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TEST REPORT

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KCTL

1. Client

- Name : Intel Mobile Communications
- Address : 100 Center Point Circle, Suite 200 Columbia, South Carolina 29210 USA
- Date of Receipt : 2021-07-05

2. Use of Report : Class II Permissive Change

3. Name of Product and Model : WLAN and BT, 2x2 PCIe M.2 1216 SD adapter card
- Model Number : AX210D2W
- Manufacturer and Country of Origin : Intel Mobile Communications / USA

4. Host Product Name : Notebook PC
- Host Model Name : NP950QDB
- Manufacturer : Samsung Electronics Co., Ltd.

5. FCC ID Number : PD9AX210D2

6. Date of Test : 2021-07-14 ~ 2021-08-05

7. Location of Test : ■ Permanent Testing Lab ☐ On Site Testing
(Address: 65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Korea)

8. Test Standards : IEEE 1528-2013, KDB Publication

9. Test Results : Refer to the test result in the test report

Affirmation	Tested by Name : Mungi Jeong (Signature)	Technical Manager Name : Jongwon Ma (Signature)

2021-08-25

KCTL Inc.

As a test result of the sample which was submitted from the client, this report does not guarantee the whole product quality. This test report should not be used and copied without a written agreement by KCTL Inc.

REPORT REVISION HISTORY

Date	Revision	Page No
2021-08-25	Originally issued	-

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(may be required by the product standard or client)

☐ **Internal procedure used for type testing through which traceability of the measuring uncertainty has been established:**

Procedure number, issue date and title:

Calculations leading to the reported values are on file with the testing laboratory that conducted the testing.

☒ **Statement not required by the standard or client used for type testing**

1. Identification when information is provided by the customer: Information marked " # " is provided by the customer. - Disclaimer: This information is provided by the customer and can affect the validity of results.

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1. General information

Client	:	Intel Mobile Communications
Address	:	100 Center Point Circle, Suite 200 Columbia, South Carolina 29210 USA
Manufacturer	:	Intel Mobile Communications
Address	:	100 Center Point Circle, Suite 200 Columbia, South Carolina 29210 USA
Contact Person		Steven Hackett / Steven.c.hackett@intel.com
Laboratory	:	KCTL Inc.
Address	:	65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Korea
Accreditations	:	FCC Site Designation No: KR0040, FCC Site Registration No: 687132
		VCCI Registration No. : R-3327, G-198, C-3706, T-1849
		CAB Identifier: KR0040, ISED Number: 8035A
		KOLAS No.: KT231

1.1 Report Overview

This report details the results of testing carried out on the samples listed in section 2, the results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

This report may only be reproduced and distributed in full. If the product in this test report is used in any configuration other than that detailed in the test report, the manufacturer must ensure the new configuration complies with all relevant standards and certification requirements. Any mention of KCTL Inc. Wireless lab or testing done by KCTL Inc. Wireless lab made in connection with the distribution or use of the tested product must be approved in writing by KCTL Inc. Wireless lab.

2. Device information

2.1 Basic description

Product Name		WLAN and BT, 2x2 PCIe M.2 1216 SD adapter card
Product Model Number		AX210D2W
Product Manufacturer		Intel Mobile Communications
Host Product Name		Notebook PC
Host Model Number		NP950QDB
Host Manufacturer		Samsung Electronics Co., Ltd.
Host Product Serial Number	Radiation	4Z139FMR300002K
		4WNS9FMR300012A
	Conduction	4WNR9FMR300014Y
Mode of Operation		WLAN 802.11a,n,ac,ax
Device Overview		U-NII-5: 5 955.0 ㎒ ~ 6 415.0 ㎒ U-NII-6: 6 435.0 ㎒ ~ 6 515.0 ㎒ U-NII-7: 6 535.0 ㎒ ~ 6 855.0 ㎒ U-NII-8: 6 875.0 ㎒ ~ 7 115.0 ㎒

Note 1: WLAN 2.4 ㎓, 5 ㎓ and Bluetooth Information refer to the legacy report. (KR21-SPF0011)

2.2 Summary of Test Results

Band	Highest Reported			
	SAR 1g (W/kg)		PD 4cm^2 (W/m^2)	
	Notebook	Tablet	Notebook	Tablet
U-NII-5	1.02	0.13	6.54	0.78
U-NII-6	1.00	0.45	5.82	0.99
U-NII-7	**1.30**	**0.46**	**6.65**	**1.68**
U-NII-8	0.80	0.41	4.59	1.32

2.3 #Maximum Tune-up power

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

2.3.1 #Maximum WLAN Output Power (Notebook Mode)

Band	Ant.	Mode	Channel	Output Power (dB m)		
				Target	Max. Allowed	SAR Test
U-NII-5	Main	802.11a	All Channel	4.50	**5.50**	No
		802.11n(HT20)	All Channel	4.50	**5.50**	No
		802.11n(HT40)	All Channel	7.75	**8.75**	No
		802.11ac(VHT20)	All Channel	4.50	**5.50**	No
		802.11ac(VHT40)	All Channel	7.75	**8.75**	No
		802.11ac(VHT80)	7~39	10.00	**11.00**	No
			55~87	8.00	**9.00**	
		802.11ac(VHT160)	15	10.00	**11.00**	No
			47~79	8.00	**9.00**	
		SU 20 MHz	All Channel	4.50	**5.50**	No
		RU 26T_20 MHz	All Channel	-4.00	**-3.00**	No
		RU 52T_20 MHz	All Channel	-1.00	**0.00**	No
		RU 106T_20 MHz	All Channel	2.00	**3.00**	No
		RU 242T_20 MHz	All Channel	4.50	**5.50**	No
		SU 40 MHz	All Channel	7.75	**8.75**	No
		RU 26T_40 MHz	All Channel	-4.00	**-3.00**	No
		RU 52T_40 MHz	All Channel	-1.00	**0.00**	No
		RU 106T_40 MHz	All Channel	2.00	**3.00**	No
		RU 242T_40 MHz	All Channel	4.50	**5.50**	No
		RU 484T_40 MHz	All Channel	7.75	**8.75**	No
		SU 80 MHz	7~39	10.00	**11.00**	No
			55~87	8.00	**9.00**	
		RU 26T_80 MHz	All Channel	-4.00	**-3.00**	No
		RU 52T_80 MHz	All Channel	-1.00	**0.00**	No
		RU 106T_80 MHz	All Channel	2.00	**3.00**	No
		RU 242T_80 MHz	All Channel	4.50	**5.50**	No
		RU 484T_80 MHz	All Channel	7.75	**8.75**	No
		RU 996T_80 MHz	7~39	10.00	**11.00**	No
			55~87	8.00	**9.00**	
		SU 160 MHz	15	10.00	**11.00**	**Yes**
			47~79	8.00	**9.00**	
		RU 26T_160 MHz	All Channel	-4.00	**-3.00**	No
		RU 52T_160 MHz	All Channel	-1.00	**0.00**	No
		RU 106T_160 MHz	All Channel	2.00	**3.00**	No
		RU 242T_160 MHz	All Channel	4.50	**5.50**	No
		RU 484T_160 MHz	All Channel	7.75	**8.75**	No
		RU 996T_160 MHz	15	10.00	**11.00**	No
			47~79	8.00	**9.00**	

Band	Ant.	Mode	Channel	Output Power (dB m)		
				Target	Max. Allowed	SAR Test
U-NII-5	Aux	802.11a	All Channel	4.50	**5.50**	No
		802.11n(HT20)	All Channel	4.50	**5.50**	No
		802.11n(HT40)	All Channel	7.75	**8.75**	No
		802.11ac(VHT20)	All Channel	4.50	**5.50**	No
		802.11ac(VHT40)	All Channel	7.75	**8.75**	No
		802.11ac(VHT80)	All Channel	9.50	**10.50**	No
		802.11ac(VHT160)	All Channel	9.50	**10.50**	No
		SU 20 MHz	All Channel	4.50	**5.50**	No
		RU 26T_20 MHz	All Channel	-4.00	**-3.00**	No
		RU 52T_20 MHz	All Channel	-1.00	**0.00**	No
		RU 106T_20 MHz	All Channel	2.00	**3.00**	No
		RU 242T_20 MHz	All Channel	4.50	**5.50**	No
		SU 40 MHz	All Channel	7.75	**8.75**	No
		RU 26T_40 MHz	All Channel	-4.00	**-3.00**	No
		RU 52T_40 MHz	All Channel	-1.00	**0.00**	No
		RU 106T_40 MHz	All Channel	2.00	**3.00**	No
		RU 242T_40 MHz	All Channel	4.50	**5.50**	No
		RU 484T_40 MHz	All Channel	7.75	**8.75**	No
		SU 80 MHz	All Channel	9.50	**10.50**	No
		RU 26T_80 MHz	All Channel	-4.00	**-3.00**	No
		RU 52T_80 MHz	All Channel	-1.00	**0.00**	No
		RU 106T_80 MHz	All Channel	2.00	**3.00**	No
		RU 242T_80 MHz	All Channel	4.50	**5.50**	No
		RU 484T_80 MHz	All Channel	7.75	**8.75**	No
		RU 996T_80 MHz	All Channel	9.50	**10.50**	No
		SU 160 MHz	All Channel	9.50	**10.50**	**Yes**
		RU 26T_160 MHz	All Channel	-4.00	**-3.00**	No
		RU 52T_160 MHz	All Channel	-1.00	**0.00**	No
		RU 106T_160 MHz	All Channel	2.00	**3.00**	No
		RU 242T_160 MHz	All Channel	4.50	**5.50**	No
		RU 484T_160 MHz	All Channel	7.75	**8.75**	No
		RU 996T_160 MHz	All Channel	9.50	**10.50**	No

Band	Ant.	Mode	Channel	Output Power (dB m)		
				Target	Max. Allowed	SAR Test
U-NII-6	Main	802.11a	All Channel	4.50	**5.50**	No
		802.11n(HT20)	All Channel	4.50	**5.50**	No
		802.11n(HT40)	All Channel	7.50	**8.50**	No
		802.11ac(VHT20)	All Channel	4.50	**5.50**	No
		802.11ac(VHT40)	All Channel	7.50	**8.50**	No
		802.11ac(VHT80)	All Channel	7.50	**8.50**	No
		802.11ac(VHT160)	All Channel	7.50	**8.50**	No
		SU 20 MHz	All Channel	4.50	**5.50**	No
		RU 26T_20 MHz	All Channel	-4.00	**-3.00**	No
		RU 52T_20 MHz	All Channel	-1.00	**0.00**	No
		RU 106T_20 MHz	All Channel	2.00	**3.00**	No
		RU 242T_20 MHz	All Channel	4.50	**5.50**	No
		SU 40 MHz	All Channel	7.50	**8.50**	No
		RU 26T_40 MHz	All Channel	-4.00	**-3.00**	No
		RU 52T_40 MHz	All Channel	-1.00	**0.00**	No
		RU 106T_40 MHz	All Channel	2.00	**3.00**	No
		RU 242T_40 MHz	All Channel	4.50	**5.50**	No
		RU 484T_40 MHz	All Channel	7.50	**8.50**	No
		SU 80 MHz	All Channel	7.50	**8.50**	No
		RU 26T_80 MHz	All Channel	-4.00	**-3.00**	No
		RU 52T_80 MHz	All Channel	-1.00	**0.00**	No
		RU 106T_80 MHz	All Channel	2.00	**3.00**	No
		RU 242T_80 MHz	All Channel	4.50	**5.50**	No
		RU 484T_80 MHz	All Channel	7.50	**8.50**	No
		RU 996T_80 MHz	All Channel	7.50	**8.50**	No
		SU 160 MHz	All Channel	7.50	**8.50**	**Yes**
		RU 26T_160 MHz	All Channel	-4.00	**-3.00**	No
		RU 52T_160 MHz	All Channel	-1.00	**0.00**	No
		RU 106T_160 MHz	All Channel	2.00	**3.00**	No
		RU 242T_160 MHz	All Channel	4.50	**5.50**	No
		RU 484T_160 MHz	All Channel	7.50	**8.50**	No
		RU 996T_160 MHz	All Channel	7.50	**8.50**	No

Band	Ant.	Mode	Channel	Output Power (dB m)		
				Target	Max. Allowed	SAR Test
U-NII-6	Aux	802.11a	All Channel	4.50	**5.50**	No
		802.11n(HT20)	All Channel	4.50	**5.50**	No
		802.11n(HT40)	All Channel	7.75	**8.75**	No
		802.11ac(VHT20)	All Channel	4.50	**5.50**	No
		802.11ac(VHT40)	All Channel	7.75	**8.75**	No
		802.11ac(VHT80)	103	9.50	**10.50**	No
			119	9.00	**10.00**	
		802.11ac(VHT160)	All Channel	9.50	**10.50**	No
		SU 20 MHz	All Channel	4.50	**5.50**	No
		RU 26T_20 MHz	All Channel	-4.00	**-3.00**	No
		RU 52T_20 MHz	All Channel	-1.00	**0.00**	No
		RU 106T_20 MHz	All Channel	2.00	**3.00**	No
		RU 242T_20 MHz	All Channel	4.50	**5.50**	No
		SU 40 MHz	All Channel	7.75	**8.75**	No
		RU 26T_40 MHz	All Channel	-4.00	**-3.00**	No
		RU 52T_40 MHz	All Channel	-1.00	**0.00**	No
		RU 106T_40 MHz	All Channel	2.00	**3.00**	No
		RU 242T_40 MHz	All Channel	4.50	**5.50**	No
		RU 484T_40 MHz	All Channel	7.75	**8.75**	No
		SU 80 MHz	103	9.50	**10.50**	No
			119	9.00	**10.00**	
		RU 26T_80 MHz	All Channel	-4.00	**-3.00**	No
		RU 52T_80 MHz	All Channel	-1.00	**0.00**	No
		RU 106T_80 MHz	All Channel	2.00	**3.00**	No
		RU 242T_80 MHz	All Channel	4.50	**5.50**	No
		RU 484T_80 MHz	All Channel	7.75	**8.75**	No
		RU 996T_80 MHz	103	9.50	**10.50**	No
			119	9.00	**10.00**	
		SU 160 MHz	All Channel	9.50	**10.50**	**Yes**
		RU 26T_160 MHz	All Channel	-4.00	**-3.00**	No
		RU 52T_160 MHz	All Channel	-1.00	**0.00**	No
		RU 106T_160 MHz	All Channel	2.00	**3.00**	No
		RU 242T_160 MHz	All Channel	4.50	**5.50**	No
		RU 484T_160 MHz	All Channel	7.75	**8.75**	No
		RU 996T_160 MHz	All Channel	9.50	**10.50**	No

Band	Ant.	Mode	Channel	Output Power (dB m)		
				Target	Max. Allowed	SAR Test
U-NII-7	Main	802.11a	All Channel	3.75	**4.75**	No
		802.11n(HT20)	All Channel	3.75	**4.75**	No
		802.11n(HT40)	115	7.50	**8.50**	No
			131~179	7.00	**8.00**	
		802.11ac(VHT20)	All Channel	3.75	**4.75**	No
		802.11ac(VHT40)	115	7.50	**8.50**	No
			131~179	7.00	**8.00**	
		802.11ac(VHT80)	All Channel	7.50	**8.50**	No
		802.11ac(VHT160)	All Channel	7.50	**8.50**	No
		SU 20 MHz	All Channel	3.75	**4.75**	No
		RU 26T_20 MHz	All Channel	-4.75	**-3.75**	No
		RU 52T_20 MHz	All Channel	-1.75	**-0.75**	No
		RU 106T_20 MHz	All Channel	1.25	**2.25**	No
		RU 242T_20 MHz	All Channel	3.75	**4.75**	No
		SU 40 MHz	115	7.50	**8.50**	No
			131~179	7.00	**8.00**	
		RU 26T_40 MHz	115	-4.00	**-3.00**	No
			131~179	-4.75	**-3.75**	
		RU 52T_40 MHz	115	-1.00	**0.00**	No
			131~179	-1.75	**-0.75**	
		RU 106T_40 MHz	115	2.00	**3.00**	No
			131~179	1.25	**2.25**	
		RU 242T_40 MHz	115	4.50	**5.50**	No
			131~179	3.75	**4.75**	
		RU 484T_40 MHz	115	7.50	**8.50**	No
			131~179	7.00	**8.00**	
		SU 80 MHz	All Channel	7.50	**8.50**	No
		RU 26T_80 MHz	All Channel	-4.75	**-3.75**	No
		RU 52T_80 MHz	All Channel	-1.75	**-0.75**	No
		RU 106T_80 MHz	All Channel	1.25	**2.25**	No
		RU 242T_80 MHz	All Channel	3.75	**4.75**	No
		RU 484T_80 MHz	All Channel	7.00	**8.00**	No
		RU 996T_80 MHz	All Channel	7.50	**8.50**	No
		SU 160 MHz	All Channel	7.50	**8.50**	**Yes**
		RU 26T_160 MHz	All Channel	-4.75	**-3.75**	No
		RU 52T_160 MHz	All Channel	-1.75	**-0.75**	No
		RU 106T_160 MHz	All Channel	1.25	**2.25**	No
		RU 242T_160 MHz	All Channel	3.75	**4.75**	No
		RU 484T_160 MHz	All Channel	7.00	**8.00**	No
		RU 996T_160 MHz	All Channel	7.50	**8.50**	No

Band	Ant.	Mode	Channel	Output Power (dB m)		
				Target	Max. Allowed	SAR Test
U-NII-7	Aux	802.11a	All Channel	3.75	**4.75**	No
		802.11n(HT20)	All Channel	3.75	**4.75**	No
		802.11n(HT40)	115	7.75	**8.75**	No
			131~179	7.00	**8.00**	
		802.11ac(VHT20)	All Channel	3.75	**4.75**	No
		802.11ac(VHT40)	115	7.75	**8.75**	No
			131~179	7.00	**8.00**	
		802.11ac(VHT80)	All Channel	9.00	**10.00**	No
		802.11ac(VHT160)	All Channel	9.00	**10.00**	No
		SU 20 MHz	All Channel	3.75	**4.75**	No
		RU 26T_20 MHz	All Channel	-4.75	**-3.75**	No
		RU 52T_20 MHz	All Channel	-1.75	**-0.75**	No
		RU 106T_20 MHz	All Channel	1.25	**2.25**	No
		RU 242T_20 MHz	All Channel	3.75	**4.75**	No
		SU 40 MHz	115	7.75	**8.75**	No
			131~179	7.00	**8.00**	
		RU 26T_40 MHz	115	-4.00	**-3.00**	No
			131~179	-4.75	**-3.75**	
		RU 52T_40 MHz	115	-1.00	**0.00**	No
			131~179	-1.75	**-0.75**	
		RU 106T_40 MHz	115	2.00	**3.00**	No
			131~179	1.25	**2.25**	
		RU 242T_40 MHz	115	4.50	**5.50**	No
			131~179	3.75	**4.75**	
		RU 484T_40 MHz	115	7.75	**8.75**	No
			131~179	7.00	**8.00**	
		SU 80 MHz	All Channel	9.00	**10.00**	No
		RU 26T_80 MHz	All Channel	-4.75	**-3.75**	No
		RU 52T_80 MHz	All Channel	-1.75	**-0.75**	No
		RU 106T_80 MHz	All Channel	1.25	**2.25**	No
		RU 242T_80 MHz	All Channel	3.75	**4.75**	No
		RU 484T_80 MHz	All Channel	7.00	**8.00**	No
		RU 996T_80 MHz	All Channel	9.00	**10.00**	No
		SU 160 MHz	All Channel	9.00	**10.00**	**Yes**
		RU 26T_160 MHz	All Channel	-4.75	**-3.75**	No
		RU 52T_160 MHz	All Channel	-1.75	**-0.75**	No
		RU 106T_160 MHz	All Channel	1.25	**2.25**	No
		RU 242T_160 MHz	All Channel	3.75	**4.75**	No
		RU 484T_160 MHz	All Channel	7.00	**8.00**	No
		RU 996T_160 MHz	All Channel	9.00	**10.00**	No

Band	Ant.	Mode	Channel	Output Power (dB m)		
				Target	Max. Allowed	SAR Test
U-NII-8	Main	802.11a	197~229	3.75	**4.75**	No
			233	-1.50	**-0.50**	
		802.11n(HT20)	197~229	3.75	**4.75**	No
			233	-1.50	**-0.50**	
		802.11n(HT40)	All Channel	7.00	**8.00**	No
		802.11ac(VHT20)	197~229	3.75	**4.75**	No
			233	-1.50	**-0.50**	
		802.11ac(VHT40)	All Channel	7.00	**8.00**	No
		802.11ac(VHT80)	All Channel	7.50	**8.50**	No
		802.11ac(VHT160)	All Channel	7.50	**8.50**	No
		SU 20 MHz	197~229	3.75	**4.75**	No
			233	-1.50	**-0.50**	
		RU 26T_20 MHz	All Channel	-4.75	**-3.75**	No
		RU 52T_20 MHz	All Channel	-1.75	**-0.75**	No
		RU 106T_20 MHz	All Channel	1.25	**2.25**	No
		RU 242T_20 MHz	197~229	3.75	**4.75**	No
			233	-1.50	**-0.50**	
		SU 40 MHz	All Channel	7.00	**8.00**	No
		RU 26T_40 MHz	All Channel	-4.75	**-3.75**	No
		RU 52T_40 MHz	All Channel	-1.75	**-0.75**	No
		RU 106T_40 MHz	All Channel	1.25	**2.25**	No
		RU 242T_40 MHz	All Channel	3.75	**4.75**	No
		RU 484T_40 MHz	All Channel	7.00	**8.00**	No
		SU 80 MHz	All Channel	7.50	**8.50**	No
		RU 26T_80 MHz	All Channel	-4.75	**-3.75**	No
		RU 52T_80 MHz	All Channel	-1.75	**-0.75**	No
		RU 106T_80 MHz	All Channel	1.25	**2.25**	No
		RU 242T_80 MHz	All Channel	3.75	**4.75**	No
		RU 484T_80 MHz	All Channel	7.00	**8.00**	No
		RU 996T_80 MHz	All Channel	7.50	**8.50**	No
		SU 160 MHz	All Channel	7.50	**8.50**	**Yes**
		RU 26T_160 MHz	All Channel	-4.75	**-3.75**	No
		RU 52T_160 MHz	All Channel	-1.75	**-0.75**	No
		RU 106T_160 MHz	All Channel	1.25	**2.25**	No
		RU 242T_160 MHz	All Channel	3.75	**4.75**	No
		RU 484T_160 MHz	All Channel	7.00	**8.00**	No
		RU 996T_160 MHz	All Channel	7.50	**8.50**	No

Band	Ant.	Mode	Channel	Output Power (dB m)		
				Target	Max. Allowed	SAR Test
U-NII-8	Aux	802.11a	197~229	3.75	**4.75**	No
			233	-1.50	**-0.50**	
		802.11n(HT20)	197~229	3.75	**4.75**	No
			233	-1.50	**-0.50**	
		802.11n(HT40)	All Channel	7.00	**8.00**	No
		802.11ac(VHT20)	197~229	3.75	**4.75**	No
			233	-1.50	**-0.50**	
		802.11ac(VHT40)	All Channel	7.00	**8.00**	No
		802.11ac(VHT80)	All Channel	9.00	**10.00**	No
		802.11ac(VHT160)	All Channel	9.00	**10.00**	No
		SU 20 MHz	197~229	3.75	**4.75**	No
			233	-1.50	**-0.50**	
		RU 26T_20 MHz	All Channel	-4.75	**-3.75**	No
		RU 52T_20 MHz	All Channel	-1.75	**-0.75**	No
		RU 106T_20 MHz	All Channel	1.25	**2.25**	No
		RU 242T_20 MHz	197~229	3.75	**4.75**	No
			233	-1.50	**-0.50**	
		SU 40 MHz	All Channel	7.00	**8.00**	No
		RU 26T_40 MHz	All Channel	-4.75	**-3.75**	No
		RU 52T_40 MHz	All Channel	-1.75	**-0.75**	No
		RU 106T_40 MHz	All Channel	1.25	**2.25**	No
		RU 242T_40 MHz	All Channel	3.75	**4.75**	No
		RU 484T_40 MHz	All Channel	7.00	**8.00**	No
		SU 80 MHz	All Channel	9.00	**10.00**	No
		RU 26T_80 MHz	All Channel	-4.75	**-3.75**	No
		RU 52T_80 MHz	All Channel	-1.75	**-0.75**	No
		RU 106T_80 MHz	All Channel	1.25	**2.25**	No
		RU 242T_80 MHz	All Channel	3.75	**4.75**	No
		RU 484T_80 MHz	All Channel	7.00	**8.00**	No
		RU 996T_80 MHz	All Channel	9.00	**10.00**	No
		SU 160 MHz	All Channel	9.00	**10.00**	**Yes**
		RU 26T_160 MHz	All Channel	-4.75	**-3.75**	No
		RU 52T_160 MHz	All Channel	-1.75	**-0.75**	No
		RU 106T_160 MHz	All Channel	1.25	**2.25**	No
		RU 242T_160 MHz	All Channel	3.75	**4.75**	No
		RU 484T_160 MHz	All Channel	7.00	**8.00**	No
		RU 996T_160 MHz	All Channel	9.00	**10.00**	No

2.3.2 #Maximum WLAN Output Power (Tablet Mode)

Tune-up and test modes for tablet mode U-NII-7 and U-NII-8 are the same as notebook mode.

Band	Ant.	Mode	Channel	Output Power (dB m)		
				Target	Max. Allowed	SAR Test
U-NII-5	Main	802.11a	All Channel	4.50	**5.50**	No
		802.11n(HT20)	All Channel	4.50	**5.50**	No
		802.11n(HT40)	All Channel	7.75	**8.75**	No
		802.11ac(VHT20)	All Channel	4.50	**5.50**	No
		802.11ac(VHT40)	All Channel	7.75	**8.75**	No
		802.11ac(VHT80)	7~39	10.00	**11.00**	No
			55~87	9.00	**10.00**	
		802.11ac(VHT160)	15	10.00	**11.00**	No
			47~79	9.00	**10.00**	
		SU 20 MHz	All Channel	4.50	**5.50**	No
		RU 26T_20 MHz	All Channel	-4.00	**-3.00**	No
		RU 52T_20 MHz	All Channel	-1.00	**0.00**	No
		RU 106T_20 MHz	All Channel	2.00	**3.00**	No
		RU 242T_20 MHz	All Channel	4.50	**5.50**	No
		SU 40 MHz	All Channel	7.75	**8.75**	No
		RU 26T_40 MHz	All Channel	-4.00	**-3.00**	No
		RU 52T_40 MHz	All Channel	-1.00	**0.00**	No
		RU 106T_40 MHz	All Channel	2.00	**3.00**	No
		RU 242T_40 MHz	All Channel	4.50	**5.50**	No
		RU 484T_40 MHz	All Channel	7.75	**8.75**	No
		SU 80 MHz	7~39	10.00	**11.00**	No
			55~87	9.00	**10.00**	
		RU 26T_80 MHz	All Channel	-4.00	**-3.00**	No
		RU 52T_80 MHz	All Channel	-1.00	**0.00**	No
		RU 106T_80 MHz	All Channel	2.00	**3.00**	No
		RU 242T_80 MHz	All Channel	4.50	**5.50**	No
		RU 484T_80 MHz	All Channel	7.75	**8.75**	No
		RU 996T_80 MHz	7~39	10.00	**11.00**	No
			55~87	9.00	**10.00**	
		SU 160 MHz	15	10.00	**11.00**	**Yes**
			47~79	9.00	**10.00**	
		RU 26T_160 MHz	All Channel	-4.00	**-3.00**	No
		RU 52T_160 MHz	All Channel	-1.00	**0.00**	No
		RU 106T_160 MHz	All Channel	2.00	**3.00**	No
		RU 242T_160 MHz	All Channel	4.50	**5.50**	No
		RU 484T_160 MHz	All Channel	7.75	**8.75**	No
		RU 996T_160 MHz	15	10.00	**11.00**	No
			47~79	9.00	**10.00**	

Band	Ant.	Mode	Channel	Output Power (dB m)		
				Target	Max. Allowed	SAR Test
U-NII-5	Aux	802.11a	All Channel	4.50	**5.50**	No
		802.11n(HT20)	All Channel	4.50	**5.50**	No
		802.11n(HT40)	All Channel	7.75	**8.75**	No
		802.11ac(VHT20)	All Channel	4.50	**5.50**	No
		802.11ac(VHT40)	All Channel	7.75	**8.75**	No
		802.11ac(VHT80)	All Channel	9.50	**10.50**	No
		802.11ac(VHT160)	All Channel	9.50	**10.50**	No
		SU 20 MHz	All Channel	4.50	**5.50**	No
		RU 26T_20 MHz	All Channel	-4.00	**-3.00**	No
		RU 52T_20 MHz	All Channel	-1.00	**0.00**	No
		RU 106T_20 MHz	All Channel	2.00	**3.00**	No
		RU 242T_20 MHz	All Channel	4.50	**5.50**	No
		SU 40 MHz	All Channel	7.75	**8.75**	No
		RU 26T_40 MHz	All Channel	-4.00	**-3.00**	No
		RU 52T_40 MHz	All Channel	-1.00	**0.00**	No
		RU 106T_40 MHz	All Channel	2.00	**3.00**	No
		RU 242T_40 MHz	All Channel	4.50	**5.50**	No
		RU 484T_40 MHz	All Channel	7.75	**8.75**	No
		SU 80 MHz	All Channel	9.50	**10.50**	No
		RU 26T_80 MHz	All Channel	-4.00	**-3.00**	No
		RU 52T_80 MHz	All Channel	-1.00	**0.00**	No
		RU 106T_80 MHz	All Channel	2.00	**3.00**	No
		RU 242T_80 MHz	All Channel	4.50	**5.50**	No
		RU 484T_80 MHz	All Channel	7.75	**8.75**	No
		RU 996T_80 MHz	All Channel	9.50	**10.50**	No
		SU 160 MHz	All Channel	9.50	**10.50**	**Yes**
		RU 26T_160 MHz	All Channel	-4.00	**-3.00**	No
		RU 52T_160 MHz	All Channel	-1.00	**0.00**	No
		RU 106T_160 MHz	All Channel	2.00	**3.00**	No
		RU 242T_160 MHz	All Channel	4.50	**5.50**	No
		RU 484T_160 MHz	All Channel	7.75	**8.75**	No
		RU 996T_160 MHz	All Channel	9.50	**10.50**	No

Band	Ant.	Mode	Channel	Output Power (dB m)		
				Target	Max. Allowed	SAR Test
U-NII-6	Main	802.11a	All Channel	4.50	**5.50**	No
		802.11n(HT20)	All Channel	4.50	**5.50**	No
		802.11n(HT40)	All Channel	7.75	**8.75**	No
		802.11ac(VHT20)	All Channel	4.50	**5.50**	No
		802.11ac(VHT40)	All Channel	7.75	**8.75**	No
		802.11ac(VHT80)	103	8.00	**9.00**	No
			119	7.50	**8.50**	
		802.11ac(VHT160)	All Channel	8.00	**9.00**	No
		SU 20 MHz	All Channel	4.50	**5.50**	No
		RU 26T_20 MHz	All Channel	-4.00	**-3.00**	No
		RU 52T_20 MHz	All Channel	-1.00	**0.00**	No
		RU 106T_20 MHz	All Channel	2.00	**3.00**	No
		RU 242T_20 MHz	All Channel	4.50	**5.50**	No
		SU 40 MHz	All Channel	7.75	**8.75**	No
		RU 26T_40 MHz	All Channel	-4.00	**-3.00**	No
		RU 52T_40 MHz	All Channel	-1.00	**0.00**	No
		RU 106T_40 MHz	All Channel	2.00	**3.00**	No
		RU 242T_40 MHz	All Channel	4.50	**5.50**	No
		RU 484T_40 MHz	All Channel	7.75	**8.75**	No
		SU 80 MHz	103	8.00	**9.00**	No
			119	7.50	**8.50**	
		RU 26T_80 MHz	All Channel	-4.00	**-3.00**	No
		RU 52T_80 MHz	All Channel	-1.00	**0.00**	No
		RU 106T_80 MHz	All Channel	2.00	**3.00**	No
		RU 242T_80 MHz	All Channel	4.50	**5.50**	No
		RU 484T_80 MHz	103	7.75	**8.75**	No
			119	7.50	**8.50**	
		RU 996T_80 MHz	103	8.00	**9.00**	No
			119	7.50	**8.50**	
		SU 160 MHz	All Channel	8.00	**9.00**	**Yes**
		RU 26T_160 MHz	All Channel	-4.00	**-3.00**	No
		RU 52T_160 MHz	All Channel	-1.00	**0.00**	No
		RU 106T_160 MHz	All Channel	2.00	**3.00**	No
		RU 242T_160 MHz	All Channel	4.50	**5.50**	No
		RU 484T_160 MHz	All Channel	7.75	**8.75**	No
		RU 996T_160 MHz	All Channel	8.00	**9.00**	No

Band	Ant.	Mode	Channel	Output Power (dB m)		
				Target	Max. Allowed	SAR Test
U-NII-6	Aux	802.11a	All Channel	4.50	**5.50**	No
		802.11n(HT20)	All Channel	4.50	**5.50**	No
		802.11n(HT40)	All Channel	7.75	**8.75**	No
		802.11ac(VHT20)	All Channel	4.50	**5.50**	No
		802.11ac(VHT40)	All Channel	7.75	**8.75**	No
		802.11ac(VHT80)	103	9.50	**10.50**	No
			119	9.00	**10.00**	
		802.11ac(VHT160)	All Channel	9.50	**10.50**	No
		SU 20 MHz	All Channel	4.50	**5.50**	No
		RU 26T_20 MHz	All Channel	-4.00	**-3.00**	No
		RU 52T_20 MHz	All Channel	-1.00	**0.00**	No
		RU 106T_20 MHz	All Channel	2.00	**3.00**	No
		RU 242T_20 MHz	All Channel	4.50	**5.50**	No
		SU 40 MHz	All Channel	7.75	**8.75**	No
		RU 26T_40 MHz	All Channel	-4.00	**-3.00**	No
		RU 52T_40 MHz	All Channel	-1.00	**0.00**	No
		RU 106T_40 MHz	All Channel	2.00	**3.00**	No
		RU 242T_40 MHz	All Channel	4.50	**5.50**	No
		RU 484T_40 MHz	All Channel	7.75	**8.75**	No
		SU 80 MHz	103	9.50	**10.50**	No
			119	9.00	**10.00**	
		RU 26T_80 MHz	All Channel	-4.00	**-3.00**	No
		RU 52T_80 MHz	All Channel	-1.00	**0.00**	No
		RU 106T_80 MHz	All Channel	2.00	**3.00**	No
		RU 242T_80 MHz	All Channel	4.50	**5.50**	No
		RU 484T_80 MHz	All Channel	7.75	**8.75**	No
		RU 996T_80 MHz	103	9.50	**10.50**	No
			119	9.00	**10.00**	
		SU 160 MHz	All Channel	9.50	**10.50**	**Yes**
		RU 26T_160 MHz	All Channel	-4.00	**-3.00**	No
		RU 52T_160 MHz	All Channel	-1.00	**0.00**	No
		RU 106T_160 MHz	All Channel	2.00	**3.00**	No
		RU 242T_160 MHz	All Channel	4.50	**5.50**	No
		RU 484T_160 MHz	All Channel	7.75	**8.75**	No
		RU 996T_160 MHz	All Channel	9.50	**10.50**	No

2.4 SAR Test Configurations

2.4.1 #DUT Antenna Locations

The device is a 2-in-1 model that operations as a laptop when folded 90 degrees and as a tablet when folded 360 degrees.
When in tablet mode the overall dimensions of this device are > 20 cm.
A diagram showing the location of the device antennas can be found in Appendix D.

2.4.2 SAR Test Exclusion Considerations (Tablet Mode)

Band / Ant.	Freq. [MHz]	Output Power		Separation distances [mm]					SAR Exemption				
		dBm	mW	Rear	Left	Right	Top	Bottom	Rear	Left	Right	Top	Bottom
U-NII-5 Main	6 415.0	11.00	13	5	353	5	70	130	2.195 Measure	0.031 EXEMPT	2.195 Measure	0.157 EXEMPT	0.084 EXEMPT
U-NII-6 Main	6 515.0	9.00	8	5	353	5	70	130	1.361 Measure	0.019 EXEMPT	1.361 Measure	0.097 EXEMPT	0.052 EXEMPT
U-NII-7 Main	6 855.0	8.50	7	5	353	5	70	130	1.222 Measure	0.017 EXEMPT	1.222 Measure	0.087 EXEMPT	0.047 EXEMPT
U-NII-8 Main	7 115.0	8.50	7	5	353	5	70	130	1.245 Measure	0.018 EXEMPT	1.245 Measure	0.089 EXEMPT	0.048 EXEMPT
U-NII-5 Aux	6 415.0	10.50	11	5	5	353	70	130	1.857 Measure	1.857 Measure	0.026 EXEMPT	0.133 EXEMPT	0.071 EXEMPT
U-NII-6 Aux	6 515.0	10.50	11	5	5	353	70	130	1.872 Measure	1.872 Measure	0.027 EXEMPT	0.134 EXEMPT	0.072 EXEMPT
U-NII-7 Aux	6 855.0	10.00	10	5	5	353	70	130	1.745 Measure	1.745 Measure	0.025 EXEMPT	0.125 EXEMPT	0.067 EXEMPT
U-NII-8 Aux	7 115.0	10.00	10	5	5	353	70	130	1.778 Measure	1.778 Measure	0.025 EXEMPT	0.127 EXEMPT	0.068 EXEMPT

Note 1: For distances < 5mm, a distance of 5mm is used to determine SAR exclusion and estimated SAR value.
Note 2: Output power is the maximum rated power (including tune-up or manufacturing tolerances) and includes source-based averaging.
Note 3: This is equivalent to the KDB 447498 formula written as: [(max. power of channel, including tune-up tolerance, mW)/(60/√f(GHz) mW)]·[20 mm/(min. test separation distance, mm)] ≤ 1.0 for 1-g SAR must be less.
Note 4: Formulas round separation distance to nearest mm and power to nearest mW before calculating thresholds or exemption values.

Device Type	Band / Ant.	Device Edge for SAR Testing (Tablet Front View)					
		Front	Rear	Left Edge	Right Edge	Top	Bottom
Notebook	WLAN 6 GHz	No	Yes	No	No	No	No
Tablet	U-NII-5 Main	No	Yes	No	Yes	No	No
	U-NII-6 Main	No	Yes	No	Yes	No	No
	U-NII-7 Main	No	Yes	No	Yes	No	No
	U-NII-8 Main	No	Yes	No	Yes	No	No
	U-NII-5 Aux	No	Yes	Yes	No	No	No
	U-NII-6 Aux	No	Yes	Yes	No	No	No
	U-NII-7 Aux	No	Yes	Yes	No	No	No
	U-NII-8 Aux	No	Yes	Yes	No	No	No

3. Specific Absorption Rate

3.1 Introduction

The SAR is related to the rate at which energy is absorbed per unit mass in an object exposed to a radio field. The SAR distribution in a biological body is complicated and is usually carried out by experimental techniques or numerical modeling. The standard recommends limits for two tiers of groups, occupational / controlled and general population/uncontrolled, based on a person's awareness and ability to exercise control over his or her exposure. In general, occupational/controlled exposure limits are higher than the limits for general population/uncontrolled.

3.2 SAR Definition

The SAR definition is the time derivative (rate) of the incremental energy (dW) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dv) of a given density (ρ). The equation description is as below:

$$\mathbf{SAR} = \frac{\mathbf{d}}{\mathbf{dt}}\left(\frac{\mathbf{dW}}{\mathbf{dm}}\right) = \frac{\mathbf{d}}{\mathbf{dt}}\left(\frac{\mathbf{dW}}{\boldsymbol{\rho}\mathbf{dv}}\right)$$

SAR is expressed in units of Watts per kilogram (W/kg)
SAR measurement can be either related to the temperature elevation in tissue by

$$\mathbf{SAR} = \mathbf{C}\left(\frac{\boldsymbol{\delta}\mathbf{T}}{\boldsymbol{\delta}\mathbf{t}}\right)$$

Where: C is the specific head capacity, δT is the temperature rise and δt is the exposure duration, or related to the electrical field in the tissue by

$$\mathbf{SAR} = \frac{\boldsymbol{\sigma}|\mathbf{E}|^2}{\boldsymbol{\rho}}$$

Where: σ is the conductivity of the tissue, ρ is the mass density of the tissue and E is the RMS electrical field strength. However for evaluating SAR of low power transmitter, electrical field measurement is typically applied.

3.3 Peak Spatially Averaged Power Density Assessment Based on E-field Measurements

Within a short distance from the transmitting source, power density was determined based on both electric and magnetic fields. Generally, the magnitude and phase of two components of either the E-field or H-field were needed on a sufficiently large surface to fully characterize the total E-field and H-field distributions. Nevertheless, solutions based on direct measurement of E-field and H-field can be used to compute power density. The general measurement approach used for this device was:

a) The local E field on the measurement surface was measured at a reference location where the field is well above the noise level. This reference level was used at the end of this procedure to assess output power drift of the DUT during the measurement.

b) The electric field on the measurement surface was scanned. Measurements are conducted according to the instructions provided by the measurement system manufacturer. Measurement spatial resolution can depend on the measured field characteristic and measurement methodology used by the system. The planar scan step size was configured at λ/4.

c) For cDASY6, H-field was calculated from the measured E-field using a reconstruction algorithm. As the power density calculation requires knowledge of both amplitude and phase, reconstruction algorithms can also be used to obtain field information from the measured E-field data (e.g. the phase from the amplitude if only the amplitude is measured). H-field and phase data was reconstructed from repeated measurements (three per measurement point) on two measurement planes separated by λ/4.

d) The total Peak spatially averaged power density (psPD) distribution on the evaluation surface is determined per the below equation. The spatial averaging area, A, is specified by the applicable exposure limits or regulatory requirements.

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

e) The maximum spatial-average on the evaluation surface is the final quantity to determine compliance against applicable limits.

f) The local E field reference value, at the same location as step 2, was re-measured after the scan was complete to calculate the power drift. If the drift deviated by more than 5%, the power density test and drift measurements were repeated.

4. SAR Test Methods and Procedures

The tests documented in this report were performed in accordance with IEEE 1528-2013 and the following published KDB procedures:

- TCB Workshop – October 2020 : RF Exposure Policies and Procedures
- SPEAG DASY6 System Handbook (June 2020)
- SPEAG DASY6 Application Note (Interim Procedures for Devices Operating at 6-10 GHz)
- IEEE 1528-2013
- IEC TR 63170:2018
- IEC 62479:2010
- IEC/IEEE 62209-1528:2020
- FCC KDB 865664 D02 v01r02
- FCC KDB 248227 D01 v02r02
- FCC KDB 447498 D01 v06
- FCC KDB 865664 D01 v01r04
- FCC KDB 616217 D04 v01r02

4.1 Tested Conditions

The Device was operated utilizing proprietary software and each channel was measured using a broadband power meter to determine the maximum average power.

As per the Interim Procedures for UNII 6-7GHz RF Exposure, explained in RF Exposure Policies and Procedures: TCB Workshop – October 2020, the testing has been performed on SAR following IEC/IEEE 62209-1528:2020 and then on Power Density for the highest SAR test configurations.

The testing has been in both chains and four considered bands U-NII-5, U-NII-6, U-NII-7 and U-NII-8 in SAR mode.

5. RF Exposure Limits

5.1 RF Exposure Limits for Frequencies Below 6 GHz

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

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

Human Exposure	Uncontrolled Environment General Population	Controlled Environment Occupational
Partial Peak SAR [1] (Partial)	1.60 mW/g	8.00 mW/g
Partial Average SAR [2] (Whole Body)	0.08 mW/g	0.40 mW/g
Partial Peak SAR [3] (Hands/Feet/Ankle/Wrist)	4.00 mW/g	20.00 mW/g

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

5.2 RF Exposure Limits for Frequencies Above 6 GHz

Per §1.1310 (d)(3), the MPE limits are applied for frequencies above 6 GHz. Power Density is expressed in units of W/m^2 or mW/cm^2.

Peak Spatially Averaged Power Density was evaluated over a circular area of 4 cm^2 per interim FCC Guidance for near-field power density evaluations per October 2018 TCB Workshop notes.

Human Exposure	Uncontrolled Environment General Population	Controlled Environment Occupational
Power Density	1.0 mW/cm^2	5.0 mW/cm^2

Note: 1.0 mW/cm^2 is 10 W/m^2

6. RF Average Conducted Output Power

Band	Ant.	Mode	Conducted Powers (dBm)					
			Notebook Mode			Tablet Mode		
			Low	Mid	High	Low	Mid	High
U-NII-5	Main	802.11ax (160-SU)	10.60	8.64	8.65	10.60	9.74	9.79
	Aux		10.23	10.17	10.18	10.23	10.17	10.18
U-NII-6	Main	802.11ax (160-SU)	-	8.29	-	-	8.63	-
	Aux		-	10.10	-	-	10.10	-
U-NII-7	Main	802.11ax (160-SU)	8.22	-	8.24	8.22	-	8.24
	Aux		9.84	-	9.74	9.84	-	9.74
U-NII-8	Main	802.11ax (160-SU)	-	8.31	-	-	8.31	-
	Aux		-	9.63	-	-	9.63	-

Justification for test configurations for WLAN per KDB Publication 248227 D01v02r02:

- Power measurements were performed for the transmission mode configuration with the highest maximum output power specified for production units.
- For transmission modes with the same maximum output power specification, powers were measured for the largest channel bandwidth, lowest order modulation and lowest data rate.
- For transmission modes with identical maximum specified output power, channel bandwidth, modulation and data rates, power measurements were required for all identical configurations.
- For each transmission mode configuration, powers were measured for the highest and lowest channels; and at the mid-band channel(s) when there were at least 3 channels supported.

Power Measurement Setup

7. System Verification

7.1 Tissue Verification

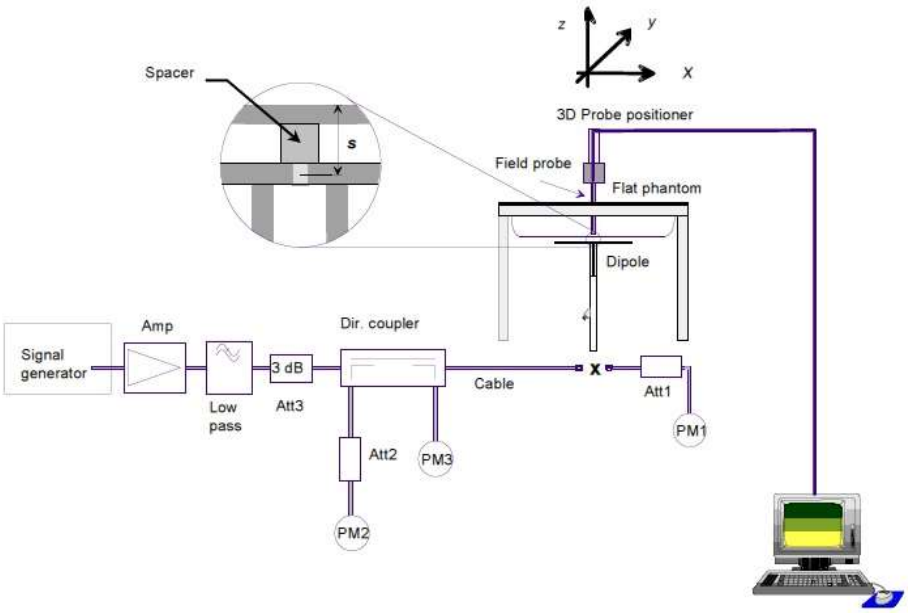
The dielectric properties for this Tissue Simulant Liquids were measured by using the SPEAG Model DAK3.5 Dielectric Probe in conjunction with Agilent E5071B Network Analyzer (300 ㎑ – 8 500 ㎒). The Conductivity (σ) and Permittivity (ρ) are listed in Table 1.For the SAR measurement given in this report. The temperature variation of the Tissue Simulant Liquids was (22 ± 2) ℃.

Freq. (㎒)	Limit/Measured		Permittivity (ρ)	Conductivity (σ)	Temp. (°C)
6 500.0	Recommended Limit		34.50 ± 5 % (32.78~36.23)	6.07 ± 5 % (5.77~6.37)	22 ± 2
	Measured	2021-07-14	33.70	5.92	20.76
6 500.0	Recommended Limit		34.50 ± 5 % (32.78~36.23)	6.07 ± 5 % (5.77~6.37)	22 ± 2
	Measured	2021-07-16	33.60	6.05	20.47
6 500.0	Recommended Limit		34.50 ± 5 % (32.78~36.23)	6.07 ± 5 % (5.77~6.37)	22 ± 2
	Measured	2021-07-17	34.80	6.23	20.81
6 500.0	Recommended Limit		34.50 ± 5 % (32.78~36.23)	6.07 ± 5 % (5.77~6.37)	22 ± 2
	Measured	2021-07-18	35.50	6.17	20.53
6 500.0	Recommended Limit		34.50 ± 5 % (32.78~36.23)	6.07 ± 5 % (5.77~6.37)	22 ± 2
	Measured	2021-07-29	35.30	6.15	20.71

<Table 1. Measurement result of Tissue electric parameters>

7.2.1 SAR Test System Verification

The microwave circuit arrangement for system verification is sketched below picture.
The daily system accuracy verification occurs within the flat section of the SAM phantom. A SAR measurement was performed to see if the measured SAR was within ± 10% from the t arget SAR values. The tests were conducted on the same days as the measurement of the EUT. The obtained results from the system accuracy verification are displayed in the Table 2. During the tests, the ambient temperature of the laboratory was in the range (22 ± 2) ℃, th e relative humidity was in the range(50 ± 20)% and the liquid depth Above the ear/grid refer ence points was above 15 cm in all the cases. It is seen that the system is operating within its specification, as the results are within acceptable tolerance of the reference values.

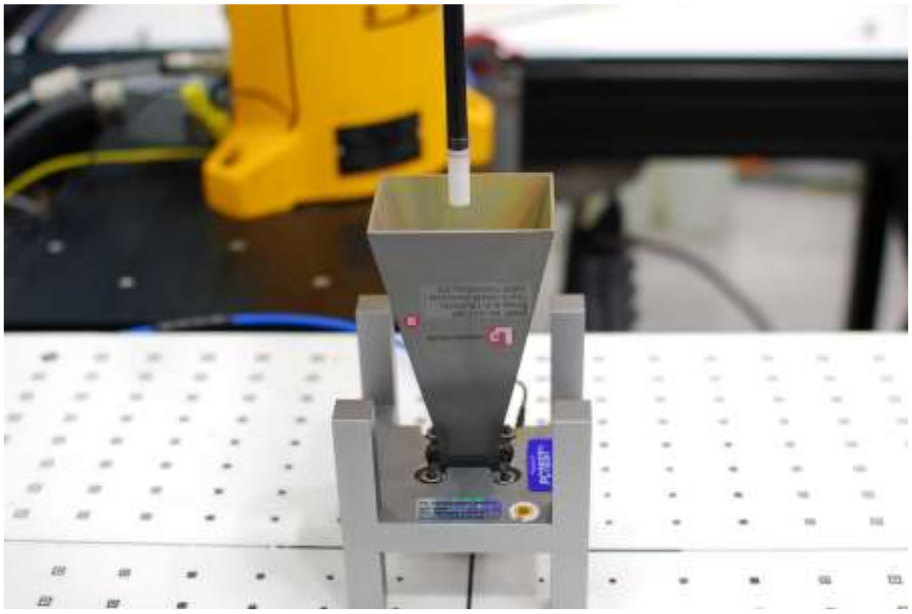


Verification Kit	Probe S/N	Frequency (㎒)	Tissue Type	Limit/Measured (Normalized to 1 W)		
D6.5GHzV2 SN: 1005	EX3DV4 SN: 7540	6 500.0	HSL	Recommended Limit 1g (Normalized)		286.00 ± 10 % (257.40~314.60)
				Measured	2021-07-14	269.00
D6.5GHzV2 SN: 1005	EX3DV4 SN: 7540	6 500.0	HSL	Recommended Limit 1g (Normalized)		286.00 ± 10 % (257.40~314.60)
				Measured	2021-07-16	277.00
D6.5GHzV2 SN: 1005	EX3DV4 SN: 7540	6 500.0	HSL	Recommended Limit 1g (Normalized)		286.00 ± 10 % (257.40~314.60)
				Measured	2021-07-17	276.00
D6.5GHzV2 SN: 1005	EX3DV4 SN: 7540	6 500.0	HSL	Recommended Limit 1g (Normalized)		286.00 ± 10 % (257.40~314.60)
				Measured	2021-07-18	276.00
D6.5GHzV2 SN: 1005	EX3DV4 SN: 7540	6 500.0	HSL	Recommended Limit 1g (Normalized)		286.00 ± 10 % (257.40~314.60)
				Measured	2021-07-29	273.00

<Table 2. System Verification Result>

7.2.2 Power Density Test System Verification

The system was verified to be within ± 0.66 dB of the power density targets on the calibration certificate according to the test system specification in the user's manual and calibration facility recommendation. The 0.66 dB deviation threshold represents the expanded uncertainty for system performance checks using SPEAG's mmWave verification sources. The same spatial resolution and measurement region used in the source calibration was applied during the system check.
The measured power density distribution of verification source was also confirmed through visual inspection to have no noticeable differences, both spatially (shape) and numerically (level) from the distribution provided by the manufacturer, per November 2017 TCBC Workshop Notes.



[Figure 3. System Verification Setup Photo]

Source (S/N)	Probe (S/N)	Frequency (㎓)	Date	Prad (㎽)	Normal psPD (W/m² over 4 cm²)		Deviation (dB)	Total psPD (W/m² over 4 cm²)		Deviation (dB)	Limit (dB)
					Measured	Target		Measured	Target		
1023	9489	10	2021-07-27	74.0	41.1	41.5	-0.04	41.2	41.6	-0.04	± 0.66
1023	9489	10	2021-07-29	74.0	37.6	41.5	-0.43	37.8	41.6	-0.42	± 0.66
1023	9489	10	2021-08-02	74.0	41.6	41.5	0.01	41.7	41.6	0.01	± 0.66
1023	9489	10	2021-08-04	74.0	46.1	41.5	0.46	46.3	41.6	0.47	± 0.66
1023	9489	10	2021-08-05	74.0	39.1	41.5	-0.26	39.2	41.6	-0.26	± 0.66

Notes
1) 10 ㎜ distance spacing was used from the reference horn antenna aperture to the probe element.
2) According to IEC TR 63170, the power density measurement results should be normalized to the delivered input power to an input power level of 0 ㏈m and compared to the appropriate target values of the calibrated reference sources.

8. SAR Test Results

8.1 Standalone Body SAR and Absorbed Power Density Test Results (Notebook Mode)

U-NII-5												
Mode	Ant.	EUT Position	Distance (mm)	Frequency (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Power Scaling Factor	Duty Cycle Compensate Factor	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Estimated APD (W/m²) 4㎠	Plot No.
802.11ax (160-SU)	Main	Rear	0	6 025.0	10.60	11.00	1.096	1.012	0.767	0.851	5.130	
		Rear	0	6 345.0	8.65	9.00	1.084	1.012	0.933	**1.024**	5.000	1
		Rear	0	6 185.0	8.64	9.00	1.086	1.012	0.784	0.862	4.340	
	Aux	Rear	0	6 025.0	10.23	10.50	1.064	1.012	0.685	**0.738**	4.080	2
		Rear	0	6 345.0	10.18	10.50	1.076	1.012	0.523	0.570	3.090	
	Repeated SAR Test											
	Main	Rear	0	6 345.0	8.65	9.00	1.084	1.012	0.926	1.016	4.940	

U-NII-6												
Mode	Ant.	EUT Position	Distance (mm)	Frequency (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Power Scaling Factor	Duty Cycle Compensate Factor	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Estimated APD (W/m²) 4㎠	Plot No.
802.11ax (160-SU)	Main	Rear	0	6 505.0	8.29	8.50	1.050	1.012	0.938	**0.997**	4.860	3
	Aux	Rear	0	6 505.0	10.10	10.50	1.096	1.012	0.457	**0.507**	2.630	4
	Repeated SAR Test											
	Main	Rear	0	6 505.0	8.29	8.50	1.050	1.012	0.933	0.991	4.840	

U-NII-7												
Mode	Ant.	EUT Position	Distance (mm)	Frequency (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Power Scaling Factor	Duty Cycle Compensate Factor	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Estimated APD (W/m²) 4㎠	Plot No.
802.11ax (160-SU)	Main	Rear	0	6 825.0	8.24	8.50	1.062	1.012	1.050	1.128	5.670	
		Rear	0	6 665.0	8.22	8.50	1.067	1.012	1.200	**1.296**	6.120	5
	Aux	Rear	0	6 665.0	9.84	10.00	1.038	1.012	0.397	**0.417**	2.220	6
	Repeated SAR Test											
	Main	Rear	0	6 665.0	8.22	8.50	1.067	1.012	1.150	1.242	5.910	

U-NII-8												
Mode	Ant.	EUT Position	Distance (mm)	Frequency (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Power Scaling Factor	Duty Cycle Compensate Factor	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Estimated APD (W/m²) 4㎠	Plot No.
802.11ax (160-SU)	Main	Rear	0	6 985.0	8.31	8.50	1.045	1.012	0.756	**0.800**	4.410	7
	Aux	Rear	0	6 985.0	9.63	10.00	1.089	1.012	0.312	**0.344**	1.610	8

8.2 Standalone Body SAR and Absorbed Power Density Test Results (Tablet Mode)

U-NII-5												
Mode	Ant.	EUT Position	Distance (mm)	Frequency (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Power Scaling Factor	Duty Cycle Compensate Factor	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Estimated APD (W/m²) 4㎠	Plot No.
802.11ax (160-SU)	Main	Rear	0	6 025.0	10.60	11.00	1.096	1.012	0.002	0.002	0.007	
		Rear	0	6 345.0	9.79	10.00	1.050	1.012	0.009	0.010	0.068	
		Right	0	6 025.0	10.60	11.00	1.096	1.012	0.073	**0.081**	0.383	9
		Right	0	6 345.0	9.79	10.00	1.050	1.012	0.057	0.061	0.250	
	Aux	Rear	0	6 025.0	10.23	10.50	1.064	1.012	0.028	0.030	0.224	
		Rear	0	6 345.0	10.18	10.50	1.076	1.012	0.012	0.013	0.058	
		Left	0	6 025.0	10.23	10.50	1.064	1.012	0.119	**0.128**	0.674	10
		Left	0	6 345.0	10.18	10.50	1.076	1.012	0.042	0.046	0.234	

U-NII-6												
Mode	Ant.	EUT Position	Distance (mm)	Frequency (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Power Scaling Factor	Duty Cycle Compensate Factor	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Estimated APD (W/m²) 4㎠	Plot No.
802.11ax (160-SU)	Main	Rear	0	6 505.0	8.63	9.00	1.089	1.012	0.019	0.021	0.163	
		Right	0	6 505.0	8.63	9.00	1.089	1.012	0.405	**0.446**	2.150	11
	Aux	Rear	0	6 505.0	10.10	10.50	1.096	1.012	N/A	N/A	0.008	
		Left	0	6 505.0	10.10	10.50	1.096	1.012	0.036	**0.040**	0.185	12

U-NII-7												
Mode	Ant.	EUT Position	Distance (mm)	Frequency (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Power Scaling Factor	Duty Cycle Compensate Factor	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Estimated APD (W/m²) 4㎠	Plot No.
802.11ax (160-SU)	Main	Rear	0	6 825.0	8.24	8.50	1.062	1.012	0.071	0.076	0.583	
		Right	0	6 825.0	8.24	8.50	1.062	1.012	0.431	**0.463**	2.230	13
	Aux	Rear	0	6 665.0	9.84	10.00	1.038	1.012	0.002	0.002	0.010	
		Left	0	6 665.0	9.84	10.00	1.038	1.012	0.021	**0.022**	0.110	14

U-NII-8												
Mode	Ant.	EUT Position	Distance (mm)	Frequency (MHz)	Measured Conducted Power (dBm)	Max. Tune-up Power (dBm)	Power Scaling Factor	Duty Cycle Compensate Factor	Measured 1g SAR (W/kg)	Scaled 1g SAR (W/kg)	Estimated APD (W/m²) 4㎠	Plot No.
802.11ax (160-SU)	Main	Rear	0	6 985.0	8.31	8.50	1.045	1.012	0.046	0.049	0.384	
		Right	0	6 985.0	8.31	8.50	1.045	1.012	0.389	**0.411**	2.110	15
	Aux	Rear	0	6 985.0	9.63	10.00	1.089	1.012	0.007	0.008	0.020	
		Left	0	6 985.0	9.63	10.00	1.089	1.012	0.007	**0.008**	0.043	16

General Notes:

1. The test data reported are the worst-case SAR values according to test procedures specified in IEEE 1528-2013, and FCC KDB Publication 447498 D01v06.
2. Batteries are fully charged at the beginning of the SAR measurements.
3. Liquid tissue depth was at least 15.0 cm for all frequencies.
4. SAR results were scaled to the maximum allowed power to demonstrate compliance per FCC KDB Publication 447498 D01v06.
5. Per FCC guidance, SAR was performed using 6.5 GHz SAR probe calibration factors. Per October 2020 TCB Workshop notes, 5 channels were tested. Absorbed power density (APD) using a 4㎠ averaging area is reported based on SAR measurements.

WLAN Notes:

1. When the maximum reported 1g averaged SAR is ≤0.8 W/kg, SAR testing on additional channels was not required. Otherwise, SAR for the next highest output power channel was required until the reported SAR result was ≤ 1.20 W/kg for 1g evaluations or all test channels were measured.
2. The device was configured to transmit continuously at the required data rate, channel bandwidth and signal modulation, using the highest transmission duty factor supported by the test mode tools. The reported SAR was scaled to the 100% transmission duty factor to determine compliance.
3. The “N/A” means there is no SAR value or the SAR is too low to be.

9. Power Density Test Results

9.1 Standalone Body Power Density Test Results (Notebook Mode)

U-NII-5											
Mode	Ant.	EUT Position	Distance (mm)	Frequency (MHz)	Max. Tune-up Power (dBm)	iPD	Grid Step (λ)	Measurement Uncertainty	Measured Total psPD (W/m²) 4㎠	Scaled Total psPD (W/m²) 4㎠	Plot No.
802.11ax (160-SU)	Main	Rear	2	6 025.0	11.00	-	0.0625	1.462	3.95	5.77	
		Rear	2	6 345.0	9.00	-	0.0625	1.462	4.47	**6.54**	17
		Rear	2	6 185.0	9.00	-	0.0625	1.462	3.54	5.18	

U-NII-6											
Mode	Ant.	EUT Position	Distance (mm)	Frequency (MHz)	Max. Tune-up Power (dBm)	iPD	Grid Step (λ)	Measurement Uncertainty	Measured Total psPD (W/m²) 4㎠	Scaled Total psPD (W/m²) 4㎠	Plot No.
802.11ax (160-SU)	Main	Rear	2	6 505.0	8.50	-	0.0625	1.462	3.98	**5.82**	18

U-NII-7											
Mode	Ant.	EUT Position	Distance (mm)	Frequency (MHz)	Max. Tune-up Power (dBm)	iPD	Grid Step (λ)	Measurement Uncertainty	Measured Total psPD (W/m²) 4㎠	Scaled Total psPD (W/m²) 4㎠	Plot No.
802.11ax (160-SU)	Main	Rear	2	6 665.0	8.50	2.28	0.0625	1.462	4.55	**6.65**	19
		Rear	9	6 665.0	8.50	1.96	0.0625	1.462	2.91	4.25	
		Rear	2	6 825.0	8.50	-	0.0625	1.462	4.09	5.98	

U-NII-8											
Mode	Ant.	EUT Position	Distance (mm)	Frequency (MHz)	Max. Tune-up Power (dBm)	iPD	Grid Step (λ)	Measurement Uncertainty	Measured Total psPD (W/m²) 4㎠	Scaled Total psPD (W/m²) 4㎠	Plot No.
802.11ax (160-SU)	Main	Rear	2	6 985.0	8.50	-	0.0625	1.462	3.14	**4.59**	20

9.2 Standalone Body Power Density Test Results (Tablet Mode)

U-NII-5											
Mode	Ant.	EUT Position	Distance (mm)	Frequency (MHz)	Max. Tune-up Power (dBm)	iPD	Grid Step (λ)	Measurement Uncertainty	Measured Total psPD (W/m²) 4㎠	Scaled Total psPD (W/m²) 4㎠	Plot No.
802.11ax (160-SU)	Aux	Left	2	6 025.0	10.50	-	0.0625	1.462	0.54	**0.78**	21
		Left	2	6 345.0	10.50	-	0.0625	1.462	0.15	0.21	

U-NII-6											
Mode	Ant.	EUT Position	Distance (mm)	Frequency (MHz)	Max. Tune-up Power (dBm)	iPD	Grid Step (λ)	Measurement Uncertainty	Measured Total psPD (W/m²) 4㎠	Scaled Total psPD (W/m²) 4㎠	Plot No.
802.11ax (160-SU)	Main	Right	2	6 505.0	9.00	-	0.0625	1.462	0.68	**0.99**	22

U-NII-7											
Mode	Ant.	EUT Position	Distance (mm)	Frequency (MHz)	Max. Tune-up Power (dBm)	iPD	Grid Step (λ)	Measurement Uncertainty	Measured Total psPD (W/m²) 4㎠	Scaled Total psPD (W/m²) 4㎠	Plot No.
802.11ax (160-SU)	Main	Right	2	6 825.0	8.50	1.31	0.0625	1.462	1.15	**1.68**	23
		Right	8.79	6 825.0	8.50	1.24	0.0625	1.462	0.75	1.09	

U-NII-8											
Mode	Ant.	EUT Position	Distance (mm)	Frequency (MHz)	Max. Tune-up Power (dBm)	iPD	Grid Step (λ)	Measurement Uncertainty	Measured Total psPD (W/m²) 4㎠	Scaled Total psPD (W/m²) 4㎠	Plot No.
802.11ax (160-SU)	Main	Right	2	6 985.0	8.50	-	0.0625	1.462	0.91	**1.32**	24

Power Density General Notes:

1. Batteries are fully charged at the beginning of the measurements.
2. Power density was calculated by repeated E-field measurements on two measurement planes separated by λ/4.
3. The device was configured to transmit continuously at the required data rate, channel bandwidth and signal modulation, using the highest transmission duty factor supported by the test mode tools.
4. Per FCC guidance and equipment manufacturer guidance, power density results were scaled according to IEC 62479:2010 for the portion of the measurement uncertainty > 30%. Total expanded uncertainty of 2.46 dB (76.198%) was used to determine the psPD measurement scaling factor.
5. Per equipment manufacturer guidance, power density was measured at d=2mm and d=λ/5mm using the same grid size and grid step size for some frequencies and surfaces. The integrated Power Density (iPD) was calculated based on these measurements. Since iPD ratio between the two distances is < 1dB, the grid step was sufficient for determining compliance at d=2mm.

10. Simultaneous Transmission

10.1 #Simultaneous Transmission Configurations

No.	Scenario	Operation
1	WLAN 6 ㎓ Main + Bluetooth Aux	Yes
2	WLAN 6 ㎓ Aux + Bluetooth Aux	Yes
3	WLAN 6 ㎓ Main + WLAN 6 ㎓ Aux	Yes
4	WLAN 6 ㎓ Main + WLAN 6 ㎓ Aux + Bluetooth Aux	Yes

Notes:
- It is to use the Bluetooth and WLAN same antenna path.

10.2 Estimated SAR

When standalone SAR is not required to be measured, SAR must also be estimated to determine simultaneous transmission SAR test exclusion.
[Tablet Mode]

Band / Ant.	Freq. [MHz]	Output Power		Separation distances [mm]					Estimated 1g SAR Value (W/kg)				
		dBm	mW	Rear	Left	Right	Top	Bottom	Rear	Left	Right	Top	Bottom
U-NII-5 Main	6 415.0	11.00	13	5	353	5	70	130	Measure	0.400	Measure	0.400	0.400
U-NII-6 Main	6 515.0	9.00	8	5	353	5	70	130	Measure	0.400	Measure	0.400	0.400
U-NII-7 Main	6 855.0	8.50	7	5	353	5	70	130	Measure	0.400	Measure	0.400	0.400
U-NII-8 Main	7 115.0	8.50	7	5	353	5	70	130	Measure	0.400	Measure	0.400	0.400
U-NII-5 Aux	6 415.0	10.50	11	5	5	353	70	130	Measure	Measure	0.400	0.400	0.400
U-NII-6 Aux	6 515.0	10.50	11	5	5	353	70	130	Measure	Measure	0.400	0.400	0.400
U-NII-7 Aux	6 855.0	10.00	10	5	5	353	70	130	Measure	Measure	0.400	0.400	0.400
U-NII-8 Aux	7 115.0	10.00	10	5	5	353	70	130	Measure	Measure	0.400	0.400	0.400

Notes:
- For distances < 5mm, a distance of 5mm is used to determine SAR exclusion and estimated SAR value.
- Output power is the maximum rated power (including tune-up or manufacturing tolerances) and includes source-based averaging.
- If the antenna separation distance is > 50mm then the estimated SAR value is 0.4 W/Kg.
- Formulas round separation distance to nearest mm and power to nearest mW before calculating estimated SAR or determining if SAR is excluded.

10.3 Simultaneous Transmission Analysis

Exposure Condition /Position		WLAN		Bluetooth	Summation			
		6.5 GHz Main	6.5 GHz Aux	Aux				
		[①]	[②]	[③]	[①+③]	[②+③]	[①+②]	[①+②+③]
Body (Notebook)	Rear	1.296	0.738	0.764	**2.060**	1.502	**2.034**	**2.798**
Body (Tablet)	Rear	0.076	0.030	0.378	0.454	0.408	0.106	0.484
	Left	0.400	0.128	0.378	0.778	0.506	0.528	0.906
	Right	0.463	0.400	0.400	0.863	0.800	0.863	1.263
	Top	0.400	0.400	0.400	0.800	0.800	0.800	1.200
	Bottom	0.400	0.400	0.400	0.800	0.800	0.800	1.200

Notes:

1) Simultaneous transmission SAR test exclusion considerations
   Simultaneous transmission SAR test exclusion is determined for each operating configuration and exposure condition according to the reported standalone SAR of each applicable simultaneously transmitting antenna. When the sum of 1-g or 10-g SAR of all simultaneously transmitting antennas in an operating mode and exposure condition combination is within the SAR limit, SAR test exclusion applies to that simultaneous transmission configuration. Per KDB Publication 447498 D01v06.
2) When the sum of SAR1g of all simultaneously transmitting antennas in an operating mode and exposure condition combination is within the SAR limit (SAR1g 1.6 W/kg), the SPLSR procedures is not required. When the sum of SAR1g is greater than the SAR limit (SAR1g 1.6 W/kg), SAR test exclusion is determined by the SPLSR.
3) Bold Values are analyzed in section 10.4 by the SPLSR.
4) Please refer to the figure in the original report (KR21-SPF0011) for Bluetooth values.

10.4 SAR to Peak Location Separation Ratio Analysis

The simultaneous transmitting antennas in each operating mode and exposure condition combination are considered one pair at a time to determine the SPLSR. When SAR is measured for both antennas in the pair, the peak location separation distance is computed by the following formula.

$$\text{Peak Location Separation Distance} = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2 + (z_1 - z_2)^2}$$

Where (x1, y1, z1) and (x2, y2, z2) are the coordinates of the extrapolated peak SAR locations in the area or zoom scans.

When standalone test exclusion applies, SAR is estimated; the peak location is assumed to be at the feed-point or geometric center of the antenna. Due to curvatures on the SAM phantom, when SAR is estimated for one of the antennas in an antenna pair, the measured peak SAR location will be translated onto the test device to determine the peak location separation for the antenna pair.

The SPLSR is determined by the following formula.

$$\text{SPLSR} = \frac{(\text{SAR}_1 + \text{SAR}_2)^{1.5}}{R_i}$$

Where SAR_1 and SAR_2 are the highest reported or estimated SAR for each antenna in the pair, and R_i is the separation distance between the peak SAR locations for the antenna pair in mm.

When the SPLSR is <= 0.04, <= 0.10 (10g) the simultaneous transmission SAR is not required. Otherwise, the enlarged zoom scan and volume scan post-processing procedures will be performed.

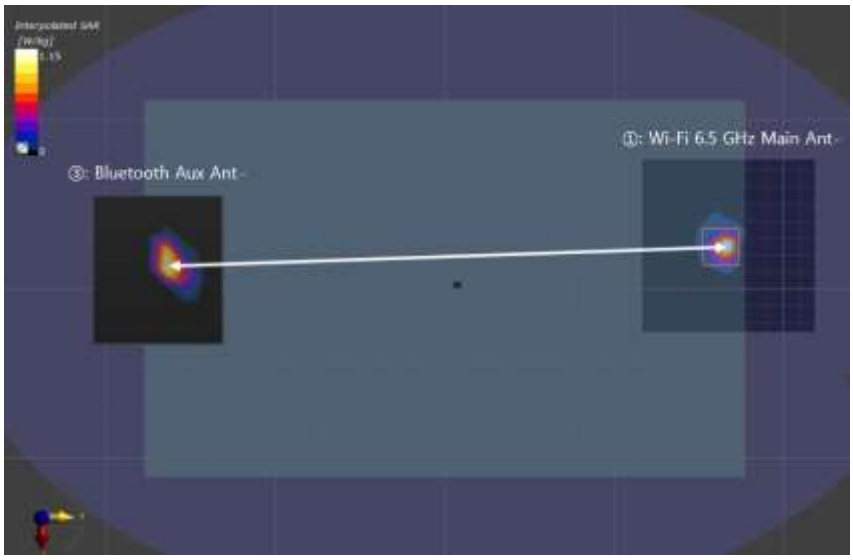
10.4.1 Maximum Simultaneous Transmission Analysis

10.4.1.1 Maximum Worst case Analysis

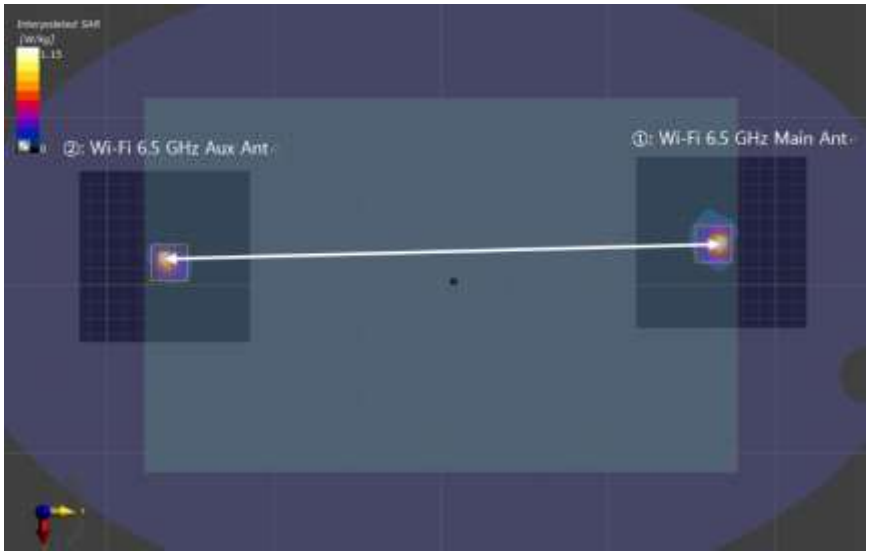
Exposure Condition /Position		WLAN 6.5 GHz		Bluetooth Aux	Worst Summation		SPLSR Result	Volume Scan (Yes / No)
		Main	Aux					
		[①]	[②]	[③]	Sum No.	[W/kg]		
Body (Notebook)	Rear	1.296	-	0.764	[①+③]	2.060	**0.01**	No
		1.296	0.738	-	[①+②]	2.034	**0.01**	No
		1.296	0.738	0.764	[①+②+③]	2.798	**0.01**	No

10.4.1.2 SPLSR Analysis

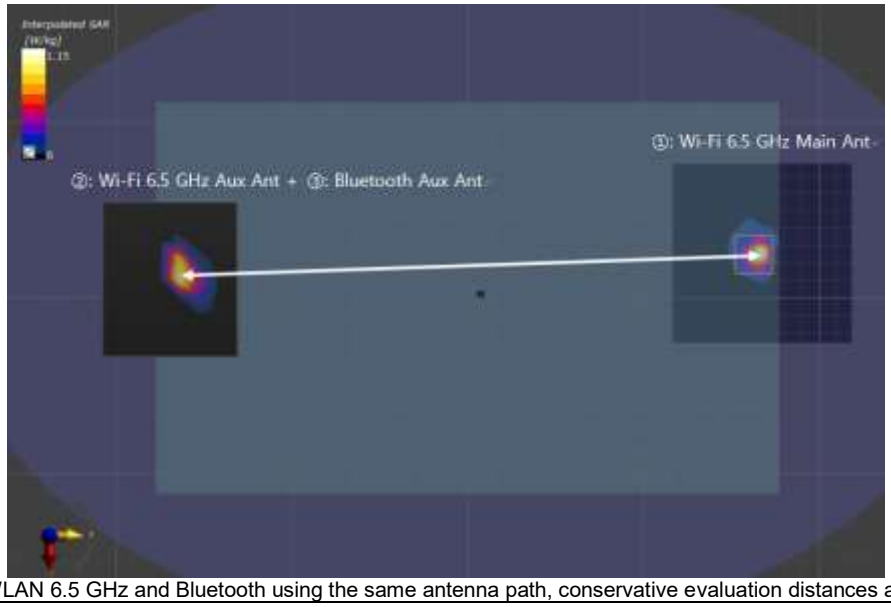
RF Exposure Condition	Mode / Ant.	SAR Value (W/kg)	Coordinates			Peak Location Separation Distance (mm)	SPLSR Result	Simultaneous Transmission SAR Test
			X	Y	Z			
Body (Notebook)	WLAN 6.5 GHz Main	1.296	-0.03006	0.16702	-0.17701	331.79	0.01	Not Required (SPLSR < 0.04)
	Bluetooth	0.764	-0.02000	-0.16460	-0.18000			



RF Exposure Condition	Mode / Ant.	SAR Value (W/kg)	Coordinates			Peak Location Separation Distance (mm)	SPLSR Result	Simultaneous Transmission SAR Test
			X	Y	Z			
Body (Notebook)	WLAN 6.5 GHz Main	1.296	-0.03006	0.16702	-0.17701	331.90	0.01	Not Required (SPLSR < 0.04)
	WLAN 6.5 GHz Aux	0.738	-0.01352	-0.16447	-0.17701			



RF Exposure Condition	Mode / Ant.	SAR Value (W/kg)	Coordinates			Peak Location Separation Distance (mm)	SPLSR Result	Simultaneous Transmission SAR Test
			X	Y	Z			
Body (Notebook)	WLAN 6.5 GHz Main	1.296	-0.03006	0.16702	-0.17701	331.79	0.01	Not Required (SPLSR < 0.04)
	WLAN 6.5 GHz Aux + Bluetooth	1.502	-0.02000	-0.16460	-0.18000			



Note: For WLAN 6.5 GHz and Bluetooth using the same antenna path, conservative evaluation distances are applied

11. SAR Measurement Variability

Per FCC KDB Publication 865664 D01v01r04, SAR measurement variability was assessed for each frequency band, which was determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. When both head and body tissue-equivalent media were required for SAR measurements in a frequency band, the variability measurement procedures were applied to the tissue medium with the highest measured SAR, using the highest measured SAR configuration for that tissue-equivalent medium. These additional measurements were repeated after the completion of all measurements requiring the same head or body tissue equivalent medium in a frequency band. The test device was returned to ambient conditions (normal room temperature) with the battery fully charged before it was re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

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

1) Repeated measurements are not required when the original highest measured SAR is < 0.80 W/kg.
2) **When the original highest measured SAR is ≥ 0.80 W/㎏, the measurement was repeated once.**
3) A second repeated measurement was performed only if the ratio of largest to smallest SAR for the original and first repeated measurements was > 1.20 or when the original or repeated measurement was ≥ 1.45 W/kg (~ 10% from the 1-g SAR limit).
4) A third repeated measurement was performed only if the original, first or second repeated measurement was ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.

Type	Band	Mode	Ant.	Frequency (㎒)	EUT Position	Separation Distance (㎜)	Measured 1 g SAR (W/kg)	Repeated 1g SAR (W/kg)	Ratio
Notebook	U-NII-5	802.11ax (160-SU)	Main	6 345.0	Rear	0	0.933	0.926	1.01
	U-NII-6	802.11ax (160-SU)	Main	6 505.0	Rear	0	0.938	0.933	1.01
	U-NII-7	802.11ax (160-SU)	Main	6 665.0	Rear	0	1.200	1.150	1.04

12. Measurement Uncertainty

12.1 SAR Measurement Uncertainty

Per KDB 865664 D01 SAR measurement 100㎒ to 6㎓, when the highest measured 1-g SAR within a frequency band is < 1.5 W/kg and the measured 10-g SAR within a frequency band is < 3.75 W/kg. The expanded SAR measurement uncertainty must be ≤ 30%, for a confidence interval of *k* = 2. If these conditions are met, extensive SAR measurement uncertainty analysis described in IEEE Standard 1528-2013 is not required in SAR reports submitted for equipment approval. For this device, the highest measured 1-g SAR is less 1.5W/kg and highest measured 10-g SAR is less 3.75W/kg. Therefore, the measurement uncertainty table is not required in this report.

12.2 Power Density Measurement Uncertainty

Source f uncertainty	Uncertainty Value (± dB)	Probability distribution	Div.	c_i	Standard Uncertainty (± dB)	v_i
Measurement system						
Calibration	0.49	N	1.00	1.00	0.49	∞
Probe correction	0.00	R	1.73	1.00	0.00	∞
Frequency response (BW ≤ 1 GHz)	0.20	R	1.73	1.00	0.12	∞
Sensor cross coupling	0.00	R	1.73	1.00	0.00	∞
Isotropy	0.50	R	1.73	1.00	0.29	∞
Linearity	0.20	R	1.73	1.00	0.12	∞
Probe scattering	0.00	R	1.73	1.00	0.00	∞
Probe positioning offset	0.30	R	1.73	1.00	0.17	∞
Probe positioning repeatability	0.04	R	1.73	1.00	0.02	∞
Sensor mechanical offset	0.00	R	1.73	1.00	0.00	∞
Probe spatial resolution	0.00	R	1.73	1.00	0.00	∞
Field impedance dependance dependence	0.00	R	1.73	1.00	0.00	∞
Amplitude and phase drift	0.00	R	1.73	1.00	0.00	∞
Amplitude and phase noise	0.04	R	1.73	1.00	0.02	∞
Measurement area truncation	0.00	R	1.73	1.00	0.00	∞
Data acquisition	0.03	N	1.00	1.00	0.03	∞
Sampling	0.00	R	1.73	1.00	0.00	∞
Field reconstruction	1.77	R	1.73	1.00	1.02	∞
Forward transformation	0.00	R	1.73	1.00	0.00	∞
Power density scaling	-	R	1.73	1.00	-	∞
Spatial averaging	0.10	R	1.73	1.00	0.06	∞
System detection limit	0.04	R	1.73	1.00	0.02	∞
DUT and environmental factors						
Probe coupling with DUT	0.00	R	1.73	1.00	0.00	∞
Modulation response	0.40	R	1.73	1.00	0.23	∞
Integration time	0.00	R	1.73	1.00	0.00	∞
Response time	0.00	R	1.73	1.00	0.00	∞
Device holder influence	0.10	R	1.73	1.00	0.06	∞
DUT alignment	0.00	R	1.73	1.00	0.00	∞
RF ambient conditions	0.04	R	1.73	1.00	0.02	∞
Ambient reflections	0.04	R	1.73	1.00	0.02	∞
Immunity / secondary reception	0.00	R	1.73	1.00	0.00	∞
Drift of the DUT	0.22	R	1.73	1.00	0.13	∞
Combined standard uncertainty	RSS				1.23	
Expanded uncertainty (95 % confidence interval)	*k* = 2				2.46	

13. Test Equipment Information

Test Platform	SPEAG DASY5 System			
Version	DASY52: 52.10.4.1527 / SEMCAD: 14.6.14 (7483)			
Location	KCTL Inc, 65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, Korea			
Manufacture	SPEAG			
Hardware Reference				
Equipment	Model	Serial Number	Date of Calibration	Due date of next Calibration
Shield Room	-	8F - 4	-	-
DASY6 Robot	TX60 Lspeag	F/19/0007289/A/001	-	-
Phantom	2mm Oval Phantom ELI5	2098	-	-
Phantom	mmWave Phantom	1062	-	-
Mounting Device	Laptop Holder	-	-	-
mmWave Device Holder	mmWave Device Holder	1116	-	-
DAE	DAE4	1342	2021-06-02	2022-06-02
Probe	EX3DV4	7540	2021-04-29	2022-04-29
Isotropic E-Field Probe	EUmmWV4	9489	2021-05-28	2022-05-28
PSG Analog Signal Generator	E8257D	MY60020337	2021-01-21	2022-01-21
Dual Power Meter	EPM-442A	GB37480680	2021-05-11	2022-05-11
Power Sensor	8481H	2703A11902	2021-05-11	2022-05-11
Power Sensor	8481H	3318A18090	2021-05-11	2022-05-11
Attenuator	8491A	21552	2021-05-10	2022-05-10
Attenuator	8491A	35560	2021-05-10	2022-05-10
Attenuator	8491A	35934	2021-05-10	2022-05-10
Dual Directional Coupler	772D	2839A160504	2021-05-10	2022-05-10
Preamplifier	8449B	3008A01802	2021-04-01	2022-04-01
Dipole Validation Kits	D6.5GHzV2	1005	2020-08-21	2021-08-21
System Verification Device	5G Verification Source 10 GHz	1023	2021-01-19	2022-01-19
Network Analyzer	E5071B	MY42403524	2021-02-15	2022-02-15
Dielectric Assessment Kit	DAK-3.5	1078	2021-05-26	2022-05-26
Humidity/Temp	MHB-382SD	46301	2021-02-28	2022-02-28
Spectrum Analyzer	FSP7	100289	2020-12-23	2021-12-23

14. Test System Verification and Test Results
14.1 SAR Test System Verification and Test Results

KCTL Inc.

Measurement Report for Dipole D6.5GHzV2, FRONT, Validation band, UID 0 -, Channel 6500 (6500.0MHz)

Device under Test Properties

Model, Manufacturer	Dimensions [mm]	IMEI	DUT Type
Dipole D6.5GHzV2, Speag	16.0 x 6.0 x 300.0	1005	Validation Dipole

Exposure Conditions

Phantom Section, TSL	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	FRONT, 5.00	Validation band	CW, 0--	6500.0, 6500	5.45	5.92	33.7

Hardware Setup

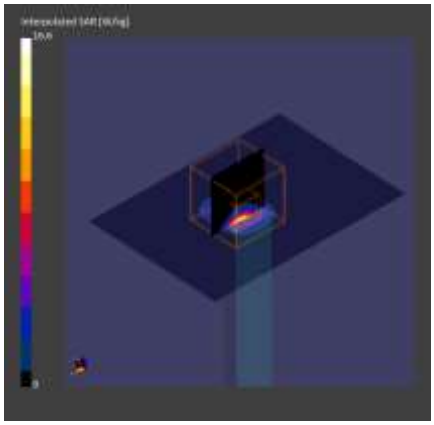
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V8.0 (20deg probe tilt) - 2098	HBBL-600-10000, 2021-Jul-14	EX3DV4 - SN7540, 2021-04-29	DAE4 Sn1342, 2021-06-02

Scan Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	60.0 x 85.0	22.0 x 22.0 x 22.0
Grid Steps [mm]	6.0 x 8.5	3.4 x 3.4 x 1.4
Sensor Surface [mm]	3.0	1.4
Graded Grid	Yes	Yes
Grading Ratio	1.5	1.4
MAIA	N/A	N/A
Surface Detection	VMS + 6p	VMS + 6p
Scan Method	Measured	Measured

Measurement Results

	Area Scan	Zoom Scan
Date	2021-07-14	2021-07-14
psSAR1g [W/kg]	2.23	2.69
psSAR10g [W/kg]	0.488	0.518
Power Drift [dB]		0.01
Power Scaling	Disabled	Disabled
Scaling Factor [dB]		
M2/M1 [%]		52.3
Dist 3dB Peak [mm]		4.8



KCTL Inc.

Measurement Report for Dipole D6.5GHzV2, FRONT, Validation band, UID 0 -, Channel 6500 (6500.0MHz)

Device under Test Properties

Model, Manufacturer	Dimensions [mm]	IMEI	DUT Type
Dipole D6.5GHzV2, Speag	16.0 x 6.0 x 300.0	1005	Validation Dipole

Exposure Conditions

Phantom Section, TSL	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	FRONT, 5.00	Validation band	CW, 0--	6500.0, 6500	5.45	6.05	33.6

Hardware Setup

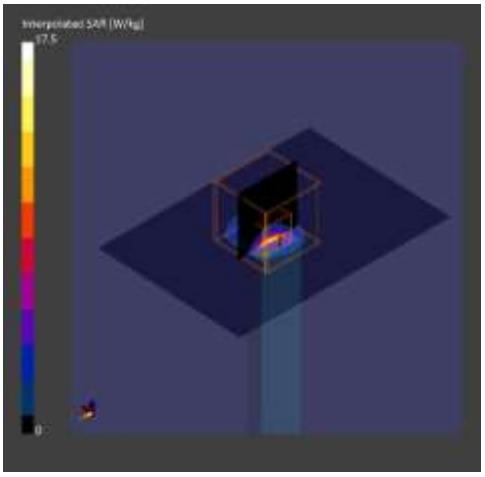
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V8.0 (20deg probe tilt) - 2098	HBBL-600-10000, 2021-Jul-16	EX3DV4 - SN7540, 2021-04-29	DAE4 Sn1342, 2021-06-02

Scan Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	60.0 x 85.0	22.0 x 22.0 x 22.0
Grid Steps [mm]	6.0 x 8.5	3.4 x 3.4 x 1.4
Sensor Surface [mm]	3.0	1.4
Graded Grid	Yes	Yes
Grading Ratio	1.5	1.4
MAIA	N/A	N/A
Surface Detection	VMS + 6p	VMS + 6p
Scan Method	Measured	Measured

Measurement Results

	Area Scan	Zoom Scan
Date	2021-07-16	2021-07-16
psSAR1g [W/kg]	2.42	2.77
psSAR10g [W/kg]	0.500	0.530
Power Drift [dB]		0.05
Power Scaling	Disabled	Disabled
Scaling Factor [dB]		
M2/M1 [%]		51.2
Dist 3dB Peak [mm]		4.8



KCTL Inc.

Measurement Report for Dipole D6.5GHzV2, FRONT, Validation band, UID 0 -, Channel 6500 (6500.0MHz)

Device under Test Properties

Model, Manufacturer	Dimensions [mm]	IMEI	DUT Type
Dipole D6.5GHzV2, Speag	16.0 x 6.0 x 300.0	1005	Validation Dipole

Exposure Conditions

Phantom Section, TSL	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	FRONT, 5.00	Validation band	CW, 0--	6500.0, 6500	5.45	6.23	34.8

Hardware Setup

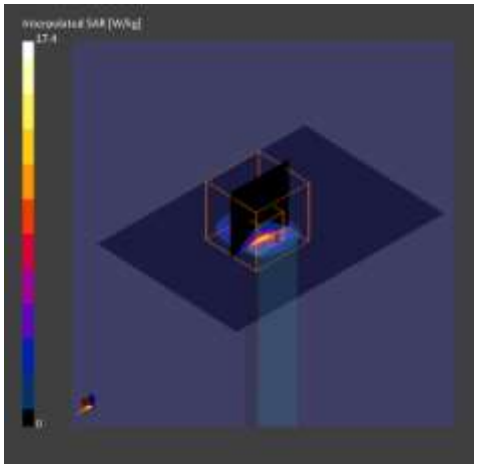
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V8.0 (20deg probe tilt) - 2098	HBBL-600-10000, 2021-Jul-17	EX3DV4 - SN7540, 2021-04-29	DAE4 Sn1342, 2021-06-02

Scan Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	60.0 x 85.0	22.0 x 22.0 x 22.0
Grid Steps [mm]	6.0 x 8.5	3.4 x 3.4 x 1.4
Sensor Surface [mm]	3.0	1.4
Graded Grid	Yes	Yes
Grading Ratio	1.5	1.4
MAIA	N/A	N/A
Surface Detection	VMS + 6p	VMS + 6p
Scan Method	Measured	Measured

Measurement Results

	Area Scan	Zoom Scan
Date	2021-07-17	2021-07-17
psSAR1g [W/kg]	2.28	2.76
psSAR10g [W/kg]	0.502	0.526
Power Drift [dB]		0.00
Power Scaling	Disabled	Disabled
Scaling Factor [dB]		
M2/M1 [%]		51.8
Dist 3dB Peak [mm]		4.8



KCTL Inc.

Measurement Report for Dipole D6.5GHzV2, FRONT, Validation band, UID 0 -, Channel 6500 (6500.0MHz)

Device under Test Properties

Model, Manufacturer	Dimensions [mm]	IMEI	DUT Type
Dipole D6.5GHzV2, Speag	16.0 x 6.0 x 300.0	1005	Validation Dipole

Exposure Conditions

Phantom Section, TSL	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	FRONT, 5.00	Validation band	CW, 0--	6500.0, 6500	5.45	6.17	35.5

Hardware Setup

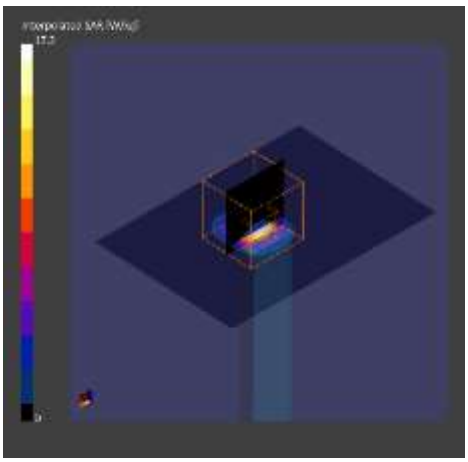
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V8.0 (20deg probe tilt) - 2098	HBBL-600-10000, 2021-Jul-18	EX3DV4 - SN7540, 2021-04-29	DAE4 Sn1342, 2021-06-02

Scan Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	60.0 x 85.0	22.0 x 22.0 x 22.0
Grid Steps [mm]	6.0 x 8.5	3.4 x 3.4 x 1.4
Sensor Surface [mm]	3.0	1.4
Graded Grid	Yes	Yes
Grading Ratio	1.5	1.4
MAIA	N/A	N/A
Surface Detection	VMS + 6p	VMS + 6p
Scan Method	Measured	Measured

Measurement Results

	Area Scan	Zoom Scan
Date	2021-07-18, 08:40	2021-07-18, 08:59
psSAR1g [W/kg]	2.24	2.76
psSAR10g [W/kg]	0.496	0.533
Power Drift [dB]		-0.01
Power Scaling	Disabled	Disabled
Scaling Factor [dB]		
M2/M1 [%]		52.2
Dist 3dB Peak [mm]		4.8



KCTL Inc.

Measurement Report for Dipole D6.5GHzV2, FRONT, Validation band, UID 0 -, Channel 6500 (6500.0MHz)

Device under Test Properties

Model, Manufacturer	Dimensions [mm]	IMEI	DUT Type
Dipole D6.5GHzV2, Speag	16.0 x 6.0 x 300.0	1005	Validation Dipole

Exposure Conditions

Phantom Section, TSL	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	FRONT, 5.00	Validation band	CW, 0--	6500.0, 6500	5.45	6.15	35.3

Hardware Setup

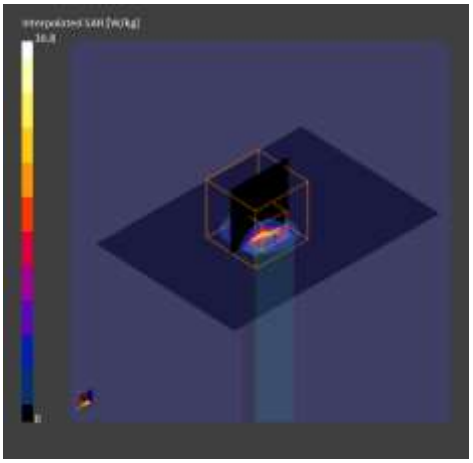
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V8.0 (20deg probe tilt) - 2098	HBBL-600-10000, 2021-Jul-29	EX3DV4 - SN7540, 2021-04-29	DAE4 Sn1342, 2021-06-02

Scan Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	60.0 x 85.0	22.0 x 22.0 x 22.0
Grid Steps [mm]	6.0 x 8.5	3.4 x 3.4 x 1.4
Sensor Surface [mm]	3.0	1.4
Graded Grid	Yes	Yes
Grading Ratio	1.5	1.4
MAIA	N/A	N/A
Surface Detection	VMS + 6p	VMS + 6p
Scan Method	Measured	Measured

Measurement Results

	Area Scan	Zoom Scan
Date	2021-07-29	2021-07-29
psSAR1g [W/kg]	2.44	2.73
psSAR10g [W/kg]	0.508	0.527
Power Drift [dB]		-0.15
Power Scaling	Disabled	Disabled
Scaling Factor [dB]		
M2/M1 [%]		53.0
Dist 3dB Peak [mm]		4.8



1)
KCTL Inc.

Measurement Report for NP950QDB, BACK, Custom Band 802.11 ax , UID 10755 AAC, Channel 79 (6345.0MHz)

Device under Test Properties

Model, Manufacturer	Dimensions [mm]	IMEI	DUT Type
NP950QDB, SAMSUNG	355.0 x 223.0 x 10.0	4Z139FMR300002K	Laptop + Main Antenna

Exposure Conditions

Phantom Section, TSL	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	BACK, 0.00	Custom Band	CW, 10755-AAC	6345.0, 79	5.45	5.93	35.6

Hardware Setup

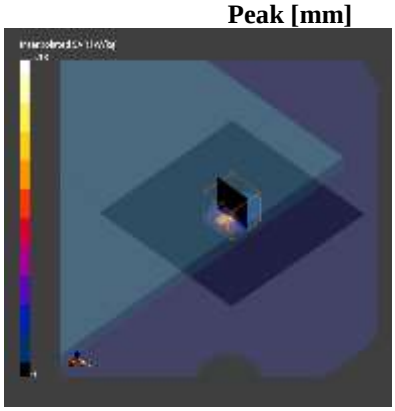
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V8.0 (20deg probe tilt) - 2098	HBBL-600-10000, 2021-Jul-29	EX3DV4 - SN7540, 2021-04-29	DAE4 Sn1342, 2021-06-02

Scan Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	102.0 x 102.0	22.0 x 22.0 x 22.0
Grid Steps [mm]	8.5 x 8.5	3.4 x 3.4 x 1.4
Sensor Surface [mm]	3.0	1.4
Graded Grid	Yes	Yes
Grading Ratio	1.5	1.4
MAIA	Y	N/A
Surface Detection	VMS + 6p	VMS + 6p
Scan Method	Measured	Measured

Measurement Results

	Area Scan	Zoom Scan
Date	2021-07-29	2021-07-29
psSAR1g [W/kg]	0.724	0.933
psSAR10g [W/kg]	0.170	0.210
Power Drift [dB]		0.01
Power Scaling	Disabled	Disabled
Scaling Factor [dB]		
M2/M1 [%]		52.2
Dist 3dB Peak [mm]		4.8



2)
KCTL Inc.

Measurement Report for NP950QDB, BACK, Custom Band 802.11 ax, UID 10755 AAC, Channel 15 (6025.0MHz)

Device under Test Properties

Model, Manufacturer	Dimensions [mm]	IMEI	DUT Type
NP950QDB, SAMSUNG	355.0 x 223.0 x 10.0	4Z139FMR300002K	Laptop + Aux Antenna

Exposure Conditions

Phantom Section, TSL	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	BACK, 0.00	Custom Band	CW, 10755-AAC	6025.0, 15	5.45	5.45	34.8

Hardware Setup

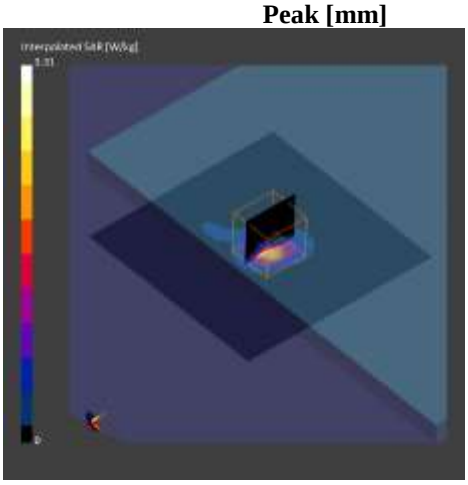
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V8.0 (20deg probe tilt) - 2098	HBBL-600-10000, 2021-Jul-16	EX3DV4 - SN7540, 2021-04-29	DAE4 Sn1342, 2021-06-02

Scan Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	102.0 x 102.0	22.0 x 22.0 x 22.0
Grid Steps [mm]	8.5 x 8.5	3.4 x 3.4 x 1.4
Sensor Surface [mm]	3.0	1.4
Graded Grid	Yes	Yes
Grading Ratio	1.5	1.4
MAIA	Y	N/A
Surface Detection	All points	VMS + 6p
Scan Method	Measured	Measured

Measurement Results

	Area Scan	Zoom Scan
Date	2021-07-16	2021-07-16
psSAR1g [W/kg]	0.587	0.685
psSAR10g [W/kg]	0.154	0.173
Power Drift [dB]		-0.04
Power Scaling	Disabled	Disabled
Scaling Factor [dB]		
M2/M1 [%]		55.8
Dist 3dB Peak [mm]		5.2



3)
KCTL Inc.

Measurement Report for NP950QDB, BACK, Custom Band 802.11 ax, UID 10755 AAC, Channel 111 (6505.0MHz)

Device under Test Properties

Model, Manufacturer	Dimensions [mm]	IMEI	DUT Type
NP950QDB, SAMSUNG	355.0 x 223.0 x 10.0	4Z139FMR300002K	Laptop + Main Antenna

Exposure Conditions

Phantom Section, TSL	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	BACK, 0.00	Custom Band	CW, 10755-AAC	6505.0, 111	5.45	6.16	35.3

Hardware Setup

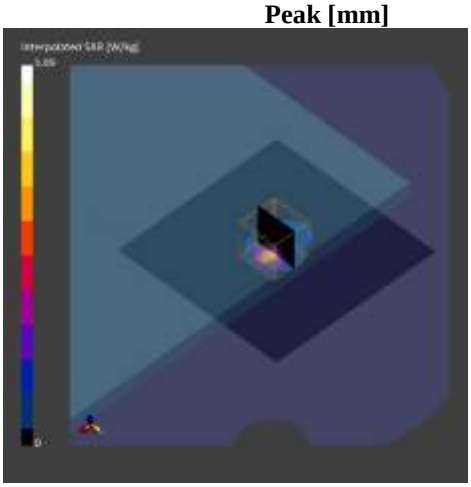
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V8.0 (20deg probe tilt) - 2098	HBBL-600-10000, 2021-Jul-29	EX3DV4 - SN7540, 2021-04-29	DAE4 Sn1342, 2021-06-02

Scan Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	102.0 x 102.0	22.0 x 22.0 x 22.0
Grid Steps [mm]	8.5 x 8.5	3.4 x 3.4 x 1.4
Sensor Surface [mm]	3.0	1.4
Graded Grid	Yes	Yes
Grading Ratio	1.5	1.4
MAIA	Y	N/A
Surface Detection	VMS + 6p	VMS + 6p
Scan Method	Measured	Measured

Measurement Results

	Area Scan	Zoom Scan
Date	2021-07-29	2021-07-29
psSAR1g [W/kg]	0.712	0.938
psSAR10g [W/kg]	0.163	0.205
Power Drift [dB]		0.02
Power Scaling	Disabled	Disabled
Scaling Factor [dB]		
M2/M1 [%]		51.9
Dist 3dB Peak [mm]		4.1



4)
KCTL Inc.

Measurement Report for NP950QDB, BACK, Custom Band 802.11 ax, UID 10755 AAC, Channel 111 (6505.0MHz)

Device under Test Properties

Model, Manufacturer	Dimensions [mm]	IMEI	DUT Type
NP950QDB, SAMSUNG	355.0 x 223.0 x 10.0	4Z139FMR300002K	Laptop + Aux Antenna

Exposure Conditions

Phantom Section, TSL	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	BACK, 0.00	Custom Band	CW, 10755-AAC	6505.0, 111	5.45	6.06	33.5

Hardware Setup

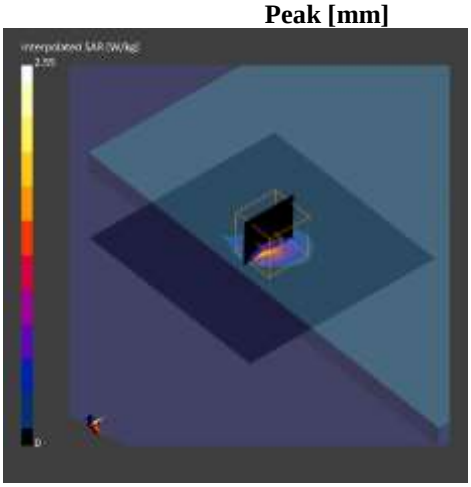
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V8.0 (20deg probe tilt) - 2098	HBBL-600-10000, 2021-Jul-16	EX3DV4 - SN7540, 2021-04-29	DAE4 Sn1342, 2021-06-02

Scan Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	102.0 x 102.0	22.0 x 22.0 x 22.0
Grid Steps [mm]	8.5 x 8.5	3.4 x 3.4 x 1.4
Sensor Surface [mm]	3.0	1.4
Graded Grid	Yes	Yes
Grading Ratio	1.5	1.4
MAIA	Y	N/A
Surface Detection	All points	VMS + 6p
Scan Method	Measured	Measured

Measurement Results

	Area Scan	Zoom Scan
Date	2021-07-16	2021-07-16
psSAR1g [W/kg]	0.387	0.457
psSAR10g [W/kg]	0.095	0.112
Power Drift [dB]		0.01
Power Scaling	Disabled	Disabled
Scaling Factor [dB]		
M2/M1 [%]		52.0
Dist 3dB Peak [mm]		4.8



5)
KCTL Inc.

Measurement Report for NP950QDB, BACK, Custom Band 802.11 ax, UID 10755 AAC, Channel 143 (6665.0MHz)

Device under Test Properties

Model, Manufacturer	Dimensions [mm]	IMEI	DUT Type
NP950QDB, SAMSUNG	355.0 x 223.0 x 10.0	4Z139FMR300002K	Laptop + Main Antenna

Exposure Conditions

Phantom Section, TSL	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	BACK, 0.00	Custom Band	CW, 10755-AAC	6665.0, 143	5.45	6.09	33.5

Hardware Setup

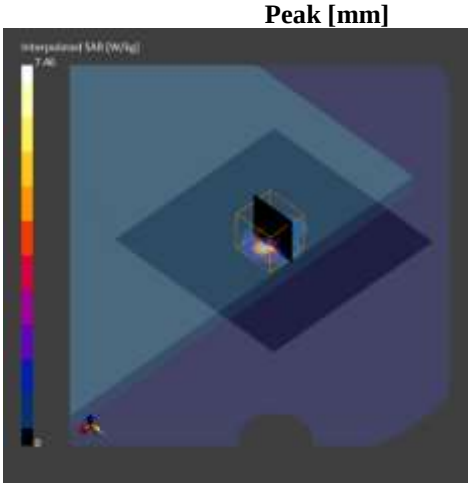
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V8.0 (20deg probe tilt) - 2098	HBBL-600-10000, 2021-Jul-14	EX3DV4 - SN7540, 2021-04-29	DAE4 Sn1342, 2021-06-02

Scan Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	102.0 x 102.0	22.0 x 22.0 x 22.0
Grid Steps [mm]	8.5 x 8.5	3.1 x 3.1 x 1.2
Sensor Surface [mm]	3.0	1.4
Graded Grid	Yes	Yes
Grading Ratio	1.5	1.2
MAIA	Y	N/A
Surface Detection	All points	VMS + 6p
Scan Method	Measured	Measured

Measurement Results

	Area Scan	Zoom Scan
Date	2021-07-14	2021-07-14
psSAR1g [W/kg]	1.10	1.20
psSAR10g [W/kg]	0.256	0.257
Power Drift [dB]		0.03
Power Scaling	Disabled	Disabled
Scaling Factor [dB]		
M2/M1 [%]		55.0
Dist 3dB Peak [mm]		3.8



6)
KCTL Inc.

Measurement Report for NP950QDB, BACK, Custom Band 802.11 ax, UID 10755 AAC, Channel 143 (6665.0MHz)

Device under Test Properties

Model, Manufacturer	Dimensions [mm]	IMEI	DUT Type
NP950QDB, SAMSUNG	355.0 x 223.0 x 10.0	4Z139FMR300002K	Laptop + Aux Antenna

Exposure Conditions

Phantom Section, TSL	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	BACK, 0.00	Custom Band	CW, 10755-AAC	6665.0, 143	5.45	6.36	33.1

Hardware Setup

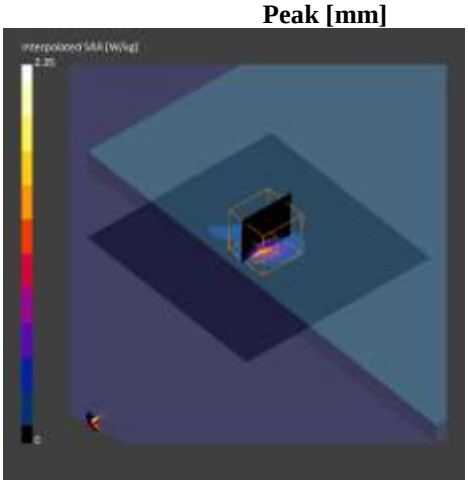
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V8.0 (20deg probe tilt) - 2098	HBBL-600-10000, 2021-Jul-16	EX3DV4 - SN7540, 2021-04-29	DAE4 Sn1342, 2021-06-02

Scan Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	102.0 x 102.0	22.0 x 22.0 x 22.0
Grid Steps [mm]	8.5 x 8.5	3.4 x 3.4 x 1.4
Sensor Surface [mm]	3.0	1.4
Graded Grid	Yes	Yes
Grading Ratio	1.5	1.4
MAIA	Y	Y
Surface Detection	All points	VMS + 6p
Scan Method	Measured	Measured

Measurement Results

	Area Scan	Zoom Scan
Date	2021-07-16	2021-07-16
psSAR1g [W/kg]	0.356	0.397
psSAR10g [W/kg]	0.083	0.094
Power Drift [dB]		-0.08
Power Scaling	Disabled	Disabled
Scaling Factor [dB]		
M2/M1 [%]		53.0
Dist 3dB Peak [mm]		4.8



7)
KCTL Inc.

Measurement Report for NP950QDB, BACK, Custom Band 802.11 ax, UID 10755 AAC, Channel 207 (6985.0MHz)

Device under Test Properties

Model, Manufacturer	Dimensions [mm]	IMEI	DUT Type
NP950QDB, SAMSUNG	355.0 x 223.0 x 10.0	4Z139FMR300002K	Laptop + Main Antenna

Exposure Conditions

Phantom Section, TSL	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	BACK, 0.00	Custom Band	CW, 10755-AAC	6985.0, 207	5.45	6.45	33.0

Hardware Setup

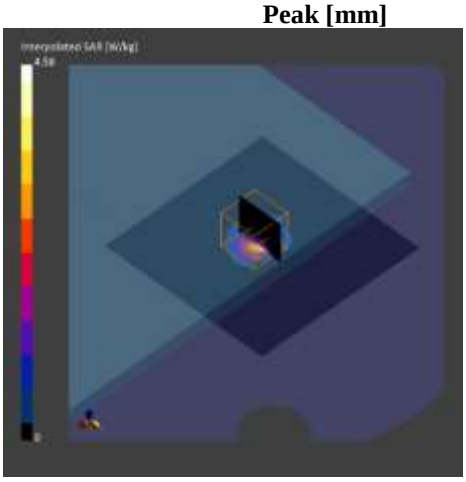
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V8.0 (20deg probe tilt) - 2098	HBBL-600-10000, 2021-Jul-14	EX3DV4 - SN7540, 2021-04-29	DAE4 Sn1342, 2021-06-02

Scan Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	102.0 x 102.0	22.0 x 22.0 x 22.0
Grid Steps [mm]	8.5 x 8.5	3.4 x 3.4 x 1.4
Sensor Surface [mm]	3.0	1.4
Graded Grid	Yes	Yes
Grading Ratio	1.5	1.4
MAIA	Y	N/A
Surface Detection	All points	VMS + 6p
Scan Method	Measured	Measured

Measurement Results

	Area Scan	Zoom Scan
Date	2021-07-14	2021-07-14
psSAR1g [W/kg]	0.745	0.756
psSAR10g [W/kg]	0.186	0.188
Power Drift [dB]		0.04
Power Scaling	Disabled	Disabled
Scaling Factor [dB]		
M2/M1 [%]		50.0
Dist 3dB Peak [mm]		4.4



8)
KCTL Inc.

Measurement Report for NP950QDB, BACK, Custom Band 802.11 ax, UID 10755 AAC, Channel 207 (6985.0MHz)

Device under Test Properties

Model, Manufacturer	Dimensions [mm]	IMEI	DUT Type
NP950QDB, SAMSUNG	355.0 x 223.0 x 10.0	4Z139FMR300002K	Laptop + Aux Antenna

Exposure Conditions

Phantom Section, TSL	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	BACK, 0.00	Custom Band	CW, 10755-AAC	6985.0, 207	5.45	6.45	33.0

Hardware Setup

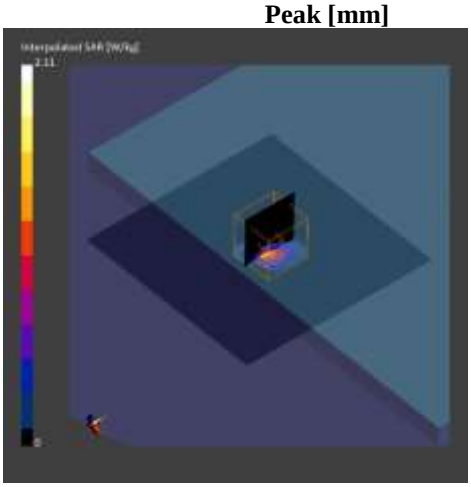
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V8.0 (20deg probe tilt) - 2098	HBBL-600-10000, 2021-Jul-14	EX3DV4 - SN7540, 2021-04-29	DAE4 Sn1342, 2021-06-02

Scan Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	102.0 x 102.0	22.0 x 22.0 x 22.0
Grid Steps [mm]	8.5 x 8.5	3.4 x 3.4 x 1.2
Sensor Surface [mm]	3.0	1.4
Graded Grid	Yes	Yes
Grading Ratio	1.5	1.2
MAIA	Y	Y
Surface Detection	All points	VMS + 6p
Scan Method	Measured	Measured

Measurement Results

	Area Scan	Zoom Scan
Date	2021-07-14	2021-07-14
psSAR1g [W/kg]	0.277	0.312
psSAR10g [W/kg]	0.062	0.068
Power Drift [dB]		-0.04
Power Scaling	Disabled	Disabled
Scaling Factor [dB]		
M2/M1 [%]		54.0
Dist 3dB Peak [mm]		3.5



9)
KCTL Inc.

Measurement Report for NP950QDB, EDGE RIGHT, Custom Band 802.11 ax, UID 10755 AAC, Channel 15 (6025.0MHz)

Device under Test Properties

Model, Manufacturer	Dimensions [mm]	IMEI	DUT Type
NP950QDB, SAMSUNG	223.0 x 355.0 x 10.0	4WNS9FMR300012A	Tablet + Main Antenna

Exposure Conditions

Phantom Section, TSL	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	EDGE RIGHT, 0.00	Custom Band	CW, 10755-AAC	6025.0, 15	5.45	5.65	35.8

Hardware Setup

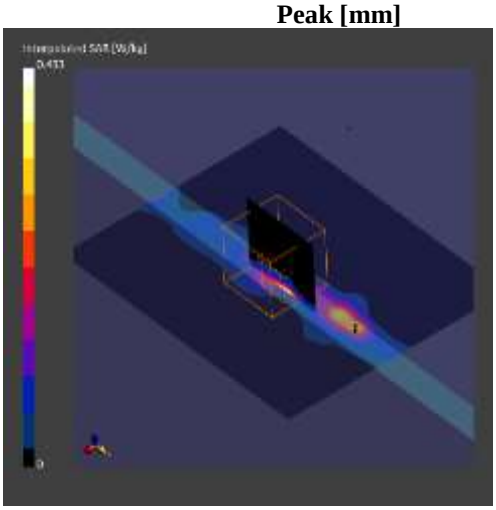
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V8.0 (20deg probe tilt) - 2098	HBBL-600-10000, 2021-Jul-17	EX3DV4 - SN7540, 2021-04-29	DAE4 Sn1342, 2021-06-02

Scan Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	85.0 x 102.0	22.0 x 22.0 x 22.0
Grid Steps [mm]	8.5 x 8.5	3.0 x 3.0 x 1.2
Sensor Surface [mm]	3.0	1.4
Graded Grid	Yes	Yes
Grading Ratio	1.5	1.2
MAIA	Y	Y
Surface Detection	VMS + 6p	VMS + 6p
Scan Method	Measured	Measured

Measurement Results

	Area Scan	Zoom Scan
Date	2021-07-17	2021-07-17
psSAR1g [W/kg]	0.057	0.073
psSAR10g [W/kg]	0.014	0.016
Power Drift [dB]		0.02
Power Scaling	Disabled	Disabled
Scaling Factor [dB]		
M2/M1 [%]		57.0
Dist 3dB Peak [mm]		3.6



10)
KCTL Inc.

Measurement Report for NP950QDB, EDGE LEFT, Custom Band 802.11 ax, UID 10755 AAC, Channel 15 (6025.0MHz)

Device under Test Properties

Model, Manufacturer	Dimensions [mm]	IMEI	DUT Type
NP950QDB, SAMSUNG	223.0 x 355.0 x 10.0	4WNS9FMR300012A	Tablet + Aux Antenna

Exposure Conditions

Phantom Section, TSL	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	EDGE LEFT, 0.00	Custom Band	CW, 10755-AAC	6025.0, 15	5.45	5.45	34.8

Hardware Setup

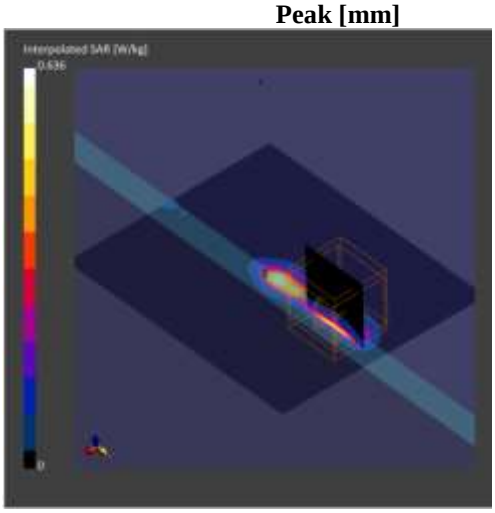
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V8.0 (20deg probe tilt) - 2098	HBBL-600-10000, 2021-Jul-16	EX3DV4 - SN7540, 2021-04-29	DAE4 Sn1342, 2021-06-02

Scan Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	85.0 x 102.0	22.0 x 22.0 x 22.0
Grid Steps [mm]	8.5 x 8.5	3.4 x 3.4 x 1.2
Sensor Surface [mm]	3.0	1.4
Graded Grid	Yes	Yes
Grading Ratio	1.5	1.2
MAIA	Y	Y
Surface Detection	All points	VMS + 6p
Scan Method	Measured	Measured

Measurement Results

	Area Scan	Zoom Scan
Date	2021-07-16	2021-07-16
psSAR1g [W/kg]	0.098	0.119
psSAR10g [W/kg]	0.022	0.029
Power Drift [dB]		-0.01
Power Scaling	Disabled	Disabled
Scaling Factor [dB]		
M2/M1 [%]		60.3
Dist 3dB Peak [mm]		4.1



11)
KCTL Inc.

Measurement Report for NP950QDB, EDGE RIGHT, Custom Band 802.11 ax, UID 10755 AAC, Channel 111 (6505.0MHz)

Device under Test Properties

Model, Manufacturer	Dimensions [mm]	IMEI	DUT Type
NP950QDB, SAMSUNG	223.0 x 355.0 x 10.0	4WNS9FMR300012A	Tablet + Main Antenna

Exposure Conditions

Phantom Section, TSL	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	EDGE RIGHT, 0.00	Custom Band	CW, 10755-AAC	6505.0, 111	5.45	6.23	34.8

Hardware Setup

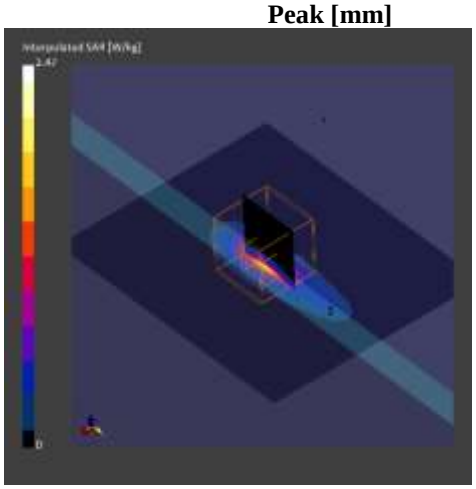
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V8.0 (20deg probe tilt) - 2098	HBBL-600-10000, 2021-Jul-17	EX3DV4 - SN7540, 2021-04-29	DAE4 Sn1342, 2021-06-02

Scan Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	85.0 x 102.0	22.0 x 22.0 x 22.0
Grid Steps [mm]	8.5 x 8.5	3.4 x 3.4 x 1.4
Sensor Surface [mm]	3.0	1.4
Graded Grid	Yes	Yes
Grading Ratio	1.5	1.4
MAIA	Y	Y
Surface Detection	VMS + 6p	VMS + 6p
Scan Method	Measured	Measured

Measurement Results

	Area Scan	Zoom Scan
Date	2021-07-17	2021-07-17
psSAR1g [W/kg]	0.350	0.405
psSAR10g [W/kg]	0.084	0.090
Power Drift [dB]		-0.14
Power Scaling	Disabled	Disabled
Scaling Factor [dB]		
M2/M1 [%]		50.2
Dist 3dB Peak [mm]		4.1



12)
KCTL Inc.

Measurement Report for NP950QDB, EDGE LEFT, Custom Band 802.11 ax, UID 10755 AAC, Channel 111 (6505.0MHz)

Device under Test Properties

Model, Manufacturer	Dimensions [mm]	IMEI	DUT Type
NP950QDB, SAMSUNG	223.0 x 355.0 x 10.0	4WNS9FMR300012A	Tablet + Aux Antenna

Exposure Conditions

Phantom Section, TSL	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	EDGE LEFT, 0.00	Custom Band	CW, 10755-AAC	6505.0, 111	5.45	6.06	33.5

Hardware Setup

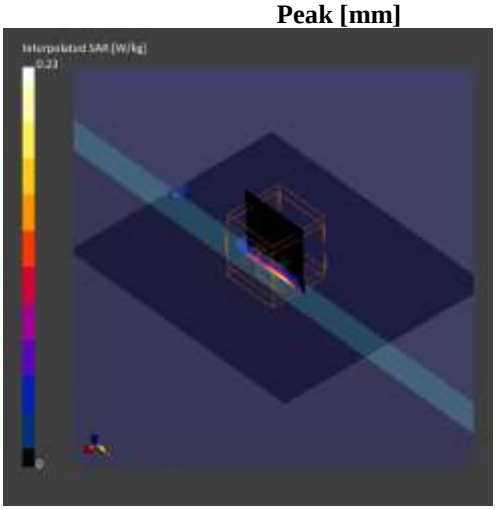
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V8.0 (20deg probe tilt) - 2098	HBBL-600-10000, 2021-Jul-16	EX3DV4 - SN7540, 2021-04-29	DAE4 Sn1342, 2021-06-02

Scan Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	85.0 x 102.0	22.0 x 22.0 x 22.0
Grid Steps [mm]	8.5 x 8.5	3.4 x 3.4 x 1.2
Sensor Surface [mm]	3.0	1.4
Graded Grid	Yes	Yes
Grading Ratio	1.5	1.2
MAIA	Y	Y
Surface Detection	VMS + 6p	VMS + 6p
Scan Method	Measured	Measured

Measurement Results

	Area Scan	Zoom Scan
Date	2021-07-16	2021-07-16
psSAR1g [W/kg]	0.023	0.036
psSAR10g [W/kg]	0.004	0.008
Power Drift [dB]		0.09
Power Scaling	Disabled	Disabled
Scaling Factor [dB]		
M2/M1 [%]		60.3
Dist 3dB Peak [mm]		4.1



13)
KCTL Inc.

Measurement Report for NP950QDB, EDGE RIGHT, Custom Band 802.11 ax, UID 10755 AAC, Channel 175 (6825.0MHz)

Device under Test Properties

Model, Manufacturer	Dimensions [mm]	IMEI	DUT Type
NP950QDB, SAMSUNG	223.0 x 355.0 x 10.0	4WNS9FMR300012A	Tablet + Main Antenna

Exposure Conditions

Phantom Section, TSL	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	EDGE RIGHT, 0.00	Custom Band	CW, 10755-AAC	6825.0, 175	5.45	6.65	34.2

Hardware Setup

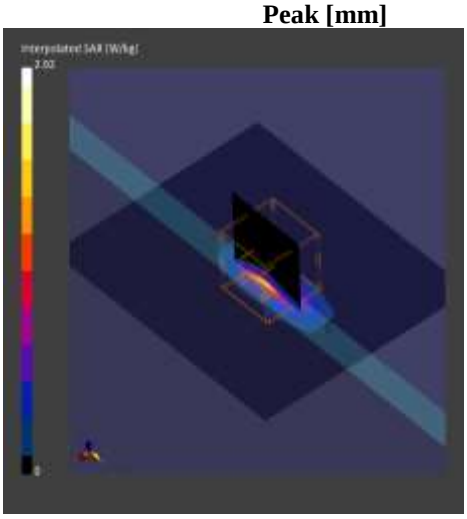
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V8.0 (20deg probe tilt) - 2098	HBBL-600-10000, 2021-Jul-17	EX3DV4 - SN7540, 2021-04-29	DAE4 Sn1342, 2021-06-02

Scan Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	85.0 x 102.0	22.0 x 22.0 x 22.0
Grid Steps [mm]	8.5 x 8.5	3.2 x 3.2 x 1.2
Sensor Surface [mm]	3.0	1.4
Graded Grid	Yes	Yes
Grading Ratio	1.5	1.2
MAIA	Y	Y
Surface Detection	VMS + 6p	VMS + 6p
Scan Method	Measured	Measured

Measurement Results

	Area Scan	Zoom Scan
Date	2021-07-17	2021-07-17
psSAR1g [W/kg]	0.367	0.431
psSAR10g [W/kg]	0.086	0.094
Power Drift [dB]		-0.18
Power Scaling	Disabled	Disabled
Scaling Factor [dB]		
M2/M1 [%]		53.0
Dist 3dB Peak [mm]		4.3



14)
KCTL Inc.

Measurement Report for NP950QDB, EDGE LEFT, Custom Band 802.11 ax, UID 10755 AAC, Channel 143 (6665.0MHz)

Device under Test Properties

Model, Manufacturer	Dimensions [mm]	IMEI	DUT Type
NP950QDB, SAMSUNG	223.0 x 355.0 x 10.0	4WNS9FMR300012A	Tablet + Aux Antenna

Exposure Conditions

Phantom Section, TSL	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	EDGE LEFT, 0.00	Custom Band	CW, 10755-AAC	6665.0, 143	5.45	6.43	34.4

Hardware Setup

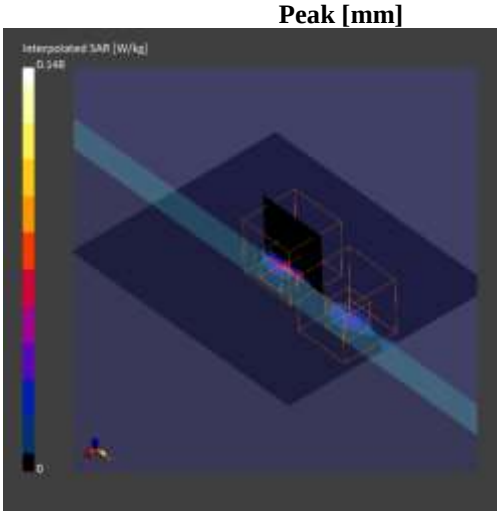
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V8.0 (20deg probe tilt) - 2098	HBBL-600-10000, 2021-Jul-17	EX3DV4 - SN7540, 2021-04-29	DAE4 Sn1342, 2021-06-02

Scan Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	85.0 x 102.0	22.0 x 22.0 x 22.0
Grid Steps [mm]	8.5 x 8.5	3.4 x 3.4 x 1.4
Sensor Surface [mm]	3.0	1.4
Graded Grid	Yes	Yes
Grading Ratio	1.5	1.4
MAIA	Y	Y
Surface Detection	VMS + 6p	VMS + 6p
Scan Method	Measured	Measured

Measurement Results

	Area Scan	Zoom Scan
Date	2021-07-17	2021-07-17
psSAR1g [W/kg]	0.017	0.021
psSAR10g [W/kg]	0.003	0.005
Power Drift [dB]		-0.01
Power Scaling	Disabled	Disabled
Scaling Factor [dB]		
M2/M1 [%]		41.3
Dist 3dB Peak [mm]		> 11.0



15)
KCTL Inc.

Measurement Report for NP950QDB, EDGE RIGHT, Custom Band 802.11 ax, UID 10755 AAC, Channel 207 (6985.0MHz)

Device under Test Properties

Model, Manufacturer	Dimensions [mm]	IMEI	DUT Type
NP950QDB, SAMSUNG	223.0 x 355.0 x 10.0	4WNS9FMR300012A	Tablet + Main Antenna

Exposure Conditions

Phantom Section, TSL	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	EDGE RIGHT, 0.00	Custom Band	CW, 10755-AAC	6985.0, 207	5.45	6.84	34.0

Hardware Setup

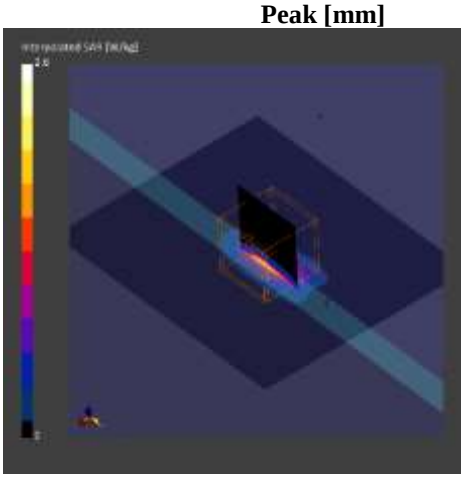
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V8.0 (20deg probe tilt) - 2098	HBBL-600-10000, 2021-Jul-17	EX3DV4 - SN7540, 2021-04-29	DAE4 Sn1342, 2021-06-02

Scan Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	85.0 x 102.0	22.0 x 22.0 x 22.0
Grid Steps [mm]	8.5 x 8.5	3.1 x 3.1 x 1.2
Sensor Surface [mm]	3.0	1.4
Graded Grid	Yes	Yes
Grading Ratio	1.5	1.2
MAIA	Y	Y
Surface Detection	VMS + 6p	VMS + 6p
Scan Method	Measured	Measured

Measurement Results

	Area Scan	Zoom Scan
Date	2021-07-17	2021-07-17
psSAR1g [W/kg]	0.369	0.389
psSAR10g [W/kg]	0.090	0.089
Power Drift [dB]		0.13
Power Scaling	Disabled	Disabled
Scaling Factor [dB]		
M2/M1 [%]		52.4
Dist 3dB Peak [mm]		4.2



16)
KCTL Inc.

Measurement Report for NP950QDB, EDGE LEFT, Custom Band 802.11 ax, UID 10755 AAC, Channel 207 (6985.0MHz)

Device under Test Properties

Model, Manufacturer	Dimensions [mm]	IMEI	DUT Type
NP950QDB, SAMSUNG	223.0 x 355.0 x 10.0	4WNS9FMR300012A	Tablet + Aux Antenna

Exposure Conditions

Phantom Section, TSL	Position, Test Distance [mm]	Band	Group, UID	Frequency [MHz], Channel Number	Conversion Factor	TSL Conductivity [S/m]	TSL Permittivity
Flat, HSL	EDGE LEFT, 0.00	Custom Band	CW, 10755-AAC	6985.0, 207	5.45	6.84	34.0

Hardware Setup

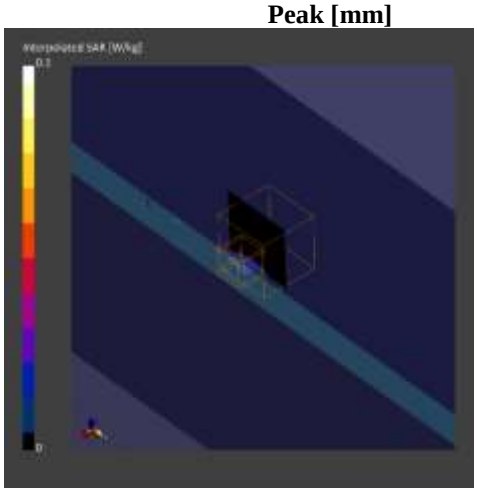
Phantom	TSL, Measured Date	Probe, Calibration Date	DAE, Calibration Date
ELI V8.0 (20deg probe tilt) - 2098	HBBL-600-10000, 2021-Jul-17	EX3DV4 - SN7540, 2021-04-29	DAE4 Sn1342, 2021-06-02

Scan Setup

	Area Scan	Zoom Scan
Grid Extents [mm]	136.0 x 357.0	22.0 x 22.0 x 22.0
Grid Steps [mm]	8.5 x 8.5	3.4 x 3.4 x 1.4
Sensor Surface [mm]	3.0	1.4
Graded Grid	Yes	Yes
Grading Ratio	1.5	1.4
MAIA	Y	Y
Surface Detection	VMS + 6p	VMS + 6p
Scan Method	Measured	Measured

Measurement Results

	Area Scan	Zoom Scan
Date	2021-07-17	2021-07-17
psSAR1g [W/kg]	0.005	0.007
psSAR10g [W/kg]	0	0.002
Power Drift [dB]		0.08
Power Scaling	Disabled	Disabled
Scaling Factor [dB]		
M2/M1 [%]		91.0
Dist 3dB Peak [mm]		> 11.0



14.2 PD Test System Verification and Test Results

KCTL Inc.

Measurement Report for Device, FRONT, Validation band, UID 0 -, Channel 10000 (10000.0MHz)

Device Under Test Properties

Model, Manufacturer	Dimensions [mm]	IMEI	DUT Type
10 GHz Verification Source, Speag	100.0 x 172.0 x 100.0	1023	Phone

Exposure Conditions

Phantom Section	Position, Test Distance [mm]	Frequency [MHz], Channel Number	Conversion Factor
5G	FRONT, 10.00	10000.0, 10000	1.0

Hardware Setup

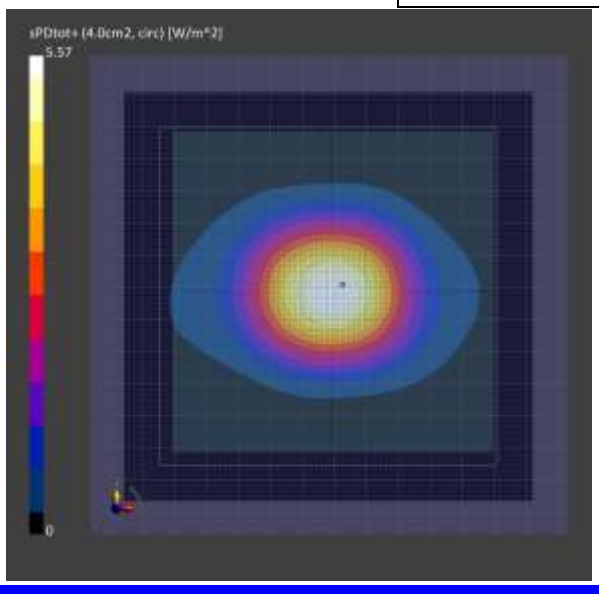
Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave	Air	EUmmWV4 - SN9489_F1-55GHz, 2021-05-28	DAE4 Sn1342, 2021-06-02

Scans Setup

Measurement Results

Scan Type	5G Scan
Grid Extents [mm]	120.0 x 120.0
Grid Steps [lambda]	0.25 x 0.25
Sensor Surface [mm]	10.0
MAIA	N/A

Scan Type	5G Scan
Date	2021-07-27
Avg. Area [cm^2]	4.00
psPDn+ [W/m^2]	5.55
psPDtot+ [W/m^2]	5.57
E_{max} [V/m]	49.1
Power Drift [dB]	-0.17



KCTL Inc.

Measurement Report for Device, FRONT, Validation band, UID 0 -, Channel 10000 (10000.0MHz)

Device Under Test Properties

Model, Manufacturer	Dimensions [mm]	IMEI	DUT Type
10 GHz Verification Source, Speag	100.0 x 172.0 x 100.0	1023	Phone

Exposure Conditions

Phantom Section	Position, Test Distance [mm]	Frequency [MHz], Channel Number	Conversion Factor
5G	FRONT, 10.00	10000.0, 10000	1.0

Hardware Setup

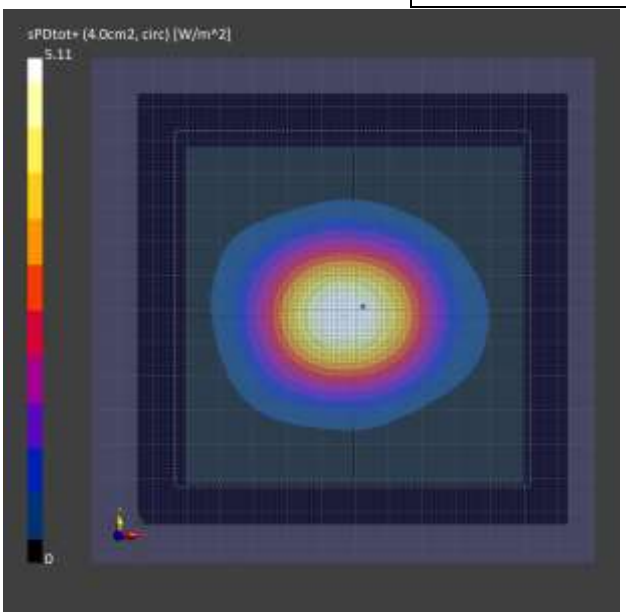
Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave	Air	EUmmWV4 - SN9489_F1-55GHz, 2021-05-28	DAE4 Sn1342, 2021-06-02

Scans Setup

Measurement Results

Scan Type	5G Scan
Grid Extents [mm]	120.0 x 120.0
Grid Steps [lambda]	0.25 x 0.25
Sensor Surface [mm]	10.0
MAIA	N/A

Scan Type	5G Scan
Date	2021-07-29
Avg. Area [cm^2]	4.00
psPDn+ [W/m^2]	5.08
psPDtot+ [W/m^2]	5.11
E_{max} [V/m]	48.6
Power Drift [dB]	-0.11



KCTL Inc.

Measurement Report for Device, FRONT, Validation band, UID 0 -, Channel 10000 (10000.0MHz)

Device Under Test Properties

Model, Manufacturer	Dimensions [mm]	IMEI	DUT Type
10 GHz Verification Source, Speag	100.0 x 172.0 x 100.0	1023	Phone

Exposure Conditions

Phantom Section	Position, Test Distance [mm]	Frequency [MHz], Channel Number	Conversion Factor
5G	FRONT, 10.00	10000.0, 10000	1.0

Hardware Setup

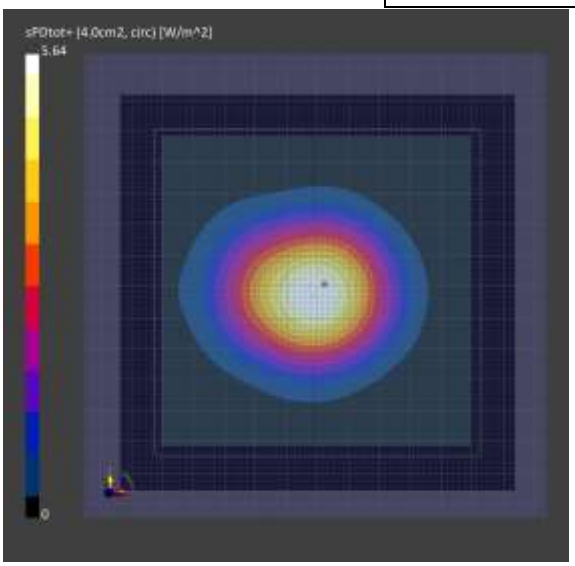
Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave	Air	EUmmWV4 - SN9489_F1-55GHz, 2021-05-28	DAE4 Sn1342, 2021-06-02

Scans Setup

Measurement Results

Scan Type	5G Scan
Grid Extents [mm]	120.0 x 120.0
Grid Steps [lambda]	0.25 x 0.25
Sensor Surface [mm]	10.0
MAIA	N/A

Scan Type	5G Scan
Date	2021-08-02
Avg. Area [cm^2]	4.00
psPDn+ [W/m^2]	5.62
psPDtot+ [W/m^2]	5.64
E_{max} [V/m]	49.5
Power Drift [dB]	-0.06



KCTL Inc.

Measurement Report for Device, FRONT, Validation band, UID 0 -, Channel 10000 (10000.0MHz)

Device Under Test Properties

Model, Manufacturer	Dimensions [mm]	IMEI	DUT Type
10 GHz Verification Source, Speag	100.0 x 172.0 x 100.0	1023	Phone

Exposure Conditions

Phantom Section	Position, Test Distance [mm]	Frequency [MHz], Channel Number	Conversion Factor
5G	FRONT, 10.00	10000.0, 10000	1.0

Hardware Setup

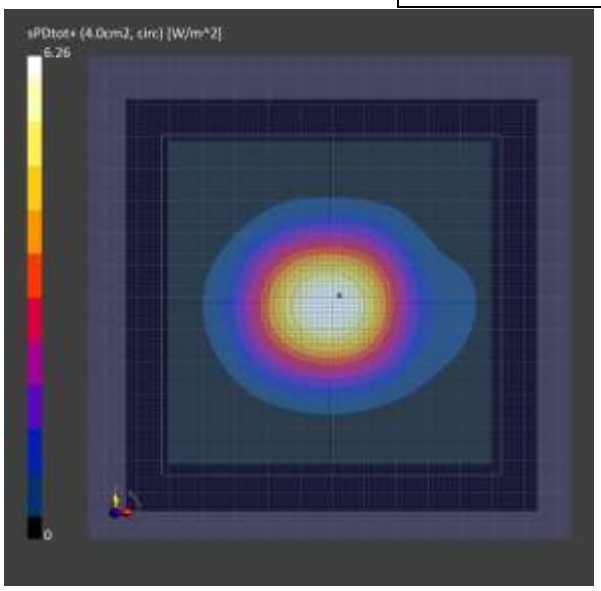
Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave	Air	EUmmWV4 - SN9489_F1-55GHz, 2021-05-28	DAE4 Sn1342, 2021-06-02

Scans Setup

Measurement Results

Scan Type	5G Scan
Grid Extents [mm]	120.0 x 120.0
Grid Steps [lambda]	0.25 x 0.25
Sensor Surface [mm]	10.0
MAIA	N/A

Scan Type	5G Scan
Date	2021-08-04
Avg. Area [cm^2]	4.00
psPDn+ [W/m^2]	6.23
psPDtot+ [W/m^2]	6.26
E_{max} [V/m]	52.1
Power Drift [dB]	0.12



KCTL Inc.

Measurement Report for Device, FRONT, Validation band, UID 0 -, Channel 10000 (10000.0MHz)

Device Under Test Properties

Model, Manufacturer	Dimensions [mm]	IMEI	DUT Type
10 GHz Verification Source, Speag	100.0 x 172.0 x 100.0	1023	Phone

Exposure Conditions

Phantom Section	Position, Test Distance [mm]	Frequency [MHz], Channel Number	Conversion Factor
5G	FRONT, 10.00	10000.0, 10000	1.0

Hardware Setup

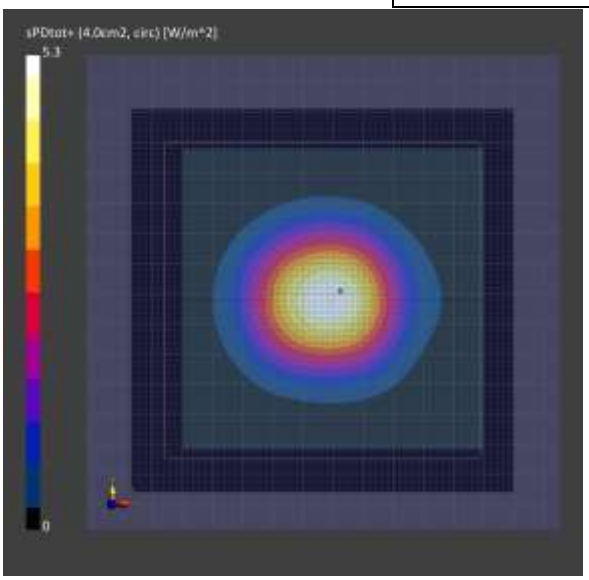
Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave	Air	EUmmWV4 - SN9489_F1-55GHz, 2021-05-28	DAE4 Sn1342, 2021-06-02

Scans Setup

Measurement Results

Scan Type	5G Scan
Grid Extents [mm]	120.0 x 120.0
Grid Steps [lambda]	0.25 x 0.25
Sensor Surface [mm]	10.0
MAIA	N/A

Scan Type	5G Scan
Date	2021-08-05
Avg. Area [cm^2]	4.00
psPDn+ [W/m^2]	5.28
psPDtot+ [W/m^2]	5.30
E_{max} [V/m]	47.2
Power Drift [dB]	0.09



17)
KCTL Inc.

Measurement Report for NP950QDB, BACK, Custom Band 802.11 ax, UID 10755 AAC, Channel 79 (6345.0MHz)

Device Under Test Properties

Model, Manufacturer	Dimensions [mm]	IMEI	DUT Type
NP950QDB, SAMSUNG	223.0 x 10.0 x 355.0	4Z139FMR300002K	Laptop + Main Antenna

Exposure Conditions

Phantom Section	Position, Test Distance [mm]	Frequency [MHz], Channel Number	Conversion Factor
5G	BACK, 2.00	6345.0, 79	1.0

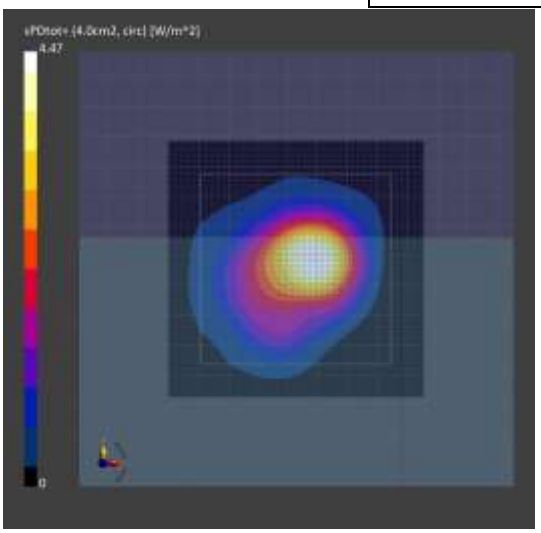
Hardware Setup

Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave	Air	EUmmWV4 - SN9489_F1-55GHz, 2021-05-28	DAE4 Sn1342, 2021-06-02

Scans Setup
Measurement Results

Scan Type	5G Scan
Grid Extents [mm]	80.0 x 80.0
Grid Steps [lambda]	0.0625 x 0.0625
Sensor Surface [mm]	2.0
MAIA	N/A

Scan Type	5G Scan
Date	2021-07-27
Avg. Area [cm^2]	4.00
psPDn+ [W/m^2]	3.48
psPDtot+ [W/m^2]	4.47
E_{max} [V/m]	77.4
Power Drift [dB]	0.01



18)
KCTL Inc.

Measurement Report for NP950QDB, BACK, Custom Band 802.11 ax, UID 10755 AAC, Channel 111 (6505.0MHz)

Device Under Test Properties

Model, Manufacturer	Dimensions [mm]	IMEI	DUT Type
NP950QDB, SAMSUNG	223.0 x 10.0 x 355.0	4Z139FMR300002K	Laptop + Main Antenna

Exposure Conditions

Phantom Section	Position, Test Distance [mm]	Frequency [MHz], Channel Number	Conversion Factor
5G	BACK, 2.00	6505.0, 111	1.0

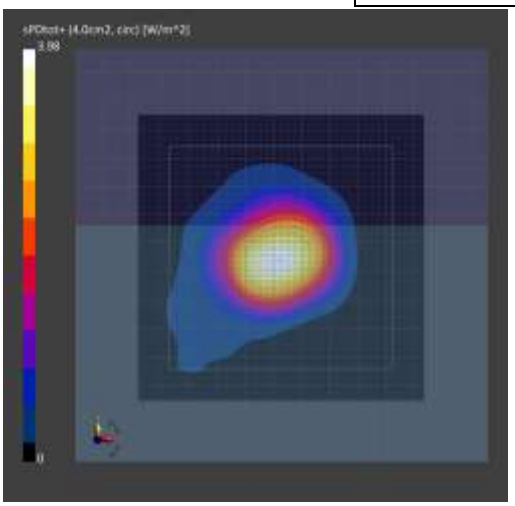
Hardware Setup

Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave	Air	EUmmWV4 - SN9489_F1-55GHz, 2021-05-28	DAE4 Sn1342, 2021-06-02

Scans Setup
Measurement Results

Scan Type	5G Scan
Grid Extents [mm]	100.0 x 100.0
Grid Steps [lambda]	0.0625 x 0.0625
Sensor Surface [mm]	2.0
MAIA	N/A

Scan Type	5G Scan
Date	2021-07-27
Avg. Area [cm^2]	4.00
psPDn+ [W/m^2]	3.23
psPDtot+ [W/m^2]	3.98
E_{max} [V/m]	75.7
Power Drift [dB]	-0.05



19)
KCTL Inc.

Measurement Report for NP950QDB, BACK, Custom Band 802.11 ax, UID 10755 AAC, Channel 143 (6665.0MHz)

Device Under Test Properties

Model, Manufacturer	Dimensions [mm]	IMEI	DUT Type
NP950QDB, SAMSUNG	223.0 x 10.0 x 355.0	4Z139FMR300002K	Laptop + Main Antenna

Exposure Conditions

Phantom Section	Position, Test Distance [mm]	Frequency [MHz], Channel Number	Conversion Factor
5G	BACK, 2.00	6665.0, 143	1.0

Hardware Setup

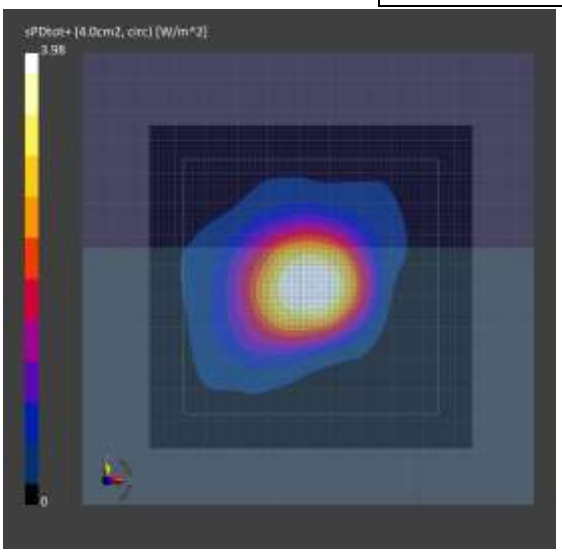
Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave	Air	EUmmWV4 - SN9489_F1-55GHz, 2021-05-28	DAE4 Sn1342, 2021-06-02

Scans Setup

Measurement Results

Scan Type	5G Scan
Grid Extents [mm]	100.0 x 100.0
Grid Steps [lambda]	0.0625 x 0.0625
Sensor Surface [mm]	2.0
MAIA	N/A

Scan Type	5G Scan
Date	2021-07-27
Avg. Area [cm^2]	4.00
psPDn+ [W/m^2]	3.14
psPDtot+ [W/m^2]	4.55
E_{max} [V/m]	78.2
Power Drift [dB]	-0.12



20)
KCTL Inc.

Measurement Report for NP950QDB, BACK, Custom Band 802.11 ax, UID 10755 AAC, Channel 207 (6985.0MHz)

Device Under Test Properties

Model, Manufacturer	Dimensions [mm]	IMEI	DUT Type
NP950QDB, SAMSUNG	223.0 x 10.0 x 355.0	4Z139FMR300002K	Laptop + Main Antenna

Exposure Conditions

Phantom Section	Position, Test Distance [mm]	Frequency [MHz], Channel Number	Conversion Factor
5G	BACK, 2.00	6985.0, 207	1.0

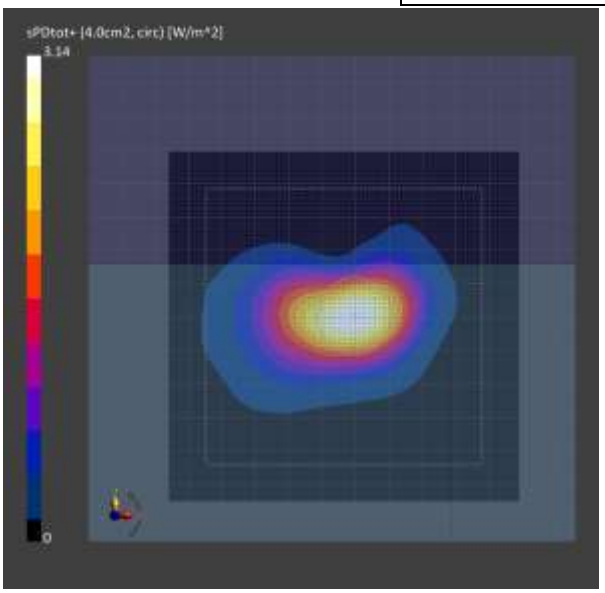
Hardware Setup

Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave	Air	EUmmWV4 - SN9489_F1-55GHz, 2021-05-28	DAE4 Sn1342, 2021-06-02

Scans Setup
Measurement Results

Scan Type	5G Scan
Grid Extents [mm]	100.0 x 100.0
Grid Steps [lambda]	0.0625 x 0.0625
Sensor Surface [mm]	2.0
MAIA	N/A

Scan Type	5G Scan
Date	2021-07-27
Avg. Area [cm^2]	4.00
psPDn+ [W/m^2]	2.58
psPDtot+ [W/m^2]	3.14
E_{max} [V/m]	60.0
Power Drift [dB]	0.05



21)
KCTL Inc.

Measurement Report for NP950QDB, EDGE LEFT, Custom Band 802.11 ax, UID 10755 AAC, Channel 15 (6025.0MHz)

Device Under Test Properties

Model, Manufacturer	Dimensions [mm]	IMEI	DUT Type
NP950QDB, SAMSUNG	355.0 x 10.0 x 223.0	4WNS9FMR300012A	Tablet + Aux Antenna

Exposure Conditions

Phantom Section	Position, Test Distance [mm]	Frequency [MHz], Channel Number	Conversion Factor
5G	EDGE LEFT, 2.00	6025.0, 15	1.0

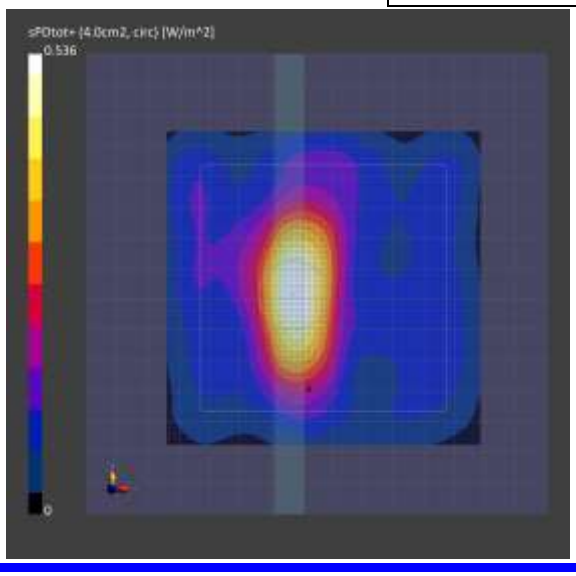
Hardware Setup

Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave	Air	EUmmWV4 - SN9489_F1-55GHz, 2021-05-28	DAE4 Sn1342, 2021-06-02

Scans Setup
Measurement Results

Scan Type	5G Scan
Grid Extents [mm]	100.0 x 100.0
Grid Steps [lambda]	0.0625 x 0.0625
Sensor Surface [mm]	2.0
MAIA	N/A

Scan Type	5G Scan
Date	2021-07-29
Avg. Area [cm^2]	4.00
psPDn+ [W/m^2]	0.502
psPDtot+ [W/m^2]	0.536
E_{max} [V/m]	22.1
Power Drift [dB]	-0.02



22)
KCTL Inc.

Measurement Report for NP950QDB, EDGE RIGHT, Custom Band 802.11 ax, UID 10755 AAC, Channel 111 (6505.0MHz)

Device Under Test Properties

Model, Manufacturer	Dimensions [mm]	IMEI	DUT Type
NP950QDB, SAMSUNG	355.0 x 10.0 x 223.0	4WNS9FMR300012A	Tablet + Main Antenna

Exposure Conditions

Phantom Section	Position, Test Distance [mm]	Frequency [MHz], Channel Number	Conversion Factor
5G	EDGE RIGHT, 2.00	6505.0, 111	1.0

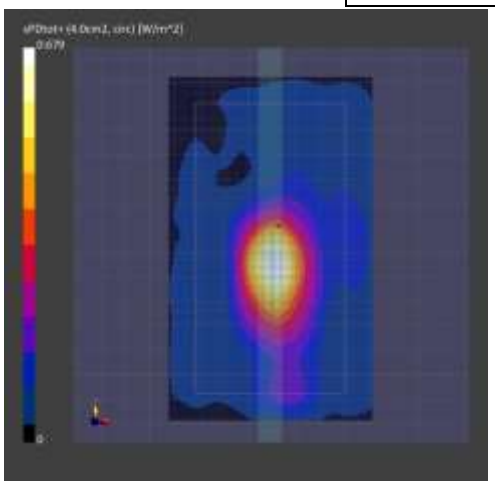
Hardware Setup

Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave	Air	EUmmWV4 - SN9489_F1-55GHz, 2021-05-28	DAE4 Sn1342, 2021-06-02

Scans Setup
Measurement Results

Scan Type	5G Scan
Grid Extents [mm]	80.0 x 140.0
Grid Steps [lambda]	0.0625 x 0.0625
Sensor Surface [mm]	2.0
MAIA	N/A

Scan Type	5G Scan
Date	2021-08-04
Avg. Area [cm^2]	4.00
psPDn+ [W/m^2]	0.628
psPDtot+ [W/m^2]	0.679
E_{max} [V/m]	25.4
Power Drift [dB]	0.04



23)
KCTL Inc.

Measurement Report for NP950QDB, EDGE RIGHT, Custom Band 802.11 ax, UID 10755 AAC, Channel 175 (6825.0MHz)

Device Under Test Properties

Model, Manufacturer	Dimensions [mm]	IMEI	DUT Type
NP950QDB, SAMSUNG	355.0 x 10.0 x 223.0	4WNS9FMR300012A	Tablet + Main Antenna

Exposure Conditions

Phantom Section	Position, Test Distance [mm]	Frequency [MHz], Channel Number	Conversion Factor
5G	EDGE RIGHT, 2.00	6825.0, 175	1.0

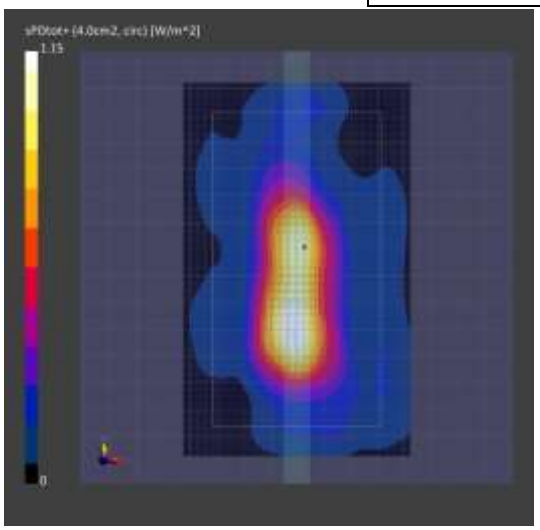
Hardware Setup

Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave	Air	EUmmWV4 - SN9489_F1-55GHz, 2021-05-28	DAE4 Sn1342, 2021-06-02

Scans Setup
Measurement Results

Scan Type	5G Scan
Grid Extents [mm]	80.0 x 140.0
Grid Steps [lambda]	0.0625 x 0.0625
Sensor Surface [mm]	2.0
MAIA	N/A

Scan Type	5G Scan
Date	2021-08-05
Avg. Area [cm^2]	4.00
psPDn+ [W/m^2]	0.938
psPDtot+ [W/m^2]	1.15
E_{max} [V/m]	37.0
Power Drift [dB]	-0.01



24)
KCTL Inc.

Measurement Report for NP950QDB, EDGE RIGHT, Custom Band 802.11 ax, UID 10755 AAC, Channel 207 (6985.0MHz)

Device Under Test Properties

Model, Manufacturer	Dimensions [mm]	IMEI	DUT Type
NP950QDB, SAMSUNG	355.0 x 10.0 x 223.0	4WNS9FMR300012A	Tablet + Main Antenna

Exposure Conditions

Phantom Section	Position, Test Distance [mm]	Frequency [MHz], Channel Number	Conversion Factor
5G	EDGE RIGHT, 2.00	6985.0, 207	1.0

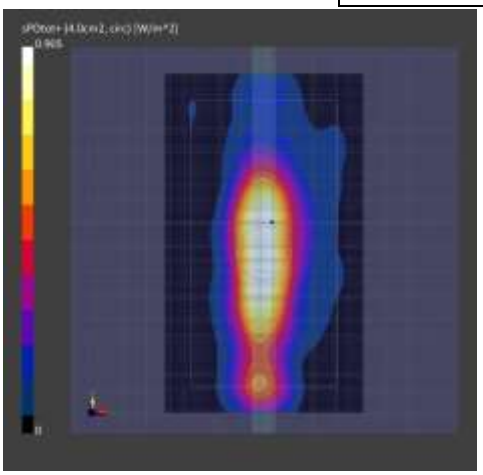
Hardware Setup

Phantom	Medium	Probe, Calibration Date	DAE, Calibration Date
mmWave	Air	EUmmWV4 - SN9489_F1-55GHz, 2021-05-28	DAE4 Sn1342, 2021-06-02

Scans Setup
Measurement Results

Scan Type	5G Scan
Grid Extents [mm]	80.0 x 140.0
Grid Steps [lambda]	0.0625 x 0.0625
Sensor Surface [mm]	2.0
MAIA	N/A

Scan Type	5G Scan
Date	2021-08-05
Avg. Area [cm^2]	4.00
psPDn+ [W/m^2]	0.768
psPDtot+ [W/m^2]	0.905
E_{max} [V/m]	37.4
Power Drift [dB]	0.07



Appendixes List

Appendix A	A.1 Probe Calibration certificate (EX3DV4_7540) A.2 Probe Calibration certificate (EUmmWV4_9489) A.3 System Calibration certificate 5G Verification Source 10 GHz_1023) A.4 Dipole Calibration certificate (D6.5GHzV2_SN1005)
Appendix B	SAR Tissue Specification
Appendix C	Power Reduction Verification
Appendix D	#Antenna Location & Distance
Appendix E	EUT Photo
Appendix F	Test Setup Photo