SAR EVALUATION REPORT

For

DT Research Inc.

6F., NO.1, Ning-Po E. Street, Taipei 100, Taiwan.

FCC ID: YE3800D
Model: DT311

Report Type:	**Product Type:**
Original Report	Mobile Tablet

Test Engineer:	Rocky Xiao
Report Number:	RDG150615001-20
Report Date:	2015-07-07
Reviewed By:	Sula Huang RF Leader
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Attestation of Test Results

EUT Information	**Company Name**	DT Research Inc.
	EUT Description	Mobile Tablet
	FCC ID	YE3800D
	Model Number	DT311
	Serial Number:	150615001
	Test Date	2015-07-05

MODE		**Max. SAR Level(s) Reported(W/Kg)**	**Limit(W/Kg)**
CDMA 850	1g Body SAR	0.211	**1. 6**
CDMA 1900	1g Body SAR	0.859	
LTE Band 4	1g Body SAR	0.563	
LTE Band 13	1g Body SAR	0.494	
2.4GHz WLAN Chain 0	1g Body SAR	0.248	
2.4GHz WLAN Chain 1	1g Body SAR	0.303	
5GHz WLAN Chain 0	1g Body SAR	0.412	
5GHz WLAN Chain 1	1g Body SAR	0.379	
Simultaneous	1g Body SAR	1.502	

Applicable Standards	**ANSI / IEEE C95.1 : 2005** IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fileds,3 kHz to 300 GHz.
	ANSI / IEEE C95.3 : 2002 IEEE Recommended Practice for Measurements and Computations of Radio Frequency Electromagnetic Fields With Respect to Human Exposure to SuchFields,100 kHz—300 GHz.
	FCC 47 CFR part 2.1093 Radiofrequency radiation exposure evaluation: portable devices
	IEEE1528:2013 IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques
	IEC 62209-2:2010 Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices-Human models, instrumentation, and procedures-Part 2: Procedure to determine the specific absorption rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)
	KDB procedures KDB 447498 D01 General RF Exposure Guidance v05r02. KDB 648474 D04 Handset SAR v01r02. KDB 865664 D01 SAR measurement 100 MHz to 6 GHz v01r03 KDB 865664 D02 RF Exposure Reporting v01r01 KDB 941225 D01 3G SAR Procedures v03 KDB 941225 D06 Hotspot Mode v02 KDB 616217 D04 SAR for laptop and tablets v01r01 KDB 248227 D01 SAR Measurement Procedures for 802.11a/b/g Transmitters KDB 941225 D05 SAR for LTE Devices v02r03

Note: This wireless device has been shown to be capable of compliance for localized specific absorption rate (SAR) for General Population/Uncontrolled Exposure limits specified in ANSI/IEEE Standards and has been tested in accordance with the measurement procedures specified in IEEE 1528-2013 and RF exposure KDB procedures.

The results and statements contained in this report pertain only to the device(s) evaluated.

TABLE OF CONTENTS

DOCUMENT REVISION HISTORY **4**

EUT DESCRIPTION **5**

TECHNICAL SPECIFICATION 5

REFERENCE, STANDARDS, AND GUILDELINES **6**

SAR LIMITS 7

FACILITIES **8**

DESCRIPTION OF TEST SYSTEM **9**

EQUIPMENT LIST AND CALIBRATION **14**

EQUIPMENTS LIST & CALIBRATION INFORMATION 14

SAR MEASUREMENT SYSTEM VERIFICATION **15**

LIQUID VERIFICATION 15
SYSTEM ACCURACY VERIFICATION 20
SAR SYSTEM VALIDATION DATA 21

EUT TEST STRATEGY AND METHODOLOGY **25**

TEST POSITIONS FOR DEVICE OPERATING NEXT TO A PERSON'S EAR 25
CHEEK/TOUCH POSITION 26
EAR/TILT POSITION 26
TEST POSITIONS FOR BODY-WORN AND OTHER CONFIGURATIONS 27
SAR EVALUATION PROCEDURE 28
TEST METHODOLOGY 28

CONDUCTED OUTPUT POWER MEASUREMENT **29**

PROVISION APPLICABLE 29
TEST PROCEDURE 29
RADIO CONFIGURATION 29
MAXIMUM TARGET OUTPUT POWER 32
PROXIMITY SENSOR OPERATION 33
TEST RESULTS: 34

SAR MEASUREMENT RESULTS **42**

ANTENNA LOCATION 42
ANTENNA DISTANCE TO EDGE 42
STANDALONE SAR TEST EXCLUSION CONSIDERATIONS 42
SAR TEST EXCLUSION FOR THE EUT EDGE CONSIDERATIONS RESULT 43
SAR TEST DATA 45

SAR SIMULTANEOUS TRANSMISSION DESCRIPTION **49**

SAR PLOTS (SUMMARY OF THE HIGHEST SAR VALUES) **57**

APPENDIX A MEASUREMENT UNCERTAINTY **62**

APPENDIX B – PROBE CALIBRATION CERTIFICATES **64**

APPENDIX C DIPOLE CALIBRATION CERTIFICATES **75**

DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	RDG150615001-20	Original Report	2015-07-07

Note: For LTE band 13 and WLAN 5G band stand-alone SAR, please refer to the SAR report: RDG150615001-20A, which was issued by Bay Area Compliance Laboratories Corp. (Shenzhen)

EUT DESCRIPTION

This report has been prepared on behalf of DT Research Inc. and their product, Model: DT311 or the EUT (Equipment under Test) as referred to in the rest of this report.

Technical Specification

Product Type	Portable
Exposure Category:	Population / Uncontrolled
Antenna Type(s):	Internal Antenna
Body-Worn Accessories:	None
Operation Mode :	CDMA 1xRTT, 1xEVDO Rev.A, LTE, WLAN 2.4G/5G and Bluetooth
Frequency Band:	CDMA 850(BC0): 824-849 MHz(TX) ; 869-894 MHz(RX) CDMA 1900(BC1): 1850-1910 MHz(TX) ; 1930-1990 MHz(RX) LTE Band 4: 1710-1755 MHz(TX) ; 2110-2155 MHz(RX) LTE Band 13: 777-787 MHz(TX) ; 746-756 MHz(RX) WLAN 2.4G: 2412MHz-2462MHz WLAN 5G: 5150-5250 MHz/ 5250-5350 MHz/ 5470-5725 MHz / 5725-5850 MHz Bluetooth : 2402MHz-2480MHz
Conducted RF Power:	CDMA 850 : 23.71 dBm CDMA 1900: 22.96 dBm LTE Band 4: 22.36 dBm LTE Band 13: 22.48 dBm Wi-Fi 2.4G: 17.97 dBm Wi-Fi 5G: 14.32 dBm Bluetooth BDR/EDR: 4.81 dBm Bluetooth LE: 3.09 dBm
Dimensions (L*W*H):	315 mm (L) × 212 mm (W) × 42 mm (H)
Power Source:	7.2 V_{DC} Rechargeable Battery
Normal Operation:	Body-worn

Note 1: the overall diagonal dimension of the EUT >200mm, so test procedures in KDB616217 should be applicable.
Note 2: For LTE band 13 and WLAN 5G band stand-alone SAR, please refer to the SAR report: RDG150615001-20A, which was issued by Bay Area Compliance Laboratories Corp. (Shenzhen)

REFERENCE, STANDARDS, AND GUILDELINES

FCC:

The Report and Order requires routine SAR evaluation prior to equipment authorization of portable transmitter devices, including portable telephones. For consumer products, the applicable limit is 1.6 mW/g as recommended by the ANSI/IEEE standard C95.1-1992 [6] for an uncontrolled environment (Paragraph 65). According to the Supplement C of OET Bulletin 65 “Evaluating Compliance with FCC Guide-lines for Human Exposure to Radio frequency Electromagnetic Fields", released on Jun 29, 2001 by the FCC, the device should be evaluated at maximum output power (radiated from the antenna) under “worst-case” conditions for normal or intended use, incorporating normal antenna operating positions, device peak performance frequencies and positions for maximum RF energy coupling.

This report describes the methodology and results of experiments performed on wireless data terminal. The objective was to determine if there is RF radiation and if radiation is found, what is the extent of radiation with respect to safety limits. SAR (Specific Absorption Rate) is the measure of RF exposure determined by the amount of RF energy absorbed by human body (or its parts) – to determine how the RF energy couples to the body or head which is a primary health concern for body worn devices. The limit below which the exposure to RF is considered safe by regulatory bodies in North America is 1.6 mW/g average over 1 gram of tissue mass.

CE:

The order requires routine SAR evaluation prior to equipment authorization of portable transmitter devices, including portable telephones. For consumer products, the applicable limit is 2 mW/g as recommended by EN62209-1 for an uncontrolled environment. According to the Standard, the device should be evaluated at maximum output power (radiated from the antenna) under “worst-case” conditions for normal or intended use, incorporating normal antenna operating positions, device peak performance frequencies and positions for maximum RF energy coupling.

This report describes the methodology and results of experiments performed on wireless data terminal. The objective was to determine if there is RF radiation and if radiation is found, what is the extent of radiation with respect to safety limits. SAR (Specific Absorption Rate) is the measure of RF exposure determined by the amount of RF energy absorbed by human body (or its parts) – to determine how the RF energy couples to the body or head which is a primary health concern for body worn devices. The limit below which the exposure to RF is considered safe by regulatory bodies in Europe is 2 mW/g average over 10 gram of tissue mass.

The test configurations were laid out on a specially designed test fixture to ensure the reproducibility of measurements. Each configuration was scanned for SAR. Analysis of each scan was carried out to characterize the above effects in the device.

SAR Limits

FCC Limit (1g Tissue)

EXPOSURE LIMITS	SAR (W/kg)	
	(General Population / Uncontrolled Exposure Environment)	(Occupational / Controlled Exposure Environment)
Spatial Average (averaged over the whole body)	0.08	0.4
Spatial Peak (averaged over any 1 g of tissue)	1.60	8.0
Spatial Peak (hands/wrists/feet/ankles averaged over 10 g)	4.0	20.0

CE Limit (10g Tissue)

EXPOSURE LIMITS	SAR (W/kg)	
	(General Population / Uncontrolled Exposure Environment)	(Occupational / Controlled Exposure Environment)
Spatial Average (averaged over the whole body)	0.08	0.4
Spatial Peak (averaged over any 10 g of tissue)	2.0	10
Spatial Peak (hands/wrists/feet/ankles averaged over 10 g)	4.0	20.0

Population/Uncontrolled Environments are defined as locations where there is the exposure of individual who have no knowledge or control of their exposure.

Occupational/Controlled Environments are defined as locations where there is exposure that may be incurred by people who are aware of the potential for exposure (i.e. as a result of employment or occupation).

General Population/Uncontrolled environments Spatial Peak limit 1.6W/kg (FCC) & 2 W/kg (CE) applied to the EUT.

FACILITIES

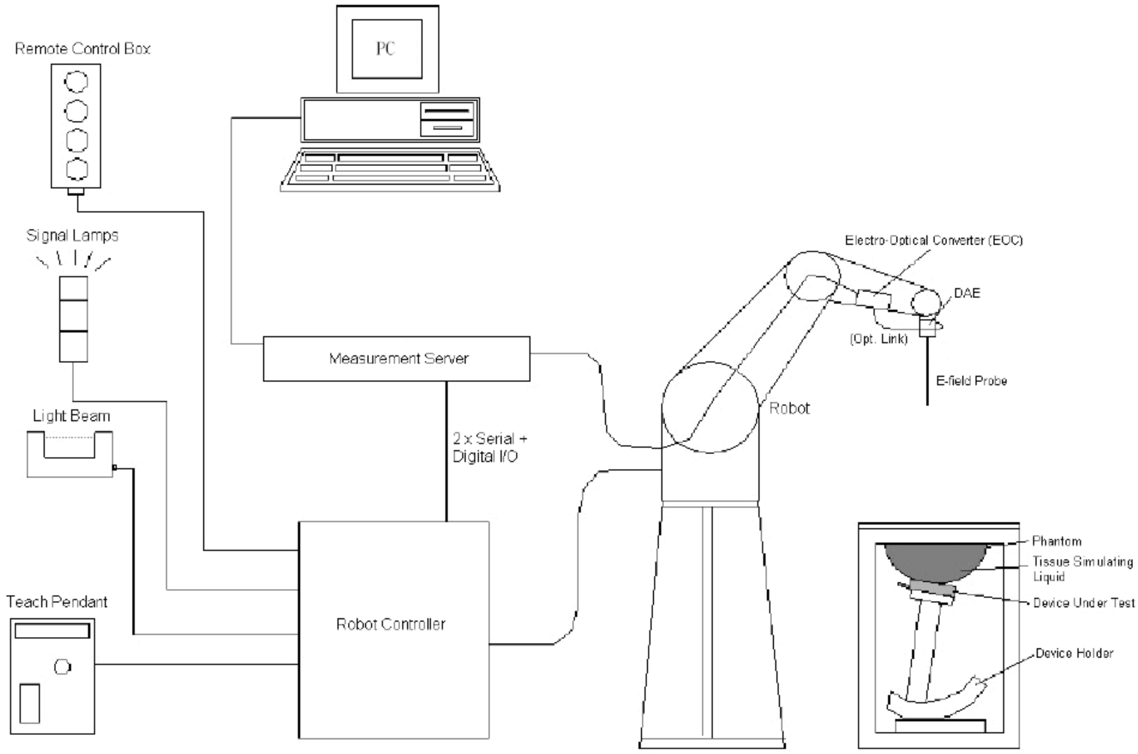
The Test site used by Bay Area Compliance Laboratories Corp. (Dongguan) to collect test data is located on the No.69 Pulongcun, Puxinhu Industrial Zone, Tangxia, Dongguan, Guangdong, China

DESCRIPTION OF TEST SYSTEM

These measurements were performed with the automated near-field scanning system DASY5 from Schmid & Partner Engineering AG (SPEAG) which is the Fifth generation of the system shown in the figure hereinafter:

DASY5 System Description

The DASY5 system for performing compliance tests consists of the following items:



- A standard high precision 6-axis robot (Staubli TX=RX family) with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- An isotropic field probe optimized and calibrated for the targeted measurement.
- A data acquisition electronics (DAE) which performs the signal amplication, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running Win7 profesional operating system and the DASY52 software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.
- The phantom, the device holder and other accessories according to the targeted measurement.

DASY5 Measurement Server

The DASY5 measurement server is based on a PC/104 CPU board with a 400MHz intel ULV Celeron, 128MB chip-disk and 128MB RAM. The necessary circuits for communication with the DAE4 (or DAE3) electronics box, as well as the 16 bit AD converter system for optical detection and digital I/O interface are contained on the DASY5 I/O board, which is directly connected to the PC/104 bus of the CPU board.

The measurement server performs all real-time data evaluation of field measurements and surface detection, controls robot movements and handles safety operation. The PC operating system cannot interfere with these time critical processes. All connections are supervised by a watchdog, and disconnection of any of the cables to the measurement server will automatically disarm the robot and disable all program-controlled robot movements. Furthermore, the measurement server is equipped with an expansion port which is reserved for future applications. Please note that this expansion port does not have a standardized point out, and therefore only devices provided by SPEAG can be connected. Devices from any other supplier could seriously damage the measurement server.

Data Acquisition Electronics

The data acquisition electronics (DAE4) consist of a highly sensitive electrometer-grade preamplifer with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder with a control logic unit. Transmission to the measurement server is accomplished through an optical downlink for data and status information, as well as an optical uplink for commands and the clock.

The mechanical probe mounting device includes two different sensor systems for frontal and sideways probe contacts. They are used for mechanical surface detection and probe collision detection.

The input impedance of both the DAE4 as well as of the DAE3 box is 200MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.

EX3DV4 E-Field Probes

Frequency	10 MHz to > 6 GHz Linearity: ± 0.2 dB (30 MHz to 6 GHz)
Directivity	± 0.3 dB in TSL (rotation around probe axis) ± 0.5 dB in TSL (rotation normal to probe axis)
Dynamic Range	10 μW/g to > 100 mW/g Linearity: ± 0.2 dB (noise: typically < 1 μW/g)
Dimensions	Overall length: 337 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm
Application	High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields); the only probe that enables compliance testing for frequencies up to 6 GHz with precision of better 30%.
Compatibility	DASY3, DASY4, DASY52 SAR and higher, EASY4/MRI

SAM Twin Phantom

The SAM twin phantom is a fiberglass shell phantom with 2mm shell thickness (except the ear region, where shell thickness increases to 6 mm). The phantom has three measurement areas:

_ Left hand
_ Right hand
_ Flat phantom

The phantom table for the DASY systems based on the TX90XL and RX160L robots have the size of 100 x 50 x 85 cm (L xWx H). The phantom table for the compact DASY systems based on the RX60L robot have the size of 100 x 75 x 91 cm (L xWx H); these tables are reinforced for mounting of the robot onto the table. For easy dislocation these tables have fork lift cut outs at the bottom.
The bottom plate contains three pairs of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections. Only one device holder is necessary if two phantoms are used (e.g., for different liquids)
A white cover is provided to cover the phantom during o_-periods to prevent water evaporation and changes in the liquid parameters. Free space scans of devices on top of this phantom cover are possible.
Three reference marks are provided on the phantom counter. These reference marks are used to teach the absolute phantom position relative to the robot.

Robots

The DASY5 system uses the high precision industrial robots TX90XL from Staubli SA (France). The TX robot family is the successor of the well known RX robot family and offers the same features important for our application:

- High precision (repeatability 0.02mm)
- High reliability (industrial design)
- Low maintenance costs (virtually maintenance free due to direct drive gears; no belt drives)
- Jerk-free straight movements (brushless synchron motors; no stepper motors)
- Low ELF interference (motor control fields shielded via the closed metallic construction shields)

The above mentioned robots are controlled by the Staubli CS8c robot controllers. All information regarding the use and maintenance of the robot arm and the robot controller is contained on the CDs delivered along with the robot. Paper manuals are available upon request direct from Staubli.

Area Scans

Area scans are defined prior to the measurement process being executed with a user defined variable spacing between each measurement point (integral) allowing low uncertainty measurements to be conducted. Scans defined for FCC applications utilize a 10mm2 step integral, with 1mm interpolation used to locate the peak SAR area used for zoom scan assessments.

Where the system identifies multiple SAR peaks (which are within 25% of peak value) the system will provide the user with the option of assessing each peak location individually for zoom scan averaging.

Zoom Scan (Cube Scan Averaging)

The averaging zoom scan volume utilized in the DASY5 software is in the shape of a cube and the side dimension of a 1 g or 10 g mass is dependent on the density of the liquid representing the simulated tissue. A density of 1000 kg/m3 is used to represent the head and body tissue density and not the phantom liquid density, in order to be consistent with the definition of the liquid dielectric properties, i.e. the side length of the 1 g cube is 10mm,with the side length of the 10 g cube 21,5mm.

When the cube intersects with the surface of the phantom, it is oriented so that 3 vertices touch the surface of the shell or the center of a face is tangent to the surface. The face of the cube closest to the surface is modified in order to conform to the tangent surface.

The zoom scan integer steps can be user defined so as to reduce uncertainty, but normal practice for typical test applications (including FCC) utilize a physical step of 5x5x8 (8mmx8mmx5mm) providing a volume of 32mm in the X & Y axis, and 35mm in the Z axis.

Tissue Dielectric Parameters for Head and Body Phantoms

The head tissue dielectric parameters recommended by the IEEE SCC-34/SC-2 in P1528 have been incorporated in the following table. These head parameters are derived from planar layer models simulating the highest expected SAR for the dielectric properties and tissue thickness variations in a human head. Other head and body tissue parameters that have not been specified in P1528 are derived from the tissue dielectric parameters computed from the 4-Cole-Cole equations described in Reference [12] and extrapolated according to the head parameters specified in P1528.

Recommended Tissue Dielectric Parameters for Head and Body

Frequency (MHz)	Head Tissue		Body Tissue	
	εr	σ (S/m)	εr	σ (S/m)
150	52.3	0.76	61.9	0.80
300	45.3	0.87	58.2	0.92
450	43.5	0.87	56.7	0.94
835	41.5	0.90	55.2	0.97
900	41.5	0.97	55.0	1.05
915	41.5	0.98	55.0	1.06
1450	40.5	1.20	54.0	1.30
1610	40.3	1.29	53.8	1.40
1800-2000	40.0	1.40	53.3	1.52
2450	39.2	1.80	52.7	1.95
3000	38.5	2.40	52.0	2.73
5800	35.3	5.27	48.2	6.00

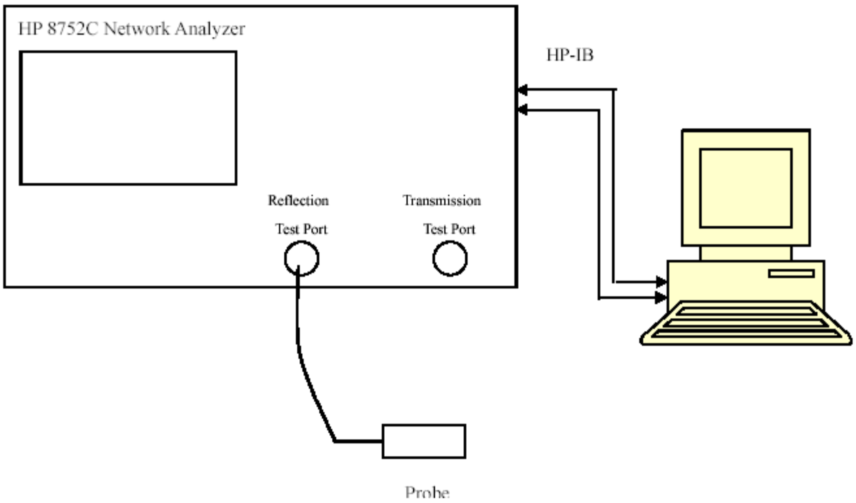
EQUIPMENT LIST AND CALIBRATION

Equipments List & Calibration Information

Equipment	Model	S/N	Calibration Date	Calibration Due Date
Robot	RX90	D03636	N/A	N/A
DASY5 Test Software	DASY52.8	N/A	N/A	N/A
DASY5 Measurement Server	DASY5 4.5.12	1470	N/A	N/A
Data Acquistion Electronics	DAE4	1459	2015-01-26	2016-01-26
E-Field Probe	EX3DV4	7329	2015-02-05	2016-02-07
Dipole, 835MHz	ALS-D-835-S-2	180-00558	2014-10-08	2017-10-08
Dipole, 1750MHz	ALS-D-1750-S-2	198-00304	2013-10-08	2016-10-08
Dipole,1900MHz	ALS-D-1900-S-2	210-00710	2014-10-09	2017-10-09
Dipole,2450MHz	ALS-D-2450-S-2	220-00758	2014-10-09	2017-10-09
R&S, universal Radio Communication Tester	CMU200	105047	2014-11-20	2015-11-20
8960 Series 10 Wireless Communication Test Set	E5515C	MY50266471	2015-01-13	2016-01-13
Wideband Radio Communication Tester	CMW500	1201.0002K50-146520-wh	2014-11-19	2015-11-19
8960 Series 10 Wireless Communication Test Set	E5515C	MY50266471	2013-09-09	2015-09-09
Mounting Device	N/A	SD 000 H01 KA	N/A	N/A
Twin SAM	Twin SAM V5.0	1874	N/A	N/A
Simulated Tissue 835 MHz Body	TS-835-B	201505	Each Time	/
Simulated Tissue 1750 MHz Body	TS-1750-B	201518	Each Time	/
Simulated Tissue 1900 MHz Body	TS-1900-B	201507	Each Time	/
Simulated Tissue 2450 MHz Body	TS-2450-B	201513	Each Time	/
Network Analyzer	8752C	3140A02356	2015-06-03	2016-06-03
Dielectric probe kit	85070B	US33020324	N/A	N/A
Signal Generator	E4422B	MY41000355	2014-10-27	2015-10-27
Power Meter	EPM-441A	GB37481494	2014-11-03	2015-11-03
Power Meter Sensor	8481A	T-03-EM-127	2014-11-03	2015-11-03
Power Amplifier	5205PE	1015	N/A	N/A
Directional Coupler	488Z	N/A	N/A	N/A
attenuator	20dB, 100W	N/A	N/A	N/A

SAR MEASUREMENT SYSTEM VERIFICATION

Liquid Verification



Liquid Verification Setup Block Diagram

Liquid Verification Results

Frequency	Liquid Type	Liquid Parameter		Target Value		Delta (%)		Tolerance (%)
		ε_r	Ơ (S/m)	ε_r	Ơ (S/m)	$\Delta\varepsilon_r$	ΔƠ (S/m)	
824.7	Body	55.15	0.96	55.2	0.97	-0.09	-1.03	±5
836.52	Body	55.1	0.98	55.2	0.97	-0.18	1.03	±5
848.31	Body	54.99	0.99	55.2	0.97	-0.38	2.06	±5
1720	Body	53.48	1.47	53.43	1.49	0.09	-1.34	±5
1732.5	Body	53.42	1.48	53.43	1.49	-0.02	-0.67	±5
1745	Body	53.31	1.49	53.43	1.49	-0.22	0	±5
1851.25	Body	55.32	1.48	53.3	1.52	3.79	-2.63	±5
1880	Body	53.76	1.54	53.3	1.52	0.86	1.32	±5
1908.75	Body	53.48	1.49	53.3	1.52	0.34	-1.97	±5
2412	Body	53.26	1.94	52.7	1.95	1.06	-0.51	±5
2437	Body	51.63	1.98	52.7	1.95	-2.03	1.54	±5
2462	Body	52.22	1.98	52.7	1.95	-0.91	1.54	±5

**Liquid Verification was performed on 2015-07-06.*

Please refer to the following tables.

835 MHz Body					
Frequency (MHz)	**e'**	**e''**	**Frequency (MHz)**	**e'**	**e''**
824	55.1248	21.0604	837	55.1098	21.0063
824.5	55.1536	20.9261	837.5	55.0481	20.9002
825	55.1421	21.0256	838	55.1028	20.9999
825.5	55.1965	20.9517	838.5	55.1416	20.9916
826	55.121	21.0458	839	55.0781	20.9886
826.5	55.1214	21.0041	839.5	55.0716	21.009
827	55.0216	20.9818	840	55.0367	21.0326
827.5	55.1803	20.9545	840.5	55.1889	20.9858
828	55.1521	20.9873	841	55.0776	21.0006
828.5	55.1993	21.018	841.5	55.0245	20.9816
829	55.1208	20.9341	842	55.0687	20.9752
829.5	55.0658	20.9136	842.5	55.0137	20.9563
830	55.0986	20.968	843	55.0302	20.9563
830.5	55.0971	20.9845	843.5	55.0293	20.9242
831	55.1044	20.9704	844	55.0676	20.8958
831.5	55.1397	20.9685	844.5	55.0867	21.0015
832	55.1767	20.9397	845	55.0947	20.969
832.5	55.0906	20.9073	845.5	55.033	20.9377
833	55.12	20.9261	846	55.0516	20.9975
833.5	55.1299	20.9689	846.5	55.0356	20.9436
834	55.1337	21.047	847	55.0149	20.9862
834.5	55.1011	20.9218	847.5	55.0508	20.9795
835	55.1148	20.9621	848	55.0152	21.0136
835.5	55.0883	21.0072	848.5	54.9679	20.9375
836	55.1239	21.0327	849	55.0074	20.9128
836.5	55.0992	20.9888	/	/	/

1750 MHz Body					
Frequency (MHz)	**e'**	**e''**	**Frequency (MHz)**	**e'**	**e''**
1710	53.5087	15.4037	1748	53.1817	15.2815
1711	53.5196	15.3734	1749	53.2625	15.3024
1712	53.49	15.3909	1750	53.3386	15.3429
1713	53.4333	15.3553	1751	53.3781	15.3213
1714	53.4293	15.3517	1752	53.3715	15.3355
1715	53.4096	15.3835	1753	53.3012	15.2782
1716	53.468	15.3867	1754	53.3123	15.3143
1717	53.4502	15.3396	1755	53.3094	15.2796
1718	53.5025	15.3726	1756	53.3193	15.3516
1719	53.41	15.4038	1757	53.285	15.3096
1720	53.4784	15.4114	1758	53.1773	15.2677
1721	53.6668	15.3318	1759	53.2117	15.2458
1722	53.5686	15.3448	1760	53.2387	15.2742
1723	53.5421	15.3076	1761	53.2685	15.3761
1724	53.6851	15.2838	1762	53.2928	15.3641
1725	53.6199	15.3137	1763	53.217	15.3495
1726	53.6324	15.2934	1764	53.1654	15.324
1727	53.4846	15.3454	1765	53.1271	15.3683
1728	53.544	15.4092	1766	53.1767	15.3819
1729	53.5352	15.3209	1767	53.1589	15.3186
1730	53.52	15.3811	1768	53.1227	15.3336
1731	53.4064	15.4334	1769	53.3696	15.3551
1732	53.4539	15.356	1770	53.3467	15.2652
1733	53.3883	15.3555	1771	53.3284	15.3049
1734	53.3918	15.3517	1772	53.3366	15.3372
1735	53.3921	15.3691	1773	53.2981	15.3478
1736	53.4553	15.3379	1774	53.2999	15.3101
1737	53.3635	15.3478	1775	53.2941	15.3047
1738	53.3452	15.4089	1776	53.2868	15.3094
1739	53.3823	15.3721	1777	53.2111	15.2764
1740	53.3533	15.3417	1778	53.1972	15.3691
1741	53.3739	15.324	1779	53.2259	15.3159
1742	53.3346	15.3443	1780	53.386	15.3055
1743	53.3205	15.3721	1781	53.3926	15.2698
1744	53.3046	15.4049	1782	53.3418	15.351
1745	53.3075	15.3289	1783	53.3029	15.3078
1746	53.2379	15.3185	1784	53.3177	15.2283
1747	53.21	15.3383	1785	53.3597	15.2524

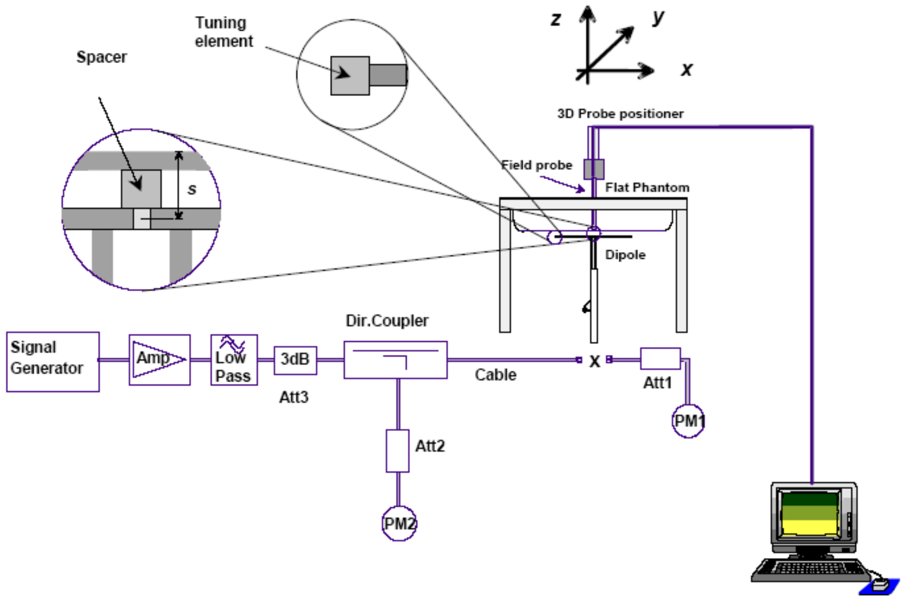
1900 MHz Body					
Frequency (MHz)	**e'**	**e''**	**Frequency (MHz)**	**e'**	**e''**
1850	55.2794	14.3755	1881	53.7297	14.7494
1851	55.3465	14.3237	1882	53.7682	14.8014
1852	55.2451	14.3674	1883	53.7975	14.7806
1853	55.1944	14.2692	1884	53.9064	14.7789
1854	55.0776	14.1739	1885	53.9615	14.814
1855	55.0433	14.2242	1886	54.1062	14.8086
1856	54.9385	14.2491	1887	54.1919	14.7507
1857	54.7715	14.1796	1888	54.2564	14.7972
1858	54.6523	14.1176	1889	54.2233	14.7431
1859	54.5685	14.0676	1890	54.2999	14.7592
1860	54.4625	14.1998	1891	54.3441	14.7205
1861	54.4801	14.0994	1892	54.3895	14.7391
1862	54.3581	14.0887	1893	54.3638	14.6518
1863	54.1979	14.105	1894	54.348	14.6512
1864	54.1548	14.1408	1895	54.3226	14.62
1865	54.0892	14.1493	1896	54.4245	14.5216
1866	53.9595	14.1339	1897	54.4039	14.4954
1867	53.9217	14.1416	1898	54.4303	14.4509
1868	53.8315	14.2185	1899	54.2735	14.3924
1869	53.7486	14.2143	1900	54.1749	14.3384
1870	53.6842	14.2982	1901	54.135	14.2776
1871	53.6144	14.2997	1902	54.0845	14.2397
1872	53.6928	14.3401	1903	53.97	14.1987
1873	53.6653	14.4307	1904	53.8814	14.1398
1874	53.5928	14.4307	1905	53.7995	14.1167
1875	53.6163	14.4852	1906	53.6996	14.1273
1876	53.6198	14.554	1907	53.6306	14.1092
1877	53.687	14.6461	1908	53.59	14.0337
1878	53.6194	14.7027	1909	53.4439	14.0323
1879	53.6786	14.6788	1910	53.3534	14.079
1880	53.7591	14.7589	/	/	/

2450 MHz Body					
Frequency (MHz)	**e'**	**e''**	**Frequency (MHz)**	**e'**	**e''**
2412	53.2577	14.5011	2443	51.7051	14.8733
2413	53.3827	14.4748	2444	51.8054	14.8609
2414	53.2422	14.4714	2445	51.8424	14.9278
2415	53.1625	14.4331	2446	51.8911	14.9026
2416	53.0316	14.303	2447	51.9873	14.9036
2417	53.046	14.3579	2448	52.0883	14.8683
2418	52.9259	14.3921	2449	52.1689	14.8888
2419	52.7598	14.3047	2450	52.2529	14.9075
2420	52.6686	14.2442	2451	52.22	14.8475
2421	52.5815	14.2037	2452	52.2828	14.854
2422	52.4477	14.322	2453	52.349	14.8479
2423	52.5105	14.2214	2454	52.3612	14.8133
2424	52.3248	14.2854	2455	52.3583	14.7872
2425	52.2029	14.2459	2456	52.3357	14.7336
2426	52.1421	14.297	2457	52.3567	14.7436
2427	52.0803	14.2781	2458	52.4373	14.5818
2428	51.9734	14.272	2459	52.3626	14.5918
2429	51.9024	14.3179	2460	52.3945	14.5634
2430	51.8448	14.3453	2461	52.2649	14.5126
2431	51.7109	14.3354	2462	52.2156	14.4663
2432	51.6779	14.3915	2463	52.1187	14.4136
2433	51.6338	14.4652	2464	52.0702	14.3899
2434	51.7	14.4659	2465	52.0012	14.3657
2435	51.6668	14.5315	2466	51.915	14.2783
2436	51.6039	14.571	2467	51.8192	14.2679
2437	51.6306	14.6177	2468	51.7389	14.2261
2438	51.652	14.6747	2469	51.6417	14.2477
2439	51.6423	14.7374	2470	51.5827	14.2085
2440	51.5887	14.7589	2471	51.4388	14.1764
2441	51.6459	14.7718	2472	51.3801	14.2045
2442	51.6967	14.8587	/	/	/

System Accuracy Verification

Prior to the assessment, the system validation kit was used to test whether the system was operating within its specifications of ±10%. The validation results are tabulated below. And also the corresponding SAR plot is attached as well in the SAR plots files.

System Verification Setup Block Diagram



System Accuracy Check Results

Date	Frequency Band (MHz)	Liquid Type	Measured SAR (W/Kg)		Target Value (W/Kg)	Delta (%)	Tolerance (%)
2015/7/6	835	Body	1g	9.33	9.736	-4.17	±10
	1750	Body	1g	38.4	36.65	4.77	±10
	1900	Body	1g	38.9	39.715	-2.05	±10
	2450	Body	1g	53.9	52.4	2.86	±10

*All SAR values are normalized to 1 Watt forward power.

SAR SYSTEM VALIDATION DATA

Test Laboratory:Bay Area Compliance Labs Corp.(Dongguan)

System Performance 835MHz Body

DUT: Dipole 835 MHz; Type: ALS-D-835-S-2; S/N:180-00558

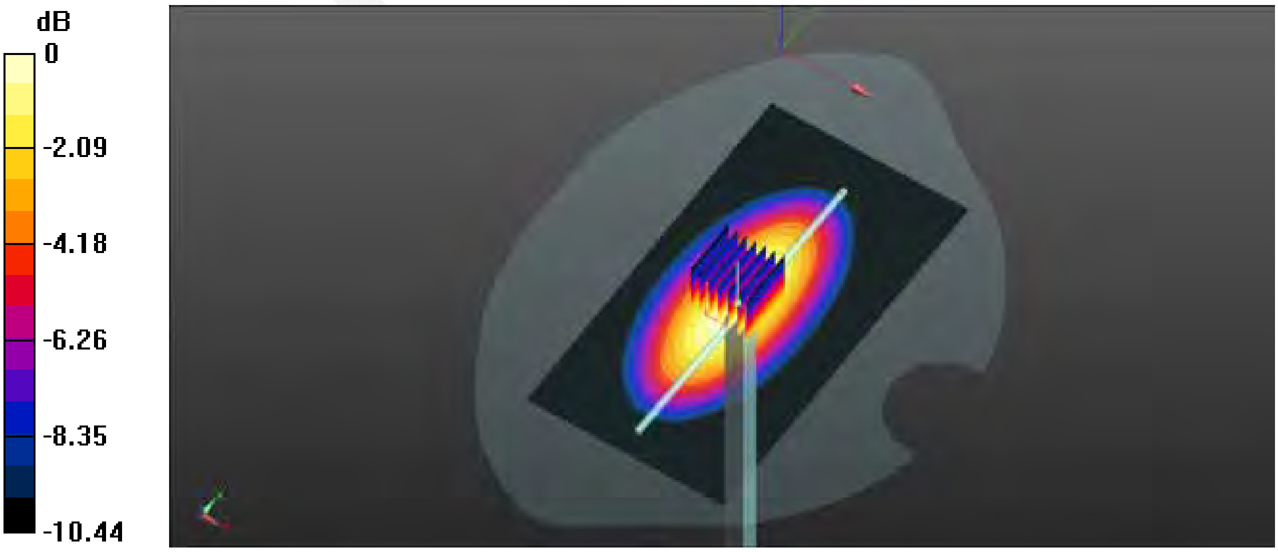
Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium parameters used: f = 835 MHz; σ = 0.974 S/m; ε_r = 55.115; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7329; ConvF(9.17, 9.17, 9.17); Calibrated: 2015/2/5;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1459; Calibrated: 2015/1/26
- Phantom: SAM (30deg probe tilt) with CRP v5.0_20150321; Type: QD000P40CD; Serial: TP:1874
- Measurement SW: DASY52, Version 52.8 (8);

Body/System Check /Area Scan (71x131x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 9.61 W/kg

Body/System Check /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 97.67 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 13.3 W/kg
SAR(1 g) = 9.33 W/kg; SAR(10 g) = 5.84 W/kg
Maximum value of SAR (measured) = 9.59 W/kg



0 dB = 9.59 W/kg = 9.82 dBW/kg

Test Laboratory: Bay Area Compliance Labs Corp.(Dongguan)

System Performance 1750MHz

DUT: ALS-D-1750-S-2; Type: 1750 MHz; Serial: 198-00304

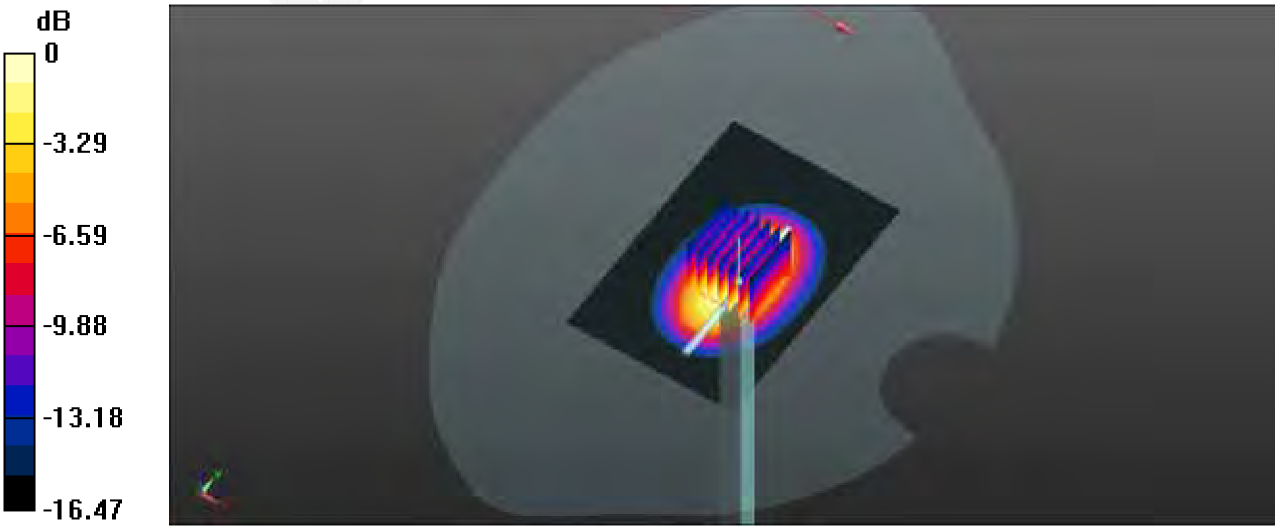
Communication System: CW; Frequency: 1750 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1750 MHz; σ = 1.501 S/m; ε_r = 53.339; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7329; ConvF(8.12, 8.12, 8.12); Calibrated: 2015/2/5;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1459; Calibrated: 2015/1/26
- Phantom: SAM (30deg probe tilt) with CRP v5.0_20150321; Type: QD000P40CD; Serial: TP:1874
- Measurement SW: DASY52, Version 52.8 (8);

System Performance 1750MHz/Area Scan (81x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 42.8 W/kg

System Performance 1750MHz/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 153.8 V/m; Power Drift = -0.00 dB
Peak SAR (extrapolated) = 72.1 W/kg
SAR(1 g) = 38.4 W/kg; SAR(10 g) = 20.1 W/kg
Maximum value of SAR (measured) = 43.3 W/kg



0 dB = 43.3 W/kg = 16.36 dBW/kg

Test Laboratory:Bay Area Compliance Labs Corp.(Dongguan)

System Performance 1900MHz Body

DUT: Dipole 1900 MHz; Type: ALS-D-1900-S-2; S/N:210-00710

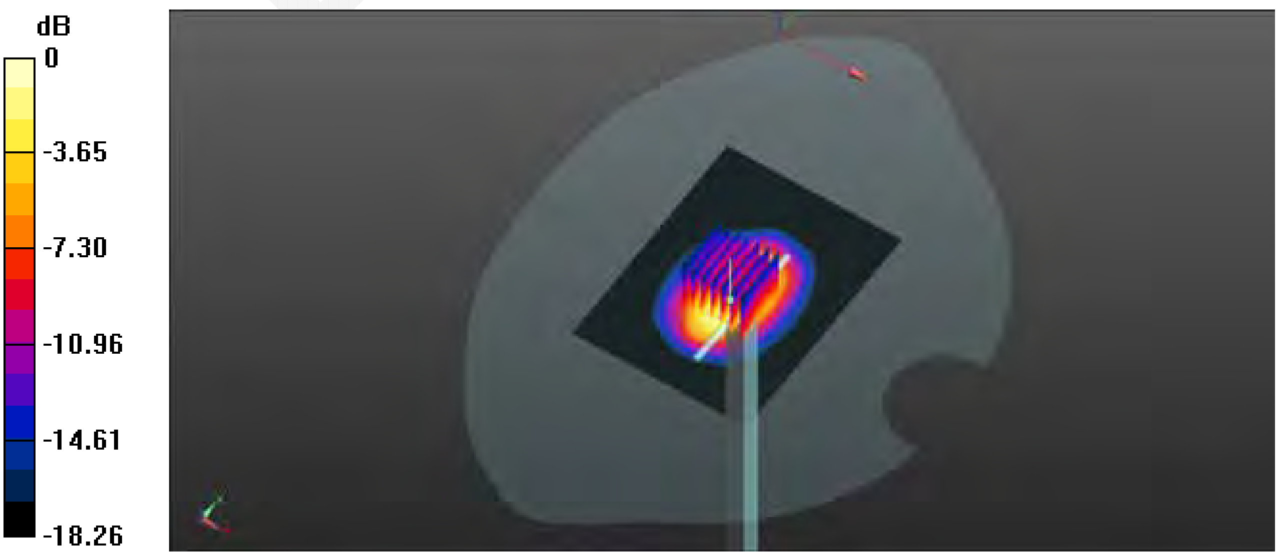
Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.515 S/m; ε_r = 54.189; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7329; ConvF(7.56, 7.56, 7.56); Calibrated: 2015/2/5;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1459; Calibrated: 2015/1/26
- Phantom: SAM (30deg probe tilt) with CRP v5.0_20150321; Type: QD000P40CD; Serial: TP:1874
- Measurement SW: DASY52, Version 52.8 (8);

Body/System Check /Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 47.2 W/kg

Body/System Check /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 163.5 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 73.8 W/kg
SAR(1 g) = 38.9 W/kg; SAR(10 g) = 19.7 W/kg
Maximum value of SAR (measured) = 43.7 W/kg



0 dB = 43.7 W/kg = 16.40 dBW/kg

Test Laboratory:Bay Area Compliance Labs Corp.（Dongguan）

System Performance 2450MHz Body

DUT: Dipole 2450 MHz; Type: ALS-D-2450-S-2; S/N:220-00758

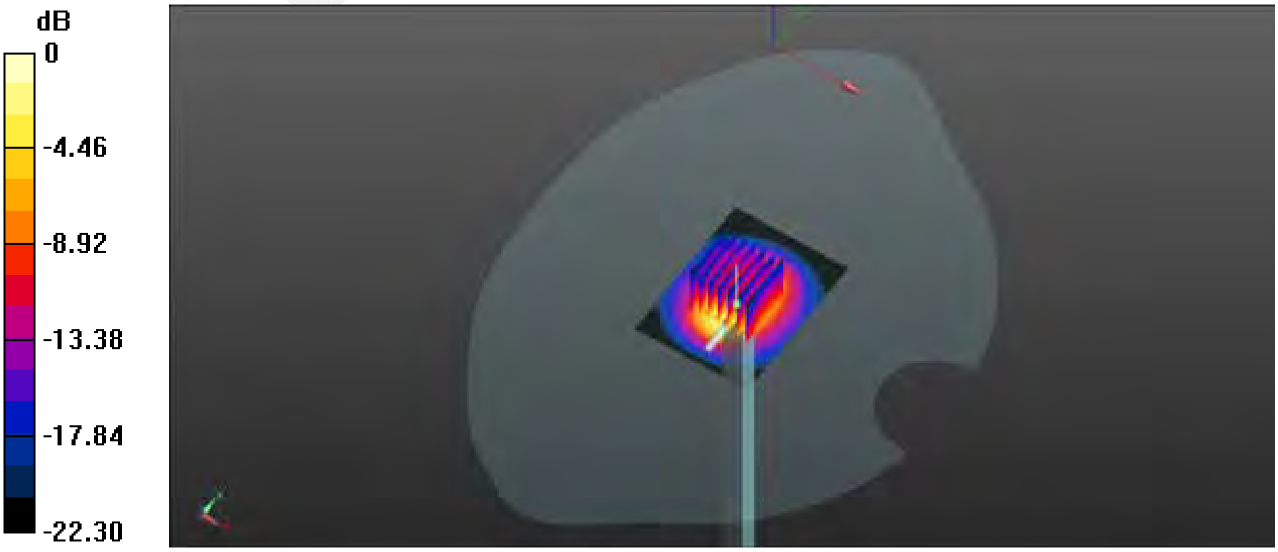
Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2450 MHz; σ = 2.032 S/m; ε_r = 52.253; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7329; ConvF(7.2, 7.2, 7.2); Calibrated: 2015/2/5;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1459; Calibrated: 2015/1/26
- Phantom: SAM (30deg probe tilt) with CRP v5.0_20150321; Type: QD000P40CD; Serial: TP:1874
- Measurement SW: DASY52, Version 52.8 (8);

Body/System Check /Area Scan (61x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 68.8 W/kg

Body/System Check /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 180.2 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 120 W/kg
SAR(1 g) = 53.9 W/kg; SAR(10 g) = 26.4 W/kg
Maximum value of SAR (measured) = 66.6 W/kg



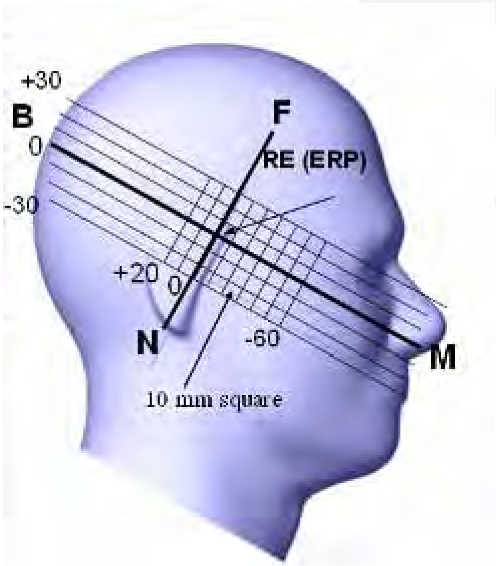
0 dB = 66.6 W/kg = 18.23 dBW/kg

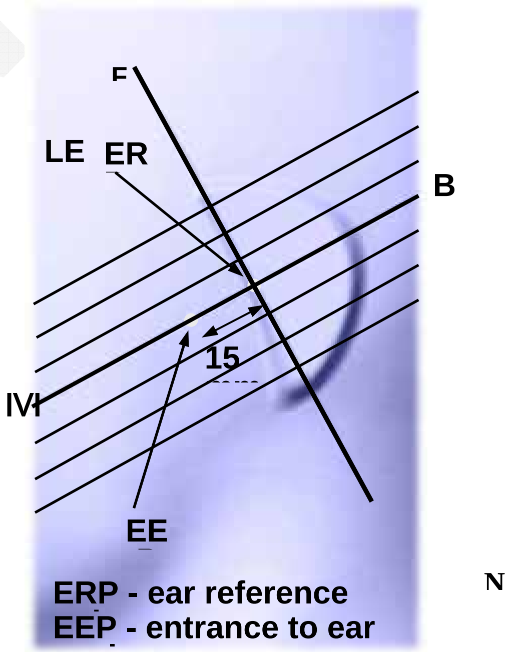
EUT TEST STRATEGY AND METHODOLOGY

Test Positions for Device Operating Next to a Person's Ear

This category includes most wireless handsets with fixed, retractable or internal antennas located toward the top half of the device, with or without a foldout, sliding or similar keypad cover. The handset should have its earpiece located within the upper ¼ of the device, either along the centerline or off-centered, as perceived by its users. This type of handset should be positioned in a normal operating position with the "test device reference point" located along the "vertical centerline" on the front of the device aligned to the "ear reference point". The "test device reference point" should be located at the same level as the center of the earpiece region. The "vertical centerline" should bisect the front surface of the handset at its top and bottom edges. A "ear reference point" is located on the outer surface of the head phantom on each ear spacer. It is located 1.5 cm above the center of the ear canal entrance in the "phantom reference plane" defined by the three lines joining the center of each "ear reference point" (left and right) and the tip of the mouth.

A handset should be initially positioned with the earpiece region pressed against the ear spacer of a head phantom. For the SCC-34/SC-2 head phantom, the device should be positioned parallel to the "N-F" line defined along the base of the ear spacer that contains the "ear reference point". For interim head phantoms, the device should be positioned parallel to the cheek for maximum RF energy coupling. The "test device reference point" is aligned to the "ear reference point" on the head phantom and the "vertical centerline" is aligned to the "phantom reference plane". This is called the "initial ear position". While maintaining these three alignments, the body of the handset is gradually adjusted to each of the following positions for evaluating SAR:





Cheek/Touch Position

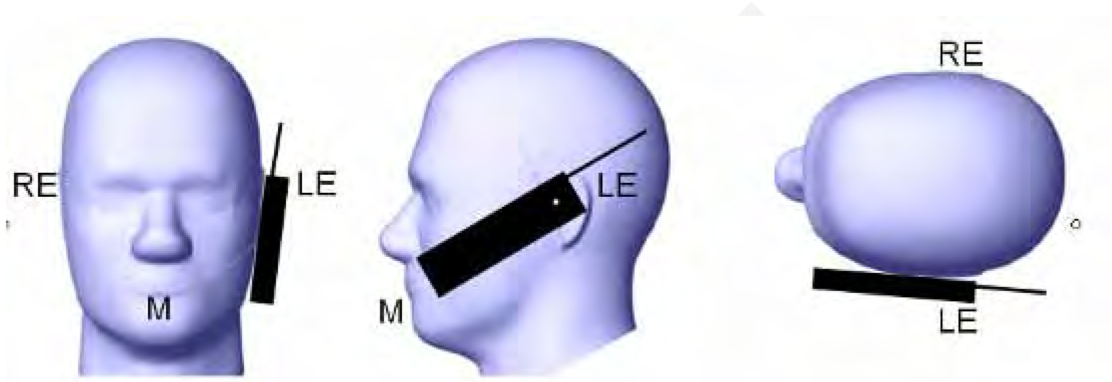
The device is brought toward the mouth of the head phantom by pivoting against the "ear reference point" or along the "N-F" line for the SCC-34/SC-2 head phantom.

This test position is established:

- When any point on the display, keypad or mouthpiece portions of the handset is in contact with the phantom.
- (or) When any portion of a foldout, sliding or similar keypad cover opened to its intended self-adjusting normal use position is in contact with the cheek or mouth of the phantom.

For existing head phantoms – when the handset loses contact with the phantom at the pivoting point, rotation should continue until the device touches the cheek of the phantom or breaks its last contact from the ear spacer.

Cheek /Touch Position



Ear/Tilt Position

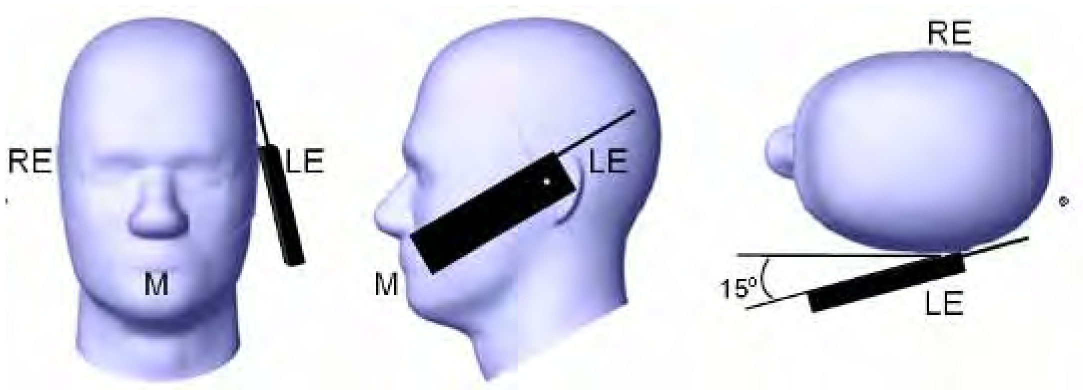
With the handset aligned in the "Cheek/Touch Position":

1) If the earpiece of the handset is not in full contact with the phantom's ear spacer (in the "Cheek/Touch position") and the peak SAR location for the "Cheek/Touch" position is located at the ear spacer region or corresponds to the earpiece region of the handset, the device should be returned to the "initial ear position" by rotating it away from the mouth until the earpiece is in full contact with the ear spacer.

2) (otherwise) The handset should be moved (translated) away from the cheek perpendicular to the line passes through both "ear reference points" (note: one of these ear reference points may not physically exist on a split head model) for approximate 2-3 cm. While it is in this position, the device handset is tilted away from the mouth with respect to the "test device reference point" until the inside angle between the vertical centerline on the front surface of the phone and the horizontal line passing through the ear reference point isby 15 80°. After the tilt, it is then moved (translated) back toward the head perpendicular to the line passes through both "ear reference points" until the device touches the phantom or the ear spacer. If the antenna touches the head first, the positioning process should be repeated with a tilt angle less than 15° so that the device and its antenna would touch the phantom simultaneously. This test position may require a device holder or positioner to achieve the translation and tilting with acceptable positioning repeatability.

If a device is also designed to transmit with its keypad cover closed for operating in the head position, such positions should also be considered in the SAR evaluation. The device should be tested on the left and right side of the head phantom in the "Cheek/Touch" and "Ear/Tilt" positions. When applicable, each configuration should be tested with the antenna in its fully extended and fully retracted positions. These test configurations should be tested at the high, middle and low frequency channels of each operating mode; for example, AMPS, CDMA, and TDMA. If the SAR measured at the middle channel for each test configuration (left, right, Cheek/Touch, Tilt/Ear, extended and retracted) is at least 2.0 dB lower than the SAR limit, testing at the high and low channels is optional for such test configuration(s). If the transmission band of the test device is less than 10 MHz, testing at the high and low frequency channels is optional.

Ear /Tilt 15° Position



Test positions for body-worn and other configurations

Body-worn operating configurations should be tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in normal use configurations. Devices with a headset output should be tested with a headset connected to the device. When multiple accessories that do not contain metallic components are supplied with the device, the device may be tested with only the accessory that dictates the closest spacing to the body. When multiple accessories that contain metallic components are supplied with the device, the device must be tested with each accessory that contains a unique metallic component. If multiple accessories share an identical metallic component (e.g., the same metallic belt-clip used with different holsters with no other metallic components), only the accessory that dictates the closest spacing to the body must be tested.

Body-worn accessories may not always be supplied or available as options for some devices that are intended to be authorized for body-worn use. A separation distance of 1.5 cm between the back of the device and a flat phantom is recommended for testing body-worn SAR compliance under such circumstances. Other separation distances may be used, but they should not exceed 2.5 cm. In these cases, the device may use body-worn accessories that provide a separation distance greater than that tested for the device provided however that the accessory contains no metallic components.

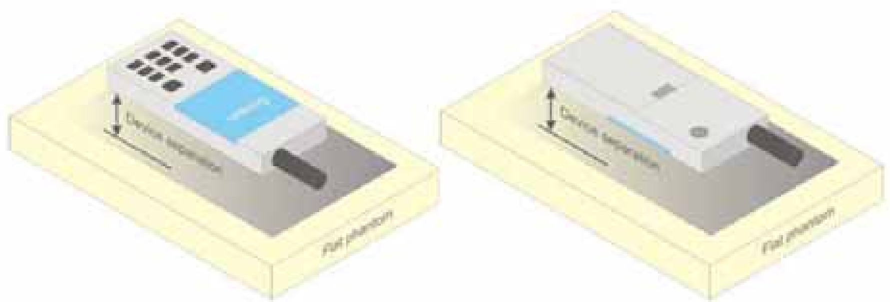


Figure 5 – Test positions for body-worn devices

SAR Evaluation Procedure

The evaluation was performed with the following procedure:

Step 1: Measurement of the SAR value at a fixed location above the ear point or central position was used as a reference value for assessing the power drop. The SAR at this point is measured at the start of the test and then again at the end of the testing.

Step 2: The SAR distribution at the exposed side of the head was measured at a distance of 4 mm from the inner surface of the shell. The area covered the entire dimension of the head or EUT and the horizontal grid spacing was 10 mm x 10 mm. Based on these data, the area of the maximum absorption was determined by spline interpolation. The first Area Scan covers the entire dimension of the EUT to ensure that the hotspot was correctly identified.

Step 3: Around this point, a volume of 35 mm x 35 mm x 35 mm was assessed by measuring 7x 7 x 7 points. On the basis of this data set, the spatial peak SAR value was evaluated under the following procedure:

1) The data at the surface were extrapolated, since the center of the dipoles is 1.2 mm away from the tip of the probe and the distance between the surface and the lowest measuring point is 1.3 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.

2) The maximum interpolated value was searched with a straightforward algorithm. Around this maximum the SAR values averaged over the spatial volumes (1 g or 10 g) were computed by the 3D-Spline interpolation algorithm. The 3D-Spline is composed of three one dimensional 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 averages.

All neighboring volumes were evaluated until no neighboring volume with a higher average value was found.

Step 4: Re-measurement of the SAR value at the same location as in Step 1. If the value changed by more than 5%, the evaluation was repeated.

Test methodology

KDB 447498 D01 General RF Exposure Guidance v05r02.
KDB 648474 D04 Handset SAR v01r02.
KDB 865664 D01 SAR measurement 100 MHz to 6 GHz v01r03
KDB 865664 D02 RF Exposure Reporting v01r01
KDB 941225 D01 3G SAR Procedures v03
KDB 941225 D06 Hotspot Mode v02
KDB 616217 D04 SAR for laptop and tablets v01r01
KDB 941225 D05 SAR for LTE Devices v02r03
KDB 248227 D01 SAR Measurement Procedures for 802.11a/b/g Transmitters

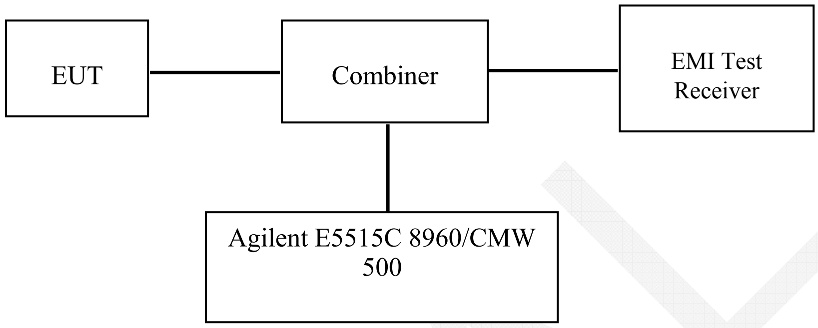
CONDUCTED OUTPUT POWER MEASUREMENT

Provision Applicable

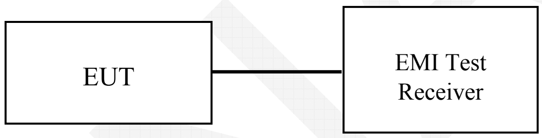
The measured peak output power should be greater and within 5% than EMI measurement.

Test Procedure

The RF output of the transmitter was connected to the input of the EMI Test Receiver through sufficient attenuation.



CDMA/ LTE



WLAN/Bluetooth

Radio Configuration

The power measurement was configured by the Wireless Communication Test Set E5515C for CDMA Band and Wideband Radio Communication Tester CMW500 for LTE Band.

CDMA 1x RTT

Maximum output power is verified on the high, middle and low channels according to procedures in section 4.4.5.2 of 3GPP2 C.S0011/TIA-98-E. Steps 3 and 4 are measured using Loopback Service Option SO55 with power control bits in “All Up” condition. Step 10 is measured using TDSO/SO32 with power control bits in the “Bits Hold” condition (i.e. alternative Up/Down Bits).

Table 4.4.5.2-1. Test Parameters for Maximum RF Output Power with a Single Traffic Code Channel, Spreading Rate 1

Parameter	Units	Value
$\hat{I}_{or}$	dBm/1.23 MHz	-104
$\frac{\text{Pilot } E_c}{I_{or}}$	dB	-7
$\frac{\text{Traffic } E_c}{I_{or}}$	dB	-7.4

Table 4.4.5.2-2. Test Parameters for Maximum RF Output Power with Multiple Traffic Code Channels, Spreading Rate 1

Parameter	Units	Value
$\frac{\text{Pilot } E_c}{I_{or}}$	dB	-7
$\frac{\text{Traffic } E_c}{I_{or}}$	dB	-7.4

EVDO

Maximum output power is verified on the high, middle and low channels according to procedures in section 3.1.2.3.4 of 3GPP2 C.S0033-0/TIA-866 for Rev. 0, section 4.3.4 of 3GPP2 C.S0033-A for Rev. A.

Maximum output power is measured for Rev. 0 and Rev. A in Subtype 0/1 and Subtype 2 Physical Layer configurations, respectively.

LTE

For UE Power Class 1 and 3, the allowed Maximum Power Reduction (MPR) for the maximum output power in Table 6.2.2-1due to higher order modulation and transmit bandwidth configuration (resource blocks) is specified in Table 6.2.3-1.

Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1 and 3

Modulation	Channel bandwidth / Transmission bandwidth (N_{RB})						MPR (dB)
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2

For UE Power Class 1 and 3 the specific requirements and identified subclauses are specified in Table 6.2.4-1 along with the allowed A-MPR values that may be used to meet these requirements. The allowed A-MPR values specified below in Table 6.2.4.-1 to 6.2.4-15 are in addition to the allowed MPR requirements specified in sub-clause 6.2.3.

Table 6.2.4-1: Additional Maximum Power Reduction (A-MPR)

Network Signalling value	Requirements (subclause)	E-UTRA Band	Channel bandwidth (MHz)	Resources Blocks (N_{RB})	A-MPR (dB)
NS_01	6.6.2.1.1	Table 5.5-1	1.4, 3, 5, 10, 15, 20	Table 5.6-1	N/A
NS_03	6.6.2.2.1	2, 4,10, 23, 25, 35, 36	3	>5	≤ 1
			5	>6	≤ 1
			10	>6	≤ 1
			15	>8	≤ 1
			20	>10	≤ 1
NS_04	6.6.2.2.2	41	5	>6	≤ 1
			10, 15, 20	Table 6.2.4-4	
NS_05	6.6.3.3.1	1	10,15,20	≥ 50	≤ 1
NS_06	6.6.2.2.3	12, 13, 14, 17	1.4, 3, 5, 10	Table 5.6-1	N/A
NS_07	6.6.2.2.3 6.6.3.3.2	13	10	Table 6.2.4-2	
NS_08	6.6.3.3.3	19	10, 15	> 44	≤ 3
NS_09	6.6.3.3.4	21	10, 15	> 40	≤ 1
				> 55	≤ 2
NS_10		20	15, 20	Table 6.2.4-3	
NS_11	6.6.2.2.1	23	1.4, 3, 5, 10, 15, 20	Table 6.2.4-5	
NS_12	6.6.3.3.5	26	1.4, 3, 5	Table 6.2.4-6	
NS_13	6.6.3.3.6	26	5	Table 6.2.4-7	
NS_14	6.6.3.3.7	26	10, 15	Table 6.2.4-8	
NS_15	6.6.3.3.8	26	1.4, 3, 5, 10, 15	Table 6.2.4-9 Table 6.2.4-10	
NS_16	6.6.3.3.9	27	3, 5, 10	Table 6.2.4-11, Table 6.2.4-12, Table 6.2.4-13	
NS_17	6.6.3.3.10	28	5, 10	Table 5.6-1	N/A
NS_18	6.6.3.3.11	28	5	≥ 2	≤ 1
			10, 15, 20	≥ 1	≤ 4
NS_19	6.6.3.3.12	44	10, 15, 20	Table 6.2.4-14	
NS_20	6.2.2 6.6.2.2.1 6.6.3.2	23	5, 10, 15, 20	Table 6.2.4-15	
…					
NS_32	-	-	-	-	-

Maximum Target Output Power

Maximum Target Output Power (dBm)			
Mode/Band	**Low Channel**	**Middle Channel**	**High Channel**
CDMA 850	23.8	23.8	23.8
CDMA 850 P-Sensor Triggered	19	19	19
CDMA 1900	23	23	23
CDMA 1900 P-Sensor Triggered	18.2	18.2	18.2
LTE Band 4	22.3	22.3	22.3
LTE Band 4 P-Sensor Triggered	17.5	17.5	17.5
LTE Band 13	22.5	22.5	22.5
LTE Band 13 P-Sensor Triggered	17.7	17.7	17.7
WLAN 2.4G Band SISO Chain 0(Main)	18	18	18
WLAN 2.4G Band SISO Chain 1(Aux)	17.2	17.2	17.2
WLAN 2.4G Band MIMO	18	18	18
WLAN 5.2G Band SISO Chain 0(Main)	11.7	11.7	11.7
WLAN 5.2G Band SISO Chain 1(Aux)	12.7	12.7	12.7
WLAN 5.2G Band MIMO	13.6	13.6	13.6
WLAN 5.3G Band SISO Chain 0(Main)	13.2	13.2	13.2
WLAN 5.3G Band SISO Chain 1(Aux)	13.4	13.4	13.4
WLAN 5.3G Band MIMO	13.5	13.5	13.5
WLAN 5.6G Band SISO Chain 0(Main)	11.4	11.4	11.4
WLAN 5.6G Band SISO Chain 1(Aux)	11.3	11.3	11.3
WLAN 5.6G Band MIMO	13.7	13.7	13.7
WLAN 5.8G Band SISO Chain 0(Main)	13.9	13.9	13.9
WLAN 5.8G Band SISO Chain 1(Aux)	13.4	13.4	13.4
WLAN 5.8G Band MIMO	14.6	14.6	14.6
Bluetooth BDR/EDR	5	5	5
Bluetooth LE	3.5	3.5	3.5

Note: the device employed a proximity sensor for WWAN.

Proximity Sensor Operation

A Proximity sensor for power reduction is implemented in this device to address RF exposure compliance when the WWAN antenna is positioned close to the user's body. This design combines the antenna and proximity sensor into a single FPC (Flexible Printed Circuit). The sensor operation area is the back and top side of the device.

The minimum detection distances for Top side and back side determined as below:

Proximity Sensor Status Table

Top edge

Distance (mm)	15	16	17	18	19	20	21	22	23	24	25	26	27
Toward	on	on	on	on	on	on	on	off	off	off	off	off	off
Away	on	on	on	on	on	on	on	on	off	off	off	off	off

Back edge

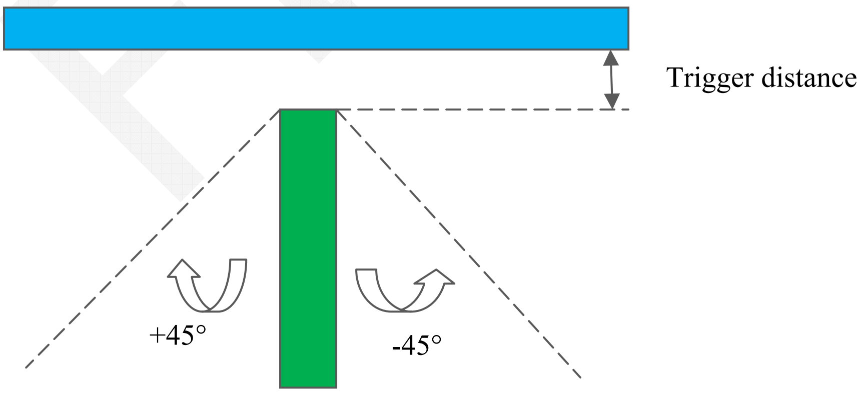
Distance (mm)	15	16	17	18	19	20	21	22	23	24	25	26	27
Toward	on	on	on	on	on	on	on	off	off	off	off	off	off
Away	on	on	on	on	on	on	on	on	off	off	off	off	off

Note: each side minimum detection distance was performed with below:
Toward: moving toward the phantom
Away: Moving away from the phantom

Tilt angle

The influence of table tilt angles to proximity sensor triggering was determined by positioning each tablet edge that contains a transmitting antenna, perpendicular to the flat phantom, at 22mm separation.

Rotating the tablet around the edge next to the phantom in ≤ 10° increments until the tablet is ± 45° from the vertical position at 0°. And the maximum output power remains in the reduced mode.



Trigger Distance (mm)	
Position	Top Edge
Minimum	22

Power Reduction Values

The power reduction values in each edge are the same as below power table at the separation distance P-sensor triggering on, please refer to the below test results.

Base on the minimum separation triggering distance is 21mm for both back and top edge, a additional SAR measurements were required at 20cm for back and top edge.

Test Results:

CDMA 1x RTT P-Sensor Not Triggered

Band	Channel No.	Frequency (MHz)	RF Output Power (dBm)			
			RC1+SO55	RC3+SO55	RC3+SO32 (FCH)	RC3+SO32 (SCH)
BC0	1013	824.7	23.45	23.61	23.52	23.04
	283	833.49	23.52	23.52	23.54	23.44
	777	848.31	23.45	23.71	23.48	23.52
BC1	25	1851.25	22.87	22.64	22.70	22.71
	600	1880	22.75	22.75	22.68	22.59
	1175	1908.75	22.73	22.61	22.59	22.61

EVDO P-Sensor Not Triggered

Band	Channel No.	Frequency (MHz)	RF Output Power (dBm)	
			RTAP 153.6kbps Subtype 0	RETAP 4096pbs Subtype 2
BC0	1013	824.7	23.47	23.56
	283	833.49	23.52	23.50
	777	848.31	23.49	23.48
BC1	25	1851.25	22.82	22.55
	600	1880	22.75	22.39
	1175	1908.75	22.68	22.46

CDMA 1x RTT P-Sensor Triggered

Band	Channel No.	Frequency (MHz)	RF Output Power (dBm)			
			RC1+SO55	RC3+SO55	RC3+SO32 (FCH)	RC3+SO32 (SCH)
BC0	1013	824.7	18.65	18.86	18.61	18.69
	283	833.49	18.75	18.68	18.59	18.66
	777	848.31	18.68	18.9	18.34	18.43
BC1	25	1851.25	18.05	17.85	18.15	18.03
	600	1880	17.94	17.97	17.88	17.89
	1175	1908.75	17.93	17.84	17.61	17.63

EVDO P-Sensor Triggered

Band	Channel No.	Frequency (MHz)	RF Output Power (dBm)	
			RTAP 153.6kbps Subtype 0	RETAP 4096pbs Subtype 2
BC0	1013	824.7	18.63	18.77
	283	833.49	18.77	18.71
	777	848.31	18.72	18.73
BC1	25	1851.25	18	17.73
	600	1880	17.96	17.58
	1175	1908.75	17.84	17.71

LTE Band 4 P-Sensor NOT Triggered:

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4M	QPSK	1#0	22.33	22.34	22.35
		1#3	22.33	22.31	22.32
		1#5	22.28	22.29	22.27
		3#0	22.23	22.21	22.26
		3#1	22.17	22.20	22.18
		3#3	22.22	22.19	22.24
		6#0	21.27	21.29	21.27
	16-QAM	1#0	21.05	21.03	21.10
		1#3	21.02	21.01	20.99
		1#5	21.03	21.01	21.02
		3#0	21.10	21.08	21.09
		3#1	21.04	21.07	21.06
		3#3	21.03	21.06	21.00
		6#0	20.26	20.26	20.22
3M	QPSK	1#0	22.22	22.24	22.26
		1#7	22.25	22.26	22.23
		1#14	22.29	22.25	22.28
		8#0	21.26	21.26	21.25
		8#4	21.25	21.25	21.27
		8#7	21.23	21.24	21.20
		15#0	21.25	21.23	21.21
	16-QAM	1#0	21.46	21.46	21.44
		1#7	21.47	21.44	21.50

		1#14	21.42	21.43	21.46
		8#0	20.21	20.18	20.25
		8#4	20.18	20.19	20.18
		8#7	20.19	20.20	20.22
		15#0	20.33	20.30	20.36
5M	QPSK	1#0	22.34	22.33	22.30
		1#12	22.30	22.30	22.34
		1#24	22.26	22.26	22.28
		12#0	21.22	21.23	21.22
		12#6	21.24	21.28	21.23
		12#11	21.33	21.29	21.33
		25#0	21.21	21.19	21.23
	16-QAM	1#0	21.11	21.14	21.14
		1#12	21.14	21.15	21.12
		1#24	21.12	21.14	21.12
		12#0	20.29	20.29	20.30
		12#6	20.27	20.27	20.25
		12#11	20.25	20.24	20.21
		25#0	20.15	20.18	20.11
10M	QPSK	1#0	22.26	22.25	22.23
		1#24	22.24	22.23	22.23
		1#49	22.22	22.24	22.20
		25#0	21.18	21.18	21.18
		25#12	21.17	21.16	21.18
		25#24	21.15	21.14	21.12
		50#0	21.13	21.10	21.13
	16-QAM	1#0	21.39	21.41	21.40
		1#24	21.45	21.45	21.46
		1#49	21.46	21.46	21.45
		25#0	20.22	20.25	20.24
		25#12	20.20	20.21	20.18
		25#24	20.22	20.22	20.21
		50#0	20.06	20.03	20.04
15M	QPSK	1#0	22.28	22.31	22.24
		1#37	22.36	22.36	22.36
		1#74	22.34	22.33	22.35
		36#0	21.06	21.08	21.05
		36#17	21.05	21.09	21.05

		36#35	21.08	21.07	21.07
		75#0	21.01	21.03	21.01
	16-QAM	1#0	21.54	21.55	21.54
		1#37	21.54	21.58	21.55
		1#74	21.58	21.59	21.60
		36#0	20.34	20.34	20.31
		36#17	20.33	20.33	20.36
		36#35	20.35	20.36	20.34
		75#0	19.98	20.01	20.00
20M	QPSK	1#0	22.22	22.23	22.21
		1#49	22.20	22.20	22.23
		1#99	22.23	22.19	22.20
		50#0	21.16	21.14	21.17
		50#24	21.11	21.12	21.09
		50#49	21.13	21.13	21.14
		100#0	21.09	21.08	21.12
	16-QAM	1#0	21.76	21.76	21.77
		1#49	21.71	21.72	21.68
		1#99	21.73	21.71	21.70
		50#0	20.22	20.22	20.22
		50#24	20.22	20.23	20.23
		50#49	20.19	20.19	20.19
		100#0	20.14	20.12	20.18

LTE Band 4 P-Sensor Triggered:

Test Bandwidth	Test Modulation	Resource Block & RB offset	Low Channel (dBm)	Middle Channel (dBm)	High Channel (dBm)
1.4M	QPSK	1#0	17.56	17.51	17.52
		1#3	17.56	17.53	17.51
		1#5	17.46	17.52	17.44
		3#0	17.44	17.43	17.47
		3#1	17.41	17.4	17.38
		3#3	17.47	17.4	17.47
		6#0	16.43	16.52	16.44
	16-QAM	1#0	16.21	16.27	16.28
		1#3	16.24	16.18	16.2
		1#5	16.2	16.21	16.27
		3#0	16.26	16.26	16.33
		3#1	16.24	16.24	16.29
		3#3	16.21	16.3	16.2
		6#0	15.47	15.49	15.39
3M	QPSK	1#0	17.46	17.47	17.46
		1#7	17.46	17.45	17.4
		1#14	17.51	17.43	17.47
		8#0	16.5	16.46	16.49
		8#4	16.4	16.5	16.51
		8#7	16.43	16.4	16.36
		15#0	16.48	16.48	16.37
	16-QAM	1#0	16.63	16.63	16.62
		1#7	16.67	16.6	16.72
		1#14	16.63	16.61	16.66
		8#0	15.44	15.37	15.42
		8#4	15.39	15.36	15.41
		8#7	15.36	15.41	15.43
		15#0	15.49	15.51	15.54
5M	QPSK	1#0	17.5	17.55	17.53
		1#12	17.46	17.54	17.54
		1#24	17.5	17.47	17.45
		12#0	16.39	16.44	16.43
		12#6	16.46	16.52	16.44
		12#11	16.5	16.47	16.53
		25#0	16.46	16.36	16.46
	16-QAM	1#0	16.32	16.32	16.36
		1#12	16.3	16.37	16.29
		1#24	16.34	16.39	16.36

		12#0	15.49	15.54	15.53
		12#6	15.51	15.49	15.43
		12#11	15.46	15.46	15.4
		25#0	15.32	15.33	15.32
10M	QPSK	1#0	17.48	17.45	17.4
		1#24	17.45	17.47	17.39
		1#49	17.41	17.43	17.44
		25#0	16.43	16.38	16.37
		25#12	16.34	16.36	16.4
		25#24	16.36	16.35	16.3
		50#0	16.36	16.29	16.37
	16-QAM	1#0	16.56	16.64	16.6
		1#24	16.63	16.67	16.69
		1#49	16.7	16.65	16.69
		25#0	15.46	15.42	15.47
		25#12	15.44	15.37	15.41
		25#24	15.38	15.39	15.37
		50#0	15.26	15.23	15.26
15M	QPSK	1#0	17.47	17.47	17.47
		1#37	17.6	17.57	**17.6**
		1#74	17.52	17.57	17.58
		36#0	16.28	16.3	16.24
		36#17	16.23	16.27	16.24
		36#35	16.31	16.25	16.32
		75#0	16.25	16.27	16.19
	16-QAM	1#0	16.74	16.79	16.76
		1#37	16.7	16.82	16.71
		1#74	16.79	16.78	16.81
		36#0	15.53	15.53	15.51
		36#17	15.48	15.53	15.52
		36#35	15.6	15.53	15.49
		75#0	15.16	15.2	15.21
20M	QPSK	1#0	**17.42**	**17.45**	**17.38**
		1#49	17.35	17.39	17.41
		1#99	17.39	17.4	17.36
		50#0	16.39	16.39	16.36
		50#24	16.29	16.28	16.3
		50#49	16.34	16.3	16.36
		100#0	16.25	16.27	16.32
	16-QAM	1#0	17	16.92	16.99
		1#49	16.9	16.93	16.9
		1#99	16.9	16.9	16.92

		50#0	15.41	15.4	15.4
		50#24	15.45	15.43	15.4
		50#49	15.36	15.36	15.35
		100#0	15.36	15.3	15.37

Note:
1.SAR for LTE band exposure configurations is measured according to the procedures of KDB 941225 D05 SAR for LTE Devices v02.
2.The CMW500 Wideband Radio Communication tester is used for LTE output power measurements and SAR testing. Closed loop power control is used to keep the radio transmitters the max output power during the test.
3.KDB941225D05v02- SAR for higher order modulation is required only when the highest maximum output power for the configuration in the higher order modulation is > ½ dB higher than the same configuration in QPSK or when the reported SAR for the QPSK configuration is > 1.45 W/kg

Bluetooth:

Mode	Channel frequency (MHz)	RF Output Power (dBm)
BDR(GFSK)	2402	4.81
	2441	4.71
	2480	4.18
EDR(4-DQPSK)	2402	3.64
	2441	3.53
	2480	2.71
EDR-8DPSK	2402	2.74
	2441	2.62
	2480	1.77
BLE	2402	3.09
	2440	2.67
	2480	1.70

WLAN 2.4G, SISO Mode:

Mode	Channel	Frequency (MHz)	Conducted Average Output Power (dBm)	
			Main(Chain 0)	Aux(Chain 1)
802.11 b	Low	2412	**16.13**	**16.6**
	Middle	2437	**17.38**	**16.28**
	High	2462	**17.97**	**16.92**
802.11 g	Low	2412	16.05	15.9
	Middle	2437	17.92	16.92
	High	2462	16.95	16.03
802.11 n20	Low	2412	15.84	15.78
	Middle	2437	16.74	17.01
	High	2462	15.26	14.46
802.11 n40	Low	2422	13.37	12.78
	Middle	2437	15.8	15.24
	High	2452	12.37	10.66

WLAN 2.4G, MIMO Mode:

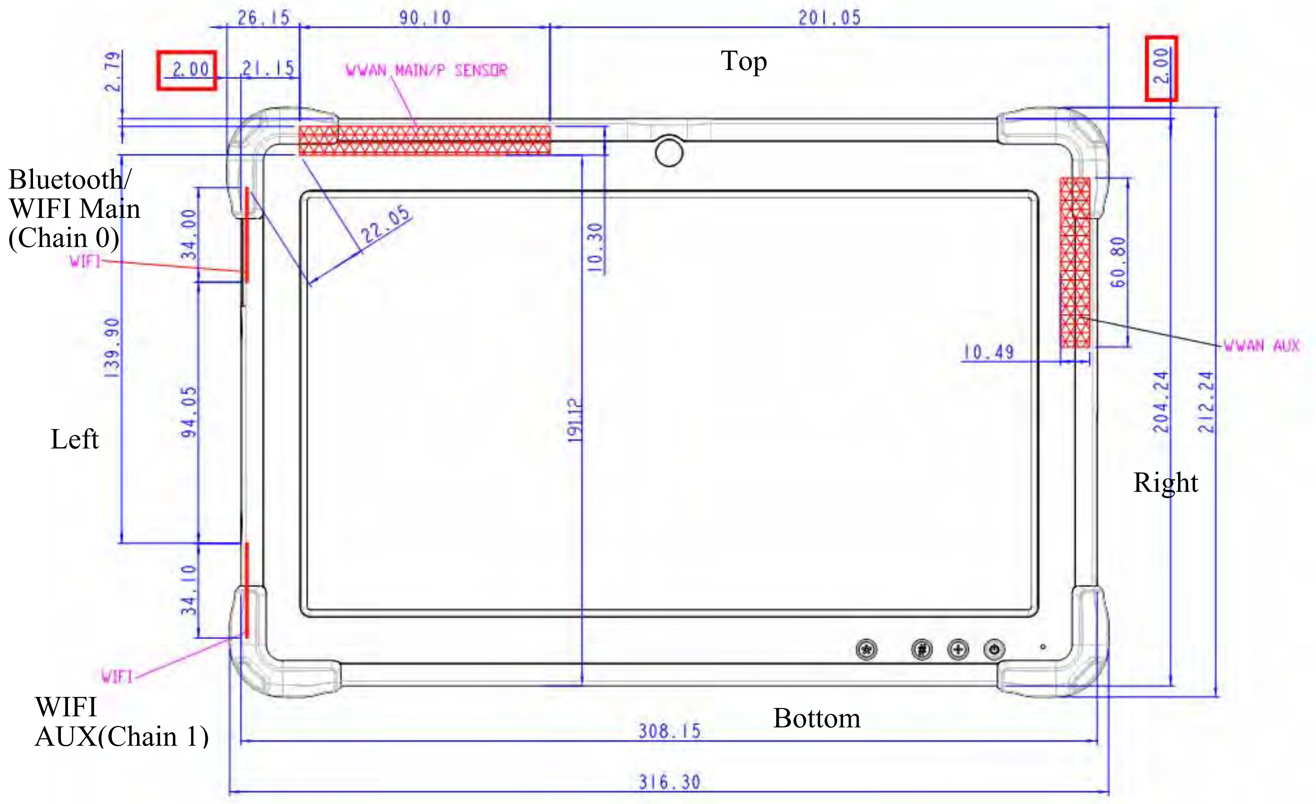
Mode	Channel	Frequency (MHz)	Conducted Average Output Power (dBm)		
			Main(Chain 0)	Aux(Chain 1)	Total
802.11 b	Low	2412	13.1	13.32	16.22
	Middle	2437	13.69	14.41	17.08
	High	2462	14.44	14.96	17.72
802.11 g	Low	2412	13.18	13.52	16.36
	Middle	2437	15.06	13.78	17.48
	High	2462	13.67	13.44	16.57
802.11 n20	Low	2412	13.18	12.97	16.09
	Middle	2437	14.27	13.73	17.02
	High	2462	13.55	13.37	16.47
802.11 n40	Low	2422	8.91	8.99	11.96
	Middle	2437	12.95	12.4	15.69
	High	2452	9.52	8.73	12.15

Note:

1. The output power was tested under data rate 1Mbps for 802.11b, 6Mbps for 802.11g, MCS0 and MCS8 for 802.11n HT20,HT40.

SAR MEASUREMENT RESULTS

Antenna Location



Antenna Distance To Edge

Antenna Distance To Edge (mm)				
Antenna	**Left Edge**	**Right Edge**	**Top Edge**	**Bottom Edge**
CDMA/LTE Main	26.15	201.05	2.79	191.12
WIFI AUX	2.0	308.15	153.02	17.12
Bluetooth/WIFI Main	2.0	308.15	24.97	145.27

Standalone SAR test exclusion considerations

Mode	Frequency (MHz)	Pavg (dBm)	Pavg (mW)	Distance (mm)	Calculated value	Threshold (1-g)	SAR Test Exclusion
WiFi	2450	18	63.1	0	19.75	3	NO
Bluetooth	2450	5	3.16	0	0.99	3	YES
CDMA 850	835	23.8	239.9	0	43.84	3	NO
CDMA 1900	1880	23	200	0	36.45	3	NO
LTE Band 4	1732.5	22.3	169.8	0	44.71	3	NO

NOTE:

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:
[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] · [√ f(GHz)] ≤ 3.0 for 1-g SAR and ≤7.5 for 10-g extremity SAR, where
1. f(GHz) is the RF channel transmit frequency in GHz.
2. Power and distance are rounded to the nearest mW and mm before calculation.
3. The result is rounded to one decimal place for comparison.
4. When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test Exclusion.

SAR test exclusion for the EUT edge considerations Result

Mode	Back	Left Edge	Right Edge	Top Edge	Bottom Edge
WLAN Main	Required	Required	Exclusion	Judge	Judge
WLAN AUX	Required	Required	Exclusion	Judge	Judge
CDMA 850	Required	Judge	Exclusion	Required	Judge
CDMA 1900	Required	Judge	Exclusion	Required	Judge
LTE Band 4	Required	Judge	Exclusion	Required	Judge

Note:
Required: the distance is less than 5mm, the SAR test is required as Standalone SAR test exclusion considerations table.
Exclusion: the distance is more than 20cm to the edge, SAR test is not application.
Judge: Please refer the below table for detail.

SAR test exclusion for the EUT edge considerations detail:

Distance< 50mm

Mode	Edge	Frequency (MHz)	Pavg (dBm)	Pavg (mW)	Distance (mm)	Calculated value	Threshold (1-g)	SAR Test required
WLAN Main	Top	2450	18	63.1	24.97	3.96	3	Yes
WLAN AUX	Bottom	2450	18	63.1	17.12	5.77	3	Yes
CDMA 850	Left	835	23.8	239.9	26.15	8.38	3	Yes
CDMA 1900	Left	1880	23	200	26.15	10.46	3	Yes
LTE Band 4	Left	1732.5	22.3	169.8	26.15	8.55	3	Yes

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:
[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] · [√ f(GHz)] ≤ 3.0 for 1-g SAR and ≤7.5 for 10-g extremity SAR, where
1. f(GHz) is the RF channel transmit frequency in GHz.
2. Power and distance are rounded to the nearest mW and mm before calculation.
3. The result is rounded to one decimal place for comparison.
4. When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test Exclusion.

Distance> 50mm

Mode	Edge	Frequency (MHz)	Pavg (dBm)	Pavg (mW)	Distance (mm)	Test exclusion Threshold (mW)	SAR Test required
WLAN Main	Bottom	2450	18	63.1	145.27	1048.5	No
WLAN AUX	Top	2450	18	63.1	153.02	1126	No
CDMA 850	Bottom	835	23.8	239.9	191.12	949.72	No
CDMA 1900	Bottom	1880	23	200	191.12	1520.6	No
LTE Band 4	Bottom	1732.5	22.3	169.8	191.12	1525.2	No

At 100 MHz to 6 GHz and for *test separation distances* > 50 mm, the SAR test exclusion threshold is determined according to the following:

a) [Power allowed at numeric threshold for 50 mm in step 1) + (test separation distance - 50 mm)·($f_{(MHz)}$/150)] mW, at 100 MHz to 1500 MHz

b) [Power allowed at numeric threshold for 50 mm in step 1) + (test separation distance - 50 mm)·10] mW at > 1500 MHz and ≤ 6 GHz

Standalone SAR estimation:

Mode	Edge	Frequency (MHz)	Pavg (dBm)	Pavg (mW)	Distance (mm)	Estimated 1-g (W/kg)
Bluetooth	Back	2450	5	3.16	0	0.132
Bluetooth	Left	2450	5	3.16	0	0.132
Bluetooth	Top	2450	5	3.16	24.97	0.026
WLAN Main	Bottom	2450	18	63.1	145.27	0.4
WLAN AUX	Top	2450	17.2	52.48	153.02	0.4
WWAN[Note]	Bottom	835	23.8	239.88	191.12	0.4

When standalone SAR test exclusion applies to an antenna that transmits simultaneously with other antennas, the standalone SAR must be estimated according to following to determine simultaneous transmission SAR test exclusion:
[(max. power of channel, including tune-up tolerance , mW)/(min. test separation distance,mm)] · [$\sqrt{f(GHz)}$/x]
W/kg for test separation distances ≤50 mm;
where x = 7.5 for 1-g SAR.

0.4 W/kg for 1-g SAR and 1.0 W/kg for 10-g SAR, when the *test separation distances* is > 50 mm.
When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test Exclusion

Note: the maximum power was used for evaluation.

SAR Test Data

Environmental Conditions

Temperature:	23-24 ℃
Relative Humidity:	31 %
ATM Pressure:	996 mbar

Testing was performed by Rocky Xiao on 2015-07-06

CDMA 850MHz Band:

EUT Position	Frequency (MHz)	Test Mode	Power Drift (%)	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	1g SAR (W/Kg)			
						Scaled Factor	Meas. SAR	Scaled SAR	Plot
Body-Top (0mm with Power Reduction)	824.7	RTAP 153.6	2.006	18.63	19	1.089	0.179	0.195	/
	833.49	RTAP 153.6	2.345	18.77	19	1.054	0.187	0.197	/
	848.31	RTAP 153.6	-4.501	18.72	19	1.067	0.198	0.211	1#
Body-Back (0mm with Power Reduction)	824.7	RTAP 153.6	/	/	/	/	/	/	/
	833.49	RTAP 153.6	2.706	18.77	19	1.054	0.052	0.055	/
	848.31	RTAP 153.6	/	/	/	/	/	/	/
Body -Left (0mmWithout Power Reduction)	824.7	RTAP 153.6	/	/	/	/	/	/	/
	833.49	RTAP 153.6	3.91	23.52	23.8	1.067	0.041	0.044	/
	848.31	RTAP 153.6	/	/	/	/	/	/	/
Body-Top (20mm Without Power Reduction)	824.7	RTAP 153.6	/	/	/	/	/	/	/
	833.49	RTAP 153.6	1.276	23.52	23.8	1.067	0.045	0.048	/
	848.31	RTAP 153.6	/	/	/	/	/	/	/
Body-Back (20mm Without Power Reduction)	824.7	RTAP 153.6	/	/	/	/	/	/	/
	833.49	RTAP 153.6	-1.013	23.52	23.8	1.067	0.015	0.016	/
	848.31	RTAP 153.6	/	/	/	/	/	/	/

Note:
1. When the 1-g SAR is≤ 0.8W/Kg, testing for other channels are optional.
2. The EUT transmit and receive through the same antenna while testing SAR.
4. KDB 941225 D01- Body-worn accessory and other body SAR are measured using Subtype 0/1 Physical Layer configurations for Rev. 0. The 3G SAR test reduction procedure is applied to Rev. A, Subtype 2 Physical layer configuration, with Rev. 0 as the primary mode;
5. When SAR or MPE 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.
6. KDB 616217 D04, the device employed a proximity sensor for WWAN, the triggered distance is 21mm from the WWAN main antenna. Test is performed at 20mm for maximum power test.

CDMA 1900MHz Band:

EUT Position	Frequency (MHz)	Test Mode	Power Drift (%)	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	1g SAR (W/Kg)			
						Scaled Factor	Meas. SAR	Scaled SAR	Plot
Body-Top (0mm with Power Reduction)	1851.25	RTAP 153.6	-1.599	18	18.2	1.047	0.82	0.859	2#
	1880	RTAP 153.6	3.562	17.96	18.2	1.057	0.73	0.771	/
	1908.75	RTAP 153.6	3.236	17.84	18.2	1.086	0.71	0.771	/
Body-Back (0mm with Power Reduction)	1851.25	RTAP 153.6	2.469	18	18.2	1.047	0.433	0.453	/
	1880	RTAP 153.6	/	/	/	/	/	/	/
	1908.75	RTAP 153.6	/	/	/	/	/	/	/
Body -Left (0mmWithout Power Reduction)	1851.25	RTAP 153.6	0.566	22.82	23	1.042	0.103	0.107	/
	1880	RTAP 153.6	/	/	/	/	/	/	/
	1908.75	RTAP 153.6	/	/	/	/	/	/	/
Body-Top (20mm Without Power Reduction)	1851.25	RTAP 153.6	-2.697	22.82	23	1.042	0.097	0.101	/
	1880	RTAP 153.6	/	/	/	/	/	/	/
	1908.75	RTAP 153.6	/	/	/	/	/	/	/
Body-Back (20mm Without Power Reduction)	1851.25	RTAP 153.6	1.152	22.82	23	1.042	0.045	0.047	/
	1880	RTAP 153.6	/	/	/	/	/	/	/
	1908.75	RTAP 153.6	/	/	/	/	/	/	/

Note:
1. When the 1-g SAR is≤ 0.8W/Kg, testing for other channels are optional.
2. The EUT transmit and receive through the same antenna while testing SAR.
4. KDB 941225 D01- Body-worn accessory and other body SAR are measured using Subtype 0/1 Physical Layer configurations for Rev. 0. The 3G SAR test reduction procedure is applied to Rev. A, Subtype 2 Physical layer configuration, with Rev. 0 as the primary mode;
5. When SAR or MPE 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.

LTE Band 4:

EUT Position	Frequency (MHz)	Test Mode	Power Drift (%)	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	1g SAR (W/Kg)			
						Scaled Factor	Meas. SAR	Scaled SAR	Plot
Body-Top (0mm with Power Reduction)	1720	1RB	0.231	17.42	17.5	1.019	0.524	0.534	/
	1732.5	1RB	-0.688	17.45	17.5	1.012	0.556	0.563	**3#**
	1745	1RB	1.517	17.38	17.5	1.028	0.503	0.517	/
	1732.5	50%RB	-3.848	16.39	17.5	1.291	0.368	0.475	/
Body-Back (0mm with Power Reduction)	1720	1RB	/	/	/	/	/	/	/
	1732.5	1RB	2.049	17.45	17.5	1.012	0.214	0.217	/
	1745	1RB	/	/	/	/	/	/	/
	1732.5	50%RB	3.578	17.45	17.5	1.012	0.207	0.209	/
Body -Left (0mmWithout Power Reduction)	1720	1RB	/	/	/	/	/	/	/
	1732.5	1RB	0.293	22.22	22.3	1.019	0.032	0.033	/
	1745	1RB	/	/	/	/	/	/	/
	1732.5	50%RB	1.23	22.22	22.3	1.019	0.029	0.030	/
Body-Top (20mm Without Power Reduction)	1720	1RB	/	/	/	/	/	/	/
	1732.5	1RB	-0.688	22.22	22.3	1.019	0.0621	0.063	/
	1745	1RB	/	/	/	/	/	/	/
	1732.5	50%RB	1.411	22.22	22.3	1.019	0.0409	0.042	/
Body-Back (20mm Without Power Reduction)	1720	1RB	/	/	/	/	/	/	/
	1732.5	1RB	-2.984	22.22	22.3	1.019	0.0231	0.024	/
	1745	1RB	/	/	/	/	/	/	/
	1732.5	50%RB	0.66	22.22	22.3	1.019	0.0158	0.016	/

Note:
1. When the 1-g SAR is ≤ 0.8W/Kg, testing for other channels are optional.
2. SAR for LTE band exposure configurations is measured according to the procedures of KDB 941225 D05 SAR for LTE Devices v02.
3. KDB941225D05- SAR for higher order modulation is required only when the highest maximum output power for the configuration in the higher order modulation is > ½ dB higher than the same configuration in QPSK or when the reported SAR for the QPSK configuration is > 1.45 W/kg
4. KDB941225D05- For QPSK with 100% RB allocation, when the reported SAR measured for the Highest output power channel is <1.45 W/kg, tests for the remaining required test channels are optional.
5.KDB941225D05- For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg.
6. KDB941225D05- Start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power among RB offset the upper edge, middle and lower edge of each required test channel.
7. KDB941225D05- SAR for the other channel bandwidth is not necessary except the highest maximum output power of a configuration requiring testing in the smaller channel bandwidth is > ½ dB higher than the equivalent channel configurations in the largest channel bandwidth configuration or the reported SAR of a configuration for the largest channel bandwidth is > 1.45 W/kg.
8. Worst case SAR for 50% RB allocation is selected to be tested.

WLAN 2.4G:

Main Antenna:

EUT Position	Frequency (MHz)	Test Mode	Power Drift (%)	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	1g SAR (W/Kg)			
						Scaled Factor	Meas. SAR	Scaled SAR	Plot
Body-Left (0mm)	2412	802.11b	-0.467	16.13	18	1.538	0.152	0.234	/
	2437	802.11b	1.686	17.38	18	1.153	0.202	0.233	/
	2462	802.11b	-0.459	17.97	18	1.007	0.246	0.248	4#
Body- Back (0mm)	2412	802.11b	/	/	/	/	/	/	/
	2437	802.11b	/	/	/	/	/	/	/
	2462	802.11b	-2.503	17.97	18	1.007	0.152	0.153	/
Body-Top (0mm)	2412	802.11b	/	/	/	/	/	/	/
	2437	802.11b	/	/	/	/	/	/	/
	2462	802.11b	3.121	17.97	18	1.007	0.023	0.023	/

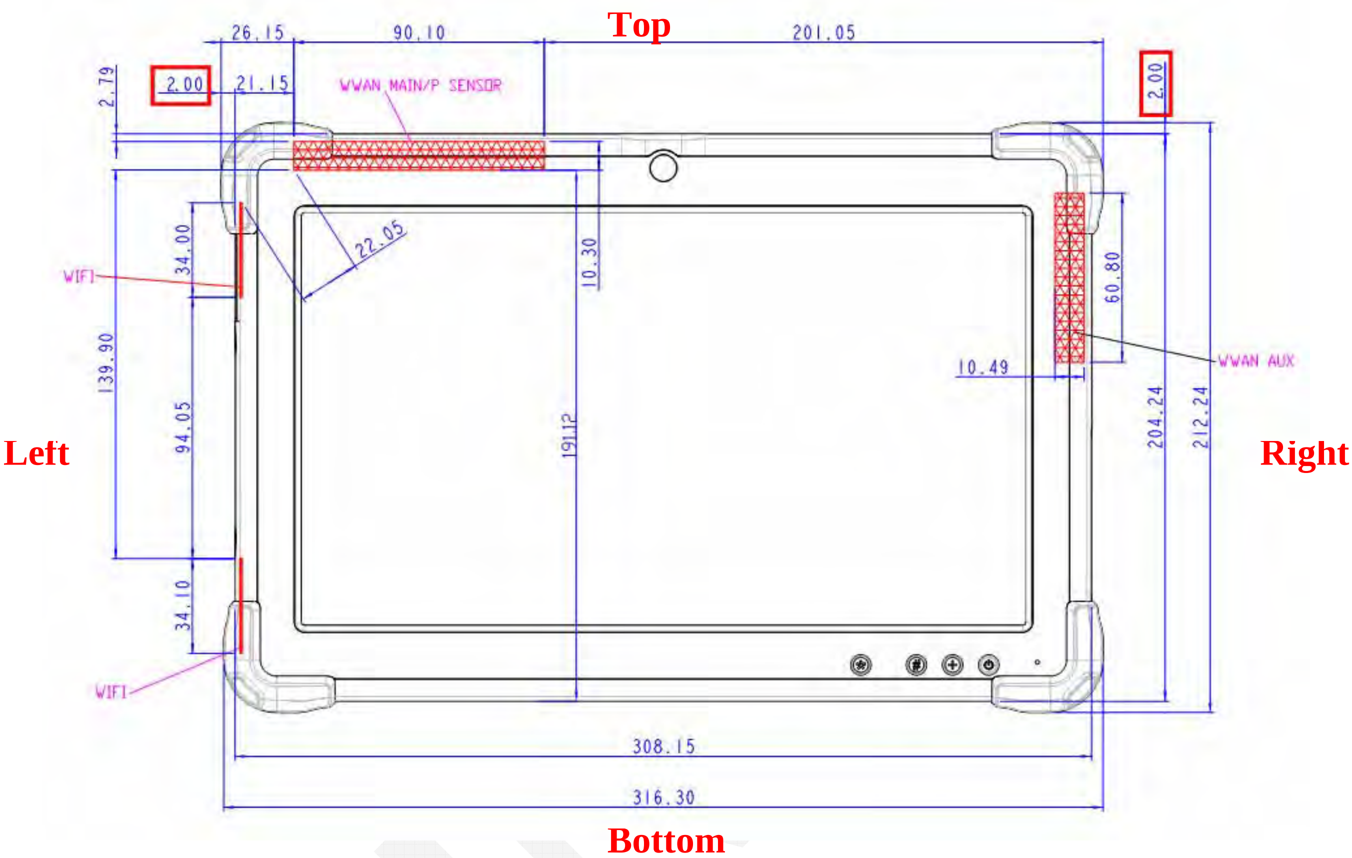
AUX Antenna:

EUT Position	Frequency (MHz)	Test Mode	Power Drift (%)	Max. Meas. Power (dBm)	Max. Rated Power (dBm)	1g SAR (W/Kg)			
						Scaled Factor	Meas. SAR	Scaled SAR	Plot
Body-Left (0mm)	2412	802.11b	2.864	16.6	17.2	1.148	0.175	0.201	/
	2437	802.11b	-2.495	16.28	17.2	1.236	0.235	0.290	/
	2462	802.11b	-0.917	16.92	17.2	1.067	0.284	0.303	5#
Body-Back (0mm)	2412	802.11b	/	/	/	/	/	/	/
	2437	802.11b	/	/	/	/	/	/	/
	2462	802.11b	2.544	16.92	17.2	1.067	0.168	0.179	/
Body-Bottom (0mm)	2412	802.11b	/	/	/	/	/	/	/
	2437	802.11b	/	/	/	/	/	/	/
	2462	802.11b	0.846	16.92	17.2	1.067	0.024	0.026	/

Note:
1. When the 1-g SAR is≤ 0.8W/Kg, testing for other channels are optional.
2. When SAR or MPE 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.
3. KDB248227-SAR is not required for 802.11g channels when the maximum average output power is less than 1/4 dB higher than that measured on the corresponding 802.11b channels.

SAR SIMULTANEOUS TRANSMISSION DESCRIPTION

BT&WiFi and CDMA2000&LTE Antennas Location:



Simultaneous Transmission:

Description of Simultaneous Transmit Capabilities			Antennas Distance (mm)
Transmitter Combination	Simultaneous?	Hotspot?	
CDMA + Bluetooth	√	×	22
CDMA + WLAN Main	√	√	22
LTE + Bluetooth	√	×	22
LTE + WLAN Main	√	√	22
CDMA + WLAN AUX	√	√	139.9 Note 2
LTE+ WLAN AUX	√	√	139.9 Note 2
Bluetooth+ WLAN AUX	√	×	94.05
WLAN Main + WLAN AUX	√	×	94.05
CDMA+ Bluetooth +WLAN AUX	√	√	/
LTE+ Bluetooth +WLAN AUX	√	√	/
CDMA+ WLAN Main +WLAN AUX	√	√	/
LTE+ WLAN Main +WLAN AUX	√	√	/

Note:

1. For LTE band 13 and WLAN 5G band stand-alone SAR, please refer to the SAR report: RDG150615001-20A, which was issued by Bay Area Compliance Laboratories Corp. (Shenzhen)
2. Hotspot mode SAR is only required for the edges within 25mm from the transmitting antenna located.

Simultaneous SAR test exclusion considerations:

WWAN + Bluetooth:

Mode (SAR1+SAR2)	Position	Reported SAR (W/kg)		ΣSAR < 1.6W/kg
		SAR1	SAR2	
CDMA 850+ Bluetooth	Body -Top	0.211	0.026	0.237
	Body -Back	0.055	0.132	0.187
	Body-Left	0.044	0.132	0.176
CDMA1900+ Bluetooth	Body -Top	0.859	0.026	0.885
	Body -Back	0.453	0.132	0.585
	Body -Left	0.107	0.132	0.239
LTE Band 4+ Bluetooth	Body -Top	0.563	0.026	0.589
	Body -Back	0.217	0.132	0.349
	Body-Left	0.033	0.132	0.165
LTE Band 13+ Bluetooth	Body -Top	0.494	0.026	0.52
	Body -Back	0.361	0.132	0.493
	Body-Left	0.309	0.132	0.441

Bluetooth + WLAN AUX:

Mode (SAR1+SAR2)	Position	Reported SAR (W/kg)		ΣSAR < 1.6W/kg
		SAR1	SAR2	
Bluetooth+ WLAN Aux 2.4G Band	Body -Top	0.211	0.4	0.611
	Body -Back	0.055	0.303	0.358
	Body-Left	0.044	0.179	0.223
	Body-Bottom	0.4	0.026	0.426
Bluetooth+ WLAN Aux W52 Band	Body -Top	0.211	0.4	0.611
	Body -Back	0.055	0.168	0.223
	Body -Left	0.044	0.255	0.299
	Body-Bottom	0.4	0.229	0.629
Bluetooth+ WLAN Aux W53 Band	Body -Top	0.211	0.4	0.611
	Body -Back	0.055	0.137	0.192
	Body-Left	0.044	0.179	0.223
	Body-Bottom	0.4	0.161	0.561
Bluetooth+ WLAN Aux W56 Band	Body -Top	0.211	0.4	0.611
	Body -Back	0.055	0.335	0.39
	Body-Left	0.044	0.379	0.423
	Body-Bottom	0.4	0.292	0.692
Bluetooth+ WLAN Aux W58 Band	Body -Top	0.211	0.4	0.611
	Body -Back	0.055	0.257	0.312
	Body-Left	0.044	0.332	0.376
	Body-Bottom	0.4	0.237	0.637

WWAN + WLAN Main:

Mode (SAR1+SAR2)	Position	Reported SAR (W/kg)		ΣSAR < 1.6W/kg
		SAR1	SAR2	
CDMA 850+ WLAN Main 2.4G Band	Body -Top	0.211	0.248	0.459
	Body -Back	0.055	0.153	0.208
	Body-Left	0.044	0.023	0.067
CDMA1900+ WLAN Main 2.4G Band	Body -Top	0.859	0.248	1.107
	Body -Back	0.453	0.153	0.606
	Body -Left	0.107	0.023	0.13
LTE Band 4+ WLAN Main 2.4G Band	Body -Top	0.563	0.248	0.811
	Body -Back	0.217	0.153	0.37
	Body-Left	0.033	0.023	0.056
LTE Band 13+ WLAN Main 2.4G Band	Body -Top	0.494	0.248	0.742
	Body -Back	0.361	0.153	0.514
	Body-Left	0.309	0.023	0.332
CDMA 850+ WLAN Main W52 Band	Body -Top	0.211	0.208	0.419
	Body -Back	0.055	0.192	0.247
	Body-Left	0.044	0.284	0.328
CDMA1900+ WLAN Main W52 Band	Body -Top	0.859	0.208	1.067
	Body -Back	0.453	0.192	0.645
	Body -Left	0.107	0.284	0.391
LTE Band 4+ WLAN Main W52 Band	Body -Top	0.563	0.208	0.771
	Body -Back	0.217	0.192	0.409
	Body-Left	0.033	0.284	0.317
LTE Band 13+ WLAN Main W52 Band	Body -Top	0.494	0.208	0.702
	Body -Back	0.361	0.192	0.553
	Body-Left	0.309	0.284	0.593
CDMA 850+ WLAN Main W53 Band	Body -Top	0.211	0.173	0.384
	Body -Back	0.055	0.155	0.21
	Body-Left	0.044	0.209	0.253
CDMA1900+ WLAN Main W53 Band	Body -Top	0.859	0.173	1.032
	Body -Back	0.453	0.155	0.608
	Body -Left	0.107	0.209	0.316
LTE Band 4+ WLAN Main W53 Band	Body -Top	0.563	0.173	0.736
	Body -Back	0.217	0.155	0.372
	Body-Left	0.033	0.209	0.242
LTE Band 13+ WLAN Main W53 Band	Body -Top	0.494	0.173	0.667
	Body -Back	0.361	0.155	0.516

	Body-Left	0.309	0.209	0.518
CDMA 850+ WLAN Main W56 Band	Body -Top	0.211	0.243	0.454
	Body -Back	0.055	0.336	0.391
	Body-Left	0.044	0.412	0.456
CDMA1900+ WLAN Main W56 Band	Body -Top	0.859	0.243	1.102
	Body -Back	0.453	0.336	0.789
	Body -Left	0.107	0.412	0.519
LTE Band 4+ WLAN Main W56 Band	Body -Top	0.563	0.243	0.806
	Body -Back	0.217	0.336	0.553
	Body-Left	0.033	0.412	0.445
LTE Band 13+ WLAN Main W56 Band	Body -Top	0.494	0.243	0.737
	Body -Back	0.361	0.336	0.697
	Body-Left	0.309	0.412	0.721
CDMA 850+ WLAN Main W58 Band	Body -Top	0.211	0.194	0.405
	Body -Back	0.055	0.207	0.262
	Body-Left	0.044	0.356	0.4
CDMA1900+ WLAN Main W58 Band	Body -Top	0.859	0.194	1.053
	Body -Back	0.453	0.207	0.66
	Body -Left	0.107	0.356	0.463
LTE Band 4+ WLAN Main W58 Band	Body -Top	0.563	0.194	0.757
	Body -Back	0.217	0.207	0.424
	Body-Left	0.033	0.356	0.389
LTE Band 13+ WLAN Main W58 Band	Body -Top	0.494	0.194	0.688
	Body -Back	0.361	0.207	0.568
	Body-Left	0.309	0.356	0.665

WWAN + WLAN AUX:

Mode (SAR1+SAR2)	**Position**	**Reported SAR (W/kg)**		**ΣSAR < 1.6W/kg**
		SAR1	**SAR2**	
CDMA 850+ WLAN Aux 2.4G Band	Body -Top	0.211	0.4	0.611
	Body -Back	0.055	0.303	0.358
	Body-Left	0.044	0.179	0.223
	Body-Bottom	0.4	0.026	0.426
CDMA1900+ WLAN Aux 2.4G Band	Body -Top	0.859	0.4	1.259
	Body -Back	0.453	0.303	0.756
	Body -Left	0.107	0.179	0.286
	Body-Bottom	0.4	0.026	0.426
LTE Band 4+ WLAN Aux 2.4G Band	Body -Top	0.563	0.4	0.963

	Body -Back	0.217	0.303	0.52
	Body-Left	0.033	0.179	0.212
	Body-Bottom	0.4	0.026	0.426
LTE Band 13+ WLAN Aux 2.4G Band	Body -Top	0.494	0.4	0.894
	Body -Back	0.361	0.303	0.664
	Body-Left	0.309	0.179	0.488
	Body-Bottom	0.4	0.026	0.426
CDMA 850+ WLAN Aux W52 Band	Body -Top	0.211	0.4	0.611
	Body -Back	0.055	0.168	0.223
	Body-Left	0.044	0.255	0.299
	Body-Bottom	0.4	0.229	0.629
CDMA1900+ WLAN Aux W52 Band	Body -Top	0.859	0.4	1.259
	Body -Back	0.453	0.168	0.621
	Body -Left	0.107	0.255	0.362
	Body-Bottom	0.4	0.229	0.629
LTE Band 4+ WLAN Aux W52 Band	Body -Top	0.563	0.4	0.963
	Body -Back	0.217	0.168	0.385
	Body-Left	0.033	0.255	0.288
	Body-Bottom	0.4	0.229	0.629
LTE Band 13+ WLAN Aux W52 Band	Body -Top	0.494	0.4	0.894
	Body -Back	0.361	0.168	0.529
	Body-Left	0.309	0.255	0.564
	Body-Bottom	0.4	0.229	0.629
CDMA 850+ WLAN Aux W53 Band	Body -Top	0.211	0.4	0.611
	Body -Back	0.055	0.137	0.192
	Body-Left	0.044	0.179	0.223
	Body-Bottom	0.4	0.161	0.561
CDMA1900+ WLAN Aux W53 Band	Body -Top	0.859	0.4	1.259
	Body -Back	0.453	0.137	0.59
	Body -Left	0.107	0.179	0.286
	Body-Bottom	0.4	0.161	0.561
LTE Band 4+ WLAN Aux W53 Band	Body -Top	0.563	0.4	0.963
	Body -Back	0.217	0.137	0.354
	Body-Left	0.033	0.179	0.212
	Body-Bottom	0.4	0.161	0.561
LTE Band 13+ WLAN Aux W53 Band	Body -Top	0.494	0.4	0.894
	Body -Back	0.361	0.137	0.498
	Body-Left	0.309	0.179	0.488
	Body-Bottom	0.4	0.161	0.561

CDMA 850+ WLAN Aux W56 Band	Body -Top	0.211	0.4	0.611
	Body -Back	0.055	0.335	0.39
	Body-Left	0.044	0.379	0.423
	Body-Bottom	0.4	0.292	0.692
CDMA1900+ WLAN Aux W56 Band	Body -Top	0.859	0.4	1.259
	Body -Back	0.453	0.335	0.788
	Body -Left	0.107	0.379	0.486
	Body-Bottom	0.4	0.292	0.692
LTE Band 4+ WLAN Aux W56 Band	Body -Top	0.563	0.4	0.963
	Body -Back	0.217	0.335	0.552
	Body-Left	0.033	0.379	0.412
	Body-Bottom	0.4	0.292	0.692
LTE Band 13+ WLAN Aux W56 Band	Body -Top	0.494	0.4	0.894
	Body -Back	0.361	0.335	0.696
	Body-Left	0.309	0.379	0.688
	Body-Bottom	0.4	0.292	0.692
CDMA 850+ WLAN Aux W58 Band	Body -Top	0.211	0.4	0.611
	Body -Back	0.055	0.257	0.312
	Body-Left	0.044	0.332	0.376
	Body-Bottom	0.4	0.237	0.637
CDMA1900+ WLAN Aux W58 Band	Body -Top	0.859	0.4	1.259
	Body -Back	0.453	0.257	0.71
	Body -Left	0.107	0.332	0.439
	Body-Bottom	0.4	0.237	0.637
LTE Band 4+ WLAN Aux W58 Band	Body -Top	0.563	0.4	0.963
	Body -Back	0.217	0.257	0.474
	Body-Left	0.033	0.332	0.365
	Body-Bottom	0.4	0.237	0.637
LTE Band 13+ WLAN Aux W58 Band	Body -Top	0.494	0.4	0.894
	Body -Back	0.361	0.257	0.618
	Body-Left	0.309	0.332	0.641
	Body-Bottom	0.4	0.237	0.637

WLAN Main + WLAN AUX:

Mode (SAR1+SAR2)	Position	Reported SAR (W/kg)		ΣSAR < 1.6W/kg
		SAR1	SAR2	
WLAN Main + WLAN Aux 2.4G Band	Body -Top	0.248	0.4	0.648
	Body -Back	0.153	0.303	0.456
	Body-Left	0.023	0.179	0.202
	Body-Bottom	0.4	0.026	0.426
WLAN Main + WLAN Aux W52 Band	Body -Top	0.208	0.4	0.608
	Body -Back	0.192	0.168	0.36
	Body -Left	0.284	0.255	0.539
	Body-Bottom	0.4	0.229	0.629
WLAN Main + WLAN Aux W53 Band	Body -Top	0.173	0.4	0.573
	Body -Back	0.155	0.137	0.292
	Body-Left	0.209	0.179	0.388
	Body-Bottom	0.4	0.161	0.561
WLAN Main + WLAN Aux W56 Band	Body -Top	0.243	0.4	0.643
	Body -Back	0.336	0.335	0.671
	Body-Left	0.412	0.379	0.791
	Body-Bottom	0.4	0.292	0.692
WLAN Main + WLAN Aux W58 Band	Body -Top	0.194	0.4	0.594
	Body -Back	0.207	0.257	0.464
	Body-Left	0.356	0.332	0.688
	Body-Bottom	0.4	0.237	0.637

For MIMO mode, the output power per chain was less than SISO mode, the SISO SAR was used for evaluation.

CDMA+ Bluetooth +WLAN AUX:

Mode (SAR1+SAR2+SAR3)	Position	Reported SAR (W/kg)			ΣSAR < 1.6W/kg
		SAR1	SAR2	SAR3	
CDMA+ Bluetooth +WLAN AUX	Body -Top	0.859	0.026	0.4	1.285
	Body -Back	0.453	0.132	0.335	0.92
	Body-Left	0.107	0.132	0.379	0.618
	Body-Bottom	0.4	0.4	0.292	1.092

LTE+ Bluetooth +WLAN AUX:

Mode (SAR1+SAR2+SAR3)	Position	Reported SAR (W/kg)			ΣSAR < 1.6W/kg
		SAR1	SAR2	SAR3	
LTE+ Bluetooth +WLAN AUX	Body -Top	0.563	0.026	0.4	0.989
	Body -Back	0.361	0.132	0.335	0.828
	Body-Left	0.309	0.132	0.379	0.82
	Body-Bottom	0.4	0.4	0.292	1.092

CDMA+ WLAN Main +WLAN AUX:

Mode (SAR1+SAR2+SAR3)	Position	Reported SAR (W/kg)			ΣSAR < 1.6W/kg
		SAR1	SAR2	SAR3	
CDMA+ WLAN Main +WLAN AUX	Body -Top	0.859	0.243	0.4	**1.502**
	Body -Back	0.453	0.336	0.335	1.124
	Body-Left	0.107	0.412	0.379	0.898
	Body-Bottom	0.4	0.4	0.292	1.092

LTE+ WLAN Main +WLAN AUX:

Mode (SAR1+SAR2+SAR3)	Position	Reported SAR (W/kg)			ΣSAR < 1.6W/kg
		SAR1	SAR2	SAR3	
LTE+ WLAN Main +WLAN AUX	Body -Top	0.563	0.243	0.4	1.206
	Body -Back	0.361	0.336	0.335	1.032
	Body-Left	0.309	0.412	0.379	1.1
	Body-Bottom	0.4	0.4	0.292	1.092

Note: For CDMA/LTE/WLAN worst mode was used for evaluation the 3 antenna chains Simultaneous SAR

Conclusion:

Σ **SAR < 1.6 W/kg** therefore simultaneous transmission SAR with Volume Scans is **not** required.

SAR Plots (Summary of the Highest SAR Values)

Test Laboratory: Bay Area Compliance Labs Corp.(Dongguan)

Test Plot 1#: CDMA 850 Body Top High Channel

DUT: Mobile Tablet; Type: DT311

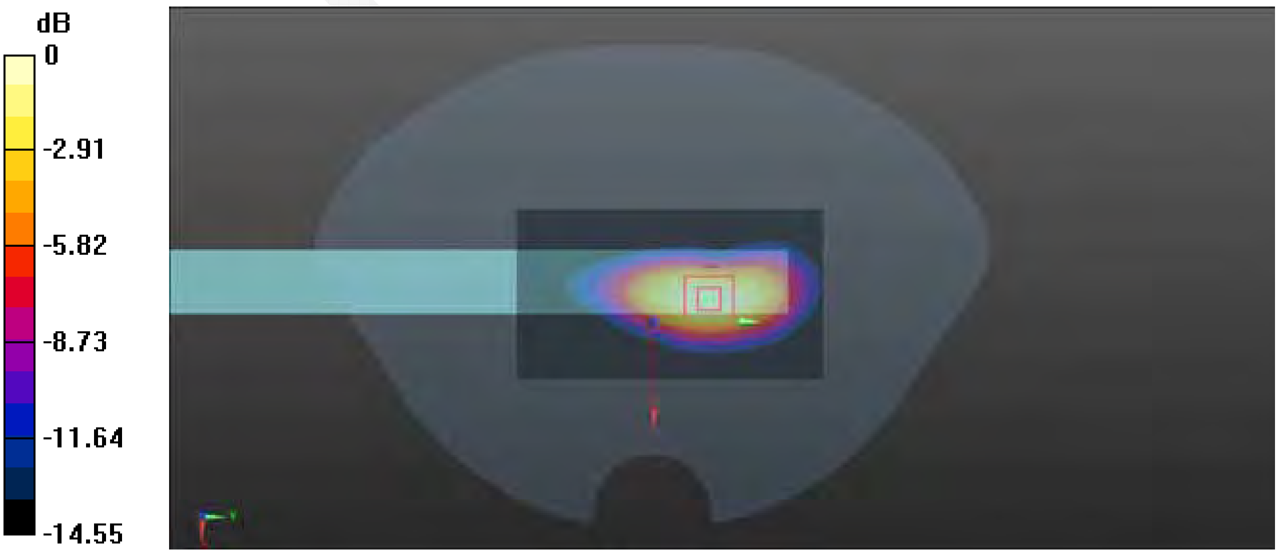
Communication System: Generic CDMA; Frequency: 848.31MHz;Duty Cycle: 1:1
Medium parameters used: f = 848.31 MHz; σ = 0.988 S/m; ε_r = 54.97; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7329; ConvF(9.17, 9.17, 9.17); Calibrated: 2015/2/5;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1459; Calibrated: 2015/1/26
- Phantom: SAM (30deg probe tilt) with CRP v5.0_20150321; Type: QD000P40CD; Serial: TP:1874
- Measurement SW: DASY52, Version 52.8 (8);

CDMA 850 Body Top /Area Scan (51x91x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.226 W/kg

CDMA 850 Body Top /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.23 V/m; Power Drift = -0.20 dB
Peak SAR (extrapolated) = 0.366 W/kg
SAR(1 g) = 0.198 W/kg; SAR(10 g) = 0.106 W/kg
Maximum value of SAR (measured) = 0.225 W/kg



0 dB = 0.225 W/kg = -6.48 dBW/kg

Test Laboratory: Bay Area Compliance Labs Corp.(Dongguan)

Test Plot 2#: CDMA 1900 Body Top-CDMA Low Channel

DUT: Mobile Tablet; Type: DT311

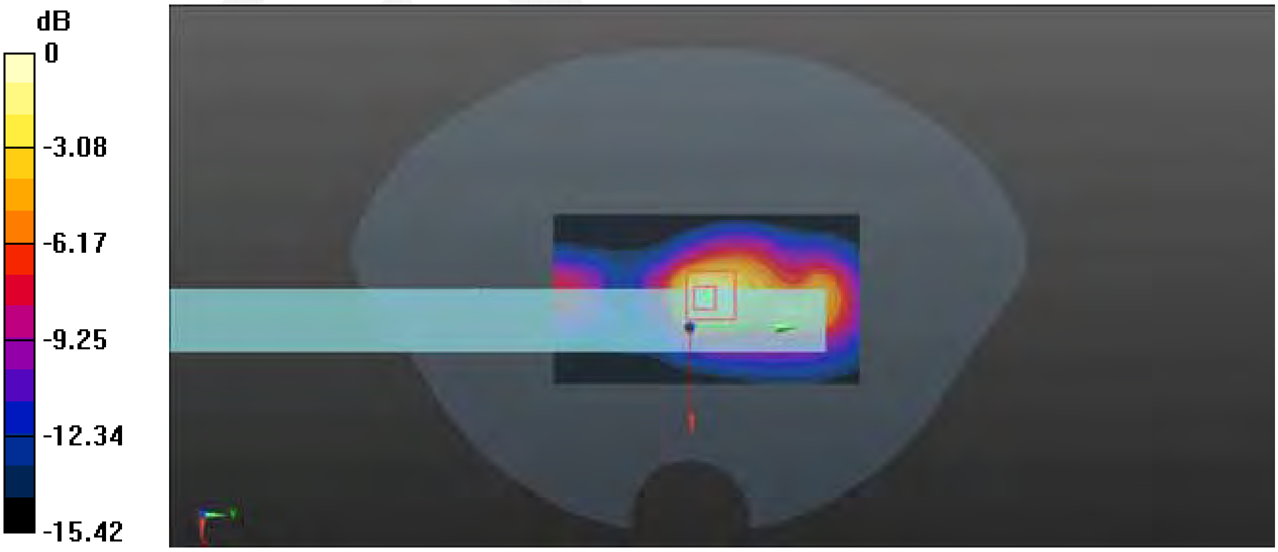
Communication System: Generic CDMA; Frequency: 1851.25 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1851.25 MHz; σ = 1.477 S/m; ε_r = 55.32; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7329; ConvF(7.56, 7.56, 7.56); Calibrated: 2015/2/5;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1459; Calibrated: 2015/1/26
- Phantom: SAM (30deg probe tilt) with CRP v5.0_20150321; Type: QD000P40CD; Serial: TP:1874
- Measurement SW: DASY52, Version 52.8 (8);

CDMA 1900 Body Top /Area Scan (51x91x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.23 W/kg

CDMA 1900 Body Top /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 24.99 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 1.61 W/kg
SAR(1 g) = 0.82 W/kg; SAR(10 g) = 0.434 W/kg
Maximum value of SAR (measured) = 1.16 W/kg



0 dB = 1.23 W/kg = 0.90 dBW/kg

Test Laboratory: Bay Area Compliance Labs Corp.(Dongguan)

Test Plot 3#: LTE Band 4 Body Top-20MHz Middle Channel

DUT: Mobile Tablet; Type: DT311; Serial: N/A

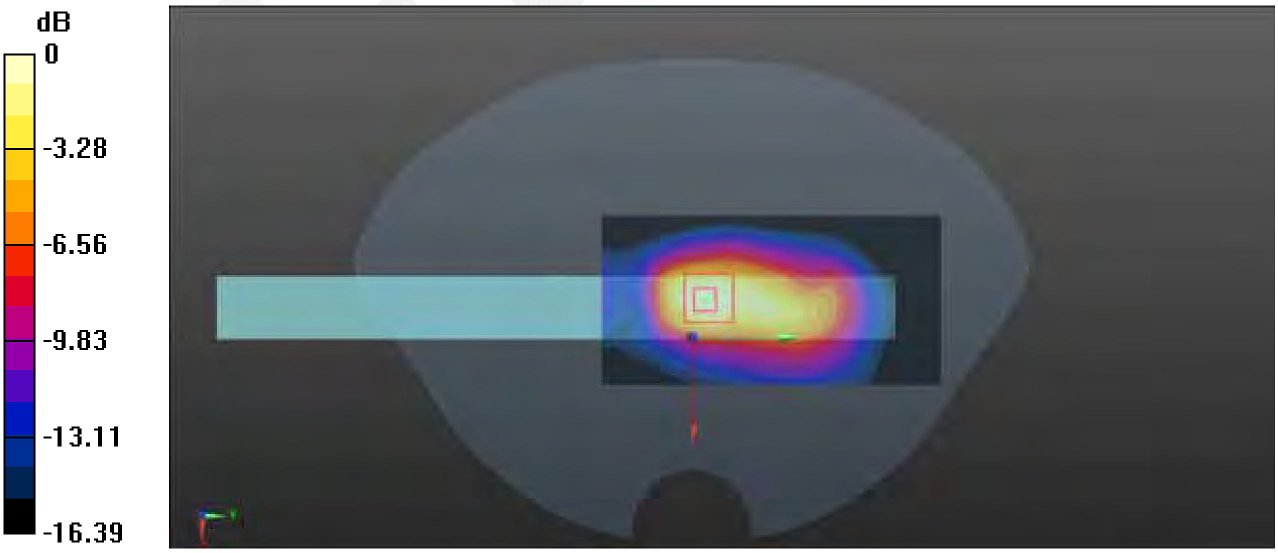
Communication System: Generic LTE; Frequency: 1732.5 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1732.5 MHz; σ = 1.48 S/m; ε_r = 53.448; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7329; ConvF(7.85, 7.85, 7.85); Calibrated: 2015/2/5;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1459; Calibrated: 2015/1/26
- Phantom: SAM (30deg probe tilt) with CRP v5.0_20150321; Type: QD000P40CD; Serial: TP:1874
- Measurement SW: DASY52, Version 52.8 (8);

LTE Band 4 Body Top /Area Scan (51x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.684 W/kg

LTE Band 4 Body Top /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 20.16 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 0.988 W/kg
SAR(1 g) = 0.556 W/kg; SAR(10 g) = 0.297 W/kg
Maximum value of SAR (measured) = 0.631 W/kg



0 dB = 0.631 W/kg = -2.00 dBW/kg

Test Laboratory: Bay Area Compliance Labs Corp.(Dongguan)

Test Plot 4#: WLAN 2.4G Antenna Chain 0 Left Side-High Channel

DUT: Mobile Tablet; Type: DT311

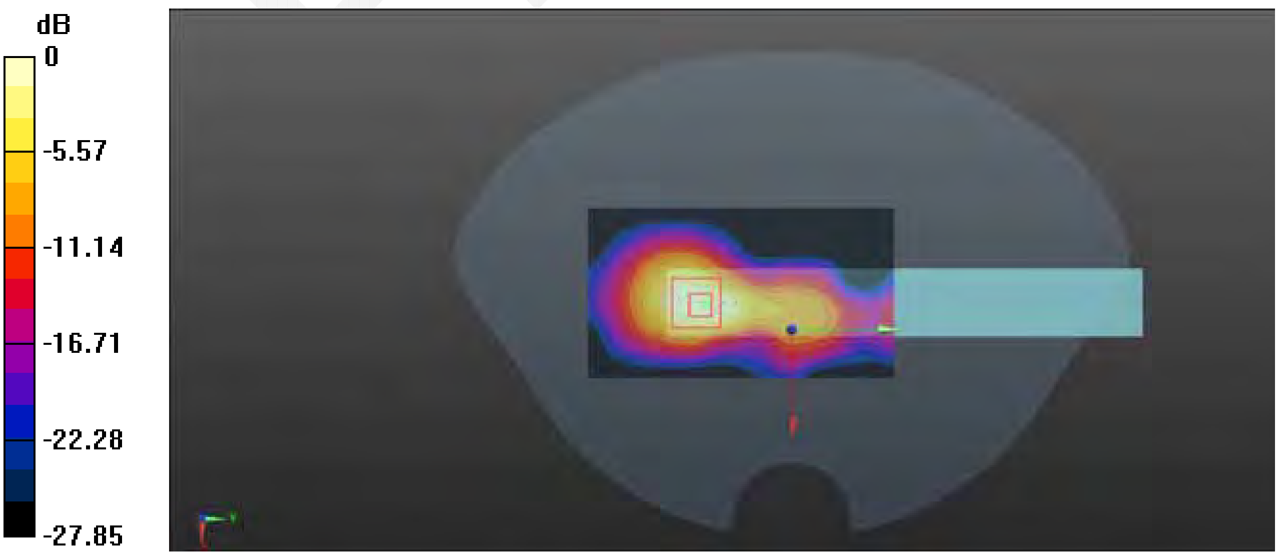
Communication System: WLAN; Frequency: 2462 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2462 MHz; σ = 1.981 S/m; ε_r = 52.216; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7329; ConvF(7.2, 7.2, 7.2); Calibrated: 2015/2/5;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1459; Calibrated: 2015/1/26
- Phantom: SAM (30deg probe tilt) with CRP v5.0_20150321; Type: QD000P40CD; Serial: TP:1874
- Measurement SW: DASY52, Version 52.8 (8);

WLAN 2.4G Antenna Chain 0 Left Side /Area Scan (51x91x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.570 W/kg

WLAN 2.4G Antenna Chain 0 Left Side /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.968 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 0.510 W/kg
SAR(1 g) = 0.246 W/kg; SAR(10 g) = 0.151 W/kg
Maximum value of SAR (measured) = 0.304 W/kg



0 dB = 0.304 W/kg = -5.17 dBW/kg

Test Laboratory: Bay Area Compliance Labs Corp.(Dongguan)

Test Plot 5#: WLAN 2.4G Antenna Chain 1 Left Side-High Channel

DUT: Mobile Tablet; Type: DT311

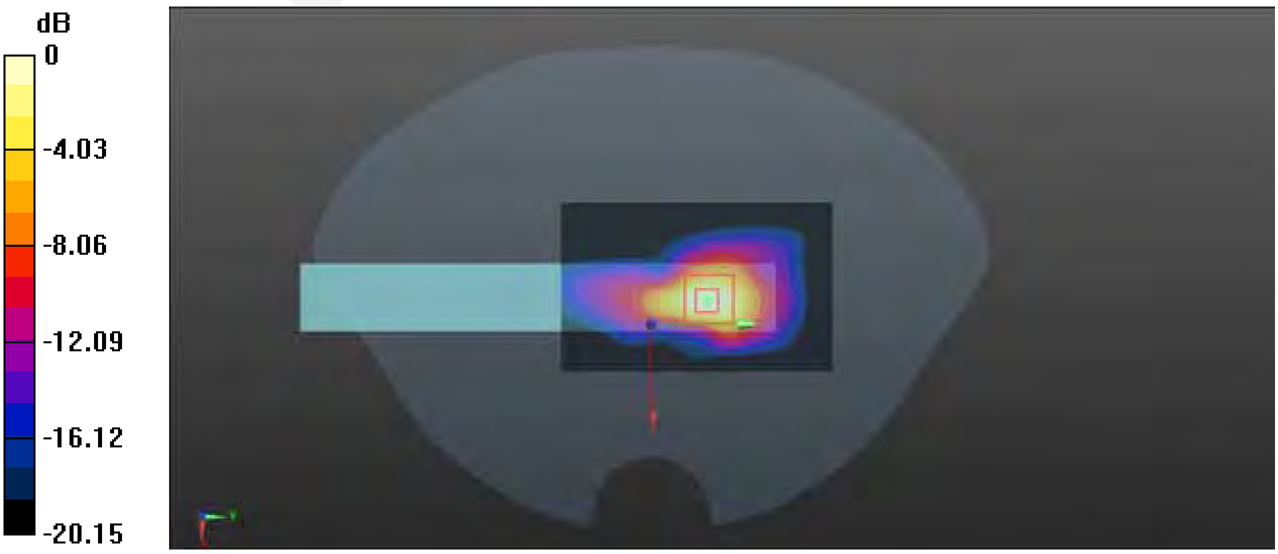
Communication System: WLAN; Frequency: 2462 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2462 MHz; σ = 1.981 S/m; ε_r = 52.216; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN7329; ConvF(7.2, 7.2, 7.2); Calibrated: 2015/2/5;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1459; Calibrated: 2015/1/26
- Phantom: SAM (30deg probe tilt) with CRP v5.0_20150321; Type: QD000P40CD; Serial: TP:1874
- Measurement SW: DASY52, Version 52.8 (8);

WLAN 2.4G Antenna Chain 1 Left Side /Area Scan (51x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.753 W/kg

WLAN 2.4G Antenna Chain 1 Left Side /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.976 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 0.51 W/kg
SAR(1 g) = 0.284 W/kg; SAR(10 g) = 0.160 W/kg
Maximum value of SAR (measured) = 0.480 W/kg



0 dB = 0.480 W/kg = -3.19 dBW/kg

APPENDIX A MEASUREMENT UNCERTAINTY

The uncertainty budget has been determined for the measurement system and is given in the following Table.

Measurement Uncertainty for 300MHz to 3GHz

Source of uncertainty	Tolerance/ uncertainty ± %	Probability distribution	Disisor	ci (1 g)	ci (10 g)	Standard uncertainty ± %, (1 g)	Standard uncertainty ± %, (10 g)
Measurement system							
Probe calibration	6.55	N	1	1	1	6.6	6.6
Axial Isotropy	4.7	R	√3	1	1	2.7	2.7
Hemispherical Isotropy	9.6	R	√3	0	0	0.0	0.0
Boundary effect	1.0	R	√3	1	1	0.6	0.6
Linearity	4.7	R	√3	1	1	2.7	2.7
Detection limits	1.0	R	√3	1	1	0.6	0.6
Readout electronics	0.3	N	1	1	1	0.3	0.3
Response time	0.0	R	√3	1	1	0.0	0.0
Integration time	0.0	R	√3	1	1	0.0	0.0
RF ambientconditions – noise	1.0	R	√3	1	1	0.6	0.6
RF ambient conditions–reflections	1.0	R	√3	1	1	0.6	0.6
Probe positioner mech. Restrictions	0.8	R	√3	1	1	0.5	0.5
Probe positioning with respect to phantom shell	6.7	R	√3	1	1	3.9	3.9
Post-processing	2.0	R	√3	1	1	1.2	1.2
Test sample related							
Test sample positioning	2.8	N	1	1	1	2.8	2.8
Device holder uncertainty	6.3	N	1	1	1	6.3	6.3
Drift of output power	5.0	R	√3	1	1	2.9	2.9
Phantom and set-up							
Phantom uncertainty (shape and thickness tolerances)	4.0	R	√3	1	1	2.3	2.3
Liquid conductivity target)	5.0	R	√3	0.64	0.43	1.8	1.2
Liquid conductivity meas.)	2.5	N	1	0.64	0.43	1.6	1.1
Liquid permittivity target)	5.0	R	√3	0.6	0.49	1.7	1.4
Liquid permittivity meas.)	2.5	N	1	0.6	0.49	1.5	1.2
Combined standard uncertainty		RSS				12.2	12.0
Expanded uncertainty 95 % confidence interval)						24.3	23.9

Measurement uncertainty evaluation for IEC62209-2 SAR test

Source of uncertainty	Tolerance/ uncertainty ± %	Probability distribution	Disisor	ci (1 g)	ci (10 g)	Standard uncertainty ± %, (1 g)	Standard uncertainty ± %, (10 g)
Measurement system							
Probe calibration	6.55	N	1	1	1	6.6	6.6
Axial Isotropy	4.7	R	√3	1	1	2.7	2.7
Hemispherical Isotropy	9.6	R	√3	0	0	0.0	0.0
Linearity	4.7	R	√3	1	1	2.7	2.7
Modulation Response	0.0	R	√3	1	1	0.0	0.0
Detection limits	1.0	R	√3	1	1	0.6	0.6
Boundary effect	1.0	R	√3	1	1	0.6	0.6
Readout electronics	0.3	N	1	1	1	0.3	0.3
Response time	0.0	R	√3	1	1	0.0	0.0
Integration time	0.0	R	√3	1	1	0.0	0.0
RF ambientconditions – noise	1.0	R	√3	1	1	0.6	0.6
RF ambient conditions–reflections	1.0	R	√3	1	1	0.6	0.6
Probe positioner mech. Restrictions	0.8	R	√3	1	1	0.5	0.5
Probe positioning with respect to phantom shell	6.7	R	√3	1	1	3.9	3.9
Post-processing	2.0	R	√3	1	1	1.2	1.2
Test sample related							
Device holder Uncertainty	6.3	N	1	1	1	6.3	6.3
Test sample positioning	2.8	N	1	1	1	2.8	2.8
Power scaling	4.5	R	√3	1	1	2.6	2.6
Drift of output power	5.0	R	√3	1	1	2.9	2.9
Phantom and set-up							
Phantom uncertainty (shape and thickness tolerances)	4.0	R	√3	1	1	2.3	2.3
Algorithm for correcting SAR for deviations in permittivity and conductivity	1.9	N	1	1	0.84	1.1	0.9
Liquid conductivity (meas.)	2.5	N	1	0.64	0.43	1.6	1.1
Liquid permittivity (meas.)	2.5	N	1	0.6	0.49	1.5	1.2
Temp. unc. - Conductivity	1.7	R	√3	0.78	0.71	0.8	0.7
Temp. unc. - Permittivity	0.3	R	√3	0.23	0.26	0.0	0.0
Combined standard uncertainty		RSS				12.2	12.1
Expanded uncertainty 95 % confidence interval)						24.5	24.2

APPENDIX B – PROBE CALIBRATION CERTIFICATES

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

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

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

Accreditation No.: **SCS 0108**

Client **BACL China (Vitec)** Certificate No: **EX3-7329_Feb15**

CALIBRATION CERTIFICATE

Object: EX3DV4 - SN:7329

Calibration procedure(s): QA CAL-01.v9, QA CAL-23.v5, QA CAL-25.v6
Calibration procedure for dosimetric E-field probes

Calibration date: February 5, 2015

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 E4419B	GB41293874	03-Apr-14 (No. 217-01911)	Apr-15
Power sensor E4412A	MY41498087	03-Apr-14 (No. 217-01911)	Apr-15
Reference 3 dB Attenuator	SN: S5054 (3c)	03-Apr-14 (No. 217-01915)	Apr-15
Reference 20 dB Attenuator	SN: S5277 (20x)	03-Apr-14 (No. 217-01919)	Apr-15
Reference 30 dB Attenuator	SN: S5129 (30b)	03-Apr-14 (No. 217-01920)	Apr-15
Reference Probe ES3DV2	SN: 3013	30-Dec-14 (No. ES3-3013_Dec14)	Dec-15
DAE4	SN: 660	14-Jan-15 (No. DAE4-660_Jan15)	Jan-16
Secondary Standards	ID	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Apr-13)	In house check: Apr-16
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-14)	In house check: Oct-15

	Name	Function	Signature
Calibrated by:	Claudio Leubler	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: February 9, 2015

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

Certificate No: EX3-7329_Feb15 Page 1 of 11

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

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

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

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
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) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005

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 E^2-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 (no uncertainty required). 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).

Probe EX3DV4

SN:7329

Manufactured: December 11, 2014
Calibrated: February 5, 2015

Calibrated for DASY/EASY Systems
(Note: non-compatible with DASY2 system!)

DASY/EASY - Parameters of Probe: EX3DV4 - SN:7329

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm (µV/(V/m)^2)[A]	0.48	0.43	0.46	± 10.1 %
DCP (mV)[B]	96.7	97.6	94.2	

Modulation Calibration Parameters

UID	Communication System Name		A dB	B dB√µV	C	D dB	VR mV	Unc[E] (k=2)
0	CW	X	0.0	0.0	1.0	0.00	137.9	±3.0 %
		Y	0.0	0.0	1.0		147.0	
		Z	0.0	0.0	1.0		150.5	

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%.

[A] The uncertainties of NormX,Y,Z do not affect the E^2-field uncertainty inside TSL (see Pages 5 and 6).
[B] Numerical linearization parameter: uncertainty not required.
[E] Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

DASY/EASY - Parameters of Probe: EX3DV4 - SN:7329

Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha [G]	Depth [G] (mm)	Unct. (k=2)
900	41.5	0.97	9.52	9.52	9.52	0.40	0.86	± 12.0 %
1750	40.1	1.37	8.12	8.12	8.12	0.29	0.90	± 12.0 %
1900	40.0	1.40	7.88	7.88	7.88	0.68	0.61	± 12.0 %
2450	39.2	1.80	7.06	7.06	7.06	0.33	0.84	± 12.0 %

[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 ConvF 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, 64, 128, 150 and 220 MHz respectively. Above 5 GHz frequency validity can be extended to ± 110 MHz.
[F] At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) 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 (ε and σ) is restricted to ± 5%. 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 and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

EX3DV4– SN:7329 February 5, 2015

DASY/EASY - Parameters of Probe: EX3DV4 - SN:7329

Calibration Parameter Determined in Body Tissue Simulating Media

f (MHz) [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha [G]	Depth [G] (mm)	Unct. (k=2)
900	55.0	1.05	9.17	9.17	9.17	0.41	0.90	± 12.0 %
1750	53.4	1.49	7.85	7.85	7.85	0.70	0.64	± 12.0 %
1900	53.3	1.52	7.56	7.56	7.56	0.56	0.70	± 12.0 %
2450	52.7	1.95	7.20	7.20	7.20	0.78	0.59	± 12.0 %

[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 ConvF 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, 64, 128, 150 and 220 MHz respectively. Above 5 GHz frequency validity can be extended to ± 110 MHz.

[F] At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) 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 (ε and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

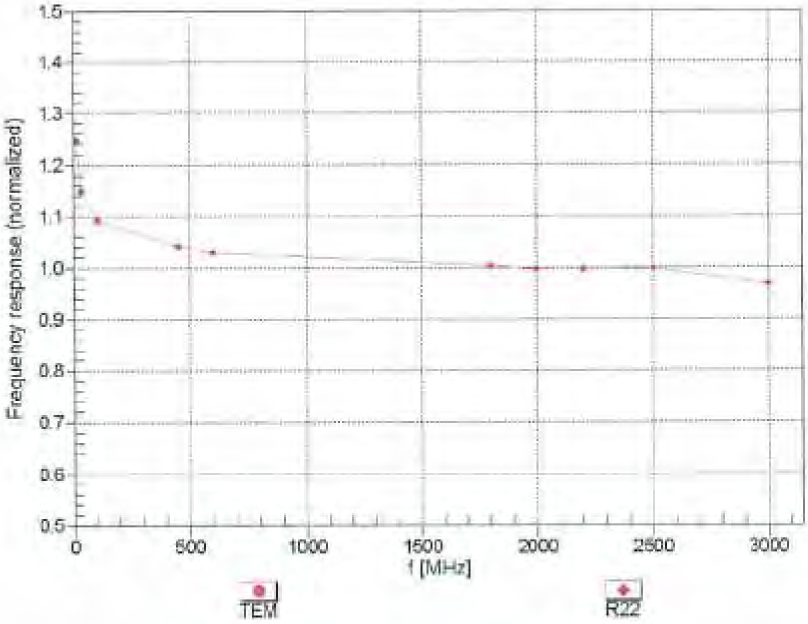
[G] Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from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

Certificate No: EX3-7329_Feb15 Page 6 of 11

EX3DV4– SN:7329 February 5, 2015

Frequency Response of E-Field

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



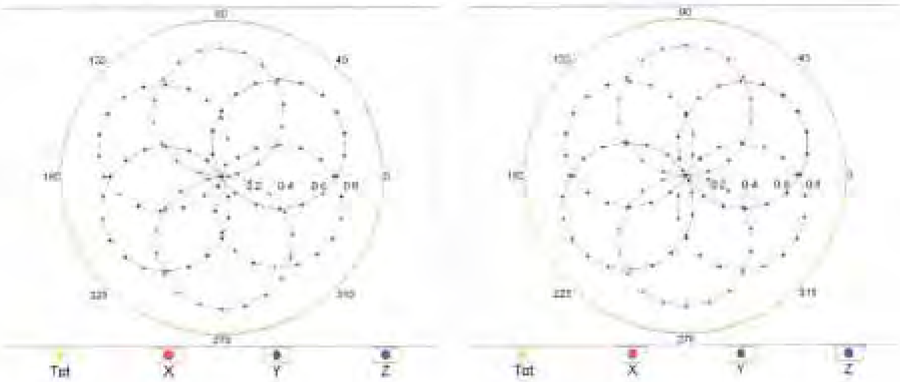
Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

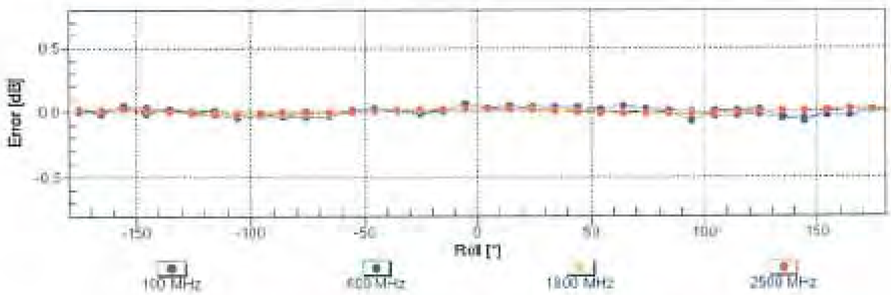
Certificate No: EX3-7329_Feb15 Page 7 of 11

EX3DV4– SN:7329 February 5, 2015

Receiving Pattern (ϕ), $\vartheta = 0°$

f=600 MHz,TEM f=1800 MHz,R22



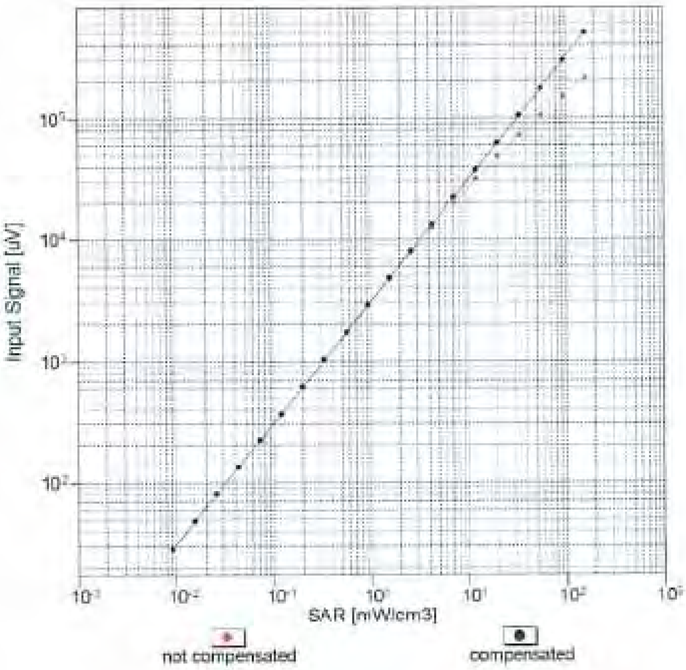


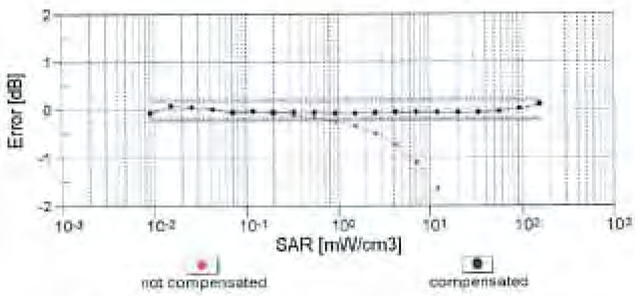
Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

Certificate No: EX3-7329_Feb15 Page 8 of 11

EX3DV4– SN:7329 February 5, 2015

Dynamic Range f(SAR$_{head}$)
(TEM cell , f_{eval}= 1900 MHz)





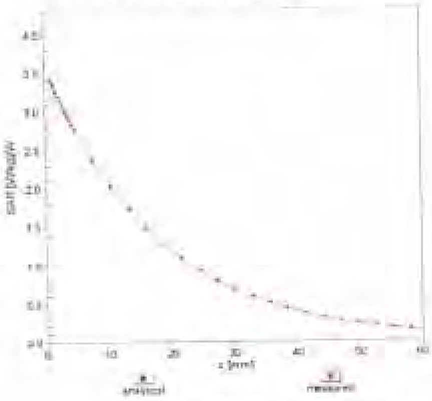
Uncertainty of Linearity Assessment: ± 0.6% (k=2)

Certificate No: EX3-7329_Feb15 Page 9 of 11

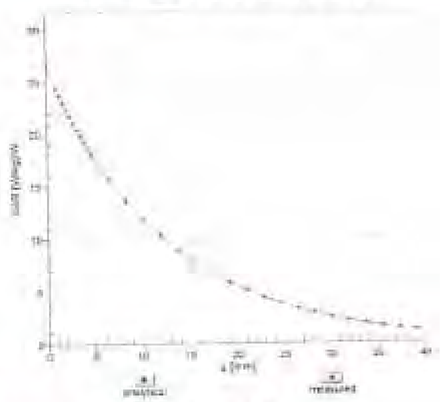
EX3DV4– SN:7329 February 5, 2015

Conversion Factor Assessment

f = 900 MHz,WGLS R9 (H_convF)

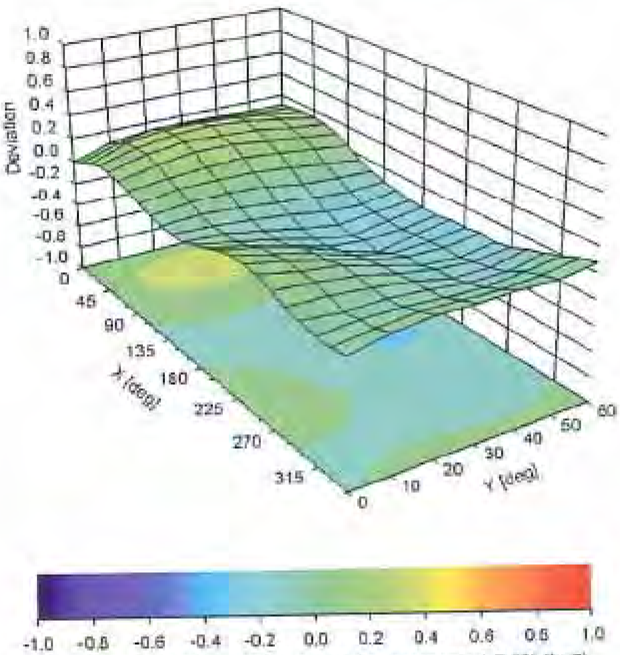


f = 1750 MHz,WGLS R22 (H_convF)



Deviation from Isotropy in Liquid

Error (ϕ, ϑ), f = 900 MHz



Uncertainty of Spherical Isotropy Assessment: ± 2.6% (k=2)

Certificate No: EX3-7329_Feb15 Page 10 of 11

DASY/EASY - Parameters of Probe: EX3DV4 - SN:7329

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	24.5
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

APPENDIX C DIPOLE CALIBRATION CERTIFICATES

NCL CALIBRATION LABORATORIES

Calibration File No: DC-1599
Project Number: BAC-dipole-cal-5779

CERTIFICATE OF CALIBRATION

It is certified that the equipment identified below has been calibrated in the **NCL CALIBRATION LABORATORIES** by qualified personnel following recognized procedures and using transfer standards traceable to NRC/NIST.

Validation Dipole(Head and Body)

Manufacturer: APREL Laboratories
Part number: ALS-D-835-S-2
Frequency: 835 MHz
Serial No: 180-00558

Customer: Bay Area Compliance Laboratory (China)

Calibrated: 8th October 2014
Released on: 8th October 2014

This Calibration Certificate is Incomplete Unless Accompanied with the Calibration Results Summary

Released By: ______________________

Art Brennan, Quality Manager

NCL CALIBRATION LABORATORIES

Suite 102, 303 Terry Fox Dr.
Kanata, ONTARIO
CANADA K2K 3J1

Division of APREL Lab
TEL (613) 435-8300
FAX (613)435-8306

NCL Calibration Laboratories
Division of APREL Laboratories

Conditions

Dipole 180-00558 was received with a damaged connection for a re-calibration.

Ambient Temperature of the Laboratory:	22 °C +/- 0.5°C
Temperature of the Tissue:	21 °C +/- 0.5°C

Attestation

The below named signatories have conducted the calibration and review of the data which is presented in this calibration report.

We the undersigned attest that to the best of our knowledge the calibration of this subject has been accurately conducted and that all information contained within the results pages have been reviewed for accuracy.

Art Brennan, Quality Manager

Maryna Nesterova Calibration Engineer

Primary Measurement Standards

Instrument	Serial Number	Cal due date
Tektronix USB Power Meter	11C940	May 14, 2015
Network Analyzer Anritsu 37347C	002106	Feb. 20, 2015

This page has been reviewed for content and attested to by signature within this document.

NCL Calibration Laboratories
Division of APREL Laboratories.

Calibration Results Summary

The following results relate the Calibrated Dipole and should be used as a quick reference for the user.

Mechanical Dimensions

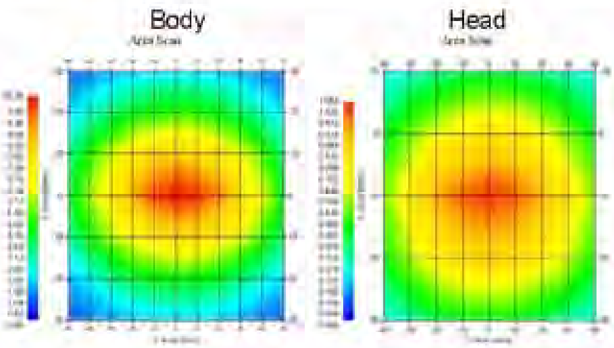
Length: 162.2 mm
Height: 89.4 mm

Electrical Specification

Tissue	Frequency	SWR:	Return Loss	Impedance
Head	835 MHz	1.066 U	-30.344 dB	49.001 Ω
Body	835 MHz	1.089 U	-28.118 dB	53.117 Ω

System Validation Results

Tissue	Frequency	1 Gram	10 Gram	Peak
Head	835 MHz	9.773	6.174	14.713
Body	835 MHz	9.736	6.297	14.513



This page has been reviewed for content and attested to by signature within this document. 3

NCL Calibration Laboratories
Division of APREL Laboratories.

Introduction

This Calibration Report has been produced in line with the SSI Dipole Calibration Procedure SSI-TP-018-ALSAS. The results contained within this report are for Validation Dipole 180-00558. The calibration routine consisted of a three-step process. Step 1 was a mechanical verification of the dipole to ensure that it meets the mechanical specifications. Step 2 was an Electrical Calibration for the Validation Dipole, where the SWR, Impedance, and the Return loss were assessed. Step 3 involved a System Validation using the ALSAS-10U, along with APREL E-020 30 MHz to 6 GHz E-Field Probe Serial Number 225.

References

- IEC-62209 "Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices – Human models, instrumentation, and procedures"
- Part 2: "Procedure to determine the Specific Absorption Rate (SAR) for hand-held devices used in close proximity of the ear (frequency range of 30 MHz to 6 GHz)"
- TP-D01-032-E020-V2 E-Field probe calibration procedure
- D22-012-Tissue dielectric tissue calibration procedure
- D28-002-Dipole procedure for validation of SAR system using a dipole
- IEEE 1309 Draft Standard for Calibration of Electromagnetic Field Sensors and Probes, Excluding Antennas, from 9kHz to 40GHz

Conditions

Dipole 180-00558 was repaired prior to this calibration. The repair reliability depends upon correct usage of the dipole.

Ambient Temperature of the Laboratory:	22 °C +/- 0.5°C
Temperature of the Tissue:	20 °C +/- 0.5°C

Dipole Calibration uncertainty

The calibration uncertainty for the dipole is made up of various parameters presented below.

Mechanical	1%
Positioning Error	1.22%
Electrical	1.7%
Tissue	2.2%
Dipole Validation	2.2%
TOTAL	**8.32% (16.64% K=2)**

4

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NCL Calibration Laboratories
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Dipole Calibration Results

Mechanical Verification

APREL Length	APREL Height	Measured Length	Measured Height
161.0 mm	89.8 mm	162.2 mm	89.4 mm

Electrical Verification

Tissue Type	Return Loss:	SWR:	Impedance:
Head	-30.344 dB	1.066 U	49.001 Ω
Body	-28.118 dB	1.089 U	53.117 Ω

Tissue Validation

	Dielectric constant, ε_r	Conductivity, σ [S/m]
Head Tissue 835MHz	43.42	0.94
Body Tissue 835MHz	55.77	1.01

5

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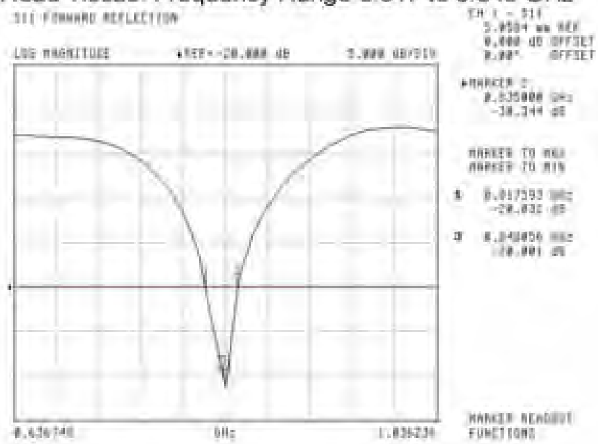
NCL Calibration Laboratories

Division of APREL Laboratories.

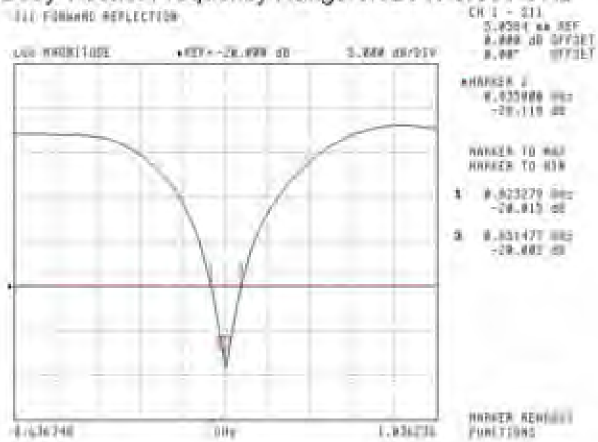
The Following Graphs are the results as displayed on the Vector Network Analyzer.

S11 Parameter Return Loss

Head Tissue: Frequency Range 0.817 to 0.848 GHz



Body Tissue: Frequency Range 0.823 to 0.851 GHz



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NCL Calibration Laboratories

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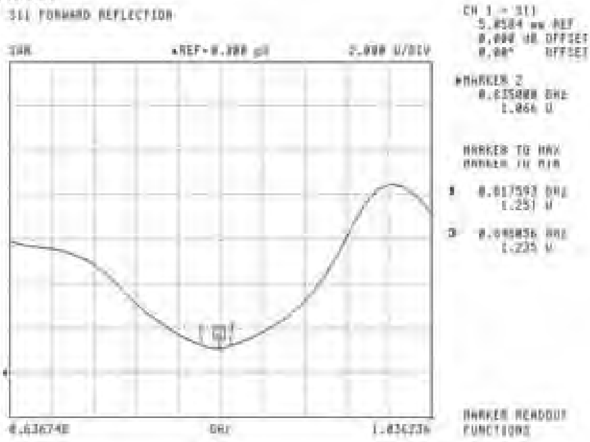
SWR

Head



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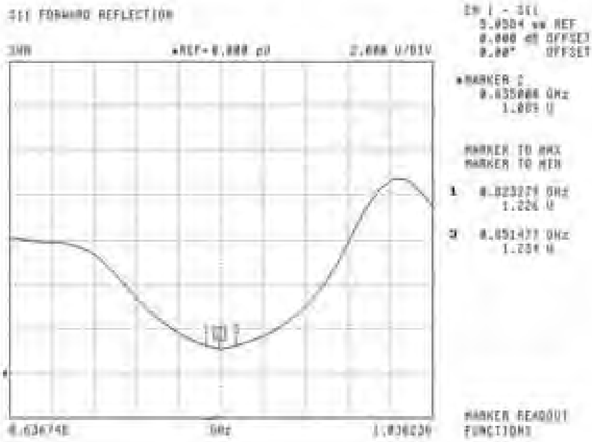

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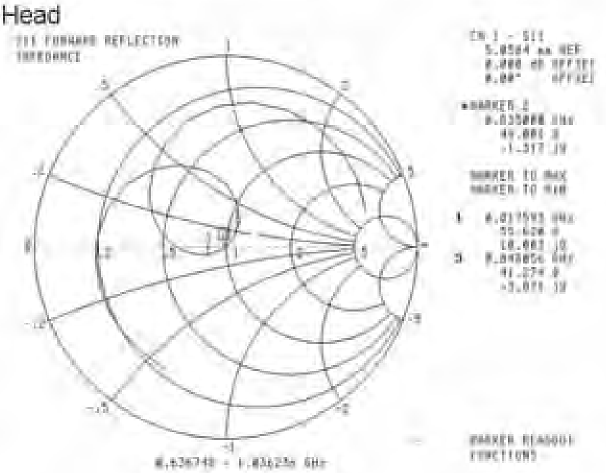
NCL Calibration Laboratories
Division of APREL Laboratories

Smith Chart Dipole Impedance

Head



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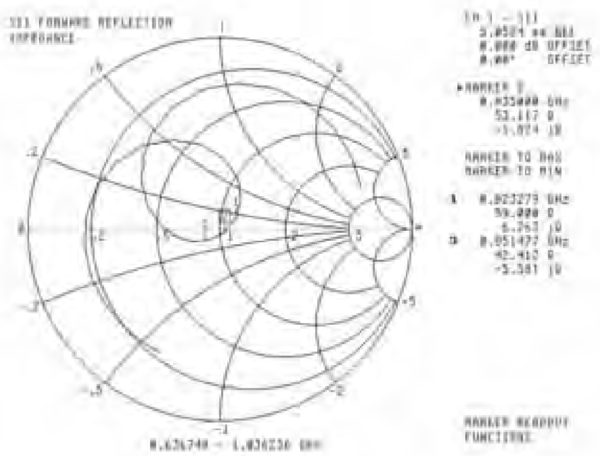

8

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Test Equipment

The test equipment used during Probe Calibration, manufacturer, model number and, current calibration status are listed and located on the main APREL server R:\NCL\Calibration Equipment\Instrument List 2014.

NCL CALIBRATION LABORATORIES

Calibration File No: DC-1601
Project Number: BAC-dipole –cal-5779

CERTIFICATE OF CALIBRATION

It is certified that the equipment identified below has been calibrated in the **NCL CALIBRATION LABORATORIES** by qualified personnel following recognized procedures and using transfer standards traceable to NRC/NIST.

Validation Dipole (Head & Body)

Manufacturer: APREL Laboratories
Part number: ALS-D-1900-S-2
Frequency: 1900 MHz
Serial No: 210-00710

Customer: Bay Area Compliance Laboratory (China)

Calibrated: 9th October, 2014
Released on: 9th October, 2014

This Calibration Certificate is Incomplete Unless Accompanied with the Calibration Results Summary

Released By: ______________________

Art Brennan, Quality Manager

NCL CALIBRATION LABORATORIES

Suite 102, 303 Terry Fox Dr.
Kanata, ONTARIO
CANADA K2K 3J1

Division of APREL Lab
TEL. (613) 435-8300
FAX. (613)435-8306

NCL Calibration Laboratories

Division of APREL Laboratories

Conditions

Dipole 210-00710 was received in good condition and was a re-calibration.

Ambient Temperature of the Laboratory:	22 °C +/- 0.5°C
Temperature of the Tissue:	21 °C +/- 0.5°C

Attestation

The below named signatories have conducted the calibration and review of the data which is presented in this calibration report.

We the undersigned attest that to the best of our knowledge the calibration of this subject has been accurately conducted and that all information contained within the results pages have been reviewed for accuracy.

Art Brennan, Quality Manager

Maryna Nesterova Calibration Engineer

Primary Measurement Standards

Instrument	Serial Number	Cal due date
Tektronix USB Power Meter	11C940	May 14, 2015
Network Analyzer Anritsu 37347C	002106	Feb. 20, 2015

This page has been reviewed for content and attested to by signature within this document.

NCL Calibration Laboratories
Division of APREL Laboratories.

Calibration Results Summary

The following results relate the Calibrated Dipole and should be used as a quick reference for the user.

Mechanical Dimensions

Length: 67.1 mm
Height: 38.9 mm

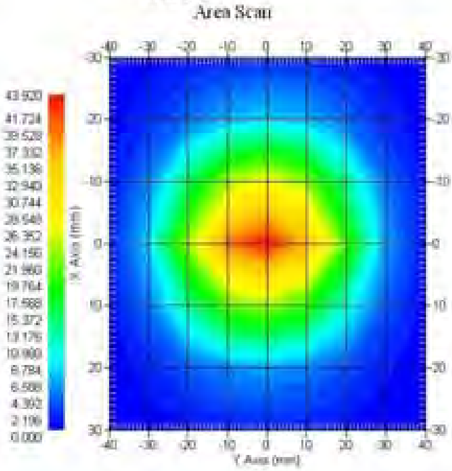
Electrical Specification

Tissue	Frequency	SWR:	Return Loss	Impedance
Head	1900MHz	1.084 U	-27.92 dB	52.247 Ω
Body	1900MHz	1.128 U	-24.40 dB	52.618 Ω

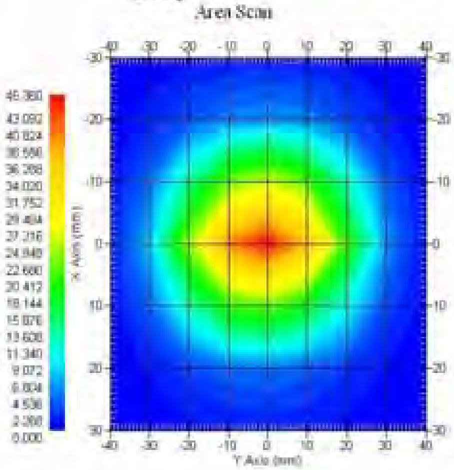
System Validation Results

Tissue	Frequency	1 Gram	10 Gram	Peak
Head	1900 MHz	39.481	20.44	73.364
Body	1900 MHz	39.715	20.552	73.565

Head



Body



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NCL Calibration Laboratories
Division of APREL Laboratories.

Introduction

This Calibration Report has been produced in line with the SSI Dipole Calibration Procedure SSI-TP-018-ALSAS. The results contained within this report are for Validation Dipole 210-00710. The calibration routine consisted of a three-step process. Step 1 was a mechanical verification of the dipole to ensure that it meets the mechanical specifications. Step 2 was an Electrical Calibration for the Validation Dipole, where the SWR, Impedance, and the Return loss were assessed. Step 3 involved a System Validation using the ALSAS-10U, along with APREL E-020 30 MHz to 6 GHz E-Field Probe Serial Number 225.

References

- IEC-62209 "Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices – Human models, instrumentation, and procedures"
- Part 2: "Procedure to determine the Specific Absorption Rate (SAR) for hand-held devices used in close proximity of the ear (frequency range of 30 MHz to 6 GHz)"
- TP-D01-032-E020-V2 E-Field probe calibration procedure
- D22-012-Tissue dielectric tissue calibration procedure
- D28-002-Dipole procedure for validation of SAR system using a dipole
- IEEE 1309 Draft Standard for Calibration of Electromagnetic Field Sensors and Probes, Excluding Antennas, from 9kHz to 40GHz

Conditions

Dipole 210-00710 was a recalibration.

Ambient Temperature of the Laboratory:	22 °C +/- 0.5°C
Temperature of the Tissue:	20 °C +/- 0.5°C

Dipole Calibration uncertainty

The calibration uncertainty for the dipole is made up of various parameters presented below.

Mechanical	1%
Positioning Error	1.22%
Electrical	1.7%
Tissue	2.2%
Dipole Validation	2.2%
TOTAL	**8.32% (16.64% K=2)**

4

This page has been reviewed for content and attested to by signature within this document.

Dipole Calibration Results

Mechanical Verification

APREL Length	APREL Height	Measured Length	Measured Height
68.0 mm	39.5 mm	67.1mm	38.9 mm

Electrical Validation

Tissue	Frequency	SWR:	Return Loss	Impedance
Head	1900MHz	1.084 U	-27.92 dB	52.247 Ω
Body	1900MHz	1.128 U	-24.40 dB	52.618 Ω

Tissue Validation

	Dielectric constant, ε_r	Conductivity, σ [S/m]
Head Tissue 1900MHz	40.20	1.38
Body Tissue 1900MHz	52.63	1.46

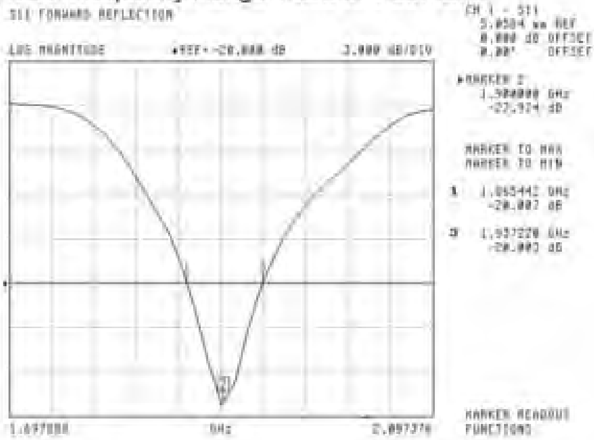
NCL Calibration Laboratories

Division of APREL Laboratories.

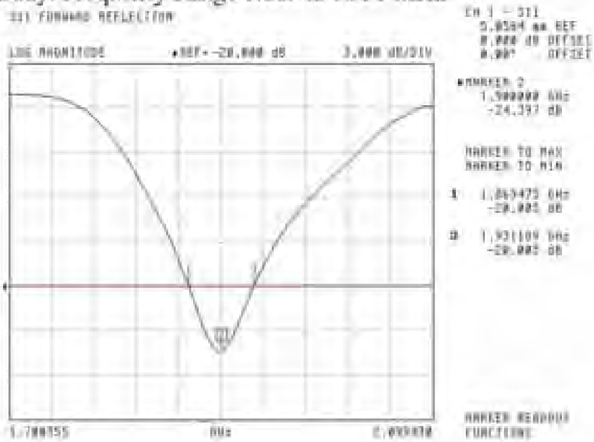
The Following Graphs are the results as displayed on the Vector Network Analyzer.

S11 Parameter Return Loss

Head: Frequency Range 1.865 to 1.937 GHz



Body: Frequency Range 1.869 to 1.931 MHz



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NCL Calibration Laboratories

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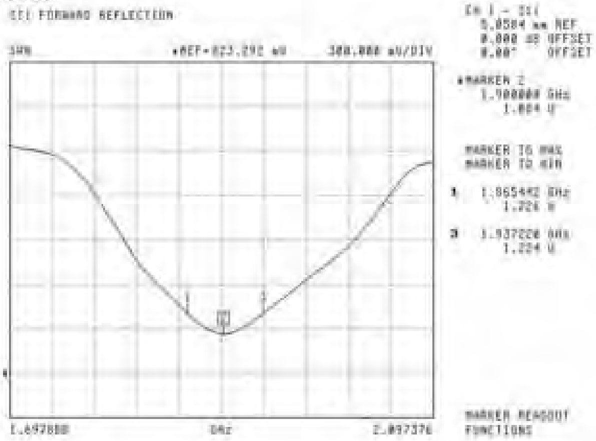
SWR

Head



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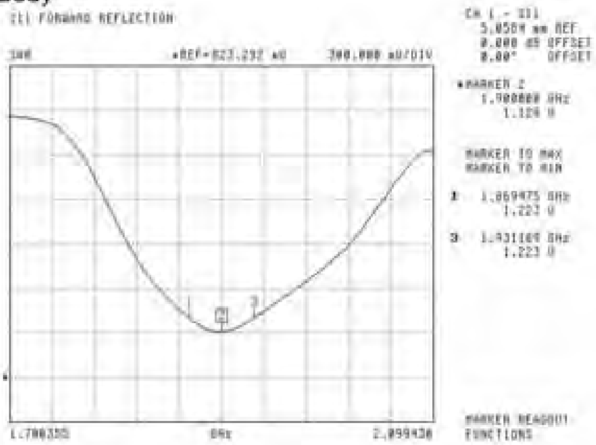

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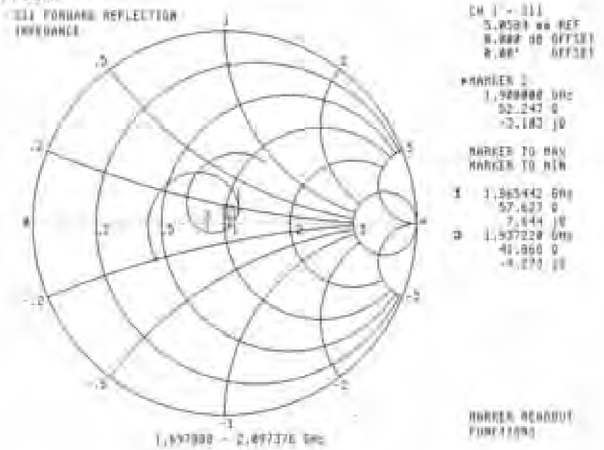
NCL Calibration Laboratories

Division of APREL Laboratories

Smith Chart Dipole Impedance

Head



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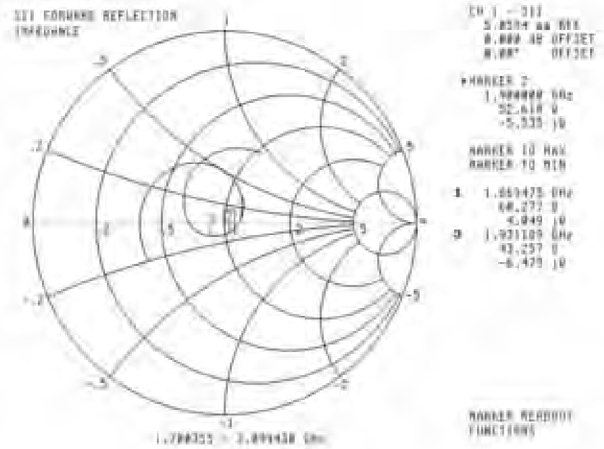

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8

Test Equipment

The test equipment used during Probe Calibration, manufacturer, model number and, current calibration status are listed and located on the main APREL server R:\NCL\Calibration Equipment\Instrument List 2014

NCL CALIBRATION LABORATORIES

Calibration File No: DC-1602
Project Number: BAC-dipole-cal-5779

CERTIFICATE OF CALIBRATION

It is certified that the equipment identified below has been calibrated in the **NCL CALIBRATION LABORATORIES** by qualified personnel following recognized procedures and using transfer standards traceable to NRC/NIST.

Validation Dipole (Head & Body)

Manufacturer: APREL Laboratories
Part number: ALS-D-2450-S-2
Frequency: 2450 MHz
Serial No: 220-00758

Customer: Bay Area Compliance Laboratory

Calibrated: 9th October, 2014
Released on: 9th October, 2014

This Calibration Certificate is Incomplete Unless Accompanied with the Calibration Results Summary

Released By: ______________________

Art Brennan, Quality Manager

NCL CALIBRATION LABORATORIES

Suite 102, 303 Terry Fox Dr
Kanata, ONTARIO
CANADA K2K 3J1

Division of APREL Lab.
TEL: (613) 435-8300
FAX: (613)435-8306

NCL Calibration Laboratories
Division of APREL Laboratories

Conditions

Dipole 220-00758 was received in good condition and was a re-calibration.

Ambient Temperature of the Laboratory: 22 °C +/- 0.5°C
Temperature of the Tissue: 21 °C +/- 0.5°C

Attestation

The below named signatories have conducted the calibration and review of the data which is presented in this calibration report.

We the undersigned attest that to the best of our knowledge the calibration of this subject has been accurately conducted and that all information contained within the results pages have been reviewed for accuracy.

Art Brennan, Quality Manager

Maryna Nesterova Calibration Engineer

Primary Measurement Standards

Instrument	Serial Number	Cal due date
Tektronix USB Power Meter	11C940	May 14, 2015
Network Analyzer Anritsu 37347C	002106	Feb. 20, 2015

This page has been reviewed for content and attested to by signature within this document.

NCL Calibration Laboratories
Division of APREL Laboratories.

Calibration Results Summary

The following results relate the Calibrated Dipole and should be used as a quick reference for the user.

Mechanical Dimensions

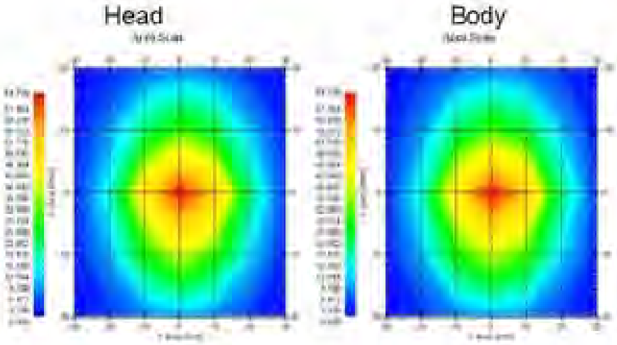
Length: 52.4 mm
Height: 30.3 mm

Electrical Specification

Tissue	Frequency	SWR:	Return Loss	Impedance
Head	2450 MHz	1.014 U	-45.184 dB	50.006Ω
Body	2450 MHz	1.070 U	-29.453 dB	50.672 Ω

System Validation Results

Tissue	Frequency	1 Gram	10 Gram	Peak
Head	2450 MHz	54.916	25.327	111.97
Body	2450 MHz	52.418	24.691	103.91



This page has been reviewed for content and attested to by signature within this document. 3

Introduction

This Calibration Report has been produced in line with the SSI Dipole Calibration Procedure SSI-TP-018-ALSAS. The results contained within this report are for Validation Dipole 220-00758. The calibration routine consisted of a three-step process. Step 1 was a mechanical verification of the dipole to ensure that it meets the mechanical specifications. Step 2 was an Electrical Calibration for the Validation Dipole, where the SWR, Impedance, and the Return loss were assessed. Step 3 involved a System Validation using the ALSAS-10U, along with APREL E-020 30 MHz to 6 GHz E-Field Probe Serial Number 225.

References

SSI-TP-018-ALSAS Dipole Calibration Procedure
SSI-TP-016 Tissue Calibration Procedure
IEEE 1528 "Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Body Due to Wireless Communications Devices: Experimental Techniques"
IEC-62209 "Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices – Human models, instrumentation, and procedures"
Part 1: "Procedure to determine the Specific Absorption Rate (SAR) for hand-held devices used in close proximity of the ear (frequency range of 300 MHz to 3 GHz)"
IEC-62209 "Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices – Human models, instrumentation, and procedures"
Part 2 *Draft*: "Procedure to determine the Specific Absorption Rate (SAR) for hand-held devices used in close proximity of the ear (frequency range of 30 MHz to 6 GHz)"

Conditions

Dipole 220-00758 was a re-calibration.

Ambient Temperature of the Laboratory: 22 °C +/- 0.5°C
Temperature of the Tissue: 20 °C +/- 0.5°C

Dipole Calibration uncertainty

The calibration uncertainty for the dipole is made up of various parameters presented below.

Mechanical	1%
Positioning Error	1.22%
Electrical	1.7%
Tissue	2.2%
Dipole Validation	2.2%
TOTAL	**8.32% (16.64% K=2)**

NCL Calibration Laboratories
Division of APREL Laboratories.

Dipole Calibration Results

Mechanical Verification

APREL Length	APREL Height	Measured Length	Measured Height
51.5 mm	30.4 mm	52.4 mm	30.3 mm

Electrical Specification

Tissue	Frequency	SWR:	Return Loss	Impedance
Head	2450 MHz	1.014 U	-45.184 dB	50.006Ω
Body	2450 MHz	1.070 U	-29.453 dB	50.672 Ω

Tissue Validation

	Dielectric constant, ε_r	Conductivity, σ [S/m]
Head Tissue 2450MHz	37.26	1.84
Body Tissue 2450MHz	53.61	1.90

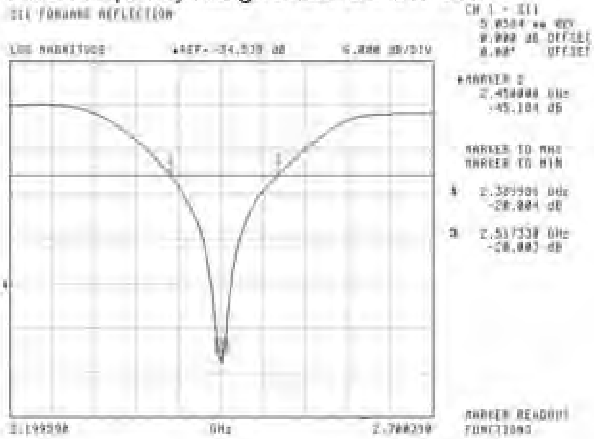
This page has been reviewed for content and attested to by signature within this document.

NCL Calibration Laboratories
Division of APREL Laboratories.

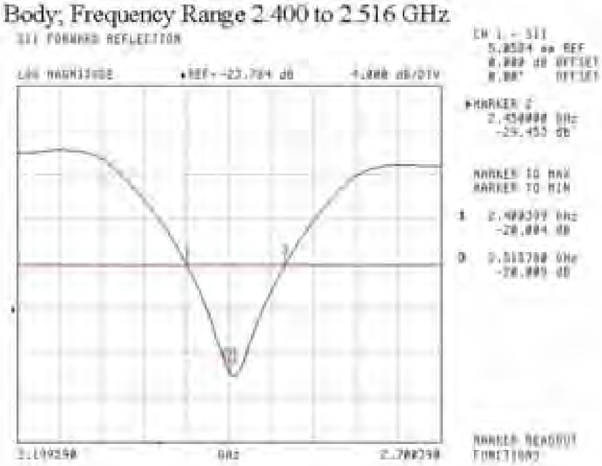
The Following Graphs are the results as displayed on the Vector Network Analyzer.

S11 Parameter Return Loss

Head: Frequency Range 2.390 to 2.517 GHz



Body; Frequency Range 2.400 to 2.516 GHz



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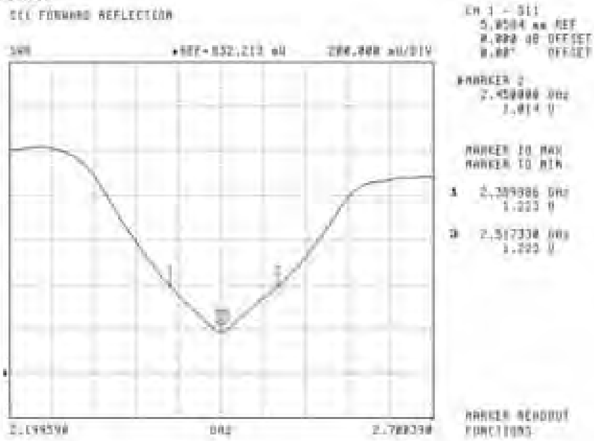
NCL Calibration Laboratories

Division of APREL Laboratories.

SWR

Head



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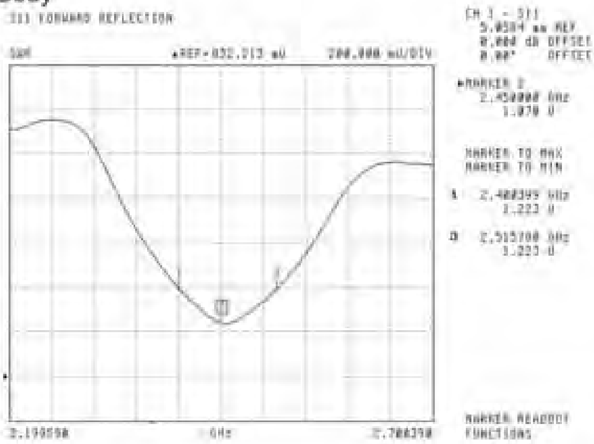

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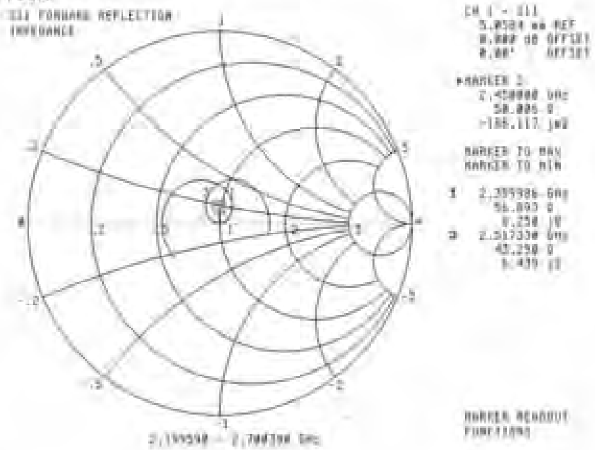
NCL Calibration Laboratories

Division of APREL Laboratories

Smith Chart Dipole Impedance

Head



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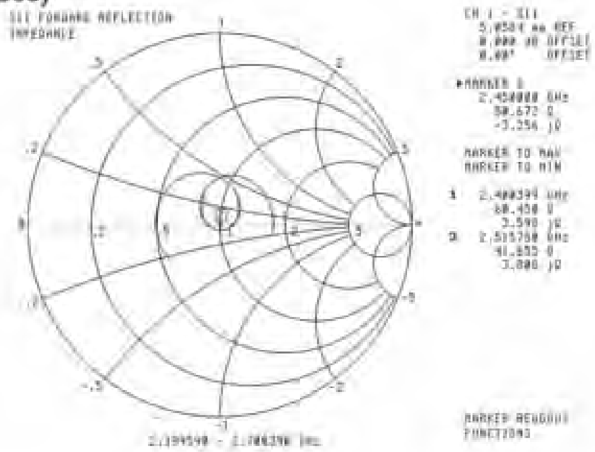

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This page has been reviewed for content and attested to by signature within this document.

Test Equipment

The test equipment used during Probe Calibration, manufacturer, model number and, current calibration status are listed and located on the main APREL server R:\NCL\Calibration Equipment\Instrument List May 2014.

NCL CALIBRATION LABORATORIES

Calibration File No: DC-1531
Project Number: BACL-5745

CERTIFICATE OF CALIBRATION

It is certified that the equipment identified below has been calibrated in the **NCL CALIBRATION LABORATORIES** by qualified personnel following recognized procedures and using transfer standards traceable to NRC/NIST.

BACL Head & Body Validation Dipole

Manufacturer: APREL Laboratories
Part number: ALS-D-1750-S-2
Frequency: 1750 MHz
Serial No: 198-00304

Customer: ISL

Calibrated: 8th October, 2013
Released on: 8th October, 2013

This Calibration Certificate is Incomplete Unless Accompanied with the Calibration Results Summary

Released By: ______________________

Art Brennan, Quality Manager

NCL CALIBRATION LABORATORIES

Suite 102, 303 Terry Fox Dr.
OTTAWA, ONTARIO
CANADA K2K 3J1

Division of APREL Lab.
TEL: (613) 435-8300
FAX: (613) 435-8306

NCL Calibration Laboratories
Division of APREL Laboratories

Conditions

Dipole 198-00304 was an original calibration.

Ambient Temperature of the Laboratory: 22 °C +/- 0.5°C
Temperature of the Tissue: 21 °C +/- 0.5°C

We the undersigned attest that to the best of our knowledge the calibration of this subject has been accurately conducted and that all information contained within the results pages have been reviewed for accuracy.

Art Brennan, Quality Manager

Constantin Teodorian, Test Engineer

This page has been reviewed for content and attested to by signature within this document.

2

NCL Calibration Laboratories
Division of APREL Laboratories

Calibration Results Summary

The following results relate the Calibrated Dipole and should be used as a quick reference for the user.

Mechanical Dimensions

Length: 75 mm
Height: 42 mm

Electrical Calibration

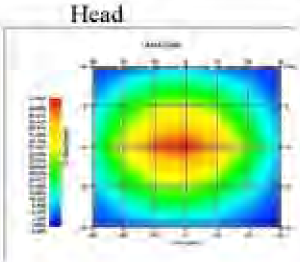
Test	Result Head	Result Body
S11 R/L	-25.567	-20.548 dB
SWR	1.111U	1.207 U
Impedance	53.637Ω	55.929 Ω

System Validation Results, 1750 MHz

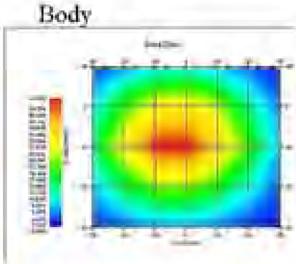
	1g	10g
Head	37.02	18.99
Body	36.65	18.85

Type	Epsilon	Sigma
Head	38.51	1.36
Body	51.79	1.53

Head



Body



This page has been reviewed for content and attested to by signature within this document 3

Introduction

This Calibration Report has been produced in line with the SSI Dipole Calibration Procedure SSI-TP-018-ALSAS. The results contained within this report are for Validation Dipole. The calibration routine consisted of a three-step process. Step 1 was a mechanical verification of the dipole to ensure that it meets the mechanical specifications. Step 2 was an Electrical Calibration for the Validation Dipole, where the SWR, Impedance, and the Return loss were assessed. Step 3 involved a System Validation using the ALSAS-10U, along with APREL E-030 130 MHz to 26 GHz E-Field Probe Serial Number 215.

References

SSI-TP-018-ALSAS Dipole Calibration Procedure
SSI-TP-016 Tissue Calibration Procedure
IEEE 1528 "Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Body Due to Wireless Communications Devices: Experimental Techniques"
IEC-62209 "Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices – Human models, instrumentation, and procedures"
Part 1: "Procedure to determine the Specific Absorption Rate (SAR) for hand-held devices used in close proximity of the ear (frequency range of 300 MHz to 3 GHz)"
IEC-62209 "Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices – Human models, instrumentation, and procedures"
Part 2 *Draft*: "Procedure to determine the Specific Absorption Rate (SAR) for hand-held devices used in close proximity of the ear (frequency range of 30 MHz to 6 GHz)"

Conditions

Ambient Temperature of the Laboratory: 22 °C +/- 0.5°C
Temperature of the Tissue: 20 °C +/- 0.5°C

This was an original calibration taken from stock.

Dipole Calibration uncertainty

The calibration uncertainty for the dipole is made up of various parameters presented below.

Mechanical	1%
Positioning Error	1.22%
Electrical	1.7%
Tissue	2.2%
Dipole Validation	2.2%
TOTAL	**8.32% (16.64% K=2)**

This page has been reviewed for content and attested to by signature within this document.

NCL Calibration Laboratories
Division of APREL Laboratories.

Dipole Calibration Results

Mechanical Verification

Measured Length	Measured Height
75 mm	42 mm

Tissue Validation

Frequency	Permittivity ε	Conductivity σ
1750 Head	38.23	1.38
1750 Body	52.86	1.54

This page has been reviewed for content and attested to by signature within this document. 5

NCL Calibration Laboratories
Division of APREL Laboratories.

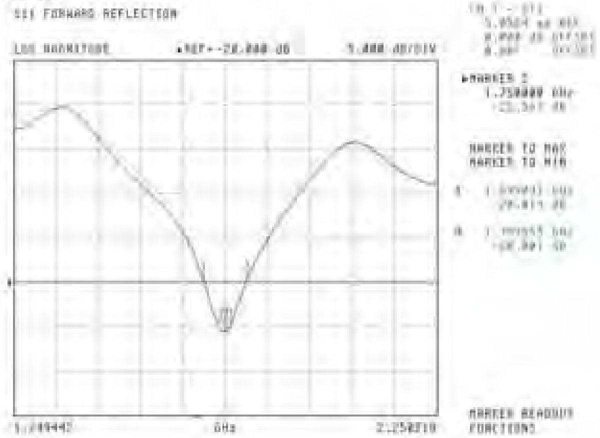
Electrical Calibration

Test	Result Head	Result Body
S11 R/L	-25.567	-20.548 dB
SWR	1.111U	1.207 U
Impedance	53.637Ω	55.929 Ω

The Following Graphs are the results as displayed on the Vector Network Analyzer.

S11 Parameter Return Loss

Head



Body

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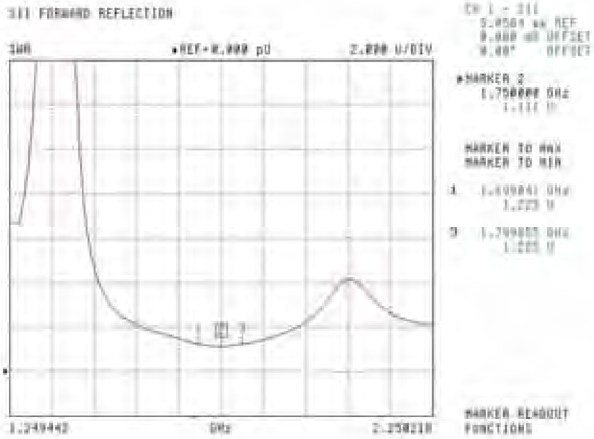
NCL Calibration Laboratories

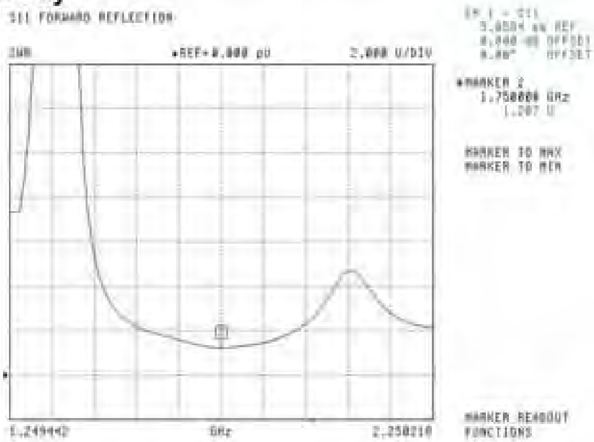
Division of APREL Laboratories.

SWR

Head



Body



7

This page has been reviewed for content and attested to by signature within this document.

NCL Calibration Laboratories

Division of APREL Laboratories.

Smith Chart Dipole Impedance

Head

NCL Calibration Laboratories

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Test Equipment

The test equipment used during Probe Calibration, manufacturer, model number and, current calibration status are listed and located on the main APREL server R:\NCL\Calibration Equipment\Instrument List May 2013

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This page has been reviewed for content and attested to by signature within this document.

******* END OF REPORT *******