

# Report on the Specific Absorption Rate Testing of the A3114

Apple Inc.  
Model: A3114

In accordance with FCC 47 CFR 2.1093  
FCC ID: BCGA3114

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Jon Kenny	Technical Director	Authorised Signatory	04 December 2023

Signatures in this approval box have checked this document in line with the requirements of TÜV SÜD document control rules.

### EXECUTIVE SUMMARY

A sample of this product was tested and found to be compliant with FCC 47 CFR 2.1093 for the tests detailed in section 1.

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## **SECTION 1**

### **REPORT SUMMARY**

Specific Absorption Rate Testing of the A3114



## 1.1 INTRODUCTION

The information contained in this report is intended to show verification of the Specific Absorption Rate testing of the A3114 to the requirements of FCC 47 CFR 2.1093.

Objective	To determine the Equipment Under Test's (EUT) compliance with the requirements specified within FCC 47 CFR 2.1093.
Applicant	Apple Inc.
Manufacturer	Apple Inc.
Manufacturing Description	Laptop computer
Model Number	A3114
Serial/IMEI Number(s)	DJ4N6G0394 (Conducted) GXMN909DWD (Radiated) G7G2M5FV1Q (Radiated)
Number of Samples Tested	3
Hardware Version	REV 1.0
Software Version	23A32771a
Test Specification/Issue/Date	FCC 47 CFR 2.1093
Start of Test	25-October-2023
Finish of Test	29-November-2023
Related Document(s)	KDB 865664 - D01 v01r04 KDB 447498 - D01 v06 IEC-IEEE 62209-1528-2020 KDB 248227 - D01 v02r02 IEC/IEEE 63195-1:2022 ICNIRP 2020 FCC 47 CFR 1.1310 SPEAG, DASY8 Application Note: SAR, APD & PD at 6 - 10 GHz (Version 6.0), August 2022 October 2020 TCBC Workshop Notes
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**1.2 BRIEF SUMMARY OF RESULTS**

The measurements shown in this report were made to the requirements of FCC 47 CFR 2.1093.

The maximum 1g volume averaged stand-alone SAR found during this Assessment:

Max 1g SAR (W/kg) Body	0.731 (Measured)	0.877 (Scaled)
The maximum 1g volume averaged SAR level measured for all the tests performed did not exceed the limits for FCC General Population/Uncontrolled Exposure (W/kg) Partial Body of 1.6 W/kg in accordance with FCC 47 CFR 1.1310		

The maximum iPD 4cm<sup>2</sup> found during this Assessment:

Max iPD 4cm <sup>2</sup> (W/m <sup>2</sup> )	6.24 (Measured) (FS)
The maximum iPD averaged over 4cm <sup>2</sup> measured for all the tests performed did not exceed the standalone limits for FCC General Population/Uncontrolled Exposure of 10.00 W/m <sup>2</sup> in accordance with FCC 47 CFR 1.1310.	

The maximum 1g volume averaged stand-alone Reported SAR found during this assessment for each supported mode:

Technology	Band	Test Configuration	Max Reported 1g SAR (W/kg)
Bluetooth (5 or 6 GHz WLAN OFF)	2450 MHz	Body	0.557
Bluetooth (5 or 6 GHz WLAN ON)	2450 MHz	Body	0.496
Narrowband	5150-5250 MHz	Body	0.197
Narrowband (5 or 6 GHz WLAN OFF)	5725-5850 MHz	Body	0.534
Narrowband (5 or 6 GHz WLAN ON)	5725-5850 MHz	Body	0.367
Thread (5 or 6 GHz OFF)	2450 MHz	Body	0.198
Thread (5 or 6 GHz ON)	2450 MHz	Body	0.143
WLAN	2450 MHz	Body	0.877
WLAN	5200 MHz	Body	0.619
WLAN	5300 MHz	Body	0.786
WLAN	5500/5600 MHz	Body	0.745
WLAN	5800 MHz	Body	0.759
The maximum 1g volume averaged SAR level measured for all the tests performed (including simultaneous transmission analysis results) did not exceed the limits for General Population/Uncontrolled Exposure (W/kg) Partial Body of 1.6 W/kg. *Measured results for Thread were scaled down from 100% duty cycle to 59.68% Refer to Annex D			



### 1.2.1 Simultaneous Transmission

Combinations of Simultaneous Transmission this EUT can achieve are the following:

- 5 or 6 GHz WLAN + 2.4 GHz Bluetooth
- 5 or 6 GHz WLAN + 2.4 GHz Thread
- 5 or 6 GHz Narrowband + 2.4 GHz WLAN

Position	5 or 6 GHz WLAN 1g SAR (W/kg) (Core 0)	2.4 GHz Bluetooth (5 or 6 GHz WLAN on) 1g SAR (W/kg) (Core 0)	Sum of 1g SAR (W/Kg)	Peak Location Separation Ratio required?	Peak Location Separation Ratio
Bottom	0.786	0.496	1.282	No	N/A

Position	5 or 6 GHz WLAN 1g SAR (W/kg) (Core 0)	Thread (5 or 6 GHz on) 1g SAR (W/kg) (Core 0)	Sum of 1g SAR (W/Kg)	Peak Location Separation Ratio required?	Peak Location Separation Ratio
Bottom	0.786	0.143	0.929	No	N/A

Position	Narrowband UNII-3 (2.4 GHz WLAN ON) 1g SAR (W/kg) (Core 1)	2.4 GHz WLAN 1g SAR (W/kg) (Core 1)	Sum of 1g SAR (W/Kg)	Peak Location Separation Ratio required?	Peak Location Separation Ratio
Bottom	0.367	0.799	1.166	No	N/A

Position	6 GHz WLAN - Exposure Ratio iPD Value (Core 0)	Bluetooth (5 or 6 GHz WLAN on) Exposure ratio (Core 0)	Total Exposure Ratio	Total Exposure Ratio less than 1.0
Bottom	0.624	0.310	0.934	Yes

Each antenna is separated to the extent that the SAR distributions do not overlap and only same core simultaneous transmission is considered.

KDB 447498 D01 - Section 4.3.2: Simultaneous test exclusion is applicable as the sum of 1g SAR of all simultaneously transmitting antennas in an operating mode and exposure condition combination is within the SAR limit or within the Peak Location Separation Ratio.



### 1.3 TEST RESULTS SUMMARY

#### 1.3.1 Results Summary Tables

Bluetooth - EDR - SISO Core 0 (5 or 6 GHz WLAN OFF) (ePA):  
 Specific Absorption Rate (SAR) 1g Results

Test Position	Channel Number	Frequency (MHz)	Measured Average Power (dBm)	Tune Up (dBm)	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Scan Figure Number
0mm Rear of Display	0	2402	15.77	16.50	0.077	0.091	-
0mm Bottom	0	2402	15.77	16.50	0.242	0.286	-
0mm Bottom	39	2441	15.33	16.50	0.242	0.317	-
0mm Bottom	78	2480	15.38	16.50	0.430	0.557	C.1
Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g)							

Bluetooth - EDR - SISO Core 1 (5 or 6 GHz WLAN OFF) (ePA):  
 Body Specific Absorption Rate (SAR) 1g Results

Test Position	Channel Number	Frequency (MHz)	Measured Average Power (dBm)	Tune Up (dBm)	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Scan Figure Number
0mm Rear of Display	0	2402	15.75	16.50	0.077	0.092	-
0mm Bottom	0	2402	15.75	16.50	0.368	0.437	C.2
0mm Bottom	39	2441	15.55	16.50	0.252	0.314	-
0mm Bottom	78	2480	15.43	16.50	0.250	0.320	-
Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g)							

Bluetooth - EDR - SISO Core 0 (5 or 6 GHz WLAN ON) (ePA):  
 Body Specific Absorption Rate (SAR) 1g Results

Test Position	Channel Number	Frequency (MHz)	Measured Average Power (dBm)	Tune Up (dBm)	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Scan Figure Number
0mm Rear of Display	0	2402	15.77	16.00	0.077	0.081	-
0mm Bottom	0	2402	15.77	16.00	0.242	0.255	-
0mm Bottom	39	2441	15.33	16.00	0.242	0.282	-
0mm Bottom	78	2480	15.38	16.00	0.430	0.496	C.3
Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g)							



Bluetooth - BT EDR - SISO Core 1 (5 or 6 GHz WLAN ON) (ePA):  
 Body Specific Absorption Rate (SAR) 1g Results

Test Position	Channel Number	Frequency (MHz)	Measured Average Power (dBm)	Tune Up (dBm)	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Scan Figure Number
0mm Rear of Display	0	2402	15.75	16.00	0.077	0.082	-
0mm Bottom	0	2402	15.75	16.00	0.368	0.390	C.4
0mm Bottom	39	2441	15.55	16.00	0.252	0.280	-
0mm Bottom	78	2480	15.43	16.00	0.250	0.285	-
Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g)							

Narrowband - UNII-1 - HDR8 - SISO Core 0 (5 or 6 GHz WLAN OFF & ON) (ePA):  
 Body Specific Absorption Rate (SAR) 1g Results

Test Position	Channel Number	Frequency (MHz)	Measured Average Power (dBm)	Tune Up (dBm)	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Scan Figure Number
0mm Rear of Display	Top	5200	12.70	13.00	0.049	0.053	-
0mm Bottom	Bottom	5150	12.70	13.00	0.145	0.155	-
0mm Bottom	Middle	5200	12.65	13.00	0.154	0.167	-
0mm Bottom	Top	5250	12.70	13.00	0.171	0.183	C.5
Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g)							

Narrowband - UNII-1 - HDR8 - SISO Core 1 (5 or 6 GHz WLAN OFF & ON) (ePA):  
 Body Specific Absorption Rate (SAR) 1g Results

Test Position	Channel Number	Frequency (MHz)	Measured Average Power (dBm)	Tune Up (dBm)	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Scan Figure Number
0mm Rear of Display	Top	5150	12.60	12.50	0.065	0.064	-
0mm Bottom	Bottom	5150	12.60	12.50	0.202	0.197	C.6
0mm Bottom	Middle	5200	12.40	12.50	0.175	0.179	-
0mm Bottom	Top	5250	12.00	12.50	0.142	0.159	-
Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g)							





Narrowband - UNII-3 - HDR4 - SISO Core 0 (5 or 6 GHz OFF) (ePA):  
 Body Specific Absorption Rate (SAR) 1g Results

Test Position	Channel Number	Frequency (MHz)	Measured Average Power (dBm)	Tune Up (dBm)	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Scan Figure Number
0mm Rear of Display	Top	5788	13.90	14.00	0.110	0.113	-
0mm Bottom	Bottom	5725	13.86	14.00	0.444	0.459	-
0mm Bottom	Middle	5788	13.90	14.00	0.459	0.470	-
0mm Bottom	Top	5850	13.66	14.00	0.482	0.521	C.7
Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g)							

Narrowband - UNII-3 - HDR4 - SISO Core 1 (5 or 6 GHz OFF) (ePA):  
 Body Specific Absorption Rate (SAR) 1g Results

Test Position	Channel Number	Frequency (MHz)	Measured Average Power (dBm)	Tune Up (dBm)	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Scan Figure Number
0mm Rear of Display	Top	5788	13.81	14.00	0.111	0.116	-
0mm Bottom	Bottom	5725	13.59	14.00	0.407	0.447	-
0mm Bottom	Middle	5788	13.81	14.00	0.467	0.488	-
0mm Bottom	Top	5850	13.67	14.00	0.495	0.534	C.8
Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g)							

Narrowband - UNII-3 - HDR4 - SISO Core 0 (5 or 6 GHz ON) (ePA):  
 Body Specific Absorption Rate (SAR) 1g Results

Test Position	Channel Number	Frequency (MHz)	Measured Average Power (dBm)	Tune Up (dBm)	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Scan Figure Number
0mm Rear of Display	Top	5850	11.68	12.00	0.076	0.082	-
0mm Bottom	Bottom	5725	11.61	12.00	0.274	0.300	-
0mm Bottom	Middle	5788	11.70	12.00	0.284	0.304	-
0mm Bottom	Top	5850	11.68	12.00	0.329	0.354	C.9
Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g)							



Narrowband - UNII-3 - HDR4 - SISO Core 1 (5 or 6 GHz ON) (ePA):  
 Body Specific Absorption Rate (SAR) 1g Results

Test Position	Channel Number	Frequency (MHz)	Measured Average Power (dBm)	Tune Up (dBm)	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Scan Figure Number
0mm Rear of Display	Top	5725	11.71	12.00	0.081	0.087	-
0mm Bottom	Bottom	5725	11.71	12.00	0.306	0.327	-
0mm Bottom	Middle	5788	11.70	12.00	0.321	0.344	-
0mm Bottom	Top	5850	11.52	12.00	0.329	0.367	C.10
Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g)							

Thread - SISO Core 0 (5 or 6 GHz WLAN OFF) (ePA):  
 Body Specific Absorption Rate (SAR) 1g Results

Test Position	Channel Number	Frequency (MHz)	Measured Average Power (dBm)	Tune Up (dBm)	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)*	Scan Figure Number
0mm Rear of Display	18	2440	17.12	17.50	0.050	0.055	-
0mm Bottom	11	2405	17.00	17.50	0.176	0.198	C.11
0mm Bottom	18	2440	17.12	17.50	0.166	0.181	-
0mm Bottom	26	2480	17.00	17.50	0.165	0.185	-
Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g)							
*Measured results for Thread were scaled down from 100% duty cycle to 59.68%. Refer to Annex D							

Thread - SISO Core 1 (5 or 6 GHz WLAN OFF) (ePA):  
 Body Specific Absorption Rate (SAR) 1g Results

Test Position	Channel Number	Frequency (MHz)	Measured Average Power (dBm)	Tune Up (dBm)	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)*	Scan Figure Number
0mm Rear of Display	26	2480	17.30	17.50	0.058	0.061	-
0mm Bottom	11	2405	17.20	17.50	0.146	0.156	-
0mm Bottom	18	2440	16.80	17.50	0.152	0.178	C.12
0mm Bottom	26	2480	17.30	17.50	0.167	0.175	-
Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g)							
*Measured results for Thread were scaled down from 100% duty cycle to 59.68%. Refer to Annex D							



Thread - SISO Core 0 (5 or 6 GHz WLAN ON) (ePA):  
 Body Specific Absorption Rate (SAR) 1g Results

Test Position	Channel Number	Frequency (MHz)	Measured Average Power (dBm)	Tune Up (dBm)	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)*	Scan Figure Number
0mm Rear of Display	11	2405	15.73	16.00	0.036	0.039	-
0mm Bottom	11	2405	15.73	16.00	0.118	0.125	-
0mm Bottom	18	2440	15.29	16.00	0.122	0.143	C.13
0mm Bottom	26	2480	15.35	16.00	0.119	0.139	-
Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g)							
*Measured results for Thread were scaled down from 100% duty cycle to 59.68%. Refer to Annex D							

Thread - SISO Core 1 (5 or 6 GHz WLAN ON) (ePA):  
 Body Specific Absorption Rate (SAR) 1g Results

Test Position	Channel Number	Frequency (MHz)	Measured Average Power (dBm)	Tune Up (dBm)	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)*	Scan Figure Number
0mm Rear of Display	11	2405	15.50	16.00	0.032	0.036	-
0mm Bottom	11	2405	15.50	16.00	0.101	0.114	-
0mm Bottom	18	2440	15.25	16.00	0.115	0.136	C.14
0mm Bottom	26	2480	15.07	16.00	0.086	0.106	-
Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g)							
*Measured results for Thread were scaled down from 100% duty cycle to 59.68%. Refer to Annex D							

WLAN - 2.4 GHz - 802.11g - 20 MHz - 1 Mbps - SISO (Core 0):  
 Body Specific Absorption Rate (SAR) 1g Results

Test Position	Channel Number	Frequency (MHz)	Measured Average Power (dBm)	Tune Up (dBm)	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Scan Figure Number
0mm Rear of Display	10	2457	18.81	19.50	0.221	0.259	-
0mm Bottom	2	2417	18.73	19.50	0.691	0.825	-
0mm Bottom	6	2437	18.80	19.50	0.731	0.859	C.15
0mm Bottom	10	2457	18.81	19.50	0.699	0.819	-
Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g)							



WLAN - 2.4 GHz - 802.11g - 20 MHz - 1 Mbps - SISO (Core 1):  
 Body Specific Absorption Rate (SAR) 1g Results

Test Position	Channel Number	Frequency (MHz)	Measured Average Power (dBm)	Tune Up (dBm)	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Scan Figure Number
0mm Rear of Display	10	2457	19.05	19.50	0.243	0.270	-
0mm Bottom	2	2417	19.10	19.50	0.669	0.734	-
0mm Bottom	6	2437	18.86	19.50	0.669	0.775	-
0mm Bottom	10	2457	19.05	19.50	0.720	0.799	C.16
Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g)							

WLAN - 2.4 GHz - 802.11g - HT20 - 2x2 MIMO Core 0 & Core 1:  
 Body Specific Absorption Rate (SAR) 1g Results

Test Position	Channel Number	Frequency (MHz)	Measured Average Power (dBm)	Tune Up (dBm)	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Scan Figure Number
0mm Rear of Display (Core 0)	3	2422	18.18	19.50	0.205	0.278	-
0mm Rear of Display (Core 1)	3	2422	19.06	19.50	0.205	0.227	
0mm Bottom (Core 0)	3	2422	18.18	19.50	0.639	0.866	-
0mm Bottom (Core 1)	3	2422	19.06	19.50	0.626	0.693	
0mm Bottom (Core 0)	6	2437	17.88	19.50	0.604	0.877	C.17
0mm Bottom (Core 1)	6	2437	19.02	19.50	0.626	0.699	
0mm Bottom (Core 0)	10	2457	18.16	19.50	0.615	0.837	-
0mm Bottom (Core 1)	10	2457	18.98	19.50	0.658	0.742	
Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g)							



WLAN - U-NII-1 - 802.11a - 20MHz - SISO Core 0  
 Body Specific Absorption Rate (SAR) 1g Results

Test Position	Channel Number	Frequency (MHz)	Measured Average Power (dBm)	Tune Up (dBm)	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Scan Figure Number
0mm Bottom	36	5180	16.31	16.50	0.447	0.467	-
0mm Bottom	40	5200	16.27	16.50	0.474	0.500	-
Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g)							

WLAN - U-NII-1 - 802.11n - HT40 - SISO Core 0  
 Body Specific Absorption Rate (SAR) 1g Results

Test Position	Channel Number	Frequency (MHz)	Measured Average Power (dBm)	Tune Up (dBm)	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Scan Figure Number
0mm Rear of Display	46	5230	16.38	16.50	0.178	0.183	-
0mm Bottom	46	5230	16.38	16.50	0.548	0.563	C.18
Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g)							

WLAN - U-NII-1 - 802.11a - 20MHz - SISO Core 1  
 Body Specific Absorption Rate (SAR) 1g Results

Test Position	Channel Number	Frequency (MHz)	Measured Average Power (dBm)	Tune Up (dBm)	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Scan Figure Number
0mm Bottom	36	5180	16.70	17.00	0.531	0.569	-
0mm Bottom	40	5200	16.80	17.00	0.549	0.575	-
Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g)							

WLAN - U-NII-1 - 802.11n - HT40 - SISO Core 1  
 Body Specific Absorption Rate (SAR) 1g Results

Test Position	Channel Number	Frequency (MHz)	Measured Average Power (dBm)	Tune Up (dBm)	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Scan Figure Number
0mm Rear of Display	46	5230	16.82	17.00	0.164	0.171	-
0mm Bottom	46	5230	16.82	17.00	0.565	0.589	C.19
Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g)							



WLAN - U-NII-1 - 802.11n - HT40 - 2x2 MIMO Core 0 & Core 1  
 Body Specific Absorption Rate (SAR) 1g Results

Test Position	Channel Number	Frequency (MHz)	Measured Average Power (dBm)	Tune Up (dBm)	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Scan Figure Number
0mm Rear of Display (Core 0)	46	5230	16.22	16.50	0.150	0.160	-
0mm Rear of Display (Core 1)	46	5230	16.73	17.00	0.148	0.157	
0mm Bottom (Core 0)	38	5190	15.24	16.00	0.372	0.443	-
0mm Bottom (Core 1)	38	5190	15.85	16.00	0.457	0.473	
0mm Bottom (Core 0)	46	5230	16.22	16.50	0.580	0.619	C.20
0mm Bottom (Core 1)	46	5230	16.73	17.00	0.570	0.607	
Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g)							



WLAN - U-NII-2A - 802.11n - HT40 - SISO Core 0  
 Body Specific Absorption Rate (SAR) 1g Results

Test Position	Channel Number	Frequency (MHz)	Measured Average Power (dBm)	Tune Up (dBm)	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Scan Figure Number
0mm Rear of Display	54	5270	15.92	16.25	0.164	0.177	-
0mm Bottom	54	5270	15.92	16.25	0.568	0.613	C.21
Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g)							

WLAN - U-NII-2A - 802.11n - HT40 - SISO Core 1  
 Body Specific Absorption Rate (SAR) 1g Results

Test Position	Channel Number	Frequency (MHz)	Measured Average Power (dBm)	Tune Up (dBm)	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Scan Figure Number
0mm Rear of Display	54	5250	16.48	17.00	0.125	0.141	-
0mm Bottom	54	5250	16.48	17.00	0.445	0.502	C.22
Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g)							

WLAN - U-NII-2A - 802.11n - HT40 - 2x2 MIMO Core 0 & Core 1  
 Body Specific Absorption Rate (SAR) 1g Results

Test Position	Channel Number	Frequency (MHz)	Measured Average Power (dBm)	Tune Up (dBm)	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Scan Figure Number
0mm Rear of Display (Core 0)	54	5270	16.15	16.25	0.155	0.159	-
0mm Rear of Display (Core 1)	54	5270	16.74	17.00	0.135	0.143	
0mm Bottom (Core 0)	54	5270	16.15	16.25	0.632	0.647	C.23
0mm Bottom (Core 1)	54	5270	16.74	17.00	0.549	0.583	
Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g)							



WLAN - U-NII-2A - 802.11a - SISO Core 0  
 Body Specific Absorption Rate (SAR) 1g Results

Test Position	Channel Number	Frequency (MHz)	Measured Average Power (dBm)	Tune Up (dBm)	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Scan Figure Number
0mm Rear of Display	60	5300	15.95	16.25	0.182	0.195	-
0mm Bottom	60	5300	15.95	16.25	0.677	0.725	-
0mm Bottom	64	5320	15.85	16.25	0.717	0.786	C.24
Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g)							

WLAN - U-NII-2A - 802.11a - SISO Core 1  
 Body Specific Absorption Rate (SAR) 1g Results

Test Position	Channel Number	Frequency (MHz)	Measured Average Power (dBm)	Tune Up (dBm)	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Scan Figure Number
0mm Rear of Display	60	5300	16.72	17.00	0.133	0.142	-
0mm Bottom	60	5300	16.72	17.00	0.499	0.532	-
0mm Bottom	64	5320	16.63	17.00	0.509	0.554	C.25
Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g)							

WLAN - U-NII-2A - 802.11n - HT20 - 2x2 MIMO Core 0 & Core 1  
 Body Specific Absorption Rate (SAR) 1g Results

Test Position	Channel Number	Frequency (MHz)	Measured Average Power (dBm)	Tune Up (dBm)	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Scan Figure Number
0mm Rear of Display	60	5300	15.10	15.75	0.523	0.607	-
0mm Rear of Display	60	5300	15.53	15.75	0.433	0.455	
0mm Bottom	64	5320	15.26	15.75	0.594	0.665	C.26
0mm Bottom	64	5320	15.70	15.75	0.469	0.474	
Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g)							





WLAN - U-NII-2C - 802.11ac - VHT80 - SISO Core 0  
 Body Specific Absorption Rate (SAR) 1g Results

Test Position	Channel Number	Frequency (MHz)	Measured Average Power (dBm)	Tune Up (dBm)	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Scan Figure Number
0mm Rear of Display	122	5610	14.64	15.00	0.204	0.222	-
0mm Bottom	106	5530	14.42	15.00	0.637	0.728	-
0mm Bottom	122	5610	14.64	15.00	0.686	0.745	C.27
0mm Bottom	138	5690	14.57	15.00	0.643	0.710	-
Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g)							

WLAN - U-NII-2C - 802.11ac - VHT80 - SISO Core 1  
 Body Specific Absorption Rate (SAR) 1g Results

Test Position	Channel Number	Frequency (MHz)	Measured Average Power (dBm)	Tune Up (dBm)	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Scan Figure Number
0mm Rear of Display	106	5530	14.69	15.00	0.133	0.143	-
0mm Bottom	106	5530	14.69	15.00	0.437	0.469	-
0mm Bottom	122	5610	14.65	15.00	0.512	0.555	-
0mm Bottom	138	5690	14.66	15.00	0.564	0.610	C.28
Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g)							



WLAN - U-NII-2C - 802.11n - HT40 - 2x2 MIMO Core 0 & Core 1  
 Body Specific Absorption Rate (SAR) 1g Results

Test Position	Channel Number	Frequency (MHz)	Measured Average Power (dBm)	Tune Up (dBm)	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Scan Figure Number
0mm Rear of Display	110	5550	14.40	15.00	0.167	0.192	-
0mm Rear of Display	110	5550	14.85	15.00	0.155	0.160	
0mm Bottom	102	5510	14.69	15.00	0.633	0.680	-
0mm Bottom	102	5510	14.78	15.00	0.526	0.553	
0mm Bottom	110	5550	14.40	15.00	0.626	0.719	-
0mm Bottom	110	5550	14.85	15.00	0.568	0.588	
0mm Bottom	118	5590	14.36	15.00	0.590	0.684	-
0mm Bottom	118	5590	14.54	15.00	0.590	0.656	
0mm Bottom	126	5630	14.63	15.00	0.658	0.717	-
0mm Bottom	126	5630	14.83	15.00	0.666	0.693	
0mm Bottom	134	5670	14.26	15.00	0.615	0.729	C.29
0mm Bottom	134	5670	14.66	15.00	0.605	0.654	
0mm Bottom	142	5710	14.26	15.00	0.569	0.675	-
0mm Bottom	142	5710	14.67	15.00	0.583	0.629	
Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g)							

WLAN - U-NII-3 - 802.11ac - VHT80 - SISO Core 0  
 Body Specific Absorption Rate (SAR) 1g Results

Test Position	Channel Number	Frequency (MHz)	Measured Average Power (dBm)	Tune Up (dBm)	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Scan Figure Number
0mm Rear of Display	155	5775	14.87	15.25	0.203	0.222	-
0mm Bottom	155	5775	14.87	15.25	0.695	0.759	C.30
Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g)							



WLAN - U-NII-3 - 802.11ac - VHT80 - SISO Core 1  
 Body Specific Absorption Rate (SAR) 1g Results

Test Position	Channel Number	Frequency (MHz)	Measured Average Power (dBm)	Tune Up (dBm)	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Scan Figure Number
0mm Rear of Display	155	5775	14.68	15.25	0.160	0.182	-
0mm Bottom	155	5775	14.68	15.25	0.588	0.670	C.31
Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g)							

WLAN - U-NII-3 - 802.11ac - VHT80 - 2x2 MIMO Core 0 & Core 1  
 Body Specific Absorption Rate (SAR) 1g Results

Test Position	Channel Number	Frequency (MHz)	Measured Average Power (dBm)	Tune Up (dBm)	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Scan Figure Number
0mm Rear of Display (Core 0)	155	5775	14.43	15.25	0.161	0.194	-
0mm Rear of Display (Core 1)	155	5775	15.07	15.25	0.160	0.167	-
0mm Bottom (Core 0)	155	5775	14.43	15.25	0.579	0.699	C.32
0mm Bottom (Core 1)	155	5775	15.07	15.25	0.583	0.608	
Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g)							

WLAN - 6 GHz 802.11ax - VHT160 - SISO Core 0  
 Body Absorbed Power Density (APD) 1g Results

Test Position	Channel Number	Frequency (MHz)	Measured Average Power (dBm)	Tune Up (dBm)	Measured APD 4cm <sup>2</sup> (W/m <sup>2</sup> )	Scaled APD 4cm <sup>2</sup> (W/m <sup>2</sup> )	Scan Figure Number
0mm Rear of Display	143	6665	12.90	13.00	1.020	1.044	-
0mm Bottom	15	6025	12.21	12.50	3.840	4.105	C.33
0mm Bottom	47	6185	12.22	12.50	3.660	3.904	-
0mm Bottom	79	6345	12.36	12.50	3.160	3.264	-
0mm Bottom	111	6505	11.59	11.75	2.400	2.490	-
0mm Bottom	143	6665	12.90	13.00	3.660	3.745	-
0mm Bottom	175	6825	11.51	11.75	3.040	3.213	-
0mm Bottom	207	6985	11.74	12.00	3.400	3.610	-
The APD values above do not have a regulatory limit. They are provided in line with FCC procedures to derive the maximum iPD test position.							



WLAN - 6 GHz 802.11ax - VHT160 - SISO Core 0  
 Body Specific Absorption Rate (SAR) 1g Results

Test Position	Channel Number	Frequency (MHz)	Measured Average Power (dBm)	Tune Up (dBm)	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Scan Figure Number
0mm Rear of Display	143	6665	12.90	13.00	0.139	0.142	-
0mm Bottom	15	6025	12.21	12.50	0.520	0.556	C.33
0mm Bottom	47	6185	12.22	12.50	0.495	0.528	-
0mm Bottom	79	6345	12.36	12.50	0.432	0.446	-
0mm Bottom	111	6505	11.59	11.75	0.335	0.348	-
0mm Bottom	143	6665	12.90	13.00	0.511	0.523	-
0mm Bottom	175	6825	11.51	11.75	0.433	0.458	-
0mm Bottom	207	6985	11.74	12.00	0.482	0.512	-
Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g)							

WLAN - 6 GHz 802.11ax - VHT160 - SISO Core 1  
 Body Absorbed Power Density (APD) 1g Results

Test Position	Channel Number	Frequency (MHz)	Measured Average Power (dBm)	Tune Up (dBm)	Measured APD 4cm <sup>2</sup> (W/m <sup>2</sup> )	Scaled APD 4cm <sup>2</sup> (W/m <sup>2</sup> )	Scan Figure Number
0mm Rear of Display	143	6665	13.35	13.50	1.580	1.636	-
0mm Bottom	15	6025	12.80	13.00	3.980	4.168	-
0mm Bottom	47	6185	12.78	13.00	3.700	3.892	-
0mm Bottom	79	6345	12.84	13.00	3.200	3.320	-
0mm Bottom	111	6505	11.64	11.75	2.800	2.872	-
0mm Bottom	143	6665	13.35	13.50	5.120	5.300	C.34
0mm Bottom	175	6825	11.60	11.75	3.261	3.376	-
0mm Bottom	207	6985	11.93	12.00	2.920	2.967	-
The APD values above do not have a regulatory limit. They are provided in line with FCC procedures to derive the maximum iPD test position.							



WLAN - 6 GHz 802.11ax - VHT160 - SISO Core 1  
 Body Specific Absorption Rate (SAR) 1g Results

Test Position	Channel Number	Frequency (MHz)	Measured Average Power (dBm)	Tune Up (dBm)	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Scan Figure Number
0mm Rear of Display	143	6665	13.35	13.50	0.213	0.220	-
0mm Bottom	15	6025	12.80	13.00	0.529	0.554	-
0mm Bottom	47	6185	12.78	13.00	0.498	0.524	-
0mm Bottom	79	6345	12.84	13.00	0.440	0.457	-
0mm Bottom	111	6505	11.64	11.75	0.388	0.398	-
0mm Bottom	143	6665	13.35	13.50	0.714	0.739	C.34
0mm Bottom	175	6825	11.60	11.75	0.450	0.466	-
0mm Bottom	207	6985	11.93	12.00	0.417	0.424	-
Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g)							



WLAN - 6 GHz - 802.11ax - VHT80 - MIMO Core 0 & Core 1  
 Body Absorbed Power Density (APD) 1g Results

Test Position	Channel Number	Frequency (MHz)	Measured Average Power (dBm)	Tune Up (dBm)	Measured APD 4cm <sup>2</sup> (W/m <sup>2</sup> )	Scaled APD 4cm <sup>2</sup> (W/m <sup>2</sup> )	Scan Figure Number
0mm Rear of Display (Core 0)	143	6665	12.80	13.00	1.440	1.508	-
0mm Rear of Display (Core 1)	143	6665	12.91	13.50	1.176	1.347	
0mm Bottom (Core 0)	15	6025	12.34	12.50	4.020	4.171	-
0mm Bottom (Core 1)	15	6025	12.87	13.00	4.140	4.266	
0mm Bottom (Core 0)	47	6185	12.25	12.50	4.100	4.343	-
0mm Bottom (Core 1)	47	6185	12.77	13.00	3.880	4.091	
0mm Bottom (Core 0)	79	6345	12.40	12.50	3.180	3.254	-
0mm Bottom (Core 1)	79	6345	12.51	13.00	3.020	3.381	
0mm Bottom (Core 0)	111	6505	8.70	9.00	1.585	1.698	-
0mm Bottom (Core 1)	111	6505	8.66	9.00	1.100	1.190	
0mm Bottom (Core 0)	143	6665	12.80	13.00	4.700	4.922	C.35
0mm Bottom (Core 1)	143	6665	12.91	13.50	3.400	3.895	
0mm Bottom (Core 0)	175	6825	7.57	9.00	1.540	2.141	-
0mm Bottom (Core 1)	175	6825	8.76	9.00	1.340	1.416	
0mm Bottom (Core 0)	207	6985	7.92	9.00	1.500	1.923	-
0mm Bottom (Core 1)	207	6985	8.87	9.00	1.616	1.665	

The APD values above do not have a regulatory limit. They are provided in line with FCC procedures to derive the maximum iPD test position.



WLAN - 6 GHz - 802.11ax - VHT80 - MIMO Core 0 & Core 1  
 Body Specific Absorption Rate (SAR) 1g Results

Test Position	Channel Number	Frequency (MHz)	Measured Average Power (dBm)	Tune Up (dBm)	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Scan Figure Number
0mm Rear of Display (Core 0)	143	6665	12.80	13.00	0.195	0.204	-
0mm Rear of Display (Core 1)	143	6665	12.91	13.50	0.159	0.182	
0mm Bottom (Core 0)	15	6025	12.34	12.50	0.541	0.561	-
0mm Bottom (Core 1)	15	6025	12.87	13.00	0.553	0.570	
0mm Bottom (Core 0)	47	6185	12.25	12.50	0.555	0.588	-
0mm Bottom (Core 1)	47	6185	12.77	13.00	0.525	0.554	
0mm Bottom (Core 0)	79	6345	12.40	12.50	0.436	0.446	-
0mm Bottom (Core 1)	79	6345	12.51	13.00	0.413	0.462	
0mm Bottom (Core 0)	111	6505	8.70	9.00	0.224	0.240	-
0mm Bottom (Core 1)	111	6505	8.66	9.00	0.159	0.172	
0mm Bottom (Core 0)	143	6665	12.80	13.00	0.655	0.686	C.35
0mm Bottom (Core 1)	143	6665	12.91	13.50	0.479	0.549	
0mm Bottom (Core 0)	175	6825	7.57	9.00	0.219	0.304	-
0mm Bottom (Core 1)	175	6825	8.76	9.00	0.197	0.208	
0mm Bottom (Core 0)	207	6985	7.92	9.00	0.216	0.277	-
0mm Bottom (Core 1)	207	6985	8.87	9.00	0.233	0.240	
Limit for General Population (Uncontrolled Exposure) 1.6 W/kg (1g)							



6 GHz - 802.11ax - HE160 - MCS0 - Core 1  
Incident Power Density (iPD) 4cm<sup>2</sup> Results

Test Position	Channel Number	Frequency (MHz)	Measured iPD 4cm <sup>2</sup> (W/m <sup>2</sup> )	Standalone iPD limit (W/m <sup>2</sup> )	Exposure Ratio	Scan Figure Number
0mm Bottom	143	6665	6.240 (FS)	10.00	0.624	C.36





### **1.3.2 Technical Description**

The equipment under test (EUT) was a portable laptop computer.

### **1.3.3 Interim Procedures for FCC Radiofrequency Exposure Evaluations**

The interim procedure for FCC radiofrequency (RF) exposure evaluations of U-NII 6–7 GHz band portable devices have been made available during the TCB workshop in October 2020. The procedure is summarized below:

- Evaluate SAR / APD with DASY Module SAR V16.0 or higher. The configurations to be tested are defined in the relevant Knowledge Database (KDB). The peak spatial averaged SAR (psSAR) and the peak spatial averaged absorbed Power Density (psAPD) are reported.
- For the configuration with the highest SAR / APD, evaluate the PD with DASY Module mmWave V3.0 or higher.



#### 1.3.4 Test Configuration and Modes of Operation

The testing was performed with an integral battery supplied and manufactured by Apple Inc.

Supported technologies are Bluetooth (EDR/BDR/LE/HDR), 2.4 GHz Thread, 5 GHz Narrowband, 2.4 GHz WLAN (802.11a/n/ac/g/ax), 5 GHz WLAN (802.11a/n/ac) and 6 GHz WLAN (802.11a/ax).

2x2 MIMO is supported for WLAN.

Where the device supports Low Power (LP) and Standard Power (SP) in a relevant frequency band of operation, the Standard Power option was always selected. This resulted in the highest output power always being selected where a choice is available.

For each scan, the device was configured into a continuous transmission test mode at a maximum power defined by the customer.

Testing was performed in each position at the frequency that gave the highest output power for each band. Some SAR levels were found to be higher than the thresholds set in KDB 447498 D01 therefore additional testing was required at the relevant frequencies / channels of the bands.

Conducted power measurements were performed on a modified device (accessible conducted port) and the measured SAR results were power scaled to the maximum declared tune-up level.

For each antenna, the bottom surface, and the rear of the EUT display were assessed for SAR.

For the 5 and 6 GHz frequency bands the transmission mode used for testing was determined by the 802.11 configuration with the highest declared output power in each frequency band. Where multiple 802.11 configurations have the same specified output power, testing was performed using the mode with the largest channel bandwidth with the lowest order modulation and lowest data rate.

For SAR assessment, the relevant surfaces of the device were placed against an Elliptical phantom with a 0mm separation distance.

The Elliptical Flat Phantom dimensions are 600mm major axis and 400mm minor axis with a shell thickness of 2mm. The phantom was filled to a minimum depth of 150mm with the appropriate liquid. The dielectric properties were in accordance with the requirements specified in KDB 865665.

Included in this report are descriptions of the test method; the equipment used and an analysis of the test uncertainties applicable and diagrams indicating the locations of maximum SAR, APD and iPD for each relevant test position.

### 1.3.5 Antenna Location Diagram

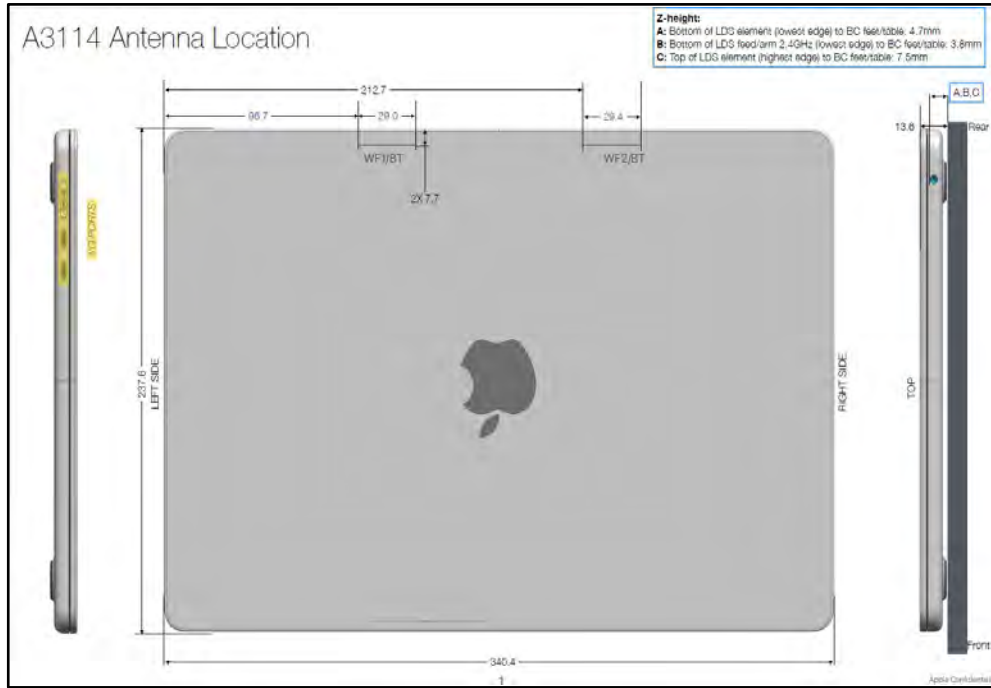


Figure 1

### 1.3.6 Deviations from Standard

Initially, area scans were completed covering the whole of the bottom surface of the EUT to determine that there were no other RF radiators (unintentional) other than the antennas. The actual SAR measurements were completed using smaller area scans covering the antenna locations only.

#### 2.4 GHz

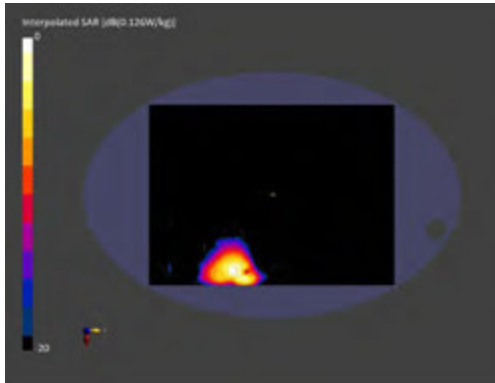


Figure 2 - (Core 0)

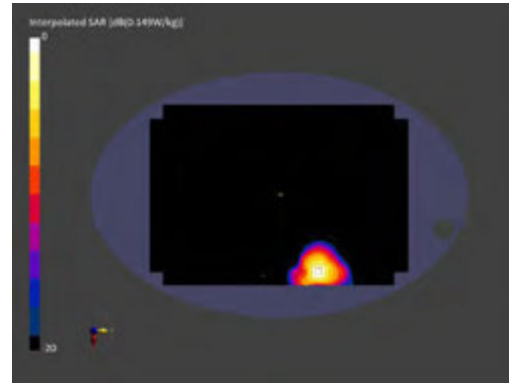


Figure 3 - (Core 1)

#### 5 GHz

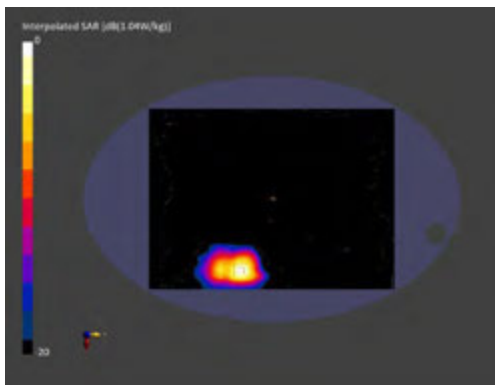


Figure 4 - (Core 0)

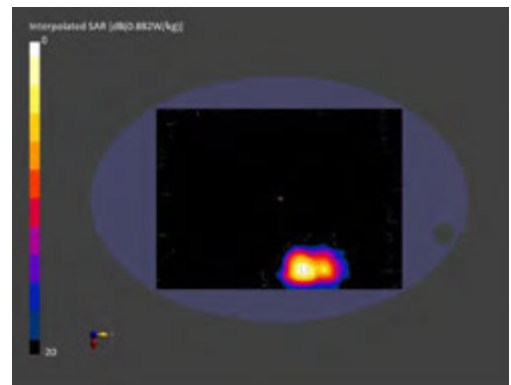
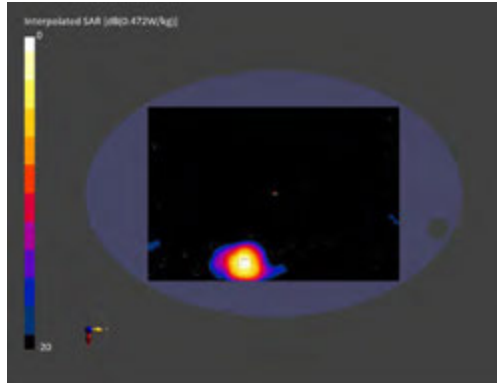
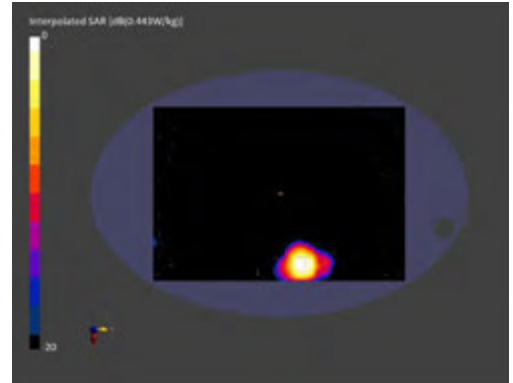


Figure 5 - (Core 1)

**6 GHz**



**Figure 6 - (Core 0)**



**Figure 7 - (Core 1)**



#### 1.4 POWER TABLES (TUNE UP VALUES)

Note: All values in dBm  
 NS= Not Supported

##### 2.4 GHz Bluetooth 5 GHz OFF

BT Core	PA	Channel	BDR	EDR	LE	HDR4	HDR8
0	iPA	All	13.00	9.50	4.00	6.50	6.50
0	ePA		13.00	16.50	14.50	14.50	13.00
1	iPA		13.00	9.50	4.50	6.50	6.50
1	ePA		13.00	16.50	14.50	14.50	13.00

##### 2.4 GHz Bluetooth 5 GHz OFF - TXBF

BT Core	PA	Channel	BDR TXBF	EDR TXBF	LE TXBF	HDR4 TXBF	HDR8 TXBF
0	iPA	All	13.00	9.50	4.00	6.50	6.50
0	ePA		13.00	13.50	14.00	14.50	13.00
1	iPA		13.00	9.50	4.50	6.50	6.50
1	ePA		13.00	13.50	13.50	14.50	13.00

##### 2.4 GHz Bluetooth 5 GHz ON

BT Core	PA	Channel	BDR	EDR	LE	HDR4	HDR8
0	iPA	All	13.00	9.50	4.00	6.50	6.50
0	ePA		13.00	16.00	14.50	14.50	13.00
1	iPA		13.00	9.50	4.50	6.50	6.50
1	ePA		13.00	16.00	14.50	14.50	13.00

##### 2.4 GHz Bluetooth 5 GHz ON - TXBF

BT Core	PA	Channel	BDR TXBF	EDR TXBF	LE TXBF	HDR4 TXBF	HDR8 TXBF
0	iPA	All	13.00	9.50	4.00	6.50	6.50
0	ePA		13.00	13.50	14.00	14.50	13.00
1	iPA		13.00	9.50	4.50	6.50	6.50
1	ePA		13.00	13.50	13.50	14.50	13.00



**Narrowband UNII-1 - When 2.4 GHz WLAN OFF**

NB Core	PA	Channel	BDR	HDR4	HDR8	BDR TXBF	HDR4 TXBF	HDR8 TXBF
0	iPA	All	9.00	3.50	3.50	2.50	3.50	3.50
0	ePA		NS	11.00	13.00	NS	4.50	6.50
1	iPA		8.50	3.50	3.50	2.50	3.50	3.50
1	ePA		NS	10.50	12.50	NS	4.50	6.50

**Narrowband UNII-1 - When 2.4 GHz WLAN ON**

NB Core	PA	Channel	BDR	HDR4	HDR8	BDR TXBF	HDR4 TXBF	HDR8 TXBF
0	iPA	All	9.00	3.50	3.50	2.50	3.50	3.50
0	ePA		NS	11.00	13.00	NS	4.50	6.50
1	iPA		8.50	3.50	3.50	2.50	3.50	3.50
1	ePA		NS	10.50	12.50	NS	4.50	6.50

**Narrowband UNII-3 - When 2.4 GHz WLAN OFF**

NB Core	PA	Channel	BDR	HDR4	HDR8	BDR TXBF	HDR4 TXBF	HDR8 TXBF
0	iPA	All	10.00	3.50	3.50	10.00	3.50	3.50
0	ePA		NS	14.00	14.00	NS	14.00	14.00
1	iPA		10.00	3.50	3.50	10.00	3.50	3.50
1	ePA		NS	14.00	14.00	NS	14.00	14.00

**Narrowband UNII-3 - When 2.4 GHz WLAN ON**

NB Core	PA	Channel	BDR	HDR4	HDR8	BDR TXBF	HDR4 TXBF	HDR8 TXBF
0	iPA	All	10.00	3.50	3.50	10.00	3.50	3.50
0	ePA		NS	12.00	12.00	NS	12.00	12.00
1	iPA		10.00	3.50	3.50	10.00	3.50	3.50
1	ePA		NS	12.00	12.00	NS	12.00	12.00

**2.4 GHz Thread - When 5 GHz OFF**

Core	PA	Channel	Thread (dBm)
0	iPA	All	13.00
0	ePA		17.50
1	iPA		13.00
1	ePA		17.50



**2.4 GHz Thread - When 5 GHz ON**

Core	PA	Channel	Thread (dBm)
0	iPA	All	13.00
0	ePA		16.00
1	iPA		13.00
1	ePA		16.00

**2.4 GHz WLAN SISO Core 0 & Core 1**

Channel	Frequency (MHz)	b (SISO)	g (SISO) Low Rate	11n/11ac HT20 (SISO) Low Rate	11ax HE20 (SISO) Low Rate	11ax HE20 RU106 (SISO)	11ax HE20 RU52 (SISO)	11ax HE20 RU26 (SISO)
1	2412	19.00	16.50	15.50	14.00	17.50	17.50	14.50
2	2417	19.00	19.50	19.50	18.50	19.50	17.50	14.50
3	2422	19.00	19.50	19.50	19.50	19.50	17.50	14.50
4	2427	19.00	19.50	19.50	19.50	19.50	17.50	14.50
5	2432	19.00	19.50	19.50	19.50	19.50	17.50	14.50
6	2437	19.00	19.50	19.50	19.50	19.50	17.50	14.50
7	2442	19.00	19.50	19.50	19.50	19.50	17.50	14.50
8	2447	19.00	19.50	19.50	19.50	19.50	17.50	14.50
9	2452	19.00	19.50	19.50	19.50	19.50	17.50	14.50
10	2457	19.00	19.50	19.50	19.50	19.50	17.50	14.50
11	2462	19.00	17.50	17.50	16.00	17.25	17.00	14.50
12	2467	18.50	15.50	15.50	14.00	14.25	15.00	14.00
13	2472	15.75	6.00	6.00	4.50	-1.00	-2.00	-4.00





**2.4 GHz WLAN MIMO Core 0 & Core 1**

Channel	Frequency (MHz)	b (2Tx, DSSS)	11n/11ac HT20 (2Tx, nonTxBF) Low Rate	11ax HE20 (2Tx, nonTxBF) Low Rate	11ax HE20 RU106 (2Tx, nonTxBF)	11ax HE20 RU52 (2Tx, nonTxBF)	11ax HE20 RU26 (2Tx, nonTxBF)	11n/11ac HT20 (2Tx, TxBF) Low Rate
1	2412	NS	14.25	12.75	17.00	17.50	14.50	NS
2	2417	NS	19.00	17.25	18.75	17.50	14.50	NS
3	2422	NS	19.50	19.00	19.50	17.50	14.50	NS
4	2427	NS	19.50	19.50	19.50	17.50	14.50	NS
5	2432	NS	19.50	19.50	19.50	17.50	14.50	NS
6	2437	NS	19.50	19.50	19.50	17.50	14.50	NS
7	2442	NS	19.50	19.50	19.50	17.50	14.50	NS
8	2447	NS	19.50	19.50	19.50	17.50	14.50	NS
9	2452	NS	19.50	19.50	19.50	17.50	14.50	NS
10	2457	NS	19.50	18.50	19.50	17.50	14.50	NS
11	2462	NS	16.00	14.50	17.25	17.00	14.50	NS
12	2467	NS	13.50	12.00	14.25	15.00	14.00	NS
13	2472	NS	3.50	2.00	-3.00	-3.50	-6.00	NS



**5 GHz WLAN - 20 MHz BW - SISO Core 0**

Channel	Frequency (MHz)	a (SISO) Low Rate	11n/11ac HT20 (SISO) Low Rate	11ax/11be HE20 (SISO) Low Rate	11ax/11be HE20 RU106 (SISO)	11ax/11be HE20 RU52 (SISO)	11ax/11be HE20 RU26 (SISO)
36	5180	16.50	16.50	16.50	15.00	13.00	10.00
40	5200	16.50	16.50	16.50	16.00	13.00	10.00
44	5220	16.50	16.50	16.50	16.00	13.00	10.00
48	5240	16.50	16.50	16.50	16.00	13.00	10.00
52	5260	16.25	16.25	16.25	16.25	13.50	NS
56	5280	16.25	16.25	16.25	16.25	13.50	NS
60	5300	16.25	16.25	16.25	16.25	13.50	NS
64	5320	16.25	16.25	16.25	13.00	10.00	NS
100	5500	15.00	15.00	15.00	15.00	14.00	NS
104	5520	15.00	15.00	15.00	15.00	14.00	NS
108	5540	15.00	15.00	15.00	15.00	14.00	NS
112	5560	15.00	15.00	15.00	15.00	14.00	NS
116	5580	15.00	15.00	15.00	15.00	14.00	NS
120	5600	15.00	15.00	15.00	15.00	14.00	NS
124	5620	15.00	15.00	15.00	15.00	14.00	NS
128	5640	15.00	15.00	15.00	15.00	14.00	NS
132	5660	15.00	15.00	15.00	15.00	14.00	NS
136	5680	15.00	15.00	15.00	15.00	14.00	NS
140	5700	15.00	15.00	14.25	15.00	13.50	NS
144	5720	15.00	15.00	15.00	15.00	14.00	NS
149	5745	15.25	15.25	15.25	15.25	15.25	13.50
153	5765	15.25	15.25	15.25	15.25	15.25	13.50
157	5785	15.25	15.25	15.25	15.25	15.25	13.50
161	5805	15.25	15.25	15.25	15.25	15.25	13.50
165	5825	15.25	15.25	15.25	15.25	15.25	13.50



**5 GHz WLAN - 20 MHz BW - SISO Core 1**

Channel	Frequency (MHz)	a (SISO) Low Rate	11n/11ac HT20 (SISO) Low Rate	11ax/11be HE20 (SISO) Low Rate	11ax/11be HE20 RU106 (SISO)	11ax/11be HE20 RU52 (SISO)	11ax/11be HE20 RU26 (SISO)
36	5180	17.00	17.00	17.00	15.00	13.00	10.00
40	5200	17.00	17.00	17.00	16.00	13.00	10.00
44	5220	17.00	17.00	17.00	16.00	13.00	10.00
48	5240	17.00	17.00	17.00	16.00	13.00	10.00
52	5260	17.00	17.00	17.00	16.50	13.50	NS
56	5280	17.00	17.00	17.00	16.50	13.50	NS
60	5300	17.00	17.00	17.00	16.50	13.50	NS
64	5320	17.00	17.00	17.00	13.00	10.00	NS
100	5500	15.00	15.00	15.00	15.00	14.00	NS
104	5520	15.00	15.00	15.00	15.00	14.00	NS
108	5540	15.00	15.00	15.00	15.00	14.00	NS
112	5560	15.00	15.00	15.00	15.00	14.00	NS
116	5580	15.00	15.00	15.00	15.00	14.00	NS
120	5600	15.00	15.00	15.00	15.00	14.00	NS
124	5620	15.00	15.00	15.00	15.00	14.00	NS
128	5640	15.00	15.00	15.00	15.00	14.00	NS
132	5660	15.00	15.00	15.00	15.00	14.00	NS
136	5680	15.00	15.00	15.00	15.00	14.00	NS
140	5700	15.00	15.00	14.25	15.00	13.50	NS
144	5720	15.00	15.00	15.00	15.00	14.00	NS
149	5745	15.25	15.25	15.25	15.25	15.25	13.50
153	5765	15.25	15.25	15.25	15.25	15.25	13.50
157	5785	15.25	15.25	15.25	15.25	15.25	13.50
161	5805	15.25	15.25	15.25	15.25	15.25	13.50
165	5825	15.25	15.25	15.25	15.25	15.25	13.50



**5 GHz WLAN - 20 MHz BW - MIMO Core 0 & Core 1 - CDD**

Channel	Frequency (MHz)	11n/11ac HT20 (2Tx, CDD, nonTxBF) Low Rate	11ax/11be HE20 (2Tx, CDD, nonTxBF) Low Rate	11ax/11be HE20 RU106 (2Tx, CDD, nonTxBF)	11ax/11be HE20 RU52 (2Tx, CDD, nonTxBF)	11ax/11be HE20 RU26 (2Tx, CDD, nonTxBF)
36	5180	12.25	12.25	10.25	7.25	4.25
40	5200	12.25	12.25	10.25	7.25	4.25
44	5220	12.25	12.25	10.25	7.25	4.25
48	5240	12.25	12.25	10.25	7.25	4.25
52	5260	12.75	12.75	10.75	7.75	NS
56	5280	12.75	12.75	10.75	7.75	NS
60	5300	12.75	12.75	10.75	7.75	NS
64	5320	12.75	12.75	10.75	7.75	NS
100	5500	13.75	13.75	11.75	8.75	NS
104	5520	13.75	13.75	11.75	8.75	NS
108	5540	13.75	13.75	11.75	8.75	NS
112	5560	13.75	13.75	11.75	8.75	NS
116	5580	13.75	13.75	11.75	8.75	NS
120	5600	13.75	13.75	11.75	8.75	NS
124	5620	13.75	13.75	11.75	8.75	NS
128	5640	13.75	13.75	11.75	8.75	NS
132	5660	13.75	13.75	11.75	8.75	NS
136	5680	13.75	13.75	11.75	8.75	NS
140	5700	13.75	13.75	11.75	8.75	NS
144	5720	13.75	13.75	11.75	8.75	NS
149	5745	15.25	15.25	15.25	15.25	13.50
153	5765	15.25	15.25	15.25	15.25	13.50
157	5785	15.25	15.25	15.25	15.25	13.50
161	5805	15.25	15.25	15.25	15.25	13.50
165	5825	15.25	15.25	15.25	15.25	13.50



**5 GHz WLAN - 20 MHz BW - MIMO Core 0 & Core 1 - SDM**

Channel	Frequency (MHz)	11n/11ac HT20 (2Tx, SDM, nonTxBF) Low Rate	11ax/11be HE20 (2Tx, SDM, nonTxBF) Low Rate	11ax/11be HE20 RU106 (2Tx, SDM, nonTxBF)	11ax/11be HE20 RU52 (2Tx, SDM, nonTxBF)	11ax/11be HE20 RU26 (2Tx, SDM, nonTxBF)	11n/11ac VHT20 (2Tx, TxBF) Low Rate
36	5180	15.25	15.25	13.25	10.25	7.25	12.25
40	5200	15.25	15.25	13.25	10.25	7.25	12.25
44	5220	15.25	15.25	13.25	10.25	7.25	12.25
48	5240	15.25	15.25	13.25	10.25	7.25	12.25
52	5260	15.75	15.75	13.75	10.75	NS	12.75
56	5280	15.75	15.75	13.75	10.75	NS	12.75
60	5300	15.75	15.75	13.75	10.75	NS	12.75
64	5320	15.75	15.75	12.50	10.75	NS	12.75
100	5500	15.00	15.00	13.00	11.50	NS	13.75
104	5520	15.00	15.00	14.50	11.50	NS	13.75
108	5540	15.00	15.00	14.50	11.50	NS	13.75
112	5560	15.00	15.00	14.50	11.50	NS	13.75
116	5580	15.00	15.00	14.50	11.50	NS	13.75
120	5600	15.00	15.00	14.50	11.50	NS	13.75
124	5620	15.00	15.00	14.50	11.50	NS	13.75
128	5640	15.00	15.00	14.50	11.50	NS	13.75
132	5660	15.00	15.00	14.50	11.50	NS	13.75
136	5680	15.00	15.00	14.50	11.50	NS	13.75
140	5700	15.00	15.00	14.50	11.50	NS	13.75
144	5720	15.00	15.00	14.50	11.50	NS	13.75
15.25	15.25	15.25	15.25	15.25	15.25	13.50	15.25
15.25	15.25	15.25	15.25	15.25	15.25	13.50	15.25
15.25	15.25	15.25	15.25	15.25	15.25	13.50	15.25
15.25	15.25	15.25	15.25	15.25	15.25	13.50	15.25
15.25	15.25	15.25	15.25	15.25	15.25	13.50	15.25



**5 GHz WLAN - 40 MHz BW - SISO Core 0**

Channel	Frequency (MHz)	11n/11ac HT40 (SISO) Low Rate	11ax/11be HE40 (SISO) Low Rate	11ax/11be HE40 RU106 (SISO)	11ax/11be HE40 RU52 (SISO)	11ax/11be HE40 RU26 (SISO)
38	5190	15.75	14.50	15.50	12.50	10.00
46	5230	16.50	16.50	16.00	13.00	10.00
54	5270	16.25	16.25	16.25	13.50	NS
62	5310	15.00	14.50	14.00	9.00	NS
102	5510	15.00	15.00	15.00	13.25	NS
110	5550	15.00	15.00	15.00	13.50	NS
118	5590	15.00	15.00	15.00	13.50	NS
126	5630	15.00	15.00	15.00	13.50	NS
134	5670	15.00	15.00	15.00	13.50	NS
142	5710	15.00	15.00	15.00	13.50	NS
151	5755	15.25	15.25	15.25	13.50	10.50
159	5795	15.25	15.25	15.25	13.50	10.50

**5 GHz WLAN - 40 MHz BW - SISO Core 1**

Channel	Frequency (MHz)	11n/11ac HT40 (SISO) Low Rate	11ax/11be HE40 (SISO) Low Rate	11ax/11be HE40 RU106 (SISO)	11ax/11be HE40 RU52 (SISO)	11ax/11be HE40 RU26 (SISO)
38	5190	15.75	14.50	15.50	12.50	10.00
46	5230	17.00	17.00	16.00	13.00	10.00
54	5270	17.00	17.00	16.50	13.50	NS
62	5310	15.00	14.50	14.00	9.00	NS
102	5510	15.00	15.00	15.00	13.25	NS
110	5550	15.00	15.00	15.00	13.50	NS
118	5590	15.00	15.00	15.00	13.50	NS
126	5630	15.00	15.00	15.00	13.50	NS
134	5670	15.00	15.00	15.00	13.50	NS
142	5710	15.00	15.00	15.00	13.50	NS
151	5755	15.25	15.25	15.25	13.50	10.50
159	5795	15.25	15.25	15.25	13.50	10.50



**5 GHz WLAN - 40 MHz BW - MIMO Core 0 & Core 1 - CDD**

Channel	Frequency (MHz)	11n/11ac HT40 (2Tx, CDD, nonTxBF) Low Rate	11ax/11be HE40 (2Tx, CDD, nonTxBF) Low Rate	11ax/11be HE40 RU106 (2Tx, CDD, nonTxBF)	11ax/11be HE40 RU52 (2Tx, CDD, nonTxBF)	11ax/11be HE40 RU26 (2Tx, CDD, nonTxBF)
38	5190	14.75	14.00	10.25	7.25	4.25
46	5230	14.75	14.75	10.25	7.25	4.25
54	5270	15.25	15.25	10.75	7.75	NS
62	5310	15.25	13.50	10.75	7.75	NS
102	5510	15.00	14.75	11.75	8.75	NS
110	5550	15.00	15.00	11.75	8.75	NS
118	5590	15.00	15.00	11.75	8.75	NS
126	5630	15.00	15.00	11.75	8.75	NS
134	5670	15.00	15.00	11.75	8.75	NS
142	5710	15.00	15.00	11.75	8.75	NS
151	5755	15.25	15.25	15.25	13.50	10.50
159	5795	15.25	15.25	15.25	13.50	10.50

**5 GHz WLAN - 40 MHz BW - MIMO Core 0 - SDM**

Channel	Frequency (MHz)	11n/11ac HT40 (2Tx, SDM, nonTxBF) Low Rate	11ax/11be HE40 (2Tx, SDM, nonTxBF) Low Rate	11ax/11be HE40 RU106 (2Tx, SDM, nonTxBF)	11ax/11be HE40 RU52 (2Tx, SDM, nonTxBF)	11ax/11be HE40 RU26 (2Tx, SDM, nonTxBF)	11n/11ac VHT40 (2Tx, TxBF) Low Rate
38	5190	16.00	14.00	13.25	10.25	7.25	14.75
46	5230	16.50	16.50	13.25	10.25	7.25	14.75
54	5270	16.25	16.25	13.75	10.75	NS	15.25
62	5310	15.00	13.75	12.00	8.00	NS	12.75
102	5510	15.00	14.75	14.00	11.50	NS	13.75
110	5550	15.00	15.00	14.50	11.50	NS	15.00
118	5590	15.00	15.00	14.50	11.50	NS	15.00
126	5630	15.00	15.00	14.50	11.50	NS	15.00
134	5670	15.00	15.00	14.50	11.50	NS	15.00
142	5710	15.00	15.00	14.50	11.50	NS	15.00
151	5755	15.25	15.25	15.25	13.50	10.50	15.25
159	5795	15.25	15.25	15.25	13.50	10.50	15.25



**5 GHz WLAN - 40 MHz BW - MIMO Core 1 - SDM**

Channel	Frequency (MHz)	11n/11ac HT40 (2Tx, SDM, nonTxBF) Low Rate	11ax/11be HE40 (2Tx, SDM, nonTxBF) Low Rate	11ax/11be HE40 RU106 (2Tx, SDM, nonTxBF)	11ax/11be HE40 RU52 (2Tx, SDM, nonTxBF)	11ax/11be HE40 RU26 (2Tx, SDM, nonTxBF)	11n/11ac VHT40 (2Tx, TxBF) Low Rate
38	5190	16.00	14.00	13.25	10.25	7.25	14.75
46	5230	17.00	17.00	13.25	10.25	7.25	14.75
54	5270	17.00	17.00	13.75	10.75	NS	15.25
62	5310	15.00	13.75	12.00	8.00	NS	12.75
102	5510	15.00	14.75	14.00	11.50	NS	13.75
110	5550	15.00	15.00	14.50	11.50	NS	15.00
118	5590	15.00	15.00	14.50	11.50	NS	15.00
126	5630	15.00	15.00	14.50	11.50	NS	15.00
134	5670	15.00	15.00	14.50	11.50	NS	15.00
142	5710	15.00	15.00	14.50	11.50	NS	15.00
151	5755	15.25	15.25	15.25	13.50	10.50	15.25
159	5795	15.25	15.25	15.25	13.50	10.50	15.25

**5 GHz WLAN - 80 MHz BW - SISO Core 0 & Core 1**

Channel	Frequency (MHz)	11ac VHT80 (SISO) Low Rate	11ax/11be HE80 (SISO) Low Rate	11ax/11be HE80 RU106 (SISO)	11ax/11be HE80 RU52 (SISO)	11ax/11be HE80 RU26 (SISO)
42	5210	13.50	13.75	10.00	9.00	7.00
58	5290	13.25	13.00	10.00	7.00	NS
106	5530	15.00	15.00	12.00	10.50	NS
122	5610	15.00	15.00	13.50	10.50	NS
138	5690	15.00	15.00	13.50	10.50	NS
155	5775	15.25	15.25	13.50	10.50	7.50

**5 GHz WLAN - 80 MHz BW - MIMO Core 0 & Core 1 - CDD**

Channel	Frequency (MHz)	11ac VHT80 (2Tx, CDD, nonTxBF) Low Rate	11ax/11be HE80 (2Tx, CDD, nonTxBF) Low Rate	11ax/11be HE80 RU106 (2Tx, CDD, nonTxBF)	11ax/11be HE80 RU52 (2Tx, CDD, nonTxBF)	11ax/11be HE80 RU26 (2Tx, CDD, nonTxBF)
42	5210	13.50	12.50	10.25	7.25	4.25
58	5290	12.25	11.75	8.50	5.50	NS
106	5530	14.00	14.00	9.00	7.00	NS
122	5610	15.00	15.00	11.75	8.75	NS
138	5690	15.00	15.00	11.75	8.75	NS
155	5775	15.25	15.25	13.50	10.50	7.50





**5 GHz WLAN - 80 MHz BW - MIMO Core 0 & Core 1 - SDM**

Channel	Frequency (MHz)	11ac VHT80 (2Tx, SDM, nonTxBF) Low Rate	11ax/11be HE80 (2Tx, SDM, nonTxBF) Low Rate	11ax/11be HE80 RU106 (2Tx, SDM, nonTxBF)	11ax/11be HE80 RU52 (2Tx, SDM, nonTxBF)	11ax/11be HE80 RU26 (2Tx, SDM, nonTxBF)	11ac VHT80 (2Tx, TxBF) Low Rate
42	5210	13.50	12.50	11.00	8.00	7.00	12.00
58	5290	12.75	11.75	8.50	5.50	NS	11.25
106	5530	14.50	14.50	9.00	7.00	NS	13.00
122	5610	15.00	15.00	13.50	10.50	NS	15.00
138	5690	15.00	15.00	13.50	10.50	NS	15.00
155	5775	15.25	15.25	13.50	10.50	7.50	15.25

**5 GHz WLAN - 160 MHz BW - SISO Core 0 & Core1**

Channel	Frequency (MHz)	11ac VHT160 (SISO) Low Rate	11ax/11be HE160 (SISO) Low Rate	11ax/11be HE160 RU106 (SISO)	11ax/11be HE160 RU52 (SISO)	11ax/11be HE160 RU26 (SISO)
50	5250	14.00	13.50	10.50	7.50	NS
114	5570	13.50	13.50	10.50	7.50	NS

**5 GHz WLAN - 160 MHz BW - MIMO Core 0 & Core 1 - CDD**

Channel	Frequency (MHz)	11ac VHT160 (2Tx, CDD, nonTxBF) Low Rate	11ax/11be HE160 (2Tx, CDD, nonTxBF) Low Rate	11ax/11be HE160 RU106 (2Tx, CDD, nonTxBF)	11ax/11be HE160 RU52 (2Tx, CDD, nonTxBF)	11ax/11be HE160 RU26 (2Tx, CDD, nonTxBF)
50	5250	13.00	12.50	10.25	7.25	NS
114	5570	12.50	13.00	10.50	7.50	NS

**5 GHz WLAN - 160 MHz BW - MIMO Core 0 & Core 1 - SDM**

Channel	Frequency (MHz)	11ac VHT160 (2Tx, SDM, nonTxBF) Low Rate	11ax/11be HE160 (2Tx, SDM, nonTxBF) Low Rate	11ax/11be HE160 RU106 (2Tx, SDM, nonTxBF)	11ax/11be HE160 RU52 (2Tx, SDM, nonTxBF)	11ax/11be HE160 RU26 (2Tx, SDM, nonTxBF)	11ac VHT160 (2Tx, TxBF) Low Rate
50	5250	13.00	13.25	10.50	7.50	NS	NS
114	5570	12.00	12.50	10.50	7.50	NS	NS



**6 GHz WLAN - 20 MHz - SISO Core 0 & Core 1 - LP**

Channel	Frequency (MHz)	a (SISO) Low Rate	11ax HE20 (SISO) Low Rate	11ax HE20 RU106 (SISO)	11ax HE20 RU52 (SISO)	11ax HE20 RU26 (SISO)
2	5935	NS	NS	NS	NS	NS
1	5955	2.50	2.50	-0.50	-3.50	-6.50
5	5975	2.50	2.50	-0.50	-3.50	-6.50
9-29	5995-6095	2.50	2.50	-0.50	-3.50	-6.50
33-61	6115-6255	3.75	3.75	0.75	-2.25	-5.25
65-85	6275-6375	3.75	3.75	0.75	-2.25	-5.25
89	6395	3.75	3.75	0.75	-2.25	-5.25
93	6415	3.75	3.75	0.75	-2.25	-5.25
97-113	6435-6515	4.50	4.50	1.50	-1.50	-4.50
117-181	6535-6855	3.25	3.25	0.25	-2.75	-5.75
185	6875	3.25	3.25	0.25	-2.75	-5.75
189-225	6895-7075	3.50	3.50	0.50	-2.50	-5.50
229	7095	3.50	3.50	0.50	-2.50	-5.50
233	7115	2.75	NS	NS	NS	NS

**6 GHz WLAN - 20 MHz - MIMO Core 0 & Core 1 - CDD - LP**

Channel	Frequency (MHz)	11ax HE20 (2Tx, CDD, nonTxBF) Low Rate	11ax HE20 RU106 (2Tx, CDD, nonTxBF)	11ax HE20 RU52 (2Tx, CDD, nonTxBF)	11ax HE20 RU26 (2Tx, CDD, nonTxBF)
2	5935	NS	NS	NS	NS
1	5955	-3.50	-6.50	NS	NS
5	5975	-3.50	-6.50	NS	NS
9-29	5995-6095	-3.50	-6.50	NS	NS
33-61	6115-6255	-2.25	-5.25	NS	NS
65-85	6275-6375	-2.00	-5.00	-8.00	NS
89	6395	-2.00	-5.00	-8.00	NS
93	6415	-2.00	-5.00	-8.00	NS
97-113	6435-6515	-1.50	-4.50	-7.50	NS
117-181	6535-6855	-2.50	-5.50	NS	NS
185	6875	-2.50	-5.50	NS	NS
189-225	6895-7075	-2.50	-5.50	NS	NS
229	7095	-2.50	-5.50	NS	NS
233	7115	NS	NS	NS	NS



**6 GHz WLAN - 20 MHz - MIMO Core 0 & Core 1 - SDM - LP**

Channel	Frequency (MHz)	11ax HE20 (2Tx, SDM, nonTxBF) Low Rate	11ax HE20 RU106 (2Tx, SDM, nonTxBF)	11ax HE20 RU52 (2Tx, SDM, nonTxBF)	11ax HE20 RU26 (2Tx, SDM, nonTxBF)	11ax HE20 (2Tx, TxBF) Low Rate
2	5935	NS	NS	NS	NS	NS
1	5955	-0.50	-3.50	-6.50	NS	NS
5	5975	-0.50	-3.50	-6.50	NS	NS
9-29	5995-6095	-0.50	-3.50	-6.50	NS	NS
33-61	6115-6255	0.75	-2.25	-5.25	NS	NS
65-85	6275-6375	1.00	-2.00	-5.00	-8.00	NS
89	6395	1.00	-2.00	-5.00	-8.00	NS
93	6415	1.00	-2.00	-5.00	-8.00	NS
97-113	6435-6515	1.50	-1.50	-4.50	-7.50	NS
117-181	6535-6855	0.50	-2.50	-5.50	NS	NS
185	6875	0.50	-2.50	-5.50	NS	NS
189-225	6895-7075	0.50	-2.50	-5.50	NS	NS
229	7095	0.50	-2.50	-5.50	NS	NS
233	7115	NS	NS	NS	NS	NS

**6 GHz WLAN - 40 MHz - SISO Core 0 & Core 1 - LP**

Channel	Frequency (MHz)	11ax HE40 (SISO) Low Rate	11ax HE40 RU106 (SISO)	11ax HE40 RU52 (SISO)	11ax HE40 RU26 (SISO)
3	5965	5.00	-0.50	-3.50	-6.50
11	6005	5.00	-0.50	-3.50	-6.50
19-27	6045-6085	5.00	-0.50	-3.50	-6.50
35-59	6125-6245	6.25	0.75	-2.25	-5.25
67-75	6285-6325	6.25	0.75	-2.25	-5.25
83	6365	6.25	0.75	-2.25	-5.25
91	6405	6.25	0.75	-2.25	-5.25
99-107	6445-6485	7.00	1.50	-1.50	-4.50
115	6525	5.75	0.25	-2.75	-5.75
123-179	6565-6845	5.75	0.25	-2.75	-5.75
187	6885	5.75	0.25	-2.75	-5.75
195-219	6925-7045	6.00	0.50	-2.50	-5.50
227	7085	6.00	0.50	-2.50	-5.50



**6 GHz WLAN - 40 MHz - MIMO Core 0 & Core 1 - CDD - LP**

Channel	Frequency (MHz)	11ax HE40 (2Tx, CDD, nonTxBF) Low Rate	11ax HE40 RU106 (2Tx, CDD, nonTxBF)	11ax HE40 RU52 (2Tx, CDD, nonTxBF)	11ax HE40 RU26 (2Tx, CDD, nonTxBF)
3	5965	-1.00	-6.50	NS	NS
11	6005	-1.00	-6.50	NS	NS
19-27	6045-6085	-1.00	-6.50	NS	NS
35-59	6125-6245	0.25	-5.25	NS	NS
67-75	6285-6325	0.50	-5.00	-8.00	NS
83	6365	0.50	-5.00	-8.00	NS
91	6405	0.50	-5.00	-8.00	NS
99-107	6445-6485	1.00	-4.50	-7.50	NS
115	6525	0.00	-5.50	NS	NS
123-179	6565-6845	0.00	-5.50	NS	NS
187	6885	0.00	-5.50	NS	NS
195-219	6925-7045	0.00	-5.50	NS	NS
227	7085	0.00	-5.50	NS	NS

**6 GHz WLAN - 40 MHz - MIMO Core 0 & Core 1 - SDM - LP**

Channel	Frequency (MHz)	11ax HE40 (2Tx, SDM, nonTxBF) Low Rate	11ax HE40 RU106 (2Tx, SDM, nonTxBF)	11ax HE40 RU52 (2Tx, SDM, nonTxBF)	11ax HE40 RU26 (2Tx, SDM, nonTxBF)	11ax HE40 (2Tx, TxBF) Low Rate
3	5965	2.00	-3.50	-6.50	NS	NS
11	6005	2.00	-3.50	-6.50	NS	NS
19-27	6045-6085	2.00	-3.50	-6.50	NS	NS
35-59	6125-6245	3.25	-2.25	-5.25	NS	NS
67-75	6285-6325	3.50	-2.00	-5.00	-8.00	NS
83	6365	3.50	-2.00	-5.00	-8.00	NS
91	6405	3.50	-2.00	-5.00	-8.00	NS
99-107	6445-6485	4.00	-1.50	-4.50	-7.50	NS
115	6525	3.00	-2.50	-5.50	NS	NS
123-179	6565-6845	3.00	-2.50	-5.50	NS	NS
187	6885	3.00	-2.50	-5.50	NS	NS
195-219	6925-7045	3.00	-2.50	-5.50	NS	NS
227	7085	3.00	-2.50	-5.50	NS	NS



**6 GHz WLAN - 80 MHz - SISO Core 0 & Core 1 - LP**

Channel	Frequency (MHz)	11ax HE80 (SISO) Low Rate	11ax HE80 RU106 (SISO)	11ax HE80 RU52 (SISO)	11ax HE80 RU26 (SISO)
7	5985	8.00	-0.50	-3.50	-6.50
23	6065	8.00	-0.50	-3.50	-6.50
39-55	6145-6225	9.25	0.75	-2.25	-5.25
71	6305	9.25	0.75	-2.25	-5.25
87	6385	9.25	0.75	-2.25	-5.25
103	6465	10.00	1.50	-1.50	-4.50
119	6545	8.75	0.25	-2.75	-5.75
135-167	6625-6785	8.75	0.25	-2.75	-5.75
183	6865	8.75	0.25	-2.75	-5.75
199	6945	9.00	0.50	-2.50	-5.50
215	7025	9.00	0.50	-2.50	-5.50

**6 GHz WLAN - 80 MHz - MIMO Core 0 & Core 1 - CDD - LP**

Channel	Frequency (MHz)	11ax HE80 (2Tx, CDD, nonTxBF) Low Rate	11ax HE80 RU106 (2Tx, CDD, nonTxBF)	11ax HE80 RU52 (2Tx, CDD, nonTxBF)	11ax HE80 RU26 (2Tx, CDD, nonTxBF)
7	5985	2.00	-6.50	NS	NS
23	6065	2.00	-6.50	NS	NS
39-55	6145-6225	3.25	-5.25	NS	NS
71	6305	3.50	-5.00	-8.00	NS
87	6385	3.50	-5.00	-8.00	NS
103	6465	4.00	-4.50	-7.50	NS
119	6545	3.00	-5.50	NS	NS
135-167	6625-6785	3.00	-5.50	NS	NS
183	6865	3.00	-5.50	NS	NS
199	6945	3.00	-5.50	NS	NS
215	7025	3.00	-5.50	NS	NS



**6 GHz WLAN - 80 MHz - MIMO Core 0 & Core 1 - SDM - LP**

Channel	Frequency (MHz)	11ax HE80 (2Tx, SDM, nonTxBF) Low Rate	11ax HE80 RU106 (2Tx, SDM, nonTxBF)	11ax HE80 RU52 (2Tx, SDM, nonTxBF)	11ax HE80 RU26 (2Tx, SDM, nonTxBF)	11ax HE80 (2Tx, TxBF) Low Rate
7	5985	5.00	-3.50	-6.50	NS	2.00
23	6065	5.00	-3.50	-6.50	NS	2.00
39-55	6145-6225	6.25	-2.25	-5.25	NS	3.25
71	6305	6.50	-2.00	-5.00	-8.00	3.50
87	6385	6.50	-2.00	-5.00	-8.00	3.50
103	6465	7.00	-1.50	-4.50	-7.50	4.00
119	6545	6.00	-2.50	-5.50	NS	3.00
135-167	6625-6785	6.00	-2.50	-5.50	NS	3.00
183	6865	6.00	-2.50	-5.50	NS	3.00
199	6945	6.00	-2.50	-5.50	NS	3.00
215	7025	6.00	-2.50	-5.50	NS	3.00

**6 GHz WLAN - 160 MHz - SISO Core 0 - LP**

Channel	Frequency (MHz)	11ax HE160 (SISO) Low Rate	11ax HE160 RU106 (SISO)	11ax HE160 RU52 (SISO)	11ax HE160 RU26 (SISO)
15	6025	11.00	-0.50	-3.50	-6.50
47	6185	12.25	0.75	-2.25	-5.25
79	6345	12.25	0.75	-2.25	-5.25
111	6505	11.75	0.25	-2.75	-5.75
143	6665	11.75	0.25	-2.75	-5.75
175	6825	11.75	0.25	-2.75	-5.75
207	6985	12.00	0.50	-2.50	-5.50

**6 GHz WLAN - 160 MHz - MIMO Core 0 & Core 1 - CDD - LP**

Channel	Frequency (MHz)	11ax HE160 (2Tx, CDD, nonTxBF) Low Rate	11ax HE160 RU106 (2Tx, CDD, nonTxBF)	11ax HE160 RU52 (2Tx, CDD, nonTxBF)	11ax HE160 RU26 (2Tx, CDD, nonTxBF)
15	6025	5.00	-6.50	NS	NS
47	6185	6.25	-5.25	NS	NS
79	6345	6.50	-5.00	-8.00	NS
111	6505	6.00	-5.50	NS	NS
143	6665	6.00	-5.50	NS	NS
175	6825	6.00	-5.50	NS	NS
207	6985	6.00	-5.50	NS	NS



**6 GHz WLAN - 160 MHz - MIMO Core 0 & Core 1 - SDM - LP**

Channel	Frequency (MHz)	11ax HE160 (2Tx, SDM, nonTxBF) Low Rate	11ax HE160 RU106 (2Tx, SDM, nonTxBF)	11ax HE160 RU52 (2Tx, SDM, nonTxBF)	11ax HE160 RU26 (2Tx, SDM, nonTxBF)
15	6025	8.00	-3.50	-6.50	NS
47	6185	9.25	-2.25	-5.25	NS
79	6345	9.50	-2.00	-5.00	-8.00
111	6505	9.00	-2.50	-5.50	NS
143	6665	9.00	-2.50	-5.50	NS
175	6825	9.00	-2.50	-5.50	NS
207	6985	9.00	-2.50	-5.50	NS

**6 GHz WLAN - 20 MHz - SISO Core 0 - SP**

Channel	Frequency (MHz)	a (SISO)	11ax HE20 (SISO)	11ax HE20 RU106 (SISO)	11ax HE20 RU52 (SISO)	11ax HE20 RU26 (SISO)
2	5935	NS	NS	NS	NS	NS
1	5955	12.50	12.50	12.50	12.50	11.00
5	5975	12.50	12.50	12.50	12.50	11.00
9-29	5995-6095	12.50	12.50	12.50	12.50	11.00
33-61	6115-6255	12.50	12.50	12.50	12.50	12.25
65-85	6275-6375	12.50	12.50	12.50	12.50	12.25
89	6395	12.50	12.50	12.50	12.50	12.25
93	6415	12.50	12.50	12.50	12.50	12.25
97-113	6435-6515	NS	NS	NS	NS	NS
117-181	6535-6855	13.00	13.00	13.00	13.00	11.75
185	6875	NS	NS	NS	NS	NS
189-225	6895-7075	NS	NS	NS	NS	NS
229	7095	NS	NS	NS	NS	NS
233	7115	NS	NS	NS	NS	NS



**6 GHz WLAN - 20 MHz - SISO Core 1 - SP**

Channel	Frequency (MHz)	a (SISO)	11ax HE20 (SISO)	11ax HE20 RU106 (SISO)	11ax HE20 RU52 (SISO)	11ax HE20 RU26 (SISO)
2	5935	NS	NS	NS	NS	NS
1	5955	13.00	13.00	13.00	13.00	11.00
5	5975	13.00	13.00	13.00	13.00	11.00
9-29	5995-6095	13.00	13.00	13.00	13.00	11.00
33-61	6115-6255	13.00	13.00	13.00	13.00	12.25
65-85	6275-6375	13.00	13.00	13.00	13.00	12.25
89	6395	13.00	13.00	13.00	13.00	12.25
93	6415	13.00	13.00	13.00	13.00	12.25
97-113	6435-6515	NS	NS	NS	NS	NS
117-181	6535-6855	13.50	13.50	13.50	13.50	11.75
185	6875	NS	NS	NS	NS	NS
189-225	6895-7075	NS	NS	NS	NS	NS
229	7095	NS	NS	NS	NS	NS
233	7115	NS	NS	NS	NS	NS

**6 GHz WLAN - 20 MHz - MIMO Core 0 - CDD - SP**

Channel	Frequency (MHz)	11ax HE20 (2Tx, CDD, nonTxBF) Low Rate	11ax HE20 RU106 (2Tx, CDD, nonTxBF)	11ax HE20 RU52 (2Tx, CDD, nonTxBF)	11ax HE20 RU26 (2Tx, CDD, nonTxBF)
2	5935	NS	NS	NS	NS
1	5955	12.50	11.00	8.00	5.00
5	5975	12.50	11.00	8.00	5.00
9-29	5995-6095	12.50	11.00	8.00	5.00
33-61	6115-6255	12.50	12.25	9.25	6.25
65-85	6275-6375	12.50	12.50	9.50	6.50
89	6395	12.50	12.50	9.50	6.50
93	6415	12.50	12.50	9.50	6.50
97-113	6435-6515	NS	NS	NS	NS
117-181	6535-6855	13.00	12.00	9.00	6.00
185	6875	NS	NS	NS	NS
189-225	6895-7075	NS	NS	NS	NS
229	7095	NS	NS	NS	NS
233	7115	NS	NS	NS	NS





**6 GHz WLAN - 20 MHz - MIMO Core 1 - CDD - SP**

Channel	Frequency (MHz)	11ax HE20 (2Tx, CDD, nonTxBF) Low Rate	11ax HE20 RU106 (2Tx, CDD, nonTxBF)	11ax HE20 RU52 (2Tx, CDD, nonTxBF)	11ax HE20 RU26 (2Tx, CDD, nonTxBF)
2	5935	NS	NS	NS	NS
1	5955	13.00	11.00	8.00	5.00
5	5975	13.00	11.00	8.00	5.00
9-29	5995-6095	13.00	11.00	8.00	5.00
33-61	6115-6255	13.00	12.25	9.25	6.25
65-85	6275-6375	13.00	12.50	9.50	6.50
89	6395	13.00	12.50	9.50	6.50
93	6415	13.00	12.50	9.50	6.50
97-113	6435-6515	NS	NS	NS	NS
117-181	6535-6855	15.00	12.00	9.00	6.00
185	6875	NS	NS	NS	NS
189-225	6895-7075	NS	NS	NS	NS
229	7095	NS	NS	NS	NS
233	7115	NS	NS	NS	NS

**6 GHz WLAN - 20 MHz - MIMO Core 0 - SDM - SP**

Channel	Frequency (MHz)	11ax HE20 (2Tx, SDM, nonTxBF) Low Rate	11ax HE20 RU106 (2Tx, SDM, nonTxBF)	11ax HE20 RU52 (2Tx, SDM, nonTxBF)	11ax HE20 RU26 (2Tx, SDM, nonTxBF)	11ax HE20 (2Tx, TxBF) Low Rate
2	5935	NS	NS	NS	NS	NS
1	5955	12.50	12.50	11.00	8.00	12.50
5	5975	12.50	12.50	11.00	8.00	12.50
9-29	5995-6095	12.50	12.50	11.00	8.00	12.50
33-61	6115-6255	12.50	12.50	12.25	9.25	12.50
65-85	6275-6375	12.50	12.50	12.50	9.50	12.50
89	6395	12.50	12.50	12.50	9.50	12.50
93	6415	12.50	12.50	12.50	9.50	12.50
97-113	6435-6515	NS	NS	NS	NS	NS
117-181	6535-6855	13.00	13.00	12.00	9.00	13.00
185	6875	NS	NS	NS	NS	NS
189-225	6895-7075	NS	NS	NS	NS	NS
229	7095	NS	NS	NS	NS	NS
233	7115	NS	NS	NS	NS	NS



**6 GHz WLAN - 20 MHz - MIMO Core 1 - SDM - SP**

Channel	Frequency (MHz)	11ax HE20 (2Tx, SDM, nonTxBF) Low Rate	11ax HE20 RU106 (2Tx, SDM, nonTxBF)	11ax HE20 RU52 (2Tx, SDM, nonTxBF)	11ax HE20 RU26 (2Tx, SDM, nonTxBF)	11ax HE20 (2Tx, TxBF) Low Rate
2	5935	NS	NS	NS	NS	NS
1	5955	13.00	13.00	11.00	8.00	13.00
5	5975	13.00	13.00	11.00	8.00	13.00
9-29	5995-6095	13.00	13.00	11.00	8.00	13.00
33-61	6115-6255	13.00	13.00	12.25	9.25	13.00
65-85	6275-6375	13.00	13.00	12.50	9.50	13.00
89	6395	13.00	13.00	12.50	9.50	13.00
93	6415	13.00	13.00	12.50	9.50	13.00
97-113	6435-6515	NS	NS	NS	NS	NS
117-181	6535-6855	13.50	13.50	12.00	9.00	13.50
185	6875	NS	NS	NS	NS	NS
189-225	6895-7075	NS	NS	NS	NS	NS
229	7095	NS	NS	NS	NS	NS
233	7115	NS	NS	NS	NS	NS

**6 GHz WLAN - 40 MHz - SISO Core 0 - SP**

Channel	Frequency (MHz)	11ax HE40 (SISO) Low Rate	11ax HE40 RU106 (SISO)	11ax HE40 RU52 (SISO)	11ax HE40 RU26 (SISO)
3	5965	12.50	12.50	12.50	10.50
11	6005	12.50	12.50	12.50	10.50
19-27	6045-6085	12.50	12.50	12.50	10.50
35-59	6125-6245	12.50	12.50	12.50	10.50
67-75	6285-6325	12.50	12.50	12.50	10.50
83	6365	12.50	12.50	12.50	10.50
91	6405	12.50	12.50	12.50	10.50
99-107	6445-6485	NS	NS	NS	NS
115	6525	NS	NS	NS	NS
123-179	6565-6845	13.00	13.00	13.00	10.50
187	6885	NS	NS	NS	NS
195-219	6925-7045	NS	NS	NS	NS
227	7085	NS	NS	NS	NS



**6 GHz WLAN - 40 MHz - SISO Core 1 - SP**

Channel	Frequency (MHz)	11ax HE40 (SISO) Low Rate	11ax HE40 RU106 (SISO)	11ax HE40 RU52 (SISO)	11ax HE40 RU26 (SISO)
3	5965	13.00	13.00	13.50	10.50
11	6005	13.00	13.00	13.50	10.50
19-27	6045-6085	13.00	13.00	13.50	10.50
35-59	6125-6245	13.00	13.00	13.50	10.50
67-75	6285-6325	13.00	13.00	13.50	10.50
83	6365	13.00	13.00	13.50	10.50
91	6405	13.00	13.00	13.50	10.50
99-107	6445-6485	NS	NS	NS	NS
115	6525	NS	NS	NS	NS
123-179	6565-6845	13.50	13.50	13.50	10.50
187	6885	NS	NS	NS	NS
195-219	6925-7045	NS	NS	NS	NS
227	7085	NS	NS	NS	NS

**6 GHz WLAN - 40MHz - MIMO Core 0 - CDD - SP**

Channel	Frequency (MHz)	11ax HE40 (2Tx, CDD, nonTxBF) Low Rate	11ax HE40 RU106 (2Tx, CDD, nonTxBF)	11ax HE40 RU52 (2Tx, CDD, nonTxBF)	11ax HE40 RU26 (2Tx, CDD, nonTxBF)
3	5965	12.50	11.00	8.00	5.00
11	6005	12.50	11.00	8.00	5.00
19-27	6045-6085	12.50	11.00	8.00	5.00
35-59	6125-6245	12.50	12.25	9.25	6.25
67-75	6285-6325	12.50	12.50	9.50	6.50
83	6365	12.50	12.50	9.50	6.50
91	6405	12.50	12.50	9.50	6.50
99-107	6445-6485	NS	NS	NS	NS
115	6525	NS	NS	NS	NS
123-179	6565-6845	13.00	12.00	9.00	6.00
187	6885	NS	NS	NS	NS
195-219	6925-7045	NS	NS	NS	NS
227	7085	NS	NS	NS	NS



**6 GHz WLAN - 40 MHz - MIMO Core 1 - CDD - SP**

Channel	Frequency (MHz)	11ax HE40 (SISO) Low Rate	11ax HE40 RU106 (SISO)	11ax HE40 RU52 (SISO)	11ax HE40 RU26 (SISO)
3	5965	13.00	11.00	8.00	5.00
11	6005	13.00	11.00	8.00	5.00
19-27	6045-6085	13.00	11.00	8.00	5.00
35-59	6125-6245	13.00	12.25	9.25	6.25
67-75	6285-6325	13.00	12.50	9.50	6.50
83	6365	13.00	12.50	9.50	6.50
91	6405	13.00	12.50	9.50	6.50
99-107	6445-6485	NS	NS	NS	NS
115	6525	NS	NS	NS	NS
123-179	6565-6845	18.00	12.00	9.00	6.00
187	6885	NS	NS	NS	NS
195-219	6925-7045	NS	NS	NS	NS
227	7085	NS	NS	NS	NS

**6 GHz WLAN - 40 MHz - MIMO Core 0 - SDM - SP**

Channel	Frequency (MHz)	11ax HE40 (2Tx, SDM, nonTxBF) Low Rate	11ax HE40 RU106 (2Tx, SDM, nonTxBF)	11ax HE40 RU52 (2Tx, SDM, nonTxBF)	11ax HE40 RU26 (2Tx, SDM, nonTxBF)	11ax HE40 (2Tx, TxBF) Low Rate
3	5965	12.50	12.50	11.00	8.00	12.50
11	6005	12.50	12.50	11.00	8.00	12.50
19-27	6045-6085	12.50	12.50	11.00	8.00	12.50
35-59	6125-6245	12.50	12.50	12.25	9.25	12.50
67-75	6285-6325	12.50	12.50	12.50	9.50	12.50
83	6365	12.50	12.50	12.50	9.50	12.50
91	6405	12.50	12.50	12.50	9.50	12.50
99-107	6445-6485	NS	NS	NS	NS	NS
115	6525	NS	NS	NS	NS	NS
123-179	6565-6845	13.00	15.00	12.00	9.00	13.00
187	6885	NS	NS	NS	NS	NS
195-219	6925-7045	NS	NS	NS	NS	NS
227	7085	NS	NS	NS	NS	NS



**6 GHz WLAN - 40 MHz - MIMO Core 1 - SDM - SP**

Channel	Frequency (MHz)	11ax HE40 (2Tx, SDM, nonTxBF) Low Rate	11ax HE40 RU106 (2Tx, SDM, nonTxBF)	11ax HE40 RU52 (2Tx, SDM, nonTxBF)	11ax HE40 RU26 (2Tx, SDM, nonTxBF)	11ax HE40 (2Tx, TxBF) Low Rate
3	5965	13.00	13.00	11.00	8.00	13.00
11	6005	13.00	13.00	11.00	8.00	13.00
19-27	6045-6085	13.00	13.00	11.00	8.00	13.00
35-59	6125-6245	13.00	13.00	12.25	9.25	13.00
67-75	6285-6325	13.00	13.00	12.50	9.50	13.00
83	6365	13.00	13.00	12.50	9.50	13.00
91	6405	13.00	13.00	12.50	9.50	13.00
99-107	6445-6485	NS	NS	NS	NS	NS
115	6525	NS	NS	NS	NS	NS
123-179	6565-6845	13.50	15.00	12.00	9.00	13.50
187	6885	NS	NS	NS	NS	NS
195-219	6925-7045	NS	NS	NS	NS	NS
227	7085	NS	NS	NS	NS	NS

**6 GHz WLAN - 80 MHz - SISO Core 0 - SP**

Channel	Frequency (MHz)	11ax HE80 (SISO) Low Rate	11ax HE80 RU106 (SISO)	11ax HE80 RU52 (SISO)	11ax HE80 RU26 (SISO)
7	5985	12.50	12.50	10.50	7.50
23	6065	12.50	12.50	10.50	7.50
39-55	6145-6225	12.50	12.50	10.50	7.50
71	6305	12.50	12.50	10.50	7.50
87	6385	12.50	12.50	10.50	7.50
103	6465	NS	NS	NS	NS
119	6545	NS	NS	NS	NS
135-167	6625-6785	13.00	13.00	10.50	7.50
183	6865	NS	NS	NS	NS
199	6945	NS	NS	NS	NS
215	7025	NS	NS	NS	NS



**6 GHz WLAN - 80 MHz - SISO Core 1 - SP**

Channel	Frequency (MHz)	11ax HE80 (SISO) Low Rate	11ax HE80 RU106 (SISO)	11ax HE80 RU52 (SISO)	11ax HE80 RU26 (SISO)
7	5985	13.00	13.00	10.50	7.50
23	6065	13.00	13.00	10.50	7.50
39-55	6145-6225	13.00	13.00	10.50	7.50
71	6305	13.00	13.00	10.50	7.50
87	6385	13.00	13.00	10.50	7.50
103	6465	NS	NS	NS	NS
119	6545	NS	NS	NS	NS
135-167	6625-6785	13.50	13.50	10.50	7.50
183	6865	NS	NS	NS	NS
199	6945	NS	NS	NS	NS
215	7025	NS	NS	NS	NS

**6 GHz WLAN - 80 MHz - MIMO Core 0 - CDD - SP**

Channel	Frequency (MHz)	11ax HE80 (2Tx, CDD, nonTxBF) Low Rate	11ax HE80 RU106 (2Tx, CDD, nonTxBF)	11ax HE80 RU52 (2Tx, CDD, nonTxBF)	11ax HE80 RU26 (2Tx, CDD, nonTxBF)
7	5985	12.50	11.00	8.00	5.00
23	6065	12.50	11.00	8.00	5.00
39-55	6145-6225	12.50	12.25	9.25	6.25
71	6305	12.50	12.50	9.50	6.50
87	6385	12.50	12.50	9.50	6.50
103	6465	NS	NS	NS	NS
119	6545	NS	NS	NS	NS
135-167	6625-6785	13.00	12.00	9.00	6.00
183	6865	NS	NS	NS	NS
199	6945	NS	NS	NS	NS
215	7025	NS	NS	NS	NS



**6 GHz WLAN - 80 MHz - MIMO Core 1 - CDD - SP**

Channel	Frequency (MHz)	11ax HE80 (2Tx, CDD, nonTxBF) Low Rate	11ax HE80 RU106 (2Tx, CDD, nonTxBF)	11ax HE80 RU52 (2Tx, CDD, nonTxBF)	11ax HE80 RU26 (2Tx, CDD, nonTxBF)
7	5985	13.00	11.00	8.00	5.00
23	6065	13.00	11.00	8.00	5.00
39-55	6145-6225	13.00	12.25	9.25	6.25
71	6305	13.00	12.50	9.50	6.50
87	6385	13.00	12.50	9.50	6.50
103	6465	NS	NS	NS	NS
119	6545	NS	NS	NS	NS
135-167	6625-6785	13.50	12.00	9.00	6.00
183	6865	NS	NS	NS	NS
199	6945	NS	NS	NS	NS
215	7025	NS	NS	NS	NS

**6 GHz WLAN - 80 MHz - MIMO Core 0 - SDM - SP**

Channel	Frequency (MHz)	11ax HE80 (2Tx, SDM, nonTxBF) Low Rate	11ax HE80 RU106 (2Tx, SDM, nonTxBF)	11ax HE80 RU52 (2Tx, SDM, nonTxBF)	11ax HE80 RU26 (2Tx, SDM, nonTxBF)	11ax HE80 (2Tx, TxBF) Low Rate
7	5985	12.50	12.50	10.50	7.50	12.50
23	6065	12.50	12.50	10.50	7.50	12.50
39-55	6145-6225	12.50	12.50	10.50	7.50	12.50
71	6305	12.50	12.50	10.50	7.50	12.50
87	6385	12.50	12.50	10.50	7.50	12.50
103	6465	NS	NS	NS	NS	NS
119	6545	NS	NS	NS	NS	NS
135-167	6625-6785	13.00	13.00	10.50	7.50	13.00
183	6865	NS	NS	NS	NS	NS
199	6945	NS	NS	NS	NS	NS
215	7025	NS	NS	NS	NS	NS



**6 GHz WLAN - 80 MHz - MIMO Core 1 - SDM - SP**

Channel	Frequency (MHz)	11ax HE80 (2Tx, SDM, nonTxBF) Low Rate	11ax HE80 RU106 (2Tx, SDM, nonTxBF)	11ax HE80 RU52 (2Tx, SDM, nonTxBF)	11ax HE80 RU26 (2Tx, SDM, nonTxBF)	11ax HE80 (2Tx, TxBF) Low Rate
7	5985	13.00	13.00	10.50	7.50	13.00
23	6065	13.00	13.00	10.50	7.50	13.00
39-55	6145-6225	13.00	13.00	10.50	7.50	13.00
71	6305	13.00	13.00	10.50	7.50	13.00
87	6385	13.00	13.00	10.50	7.50	13.00
103	6465	NS	NS	NS	NS	NS
119	6545	NS	NS	NS	NS	NS
135-167	6625-6785	13.50	13.50	10.50	7.50	13.50
183	6865	NS	NS	NS	NS	NS
199	6945	NS	NS	NS	NS	NS
215	7025	NS	NS	NS	NS	NS

**6 GHz WLAN - 160 MHz - SISO Core 0 - SP**

Channel	Frequency (MHz)	11ax HE160 (SISO) Low Rate	11ax HE160 RU106 (SISO)	11ax HE160 RU52 (SISO)	11ax HE160 RU26 (SISO)
15	6025	12.50	10.50	7.50	4.50
47	6185	12.50	10.50	7.50	4.50
79	6345	12.50	10.50	7.50	4.50
111	6505	NS	NS	NS	NS
143	6665	13.00	10.50	7.50	4.50
175	6825	NS	NS	NS	NS
207	6985	NS	NS	NS	NS

**6 GHz WLAN - 160 MHz - SISO Core 1 - SP**

Channel	Frequency (MHz)	11ax HE160 (SISO) Low Rate	11ax HE160 RU106 (SISO)	11ax HE160 RU52 (SISO)	11ax HE160 RU26 (SISO)
15	6025	13.00	10.50	7.50	4.50
47	6185	13.00	10.50	7.50	4.50
79	6345	13.00	10.50	7.50	4.50
111	6505	NS	NS	NS	NS
143	6665	13.50	10.50	7.50	4.50
175	6825	NS	NS	NS	NS
207	6985	NS	NS	NS	NS





**6 GHz WLAN - 160 MHz - MIMO Core 0 - CDD - SP**

Channel	Frequency (MHz)	11ax HE160 (2Tx, CDD, nonTxBF) Low Rate	11ax HE160 RU106 (2Tx, CDD, nonTxBF)	11ax HE160 RU52 (2Tx, CDD, nonTxBF)	11ax HE160 RU26 (2Tx, CDD, nonTxBF)
15	6025	12.50	10.50	7.50	4.50
47	6185	12.50	10.50	7.50	4.50
79	6345	12.50	10.50	7.50	4.50
111	6505	NS	NS	NS	NS
143	6665	13.50	10.50	7.50	4.50
175	6825	NS	NS	NS	NS
207	6985	NS	NS	NS	NS

**6 GHz WLAN - 160 MHz - MIMO Core 1 - CDD - SP**

Channel	Frequency (MHz)	11ax HE160 (2Tx, CDD, nonTxBF) Low Rate	11ax HE160 RU106 (2Tx, CDD, nonTxBF)	11ax HE160 RU52 (2Tx, CDD, nonTxBF)	11ax HE160 RU26 (2Tx, CDD, nonTxBF)
15	6025	13.00	10.50	7.50	4.50
47	6185	13.00	10.50	7.50	4.50
79	6345	13.00	10.50	7.50	4.50
111	6505	NS	NS	NS	NS
143	6665	13.50	10.50	7.50	4.50
175	6825	NS	NS	NS	NS
207	6985	NS	NS	NS	NS

**6 GHz WLAN - 160 MHz - MIMO Core 0 - SDM- SP**

Channel	Frequency (MHz)	11ax HE160 (2Tx, SDM, nonTxBF) Low Rate	11ax HE160 RU106 (2Tx, SDM, nonTxBF)	11ax HE160 RU52 (2Tx, SDM, nonTxBF)	11ax HE160 RU26 (2Tx, SDM, nonTxBF)
15	6025	12.50	10.50	7.50	4.50
47	6185	12.50	10.50	7.50	4.50
79	6345	12.50	10.50	7.50	4.50
111	6505	NS	NS	NS	NS
143	6665	13.00	10.50	7.50	4.50
175	6825	NS	NS	NS	NS
207	6985	NS	NS	NS	NS



**6 GHz WLAN - 160 MHz - MIMO Core 1 - SDM - SP**

Channel	Frequency (MHz)	11ax HE160 (2Tx, SDM, nonTxBF) Low Rate	11ax HE160 RU106 (2Tx, SDM, nonTxBF)	11ax HE160 RU52 (2Tx, SDM, nonTxBF)	11ax HE160 RU26 (2Tx, SDM, nonTxBF)
15	6025	13.00	10.50	7.50	4.50
47	6185	13.00	10.50	7.50	4.50
79	6345	13.00	10.50	7.50	4.50
111	6505	NS	NS	NS	NS
143	6665	13.50	10.50	7.50	4.50
175	6825	NS	NS	NS	NS
207	6985	NS	NS	NS	NS



## 1.5 CONDUCTED POWER MEASUREMENTS

### 1.5.1 Method

Conducted power measurements were made using a power meter.

### 1.5.2 Measured Results

#### Bluetooth (When 5 GHz WLAN OFF)

##### (BT Core 0 - ePA)

Technology	Channel	Modulation	Duty Cycle (%)	Packet Type	Frequency (MHz)	Measured Power (dBm)	Tune Up (dBm)
EDR	0	GFSK	77	3-DH5	2402	15.77	16.50
EDR	39	GFSK	77	3-DH5	2441	15.33	16.50
EDR	78	GFSK	77	3-DH5	2480	15.38	16.50

##### (BT Core 1 - ePA)

Technology	Channel	Modulation	Duty Cycle (%)	Packet Type	Frequency (MHz)	Measured Power (dBm)	Tune Up (dBm)
EDR	0	GFSK	77	3-DH5	2402	15.75	16.50
EDR	39	GFSK	77	3-DH5	2441	15.55	16.50
EDR	78	GFSK	77	3-DH5	2480	15.43	16.50

#### Bluetooth (When 5 GHz WLAN ON)

##### (BT Core 0 - ePA)

Technology	Channel	Modulation	Duty Cycle (%)	Packet Type	Frequency (MHz)	Measured Power (dBm)	Tune Up (dBm)
EDR	0	GFSK	77	3-DH5	2402	15.77	16.00
EDR	39	GFSK	77	3-DH5	2441	15.33	16.00
EDR	78	GFSK	77	3-DH5	2480	15.38	16.00

##### (BT Core 1 - ePA)

Technology	Channel	Modulation	Duty Cycle (%)	Packet Type	Frequency (MHz)	Measured Power (dBm)	Tune Up (dBm)
EDR	0	GFSK	77	3-DH5	2402	15.75	16.00
EDR	39	GFSK	77	3-DH5	2441	15.55	16.00
EDR	78	GFSK	77	3-DH5	2480	15.43	16.00



**Narrowband UNII-1 - When 2.4 GHz WLAN OFF**

**(UNII-1 - Core 0)**

Technology	Channel	Modulation	Duty Cycle (%)	Packet Type	Frequency (MHz)	Measured Power (dBm)	Tune Up (dBm)
HDR8	Bottom	8-DPSK	78	8DH5	5150	12.70	13.00
HDR8	Middle	8-DPSK	78	8DH5	5200	12.65	13.00
HDR8	Top	8-DPSK	78	8DH5	5250	12.70	13.00

**(UNII-1 - Core 1)**

Technology	Channel	Modulation	Duty Cycle (%)	Packet Type	Frequency (MHz)	Measured Power (dBm)	Tune Up (dBm)
HDR8	Bottom	8-DPSK	78	8DH5	5150	12.60	12.50
HDR8	Middle	8-DPSK	78	8DH5	5200	12.40	12.50
HDR8	Top	8-DPSK	78	8DH5	5250	12.00	12.50

**Narrowband UNII-1 - When 2.4 GHz WLAN ON**

**(UNII-1 - Core 0)**

Technology	Channel	Modulation	Duty Cycle (%)	Packet Type	Frequency (MHz)	Measured Power (dBm)	Tune Up (dBm)
HDR8	Bottom	8-DPSK	78	8DH5	5150	12.70	13.00
HDR8	Middle	8-DPSK	78	8DH5	5200	12.65	13.00
HDR8	Top	8-DPSK	78	8DH5	5250	12.70	13.00

**(UNII-1 - Core 1)**

Technology	Channel	Modulation	Duty Cycle (%)	Packet Type	Frequency (MHz)	Measured Power (dBm)	Tune Up (dBm)
HDR8	Bottom	8-DPSK	78	8DH5	5150	12.60	12.50
HDR8	Middle	8-DPSK	78	8DH5	5200	12.40	12.50
HDR8	Top	8-DPSK	78	8DH5	5250	12.00	12.50

**Narrowband U-NII-3- When 2.4 GHz WLAN OFF**

**(UNII-3 - Core 0)**

Technology	Channel	Modulation	Duty Cycle (%)	Packet Type	Frequency (MHz)	Measured Power (dBm)	Tune Up (dBm)
HDR4	Bottom	8-DPSK	78	4DH5	5725	13.86	14.00
HDR4	Middle	8-DPSK	78	4DH5	5788	13.90	14.00
HDR4	Top	8-DPSK	78	4DH5	5850	13.66	14.00



**(UNII-3 - Core 1)**

Technology	Channel	Modulation	Duty Cycle (%)	Packet Type	Frequency (MHz)	Measured Power (dBm)	Tune Up (dBm)
HDR4	Bottom	8-DPSK	78	4DH5	5725	13.59	14.00
HDR4	Middle	8-DPSK	78	4DH5	5788	13.81	14.00
HDR4	Top	8-DPSK	78	4DH5	5850	13.67	14.00

**Narrowband U-NII-3 - When 2.4 GHz WLAN ON**

**(UNII-3 - Core 0)**

Technology	Channel	Modulation	Duty Cycle (%)	Packet Type	Frequency (MHz)	Measured Power (dBm)	Tune Up (dBm)
HDR4	Bottom	8-DPSK	78	4DH5	5725	11.61	12.00
HDR4	Middle	8-DPSK	78	4DH5	5788	11.70	12.00
HDR4	Top	8-DPSK	78	4DH5	5850	11.68	12.00

**(UNII-3 - Core 1)**

Technology	Channel	Modulation	Duty Cycle (%)	Packet Type	Frequency (MHz)	Measured Power (dBm)	Tune Up (dBm)
HDR4	Bottom	8-DPSK	78	4DH5	5725	11.71	12.00
HDR4	Middle	8-DPSK	78	4DH5	5788	11.70	12.00
HDR4	Top	8-DPSK	78	4DH5	5850	11.52	12.00

**Thread (When 5 GHz WLAN OFF)**

**(Core 0 - ePA)**

Technology	Channel	Modulation	Duty Cycle (%)	Packet Type	Frequency (MHz)	Measured Power (dBm)	Tune Up (dBm)
Thread	11	OQPSK	100	N/A	2405	17.00	17.50
Thread	18	OQPSK	100	N/A	2440	17.12	17.50
Thread	26	OQPSK	100	N/A	2480	17.00	17.50

**(Core 1 - ePA)**

Technology	Channel	Modulation	Duty Cycle (%)	Packet Type	Frequency (MHz)	Measured Power (dBm)	Tune Up (dBm)
Thread	11	OQPSK	100	N/A	2405	17.20	17.50
Thread	18	OQPSK	100	N/A	2440	16.80	17.50
Thread	26	OQPSK	100	N/A	2480	17.30	17.50



**Thread (When 5 GHz WLAN ON)**

**(Core 0 - ePA)**

Technology	Channel	Modulation	Duty Cycle (%)	Packet Type	Frequency (MHz)	Measured Power (dBm)	Tune Up (dBm)
Thread	11	OQPSK	100	N/A	2405	15.73	16.00
Thread	18	OQPSK	100	N/A	2440	15.29	16.00
Thread	26	OQPSK	100	N/A	2480	15.35	16.00

**(Core 1 - ePA)**

Technology	Channel	Modulation	Duty Cycle (%)	Packet Type	Frequency (MHz)	Measured Power (dBm)	Tune Up (dBm)
Thread	11	OQPSK	100	N/A	2405	15.50	16.00
Thread	18	OQPSK	100	N/A	2440	15.25	16.00
Thread	26	OQPSK	100	N/A	2480	15.07	16.00

**WLAN 2.4 GHz - SISO**

**(Core 0)**

Technology	Channel	Modulation	Duty Cycle (%)	Rate (Mbps)	Frequency (MHz)	Measured Power (dBm)	Tune Up (dBm)
802.11g	2	BPSK	100	6.0	2417	18.73	19.50
802.11g	6	BPSK	100	6.0	2437	18.80	19.50
802.11g	10	BPSK	100	6.0	2457	18.81	19.50

**(Core 1)**

Technology	Channel	Modulation	Duty Cycle (%)	Rate (Mbps)	Frequency (MHz)	Measured Power (dBm)	Tune Up (dBm)
802.11g	2	BPSK	100	6.0	2417	19.10	19.50
802.11g	6	BPSK	100	6.0	2437	18.86	19.50
802.11g	10	BPSK	100	6.0	2457	19.05	19.50



**WLAN 2.4 GHz - 2x2 MIMO**

(Core 0)

Technology	Channel	Modulation	Duty Cycle (%)	Rate (Mbps)	Frequency (MHz)	Measured Power (dBm)	Tune Up (dBm)
11n HT20 (2TX, nonTXBF) (Core 0)	3	BPSK	100	6.5	2422	18.18	19.50
11n HT20 (2TX, nonTXBF) (Core 1)	3	BPSK	100	6.5	2422	19.06	19.50
11n HT20 (2TX, nonTXBF) (Core 0)	6	BPSK	100	6.5	2437	17.88	19.50
11n HT20 (2TX, nonTXBF) (Core 1)	6	BPSK	100	6.5	2437	19.02	19.50
11n HT20 (2TX, nonTXBF) (Core 0)	10	BPSK	100	6.5	2457	18.16	19.50
11n HT20 (2TX, nonTXBF) (Core 1)	10	BPSK	100	6.5	2457	18.98	19.50

**WLAN U-NII 1/2A - 5.2 & 5.3 GHz SISO**

(Core 0)

Technology	Channel	Modulation	Duty Cycle (%)	Rate (Mbps)	Frequency (MHz)	Measured Power (dBm)	Tune Up (dBm)
a (SISO) Low Rate	36	BPSK	100	6.5	5180	16.31	16.50
a (SISO) Low Rate	40	BPSK	100	6.5	5200	16.27	16.50
11n/ac HT40	46	BPSK	100	13.5	5230	16.38	16.50
11n/ac HT40	54	BPSK	100	13.5	5270	15.92	16.25
a (SISO) Low Rate	60	BPSK	100	6.5	5300	15.95	16.25
a (SISO) Low Rate	64	BPSK	100	6.5	5320	15.85	16.25



**(Core 1)**

Technology	Channel	Modulation	Duty Cycle (%)	Rate (Mbps)	Frequency (MHz)	Measured Power (dBm)	Tune Up (dBm)
a (SISO) Low Rate	36	BPSK	100	6.5	5180	16.70	17.00
a (SISO) Low Rate	40	BPSK	100	6.5	5200	16.80	17.00
11n/ac HT40	46	BPSK	100	13.5	5230	16.82	17.00
11n/ac HT40	54	BPSK	100	13.5	5270	16.48	17.00
a (SISO) Low Rate	60	BPSK	100	6.5	5300	16.72	17.00
a (SISO) Low Rate	64	BPSK	100	6.5	5320	16.63	17.00





**WLAN U-NII 1/2A - 5.2/5.3 GHz MIMO**

Technology	Channel	Modulation	Duty Cycle (%)	Rate (Mbps)	Frequency (MHz)	Measured Power (dBm)	Tune Up (dBm)
11n/11ac HT40 (2Tx, SDM, nonTxBF) Low Rate (Core 0)	38	BPSK	100	13.5	5190	15.24	16.00
11n/11ac HT40 (2Tx, SDM, nonTxBF) Low Rate (Core 1)	38	BPSK	100	13.5	5190	15.85	16.00
11n/11ac HT40 (2Tx, SDM, nonTxBF) Low Rate (Core 0)	46	BPSK	100	13.5	5230	16.22	17.00
11n/11ac HT40 (2Tx, SDM, nonTxBF) Low Rate (Core 1)	46	BPSK	100	13.5	5230	16.73	17.00
11n/11ac HT40 (2Tx, SDM, nonTxBF) Low Rate (Core 0)	54	BPSK	100	13.5	5270	16.15	17.00
11n/11ac HT40 (2Tx, SDM, nonTxBF) Low Rate (Core 1)	54	BPSK	100	13.5	5270	16.74	17.00
11n/11ac HT20 (2Tx, SDM, nonTxBF) Low Rate (Core 0)	60	BPSK	100	6.5	5300	15.10	15.75
11n/11ac HT20 (2Tx, SDM, nonTxBF) Low Rate (Core 1)	60	BPSK	100	6.5	5300	15.53	15.75
11n/11ac HT20 (2Tx, SDM, nonTxBF) Low Rate (Core 0)	64	BPSK	100	6.5	5320	15.26	15.75
11n/11ac HT20 (2Tx, SDM, nonTxBF) Low Rate (Core 1)	64	BPSK	100	6.5	5320	15.70	15.75



**WLAN U-NII 2C - 5.5 GHz SISO**

**(Core 0)**

Technology	Channel	Modulation	Duty Cycle (%)	Rate (Mbps)	Frequency (MHz)	Measured Power (dBm)	Tune Up (dBm)
802.11ac VHT80	106	BPSK	100	29.3	5530	14.42	15.00
802.11ac VHT80	122	BPSK	100	29.3	5610	14.64	15.00
802.11ac VHT80	138	BPSK	100	29.3	5690	14.57	15.00

**(Core 1)**

Technology	Channel	Modulation	Duty Cycle (%)	Rate (Mbps)	Frequency (MHz)	Measured Power (dBm)	Tune Up (dBm)
802.11ac VHT80	106	BPSK	100	29.3	5530	14.69	15.00
802.11ac VHT80	122	BPSK	100	29.3	5610	14.65	15.00
802.11ac VHT80	138	BPSK	100	29.3	5690	14.66	15.00



**WLAN U-NII 2C - 5.5 GHz MIMO**

Technology	Channel	Modulation	Duty Cycle (%)	Rate (Mbps)	Frequency (MHz)	Measured Power (dBm)	Tune Up (dBm)
11n/11ac HT40 (2Tx, CDD, nonTxBF) Low Rate (Core 0)	102	BPSK	100	13.5	5510	14.69	15.00
11n/11ac HT40 (2Tx, CDD, nonTxBF) Low Rate (Core 1)	102	BPSK	100	13.5	5510	14.78	15.00
11n/11ac HT40 (2Tx, CDD, nonTxBF) Low Rate (Core 0)	110	BPSK	100	13.5	5550	14.40	15.00
11n/11ac HT40 (2Tx, CDD, nonTxBF) Low Rate (Core 1)	110	BPSK	100	13.5	5550	14.85	15.00
11n/11ac HT40 (2Tx, CDD, nonTxBF) Low Rate (Core 0)	118	BPSK	100	13.5	5610	14.36	15.00
11n/11ac HT40 (2Tx, CDD, nonTxBF) Low Rate (Core 1)	118	BPSK	100	13.5	5610	14.54	15.00
11n/11ac HT40 (2Tx, CDD, nonTxBF) Low Rate (Core 0)	126	BPSK	100	13.5	5630	14.63	15.00
11n/11ac HT40 (2Tx, CDD, nonTxBF) Low Rate (Core 1)	126	BPSK	100	13.5	5630	14.83	15.00
11n/11ac HT40 (2Tx, CDD, nonTxBF) Low Rate (Core 0)	134	BPSK	100	13.5	5670	14.26	15.00
11n/11ac HT40 (2Tx, CDD, nonTxBF) Low Rate (Core 1)	134	BPSK	100	13.5	5670	14.66	15.00
11n/11ac HT40 (2Tx, CDD, nonTxBF) Low Rate (Core 0)	142	BPSK	100	13.5	5710	14.26	15.00
11n/11ac HT40 (2Tx, CDD, nonTxBF) Low Rate (Core 1)	142	BPSK	100	13.5	5710	14.67	15.00



**WLAN U-NII 3 - 5.8GHz SISO**

**(Core 0)**

Technology	Channel	Modulation	Duty Cycle (%)	Rate (Mbps)	Frequency (MHz)	Measured Power (dBm)	Tune Up (dBm)
11ac VHT80 (SISO) Low Rate	155	BPSK	100	29.3	5775	14.87	15.25

**(Core 1)**

Technology	Channel	Modulation	Duty Cycle (%)	Rate (Mbps)	Frequency (MHz)	Measured Power (dBm)	Tune Up (dBm)
11ac VHT80 (SISO) Low Rate	155	BPSK	100	29.3	5775	14.68	15.25

**WLAN U-NII 3 - 5.8 GHz MIMO**

Technology	Channel	Modulation	Duty Cycle (%)	Rate (Mbps)	Frequency (MHz)	Measured Power (dBm)	Tune Up (dBm)
11ac VHT80 (2Tx, CDD, nonTxBF) Low Rate	155	BPSK	100	29.3	5775	14.43	15.25
11ac VHT80 (2Tx, CDD, nonTxBF) Low Rate	155	BPSK	100	29.3	5775	15.07	15.25



**WLAN 6 GHz SISO**

**(Core 0)**

Technology	Channel	Modulation	Duty Cycle (%)	Rate (Mbps)	Frequency (MHz)	Measured Power (dBm)	Tune Up (dBm)
11ax HE160 (SISO) Low Rate	15	BPSK	100	72.1	6025	12.21	12.50
11ax HE160 (SISO) Low Rate	47	BPSK	100	72.1	6185	12.22	12.50
11ax HE160 (SISO) Low Rate	79	BPSK	100	72.1	6345	12.36	12.50
11ax HE160 (SISO) Low Rate	111	BPSK	100	72.1	6505	11.59	11.75
11ax HE160 (SISO) Low Rate	143	BPSK	100	72.1	6665	12.90	13.00
11ax HE160 (SISO) Low Rate	175	BPSK	100	72.1	6825	11.51	11.75
11ax HE160 (SISO) Low Rate	207	BPSK	100	72.1	6985	11.74	12.00

**(Core 1)**

Technology	Channel	Modulation	Duty Cycle (%)	Rate (Mbps)	Frequency (MHz)	Measured Power (dBm)	Tune Up (dBm)
11ax HE160 (SISO) Low Rate	15	BPSK	100	72.1	6025	12.80	13.00
11ax HE160 (SISO) Low Rate	47	BPSK	100	72.1	6185	12.78	13.00
11ax HE160 (SISO) Low Rate	79	BPSK	100	72.1	6345	12.84	13.00
11ax HE160 (SISO) Low Rate	111	BPSK	100	72.1	6505	11.64	11.75
11ax HE160 (SISO) Low Rate	143	BPSK	100	72.1	6665	13.35	13.50
11ax HE160 (SISO) Low Rate	175	BPSK	100	72.1	6825	11.60	11.75
11ax HE160 (SISO) Low Rate	207	BPSK	100	72.1	6985	11.93	12.00



**WLAN 6 GHz MIMO**

Technology	Channel	Modulation	Duty Cycle (%)	Rate (Mbps)	Frequency (MHz)	Measured Power (dBm)	Tune Up (dBm)
11ax/11be HE160 (2Tx, SDM, nonTxBF) Low Rate	15	BPSK	100	72.1	6025	12.34	12.50
11ax/11be HE160 (2Tx, SDM, nonTxBF) Low Rate	15	BPSK	100	72.1	6025	12.87	13.00
11ax/11be HE160 (2Tx, SDM, nonTxBF) Low Rate	47	BPSK	100	72.1	6185	12.25	12.50
11ax/11be HE160 (2Tx, SDM, nonTxBF) Low Rate	47	BPSK	100	72.1	6185	12.77	13.00
11ax/11be HE160 (2Tx, SDM, nonTxBF) Low Rate	79	BPSK	100	72.1	6345	12.40	12.50
11ax/11be HE160 (2Tx, SDM, nonTxBF) Low Rate	79	BPSK	100	72.1	6345	12.51	13.00
11ax/11be HE160 (2Tx, SDM, nonTxBF) Low Rate	111	BPSK	100	72.1	6505	8.70	9.00
11ax/11be HE160 (2Tx, SDM, nonTxBF) Low Rate	111	BPSK	100	72.1	6505	8.66	9.00
11ax/11be HE160 (2Tx, SDM, nonTxBF) Low Rate	143	BPSK	100	72.1	6665	12.80	13.00
11ax/11be HE160 (2Tx, SDM, nonTxBF) Low Rate	143	BPSK	100	72.1	6665	12.91	13.50
11ax/11be HE160 (2Tx, SDM, nonTxBF) Low Rate	175	BPSK	100	72.1	6825	7.57	9.00
11ax/11be HE160 (2Tx, SDM, nonTxBF) Low Rate	175	BPSK	100	72.1	6825	8.76	9.00
11ax/11be HE160 (2Tx, SDM, nonTxBF) Low Rate	207	BPSK	100	72.1	6985	7.92	9.00
11ax/11be HE160 (2Tx, SDM, nonTxBF) Low Rate	207	BPSK	100	72.1	6985	8.87	9.00



## **SECTION 2**

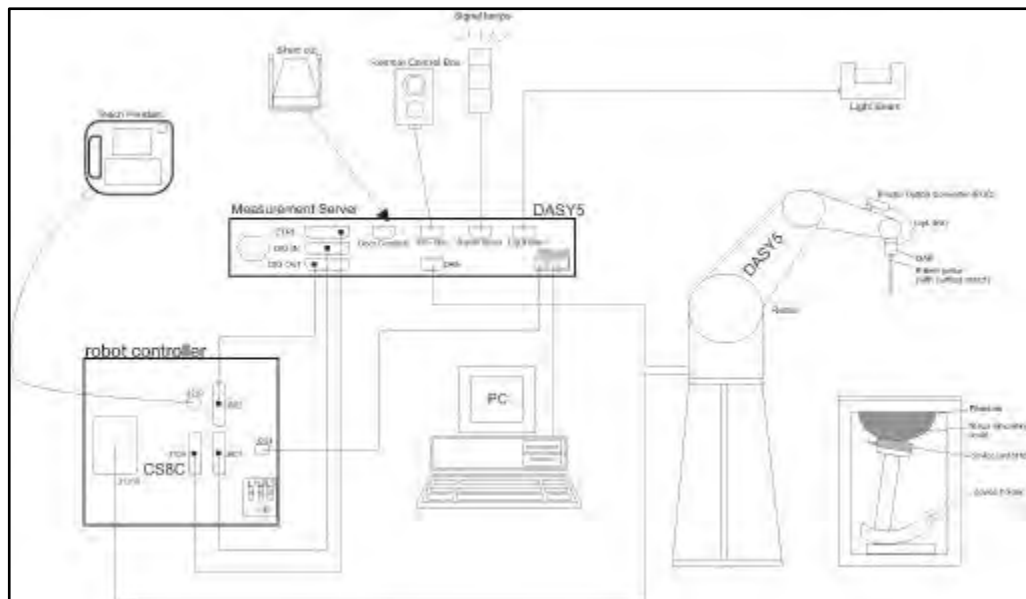
### **TEST DETAILS**

Specific Absorption Rate Testing of the A3114

## 2.1 DASY6 MEASUREMENT SYSTEM

### 2.1.1 System Description

The DASY6 system for performing compliance tests consists of the following items:



**Figure 8 - System Description Diagram**

A standard high precision 6-axis robot (Stäubli 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 amplification, 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 the DASY6 software to display and interact with the robot and information.

There is a remote control and a 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.





### 2.1.2 Probe Specification

The probes used by the DASY system are isotropic E-field probes, constructed with a symmetric design and a triangular core. The probes have built-in shielding against static charges and are contained within a PEEK enclosure material. These probes are specially designed and calibrated for use in liquids with high permittivity. The frequency range of the probes are from 6 MHz to 6 GHz.

### 2.1.3 Data Acquisition Electronics

The data acquisition electronics (DAE4 or DAE3) consist of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder 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 200M $\Omega$ ; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.

### 2.1.4 SAR Evaluation Description

The cDASY6 software includes all numerical procedures necessary to evaluate the spatial peak SAR values.

#### **Fast Area Scan:**

The Fast Area Scan provides an easy, time efficient and accurate way to define the optimal power reference location. The location of the power reference and power drift measurements for the subsequent Area, Fast Volume and Zoom Scans will be automatically set at the maximum of the Fast Area Scan.

#### **Area Scan:**

Area Scans are used to determine the peak location of the measured field before doing a finer measurement around the hotspot. Peak location can be found accurately even on coarse grids using the advanced interpolation routines implemented in cDASY6 Module SAR. Area Scans measure a two dimensional volume covering the full device under test area. cDASY6 Module SAR uses Fast Averaged SAR algorithm to compute the 1g and 10g of simulated tissue from the Area Scan.

#### **Fast Volume Scans:**

Fast Volume Scans are 3D scans used to assess the peak spatial SAR values within an averaging volume containing 1g and 10g of simulated tissue. It is compatible with any phantom. For regular phantoms, the measurement grid is generated by projecting a plane onto the phantom surface as for Area and Zoom scans. For specific phantoms, the measurement grid is generated by a conformal offset to the phantom surface at the desired distances. The grid extents can be set by the end user to cover the DUT dimensions or the whole measurable area of the phantom.

### **Zoom Scan:**

Zoom scans are used to assess the peak spatial SAR values within a cubic averaging volume containing 1g and 10g of simulated tissue. Zoom scans measure a three dimensional volume (cube). The bottom face of the cube is Centreed on the maximum of the preceding Area Scan in the same measurement group. For maxima at border of the phantom, the zoom scan can be enabled to automatically extend in order to ensure correct evaluation of peak spatial SAR.

Zoom Scans can be performed in two different modes:

Smart Mode: the grid settings are adjusted on the fly based on the distribution being measured to fulfill to the IEC 62209-2 Amendment 1 criteria on grid resolution.

Custom Mode: the user specifies the grid settings to be used. In both modes, Zoom Scans are always anchored to the peak location of the preceding Fast Area / Area / Fast Volume Scan.

### **2.1.5 DASY 6 Absorbed Power Density Evaluation**

The DASY 6 measurement system will output the absorbed power density result values by default from version 16.0 of DASY software onwards. All the measurement details described in this section are utilised to collect the required data which is the converted automatically within the software and displayed for frequencies above 5.9 GHz.

## 2.2 DASY 6 mmWave PD Module

### 2.2.1 Measurement System

A DASY 6 measurement system equipped with the DASY 6 mmWave module was used to carry out the peak spatially averaged power density (psPD) measurements. It consists of a 6-axis industrial robot and controller that provides a highly accurate positioning system, a PC for the system control software, a near field probe (EUmmWVx), a probe alignment sensor and the 5G phantom. The high accuracy positioning system places the near field probe at the key location points of the maximum electromagnetic field.

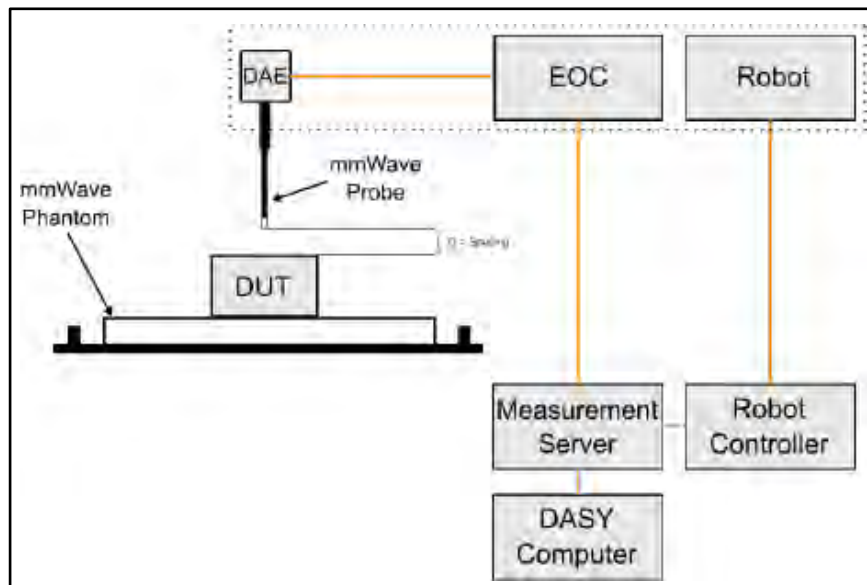


Figure 9 - Typical measurement setup for PD measurement with DASY 6

### 2.2.2 EUmWVx E-field probe details

The EUmWVx probe utilises two dipole elements that are specifically arranged to allow for the generation of pseudo-vector data.

<b>Frequency Range</b>	750 MHz – 110 GHz
<b>Dynamic Range</b>	<20 V/m – 10'000 V/m with PRE-10 (min <20 V/m – 2000 V/m)
<b>Position Precision</b>	<0.2 mm (DASY6)
<b>Dimensions</b>	Overall length: 320 mm (tip: 20 mm) Tip and body diameter: encapsulation 8 mm (internal sensor <1mm) Distance from probe tip to sensor Y cal point:1.5 mm Distance from probe tip to sensor X cal point:1.5 mm
<b>Applications</b>	E-field measurements of 5G devices and other mm-wave transmitters operating above 10GHz in <2 mm distance from device (free-space) Power density, H-field, and far-field analysis using total field reconstruction.
<b>Compatibility</b>	cDASY6 + 5G-Module SW1.0 and higher

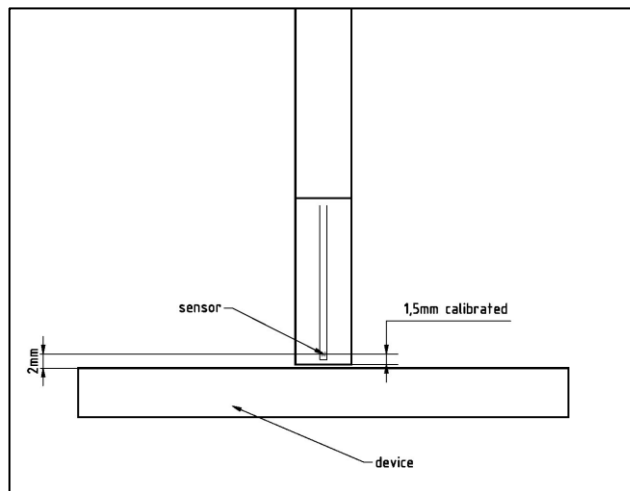


Figure 10 - Diagram of the distance sensor to the EUT surface

### 2.2.3 Peak spatially averaged power density assessment based on E-field measurements.

Power density was determined for both the electric and magnetic fields within a small distance from the transmitting source. In general, the magnitude and phase of two components of either E-field or H-field are needed on a sufficiently large surface to characterise their total distributions. Despite this being the case, a solution based on the direct measurement of the E and H field can be used to compute power density. The measurement approach to achieve this is given below.

- a) The local E-field is measured at a reference point on the measurement surface where the field is well above the system noise floor. This reference point is re-visited at the end of the measurement routine and re-measured to determine and assess the power drift of the EUT.
- b) The electric field on the measurement surface was scanned using instructions provided by the test system manufacturer. The spatial resolution of the measurement can depend on the measured field characteristic and measurement methodology used by the test system. The planar scan step size is configured to be  $\lambda/4$ .
- c) DASY6 uses a reconstruction algorithm to calculate the H-field from the measured E-field. As the power density calculation requires amplitude and phase, reconstruction algorithms can also be used to obtain field information from the measured E-field data, for example phase information from the amplitude if only the amplitude is measured. Three measurements per point on two measurement planes separated by  $\lambda/4$  are carried out in order for the H-field and phase data to be reconstructed.
- d) Using the equation below the total peak spatially averaged power density (psPD) distribution on the evaluation surface can be determined. The applicable regulatory requirements specify the spatial averaging area A. A circular shape is used.

$$psPD = \frac{1}{2A_{av}} \iint_{A_{av}} ||Re\{E \times H^*\} || dA$$

- e) The final quantity used to determine compliance against the applicable limits is the maximum spatial average on the evaluation.
- f) Following the measurement of the power drift as described in step a) the drift was assessed. If the drift deviated by more than 5% then the power density test and drift measurements shall be repeated.

#### 2.2.4 Reconstruction Algorithm

Computation of the PD in general requires knowledge of the electric (E-) and magnetic (H-) field amplitudes and phases in the plane of incidence. Reconstruction of these quantities from pseudo-vector E-field measurements is feasible, as they are constrained by Maxwell's equations.

The test system utilises a reconstruction approach based on the Gerchberg -Saxton algorithm which benefits from the availability of the E-field polarization ellipse information obtained with the EUmmWVx probe. This reconstruction algorithm, together with the ability of the probe to measure extremely close to the source without perturbing the field, permits reconstruction of the E- and H-fields and the PD on measurement planes located as near as  $\lambda/2\pi$ .

#### 2.2.5 Standalone PD limit

The following formula provides the reference levels for local exposure to electromagnetic fields from >6 GHz to 300GHz for general public as referenced in ICNIRP 2020:

$$55/f_G^{0.177}$$

The FCC Oct 2020 TCB workshop states their own incident power density limit of  $1\text{mW/cm}^2$  plane-wave equivalent, averaged over  $4\text{cm}^2$  as reflected in FCC 47 CFR 1.1310.

#### 2.2.6 Exposure Ratio

The following formulas used to calculate the exposure ratio of SAR, APD and iPD respectively as referenced in ICNIRP 2020:

$$\text{SAR} \quad \sum_{i=100\text{ kHz}}^{300\text{ GHz}} \frac{\text{SAR}_i}{\text{SAR}_{\text{BR}}} \leq 1$$

$$\text{APD} \quad \sum_{i>6\text{ GHz}}^{30\text{ GHz}} \frac{S_{\text{ab},4\text{cm},i}}{S_{\text{ab},4\text{cm},\text{BR}}} \leq 1$$

$$\text{iPD} \quad \sum_{i>6\text{ GHz}}^{30\text{ GHz}} \left( \frac{S_{\text{inc},4\text{cm},j}}{S_{\text{inc},4\text{cm},\text{RL},i}} \right) \leq 1$$

### 2.2.7 Total Exposure Ratio (TER)

The total exposure ratio is the sum of local specific absorption rate (SAR), local absorbed power density (APD) and local incident power density (iPD) referenced in ICNIRP 2020:

where,  $SAR_i$  and  $SAR_{BR}$  are the local SAR level at frequency  $i$  and the local SAR basic restriction given in ICNIRP 2020.  $S_{ab,4cm,i}$  and  $S_{ab,4cm,BR}$  are the  $4cm^2$  absorbed power density level at frequency  $i$  and the  $4cm^2$  absorbed power density basic restriction given in ICNIRP 2020.  $S_{inc,4cm,i}$  and  $S_{inc,4cm,RL,i}$  are the local  $4cm^2$  incident power density at frequency  $i$  and the local  $4cm^2$  incident power density reference level at frequency  $i$  given in ICNIRP 2020.

$$\begin{aligned} & \sum_{i=100 \text{ kHz}}^{6 \text{ GHz}} \frac{SAR_i}{SAR_{BR}} \\ & + \sum_{i>6 \text{ GHz}}^{30 \text{ GHz}} \frac{S_{ab,4cm,i}}{S_{ab,4cm,BR}} \\ & + \sum_{i>6 \text{ GHz}}^{30 \text{ GHz}} \left( \frac{S_{inc,4cm,i}}{S_{inc,4cm,RL,i}} \right) \leq 1 \end{aligned}$$

TER is applied when simultaneous transmission of the different types of measurement is tested, and basic restriction limits cannot be applied. The TER of the applicable measurements is calculated and summed up to not exceed 1.



### **SECTION 3**

#### **TEST EQUIPMENT USED**





### 3.1 TEST EQUIPMENT USED

The following test equipment was used at TÜV SÜD Product Service:

Instrument Description	Manufacturer	Model Type	TE Number	Cal Period (months)	Calibration Due Date
Thermometer	LKM Electronics	-	4697	12	04-Sep-2024
Thermohygrometer	PCE Instruments	-	5474	12	21-Apr-2024
DASY 8 Device Positioner	SPEAG	-	6496	-	TU
DASY 8 Device Positioner	SPEAG	-	N/A	-	TU
Laptop Device Holder	SPEAG	MDA4LAP	N/A	-	TU
Laptop Device Holder	SPEAG	MDA4LAP	N/A	-	TU
Measurement server	SPEAG	DASY 6 Measurement Server	5337	-	TU
Measurement server	SPEAG	DASY 8 Measurement Server	6492	-	TU
Measurement server	SPEAG	DASY 8 Measurement Server	SN:10113	-	TU
Mounting Platform	SPEAG	MP6C-TX90XL	4702	-	TU
Mounting Platform	SPEAG	MP6C-TX90XL	6493	-	TU
Mounting Platform	SPEAG	MP6C-TX90XL	5338	-	TU
Robot	Stäubli	TX90 XL	5340	-	TU
Robot	Stäubli	TX2 90XL	6494	-	TU
Robot	Stäubli	TX2 90XL	SN:002	-	TU
Power Source for SAR system validation	SPEAG	POWERSOURCE1-SE UMS 160 BA	6503	12	03-Mar-2024
Power Source for SAR system validation	SPEAG	POWERSOURCE1-SE UMS 160 CB	6504	12	23-Feb-2024
Body Phantom	SPEAG	DASY 6 Flat phantom	SN:2102	-	TU
Body Phantom	SPEAG	DASY 8 Flat phantom	SN:6491	-	TU
Body Phantom	SPEAG	DASY 8 Flat phantom	SN:2203	-	TU
Dielectric Assessment Kit	SPEAG	DAK-3.5	6502	-	03-Apr-2024
Validation Dipole 2450MHz	SPEAG	D2450V2	5329	12	05-Jun-2024
Validation Dipole 5000MHz	SPEAG	D5 GHzV2	5328	12	06-Jun-2024



Instrument Description	Manufacturer	Model Type	TE Number	Cal Period (months)	Calibration Due Date
Validation Dipole 6500MHz	SPEAG	D6.5 GHzV2	6157	12	06-Jul-2024
Signal Generator: 10MHz to 20GHz	Rohde & Schwarz	SMR20	3475	12	29-Jun-2024
Directional Coupler	Hewlett Packard	11692D	452	-	TU
Attenuator (10dB)	Aaren	AT40A-4041-D18-10	5493	12	18-Apr-2024
Attenuator (10dB)	Aaren	AT40A-4041-D18-10	6549	12	18-Jun-2024
Power Meter	Rohde & Schwarz	NRX	6535	12	05-Apr-2024
Power Sensor	Rohde & Schwarz	NRP18S	6534	12	17-Apr-2025
Power Sensor	Rohde & Schwarz	NRP18S	6533	12	17-Apr-2025
ENA Series network analyser	Keysight Technologies	E5063A	6499	12	07-Mar-2024
Data Acquisition	SPEAG	DAE4ip	6500	12	03-Apr-2024
Data Acquisition	SPEAG	DAE4ip	6501	12	03-Apr-2024
Data Acquisition	SPEAG	DAE4ip	6574	12	02-May-2024
Dosimetric SAR Probe	SPEAG	EX3DV4	6498	12	06-Apr-2024
Dosimetric SAR Probe	SPEAG	EX3DV4	6573	12	03-May-2024
Dosimetric SAR Probe	SPEAG	EX3DV4	5330	12	17-Jun-2024
Tissue Simulant Liquid	SPEAG	HBBL 600-10000	Batch 3	-	Note 1
Tissue Simulant Liquid	SPEAG	HBBL 600-10000	Batch 5	-	Note 1
Tissue Simulant Liquid	SPEAG	HBBL 600-10000	Batch 6	-	Note 1

TU - Traceability Unscheduled

Note 1, the calibration dates for the relevant batches of TSL can be found in the fluid parameter tables within this report.



### 3.2 TEST SOFTWARE

The following software was used to control the TÜV SÜD Product Service DASY System.

Instrument	Version Number
DASY system	cDASY6 Module SAR V16.2.2.1588
DASY system	cDASY8 Module SAR V16.2.2.1588
DASY system	cDASY6 Module mmWave V3.2.0.1840



### 3.3 TEST VERIFICATION

#### 3.3.1 System Performance Check Results

Prior to formal testing being performed a System Check was performed in accordance with KDB 865664 and the results were compared against the calibration certificates of each corresponding system verification dipole. The following results were obtained and within the  $\pm 10\%$  acceptance criteria. A system performance check in DASY Module mmWave was also performed with the Verification Source available at 10 GHz in accordance with IEC/IEEE 63195.

##### System performance / Validation results

Date	Frequency (MHz)	Fluid Type	Measured Max 1g SAR (W/kg)*	Max 1g SAR Target (W/kg)	Percentage Deviation from Target 1g (%)
28/10/2023	2450	HBBL/B3	53.87	52.20	3.20
31/10/2023	2450	HBBL/B3	56.67	52.20	8.55
29/10/2023	5200	HBBL/B6	80.61	76.30	5.56
31/10/2023	5200	HBBL/B6	78.41	76.30	2.77
01/11/2023	5200	HBBL/B6	77.62	76.30	1.72
02/11/2023	5200	HBBL/B6	77.42	76.30	1.46
29/11/2023	5200	HBBL/B6	81.21	76.30	6.43
29/10/2023	5300	HBBL/B6	79.81	80.00	-0.24
31/10/2023	5300	HBBL/B6	80.81	80.00	1.01
01/11/2023	5300	HBBL/B6	77.82	80.00	-2.73
03/11/2023	5300	HBBL/B6	77.22	80.00	-3.48
30/10/2023	5500	HBBL/B6	88.19	81.70	7.94
11/01/2023	5500	HBBL/B6	86.00	81.70	5.26
29/10/2023	5600	HBBL/B6	87.99	81.80	7.57
30/10/2023	5600	HBBL/B6	88.79	81.80	8.54
03/11/2023	5600	HBBL/B6	86.59	81.80	5.86
30/10/2023	5800	HBBL/B6	79.21	79.00	0.27
01/11/2023	5800	HBBL/B6	78.01	79.00	-1.25
02/11/2023	5800	HBBL/B6	77.82	77.82	-1.50
27/10/2023	6500	HBBL/B5	284.00	292.00	-2.74
28/10/2023	6500	HBBL/B5	281.00	292.00	-3.77
30/11/2023	6500	HBBL/B5	274.00	292.00	-6.16

\*Normalised to a forward power of 1W



System performance / Validation results APD

Date	Frequency (MHz)	Fluid Type	Absorbed Power Density over 4cm <sup>2</sup> (W/m <sup>2</sup> )*	Absorbed Power Density Target over 4cm <sup>2</sup> (W/m <sup>2</sup> )	Percentage Deviation from Target 4cm <sup>2</sup> (%)
27/10/2023	6500	HBBL/B5	1330	1330	0.00
28/10/2023	6500	HBBL/B5	1300	1330	-2.26
30/10/2023	6500	HBBL/B5	1260	1330	-5.26

\*Normalised to a forward power of 1W

System performance / Validation results iPD

Date	Frequency (MHz)	Medium	Measured psPDtot+ (W/m <sup>2</sup> )	Target psPDtot+ (W/m <sup>2</sup> )	Percentage Deviation from Target (%)
10/11/2023	10000	Air	57.30	57.80	-0.87



### 3.4 DIELECTRIC PROPERTIES OF SIMULANT LIQUIDS

The fluid properties of the simulant fluids used during routine SAR evaluation meet the dielectric properties required KDB 865664.

The dielectric properties of the tissue simulant liquids used are within the  $\pm 10\%$  acceptance criteria for the SAR testing at TÜV SÜD Product Service and are as follows:-

Fluid Type and Frequency	Relative Permittivity Measured	Relative Permittivity Target	Conductivity Measured (S/m)	Conductivity Target (S/m)	Date	Fluid Temperature °C
HBBL/B3 - 2450 MHz	40.05	39.20	1.86	1.80	18/10/2023	20.85
HBBL/B3 - 2450 MHz	39.65	39.20	1.84	1.80	20/10/2023	21.65
HBBL/B6 - 5200 MHz	34.06	35.98	4.59	4.65	18/10/2023	21.83
HBBL/B6 - 5200 MHz	33.94	35.98	4.38	4.65	23/10/2023	20.15
HBBL/B6 - 5200 MHz	34.01	35.98	4.37	4.65	29/10/2023	20.95
HBBL/B6 - 5200 MHz	33.69	35.98	4.50	4.65	31/10/2023	21.70
HBBL/B6 - 5200 MHz	33.60	35.98	4.47	4.65	29/11/2023	18.97
HBBL/B6 - 5300 MHz	33.89	35.87	4.64	4.75	20/10/2023	20.70
HBBL/B6 - 5300 MHz	33.76	35.87	4.49	4.75	23/10/2023	20.15
HBBL/B6 - 5300 MHz	34.27	35.87	4.66	4.75	25/10/2023	20.90
HBBL/B6 - 5300 MHz	33.84	35.87	4.47	4.75	29/10/2023	20.95
HBBL/B6 - 5500 MHz	33.40	35.64	4.70	4.96	23/10/2023	20.15
HBBL/B6 - 5500 MHz	33.89	35.64	4.89	4.96	25/10/2023	20.90
HBBL/B6 - 5500 MHz	33.49	35.64	4.68	4.96	29/10/2023	20.95
HBBL/B6 - 5500 MHz	33.34	35.64	4.71	4.96	31/10/2023	21.70
HBBL/B6 - 5600 MHz	33.22	35.52	4.81	5.06	23/10/2023	20.15
HBBL/B6 - 5600 MHz	33.70	35.52	5.00	5.06	25/10/2023	20.9
HBBL/B6 - 5800 MHz	32.90	35.30	5.27	5.27	18/10/2023	21.83
HBBL/B6 - 5800 MHz	32.95	35.30	5.19	5.27	20/10/2023	20.70
HBBL/B6 - 5800 MHz	32.89	35.30	5.03	5.27	23/10/2023	20.15
HBBL/B6 - 5800 MHz	32.98	35.30	5.02	5.27	29/10/2023	20.95
HBBL/B6 - 5800 MHz	32.83	35.3	5.03	5.27	31/10/2023	21.50
HBBL/B5 - 6500 MHz	31.75	34.46	5.76	6.07	23/10/2023	20.35
HBBL/B5 - 6500 MHz	32.52	34.46	6.07	6.07	25/10/2023	21.50
HBBL/B5 - 6500 MHz	32.15	34.46	5.88	6.07	30/10/2023	21.70



### 3.5 TEST CONDITIONS

#### 3.5.1 Test Laboratory Conditions

Ambient temperature: Within +18°C to +25°C.

The actual temperature during the testing ranged from 19.71°C to 22.9C.

The actual humidity during the testing ranged from 37.9% to 50.5% RH.

The temperature of the tissue simulating fluid during test sessions did not deviate by more than 2°C.

#### 3.5.2 Test Fluid Temperature Range

Frequency	Body / Head Fluid	Min Temperature °C	Max Temperature °C
2450 MHz	Head	21.01	21.50
5200 MHz	Head	18.97	21.50
5500 MHz	Head	19.60	21.50
5600 MHz	Head	20.30	21.50
5800 MHz	Head	20.30	21.83
6500 MHz	Head	20.44	21.50



### 3.6 MEASUREMENT UNCERTAINTY

Body, Full SAR Measurements, 300 MHz to 3 GHz

Source of Uncertainty	Uncertainty ± %	Probability distribution	Div	c <sub>i</sub> (1g)	Standard Uncertainty ± % (1g)
<b>Measurement System Errors</b>					
Probe Calibration	12.0	Normal	2.00	1.00	6.0
Probe Calibration Drift	1.7	Rectangular	1.73	1.00	1.0
Probe Linearity	4.7	Rectangular	1.73	1.00	2.7
Broadband Signal	3.0	Rectangular	1.73	1.00	1.7
Probe Isotropy	7.6	Rectangular	1.73	1.00	4.4
Data Acquisition	0.3	Normal	1.00	1.00	0.3
RF Ambient	1.8	Normal	1.00	1.00	1.8
Probe Positioning	0.2	Normal	1.00	0.14	0.0
Data Processing	1.2	Normal	1.00	1.00	1.2
<b>Phantom and Device errors</b>					
Liquid Conductivity Meas.	2.5	Normal	1.00	0.78	2.0
Liquid Conductivity Temp	3.3	Rectangular	1.73	0.78	1.5
Phantom Permittivity	14.0	Rectangular	1.73	0.00	0.0
Distance DUT - TSL	2.0	Normal	1.00	2.00	4.0
Device Positioning (±0.5mm)	1.0	Normal	1.00	1.00	1.0
Device Holder	3.6	Normal	1.00	1.00	3.6
Device Modulation	2.4	Rectangular	1.73	1.00	1.4
Time-average SAR	2.6	Rectangular	1.73	1.00	1.5
DUT Drift	5.0	Normal	1.00	1.00	5.0
<b>Correction to the SAR results</b>					
Deviation to Target	1.9	Normal	1.00	1.00	1.9
SAR Scaling	0.0	Rectangular	1.73	1.00	0.0
<b>Combined Standard Uncertainty</b>		<b>RSS</b>			11.8
<b>Expanded Standard Uncertainty</b>		<b>K=2</b>			23.7





Body, Full SAR Measurements, 3 GHz to 6 GHz

Source of Uncertainty	Uncertainty $\pm$ %	Probability distribution	Div	$c_i$ (1g)	Standard Uncertainty $\pm$ % (1g)
<b>Measurement System Errors</b>					
Probe Calibration	14.0	Normal	2.00	1.00	7.0
Probe Calibration Drift	1.7	Rectangular	1.73	1.00	1.0
Probe Linearity	4.7	Rectangular	1.73	1.00	2.7
Broadband Signal	2.6	Rectangular	1.73	1.00	1.5
Probe Isotropy	7.6	Rectangular	1.73	1.00	4.4
Data Acquisition	0.3	Normal	1.00	1.00	0.3
RF Ambient	1.8	Normal	1.00	1.00	1.8
Probe Positioning	0.2	Normal	1.00	0.33	0.1
Data Processing	2.3	Normal	1.00	1.00	2.3
<b>Phantom and Device errors</b>					
Liquid Conductivity Meas.	2.5	Normal	1.00	0.78	2.0
Liquid Conductivity Temp	3.4	Rectangular	1.73	0.78	1.5
Phantom Permittivity	14.0	Rectangular	1.73	0.25	2.0
Distance DUT - TSL	2.0	Normal	1.00	2.00	4.0
Device Positioning ( $\pm 0.5$ mm)	1.0	Normal	1.00	1.00	1.0
Device Holder	3.6	Normal	1.00	1.00	3.6
Device Modulation	2.4	Rectangular	1.73	1.00	1.4
Time-average SAR	2.6	Rectangular	1.73	1.00	1.5
DUT Drift	5.0	Normal	1.00	1.00	5.0
<b>Correction to the SAR results</b>					
Deviation to Target	1.9	Normal	1.00	1.00	1.9
SAR Scaling	0.0	Rectangular	1.73	1.00	0.0
<b>Combined Standard Uncertainty</b>		<b>RSS</b>			12.7
<b>Expanded Standard Uncertainty</b>		<b>K=2</b>			25.3



Body, Full SAR Measurements, 6 GHz to 10 GHz

Source of Uncertainty	Uncertainty ± %	Probability distribution	Div	c <sub>i</sub> (1g)	Standard Uncertainty ± % (1g)
<b>Measurement System Errors</b>					
Probe Calibration	18.6	Normal	2.00	1.00	9.3
Probe Calibration Drift	1.7	Rectangular	1.73	1.00	1.0
Probe Linearity	4.7	Rectangular	1.73	1.00	2.7
Broadband Signal	2.8	Rectangular	1.73	1.00	1.6
Probe Isotropy	7.6	Rectangular	1.73	1.00	4.4
Data Acquisition	0.3	Normal	1.00	1.00	0.3
RF Ambient	1.8	Normal	1.00	1.00	1.8
Probe Positioning	0.2	Normal	1.00	0.67	0.1
Data Processing	3.5	Normal	1.00	1.00	3.5
<b>Phantom and Device errors</b>					
Liquid Conductivity Meas.	2.5	Normal	1.00	0.78	2.0
Liquid Conductivity Temp	2.4	Rectangular	1.73	0.78	1.1
Phantom Permittivity	14.0	Rectangular	1.73	0.50	4.0
Distance DUT - TSL	2.0	Normal	1.00	2.00	4.0
Device Positioning (±0.5mm)	1.0	Normal	1.00	1.00	1.0
Device Holder	3.6	Normal	1.00	1.00	3.6
Device Modulation	2.4	Rectangular	1.73	1.00	1.4
Time-average SAR	2.6	Rectangular	1.73	1.00	1.5
DUT Drift	5.0	Normal	1.00	1.00	5.0
<b>Correction to the SAR results</b>					
Deviation to Target	1.9	Normal	1.00	1.00	1.9
SAR Scaling	0.0	Rectangular	1.73	1.00	0.0
<b>Combined Standard Uncertainty</b>		<b>RSS</b>			14.7
<b>Expanded Standard Uncertainty</b>		<b>K=2</b>			29.4



Body, Full APD Measurements, 6 GHz to 10 GHz

Symbol	Error Description	Value %	Probability distribution	Divisor	$C_i$ (1 g)	Std Uncertainty (1 g)	$C_i$ (10 g)	Std Uncertainty (10 g)
<b>Measurement System Errors</b>								
<i>CF</i>	Probe Calibration	18.60	normal 2	2.000	1	9.30	1	9.30
<i>CF<sub>DRIFT</sub></i>	Probe Calibration Drift	1.70	rectangular	1.732	1	0.98	1	0.98
<i>LIN</i>	Probe Linearity	4.70	rectangular	1.732	1	2.71	1	2.71
<i>BBS</i>	Broadband Signal	2.80	rectangular	1.732	1	1.62	1	1.62
<i>ISO</i>	Probe Isotropy	7.60	rectangular	1.732	1	4.39	1	4.39
<i>DAE</i>	Other Probe+Electronic	0.30	normal 1	1.000	1	0.30	1	0.30
<i>DAE</i>	Boundary Effects + Corrections	4.00	rectangular	1.732	1	2.31	1	2.31
<i>DAE</i>	Sensor Offset & Uncertainty	0.10	normal 1	1.000	1	0.10	1	0.10
<i>AMB</i>	RF Ambient	3.00	normal 1	1.000	1	3.00	1	3.00
$\Delta_{sys}$	Probe Positioning	0.01	normal 1	1.000	0.5	0.00	0.5	0.00
<i>DAT</i>	Data Processing	1.00	rectangular	1.732	1	0.58	1	0.58
<b>Phantom and Device Errors</b>								
<i>LIQ(<math>\sigma</math>)</i>	Conductivity (meas) <sup>DAK</sup>	2.50	normal 1	1.000	0.78	1.95	0.71	1.78
<i>LIQ(<math>T\sigma</math>)</i>	Conductivity (temp) <sup>BB</sup>	2.40	rectangular	1.732	0.78	1.08	0.71	0.98
<i>EPS</i>	Phantom Permittivity	14.00	rectangular	1.732	0.5	4.04	0.5	4.04
<i>DIS</i>	Distance DUT – TSL	2.00	normal 1	1.000	2	4.00	2	4.00
<i>Dxyz</i>	Device Positioning	1.00	normal 1	1.000	1	1.00	1	1.00
<i>H</i>	Device Holder	3.60	normal 1	1.000	1	3.60	1	3.60
<i>MOD</i>	DUT Modulation <sup>m</sup>	2.40	rectangular	1.732	1	1.39	1	1.39
<i>TAS</i>	Time-average SAR	1.70	rectangular	1.732	1	0.98	1	0.98
<i>Rfdrift</i>	DUT drift	5.00	normal 1	1.000	1	5.00	1	5.00
<i>VAL</i>	Val Antenna Unc. <sup>val</sup>	0.00	normal 1	1.000	1	0.00	1	0.00
<i>Rfin</i>	Unc. Input Power <sup>val</sup>	0.00	normal 1	1.000	1	0.00	1	0.00
<b>Correction To The SAR Results</b>								
<i>C(<math>\epsilon, \sigma</math>)</i>	Deviation to Target	1.90	normal 1	1.000	1	1.90	0.84	1.60
<i>C(R)</i>	SAR scaling	0.00	rectangular	1.732	1	0.00	1	0.00
<b>APD</b>								
<i>PDC</i>	Power Density Conversion	13.50	rectangular	1.732	1	7.79	1	7.79
<i>u(<math>\Delta</math>SAR)</i>	Combined Standard Uncertainty	-	normal	-	-	16.58	-	16.52
<i>U</i>	Expanded Uncertainty	-	normal k =	2.00	-	33.2	-	33



DASY6 Uncertainty Budget for iPD

Symbol	Error Description	Value dB	Probability distribution	Divisor	$c_i$	$u(y)$ dB	$(u(y))^2$	$v_i$ or $v_{eff}$	$u_i^4(y)$
<b>Uncertainty terms dependent on the measurement system</b>									
CAL	Calibration	0.49	normal 1	1.000	1	0.49	0.240	$\infty$	0
COR	Probe correction	0.00	rectangular	1.732	1	0.00	0.000	$\infty$	0
FRS	Frequency response (BW $\leq$ 1 GHz)	0.20	rectangular	1.732	1	0.12	0.013	$\infty$	0
SCC	Sensor cross coupling	0.00	rectangular	1.732	1	0.00	0.000	$\infty$	0
ISO	Isotropy	0.50	rectangular	1.732	1	0.29	0.083	$\infty$	0
LIN	Linearity	0.20	rectangular	1.732	1	0.12	0.013	$\infty$	0
PSC	Probe scattering	0.00	rectangular	1.732	1	0.00	0.000	$\infty$	0
PPO	Probe positioning offset	0.30	rectangular	1.732	1	0.17	0.030	$\infty$	0
PPR	Probe positioning repeatability	0.04	rectangular	1.732	1	0.02	0.001	$\infty$	0
SMO	Sensor mechanical offset	0.00	rectangular	1.732	1	0.00	0.000	$\infty$	0
PSR	Probe spatial resolution	0.00	rectangular	1.732	1	0.00	0.000	$\infty$	0
FLD	Field impedance dependence	0.00	rectangular	1.732	1	0.00	0.000	$\infty$	0
APD	Amplitude and phase drift	0.00	rectangular	1.732	1	0.00	0.000	$\infty$	0
APN	Amplitude and phase noise	0.04	rectangular	1.732	1	0.02	0.001	$\infty$	0
TR	Measurement area truncation	0.00	rectangular	1.732	1	0.00	0.000	$\infty$	0
DAQ	Data acquisition	0.03	normal 1	1.000	1	0.03	0.001	$\infty$	0
SMP	Sampling	0.00	rectangular	1.732	1	0.00	0.000	$\infty$	0
REC	Field reconstruction	0.60	rectangular	1.732	1	0.35	0.120	$\infty$	0
TRA	FTE/MEO	0.70	rectangular	1.732	1	0.40	0.163	$\infty$	0
SCA	Power density scaling	0.00	rectangular	1.732	1	0.00	0.000	$\infty$	0
SAV	Spatial averaging	0.10	rectangular	1.732	1	0.06	0.003	$\infty$	0
SDL	System detection limit	0.04	rectangular	1.732	1	0.02	0.001	$\infty$	0
<b>Uncertainty terms dependent on the DUT and environmental factors</b>									
PC	Probe coupling with DUT	0.00	rectangular	1.732	1	0.00	0.000	$\infty$	0
MOD	Modulation response	0.40	rectangular	1.732	1	0.23	0.053	$\infty$	0
IT	Integration time	0.00	rectangular	1.732	1	0.00	0.000	$\infty$	0
RT	Response time	0.00	rectangular	1.732	1	0.00	0.000	$\infty$	0
DH	Device holder influence	0.10	rectangular	1.732	1	0.06	0.003	$\infty$	0
DA	DUT alignment	0.00	rectangular	1.732	1	0.00	0.000	$\infty$	0
REF	Reflections in laboratory	0.10	rectangular	1.732	1	0.06	0.003	$\infty$	0
TEM	Laboratory temperature	0.10	rectangular	1.732	1	0.06	0.003	$\infty$	0
AC	RF ambient conditions	0.04	rectangular	1.732	1	0.02	0.001	$\infty$	0
AR	Ambient reflections	0.04	rectangular	1.732	1	0.02	0.001	$\infty$	0
MSI	Immunity / secondary reception	0.00	rectangular	1.732	1	0.00	0.000	$\infty$	0
DRI	Drift of the DUT	0.00	rectangular	1.732	1	0.00	0.000	$\infty$	0
$u_c(F_s)$	Combined Standard Uncertainty (w/ FTE/MEO)	-	normal	-	-	0.86	0.734	$\infty$	0
$U(F_s)$	Expanded Uncertainty (w/ FTE/MEO)	-	normal k =	2.00	-	1.7	-	$\infty$	-



DASY6 mmWave Uncertainty Budget - System Performance Check

Symbol	Error Description	Value dB	Probability distribution	Divisor	$c_i$	$u(y)$ dB	$(u(y))^2$ dB	$v_i$ or $v_{eff}$	$u_i^4(y)$
<b>Uncertainty terms dependent on the measurement system</b>									
CAL	Calibration Repeatability	0.21	normal 1	1.000	1	0.21	0.044	$\infty$	0
COR	Probe correction	0.00	rectangular	1.732	1	0.00	0.000	$\infty$	0
FRS	Frequency response (BW $\leq$ 1 GHz)	0.20	rectangular	1.732	0	0.00	0.000	$\infty$	0
SCC	Sensor cross coupling	0.00	rectangular	1.732	1	0.00	0.000	$\infty$	0
ISO	Isotropy	0.30	rectangular	1.732	1	0.17	0.030	$\infty$	0
LIN	Linearity	0.20	rectangular	1.732	1	0.12	0.013	$\infty$	0
PSC	Probe scattering	0.00	rectangular	1.732	1	0.00	0.000	$\infty$	0
PPO	Probe positioning offset	0.11	rectangular	1.732	1	0.06	0.004	$\infty$	0
PPR	Probe positioning repeatability	0.04	rectangular	1.732	1	0.02	0.001	$\infty$	0
SMO	Sensor mechanical offset	0.00	rectangular	1.732	1	0.00	0.000	$\infty$	0
PSR	Probe spatial resolution	0.00	rectangular	1.732	1	0.00	0.000	$\infty$	0
FLD	Field impedance dependence	0.00	rectangular	1.732	1	0.00	0.000	$\infty$	0
APD	Amplitude and phase drift	0.00	rectangular	1.732	1	0.00	0.000	$\infty$	0
APN	Amplitude and phase noise	0.04	rectangular	1.732	0	0.00	0.000	$\infty$	0
TR	Measurement area truncation	0.00	rectangular	1.732	1	0.00	0.000	$\infty$	0
DAQ	Data acquisition	0.03	normal 1	1.000	1	0.03	0.001	$\infty$	0
SMP	Sampling	0.00	rectangular	1.732	1	0.00	0.000	$\infty$	0
REC	Field reconstruction	0.60	rectangular	1.732	0.3	0.10	0.011	$\infty$	0
TRA	Forward transformation	0.00	rectangular	1.732	1	0.00	0.000	$\infty$	0
SCA	Power density scaling	0.00	rectangular	1.732	1	0.00	0.000	$\infty$	0
SAV	Spatial averaging	0.10	rectangular	1.732	0	0.00	0.000	$\infty$	0
SDL	System detection limit	0.04	rectangular	1.732	1	0.02	0.001	$\infty$	0
<b>Uncertainty terms dependent on the DUT and environmental factors</b>									
PC	Probe coupling with DUT	0.00	rectangular	1.732	1	0.00	0.000	$\infty$	0
MOD	Modulation response	0.40	rectangular	1.732	0	0.00	0.000	$\infty$	0
IT	Integration time	0.00	rectangular	1.732	1	0.00	0.000	$\infty$	0
RT	Response time	0.00	rectangular	1.732	1	0.00	0.000	$\infty$	0
DH	Device holder influence	0.10	rectangular	1.732	0	0.00	0.000	$\infty$	0
REF	Reflections in laboratory	0.10	rectangular	1.732	1	0.06	0.003	$\infty$	0
TEM	Laboratory temperature	0.10	rectangular	1.732	1	0.06	0.003	$\infty$	0
DA	DUT alignment	0.00	rectangular	1.732	1	0.00	0.000	$\infty$	0
AC	RF ambient conditions	0.04	rectangular	1.732	1	0.02	0.001	$\infty$	0
AR	Ambient reflections	0.04	rectangular	1.732	1	0.02	0.001	$\infty$	0
MSI	Immunity / secondary reception	0.00	rectangular	1.732	0	0.00	0.000	$\infty$	0
DRI	Drift of the DUT	0.10	rectangular	1.732	1	0.06	0.003	$\infty$	0
$u_c(F_s)$	Combined Standard Uncertainty (w/ FTE/MEO)	-	normal	-	-	0.34	0.115	$\infty$	0
$U(F_s)$	Expanded Uncertainty (w/ FTE/MEO)	-	normal	k =	2.00	-	0.7	$\infty$	-



### 3.6.1 Decision Rule

#### Accuracy Method

Determination of conformity with the specification limits is based on the decision rule according to IEC Guide 115:2007, Clause 4.4.3 and 4.5.1. (Procedure 2). The measurement results are directly compared with the test limit to determine conformance with the requirements of the standard.

Risk: The uncertainty of measurement about the measured result is negligible with regard to the final pass/fail decision. The measurement result can be directly compared with the test limit to determine conformance with the requirement (compare IEC Guide 115). The level of risk to falsely accept and falsely reject items is further described in ILAC-G8."



## **SECTION 4**

### **ACCREDITATION, DISCLAIMERS AND COPYRIGHT**

#### 4.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT



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This report relates only to the actual item/items tested.

Results of tests covered by our Flexible UKAS Accreditation Schedule are marked FS (Flexible Scope)

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Our UKAS Accreditation does not cover opinions and interpretations and any expressed are outside the scope of our UKAS Accreditation





## **ANNEX A**

### **PROBE CALIBRATION REPORT**



**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**

Client	<b>TÜV SÜD</b> Fareham, United Kingdom	Certificate No.	<b>EX-7536_Jun23</b>
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**CALIBRATION CERTIFICATE**

Object	EX3DV4 - SN:7536
Calibration procedure(s)	QA CAL-01.v10, QA CAL-12.v10, QA CAL-14.v7, QA CAL-23.v6, QA CAL-25.v8 Calibration procedure for dosimetric E-field probes
Calibration date	June 12, 2023

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 NRP2	SN: 104778	30-Mar-23 (No. 217-03804/03805)	Mar-24
Power sensor NRP-Z91	SN: 103244	30-Mar-23 (No. 217-03804)	Mar-24
OCP DAK-3.5 (weighted)	SN: 1249	20-Oct-22 (OCP-DAK3.5-1249_Oct22)	Oct-23
OCP DAK-12	SN: 1016	20-Oct-22 (OCP-DAK12-1016_Oct22)	Oct-23
Reference 20 dB Attenuator	SN: CC2552 (20x)	30-Mar-23 (No. 217-03809)	Mar-24
DAE4	SN: 660	16-Mar-23 (No. DAE4-660_Mar23)	Mar-24
Reference Probe ES3DV2	SN: 3013	06-Jan-23 (No. ES3-3013_Jan23)	Jan-24

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

Calibrated by	Name: Michael Weber	Function: Laboratory Technician	Signature:
Approved by	Name: Sven Kühn	Function: Technical Manager	Signature:

Issued: June 14, 2023

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



**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)  
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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

## Glossary

TSL	tissue simulating liquid
NORM <sub>x,y,z</sub>	sensitivity in free space
ConvF	sensitivity in TSL / NORM <sub>x,y,z</sub>
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A, B, C, D	modulation dependent linearization parameters
Polarization $\varphi$	$\varphi$ rotation around probe axis
Polarization $\theta$	$\theta$ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., $\theta = 0$ 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:

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

## Methods Applied and Interpretation of Parameters:

- NORM<sub>x,y,z</sub>**: Assessed for E-field polarization  $\theta = 0$  ( $f \leq 900$  MHz in TEM-cell;  $f > 1800$  MHz: R22 waveguide). NORM<sub>x,y,z</sub> are only intermediate values, i.e., the uncertainties of NORM<sub>x,y,z</sub> does not affect the E<sup>2</sup>-field uncertainty inside TSL (see below ConvF).
- NORM(f)<sub>x,y,z</sub> = NORM<sub>x,y,z</sub> \* 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.
- DCP<sub>x,y,z</sub>**: DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal. DCP does not depend on frequency nor media.
- PAR**: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- A<sub>x,y,z</sub>; B<sub>x,y,z</sub>; C<sub>x,y,z</sub>; D<sub>x,y,z</sub>; VR<sub>x,y,z</sub>**: 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  $f \leq 800$  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 NORM<sub>x,y,z</sub> \* 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  $\pm 50$  MHz to  $\pm 100$  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 NORM<sub>x</sub> (no uncertainty required).



EX3DV4 - SN:7536

June 12, 2023

**Parameters of Probe: EX3DV4 - SN:7536**

**Basic Calibration Parameters**

	Sensor X	Sensor Y	Sensor Z	Unc (k = 2)
Norm ( $\mu V/(V/m)^2$ ) <sup>A</sup>	0.55	0.61	0.65	±10.1%
DGP (mV) <sup>B</sup>	97.3	97.6	98.1	±4.7%

**Calibration Results for Modulation Response**

UID	Communication System Name		A dB	B dB $\sqrt{\mu V}$	C	D dB	VR mV	Max dev.	Max Unc <sup>E</sup> k = 2
10351	CW	X	0.00	0.00	1.00	0.00	172.0	±3.3%	±4.7%
		Y	0.00	0.00	1.00		156.0		
		Z	0.00	0.00	1.00		163.5		
10352	Pulse Waveform (200Hz, 10%)	X	3.65	69.60	11.91	10.00	60.0	±3.6%	±9.6%
		Y	20.00	89.11	19.07		60.0		
		Z	2.53	85.18	9.75		60.0		
10353	Pulse Waveform (200Hz, 20%)	X	3.67	71.17	11.63	6.99	80.0	±2.4%	±9.6%
		Y	20.00	95.68	18.67		80.0		
		Z	1.74	63.98	8.49		80.0		
10354	Pulse Waveform (200Hz, 40%)	X	5.31	78.53	12.84	3.98	95.0	±1.4%	±9.6%
		Y	20.00	90.71	17.24		95.0		
		Z	1.68	63.28	7.50		95.0		
10355	Pulse Waveform (200Hz, 60%)	X	7.99	72.59	10.20	2.22	120.0	±1.0%	±9.6%
		Y	20.00	87.61	14.55		120.0		
		Z	0.61	62.35	6.59		120.0		
10387	QPSK Waveform, 1 MHz	X	1.61	65.65	14.53	1.00	150.0	±2.9%	±9.6%
		Y	1.49	64.98	13.78		150.0		
		Z	1.53	65.01	14.06		150.0		
10388	QPSK Waveform, 15 MHz	X	2.17	67.52	15.36	0.00	150.0	±1.1%	±9.6%
		Y	2.02	66.66	14.73		150.0		
		Z	2.04	66.69	14.85		150.0		
10395	64-QAM Waveform, 100 kHz	X	2.65	68.86	18.11	3.01	150.0	±0.8%	±9.6%
		Y	2.57	68.29	17.88		150.0		
		Z	2.87	70.68	18.98		150.0		
10399	64-QAM Waveform, 40 MHz	X	3.49	66.95	15.65	0.00	150.0	±2.3%	±9.6%
		Y	3.40	66.61	15.34		150.0		
		Z	3.39	66.48	15.35		150.0		
10414	WLAN CCDF, 64-QAM, 40 MHz	X	4.88	65.63	15.55	0.00	150.0	±4.3%	±9.6%
		Y	4.79	65.54	15.39		150.0		
		Z	4.77	65.36	15.33		150.0		

Note: For details on UID parameters see Appendix

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

<sup>A</sup> The uncertainties of Norm X,Y,Z do not affect the E<sup>2</sup>-field uncertainty inside TSV. (See Pages 5 to 7);  
<sup>B</sup> Localization parameter uncertainty for maximum specified field strength;  
<sup>E</sup> Uncertainty is determined using the maximum deviation from linear response applying rectangular distribution and is expressed for the square of the field value



EX3DV4 - SN:7536

June 12, 2023

**Parameters of Probe: EX3DV4 - SM:7536**

**Sensor Model Parameters**

	C1 IF	C2 fP	$\kappa$ V <sup>-1</sup>	T1 msV <sup>-2</sup>	T2 msV <sup>-1</sup>	T3 ms	T4 V <sup>-2</sup>	T5 V <sup>-1</sup>	T6
x	45.3	345.75	36.79	4.26	0.00	5.03	0.48	0.34	1.01
y	41.5	314.76	36.30	4.37	0.00	5.09	0.26	0.38	1.01
z	42.4	319.51	35.93	4.54	0.00	4.99	1.51	0.15	1.01

**Other Probe Parameters**

Sensor Arrangement	Triangular
Connector Angle	-161.6°
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	9 mm
Tip Diameter	2.5 mm
Probe Tip to Sensor X Calibration Point	1 mm
Probe Tip to Sensor Y Calibration Point	1 mm
Probe Tip to Sensor Z Calibration Point	1 mm
Recommended Measurement Distance from Surface	1.4 mm

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



EX3DV4 - SN:7536

June 12, 2023

**Parameters of Probe: EX3DV4 - SN:7536**

**Calibration Parameter Determined in Head Tissue Simulating Media**

f (MHz) <sup>C</sup>	Relative Permittivity <sup>E</sup>	Conductivity <sup>F</sup> (S/m)	ConvF X	ConvF Y	ConvF Z	Alpha <sup>G</sup>	Depth <sup>G</sup> (mm)	Unc (k = 2)
128	52.8	0.76	15.23	15.23	15.23	0.00	1.90	±13.3%
450	43.5	0.87	12.05	12.05	12.05	0.16	1.50	±13.3%
750	41.9	0.89	11.18	11.18	11.18	0.59	0.80	±12.0%
835	41.5	0.90	10.77	10.77	10.77	0.48	0.91	±12.0%
900	41.5	0.97	10.52	10.52	10.52	0.48	0.80	±12.0%
1300	40.8	1.14	9.59	9.59	9.59	0.48	0.80	±12.0%
1450	40.5	1.20	9.27	9.27	9.27	0.45	0.80	±12.0%
1640	40.2	1.31	9.14	9.14	9.14	0.42	0.86	±12.0%
1750	40.1	1.37	9.10	9.10	9.10	0.35	0.86	±12.0%
1810	40.0	1.40	8.81	8.81	8.81	0.36	0.86	±12.0%
1900	40.0	1.40	8.70	8.70	8.70	0.34	0.89	±12.0%
2000	40.0	1.40	8.61	8.61	8.61	0.36	0.86	±12.0%
2100	39.8	1.49	8.53	8.53	8.53	0.33	0.86	±12.0%
2300	39.5	1.67	8.12	8.12	8.12	0.36	0.90	±12.0%
2450	39.2	1.80	7.78	7.78	7.78	0.39	0.90	±12.0%
2600	39.0	1.96	7.52	7.52	7.52	0.41	0.90	±12.0%
3300	38.2	2.71	7.13	7.13	7.13	0.30	1.35	±14.0%
3500	37.9	2.91	7.07	7.07	7.07	0.30	1.35	±14.0%
3700	37.7	3.12	7.05	7.05	7.05	0.35	1.35	±14.0%
4100	37.2	3.53	6.61	6.61	6.61	0.40	1.60	±14.0%
5200	36.0	4.66	5.63	5.63	5.63	0.40	1.80	±14.0%
5300	35.9	4.76	5.47	5.47	5.47	0.40	1.80	±14.0%
5500	35.6	4.96	5.10	5.10	5.10	0.40	1.80	±14.0%
5600	35.5	5.07	4.90	4.90	4.90	0.40	1.80	±14.0%
5800	35.3	5.27	4.88	4.88	4.88	0.40	1.80	±14.0%

<sup>C</sup> Frequency validity above 300 MHz or  $\pm 100$  MHz only applies for CAS<sup>SM</sup> v4.4 and higher (see Page 2), else it is restricted to  $\pm 50$  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  $\pm 10$ , 25, 43, 50 and 70 MHz for ConvF assessments at 30, 64, 100, 150 and 220 MHz respectively. Validity of ConvF assessed at 6 MHz is 4-8 MHz, and ConvF assessed at 13 MHz is 9-19 MHz. Above 5 GHz frequency validity can be extended to  $\pm 110$  MHz.

<sup>E</sup> The probes are calibrated using tissue simulating liquids (TSL) that deviate for  $\alpha$  and  $\mu$  by less than  $\pm 5\%$  from the target values (typically better than  $\pm 3\%$ ) and are valid for TSL with deviations of up to  $\pm 10\%$ . If TSL with deviations from the target of less than  $\pm 5\%$  are used, the calibration uncertainties are  $\pm 11\%$  for 0.7-3 GHz and  $\pm 3.1\%$  for 3-6 GHz.

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



EX3DV4 - SN:7536

June 12, 2023

**Parameters of Probe: EX3DV4 - SN:7536**

**Calibration Parameter Determined in Body Tissue Simulating Media**

f (MHz) <sup>C</sup>	Relative Permittivity <sup>F</sup>	Conductivity <sup>F</sup> (S/m)	ConvF X	ConvF Y	ConvF Z	Alpha <sup>G</sup>	Depth <sup>G</sup> (mm)	Unc (k = 2)
450	56.7	0.94	12.29	12.29	12.29	0.11	1.20	±13.3%
750	55.5	0.96	10.90	10.90	10.90	0.47	0.87	±12.0%
835	55.2	0.97	10.67	10.67	10.67	0.40	0.84	±12.0%
900	55.0	1.05	10.44	10.44	10.44	0.46	0.84	±12.0%
1300	54.3	1.23	9.36	9.36	9.36	0.20	1.59	±12.0%
1450	54.0	1.30	9.03	9.03	9.03	0.35	0.80	±12.0%
1640	53.7	1.42	8.92	8.92	8.92	0.37	0.86	±12.0%
1750	53.4	1.49	8.87	8.87	8.87	0.36	0.86	±12.0%
1810	53.3	1.52	8.72	8.72	8.72	0.39	0.86	±12.0%
1900	53.3	1.52	8.58	8.58	8.58	0.34	0.66	±12.0%
2000	53.3	1.52	8.47	8.47	8.47	0.40	0.69	±12.0%
2100	53.2	1.62	8.45	8.45	8.45	0.24	0.69	±12.0%
2300	52.9	1.81	8.10	8.10	8.10	0.33	0.90	±12.0%
2450	52.7	1.95	7.77	7.77	7.77	0.32	0.90	±12.0%
2600	52.5	2.16	7.64	7.64	7.64	0.26	0.90	±12.0%
3300	51.8	3.08	6.57	6.57	6.57	0.40	1.35	±14.0%
3500	51.3	3.31	6.54	6.54	6.54	0.40	1.35	±14.0%
3700	51.0	3.55	6.43	6.43	6.43	0.40	1.35	±14.0%
4100	50.5	4.01	5.90	5.90	5.90	0.40	1.70	±14.0%
5200	49.0	5.30	5.04	5.04	5.04	0.50	1.90	±14.0%
5300	48.9	5.42	4.94	4.94	4.94	0.50	1.90	±14.0%
5500	48.6	5.65	4.54	4.54	4.54	0.50	1.90	±14.0%
5600	48.5	5.77	4.41	4.41	4.41	0.50	1.90	±14.0%
5800	48.2	6.00	4.37	4.37	4.37	0.50	1.90	±14.0%

<sup>C</sup> Frequency validity above 300 MHz of ±100 MHz only applies for DASY 4.4 and higher (see Page 2), else this 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. Validity of ConvF assessed at 6 MHz is 4-8 MHz and ConvF assessed at 13 MHz is 9-19 MHz. Above 5 GHz frequency validity can be extended to ±10 MHz.

<sup>F</sup> The probes are calibrated using tissue simulating liquids (TSL) that deviate for ε and σ by less than ±5% from the target values (typically better than ±3%) and are valid for TSL with deviations of up to ±10%. If TSL with deviations from the target of less than ±5% are used, the calibration uncertainties are ±0.11 1% for 0.7 - 3 GHz and ±0.1% for 3 - 6 GHz.

<sup>G</sup> Alpha/Depth are determined during calibration. SPFG warrants that the remaining deviation due to the boundary effect after compensation is always less than ±1% for frequencies below 3.5 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:7536

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**Parameters of Probe: EX3DV4 - SN:7536**

**Calibration Parameter Determined In Head Tissue Simulating Media**

f (MHz) <sup>C</sup>	Relative Permittivity <sup>F</sup>	Conductivity <sup>F</sup> (S/m)	ConvF X	ConvF Y	ConvF Z	Alpha <sup>G</sup>	Depth <sup>G</sup> (mm)	Unc (k <sub>z</sub> )
6500	34.5	6.07	5.40	5.40	5.40	0.20	2.50	±18.8%

<sup>C</sup> Frequency valid for 5.5 GHz to 60 MHz, 700 MHz, and ±200 MHz at or above 7 GHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

<sup>F</sup> The probes are calibrated using tissue simulating liquids (TSL) that deviate for  $\epsilon'$  and  $\sigma$  by less than ±10% from the target values (typically better than ±6%) and are valid for TSL with deviations as large as ±10%.

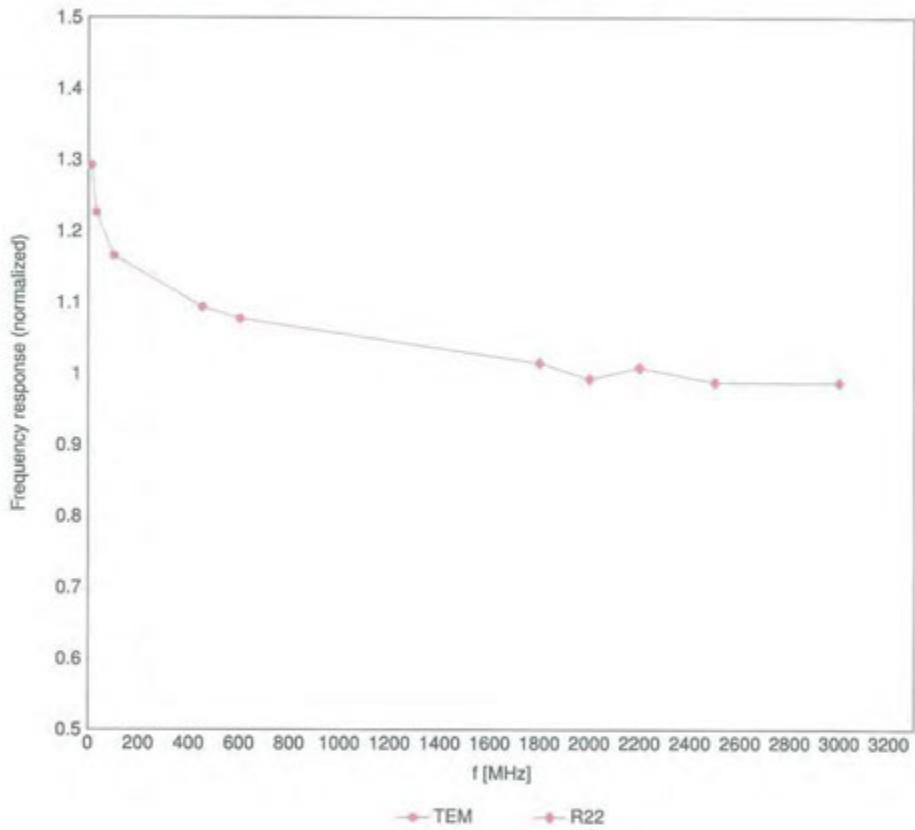
<sup>G</sup> Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ±1% for frequencies below 3 GHz, below ±2% for frequencies between 3–6 GHz, and below ±4% for frequencies between 6–13 GHz at any distance larger than half the probe tip diameter from the boundary.



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### Frequency Response of E-Field (TEM-Cell:ifi110 EXX, Waveguide:R22)

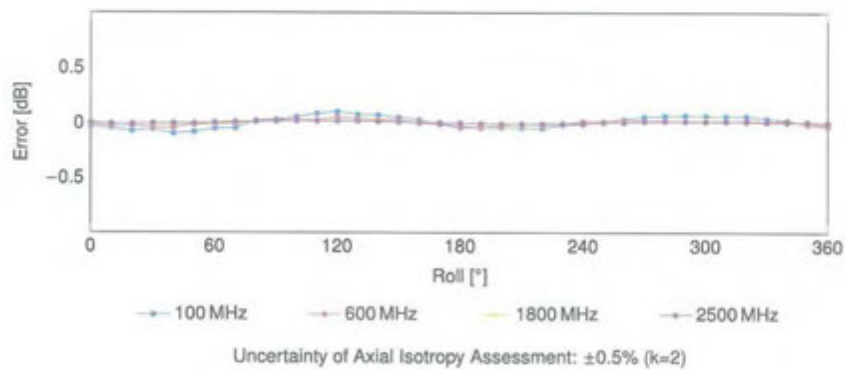
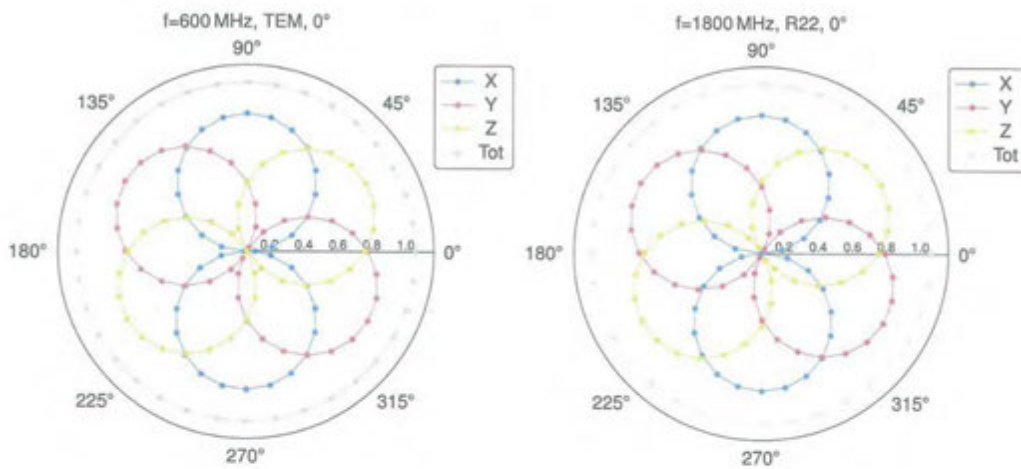


Uncertainty of Frequency Response of E-field:  $\pm 6.3\%$  (k=2)

EX3DV4 - SN:7536

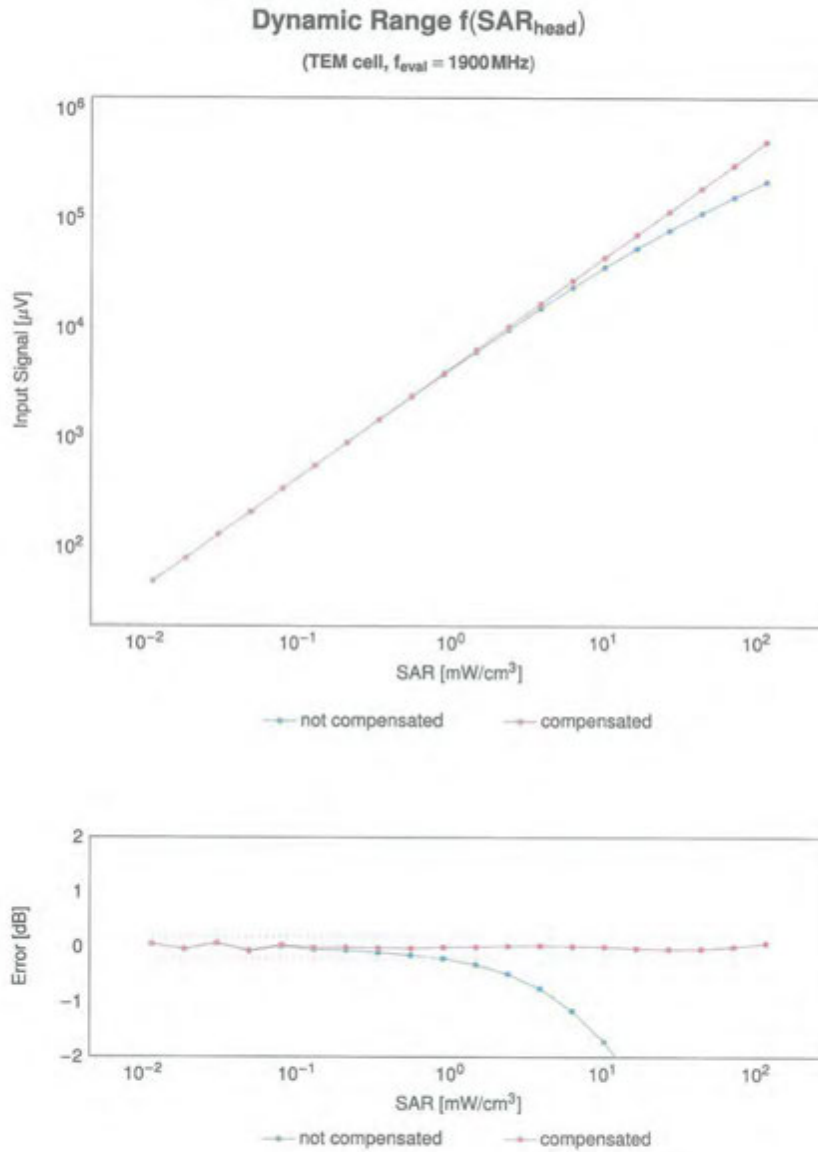
June 12, 2023

Receiving Pattern ( $\phi$ ),  $\theta = 0^\circ$



EX3DV4 - SN:7536

June 12, 2023

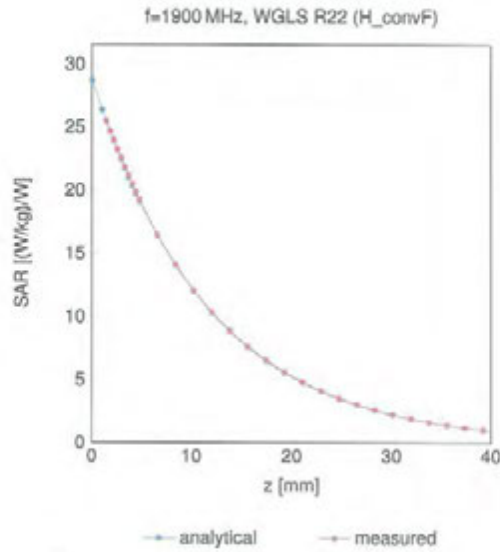


Uncertainty of Linearity Assessment:  $\pm 0.6\%$  (k=2)

EX3DV4 - SN:7536

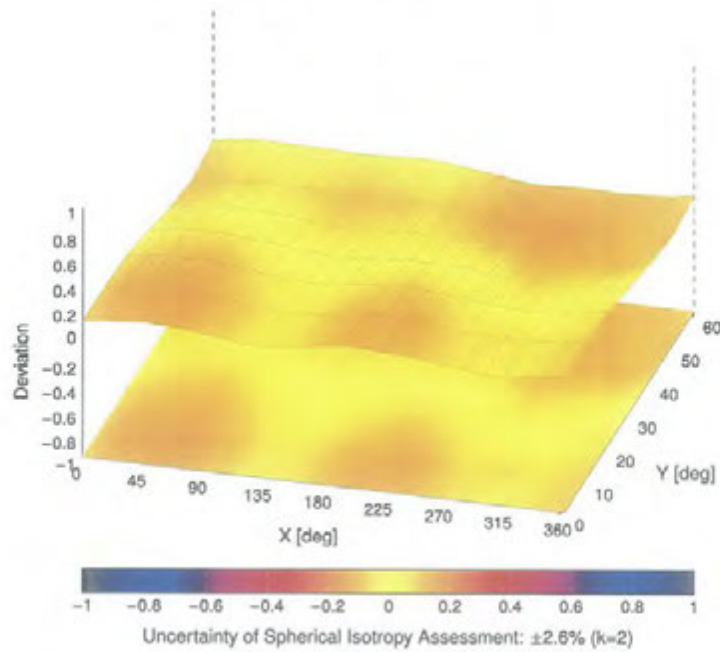
June 12, 2023

### Conversion Factor Assessment



### Deviation from Isotropy in Liquid

Error ( $\phi, \theta$ ), f = 900 MHz





LXG.0V4 - SN:7536

June 12, 2023

**Appendix: Modulation Calibration Parameters**

UID	Rev	Communication System Name	Group	PAR (dB)	Unc <sup>k</sup> k = 2
0		CW	CW	0.00	±4.7
10010	CAB	SAR Validation (Square, 100 ms, 10 ms)	Test	10.00	-9.6
10011	CAC	UMTS-FDD (WCDMA)	WCDMA	7.01	±9.6
10012	CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1Mbps)	WLAN	1.87	±9.6
10013	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6Mbps)	WLAN	9.46	±9.6
10021	CAC	GSM-FDD (TDMA, GMSK)	GSM	9.29	±9.6
10023	CAC	GPRS-FDD (TDMA, GMSK, TN 0)	GSM	9.57	±9.6
10024	CAC	GPRS-FDD (TDMA, GMSK, TN 0-1)	GSM	6.56	±9.6
10025	CAC	EDGE-FDD (TDMA, 8PSK, TN 0)	GSM	12.62	±9.6
10026	CAC	EDGE-FDD (TDMA, 8PSK, TN 0-1)	GSM	9.55	±9.6
10027	CAC	GPRS-FDD (TDMA, GMSK, TN 0-1-2)	GSM	4.60	±9.6
10028	CAC	GPRS-FDD (TDMA, GMSK, TN 0-1-2-3)	GSM	3.54	±9.6
10029	CAC	EDGE-FDD (TDMA, 8PSK, TN 0-1-2)	GSM	7.78	±9.6
10030	CAA	IEEE 802.15.1 Bluetooth (GFSK, DH1)	Bluetooth	5.30	±9.6
10031	CAA	IEEE 802.15.1 Bluetooth (GFSK, DH3)	Bluetooth	1.87	±9.6
10032	CAA	IEEE 802.15.1 Bluetooth (GFSK, DH5)	Bluetooth	1.16	±9.6
10033	CAA	IEEE 802.15.1 Bluetooth (PI4-DQPSK, DH1)	Bluetooth	7.74	±9.6
10034	CAA	IEEE 802.15.1 Bluetooth (PI4-DQPSK, DH3)	Bluetooth	4.53	±9.6
10035	CAA	IEEE 802.15.1 Bluetooth (PI4-DQPSK, DH5)	Bluetooth	3.83	±9.6
10036	CAA	IEEE 802.15.1 Bluetooth (B-DPSK, DH1)	Bluetooth	8.07	±9.6
10037	CAA	IEEE 802.15.1 Bluetooth (B-DPSK, DH3)	Bluetooth	4.77	±9.6
10038	CAA	IEEE 802.15.1 Bluetooth (B-DPSK, DH5)	Bluetooth	4.70	±9.6
10039	CAB	CDMA2000 (1xRTT, RC1)	CDMA2000	4.57	±9.6
10042	CAB	IS-54/IS-136 FDD (TDMA-FDM, PI4-DQPSK, Fullrate)	AMPS	7.78	±9.6
10044	CAA	IS-97/IS-136 FDD (TDMA-FDM, FM)	AMPS	0.00	±9.6
10048	CAA	DECT (TDD, TDMA-FDM, GFSK, Full Slot, 84)	DECT	11.60	±9.6
10049	CAA	DECT (TDD, TDMA-FDM, GFSK, Double Slot, 12)	DECT	10.79	±9.6
10056	CAA	UMTS-TDD (TD-SCDMA, 1.23Mbps)	TD-SCDMA	11.01	±9.6
10058	CAC	EDGE-FDD (TDMA, 8PSK, TN 0-1-2-3)	GSM	6.52	±9.6
10059	CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 2Mbps)	WLAN	2.12	±9.6
10060	CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5Mbps)	WLAN	2.83	±9.6
10061	CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 11Mbps)	WLAN	3.53	±9.6
10062	CAD	IEEE 802.11g WiFi 2.4 GHz (OFDM, 6Mbps)	WLAN	9.58	±9.6
10063	CAD	IEEE 802.11g WiFi 2.4 GHz (OFDM, 9Mbps)	WLAN	5.63	±9.6
10064	CAD	IEEE 802.11g WiFi 2.4 GHz (OFDM, 12Mbps)	WLAN	3.00	±9.6
10065	CAD	IEEE 802.11g WiFi 2.4 GHz (OFDM, 18Mbps)	WLAN	9.00	±9.6
10066	CAD	IEEE 802.11g WiFi 2.4 GHz (OFDM, 24Mbps)	WLAN	3.28	±9.6
10067	CAD	IEEE 802.11g WiFi 2.4 GHz (OFDM, 36Mbps)	WLAN	10.12	±9.6
10068	CAD	IEEE 802.11g WiFi 2.4 GHz (OFDM, 48Mbps)	WLAN	10.24	±9.6
10069	CAD	IEEE 802.11g WiFi 2.4 GHz (OFDM, 54Mbps)	WLAN	10.56	±9.6
10071	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 9Mbps)	WLAN	9.83	±9.6
10072	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 12Mbps)	WLAN	5.62	±9.6
10073	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 18Mbps)	WLAN	9.94	±9.6
10074	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 24Mbps)	WLAN	10.30	±9.6
10075	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 36Mbps)	WLAN	10.77	±9.6
10076	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 48Mbps)	WLAN	10.94	±9.6
10077	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 54Mbps)	WLAN	11.00	±9.6
10081	CAB	CDMA2000 (1xRTT, RC3)	CDMA2000	3.97	±9.6
10082	CAB	IS-54/IS-136 FDD (TDMA-FDM, PI4-DQPSK, Fullrate)	AMPS	4.77	±9.6
10090	CAC	GPRS-FDD (TDMA, GMSK, TN 0-4)	GSM	6.56	±9.6
10097	CAC	UMTS-FDD (HSDPA)	WCDMA	3.38	±9.6
10098	CAC	UMTS-FDD (HSUPA, Subtest 2)	WCDMA	3.98	±9.6
10099	CAC	EDGE-FDD (TDMA, 8PSK, TN 0-4)	GSM	3.55	±9.6
10100	CAC	LTE-FDD (SC-FDMA, 100% RB, 20MHz, QPSK)	LTE-FDD	5.67	±9.6
10101	CAC	LTE-FDD (SC-FDMA, 100% RB, 20MHz, 16-QAM)	LTE-FDD	6.42	±9.6
10102	CAC	LTE-FDD (SC-FDMA, 100% RB, 20MHz, 64-QAM)	LTE-FDD	6.60	±9.6
10103	CAC	LTE-TDD (SC-FDMA, 100% RB, 20MHz, QPSK)	LTE-TDD	9.25	±9.6
10104	CAC	LTE-TDD (SC-FDMA, 100% RB, 20MHz, 16-QAM)	LTE-TDD	9.57	±9.6
10105	CAC	LTE-TDD (SC-FDMA, 100% RB, 20MHz, 64-QAM)	LTE-TDD	10.07	±9.6
10108	CAC	LTE-FDD (SC-FDMA, 100% RB, 5MHz, QPSK)	LTE-FDD	3.80	±9.6
10109	CAC	LTE-FDD (SC-FDMA, 100% RB, 5MHz, 16-QAM)	LTE-FDD	6.43	±9.6
10110	CAC	LTE-FDD (SC-FDMA, 100% RB, 5MHz, QPSK)	LTE-FDD	3.75	±9.6
10111	CAC	LTE-FDD (SC-FDMA, 100% RB, 5MHz, 16-QAM)	LTE-FDD	6.44	±9.6



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UID	Rev	Communication System Name	Group	PAR (dB)	Unc <sup>2</sup> # = 2
10112	CAH	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM)	LTE-FDD	5.59	±9.6
10113	CAH	LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM)	LTE-FDD	6.02	±9.6
10114	CAO	IEEE 802.11n (HT Green fld, 3.5 Mbps, BPSK)	WLAN	8.10	±9.6
10115	CAD	IEEE 802.11n (HT Green fld, 6.5 Mbps, 64-QAM)	WLAN	8.46	±9.6
10116	CAO	IEEE 802.11n (HT Green fld, 13.5 Mbps, 64-QAM)	WLAN	8.15	±9.6
10117	CAD	IEEE 802.11n (HT Mixed, 13.5 Mbps, BPSK)	WLAN	8.07	±9.6
10118	CAO	IEEE 802.11n (HT Mixed, 81 Mbps, 16-QAM)	WLAN	8.59	±9.6
10119	CAO	IEEE 802.11n (HT Mixed, 135 Mbps, 64-QAM)	WLAN	8.13	±9.6
10140	CAF	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM)	LTE-FDD	6.49	±9.6
10141	CAF	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM)	LTE-FDD	6.50	±9.6
10142	CAF	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, QPSK)	LTE-FDD	5.73	±9.6
10143	CAF	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM)	LTE-FDD	6.35	±9.6
10144	CAF	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM)	LTE-FDD	6.65	±9.6
10145	CAG	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK)	LTE-FDD	5.76	±9.6
10146	CAG	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM)	LTE-FDD	6.41	±9.6
10147	CAG	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM)	LTE-FDD	6.72	±9.6
10149	CAF	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM)	LTE-FDD	6.12	±9.6
10150	CAF	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM)	LTE-FDD	6.60	±9.6
10151	CAH	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, QPSK)	LTE-TDD	9.28	±9.6
10152	CAH	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM)	LTE-TDD	9.92	±9.6
10153	CAH	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM)	LTE-TDD	10.05	±9.6
10154	CAH	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, QPSK)	LTE-FDD	6.75	±9.6
10155	CAH	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM)	LTE-FDD	6.43	±9.6
10156	CAH	LTE-FDD (SC-FDMA, 50% RB, 5 MHz, QPSK)	LTE-FDD	5.78	±9.6
10157	CAH	LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM)	LTE-FDD	6.43	±9.6
10158	CAH	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM)	LTE-FDD	6.62	±9.6
10159	CAH	LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM)	LTE-FDD	6.56	±9.6
10160	CAF	LTE-FDD (SC-FDMA, 50% RB, 15 MHz, QPSK)	LTE-FDD	5.82	±9.6
10161	CAF	LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM)	LTE-FDD	5.43	±9.6
10162	CAF	LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM)	LTE-FDD	6.58	±9.6
10165	CAG	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK)	LTE-FDD	5.46	±9.6
10167	CAG	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM)	LTE-FDD	6.21	±9.6
10168	CAG	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM)	LTE-FDD	6.78	±9.6
10169	CAF	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, QPSK)	LTE-FDD	5.71	±9.6
10170	CAF	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM)	LTE-FDD	6.52	±9.6
10171	CAF	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM)	LTE-FDD	6.45	±9.6
10172	CAH	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK)	LTE-TDD	9.21	±9.6
10173	CAH	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM)	LTE-TDD	9.48	±9.6
10174	CAH	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM)	LTE-TDD	10.25	±9.6
10175	CAH	LTE-FDD (SC-FDMA, 1 RB, 13 MHz, QPSK)	LTE-FDD	5.72	±9.6
10176	CAH	LTE-FDD (SC-FDMA, 1 RB, 13 MHz, 16-QAM)	LTE-FDD	6.62	±9.6
10177	CAH	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, QPSK)	LTE-FDD	5.73	±9.6
10178	CAH	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM)	LTE-FDD	6.62	±9.6
10179	CAH	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM)	LTE-FDD	6.50	±9.6
10180	CAH	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM)	LTE-FDD	6.60	±9.6
10181	CAF	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, QPSK)	LTE-FDD	5.72	±9.6
10182	CAF	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	LTE-FDD	6.52	±9.6
10183	AAF	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM)	LTE-FDD	6.50	±9.6
10184	CAF	LTE-FDD (SC-FDMA, 1 RB, 3 MHz, QPSK)	LTE-FDD	5.73	±9.6
10185	CAF	LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM)	LTE-FDD	6.51	±9.6
10186	AAF	LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM)	LTE-FDD	6.50	±9.6
10187	CAG	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK)	LTE-FDD	5.73	±9.6
10188	CAG	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM)	LTE-FDD	6.50	±9.6
10189	AAO	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM)	LTE-FDD	6.50	±9.6
10193	CAD	IEEE 802.11n (HT Greenfield, 6.5 Mbps, BPSK)	WLAN	5.99	±9.6
10194	CAD	IEEE 802.11n (HT Greenfield, 39 Mbps, 16-QAM)	WLAN	8.12	±9.6
10195	CAD	IEEE 802.11n (HT Greenfield, 65 Mbps, 64-QAM)	WLAN	8.21	±9.6
10196	CAD	IEEE 802.11n (HT Mixed, 6.5 Mbps, BPSK)	WLAN	8.11	±9.6
10197	CAD	IEEE 802.11n (HT Mixed, 39 Mbps, 16-QAM)	WLAN	8.13	±9.6
10198	CAD	IEEE 802.11n (HT Mixed, 65 Mbps, 64-QAM)	WLAN	8.27	±9.6
10219	CAD	IEEE 802.11n (HT Mixed, 7.2 Mbps, BPSK)	WLAN	8.03	±9.6
10220	CAD	IEEE 802.11n (HT Mixed, 43.3 Mbps, 16-QAM)	WLAN	8.13	±9.6
10221	CAD	IEEE 802.11n (HT Mixed, 72.2 Mbps, 64-QAM)	WLAN	8.27	±9.6
10222	CAD	IEEE 802.11n (HT Mixed, 15 Mbps, BPSK)	WLAN	8.06	±9.6
10223	CAD	IEEE 802.11n (HT Mixed, 90 Mbps, 16-QAM)	WLAN	8.48	±9.6
10224	CAD	IEEE 802.11n (HT Mixed, 150 Mbps, 64-QAM)	WLAN	8.08	±9.6



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10225	CAC	UMTS-FDD (HSPA+)	WCDMA	5.97	-9.6
10226	CAC	LTE-TDD (SC-FDMA, 1 RB, 1.4MHz, 16-QAM)	LTE-TDD	9.49	-9.6
10227	CAC	LTE-TDD (SC-FDMA, 1 RB, 1.4MHz, 64-QAM)	LTE-TDD	0.26	-9.6
10228	CAC	LTE-TDD (SC-FDMA, 1 RB, 1.4MHz, QPSK)	LTE-TDD	9.22	-9.6
10229	CAE	LTE-TDD (SC-FDMA, 1 RB, 3MHz, 16-QAM)	LTE-TDD	9.48	-9.6
10230	CAF	LTE-TDD (SC-FDMA, 1 RB, 3MHz, 64-QAM)	LTE-TDD	0.25	-9.6
10231	CAE	LTE-TDD (SC-FDMA, 1 RB, 3MHz, QPSK)	LTE-TDD	9.19	-9.6
10232	CAH	LTE-TDD (SC-FDMA, 1 RB, 5MHz, 16-QAM)	LTE-TDD	9.49	-9.6
10233	CAH	LTE-TDD (SC-FDMA, 1 RB, 5MHz, 64-QAM)	LTE-TDD	0.25	-9.6
10234	CAH	LTE-TDD (SC-FDMA, 1 RB, 5MHz, QPSK)	LTE-TDD	9.21	-9.6
10235	CAH	LTE-TDD (SC-FDMA, 1 RB, 10MHz, 16-QAM)	LTE-TDD	9.48	-9.6
10236	CAH	LTE-TDD (SC-FDMA, 1 RB, 10MHz, 64-QAM)	LTE-TDD	0.25	-9.6
10237	CAH	LTE-TDD (SC-FDMA, 1 RB, 10MHz, QPSK)	LTE-TDD	9.21	-9.6
10238	CAG	LTE-TDD (SC-FDMA, 1 RB, 15MHz, 16-QAM)	LTE-TDD	9.48	-9.6
10239	CAG	LTE-TDD (SC-FDMA, 1 RB, 15MHz, 64-QAM)	LTE-TDD	0.25	-9.6
10240	CAG	LTE-TDD (SC-FDMA, 1 RB, 15MHz, QPSK)	LTE-TDD	9.21	-9.6
10241	CAC	LTE-TDD (SC-FDMA, 50% RB, 1.4MHz, 16-QAM)	LTE-TDD	9.82	-9.6
10242	CAC	LTE-TDD (SC-FDMA, 50% RB, 1.4MHz, 64-QAM)	LTE-TDD	9.86	-9.6
10243	CAC	LTE-TDD (SC-FDMA, 50% RB, 1.4MHz, QPSK)	LTE-TDD	9.66	-9.6
10244	CAE	LTE-TDD (SC-FDMA, 50% RB, 3MHz, 16-QAM)	LTE-TDD	10.06	-9.6
10245	CAE	LTE-TDD (SC-FDMA, 50% RB, 3MHz, 64-QAM)	LTE-TDD	10.08	-9.6
10246	CAE	LTE-TDD (SC-FDMA, 50% RB, 3MHz, QPSK)	LTE-TDD	9.90	-9.6
10247	CAH	LTE-TDD (SC-FDMA, 50% RB, 5MHz, 16-QAM)	LTE-TDD	9.57	-9.6
10248	CAH	LTE-TDD (SC-FDMA, 50% RB, 5MHz, 64-QAM)	LTE-TDD	10.05	-9.6
10249	CAH	LTE-TDD (SC-FDMA, 50% RB, 5MHz, QPSK)	LTE-TDD	9.29	-9.6
10250	CAH	LTE-TDD (SC-FDMA, 50% RB, 10MHz, 16-QAM)	LTE-TDD	9.81	-9.6
10251	CAH	LTE-TDD (SC-FDMA, 50% RB, 10MHz, 64-QAM)	LTE-TDD	10.17	-9.6
10252	CAH	LTE-TDD (SC-FDMA, 50% RB, 10MHz, QPSK)	LTE-TDD	9.24	-9.6
10253	CAG	LTE-TDD (SC-FDMA, 50% RB, 15MHz, 16-QAM)	LTE-TDD	9.90	-9.6
10254	CAG	LTE-TDD (SC-FDMA, 50% RB, 15MHz, 64-QAM)	LTE-TDD	10.14	-9.6
10255	CAG	LTE-TDD (SC-FDMA, 50% RB, 15MHz, QPSK)	LTE-TDD	9.20	-9.6
10256	CAC	LTE-TDD (SC-FDMA, 100% RB, 1.4MHz, 16-QAM)	LTE-TDD	5.96	-9.6
10257	CAC	LTE-TDD (SC-FDMA, 100% RB, 1.4MHz, 64-QAM)	LTE-TDD	10.09	-9.6
10258	CAC	LTE-TDD (SC-FDMA, 100% RB, 1.4MHz, QPSK)	LTE-TDD	9.34	-9.6
10259	CAE	LTE-TDD (SC-FDMA, 100% RB, 3MHz, 16-QAM)	LTE-TDD	9.99	-9.6
10260	CAE	LTE-TDD (SC-FDMA, 100% RB, 3MHz, 64-QAM)	LTE-TDD	9.97	-9.6
10261	CAE	LTE-TDD (SC-FDMA, 100% RB, 3MHz, QPSK)	LTE-TDD	9.24	-9.6
10262	CAH	LTE-TDD (SC-FDMA, 100% RB, 5MHz, 16-QAM)	LTE-TDD	9.83	-9.6
10263	CAH	LTE-TDD (SC-FDMA, 100% RB, 5MHz, 64-QAM)	LTE-TDD	10.18	-9.6
10264	CAH	LTE-TDD (SC-FDMA, 100% RB, 5MHz, QPSK)	LTE-TDD	9.23	-9.6
10265	CAH	LTE-TDD (SC-FDMA, 100% RB, 10MHz, 16-QAM)	LTE-TDD	9.92	-9.6
10266	CAH	LTE-TDD (SC-FDMA, 100% RB, 10MHz, 64-QAM)	LTE-TDD	10.07	-9.6
10267	CAH	LTE-TDD (SC-FDMA, 100% RB, 10MHz, QPSK)	LTE-TDD	9.23	-9.6
10268	CAG	LTE-TDD (SC-FDMA, 100% RB, 15MHz, 16-QAM)	LTE-TDD	10.06	-9.6
10269	CAG	LTE-TDD (SC-FDMA, 100% RB, 15MHz, 64-QAM)	LTE-TDD	10.13	-9.6
10270	CAG	LTE-TDD (SC-FDMA, 100% RB, 15MHz, QPSK)	LTE-TDD	9.58	-9.6
10274	CAC	JM'S FDD (HSPA, Subnet 5, 3GPP Rel8-10)	WCDMA	4.87	-9.6
10275	CAC	JM'S FDD (HSPA, Subnet 5, 3GPP Rel8-10)	WCDMA	3.96	-9.6
10277	CAA	PHS (QPSK)	PHS	11.81	-9.6
10278	CAA	PHS (QPSK, BW 634 MHz, Rn c1 1.5)	PHS	11.81	-9.6
10279	CAA	PHS (QPSK, BW 634 MHz, Rn c1 1.38)	PHS	12.18	-9.6
10290	AAB	CDMA2000, RC1, SQ55, Full Rate	CDMA2000	3.91	-9.6
10291	AAB	CDMA2000, RC3, SQ55, Full Rate	CDMA2000	3.46	-9.6
10292	AAB	CDMA2000, RC3, SQ32, Full Rate	CDMA2000	3.39	-9.6
10293	AAB	CDMA2000, RC3, SQ3, Full Rate	CDMA2000	3.50	-9.6
10295	AAB	CDMA2000, RC1, SQ1, 1/8th Rate 25.4	CDMA2000	12.49	-9.6
10297	AAB	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, QPSK)	LTE-FDD	5.67	-9.6
10298	AAB	LTE-FDD (SC-FDMA, 50% RB, 3 MHz, QPSK)	LTE-FDD	5.72	-9.6
10299	AAB	LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM)	LTE-FDD	6.39	-9.6
10300	AAB	LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM)	LTE-FDD	6.60	-9.6
10301	AAA	IEEE 802.16e WMAX (29 18, 5ms, 10 MHz, QPSK, PLSC)	W MAX	12.03	-9.6
10302	AAA	IEEE 802.16e WMAX (29 18, 5ms, 10 MHz, QPSK, PLSC, 3 CTRL symbols)	W MAX	12.57	-9.6
10303	AAA	IEEE 802.16e WMAX (29 15, 5ms, 10 MHz, 64-QAM, PUSC)	W MAX	12.52	-9.6
10304	AAA	IEEE 802.16e WMAX (29 18, 5ms, 10 MHz, 64-QAM, PUSC)	W MAX	11.86	-9.6
10305	AAA	IEEE 802.16e WMAX (29 15, 10ms, 10 MHz, 64-QAM, PUSC, 15 symbols)	W MAX	15.24	-9.6
10306	AJA	IEEE 802.16e WMAX (29 18, 10ms, 10 MHz, 64-QAM, PUSC, 18 symbols)	W MAX	14.67	-9.6



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UID	Rev	Communication System Name	Group	PAR (dB)	Unc <sup>1</sup> # = 2
10307	AAA	IEEE 802.16e WiMAX (9.18, 10ms, 10MHz, QPSK, PUSC, 18 symbols)	WiMAX	14.49	±9.6
10308	AUA	IEEE 802.16e WiMAX (9.18, 10ms, 10MHz, 16QAM, PUSC)	WiMAX	14.46	±9.6
10309	AAA	IEEE 802.16e WiMAX (9.18, 10ms, 10MHz, 16QAM, AMC 2x3, 18 symbols)	WiMAX	14.58	±9.6
10310	AUA	IEEE 802.16e WiMAX (9.18, 10ms, 10MHz, QPSK, AMC 2x3, 18 symbols)	WiMAX	14.57	±9.5
10311	AAE	LTE-FDD (SC-FDMA, 100% RB, 15MHz, QPSK)	LTE-FDD	8.08	±9.6
10313	AAA	ISDN 1.3	ISDN	10.51	±9.6
10314	AAA	ISDN 1.6	ISDN	13.48	±9.6
10315	AAE	IEEE 802.11b WiFi 2.4GHz (DSSS, 1 Mbps, 99pc duty cycle)	WLAN	1.71	±9.6
10316	AAE	IEEE 802.11g WiFi 2.4GHz (ERP-OFDM, 6Mbps, 99pc duty cycle)	WLAN	8.36	±9.6
10317	AAE	IEEE 802.11a WiFi 5GHz (OFDM, 6Mbps, 99pc duty cycle)	WLAN	8.36	±9.6
10352	AUA	Pulse Waveform (20MHz, 10%)	Generic	13.00	±9.6
10353	AAA	Pulse Waveform (20MHz, 20%)	Generic	8.99	±9.5
10354	AUA	Pulse Waveform (20MHz, 40%)	Generic	3.58	±9.5
10355	AAA	Pulse Waveform (20MHz, 60%)	Generic	2.22	±9.6
10356	AAA	Pulse Waveform (20MHz, 80%)	Generic	0.97	±9.6
10387	AAA	QPSK Waveform 1MHz	Generic	5.10	±9.6
10388	AAA	QPSK Waveform 10MHz	Generic	5.22	±9.6
10396	AAA	64-QAM Waveform 100kHz	Generic	6.27	±9.6
10399	AAA	64-QAM Waveform 40MHz	Generic	6.27	±9.6
10400	AAC	IEEE 802.11ac WiFi (20MHz, 64-QAM, 99pc duty cycle)	WLAN	8.37	±9.6
10401	AAE	IEEE 802.11ac WiFi (40MHz, 64-QAM, 99pc duty cycle)	WLAN	8.60	±9.6
10402	AAE	IEEE 802.11ac WiFi (80MHz, 64-QAM, 99pc duty cycle)	WLAN	8.53	±9.6
10403	AAB	CDMA2000 (1xEV-DO, Rev. 0)	CDMA2000	3.76	±9.0
10404	AAB	CDMA2000 (1xEV-DO, Rev. A)	CDMA2000	3.77	±9.6
10406	AAE	CDMA2000, RC3, SC32, SCH0, Full Rate	CDMA2000	5.72	±9.0
10410	AAH	LTE-TDD (SC-FDMA, 1 RB, 10MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.82	±9.6
10414	AAA	WLAN CCDF 64-QAM, 40MHz	Generic	8.54	±9.6
10415	AAA	IEEE 802.11b WiFi 2.4GHz (DSSS, 1 Mbps, 99pc duty cycle)	WLAN	1.54	±9.6
10416	AAA	IEEE 802.11g WiFi 2.4GHz (ERP-OFDM, 6 Mbps, 99pc duty cycle)	WLAN	8.23	±9.6
10417	AAE	IEEE 802.11a WiFi 5GHz (OFDM, 6 Mbps, 99pc duty cycle)	WLAN	8.23	±9.6
10418	AAE	IEEE 802.11g WiFi 2.4GHz (DSSS-OFDM, 6 Mbps, 99pc duty cycle, Long preamble)	WLAN	9.14	±9.6
10419	AAA	IEEE 802.11g WiFi 2.4GHz (DSSS-OFDM, 6 Mbps, 99pc duty cycle, Short preamble)	WLAN	8.19	±9.6
10422	AAC	IEEE 802.11n (HT) Greenfield, 7.2Mbps, SPSP	WLAN	9.32	±9.6
10423	AAC	IEEE 802.11n (HT) Greenfield, 43.3Mbps, 16-QAM	WLAN	8.67	±9.6
10424	AAC	IEEE 802.11n (HT) Greenfield, 72.3Mbps, 64-QAM	WLAN	8.40	±9.6
10425	AAC	IEEE 802.11n (HT) Greenfield, 15Mbps, BPSK	WLAN	8.41	±9.6
10426	AAC	IEEE 802.11n (HT) Greenfield, 30Mbps, 16-QAM	WLAN	8.46	±9.6
10427	AAC	IEEE 802.11n (HT) Greenfield, 15Mbps, 64-QAM	WLAN	8.41	±9.6
10430	AAE	LTE-FDD (OFDMA, 5MHz, E-TM 3.1)	LTE-FDD	8.28	±9.6
10431	AAE	LTE-FDD (OFDMA, 10MHz, E-TM 3.1)	LTE-FDD	8.38	±9.6
10432	AAE	LTE-FDD (OFDMA, 15MHz, E-TM 3.1)	LTE-FDD	8.34	±9.6
10433	AAE	LTE-FDD (OFDMA, 20MHz, E-TM 3.1)	LTE-FDD	8.34	±9.6
10434	AAE	W-CDMA (BS Test Model 1, 64-QPSK)	WCDMA	8.60	±9.6
10435	AAE	LTE-TDD (SC-FDMA, 1 RB, 20MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.82	±9.6
10447	AAE	LTE-FDD (OFDMA, 5 MHz, E-TM 3.1, Clipping 44%)	LTE-FDD	7.56	±9.6
10448	AAE	LTE-FDD (OFDMA, 10 MHz, E-TM 3.1, Clipping 44%)	LTE-FDD	7.53	±9.6
10449	AAE	LTE-FDD (OFDMA, 15 MHz, E-TM 3.1, Clipping 44%)	LTE-FDD	7.51	±9.6
10450	AAE	LTE-FDD (OFDMA, 20 MHz, E-TM 3.1, Clipping 44%)	LTE-FDD	7.48	±9.6
10451	AAE	W-CDMA (BS Test Model 1, 64-QPSK, Clipping 44%)	WCDMA	7.59	±9.6
10453	AAC	US 4800A (Square, 10ms, 1ms)	US	10.00	±9.6
10456	AAC	IEEE 802.11ac WiFi (60MHz, 64-QAM, 99pc duty cycle)	WLAN	8.93	±9.6
10457	AAE	UMTS-FDD (DC-HSDPA)	WCDMA	6.62	±9.6
10458	AAA	CDMA2000 (1xEV-DO, Rev. B, 3 carriers)	CDMA2000	6.95	±9.6
10459	AAA	CDMA2000 (1xEV-DO, Rev. B, 3 carriers)	CDMA2000	8.25	±9.6
10460	AAE	UMTS-FDD (WCDMA, AMR)	WCDMA	2.35	±9.6
10461	AAC	LTE-TDD (SC-FDMA, 1 RB, 1.4MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.02	±9.6
10462	AAC	LTE-TDD (SC-FDMA, 1 RB, 1.4MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.30	±9.6
10463	AAC	LTE-TDD (SC-FDMA, 1 RB, 1.4MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.56	±9.6
10464	AAE	LTE-TDD (SC-FDMA, 1 RB, 3MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.82	±9.6
10465	AAE	LTE-TDD (SC-FDMA, 1 RB, 3MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.32	±9.6
10466	AAE	LTE-TDD (SC-FDMA, 1 RB, 3MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.57	±9.5
10467	AAE	LTE-TDD (SC-FDMA, 1 RB, 5MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.82	±9.5
10468	AAE	LTE-TDD (SC-FDMA, 1 RB, 5MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.32	±9.5
10469	AAE	LTE-TDD (SC-FDMA, 1 RB, 5MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.55	±9.5
10470	AAE	LTE-TDD (SC-FDMA, 1 RB, 10MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.82	±9.5
10471	AAE	LTE-TDD (SC-FDMA, 1 RB, 10MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.32	±9.5





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10472	AAC	LTE-TDD (SC-FDMA) 1 RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9	LTE-TDD	8.57	±9.6
10473	AAF	LTE-TDD (SC-FDMA) 1 RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9	LTE-TDD	7.82	±9.6
10474	AAF	LTE-TDD (SC-FDMA) 1 RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9	LTE-TDD	8.32	±9.6
10475	AAF	LTE-TDD (SC-FDMA) 1 RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9	LTE-TDD	8.57	±9.6
10477	AAG	LTE-TDD (SC-FDMA) 1 RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9	LTE-TDD	8.32	±9.6
10478	AAG	LTE-TDD (SC-FDMA) 1 RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9	LTE-TDD	8.57	±9.6
10479	AAC	LTE-TDD (SC-FDMA) 50% RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9	LTE-TDD	7.71	±9.6
10480	AAC	LTE-TDD (SC-FDMA) 50% RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9	LTE-TDD	8.18	±9.6
10481	AAC	LTE-TDD (SC-FDMA) 50% RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9	LTE-TDD	8.45	±9.6
10482	AAC	LTE-TDD (SC-FDMA) 50% RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9	LTE-TDD	7.71	±9.6
10483	AAC	LTE-TDD (SC-FDMA) 50% RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9	LTE-TDD	8.39	±9.6
10484	AAC	LTE-TDD (SC-FDMA) 50% RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9	LTE-TDD	8.47	±9.6
10485	AAG	LTE-TDD (SC-FDMA) 50% RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9	LTE-TDD	7.59	±9.6
10486	AAG	LTE-TDD (SC-FDMA) 50% RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9	LTE-TDD	8.58	±9.6
10487	AAG	LTE-TDD (SC-FDMA) 50% RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9	LTE-TDD	8.60	±9.6
10488	AAG	LTE-TDD (SC-FDMA) 50% RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9	LTE-TDD	7.70	±9.6
10489	AAC	LTE-TDD (SC-FDMA) 50% RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9	LTE-TDD	8.51	±9.6
10490	AAG	LTE-TDD (SC-FDMA) 50% RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9	LTE-TDD	8.54	±9.6
10491	AAF	LTE-TDD (SC-FDMA) 50% RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9	LTE-TDD	7.74	±9.6
10492	AAF	LTE-TDD (SC-FDMA) 50% RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9	LTE-TDD	8.41	±9.6
10493	AAF	LTE-TDD (SC-FDMA) 50% RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9	LTE-TDD	8.55	±9.6
10494	AAG	LTE-TDD (SC-FDMA) 50% RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9	LTE-TDD	7.74	±9.6
10495	AAC	LTE-TDD (SC-FDMA) 50% RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9	LTE-TDD	8.37	±9.6
10496	AAG	LTE-TDD (SC-FDMA) 50% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9	LTE-TDD	8.54	±9.6
10497	AAC	LTE-TDD (SC-FDMA) 100% RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9	LTE-TDD	7.57	±9.6
10498	AAC	LTE-TDD (SC-FDMA) 100% RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9	LTE-TDD	8.43	±9.6
10499	AAC	LTE-TDD (SC-FDMA) 100% RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9	LTE-TDD	8.68	±9.6
10500	AAC	LTE-TDD (SC-FDMA) 100% RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9	LTE-TDD	7.67	±9.6
10501	AAC	LTE-TDD (SC-FDMA) 100% RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9	LTE-TDD	8.44	±9.6
10502	AAC	LTE-TDD (SC-FDMA) 100% RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9	LTE-TDD	8.52	±9.6
10503	AAG	LTE-TDD (SC-FDMA) 100% RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9	LTE-TDD	7.72	±9.6
10504	AAG	LTE-TDD (SC-FDMA) 100% RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9	LTE-TDD	8.31	±9.6
10505	AAG	LTE-TDD (SC-FDMA) 100% RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9	LTE-TDD	8.54	±9.6
10506	AAG	LTE-TDD (SC-FDMA) 100% RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9	LTE-TDD	7.74	±9.6
10507	AAG	LTE-TDD (SC-FDMA) 100% RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9	LTE-TDD	8.36	±9.6
10508	AAC	LTE-TDD (SC-FDMA) 100% RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9	LTE-TDD	8.55	±9.6
10509	AAF	LTE-TDD (SC-FDMA) 100% RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9	LTE-TDD	7.89	±9.6
10510	AAF	LTE-TDD (SC-FDMA) 100% RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9	LTE-TDD	8.49	±9.6
10511	AAF	LTE-TDD (SC-FDMA) 100% RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9	LTE-TDD	8.51	±9.6
10512	AAG	LTE-TDD (SC-FDMA) 100% RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9	LTE-TDD	7.74	±9.6
10513	AAG	LTE-TDD (SC-FDMA) 100% RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9	LTE-TDD	8.42	±9.6
10514	AAG	LTE-TDD (SC-FDMA) 100% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9	LTE-TDD	8.45	±9.6
10515	AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps, 99pc duty cycle)	WLAN	1.58	±9.6
10516	AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps, 99pc duty cycle)	WLAN	1.57	±9.6
10517	AAA	IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps, 99pc duty cycle)	WLAN	1.58	±9.6
10518	AAC	IEEE 802.11a/n WiFi 5 GHz (OFDM, 9 Mbps, 99pc duty cycle)	WLAN	8.23	±9.6
10519	AAC	IEEE 802.11a/n WiFi 5 GHz (OFDM, 12 Mbps, 99pc duty cycle)	WLAN	8.39	±9.6
10520	AAC	IEEE 802.11a/n WiFi 5 GHz (OFDM, 18 Mbps, 99pc duty cycle)	WLAN	8.12	±9.6
10521	AAC	IEEE 802.11a/n WiFi 5 GHz (OFDM, 24 Mbps, 99pc duty cycle)	WLAN	7.97	±9.6
10522	AAC	IEEE 802.11a/n WiFi 5 GHz (OFDM, 36 Mbps, 99pc duty cycle)	WLAN	8.45	±9.6
10523	AAC	IEEE 802.11a/n WiFi 5 GHz (OFDM, 48 Mbps, 99pc duty cycle)	WLAN	8.08	±9.6
10524	AAC	IEEE 802.11a/n WiFi 5 GHz (OFDM, 54 Mbps, 99pc duty cycle)	WLAN	8.27	±9.6
10525	AAC	IEEE 802.11ac WiFi (20 MHz, MCS0, 99pc duty cycle)	WLAN	8.05	±9.6
10526	AAC	IEEE 802.11ac WiFi (20 MHz, MCS1, 99pc duty cycle)	WLAN	8.42	±9.6
10527	AAC	IEEE 802.11ac WiFi (20 MHz, MCS2, 99pc duty cycle)	WLAN	8.21	±9.6
10528	AAC	IEEE 802.11ac WiFi (20 MHz, MCS3, 99pc duty cycle)	WLAN	8.05	±9.6
10529	AAC	IEEE 802.11ac WiFi (20 MHz, MCS4, 99pc duty cycle)	WLAN	8.26	±9.6
10531	AAC	IEEE 802.11ac WiFi (20 MHz, MCS5, 99pc duty cycle)	WLAN	8.43	±9.6
10532	AAC	IEEE 802.11ac WiFi (20 MHz, MCS7, 99pc duty cycle)	WLAN	8.29	±9.6
10533	AAC	IEEE 802.11ac WiFi (20 MHz, MCS8, 99pc duty cycle)	WLAN	8.38	±9.6
10534	AAC	IEEE 802.11ac WiFi (40 MHz, MCS0, 99pc duty cycle)	WLAN	8.45	±9.6
10535	AAC	IEEE 802.11ac WiFi (40 MHz, MCS1, 99pc duty cycle)	WLAN	8.45	±9.6
10536	AAC	IEEE 802.11ac WiFi (40 MHz, MCS2, 99pc duty cycle)	WLAN	8.32	±9.6
10537	AAC	IEEE 802.11ac WiFi (40 MHz, MCS3, 99pc duty cycle)	WLAN	8.44	±9.6
10538	AAC	IEEE 802.11ac WiFi (40 MHz, MCS4, 99pc duty cycle)	WLAN	8.54	±9.6
10540	AAC	IEEE 802.11ac WiFi (40 MHz, MCS6, 99pc duty cycle)	WLAN	8.39	±9.6



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10541	AAC	IEEE 802.11ac WiFi (43MHz, MCS7, 99pc duty cycle)	WLAN	9.46	-9.6
10542	AAC	IEEE 802.11ac WiFi (43MHz, MCS8, 99pc duty cycle)	WLAN	9.55	-9.6
10543	AAC	IEEE 802.11ac WiFi (43MHz, MCS9, 99pc duty cycle)	WLAN	9.65	-9.6
10544	AAC	IEEE 802.11ac WiFi (80MHz, MCS8, 99pc duty cycle)	WLAN	8.47	-9.6
10545	AAC	IEEE 802.11ac WiFi (80MHz, MCS1, 99pc duty cycle)	WLAN	8.55	-9.6
10546	AAC	IEEE 802.11ac WiFi (80MHz, MCS2, 99pc duty cycle)	WLAN	8.55	-9.6
10547	AAC	IEEE 802.11ac WiFi (80MHz, MCS3, 99pc duty cycle)	WLAN	8.47	-9.6
10548	AAC	IEEE 802.11ac WiFi (80MHz, MCS4, 99pc duty cycle)	WLAN	8.37	-9.6
10550	AAC	IEEE 802.11ac WiFi (80MHz, MCS6, 99pc duty cycle)	WLAN	8.39	-9.6
10551	AAC	IEEE 802.11ac WiFi (80MHz, MCS7, 99pc duty cycle)	WLAN	8.50	-9.6
10552	AAC	IEEE 802.11ac WiFi (80MHz, MCS8, 99pc duty cycle)	WLAN	8.42	-9.6
10553	AAC	IEEE 802.11ac WiFi (80MHz, MCS9, 99pc duty cycle)	WLAN	8.45	-9.6
10554	AAD	IEEE 802.11ac WiFi (160MHz, MCS0, 99pc duty cycle)	WLAN	8.48	-9.6
10555	AAD	IEEE 802.11ac WiFi (160MHz, MCS1, 99pc duty cycle)	WLAN	8.47	-9.6
10556	AAD	IEEE 802.11ac WiFi (160MHz, MCS2, 99pc duty cycle)	WLAN	8.50	-9.6
10557	AAD	IEEE 802.11ac WiFi (160MHz, MCS3, 99pc duty cycle)	WLAN	8.52	-9.6
10558	AAD	IEEE 802.11ac WiFi (160MHz, MCS4, 99pc duty cycle)	WLAN	8.51	-9.6
10559	AAD	IEEE 802.11ac WiFi (160MHz, MCS5, 99pc duty cycle)	WLAN	8.73	-9.6
10561	AAD	IEEE 802.11ac WiFi (160MHz, MCS7, 99pc duty cycle)	WLAN	8.56	-9.6
10562	AAD	IEEE 802.11ac WiFi (160MHz, MCS8, 99pc duty cycle)	WLAN	8.59	-9.6
10563	AAD	IEEE 802.11ac WiFi (160MHz, MCS9, 99pc duty cycle)	WLAN	8.77	-9.6
10564	AAA	IEEE 802.11g WiFi 2.4GHz (DSSS-OFDM, 9Mbps, 99pc duty cycle)	WLAN	8.25	-9.6
10565	AAA	IEEE 802.11g WiFi 2.4GHz (DSSS-OFDM, 12Mbps, 99pc duty cycle)	WLAN	8.45	-9.6
10566	AAA	IEEE 802.11g WiFi 2.4GHz (DSSS-OFDM, 18Mbps, 99pc duty cycle)	WLAN	8.13	-9.6
10567	AAA	IEEE 802.11g WiFi 2.4GHz (DSSS-OFDM, 24Mbps, 99pc duty cycle)	WLAN	6.00	-9.6
10568	AAA	IEEE 802.11g WiFi 2.4GHz (DSSS-OFDM, 36Mbps, 99pc duty cycle)	WLAN	8.37	-9.6
10569	AAA	IEEE 802.11g WiFi 2.4GHz (DSSS-OFDM, 48Mbps, 99pc duty cycle)	WLAN	8.13	-9.6
10570	AAA	IEEE 802.11g WiFi 2.4GHz (DSSS-OFDM, 54Mbps, 99pc duty cycle)	WLAN	8.30	-9.6
10571	AAA	IEEE 802.11b WiFi 2.4GHz (DSSS, 1Mbps, 99pc duty cycle)	WLAN	1.99	-9.6
10572	AAA	IEEE 802.11b WiFi 2.4GHz (DSSS, 2Mbps, 99pc duty cycle)	WLAN	1.98	-9.6
10573	AAA	IEEE 802.11b WiFi 2.4GHz (DSSS, 3Mbps, 99pc duty cycle)	WLAN	1.98	-9.6
10574	AAA	IEEE 802.11b WiFi 2.4GHz (DSSS, 4Mbps, 99pc duty cycle)	WLAN	1.98	-9.6
10575	AAA	IEEE 802.11b WiFi 2.4GHz (DSSS, 5Mbps, 99pc duty cycle)	WLAN	1.98	-9.6
10576	AAA	IEEE 802.11g WiFi 2.4GHz (DSSS-OFDM, 6Mbps, 99pc duty cycle)	WLAN	4.55	-9.6
10577	AAA	IEEE 802.11g WiFi 2.4GHz (DSSS-OFDM, 9Mbps, 99pc duty cycle)	WLAN	4.60	-9.6
10578	AAA	IEEE 802.11g WiFi 2.4GHz (DSSS-OFDM, 12Mbps, 99pc duty cycle)	WLAN	8.70	-9.6
10579	AAA	IEEE 802.11g WiFi 2.4GHz (DSSS-OFDM, 18Mbps, 99pc duty cycle)	WLAN	8.49	-9.6
10579	AAA	IEEE 802.11g WiFi 2.4GHz (DSSS-OFDM, 24Mbps, 99pc duty cycle)	WLAN	8.36	-9.6
10580	AAA	IEEE 802.11g WiFi 2.4GHz (DSSS-OFDM, 36Mbps, 99pc duty cycle)	WLAN	8.76	-9.6
10581	AAA	IEEE 802.11g WiFi 2.4GHz (DSSS-OFDM, 48Mbps, 99pc duty cycle)	WLAN	8.35	-9.6
10582	AAA	IEEE 802.11g WiFi 2.4GHz (DSSS-OFDM, 54Mbps, 99pc duty cycle)	WLAN	8.57	-9.6
10583	AAC	IEEE 802.11ah WiFi 5GHz (OFDM, 6Mbps, 99pc duty cycle)	WLAN	8.59	-9.6
10584	AAC	IEEE 802.11ah WiFi 5GHz (OFDM, 9Mbps, 99pc duty cycle)	WLAN	8.53	-9.6
10585	AAC	IEEE 802.11ah WiFi 5GHz (OFDM, 12Mbps, 99pc duty cycle)	WLAN	8.73	-9.6
10586	AAC	IEEE 802.11ah WiFi 5GHz (OFDM, 18Mbps, 99pc duty cycle)	WLAN	8.49	-9.6
10587	AAC	IEEE 802.11ah WiFi 5GHz (OFDM, 24Mbps, 99pc duty cycle)	WLAN	8.35	-9.6
10588	AAC	IEEE 802.11ah WiFi 5GHz (OFDM, 36Mbps, 99pc duty cycle)	WLAN	8.76	-9.6
10589	AAC	IEEE 802.11ah WiFi 5GHz (OFDM, 48Mbps, 99pc duty cycle)	WLAN	8.35	-9.6
10590	AAC	IEEE 802.11ah WiFi 5GHz (OFDM, 54Mbps, 99pc duty cycle)	WLAN	8.97	-9.6
10591	AAC	IEEE 802.11r (HT) Mixed, 20MHz, MCS0, 99pc duty cycle)	WLAN	8.63	-9.6
10592	AAC	IEEE 802.11r (HT) Mixed, 20MHz, MCS1, 99pc duty cycle)	WLAN	8.45	-9.6
10593	AAC	IEEE 802.11r (HT) Mixed, 20MHz, MCS2, 99pc duty cycle)	WLAN	8.64	-9.6
10594	AAC	IEEE 802.11r (HT) Mixed, 20MHz, MCS3, 99pc duty cycle)	WLAN	8.74	-9.6
10595	AAC	IEEE 802.11r (HT) Mixed, 20MHz, MCS4, 99pc duty cycle)	WLAN	8.74	-9.6
10596	AAC	IEEE 802.11r (HT) Mixed, 20MHz, MCS5, 99pc duty cycle)	WLAN	8.71	-9.6
10597	AAC	IEEE 802.11r (HT) Mixed, 20MHz, MCS6, 99pc duty cycle)	WLAN	8.72	-9.6
10598	AAC	IEEE 802.11r (HT) Mixed, 20MHz, MCS7, 99pc duty cycle)	WLAN	8.50	-9.6
10599	AAC	IEEE 802.11r (HT) Mixed, 40MHz, MCS0, 99pc duty cycle)	WLAN	8.79	-9.6
10600	AAC	IEEE 802.11r (HT) Mixed, 40MHz, MCS1, 99pc duty cycle)	WLAN	8.88	-9.6
10601	AAC	IEEE 802.11r (HT) Mixed, 40MHz, MCS2, 99pc duty cycle)	WLAN	8.82	-9.6
10602	AAC	IEEE 802.11r (HT) Mixed, 40MHz, MCS3, 99pc duty cycle)	WLAN	8.94	-9.6
10603	AAC	IEEE 802.11r (HT) Mixed, 40MHz, MCS4, 99pc duty cycle)	WLAN	9.03	-9.6
10604	AAC	IEEE 802.11r (HT) Mixed, 40MHz, MCS5, 99pc duty cycle)	WLAN	8.76	-9.6
10605	AAC	IEEE 802.11r (HT) Mixed, 40MHz, MCS6, 99pc duty cycle)	WLAN	8.97	-9.6
10605	AAC	IEEE 802.11r (HT) Mixed, 40MHz, MCS7, 99pc duty cycle)	WLAN	8.87	-9.6
10607	AAC	IEEE 802.11ac WiFi (20MHz, MCS0, 99pc duty cycle)	WLAN	8.54	-9.6
10608	AAC	IEEE 802.11ac WiFi (20MHz, MCS1, 99pc duty cycle)	WLAN	8.77	-9.6



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10609	AAC	IEEE 802.11ac WiFi (20 MHz, MCS2, 90pc duty cycle)	WLAN	8.57	±9.6
10610	AAC	IEEE 802.11ac WiFi (20 MHz, MCS3, 90pc duty cycle)	WLAN	8.78	±9.6
10611	AAC	IEEE 802.11ac WiFi (20 MHz, MCS4, 90pc duty cycle)	WLAN	8.70	±9.6
10612	AAC	IEEE 802.11ac WiFi (20 MHz, MCS5, 90pc duty cycle)	WLAN	8.77	±9.6
10613	AAC	IEEE 802.11ac WiFi (20 MHz, MCS6, 90pc duty cycle)	WLAN	8.54	±9.6
10614	AAC	IEEE 802.11ac WiFi (20 MHz, MCS7, 90pc duty cycle)	WLAN	8.59	±9.6
10615	AAC	IEEE 802.11ac WiFi (20 MHz, MCS8, 90pc duty cycle)	WLAN	8.82	±9.6
10616	AAC	IEEE 802.11ac WiFi (40 MHz, MCS0, 90pc duty cycle)	WLAN	8.82	±9.6
10617	AAC	IEEE 802.11ac WiFi (40 MHz, MCS1, 90pc duty cycle)	WLAN	8.51	±9.6
10618	AAC	IEEE 802.11ac WiFi (40 MHz, MCS2, 90pc duty cycle)	WLAN	8.58	±9.6
10619	AAC	IEEE 802.11ac WiFi (40 MHz, MCS3, 90pc duty cycle)	WLAN	8.86	±9.6
10620	AAC	IEEE 802.11ac WiFi (40 MHz, MCS4, 90pc duty cycle)	WLAN	8.87	±9.6
10621	AAC	IEEE 802.11ac WiFi (40 MHz, MCS5, 90pc duty cycle)	WLAN	8.77	±9.6
10622	AAC	IEEE 802.11ac WiFi (40 MHz, MCS6, 90pc duty cycle)	WLAN	8.58	±9.6
10623	AAC	IEEE 802.11ac WiFi (40 MHz, MCS7, 90pc duty cycle)	WLAN	8.82	±9.6
10624	AAC	IEEE 802.11ac WiFi (40 MHz, MCS8, 90pc duty cycle)	WLAN	8.96	±9.6
10625	AAC	IEEE 802.11ac WiFi (40 MHz, MCS9, 90pc duty cycle)	WLAN	8.96	±9.6
10626	AAC	IEEE 802.11ac WiFi (80 MHz, MCS0, 90pc duty cycle)	WLAN	8.83	±9.6
10627	AAC	IEEE 802.11ac WiFi (80 MHz, MCS1, 90pc duty cycle)	WLAN	8.88	±9.6
10628	AAC	IEEE 802.11ac WiFi (80 MHz, MCS2, 90pc duty cycle)	WLAN	8.71	±9.6
10629	AAC	IEEE 802.11ac WiFi (80 MHz, MCS3, 90pc duty cycle)	WLAN	8.85	±9.6
10630	AAC	IEEE 802.11ac WiFi (80 MHz, MCS4, 90pc duty cycle)	WLAN	8.72	±9.6
10631	AAC	IEEE 802.11ac WiFi (80 MHz, MCS5, 90pc duty cycle)	WLAN	8.81	±9.6
10632	AAC	IEEE 802.11ac WiFi (80 MHz, MCS6, 90pc duty cycle)	WLAN	8.74	±9.6
10633	AAC	IEEE 802.11ac WiFi (80 MHz, MCS7, 90pc duty cycle)	WLAN	8.83	±9.6
10634	AAC	IEEE 802.11ac WiFi (80 MHz, MCS8, 90pc duty cycle)	WLAN	8.80	±9.6
10635	AAC	IEEE 802.11ac WiFi (80 MHz, MCS9, 90pc duty cycle)	WLAN	8.81	±9.6
10636	AAD	IEEE 802.11ac WiFi (160 MHz, MCS0, 90pc duty cycle)	WLAN	8.63	±9.6
10637	AAD	IEEE 802.11ac WiFi (160 MHz, MCS1, 90pc duty cycle)	WLAN	8.73	±9.6
10638	AAD	IEEE 802.11ac WiFi (160 MHz, MCS2, 90pc duty cycle)	WLAN	8.85	±9.6
10639	AAD	IEEE 802.11ac WiFi (160 MHz, MCS3, 90pc duty cycle)	WLAN	8.85	±9.6
10640	AAD	IEEE 802.11ac WiFi (160 MHz, MCS4, 90pc duty cycle)	WLAN	8.98	±9.6
10641	AAD	IEEE 802.11ac WiFi (160 MHz, MCS5, 90pc duty cycle)	WLAN	9.08	±9.6
10642	AAD	IEEE 802.11ac WiFi (160 MHz, MCS6, 90pc duty cycle)	WLAN	9.28	±9.6
10643	AAD	IEEE 802.11ac WiFi (160 MHz, MCS7, 90pc duty cycle)	WLAN	9.09	±9.6
10644	AAD	IEEE 802.11ac WiFi (160 MHz, MCS8, 90pc duty cycle)	WLAN	9.05	±9.6
10645	AAC	IEEE 802.11ac WiFi (160 MHz, MCS9, 90pc duty cycle)	WLAN	9.11	±9.6
10646	AAF	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK, UL Subframe=2,7)	LTE-TDD	11.86	±9.6
10647	AAG	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK, UL Subframe=2,7)	LTE-TDD	11.56	±9.6
10648	AAA	CDMA2000 (1x Advanced)	CDMA2000	8.45	±9.6
10649	AAF	LTE-TDD (OFDMA, 5 MHz, E-TM 3.1, Clipping 44%)	LTE-TDD	6.91	±9.6
10650	AAF	LTE-TDD (OFDMA, 10 MHz, E-TM 3.1, Clipping 44%)	LTE-TDD	7.42	±9.6
10651	AUE	LTE-TDD (OFDMA, 15 MHz, E-TM 3.1, Clipping 44%)	LTE-TDD	6.96	±9.6
10652	AAF	LTE-TDD (OFDMA, 20 MHz, E-TM 3.1, Clipping 44%)	LTE-TDD	7.21	±9.6
10653	AAB	Pulse Waveform (200Hz, 10%)	Test	7.00	±9.6
10654	AAB	Pulse Waveform (200Hz, 20%)	Test	6.93	±9.6
10655	AAB	Pulse Waveform (200Hz, 40%)	Test	6.98	±9.6
10656	AAB	Pulse Waveform (200Hz, 60%)	Test	7.22	±9.6
10657	AAB	Pulse Waveform (200Hz, 80%)	Test	7.87	±9.6
10658	AAA	Bluetooth Low Energy	Bluetooth	2.19	±9.6
10659	AAC	IEEE 802.11ax (20 MHz, MCS0, 90pc duty cycle)	WLAN	8.93	±9.6
10660	AAC	IEEE 802.11ax (20 MHz, MCS1, 90pc duty cycle)	WLAN	8.57	±9.6
10661	AAC	IEEE 802.11ax (20 MHz, MCS2, 90pc duty cycle)	WLAN	8.78	±9.6
10662	AAC	IEEE 802.11ax (20 MHz, MCS3, 90pc duty cycle)	WLAN	8.74	±9.6
10663	AAC	IEEE 802.11ax (20 MHz, MCS4, 90pc duty cycle)	WLAN	8.50	±9.6
10664	AAC	IEEE 802.11ax (20 MHz, MCS5, 90pc duty cycle)	WLAN	8.77	±9.6
10665	AAC	IEEE 802.11ax (20 MHz, MCS6, 90pc duty cycle)	WLAN	8.73	±9.6
10666	AAC	IEEE 802.11ax (20 MHz, MCS7, 90pc duty cycle)	WLAN	8.75	±9.6
10667	AAC	IEEE 802.11ax (20 MHz, MCS8, 90pc duty cycle)	WLAN	8.86	±9.6
10668	AAC	IEEE 802.11ax (20 MHz, MCS9, 90pc duty cycle)	WLAN	8.80	±9.6
10669	AAC	IEEE 802.11ax (20 MHz, MCS0, 90pc duty cycle)	WLAN	8.62	±9.6
10670	AAC	IEEE 802.11ax (20 MHz, MCS1, 90pc duty cycle)	WLAN	8.63	±9.6
10671	AAC	IEEE 802.11ax (20 MHz, MCS2, 90pc duty cycle)	WLAN	8.42	±9.6
10672	AAC	IEEE 802.11ax (20 MHz, MCS3, 90pc duty cycle)	WLAN	8.26	±9.6
10673	AAC	IEEE 802.11ax (20 MHz, MCS4, 90pc duty cycle)	WLAN	8.33	±9.6
10674	AAC	IEEE 802.11ax (20 MHz, MCS5, 90pc duty cycle)	WLAN	8.28	±9.6



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10667	AAC	IFFF 802.11ax (20 MHz, MCS4, 99pc duty cycle)	WLAN	8.45	±9.6
10668	AAC	IBBB 802.11ax (20 MHz, MCS5, 99pc duty cycle)	WLAN	8.29	±9.6
10669	AAC	IEEE 802.11ax (20 MHz, MCS6, 99pc duty cycle)	WLAN	8.55	±9.5
10690	AAC	IFFF 802.11ax (20 MHz, MCS7, 99pc duty cycle)	WLAN	8.29	±9.5
10691	AAC	ICCC 802.11ax (20 MHz, MCS8, 99pc duty cycle)	WLAN	8.25	±9.6
10692	AAC	IFFF 802.11ax (20 MHz, MCS9, 99pc duty cycle)	WLAN	8.29	±9.6
10693	AAC	IEEE 802.11ax (20 MHz, MCS10, 99pc duty cycle)	WLAN	8.25	±9.6
10694	AAC	IEEE 802.11ax (20 MHz, MCS11, 99pc duty cycle)	WLAN	8.57	±9.6
10695	AAC	IEEE 802.11ax (40 MHz, MCS0, 90pc duty cycle)	WLAN	8.72	±9.6
10696	AAC	IFFF 802.11ax (40 MHz, MCS1, 90pc duty cycle)	WLAN	8.91	±9.5
10697	AAC	IEEE 802.11ax (40 MHz, MCS2, 90pc duty cycle)	WLAN	8.61	±9.5
10698	AAC	IEEE 802.11ax (40 MHz, MCS3, 90pc duty cycle)	WLAN	8.89	±9.5
10699	AAC	IEEE 802.11ax (40 MHz, MCS4, 90pc duty cycle)	WLAN	8.82	±9.5
10700	AAC	IEEE 802.11ax (40 MHz, MCS5, 90pc duty cycle)	WLAN	6.73	±9.6
10701	AAC	IEEE 802.11ax (40 MHz, MCS6, 90pc duty cycle)	WLAN	6.85	±9.6
10702	AAC	IEEE 802.11ax (40 MHz, MCS7, 90pc duty cycle)	WLAN	8.73	±9.6
10703	AAC	IEEE 802.11ax (40 MHz, MCS8, 90pc duty cycle)	WLAN	5.82	±9.6
10704	AAC	IEEE 802.11ax (40 MHz, MCS9, 90pc duty cycle)	WLAN	9.55	±9.6
10705	AAC	IEEE 802.11ax (40 MHz, MCS10, 90pc duty cycle)	WLAN	9.69	±9.6
10706	AAC	ICCC 802.11ax (40 MHz, MCS11, 90pc duty cycle)	WLAN	8.66	±9.6
10707	AAC	IFFF 802.11ax (40 MHz, MCS1, 99pc duty cycle)	WLAN	9.32	±9.5
10708	AAC	IEEE 802.11ax (40 MHz, MCS1, 99pc duty cycle)	WLAN	8.55	±9.6
10709	AAC	IEEE 802.11ax (40 MHz, MCS2, 99pc duty cycle)	WLAN	8.32	±9.6
10710	AAC	IBBB 802.11ax (40 MHz, MCS3, 99pc duty cycle)	WLAN	8.29	±9.6
10711	AAC	IEEE 802.11ax (40 MHz, MCS4, 99pc duty cycle)	WLAN	8.39	±9.6
10712	AAC	IFFF 802.11ax (40 MHz, MCS5, 99pc duty cycle)	WLAN	8.67	±9.6
10713	AAC	IEEE 802.11ax (40 MHz, MCS6, 99pc duty cycle)	WLAN	5.33	±9.6
10714	AAC	IFFF 802.11ax (40 MHz, MCS7, 99pc duty cycle)	WLAN	8.26	±9.6
10715	AAC	IEEE 802.11ax (40 MHz, MCS8, 99pc duty cycle)	WLAN	8.45	±9.6
10716	AAC	IEEE 802.11ax (40 MHz, MCS9, 99pc duty cycle)	WLAN	8.30	±9.5
10717	AAC	IEEE 802.11ax (40 MHz, MCS10, 99pc duty cycle)	WLAN	8.48	±9.6
10718	AAC	IFFF 802.11ax (40 MHz, MCS11, 99pc duty cycle)	WLAN	8.24	±9.5
10719	AAC	IBBB 802.11ax (80 MHz, MCS0, 90pc duty cycle)	WLAN	8.81	±9.6
10720	AAC	IEEE 802.11ax (80 MHz, MCS1, 90pc duty cycle)	WLAN	8.97	±9.5
10721	AAC	IEEE 802.11ax (80 MHz, MCS2, 90pc duty cycle)	WLAN	8.75	±9.5
10722	AAC	IEEE 802.11ax (80 MHz, MCS3, 90pc duty cycle)	WLAN	8.55	±9.6
10723	AAC	IEEE 802.11ax (80 MHz, MCS4, 90pc duty cycle)	WLAN	8.70	±9.6
10724	AAC	IBBB 802.11ax (80 MHz, MCS5, 90pc duty cycle)	WLAN	8.93	±9.6
10725	AAC	ICCC 802.11ax (80 MHz, MCS6, 90pc duty cycle)	WLAN	8.74	±9.6
10726	AAC	IFFF 802.11ax (80 MHz, MCS7, 90pc duty cycle)	WLAN	8.72	±9.6
10727	AAC	IEEE 802.11ax (80 MHz, MCS8, 90pc duty cycle)	WLAN	9.66	±9.6
10728	AAC	IEEE 802.11ax (80 MHz, MCS9, 90pc duty cycle)	WLAN	8.85	±9.6
10729	AAC	IEEE 802.11ax (80 MHz, MCS10, 90pc duty cycle)	WLAN	8.64	±9.6
10730	AAC	IEEE 802.11ax (80 MHz, MCS11, 90pc duty cycle)	WLAN	8.67	±9.6
10731	AAC	IEEE 802.11ax (80 MHz, MCS0, 99pc duty cycle)	WLAN	8.42	±9.6
10732	AAC	IEEE 802.11ax (80 MHz, MCS1, 99pc duty cycle)	WLAN	8.46	±9.6
10733	AAC	IEEE 802.11ax (80 MHz, MCS2, 99pc duty cycle)	WLAN	3.40	±9.6
10734	AAC	IEEE 802.11ax (80 MHz, MCS3, 99pc duty cycle)	WLAN	8.25	±9.6
10735	AAC	IEEE 802.11ax (80 MHz, MCS4, 99pc duty cycle)	WLAN	8.33	±9.6
10736	AAC	IEEE 802.11ax (80 MHz, MCS5, 99pc duty cycle)	WLAN	9.27	±9.6
10737	AAC	IEEE 802.11ax (80 MHz, MCS6, 99pc duty cycle)	WLAN	8.36	±9.6
10738	AAC	IBBB 802.11ax (80 MHz, MCS7, 99pc duty cycle)	WLAN	5.47	±9.6
10739	AAC	ICCC 802.11ax (80 MHz, MCS8, 99pc duty cycle)	WLAN	8.29	±9.6
10740	AAC	IFFF 802.11ax (80 MHz, MCS9, 99pc duty cycle)	WLAN	9.48	±9.6
10741	AAC	ICCC 802.11ax (80 MHz, MCS10, 99pc duty cycle)	WLAN	9.40	±9.6
10742	AAC	IFFF 802.11ax (80 MHz, MCS11, 99pc duty cycle)	WLAN	8.43	±9.6
10743	AAC	IEEE 802.11ax (160 MHz, MCS0, 90pc duty cycle)	WLAN	8.94	±9.6
10744	AAC	IEEE 802.11ax (160 MHz, MCS1, 90pc duty cycle)	WLAN	9.18	±9.6
10745	AAC	IEEE 802.11ax (160 MHz, MCS2, 90pc duty cycle)	WLAN	8.93	±9.6
10746	AAC	IFFF 802.11ax (160 MHz, MCS3, 90pc duty cycle)	WLAN	9.11	±9.6
10747	AAC	IEEE 802.11ax (160 MHz, MCS4, 90pc duty cycle)	WLAN	8.04	±9.6
10748	AAC	IFFF 802.11ax (160 MHz, MCS5, 90pc duty cycle)	WLAN	8.93	±9.6
10749	AAC	IBBB 802.11ax (160 MHz, MCS6, 90pc duty cycle)	WLAN	8.90	±9.6
10750	AAC	ICCC 802.11ax (160 MHz, MCS7, 90pc duty cycle)	WLAN	8.79	±9.6
10751	AAC	IBBB 802.11ax (160 MHz, MCS8, 90pc duty cycle)	WLAN	8.82	±9.6
10752	AAC	IEEE 802.11ax (160 MHz, MCS9, 90pc duty cycle)	WLAN	8.61	±9.6



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10753	AAD	IEEE 802.11ax (160 MHz, MCS10, 99pc duty cycle)	WLAN	9.00	-9.6
10754	AAC	IEEE 802.11ax (160 MHz, MCS11, 99pc duty cycle)	WLAN	9.04	-9.6
10755	AAC	IEEE 802.11ax (160 MHz, MCS0, 99pc duty cycle)	WLAN	9.04	-9.6
10756	AAC	IEEE 802.11ax (160 MHz, MCS1, 99pc duty cycle)	WLAN	9.77	-9.6
10757	AAC	IEEE 802.11ax (160 MHz, MCS2, 99pc duty cycle)	WLAN	9.77	-9.6
10758	AAC	IEEE 802.11ax (160 MHz, MCS3, 99pc duty cycle)	WLAN	9.69	-9.6
10759	AAC	IEEE 802.11ax (160 MHz, MCS4, 99pc duty cycle)	WLAN	9.58	-9.6
10760	AAC	IEEE 802.11ax (160 MHz, MCS5, 99pc duty cycle)	WLAN	8.49	-9.6
10761	AAC	IEEE 802.11ax (160 MHz, MCS6, 99pc duty cycle)	WLAN	8.58	-9.6
10762	AAC	IEEE 802.11ax (160 MHz, MCS7, 99pc duty cycle)	WLAN	8.49	-9.6
10763	AAC	IEEE 802.11ax (160 MHz, MCS8, 99pc duty cycle)	WLAN	8.53	-9.6
10764	AAC	IEEE 802.11ax (160 MHz, MCS9, 99pc duty cycle)	WLAN	8.54	-9.6
10765	AAC	IEEE 802.11ax (160 MHz, MCS10, 99pc duty cycle)	WLAN	8.54	-9.6
10766	AAC	IEEE 802.11ax (160 MHz, MCS11, 99pc duty cycle)	WLAN	8.51	-9.6
10767	AAE	5G NR (CP-OFDM, 1 RB, 5 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	7.99	-9.6
10768	AAD	5G NR (CP-OFDM, 1 RB, 10 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.01	-9.6
10769	AAC	5G NR (CP-OFDM, 1 RB, 15 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.01	-9.6
10770	AAD	5G NR (CP-OFDM, 1 RB, 20 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.02	-9.6
10771	AAD	5G NR (CP-OFDM, 1 RB, 25 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.02	-9.6
10772	AAD	5G NR (CP-OFDM, 1 RB, 30 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.23	-9.6
10773	AAD	5G NR (CP-OFDM, 1 RB, 40 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.33	-9.6
10774	AAD	5G NR (CP-OFDM, 1 RB, 50 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.32	-9.6
10775	AAD	5G NR (CP-OFDM, 50% RB, 5 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.31	-9.6
10776	AAD	5G NR (CP-OFDM, 50% RB, 10 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.30	-9.6
10777	AAC	5G NR (CP-OFDM, 50% RB, 15 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.30	-9.6
10778	AAD	5G NR (CP-OFDM, 50% RB, 20 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.34	-9.6
10779	AAC	5G NR (CP-OFDM, 50% RB, 25 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.42	-9.6
10780	AAD	5G NR (CP-OFDM, 50% RB, 30 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.38	-9.6
10781	AAD	5G NR (CP-OFDM, 50% RB, 40 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.38	-9.6
10782	AAD	5G NR (CP-OFDM, 50% RB, 50 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.43	-9.6
10783	AAE	5G NR (CP-OFDM, 100% RB, 5 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.31	-9.6
10784	AAD	5G NR (CP-OFDM, 100% RB, 10 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.29	-9.6
10785	AAD	5G NR (CP-OFDM, 100% RB, 15 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.40	-9.6
10786	AAD	5G NR (CP-OFDM, 100% RB, 20 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.35	-9.6
10787	AAD	5G NR (CP-OFDM, 100% RB, 25 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.44	-9.6
10788	AAD	5G NR (CP-OFDM, 100% RB, 30 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.39	-9.6
10789	AAD	5G NR (CP-OFDM, 100% RB, 40 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.37	-9.6
10790	AAD	5G NR (CP-OFDM, 100% RB, 50 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	8.39	-9.6
10791	AAE	5G NR (CP-OFDM, 1 RB, 5 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.83	-9.6
10792	AAD	5G NR (CP-OFDM, 1 RB, 10 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.92	-9.6
10793	AAD	5G NR (CP-OFDM, 1 RB, 15 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.95	-9.6
10794	AAD	5G NR (CP-OFDM, 1 RB, 20 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.82	-9.6
10795	AAD	5G NR (CP-OFDM, 1 RB, 25 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.84	-9.6
10796	AAD	5G NR (CP-OFDM, 1 RB, 30 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.82	-9.6
10797	AAD	5G NR (CP-OFDM, 1 RB, 40 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.01	-9.6
10798	AAD	5G NR (CP-OFDM, 1 RB, 50 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.99	-9.6
10799	AAD	5G NR (CP-OFDM, 1 RB, 60 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.83	-9.6
10801	AAD	5G NR (CP-OFDM, 1 RB, 80 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.88	-9.6
10802	AAD	5G NR (CP-OFDM, 1 RB, 90 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.87	-9.6
10803	AAD	5G NR (CP-OFDM, 1 RB, 100 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.93	-9.6
10805	AAD	5G NR (CP-OFDM, 50% RB, 10 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.34	-9.6
10806	AAD	5G NR (CP-OFDM, 50% RB, 15 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.37	-9.6
10809	AAD	5G NR (CP-OFDM, 50% RB, 20 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.34	-9.6
10810	AAD	5G NR (CP-OFDM, 50% RB, 40 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.34	-9.6
10812	AAD	5G NR (CP-OFDM, 50% RB, 60 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.25	-9.6
10817	AAE	5G NR (CP-OFDM, 100% RB, 5 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.35	-9.6
10818	AAD	5G NR (CP-OFDM, 100% RB, 10 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.34	-9.6
10819	AAD	5G NR (CP-OFDM, 100% RB, 15 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.33	-9.6
10820	AAD	5G NR (CP-OFDM, 100% RB, 20 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.50	-9.6
10821	AAD	5G NR (CP-OFDM, 100% RB, 25 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.41	-9.6
10822	AAD	5G NR (CP-OFDM, 100% RB, 30 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.41	-9.6
10823	AAD	5G NR (CP-OFDM, 100% RB, 40 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.35	-9.6
10824	AAD	5G NR (CP-OFDM, 100% RB, 50 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.39	-9.6
10825	AAD	5G NR (CP-OFDM, 100% RB, 60 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.41	-9.6
10827	AAD	5G NR (CP-OFDM, 100% RB, 80 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.42	-9.6
10828	AAD	5G NR (CP-OFDM, 100% RB, 90 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.43	-9.6



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UID	Rev	Communication System Name	Group	PAR (dB)	Unc <sup>2</sup> n = 2
10829	AA0	5G NR (CP-OFDM, 100% RB, 100 MHz, QPSK, 50 kHz)	5G NR FR1 TDD	8.40	+9.6
10830	AA0	5G NR (CP-OFDM, 1 RB, 10 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	7.02	+9.6
10831	AA0	5G NR (CP-OFDM, 1 RB, 15 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	7.73	+9.6
10832	AA0	5G NR (CP-OFDM, 1 RB, 20 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	7.74	+9.6
10833	AA0	5G NR (CP-OFDM, 1 RB, 25 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	7.70	+9.6
10834	AA0	5G NR (CP-OFDM, 1 RB, 30 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	7.75	+9.6
10835	AA0	5G NR (CP-OFDM, 1 RB, 40 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	7.70	+9.6
10836	AA0	5G NR (CP-OFDM, 1 RB, 50 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	7.66	+9.6
10837	AA0	5G NR (CP-OFDM, 1 RB, 60 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	7.68	+9.6
10839	AA0	5G NR (CP-OFDM, 1 RB, 80 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	7.70	+9.6
10840	AA0	5G NR (CP-OFDM, 1 RB, 90 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	7.87	+9.6
10841	AA0	5G NR (CP-OFDM, 1 RB, 100 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	7.71	+9.5
10843	AA0	5G NR (CP-OFDM, 50% RB, 15 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.49	+9.5
10844	AA0	5G NR (CP-OFDM, 50% RB, 20 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.54	+9.5
10846	AA0	5G NR (CP-OFDM, 50% RB, 30 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.41	+9.5
10854	AA0	5G NR (CP-OFDM, 100% RB, 10 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.34	+9.6
10855	AA0	5G NR (CP-OFDM, 100% RB, 15 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.35	+9.5
10856	AA0	5G NR (CP-OFDM, 100% RB, 20 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.37	+9.6
10857	AA0	5G NR (CP-OFDM, 100% RB, 25 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.35	+9.5
10858	AA0	5G NR (CP-OFDM, 100% RB, 30 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.36	+9.6
10859	AA0	5G NR (CP-OFDM, 100% RB, 40 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.34	+9.6
10860	AA0	5G NR (CP-OFDM, 100% RB, 50 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.61	+9.6
10861	AA0	5G NR (CP-OFDM, 100% RB, 60 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.40	+9.6
10863	AA0	5G NR (CP-OFDM, 100% RB, 80 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.41	+9.6
10864	AA0	5G NR (CP-OFDM, 100% RB, 90 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.37	+9.6
10865	AA0	5G NR (CP-OFDM, 100% RB, 100 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.41	+9.6
10866	AA0	5G NR (DFT-s-OFDM, 1 RB, 100 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.66	+9.6
10868	AA0	5G NR (DFT-s-OFDM, 100% RB, 100 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.89	+9.6
10869	AA0	5G NR (DFT-s-OFDM, 1 RB, 100 MHz, QPSK, 120 kHz)	5G NR FR2 TDD	5.75	+9.6
10870	AA0	5G NR (DFT-s-OFDM, 100% RB, 100 MHz, QPSK, 120 kHz)	5G NR FR2 TDD	5.86	+9.6
10871	AA0	5G NR (DFT-s-OFDM, 1 RB, 100 MHz, 64QAM, 120 kHz)	5G NR FR2 TDD	5.75	+9.6
10872	AA0	5G NR (DFT-s-OFDM, 100% RB, 100 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	6.62	+9.6
10873	AA0	5G NR (DFT-s-OFDM, 1 RB, 100 MHz, 64QAM, 120 kHz)	5G NR FR2 TDD	6.61	+9.6
10874	AA0	5G NR (DFT-s-OFDM, 100% RB, 100 MHz, 64QAM, 120 kHz)	5G NR FR2 TDD	6.65	+9.6
10875	AA0	5G NR (CP-OFDM, 1 RB, 100 MHz, QPSK, 120 kHz)	5G NR FR2 TDD	7.78	+9.6
10876	AA0	5G NR (CP-OFDM, 100% RB, 100 MHz, QPSK, 120 kHz)	5G NR FR2 TDD	3.39	+9.6
10877	AA0	5G NR (CP-OFDM, 1 RB, 100 MHz, 64QAM, 120 kHz)	5G NR FR2 TDD	7.95	+9.5
10878	AA0	5G NR (CP-OFDM, 100% RB, 100 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	8.41	+9.5
10879	AA0	5G NR (CP-OFDM, 1 RB, 100 MHz, 64QAM, 120 kHz)	5G NR FR2 TDD	8.12	+9.5
10880	AA0	5G NR (CP-OFDM, 100% RB, 100 MHz, 64QAM, 120 kHz)	5G NR FR2 TDD	8.38	+9.6
10881	AA0	5G NR (CP-OFDM, 1 RB, 50 MHz, QPSK, 120 kHz)	5G NR FR2 TDD	5.75	+9.6
10882	AA0	5G NR (DFT-s-OFDM, 100% RB, 30 MHz, QPSK, 120 kHz)	5G NR FR2 TDD	5.90	+9.6
10883	AA0	5G NR (DFT-s-OFDM, 1 RB, 50 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	5.57	+9.6
10884	AA0	5G NR (DFT-s-OFDM, 100% RB, 50 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	6.53	+9.6
10885	AA0	5G NR (DFT-s-OFDM, 1 RB, 50 MHz, 64QAM, 120 kHz)	5G NR FR2 TDD	6.61	+9.6
10886	AA0	5G NR (DFT-s-OFDM, 100% RB, 50 MHz, 64QAM, 120 kHz)	5G NR FR2 TDD	6.63	+9.6
10887	AA0	5G NR (CP-OFDM, 1 RB, 50 MHz, QPSK, 120 kHz)	5G NR FR2 TDD	7.78	+9.6
10888	AA0	5G NR (CP-OFDM, 100% RB, 50 MHz, QPSK, 120 kHz)	5G NR FR2 TDD	8.35	+9.6
10889	AA0	5G NR (CP-OFDM, 1 RB, 50 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	8.02	+9.6
10890	AA0	5G NR (CP-OFDM, 100% RB, 50 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	8.40	+9.6
10891	AA0	5G NR (CP-OFDM, 1 RB, 50 MHz, 64QAM, 120 kHz)	5G NR FR2 TDD	8.13	+9.6
10892	AA0	5G NR (CP-OFDM, 100% RB, 50 MHz, 64QAM, 120 kHz)	5G NR FR2 TDD	8.41	+9.6
10897	AA0	5G NR (DFT-s-OFDM, 1 RB, 50 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.66	+9.6
10898	AA0	5G NR (DFT-s-OFDM, 1 RB, 10 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.67	+9.6
10899	AA0	5G NR (DFT-s-OFDM, 1 RB, 15 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.67	+9.6
10900	AA0	5G NR (DFT-s-OFDM, 1 RB, 20 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.68	+9.6
10901	AA0	5G NR (DFT-s-OFDM, 1 RB, 25 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.68	+9.6
10902	AA0	5G NR (DFT-s-OFDM, 1 RB, 30 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.68	+9.6
10903	AA0	5G NR (DFT-s-OFDM, 1 RB, 40 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.58	+9.6
10904	AA0	5G NR (DFT-s-OFDM, 1 RB, 50 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.68	+9.6
10905	AA0	5G NR (DFT-s-OFDM, 1 RB, 60 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.58	+9.5
10906	AA0	5G NR (DFT-s-OFDM, 1 RB, 80 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.68	+9.6
10907	AA0	5G NR (DFT-s-OFDM, 50% RB, 5 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.78	+9.6
10908	AA0	5G NR (DFT-s-OFDM, 50% RB, 10 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.93	+9.6
10909	AA0	5G NR (DFT-s-OFDM, 50% RB, 15 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.96	+9.6
10910	AA0	5G NR (DFT-s-OFDM, 50% RB, 20 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.83	+9.6



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UID	Rev	Communication System Name	Group	PAIR (dB)	Unc <sup>2</sup> k = 2
10911	AAB	5G NR (DFT-s-OFDM, 50% RB, 25 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.83	-9.6
10912	AAB	5G NR (DFT-s-OFDM, 50% RB, 30 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.81	-9.8
10913	AAB	5G NR (DFT-s-OFDM, 50% RB, 40 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.84	-9.6
10914	AAB	5G NR (DFT-s-OFDM, 50% RB, 50 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.85	-9.6
10915	AAB	5G NR (DFT-s-OFDM, 50% RB, 60 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.82	-9.6
10917	AAB	5G NR (DFT-s-OFDM, 50% RB, 80 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.87	-9.6
10918	AAC	5G NR (DFT-s-OFDM, 100% RB, 100 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.84	-9.6
10918	AAB	5G NR (DFT-s-OFDM, 100% RB, 10 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.86	-9.6
10920	AAB	5G NR (DFT-s-OFDM, 100% RB, 15 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.87	-9.6
10921	AAB	5G NR (DFT-s-OFDM, 100% RB, 20 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.84	-9.8
10922	AAB	5G NR (DFT-s-OFDM, 100% RB, 25 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.82	-9.6
10923	AAB	5G NR (DFT-s-OFDM, 100% RB, 30 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.84	-9.6
10924	AAB	5G NR (DFT-s-OFDM, 100% RB, 40 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.84	-9.6
10925	AAB	5G NR (DFT-s-OFDM, 100% RB, 50 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.95	-9.6
10926	AAB	5G NR (DFT-s-OFDM, 100% RB, 60 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.84	-9.6
10927	AAB	5G NR (DFT-s-OFDM, 100% RB, 80 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.94	-9.6
10928	AAC	5G NR (DFT-s-OFDM, 1 RB, 5 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.52	-9.6
10929	AAC	5G NR (DFT-s-OFDM, 1 RB, 5 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.52	-9.6
10930	AAC	5G NR (DFT-s-OFDM, 1 RB, 15 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.52	-9.6
10931	AAC	5G NR (DFT-s-OFDM, 1 RB, 20 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.51	-9.6
10932	AAC	5G NR (DFT-s-OFDM, 1 RB, 25 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.51	-9.6
10933	AAC	5G NR (DFT-s-OFDM, 1 RB, 30 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.51	-9.6
10934	AAC	5G NR (DFT-s-OFDM, 1 RB, 40 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.51	-9.6
10935	AAC	5G NR (DFT-s-OFDM, 1 RB, 50 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.51	-9.6
10936	AAC	5G NR (DFT-s-OFDM, 50% RB, 5 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.60	-9.6
10937	AAC	5G NR (DFT-s-OFDM, 50% RB, 10 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.77	-9.6
10938	AAC	5G NR (DFT-s-OFDM, 50% RB, 15 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.90	-9.6
10939	AAC	5G NR (DFT-s-OFDM, 50% RB, 20 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.82	-9.6
10940	AAC	5G NR (DFT-s-OFDM, 50% RB, 25 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.89	-9.6
10941	AAC	5G NR (DFT-s-OFDM, 50% RB, 30 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.83	-9.6
10942	AAC	5G NR (DFT-s-OFDM, 50% RB, 40 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.65	-9.6
10943	AAB	5G NR (DFT-s-OFDM, 50% RB, 50 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.95	-9.6
10944	AAC	5G NR (DFT-s-OFDM, 100% RB, 5 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.81	-9.6
10945	AAC	5G NR (DFT-s-OFDM, 100% RB, 10 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.85	-9.6
10946	AAC	5G NR (DFT-s-OFDM, 100% RB, 15 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.83	-9.6
10947	AAC	5G NR (DFT-s-OFDM, 100% RB, 20 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.87	-9.6
10948	AAC	5G NR (DFT-s-OFDM, 100% RB, 25 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.84	-9.6
10949	AAC	5G NR (DFT-s-OFDM, 100% RB, 30 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.87	-9.6
10950	AAC	5G NR (DFT-s-OFDM, 100% RB, 40 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.94	-9.6
10951	AAD	5G NR (DFT-s-OFDM, 100% RB, 50 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.52	-9.6
10952	AAA	5G NR DL (CP-OFDM, TM 3.1, 5 MHz, 64-QAM, 15 kHz)	5G NR FR1 FDD	8.25	-9.6
10953	AAA	5G NR DL (CP-OFDM, TM 3.1, 10 MHz, 64-QAM, 15 kHz)	5G NR FR1 FDD	8.15	-9.6
10954	AAA	5G NR DL (CP-OFDM, TM 3.1, 15 MHz, 64-QAM, 15 kHz)	5G NR FR1 FDD	8.23	-9.6
10955	AAA	5G NR DL (CP-OFDM, TM 3.1, 20 MHz, 64-QAM, 15 kHz)	5G NR FR1 FDD	8.42	-9.6
10956	AAA	5G NR DL (CP-OFDM, TM 3.1, 5 MHz, 64-QAM, 30 kHz)	5G NR FR1 FDD	8.14	-9.6
10957	AAA	5G NR DL (CP-OFDM, TM 3.1, 10 MHz, 64-QAM, 30 kHz)	5G NR FR1 FDD	8.31	-9.6
10958	AAA	5G NR DL (CP-OFDM, TM 3.1, 15 MHz, 64-QAM, 30 kHz)	5G NR FR1 FDD	8.61	-9.6
10959	AAA	5G NR DL (CP-OFDM, TM 3.1, 20 MHz, 64-QAM, 30 kHz)	5G NR FR1 FDD	8.33	-9.6
10960	AAC	5G NR DL (CP-OFDM, TM 3.1, 5 MHz, 64-QAM, 15 kHz)	5G NR FR1 TDD	9.32	-9.6
10961	AAB	5G NR DL (CP-OFDM, TM 3.1, 10 MHz, 64-QAM, 15 kHz)	5G NR FR1 TDD	9.36	-9.6
10962	AAB	5G NR DL (CP-OFDM, TM 3.1, 15 MHz, 64-QAM, 15 kHz)	5G NR FR1 TDD	9.43	-9.6
10963	AAB	5G NR DL (CP-OFDM, TM 3.1, 20 MHz, 64-QAM, 15 kHz)	5G NR FR1 TDD	9.55	-9.6
10964	AAC	5G NR DL (CP-OFDM, TM 3.1, 5 MHz, 64-QAM, 30 kHz)	5G NR FR1 TDD	9.23	-9.6
10965	AAB	5G NR DL (CP-OFDM, TM 3.1, 10 MHz, 64-QAM, 30 kHz)	5G NR FR1 TDD	9.37	-9.6
10966	AAB	5G NR DL (CP-OFDM, TM 3.1, 15 MHz, 64-QAM, 30 kHz)	5G NR FR1 TDD	9.55	-9.6
10967	AAB	5G NR DL (CP-OFDM, TM 3.1, 20 MHz, 64-QAM, 30 kHz)	5G NR FR1 TDD	9.42	-9.6
10968	AAB	5G NR DL (CP-OFDM, TM 3.1, 100 MHz, 64-QAM, 30 kHz)	5G NR FR1 TDD	9.49	-9.6
10972	AAB	5G NR (CP-OFDM, 1 RB, 20 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	11.59	-9.6
10973	AAB	5G NR (DFT-s-OFDM, 1 RB, 100 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	9.06	-9.6
10974	AAB	5G NR (CP-OFDM, 150% RB, 100 MHz, 256-QAM, 30 kHz)	5G NR FR1 TDD	10.28	-9.6
10978	AAA	ULLA HDR	LLA	1.16	-9.6
10979	AAA	ULLA HDR4	LLA	8.58	-9.6
10980	AAA	ULLA HDR8	LLA	10.32	-9.6
10981	AAA	ULLA HDRp4	LLA	3.19	-9.6
10982	AAA	ULLA HDRps	LLA	3.43	-9.6



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UID	Rev	Communication System Name	Group	PAR (dB)	Unc <sup>E</sup> k = 2
10983	AAA	5G NR DL (CP-OFDM, TM 3.1, 40 MHz, 64-QAM, 15 kHz)	5G NR FR1 TDD	9.31	±9.6
10984	AAA	5G NR DL (CP-OFDM, TM 3.1, 50 MHz, 64-QAM, 15 kHz)	5G NR FR1 TDD	9.42	±9.6
10985	AAA	5G NR DL (CP-OFDM, TM 3.1, 40 MHz, 64-QAM, 30 kHz)	5G NR FR1 TDD	9.54	±9.6
10986	AAA	5G NR DL (CP-OFDM, TM 3.1, 50 MHz, 64-QAM, 30 kHz)	5G NR FR1 TDD	9.50	±9.6
10987	AAA	5G NR DL (CP-OFDM, TM 3.1, 60 MHz, 64-QAM, 30 kHz)	5G NR FR1 TDD	9.53	±9.6
10988	AAA	5G NR DL (CP-OFDM, TM 3.1, 70 MHz, 64-QAM, 30 kHz)	5G NR FR1 TDD	9.36	±9.6
10989	AAA	5G NR DL (CP-OFDM, TM 3.1, 80 MHz, 64-QAM, 30 kHz)	5G NR FR1 TDD	9.33	±9.6
10990	AAA	5G NR DL (CP-OFDM, TM 3.1, 90 MHz, 64-QAM, 30 kHz)	5G NR FR1 TDD	9.52	±9.6
11003	AAA	5G NR DL (CP-OFDM, TM 3.1, 90 MHz, 64-QAM, 15 kHz)	5G NR FR1 TDD	10.24	±9.6
11004	AAA	5G NR DL (CP-OFDM, TM 3.1, 30 MHz, 64-QAM, 30 kHz)	5G NR FR1 TDD	10.73	±9.6
11005	AAA	5G NR DL (CP-OFDM, TM 3.1, 25 MHz, 64-QAM, 15 kHz)	5G NR FR1 FDD	9.73	±9.6
11006	AAA	5G NR DL (CP-OFDM, TM 3.1, 30 MHz, 64-QAM, 15 kHz)	5G NR FR1 FDD	9.55	±9.6
11007	AAA	5G NR DL (CP-OFDM, TM 3.1, 40 MHz, 64-QAM, 15 kHz)	5G NR FR1 FDD	8.46	±9.6
11008	AAA	5G NR DL (CP-OFDM, TM 3.1, 50 MHz, 64-QAM, 15 kHz)	5G NR FR1 FDD	8.27	±9.6
11009	AAA	5G NR DL (CP-OFDM, TM 3.1, 25 MHz, 64-QAM, 30 kHz)	5G NR FR1 FDD	8.76	±9.6
11010	AAA	5G NR DL (CP-OFDM, TM 3.1, 30 MHz, 64-QAM, 30 kHz)	5G NR FR1 FDD	8.56	±9.6
11011	AAA	5G NR DL (CP-OFDM, TM 3.1, 40 MHz, 64-QAM, 30 kHz)	5G NR FR1 FDD	8.56	±9.6
11012	AAA	5G NR DL (CP-OFDM, TM 3.1, 50 MHz, 64-QAM, 30 kHz)	5G NR FR1 FDD	8.66	±9.6
11013	AAA	IEEE 802.11be (320 MHz, MCS1, 99pc duty cycle)	WLAN	8.47	±9.0
11014	AAA	IEEE 802.11be (320 MHz, MCS2, 99pc duty cycle)	WLAN	8.45	±9.6
11015	AAA	IEEE 802.11be (320 MHz, MCS3, 99pc duty cycle)	WLAN	8.44	±9.6
11016	AAA	IEEE 802.11be (320 MHz, MCS4, 99pc duty cycle)	WLAN	8.44	±9.6
11017	AAA	IEEE 802.11be (320 MHz, MCS5, 99pc duty cycle)	WLAN	8.41	±9.6
11018	AAA	IEEE 802.11be (320 MHz, MCS6, 99pc duty cycle)	WLAN	8.43	±9.6
11019	AAA	IEEE 802.11be (320 MHz, MCS7, 99pc duty cycle)	WLAN	8.29	±9.6
11020	AAA	IEEE 802.11be (320 MHz, MCS8, 99pc duty cycle)	WLAN	8.27	±9.6
11021	AAA	IEEE 802.11be (320 MHz, MCS9, 99pc duty cycle)	WLAN	8.46	±9.6
11022	AAA	IEEE 802.11be (320 MHz, MCS10, 99pc duty cycle)	WLAN	8.38	±9.6
11023	AAA	IEEE 802.11be (320 MHz, MCS11, 99pc duty cycle)	WLAN	8.09	±9.6
11024	AAA	IEEE 802.11be (320 MHz, MCS12, 99pc duty cycle)	WLAN	8.42	±9.6
11025	AAA	IEEE 802.11be (320 MHz, MCS13, 99pc duty cycle)	WLAN	8.37	±9.6
11026	AAA	IEEE 802.11be (320 MHz, MCS14, 99pc duty cycle)	WLAN	8.38	±9.6

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





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Accreditation No.: SCS 0108

**Client** **TÜV SÜD**  
 Fareham, United Kingdom

**Certificate No.** **EX-7805\_Apr23**

**CALIBRATION CERTIFICATE**

**Object** EX3DV4 - SN:7805

**Calibration procedure(s)** QA CAL-01.v10, QA CAL-12.v10, QA CAL-14.v7, QA CAL-23.v6,  
 QA CAL-25.v8  
 Calibration procedure for dosimetric E-field probes

**Calibration date** April 06, 2023

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 NRP2	SN: 104778	30-Mar-23 (No. 217-03804/03805)	Mar-24
Power sensor NRP-Z91	SN: 103244	30-Mar-23 (No. 217-03804)	Mar-24
OCP DAK-3.5 (weighted)	SN: 1249	20-Oct-22 (OCP-DAK3.5-1249_Oct22)	Oct-23
OCP DAK-12	SN: 1016	20-Oct-22 (OCP-DAK12-1016_Oct22)	Oct-23
Reference 20 dB Attenuator	SN: CC2552 (20x)	30-Mar-23 (No. 217-03809)	Mar-24
DAE4	SN: 660	16-Mar-23 (No. DAE4-660_Mar23)	Mar-24
Reference Probe ES3DV2	SN: 3013	06-Jan-23 (No. ES3-3013_Jan23)	Jan-24

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

<b>Calibrated by</b>	Name Jeffrey Katzman	Function Laboratory Technician	Signature 
<b>Approved by</b>	Name Sven Kühn	Function Technical Manager	Signature 

Issued: April 07, 2023

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

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## Glossary

TSL	tissue simulating liquid
NORM <sub>x,y,z</sub>	sensitivity in free space
ConvF	sensitivity in TSL / NORM <sub>x,y,z</sub>
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A, B, C, D	modulation dependent linearization parameters
Polarization $\varphi$	$\varphi$ rotation around probe axis
Polarization $\theta$	$\theta$ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., $\theta = 0$ 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:

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

## Methods Applied and Interpretation of Parameters:

- NORM<sub>x,y,z</sub>**: Assessed for E-field polarization  $\theta = 0$  ( $f \leq 900$  MHz in TEM-cell;  $f > 1800$  MHz: R22 waveguide). NORM<sub>x,y,z</sub> are only intermediate values, i.e., the uncertainties of NORM<sub>x,y,z</sub> does not affect the  $E^2$ -field uncertainty inside TSL (see below ConvF).
- NORM(f)<sub>x,y,z</sub> = NORM<sub>x,y,z</sub> \* 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.
- DCP<sub>x,y,z</sub>**: DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal. DCP does not depend on frequency nor media.
- PAR**: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- A<sub>x,y,z</sub>; B<sub>x,y,z</sub>; C<sub>x,y,z</sub>; D<sub>x,y,z</sub>; VR<sub>x,y,z</sub>**: 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  $f \leq 800$  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 NORM<sub>x,y,z</sub> \* 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  $\pm 50$  MHz to  $\pm 100$  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 NORM<sub>x</sub> (no uncertainty required).



EX3DV4 - SN:7805

April 06, 2023

**Parameters of Probe: EX3DV4 - SN:7805**

**Basic Calibration Parameters**

	Sensor X	Sensor Y	Sensor Z	Unc (k = 2)
Norm ( $\mu\text{V}/(\text{V}/\text{m})^2$ ) <sup>A</sup>	0.62	0.60	0.71	±10.1%
DCP (mV) <sup>B</sup>	103.0	102.0	104.0	±4.7%

**Calibration Results for Modulation Response**

UID	Communication System Name		A dB	B dB $\sqrt{\mu\text{V}}$	C	D dB	VR mV	Max dev.	Max Unc <sup>E</sup> k = 2
0	CW	X	0.00	0.00	1.00	0.00	114.0	±2.4%	±4.7%
		Y	0.00	0.00	1.00		113.6		
		Z	0.00	0.00	1.00		124.2		
10352	Pulse Waveform (200Hz, 10%)	X	1.35	60.00	6.03	10.00	60.0	±3.1%	±9.6%
		Y	1.68	61.71	7.29		60.0		
		Z	1.46	60.39	6.22		60.0		
10353	Pulse Waveform (200Hz, 20%)	X	10.00	72.00	9.00	6.99	80.0	±2.5%	±9.6%
		Y	0.91	60.40	5.63		80.0		
		Z	0.84	60.00	5.00		80.0		
10354	Pulse Waveform (200Hz, 40%)	X	0.45	60.00	3.80	3.98	95.0	±1.8%	±9.6%
		Y	0.46	60.00	4.49		95.0		
		Z	0.48	60.00	3.87		95.0		
10355	Pulse Waveform (200Hz, 60%)	X	0.31	60.00	2.97	2.22	120.0	±1.9%	±9.6%
		Y	12.99	159.86	1.57		120.0		
		Z	10.02	84.67	3.26		120.0		
10387	QPSK Waveform, 1 MHz	X	0.63	67.34	14.78	1.00	150.0	±3.3%	±9.6%
		Y	0.56	64.10	12.53		150.0		
		Z	0.59	65.65	13.87		150.0		
10388	QPSK Waveform, 10 MHz	X	1.48	68.40	15.12	0.00	150.0	±1.0%	±9.6%
		Y	1.35	66.06	13.93		150.0		
		Z	1.42	67.37	14.72		150.0		
10396	64-QAM Waveform, 100 kHz	X	1.84	66.17	16.65	3.01	150.0	±1.2%	±9.6%
		Y	1.84	65.74	16.35		150.0		
		Z	1.64	64.22	15.77		150.0		
10399	64-QAM Waveform, 40 MHz	X	2.89	67.21	15.63	0.00	150.0	±1.7%	±9.6%
		Y	2.83	66.37	15.10		150.0		
		Z	2.85	66.76	15.39		150.0		
10414	WLAN CCDF, 64-QAM, 40 MHz	X	3.81	66.67	15.60	0.00	150.0	±3.1%	±9.6%
		Y	3.80	66.03	15.25		150.0		
		Z	3.77	66.25	15.40		150.0		

Note: For details on UID parameters see Appendix

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

<sup>A</sup> The uncertainties of Norm X,Y,Z do not affect the E<sup>2</sup>-field uncertainty inside TSL (see Pages 5 and 6).

<sup>B</sup> Linearization parameter uncertainty for maximum specified field strength.

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



EX3DV4 - SN:7805

April 06, 2023

**Parameters of Probe: EX3DV4 - SN:7805**

**Sensor Model Parameters**

	C1 fF	C2 fF	$\alpha$ V <sup>-1</sup>	T1 ms V <sup>-2</sup>	T2 ms V <sup>-1</sup>	T3 ms	T4 V <sup>-2</sup>	T5 V <sup>-1</sup>	T6
x	8.5	60.88	33.01	4.65	0.00	4.90	0.67	0.00	1.00
y	9.5	68.51	33.09	5.59	0.00	4.95	0.73	0.00	1.00
z	9.0	64.04	32.66	4.94	0.00	4.90	0.25	0.02	1.00

**Other Probe Parameters**

Sensor Arrangement	Triangular
Connector Angle	-7.8°
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	9 mm
Tip Diameter	2.5 mm
Probe Tip to Sensor X Calibration Point	1 mm
Probe Tip to Sensor Y Calibration Point	1 mm
Probe Tip to Sensor Z Calibration Point	1 mm
Recommended Measurement Distance from Surface	1.4 mm

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



EX3DV4 - SN:7805

April 06, 2023

**Parameters of Probe: EX3DV4 - SN:7805**

**Calibration Parameter Determined in Head Tissue Simulating Media**

f (MHz) <sup>C</sup>	Relative Permittivity <sup>F</sup>	Conductivity <sup>F</sup> (S/m)	ConvF X	ConvF Y	ConvF Z	Alpha <sup>G</sup>	Depth <sup>G</sup> (mm)	Unc (k = 2)
128	52.8	0.76	12.30	12.30	12.30	0.00	1.25	±13.3%
450	43.5	0.87	10.62	10.62	10.62	0.16	1.30	±13.3%
750	41.9	0.89	9.02	9.55	9.06	0.39	1.27	±12.0%
835	41.5	0.90	8.96	9.50	9.01	0.38	1.27	±12.0%
900	41.5	0.97	8.93	9.61	9.03	0.38	1.27	±12.0%
1300	40.8	1.14	7.78	8.31	7.96	0.50	1.27	±12.0%
1450	40.5	1.20	7.69	8.18	7.86	0.47	1.27	±12.0%
1640	40.2	1.31	7.64	8.14	7.88	0.43	1.27	±12.0%
1750	40.1	1.37	8.00	8.66	8.21	0.26	1.27	±12.0%
1810	40.0	1.40	7.81	8.37	7.98	0.29	1.27	±12.0%
1900	40.0	1.40	7.65	8.19	7.83	0.29	1.27	±12.0%
2000	40.0	1.40	7.47	8.00	7.63	0.29	1.27	±12.0%
2100	39.8	1.49	7.33	7.85	7.47	0.30	1.27	±12.0%
2300	39.5	1.67	7.18	7.68	7.34	0.30	1.27	±12.0%
2450	39.2	1.80	7.04	7.51	7.18	0.29	1.27	±12.0%
2600	39.0	1.96	6.95	7.45	7.07	0.27	1.27	±12.0%
3300	38.2	2.71	6.66	7.13	6.76	0.34	1.27	±14.0%
3500	37.9	2.91	6.63	7.08	6.72	0.36	1.27	±14.0%
3700	37.7	3.12	6.52	6.97	6.64	0.35	1.27	±14.0%
4100	37.2	3.53	6.37	6.79	6.46	0.35	1.27	±14.0%
5200	36.0	4.66	5.21	5.54	5.30	0.30	1.67	±14.0%
5300	35.9	4.76	5.02	5.32	5.09	0.33	1.64	±14.0%
5500	35.6	4.96	4.82	5.07	4.89	0.36	1.61	±14.0%
5600	35.5	5.07	4.65	4.86	4.76	0.36	1.67	±14.0%
5800	35.3	5.27	4.66	4.92	4.77	0.34	1.87	±14.0%

<sup>C</sup> 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. Validity of ConvF assessed at 6 MHz is 4–9 MHz, and ConvF assessed at 13 MHz is 9–19 MHz. Above 5 GHz frequency validity can be extended to ±110 MHz.

<sup>F</sup> The probes are calibrated using tissue simulating liquids (TSL) that deviate for  $\epsilon$  and  $\sigma$  by less than ±5% from the target values (typically better than ±3%) and are valid for TSL with deviations of up to ±10%. If TSL with deviations from the target of less than ±5% are used, the calibration uncertainties are 11.1% for 0.7 - 3 GHz and 13.1% for 3 - 6 GHz.

<sup>G</sup> 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.