TEST REPORT

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1. Client

- Name : Samsung Electronics Co., Ltd.
- Address : 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea
- Date of Receipt : 2021-03-31

2. Use of Report : Certification

3. Name of Product and Model : Mobile Phone
- Model Number : SM-A225F/DSN
- Manufacturer and Country of Origin : Samsung Electronics Co., Ltd. / VIETNAM

4. FCC ID : A3LSMA225F

5. Date of Test : 2021-04-13 ~ 2021-05-17

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

7. Test Standards : IEEE 1528-2013, ANSI/IEEE C95.1, KDB Publication

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

	Tested by	Technical Manager
Affirmation	Name : Dongkyu Kim (Signature)	Name : Hosik Sim (Signature)

2021-05-17

KCTL Inc.

REPORT REVISION HISTORY

Date	Revision	Page No
2021-05-13	Originally issued	-
2021-05-17	-Original Updated Data reference related: Section 2.1.3 & 2.1.4 Summary of SAR test results: Section 2.2 Simultaneous Transmission: Section 12.2 SAR Test Results: Section 11 Test Setup Photo: Appendix E	- 6~7 8 53~54 43~51 182~190

Note: The Report No. KR21-SPF0025 is superseded by the report No. KR21-SPF0025-A

General remarks for test reports

Statement concerning the uncertainty of the measurement systems used for the tests

(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**

(Note: When standard requires a statement concerning the uncertainty of the measurement systems used for tests, this should be reported above. The informative text in parenthesis should be delete in both cases after selecting the applicable option)

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.

CONTENTS

1. General information

Client	:	Samsung Electronics Co., Ltd.
Address	:	129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea
Manufacturer	:	Samsung Electronics Co., Ltd.
Address	:	129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea
Factory	:	SAMSUNG ELECTRONICS VIETNAM CO.,LTD.
Address	:	Yenphong 1 -I.P Yentrung Commune, Yenphong Dist., Bac Ninh Province, Vietnam
Contact Person	:	Dongsoon Kim/ ds0125.kim@samsung.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		Mobile Phone		
Product Model Number		SM-A225F/DSN		
Derivative Model		SM-A225F/N		
Product Manufacturer		Samsung Electronics Co., Ltd.		
Product Serial Number	Radiation	R38R302E8FA		
	WWAN Conduction	R38R302E8PW		
	WLAN Conduction	R38R302E90Y		
Device Overview		Band & Mode	Operating Modes	Tx Frequency (㎒)
		GSM/GPRS/EDGE 850	Voice/Data	824.2 ~ 848.8
		GSM/GPRS/EDGE 1900	Voice/Data	1 850.2 ~ 1 909.8
		WCDMA Band V	Voice/Data	826.4 ~ 846.6
		LTE Band 5	Voice/Data	824.7 ~ 848.3
		LTE Band 41	Voice/Data	2 498.5 ~ 2 687.5
		2.4 ㎓ WLAN	Voice/Data	2 412.0 ~ 2 472.0
		U-NII-1	Voice/Data	5 180.0 ~ 5 240.0
		U-NII-2A	Voice/Data	5 260.0 ~ 5 320.0
		U-NII-2C	Voice/Data	5 500.0 ~ 5 720.0
		U-NII-3	Voice/Data	5 745.0 ~ 5 825.0
		Bluetooth	Data	2 402.0 ~ 2 480.0
		NFC	Data	13.56
TDWR Information		5.60 ㎓~ 5.65 ㎓ band (TDWR) is supported by the device.		

2.1.1 Introduction for Data referencing

This report referenced from the FCC ID: A3LSMA225M
Based on their similarity, the SAR reuses the original model's result and do spot-check, following the FCC KDB 484596 D01 v01.
And the applicant takes full responsibility that the test data as referenced in this report represent compliance for this FCC ID.

2.1.2 Difference for Depopulated model

The FCC ID: A3LSMA225F shares the same enclosure and circuit board as FCC ID: A3LSMA225M. The WIFI/BT/BLE/NFC/WCDMA/LTE antenna and surrounding circuitry and layout are identical between these two units.
As for all bands, they have been verified and the parent model test results under FCC ID: A3LSMA225M shall remain representative of FCC ID: A3LSMA225F.

Note: The Product equality letter includes detailed information about the differences between FCC ID: A3LSMA225M and FCC ID: A3LSMA225F.

2.1.3 Spot check Verification data

Exposure Condition /Position		Distance (mm)	Frequency (㎒)	Scaled SAR (W/kg)		Deviation (%)	Remark
				SM-A225M /DSN	SM-A225F /DSN		
GSM850							
Head	Right Cheek	0	836.6	0.421	0.362	-14.0	
Body-worn	Rear	15	836.6	0.704	0.427	-39.3	
Hotspot	Right	10	836.6	0.690	0.445	-35.5	
GSM1900							
Head	Left Tilt	0	1 880.0	0.144	0.149	3.5	
Body-worn	Rear	15	1 880.0	0.374	0.385	2.9	
Hotspot	Rear	10	1 880.0	0.772	0.737	-4.5	
WCDMA Band V							
Head	Right Cheek	0	836.6	0.402	0.358	-10.9	
Body-worn	Rear	15	836.6	0.501	0.472	-5.8	
Hotspot	Rear	10	836.6	0.756	0.705	-6.7	
LTE Band 5							
Head	Right Cheek	0	836.5	0.406	0.331	-18.5	
Body-worn	Rear	15	836.5	0.486	0.431	-11.3	
Hotspot	Rear	10	836.5	0.708	0.638	-9.9	
LTE Band 41							
Head	Right Cheek	0	2 506.0	0.968	0.826	-14.7	
Body-worn	Rear	15	2 636.5	0.576	0.704	22.2	
Hotspot	Rear	10	2 636.5	0.430	0.528	22.8	
Phablet	Rear	0	2 636.5	0.945	0.959	1.5	
2.4 ㎓ WLAN							
Head	Right Cheek	0	2 437.0	0.188	0.202	7.5	
Body-worn	Front	15	2 437.0	0.078	0.078	0.0	
Hotspot	Rear	10	2 437.0	0.155	0.154	-0.6	
NII							
Head	Right Tilt	0	5 690.0	0.090	0.069	-23.3	
Body-worn	Rear	15	5 300.0	0.488	0.449	-8.0	
Hotspot	Rear	10	5 795.0	0.596	0.617	3.5	
Phablet	Rear	0	5 300.0	0.895	0.779	-13.0	
Bluetooth							
Head	Right Cheek	0	2 480.0	0.097	0.101	4.1	

Notes:

1. For FCC ID: A3LSMA225F has been verified the performance as for RF exposure identical with the FCC ID: A3LSMA225M.
2. Compared worst configuration of the reference model, please refer to section 11 for detailed results.

2.1.4 Reference Detail

Reference application that contains the reused reference data in the individual test reports.

ITEM	Reference FCC ID	Application Type	Reference Test report Number	Exhibit Type	Variant Test Report Number	Date Re-used
RF Exposure	A3LSMA225M	Original	KR21-SPF0024-A	Test report	KR21-SPF0025-A	All

For this application the data reuse is summarized below for each equipment class

Equipment Class	Reference FCC ID	Application Type	Test Item	Data Re-used
PCE	A3LSMA225M	Original	2G, 3G	GSM 850, GSM 1900, WCDMA V
			LTE	Band 5, Band 41
DTS	A3LSMA225M	Original	WLAN (802.11b/g/n)	All
			Bluetooth LE	All
NII	A3LSMA225M	Original	WLAN (802.11a/n/ac)	All
DSS	A3LSMA225M	Original	Bluetooth	All

2.2 Summary of SAR Test Results

Band	Equipment Class	Highest Reported			
		1g SAR (W/kg)			10g SAR (W/kg)
		Head	Body-Worn	Hotspot	Phablet
GSM/GPRS/EDGE 850	PCE	0.45	**0.70**	0.69	N/A
GSM/GPRS/EDGE 1900	PCE	0.14	0.37	**0.77**	N/A
WCDMA Band V	PCE	0.40	0.50	0.76	N/A
LTE Band 5	PCE	0.41	0.49	0.71	N/A
LTE Band 41	PCE	**0.97**	0.58	0.43	**0.95**
2.4㎓ WLAN	DTS	0.19	< 0.10	0.16	N/A
U-NII-1	NII	N/A	N/A	N/A	N/A
U-NII-2A	NII	< 0.10	0.49	N/A	0.90
U-NII-2C	NII	< 0.10	0.46	N/A	0.70
U-NII-3	NII	< 0.10	0.34	0.60	N/A
Bluetooth	DSS	< 0.10	N/A	N/A	N/A
Simultaneous SAR per KDB 690783 D01v01r03		1.16	1.33	1.58	1.84

2.3 Power Reduction for SAR

This device utilizes a power reduction mechanism for some wireless modes and bands for SAR compliance under portable hotspot conditions. All hotspot SAR evaluations for this device were performed at the maximum allowed output power when hotspot is enabled.

This device uses an independent fixed level power reduction mechanism for LTE Band 41 and WLAN operations during VoLTE and VoWIFI held to ear scenarios. Per FCC Guidance, the held-to-ear exposure conditions were evaluated at reduced power according to the Head SAR positions described in IEEE 1528-2013. Detailed descriptions of the power reduction mechanism are included in the operational description.

2.4 #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.

2.4.1 Maximum 2G/3G/4G Output Power

Band	Mode	Output Power (dBm)	
		Target	Max. Allowed
GSM 850	GSM Voice	33.00	**34.00**
	GPRS 1 TX	33.00	**34.00**
	GPRS 2 TX	31.50	**32.50**
	GPRS 3 TX	30.50	**31.50**
	GPRS 4 TX	29.50	**30.50**
	EGPRS 1 TX	27.00	**28.00**
	EGPRS 2 TX	25.50	**26.50**
	EGPRS 3 TX	23.50	**24.50**
	EGPRS 4 TX	22.50	**23.50**
GSM 1900	GSM Voice	30.00	**31.00**
	GPRS 1 TX	30.00	**31.00**
	GPRS 2 TX	28.50	**29.50**
	GPRS 3 TX	27.50	**28.50**
	GPRS 4 TX	26.50	**27.50**
	EGPRS 1 TX	26.00	**27.00**
	EGPRS 2 TX	24.50	**25.50**
	EGPRS 3 TX	22.50	**23.50**
	EGPRS 4 TX	21.50	**22.50**

Band	Mode		Output Power (dBm)	
			Target	Max. Allowed
WCDMA Band V	RMC		24.50	**25.50**
	AMR		24.50	**25.50**
	HSDPA	Subtest 1	23.50	**24.50**
		Subtest 2	23.50	**24.50**
		Subtest 3	23.00	**24.00**
		Subtest 4	23.00	**24.00**
	HSUPA	Subtest 1	23.00	**24.00**
		Subtest 2	21.00	**22.00**
		Subtest 3	22.00	**23.00**
		Subtest 4	21.00	**22.00**
		Subtest 5	23.00	**24.00**
	DC-HSDPA	Subtest 1	23.50	**24.50**
		Subtest 2	23.50	**24.50**
		Subtest 3	23.00	**24.00**
		Subtest 4	23.00	**24.00**
LTE Band 5			24.50	**25.50**
LTE Band 41			22.80	**23.80**

2.4.2 Reduced 3G/4G Output Power (Ear-jack, Grip Sensor, Hotspot, RCV)

Band	Mode	Output Power (dBm)	
		Target	Max. Allowed
LTE Band 41 (Ear-jack, Grip Sensor, Hotspot)		16.30	**17.30**
LTE Band 41 (RCV)		20.50	**21.50**

2.4.3 Maximum WLAN and Bluetooth Output Power

Band	Mode	Channel	Output Power (dB m)	
			Target	Max. Allowed
WLAN 2.4 GHz	802.11b	Except 12,13	18.50	**19.50**
		12,13	8.00	**9.00**
	802.11g	Except 12,13	16.50	**17.50**
		12,13	8.00	**9.00**
	802.11n(HT20)	Except 11,12,13	16.50	**17.50**
		11	15.50	**16.50**
		12,13	8.00	**9.00**
U-NII-1, U-NII-2A	802.11a	All Channel	15.50	**16.50**
	802.11n(HT20)	All Channel	15.50	**16.50**
	802.11n(HT40)	All Channel	15.00	**16.00**
	802.11ac(VHT20)	All Channel	15.00	**16.00**
	802.11ac(VHT40)	All Channel	15.00	**16.00**
	802.11ac(VHT80)	All Channel	14.00	**15.00**
U-NII-2C	802.11a	All Channel	15.50	**16.50**
	802.11n(HT20)	All Channel	15.50	**16.50**
	802.11n(HT40)	Except 102	15.00	**16.00**
		102	14.50	**15.50**
	802.11ac(VHT20)	Except 100	15.00	**16.00**
		100	14.50	**15.50**
	802.11ac(VHT40)	Except 102	15.00	**16.00**
		102	14.50	**15.50**
	802.11ac(VHT80)	Except 106	14.00	**15.00**
		106	13.50	**14.50**
U-NII-3	802.11a	All Channel	15.00	**16.00**
	802.11n(HT20)	All Channel	15.00	**16.00**
	802.11n(HT40)	All Channel	15.00	**16.00**
	802.11ac(VHT20)	All Channel	13.50	**14.50**
	802.11ac(VHT40)	All Channel	15.00	**16.00**
	802.11ac(VHT80)	All Channel	14.00	**15.00**

Note: When the specified maximum output power is the same for both UNII Band1 and UNII Band 2A, begins SAR measurement in UNII band 2A; and if the highest reported SAR for U NII band 2A is ≤ 1.2W/kg, SAR is not required for U-NII-1 band for that configuration; otherwise, each band is tested independently for SAR.

Band	Mode	Channel	Output Power (dB m)	
			Target	Max. Allowed
Bluetooth	BDR(GFSK)	All Channel	9.00	**10.00**
	EDR (π/4DQPSK)	All Channel	7.00	**8.00**
	EDR(8DPSK)	All Channel	7.00	**8.00**
	LE(GFSK)	All Channel	6.00	**7.00**

2.4.4 Reduced WLAN Output Power (RCV)

Band	Mode	Channel	Output Power (dB m)	
			Target	Max. Allowed
WLAN 2.4 GHz	802.11b	Except 12,13	13.00	**14.00**
		12,13	8.00	**9.00**
	802.11g	Except 12,13	13.00	**14.00**
		12,13	8.00	**9.00**
	802.11n(HT20)	Except 12,13	13.00	**14.00**
		12,13	8.00	**9.00**
U-NII-1, U-NII-2A	802.11a	All Channel	12.00	**13.00**
	802.11n(HT20)	All Channel	12.00	**13.00**
	802.11n(HT40)	All Channel	12.00	**13.00**
	802.11ac(VHT20)	All Channel	12.00	**13.00**
	802.11ac(VHT40)	All Channel	12.00	**13.00**
	802.11ac(VHT80)	All Channel	12.00	**13.00**
U-NII-2C	802.11a	All Channel	12.00	**13.00**
	802.11n(HT20)	All Channel	12.00	**13.00**
	802.11n(HT40)	All Channel	12.00	**13.00**
	802.11ac(VHT20)	All Channel	12.00	**13.00**
	802.11ac(VHT40)	All Channel	12.00	**13.00**
	802.11ac(VHT80)	All Channel	12.00	**13.00**
U-NII-3	802.11a	All Channel	12.00	**13.00**
	802.11n(HT20)	All Channel	12.00	**13.00**
	802.11n(HT40)	All Channel	12.00	**13.00**
	802.11ac(VHT20)	All Channel	12.00	**13.00**
	802.11ac(VHT40)	All Channel	12.00	**13.00**
	802.11ac(VHT80)	All Channel	12.00	**13.00**

Note: When the specified maximum output power is the same for both UNII Band1 and UNII Band 2A, begins SAR measurement in UNII band 2A; and if the highest reported SAR for U NII band 2A is ≤ 1.2W/kg, SAR is not required for U-NII-1 band for that configuration; otherwise, each band is tested independently for SAR.

2.5 #DUT Antenna Locations

The overall dimensions of this device are > 9 x 5 ㎝. A diagram showing the location of the device antennas can be found in Appendix C. Since the diagonal dimension of this device is > 160 ㎜ and < 200 ㎜, it is considered a “Phablet”.

Mode	Device Edge for SAR Testing (Front View)					
	Front	Rear	Left Edge	Right Edge	Top	Bottom
GPRS 850	Yes	Yes	Yes	Yes	No	Yes
GPRS 1900	Yes	Yes	Yes	Yes	No	Yes
WCDMA Band V	Yes	Yes	Yes	Yes	No	Yes
LTE Band 5	Yes	Yes	Yes	Yes	No	Yes
LTE Band 41	Yes	Yes	Yes	Yes	No	Yes
2.4 ㎓ WLAN	Yes	Yes	Yes	No	Yes	No
5 ㎓ WLAN	Yes	Yes	Yes	No	Yes	No
Bluetooth	No	No	No	No	No	No

Note: Particular DUT edges were not required to be evaluated for Hotspot SAR or Phablet SAR if the edges were greater than 2.5 ㎝ from the transmitting antenna according to FCC KDB Publication 941225 D06v02r01 and FCC KDB Publication 648474 D04v01r03. The antenna document shows the distances between the transmit antennas and the edges of the device. When Hotspot mode is enabled, U-NII-1, U-NII-2A, U-NII-2C operations is disabled.

2.6 Near Field Communications (NFC) Antenna

This DUT has NFC operations. The NFC antenna is integrated into the device for the model. Therefore, all SAR test were performed with the device which already incorporates the NFC antenna.
A diagram showing the location of the NFC antenna can be found in Appendix C.

2.7 #Simultaneous Transmission Configurations

According to FCC KDB 447498 D01v06, transmitters are considered to be transmitting simultaneously when there is overlapping transmission, with the exception of transmissions during network hand-offs with maximum hand-off duration less than 30 seconds.
This device contains multiple transmitters that may operate simultaneously, and therefore requires a simultaneous transmission analysis according to FCC KDB Publication 447498 D01v06 4.3.2 procedures.

No	Scenario	RF Exposure Condition			
		Head	Body-Worn	Hotspot	Phablet
1	GSM Voice + WLAN 2.4 ㎓	Yes	Yes	No	Yes
2	GSM Voice + WLAN 5 ㎓	Yes	Yes	No	Yes
3	GSM Voice + 2.4 ㎓ Bluetooth	Yes	Yes	No	Yes
4	GSM Voice + 2.4 ㎓ Bluetooth + WLAN 5 ㎓	Yes	Yes	No	Yes
5	WCDMA + WLAN 2.4 ㎓	Yes	Yes	Yes	Yes
6	WCDMA + WLAN 5 ㎓	Yes	Yes	Yes	Yes
7	WCDMA + 2.4 ㎓ Bluetooth	Yes	Yes	Yes	Yes
8	WCDMA + 2.4 ㎓ Bluetooth + WLAN 5 ㎓	Yes	Yes	Yes	Yes
9	LTE + WLAN 2.4 ㎓	Yes	Yes	Yes	Yes
10	LTE + WLAN 5 ㎓	Yes	Yes	Yes	Yes
11	LTE + 2.4 ㎓ Bluetooth	Yes	Yes	Yes	Yes
12	LTE + 2.4 ㎓ Bluetooth + WLAN 5 ㎓	Yes	Yes	Yes	Yes
13	GPRS/EDGE + WLAN 2.4 ㎓	Yes	Yes	Yes	Yes
14	GPRS/EDGE + WLAN 5 ㎓	Yes	Yes	Yes	Yes
15	GPRS/EDGE + 2.4 ㎓ Bluetooth	Yes	Yes	Yes	Yes
16	GPRS/EDGE + 2.4 ㎓ Bluetooth + WLAN 5 ㎓	Yes	Yes	Yes	Yes
17	WLAN 2.4 ㎓ + WLAN 5 ㎓	No			

Notes:

- It does not to transmit simultaneously the Bluetooth and 2.4 ㎓ WLAN.
- It is to use the Bluetooth and 2.4 ㎓ WLAN same antenna path.
- WLAN Hotspot is supported for 2.4 ㎓ and UNII-3 of 5 ㎓ WLAN.
- This device supports Bluetooth Tethering.
- This device supports VoLTE.
- This device supports VoWIFI.
- 5 ㎓ Hotspot mode is only supported for the UNII-3, therefore U-NII-1, U-NII-2A, U-NII-2C were not evaluated for Hotspot mode conditions.

2.8 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:

- IEEE 1528-2013
- 447498 D01 General RF Exposure Guidance v06
- 484596 D01 Referencing Test Data v01
- 865664 D01 SAR measurement 100 ㎒ to 6 ㎓ v01r04
- 865664 D02 RF Exposure Reporting v01r02
- October 2016 TCB Workshop Notes (Bluetooth Duty Factor)
- April 2019 TCB Workshop Notes (Tissue Simulation Liquids)
- October 2020 TCB Workshop Notes (Data Referencing)

3. #LTE Information

LTE Information					
Form Factor	Portable Handset				
Frequency Range of each LTE transmission band	LTE Band 5 (824.7 ~ 848.3) ㎒ LTE Band 41 (2 498.5 ~ 2 687.5) ㎒				
Channel Bandwidths	LTE Band 5: 1.4 ㎒, 3 ㎒, 5 ㎒, 10 ㎒ LTE Band 41: 5 ㎒, 10 ㎒, 15 ㎒, 20 ㎒				
Channel Numbers and Frequencies (㎒)	Low	Low-Mid	Mid	Mid-High	High
LTE Band 5: 1.4 ㎒	824.7 (20 407)		836.5 (20 525)		848.3 (20 643)
LTE Band 5: 3 ㎒	825.5 (20 415)		836.5 (20 525)		847.5 (20 635)
LTE Band 5: 5 ㎒	826.5 (20 425)		836.5 (20 525)		846.5 (20 625)
LTE Band 5: 10 ㎒	829.0 (20 450)		836.5 (20 525)		844.0 (20 600)
LTE Band 41: 5 ㎒	2 506.0 (39 750)	2 549.5 (40 185)	2 593.0 (40 620)	2 636.5 (41 055)	2 680.0 (41 490)
LTE Band 41: 10 ㎒	2 506.0 (39 750)	2 549.5 (40 185)	2 593.0 (40 620)	2 636.5 (41 055)	2 680.0 (41 490)
LTE Band 41: 15 ㎒	2 506.0 (39 750)	2 549.5 (40 185)	2 593.0 (40 620)	2 636.5 (41 055)	2 680.0 (41 490)
LTE Band 41: 20 ㎒	2 506.0 (39 750)	2 549.5 (40 185)	2 593.0 (40 620)	2 636.5 (41 055)	2 680.0 (41 490)
UE Category	UL:5, DL:4				
Modulations Supported in UL	QPSK, 16QAM, 64QAM				
LTE MPR Permanently implemented per 3GPP TS 36.101 section 6.2.3 ~ 6.2.5?(manufacturer attestation to be provided)	YES				
A-MPR(Additional MPR) disabled for SAR Testing?	YES				
LTE Carrier Aggregation Possible Combinations	This device not supports LTE CA aggregation.				
LTE Additional Information	The following LTE Release 11 Features are not supported: Relay, HetNet, Enhanced MIMO, eICIC, WIFI Offloading, MDH, eMBMS, Cross-Carrier Scheduling, Enhanced SC-FDMA.				

4. Specific Absorption Rate

4.1 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.

4.2 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.

5. SAR Measurement Procedures

5.1 SAR Scan Procedures

Step 1: Power Reference Measurement
The Power Reference Measurement and Power Drift Measurements are for monitoring the power drift of the device under test in the batch process. The Minimum distance of probe sensors to surface determines the closest measurement point to phantom surface. The minimum distance of probe sensors to surface is 1.4 mm. This distance cannot be smaller than the Distance of sensor calibration points to probe tip as defined in the probe properties.
Step 2: Area Scan & Zoom Scan
The Area Scan is used as a fast scan in two dimensions to find the area of high field values, before doing a fine measurement around the hot spot and Zoom Scans are used to assess the peak spatial SAR values within a cubic averaging volume containing1 g and 10 g of simulated tissue. If only one Zoom Scan follows the Area Scan, then only the absolute maximum will be taken as reference. For cases where multiple maximums are detected, the number of Zoom Scans has to be increased accordingly. Area Scan & Zoom Scan Parameters extracted from KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04.

			≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface			5 mm ± 1 mm	½·δ·ln(2) mm 0.5 mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location			30° ± 1°	20° ± 1°
Maximum area scan spatial resolution: Δx_{Area}, Δy_{Area}			≤ 2 GHz: ≤ 15 mm 2 – 3 GHz: ≤ 12 mm	3 – 4 GHz: ≤ 12 mm 4 – 6 GHz: ≤ 10 mm
			When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.	
Maximum zoom scan spatial resolution: Δx_{Zoom}, Δy_{Zoom}			≤ 2 GHz: ≤ 8 mm 2 – 3 GHz: ≤ 5 mm*	3 – 4 GHz: ≤ 5 mm* 4 – 6 GHz: ≤ 4 mm*
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{Zoom}(n)$		≤ 5 mm	3 – 4 GHz: ≤ 4 mm 4 – 5 GHz: ≤ 3 mm 5 – 6 GHz: ≤ 2 mm
	graded grid	$\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface	≤ 4 mm	3 – 4 GHz: ≤ 3 mm 4 – 5 GHz: ≤ 2.5 mm 5 – 6 GHz: ≤ 2 mm
		$\Delta z_{Zoom}(n>1)$: between subsequent points	≤ 1.5·$\Delta z_{Zoom}(n-1)$ mm	
Minimum zoom scan volume	x, y, z		≥ 30 mm	3 – 4 GHz: ≥ 28 mm 4 – 5 GHz: ≥ 25 mm 5 – 6 GHz: ≥ 22 mm
Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see IEEE Std 1528-2013 for details. * When zoom scan is required and the reported SAR from the area scan based 1-g SAR estimation procedures of KDB Publication 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.				

Step 3: Power drift measurement
The Power Drift Measurement measures the field at the same location as the most recent power reference measurement within the same procedure, and with the same settings. The Power Drift Measurement gives the field difference in dB from the reading conducted within the last Power Reference Measurement. This allows a user to monitor the power drift of the device under test within a batch process. The measurement procedure is the same as Step 1.

6. SAR Measurement Configurations

6.1 Ear Reference Point

Figure 1shows the front, back and side views of the SAM phantom. The "M" is the reference point for the center of the mouth, "LE" is the left ear reference point (ERP), and "RE" is the right ERP. The ERPs are 15 mm posterior to the entrance to the Ear canal (EEC) along the B-M line (Back-Mouth), as shown in Figure 1. The plane Passing, through the two ear canals and M is defined as the Reference Plane. The line N-F (Neck – Front) is perpendicular to the reference plane and passing through the LE (or RE) is called the Reference Pivoting Line. Both N-F and B-M lines are marked on the external phantom shell to facilitate handset positioning.

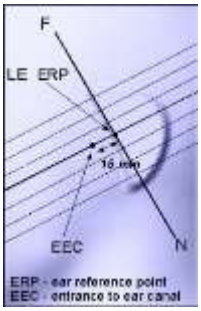


Figure 1
Close-Up Side view of ERP

6.2 Handset Reference Points

Two imaginary lines on the handset were established: the vertical centerline and the horizontal line. The test device was placed in a normal operating position with the acoustic output located along the "vertical centerline" on the front of the device aligned to the "ear reference point" (See Figure 3). The acoustic output was than located at the same level as the center of the ear reference point. The test device was positioned so that the "vertical centerline" was bisecting the front surface of the handset at its top and bottom edges, positioning the "ear reference point" on the outer surface of the both the left and right head phantoms on the ear reference point.

Figure 2
Front, back and side view of SAM Twin Phantom

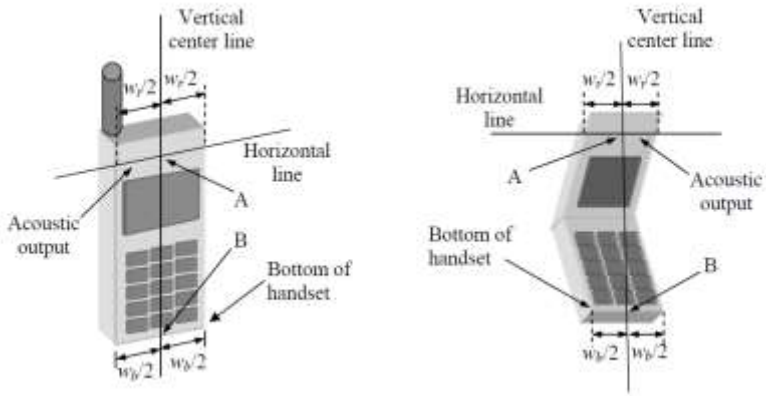


Figure 3
Handset Vertical Center & Horizontal Line Reference Points

6.3 Device Holder

The device holder is made out of low-loss POM material having the following dielectric parameters: relative permittivity ε = 3 and loss tangent δ = 0.02.

6.4 Positioning for Cheek/Touch

1. The test device was positioned with the device close to the surface of the phantom such that point A is on the (virtual) extension of the line passing through points RE and LE on the phantom (see Figure 4), such that the plane defined by the vertical center line and the horizontal line of the phone is approximately parallel to the sagittal plane of the phantom.

Figure 4: Front, Side and Top View of Cheek Position

2. The handset was translated towards the phantom along the line passing through RE & LE until the handset touches the pinna.
3. While maintaining the handset in this plane, the handset was rotated around the LE-RE line until the vertical centerline was in the reference plane.
4. The phone was then rotated around the vertical centerline until the phone (horizontal line) was symmetrical was respect to the line NF.
5. While maintaining the vertical centerline in the reference plane, keeping point A on the line passing through RE and LE, and maintaining the device contact with the ear, the device was rotated about the NF line until any point on the handset made contact with a phantom point below the ear (cheek) (See Figure 5).

6.5 Positioning for Ear / 15˚ Tilt

With the test device aligned in the “Cheek Position”:

1. While maintaining the orientation of the phone, the phone was retracted parallel to the reference plane far enough to enable a rotation of the phone by 15 degrees.
2. The phone was then rotated around the horizontal line by 15 degrees.
3. While maintaining the orientation of the phone, the phone was moved parallel to the reference plane until any part of the handset touched the head. (In this position, point A was located on the line RE-LE). The tilted position is obtained when the contact is on the pinna. If the contact was at any location other than the pinna, the angle of the phone would then be reduced. In this situation, the tilted position was obtained when any part of the phone was in contact of the ear as well as a second part of the phone was in contact with the head (see Figure 5).

Figure 5: Front, Side and Top View of Ear/ 15˚ Tilt

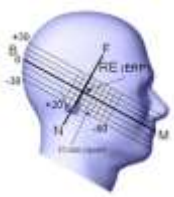


Figure 6: Side view w/ relevant markings

6.6 Body-Worn Accessory Configurations

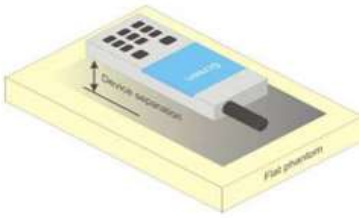


Figure 7
Sample Body-Worn Diagram

Body-worn operating configurations are tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in a normal use configuration (see Figure 7). Per FCC KDB Publication 648474 D04v01r03, Body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. The body-worn accessory procedures in FCC KDB Publication 447498 D01v06 should be used to test for body-worn accessory SAR compliance, without a headset connected to it. This enables the test results for such configuration to be compatible with that required for hotspot mode when the body-worn accessory test separation distance is greater than or equal to that required for hotspot mode, when applicable. When the reported SAR for a body-worn accessory, measured without a headset connected to the handset, is > 1.2 W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a headset attached to the handset.

Accessories for Body-worn operation configurations are divided into two categories: those that do not contain metallic components and those that do contain metallic components. When multiple accessories that do not contain metallic components are supplied with the device, the device is tested with only the accessory that dictates the closest spacing to the body. Then multiple accessories that contain metallic components are tested with the device with each accessory. If multiple accessories share an identical metallic component (i.e. the same metallic belt-clip used with different holsters with no other metallic components) only the accessory that dictates the closest spacing to the body is tested.
Body-worn accessories may not always be supplied or available as options for some devices intended to be authorized for body-worn use. In this case, a test configuration with a separation distance between the back of the device and the flat phantom is used. Test position spacing was documented. Transmitters that are designed to operate in front of a person's face, as in push-to-talk configurations, are tested for SAR compliance with the front of the device positioned to face the flat phantom in head fluid. For devices that are carried next to the body such as a shoulder, waist or chest-worn transmitters, SAR compliance is tested with the accessories, including headsets and microphones, attached to the device and positioned against a flat phantom in a normal use configuration.

6.7 Wireless Router Configurations

Some battery-operated handsets have the capability to transmit and receive user data through simultaneous transmission of WIFI simultaneously with a separate licensed transmitter. The FCC has provided guidance in FCC KDB Publication 941225 D06v02r01 where SAR test considerations for handsets (L x W ≥ 9 cm x 5 cm) are based on a composite test separation distance of 10 mm from the front, back and edges of the device containing transmitting antennas within 2.5 cm of their edges, determined from general mixed use conditions for this type of devices. Since the hotspot SAR results may overlap with the body-worn accessory SAR requirements, the more conservative configurations can be considered, thus excluding some body-worn accessory SAR tests.

When the user enables the personal wireless router functions for the handset, actual operations include simultaneous transmission of both the WIFI transmitter and another licensed transmitter. Both transmitters often do not transmit at the same transmitting frequency and thus cannot be evaluated for SAR under actual use conditions due to the limitations of the SAR assessment probes. Therefore, SAR must be evaluated for each frequency transmission and mode separately and spatially summed with the WIFI transmitter according to FCC KDB Publication 447498 D01v06 procedures. The "Portable Hotspot" feature on the handset was NOT activated during SAR assessments, to ensure the SAR measurements were evaluated for a single transmission frequency RF signal at a time.

6.8 Proximity Sensor Considerations

This device uses a power reduction mechanism to reduce output powers in certain use conditions when the device is used close to the user's body.
When the device's antenna is within a certain distance of the user, the sensor activates and reduces the maximum allowed output power. However, the sensor is not active when the device is moved beyond the sensor triggering distance and the maximum output power is no longer limited. Therefore, additional evaluation is needed in the vicinity of the triggering distance to ensure SAR is compliant when the device is allowed to operate at a non-reduced output power level. FCC KDB Publication 616217 D04v01r02 Section 6 was used as a guideline for selecting SAR test distances for this device at these additional test positions.

6.9 Phablet Configurations

For smart phones with a display diagonal dimension > 150 ㎜ or an overall diagonal dimension > 160 ㎜ that provide similar mobile web access and multimedia support found in mini-tablets or UMPC mini-tablets that support voice calls next to the ear, the phablets procedures outlined in KDB Publication 648474 D04v01r03 should be applied to evaluate SAR compliance. A device marketed as phablets, regardless of form factors and operating characteristics must be tested as a phablet to determine SAR compliance. In addition to the normally required head and body-worn accessory SAR test procedures required for handsets, the UMPC mini-tablet procedures must also be applied to test the SAR of all surfaces and edges with an antenna <=25 ㎜ from that surface or edge, in direct contact with the phantom, for 10g SAR. The UMPC mini-tablet 1g SAR at 5 ㎜ is not required. When hotspot mode applies, 10g SAR is required only for the surfaces and edges with hotspot mode 1g SAR > 1.2 W/kg.

7. RF Exposure Limits

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.

8. FCC SAR General Measurement Procedures

8.1 Measured and Reported SAR

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

9. RF Average Conducted Output Power

9.1 GSM Average Conducted Output Power (Maximum Average Power)

Maximum Burst-Average Output Power (dB m)										
Band	Channel	GSM	GPRS (GMSK)				EGPRS (8-PSK)			
		Voice	1Tx	2Tx	3Tx	4Tx	1Tx	2Tx	3Tx	4Tx
GSM 850	128	32.75	32.97	31.85	29.94	28.88	26.06	24.74	22.61	21.94
	190	33.18	33.18	32.06	30.16	29.15	26.19	24.83	22.78	21.59
	251	32.77	32.78	31.66	29.79	28.77	26.05	24.79	22.54	21.50
GSM 1900	512	29.85	29.85	28.74	26.79	25.73	25.14	23.94	21.81	20.67
	661	29.70	29.70	28.59	26.59	25.63	25.09	23.66	21.58	20.55
	810	29.05	29.05	27.92	26.50	25.62	25.01	23.57	21.55	20.50

Maximum Frame-Average Output Power (dB m)										
Band	Channel	GSM	GPRS (GMSK)				EGPRS (8-PSK)			
		Voice	1Tx	2Tx	3Tx	4Tx	1Tx	2Tx	3Tx	4Tx
GSM 850	128	23.72	23.94	25.83	25.68	25.87	17.03	18.72	18.35	18.93
	190	24.15	24.15	26.04	25.90	26.14	17.16	18.81	18.52	18.58
	251	23.74	23.75	25.64	25.53	25.76	17.02	18.77	18.28	18.49
GSM 1900	512	20.82	20.82	22.72	22.53	22.72	16.11	17.92	17.55	17.66
	661	20.67	20.67	22.57	22.33	22.62	16.06	17.64	17.32	17.54
	810	20.02	20.02	21.90	22.24	22.61	15.98	17.55	17.29	17.49
GSM 850	Frame Avg, Target	24.97	24.97	26.48	27.24	**27.49**	18.97	20.48	20.24	20.49
GSM 1900		21.97	21.97	23.48	24.24	**24.49**	17.97	19.48	19.24	19.49

9.2 WCDMA Average Conducted Output Power (Maximum Average Power)

Band	Mode	Average Conducted Power (dB m)			3GPP MPR [dB]
		Channel			
		4 132	4 183	4 233	
WCDMA Band V	RMC	24.70	24.66	24.39	-
	AMR	24.65	24.61	24.33	-
	HSDPA-Subtest 1	23.76	23.68	23.46	0
	HSDPA-Subtest 2	23.79	23.74	23.49	0
	HSDPA-Subtest 3	23.29	23.29	23.03	0.5
	HSDPA-Subtest 4	23.21	23.29	22.87	0.5
	HSUPA-Subtest 1	22.13	22.05	22.01	0
	HSUPA-Subtest 2	21.31	21.21	21.09	2
	HSUPA-Subtest 3	22.02	21.98	21.88	1
	HSUPA-Subtest 4	21.54	21.41	21.35	2
	HSUPA-Subtest 5	22.43	22.31	22.27	0
	DC-HSDPA-Subtest 1	23.74	23.69	23.48	0
	DC-HSDPA-Subtest 2	23.73	23.67	23.33	0
	DC-HSDPA-Subtest 3	23.22	23.06	22.88	0.5
	DC-HSDPA-Subtest 4	23.22	23.01	22.81	0.5

9.3 LTE Average Conducted Output Power (Maximum Average Power)

9.3.1 LTE Band 5

Band width	Modulation	RB Size	RB offset	Maximum Average Power	MPR
				20 525	
				836.5 ㎒	
10 ㎒	QPSK	1	0	24.07	0
		1	25	24.87	0
		1	49	24.61	0
		25	0	23.22	1
		25	12	23.27	1
		25	25	23.25	1
		50	0	23.25	1
	16QAM	1	0	23.44	1
		1	25	23.96	1
		1	49	23.84	1
		25	0	22.35	2
		25	12	22.24	2
		25	25	22.28	2
		50	0	22.20	2
	64QAM	1	0	22.68	2
		1	25	22.78	2
		1	49	22.59	2
		25	0	21.66	3
		25	12	21.55	3
		25	25	21.53	3
		50	0	21.60	3

10 ㎒ Bandwidths does not support at least three non-overlapping channels in certain channel bandwidths. When a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing per KDB 941225 D05 SAR for LTE Devices.

Band width	Modulation	RB Size	RB offset	Maximum Average Power			MPR
				20 425	20 525	20 625	
				826.5 ㎒	836.5 ㎒	846.5 ㎒	
5 ㎒	QPSK	1	0	24.47	23.96	24.67	0
		1	12	24.90	24.35	24.37	0
		1	24	24.23	24.00	24.64	0
		12	0	23.29	23.17	23.40	1
		12	7	23.88	23.19	23.50	1
		12	13	23.33	22.95	23.08	1
		25	0	22.97	23.25	23.68	1
	16QAM	1	0	23.46	23.31	23.26	1
		1	12	23.10	23.47	23.06	1
		1	24	23.17	23.72	23.54	1
		12	0	22.57	22.23	22.29	2
		12	7	22.20	22.18	22.79	2
		12	13	22.09	22.35	22.15	2
		25	0	22.55	22.40	22.56	2
	64QAM	1	0	22.50	22.50	22.44	2
		1	12	22.80	22.85	22.50	2
		1	24	22.60	22.47	22.25	2
		12	0	21.35	21.52	21.27	3
		12	7	21.46	21.53	21.27	3
		12	13	21.42	21.44	21.14	3
		25	0	21.43	21.53	21.27	3

Band width	Modulation	RB Size	RB offset	Maximum Average Power			MPR
				20 407	20 525	20 643	
				824.7 MHz	836.5 MHz	848.3 MHz	
3 MHz	QPSK	1	0	24.73	24.52	24.74	0
		1	8	24.18	24.44	24.39	0
		1	14	24.40	23.99	24.61	0
		8	0	23.01	23.51	22.92	1
		8	4	23.55	23.36	23.57	1
		8	7	23.75	23.09	23.15	1
		15	0	23.36	23.25	23.62	1
	16QAM	1	0	23.76	23.16	23.63	1
		1	8	24.13	23.69	22.87	1
		1	14	23.82	23.19	23.11	1
		8	0	22.55	22.08	22.37	2
		8	4	22.58	22.31	22.28	2
		8	7	22.46	22.59	22.71	2
		15	0	22.11	22.16	22.29	2
	64QAM	1	0	22.57	22.67	22.42	2
		1	8	22.59	22.65	22.36	2
		1	14	22.62	22.65	22.33	2
		8	0	21.42	21.53	21.21	3
		8	4	21.44	21.54	21.21	3
		8	7	21.40	21.44	21.15	3
		15	0	21.45	21.50	21.20	3

Band width	Modulation	RB Size	RB offset	Maximum Average Power			MPR
				20 407	20 525	20 643	
				824.7 MHz	836.5 MHz	848.3 MHz	
1.4 MHz	QPSK	1	0	23.96	23.86	24.43	0
		1	3	24.52	24.20	24.70	0
		1	5	24.57	24.21	24.00	0
		3	0	24.08	24.67	24.42	0
		3	1	24.74	24.50	24.63	0
		3	3	24.76	24.62	23.88	0
		6	0	23.73	23.47	23.60	1
	16QAM	1	0	23.57	23.39	23.11	1
		1	3	23.36	23.75	23.90	1
		1	5	23.70	23.33	23.15	1
		3	0	23.84	23.86	23.00	1
		3	1	23.22	23.27	23.38	1
		3	3	23.42	23.61	23.16	1
		6	0	22.19	22.03	22.05	2
	64QAM	1	0	22.55	22.63	22.31	2
		1	3	22.75	22.73	22.35	2
		1	5	22.64	22.59	22.31	2
		3	0	22.55	22.56	22.28	2
		3	1	22.62	22.68	22.34	2
		3	3	22.57	22.59	22.30	2
		6	0	21.50	21.42	21.14	3

9.3.2 LTE Band 41

Band width	Modulation	RB Size	RB offset	Maximum Average Power					MPR
				39 750	40 185	40 620	41 055	41 490	
				2 506.0 MHz	2 549.5 MHz	2 593.0 MHz	2 636.5 MHz	2 680.0 MHz	
20 MHz	QPSK	1	0	22.71	22.82	22.65	22.44	22.69	0
		1	49	23.05	23.04	22.93	23.10	22.98	0
		1	99	22.78	22.66	22.37	22.42	22.74	0
		50	0	21.82	21.65	21.73	21.75	21.84	1
		50	24	21.61	21.64	21.70	21.85	21.64	1
		50	50	21.63	21.68	21.54	21.78	21.84	1
		100	0	21.81	21.81	21.64	21.84	21.82	1
	16QAM	1	0	21.76	21.57	21.22	21.47	21.47	1
		1	49	22.19	21.87	21.44	21.79	21.88	1
		1	99	21.83	21.43	20.94	21.45	21.49	1
		50	0	20.91	20.89	20.82	20.52	20.81	2
		50	24	20.95	20.90	20.71	20.53	20.91	2
		50	50	21.00	20.88	20.58	20.48	20.81	2
		100	0	20.92	20.89	20.67	20.55	20.78	2
	64QAM	1	0	20.84	20.95	20.48	20.39	20.46	2
		1	49	21.28	21.05	20.60	20.60	20.72	2
		1	99	21.03	20.56	20.28	20.36	20.34	2
		50	0	20.43	20.27	19.84	19.74	19.89	3
		50	24	20.48	20.20	19.82	19.80	19.92	3
		50	50	20.58	20.20	19.67	19.79	19.85	3
		100	0	20.63	20.34	19.84	19.97	19.98	3

Band width	Modulation	RB Size	RB offset	Maximum Average Power					MPR
				39 750	40 185	40 620	41 055	41 490	
				2 506.0 MHz	2 549.5 MHz	2 593.0 MHz	2 636.5 MHz	2 680.0 MHz	
15 MHz	QPSK	1	0	22.74	22.90	22.60	22.46	22.83	0
		1	36	22.91	22.98	22.62	22.56	22.98	0
		1	74	22.87	22.78	22.42	22.45	22.83	0
		36	0	21.89	22.01	21.76	21.58	22.01	1
		36	18	21.92	21.99	21.72	21.57	22.08	1
		36	37	21.98	21.93	21.64	21.58	21.99	1
		75	0	21.90	21.95	21.74	21.52	22.01	1
	16QAM	1	0	21.96	21.82	21.51	21.64	21.72	1
		1	36	22.09	21.89	21.53	21.72	21.85	1
		1	74	22.03	21.69	21.34	21.61	21.78	1
		36	0	20.93	20.93	20.71	20.54	20.91	2
		36	18	20.92	20.96	20.66	20.60	20.95	2
		36	37	20.96	20.87	20.60	20.55	20.90	2
		75	0	20.91	20.94	20.68	20.51	20.92	2
	64QAM	1	0	20.62	20.78	20.30	20.22	20.71	2
		1	36	20.83	20.75	20.27	20.34	20.75	2
		1	74	20.85	20.47	20.17	20.28	20.63	2
		36	0	20.10	20.12	19.72	19.65	20.18	3
		36	18	20.28	20.15	19.72	19.69	20.24	3
		36	37	20.31	20.10	19.59	19.71	20.22	3
		75	0	20.26	20.10	19.67	19.77	20.17	3

Band width	Modulation	RB Size	RB offset	Maximum Average Power					MPR
				39 750	40 185	40 620	41 055	41 490	
				2 506.0 ㎒	2 549.5 ㎒	2 593.0 ㎒	2 636.5 ㎒	2 680.0 ㎒	
10 ㎒	QPSK	1	0	22.70	23.00	22.72	22.56	22.92	0
		1	25	23.11	23.13	22.77	22.76	23.17	0
		1	49	22.94	22.89	22.58	22.58	22.93	0
		25	0	21.92	21.97	21.70	21.61	21.96	1
		25	12	21.92	21.94	21.67	21.53	21.96	1
		25	25	21.97	21.97	21.59	21.55	21.97	1
		50	0	21.95	21.98	21.67	21.54	21.95	1
	16QAM	1	0	22.05	21.89	21.45	21.69	21.81	1
		1	25	22.25	22.03	21.48	21.88	21.96	1
		1	49	22.13	21.79	21.29	21.74	21.86	1
		25	0	20.99	20.94	20.79	20.62	20.89	2
		25	12	20.99	20.93	20.72	20.61	20.89	2
		25	25	21.03	20.96	20.62	20.56	20.91	2
		50	0	20.96	20.96	20.65	20.54	20.90	2
	64QAM	1	0	20.76	20.83	20.35	20.35	20.52	2
		1	25	20.72	20.61	20.15	20.21	20.32	2
		1	49	20.90	20.58	20.23	20.38	20.42	2
		25	0	20.20	20.21	19.72	19.74	19.84	3
		25	12	20.30	20.19	19.68	19.72	19.80	3
		25	25	20.38	20.14	19.62	19.77	19.92	3
		50	0	20.30	20.17	19.67	19.73	19.86	3

Band width	Modulation	RB Size	RB offset	Maximum Average Power					MPR
				39 750	40 185	40 620	41 055	41 490	
				2 506.0 ㎒	2 549.5 ㎒	2 593.0 ㎒	2 636.5 ㎒	2 680.0 ㎒	
5 ㎒	QPSK	1	0	23.16	22.89	22.57	22.43	22.68	0
		1	12	23.41	23.14	22.75	22.67	23.07	0
		1	24	23.10	22.83	22.47	22.35	22.83	0
		12	0	22.08	21.96	21.64	21.50	21.92	1
		12	7	22.10	22.05	21.71	21.52	21.95	1
		12	13	22.06	21.95	21.60	21.44	21.90	1
		25	0	22.09	21.96	21.67	21.46	21.93	1
	16QAM	1	0	22.30	21.89	21.65	21.67	21.82	1
		1	12	22.54	22.18	21.89	21.94	22.09	1
		1	24	22.29	21.81	21.60	21.68	21.81	1
		12	0	20.98	20.91	20.66	20.41	20.85	2
		12	7	21.03	20.92	20.71	20.47	20.92	2
		12	13	20.95	20.88	20.63	20.39	20.86	2
		25	0	21.08	20.93	20.66	20.46	20.92	2
	64QAM	1	0	20.64	20.14	20.09	20.20	20.32	2
		1	12	20.86	20.22	20.21	20.36	20.40	2
		1	24	20.67	20.07	20.06	20.25	20.21	2
		12	0	20.13	19.54	19.55	19.64	19.67	3
		12	7	20.16	19.56	19.61	19.68	19.75	3
		12	13	20.24	19.53	19.54	19.61	19.63	3
		25	0	20.18	19.59	19.61	19.75	19.67	3

9.4 LTE Average Conducted Output Power (Reduced Average Power) (Ear-jack, Grip Sensor, Hotspot)

9.4.1 LTE Band 41

Band width	Modulation	RB Size	RB offset	Maximum Average Power					MPR
				39 750	40 185	40 620	41 055	41 490	
				2 506.0 ㎒	2 549.5 ㎒	2 593.0 ㎒	2 636.5 ㎒	2 680.0 ㎒	
20 ㎒	QPSK	1	0	16.21	16.35	16.19	16.30	15.96	0
		1	49	16.68	16.65	16.43	16.73	16.34	0
		1	99	16.33	16.22	15.91	16.39	16.01	0
		50	0	16.47	16.43	16.33	16.59	16.13	0
		50	24	16.53	16.41	16.29	16.58	16.11	0
		50	50	16.53	16.37	16.11	16.52	16.10	0
		100	0	16.47	16.40	16.24	16.52	16.12	0
	16QAM	1	0	16.35	16.14	15.85	16.07	16.04	0
		1	49	16.74	16.51	16.07	16.54	16.32	0
		1	99	16.39	15.99	15.55	16.08	16.00	0
		50	0	16.42	16.41	16.37	16.47	16.11	0
		50	24	16.48	16.38	16.29	16.54	16.10	0
		50	50	16.47	16.45	16.14	16.48	16.09	0
		100	0	16.44	16.47	16.24	16.42	16.10	0
	64QAM	1	0	16.20	16.39	16.35	16.25	16.45	0
		1	49	16.65	16.43	16.47	16.56	16.67	0
		1	99	16.42	15.97	16.10	16.35	16.32	0
		50	0	16.81	16.73	16.77	16.74	16.86	0
		50	24	16.85	16.68	16.70	16.72	16.87	0
		50	50	16.94	16.55	16.53	16.74	16.78	0
		100	0	16.86	16.68	16.64	16.82	16.86	0

Band width	Modulation	RB Size	RB offset	Maximum Average Power					MPR
				39 750	40 185	40 620	41 055	41 490	
				2 506.0 ㎒	2 549.5 ㎒	2 593.0 ㎒	2 636.5 ㎒	2 680.0 ㎒	
15 ㎒	QPSK	1	0	16.30	16.35	16.11	16.40	15.96	0
		1	36	16.43	16.47	16.17	16.53	16.12	0
		1	74	16.40	16.31	15.96	16.40	16.03	0
		36	0	16.41	16.51	16.33	16.55	16.12	0
		36	18	16.50	16.52	16.30	16.61	16.10	0
		36	37	16.47	16.51	16.22	16.60	16.12	0
		75	0	16.46	16.42	16.25	16.60	16.11	0
	16QAM	1	0	16.50	16.36	16.09	16.36	16.17	0
		1	36	16.66	16.49	16.10	16.48	16.25	0
		1	74	16.60	16.27	15.87	16.33	16.19	0
		36	0	16.39	16.47	16.32	16.48	16.01	0
		36	18	16.46	16.48	16.22	16.56	16.00	0
		36	37	16.45	16.42	16.13	16.51	16.08	0
		75	0	16.42	16.46	16.26	16.51	16.02	0
	64QAM	1	0	16.33	16.49	16.43	16.39	16.60	0
		1	36	16.55	16.48	16.46	16.51	16.64	0
		1	74	16.50	16.15	16.28	16.48	16.49	0
		36	0	16.76	16.76	16.82	16.72	16.99	0
		36	18	16.89	16.69	16.79	16.83	16.97	0
		36	37	16.82	16.63	16.66	16.78	16.89	0
		75	0	16.90	16.73	16.76	16.74	16.86	0

Band width	Modulation	RB Size	RB offset	Maximum Average Power					MPR
				39 750	40 185	40 620	41 055	41 490	
				2 506.0 ㎒	2 549.5 ㎒	2 593.0 ㎒	2 636.5 ㎒	2 680.0 ㎒	
10 ㎒	QPSK	1	0	16.37	16.42	16.25	16.42	16.03	0
		1	25	16.56	16.55	16.28	16.62	16.20	0
		1	49	16.41	16.38	16.13	16.47	16.06	0
		25	0	16.39	16.46	16.24	16.49	16.06	0
		25	12	16.44	16.42	16.19	16.49	16.05	0
		25	25	16.49	16.48	16.12	16.56	16.05	0
		50	0	16.45	16.47	16.19	16.51	16.07	0
	16QAM	1	0	16.57	16.48	15.96	16.44	16.22	0
		1	25	16.74	16.53	16.00	16.59	16.32	0
		1	49	16.57	16.37	15.82	16.43	16.17	0
		25	0	16.40	16.48	16.28	16.44	16.07	0
		25	12	16.42	16.39	16.20	16.44	16.05	0
		25	25	16.46	16.43	16.18	16.45	15.99	0
		50	0	16.46	16.42	16.24	16.46	16.01	0
	64QAM	1	0	16.27	16.63	16.56	16.55	16.72	0
		1	25	16.28	16.47	16.42	16.47	16.59	0
		1	49	16.41	16.42	16.45	16.60	16.61	0
		25	0	16.72	17.00	16.92	16.93	17.03	0
		25	12	16.73	16.92	16.88	16.90	16.99	0
		25	25	16.76	16.85	16.87	16.88	16.98	0
		50	0	16.85	16.85	16.86	16.85	16.99	0

Band width	Modulation	RB Size	RB offset	Maximum Average Power					MPR
				39 750	40 185	40 620	41 055	41 490	
				2 506.0 ㎒	2 549.5 ㎒	2 593.0 ㎒	2 636.5 ㎒	2 680.0 ㎒	
5 ㎒	QPSK	1	0	16.39	16.17	15.95	16.24	15.86	0
		1	12	16.67	16.43	16.12	16.52	16.15	0
		1	24	16.39	16.18	15.89	16.29	15.91	0
		12	0	16.41	16.30	16.06	16.35	15.92	0
		12	7	16.29	16.38	16.14	16.45	15.93	0
		12	13	16.26	16.32	16.03	16.33	15.92	0
		25	0	16.30	16.38	16.07	16.44	15.97	0
	16QAM	1	0	16.46	16.31	16.14	16.32	16.19	0
		1	12	16.80	16.54	16.30	16.57	16.40	0
		1	24	16.52	16.22	16.06	16.36	16.18	0
		12	0	16.35	16.27	16.10	16.33	15.84	0
		12	7	16.45	16.30	16.17	16.40	15.89	0
		12	13	16.41	16.26	16.05	16.32	15.88	0
		25	0	16.53	16.31	16.10	16.40	15.93	0
	64QAM	1	0	16.15	16.55	16.25	16.28	16.45	0
		1	12	16.36	16.68	16.30	16.47	16.55	0
		1	24	16.16	16.43	16.17	16.31	16.36	0
		12	0	16.48	16.98	16.63	16.71	16.85	0
		12	7	16.57	16.97	16.64	16.71	16.81	0
		12	13	16.57	16.90	16.55	16.61	16.82	0
		25	0	16.55	17.04	16.68	16.64	16.82	0

9.5 LTE Average Conducted Output Power (Reduced Average Power)(RCV)

9.5.1 LTE Band 41

Band width	Modulation	RB Size	RB offset	Maximum Average Power					MPR
				39 750	40 185	40 620	41 055	41 490	
				2 506.0 MHz	2 549.5 MHz	2 593.0 MHz	2 636.5 MHz	2 680.0 MHz	
20 MHz	QPSK	1	0	20.08	20.23	20.15	19.92	20.16	0
		1	49	20.60	20.55	20.35	20.24	20.47	0
		1	99	20.24	20.08	19.83	19.92	20.17	0
		50	0	20.35	20.44	20.30	20.07	20.31	0
		50	24	20.50	20.45	20.20	20.08	20.37	0
		50	50	20.47	20.41	20.05	20.01	20.37	0
		100	0	20.41	20.39	20.20	20.07	20.33	0
	16QAM	1	0	20.25	20.09	19.79	19.97	19.93	0
		1	49	20.62	20.32	19.96	20.25	20.33	0
		1	99	20.24	19.88	19.54	19.87	19.93	0
		50	0	20.36	20.38	20.31	19.99	20.27	0
		50	24	20.39	20.39	20.25	20.03	20.37	0
		50	50	20.42	20.31	20.07	19.92	20.30	0
		100	0	20.33	20.33	20.20	19.95	20.32	0
	64QAM	1	0	20.61	20.65	20.13	20.12	20.28	0
		1	49	20.72	20.43	19.98	20.13	20.20	0
		1	99	20.73	20.37	19.97	20.14	20.19	0
		50	0	20.58	20.33	19.94	19.97	20.04	0
		50	24	20.51	20.39	19.94	20.01	20.09	0
		50	50	20.56	20.40	19.92	19.99	20.07	0
		100	0	20.55	20.44	19.91	19.97	20.08	0

Band width	Modulation	RB Size	RB offset	Maximum Average Power					MPR
				39 750	40 185	40 620	41 055	41 490	
				2 506.0 MHz	2 549.5 MHz	2 593.0 MHz	2 636.5 MHz	2 680.0 MHz	
15 MHz	QPSK	1	0	20.22	20.33	20.13	19.99	20.24	0
		1	36	20.39	20.42	20.10	20.06	20.41	0
		1	74	20.37	20.25	19.92	20.00	20.31	0
		36	0	20.40	20.56	20.32	20.10	20.51	0
		36	18	20.50	20.58	20.35	20.14	20.53	0
		36	37	20.51	20.51	20.23	20.09	20.52	0
		75	0	20.47	20.54	20.28	20.11	20.52	0
	16QAM	1	0	20.47	20.38	20.11	20.18	20.24	0
		1	36	20.58	20.42	20.08	20.20	20.39	0
		1	74	20.55	20.21	19.90	20.16	20.22	0
		36	0	20.38	20.43	20.29	20.02	20.38	0
		36	18	20.39	20.50	20.23	20.04	20.40	0
		36	37	20.37	20.45	20.12	19.99	20.36	0
		75	0	20.40	20.44	20.23	20.01	20.39	0
	64QAM	1	0	20.46	20.51	20.06	19.98	20.20	0
		1	36	20.55	20.34	19.95	20.00	20.14	0
		1	74	20.55	20.34	19.93	20.02	20.12	0
		36	0	20.46	20.31	19.91	19.93	20.05	0
		36	18	20.42	20.37	19.94	19.96	20.05	0
		36	37	20.45	20.38	19.91	19.98	20.06	0
		75	0	20.50	20.39	19.93	20.02	20.08	0

Band width	Modulation	RB Size	RB offset	Maximum Average Power					MPR
				39 750	40 185	40 620	41 055	41 490	
				2 506.0 MHz	2 549.5 MHz	2 593.0 MHz	2 636.5 MHz	2 680.0 MHz	
10 MHz	QPSK	1	0	20.46	20.49	20.34	20.11	20.39	0
		1	25	20.65	20.60	20.32	20.24	20.64	0
		1	49	20.52	20.41	20.15	20.16	20.46	0
		25	0	20.51	20.56	20.27	20.13	20.47	0
		25	12	20.46	20.50	20.29	20.10	20.44	0
		25	25	20.53	20.50	20.20	20.07	20.50	0
		50	0	20.57	20.59	20.35	20.16	20.55	0
	16QAM	1	0	20.63	20.47	20.10	20.28	20.36	0
		1	25	20.80	20.55	20.10	20.39	20.52	0
		1	49	20.70	20.38	19.86	20.27	20.39	0
		25	0	20.50	20.46	20.31	20.09	20.36	0
		25	12	20.51	20.42	20.31	20.06	20.36	0
		25	25	20.56	20.44	20.23	20.06	20.42	0
		50	0	20.48	20.50	20.28	20.08	20.39	0
	64QAM	1	0	20.51	20.57	20.13	20.07	20.17	0
		1	25	20.50	20.36	19.87	19.99	20.07	0
		1	49	20.67	20.33	19.95	20.05	20.11	0
		25	0	20.43	20.33	19.92	19.96	19.99	0
		25	12	20.47	20.32	19.87	19.98	20.02	0
		25	25	20.57	20.36	19.87	19.99	20.07	0
		50	0	20.50	20.36	19.91	19.92	20.04	0

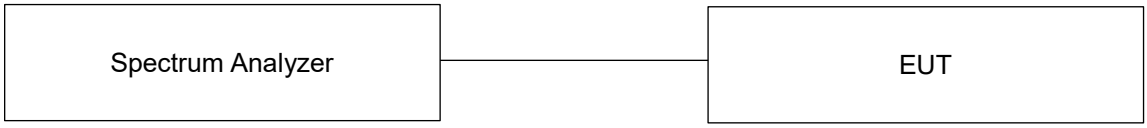
Band width	Modulation	RB Size	RB offset	Maximum Average Power					MPR
				39 750	40 185	40 620	41 055	41 490	
				2 506.0 MHz	2 549.5 MHz	2 593.0 MHz	2 636.5 MHz	2 680.0 MHz	
5 MHz	QPSK	1	0	20.72	20.57	20.28	20.17	20.37	0
		1	12	20.73	20.78	20.45	20.40	20.69	0
		1	24	20.71	20.52	20.17	20.20	20.48	0
		12	0	20.72	20.68	20.39	20.17	20.53	0
		12	7	20.74	20.71	20.45	20.24	20.63	0
		12	13	20.68	20.64	20.32	20.15	20.55	0
		25	0	20.66	20.64	20.34	20.13	20.54	0
	16QAM	1	0	20.74	20.68	20.40	20.42	20.44	0
		1	12	20.78	20.78	20.61	20.64	20.73	0
		1	24	20.74	20.54	20.37	20.41	20.42	0
		12	0	20.57	20.60	20.35	20.07	20.42	0
		12	7	20.65	20.64	20.44	20.09	20.50	0
		12	13	20.58	20.56	20.36	20.03	20.42	0
		25	0	20.66	20.61	20.31	20.12	20.46	0
	64QAM	1	0	20.47	20.39	19.94	19.96	20.09	0
		1	12	20.67	20.50	20.02	20.15	20.24	0
		1	24	20.51	20.23	19.84	19.95	20.01	0
		12	0	20.43	20.33	19.86	19.90	20.04	0
		12	7	20.54	20.37	19.91	19.93	20.06	0
		12	13	20.52	20.34	19.79	19.92	20.07	0
		25	0	20.50	20.32	19.97	19.95	20.06	0

9.6 WLAN & Bluetooth Average Conducted Output Power

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. For configurations with multiple mid-band channels, due to an even number of channels, both channels were measured.

Power Measurement Setup



9.6.1 WLAN Average Conducted Output Power(Maximum Average Power)

Band	Freq. [㎒]	Channel	Mode		
			802.11b	802.11g	802.11n
WLAN 2.4 ㎓	2 412.0	1	17.79	15.71	15.61
	2 437.0	6	18.19	16.14	15.88
	2 462.0	11	17.88	15.56	14.64
	2 467.0	12	8.20	8.01	7.87
	2 472.0	13	8.75	8.65	8.46
Band	**Freq. [㎒]**	**Channel**	**Mode**		
			802.11a	**802.11n**	**802.11ac**
NII (20 ㎒)	5 180.0	36	15.06	15.06	14.08
	5 200.0	40	15.05	15.02	14.08
	5 220.0	44	15.26	15.11	14.07
	5 240.0	48	15.24	15.18	14.04
	5 260.0	52	15.07	15.03	14.09
	5 280.0	56	15.09	15.09	14.10
	5 300.0	60	15.31	15.35	14.05
	5 320.0	64	14.94	15.01	14.04
	5 500.0	100	14.96	14.88	13.70
	5 600.0	120	15.10	15.18	14.04
	5 620.0	124	15.47	15.37	14.22
	5 720.0	144	15.54	15.25	14.57
	5 745.0	149	14.14	14.03	12.60
	5 785.0	157	14.06	14.04	12.56
	5 825.0	165	14.12	14.07	12.82
Band	**Freq. [㎒]**	**Channel**	**Mode**		
			802.11n		**802.11ac**
NII (40 ㎒)	5 190.0	38	14.10		14.09
	5 230.0	46	14.08		14.12
	5 270.0	54	14.05		14.03
	5 310.0	62	14.04		14.01
	5 510.0	102	13.53		13.55
	5 590.0	118	14.08		14.05
	5 630.0	126	14.62		14.35
	5 710.0	142	14.28		14.42
	5 755.0	151	14.10		14.05
	5 795.0	159	14.47		14.10
Band	**Freq. [㎒]**	**Channel**	**Mode**		
			802.11ac		
NII (80 ㎒)	5 210.0	42	13.07		
	5 290.0	58	13.02		
	5 530.0	106	12.69		
	5 610.0	122	13.04		
	5 690.0	138	13.29		
	5 775.0	155	13.23		

9.6.2 WLAN Average Conducted Output Power(Reduced Average Power)(RCV)

Band	Freq. [㎒]	Channel	Mode		
			802.11b	802.11g	802.11n
WLAN 2.4 ㎓	2 412.0	1	12.87	12.70	12.80
	2 437.0	6	13.16	13.15	12.96
	2 462.0	11	12.85	12.79	12.69
	2 467.0	12	8.19	8.00	7.88
	2 472.0	13	8.80	8.62	8.49
Band	**Freq. [㎒]**	**Channel**	**Mode**		
			802.11a	**802.11n**	**802.11ac**
NII (20 ㎒)	5 180.0	36	12.20	12.24	12.22
	5 200.0	40	12.07	12.35	12.26
	5 220.0	44	12.51	12.11	12.15
	5 240.0	48	12.37	12.28	12.30
	5 260.0	52	12.30	12.20	12.38
	5 280.0	56	12.52	12.29	12.47
	5 300.0	60	12.56	12.39	12.42
	5 320.0	64	12.28	12.19	12.29
	5 500.0	100	12.03	11.85	12.01
	5 600.0	120	12.50	12.24	12.15
	5 620.0	124	12.46	12.50	12.38
	5 720.0	144	12.55	12.61	12.53
	5 745.0	149	12.42	12.16	12.25
	5 785.0	157	12.51	12.24	12.36
	5 825.0	165	12.44	12.26	12.31
Band	**Freq. [㎒]**	**Channel**	**Mode**		
			802.11n		**802.11ac**
NII (40 ㎒)	5 190.0	38	12.26		12.52
	5 230.0	46	12.47		12.35
	5 270.0	54	12.52		12.53
	5 310.0	62	12.40		12.49
	5 510.0	102	12.17		12.07
	5 590.0	118	12.10		12.54
	5 630.0	126	12.33		12.44
	5 710.0	142	12.40		12.39
	5 755.0	151	12.68		12.65
	5 795.0	159	12.62		12.67
Band	**Freq. [㎒]**	**Channel**	**Mode**		
			802.11ac		
NII (80 ㎒)	5 210.0	42	12.39		
	5 290.0	58	12.37		
	5 530.0	106	12.09		
	5 610.0	122	12.38		
	5 690.0	138	12.41		
	5 775.0	155	12.56		

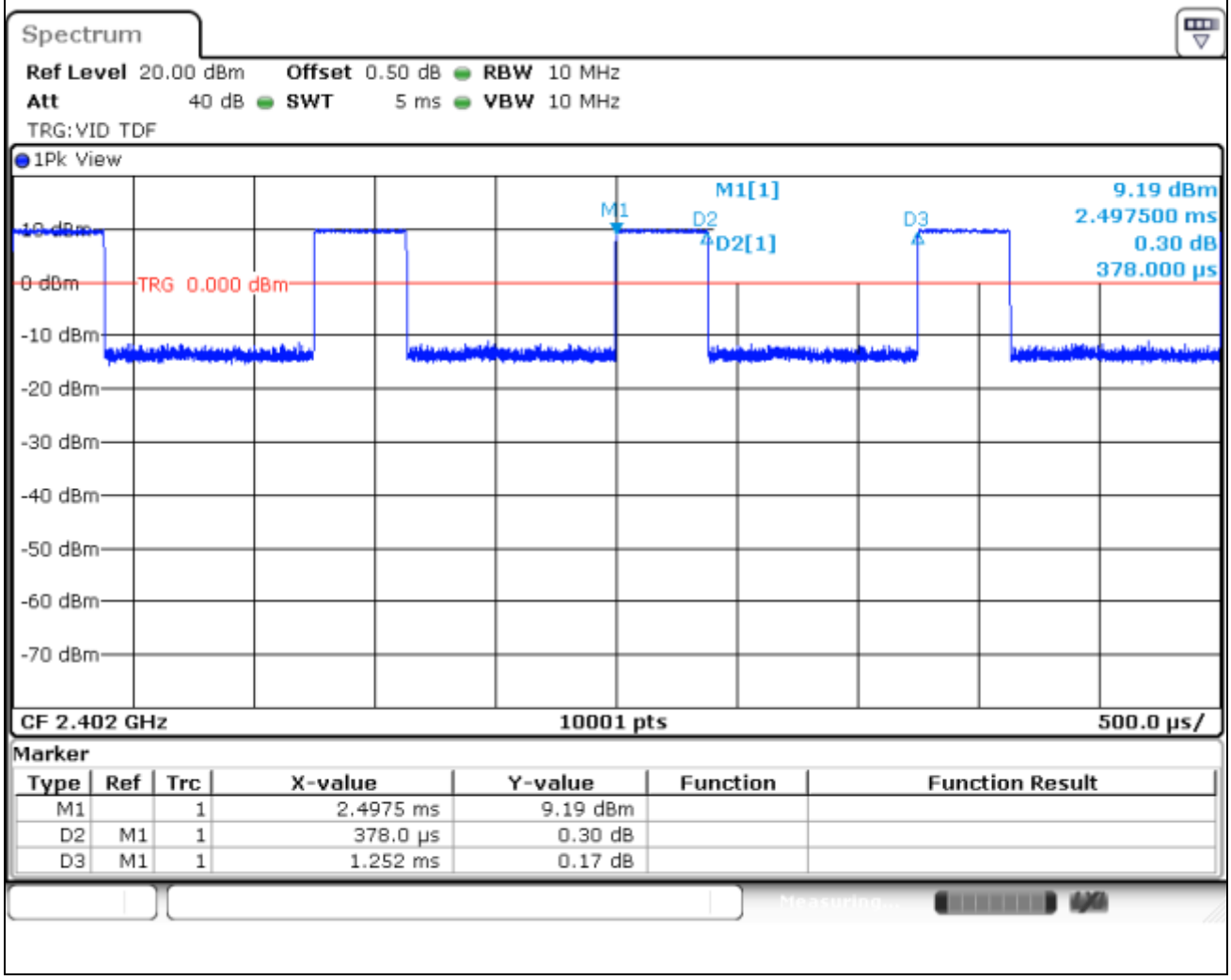
9.7 Bluetooth Average Conducted Output Power

Mode	Freq. [㎒]	Channel	Conducted Powers
			(dBm)
BDR_DH1 (1 Mbps)	2 402.0	0	9.55
	2 441.0	39	9.59
	2 480.0	78	9.62
EDR_2-DH1 (2 Mbps)	2 402.0	0	7.33
	2 441.0	39	7.29
	2 480.0	78	7.23
EDR_3-DH1 (3 Mbps)	2 402.0	0	7.43
	2 441.0	39	7.29
	2 480.0	78	7.23
LE (1 Mbps 37)	2 402.0	0	5.69
	2 440.0	19	5.88
	2 480.0	39	5.83
LE (1 Mbps 255)	2 402.0	0	5.69
	2 440.0	19	5.88
	2 480.0	39	5.93
LE (2 Mbps 37)	2 402.0	0	5.56
	2 440.0	19	5.84
	2 480.0	39	5.79
LE (2 Mbps 255)	2 402.0	0	5.57
	2 440.0	19	5.87
	2 480.0	39	5.83

9.8 Wireless Band Duty Cycle

Wireless Bands	Frequency Bands	Mode	Duty Cycle (%)
GSM	850 1900	Voice, GPRS(GMSK), EGPRS(8PSK)	Voice: 12.5
			(E)GPRS 1Tx : 12.5
			(E)GPRS 2Tx : 25.0
			(E)GPRS 3Tx : 37.5
			(E)GPRS 4Tx : 50.0
WCDMA	Band V	RMC, AMR, HSDPA, HSUPA,DC-HSDPA	100
LTE	FDD Band 5	QPSK, 16QAM, 64QAM	100
	TDD Band 41		63.33
WLAN	2.4 ㎓	802.11b	99.0
	NII	802.11a	96.9
		802.11n(HT40)	93.6
		802.11ac(VHT80)	88.0

Wireless Bands	Frequency Bands		Mode		Duty Cycle (%)	
	Mode	Packet	On Time (ms)	On-Off Time (ms)	Duty Cycle (%)	Duty Cycle Compensate Factor
Bluetooth	BDR(GFSK)	DH1	0.38	1.25	0.302	3.312



10. System Verification

10.1 Tissue Verification

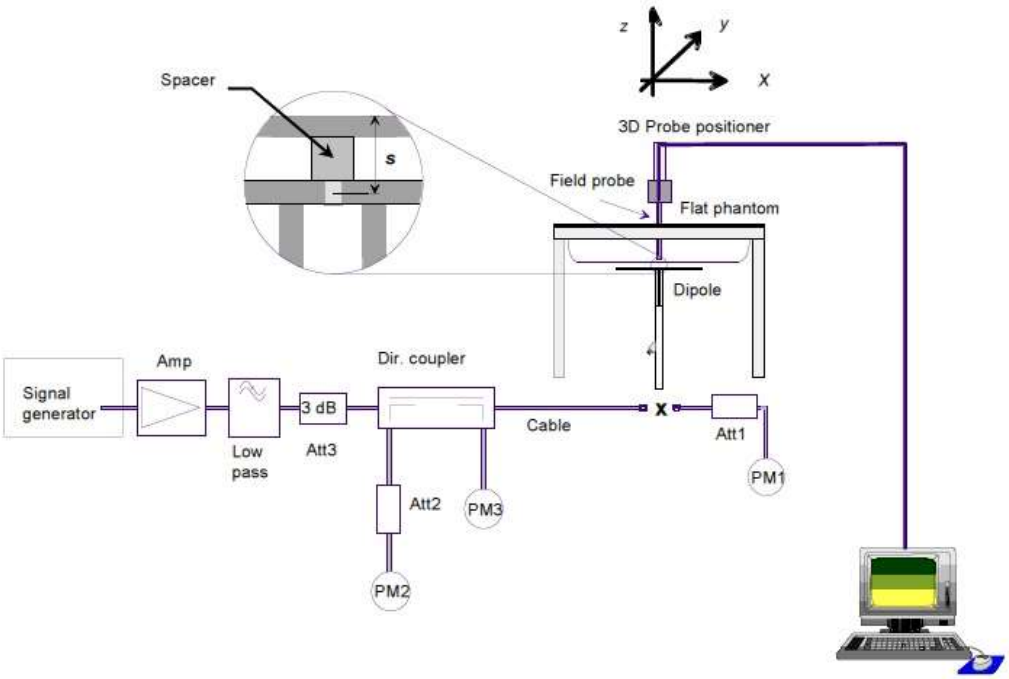
The dielectric properties for this Tissue Simulant Liquids were measured by using the SPEAG Model DAK3.5 Dielectric Probe in conjunction with Agilent E5071B Network Analyzer (300 ㎑ – 8 500 ㎒). The Conductivity (σ) and Permittivity (ρ) are listed in Table 1.For the SAR measurement given in this report.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

Freq. (㎒)	Limit/Measured		Permittivity (ρ)	Conductivity (σ)	Temp. (°C)
850.0	Recommended Limit		41.50 ± 5 % (39.43 ~ 43.58)	0.92 ± 5 % (0.87 ~ 0.97)	22 ± 2
	Measured	2021-04-13	42.87	0.92	21.11
850.0	Recommended Limit		41.50 ± 5 % (39.43 ~ 43.58)	0.92 ± 5 % (0.87 ~ 0.97)	22 ± 2
	Measured	2021-04-14	42.79	0.92	21.07
850.0	Recommended Limit		41.50 ± 5 % (39.43 ~ 43.58)	0.92 ± 5 % (0.87 ~ 0.97)	22 ± 2
	Measured	2021-05-17	41.30	0.90	21.03
1 900.0	Recommended Limit		40.00 ± 5 % (38.00 ~ 42.00)	1.40 ± 5 % (1.33 ~ 1.47)	22 ± 2
	Measured	2021-04-14	39.03	1.41	20.91
2 450.0	Recommended Limit		39.20 ± 5 % (37.24 ~ 41.16)	1.80 ± 5 % (1.71 ~ 1.89)	22 ± 2
	Measured	2021-04-27	38.36	1.86	21.01
2 600.0	Recommended Limit		39.00 ± 5 % (37.05 ~ 40.95)	1.96 ± 5 % (1.86 ~ 2.06)	22 ± 2
	Measured	2021-04-30	38.63	2.01	20.71
2 600.0	Recommended Limit		39.00 ± 5 % (37.05 ~ 40.95)	1.96 ± 5 % (1.86 ~ 2.06)	22 ± 2
	Measured	2021-05-16	38.21	2.01	20.76
5 300.0	Recommended Limit		35.90 ± 5 % (34.11 ~ 37.70)	4.76 ± 5 % (4.52 ~ 5.00)	22 ± 2
	Measured	2021-04-23	35.55	4.78	20.88
5 600.0	Recommended Limit		35.50 ± 5 % (33.73 ~ 37.28)	5.07 ± 5 % (4.82 ~ 5.32)	22 ± 2
	Measured	2021-04-24	35.50	5.10	20.91
5 800.0	Recommended Limit		35.30 ± 5 % (33.54 ~ 37.07)	5.27 ± 5 % (5.01 ~ 5.53)	22 ± 2
	Measured	2021-04-26	35.62	5.34	20.77

<Table 1. Measurement result Tissue electric parameters>

10.2 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 ㎝ 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)		
D850V2 SN: 1006	EX3DV4 SN: 3865	850.0	HSL	Recommended Limit 1g (Normalized)		9.95 ± 10 % (8.96 ~ 10.95)
				Measured	2021-04-13	9.64
D850V2 SN: 1006	EX3DV4 SN: 3865	850.0	HSL	Recommended Limit 1g (Normalized)		9.95 ± 10 % (8.96 ~ 10.95)
				Measured	2021-04-14	10.36
D850V2 SN: 1006	EX3DV4 SN: 3865	850.0	HSL	Recommended Limit 1g (Normalized)		9.95 ± 10 % (8.96 ~ 10.95)
				Measured	2021-05-17	10.00
D1900V2 SN: 5d160	EX3DV4 SN: 3697	1 900.0	HSL	Recommended Limit 1g (Normalized)		39.40 ± 10 % (35.46 ~ 43.34)
				Measured	2021-04-14	38.80
D2450V2 SN: 895	EX3DV4 SN: 3865	2 450.0	HSL	Recommended Limit 1g (Normalized)		52.40 ± 10 % (47.16 ~ 57.64)
				Measured	2021-04-27	50.60
D2600V2 SN: 1050	EX3DV4 SN: 3697	2 600.0	HSL	Recommended Limit 1g (Normalized)		56.20 ± 10 % (50.58 ~ 61.82)
				Measured	2021-04-30	57.00
D2600V2 SN: 1050	EX3DV4 SN: 3697	2 600.0	HSL	Recommended Limit 1g (Normalized)		56.20 ± 10 % (50.58 ~ 61.82)
				Measured	2021-05-16	57.60
D5GHzV2 SN: 1134	EX3DV4 SN: 3865	5 300.0	HSL	Recommended Limit 1g (Normalized)		82.30 ± 10 % (74.07 ~ 90.53)
				Measured	2021-04-23	86.70
D5GHzV2 SN: 1134	EX3DV4 SN: 3865	5 600.0	HSL	Recommended Limit 1g (Normalized)		84.10 ± 10 % (75.69 ~ 92.51)
				Measured	2021-04-24	85.00
D5GHzV2 SN: 1134	EX3DV4 SN: 3865	5 800.0	HSL	Recommended Limit 1g (Normalized)		81.50 ± 10 % (73.35 ~ 89.65)
				Measured	2021-04-26	82.60

<Table 2. System Verification 1g Result>

Verification Kit	Probe S/N	Frequency (㎒)	Tissue Type	Limit/Measured (Normalized to 1 W)		
D2600V2 SN: 1050	EX3DV4 SN: 3697	2 600.0	HSL	Recommended Limit 10g (Normalized)		24.90 ± 10 % (22.41 ~ 27.39)
				Measured	2021-04-30	24.20
D2600V2 SN: 1050	EX3DV4 SN: 3697	2 600.0	HSL	Recommended Limit 10g (Normalized)		24.90 ± 10 % (22.41 ~ 27.39)
				Measured	2021-05-16	24.60
D5GHzV2 SN: 1134	EX3DV4 SN: 3865	5 300.0	HSL	Recommended Limit 10g (Normalized)		23.20 ± 10 % (20.88 ~ 25.52)
				Measured	2021-04-23	24.90
D5GHzV2 SN: 1134	EX3DV4 SN: 3865	5 600.0	HSL	Recommended Limit 10g (Normalized)		23.80 ± 10 % (21.42 ~ 26.18)
				Measured	2021-04-24	24.30

<Table 3. System Verification 10g Result>

11. SAR Spot check Results

11.1 Standalone Head SAR Test Results

GSM 850 Band											
Reference Data						Variant Measurement					
Mode	EUT Position	Distance (mm)	Frequency (MHz)	Max. Tune-up Power (dBm)	Scaled 1 g SAR (W/kg)	Measured Conducted Power (dBm)	Power Scaling Factor	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	SAR Deviation (%)	Plot No.
Voice	Right Cheek	0	836.6	34.00	0.254						
	Right Tilt	0	836.6	34.00	0.122						
	Left Cheek	0	836.6	34.00	0.269						
	Left Tilt	0	836.6	34.00	0.155						
GPRS 4Tx	Right Cheek	0	836.6	30.50	**0.421**	29.15	1.365	0.265	**0.362**	-14.0	1
	Right Tilt	0	836.6	30.50	0.208						
	Left Cheek	0	836.6	30.50	**0.449**	29.15	1.365	0.236	0.322	-28.3	
	Left Tilt	0	836.6	30.50	0.261						

GSM 1900 Band											
Reference Data						Variant Measurement					
Mode	EUT Position	Distance (mm)	Frequency (MHz)	Max. Tune-up Power (dBm)	Scaled 1 g SAR (W/kg)	Measured Conducted Power (dBm)	Power Scaling Factor	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	SAR Deviation (%)	Plot No.
Voice	Right Cheek	0	1 880.0	31.00	0.076						
	Right Tilt	0	1 880.0	31.00	0.058						
	Left Cheek	0	1 880.0	31.00	0.122						
	Left Tilt	0	1 880.0	31.00	0.087						
GPRS 4Tx	Right Cheek	0	1 880.0	27.50	0.083						
	Right Tilt	0	1 880.0	27.50	0.095						
	Left Cheek	0	1 880.0	27.50	0.138						
	Left Tilt	0	1 880.0	27.50	**0.144**	25.63	1.538	0.097	**0.149**	3.5	2

WCDMA Band V											
Reference Data						Variant Measurement					
Mode	EUT Position	Distance (mm)	Frequency (MHz)	Max. Tune-up Power (dBm)	Scaled 1 g SAR (W/kg)	Measured Conducted Power (dBm)	Power Scaling Factor	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	SAR Deviation (%)	Plot No.
RMC	Right Cheek	0	836.6	25.50	**0.402**	24.66	1.213	0.295	**0.358**	-10.9	3
	Right Tilt	0	836.6	25.50	0.206						
	Left Cheek	0	836.6	25.50	0.344						
	Left Tilt	0	836.6	25.50	0.207						

LTE Band 5											
Reference Data						Variant Measurement					
Mode	EUT Position	Distance (㎜)	Frequency (㎒)	Max. Tune-up Power (dBm)	Scaled 1 g SAR (W/kg)	Measured Conducted Power (dBm)	Power Scaling Factor	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	SAR Deviation (%)	Plot No.
QPSK 10M 1RB 25Offset	Right Cheek	0	836.5	25.50	**0.406**	24.87	1.156	0.286	**0.331**	-18.5	4
QPSK 10M 25RB 12Offset	Right Cheek	0	836.5	24.50	0.332						
QPSK 10M 1RB 25Offset	Right Tilt	0	836.5	25.50	0.210						
QPSK 10M 25RB 12Offset	Right Tilt	0	836.5	24.50	0.168						
QPSK 10M 1RB 25Offset	Left Cheek	0	836.5	25.50	0.353						
QPSK 10M 25RB 12Offset	Left Cheek	0	836.5	24.50	0.283						
QPSK 10M 1RB 25Offset	Left Tilt	0	836.5	25.50	0.203						
QPSK 10M 25RB 12Offset	Left Tilt	0	836.5	24.50	0.166						

LTE Band 41											
Reference Data						Variant Measurement					
Mode	EUT Position	Distance (㎜)	Frequency (㎒)	Max. Tune-up Power (dBm)	Scaled 1 g SAR (W/kg)	Measured Conducted Power (dBm)	Power Scaling Factor	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	SAR Deviation (%)	Plot No.
QPSK 20M 1RB 49Offset	Right Cheek	0	2 506.0	21.50	0.614	20.60	1.230	0.633	0.779	26.9	
QPSK 20M 1RB 49Offset	Right Cheek	0	2 549.5	21.50	0.831	20.55	1.245	0.549	0.684	-17.7	
QPSK 20M 1RB 49Offset	Right Cheek	0	2 593.0	21.50	0.706	20.35	1.303	0.518	0.675	-4.4	
QPSK 20M 1RB 49Offset	Right Cheek	0	2 636.5	21.50	0.571	20.24	1.337	0.356	0.476	-16.6	
QPSK 20M 1RB 49Offset	Right Cheek	0	2 680.0	21.50	0.492	20.47	1.268	0.287	0.364	-26.0	
QPSK 20M 50RB 24Offset	Right Cheek	0	2 506.0	21.50	0.624	20.50	1.259	0.381	0.480	-23.1	
QPSK 20M 50RB 24Offset	Right Cheek	0	2 549.5	21.50	0.847	20.45	1.274	0.600	0.764	-9.8	
QPSK 20M 50RB 24Offset	Right Cheek	0	2 593.0	21.50	0.710	20.20	1.349	0.560	0.755	6.3	
QPSK 20M 50RB 24Offset	Right Cheek	0	2 636.5	21.50	0.586	20.08	1.387	0.390	0.541	-7.7	
QPSK 20M 50RB 24Offset	Right Cheek	0	2 680.0	21.50	0.518	20.37	1.297	0.379	0.492	-5.0	
QPSK 20M 100RB 0Offset	Right Cheek	0	2 506.0	21.50	**0.968**	20.41	1.285	0.643	**0.826**	-14.7	5
QPSK 20M 1RB 49Offset	Right Tilt	0	2 506.0	21.50	0.240						
QPSK 20M 50RB 24Offset	Right Tilt	0	2 506.0	21.50	0.246						
QPSK 20M 1RB 49Offset	Left Cheek	0	2 506.0	21.50	0.220						
QPSK 20M 50RB 24Offset	Left Cheek	0	2 506.0	21.50	0.234						
QPSK 20M 1RB 49Offset	Left Tilt	0	2 506.0	21.50	0.113						
QPSK 20M 50RB 24Offset	Left Tilt	0	2 506.0	21.50	0.109						

2.4 GHz WLAN												
Reference Data						Variant Measurement						
Mode	EUT Position	Distance (mm)	Frequency (MHz)	Max. Tune-up Power (dBm)	Scaled 1 g SAR (W/kg)	Measured Conducted Power (dBm)	Power Scaling Factor	Duty Cycle Compensate Factor	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	SAR Deviation (%)	Plot No.
802.11b	Right Cheek	0	2 437.0	14.00	**0.188**	13.16	1.213	1.010	0.165	**0.202**	7.5	6
	Right Tilt	0	2 437.0	14.00	-							
	Left Cheek	0	2 437.0	14.00	-							
	Left Tilt	0	2 437.0	14.00	-							

NII												
Reference Data						Variant Measurement						
Mode	EUT Position	Distance (mm)	Frequency (MHz)	Max. Tune-up Power (dBm)	Scaled 1 g SAR (W/kg)	Measured Conducted Power (dBm)	Power Scaling Factor	Duty Cycle Compensate Factor	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	SAR Deviation (%)	Plot No.
802.11ac (VHT80)	Right Cheek	0	5 290.0	13.00								
	Right Tilt	0	5 290.0	13.00	-							
	Left Cheek	0	5 290.0	13.00	-							
	Left Tilt	0	5 290.0	13.00	**0.084**	12.37	1.156	1.136	0.044	**0.058**	-31.0	7
802.11ac (VHT80)	Right Cheek	0	5 690.0	13.00	-							
	Right Tilt	0	5 690.0	13.00	**0.090**	12.41	1.146	1.136	0.053	**0.069**	-23.3	8
	Left Cheek	0	5 690.0	13.00	-							
	Left Tilt	0	5 690.0	13.00	-							
802.11ac (VHT80)	Right Cheek	0	5 775.0	13.00	-							
	Right Tilt	0	5 775.0	13.00	**0.084**	12.56	1.107	1.136	0.061	**0.077**	-8.3	9
	Left Cheek	0	5 775.0	13.00	-							
	Left Tilt	0	5 775.0	13.00	-							

Bluetooth												
Reference Data						Variant Measurement						
Mode	EUT Position	Distance (mm)	Frequency (MHz)	Max. Tune-up Power (dBm)	Scaled 1 g SAR (W/kg)	Measured Conducted Power (dBm)	Power Scaling Factor	Duty Cycle Compensate Factor	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	SAR Deviation (%)	Plot No.
BDR_ DH1	Right Cheek	0	2 480.0	10.00	**0.097**	9.62	1.091	3.312	0.028	**0.101**	4.1	10
	Right Tilt	0	2 480.0	10.00	0.079							
	Left Cheek	0	2 480.0	10.00	0.022							
	Left Tilt	0	2 480.0	10.00	0.014							

11.2 Standalone Body-Worn SAR Test Results

GSM 850 Band											
Reference Data						Variant Measurement					
Mode	EUT Position	Distance (mm)	Frequency (MHz)	Max. Tune-up Power (dBm)	Scaled 1 g SAR (W/kg)	Measured Conducted Power (dBm)	Power Scaling Factor	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	SAR Deviation (%)	Plot No.
Voice	Front	15	836.6	34.00	0.282						
	Rear	15	836.6	34.00	0.419	33.18	1.183	0.262	0.316	-24.6	
GPRS 4Tx	Front	15	836.6	30.50	**0.475**	29.15	1.365	0.247	0.337	-29.1	
	Rear	15	836.6	30.50	**0.704**	29.15	1.365	0.313	**0.427**	-39.3	11

GSM 1900 Band											
Reference Data						Variant Measurement					
Mode	EUT Position	Distance (mm)	Frequency (MHz)	Max. Tune-up Power (dBm)	Scaled 1 g SAR (W/kg)	Measured Conducted Power (dBm)	Power Scaling Factor	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	SAR Deviation (%)	Plot No.
Voice	Front	15	1 880.0	31.00	0.109						
	Rear	15	1 880.0	31.00	0.216						
GPRS 4Tx	Front	15	1 880.0	27.50	0.194						
	Rear	15	1 880.0	27.50	**0.374**	25.63	1.538	0.250	**0.385**	2.9	12

WCDMA Band V											
Reference Data						Variant Measurement					
Mode	EUT Position	Distance (mm)	Frequency (MHz)	Max. Tune-up Power (dBm)	Scaled 1 g SAR (W/kg)	Measured Conducted Power (dBm)	Power Scaling Factor	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	SAR Deviation (%)	Plot No.
RMC	Front	15	836.6	25.50	0.336						
	Rear	15	836.6	25.50	**0.501**	24.66	1.213	0.389	**0.472**	-5.8	13

LTE Band 5											
Reference Data						Variant Measurement					
Mode	EUT Position	Distance (mm)	Frequency (MHz)	Max. Tune-up Power (dBm)	Scaled 1 g SAR (W/kg)	Measured Conducted Power (dBm)	Power Scaling Factor	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	SAR Deviation (%)	Plot No.
QPSK 10M 1RB 25Offset	Front	15	836.5	25.50	0.328						
QPSK 10M 25RB 12Offset	Front	15	836.5	24.50	0.266						
QPSK 10M 1RB 25Offset	Rear	15	836.5	25.50	**0.486**	24.87	1.156	0.373	**0.431**	-11.3	14
QPSK 10M 25RB 12Offset	Rear	15	836.5	24.50	0.390						

LTE Band 41											
Reference Data						Variant Measurement					
Mode	EUT Position	Distance (㎜)	Frequency (㎒)	Max. Tune-up Power (dBm)	Scaled 1 g SAR (W/kg)	Measured Conducted Power (dBm)	Power Scaling Factor	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	SAR Deviation (%)	Plot No.
QPSK 20M 1RB 49Offset	Front	15	2 636.5	23.80	0.114						
QPSK 20M 50RB 0Offset	Front	15	2 636.5	22.80	0.097						
QPSK 20M 1RB 49Offset	Rear	15	2 636.5	23.80	**0.576**	23.10	1.175	0.599	**0.704**	22.2	15
QPSK 20M 50RB 0Offset	Rear	15	2 636.5	22.80	0.526	21.85	1.245	0.513	0.639	21.5	

2.4 ㎓ WLAN												
Reference Data						Variant Measurement						
Mode	EUT Position	Distance (㎜)	Frequency (㎒)	Max. Tune-up Power (dBm)	Scaled 1 g SAR (W/kg)	Measured Conducted Power (dBm)	Power Scaling Factor	Duty Cycle Compensate Factor	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	SAR Deviation (%)	Plot No.
802.11b	Front	15	2 437.0	19.50	**0.078**	18.19	1.352	1.010	0.057	**0.078**	0.0	16
	Rear	15	2 437.0	19.50	-							

NII												
Reference Data						Variant Measurement						
Mode	EUT Position	Distance (㎜)	Frequency (㎒)	Max. Tune-up Power (dBm)	Scaled 1 g SAR (W/kg)	Measured Conducted Power (dBm)	Power Scaling Factor	Duty Cycle Compensate Factor	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	SAR Deviation (%)	Plot No.
802.11a	Front	15	5 300.0	16.50	0.011							
	Rear	15	5 300.0	16.50	**0.488**	15.31	1.315	1.032	0.331	**0.449**	-8.0	17
802.11a	Front	15	5 620.0	16.50	0.012							
	Rear	15	5 620.0	16.50	**0.456**	15.47	1.268	1.032	0.317	**0.415**	-9.0	18
802.11n (HT40)	Front	15	5 795.0	16.00	-							
	Rear	15	5 795.0	16.00	**0.335**	14.47	1.422	1.068	0.222	**0.337**	0.6	19

11.3 Standalone Hotspot SAR Test Results

GSM 850 Band											
Reference Data						Variant Measurement					
Mode	EUT Position	Distance (mm)	Frequency (MHz)	Max. Tune-up Power (dBm)	Scaled 1 g SAR (W/kg)	Measured Conducted Power (dBm)	Power Scaling Factor	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	SAR Deviation (%)	Plot No.
GPRS 4Tx	Front	10	836.6	30.50	**0.444**	29.15	1.365	0.242	0.330	-25.7	
	Rear	10	836.6	30.50	0.342						
	Left	10	836.6	30.50	0.249						
	Right	10	836.6	30.50	**0.690**	29.15	1.365	0.326	**0.445**	-35.5	20
	Bottom	10	836.6	30.50	0.377						

GSM 1900 Band											
Reference Data						Variant Measurement					
Mode	EUT Position	Distance (mm)	Frequency (MHz)	Max. Tune-up Power (dBm)	Scaled 1 g SAR (W/kg)	Measured Conducted Power (dBm)	Power Scaling Factor	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	SAR Deviation (%)	Plot No.
GPRS 4Tx	Front	10	1 880.0	27.50	0.380						
	Rear	10	1 880.0	27.50	**0.772**	25.63	1.538	0.479	**0.737**	-4.5	21
	Left	10	1 880.0	27.50	0.358						
	Right	10	1 880.0	27.50	0.170						
	Bottom	10	1 880.0	27.50	**0.630**	25.63	1.538	0.416	0.640	1.6	

WCDMA Band V											
Reference Data						Variant Measurement					
Mode	EUT Position	Distance (mm)	Frequency (MHz)	Max. Tune-up Power (dBm)	Scaled 1 g SAR (W/kg)	Measured Conducted Power (dBm)	Power Scaling Factor	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	SAR Deviation (%)	Plot No.
RMC	Front	10	836.6	25.50	0.328						
	Rear	10	836.6	25.50	**0.756**	24.66	1.213	0.581	**0.705**	-6.7	22
	Left	10	836.6	25.50	0.216						
	Right	10	836.6	25.50	**0.505**	24.66	1.213	0.367	0.445	-11.9	
	Bottom	10	836.6	25.50	0.320						

LTE Band 5											
Reference Data						Variant Measurement					
Mode	EUT Position	Distance (㎜)	Frequency (㎒)	Max. Tune-up Power (dBm)	Scaled 1 g SAR (W/kg)	Measured Conducted Power (dBm)	Power Scaling Factor	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	SAR Deviation (%)	Plot No.
QPSK 10M 1RB 25Offset	Front	10	836.5	25.50	0.320						
QPSK 10M 25RB 12Offset	Front	10	836.5	24.50	0.259						
QPSK 10M 1RB 25Offset	Rear	10	836.5	25.50	**0.708**	24.87	1.156	0.552	**0.638**	-9.9	23
QPSK 10M 25RB 12Offset	Rear	10	836.5	24.50	0.575	23.27	1.327	0.412	0.547	-4.9	
QPSK 10M 1RB 25Offset	Left	10	836.5	25.50	0.127						
QPSK 10M 25RB 12Offset	Left	10	836.5	24.50	0.099						
QPSK 10M 1RB 25Offset	Right	10	836.5	25.50	0.254						
QPSK 10M 25RB 12Offset	Right	10	836.5	24.50	0.198						
QPSK 10M 1RB 25Offset	Bottom	10	836.5	25.50	0.129						
QPSK 10M 25RB 12Offset	Bottom	10	836.5	24.50	0.101						

LTE Band 41											
Reference Data						Variant Measurement					
Mode	EUT Position	Distance (㎜)	Frequency (㎒)	Max. Tune-up Power (dBm)	Scaled 1 g SAR (W/kg)	Measured Conducted Power (dBm)	Power Scaling Factor	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	SAR Deviation (%)	Plot No.
QPSK 20M 1RB 49Offset	Front	10	2 636.5	17.30	0.045						
QPSK 20M 50RB 0Offset	Front	10	2 636.5	17.30	0.049						
QPSK 20M 1RB 49Offset	Rear	10	2 636.5	17.30	0.393						
QPSK 20M 50RB 0Offset	Rear	10	2 636.5	17.30	**0.430**	16.59	1.178	0.448	**0.528**	22.8	24
QPSK 20M 1RB 49Offset	Left	10	2 636.5	17.30	0.269						
QPSK 20M 50RB 0Offset	Left	10	2 636.5	17.30	0.291						
QPSK 20M 1RB 49Offset	Top	10	2 636.5	17.30	0.022						
QPSK 20M 50RB 0Offset	Top	10	2 636.5	17.30	0.025						

2.4 GHz WLAN												
Reference Data						Variant Measurement						
Mode	EUT Position	Distance (mm)	Frequency (MHz)	Max. Tune-up Power (dBm)	Scaled 1 g SAR (W/kg)	Measured Conducted Power (dBm)	Power Scaling Factor	Duty Cycle Compensate Factor	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	SAR Deviation (%)	Plot No.
802.11b	Front	10	2 437.0	19.50	-							
	Rear	10	2 437.0	19.50	**0.155**	18.19	1.352	1.010	0.113	**0.154**	-0.6	25
	Left	10	2 437.0	19.50	-							
	Top	10	2 437.0	19.50	-							

NII												
Reference Data						Variant Measurement						
Mode	EUT Position	Distance (mm)	Frequency (MHz)	Max. Tune-up Power (dBm)	Scaled 1 g SAR (W/kg)	Measured Conducted Power (dBm)	Power Scaling Factor	Duty Cycle Compensate Factor	Measured 1 g SAR (W/kg)	Scaled 1 g SAR (W/kg)	SAR Deviation (%)	Plot No.
802.11n (HT40)	Front	10	5 795.0	16.00	-							
	Rear	10	5 795.0	16.00	**0.596**	14.47	1.422	1.068	0.406	**0.617**	3.5	26
	Left	10	5 795.0	16.00	-							
	Top	10	5 795.0	16.00	0.226							

11.4 Standalone Phablet SAR Test Results

LTE Band 41											
Reference Data						Variant Measurement					
Mode	EUT Position	Distance (mm)	Frequency (MHz)	Max. Tune-up Power (dBm)	Scaled 10 g SAR (W/kg)	Measured Conducted Power (dBm)	Power Scaling Factor	Measured 10 g SAR (W/kg)	Scaled 10 g SAR (W/kg)	SAR Deviation (%)	Plot No.
QPSK 20M 1RB 49Offset	Front	0	2 636.5	23.80	0.545	23.10	1.175	0.432	0.508	-6.8	
QPSK 20M 50RB 0Offset	Front	0	2 636.5	22.80	0.484	21.85	1.245	0.449	0.559	15.5	
QPSK 20M 1RB 49Offset	Rear	12	2 636.5	23.80	0.372						
QPSK 20M 50RB 0Offset	Rear	12	2 636.5	22.80	0.352						
QPSK 20M 1RB 49Offset	Left	9	2 636.5	23.80	0.524	23.10	1.175	0.466	0.548	4.6	
QPSK 20M 50RB 0Offset	Left	9	2 636.5	22.80	0.464	21.85	1.245	0.441	0.549	18.3	
QPSK 20M 1RB 49Offset	Top	0	2 636.5	23.80	0.208						
QPSK 20M 50RB 0Offset	Top	0	2 636.5	22.80	0.180						
Grip Sensor On											
QPSK 20M 1RB 49Offset	Rear	0	2 636.5	17.30	0.857	16.73	1.140	0.891	**1.016**	18.6	27
QPSK 20M 50RB 0Offset	Rear	0	2 636.5	17.30	**0.945**	16.59	1.178	0.814	0.959	1.5	
QPSK 20M 1RB 49Offset	Left	0	2 636.5	17.30	0.671	16.73	1.140	0.748	0.853	27.1	
QPSK 20M 50RB 0Offset	Left	0	2 636.5	17.30	0.713	16.59	1.178	0.737	0.868	21.7	

NII												
Reference Data						Variant Measurement						
Mode	EUT Position	Distance (mm)	Frequency (MHz)	Max. Tune-up Power (dBm)	Scaled 10 g SAR (W/kg)	Measured Conducted Power (dBm)	Power Scaling Factor	Duty Cycle Compensate Factor	Measured 10 g SAR (W/kg)	Scaled 10 g SAR (W/kg)	SAR Deviation (%)	Plot No.
802.11a	Front	0	5 300.0	16.50	-							
	Rear	0	5 300.0	16.50	**0.895**	15.31	1.315	1.032	0.574	**0.779**	-13.0	28
	Left	0	5 300.0	16.50	-							
	Top	0	5 300.0	16.50	-							
802.11a	Front	0	5 620.0	16.50	-							
	Rear	0	5 620.0	16.50	**0.702**	15.47	1.268	1.032	0.470	**0.615**	-12.4	29
	Left	0	5 620.0	16.50	-							
	Top	0	5 620.0	16.50	-							

12. Simultaneous Transmission

The following procedures adopted from FCC KDB Publication 447498 D01v06 are applicable to devices with built in unlicensed transmitters such as 802.11 and Bluetooth devices which may simultaneously transmit with the licensed transmitter.
This device contains transmitters that may operate simultaneously. Therefore, simultaneous transmission analysis is required. Per FCC KDB Publication 447498 D01v06 4.3.2 and IEEE 1528-2013 Section 6.3.4.1.2, simultaneous transmission SAR test exclusion may be applied when the sum of the 1g or 10g SAR for all the simultaneous transmitting antennas in a specific a physical test configuration is within SAR limits. The different test positions in an exposure condition may be considered collectively to determine SAR test exclusion according to the sum of 1g or 10g SAR.

12.1 Estimated SAR

When standalone SAR is not required to be measured, per FCC KDB 447498 D01v06 4.3.2 b), the following equation must be used to estimate the standalone 1g or 10g SAR for simultaneous transmission assessment involving that transmitter.

$$\text{Estimated SAR} = \frac{\sqrt{f(\text{GHz})}}{7.5} \times \frac{(\text{Max Power of channel, mW})}{\text{Min. Separation Distance, mm}}$$

Mode	Position	Frequency	Maximum Allowed Power	Separation Distance	Estimated 1g SAR
		MHz	mW	mm	W/kg
Bluetooth	Body-worn	2 480.0	10	15	0.140
	Hotspot	2 480.0	10	10	0.210

Note:
- Bluetooth SAR was not required to be measured per FCC KDB Publication 447498 D01v06.
- Estimated SAR results were used in the above table to determine simultaneous transmission SAR test exclusion.

12.2 Simultaneous Transmission Analysis

Exposure Condition /Position		licensed	WLAN		Bluetooth	Summation			
			2.4 GHz	5 GHz					
		[①]	[②]	[③]	[④]	[①+②]	[①+③]	[①+④]	[①+③+④]
GSM/GPRS 850 Band									
Head	Right Cheek	0.421	0.188	0.090	0.097	0.609	0.511	0.518	0.608
	Right Tilt	0.208	0.188	0.090	0.079	0.396	0.298	0.287	0.377
	Left Cheek	0.449	0.188	0.090	0.022	0.637	0.539	0.471	0.561
	Left Tilt	0.261	0.188	0.090	0.014	0.449	0.351	0.275	0.365
Body-Worn	Front	0.475	0.078	0.012	0.140	0.553	0.487	0.615	0.627
	Rear	0.704	0.078	0.488	0.140	0.782	1.192	0.844	1.332
Hotspot	Front	0.444	0.155	0.596	0.210	0.599	1.040	0.654	1.250
	Rear	0.342	0.155	0.596	0.210	0.497	0.938	0.552	1.148
	Left	0.249	0.155	0.596	0.210	0.404	0.845	0.459	1.055
	Right	0.690	-	-	-	0.690	0.690	0.690	0.690
	Top	-	0.155	0.226	0.210	0.155	0.226	0.210	0.436
	Bottom	0.377	-	-	-	0.377	0.377	0.377	0.377
GSM/GPRS 1900 Band									
Head	Right Cheek	0.083	0.188	0.090	0.097	0.271	0.173	0.180	0.270
	Right Tilt	0.095	0.188	0.090	0.079	0.283	0.185	0.174	0.264
	Left Cheek	0.138	0.188	0.090	0.022	0.326	0.228	0.160	0.250
	Left Tilt	0.144	0.188	0.090	0.014	0.332	0.234	0.158	0.248
Body-Worn	Front	0.194	0.078	0.012	0.140	0.272	0.206	0.334	0.346
	Rear	0.374	0.078	0.488	0.140	0.452	0.862	0.514	1.002
Hotspot	Front	0.380	0.155	0.596	0.210	0.535	0.976	0.590	1.186
	Rear	0.772	0.155	0.596	0.210	0.927	1.368	0.982	1.578
	Left	0.358	0.155	0.596	0.210	0.513	0.954	0.568	1.164
	Right	0.170	-	-	-	0.170	0.170	0.170	0.170
	Top	-	0.155	0.226	0.210	0.155	0.226	0.210	0.436
	Bottom	0.630	-	-	-	0.630	0.630	0.630	0.630
WCDMA Band V									
Head	Right Cheek	0.402	0.188	0.090	0.097	0.590	0.492	0.499	0.589
	Right Tilt	0.206	0.188	0.090	0.079	0.394	0.296	0.285	0.375
	Left Cheek	0.344	0.188	0.090	0.022	0.532	0.434	0.366	0.456
	Left Tilt	0.207	0.188	0.090	0.014	0.395	0.297	0.221	0.311
Body-Worn	Front	0.336	0.078	0.012	0.140	0.414	0.348	0.476	0.488
	Rear	0.501	0.078	0.488	0.140	0.579	0.989	0.641	1.129
Hotspot	Front	0.328	0.155	0.596	0.210	0.483	0.924	0.538	1.134
	Rear	0.756	0.155	0.596	0.210	0.911	1.352	0.966	1.562
	Left	0.216	0.155	0.596	0.210	0.371	0.812	0.426	1.022
	Right	0.505	-	-	-	0.505	0.505	0.505	0.505
	Top	-	0.155	0.226	0.210	0.155	0.226	0.210	0.436
	Bottom	0.320	-	-	-	0.320	0.320	0.320	0.320

Exposure Condition /Position		licensed	WLAN		Bluetooth	Summation			
			2.4 GHz	5 GHz					
		[①]	[②]	[③]	[④]	[①+②]	[①+③]	[①+④]	[①+③+④]
LTE Band 41									
Head	Right Cheek	0.968	0.188	0.090	0.097	1.156	1.058	1.065	1.155
	Right Tilt	0.246	0.188	0.090	0.079	0.434	0.336	0.325	0.415
	Left Cheek	0.234	0.188	0.090	0.022	0.422	0.324	0.256	0.346
	Left Tilt	0.113	0.188	0.090	0.014	0.301	0.203	0.127	0.217
Body-Worn	Front	0.114	0.078	0.012	0.140	0.192	0.126	0.254	0.266
	Rear	0.576	0.078	0.488	0.140	0.654	1.064	0.716	1.204
Hotspot	Front	0.049	0.155	0.596	0.210	0.204	0.645	0.259	0.855
	Rear	0.430	0.155	0.596	0.210	0.585	1.026	0.640	1.236
	Left	0.291	0.155	0.596	0.210	0.446	0.887	0.501	1.097
	Right	-	-	-	-	-	-	-	-
	Top	0.025	0.155	0.226	0.210	0.180	0.251	0.235	0.461
	Bottom	-	-	-	-	-	-	-	-
Phablet	Front	0.545	-	0.895	-	0.545	1.440	0.545	1.440
	Rear	0.945	-	0.895	-	0.945	1.840	0.945	1.840
	Left	0.713	-	0.895	-	0.713	1.608	0.713	1.608
	Right	-	-	-	-	-	-	-	-
	Top	0.208	-	0.895	-	0.208	1.103	0.208	1.103
	Bottom	-	-	-	-	-	-	-	-

Notes: 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.
- 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.
- " - " = SAR test exclusion

13. 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.

14. 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 - 3	-	-
Shield Room	-	8F - 4	-	-
DASY6 Robot	TX90XL speag	F/18/0004968/A/001	-	-
DASY6 Robot	TX60 Lspeag	F/19/0007289/A/001	-	-
Phantom	Twin SAM Phantom	1974	-	-
Phantom	Twin SAM Phantom	1975	-	-
Phantom	Twin SAM Phantom	1983	-	-
Phantom	Twin SAM Phantom	1984	-	-
Mounting Device	Mounting Device	-	-	-
DAE	DAE4	1342	2020-05-25	2021-05-25
DAE	DAE4	1587	2020-07-29	2021-07-29
Probe	EX3DV4	3697	2021-03-22	2022-03-22
Probe	EX3DV4	3865	2021-01-25	2022-01-25
ESG Vector Signal Generator	E4438C	MY42080845	2021-02-25	2022-02-25
Dual Power Meter	EPM-442A	GB37480680	2020-05-12	2021-05-12
			2021-05-11	2022-05-11
Power Sensor	8481H	2703A11902	2020-05-12	2021-05-12
			2021-05-11	2022-05-11
Power Sensor	8481H	3318A18090	2020-05-12	2021-05-12
			2021-05-11	2022-05-11
Attenuator	8491A	21552	2020-05-12	2021-05-12
			2021-05-10	2022-05-10
Attenuator	8491A	35560	2020-05-12	2021-05-12
			2021-05-10	2022-05-10
Attenuator	8491A	35934	2020-05-12	2021-05-12
			2021-05-10	2022-05-10
Power Amplifier	AMP2027	10010	2020-05-12	2021-05-12
			2021-05-10	2022-05-10
Dual Directional Coupler	778D-012	50136	2020-05-12	2021-05-12
			2021-05-10	2022-05-10
Dual Directional Coupler	772D	2839A160504	2020-05-12	2021-05-12
			2021-05-10	2022-05-10

Hardware Reference				
Equipment	Model	Serial Number	Date of Calibration	Due date of next Calibration
Low Pass Filter	NLP-1000+	VUU79701846	2020-05-12	2021-05-12
			2021-05-10	2022-05-10
Low Pass Filter	VLF-3000+	31831	2020-05-12	2021-05-12
			2021-05-10	2022-05-10
Low Pass Filter	VLF-6000+	31838	2020-05-12	2021-05-12
			2021-05-10	2022-05-10
Dipole Validation Kits	D850V2	1006	2020-04-21	2022-04-21
Dipole Validation Kits	D1900V2	5d160	2020-04-22	2022-04-22
Dipole Validation Kits	D2450V2	895	2020-07-21	2022-07-21
Dipole Validation Kits	D2600V2	1050	2020-07-21	2022-07-21
Dipole Validation Kits	D5GHzV2	1134	2020-05-20	2022-05-20
Network Analyzer	E5071B	MY42403524	2021-02-15	2022-02-15
Dielectric Assessment Kit	DAK-3.5	1078	2020-05-19	2021-05-19
Humidity/Temp	MHB-382SD	46307	2021-03-08	2022-03-08
Humidity/Temp	MHB-382SD	46301	2021-02-28	2022-02-28
Wideband Radio Communication Tester	CMW500	132423	2021-02-25	2022-02-25
Radio Communication Analyzer	MT8821C	6262170371	2020-11-09	2021-11-09
Network Analyzer	E5071B	MY42403524	2021-02-15	2022-02-15
Dielectric Assessment Kit	DAK-3.5	1078	2020-05-19	2021-05-19

15. Test System Verification Results

Date: 4/13/2021

Test Laboratory: KCTL Inc.
File Name: 850 MHz Verification Input Power 250 mW 2021-04-13.da52:0

DUT: Dipole 850 MHz D850V2, Type: D850V2, Serial: D850V2 - SN:1006

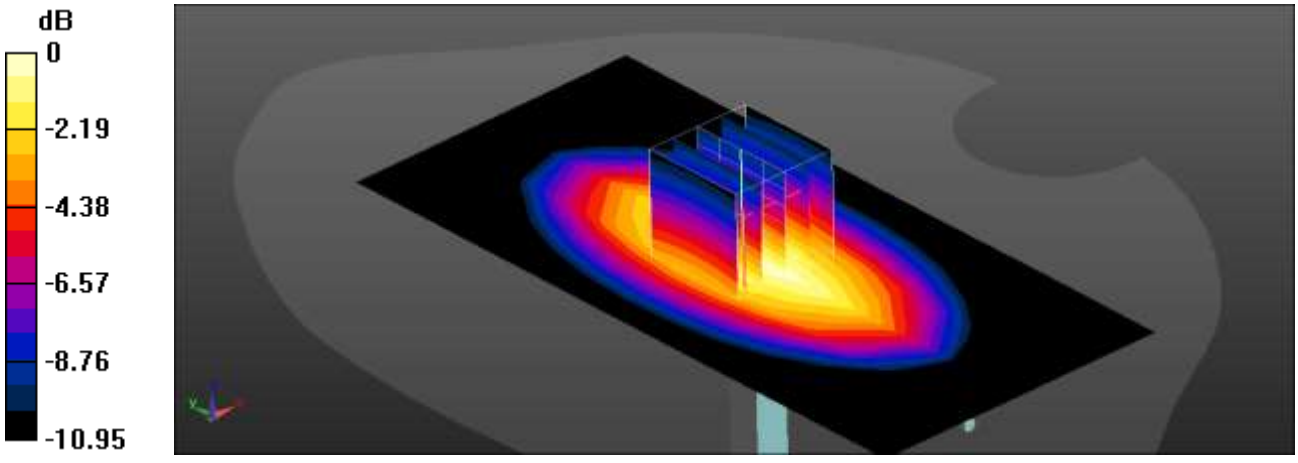
Communication System: UID 0, CW (0); Frequency: 850 MHz; Duty Cycle: 1:1
Medium parameters used: f = 850 MHz; σ = 0.922 S/m; ε_r = 42.873; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3865; ConvF(9.89, 9.89, 9.89) @ 850 MHz; ; Calibrated: 1/25/2021
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1587; Calibrated: 7/29/2020
- Phantom: Twin-SAM V8.0_Right; Type: QD 000 P41 Ax; Serial: 1984
- Measurement SW: DASY52, Version 52.10 (4);

System Performance Check (without Area Scan)/850 MHz Verification Input Power 250 mW 2021-04-13/Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 3.23 W/kg

System Performance Check (without Area Scan)/850 MHz Verification Input Power 250 mW 2021-04-13/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 61.18 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 3.72 W/kg
SAR(1 g) = 2.41 W/kg; SAR(10 g) = 1.57 W/kg
Smallest distance from peaks to all points 3 dB below = 16.7 mm
Ratio of SAR at M2 to SAR at M1 = 64.8%
Maximum value of SAR (measured) = 3.26 W/kg



0 dB = 3.26 W/kg = 5.13 dBW/kg

Date: 4/14/2021

Test Laboratory: KCTL Inc.
File Name: 850 MHz Verification Input Power 250 mW 2021-04-14.da52:0

DUT: Dipole 850 MHz D850V2, Type: D850V2, Serial: D850V2 - SN:1006

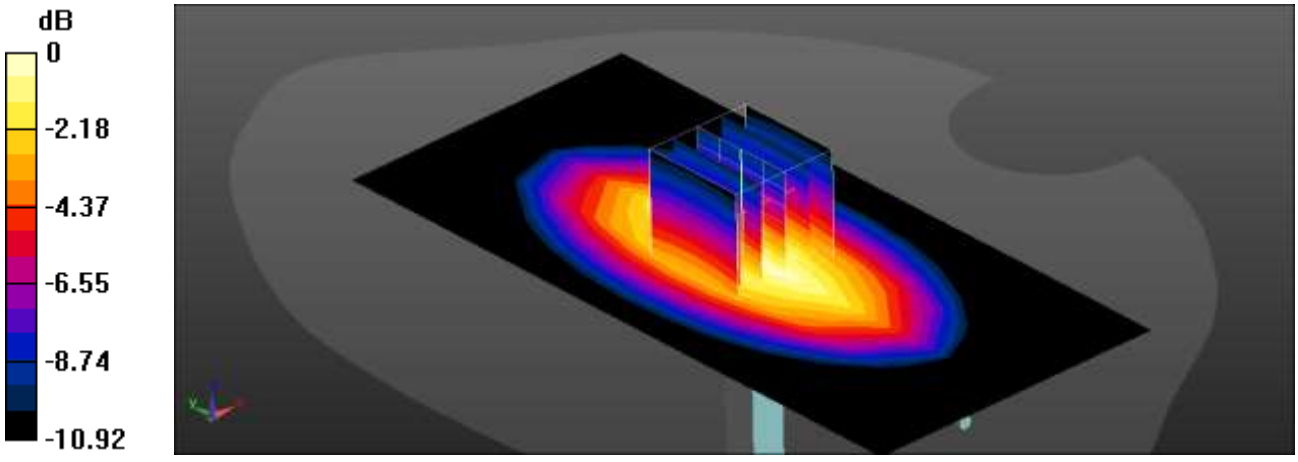
Communication System: UID 0, CW (0); Frequency: 850 MHz; Duty Cycle: 1:1
Medium parameters used: f = 850 MHz; σ = 0.918 S/m; ε_r = 42.789; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3865; ConvF(9.89, 9.89, 9.89) @ 850 MHz; ; Calibrated: 1/25/2021
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1587; Calibrated: 7/29/2020
- Phantom: Twin-SAM V8.0_Right; Type: QD 000 P41 Ax; Serial: 1984
- Measurement SW: DASY52, Version 52.10 (4);

System Performance Check (without Area Scan)/850 MHz Verification Input Power 250 mW 2021-04-14/Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 3.46 W/kg

System Performance Check (without Area Scan)/850 MHz Verification Input Power 250 mW 2021-04-14/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 63.40 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 4.00 W/kg
SAR(1 g) = 2.59 W/kg; SAR(10 g) = 1.69 W/kg
Smallest distance from peaks to all points 3 dB below = 16.1 mm
Ratio of SAR at M2 to SAR at M1 = 64.9%
Maximum value of SAR (measured) = 3.51 W/kg



0 dB = 3.51 W/kg = 5.45 dBW/kg

Date: 5/17/2021

Test Laboratory: KCTL Inc.
File Name: 850 MHz Verification Input Power 250 mW 2021-05-17.da52:0

DUT: Dipole 850 MHz D850V2, Type: D850V2, Serial: D850V2 - SN:1006

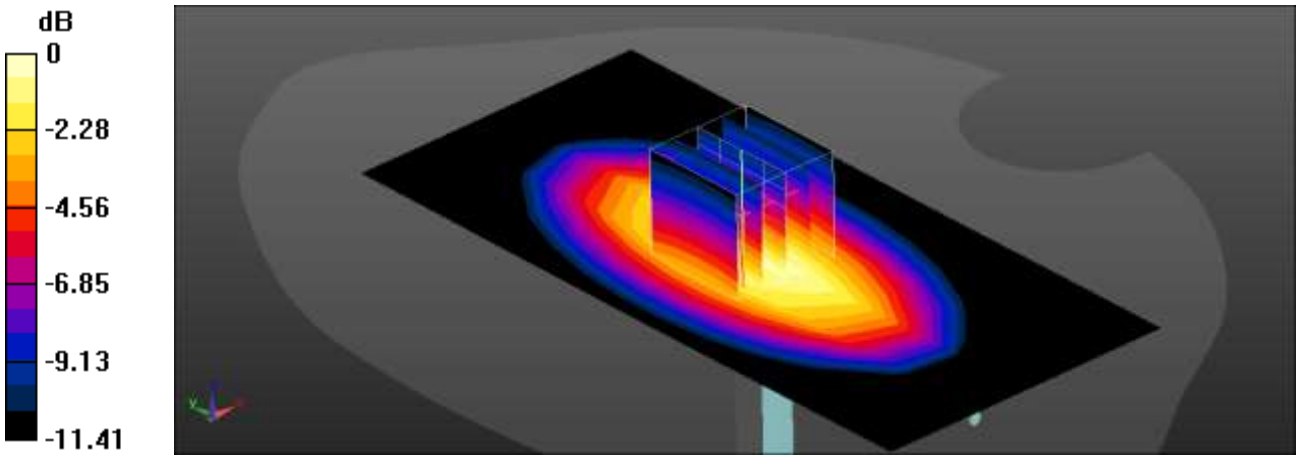
Communication System: UID 0, CW (0); Frequency: 850 MHz; Duty Cycle: 1:1
Medium parameters used: f = 850 MHz; σ = 0.902 S/m; ε_r = 41.298; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3865; ConvF(9.89, 9.89, 9.89) @ 850 MHz; ; Calibrated: 1/25/2021
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1587; Calibrated: 7/29/2020
- Phantom: Twin-SAM V8.0_Right; Type: QD 000 P41 Ax; Serial: 1984
- Measurement SW: DASY52, Version 52.10 (4);

System Performance Check (without Area Scan)/850 MHz Verification Input Power 250 mW 2021-05-17/Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 3.22 W/kg

System Performance Check (without Area Scan)/850 MHz Verification Input Power 250 mW 2021-05-17/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 62.17 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 3.92 W/kg
SAR(1 g) = 2.5 W/kg; SAR(10 g) = 1.61 W/kg
Smallest distance from peaks to all points 3 dB below = 16 mm
Ratio of SAR at M2 to SAR at M1 = 63.6%
Maximum value of SAR (measured) = 3.42 W/kg



0 dB = 3.42 W/kg = 5.34 dBW/kg

Date: 4/14/2021

Test Laboratory: KCTL Inc.
File Name: 1900 MHz Verification Input Power 250 mW 2021-04-14.da52:0

DUT: Dipole 1900 MHz D1900V2, Type: D1900V2, Serial: D1900V2 - SN:5d160

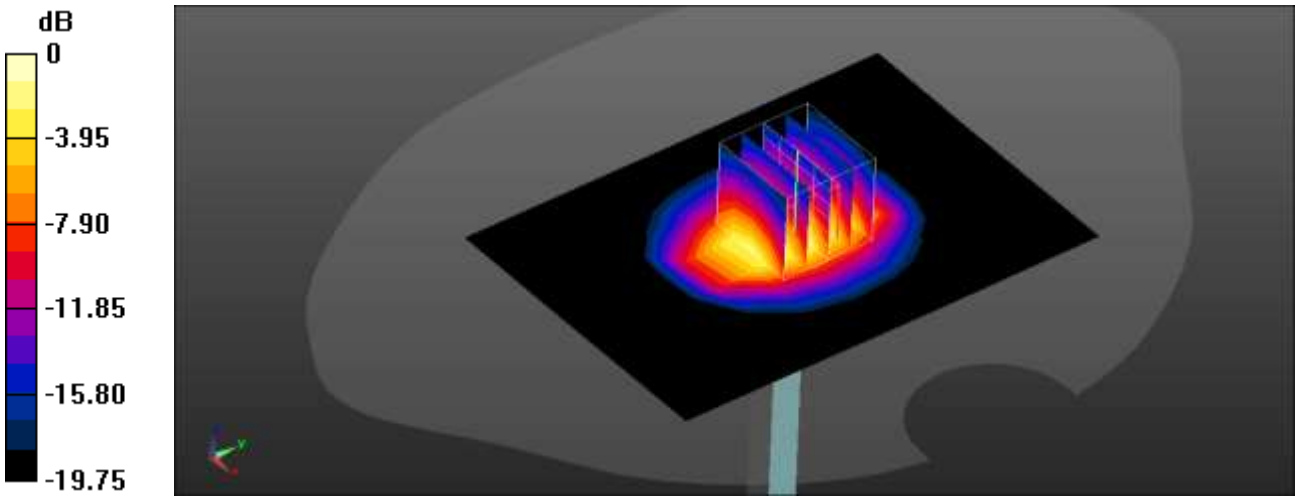
Communication System: UID 0, CW (0); Frequency: 1900 MHz; Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.41 S/m; ε_r = 39.032; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3697;ConvF(7.64, 7.64, 7.64) @ 1900 MHz; Calibrated: 3/22/2021
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1342; Calibrated: 5/25/2020
- Phantom: Back_Left_Twin-SAM V8.0; Type: QD 000 P41 AA; Serial: 1974
- Measurement SW: DASY52, Version 52.10 (4);

System Performance Check/1900 MHz Verification Input Power 250 mW 2021-04-14/Area Scan (8x11x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 11.0 W/kg

System Performance Check/1900 MHz Verification Input Power 250 mW 2021-04-14/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 108.3 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 18.8 W/kg
SAR(1 g) = 9.7 W/kg; SAR(10 g) = 4.92 W/kg
Smallest distance from peaks to all points 3 dB below = 9.6 mm
Ratio of SAR at M2 to SAR at M1 = 51.1%
Maximum value of SAR (measured) = 15.3 W/kg



0 dB = 15.3 W/kg = 11.85 dBW/kg

Date: 4/27/2021

Test Laboratory: KCTL Inc.
File Name: 2450 MHz Verification Input Power 100 mW 2021-04-27.da5:0

DUT: Dipole 2450 MHz D2450V2, Type: D2450V2, Serial: D2450V2 - SN:895

Communication System: UID 0, CW (0); Frequency: 2450 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): f = 2450 MHz; σ = 1.855 S/m; ε_r = 38.357; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

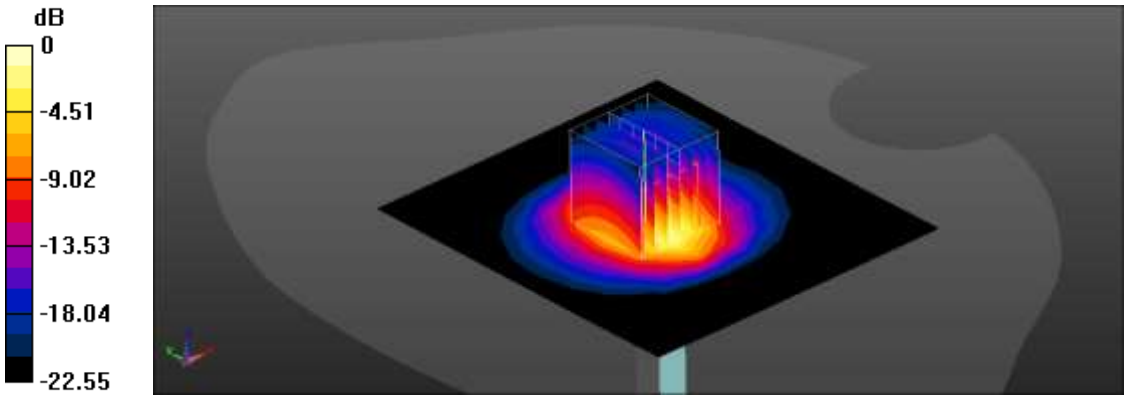
- Probe: EX3DV4 - SN3865; ConvF(7.87, 7.87, 7.87) @ 2450 MHz; ; Calibrated: 1/25/2021
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1587; Calibrated: 7/29/2020
- Phantom: Twin-SAM V8.0_Left; Type: QD 000 P41 Ax; Serial: 1983
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/2450 MHz Verification Input Power 100 mW 2021-04-27/Area Scan (10x11x1):
Measurement grid: dx=12mm, dy=12mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 8.34 W/kg

Configuration/2450 MHz Verification Input Power 100 mW 2021-04-27/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 64.34 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 10.8 W/kg
SAR(1 g) = 5.06 W/kg; SAR(10 g) = 2.33 W/kg
Smallest distance from peaks to all points 3 dB below = 9 mm
Ratio of SAR at M2 to SAR at M1 = 46.8%

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 8.64 W/kg



0 dB = 8.64 W/kg = 9.37 dBW/kg

Date: 4/30/2021

Test Laboratory: KCTL Inc.
File Name: 2600 MHz Verification Input Power 100 mW 2021-04-30.da5:0

DUT: Dipole 2600 MHz D2600V2, Type: D2600V2, Serial: D2600V2 - SN:1050

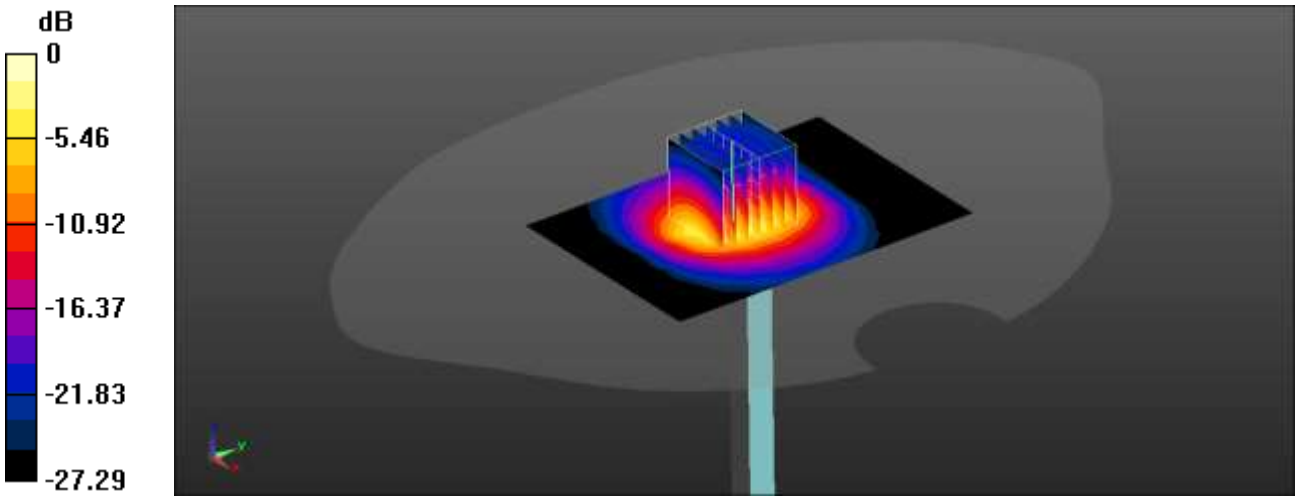
Communication System: UID 0, CW (0); Frequency: 2600 MHz; Duty Cycle: 1:1
Medium parameters used: f = 2600 MHz; σ = 2.006 S/m; ε_r = 38.627; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3697;ConvF(6.85, 6.85, 6.85) @ 2600 MHz; Calibrated: 3/22/2021
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1342; Calibrated: 5/25/2020
- Phantom: Back_Right_Twin-SAM V8.0; Type: QD 000 P41 AA; Serial: 1975
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/2600 MHz Verification Input Power 100 mW 2021-04-30/Area Scan (8x11x1):
Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 9.05 W/kg

Configuration/2600 MHz Verification Input Power 100 mW 2021-04-30/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 71.46 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 13.9 W/kg
SAR(1 g) = 5.7 W/kg; SAR(10 g) = 2.42 W/kg
Smallest distance from peaks to all points 3 dB below = 9 mm
Ratio of SAR at M2 to SAR at M1 = 39.6%
Maximum value of SAR (measured) = 10.5 W/kg



0 dB = 10.5 W/kg = 10.21 dBW/kg

Date: 5/16/2021

Test Laboratory: KCTL Inc.
File Name: 2600 MHz Verification Input Power 100 mW 2021-05-16.da5:0

DUT: Dipole 2600 MHz D2600V2, Type: D2600V2, Serial: D2600V2 - SN:1050

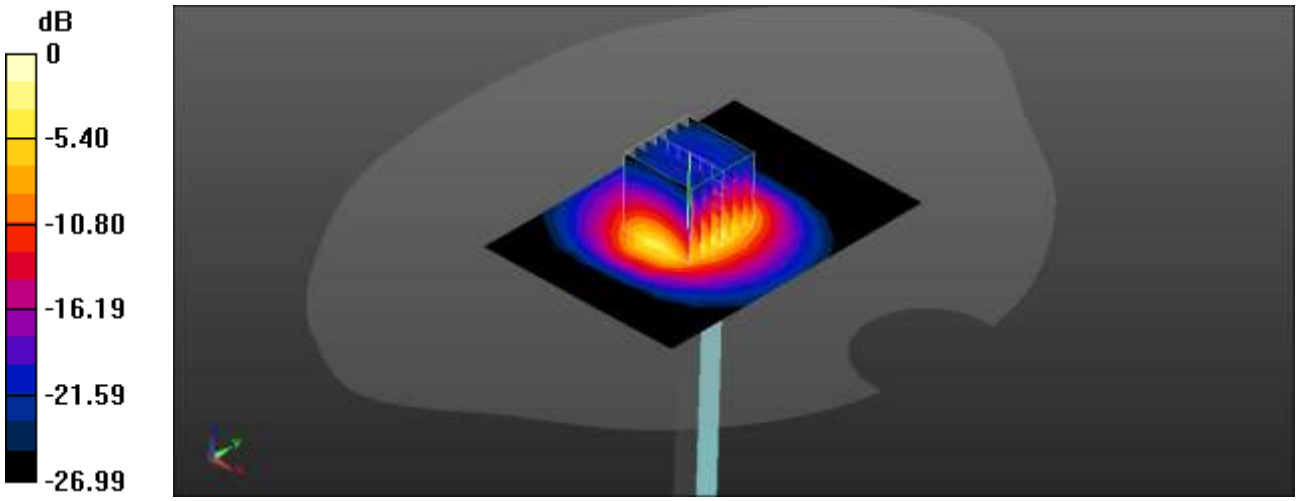
Communication System: UID 0, CW (0); Frequency: 2600 MHz; Duty Cycle: 1:1
Medium parameters used: f = 2600 MHz; σ = 2.008 S/m; ε_r = 38.214; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3697;ConvF(6.85, 6.85, 6.85) @ 2600 MHz; Calibrated: 3/22/2021
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1342; Calibrated: 5/25/2020
- Phantom: Back_Right_Twin-SAM V8.0; Type: QD 000 P41 AA; Serial: 1975
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/2600 MHz Verification Input Power 100 mW 2021-05-16/Area Scan (8x11x1):
Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 8.57 W/kg

Configuration/2600 MHz Verification Input Power 100 mW 2021-05-16/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 72.34 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 13.9 W/kg
SAR(1 g) = 5.76 W/kg; SAR(10 g) = 2.46 W/kg
Smallest distance from peaks to all points 3 dB below = 9 mm
Ratio of SAR at M2 to SAR at M1 = 40.2%
Maximum value of SAR (measured) = 10.6 W/kg



0 dB = 10.6 W/kg = 10.25 dBW/kg

Date: 4/23/2021

Test Laboratory: KCTL Inc.
File Name: 5300 MHz Verification Input Power 100 mW 2021-04-23.da5:0

DUT: Dipole D5GHzV2, Type: D5GHzV2, Serial: D5GHzV2 - SN:1134

Communication System: UID 0, CW (0); Frequency: 5300 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): f = 5300 MHz; σ = 4.775 S/m; ε_r = 35.55; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

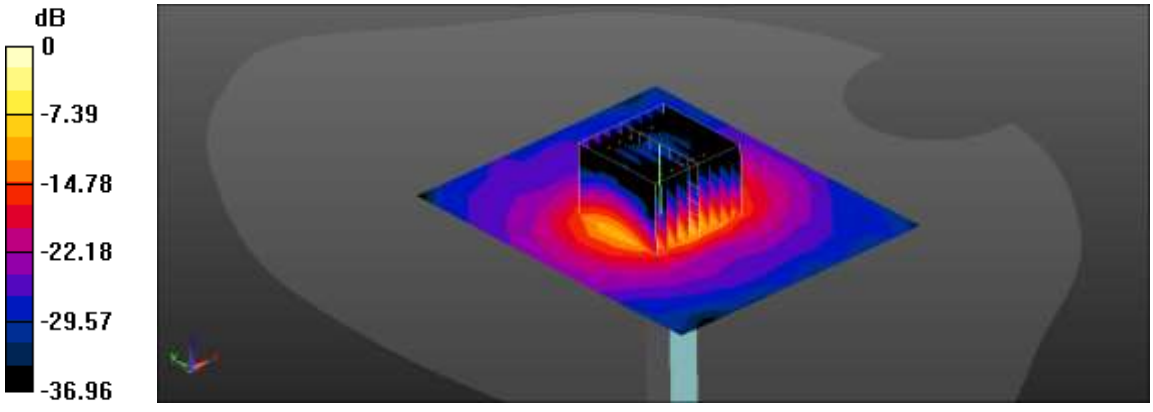
- Probe: EX3DV4 - SN3865; ConvF(5.43, 5.43, 5.43) @ 5300 MHz; ; Calibrated: 1/25/2021
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1587; Calibrated: 7/29/2020
- Phantom: Twin-SAM V8.0_Left; Type: QD 000 P41 Ax; Serial: 1983
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/5300 MHz Verification Input Power 100 mW 2021-04-23/Area Scan (10x12x1):
Measurement grid: dx=10mm, dy=10mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 16.1 W/kg

Configuration/5300 MHz Verification Input Power 100 mW 2021-04-23/Zoom Scan (9x9x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 70.85 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 34.9 W/kg
SAR(1 g) = 8.67 W/kg; SAR(10 g) = 2.49 W/kg
Smallest distance from peaks to all points 3 dB below = 7.2 mm
Ratio of SAR at M2 to SAR at M1 = 65%

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 22.0 W/kg



0 dB = 22.0 W/kg = 13.42 dBW/kg

Date: 4/24/2021

Test Laboratory: KCTL Inc.
File Name: 5600 MHz Verification Input Power 100 mW 2021-04-24.da5:0

DUT: Dipole D5GHzV2, Type: D5GHzV2, Serial: D5GHzV2 - SN:1134

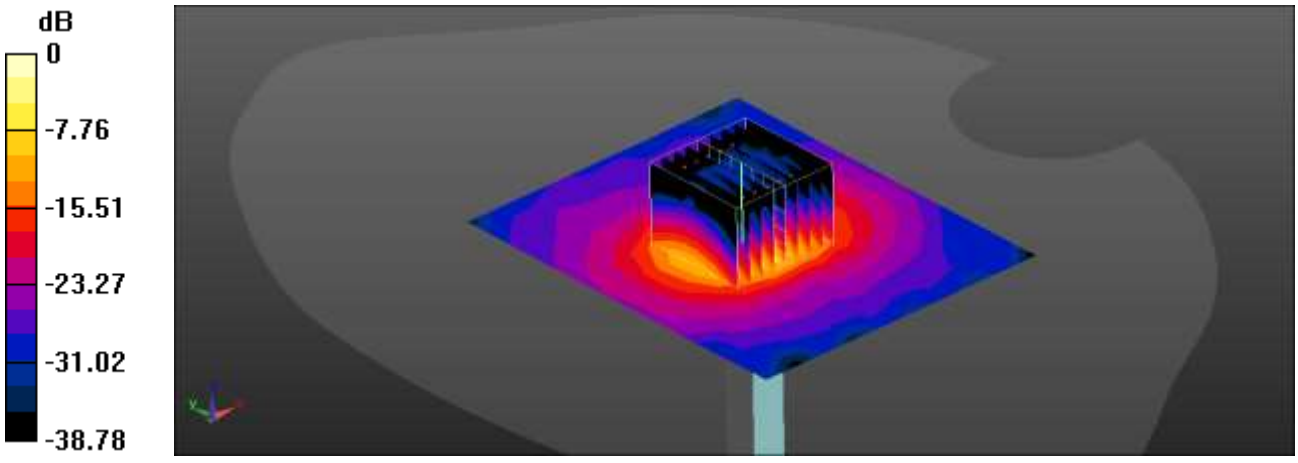
Communication System: UID 0, CW (0); Frequency: 5600 MHz; Duty Cycle: 1:1
Medium parameters used: f = 5600 MHz; σ = 5.1 S/m; ε_r = 35.502; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3865; ConvF(5.02, 5.02, 5.02) @ 5600 MHz; ; Calibrated: 1/25/2021
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1587; Calibrated: 7/29/2020
- Phantom: Twin-SAM V8.0_Left; Type: QD 000 P41 Ax; Serial: 1983
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/5600 MHz Verification Input Power 100 mW 2021-04-24/Area Scan (10x12x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 15.8 W/kg

Configuration/5600 MHz Verification Input Power 100 mW 2021-04-24/Zoom Scan (9x9x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 67.55 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 34.3 W/kg
SAR(1 g) = 8.5 W/kg; SAR(10 g) = 2.43 W/kg
Smallest distance from peaks to all points 3 dB below = 7.2 mm
Ratio of SAR at M2 to SAR at M1 = 65%
Maximum value of SAR (measured) = 21.5 W/kg



0 dB = 21.5 W/kg = 13.32 dBW/kg

Date: 4/26/2021

Test Laboratory: KCTL Inc.
File Name: 5800 MHz Verification Input Power 100 mW 2021-04-26.da5:0

DUT: Dipole D5GHzV2, Type: D5GHzV2, Serial: D5GHzV2 - SN:1134

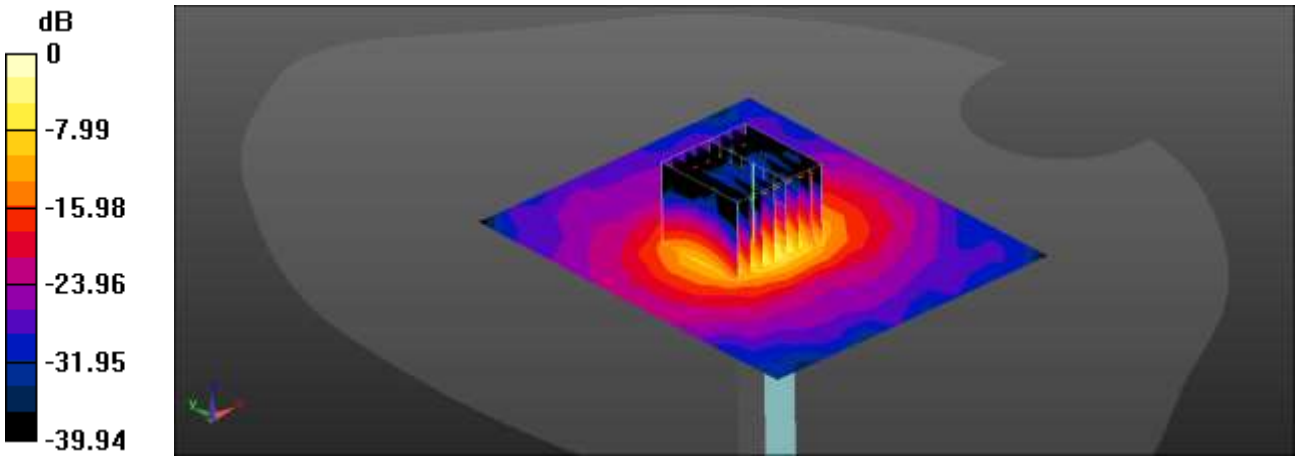
Communication System: UID 0, CW (0); Frequency: 5800 MHz; Duty Cycle: 1:1
Medium parameters used: f = 5800 MHz; σ = 5.344 S/m; ε_r = 35.62; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3865; ConvF(4.99, 4.99, 4.99) @ 5800 MHz; ; Calibrated: 1/25/2021
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1587; Calibrated: 7/29/2020
- Phantom: Twin-SAM V8.0_Left; Type: QD 000 P41 Ax; Serial: 1983
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/5800 MHz Verification Input Power 100 mW 2021-04-26/Area Scan (10x12x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 15.7 W/kg

Configuration/5800 MHz Verification Input Power 100 mW 2021-04-26/Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 65.09 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 33.2 W/kg
SAR(1 g) = 8.26 W/kg; SAR(10 g) = 2.37 W/kg
Smallest distance from peaks to all points 3 dB below = 7.2 mm
Ratio of SAR at M2 to SAR at M1 = 65%
Maximum value of SAR (measured) = 20.9 W/kg



0 dB = 20.9 W/kg = 13.20 dBW/kg

16. Test Results

1)

Date: 4/13/2021

Test Laboratory: KCTL Inc.
File Name: 1.GSM850_Head.da53:0

DUT: SM-A225F/DSN, Type: Mobile Phone, Serial: R38R302E8FA

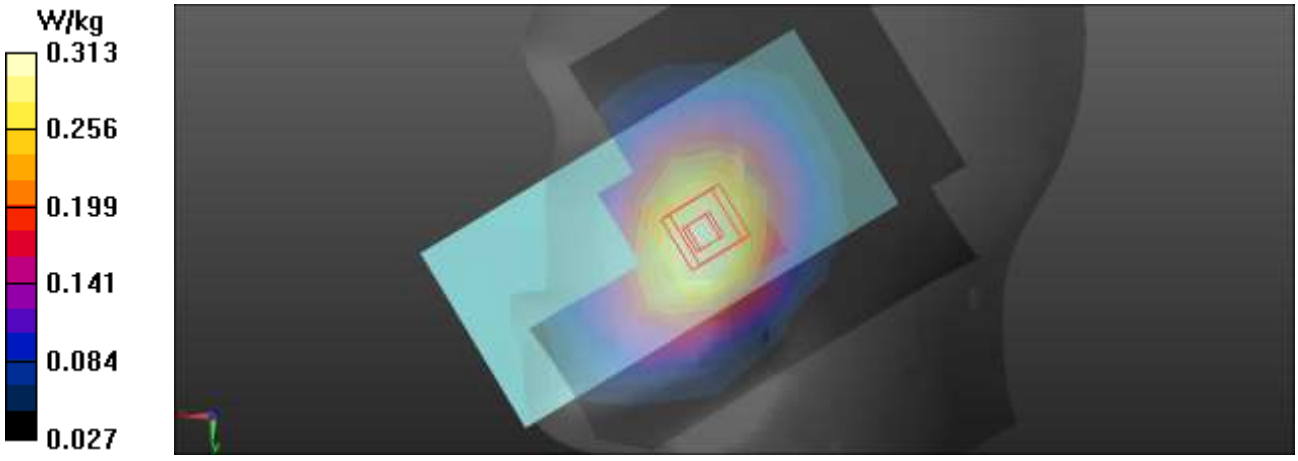
Communication System: UID 0, GSM850_4TX (0); Frequency: 836.6 MHz; Duty Cycle: 1:2.07491
Medium parameters used: f = 836.6 MHz; σ = 0.909 S/m; ε_r = 42.894; ρ = 1000 kg/m^3
Phantom section: Right Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3865; ConvF(9.89, 9.89, 9.89) @ 836.6 MHz; ; Calibrated: 1/25/2021
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1587; Calibrated: 7/29/2020
- Phantom: Twin-SAM V8.0_Right; Type: QD 000 P41 Ax; Serial: 1984
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/GSM850_GPRS 4Tx_CH190_Right Cheek/Area Scan (10x13x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.310 W/kg

Configuration/GSM850_GPRS 4Tx_CH190_Right Cheek/Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.17 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 0.340 W/kg
SAR(1 g) = 0.265 W/kg; SAR(10 g) = 0.204 W/kg
Smallest distance from peaks to all points 3 dB below = 27.4 mm
Ratio of SAR at M2 to SAR at M1 = 77.7%
Maximum value of SAR (measured) = 0.313 W/kg



2)

Date: 4/14/2021

Test Laboratory: KCTL Inc.
File Name: 1.GSM 1900_Head.da53:1

DUT: SM-A225F/DSN, Type: Mobile Phone, Serial: R38R302E8FA

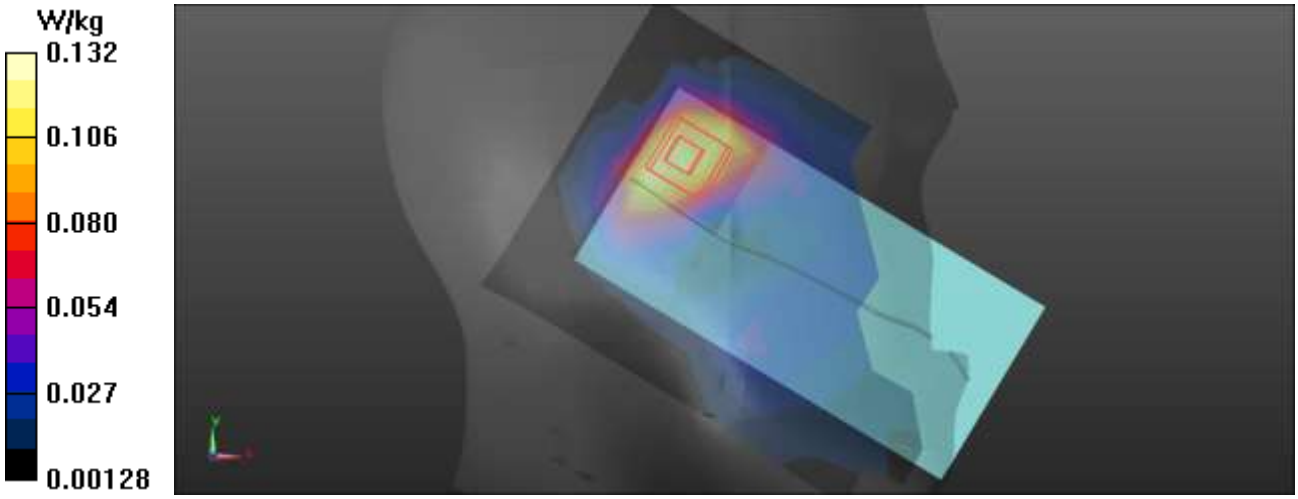
Communication System: UID 0, GSM1900_4TX (0); Frequency: 1880 MHz; Duty Cycle: 1:2.07491
Medium parameters used: f = 1880 MHz; σ = 1.395 S/m; ε_r = 39.117; ρ = 1000 kg/m^3
Phantom section: Left Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3697;ConvF(7.64, 7.64, 7.64) @ 1880 MHz; Calibrated: 3/22/2021
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1342; Calibrated: 5/25/2020
- Phantom: Back_Left_Twin-SAM V8.0; Type: QD 000 P41 AA; Serial: 1974
- Measurement SW: DASY52, Version 52.10 (4);

Configuration 2 2/GSM 1900_GPRS 4Tx_CH661_Left Tilt/Area Scan (9x12x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.119 W/kg

Configuration 2 2/GSM 1900_GPRS 4Tx_CH661_Left Tilt/Zoom Scan (6x6x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.326 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 0.165 W/kg
SAR(1 g) = 0.097 W/kg; SAR(10 g) = 0.058 W/kg
Smallest distance from peaks to all points 3 dB below = 12.8 mm
Ratio of SAR at M2 to SAR at M1 = 63.3%
Maximum value of SAR (measured) = 0.132 W/kg



3)

Date: 4/14/2021

Test Laboratory: KCTL Inc.
File Name: 1.WCDMA Band 5_Head.da53:0

DUT: SM-A225F/DSN, Type: Mobile Phone, Serial: R38R302E8FA

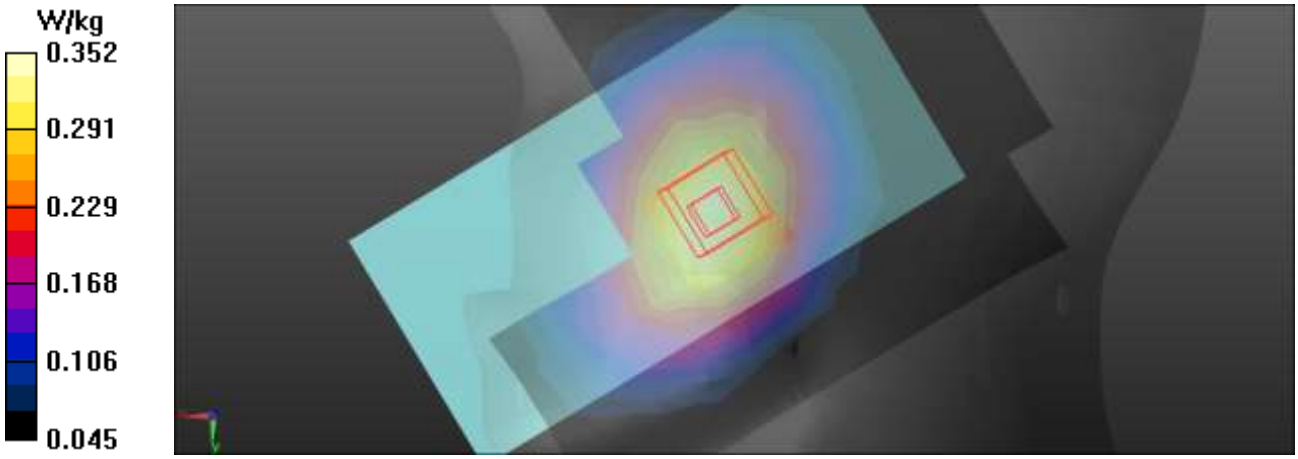
Communication System: UID 0, W-CDMA 850 (Band 5) (0); Frequency: 836.6 MHz; Duty Cycle: 1:1
Medium parameters used: f = 836.6 MHz; σ = 0.904 S/m; ε_r = 42.813; ρ = 1000 kg/m^3
Phantom section: Right Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3865; ConvF(9.89, 9.89, 9.89) @ 836.6 MHz; ; Calibrated: 1/25/2021
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1587; Calibrated: 7/29/2020
- Phantom: Twin-SAM V8.0_Right; Type: QD 000 P41 Ax; Serial: 1984
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/WCDMA_FDD_V_CH4183_Right Cheek/Area Scan (10x13x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.344 W/kg

Configuration/WCDMA_FDD_V_CH4183_Right Cheek/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.83 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 0.380 W/kg
SAR(1 g) = 0.295 W/kg; SAR(10 g) = 0.227 W/kg
Smallest distance from peaks to all points 3 dB below: Larger than measurement grid
Ratio of SAR at M2 to SAR at M1 = 78.3%
Maximum value of SAR (measured) = 0.352 W/kg



4)

Date: 4/14/2021

Test Laboratory: KCTL Inc.
File Name: 4.LTE Band 5_Head.da53:0

DUT: SM-A225F/DSN, Type: Mobile Phone, Serial: R38R302E8FA

Communication System: UID 0, LTE Band 5 (0); Frequency: 836.5 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): f = 836.5 MHz; σ = 0.905 S/m; ε_r = 42.797; ρ = 1000 kg/m^3
Phantom section: Right Section

DASY5 Configuration:

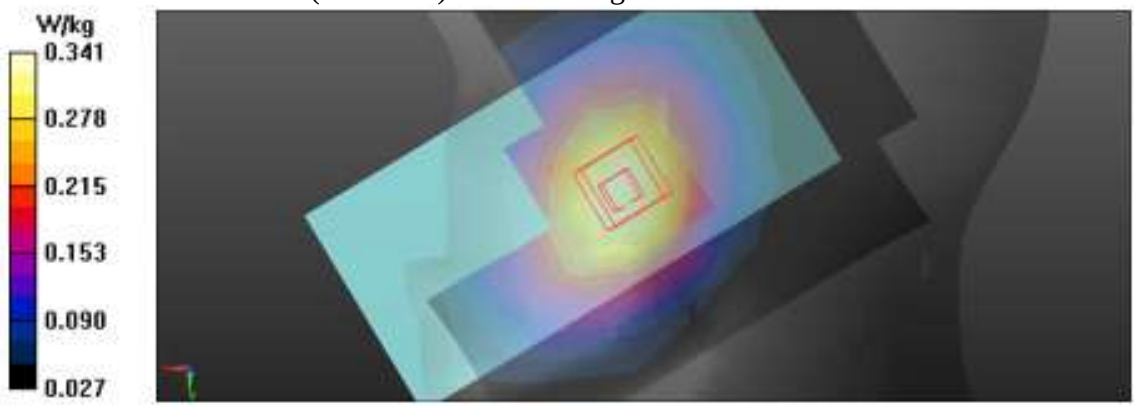
- Probe: EX3DV4 - SN3865; ConvF(9.89, 9.89, 9.89) @ 836.5 MHz; ; Calibrated: 1/25/2021
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1587; Calibrated: 7/29/2020
- Phantom: Twin-SAM V8.0_Right; Type: QD 000 P41 Ax; Serial: 1984
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/LTE Band 5_QPSK_10MHz_1RB_25offset_CH20525_Right Cheek/Area Scan (10x13x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.329 W/kg

Configuration/LTE Band 5_QPSK_10MHz_1RB_25offset_CH20525_Right Cheek/Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.75 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 0.370 W/kg
SAR(1 g) = 0.286 W/kg; SAR(10 g) = 0.220 W/kg
Smallest distance from peaks to all points 3 dB below = 26.3 mm
Ratio of SAR at M2 to SAR at M1 = 77%

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.341 W/kg



5)

Date: 4/30/2021

Test Laboratory: KCTL Inc.
File Name: 1.LTE Band 41_Head.da53:0

DUT: SM-A225F/DSN, Type: Mobile Phone, Serial: R38R302E8FA

Communication System: UID 0, LTE Band 41 (0); Frequency: 2506 MHz; Duty Cycle: 1:1.58016
Medium parameters used (interpolated): f = 2506 MHz; σ = 1.932 S/m; ε_r = 38.799; ρ = 1000 kg/m^3
Phantom section: Right Section

DASY5 Configuration:

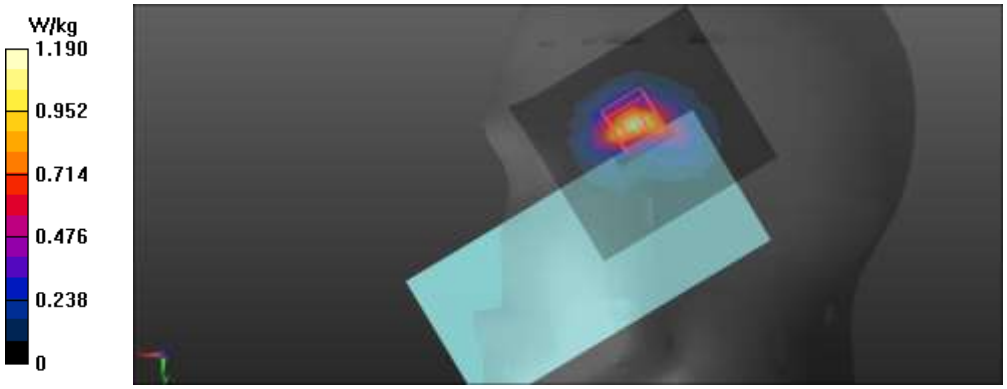
- Probe: EX3DV4 - SN3697;ConvF(6.85, 6.85, 6.85) @ 2506 MHz; Calibrated: 3/22/2021
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1342; Calibrated: 5/25/2020
- Phantom: Back_Right_Twin-SAM V8.0; Type: QD 000 P41 AA; Serial: 1975
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/LTE Band 41_QPSK_20 MHz_100RB_0offset_CH39750_Right Cheek/Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.25 W/kg

Configuration/LTE Band 41_QPSK_20 MHz_100RB_0offset_CH39750_Right Cheek/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.523 V/m; Power Drift = 0.15 dB
Peak SAR (extrapolated) = 1.54 W/kg
SAR(1 g) = 0.643 W/kg; SAR(10 g) = 0.265 W/kg
Smallest distance from peaks to all points 3 dB below = 6.3 mm
Ratio of SAR at M2 to SAR at M1 = 42.2%

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.19 W/kg



6)

Date: 4/27/2021

Test Laboratory: KCTL Inc.
File Name: 1.802.11 b_Head.da53:0

DUT: SM-A225F/DSN, Type: Mobile Phone, Serial: R38R302E8FA

Communication System: UID 0, 2.4GWLAN (0); Frequency: 2437 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): f = 2437 MHz; σ = 1.844 S/m; ε_r = 38.386; ρ = 1000 kg/m^3
Phantom section: Right Section

DASY5 Configuration:

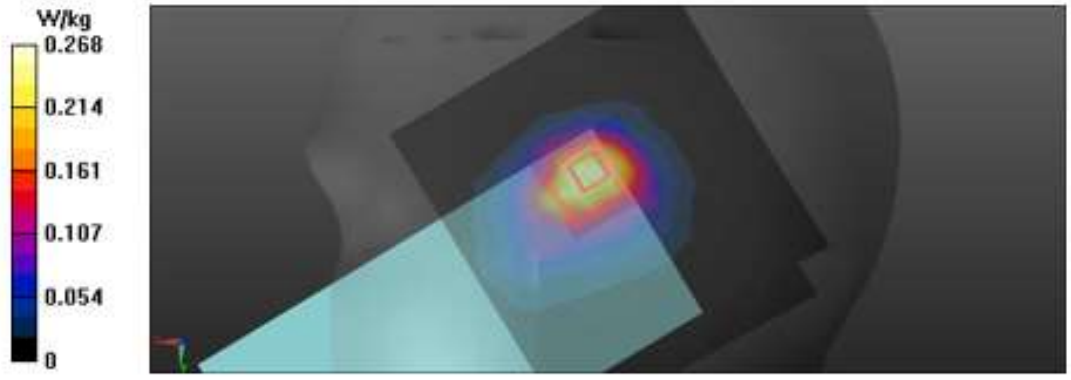
- Probe: EX3DV4 - SN3865; ConvF(7.87, 7.87, 7.87) @ 2437 MHz; ; Calibrated: 1/25/2021
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1587; Calibrated: 7/29/2020
- Phantom: Twin-SAM V8.0_Left; Type: QD 000 P41 Ax; Serial: 1983
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/802.11 b_CH6_Right Cheek/Area Scan (11x10x1): Measurement grid: dx=12mm, dy=12mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.255 W/kg

Configuration/802.11 b_CH6_Right Cheek/Zoom Scan (7x8x5)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.072 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 0.363 W/kg
SAR(1 g) = 0.165 W/kg; SAR(10 g) = 0.082 W/kg
Smallest distance from peaks to all points 3 dB below = 9.2 mm
Ratio of SAR at M2 to SAR at M1 = 52.4%

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.268 W/kg



7)

Date: 4/23/2021

Test Laboratory: KCTL Inc.
File Name: 1.802.11 ac_VHT80_Head.da53:0

DUT: SM-A225F/DSN, Type: Mobile Phone, Serial: R38R302E8FA

Communication System: UID 0, 5GWLAN (0); Frequency: 5290 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): f = 5290 MHz; σ = 4.766 S/m; ε_r = 35.554; ρ = 1000 kg/m^3
Phantom section: Left Section

DASY5 Configuration:

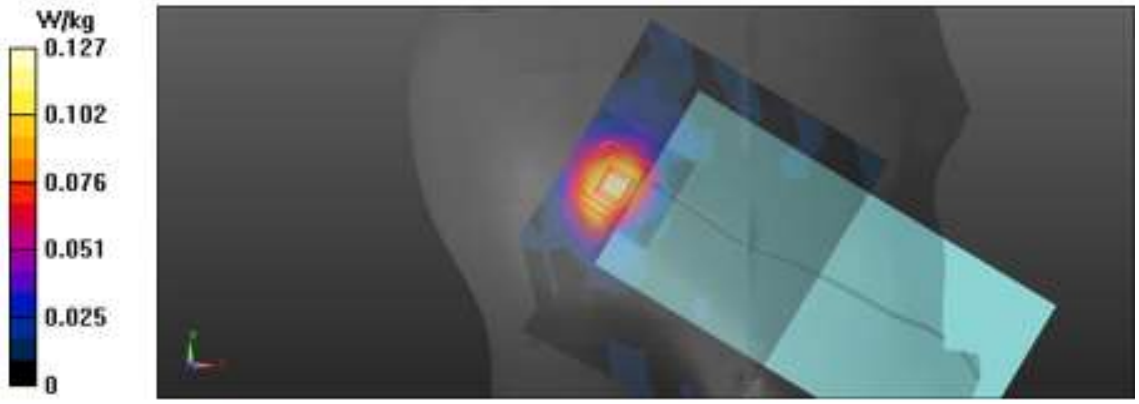
- Probe: EX3DV4 - SN3865; ConvF(5.43, 5.43, 5.43) @ 5290 MHz; ; Calibrated: 1/25/2021
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1587; Calibrated: 7/29/2020
- Phantom: Twin-SAM V8.0_Left; Type: QD 000 P41 Ax; Serial: 1983
- Measurement SW: DASY52, Version 52.10 (4);

Configuration 2/802.11 ac_VHT80_CH58_Left Tilt/Area Scan (13x11x1): Measurement grid: dx=10mm, dy=10mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.128 W/kg

Configuration 2/802.11 ac_VHT80_CH58_Left Tilt/Zoom Scan (10x11x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 2.670 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.426 W/kg
SAR(1 g) = 0.044 W/kg; SAR(10 g) = 0.016 W/kg
Smallest distance from peaks to all points 3 dB below = 6.5 mm
Ratio of SAR at M2 to SAR at M1 = 58.7%

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.127 W/kg



8)

Date: 4/24/2021

Test Laboratory: KCTL Inc.
File Name: 1.802.11 ac_VHT80_Head.da53:0

DUT: SM-A225F/DSN, Type: Mobile Phone, Serial: R38R302E8FA

Communication System: UID 0, 5GWLAN (0); Frequency: 5690 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): f = 5690 MHz; σ = 5.199 S/m; ε_r = 35.362; ρ = 1000 kg/m^3
Phantom section: Right Section

DASY5 Configuration:

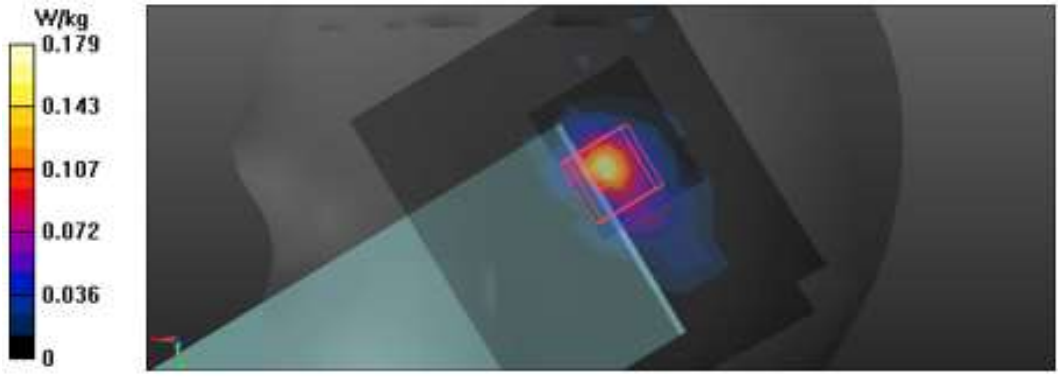
- Probe: EX3DV4 - SN3865; ConvF(5.02, 5.02, 5.02) @ 5690 MHz; ; Calibrated: 1/25/2021
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1587; Calibrated: 7/29/2020
- Phantom: Twin-SAM V8.0_Left; Type: QD 000 P41 Ax; Serial: 1983
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/802.11 ac_VHT80_CH138_Right Tilt/Area Scan (13x11x1): Measurement grid: dx=10mm, dy=10mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.181 W/kg

Configuration/802.11 ac_VHT80_CH138_Right Tilt/Zoom Scan (12x10x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 4.071 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 0.572 W/kg
SAR(1 g) = 0.053 W/kg; SAR(10 g) = 0.013 W/kg
Smallest distance from peaks to all points 3 dB below = 4.3 mm
Ratio of SAR at M2 to SAR at M1 = 54.3%

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.179 W/kg



9)

Date: 4/26/2021

Test Laboratory: KCTL Inc.
File Name: 1.802.11 ac_VHT80_Head.da53:0

DUT: SM-A225F/DSN, Type: Mobile Phone, Serial: R38R302E8FA

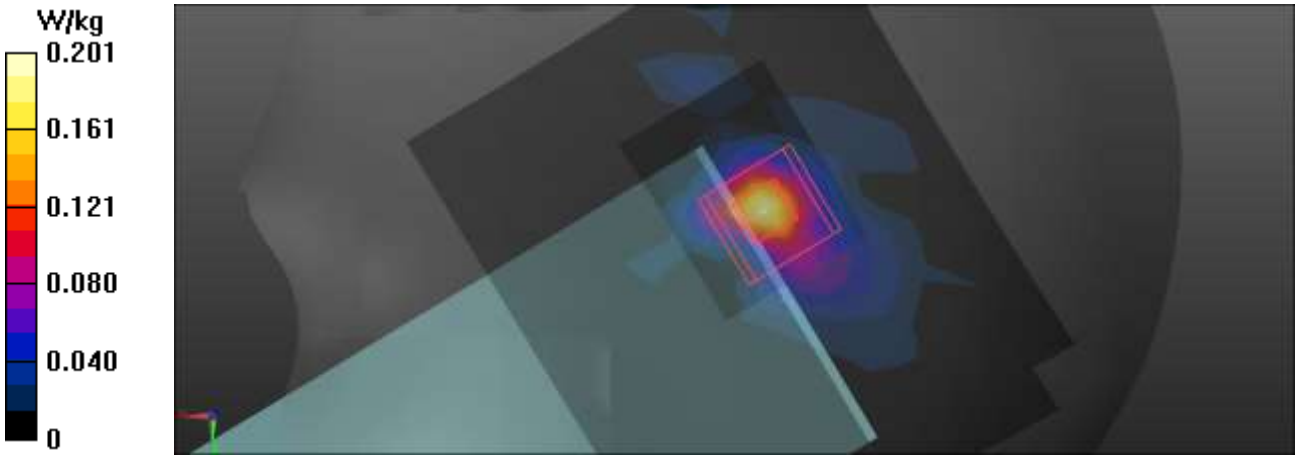
Communication System: UID 0, 5GWLAN (0); Frequency: 5775 MHz; Duty Cycle: 1:1
Medium parameters used: f = 5775 MHz; σ = 5.317 S/m; ε_r = 35.675; ρ = 1000 kg/m^3
Phantom section: Right Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3865; ConvF(4.99, 4.99, 4.99) @ 5775 MHz; ; Calibrated: 1/25/2021
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1587; Calibrated: 7/29/2020
- Phantom: Twin-SAM V8.0_Left; Type: QD 000 P41 Ax; Serial: 1983
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/802.11 ac_VHT80_CH155_Right Tilt/Area Scan (13x11x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.199 W/kg

Configuration/802.11 ac_VHT80_CH155_Right Tilt/Zoom Scan (12x10x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 4.547 V/m; Power Drift = 0.17 dB
Peak SAR (extrapolated) = 0.473 W/kg
SAR(1 g) = 0.061 W/kg; SAR(10 g) = 0.016 W/kg
Smallest distance from peaks to all points 3 dB below = 4.7 mm
Ratio of SAR at M2 to SAR at M1 = 56.7%
Maximum value of SAR (measured) = 0.201 W/kg



10)

Date: 4/27/2021

Test Laboratory: KCTL Inc.
File Name: 4.Bluetooth_Head.da53:0

DUT: SM-A225F/DSN, Type: Mobile Phone, Serial: R38R302E8FA

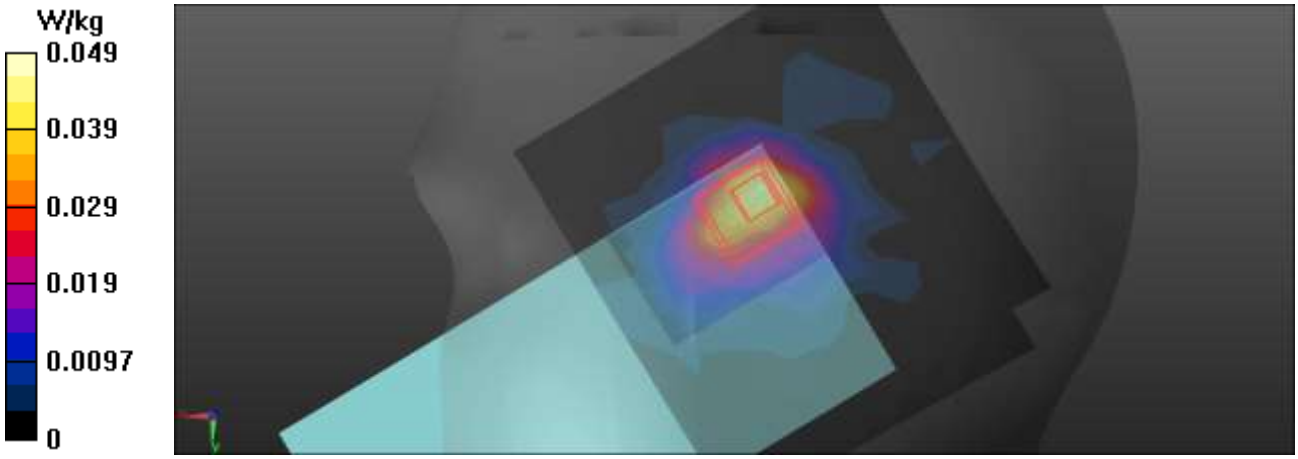
Communication System: UID 0, Bluetooth DH1 (0); Frequency: 2480 MHz; Duty Cycle: 1:3.31207
Medium parameters used: f = 2480 MHz; σ = 1.892 S/m; ε_r = 38.23; ρ = 1000 kg/m^3
Phantom section: Right Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3865; ConvF(7.87, 7.87, 7.87) @ 2480 MHz; ; Calibrated: 1/25/2021
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1587; Calibrated: 7/29/2020
- Phantom: Twin-SAM V8.0_Left; Type: QD 000 P41 Ax; Serial: 1983
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/Bluetooth_DH1_CH78_Right Cheek/Area Scan (11x10x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (measured) = 0.0403 W/kg

Configuration/Bluetooth_DH1_CH78_Right Cheek/Zoom Scan (8x11x5)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.075 V/m; Power Drift = -0.14 dB
Peak SAR (extrapolated) = 0.0750 W/kg
SAR(1 g) = 0.028 W/kg; SAR(10 g) = 0.012 W/kg
Smallest distance from peaks to all points 3 dB below: Larger than measurement grid
Ratio of SAR at M2 to SAR at M1 = 43.5%
Maximum value of SAR (measured) = 0.0485 W/kg



11)

Date: 4/13/2021

Test Laboratory: KCTL Inc.
File Name: 2.GSM850_Body.da53:0

DUT: SM-A225F/DSN, Type: Mobile Phone, Serial: R38R302E8FA

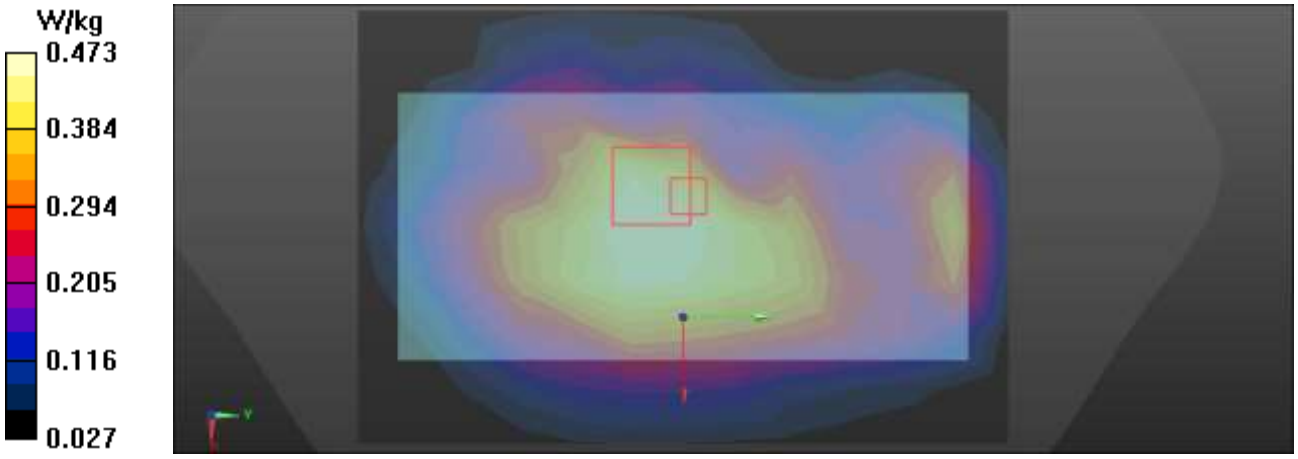
Communication System: UID 0, GSM850_4TX (0); Frequency: 836.6 MHz; Duty Cycle: 1:2.07491
Medium parameters used: f = 836.6 MHz; σ = 0.909 S/m; ε_r = 42.894; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3865; ConvF(9.89, 9.89, 9.89) @ 836.6 MHz; ; Calibrated: 1/25/2021
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1587; Calibrated: 7/29/2020
- Phantom: Twin-SAM V8.0_Right; Type: QD 000 P41 Ax; Serial: 1984
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/GSM850_GPRS 4Tx_CH190_Rear_15 mm/Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.487 W/kg

Configuration/GSM850_GPRS 4Tx_CH190_Rear_15 mm/Zoom Scan (6x6x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.25 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 0.558 W/kg
SAR(1 g) = 0.313 W/kg; SAR(10 g) = 0.211 W/kg
Smallest distance from peaks to all points 3 dB below = 20.8 mm
Ratio of SAR at M2 to SAR at M1 = 70.4%
Maximum value of SAR (measured) = 0.473 W/kg



12)

Date: 4/14/2021

Test Laboratory: KCTL Inc.
File Name: 2.GSM 1900_Body.da53:1

DUT: SM-A225F/DSN, Type: Mobile Phone, Serial: R38R302E8FA

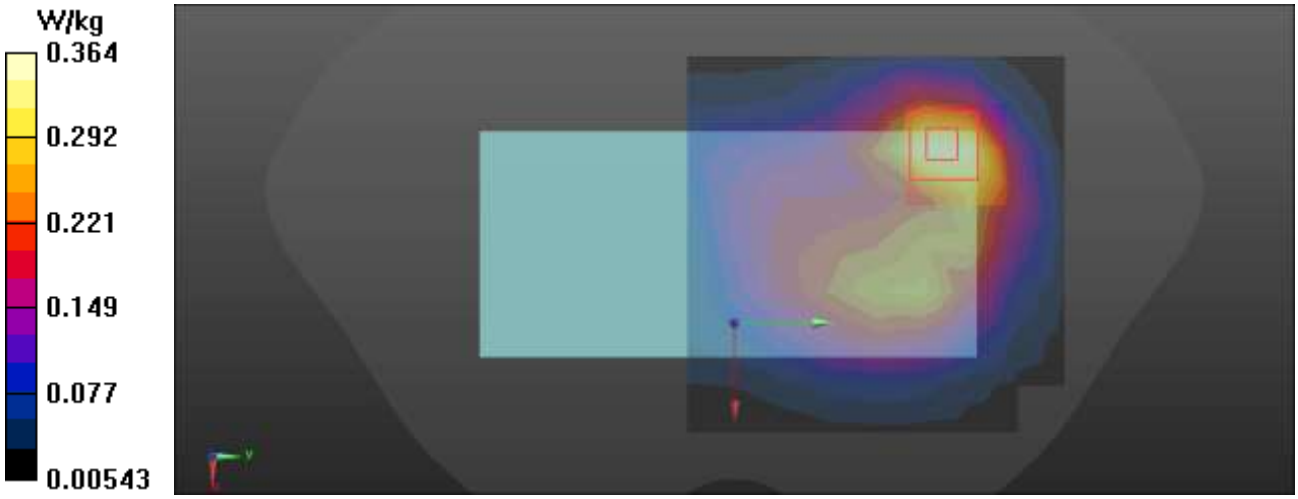
Communication System: UID 0, GSM1900_4TX (0); Frequency: 1880 MHz; Duty Cycle: 1:2.07491
Medium parameters used: f = 1880 MHz; σ = 1.395 S/m; ε_r = 39.117; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3697;ConvF(7.64, 7.64, 7.64) @ 1880 MHz; Calibrated: 3/22/2021
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1342; Calibrated: 5/25/2020
- Phantom: Back_Left_Twin-SAM V8.0; Type: QD 000 P41 AA; Serial: 1974
- Measurement SW: DASY52, Version 52.10 (4);

Configuration 2/GSM 1900_GPRS 4Tx_CH661_Rear_15 mm/Area Scan (9x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.363 W/kg

Configuration 2/GSM 1900_GPRS 4Tx_CH661_Rear_15 mm/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.866 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 0.461 W/kg
SAR(1 g) = 0.250 W/kg; SAR(10 g) = 0.139 W/kg
Smallest distance from peaks to all points 3 dB below = 16 mm
Ratio of SAR at M2 to SAR at M1 = 52.8%
Maximum value of SAR (measured) = 0.364 W/kg



13)

Date: 4/14/2021

Test Laboratory: KCTL Inc.
File Name: 2.WCDMA Band 5_Body.da53:0

DUT: SM-A225F/DSN, Type: Mobile Phone, Serial: R38R302E8FA

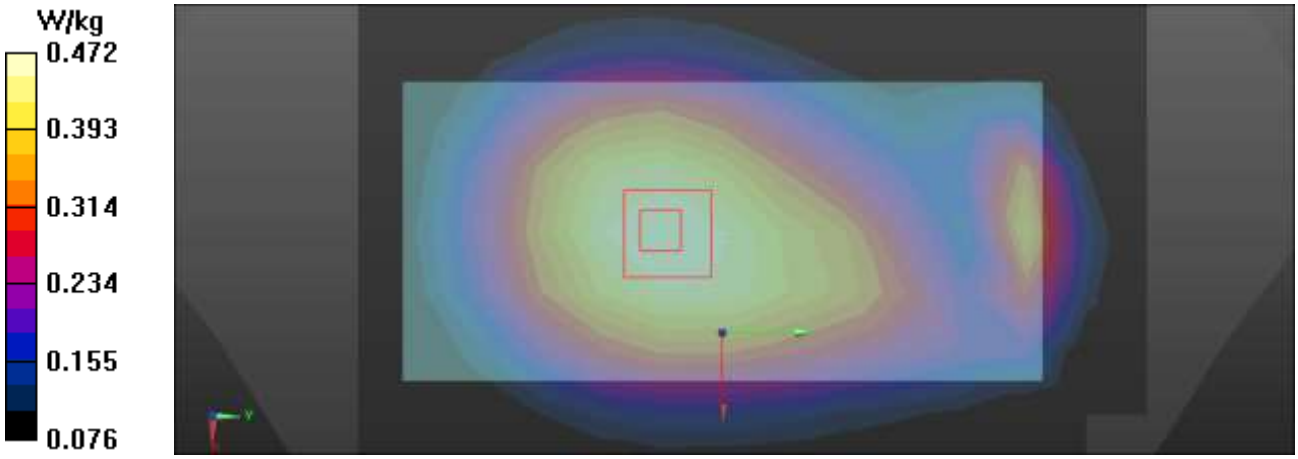
Communication System: UID 0, W-CDMA 850 (Band 5) (0); Frequency: 836.6 MHz; Duty Cycle: 1:1
Medium parameters used: f = 836.6 MHz; σ = 0.904 S/m; ε_r = 42.813; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3865; ConvF(9.89, 9.89, 9.89) @ 836.6 MHz; ; Calibrated: 1/25/2021
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1587; Calibrated: 7/29/2020
- Phantom: Twin-SAM V8.0_Right; Type: QD 000 P41 Ax; Serial: 1984
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/WCDMA_FDD_V_CH4183_Rear_15 mm/Area Scan (9x14x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.471 W/kg

Configuration/WCDMA_FDD_V_CH4183_Rear_15 mm/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.99 V/m; Power Drift = -0.00 dB
Peak SAR (extrapolated) = 0.522 W/kg
SAR(1 g) = 0.389 W/kg; SAR(10 g) = 0.294 W/kg
Smallest distance from peaks to all points 3 dB below: Larger than measurement grid
Ratio of SAR at M2 to SAR at M1 = 75.1%
Maximum value of SAR (measured) = 0.472 W/kg



14)

Date: 4/14/2021

Test Laboratory: KCTL Inc.
File Name: 5.LTE Band 5_Body.da53:0

DUT: SM-A225F/DSN, Type: Mobile Phone, Serial: R38R302E8FA

Communication System: UID 0, LTE Band 5 (0); Frequency: 836.5 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): f = 836.5 MHz; σ = 0.905 S/m; ε_r = 42.797; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

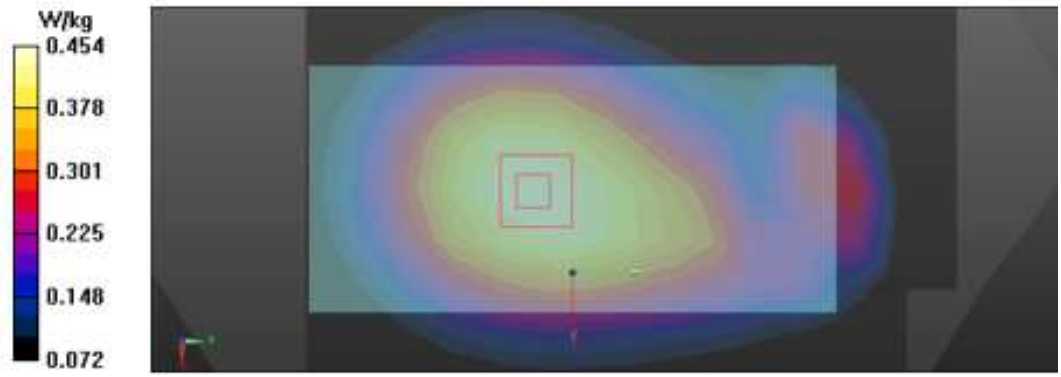
- Probe: EX3DV4 - SN3865; ConvF(9.89, 9.89, 9.89) @ 836.5 MHz; ; Calibrated: 1/25/2021
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1587; Calibrated: 7/29/2020
- Phantom: Twin-SAM V8.0_Right; Type: QD 000 P41 Ax; Serial: 1984
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/LTE Band 5_QPSK_10MHz_1RB_25offset_CH20525_Rear_15 mm/Area Scan (9x14x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.453 W/kg

Configuration/LTE Band 5_QPSK_10MHz_1RB_25offset_CH20525_Rear_15 mm/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.71 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 0.498 W/kg
SAR(1 g) = 0.373 W/kg; SAR(10 g) = 0.282 W/kg
Smallest distance from peaks to all points 3 dB below: Larger than measurement grid
Ratio of SAR at M2 to SAR at M1 = 74.7%

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.454 W/kg



15)

Date: 4/30/2021

Test Laboratory: KCTL Inc.
File Name: 2.LTE Band 41_Body.da53:0

DUT: SM-A225F/DSN, Type: Mobile Phone, Serial: R38R302E8FA

Communication System: UID 0, LTE Band 41 (0); Frequency: 2636.5 MHz; Duty Cycle: 1:1.58016
Medium parameters used (interpolated): f = 2636.5 MHz; σ = 2.031 S/m; ε_r = 38.502; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

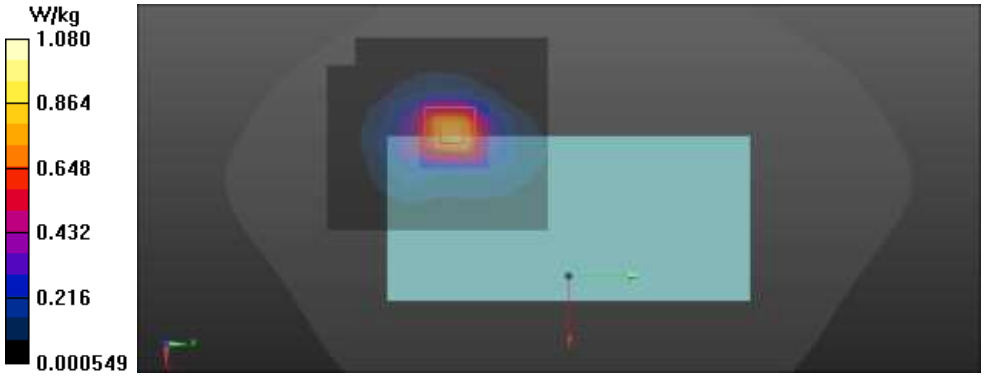
- Probe: EX3DV4 - SN3697;ConvF(6.85, 6.85, 6.85) @ 2636.5 MHz; Calibrated: 3/22/2021
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1342; Calibrated: 5/25/2020
- Phantom: Back_Right_Twin-SAM V8.0; Type: QD 000 P41 AA; Serial: 1975
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/LTE Band 41_QPSK_20 MHz_1RB_49offset_CH41055_Rear_15 mm/Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.749 W/kg

Configuration/LTE Band 41_QPSK_20 MHz_1RB_49offset_CH41055_Rear_15 mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 23.25 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 1.41 W/kg
SAR(1 g) = 0.599 W/kg; SAR(10 g) = 0.261 W/kg
Smallest distance from peaks to all points 3 dB below = 9 mm
Ratio of SAR at M2 to SAR at M1 = 41.9%

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.08 W/kg



16)

Date: 4/27/2021

Test Laboratory: KCTL Inc.
File Name: 2.802.11 b_Body.da53:0

DUT: SM-A225F/DSN, Type: Mobile Phone, Serial: R38R302E8FA

Communication System: UID 0, 2.4GWLAN (0); Frequency: 2437 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): f = 2437 MHz; σ = 1.844 S/m; ε_r = 38.386; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

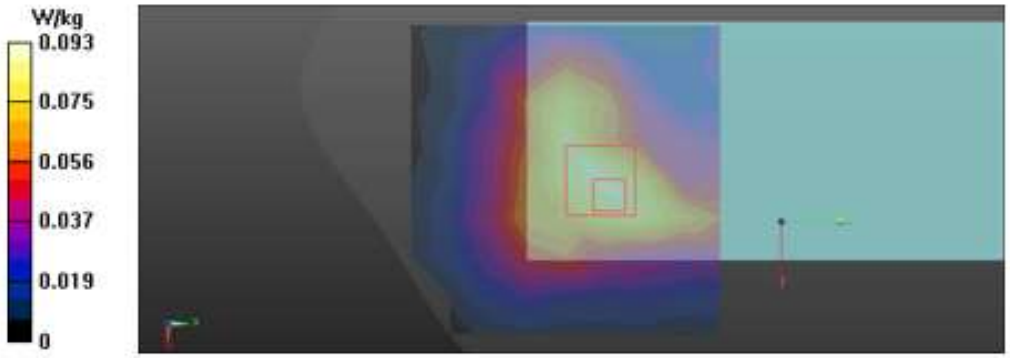
- Probe: EX3DV4 - SN3865; ConvF(7.87, 7.87, 7.87) @ 2437 MHz; ; Calibrated: 1/25/2021
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1587; Calibrated: 7/29/2020
- Phantom: Twin-SAM V8.0_Left; Type: QD 000 P41 Ax; Serial: 1983
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/802.11 b_CH6_Front_15 mm/Area Scan (9x9x1): Measurement grid: dx=12mm, dy=12mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.0922 W/kg

Configuration/802.11 b_CH6_Front_15 mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.827 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 0.120 W/kg
SAR(1 g) = 0.057 W/kg; SAR(10 g) = 0.032 W/kg
Smallest distance from peaks to all points 3 dB below: Larger than measurement grid
Ratio of SAR at M2 to SAR at M1 = 38.4%

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.0934 W/kg



17)

Date: 4/23/2021

Test Laboratory: KCTL Inc.
File Name: 2.802.11 a_Body.da53:0

DUT: SM-A225F/DSN, Type: Mobile Phone, Serial: R38R302E8FA

Communication System: UID 0, 5GWLAN (0); Frequency: 5300 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): f = 5300 MHz; σ = 4.775 S/m; ε_r = 35.55; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

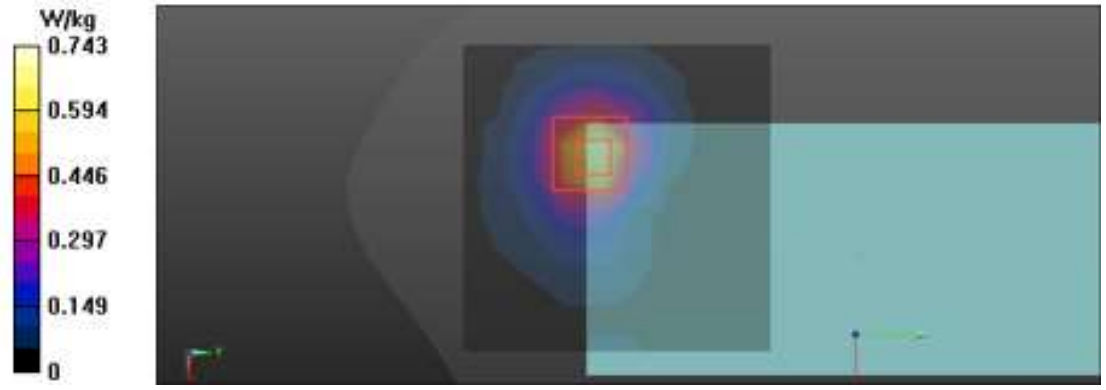
- Probe: EX3DV4 - SN3865; ConvF(5.43, 5.43, 5.43) @ 5300 MHz; ; Calibrated: 1/25/2021
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1587; Calibrated: 7/29/2020
- Phantom: Twin-SAM V8.0_Left; Type: QD 000 P41 Ax; Serial: 1983
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/802.11 a_CH60_Rear_15 mm/Area Scan (10x10x1): Measurement grid: dx=10mm, dy=10mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.696 W/kg

Configuration/802.11 a_CH60_Rear_15 mm/Zoom Scan (9x9x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 12.94 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 1.16 W/kg
SAR(1 g) = 0.331 W/kg; SAR(10 g) = 0.119 W/kg
Smallest distance from peaks to all points 3 dB below = 10.2 mm
Ratio of SAR at M2 to SAR at M1 = 65.3%

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.743 W/kg



18)

Date: 4/24/2021

Test Laboratory: KCTL Inc.
File Name: 2.802.11 a_Body.da53:0

DUT: SM-A225F/DSN, Type: Mobile Phone, Serial: R38R302E8FA

Communication System: UID 0, 5GWLAN (0); Frequency: 5620 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): f = 5620 MHz; σ = 5.122 S/m; ε_r = 35.478; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

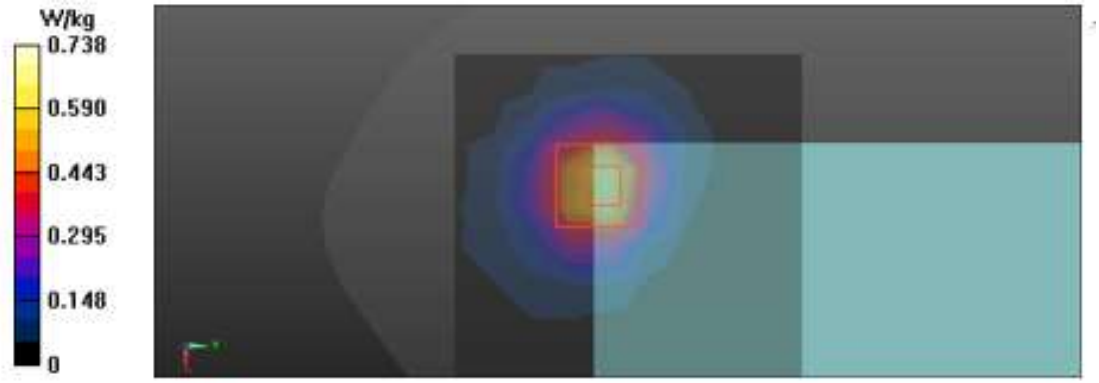
- Probe: EX3DV4 - SN3865; ConvF(5.02, 5.02, 5.02) @ 5620 MHz; ; Calibrated: 1/25/2021
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1587; Calibrated: 7/29/2020
- Phantom: Twin-SAM V8.0_Left; Type: QD 000 P41 Ax; Serial: 1983
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/802.11 a_CH124_Rear_15 mm/Area Scan (10x10x1): Measurement grid: dx=10mm, dy=10mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.690 W/kg

Configuration/802.11 a_CH124_Rear_15 mm/Zoom Scan (9x9x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 1.781 V/m; Power Drift = 0.18 dB
Peak SAR (extrapolated) = 1.20 W/kg
SAR(1 g) = 0.317 W/kg; SAR(10 g) = 0.115 W/kg
Smallest distance from peaks to all points 3 dB below = 10.7 mm
Ratio of SAR at M2 to SAR at M1 = 63.1%

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.738 W/kg



19)

Date: 4/26/2021

Test Laboratory: KCTL Inc.
File Name: 2.802.11 n_HT40_Body.da53:0

DUT: SM-A225F/DSN, Type: Mobile Phone, Serial: R38R302E8FA

Communication System: UID 0, 5GWLAN (0); Frequency: 5795 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): f = 5795 MHz; σ = 5.339 S/m; ε_r = 35.632; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

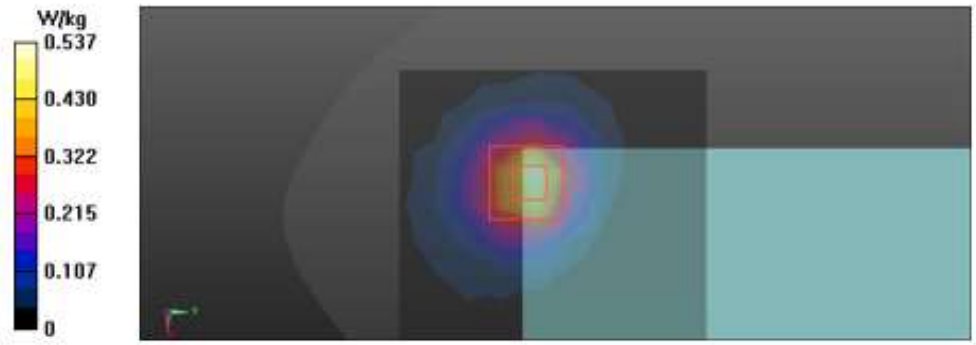
- Probe: EX3DV4 - SN3865; ConvF(4.99, 4.99, 4.99) @ 5795 MHz; ; Calibrated: 1/25/2021
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1587; Calibrated: 7/29/2020
- Phantom: Twin-SAM V8.0_Left; Type: QD 000 P41 Ax; Serial: 1983
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/802.11 n_HT40_CH159_Rear_15 mm/Area Scan (10x10x1): Measurement grid: dx=10mm, dy=10mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.522 W/kg

Configuration/802.11 n_HT40_CH159_Rear_15 mm/Zoom Scan (9x9x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 10.63 V/m; Power Drift = -0.11 dB
Peak SAR (extrapolated) = 0.871 W/kg
SAR(1 g) = 0.222 W/kg; SAR(10 g) = 0.079 W/kg
Smallest distance from peaks to all points 3 dB below = 11.3 mm
Ratio of SAR at M2 to SAR at M1 = 61%

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.537 W/kg



20)

Date: 4/13/2021

Test Laboratory: KCTL Inc.
File Name: 3.GSM850_Hotspot.da53:1

DUT: SM-A225F/DSN, Type: Mobile Phone, Serial: R38R302E8FA

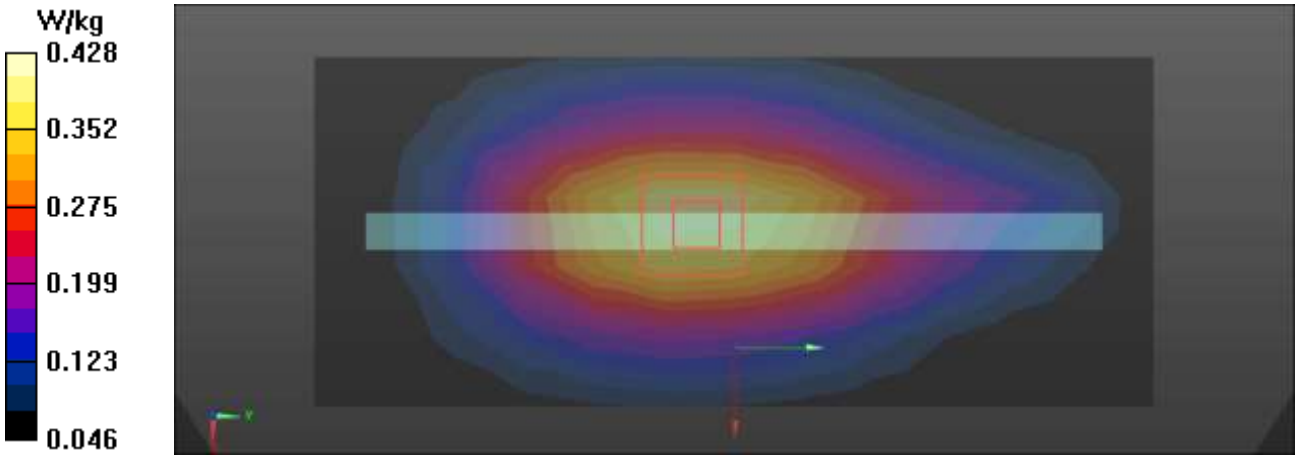
Communication System: UID 0, GSM850_4TX (0); Frequency: 836.6 MHz; Duty Cycle: 1:2.07491
Medium parameters used: f = 836.6 MHz; σ = 0.909 S/m; ε_r = 42.894; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3865; ConvF(9.89, 9.89, 9.89) @ 836.6 MHz; ; Calibrated: 1/25/2021
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1587; Calibrated: 7/29/2020
- Phantom: Twin-SAM V8.0_Right; Type: QD 000 P41 Ax; Serial: 1984
- Measurement SW: DASY52, Version 52.10 (4);

Configuration 2/GSM850_GPRS 4Tx_CH190_Right_10 mm/Area Scan (6x13x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.397 W/kg

Configuration 2/GSM850_GPRS 4Tx_CH190_Right_10 mm/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.20 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 0.485 W/kg
SAR(1 g) = 0.326 W/kg; SAR(10 g) = 0.224 W/kg
Smallest distance from peaks to all points 3 dB below: Larger than measurement grid
Ratio of SAR at M2 to SAR at M1 = 67%
Maximum value of SAR (measured) = 0.428 W/kg



21)

Date: 4/14/2021

Test Laboratory: KCTL Inc.
File Name: 3.GSM 1900_Hotspot.da53:2

DUT: SM-A225F/DSN, Type: Mobile Phone, Serial: R38R302E8FA

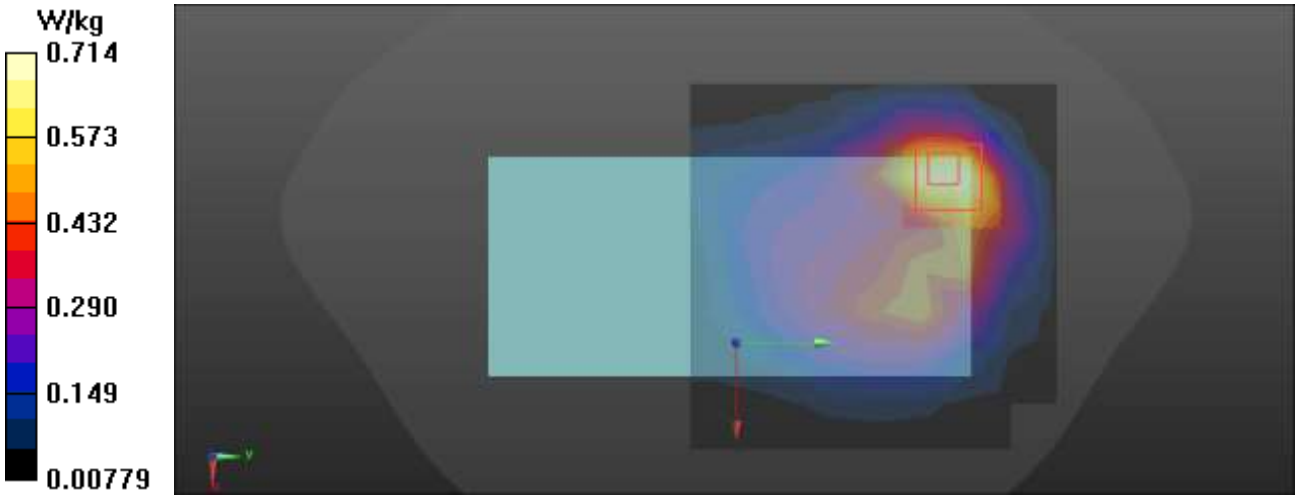
Communication System: UID 0, GSM1900_4TX (0); Frequency: 1880 MHz; Duty Cycle: 1:2.07491
Medium parameters used: f = 1880 MHz; σ = 1.395 S/m; ε_r = 39.117; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3697;ConvF(7.64, 7.64, 7.64) @ 1880 MHz; Calibrated: 3/22/2021
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1342; Calibrated: 5/25/2020
- Phantom: Back_Left_Twin-SAM V8.0; Type: QD 000 P41 AA; Serial: 1974
- Measurement SW: DASY52, Version 52.10 (4);

Configuration 2/GSM 1900_GPRS 4Tx_CH661_Rear_10 mm/Area Scan (9x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.725 W/kg

Configuration 2/GSM 1900_GPRS 4Tx_CH661_Rear_10 mm/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.64 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 0.931 W/kg
SAR(1 g) = 0.479 W/kg; SAR(10 g) = 0.259 W/kg
Smallest distance from peaks to all points 3 dB below = 11.2 mm
Ratio of SAR at M2 to SAR at M1 = 49.9%
Maximum value of SAR (measured) = 0.714 W/kg



22)

Date: 4/14/2021

Test Laboratory: KCTL Inc.
File Name: 3.WCDMA Band 5_Hotspot.da53:0

DUT: SM-A225F/DSN, Type: Mobile Phone, Serial: R38R302E8FA

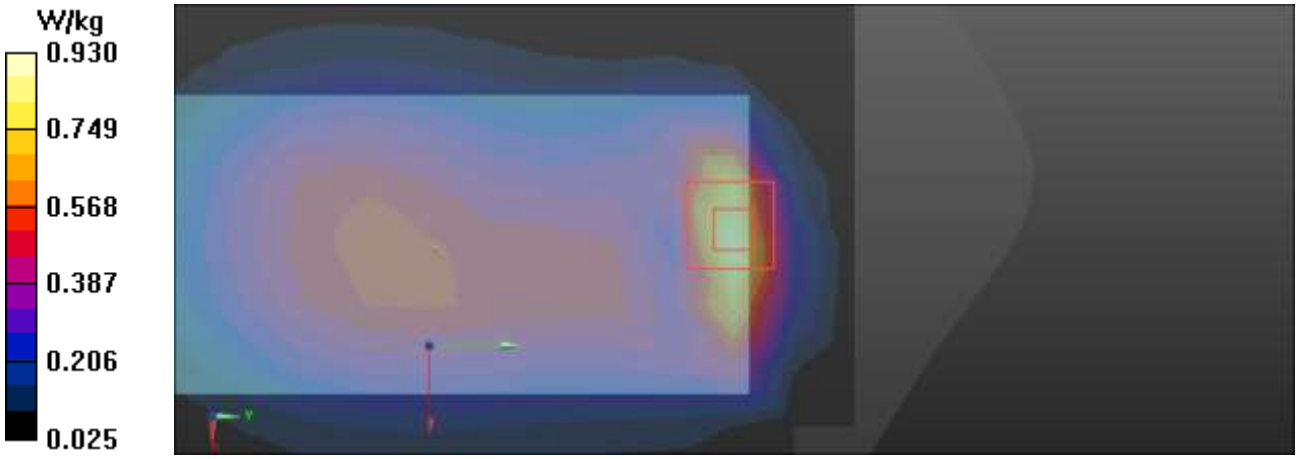
Communication System: UID 0, W-CDMA 850 (Band 5) (0); Frequency: 836.6 MHz; Duty Cycle: 1:1
Medium parameters used: f = 836.6 MHz; σ = 0.904 S/m; ε_r = 42.813; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3865; ConvF(9.89, 9.89, 9.89) @ 836.6 MHz; ; Calibrated: 1/25/2021
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1587; Calibrated: 7/29/2020
- Phantom: Twin-SAM V8.0_Right; Type: QD 000 P41 Ax; Serial: 1984
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/WCDMA_FDD_V_CH4183_Rear_10 mm/Area Scan (9x14x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.927 W/kg

Configuration/WCDMA_FDD_V_CH4183_Rear_10 mm/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 24.73 V/m; Power Drift = -0.00 dB
Peak SAR (extrapolated) = 1.14 W/kg
SAR(1 g) = 0.581 W/kg; SAR(10 g) = 0.313 W/kg
Smallest distance from peaks to all points 3 dB below = 10.1 mm
Ratio of SAR at M2 to SAR at M1 = 51.2%
Maximum value of SAR (measured) = 0.930 W/kg



23)

Date: 4/14/2021

Test Laboratory: KCTL Inc.
File Name: 6.LTE Band 5_Hotspot.da53:0

DUT: SM-A225F/DSN, Type: Mobile Phone, Serial: R38R302E8FA

Communication System: UID 0, LTE Band 5 (0); Frequency: 836.5 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): f = 836.5 MHz; σ = 0.905 S/m; ε_r = 42.797; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

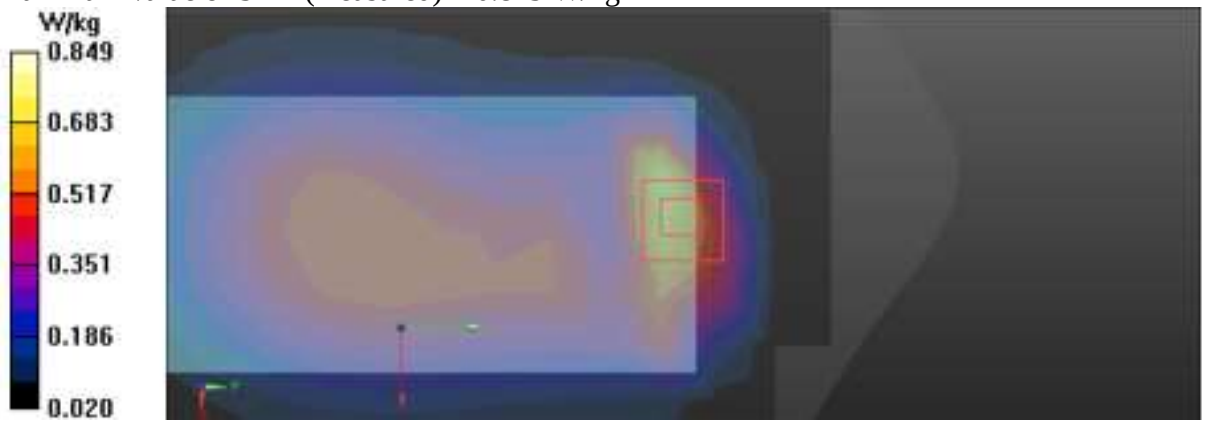
- Probe: EX3DV4 - SN3865; ConvF(9.89, 9.89, 9.89) @ 836.5 MHz; ; Calibrated: 1/25/2021
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1587; Calibrated: 7/29/2020
- Phantom: Twin-SAM V8.0_Right; Type: QD 000 P41 Ax; Serial: 1984
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/LTE Band 5_QPSK_10MHz_1RB_25offset_CH20525_Rear_10 mm/Area Scan (9x14x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.751 W/kg

Configuration/LTE Band 5_QPSK_10MHz_1RB_25offset_CH20525_Rear_10 mm/Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 24.10 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 1.08 W/kg
SAR(1 g) = 0.552 W/kg; SAR(10 g) = 0.297 W/kg
Smallest distance from peaks to all points 3 dB below = 9.7 mm
Ratio of SAR at M2 to SAR at M1 = 51.1%

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.849 W/kg



24)

Date: 4/30/2021

Test Laboratory: KCTL Inc.
File Name: 3.LTE Band 41_Hotspot.da53:0

DUT: SM-A225F/DSN, Type: Mobile Phone, Serial: R38R302E8FA

Communication System: UID 0, LTE Band 41 (0); Frequency: 2636.5 MHz; Duty Cycle: 1:1.58016
Medium parameters used (interpolated): f = 2636.5 MHz; σ = 2.031 S/m; ε_r = 38.502; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

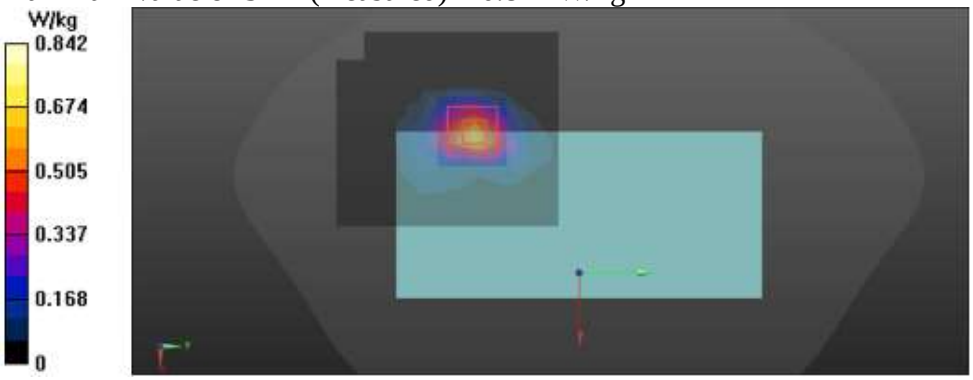
- Probe: EX3DV4 - SN3697;ConvF(6.85, 6.85, 6.85) @ 2636.5 MHz; Calibrated: 3/22/2021
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1342; Calibrated: 5/25/2020
- Phantom: Back_Right_Twin-SAM V8.0; Type: QD 000 P41 AA; Serial: 1975
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/LTE Band 41_QPSK_20 MHz_50RB_0offset_CH41055_Rear_10 mm/Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.658 W/kg

Configuration/LTE Band 41_QPSK_20 MHz_50RB_0offset_CH41055_Rear_10 mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 20.11 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 1.12 W/kg
SAR(1 g) = 0.448 W/kg; SAR(10 g) = 0.177 W/kg
Smallest distance from peaks to all points 3 dB below = 8 mm
Ratio of SAR at M2 to SAR at M1 = 40.4%

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.842 W/kg



25)

Date: 4/27/2021

Test Laboratory: KCTL Inc.
File Name: 3.802.11 b_Hotspot.da53:0

DUT: SM-A225F/DSN, Type: Mobile Phone, Serial: R38R302E8FA

Communication System: UID 0, 2.4GWLAN (0); Frequency: 2437 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): f = 2437 MHz; σ = 1.844 S/m; ε_r = 38.386; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

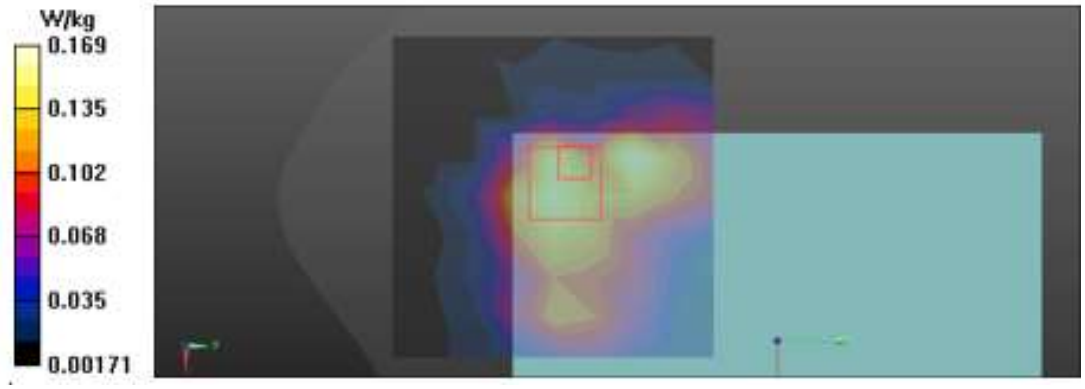
- Probe: EX3DV4 - SN3865; ConvF(7.87, 7.87, 7.87) @ 2437 MHz; ; Calibrated: 1/25/2021
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1587; Calibrated: 7/29/2020
- Phantom: Twin-SAM V8.0_Left; Type: QD 000 P41 Ax; Serial: 1983
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/802.11 b_CH6_Rear_10 mm/Area Scan (9x9x1): Measurement grid: dx=12mm, dy=12mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.169 W/kg

Configuration/802.11 b_CH6_Rear_10 mm/Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.776 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.289 W/kg
SAR(1 g) = 0.113 W/kg; SAR(10 g) = 0.058 W/kg
Smallest distance from peaks to all points 3 dB below = 4 mm
Ratio of SAR at M2 to SAR at M1 = 48%

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.229 W/kg



26)

Date: 4/26/2021

Test Laboratory: KCTL Inc.
File Name: 3.802.11 n_HT40_Hotspot.da53:0

DUT: SM-A225F/DSN, Type: Mobile Phone, Serial: R38R302E8FA

Communication System: UID 0, 5GWLAN (0); Frequency: 5795 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): f = 5795 MHz; σ = 5.339 S/m; ε_r = 35.632; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

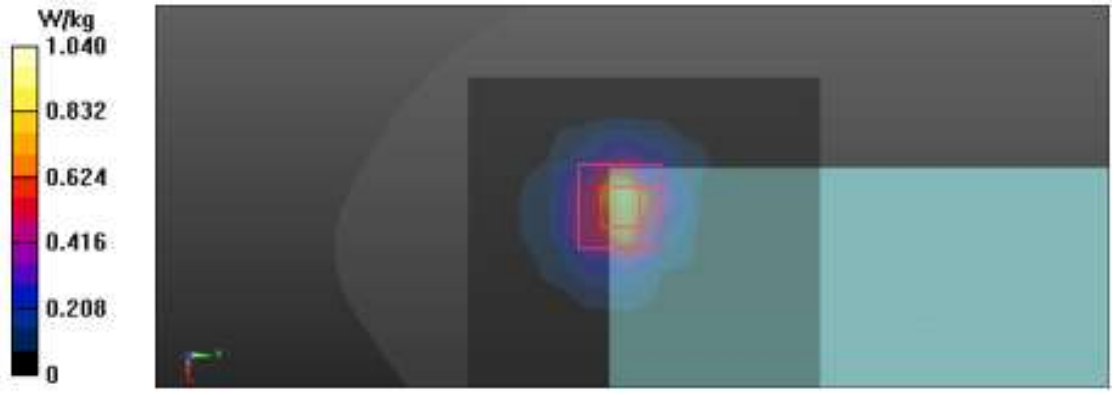
- Probe: EX3DV4 - SN3865; ConvF(4.99, 4.99, 4.99) @ 5795 MHz; ; Calibrated: 1/25/2021
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1587; Calibrated: 7/29/2020
- Phantom: Twin-SAM V8.0_Left; Type: QD 000 P41 Ax; Serial: 1983
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/802.11 n_HT40_CH159_Rear_10 mm/Area Scan (10x10x1): Measurement grid: dx=10mm, dy=10mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.973 W/kg

Configuration/802.11 n_HT40_CH159_Rear_10 mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 13.37 V/m; Power Drift = -0.13 dB
Peak SAR (extrapolated) = 1.75 W/kg
SAR(1 g) = 0.406 W/kg; SAR(10 g) = 0.124 W/kg
Smallest distance from peaks to all points 3 dB below = 8.2 mm
Ratio of SAR at M2 to SAR at M1 = 61.1%

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.04 W/kg



27)

Date: 5/16/2021

Test Laboratory: KCTL Inc.
File Name: 4.LTE Band 41_Phablet.da53:0

DUT: SM-A225F/DSN, Type: Mobile Phone, Serial: R38R302E8FA

Communication System: UID 0, LTE Band 41 (0); Frequency: 2636.5 MHz; Duty Cycle: 1:1.58016
Medium parameters used (interpolated): f = 2636.5 MHz; σ = 2.046 S/m; ε_r = 38.123; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

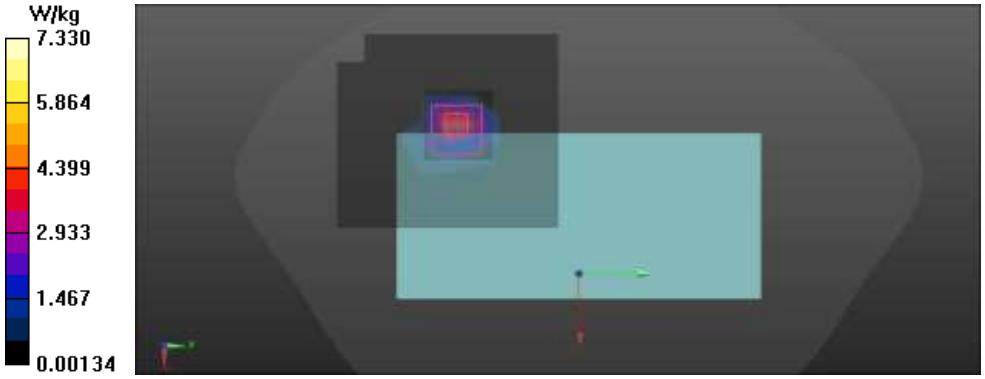
- Probe: EX3DV4 - SN3697;ConvF(6.85, 6.85, 6.85) @ 2636.5 MHz; Calibrated: 3/22/2021
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1342; Calibrated: 5/25/2020
- Phantom: Back_Right_Twin-SAM V8.0; Type: QD 000 P41 AA; Serial: 1975
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/LTE Band 41_QPSK_20 MHz_1RB_49offset_CH41055_Rear_0 mm/Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 3.88 W/kg

Configuration/LTE Band 41_QPSK_20 MHz_1RB_49offset_CH41055_Rear_0 mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 51.22 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 11.5 W/kg
SAR(1 g) = 2.79 W/kg; SAR(10 g) = 0.891 W/kg
Smallest distance from peaks to all points 3 dB below = 4.1 mm
Ratio of SAR at M2 to SAR at M1 = 24.9%

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 7.33 W/kg



28)

Date: 4/23/2021

Test Laboratory: KCTL Inc.
File Name: 3.802.11 a_Phablet.da53:0

DUT: SM-A225F/DSN, Type: Mobile Phone, Serial: R38R302E8FA

Communication System: UID 0, 5GWLAN (0); Frequency: 5300 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): f = 5300 MHz; σ = 4.775 S/m; ε_r = 35.55; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

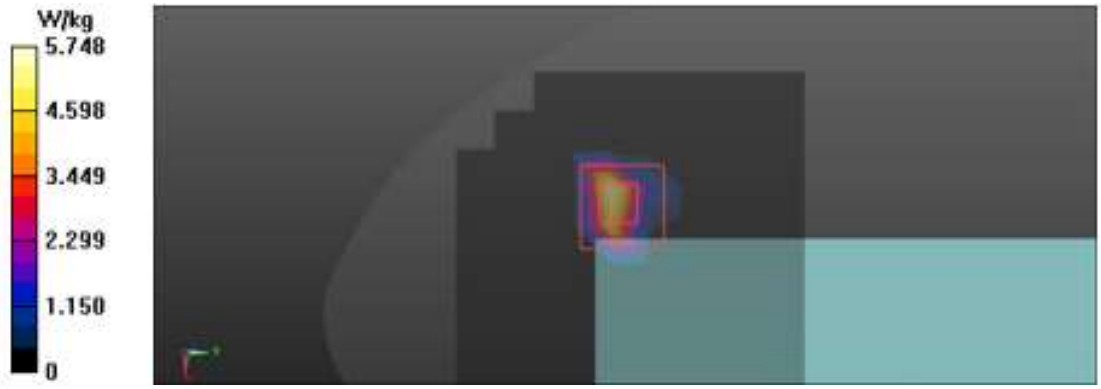
- Probe: EX3DV4 - SN3865; ConvF(5.43, 5.43, 5.43) @ 5300 MHz; ; Calibrated: 1/25/2021
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1587; Calibrated: 7/29/2020
- Phantom: Twin-SAM V8.0_Left; Type: QD 000 P41 Ax; Serial: 1983
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/802.11 a_CH60_Rear_0 mm/Area Scan (11x10x1): Measurement grid: dx=10mm, dy=10mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 5.75 W/kg

Configuration/802.11 a_CH60_Rear_0 mm/Zoom Scan (9x9x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 5.415 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 19.0 W/kg
SAR(1 g) = 3.06 W/kg; SAR(10 g) = 0.574 W/kg
Smallest distance from peaks to all points 3 dB below = 3.6 mm
Ratio of SAR at M2 to SAR at M1 = 61%

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 10.5 W/kg



29)

Date: 4/24/2021

Test Laboratory: KCTL Inc.
File Name: 3.802.11 a_Phablet.da53:0

DUT: SM-A225F/DSN, Type: Mobile Phone, Serial: R38R302E8FA

Communication System: UID 0, 5GWLAN (0); Frequency: 5620 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): f = 5620 MHz; σ = 5.122 S/m; ε_r = 35.478; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY5 Configuration:

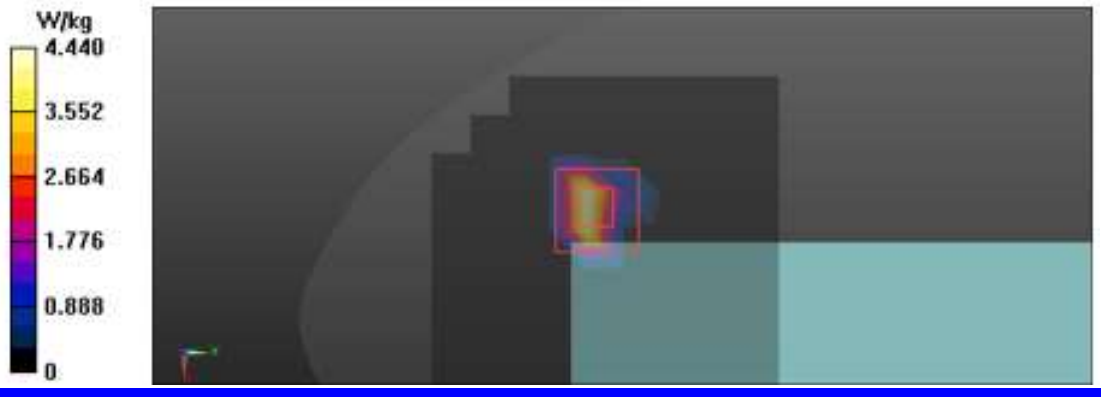
- Probe: EX3DV4 - SN3865; ConvF(5.02, 5.02, 5.02) @ 5620 MHz; ; Calibrated: 1/25/2021
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1587; Calibrated: 7/29/2020
- Phantom: Twin-SAM V8.0_Left; Type: QD 000 P41 Ax; Serial: 1983
- Measurement SW: DASY52, Version 52.10 (4);

Configuration/802.11 a_CH124_Rear_0 mm/Area Scan (11x10x1): Measurement grid: dx=10mm, dy=10mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 4.44 W/kg

Configuration/802.11 a_CH124_Rear_0 mm/Zoom Scan (9x9x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 5.211 V/m; Power Drift = -0.16 dB
Peak SAR (extrapolated) = 16.3 W/kg
SAR(1 g) = 2.51 W/kg; SAR(10 g) = 0.470 W/kg
Smallest distance from peaks to all points 3 dB below = 4 mm
Ratio of SAR at M2 to SAR at M1 = 59.1%

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 8.66 W/kg



Appendixes List

Appendix A	A.1 Probe Calibration certificate (EX3DV4_3697) A.2 Probe Calibration certificate (EX3DV4_3685) A.3 Dipole Calibration certificate (D850V2_1006) A.4 Dipole Calibration certificate (D1900V2_5d160) A.5 Dipole Calibration certificate (D2450V2_895) A.6 Dipole Calibration certificate (D2600V2_1050) A.7 Dipole Calibration certificate (D5GHzV2_1134)
Appendix B	SAR Tissue Specification
Appendix C	#Antenna Location & Distance
Appendix D	EUT Photo
Appendix E	Test Setup Photo
Appendix F	Power Reduction Verification