD (SC-FDMA, 1 RB, 15MHz, 84-QAM)	LTE-FDO	6.50	±9.6
184	CAG	LTE-FDD (SC-FDMA, 1 RB, 3 MHz, QPSK)	LTE-FDO	5.73	±9.6
185	CAI	LTE-FDD (SC-FDMA, 1 R8, 3 MHz, 16-QAM)	LTE-FD0	6.51	±9.8
186	CAG	LTE-FDD (SC-FDMA, 1 RB, 3MHz, 64-QAM)	LTE-FDD	6.50	±9.6
187	CAG	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK)	LTE-FD0	5.73	±9.6
188	CAG	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM)	LTE-FD0	6.52	±9.6
189	CAE	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM)	LTE-FDD	6,50	±9.6
193	CAE	IEEE 802,11n (HT Greenfield, 6.5 Mbps, BPSK)	WLAN	8.09	±9.6
194	AAD	IEEE 802.11n (HT Greenfield, 39 Mbps, 16-QAM)	WLAN	8.12	±9.6
195	CAE	IEEE 802.11n (HT Greenfield, 65 Mbps, 64-QAM)	WLAN	8.21	±9.6
195	CAE	IEEE 802.11n (HT Mixed, 6.5 Mbps, BPSK)	WLAN	8,10	±9,6
197	AAE	IEEE 802.11n (HT Mixed, 39 Mbps, 16-QAM)	WLAN	8.13	±9.6
198	CAF	IEEE 802.11n (HT Mixed, 65 Mbps, 64-QAM)	WLAN	8.27	±9.6
219	CAF	IEEE 802.11n (HT Mixed, 7.2 Mbps, BPSK)	WLAN	8.03	±9.6
1220	AAF	IEEE 802.11n (HT Mixed, 43.3 Mbps, 16-QAM)	WLAN	8.13	19.6
1221	CAC	IEEE 802.11n (HT Mixed, 72.2 Mbps, 64-QAM)	WLAN	8.27	±9.6
222	CAC	IEEE 802.11n (HT Mixed, 15Mbps, BPSK)	WLAN	8.06	±9.6
223	CAD	IEEE 802.11n (HT Mixed, 90 Mbps, 16-QAM)	WLAN	8.48	±9.6
224	CAD	IEEE 802.11n (HT Mixed, 150 Mbps, 64-QAM)	WLAN	8.08	±9.6

Certificate No: EX-3968_Sep22

Page 12 of 22



CUSTOMER SECRET



Report No. HCT-SR-2301-FC004

EX3DV4 - SN:3968 September 28, 2022

UID	Rev	Communication System Name	Group	PAR (dB)	UncE k = 2
10225	CAD	UMTS-FDD (HSPA+)	WCDMA	5.97	±9.6
10226	CAD	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM)	LTE-TOD	9.49	±9.6
10227	CAD	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM)	LTE-TOD	10.26	±9.6
10228	CAD	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK)	LTE-TOD	9.22	±9.6
10229	DAC	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM)	LTE-TDD	9.48	±9.6
0230	CAC	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM)	LTE-TOO	10.25	#9.6
0231	CAC	LTE-TDO (SC-FDMA, 1 RB, 3MHz, QPSK)	LTE-TOD	9.19	±9.5
0232	CAD	LTE-TDO (SC-FDMA, 1 RB, 5MHz, 16-QAM)	LTE-TOD	9.48	±9.6
0233	CAD	LTE-TDD (SC-FDMA, 1 RB, 5MHz, 64-QAM)	LTE-TOD	10.25	±9.6
0234	CAD	LTE-TDO (SC-FDMA, 1 RB, 5MHz, QPSK)	LTE-TOD	9.21	±9.6
0235	CAD	LTE-TDO (SC-FDMA, 1 RB, 10 MHz, 16-QAM)	LTE-TOD	9,48	±9.6
0236	CAD	LTE-TDO (SC-FDMA, 1 RB, 10 MHz, 64-QAM)	LTE-TOD	10.25	±9.6
0.237	CAD	LTE-TDO (SC-FDMA, 1 RB, 10MHz, QPSK)	LTE-TOD	9.21	±9.6
0.538	CAB	LTE-TDD (SC-FDMA, 1 R8, 15MHz, 16-QAM)	LTE-TOD	9.48	±9.6
0239	CAB	LTE-TDO (SC-FDMA, 1 RB, 15MHz, 64-QAM)	LTE-TDD	10.25	±9.6
0.240	CAB	LTE-TDO (SC-FDMA, 1 RB, 15MHz, QPSK)	LTE-TOD	9.21	±9.6
0.241	CAB	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM)	LTE-TOD	9.82	±9.5
0242	CAD	LTE-TDO (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM)	LTE-TOD	9.86	±9.6
0243	CAD	LTE-TDD (SC-FDMA, 50% RB, 1,4 MHz, QPSK)	LTE-TOD	9.46	±9.8
0244	CAD	LTE-TDO (SC-FDMA, 50% RB, 3MHz, 16-QAM)	LTE-TOD	10.06	±9.6
0245	CAG	LTE-TDO (SC-FDMA, 50% RB, 3 MHz, 64-QAM)	LTE-TOD	10.08	±9.6
0246	CAG	LTE-TDO (SC-FDMA, 50% RB, 3 MHz, QPSK)	LTE-TOD	9.30	±9.6
0247	CAG	LTE-TDO (SC-FDMA, 50% RB, 5 MHz, 16-QAM)	LTE-TOD	9.91	±9.6
0248	CAG	LTE-TDO (SC-FDMA, 50% RB, 5 MHz, 64-QAM)	LTE-TOD	10.09	±9.6
0249	CAG	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, QPSK)	LTE-TDD	9.29	±9.6
0250	CAG	LTE-TDO (SC-FDMA, 50% RB, 10 MHz, 16-QAM)	LTE-TOD	9.81	±9.6
0251	CAF	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM)	LTE-TDD	10.17	±9.6
0.252	CAF	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, QPSK)	LTE-TOD	9.24	±9.6
0253	CAF	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM)	LTE-TOD	9.90	±9.0
0254	CAB	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM)	LTE-TOD	10.14	±9.6
0255	CAB	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, QPSK)	LTE-TOD	9.20	±9.6
0256	CAB	LTE-TDD (SC-FDMA, 100% RB, 1.4MHz, 16-QAM)	LTE-TOD	9.96	±9.6
0257	CAD	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM)	LTE-TOD	10.08	±9.6
0258	CAD	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK)	LTE-TOD	9.34	±9.5
0259	CAD	LTE-TDO (SC-FDMA, 100% RB, 3 MHz, 16-QAM)	LTE-TOD	9.98	±9.6
0260	CAG	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM)	LTE-TOD	9.97	±9.6
0261	CAG	LTE-TDO (SC-FDMA, 100% RB, 3 MHz, QPSK)	LTE-TOD	9.24	土9.6
0.565	CAG	LTE-TD0 (SC-FDMA, 100% RB, 5MHz, 16-QAM)	LTE-TOD	9.83	±9.6
0263	CAG	LTE-TDO (SC-FDMA, 100% RB, 5 MHz, 64-QAM)	LTE-TOO	10.16	±9.6
0264	CAG	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, QPSK)	LTE-TOO	9.23	±9.6
0.265	CAG	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM)	LTE-TOO	9.92	±9.6
0266	CAF	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 54-QAM)	LTE-TOO	10.07	±9.6
0267	CAF	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, QPSK)	LTE-TDO	9.30	±9.6
0.268	CAF	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM)	LTE-TOD	10.06	±9.6
0.269	CAB	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM)	LTE-TOD	10.13	±9.6
0270	CAB	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, QPSK)	LTE-TDO	9.58	±9.6
0274	CAB	UMTS-FDD (HSUPA, Subtest 5, 3GPP Rel8.10)	WCDMA	4.87	±9.6
0275	CAD	UMTS-FDD (HSUPA, Subtest 5, 3GPP Rel8.4)	WCDMA	3.96	19.6
0277	CAD	PHS (QPSK)	PHS	11.81	±9.6
0278	CAD	PHS (QPSK, BW 884 MHz, Rolloff 0.5)	PHS	11.81	±9.6
	100000000000000000000000000000000000000	PHS (OPSK, BW 864 MHz, Rolloff 0.38)	PHS	12.18	19.6
0290	CAG	CDMA2000, RC1, SD55, Full Rate	CDMA2000	3.91	±9.6
0292	CAG	CDMA2000, RC3, SO55, Full Rate COMA2000, RC3, SO32, Full Rate	CDMA2000	3.46	±9.6
0293	CAG		CDMA2000	3.39	19.6
0.295	CAG	COMA2000, RC3, SO3, Full Rate	CDMA2000	3.50	±9.6
0297	CAF	CDMA2000, RC1, SO3, 1/8th Rate 25 fr.	CDMA2000	12.49	±9.6
tertologia (ana	CAF	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, QPSK) LTE-FDD (SC-FDMA, 50% RB, 3 MHz, QPSK)	LTE-FDD	5.81	19.6
0298	CAF	LTE-FDD (SC-FDMA, 50% RB, 3MHz, QPSK) LTE-FDD (SC-FDMA, 50% RB, 3MHz, 16-QAM)	LTE-FDD	5.72	±9.6
0300	CAC		LTE-FOD	8.39	±9.6
the second second	GAC	LTE-FDD (SC-FDMA, 50% RB, 3MHz, 64-QAM)	LTE-FDD	6.60	±9.6
0301	CAB	IEEE 802.16e WMAX (29:18, 5 ms, 10 MHz, QPSK, PUSC)	WMAX	12.03	±9.6
0302	and the latest and th	IEEE 802.16s WIMAX (29:18, 5 ms, 10 MHz, QPSK, PUSC, 3CTRL)	WIMAX	12.57	±9.6
0303	CAA	IEEE 802,16e WMAX (31:15, 5 ms, 10 MHz, 54QAM, PUSC)	WMAX	12.52	±9.6
0304	CAA	IEEE 802 15e WMAX (29-18, 5ms, 10 MHz, 64QAM, PUSC)	WIMAX	11.88	±9.6
0306	the state of the latest terminal to the	IEEE 802.16e WIMAX (31:15, 10 ms, 10 MHz, 64QAM, PUSC)	WIMAX	15.24	±9.6
0306	CAA	IEEE 802.16e WMAX (29:18, 10 ms, 10 MHz, 64QAM, PUSC)	WiMAX	14.67	±9.6

Certificate No: EX-3968_Sep22 Page 13 of 22

F-TP22-03 (Rev. 04) Page 81 of 131



CUSTOMER SECRET



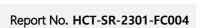
EX3DV4 - SN:3968

September 28, 2022

UID	Rev	Communication System Name	Group	PAR (dB)	Unc ^E k =
10307	AAB	IEEE 802.16e WIMAX (29:18, 10 ms, 10 MHz, QPSK, PUSC)	WIMAX	14.49	±9.6
0.308	AAB	IEEE 802.18e WIMAX (29:18, 10 ms, 10 MHz, 16QAM, PUSC)	WIMAX	14.46	±9.6
0.309	AAB	IEEE 802.16e WIMAX (29:18, 10 ms, 10 MHz, 16QAM,AMC 2x3)	WIMAX	14.58	±9.6
0310	AAB	IEEE 802.16e WIMAX (29:18, 10 ms, 10 MHz, QPSK, AMC 2x3	WIMAX	14.57	±9.6
0311	AAB	LTE-FDO (SC-FDMA, 100% RB, 15 MHz, QPSK)	LTE-FDD	6.06	8,9.6
0313	AAD	IDEN 13	IDEN	10.51	±9.6
0314	AAD	IDEN 1:8	IDEN	13.48	±9.6
0315	AAD	IEEE 802.11b WIFI 2.4 GHz (DSSS, 1 Mbps, 96pc dc)	WLAN	1.71	±9.6
0316	AAD	IEEE 802.11g WiFi 2.4 GHz (ERP-OFDM, 6 Mbps, 96pc dc)	WLAN	8.36	±9.8
0317	AAA	IEEE 802.11e WIFI 5 GHz (OFDM, 6 Mbps, 96pc dc)	WLAN	8.36	±9.6
0352	AAA	Pulse Waveform (200 Hz, 10%)	Generic	10.00	±9.6
353	AAA	Pulse Waveform (200 Hz, 20%)	Generic	6,99	±9.6
0354	AAA	Pulse Waveform (200 Hz, 40%)	Generic	3.98	±9.6
And in column 2 is not a second	AAA	Pulse Waveform (200 Hz, 60%)	Generic	2.22	±9.6
0356	AAA	Pulse Waveform (200 Hz, 80%) QPSK Waveform, 1 MHz	Generio	0.97	±9.6
387	AAA	A DESCRIPTION OF THE PROPERTY	Generic	5.10	±9.6
388	AAA	QPSK Waveform, 10 MHz	Generic	5.22	±9.6
396	AAA	84-QAM Waveform, 100 kHz	Generic	6.27	±9.6
399	AAA	64-QAM Waveform, 40 MHz	Generic	6.27	±9.6
1400	AAA	IEEE 802 11ac WIFI (20 MHz, 64-QAM, 99pc dc)	WLAN	8.37	±9.6
1401	AAA	IEEE 802 11ac WFI (40 MHz, 64-QAM, 99pc do)	WLAN	8.60	±9.6
1402	AAB	EEE 802.11ac WiFI (80 MHz, 64-QAM, 99pc dc) CDMA2000 (1xEV-DO, Rev. 0)	WLAN	8.53	±9.6
1404	AAB	CDMA2000 (1xEV-DO, Rev. 0) CDMA2000 (1xEV-DO, Rev. A)	CDMA2000	3.76	±9.6
1404	AAD	CDMA2000 (1xEV-DO, Hev. A) CDMA2000, RC3, SO92, SCH0, Full Rate	CDMA2000	3.77	±9.5
1410	AAA	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK, UI, Su6=2,3,4,7,8,9)	CDMA2000	5.22	±9.6
1414	AAA	and the second s	LTE-TOO	7.82	£9.6
1415	AAA	WLAN CCDF, 64-QAM, 40 MHz IEEE 802.11b WiFI 2.4 GHz (DSSS, 1 Mbps, 99pc dc)	Generic WLAN	8.54	±9.6
1415	AAA	IEEE 802.11g WIFI 2.4 GHz (ERP-OFDM, 8 Mbps, 99pc dc)	WLAN	1.54	±9.6
1417	AAA	IEEE 802.11a/h WFI 5 GHz (OFDM, 6 Mbps, 99pc dc)	WLAN	8.23	±9.6
1418	AAA	IEEE 802.11g WIFI 2.4 GHz (DSSS-OFDM, 6 Mbps, 99pc, Long)	WLAN	8.23	19.6
1419	AAA	IEEE 802:11g WIFI 2.4 GHz (DSSS-OFDM, 6 Mbps, 99pc, 5hort)	WLAN		±9.6
1422	AAA	IEEE 802.11n (HT Greenfield, 7.2 Mbps, BPSK)	WLAN	8.19	±9.6
1423	AAA	IEEE 802.11ri (HT Greenfield, 43.3 Mbps, 16-QAM)	18395351	8.32	±9.6
1424	AAE	IEEE 802.11n (HT Greenfield, 72.2 Mbps, 64-QAM)	WLAN	8.47	±9.6
1425	AAE	IEEE 802.11n (HT Greenfield, 15 Mbps, BPSK)	WLAN	8.40	19.6
1426	AAE	IEEE 802.11n (HT Greenfield, 90 Mbps, 16-GAM)	WLAN	8.41	19.6
1427	AAB	IEEE 802,11n (HT Greenfield, 150 Mbps, 64-QAM)	WLAN	8.41	±9.6
1430	AAB	LTE-FDD (OFDMA, 5 MHz, E-TM 3.1)	LTE-FDD	8.28	±9.6
1431	AAC	LTE-FOD (OFDMA, 10 MHz, E-TM 3.1)	LTE-FDD	8.38	±9.6
1432	AAB	LTE-FDD (OFDMA, 15 MHz, E-TM 3.1)	LTE-FDD	8.34	19.6
433	AAC	LTE-FDD (OFDMA, 20 MHz, E-TM 3.1)	LTE-FOD	8.34	±9.6
1434	AAG	W-CDMA (BS Test Model 1, 64 DPCH)	WCDMA	8.60	19.6
435	AAA	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK, UL Sub)	LTE-TDD	7.82	19.6
447	AAA	LTE-FDD (OFDMA, 5 MHz, E-TM 3.1, Clipping 44%)	LTE-FDD	7.56	±9.6
1448	AAA	LTE-FDD (OFDMA, 10 MHz, E-TM 3.1, Clippin 44%)	LTE-FOD	7.53	±9.6
449	AAC	LTE-FDD (OFDMA, 15 MHz, E-TM 3.1, Cliping 44%)	LTE-FDD	7.51	±9.6
450	AAA	LTE-FDD (OFDMA, 20 MHz, E-TM 3.1, Clipping 44%)	LTE-FOD	7.48	±9.6
451	AAA	W-CDMA (BS Test Model 1, 64 DPCH, Clipping 44%)	WCDMA	7.59	±9.6
453	AAG	Validation (Square, 10 ms, 1 ms)	Test	10.00	±9.6
456	AAC	IEEE 802.11ac WIFI (160 MHz, 64-DAM, 99pc dc)	WLAN	8.63	±9.6
457	AAC	UMTS-FDD (DC-HSDPA)	WCDMA	6.62	±9.6
458	AAC	CDMA2000 (1xEV-DO, Rev. B, 2 carriers)	CDMA2000	6.55	±9.6
459	AAG	CDMA2000 (1xEV-DO, Rev. B, 3 carriers)	CDMA2000	8.25	±9.6
480	AAC	UMTS-FDD (WCDMA, AMR)	WCDMA	2.39	±9.6
461	AAC	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK, UL Sub)	LTE-TD0	7.82	±9.6
462	AAC	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM, UL Sub)	LTE-TDO	8.30	±9.6
463	AAD	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM, UL Sub)	LTE-TOO	8.56	19.6
464	AAD	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, QPSK, UL Sub)	LTE-TOO	7.82	19.6
465	AAC	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM, UL Sub)	LTE-TDO	8.32	19.6
468	AAC	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM, UL Sub)	LTE-TDD	8.57	19.6
467	AAA	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK, UL Sub)	LTE-TOD	7.82	19.6
468	AAF	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM, UL Sub)	LTE-TDD	8.32	19.6
1469	AAD	LTE-TOD (SC-FDMA, 1 RB, 5MHz, 84-QAM, UL Sub)	LTE-TDD	8.56	±9.6
470	AAD	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK, UL Sub)	LTE-TDD	7.82	19.6
	AAC	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 15 QAM, UL Sub)	LTE-TDD	8.32	70.6

Certificate No: EX-3968_Sep22

Page 14 of 22



CUSTOMER SECRET



EX3DV4 - SN:3968 September 28, 2022

UID	Rev	Communication System Name	Group	PAR (dB)	UncE k = 2
10472	AAC	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM, UL Sub)	LTE-TDD	8.57	±9.6
10473	AAA	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, QPSK, UL Sub)	LTE-TDD	7.82	±9.6
10474	AAC	LTE-TDD (SC-FDMA, 1 RB, 15MHz, 16-QAM, UL Sub)	LTE-TOD	8.32	±9.6
10475	AAD	LTE-TDD (SC-FDMA, 1 RB, 15MHz, 64-QAM, UL Sub)	LTE-TOD	8.57	±9.6
10477	AAC	LTE-TDD (SC-FDMA, 1 RB, 28MHz, 16-QAM, UL Sub)	LTE-TOD	8.32	±9.6
10478	AAC	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM, UL Sub)	LTE-TDD	8.57	≘9.6
10479	AAC	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK, UL Sub)	LTE-TOD	7.74	±9.6
10480	AAA	LTE-TDD (SC-FDMA, 50% RB, 1.4MHz, 16-QAM, UL Sub)	LTE-TDD	8,18	±9.6
10481	AAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM, UL Sub)	LTE-TDD	8.45	±9.6
10482	AAA	LTE-TDO (SC-FDMA, 50% RB, 3 MHz, QPSK, UL Sub)	LTE-TDD	7.71	±9.6
10482	AAA	LTE-TDO (SC-FDMA, 50% RB, 3 MHz, 16-QAM, Sub)	LTE-TOD	8.39	8.9.6
10484	AAB	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 84-QAM, UL Sub)	LTE-TOD	8.47	±9.6
10485	AAB	LTE-TDO (SC-FDMA, 50% RB, 5 MHz, QPSK, LIL Sub)	LTE-TDD	7.59	±9.6
0486	AAB	LTE-TDO (SC-FDMA, 50% RB, 5 MHz, 16-QAM, UL Sub)	LTE-TOD	8.38	±9.6
10487	AAC	LTE-TDO (SC-FDMA, 50% RB, 5 MHz, 64-QAM, UL Sub)	LTE-TOD	8.60	±9.6
0.488	AAC	LTE-TDO (SC-FDMA, 50% RB, 10 MHz, QPSK, UL Sub)	LTE-TOD	7.70	±9.6
0488	AAC	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM, UL Sub)	LTE-TOD	8.31	±9.6
0490	AAF	LTE-TDO (SC-FDMA, 50% RB, 10 MHz, 64-QAM, UL Sub)	LTE-TOD	8.54	±9.6
0.491	AAF.	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, QPSK, UL Sub)	LTE-TOD	7.74	±9.6
0.492	AAF	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM, UL Sub)	LTE-TOD	8.41	±9.6
0.493	AAF	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM, UL Sub)	LTE-TDD	8.55	±9.6
0.494	AAF	LTE-TDO (SC-FDMA, 50% RB, 20 MHz, QPSK, UL Sub)	LTE-TOO	7.74	±9.6
0.495	AAF	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM, UL Sub)	LTE-TOO	8.37	±9.6
0496	AAE	LTE-TDD (SC-FDMA, 50% RB, 20MHz, 64-QAM, UL Sub)	LTE-TOO	8.54	±9.6
0497	AAE	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK, UL Sub)	LTE-TOO	7,67	±9.6
0498	AAE	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM, UL Sub)	LTE-TOO	8.40	±9.6
0499	AAC	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM, UL Sub)	LTE-TDD	88.8	±9.6
0500	AAF	LTE-TDD (SC-FDMA, 100% RB, 3MHz, QPSK, UL Sub)	LTE-TDD	7,67	±9.6
0501	AAF	LTE-TDD (SC-FDMA, 100% RB, 3MHz, 16-QAM, UL Sub)	LTE-TDD	8.44	19.8
0.502	100000	LTE-TDD (SC-FDMA, 100% RB, 3MHz, 64-QAM, UL Sub)	LTE-TOD	8,52	±9.6
0503	BAA	LTE-TDD (SC-FDMA, 100% RB, 5MHz, QPSK, UL Sub)	LTE-TOO	7,72	±9.6
0504	AAC	LTE-TDD (SC-FDMA, 100% RB, 5MHz, 16-QAM, UL Sub)	LTE-TOD	8.31	±9.6
0506	AAC	LTE-TDD (SC-FDMA, 100% RB, 5MHz, 64-QAM, UL Sub)	LTE-TOD	8.54	±9.6
0507	AAC	LTE-TOD (SC-FDMA, 100% AB, 10 MHz, QPSK, UL Sub)	LTE-TOD	7.74	19.6
0508	AAF	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM, UL Sub)	LTE-TOO	8,36	±9.6
0509	AAF	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM, UL Sub) LTE-TDD (SC-FDMA, 100% RB, 15 MHz, QPSK, UL Sub)	LTE-TOD	8.55	±9.6
0510	AAF	LTE-TOD (SC-FDMA, 100% RB, 15MHz, 16-QAM, UL Sub)	LTE-TDD	7.99	±9.6
0611	AAF	LTE-TDD (SC-FDMA, 100% RB, 15MHz, 64-QAM, UL Sub)	LTE-TDD	8.49	±9.6
0512	AAF	LTE-TOD (SC-FDMA, 100% RB, 20 MHz, QPSK, UL Sub)	LTE-TOD	8.51	±9.6
0513	AAF	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM, UL Sub)	LTE-TOD	7.74	±9.6
0514	AAE	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Sub)	The first first and the first state of the first st	8.42	±9.6
0515	AAE	IEEE 802 11b WIFI 2.4 GHz (DSSS, 2 Mbps, 99pc dc)	WLAN	8.45	±9.6
0516	AAE	IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps, 99pc dc)	WLAN	1.58	±9.8
0517	AAF	IEEE 802.11b WIFI 2.4 GHz (DSSS, 11 Mbps, 99pc dc)	CONTRACTOR AND ADDRESS OF	1.57	±9.6
0518	AAF	IEEE 802.11a/h WiFI 5 GHz (OFDM, 9 Mbps, 99pc dc)	WLAN	1.88	19.6
0519	AAF	IEEE 802.11a/h WIFI 5 GHz (OFDM, 12 Mbps, 99pc dc)	WLAN	8.23	±9.6
0520	AAB	IEEE 802.11a/h WIFI 5 GHz (OFDM, 18 Mbps, 99pc dc)	The state of the s	8.39	±9.6
0521	AAB	IEEE 802.11a/h WIFI 5 GHz (OFDM, 18 Mbps, 99pc dc)	WLAN	8,12	±9.6
0522	AAB	IEEE 802.11a/h WIFI 5 GHz (OFDM, 36 Mbps, 99pc dc)	WLAN	7.97	±9.6
0523	AAC	IEEE 802.11a/h WIFI 5 GHz (OFDM, 48 Mbps, 99pc dc)	The second second second	8.45	±9.6
0524	AAC	IEEE 802.11a/h WFI 5 GHz (OFDM, 54 Mbps, 99pc dc)	WLAN	8.08	19.6
0525	AAC	IEEE 802,11ac WiFi (20 MHz, MCS0, 99pc dc)	WLAN	8.27	±9.6
0526	AAF	IEEE 802.11ac WIFI (20 MHz, MCS1, 99pc dc)	WLAN	8.36	#9.6
0527	AAF	IEEE 802.11ac WIFI (20 MHz, MCS2, 99pc dc)	WLAN	8.42	±9.6
528	AAF	IEEE 802 11ac WiFi (20 MHz, MCS3, 99pc dc)	WLAN	8.21	±9.6
529	AAF	IEEE 802 11sc WiFI (20MHz, MCS4, 99pc dc)	WLAN	8.36	±9.6
531	AAF	IEEE 802:11ac WIFI (20 MHz, MC56, 99pc dc)	WLAN	8.36	±9.6
0.532	AAF	IEEE 802.11ac WIFI (20 MHz, MCS7, 99pc do)	WLAN	8.43	±9.5
2533	AAE	IEEE 802.11ac WIFI (20 MHz, MCSB, 99pc dc)	WLAN	8.29	±9.6
0534	AAE	IEEE 802.11ac WIFI (40 MHz, MCS0, 99pc dc)	The state of the s	8.38	±9.6
0535	AAE	IEEE 802.11ac WiFi (40 MHz, MCS1, 99pc dc)	WLAN	8.45	±9.6
0536	AAF	IEEE 802.11ac WiFi (40 MHz, MCS2, 99pc dc)	WLAN	8.45	±9.6
0537	AAF	IEEE 802,11ac WFI (40 MHz, MCS3, 99pc dc)	WLAN	8.32	±9.6
Carlo Maria	AAF	IEEE 902.11ac WIFI (40 MHz, MCS4, 99pc dc)	WLAN	8.44 8.54	±9.6
0538	ALMON .				

Certificate No: EX-3968_Sep22

Page 15 of 22



CUSTOMER SECRET



EX3DV4 - SN:3968

September 28, 2022

UID	Rev	Communication System Name	Group	PAR (dB)	Unc ^E k =
10541	AAA	IEEE 802,11ac WFI (40 MHz, MCS7, 99pc dc)	WLAN	8.46	±9.6
10542	AAA	IEEE 802.11ac WiFi (40 MHz, MCS8, 99pc dc)	WLAN	8.65	±9.6
10543	AAC	IEEE 802.11ac WFI (40 MHz, MCS9, 99pc dc)	WLAN	8.65	19.8
10544	AAC	IEEE 802,11ac WIFI (80 MHz, MCS0, 99pc dc)	WLAN	8.47	±9.6
10545	AAC	IEEE 802.11ac WIFI (80 MHz, MCS1, 99pc dc)	WLAN	8.55	19.6
10546	AAC	IEEE 802.11ac WIFI (80 MHz, MCS2, 99pc dc)	WLAN	8.35	±9.6
10547	AAC	IEEE 802.11ac WFI (80 MHz, MCS3, 99pc dc)	WLAN	E.49	±9.6
10548	AAC	IEEE 802,11ac WiFi (90 MHz, MCS4, 99pc dc)	WLAN	8.37	±9.6
10550	AAC	IEEE 802,11ac WiFi (80 MHz, MCS6, 99pc dc)	WLAN	0.38	±9.6
10551	AAC	IEEE 802.11ac WFi (80 MHz, MCS7, 99pc dc)	WLAN	8.50	±9.5
10552	AAC	IEEE 802.11ac WFi (80 MHz, MCSB, 99cc dc)	WLAN	8.42	±9.6
10553	AAC	IEEE 802 11ac WF (80 MHz, MCS8, 99pc dc)	WLAN	8.45	±9.6
10554	AAC	IEEE 802.11ac WFI (160 MHz, MCS0, 99pc dc)	WLAN	8.48	±9.6
10555	AAC	IEEE 802.11ac WFI (160 MHz, MCS1, 99pc dc)	WLAN	8.47	19.6
10556	AAC	IEEE 802 11ac WFI (160 MHz, MCS2, 99pc dc)	WLAN	8.50	±9.6
10557	AAC	IEEE 802.11ac WIFI (160 MHz, MCS3, 99pc dc)	WLAN	6.52	19.6
10558	AAC	IEEE 802.11ac WFI (160 MHz, MCS4, 99pc dc)	WLAN	8.61	19.6
10560	AAC	IEEE 802,11ac WFi (160 MHz, MCS6, 99pc dc)	WLAN	8.73	±9.6
10561	AAC	IEEE 802.11ac WiFi (160 MHz, MCS7, 99pc dc)	WLAN	8.56	19.6
10562	AAC	IEEE 802.11ac WiFi (160 MHz, MCS8, 99pc dc)	WLAN	8.69	
10563	AAC	IEEE 802.11ac WiFi (160 MHz, MCS9, 99pc dc)	WLAN	8.77	±9.6
10564	AAC	IEEE 802.11g WIF1 2.4 GHz (DSSS-OFDM, 9 Mbps, 99pc do)	WLAN		19.6
10565	AAC	IEEE 802.11g WIFI 2.4 GHz (DSSS-OFDM, 12 Mbps, 99pc dc)	WLAN	8.25	±9.6
10566	AAC	IEEE 802.11g WIFI 2.4 GHZ (DSSS-OFDM, 12 Mbps, 99pc dc)	WLAN	8.45	±9.6
10567	AAC	IEEE 802.11g WIFI 2.4 GHz (DSSS-OFDM, 24 Mbps, 99pc dc)	A Company of the Comp	8.13	±9.6
10568	AAC	IEEE 802.11g WIFI 2.4 GHz (DSSS-OFDM, 24 Mops, 99pc dc)	WLAN	8.00	±9.6
10569	AAC	the second production and the production of the second production and the second production of the second production	WLAN	8.37	±9.6
10570	AAC	IEEE 802.11g WIFI 2.4 GHz (DSSS-OFDM, 48 Mbps, 99pc dc)	WLAN	8.10	±9.6
10571	AAC	IEEE 802 11g WIFI 2.4 GHz (DSSS-OFDM, 54 Mbps, 99pc dc)	WLAN	8.30	±9.6
10572	AAC	IEEE 802.11b WIFI 2.4 GHz (DSSS, 1 Mbps, 90pc dc)	WLAN	1,99	±9,6
-	AAC	IEEE 802.11b WFi 2.4 GHz (DSSS, 2Mbps, 90pc dc)	WLAN	1.99	±9.6
10573		IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps, 90pc dc)	WLAN	1.98	±9.6
10575	AAC	IEEE 802.11b WIFI 2.4 GHz (DSSS, 11 Mbps, 90pc dc)	WLAN	1.98	±9.6
10576	AAC	IEEE 802 11g WIFI 2.4 GHz (DSSS-OFDM, 6 Mbps, 90pc dc)	WLAN	8.59	±9.6
0577	AAC	IEEE 802.11g WIFI 2.4 GHz (DSSS-OFDM, 9 Mbps, 90pc dc) IEEE 802.11g WIFI 2.4 GHz (DSSS-OFDM, 12 Mbps, 90pc dc)	WLAN	8.60	±9.6
0578	AAD		WLAN	8.70	±0.6
10578	AAD	IEEE 802.11g WFI 2.4 GHz (DSSS-OFDM, 18 Mbps, 90pc dc)	WLAN	8.49	±9.6
0580	AAD	IEEE 802.11g WIFI 2.4 GHz (DSSS-OFDM, 24 Mbps, 90pc dc)	WLAN	8.36	#9.6
10.581	AAD	IEEE 802.11g WIFI 2.4 GHz (DSSS-OFDM, 36 Mbps, 90pc dc)	WLAN	8.76	±9.6
0.582	AAD	IEEE 802.11g WiFi 2.4 GHz (DSSS-QFDM, 48 Mbps, 90pc dc)	WLAN	8.35	±9.6
0583	and the second	IEEE 802.11g WIFI 2.4 GHz (DSSS-OFDM, 54 Mbps, 90pc dc)	WLAN	8.67	±9.6
with the behavior and the	AAD	IEEE 802.11a/h WIFI 5 GHz (OFDM, 6 Mbps, 90pc dc)	WLAN	8.59	±9.6
0584	AAD	IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps, 90pc dc)	WLAN	8.60	±9.6
0585	AAD	IEEE 802,11a/h WIFI 5 GHz (OFDM, 12 Mbps, 90pc dc)	WLAN	8.70	±9.6
0586	AAD	IEEE 802.11a/h WIFI 5 GHz (OFDM, 18 Mbps, 90pc dc)	WLAN	8.49	±9.6
0.587	AAA	IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps, 90pc do)	WLAN	8.36	±8.6
0588	AAA	IEEE 802.11a/h WIFI 5 GHz (OFDM, 36 Mbps, 90pc dc)	WLAN	8.76	19.6
0589	AAA	IEEE 802.11a/h WIFI 5 GHz (OFDM, 48 Mbps, 90pc dc)	WLAN	8.35	±9.6
0590	AAA	IEEE 802.11a/h WIFI 5 GHz (OFDM, 54 Mbps, 90pc dc)	WLAN	8.67	±9.6
0591	AAA	IEEE 802.11n (HT Mixed, 20 MHz, MCS0, 90pc dc)	WLAN	8.63	±9.6
0582	AAA	IEEE 802.11n (HT Mixed, 20 MHz, MCS1, 90pc dc)	WLAN	8.79	±9.6
1000	AAA	IEEE 802 11n (HT Mixed, 20 MHz, MCS2, 90pc dc)	WLAN	8.64	±9.fi
0594	AAA	IEEE 802.11n (HT Mixed, 20 MHz, MCS3, 90pc dc)	WLAN	8.74	±9.6
0596	AAA	IEEE 802 11n (HT Mixed, 20 MHz, MCS4, 90pc dc)	WLAN	8.74	±9.6
0596	AAA	IEEE 802 11n (HT Mixed, 20 MHz, MCS5, 90pc dc)	WLAN	8.71	±9.6
0597	AAA	IEEE 802.11n (HT Mixed, 20 MHz, MCS6, 90pc dc)	WLAN	8.72	±9.6
0.598	AAA	IEEE 802.11n (HT Mixed, 20 MHz, MCS7, 90pc dc)	WLAN	8.50	±9.6
0599	AAA	IEEE 802.11n (HT Mixed, 40 MHz, MCS0, 90pc dc)	WLAN	8.79	±9.6
0000	AAA	IEEE 802.11n (HT Mixed, 40 MHz, MCS1, 90pc dc)	WLAN	8.88	±9.6
0601	AAA	IEEE 802.11n (HT Mixed, 40 MHz, MCS2, 90pc dc)	WLAN	8.82	±9.6
0.602	AAA	IEEE 802.11n (HT Mixed, 40 MHz, MC\$3, 90pc dc)	WLAN	8.94	±9.6
0603	AAA	IEEE 802.11n (HT Mixed, 40 MHz, MCS4, 90pc dc)	WLAN	9.00	19.6
0604	AAA	IEEE 802.11n (HT Mixed, 40 MHz, MCS5, 90pc dc)	WLAN	8.76	19.6
0605	AAA	IEEE 802.11n (HT Mixed, 40 MHz, MCS6, 90pc dc)	WLAN	8.97	±8.6
0608	AAC	IEEE 802.11n (HT Mixed, 40 MHz, MCS7, 90pc dc)	WLAN	8,82	±9.6
0607	AAC	IEEE 802,11ac WIFI (20 MHz, MCS0, 90pc dc)	WLAN	8.64	±9.6
0608	AAC	IEEE 802.11ac WiFi (20 MHz, MCS1, 90pc dc)	WLAN	8.77	±9.6

Certificate No: EX-3968_Sep22

Page 16 of 22



CUSTOMER SECRET



EX3DV4 - SN:3968

September 28, 2022

UID Rev	Communication System Name	Group	PAR (dB)	UncE k =
10809 AAC	IEEE 802.11ac WiFi (20 MHz, MCS2, 90pc dc)	WLAN	8.57	±9.6
10610 AAC	IEEE 802.11ac WIFi (20 MHz, MCS3, 90pc dc)	WLAN	8.78	±9.6
10511 AAC	IEEE 802.11sc WIFI (20 MHz, MCS4, 90pc dc)	WLAN	8.70	±9.6
0612 AAC	IEEE 802.11ac WiFi (20 MHz, MCS5, 90pc de)	WLAN	8.77	±9.8
0613 AAC	IEEE 802.11ac WiFi (20 MHz, MC86, 90pc dc)	WLAN	8.94	±9.6
0814 AAC	IEEE 802.11ac WiFi (20 MHz, MCS7, 90pc dc)	WLAN	8.59	±9.6
0615 AAC	IEEE 802.11ac WIFI (20 MHz, MCS8, 90pc dc)	WLAN	8.82	±9.6
0515 AAC	IEEE 802.11ac WIFI (40 MHz, MCS0, 90pc dc)	WLAN	8.82	±9.6
0617 AAC	IEEE 802.11ac WIFi (40 MHz, MCS1, 90pc dc)	WLAN	8.81	±9.6
0618 AAC	IEEE 802.11ac WIFI (40 MHz, MCS2, 90pc dc)	WLAN	8.58	±9.6
0919 AAC	IEEE 802.11ac WiFi (40 MHz, MCS3, 90pc dc)	WLAN	8.86	±9.6
0620 AAC	IEEE 802.11ac WIFi (40 MHz, MCS4, 90pc dc)	WLAN	8.87	±9.6
0821 AAC	IEEE 802.11ac WIFI (40 MHz, MCSS, 90pc dc)	WLAN	8,77	±9.6
0fi22 AAC	IEEE 802.11ac WIFI (40 MHz, MCS6, 90pc dc)	WLAN	8.68	±9.6
0623 AAC	IEEE 802.11ac WiFi (40 MHz, MCS7, 90pc dc)	WLAN	8.82	±9.6
0624 AAC	IEEE 802.11ac WFI (40 MHz, MCS8, 90pc dc)	WLAN:	8.96	±9.6
0625 AAC	IEEE 802.11sc WiFi (40 MHz, MCS9, 90pc dc)	WLAN	8.96	±9.6
0626 AAC	IEEE 802.11ac WiFi (80 MHz, MCS0, 90pc dc)	WLAN	8.83	±9,6
0627 AAC	IEEE 802.11ac WIFI (80 MHz, MCS1, 90pc dc)	WLAN	8.88	±9.6
0628 AAC	IEEE 802.11sc WiFi (80 MHz, MGS2, 90pc dc)	WLAN	8.71	±9.6
0629 AAC	IEEE 802.11ac WIFI (80 MHz, MGS3, 90pc dc)	WLAN	8.85	±9.6
0630 AAC	IEEE 802.11ac W/FI (80 MHz, MCS4, 90pc dc)	WLAN	8.72	±9.6
0631 AAC	IEEE 802.11ac WFi (80 MHz, MCS5, 90pc dc)	WLAN	8.81	±9.6
D632 AAC	IEEE 802.11ac WFI (80 MHz, MCS6, 90pc dc)	WLAN	8.74	±9.6
0633 AAC	IEEE 802.11ac WIFI (80 MHz, MCS7, 90pc dc)	WLAN	E-83	±9.6
0634 AAC	IEEE 802 11ac WiFi (80 MHz, MCS8, 90pc dc)	WLAN	8.80	±9.6
0635 AAC	IEEE 802.11ac WIFI (80 MHz, MCS9, 90pc dc)	WLAN	8.81	19.6
0636 AAC	IEEE 802.11ac WiFi (160 MHz, MCS0, 90pc dc)	WLAN	8.83	±9.6
0637 AAC	IEEE 802.11ac WIFi (160 MHz, MCS1, 90pc dc)	WLAN	8.79	±9.6
0638 AAC	IEEE 802.11ac WIFI (150 MHz, MCS2, 90pc dc)	WLAN	8.86	±9.6
0639 AAC	IEEE 802.11ac WIFI (160 MHz, MCS3, 90pc dc)	WLAN	8.85	±9.6
0640 AAC	IEEE 802,11ac WiFi (160 MHz, MCS4, 90pc dc)	WLAN	9.98	±9,6
0641 AAC	IEEE 802 11ac WiFi (160 MHz, MCS5, 90pc dc)	WLAN	9.06	±9.6
0842 AAC	IEEE 802,11ac WIFI (160 MHz, MCS6, 90pc dc)	WLAN	9.06	±9.6
0643 AAC	IEEE 802.11ac WiFi (160 MHz, MCS7, 90pc dc)	WLAN	8.89	±9.6
0644 AAC	IEEE 802.11ac WiFi (160 MHz, MCS8, 90pc dc)	WLAN	9.05	±9.6
0645 AAC	(EEE 802.11ac WiFi (160 MHz, MCS9, 90pc dc)	WLAN	9.11	±9.6
0546 AAC	LTE-TDD (SC-FDMA, 1 RB, 5MHz, QPSK, UL Sub=2,7)	LTE-TDD	11.98	±9.6
0547 AAC	LTE-TOD (SC-FDMA, 1 RB, 20 MHz, QPSK, UL Sub=2,7)	LTE-TOD	11.96	29.6
0648 AAC	CDMA2000 (1x Advanced)	CDMA2000	3.45	±9.6
652 AAC	LTE-TDD (OFDMA, 5 MHz, E-TM 3.1, Clipping 44%)	LTE-TOD	6.91	±9.6
9553 AAC	LTE-TDD (OFDMA, 10 MHz, E-TM 3.1, Clipping 44%)	LTE-TOD	7,42	±9.6
0654 AAC	LTE-TDD (OFDMA, 15 MHz, E-TM 3.1, Clipping 44%)	LTE-TOD	6.96	±9.6
0655 AAC	LTE-TDD (OFDMA, 20MHz, E-TM 3.1, Clipping 44%)	LTE-TOD	7.21	19.6
1658 AAC	Pulse Waveform (200 Hz, 10%)	Test	10.00	
0659 AAC	Pulse Wavelorm (200 Hz, 20%)	Test	6.99	±9.6
1880 AAC	Pulse Waveform (200 Hz, 40%)	Test	3.98	±9.5
1681 AAC	Pulse Waveform (200 Hz, 60%)	Test		19.6
0662 AAC	Pulse Waveform (200 Hz, 80%)	Test	2.22	±9.6
0670 AAC	Sluetpath Law Energy	THE RESERVE AND DESCRIPTION OF THE PERSON NAMED IN COLUMN TWO	0.97	±9.6
1671 AAD	IEEE 802.11ax (20 MHz, MCS0, 90pc dc)	Bluetooth	2.19	±9.6
1672 AAD	IEEE 802.11ax (20 MHz, MCS1, 90pc dc)	WLAN	9.09	±9.6
1673 AAD	IEEE 802.11ax (20 MHz, MCS2, 90pc dc)	WLAN	8.57	±9.6
674 AAD	IEEE 802.11ax (20 MHz, MCS3, 90pc dc)	WLAN	8.78	±9.6
675 AAD	IEEE 802.11ax (20 MHz, MCS4, 90pc dc)	WLAN	8.74	±9.6
876 AAD	IEEE 802 11ax (20 MHz, MCS5, 90pc dc)	The second secon	8.90	±9.6
677 AAD	IEEE 802.11ax (20 MHz, MCS6, 90pc do)	WLAN	8.77	±9.6
67B AAD	IEEE 802.11ax (20 MHz, MCS7, 90pc do)	WLAN	8.73	±9.6
679 AAD	IEEE 802.11ax (20 MHz, MCS7, 90pc dc)	WLAN	8.78	±9.6
DAA 088	IEEE 802.11ax (20 MHz, MCS8, 90pc dc)	WLAN	8.89	±9.6
1681 AAG	IEEE 802.118x (20 MHz, MCS10, 90pc dc)	WLAN	8.80	±9.8
682 AAF		WLAN	8.62	±9.0
37300	IEEE 802 11ax (20 MHz, MCS11, 90pc dc)	WLAN	8.83	±9.6
0883 AAA	IEEE 802.11ax (20 MHz, MCS0, 99pc dc)	WLAN	8.42	±9.6
0684 AAC	IEEE 802.11ex (20 MHz, MCS1, 99pc dc)	WLAN	8.26	±9.6
1685 AAC	IEEE 802.11ax (20 MHz, MCS2, 99pc dc)	WLAN	8.33	±9.6
1686 AAC	IEEE 802.11ax (20 MHz, MCS3, 99pc dc)	WLAN	8.28	±9.6

Certificate No: EX-3968_Sep22

Page 17 of 22



CUSTOMER SECRET



Report No. HCT-SR-2301-FC004

EX3DV4 - SN:3968

September 28, 2022

UID	Rev	Communication System Name	Group	PAR (dB)	UncE k =
10687	AAE	IEEE 802.11ax (20MHz, MCS4, 99pc dc)	WLAN	8.45	±9.6
10688	AAE	IEEE 802.11ax (20MHz, MCS5, 99pc dc)	WLAN	8.29	±9.6
10689	AAD	IEEE 802.11ax (20 MHz, MCS6, 99pc dc)	WLAN	8.55	±9.6
10890	AAE	IEEE 802.11ax (20MHz, MCS7, 99pc dc)	WLAN	8.29	±9.6
0691	AAB	IEEE 802.11ax (20 MHz, MCS8, 99pc dc)	WLAN	8.25	19.6
0092	AAA	IEEE 802.11ax (20 MHz, MCS9, 99pc do)	WLAN	8.29	±9.6
California Control	AAA		WLAN	8.25	19.6
0893		IEEE 802.11ax (20 MHz, MCS10, 99pc dc)	A STATE OF THE PARTY OF THE PAR	100.00	
0694	AAA	IEEE 802.11ax (20 MHz, MCS11, 99pc dc)	WLAN	8.57	±9.6
0695	AAA	IEEE 802,11ax (40 MHz, MCS0, 90pc do)	WLAN	6.78	±9.6
0698	AAA	IEEE 802.11ax (40 MHz, MCS1, 90pc do)	WLAN	8.91	±9.6
0697	AAA	IEEE 802,11ax (40 MHz, MCS2, 90pc dc)	WLAN	8.61	±9.6
0698	AAA	IEEE 802.11ax (40 MHz, MCS3, 90pc dc)	WLAN	8.89	±9.6
0.699	AAA	IEEE 802.11ax (40 MHz, MCS4, 90pc dc)	WLAN	8.82	±9.6
0700	AAA	IEEE 802,11ax (40 MHz, MCSS, 90pc dc)	WLAN	8.73	±9.6
0701	AAA	IEEE 802.11ax (40 MHz, MCS6, 90pc do)	WLAN	8.86	±9.6
0702	AAA	IEEE 802.11ax (40 MHz, MCS7, 90pc do)	WLAN	8.70	±9.6
0703	AAA	IEEE 802,11ax (40 MHz, MCS8, 90pc dc)	WLAN	8.82	±9.6
0704	AAA	IEEE 802.11ax (40 MHz, MCSB, 90pc dc)	WLAN	8.56	±9.6
0705	AAA	IEEE 802.11ax (40 MHz, MCS10, 90pc dc)	WLAN	8.69	±9.6
0706	AAC	IEEE 802.11ax (40 MHz, MCS11, 90pc dc)	WLAN	8.66	±9.6
0707	AAC	IEEE 802.11ax (40 MHz, MCS0, 99pc dc)	WLAN	8.32	19.6
0708	AAG	IEEE 802,11ax (40 MHz, MCS1, 99pc dc)	WLAN	8.55	±9.6
0709	AAC	IEEE 802.11ax (40 MHz, MCS1, 99pc dc)	WLAN	8.33	
	-		1112222		±9.6
0710	AAC	IEEE 802.11ax (40 MHz, MCS3, 99pc dc)	WLAN	8,29	±9.6
0711	AAC	IEEE 802.11ax (40 MHz, MCS4, 99pc do)	WLAN	8,39	±9.6
10712	AAC	IEEE 802.11ax (40 MHz, MCSS, 99pc do)	WLAN	8.67	±9.6
0713	AAC	IEEE 802.11ax (40 MHz, MCS6, 99pc dc)	WLAN	8.33	±9.6
0714	AAC	IEEE 802.11ax (40 MHz, MCS7, 99pc dc)	WLAN	8.26	±9.6
10715	AAC	IEEE 802.118x (40 MHz, MCS8, 99pc dc)	WLAN	8.45	±9.6
0716	AAC	IEEE 802.11ax (40 MHz, MCS9, 99pc dc)	WLAN	8.30	±9.6
0717	AAC	IEEE 802.11ax (40 MHz, MCS10, 99pc dc)	WLAN	8.48	19.5
0718	AAC	IEEE 802.11ax (40 MHz, MCS11, 99pc dc)	WLAN	8.24	±9.6
0719	AAC	IEEE 802.11ax (80 MHz, MCS0, 90pc dc)	WLAN	8.81	±9.6
0720	AAC	IEEE 802.11ax (80 MHz, MCS1, 90pc dc)	WLAN	8.87	±9.6
0721	AAC	IEEE 802.11ax (80 MHz, MCS2, 90pc dc)	WLAN	8.76	±9.6
0722	AAC	(EEE 802.11ax (80 MHz, MCS3, 90pc dc)	WLAN	8.55	±9.6
0723	AAC	IEEE 802.11ax (80 MHz, MCS4, 90pc dc)	WLAN	8.70	
0724	AAC	IEEE 802.11ax (80 MHz, MCSS, 90pc dc)	The state of the s	17.17.53	19.6
0725	AAG	IEEE 802.11ax (80 MHz, MCS6, 90pc dc)	WLAN	8.90	±9.6
	AAC		WLAN	8,74	±9.6
0726		IEEE 802.11ax (80 MHz, MCS7, 90pc dc)	WLAN	8.72	±9,6
0727	AAC	IEEE 802.11ax (80 MHz, MCS8, 90pc dc)	WLAN	8.66	±9.0
0728	AAC	IEEE 802.11ex (80 MHz, MCS9, 90pc dc)	WLAN	8.65	±9.6
0729	AAC	IEEE 802.11ax (80 MHz, MCS10, 90pc dc)	WLAN	8.64	±9.8
0730	AAC	IEEE 802.11ax (80 MHz, MCS11, 90pc dc)	WLAN	8.67	±9.6
0731	AAC	IEEE 802.11ax (80 MHz, MCS0, 99pc dc)	WLAN	8.42	±9.6
0732	AAC.	IEEE 802.11ax (80 MHz, MCS1, 99pc dc)	WLAN	8.46	±9.6
0733	AAC	IEEE 802.11ax (80 MHz, MCS2, 99pc dc)	WLAN	8.40	±9.6
0734	AAC	IEEE 802.11ax (80 MHz, MCS3, 99pc dc)	WLAN	8.25	±9.6
0735	AAC	IEEE 802.118x (80 MHz, MCS4, 99pc dc)	WLAN	8.33	19.6
0736	AAC	(EEE 802.11ax (80 MHz, MCS5, 99pc dc)	WLAN	8.27	±9.6
0737	AAC	IEEE 802.11ax (80 MHz, MCS8, 99pc dc)	WLAN	8.36	19.6
0738	AAC	IEEE 802.11ax (80 MHz, MCS7, 99pc dc)	WLAN	8.42	
0739	AAC	(EEE 802.11ax (80 MHz, MCS8, 99pc dc)	WLAN		±9.6
0740	AAC	IEEE 802.11ax (80 MHz, MCS9, 99pc dc)	The second secon	8.29	±9.6
0741	AAC		WLAN	8.48	±9.6
0742	AAC	IEEE 802.11ax (80 MHz, MCS10, 99pc dc)	WLAN	8.40	±9.6
	10.00	IEEE 802.11ax (80 MHz, MCS11, 99pc dc)	WLAN	8.43	#9.6
0743	AAC	IEEE 802.11ax (180 MHz, MCS0, 90pc dc)	WLAN	8.94	±9.6
0744	AAC	IEEE 802.11ax (160 MHz, MCS1, 90pc dc)	WLAN	9.16	±9.6
0745	AAC	IEEE 802.11ax (160 MHz, MCS2, 90pc dc)	WLAN	8.93	±9.6
0746	AAC	IEEE 802.11ax (160 MHz, MCS3, 90pc dc)	WLAN	9,11	±9.6
0747	AAC	IEEE 802.11ax (160 MHz, MCS4, 90pc dc)	WLAN	9.04	±9.6
0748	AAC	IEEE 802.11ax (160 MHz, MCSS, 90pc dc)	WLAN	8.93	±9.6
0749	AAC	IEEE 802.11ax (160 MHz, MCS6, 90pc dc)	WLAN	8.90	±9.6
0.750	AAC	IEEE 802.11ax (160 MHz, MCS7, 90pc dc)	WLAN	8.79	±9.6
	and the second second second	IEEE 802.118x (160 MHz, MCS8, 90pc dc)	WLAN		±9.6
0751	AAC -			8.82	

Certificate No: EX-3968_Sep22

Page 18 of 22



CUSTOMER SECRET



EX3DV4 - SN:3968 September 28, 2022

UID	Rev	Communication System Name	Group	PAR (dB)	Unc ^E k =
10753	AAC	(EEE 802.11ax (160 MHz, MCS10, 90pc dc)	WLAN	9.00	±9.6
10754	AAC	IEEE 802.11ax (160 MHz, MCS11, 90pc dc)	WLAN	8.94	±9.6
10755	AAC	IEEE 802 11ax (160 MHz, MCS0, 99pc dc)	WLAN	8.64	±9.6
10756	AAC	JEEE 802,11ax (160 MHz, MCS1, 99pc dc)	WLAN	8.77	±9.6
10757	AAC	IEEE 802.11ax (160 MHz, MCS2, 99pc dc)	WLAN	8.77	±9.6
10758	AAC	IEEE 802.11ax (160 MHz, MCS3, 99pc dc)	WLAN	8.69	±9.6
10759	AAC	IEEE 802.11ax (160 MHz, MCS4, 99pc dc)	WLAN	8.58	±9.6
10760	AAC	IEEE 802.11ax (160 MHz, MCS5, 99pc dc)	WLAN	8.49	±9.6
10761	AAC	IEEE 802.11ax (160 MHz, MCS6, 99pc dc)	WLAN	8.58	±9.6
10762	AAC	IEEE 802.11ax (160 MHz, MCS7, 98pc dc)	WLAN	8.49	±9.6
10763	AAC	IEEE 802.11ax (160 MH≥, MCS8, 99pc dc)	WLAN	8.53	±9.6
10764	AAC	IEEE 802.11ax (160 MHz, MCS9, 99pc dc)	WLAN	8.54	±9.6
10765	AAC	IEEE 802.11ax (160 MHz, MCS10, 99pc dc)	WLAN	8.54	#9.6
10766	AAC	IEEE 802.11ax (160 MHz, MCS11, 99pc dc)	WLAN	8.51	±9.6
10767	AAC	5G NR (CP-OFDM, 1 RB, 5 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	7.99	±9.6
10768	AAC	5G NR (CP-OFDM, 1 RB, 10 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.01	±9.6
10769	AAC	5G NR (CP-OFDM, 1 RB, 15 MHz, QPSK, 15 kHz)	5G NR FR1 TD0	8.01	±9.6
10770	AAC	5G NR (CP-OFDM, 1 RB, 20MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.02	±9.6
10771	AAC	5G NR (CP-OFDM, 1 RB, 25 MHz, QPSK, 15 kHz)	SG NR FR1 TDD	8.02	±9.6
10772	AAC	50 NR (CP-OFDM, 1 RB, 30 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.23	±9.6
10773	AAC	5G NR (CP-OFDM, 1 RB, 40 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.03	±9.6
10774	AAC	5G NR (CP-OFDM, 1 RB, 50MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.02	±9.6
10.775	AAC	5G NR (CP-OFDM, 50% RB, 5MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.31	±9.6
10776	AAC	5G NR (CP-OFDM, 50% RB, 10 MHz, QPSK, 15 kHz)	5G NR FR1 TOD	8.30	±9.6
10777	AAC	9G NR (CP-OFDM, 50% RB, 15 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.30	±9.6
10778	AAC	5G NR (CP-OFDM, 50% RB, 20 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.34	±9.6
10779	AAC	50 NR (CP-OFDM, 50% RB, 25 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.42	±9.6
0780	AAC	5G NR (CP-OFDM, 50% RB, 30 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.38	±9.6
10781	AAC	5G NR (CP-OFDM, 50% RB, 40 MHz, QPSK, 15 kHz)	5G NR FR1 TOD	8.38	±9.8
0.782	AAC	50 NR (CP-OFDM, 50% RB, 50 MHz, QPSK, 15 kHz)	5G NR FR1 TOD	8.43	±9.6
0783	AAC	5G NR (CP-OFDM, 100% RB, 5 MHz, QPSK, 15 kHz)	50 NR FR1 TOD	8.31	±9.6
10784	AAC	5G NR (CP-OFDM, 100% RB, 10 MHz, QPSK, 15 kHz)	5G NR FR1 TOD	8.29	±9.6
0.785	AAG	5G NR (CP-OFDM, 100% RB, 15 MHz, OPSK, 15 kHz)	5G NR FR1 TDD	8.40	±9.6
10786	AAC	5G NR (CP-OFDM, 100% RB, 20 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.35	19.6
10787	AAC	5G NR (CP-OFDM, 100% RB, 25 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8,44	±9.8
10788	AAC	5G NR (CP-OFDM, 100% RB, 30 MHz, OPSK, 15 kHz)	5G NR FR1 TDO	8.39	±9.6
10799	AAC	5G NR (CP-OFDM, 100% RB, 40 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.37	19.6
10791	AAC	5G NR (CP-OFDM, 100% RB, 50 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.39	±9.6
0792	AAC	5G NR (CP-OFDM, 1 RB, 5 MHz, QPSK, 30 kHz) 5G NR (CP-OFDM, 1 RB, 10 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.83	±9.6
10793	AAC	5G NR (CP-OFDM, 1 RB, 15 MHz, QPSK, 30 kHz)	5G NA FR1 TDD	7.92	±9.6
10794	AAC	5G NR (CP-OFDM, 1 RB, 20 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.95	±9.6
0.795	AAC	5G NR (CP-OFDM, 1 RB, 25 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.82	±9.6
10796	AAC	5G NR (CP-OFDM, 1 RB, 30 MHz, QPSK, 30 kHz)	The state of the s	7.84	±9.6
0797	AAC	5G NR (CP-OFDM, 1 RB, 40 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.82	±9.6
0798	AAC	5G NR (CP-OFDM, 1 RB, 50 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.01	±9.6
0799	AAC	50 NR (CP-OFDM, 1 RB, 60 MHz, QPSK, 30 kHz)	The base of the second	7.89	±9.8
0801	AAC	5G NR (CP-OFDM, 1 RB, 80 MHz, QPSK, 30 kHz)	5G NA FRI TOD	7.93	±9.6
0.802	AAC	5G NR (CP-OFDM, 1 RB, 90 MHz, QPSK, 30 kHz)	5G NR FR1 TOD	7.89	±9.6
0.803	AAE	5G NR (CP-OFDM, 1 RB, 100 MHz, QPSK, 30 kHz)	5G NR FRI TOD	7.87	±9.6
0805	AAD	5G NR (CP-OFDM, 50% RB, 10 MHz, QPSK, 30 kHz)	5G NR FR1 TDD		±9.6
0806	AAD	5G NR (CP-OFDM, 50% RB, 15 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.34	±9.6
0809	AAD	5G NR (CP-OFDM, 50% RB, 30 MHz, QPSK, 30 kHz)	5G NR FRI TOD	8.37 8.34	±9.6
0810	AAD	5G NR (CP-OFDM, 50% RB, 40 MHz, QPSK, 30 kHz)			±9.6
0812	AAD	5G NR (CP-OFDM, 50% RB, 60 MHz, QPSK, 30 kHz)	5G NR FR1 TD0 5G NR FR1 TD0	8.34 8.35	±9.6
0817	AAD	5G NR (CP-OFDM, 100% RB, 5MHz, QPSK, 30 kHz)	5G NR FR1 TDD		±9.6
0818	AAD	5G NR (CP-OFDM, 100% RB, 10 MHz, OPSK, 30 kHz)	59 NR FR1 TDD	8.35	±9.6
0819	AAD	5G NR (CP-OFDM, 100% RB, 15MHz, QPSK, 30 kHz)	50 NR FR1 TDD	8.34	±9.6
0880	AAD	5G NR (CP-OFDM, 100% RB, 20 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.33	±9.6
0821	AAC	5G NR (CP-OFDM, 100% R8, 25 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.30	±9.6
0822	AAD	5G NR (CP-OFOM, 100% RB, 30 MHz, QPSK, 30 kHz)	5G NA FRI TOD	8.41	±9.6
0823	AAC	5G NR (CP-OFDM, 100% RB, 40 MHz, QPSK, 30 kHz)	5G NR FR1 TOD	8.41	±9.6
0824	AAD	5G NR (CP-OFDM, 100% RB, 50 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.36	±9.6
0825	AAD	5G NR (CP-OFDM, 100% RB, 60 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.39	±9.6
0827	AAD	5G NR (CP-OFDM, 100% RB, 80 MHz, QPSK, 30 kHz)	5G NR FRI TOD	8.41	±9.6
	AAE	5G NR (CP-OFDM, 100% RB, 90 MHz, QPSK, 30 kHz)	5G NR FR1 TOD	8.42	±9.6

Certificate No: EX-3968_Sep22

Page 19 of 22



CUSTOMER SECRET



EX3DV4 - SN:3968 September 28, 2022

UID	Rev	Communication System Name	Group	PAR (dB)	UncE k = 2
10829	AAD	5G NR (CP-OFDM, 100% RB, 100 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.40	±9.6
10830	AAD	5G NR (CP-OFDM, 1 RB, 10 MHz, QPSK, 60 kHz)	50 NR FR1 TOD	7.63	±9.6
10831	AAD	5G NR (CP-OFDM, 1 RB, 15 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	7.73	±9.6
0832	AAD	5G NR (CP-OFDM, 1 RB, 20 MHz, QPSK, 60 kHz)	5G NR FR1 TOD	7.74	±9.6
0833	AAD	50, NR (CP-OFDM, 1 RB, 25 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	7.70	±9.6
0834	AAD	5G NR (CP-OFDM, 1 RB, 30 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	7.75	±9.6
0835	AAD	5G NR (CP-OFDM, 1 RB, 40 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	7,70	±9.6
0836	AAE	5G NR (CP-OFDM, 1 RB, 50 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	7.66	±9.6
0837	AAD	5G NR (CP-OFDM, 1 RB, 60 MHz, QPSK, 60 kHz)	5G NR FR1 TOD	7.68	±9.6
10839	AAD	5G NR (CP-OFDM, 1 RB, 80 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	7.70	±9.6
0840	AAD	5G NR (CP-OFDM, 1 RB, 90 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	7.67	±9.6
0841	AAD	5G NR (CP-CFDM, 1 RB, 100 MHz, QPSK, 60 kHz)	5G NR FR1 TOO	7.71	±9.6
0843	AAD	5G NR (CP-OFDM, 50% RB, 15 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.49	±9.6
0844	AAD	5G NR (CP-OFDM, 50% RB, 20 MHz, QPSK, 60 kHz)	5G NR FR1 TD0	8:34	±9.6
0846	CAA	5G NR (CP-OFDM, 50% RB, 30 MHz, QPSK, 60 kHz)	5G NR FR1 TD0	8,41	±9.6
0854	AAD	SG NR (CP-OFDM, 100% RB, 10 MHz, QPSK, 60 kHz)	5G NR FR1 TDO	8.34	±9.6
0855	AAD	5G NR (CP-OFDM, 100% RB, 15 MHz, QPSK, 60 kHz)	5G NR FR1 TDO	8.36	±9.6
0856	AAD	SG NR (CP-OFDM, 100% RB, 20 MHz, QPSK, 60 kHz)	50 NR FR1 TDO	8.37	±9.6
0857	AAD	5G NR (CP-OFDM, 100% RB, 25MHz, QPSK, 60 kHz)	5G NR FR1 TOO	8.35	±9.6
0858	AAD	5G NR (CP-OFDM, 100% RB, 30 MHz, QPSK, 50 kHz)	5G NR FR1 TDD	8.36	±9.6
0859	AAD	5G NR (CP-OFDM, 100% RB, 40 MHz, QPSK, 60 kHz)	50 NR FR1 TDD	8.34	±9.6
0880	AAD	5G NR (CP-OFDM, 100% RB, 50 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.41	±9.6
0861	AAD	5G NR (CP-OFDM, 100% RB, 60MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.40	±9.6
0883	AAD	5G NR (CP-OFDM, 100% RB, 80 MHz, QPSK, 60 kHz)	50 NR FR1 TDO	8.41	±9.6
0864	AAE	5G NR (CP-GFDM, 100% RB, 90 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.37	±9.6
0865	AAD	5G NR (CP-OFDM, 100% RB, 100 MHz, QPSK, 60 kHz)	5G NR FR1 TD0	8.41	±9.6
0886	AAD	5G NR (DFT-s-OFDM, 1 RB, 100 MHz, QPSK, 30 kHz)	50 NR FR1 TOD	5.68	±9.6
0868	AAD	5G NR (DFT-e-OFDM, 100% RB, 100 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.89	±9.6
0889	AAD	5G NR (DFT+-OFDM, 1 RB, 100 MHz, QPSK, 120 kHz)	5G NR FR2 TOD	5.75	±9.6
0870	AAD	5G NR (DFTs-OFDM, 100% RB, 100 MHz, QPSK, 120 kHz)	50 NR FR2 TDD	5.86	±9.6
0871	CAA	5G NR (DFTs-OFDM, 1 RB, 100MHz, 16QAM, 120 kHz)	5G NR FR2 TDO	5.75	±9.6
0872	AAD	5G NR (DFTs-OFDM, 100% RB, 100 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	6.52	±9.6
0873	AAD	5G NR (DFT-s-OFDM, 1 RB, 100 MHz, 64QAM, 120 kHz)	5G NR FR2 TDD	6.61	±9.6
0874	AAD	5G NR (DFT-s-OFDM, 100% RB, 100 MHz, 64QAM, 120 kHz)	5G NR FR2 TDO	6.65	±9,6
0875	AAD	5G NR (CP-OFDM, 1 RB, 100 MHz, QPSK, 120 kHz)	5G NR FR2 TDD	7.78	±9.6
0876	AAD	5G NR (CP-CFDM, 100% RB, 100 MHz, QPSK, 120 kHz)	SG NR FR2 TOO	8.39	±9.6
0878	AAD	5G NR (CP-OFDM, 1 RB, 100 MHz, 16QAM, 120 kHz) 5G NR (CP-OFDM, 100% RB, 100 MHz, 16QAM, 120 kHz)	5G NR FR2 TDO	7.95	19.6
	AAD		5G NR FR2 TDD	8,41	±9.6
0879	AAD	5G NR (CP-OFOM, 1 RB, 100 MHz, 64QAM, 120 kHz)	5G NR FR2 TDD	8.12	±9.6
0881	AAD	SG NR (CP-OFDM, 100% RB, 100 MHz, 64QAM, 120 kHz) SG NR (DFT-I-OFDM, 1 RB, 50 MHz, QPSK, 120 kHz)	5G NR FR2 TDD	8.38	19.6
0882	AAD	5G NR (DFT-s-OFDM, 180% RB, 50MHz, QPSK, 120 KHz)	5G NR FR2 TDD	5.75	±9.6
0883	AAD	5G NR (DFT-s-OFDM, 180x 9B, 50 MHz, GPSK, 120 KHz)	5G NR FR2 TDD 5G NR FR2 TDD	5.96	19.6
0.884	AAD		- The second protection representation and the second	6.57	±9.6
0885	AAD	5G NR (DFT-e-OFDM, 100% RB, 50 MHz, 16QAM, 120 kHz) 5G NR (DFT-e-OFDM, 1 RB, 50 MHz, 64QAM, 120 kHz)	5G NR FR2 TDD	6.53	±9.6
0886	AAD	5G NR (DFT-s-OFDM, 100% RB, 50 MHz, 64QAM, 120 kHz)	5G NR FR2 TDD	6.61	±9.6
0887	AAD	5G NR (CP-OFDM, 1 RB, 50 MHz, QPSK, 120 kHz)	5G NR FR2 TDD	6.65	±9.6
0888	AAD	5G NR (CP-OFDM, 100% RB, 50 MHz, QPSK, 120 kHz)	5G NR FR2 TDD	7,78	±9.6
0889	AAD	5G NR (CP-OFDM, 100% RB, 50 MHz, 16QAM, 120 MHz)	5G NR FR2 TOD	8.35	±9.6
0890	AAD	5G NR (CP-OFDM, 100% RB, 50 MHz, 18QAM, 120 kHz)	5G NR FR2 TOD	8.40	±9.6
0891	AAD	5G NR (CP-OFDM, 100% HB, 50 MHz, 64QAM, 120 kHz)	5G NR FR2 TDD	8.40	±9.6
0892	AAD	5G NR (CP-OFDM, 100% RB, 50 MHz, 64QAM, 120 kHz)	SG NR FR2 TDD	8.41	±9.6
0887	AAD	5G NR (DFT-s-OFDM, 1 RB, 5MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.66	±9.6
0898	AAD	5G NR (DFT-e-OFDM, 1 RB, 10 MHz, QPSK, 30 kHz)	5G NR FR1 TOD	5.67	±9.6
0899	AAD	5G NR (DFT-s-OFDM, 1 RB, 15MHz, QPSK, 30 kHz)	5G NR FR1 TOD	5.67	±9.6
0900	AAD	5G NR (DFT-e-OFDM, 1 RB, 20MHz, QPSK, 30 kHz)	SG NR FRI TOD		±9.6
0901	AAD	5G NR (DFT-e-OFDM, 1 RB, 25MHz, QPSK, 30 kHz)	5G NR FR1 TOD	5.68 5.68	±9.6
0.005	AAD	5G NR (DFT-s-OFDM, 1 RB, 30 MHz, QPSK, 30 kHz)	5G NA FRI TOD	5.68	±9.6
0903	AAD	5G NR (DFT-s-OFDM, 1 RB, 40 MHz, QPSK, 30 kHz)	5G NR FR1 TOD	5.68	±9.6
0904	AAD	5G NR (DFT-e-OFDM, 1 RB, 50 MHz, QPSK, 30 kHz)	5G NR FRI TOD	5.68	±9.8
0905	AAD	5G NR (DFT-s-OFDM, 1 RB, 60 MHz, QPSK, 30 kHz)	5G NR FRI TOD	The state of the s	±9.6
0906	AAD	5G NR (DFT-s-OFDM, 1 RB, 80 MHz, QPSK, 30 kHz)	5G NR FRI TOD	5.68	±9.6
0907	AAD	5G NR (DFT-s-OFDM, 50% RB, 5 MHz, QPSK, 30 kHz)	5G NR FR1 TOO	5.68	±9.6
0908	AAD	5G NR (DFT-e-OFDM, 50% RB, 10 MHz, QPSK, 30 kHz)	50 NR FR1 TDD		±9.6
0.909	AAD	5G NR (DFT-s-OFDM, 50% RB, 15 MHz, OPSK, 30 kHz)	5G NR FR1 TDD	5.93	±9.6
	THE	The second secon	Decimination (40.80	±9.6

Certificate No: EX-3968_Sep22

Page 20 of 22



CUSTOMER SECRET



EX3DV4 - SN:3968 September 28, 2022

UID	Rev	Communication System Name	Group	PAR (dB)	Unce k = 2
10911	AAD	5G NR (DFT-e-OFDM, 50% RB, 25 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.93	19.6
10912	AAD	5G NR (DFT-s-OFDM, 50% RB, 30 MHz, QPSK, 30 kHz)	5G NR FR1 TD0	5.84	±9.6
10913	AAD	5G NR (DFT-s-OFDM, 50% RB, 40 MHz, QPSK, 30 kHz)	5G NR FR1 TD0	5.84	±9.6
10914	AAD	5G NR (DFT-s-OFDM, 50% RB, 50 MHz, QPSK, 30 kHz)	5G NR FR1 TD0	5.85	19.6
10915	AAD	5G NR (DFT-a-OFDM, 50% RB, 60 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.83	±9.6
10916	AAD	5G NR (DFT-s-OFDM, 50% RB, 80 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.87	19.6
10917	AAD	5G NR (DFT-s-OFDM, 50%, R8, 100 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.94	±9.6
10918	AAD	5G NR (DFT-s-OFDM, 100% RB, 5MHz, QPSK, 30 kHz)	53 NR FR1 TDD	5.86	±9.6
10919	AAD	5G NR (DFT-s-OFDM, 100% RB, 10 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.86	±9.6
10920	AAD	5G NR (DFT-s-OFDM, 100% RB, 15 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.87	±9.6
10921	AAD	5G NR (DFT-s-OFDM, 100% RB, 20 MHz, QPSK, 30 kHz)	50 NR FR1 TDD	5.84	±9.6
10922	AAD	5G NR (DFT-s-OFDM, 100% RB, 25 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.82	19.6
10923	AAD	5G NR (DFT-8-OFDM, 100% R8, 30 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.84	±9.6
10924	AAD	5G NR (DFTs-OFDM, 100% RB, 40MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.84	#9.6
10925	AAD	5G NR (DFT-s-OFDM, 100% RB, 50 MHz, QPSK, 30 kHz)	5G NR FR1 TOD	5.95	±9.6
10926	AAD	5G NR (DFT-s-OFDM, 100% RB, 60 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.84	±9.6
10927	AAD	5G NR (DFT-s-OFDM, 100% RB, 80 MHz, QPSK, 30 kHz)	5G NR FRI TOD	5.94	±9.6
10928	AAD	5G NR (DFT-s-OFDM, 1 RB, 5 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.52	±9.6
10929	AAD	5G NR (DFT-s-OFDM, 1 RB, 10 MHz, QPSK, 15 kHz)	SG NR FR1 FDD	5.52	±9.6
0930	AAD	5G NR (DFT-e-OFDM, 1 RB, 15 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.52	±9.6
0931	AAD	5G NR (DFT-s-OFDM, 1 RB, 20MHz, QPSK, 15 kHz)	50 NR FR1 FDD	5.51	±9.6
0932	AAB	5G NR (DFT-s-OFDM, 1 RB, 25MHz, QPSK, 15 kHz)	5G NR FR1 FOD	5.51	±9.6
0933	AAA	5G NR (DFT-6-OFDM, 1 RB, 30 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.51	±9.6
0934	AAA	5G NR (DFT-s-OFDM, 1 RB, 40 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.51	±9.6
0935	AAA	5G NR (DFT-s-OFDM, 1 RB, 50 MHz, QPSK, 15 kHz)	5G NR FR1 FOD	5.51	±9.6
0936	AAC	5G NR (DFT-s-OFDM, 50% RB, 5 MHz, QPSK, 18 kHz)	5G NR FR1 FDD	5.90	±9.6
0937	AAB	5G NR (DFT-s-OFDM, 50% RB, 10 MHz, QPSK, 15 kHz)	50 NR FR1 FDD	5.77	±9.6
0938	AAB	5G NR (DFT-s-OFDM, 50% RB, 15 MHz, QPSK, 15 kHz)	SG NR FR1 FDD	5.90	±9.6
0939	AAB	5G NR (DFT-s-OFDM, 50% RB, 20 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.82	±9.6
0940	AAB	5G NR (DFT-e-OFDM, 50% RB, 25 MHz, QPSK, 15 kHz)	50 NR FR1 FDD	5,89	±9.6
0941	AAB	5G NR (DFT-s-OFDM, 50% RB, 30 MHz, QPSK, 15 kHz)	SG NR FR1 FDD	5.83	±9.6
0942	AAB	SG NR (DFT-s-OFDM, 50% RB, 40 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.85	±9.6
0943	AAB	5G NR (DFT-s-OFDM, 50% RB, 50 MHz, QPSK, 15 kHz)	5G NR FR1 FD0	5.95	19.6
0944	AAB	5G NR (DFT-e-OFDM, 100% RB, 5MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.81	±9.6
0945	AAB	5G NR (DFT-s-OFDM, 100% RB, 10 MHz, QPSK, 15 kHz)	5G NR FR1 FD0	5,85	±8.6
0946	AAC	SG NR (DFT-s-OFDM, 100% RB, 15MHz, QPSK, 15 kHz)	5G NR FR1 FD0	5.83	±9.6
0947	AAB	5G NR (DFT-s-OFDM, 100% RB, 20 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.87	±9.6
0948	BAA	5G NR (DFT-s-OFDM, 100% RB, 25MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.94	±9.6
0949	AAB	9G NR (DFT-8-OFDM, 100% RB, 30 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.87	±9.6
0960	AAB	5G NR (DFT-s-OFDM, 100% RB, 40 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.94	±9.6
0951	AAB	5G NR (DFT-s-OFDM, 100% RB, 50 MHz, QPSK, 15 kHz)	5G NR FR1 FOD	5.92	±9.6
0952	AAB	5G NR DL (CP-OFDM, TM 3.1, 5MHz, 64-QAM, 15 kHz)	50 NR FR1 FDD	8.25	±9.6
0953	AAB	5G NR DL (CP-OFDM, TM 3.1, 10 MHz, 64-QAM, 15 kHz)	5G NR FR1 FOD	8.15	±9.6
0954	AAB	5G NR DL (CP-OFDM, TM 3.1, 15 MHz, 64-QAM, 15 kHz)	5G NR FR1 FDD	8.23	±9.6
0955	AAB	5G NR DL (CP-OFDM, TM 3.1, 20 MHz, 64-QAM, 15 kHz)	50 NR FR1 FD0	8.42	±9.6
0956	AAB	5G NR DL (CP-OFDM, TM 3.1, 5 MHz, 64-QAM, 30 kHz)	5G NR FR1 FD0	8.14	±9.6
nine era gradia i	AAC	5G NR DL (OP-OFDM, TM 3.1, 10 MHz, 64-QAM, 30 kHz)	5G NR FR1 FDD	8.31	±9.6
0958	11.00	5G NR DL (CP-OFDM, TM 3.1, 15 MHz, 64-QAM, 30 kHz)	5G NR FR1 FDD	8,61	±9.6
0959	AAB	5G NR DL (CP-OFDM, TM 3.1, 20 MHz, 64-QAM, 30 kHz)	5G NR FR1 FDD	8.33	±9,6
0960	and and	5G NR DL (CP-OFDM, TM 3.1, 5MHz, 64-QAM, 15 kHz)	5G NR FR1 TDD	9.32	±9,6
0961	AAB	5G NR DL (CP-OFDM, TM 3.1, 10 MHz, 64-QAM, 15 kHz)	5G NR FR1 TDD	9.36	±9.6
-	AAB	5G NR DL (CP-OFDM, TM 3.1, 15 MHz, 54-QAM, 15 kHz)	5G NR FR1 TDD	9:40	±9.6
0963 0964	to be the later of	5G NR DL (CP-OFDM, TM 3.1, 20MHz, 64-QAM, 15 kHz)	5G NR FR1 TDD	9.55	±9.6
0065	AAB	5G NR DL (CP-OFDM, TM 3.1, 5MHz, 64-QAM, 30 kHz)	5G NA FRI TOD	9.29	±9.6
0966	AAB	5G NR DL (CP-OFDM, TM 3.1, 10 MHz, 64-QAM, 30 kHz)	5G NR FR1 TOD	9.37	±9.6
ere to the section in	Check to be harmonical	5G NR DL (CP-OFDM, TM 3.1, 15MHz, 64-QAM, 30 kHz)	5G NR FR1 TOD	9.55	±9.6
0967	AAB	5G NR DL (CP-OFDM, TM 3.1, 20 MHz, 64-QAM, 30 kHz)	50 NR FR1 TOD	9.42	±9.6
	AAB	6G NR DL (CP-OFDM, TM 3.1, 100 MHz, 64-QAM, 30 kHz)	5G NR FR1 TOD	9.49	±9.6
0972		5G NR (CP-OFDM, 1 RB, 20 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	11,59	±9.6
0973	AAB	5G NR (DFT-e-OFDM, 1 RB, 100 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	9.06	±9.6
0974	AAB	5G NR (CP-OFDM, 100% RB, 100 MHz, 256-QAM, 30 kHz)	5G NR FR1 TDD	10.28	±9.6
0978	AAA	ULLA BOR	ULLA	2.23	19.6
0979	AAA	ULLA HDR4	ULLA	7.02	±9.6
0.980	AAA	ULLA HDRB	ULLA	8.82	±9.6
1890	AAA	ULLA HDRp# ULLA HDRp#	ULLA	1.50	±9.6
0982			ULLA	1.44	±9.6

Certificate No: EX-3968_Sep22

Page 21 of 22



CUSTOMER SECRET



EX3DV4 - SN:3968

September 28, 2022

UID	Rev	Communication System Name	Group	PAR (dB)	Unc ^E k = 2
10983	AAA	5G NR DL (CP-QFDM, TM 3.1, 40 MHz, 64-QAM, 15 kHz)	5G NR FR1 TDD	9.31	±9.6
10984	AAA	5G NR DL (CP-OFDM, TM 3.1, 50 MHz, 64-QAM, 15 kHz)	5G NR FR1 TOD	9.42	±9.6
10985	AAA	5G NR DL (CP-OFDM, TM 3.1, 40 MHz, 64-QAM, 30 kHz)	5G NR FR1 TDD	9.54	±9.6
10986	AAA	SG NR DL (CP-OFDM, TM 3.1, 50 MHz, 64-QAM, 30 kHz)	5G NR FR1 TDD	9.50	±9.6
10987	AAA	5G NR DL (CP-OFDM, TM 3.1, 60 MHz, 64-QAM, 30 kHz)	5G NR FR1 TDD	9.53	±9.6
10988	AAA.	53 NR DL (CP-OFDM, TM 3.1, 70 MHz, 64-QAM, 30 kHz)	5G NR FR1 TDD	9.38	±9.6
10989	AAA	5G NR DL (CP-OFDM, TM 3.1, 80 MHz, 64-QAM, 30 kHz)	5G NR FR1 TOD	9.33	±9.6
10990	AAA	5G NR DL (CP-OFDM, TM 3.1, 90 MHz, 64-QAM, 30 kHz)	5G NR FR1 TDD	9,52	±9.6

^E Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

Certificate No: EX-3968_Sep22

Page 22 of 22





Calibration Laboratory of

Schmid & Partner Engineering AG

Zeughausstrasse 43, 8004 Zurich, Switzerland



Schweizerischer Kalibrierdienst Service suisse d'étalonnage C Servizio svizzero di taratura

Swiss Calibration Service

Accreditation No.: SCS 0108

Accredited by the Swiss Accreditation Service (SAS) The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Client

HCT (Dymstec)

Certificate No

EX-7751 Oct22

CALIBRATION CERTIFICATE

Object

EX3DV4 - SN:7751

Calibration procedure(s)

QA CAL-D1.v9, QA CAL-12.v9, QA CAL-14.v6, QA CAL-23.v5,

QA CAL-25.v7

Calibration procedure for dosimetric E-field probes

Calibration date

October 07, 2022

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate,

All calibrations have been conducted in the closed laboratory facility: environment temperature (22±3)*C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID.	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	04-Apr-22 (No. 217-03525/03524)	Apr-23
Power sensor NRP-Z91	SN: 103244	04-Apr-22 (No. 217-03524)	Apr-23
OCP DAK-3.5 (weighted)	SN: 1249	20-Oct-21 (OCP-DAK3.5-1249_Oct21)	Oct-22
OCP DAK-12	SN: 1016	.20-Oct-21 (OCP-DAK12-1016_Oct21)	Oct-22
Reference 20 dB Attenuator	SN: CC2552 (20x)	04-Apr-22 (No. 217-03527)	Apr-23
DAE4	SN: 660	13-Oct-21 (No. DAE4-660_Oct21)	Oct-22
Reference Probe ES3DV2	SN: 3013	27-Dec-21 (No. ES3-3013 Dec21)	Dec-22

Secondary Standards	ID	Check Date (in house)	Scheduled Check
Power meter E4419B	SN: GB41293874	06-Apr-16 (in house check Jun-22)	In house check: Jun-24
Power sensor E4412A	SN: MY41498087	06-Apr-16 (in house check Jun-22)	In house check: Jun-24
Power sensor E4412A	SN: 000110210	06-Apr-16 (in house check Jun-22)	In house check: Jun-24
RF generator HP 8648C	SN: US3642U01700	04-Aug-99 (in house check Jun-22)	In house check: Jun-24
Network Analyzer E8358A	SN: US41080477	31-Mar-14 (in house check Oct-22)	In house check: Oct-24

	Name	Function	Signature
Calibrated by	Jelon Kastræli	Laboratory Technician	X-14
Approved by	Niels Kuster	Quality Manager	1/8
This call control control		n full without written approval of the la	Issued: October 07, 2022

Certificate No: EX-7751_Oct22

Page 1 of 22



Report No. HCT-SR-2301-FC004

Calibration Laboratory of

Schmid & Partner Engineering AG

Zeughausstrasse 43, 8004 Zurich, Switzerland

ilac mra



S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
Servizio svizzero di taratura
S Swiss Calibration Service

Accreditation No.: SCS 0108

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Glossary

NORMx,y,z

tissue simulating liquid sensitivity in free space

ConvF DCP sensitivity in TSL / NORMx,y,z diode compression point

CF

crest factor (1/duty_cycle) of the RF signal modulation dependent linearization parameters

A, B, C, D Polarization φ

φ rotation around probe axis

Polarization @

 θ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., θ = 0 is

normal to probe axis

Connector Angle information used in DASY system to align probe sensor X to the robot coordinate system

Calibration is Performed According to the Following Standards:

- a) IEC/IEEE 62209-1528, "Measurement Procedure For The Assessment Of Specific Absorption Rate Of Human Exposure To Radio Frequency Fields From Hand-Held And Body-Worn Wireless Communication Devices – Part 1528: Human Models, Instrumentation And Procedures (Frequency Range of 4 MHz to 10 GHz)", October 2020.
- b) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Methods Applied and Interpretation of Parameters:

- NORMx,y,z: Assessed for E-field polarization θ = 0 (f ≤ 900 MHz in TEM-cell; f > 1800 MHz; R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not affect the E²-field uncertainty inside TSL (see below ConvF).
- NORM(f)x,y,z = NORMx,y,z * frequency_response (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of Conver.
- DCPx,y,z: DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal. DCP does not depend on frequency nor media.
- · PAR: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- Ax,y,z; Bx,y,z; Cx,y,z; Dx,y,z; VRx,y,z: A, B, C, D are numerical linearization parameters assessed based on the data of
 power sweep for specific modulation signal. The parameters do not depend on frequency nor media. VR is the maximum
 calibration range expressed in RMS voltage across the diode.
- ConvF and Boundary Effect Parameters: Assessed in that phantom using E-field (or Temperature Transfer Standard for f≤800MHz) and inside waveguide using analytical field distributions based on power measurements for f>800MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORMx,y,z * ConvF whereby the uncertainty corresponds to that given for ConvF. A frequency dependent ConvF is used in DASY version 4.4 and higher which allows extending the validity from ±50 MHz to ±100 MHz.
- Spherical isotropy (3D deviation from isotropy); in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- Sensor Offset: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis).
 No tolerance required.
- Connector Angle: The angle is assessed using the information gained by determining the NORMx (no uncertainty required).

Certificate No: EX-7751_Oct22

Page 2 of 22

CUSTOMER SECRET





EX3DV4 - SN:7751

October 07, 2022

Parameters of Probe: EX3DV4 - SN:7751

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k = 2)
Norm (µV/(V/m) ²) ^A	0.52	0.56	0.60	±10.1%
DCP (mV) B	108.8	107.0	104.8	±4.7%

Calibration Results for Modulation Response

UID	Communication System Name		A dB	8 dB√μV	С	D dB	WR mV	Max dev.	Max Unc ^E k = 2
0	GW	X	0.00	0.00	1.00	0.00	172.8	±2.7%	±4.7%
		Y	0.00	0.00	1.00		160.9		
		Z	0.00	0.00	1.00		155.4		
10352	Pulse Waveform (200Hz, 10%)	X	1.39	60.00	5.90	10.00	60.0	±3.0%	±9.6%
	V. 25 VI	Y	1,38	60.00	5.84		60.0		
		Z:	1,49	60.48	6.09		60.0		
10353	Pulse Waveform (200Hz, 20%)	X	0.81	60.00	4.70	6.99	80.0	±2.7%	±9.6%
		Y	22.00	74.00	9.00		80.0	No. of Control of Control	0.000
	The water of the control of the cont	Z	8.00	72.00	9.00		80.0		1000000
10354	Pulse Waveform (200Hz, 40%)	X	0.01	127.65	0.04	3.98	95.0	±2.4%	±9.6%
	Control Charles (Acon Canada Con Canada	Y	0.46	60.00	3.49		95.0		
		2	0.13	137.63	0.03		95.0		
10355	Pulse Waveform (200Hz, 60%)	X	2.57	159.96	3.14	2.22	120.0	±1.6%	±9.6%
		Y	9.73	84.79	0.43		120.0		
		Z	5.95	159.99	22.50		120.0		
10387	QPSK Waveform, 1 MHz	X	0.40	62.31	11.37	1.00	150.0	±3.8%	±9.6%
	1 9 CE-10 (100 PC 10 PC	Y	0.50	64.42	12.77		150.0		199960
		Z	0.48	63.11	11.57		150.0		
10388	QPSK Waveform, 10 MHz	X	1.15	65.38	13.12	0.00	150.0	±0.9%	±9.6%
	22 September 200-0 September 2	Y	1.31	66.74	13.99		150.0		CT 9 10940
	HORE CONTROL AT DESCRIPTION	Z	1.26	65.49	13.46		150.0		
10396	64-QAM Waveform, 100 kHz	X	1.58	63.74	15.54	3.01	150.0	±1.0%	±9.6%
		Y	1.78	65.74	16.50		150.0		
		Z.	1.70	64.90	16.00		150.0		
10399	64-QAM Waveform, 40 MHz	X	2.65	66.10	14.90	0.00	150.0	±2.4%	±9.6%
	2	Y	2.79	66.72	15.27	4.00	150.0	-15541106	10000
		Z	2.75	66.07	14.92		150.0		
10414	WLAN CCDF, 64-QAM, 40 MHz	X	3.70	66,48	15.35	0.00	150.0	±3.9%	±9.6%
	Process reputation and the State of Colors	Y	3.69	66.28	15.31		150.0		14.070
		Z	3.89	66.54	15.48		150.0		

Note: For details on UID parameters see Appendix

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Certificate No: EX-7751_Oct22

Page 3 of 22

A The uncertainties of Norm X.Y.Z do not affect the E²-field uncertainty inside TSL (see Pages 5 and 6).

Uncertainty is parameter uncertainty for maximum specified field strength.

Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the agrees of the field value.

CUSTOMER SECRET





EX3DV4 - SN:7751 October 07, 2022

Parameters of Probe: EX3DV4 - SN:7751

Sensor Model Parameters

	C1 fF	C2 fF	ν-1	T1 msV ⁻²	T2 ms V ⁻¹	T3 ms	T4 V-2	T5 V ⁻¹	T6
X:	7.9	57.59	33.60	3.45	0.00	4.92	0.05	0.06	1.00
у	5.2	59.08	33.26	4.45	0.00	4.90	0.57	0.00	1,00
Z	9.4	68.49	33.85	3.83	0.00	4.92	0.55	0.00	1.00

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle	-122.2°
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	9 mm
Tip Diameter	2.5 mm
Probe Tip to Sensor X Calibration Point	1 mm
Probe Tip to Sensor Y Calibration Point	1 mm
Probe Tip to Sensor Z Calibration Point	1 mm
Recommended Measurement Distance from Surface	1.4 mm

Note: Measurement distance from surface can be increased to 3-4 mm for an Area Scan job.

CUSTOMER SECRET





October 07, 2022 EX3DV4 - SN:7751

Parameters of Probe: EX3DV4 - SN:7751

Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) ^C	Relative Permittivity ^F	Conductivity ^F (S/m)	ConvF X	ConvF Y	ConvF Z	Alpha ^G	Depth ^G (mm)	Unc (k = 2)
750	41.9	0.89	9.87	9.87	9.87	0.45	0.93	±12.0%
835	41.5	0.90	9.57	9.57	9.57	0.41	0.96	±12.0%
900	41.5	0.97	9.37	9.37	9.37	0.48	0.93	±12.0%
1750	40.1	1.37	8.43	8.43	8.43	0.33	0.86	±12.0%
1900	40.0	1.40	8.03	8.03	8.03	0.42	0.86	±12.0%
2300	39.5	1.67	7.99	7.99	7.99	0.26	0.90	±12.0%
2450	39.2	1.80	7.65	7,65	7.65	0.39	0.90	±12.0%
2600	39.0	1.96	7.41	7,41	7.41	0.39	0.90	±12.0%
3300	38.2	2.71	6.93	6.93	6.93	0.30	1.30	±13.1%
3500	37.9	2.91	6.90	6.90	6.90	0.30	1.35	±13.1%
3700	37.7	3.12	6.55	6.55	6.55	0.30	1.35	±13.1%
3900	37.5	3.32	6.09	6.09	6.09	0.40	1.50	±13.1%
4950	36.3	4.40	5.62	5.62	5.62	0.40	1.80	±13.1%
5250	35.9	4.71	5.20	5.20	5.20	0.40	1.80	±13.1%
5600	35.5	5.07	4.51	4.51	4.51	0.40	1.80	±13.1%
5750	35.4	5.22	4.70	4.70	4.70	0.40	1.80	±13.1%
5800	35.3	5.27	4.65	4.65	4.65	0.40	1.80	±13.1%

[□] Frequency validity above 300 MHz of ±100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ±50 MHz. The uncertainty is the RSS of the ComvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is ±10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 84, 128, 150 and 220 MHz respectively. Validity of ConvF assessed at 6 MHz is 4–9 MHz, and ConvF assessed at 13 MHz is 9–19 MHz. Above 5 GHz frequency validity can be extended to ±110 MHz.

**All frequencies below 3 GHz, the validity of issue parameters (ε and σ) are necessary 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of issue parameters (ε and σ) is restricted to ±5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

Certificate No: EX-7751_Oct22

Page 5 of 22

^Q Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ±1% for frequencies below 3 GHz and below ±2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.



CUSTOMER SECRET



EX3DV4 - SN:7751

October 07, 2022

Parameters of Probe: EX3DV4 - SN:7751

Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) ^C	Relative Permittivity ^F	Conductivity ^F (S/m)	ConvF X	ConvF Y	ConvF Z	Alpha ^G	Depth ^G (mm)	Unc (k = 2)
6500	34.5	6.07	5.00	5.00	5.00	0.25	2.50	±18.6%

[©] Frequency validity at 6.5 GHz is -600/+700 MHz, and ±700 MHz at or above 7 GHz. The uncertainty is the RSS of the ConvF uncertainty at calibration

Certificate No: EX-7751_Oct22

Finduces and the uncertainty for the indicated frequency band.

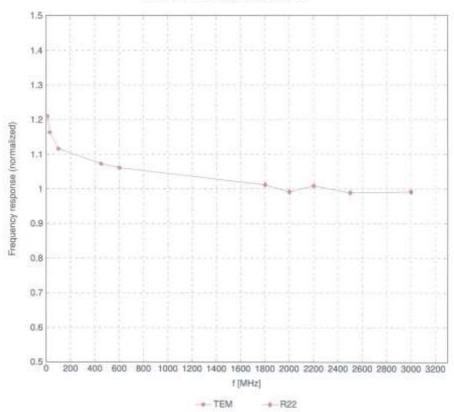
At frequencies 6–10 GHz, the velidity of tissue parameters (if and iii) can be relaxed to ±10% if significant formula is applied to measured SAR values. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

G Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ±1% for frequencies below 3 GHz; below ±2% for frequencies between 3-5 GHz; and below ±4% for frequencies between 6-10 GHz at any distance larger than half the probe tip diameter from the boundary.



Frequency Response of E-Field

(TEM-Cell:ifi110 EXX, Waveguide:R22)

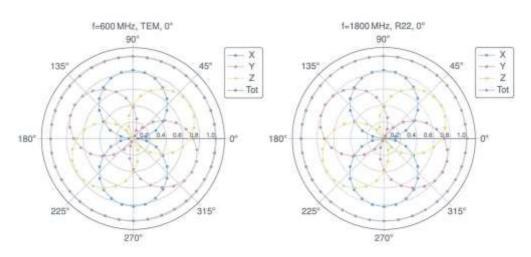


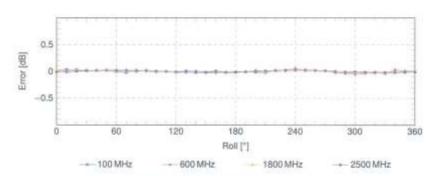
Uncertainty of Frequency Response of E-field: ±6.3% (k=2)

Certificate No: EX-7751_Oct22 Page 7 of 22



Receiving Pattern (ϕ), $\theta = 0^{\circ}$





Uncertainty of Axial Isotropy Assessment: ±0.5% (k=2)

Certificate No: EX-7751_Oct22

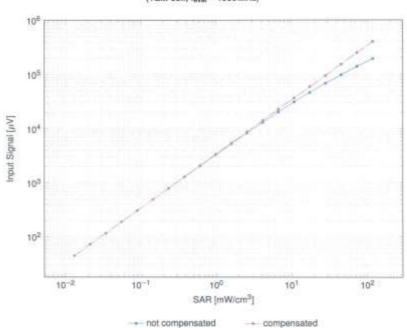
Page 8 of 22

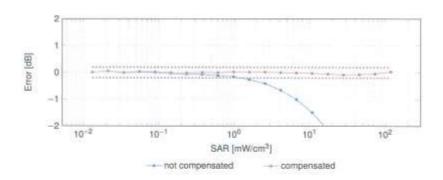




Dynamic Range f(SAR_{head})

(TEM cell, f_{eval} = 1900 MHz)





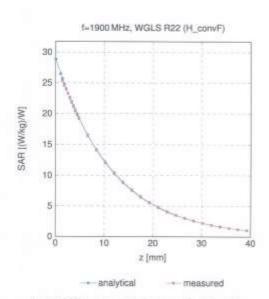
Uncertainty of Linearity Assessment: ±0.6% (k=2)

Certificate No: EX-7751_Oct22 Page 9 of 22

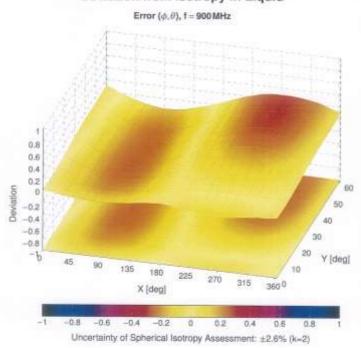
F-TP22-03 (Rev. 04) Page 99 of 131



Conversion Factor Assessment



Deviation from Isotropy in Liquid



Certificate No: EX-7751_Oct22 Page 10 of 22

F-TP22-03 (Rev. 04) Page 100 of 131

CUSTOMER SECRET





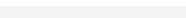
October 07, 2022 EX3DV4 - SN:7751

Appendix: Modulation Calibration Parameters

NiD	Rev	Communication System Name	Group	PAR (dB)	Unc ^E k =
. 9	190000	ĊW	CW	0.00	±4.7
0010	CAA	SAR Validation (Square, 100 ms, 10 ms)	Test	10.00	±9.6
0011	CAB	UMTS-FDD (WCDMA)	WCDMA	2.91	±9.6
0012	CAB	IEEE 802.11b WIFI 2.4 GHz (DSSS, 1 Mbps)	WLAN	1.87	±9.6
0013	CAB	IEEE 802.11g WIFI 2.4 GHz (DSSS-OFDM, 6Mbps)	WLAN	9.46	±9.6
0021	DAC	GSM-FDD (TDMA, GMSK)	GSM	9.39	±9.6
0023	DAC	GPRS-FDD (TDMA, GMSK, TN 0)	GSM	9.57	±9.6
0024	DAC	GPRS-FDD (TDMA, GMSK, TN 0-1)	GSM	6.56	±9.6
10025	DAC	EDGE-FDD (TDMA, 8PSK, TN 0)	ISSM	12.62	±9.6
10026	DAC	EDGE-FDD (TDMA, 8PSK, TN 0-1)	GSM	9.55	±9.6
10027	DAC	GPRS-FDD (TDMA, GMSK, TN 0-1-2)	GSM	4.80	±9.6
10026	DAC	GPRS-FDD (TDMA, GMSK, TN 0-1-2-3)	GSM	3.55	±9.6
10029	DAG	EDGE-FDD (TDMA, 8PSK, TN 0-1-2)	GSM	7.78	±9.6
10030	CAA	IEEE 802 15.1 Bluetooth (GFSK, DH1)	Bluetooth	5.30	±9.6
10030	CAA	IEEE 802.15.1 Bluetooth (GFSK, DH3)	Bluetooth	1.87	±9.6
	CAA		Bluetooth	1.16	±9.6
10032	CAA	IEEE 802.15.1 Bluetooth (GFSK, DH5)	Bluetooth	7.74	
to the private or become		IEEE 802.15.1 Bluetooth (PV4-DQPSK, DH1)	The state of the s	4.53	±9.6
10034	CAA	IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH3)	Bluetooth	-	±9.6
10035	CAA	IEEE 802.15.1 Bluetooth (PV4-DQPSK, DH5)	Bluetooth	3.83	±9.6
10036	CAA	IEEE 802.15.1 Bluetooth (8-DPSK, DH1)	Bluetooth	8.01	±9.6
10037	CAA	(EEE 802.15.1 Bluetooth (8-DPSK, DH3)	Bluetooth	4.77	±8.6
10038	CAA	IEEE 802.15.1 Bluetooth (B-DPSK, DH5)	Blustooth	4.10	±9.6
10039	CAB	CDMA2000 (1xRTT, RC1)	CDMA2000	4.57	±9.6
10042	CAB	IS-54 / IS-136 FDD (TDMA/FDM, PV4-DQPSK, Halfrate)	AMPS	7.78	±9.6
10044	CAA	IS-91/EIA/TIA-553 FDD (FDMA, FM)	AMPS	0.00	±9.6
10048	CAA	DECT (TDD, TDMA/FDM, GFSK, Full Slot, 24)	DECT	13.80	±9.6
10049	CAA	DECT (TDD, TDMA/FDM, GFSK, Double Slot, 12)	DECT	10.79	±9.6
10056	CAA	UMTS-TDD (TD-SCDMA, 1.28 Mops)	TD-SCDMA	11.01	±9.6
10058	DAC	EDGE-FDD (TDMA, BPSK, TN 0-1-2-3)	GGM	6.52	+9.6
10059	CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 2Mbps)	WLAN	2.12	±9.6
10060	CAB	IEEE 802.11b WIFI 2.4 GHz (DSSS, 5.5 Mbps)	WLAN	2.83	±9.6
10061	CAB	IEEE 802.116 WIFI 2.4 GHz (DSSS, 11 Mbps)	WLAN	3.60	±9.6
10062	CAD	IEEE 802.11a/h WIFI 5 GHz (OFDM, 6 Mbps)	WLAN	8.68	+9.6
10063	CAD	IEEE 802.11a/h WIFI 5 GHz (OFDM, 9 Mbps)	WLAN	8.63	±9.6
10064	GAD	IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps)	WLAN	9.09	±9.6
10065	CAD	IEEE 802.11ah WIFI 5 GHz (OFDM, 18 Mbps)	WLAN	9.00	±9.6
10066	CAD	IEEE 802.11a/h WIFI 5 GHz (OFDM, 24 Mbps)	WLAN	9.38	+9.6
10067	CAD	IEEE 802 11a/h WFI 5 GHz (OFDM, 36 Mbps)	WLAN	10.12	±9.6
10068	CAD	IEEE 802.11ah WFI 5 GHz (OFDM, 48 Mbps)	WLAN	10.24	±9.6
10089	CAD	IEEE 802.11a/h WIFI 5 GHz (OFDM, 54 Mbps)	WLAN	10.55	±9.6
10071	CAB	IEEE 802.110 WIFI 2.4 GHz (DSSS/OFDM, 9 Mbps)	WLAN	9.83	
	CAB				±9.6
10072		IEEE 802.11g WIFI 2.4 GHz (DSSS/OFDM, 12 Mbps)	WLAN	9.82	±9.6
10073	CAB	IEEE 802.11g WIFI 2.4 GHz (DSSS/OFDM, 18 Mbps)	WLAN	9,94	+9.6
10074	CAB	IEEE 802.11g WIFI 2.4 GHz (DSSS/OFDM, 24 Mbps)	WLAN	10.30	+9.6
10075	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 36 Mbps)	WLAN	10.77	±0.6
10076	CAB	IEEE 802.11g WIFI 2.4 GHz (DSSS/OFDM, 48 Mbps)	WLAN	10.94	±9.6
10077	CAB	IEEE 802.11g WIFI 2.4 GHz (DSSS/OFDM, 54 Mbps)	WLAN	11.00	±9.6
10081	CAB	CDMA2000 (1xRTT, RC3)	CDMA2000	3.97	±9.6
10082	CAB	IS-54 / IS-136 FDD (TDMA/FDM, PI/4-DQPSK, Fullrate)	AMPS.	4.77	±9.6
10090	DAC	GPRS-FDD (TDMA, GMSK, TN 0-4)	OSM	6.58	±9.6
10097	CAC	UMTS-FDO (HSDPA)	WCDMA	3.98	+9.6
10098	DAG	UMTS-FDO (HSUPA, Subtest 2)	WCDMA	3.98	±9.6
10099	CAC	EDGE-FD0 (TDMA, 8PSK, TN 0-4)	GSM	9.55	±9.6
10100	CAC	LTE-FDO (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-FDD	5.67	±9.6
10101	CAB	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM)	LTE-FDD	6.42	±9.6
10102	CAB	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM)	LTE-FD0	6.60	±9.6
10103	DAC	LTE-TDO (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-TDD	9.29	±9.6
10104	CAE	LTE-TDO (SC-FDMA, 100% RB, 20MHz, 16-QAM)	LTE-TOD	9.97	+9.6
10105	CAE	LTE-TDO (SC-FDMA, 100% RB, 20 MHz, 64-QAM)	LTE-TDD	10.01	±9.6
10108	CAE	LTE-FDD (SC-FDMA, 100% RB, 10MHz, QPSK)	LTE-FDD	5.80	±9.6
10109	CAG	LTE-FDO (SC-FDMA, 100% RB, 10MHz, 16-QAM)	LTE-FDD	6.43	19.0
	20,475		The state of the s		
10110	CAG	LTE-FDO (SC-FDMA, 100% RB, 5MHz, QPSK)	LTE-FDO	5.75	+9.6

Certificate No: EX-7751_Oct22

Page 11 of 22



CUSTOMER SECRET



Report No. HCT-SR-2301-FC004

EX3DV4 - SN:7751 October 07, 2022

UID	Rev	Communication System Name	Group	PAR (dB)	Unct k =
10112	CAG	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM)	LTE-FDD	6.59	±9.8
10113	CAG	LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM)	LTE-FOO	6.62	±9.6
10114	CAG	IEEE 802.11n (HT Greenfield, 13.5Mbps, BPSK)	WLAN	8.10	±9.6
10115	CAG	IEEE 802.11n (HT Greenfield, 81 Mbps, 16-QAM)	WLAN	8.46	+9.6
0116	CAG	IEEE 802.11n (HT Greenfield, 135 Mbps, 64-QAM)	WLAN	8.15	±9.6
0117	CAG	IEEE 802.11n (HT Mixed, 13.5 Mbps, BPSK)	WLAN	8.07	±9.6
0118	CAD	IEEE 802.11n (HT Mixed, 81 Mbps, 16-QAM)	WLAN	8.59	+9.6
10119	CAD	IEEE 802.11n (HT Mixed, 135 Mbps, 64-QAM)	WLAN	8.13	±9.8
0140	CAD	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM)	LTE-FDD	6.49	±9.6
0141	CAD	LTE-FDD (SC-FDMA, 100% RB, 15MHz, 64-QAM)	LTE-FDO	6.53	±9.6
0142	CAD	LTE-FDD (SC-FDMA, 100% RB, 3MHz, QPSK)	LTE-FDO	5.73	±9.6
0143	CAD	LTE-FDD (SC-FDMA, 100% RB, 3MHz, 16-QAM)	LTE-FDD	6.35	±9.6
0144	CAC	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM)	LTE-FDO	6.65	±9.6
0.145	CAG	LTE-FDD (SC-FDMA, 100% RB, 1.4MHz, QPSK)	LTE-FD0	5.78	±9.6
0146	CAC	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM)	LTE-FOD	6.41	±9.6
0147	CAC	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM)	LTE-FDD	6.72	±9.6
0149	CAE	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM)	LTE-FOO	6.42	±9.6
0150	CAE	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM)	LTE-FOD	6.60	±9.6
0151	CAE	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, QPSK)	LTE-TOD	9.28	±9.6
0152	CAE	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM)	LTE-TOD	9.92	±9.6
0153	CAE	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 84-QAM)	LTE-TOD	10.05	±9.6
0154	CAF	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, QPSK)	LTE-FOD	5.75	±9.6
10166	CAF	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM)	LTE-FOD	6.43	±9.6
0156	CAF	LTE-FDD (SC-FDMA, 50% RB, 5MHz, QPSK)	LTE-FDD	5.79	±9.6
0157	CAE	LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM)	LTE-FDD	6.49	±9.6
10158	CAE	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM)	LTE-FDD	6.62	±9.6
10159	CAG	LTE-FDD (SC-FDMA, 50% RB, 5MHz, 64-QAM)	LTE-FDD	6.56	+9.6
10160	CAG	LTE-FDD (SC-FDMA, 50% RB, 15MHz, QPSK)	LTE-FDD	5.82	±8.6
10161	CAG	LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM)	LTE-FDD	6.43	±9.6
0162	CAG	LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM)	LTE-FDD	6.58	±9.6
0166	CAG	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK)	LTE-FDD	5.46	19.6
10167	CAG	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM)	LTE-FDD	6.21	-
10168	CAG	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 84-QAM)	LTE-FDD	6.79	±9.6
0169	CAG	LTE-FDD (SC-FDMA, 1 RB, 20MHz, QPSK)	LTE-FOD	1-1-1-1	
10170	CAG	LTE-FDD (SC-FDMA, 1 RB, 20MHz, 16-QAM)		5.73	±9.6
10171	CAE	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM)	LTE-FOD	6.52	±9.0
10172	CAE		1.7011.00701.0	6.49	±9.6
	CAE	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK)	LTE-TOD	9.21	±9.6
10173		LTE-TOD (SC-FDMA, 1 RB, 20 MHz, 16-QAM)	LTE-TOD	9.48	±9.6
10.174	CAF	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM)	LTE-TOD	10.25	±9.6
10175		LTE-FDD (SC-FDMA, 1 RB, 10 MHz, QPSK)	LTE-FOD	5.72	±9.8
10176	CAF	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM)	LTE-FOD	6,52	±9.6
10177	CAE	LTE-FDD (SC-FDMA, 1 RB, 5MHz, QPSK)	LTE-F00	5,73	±9.6
10178	CAE	LTE-FDD (SC-FDMA, 1 RB, 5MHz, 16-QAM)	LTE-FOD	6,52	±9.6
0179	AAE	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM)	LTE-FDD	6.50	±9.6
10180	CAG	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 84-QAM)	LTE-FDD	8,50	±9.6
10181	CAO	LTE-FDD (SC-FDMA, 1 RB, 15MHz, QPSK)	LTE-FDD	5.72	±9.6
10182	CAG	LTE-FDD (SC-FDMA, 1 RB, 15MHz, 16-QAM)	LTE-FOD	8,52	±9.6
0183	CAG	LTE-FDD (SC-FDMA, 1 RB, 15MHz, 64-QAM)	LTE-FOD	6.50	±9.6
0184	CAG	LTE-FDD (SC-FDMA, 1 RB, 3 MHz, QPSK)	LTE-FDD	5.73	±9.6
10185	CAL	LTE-FDD (SC-FDMA, 1 RB, 3MHz, 16-QAM)	LTE-F00	6.51	±9.6
0188	CAG	LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM)	LTE-FOD	6.50	±8.6
10187	CAG	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK)	LTE-FOD	5.73	±9.6
0188	CAG	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM)	LTE-FOD	6.52	±9.6
10189	CAE	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM)	LTE-FOD	6.50	±9.6
0193	CAE	IEEE 802.11n (HT Greenfield, 6.5Mbps, BPSK)	WLAN	8.09	±9.6
0194	AAD	IEEE 802.11n (HT Greenfield, 39 Mbps, 16-QAM)	WLAN	8.12	±9.6
0195	CAE	IEEE 802.11n (HT Greenfield, 65 Mbps, 64-QAM)	WLAN	8.21	±9.6
0196	CAE	IEEE 802.11n (HT Mixed, 6.5 Mbps, 8PSK)	WLAN	8.10	±9.6
0197	AAE	IEEE 802.11n (HT Mixed, 39 Mbps, 16-QAM)	WLAN	8.13	±9.8
0198	CAF	IEEE 802.11n (HT Mixed, 65 Mbps, 64-QAM)	WLAN	8.27	±9.6
0219	CAF	IEEE 802,11n (HT Mixed, 7.2 Mbps, BPSK)	WLAN	8.03	±9.6
10220	AAF	IEEE 802.11n (HT Mixed, 43.3 Mbps, 16-QAM)	WLAN	8.13	±9.6
10221	CAC	IEEE 802.11n (HT Mixed, 72.2 Mbps, 64-QAM)	WLAN	8.27	±9.6
0222	CAC	IEEE 802.11n (HT Mixed, 15 Mbps, BPSK)	WLAN	8.06	±9.6
10223	CAD	IEEE 802.11n (HT Mixed, 90 Mbps, 16-QAM)	WLAN	8.48	±9.6
	1 17 17 17	IEEE 802 11n (HT Mixed, 150 Mbps, 64-QAM)	WLAN	90,000	200

Certificate No: EX-7751_Oct22

Page 12 of 22



Report No. HCT-SR-2301-FC004

EX3DV4 - SN:7751

October 07, 2022

UID	Rev	Communication System Name	Group	PAR (dB)	Unc [®] k =
10225	CAD	UMTS-FDO (HSPA+)	WCDMA	5.97	±9.6
10226	CAD	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM)	LTE-TDD	9.49	±9.6
10227	CAD	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM)	LTE-TDD	10.25	+9.6
0228	GAD	LTE-TDO (SC-FDMA, 1 RB, 1.4 MHz, QPSK)	LTE-TDD	9.22	±9.6
10229	DAC	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 16-GAM)	LTE-TDO	9.48	±9.6
10230	CAC	LTE-TDO (SC-FDMA, 1 RB, 3 MHz, 64-QAM)	LTE-TDD	10.25	±9.6
10231	CAC	LTE-TDD (SC-FDMA, 1 RB, 3MHz, QPSK)	LTE-TOO	9.19	19.6
10232	CAD	LTE-TDD (SC-FDMA, 1 RB, 5MHz, 16-QAM)	LTE-TOO	9.48	±9.6
10233	CAD	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM)	LTE-TDO	10.25	±9.6
10234	CAD	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK)	LTE-TOO	9.21	196
10235	CAD	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM)	LTE-TOD	9.48	±9.6
10236	CAD	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM)	LTE-TDD	10.25	±9.6
10237	CAD	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, GPSK)	LTE-TDD	9.21	19.6
	CAB	LTE-TDD (SC-FDMA, 1 RB, 15MHz, GPSK)	Control of the Contro	9.48	
10238	177, 177		LTE-TOO		±9.6
10239	CAB	LTE-TDO (SC-FDMA, 1 RB, 15MHz, 64-QAM)	LTE-TOD	10.25	±9.6
0240	CAB	LTE-TDO (SC-FDMA, 1 RB, 15 MHz, QPSK)	LTE-TOO	9.21	±9.6
0241	CAB	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM)	LTE-TDD	9.82	±9.6
10242	CAD	LTE-TDD (SC-FDMA, 50% RB, 1.4MHz, 64-QAM)	LTE-TDO	9.86	+9.6
0243	GAD	LTE-TDD (SC-FDMA, 50% R9, 1.4 MHz, QPSK)	LTE-TDD	9.45	±9.6
0244	CAD	LTE-TDO (SC-FDMA, 50% RB, 3 MHz, 16-QAM)	LTE-TOO	10.06	±9,6
10245	CAG	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM)	LTE-TDO	10.06	±9.6
10246	CAG	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, QPSK)	LTE-TOD	9,30	±9.8
0247	CAG	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM)	LTE-TDD	9.91	±9.6
0248	CAG	LTE-TDD (SC-FDMA, 50% RB, 5MHz, 64-QAM)	LTE-TOD	10.08	±9.6
10249	CAG	LTE-TDD (SC-FDMA, 50% RB, 5MHz, QPSK)	LTE-TOD	9.29	±9.6
0250	CAG	LTE-TOD (SC-FDMA, 50% RB, 10 MHz, 16-QAM)	LTE-TOD	9.81	±9.6
10251	CAF	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM)	LTE-TOD	10.17	±9.6
0252	CAF	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, QPSK)	LTE-TDD	9.24	±9.6
10253	CAF	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM)	LTE-TOD	9:90	±9.6
0254	CAB	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM)	LTE-TOD	10.14	±5.6
0255	CAB	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, QPSK)	LTE-TOD	9.20	
0256	CAB				±9.6
		LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM)	LTE-TOD	9.96	±9.6
10257	CAD	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM)	LTE-TOD	10.08	±9.6
0.258	CAD	LTE-TDD (SC-FDMA, 100% RB, 1.4MHz, QPSK)	LTE-TOD	9.34	±9.6
0250	CAD	LTE-TDD (SC-FDMA, 100% RB, 3MHz, 18-QAM)	LTE-TOD	9.98	±9.6
10260	CAG	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM)	LTE-TOO	9.97	±9.8
0261	CAG	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, QPSK)	LTE-TDD	9.24	±9.6
10262	CAG	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM)	LTE-TOD	9,83	±9.6
10263	CAG	LTE-TDD (SC-FDMA, 100% RB, 5MHz, 64-QAM)	LTE-TDD	10.16	±9.6
0.264	CAG	LTE-TOD (SC-FDMA, 100% RB, 5MHz, QPSK)	LTE-TOO	9.23	±9.6
0.265	CAG	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM)	LTE-TOO.	9.92	±9.6
10266	CAF	LTE-TOD (SC-FDMA, 100% RB, 10 MHz, 64-QAM)	LTE-TOO	10.07	±9.6
0267	CAF	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, GPSK)	LTE-TDD	9.30	±9.0
0268	CAF	LTE-TDD (SC-FDMA, 100% RB, 15MHz, 16-QAM)	LTE-TDO	10.06	±9.6
0.568	CAB	LTE-TDD (SC-FDMA, 100% RB, 15MHz, 64-QAM)	LTE-TDD	10.13	±9.6
0270	CAB	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, QPSK)	LTE-TDO	9.58	±9.6
10274	CAB	UMTS-FDD (HSUPA, Subtest 5, 3GPP Rel8.10)	WCDMA	4,87	±9.6
0275	CAD	UMTS-FDD (HSUPA, Sublekt 5, 3GPP Rel8.4)	WCDMA	3.96	±9.6
0277	CAD	PHS (QPSK)	PHS	11.81	±9.6
0278	CAD	PHS (QPSK, BW 884 MHz, Rolloft 0.5)	PHS		
0279	CAG	PHS (QPSK, BW 884 MHz, Rolloff 0.38)	1.010.1	11.81	±9.6
0290	CAG	CDMA2000, RC1, SOSS, Full Rate	PHS	12.18	±9.6
	A TO A 1772	A TOTAL CONTRACTOR OF THE CONT	CDMA2000	3.91	±9.6
0291	CAG	CDMA2000, RC3, SC65, Full Rate	CDMA2000	3.46	±9.6
0292	CAG	COMA2000, RC3, SO32, Full Rate	CDMA2000	3.39	±9.6
0293	CAG	COMA2000, RC3, SO3, Full Rate	CDMA2000	3.50	±9.6
0295	CAG	CDMA2000, RC1, S03, 1/8th Rate 25 fr.	CDMA2000	12.49	±9.6
0.297	CAF	LTE-FDD (SC-FDMA, 50% RB, 20MHz, QPSK)	LTE-FDD	5.81	±9.6
0298	CAF	LTE-FDD (SC-FDMA, 50% R8, 3 MHz, QPSK)	LTE-FDO	5.72	±9.6
0.599	CAF	LTE-FDD (SC-FDMA, 50% AB, 3 MHz, 16-QAM)	LTE-FDD	6,39	+9.6
0.300	CAC	LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM)	LTE-FD0	6.60	±9.8
0301	CAC	IEEE 802.16e WIMAX (29:18, 5ms, 10 MHz, QPSK, PUSC)	WMAX	12.03	±9.6
0302	CAB	IEEE 802 16e WIMAX (29:18, 5 ms, 10 MHz, QPSK, PUSC, 3CTRL)	WMAX	12.57	±9.6
0303	CAB	IEEE 802,16e WIMAX (31:15, 5 ms, 10 MHz, 84DAM, PUSC)	WMAX	12.52	19.6
0304	CAA	IEEE 802.15e WIMAX (29:18, 5ms, 10 MHz, 64QAM, PUSC)	WMAX	11.85	±9.6
0305	CAA	IEEE 802.16e WIMAX (31:15, 10 ms, 10 MHz, 54QAM, PUSC)	WMAX	15.24	±9.6
0306	CAA	IEEE 802.16e WIMAX (29:18, 10 ms, 10 MHz, 64QAM, PUSC)	WMAX	14.57	196

Certificate No: EX-7751_Oct22

Page 13 of 22



CUSTOMER SECRET



Report No. HCT-SR-2301-FC004

EX3DV4 - SN:7751

October 07, 2022

uin	Rev	Communication System Name	Group	PAR (dB)	UncE k =
10307	AAB	IEEE 802,16e WIMAX (29:18, 10 ms, 10 MHz, QPSK, PUSC)	WIMAX	14.49	±9.6
10368	AAB	IEEE 802.16e WIMAX (29:18, 10 ms, 10 MHz, 16QAM, PUSC)	WIMAX	14.46	±9.8
0309	AAB	IEEE 802.16e WIMAX (29:18, 10:ms, 10 MHz, 16QAM,AMC 2x3)	WIMAX	14.58	±9.6
0310	AAB	IEEE 802.16e WIMAX (29:18, 10 ms, 10 MHz, QPSK, AMC 2x)	WIMAX	14.57	±9.6
0311	AAB	LTE-FDD (SC-FDMA, 100% RB, 15MHz, QPSK)	LTE-FDD	8.06	±9.6
0313	AAD	IDEN 13	IDEN	10.51	±9.6
0314	AAD	IDEN 1.6	IDEN	13.48	±9.6
0315	AAD	IEEE 802.11b WIFI 2.4 GHz (DSSS, 1 Mbps, 96pc dc)	WLAN	1.71	±9.6
0316	AAD	IEEE 802.11g WIFI 2.4 GHz (ERP-OFDM, 6 Mbps, 96pc dc)	WLAN	8.36	±9.6
0317	AAA	IEEE 802.11a WiFi 5 GHz (OFDM, 6 Mbps, 96pc dc)	WLAN	8.36	±9.6
0352	AAA	Pulse Wayeform (200 Hz, 10%)	Generic	10.00	±9.6
0353	AAA	Pulse Waveform (200 Hz, 20%)	Generic	6.99	±9.6
0354	AAA	Pulse Waveform (200 Hz, 40%)	Generic	3,98	±9.6
0855	AAA	Pulse Waveform (200 Hz, 60%)	Ganeric	2.22	+9.6
0356	AAA	Pulse Waveform (200 Hz, 80%)	Generic	0.97	±9.6
0387	AAA	QPSK Waveform, 1 MHz	Generic	5.10	±9.6
0388	AAA	QPSK Waveform, 10 MHz	Generic	5.22	±9.6
0396	AAA	64-QAM Waveform, 100 kHz	Generic	6.27	+9.6
0399	AAA	64-CAM Waveform, 40 MHz	Generic	6.27	±9.6
0400	AAD	IEEE 802.11ac WFI (20 MHz, 64-QAM, 99pc dc)	WLAN	8.37	±9.6
0.401	AAA	IEEE 802.11ac WFI (40 MHz, 64-QAM, 99pc dc)	WLAN	8.60	+9.6
0402	AAA	IEEE 802.11ac WFI (80 MHz, 64-QAM, 99pc do)	WLAN	8.53	±9.6
0403	AAB	CDMA2000 (1xEV-DO, Rev. 0)	CDMA2000	3.76	±9.6
0404	AAB	GDMA2000 (1xEV-DO, Rev. A)	CDMA2000	3.77	19.5
0408	AAD	CDMA2000, RC3, SO32, SCH0, Full Rate	CDMA2000	5.22	19.6
0410	AAA	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK, UL Sub=2,3,4,7,8,9)	LTE-TOD	7.82	19.6
0414	AAA	WLAN CCDF 64-QAM, 40 MHz		8.54	
0415	AAA	IEEE 802.11b WIFI 2.4 GHz (DSSS, 1 Mbps, 99pc dc)	Generic WLAN	1.54	±9.6
0416	AAA		The state of the s		±9.6
	AAA	IEEE 802.11g WIFI 2.4 GHz (ERP-OFDM, 6Mbps, 95pc dc)	WLAN	8.23	±9.6
0417	AAA	IEEE 802.11a/n WIFI 5 GHz (OFDM, 6 Mbps, 99pc dc)	1 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	8.23	±9.6
0418		IEEE 802.11g WIFI 2.4 GHz (DSSS-OFDM, 6 Mbps, 99pc, Long)	WLAN	8.14	±9.6
0419	AAA.	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 99pc, Short)	WLAN	8.19	±9.6
0422	AAA	IEEE 802.11n (HT Greenfield, 7.2 Mbps, BPSK)	WLAN	8.32	±9.6
0423	AAA.	IEEE 802.11n (HT Greenfield, 43.3 Mbps, 16-QAM)	WLAN	8,47	±9.6
10424	AAE	IEEE 802.11n (HT Greenfield, 72.2 Mbps, 64-QAM)	WLAN	8.40	±9.6
0425	AAE	IEEE 802.11n (HT Greenfield, 15 Mbps, BPSK)	WLAN	8.41	±9.6
10.426	AAE	IEEE 802.11n (HT Greenfield, 90 Mbps, 16-QAM)	WLAN	8.45	±9.6
10427	AAB	IEEE 802.11n (HT Greenfield, 150 Mbps. 64-QAM)	WLAN	8.41	19.6
10430	AAB	LTE-FDD (OFDMA, 5 MHz, E-TM 3.1)	LTE-FDD	8.28	±9.6
10431	AAC	LTE-FDD (OFDMA, 10 MHz, E-TM 3.1)	LTE-FDD	8.38	±9.6
10432	AAB	LTE-FDD (OFDMA, 15MHz, E-TM 3.1)	LTE-FDD	8.34	±9,6
10433	AAC	LTE-FDD (OFDMA, 20 MHz, E-TM 3.1)	LTE-FDD	8.34	+9.6
0434	AAG	W-CDMA (BS Test Model 1, 64 DPCH)	WCDMA	8.60	±9.6
10435	AAA	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK, UL Sub)	LTE-TOD	7.82	±9.6
10447	AAA	LTE-FDD (OFDMA, 5 MHz, E-TM 3.1, Clipping 44%)	LTE-FD0	7,56	±9.6
10448	AAA	LTE-FDD (OFDMA, 10 MHz, E-TM 3.1, Olippin 44%)	LTE-FDD	7.53	±9.6
10449	AAC	LTE-FDD (OFDMA, 15 MHz, E-TM 3.1, Cliping 44%)	LTE-FDD	7.51	±9.6
10450	AAA	LTE-FDD (OFDMA, 20 MHz, E-TM 3.1, Clipping 44%)	LTE-FDD	7,48	±9.6
0451	AAA	W-CDMA (BS Test Model 1, 54 DPCH, Clipping 44%)	WCDMA	7.59	±9.6
0453	AAC	Validation (Square, 10 ms, 1 ms)	Test	10.00	±9.6
0456	AAC	IEEE 802.11ac WiFi (160 MHz, 64-QAM, 99pc dc)	WLAN	8.63	±9.6
0457	AAC	UMTS-FDD (DC-HSDPA)	WCDMA	6.62	±9:0
0456	AAC	CDMA2000 (1xEV-DQ, Rev. B, 2 carriers)	CDMA2000	6.55	±9.6
0459	AAC	CDMA2000 (1xEV-DO, Rev. B, 3 carriers)	CDMA2000	8.25	±9.6
0460	AAC	UMTS-FDD (WCDMA, AMR)	WCDMA	2.39	±9.6
0461	AAC	LTE-TDD (SC-FDMA, 1 RB, 1,4 MHz, QPSK, UL Sub)	LTE-TOD	7.82	±9.6
0462	AAC	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM, UL Sub)	LTE-TDD	8.30	+9.6
0463	AAD	LTE-TDD (SC-FDMA, 1 RB; 1.4 MHz, 64-QAM, UL Sub)	LTE-TDD	8.56	±9.6
0464	AAD	LTE-TOD (SC-FDMA, 1 RB, 3MHz, QPSK, UL Sub)	LTE-TDD	7.82	±9.6
0468	AAC	LTE-TDD (SC-FDMA, 1 RB, 3MHz, 16-QAM, UL Sub)	LTE-TDD	8.32	±9.6
0488	AAC	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM, UL Sub)	LTE-TOD	8.67	±9.6
10467	AAA	LTE-TDD (SC-FDMA, 1 RB, 5MHz, QPSK, UL Sub)	LTE-TOD	7.82	19.6
0468	AAF	LTE-TDD (SC-FDMA, 1 RB, 5MHz, 16-QAM, UL Sub)	LTE-TOD	8.32	±9.6
0469	AAD	LTE-TDD (SC-FDMA, 1 RB, 5MHz, 64-QAM, UL Sub)	LTE-TOD	8.56	
10470	AAD	LTE-TDD (SC-FDMA, 1 RB, 10MHz, QPSK, UL Sub)	LTE-TOD	7.82	±9.8
	7 17 140	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 18-QAM, UL Sub)	616,100	7.596	±9.8

Certificate No: EX-7751_Oct22

Page 14 of 22





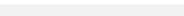
Report No. HCT-SR-2301-FC004

EX3DV4 - SN:7751 October 07, 2022

UID	Rev	Communication System Name	Group	PAR (dB)	Unct k =
10472	AAC	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 94-QAM, UL Sub)	LTE-TDD	8.57	±9.6
10473	AAA	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, QPSK, UL Sub)	LTE-TDD	7.82	±9.6
10474	AAC	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM, UL Sub)	LTE-TD0	8.32	±9.6
10475	AAD	LTE-TDO (SC-FDMA, 1 RB, 15 MHz, 94 QAM, UL Sub)	LYE-YOO	8.57	±9.6
10477	AAC	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM, UL Sub)	LTE-TDD	8.32	±9.0
10478	AAC	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 84-QAM, UL Sub)	LTE-TOO	8.57	±9.6
10479	AAC	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, GPSK, UL Sub)	LTE-TOO	7.74	+9.6
10480	AAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM, UL Sub)	LTE-TDO	8.18	±9.6
	AAA	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM, UL Sub)	LTE-TOO	-	±9.6
10481	7.7.7.1	THE STATE OF THE S		8,45	
10482	AAA	LTE-TDD (SC-FDMA, 50% RB, 3MHz, QPSK, UL Sub)	LTE-TDD	7.71	±9.6
10483	ΑΑΑ	LTE-TDD (SC-FDMA, 50% RB, 3MHz, 16-QAM, Sub)	LTE-TOO	8.39	±9.6
10484	AAB	LTE-TDD (SC-FDMA, 50% RB, 3MHz, 64-QAM, UL Sub)	LTE-TDO	8,47	±9.6
10485	AAB	LTE-TDD (SC-FDMA, 50% RB, 5MHz, QPSK, UL Sub)	LTE-TDO	7.59	±9.6
10486	AAB	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM, UL Sub)	LTE-TDD	8.38	±9.6
10487	AAC	LTE-TDD (SC-FDMA, 50% RB, 5MHz, 64-QAM, UL Sub)	LTE-TOD	8.60	±9.8
10488	AAC	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, QPSK, UL Sub)	LTE-TOD	7.70	±9.6
0.489	AAC	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM, UL Sub)	LTE-TOD	8.31	±9.6
0490	AAF	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 54-QAM, UL Sub)	LTE-TOD	8.54	±9.6
10491	AAF	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, QPSK, UL Sub)	LTE-TOD	7.74	±9.6
10482	AAF	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM, UL Sub)	LTE-TOD	8,41	#9.6
0493	AAF	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM, UL Sub)	LTE-TOD	8.55	±9.6
10494	AAF	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, CPSK, UL Sub)	LTE-TOD	7.74	±9.8
10485	AAF		LTE-TOD	8.37	
		LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM, UL Sub) LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 54-QAM, UL Sub)	The second secon		±9.6
10496	AAE		LTE-TOD	8.54	±9.6
10497	AAE	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK, UL Sub)	LTE-TOD	7.67	±9.6
10496	AAE	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM, UL Sub)	LTE-TOD	8.40	±9.6
10499	AAC	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 84-QAM, UL Sub)	LTE-TDD	8.68	±9.6
10500	AAF	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, QPSK, UL Sub)	LTE-TOD	7.67	±9.6
10501	AAF	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM, UL Sub)	LTE-TOD	8.44	±9.6
10502	AAB	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM, UL Suti)	LTE-TDD	8,52	±9.6
10503	AAB	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, QPSK, UL Sub)	LTE-TDD	7.72	+9.6
10504	AAB	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM, UL Sub)	LTE-TOD	8.31	±9.6
10505	AAC	LTE-TDD (SC-FDMA, 100%, RB, 5MHz, 64-QAM, UL Sub)	LTE-TOO	8.54	±9.6
10506	AAC	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, QPSK, UL Sub)	LTE-TOD	7.74	±9.6
10507	AAC	LTE-TOD (SC-FDMA, 100% RB, 10 MHz, 16-QAM, UL Sub)	LTE-TOD	8.36	19.6
10508	AAF	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM, UL Sub)	LTE-TOD	8.55	±9.6
10509	AAF	LTE-TDD (SC-FDMA, 100% RB, 15MHz; QPSK, UL Sub)	LTE-TOD	7.99	19.6
10510	AAF	LTE-TDD (SC-FDMA, 100% RB, 15MHz, 18-QAM, UL Sub)	LTE-TOO	5.49	19.6
10511	AAF	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM, UL Sub)			The second second
	AAF		LTE-TOD	8.51	±9.6
10512	17.70.00	LTE-TDD (SC-FDMA, 100% R8, 20MHz; QPSK, UL Sub)	LTE-TOD	7.74	±9.6
0513	AAF	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM, UL Sub)	LTE-TOD	8.42	±9.6
10514	AAE	LTE-TOD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Sub)	LTE-TDD	8.45	±9.6
10515	AAE	IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps, 99pc dc)	WLAN	1.58	±9.8
10516	AAE	IEEE 802.11b WIFI 2.4 GHz (DSSS, 5.5 Mbps, 99pc dc)	WLAN	1,57	±9.6
10517	AAF	IEEE 802.11b WIFI 2.4 GHz (DSSS, 11 Mbps, 99pc dc)	WLAN	1.58	±9.6
10518	AAF	IEEE 802.11a/h WIFI 5 GHz (OFDM, 9 Mbps, 99pc dc)	WLAN	8.23	±9.6
10519	AAF	IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 99pp dc)	WLAN	8.39	±9.6
10520	AAB	IEEE 802.11a/h WIFI 5 GHz (OFDM, 18 Mbps, 99pc dc)	WLAN	8.12	±9.6
10521	AAB	IEEE 802.11a/h WIFI 5 GHz (OFDM, 24 Mbps, 99pc dc)	WLAN	7.97	+9.6
10522	AAB	IEEE 802.11a/h WIFI 5 GHz (OFDM, 36 Mbps, 99pp do)	WLAN	8.45	19.6
10523	AAC	IEEE 802.11a/h WIFI 5 GHz (OFDM, 48 Mbps, 99pc dc)	WLAN	8.08	±9.8
10524	AAC	IEEE 802 11a/h WIFI 5 GHz (OFDM, 54 Mbps, 99oc dc)	WLAN	8.27	19.6
0525	AAC	IEEE 802.11ac WIFI (20 MHz, MCS0, 99ec dc)	WLAN	8.36	19.6
10528	AAF	IEEE 802.11ac WFI (20 MHz, MCS1, 99ac dc)	WLAN	8.42	-
0527	AAF	IEEE 802 11ac WFI (20 MHz, MCS1, Hape do)	WLAN		±9.6
0528	1.7.7.7		CONT. P. C.	8.21	±9.6
-	AAF	IEEE 802 11ac WIFI (20 MHz, MCS3, 99pc dc)	WLAN	8.36	±9.6
0529	AAF-	IEEE 802.11ac WIF1 (20 MHz, MCS4, 99pc dc)	WLAN	8.36	±9.6
0531	AAF	IEEE 802.11ac WiFi (20 MHz, MCS8, 98pc dc)	WLAN	8.43	±9.8
0532	AAF	IEEE 802.11ac WiFi (20 MHz, MCS7, 99pc dc)	WLAN	8.29	±9.6
0533	AAE	IEEE 802.11ac WIFI (20 MHz, MCS8, 99pc dc)	W.AN	8.38	±9.6
10534	AAE	IEEE 802.11ac WIFt (40 MHz, MCS0, 99pc dc)	WLAN	8.45	±9.6
10535	AAE	IEEE 802.11ac WIFI (40 MHz, MCS1, 99pc dc)	WLAN	8.45	19.6
10538	AAF	IEEE 802.11ac WIFI (40 MHz, MCS2, 99pc dc)	WLAN	8.32	±9.6
	AAF	IEEE 802 11sc WIFI (40 MHz, MCS3, 99pc dc)	W.AN	8.44	±9.6
10537			111001000000000000000000000000000000000	25075	-0.00,00
10537 10538	AAF	IEEE 802.11ac WiFi (40 MHz, MCS4, 99pc dc)	WLAN	8.54	±9.6

Certificate No: EX-7751_Oct22

Page 15 of 22



CUSTOMER SECRET



Report No. HCT-SR-2301-FC004

EX3DV4 - SN:7751

October 07, 2022

UID	Rev	Communication System Name	Group	PAR (dB)	Unc ^E k =
0541	AAA	IEEE 802.11ac WiFi (40 MHz, MCS7, 99pc dc)	WLAN	8.46	±9.6
10542	AAA	IEEE 802.11ac WIFI (40 MHz, MCS8, 99pc dc)	WLAN	8.65	±9.6
10543	AAC-	IEEE 802.11ac WiFi (40 MHz, MCS9, 99pc dc)	WLAN	8.65	±9.6
0544	AAC	IEEE 802,11ac WiFi (80 MHz, MCS0, 99pc dc)	WLAN	8.47	±9.6
10545	AAC	IEEE 802.11sc WIFI (80 MHz, MCS1, 99pc dc)	WLAN	8.55	±9.6
10546	AAC	IEEE 802.11ac WIFI (80 MHz, MCS2, 99pc dc)	WLAN	8.35	58.6
10547	AAC	IEEE 802.11ac WiFi (80 MHz, MCS3, 99pc dc)	WLAN	8.49	+9.6
10548	AAC	IEEE 802 11ac WIFI (80 WHz, MCS4, 96pc dc)	WLAN	8.37	±9.8
10550	AAC	IEEE 802.11ac WIFI (80 MHz, MCS6, 99pc dc)	WLAN	8.38	±9.6
10551	AAC	IEEE 802.11ac WIFI (80 MHz, MCS7, 99pc dc)	WLAN	0.50	+9.6
10552	AAC	IEEE 802.11ac WiFi (80 MHz, MCS8, 99pc dc)	WLAN	8.42	±9.6
10553	AAC	IEEE 802.11ac WIFI (80 MHz, MCS9, 99pc dc)	WLAN	0.45	±9.6
10554	AAC	IEEE 802.11ac WiFI (160 MHz, MCSO, 99pc dc)	WLAN	8.48	±9.6
10555	AAC	IEEE 802.11ac WIFI (160 MHz, MCS1, 99pc dc)	WLAN	8.47	±9.6
10558	AAC	(EEE 802,11ac WiFi (160 MHz, MCS2, 99pc dc)	WLAN	8.50	±9.6
10557	AAC	IEEE 802.11ac WiFi (160 MHz, MCS3, 99pc dc)	WLAN	6.52	#9.6
10558	AAC	IEEE 802.11ac WiFI (160 MHz, MCS4, 99pc dc)	WLAN	8.65	
10560	AAC	IEEE 802.11ac WIFI (160 MHz, MCS6, 99pc dc)	The second secon	1000	±9.6
	-		WLAN	8.73	±9.6
10561	AAC	IEEE 802 11ac WIFI (160 MHz, MCS7, 99pc dc)	WLAN	8.56	#9.0
0562	and the second	IEEE 802.11ac WiFi (160 MHz, MCS8, 99pc dc)	WLAN	8.69	±9.6
10563	AAC	IEEE 802.11ac WiFi (160 MHz, MCS9, 99pc dc)	WLAN	8.77	±9.6
10564	AAC	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFOM, 9 Mbps, 99pc dc)	WLAN	8.25	±9.6
10565	AAC	IEEE 802.11g WIFI 2.4 GHz (DSSS-OFDM, 12 Mbps, 99pc dc)	WLAN	8.45	±9.6
10566	AAC	IEEE 802.11g WIFI 2.4 GHz (DSSS-OFDM, 18 Mbps, 99pc dc)	WLAN	8.13	9.8
0567	AAC	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 24 Mbps, 99pc dc)	WLAN	8.00	±0.6
10568	AAC	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 36 Mbps, 98pc dc)	WLAN	8.37	±9.6
10569	AAC	(EEE 802.11g WIFI 2.4 GHz (DSSS-OFDM, 48 Mbps, 99pc dc)	WLAN	8.10	±9.6
10570	AAC	IEEE 802 11g WIFI 2.4 GHz (DSSS-OFDM, 54 Mbps, 98pc dc)	WLAN	8.30	±9.6
10571	AAC	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 90pc dc)	WLAN	1.99	±9.6
10:572	AAC	IEEE 802.11b WIFi 2.4 GHz (DSSS, 2 Mbps, 90pc dc)	WLAN	1,99	±9.6
10573	AAC	IEEE 802.11b WIFI 2.4 GHz (DSSS, 5.5 Mbps, 90pc dc)	WLAN	1,98	±9.6
0.574	AAC	IEEE 802.11b WIFI 2.4 GHz (DSSS, 11 Mbps, 90pc dc)	WLAN	1,98	±0.6
10575	AAC	IEEE 802.11g WIFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 90pc dc)	WLAN	8.59	±9.6
10576	AAC	IEEE 802.11g WFi 2.4 GHz (DSSS-OFDM, 9Mbps, 90pc dc)	WLAN	8.80	±3.6
10577	AAC	IEEE 802 11g WIFI 2.4 GHz (DSSS-OFDM, 12 Mbps, 90pc dc)	WLAN	8.70	+9.6
10578	AAD	IEEE 802.11g WIFI 2.4 GHz (DSSS-OFDM, 18 Mbps, 90pc dc)	WLAN	8.49	±9.6
10579	CIAA	IEEE 802.11g WIFI 2.4 GHz (DSSS-OFDM, 24 Mbps, 90pc dc)	WLAN	8.36	±9.6
10580	AAD	IEEE 802.11g WIFI 2.4 GHz (DSSS-OFDM, 36 Mbps, 90pc dc)	WLAN	8.76	+9.6
10581	AAD	IEEE 802.11g WIFI 2.4 GHz (DSSS-OFDM, 48 Mbps, 90pc dc)	WLAN	8.35	±9.6
10582	CAA	IEEE 802.11g WIFI 2.4 GHz (DSSS-OFDM, 54 Mbps, 90pc dc)	WLAN	8.67	±9.6
0583	CAA	IEEE 802.11a/h WIFi 5 GHz (OFDM, 6 Mbps, 90pc dc)	WLAN	8.59	±9.6
0584	CAA	IEEE 802.11a/h WIFI 5 GHz (OFDM, 9 Mbps, 90pc do)	WLAN	8.60	+9.6
10585	AAD	IEEE 802.11a/n WFI 5 GHz (OFDM, 12 Mbps, 90pc dc)	WLAN	8:70	19.6
0.586	AAD	IEEE 802.11a/h WIFI 5 GHz (OFDM, 18 Mbps, 90pc dc)	WLAN	8.49	±9.6
0587	AAA	IEEE 802,11ah WIFI 5 GHz (OFDM, 24 Mbps, 90pc do)	WLAN	8.36	±9.6
10588	AAA	IEEE 802.11a/h WIFI 5 GHz (OFDM, 36 Mbps, 90pc dc)	WLAN	8.76	±9.6
10589	AAA	IEEE 802.11a/h WIFI 5 GHz (OFDM, 48 Mbps, 90pc dc)	WLAN	8.35	±9.6
0590	AAA	IEEE 802 11a/h WIFI 5 GHz (OFDM, 54 Mbps, 90pc dc)	WLAN	8.67	19.6
0591	AAA	IEEE 802.11n (HT Mixed, 20 MHz, MCS0, 90pc do)	WLAN	8.63	19.6
0592	AAA	IEEE 802.11n (HT Mixed, 20 MHz, MCS1, 90pc do)	WLAN	8.79	
0593	AAA	IEEE 802.11n (HT Mixed, 20MHz, MCS2, 90pc dc)	WLAN		±9.6
0554	AAA	IEEE 802,110 (HT Mixed, 20 MHz, MCS2, 90pc dc)		8.64	±9,6
0595	AAA	IEEE 802.11n (HT Mixed, 20 MHz, MCS3, 90pc do)	WLAN	8.74	±9.6
0596	AAA		WLAN	8.74	±9.6
0597	AAA	IEEE 802.11n (HT Mixed, 20 MHz, MCSS, 90pc dc)	WLAN	8.7t	±9.6
0598	AAA	IEEE 802.11n (HT Mixed, 20 MHz, MCS6, 90pc dc)	WLAN	8,72	±9.6
And the later of t		IEEE 802.11n (HT Mlaed, 20 MHz, MCS7, 90pc dc)	WLAN	8,50	±9.6
0599	AAA	IEEE 802.11n (HT Mixed, 40 MHz, MCS0, 80pc dc)	WLAN	8.79	±9,6
0.000	AAA	IEEE 802 11n (HT Mixed, 40 MHz, MCS1, 90pc dc)	WLAN	8.88	±9.6
0601	AAA	IEEE 802,11n (HT Mixed, 40 MHz, MCS2, 90pc dc)	WLAN	8.82	±9.6
10802	AAA	IEEE 802.11n (HT Mixed, 40 MHz, MCS3, 90pc dc)	WLAN	8.94	±9.6
10603	AAA	IEEE 802.11n (HT Mixed, 40 MHz, MCS4, 80pc dc)	WLAN	9.03	±9.6
0804	AAA	IEEE 802.11n (HT Mixed, 40 MHz, MCS5, 90pc do)	WLAN	8.76	±9.6
0.605	AAA	IEEE 802.11n (HT Mixed, 40 MHz, MCS6, 90pc dc)	WLAN	8.97	±9.6
0606	AAC	IEEE B02.11n (HT Mixed, 40 MHz, MCS7, 90pc dc)	WLAN	8.82	±9.6
0807	AAC	IEEE 802.11ac WiFi (20 MHz, MCS0, 90pc dc)	WLAN	8.64	±9.6
0608	AAC	IEEE 802.11ac WiFi (20 MHz, MCS1, 90pc dc)	WLAN	8.77	±9.6

Certificate No: EX-7751_Oct22

Page 16 of 22





Report No. HCT-SR-2301-FC004

EX3DV4 - SN:7751 October 07, 2022

UID	Rev	Communication System Name	Group	PAR (dB)	Unch k =
10609	AAC	IEEE 802.11ac WiFi (20 MHz, MCS2, 90pc dc)	WLAN	8.57	±9.6
0610	AAC	IEEE 802.11ac WIFI (20 MHz, MCS3, 90pc dc)	WLAN	8.78	±9.6
0611	AAC	IEEE 802.11ac WIFI (20 MHz, MCS4, 90pc dc)	WLAN	8.70	±9.6
0612	AAC	IEEE 802,11ac WiFi (20 MHz, MCS5, 90pc dc)	WLAN	8.77	±9.6
0613	AAC	IEEE 802.11ac WIFI (20 MHz, MCS6, 80pc dc)	WLAN	8.94	±9:8
0614	AAC	IEEE 802.11ac WiFi (20 MHz, MCS7, 90pc dc)	WLAN	8.59	±9.6
0615	AAC	IEEE 802.11ac WiFi (20 MHz, MCS8, 90pc dc)	WLAN	8.82	±9.6
0616	AAC	IEEE 802,11ac WIFI (40 MHz, MCS0, 90pc dc)	WLAN	8.82	±9.6
0617	AAC	IEEE 802.11ac WIFI (40 MHz, MCS1, 90pc dc)	WLAN	8.81	+9.6
8190	AAC	IEEE 802 11sc WIFI (40 MHz, MCS2, 90pc dc)	WLAN	8.58	±9.6
0618	AAC	EEE 802,11ac WiFi (40 MHz, MCS3, 90pc dc)	WLAN	8.86	±9.6
0620	AAC	IEEE 802,11ac WFI (40 MHz, MCS4, 90cc dc)	WLAN	8.87	±9.6
0621	AAG	IEEE 802.11sc WIFI (40 MHz, MCS5, 90pc dc)	WLAN	8.77	±9.6
0622	AAC	IEEE 802.11ac WFi (40 MHz, MCS6, 90pc dc)	WLAN	8.68	±9.6
0623	AAC	IEEE 802 11ac WFI (40 MHz, MCS7, 90pc dc)	WLAN	8.82	±9.6
0.624	AAG	IEEE 802.11ac WFi (40 MHz, MCS8, 90pc dc)	WLAN	8.96	±9.6
0625	AAC	IEEE 802.11ac WIFI (40 MHz, MCS9, 90pc dc)	WLAN	8.96	±9.6
0626	:AAC	IEEE 802.11ac WiFi (80 MHz, MCS0, 90pc dc)	WLAN	8.83	±9.6
0827	AAC	IEEE 802.11ac WiFI (80 MHz, MCS1, 90pc dc)	WLAN	8.88	±9.6
8590	AAC	IEEE 802.11ac WiFi (80 MHz, MCS2, 90pc dc)	WLAN	8.71	±9,6
0629	AAC	IEEE 802 11ac WIFI (80 MHz, MCS3, 90pc dc)	WLAN	8.85	±9.6
0.630	AAC	IEEE 802 11ac WiFi (80 MHz, MCS4, 90pc dc)	WLAN	8.72	±9.6
0.631	AAG	IEEE 802.11ac WIFI (80 MHz, MCSS, 90pc dc)	WLAN	8.81	±9.6
0632	AAC	IEEE 802.11ac WiFI (80 MHz, MCS8, 90pc dc)	WLAN	8.74	±9.6
0633	AAC	IEEE 802.11ac WiFi (80 MHz, MCS7, 90pc dc)	WLAN	8.83	±9.6
0834	AAC	IEEE 802.11ac WIFI (80 MHz, MCS8, 90pc dc)	WLAN	8.80	+9.8
0635	AAC	IEEE 802.11ac WIFI (80 MHz, MCS9, 90pc dc)	WLAN	8.81	±9.6
0636	AAC	IEEE 802.11ac WiFi (160 MHz, MCS0, 90pc dc)	WLAN	8.83	±9.6
0637	AAC	IEEE 802.11ac WiFi (160 MHz, MCS1, 90pc do)	WLAN	8.79	±9.6
0638	AAC	IEEE 802,11ac WIFI (160 MHz, MC52, 90pc dc)	WLAN	8.86	±9.6
0638	AAC	IEEE 802.11ac WiFi (160 MHz, MCS3, 90pc dc)	WLAN	8.85	±9.6
0640	AAC	IEEE 802.11ag WIFI (160 MHz, MCS4, 90pc dq)	WLAN	8.98	±9.0
0641	AAC	IEEE 802.11ac WIFI (160 MHz, MCS5, 90pc dc)	WLAN	9.06	±9.6
0842	AAC	IEEE 802.11ac WIFI (160 MHz, MCS8, 90pc dc)	WLAN	9.06	±9.6
10643	AAC	IEEE 802.11ac WiFi (160 MHz, MCS7, 90pc dc)	WLAN	8.89	±9.6
10644	AAC	IEEE 802.11ac WFi (160 MHz, MCS8, 90pc dc)	WLAN	9.05	±9.6
10645	AAC	IEEE 802.11ac WIFI (160 MHz, MCS9, 90pc dc)	WLAN	9.11	±9.6
0846	AAC	LTE-TDD (SC-FDMA, 1 RB, 5MHz, QPSK, UL Sub-2.7)	LTE-TOD	11.96	±9.6
10647	AAC	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK, UL Sub-2,7)	LTE-TDD	11.96	±9.6
10648	AAC	CDMA2000 (1x Advanced)	CDMA2000	3.45	±8.6
10652	AAC	LTE-TDD (OFDMA, 5 MHz, E-TM 3.1, Clipping 44%)	LTE-TOD	6.91	±9.6
10653	AAC	LTE-TDD (OFDMA, 10 MHz, E-TM 3.1, Clipping 44%)	LTE-TDD	7,42	±9.6
10654	AAC	LTE-TDD (OFDMA, 15MHz, E-TM 3.1, Olipping 44%)	LTE-TOD	6.96	±9.6
10655	AAC	LTE-TDD (OFDMA, 20 MHz, E-TM 3.1, Clipping 44%)	LTE-TDD	7.21	+9.6
10658	AAC	Pulse Waveform (200 Hz. 10%)	Test	10.00	±9.6
10659	AAC	Pulse Waveform (200 Hz, 20%)	Test	6.99	±9.6
10660	AAC	Pulse Waveform (200 Hz, 40%)	Test	3.98	+9.6
10661	AAC	Puise Waveform (200 Hz. 60%)	Test	2.22	+9.6
10662	AAC	Pulse Waveform (200 Hz, 80%)	Test	0.97	±9.6
10670	AAC	Bluetooth Low Energy	Bluetooth	2.19	±9.6
10671	AAD	IEEE 802.11ax (20 MHz, MCS0, 90pc dc)	WLAN	9.09	±9.6
10672	AAD	IEEE 802.11ax (20 MHz, MCS1, 90pc dc)	WLAN	8.57	19.6
0673	AAD	IEEE 802.11ax (20MHz, MCS2, 90pc dc)	WLAN	8.78	±9.6
0674	-AAD	IEEE 802.11ax (20 MHz, MCS3, 90pc dc)	WLAN	8.74	±9.6
10675	AAD	IEEE 802.11ax (20 MHz, MCS4, 90pc dc)	WLAN	8.90	±9.6
0676	AAD	IEEE 802.11ax (20 MHz, MCSS, 90pc dc)	WLAN	8.77	±9.6
0677	AAD	IEEE 802.11ax (29 MHz, MCS6, 90pc dc)	WLAN	8.73	±9.6
0678	AAD	IEEE 802.11ax (20MHz, MOS7, 90pc dc)	WLAN	8.78	±9.6
0679	AAD	IEEE 802.11ax (20MHz, MCS8, 90pc dc)	WLAN	8.89	+9.6
10680	AAD	IEEE 802.11ax (20MHz, MCS9, 90pc dc)	WLAN	8.80	+9.6
10681	AAG	IEEE 802.11ax (20 MHz, MCS10, 90pc dc)	WLAN	8.62	±9.8
10682	AAF	IEEE 802.11ax (20MHz, MOS11, 90pc dc)	WLAN	8.83	±9.6
10683	AAA	IEEE 802.118x (20 MHz, MCS0, 99pc dc)	WLAN	8.42	+9.6
10684	AAC	IEEE 802.11ax (20 MHz, MCS1, 99pc dc)	WLAN	8.26	±9.6
	AAC	IEEE 802.11ax (20 MHz, MCS2, 99pc dc)	WLAN	8.33	19.6
10685					

Certificate No: EX-7751_Oct22 Page 17 of 22



Report No. HCT-SR-2301-FC004

EX3DV4 - SN:7751 October 07, 2022

UID	Rev	Communication System Name	Group	PAR (dB)	Unc* k =
10687	AAE	IEEE 802.11ax (20 MHz, MCS4, 99pc dc)	WLAN	8.45	+9.6
0688	AAE	IEEE 802.11ax (20 MHz, MCS5, 99pc dc)	WLAN	8.29	±9.6
0889	AAD	IEEE 802.11ax (20 MHz, MCS6, 99pc dc)	WLAN	8.55	±9.6
0690	AAE	IEEE 802.11ax (20 MHz, MCS7, 99pc dc)	WLAN	8.29	±9.6
0691	AAB	IEEE 802.11ax (20 MHz, MCS8, 99pc dc)	WLAN	8.25	19.6
0692	AAA	IEEE 802 11ax (20 MHz, MCS9, 99pc dc)	WLAN	8.29	±9.6
0693	AAA	IEEE 802 11ax (20 MHz, MCS10, 99pc dc)	WLAN	8.25	+9.6
8694	AAA	IEEE 802 11ax (20 MHz, MCS11, 99pc dc)	WLAN	8.57	19.6
0695	AAA	IEEE 802.11ax (40 MHz, MCS0, 90pc dc)	WLAN	8.78	±9.6
10696	AAA	IEEE 802.11ax (40 MHz, MCS1, 90pc dc)	WLAN	8.91	±9.6
10697	AAA	IEEE 802,11mx (40 MHz, MCS2, 90pc dc)	WLAN	8.61	±9.6
10698	AAA	IEEE 802 11ax (40 MHz, MCS3, 90pc dc)	WLAN	8.89	±9.6
10699	AAA	IEEE 802 11ax (40 MHz, MCS4, 90pc dc)	WLAN	8.82	±9.6
10700	AAA	IEEE 802.11ax (40 MHz, MCS5, 90pc dc)	WLAN	8.73	±9.6
	Annual Park Street, Section 1		WLAN	8.86	19.6
10701	AAA	SEEE 902.11ax (40 MHz, MCS6, 90pc do)	1000000		
10.702	AAA	IEEE 802.11ax (40 MHz, MCS7, 90pc dc)	WLAN	8.70	#8.6
10703	AAA	IEEE 802.11ax (40 MHz, MCS8, 90pc dc)	WLAN	8.82	±9.6
10704	AAA	IEEE 802.11ax (40 MHz, MCS9, 90pc dc)	WLAN	8.56	±9.6
10705	AAA	IEEE 802.11ax (40 MHz, MCS10, 90pc dc)	WLAN	8.69	±9.6
10706	AAC	IEEE 802.11ax (40 MHz, MCS11, 90pc dc)	WLAN	8.66	±9.6
10707	AAC	IEEE 802,11ax (40 MHz, MCS0, 99pc dc)	WLAN	8.32	±9.6
10708	AAC	IEEE 802.11ax (40 MHz, MCS1, 99pc dc)	WLAN	8.55	±9.6
10709	AAC	IEEE 802.11ax (40 MHz, MCS2, 99pc dc)	WLAN	8.33	±9.6
10710	AAC	IEEE 802.11ax (40 MHz, MCS3, 99pc dc)	WLAN	8.29	±9.6
10711	AAC	IEEE 802.11ax (40 MHz, MCS4, 99pc dc)	WLAN	8.39	±9,6
10712	AAC	IEEE 802.11ax (40 MHz, MCS5, 99pc dc)	WLAN	8:67	±9.6
10713	AAC	IEEE 802.11ax (40 MHz, MCS6, 99pc dc)	WLAN	8.33	±9.6
10714	AAC	IEEE 802,11ax (40 MHz, MCS7, 99pc dc)	WLAN	8.26	±9.6
10715	AAC	IEEE 802.11ax (40 MHz, MCS8, 98pc dc)	WLAN	8.45	±9.6
10716	AAC	IEEE 802 11ax (40 MHz, MCSB, 99pc dc)	WLAN	8.30	±9.6
10717	AAC	IEEE 802 11ax (40 MHz, MCS10, 99pc dc)	WLAN	8.48	+9.6
10718	AAG	IEEE 802.11ax (40 MHz, MCS11, 99pc dc)	WLAN	8.24	±9.6
10719	AAC	IEEE 802.11ax (80 MHz, MCS0, 90pc dd)	WLAN	8.81	±9.6
10720	AAC	IEEE 802.11ax (80 MHz, MCS1, 90pc do)	WLAN	8.87	±9.6
10721	AAC	IEEE 802.11ax (80 MHz, MCS2, 90pc dc)	WLAN	8.76	+9.6
10722	AAC	IEEE 802 11ax (80 MHz, MCS3, 90pc dc)	WLAN	8.55	±9,6
10723	AAC	IEEE 802.11ax (80 MHz, MCS4, 90pc do)	WLAN	8.70	±9.6
10724	AAC	(EEE 802.11ax (80 MHz, MCS5, 90pc dc)	WLAN	8.90	±9.6
10725	AAC	IEEE 802.11ax (80 MHz, MCS6, 90pc de)	WLAN	8.74	±9.6
10726	AAC	IEEE 802.11sx (80 MHz. MGS7, 90cc dc)	WLAN	8.72	+9.8
10727	AAC	IEEE 802.11ax (80 MHz, MCS8, 90pc dc)	WLAN	8.66	±9.6
10728	AAC	IEEE 802.11ax (80 MHz, MCS8, 90pc dc)	WLAN	8.65	±9.6
	AAC		WLAN	8.64	±9.6
10729	100000	IEEE 802.11ax (80 MHz, MCS10, 90gc dc)	100000000000000000000000000000000000000	307.5	
10730	AAC	IEEE 802.11ex (80 MHz, MCS11, 90pc dc)	WLAN	8.67	±9.6
10731	AAC	IEEE 802.11ax (90MHz, MCS0, 99pc dc)	WLAN	8.42	±9.6
10732	AAC	IEEE 802.11ax (80 MHz, MCS1, 99pc dc)	WLAN	8.46	#9.6
10733	AAC	IEEE 802.11ax (80 MHz, MCS2, 99pc dc)	WLAN	8.40	±9.0
10734	AAC	IEEE 802,11ax (80 MHz, MGS3, 99pc dc)	WLAN	8.25	29.6
10735	AAC	IEEE 802.11ax (80 MHz, MCS4, 99pc dc)	WLAN	8.33	±9.6
10736	AAC	IEEE 802.11ax (80 MHz, MCS5, 99pc do)	WLAN	8.27	+9.6
10737	AAC	IEEE 802.11ax (80 MHz, MCS6, 99pc dc)	WLAN	8.36	±9.6
10738	AAC	IEEE 802.11ax (80 MHz, MCS7, 99pc dc)	WLAN	8.42	±9.8
10739	AAC	IEEE 802.11ax (80 MHz, MCS8, 99pc dc)	WLAN	8.29	±9.6
10740	AAC	IEEE 802.11ax (80 MHz, MCS9, 99pc dc)	WLAN	8.48	±9.6
10741	AAC	IEEE 802.11ax (86 MHz, MCS10, 99pc dc)	WLAN	8.40	29.6
10742	AAC	IEEE 802.11ax (80 MHz, MCS11, 99pc dc)	WLAN	8.43	±9.6
10743	AAC	IEEE 802.11ax (160 MHz, MCS0, 90pc dc)	WLAN	8.94	±9.6
10744	AAC	IEEE 802.11ax (160 MHz, MCS1, 90pc dc)	WLAN	9.16	±9.6
10745		IEEE 802.11ax (160 MHz, MCS2, 90pc dc)	WLAN	8.93	±9.6
10746	-	IEEE 802.11ax (180 MHz, MCS3, 90pc dc)	WLAN	9,11	±9.8
10747		IEEE 802.11ax (180 MHz, MCS4, 90pc dc)	WLAN	9:04	±9.6
10748		IEEE 802.11ax (160 MHz, MCS5, 90pc dc)	WLAN	8.93	±5.6
10749		IEEE 802.11ax (160 MHz, MCS6, 90pc dc)	WLAN	8.90	±9.6
10750	_	IEEE 802.11ax (160 MHz, MCS7, 90pc dc)	WLAN	8.79	±9.6
10751	AAC	IEEE 802.11ax (160 MHz, MCS8, 90pc do)	WLAN	8.82	±9.6
100 (100)	AAC	IEEE 802.11ax (160 MHz, MCS9, 90pc do)	WLAN	8.81	±9.6

Certificate No: EX-7751_Oct22

Page 18 of 22





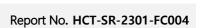
Report No. HCT-SR-2301-FC004

EX3DV4 - SN:7751 October 07, 2022

UID	Rev	Communication System Name	Group	PAR (dB)	Unc ^E k =
10.753	AAC	IEEE 802.11ax (160 MHz, MCS10, 90pc dc)	WLAN	9.00	±9.8
10754	AAC	IEEE 802.11ax (160 MHz, MCS11, 90pc dc)	WLAN	8.94	±9.6
0755	AAC	IEEE 802.11ax (160 MHz, MCS0, 99pc dc)	WLAN	8.64	±9.6
0.756	AAC	IEEE 802.11ax (160 MHz, MCS1, 99pc dc)	WLAN	8.77	±9.6
0757	AAC	IEEE 802.11ax (160 MHz, MCS2, 99pc dc)	WLAN .	8.77	±9.6
0758	AAC	IEEE 802.11ax (160 MHz, MCS3, 99pp dc)	WLAN	8.69	±9.6
0759	AAC	IEEE 802.11ax (160 MHz, MCS4, 99pc dc)	WLAN	8.58	±9.6
0760	AAC	IEEE 802,11ax (160 MHz, MCS5, 99pc dc)	WLAN	8.48	±9.6
0761	AAC	IEEE 802 11ax (160 MHz, MCS6, 99pc dc)	WLAN	8.58	±9.6
0762	AAC	IEEE 802.11ax (160 MHz, MCS7, 98pc dc)	WLAN	8.49	±9.6
0763	AAG	IEEE 802.11ax (180 MHz, MCS8, 99pc dc)	WLAN	8.53	±9.6
0784	AAC	IEEE 802.11ax (180 MHz, MCS9, 99pc dc)	WLAN	8.54	±9.6
0765	AAC	IEEE 802.11ax (160 MHz, MCS10, 99pc dc)	WLAN	8.54	±9.6
0766	AAC	IEEE 802.11ax (160 MHz, MCS11, 99pc dc)	WLAN	8.51	±9.6
0767	AAC	5G NR (CP-OFDM, 1 RB, 5MHz, QPSK, 15 kHz)	5G NR FR1 TDD	7.99	±9.8
0768	AAC	5G NR (CP-OFDM, 1 RB, 10MHz, QPSK, 15 kHz)	5G NR FR1 TDO	8.01	±9.6
0.788	AAC	5G NR (CP-OFDM, 1 RB, 15MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.01	±9.6
0.770	AAC	5G NR (CP-OFDM, 1 RB, 20 MHz, QPSK, 15 kHz)	5G NR FR1 TOO	8.02	±9.6
0778	AAC		and the second s	100000	
0772	AAC	5G NR (CP-OFDM, 1 RB, 25 MHz, QPSK, 15 kHz)	5G NA FR1 TOD	8.02	±9.6
a tida ina	400000	SG NR (CP-OFDM, 1 RB, 30MHz, QPSK, 15 kHz)	5G NR FR1 TOD	8.23	±9.6
0.773	AAG	5G NR (CP-OFDM, 1 RB, 40MHz, QPSK, 15 kHz)	5G NR FR1 TOD	8.03	±9.6
0.774	AAC	5G NR (CP-OFDM, 1 RB, 50MHz, OPSK, 15 kHz)	5G NR FR1 TDD	8.02	±9.6
0775	AAC	5G NR (CP-OFDM, 50% RB, 5 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.31	±9.6
0776	AAG	5G NR (CP-OFDM, 50% RB, 10 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.30	±9.6
0777	AAC	53 NR (CP-OFDM, 50% R8, 15 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.30	±9.6
0778	AAC	5G NR (CP-OFDM, 50% RB, 20 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.34	±9.8
0779	AAC	5G NR (CP-OFDM, 50% RB, 25 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.42	±9.6
0780	AAC	5G NR (CP-OFDM, 50% RB, 30 MHz, QPSK, 15 kHz)	53 NR FR1 TDD	8.38	±9.6
0781	AAC	5G NR (CP-OFDM, 50% RB, 40 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.38	±8.6
0782	AAC	5G NR (CP-OFDM, 50% RB, 50 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.43	19.5
0783	AAC	5G NR (CP-OFDM, 100% RB, 5MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.31	±9.6
10784	AAC	5G NR (CP-OFDM, 100% RB, 10 MHz, QPSK, 15 kHz)	5G NR FR1 TOD	8.29	±8.6
10785	AAC	5G NR (CP-OFDM, 100% RB, 15MHz, QPSK, 15 kHz)	5G NA FR1 TDD	8.40	±9.6
0786	AAC	5G NR (CP-OFDM, 100% RB, 20 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.35	19.6
10787	AAC	5G NR (CP-OFDM, 100% RB, 25 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.44	±9.6
10788	AAC	5G NR (CP-OFDM, 100% RB, 30 MHz, QPSK, 15 kHz)	53 NR FR1 TDD	8.39	±9.6
10789	AAC	5G NR (CP-OFDM, 100% RB, 40 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.37	±9.6
10790	AAC	5G NR (CP-OFDM, 100%, RB, 50 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.39	±9.6
0.791	AAC	5G NR (CP-OFDM, 1 RB, 5 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.83	±9.6
0792	AAC	5G NR (CP-OFDM, 1 RB, 10 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.92	±9.6
0793	AAC	50 NR (CP-OFDM, 1 RB, 15 MHz, OPSK, 30 kHz)	5G NR FR1 TDD	7.95	19.5
0794	AAC	5G NR (CP-OFDM, 1 RB, 20 MHz, QPSK, 30 kHz)	53 NR FR1 TDD	7.82	±9.8
0795	AAC	9G NR (CP-OFDM, 1 RB, 25 MHz, QPSK, 30 kHz)	53 NR FR1 TDD	7.84	±9.6
10796	AAD	5G NR (CP-OFDM, 1 RB, 30 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.82	±9.6
10797	AAC	5G NR (CP-OFDM, 1 RB, 40 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.01	19.6
10798	AAC	5G NR (CP-OFDM, 1 RB, 50 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.89	±9.6
10799	AAC	5G NR (CP-OFDM, 1 RB, 60 MHz, CPSK, 30 kHz)	5G NR FR1 TDD	7.93	±9.6
0801	AAC	5G NR (CP-OFDM, 1 RB, 80 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.89	19.6
0802	AAC	55 NR (CP-OFDM, 1 RB, 90 MHz, CPSK, 30 kHz)	5G NR FR1 TDD	7.87	19.6
0803	AAE	5G NR (CP-OFDM, 1 RB, 100 MHz, CPSK, 30 kHz)	5G NR FR1 TDD	7.93	±9.6
0805	AAD	5G NR (CP-OFDM, 1 HB, 10 MHz, GPSK, 30 kHz)	50 NR FR1 TDD	8.34	±9.6
0806	AAD	5G NR (CP-OFDM, 50% RB, 15MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.37	+9.6
0809	AAD	50 NR (CP-OFDM, 50% RB, 30MHz, CPSK, 30 KHz)	5G NR FR1 TDD	8.34	
0.810	AAD	5G NR (CP-OFDM, 50% RB, 40 MHz, CPSK, 30 kHz)		200,000	±9.6
0812	AAD	5G NR (CP-OFDM, 50% RB, 40MHz, QPSK, 30 kHz) 5G NR (CP-OFDM, 50% RB, 60MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.34	±9.6
0817	AAD		5G NR FR1 TDD	8.35	±9.6
345		5G NR (CP-OFDM, 100% RB, 5MHz, QPSK, 30 kHz)	Contract of the Contract of th	8.35	±9.6
0818	AAD	5G NR (CP-OFDM, 100% RB, 10MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.34	±9.6
0819	AAD	5G NR (CP-OFDM, 100% RB, 15MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.33	±9.6
0820	AAD	5G NR (CP-OFDM, 100% RB, 20MHz, QPSK, 30 kHz)	50 NR FR1 T0D	8.30	±9.6
0821	AAC	53 NR (CP-OFDM, 100% RB, 25 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.41	19.6
10822	AAD	5G NR (CP-OFDM, 100% R8, 30 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.41	±9.8
10823	AAC	5G NR (CP-OFDM, 100% RB, 40 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.38	±9.6
0824	AAD	5G NR (CP-OFDM, 100% RB, 50 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.39	19.6
0825	DAA	53 NR (CP-OFDM, 100% RB, 60 MHz, QPSK, 30 kHz)	5G NA FR1 TOD	8.41	19.8
10827	AAD	5G NR (CP-OFDM, 100% RB, 80 MHz, QPSK, 30 kHz)	5G NA FR1 TOD	8.42	±9.8
6590	AAE	5G NR (CP-OFDM, 100% RB, 80 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.43	±9.6

Certificate No: EX-7751_Oct22

Page 19 of 22



October 07, 2022

비

CUSTOMER SECRET



EX3DV4 - SN:7751

UID	Rev	Communication System Name	Group	PAR (dB)	UncE k = 2
10829	AAD	5G NR (CP-OFDM, 100% RB, 100 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.40	±9.6
10830	AAD	5G NR (CP-OFDM, 1 RB, 10 MHz, QPSK, 60 kHz)	53 NR FR1 TDD	7.63	19.6
10831	AAD	5G NR (CP-OFDM, 1 RB, 15MHz, QPSK, 60 kHz)	5G NR FR1 TDD	7.73	±9.6
10832	AAD	9G NR (CP-OFDM, 1 RB, 20 MHz, OPSK, 60 kHz)	5G NR FR1 TDD	7.74	19.6
0833	AAD	SG NR (CP-OFDM, 1 RB, 25 MHz, QPSK, 80 kHz)	5G NR FR1 TDD	7,70	±9.6
10834	AAD	50 NR (CP-OFDM, 1 RB, 30 MHz, QPSK, 60 kHz)	50 NR FR1 TDD	7.75	±9.6
10835	AAD	5G NR (CP-OFDM, 1 RB, 40 MHz, QPSK, 60 kHz)	5G NA FA1 TOD	7.70	±9.6
0836	AAE	5G NR (CP-OFDM, 1 RB, 50 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	7.66	±9.6
10837	AAD	5G NR (CP-OFDM, 1 RB, 80 MHz, CIPSK, 80 kHz)	50 NR FR1 TDD	7.68	±9.6
10839	AAD	5G NR (CP-OFDM, 1 RB, 80 MHz, QPSK, 80 kHz)	5G NR FR1 TDD	7.70	±9.6
10840	AAD	9G NR (CP-OFDM, 1 RB, 90 MHz, QPSK, 80 kHz)	5G NR FR1 TDD	7.57	19.6
10841	AAD	5G NR (CP-OFDM, 1 RB, 100 MHz, QPSK, 80 kHz)	5G NR FR1 TDD	7.71	±9.8
0843	AAD	5G NR (CP-OFDM, 50% RB, 15MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.49	±9.6
0844	AAD	5G NR (CP-OFDM, 50% RB, 20MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.34	±9.6
10845	AAD	5G NR (CP-OFDM, 50% RB, 30 MHz, QPSK, 60 kHz)	50 NR FR1 TDD	8.41	±9.6
0854	AAD	5G NR (CP-OFDM, 100% RB, 10 MHz, QPSK, 60 kHz)	5G NA FA1 TOO	8.34	±9.6
0855	AAD	5G NR (CP-OFDM, 100% RB, 15MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.36	±9.6
0856	AAD	5G NR (CP-OFDM, 100% RB, 20 MHz, QPSK, 60 kHz)	5G NR FR1 TOD	8,37	±9.6
0857	AAD	5G NR (CP-OFDM, 100% RB, 25MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.35	±9.6
0858	AAD	5G NR (CP-OFDM, 100% RB, 30 MHz, QPSK, 60 kHz)	5G NR FR1 TDO	8.36	±9.6
0859	AAD)	5G NR (CP-OFDM, 100% RB, 40 MHz, QPSK, 80 kHz)	5G NR FR1 TDD	8.34	±9.6
0880	AAD	SG NR (CP-OFDM, 100% RB, 50 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.41	±9.6
10861	AAD	5G NR (CP-OFDM, 100% RB, 80 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.40	±9.6
0863	AAD	5G NR (CP-OFDM, 100% RB, 80 MHz, QPSK, 80 kHz)	5G NR FRI TOD	8.41	±9.6
0864	AAE	5G NR (CP-OFDM, 100% RB, 90 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.37	±9.6
10865	AAD	SG NR (CP-OFDM, 100% RB, 100 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.41	±9.6
0.666	AAD	5G NR (DFT:s-OFDM, 1 RB, 100 MHz, QPSK, 30 kHz)	5G NA FRI TOD	5,68	±9.6
9990	AAD	5G NR (DFT-s-OFDM, 100% RB, 100 MHz, QPSK, 30 kHz)	5G NR FR1 TOD	5.89	±9.6
0869	AAD	5G NR (DFT-s-OFDM, 1 RB, 100 MHz, QPSK, 120 kHz)	5G NR FR2 TOD	5.75	±9.6
0870	AAD	5G NR (DFT-s-OFDM, 100% RB, 100 MHz, QPSK, 120 kHz)	5G NR FR2 TOD	5.86	±9.6
0871	AAD	5G NR (DFT-s-OFDM, 1 RE. 100 MHz, 16QAM, 120 kHz)	5G NA FR2 TOD	5.75	±9.6
0872	AAD	5G NR (DFT-s-OFDM, 100% RB, 100 MHz, 16QAM, 120 kHz)	5G NR FR2 TOD	8.52	±9.6
0873	AAD	5G NR (DFTs-OFDM, 1 RB, 100 MHz, 64QAM, 120 kHz)	5G NR FR2 TOD	6.61	±9.6
0874	AAD	5G NR (DFT-s-OFDM, 100% RB, 100 MHz, 64QAM, 120 HHz)	5G NA FR2 TOD	6,65	±9.6
10875	AAD	5G NR (CP-OFDM, 1 RB, 100 MHz, QPSK, 120 kHz)	5G NR FR2 TOD	7.78	±9.6
10876	AAD	5G NR (CP-OFDM, 100% RB, 100 MHz, QPSK, 120 KHz)	5G NR FR2 TDD	8.39	±9.6
10877	AAD	5G NR (CP-QFDM, 1 RB, 100 MHz, 16QAM, 120 kHz)	50 NR FR2 TOD	7,95	±9.6
15878	AAD	5G NR (CP-OFDM, 100% RB, 100 MHz, 16QAM, 120 kHz)	5G NA FR2 TOD	8.41	±9.6
10879	AAD	5G NR (CP-OFDM, 1 RB, 100 MHz, 54QAM, 120 kHz)	5G NR FR2 TOD	8.12	±9.6
10880	AAD	5G NR (CP-OFDM, 100% RB, 100 MHz, 64QAM, 120 kHz)	5G NR FR2 TOD	8.38	±9.6
10881	AAD	5G NR (DFT-e-OFDM, 1 RB, 50 MHz, QPSK, 120 kHz)	5G NR FR2 TDD	5.75	±9,6
10882	AAD	5G NR (DFT-e-OFDM, 100% RB, 50 MHz, QPSK, 120 kHz)	5G NR FR2 TDD	5.96	±9.6
10883	AAD	5G NR (DFT-e-OFDM, 1 RB, 50 MHz, 16QAM, 120 kHz)	SG NR FR2 TDD	6.57	±9.6
0884	AAD	5G NR (DFT:s-OFDM, 100% RB, 50 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	6,63	±9.6
0.685	AAD	SG NR (DFT-s-OFDM, 1 RB, 50MHz, 64QAM, 120 kHz)	5G NA FR2 TDD	6.61	±9.6
0886	AAD	SG NR (DFT-s-OFDM, 100% RB, 50 MHz, 64QAM, 120 kHz)	5G NR FR2 TDD	6.65	±9.6
0887	AAD	5G NR (CP-OFDM, 1 RB, 50MHz, QPSK, 120 kHz)	5G NR FR2 TDO	7.78	±9.6
88801	AAD	5G NR (CP-OFDM, 100% RB, 50 MHz, QPSK, 120 kHz)	50 NR FR2 TDD	8.35	±9.6
0889	AAD	5G NR (CP-OFDM, 1 RB, 50 MHz, 16QAM, 120 kHz)	50 NR FR2 TD0	0.02	±9.6
0890	AAD	5G NR (CP-OFDM, 100% RB, 50 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	8.40	±9.6
0891	AAD	5G NR (CP-OFDM, 1 RB, 50 MHz, 64QAM, 120 kHz)	5G NR FR2 TOD	B.13	±9.6
0892	AAD	5G NR (CP-OFDM, 100% RB, 50 MHz, 64QAM, 120 kHz)	SG NR FR2 TOD	8.41	±9.0
0897	AAD	5G NR (DFT-6-OFDM, 1 RB, 5 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.66	±9.6
0898	AAD	5G NR (DFT-s-OFDM, 1 RB, 10 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.67	±9.6
0899	AAD	5G NR (DFT-s-OFDM, 1 RB, 15 MHz, QPSK, 30 kHz)	5G NR FR1 TOD	5.87	±9,6
0900	AAD	5G NR (DFTs-OFDM, 1 RB, 20MHz, QPSK, 30 kHz)	5G NR FR1 TOD	5.68	±9.6
0501	AAD	5G NR (DFT+s-OFDM, 1 RB, 25 MHz, QPSK, 30 kHz)	5G NR FR1 TOD	5.68	±9.6
0902	AAD	SG NR (DFT-a-OFDM, 1 RB, 30 MHz, QPSK, 30 kHz)	5G NR FR1 TOD	5,68	±9.6
0903	AAD	5G NR (DFT-s-OFDM, 1 RB, 40 MHz, QPSK, 30 kHz)	5G NA FR1 TDD	5.88	±9.6
0904	AAD	5G NR (DFT-s-OFDM, 1 RB, 50 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.68	±9.6
0905	AAD	SG NR (DFTs-OFDM, 1 RB, 60MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.68	±9.6
0906	AAD	5G NR (DFT-s-OFDM, 1 RB, 80 MHz, QPSK, 30 kHz)	5G NR FR1 TDO	5.68	±9.6
0.907	AAD	5G NR (DFT-s-OFDM, 50% RB, 5 MHz, QPSK, 30 kHz)	5G NR FR1 TOO	5.78	±9.6
8000	AAD	5G NR (DFT-s-OFDM, 50% RB, 10 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.93	±9.6
0909	AAD	5G NR (DFTs-OFDM, 50% RB, 15 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.96	±9.8
0910	AAD	5G NR (DFT-e-OFDM, 50% RB, 29 MHz, QPSK, 30 kHz)	5G NA FR1 TDD	5.83	±9.6

Certificate No: EX-7751_Oct22

Page 20 of 22



CUSTOMER SECRET



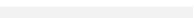
EX3DV4 - SN:7751

October 07, 2022

UID	Rev	Communication System Name	Group	PAR (dB)	Unc ^E k =
10911	AAD	5G NR (DFT-s-OFDM, 50% RB, 25 MHz, QPSK, 30 kHz)	50 NR FR1 TDD	5,93	±9.6
10912	AAD	SG NR (DFT-s-OFDM, 50% RB, 30 MHz, QPSK, 30 kHz)	5G NA FR1 TOD	5.84	±9.6
10913	CAA	5G NR (DFT-6-OFDM, 50% RB, 40 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.84	±9,6
0914	AAD	5G NR (DFT-s-OFDM, 50% RB, 50 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5,85	±9.6
0915	AAD	5G NR (DFT-s-OFDM, 50% RB, 80 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5,83	±9.6
0916	AAD	5G NR (DFT-9-OFDM, 50% RB, 80 MHz, QPSK, 30 kHz)	5G NR FR1 TOD	5.87	±9.6
0917	CIAA	5G NR (DFT-s-OFDM, 50% RB, 100 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.94	±9.6
0918	AAD	5G NR (DFTs-OFDM, 100% RB, 5MHz, QPSK, 30 kHz)	5G NR FR1 TOD	5.86	±9.6
0919	AAD	5G NR (DFT-s-OFDM, 100% RB, 10 MHz, QPSK, 30 kHz)	5G NR FR1 TOD	5.88	±9.6
0920	AAD	5G NR (DFT-s-OFDM, 100% RB, 15 MHz, QPSK, 30 kHz)	5G NA FR1 TDD	5.87	±9.6
0921	AAD	5G NR (DFT-s-OFDM, 100% RB, 20 MHz, QPSK, 30 kHz)	5G NR FR1 TDO	5.84	±9.6
0922	AAD	5G NR (DFT-s-OFDM, 100% RB, 25MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.82	±9.6
0823	AAD	5G NR (DFT-e-OFDM, 100% RB, 30 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.84	#9.6
0924	CAA	5G NR (DFT-s-OFDM, 100% RB, 40 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.84	±9.6
0925	AAD	5G NR (DFT-s-OFDM, 100% RB, 50 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.95	±9.6
0926	AAD	5G NR (DFT-s-OFDM, 100% RB, 60 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.84	±9.6
0927	AAD		The other Lates and the Personal Control		
ne limination	market and an artist	5G NR (DFT-s-OFDM, 100% RB, 80 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.94	±9.6
0928	AAD	5G NR (DFT-e-OFDM, 1 RB, 5MHz, QPSK, 15 kHz)	5G NR FR1 FOD	5.52	±9.8
0.959	AAD	SG NR (DFT-s-OFDM, 1 R8, 10 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.52	±9.6
0930	AAD	5G NR (DFT-s-OFDM, 1 RB, 15MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.52	±9.6
0931	AAD	5G NR (DFT-s-OFDM, 1 RB, 20MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.51	±9:6
0932	AAB	SG NR (DFT-e-OFDM, 1 RB, 25MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.51	±9.6
0933	AAA	5G NR (DFT-8-OFDM, 1 RB, 30 MHz, QPSK, 15 kHz)	5G NA FR1 FDD	5.51	±9.6
0934	AAA	SG NR (DFT-s-OFDM, 1 RB, 40MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.51	±9:6
0935	AAA	SG NR (DFT-s-OFDM, 1 RB, 50 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5,51	±9.6
0936	AAC	5G NR (DFT-e-OFDM, 50% RB, 5 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.90	±9.8
0937	AAB	5G NR (DFT-s-OFDM, 50% RB, 10 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.77	±9.6
0938	AAB	5G NR (DFT-s-OFDM, 50% RB, 15 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.90	±9.6
0939	AAB	5G NR (DFTs-OFDM, 50% RB, 20 MHz, QPSK, 15 kHz)	5G NR FR1 FD0	5.82	±9.6
0940	AAB	5G NR (DFT-s-OFDM, 50% RB, 25 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.89	±9.6
0941	AAB	5G NR (DFT-s-OFDM, 50% RB, 30 MHz, QPSK, 15 kHz)	5G NR FR1 FOD	5.83	±9.6
0942	AAB	5G NR (DFT-s-OFDM, 50% RB, 40 MHz, OPSK, 15 kHz)	50 NR FR1 FDD	5.85	±9.6
0943	AAB	9G NR (DFT-s-OFDM, 50% RB, 50 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.95	±9.6
0944	AAB	5G NR (DFT-s-OFDM, 100% RB, 5MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.81	±9.6
0945	AAB	5G NR (DFT-s-OFDM, 100% RB, 18 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.85	±9.6
0946	AAC	5G NR (DFT-s-OFDM, 100% RB, 15 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.83	±9.6
0847	AAB	5G NR (DFTs-OFDM, 100% RB, 20 MHz, OPSK, 15 kHz)	5G NA FRI FOD	5.87	
0948	AAB	5G NR (DFT-6-OFDM, 100% RB, 25 MHz, QPSK, 15 kHz)	The state of the s	5.94	±9.6
0949	AAB	5G NR (DFT-s-OFDM, 100% RB, 30 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	1000	±9.6
0950	AAB		5G NR FR1 FDD	5,87	±9.6
	_	5G NR (DFT-s-OFDM, 100% RB, 40 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.94	±9.8
0961	AAB	SG NR (DFT-s-OFDM, 100% RB, 50 MHz, QPSK, 15 kHz)	50 NR FR1 FDD	5,92	±9.6
0892	AAB	SG NR DL (CP-OFDM, TM 3.1, 5 MHz, 64-QAM, 15 kHz)	5G NR FR1 FD0	8.25	±9.fr
0953	AAB	5G NR DL (CP-OFOM, TM 3.1, 10 MHz, 64-QAM, 15 kHz)	5G NR FR1 FOD	8.15	±9.6
0954	AAB	5G NR DL (CP-OFDM, TM 3.1, 15 MHz, 64-QAM, 15 kHz)	5G NR FR1 FDD	8.23	±9.6
0955	AAB	5G NR DL (CP-OFDM, TM 3.1, 20 MHz, 64-QAM, 15 kHz)	5G NR FR1 FDD	8.42	±9.6
0956	AAB	5G NR DL (CP-OFOM, TM 3.1, 5 MHz, 84-QAM, 30 kHz)	5G NR FR1 FDO	8.14	±9.6
0957	AAC	5G NR DL (CP-OFDM, TM 3.1, 10 MHz, 64-QAM, 30 kHz)	5G NR FR1 FDD	8.31	±9.6
0.958	AAB	5G NR DL (CP-OFDM, TM 3.1, 15 MHz, 64-QAM, 30 kHz)	5G NR FR1 FDD	8.61	±9.6
0959	AAB	5G NR DL (CP-OFDM, TM 3.1, 20 MHz, 64-QAM, 30 kHz)	5G NR FR1 FDO	8.33	±9.6
0960	AAB	5G NR DL (CP-OFDM, TM 3.1, 5 MHz, 84-QAM, 15 kHz)	5G NR FR1 TDD	9.32	±9.6
0961	AAB	5G NR DL (CP-OFDM, TM 3.1, 10 MHz, 64-QAM, 15 kHz)	5G NR FR1 TDD	9.36	±9.6
0962	AAB	5G NR DL (CP-OFDM, TM 3.1, 15 MHz, 64-QAM, 15 kHz)	5G NR FR1 TDD	9.40	±9.6
0963	AAB	5G NR.DL (CP-OFDM, TM 3.1, 20 MHz, 64-QAM, 15 kHz)	5G NR FR1 TDD	9.55	±9.6
0964	AAB	5G NR DL (CP-OFDM, TM 3.1, 5 MHz, 64-QAM, 30 kHz)	5G NR FR1 TDD	9.29	±9.6
0965	AAS	5G NR DL (CP-OFDM, TM 3.1, 10 MHz, 64-QAM, 30 kHz)	5G NR FR1 TDD	9.37	±9.6
0966	AAB	5G NR DL (CP-OFDM, TM 3.1, 15MHz, 54-QAM, 30 kHz)	5G NR FR1 TDD	9.55	±9.6
0967	AAB	SG NR DL (CP-OFDM, TM 3.1, 20 MHz, 64-QAM, 30 kHz)	5G NR FR1 TDD	9.42	±9.6
0968	AAS	5G NR DL (CP-OFDM, TM 3.1, 100 MHz, 84-QAM, 30 kHz)	5G NR FR1 TDD	9.49	29.6
0972	AAB	5G NR (OP-OFDM, 1 RB, 20 MHz, QPSK, 15 kHz)	The state of the s		
0973	AAB	5G NR (DFT-s-OFDM, 1 RB, 100 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	11.59	±9.6
0974	AAB	5G NR (CP-OFDM, 100% RB, 100 MHz, QFSK, 30 KHz)	5G NR FR1 TDD	9.06	±9.6
	and the last of the last	A STATE OF THE PROPERTY OF THE	5G NR FR1 TDD	10,28	±9.8
0978	AAA	ULLA BDR	ULEA	2.23	±9.6
0979	AAA	ULLA HDR4	ULLA	7.02	±9.6
0980	AAA	ULLA HDRII	ULLA	8.82	±9.6
0981	AAA.	ULLA HDRp4	ULLA	1.50	±9.5
0982	AAA	ULLA HDRp8	ULLA	1,64	19.6

Certificate No: EX-7751_Oct22

Page 21 of 22



CUSTOMER SECRET



Report No. HCT-SR-2301-FC004

EX3DV4 - SN:7751

October 07, 2022

UID	Rev	Communication System Name	Group	PAR (dB)	Unc ^E k = 2
10983	AAA	5G NR DL (CP-OFDM, TM 3.1, 40 MHz, 64 QAM, 15 kHz)	5G NR FR1 TDD:	9.31	±9.6
10984	AAA	5G NR DL (CP-OFDM, TM 3.1, 50 MHz, 64-QAM, 15 kHz)	50 NR FR1 TDD	9.42	±9.6
10985	AAA	5G NR DL (CP-OFDM, TM 3.1, 40 MHz, 64-QAM, 30 kHz)	5G NR FR1 TDD	9.54	19.6
10986	AAA	5G NR DL (CP-OFDM, TM 3.1, 50 MHz, 64-QAM, 30 kHz)	5G NR FR1 TDD	9.50	±9.6
10987	AAA	5G NR DL (CP-OFDM, TM 3.1, 60 MHz, 64-QAM, 30 kHz)	53 NR FR1 TDD	9.53	±9.6
10988	AAA	5G NR DL (CP-OFDM, TM 3.1, 70 MHz, 64-QAM, 30 kHz)	5G NR FR1 TDD	9.38	±9.5
10989	AAA	5G NR DL (CP-OFDM, TM 3.1, 80 MHz, 64-QAM, 30 kHz)	5G NR FR1 TDD	9.33	19.6
10990	:AAA	5G NR DL (CP-OFDM, TM 3.1, 90 MHz, 64-QAM, 30 kHz)	5G NR FR1 TDD	9.52	±9.6

E Uncertainty is determined using the max, deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

고 객 비 밀 CUSTOMER SECRET





Attachment 6. – Dipole Calibration Data

Page 113 of 131 F-TP22-03 (Rev. 04)



CUSTOMER SECRET



Calibration Laboratory of Schmid & Partner Engineering AG Zeughausstrasse 43, 8004 Zurich, Switzerland





S Schweizerischer Kallbrierdienst
C Service suisse d'étalonnage
Servizio avizzero di taratura
Swiss Calibration Service

Accreditation No.: SCS 0108

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Multilateral Agreement for the recognition of calibration certificate:

Client HCT (Dymstec)

Certificate No: D835V2-441_Jul22

CALIBRATION CERTIFICATE D835V2 - SN:441 Calibration procedure(s) QA-CAL-05.v11 Calibration Procedure for SAR Validation Sources between 0.7-3 GHz Calibration date: July 15, 2022 This calibration certificate documents the traceability to national standards, which resize the physical units of measurements (SI). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate. All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%. Calibration Equipment used (M&TE critical for calibration) Primary Standards ID# Cal Date (Certificate No.) Scheduled Calibration Power meter NRP SN: 104778 04-Apr-22 (No. 217-03525/03524) Apr-23 Power sensor NRP-291 SN: 103244 04-Apr-22 (No. 217-03524) Apr-23 Power sensor NRP-Z91 SN: 103245 04-Apr-22 (No. 217-03525) Apr-23 Reference 20 dB Attenuator SN: BH9394 (20k) 04-Apr-22 (No. 217-03527) Apr-23 Type-N mismatch combination SN: 310982 / 06327 04-Apr-22 (No. 217-03528) Apr-23 Reference Probe EX3DV4 SN: 7349 31-Dec-21 (No. EX3-7349_Dec21) Dec-22 DAE4 SN: 601 02-May-22 (No. DAE4-601_May22) May-23 Secondary Standards ID 6 Check Date (in house) Scheduled Check Power meter E4419B SN: GB39512475 30-Oct-14 (In house check Oct-20) In house check: Oct-22 Power sensor HP 8481A SN: US37292783 07-Oct-15 (in house check Oct-20) In house check: Oct-22 Power sensor HP 8481A SN: MY41093315 07-Oct-15 (In house check Oct-20) In house check: Oct-22 RF generator RAS SMT-08 SN: 100972 15-Jun-15 (in house check Oct-20) In house check: Oct-22 Network Analyzer Agilent E8358A SN: US41080477 31-Mar-14 (in house check Oct-20) In house check: Oct-22 Calibrated by: Aldonia Georgiadou Laboratory Technician Approved by: Swen Kühn Technical Manager Issued: July 25, 2022 This calibration certificate shall not be reproduced except in full without written approval "땀 당 자 (p - (g Certificate No: D835V2-441_Jul22 Page 1 of 6 ひレノがなり 재 15/6/6

F-TP22-03 (Rev. 04) Page 114 of 131



Report No. HCT-SR-2301-FC004

Calibration Laboratory of Schmid & Partner Engineering AG Zeughausstrasse 43, 8004 Zurich, Switzerland





S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
Servizio svizzero di taratura
Swiss Calibration Service

Accreditation No.: SCS 0108

Accredited by the Swiss Accreditation Service (SAS)

The Swiss Accreditation Service is one of the signatories to the EA

Multilateral Agreement for the recognition of calibration certificates

Glossary:

TSL tissue simulating liquid

ConvF sensitivity in TSL / NORM x,y,z N/A not applicable or not measured

Calibration is Performed According to the Following Standards:

- a) IEC/IEEE 62209-1528, "Measurement Procedure For The Assessment Of Specific Absorption Rate Of Human Exposure To Radio Frequency Fields From Hand-Held And Body-Worn Wireless Communication Devices - Part 1528: Human Models, Instrumentation And Procedures (Frequency Range of 4 MHz to 10 GHz)", October 2020.
- b) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

c) DASY System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions: Further details are available from the Validation Report at the end
 of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL: The source is mounted in a touch configuration below the center marking of the flat phantom.
- Return Loss: This parameter is measured with the source positioned under the liquid filled phantom (as described in the measurement condition clause). The Return Loss ensures low reflected power, No uncertainty required.
- SAR measured: SAR measured at the stated antenna input power.
- SAR normalized: SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters: The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Certificate No: D835V2-441_Jul22

Page 2 of 6

CUSTOMER SECRET





Measurement Conditions

DASY Version	DASY52	V52.10.4
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	835 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	41.5	0.90 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	40:3 ± 6 %	0.93 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	-	-

SAR result with Head TSL

SAR averaged over 1 cm ² (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.51 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	9.73 W/kg ± 17.0 % (k=2)

SAR averaged over 10 cm3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.62 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	6.33 W/kg ± 16.5 % (k=2)

CUSTOMER SECRET





Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	52.4 Ω + 5.5 jΩ
Return Loss	- 24.7 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.372 ns

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG

Certificate No: DB35V2-441 Jul22

Page 4 of 6

F-TP22-03 (Rev. 04) Page 117 of 131

CUSTOMER SECRET





DASY5 Validation Report for Head TSL

Date: 15.07.2022

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:441

Communication System: UID 0 - CW; Frequency: 835 MHz

Medium parameters used: f = 835 MHz; $\sigma = 0.93$ S/m; $\epsilon_c = 40.3$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 SN7349; ConvF(9.69, 9.69, 9.69) @ 835 MHz; Calibrated: 31.12.2021
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 02.05.2022
- Phantom: Flat Phantom 4.9 (front); Type: QD 00L P49 AA; Serial: 1001
- DASY52 52.10.4(1535); SEMCAD X 14.6.14(7501)

Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 64.34 V/m; Power Drift = -0.01 dB Peak SAR (extrapolated) = 3.83 W/kg

SAR(1 g) = 2.51 W/kg; SAR(10 g) = 1.62 W/kg

Smallest distance from peaks to all points 3 dB below = 16 mm

Ratio of SAR at M2 to SAR at M1 = 65.4% Maximum value of SAR (measured) = 3.39 W/kg



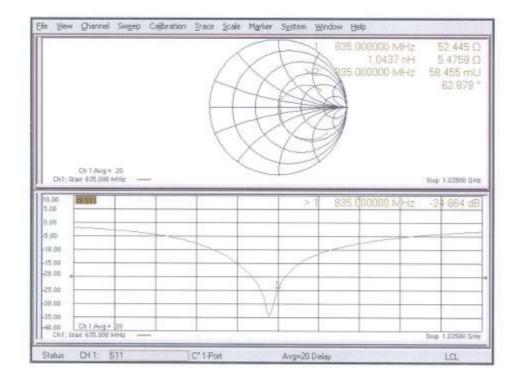
0 dB = 3.39 W/kg = 5.30 dBW/kg

Certificate No: D835V2-441 Jul22

Page 5 of 6



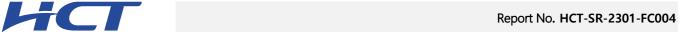
Impedance Measurement Plot for Head TSL



Certificate No: D835V2-441_Jul22

Page 6 of 6

밀



Calibration Laboratory of Schmid & Partner Engineering AG Zeughausstrasse 43, 8004 Zurich, Switzerland



Accreditation No.: SCS 0108

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA

Multilateral Agreement for the recognition of calibration certificates

Client HCT (Dymstec) Certificate No: D900V2-130_Jan22

CALIBRATION CERTIFICATE Object D900V2 - SN:130 Calibration procedure(s) QA CAL-05, v11 Calibration Procedure for SAR Validation Sources between 0.7-3 GHz Calibration date: January 21, 2022 This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (St). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate. All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%. Calibration Equipment used (M&TE critical for calibration) Primary Standards ID# Cal Date (Certificate No.) Scheduled Calibration Power meter NRP SN: 104778 09-Apr-21 (No. 217-03291/03292) Apr-22 Power sensor NRP-Z91 SN: 103244 09-Apr-21 (No. 217-03291) Apr-22 Power sensor NRP-Z91 SN: 103245 09-Apr-21 (No. 217-03292) Apr-22 Reference 20 dB Attenuator SN: BH9394 (20k) 09-Apr-21 (No. 217-03343) Apr-22 Type-N mismatch combination SN: 310982 / 06327 09-Apr-21 (No. 217-03344) Apr-22 Reference Probe EX3DV4 SN: 7349 31-Dec-21 (No. EX3-7349_Dec21) Dec-22 DAE4 SN: 601 01-Nov-21 (No. DAE4-601_Nov21) Nov-22 Secondary Standards Check Date (in house) Scheduled Check Power meter E4419B SN: GB39512475 30-Oct-14 (in house check Oct-20) In house check: Oct-22 Power sensor HP 8481A SN: US37292783 07-Oct-15 (in house check Oct-20) In house check: Oct-22 Power sensor HP 8481A SN: MY41093315 07-Oct-15 (in house check Oct-20) In house check: Oct-22 RF generator R&S SMT-06 SN: 100972 15-Jun-15 (in house check Oct-20) In house check: Oct-22 Network Analyzer Aglient E8358A SN: US41080477 In house check: Oct-22 31-Mar-14 (in house check Oct-20) Function Aldonia Georgiadou Calibrated by: Laboratory Technician Approved by: Sven Kühn Deputy Manager Issued: January 28, 2022 This calibration certificate shall not be reproduced except in full without written approval of the laboratory

Certificate No: D900V2-130_Jan22

Page 1 of 6

F-TP22-03 (Rev. 04) Page 120 of 131





Calibration Laboratory of Schmid & Partner Engineering AG Zaughausstrasse 43, 8004 Zurich, Switzerland





S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
Servizio svizzero di taratura
Swiss Calibration Service

Accreditation No.: SCS 0108

Accredited by the Swiss Accreditation Service (SAS)

The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Glossary:

TSL

tissue simulating liquid

ConvF N/A sensitivity in TSL / NORM x,y,z not applicable or not measured

Calibration is Performed According to the Following Standards:

- a) IEC/IEEE 62209-1528, "Measurement Procedure For The Assessment Of Specific Absorption Rate Of Human Exposure To Radio Frequency Fields From Hand-Held And Body-Worn Wireless Communication Devices - Part 1528: Human Models, Instrumentation And Procedures (Frequency Range of 4 MHz to 10 GHz)", October 2020.
- b) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

c) DASY System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions: Further details are available from the Validation Report at the end
 of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL: The source is mounted in a touch configuration below the center marking of the flat phantom.
- Return Loss: This parameter is measured with the source positioned under the liquid filled phantom (as described in the measurement condition clause). The Return Loss ensures low reflected power. No uncertainty required.
- SAR measured: SAR measured at the stated antenna input power.
- SAR normalized: SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters: The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Certificate No: D900V2-130 Jan22

Page 2 of 6

CUSTOMER SECRET





Measurement Conditions

DASY system configuration, as far as not given on page 1

DASY Version	DASY52	V52.10.4
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	900 MHz ± 1 MHz	

Head TSL parameters
The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22,0 °C	41.5	0.97 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	41.8 ± 6 %	0.94 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C		

SAR result with Head TSL

SAR averaged over 1 cm3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.63 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	10.8 W/kg ± 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.69 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	6.89 W/kg ± 16.5 % (k=2)

Certificate No: D900V2-130_Jan22

Page 3 of 6

ы

CUSTOMER SECRET



Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	51.5 Ω - 0.4 μΩ	
Return Loss	- 36.3 dB	

General Antenna Parameters and Design

Electrical Delay (one direction)	1.414 ns
----------------------------------	----------

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG

Certificate No: D900V2-130_Jan22

Page 4 of 6

CUSTOMER SECRET





DASY5 Validation Report for Head TSL

Date: 21.01.2022

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 900 MHz; Type: D900V2; Serial: D900V2 - SN:130

Communication System: UID 0 - CW; Frequency: 900 MHz

Medium parameters used: f = 900 MHz; $\sigma = 0.94 \text{ S/m}$; $\epsilon_r = 41.8$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 SN7349; ConvF(9.62, 9.62, 9.62) @ 900 MHz; Calibrated: 31.12.2021
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 01.11.2021
- Phantom: Flat Phantom 4.9 (front); Type: QD 00L P49 AA; Serial: 1001
- DASY52 52.10.4(1535); SEMCAD X 14.6.14(7501)

Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 64.35 V/m; Power Drift = -0.00 dB

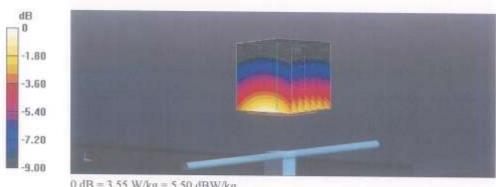
Peak SAR (extrapolated) = 4.03 W/kg

SAR(1 g) = 2.63 W/kg; SAR(10 g) = 1.69 W/kg

Smallest distance from peaks to all points 3 dB below = 16 mm

Ratio of SAR at M2 to SAR at M1 = 65.2%

Maximum value of SAR (measured) = 3.55 W/kg



0 dB = 3.55 W/kg = 5.50 dBW/kg

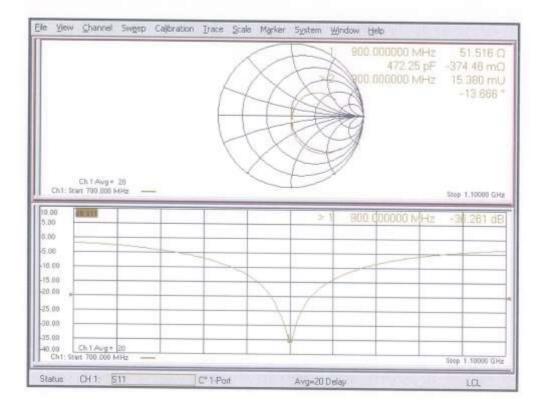
Certificate No: D900V2-130_Jan22

Page 5 of 6





Impedance Measurement Plot for Head TSL



Certificate No: D900V2-130_Jan22

Page 6 of 6



Calibration Laboratory of Schmid & Partner Engineering AG Zeughausstrasse 43, 8004 Zurich, Switzerland





Schweizerischer Kalibrierdienst Service suisse d'étalonnage Servizio svizzero di teratura Swiss Calibration Service

Accreditation No.: SCS 0108

Accredited by the Swiss Accreditation Service (SAS)

The Swiss Accreditation Service is one of the signatories to the EA

Multilateral Agreement for the recognition of calibration certificates

Client HCT (Dymstec) Certificate No: D2450V2-743_May22

CALIBRATION CERTIFICATE D2450V2 - SN:743 195/4 T/ hogy 재 Calibration procedure(s) QA CAL-05, V11 Calibration Procedure for SAR Validation Sources between 0.7-3 GHz Calibration date: May 31, 2022 This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate. All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%. Calibration Equipment used (M&TE critical for calibration) Primary Standards ID# Cal Date (Certificate No.) Scheduled Calibration Power meter NRP SN: 104778 04-Apr-22 (No. 217-03525/03524) Apr-23 Power sensor NRP-Z91 SN: 103244 04-Apr-22 (No. 217-03524) Apr-23 Power sensor NRP-Z91 SN: 103245 04-Apr-22 (No. 217-03525) Apr-23 Reference 20 dB Attenuator SN: BH9394 (20k) 04-Apr-22 (No. 217-03527) Apr-23 Type-N mismatch combination SN: 310982 / 06327 04-Apr-22 (No. 217-03528) Apr-23 Reference Probe EX3DV4 SN: 7349 31-Dec-21 (No. EX3-7349 Dec21) Dec-22 DAE4 SN: 601 02-May-22 (No. DAE4-601_May22) May-23 Secondary Standards Check Date (in house) Scheduled Check Power meter E4419B SN: GB39512475 30-Oct-14 (in house check Oct-20) In house check: Oct-22 Power sensor HP 8481A SN: US37292783 07-Oct-15 (in house check Oct-20) In house check: Oct-22 Power sensor HP 8481A SN: MY41093315 07-Oct-15 (in house check Oct-20) In house check: Oct-22 RF generator R&S SMT-06 SN: 100972 15-Jun-15 (in house check Oct-20) In house check: Oct-22 SN: US41080477 Network Analyzer Agilent E8358A 31-Mar-14 (in house check Oct-20) In house check: Oct-22 Signature Calibrated by: Joanna Lleshaj Laboratory Technician Sven Kühn Technical Manager Approved by: Issued: June 3, 2022 This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

Certificate No: D2450V2-743 May22

Page 1 of 6

F-TP22-03 (Rev. 04) Page 126 of 131





Calibration Laboratory of Schmid & Partner Engineering AG Zeughausstrasse 43, 8004 Zurich, Switzerland





S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
Servizio svizzero di taratura
Swiss Calibration Service

Accreditation No.: SCS 0108

Accredited by the Swiss Accreditation Service (SAS)

The Swiss Accreditation Service is one of the signatories to the EA

Multilateral Agreement for the recognition of calibration certificates

Glossary:

TSL tissue simulating liquid

ConvF sensitivity in TSL / NORM x,y,z N/A not applicable or not measured

Calibration is Performed According to the Following Standards:

- a) IEC/IEEE 62209-1528, "Measurement Procedure For The Assessment Of Specific Absorption Rate Of Human Exposure To Radio Frequency Fields From Hand-Held And Body-Worn Wireless Communication Devices - Part 1528: Human Models, Instrumentation And Procedures (Frequency Range of 4 MHz to 10 GHz)", October 2020.
- b) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

c) DASY System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions: Further details are available from the Validation Report at the end
 of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL: The source is mounted in a touch configuration below the center marking of the flat phantom.
- Return Loss: This parameter is measured with the source positioned under the liquid filled phantom (as described in the measurement condition clause). The Return Loss ensures low reflected power. No uncertainty required.
- SAR measured: SAR measured at the stated antenna input power.
- SAR normalized: SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters: The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Certificate No: D2450V2-743_May22

Page 2 of 6





Measurement Conditions

ASY system configuration, as far as not	given on page 1.	
DASY Version	DASY52	V52.10.4
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10.mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	2450 MHz ± 1 MHz	

Head TSL parameters
The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	39.2	1.80 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	38.3 ± 6 %	1.84 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C		_

SAR result with Head TSL

SAR averaged over 1 cm ² (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	13.5 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	53.2 W/kg ± 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	6.26 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	24.8 W/kg ± 16.5 % (k=2)

CUSTOMER SECRET





Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	54.7 Ω + 5.9 jΩ	
Return Loss	- 22.8 dB	

General Antenna Parameters and Design

Electrical Delay (one direction)	1.160 ns
----------------------------------	----------

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
110000000000000000000000000000000000000	

Certificate No: D2450V2-743_May22

Page 4 of 6

CUSTOMER SECRET





DASY5 Validation Report for Head TSL

Date: 31.05.2022

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:743

Communication System; UID 0 - CW; Frequency; 2450 MHz

Medium parameters used: f = 2450 MHz; $\sigma = 1.84 \text{ S/m}$; $\epsilon_r = 38.3$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

Probe: EX3DV4 - SN7349; ConvF(7.96, 7.96, 7.96) @ 2450 MHz; Calibrated: 31.12.2021

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn601; Calibrated: 02.05.2022

Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001

DASY52 52.10.4(1535); SEMCAD X 14.6.14(7501)

Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 116.2 V/m; Power Drift = 0.08 dB

Peak SAR (extrapolated) = 27.0 W/kg

SAR(1 g) = 13.5 W/kg; SAR(10 g) = 6.26 W/kg

Smallest distance from peaks to all points 3 dB below = 9 mm

Ratio of SAR at M2 to SAR at M1 = 50%

Maximum value of SAR (measured) = 22.1 W/kg

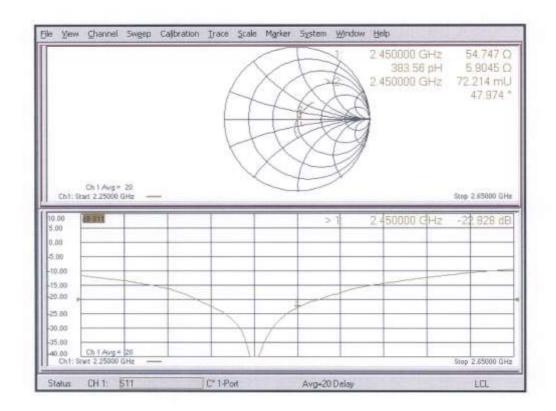


0 dB = 22.1 W/kg = 13.44 dBW/kg

Certificate No: D2450V2-743_May22



Impedance Measurement Plot for Head TSL



Certificate No: D2450V2-743_May22