



SAR EVALUATION REPORT

Applicant Name:

LG Electronics MobileComm U.S.A., Inc.
1000 Sylvan Avenue
Englewood Cliffs, NJ 07632
United States

Date of Testing:

07/05/16 - 07/19/16

Test Site/Location:

PCTEST Lab, Columbia, MD, USA

Document Serial No.:

0Y1607051202-R2.ZNF

FCC ID:

ZNFLS997

APPLICANT:

LG ELECTRONICS MOBILECOMM U.S.A., INC.

DUT Type:

Portable Handset

Application Type:

Certification

FCC Rule Part(s):

CFR §2.1093

Model(s):

LG-LS997, LGLS997, LS997

Equipment Class	Band & Mode	Tx Frequency	SAR			
			1 gm Head (W/kg)	1 gm Body-Worn (W/kg)	1 gm Hotspot (W/kg)	10 gm Phablet (W/kg)
PCE	GSM/GPRS/EDGE 850	824.20 - 848.80 MHz	0.48	0.68	0.68	N/A
PCE	GSM/GPRS/EDGE 1900	1850.20 - 1909.80 MHz	0.22	0.66	0.66	N/A
PCE	UMTS 850	826.40 - 846.60 MHz	0.30	0.60	0.60	N/A
PCE	UMTS 1750	1712.4 - 1752.6 MHz	0.25	0.72	0.85	N/A
PCE	UMTS 1900	1852.4 - 1907.6 MHz	0.33	1.19	1.19	N/A
PCE	CDMA/EVDO BC10 (\$90S)	817.90 - 823.10 MHz	0.28	0.39	0.36	N/A
PCE	CDMA/EVDO BC0 (\$22H)	824.70 - 848.31 MHz	0.31	0.57	0.55	N/A
PCE	PCS CDMA/EVDO	1851.25 - 1908.75 MHz	0.35	1.14	1.07	N/A
PCE	LTE Band 12	699.7 - 715.3 MHz	0.30	0.35	0.37	N/A
PCE	LTE Band 26 (Cell)	814.7 - 848.3 MHz	0.73	0.32	0.34	N/A
PCE	LTE Band 5 (Cell)	824.7 - 848.3 MHz	N/A	N/A	N/A	N/A
PCE	LTE Band 4 (AWS)	1710.7 - 1754.3 MHz	0.23	0.58	0.58	N/A
PCE	LTE Band 25 (PCS)	1850.7 - 1914.3 MHz	0.39	1.05	1.05	N/A
PCE	LTE Band 2 (PCS)	1850.7 - 1909.3 MHz	N/A	N/A	N/A	N/A
PCE	LTE Band 41	2498.5 - 2687.5 MHz	0.11	0.31	0.43	N/A
DTS	2.4 GHz WLAN	2412 - 2462 MHz	0.48	0.29	0.36	N/A
NIJ	U-NII-1	5180 - 5240 MHz	N/A	N/A	0.28	N/A
NIJ	U-NII-2A	5260 - 5320 MHz	0.49	0.14	N/A	0.71
NIJ	U-NII-2C	5500 - 5720 MHz	0.75	< 0.1	N/A	0.52
NIJ	U-NII-3	5745 - 5825 MHz	0.66	< 0.1	0.10	N/A
DSS/DTS	Bluetooth	2402 - 2480 MHz	N/A	< 0.1	N/A	0.12
Simultaneous SAR per KDB 690783 D01v01r03:			1.59	1.57	1.59	1.14

Note: This revised Test Report (S/N: 0Y1607051202-R2.ZNF) supersedes and replaces the previously issued test report on the same subject device for the same type of testing as indicated. Please discard or destroy the previously issued test report(s) and dispose of it accordingly.

This wireless portable device has been shown to be capable of compliance for localized specific absorption rate (SAR) for uncontrolled environment/general population exposure limits specified in ANSI/IEEE C95.1-1992 and has been tested in accordance with the measurement procedures specified in Section 1.8 of this report; for North American frequency bands only.

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them. Test results reported herein relate only to the item(s) tested.


Randy Ortanez
President



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FCC ID: ZNFLS997		SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: 0Y1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset		Page 1 of 83

T A B L E O F C O N T E N T S

1	DEVICE UNDER TEST	3
2	LTE INFORMATION	13
3	INTRODUCTION	14
4	DOSIMETRIC ASSESSMENT	15
5	DEFINITION OF REFERENCE POINTS	16
6	TEST CONFIGURATION POSITIONS	17
7	RF EXPOSURE LIMITS	20
8	FCC MEASUREMENT PROCEDURES.....	21
9	RF CONDUCTED POWERS	28
10	SYSTEM VERIFICATION.....	50
11	SAR DATA SUMMARY	54
12	FCC MULTI-TX AND ANTENNA SAR CONSIDERATIONS.....	71
13	SAR MEASUREMENT VARIABILITY	78
14	EQUIPMENT LIST.....	79
15	MEASUREMENT UNCERTAINTIES.....	80
16	CONCLUSION.....	81
17	REFERENCES	82
APPENDIX A: SAR TEST PLOTS		
APPENDIX B: SAR DIPOLE VERIFICATION PLOTS		
APPENDIX C: PROBE AND DIPOLE CALIBRATION CERTIFICATES		
APPENDIX D: SAR TISSUE SPECIFICATIONS		
APPENDIX E: SAR SYSTEM VALIDATION		
APPENDIX F: DUT ANTENNA DIAGRAM & SAR TEST SETUP PHOTOGRAPHS		

FCC ID: ZNFLS997	 SAR EVALUATION REPORT 	Reviewed by: Quality Manager
Document S/N: 0Y1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset
		Page 2 of 83

1 DEVICE UNDER TEST

1.1 Device Overview

Band & Mode	Operating Modes	Tx Frequency
GSM/GPRS/EDGE 850	Voice/Data	824.20 - 848.80 MHz
GSM/GPRS/EDGE 1900	Voice/Data	1850.20 - 1909.80 MHz
UMTS 850	Voice/Data	826.40 - 846.60 MHz
UMTS 1750	Voice/Data	1712.4 - 1752.6 MHz
UMTS 1900	Voice/Data	1852.4 - 1907.6 MHz
CDMA/EVDO BC10 (§90S)	Voice/Data	817.90 - 823.10 MHz
CDMA/EVDO BC0 (§22H)	Voice/Data	824.70 - 848.31 MHz
PCS CDMA/EVDO	Voice/Data	1851.25 - 1908.75 MHz
LTE Band 12	Voice/Data	699.7 - 715.3 MHz
LTE Band 26 (Cell)	Voice/Data	814.7 - 848.3 MHz
LTE Band 5 (Cell)	Voice/Data	824.7 - 848.3 MHz
LTE Band 4 (AWS)	Voice/Data	1710.7 - 1754.3 MHz
LTE Band 25 (PCS)	Voice/Data	1850.7 - 1914.3 MHz
LTE Band 2 (PCS)	Voice/Data	1850.7 - 1909.3 MHz
LTE Band 41	Voice/Data	2498.5 - 2687.5 MHz
2.4 GHz WLAN	Voice/Data	2412 - 2462 MHz
U-NII-1	Voice/Data	5180 - 5240 MHz
U-NII-2A	Voice/Data	5260 - 5320 MHz
U-NII-2C	Voice/Data	5500 - 5720 MHz
U-NII-3	Voice/Data	5745 - 5825 MHz
Bluetooth	Data	2402 - 2480 MHz
NFC	Data	13.56 MHz

1.2 Power Reduction for SAR

This device uses a fixed level power reduction mechanism for WLAN operations during voice or VoIP 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. The reduced powers for the power reduction mechanisms were confirmed via conducted power measurement at the RF port (See Section 9). Detailed descriptions of the power reduction mechanism are included in the operational description.

FCC ID: ZNFLS997	 PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: 0Y1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset		Page 3 of 83

1.3 Nominal and Maximum Output Power Specifications

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

1.3.1 Maximum PCE Power

Mode / Band		Voice (dBm)	Burst Average GMSK (dBm)		Burst Average 8-PSK (dBm)	
		1 TX Slot	1 TX Slots	2 TX Slots	1 TX Slots	2 TX Slots
GSM/GPRS/EDGE 850	Maximum	33.7	33.7	32.2	27.2	27.2
	Nominal	33.2	33.2	31.7	26.7	26.7
GSM/GPRS/EDGE 1900	Maximum	30.7	30.7	29.2	26.2	26.2
	Nominal	30.2	30.2	28.7	25.7	25.7

Mode / Band		Modulated Average (dBm)		
		3GPP WCDMA	3GPP HSDPA	3GPP HSUPA
UMTS Band 5 (850 MHz)	Maximum	24.7	24.7	24.7
	Nominal	24.2	24.2	24.2
UMTS Band 4 (1750 MHz)	Maximum	25.0	25.0	25.0
	Nominal	24.5	24.5	24.5
UMTS Band 2 (1900 MHz)	Maximum	25.0	25.0	25.0
	Nominal	24.5	24.5	24.5

Mode / Band		Modulated Average (dBm)
CDMA/EVDO BC10 (\$90S)	Maximum	25.2
	Nominal	24.7
CDMA/EVDO BC0 (\$22H)	Maximum	25.2
	Nominal	24.7
PCS CDMA/EVDO	Maximum	25.2
	Nominal	24.7

FCC ID: ZNFLS997	 SAR EVALUATION REPORT 		Reviewed by: Quality Manager
Document S/N: 0Y1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset	Page 4 of 83

Mode / Band		Modulated Average (dBm)
LTE Band 12	Maximum	25.0
	Nominal	24.5
LTE Band 26 (Cell)	Maximum	24.7
	Nominal	24.2
LTE Band 5 (Cell)	Maximum	24.7
	Nominal	24.2
LTE Band 4 (AWS)	Maximum	24.7
	Nominal	24.2
LTE Band 25 (PCS)	Maximum	24.7
	Nominal	24.2
LTE Band 2 (PCS)	Maximum	24.7
	Nominal	24.2
LTE Band 41	Maximum	24.7
	Nominal	24.2

1.3.2 Maximum WLAN/BT Power

Mode / Band		Modulated Average - Single Tx Chain (Primary Antenna) (dBm)		
		Ch. 1-3	Ch. 4-8	Ch. 9-11
IEEE 802.11b (2.4 GHz)	Maximum	19.0	20.0	18.0
	Nominal	18.0	19.0	17.0
IEEE 802.11g (2.4 GHz)	Maximum	14.5	15.5	13.5
	Nominal	13.5	14.5	12.5
IEEE 802.11n (2.4 GHz)	Maximum	14.5	15.5	13.5
	Nominal	13.5	14.5	12.5
IEEE 802.11ac (2.4 GHz)	Maximum	14.5	15.5	13.5
	Nominal	13.5	14.5	12.5

Mode / Band		Modulated Average - Single Tx Chain (Secondary Antenna) (dBm)		
		Ch. 1-3	Ch. 4-8	Ch. 9-11
IEEE 802.11b (2.4 GHz)	Maximum	19.5	20.0	19.0
	Nominal	18.5	19.0	18.0
IEEE 802.11g (2.4 GHz)	Maximum	15.0	15.5	14.5
	Nominal	14.0	14.5	13.5
IEEE 802.11n (2.4 GHz)	Maximum	15.0	15.5	14.5
	Nominal	14.0	14.5	13.5
IEEE 802.11ac (2.4 GHz)	Maximum	15.0	15.5	14.5
	Nominal	14.0	14.5	13.5

FCC ID: ZNFLS997	 SAR EVALUATION REPORT 		Reviewed by: Quality Manager
Document S/N: 0Y1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset	Page 5 of 83

Mode / Band		Modulated Average - MIMO (dBm)		
		Ch. 1-3	Ch. 4-8	Ch. 9-11
IEEE 802.11g (2.4 GHz)	Maximum	17.8	18.5	17.0
	Nominal	16.8	17.5	16.0
IEEE 802.11n (2.4 GHz)	Maximum	17.8	18.5	17.0
	Nominal	16.8	17.5	16.0
IEEE 802.11ac (2.4 GHz)	Maximum	17.8	18.5	17.0
	Nominal	16.8	17.5	16.0

Mode / Band		Modulated Average - Single Tx Chain (Primary Antenna) (dBm)				
		20 MHz Bandwidth	40 MHz Bandwidth		80 MHz Bandwidth	
			Ch. 38, 62, 102	Ch. 46-54, 110-159	Ch. 42-106	Ch. 138-155
IEEE 802.11a (5 GHz)	Maximum	15.0				
	Nominal	14.0				
IEEE 802.11n (5 GHz)	Maximum	15.0	12.0	14.0		
	Nominal	14.0	11.0	13.0		
IEEE 802.11ac (5 GHz)	Maximum	15.0	12.0	14.0	11.5	13.5
	Nominal	14.0	11.0	13.0	10.5	12.5

Mode / Band		Modulated Average - Single Tx Chain (Secondary Antenna) (dBm)				
		20 MHz Bandwidth	40 MHz Bandwidth		80 MHz Bandwidth	
			Ch. 38, 62, 102	Ch. 46-54, 110-159	Ch. 42-106	Ch. 138-155
IEEE 802.11a (5 GHz)	Maximum	14.0				
	Nominal	13.0				
IEEE 802.11n (5 GHz)	Maximum	14.0	11.0	13.0		
	Nominal	13.0	10.0	12.0		
IEEE 802.11ac (5 GHz)	Maximum	14.0	11.0	13.0	10.5	12.5
	Nominal	13.0	10.0	12.0	9.5	11.5

Mode / Band		Modulated Average - MIMO (dBm)				
		20 MHz Bandwidth	40 MHz Bandwidth		80 MHz Bandwidth	
			Ch. 38, 62, 102	Ch. 46-54, 110-159	Ch. 42-106	Ch. 138-155
IEEE 802.11a (5 GHz)	Maximum	17.5				
	Nominal	16.5				
IEEE 802.11n (5 GHz)	Maximum	17.5	14.5	16.5		
	Nominal	16.5	13.5	15.5		
IEEE 802.11ac (5 GHz)	Maximum	17.5	14.5	16.5	14.0	16.0
	Nominal	16.5	13.5	15.5	13.0	15.0

FCC ID: ZNFLS997	 SAR EVALUATION REPORT 		Reviewed by: Quality Manager
Document S/N: 0Y1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset	Page 6 of 83

Mode / Band		Modulated Average (dBm)
Bluetooth (1 Mbps)	Maximum	13.0
	Nominal	12.0
Bluetooth (2 Mbps)	Maximum	11.0
	Nominal	10.0
Bluetooth (3 Mbps)	Maximum	11.0
	Nominal	10.0
Bluetooth LE	Maximum	6.0
	Nominal	5.0

1.3.3 Reduced WLAN Power

Mode / Band		Modulated Average - Single Tx Chain (Primary Antenna) (dBm)
IEEE 802.11b (2.4 GHz)	Maximum	12.5
	Nominal	11.5
IEEE 802.11g (2.4 GHz)	Maximum	12.5
	Nominal	11.5
IEEE 802.11n (2.4 GHz)	Maximum	12.5
	Nominal	11.5
IEEE 802.11ac (2.4 GHz)	Maximum	12.5
	Nominal	11.5

Mode / Band		Modulated Average - Single Tx Chain (Secondary Antenna) (dBm)
IEEE 802.11b (2.4 GHz)	Maximum	5.5
	Nominal	4.5
IEEE 802.11g (2.4 GHz)	Maximum	5.5
	Nominal	4.5
IEEE 802.11n (2.4 GHz)	Maximum	5.5
	Nominal	4.5
IEEE 802.11ac (2.4 GHz)	Maximum	5.5
	Nominal	4.5

FCC ID: ZNFLS997	 SAR EVALUATION REPORT 		Reviewed by: Quality Manager
Document S/N: 0Y1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset	Page 7 of 83

Mode / Band		Modulated Average - MIMO (dBm)
IEEE 802.11g (2.4 GHz)	Maximum	13.3
	Nominal	12.3
IEEE 802.11n (2.4 GHz)	Maximum	13.3
	Nominal	12.3
IEEE 802.11ac (2.4 GHz)	Maximum	13.3
	Nominal	12.3

Mode / Band		Modulated Average - Single Tx Chain (Primary Antenna) (dBm)				
		20 MHz Bandwidth	40 MHz Bandwidth		80 MHz Bandwidth	
			Ch. 38, 62, 102	Ch. 46-54, 110-159	Ch. 42-106	Ch. 138-155
IEEE 802.11a (5 GHz)	Maximum	13.0				
	Nominal	12.0				
IEEE 802.11n (5 GHz)	Maximum	13.0	12.0	13.0		
	Nominal	12.0	11.0	12.0		
IEEE 802.11ac (5 GHz)	Maximum	13.0	12.0	13.0	11.5	13.0
	Nominal	12.0	11.0	12.0	10.5	12.0

Mode / Band		Modulated Average - Single Tx Chain (Secondary Antenna) (dBm)		
		20 MHz Bandwidth	40 MHz Bandwidth	80 MHz Bandwidth
IEEE 802.11a (5 GHz)	Maximum	5.5		
	Nominal	4.5		
IEEE 802.11n (5 GHz)	Maximum	5.5	5.5	
	Nominal	4.5	4.5	
IEEE 802.11ac (5 GHz)	Maximum	5.5	5.5	5.5
	Nominal	4.5	4.5	4.5

Mode / Band		Modulated Average - MIMO (dBm)				
		20 MHz Bandwidth	40 MHz Bandwidth		80 MHz Bandwidth	
			Ch. 38, 62, 102	Ch. 46-54, 110-159	Ch. 42-106	Ch. 138-155
IEEE 802.11a (5 GHz)	Maximum	13.7				
	Nominal	12.7				
IEEE 802.11n (5 GHz)	Maximum	13.7	12.9	13.7		
	Nominal	12.7	11.9	12.7		
IEEE 802.11ac (5 GHz)	Maximum	13.7	12.9	13.7	12.5	13.7
	Nominal	12.7	11.9	12.7	11.5	12.7

FCC ID: ZNFLS997	 SAR EVALUATION REPORT 		Reviewed by: Quality Manager
Document S/N: 0Y1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset	Page 8 of 83

1.4 DUT Antenna Locations

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

Table 1-1
Device Edges/Sides for SAR Testing

Mode	Back	Front	Top	Bottom	Right	Left
GPRS 850	Yes	Yes	No	Yes	Yes	Yes
GPRS 1900	Yes	Yes	No	Yes	No	Yes
UMTS 850	Yes	Yes	No	Yes	Yes	Yes
UMTS 1750	Yes	Yes	No	Yes	No	Yes
UMTS 1900	Yes	Yes	No	Yes	No	Yes
EVDO BC10 (\$90S) Ant 1	Yes	Yes	No	Yes	Yes	Yes
EVDO BC0 (\$22H) Ant 1	Yes	Yes	No	Yes	Yes	Yes
PCS EVDO	Yes	Yes	No	Yes	No	Yes
LTE Band 12	Yes	Yes	No	Yes	Yes	Yes
LTE Band 26 (Cell) Ant 1	Yes	Yes	No	Yes	Yes	Yes
LTE Band 4 (AWS)	Yes	Yes	No	Yes	No	Yes
LTE Band 25 (PCS)	Yes	Yes	No	Yes	No	Yes
LTE Band 41	Yes	Yes	No	Yes	Yes	Yes
EVDO BC10 (\$90S) Ant 3	Yes	Yes	Yes	No	Yes	Yes
EVDO BC0 (\$22H) Ant 3	Yes	Yes	Yes	No	Yes	Yes
LTE Band 26 (Cell) Ant 3	Yes	Yes	Yes	No	Yes	Yes
2.4 GHz WLAN Primary Ant	Yes	Yes	Yes	No	Yes	No
2.4 GHz WLAN Secondary Ant	Yes	Yes	Yes	No	Yes	No
5 GHz WLAN Primary Ant	Yes	Yes	Yes	No	Yes	No
5 GHz WLAN Secondary Ant	Yes	Yes	Yes	No	Yes	No
Bluetooth	Yes	Yes	Yes	No	Yes	No

Note: Particular DUT edges were not required to be evaluated for wireless router SAR or phablet SAR if the edges were greater than 2.5 cm from the transmitting antenna according to FCC KDB Publication 941225 D06v02r01 Section III and FCC KDB Publication 648474 D04v01r03. The distances between the transmit antennas and the edges of the device are included in the filing.

1.5 Near Field Communications (NFC) Antenna

This DUT has NFC operations. The NFC antenna is integrated into the device for this model. Therefore, all SAR tests 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 F.

1.6 Simultaneous Transmission Capabilities

According to FCC KDB Publication 447498 D01v06, transmitters are considered to be transmitting simultaneously when there is overlapping transmission, with the exception of transmissions during network hand-offs with maximum hand-off duration less than 30 seconds. Possible transmission paths for the DUT are shown in Figure 1-1 and are color-coded to indicate communication modes which share the same path. Modes which share the same transmission path cannot transmit simultaneously with one another.

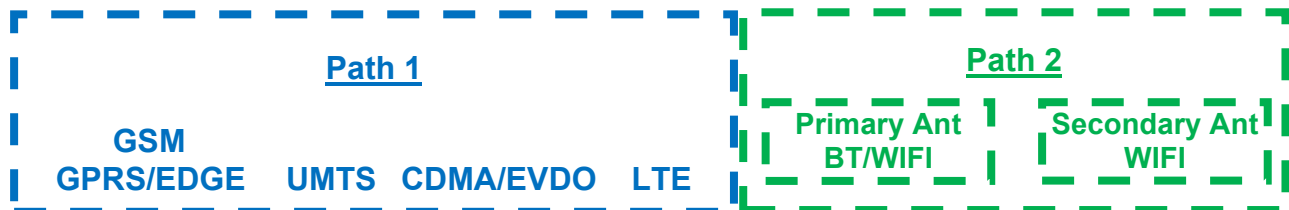


Figure 1-1
Simultaneous Transmission Paths

FCC ID: ZNFLS997	 PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: OY1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset		Page 9 of 83

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.

Table 1-2
Simultaneous Transmission Scenarios

No.	Capable Transmit Configuration	Head	Body-Worn Accessory	Wireless Router	Phablet	Notes
1	1x CDMA voice + 2.4 GHz Wi-Fi	Yes	Yes	N/A	Yes	
2	1x CDMA voice + 5 GHz Wi-Fi	Yes	Yes	N/A	Yes	
3	1x CDMA voice + 2.4 GHz Bluetooth	N/A	Yes	N/A	Yes	
4	1x CDMA voice + 2.4 GHz Wi-Fi MIMO	Yes	Yes	N/A	Yes	
5	1x CDMA voice + 5 GHz Wi-Fi MIMO	Yes	Yes	N/A	Yes	
6	GSM voice + 2.4 GHz Wi-Fi	Yes	Yes	N/A	Yes	
7	GSM voice + 5 GHz Wi-Fi	Yes	Yes	N/A	Yes	
8	GSM voice + 2.4 GHz Bluetooth	N/A	Yes	N/A	Yes	
9	GSM voice + 2.4 GHz Wi-Fi MIMO	Yes	Yes	N/A	Yes	
10	GSM voice + 5 GHz Wi-Fi MIMO	Yes	Yes	N/A	Yes	
11	UMTS + 2.4 GHz Wi-Fi	Yes	Yes	Yes	Yes	
12	UMTS + 5 GHz Wi-Fi	Yes	Yes	Yes	Yes	
13	UMTS + 2.4 GHz Bluetooth	N/A	Yes	N/A	Yes	
14	UMTS + 2.4 GHz Wi-Fi MIMO	Yes	Yes	Yes	Yes	
15	UMTS + 5 GHz Wi-Fi MIMO	Yes	Yes	Yes	Yes	
16	LTE + 2.4 GHz Wi-Fi	Yes	Yes	Yes	Yes	
17	LTE + 5 GHz Wi-Fi	Yes	Yes	Yes	Yes	
18	LTE + 2.4 GHz Bluetooth	N/A	Yes	N/A	Yes	
19	LTE + 2.4 GHz Wi-Fi MIMO	Yes	Yes	Yes	Yes	
20	LTE + 5 GHz Wi-Fi MIMO	Yes	Yes	Yes	Yes	
21	CDMA/EVDO data + 2.4 GHz Wi-Fi	Yes*	Yes*	Yes	Yes	*-Pre-installed VOIP applications are considered.
22	CDMA/EVDO data + 5 GHz Wi-Fi	Yes*	Yes*	Yes	Yes	*-Pre-installed VOIP applications are considered.
23	CDMA/EVDO data + 2.4 GHz Bluetooth	N/A	Yes*	N/A	Yes	*-Pre-installed VOIP applications are considered.
24	CDMA/EVDO data + 2.4 GHz Wi-Fi MIMO	Yes*	Yes*	Yes	Yes	*-Pre-installed VOIP applications are considered.
25	CDMA/EVDO data + 5 GHz Wi-Fi MIMO	Yes*	Yes*	Yes	Yes	*-Pre-installed VOIP applications are considered.
26	GPRS/EDGE + 2.4 GHz Wi-Fi	Yes*	Yes*	Yes	Yes	*-Pre-installed VOIP applications are considered.
27	GPRS/EDGE + 5 GHz Wi-Fi	Yes*	Yes*	Yes	Yes	*-Pre-installed VOIP applications are considered.
28	GPRS/EDGE + 2.4 GHz Bluetooth	N/A	Yes*	N/A	Yes	*-Pre-installed VOIP applications are considered.
29	GPRS/EDGE + 2.4 GHz Wi-Fi MIMO	Yes*	Yes*	Yes	Yes	*-Pre-installed VOIP applications are considered.
30	GPRS/EDGE + 5 GHz Wi-Fi MIMO	Yes*	Yes*	Yes	Yes	*-Pre-installed VOIP applications are considered.

- 2.4 GHz WLAN and 5 GHz WLAN that share the same transmission path cannot transmit simultaneously.
- All licensed modes share the same antenna path and cannot transmit simultaneously.
- When the user utilizes multiple services in UMTS 3G mode it uses multi-Radio Access Bearer or multi-RAB. The power control is based on a physical control channel (Dedicated Physical Control Channel [DPCCH]) and power control will be adjusted to meet the needs of both services. Therefore, the UMTS+WLAN scenario also represents the UMTS Voice/DATA + WLAN Hotspot scenario.
- Per the manufacturer, WIFI Direct is expected to be used in conjunction with a held-to-ear or body-worn accessory voice call. Simultaneous transmission scenarios involving WIFI direct are included in the above table.
- 5 GHz Wireless Router is only supported for the U-NII-1 and U-NII-3 by S/W, therefore U-NII2A and U-NII2C were not evaluated for wireless router conditions.
- This device supports 2x2 MIMO Tx for WLAN 802.11a/g/n/ac when both primary and secondary WLAN antennas transmit together. Independent (SISO) WLAN transmission from the secondary WLAN antenna is limited to 2.4 GHz 802.11b mode only.
- This device supports VoLTE.
- This device supports VoWIFI

FCC ID: ZNFLS997		SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: 0Y1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset		Page 10 of 83

1.7 Miscellaneous SAR Test Considerations

(A) WIFI/BT

Since U-NII-1 and U-NII-2A bands have the same maximum output power and the highest reported SAR for U-NII-2A is less than 1.2 W/kg, SAR is not required for U-NII-1 band according to FCC KDB Publication 248227 D01v02r02.

Since Wireless Router operations are not allowed by the chipset firmware using U-NII-2A & U-NII-2C WIFI, only 2.4 GHz, U-NII-1, and U-NII-3 WIFI Hotspot SAR tests and combinations are considered for SAR with respect to Wireless Router configurations according to FCC KDB 941225 D06v02r01.

This device supports IEEE 802.11ac with the following features:

- a) Up to 80 MHz Bandwidth only
- b) No aggregate channel configurations
- c) 2 Tx antenna output
- d) 256 QAM is supported
- e) Band gap channels are supported

Per FCC KDB Publication 648474 D04v01r03, this device is considered a "phablet" since the diagonal dimension is greater than 160mm and less than 200mm. Phablet SAR tests are required when wireless router mode does not apply or if wireless router 1g SAR > 1.2 W/kg. Because wireless router operations are not supported for U-NII-2A & U-NII-2C WLAN, phablet SAR tests were performed. Phablet SAR was not evaluated for 2.4 GHz, U-NII-1, and U-NII-3 WLAN operations since wireless router 1g SAR was < 1.2 W/kg.

(B) Licensed Transmitter(s)

GSM/GPRS/EDGE DTM is not supported for US bands. Therefore, the GSM Voice modes in this report do not transmit simultaneously with GPRS/EDGE Data.

This device is only capable of QPSK HSUPA in the uplink. Therefore, no additional SAR tests are required beyond that described for devices with HSUPA in KDB 941225 D01v03r01.

CDMA 1X Advanced technology was not required for SAR since the maximum allowed output powers for 1x Advanced was not more than 0.25 dB higher than the maximum powers for 1x and the measured SAR in any 1x mode exposure conditions was not greater than 1.2 W/kg per FCC KDB Publication 941225 D01v03r01.

LTE SAR for the higher modulations and lower bandwidths were not tested since the maximum average output power of all required channels and configurations was not more than 0.5 dB higher than the highest bandwidth; and the reported LTE SAR for the highest bandwidth was less than 1.45 W/kg for all configurations according to FCC KDB 941225 D05v02r04.

This device supports both LTE B26 (Cell) and LTE B5 (Cell). Since the supported frequency span for LTE B5 (Cell) falls completely within the supported frequency span for LTE B26 (Cell), both LTE bands have the same target power, and both LTE bands share the same transmission path, SAR was only assessed for LTE B26 (Cell).

This device supports both LTE B25 (PCS) and LTE B2 (PCS). Since the supported frequency span for LTE B2 (PCS) falls completely within the supported frequency span for LTE B25 (PCS), both LTE bands have the same target power, and both LTE bands share the same transmission path, SAR was only assessed for LTE B25 (PCS).

This device supports LTE Carrier Aggregation (CA) in the downlink only. All uplink communications are identical to Release 8 specifications. Per FCC KDB Publication 941225 D05A v01r02, SAR for LTE CA

FCC ID: ZNFLS997	 SAR EVALUATION REPORT 		Reviewed by: Quality Manager
Document S/N: 0Y1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset	Page 11 of 83

operations was not needed since the maximum average output power in LTE CA mode was not >0.25 dB higher than the maximum output power when downlink carrier aggregation was inactive.

Per FCC KDB Publication 648474 D04v01r03, this device is considered a "phablet" since the diagonal dimension is greater than 160mm and less than 200mm. Therefore, phablet SAR tests are required when wireless router mode does not apply or if wireless router 1g SAR > 1.2 W/kg. Phablet SAR was not evaluated for licensed technologies since wireless router 1g SAR was < 1.2 W/kg for these modes.

1.8 Guidance Applied

- IEEE 1528-2013
- FCC KDB Publication 941225 D01v03r01, D05v02r04, D05Av01r02, D06v02r01 (2G/3G/4G and Hotspot)
- FCC KDB Publication 248227 D01v02r02 (SAR Considerations for 802.11 Devices)
- FCC KDB Publication 447498 D01v06 (General SAR Guidance)
- FCC KDB Publication 865664 D01v01r04, D02v01r02 (SAR Measurements up to 6 GHz)
- FCC KDB Publication 648474 D04v01r03 (Phablet Procedures)
- October 2013 TCB Workshop Notes (GPRS Testing Considerations)

1.9 Device Serial Numbers

Several samples with identical hardware were used to support SAR testing. The manufacturer has confirmed that the device(s) tested have the same physical, mechanical and thermal characteristics and are within operational tolerances expected for production units.

	Head Serial Number	Body-Worn Serial Number	Hotspot Serial Number	Phablet Serial Number
GSM/GPRS/EDGE 850	00305	00230	00230	-
GSM/GPRS/EDGE 1900	00271	00230	00230	-
UMTS 850	00271	00230	00230	-
UMTS 1750	00248	00248	00248	-
UMTS 1900	00248	00230	00230	-
CDMA/EVDO BC10 (§90S) Ant 1	00248	00230	00230	-
CDMA/EVDO BC0 (§22H) Ant 1	00248	00230	00230	-
PCS CDMA/EVDO	00271	00230	00230	-
LTE Band 12	00206	00206	00206	-
LTE Band 26 (Cell) Ant 1	00206	00198	00198	-
LTE Band 4 (AWS)	00222	00222	00222	-
LTE Band 25 (PCS)	00222	00214	00214	-
LTE Band 41	00206	00206	00206	-
CDMA/EVDO BC10 (§90S) Ant 3	00396	00230	00230	-
CDMA/EVDO BC0 (§22H) Ant 3	00396	00230	00230	-
LTE Band 26 (Cell) Ant 3	00206	00206	00206	-
2.4 GHz WLAN	00321	00313	00313	-
5 GHz WLAN	00313	00321	00321	00321
Bluetooth	-	00313	-	00313

FCC ID: ZNFLS997	 SAR EVALUATION REPORT 		Reviewed by: Quality Manager
Document S/N: 0Y1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset	Page 12 of 83

2

LTE INFORMATION

LTE Information					
FCC ID	ZNFLS997				
Form Factor	Portable Handset				
Frequency Range of each LTE transmission band	LTE Band 12 (699.7 - 715.3 MHz)				
	LTE Band 26 (Cell) (814.7 - 848.3 MHz)				
	LTE Band 5 (Cell) (824.7 - 848.3 MHz)				
	LTE Band 4 (AWS) (1710.7 - 1754.3 MHz)				
	LTE Band 25 (PCS) (1850.7 - 1914.3 MHz)				
	LTE Band 2 (PCS) (1850.7 - 1909.3 MHz)				
	LTE Band 41 (2498.5 - 2687.5 MHz)				
Channel Bandwidths	LTE Band 12: 1.4 MHz, 3 MHz, 5 MHz, 10 MHz				
	LTE Band 26 (Cell): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz				
	LTE Band 5 (Cell): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz				
	LTE Band 4 (AWS): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz				
	LTE Band 25 (PCS): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz				
	LTE Band 2 (PCS): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz				
	LTE Band 41: 5 MHz, 10 MHz, 15 MHz, 20 MHz				
Channel Numbers and Frequencies (MHz)	Low	Low-Mid	Mid	Mid-High	High
LTE Band 12: 1.4 MHz	699.7 (23017)		707.5 (23095)		715.3 (23173)
LTE Band 12: 3 MHz	700.5 (23025)		707.5 (23095)		714.5 (23165)
LTE Band 12: 5 MHz	701.5 (23035)		707.5 (23095)		713.5 (23155)
LTE Band 12: 10 MHz	704 (23060)		707.5 (23095)		711 (23130)
LTE Band 26 (Cell): 1.4 MHz	814.7 (26697)		831.5 (26865)		848.3 (27033)
LTE Band 26 (Cell): 3 MHz	815.5 (26705)		831.5 (26865)		847.5 (27025)
LTE Band 26 (Cell): 5 MHz	816.5 (26715)		831.5 (26865)		846.5 (27015)
LTE Band 26 (Cell): 10 MHz	819 (26740)		831.5 (26865)		844 (26990)
LTE Band 26 (Cell): 15 MHz	821.5 (26765)		831.5 (26865)		841.5 (26965)
LTE Band 5 (Cell): 1.4 MHz	824.7 (20407)		836.5 (20525)		848.3 (20643)
LTE Band 5 (Cell): 3 MHz	825.5 (20415)		836.5 (20525)		847.5 (20635)
LTE Band 5 (Cell): 5 MHz	826.5 (20425)		836.5 (20525)		846.5 (20625)
LTE Band 5 (Cell): 10 MHz	829 (20450)		836.5 (20525)		844 (20600)
LTE Band 4 (AWS): 1.4 MHz	1710.7 (19957)		1732.5 (20175)		1754.3 (20393)
LTE Band 4 (AWS): 3 MHz	1711.5 (19965)		1732.5 (20175)		1753.5 (20385)
LTE Band 4 (AWS): 5 MHz	1712.5 (19975)		1732.5 (20175)		1752.5 (20375)
LTE Band 4 (AWS): 10 MHz	1715 (20000)		1732.5 (20175)		1750 (20350)
LTE Band 4 (AWS): 15 MHz	1717.5 (20025)		1732.5 (20175)		1747.5 (20325)
LTE Band 4 (AWS): 20 MHz	1720 (20050)		1732.5 (20175)		1745 (20300)
LTE Band 25 (PCS): 1.4 MHz	1850.7 (26047)		1882.5 (26365)		1914.3 (26683)
LTE Band 25 (PCS): 3 MHz	1851.5 (26055)		1882.5 (26365)		1913.5 (26675)
LTE Band 25 (PCS): 5 MHz	1852.5 (26065)		1882.5 (26365)		1912.5 (26665)
LTE Band 25 (PCS): 10 MHz	1855 (26090)		1882.5 (26365)		1910 (26640)
LTE Band 25 (PCS): 15 MHz	1857.5 (26115)		1882.5 (26365)		1907.5 (26615)
LTE Band 25 (PCS): 20 MHz	1860 (26140)		1882.5 (26365)		1905 (26590)
LTE Band 2 (PCS): 1.4 MHz	1850.7 (18607)		1880 (18900)		1909.3 (19193)
LTE Band 2 (PCS): 3 MHz	1851.5 (18615)		1880 (18900)		1908.5 (19185)
LTE Band 2 (PCS): 5 MHz	1852.5 (18625)		1880 (18900)		1907.5 (19175)
LTE Band 2 (PCS): 10 MHz	1855 (18650)		1880 (18900)		1905 (19150)
LTE Band 2 (PCS): 15 MHz	1857.5 (18675)		1880 (18900)		1902.5 (19125)
LTE Band 2 (PCS): 20 MHz	1860 (18700)		1880 (18900)		1900 (19100)
LTE Band 41: 5 MHz	2506 (39750)	2549.5 (40185)	2593 (40620)	2636.5 (41055)	2680 (41490)
LTE Band 41: 10 MHz	2506 (39750)	2549.5 (40185)	2593 (40620)	2636.5 (41055)	2680 (41490)
LTE Band 41: 15 MHz	2506 (39750)	2549.5 (40185)	2593 (40620)	2636.5 (41055)	2680 (41490)
LTE Band 41: 20 MHz	2506 (39750)	2549.5 (40185)	2593 (40620)	2636.5 (41055)	2680 (41490)
UE Category	9				
Modulations Supported in UL	QPSK, 16QAM				
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	The technical description includes all the possible carrier aggregation combinations				
LTE Release 10 Additional Information	This device does not support full CA features on 3GPP Release 10. All uplink communications are identical to the Release 8 Specifications. Uplink communications are done on the PCC. The following LTE Release 10 Features are not supported: Relay, HetNet, Enhanced MIMO, eICIC, WIFI Offloading, MDH, eMBMS, Cross-Carrier Scheduling, Enhanced SC-FDMA.				

FCC ID: ZNFLS997		SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: 0Y1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset		Page 13 of 83

3 INTRODUCTION

The FCC and Innovation, Science, and Economic Development Canada have adopted the guidelines for evaluating the environmental effects of radio frequency (RF) radiation in ET Docket 93-62 on Aug. 6, 1996 and Health Canada Safety Code 6 to protect the public and workers from the potential hazards of RF emissions due to FCC-regulated portable devices. [1]

The safety limits used for the environmental evaluation measurements are based on the criteria published by the American National Standards Institute (ANSI) for localized specific absorption rate (SAR) in IEEE/ANSI C95.1-1992 Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz [3] and Health Canada RF Exposure Guidelines Safety Code 6 [22]. The measurement procedure described in IEEE/ANSI C95.3-2002 Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields - RF and Microwave [4] is used for guidance in measuring the Specific Absorption Rate (SAR) due to the RF radiation exposure from the Equipment Under Test (EUT). These criteria for SAR evaluation are similar to those recommended by the International Committee for Non-Ionizing Radiation Protection (ICNIRP) in Biological Effects and Exposure Criteria for Radiofrequency Electromagnetic Fields,” Report No. Vol 74. SAR is a measure of the rate of energy absorption due to exposure to an RF transmitting source. SAR values have been related to threshold levels for potential biological hazards.

3.1 SAR Definition

Specific Absorption Rate is defined as the time derivative (rate) of the incremental energy (dU) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dV) of a given density (ρ). It is also defined as the rate of RF energy absorption per unit mass at a point in an absorbing body (see Equation 3-1).

Equation 3-1
SAR Mathematical Equation

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

SAR is expressed in units of Watts per Kilogram (W/kg).

$$SAR = \frac{\sigma \cdot E^2}{\rho}$$

where:

- σ = conductivity of the tissue-simulating material (S/m)
- ρ = mass density of the tissue-simulating material (kg/m³)
- E = Total RMS electric field strength (V/m)

NOTE: The primary factors that control rate of energy absorption were found to be the wavelength of the incident field in relation to the dimensions and geometry of the irradiated organism, the orientation of the organism in relation to the polarity of field vectors, the presence of reflecting surfaces, and whether conductive contact is made by the organism with a ground plane.[6]

FCC ID: ZNFLS997		SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: 0Y1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset		Page 14 of 83

4 DOSIMETRIC ASSESSMENT

4.1 Measurement Procedure

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

1. The SAR distribution at the exposed side of the head or body was measured at a distance no greater than 5.0 mm from the inner surface of the shell. The area covered the entire dimension of the device-head and body interface and the horizontal grid resolution was determined per FCC KDB Publication 865664 D01v01r04 (See Table 4-1) and IEEE 1528-2013.
2. The point SAR measurement was taken at the maximum SAR region determined from Step 1 to enable the monitoring of SAR fluctuations/drifts during the 1g/10g cube evaluation. SAR at this fixed point was measured and used as a reference value.
3. Based on the area scan data, the peak of the region with maximum SAR was determined by spline interpolation. Around this point, a volume was assessed according to the measurement resolution and volume size requirements of FCC KDB Publication 865664 D01v01r04 (See Table 4-1) and IEEE 1528-2013. On the basis of this data set, the spatial peak SAR value was evaluated with the following procedure (see references or the DASY manual online for more details):
 - a. SAR values at the inner surface of the phantom are extrapolated from the measured values along the line away from the surface with spacing no greater than that in Table 4-1. The extrapolation was based on a least-squares algorithm. A polynomial of the fourth order was calculated through the points in the z-axis (normal to the phantom shell).
 - b. After the maximum interpolated values were calculated between the points in the cube, the SAR was averaged over the spatial volume (1g or 10g) using a 3D-Spline interpolation algorithm. The 3D-spline is composed of three one-dimensional splines with the “Not a knot” condition (in x, y, and z directions). The volume was then integrated with the trapezoidal algorithm. One thousand points (10 x 10 x 10) were obtained through interpolation, in order to calculate the averaged SAR.
 - c. All neighboring volumes were evaluated until no neighboring volume with a higher average value was found.
4. The SAR reference value, at the same location as step 2, was re-measured after the zoom scan was complete to calculate the SAR drift. If the drift deviated by more than 5%, the SAR test and drift measurements were repeated.

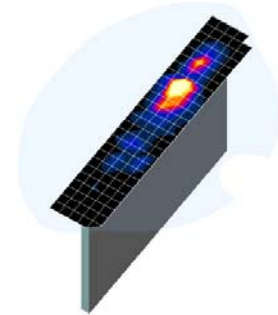


Figure 4-1
Sample SAR Area
Scan

Table 4-1
Area and Zoom Scan Resolutions per FCC KDB Publication 865664 D01v01r04*

Frequency	Maximum Area Scan Resolution (mm) ($\Delta x_{\text{area}}, \Delta y_{\text{area}}$)	Maximum Zoom Scan Resolution (mm) ($\Delta x_{\text{zoom}}, \Delta y_{\text{zoom}}$)	Maximum Zoom Scan Spatial Resolution (mm)			Minimum Zoom Scan Volume (mm) (x,y,z)
			Uniform Grid $\Delta z_{\text{zoom}}(n)$	Graded Grid		
				$\Delta z_{\text{zoom}}(1)^*$	$\Delta z_{\text{zoom}}(n>1)^*$	
≤ 2 GHz	≤ 15	≤ 8	≤ 5	≤ 4	≤ 1.5* $\Delta z_{\text{zoom}}(n-1)$	≥ 30
2-3 GHz	≤ 12	≤ 5	≤ 5	≤ 4	≤ 1.5* $\Delta z_{\text{zoom}}(n-1)$	≥ 30
3-4 GHz	≤ 12	≤ 5	≤ 4	≤ 3	≤ 1.5* $\Delta z_{\text{zoom}}(n-1)$	≥ 28
4-5 GHz	≤ 10	≤ 4	≤ 3	≤ 2.5	≤ 1.5* $\Delta z_{\text{zoom}}(n-1)$	≥ 25
5-6 GHz	≤ 10	≤ 4	≤ 2	≤ 2	≤ 1.5* $\Delta z_{\text{zoom}}(n-1)$	≥ 22

*Also compliant to IEEE 1528-2013 Table 6

FCC ID: ZNFLS997	 SAR EVALUATION REPORT 			Reviewed by: Quality Manager
Document S/N: 0Y1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset		Page 15 of 83

5 DEFINITION OF REFERENCE POINTS

5.1 EAR REFERENCE POINT

Figure 5-2 shows the front, back and side views of the SAM Twin Phantom. The point “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 ERP is 15mm posterior to the entrance to the ear canal (EEC) along the B-M line (Back-Mouth), as shown in Figure 5-1. The plane passing through the two ear canals and M is defined as the Reference Plane. The line N-F (Neck-Front), also called the Reference Pivoting Line, is not perpendicular to the reference plane (see Figure 5-1). Line B-M is perpendicular to the N-F line. Both N-F and B-M lines are marked on the external phantom shell to facilitate handset positioning [5].

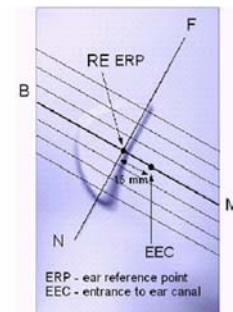


Figure 5-1
Close-Up Side view
of ERP

5.2 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 5-3). The acoustic output was then 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 5-2
Front, back and side view of SAM Twin Phantom

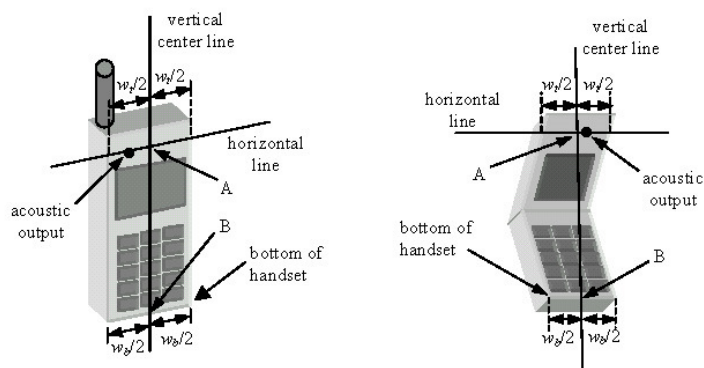


Figure 5-3
Handset Vertical Center & Horizontal Line Reference Points

FCC ID: ZNFLS997	 PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT	 LG	Reviewed by: Quality Manager
Document S/N: OY1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset		Page 16 of 83

6 TEST CONFIGURATION POSITIONS

6.1 Device Holder

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

6.2 Positioning for Cheek

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 6-1), 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.

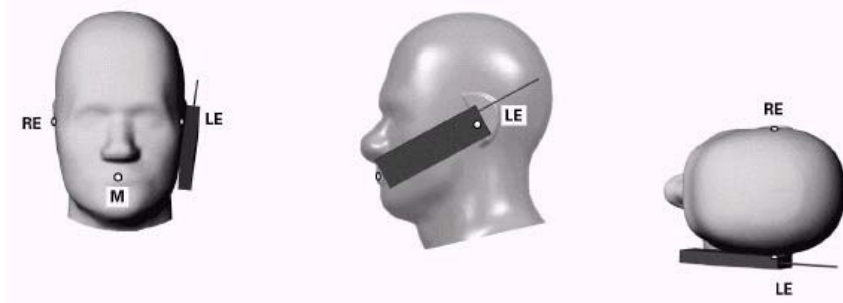


Figure 6-1 Front, Side and Top View of Cheek Position

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 with 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 6-2).

6.3 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 6-2).

FCC ID: ZNFLS997	 PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: 0Y1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset		Page 17 of 83

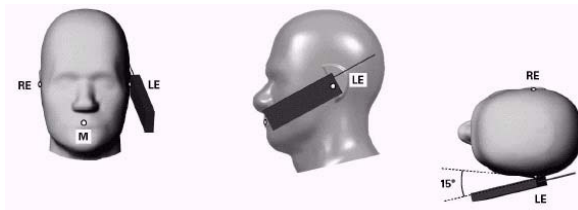


Figure 6-2 Front, Side and Top View of Ear/15° Tilt Position

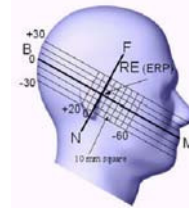


Figure 6-3 Side view w/ relevant markings

6.4 SAR Evaluations near the Mouth/Jaw Regions of the SAM Phantom

Antennas located near the bottom of a phone may require SAR measurements around the mouth and jaw regions of the SAM head phantom. This typically applies to clam-shell style phones that are generally longer in the unfolded normal use positions or to certain older style long rectangular phones. Per IEEE 1528-2013, a rotated SAM phantom is necessary to allow probe access to such regions. Both SAM heads of the TwinSAM-Chin20 are rotated 20 degrees around the NF line. Each head can be removed from the table for emptying and cleaning.

Under these circumstances, the following procedures apply, adopted from the FCC guidance on SAR handsets document FCC KDB Publication 648474 D04v01r03. The SAR required in these regions of SAM should be measured using a flat phantom. The phone should be positioned with a separation distance of 4 mm between the ear reference point (ERP) and the outer surface of the flat phantom shell. While maintaining this distance at the ERP location, the low (bottom) edge of the phone should be lowered from the phantom to establish the same separation distance between the peak SAR location identified by the truncated partial SAR distribution measured with the SAM phantom. The distance from the peak SAR location to the phone is determined by the straight line passing perpendicularly through the phantom surface. When it is not feasible to maintain 4 mm separation at the ERP while also establishing the required separation at the peak SAR location, the top edge of the phone will be allowed to touch the phantom with a separation < 4 mm at the ERP. The phone should not be tilted to the left or right while placed in this inclined position to the flat phantom.

6.5 Body-Worn Accessory Configurations

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 6-4). 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.

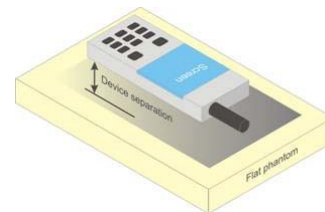


Figure 6-4 Sample Body-Worn Diagram

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.

FCC ID: ZNFLS997		SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: 0Y1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset		Page 18 of 83

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.

6.6 Extremity Exposure Configurations

Devices that are designed or intended for use on extremities or mainly operated in extremity only exposure conditions; i.e., hands, wrists, feet and ankles, may require extremity SAR evaluation. When the device also operates in close proximity to the user's body, SAR compliance for the body is also required. The 1-g body and 10-g extremity SAR Exclusion Thresholds found in KDB Publication 447498 D01v06 should be applied to determine SAR test requirements.

Per KDB Publication 447498 D01v06, Cell phones (handsets) are not normally designed to be used on extremities or operated in extremity only exposure conditions. The maximum output power levels of handsets generally do not require extremity SAR testing to show compliance. Therefore, extremity SAR was not evaluated for this device.

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 ($L \times W \geq 9 \text{ cm} \times 5 \text{ cm}$) 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 Phablet Configurations

For smart phones with a display diagonal dimension $> 150 \text{ mm}$ or an overall diagonal dimension $> 160 \text{ mm}$ 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 $\leq 25 \text{ mm}$ from that surface or edge, in direct contact with the phantom, for 10-g SAR. The UMPC mini-tablet 1-g SAR at 5 mm is not required. When hotspot mode applies, 10-g SAR is required only for the surfaces and edges with hotspot mode 1-g SAR $> 1.2 \text{ W/kg}$.

FCC ID: ZNFLS997		SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: 0Y1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset		Page 19 of 83

7 RF EXPOSURE LIMITS

7.1 Uncontrolled Environment

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.

7.2 Controlled Environment

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.

Table 7-1
SAR Human Exposure Specified in ANSI/IEEE C95.1-1992 and Health Canada Safety Code 6

HUMAN EXPOSURE LIMITS		
	UNCONTROLLED ENVIRONMENT <i>General Population</i> (W/kg) or (mW/g)	CONTROLLED ENVIRONMENT <i>Occupational</i> (W/kg) or (mW/g)
Peak Spatial Average SAR Head	1.6	8.0
Whole Body SAR	0.08	0.4
Peak Spatial Average SAR Hands, Feet, Ankle, Wrists, etc.	4.0	20

1. The Spatial Peak value of the SAR averaged over any 1 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.

FCC ID: ZNFLS997	 PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: 0Y1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset		Page 20 of 83

8 FCC MEASUREMENT PROCEDURES

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

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. The highest *reported* SAR results are identified on the grant of equipment authorization according to procedures in KDB 690783 D01v01r03.

8.2 3G SAR Test Reduction Procedure

In FCC KDB Publication 941225 D01v03r01, certain transmission modes within a frequency band and wireless mode evaluated for SAR are defined as primary modes. The equivalent modes considered for SAR test reduction are denoted as secondary modes. When the maximum output power including tune-up tolerance specified for production units in a secondary mode is ≤ 0.25 dB higher than the primary mode or when the highest reported SAR of the primary mode, scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode, is ≤ 1.2 W/kg, SAR measurements are not required for the secondary mode. These criteria are referred to as the 3G SAR test reduction procedure. When the 3G SAR test reduction procedure is not satisfied, SAR measurements are additionally required for the secondary mode.

8.3 Procedures Used to Establish RF Signal for SAR

The following procedures are according to FCC KDB Publication 941225 D01v03r01 “3G SAR Measurement Procedures.”

The device is placed into a simulated call using a base station simulator in a RF shielded chamber. Establishing connections in this manner ensure a consistent means for testing SAR and are recommended for evaluating SAR [4]. Devices under test are evaluated prior to testing, with a fully charged battery and were configured to operate at maximum output power. In order to verify that the device is tested throughout the SAR test at maximum output power, the SAR measurement system measures a “point SAR” at an arbitrary reference point at the start and end of the 1 gram SAR evaluation, to assess for any power drifts during the evaluation. If the power drift deviates by more than 5%, the SAR test and drift measurements are repeated.

8.4 SAR Measurement Conditions for CDMA2000

The following procedures were performed according to FCC KDB Publication 941225 D01v03r01 “3G SAR Measurement Procedures.”

8.4.1 Output Power Verification

See 3GPP2 C.S0011/TIA-98-E as recommended by FCC KDB Publication 941225 D01v03r01 “3G SAR Measurement Procedures.” Maximum output power is verified on the High, Middle and Low channels according to procedures in section 4.4.5.2 of 3GPP2 C.S0011/TIA-98-E. SO55 tests were measured with power control bits in the “All Up” condition.

FCC ID: ZNFLS997	 PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: 0Y1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset		Page 21 of 83

1. If the mobile station (MS) supports Reverse TCH RC 1 and Forward TCH RC 1, set up a call using Fundamental Channel Test Mode 1 (RC=1/1) with 9600 bps data rate only.
2. Under RC1, C.S0011 Table 4.4.5.2-1, Table 8-1 parameters were applied.
3. If the MS supports the RC 3 Reverse FCH, RC3 Reverse SCH₀ and demodulation of RC 3,4, or 5, set up a call using Supplemental Channel Test Mode 3 (RC 3/3) with 9600 bps Fundamental Channel and 9600 bps SCH₀ data rate.
4. Under RC3, C.S0011 Table 4.4.5.2-2, Table 8-2 was applied.

Table 8-1
Parameters for Max. Power for RC1

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

Table 8-2
Parameters for Max. Power for RC3

Parameter	Units	Value
$\frac{I_{or}}{I_{or}}$	dBm/1.23 MHz	-86
$\frac{Pilot E_c}{I_{or}}$	dB	-7
$\frac{Traffic E_c}{I_{or}}$	dB	-7.4

5. FCHs were configured at full rate for maximum SAR with “All Up” power control bits.

8.4.2 Head SAR Measurements

SAR for next to the ear head exposure is measured in RC3 with the handset configured to transmit at full rate in SO55. The 3G SAR test reduction procedure is applied to RC1 with RC3 as the primary mode; otherwise, SAR is required for the channel with maximum measured output in RC1 using the head exposure configuration that results in the highest reported SAR in RC3.

Head SAR is additionally evaluated using EVDO Rev. A to support compliance for VoIP operations. See Section 8.4.5 for EVDO Rev. A configuration parameters.

8.4.3 Body-worn SAR Measurements

SAR for body-worn exposure configurations is measured in RC3 with the DUT configured to transmit at full rate on FCH with all other code channels disabled using TDSO / SO32. The 3G SAR test reduction procedure is applied to the multiple code channel configuration (FCH+SCH_n), with FCH only as the primary mode. Otherwise, SAR is required for multiple code channel configuration (FCH + SCH_n), with FCH at full rate and SCH₀ enabled at 9600 bps, using the highest reported SAR configuration for FCH only. When multiple code channels are enabled, the transmitter output can shift by more than 0.5 dB and may lead to higher SAR drifts and SCH dropouts.

The 3G SAR test reduction procedure is applied to body-worn accessory SAR in RC1 with RC3 as the primary mode. Otherwise, SAR is required for RC1, with SO55 and full rate, using the highest reported SAR configuration for body-worn accessory exposure in RC3.

8.4.4 Body-worn SAR Measurements for EVDO Devices

For handsets with Ev-Do capabilities, the 3G SAR test reduction procedure is applied to Ev-Do Rev. 0 with 1x RTT RC3 as the primary mode to determine body-worn accessory test requirements. Otherwise, body-worn accessory SAR is required for Rev. 0, at 153.6 kbps, using the highest reported SAR configuration for body-worn accessory exposure in RC3.

The 3G SAR test reduction procedure is applied to Rev. A, with Rev. 0 as the primary mode to determine body-worn accessory SAR test requirements. When SAR is not required for Rev. 0, the 3G SAR test reduction is applied with 1x RTT RC3 as the primary mode.

When SAR is required for EVDO Rev. A, SAR is measured with a Reverse Data Channel payload size of 4096 bits and a Termination Target of 16 slots defined for Subtype 2 Physical Layer configurations, using

FCC ID: ZNFLS997	 SAR EVALUATION REPORT 		Reviewed by: Quality Manager
Document S/N: 0Y1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset	Page 22 of 83

the highest reported SAR configuration for body-worn accessory exposure in Rev. 0 or 1x RTT RC3, as appropriate.

8.4.5 Body SAR Measurements for EVDO Hotspot

Hotspot Body SAR is measured using Subtype 0/1 Physical Layer configurations for Rev. 0. The 3G SAR test reduction procedure is applied to Rev. A, Subtype 2 Physical layer configuration, with Rev. 0 as the primary mode; otherwise, SAR is measured for Rev. A using the highest reported SAR configuration for body-worn accessory exposure in Rev. 0. The AT is tested with a Reverse Data Channel rate of 153.6 kbps in Subtype 0/1 Physical Layer configurations; and a Reverse Data Channel payload size of 4096 bits and Termination Target of 16 slots in Subtype 2 Physical Layer configurations.

For Ev-Do data devices that also support 1x RTT voice and/or data operations, the 3G SAR test reduction procedure is applied to 1x RTT RC3 and RC1 with Ev-Do Rev. 0 and Rev. A as the respective primary modes. Otherwise, the 'Body-Worn Accessory SAR' procedures in the '3GPP2 CDMA 2000 1x Handsets' section are applied.

8.4.6 CDMA2000 1x Advanced

This device additionally supports 1x Advanced. Conducted powers are measured using SO75 with RC8 on the uplink and RC11 on the downlink per FCC KDB Publication 941225 D01v03r01. Smart blanking is disabled for all measurements. The EUT is configured with forward power control Mode 000 and reverse power control at 400 bps. Conducted powers are measured on an Agilent 8960 Series 10 Wireless Communications Test Set, Model E5515C using the CDMA2000 1x Advanced application, Option E1962B-410.

The 3G SAR test reduction procedure is applied to the 1x-Advanced transmission mode with 1x RTT RC3 as the primary mode. When SAR measurement is required, the 1x-Advanced power measurement configurations are used. The 1x Advanced SAR procedures are applied separately to head, body-worn accessory and other exposure conditions.

8.5 SAR Measurement Conditions for UMTS

8.5.1 Output Power Verification

Maximum output power is verified on the High, Middle and Low channels according to the general descriptions in section 5.2 of 3GPP TS 34.121, using the appropriate RMC with TPC (transmit power control) set to all "1s" or applying the required inner loop power control procedures to maintain maximum output power while HSUPA is active. Results for all applicable physical channel configurations (DPCCH, DPDCH_n and spreading codes, HS-DPCCH etc) are tabulated in this test report. All configurations that are not supported by the DUT or cannot be measured due to technical or equipment limitations are identified.

8.5.2 Head SAR Measurements

SAR for next to the ear head exposure is measured using a 12.2 kbps RMC with TPC bits configured to all "1s". The 3G SAR test reduction procedure is applied to AMR configurations with 12.2 kbps RMC as the primary mode. Otherwise, SAR is measured for 12.2 kbps AMR in 3.4 kbps SRB (signaling radio bearer) using the highest reported SAR configuration in 12.2 kbps RMC for head exposure.

8.5.3 Body SAR Measurements

SAR for body exposure configurations is measured using the 12.2 kbps RMC with the TPC bits all "1s". The 3G SAR test reduction procedure is applied to other spreading codes and multiple DPDCH_n configurations supported by the handset with 12.2 kbps RMC as the primary mode. Otherwise, SAR is measured using an applicable RMC configuration with the corresponding spreading code or DPDCH_n, for the highest reported SAR configuration in 12.2 kbps RMC.

FCC ID: ZNFLS997	 PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: OY1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset		Page 23 of 83

8.5.4 SAR Measurements with Rel 5 HSDPA

The 3G SAR test reduction procedure is applied to HSDPA body configurations with 12.2 kbps RMC as the primary mode. Otherwise, Body SAR for HSDPA is measured using an FRC with H-Set 1 in Sub-test 1 and a 12.2 kbps RMC configured in Test Loop Mode 1, for the highest reported SAR configuration in 12.2 kbps RMC without HSDPA. Handsets with both HSDPA and HSUPA are tested according to Release 6 HSPA test procedures.

8.5.5 SAR Measurements with Rel 6 HSUPA

The 3G SAR test reduction procedure is applied to HSPA (HSUPA/HSDPA with RMC) body configurations with 12.2 kbps RMC as the primary mode. Otherwise, Body SAR for HSPA is measured with E-DCH Sub-test 5, using H-Set 1 and QPSK for FRC and a 12.2 kbps RMC configured in Test Loop Mode 1 and power control algorithm 2, according to the highest reported body SAR configuration in 12.2 kbps RMC without HSPA.

When VOIP applies to head exposure, the 3G SAR test reduction procedure is applied with 12.2 kbps RMC as the primary mode; otherwise, the same HSPA configuration used for body SAR measurements are applied to head exposure testing.

8.6 SAR Measurement Conditions for LTE

LTE modes are tested according to FCC KDB 941225 D05v02r04 publication. Establishing connections with base station simulators ensure a consistent means for testing SAR and are recommended for evaluating SAR [4]. The R&S CMW500 or Anritsu MT8820C simulators are used for LTE output power measurements and SAR testing. Closed loop power control was used so the UE transmits with maximum output power during SAR testing. SAR tests were performed with the same number of RB and RB offsets transmitting on all TTI frames (maximum TTI).

8.6.1 Spectrum Plots for RB Configurations

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

8.6.2 MPR

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

8.6.3 A-MPR

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

8.6.4 Required RB Size and RB Offsets for SAR Testing

According to FCC KDB 941225 D05v02r04:

- a. Per Section 5.2.1, SAR is required for QPSK 1 RB Allocation for the largest bandwidth
 - i. The required channel and offset combination with the highest maximum output power is required for SAR.
 - ii. When the reported SAR is ≤ 0.6 W/kg for LTE Band 41 or the reported SAR is ≤ 0.8 W/kg for all other bands, testing of the remaining RB offset configurations and required test channels is not required. Otherwise, SAR is required for the remaining required test channels using the RB offset configuration with highest output power for that channel.

FCC ID: ZNFLS997	 PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: OY1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset		Page 24 of 83

- iii. When the reported SAR for a required test channel is > 1.45 W/kg, SAR is required for all RB offset configurations for that channel.
- b. Per Section 5.2.2, SAR is required for 50% RB allocation using the largest bandwidth following the same procedures outlined in Section 5.2.1.
- c. Per Section 5.2.3, QPSK SAR is not required for the 100% allocation when the highest maximum output power for the 100% allocation is less than the highest maximum output power of the 1 RB and 50% RB allocations and the reported SAR for the 1 RB and 50% RB allocations is < 0.8 W/kg.
- d. Per Section 5.2.4 and 5.3, SAR tests for higher order modulations and lower bandwidths configurations are not required when the conducted power of the required test configurations determined by Sections 5.2.1 through 5.2.3 is less than or equal to ½ dB higher than the equivalent configuration using QPSK modulation and when the QPSK SAR for those configurations is <1.45 W/kg.

8.6.5 TDD

LTE TDD testing is performed using the SAR test guidance provided in FCC KDB 941225 D05v02r04. TDD is tested at the highest duty factor using UL-DL configuration 0 with special subframe configuration 6 and applying the FDD LTE procedures in KDB 941225 D05v02r04. SAR testing is performed using the normal cyclic prefix and then scaling up the measured SAR results to the extended cyclic prefix listed in 3GPP TS 36.211 Section 4.

8.6.6 Downlink Only Carrier Aggregation

Conducted power measurements with LTE Carrier Aggregation (CA) (downlink only) active are made in accordance to KDB Publication 941225 D05Av01r02. The RRC connection is only handled by one cell, the primary component carrier (PCC) for downlink and uplink communications. After making a data connection to the PCC, the UE device adds secondary component carrier(s) (SCC) on the downlink only. All uplink communications and acknowledgements remain identical to specifications when downlink carrier aggregation is inactive on the PCC. For every supported combination of downlink only carrier aggregation, additional conducted output powers are measured with the downlink carrier aggregation active for the configuration with highest measured maximum conducted power with downlink carrier aggregation inactive measured among the channel bandwidth, modulation, and RB combinations in each frequency band. Per FCC KDB Publication 941225 D05Av01r02, no SAR measurements are required for carrier aggregation configurations when the average output power with downlink only carrier aggregation active is not more than 0.25 dB higher than the average output power with downlink only carrier aggregation inactive.

8.7 SAR Testing with 802.11 Transmitters

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

8.7.1 General Device Setup

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

A periodic duty factor is required for current generation SAR systems to measure SAR. When 802.11 frame gaps are accounted for in the transmission, a maximum transmission duty factor of 92 - 96% is typically achievable in most test mode configurations. A minimum transmission duty factor of 85% is required to avoid certain hardware and device implementation issues related to wide range SAR scaling.

FCC ID: ZNFLS997	 PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: OY1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset		Page 25 of 83

The reported SAR is scaled to 100% transmission duty factor to determine compliance at the maximum tune-up tolerance limit.

8.7.2 U-NII-1 and U-NII-2A

For devices that operate in both U-NII-1 and U-NII-2A bands, when the same maximum output power is specified for both bands, SAR measurement using OFDM SAR test procedures is not required for U-NII-1 unless the highest reported SAR for U-NII-2A is > 1.2 W/kg. When different maximum output powers are specified for the bands, SAR measurement for the U-NII band with the lower maximum output power is not required unless the highest reported SAR for the U-NII band with the higher maximum output power, adjusted by the ratio of lower to higher specified maximum output power for the two bands, is > 1.2 W/kg.

8.7.3 U-NII-2C and U-NII-3

The frequency range covered by U-NII-2C and U-NII-3 is 380 MHz (5.47 – 5.85 GHz), which requires a minimum of at least two SAR probe calibration frequency points to support SAR measurements. When Terminal Doppler Weather Radar (TDWR) restriction applies, the channels at 5.60 – 5.65 GHz in U-NII-2C band must be disabled with acceptable mechanisms and documented in the equipment certification. Unless band gap channels are permanently disabled, SAR must be considered for these channels. Each band is tested independently according to the normally required OFDM SAR measurement and probe calibration frequency points requirements.

8.7.4 Initial Test Position Procedure

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

8.7.5 2.4 GHz SAR Test Requirements

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

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

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

8.7.6 OFDM Transmission Mode and SAR Test Channel Selection

When the same maximum output power was specified for multiple OFDM transmission mode configurations in a frequency band or aggregated band, SAR is measured using the configuration with the largest channel bandwidth, lowest order modulation and lowest data rate. When the maximum output power of a channel is the same for equivalent OFDM configurations; for example, 802.11a, 802.11n and 802.11ac or 802.11g and 802.11n with the same channel bandwidth, modulation and data rate etc., the

FCC ID: ZNFLS997	 PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: OY1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset		Page 26 of 83

lower order 802.11 mode i.e., 802.11a, then 802.11n and 802.11ac or 802.11g then 802.11n, is used for SAR measurement. When the maximum output power are the same for multiple test channels, either according to the default or additional power measurement requirements, SAR is measured using the channel closest to the middle of the frequency band or aggregated band. When there are multiple channels with the same maximum output power, SAR is measured using the higher number channel.

8.7.7 Initial Test Configuration Procedure

For OFDM, an initial test configuration is determined for each frequency band and aggregated band, according to the transmission mode with the highest maximum output power specified for SAR measurements. When the same maximum output power is specified for multiple OFDM transmission mode configurations in a frequency band or aggregated band, SAR is measured using the configuration(s) with the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order IEEE 802.11 mode. The channel of the transmission mode with the highest average RF output conducted power will be the initial test configuration.

When the reported SAR is ≤ 0.8 W/kg, no additional measurements on other test channels are required. Otherwise, SAR is evaluated using the subsequent highest average RF output channel until the reported SAR result is ≤ 1.2 W/kg or all channels are measured. When there are multiple untested channels having the same subsequent highest average RF output power, the channel with higher frequency from the lowest 802.11 mode is considered for SAR measurements (See Section 8.7.6).

8.7.8 Subsequent Test Configuration Procedures

For OFDM configurations in each frequency band and aggregated band, SAR is evaluated for initial test configuration using the fixed test position or the initial test position procedure. When the highest reported SAR (for the initial test configuration), adjusted by the ratio of the specified maximum output power of the subsequent test configuration to initial test configuration, is ≤ 1.2 W/kg, no additional SAR tests for the subsequent test configurations are required.

8.7.9 MIMO SAR considerations

Per KDB Publication 248227 D01v02r02, the simultaneous SAR provisions in KDB Publication 447498 D01v06 should be applied to determine simultaneous transmission SAR test exclusion for WIFI MIMO. If the sum of 1g single transmission chain SAR measurements is < 1.6 W/kg, no additional SAR measurements for MIMO are required. Alternatively, SAR for MIMO can be measured with all antennas transmitting simultaneously at the specified maximum output power of MIMO operation.

FCC ID: ZNFLS997	 PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: 0Y1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset		Page 27 of 83

9 RF CONDUCTED POWERS

9.1 CDMA Conducted Powers

Band	Channel	Rule Part	Frequency	SO55 [dBm]	SO55 [dBm]	SO75 [dBm]	TDSO SO32 [dBm]	TDSO SO32 [dBm]	1x EvDO Rev. 0 [dBm]	1x EvDO Rev. A [dBm]
	F-RC		MHz	RC1	RC3	RC11	FCH+SCH	FCH	(RTAP)	(RETAP)
Cellular	564	90S	820.1	25.18	25.12	25.04	25.17	25.11	24.88	24.87
Cellular	1013	22H	824.7	25.11	25.17	25.13	25.14	25.13	24.86	24.85
	384	22H	836.52	25.19	25.18	25.16	25.16	25.15	24.81	24.83
	777	22H	848.31	25.13	25.14	25.14	25.19	25.18	24.82	24.83
PCS	25	24E	1851.25	25.16	25.14	25.16	25.15	25.15	25.13	25.14
	600	24E	1880	25.07	25.06	25.07	25.13	25.07	25.18	25.18
	1175	24E	1908.75	25.13	25.06	25.09	25.13	25.07	25.16	25.15

Note: RC1 is only applicable for IS-95 compatibility. For FCC Rule Part 90S, Per FCC KDB Publication 447498 D01v06 4.1.g), only one channel is required since the device operates within the transmission range of 817.90 – 823.10 MHz.

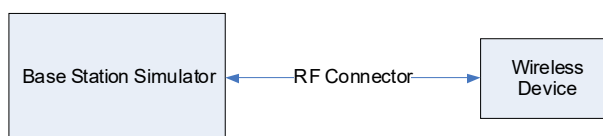


Figure 9-1
Power Measurement Setup

FCC ID: ZNFLS997	 PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: 0Y1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset		Page 28 of 83

9.2 GSM Conducted Powers

Maximum Burst-Averaged Output Power						
		Voice	GPRS/EDGE Data (GMSK)		EDGE Data (8-PSK)	
Band	Channel	GSM [dBm] CS (1 Slot)	GPRS [dBm] 1 Tx Slot	GPRS [dBm] 2 Tx Slot	EDGE [dBm] 1 Tx Slot	EDGE [dBm] 2 Tx Slot
GSM 850	128	33.09	33.16	31.77	27.00	27.05
	190	33.11	33.15	31.78	27.01	26.84
	251	33.15	33.08	31.83	26.95	26.80
GSM 1900	512	30.54	30.55	28.72	26.13	26.00
	661	30.56	30.51	28.89	26.20	25.94
	810	30.40	30.40	28.94	26.10	25.91

Calculated Maximum Frame-Averaged Output Power						
		Voice	GPRS/EDGE Data (GMSK)		EDGE Data (8-PSK)	
Band	Channel	GSM [dBm] CS (1 Slot)	GPRS [dBm] 1 Tx Slot	GPRS [dBm] 2 Tx Slot	EDGE [dBm] 1 Tx Slot	EDGE [dBm] 2 Tx Slot
GSM 850	128	24.06	24.13	25.75	17.97	21.03
	190	24.08	24.12	25.76	17.98	20.82
	251	24.12	24.05	25.81	17.92	20.78
GSM 1900	512	21.51	21.52	22.70	17.10	19.98
	661	21.53	21.48	22.87	17.17	19.92
	810	21.37	21.37	22.92	17.07	19.89

GSM 850	Frame	24.17	24.17	25.68	17.67	20.68
GSM 1900	Avg. Targets:	21.17	21.17	22.68	16.67	19.68

Note:

- Both burst-averaged and calculated frame-averaged powers are included. Frame-averaged power was calculated from the measured burst-averaged power by converting the slot powers into linear units and calculating the energy over 8 timeslots.
- GPRS/EDGE (GMSK) output powers were measured with coding scheme setting of 1 (CS1) on the base station simulator. CS1 was configured to measure GPRS output power measurements and SAR to ensure GMSK modulation in the signal. Our Investigation has shown that CS1 - CS4 settings do not have any impact on the output levels or modulation in the GPRS modes.
- EDGE (8-PSK) output powers were measured with MCS7 on the base station simulator. MCS7 coding scheme was used to measure the output powers for EDGE since investigation has shown that choosing MCS7 coding scheme will ensure 8-PSK modulation. It has been shown that MCS levels that produce 8PSK modulation do not have an impact on output power.

GSM Class: B
GPRS Multislot class: 10 (Max 2 Tx uplink slots)
EDGE Multislot class: 10 (Max 2 Tx uplink slots)
DTM Multislot Class: N/A



Figure 9-2
Power Measurement Setup

FCC ID: ZNFLS997				Reviewed by: Quality Manager
Document S/N: 0Y1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset		Page 29 of 83

9.3 UMTS Conducted Powers

3GPP Release Version	Mode	3GPP 34.121 Subtest	Cellular Band [dBm]			AWS Band [dBm]			PCS Band [dBm]			3GPP MPR [dB]
			4132	4183	4233	1312	1412	1513	9262	9400	9538	
99	WCDMA	12.2 kbps RMC	24.20	24.50	24.46	24.48	24.46	24.45	24.55	24.65	24.51	-
99		12.2 kbps AMR	24.18	24.48	24.36	24.36	24.42	24.44	24.45	24.56	24.44	-
6	HSDPA	Subtest 1	24.17	24.12	24.13	24.48	24.51	24.45	24.48	24.46	24.45	0
6		Subtest 2	24.10	24.14	24.12	24.42	24.44	24.46	23.88	23.87	23.86	0
6		Subtest 3	23.68	23.66	23.65	23.92	23.96	23.94	23.91	23.89	23.92	0.5
6		Subtest 4	23.64	23.60	23.62	23.92	23.88	23.87	23.91	23.88	23.90	0.5
6	HSUPA	Subtest 1	24.13	24.04	24.12	24.41	24.43	24.46	24.44	24.54	24.49	0
6		Subtest 2	22.21	22.16	22.17	22.45	22.38	22.35	22.36	22.42	22.44	2
6		Subtest 3	23.15	23.14	23.12	23.26	23.31	23.29	23.25	23.25	23.28	1
6		Subtest 4	22.07	22.08	22.11	22.25	22.26	22.32	22.44	22.44	22.51	2
6		Subtest 5	23.92	23.94	23.91	24.14	24.12	24.06	24.22	24.16	24.16	0

This device does not support DC-HSDPA.



Figure 9-3
Power Measurement Setup

FCC ID: ZNFLS997	 SAR EVALUATION REPORT 		Reviewed by: Quality Manager
Document S/N: 0Y1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset	Page 30 of 83

9.4 LTE Conducted Powers

9.4.1 LTE Band 12

Table 9-1
LTE Band 12 Conducted Powers - 10 MHz Bandwidth

LTE Band 12 10 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			23095 (707.5 MHz)		
			Conducted Power [dBm]		
QPSK	1	0	24.77	0	0
	1	25	24.68		0
	1	49	24.66		0
	25	0	23.87	0-1	1
	25	12	23.68		1
	25	25	23.73		1
	50	0	23.63		1
16QAM	1	0	23.73	0-1	1
	1	25	23.83		1
	1	49	23.73		1
	25	0	22.78	0-2	2
	25	12	22.73		2
	25	25	22.65		2
	50	0	22.62		2

Note: LTE Band 12 at 10 MHz bandwidth does not support three non-overlapping channels. Per KDB Publication 941225 D05v02, 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.

Table 9-2
LTE Band 12 Conducted Powers - 5 MHz Bandwidth

LTE Band 12 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			23035 (701.5 MHz)	23095 (707.5 MHz)	23155 (713.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	24.76	24.82	24.78	0	0
	1	12	24.93	24.81	24.66		0
	1	24	24.93	24.78	24.58		0
	12	0	23.76	23.77	23.68	0-1	1
	12	6	23.86	23.75	23.74		1
	12	13	23.92	23.91	23.70		1
	25	0	23.82	23.82	23.68		1
16QAM	1	0	24.00	23.86	23.98	0-1	1
	1	12	24.00	23.76	23.88		1
	1	24	23.95	23.72	23.90		1
	12	0	22.79	22.72	22.79	0-2	2
	12	6	22.90	22.85	22.71		2
	12	13	22.80	22.91	22.74		2
	25	0	22.84	22.80	22.70		2

FCC ID: ZNFLS997	 SAR EVALUATION REPORT 		Reviewed by: Quality Manager
Document S/N: 0Y1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset	Page 31 of 83

Table 9-3
LTE Band 12 Conducted Powers - 3 MHz Bandwidth

LTE Band 12 3 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			23025 (700.5 MHz)	23095 (707.5 MHz)	23165 (714.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	24.78	24.80	24.87	0	0
	1	7	24.85	24.95	24.85		0
	1	14	24.82	24.93	24.89		0
	8	0	23.63	23.92	23.65	0-1	1
	8	4	23.69	23.82	23.85		1
	8	7	23.73	23.83	23.84		1
	15	0	23.72	23.85	23.69		1
16QAM	1	0	23.88	23.73	23.85	0-1	1
	1	7	24.00	23.79	23.66		1
	1	14	23.93	23.61	23.99		1
	8	0	22.64	22.77	22.63	0-2	2
	8	4	22.74	22.96	22.60		2
	8	7	22.72	22.82	22.74		2
	15	0	22.80	22.85	22.69		2

Table 9-4
LTE Band 12 Conducted Powers -1.4 MHz Bandwidth

LTE Band 12 1.4 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			23017 (699.7 MHz)	23095 (707.5 MHz)	23173 (715.3 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	24.66	24.68	24.76	0	0
	1	2	24.67	24.62	24.91		0
	1	5	24.67	24.82	24.82		0
	3	0	24.70	24.81	24.64		0
	3	2	24.58	24.82	24.73		0
	3	3	24.58	24.62	24.50		0
	6	0	23.66	23.62	23.64	0-1	1
16QAM	1	0	23.58	23.76	23.54	0-1	1
	1	2	23.59	23.97	23.66		1
	1	5	23.71	23.72	23.60		1
	3	0	23.78	23.83	23.91		1
	3	2	23.62	23.85	24.00		1
	3	3	23.45	23.67	23.95		1
	6	0	22.73	22.82	22.57	0-2	2

FCC ID: ZNFLS997	 PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT	 LG	Reviewed by: Quality Manager
Document S/N: OY1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset		Page 32 of 83

9.4.2 LTE Band 26 (Cell)

Table 9-5
LTE Band 26 (Cell) Conducted Powers - 15 MHz Bandwidth

LTE Band 26 (Cell) 15 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			26865 (831.5 MHz)		
			Conducted Power [dBm]		
QPSK	1	0	24.35	0	0
	1	36	24.50		0
	1	74	24.34		0
	36	0	23.41	0-1	1
	36	18	23.34		1
	36	37	23.37		1
	75	0	23.37		1
16QAM	1	0	23.66	0-1	1
	1	36	23.55		1
	1	74	23.65		1
	36	0	22.37	0-2	2
	36	18	22.35		2
	36	37	22.39		2
	75	0	22.51		2

Note: LTE Band 26 (Cell) at 15 MHz bandwidth does not support three non-overlapping channels. Per KDB Publication 941225 D05v02, 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.

Table 9-6
LTE Band 26 (Cell) Conducted Powers - 10 MHz Bandwidth

LTE Band 26 (Cell) 10 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			26740 (819.0 MHz)	26865 (831.5 MHz)	26990 (844.0 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	24.50	24.51	24.42	0	0
	1	25	24.42	24.70	24.38		0
	1	49	24.53	24.42	24.59		0
	25	0	23.70	23.67	23.56	0-1	1
	25	12	23.54	23.70	23.62		1
	25	25	23.68	23.61	23.59		1
	50	0	23.66	23.58	23.50		1
16QAM	1	0	23.47	23.59	23.64	0-1	1
	1	25	23.57	23.69	23.67		1
	1	49	23.70	23.60	23.64		1
	25	0	22.63	22.51	22.60	0-2	2
	25	12	22.52	22.58	22.66		2
	25	25	22.70	22.62	22.48		2
	50	0	22.62	22.65	22.61		2

FCC ID: ZNFLS997	 SAR EVALUATION REPORT 		Reviewed by: Quality Manager
Document S/N: 0Y1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset	Page 33 of 83

Table 9-7
LTE Band 26 (Cell) Conducted Powers - 5 MHz Bandwidth

LTE Band 26 (Cell) 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			26715 (816.5 MHz)	26865 (831.5 MHz)	27015 (846.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	24.42	24.37	24.58	0	0
	1	12	24.51	24.42	24.35		0
	1	24	24.44	24.44	24.53		0
	12	0	23.58	23.32	23.44	0-1	1
	12	6	23.70	23.70	23.68		1
	12	13	23.50	23.51	23.70		1
	25	0	23.60	23.54	23.48		1
16QAM	1	0	23.67	23.70	23.51	0-1	1
	1	12	23.63	23.48	23.40		1
	1	24	23.56	23.57	23.34		1
	12	0	22.61	22.64	22.60	0-2	2
	12	6	22.68	22.43	22.61		2
	12	13	22.59	22.63	22.64		2
	25	0	22.70	22.66	22.52		2

Table 9-8
LTE Band 26 (Cell) Conducted Powers - 3 MHz Bandwidth

LTE Band 26 (Cell) 3 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			26705 (815.5 MHz)	26865 (831.5 MHz)	27025 (847.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	24.56	24.64	24.38	0	0
	1	7	24.33	24.63	24.48		0
	1	14	24.50	24.68	24.38		0
	8	0	23.61	23.56	23.52	0-1	1
	8	4	23.40	23.66	23.45		1
	8	7	23.43	23.45	23.53		1
16QAM	15	0	23.45	23.35	23.70	0-1	1
	1	0	23.70	23.64	23.67		1
	1	7	23.62	23.70	23.58		1
	1	14	23.61	23.69	23.51	0-2	1
	8	0	22.55	22.47	22.39		2
	8	4	22.65	22.58	22.51		2
	8	7	22.70	22.53	22.70		2
15	0	22.70	22.68	22.62	2		

FCC ID: ZNFLS997		SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: 0Y1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset		Page 34 of 83

Table 9-9
LTE Band 26 (Cell) Conducted Powers -1.4 MHz Bandwidth

LTE Band 26 (Cell) 1.4 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			26697 (814.7 MHz)	26865 (831.5 MHz)	27033 (848.3 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	24.47	24.34	24.45	0	0
	1	2	24.38	24.31	24.27		0
	1	5	24.31	24.21	24.32		0
	3	0	24.51	24.42	24.53		0
	3	2	24.48	24.26	24.39		0
	3	3	24.54	24.42	24.56		0
	6	0	23.36	23.50	23.65	0-1	1
16QAM	1	0	23.57	23.66	23.70	0-1	1
	1	2	23.68	23.65	23.63		1
	1	5	23.18	23.36	23.45		1
	3	0	23.55	23.40	23.61		1
	3	2	23.55	23.60	23.41		1
	3	3	23.61	23.64	23.60		1
	6	0	22.70	22.68	22.57	0-2	2

FCC ID: ZNFLS997		SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: 0Y1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset		Page 35 of 83

9.4.3 LTE Band 4 (AWS)

Table 9-10
LTE Band 4 (AWS) Conducted Powers - 20 MHz Bandwidth

LTE Band 4 (AWS) 20 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			20175 (1732.5 MHz)		
			Conducted Power [dBm]		
QPSK	1	0	24.51	0	0
	1	50	24.55		0
	1	99	24.65		0
	50	0	23.69	0-1	1
	50	25	23.61		1
	50	50	23.63		1
	100	0	23.58		1
16QAM	1	0	23.70	0-1	1
	1	50	23.62		1
	1	99	23.67		1
	50	0	22.68	0-2	2
	50	25	22.63		2
	50	50	22.57		2
	100	0	22.61		2

Note: LTE Band 4 (AWS) at 20 MHz bandwidth does not support three non-overlapping channels. Per KDB Publication 941225 D05v02, 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.

Table 9-11
LTE Band 4 (AWS) Conducted Powers - 15 MHz Bandwidth

LTE Band 4 (AWS) 15 MHzBandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			20025 (1717.5 MHz)	20175 (1732.5 MHz)	20325 (1747.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	24.42	24.42	24.47	0	0
	1	36	24.47	24.51	24.59		0
	1	74	24.52	24.52	24.48		0
	36	0	23.45	23.49	23.44	0-1	1
	36	18	23.42	23.66	23.47		1
	36	37	23.37	23.48	23.49		1
	75	0	23.39	23.38	23.46		1
16QAM	1	0	23.64	23.24	23.49	0-1	1
	1	36	23.59	23.41	23.52		1
	1	74	23.48	23.24	23.56		1
	36	0	22.38	22.44	22.64	0-2	2
	36	18	22.51	22.67	22.61		2
	36	37	22.45	22.42	22.61		2
	75	0	22.48	22.53	22.50		2

FCC ID: ZNFLS997	 SAR EVALUATION REPORT 		Reviewed by: Quality Manager
Document S/N: 0Y1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset	Page 36 of 83

Table 9-12
LTE Band 4 (AWS) Conducted Powers - 10 MHz Bandwidth

LTE Band 4 (AWS) 10 MHzBandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			20000 (1715.0 MHz)	20175 (1732.5 MHz)	20350 (1750.0 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	24.37	24.35	24.61	0	0
	1	25	24.39	24.32	24.61		0
	1	49	24.32	24.38	24.51		0
	25	0	23.41	23.37	23.47	0-1	1
	25	12	23.47	23.37	23.64		1
	25	25	23.30	23.31	23.49		1
	50	0	23.27	23.36	23.53		1
16QAM	1	0	23.62	23.29	23.60	0-1	1
	1	25	23.54	23.26	23.67		1
	1	49	23.50	23.32	23.70		1
	25	0	22.34	22.32	22.66	0-2	2
	25	12	22.48	22.31	22.56		2
	25	25	22.36	22.33	22.46		2
	50	0	22.24	22.30	22.48		2

Table 9-13
LTE Band 4 (AWS) Conducted Powers - 5 MHz Bandwidth

LTE Band 4 (AWS) 5 MHzBandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			19975 (1712.5 MHz)	20175 (1732.5 MHz)	20375 (1752.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	24.63	24.35	24.65	0	0
	1	12	24.49	24.14	24.62		0
	1	24	24.46	24.37	24.57		0
	12	0	23.57	23.43	23.70	0-1	1
	12	6	23.46	23.32	23.61		1
	12	13	23.41	23.39	23.69		1
	25	0	23.40	23.29	23.60		1
16QAM	1	0	23.64	23.53	23.59	0-1	1
	1	12	23.62	23.36	23.65		1
	1	24	23.59	23.54	23.61		1
	12	0	22.47	22.35	22.52	0-2	2
	12	6	22.48	22.43	22.65		2
	12	13	22.29	22.39	22.70		2
	25	0	22.35	22.45	22.56		2

FCC ID: ZNFLS997	 PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: 0Y1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset		Page 37 of 83

Table 9-14
LTE Band 4 (AWS) Conducted Powers - 3 MHz Bandwidth

LTE Band 4 (AWS) 3 MHzBandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			19965 (1711.5 MHz)	20175 (1732.5 MHz)	20385 (1753.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	24.55	24.45	24.58	0	0
	1	7	24.64	24.66	24.70		0
	1	14	24.57	24.46	24.61		0
	8	0	23.53	23.45	23.70	0-1	1
	8	4	23.50	23.47	23.59		1
	8	7	23.56	23.54	23.63		1
	15	0	23.35	23.44	23.62		1
16QAM	1	0	23.69	23.41	23.69	0-1	1
	1	7	23.70	23.44	23.67		1
	1	14	23.54	23.39	23.70		1
	8	0	22.47	22.46	22.70	0-2	2
	8	4	22.44	22.52	22.64		2
	8	7	22.55	22.37	22.43		2
	15	0	22.48	22.42	22.59		2

Table 9-15
LTE Band 4 (AWS) Conducted Powers -1.4 MHz Bandwidth

LTE Band 4 (AWS) 1.4 MHzBandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			19957 (1710.7 MHz)	20175 (1732.5 MHz)	20393 (1754.3 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	24.69	24.39	24.60	0	0
	1	2	24.62	24.58	24.70		0
	1	5	24.65	24.36	24.62		0
	3	0	24.57	24.63	24.58		0
	3	2	24.63	24.60	24.63		0
	3	3	24.60	24.48	24.65		0
	6	0	23.50	23.46	23.53	0-1	1
16QAM	1	0	23.70	23.29	23.69	0-1	1
	1	2	23.64	23.36	23.62		1
	1	5	23.64	23.29	23.66		1
	3	0	23.65	23.49	23.59		1
	3	2	23.68	23.65	23.70		1
	3	3	23.46	23.58	23.62		1
	6	0	22.54	22.42	22.56	0-2	2

FCC ID: ZNFLS997	 PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: 0Y1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset		Page 38 of 83

9.4.4 LTE Band 25 (PCS)

Table 9-16
LTE Band 25 (PCS) Conducted Powers - 20 MHz Bandwidth

LTE Band 25 (PCS) 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			26140 (1860.0 MHz)	26365 (1882.5 MHz)	26590 (1905.0 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	24.70	24.44	24.49	0	0
	1	50	24.46	24.42	24.33		0
	1	99	24.58	24.51	24.43		0
	50	0	23.49	23.39	23.40	0-1	1
	50	25	23.48	23.32	23.41		1
	50	50	23.59	23.34	23.40		1
	100	0	23.43	23.43	23.52		1
16QAM	1	0	23.68	23.68	23.70	0-1	1
	1	50	23.67	23.65	23.70		1
	1	99	23.70	23.66	23.62		1
	50	0	22.53	22.37	22.47	0-2	2
	50	25	22.53	22.41	22.45		2
	50	50	22.51	22.38	22.40		2
	100	0	22.70	22.40	22.49		2

Table 9-17
LTE Band 25 (PCS) Conducted Powers - 15 MHz Bandwidth

LTE Band 25 (PCS) 15 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			26115 (1857.5 MHz)	26365 (1882.5 MHz)	26615 (1907.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	24.60	24.66	24.64	0	0
	1	36	24.66	24.58	24.69		0
	1	74	24.70	24.67	24.70		0
	36	0	23.62	23.59	23.70	0-1	1
	36	18	23.70	23.63	23.54		1
	36	37	23.64	23.58	23.50		1
	75	0	23.56	23.54	23.65		1
16QAM	1	0	23.60	23.62	23.65	0-1	1
	1	36	23.59	23.58	23.60		1
	1	74	23.45	23.46	23.56		1
	36	0	22.54	22.44	22.70	0-2	2
	36	18	22.67	22.53	22.68		2
	36	37	22.65	22.60	22.51		2
	75	0	22.58	22.63	22.69		2

FCC ID: ZNFLS997	 SAR EVALUATION REPORT 		Reviewed by: Quality Manager
Document S/N: 0Y1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset	Page 39 of 83

Table 9-18
LTE Band 25 (PCS) Conducted Powers - 10 MHz Bandwidth

LTE Band 25 (PCS) 10 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			26090 (1855.0 MHz)	26365 (1882.5 MHz)	26640 (1910.0 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	24.66	24.70	24.69	0	0
	1	25	24.67	24.69	24.49		0
	1	49	24.52	24.60	24.63		0
	25	0	23.62	23.70	23.63	0-1	1
	25	12	23.70	23.59	23.58		1
	25	25	23.66	23.65	23.59		1
	50	0	23.68	23.49	23.58		1
16QAM	1	0	23.54	23.68	23.65	0-1	1
	1	25	23.62	23.70	23.65		1
	1	49	23.53	23.55	23.46		1
	25	0	22.70	22.63	22.63	0-2	2
	25	12	22.59	22.68	22.69		2
	25	25	22.47	22.70	22.59		2
	50	0	22.44	22.64	22.63		2

Table 9-19
LTE Band 25 (PCS) Conducted Powers - 5 MHz Bandwidth

LTE Band 25 (PCS) 5 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			26065 (1852.5 MHz)	26365 (1882.5 MHz)	26665 (1912.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	24.70	24.61	24.68	0	0
	1	12	24.65	24.52	24.66		0
	1	24	24.65	24.66	24.61		0
	12	0	23.70	23.70	23.68	0-1	1
	12	6	23.70	23.70	23.65		1
	12	13	23.61	23.53	23.65		1
	25	0	23.48	23.55	23.61		1
16QAM	1	0	23.50	23.66	23.65	0-1	1
	1	12	23.70	23.65	23.63		1
	1	24	23.64	23.69	23.69		1
	12	0	22.64	22.70	22.67	0-2	2
	12	6	22.57	22.65	22.70		2
	12	13	22.64	22.61	22.66		2
	25	0	22.59	22.64	22.69		2

FCC ID: ZNFLS997	 PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT	 LG	Reviewed by: Quality Manager
Document S/N: 0Y1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset		Page 40 of 83

Table 9-20
LTE Band 25 (PCS) Conducted Powers - 3 MHz Bandwidth

LTE Band 25 (PCS) 3 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			26055 (1851.5 MHz)	26365 (1882.5 MHz)	26675 (1913.5 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	24.59	24.70	24.58	0	0
	1	7	24.70	24.70	24.70		0
	1	14	24.70	24.70	24.65		0
	8	0	23.65	23.65	23.70	0-1	1
	8	4	23.48	23.57	23.57		1
	8	7	23.66	23.59	23.68		1
	15	0	23.70	23.59	23.63		1
16QAM	1	0	23.70	23.65	23.57	0-1	1
	1	7	23.61	23.57	23.59		1
	1	14	23.62	23.60	23.56		1
	8	0	22.54	22.64	22.62	0-2	2
	8	4	22.56	22.51	22.58		2
	8	7	22.70	22.48	22.61		2
	15	0	22.46	22.63	22.63		2

Table 9-21
LTE Band 25 (PCS) Conducted Powers -1.4 MHz Bandwidth

LTE Band 25 (PCS) 1.4 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			26047 (1850.7 MHz)	26365 (1882.5 MHz)	26683 (1914.3 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	24.64	24.63	24.60	0	0
	1	2	24.65	24.69	24.66		0
	1	5	24.59	24.70	24.69		0
	3	0	24.50	24.52	24.70		0
	3	2	24.70	24.70	24.42		0
	3	3	24.42	24.69	24.68		0
	6	0	23.63	23.63	23.60	0-1	1
16QAM	1	0	23.64	23.70	23.70	0-1	1
	1	2	23.54	23.61	23.61		1
	1	5	23.69	23.65	23.70		1
	3	0	23.70	23.54	23.60		1
	3	2	23.58	23.57	23.66		1
	3	3	23.65	23.49	23.60		1
	6	0	22.70	22.59	22.66	0-2	2

FCC ID: ZNFLS997	 PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: 0Y1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset		Page 41 of 83

9.4.5 LTE Band 41

Table 9-22
LTE Band 41 Conducted Powers - 20 MHz Bandwidth

LTE Band 41 20 MHzBandwidth									
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			39750 (2506.0 MHz)	40185 (2549.5 MHz)	40620 (2593.0 MHz)	41055 (2636.5 MHz)	41490 (2680.0 MHz)		
			Conducted Power [dBm]						
QPSK	1	0	24.48	24.57	24.49	24.50	24.52	0	0
	1	50	24.59	24.53	24.59	24.57	24.63		0
	1	99	24.70	24.56	24.63	24.63	24.62		0
	50	0	23.47	23.50	23.52	23.47	23.49	0-1	1
	50	25	23.69	23.60	23.66	23.60	23.55		1
	50	50	23.65	23.55	23.57	23.58	23.60		1
	100	0	23.53	23.59	23.68	23.57	23.63		1
16QAM	1	0	23.66	23.66	23.65	23.70	23.64	0-1	1
	1	50	23.47	23.48	23.47	23.50	23.42		1
	1	99	23.40	23.49	23.50	23.47	23.48		1
	50	0	22.59	22.63	22.67	22.55	22.57	0-2	2
	50	25	22.54	22.69	22.67	22.67	22.61		2
	50	50	22.61	22.62	22.62	22.59	22.58		2
	100	0	22.67	22.64	22.65	22.70	22.69		2

Table 9-23
LTE Band 41 Conducted Powers - 15 MHz Bandwidth

LTE Band 41 15 MHzBandwidth									
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			39750 (2506.0 MHz)	40185 (2549.5 MHz)	40620 (2593.0 MHz)	41055 (2636.5 MHz)	41490 (2680.0 MHz)		
			Conducted Power [dBm]						
QPSK	1	0	24.70	24.69	24.68	24.62	24.70	0	0
	1	36	24.65	24.52	24.56	24.58	24.60		0
	1	74	24.59	24.68	24.59	24.57	24.64		0
	36	0	23.70	23.70	23.70	23.65	23.64	0-1	1
	36	18	23.60	23.65	23.58	23.57	23.60		1
	36	37	23.53	23.67	23.61	23.60	23.56		1
	75	0	23.47	23.47	23.54	23.44	23.42		1
16QAM	1	0	23.68	23.58	23.54	23.58	23.57	0-1	1
	1	36	23.67	23.70	23.68	23.69	23.70		1
	1	74	23.63	23.61	23.68	23.66	23.63		1
	36	0	22.66	22.69	22.68	22.64	22.69	0-2	2
	36	18	22.61	22.60	22.61	22.53	22.60		2
	36	37	22.59	22.65	22.61	22.61	22.58		2
	75	0	22.51	22.53	22.52	22.59	22.48		2

FCC ID: ZNFLS997	 SAR EVALUATION REPORT 		Reviewed by: Quality Manager
Document S/N: OY1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset	Page 42 of 83

Table 9-24
LTE Band 41 Conducted Powers - 10 MHz Bandwidth

LTE Band 41 10 MHzBandwidth									
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			39750 (2506.0 MHz)	40185 (2549.5 MHz)	40620 (2593.0 MHz)	41055 (2636.5 MHz)	41490 (2680.0 MHz)		
			Conducted Power [dBm]						
QPSK	1	0	24.70	24.65	24.62	24.70	24.70	0	0
	1	25	24.66	24.57	24.67	24.62	24.59		0
	1	49	24.62	24.51	24.59	24.53	24.62		0
	25	0	23.70	23.70	23.56	23.70	23.67	0-1	1
	25	12	23.69	23.70	23.70	23.64	23.60		1
	25	25	23.66	23.55	23.62	23.63	23.60		1
	50	0	23.44	23.48	23.53	23.51	23.48		1
16QAM	1	0	23.53	23.54	23.50	23.51	23.49	0-1	1
	1	25	23.54	23.58	23.63	23.54	23.62		1
	1	49	23.63	23.57	23.65	23.54	23.60		1
	25	0	22.51	22.66	22.55	22.63	22.52	0-2	2
	25	12	22.59	22.61	22.58	22.61	22.65		2
	25	25	22.58	22.61	22.59	22.59	22.62		2
	50	0	22.68	22.70	22.66	22.68	22.69		2

Table 9-25
LTE Band 41 Conducted Powers - 5 MHz Bandwidth

LTE Band 41 5 MHz Bandwidth									
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			39750 (2506.0 MHz)	40185 (2549.5 MHz)	40620 (2593.0 MHz)	41055 (2636.5 MHz)	41490 (2680.0 MHz)		
			Conducted Power [dBm]						
QPSK	1	0	24.61	24.67	24.63	24.53	24.65	0	0
	1	12	24.64	24.65	24.62	24.64	24.66		0
	1	24	24.68	24.70	24.64	24.70	24.68		0
	12	0	23.55	23.57	23.57	23.65	23.59	0-1	1
	12	6	23.69	23.70	23.68	23.66	23.70		1
	12	13	23.54	23.61	23.66	23.57	23.57		1
	25	0	23.68	23.66	23.67	23.67	23.67		1
16QAM	1	0	23.61	23.58	23.63	23.66	23.59	0-1	1
	1	12	23.60	23.60	23.62	23.59	23.61		1
	1	24	23.59	23.59	23.56	23.53	23.52		1
	12	0	22.67	22.70	22.70	22.70	22.70	0-2	2
	12	6	22.66	22.70	22.70	22.67	22.70		2
	12	13	22.61	22.66	22.58	22.65	22.56		2
	25	0	22.57	22.64	22.61	22.56	22.66		2

FCC ID: ZNFLS997		SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: 0Y1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset		Page 43 of 83

9.4.6 LTE Carrier Aggregation Conducted Powers

Table 9-26
Two Component Carrier Maximum Conducted Powers

PCC									SCC				Power	
PCC Band	PCC Bandwidth [MHz]	PCC (UL) Channel	PCC (UL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	PCC (DL) Channel	PCC (DL) Frequency [MHz]	SCC Band	SCC Bandwidth [MHz]	SCC (DL) Channel	SCC (DL) Frequency [MHz]	LTE Rel 10 Tx.Power (dBm)	LTE Rel. 8 Tx.Power (dBm)
LTE B41	20	39750	2506	QPSK	1	99	39750	2506	LTE B41	20	39948	2525.8	24.66	24.70
LTE B25	10	26365	1882.5	QPSK	1	0	8365	1962.5	LTE B25	5	8065	1932.5	24.68	24.70

Table 9-27
Three Component Carrier Maximum Conducted Powers

PCC									SCC				SCC				Power	
PCC Band	PCC Bandwidth [MHz]	PCC (UL) Channel	PCC (UL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	PCC (DL) Channel	PCC (DL) Frequency [MHz]	SCC Band	SCC Bandwidth [MHz]	SCC (DL) Channel	SCC (DL) Frequency [MHz]	SCC Band	SCC Bandwidth [MHz]	SCC (DL) Channel	SCC (DL) Frequency [MHz]	LTE Rel 10 Tx.Power (dBm)	LTE Rel. 8 Tx.Power (dBm)
LTE B41	20	39750	2506	QPSK	1	99	39750	2506	LTE B41	20	39948	2525.8	LTE B41	20	40146	2545.6	24.63	24.70

Notes:

1. The device only supports downlink Carrier Aggregation. Uplink Carrier Aggregation is not supported. For every supported combination of downlink carrier aggregation, power measurements were performed with the downlink carrier aggregation active for the configuration with highest measured maximum conducted power with downlink carrier aggregation inactive measured among the channel bandwidth, modulation, and RB combinations in each frequency band.
2. All control and acknowledge data is sent on uplink channels that operate identical to specifications when downlink carrier aggregation is inactive.



Figure 9-4
Power Measurement Setup

FCC ID: ZNFLS997		SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: 0Y1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset		Page 44 of 83

9.5 WLAN Conducted Powers

Table 9-28
2.4 GHz WLAN Maximum Average RF Power – Primary Antenna

Freq [MHz]	Channel	2.4GHz Conducted Power [dBm]			
		IEEE Transmission Mode			
		802.11b	802.11g	802.11n	802.11ac
2412	1	18.36	14.45	13.91	13.92
2427	4	19.23	15.35	14.69	14.71
2437	6	19.34	15.25	14.80	14.75
2447	8	19.45	15.35	14.78	14.75
2462	11	17.23	13.35	13.16	13.04

Table 9-29
2.4 GHz WLAN Maximum Average RF Power – Secondary Antenna

Freq [MHz]	Channel	2.4GHz Conducted Power [dBm]			
		IEEE Transmission Mode			
		802.11b	802.11g	802.11n	802.11ac
2412	1	19.07	14.95	14.26	14.37
2427	4	19.45	15.30	14.63	14.65
2437	6	19.74	15.39	14.83	14.87
2447	8	19.50	15.38	14.73	14.79
2462	11	18.60	14.44	13.76	13.75

Table 9-30
2.4 GHz WLAN Reduced Average RF Power – Primary Antenna

Freq [MHz]	Channel	2.4GHz Conducted Power [dBm]			
		IEEE Transmission Mode			
		802.11b	802.11g	802.11n	802.11ac
2412	1	11.59	12.26	12.11	12.16
2437	6	11.95	12.38	12.33	12.40
2462	11	11.78	12.37	12.05	12.13

Table 9-31
2.4 GHz WLAN Reduced Average RF Power – Secondary Antenna

Freq [MHz]	Channel	2.4GHz Conducted Power [dBm]			
		IEEE Transmission Mode			
		802.11b	802.11g	802.11n	802.11ac
2412	1	4.82	5.11	4.88	4.84
2437	6	5.49	5.49	5.48	5.46
2462	11	5.22	5.43	5.12	5.23

FCC ID: ZNFLS997		SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: 0Y1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset		Page 45 of 83

Table 9-32
5 GHz WLAN Maximum Average RF Power – Primary Antenna

Freq [MHz]	Channel	5GHz (20MHz) Conducted Power [dBm]		
		IEEE Transmission Mode		
		802.11a	802.11n	802.11ac
5180	36	14.38	14.31	14.46
5200	40	14.38	14.55	14.53
5220	44	14.32	14.41	14.38
5240	48	14.51	14.36	14.45
5260	52	14.88	14.71	14.70
5280	56	14.70	14.60	14.65
5300	60	14.73	14.53	14.61
5320	64	14.68	14.62	14.63
5500	100	14.42	14.33	14.38
5580	116	14.39	14.32	14.23
5660	132	14.40	14.16	14.32
5720	144	14.21	14.10	14.30
5745	149	14.56	14.30	14.36
5785	157	14.48	14.34	14.45
5825	165	14.53	14.42	14.41

Table 9-33
5 GHz WLAN Maximum Average RF Power – Secondary Antenna

Freq [MHz]	Channel	5GHz (20MHz) Conducted Power [dBm]		
		IEEE Transmission Mode		
		802.11a	802.11n	802.11ac
5180	36	13.50	13.39	13.40
5200	40	13.79	13.37	13.30
5220	44	13.51	13.41	13.32
5240	48	13.49	13.50	13.36
5260	52	13.54	13.41	13.41
5280	56	13.47	13.49	13.30
5300	60	13.47	13.34	13.35
5320	64	13.45	13.43	13.40
5500	100	13.15	13.08	13.09
5580	116	13.50	13.25	13.33
5660	132	13.55	13.40	13.47
5720	144	13.56	13.52	13.45
5745	149	13.65	13.55	13.51
5785	157	13.38	13.56	13.57
5825	165	13.32	13.38	13.44

FCC ID: ZNFLS997		SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: 0Y1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset	Page 46 of 83	

Table 9-34
5 GHz WLAN Reduced Average RF Power – Primary Antenna (40MHz)

Freq [MHz]	Channel	5GHz (40MHz) Conducted Power [dBm]	
		IEEE Transmission Mode	
		802.11n	802.11ac
5190	38	11.39	11.25
5230	46	12.01	12.24
5270	54	12.07	12.06
5310	62	11.10	11.40

Table 9-35
5 GHz WLAN Reduced Average RF Power – Primary Antenna (80MHz)

5GHz (80MHz) Conducted Power [dBm]		
Freq [MHz]	Channel	IEEE Transmission Mode
		802.11ac
5530	106	10.63
5690	138	11.92
5775	155	11.85

Table 9-36
5 GHz WLAN Reduced Average RF Power – Secondary Antenna

5GHz (80MHz) Conducted Power [dBm]		
Freq [MHz]	Channel	IEEE Transmission Mode
		802.11ac
5210	42	4.56
5290	58	4.66
5530	106	4.71
5690	138	4.92
5775	155	4.69

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.

FCC ID: ZNFLS997		SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: 0Y1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset		Page 47 of 83

- 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.
- The bolded data rate and channel above were tested for SAR.

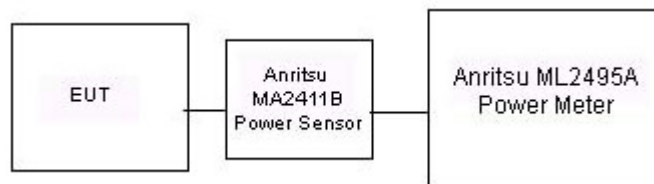


Figure 9-5
Power Measurement Setup for Bandwidths < 50 MHz

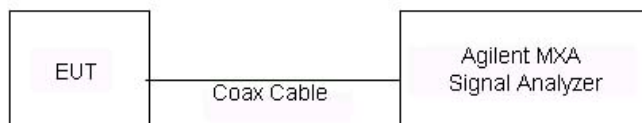


Figure 9-6
Power Measurement Setup for Bandwidths > 50 MHz

FCC ID: ZNFLS997		SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: 0Y1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset		Page 48 of 83

9.6 Bluetooth Conducted Powers

Table 9-37
Bluetooth Average RF Powers

Frequency [MHz]	Data Rate [Mbps]	Channel No.	Avg Conducted Power	
			[dBm]	[mW]
2402	1.0	0	10.05	10.123
2441	1.0	39	12.44	17.548
2480	1.0	78	12.72	18.709
2402	2.0	0	6.93	4.927
2441	2.0	39	8.59	7.233
2480	2.0	78	8.17	6.568
2402	3.0	0	6.94	4.939
2441	3.0	39	8.61	7.266
2480	3.0	78	8.24	6.666

Note: The bolded data rate and channel above were tested for SAR.

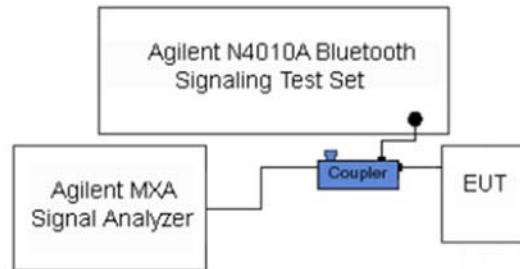


Figure 9-7
Power Measurement Setup

FCC ID: ZNFLS997	 PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: 0Y1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset		Page 49 of 83

10 SYSTEM VERIFICATION

10.1 Tissue Verification

Table 10-1
Measured Head Tissue Properties

Calibrated for Tests Performed on:	Tissue Type	Tissue Temp During Calibration (°C)	Measured Frequency (MHz)	Measured Conductivity, σ (S/m)	Measured Dielectric Constant, ϵ	TARGET Conductivity, σ (S/m)	TARGET Dielectric Constant, ϵ	% dev σ	% dev ϵ
7/5/2016	750H	21.3	700	0.849	41.651	0.889	42.201	-4.50%	-1.30%
			710	0.857	41.450	0.890	42.149	-3.71%	-1.66%
			740	0.881	41.121	0.893	41.994	-1.34%	-2.08%
			755	0.899	40.902	0.894	41.916	0.56%	-2.42%
7/11/2016	835H	22.4	820	0.877	41.348	0.899	41.578	-2.45%	-0.55%
			835	0.891	41.152	0.900	41.500	-1.00%	-0.84%
			850	0.904	40.961	0.916	41.500	-1.31%	-1.30%
7/12/2016	835H	22.1	820	0.895	41.897	0.899	41.578	-0.44%	0.77%
			835	0.908	41.718	0.900	41.500	0.89%	0.53%
			850	0.923	41.525	0.916	41.500	0.76%	0.06%
7/15/2016	835H	21.6	820	0.886	41.346	0.899	41.578	-1.45%	-0.56%
			835	0.899	41.086	0.900	41.500	-0.11%	-1.00%
			850	0.912	40.947	0.916	41.500	-0.44%	-1.33%
7/11/2016	1750H	22.0	1710	1.284	39.403	1.348	40.142	-4.75%	-1.84%
			1750	1.320	39.220	1.371	40.079	-3.72%	-2.14%
			1790	1.354	39.060	1.394	40.016	-2.87%	-2.39%
7/5/2016	1900H	21.3	1850	1.402	39.475	1.400	40.000	0.14%	-1.31%
			1880	1.431	39.346	1.400	40.000	2.21%	-1.64%
			1910	1.463	39.193	1.400	40.000	4.50%	-2.02%
7/5/2016	2450H	22.3	2450	1.860	38.548	1.800	39.200	3.33%	-1.66%
			2500	1.910	38.333	1.855	39.136	2.96%	-2.05%
			2550	1.976	38.090	1.909	39.073	3.51%	-2.52%
			2600	2.035	37.959	1.964	39.009	3.62%	-2.69%
7/15/2016	2450H	22.6	2400	1.791	40.475	1.756	39.289	1.99%	3.02%
			2450	1.845	40.279	1.800	39.200	2.50%	2.75%
			2500	1.904	40.093	1.855	39.136	2.64%	2.45%
07/15/2016	5200H-5800H	21.8	5240	4.565	36.748	4.696	35.940	-2.79%	2.25%
			5260	4.588	36.674	4.717	35.917	-2.73%	2.11%
			5280	4.603	36.660	4.737	35.894	-2.83%	2.13%
			5300	4.623	36.646	4.758	35.871	-2.84%	2.16%
			5680	5.038	36.106	5.147	35.437	-2.12%	1.89%
			5700	5.049	36.080	5.168	35.414	-2.30%	1.88%
			5745	5.097	36.009	5.214	35.363	-2.24%	1.83%
			5765	5.141	35.976	5.234	35.340	-1.78%	1.80%
			5785	5.159	35.955	5.255	35.317	-1.83%	1.81%

FCC ID: ZNFLS997		SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: OY1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset		Page 50 of 83

Table 10-2
Measured Body Tissue Properties

Calibrated for Tests Performed on:	Tissue Type	Tissue Temp During Calibration (°C)	Measured Frequency (MHz)	Measured Conductivity, σ (S/m)	Measured Dielectric Constant, ϵ	TARGET Conductivity, σ (S/m)	TARGET Dielectric Constant, ϵ	% dev σ	% dev ϵ
7/6/2016	750B	22.6	700	0.923	55.338	0.959	55.726	-3.75%	-0.70%
			710	0.925	55.242	0.960	55.687	-3.65%	-0.80%
			740	0.950	54.839	0.963	55.570	-1.35%	-1.32%
			755	0.963	54.644	0.964	55.512	-0.10%	-1.56%
7/13/2016	835B	23.4	820	0.970	53.415	0.969	55.258	0.10%	-3.34%
			835	0.984	53.281	0.970	55.200	1.44%	-3.48%
			850	0.998	53.124	0.988	55.154	1.01%	-3.68%
7/7/2016	1750B	22.2	1710	1.415	52.090	1.463	53.537	-3.28%	-2.70%
			1750	1.459	51.893	1.488	53.432	-1.95%	-2.88%
			1790	1.506	51.797	1.514	53.326	-0.53%	-2.87%
7/11/2016	1750B	21.9	1710	1.466	52.776	1.463	53.537	0.21%	-1.42%
			1750	1.510	52.589	1.488	53.432	1.48%	-1.58%
			1790	1.552	52.438	1.514	53.326	2.51%	-1.67%
7/5/2016	1900B	22.1	1850	1.511	52.789	1.520	53.300	-0.59%	-0.96%
			1880	1.542	52.701	1.520	53.300	1.45%	-1.12%
			1910	1.576	52.549	1.520	53.300	3.68%	-1.41%
7/11/2016	1900B	22.8	1850	1.527	52.150	1.520	53.300	0.46%	-2.16%
			1880	1.561	52.091	1.520	53.300	2.70%	-2.27%
			1910	1.589	51.937	1.520	53.300	4.54%	-2.56%
7/5/2016	2450B	22.4	2450	2.029	52.833	1.950	52.700	4.05%	0.25%
			2500	2.090	52.682	2.021	52.636	3.41%	0.09%
			2550	2.161	52.477	2.092	52.573	3.30%	-0.18%
7/14/2016	2450B	22.2	2400	1.946	53.581	1.902	52.767	2.31%	1.54%
			2450	2.018	53.383	1.950	52.700	3.49%	1.30%
			2500	2.085	53.218	2.021	52.636	3.17%	1.11%
7/19/2016	2450B	23.0	2400	1.893	53.253	1.902	52.767	-0.47%	0.92%
			2450	1.960	53.064	1.950	52.700	0.51%	0.69%
			2500	2.027	52.895	2.021	52.636	0.30%	0.49%
07/11/2016	5200B-5800B	21.7	5200	5.350	47.460	5.299	49.014	0.96%	-3.17%
			5240	5.405	47.389	5.346	48.960	1.10%	-3.21%
			5260	5.438	47.409	5.369	48.933	1.29%	-3.11%
			5500	5.723	46.987	5.650	48.607	1.29%	-3.33%
			5600	5.849	46.811	5.766	48.471	1.44%	-3.42%
			5700	5.983	46.726	5.883	48.336	1.70%	-3.33%
			5745	6.045	46.550	5.936	48.275	1.84%	-3.57%
			5765	6.069	46.587	5.959	48.248	1.85%	-3.44%

The above measured tissue parameters were used in the DASY software. The DASY software was used to perform interpolation to determine the dielectric parameters at the SAR test device frequencies (per KDB Publication 865664 D01v01r04 and IEEE 1528-2013 6.6.1.2). The tissue parameters listed in the SAR test plots may slightly differ from the table above due to significant digit rounding in the software.

FCC ID: ZNFLS997		SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: 0Y1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset	Page 51 of 83	

10.2 Test System Verification

Prior to SAR assessment, the system is verified to $\pm 10\%$ of the SAR measurement on the reference dipole at the time of calibration by the calibration facility. Full system validation status and result summary can be found in Appendix E.

Table 10-3
System Verification Results – 1 g

System Verification TARGET & MEASURED												
SAR System #	Tissue Frequency (MHz)	Tissue Type	Date:	Amb. Temp (°C)	Liquid Temp (°C)	Input Power (W)	Dipole SN	Probe SN	Measured SAR _{1g} (W/kg)	1 W Target SAR _{1g} (W/kg)	1 W Normalized SAR _{1g} (W/kg)	Deviation _{1g} (%)
K	750	HEAD	07/05/2016	21.8	21.2	0.200	1046	3022	1.560	8.200	7.800	-4.88%
J	835	HEAD	07/11/2016	22.8	22.4	0.200	4d119	3318	1.830	9.140	9.150	0.11%
G	835	HEAD	07/12/2016	23.2	22.1	0.200	4d119	3334	1.790	9.140	8.950	-2.08%
G	835	HEAD	07/15/2016	21.2	21.7	0.200	4d119	3334	1.850	9.140	9.250	1.20%
E	1750	HEAD	07/11/2016	23.0	22.0	0.100	1051	7406	3.390	36.100	33.900	-6.09%
I	1900	HEAD	07/05/2016	22.6	21.3	0.100	5d141	3333	4.000	38.500	40.000	3.90%
G	2450	HEAD	07/05/2016	20.2	22.0	0.100	719	3334	5.430	54.200	54.300	0.18%
K	2450	HEAD	07/15/2016	21.8	22.6	0.100	719	7409	5.090	54.200	50.900	-6.09%
D	5250	HEAD	07/15/2016	23.0	21.8	0.050	1120	3914	3.650	78.700	73.000	-7.24%
D	5750	HEAD	07/15/2016	23.0	21.8	0.050	1120	3914	3.690	79.100	73.800	-6.70%
K	750	BODY	07/06/2016	23.4	22.0	0.200	1046	7409	1.830	8.770	9.150	4.33%
I	835	BODY	07/13/2016	24.0	23.5	0.200	4d119	3333	1.760	9.140	8.800	-3.72%
F	1750	BODY	07/07/2016	24.6	22.0	0.100	1008	3209	3.920	37.300	39.200	5.09%
K	1750	BODY	07/11/2016	23.2	21.9	0.100	1051	7409	3.900	36.500	39.000	6.85%
H	1900	BODY	07/05/2016	22.9	22.1	0.100	5d149	3319	4.230	40.400	42.300	4.70%
H	1900	BODY	07/11/2016	22.7	22.8	0.100	5d141	3319	4.200	39.600	42.000	6.06%
G	2450	BODY	07/05/2016	21.2	22.0	0.100	719	3334	5.230	51.900	52.300	0.77%
E	2450	BODY	07/14/2016	23.2	22.4	0.100	719	7406	5.250	51.900	52.500	1.16%
D	5250	BODY	07/11/2016	21.9	21.7	0.050	1120	3914	3.710	75.600	74.200	-1.85%
D	5600	BODY	07/11/2016	21.9	21.7	0.050	1120	3914	3.740	80.800	74.800	-7.43%
D	5750	BODY	07/11/2016	21.9	21.7	0.050	1120	3914	3.500	76.500	70.000	-8.50%

FCC ID: ZNFLS997	 SAR EVALUATION REPORT 		Reviewed by: Quality Manager
Document S/N: 0Y1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset	Page 52 of 83

Table 10-4
System Verification Results – 10 g

System Verification TARGET & MEASURED												
SAR System #	Tissue Frequency (MHz)	Tissue Type	Date :	Amb. Temp (°C)	Liquid Temp (°C)	Input Power (W)	Dipole SN	Probe SN	Measured SAR _{10g} (W/kg)	1 W Target SAR _{10g} (W/kg)	1 W Normalized SAR _{10g} (W/kg)	Deviation _{10g} (%)
E	2450	BODY	07/19/2016	23.5	23.0	0.100	719	7406	2.340	24.300	23.400	-3.70%
D	5250	BODY	07/11/2016	21.9	21.7	0.050	1120	3914	1.050	21.200	21.000	-0.94%
D	5600	BODY	07/11/2016	21.9	21.7	0.050	1120	3914	1.060	22.600	21.200	-6.19%
D	5750	BODY	07/11/2016	21.9	21.7	0.050	1120	3914	0.988	21.300	19.760	-7.23%

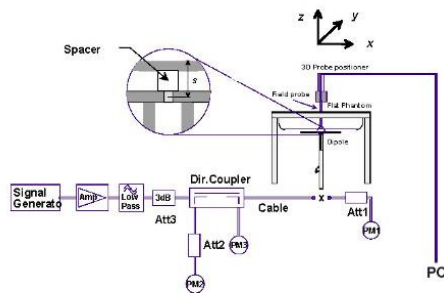


Figure 10-1
System Verification Setup Diagram



Figure 10-2
System Verification Setup Photo

FCC ID: ZNFLS997		SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: 0Y1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset		Page 53 of 83

11 SAR DATA SUMMARY

11.1 Standalone Head SAR Data

**Table 11-1
GSM 850 Head SAR**

MEASUREMENT RESULTS															
FREQUENCY		Mode/Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	# of Time Slots	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
836.60	190	GSM 850	GSM	33.7	33.11	0.04	Right	Cheek	00305	1	1:8.3	0.253	1.146	0.290	
836.60	190	GSM 850	GSM	33.7	33.11	0.07	Right	Tilt	00305	1	1:8.3	0.109	1.146	0.125	
836.60	190	GSM 850	GSM	33.7	33.11	0.17	Left	Cheek	00305	1	1:8.3	0.262	1.146	0.300	
836.60	190	GSM 850	GSM	33.7	33.11	-0.03	Left	Tilt	00305	1	1:8.3	0.161	1.146	0.185	
836.60	190	GSM 850	GPRS	32.2	31.78	-0.02	Right	Cheek	00305	2	1:4.15	0.435	1.102	0.479	A1
836.60	190	GSM 850	GPRS	32.2	31.78	0.07	Right	Tilt	00305	2	1:4.15	0.183	1.102	0.202	
836.60	190	GSM 850	GPRS	32.2	31.78	0.02	Left	Cheek	00305	2	1:4.15	0.370	1.102	0.408	
836.60	190	GSM 850	GPRS	32.2	31.78	-0.02	Left	Tilt	00305	2	1:4.15	0.200	1.102	0.220	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Head 1.6 W/kg (mW/g) averaged over 1 gram							

**Table 11-2
GSM 1900 Head SAR**

MEASUREMENT RESULTS															
FREQUENCY		Mode/Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	# of Time Slots	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
1880.00	661	GSM 1900	GSM	30.7	30.56	0.01	Right	Cheek	00271	1	1:8.3	0.066	1.033	0.068	
1880.00	661	GSM 1900	GSM	30.7	30.56	0.11	Right	Tilt	00271	1	1:8.3	0.047	1.033	0.049	
1880.00	661	GSM 1900	GSM	30.7	30.56	0.02	Left	Cheek	00271	1	1:8.3	0.103	1.033	0.106	
1880.00	661	GSM 1900	GSM	30.7	30.56	0.05	Left	Tilt	00271	1	1:8.3	0.057	1.033	0.059	
1880.00	661	GSM 1900	GPRS	29.2	28.89	-0.21	Right	Cheek	00271	2	1:4.15	0.107	1.074	0.115	
1880.00	661	GSM 1900	GPRS	29.2	28.89	-0.02	Right	Tilt	00271	2	1:4.15	0.081	1.074	0.087	
1880.00	661	GSM 1900	GPRS	29.2	28.89	0.09	Left	Cheek	00271	2	1:4.15	0.207	1.074	0.222	A2
1880.00	661	GSM 1900	GPRS	29.2	28.89	0.18	Left	Tilt	00271	2	1:4.15	0.102	1.074	0.110	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Head 1.6 W/kg (mW/g) averaged over 1 gram								

FCC ID: ZNFLS997	 PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: OY1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset		Page 54 of 83

Table 11-3
UMTS 850 Head SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode/Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
836.60	4183	UMTS 850	RMC	24.7	24.50	-0.02	Right	Cheek	00271	1:1	0.283	1.047	0.296	A3
836.60	4183	UMTS 850	RMC	24.7	24.50	0.09	Right	Tilt	00271	1:1	0.132	1.047	0.138	
836.60	4183	UMTS 850	RMC	24.7	24.50	0.05	Left	Cheek	00271	1:1	0.270	1.047	0.283	
836.60	4183	UMTS 850	RMC	24.7	24.50	0.04	Left	Tilt	00271	1:1	0.147	1.047	0.154	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Head 1.6 W/kg (mW/g) averaged over 1 gram							

Table 11-4
UMTS 1750 Head SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode/Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
1732.40	1412	UMTS 1750	RMC	25.0	24.46	0.07	Right	Cheek	00248	1:1	0.118	1.132	0.134	
1732.40	1412	UMTS 1750	RMC	25.0	24.46	0.08	Right	Tilt	00248	1:1	0.122	1.132	0.138	
1732.40	1412	UMTS 1750	RMC	25.0	24.46	0.09	Left	Cheek	00248	1:1	0.221	1.132	0.250	A4
1732.40	1412	UMTS 1750	RMC	25.0	24.46	0.08	Left	Tilt	00248	1:1	0.102	1.132	0.115	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Head 1.6 W/kg (mW/g) averaged over 1 gram							

Table 11-5
UMTS 1900 Head SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode/Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
1880.00	9400	UMTS 1900	RMC	25.0	24.65	0.00	Right	Cheek	00248	1:1	0.227	1.084	0.246	
1880.00	9400	UMTS 1900	RMC	25.0	24.65	0.03	Right	Tilt	00248	1:1	0.163	1.084	0.177	
1880.00	9400	UMTS 1900	RMC	25.0	24.65	0.04	Left	Cheek	00248	1:1	0.305	1.084	0.331	A5
1880.00	9400	UMTS 1900	RMC	25.0	24.65	0.05	Left	Tilt	00248	1:1	0.137	1.084	0.149	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Head 1.6 W/kg (mW/g) averaged over 1 gram							

FCC ID: ZNFLS997	 PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT	 LG	Reviewed by: Quality Manager
Document S/N: 0Y1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset		Page 55 of 83

Table 11-6
CDMA BC10 (\$90S) Head SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode/Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Antenna Config.	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
820.10	564	CDMA BC10 (\$90S)	RC3 / SO55	25.2	25.12	0.11	Right	Cheek	Ant 1	00248	1:1	0.233	1.019	0.237	
820.10	564	CDMA BC10 (\$90S)	RC3 / SO55	25.2	25.12	-0.02	Right	Tilt	Ant 1	00248	1:1	0.098	1.019	0.100	
820.10	564	CDMA BC10 (\$90S)	RC3 / SO55	25.2	25.12	0.12	Left	Cheek	Ant 1	00248	1:1	0.207	1.019	0.211	
820.10	564	CDMA BC10 (\$90S)	RC3 / SO55	25.2	25.12	-0.02	Left	Tilt	Ant 1	00248	1:1	0.109	1.019	0.111	
820.10	564	CDMA BC10 (\$90S)	EVDO Rev. A	25.2	24.87	-0.01	Right	Cheek	Ant 1	00248	1:1	0.203	1.079	0.219	
820.10	564	CDMA BC10 (\$90S)	EVDO Rev. A	25.2	24.87	-0.01	Right	Tilt	Ant 1	00248	1:1	0.090	1.079	0.097	
820.10	564	CDMA BC10 (\$90S)	EVDO Rev. A	25.2	24.87	0.05	Left	Cheek	Ant 1	00248	1:1	0.184	1.079	0.199	
820.10	564	CDMA BC10 (\$90S)	EVDO Rev. A	25.2	24.87	0.17	Left	Tilt	Ant 1	00248	1:1	0.084	1.079	0.091	
820.10	564	CDMA BC10 (\$90S)	RC3 / SO55	25.2	25.12	-0.04	Right	Cheek	Ant 3	00396	1:1	0.199	1.019	0.203	
820.10	564	CDMA BC10 (\$90S)	RC3 / SO55	25.2	25.12	0.05	Right	Tilt	Ant 3	00396	1:1	0.271	1.019	0.276	A6
820.10	564	CDMA BC10 (\$90S)	RC3 / SO55	25.2	25.12	0.00	Left	Cheek	Ant 3	00396	1:1	0.123	1.019	0.125	
820.10	564	CDMA BC10 (\$90S)	RC3 / SO55	25.2	25.12	0.06	Left	Tilt	Ant 3	00396	1:1	0.138	1.019	0.141	
820.10	564	CDMA BC10 (\$90S)	EVDO Rev. A	25.2	24.87	0.02	Right	Cheek	Ant 3	00396	1:1	0.181	1.079	0.195	
820.10	564	CDMA BC10 (\$90S)	EVDO Rev. A	25.2	24.87	-0.03	Right	Tilt	Ant 3	00396	1:1	0.261	1.079	0.282	
820.10	564	CDMA BC10 (\$90S)	EVDO Rev. A	25.2	24.87	0.07	Left	Cheek	Ant 3	00396	1:1	0.068	1.079	0.073	
820.10	564	CDMA BC10 (\$90S)	EVDO Rev. A	25.2	24.87	0.06	Left	Tilt	Ant 3	00396	1:1	0.085	1.079	0.092	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Head 1.6 W/kg (mW/g) averaged over 1 gram								

FCC ID: ZNFLS997		SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: 0Y1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset		Page 56 of 83

Table 11-7
CDMA BC0 (\$22H) Head SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode/Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Antenna Config.	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
836.52	384	CDMA BC0 (\$22H)	RC3 / SO55	25.2	25.18	-0.02	Right	Cheek	Ant 1	00248	1:1	0.309	1.005	0.311	A7
836.52	384	CDMA BC0 (\$22H)	RC3 / SO55	25.2	25.18	-0.07	Right	Tilt	Ant 1	00248	1:1	0.117	1.005	0.118	
836.52	384	CDMA BC0 (\$22H)	RC3 / SO55	25.2	25.18	0.03	Left	Cheek	Ant 1	00248	1:1	0.276	1.005	0.277	
836.52	384	CDMA BC0 (\$22H)	RC3 / SO55	25.2	25.18	-0.13	Left	Tilt	Ant 1	00248	1:1	0.135	1.005	0.136	
836.52	384	CDMA BC0 (\$22H)	EVDO Rev. A	25.2	24.83	0.11	Right	Cheek	Ant 1	00248	1:1	0.261	1.089	0.284	
836.52	384	CDMA BC0 (\$22H)	EVDO Rev. A	25.2	24.83	0.10	Right	Tilt	Ant 1	00248	1:1	0.129	1.089	0.140	
836.52	384	CDMA BC0 (\$22H)	EVDO Rev. A	25.2	24.83	0.13	Left	Cheek	Ant 1	00248	1:1	0.251	1.089	0.273	
836.52	384	CDMA BC0 (\$22H)	EVDO Rev. A	25.2	24.83	0.00	Left	Tilt	Ant 1	00248	1:1	0.117	1.089	0.127	
836.52	384	CDMA BC0 (\$22H)	RC3 / SO55	25.2	25.18	0.02	Right	Cheek	Ant 3	00396	1:1	0.215	1.005	0.216	
836.52	384	CDMA BC0 (\$22H)	RC3 / SO55	25.2	25.18	0.07	Right	Tilt	Ant 3	00396	1:1	0.259	1.005	0.260	
836.52	384	CDMA BC0 (\$22H)	RC3 / SO55	25.2	25.18	0.07	Left	Cheek	Ant 3	00396	1:1	0.171	1.005	0.172	
836.52	384	CDMA BC0 (\$22H)	RC3 / SO55	25.2	25.18	0.04	Left	Tilt	Ant 3	00396	1:1	0.188	1.005	0.189	
836.52	384	CDMA BC0 (\$22H)	EVDO Rev. A	25.2	24.83	-0.06	Right	Cheek	Ant 3	00396	1:1	0.142	1.089	0.155	
836.52	384	CDMA BC0 (\$22H)	EVDO Rev. A	25.2	24.83	0.00	Right	Tilt	Ant 3	00396	1:1	0.206	1.089	0.224	
836.52	384	CDMA BC0 (\$22H)	EVDO Rev. A	25.2	24.83	0.10	Left	Cheek	Ant 3	00396	1:1	0.077	1.089	0.084	
836.52	384	CDMA BC0 (\$22H)	EVDO Rev. A	25.2	24.83	0.04	Left	Tilt	Ant 3	00396	1:1	0.096	1.089	0.105	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Head 1.6 W/kg (mW/g) averaged over 1 gram								

Table 11-8
PCS CDMA Head SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode/Band	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
1880.00	600	PCS CDMA	RC3 / SO55	25.2	25.06	0.10	Right	Cheek	00271	1:1	0.178	1.033	0.184	
1880.00	600	PCS CDMA	RC3 / SO55	25.2	25.06	-0.07	Right	Tilt	00271	1:1	0.101	1.033	0.104	
1880.00	600	PCS CDMA	RC3 / SO55	25.2	25.06	0.00	Left	Cheek	00271	1:1	0.337	1.033	0.348	
1880.00	600	PCS CDMA	RC3 / SO55	25.2	25.06	0.06	Left	Tilt	00271	1:1	0.149	1.033	0.154	
1880.00	600	PCS CDMA	EVDO Rev. A	25.2	25.18	-0.10	Right	Cheek	00271	1:1	0.172	1.005	0.173	
1880.00	600	PCS CDMA	EVDO Rev. A	25.2	25.18	0.14	Right	Tilt	00271	1:1	0.095	1.005	0.095	
1880.00	600	PCS CDMA	EVDO Rev. A	25.2	25.18	0.05	Left	Cheek	00271	1:1	0.344	1.005	0.346	A8
1880.00	600	PCS CDMA	EVDO Rev. A	25.2	25.18	0.07	Left	Tilt	00271	1:1	0.149	1.005	0.150	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Head 1.6 W/kg (mW/g) averaged over 1 gram							

FCC ID: ZNFLS997	 PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: 0Y1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset		Page 57 of 83

Table 11-9
LTE Band 12 Head SAR

MEASUREMENT RESULTS																			
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.	(W/kg)														(W/kg)			
707.50	23095	Mid	LTE Band 12	10	25.0	24.77	-0.06	0	Right	Cheek	QPSK	1	0	00206	1:1	0.284	1.054	0.299	A9
707.50	23095	Mid	LTE Band 12	10	24.0	23.87	0.06	1	Right	Cheek	QPSK	25	0	00206	1:1	0.214	1.030	0.220	
707.50	23095	Mid	LTE Band 12	10	25.0	24.77	0.08	0	Right	Tilt	QPSK	1	0	00206	1:1	0.100	1.054	0.105	
707.50	23095	Mid	LTE Band 12	10	24.0	23.87	0.07	1	Right	Tilt	QPSK	25	0	00206	1:1	0.078	1.030	0.080	
707.50	23095	Mid	LTE Band 12	10	25.0	24.77	0.03	0	Left	Cheek	QPSK	1	0	00206	1:1	0.267	1.054	0.281	
707.50	23095	Mid	LTE Band 12	10	24.0	23.87	0.13	1	Left	Cheek	QPSK	25	0	00206	1:1	0.190	1.030	0.196	
707.50	23095	Mid	LTE Band 12	10	25.0	24.77	0.08	0	Left	Tilt	QPSK	1	0	00206	1:1	0.127	1.054	0.134	
707.50	23095	Mid	LTE Band 12	10	24.0	23.87	-0.10	1	Left	Tilt	QPSK	25	0	00206	1:1	0.106	1.030	0.109	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Head 1.6 W/kg (mW/g) averaged over 1 gram									

Table 11-10
LTE Band 26 (Cell) Head SAR

MEASUREMENT RESULTS																				
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Antenna Config.	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
MHz	Ch.															(W/kg)		(W/kg)		
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.7	24.50	0.16	0	Right	Cheek	Ant 1	QPSK	1	36	00206	1:1	0.368	1.047	0.385	
831.50	26865	Mid	LTE Band 26 (Cell)	15	23.7	23.41	0.05	1	Right	Cheek	Ant 1	QPSK	36	0	00206	1:1	0.289	1.069	0.309	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.7	24.50	0.00	0	Right	Tilt	Ant 1	QPSK	1	36	00206	1:1	0.183	1.047	0.192	
831.50	26865	Mid	LTE Band 26 (Cell)	15	23.7	23.41	0.05	1	Right	Tilt	Ant 1	QPSK	36	0	00206	1:1	0.140	1.069	0.150	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.7	24.50	0.06	0	Left	Cheek	Ant 1	QPSK	1	36	00206	1:1	0.324	1.047	0.339	
831.50	26865	Mid	LTE Band 26 (Cell)	15	23.7	23.41	-0.09	1	Left	Cheek	Ant 1	QPSK	36	0	00206	1:1	0.245	1.069	0.262	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.7	24.50	-0.01	0	Left	Tilt	Ant 1	QPSK	1	36	00206	1:1	0.157	1.047	0.164	
831.50	26865	Mid	LTE Band 26 (Cell)	15	23.7	23.41	0.12	1	Left	Tilt	Ant 1	QPSK	36	0	00206	1:1	0.119	1.069	0.127	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.7	24.50	-0.18	0	Right	Cheek	Ant 3	QPSK	1	36	00206	1:1	0.680	1.047	0.712	
831.50	26865	Mid	LTE Band 26 (Cell)	15	23.7	23.41	-0.07	1	Right	Cheek	Ant 3	QPSK	36	0	00206	1:1	0.615	1.069	0.657	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.7	24.50	-0.19	0	Right	Tilt	Ant 3	QPSK	1	36	00206	1:1	0.695	1.047	0.728	A10
831.50	26865	Mid	LTE Band 26 (Cell)	15	23.7	23.41	-0.08	1	Right	Tilt	Ant 3	QPSK	36	0	00206	1:1	0.666	1.069	0.712	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.7	24.50	0.03	0	Left	Cheek	Ant 3	QPSK	1	36	00206	1:1	0.321	1.047	0.336	
831.50	26865	Mid	LTE Band 26 (Cell)	15	23.7	23.41	0.04	1	Left	Cheek	Ant 3	QPSK	36	0	00206	1:1	0.290	1.069	0.310	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.7	24.50	0.02	0	Left	Tilt	Ant 3	QPSK	1	36	00206	1:1	0.299	1.047	0.313	
831.50	26865	Mid	LTE Band 26 (Cell)	15	23.7	23.41	0.08	1	Left	Tilt	Ant 3	QPSK	36	0	00206	1:1	0.274	1.069	0.293	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population									Head 1.6 W/kg (mW/g) averaged over 1 gram											

FCC ID: ZNFLS997		SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: OY1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset		Page 58 of 83

Table 11-11
LTE Band 4 (AWS) Head SAR

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
MHz	Ch.														(W/kg)		(W/kg)		
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.7	24.65	0.06	0	Right	Cheek	QPSK	1	99	00222	1:1	0.121	1.012	0.122	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.7	23.69	0.05	1	Right	Cheek	QPSK	50	0	00222	1:1	0.082	1.002	0.082	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.7	24.65	0.08	0	Right	Tilt	QPSK	1	99	00222	1:1	0.083	1.012	0.084	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.7	23.69	0.11	1	Right	Tilt	QPSK	50	0	00222	1:1	0.066	1.002	0.066	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.7	24.65	0.10	0	Left	Cheek	QPSK	1	99	00222	1:1	0.225	1.012	0.228	A11
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.7	23.69	0.10	1	Left	Cheek	QPSK	50	0	00222	1:1	0.168	1.002	0.168	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.7	24.65	0.13	0	Left	Tilt	QPSK	1	99	00222	1:1	0.098	1.012	0.099	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.7	23.69	0.16	1	Left	Tilt	QPSK	50	0	00222	1:1	0.084	1.002	0.084	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population									Head 1.6 W/kg (mW/g) averaged over 1 gram										

Table 11-12
LTE Band 25 (PCS) Head SAR

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
MHz	Ch.														(W/kg)		(W/kg)		
1860.00	26140	Low	LTE Band 25 (PCS)	20	24.7	24.70	0.05	0	Right	Cheek	QPSK	1	0	00222	1:1	0.174	1.000	0.174	
1860.00	26140	Low	LTE Band 25 (PCS)	20	23.7	23.59	0.00	1	Right	Cheek	QPSK	50	50	00222	1:1	0.150	1.026	0.154	
1860.00	26140	Low	LTE Band 25 (PCS)	20	24.7	24.70	0.01	0	Right	Tilt	QPSK	1	0	00222	1:1	0.115	1.000	0.115	
1860.00	26140	Low	LTE Band 25 (PCS)	20	23.7	23.59	-0.03	1	Right	Tilt	QPSK	50	50	00222	1:1	0.097	1.026	0.100	
1860.00	26140	Low	LTE Band 25 (PCS)	20	24.7	24.70	0.07	0	Left	Cheek	QPSK	1	0	00222	1:1	0.385	1.000	0.385	A12
1860.00	26140	Low	LTE Band 25 (PCS)	20	23.7	23.59	0.12	1	Left	Cheek	QPSK	50	50	00222	1:1	0.266	1.026	0.273	
1860.00	26140	Low	LTE Band 25 (PCS)	20	24.7	24.70	0.05	0	Left	Tilt	QPSK	1	0	00222	1:1	0.159	1.000	0.159	
1860.00	26140	Low	LTE Band 25 (PCS)	20	23.7	23.59	0.05	1	Left	Tilt	QPSK	50	50	00222	1:1	0.114	1.026	0.117	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population									Head 1.6 W/kg (mW/g) averaged over 1 gram										

Table 11-13
LTE Band 41 Head SAR

MEASUREMENT RESULTS																				
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Extended Cyclic Prefix)	Reported SAR (1g)	Plot #	
MHz	Ch.														(W/kg)			(W/kg)		
2506.00	39750	Low	LTE Band 41	20	24.7	24.70	0.12	0	Right	Cheek	QPSK	1	99	00206	1:1.59	0.076	1.000	1.010	0.077	
2506.00	39750	Low	LTE Band 41	20	23.7	23.69	0.07	1	Right	Cheek	QPSK	50	25	00206	1:1.59	0.057	1.002	1.010	0.058	
2506.00	39750	Low	LTE Band 41	20	24.7	24.70	-0.09	0	Right	Tilt	QPSK	1	99	00206	1:1.59	0.056	1.000	1.010	0.057	
2506.00	39750	Low	LTE Band 41	20	23.7	23.69	0.12	1	Right	Tilt	QPSK	50	25	00206	1:1.59	0.040	1.002	1.010	0.040	
2506.00	39750	Low	LTE Band 41	20	24.7	24.70	-0.05	0	Left	Cheek	QPSK	1	99	00206	1:1.59	0.111	1.000	1.010	0.112	A13
2506.00	39750	Low	LTE Band 41	20	23.7	23.69	-0.03	1	Left	Cheek	QPSK	50	25	00206	1:1.59	0.089	1.002	1.010	0.090	
2506.00	39750	Low	LTE Band 41	20	24.7	24.70	0.14	0	Left	Tilt	QPSK	1	99	00206	1:1.59	0.033	1.000	1.010	0.033	
2506.00	39750	Low	LTE Band 41	20	23.7	23.69	0.00	1	Left	Tilt	QPSK	50	25	00206	1:1.59	0.024	1.002	1.010	0.024	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population									Head 1.6 W/kg (mW/g) averaged over 1 gram											

FCC ID: ZNFLS997		SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: 0Y1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset		Page 59 of 83

**Table 11-14
DTS Head SAR**

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.													W/kg	(W/kg)			(W/kg)	
2437	6	802.11b	DSSS	22	12.5	11.95	0.18	Right	Cheek	Primary	00321	1	99.9	0.229	-	1.135	1.001	-	
2437	6	802.11b	DSSS	22	12.5	11.95	0.15	Right	Tilt	Primary	00321	1	99.9	0.243	-	1.135	1.001	-	
2437	6	802.11b	DSSS	22	12.5	11.95	0.07	Left	Cheek	Primary	00321	1	99.9	0.681	0.421	1.135	1.001	0.478	A14
2437	6	802.11b	DSSS	22	12.5	11.95	-0.06	Left	Tilt	Primary	00321	1	99.9	0.681	0.393	1.135	1.001	0.447	
2437	6	802.11b	DSSS	22	5.5	5.49	0.02	Right	Cheek	Secondary	00321	1	99.9	0.073	-	1.002	1.001	-	
2437	6	802.11b	DSSS	22	5.5	5.49	-0.21	Right	Tilt	Secondary	00321	1	99.9	0.038	-	1.002	1.001	-	
2437	6	802.11b	DSSS	22	5.5	5.49	0.15	Left	Cheek	Secondary	00321	1	99.9	0.207	0.091	1.002	1.001	0.091	
2437	6	802.11b	DSSS	22	5.5	5.49	0.20	Left	Tilt	Secondary	00321	1	99.9	0.175	-	1.002	1.001	-	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population									Head 1.6 W/kg (mW/g) averaged over 1 gram										

**Table 11-15
NII Head SAR**

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.													W/kg	(W/kg)			(W/kg)	
5270	54	802.11n	OFDM	40	13.0	12.07	0.10	Right	Cheek	Primary	00313	13.5	99.3	0.183	0.104	1.239	1.007	0.130	
5270	54	802.11n	OFDM	40	13.0	12.07	0.14	Right	Tilt	Primary	00313	13.5	99.3	0.219	0.111	1.239	1.007	0.138	
5270	54	802.11n	OFDM	40	13.0	12.07	0.17	Left	Cheek	Primary	00313	13.5	99.3	0.430	-	1.239	1.007	-	
5270	54	802.11n	OFDM	40	13.0	12.07	0.13	Left	Tilt	Primary	00313	13.5	99.3	0.515	0.214	1.239	1.007	0.267	
5290	58	802.11ac	OFDM	80	5.5	4.66	0.13	Right	Cheek	Secondary	00313	29.3	98.4	0.257	-	1.213	1.016	-	
5290	58	802.11ac	OFDM	80	5.5	4.66	0.11	Right	Tilt	Secondary	00313	29.3	98.4	0.264	-	1.213	1.016	-	
5290	58	802.11ac	OFDM	80	5.5	4.66	0.17	Left	Cheek	Secondary	00313	29.3	98.4	0.649	0.314	1.213	1.016	0.387	
5290	58	802.11ac	OFDM	80	5.5	4.66	0.20	Left	Tilt	Secondary	00313	29.3	98.4	0.894	0.400	1.213	1.016	0.493	
5690	138	802.11ac	OFDM	80	13.0	11.92	0.16	Right	Cheek	Primary	00313	29.3	98.4	0.396	0.234	1.282	1.016	0.305	
5690	138	802.11ac	OFDM	80	13.0	11.92	0.21	Right	Tilt	Primary	00313	29.3	98.4	0.437	0.194	1.282	1.016	0.253	
5690	138	802.11ac	OFDM	80	13.0	11.92	0.06	Left	Cheek	Primary	00313	29.3	98.4	0.862	0.387	1.282	1.016	0.504	
5690	138	802.11ac	OFDM	80	13.0	11.92	0.19	Left	Tilt	Primary	00313	29.3	98.4	1.020	0.572	1.282	1.016	0.745	A15
5690	138	802.11ac	OFDM	80	5.5	4.92	0.13	Right	Cheek	Secondary	00313	29.3	98.4	0.147	-	1.143	1.016	-	
5690	138	802.11ac	OFDM	80	5.5	4.92	-0.05	Right	Tilt	Secondary	00313	29.3	98.4	0.154	-	1.143	1.016	-	
5690	138	802.11ac	OFDM	80	5.5	4.92	0.17	Left	Cheek	Secondary	00313	29.3	98.4	0.270	-	1.143	1.016	-	
5690	138	802.11ac	OFDM	80	5.5	4.92	0.19	Left	Tilt	Secondary	00313	29.3	98.4	0.353	0.166	1.143	1.016	0.193	
5775	155	802.11ac	OFDM	80	13.0	11.85	0.09	Right	Cheek	Primary	00313	29.3	98.4	0.409	0.219	1.303	1.016	0.290	
5775	155	802.11ac	OFDM	80	13.0	11.85	0.19	Right	Tilt	Primary	00313	29.3	98.4	0.405	0.197	1.303	1.016	0.261	
5775	155	802.11ac	OFDM	80	13.0	11.85	-0.07	Left	Cheek	Primary	00313	29.3	98.4	0.855	0.359	1.303	1.016	0.475	
5775	155	802.11ac	OFDM	80	13.0	11.85	0.12	Left	Tilt	Primary	00313	29.3	98.4	1.040	0.497	1.303	1.016	0.658	
5775	155	802.11ac	OFDM	80	5.5	4.69	0.12	Right	Cheek	Secondary	00313	29.3	98.4	0.106	-	1.205	1.016	-	
5775	155	802.11ac	OFDM	80	5.5	4.69	0.14	Right	Tilt	Secondary	00313	29.3	98.4	0.134	-	1.205	1.016	-	
5775	155	802.11ac	OFDM	80	5.5	4.69	0.12	Left	Cheek	Secondary	00313	29.3	98.4	0.216	-	1.205	1.016	-	
5775	155	802.11ac	OFDM	80	5.5	4.69	0.13	Left	Tilt	Secondary	00313	29.3	98.4	0.285	0.138	1.205	1.016	0.169	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population									Head 1.6 W/kg (mW/g) averaged over 1 gram										

FCC ID: ZNFLS997	 SAR EVALUATION REPORT 	Reviewed by: Quality Manager
Document S/N: OY1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset
Page 60 of 83		

11.2 Standalone Body-Worn SAR Data

Table 11-16
GSM/UMTS/CDMA Body-Worn SAR Data

MEASUREMENT RESULTS																
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	# of Time Slots	Duty Cycle	Side	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.												(W/kg)		(W/kg)	
836.60	190	GSM 850	GSM	33.7	33.11	-0.02	10 mm	Ant 1	00230	1	1:8.3	back	0.468	1.146	0.536	
836.60	190	GSM 850	GPRS	32.2	31.78	-0.03	10 mm	Ant 1	00230	2	1:4.15	back	0.617	1.102	0.680	A16
1880.00	661	GSM 1900	GSM	30.7	30.56	0.00	10 mm	Ant 2	00230	1	1:8.3	back	0.487	1.033	0.503	
1880.00	661	GSM 1900	GPRS	29.2	28.89	-0.07	10 mm	Ant 2	00230	2	1:4.15	back	0.616	1.074	0.662	A17
836.60	4183	UMTS 850	RMC	24.7	24.50	0.00	10 mm	Ant 1	00230	N/A	1:1	back	0.571	1.047	0.598	A18
1732.40	1412	UMTS 1750	RMC	25.0	24.46	-0.08	10 mm	Ant 2	00248	N/A	1:1	back	0.637	1.132	0.721	A19
1852.40	9262	UMTS 1900	RMC	25.0	24.55	0.00	10 mm	Ant 2	00230	N/A	1:1	back	1.070	1.109	1.187	
1880.00	9400	UMTS 1900	RMC	25.0	24.65	0.00	10 mm	Ant 2	00230	N/A	1:1	back	1.100	1.084	1.192	A21
1907.60	9538	UMTS 1900	RMC	25.0	24.51	0.00	10 mm	Ant 2	00230	N/A	1:1	back	1.040	1.119	1.164	
820.10	564	CDMABC10 (§90S)	TDSO / SO32	25.2	25.11	-0.03	10 mm	Ant 1	00230	N/A	1:1	back	0.385	1.021	0.393	A22
820.10	564	CDMABC10 (§90S)	TDSO / SO32	25.2	25.11	0.02	10 mm	Ant 3	00230	N/A	1:1	back	0.102	1.021	0.104	
836.52	384	CDMABC0 (§22H)	TDSO / SO32	25.2	25.15	-0.02	10 mm	Ant 1	00230	N/A	1:1	back	0.567	1.012	0.574	A24
836.52	384	CDMABC0 (§22H)	TDSO / SO32	25.2	25.15	0.09	10 mm	Ant 3	00230	N/A	1:1	back	0.063	1.012	0.064	
1851.25	25	PCS CDMA	TDSO / SO32	25.2	25.15	-0.05	10 mm	Ant 2	00230	N/A	1:1	back	1.080	1.012	1.093	
1880.00	600	PCS CDMA	TDSO / SO32	25.2	25.07	-0.03	10 mm	Ant 2	00230	N/A	1:1	back	1.110	1.030	1.143	A26
1908.75	1175	PCS CDMA	TDSO / SO32	25.2	25.07	-0.01	10 mm	Ant 2	00230	N/A	1:1	back	1.060	1.030	1.092	
1880.00	600	PCS CDMA	TDSO / SO32	25.2	25.07	-0.01	10 mm	Ant 2	00230	N/A	1:1	back	1.110	1.030	1.143	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Body 1.6 W/kg (mW/g) averaged over 1 gram									

Note: Blue entry represents variability data

Table 11-17
LTE Body-Worn SAR

MEASUREMENT RESULTS																					
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Antenna Config.	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Extended Cyclic Prefix)	Reported SAR (1g)	Plot #	
MHz	Ch.															(W/kg)			(W/kg)		
707.50	23095	Mid	LTE Band 12	10	25.0	24.77	0.02	0	Ant 1	00206	QPSK	1	0	10 mm	back	1:1	0.333	1.054	N/A	0.351	A28
707.50	23095	Mid	LTE Band 12	10	24.0	23.87	0.09	1	Ant 1	00206	QPSK	25	0	10 mm	back	1:1	0.251	1.030	N/A	0.259	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.7	24.50	-0.01	0	Ant 1	00198	QPSK	1	36	10 mm	back	1:1	0.302	1.047	N/A	0.316	A30
831.50	26865	Mid	LTE Band 26 (Cell)	15	23.7	23.41	-0.01	1	Ant 1	00198	QPSK	36	0	10 mm	back	1:1	0.221	1.069	N/A	0.236	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.7	24.50	-0.01	0	Ant 3	00206	QPSK	1	36	10 mm	back	1:1	0.055	1.047	N/A	0.058	
831.50	26865	Mid	LTE Band 26 (Cell)	15	23.7	23.41	0.05	1	Ant 3	00206	QPSK	36	0	10 mm	back	1:1	0.050	1.069	N/A	0.053	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.7	24.65	-0.06	0	Ant 2	00222	QPSK	1	99	10 mm	back	1:1	0.576	1.012	N/A	0.583	A32
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.7	23.69	-0.03	1	Ant 2	00222	QPSK	50	0	10 mm	back	1:1	0.435	1.002	N/A	0.436	
1860.00	26140	Low	LTE Band 25 (PCS)	20	24.7	24.70	0.12	0	Ant 2	00214	QPSK	1	0	10 mm	back	1:1	1.050	1.000	N/A	1.050	A33
1882.50	26365	Mid	LTE Band 25 (PCS)	20	24.7	24.51	-0.02	0	Ant 2	00214	QPSK	1	99	10 mm	back	1:1	0.965	1.045	N/A	1.008	
1905.00	26590	High	LTE Band 25 (PCS)	20	24.7	24.49	-0.03	0	Ant 2	00214	QPSK	1	0	10 mm	back	1:1	0.981	1.050	N/A	1.030	
1860.00	26140	Low	LTE Band 25 (PCS)	20	23.7	23.59	-0.07	1	Ant 2	00214	QPSK	50	50	10 mm	back	1:1	0.782	1.026	N/A	0.802	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	23.7	23.39	0.01	1	Ant 2	00214	QPSK	50	0	10 mm	back	1:1	0.813	1.074	N/A	0.873	
1905.00	26590	High	LTE Band 25 (PCS)	20	23.7	23.41	-0.02	1	Ant 2	00214	QPSK	50	25	10 mm	back	1:1	0.767	1.069	N/A	0.820	
1905.00	26590	High	LTE Band 25 (PCS)	20	23.7	23.52	-0.01	1	Ant 2	00214	QPSK	100	0	10 mm	back	1:1	0.795	1.042	N/A	0.828	
2506.00	39750	Low	LTE Band 41	20	24.7	24.70	-0.05	0	Ant 1	00206	QPSK	1	99	10 mm	back	1:1.59	0.310	1.000	1.010	0.313	A34
2506.00	39750	Low	LTE Band 41	20	23.7	23.69	0.01	1	Ant 1	00206	QPSK	50	25	10 mm	back	1:1.59	0.250	1.002	1.010	0.254	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT																					
Spatial Peak									Body												
Uncontrolled Exposure/General Population									1.6 W/kg (mW/g)												
									averaged over 1 gram												

FCC ID: ZNFLS997		SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: OY1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset		Page 61 of 83

**Table 11-18
DTS Body-Worn SAR**

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.													W/kg	(W/kg)			(W/kg)	
2447	8	802.11b	DSSS	22	20.0	19.45	-0.21	10 mm	Primary	00313	1	back	99.9	0.430	0.251	1.135	1.001	0.285	A36
2437	6	802.11b	DSSS	22	20.0	19.74	0.04	10 mm	Secondary	00313	1	back	99.9	0.138	0.090	1.062	1.001	0.096	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Body 1.6 W/kg (mW/g) averaged over 1 gram											

**Table 11-19
NII Body-Worn SAR**

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.													W/kg	(W/kg)			(W/kg)	
5260	52	802.11a	OFDM	20	15.0	14.88	-0.16	10 mm	Primary	00321	6	back	99.4	0.236	0.108	1.028	1.006	0.112	A38
5260	52	802.11a	OFDM	20	14.0	13.54	-0.04	10 mm	Secondary	00321	6	back	99.4	0.230	0.122	1.112	1.006	0.136	
5500	100	802.11a	OFDM	20	15.0	14.42	-0.12	10 mm	Primary	00321	6	back	99.4	0.118	0.058	1.143	1.006	0.067	
5720	144	802.11a	OFDM	20	14.0	13.56	-0.06	10 mm	Secondary	00321	6	back	99.4	0.086	0.055	1.107	1.006	0.061	
5745	149	802.11a	OFDM	20	15.0	14.56	0.13	10 mm	Primary	00321	6	back	99.4	0.114	0.052	1.107	1.006	0.058	
5745	149	802.11a	OFDM	20	14.0	13.65	-0.21	10 mm	Secondary	00321	6	back	99.4	0.101	0.055	1.084	1.006	0.060	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT								Body											
Spatial Peak								1.6 W/kg (mW/g)											
Uncontrolled Exposure/General Population								averaged over 1 gram											

**Table 11-20
Bluetooth Body-Worn SAR**

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
2480	78	Bluetooth	FHSS	13.0	12.72	0.18	10 mm	00313	1	back	1:1	0.020	1.067	0.021	A40
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Body 1.6 W/kg (mW/g) averaged over 1 gram								

FCC ID: ZNFLS997		SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: 0Y1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset		Page 62 of 83

11.3 Standalone Hotspot SAR Data

Table 11-21
GPRS/UMTS/CDMA Hotspot SAR Data

MEASUREMENT RESULTS													
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	# of GPRS Slots	Duty Cycle	Side	SAR (1g)
MHz	Ch.												(W/kg)
836.60	190	GSM 850	GPRS	32.2	31.78	-0.03	10 mm	Ant 1	00230	2	1:4.15	back	0.617
836.60	190	GSM 850	GPRS	32.2	31.78	-0.06	10 mm	Ant 1	00230	2	1:4.15	front	0.527
836.60	190	GSM 850	GPRS	32.2	31.78	-0.06	10 mm	Ant 1	00230	2	1:4.15	bottom	0.591
836.60	190	GSM 850	GPRS	32.2	31.78	0.00	10 mm	Ant 1	00230	2	1:4.15	right	0.507
836.60	190	GSM 850	GPRS	32.2	31.78	0.04	10 mm	Ant 1	00230	2	1:4.15	left	0.302
1880.00	661	GSM 1900	GPRS	29.2	28.89	-0.07	10 mm	Ant 2	00230	2	1:4.15	back	0.616
1880.00	661	GSM 1900	GPRS	29.2	28.89	-0.08	10 mm	Ant 2	00230	2	1:4.15	front	0.595
1880.00	661	GSM 1900	GPRS	29.2	28.89	0.03	10 mm	Ant 2	00230	2	1:4.15	bottom	0.296
1880.00	661	GSM 1900	GPRS	29.2	28.89	-0.04	10 mm	Ant 2	00230	2	1:4.15	left	0.429
836.60	4183	UMTS 850	RMC	24.7	24.50	0.00	10 mm	Ant 1	00230	N/A	1:1	back	0.571
836.60	4183	UMTS 850	RMC	24.7	24.50	0.01	10 mm	Ant 1	00230	N/A	1:1	front	0.456
836.60	4183	UMTS 850	RMC	24.7	24.50	-0.01	10 mm	Ant 1	00230	N/A	1:1	bottom	0.500
836.60	4183	UMTS 850	RMC	24.7	24.50	0.01	10 mm	Ant 1	00230	N/A	1:1	right	0.477
836.60	4183	UMTS 850	RMC	24.7	24.50	0.00	10 mm	Ant 1	00230	N/A	1:1	left	0.283
1732.40	1412	UMTS 1750	RMC	25.0	24.46	-0.08	10 mm	Ant 2	00248	N/A	1:1	back	0.637
1712.40	1312	UMTS 1750	RMC	25.0	24.48	0.03	10 mm	Ant 2	00248	N/A	1:1	front	0.622
1732.40	1412	UMTS 1750	RMC	25.0	24.46	0.03	10 mm	Ant 2	00248	N/A	1:1	front	0.715
1752.60	1513	UMTS 1750	RMC	25.0	24.45	0.17	10 mm	Ant 2	00248	N/A	1:1	front	0.751
1732.40	1412	UMTS 1750	RMC	25.0	24.46	0.00	10 mm	Ant 2	00248	N/A	1:1	bottom	0.394
1732.40	1412	UMTS 1750	RMC	25.0	24.46	0.02	10 mm	Ant 2	00248	N/A	1:1	left	0.416
1852.40	9262	UMTS 1900	RMC	25.0	24.55	0.00	10 mm	Ant 2	00230	N/A	1:1	back	1.070
1880.00	9400	UMTS 1900	RMC	25.0	24.65	0.00	10 mm	Ant 2	00230	N/A	1:1	back	1.100
1907.60	9538	UMTS 1900	RMC	25.0	24.51	0.00	10 mm	Ant 2	00230	N/A	1:1	back	1.040
1852.40	9262	UMTS 1900	RMC	25.0	24.55	-0.02	10 mm	Ant 2	00230	N/A	1:1	front	0.842
1880.00	9400	UMTS 1900	RMC	25.0	24.65	-0.02	10 mm	Ant 2	00230	N/A	1:1	front	0.841
1907.60	9538	UMTS 1900	RMC	25.0	24.51	-0.02	10 mm	Ant 2	00230	N/A	1:1	front	0.836
1880.00	9400	UMTS 1900	RMC	25.0	24.65	0.00	10 mm	Ant 2	00230	N/A	1:1	bottom	0.522
1880.00	9400	UMTS 1900	RMC	25.0	24.65	-0.01	10 mm	Ant 2	00230	N/A	1:1	left	0.711
820.10	564	CDMA BC10 (§905)	EVDO Rev. 0	25.2	24.88	-0.04	10 mm	Ant 1	00230	N/A	1:1	back	0.336
820.10	564	CDMA BC10 (§905)	EVDO Rev. 0	25.2	24.88	0.06	10 mm	Ant 1	00230	N/A	1:1	front	0.305
820.10	564	CDMA BC10 (§905)	EVDO Rev. 0	25.2	24.88	-0.02	10 mm	Ant 1	00230	N/A	1:1	bottom	0.315
820.10	564	CDMA BC10 (§905)	EVDO Rev. 0	25.2	24.88	0.06	10 mm	Ant 1	00230	N/A	1:1	right	0.304
820.10	564	CDMA BC10 (§905)	EVDO Rev. 0	25.2	24.88	-0.04	10 mm	Ant 1	00230	N/A	1:1	left	0.175
820.10	564	CDMA BC10 (§905)	EVDO Rev. 0	25.2	24.88	0.03	10 mm	Ant 3	00230	N/A	1:1	back	0.089
820.10	564	CDMA BC10 (§905)	EVDO Rev. 0	25.2	24.88	0.07	10 mm	Ant 3	00230	N/A	1:1	front	0.090
820.10	564	CDMA BC10 (§905)	EVDO Rev. 0	25.2	24.88	0.01	10 mm	Ant 3	00230	N/A	1:1	top	0.093
820.10	564	CDMA BC10 (§905)	EVDO Rev. 0	25.2	24.88	0.01	10 mm	Ant 3	00230	N/A	1:1	right	0.055
820.10	564	CDMA BC10 (§905)	EVDO Rev. 0	25.2	24.88	-0.03	10 mm	Ant 3	00230	N/A	1:1	left	0.088
836.52	384	CDMA BC0 (§22H)	EVDO Rev. 0	25.2	24.81	0.01	10 mm	Ant 1	00230	N/A	1:1	back	0.487
836.52	384	CDMA BC0 (§22H)	EVDO Rev. 0	25.2	24.81	-0.02	10 mm	Ant 1	00230	N/A	1:1	front	0.462
836.52	384	CDMA BC0 (§22H)	EVDO Rev. 0	25.2	24.81	0.07	10 mm	Ant 1	00230	N/A	1:1	bottom	0.506
836.52	384	CDMA BC0 (§22H)	EVDO Rev. 0	25.2	24.81	-0.01	10 mm	Ant 1	00230	N/A	1:1	right	0.411
836.52	384	CDMA BC0 (§22H)	EVDO Rev. 0	25.2	24.81	0.02	10 mm	Ant 1	00230	N/A	1:1	left	0.242
836.52	384	CDMA BC0 (§22H)	EVDO Rev. 0	25.2	24.81	0.07	10 mm	Ant 3	00230	N/A	1:1	back	0.058
836.52	384	CDMA BC0 (§22H)	EVDO Rev. 0	25.2	24.81	0.01	10 mm	Ant 3	00230	N/A	1:1	front	0.052
836.52	384	CDMA BC0 (§22H)	EVDO Rev. 0	25.2	24.81	-0.07	10 mm	Ant 3	00230	N/A	1:1	top	0.073
836.52	384	CDMA BC0 (§22H)	EVDO Rev. 0	25.2	24.81	0.05	10 mm	Ant 3	00230	N/A	1:1	right	0.039
836.52	384	CDMA BC0 (§22H)	EVDO Rev. 0	25.2	24.81	-0.02	10 mm	Ant 3	00230	N/A	1:1	left	0.042
1851.25	25	PCS CDMA	EVDO Rev. 0	25.2	25.13	0.09	10 mm	Ant 2	00230	N/A	1:1	back	1.050
1880.00	600	PCS CDMA	EVDO Rev. 0	25.2	25.18	-0.01	10 mm	Ant 2	00230	N/A	1:1	back	1.010
1908.75	1175	PCS CDMA	EVDO Rev. 0	25.2	25.16	-0.01	10 mm	Ant 2	00230	N/A	1:1	back	1.030
1851.25	25	PCS CDMA	EVDO Rev. 0	25.2	25.13	0.10	10 mm	Ant 2	00230	N/A	1:1	front	0.928
1880.00	600	PCS CDMA	EVDO Rev. 0	25.2	25.18	0.01	10 mm	Ant 2	00230	N/A	1:1	front	0.950
1908.75	1175	PCS CDMA	EVDO Rev. 0	25.2	25.16	0.18	10 mm	Ant 2	00230	N/A	1:1	front	0.945
1880.00	600	PCS CDMA	EVDO Rev. 0	25.2	25.18	-0.01	10 mm	Ant 2	00230	N/A	1:1	bottom	0.525
1880.00	600	PCS CDMA	EVDO Rev. 0	25.2	25.18	-0.15	10 mm	Ant 2	00230	N/A	1:1	left	0.726
ANSI / IEEE C63.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Body 1.6 W/kg (mW/g) averaged over 1 gram						

FCC ID: ZNFLS997			SAR EVALUATION REPORT			Reviewed by: Quality Manager
Document S/N: 0Y1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16		DUT Type: Portable Handset		Page 63 of 83	

Table 11-22
LTE Band 12 Hotspot SAR

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
MHz	Ch.														(W/kg)		(W/kg)		
707.50	23095	Mid	LTE Band 12	10	25.0	24.77	0.02	0	00206	QPSK	1	0	10 mm	back	1:1	0.333	1.054	0.351	
707.50	23095	Mid	LTE Band 12	10	24.0	23.87	0.09	1	00206	QPSK	25	0	10 mm	back	1:1	0.251	1.030	0.259	
707.50	23095	Mid	LTE Band 12	10	25.0	24.77	0.02	0	00206	QPSK	1	0	10 mm	front	1:1	0.268	1.054	0.282	
707.50	23095	Mid	LTE Band 12	10	24.0	23.87	0.08	1	00206	QPSK	25	0	10 mm	front	1:1	0.203	1.030	0.209	
707.50	23095	Mid	LTE Band 12	10	25.0	24.77	-0.02	0	00206	QPSK	1	0	10 mm	bottom	1:1	0.221	1.054	0.233	
707.50	23095	Mid	LTE Band 12	10	24.0	23.87	-0.03	1	00206	QPSK	25	0	10 mm	bottom	1:1	0.168	1.030	0.173	
707.50	23095	Mid	LTE Band 12	10	25.0	24.77	0.00	0	00206	QPSK	1	0	10 mm	right	1:1	0.354	1.054	0.373	A29
707.50	23095	Mid	LTE Band 12	10	24.0	23.87	0.03	1	00206	QPSK	25	0	10 mm	right	1:1	0.286	1.030	0.295	
707.50	23095	Mid	LTE Band 12	10	25.0	24.77	0.12	0	00206	QPSK	1	0	10 mm	left	1:1	0.204	1.054	0.215	
707.50	23095	Mid	LTE Band 12	10	24.0	23.87	-0.07	1	00206	QPSK	25	0	10 mm	left	1:1	0.169	1.030	0.174	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT									Body										
Spatial Peak									1.6 W/kg (mW/g)										
Uncontrolled Exposure/General Population									averaged over 1 gram										

Table 11-23
LTE Band 26 (Cell) Hotspot SAR

MEASUREMENT RESULTS																				
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Antenna Config.	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
MHz	Ch.															(W/kg)		(W/kg)		
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.7	24.50	-0.01	0	Ant 1	00198	QPSK	1	36	10 mm	back	1:1	0.302	1.047	0.316	
831.50	26865	Mid	LTE Band 26 (Cell)	15	23.7	23.41	-0.01	1	Ant 1	00198	QPSK	36	0	10 mm	back	1:1	0.221	1.069	0.236	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.7	24.50	0.03	0	Ant 1	00198	QPSK	1	36	10 mm	front	1:1	0.281	1.047	0.294	
831.50	26865	Mid	LTE Band 26 (Cell)	15	23.7	23.41	0.01	1	Ant 1	00198	QPSK	36	0	10 mm	front	1:1	0.204	1.069	0.218	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.7	24.50	0.04	0	Ant 1	00198	QPSK	1	36	10 mm	bottom	1:1	0.322	1.047	0.337	A31
831.50	26865	Mid	LTE Band 26 (Cell)	15	23.7	23.41	-0.05	1	Ant 1	00198	QPSK	36	0	10 mm	bottom	1:1	0.240	1.069	0.257	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.7	24.50	0.00	0	Ant 1	00198	QPSK	1	36	10 mm	right	1:1	0.302	1.047	0.316	
831.50	26865	Mid	LTE Band 26 (Cell)	15	23.7	23.41	-0.02	1	Ant 1	00198	QPSK	36	0	10 mm	right	1:1	0.232	1.069	0.248	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.7	24.50	0.08	0	Ant 1	00198	QPSK	1	36	10 mm	left	1:1	0.182	1.047	0.191	
831.50	26865	Mid	LTE Band 26 (Cell)	15	23.7	23.41	-0.02	1	Ant 1	00198	QPSK	36	0	10 mm	left	1:1	0.144	1.069	0.154	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.7	24.50	-0.01	0	Ant 3	00206	QPSK	1	36	10 mm	back	1:1	0.055	1.047	0.058	
831.50	26865	Mid	LTE Band 26 (Cell)	15	23.7	23.41	0.05	1	Ant 3	00206	QPSK	36	0	10 mm	back	1:1	0.050	1.069	0.053	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.7	24.50	0.12	0	Ant 3	00206	QPSK	1	36	10 mm	front	1:1	0.065	1.047	0.068	
831.50	26865	Mid	LTE Band 26 (Cell)	15	23.7	23.41	0.08	1	Ant 3	00206	QPSK	36	0	10 mm	front	1:1	0.057	1.069	0.061	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.7	24.50	-0.03	0	Ant 3	00206	QPSK	1	36	10 mm	top	1:1	0.066	1.047	0.069	
831.50	26865	Mid	LTE Band 26 (Cell)	15	23.7	23.41	-0.04	1	Ant 3	00206	QPSK	36	0	10 mm	top	1:1	0.055	1.069	0.059	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.7	24.50	-0.02	0	Ant 3	00206	QPSK	1	36	10 mm	right	1:1	0.039	1.047	0.041	
831.50	26865	Mid	LTE Band 26 (Cell)	15	23.7	23.41	-0.04	1	Ant 3	00206	QPSK	36	0	10 mm	right	1:1	0.029	1.069	0.031	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.7	24.50	-0.02	0	Ant 3	00206	QPSK	1	36	10 mm	left	1:1	0.045	1.047	0.047	
831.50	26865	Mid	LTE Band 26 (Cell)	15	23.7	23.41	0.01	1	Ant 3	00206	QPSK	36	0	10 mm	left	1:1	0.037	1.069	0.040	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT									Body											
Spatial Peak									1.6 W/kg (mW/g)											
Uncontrolled Exposure/General Population									averaged over 1 gram											

FCC ID: ZNFLS997		SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: OY1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset		Page 64 of 83

Table 11-24
LTE Band 4 (AWS) Hotspot SAR

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
MHz	Ch.														(W/kg)		(W/kg)		
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.7	24.65	-0.06	0	00222	QPSK	1	99	10 mm	back	1:1	0.576	1.012	0.583	A32
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.7	23.69	-0.03	1	00222	QPSK	50	0	10 mm	back	1:1	0.435	1.002	0.436	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.7	24.65	-0.16	0	00222	QPSK	1	99	10 mm	front	1:1	0.450	1.012	0.455	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.7	23.69	0.06	1	00222	QPSK	50	0	10 mm	front	1:1	0.335	1.002	0.336	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.7	24.65	0.04	0	00222	QPSK	1	99	10 mm	bottom	1:1	0.412	1.012	0.417	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.7	23.69	-0.01	1	00222	QPSK	50	0	10 mm	bottom	1:1	0.298	1.002	0.299	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	24.7	24.65	-0.03	0	00222	QPSK	1	99	10 mm	left	1:1	0.429	1.012	0.434	
1732.50	20175	Mid	LTE Band 4 (AWS)	20	23.7	23.69	-0.02	1	00222	QPSK	50	0	10 mm	left	1:1	0.300	1.002	0.301	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Body 1.6 W/kg (mW/g) averaged over 1 gram											

Table 11-25
LTE Band 25 (PCS) Hotspot SAR

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
MHz	Ch.														(W/kg)		(W/kg)		
1860.00	26140	Low	LTE Band 25 (PCS)	20	24.7	24.70	0.12	0	00214	QPSK	1	0	10 mm	back	1:1	1.050	1.000	1.050	A33
1882.50	26365	Mid	LTE Band 25 (PCS)	20	24.7	24.51	-0.02	0	00214	QPSK	1	99	10 mm	back	1:1	0.965	1.045	1.008	
1905.00	26590	High	LTE Band 25 (PCS)	20	24.7	24.49	-0.03	0	00214	QPSK	1	0	10 mm	back	1:1	0.981	1.050	1.030	
1860.00	26140	Low	LTE Band 25 (PCS)	20	23.7	23.59	-0.07	1	00214	QPSK	50	50	10 mm	back	1:1	0.782	1.026	0.802	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	23.7	23.39	0.01	1	00214	QPSK	50	0	10 mm	back	1:1	0.813	1.074	0.873	
1905.00	26590	High	LTE Band 25 (PCS)	20	23.7	23.41	-0.02	1	00214	QPSK	50	25	10 mm	back	1:1	0.767	1.069	0.820	
1905.00	26590	High	LTE Band 25 (PCS)	20	23.7	23.52	-0.01	1	00214	QPSK	100	0	10 mm	back	1:1	0.795	1.042	0.828	
1860.00	26140	Low	LTE Band 25 (PCS)	20	24.7	24.70	0.00	0	00214	QPSK	1	0	10 mm	front	1:1	0.862	1.000	0.862	
1882.50	26365	Mid	LTE Band 25 (PCS)	20	24.7	24.51	0.00	0	00214	QPSK	1	99	10 mm	front	1:1	0.769	1.045	0.804	
1905.00	26590	High	LTE Band 25 (PCS)	20	24.7	24.49	0.02	0	00214	QPSK	1	0	10 mm	front	1:1	0.791	1.050	0.831	
1860.00	26140	Low	LTE Band 25 (PCS)	20	23.7	23.59	-0.04	1	00214	QPSK	50	50	10 mm	front	1:1	0.658	1.026	0.675	
1905.00	26590	High	LTE Band 25 (PCS)	20	23.7	23.52	0.00	1	00214	QPSK	100	0	10 mm	front	1:1	0.628	1.042	0.654	
1860.00	26140	Low	LTE Band 25 (PCS)	20	24.7	24.70	0.04	0	00214	QPSK	1	0	10 mm	bottom	1:1	0.477	1.000	0.477	
1860.00	26140	Low	LTE Band 25 (PCS)	20	23.7	23.59	-0.06	1	00214	QPSK	50	50	10 mm	bottom	1:1	0.343	1.026	0.352	
1860.00	26140	Low	LTE Band 25 (PCS)	20	24.7	24.70	-0.04	0	00214	QPSK	1	0	10 mm	left	1:1	0.691	1.000	0.691	
1860.00	26140	Low	LTE Band 25 (PCS)	20	23.7	23.59	-0.10	1	00214	QPSK	50	50	10 mm	left	1:1	0.495	1.026	0.508	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak								Body 1.6 W/kg (mW/g) averaged over 1 gram											
Uncontrolled Exposure/General Population																			

FCC ID: ZNFLS997		SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: OY1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset		Page 65 of 83

Table 11-26
LTE Band 41 Hotspot SAR

MEASUREMENT RESULTS																				
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Extended Cyclic Prefix)	Reported SAR (1g)	Plot #	
MHz	Ch.														(W/kg)			(W/kg)		
2506.00	39750	Low	LTE Band 41	20	24.7	24.70	-0.05	0	00206	QPSK	1	99	10 mm	back	1:1.59	0.310	1.000	1.010	0.313	
2506.00	39750	Low	LTE Band 41	20	23.7	23.69	0.01	1	00206	QPSK	50	25	10 mm	back	1:1.59	0.250	1.002	1.010	0.254	
2506.00	39750	Low	LTE Band 41	20	24.7	24.70	-0.05	0	00206	QPSK	1	99	10 mm	front	1:1.59	0.428	1.000	1.010	0.432	A35
2506.00	39750	Low	LTE Band 41	20	23.7	23.69	-0.04	1	00206	QPSK	50	25	10 mm	front	1:1.59	0.341	1.002	1.010	0.345	
2506.00	39750	Low	LTE Band 41	20	24.7	24.70	-0.01	0	00206	QPSK	1	99	10 mm	bottom	1:1.59	0.379	1.000	1.010	0.383	
2506.00	39750	Low	LTE Band 41	20	23.7	23.69	-0.04	1	00206	QPSK	50	25	10 mm	bottom	1:1.59	0.296	1.002	1.010	0.300	
2506.00	39750	Low	LTE Band 41	20	24.7	24.70	0.14	0	00206	QPSK	1	99	10 mm	right	1:1.59	0.019	1.000	1.010	0.019	
2506.00	39750	Low	LTE Band 41	20	23.7	23.69	0.15	1	00206	QPSK	50	25	10 mm	right	1:1.59	0.014	1.002	1.010	0.014	
2506.00	39750	Low	LTE Band 41	20	24.7	24.70	0.13	0	00206	QPSK	1	99	10 mm	left	1:1.59	0.116	1.000	1.010	0.117	
2506.00	39750	Low	LTE Band 41	20	23.7	23.69	0.07	1	00206	QPSK	50	25	10 mm	left	1:1.59	0.093	1.002	1.010	0.094	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT								Body												
Spatial Peak								1.6 W/kg (mW/g)												
Uncontrolled Exposure/General Population								averaged over 1 gram												

Table 11-27
WLAN Hotspot SAR

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.													W/kg	(W/kg)			(W/kg)	
2447	8	802.11b	DSSS	22	20.0	19.45	-0.21	10 mm	Primary	00313	1	back	99.9	0.430	0.251	1.135	1.001	0.285	
2447	8	802.11b	DSSS	22	20.0	19.45	-0.01	10 mm	Primary	00313	1	front	99.9	0.446	0.313	1.135	1.001	0.356	A37
2447	8	802.11b	DSSS	22	20.0	19.45	0.06	10 mm	Primary	00313	1	top	99.9	0.250	-	1.135	1.001	-	
2447	8	802.11b	DSSS	22	20.0	19.45	-0.18	10 mm	Primary	00313	1	right	99.9	0.329	-	1.135	1.001	-	
2437	6	802.11b	DSSS	22	20.0	19.74	0.04	10 mm	Secondary	00313	1	back	99.9	0.138	0.090	1.062	1.001	0.096	
2437	6	802.11b	DSSS	22	20.0	19.74	0.00	10 mm	Secondary	00313	1	front	99.9	0.261	0.148	1.062	1.001	0.157	
2437	6	802.11b	DSSS	22	20.0	19.74	0.15	10 mm	Secondary	00313	1	top	99.9	0.226	-	1.062	1.001	-	
2437	6	802.11b	DSSS	22	20.0	19.74	-0.18	10 mm	Secondary	00313	1	right	99.9	0.052	-	1.062	1.001	-	
5240	48	802.11a	OFDM	20	15.0	14.51	0.02	10 mm	Primary	00321	6	back	99.4	0.266	0.122	1.119	1.006	0.137	
5240	48	802.11a	OFDM	20	15.0	14.51	0.21	10 mm	Primary	00321	6	front	99.4	0.239	-	1.119	1.006	-	
5240	48	802.11a	OFDM	20	15.0	14.51	-0.04	10 mm	Primary	00321	6	top	99.4	0.473	0.215	1.119	1.006	0.242	
5240	48	802.11a	OFDM	20	15.0	14.51	0.12	10 mm	Primary	00321	6	right	99.4	0.076	-	1.119	1.006	-	
5200	40	802.11a	OFDM	20	14.0	13.79	0.09	10 mm	Secondary	00321	6	back	99.4	0.231	0.156	1.050	1.006	0.165	
5200	40	802.11a	OFDM	20	14.0	13.79	-0.12	10 mm	Secondary	00321	6	front	99.4	0.192	-	1.050	1.006	-	
5200	40	802.11a	OFDM	20	14.0	13.79	0.16	10 mm	Secondary	00321	6	top	99.4	0.589	0.261	1.050	1.006	0.276	A39
5200	40	802.11a	OFDM	20	14.0	13.79	0.18	10 mm	Secondary	00321	6	right	99.4	0.088	-	1.050	1.006	-	
5745	149	802.11a	OFDM	20	15.0	14.56	0.13	10 mm	Primary	00321	6	back	99.4	0.114	0.052	1.107	1.006	0.058	
5745	149	802.11a	OFDM	20	15.0	14.56	0.15	10 mm	Primary	00321	6	front	99.4	0.087	-	1.107	1.006	-	
5745	149	802.11a	OFDM	20	15.0	14.56	0.18	10 mm	Primary	00321	6	top	99.4	0.183	0.085	1.107	1.006	0.095	
5745	149	802.11a	OFDM	20	15.0	14.56	-0.18	10 mm	Primary	00321	6	right	99.4	0.056	-	1.107	1.006	-	
5745	149	802.11a	OFDM	20	14.0	13.65	-0.21	10 mm	Secondary	00321	6	back	99.4	0.101	0.055	1.084	1.006	0.060	
5745	149	802.11a	OFDM	20	14.0	13.65	0.12	10 mm	Secondary	00321	6	front	99.4	0.081	-	1.084	1.006	-	
5745	149	802.11a	OFDM	20	14.0	13.65	0.16	10 mm	Secondary	00321	6	top	99.4	0.206	0.093	1.084	1.006	0.101	
5745	149	802.11a	OFDM	20	14.0	13.65	0.20	10 mm	Secondary	00321	6	right	99.4	0.097	-	1.084	1.006	-	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT								Body											
Spatial Peak								1.6 W/kg (mW/g)											
Uncontrolled Exposure/General Population								averaged over 1 gram											

FCC ID: ZNFLS997		SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: 0Y1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset		Page 66 of 83

11.4 Standalone Phablet SAR Data

Table 11-28
WLAN Phablet SAR

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Antenna Config.	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan	SAR (10g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (10g)	Plot #
MHz	Ch.													W/kg	(W/kg)			(W/kg)	
5260	52	802.11a	OFDM	20	15.0	14.88	0.16	0 mm	Primary	00321	6	back	99.4	2.768	-	1.028	1.006	-	
5260	52	802.11a	OFDM	20	15.0	14.88	0.16	0 mm	Primary	00321	6	front	99.4	1.202	-	1.028	1.006	-	
5260	52	802.11a	OFDM	20	15.0	14.88	0.13	0 mm	Primary	00321	6	top	99.4	4.030	0.418	1.028	1.006	0.432	
5260	52	802.11a	OFDM	20	15.0	14.88	0.16	0 mm	Primary	00321	6	right	99.4	1.291	-	1.028	1.006	-	
5260	52	802.11a	OFDM	20	14.0	13.54	0.14	0 mm	Secondary	00321	6	back	99.4	0.946	-	1.112	1.006	-	
5260	52	802.11a	OFDM	20	14.0	13.54	0.14	0 mm	Secondary	00321	6	front	99.4	7.325	-	1.112	1.006	-	
5260	52	802.11a	OFDM	20	14.0	13.54	0.09	0 mm	Secondary	00321	6	top	99.4	10.429	0.634	1.112	1.006	0.709	A41
5260	52	802.11a	OFDM	20	14.0	13.54	0.20	0 mm	Secondary	00321	6	right	99.4	0.357	-	1.112	1.006	-	
5500	100	802.11a	OFDM	20	15.0	14.42	0.14	0 mm	Primary	00321	6	back	99.4	2.512	-	1.143	1.006	-	
5500	100	802.11a	OFDM	20	15.0	14.42	0.12	0 mm	Primary	00321	6	front	99.4	0.769	-	1.143	1.006	-	
5500	100	802.11a	OFDM	20	15.0	14.42	-0.12	0 mm	Primary	00321	6	top	99.4	2.603	0.220	1.143	1.006	0.253	
5500	100	802.11a	OFDM	20	15.0	14.42	0.14	0 mm	Primary	00321	6	right	99.4	1.374	-	1.143	1.006	-	
5720	144	802.11a	OFDM	20	14.0	13.56	0.20	0 mm	Secondary	00321	6	back	99.4	0.347	-	1.107	1.006	-	
5720	144	802.11a	OFDM	20	14.0	13.56	0.14	0 mm	Secondary	00321	6	front	99.4	4.480	-	1.107	1.006	-	
5720	144	802.11a	OFDM	20	14.0	13.56	0.12	0 mm	Secondary	00321	6	top	99.4	5.942	0.470	1.107	1.006	0.523	
5720	144	802.11a	OFDM	20	14.0	13.56	0.17	0 mm	Secondary	00321	6	right	99.4	0.387	-	1.107	1.006	-	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT									Phablet										
Spatial Peak									4.0 W/kg (mW/g)										
Uncontrolled Exposure/General Population									averaged over 10 grams										

Table 11-29
Bluetooth Phablet SAR

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle	SAR (10g)	Scaling Factor	Reported SAR (10g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
2480	78	Bluetooth	FHSS	13.0	12.72	0.16	0 mm	00313	1	back	1:1	0.060	1.067	0.064	
2480	78	Bluetooth	FHSS	13.0	12.72	-0.13	0 mm	00313	1	front	1:1	0.048	1.067	0.051	
2480	78	Bluetooth	FHSS	13.0	12.72	-0.17	0 mm	00313	1	top	1:1	0.064	1.067	0.068	
2480	78	Bluetooth	FHSS	13.0	12.72	-0.12	0 mm	00313	1	right	1:1	0.112	1.067	0.120	A42
ANSI / IEEE C95.1 1992 - SAFETY LIMIT							Phablet								
Spatial Peak							4.0 W/kg (mW/g)								
Uncontrolled Exposure/General Population							averaged over 10 grams								

11.5 SAR Test Notes

General Notes:

- The test data reported are the worst-case SAR values according to test procedures specified in IEEE 1528-2013, and FCC KDB Publication 447498 D01v06.
- Batteries are fully charged at the beginning of the SAR measurements.
- Liquid tissue depth was at least 15.0 cm for all frequencies.
- The manufacturer has confirmed that the device(s) tested have the same physical, mechanical and thermal characteristics and are within operational tolerances expected for production units.
- SAR results were scaled to the maximum allowed power to demonstrate compliance per FCC KDB Publication 447498 D01v06.

FCC ID: ZNFLS997	 SAR EVALUATION REPORT 		Reviewed by: Quality Manager
Document S/N: OY1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset	Page 67 of 83

6. Device was tested using a fixed spacing for body-worn accessory testing. A separation distance of 10 mm was considered because the manufacturer has determined that there will be body-worn accessories available in the marketplace for users to support this separation distance.
7. Per FCC KDB Publication 648474 D04v01r03, body-worn SAR was evaluated without a headset connected to the device. Since the standalone reported body-worn SAR was ≤ 1.2 W/kg, no additional body-worn SAR evaluations using a headset cable were required.
8. Per FCC KDB 865664 D01v01r04, variability SAR tests were performed when the measured SAR results for a frequency band were greater than or equal to 0.8 W/kg. Repeated SAR measurements are highlighted in the tables above for clarity. Please see Section 13 for variability analysis.
9. During SAR Testing for the Wireless Router conditions per FCC KDB Publication 941225 D06v02r01, the actual Portable Hotspot operation (with actual simultaneous transmission of a transmitter with WIFI) was not activated (See Section 6.7 for more details).
10. Per FCC KDB Publication 648474 D04v01r03, this device is considered a “phablet” since the diagonal dimension is > 160 mm and < 200 mm. Therefore, phablet SAR tests are required when wireless router mode does not apply or if wireless router 1g SAR > 1.2 W/kg.
11. This device utilizes power reduction for some wireless modes and technologies, as outlined in Section 1.3. The maximum output power allowed for each transmitter and exposure condition was evaluated for SAR compliance based on expected use conditions and simultaneous transmission scenarios.

GSM Test Notes:

1. Body-Worn accessory testing is typically associated with voice operations. Therefore, GSM voice was evaluated for body-worn SAR.
2. Justification for reduced test configurations per KDB Publication 941225 D01v03r01 and October 2013 TCB Workshop Notes: The source-based frame-averaged output power was evaluated for all GPRS/EDGE slot configurations. The configuration with the highest target frame averaged output power was evaluated for hotspot SAR. When the maximum frame-averaged powers are equivalent across two or more slots (within 0.25 dB), the configuration with the most number of time slots was tested.
3. Per FCC KDB Publication 447498 D01v06, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is not required for such test configuration(s). When the maximum output power variation across the required test channels is $> \frac{1}{2}$ dB, instead of the middle channel, the highest output power channel was used.
4. GPRS was additionally evaluated for head and body-worn exposure conditions to address possible VoIP scenarios.

CDMA Notes:

1. Head SAR for CDMA2000 mode was tested under RC3/SO55 per FCC KDB Publication 941225 D01v03r01.
2. Body-Worn SAR was tested with 1x RTT with TDSO / SO32 FCH Only. EVDO Rev0 and RevA and TDSO / SO32 FCH+SCH SAR tests were not required per the 3G SAR Test Reduction Procedure in FCC KDB Publication 941225 D01v03r01.
3. CDMA Wireless Router SAR is measured using Subtype 0/1 Physical Layer configurations for Rev. 0 according to KDB 941225 D01v03r01 procedures for data devices. Wireless Router SAR tests for Subtype 2 of Rev.A and 1x RTT configurations were not required per the 3G SAR Test Reduction Policy in KDB Publication 941225 D01v03r01.
4. Head SAR was additionally evaluated using EVDO Rev. A to determine compliance for VoIP operations.
5. Per FCC KDB Publication 447498 D01v06, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is not required for such test configuration(s). When the maximum output power variation across the required test channels is $> \frac{1}{2}$ dB, instead of the middle channel, the highest output power channel was used.

FCC ID: ZNFLS997	 SAR EVALUATION REPORT 		Reviewed by: Quality Manager
Document S/N: 0Y1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset	Page 68 of 83

UMTS Notes:

1. UMTS mode in was tested under RMC 12.2 kbps with HSPA Inactive per KDB Publication 941225 D01v03r01. AMR and HSPA SAR was not required per the 3G Test Reduction Procedure in KDB Publication 941225 D01v03r01.
2. Per FCC KDB Publication 447498 D01v06, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is ≤ 0.8 W/kg then testing at the other channels is not required for such test configuration(s). When the maximum output power variation across the required test channels is $> \frac{1}{2}$ dB, instead of the middle channel, the highest output power channel was used.

LTE Notes:

1. LTE Considerations: LTE test configurations are determined according to SAR Evaluation Considerations for LTE Devices in FCC KDB Publication 941225 D05v02r04. The general test procedures used for testing can be found in Section 8.6.4.
2. MPR is permanently implemented for this device by the manufacturer. The specific manufacturer target MPR is indicated alongside the SAR results. MPR is enabled for this device, according to 3GPP TS36.101 Section 6.2.3 – 6.2.5 under Table 6.2.3-1.
3. A-MPR was disabled for all SAR tests by setting NS=01 on the base station simulator. SAR tests were performed with the same number of RB and RB offsets transmitting on all TTI frames (maximum TTI).
4. Per FCC KDB Publication 447498 D01v06, when the reported (scaled) for LTE Band 41 SAR measured at the highest output power channel in a given a test configuration was > 0.6 W/kg, testing at the other channels was required for such test configurations.
5. TDD LTE was tested per the guidance provided in FCC KDB Publication 941225 D05v02r04. Testing was performed using UL-DL configuration 0 with 6 UL subframes and 2 S subframes using normal cyclic prefix only and special subframe configuration 6. Due to equipment setup issues with extended cyclic prefix as a result of test samples configured for normal cyclic prefix, SAR tests were performed at maximum output power and worst-case transmission duty factor in normal cyclic prefix. Results were then scaled to the duty factor required for extended cyclic prefix listed in 3GPP TS 36.211 Section 4. The cyclic prefix scaling factor for LTE Band 41 was calculated by dividing the extended cyclic prefix duty factor by the normal cyclic prefix duty factor. Per 3GPP 36.211 Section 4, the duty factor for special subframe configuration 6 using normal cyclic prefix is 0.629. The duty factor for special subframe configuration 6 using extended cyclic prefix is 0.633.
6. Per KDB Publication 941225 D05Av01r02, SAR for LTE CA operations was not needed since the maximum average output power in LTE CA mode was not >0.25 dB higher than the maximum output power when downlink carrier aggregation was inactive.

WLAN Notes:

1. For held-to-ear, hotspot, and phablet operations, the initial test position procedures were applied. The test position with the highest extrapolated peak SAR will be used as the initial test position. When reported SAR for the initial test position is ≤ 0.4 W/kg, no additional testing for the remaining test positions was required. Otherwise, SAR is evaluated at the subsequent highest peak SAR positions until the reported SAR result is ≤ 0.8 W/kg or all test positions are measured. SAR for 5 GHz WLAN primary antenna right cheek/tilt and 2.4/5 GHz WLAN hotspot back side were additionally tested per manufacturer request.
2. Justification for test configurations for WLAN per KDB Publication 248227 D01v02r02 for 2.4 GHz WIFI single transmission chain operations, the highest measured maximum output power channel for DSSS was selected for SAR measurement. SAR for OFDM modes (2.4 GHz 802.11g/n) was not required due to the maximum allowed powers and the highest reported DSSS SAR. See Section 8.7.5 for more information.
3. Justification for test configurations for WLAN per KDB Publication 248227 D01v02r02 for 5 GHz WIFI single transmission chain operations, the initial test configuration was selected according to the transmission mode with the highest maximum allowed powers. Other transmission modes were not investigated since the highest reported SAR for initial test configuration adjusted by the ratio of maximum output powers is less than 1.2 W/kg. See Section 8.7.6 for more information.

FCC ID: ZNFLS997	 PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: 0Y1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset		Page 69 of 83

4. Per KDB Publication 248227 D01v02r02, SAR for MIMO was evaluated by following the simultaneous SAR provisions from KDB Publication 447498 D01v06. Please see Section 12 for complete analysis.
5. When the maximum reported 1g averaged SAR is ≤ 0.8 W/kg, SAR testing on additional channels was not required. Otherwise, SAR for the next highest output power channel was required until the reported SAR result was ≤ 1.20 W/kg or all test channels were measured.
6. When 10-g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.
7. The device was configured to transmit continuously at the required data rate, channel bandwidth and signal modulation, using the highest transmission duty factor supported by the test mode tools. The reported SAR was scaled to the 100% transmission duty factor to determine compliance. Procedures used to measure the duty factor are identical to that in the associated EMC test reports.
8. Under normal operation this device supports independent (SISO) WLAN transmission from the primary antenna for all modes and from the secondary antenna for 2.4 GHz 802.11b mode only. Other WLAN modes tested for standalone scenarios for the secondary antenna were evaluated using the test mode software provided by the manufacturer to determine simultaneous transmission SAR compliance for potential MIMO operations.

FCC ID: ZNFLS997		SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: 0Y1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset		Page 70 of 83

12 FCC MULTI-TX AND ANTENNA SAR CONSIDERATIONS

12.1 Introduction

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.

12.2 Simultaneous Transmission Procedures

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 1-g SAR for all the simultaneous transmitting antennas in a specific physical test configuration is ≤ 1.6 W/kg. The different test positions in an exposure condition may be considered collectively to determine SAR test exclusion according to the sum of 1-g or 10-g SAR.

Main antenna and 2.4 GHz WIFI SAR testing was not required for phablet exposure conditions per FCC KDB 648474 D04v01r03. Therefore, no further analysis beyond Table 12-11 was required to determine that possible simultaneous scenarios would not exceed the SAR limit.

Per FCC KDB Publication 941225 D06v02r01, the devices edges with antennas more than 2.5 cm from edge are not required to be evaluated for SAR (“-”).

12.3 Head SAR Simultaneous Transmission Analysis

(*) For test positions that were not required to be evaluated for WLAN SAR per FCC KDB Publication 248227, the worst case WLAN head SAR result was used for simultaneous transmission analysis.

Table 12-1
Simultaneous Transmission Scenario with 2.4 GHz WLAN (Held to Ear)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz WLAN Primary Antenna SAR (W/kg)	2.4 GHz WLAN Secondary Antenna SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Head SAR	GSM/GPRS 850	0.479	0.478	0.091	0.957	0.570	1.048
	GSM/GPRS 1900	0.222	0.478	0.091	0.700	0.313	0.791
	UMTS 850	0.296	0.478	0.091	0.774	0.387	0.865
	UMTS 1750	0.250	0.478	0.091	0.728	0.341	0.819
	UMTS 1900	0.331	0.478	0.091	0.809	0.422	0.900
	CDMA/EVDO BC10 (\$90S)	0.282	0.478	0.091	0.760	0.373	0.851
	CDMA/EVDO BC0 (\$22H)	0.311	0.478	0.091	0.789	0.402	0.880
	PCS CDMA/EVDO	0.348	0.478	0.091	0.826	0.439	0.917
	LTE Band 12	0.299	0.478	0.091	0.777	0.390	0.868
	LTE Band 26 (Cell)	0.728	0.478	0.091	1.206	0.819	1.297
	LTE Band 4 (AWS)	0.228	0.478	0.091	0.706	0.319	0.797
	LTE Band 25 (PCS)	0.385	0.478	0.091	0.863	0.476	0.954
	LTE Band 41	0.112	0.478	0.091	0.590	0.203	0.681

FCC ID: ZNFLS997		SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: 0Y1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset		Page 71 of 83

Table 12-2
Simultaneous Transmission Scenario with 5 GHz WLAN (Held to Ear)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	5 GHz WLAN Primary Antenna SAR (W/kg)	5 GHz WLAN Secondary Antenna SAR (W/kg)	Σ SAR (W/kg)	
		1	2	3	1+2	1+2+3
Head SAR	GSM/GPRS 850	0.479	0.745	0.493	1.224	See Table 12-3
	GSM/GPRS 1900	0.222	0.745	0.493	0.967	1.460
	UMTS 850	0.296	0.745	0.493	1.041	1.534
	UMTS 1750	0.250	0.745	0.493	0.995	1.488
	UMTS 1900	0.331	0.745	0.493	1.076	1.569
	CDMA/EVDO BC10 (§90S)	0.282	0.745	0.493	1.027	1.520
	CDMA/EVDO BC0 (§22H)	0.311	0.745	0.493	1.056	1.549
	PCS CDMA/EVDO	0.348	0.745	0.493	1.093	1.586
	LTE Band 12	0.299	0.745	0.493	1.044	1.537
	LTE Band 26 (Cell)	0.728	0.745	0.493	1.473	See Table 12-3
	LTE Band 4 (AWS)	0.228	0.745	0.493	0.973	1.466
	LTE Band 25 (PCS)	0.385	0.745	0.493	1.130	See Table 12-3
	LTE Band 41	0.112	0.745	0.493	0.857	1.350

Note: The highest 5 GHz WIFI reported SAR for each head configuration was considered for simultaneous SAR exclusion via summation of standalone SAR, regardless of whether the WIFI channel has WIFI Hotspot capability, for simplicity to determine compliance. Please note that the actual simultaneous transmission SAR will not exceed the summed levels indicated.

Table 12-3
Simultaneous Transmission Scenario with 5 GHz WLAN (Held to Ear)

Simult Tx	Configuration	GSM 850 SAR (W/kg)	5 GHz WLAN Primary Antenna SAR (W/kg)	5 GHz WLAN Secondary Antenna SAR (W/kg)	Σ SAR (W/kg)	
		1	2	3	1+2	1+2+3
Head SAR	Right Cheek	0.290	0.305	0.493*	0.595	1.088
	Right Tilt	0.125	0.261	0.493*	0.386	0.879
	Left Cheek	0.300	0.504	0.387	0.804	1.191
	Left Tilt	0.185	0.745	0.493	0.930	1.423
Simult Tx	Configuration	GPRS 850 SAR (W/kg)	5 GHz WLAN Primary Antenna SAR (W/kg)	5 GHz WLAN Secondary Antenna SAR (W/kg)	Σ SAR (W/kg)	
		1	2	3	1+2	1+2+3
Head SAR	Right Cheek	0.479	0.305	0.493*	0.784	1.277
	Right Tilt	0.202	0.261	0.493*	0.463	0.956
	Left Cheek	0.408	0.504	0.387	0.912	1.299
	Left Tilt	0.220	0.745	0.493	0.965	1.458

FCC ID: ZNFLS997		SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: 0Y1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset		Page 72 of 83

Simult Tx	Configuration	LTE Band 26 (Cell) Ant 1 SAR (W/kg)	5 GHz WLAN Primary Antenna SAR (W/kg)	5 GHz WLAN Secondary Antenna SAR (W/kg)	Σ SAR (W/kg)	
		1	2	3	1+2	1+2+3
Head SAR	Right Cheek	0.385	0.305	0.493*	0.690	1.183
	Right Tilt	0.192	0.261	0.493*	0.453	0.946
	Left Cheek	0.339	0.504	0.387	0.843	1.230
	Left Tilt	0.164	0.745	0.493	0.909	1.402
Simult Tx	Configuration	LTE Band 26 (Cell) Ant 3 SAR (W/kg)	5 GHz WLAN Primary Antenna SAR (W/kg)	5 GHz WLAN Secondary Antenna SAR (W/kg)	Σ SAR (W/kg)	
		1	2	3	1+2	1+2+3
Head SAR	Right Cheek	0.712	0.305	0.493*	1.017	1.510
	Right Tilt	0.728	0.261	0.493*	0.989	1.482
	Left Cheek	0.336	0.504	0.387	0.840	1.227
	Left Tilt	0.313	0.745	0.493	1.058	1.551
Simult Tx	Configuration	LTE Band 25 (PCS) SAR (W/kg)	5 GHz WLAN Primary Antenna SAR (W/kg)	5 GHz WLAN Secondary Antenna SAR (W/kg)	Σ SAR (W/kg)	
		1	2	3	1+2	1+2+3
Head SAR	Right Cheek	0.174	0.305	0.493*	0.479	0.972
	Right Tilt	0.115	0.261	0.493*	0.376	0.869
	Left Cheek	0.385	0.504	0.387	0.889	1.276
	Left Tilt	0.159	0.745	0.493	0.904	1.397

Note: The highest 5 GHz WIFI reported SAR for each head configuration was considered for simultaneous SAR exclusion via summation of standalone SAR, regardless of whether the WIFI channel has WIFI Hotspot capability, for simplicity to determine compliance. Please note that the actual simultaneous transmission SAR will not exceed the summed levels indicated.

FCC ID: ZNFLS997	 SAR EVALUATION REPORT 		Reviewed by: Quality Manager
Document S/N: 0Y1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset	Page 73 of 83

12.4 Body-Worn Simultaneous Transmission Analysis

Table 12-4
Simultaneous Transmission Scenario with 2.4 GHz WLAN (Body-Worn at 1.0 cm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz WLAN Primary Antenna SAR (W/kg)	2.4 GHz WLAN Secondary Antenna SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Body-Worn	GSM/GPRS 850	0.680	0.285	0.096	0.965	0.776	1.061
	GSM/GPRS 1900	0.662	0.285	0.096	0.947	0.758	1.043
	UMTS 850	0.598	0.285	0.096	0.883	0.694	0.979
	UMTS 1750	0.721	0.285	0.096	1.006	0.817	1.102
	UMTS 1900	1.192	0.285	0.096	1.477	1.288	1.573
	CDMA BC10 (§90S)	0.393	0.285	0.096	0.678	0.489	0.774
	CDMA BC0 (§22H)	0.574	0.285	0.096	0.859	0.670	0.955
	PCS CDMA	1.143	0.285	0.096	1.428	1.239	1.524
	LTE Band 12	0.351	0.285	0.096	0.636	0.447	0.732
	LTE Band 26 (Cell)	0.316	0.285	0.096	0.601	0.412	0.697
	LTE Band 4 (AWS)	0.583	0.285	0.096	0.868	0.679	0.964
	LTE Band 25 (PCS)	1.050	0.285	0.096	1.335	1.146	1.431
	LTE Band 41	0.313	0.285	0.096	0.598	0.409	0.694

Table 12-5
Simultaneous Transmission Scenario with 5 GHz WLAN (Body-Worn at 1.0 cm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	5 GHz WLAN Primary Antenna SAR (W/kg)	5 GHz WLAN Secondary Antenna SAR (W/kg)	Σ SAR (W/kg)	
		1	2	3	1+2	1+2+3
Body-Worn	GSM/GPRS 850	0.680	0.112	0.136	0.792	0.928
	GSM/GPRS 1900	0.662	0.112	0.136	0.774	0.910
	UMTS 850	0.598	0.112	0.136	0.710	0.846
	UMTS 1750	0.721	0.112	0.136	0.833	0.969
	UMTS 1900	1.192	0.112	0.136	1.304	1.440
	CDMA BC10 (§90S)	0.393	0.112	0.136	0.505	0.641
	CDMA BC0 (§22H)	0.574	0.112	0.136	0.686	0.822
	PCS CDMA	1.143	0.112	0.136	1.255	1.391
	LTE Band 12	0.351	0.112	0.136	0.463	0.599
	LTE Band 26 (Cell)	0.316	0.112	0.136	0.428	0.564
	LTE Band 4 (AWS)	0.583	0.112	0.136	0.695	0.831
	LTE Band 25 (PCS)	1.050	0.112	0.136	1.162	1.298
	LTE Band 41	0.313	0.112	0.136	0.425	0.561

Note: The highest 5 GHz WIFI reported SAR for each body-worn configuration was considered for simultaneous SAR exclusion via summation of standalone SAR, regardless of whether the WIFI channel has WIFI Hotspot capability, for simplicity to determine compliance. Please note that the actual simultaneous transmission SAR will not exceed the summed levels indicated

FCC ID: ZNFLS997		SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: OY1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset		Page 74 of 83

Table 12-6
Simultaneous Transmission Scenario with Bluetooth (Body-Worn at 1.0 cm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	Bluetooth SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Body-Worn	GSM/GPRS 850	0.680	0.021	0.701
	GSM/GPRS 1900	0.662	0.021	0.683
	UMTS 850	0.598	0.021	0.619
	UMTS 1750	0.721	0.021	0.742
	UMTS 1900	1.192	0.021	1.213
	CDMA BC10 (§90S)	0.393	0.021	0.414
	CDMA BC0 (§22H)	0.574	0.021	0.595
	PCS CDMA	1.143	0.021	1.164
	LTE Band 12	0.351	0.021	0.372
	LTE Band 26 (Cell)	0.316	0.021	0.337
	LTE Band 4 (AWS)	0.583	0.021	0.604
	LTE Band 25 (PCS)	1.050	0.021	1.071
	LTE Band 41	0.313	0.021	0.334

12.5 Hotspot SAR Simultaneous Transmission Analysis

(*) For test positions that were not required to be evaluated for WLAN SAR per FCC KDB Publication 248227, the worst case WLAN hotspot SAR result was used for simultaneous transmission analysis.

Table 12-7
Simultaneous Transmission Scenario with 2.4 GHz (Hotspot at 1.0 cm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz WLAN Primary Antenna SAR (W/kg)	2.4 GHz WLAN Secondary Antenna SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Hotspot SAR	GPRS 850	0.680	0.356	0.157	1.036	0.837	1.193
	GPRS 1900	0.662	0.356	0.157	1.018	0.819	1.175
	UMTS 850	0.598	0.356	0.157	0.954	0.755	1.111
	UMTS 1750	0.852	0.356	0.157	1.208	1.009	1.365
	UMTS 1900	1.192	0.356	0.157	1.548	1.349	See Table 12-8
	EVDO BC10 (§90S)	0.362	0.356	0.157	0.718	0.519	0.875
	EVDO BC0 (§22H)	0.554	0.356	0.157	0.910	0.711	1.067
	PCS EVDO	1.067	0.356	0.157	1.423	1.224	1.580
	LTE Band 12	0.373	0.356	0.157	0.729	0.530	0.886
	LTE Band 26 (Cell)	0.337	0.356	0.157	0.693	0.494	0.850
	LTE Band 4 (AWS)	0.583	0.356	0.157	0.939	0.740	1.096
	LTE Band 25 (PCS)	1.050	0.356	0.157	1.406	1.207	1.563
	LTE Band 41	0.432	0.356	0.157	0.788	0.589	0.945

FCC ID: ZNFLS997		SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: 0Y1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset		Page 75 of 83

Table 12-8
Simultaneous Transmission Scenario with 2.4 GHz (Hotspot at 1.0 cm)

Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	2.4 GHz WLAN Primary Antenna SAR (W/kg)	2.4 GHz WLAN Secondary Antenna SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Hotspot SAR	Back	1.192	0.285	0.096	1.477	1.288	1.573
	Front	0.935	0.356	0.157	1.291	1.092	1.448
	Top	-	0.356*	0.157*	0.356	0.157	0.513
	Bottom	0.566	-	-	0.566	0.566	0.566
	Right	-	0.356*	0.157*	0.356	0.157	0.513
	Left	0.771	-	-	0.771	0.771	0.771

Table 12-9
Simultaneous Transmission Scenario with 5 GHz (Hotspot at 1.0 cm)

Exposure Condition	Mode	2G/3G/4G SAR (W/kg)	5 GHz WLAN Primary Antenna SAR (W/kg)	5 GHz WLAN Secondary Antenna SAR (W/kg)	Σ SAR (W/kg)	
		1	2	3	1+2	1+2+3
Hotspot SAR	GPRS 850	0.680	0.242	0.276	0.922	1.198
	GPRS 1900	0.662	0.242	0.276	0.904	1.180
	UMTS 850	0.598	0.242	0.276	0.840	1.116
	UMTS 1750	0.852	0.242	0.276	1.094	1.370
	UMTS 1900	1.192	0.242	0.276	1.434	See Table 12-10
	EVDO BC10 (§90S)	0.362	0.242	0.276	0.604	0.880
	EVDO BC0 (§22H)	0.554	0.242	0.276	0.796	1.072
	PCS EVDO	1.067	0.242	0.276	1.309	1.585
	LTE Band 12	0.373	0.242	0.276	0.615	0.891
	LTE Band 26 (Cell)	0.337	0.242	0.276	0.579	0.855
	LTE Band 4 (AWS)	0.583	0.242	0.276	0.825	1.101
	LTE Band 25 (PCS)	1.050	0.242	0.276	1.292	1.568
	LTE Band 41	0.432	0.242	0.276	0.674	0.950

Table 12-10
Simultaneous Transmission Scenario with 5 GHz (Hotspot at 1.0 cm)

Simult Tx	Configuration	UMTS 1900 SAR (W/kg)	5 GHz WLAN Primary Antenna SAR (W/kg)	5 GHz WLAN Secondary Antenna SAR (W/kg)	Σ SAR (W/kg)	
		1	2	3	1+2	1+2+3
Hotspot SAR	Back	1.192	0.137	0.165	1.329	1.494
	Front	0.935	0.242*	0.276*	1.177	1.453
	Top	-	0.242	0.276	0.242	0.518
	Bottom	0.566	-	-	0.566	0.566
	Right	-	0.242*	0.276*	0.242	0.518
	Left	0.771	-	-	0.771	0.771

FCC ID: ZNFLS997	 SAR EVALUATION REPORT 	Reviewed by: Quality Manager
Document S/N: 0Y1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset
Page 76 of 83		

12.6 Phablet SAR Simultaneous Transmission Analysis

Table 12-11
Simultaneous Transmission Scenario with 5 GHz WLAN (Phablet at 0.0 cm)

Exposure Condition	5 GHz WLAN Primary Antenna SAR (W/kg)	5 GHz WLAN Secondary Antenna SAR (W/kg)	Σ SAR (W/kg)
	1	2	1+2
Phablet SAR	0.432	0.709	1.141

12.7 Simultaneous Transmission Conclusion

The above numerical summed SAR results for all the worst-case simultaneous transmission conditions were below the SAR limit. Therefore, the above analysis is sufficient to determine that simultaneous transmission cases will not exceed the SAR limit and therefore no measured volumetric simultaneous SAR summation is required per FCC KDB Publication 447498 D01v06 and IEEE 1528-2013 Section 6.3.4.1.2.

FCC ID: ZNFLS997	 PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: 0Y1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset		Page 77 of 83

13 SAR MEASUREMENT VARIABILITY

13.1 Measurement Variability

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

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

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

Table 13-1
Body SAR Measurement Variability Results

BODY VARIABILITY RESULTS													
Band	FREQUENCY		Mode	Service	Side	Spacing	Measured SAR (1g)	1st Repeated SAR (1g)	Ratio	2nd Repeated SAR (1g)	Ratio	3rd Repeated SAR (1g)	Ratio
	MHz	Ch.					(W/kg)	(W/kg)		(W/kg)		(W/kg)	
1900	1880.00	600	PCS CDMA	TDSO / SO32	back	10 mm	1.110	1.110	1.00	N/A	N/A	N/A	N/A
ANSI / IEEE C95.1 1992 - SAFETY LIMIT						Body							
Spatial Peak						1.6 W/kg (mW/g)							
Uncontrolled Exposure/General Population						averaged over 1 gram							

13.2 Measurement Uncertainty

The measured 1g SAR was < 1.5 W/kg and 10g SAR was < 3.75 W/kg for all frequency bands. Therefore, per KDB Publication 865664 D01v01r04, the extended measurement uncertainty analysis per IEEE 1528-2013 was not required.

FCC ID: ZNFLS997	 PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: OY1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset		Page 78 of 83

14 EQUIPMENT LIST

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent	8594A	(9kHz-2.9GHz) Spectrum Analyzer	N/A	N/A	N/A	3051A00187
Agilent	8753E	(30kHz-6GHz) Network Analyzer	3/2/2016	Annual	3/2/2017	JP38020182
Agilent	8753ES	S-Parameter Network Analyzer	6/28/2016	Annual	6/28/2017	MY40000670
Agilent	E4432B	ESG-D Series Signal Generator	3/5/2016	Annual	3/5/2017	US40053896
Agilent	E4438C	ESG Vector Signal Generator	3/2/2016	Annual	3/2/2017	MY47270002
Agilent	E5515C	Wireless Communications Test Set	6/18/2015	Biennial	6/18/2017	GB41450275
Agilent	E8257D	(250kHz-20GHz) Signal Generator	3/2/2016	Annual	3/2/2017	MY45470194
Agilent	N4010A	Wireless Connectivity Test Set	N/A	N/A	N/A	GB44450273
Agilent	N5182A	MXG Vector Signal Generator	11/6/2015	Annual	11/6/2016	MY47420603
Agilent	N9020A	MXA Signal Analyzer	11/5/2015	Annual	11/5/2016	US46470561
Amplifier Research	15S1G8	Amplifier	CBT	N/A	CBT	433971
Anritsu	MA24106A	USB Power Sensor	6/2/2016	Annual	6/2/2017	1231535
Anritsu	MA24106A	USB Power Sensor	6/2/2016	Annual	6/2/2017	1231538
Anritsu	MA2411B	Pulse Power Sensor	8/3/2015	Annual	8/3/2016	1126066
Anritsu	MA2411B	Pulse Power Sensor	12/7/2015	Annual	12/7/2016	1207364
Anritsu	MA2481A	Power Sensor	CBT	N/A	CBT	3681
Anritsu	MA2481A	Power Sensor	3/3/2016	Annual	3/3/2017	5318
Anritsu	ML2495A	Power Meter	10/16/2015	Biennial	10/16/2017	941001
Anritsu	ML2496A	Power Meter	3/5/2016	Annual		1351001
Anritsu	MT8820C	Radio Communication Analyzer	11/12/2015	Annual	11/12/2016	6201144418
Anritsu	MT8820C	Radio Communication Analyzer	12/4/2015	Annual		6201300731
COMTECH	AR85729-5	Solid State Amplifier	CBT	N/A	CBT	M155A00-009
COMTECH	AR85729-5/5759B	Solid State Amplifier	CBT	N/A	CBT	M3W1A00-1002
Control Company	4040	Digital Thermometer	3/15/2015	Biennial	3/15/2017	150195005
Control Company	4352	Ultra Long Stem Thermometer	3/8/2016	Biennial	3/8/2018	160261694
Control Company	4353	Long Stem Thermometer	3/5/2015	Biennial	3/5/2017	150149565
Gigatronics	80701A	(0.05-18GHz) Power Sensor	11/4/2015	Annual	11/4/2016	1833460
Gigatronics	8651A	Universal Power Meter	11/4/2015	Annual	11/4/2016	8650319
Keysight	772D	Dual Directional Coupler	CBT	N/A	CBT	MY52180215
MCL	BW-N6W5+	6dB Attenuator	CBT	N/A	CBT	1139
MiniCircuits	SLP-2400+	Low Pass Filter	CBT	N/A	CBT	R8979500903
MiniCircuits	VLF-6000+	Low Pass Filter	CBT	N/A	CBT	N/A
Mini-Circuits	BW-N20W5	Power Attenuator	CBT	N/A	CBT	1228
Mini-Circuits	BW-N20W5+	DC to 18 GHz Precision Fixed 20 dB Attenuator	CBT	N/A	CBT	N/A
Mini-Circuits	NLP-1200+	Low Pass Filter DC to 1000 MHz	CBT	N/A	CBT	N/A
Mini-Circuits	NLP-2950+	Low Pass Filter DC to 2700 MHz	CBT	N/A	CBT	N/A
Mitutoyo	CD-6°CSX	Digital Caliper	3/2/2016	Biennial	3/2/2018	13264162
Narda	4014C-6	4 - 8 GHz SMA 6 dB Directional Coupler	CBT	N/A	CBT	N/A
Narda	4772-3	Attenuator (3dB)	CBT	N/A	CBT	9406
Narda	BW-S3W2	Attenuator (3dB)	CBT	N/A	CBT	120
Pasternack	NC-100	Torque Wrench	5/21/2015	Biennial	5/21/2017	N/A
Pasternack	PE2208-6	Bidirectional Coupler	CBT	N/A	CBT	N/A
Pasternack	PE2209-10	Bidirectional Coupler	CBT	N/A	CBT	N/A
Rohde & Schwarz	CMU200	Base Station Simulator	12/2/2015	Annual	12/2/2016	8338550010
Rohde & Schwarz	CMW500	Radio Communication Tester	10/13/2015	Annual	10/13/2016	100976
Rohde & Schwarz	CMW500	Radio Communication Tester	4/13/2016	Annual	4/13/2017	140148
Rohde & Schwarz	NRVD	Dual Channel Power Meter	CBT	N/A	CBT	101695
Rohde & Schwarz	NRV-Z32	Peak Power Sensor	CBT	N/A	CBT	836019/013
Rohde & Schwarz	SMIQ03B	Signal Generator	CBT	N/A	CBT	DE27259
Seekonk	NC-100	Torque Wrench	11/6/2015	Biennial	11/6/2017	22313
SPEAG	D750V3	750 MHz SAR Dipole	2/16/2016	Annual	2/16/2017	1046
SPEAG	D835V2	835 MHz SAR Dipole	4/14/2016	Annual	4/14/2017	4d119
SPEAG	D1750V2	1750 MHz SAR Dipole	4/13/2016	Annual	4/13/2017	1051
SPEAG	D1765V2	1765 MHz SAR Dipole	5/11/2016	Annual	5/11/2017	1008
SPEAG	D1900V2	1900 MHz SAR Dipole	4/12/2016	Annual	4/12/2017	5d141
SPEAG	D1900V2	1900 MHz SAR Dipole	7/14/2015	Annual	7/14/2016	5d149
SPEAG	D2450V2	2450 MHz SAR Dipole	8/20/2015	Annual	8/20/2016	719
SPEAG	D5GHzV2	5 GHz SAR Dipole	2/25/2016	Annual	2/25/2017	1120
SPEAG	DAE4	Dasy Data Acquisition Electronics	2/19/2016	Annual	2/19/2017	665
SPEAG	DAE4	Dasy Data Acquisition Electronics	5/11/2016	Annual	5/11/2017	859
SPEAG	DAE4	Dasy Data Acquisition Electronics	2/18/2016	Annual	2/18/2017	1272
SPEAG	DAE4	Dasy Data Acquisition Electronics	3/14/2016	Annual	3/14/2017	1368
SPEAG	DAE4	Dasy Data Acquisition Electronics	4/14/2016	Annual	4/14/2017	1407
SPEAG	DAE4	Dasy Data Acquisition Electronics	11/11/2015	Annual	11/11/2016	1415
SPEAG	DAE4	Dasy Data Acquisition Electronics	9/16/2015	Annual	9/16/2016	1323
SPEAG	DAE4	Dasy Data Acquisition Electronics	10/27/2015	Annual	10/27/2016	1333
SPEAG	DAE4	Dasy Data Acquisition Electronics	11/11/2015	Annual	11/11/2016	1334
SPEAG	DAK-12	Dielectric Assessment Kit (10MHz - 3GHz)	3/1/2016	Annual	3/1/2017	1102
SPEAG	DAK-3.5	Dielectric Assessment Kit	5/10/2016	Annual	5/10/2017	1070
SPEAG	ES3DV3	SAR Probe	3/18/2016	Annual	3/18/2017	3319
SPEAG	ES3DV3	SAR Probe	11/17/2015	Annual	11/17/2016	3334
SPEAG	EX3DV4	SAR Probe	2/22/2016	Annual	2/22/2017	3914
SPEAG	ES3DV2	SAR Probe	8/26/2015	Annual	8/26/2016	3022
SPEAG	EX3DV4	SAR Probe	4/19/2016	Annual	4/19/2017	7406
SPEAG	EX3DV4	SAR Probe	5/17/2016	Annual	5/17/2017	7409
SPEAG	ES3DV3	SAR Probe	2/19/2016	Annual	2/19/2017	3318
SPEAG	ES3DV3	SAR Probe	10/29/2015	Annual	10/29/2016	3333
SPEAG	ES3DV3	SAR Probe	3/18/2016	Annual	3/18/2017	3209

Notes:

1. CBT (Calibrated Before Testing). Prior to testing, the measurement paths containing a cable, amplifier, attenuator, coupler or filter were connected to a calibrated source (i.e. a signal generator) to determine the losses of the measurement path. The power meter offset was then adjusted to compensate for the measurement system losses. This level offset is stored within the power meter before measurements are made. This calibration verification procedure applies to the system verification and output power measurements. The calibrated reading is then taken directly from the power meter after compensation of the losses for all final power measurements.
2. All equipment was used solely within its calibration period.

FCC ID: ZNFLS997		SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: 0Y1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset		Page 79 of 83

15 MEASUREMENT UNCERTAINTIES

a	c	d	e= f(d,k)	f	g	h = c x f/e	i = c x g/e	k
Uncertainty Component	Tol. (± %)	Prob. Dist.	Div.	c _i 1gm	c _i 10 gms	1gm u _i (± %)	10gms u _i (± %)	v _i
Measurement System								
Probe Calibration	6.55	N	1	1.0	1.0	6.6	6.6	∞
Axial Isotropy	0.25	N	1	0.7	0.7	0.2	0.2	∞
Hemishperical Isotropy	1.3	N	1	0.7	0.7	0.9	0.9	∞
Boundary Effect	2.0	R	1.73	1.0	1.0	1.2	1.2	∞
Linearity	0.3	N	1	1.0	1.0	0.3	0.3	∞
System Detection Limits	0.25	R	1.73	1.0	1.0	0.1	0.1	∞
Readout Electronics	0.3	N	1	1.0	1.0	0.3	0.3	∞
Response Time	0.8	R	1.73	1.0	1.0	0.5	0.5	∞
Integration Time	2.6	R	1.73	1.0	1.0	1.5	1.5	∞
RF Ambient Conditions - Noise	3.0	R	1.73	1.0	1.0	1.7	1.7	∞
RF Ambient Conditions - Reflections	3.0	R	1.73	1.0	1.0	1.7	1.7	∞
Probe Positioner Mechanical Tolerance	0.4	R	1.73	1.0	1.0	0.2	0.2	∞
Probe Positioning w/ respect to Phantom	6.7	R	1.73	1.0	1.0	3.9	3.9	∞
Extrapolation, Interpolation & Integration algorithms for Max. SAR Evaluation	4.0	R	1.73	1.0	1.0	2.3	2.3	∞
Test Sample Related								
Test Sample Positioning	2.7	N	1	1.0	1.0	2.7	2.7	35
Device Holder Uncertainty	1.67	N	1	1.0	1.0	1.7	1.7	5
Output Power Variation - SAR drift measurement	5.0	R	1.73	1.0	1.0	2.9	2.9	∞
SAR Scaling	0.0	R	1.73	1.0	1.0	0.0	0.0	∞
Phantom & Tissue Parameters								
Phantom Uncertainty (Shape & Thickness tolerances)	7.6	R	1.73	1.0	1.0	4.4	4.4	∞
Liquid Conductivity - measurement uncertainty	4.2	N	1	0.78	0.71	3.3	3.0	10
Liquid Permittivity - measurement uncertainty	4.1	N	1	0.23	0.26	1.0	1.1	10
Liquid Conductivity - Temperature Uncertainty	3.4	R	1.73	0.78	0.71	1.5	1.4	∞
Liquid Permittivity - Temperature Uncertainty	0.6	R	1.73	0.23	0.26	0.1	0.1	∞
Liquid Conductivity - deviation from target values	5.0	R	1.73	0.64	0.43	1.8	1.2	∞
Liquid Permittivity - deviation from target values	5.0	R	1.73	0.60	0.49	1.7	1.4	∞
Combined Standard Uncertainty (k=1)						RSS	11.5	11.3
Expanded Uncertainty (95% CONFIDENCE LEVEL)						k=2	23.0	22.6

FCC ID: ZNFLS997		SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: 0Y1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset		Page 80 of 83

16 CONCLUSION

16.1 Measurement Conclusion

The SAR evaluation indicates that the EUT complies with the RF radiation exposure limits of the FCC and Innovation, Science, and Economic Development Canada, with respect to all parameters subject to this test. These measurements were taken to simulate the RF effects of RF exposure under worst-case conditions. Precise laboratory measures were taken to assure repeatability of the tests. The results and statements relate only to the item(s) tested.

Please note that the absorption and distribution of electromagnetic energy in the body are very complex phenomena that depend on the mass, shape, and size of the body, the orientation of the body with respect to the field vectors, and the electrical properties of both the body and the environment. Other variables that may play a substantial role in possible biological effects are those that characterize the environment (e.g. ambient temperature, air velocity, relative humidity, and body insulation) and those that characterize the individual (e.g. age, gender, activity level, debilitation, or disease). Because various factors may interact with one another to vary the specific biological outcome of an exposure to electromagnetic fields, any protection guide should consider maximal amplification of biological effects as a result of field-body interactions, environmental conditions, and physiological variables. [3]

FCC ID: ZNFLS997	 PCTEST ENGINEERING LABORATORY, INC.	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Document S/N: 0Y1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset		Page 81 of 83

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FCC ID: ZNFLS997	 SAR EVALUATION REPORT 		Reviewed by: Quality Manager
Document S/N: 0Y1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset	Page 82 of 83

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FCC ID: ZNFLS997	 SAR EVALUATION REPORT 		Reviewed by: Quality Manager
Document S/N: 0Y1607051202-R2.ZNF	Test Dates: 07/05/16 - 07/19/16	DUT Type: Portable Handset	Page 83 of 83

APPENDIX A: SAR TEST DATA

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFLS997; Type: Portable Handset; Serial: 00305

Communication System: UID 0, GSM GPRS; 2 Tx slots; Frequency: 836.6 MHz; Duty Cycle: 1:4.15

Medium: 835 Head; Medium parameters used (interpolated):

$f = 836.6 \text{ MHz}$; $\sigma = 0.9 \text{ S/m}$; $\epsilon_r = 41.071$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

Test Date: 07-15-2016; Ambient Temp: 21.2°C; Tissue Temp: 21.7°C

Probe: ES3DV3 - SN3334; ConvF(6.37, 6.37, 6.37); Calibrated: 11/17/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1415; Calibrated: 11/11/2015

Phantom: SAM Front; Type: SAM; Serial: 1686

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: GPRS 850, Right Head, Cheek, Mid.ch, 2 Tx slots

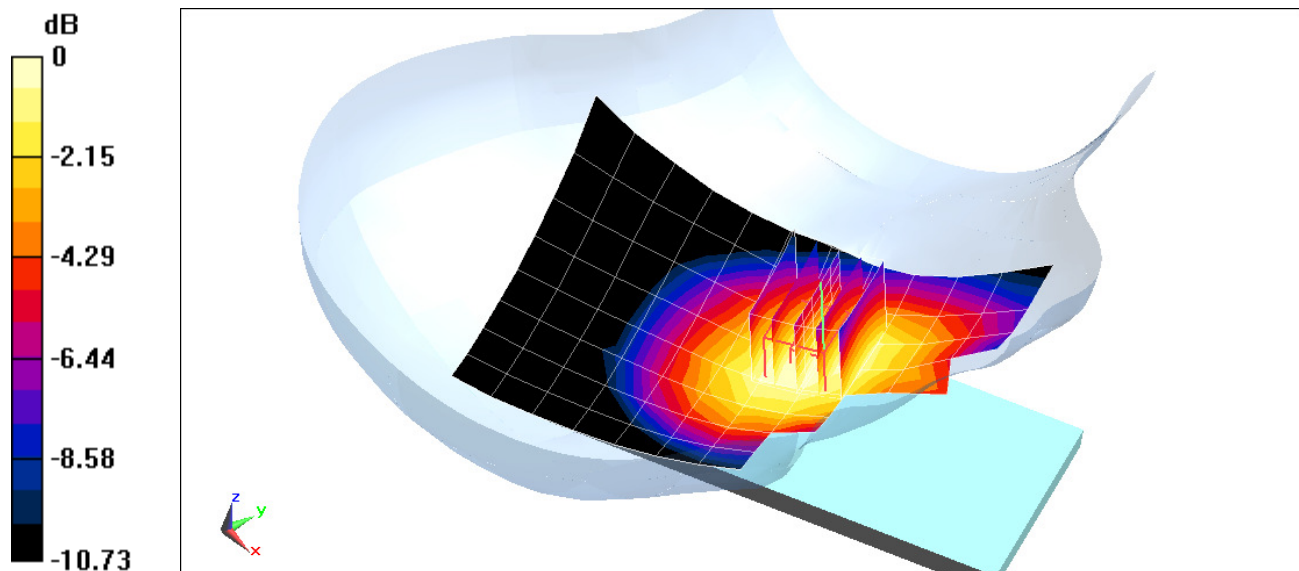
Area Scan (9x15x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (6x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 22.67 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 0.562 W/kg

SAR(1 g) = 0.435 W/kg



0 dB = 0.474 W/kg = -3.24 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFLS997; Type: Portable Handset; Serial: 00271

Communication System: UID 0, GSM GPRS; 2 Tx slots; Frequency: 1880 MHz; Duty Cycle: 1:4.15

Medium: 1900 Head; Medium parameters used:

$f = 1880 \text{ MHz}$; $\sigma = 1.431 \text{ S/m}$; $\epsilon_r = 39.346$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Test Date: 07-05-2016; Ambient Temp: 22.6°C; Tissue Temp: 21.3°C

Probe: ES3DV3 - SN3333; ConvF(5.03, 5.03, 5.03); Calibrated: 10/29/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1333; Calibrated: 10/27/2015

Phantom: SAM Front; Type: QD000P40CD; Serial: TP:1758

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: GPRS 1900, Left Head, Cheek, Mid.ch, 2 Tx slots

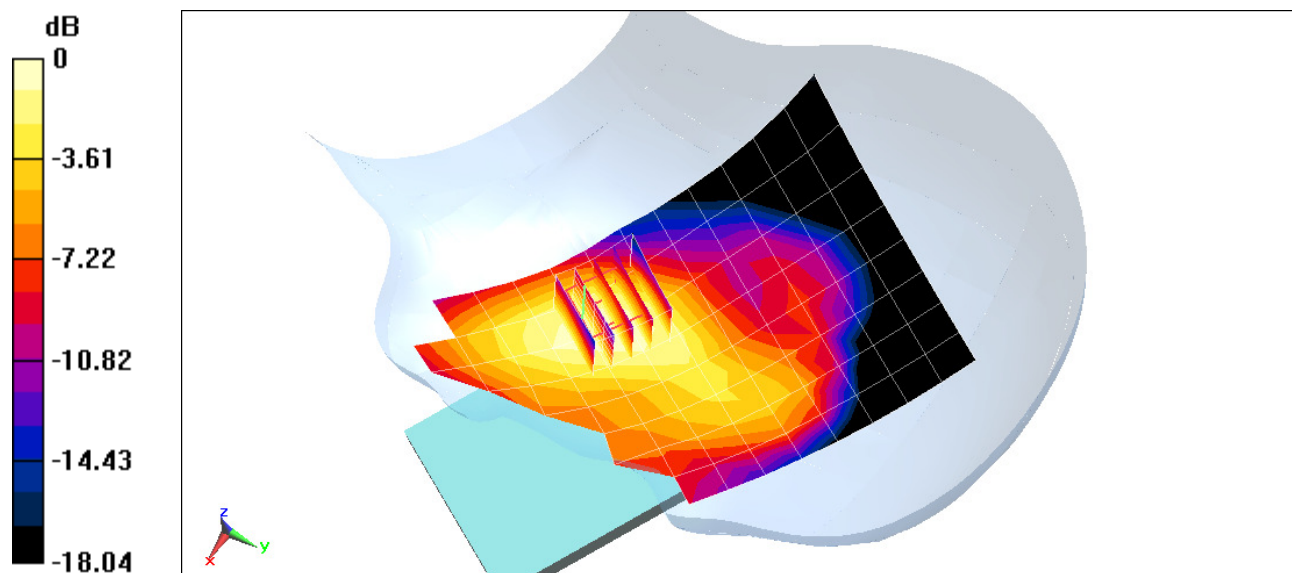
Area Scan (9x15x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 12.53 V/m; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 0.305 W/kg

SAR(1 g) = 0.207 W/kg



0 dB = 0.235 W/kg = -6.29 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFLS997; Type: Portable Handset; Serial: 00271

Communication System: UID 0, UMTS; Frequency: 836.6 MHz; Duty Cycle: 1:1

Medium: 835 Head; Medium parameters used (interpolated):

$f = 836.6 \text{ MHz}$; $\sigma = 0.9 \text{ S/m}$; $\epsilon_r = 41.071$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

Test Date: 07-15-2016; Ambient Temp: 21.2°C; Tissue Temp: 21.7°C

Probe: ES3DV3 - SN3334; ConvF(6.37, 6.37, 6.37); Calibrated: 11/17/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1415; Calibrated: 11/11/2015

Phantom: SAM Front; Type: SAM; Serial: 1686

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: UMTS 850, Right Head, Cheek, Mid.ch

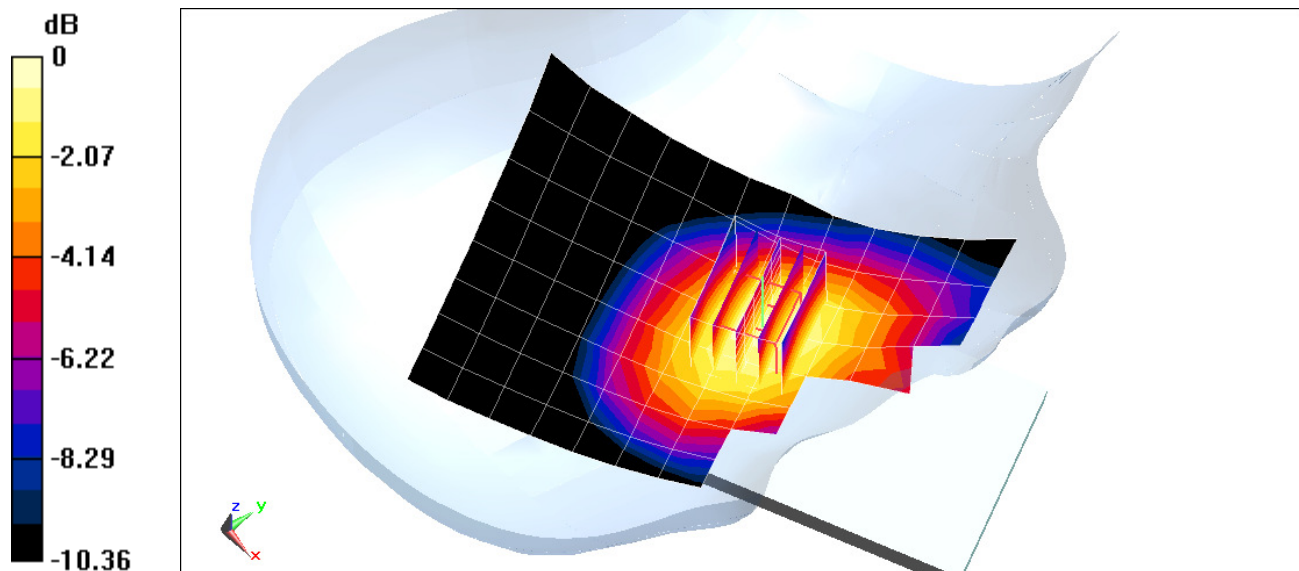
Area Scan (9x15x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (6x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 18.40 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 0.374 W/kg

SAR(1 g) = 0.283 W/kg



0 dB = 0.312 W/kg = -5.06 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFLS997; Type: Portable Handset; Serial: 00248

Communication System: UID 0, UMTS; Frequency: 1732.4 MHz; Duty Cycle: 1:1
Medium: 1750 Head; Medium parameters used (interpolated):
 $f = 1732.4 \text{ MHz}$; $\sigma = 1.304 \text{ S/m}$; $\epsilon_r = 39.301$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Left Section

Test Date: 07-11-2016; Ambient Temp: 23.0°C; Tissue Temp: 22.0°C

Probe: EX3DV4 - SN7406; ConvF(8.85, 8.85, 8.85); Calibrated: 4/19/2016;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/14/2016
Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: UMTS 1750, Left Head, Cheek, Mid.ch

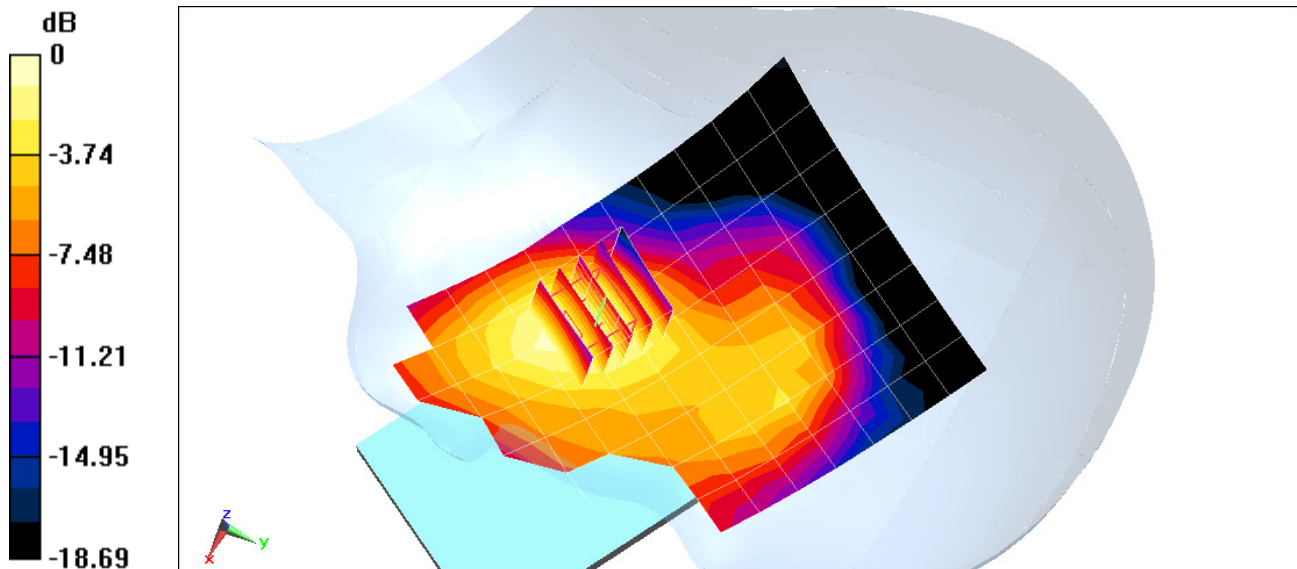
Area Scan (9x15x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 13.53 V/m; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 0.323 W/kg

SAR(1 g) = 0.221 W/kg



0 dB = 0.278 W/kg = -5.56 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFLS997; Type: Portable Handset; Serial: 00248

Communication System: UID 0, UMTS; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: 1900 Head; Medium parameters used:

$f = 1880 \text{ MHz}$; $\sigma = 1.431 \text{ S/m}$; $\epsilon_r = 39.346$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Test Date: 07-05-2016; Ambient Temp: 22.6°C; Tissue Temp: 21.3°C

Probe: ES3DV3 - SN3333; ConvF(5.03, 5.03, 5.03); Calibrated: 10/29/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1333; Calibrated: 10/27/2015

Phantom: SAM Front; Type: QD000P40CD; Serial: TP:1758

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: UMTS 1900, Left Head, Cheek, Mid.ch

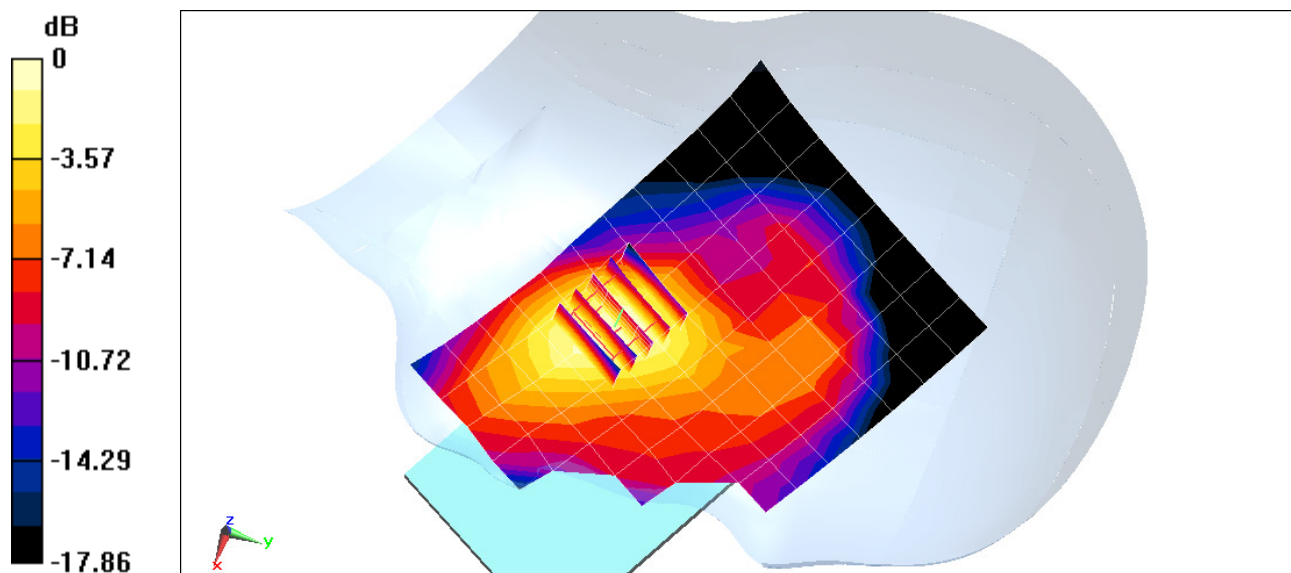
Area Scan (9x15x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 15.31 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 0.460 W/kg

SAR(1 g) = 0.305 W/kg



0 dB = 0.351 W/kg = -4.55 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFLS997; Type: Portable Handset; Serial: 00396

Communication System: UID 0, Cellular CDMA; Frequency: 820.1 MHz; Duty Cycle: 1:1

Medium: 835 Head; Medium parameters used (interpolated):

$f = 820.1 \text{ MHz}$; $\sigma = 0.895 \text{ S/m}$; $\epsilon_r = 41.896$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

Test Date: 07-12-2016; Ambient Temp: 23.2°C; Tissue Temp: 22.1°C

Probe: ES3DV3 - SN3334; ConvF(6.37, 6.37, 6.37); Calibrated: 11/17/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1415; Calibrated: 11/11/2015

Phantom: SAM Front; Type: SAM; Serial: 1686

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: Cell. CDMA, Rule Part 90S, Antenna 3, Right Head, Tilt, Mid.ch

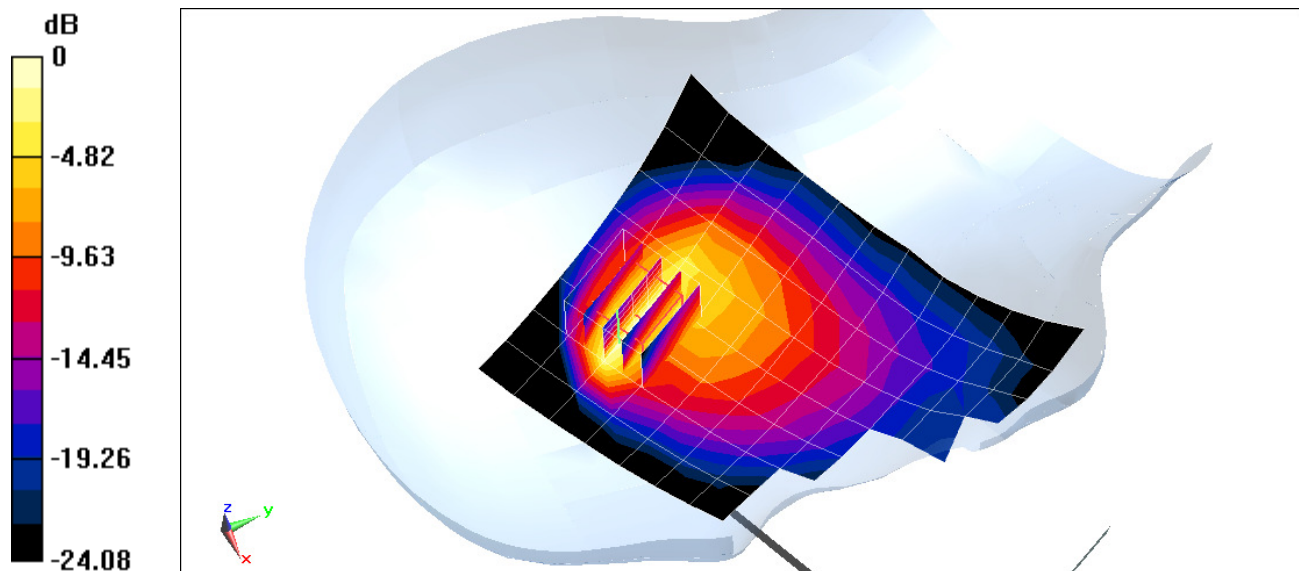
Area Scan (9x15x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 19.15 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 0.777 W/kg

SAR(1 g) = 0.271 W/kg



0 dB = 0.387 W/kg = -4.12 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFLS997; Type: Portable Handset; Serial: 00248

Communication System: UID 0, CDMA; Frequency: 836.52 MHz; Duty Cycle: 1:1

Medium: 835 Head; Medium parameters used (interpolated):

$f = 836.52$ MHz; $\sigma = 0.892$ S/m; $\epsilon_r = 41.133$; $\rho = 1000$ kg/m³

Phantom section: Right Section

Test Date: 07-11-2016; Ambient Temp: 22.8°C; Tissue Temp: 22.4°C

Probe: ES3DV3 - SN3318; ConvF(6.23, 6.23, 6.23); Calibrated: 2/19/2016;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 2/19/2016

Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1800

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: Cell. CDMA, Rule Part 22H, Antenna 1, Right Head, Cheek, Mid.ch

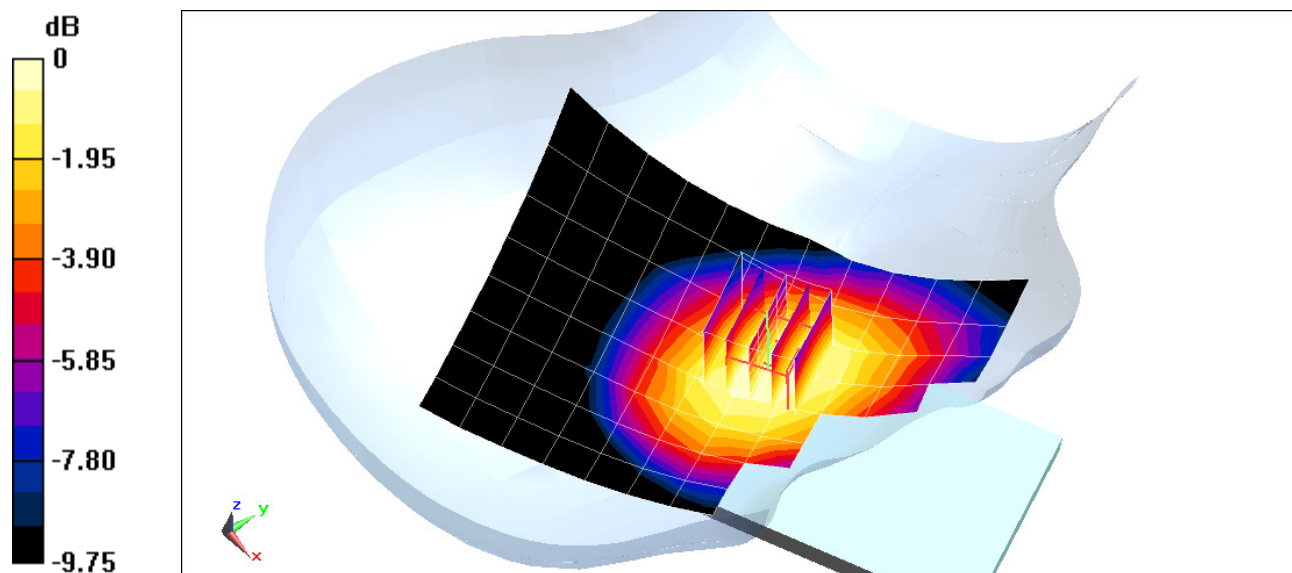
Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 19.28 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 0.393 W/kg

SAR(1 g) = 0.309 W/kg



0 dB = 0.335 W/kg = -4.75 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFLS997; Type: Portable Handset; Serial: 00271

Communication System: UID 0, PCS CDMA; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: 1900 Head; Medium parameters used:

$f = 1880 \text{ MHz}$; $\sigma = 1.431 \text{ S/m}$; $\epsilon_r = 39.346$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Test Date: 07-05-2016; Ambient Temp: 22.6°C; Tissue Temp: 21.3°C

Probe: ES3DV3 - SN3333; ConvF(5.03, 5.03, 5.03); Calibrated: 10/29/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1333; Calibrated: 10/27/2015

Phantom: SAM Front; Type: QD000P40CD; Serial: TP:1758

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: PCS EVDO Rev A, Left Head, Cheek, Mid.ch

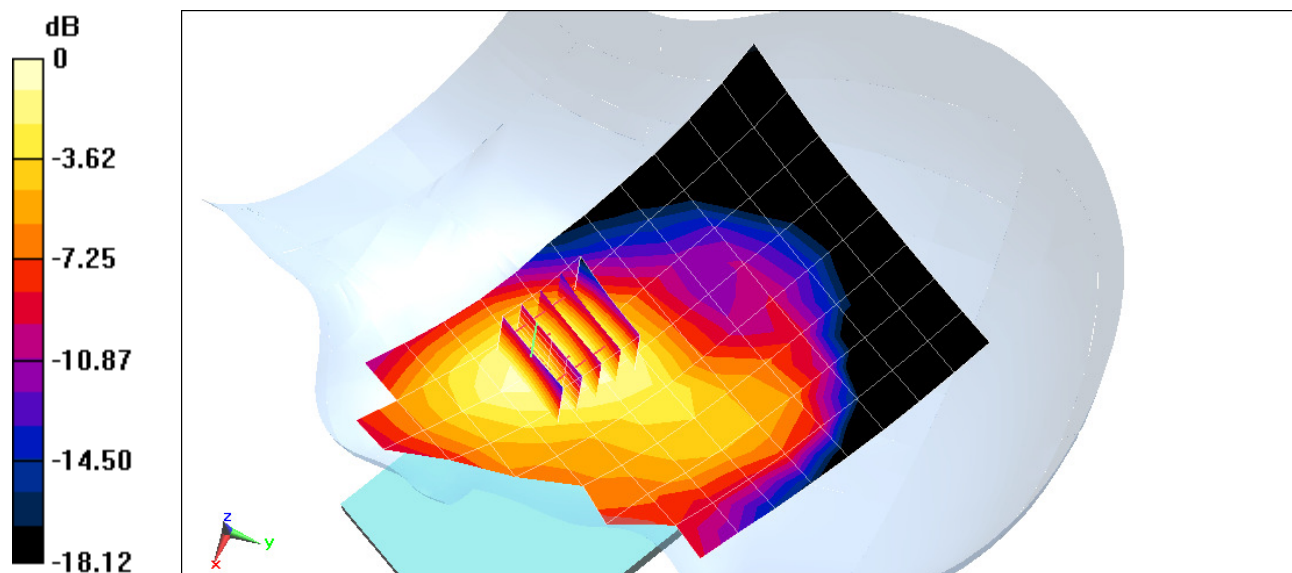
Area Scan (9x15x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 16.16 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 0.519 W/kg

SAR(1 g) = 0.344 W/kg



0 dB = 0.394 W/kg = -4.05 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFLS997; Type: Portable Handset; Serial: 00206

Communication System: UID 0, LTE Band 12; Frequency: 707.5 MHz; Duty Cycle: 1:1

Medium: 750 Head; Medium parameters used (interpolated):

$f = 707.5 \text{ MHz}$; $\sigma = 0.855 \text{ S/m}$; $\epsilon_r = 41.5$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

Test Date: 07-05-2016; Ambient Temp: 21.8°C; Tissue Temp: 21.2°C

Probe: ES3DV2 - SN3022; ConvF(6.33, 6.33, 6.33); Calibrated: 8/26/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1323; Calibrated: 9/16/2015

Phantom: SAM Left; Type: QD000P40CC; Serial: TP: 1375

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 12, Right Head, Cheek, Mid.ch
10 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset

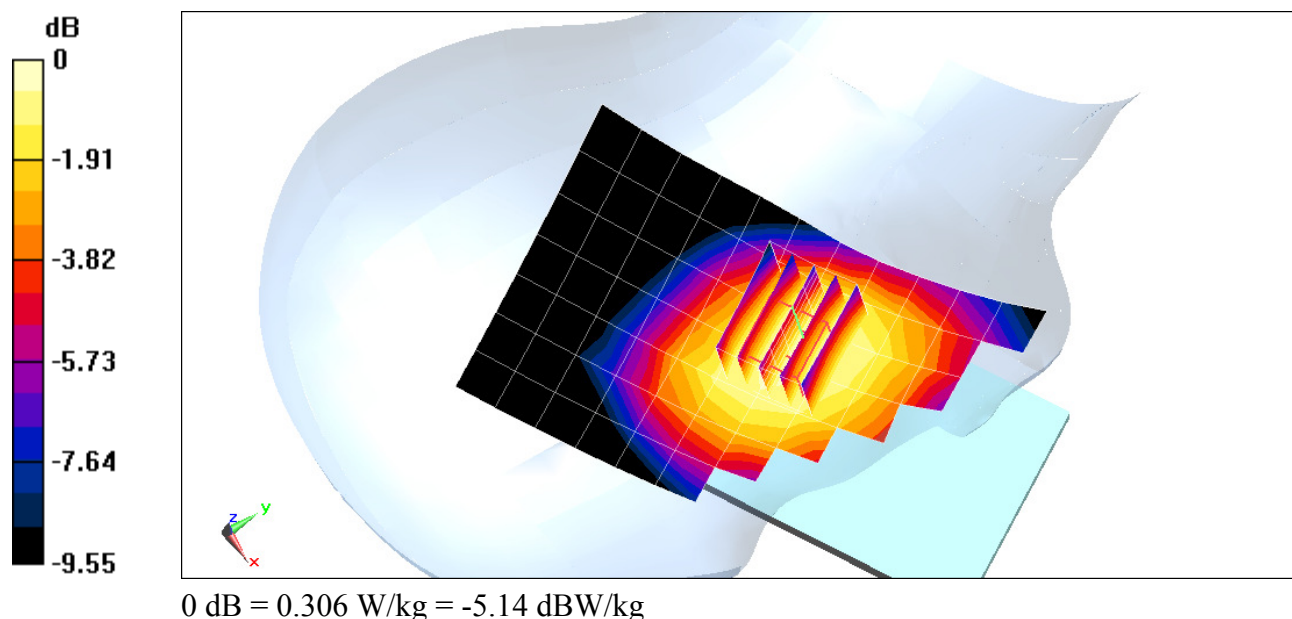
Area Scan (8x13x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (6x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 19.55 V/m; Power Drift = -0.06 dB

Peak SAR (extrapolated) = 0.344 W/kg

SAR(1 g) = 0.284 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFLS997; Type: Portable Handset; Serial: 00206

Communication System: UID 0, LTE Band 26; Frequency: 831.5 MHz; Duty Cycle: 1:1

Medium: 835 Head; Medium parameters used (interpolated):

$f = 831.5 \text{ MHz}$; $\sigma = 0.888 \text{ S/m}$; $\epsilon_r = 41.198$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

Test Date: 07-11-2016; Ambient Temp: 22.8°C; Tissue Temp: 22.4°C

Probe: ES3DV3 - SN3318; ConvF(6.23, 6.23, 6.23); Calibrated: 2/19/2016;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 2/19/2016

Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1800

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 26 (Cell.), Antenna 3, Right Head, Tilt, Mid.ch
15 MHz Bandwidth, QPSK, 1 RB, 36 RB Offset

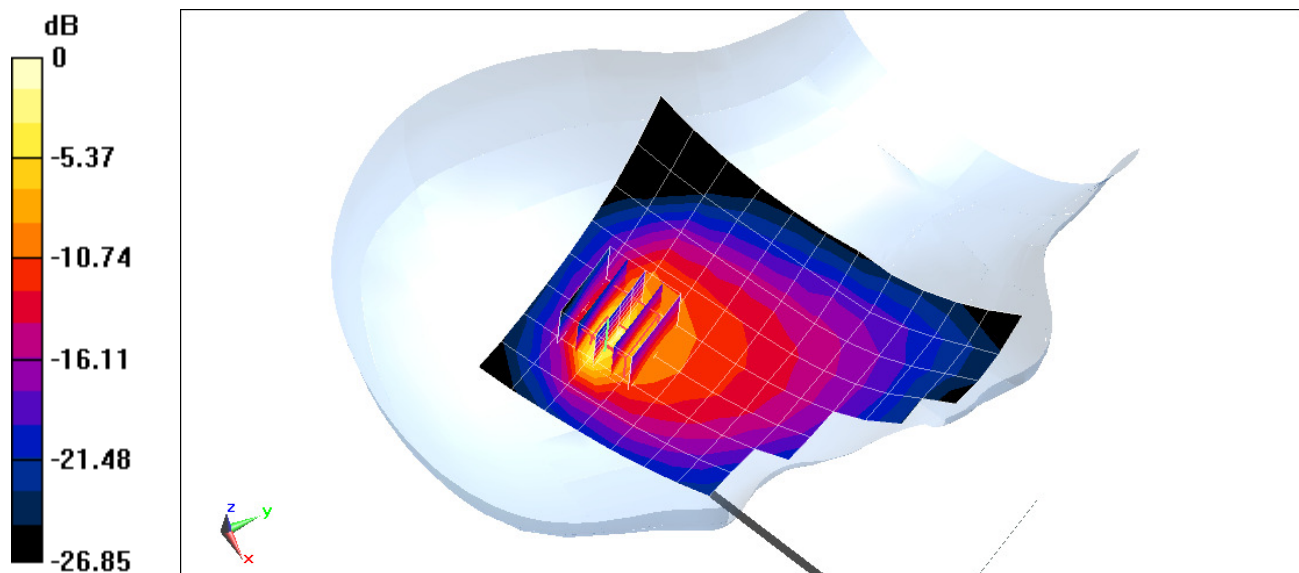
Area Scan (9x15x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 35.29 V/m; Power Drift = -0.19 dB

Peak SAR (extrapolated) = 3.11 W/kg

SAR(1 g) = 0.695 W/kg



0 dB = 1.09 W/kg = 0.37 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFLS997; Type: Portable Handset; Serial: 00222

Communication System: UID 0, LTE Band 4 (AWS); Frequency: 1732.5 MHz; Duty Cycle: 1:1

Medium: 1750 Head; Medium parameters used (interpolated):

$f = 1732.5 \text{ MHz}$; $\sigma = 1.304 \text{ S/m}$; $\epsilon_r = 39.3$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Test Date: 07-11-2016; Ambient Temp: 23.0°C; Tissue Temp: 22.0°C

Probe: EX3DV4 - SN7406; ConvF(8.85, 8.85, 8.85); Calibrated: 4/19/2016;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1407; Calibrated: 4/14/2016

Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 4 (AWS), Left Head, Cheek, Mid.ch
20 MHz Bandwidth, QPSK, 1 RB, 99 RB Offset

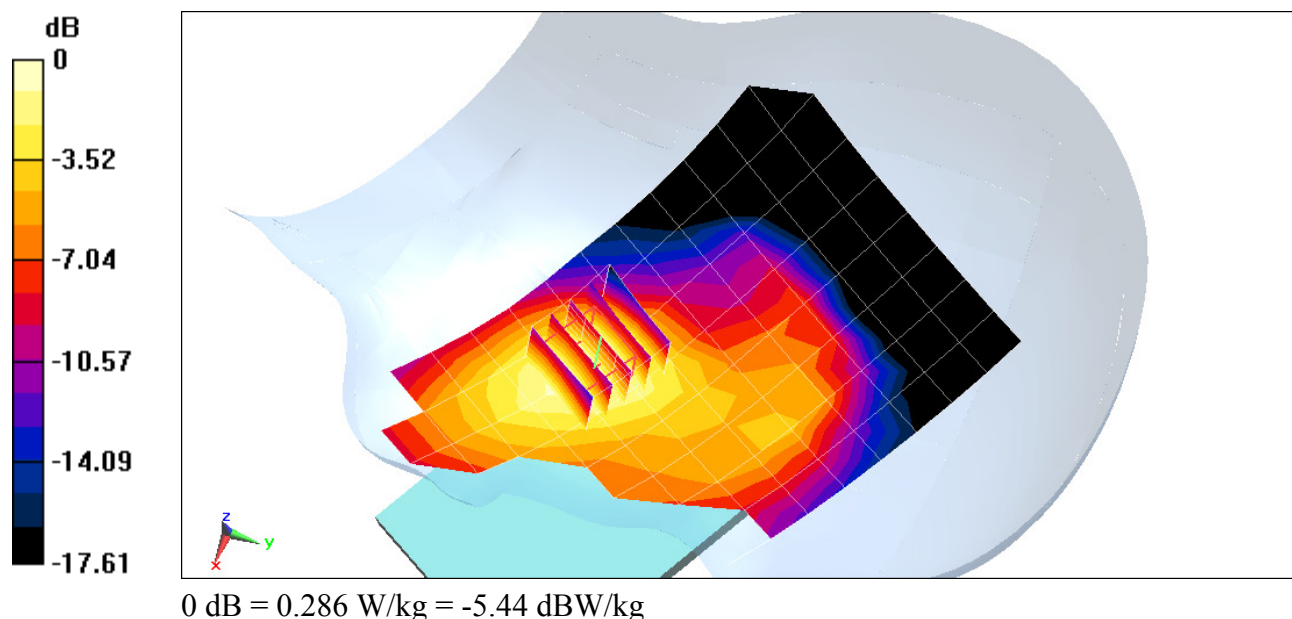
Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 14.16 V/m; Power Drift = 0.10 dB

Peak SAR (extrapolated) = 0.327 W/kg

SAR(1 g) = 0.225 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFLS997; Type: Portable Handset; Serial: 00222

Communication System: UID 0, LTE Band 25 (PCS); Frequency: 1860 MHz; Duty Cycle: 1:1

Medium: 1900 Head; Medium parameters used (interpolated):

$f = 1860 \text{ MHz}$; $\sigma = 1.412 \text{ S/m}$; $\epsilon_r = 39.432$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Test Date: 07-05-2016; Ambient Temp: 22.6°C; Tissue Temp: 21.3°C

Probe: ES3DV3 - SN3333; ConvF(5.03, 5.03, 5.03); Calibrated: 10/29/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1333; Calibrated: 10/27/2015

Phantom: SAM Front; Type: QD000P40CD; Serial: TP:1758

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 25 (PCS), Left Head, Cheek, Low.ch

20 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset

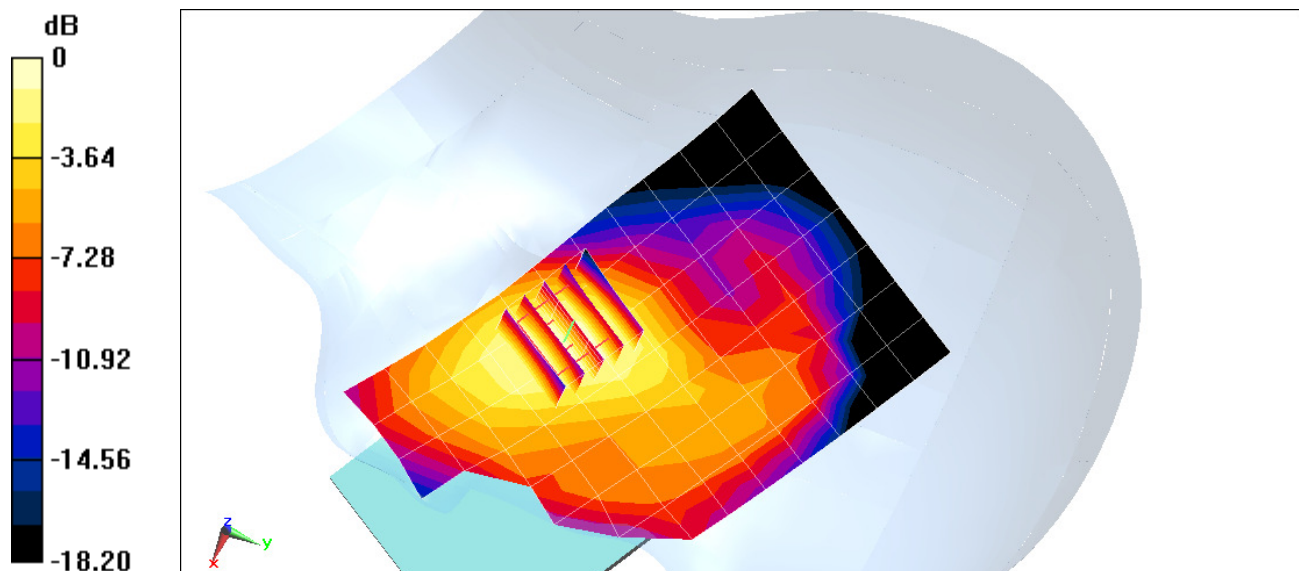
Area Scan (8x14x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 18.25 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 0.574 W/kg

SAR(1 g) = 0.385 W/kg



0 dB = 0.442 W/kg = -3.55 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFLS997; Type: Portable Handset; Serial: 00206

Communication System: UID 0, LTE Band 41; Frequency: 2506 MHz; Duty Cycle: 1:1.59

Medium: 2450 Head; Medium parameters used (interpolated):

$f = 2506 \text{ MHz}$; $\sigma = 1.918 \text{ S/m}$; $\epsilon_r = 38.304$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Test Date: 07-05-2016; Ambient Temp: 20.2°C; Tissue Temp: 22.0°C

Probe: ES3DV3 - SN3334; ConvF(4.58, 4.58, 4.58); Calibrated: 11/17/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1415; Calibrated: 11/11/2015

Phantom: SAM Front; Type: SAM; Serial: 1686

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 41, Left Head, Cheek, Low.ch

20 MHz Bandwidth, QPSK, 1 RB, 99 RB Offset

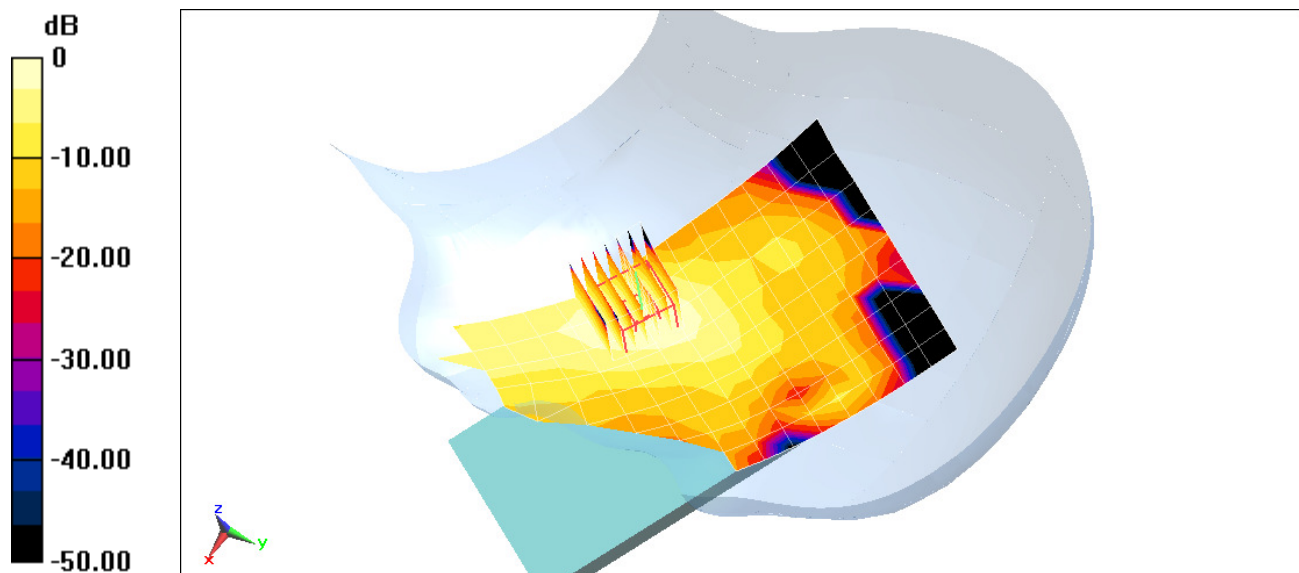
Area Scan (10x17x1): Measurement grid: $dx=12\text{mm}$, $dy=12\text{mm}$

Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 8.841 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 0.212 W/kg

SAR(1 g) = 0.111 W/kg



0 dB = 0.139 W/kg = -8.57 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFLS997; Type: Portable Handset; Serial: 00321

Communication System: UID 0, IEEE 802.11b; Frequency: 2437 MHz; Duty Cycle: 1:1

Medium: 2450 Head; Medium parameters used (interpolated):

$f = 2437 \text{ MHz}$; $\sigma = 1.831 \text{ S/m}$; $\epsilon_r = 40.33$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Test Date: 07-15-2016; Ambient Temp: 21.8°C; Tissue Temp: 22.6°C

Probe: EX3DV4 - SN7409; ConvF(6.9, 6.9, 6.9); Calibrated: 5/17/2016;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn859; Calibrated: 5/11/2016

Phantom: SAM Right; Type: QD000P40CD; Serial: TP:7535

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: IEEE 802.11b, Primary Antenna, 22 MHz Bandwidth

Left Head, Cheek, Ch 06, 1 Mbps

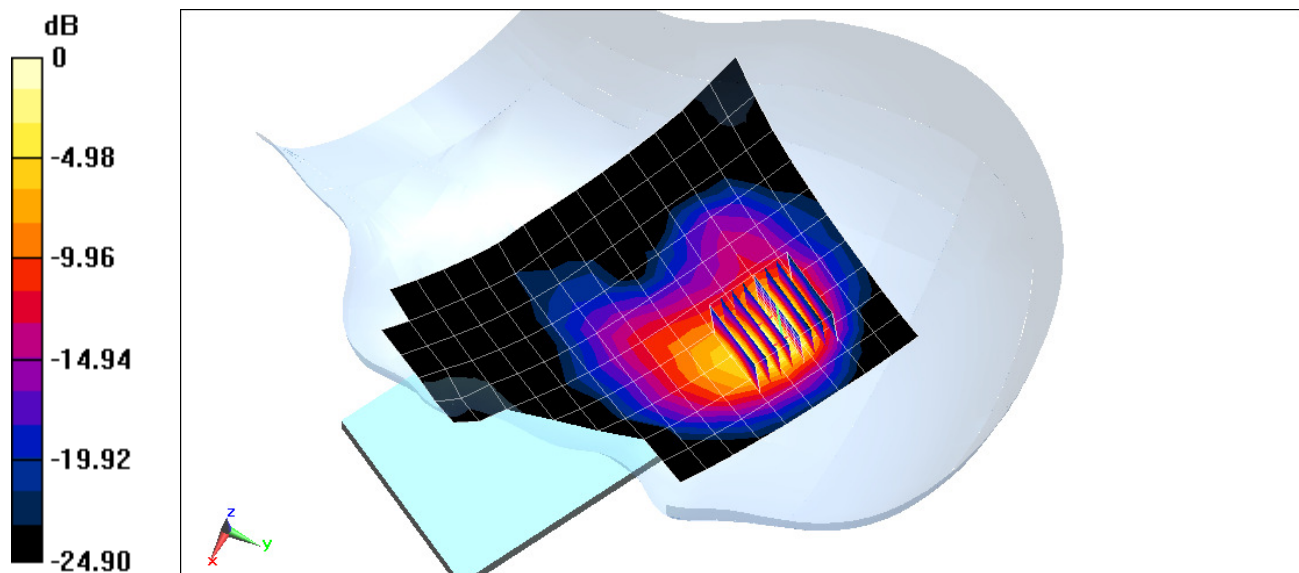
Area Scan (11x18x1): Measurement grid: $dx=12\text{mm}$, $dy=12\text{mm}$

Zoom Scan (7x8x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 15.96 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 1.06 W/kg

SAR(1 g) = 0.421 W/kg



0 dB = 0.774 W/kg = -1.11 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFLS997; Type: Portable Handset; Serial: 00313

Communication System: UID 0, IEEE 802.11ac; Frequency: 5690 MHz; Duty Cycle: 1:1

Medium: 5 GHz Head; Medium parameters used (interpolated):

$f = 5690 \text{ MHz}$; $\sigma = 5.043 \text{ S/m}$; $\epsilon_r = 36.093$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Test Date: 07-15-2016; Ambient Temp: 23.0°C; Tissue Temp: 21.8°C

Probe: EX3DV4 - SN3914; ConvF(4.74, 4.74, 4.74); Calibrated: 2/22/2016;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1272; Calibrated: 2/18/2016

Phantom: SAM v5.0 Left; Type: QD000P40CD; Serial: TP: 1687

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

**Mode: IEEE 802.11ac, Primary Antenna, U-NII-2C, 80 MHz Bandwidth
Left Head, Tilt, Ch 138, 29.3 Mbps**

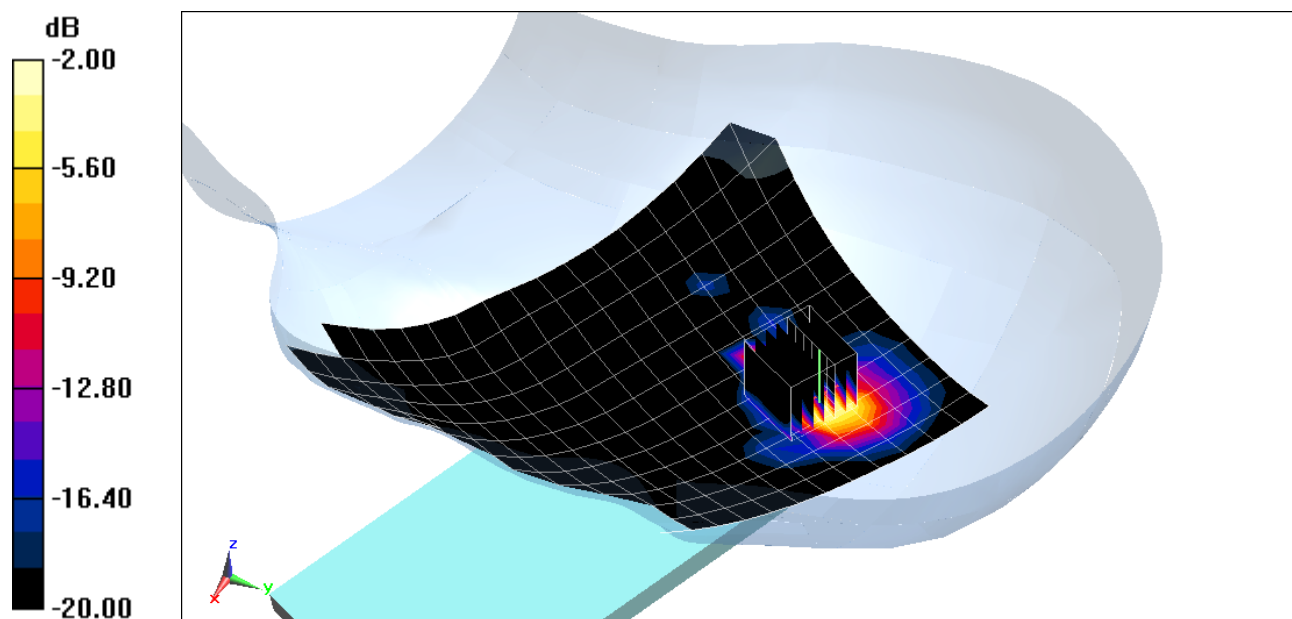
Area Scan (13x22x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=1.4\text{mm}$; Graded Ratio: 1.4

Reference Value = 9.407 V/m; Power Drift = 0.19 dB

Peak SAR (extrapolated) = 2.80 W/kg

SAR(1 g) = 0.572 W/kg



0 dB = 1.58 W/kg = 1.99 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFLS997; Type: Portable Handset; Serial: 00230

Communication System: UID 0, GSM GPRS; 2 Tx slots; Frequency: 836.6 MHz; Duty Cycle: 1:4.15

Medium: 835 Body; Medium parameters used (interpolated):

$f = 836.6 \text{ MHz}$; $\sigma = 0.985 \text{ S/m}$; $\epsilon_r = 53.264$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-13-2016; Ambient Temp: 24.0°C; Tissue Temp: 23.5°C

Probe: ES3DV3 - SN3333; ConvF(6.25, 6.25, 6.25); Calibrated: 10/29/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1333; Calibrated: 10/27/2015

Phantom: SAM Front; Type: QD000P40CD; Serial: TP:1758

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: GPRS 850, Body SAR, Back side, Mid.ch, 2 Tx Slots

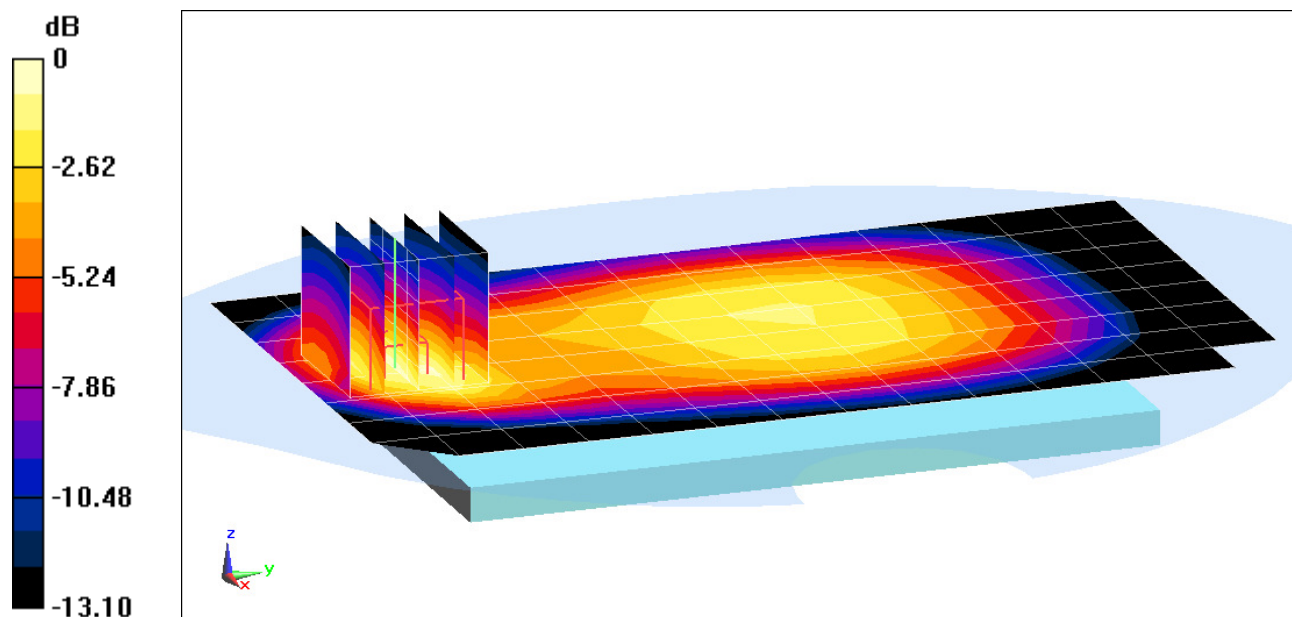
Area Scan (9x15x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 26.73 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 1.06 W/kg

SAR(1 g) = 0.617 W/kg



0 dB = 0.747 W/kg = -1.27 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFLS997; Type: Portable Handset; Serial: 00230

Communication System: UID 0, GSM GPRS; 2 Tx slots; Frequency: 1880 MHz; Duty Cycle: 1:4.15

Medium: 1900 Body; Medium parameters used:

$f = 1880 \text{ MHz}$; $\sigma = 1.542 \text{ S/m}$; $\epsilon_r = 52.701$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-05-2016; Ambient Temp: 22.9°C; Tissue Temp: 22.1°C

Probe: ES3DV3 - SN3319; ConvF(4.7, 4.7, 4.7); Calibrated: 3/18/2016;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1368; Calibrated: 3/14/2016

Phantom: SAM with CRP v5.0 (Right); Type: QD000P40CD; Serial: TP:1759

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: GPRS 1900, Body SAR, Back side, Mid.ch, 2 Tx Slots

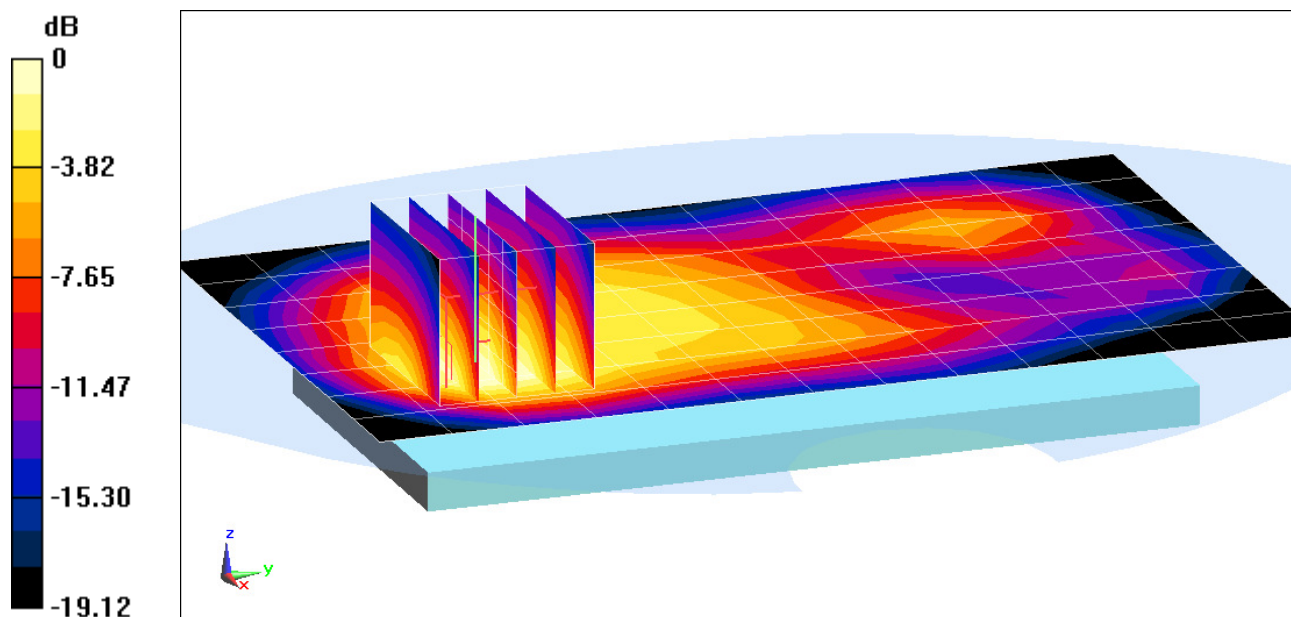
Area Scan (9x14x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (6x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 22.41 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 1.12 W/kg

SAR(1 g) = 0.616 W/kg



0 dB = 0.702 W/kg = -1.54 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFLS997; Type: Portable Handset; Serial: 00230

Communication System: UID 0, UMTS; Frequency: 836.6 MHz; Duty Cycle: 1:1

Medium: 835 Body; Medium parameters used (interpolated):

$f = 836.6 \text{ MHz}$; $\sigma = 0.985 \text{ S/m}$; $\epsilon_r = 53.264$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-13-2016; Ambient Temp: 24.0°C; Tissue Temp: 23.5°C

Probe: ES3DV3 - SN3333; ConvF(6.25, 6.25, 6.25); Calibrated: 10/29/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1333; Calibrated: 10/27/2015

Phantom: SAM Front; Type: QD000P40CD; Serial: TP:1758

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: UMTS 850, Body SAR, Back side, Mid.ch

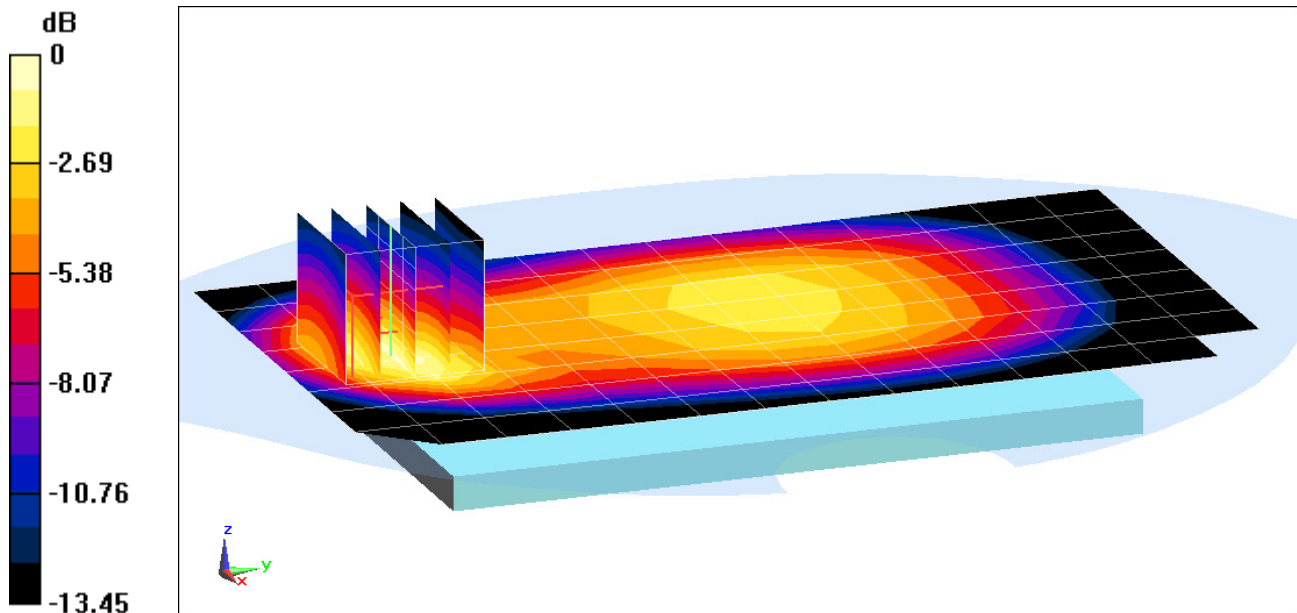
Area Scan (9x15x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 25.74 V/m; Power Drift = 0.00 dB

Peak SAR (extrapolated) = 0.986 W/kg

SAR(1 g) = 0.571 W/kg



0 dB = 0.707 W/kg = -1.51 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFLS997; Type: Portable Handset; Serial: 00248

Communication System: UID 0, UMTS; Frequency: 1732.4 MHz; Duty Cycle: 1:1
Medium: 1750 Body; Medium parameters used (interpolated):
 $f = 1732.4 \text{ MHz}$; $\sigma = 1.491 \text{ S/m}$; $\epsilon_r = 52.671$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-11-2016; Ambient Temp: 23.2°C; Tissue Temp: 21.9°C

Probe: EX3DV4 - SN7409; ConvF(7.72, 7.72, 7.72); Calibrated: 5/17/2016;
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn859; Calibrated: 5/11/2016
Phantom: SAM Right; Type: QD000P40CD; Serial: TP:7535
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: UMTS 1750, Body SAR, Back side, Mid.ch

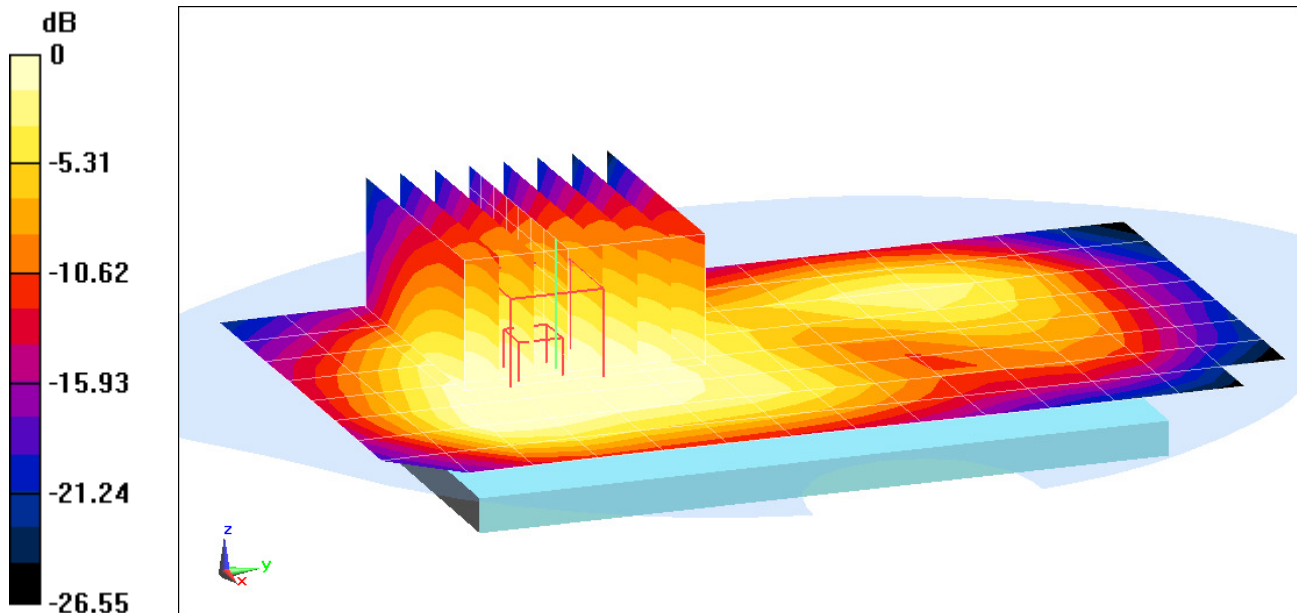
Area Scan (9x15x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (9x8x7)/Cube 1: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 21.39 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 0.962 W/kg

SAR(1 g) = 0.637 W/kg



0 dB = 0.838 W/kg = -0.77 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFLS997; Type: Portable Handset; Serial: 00248

Communication System: UID 0, UMTS; Frequency: 1752.6 MHz; Duty Cycle: 1:1

Medium: 1750 Body; Medium parameters used (interpolated):

$f = 1752.6 \text{ MHz}$; $\sigma = 1.513 \text{ S/m}$; $\epsilon_r = 52.579$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-11-2016; Ambient Temp: 23.2°C; Tissue Temp: 21.9°C

Probe: EX3DV4 - SN7409; ConvF(7.72, 7.72, 7.72); Calibrated: 5/17/2016;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn859; Calibrated: 5/11/2016

Phantom: SAM Right; Type: QD000P40CD; Serial: TP:7535

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: UMTS 1750, Body SAR, Front side, High.ch

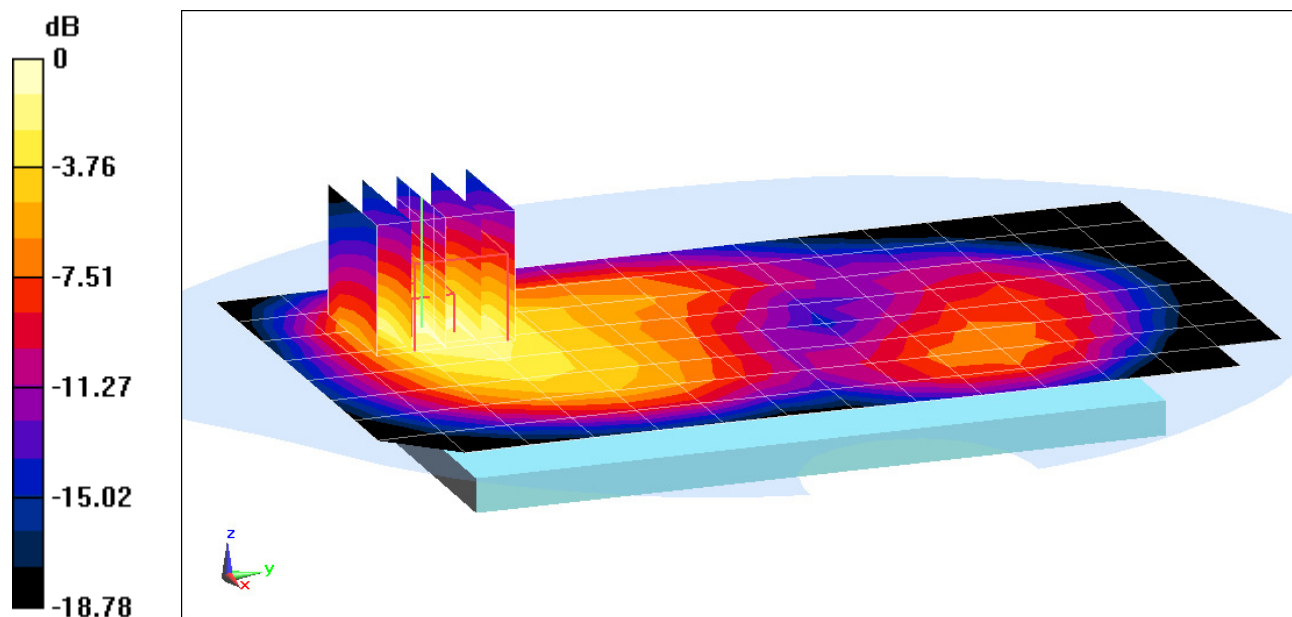
Area Scan (9x15x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 22.80 V/m; Power Drift = 0.17 dB

Peak SAR (extrapolated) = 1.35 W/kg

SAR(1 g) = 0.751 W/kg



0 dB = 1.12 W/kg = 0.49 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFLS997; Type: Portable Handset; Serial: 00230

Communication System: UID 0, UMTS; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: 1900 Body; Medium parameters used:

$f = 1880 \text{ MHz}$; $\sigma = 1.542 \text{ S/m}$; $\epsilon_r = 52.701$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-05-2016; Ambient Temp: 22.9°C; Tissue Temp: 22.1°C

Probe: ES3DV3 - SN3319; ConvF(4.7, 4.7, 4.7); Calibrated: 3/18/2016;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1368; Calibrated: 3/14/2016

Phantom: SAM with CRP v5.0 (Right); Type: QD000P40CD; Serial: TP:1759

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: UMTS 1900, Body SAR, Back side, Mid.ch

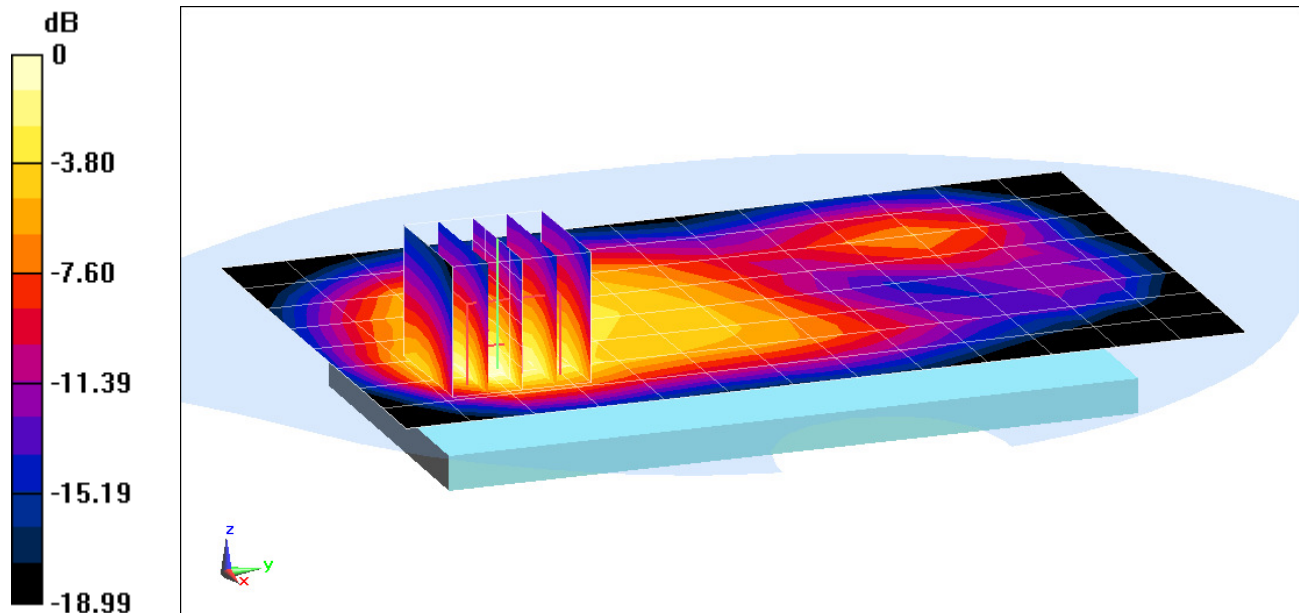
Area Scan (9x14x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 28.78 V/m; Power Drift = 0.00 dB

Peak SAR (extrapolated) = 1.99 W/kg

SAR(1 g) = 1.1 W/kg



0 dB = 1.37 W/kg = 1.37 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFLS997; Type: Portable Handset; Serial: 00230

Communication System: UID 0, CDMA; Frequency: 820.1 MHz; Duty Cycle: 1:1

Medium: 835 Body; Medium parameters used (interpolated):

$f = 820.1 \text{ MHz}$; $\sigma = 0.97 \text{ S/m}$; $\epsilon_r = 53.414$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-13-2016; Ambient Temp: 24.0°C; Tissue Temp: 23.5°C

Probe: ES3DV3 - SN3333; ConvF(6.25, 6.25, 6.25); Calibrated: 10/29/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1333; Calibrated: 10/27/2015

Phantom: SAM Front; Type: QD000P40CD; Serial: TP:1758

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: Cell. CDMA, Rule Part 90S, Antenna 1, Body SAR, Back side, Mid.ch

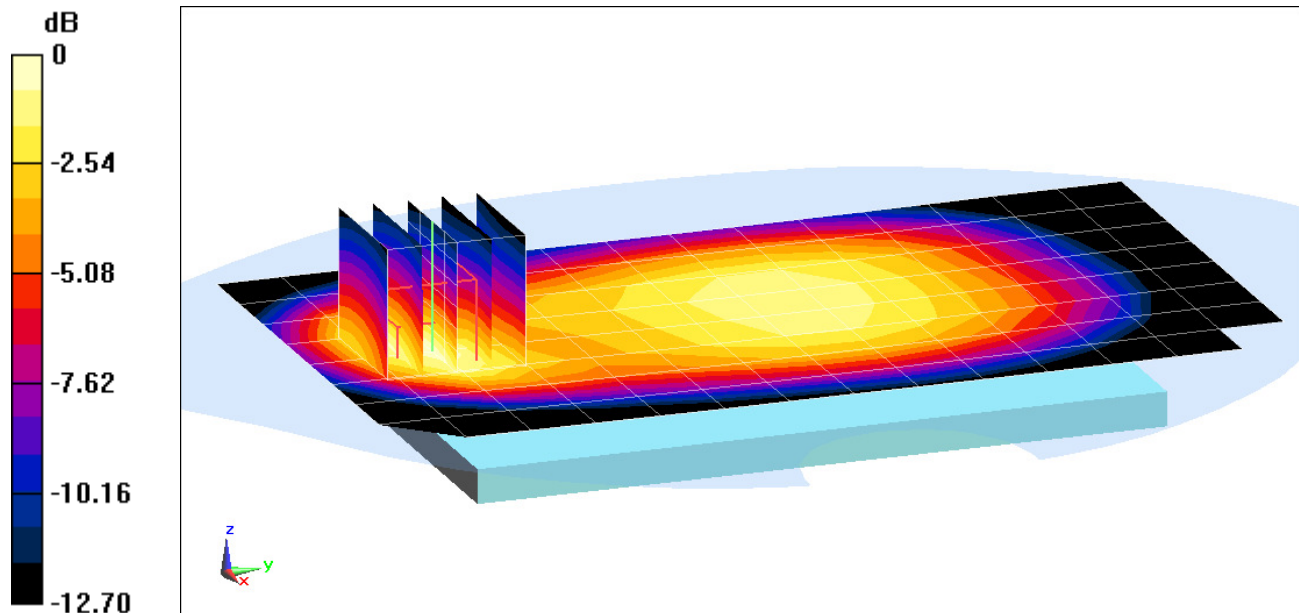
Area Scan (9x15x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 20.59 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 0.673 W/kg

SAR(1 g) = 0.385 W/kg



0 dB = 0.462 W/kg = -3.35 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFLS997; Type: Portable Handset; Serial: 00230

Communication System: UID 0, CDMA; Frequency: 820.1 MHz; Duty Cycle: 1:1

Medium: 835 Body; Medium parameters used (interpolated):

$f = 820.1$ MHz; $\sigma = 0.97$ S/m; $\epsilon_r = 53.414$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-13-2016; Ambient Temp: 24.0°C; Tissue Temp: 23.5°C

Probe: ES3DV3 - SN3333; ConvF(6.25, 6.25, 6.25); Calibrated: 10/29/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1333; Calibrated: 10/27/2015

Phantom: SAM Front; Type: QD000P40CD; Serial: TP:1758

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: Cell. EVDO Rev 0, Rule Part 90S, Antenna 1, Body SAR, Back side, Mid.ch

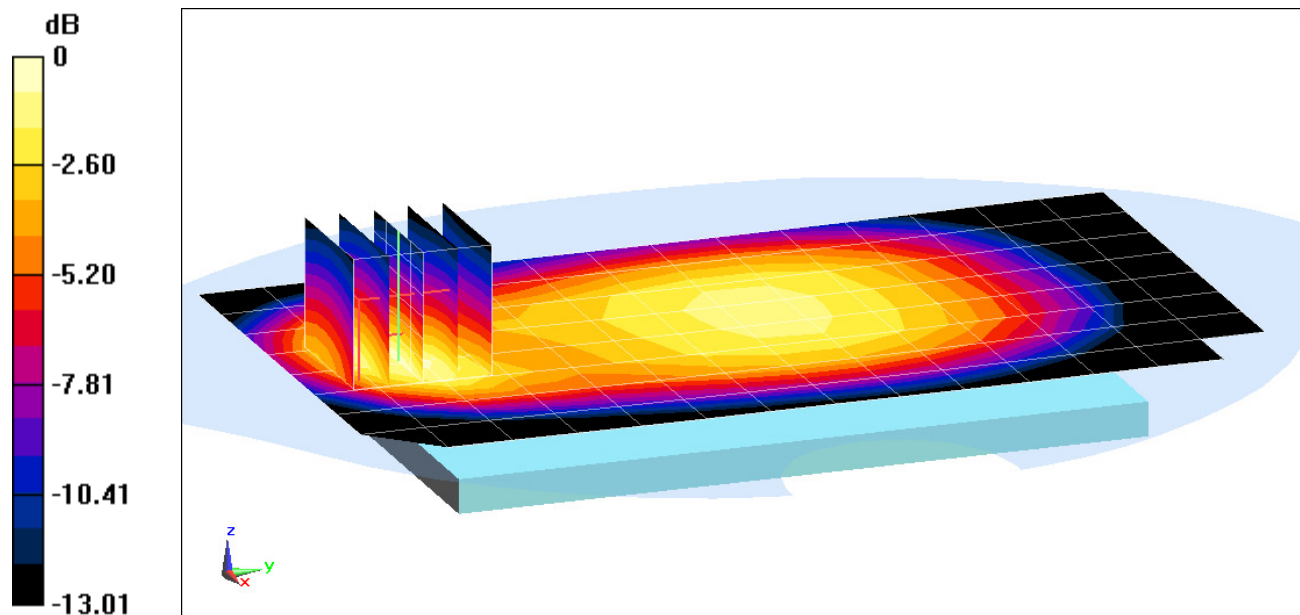
Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 18.77 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 0.588 W/kg

SAR(1 g) = 0.336 W/kg



0 dB = 0.414 W/kg = -3.83 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFLS997; Type: Portable Handset; Serial: 00230

Communication System: UID 0, CDMA; Frequency: 836.52 MHz; Duty Cycle: 1:1
Medium: 835 Body; Medium parameters used (interpolated):
 $f = 836.52 \text{ MHz}$; $\sigma = 0.985 \text{ S/m}$; $\epsilon_r = 53.265$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-13-2016; Ambient Temp: 24.0°C; Tissue Temp: 23.5°C

Probe: ES3DV3 - SN3333; ConvF(6.25, 6.25, 6.25); Calibrated: 10/29/2015;
Sensor-Surface: 3mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 10/27/2015
Phantom: SAM Front; Type: QD000P40CD; Serial: TP:1758
Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: Cell. CDMA, Rule Part 22H, Antenna 1, Body SAR, Back side, Mid.ch

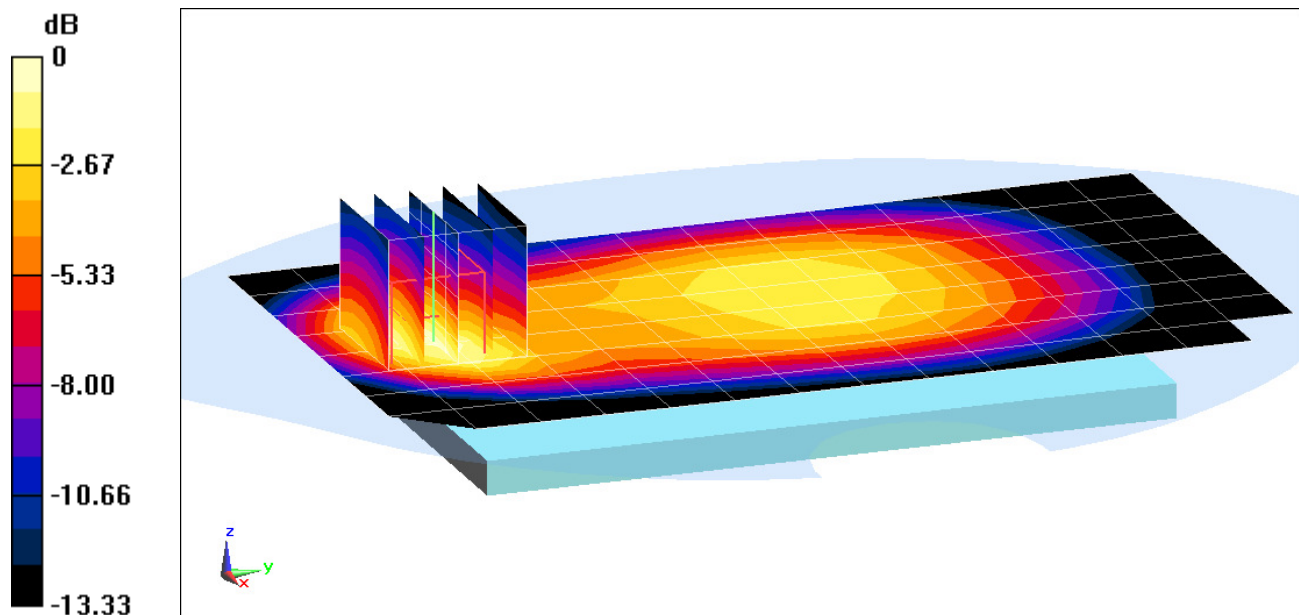
Area Scan (9x15x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 25.46 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 0.979 W/kg

SAR(1 g) = 0.567 W/kg



0 dB = 0.692 W/kg = -1.60 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFLS997; Type: Portable Handset; Serial: 00230

Communication System: UID 0, CDMA; Frequency: 836.52 MHz; Duty Cycle: 1:1

Medium: 835 Body; Medium parameters used (interpolated):

$f = 836.52$ MHz; $\sigma = 0.985$ S/m; $\epsilon_r = 53.265$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-13-2016; Ambient Temp: 24.0°C; Tissue Temp: 23.5°C

Probe: ES3DV3 - SN3333; ConvF(6.25, 6.25, 6.25); Calibrated: 10/29/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1333; Calibrated: 10/27/2015

Phantom: SAM Front; Type: QD000P40CD; Serial: TP:1758

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: Cell. EVDO Rev 0, Rule Part 22H, Antenna 1, Body SAR, Bottom Edge, Mid.ch

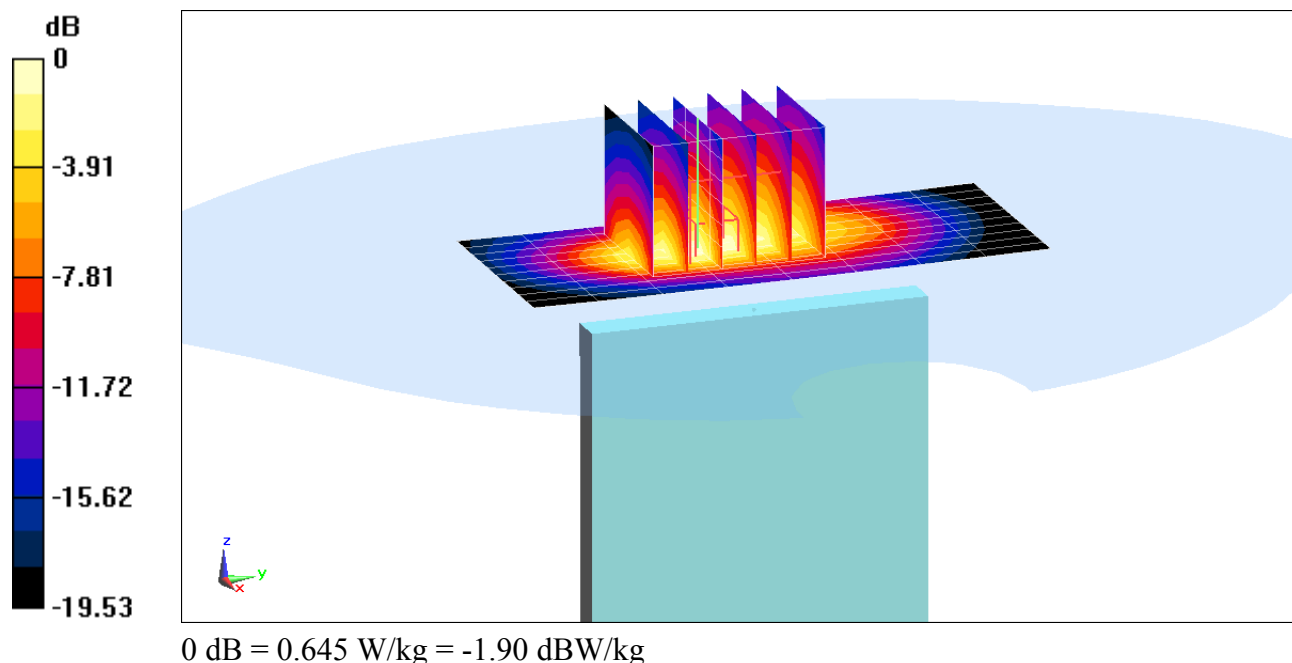
Area Scan (10x7x1): Measurement grid: dx=5mm, dy=15mm

Zoom Scan (7x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 24.10 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 0.920 W/kg

SAR(1 g) = 0.506 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFLS997; Type: Portable Handset; Serial: 00230

Communication System: UID 0, CDMA; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: 1900 Body; Medium parameters used:

$f = 1880 \text{ MHz}$; $\sigma = 1.561 \text{ S/m}$; $\epsilon_r = 52.091$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-11-2016; Ambient Temp: 22.7°C; Tissue Temp: 22.8°C

Probe: ES3DV3 - SN3319; ConvF(4.7, 4.7, 4.7); Calibrated: 3/18/2016;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1368; Calibrated: 3/14/2016

Phantom: SAM with CRP v5.0 (Right); Type: QD000P40CD; Serial: TP:1759

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: PCS CDMA, Body SAR, Back side, Mid.ch

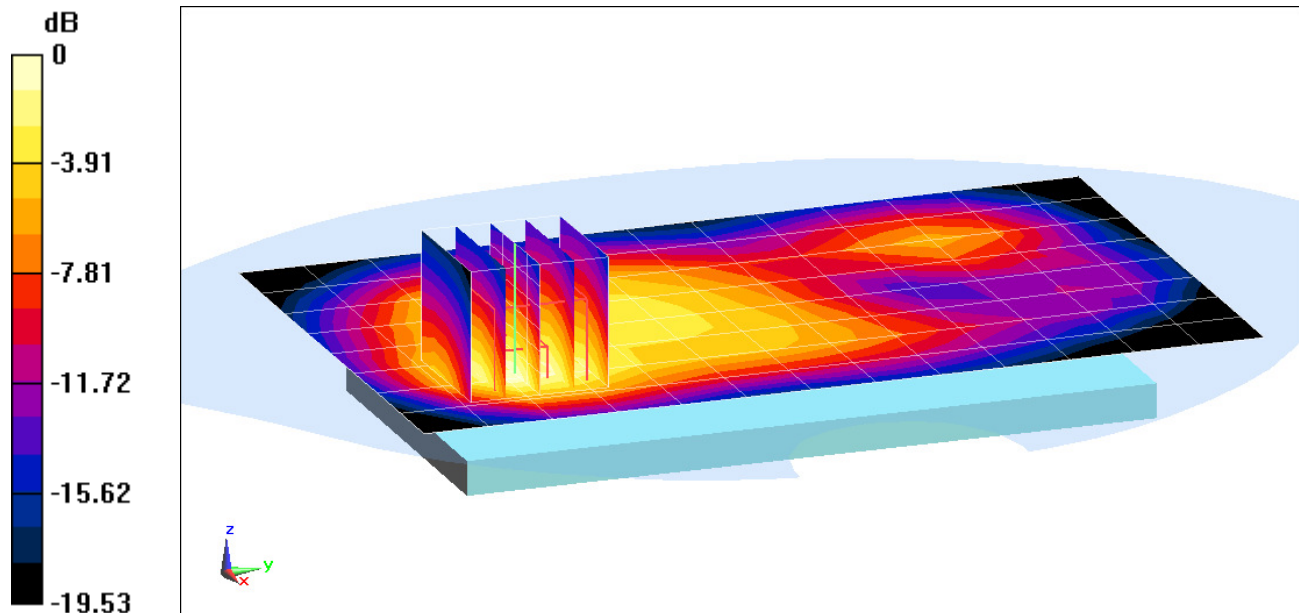
Area Scan (9x14x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 31.08 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 2.00 W/kg

SAR(1 g) = 1.11 W/kg



0 dB = 1.39 W/kg = 1.43 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFLS997; Type: Portable Handset; Serial: 00230

Communication System: UID 0, CDMA; Frequency: 1851.25 MHz; Duty Cycle: 1:1
Medium: 1900 Body; Medium parameters used (interpolated):
 $f = 1851.25 \text{ MHz}$; $\sigma = 1.512 \text{ S/m}$; $\epsilon_r = 52.785$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-05-2016; Ambient Temp: 22.9°C; Tissue Temp: 22.1°C

Probe: ES3DV3 - SN3319; ConvF(4.7, 4.7, 4.7); Calibrated: 3/18/2016;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1368; Calibrated: 3/14/2016

Phantom: SAM with CRP v5.0 (Right); Type: QD000P40CD; Serial: TP:1759

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: PCS EVDO Rev 0, Body SAR, Back side, Low.ch

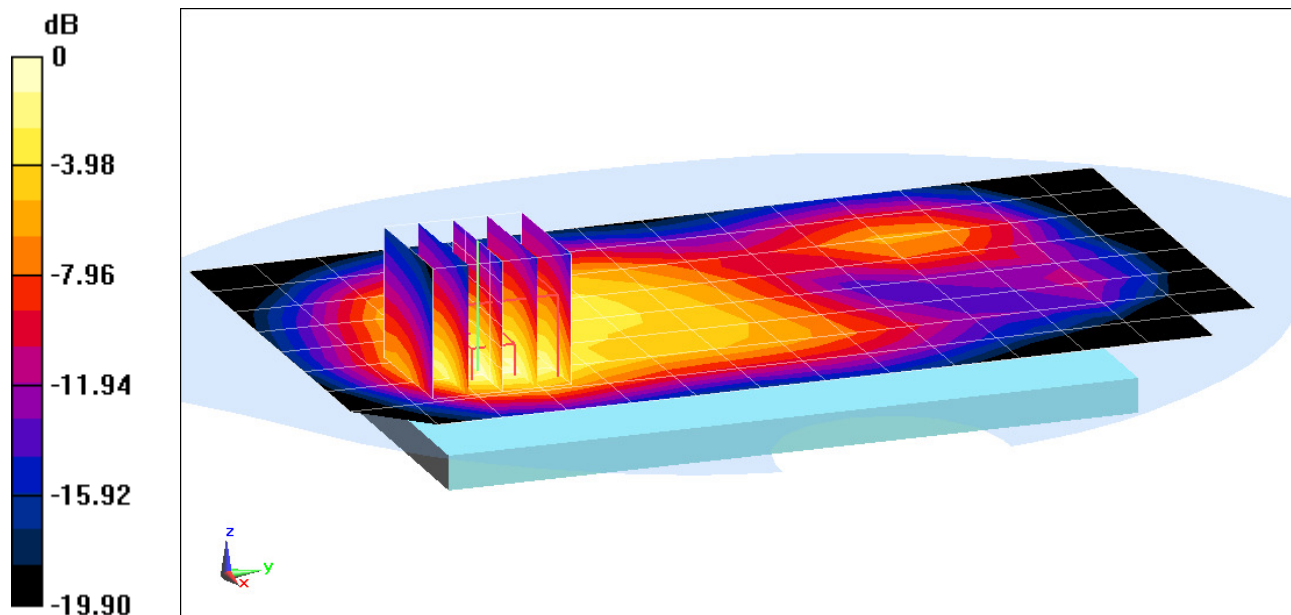
Area Scan (9x15x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 28.19 V/m; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 1.87 W/kg

SAR(1 g) = 1.05 W/kg



0 dB = 1.32 W/kg = 1.21 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFLS997; Type: Portable Handset; Serial: 00206

Communication System: UID 0, LTE Band 12; Frequency: 707.5 MHz; Duty Cycle: 1:1

Medium: 750 Body; Medium parameters used (interpolated):

$f = 707.5 \text{ MHz}$; $\sigma = 0.925 \text{ S/m}$; $\epsilon_r = 55.266$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-06-2016; Ambient Temp: 23.4°C; Tissue Temp: 22.0°C

Probe: EX3DV4 - SN7409; ConvF(9.46, 9.46, 9.46); Calibrated: 5/17/2016;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn859; Calibrated: 5/11/2016

Phantom: SAM Right; Type: QD000P40CD; Serial: TP:7535

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 12, Body SAR, Back side, Mid.ch

10 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset

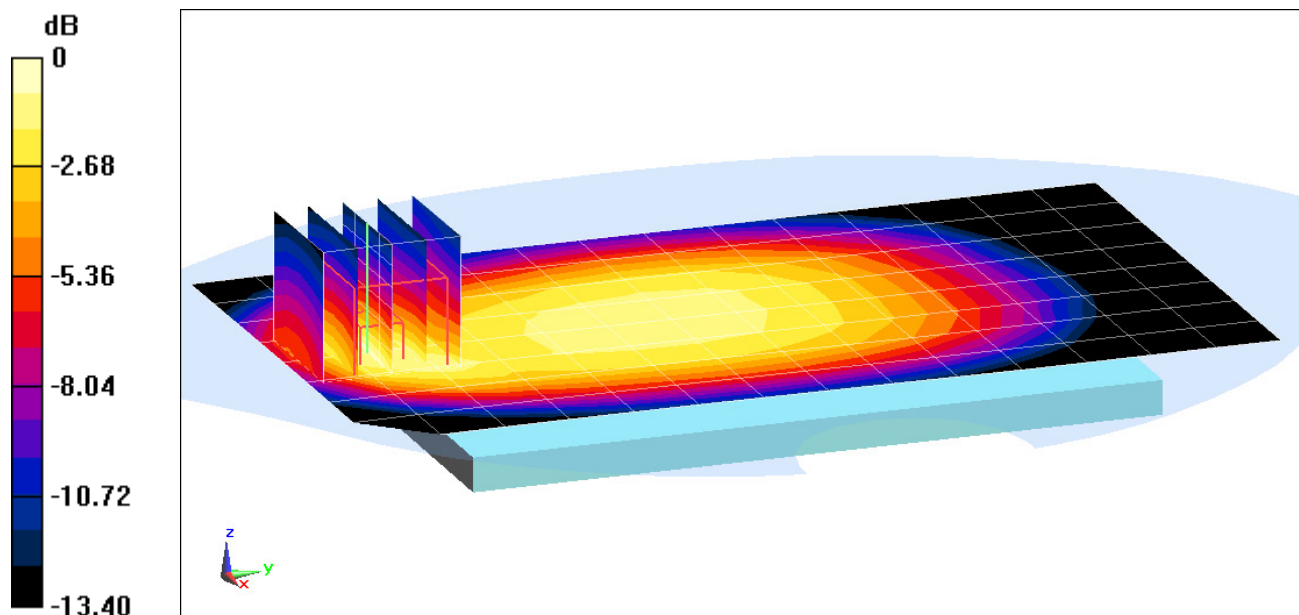
Area Scan (9x15x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 19.76 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 0.623 W/kg

SAR(1 g) = 0.333 W/kg



0 dB = 0.508 W/kg = -2.94 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFLS997; Type: Portable Handset; Serial: 00206

Communication System: UID 0, LTE Band 12; Frequency: 707.5 MHz; Duty Cycle: 1:1

Medium: 750 Body; Medium parameters used (interpolated):

$f = 707.5 \text{ MHz}$; $\sigma = 0.925 \text{ S/m}$; $\epsilon_r = 55.266$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-06-2016; Ambient Temp: 23.4°C; Tissue Temp: 22.0°C

Probe: EX3DV4 - SN7409; ConvF(9.46, 9.46, 9.46); Calibrated: 5/17/2016;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn859; Calibrated: 5/11/2016

Phantom: SAM Right; Type: QD000P40CD; Serial: TP:7535

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 12, Body SAR, Right Edge, Mid.ch

10 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset

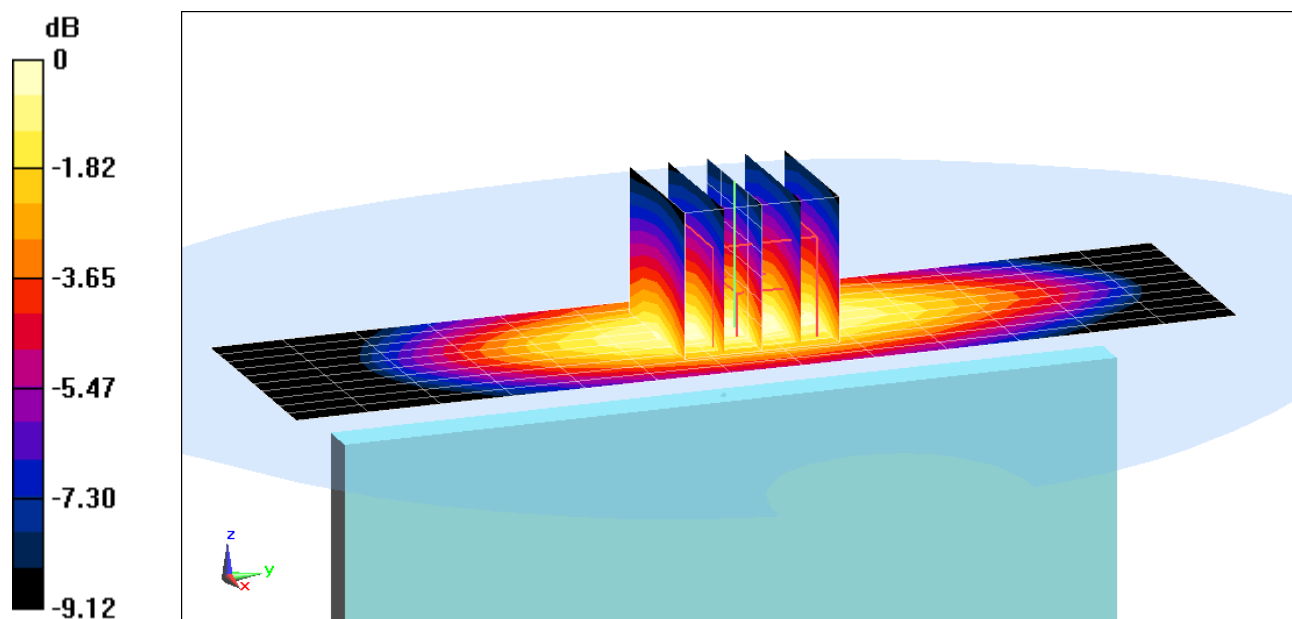
Area Scan (11x14x1): Measurement grid: dx=5mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 19.99 V/m; Power Drift = 0.00 dB

Peak SAR (extrapolated) = 0.532 W/kg

SAR(1 g) = 0.354 W/kg



0 dB = 0.467 W/kg = -3.31 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFLS997; Type: Portable Handset; Serial: 00198

Communication System: UID 0, LTE Band 26; Frequency: 831.5 MHz; Duty Cycle: 1:1

Medium: 835 Body; Medium parameters used (interpolated):

$f = 831.5 \text{ MHz}$; $\sigma = 0.981 \text{ S/m}$; $\epsilon_r = 53.312$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-13-2016; Ambient Temp: 24.0°C; Tissue Temp: 23.5°C

Probe: ES3DV3 - SN3333; ConvF(6.25, 6.25, 6.25); Calibrated: 10/29/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1333; Calibrated: 10/27/2015

Phantom: SAM Front; Type: QD000P40CD; Serial: TP:1758

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 26 (Cell.), Antenna 1, Body SAR, Back side, Mid.ch
15 MHz Bandwidth, QPSK, 1 RB, 36 RB Offset

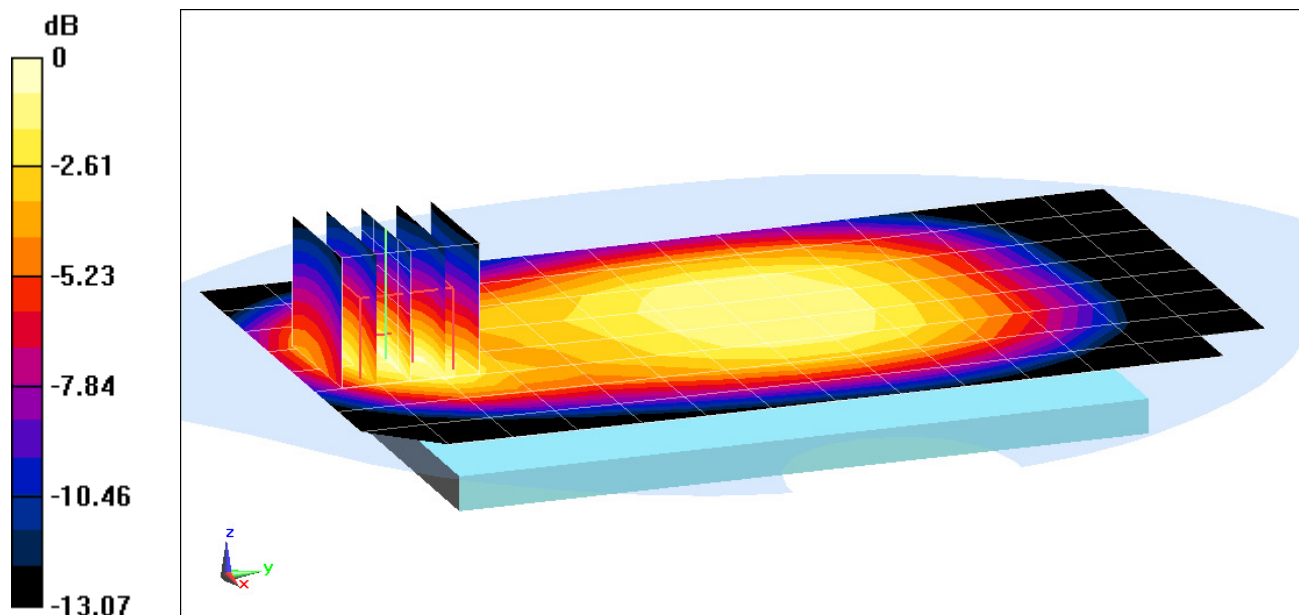
Area Scan (9x15x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 18.72 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 0.520 W/kg

SAR(1 g) = 0.302 W/kg



0 dB = 0.368 W/kg = -4.34 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFLS997; Type: Portable Handset; Serial: 00198

Communication System: UID 0, LTE Band 26; Frequency: 831.5 MHz; Duty Cycle: 1:1

Medium: 835 Body; Medium parameters used (interpolated):

$f = 831.5 \text{ MHz}$; $\sigma = 0.981 \text{ S/m}$; $\epsilon_r = 53.312$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-13-2016; Ambient Temp: 24.0°C; Tissue Temp: 23.5°C

Probe: ES3DV3 - SN3333; ConvF(6.25, 6.25, 6.25); Calibrated: 10/29/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1333; Calibrated: 10/27/2015

Phantom: SAM Front; Type: QD000P40CD; Serial: TP:1758

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 26 (Cell.), Antenna 1, Body SAR, Bottom Edge, Mid.ch
15 MHz Bandwidth, QPSK, 1 RB, 36 RB Offset

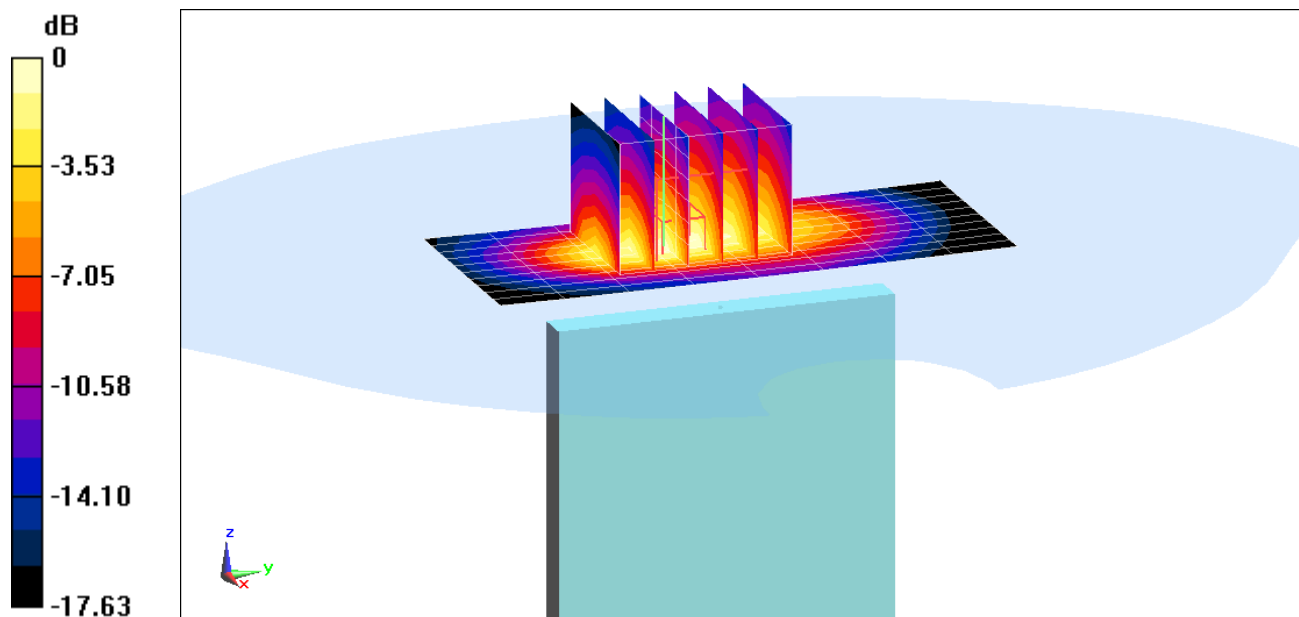
Area Scan (11x9x1): Measurement grid: $dx=5\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x6x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 19.36 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 0.609 W/kg

SAR(1 g) = 0.322 W/kg



0 dB = 0.411 W/kg = -3.86 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFLS997; Type: Portable Handset; Serial: 00222

Communication System: UID 0, LTE Band 4 (AWS); Frequency: 1732.5 MHz; Duty Cycle: 1:1

Medium: 1750 Body; Medium parameters used (interpolated):

$f = 1732.5 \text{ MHz}$; $\sigma = 1.44 \text{ S/m}$; $\epsilon_r = 51.979$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-07-2016; Ambient Temp: 24.6°C; Tissue Temp: 22.0°C

Probe: ES3DV3 - SN3209; ConvF(4.99, 4.99, 4.99); Calibrated: 3/18/2016;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1334; Calibrated: 11/11/2015

Phantom: SAM Left; Type: SAM; Serial: 1688

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 4 (AWS), Body SAR, Back side, Mid.ch
20 MHz Bandwidth, QPSK, 1 RB, 99 RB Offset

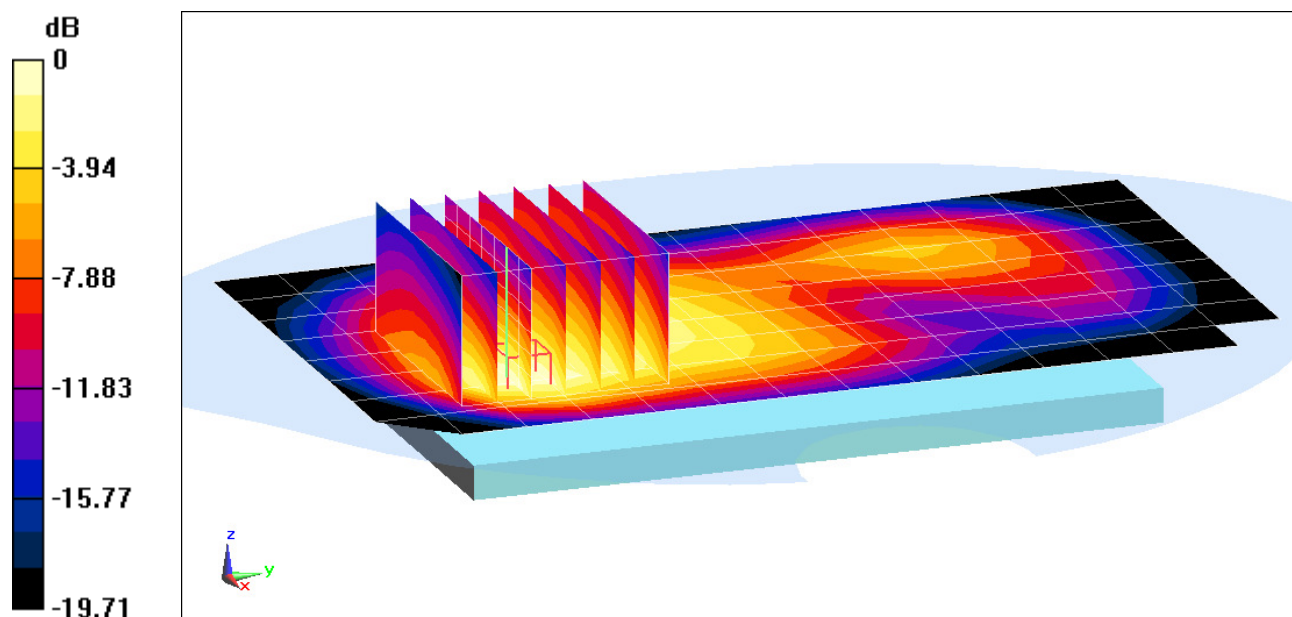
Area Scan (9x15x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (8x7x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 21.21 V/m; Power Drift = -0.06 dB

Peak SAR (extrapolated) = 1.01 W/kg

SAR(1 g) = 0.576 W/kg



0 dB = 0.687 W/kg = -1.63 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFLS997; Type: Portable Handset; Serial: 00214

Communication System: UID 0, LTE Band 25 (PCS); Frequency: 1860 MHz; Duty Cycle: 1:1

Medium: 1900 Body; Medium parameters used (interpolated):

$f = 1860 \text{ MHz}$; $\sigma = 1.521 \text{ S/m}$; $\epsilon_r = 52.76$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-05-2016; Ambient Temp: 22.9°C; Tissue Temp: 22.1°C

Probe: ES3DV3 - SN3319; ConvF(4.7, 4.7, 4.7); Calibrated: 3/18/2016;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1368; Calibrated: 3/14/2016

Phantom: SAM with CRP v5.0 (Right); Type: QD000P40CD; Serial: TP:1759

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 25 (PCS), Body SAR, Back side, Low.ch
20 MHz Bandwidth, QPSK, 1 RB, 0 RB Offset

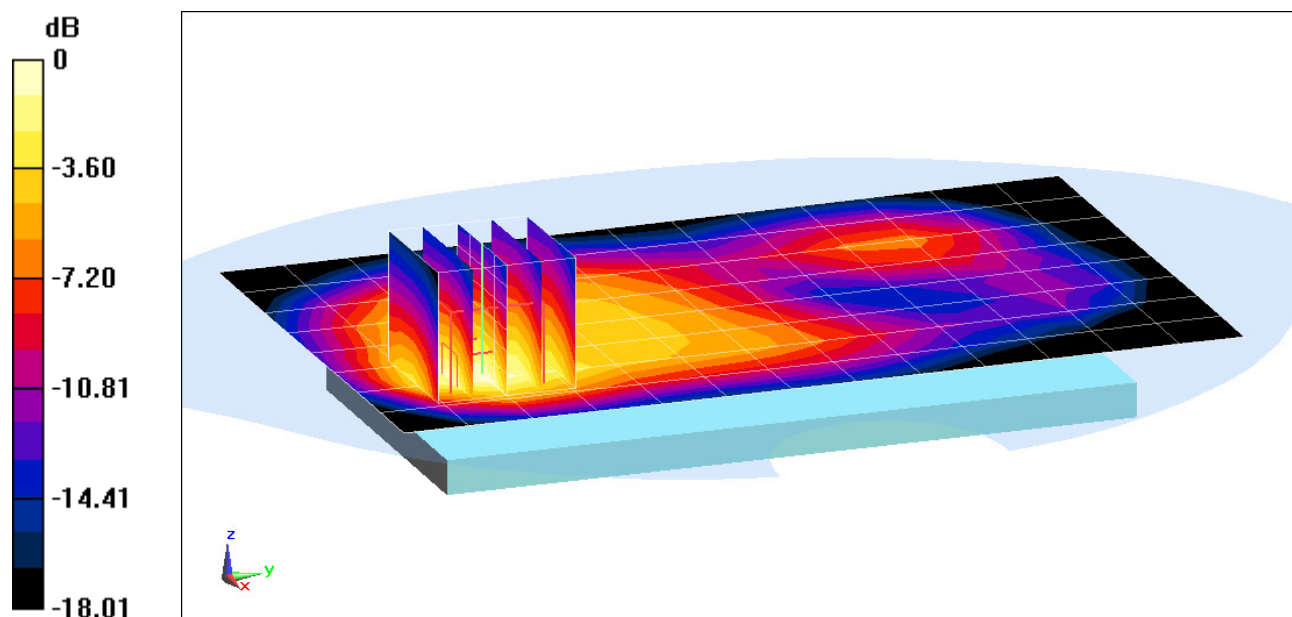
Area Scan (9x14x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 27.63 V/m; Power Drift = 0.12 dB

Peak SAR (extrapolated) = 1.86 W/kg

SAR(1 g) = 1.05 W/kg



0 dB = 1.27 W/kg = 1.04 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFLS997; Type: Portable Handset; Serial: 00206

Communication System: UID 0, LTE Band 41; Frequency: 2506 MHz; Duty Cycle: 1:1.59

Medium: 2450 Body; Medium parameters used (interpolated):

$f = 2506 \text{ MHz}$; $\sigma = 2.099 \text{ S/m}$; $\epsilon_r = 52.657$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-05-2016; Ambient Temp: 21.2°C; Tissue Temp: 22.0°C

Probe: ES3DV3 - SN3334; ConvF(4.45, 4.45, 4.45); Calibrated: 11/17/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1415; Calibrated: 11/11/2015

Phantom: SAM Front; Type: SAM; Serial: 1686

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 41, Body SAR, Back side, Low.ch

20 MHz Bandwidth, QPSK, 1 RB, 99 RB Offset

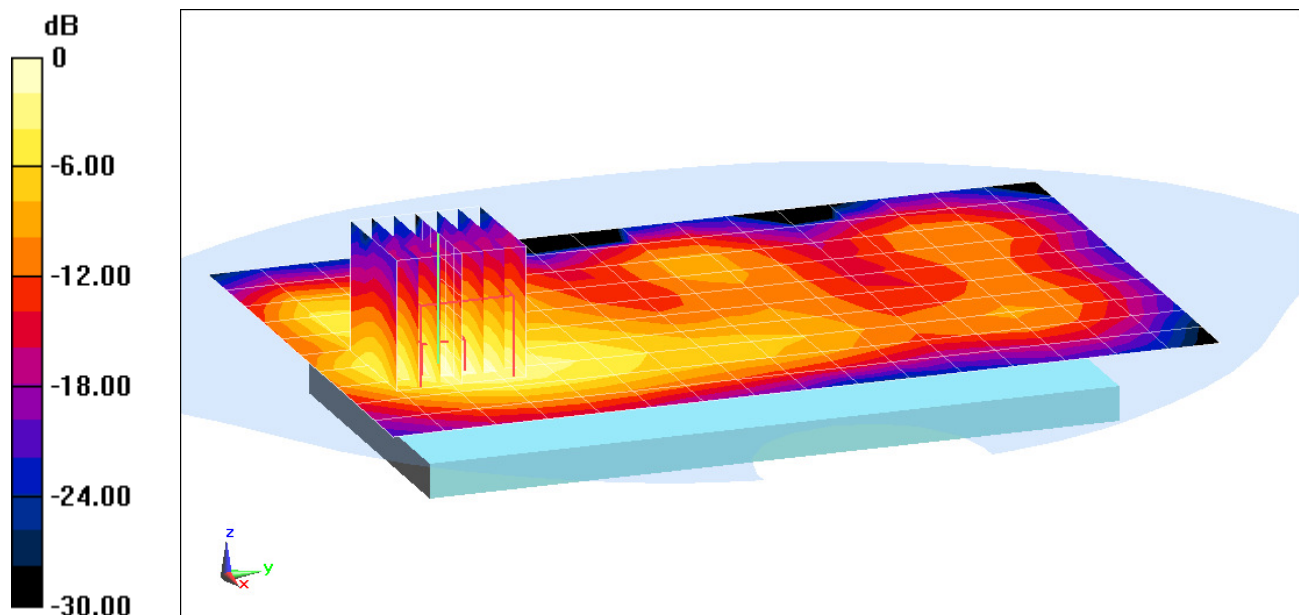
Area Scan (11x17x1): Measurement grid: $dx=12\text{mm}$, $dy=12\text{mm}$

Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 13.09 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 0.678 W/kg

SAR(1 g) = 0.310 W/kg



0 dB = 0.406 W/kg = -3.91 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFLS997; Type: Portable Handset; Serial: 00206

Communication System: UID 0, LTE Band 41; Frequency: 2506 MHz; Duty Cycle: 1:1.59

Medium: 2450 Body; Medium parameters used (interpolated):

$f = 2506$ MHz; $\sigma = 2.099$ S/m; $\epsilon_r = 52.657$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-05-2016; Ambient Temp: 21.2°C; Tissue Temp: 22.0°C

Probe: ES3DV3 - SN3334; ConvF(4.45, 4.45, 4.45); Calibrated: 11/17/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1415; Calibrated: 11/11/2015

Phantom: SAM Front; Type: SAM; Serial: 1686

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: LTE Band 41, Body SAR, Front side, Low.ch

20 MHz Bandwidth, QPSK, 1 RB, 99 RB Offset

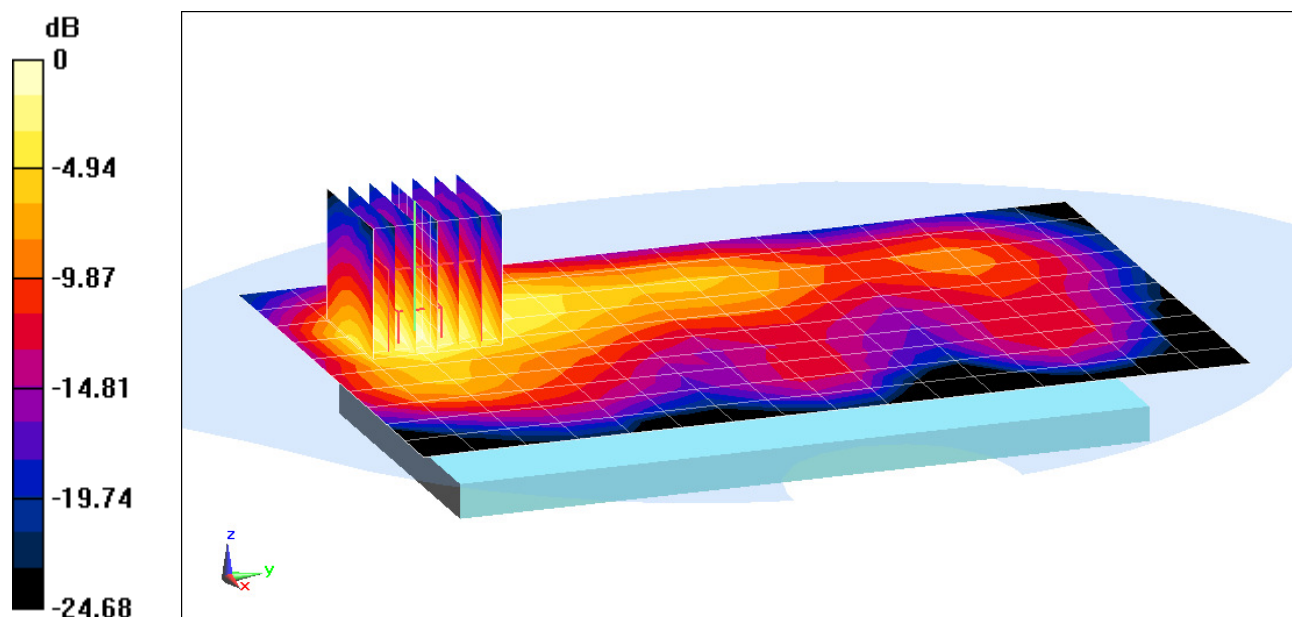
Area Scan (11x17x1): Measurement grid: dx=12mm, dy=12mm

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 15.32 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 0.908 W/kg

SAR(1 g) = 0.428 W/kg



0 dB = 0.553 W/kg = -2.57 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFLS997; Type: Portable Handset; Serial: 00313

Communication System: UID 0, IEEE 802.11b; Frequency: 2447 MHz; Duty Cycle: 1:1

Medium: 2450 Body; Medium parameters used (interpolated):

$f = 2447 \text{ MHz}$; $\sigma = 2.014 \text{ S/m}$; $\epsilon_r = 53.395$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-14-2016; Ambient Temp: 23.2°C; Tissue Temp: 22.4°C

Probe: EX3DV4 - SN7406; ConvF(7.24, 7.24, 7.24); Calibrated: 4/19/2016;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1407; Calibrated: 4/14/2016

Phantom: SAM V5.0 Right; Type: QD000P40CD; Serial: 1647

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: IEEE 802.11b, Primary Antenna, 22 MHz Bandwidth

Body SAR, Ch 8, 1 Mbps, Back Side

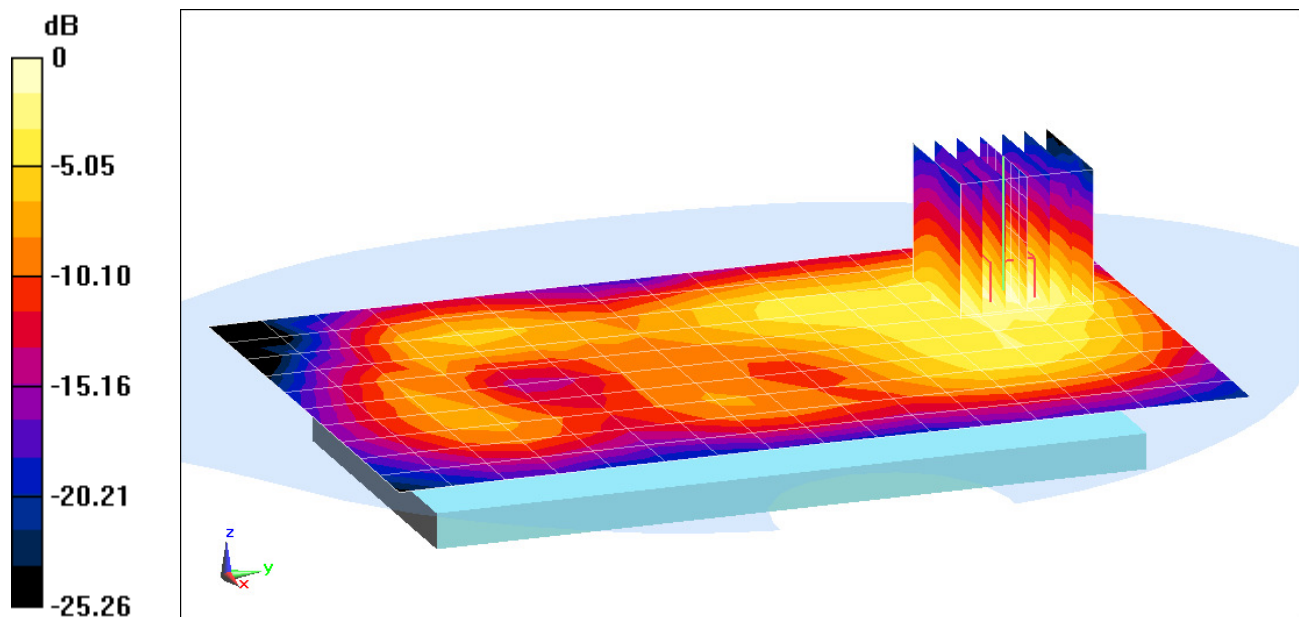
Area Scan (11x17x1): Measurement grid: $dx=12\text{mm}$, $dy=12\text{mm}$

Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 12.14 V/m; Power Drift = -0.21 dB

Peak SAR (extrapolated) = 0.523 W/kg

SAR(1 g) = 0.251 W/kg



0 dB = 0.413 W/kg = -3.84 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFLS997; Type: Portable Handset; Serial: 00313

Communication System: UID 0, IEEE 802.11b; Frequency: 2447 MHz; Duty Cycle: 1:1

Medium: 2450 Body; Medium parameters used (interpolated):

$f = 2447 \text{ MHz}$; $\sigma = 2.014 \text{ S/m}$; $\epsilon_r = 53.395$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-14-2016; Ambient Temp: 23.2°C; Tissue Temp: 22.4°C

Probe: EX3DV4 - SN7406; ConvF(7.24, 7.24, 7.24); Calibrated: 4/19/2016;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1407; Calibrated: 4/14/2016

Phantom: SAM V5.0 Right; Type: QD000P40CD; Serial: 1647

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: IEEE 802.11b, Primary Antenna, 22 MHz Bandwidth

Body SAR, Ch 8, 1 Mbps, Front Side

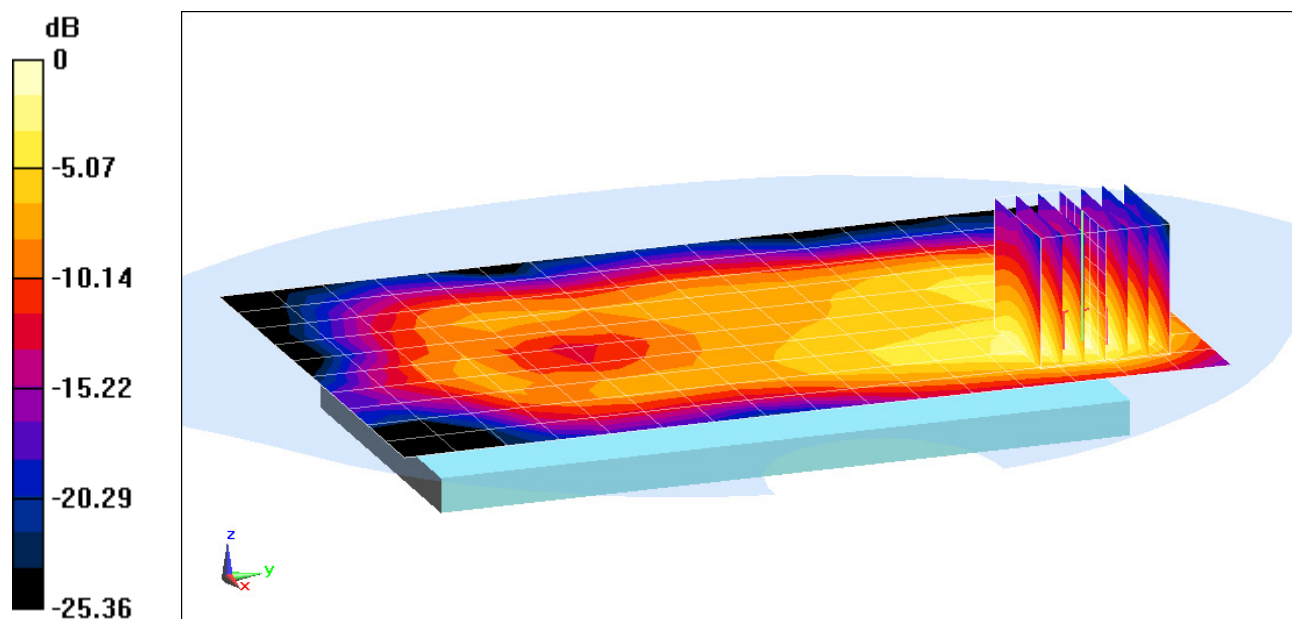
Area Scan (11x17x1): Measurement grid: $dx=12\text{mm}$, $dy=12\text{mm}$

Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 13.25 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 0.626 W/kg

SAR(1 g) = 0.313 W/kg



0 dB = 0.502 W/kg = -2.99 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFLS997; Type: Portable Hand; Serial: 00321

Communication System: UID 0, 802.11a 5.2-5.8 GHz Band; Frequency: 5260 MHz; Duty Cycle: 1:1

Medium: 5 GHz Body; Medium parameters used:

$f = 5260 \text{ MHz}$; $\sigma = 5.438 \text{ S/m}$; $\epsilon_r = 47.409$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-11-2016; Ambient Temp: 21.9°C; Tissue Temp: 21.7°C

Probe: EX3DV4 - SN3914; ConvF(4.32, 4.32, 4.32); Calibrated: 2/22/2016;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1272; Calibrated: 2/18/2016

Phantom: SAM v5.0 front; Type: QD000P40CD; Serial: TP-1646

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

**Mode: IEEE 802.11a, Secondary Antenna, UNII-2A, 20 MHz Bandwidth
Body SAR, Ch 52, 6 Mbps, Back Side**

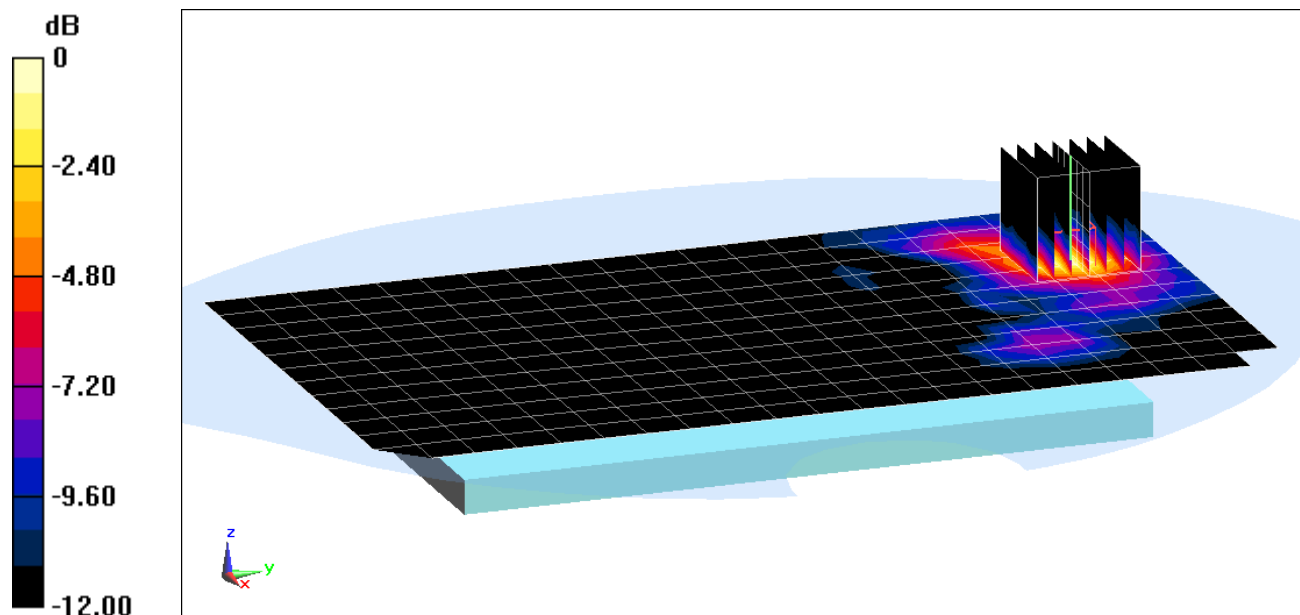
Area Scan (13x22x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=1.4\text{mm}$; Graded Ratio: 1.4

Reference Value = 4.800 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 0.442 W/kg

SAR(1 g) = 0.122 W/kg



0 dB = 0.274 W/kg = -5.62 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFLS997; Type: Portable Hand; Serial: 00321

Communication System: UID 0, 802.11a 5.2-5.8 GHz Band; Frequency: 5200 MHz; Duty Cycle: 1:1

Medium: 5 GHz Body; Medium parameters used:

$f = 5200 \text{ MHz}$; $\sigma = 5.35 \text{ S/m}$; $\epsilon_r = 47.46$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-11-2016; Ambient Temp: 21.9°C; Tissue Temp: 21.7°C

Probe: EX3DV4 - SN3914; ConvF(4.32, 4.32, 4.32); Calibrated: 2/22/2016;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1272; Calibrated: 2/18/2016

Phantom: SAM v5.0 front; Type: QD000P40CD; Serial: TP-1646

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

**Mode: IEEE 802.11a, Secondary Antenna, UNII-1, 20 MHz Bandwidth
Body SAR, Ch 40, 6 Mbps, Top Side**

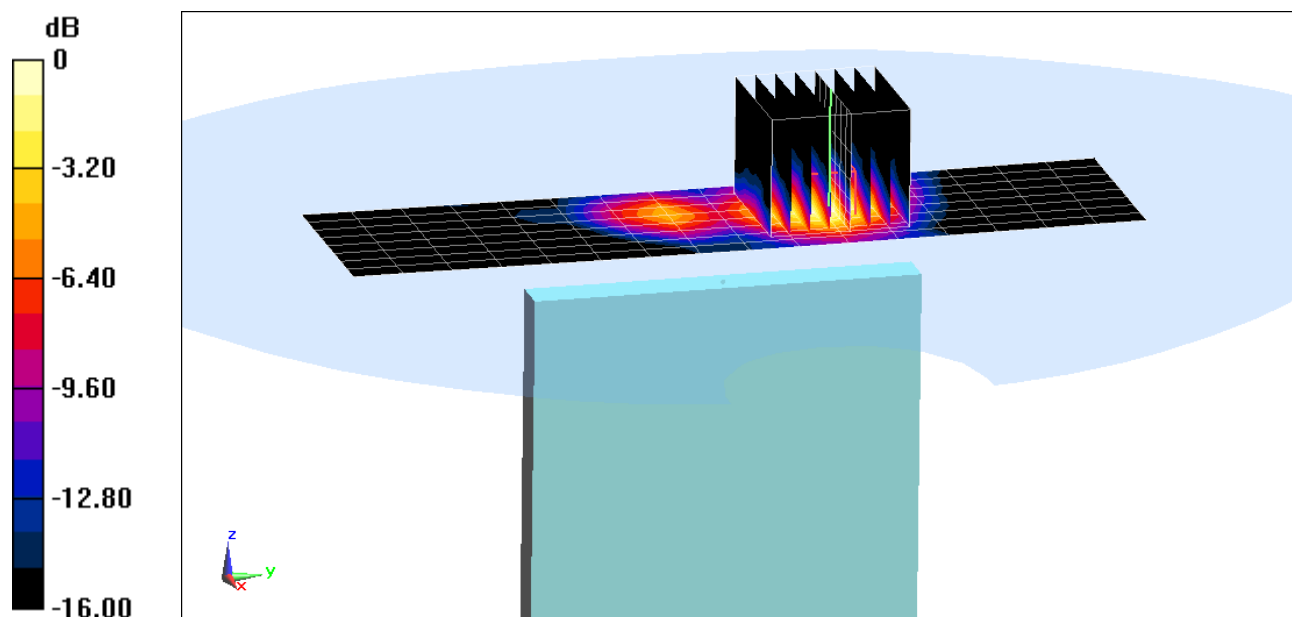
Area Scan (9x17x1): Measurement grid: $dx=5\text{mm}$, $dy=10\text{mm}$

Zoom Scan (8x8x7)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=1.4\text{mm}$; Graded Ratio: 1.4

Reference Value = 1.374 V/m; Power Drift = 0.16 dB

Peak SAR (extrapolated) = 0.942 W/kg

SAR(1 g) = 0.261 W/kg



PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFLS997; Type: Portable Handset; Serial: 00313

Communication System: UID 0, Bluetooth; Frequency: 2480 MHz; Duty Cycle: 1:1

Medium: 2450 Body; Medium parameters used (interpolated):

$f = 2480 \text{ MHz}$; $\sigma = 2.058 \text{ S/m}$; $\epsilon_r = 53.284$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-14-2016; Ambient Temp: 23.2°C; Tissue Temp: 22.4°C

Probe: EX3DV4 - SN7406; ConvF(7.24, 7.24, 7.24); Calibrated: 4/19/2016;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1407; Calibrated: 4/14/2016

Phantom: SAM V5.0 Right; Type: QD000P40CD; Serial: 1647

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: Bluetooth, Body SAR, Ch 78, 1 Mbps, Back Side

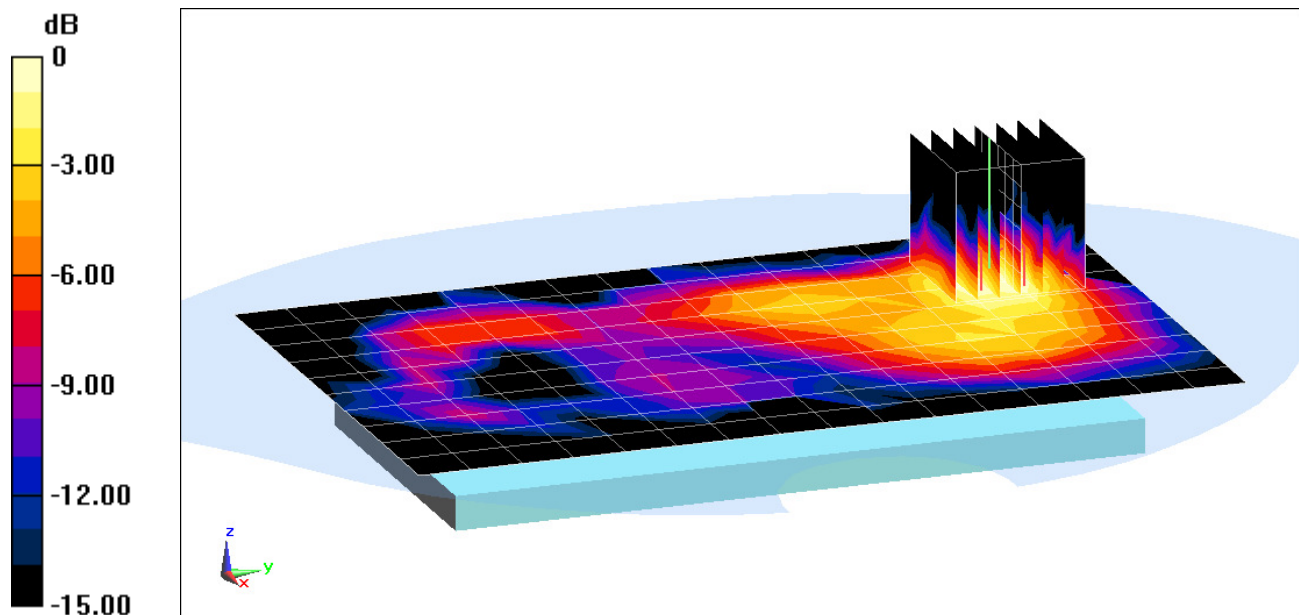
Area Scan (11x17x1): Measurement grid: $dx=12\text{mm}$, $dy=12\text{mm}$

Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 3.178 V/m; Power Drift = 0.18 dB

Peak SAR (extrapolated) = 0.0520 W/kg

SAR(1 g) = 0.020 W/kg



0 dB = 0.0260 W/kg = -15.85 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFLS997; Type: Portable Handset; Serial: 00321

Communication System: UID 0, 802.11a 5.2-5.8 GHz Band; Frequency: 5260 MHz; Duty Cycle: 1:1

Medium: 5 GHz Body; Medium parameters used:

$f = 5260 \text{ MHz}$; $\sigma = 5.438 \text{ S/m}$; $\epsilon_r = 47.409$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 0.0 cm

Test Date: 07-11-2016; Ambient Temp: 21.9°C; Tissue Temp: 21.7°C

Probe: EX3DV4 - SN3914; ConvF(4.32, 4.32, 4.32); Calibrated: 2/22/2016;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1272; Calibrated: 2/18/2016

Phantom: SAM v5.0 front; Type: QD000P40CD; Serial: TP-1646

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

**Mode: IEEE 802.11a, Secondary Antenna, UNII-2A, 20 MHz Bandwidth
Phablet SAR, Ch 52, 6 Mbps, Top Side**

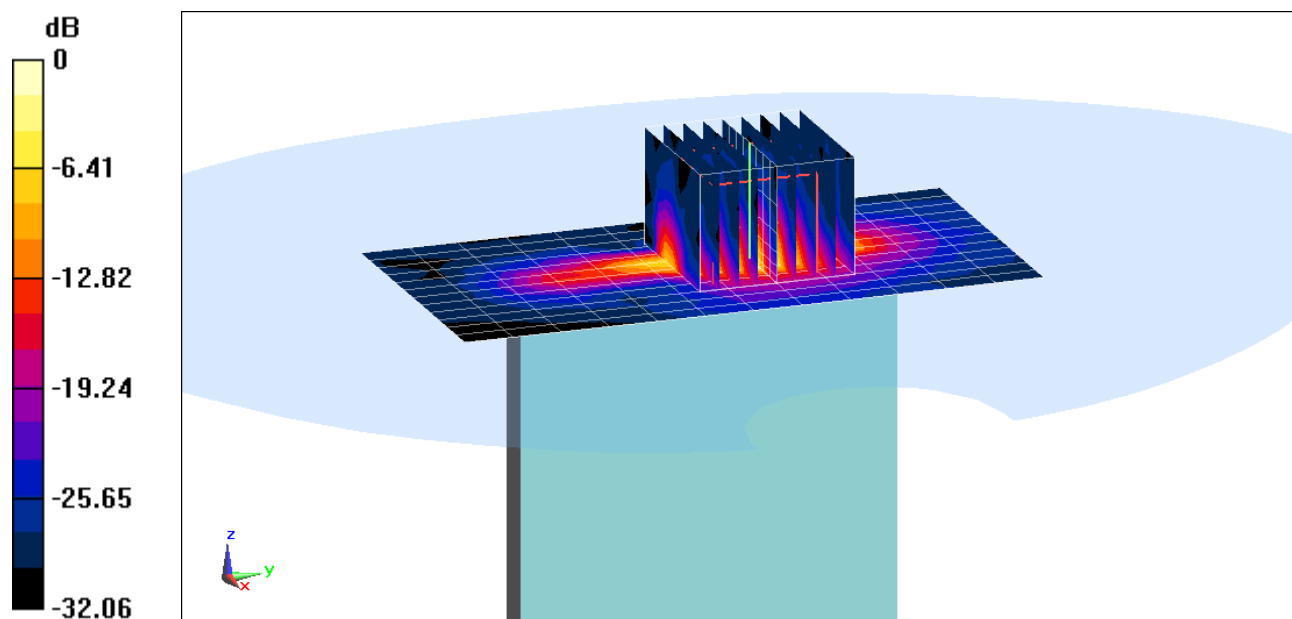
Area Scan (13x13x1): Measurement grid: $dx=5\text{mm}$, $dy=10\text{mm}$

Zoom Scan (9x9x7)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=1.4\text{mm}$; Graded Ratio: 1.4

Reference Value = 28.49 V/m; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 22.0 W/kg

SAR(10 g) = 0.634 W/kg



0 dB = 10.8 W/kg = 10.33 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: ZNFLS997; Type: Portable Handset; Serial: 00313

Communication System: UID 0, Bluetooth; Frequency: 2480 MHz; Duty Cycle: 1:1

Medium: 2450 Body; Medium parameters used (interpolated):

$f = 2480 \text{ MHz}$; $\sigma = 2 \text{ S/m}$; $\epsilon_r = 52.963$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 0.0 cm

Test Date: 07-19-2016; Ambient Temp: 23.5°C; Tissue Temp: 23.0°C

Probe: EX3DV4 - SN7406; ConvF(7.24, 7.24, 7.24); Calibrated: 4/19/2016;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1407; Calibrated: 4/14/2016

Phantom: SAM V5.0 Right; Type: QD000P40CD; Serial: 1647

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Mode: Bluetooth, Phablet SAR, Ch 78, 1 Mbps, Right Edge

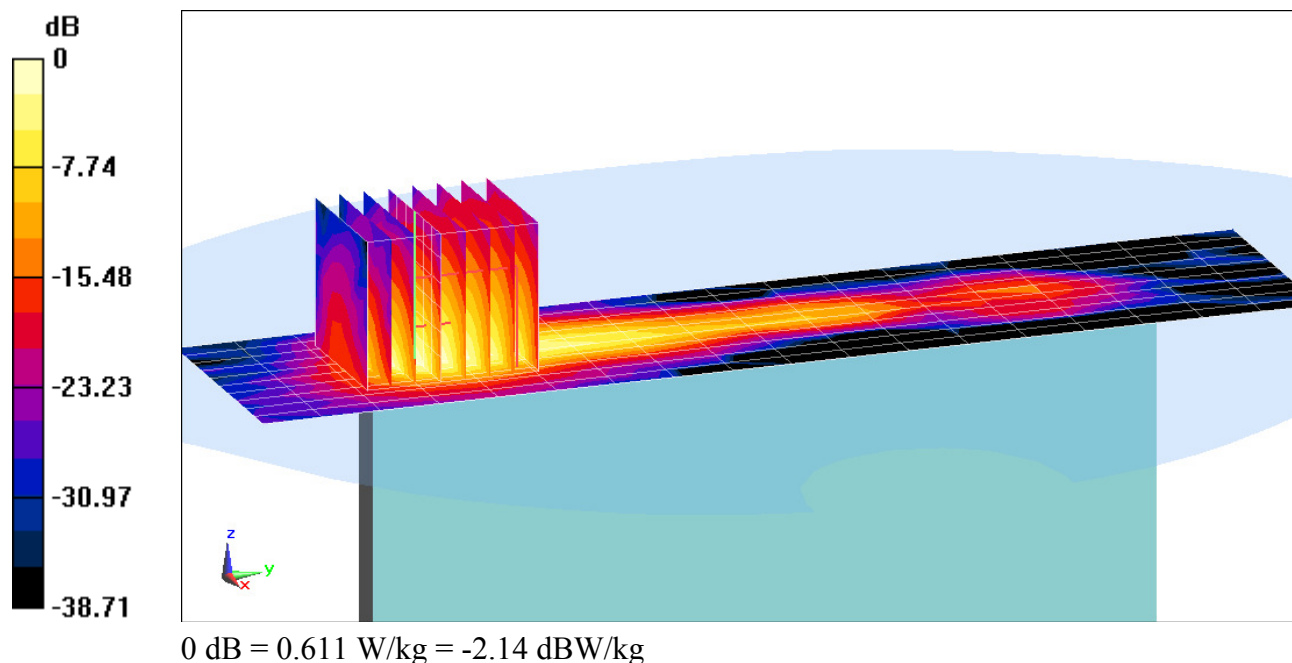
Area Scan (11x19x1): Measurement grid: $dx=5\text{mm}$, $dy=12\text{mm}$

Zoom Scan (7x8x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 12.18 V/m; Power Drift = -0.12 dB

Peak SAR (extrapolated) = 0.946 W/kg

SAR(10 g) = 0.112 W/kg



APPENDIX B: SYSTEM VERIFICATION

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 750 MHz; Type: D750V3; Serial: 1046

Communication System: UID 0, CW; Frequency: 750 MHz; Duty Cycle: 1:1

Medium: 750 Head; Medium parameters used (interpolated):

$f = 750 \text{ MHz}$; $\sigma = 0.893 \text{ S/m}$; $\epsilon_r = 40.975$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 07-05-2016; Ambient Temp: 21.8°C; Tissue Temp: 21.2°C

Probe: ES3DV2 - SN3022; ConvF(6.33, 6.33, 6.33); Calibrated: 8/26/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1323; Calibrated: 9/16/2015

Phantom: SAM Left; Type: QD000P40CC; Serial: TP: 1375

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

750 MHz System Verification at 23.0 dBm (200 mW)

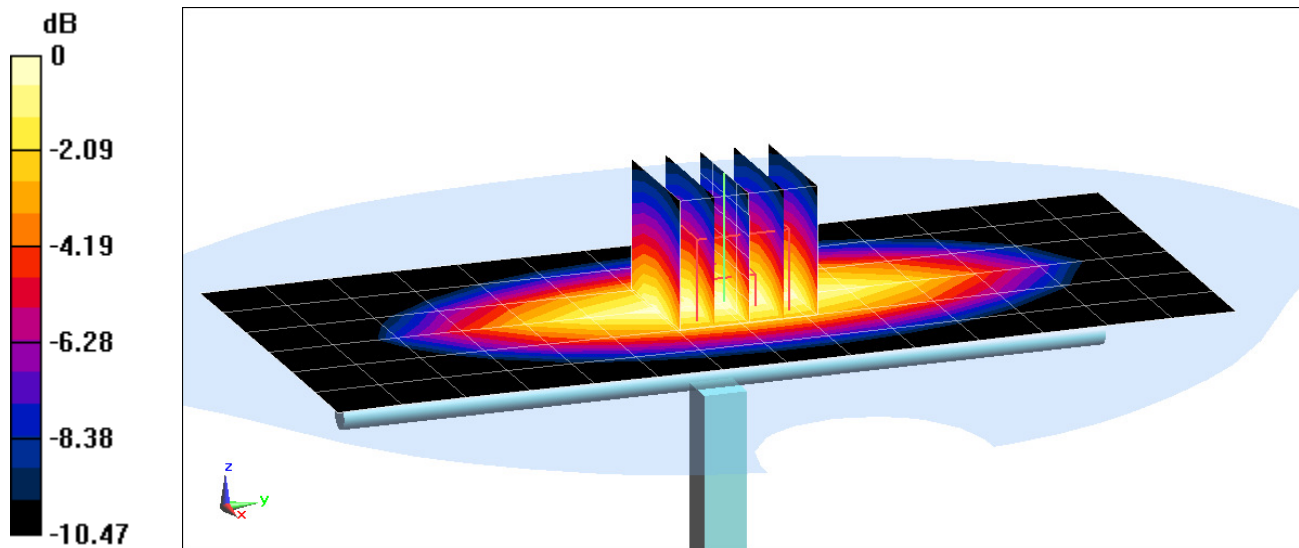
Area Scan (7x15x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Peak SAR (extrapolated) = 2.33 W/kg

SAR(1 g) = 1.56 W/kg

Deviation(1 g) = -4.88%



0 dB = 1.83 W/kg = 2.62 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 835 MHz; Type: D835V2; Serial: 4d119

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

Medium: 835 Head; Medium parameters used:

$f = 835 \text{ MHz}$; $\sigma = 0.891 \text{ S/m}$; $\epsilon_r = 41.152$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 07-11-2016; Ambient Temp: 22.8°C; Tissue Temp: 22.4°C

Probe: ES3DV3 - SN3318; ConvF(6.23, 6.23, 6.23); Calibrated: 2/19/2016;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn665; Calibrated: 2/19/2016

Phantom: SAM with CRP v4.0; Type: QD000P40CD; Serial: TP:1800

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

835 MHz System Verification at 23.0 dBm (200 mW)

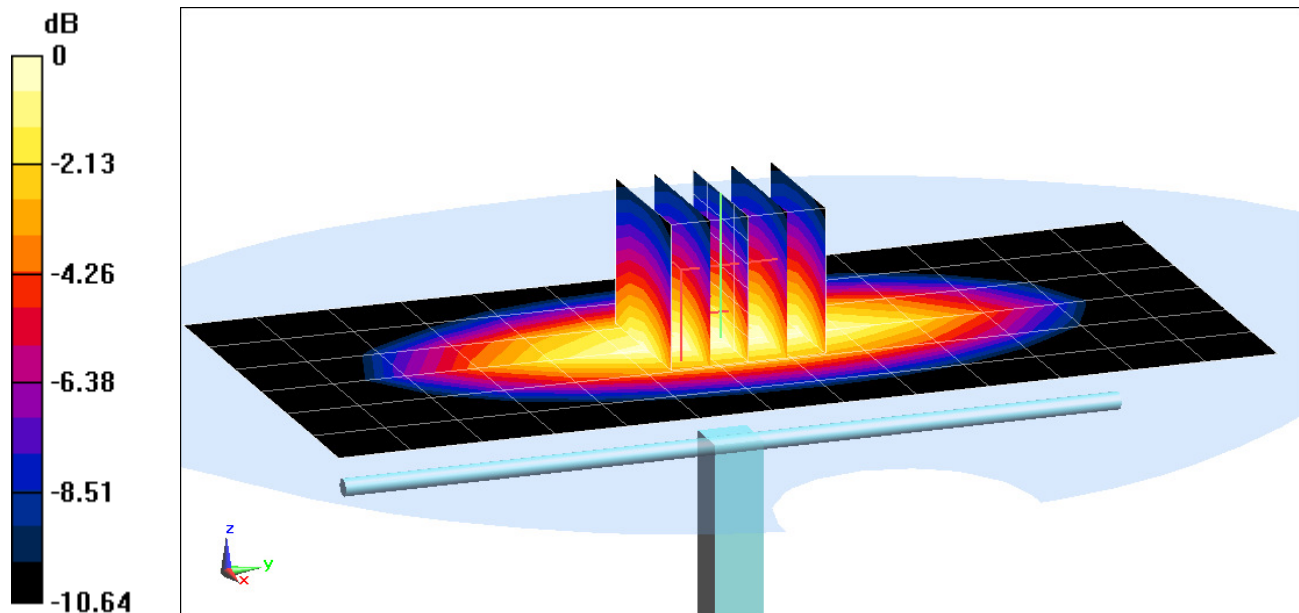
Area Scan (7x14x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Peak SAR (extrapolated) = 2.71 W/kg

SAR(1 g) = 1.83 W/kg

Deviation(1 g) = 0.11%



0 dB = 2.14 W/kg = 3.30 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 835 MHz; Type: D835V2; Serial: 4d119

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

Medium: 835 Head; Medium parameters used:

$f = 835 \text{ MHz}$; $\sigma = 0.908 \text{ S/m}$; $\epsilon_r = 41.718$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 07-12-2016; Ambient Temp: 23.2°C; Tissue Temp: 22.1°C

Probe: ES3DV3 - SN3334; ConvF(6.37, 6.37, 6.37); Calibrated: 11/17/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1415; Calibrated: 11/11/2015

Phantom: SAM Front; Type: SAM; Serial: 1686

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

835 MHz System Verification at 23.0 dBm (200 mW)

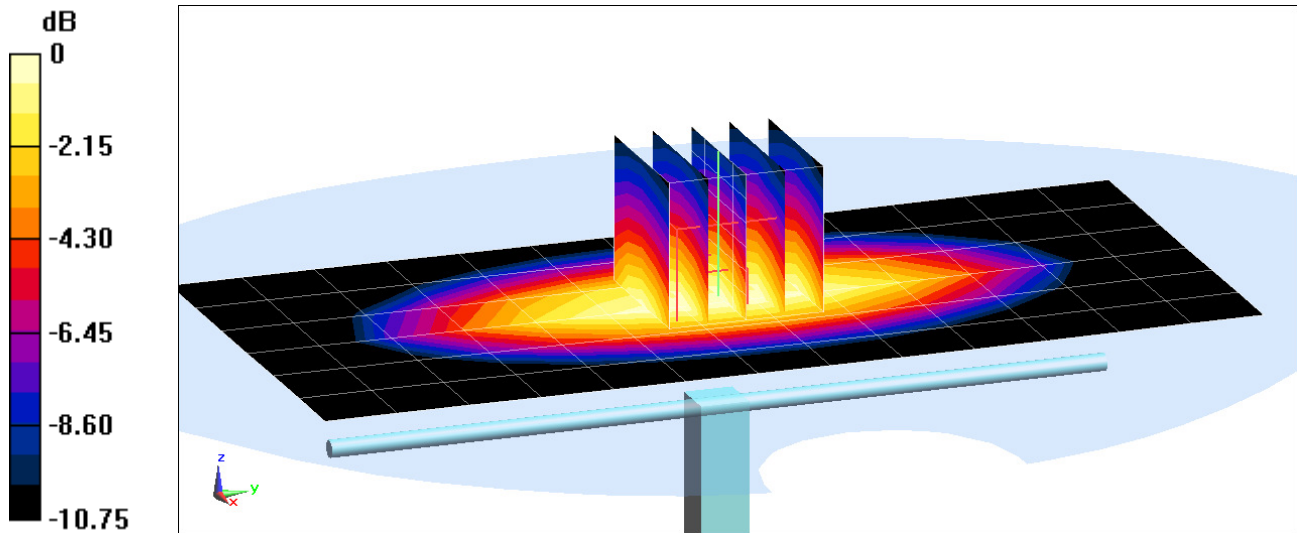
Area Scan (7x14x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Peak SAR (extrapolated) = 2.69 W/kg

SAR(1 g) = 1.79 W/kg

Deviation(1 g) = -2.08%



0 dB = 2.06 W/kg = 3.14 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 1750 MHz; Type: D1750V2; Serial: 1051

Communication System: UID 0, CW; Frequency: 1750 MHz; Duty Cycle: 1:1

Medium: 1750 Head; Medium parameters used:

$f = 1750 \text{ MHz}$; $\sigma = 1.32 \text{ S/m}$; $\epsilon_r = 39.22$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-11-2016; Ambient Temp: 23.0°C; Tissue Temp: 22.0°C

Probe: EX3DV4 - SN7406; ConvF(8.85, 8.85, 8.85); Calibrated: 4/19/2016;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1407; Calibrated: 4/14/2016

Phantom: SAM 5.0 front; Type: QD000P40CD; Serial: TP:-1648

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

1750 MHz System Verification at 20.0 dBm (100 mW)

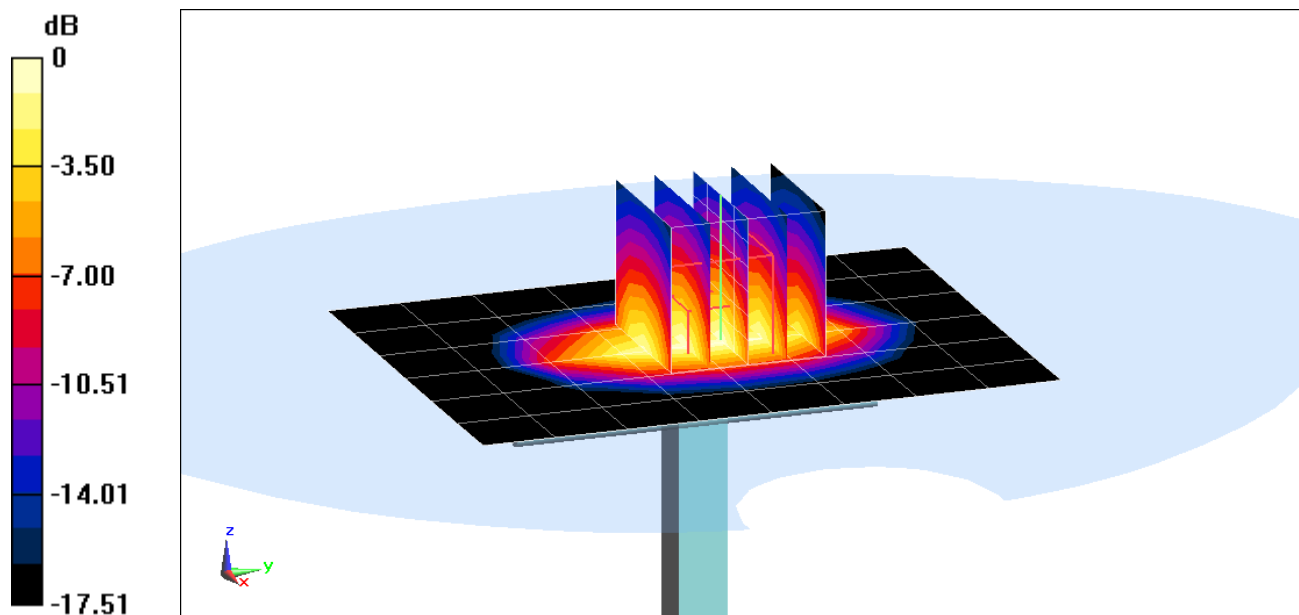
Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Peak SAR (extrapolated) = 6.01 W/kg

SAR(1 g) = 3.39 W/kg

Deviation(1 g) = -6.09%



0 dB = 5.07 W/kg = 7.05 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 5d141

Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1

Medium: 1900 Head; Medium parameters used (interpolated):

$f = 1900 \text{ MHz}$; $\sigma = 1.452 \text{ S/m}$; $\epsilon_r = 39.244$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-05-2016; Ambient Temp: 22.6°C; Tissue Temp: 21.3°C

Probe: ES3DV3 - SN3333; ConvF(5.03, 5.03, 5.03); Calibrated: 10/29/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1333; Calibrated: 10/27/2015

Phantom: SAM Front; Type: QD000P40CD; Serial: TP:1758

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

1900 MHz System Verification at 20.0 dBm (100 mW)

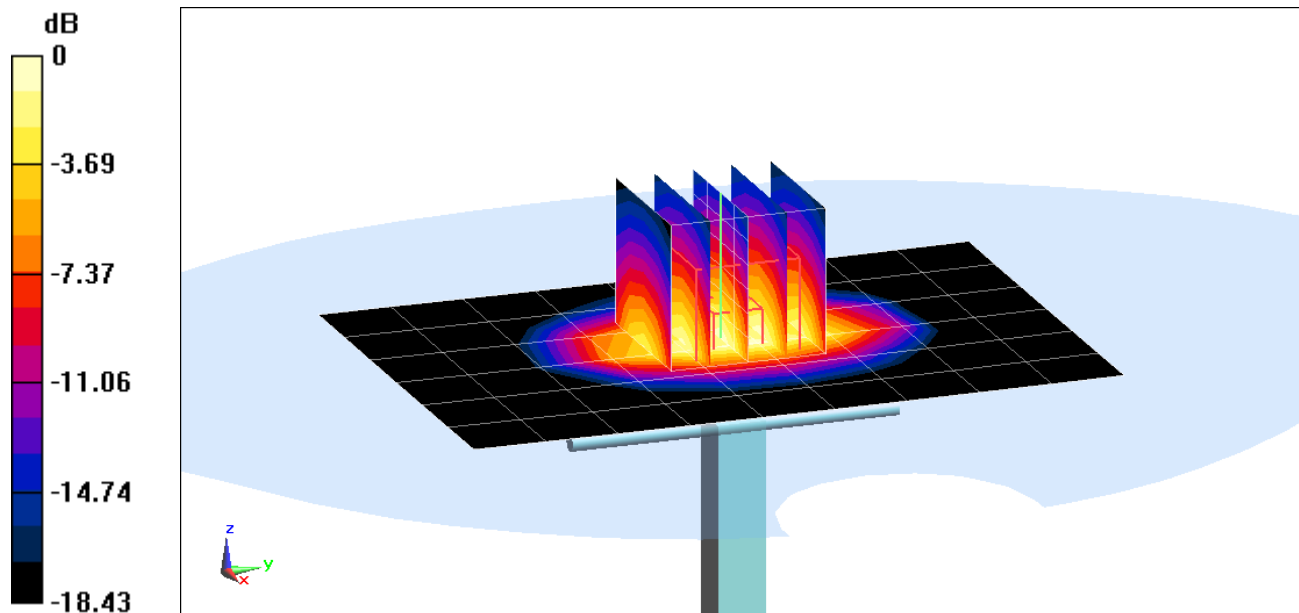
Area Scan (7x10x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Peak SAR (extrapolated) = 7.38 W/kg

SAR(1 g) = 4.00 W/kg

Deviation(1 g) = 3.90%



0 dB = 5.08 W/kg = 7.06 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: 719

Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: 2450 Head; Medium parameters used:

$f = 2450 \text{ MHz}$; $\sigma = 1.86 \text{ S/m}$; $\epsilon_r = 38.548$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-05-2016; Ambient Temp: 20.2°C; Tissue Temp: 22.0°C

Probe: ES3DV3 - SN3334; ConvF(4.58, 4.58, 4.58); Calibrated: 11/17/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1415; Calibrated: 11/11/2015

Phantom: SAM Front; Type: SAM; Serial: 1686

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

2450 MHz System Verification at 20.0 dBm (100 mW)

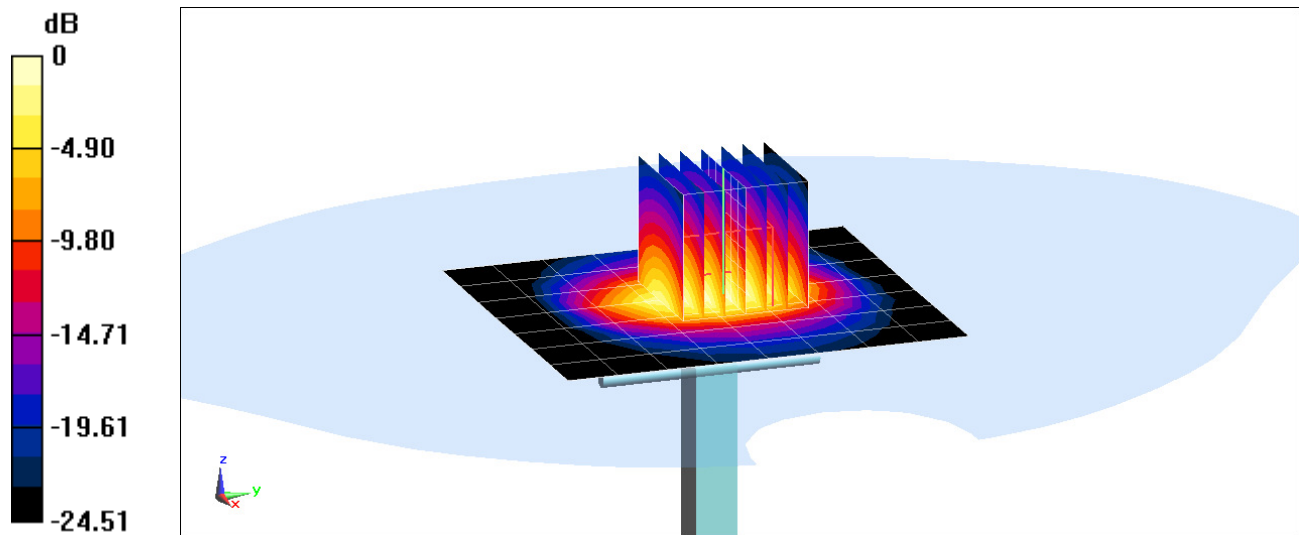
Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Peak SAR (extrapolated) = 11.9 W/kg

SAR(1 g) = 5.43 W/kg

Deviation(1 g) = 0.18%



0 dB = 7.16 W/kg = 8.55 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: 719

Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: 2450 Head; Medium parameters used:

$f = 2450 \text{ MHz}$; $\sigma = 1.845 \text{ S/m}$; $\epsilon_r = 40.279$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-15-2016; Ambient Temp: 21.8°C; Tissue Temp: 22.6°C

Probe: EX3DV4 - SN7409; ConvF(6.9, 6.9, 6.9); Calibrated: 5/17/2016;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn859; Calibrated: 5/11/2016

Phantom: SAM Right; Type: QD000P40CD; Serial: TP:7535

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

2450 MHz System Verification at 20.0 dBm (100 mW)

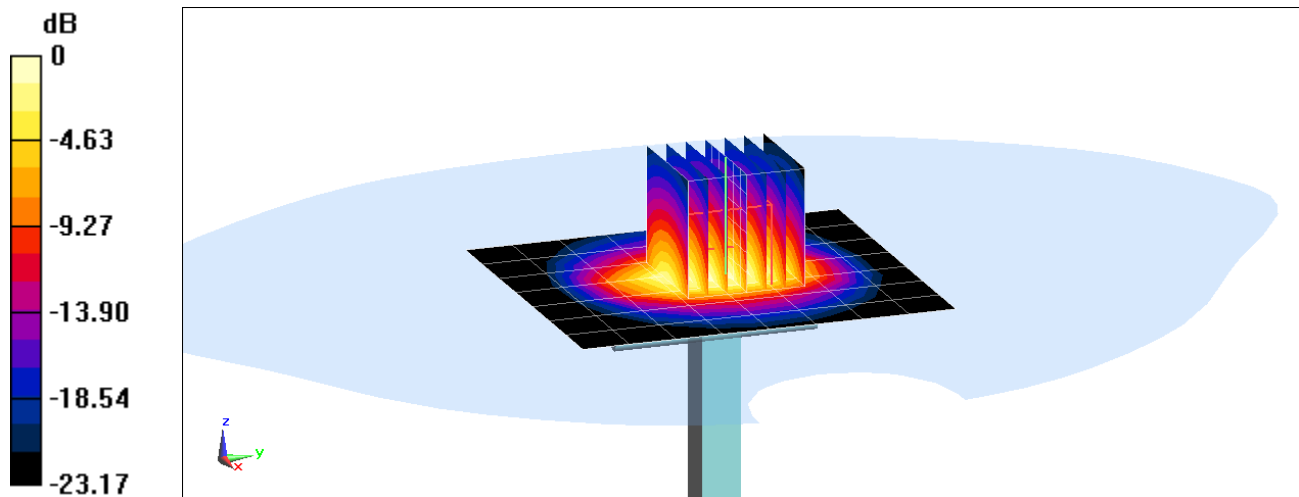
Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Peak SAR (extrapolated) = 11.0 W/kg

SAR(1 g) = 5.09 W/kg

Deviation(1 g) = -6.09%



0 dB = 8.63 W/kg = 9.36 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1120

Communication System: UID 0, CW; Frequency: 5250 MHz; Duty Cycle: 1:1

Medium: 5 GHz Head; Medium parameters used (interpolated):

$f = 5250 \text{ MHz}$; $\sigma = 4.577 \text{ S/m}$; $\epsilon_r = 36.711$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-15-2016; Ambient Temp: 23.0°C; Tissue Temp: 21.8°C

Probe: EX3DV4 - SN3914; ConvF(5.07, 5.07, 5.07); Calibrated: 2/22/2016;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1272; Calibrated: 2/18/2016

Phantom: SAM v5.0 Left; Type: QD000P40CD; Serial: TP: 1687

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

5250 MHz System Verification at 17.0 dBm (50 mW)

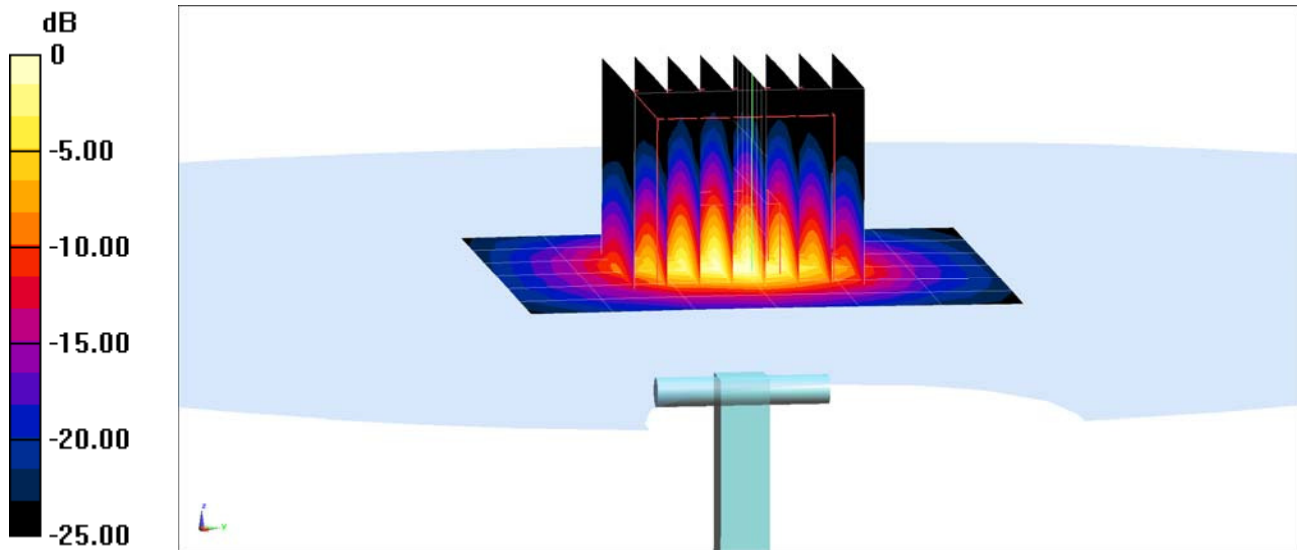
Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm

Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4

Peak SAR (extrapolated) = 15.5 W/kg

SAR(1 g) = 3.65 W/kg

Deviation(1 g) = -7.24%



0 dB = 8.43 W/kg = 9.26 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1120

Communication System: UID 0, CW; Frequency: 5750 MHz; Duty Cycle: 1:1

Medium: 5 GHz Head; Medium parameters used (interpolated):

$f = 5750 \text{ MHz}$; $\sigma = 5.108 \text{ S/m}$; $\epsilon_r = 36.001$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-15-2016; Ambient Temp: 23.0°C; Tissue Temp: 21.8°C

Probe: EX3DV4 - SN3914; ConvF(4.74, 4.74, 4.74); Calibrated: 2/22/2016;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1272; Calibrated: 2/18/2016

Phantom: SAM v5.0 Left; Type: QD000P40CD; Serial: TP: 1687

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

5750 MHz System Verification at 17.0 dBm (50 mW)

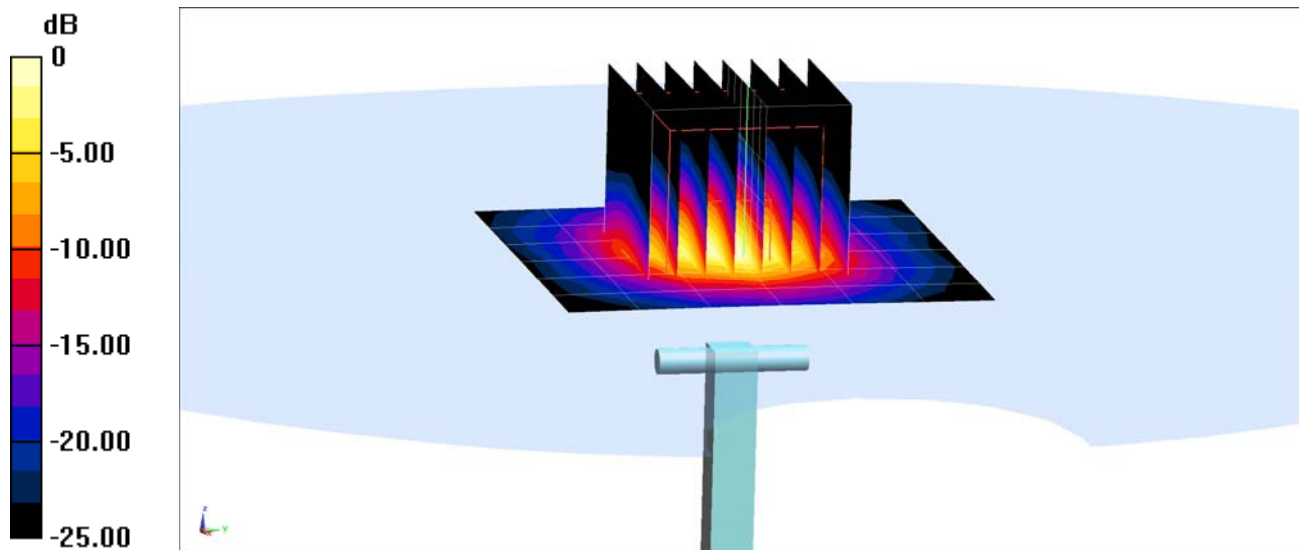
Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm

Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4

Peak SAR (extrapolated) = 17.0 W/kg

SAR(1 g) = 3.69 W/kg

Deviation(1 g) = -6.70%



0 dB = 8.80 W/kg = 9.44 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 750 MHz; Type: D750V3; Serial: 1046

Communication System: UID 0, CW; Frequency: 750 MHz; Duty Cycle: 1:1

Medium: 750 Body; Medium parameters used (interpolated):

$f = 750 \text{ MHz}$; $\sigma = 0.959 \text{ S/m}$; $\epsilon_r = 54.709$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 07-06-2016; Ambient Temp: 23.4°C; Tissue Temp: 22.0°C

Probe: EX3DV4 - SN7409; ConvF(9.46, 9.46, 9.46); Calibrated: 5/17/2016;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn859; Calibrated: 5/11/2016

Phantom: SAM Right; Type: QD000P40CD; Serial: TP:7535

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

750 MHz System Verification at 23.0 dBm (200 mW)

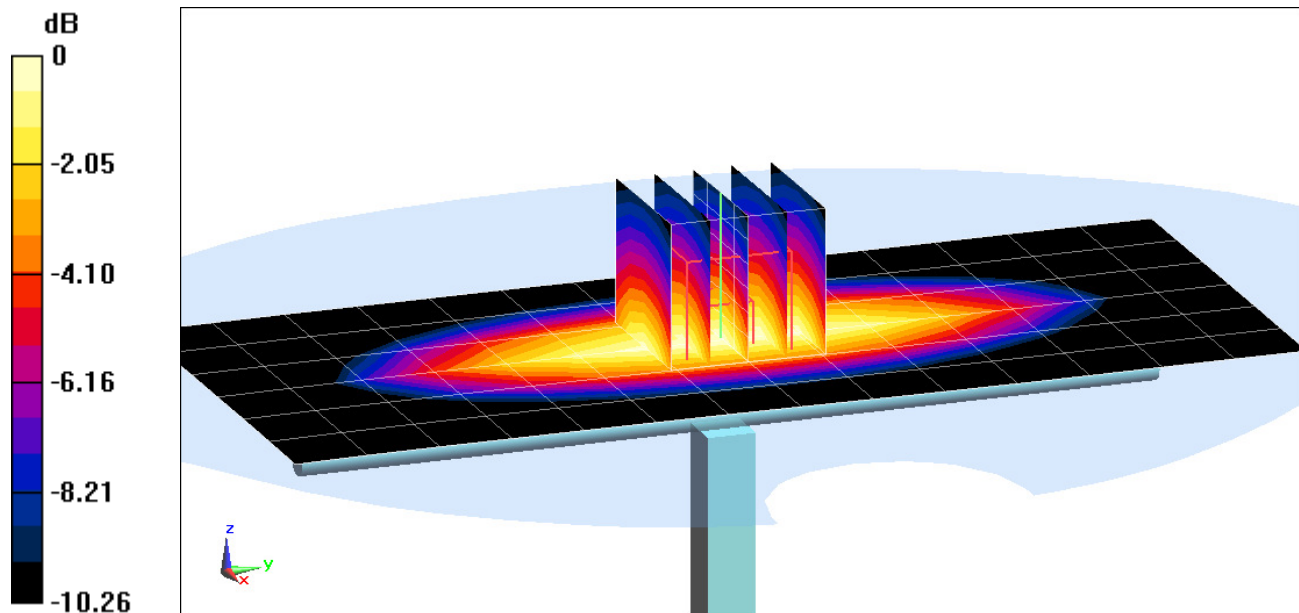
Area Scan (7x15x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Peak SAR (extrapolated) = 2.77 W/kg

SAR(1 g) = 1.83 W/kg

Deviation(1 g) = 4.33%



0 dB = 2.45 W/kg = 3.89 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 835 MHz; Type: D835V2; Serial: 4d119

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

Medium: 835 Body; Medium parameters used:

$f = 835 \text{ MHz}$; $\sigma = 0.984 \text{ S/m}$; $\epsilon_r = 53.281$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 07-13-2016; Ambient Temp: 24.0°C; Tissue Temp: 23.5°C

Probe: ES3DV3 - SN3333; ConvF(6.25, 6.25, 6.25); Calibrated: 10/29/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1333; Calibrated: 10/27/2015

Phantom: SAM Front; Type: QD000P40CD; Serial: TP:1758

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

835 MHz System Verification at 23.0 dBm (200 mW)

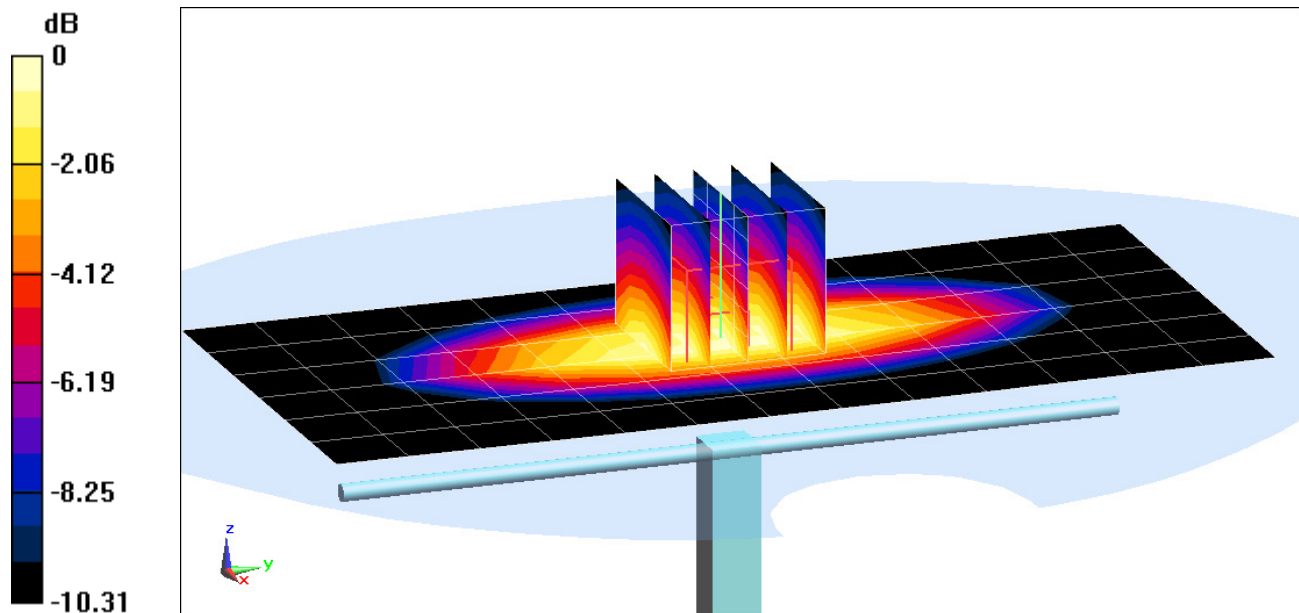
Area Scan (7x14x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Peak SAR (extrapolated) = 2.57 W/kg

SAR(1 g) = 1.76 W/kg

Deviation(1 g) = -3.72%



0 dB = 2.05 W/kg = 3.12 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 1750 MHz; Type: D1765V2; Serial: 1008

Communication System: UID 0, CW; Frequency: 1750 MHz; Duty Cycle: 1:1

Medium: 1750 Body; Medium parameters used:

$f = 1750 \text{ MHz}$; $\sigma = 1.459 \text{ S/m}$; $\epsilon_r = 51.893$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-07-2016; Ambient Temp: 24.6°C; Tissue Temp: 22.0°C

Probe: ES3DV3 - SN3209; ConvF(4.99, 4.99, 4.99); Calibrated: 3/18/2016;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1334; Calibrated: 11/11/2015

Phantom: SAM Left; Type: SAM; Serial: 1688

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

1750 MHz System Verification at 20.0 dBm (100 mW)

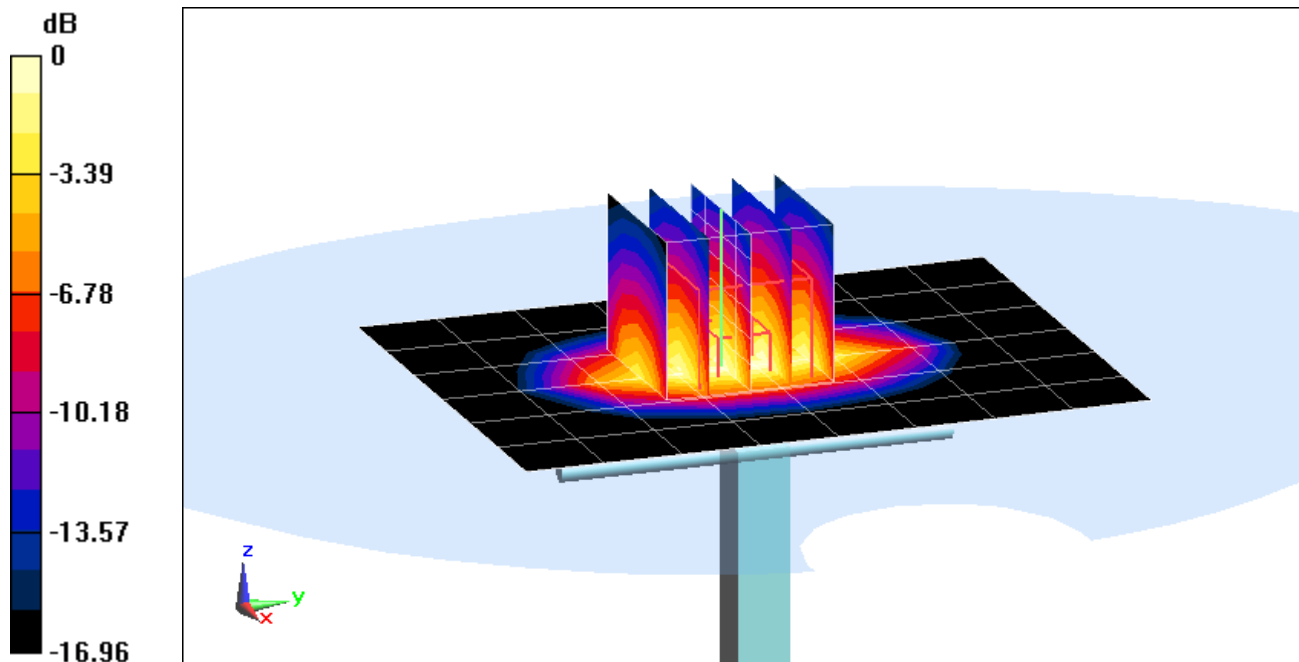
Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Peak SAR (extrapolated) = 6.83 W/kg

SAR(1 g) = 3.92 W/kg

Deviation(1 g) = 5.09%



0 dB = 4.87 W/kg = 6.88 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 1750 MHz; Type: D1750V2; Serial: 1051

Communication System: UID 0, CW; Frequency: 1750 MHz; Duty Cycle: 1:1

Medium: 1750 Body; Medium parameters used:

$f = 1750 \text{ MHz}$; $\sigma = 1.51 \text{ S/m}$; $\epsilon_r = 52.589$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-11-2016; Ambient Temp: 23.2°C; Tissue Temp: 21.9°C

Probe: EX3DV4 - SN7409; ConvF(7.72, 7.72, 7.72); Calibrated: 5/17/2016;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn859; Calibrated: 5/11/2016

Phantom: SAM Right; Type: QD000P40CD; Serial: TP:7535

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

1750 MHz System Verification at 20.0 dBm (100 mW)

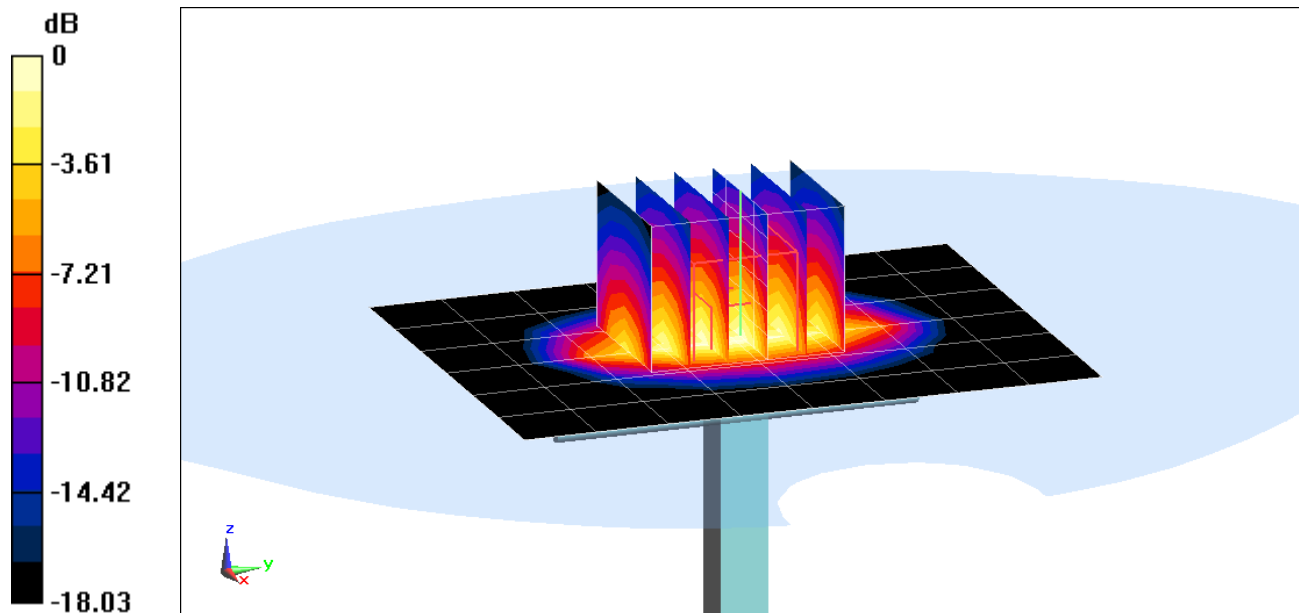
Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (5x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Peak SAR (extrapolated) = 7.06 W/kg

SAR(1 g) = 3.90 W/kg

Deviation(1 g) = 6.85%



0 dB = 5.94 W/kg = 7.74 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 5d149

Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1

Medium: 1900 Body; Medium parameters used (interpolated):

$f = 1900 \text{ MHz}$; $\sigma = 1.565 \text{ S/m}$; $\epsilon_r = 52.6$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-05-2016; Ambient Temp: 22.9°C; Tissue Temp: 22.1°C

Probe: ES3DV3 - SN3319; ConvF(4.7, 4.7, 4.7); Calibrated: 3/18/2016;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1368; Calibrated: 3/14/2016

Phantom: SAM with CRP v5.0 (Right); Type: QD000P40CD; Serial: TP:1759

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

1900 MHz System Verification at 20.0 dBm (100 mW)

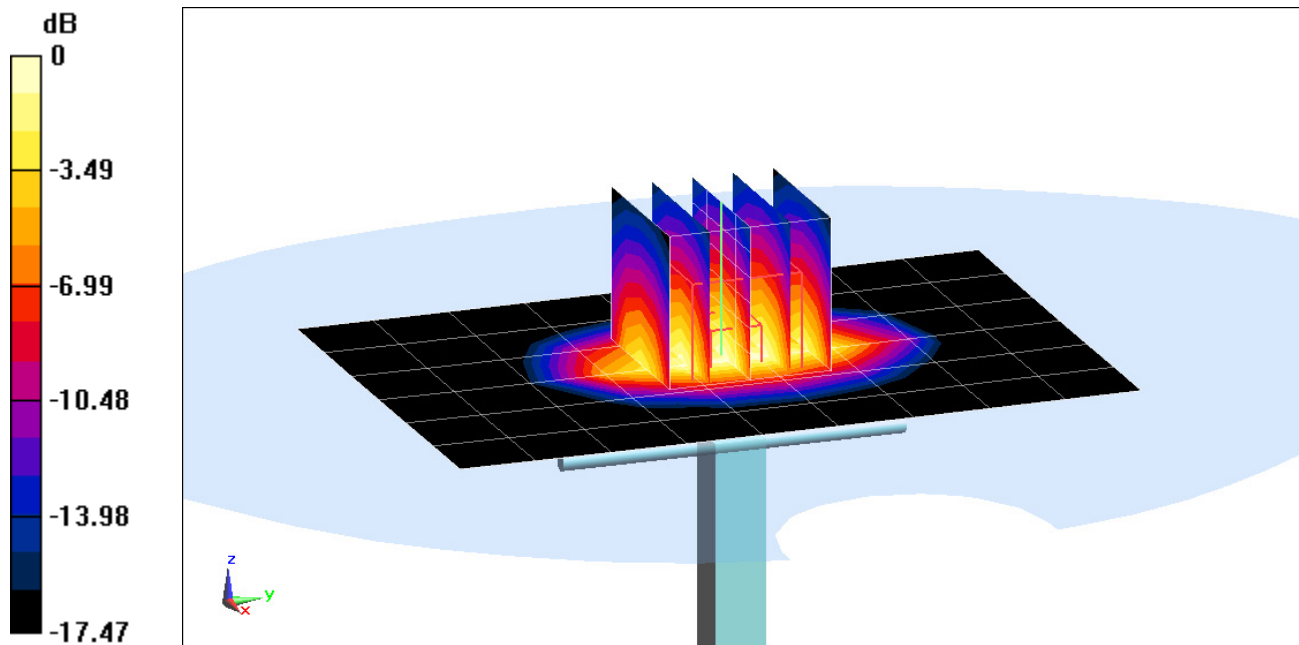
Area Scan (7x10x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Peak SAR (extrapolated) = 7.54 W/kg

SAR(1 g) = 4.23 W/kg

Deviation(1 g) = 4.70%



0 dB = 5.33 W/kg = 7.27 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 5d141

Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1

Medium: 1900 Body; Medium parameters used (interpolated):

$f = 1900 \text{ MHz}$; $\sigma = 1.58 \text{ S/m}$; $\epsilon_r = 51.988$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-11-2016; Ambient Temp: 22.7°C; Tissue Temp: 22.8°C

Probe: ES3DV3 - SN3319; ConvF(4.7, 4.7, 4.7); Calibrated: 3/18/2016;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1368; Calibrated: 3/14/2016

Phantom: SAM with CRP v5.0 (Right); Type: QD000P40CD; Serial: TP:1759

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

1900 MHz System Verification at 20.0 dBm (100 mW)

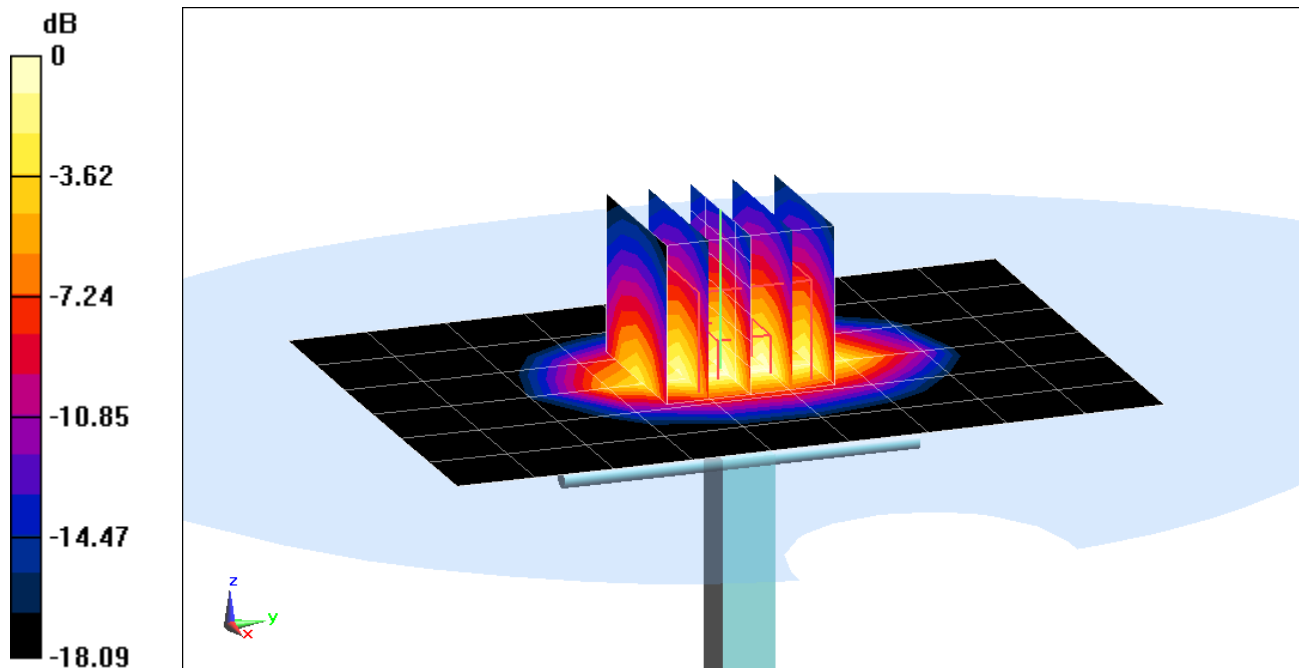
Area Scan (7x10x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Peak SAR (extrapolated) = 7.61 W/kg

SAR(1 g) = 4.20 W/kg

Deviation(1 g) = 6.06%



0 dB = 5.30 W/kg = 7.24 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: 719

Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: 2450 Body; Medium parameters used:

$f = 2450 \text{ MHz}$; $\sigma = 2.029 \text{ S/m}$; $\epsilon_r = 52.833$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-05-2016; Ambient Temp: 21.2°C; Tissue Temp: 22.0°C

Probe: ES3DV3 - SN3334; ConvF(4.45, 4.45, 4.45); Calibrated: 11/17/2015;

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1415; Calibrated: 11/11/2015

Phantom: SAM Front; Type: SAM; Serial: 1686

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

2450 MHz System Verification at 20.0 dBm (100 mW)

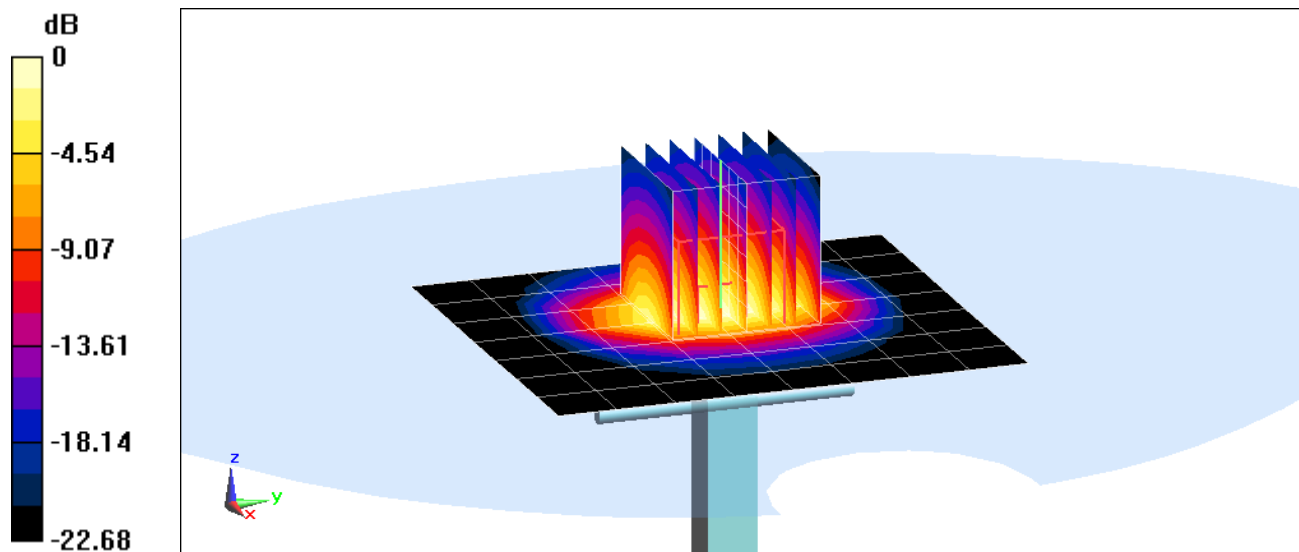
Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Peak SAR (extrapolated) = 11.1 W/kg

SAR(1 g) = 5.23 W/kg

Deviation(1 g) = 0.77%



0 dB = 6.90 W/kg = 8.39 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: 719

Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: 2450 Body; Medium parameters used:

$f = 2450 \text{ MHz}$; $\sigma = 2.018 \text{ S/m}$; $\epsilon_r = 53.383$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-14-2016; Ambient Temp: 23.2°C; Tissue Temp: 22.4°C

Probe: EX3DV4 - SN7406; ConvF(7.24, 7.24, 7.24); Calibrated: 4/19/2016;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1407; Calibrated: 4/14/2016

Phantom: SAM V5.0 Right; Type: QD000P40CD; Serial: 1647

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

2450 MHz System Verification at 20.0 dBm (100 mW)

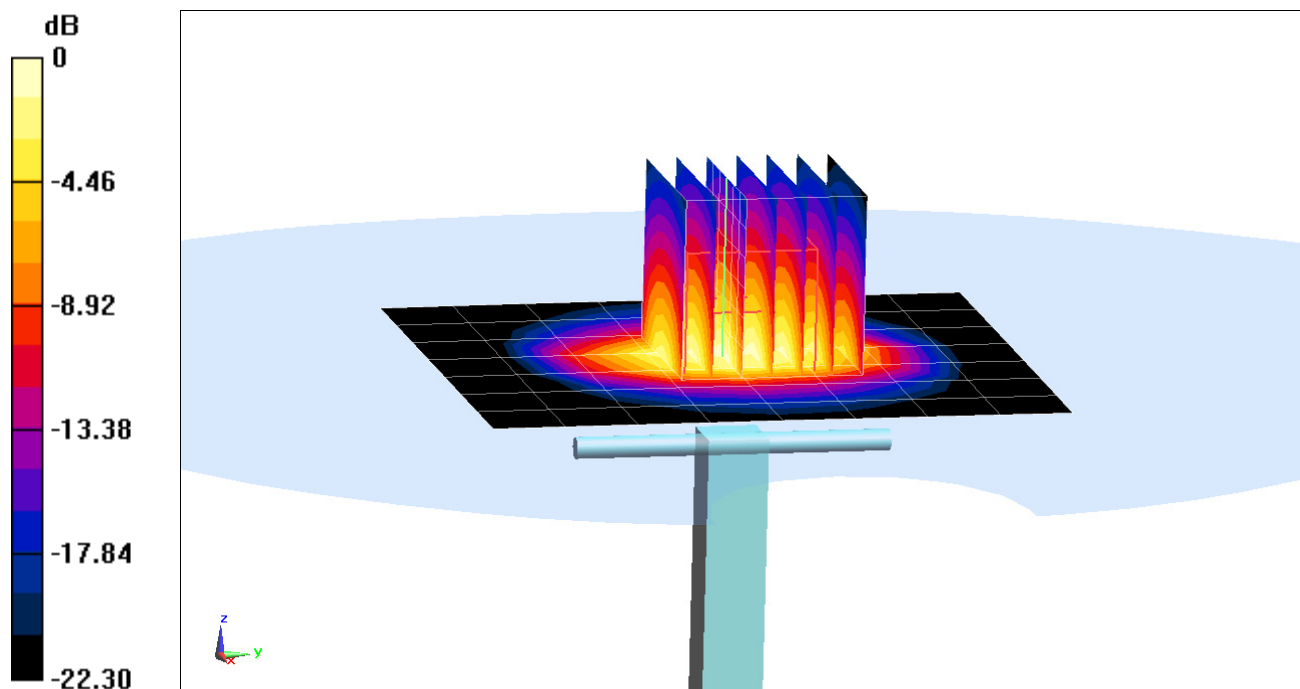
Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Peak SAR (extrapolated) = 10.7 W/kg

SAR(1 g) = 5.25 W/kg

Deviation(1 g) = 1.16%



0 dB = 8.62 W/kg = 9.36 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: 719

Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: 2450 Body; Medium parameters used:

$f = 2450$ MHz; $\sigma = 1.96$ S/m; $\epsilon_r = 53.064$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-19-2016; Ambient Temp: 23.5°C; Tissue Temp: 23.0°C

Probe: EX3DV4 - SN7406; ConvF(7.24, 7.24, 7.24); Calibrated: 4/19/2016;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1407; Calibrated: 4/14/2016

Phantom: SAM V5.0 Right; Type: QD000P40CD; Serial: 1647

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

2450 MHz System Verification at 20.0 dBm (100 mW)

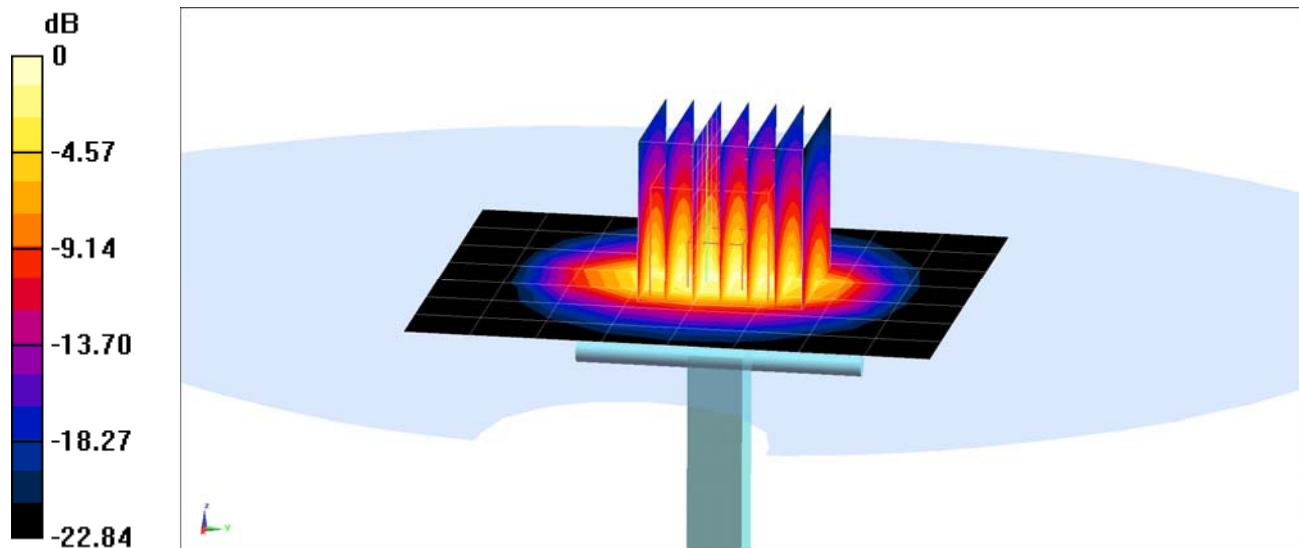
Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Peak SAR (extrapolated) = 10.4 W/kg

SAR(10 g) = 2.34 W/kg

Deviation(10 g) = -3.70%



0 dB = 8.38 W/kg = 9.23 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1120

Communication System: UID 0, CW; Frequency: 5250 MHz; Duty Cycle: 1:1

Medium: 5 GHz Body; Medium parameters used (interpolated):

$f = 5250 \text{ MHz}$; $\sigma = 5.422 \text{ S/m}$; $\epsilon_r = 47.399$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-11-2016; Ambient Temp: 21.9°C; Tissue Temp: 21.7°C

Probe: EX3DV4 - SN3914; ConvF(4.32, 4.32, 4.32); Calibrated: 2/22/2016;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1272; Calibrated: 2/18/2016

Phantom: SAM v5.0 front; Type: QD000P40CD; Serial: TP-1646

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

5250 MHz System Verification at 17.0 dBm (50 mW)

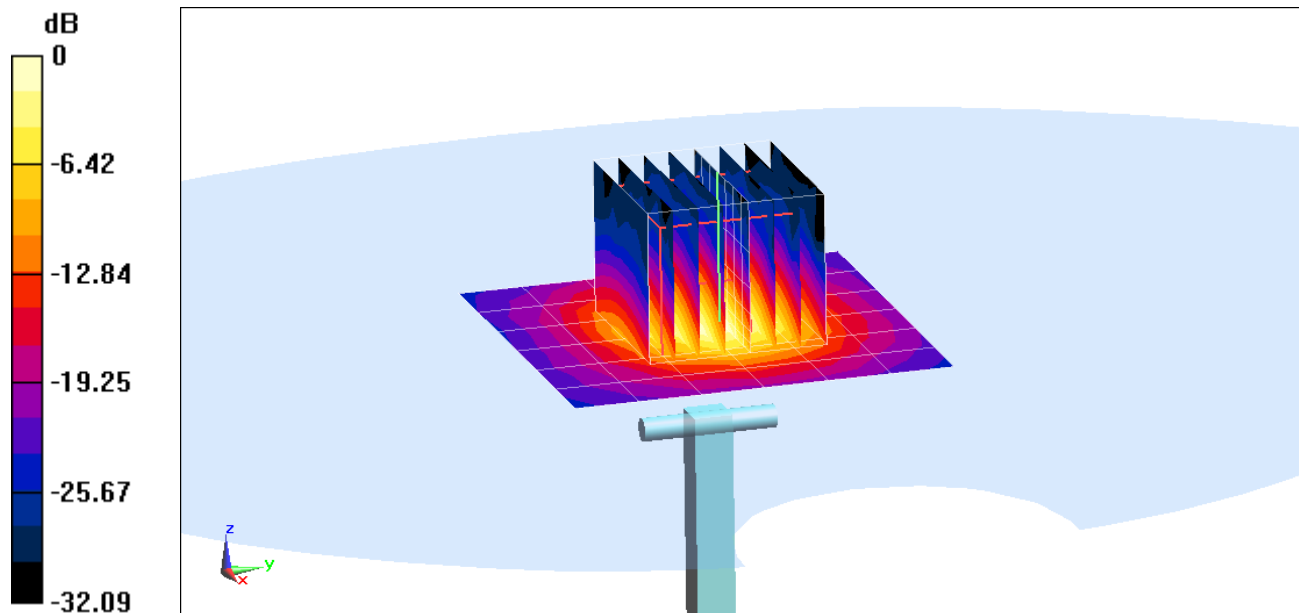
Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm

Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4

Peak SAR (extrapolated) = 15.2 W/kg

SAR(1 g) = 3.71 W/kg; SAR(10 g) = 1.05 W/kg

Deviation(1 g) = -1.85%; Deviation(10 g) = -0.94%



0 dB = 8.83 W/kg = 9.46 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1120

Communication System: UID 0, CW; Frequency: 5600 MHz; Duty Cycle: 1:1

Medium: 5 GHz Body; Medium parameters used:

$f = 5600 \text{ MHz}$; $\sigma = 5.849 \text{ S/m}$; $\epsilon_r = 46.811$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-11-2016; Ambient Temp: 21.9°C; Tissue Temp: 21.7°C

Probe: EX3DV4 - SN3914; ConvF(3.63, 3.63, 3.63); Calibrated: 2/22/2016;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1272; Calibrated: 2/18/2016

Phantom: SAM v5.0 front; Type: QD000P40CD; Serial: TP-1646

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

5600 MHz System Verification at 17.0 dBm (50 mW)

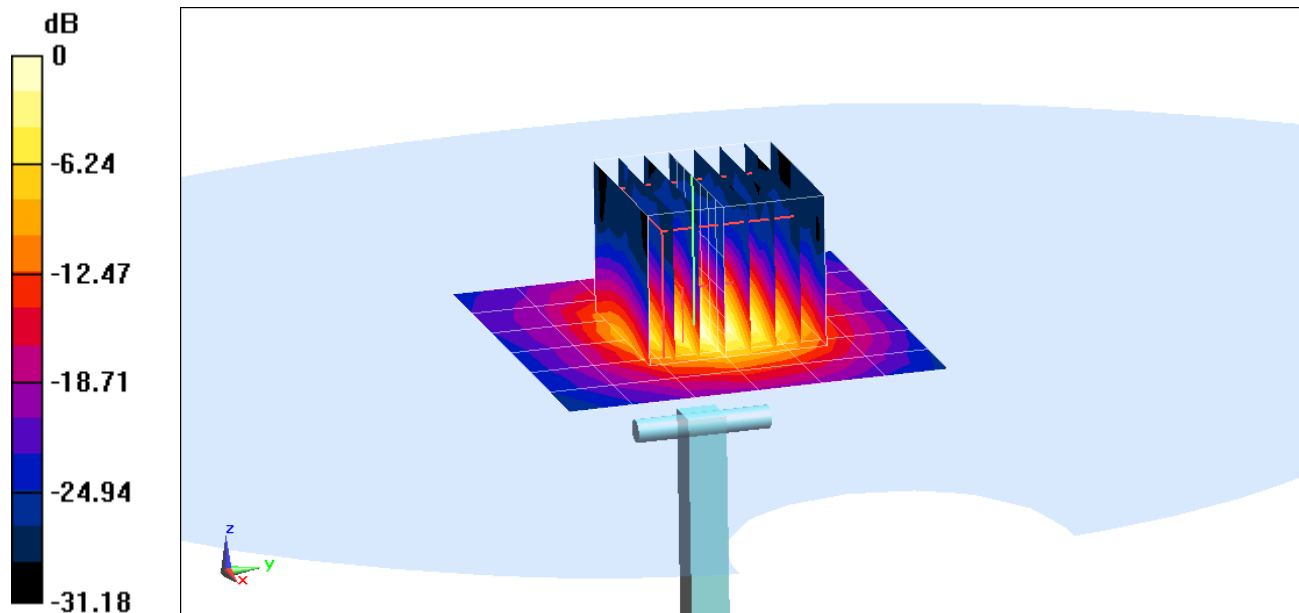
Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm

Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4

Peak SAR (extrapolated) = 15.3 W/kg

SAR(1 g) = 3.74 W/kg; SAR(10 g) = 1.06 W/kg

Deviation(1 g) = -7.43%; Deviation(10 g) = -6.19%



0 dB = 8.98 W/kg = 9.53 dBW/kg

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1120

Communication System: UID 0, CW; Frequency: 5750 MHz; Duty Cycle: 1:1

Medium: 5 GHz Body; Medium parameters used (interpolated):

$f = 5750 \text{ MHz}$; $\sigma = 6.051 \text{ S/m}$; $\epsilon_r = 46.559$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07-11-2016; Ambient Temp: 21.9°C; Tissue Temp: 21.7°C

Probe: EX3DV4 - SN3914; ConvF(3.86, 3.86, 3.86); Calibrated: 2/22/2016;

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1272; Calibrated: 2/18/2016

Phantom: SAM v5.0 front; Type: QD000P40CD; Serial: TP-1646

Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

5750 MHz System Verification at 17.0 dBm (50 mW)

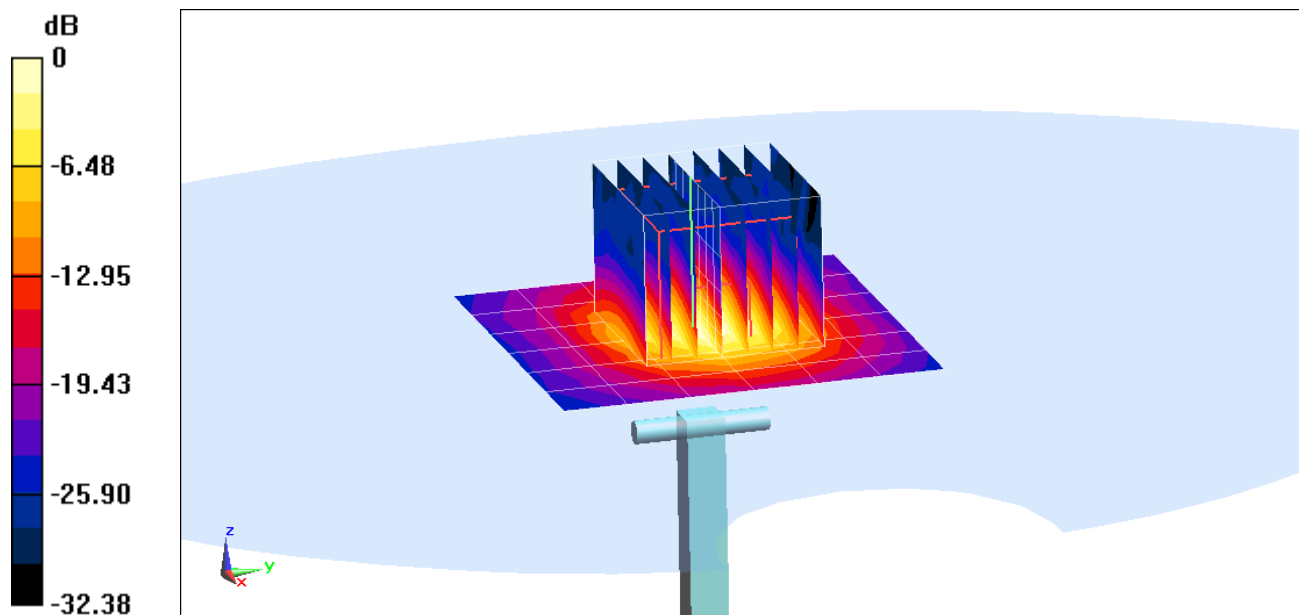
Area Scan (7x7x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Zoom Scan (8x8x7)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=1.4\text{mm}$; Graded Ratio: 1.4

Peak SAR (extrapolated) = 15.1 W/kg

SAR(1 g) = 3.50 W/kg; SAR(10 g) = 0.988 W/kg

Deviation(1 g) = -8.50%; Deviation(10 g) = -7.23%



0 dB = 8.57 W/kg = 9.33 dBW/kg