



SAR EVALUATION REPORT

Applicant Name:
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Date of Testing:
 01/22/21 - 02/22/21
Test Site/Location:
 PCTEST Lab, Columbia, MD, USA
Document Serial No.:
 1M2012210203-01.A3L

FCC ID: A3LSMG998U

APPLICANT: SAMSUNG ELECTRONICS CO., LTD.


DUT Type: Portable Handset
Application Type: Class II Permissive Change
FCC Rule Part(s): CFR §2.1093
Model: SM-G998U
Additional Model: SM-G998U1
Permissive Change(s): See FCC Change Document
Date of Original Certification: 12/23/20

Equipment Class	Band & Mode	Tx Frequency	SAR			
			1g Head (W/kg)	1g Body-Worn (W/kg)	1g Hotspot (W/kg)	10g Phablet (W/kg)
PCE	NR Band n77	3710.01 - 3969.99 MHz	< 0.1	< 0.1	0.16	N/A
Simultaneous SAR per KDB 690783 D01v01r03:			0.45	0.62	1.07	N/A

Note: The following test data was evaluated for the current test report. Please refer to RF Exposure Technical Report S/N 1M2009230152-01-R2.A3L for original compliance evaluation.

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 1.9 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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1 DEVICE UNDER TEST

1.1 Device Overview

Band & Mode	Operating Modes	Tx Frequency
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
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
LTE Band 71	Voice/Data	665.5 - 695.5 MHz
LTE Band 12	Voice/Data	699.7 - 715.3 MHz
LTE Band 13	Voice/Data	779.5 - 784.5 MHz
LTE Band 14	Voice/Data	790.5 - 795.5 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 66 (AWS)	Voice/Data	1710.7 - 1779.3 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 30	Voice/Data	2307.5 - 2312.5 MHz
LTE Band 7	Voice/Data	2502.5 - 2567.5 MHz
LTE Band 48	Voice/Data	3552.5 - 3697.5 MHz
LTE Band 41	Voice/Data	2498.5 - 2687.5 MHz
LTE Band 38	Voice/Data	2572.5 - 2617.5 MHz
NR Band n71	Data	665.5 - 695.5 MHz
NR Band n12	Data	701.5 - 713.5 MHz
NR Band n5 (Cell)	Data	826.5 - 846.5 MHz
NR Band n66 (AWS)	Data	1712.5 - 1777.5 MHz
NR Band n25 (PCS)	Data	1852.5 - 1912.5 MHz
NR Band n2 (PCS)	Data	1852.5 - 1907.5 MHz
NR Band n30	Data	2307.5 - 2312.5 MHz
NR Band n41	Data	2506.02 - 2679.99 MHz
NR Band n77	Data	3710.01 - 3969.99 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
U-NII-5	Voice/Data	5925 - 6425 MHz
U-NII-6	Voice/Data	6425 - 6525 MHz
U-NII-7	Voice/Data	6525 - 6875 MHz
U-NII-8	Voice/Data	6875 - 7125 MHz
Bluetooth	Data	2402 - 2480 MHz
NFC	Data	13.56 MHz
NR Band n260	Data	37000 - 40000 MHz
NR Band n261	Data	27500 - 28350 MHz

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1.2 Time-Averaging Algorithm for RF Exposure Compliance

Exposure Scenario:		Body-Worn	Phablet	Phablet	Head	Hotspot	Earjack	Maximum Tune-up Output Power*
Averaging Volume:		1g	10g	10g	1g	1g	10g	
Spacing:		15 mm	8, 6, 11 mm	0 mm	0 mm	10 mm	0 mm	
DSI:		0	0	1	2	3	4	
Technology/Band	Antenna	Plimit corresponding to 1mW/g (SAR design target)						Pmax
CDMA/EVDO BC10	A	30.7		26.9	32.1	26.9	26.9	24.8
CDMA/EVDO BC0	A	30.5		27.0	31.9	27.0	27.0	24.8
CDMA/EVDO BC1	A	27.2		18.5	34.3	18.5	18.5	23.0
GSM/GPRS/EDGE 850 MHz	A	31.8		26.9	33.6	26.9	26.9	24.8
GSM/GPRS/EDGE 1900 MHz	A	26.3		18.8	35.4	18.8	18.8	21.3
UMTS B5	A	30.9		26.7	32.3	26.7	26.7	24.5
UMTS B4	A	25.4		18.5	32.5	18.5	18.5	23.0
UMTS B2	A	27.0		18.5	34.2	18.5	18.5	23.0
LTE FDD B71	A	31.8		27.4	34.0	27.4	27.4	24.8
LTE FDD B12	A	32.0		27.2	33.3	27.2	27.2	24.8
LTE FDD B13	A	31.5		27.0	32.6	27.0	27.0	24.8
LTE FDD B14	A	31.3		26.8	32.8	26.8	26.8	24.8
LTE FDD B26	A	31.4		26.9	32.9	26.9	26.9	24.8
LTE FDD B5	A	30.6		26.9	32.2	26.9	26.9	24.8
LTE FDD B66/4	A	24.8		18.5	31.9	18.5	18.5	23.0
LTE FDD B66	E	23.5		23.5	19.0	19.0	23.5	23.0
LTE FDD B25/2	A	25.7		18.5	32.0	18.5	18.5	23.5
LTE FDD B25/2	E	23.5		23.5	17.5	19.0	23.5	23.5
LTE FDD B30	A	27.2		20.0	37.6	19.0	20.0	23.0
LTE FDD B7	B	28.7		20.0	33.4	20.0	20.0	23.0
LTE TDD B48	I	20.0		20.0	17.0	20.0	20.0	21.5
LTE TDD B41/38	B	26.6		20.0	35.6	19.0	20.0	22.0
LTE TDD B41 (PC2)	B	26.6		20.0	35.6	19.0	20.0	22.9
NR FDD n71	A	31.3		29.2	33.6	29.2	29.2	24.5
NR FDD n12	A	31.1		28.8	33.3	28.8	28.8	24.5
NR FDD n5	A	30.3		27.1	31.8	26.6	27.1	24.5
NR FDD n66	A	24.6		18.5	32.1	18.5	18.5	23.8
NR FDD n66	E	23.5		23.5	19.0	19.0	23.5	23.5
NR FDD n25/2	A	26.5		18.5	33.8	18.5	18.5	23.8
NR FDD n25/2	E	23.5		23.5	19.0	19.0	23.5	23.5
NR FDD n30	A	25.4		20.0	35.9	19.0	20.0	23.0
NR TDD n41 (PC3)	B	18.0		14.0	18.0	13.0	14.0	24.5
NR TDD n41 (PC2)	B	18.0		14.0	18.0	13.0	14.0	25.0
NR TDD n41 (PC3)	E	17.0		17.0	14.0	15.0	17.0	24.0
NR TDD n41 (PC2)	E	17.0		17.0	14.0	15.0	17.0	26.0
NR TDD n77 (PC3)	I	19.5		19.5	15.0	17.5	19.5	23.5
NR TDD n77 (PC2)	I	19.5		19.5	15.0	17.5	19.5	25.5
NR TDD n77 (PC3)	B	18.0		18.0	13.5	16.0	18.0	22.0
NR TDD n77 (PC2)	B	18.0		18.0	13.5	16.0	18.0	24.0
NR TDD n77 (PC3)	G	15.5		15.5	11.0	13.5	15.5	19.5
NR TDD n77 (PC2)	G	15.5		15.5	11.0	13.5	15.5	21.5
NR TDD n77 (PC3)	D	16.5		16.5	12.0	14.5	16.5	20.5
NR TDD n77 (PC2)	D	16.5		16.5	12.0	14.5	16.5	22.5

The Smart Transmit Algorithm was not affected by the permissive changes. Please see original technical filings 1M2009230152-01-R2.A3L for compliance evaluation.

1.3 Power Reduction for SAR

This device used an independent fixed level power reduction mechanism for WLAN when 5G NR is active and also for WLAN/BT during all 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. Detailed descriptions of the power reduction mechanism are included in the operational description.




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1.4 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.

1.4.1 2G/3G/4G/5G Output Power

CDMA BC10 (815 MHz)				
Power Level		Modulated Average Output Power (in dBm)		
		1x-RTT	EVDO Rev 0	EVDO Rev A
DSI = 0 (Body-Worn or Phablet Max)	Max allowed power	25.8	25.8	25.8
	Nominal	24.8	24.8	24.8
DSI = 1 (Phablet Reduced)	Max allowed power	25.8	25.8	25.8
	Nominal	24.8	24.8	24.8
DSI = 2 (Head)	Max allowed power	25.8	25.8	25.8
	Nominal	24.8	24.8	24.8
DSI = 3 (Hotspot)	Max allowed power	25.8	25.8	25.8
	Nominal	24.8	24.8	24.8
DSI = 4 (Earjack)	Max allowed power	25.8	25.8	25.8
	Nominal	24.8	24.8	24.8
CDMA BC0 (835 MHz)				
Power Level		Modulated Average Output Power (in dBm)		
		1x-RTT	EVDO Rev 0	EVDO Rev A
DSI = 0 (Body-Worn or Phablet Max)	Max allowed power	25.8	25.8	25.8
	Nominal	24.8	24.8	24.8
DSI = 1 (Phablet Reduced)	Max allowed power	25.8	25.8	25.8
	Nominal	24.8	24.8	24.8
DSI = 2 (Head)	Max allowed power	25.8	25.8	25.8
	Nominal	24.8	24.8	24.8
DSI = 3 (Hotspot)	Max allowed power	25.8	25.8	25.8
	Nominal	24.8	24.8	24.8
DSI = 4 (Earjack)	Max allowed power	25.8	25.8	25.8
	Nominal	24.8	24.8	24.8
CDMA BC1 (1900 MHz)				
Power Level		Modulated Average Output Power (in dBm)		
		1x-RTT	EVDO Rev 0	EVDO Rev A
DSI = 0 (Body-Worn or Phablet Max)	Max allowed power	24.0	24.0	24.0
	Nominal	23.0	23.0	23.0
DSI = 1 (Phablet Reduced)	Max allowed power	19.5	19.5	19.5
	Nominal	18.5	18.5	18.5
DSI = 2 (Head)	Max allowed power	24.0	24.0	24.0
	Nominal	23.0	23.0	23.0
DSI = 3 (Hotspot)	Max allowed power	19.5	19.5	19.5
	Nominal	18.5	18.5	18.5
DSI = 4 (Earjack)	Max allowed power	19.5	19.5	19.5
	Nominal	18.5	18.5	18.5

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GSM/GPRS/EDGE 850										
Power Level		Voice (in dBm)	Data - Burst Average GMSK (in dBm)				Data - Burst Average 8-PSK (in dBm)			
			1 TX Slot	1 TX Slots	2 TX Slots	3 TX Slots	4 TX Slots	1 TX Slots	2 TX Slots	3 TX Slots
DSI = 0 (Body-Worn or Phablet Max)	Max allowed power	33.5	33.5	32.0	30.0	28.0	27.5	25.5	23.5	22.5
	Nominal	32.5	32.5	31.0	29.0	27.0	26.5	24.5	22.5	21.5
DSI = 1 (Phablet Reduced)	Max allowed power	33.5	33.5	32.0	30.0	28.0	27.5	25.5	23.5	22.5
	Nominal	32.5	32.5	31.0	29.0	27.0	26.5	24.5	22.5	21.5
DSI = 2 (Head)	Max allowed power	33.5	33.5	32.0	30.0	28.0	27.5	25.5	23.5	22.5
	Nominal	32.5	32.5	31.0	29.0	27.0	26.5	24.5	22.5	21.5
DSI = 3 (Hotspot)	Max allowed power	N/A	33.5	32.0	30.0	28.0	27.5	25.5	23.5	22.5
	Nominal	N/A	32.5	31.0	29.0	27.0	26.5	24.5	22.5	21.5
DSI = 4 (Earjack)	Max allowed power	33.5	33.5	32.0	30.0	28.0	27.5	25.5	23.5	22.5
	Nominal	32.5	32.5	31.0	29.0	27.0	26.5	24.5	22.5	21.5



GSM/GPRS/EDGE 1900										
Power Level		Voice (in dBm)	Data - Burst Average GMSK (in dBm)				Data - Burst Average 8-PSK (in dBm)			
			1 TX Slot	1 TX Slots	2 TX Slots	3 TX Slots	4 TX Slots	1 TX Slots	2 TX Slots	3 TX Slots
DSI = 0 (Body-Worn or Phablet Max)	Max allowed power	30.0	30.0	28.5	26.5	24.5	26.5	24.0	22.0	21.0
	Nominal	29.0	29.0	27.5	25.5	23.5	25.5	23.0	21.0	20.0
DSI = 1 (Phablet Reduced)	Max allowed power	29.0	29.0	26.0	24.2	23.0	26.5	24.0	22.0	21.0
	Nominal	28.0	28.0	25.0	23.2	22.0	25.5	23.0	21.0	20.0
DSI = 2 (Head)	Max allowed power	30.0	30.0	28.5	26.5	24.5	26.5	24.0	22.0	21.0
	Nominal	29.0	29.0	27.5	25.5	23.5	25.5	23.0	21.0	20.0
DSI = 3 (Hotspot)	Max allowed power	N/A	29.0	26.0	24.2	23.0	26.5	24.0	22.0	21.0
	Nominal	N/A	28.0	25.0	23.2	22.0	25.5	23.0	21.0	20.0
DSI = 4 (Earjack)	Max allowed power	29.0	29.0	26.0	24.2	23.0	26.5	24.0	22.0	21.0
	Nominal	28.0	28.0	25.0	23.2	22.0	25.5	23.0	21.0	20.0

For GSM, the above powers listed are GSM burst average values.




UMTS Band 5 (850 MHz)					
Power Level		Modulated Average Output Power (in dBm)			
		3GPP WCDMA Rel 99	3GPP HSDPA Rel 5	3GPP HSUPA Rel 6	3GPP DC-HSDPA Rel 8
DSI = 0 (Body-Worn or Phablet Max)	Max allowed power	25.5	24.5	24.5	24.5
	Nominal	24.5	23.5	23.5	23.5
DSI = 1 (Phablet Reduced)	Max allowed power	25.5	24.5	24.5	24.5
	Nominal	24.5	23.5	23.5	23.5
DSI = 2 (Head)	Max allowed power	25.5	24.5	24.5	24.5
	Nominal	24.5	23.5	23.5	23.5
DSI = 3 (Hotspot)	Max allowed power	25.5	24.5	24.5	24.5
	Nominal	24.5	23.5	23.5	23.5
DSI = 4 (Earjack)	Max allowed power	25.5	24.5	24.5	24.5
	Nominal	24.5	23.5	23.5	23.5

UMTS Band 4 (1750 MHz)					
Power Level		Modulated Average Output Power (in dBm)			
		3GPP WCDMA Rel 99	3GPP HSDPA Rel 5	3GPP HSUPA Rel 6	3GPP DC-HSDPA Rel 8
DSI = 0 (Body-Worn or Phablet Max)	Max allowed power	24.0	23.0	23.0	23.0
	Nominal	23.0	22.0	22.0	22.0
DSI = 1 (Phablet Reduced)	Max allowed power	19.5	18.5	18.5	18.5
	Nominal	18.5	17.5	17.5	17.5
DSI = 2 (Head)	Max allowed power	24.0	23.0	23.0	23.0
	Nominal	23.0	22.0	22.0	22.0
DSI = 3 (Hotspot)	Max allowed power	19.5	18.5	18.5	18.5
	Nominal	18.5	17.5	17.5	17.5
DSI = 4 (Earjack)	Max allowed power	19.5	18.5	18.5	18.5
	Nominal	18.5	17.5	17.5	17.5

UMTS Band 2 (1900 MHz)					
Power Level		Modulated Average Output Power (in dBm)			
		3GPP WCDMA Rel 99	3GPP HSDPA Rel 5	3GPP HSUPA Rel 6	3GPP DC-HSDPA Rel 8
DSI = 0 (Body-Worn or Phablet Max)	Max allowed power	24.0	23.0	23.0	23.0
	Nominal	23.0	22.0	22.0	22.0
DSI = 1 (Phablet Reduced)	Max allowed power	19.5	18.5	18.5	18.5
	Nominal	18.5	17.5	17.5	17.5
DSI = 2 (Head)	Max allowed power	24.0	23.0	23.0	23.0
	Nominal	23.0	22.0	22.0	22.0
DSI = 3 (Hotspot)	Max allowed power	19.5	18.5	18.5	18.5
	Nominal	18.5	17.5	17.5	17.5
DSI = 4 (Earjack)	Max allowed power	19.5	18.5	18.5	18.5
	Nominal	18.5	17.5	17.5	17.5




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Mode / Band		Modulated Average Output Power (in dBm)				
		DSI = 0 (Body-Worn or Phablet Max)	DSI = 1 (Phablet Reduced)	DSI = 2 (Head)	DSI = 3 (Hotspot)	DSI = 4 (Earjack)
LTE FDD Band 71	Max allowed	25.8	25.8	25.8	25.8	25.8
	Nominal	24.8	24.8	24.8	24.8	24.8
LTE FDD Band 12	Max allowed	25.8	25.8	25.8	25.8	25.8
	Nominal	24.8	24.8	24.8	24.8	24.8
LTE FDD Band 17	Max allowed	25.8	25.8	25.8	25.8	25.8
	Nominal	24.8	24.8	24.8	24.8	24.8
LTE FDD Band 13	Max allowed	25.8	25.8	25.8	25.8	25.8
	Nominal	24.8	24.8	24.8	24.8	24.8
LTE FDD Band 14	Max allowed	25.8	25.8	25.8	25.8	25.8
	Nominal	24.8	24.8	24.8	24.8	24.8
LTE FDD Band 26	Max allowed	25.8	25.8	25.8	25.8	25.8
	Nominal	24.8	24.8	24.8	24.8	24.8
LTE FDD Band 5	Max allowed	25.8	25.8	25.8	25.8	25.8
	Nominal	24.8	24.8	24.8	24.8	24.8
LTE FDD Band 66 Ant A	Max allowed	24.0	19.5	24.0	19.5	19.5
	Nominal	23.0	18.5	23.0	18.5	18.5
LTE FDD Band 66 Ant E	Max allowed	24.0	24.0	20.0	20.0	24.0
	Nominal	23.0	23.0	19.0	19.0	23.0
LTE FDD Band 4 Ant A	Max allowed	24.0	19.5	24.0	19.5	19.5
	Nominal	23.0	18.5	23.0	18.5	18.5
LTE FDD Band 25 Ant A	Max allowed	24.5	19.5	24.5	19.5	19.5
	Nominal	23.5	18.5	23.5	18.5	18.5
LTE FDD Band 25 Ant E	Max allowed	24.5	24.5	18.5	20.0	24.5
	Nominal	23.5	23.5	17.5	19.0	23.5
LTE FDD Band 2 Ant A	Max allowed	24.5	19.5	24.5	19.5	19.5
	Nominal	23.5	18.5	23.5	18.5	18.5
LTE FDD Band 2 Ant E	Max allowed	24.5	24.5	18.5	20.0	24.5
	Nominal	23.5	23.5	17.5	19.0	23.5
LTE FDD Band 30	Max allowed	24.0	21.0	24.0	20.0	21.0
	Nominal	23.0	20.0	23.0	19.0	20.0
LTE FDD Band 7	Max allowed	24.0	21.0	24.0	21.0	21.0
	Nominal	23.0	20.0	23.0	20.0	20.0
LTE TDD Band 48	Max allowed	23.0	23.0	20.0	23.0	23.0
	Nominal	22.0	22.0	19.0	22.0	22.0
LTE TDD Band 41	Max allowed	25.0	23.0	25.0	22.0	23.0
	Nominal	24.0	22.0	24.0	21.0	22.0
LTE TDD Band 41 (PC2)	Max allowed	27.5	24.6	27.5	23.6	24.6
	Nominal	26.5	23.6	26.5	22.6	23.6
LTE TDD Band 38	Max allowed	25.0	23.0	25.0	22.0	23.0
	Nominal	24.0	22.0	24.0	21.0	22.0

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Mode / Band		Modulated Average Output Power (in dBm)				
		DSI = 0 (Body-Worn or Phablet Max)	DSI = 1 (Phablet Reduced)	DSI = 2 (Head)	DSI = 3 (Hotspot)	DSI = 4 (Earjack)
NR FDD Band n71	Max allowed	25.5	25.5	25.5	25.5	25.5
	Nominal	24.5	24.5	24.5	24.5	24.5
NR FDD Band n12	Max allowed	25.5	25.5	25.5	25.5	25.5
	Nominal	24.5	24.5	24.5	24.5	24.5
NR FDD Band n5	Max allowed	25.5	25.5	25.5	25.5	25.5
	Nominal	24.5	24.5	24.5	24.5	24.5
NR FDD Band n66 Ant A	Max allowed	24.8	19.5	24.8	19.5	19.5
	Nominal	23.8	18.5	23.8	18.5	18.5
NR FDD Band n66 Ant E	Max allowed	24.5	24.5	20.0	20.0	24.5
	Nominal	23.5	23.5	19.0	19.0	23.5
NR FDD Band n25 Ant A	Max allowed	24.8	19.5	24.8	19.5	19.5
	Nominal	23.8	18.5	23.8	18.5	18.5
NR FDD Band n25 Ant E	Max allowed	24.5	24.5	20.0	20.0	24.5
	Nominal	23.5	23.5	19.0	19.0	23.5
NR FDD Band n2 Ant A	Max allowed	24.8	19.5	24.8	19.5	19.5
	Nominal	23.8	18.5	23.8	18.5	18.5
NR FDD Band n2 Ant E	Max allowed	24.5	24.5	20.0	20.0	24.5
	Nominal	23.5	23.5	19.0	19.0	23.5
NR FDD Band n30	Max allowed	24.0	21.0	24.0	20.0	21.0
	Nominal	23.0	20.0	23.0	19.0	20.0
NR TDD Band n41 (PC3) Ant B	Max allowed	19.0	15.0	19.0	14.0	15.0
	Nominal	18.0	14.0	18.0	13.0	14.0
NR TDD Band n41 (PC2) Ant B	Max allowed	19.0	15.0	19.0	14.0	15.0
	Nominal	18.0	14.0	18.0	13.0	14.0
NR TDD Band n41 (PC3) Ant E	Max allowed	18.0	18.0	15.0	16.0	18.0
	Nominal	17.0	17.0	14.0	15.0	17.0
NR TDD Band n41 (PC2) Ant E	Max allowed	18.0	18.0	15.0	16.0	18.0
	Nominal	17.0	17.0	14.0	15.0	17.0
NR TDD Band n77 Ant I (PC3)	Max allowed	20.5	20.5	16.0	18.5	20.5
	Nominal	19.5	19.5	15.0	17.5	19.5
NR TDD Band n77 Ant I (PC2)	Max allowed	20.5	20.5	16.0	18.5	20.5
	Nominal	19.5	19.5	15.0	17.5	19.5
NR TDD Band n77 Ant B (PC3)	Max allowed	19.0	19.0	14.5	17.0	19.0
	Nominal	18.0	18.0	13.5	16.0	18.0
NR TDD Band n77 Ant B (PC2)	Max allowed	19.0	19.0	14.5	17.0	19.0
	Nominal	18.0	18.0	13.5	16.0	18.0
NR TDD Band n77 Ant G (PC3)	Max allowed	16.5	16.5	12.0	14.5	16.5
	Nominal	15.5	15.5	11.0	13.5	15.5
NR TDD Band n77 Ant G (PC2)	Max allowed	16.5	16.5	12.0	14.5	16.5
	Nominal	15.5	15.5	11.0	13.5	15.5
NR TDD Band n77 Ant D (PC3)	Max allowed	17.5	17.5	13.0	15.5	17.5
	Nominal	16.5	16.5	12.0	14.5	16.5
NR TDD Band n77 Ant D (PC2)	Max allowed	17.5	17.5	13.0	15.5	17.5
	Nominal	16.5	16.5	12.0	14.5	16.5

For LTE TDD and NR TDD, the above powers listed are TDD burst average values.

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1.4.2 2.4 GHz Maximum SISO/MIMO WLAN Output Power

Note: Targets for 802.11ax RU operations can be found in the original filing S/N: 1M2009230152-01-R2.A3L

Mode	Band	IEEE 802.11 (in dBm)									
		SISO				MIMO					
		Antenna 1		Antenna 2		g (CDD + STBC)		n (CDD + STBC, SDM)		ax (SU) (CDD + STBC, SDM)	
		b				g (CDD + STBC)		n (CDD + STBC, SDM)		ax (SU) (CDD + STBC, SDM)	
		Nominal	Maximum	Nominal	Maximum	Nominal	Maximum	Nominal	Maximum	Nominal	Maximum
2.4 GHz WIFI	2.45 GHz	18.5	19.5	19.5	20.5	20.5	21.5	20.5	21.5	20.5 ch. 1: 17.0 ch. 11: 17.5	21.5 ch. 1: 18.0 ch. 11: 18.5

1.4.3 2.4 GHz Reduced WLAN Output Powers

Note: Targets for 802.11ax RU operations can be found in the original filing S/N: 1M2009230152-01-R2.A3L

The below table is applicable in the following conditions:



- RCV Active
- Simultaneous conditions with 5/6 GHz WLAN (RCV not Active)
- Simultaneous conditions with 5G NR (RCV not Active)

Mode	Band	IEEE 802.11 (in dBm)							
		SISO		MIMO					
		Antenna 1 & Antenna 2		g (CDD + STBC)		n (CDD + STBC, SDM)		ax (SU) (CDD + STBC, SDM)	
		b		g (CDD + STBC)		n (CDD + STBC, SDM)		ax (SU) (CDD + STBC, SDM)	
		Nominal	Maximum	Nominal	Maximum	Nominal	Maximum	Nominal	Maximum
2.4 GHz WIFI	2.45 GHz	16.0	17.0	19.0	20.0	19.0	20.0	19.0 ch. 1: 17.0 ch. 11: 17.5	20.0 ch. 1: 18.0 ch. 11: 18.5

The below table is applicable in the following conditions:

- RCV Active during simultaneous conditions with 5/6 GHz WLAN
- RCV Active during simultaneous conditions with 5G NR




Mode	Band	IEEE 802.11 (in dBm)							
		SISO		MIMO					
		Antenna 1 & Antenna 2		g (CDD + STBC)		n (CDD + STBC, SDM)		ax (SU) (CDD + STBC, SDM)	
		b		g (CDD + STBC)		n (CDD + STBC, SDM)		ax (SU) (CDD + STBC, SDM)	
		Nominal	Maximum	Nominal	Maximum	Nominal	Maximum	Nominal	Maximum
2.4 GHz WIFI	2.45 GHz	13.0	14.0	16.0	17.0	16.0	17.0	16.0	17.0

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1.4.4 5 GHz Maximum SISO/MIMO WLAN Output Power

Note: Targets for 802.11ax RU operations can be found in the original filing S/N: 1M2009230152-01-R2.A3L

Mode	Band	IEEE 802.11 (in dBm)							
		MIMO							
		a (CDD + STBC)		n (CDD + STBC, SDM)		ac (CDD + STBC, SDM)		ax (SU) (CDD + STBC, SDM)	
		Nominal	Maximum	Nominal	Maximum	Nominal	Maximum	Nominal	Maximum
5 GHz WIFI (20MHz BW)	5200 MHz	19.5	20.5	19.5	20.5	19.5	20.5	19.5	20.5
	5300 MHz	19.5	20.5	19.5	20.5	19.5	20.5	19.5	20.5
	5500 MHz	19.5	20.5	19.5	20.5	19.5	20.5	19.5	20.5
	5800 MHz	19.5	20.5	19.5	20.5	19.5	20.5	19.5	20.5
5 GHz WIFI (40MHz BW)	5200 MHz			19.0	20.0	19.0	20.0	19.0	20.0
				ch. 38 17.0	ch. 38 18.0	ch. 38 17.0	ch. 38 18.0	ch. 38 17.0	ch. 38 18.0
	5300 MHz			19.0	20.0	19.0	20.0	19.0	20.0
				ch. 62 17.0	ch. 62 18.0	ch. 62 17.0	ch. 62 18.0	ch. 62 17.0	ch. 62 18.0
	5500 MHz			19.0	20.0	19.0	20.0	19.0	20.0
				ch. 102 17.5	ch. 102 18.5	ch. 102 17.5	ch. 102 18.5	ch. 102 17.5	ch. 102 18.5
	5800 MHz			19.0	20.0	19.0	20.0	19.0	20.0
5 GHz WIFI (80MHz BW)	5200 MHz					17.0	18.0	17.0	18.0
	5300 MHz					17.0	18.0	17.0	18.0
	5500 MHz					18.5	19.5	18.5	19.5
	5800 MHz					18.5	19.5	18.5	19.5
5 GHz WIFI (160MHz BW)	5250 MHz					15.0	16.0	15.0	16.0
	5570 MHz					16.5	17.5	16.5	17.5

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1.4.5 5 GHz Reduced WLAN Output Powers

Note: Targets for 802.11ax RU operations can be found in the original filing S/N: 1M2009230152-01-R2.A3L

The below table is applicable in the following conditions:

- RCV Active
- Simultaneous conditions with 2.4 GHz WLAN
- Simultaneous conditions with 5G NR
- RCV Active during simultaneous conditions with 2.4 GHz WLAN
- RCV Active during simultaneous conditions with 5G NR

Mode	Band	IEEE 802.11 (in dBm)							
		MIMO							
		a (CDD + STBC)		n (CDD + STBC, SDM)		ac (CDD + STBC, SDM)		ax (SU) (CDD + STBC, SDM)	
		Nominal	Maximum	Nominal	Maximum	Nominal	Maximum	Nominal	Maximum
5 GHz WIFI (20MHz BW)	5200 MHz	16.0	17.0	16.0	17.0	16.0	17.0	16.0	17.0
	5300 MHz	16.0	17.0	16.0	17.0	16.0	17.0	16.0	17.0
	5500 MHz	16.0	17.0	16.0	17.0	16.0	17.0	16.0	17.0
	5800 MHz	16.0	17.0	16.0	17.0	16.0	17.0	16.0	17.0
5 GHz WIFI (40MHz BW)	5200 MHz			16.0	17.0	16.0	17.0	16.0	17.0
	5300 MHz			16.0	17.0	16.0	17.0	16.0	17.0
	5500 MHz			16.0	17.0	16.0	17.0	16.0	17.0
	5800 MHz			16.0	17.0	16.0	17.0	16.0	17.0
5 GHz WIFI (80MHz BW)	5200 MHz					16.0	17.0	16.0	17.0
	5300 MHz					16.0	17.0	16.0	17.0
	5500 MHz					16.0	17.0	16.0	17.0
	5800 MHz					16.0	17.0	16.0	17.0
5 GHz WIFI (160MHz BW)	5250 MHz					15.0	16.0	15.0	16.0
	5570 MHz					16.0	17.0	16.0	17.0

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1.4.6 2.4 GHz Maximum Bluetooth Output Power




Mode	Single Antenna				Single Antenna in Dual Mode				Dual	
	Antenna 1		Antenna 2		Antenna 1		Antenna 2			
	Nominal	Maximum	Nominal	Maximum	Nominal	Maximum	Nominal	Maximum	Nominal	Maximum
Bluetooth (in dBm)	16.0	17.0	16.0	17.0	11.1	12.1	10.9	11.9	14.0	15.0
Bluetooth EDR (in dBm)	13.0	14.0	13.0	14.0	15.0	16.0	12.6	13.6	17.0	18.0
Bluetooth LE 2Mbps (in dBm)			9.0	10.0						
Bluetooth LE 1Mbps, 125/500Kbps (in dBm)			9.0	10.0						

1.4.7 2.4 GHz Reduced Bluetooth Output Power

The below table is applicable in the following conditions:

- RCV active

Mode	Single Antenna				Single Antenna in Dual Mode				Dual	
	Antenna 1		Antenna 2		Antenna 1		Antenna 2			
	Nominal	Maximum	Nominal	Maximum	Nominal	Maximum	Nominal	Maximum	Nominal	Maximum
Bluetooth (in dBm)	13.0	14.0	13.0	14.0	10.0	11.0	10.0	11.0	13.0	14.0
Bluetooth EDR (in dBm)	13.0	14.0	13.0	14.0	10.0	11.0	10.0	11.0	13.0	14.0
Bluetooth LE 2Mbps (in dBm)			9.0	10.0						
Bluetooth LE 1Mbps, 125/500Kbps (in dBm)			9.0	10.0						

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1.5 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 E. 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
NR Band n77 Antenna B	Yes	Yes	No	Yes	No	Yes
NR Band n77 Antenna G	Yes	Yes	Yes	No	No	Yes
NR Band n77 Antenna D	Yes	Yes	No	Yes	Yes	Yes

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.

1.6 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 E.

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1.7 Simultaneous Transmission Capabilities

According to FCC KDB Publication 447498 D01v06, transmitters are considered to be operating simultaneously when there is overlapping transmission, with the exception of transmissions during network hand-offs with maximum hand-off duration less than 30 seconds.

This device contains multiple transmitters that may operate simultaneously, and therefore requires a simultaneous transmission analysis according to FCC KDB Publication 447498 D01v06 4.3.2 procedures.



**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 WLAN	Yes	Yes	N/A	Yes	
2	1x CDMA voice + 2.4 GHz WLAN MIMO	Yes	Yes	N/A	Yes	
3	1x CDMA voice + 5 GHz WLAN MIMO	Yes	Yes	N/A	Yes	
4	1x CDMA voice + 6 GHz WLAN MIMO	Yes	Yes	N/A	Yes	
5	1x CDMA voice + 2.4 GHz WLAN + 5 GHz WLAN MIMO	Yes	Yes	N/A	Yes	
6	1x CDMA voice + 2.4 GHz WLAN MIMO + 5 GHz WLAN MIMO	Yes	Yes	N/A	Yes	
7	1x CDMA voice + 2.4 GHz WLAN + 6 GHz WLAN MIMO	Yes	Yes	N/A	Yes	
8	1x CDMA voice + 2.4 GHz WLAN MIMO + 6 GHz WLAN MIMO	Yes	Yes	N/A	Yes	
9	1x CDMA voice + 2.4 GHz Bluetooth Ant 1	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered
10	1x CDMA voice + 2.4 GHz Bluetooth Ant 2	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered
11	1x CDMA voice + 2.4 GHz Bluetooth Ant 1 + 5 GHz WLAN MIMO	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered
12	1x CDMA voice + 2.4 GHz Bluetooth Ant 1 + 6 GHz WLAN MIMO	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered
13	1x CDMA voice + 2.4 GHz Bluetooth Ant 2 + 5 GHz WLAN MIMO	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered
14	1x CDMA voice + 2.4 GHz Bluetooth Ant 2 + 6 GHz WLAN MIMO	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered
15	1x CDMA voice + 2.4 GHz Bluetooth Ant 1 + 2.4 GHz Bluetooth Ant 2	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered
16	1x CDMA voice + 2.4 GHz Bluetooth Ant 1 + 2.4 GHz Bluetooth Ant 2 + 5 GHz WLAN MIMO	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered
17	1x CDMA voice + 2.4 GHz Bluetooth Ant 1 + 2.4 GHz Bluetooth Ant 2 + 6 GHz WLAN MIMO	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered
18	GSM voice + 2.4 GHz WLAN	Yes	Yes	N/A	Yes	
19	GSM voice + 2.4 GHz WLAN MIMO	Yes	Yes	N/A	Yes	
20	GSM voice + 5 GHz WLAN MIMO	Yes	Yes	N/A	Yes	
21	GSM voice + 6 GHz WLAN MIMO	Yes	Yes	N/A	Yes	
22	GSM voice + 2.4 GHz WLAN + 5 GHz WLAN MIMO	Yes	Yes	N/A	Yes	
23	GSM voice + 2.4 GHz WLAN MIMO + 5 GHz WLAN MIMO	Yes	Yes	N/A	Yes	
24	GSM voice + 2.4 GHz WLAN + 6 GHz WLAN MIMO	Yes	Yes	N/A	Yes	
25	GSM voice + 2.4 GHz WLAN MIMO + 6 GHz WLAN MIMO	Yes	Yes	N/A	Yes	
26	GSM voice + 2.4 GHz Bluetooth Ant 1	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered
27	GSM voice + 2.4 GHz Bluetooth Ant 2	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered
28	GSM voice + 2.4 GHz Bluetooth Ant 1 + 5 GHz WLAN MIMO	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered
29	GSM voice + 2.4 GHz Bluetooth Ant 1 + 6 GHz WLAN MIMO	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered
30	GSM voice + 2.4 GHz Bluetooth Ant 2 + 5 GHz WLAN MIMO	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered
31	GSM voice + 2.4 GHz Bluetooth Ant 2 + 6 GHz WLAN MIMO	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered
32	GSM voice + 2.4 GHz Bluetooth Ant 1 + 2.4 GHz Bluetooth Ant 2	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered
33	GSM voice + 2.4 GHz Bluetooth Ant 1 + 2.4 GHz Bluetooth Ant 2 + 5 GHz WLAN MIMO	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered
34	GSM voice + 2.4 GHz Bluetooth Ant 1 + 2.4 GHz Bluetooth Ant 2 + 6 GHz WLAN MIMO	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered
35	UMTS + 2.4 GHz WLAN	Yes	Yes	Yes	Yes	
36	UMTS + 2.4 GHz WLAN MIMO	Yes	Yes	Yes	Yes	
37	UMTS + 5 GHz WLAN MIMO	Yes	Yes	Yes	Yes	
38	UMTS + 6 GHz WLAN MIMO	Yes	Yes	N/A	Yes	
39	UMTS + 2.4 GHz WLAN + 5 GHz WLAN MIMO	Yes	Yes	Yes	Yes	
40	UMTS + 2.4 GHz WLAN MIMO + 5 GHz WLAN MIMO	Yes	Yes	Yes	Yes	
41	UMTS + 2.4 GHz WLAN + 6 GHz WLAN MIMO	Yes	Yes	N/A	Yes	
42	UMTS + 2.4 GHz WLAN MIMO + 6 GHz WLAN MIMO	Yes	Yes	N/A	Yes	
43	UMTS + 2.4 GHz Bluetooth Ant 1	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
44	UMTS + 2.4 GHz Bluetooth Ant 2	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
45	UMTS + 2.4 GHz Bluetooth Ant 1 + 5 GHz WLAN MIMO	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
46	UMTS + 2.4 GHz Bluetooth Ant 1 + 6 GHz WLAN MIMO	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered
47	UMTS + 2.4 GHz Bluetooth Ant 2 + 5 GHz WLAN MIMO	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
48	UMTS + 2.4 GHz Bluetooth Ant 2 + 6 GHz WLAN MIMO	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered
49	UMTS + 2.4 GHz Bluetooth Ant 1 + 2.4 GHz Bluetooth Ant 2	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
50	UMTS + 2.4 GHz Bluetooth Ant 1 + 2.4 GHz Bluetooth Ant 2 + 5 GHz WLAN MIMO	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
51	UMTS + 2.4 GHz Bluetooth Ant 1 + 2.4 GHz Bluetooth Ant 2 + 6 GHz WLAN MIMO	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered
52	LTE + 2.4 GHz WLAN	Yes	Yes	Yes	Yes	
53	LTE + 2.4 GHz WLAN MIMO	Yes	Yes	Yes	Yes	
54	LTE + 5 GHz WLAN MIMO	Yes	Yes	Yes	Yes	
55	LTE + 6 GHz WLAN MIMO	Yes	Yes	N/A	Yes	
56	LTE + 2.4 GHz WLAN + 5 GHz WLAN MIMO	Yes	Yes	Yes	Yes	
57	LTE + 2.4 GHz WLAN MIMO + 5 GHz WLAN MIMO	Yes	Yes	Yes	Yes	
58	LTE + 2.4 GHz WLAN + 6 GHz WLAN MIMO	Yes	Yes	N/A	Yes	
59	LTE + 2.4 GHz WLAN MIMO + 6 GHz WLAN MIMO	Yes	Yes	N/A	Yes	
60	LTE + 2.4 GHz Bluetooth Ant 1	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
61	LTE + 2.4 GHz Bluetooth Ant 2	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
62	LTE + 2.4 GHz Bluetooth Ant 1 + 5 GHz WLAN MIMO	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
63	LTE + 2.4 GHz Bluetooth Ant 1 + 6 GHz WLAN MIMO	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered
64	LTE + 2.4 GHz Bluetooth Ant 2 + 5 GHz WLAN MIMO	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
65	LTE + 2.4 GHz Bluetooth Ant 2 + 6 GHz WLAN MIMO	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered
66	LTE + 2.4 GHz Bluetooth Ant 1 + 2.4 GHz Bluetooth Ant 2	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
67	LTE + 2.4 GHz Bluetooth Ant 1 + 2.4 GHz Bluetooth Ant 2 + 5 GHz WLAN MIMO	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
68	LTE + 2.4 GHz Bluetooth Ant 1 + 2.4 GHz Bluetooth Ant 2 + 6 GHz WLAN MIMO	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered

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**Table 1-3
Simultaneous Transmission Scenarios Cont.**

No.	Capable Transm Configuration	Head	Body-Worn Accessory	Wireless Router	Phablet	Notes
69	LTE + NR	Yes	Yes	N/A	Yes	
70	LTE + NR + 2.4 GHz WLAN	Yes	Yes	Yes	Yes	
71	LTE + NR + 2.4 GHz WLAN MIMO	Yes	Yes	Yes	Yes	
72	LTE + NR + 5 GHz WLAN MIMO	Yes	Yes	Yes	Yes	
73	LTE + NR + 6 GHz WLAN MIMO	Yes	Yes	N/A	Yes	
74	LTE + NR + 2.4 GHz WLAN + 5 GHz WLAN MIMO	Yes	Yes	Yes	Yes	
75	LTE + NR + 2.4 GHz WLAN MIMO + 5 GHz WLAN MIMO	Yes	Yes	Yes	Yes	
76	LTE + NR + 2.4 GHz WLAN + 6 GHz WLAN MIMO	Yes	Yes	N/A	Yes	
77	LTE + NR + 2.4 GHz WLAN MIMO + 6 GHz WLAN MIMO	Yes	Yes	N/A	Yes	
78	LTE + NR + 2.4 GHz Bluetooth Ant 1	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
79	LTE + NR + 2.4 GHz Bluetooth Ant 2	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
80	LTE + NR + 2.4 GHz Bluetooth Ant 1 + 5 GHz WLAN MIMO	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
81	LTE + NR + 2.4 GHz Bluetooth Ant 1 + 6 GHz WLAN MIMO	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered
82	LTE + NR + 2.4 GHz Bluetooth Ant 2 + 5 GHz WLAN MIMO	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
83	LTE + NR + 2.4 GHz Bluetooth Ant 2 + 6 GHz WLAN MIMO	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered
84	LTE + NR + 2.4 GHz Bluetooth Ant 1 + 2.4 GHz Bluetooth Ant 2	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
85	LTE + NR + 2.4 GHz Bluetooth Ant 1 + 2.4 GHz Bluetooth Ant 2 + 5 GHz WLAN MIMO	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
86	LTE + NR + 2.4 GHz Bluetooth Ant 1 + 2.4 GHz Bluetooth Ant 2 + 6 GHz WLAN MIMO	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered
87	NR + 2.4 GHz WLAN	Yes*	Yes*	Yes	Yes	* Pre-installed VOIP applications are considered.
88	NR + 2.4 GHz WLAN MIMO	Yes*	Yes*	Yes	Yes	* Pre-installed VOIP applications are considered.
89	NR + 5 GHz WLAN MIMO	Yes*	Yes*	Yes	Yes	* Pre-installed VOIP applications are considered.
90	NR + 6 GHz WLAN MIMO	Yes*	Yes*	N/A	Yes	* Pre-installed VOIP applications are considered.
91	NR + 2.4 GHz WLAN + 5 GHz WLAN MIMO	Yes*	Yes*	Yes	Yes	* Pre-installed VOIP applications are considered.
92	NR + 2.4 GHz WLAN MIMO + 5 GHz WLAN MIMO	Yes*	Yes*	Yes	Yes	* Pre-installed VOIP applications are considered.
93	NR + 2.4 GHz WLAN + 6 GHz WLAN MIMO	Yes*	Yes*	N/A	Yes	* Pre-installed VOIP applications are considered.
94	NR + 2.4 GHz WLAN MIMO + 6 GHz WLAN MIMO	Yes*	Yes*	N/A	Yes	* Pre-installed VOIP applications are considered.
95	NR + 2.4 GHz Bluetooth Ant 1	Yes^*	Yes*	Yes^	Yes	* Pre-installed VOIP applications are considered. ^ Bluetooth Tethering is considered
96	NR + 2.4 GHz Bluetooth Ant 2	Yes^*	Yes*	Yes^	Yes	* Pre-installed VOIP applications are considered. ^ Bluetooth Tethering is considered
97	NR + 2.4 GHz Bluetooth Ant 1 + 5 GHz WLAN MIMO	Yes^*	Yes*	Yes^	Yes	* Pre-installed VOIP applications are considered. ^ Bluetooth Tethering is considered
98	NR + 2.4 GHz Bluetooth Ant 1 + 6 GHz WLAN MIMO	Yes^*	Yes*	N/A	Yes	* Pre-installed VOIP applications are considered. ^ Bluetooth Tethering is considered
99	NR + 2.4 GHz Bluetooth Ant 2 + 5 GHz WLAN MIMO	Yes^*	Yes*	Yes^	Yes	* Pre-installed VOIP applications are considered. ^ Bluetooth Tethering is considered
100	NR + 2.4 GHz Bluetooth Ant 2 + 6 GHz WLAN MIMO	Yes^*	Yes*	N/A	Yes	* Pre-installed VOIP applications are considered. ^ Bluetooth Tethering is considered
101	NR + 2.4 GHz Bluetooth Ant 1 + 2.4 GHz Bluetooth Ant 2	Yes^*	Yes*	Yes^	Yes	* Pre-installed VOIP applications are considered. ^ Bluetooth Tethering is considered
102	NR + 2.4 GHz Bluetooth Ant 1 + 2.4 GHz Bluetooth Ant 2 + 5 GHz WLAN MIMO	Yes^*	Yes*	Yes^	Yes	* Pre-installed VOIP applications are considered. ^ Bluetooth Tethering is considered
103	NR + 2.4 GHz Bluetooth Ant 1 + 2.4 GHz Bluetooth Ant 2 + 6 GHz WLAN MIMO	Yes^*	Yes*	N/A	Yes	* Pre-installed VOIP applications are considered. ^ Bluetooth Tethering is considered
104	CDMA/EVDO data + 2.4 GHz WLAN	Yes*	Yes*	Yes	Yes	* Pre-installed VOIP applications are considered.
105	CDMA/EVDO data + 2.4 GHz WLAN MIMO	Yes*	Yes*	Yes	Yes	* Pre-installed VOIP applications are considered.
106	CDMA/EVDO data + 5 GHz WLAN MIMO	Yes*	Yes*	Yes	Yes	* Pre-installed VOIP applications are considered.
107	CDMA/EVDO data + 6 GHz WLAN MIMO	Yes*	Yes*	N/A	Yes	* Pre-installed VOIP applications are considered.
108	CDMA/EVDO data + 2.4 GHz WLAN + 5 GHz WLAN MIMO	Yes*	Yes*	Yes	Yes	* Pre-installed VOIP applications are considered.
109	CDMA/EVDO data + 2.4 GHz WLAN MIMO + 5 GHz WLAN MIMO	Yes*	Yes*	Yes	Yes	* Pre-installed VOIP applications are considered.
110	CDMA/EVDO data + 2.4 GHz WLAN + 6 GHz WLAN MIMO	Yes*	Yes*	N/A	Yes	* Pre-installed VOIP applications are considered.
111	CDMA/EVDO data + 2.4 GHz WLAN MIMO + 6 GHz WLAN MIMO	Yes*	Yes*	N/A	Yes	* Pre-installed VOIP applications are considered.
112	CDMA/EVDO data + 2.4 GHz Bluetooth Ant 1	Yes^*	Yes*	Yes^	Yes	* Pre-installed VOIP applications are considered. ^ Bluetooth Tethering is considered
113	CDMA/EVDO data + 2.4 GHz Bluetooth Ant 2	Yes^*	Yes*	Yes^	Yes	* Pre-installed VOIP applications are considered. ^ Bluetooth Tethering is considered
114	CDMA/EVDO data + 2.4 GHz Bluetooth Ant 1 + 5 GHz WLAN MIMO	Yes^*	Yes*	Yes^	Yes	* Pre-installed VOIP applications are considered. ^ Bluetooth Tethering is considered
115	CDMA/EVDO data + 2.4 GHz Bluetooth Ant 1 + 6 GHz WLAN MIMO	Yes^*	Yes*	N/A	Yes	* Pre-installed VOIP applications are considered. ^ Bluetooth Tethering is considered
116	CDMA/EVDO data + 2.4 GHz Bluetooth Ant 2 + 5 GHz WLAN MIMO	Yes^*	Yes*	Yes^	Yes	* Pre-installed VOIP applications are considered. ^ Bluetooth Tethering is considered
117	CDMA/EVDO data + 2.4 GHz Bluetooth Ant 2 + 6 GHz WLAN MIMO	Yes^*	Yes*	N/A	Yes	* Pre-installed VOIP applications are considered. ^ Bluetooth Tethering is considered
118	CDMA/EVDO data + 2.4 GHz Bluetooth Ant 1 + 2.4 GHz Bluetooth Ant 2	Yes^*	Yes*	Yes^	Yes	* Pre-installed VOIP applications are considered. ^ Bluetooth Tethering is considered
119	CDMA/EVDO data + 2.4 GHz Bluetooth Ant 1 + 2.4 GHz Bluetooth Ant 2 + 5 GHz WLAN MIMO	Yes^*	Yes*	Yes^	Yes	* Pre-installed VOIP applications are considered. ^ Bluetooth Tethering is considered
120	CDMA/EVDO data + 2.4 GHz Bluetooth Ant 1 + 2.4 GHz Bluetooth Ant 2 + 6 GHz WLAN MIMO	Yes^*	Yes*	N/A	Yes	* Pre-installed VOIP applications are considered. ^ Bluetooth Tethering is considered
121	GPRS/EDGE + 2.4 GHz WLAN	N/A	N/A	Yes	Yes	
122	GPRS/EDGE + 2.4 GHz WLAN MIMO	N/A	N/A	Yes	Yes	
123	GPRS/EDGE + 5 GHz WLAN MIMO	N/A	N/A	Yes	Yes	
124	GPRS/EDGE + 6 GHz WLAN MIMO	N/A	N/A	N/A	Yes	
125	GPRS/EDGE + 2.4 GHz WLAN + 5 GHz WLAN MIMO	N/A	N/A	Yes	Yes	
126	GPRS/EDGE + 2.4 GHz WLAN MIMO + 5 GHz WLAN MIMO	N/A	N/A	Yes	Yes	
127	GPRS/EDGE + 2.4 GHz WLAN + 6 GHz WLAN MIMO	N/A	N/A	N/A	Yes	
128	GPRS/EDGE + 2.4 GHz WLAN MIMO + 6 GHz WLAN MIMO	N/A	N/A	N/A	Yes	
129	GPRS/EDGE + 2.4 GHz Bluetooth Ant 1	N/A	N/A	Yes^	Yes	^ Bluetooth Tethering is considered
130	GPRS/EDGE + 2.4 GHz Bluetooth Ant 2	N/A	N/A	Yes^	Yes	^ Bluetooth Tethering is considered
131	GPRS/EDGE + 2.4 GHz Bluetooth Ant 1 + 5 GHz WLAN MIMO	N/A	N/A	Yes^	Yes	^ Bluetooth Tethering is considered
132	GPRS/EDGE + 2.4 GHz Bluetooth Ant 1 + 6 GHz WLAN MIMO	N/A	N/A	N/A	Yes	
133	GPRS/EDGE + 2.4 GHz Bluetooth Ant 2 + 5 GHz WLAN MIMO	N/A	N/A	Yes^	Yes	^ Bluetooth Tethering is considered
134	GPRS/EDGE + 2.4 GHz Bluetooth Ant 2 + 6 GHz WLAN MIMO	N/A	N/A	N/A	Yes	
135	GPRS/EDGE + 2.4 GHz Bluetooth Ant 1 + 2.4 GHz Bluetooth Ant 2	N/A	N/A	Yes^	Yes	^ Bluetooth Tethering is considered
136	GPRS/EDGE + 2.4 GHz Bluetooth Ant 1 + 2.4 GHz Bluetooth Ant 2 + 5 GHz WLAN MIMO	N/A	N/A	Yes^	Yes	^ Bluetooth Tethering is considered
137	GPRS/EDGE + 2.4 GHz Bluetooth Ant 1 + 2.4 GHz Bluetooth Ant 2 + 6 GHz WLAN MIMO	N/A	N/A	N/A	Yes	

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1. 2.4 GHz WLAN and 2.4 GHz Bluetooth share the same antenna path and cannot transmit simultaneously.
2. 5 GHz WLAN and 6 GHz WLAN share the same antenna path and cannot transmit simultaneously.
3. All licensed modes share the same antenna path and cannot transmit simultaneously.
4. 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.
5. Per the manufacturer, WIFI Direct is not expected to be used in conjunction with a held-to-ear or body-worn accessory voice call. Therefore, there are no simultaneous transmission scenarios involving WIFI direct beyond that listed in the above table.
6. 5 GHz Wireless Router is only supported for the U-NII-3 by S/W, therefore U-NII-1, U-NII2A, and U-NII2C were not evaluated for wireless router conditions.
7. 6 GHz Wireless Router is not supported, therefore it was not evaluated for wireless router conditions.
8. This device supports 2x2 MIMO Tx for WLAN 802.11a/g/n/ac/ax. 802.11a/g/n/ac/ax supports CDD and STBC and 802.11n/ac/ax additionally supports SDM. 2.4 GHz WLAN antenna can transmit independently or together when operating with MIMO. 5/6 GHz WLAN can transmit only when operating with MIMO.
9. This device supports VoWIFI.
10. This device supports Bluetooth Tethering.
11. This device supports VoLTE.
12. LTE + 5G NR FR1 Scenarios are limited to EN-DC combinations with anchor bands as shown in the NR FR1 checklist.
13. 5G NR FR2 n260 and n261 cannot transmit simultaneously.
14. LTE + 5G NR FR2 Scenarios are limited to EN-DC combinations with anchor bands as shown in the NR FR2 checklist.

1.8 Miscellaneous SAR Test Considerations

(A) WIFI/BT

There were no changes made to the WIFI and BT operations within this device. Please see original compliance evaluation in RF Exposure Technical Report S/N 1M2009230152-01-R2.A3L for complete evaluation of these operating modes.

(B) Licensed Transmitter(s)




Only operations relevant to this permissive change were evaluated for compliance. Please see original compliance evaluation in RF Exposure Technical Report S/N 1M2009230152-01-R2.A3L for complete evaluation of all other operating modes. The operational description includes a description of all changed items.

This device supports NR capabilities with overlapping transmission frequency ranges. When the supported frequency range of an NR Band falls completely within an NR band with a larger transmission frequency range, both NR bands have the same target power (or the band with the larger transmission frequency range has a higher target power), and both NR bands share the same transmission path and signal characteristics, SAR was only assessed for the band with the larger transmission frequency range.

NR implementation supports SA and NSA mode. In EN-DC mode, NR operates with the LTE Bands shown in the NR FR1 checklist acting as anchor bands. Per FCC guidance, SAR tests for NR Bands and LTE Anchors Bands were performed separately due to limitations in SAR probe calibration factors

NR Test Configurations were selected per the following guidelines

- MPR is permanently implemented per 3GPP standards. Conducted power and SAR test configurations were identified for RB configurations/modulations with MPR=0 dB as the most conservative SAR scenarios. 1 RB and 50% RB allocations with a low, mid and high offset within the “Inner RB allocation” range were selected to identify the configurations with the highest power.

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- The SAR test guidance outlined in section 5 of KDB 941225 D05 was generally adapted for the NR testing. DFT-S-OFDM QPSK was used as the lowest order modulation. Additional modulations were not required since conducted power was not > 0.5 dB higher than the lowest order modulation.
- All available SCS settings for this device were evaluated. The NR checklist contains information about the SCS settings per band.

No additional Part 2 testing was required for this C2PC since the changes do not impact the essential test cases evaluated in the original filing. The original filing includes at least one band of evaluation with same output power characteristics, and therefore, any additional evaluation for Part 2 smart transmit algorithm verification was not necessary.

1.9 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)
- FCC KDB Publication 616217 D04v01r02 (Proximity Sensor)

1.10 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. The serial numbers used for each test are indicated alongside the results in Section 11.

1.11 Bibliography



Report Type	Report Serial Number
RF Exposure Part 0 Test Report	1M2012210203-02.A3L

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LTE Information					
Form Factor	Portable Handset				
Frequency Range of each LTE transmission band	LTE Band 71 (665.5 - 695.5 MHz)				
	LTE Band 12 (699.7 - 715.3 MHz)				
	LTE Band 13 (779.5 - 784.5 MHz)				
	LTE Band 14 (790.5 - 795.5 MHz)				
	LTE Band 26 (Cell) (814.7 - 848.3 MHz)				
	LTE Band 5 (Cell) (824.7 - 848.3 MHz)				
	LTE Band 66 (AWS) (1710.7 - 1779.3 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 30 (2307.5 - 2312.5 MHz)				
	LTE Band 7 (2502.5 - 2567.5 MHz)				
	LTE Band 48 (3552.5 - 3697.5 MHz)				
	LTE Band 41 (2498.5 - 2687.5 MHz)				
	LTE Band 38 (2572.5 - 2617.5 MHz)				
Channel Bandwidths	LTE Band 71: 5 MHz, 10 MHz, 15 MHz, 20 MHz				
	LTE Band 12: 1.4 MHz, 3 MHz, 5 MHz, 10 MHz				
	LTE Band 13: 5 MHz, 10 MHz				
	LTE Band 14: 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 66 (AWS): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 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 30: 5 MHz, 10 MHz				
	LTE Band 7: 5 MHz, 10 MHz, 15 MHz, 20 MHz				
	LTE Band 48: 5 MHz, 10 MHz, 15 MHz, 20 MHz				
	LTE Band 41: 5 MHz, 10 MHz, 15 MHz, 20 MHz				
	LTE Band 38: 5 MHz, 10 MHz, 15 MHz, 20 MHz				
Channel Numbers and Frequencies (MHz)	Low	Low-Mid	Mid	Mid-High	High
LTE Band 71: 5 MHz	665.5 (133147)		680.5 (133297)		695.5 (133447)
LTE Band 71: 10 MHz	668 (133172)		680.5 (133297)		693 (133422)
LTE Band 71: 15 MHz	670.5 (133197)		680.5 (133297)		690.5 (133397)
LTE Band 71: 20 MHz	673 (133222)		680.5 (133297)		688 (133372)
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 13: 5 MHz	779.5 (23205)		782 (23230)		784.5 (23255)
LTE Band 13: 10 MHz	N/A		782 (23230)		N/A
LTE Band 14: 5 MHz	790.5 (23305)		793 (23330)		795.5 (23355)
LTE Band 14: 10 MHz	N/A		793 (23330)		N/A
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 66 (AWS): 1.4 MHz	1710.7 (131979)		1745 (132322)		1779.3 (132665)
LTE Band 66 (AWS): 3 MHz	1711.5 (131987)		1745 (132322)		1778.5 (132657)
LTE Band 66 (AWS): 5 MHz	1712.5 (131997)		1745 (132322)		1777.5 (132647)
LTE Band 66 (AWS): 10 MHz	1715 (132022)		1745 (132322)		1775 (132622)
LTE Band 66 (AWS): 15 MHz	1717.5 (132047)		1745 (132322)		1772.5 (132597)
LTE Band 66 (AWS): 20 MHz	1720 (132072)		1745 (132322)		1770 (132572)
LTE Band 4 (AWS): 1.4 MHz	1710.7 (19857)		1732.5 (20175)		1754.3 (20393)
LTE Band 4 (AWS): 3 MHz	1711.5 (19865)		1732.5 (20175)		1753.5 (20385)
LTE Band 4 (AWS): 5 MHz	1712.5 (19875)		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 30: 5 MHz	2307.5 (27685)		2310 (27710)		2312.5 (27735)
LTE Band 30: 10 MHz	N/A		2310 (27710)		N/A
LTE Band 7: 5 MHz	2502.5 (20775)		2535 (21100)		2567.5 (21425)
LTE Band 7: 10 MHz	2505 (20800)		2535 (21100)		2565 (21400)
LTE Band 7: 15 MHz	2507.5 (20825)		2535 (21100)		2562.5 (21375)
LTE Band 7: 20 MHz	2510 (20850)		2535 (21100)		2560 (21350)
LTE Band 48: 5 MHz	3552.5 (55265)	3600.8 (55748)	N/A	3649.2 (56232)	3697.5 (56715)
LTE Band 48: 10 MHz	3555 (55290)	3601.7 (55757)	N/A	3648.3 (56223)	3696 (56690)
LTE Band 48: 15 MHz	3557.5 (55315)	3602.5 (55765)	N/A	3647.5 (56215)	3694.5 (56685)
LTE Band 48: 20 MHz	3560 (55340)	3603.3 (55773)	N/A	3646.7 (56207)	3690 (56640)
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)
LTE Band 38: 5 MHz		2572.5 (37775)	2595 (38000)		2617.5 (38225)
LTE Band 38: 10 MHz		2575 (37800)	2595 (38000)		2615 (38200)
LTE Band 38: 15 MHz		2577.5 (37825)	2595 (38000)		2612.5 (38175)
LTE Band 38: 20 MHz		2580 (37850)	2595 (38000)		2610 (38150)
UE Category	DL UE Cat 20, UL UE Cat 18				
Modulations Supported in UL	QPSK, 16QAM, 64QAM, 256QAM				
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 Additional Information	This device does not support full CA features on 3GPP Release 16. It supports carrier aggregation, downlink MIMO, LAA features as shown in Section 9 and Appendix F. All uplink communications are identical to the Release 8 Specifications. Uplink communications are done on the PCC. The following LTE Release 16 Features are not supported: Relay, HetNet, Enhanced MIMO, eICG, eMBMS, Cross-Carrier Scheduling, Enhanced SC-FDMA.				

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NR Information					
Form Factor	Portable Handset				
Frequency Range of each NR transmission band	NR Band n71 (665.5 - 695.5 MHz)				
	NR Band n12 (701.5 - 713.5 MHz)				
	NR Band n5 (Cell) (826.5 - 846.5 MHz)				
	NR Band n66 (AWS) (1712.5 - 1777.5 MHz)				
	NR Band n25 (PCS) (1852.5 - 1912.5 MHz)				
	NR Band n2 (PCS) (1852.5 - 1907.5 MHz)				
	NR Band n30 (2307.5 - 2312.5 MHz)				
	NR Band n41 (2506.02 - 2679.99 MHz)				
	NR Band n77 (3710.01 - 3969.99 MHz)				
Channel Bandwidths	NR Band n71: 5 MHz, 10 MHz, 15 MHz, 20 MHz				
	NR Band n12: 5 MHz, 10 MHz, 15 MHz				
	NR Band n5 (Cell): 5 MHz, 10 MHz, 15 MHz, 20 MHz				
	NR Band n66 (AWS): 5 MHz, 10 MHz, 15 MHz, 20 MHz, 30 MHz, 40 MHz				
	NR Band n25 (PCS): 5 MHz, 10 MHz, 15 MHz, 20 MHz, 25 MHz, 30 MHz, 40 MHz				
	NR Band n2 (PCS): 5 MHz, 10 MHz, 15 MHz, 20 MHz				
	NR Band n30: 5 MHz, 10 MHz				
	NR Band n41: 20 MHz, 30 MHz, 40 MHz, 50 MHz, 60 MHz, 80 MHz, 90 MHz, 100 MHz				
	NR Band n77: 20 MHz, 30 MHz, 40 MHz, 50 MHz, 60 MHz, 70 MHz, 80 MHz, 90 MHz, 100 MHz				
Channel Numbers and Frequencies (MHz)	Low	Low-Mid	Mid	Mid-High	High
NR Band n71: 5 MHz	665.5 (133147)		680.5 (136100)		695.5 (133447)
NR Band n71: 10 MHz	668 (133600)		680.5 (136100)		693 (138600)
NR Band n71: 15 MHz	670.5 (134100)		680.5 (136100)		690.5 (138100)
NR Band n71: 20 MHz	673 (134600)		680.5 (136100)		688 (137600)
NR Band n12: 5 MHz	701.5 (140300)		707.5 (141500)		713.5 (142700)
NR Band n12: 10 MHz	704 (140800)		707.5 (141500)		711 (142200)
NR Band n12: 15 MHz	706.5 (141300)		707.5 (141500)		708.5 (141700)
NR Band n5 (Cell): 5 MHz	826.5 (165300)		836.5 (167300)		846.5 (169300)
NR Band n5 (Cell): 10 MHz	829 (165800)		836.5 (167300)		844 (168800)
NR Band n5 (Cell): 15 MHz	831.5 (166300)		836.5 (167300)		841.5 (168300)
NR Band n5 (Cell): 20 MHz	834 (166800)		836.5 (167300)		839 (167800)
NR Band n66 (AWS): 5 MHz	1712.5 (342500)		1745 (349000)		1777.5 (355500)
NR Band n66 (AWS): 10 MHz	1715 (343000)		1745 (349000)		1775 (355000)
NR Band n66 (AWS): 15 MHz	1717.5 (343500)		1745 (349000)		1772.5 (354500)
NR Band n66 (AWS): 20 MHz	1720 (344000)		1745 (349000)		1770 (354000)
NR Band n66 (AWS): 30 MHz	1725 (345000)		1745 (349000)		1765 (353000)
NR Band n66 (AWS): 40 MHz	1730 (346000)		1745 (349000)		1760 (352000)
NR Band n25 (PCS): 5 MHz	1852.5 (370500)		1882.5 (376500)		1912.5 (382500)
NR Band n25 (PCS): 10 MHz	1855 (371000)		1882.5 (376500)		1910 (382000)
NR Band n25 (PCS): 15 MHz	1857.5 (371500)		1882.5 (376500)		1907.5 (381500)
NR Band n25 (PCS): 20 MHz	1860 (372000)		1882.5 (376500)		1905 (381000)
NR Band n25 (PCS): 25 MHz	1862.5 (372500)		1882.5 (376500)		1902.5 (380500)
NR Band n25 (PCS): 30 MHz	1865 (373000)		1882.5 (376500)		1900 (380000)
NR Band n25 (PCS): 40 MHz	1870 (374000)		1882.5 (376500)		1895 (379000)
NR Band n2 (PCS): 5 MHz	1852.5 (370500)		1880 (376000)		1907.5 (381500)
NR Band n2 (PCS): 10 MHz	1855 (371000)		1880 (376000)		1905 (381000)
NR Band n2 (PCS): 15 MHz	1857.5 (371500)		1880 (376000)		1902.5 (380500)
NR Band n2 (PCS): 20 MHz	1860 (372000)		1880 (376000)		1900 (380000)
NR Band n30: 5 MHz	2307.5 (461500)		2310 (462000)		2312.5 (462500)
NR Band n30: 10 MHz	N/A		2310 (462000)		N/A
NR Band n41: 20 MHz	2506.02 (501204)	2549.49 (509898)	2592.99 (518598)	2636.49 (527298)	2679.99 (535998)
NR Band n41: 30 MHz	2511 (502200)	2552.01 (510402)	2592.99 (518598)	2634 (526800)	2674.98 (534996)
NR Band n41: 40 MHz	2516.01 (503202)	2567.34 (513468)	N/A	2618.67 (523734)	2670 (534000)
NR Band n41: 50 MHz	2521.02 (504204)		2592.99 (518598)		2664.99 (532998)
NR Band n41: 60 MHz	2526 (505200)		2592.99 (518598)		2659.98 (531996)
NR Band n41: 80 MHz	2536.02 (507204)		N/A		2649.99 (529998)
NR Band n41: 90 MHz	2541 (508200)		N/A		2644.98 (528996)
NR Band n41: 100 MHz	2546.01 (509202)		2592.99 (518598)		2640 (528000)
NR Band n77: 20 MHz	3710.01 (647334)	3762 (650800)	3813.99 (654266)	3866.01 (657734)	3918 (661200)
NR Band n77: 30 MHz	3715.02 (647668)	3765 (651000)	3815.01 (654334)	3864.99 (657666)	3915 (661000)
NR Band n77: 40 MHz	3720 (648000)	3768 (651200)	3816 (654400)	3864 (657600)	3912 (660800)
NR Band n77: 50 MHz	3725.01 (648334)	3782.49 (652166)	3840 (656000)		3897.51 (659834)
NR Band n77: 60 MHz	3730.02 (648668)	3803.34 (653556)	N/A	N/A	3876.66 (658444)
NR Band n77: 70 MHz	3735 (649000)	3804.99 (653666)	N/A	N/A	3875.01 (653334)
NR Band n77: 80 MHz	3740.01 (649334)	N/A	3840 (656000)		N/A
NR Band n77: 90 MHz	3745.02 (649668)	N/A	3840 (656000)		N/A
NR Band n77: 100 MHz	3750 (650000)	N/A	N/A	N/A	3930 (662000)
SCS for NR Band n71/n12/n5/n66/n25/n2/n30	15 kHz				
SCS for NR Band n41/n77	30 kHz				
Modulations Supported in UL	DFT-s-OFDM: $\pi/2$ BPSK, QPSK, 16QAM, 64QAM, 256QAM CP-OFDM: QPSK, 16QAM, 64QAM, 256QAM				
NR MPR Permanently implemented per 3GPP TS 38.101	YES				
A-MPR (Additional MPR) disabled for SAR Testing?	YES				
EN-DC Carrier Aggregation Possible Combinations	The technical description includes all the possible carrier aggregation combinations				
LTE Anchor Bands for NR Band n71	LTE Band 2/66				
LTE Anchor Bands for NR Band n12	LTE Band 2/66				
LTE Anchor Bands for NR Band n5 (Cell)	LTE Band 2/30/48/66				
LTE Anchor Bands for NR Band n66 (AWS)	LTE Band 2/5/12/13/14/30/48				
LTE Anchor Bands for NR Band n25 (PCS)	LTE Band 12/66				
LTE Anchor Bands for NR Band n2 (PCS)	LTE Band 5/12/13/14/30/48/66				
LTE Anchor Bands for NR Band n30	N/A				
LTE Anchor Bands for NR Band n41	LTE Band 2/12/25/41/66				
LTE Anchor Bands for NR Band n77	LTE Band 2/5/12/13/14/30/66				

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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]

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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.

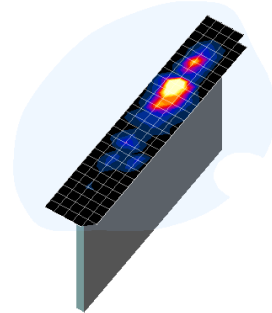


Figure 4-1
Sample SAR Area Scan

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	Graded Grid		
			$\Delta z_{\text{zoom}}(n)$	$\Delta z_{\text{zoom}}(1)^*$	$\Delta z_{\text{zoom}}(n>1)^*$	
≤ 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

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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].

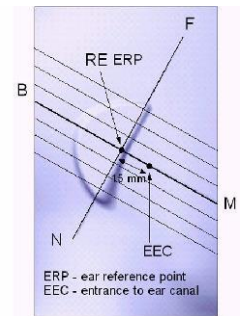


Figure 5-1
Close-Up Side view of ERP

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

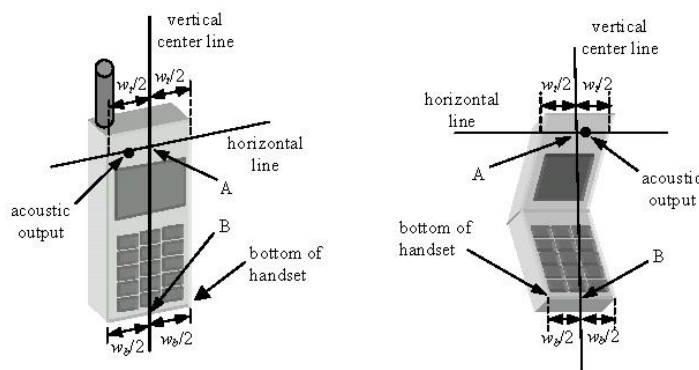


Figure 5-3
Handset Vertical Center & Horizontal Line Reference Points

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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.

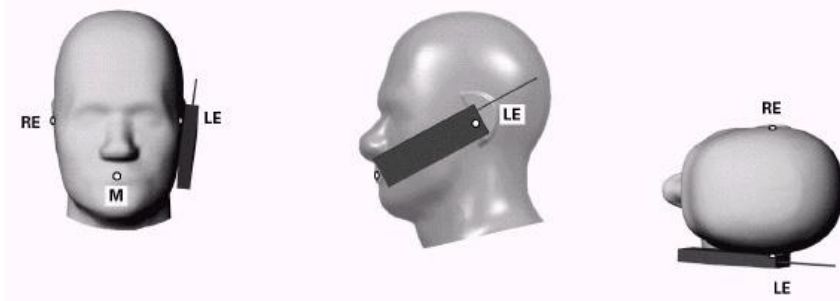





Figure 6-1 Front, Side and Top View of Cheek Position

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).

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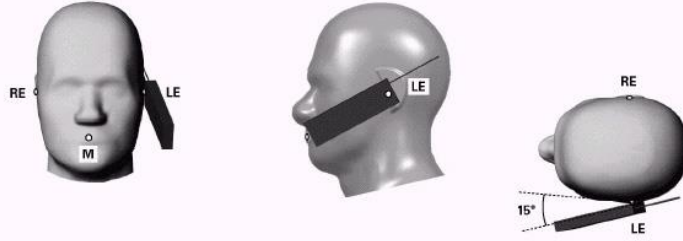


Figure 6-2 Front, Side and Top View of Ear/15° Tilt Position

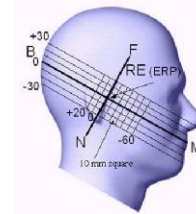


Figure 6-3 Side view w/ relevant markings

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.

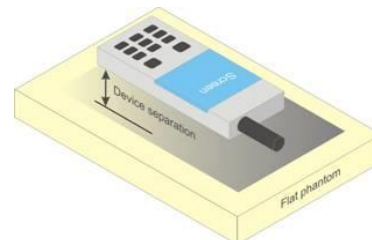





Figure 6-4 Sample Body-Worn Diagram

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

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contain metallic components are supplied with the device, the device is tested with only the accessory that dictates the closest spacing to the body. Then multiple accessories that contain metallic components are tested with the device with each accessory. If multiple accessories share an identical metallic component (i.e. the same metallic belt-clip used with different holsters with no other metallic components) only the accessory that dictates the closest spacing to the body is tested.

Body-worn accessories may not always be supplied or available as options for some devices intended to be authorized for body-worn use. In this case, a test configuration with a separation distance between the back of the device and the flat phantom is used. Test position spacing was documented. Transmitters that are designed to operate in front of a person’s face, as in push-to-talk configurations, are tested for SAR compliance with the front of the device positioned to face the flat phantom in head fluid. For devices that are carried next to the body such as a shoulder, waist or chest-worn transmitters, SAR compliance is tested with the accessories, including headsets and microphones, attached to the device and positioned against a flat phantom in a normal use configuration.

6.6 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 1g body and 10g 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 x W ≥ 9 cm x 5 cm) are based on a composite test separation distance of 10 mm from the front, back and edges of the device containing transmitting antennas within 2.5 cm of their edges, determined from general mixed use conditions for this type of devices. Since the hotspot SAR results may overlap with the body-worn accessory SAR requirements, the more conservative configurations can be considered, thus excluding some body-worn accessory SAR tests.

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

6.8 Phablet Configurations

For smart phones with a display diagonal dimension > 150 mm or an overall diagonal dimension > 160 mm that provide similar mobile web access and multimedia support found in mini-tablets or UMPC mini-tablets that

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

6.9 Proximity Sensor Considerations

This device uses a power reduction mechanism to reduce output powers in certain use conditions when the device is used close the user's body.

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

The sensor is designed to support sufficient detection range and sensitivity to cover regions of the sensors in all applicable directions since the sensor entirely covers the antennas.

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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.

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8 FCC MEASUREMENT PROCEDURES

8.1 Measured and Reported SAR

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

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All conducted power measurements in this section were performed by setting *Reserve_power_margin* (Qualcomm® Smart Transmit EFS entry) to 0dB, so that the EUT transmits continuously at minimum (P_{limit} , maximum tune up output power P_{max}).

Per October 2020 TCB Workshop Guidance, NR FR1 SAR evaluations are being generally based on adapting the existing LTE SAR procedures (FCC KDB Publication 941225 D05v02r05). Therefore, NR SAR for the lower bandwidths was not required for testing based on the measured output power and the reported NR SAR for the highest bandwidth. Lower bandwidth conducted powers for all NR bands can be found in appendix F.

9.1 NR Band n77 Antenna B

Table 9-1

NR Band n77 Antenna B Measured P_{Limit} for DSI = 0 (Body-worn, or Phablet with grip sensor inactive), or DSI = 1 (Phablet with grip sensor active) and/or DSI = 4 (Earjack Active) - 100 MHz Bandwidth

NR Band n77 100 MHz Bandwidth						
Modulation	RB Size	RB Offset	Channel		MPR Allowed per 3GPP [dB]	MPR [dB]
			650000 (3750 MHz)	662000 (3930 MHz)		
			Conducted Power [dBm]			
DFT-s-OFDM $\pi/2$ BPSK	1	1	17.27	17.37	0	0.0
	1	137	17.25	18.24		0.0
	1	271	17.32	18.01		0.0
	135	0	16.97	17.30	0-0.5	0.5
	135	69	17.50	18.13	0	0.0
	135	138	16.91	17.78	0-0.5	0.5
	270	0	17.00	17.42		0.5
DFT-s-OFDM QPSK	1	1	17.05	17.28	0	0.0
	1	137	17.18	18.17		0.0
	1	271	17.15	17.94		0.0
	135	0	16.23	16.60	0-1	1.0
	135	69	17.17	17.97	0	0.0
	135	138	16.12	17.12	0-1	1.0
	270	0	16.13	16.71		1.0
DFT-s-OFDM 16QAM	1	1	16.33	16.43	0-1	1.0
CP-OFDM QPSK	1	1	15.74	15.90	0-1.5	1.5







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Table 9-2
NR Band n77 Antenna B Measured P_{Limit} for DSI = 2 (Head)- 100 MHz Bandwidth

NR Band n77 100 MHz Bandwidth						
Modulation	RB Size	RB Offset	Channel		MPR Allowed per 3GPP [dB]	MPR [dB]
			650000 (3750 MHz)	662000 (3930 MHz)		
			Conducted Power [dBm]			
DFT-s-OFDM $\pi/2$ BPSK	1	1	12.74	12.72	0	0.0
	1	137	12.86	13.58		0.0
	1	271	12.53	13.45		0.0
	135	0	12.71	13.21	0-0.5	0.0
	135	69	12.52	13.52	0	0.0
	135	138	12.51	13.50	0-0.5	0.0
	270	0	12.65	13.31		0.0
DFT-s-OFDM QPSK	1	1	12.50	12.70	0	0.0
	1	137	12.51	13.68		0.0
	1	271	12.52	13.43		0.0
	135	0	12.62	13.28	0-1	0.0
	135	69	12.52	13.52	0	0.0
	135	138	12.55	13.58	0-1	0.0
	270	0	12.51	13.36		0.0
DFT-s-OFDM 16QAM	1	1	12.72	12.92	0-1	0.0
CP-OFDM QPSK	1	1	12.76	12.74	0-1.5	0.0

Table 9-3
NR Band n77 Antenna B Measured P_{Limit} for DSI = 3 (Hotspot Mode) - 100 MHz Bandwidth

NR Band n77 100 MHz Bandwidth						
Modulation	RB Size	RB Offset	Channel		MPR Allowed per 3GPP [dB]	MPR [dB]
			650000 (3750 MHz)	662000 (3930 MHz)		
			Conducted Power [dBm]			
DFT-s-OFDM $\pi/2$ BPSK	1	1	15.00	15.31	0	0.0
	1	137	15.19	16.25		0.0
	1	271	15.16	15.92		0.0
	135	0	15.21	15.76	0-0.5	0.0
	135	69	15.22	16.04	0	0.0
	135	138	15.24	16.16	0-0.5	0.0
	270	0	15.26	15.86		0.0
DFT-s-OFDM QPSK	1	1	15.06	15.36	0	0.0
	1	137	15.18	16.26		0.0
	1	271	15.25	16.07		0.0
	135	0	15.15	15.81	0-1	0.0
	135	69	15.18	16.13	0	0.0
	135	138	15.26	16.16	0-1	0.0
	270	0	15.29	15.97		0.0
DFT-s-OFDM 16QAM	1	1	15.13	15.28	0-1	0.0
CP-OFDM QPSK	1	1	15.01	15.32	0-1.5	0.0

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9.2 NR Band n77 Antenna G

Table 9-4

NR Band n77 Antenna G Measured P_{Limit} for DSI = 0 (Body-worn, or Phablet with grip sensor inactive), or DSI = 1 (Phablet with grip sensor active) and/or DSI = 4 (Earjack Active) - 100 MHz Bandwidth

NR Band n77 100 MHz Bandwidth						
Modulation	RB Size	RB Offset	Channel		MPR Allowed per 3GPP [dB]	MPR [dB]
			650000 (3750 MHz)	662000 (3930 MHz)		
			Conducted Power [dBm]			
DFT-s-OFDM $\pi/2$ BPSK	1	1	15.23	15.04	0	0.0
	1	137	15.55	15.66		0.0
	1	271	15.56	15.67		0.0
	135	0	14.86	14.92	0-0.5	0.5
	135	69	15.51	15.79	0	0.0
	135	138	15.00	15.12	0-0.5	0.5
270	0	14.95	15.03	0.5		
DFT-s-OFDM QPSK	1	1	15.08	15.01	0	0.0
	1	137	15.41	15.71		0.0
	1	271	15.39	15.53		0.0
	135	0	14.44	14.39	0-1	1.0
	135	69	15.46	15.55	0	0.0
	135	138	14.45	14.70	0-1	1.0
270	0	14.46	14.45	1.0		
DFT-s-OFDM 16QAM	1	1	14.22	14.29	0-1	1.0
CP-OFDM QPSK	1	1	13.81	13.55	0-1.5	1.5

Table 9-5

NR Band n77 Antenna G Measured P_{Limit} for DSI = 2 (Head)- 100 MHz Bandwidth

NR Band n77 100 MHz Bandwidth						
Modulation	RB Size	RB Offset	Channel		MPR Allowed per 3GPP [dB]	MPR [dB]
			650000 (3750 MHz)	662000 (3930 MHz)		
			Conducted Power [dBm]			
DFT-s-OFDM $\pi/2$ BPSK	1	1	10.63	10.62	0	0.0
	1	137	10.94	11.14		0.0
	1	271	10.88	10.91		0.0
	135	0	10.79	10.85	0-0.5	0.0
	135	69	10.89	10.95	0	0.0
	135	138	10.95	10.96	0-0.5	0.0
270	0	10.85	10.87	0.0		
DFT-s-OFDM QPSK	1	1	10.41	10.42	0	0.0
	1	137	10.91	11.02		0.0
	1	271	10.88	10.86		0.0
	135	0	10.77	10.86	0-1	0.0
	135	69	10.83	11.01	0	0.0
	135	138	10.88	11.02	0-1	0.0
270	0	10.81	10.83	0.0		
DFT-s-OFDM 16QAM	1	1	10.55	10.67	0-1	0.0
CP-OFDM QPSK	1	1	10.46	10.63	0-1.5	0.0



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Table 9-6
NR Band n77 Antenna G Measured P_{Limit} for DSI = 3 (Hotspot Mode) - 100 MHz Bandwidth

NR Band n77 100 MHz Bandwidth						
Modulation	RB Size	RB Offset	Channel		MPR Allowed per 3GPP [dB]	MPR [dB]
			650000 (3750 MHz)	662000 (3930 MHz)		
			Conducted Power [dBm]			
DFT-s-OFDM $\pi/2$ BPSK	1	1	13.14	13.02	0	0.0
	1	137	13.48	13.69		0.0
	1	271	13.16	13.44		0.0
	135	0	13.40	13.36	0-0.5	0.0
	135	69	13.49	13.63	0	0.0
	135	138	13.46	13.61	0-0.5	0.0
	270	0	13.50	13.45		0.0
DFT-s-OFDM QPSK	1	1	13.08	12.99	0	0.0
	1	137	13.49	13.65		0.0
	1	271	13.42	13.45		0.0
	135	0	13.43	13.39	0-1	0.0
	135	69	13.51	13.66	0	0.0
	135	138	13.47	13.59	0-1	0.0
	270	0	13.48	13.52		0.0
DFT-s-OFDM 16QAM	1	1	13.26	13.10	0-1	0.0
CP-OFDM QPSK	1	1	13.16	13.17	0-1.5	0.0

9.3 NR Band n77 Antenna D

Table 9-7
NR Band n77 Antenna D Measured P_{Limit} for DSI = 0 (Body-worn, or Phablet with grip sensor inactive), or DSI = 1 (Phablet with grip sensor active) and/or DSI = 4 (Earjack Active) - 100 MHz Bandwidth

NR Band n77 100 MHz Bandwidth						
Modulation	RB Size	RB Offset	Channel		MPR Allowed per 3GPP [dB]	MPR [dB]
			650000 (3750 MHz)	662000 (3930 MHz)		
			Conducted Power [dBm]			
DFT-s-OFDM $\pi/2$ BPSK	1	1	15.71	15.40	0	0.0
	1	137	15.64	16.26		0.0
	1	271	15.26	16.14		0.0
	135	0	15.31	15.22	0-0.5	0.5
	135	69	15.61	16.12	0	0.0
	135	138	14.91	15.74	0-0.5	0.5
	270	0	15.17	15.39		0.5
DFT-s-OFDM QPSK	1	1	15.72	15.45	0	0.0
	1	137	15.60	16.28		0.0
	1	271	15.30	16.10		0.0
	135	0	14.78	14.86	0-1	1.0
	135	69	15.62	16.22	0	0.0
	135	138	14.46	15.38	0-1	1.0
	270	0	14.71	15.06		1.0
DFT-s-OFDM 16QAM	1	1	14.77	14.47	0-1	1.0
CP-OFDM QPSK	1	1	14.26	14.29	0-1.5	1.5




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Table 9-8
NR Band n77 Antenna D Measured P_{Limit} for DSI = 2 (Head)- 100 MHz Bandwidth

NR Band n77 100 MHz Bandwidth						
Modulation	RB Size	RB Offset	Channel		MPR Allowed per 3GPP [dB]	MPR [dB]
			650000 (3750 MHz)	662000 (3930 MHz)		
			Conducted Power [dBm]			
DFT-s-OFDM $\pi/2$ BPSK	1	1	11.23	11.08	0	0.0
	1	137	11.01	11.90		0.0
	1	271	10.63	11.83		0.0
	135	0	11.26	11.53	0-0.5	0.0
	135	69	10.94	11.84	0	0.0
	135	138	10.81	11.90	0-0.5	0.0
	270	0	10.98	11.66		0.0
DFT-s-OFDM QPSK	1	1	11.28	11.02	0	0.0
	1	137	11.06	11.88		0.0
	1	271	10.69	11.81		0.0
	135	0	11.18	11.52	0-1	0.0
	135	69	10.91	11.81	0	0.0
	135	138	10.83	11.89	0-1	0.0
	270	0	11.03	11.68		0.0
DFT-s-OFDM 16QAM	1	1	11.33	10.94	0-1	0.0
CP-OFDM QPSK	1	1	11.17	10.99	0-1.5	0.0

Table 9-9
NR Band n77 Antenna D Measured P_{Limit} for DSI = 3 (Hotspot Mode) - 100 MHz Bandwidth

NR Band n77 100 MHz Bandwidth						
Modulation	RB Size	RB Offset	Channel		MPR Allowed per 3GPP [dB]	MPR [dB]
			650000 (3750 MHz)	662000 (3930 MHz)		
			Conducted Power [dBm]			
DFT-s-OFDM $\pi/2$ BPSK	1	1	13.76	13.73	0	0.0
	1	137	13.63	14.48		0.0
	1	271	13.34	14.52		0.0
	135	0	13.84	14.10	0-0.5	0.0
	135	69	13.58	14.51	0	0.0
	135	138	13.37	14.58	0-0.5	0.0
	270	0	13.75	14.36		0.0
DFT-s-OFDM QPSK	1	1	13.67	13.82	0	0.0
	1	137	13.66	14.22		0.0
	1	271	13.38	14.31		0.0
	135	0	13.72	14.06	0-1	0.0
	135	69	13.57	14.50	0	0.0
	135	138	13.42	14.59	0-1	0.0
	270	0	13.61	14.10		0.0
DFT-s-OFDM 16QAM	1	1	13.70	13.73	0-1	0.0
CP-OFDM QPSK	1	1	13.71	13.72	0-1.5	0.0

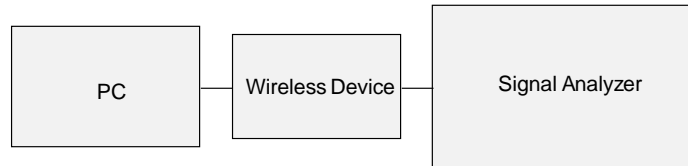


Figure 9-1
Power Measurement Setup

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10 SYSTEM VERIFICATION

10.1 Tissue Verification

**Table 10-1
Measured 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
02/19/2021	3600H	18.0	3700	3.101	38.664	3.117	37.700	-0.51%	2.56%
			3750	3.150	38.549	3.169	37.643	-0.60%	2.41%
			3900	3.322	38.306	3.323	37.471	-0.03%	2.23%
			3930	3.337	38.245	3.353	37.437	-0.48%	2.16%
01/22/2021	3600B	20.3	3700	3.451	49.678	3.548	51.050	-2.73%	-2.69%
			3750	3.515	49.561	3.606	50.982	-2.52%	-2.79%
			3900	3.712	49.333	3.781	50.779	-1.82%	-2.85%
			3930	3.735	49.266	3.816	50.738	-2.12%	-2.90%
02/22/2021	3600B	19.6	3700	3.539	49.424	3.548	51.050	-0.25%	-3.19%
			3750	3.602	49.298	3.606	50.982	-0.11%	-3.30%
			3900	3.803	49.039	3.781	50.779	0.58%	-3.43%
			3930	3.841	48.956	3.816	50.738	0.66%	-3.51%

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.

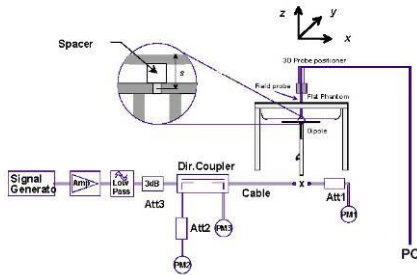
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10.2 Test System Verification

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 D.

**Table 10-2
System Verification Results**

System Verification TARGET & MEASURED												
SAR System #	Tissue Frequency (MHz)	Tissue Type	Date	Amb. Temp (°C)	Liquid Temp (°C)	Input Power (W)	Source SN	Probe SN	Measured SAR _{1g} (W/kg)	1 W Target SAR _{1g} (W/kg)	1 W Normalized SAR _{1g} (W/kg)	Deviation _{1g} (%)
D	3700	HEAD	02/19/2021	21.2	19.9	0.100	1067	3589	6.860	67.200	68.600	2.08%
D	3900	HEAD	02/19/2021	21.2	19.9	0.100	1056	3589	6.900	68.900	69.000	0.15%
L	3700	BODY	01/22/2021	23.3	20.1	0.100	1067	7539	6.480	65.200	64.800	-0.61%
L	3900	BODY	01/22/2021	23.3	20.1	0.100	1056	7539	6.720	66.300	67.200	1.36%
L	3700	BODY	02/22/2021	21.3	20.2	0.100	1067	7539	6.670	65.200	66.700	2.30%
L	3900	BODY	02/22/2021	21.3	20.2	0.100	1056	7539	6.740	66.300	67.400	1.66%



**Figure 10-1
System Verification Setup Diagram**



**Figure 10-2
System Verification Setup Photo**

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11 SAR DATA SUMMARY

11.1 Standalone Head SAR Data

**Table 11-1
NR Band n77 Antenna B Head SAR**



MEASUREMENT RESULTS																					
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Antenna Config	Power Drift [dB]	MPR [dB]	Side	Test Position	Waveform	Modulation	RB Size	RB Offset	Serial Number	Duty Cycle	SAR (1g) (W/kg)	Scaling Factor	Reported SAR (1g) (W/kg)	Plot #	
MHz	Ch.																				
3930.00	662000	High	NR Band n77	100	14.5	13.68	B	0.16	0	Right	Cheek	DFT-S-OFDM	QPSK	1	137	3972S	1:1	0.000	1.208	0.000	
3930.00	662000	High	NR Band n77	100	14.5	13.58	B	0.02	0	Right	Cheek	DFT-S-OFDM	QPSK	135	138	3972S	1:1	0.000	1.236	0.000	
3930.00	662000	High	NR Band n77	100	14.5	13.68	B	0.10	0	Right	Tilt	DFT-S-OFDM	QPSK	1	137	3972S	1:1	0.000	1.208	0.000	
3930.00	662000	High	NR Band n77	100	14.5	13.58	B	0.10	0	Right	Tilt	DFT-S-OFDM	QPSK	135	138	3972S	1:1	0.000	1.236	0.000	
3930.00	662000	High	NR Band n77	100	14.5	13.68	B	0.02	0	Left	Cheek	DFT-S-OFDM	QPSK	1	137	3972S	1:1	0.000	1.208	0.000	
3930.00	662000	High	NR Band n77	100	14.5	13.58	B	0.11	0	Left	Cheek	DFT-S-OFDM	QPSK	135	138	3972S	1:1	0.000	1.236	0.000	
3750.00	650000	Low	NR Band n77	100	14.5	12.76	B	0.03	0	Left	Cheek	CP-OFDM	QPSK	1	1	3972S	1:1	0.000	1.493	0.000	
3930.00	662000	High	NR Band n77	100	14.5	13.68	B	0.05	0	Left	Tilt	DFT-S-OFDM	QPSK	1	137	3972S	1:1	0.000	1.208	0.000	
3930.00	662000	High	NR Band n77	100	14.5	13.58	B	-0.02	0	Left	Tilt	DFT-S-OFDM	QPSK	135	138	3972S	1:1	0.000	1.236	0.000	
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
NR Band n77 Antenna G Head SAR**

MEASUREMENT RESULTS																					
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Antenna Config	Power Drift [dB]	MPR [dB]	Side	Test Position	Waveform	Modulation	RB Size	RB Offset	Serial Number	Duty Cycle	SAR (1g) (W/kg)	Scaling Factor	Reported SAR (1g) (W/kg)	Plot #	
MHz	Ch.																				
3930.00	662000	High	NR Band n77	100	12.0	11.02	G	-0.03	0	Right	Cheek	DFT-S-OFDM	QPSK	1	137	3987S	1:1	0.000	1.253	0.000	
3930.00	662000	High	NR Band n77	100	12.0	11.02	G	0.02	0	Right	Cheek	DFT-S-OFDM	QPSK	135	138	3987S	1:1	0.001	1.253	0.001	
3930.00	662000	High	NR Band n77	100	12.0	11.02	G	0.07	0	Right	Tilt	DFT-S-OFDM	QPSK	1	137	3987S	1:1	0.001	1.253	0.001	A1
3930.00	662000	High	NR Band n77	100	12.0	11.02	G	0.10	0	Right	Tilt	DFT-S-OFDM	QPSK	135	138	3987S	1:1	0.000	1.253	0.000	
3930.00	662000	High	NR Band n77	100	12.0	10.63	G	-0.03	0	Right	Tilt	CP-OFDM	QPSK	1	1	3987S	1:1	0.000	1.371	0.000	
3930.00	662000	High	NR Band n77	100	12.0	11.02	G	0.02	0	Left	Cheek	DFT-S-OFDM	QPSK	1	137	3987S	1:1	0.000	1.253	0.000	
3930.00	662000	High	NR Band n77	100	12.0	11.02	G	0.03	0	Left	Cheek	DFT-S-OFDM	QPSK	135	138	3987S	1:1	0.001	1.253	0.001	
3930.00	662000	High	NR Band n77	100	12.0	11.02	G	0.15	0	Left	Tilt	DFT-S-OFDM	QPSK	1	137	3987S	1:1	0.000	1.253	0.000	
3930.00	662000	High	NR Band n77	100	12.0	11.02	G	0.05	0	Left	Tilt	DFT-S-OFDM	QPSK	135	138	3987S	1:1	0.001	1.253	0.001	
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 11-3
NR Band n77 Antenna D Head SAR**

MEASUREMENT RESULTS																					
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Antenna Config	Power Drift [dB]	MPR [dB]	Side	Test Position	Waveform	Modulation	RB Size	RB Offset	Serial Number	Duty Cycle	SAR (1g) (W/kg)	Scaling Factor	Reported SAR (1g) (W/kg)	Plot #	
MHz	Ch.																				
3930.00	662000	High	NR Band n77	100	13.0	11.88	D	-0.16	0	Right	Cheek	DFT-S-OFDM	QPSK	1	137	3982S	1:1	0.000	1.294	0.000	
3930.00	662000	High	NR Band n77	100	13.0	11.89	D	0.00	0	Right	Cheek	DFT-S-OFDM	QPSK	135	138	3982S	1:1	0.000	1.291	0.000	
3930.00	662000	High	NR Band n77	100	13.0	11.88	D	0.16	0	Right	Tilt	DFT-S-OFDM	QPSK	1	137	3982S	1:1	0.000	1.294	0.000	
3930.00	662000	High	NR Band n77	100	13.0	11.89	D	0.04	0	Right	Tilt	DFT-S-OFDM	QPSK	135	138	3982S	1:1	0.000	1.291	0.000	
3750.00	650000	Low	NR Band n77	100	13.0	11.17	D	0.10	0	Right	Tilt	CP-OFDM	QPSK	1	1	3982S	1:1	0.000	1.524	0.000	
3930.00	662000	High	NR Band n77	100	13.0	11.88	D	-0.10	0	Left	Cheek	DFT-S-OFDM	QPSK	1	137	3982S	1:1	0.000	1.294	0.000	
3930.00	662000	High	NR Band n77	100	13.0	11.89	D	0.10	0	Left	Cheek	DFT-S-OFDM	QPSK	135	138	3982S	1:1	0.000	1.291	0.000	
3930.00	662000	High	NR Band n77	100	13.0	11.88	D	0.02	0	Left	Tilt	DFT-S-OFDM	QPSK	1	137	3982S	1:1	0.000	1.294	0.000	
3930.00	662000	High	NR Band n77	100	13.0	11.89	D	0.11	0	Left	Tilt	DFT-S-OFDM	QPSK	135	138	3982S	1:1	0.000	1.291	0.000	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Head 1.6 W/kg (mW/g) averaged over 1 gram											

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11.2 Standalone Body-Worn SAR Data



Table 11-4
NR Body-Worn SAR

MEASUREMENT RESULTS																					
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Antenna Config	Power Drift [dB]	MPR [dB]	Serial Number	Waveform	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
MHz	Ch.																(W/kg)		(W/kg)		
3930.00	662000	High	NR Band n77	100	19.0	18.17	B	0.04	0	3982S	DFT-S-OFDM	QPSK	1	137	15 mm	back	1:1	0.035	1.211	0.042	
3930.00	662000	High	NR Band n77	100	19.0	17.97	B	0.04	0	3982S	DFT-S-OFDM	QPSK	135	69	15 mm	back	1:1	0.055	1.268	0.070	
3930.00	662000	High	NR Band n77	100	17.5	15.90	B	0.03	1.5	3982S	CP-OFDM	QPSK	1	1	15 mm	back	1:1	0.024	1.445	0.035	
3930.00	662000	High	NR Band n77	100	16.5	15.71	G	0.10	0	3987S	DFT-S-OFDM	QPSK	1	137	15 mm	back	1:1	0.069	1.199	0.083	
3930.00	662000	High	NR Band n77	100	16.5	15.55	G	0.17	0	3987S	DFT-S-OFDM	QPSK	135	69	15 mm	back	1:1	0.069	1.245	0.086	A2
3750.00	650000	Low	NR Band n77	100	15.0	13.81	G	0.03	1.5	3987S	CP-OFDM	QPSK	1	1	15 mm	back	1:1	0.037	1.315	0.049	
3930.00	662000	High	NR Band n77	100	17.5	16.28	D	0.09	0	3972S	DFT-S-OFDM	QPSK	1	137	15 mm	back	1:1	0.028	1.324	0.037	
3930.00	662000	High	NR Band n77	100	17.5	16.22	D	0.07	0	3972S	DFT-S-OFDM	QPSK	135	69	15 mm	back	1:1	0.028	1.343	0.038	
3930.00	662000	High	NR Band n77	100	16.0	14.29	D	0.15	1.5	3972S	CP-OFDM	QPSK	1	1	15 mm	back	1:1	0.019	1.483	0.028	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Body 1.6 W/kg (mW/g) averaged over 1 gram											

11.3 Standalone Hotspot SAR Data

Table 11-5
NR Band n77 Antenna B Hotspot SAR

MEASUREMENT RESULTS																					
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Antenna Config	Power Drift [dB]	MPR [dB]	Serial Number	Waveform	Modulation	RB Size	RB Offset	Spacing	MPR [dB]	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
MHz	Ch.																(W/kg)		(W/kg)		
3930.00	662000	High	NR Band n77	100	17.0	16.26	B	0.05	0	3982S	DFT-S-OFDM	QPSK	1	137	10 mm	back	1:1	0.038	1.186	0.045	
3930.00	662000	High	NR Band n77	100	17.0	16.16	B	0.07	0	3982S	DFT-S-OFDM	QPSK	135	138	10 mm	back	1:1	0.033	1.213	0.040	
3930.00	662000	High	NR Band n77	100	17.0	16.26	B	-0.04	0	3982S	DFT-S-OFDM	QPSK	1	137	10 mm	front	1:1	0.032	1.186	0.038	
3930.00	662000	High	NR Band n77	100	17.0	16.16	B	0.05	0	3982S	DFT-S-OFDM	QPSK	135	138	10 mm	front	1:1	0.030	1.213	0.036	
3930.00	662000	High	NR Band n77	100	17.0	16.26	B	0.09	0	3982S	DFT-S-OFDM	QPSK	1	137	10 mm	bottom	1:1	0.087	1.186	0.103	
3930.00	662000	High	NR Band n77	100	17.0	16.16	B	0.11	0	3982S	DFT-S-OFDM	QPSK	135	138	10 mm	bottom	1:1	0.076	1.213	0.092	
3930.00	662000	High	NR Band n77	100	17.0	15.32	B	0.11	0	3982S	CP-OFDM	QPSK	1	1	10 mm	bottom	1:1	0.105	1.472	0.155	A3
3930.00	662000	High	NR Band n77	100	17.0	16.26	B	-0.18	0	3982S	DFT-S-OFDM	QPSK	1	137	10 mm	left	1:1	0.002	1.186	0.002	
3930.00	662000	High	NR Band n77	100	17.0	16.16	B	0.09	0	3982S	DFT-S-OFDM	QPSK	135	138	10 mm	left	1:1	0.002	1.213	0.002	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Body 1.6 W/kg (mW/g) averaged over 1 gram											

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**Table 11-6
NR Band n77 Antenna G Hotspot SAR**

MEASUREMENT RESULTS																					
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Antenna Config	Power Drift [dB]	MPR [dB]	Serial Number	Waveform	Modulation	RB Size	RB Offset	Spacing	MPR [dB]	Duty Cycle	SAR (1g) (W/kg)	Scaling Factor	Reported SAR (1g) (W/kg)	Plot #	
MHz	Ch.																				
3930.00	662000	High	NR Band n77	100	14.5	13.65	G	-0.15	0	3987S	DFT-S-OFDM	QPSK	1	137	10 mm	back	1:1	0.083	1.216	0.101	
3930.00	662000	High	NR Band n77	100	14.5	13.66	G	-0.01	0	3987S	DFT-S-OFDM	QPSK	135	69	10 mm	back	1:1	0.083	1.213	0.101	
3930.00	662000	High	NR Band n77	100	14.5	13.17	G	0.08	0	3987S	CP-OFDM	QPSK	1	1	10 mm	back	1:1	0.082	1.358	0.111	
3930.00	662000	High	NR Band n77	100	14.5	13.65	G	0.09	0	3987S	DFT-S-OFDM	QPSK	1	137	10 mm	front	1:1	0.000	1.216	0.000	
3930.00	662000	High	NR Band n77	100	14.5	13.66	G	0.09	0	3987S	DFT-S-OFDM	QPSK	135	69	10 mm	front	1:1	0.000	1.213	0.000	
3930.00	662000	High	NR Band n77	100	14.5	13.65	G	0.00	0	3987S	DFT-S-OFDM	QPSK	1	137	10 mm	top	1:1	0.011	1.216	0.013	
3930.00	662000	High	NR Band n77	100	14.5	13.66	G	0.17	0	3987S	DFT-S-OFDM	QPSK	135	69	10 mm	top	1:1	0.012	1.213	0.015	
3930.00	662000	High	NR Band n77	100	14.5	13.65	G	0.03	0	3987S	DFT-S-OFDM	QPSK	1	137	10 mm	left	1:1	0.007	1.216	0.009	
3930.00	662000	High	NR Band n77	100	14.5	13.66	G	0.18	0	3987S	DFT-S-OFDM	QPSK	135	69	10 mm	left	1:1	0.006	1.213	0.007	
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 11-7
NR Band n77 Antenna D Hotspot SAR**

MEASUREMENT RESULTS																					
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Antenna Config	Power Drift [dB]	MPR [dB]	Serial Number	Waveform	Modulation	RB Size	RB Offset	Spacing	MPR [dB]	Duty Cycle	SAR (1g) (W/kg)	Scaling Factor	Reported SAR (1g) (W/kg)	Plot #	
MHz	Ch.																				
3930.00	662000	High	NR Band n77	100	15.5	14.31	D	0.03	0.0	3972S	DFT-S-OFDM	QPSK	1	271	10 mm	back	1:1	0.040	1.315	0.053	
3930.00	662000	High	NR Band n77	100	15.5	14.59	D	-0.18	0.0	3972S	DFT-S-OFDM	QPSK	135	138	10 mm	back	1:1	0.040	1.233	0.049	
3930.00	662000	High	NR Band n77	100	15.5	13.72	D	0.02	0.0	3972S	CP-OFDM	QPSK	1	1	10 mm	back	1:1	0.050	1.507	0.075	
3930.00	662000	High	NR Band n77	100	15.5	14.31	D	0.05	0.0	3972S	DFT-S-OFDM	QPSK	1	271	10 mm	front	1:1	0.000	1.315	0.000	
3930.00	662000	High	NR Band n77	100	15.5	14.59	D	-0.02	0.0	3972S	DFT-S-OFDM	QPSK	135	138	10 mm	front	1:1	0.000	1.233	0.000	
3930.00	662000	High	NR Band n77	100	15.5	14.31	D	-0.15	0.0	3972S	DFT-S-OFDM	QPSK	1	271	10 mm	bottom	1:1	0.008	1.315	0.011	
3930.00	662000	High	NR Band n77	100	15.5	14.59	D	0.15	0.0	3972S	DFT-S-OFDM	QPSK	135	138	10 mm	bottom	1:1	0.007	1.233	0.009	
3930.00	662000	High	NR Band n77	100	15.5	14.31	D	0.05	0.0	3972S	DFT-S-OFDM	QPSK	1	271	10 mm	right	1:1	0.003	1.315	0.004	
3930.00	662000	High	NR Band n77	100	15.5	14.59	D	0.03	0.0	3972S	DFT-S-OFDM	QPSK	135	138	10 mm	right	1:1	0.002	1.233	0.002	
3930.00	662000	High	NR Band n77	100	15.5	14.31	D	-0.15	0.0	3972S	DFT-S-OFDM	QPSK	1	271	10 mm	left	1:1	0.002	1.315	0.003	
3930.00	662000	High	NR Band n77	100	15.5	14.59	D	-0.06	0.0	3972S	DFT-S-OFDM	QPSK	135	138	10 mm	left	1:1	0.000	1.233	0.000	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Body 1.6 W/kg (mW/g) averaged over 1 gram											

11.4 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.
- Device was tested using a fixed spacing for body-worn accessory testing. A separation distance of 15 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.
- 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.

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8. Per FCC KDB Publication 865664 D01v01r04, variability SAR tests were not required since measured SAR results for all frequency bands were less than 0.8 W/kg.
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 uses Qualcomm Smart Transmit for 2G/3G/4G/5G operations to control and manage transmitting power in real time to ensure RF Exposure compliance. Per FCC Guidance, compliance was assessed at the minimum of the time averaged power and the maximum output power for each band/mode/exposure condition (DSI).

NR Notes:

1. NR implementation supports SA and NSA mode. In EN-DC mode, NR operates with the LTE Bands shown in the NR FR1 checklist acting as anchor bands. Per FCC guidance, SAR tests for NR Bands and LTE Anchors Bands were performed separately due to limitations in SAR probe calibration factors.
2. Due to test setup limitations, SAR testing for NR was performed using test mode software to establish the connection.
3. No additional Part 2 testing was required for this C2PC since the changes do not impact the essential test cases evaluated in the original filing.
4. Per FCC Guidance, NR modulations and RB Sizes/Offsets were selected for testing such that configurations with the highest output power were evaluated for SAR tests.

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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.

Please see the original compliance evaluation in RF Exposure Technical Report S/N: 1M2009230152-01-R2.A3L for the standalone reported SAR for modes and bands not evaluated for this permissive change.




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 1g SAR for all the simultaneous transmitting antennas in a specific a 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 1g or 10g SAR.

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 (“-“).

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

Qualcomm Smart Transmit algorithm in WWAN adds directly the time-averaged RF exposure from 4G and time-averaged RF exposure from 5G NR. Smart Transmit algorithm controls the total RF exposure from both 4G and 5G NR to not exceed FCC limit. Therefore, simultaneous transmission compliance between 4G+5G operations is demonstrated in the Part 2 Report during algorithm validation.

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12.3 Head SAR Simultaneous Transmission Analysis

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

Configuration	Mode	5G SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	2.4 GHz WLAN MIMO at 19 dBm SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	4	1+2	1+3	1+4
Head SAR	NR Band n77 Antenna B	0.000	0.127	0.307	0.400	0.127	0.307	0.400
	NR Band n77 Antenna G	0.001	0.127	0.307	0.400	0.128	0.308	0.401
	NR Band n77 Antenna D	0.000	0.127	0.307	0.400	0.127	0.307	0.400

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

Configuration	Mode	5G SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Head SAR	NR Band n77 Antenna B	0.000	0.146	0.146
	NR Band n77 Antenna G	0.001	0.146	0.147
	NR Band n77 Antenna D	0.000	0.146	0.146

Table 12-3
Simultaneous Transmission Scenario with 6 GHz WLAN (Held to Ear)

Configuration	Mode	5G SAR (W/kg)	6 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Head SAR	NR Band n77 Antenna B	0.000	0.023	0.023
	NR Band n77 Antenna G	0.001	0.023	0.024
	NR Band n77 Antenna D	0.000	0.023	0.023

Table 12-4
Simultaneous Transmission Scenario with 2.4 GHz WLAN and 5 GHz WLAN MIMO (Held to Ear)

Configuration	Mode	5G SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	2.4 GHz WLAN MIMO at 16 dBm SAR (W/kg)	5 GHz WLAN MIMO at 16 dBm SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	4	5	1+2+5	1+3+5	1+4+5
Head SAR	NR Band n77 Antenna B	0.000	0.127	0.307	0.166	0.146	0.273	0.453	0.312
	NR Band n77 Antenna G	0.001	0.127	0.307	0.166	0.146	0.274	0.454	0.313
	NR Band n77 Antenna D	0.000	0.127	0.307	0.166	0.146	0.273	0.453	0.312

Table 12-5
Simultaneous Transmission Scenario with 2.4 GHz WLAN and 6 GHz WLAN MIMO (Held to Ear)

Configuration	Mode	5G SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	2.4 GHz WLAN MIMO at 16 dBm SAR (W/kg)	6 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	4	5	1+2+5	1+3+5	1+4+5
Head SAR	NR Band n77 Antenna B	0.000	0.127	0.307	0.166	0.023	0.150	0.330	0.189
	NR Band n77 Antenna G	0.001	0.127	0.307	0.166	0.023	0.151	0.331	0.190
	NR Band n77 Antenna D	0.000	0.127	0.307	0.166	0.023	0.150	0.330	0.189




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Table 12-6
Simultaneous Transmission Scenario with Bluetooth (Held to Ear)

Configuration	Mode	5G SAR (W/kg)	2.4 GHz Bluetooth Ant 1 SAR (W/kg)	2.4 GHz Bluetooth Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Head SAR	NR Band n77 Antenna B	0.000	0.027	0.142	0.027	0.142	0.169
	NR Band n77 Antenna G	0.001	0.027	0.142	0.028	0.143	0.170
	NR Band n77 Antenna D	0.000	0.027	0.142	0.027	0.142	0.169

Table 12-7
Simultaneous Transmission Scenario with Bluetooth and 5 GHz WLAN (Held to Ear)

Configuration	Mode	5G SAR (W/kg)	2.4 GHz Bluetooth Ant 1 SAR (W/kg)	2.4 GHz Bluetooth Ant 2 SAR (W/kg)	5 GHz WLAN MIMO at 16 dBm SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	4	1+2+4	1+3+4	1+2+3+4
Head SAR	NR Band n77 Antenna B	0.000	0.027	0.142	0.146	0.173	0.288	0.315
	NR Band n77 Antenna G	0.001	0.027	0.142	0.146	0.174	0.289	0.316
	NR Band n77 Antenna D	0.000	0.027	0.142	0.146	0.173	0.288	0.315

Table 12-8
Simultaneous Transmission Scenario with Bluetooth and 6 GHz WLAN (Held to Ear)

Configuration	Mode	5G SAR (W/kg)	2.4 GHz Bluetooth Ant 1 SAR (W/kg)	2.4 GHz Bluetooth Ant 2 SAR (W/kg)	6 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	4	1+2+4	1+3+4	1+2+3+4
Head SAR	NR Band n77 Antenna B	0.000	0.027	0.142	0.023	0.050	0.165	0.192
	NR Band n77 Antenna G	0.001	0.027	0.142	0.023	0.051	0.166	0.193
	NR Band n77 Antenna D	0.000	0.027	0.142	0.023	0.050	0.165	0.192

12.4 Body-Worn Simultaneous Transmission Analysis

Table 12-9
Simultaneous Transmission Scenario with 2.4 GHz WLAN (Body-Worn at 1.5 cm)

Configuration	Mode	5G SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Body - Worn SAR	NR Band n77 Antenna B	0.070	0.209	0.134	0.279	0.204	0.413
	NR Band n77 Antenna G	0.086	0.209	0.134	0.295	0.220	0.429
	NR Band n77 Antenna D	0.038	0.209	0.134	0.247	0.172	0.381

Table 12-10
Simultaneous Transmission Scenario with 5 GHz WLAN (Body-Worn at 1.5 cm)

Configuration	Mode	5G SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Body - Worn SAR	NR Band n77 Antenna B	0.070	0.472	0.542
	NR Band n77 Antenna G	0.086	0.472	0.558
	NR Band n77 Antenna D	0.038	0.472	0.510



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Table 12-11
Simultaneous Transmission Scenario with 6 GHz WLAN (Body-Worn at 1.5 cm)

Configuration	Mode	5G SAR (W/kg)	6 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Body - Worn SAR	NR Band n77 Antenna B	0.070	0.061	0.131
	NR Band n77 Antenna G	0.086	0.061	0.147
	NR Band n77 Antenna D	0.038	0.061	0.099

Table 12-12
Simultaneous Transmission Scenario with 2.4 GHz WLAN and 5 GHz WLAN MIMO (Body-Worn at 1.5 cm)

Configuration	Mode	5G SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	2.4 GHz WLAN MIMO at 19 dBm SAR (W/kg)	5 GHz WLAN MIMO at 16 dBm SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	4	5	1+2+5	1+3+5	1+4+5
Body - Worn SAR	NR Band n77 Antenna B	0.070	0.209	0.134	0.074	0.110	0.389	0.314	0.254
	NR Band n77 Antenna G	0.086	0.209	0.134	0.074	0.110	0.405	0.330	0.270
	NR Band n77 Antenna D	0.038	0.209	0.134	0.074	0.110	0.357	0.282	0.222

Table 12-13
Simultaneous Transmission Scenario with 2.4 GHz WLAN and 6 GHz WLAN MIMO (Body-Worn at 1.5 cm)

Configuration	Mode	5G SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	2.4 GHz WLAN MIMO at 19 dBm SAR (W/kg)	6 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	4	5	1+2+5	1+3+5	1+4+5
Body - Worn SAR	NR Band n77 Antenna B	0.070	0.209	0.134	0.074	0.061	0.340	0.265	0.205
	NR Band n77 Antenna G	0.086	0.209	0.134	0.074	0.061	0.356	0.281	0.221
	NR Band n77 Antenna D	0.038	0.209	0.134	0.074	0.061	0.308	0.233	0.173

Table 12-14
Simultaneous Transmission Scenario with Bluetooth (Body-Worn at 1.5 cm)

Configuration	Mode	5G SAR (W/kg)	2.4 GHz Bluetooth Ant 1 SAR (W/kg)	2.4 GHz Bluetooth Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Body - Worn SAR	NR Band n77 Antenna B	0.070	0.046	0.012	0.116	0.082	0.128
	NR Band n77 Antenna G	0.086	0.046	0.012	0.132	0.098	0.144
	NR Band n77 Antenna D	0.038	0.046	0.012	0.084	0.050	0.096

Table 12-15
Simultaneous Transmission Scenario with Bluetooth and 5 GHz WLAN MIMO (Body-Worn at 1.5 cm)

Configuration	Mode	5G SAR (W/kg)	2.4 GHz Bluetooth Ant 1 SAR (W/kg)	2.4 GHz Bluetooth Ant 2 SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	4	1+2+4	1+3+4	1+2+3+4
Body - Worn SAR	NR Band n77 Antenna B	0.070	0.046	0.012	0.472	0.588	0.554	0.600
	NR Band n77 Antenna G	0.086	0.046	0.012	0.472	0.604	0.570	0.616
	NR Band n77 Antenna D	0.038	0.046	0.012	0.472	0.556	0.522	0.568




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Table 12-16

Simultaneous Transmission Scenario with Bluetooth and 6 GHz WLAN MIMO (Body-Worn at 1.5 cm)

Configuration	Mode	5G SAR (W/kg)	2.4 GHz Bluetooth Ant 1 SAR (W/kg)	2.4 GHz Bluetooth Ant 2 SAR (W/kg)	6 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	4	1+2+4	1+3+4	1+2+3+4
Body - Worn SAR	NR Band n77 Antenna B	0.070	0.046	0.012	0.061	0.177	0.143	0.189
	NR Band n77 Antenna G	0.086	0.046	0.012	0.061	0.193	0.159	0.205
	NR Band n77 Antenna D	0.038	0.046	0.012	0.061	0.145	0.111	0.157

12.5 Hotspot SAR Simultaneous Transmission Analysis

Table 12-17

Simultaneous Transmission Scenario with 2.4 GHz WLAN (Hotspot at 1.0 cm)

Configuration	Mode	5G SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Hotspot SAR	NR Band n77 Antenna B	0.155	0.454	0.458	0.609	0.613	1.067
	NR Band n77 Antenna G	0.111	0.454	0.458	0.565	0.569	1.023
	NR Band n77 Antenna D	0.075	0.454	0.458	0.529	0.533	0.987

Table 12-18

Simultaneous Transmission Scenario with 5 GHz WLAN MIMO (Hotspot at 1.0 cm)

Configuration	Mode	5G SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Hotspot SAR	NR Band n77 Antenna B	0.155	0.492	0.647
	NR Band n77 Antenna G	0.111	0.492	0.603
	NR Band n77 Antenna D	0.075	0.492	0.567

Table 12-19

Simultaneous Transmission Scenario with 2.4 GHz WLAN and 5 GHz WLAN MIMO (Hotspot at 1.0 cm)

Configuration	Mode	5G SAR (W/kg)	2.4 GHz WLAN Ant 1 SAR (W/kg)	2.4 GHz WLAN Ant 2 SAR (W/kg)	2.4 GHz WLAN MIMO at 19 dBm SAR (W/kg)	5 GHz WLAN MIMO at 16 dBm SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	4	5	1+2+5	1+3+5	1+4+5
Hotspot SAR	NR Band n77 Antenna B	0.155	0.454	0.458	0.182	0.174	0.783	0.787	0.511
	NR Band n77 Antenna G	0.111	0.454	0.458	0.182	0.174	0.739	0.743	0.467
	NR Band n77 Antenna D	0.075	0.454	0.458	0.182	0.174	0.703	0.707	0.431




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Table 12-20
Simultaneous Transmission Scenario with Bluetooth (Hotspot at 1.0 cm)




Configuration	Mode	5G SAR (W/kg)	2.4 GHz Bluetooth Ant 1 SAR (W/kg)	2.4 GHz Bluetooth Ant 2 SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	1+2	1+3	1+2+3
Hotspot SAR	NR Band n77 Antenna B	0.155	0.122	0.064	0.277	0.219	0.341
	NR Band n77 Antenna G	0.111	0.122	0.064	0.233	0.175	0.297
	NR Band n77 Antenna D	0.075	0.122	0.064	0.197	0.139	0.261

Table 12-21
Simultaneous Transmission Scenario with Bluetooth and 5 GHz WLAN (Hotspot at 1.0 cm)

Configuration	Mode	5G SAR (W/kg)	2.4 GHz Bluetooth Ant 1 SAR (W/kg)	2.4 GHz Bluetooth Ant 2 SAR (W/kg)	5 GHz WLAN MIMO SAR (W/kg)	Σ SAR (W/kg)		
		1	2	3	4	1+2+4	1+3+4	1+2+3+4
Hotspot SAR	NR Band n77 Antenna B	0.155	0.122	0.064	0.492	0.769	0.711	0.833
	NR Band n77 Antenna G	0.111	0.122	0.064	0.492	0.725	0.667	0.789
	NR Band n77 Antenna D	0.075	0.122	0.064	0.492	0.689	0.631	0.753

12.6 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.

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13 SAR MEASUREMENT VARIABILITY

13.1 Measurement Variability

Per FCC KDB Publication 865664 D01v01r04, variability SAR tests were not required since measured SAR results for all frequency bands were less than 0.8 W/kg

13.2 Measurement Uncertainty




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

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14 EQUIPMENT LIST




Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent	85033E	3.5mm Standard Calibration Kit	6/6/2020	Annual	6/6/2021	MY53402352
Agilent	E4438C	ESG Vector Signal Generator	9/8/2020	Biennial	9/8/2022	MY45090700
Agilent	E4438C	ESG Vector Signal Generator	9/18/2020	Annual	9/18/2021	MY45091346
Agilent	N5182A	MXG Vector Signal Generator	5/13/2020	Annual	5/13/2021	MY47420603
Agilent	8753ES	S-Parameter Network Analyzer	9/16/2020	Annual	9/16/2021	MY40000670
Amplifier Research	1551G6	Amplifier	CBT	N/A	CBT	353469
Amplifier Research	1551G6	Amplifier	CBT	N/A	CBT	433972
Anritsu	ML2496A	Power Meter	2/13/2020	Annual	2/13/2021	1306009
Anritsu	ML2496A	Power Meter	3/23/2020	Annual	3/23/2021	1351001
Anritsu	MA2411B	Pulse Power Sensor	8/12/2020	Annual	8/12/2021	1207364
Anritsu	MA2411B	Pulse Power Sensor	9/22/2020	Annual	9/22/2021	1339008
Anritsu	MA24106A	USB Power Sensor	6/8/2020	Annual	6/8/2021	1349501
Anritsu	MA24106A	USB Power Sensor	1/15/2021	Annual	1/15/2022	1349503
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	4352	Long Stem Thermometer	1/24/2020	Biennial	1/24/2022	200043644
Control Company	4352	Long Stem Thermometer	1/24/2020	Biennial	1/24/2022	200043647
Control Company	4040	Therm./Clock/Humidity Monitor	3/6/2020	Biennial	3/6/2022	200170313
Control Company	4040	Therm./Clock/Humidity Monitor	6/29/2019	Biennial	6/29/2021	192291455
Keysight	772D	Dual Directional Coupler	CBT	N/A	CBT	MY52180215
Keysight Technologies	N6705B	DC Power Analyzer	4/27/2019	Biennial	4/27/2021	MY53004059
Keysight Technologies	N9020A	MXA Signal Analyzer	8/14/2020	Annual	8/14/2021	US46470561
Keysight Technologies	85033E	Standard Mechanical Calibration Kit (DC to 9GHz, 3.5mm)	9/1/2020	Annual	9/1/2021	MY53401181
MCL	BW-N6W5+	6dB Attenuator	CBT	N/A	CBT	1139
MiniCircuits	VLf-6000+	Low Pass Filter	CBT	N/A	CBT	N/A
MiniCircuits	SLP-2400+	Low Pass Filter	CBT	N/A	CBT	R8979500903
Mini-Circuits	BW-N20W5+	DC to 18 GHz Precision Fixed 20 dB Attenuator	CBT	N/A	CBT	N/A
Mini-Circuits	BW-N20W5	Power Attenuator	CBT	N/A	CBT	1226
Narda	4014C-6	4 - 8 GHz SMA 6 dB Directional Coupler	CBT	N/A	CBT	N/A
Narda	BW-S3W2	Attenuator (3dB)	CBT	N/A	CBT	120
Narda	4772-3	Attenuator (3dB)	CBT	N/A	CBT	9406
Pasternack	PE2208-6	Bidirectional Coupler	CBT	N/A	CBT	N/A
Pasternack	PE2209-10	Bidirectional Coupler	CBT	N/A	CBT	N/A
Pasternack	NC-100	Torque Wrench	12/1/2020	Annual	12/1/2021	N/A
Pasternack	NC-100	Torque Wrench	8/4/2020	Biennial	8/4/2022	N/A
Rohde & Schwarz	ZNLE6	Vector Network Analyzer	9/29/2020	Annual	9/29/2021	101307
SPEAG	DAK-12	Dielectric Assessment Kit (10MHz - 3GHz)	3/17/2020	Annual	3/17/2021	1102
SPEAG	DAK-3.5	Dielectric Assessment Kit	10/14/2020	Annual	10/14/2021	1091
SPEAG	D3700V2	3700 MHz SAR Dipole	1/21/2020	Biennial	1/21/2022	1067
SPEAG	D3900V2	3900 MHz SAR Dipole	10/9/2020	Annual	10/9/2021	1056
SPEAG	DAE4	Dasy Data Acquisition Electronics	5/20/2020	Annual	5/20/2021	728
SPEAG	DAE4	Data Acquisition Electronics	12/7/2020	Annual	12/7/2021	1533
SPEAG	EX3DV4	SAR Probe	1/20/2021	Annual	1/20/2022	3589
SPEAG	EX3DV4	SAR Probe	10/20/2020	Annual	10/20/2021	7539

Note: 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.

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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	60
Expanded Uncertainty (95% CONFIDENCE LEVEL)	k=2					23.0	22.6	




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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]




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APPENDIX A: SAR TEST DATA

PCTEST

DUT: A3LSMG998U; Type: Portable Handset; Serial: 3987S

Communication System: UID 0, NR Band n77; Frequency: 3930 MHz; Duty Cycle: 1:1

Medium: 3600 Head; Medium parameters used:

$f = 3930$ MHz; $\sigma = 3.337$ S/m; $\epsilon_r = 38.245$; $\rho = 1000$ kg/m³

Phantom section: Right Section

Test Date: 02/19/2021; Ambient Temp: 21.2°C; Tissue Temp: 19.9°C

Probe: EX3DV4 - SN3589; ConvF(5.93, 5.93, 5.93) @ 3930 MHz; Calibrated: 1/20/2021

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1558; Calibrated: 1/13/2021

Phantom: Twin-SAM V5.0 (20); Type: QD 000 P40 CD; Serial: 1646

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

**Mode: NR Band n77, Antenna G, Right Head, Tilt, Ch. 662000,
100 MHz Bandwidth, DFT-s-OFDM QPSK, 1 RB, 137 RB Offset**

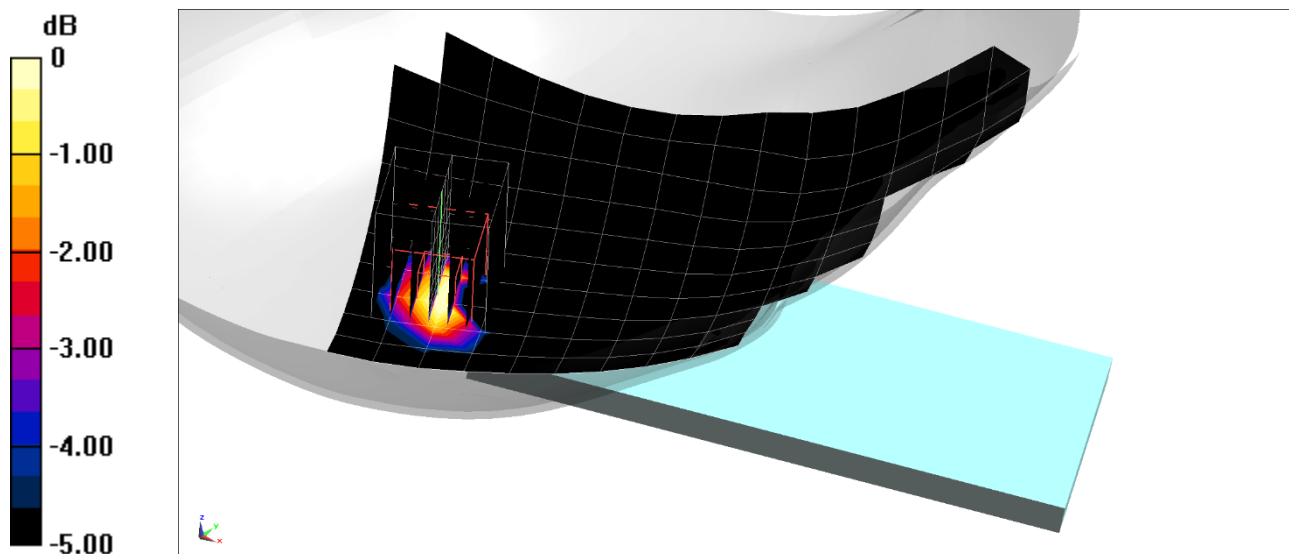
Area Scan (11x18x1): Measurement grid: dx=12mm, dy=12mm

Zoom Scan (8x8x8)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=1.4mm; Graded Ratio: 1.4

Reference Value = 0.6020 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 0.0290 W/kg

SAR(1 g) = 0.00125 W/kg



0 dB = 0.0155 W/kg = -18.10 dBW/kg

PCTEST

DUT: A3LSMG998U; Type: Portable Handset; Serial: 3987S

Communication System: UID 0, NR Band n77; Frequency: 3930 MHz; Duty Cycle: 1:1

Medium: 3600 Body; Medium parameters used:

$f = 3930$ MHz; $\sigma = 3.841$ S/m; $\epsilon_r = 48.956$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 02/22/2021; Ambient Temp: 21.3°C; Tissue Temp: 20.2°C

Probe: EX3DV4 - SN7539; ConvF(6.18, 6.18, 6.18) @ 3930 MHz; Calibrated: 10/20/2020

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn728; Calibrated: 5/20/2020

Phantom: Twin-SAM V5.0 (left 20); Type: QD 000 P40 CD; Serial: 1630

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

**Mode: NR Band n77, Antenna G, Body SAR, Back side, Ch. 662000,
100 MHz Bandwidth, DFT-s-OFDM QPSK, 135 RB, 69 RB Offset**

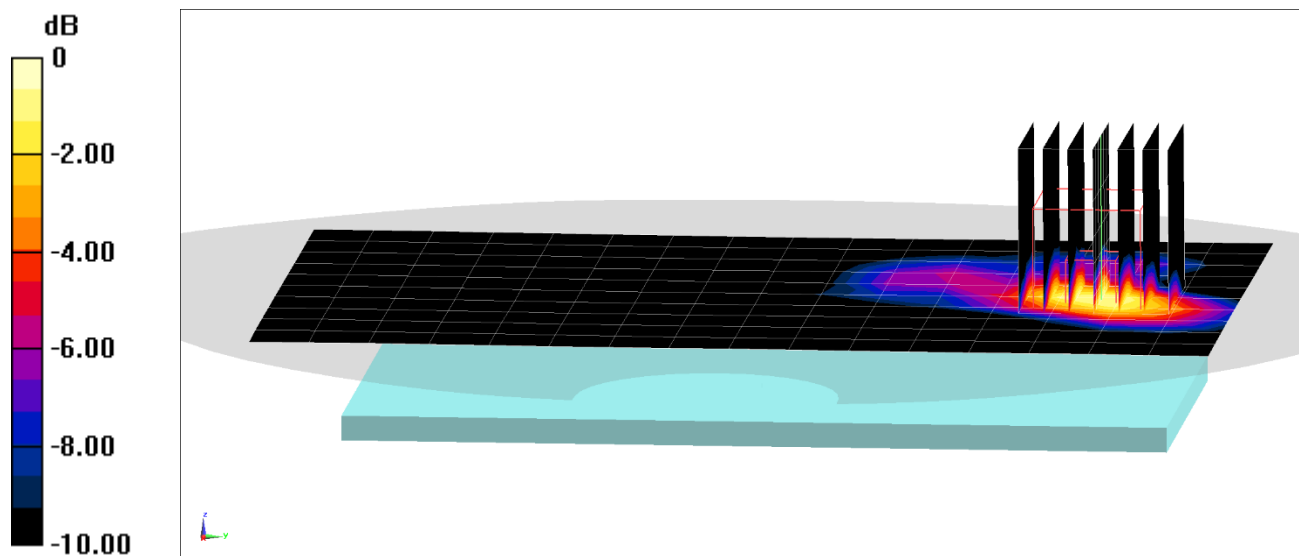
Area Scan (11x17x1): Measurement grid: dx=12mm, dy=12mm

Zoom Scan (7x7x8)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=1.4mm; Graded Ratio: 1.4

Reference Value = 4.454 V/m; Power Drift = 0.17 dB

Peak SAR (extrapolated) = 0.179 W/kg

SAR(1 g) = 0.069 W/kg



0 dB = 0.127 W/kg = -8.96 dBW/kg

PCTEST

DUT: A3LSMG998U; Type: Portable Handset; Serial: 3982S

Communication System: UID 0, NR Band n77; Frequency: 3930 MHz; Duty Cycle: 1:1

Medium: 3600 Body; Medium parameters used:

$f = 3930 \text{ MHz}$; $\sigma = 3.735 \text{ S/m}$; $\epsilon_r = 49.266$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01/22/2021; Ambient Temp: 23.3°C; Tissue Temp: 20.1°C

Probe: EX3DV4 - SN7539; ConvF(6.18, 6.18, 6.18) @ 3930 MHz; Calibrated: 10/20/2020

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn728; Calibrated: 5/20/2020

Phantom: Twin-SAM V5.0 (left 20); Type: QD 000 P40 CD; Serial: 1630

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

**Mode: NR Band n77, Antenna B, Body SAR, Bottom Edge, Ch. 662000,
100 MHz Bandwidth, CP-OFDM QPSK, 1 RB, 1 RB Offset**

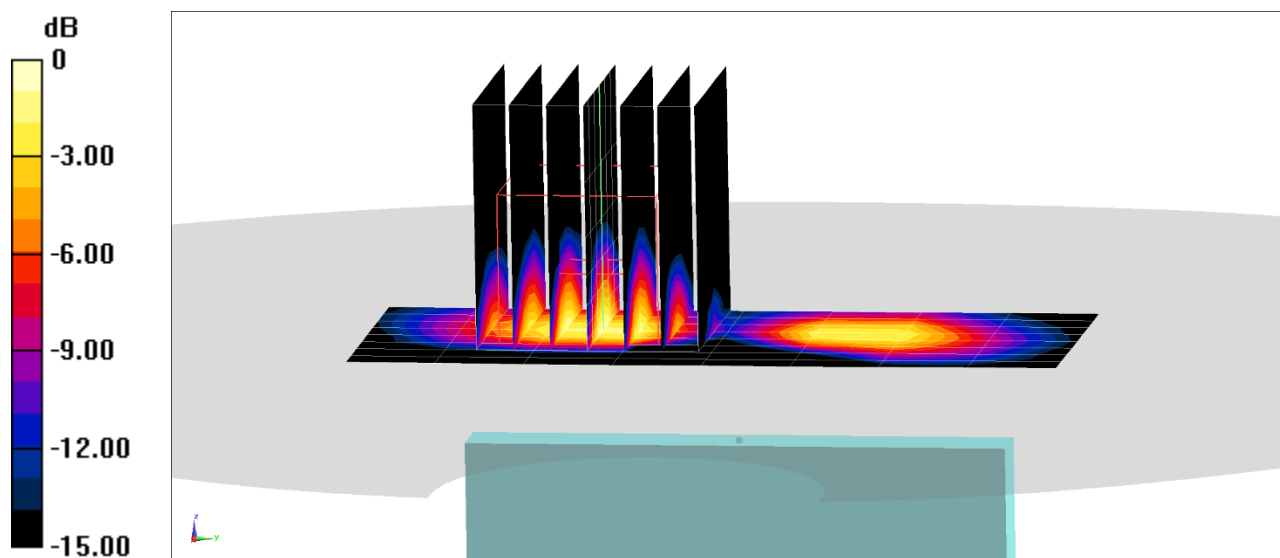
Area Scan (9x9x1): Measurement grid: dx=5mm, dy=12mm

Zoom Scan (7x7x8)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=1.4mm; Graded Ratio: 1.4

Reference Value = 5.762 V/m; Power Drift = 0.11 dB

Peak SAR (extrapolated) = 0.284 W/kg

SAR(1 g) = 0.105 W/kg



0 dB = 0.208 W/kg = -6.82 dBW/kg

APPENDIX B: SYSTEM VERIFICATION

PCTEST

DUT: Dipole 3700 MHz; Type: D3700V2; Serial: 1067

Communication System: UID 0, CW; Frequency: 3700 MHz; Duty Cycle: 1:1

Medium: 3600 Head Medium parameters used:

$f = 3700$ MHz; $\sigma = 3.101$ S/m; $\epsilon_r = 38.664$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02/19/2021; Ambient Temp: 21.2°C; Tissue Temp: 19.9°C

Probe: EX3DV4 - SN3589; ConvF(6.05, 6.05, 6.05) @ 3700 MHz; Calibrated: 1/20/2021

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1558; Calibrated: 1/13/2021

Phantom: Twin-SAM V5.0 (20); Type: QD 000 P40 CD; Serial: 1646

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

3700 MHz System Verification at 20.0 dBm (100 mW)

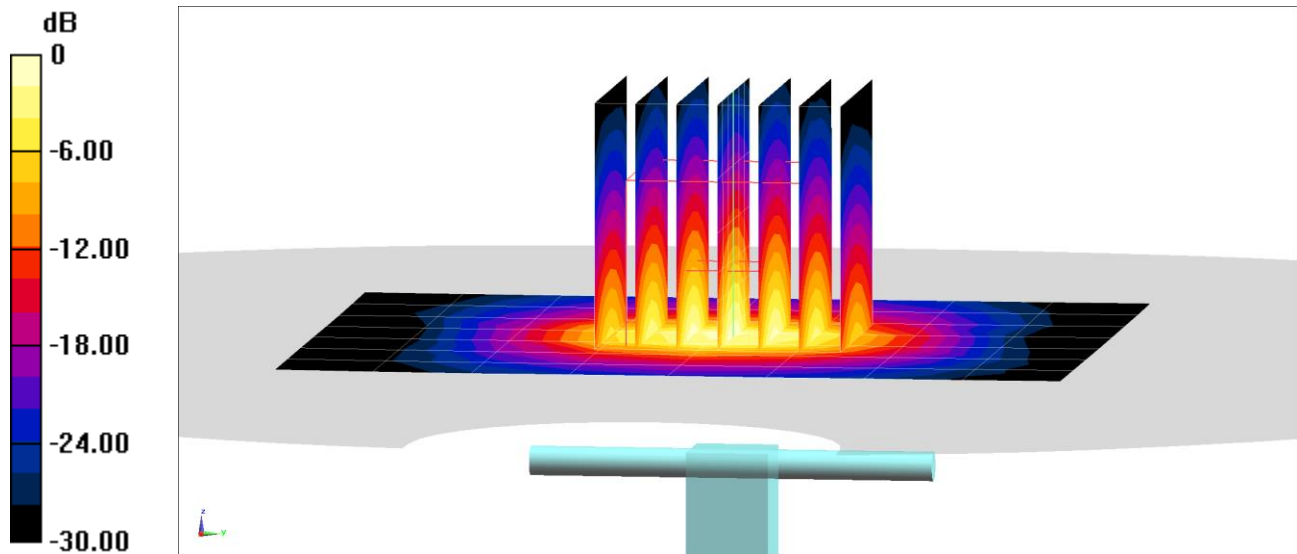
Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm

Zoom Scan (7x7x8)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=1.4mm; Graded Ratio: 1.4

Peak SAR (extrapolated) = 19.9 W/kg

SAR(1 g) = 6.86 W/kg

Deviation(1 g) = 2.08%



0 dB = 13.8 W/kg = 11.40 dBW/kg

PCTEST

DUT: Dipole 3900 MHz; Type: D3900V2; Serial: 1056

Communication System: UID 0, CW; Frequency: 3900 MHz; Duty Cycle: 1:1

Medium: 3600 Head Medium parameters used:

$f = 3900$ MHz; $\sigma = 3.322$ S/m; $\epsilon_r = 38.306$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02/19/2021; Ambient Temp: 21.2°C; Tissue Temp: 19.9°C

Probe: EX3DV4 - SN3589; ConvF(5.93, 5.93, 5.93) @ 3900 MHz; Calibrated: 1/20/2021

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1558; Calibrated: 1/13/2021

Phantom: Twin-SAM V5.0 (20); Type: QD 000 P40 CD; Serial: 1646

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

3900 MHz System Verification at 20.0 dBm (100 mW)

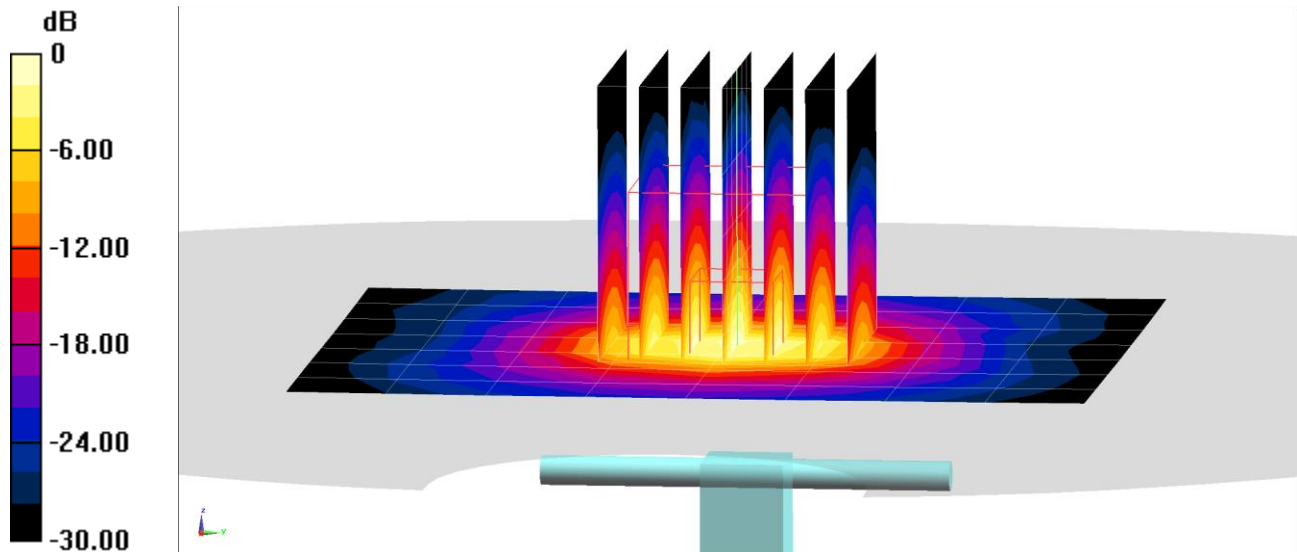
Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm

Zoom Scan (7x7x8)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=1.4mm; Graded Ratio: 1.4

Peak SAR (extrapolated) = 21.1 W/kg

SAR(1 g) = 6.9 W/kg

Deviation(1 g) = 0.15%



0 dB = 14.6 W/kg = 11.64 dBW/kg

PCTEST

DUT: Dipole 3700 MHz; Type: D3700V2; Serial: 1067

Communication System: UID 0, CW; Frequency: 3700 MHz; Duty Cycle: 1:1

Medium: 3600 Body Medium parameters used:

$f = 3700$ MHz; $\sigma = 3.451$ S/m; $\epsilon_r = 49.678$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01/22/2021; Ambient Temp: 23.3°C; Tissue Temp: 20.1°C

Probe: EX3DV4 - SN7539; ConvF(6.48, 6.48, 6.48) @ 3700 MHz; Calibrated: 10/20/2020

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn728; Calibrated: 5/20/2020

Phantom: Twin-SAM V5.0 (left 20); Type: QD 000 P40 CD; Serial: 1630

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

3700 MHz System Verification at 20.0 dBm (100 mW)

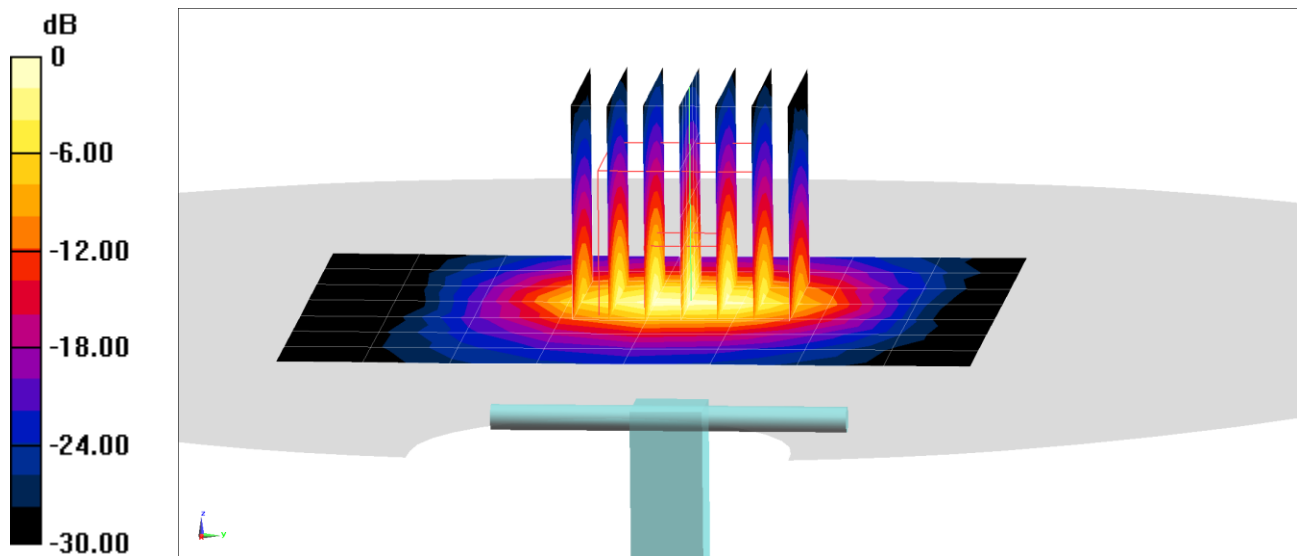
Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm

Zoom Scan (7x7x8)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=1.4mm; Graded Ratio: 1.4

Peak SAR (extrapolated) = 18.8 W/kg

SAR(1 g) = 6.48 W/kg

Deviation(1 g) = -0.61%



0 dB = 13.3 W/kg = 11.24 dBW/kg

PCTEST

DUT: Dipole 3900 MHz; Type: D3900V2; Serial: 1056

Communication System: UID 0, CW; Frequency: 3900 MHz; Duty Cycle: 1:1

Medium: 3600 Body Medium parameters used:

$f = 3900$ MHz; $\sigma = 3.712$ S/m; $\epsilon_r = 49.333$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01/22/2021; Ambient Temp: 23.3°C; Tissue Temp: 20.1°C

Probe: EX3DV4 - SN7539; ConvF(6.18, 6.18, 6.18) @ 3900 MHz; Calibrated: 10/20/2020

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn728; Calibrated: 5/20/2020

Phantom: Twin-SAM V5.0 (left 20); Type: QD 000 P40 CD; Serial: 1630

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

3900 MHz System Verification at 20.0 dBm (100 mW)

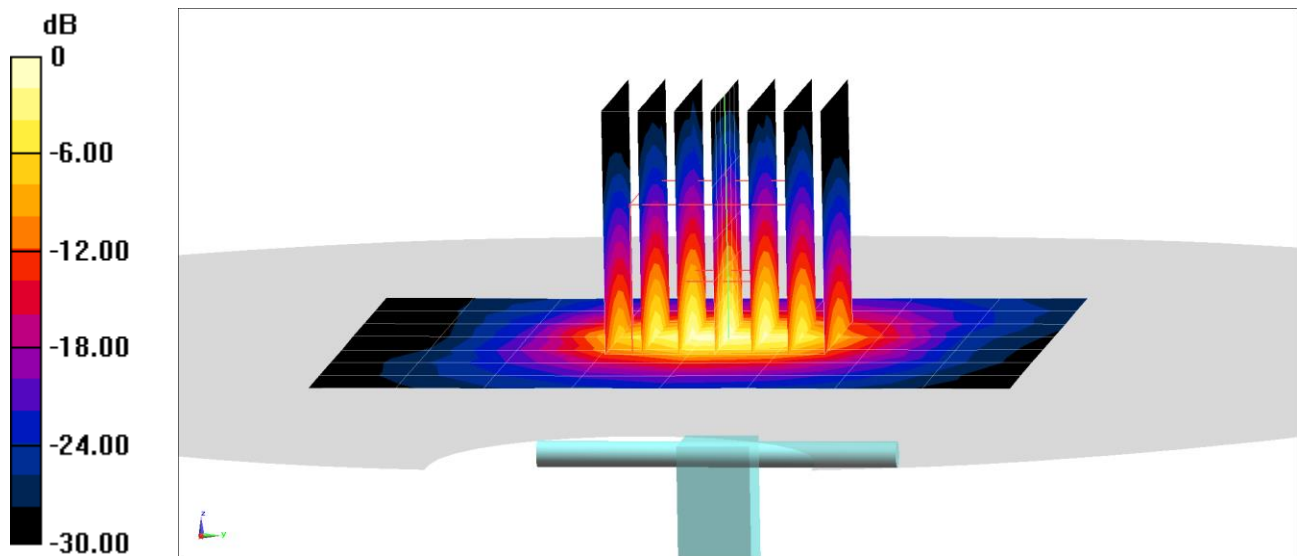
Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm

Zoom Scan (7x7x8)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=1.4mm; Graded Ratio: 1.4

Peak SAR (extrapolated) = 19.0 W/kg

SAR(1 g) = 6.72 W/kg

Deviation(1 g) = 1.36%



0 dB = 13.9 W/kg = 11.43 dBW/kg

PCTEST

DUT: Dipole 3700 MHz; Type: D3700V2; Serial: 1067

Communication System: UID 0, CW; Frequency: 3700 MHz; Duty Cycle: 1:1

Medium: 3600 Body Medium parameters used:

$f = 3700$ MHz; $\sigma = 3.539$ S/m; $\epsilon_r = 49.424$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02/22/2021; Ambient Temp: 21.3°C; Tissue Temp: 20.2°C

Probe: EX3DV4 - SN7539; ConvF(6.48, 6.48, 6.48) @ 3700 MHz; Calibrated: 10/20/2020

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn728; Calibrated: 5/20/2020

Phantom: Twin-SAM V5.0 (left 20); Type: QD 000 P40 CD; Serial: 1630

Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

3700 MHz System Verification at 20.0 dBm (100 mW)

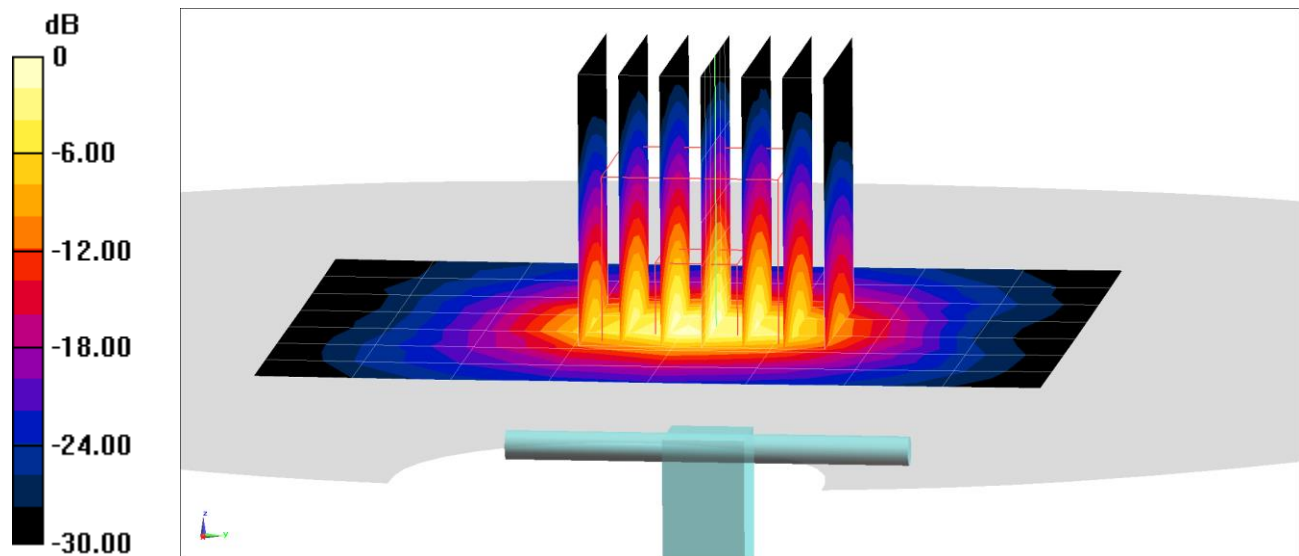
Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm

Zoom Scan (7x7x8)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=1.4mm; Graded Ratio: 1.4

Peak SAR (extrapolated) = 18.1 W/kg

SAR(1 g) = 6.67 W/kg

Deviation(1 g) = 2.30%



PCTEST

DUT: Dipole 3900 MHz; Type: D3900V2; Serial: 1056

Communication System: UID 0, CW; Frequency: 3900 MHz; Duty Cycle: 1:1

Medium: 3600 Body Medium parameters used:

$f = 3900$ MHz; $\sigma = 3.803$ S/m; $\epsilon_r = 49.039$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02/22/2021; Ambient Temp: 21.3°C; Tissue Temp: 20.2°C

Probe: EX3DV4 - SN7539; ConvF(6.18, 6.18, 6.18) @ 3900 MHz; Calibrated: 10/20/2020

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn728; Calibrated: 5/20/2020

Phantom: Twin-SAM V5.0 (left 20); Type: QD 000 P40 CD; Serial: 1630

Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

3900 MHz System Verification at 20.0 dBm (100 mW)

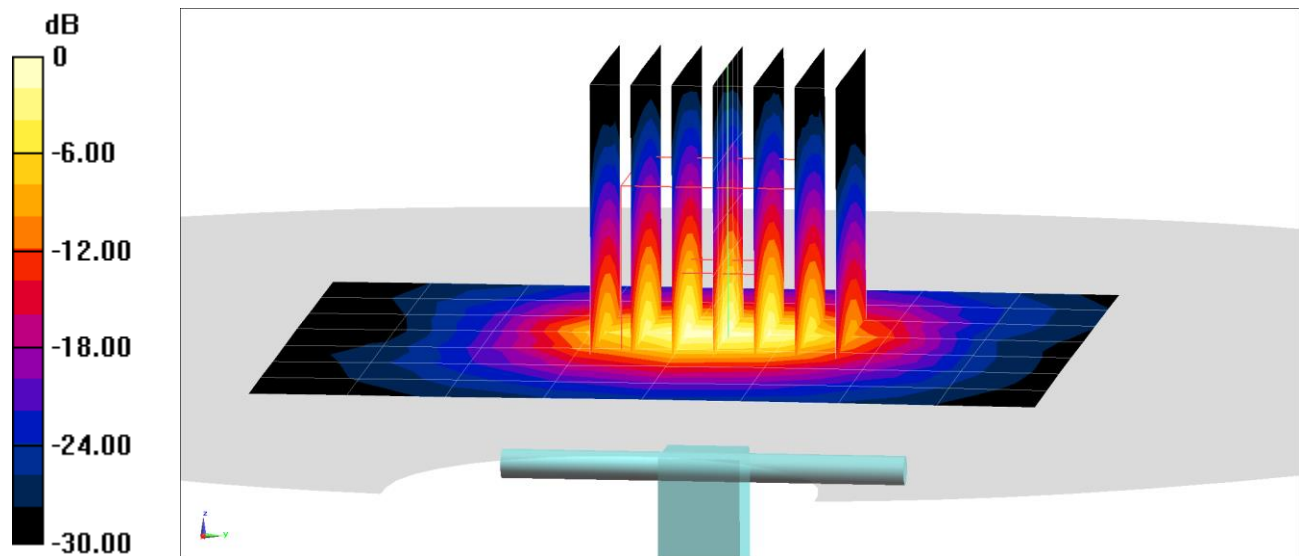
Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm

Zoom Scan (7x7x8)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=1.4mm; Graded Ratio: 1.4

Peak SAR (extrapolated) = 18.5 W/kg

SAR(1 g) = 6.74 W/kg

Deviation(1 g) = 1.66%



0 dB = 13.8 W/kg = 11.40 dBW/kg

APPENDIX C: SAR TISSUE SPECIFICATIONS

Measurement Procedure for Tissue verification:

- 1) The network analyzer and probe system was configured and calibrated.
- 2) The probe was immersed in the tissue. The tissue was placed in a nonmetallic container. Trapped air bubbles beneath the flange were minimized by placing the probe at a slight angle.
- 3) The complex admittance with respect to the probe aperture was measured
- 4) The complex relative permittivity ϵ' can be calculated from the below equation (Pournaropoulos and Misra):

$$Y = \frac{j2\omega\epsilon_r\epsilon_0}{[\ln(b/a)]^2} \int_a^b \int_a^b \int_0^\pi \cos\phi' \frac{\exp[-j\omega r(\mu_0\epsilon_r'\epsilon_0)^{1/2}]}{r} d\phi' d\rho' d\rho$$

where Y is the admittance of the probe in contact with the sample, the primed and unprimed coordinates refer to source and observation points, respectively, $r^2 = \rho^2 + \rho'^2 - 2\rho\rho' \cos\phi'$, ω is the angular frequency, and $j = \sqrt{-1}$.

3 Composition / Information on ingredients

3.2 Mixtures

Description: Aqueous solution with surfactants and inhibitors

Declarable, or hazardous components:

CAS: 107-21-1 EINECS: 203-473-3 Reg.nr.: 01-2119456816-28-0000	Ethenediol STOT RE 2, H373; Acute Tox. 4, H302	>1.0-4.9%
CAS: 68608-26-4 EINECS: 271-781-5 Reg.nr.: 01-2119527859-22-0000	Sodium petroleum sulfonate Eye Irrit. 2, H319	< 2.9%
CAS: 107-41-5 EINECS: 203-489-0 Reg.nr.: 01-2119539582-35-0000	Hexylene Glycol / 2-Methyl-pentane-2,4-diol Skin Irrit. 2, H315; Eye Irrit. 2, H319	< 2.9%
CAS: 68920-66-1 NLP: 500-236-9 Reg.nr.: 01-2119489407-26-0000	Alkoxylated alcohol, > C₁₆ Aquatic Chronic 2, H411; Skin Irrit. 2, H315; Eye Irrit. 2, H319	< 2.0%

Additional information:



For the wording of the listed risk phrases refer to section 16.

Not mentioned CAS-, EINECS- or registration numbers are to be regarded as Proprietary/Confidential.

The specific chemical identity and/or exact percentage concentration of proprietary components is withheld as a trade secret.

Figure C-1

Note: Liquid recipes are proprietary SPEAG. Since the composition is approximate to the actual liquids utilized, the manufacturer tissue-equivalent liquid data sheets are provided below.

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Measurement Certificate / Material Test

Item Name	Body Tissue Simulating Liquid (MBBL600-6000V6)
Product No.	SL AAM U16 BC (Batch: 200803-1)
Manufacturer	SPEAG

Measurement Method

TSL dielectric parameters measured using calibrated DAK probe.

Target Parameters

Target parameters as defined in the KDB 865664 compliance standard.

Test Condition

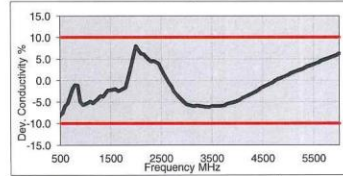
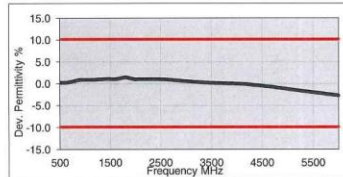
Ambient Condition 22°C ; 30% humidity
 TSL Temperature 22°C
 Test Date 6-Aug-20
 Operator CL

Additional Information

TSL Density
 TSL Heat-capacity

Results

f [MHz]	Measured			Target		Diff.to Target [%]	
	e'	e''	sigma	eps	sigma	Δ-eps	Δ-sigma
600	56.3	26.8	0.89	56.1	0.96	0.3	-6.3
750	55.8	22.6	0.94	55.5	0.96	0.5	-2.1
800	55.7	21.6	0.96	55.3	0.97	0.7	-1.0
825	55.7	21.1	0.97	55.2	0.98	0.8	-1.0
835	55.7	20.9	0.98	55.1	0.99	1.0	-0.5
850	55.6	20.7	0.98	55.2	0.99	0.8	-1.0
900	55.5	19.9	1.00	55.0	1.05	0.9	-4.8
1400	54.7	15.9	1.24	54.1	1.28	1.1	-3.1
1450	54.6	15.8	1.27	54.0	1.30	1.1	-2.3
1600	54.4	15.3	1.36	53.8	1.39	1.1	-2.2
1625	54.4	15.3	1.38	53.8	1.41	1.2	-2.1
1640	54.4	15.2	1.39	53.7	1.42	1.3	-2.1
1650	54.3	15.2	1.39	53.7	1.43	1.1	-2.8
1700	54.2	15.1	1.43	53.6	1.46	1.2	-2.1
1750	54.2	15.0	1.46	53.4	1.49	1.4	-2.0
1800	54.1	14.9	1.50	53.3	1.52	1.5	-1.3
1810	54.1	14.9	1.51	53.3	1.52	1.5	-0.7
1825	54.1	14.9	1.52	53.3	1.52	1.5	0.0
1850	54.0	14.9	1.53	53.3	1.52	1.3	0.7
1900	54.0	14.8	1.57	53.3	1.52	1.3	3.3
1950	53.9	14.8	1.60	53.3	1.52	1.1	5.3
2000	53.8	14.8	1.64	53.3	1.52	0.9	7.9
2050	53.8	14.7	1.68	53.2	1.57	1.1	7.0
2100	53.7	14.7	1.72	53.2	1.62	1.0	6.2
2150	53.7	14.7	1.76	53.1	1.66	1.1	6.0
2200	53.6	14.7	1.80	53.0	1.71	1.1	5.3
2250	53.5	14.8	1.85	53.0	1.76	1.0	5.1
2300	53.5	14.8	1.89	52.9	1.81	1.1	4.4
2350	53.4	14.8	1.94	52.8	1.85	1.1	4.9
2400	53.3	14.8	1.98	52.8	1.90	1.0	4.2
2450	53.3	14.9	2.03	52.7	1.95	1.1	4.1
2500	53.2	14.9	2.07	52.6	2.02	1.1	2.5
2550	53.1	15.0	2.12	52.6	2.09	1.0	1.4
2600	53.0	15.0	2.17	52.5	2.16	0.9	0.5



3500	51.4	16.0	3.11	51.3	3.31	0.2	-6.0
3700	51.1	16.2	3.34	51.1	3.55	0.1	-5.9
5200	48.3	18.7	5.42	49.0	5.30	-1.5	2.3
5250	48.2	18.8	5.50	49.0	5.36	-1.6	2.5
5300	48.1	18.9	5.57	48.9	5.42	-1.7	2.8
5500	47.7	19.2	5.86	48.6	5.65	-2.0	3.8
5600	47.5	19.3	6.01	48.5	5.77	-2.1	4.2
5700	47.3	19.4	6.16	48.3	5.88	-2.3	4.8
5800	47.0	19.6	6.32	48.2	6.00	-2.4	5.3
6000	46.6	19.8	6.62	47.9	6.23	-2.7	6.3
6500							
7000							
7500							
8000							
8500							
9000							
9500							
10000							

Figure C-2
600 – 5800 MHz Body Tissue Equivalent Matter

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Measurement Certificate / Material Test

Item Name	Head Tissue Simulating Liquid (HBBL600-10000V6)
Product No.	SL AAH U16 BC (Batch: 200805-4)
Manufacturer	SPEAG

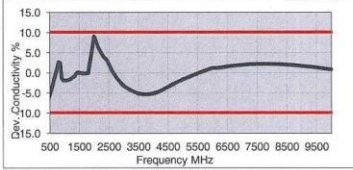
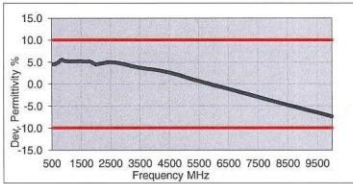
Measurement Method
TSL dielectric parameters measured using calibrated DAK probe.

Target Parameters
Target parameters as defined in the IEEE 1528 and IEC 62209 compliance standards.

Test Condition
Ambient Condition 22°C ; 30% humidity
TSL Temperature 22°C
Test Date 6-Aug-20
Operator CL



Additional Information
TSL Density
TSL Heat-capacity

f [MHz]	Measured			Target		Diff.to Target [%]	
	e'	e''	sigma	eps	sigma	Δ-eps	Δ-sigma
600	44.7	25.7	0.86	42.7	0.88	4.6	-2.5
750	44.1	21.7	0.90	41.9	0.89	5.1	0.7
800	44.0	20.7	0.92	41.7	0.90	5.6	2.5
825	43.9	20.3	0.93	41.6	0.91	5.6	2.6
835	43.9	20.1	0.94	41.5	0.91	5.7	3.1
850	43.8	19.9	0.94	41.5	0.92	5.5	2.6
900	43.7	19.1	0.96	41.5	0.97	5.3	-1.0
1400	42.7	15.1	1.18	40.6	1.18	5.2	0.0
1450	42.6	14.9	1.20	40.5	1.20	5.2	0.0
1600	42.4	14.4	1.28	40.3	1.28	5.2	-0.3
1625	42.4	14.4	1.30	40.3	1.30	5.3	0.1
1640	42.4	14.3	1.31	40.3	1.31	5.3	0.3
1650	42.3	14.3	1.31	40.2	1.31	5.1	-0.2
1700	42.2	14.2	1.34	40.2	1.34	5.1	-0.2
1750	42.2	14.1	1.37	40.1	1.37	5.3	-0.1
1800	42.1	14.0	1.40	40.0	1.40	5.3	0.0
1810	42.1	14.0	1.41	40.0	1.40	5.3	0.7
1825	42.1	13.9	1.42	40.0	1.40	5.3	1.4
1850	42.0	13.9	1.43	40.0	1.40	5.0	2.1
1900	41.9	13.8	1.46	40.0	1.40	4.7	4.3
1950	41.9	13.8	1.49	40.0	1.40	4.7	6.4
2000	41.8	13.7	1.53	40.0	1.40	4.5	9.3
2050	41.7	13.7	1.56	39.9	1.44	4.5	8.0
2100	41.7	13.7	1.60	39.8	1.49	4.7	7.5
2150	41.6	13.6	1.63	39.7	1.53	4.7	6.3
2200	41.5	13.6	1.67	39.6	1.58	4.7	5.8
2250	41.5	13.6	1.70	39.6	1.62	4.9	4.8
2300	41.4	13.6	1.74	39.5	1.67	4.9	4.4
2350	41.3	13.6	1.78	39.4	1.71	4.9	4.0
2400	41.2	13.6	1.82	39.3	1.76	4.9	3.7
2450	41.2	13.6	1.85	39.2	1.80	5.1	2.8
2500	41.1	13.6	1.89	39.1	1.85	5.0	1.9
2550	41.0	13.7	1.94	39.1	1.91	4.9	1.6
2600	40.9	13.7	1.98	39.0	1.96	4.8	0.8



3500	39.4	14.2	2.77	37.9	2.91	3.7	-5.1
3700	39.0	14.3	2.95	37.7	3.12	3.5	-5.3
5200	36.4	15.9	4.61	36.0	4.66	1.3	-1.0
5250	36.4	16.0	4.67	35.9	4.71	1.2	-0.9
5300	36.3	16.0	4.72	35.9	4.76	1.1	-0.7
5500	35.9	16.2	4.96	35.6	4.96	0.7	-0.1
5600	35.7	16.3	5.07	35.5	5.07	0.5	0.2
5700	35.5	16.4	5.19	35.4	5.17	0.3	0.4
5800	35.4	16.5	5.31	35.3	5.27	0.1	0.7
6000	35.0	16.6	5.54	35.1	5.48	-0.2	1.2
6500	34.1	17.1	6.17	34.5	6.07	-1.1	1.6
7000	33.2	17.4	6.78	33.9	6.65	-2.0	2.0
7500	32.3	17.7	7.40	33.3	7.24	-2.9	2.2
8000	31.5	18.0	8.01	32.7	7.84	-3.8	2.2
8500	30.6	18.2	8.63	32.1	8.45	-4.7	2.1
9000	29.8	18.4	9.24	31.5	9.08	-5.6	1.8
9500	29.0	18.6	9.84	31.0	9.71	-6.5	1.3
10000	28.1	18.8	10.44	30.4	10.36	-7.4	0.8

Figure C-3
600 – 5800 MHz Head Tissue Equivalent Matter

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APPENDIX D: SAR SYSTEM VALIDATION




Per FCC KDB Publication 865664 D02v01r02, SAR system validation status should be documented to confirm measurement accuracy. The SAR systems (including SAR probes, system components and software versions) used for this device were validated against its performance specifications prior to the SAR measurements. Reference dipoles were used with the required tissue- equivalent media for system validation, according to the procedures outlined in FCC KDB Publication 865664 D01v01r04 and IEEE 1528-2013. Since SAR probe calibrations are frequency dependent, each probe calibration point was validated at a frequency within the valid frequency range of the probe calibration point, using the system that normally operates with the probe for routine SAR measurements and according to the required tissue-equivalent media.

A tabulated summary of the system validation status including the validation date(s), measurement frequencies, SAR probes and tissue dielectric parameters has been included.

Table D-1
SAR System Validation Summary – 1g

SAR SYSTEM #	FREQ. [MHz]	DATE	PROBE SN	PROBE CAL. POINT		COND.	PERM.	CW VALIDATION			MOD. VALIDATION		
						(σ)	(ϵ_r)	SENSITIVITY	PROBE LINEARITY	PROBE ISOTROPY	MOD. TYPE	DUTY FACTOR	PAR
D	3700	1/28/2021	3589	3700	Head	2.977	36.981	PASS	PASS	PASS	TDD	PASS	N/A
D	3900	2/10/2021	3589	3900	Head	3.217	36.61	PASS	PASS	PASS	TDD	PASS	N/A
L	3700	11/3/2020	7539	3700	Body	3.423	50.88	PASS	PASS	PASS	TDD	PASS	N/A
L	3900	11/2/2020	7539	3900	Body	3.674	50.52	PASS	PASS	PASS	TDD	PASS	N/A

NOTE: While the probes have been calibrated for both CW and modulated signals, all measurements were performed using communication systems calibrated for CW signals only. Modulations in the table above represent test configurations for which the measurement system has been validated per FCC KDB Publication 865664 D01v01r04 for scenarios when CW probe calibrations are used with other signal types. SAR systems were validated for modulated signals with a periodic duty cycle, such as GMSK, or with a high peak to average ratio (>5 dB), such as OFDM according to FCC KDB Publication 865664 D01v01r04.

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APPENDIX F: NR LOWER BANDWIDTH RF CONDUCTED POWERS

F.1.1 NR Band n77 Antenna B

Table F-1

NR Band n77 Antenna B Measured P_{Limit} for DSI = 0 (Body-worn, or Phablet with grip sensor inactive), or DSI = 1 (Phablet with grip sensor active) and/or DSI = 4 (Earjack Active) - 90 MHz Bandwidth

NR Band n77 90 MHz Bandwidth							
Modulation	RB Size	RB Offset	Channel			MPR Allowed per 3GPP [dB]	MPR [dB]
			649668 (3745.02 MHz)	656000 (3840 MHz)	662332 (3934.98 MHz)		
			Conducted Power [dBm]				
DFT-s-OFDM $\pi/2$ BPSK	1	1	17.52	17.46	17.90	0	0.0
	1	123	17.60	17.62	17.98		0.0
	1	243	17.53	17.90	18.01		0.0
	120	0	17.07	16.96	17.42	0-0.5	0.5
	120	63	17.54	17.56	18.13	0	0.0
	120	125	17.03	17.29	17.86	0-0.5	0.5
243	0	17.09	17.13	17.77	0.5		
DFT-s-OFDM QPSK	1	1	17.63	17.49	17.94	0	0.0
	1	123	17.65	17.61	18.41		0.0
	1	243	17.40	17.95	18.19		0.0
	120	0	16.60	16.48	17.29	0-1	1.0
	120	63	17.58	17.55	18.43	0	0.0
	120	125	16.52	16.81	17.43	0-1	1.0
243	0	16.63	16.63	17.41	1.0		
DFT-s-OFDM 16QAM	1	1	16.51	16.48	16.83	0-1	1.0
CP-OFDM QPSK	1	1	15.98	15.86	16.36	0-1.5	1.5

Table F-2

NR Band n77 Antenna B Measured P_{Limit} for DSI = 0 (Body-worn, or Phablet with grip sensor inactive), or DSI = 1 (Phablet with grip sensor active) and/or DSI = 4 (Earjack Active) - 80 MHz Bandwidth

NR Band n77 80 MHz Bandwidth							
Modulation	RB Size	RB Offset	Channel			MPR Allowed per 3GPP [dB]	MPR [dB]
			649334 (3740.01 MHz)	656000 (3840 MHz)	662666 (3939.99 MHz)		
			Conducted Power [dBm]				
DFT-s-OFDM $\pi/2$ BPSK	1	1	17.17	17.25	17.87	0	0.0
	1	109	17.45	17.39	18.46		0.0
	1	215	17.34	17.74	18.33		0.0
	108	0	16.99	16.89	17.81	0-0.5	0.5
	108	55	17.55	17.50	18.49	0	0.0
	108	109	17.01	17.21	18.00	0-0.5	0.5
216	0	16.99	17.05	17.97	0.5		
DFT-s-OFDM QPSK	1	1	17.38	17.33	18.01	0	0.0
	1	109	17.57	17.39	18.43		0.0
	1	215	17.37	17.79	18.26		0.0
	108	0	16.55	16.38	17.22	0-1	1.0
	108	55	17.66	17.49	18.42	0	0.0
	108	109	16.57	16.77	17.48	0-1	1.0
216	0	16.47	16.61	17.36	1.0		
DFT-s-OFDM 16QAM	1	1	16.56	16.28	16.88	0-1	1.0
CP-OFDM QPSK	1	1	15.99	15.70	16.46	0-1.5	1.5

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Table F-3

NR Band n77 Antenna B Measured P_{Limit} for DSI = 0 (Body-worn, or Phablet with grip sensor inactive), or DSI = 1 (Phablet with grip sensor active) and/or DSI = 4 (Earjack Active) - 70 MHz Bandwidth

NR Band n77 70 MHz Bandwidth								
Modulation	RB Size	RB Offset	Channel				MPR Allowed per 3GPP [dB]	MPR [dB]
			649000 (3735 MHz)	653666 (3804.99 MHz)	658334 (3875.01 MHz)	663000 (3945 MHz)		
			Conducted Power [dBm]					
DFT-s-OFDM $\pi/2$ BPSK	1	1	16.99	17.45	17.60	18.38	0	0.0
	1	95	17.25	17.52	17.78	18.50		0.0
	1	187	17.53	17.74	18.17	18.45		0.0
	90	0	16.71	17.12	17.85	17.99	0-0.5	0.5
	90	50	17.22	17.33	17.78	18.44	0	0.0
	90	99	16.97	17.36	17.74	17.97	0-0.5	0.5
DFT-s-OFDM QPSK	180	0	16.82	17.26	17.69	18.00	0	0.5
	1	1	17.07	17.46	17.71	18.42	0	0.0
	1	95	17.30	17.72	17.95	18.50		0.0
	1	187	17.47	17.72	18.14	18.49		0.0
	90	0	16.21	16.85	16.89	17.50	0-1	1.0
	90	50	16.86	17.82	17.73	18.50	0	0.0
90	99	16.70	16.90	17.42	17.49	0-1	1.0	
DFT-s-OFDM 16QAM	180	0	16.42	16.85	17.15	17.50	0-1	1.0
CP-OFDM QPSK	1	1	16.25	16.61	16.84	17.50	0-1	1.0
	1	1	15.83	16.34	16.32	16.86	0-1.5	1.5

Table F-4

NR Band n77 Antenna B Measured P_{Limit} for DSI = 0 (Body-worn, or Phablet with grip sensor inactive), or DSI = 1 (Phablet with grip sensor active) and/or DSI = 4 (Earjack Active) - 60 MHz Bandwidth

NR Band n77 60 MHz Bandwidth								
Modulation	RB Size	RB Offset	Channel				MPR Allowed per 3GPP [dB]	MPR [dB]
			648668 (3730.02 MHz)	653556 (3803.34 MHz)	658444 (3876.66 MHz)	663332 (3949.98 MHz)		
			Conducted Power [dBm]					
DFT-s-OFDM $\pi/2$ BPSK	1	1	17.16	17.67	17.95	18.11	0	0.0
	1	81	17.46	17.89	18.16	18.48		0.0
	1	160	17.58	18.01	18.48	18.50		0.0
	81	0	16.86	17.25	17.60	17.99	0-0.5	0.5
	81	41	17.50	17.64	18.35	18.43	0	0.0
	81	81	17.33	17.54	18.00	17.98	0-0.5	0.5
DFT-s-OFDM QPSK	162	0	17.05	17.41	17.99	18.00	0	0.5
	1	1	17.15	17.62	18.05	18.49	0	0.0
	1	81	17.46	17.76	17.72	18.50		0.0
	1	160	17.70	17.91	17.83	18.14		0.0
	81	0	16.56	17.36	16.75	17.45	0-1	1.0
	81	41	17.33	17.74	18.06	18.43	0	0.0
DFT-s-OFDM 16QAM	81	81	16.61	16.94	17.39	17.50	0-1	1.0
	162	0	16.53	16.95	17.18	17.49	0-1	1.0
CP-OFDM QPSK	1	1	16.47	16.92	16.76	17.49	0-1	1.0
	1	1	16.05	16.32	16.58	16.93	0-1.5	1.5




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Table F-5

NR Band n77 Antenna B Measured P_{Limit} for DSI = 0 (Body-worn, or Phablet with grip sensor inactive), or DSI = 1 (Phablet with grip sensor active) and/or DSI = 4 (Earjack Active) - 50 MHz Bandwidth

NR Band n77 50 MHz Bandwidth									
Modulation	RB Size	RB Offset	Channel					MPR Allowed per 3GPP [dB]	MPR [dB]
			648334 (3725.01 MHz)	652166 (3782.49 MHz)	656000 (3840 MHz)	659834 (3897.51 MHz)	663666 (3954.99 MHz)		
			Conducted Power [dBm]						
DFT-s-OFDM $\pi/2$ BPSK	1	1	17.45	17.71	17.93	18.38	18.89	0	0.0
	1	67	17.56	17.87	18.12	18.65	18.98		0.0
	1	131	17.64	18.15	18.40	19.00	18.87		0.0
	64	0	17.61	17.84	17.72	18.22	18.50	0-0.5	0.5
	64	35	17.73	17.84	18.30	18.77	18.79	0	0.0
	64	69	17.51	17.88	17.95	18.45	18.49	0-0.5	0.5
DFT-s-OFDM QPSK	128	0	17.23	17.69	17.98	18.30	18.50	0	0.5
	1	1	17.48	17.72	18.00	18.33	18.70	0	0.0
	1	67	17.60	17.65	18.46	18.51	18.94		0.0
	1	131	17.55	17.70	18.49	18.82	18.92		0.0
	64	0	16.58	17.06	17.50	17.68	18.00	0-1	1.0
	64	35	17.48	17.74	18.50	18.60	18.62	0	0.0
64	69	16.84	17.16	16.96	17.95	17.99	0-1	1.0	
128	0	16.83	17.10	16.92	17.87	18.00	0-1	1.0	
DFT-s-OFDM 16QAM	1	1	16.72	16.88	16.90	17.69	17.98	0-1	1.0
CP-OFDM QPSK	1	1	16.21	16.33	16.82	17.46	17.50	0-1.5	1.5

Table F-6

NR Band n77 Antenna B Measured P_{Limit} for DSI = 0 (Body-worn, or Phablet with grip sensor inactive), or DSI = 1 (Phablet with grip sensor active) and/or DSI = 4 (Earjack Active) - 40 MHz Bandwidth

NR Band n77 40 MHz Bandwidth										
Modulation	RB Size	RB Offset	Channel						MPR Allowed per 3GPP [dB]	MPR [dB]
			648000 (3720 MHz)	651200 (3768 MHz)	654400 (3816 MHz)	657600 (3864 MHz)	660800 (3912 MHz)	664000 (3960 MHz)		
			Conducted Power [dBm]							
DFT-s-OFDM $\pi/2$ BPSK	1	1	17.59	17.70	17.98	18.27	18.59	19.00	0	0.0
	1	53	17.61	17.64	18.07	18.23	18.80	18.86		0.0
	1	104	17.79	18.03	18.22	18.49	19.00	18.90		0.0
	50	0	17.06	17.51	17.66	17.89	18.16	18.50	0-0.5	0.5
	50	28	17.66	17.80	18.03	18.29	18.75	18.68	0	0.0
	50	56	17.55	17.81	17.98	18.00	18.45	18.27	0-0.5	0.5
DFT-s-OFDM QPSK	100	0	17.21	17.50	17.72	17.99	18.20	18.45	0	0.5
	1	1	17.37	17.68	17.87	18.35	18.51	18.58	0	0.0
	1	53	17.58	17.84	18.02	18.21	18.57	18.91		0.0
	1	104	17.63	17.94	18.20	18.50	18.87	18.92		0.0
	50	0	17.01	16.91	17.13	17.31	17.67	18.00	0-1	1.0
	50	28	17.31	17.80	18.00	18.37	18.81	18.89	0	0.0
50	56	16.61	17.50	17.22	17.45	17.99	17.86	0-1	1.0	
100	0	16.64	17.17	17.14	17.29	17.74	17.96	0-1	1.0	
DFT-s-OFDM 16QAM	1	1	16.65	16.99	17.13	17.27	17.91	17.99	0-1	1.0
CP-OFDM QPSK	1	1	16.58	16.87	16.65	16.90	17.50	17.50	0-1.5	1.5




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Table F-7

NR Band n77 Antenna B Measured P_{Limit} for DSI = 0 (Body-worn, or Phablet with grip sensor inactive), or DSI = 1 (Phablet with grip sensor active) and/or DSI = 4 (Earjack Active) - 30 MHz Bandwidth

NR Band n77 30 MHz Bandwidth											
Modulation	RB Size	RB Offset	Channel						MPR Allowed per 3GPP [dB]	MPR [dB]	
			647668 (3715.02 MHz)	651000 (3765 MHz)	654334 (3815.01 MHz)	657666 (3864.99 MHz)	661000 (3915 MHz)	664332 (3964.98 MHz)			
			Conducted Power [dBm]								
DFT-s-OFDM $\pi/2$ BPSK	1	1	17.50	17.74	17.92	18.24	18.57	19.00	0	0.0	
	1	39	17.52	17.75	18.07	18.14	18.69	18.95		0.0	
	1	76	17.51	17.70	18.18	18.39	18.87	18.94		0.0	
		36	0	17.19	17.23	17.85	17.70	18.50	18.48	0-0.5	0.5
		36	21	17.54	17.92	17.92	18.23	18.76	18.73	0	0.0
		36	42	17.21	17.55	17.67	18.00	18.49	18.36	0-0.5	0.5
		75	0	17.07	17.52	17.63	17.97	18.50	18.37		0.5
DFT-s-OFDM QPSK	1	1	17.18	17.65	17.82	18.11	18.59	19.00	0	0.0	
	1	39	17.42	17.85	17.93	18.14	18.72	18.93		0.0	
	1	76	17.47	18.06	18.09	18.50	19.00	18.93		0.0	
		36	0	16.43	16.78	17.22	17.23	17.99	17.99	0-1	1.0
		36	21	17.50	17.85	18.08	18.36	18.63	18.89	0	0.0
		36	42	16.59	17.09	17.50	17.50	17.97	17.84	0-1	1.0
		75	0	16.61	16.88	17.01	17.42	17.85	17.96		1.0
DFT-s-OFDM 16QAM	1	1	16.57	16.94	17.03	17.32	17.58	18.00	0-1	1.0	
CP-OFDM QPSK	1	1	16.56	16.53	16.96	16.54	17.50	17.50	0-1.5	1.5	

Table F-8

NR Band n77 Antenna B Measured P_{Limit} for DSI = 0 (Body-worn, or Phablet with grip sensor inactive), or DSI = 1 (Phablet with grip sensor active) and/or DSI = 4 (Earjack Active) - 20 MHz Bandwidth

NR Band n77 20 MHz Bandwidth											
Modulation	RB Size	RB Offset	Channel						MPR Allowed per 3GPP [dB]	MPR [dB]	
			647334 (3710.01 MHz)	650800 (3762 MHz)	654266 (3813.99 MHz)	657734 (3866.01 MHz)	661200 (3918 MHz)	664666 (3969.99 MHz)			
			Conducted Power [dBm]								
DFT-s-OFDM $\pi/2$ BPSK	1	1	17.63	17.68	18.15	18.35	18.72	18.93	0	0.0	
	1	26	17.43	17.91	18.03	18.32	18.82	18.84		0.0	
	1	49	17.57	17.96	18.14	18.31	18.82	18.74		0.0	
		25	0	17.44	17.42	17.55	17.88	18.50	18.45	0-0.5	0.5
		25	13	17.38	17.47	17.75	18.40	18.89	18.93	0	0.0
		25	26	17.10	17.62	17.76	17.91	18.50	18.18	0-0.5	0.5
		50	0	17.03	17.45	17.59	17.80	18.50	18.42		0.5
DFT-s-OFDM QPSK	1	1	17.83	17.68	17.95	18.35	18.54	19.00	0	0.0	
	1	26	17.47	17.70	18.11	18.37	18.81	18.90		0.0	
	1	49	17.65	17.95	18.19	18.50	18.97	18.85		0.0	
		25	0	16.52	16.78	17.50	17.38	18.00	18.00	0-1	1.0
		25	13	17.46	17.83	18.00	17.97	18.80	18.89	0	0.0
		25	26	16.98	16.95	17.21	17.50	17.99	17.46	0-1	1.0
		50	0	16.61	17.00	17.18	17.45	17.86	17.84		1.0
DFT-s-OFDM 16QAM	1	1	16.56	16.94	17.22	17.43	17.81	17.99	0-1	1.0	
CP-OFDM QPSK	1	1	16.57	16.73	16.98	16.92	17.49	17.46	0-1.5	1.5	




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Table F-9
NR Band n77 Antenna B Measured P_{Limit} for DSI = 2 (Head) - 90 MHz Bandwidth

NR Band n77 90 MHz Bandwidth								
Modulation	RB Size	RB Offset	Channel			MPR Allowed per 3GPP [dB]	MPR [dB]	
			649668 (3745.02 MHz)	656000 (3840 MHz)	662332 (3934.98 MHz)			
			Conducted Power [dBm]					
DFT-s-OFDM $\pi/2$ BPSK	1	1	12.50	12.52	13.00	0	0.0	
	1	123	12.58	12.76	13.79		0.0	
	1	243	12.77	12.96	13.57		0.0	
		120	0	12.53	12.81	13.50	0-0.5	0.0
		120	63	12.50	12.88	13.73	0	0.0
		120	125	12.74	13.10	13.71	0-0.5	0.0
		243	0	12.63	13.04	13.62		0.0
DFT-s-OFDM QPSK	1	1	12.51	12.69	13.24	0	0.0	
	1	123	12.62	12.89	13.81		0.0	
	1	243	12.90	13.16	13.70		0.0	
		120	0	12.77	12.97	13.53	0-1	0.0
		120	63	12.56	12.94	13.61	0	0.0
		120	125	12.65	13.13	13.76	0-1	0.0
		243	0	12.60	13.04	13.67		0.0
DFT-s-OFDM 16QAM	1	1	12.57	12.86	13.16	0-1	0.0	
CP-OFDM QPSK	1	1	12.50	12.59	13.03	0-1.5	0.0	

Table F-10
NR Band n77 Antenna B Measured P_{Limit} for DSI = 2 (Head) - 80 MHz Bandwidth

NR Band n77 80 MHz Bandwidth								
Modulation	RB Size	RB Offset	Channel			MPR Allowed per 3GPP [dB]	MPR [dB]	
			649334 (3740.01 MHz)	656000 (3840 MHz)	662666 (3939.99 MHz)			
			Conducted Power [dBm]					
DFT-s-OFDM $\pi/2$ BPSK	1	1	12.50	12.72	13.26	0	0.0	
	1	109	12.51	12.95	13.50		0.0	
	1	215	12.80	13.18	13.65		0.0	
		108	0	12.81	13.02	13.63	0-0.5	0.0
		108	55	12.56	13.00	13.77	0	0.0
		108	109	12.75	13.18	13.80	0-0.5	0.0
		216	0	12.70	13.15	13.75		0.0
DFT-s-OFDM QPSK	1	1	12.53	12.93	13.49	0	0.0	
	1	109	12.55	13.03	13.67		0.0	
	1	215	12.91	13.24	13.87		0.0	
		108	0	12.63	13.19	13.72	0-1	0.0
		108	55	12.57	13.05	13.77	0	0.0
		108	109	12.73	13.13	13.88	0-1	0.0
		216	0	12.66	13.18	13.81		0.0
DFT-s-OFDM 16QAM	1	1	12.65	13.16	13.59	0-1	0.0	
CP-OFDM QPSK	1	1	12.57	12.89	13.35	0-1.5	0.0	




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Table F-11
NR Band n77 Antenna B Measured P_{Limit} for DSI = 2 (Head) - 70 MHz Bandwidth

NR Band n77 70 MHz Bandwidth								
Modulation	RB Size	RB Offset	Channel				MPR Allowed per 3GPP [dB]	MPR [dB]
			649000 (3735 MHz)	653666 (3804.99 MHz)	658334 (3875.01 MHz)	663000 (3945 MHz)		
			Conducted Power [dBm]					
DFT-s-OFDM $\pi/2$ BPSK	1	1	12.51	12.71	12.88	13.37	0	0.0
	1	95	12.58	12.77	13.10	13.61		0.0
	1	187	12.81	12.96	13.39	13.65		0.0
	90	0	12.68	12.94	13.30	13.68	0-0.5	0.0
	90	50	12.58	12.89	13.18	13.77	0	0.0
	90	99	12.67	12.97	13.28	13.82	0-0.5	0.0
	180	0	12.65	13.03	13.38	13.84	0	0.0
DFT-s-OFDM QPSK	1	1	12.61	12.98	13.02	13.74	0	0.0
	1	95	12.62	13.11	13.18	13.99		0.0
	1	187	12.76	13.15	13.50	13.79		0.0
	90	0	12.51	12.91	13.40	13.75	0-1	0.0
	90	50	12.53	12.94	13.31	13.86	0	0.0
	90	99	12.65	13.03	13.41	13.92	0	0.0
	180	0	12.64	13.07	13.41	13.89	0-1	0.0
DFT-s-OFDM 16QAM	1	1	12.71	13.01	13.11	13.94	0-1	0.0
CP-OFDM QPSK	1	1	12.54	12.80	13.06	13.62	0-1.5	0.0

Table F-12
NR Band n77 Antenna B Measured P_{Limit} for DSI = 2 (Head) - 60 MHz Bandwidth

NR Band n77 60 MHz Bandwidth								
Modulation	RB Size	RB Offset	Channel				MPR Allowed per 3GPP [dB]	MPR [dB]
			648668 (3730.02 MHz)	653556 (3803.34 MHz)	658444 (3876.66 MHz)	663332 (3949.98 MHz)		
			Conducted Power [dBm]					
DFT-s-OFDM $\pi/2$ BPSK	1	1	12.60	12.81	12.97	13.59	0	0.0
	1	81	12.70	12.94	13.27	13.80		0.0
	1	160	12.89	12.99	13.36	13.76		0.0
	81	0	12.86	13.00	13.46	13.74	0-0.5	0.0
	81	41	12.61	12.99	13.28	13.79	0	0.0
	81	81	12.65	13.03	13.44	13.88	0-0.5	0.0
	162	0	12.65	13.04	13.43	13.85	0	0.0
DFT-s-OFDM QPSK	1	1	12.66	12.96	13.25	13.81	0	0.0
	1	81	12.65	13.04	13.47	14.00		0.0
	1	160	12.84	13.13	13.65	13.81		0.0
	81	0	12.87	13.05	13.24	14.00	0-1	0.0
	81	41	12.67	13.00	13.35	13.93	0	0.0
	81	81	12.65	13.03	13.51	13.92	0-1	0.0
	162	0	12.64	13.10	13.39	13.90	0	0.0
DFT-s-OFDM 16QAM	1	1	12.64	13.05	13.14	13.90	0-1	0.0
CP-OFDM QPSK	1	1	12.59	12.97	13.11	13.62	0-1.5	0.0




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Table F-13
NR Band n77 Antenna B Measured P_{Limit} for DSI = 2 (Head) - 50 MHz Bandwidth

NR Band n77 50 MHz Bandwidth									
Modulation	RB Size	RB Offset	Channel					MPR Allowed per 3GPP [dB]	MPR [dB]
			648334 (3725.01 MHz)	652166 (3782.49 MHz)	656000 (3840 MHz)	659834 (3897.51 MHz)	663666 (3954.99 MHz)		
			Conducted Power [dBm]						
DFT-s-OFDM $\pi/2$ BPSK	1	1	12.79	12.75	13.01	13.73	14.46	0	0.0
	1	67	12.78	12.90	13.15	13.83	14.50		0.0
	1	131	12.88	13.16	13.34	14.00	14.19		0.0
	64	0	12.83	13.07	13.27	13.80	14.25	0-0.5	0.0
	64	35	12.77	13.11	13.30	13.95	14.37	0	0.0
	64	69	12.85	13.15	13.47	13.99	14.28	0-0.5	0.0
DFT-s-OFDM QPSK	128	0	12.85	13.11	13.37	13.90	14.28	0	0.0
	1	1	12.80	13.07	13.25	13.81	14.47	0	0.0
	1	67	12.85	13.10	13.23	13.75	14.46		0.0
	1	131	12.90	13.24	13.59	14.00	14.28		0.0
	64	0	12.84	13.20	13.51	13.79	14.29	0-1	0.0
	64	35	12.81	13.12	13.37	13.87	14.38	0	0.0
64	69	12.86	13.23	13.42	13.91	14.33	0-1	0.0	
128	0	12.85	13.28	13.47	14.00	14.30	0	0.0	
DFT-s-OFDM 16QAM	1	1	12.85	13.21	13.38	13.63	14.48	0-1	0.0
CP-OFDM QPSK	1	1	12.74	12.98	13.25	13.53	14.46	0-1.5	0.0

Table F-14
NR Band n77 Antenna B Measured P_{Limit} for DSI = 2 (Head) - 40 MHz Bandwidth

NR Band n77 40 MHz Bandwidth										
Modulation	RB Size	RB Offset	Channel						MPR Allowed per 3GPP [dB]	MPR [dB]
			648000 (3720 MHz)	651200 (3768 MHz)	654400 (3816 MHz)	657600 (3864 MHz)	660800 (3912 MHz)	664000 (3960 MHz)		
			Conducted Power [dBm]							
DFT-s-OFDM $\pi/2$ BPSK	1	1	13.01	13.02	13.27	13.44	13.81	14.48	0	0.0
	1	53	13.04	13.08	13.30	13.42	13.88	14.23		0.0
	1	104	13.03	13.23	13.41	13.64	13.96	14.14		0.0
	50	0	13.05	13.25	13.49	13.58	13.86	14.30	0-0.5	0.0
	50	28	12.99	13.16	13.34	13.49	13.84	14.27	0	0.0
	50	56	13.00	13.24	13.35	13.55	14.00	14.24	0-0.5	0.0
DFT-s-OFDM QPSK	100	0	13.04	13.29	13.40	13.61	13.99	14.25	0	0.0
	1	1	13.12	13.22	13.38	13.55	14.04	14.50	0	0.0
	1	53	13.11	13.19	13.40	13.60	14.01	14.49		0.0
	1	104	13.10	13.32	13.55	13.72	14.27	14.26		0.0
	50	0	13.06	13.33	13.50	13.68	13.89	14.33	0-1	0.0
	50	28	13.00	13.22	13.29	13.53	13.88	14.33	0	0.0
DFT-s-OFDM 16QAM	50	56	13.03	13.29	13.31	13.61	14.22	14.25	0-1	0.0
	100	0	13.04	13.33	13.42	13.67	13.99	14.29	0	0.0
	1	1	13.04	13.22	13.49	13.60	14.00	14.41	0-1	0.0
CP-OFDM QPSK	1	1	13.02	13.11	13.45	13.15	13.88	14.50	0-1.5	0.0




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Table F-15
NR Band n77 Antenna B Measured P_{Limit} for DSI = 2 (Head) - 30 MHz Bandwidth

NR Band n77 30 MHz Bandwidth										
Modulation	RB Size	RB Offset	Channel						MPR Allowed per 3GPP [dB]	MPR [dB]
			647668 (3715.02 MHz)	651000 (3765 MHz)	654334 (3815.01 MHz)	657666 (3864.99 MHz)	661000 (3915 MHz)	664332 (3964.98 MHz)		
Conducted Power [dBm]										
DFT-s-OFDM $\pi/2$ BPSK	1	1	13.00	13.01	13.31	13.31	13.74	14.25	0	0.0
	1	39	12.88	13.05	13.21	13.40	13.82	14.30		0.0
	1	76	12.89	13.18	13.31	13.54	14.08	14.06		0.0
	36	0	12.90	13.27	13.18	13.58	14.19	14.06	0-0.5	0.0
	36	21	12.89	13.14	13.20	13.42	14.03	14.08	0	0.0
	36	42	12.91	13.15	13.27	13.54	14.18	14.06	0-0.5	0.0
	75	0	12.90	13.21	13.34	13.55	14.13	14.08	0	0.0
DFT-s-OFDM QPSK	1	1	12.93	13.11	13.35	13.43	13.97	14.27	0	0.0
	1	39	12.96	13.16	13.37	13.44	13.98	14.42		0.0
	1	76	12.95	13.38	13.38	13.62	14.16	14.08		0.0
	36	0	12.85	13.25	13.19	13.71	13.93	14.11	0-1	0.0
	36	21	12.84	13.12	13.27	13.43	13.96	14.16	0	0.0
	36	42	12.88	13.18	13.31	13.51	14.09	14.02	0-1	0.0
	75	0	12.93	13.23	13.24	13.60	14.09	14.06	0	0.0
DFT-s-OFDM 16QAM	1	1	12.95	13.11	13.44	13.44	13.90	14.18	0-1	0.0
CP-OFDM QPSK	1	1	12.88	13.01	13.49	13.36	13.81	14.37	0-1.5	0.0

Table F-16
NR Band n77 Antenna B Measured P_{Limit} for DSI = 2 (Head) - 20 MHz Bandwidth

NR Band n77 20 MHz Bandwidth										
Modulation	RB Size	RB Offset	Channel						MPR Allowed per 3GPP [dB]	MPR [dB]
			647334 (3710.01 MHz)	650800 (3762 MHz)	654266 (3813.99 MHz)	657734 (3866.01 MHz)	661200 (3918 MHz)	664666 (3969.99 MHz)		
Conducted Power [dBm]										
DFT-s-OFDM $\pi/2$ BPSK	1	1	12.83	13.24	13.42	13.68	14.10	14.50	0	0.0
	1	26	12.76	13.20	13.42	13.73	13.91	14.31		0.0
	1	49	12.86	13.24	13.55	13.88	14.09	14.19		0.0
	25	0	12.85	13.23	13.48	13.90	14.06	14.26	0-0.5	0.0
	25	13	12.85	13.19	13.43	13.74	14.06	14.17	0	0.0
	25	26	12.86	13.17	13.49	13.74	14.15	14.14	0-0.5	0.0
	50	0	12.88	13.19	13.52	13.73	14.06	14.18	0	0.0
DFT-s-OFDM QPSK	1	1	12.90	13.22	13.56	13.68	14.21	14.32	0	0.0
	1	26	12.82	13.15	13.44	13.75	14.11	14.29		0.0
	1	49	12.93	13.24	13.46	13.83	14.27	14.30		0.0
	25	0	13.00	13.33	13.53	13.84	14.30	14.28	0-1	0.0
	25	13	12.94	13.26	13.48	13.75	14.17	14.22	0	0.0
	25	26	12.91	13.24	13.46	13.72	14.17	14.16	0-1	0.0
	50	0	12.91	13.23	13.50	13.76	14.23	14.21	0	0.0
DFT-s-OFDM 16QAM	1	1	12.93	13.24	13.49	13.74	14.24	14.27	0-1	0.0
CP-OFDM QPSK	1	1	13.00	13.30	13.45	13.60	14.23	14.48	0-1.5	0.0




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Table F-17
NR Band n77 Antenna B Measured P_{Limit} for DSI = 3 (Hotspot Mode) - 90 MHz Bandwidth

NR Band n77 90 MHz Bandwidth							
Modulation	RB Size	RB Offset	Channel			MPR Allowed per 3GPP [dB]	MPR [dB]
			649668 (3745.02 MHz)	656000 (3840 MHz)	662332 (3934.98 MHz)		
			Conducted Power [dBm]				
DFT-s-OFDM $\pi/2$ BPSK	1	1	14.76	15.26	15.85	0	0.0
	1	123	15.02	15.49	16.47		0.0
	1	243	15.61	15.86	16.50		0.0
	120	0	15.17	15.97	16.43	0-0.5	0.0
	120	63	15.34	15.77	16.48	0	0.0
	120	125	15.50	15.88	16.59	0-0.5	0.0
	243	0	15.38	15.98	16.62		0.0
DFT-s-OFDM QPSK	1	1	15.15	15.79	15.94	0	0.0
	1	123	15.17	15.62	16.69		0.0
	1	243	15.37	15.79	16.23		0.0
	120	0	15.39	15.67	16.45	0-1	0.0
	120	63	15.34	15.77	16.55	0	0.0
	120	125	15.59	15.96	16.66	0-1	0.0
	243	0	15.54	16.02	16.55		0.0
DFT-s-OFDM 16QAM	1	1	15.46	15.58	16.25	0-1	0.0
CP-OFDM QPSK	1	1	15.18	15.51	15.85	0-1.5	0.0

Table F-18
NR Band n77 Antenna B Measured P_{Limit} for DSI = 3 (Hotspot Mode) - 80 MHz Bandwidth

NR Band n77 80 MHz Bandwidth							
Modulation	RB Size	RB Offset	Channel			MPR Allowed per 3GPP [dB]	MPR [dB]
			649334 (3740.01 MHz)	656000 (3840 MHz)	662666 (3939.99 MHz)		
			Conducted Power [dBm]				
DFT-s-OFDM $\pi/2$ BPSK	1	1	15.21	15.58	15.98	0	0.0
	1	109	15.37	15.75	16.59		0.0
	1	215	15.54	15.97	16.35		0.0
	108	0	15.50	15.91	16.53	0-0.5	0.0
	108	55	15.43	15.85	16.60	0	0.0
	108	109	15.46	15.96	16.59	0-0.5	0.0
	216	0	15.51	15.85	16.57		0.0
DFT-s-OFDM QPSK	1	1	15.22	15.77	16.12	0	0.0
	1	109	15.38	15.70	16.56		0.0
	1	215	15.55	15.96	16.41		0.0
	108	0	15.45	15.91	16.33	0-1	0.0
	108	55	15.48	15.80	16.62	0	0.0
	108	109	15.51	15.91	16.61	0-1	0.0
	216	0	15.45	15.94	16.61		0.0
DFT-s-OFDM 16QAM	1	1	15.51	15.93	16.45	0-1	0.0
CP-OFDM QPSK	1	1	15.27	15.45	16.25	0-1.5	0.0




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Table F-19

NR Band n77 Antenna B Measured P_{Limit} for DSI = 3 (Hotspot Mode) - 70 MHz Bandwidth

NR Band n77 70 MHz Bandwidth								
Modulation	RB Size	RB Offset	Channel				MPR Allowed per 3GPP [dB]	MPR [dB]
			649000 (3735 MHz)	653666 (3804.99 MHz)	658334 (3875.01 MHz)	663000 (3945 MHz)		
			Conducted Power [dBm]					
DFT-s-OFDM $\pi/2$ BPSK	1	1	15.27	15.56	15.53	16.27	0	0.0
	1	95	15.27	15.80	15.76	16.53		0.0
	1	187	15.43	15.82	16.26	16.44		0.0
	90	0	15.53	15.75	15.97	16.50	0-0.5	0.0
	90	50	15.38	15.79	15.95	16.79	0	0.0
	90	99	15.43	15.88	16.27	16.74	0-0.5	0.0
	180	0	15.47	15.82	16.21	16.64		0.0
DFT-s-OFDM QPSK	1	1	15.37	15.76	15.77	16.60	0	0.0
	1	95	15.35	15.66	16.08	16.55		0.0
	1	187	15.53	15.78	16.35	16.60		0.0
	90	0	15.35	15.74	16.07	16.50	0-1	0.0
	90	50	15.35	15.71	16.10	16.65	0	0.0
	90	99	15.42	15.83	16.21	16.70	0-1	0.0
	180	0	15.47	15.87	16.29	16.67		0.0
DFT-s-OFDM 16QAM	1	1	15.55	15.90	16.11	16.64	0-1	0.0
CP-OFDM QPSK	1	1	15.39	15.85	16.00	16.59	0-1.5	0.0

Table F-20

NR Band n77 Antenna B Measured P_{Limit} for DSI = 3 (Hotspot Mode) - 60 MHz Bandwidth

NR Band n77 60 MHz Bandwidth								
Modulation	RB Size	RB Offset	Channel				MPR Allowed per 3GPP [dB]	MPR [dB]
			648668 (3730.02 MHz)	653556 (3803.34 MHz)	658444 (3876.66 MHz)	663332 (3949.98 MHz)		
			Conducted Power [dBm]					
DFT-s-OFDM $\pi/2$ BPSK	1	1	15.30	15.27	15.81	16.34	0	0.0
	1	81	15.46	15.66	15.79	16.71		0.0
	1	160	15.44	15.79	16.27	16.73		0.0
	81	0	15.52	15.73	16.25	16.59	0-0.5	0.0
	81	41	15.44	15.68	16.12	16.69	0	0.0
	81	81	15.47	15.76	16.20	16.73	0-0.5	0.0
	162	0	15.53	15.77	16.22	16.70		0.0
DFT-s-OFDM QPSK	1	1	15.26	15.59	16.11	16.66	0	0.0
	1	81	15.34	15.70	16.18	16.73		0.0
	1	160	15.58	15.87	16.26	16.63		0.0
	81	0	15.33	15.74	16.24	16.55	0-1	0.0
	81	41	15.36	15.75	16.10	16.70	0	0.0
	81	81	15.41	15.80	16.20	16.74	0-1	0.0
	162	0	15.32	15.81	16.24	16.73		0.0
DFT-s-OFDM 16QAM	1	1	15.38	15.82	16.11	16.75	0-1	0.0
CP-OFDM QPSK	1	1	15.35	15.68	15.90	16.64	0-1.5	0.0




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Table F-21
NR Band n77 Antenna B Measured P_{Limit} for DSI = 3 (Hotspot Mode) - 50 MHz Bandwidth

NR Band n77 50 MHz Bandwidth									
Modulation	RB Size	RB Offset	Channel					MPR Allowed per 3GPP [dB]	MPR [dB]
			648334 (3725.01 MHz)	652166 (3782.49 MHz)	656000 (3840 MHz)	659834 (3897.51 MHz)	663666 (3954.99 MHz)		
			Conducted Power [dBm]						
DFT-s-OFDM $\pi/2$ BPSK	1	1	15.30	15.46	15.44	16.05	16.88	0	0.0
	1	67	15.38	15.62	15.73	16.22	16.82		0.0
	1	131	15.50	15.97	16.15	16.46	16.80		0.0
	64	0	15.48	15.75	16.07	16.62	16.77	0-0.5	0.0
	64	35	15.48	15.88	15.99	16.44	16.88	0	0.0
	64	69	15.55	15.98	16.05	16.56	16.77	0-0.5	0.0
DFT-s-OFDM QPSK	128	0	15.55	15.85	16.14	16.47	16.78	0	0.0
	1	1	15.42	15.63	15.81	16.45	16.84	0	0.0
	1	67	15.53	15.66	16.14	16.32	16.91		0.0
	1	131	15.63	15.87	16.15	16.62	16.77		0.0
	64	0	15.53	15.81	16.20	16.56	16.70	0-1	0.0
	64	35	15.54	15.80	16.14	16.49	16.84	0	0.0
DFT-s-OFDM 16QAM	64	69	15.62	15.95	16.24	16.67	16.83	0-1	0.0
	128	0	15.61	15.85	16.25	16.54	16.80		0.0
	1	1	15.76	15.90	16.20	16.52	16.99	0-1	0.0
	CP-OFDM QPSK	1	1	15.61	15.89	16.12	16.32	17.00	0-1.5

Table F-22
NR Band n77 Antenna B Measured P_{Limit} for DSI = 3 (Hotspot Mode) - 40 MHz Bandwidth

NR Band n77 40 MHz Bandwidth										
Modulation	RB Size	RB Offset	Channel						MPR Allowed per 3GPP [dB]	MPR [dB]
			648000 (3720 MHz)	651200 (3768 MHz)	654400 (3816 MHz)	657600 (3864 MHz)	660800 (3912 MHz)	664000 (3960 MHz)		
			Conducted Power [dBm]							
DFT-s-OFDM $\pi/2$ BPSK	1	1	15.56	15.86	16.00	16.28	16.66	17.00	0	0.0
	1	53	15.55	15.83	16.06	16.32	16.67	16.90		0.0
	1	104	15.80	15.98	16.18	16.50	16.95	16.96		0.0
	50	0	15.81	16.09	16.26	16.47	16.64	16.92	0-0.5	0.0
	50	28	15.64	15.91	16.20	16.41	16.70	16.90	0	0.0
	50	56	15.64	16.04	16.16	16.48	16.83	16.97	0-0.5	0.0
DFT-s-OFDM QPSK	100	0	15.69	16.11	16.21	16.54	16.91	16.90	0	0.0
	1	1	15.67	15.93	16.16	16.47	16.80	17.00	0	0.0
	1	53	15.72	15.88	16.14	16.35	16.79	16.98		0.0
	1	104	15.70	15.99	16.28	16.47	16.98	16.99		0.0
	50	0	15.75	16.08	16.33	16.64	16.66	17.00	0-1	0.0
	50	28	15.67	15.94	16.22	16.48	16.69	16.95	0	0.0
DFT-s-OFDM 16QAM	50	56	15.68	16.00	16.21	16.67	16.84	17.00	0-1	0.0
	100	0	15.72	16.08	16.24	16.47	16.90	16.98		0.0
	1	1	15.79	15.99	16.26	16.55	16.84	16.98	0-1	0.0
CP-OFDM QPSK	1	1	15.98	16.21	16.24	16.33	16.80	16.99	0-1.5	0.0







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Table F-23
NR Band n77 Antenna B Measured P_{Limit} for DSI = 3 (Hotspot Mode) - 30 MHz Bandwidth

NR Band n77 30 MHz Bandwidth										
Modulation	RB Size	RB Offset	Channel						MPR Allowed per 3GPP [dB]	MPR [dB]
			647668 (3715.02 MHz)	651000 (3765 MHz)	654334 (3815.01 MHz)	657666 (3864.99 MHz)	661000 (3915 MHz)	664332 (3964.98 MHz)		
			Conducted Power [dBm]							
DFT-s-OFDM $\pi/2$ BPSK	1	1	15.60	15.96	16.08	16.32	16.60	16.99	0	0.0
	1	39	15.86	15.97	16.06	16.35	16.61	16.86		0.0
	1	76	15.90	16.24	16.20	16.34	16.76	16.80		0.0
	36	0	15.83	16.12	16.14	16.40	16.96	16.81	0-0.5	0.0
	36	21	15.83	15.96	16.11	16.32	16.74	16.78	0	0.0
	36	42	15.89	16.06	16.10	16.44	16.77	16.73	0-0.5	0.0
	75	0	15.93	16.03	16.17	16.48	16.82	16.76	0	0.0
DFT-s-OFDM QPSK	1	1	15.90	15.89	16.06	16.33	16.68	16.93	0	0.0
	1	39	15.90	15.88	16.10	16.23	16.64	16.89		0.0
	1	76	15.96	16.16	16.20	16.42	16.81	16.74		0.0
	36	0	15.87	16.12	16.23	16.42	16.81	16.71	0-1	0.0
	36	21	15.89	15.97	16.18	16.35	16.71	16.76	0	0.0
	36	42	15.91	16.09	16.15	16.44	16.77	16.70	0-1	0.0
	75	0	15.91	16.07	16.14	16.47	16.82	16.73	0	0.0
DFT-s-OFDM 16QAM	1	1	15.54	15.83	16.03	15.83	16.58	16.63	0-1	0.0
CP-OFDM QPSK	1	1	15.49	15.75	15.96	16.16	16.44	16.40	0-1.5	0.0

Table F-24
NR Band n77 Antenna B Measured P_{Limit} for DSI = 3 (Hotspot Mode) - 20 MHz Bandwidth

NR Band n77 20 MHz Bandwidth										
Modulation	RB Size	RB Offset	Channel						MPR Allowed per 3GPP [dB]	MPR [dB]
			647334 (3710.01 MHz)	650800 (3762 MHz)	654266 (3813.99 MHz)	657734 (3866.01 MHz)	661200 (3918 MHz)	664666 (3969.99 MHz)		
			Conducted Power [dBm]							
DFT-s-OFDM $\pi/2$ BPSK	1	1	15.26	15.65	16.17	16.35	16.72	17.00	0	0.0
	1	26	15.34	15.74	16.12	16.38	16.82	16.98		0.0
	1	49	15.40	15.94	16.12	16.42	16.85	16.96		0.0
	25	0	15.45	15.99	16.17	16.47	16.89	16.92	0-0.5	0.0
	25	13	15.39	15.81	16.10	16.36	16.83	16.91	0	0.0
	25	26	15.39	15.85	16.11	16.33	16.82	16.93	0-0.5	0.0
	50	0	15.37	15.91	16.10	16.33	16.89	16.90	0	0.0
DFT-s-OFDM QPSK	1	1	15.56	15.95	16.14	16.42	16.85	16.93	0	0.0
	1	26	15.49	15.92	16.13	16.41	16.83	16.97		0.0
	1	49	15.47	15.98	16.10	16.42	16.84	16.88		0.0
	25	0	15.45	15.99	16.23	16.57	16.80	16.80	0-1	0.0
	25	13	15.50	15.92	16.13	16.41	16.83	16.91	0	0.0
	25	26	15.49	15.93	16.14	16.40	16.82	16.85	0-1	0.0
	50	0	15.47	16.02	16.10	16.42	16.84	16.83	0	0.0
DFT-s-OFDM 16QAM	1	1	15.35	15.88	16.08	16.34	16.69	16.81	0-1	0.0
CP-OFDM QPSK	1	1	15.60	16.06	16.14	16.23	16.59	16.82	0-1.5	0.0

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F.1.2 NR Band n77 Antenna G

Table F-25

NR Band n77 Antenna G Measured P_{Limit} for DSI = 0 (Body-worn, or Phablet with grip sensor inactive), or DSI = 1 (Phablet with grip sensor active) and/or DSI = 4 (Earjack Active) - 90 MHz Bandwidth

NR Band n77 90 MHz Bandwidth							
Modulation	RB Size	RB Offset	Channel			MPR Allowed per 3GPP [dB]	MPR [dB]
			649668 (3745.02 MHz)	656000 (3840 MHz)	662332 (3934.98 MHz)		
Conducted Power [dBm]							
DFT-s-OFDM $\pi/2$ BPSK	1	1	14.98	15.05	15.14	0	0.0
	1	123	15.45	15.29	15.89		0.0
	1	243	15.21	15.52	15.96		0.0
	120	0	14.83	14.67	15.12	0-0.5	0.5
	120	63	15.44	15.23	15.87	0	0.0
	120	125	14.93	14.80	15.38	0-0.5	0.5
243	0	14.99	14.75	15.30	0-0.5	0.5	
DFT-s-OFDM QPSK	1	1	14.89	15.08	15.23	0	0.0
	1	123	15.53	15.19	16.05		0.0
	1	243	15.40	15.45	15.62		0.0
	120	0	14.41	14.10	14.66	0-1	1.0
	120	63	15.45	15.15	15.85	0	0.0
	120	125	14.44	14.36	14.90	0-1	1.0
243	0	14.44	14.25	14.85	0-1	1.0	
DFT-s-OFDM 16QAM	1	1	14.42	14.25	14.52	0-1	1.0
CP-OFDM QPSK	1	1	13.75	13.56	13.90	0-1.5	1.5

Table F-26

NR Band n77 Antenna G Measured P_{Limit} for DSI = 0 (Body-worn, or Phablet with grip sensor inactive), or DSI = 1 (Phablet with grip sensor active) and/or DSI = 4 (Earjack Active) - 80 MHz Bandwidth

NR Band n77 80 MHz Bandwidth							
Modulation	RB Size	RB Offset	Channel			MPR Allowed per 3GPP [dB]	MPR [dB]
			649334 (3740.01 MHz)	656000 (3840 MHz)	662666 (3939.99 MHz)		
Conducted Power [dBm]							
DFT-s-OFDM $\pi/2$ BPSK	1	1	15.32	15.16	15.54	0	0.0
	1	109	15.62	15.38	15.85		0.0
	1	215	15.34	15.44	15.65		0.0
	108	0	14.98	14.73	15.18	0-0.5	0.5
	108	55	15.62	15.27	15.90	0	0.0
	108	109	15.06	14.89	15.41	0-0.5	0.5
216	0	14.95	14.75	15.31	0-0.5	0.5	
DFT-s-OFDM QPSK	1	1	15.50	15.12	15.31	0	0.0
	1	109	15.60	15.26	16.00		0.0
	1	215	15.51	15.28	15.62		0.0
	108	0	14.49	14.29	14.64	0-1	1.0
	108	55	15.62	15.26	15.87	0	0.0
	108	109	14.50	14.37	14.82	0-1	1.0
216	0	14.50	14.33	14.82	0-1	1.0	
DFT-s-OFDM 16QAM	1	1	14.42	14.30	14.68	0-1	1.0
CP-OFDM QPSK	1	1	14.05	13.85	14.09	0-1.5	1.5




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Table F-27

NR Band n77 Antenna G Measured P_{Limit} for DSI = 0 (Body-worn, or Phablet with grip sensor inactive), or DSI = 1 (Phablet with grip sensor active) and/or DSI = 4 (Earjack Active) - 70 MHz Bandwidth

NR Band n77 70 MHz Bandwidth								
Modulation	RB Size	RB Offset	Channel				MPR Allowed per 3GPP [dB]	MPR [dB]
			649000 (3735 MHz)	653666 (3804.99 MHz)	658334 (3875.01 MHz)	663000 (3945 MHz)		
			Conducted Power [dBm]					
DFT-s-OFDM $\pi/2$ BPSK	1	1	15.17	15.35	15.07	15.53	0	0.0
	1	95	15.50	15.44	15.54	15.93		0.0
	1	187	15.45	15.41	15.79	15.61		0.0
	90	0	14.84	14.86	14.82	15.13	0-0.5	0.5
	90	50	15.44	15.50	15.50	15.92	0	0.0
	90	99	15.06	14.93	15.13	15.38	0-0.5	0.5
DFT-s-OFDM QPSK	180	0	14.87	14.91	15.02	15.32	0	0.5
	1	1	15.17	15.47	15.15	15.63	0	0.0
	1	95	15.60	15.56	15.55	16.00		0.0
	1	187	15.48	15.22	15.69	15.65		0.0
	90	0	14.41	14.41	14.35	14.73	0-1	1.0
	90	50	15.50	15.45	15.52	16.04	0	0.0
90	99	14.51	14.42	14.65	14.94	0	1.0	
DFT-s-OFDM 16QAM	180	0	14.36	14.50	14.47	14.85	0-1	1.0
CP-OFDM QPSK	1	1	14.53	14.29	14.04	15.13	0-1	1.0
	1	1	13.87	13.67	13.72	14.30	0-1.5	1.5

Table F-28

NR Band n77 Antenna G Measured P_{Limit} for DSI = 0 (Body-worn, or Phablet with grip sensor inactive), or DSI = 1 (Phablet with grip sensor active) and/or DSI = 4 (Earjack Active) - 60 MHz Bandwidth

NR Band n77 60 MHz Bandwidth								
Modulation	RB Size	RB Offset	Channel				MPR Allowed per 3GPP [dB]	MPR [dB]
			648668 (3730.02 MHz)	653556 (3803.34 MHz)	658444 (3876.66 MHz)	663332 (3949.98 MHz)		
			Conducted Power [dBm]					
DFT-s-OFDM $\pi/2$ BPSK	1	1	15.13	15.42	15.15	15.77	0	0.0
	1	81	15.40	15.41	15.48	16.04		0.0
	1	160	15.40	15.58	15.86	15.71		0.0
	81	0	14.91	14.85	14.85	15.33	0-0.5	0.5
	81	41	15.51	15.40	15.45	15.95	0	0.0
	81	81	15.15	14.85	15.17	15.36	0-0.5	0.5
DFT-s-OFDM QPSK	162	0	14.97	14.86	14.96	15.40	0	0.5
	1	1	14.93	15.56	15.30	15.75	0	0.0
	1	81	15.50	15.51	15.55	15.95		0.0
	1	160	15.42	15.39	15.84	15.80		0.0
	81	0	14.43	14.35	14.32	14.85	0-1	1.0
	81	41	15.45	15.41	15.52	16.00	0	0.0
DFT-s-OFDM 16QAM	81	81	14.45	14.34	14.65	14.87	0-1	1.0
	162	0	14.41	14.42	14.49	14.99	0	1.0
	1	1	14.15	14.21	14.11	14.60	0-1	1.0
CP-OFDM QPSK	1	1	13.71	13.78	13.71	14.23	0-1.5	1.5




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Table F-29

NR Band n77 Antenna G Measured P_{Limit} for DSI = 0 (Body-worn, or Phablet with grip sensor inactive), or DSI = 1 (Phablet with grip sensor active) and/or DSI = 4 (Earjack Active) - 50 MHz Bandwidth

NR Band n77 50 MHz Bandwidth									
Modulation	RB Size	RB Offset	Channel					MPR Allowed per 3GPP [dB]	MPR [dB]
			648334 (3725.01 MHz)	652166 (3782.49 MHz)	656000 (3840 MHz)	659834 (3897.51 MHz)	663666 (3954.99 MHz)		
			Conducted Power [dBm]						
DFT-s-OFDM $\pi/2$ BPSK	1	1	15.51	15.48	15.31	15.54	15.44	0	0.0
	1	67	15.75	15.75	15.54	15.83	15.26		0.0
	1	131	15.85	15.65	15.60	16.21	15.15		0.0
	64	0	15.14	15.16	15.00	15.24	14.83	0-0.5	0.5
	64	35	15.71	15.62	15.63	15.82	15.34	0	0.0
	64	69	15.35	15.15	15.18	15.51	14.67	0-0.5	0.5
DFT-s-OFDM QPSK	128	0	15.24	15.09	15.00	15.37	14.80	0	0.5
	1	1	15.53	15.56	15.36	15.55	15.37	0	0.0
	1	67	15.80	15.42	15.50	15.85	15.29		0.0
	1	131	15.74	15.75	15.65	16.28	15.00		0.0
	64	0	14.65	14.69	14.42	14.78	14.29	0-1	1.0
	64	35	15.78	15.68	15.63	15.85	15.29	0	0.0
64	69	14.82	14.67	14.65	14.98	14.22	0-1	1.0	
128	0	14.69	14.62	14.56	14.91	14.26	0-1	1.0	
DFT-s-OFDM 16QAM	1	1	14.43	14.35	14.45	14.65	14.23	0-1	1.0
CP-OFDM QPSK	1	1	13.99	14.02	14.10	14.01	13.82	0-1.5	1.5

Table F-30

NR Band n77 Antenna G Measured P_{Limit} for DSI = 0 (Body-worn, or Phablet with grip sensor inactive), or DSI = 1 (Phablet with grip sensor active) and/or DSI = 4 (Earjack Active) - 40 MHz Bandwidth

NR Band n77 40 MHz Bandwidth										
Modulation	RB Size	RB Offset	Channel						MPR Allowed per 3GPP [dB]	MPR [dB]
			648000 (3720 MHz)	651200 (3768 MHz)	654400 (3816 MHz)	657600 (3864 MHz)	660800 (3912 MHz)	664000 (3960 MHz)		
			Conducted Power [dBm]							
DFT-s-OFDM $\pi/2$ BPSK	1	1	15.46	15.76	15.72	15.70	15.96	15.56	0	0.0
	1	53	15.75	15.70	15.68	15.60	16.04	15.22		0.0
	1	104	15.95	15.78	15.75	16.00	16.30	15.28		0.0
	50	0	15.15	15.18	15.22	15.07	15.35	14.86	0-0.5	0.5
	50	28	15.65	15.70	15.56	15.70	16.07	15.23	0	0.0
	50	56	15.26	15.35	15.23	15.34	15.72	14.74	0-0.5	0.5
DFT-s-OFDM QPSK	100	0	15.20	15.30	15.06	15.18	15.56	14.73	0	0.5
	1	1	15.50	15.99	15.82	15.77	16.02	15.60	0	0.0
	1	53	15.59	15.71	15.47	15.70	16.18	15.20		0.0
	1	104	16.10	15.91	15.91	15.99	16.10	15.30		0.0
	50	0	14.69	14.83	14.70	14.58	14.98	14.42	0-1	1.0
	50	28	15.72	15.77	15.58	15.72	16.03	15.20	0	0.0
DFT-s-OFDM 16QAM	50	56	14.75	14.87	14.00	14.87	15.24	14.30	0-1	1.0
	100	0	14.70	14.81	14.70	14.69	15.05	14.31	0-1	1.0
DFT-s-OFDM 16QAM	1	1	14.43	14.53	14.88	14.50	14.83	14.64	0-1	1.0
CP-OFDM QPSK	1	1	13.95	14.35	14.25	14.08	14.47	14.00	0-1.5	1.5




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Table F-31

NR Band n77 Antenna G Measured P_{Limit} for DSI = 0 (Body-worn, or Phablet with grip sensor inactive), or DSI = 1 (Phablet with grip sensor active) and/or DSI = 4 (Earjack Active) - 30 MHz Bandwidth

NR Band n77 30 MHz Bandwidth											
Modulation	RB Size	RB Offset	Channel						MPR Allowed per 3GPP [dB]	MPR [dB]	
			647668 (3715.02 MHz)	651000 (3765 MHz)	654334 (3815.01 MHz)	657666 (3864.99 MHz)	661000 (3915 MHz)	664332 (3964.98 MHz)			
			Conducted Power [dBm]								
DFT-s-OFDM $\pi/2$ BPSK	1	1	15.43	15.80	15.55	15.61	15.85	15.61	0	0.0	
	1	39	15.45	15.74	15.50	15.63	15.95	15.21		0.0	
	1	76	15.80	15.80	15.73	15.87	16.27	15.23		0.0	
		36	0	14.93	15.15	15.10	15.06	15.51	14.84	0-0.5	0.5
		36	21	15.65	15.72	15.62	15.71	16.03	15.23	0	0.0
		36	42	15.20	15.29	15.13	15.25	15.65	14.72	0-0.5	0.5
		75	0	15.16	15.26	15.03	15.13	15.48	14.79		0.5
DFT-s-OFDM QPSK	1	1	15.37	15.74	15.50	15.53	15.85	15.55	0	0.0	
	1	39	15.57	15.78	15.41	15.65	16.12	15.23		0.0	
	1	76	15.76	15.99	15.77	15.85	16.40	15.21		0.0	
		36	0	14.52	14.73	14.66	14.58	15.06	14.38	0-1	1.0
		36	21	15.61	15.77	15.48	15.71	16.00	15.33	0	0.0
		36	42	14.75	14.87	14.62	14.76	15.28	14.26	0-1	1.0
		75	0	14.70	14.73	14.58	14.71	15.08	14.27		1.0
DFT-s-OFDM 16QAM	1	1	14.23	14.50	14.61	14.35	15.00	14.47	0-1	1.0	
CP-OFDM QPSK	1	1	13.94	14.25	14.16	14.23	14.20	14.15	0-1.5	1.5	

Table F-32

NR Band n77 Antenna G Measured P_{Limit} for DSI = 0 (Body-worn, or Phablet with grip sensor inactive), or DSI = 1 (Phablet with grip sensor active) and/or DSI = 4 (Earjack Active) - 20 MHz Bandwidth

NR Band n77 20 MHz Bandwidth											
Modulation	RB Size	RB Offset	Channel						MPR Allowed per 3GPP [dB]	MPR [dB]	
			647334 (3710.01 MHz)	650800 (3762 MHz)	654266 (3813.99 MHz)	657734 (3866.01 MHz)	661200 (3918 MHz)	664666 (3969.99 MHz)			
			Conducted Power [dBm]								
DFT-s-OFDM $\pi/2$ BPSK	1	1	15.58	15.75	15.64	15.52	16.22	15.34	0	0.0	
	1	26	15.34	15.95	15.65	15.42	16.06	15.31		0.0	
	1	49	16.00	15.99	15.72	15.91	16.21	15.25		0.0	
		25	0	15.07	15.31	15.15	15.10	15.62	14.75	0-0.5	0.5
		25	13	15.58	15.72	15.59	15.70	15.93	15.18	0	0.0
		25	26	15.15	15.33	15.10	15.17	15.58	14.68	0-0.5	0.5
		50	0	15.05	15.39	15.12	15.13	15.64	14.75		0.5
DFT-s-OFDM QPSK	1	1	15.55	15.78	15.62	15.55	16.00	15.37	0	0.0	
	1	26	15.58	15.73	15.53	15.50	16.15	15.27		0.0	
	1	49	15.80	15.86	15.69	15.80	16.20	15.33		0.0	
		25	0	14.49	14.85	14.64	14.62	15.05	14.20	0-1	1.0
		25	13	15.61	15.87	15.64	15.60	16.10	15.25	0	0.0
		25	26	14.70	14.87	14.68	14.67	15.17	14.18	0-1	1.0
		50	0	14.60	14.82	14.68	14.77	15.14	14.20		1.0
DFT-s-OFDM 16QAM	1	1	14.70	14.99	14.47	14.50	14.99	14.35	0-1	1.0	
CP-OFDM QPSK	1	1	13.95	14.29	14.40	14.02	14.58	14.00	0-1.5	1.5	



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Table F-33
NR Band n77 Antenna G Measured P_{Limit} for DSI = 2 (Head) - 90 MHz Bandwidth

NR Band n77 90 MHz Bandwidth								
Modulation	RB Size	RB Offset	Channel			MPR Allowed per 3GPP [dB]	MPR [dB]	
			649668 (3745.02 MHz)	656000 (3840 MHz)	662332 (3934.98 MHz)			
			Conducted Power [dBm]					
DFT-s-OFDM $\pi/2$ BPSK	1	1	10.52	10.30	10.41	0	0.0	
	1	123	10.81	10.53	11.20		0.0	
	1	243	10.60	10.66	10.91		0.0	
		120	0	10.73	10.49	11.00	0-0.5	0.0
		120	63	10.64	10.52	11.14	0	0.0
		120	125	10.76	10.63	11.24	0-0.5	0.0
		243	0	10.69	10.55	11.05		0.0
DFT-s-OFDM QPSK	1	1	10.52	10.27	10.50	0	0.0	
	1	123	10.89	10.55	11.27		0.0	
	1	243	10.60	10.68	11.05		0.0	
		120	0	10.77	10.54	11.02	0-1	0.0
		120	63	10.77	10.54	11.16	0	0.0
		120	125	10.78	10.66	11.12	0-1	0.0
		243	0	10.76	10.58	11.15		0.0
DFT-s-OFDM 16QAM	1	1	10.35	10.20	10.50	0-1	0.0	
CP-OFDM QPSK	1	1	10.40	10.40	10.57	0-1.5	0.0	

Table F-34
NR Band n77 Antenna G Measured P_{Limit} for DSI = 2 (Head) - 80 MHz Bandwidth

NR Band n77 80 MHz Bandwidth								
Modulation	RB Size	RB Offset	Channel			MPR Allowed per 3GPP [dB]	MPR [dB]	
			649334 (3740.01 MHz)	656000 (3840 MHz)	662666 (3939.99 MHz)			
			Conducted Power [dBm]					
DFT-s-OFDM $\pi/2$ BPSK	1	1	10.70	10.42	10.72	0	0.0	
	1	109	10.86	10.66	11.26		0.0	
	1	215	10.66	10.72	10.89		0.0	
		108	0	10.84	10.46	10.96	0-0.5	0.0
		108	55	10.83	10.55	11.23	0	0.0
		108	109	10.83	10.63	11.02	0-0.5	0.0
		216	0	10.78	10.62	11.05		0.0
DFT-s-OFDM QPSK	1	1	10.70	10.30	10.72	0	0.0	
	1	109	10.68	10.62	11.40		0.0	
	1	215	10.77	10.68	11.00		0.0	
		108	0	10.80	10.53	10.89	0-1	0.0
		108	55	10.79	10.50	11.21	0	0.0
		108	109	10.85	10.72	11.04	0-1	0.0
		216	0	10.85	10.60	11.02		0.0
DFT-s-OFDM 16QAM	1	1	10.30	10.30	10.50	0-1	0.0	
CP-OFDM QPSK	1	1	10.75	10.55	11.05	0-1.5	0.0	




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Table F-35
NR Band n77 Antenna G Measured P_{Limit} for DSI = 2 (Head) - 70 MHz Bandwidth

NR Band n77 70 MHz Bandwidth								
Modulation	RB Size	RB Offset	Channel				MPR Allowed per 3GPP [dB]	MPR [dB]
			649000 (3735 MHz)	653666 (3804.99 MHz)	658334 (3875.01 MHz)	663000 (3945 MHz)		
			Conducted Power [dBm]					
DFT-s-OFDM $\pi/2$ BPSK	1	1	10.49	10.41	10.42	10.79	0	0.0
	1	95	10.81	10.75	10.72	11.11		0.0
	1	187	10.80	10.28	10.95	10.97		0.0
	90	0	10.56	10.48	10.55	11.04	0-0.5	0.0
	90	50	10.74	10.50	10.67	11.17	0	0.0
	90	99	10.80	10.55	10.67	11.12	0-0.5	0.0
DFT-s-OFDM QPSK	180	0	10.73	10.62	10.62	11.18	0	0.0
	1	1	10.61	10.69	10.41	10.87		0.0
	1	95	10.77	10.50	10.80	11.40		0.0
	1	187	10.65	10.47	10.78	10.91	0.0	
	90	0	10.67	10.51	10.55	11.04	0-1	0.0
	90	50	10.72	10.55	10.73	11.25	0	0.0
DFT-s-OFDM 16QAM	90	99	10.82	10.57	10.83	11.14	0-1	0.0
	180	0	10.69	10.62	10.74	11.15		0.0
	1	1	10.46	10.58	10.21	10.82		0.0
CP-OFDM QPSK	1	1	10.53	10.75	10.35	10.89	0-1.5	0.0

Table F-36
NR Band n77 Antenna G Measured P_{Limit} for DSI = 2 (Head) - 60 MHz Bandwidth

NR Band n77 60 MHz Bandwidth								
Modulation	RB Size	RB Offset	Channel				MPR Allowed per 3GPP [dB]	MPR [dB]
			648668 (3730.02 MHz)	653556 (3803.34 MHz)	658444 (3876.66 MHz)	663332 (3949.98 MHz)		
			Conducted Power [dBm]					
DFT-s-OFDM $\pi/2$ BPSK	1	1	10.58	10.57	10.32	11.01	0	0.0
	1	81	10.95	10.76	10.82	11.36		0.0
	1	160	10.75	10.69	11.19	11.08		0.0
	81	0	10.70	10.62	10.59	11.10	0-0.5	0.0
	81	41	10.84	10.62	10.76	11.25	0	0.0
	81	81	10.82	10.66	10.92	11.16	0-0.5	0.0
DFT-s-OFDM QPSK	162	0	10.80	10.66	10.75	11.12	0	0.0
	1	1	10.42	10.70	10.45	10.93		0.0
	1	81	10.96	10.75	11.00	11.26		0.0
	1	160	10.83	10.73	11.15	11.10	0.0	
	81	0	10.61	10.62	10.64	11.15	0-1	0.0
	81	41	10.78	10.63	10.82	11.22	0	0.0
DFT-s-OFDM 16QAM	81	81	10.75	10.66	10.80	11.22	0-1	0.0
	162	0	10.81	10.69	10.78	11.19		0.0
	1	1	10.15	10.77	10.23	10.80		0.0
CP-OFDM QPSK	1	1	10.58	10.66	10.40	11.08	0-1.5	0.0




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Table F-37
NR Band n77 Antenna G Measured P_{Limit} for DSI = 2 (Head) - 50 MHz Bandwidth

NR Band n77 50 MHz Bandwidth										
Modulation	RB Size	RB Offset	Channel					MPR Allowed per 3GPP [dB]	MPR [dB]	
			648334 (3725.01 MHz)	652166 (3782.49 MHz)	656000 (3840 MHz)	659834 (3897.51 MHz)	663666 (3954.99 MHz)			
			Conducted Power [dBm]							
DFT-s-OFDM $\pi/2$ BPSK	1	1	10.91	10.95	10.43	10.77	10.10	0	0.0	
	1	67	11.07	10.77	10.84	10.90	10.31		0.0	
	1	131	10.97	10.95	10.98	11.37	9.97		0.0	
		64	0	10.86	10.91	10.78	10.92	10.34	0-0.5	0.0
		64	35	11.03	10.93	10.78	11.03	10.36	0	0.0
		64	69	10.91	10.89	10.88	11.21	10.02	0-0.5	0.0
		128	0	10.98	10.87	10.86	11.02	10.28		0.0
DFT-s-OFDM QPSK	1	1	10.91	10.85	10.63	10.71	10.58	0	0.0	
	1	67	11.05	10.75	10.80	11.05	10.35		0.0	
	1	131	11.09	10.95	11.04	11.43	10.10		0.0	
		64	0	10.75	11.00	10.78	10.90	10.32	0-1	0.0
		64	35	10.99	10.97	10.84	11.05	10.36	0	0.0
		64	69	10.98	10.84	10.91	11.09	10.17	0-1	0.0
		128	0	11.02	10.92	10.88	11.15	10.35		0.0
DFT-s-OFDM 16QAM	1	1	10.70	10.75	10.45	10.70	10.43	0-1	0.0	
CP-OFDM QPSK	1	1	10.86	10.75	10.57	10.80	10.30	0-1.5	0.0	

Table F-38
NR Band n77 Antenna G Measured P_{Limit} for DSI = 2 (Head) - 40 MHz Bandwidth

NR Band n77 40 MHz Bandwidth											
Modulation	RB Size	RB Offset	Channel						MPR Allowed per 3GPP [dB]	MPR [dB]	
			648000 (3720 MHz)	651200 (3768 MHz)	654400 (3816 MHz)	657600 (3864 MHz)	660800 (3912 MHz)	664000 (3960 MHz)			
			Conducted Power [dBm]								
DFT-s-OFDM $\pi/2$ BPSK	1	1	10.93	11.13	11.00	10.93	11.35	10.42	0	0.0	
	1	53	11.10	11.12	11.03	10.98	11.27	10.26		0.0	
	1	104	11.25	11.10	10.99	11.20	11.56	10.19		0.0	
		50	0	10.93	11.01	10.86	10.90	11.18	10.41	0-0.5	0.0
		50	28	11.07	11.03	10.89	10.89	11.35	10.23	0	0.0
		50	56	11.12	10.97	10.92	11.17	11.41	10.21	0-0.5	0.0
		100	0	11.05	11.08	10.91	11.03	11.32	10.39		0.0
DFT-s-OFDM QPSK	1	1	10.90	11.03	11.09	10.94	11.34	10.46	0	0.0	
	1	53	11.10	11.08	10.94	10.81	11.33	10.31		0.0	
	1	104	11.25	11.05	11.10	11.28	11.54	10.17		0.0	
		50	0	10.98	11.05	10.99	10.90	11.28	10.40	0-1	0.0
		50	28	11.15	11.11	10.89	10.93	11.27	10.32	0	0.0
		50	56	11.14	11.03	11.01	11.13	11.45	10.13	0-1	0.0
		100	0	11.12	11.12	10.91	11.03	11.27	10.35		0.0
DFT-s-OFDM 16QAM	1	1	11.15	11.21	10.63	11.05	10.79	10.27	0-1	0.0	
CP-OFDM QPSK	1	1	10.90	10.83	10.80	11.08	11.25	10.48	0-1.5	0.0	




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Table F-39
NR Band n77 Antenna G Measured P_{Limit} for DSI = 2 (Head) - 30 MHz Bandwidth

NR Band n77 30 MHz Bandwidth										
Modulation	RB Size	RB Offset	Channel						MPR Allowed per 3GPP [dB]	MPR [dB]
			647668 (3715.02 MHz)	651000 (3765 MHz)	654334 (3815.01 MHz)	657666 (3864.99 MHz)	661000 (3915 MHz)	664332 (3964.98 MHz)		
			Conducted Power [dBm]							
DFT-s-OFDM $\pi/2$ BPSK	1	1	10.71	10.98	10.93	10.95	11.11	10.60	0	0.0
	1	39	10.85	11.15	10.81	10.85	11.29	10.35		0.0
	1	76	11.07	11.14	11.08	11.10	11.61	10.13		0.0
	36	0	10.86	10.99	10.85	10.85	11.32	10.35	0-0.5	0.0
	36	21	10.95	11.05	10.86	10.89	11.45	10.20	0	0.0
	36	42	11.04	11.06	10.91	11.13	11.39	10.20	0-0.5	0.0
DFT-s-OFDM QPSK	75	0	10.96	11.09	10.86	10.90	11.29	10.20	0	0.0
	1	1	10.82	11.11	10.92	10.67	11.05	10.40	0	0.0
	1	39	11.05	11.10	10.90	10.90	11.43	10.16		0.0
	1	76	10.86	11.28	10.99	11.19	11.59	10.15		0.0
	36	0	10.88	11.04	10.82	10.88	11.28	10.35	0-1	0.0
	36	21	11.00	11.01	10.92	10.98	11.46	10.18	0	0.0
36	42	11.14	11.00	10.83	11.07	11.52	10.12	0-1	0.0	
75	0	10.92	11.08	10.93	10.94	11.40	10.28	0	0.0	
DFT-s-OFDM 16QAM	1	1	10.73	11.30	10.99	10.65	11.45	10.32	0-1	0.0
CP-OFDM QPSK	1	1	10.89	10.95	10.94	10.65	11.22	10.45	0-1.5	0.0

Table F-40
NR Band n77 Antenna G Measured P_{Limit} for DSI = 2 (Head) - 20 MHz Bandwidth

NR Band n77 20 MHz Bandwidth										
Modulation	RB Size	RB Offset	Channel						MPR Allowed per 3GPP [dB]	MPR [dB]
			647334 (3710.01 MHz)	650800 (3762 MHz)	654266 (3813.99 MHz)	657734 (3866.01 MHz)	661200 (3918 MHz)	664666 (3969.99 MHz)		
			Conducted Power [dBm]							
DFT-s-OFDM $\pi/2$ BPSK	1	1	11.11	11.16	11.03	11.06	11.41	10.22	0	0.0
	1	26	10.71	10.88	10.92	10.89	11.42	10.20		0.0
	1	49	10.97	11.35	11.20	11.09	11.62	10.12		0.0
	25	0	10.90	11.12	10.89	11.02	11.38	10.15	0-0.5	0.0
	25	13	10.98	11.18	10.96	11.05	11.25	10.02	0	0.0
	25	26	11.02	11.00	10.93	11.04	11.46	10.18	0-0.5	0.0
DFT-s-OFDM QPSK	50	0	10.99	11.14	10.95	11.02	11.33	10.21	0	0.0
	1	1	10.91	11.20	10.85	10.81	11.13	10.18	0	0.0
	1	26	10.75	11.25	11.07	11.17	11.34	10.15		0.0
	1	49	11.12	11.30	11.03	11.22	11.51	10.25		0.0
	25	0	10.96	11.16	11.00	10.99	11.36	10.16	0-1	0.0
	25	13	10.97	11.17	11.08	10.99	11.36	10.05	0	0.0
25	26	10.98	11.12	10.95	10.96	11.43	10.04	0-1	0.0	
50	0	10.95	11.13	10.99	11.10	11.41	10.13	0	0.0	
DFT-s-OFDM 16QAM	1	1	10.70	11.18	11.13	11.10	11.32	10.12	0-1	0.0
CP-OFDM QPSK	1	1	11.00	10.96	11.07	11.11	11.18	10.14	0-1.5	0.0




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Table F-41
NR Band n77 Antenna G Measured P_{Limit} for DSI = 3 (Hotspot Mode) - 90 MHz Bandwidth

NR Band n77 90 MHz Bandwidth								
Modulation	RB Size	RB Offset	Channel			MPR Allowed per 3GPP [dB]	MPR [dB]	
			649668 (3745.02 MHz)	656000 (3840 MHz)	662332 (3934.98 MHz)			
			Conducted Power [dBm]					
DFT-s-OFDM $\pi/2$ BPSK	1	1	12.95	12.88	12.95	0	0.0	
	1	123	13.39	13.14	13.82		0.0	
	1	243	13.14	13.28	13.54		0.0	
		120	0	13.26	13.02	13.51	0-0.5	0.0
		120	63	13.36	13.11	13.73	0	0.0
		120	125	13.32	13.22	13.81	0-0.5	0.0
		243	0	13.41	13.15	13.62		0.0
DFT-s-OFDM QPSK	1	1	13.02	12.95	13.10	0	0.0	
	1	123	13.37	13.06	13.69		0.0	
	1	243	13.20	13.41	13.41		0.0	
		120	0	13.34	13.11	13.53	0-1	0.0
		120	63	13.42	13.11	13.77	0	0.0
		120	125	13.38	13.25	13.78	0-1	0.0
		243	0	13.45	13.15	13.69		0.0
DFT-s-OFDM 16QAM	1	1	12.85	13.37	12.91	0-1	0.0	
CP-OFDM QPSK	1	1	13.02	12.86	13.13	0-1.5	0.0	

Table F-42
NR Band n77 Antenna G Measured P_{Limit} for DSI = 3 (Hotspot Mode) - 80 MHz Bandwidth

NR Band n77 80 MHz Bandwidth								
Modulation	RB Size	RB Offset	Channel			MPR Allowed per 3GPP [dB]	MPR [dB]	
			649334 (3740.01 MHz)	656000 (3840 MHz)	662666 (3939.99 MHz)			
			Conducted Power [dBm]					
DFT-s-OFDM $\pi/2$ BPSK	1	1	13.15	12.98	13.25	0	0.0	
	1	109	13.62	13.18	13.83		0.0	
	1	215	13.19	13.23	13.46		0.0	
		108	0	13.40	13.19	13.65	0-0.5	0.0
		108	55	13.49	13.26	13.77	0	0.0
		108	109	13.46	13.30	13.76	0-0.5	0.0
		216	0	13.40	13.20	13.68		0.0
DFT-s-OFDM QPSK	1	1	13.26	13.05	13.38	0	0.0	
	1	109	13.48	13.28	14.04		0.0	
	1	215	13.26	13.38	13.48		0.0	
		108	0	13.43	13.16	13.61	0-1	0.0
		108	55	13.52	13.23	13.78	0	0.0
		108	109	13.51	13.37	13.80	0-1	0.0
		216	0	13.40	13.21	13.72		0.0
DFT-s-OFDM 16QAM	1	1	12.90	12.84	13.45	0-1	0.0	
CP-OFDM QPSK	1	1	13.13	12.70	13.45	0-1.5	0.0	




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Table F-43
NR Band n77 Antenna G Measured P_{Limit} for DSI = 3 (Hotspot Mode) - 70 MHz Bandwidth

NR Band n77 70 MHz Bandwidth								
Modulation	RB Size	RB Offset	Channel				MPR Allowed per 3GPP [dB]	MPR [dB]
			649000 (3735 MHz)	653666 (3804.99 MHz)	658334 (3875.01 MHz)	663000 (3945 MHz)		
			Conducted Power [dBm]					
DFT-s-OFDM $\pi/2$ BPSK	1	1	13.02	13.17	13.00	13.47	0	0.0
	1	95	13.35	13.30	13.30	13.92		0.0
	1	187	13.09	13.10	13.56	13.45		0.0
	90	0	13.29	13.13	13.07	13.57	0-0.5	0.0
	90	50	13.38	13.31	13.35	13.81	0	0.0
	90	99	13.36	13.25	13.43	13.67	0-0.5	0.0
DFT-s-OFDM QPSK	180	0	13.34	13.25	13.30	13.63	0	0.0
	1	1	13.04	13.14	12.99	13.40		0.0
	1	95	13.48	13.21	13.32	13.75		0.0
	1	187	13.45	13.22	13.55	13.60	0.0	
	90	0	13.32	13.17	13.17	13.66	0-1	0.0
	90	50	13.42	13.23	13.35	13.80	0	0.0
DFT-s-OFDM 16QAM	90	99	13.48	13.24	13.43	13.77	0-1	0.0
	180	0	13.39	13.25	13.28	13.75		0.0
	1	1	13.03	13.18	12.78	13.35		0-1
CP-OFDM QPSK	1	1	13.11	13.28	12.62	13.55	0-1.5	0.0

Table F-44
NR Band n77 Antenna G Measured P_{Limit} for DSI = 3 (Hotspot Mode) - 60 MHz Bandwidth

NR Band n77 60 MHz Bandwidth								
Modulation	RB Size	RB Offset	Channel				MPR Allowed per 3GPP [dB]	MPR [dB]
			648668 (3730.02 MHz)	653556 (3803.34 MHz)	658444 (3876.66 MHz)	663332 (3949.98 MHz)		
			Conducted Power [dBm]					
DFT-s-OFDM $\pi/2$ BPSK	1	1	12.97	13.15	13.03	13.56	0	0.0
	1	81	13.39	13.34	13.38	13.93		0.0
	1	160	13.48	13.35	13.69	13.65		0.0
	81	0	13.30	13.15	13.22	13.87	0-0.5	0.0
	81	41	13.37	13.30	13.38	13.90	0	0.0
	81	81	13.52	13.28	13.41	13.80	0-0.5	0.0
DFT-s-OFDM QPSK	162	0	13.30	13.23	13.38	13.83	0	0.0
	1	1	13.03	13.40	13.00	13.61		0.0
	1	81	13.38	13.15	13.35	13.92		0.0
	1	160	13.50	13.26	13.75	13.68	0.0	
	81	0	13.32	13.25	13.26	13.81	0-1	0.0
	81	41	13.35	13.29	13.35	13.95	0	0.0
DFT-s-OFDM 16QAM	81	81	13.46	13.21	13.46	13.77	0-1	0.0
	162	0	13.33	13.24	13.37	13.85		0.0
	1	1	13.08	13.00	13.15	13.92		0-1
CP-OFDM QPSK	1	1	12.99	13.25	13.25	13.66	0-1.5	0.0




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Table F-45
NR Band n77 Antenna G Measured P_{Limit} for DSI = 3 (Hotspot Mode) - 50 MHz Bandwidth

NR Band n77 50 MHz Bandwidth									
Modulation	RB Size	RB Offset	Channel					MPR Allowed per 3GPP [dB]	MPR [dB]
			648334 (3725.01 MHz)	652166 (3782.49 MHz)	656000 (3840 MHz)	659834 (3897.51 MHz)	663666 (3954.99 MHz)		
			Conducted Power [dBm]						
DFT-s-OFDM $\pi/2$ BPSK	1	1	13.39	13.47	13.25	13.47	13.20	0	0.0
	1	67	13.66	13.51	13.61	13.70	13.10		0.0
	1	131	13.85	13.55	13.67	14.04	12.95		0.0
	64	0	13.65	13.59	13.42	13.67	13.15	0-0.5	0.0
	64	35	13.70	13.54	13.50	13.84	13.25	0	0.0
	64	69	13.72	13.54	13.52	13.80	13.04	0-0.5	0.0
DFT-s-OFDM QPSK	128	0	13.65	13.55	13.46	13.75	13.16	0	0.0
	1	1	13.42	13.47	13.26	13.55	13.20		0.0
	1	67	13.65	13.51	13.53	13.70	13.22		0.0
	1	131	13.82	13.65	13.60	14.11	12.99	0	0.0
	64	0	13.57	13.58	13.43	13.63	13.18	0-1	0.0
	64	35	13.61	13.57	13.59	13.75	13.19	0	0.0
DFT-s-OFDM 16QAM	64	69	13.77	13.61	13.54	13.92	13.13	0-1	0.0
128	0	13.61	13.54	13.57	13.80	13.25	0.0		
CP-OFDM QPSK	1	1	13.46	13.30	13.05	13.51	13.10	0-1	0.0
	1	1	13.75	13.55	13.25	13.58	13.37	0-1.5	0.0

Table F-46
NR Band n77 Antenna G Measured P_{Limit} for DSI = 3 (Hotspot Mode) - 40 MHz Bandwidth

NR Band n77 40 MHz Bandwidth										
Modulation	RB Size	RB Offset	Channel						MPR Allowed per 3GPP [dB]	MPR [dB]
			648000 (3720 MHz)	651200 (3768 MHz)	654400 (3816 MHz)	657600 (3864 MHz)	660800 (3912 MHz)	664000 (3960 MHz)		
			Conducted Power [dBm]							
DFT-s-OFDM $\pi/2$ BPSK	1	1	13.35	13.75	13.61	13.52	13.89	13.48	0	0.0
	1	53	13.62	13.52	13.46	13.52	13.95	13.14		0.0
	1	104	13.86	13.57	13.65	13.89	14.25	13.23		0.0
	50	0	13.51	13.65	13.50	13.56	13.75	13.38	0-0.5	0.0
	50	28	13.60	13.61	13.41	13.58	13.92	13.15	0	0.0
	50	56	13.62	13.75	13.48	13.69	14.11	13.25	0-0.5	0.0
DFT-s-OFDM QPSK	100	0	13.62	13.66	13.48	13.53	13.93	13.26	0	0.0
	1	1	13.37	13.80	13.65	13.62	13.83	13.55		0.0
	1	53	13.61	13.79	13.56	13.49	14.11	13.31		0.0
	1	104	13.70	13.75	13.66	13.77	14.26	13.10	0	0.0
	50	0	13.49	13.65	13.52	13.45	13.78	13.26	0-1	0.0
	50	28	13.60	13.70	13.47	13.51	13.99	13.17	0	0.0
DFT-s-OFDM 16QAM	50	56	13.69	13.80	13.55	13.72	14.11	13.26	0-1	0.0
	100	0	13.61	13.60	13.50	13.61	13.91	13.26		0.0
CP-OFDM QPSK	1	1	13.52	14.00	13.38	13.40	14.03	13.14	0-1	0.0
	1	1	13.39	13.71	13.45	13.50	13.71	13.71	0-1.5	0.0







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Table F-47
NR Band n77 Antenna G Measured P_{Limit} for DSI = 3 (Hotspot Mode) - 30 MHz Bandwidth

NR Band n77 30 MHz Bandwidth										
Modulation	RB Size	RB Offset	Channel						MPR Allowed per 3GPP [dB]	MPR [dB]
			647668 (3715.02 MHz)	651000 (3765 MHz)	654334 (3815.01 MHz)	657666 (3864.99 MHz)	661000 (3915 MHz)	664332 (3964.98 MHz)		
			Conducted Power [dBm]							
DFT-s-OFDM $\pi/2$ BPSK	1	1	13.02	13.43	13.38	13.47	13.75	13.52	0	0.0
	1	39	13.15	13.26	13.31	13.30	13.65	13.31		0.0
	1	76	13.00	13.61	13.36	13.64	14.25	13.00		0.0
	36	0	12.99	13.33	13.30	13.47	13.80	13.24	0-0.5	0.0
	36	21	13.21	13.28	13.17	13.56	13.88	13.18	0	0.0
	36	42	13.45	13.51	13.32	13.58	14.00	13.16	0-0.5	0.0
DFT-s-OFDM QPSK	75	0	13.29	13.44	13.30	13.52	13.82	13.22	0	0.0
	1	1	12.89	13.40	13.31	13.54	13.88	13.45	0	0.0
	1	39	13.32	13.53	13.45	13.56	13.72	13.15		0.0
	1	76	13.31	13.66	13.29	13.82	14.18	13.25		0.0
	36	0	13.01	13.41	13.35	13.40	13.86	13.31	0-1	0.0
	36	21	13.25	13.45	13.25	13.50	13.85	13.15	0	0.0
DFT-s-OFDM 16QAM	1	1	13.32	13.64	13.60	13.87	14.12	14.00	0-1	0.0
CP-OFDM QPSK	1	1	13.30	13.55	13.75	13.41	14.05	13.53	0-1.5	0.0

Table F-48
NR Band n77 Antenna G Measured P_{Limit} for DSI = 3 (Hotspot Mode) - 20 MHz Bandwidth

NR Band n77 20 MHz Bandwidth										
Modulation	RB Size	RB Offset	Channel						MPR Allowed per 3GPP [dB]	MPR [dB]
			647334 (3710.01 MHz)	650800 (3762 MHz)	654266 (3813.99 MHz)	657734 (3866.01 MHz)	661200 (3918 MHz)	664666 (3969.99 MHz)		
			Conducted Power [dBm]							
DFT-s-OFDM $\pi/2$ BPSK	1	1	13.53	13.40	13.52	13.53	13.83	13.32	0	0.0
	1	26	13.43	13.60	13.58	13.49	13.96	13.09		0.0
	1	49	13.75	13.84	13.85	13.55	14.25	13.10		0.0
	25	0	13.45	13.75	13.56	13.61	14.00	13.11	0-0.5	0.0
	25	13	13.49	13.70	13.44	13.65	14.02	13.20	0	0.0
	25	26	13.68	13.75	13.40	13.69	14.07	13.18	0-0.5	0.0
DFT-s-OFDM QPSK	50	0	13.60	13.62	13.58	13.64	13.95	13.12	0	0.0
	1	1	13.55	13.98	13.43	13.64	13.88	13.21	0	0.0
	1	26	13.44	13.76	13.75	13.47	14.15	13.20		0.0
	1	49	13.96	14.05	13.83	13.80	14.25	13.10		0.0
	25	0	13.41	13.77	13.55	13.60	14.07	13.26	0-1	0.0
	25	13	13.56	13.75	13.51	13.64	13.90	13.15	0	0.0
DFT-s-OFDM 16QAM	1	1	14.10	14.00	13.67	13.90	14.20	13.43	0-1	0.0
CP-OFDM QPSK	1	1	13.11	13.99	13.57	13.66	13.95	13.46	0-1.5	0.0

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F.1.3

NR Band n77 Antenna D

Table F-49

NR Band n77 Antenna D Measured P_{Limit} for DSI = 0 (Body-worn, or Phablet with grip sensor inactive), or DSI = 1 (Phablet with grip sensor active) and/or DSI = 4 (Earjack Active) - 90 MHz Bandwidth

NR Band n77 90 MHz Bandwidth							
Modulation	RB Size	RB Offset	Channel			MPR Allowed per 3GPP [dB]	MPR [dB]
			649668 (3745.02 MHz)	656000 (3840 MHz)	662332 (3934.98 MHz)		
			Conducted Power [dBm]				
DFT-s-OFDM $\pi/2$ BPSK	1	1	15.15	15.00	15.70	0	0.0
	1	123	15.44	15.06	16.55		0.0
	1	243	15.00	15.59	16.21		0.0
	120	0	15.05	14.50	15.65	0-0.5	0.5
	120	63	15.52	15.10	16.53	0	0.0
	120	125	14.81	14.97	16.09	0-0.5	0.5
	243	0	15.00	14.64	15.89		0.5
DFT-s-OFDM QPSK	1	1	15.42	15.00	15.65	0	0.0
	1	123	15.57	15.23	16.62		0.0
	1	243	15.08	15.75	16.36		0.0
	120	0	14.55	14.00	15.20	0-1	1.0
	120	63	15.51	15.18	16.55	0	0.0
	120	125	14.42	14.55	15.60	0-1	1.0
	243	0	14.55	14.27	15.43		1.0
DFT-s-OFDM 16QAM	1	1	14.72	14.05	14.72	0-1	1.0
CP-OFDM QPSK	1	1	13.72	13.60	14.13	0-1.5	1.5

Table F-50

NR Band n77 Antenna D Measured P_{Limit} for DSI = 0 (Body-worn, or Phablet with grip sensor inactive), or DSI = 1 (Phablet with grip sensor active) and/or DSI = 4 (Earjack Active) - 80 MHz Bandwidth

NR Band n77 80 MHz Bandwidth							
Modulation	RB Size	RB Offset	Channel			MPR Allowed per 3GPP [dB]	MPR [dB]
			649334 (3740.01 MHz)	656000 (3840 MHz)	662666 (3939.99 MHz)		
			Conducted Power [dBm]				
DFT-s-OFDM $\pi/2$ BPSK	1	1	15.57	15.15	15.93	0	0.0
	1	109	15.70	15.33	16.81		0.0
	1	215	15.37	15.73	16.41		0.0
	108	0	15.26	14.59	15.95	0-0.5	0.5
	108	55	15.71	15.33	16.72	0	0.0
	108	109	15.08	15.16	16.25	0-0.5	0.5
	216	0	15.09	14.89	16.15		0.5
DFT-s-OFDM QPSK	1	1	15.64	15.07	15.99	0	0.0
	1	109	15.66	15.40	16.74		0.0
	1	215	15.41	15.82	16.55		0.0
	108	0	14.74	14.15	15.52	0-1	1.0
	108	55	15.81	15.40	16.74	0	0.0
	108	109	14.70	14.75	15.85	0-1	1.0
	216	0	14.62	14.47	15.67		1.0
DFT-s-OFDM 16QAM	1	1	14.85	14.99	15.33	0-1	1.0
CP-OFDM QPSK	1	1	14.10	13.51	14.51	0-1.5	1.5




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Table F-51

NR Band n77 Antenna D Measured P_{Limit} for DSI = 0 (Body-worn, or Phablet with grip sensor inactive), or DSI = 1 (Phablet with grip sensor active) and/or DSI = 4 (Earjack Active) - 70 MHz Bandwidth

NR Band n77 70 MHz Bandwidth								
Modulation	RB Size	RB Offset	Channel				MPR Allowed per 3GPP [dB]	MPR [dB]
			649000 (3735 MHz)	653666 (3804.99 MHz)	658334 (3875.01 MHz)	663000 (3945 MHz)		
			Conducted Power [dBm]					
DFT-s-OFDM $\pi/2$ BPSK	1	1	15.50	15.27	15.30	15.82	0	0.0
	1	95	15.65	15.18	15.85	16.48		0.0
	1	187	15.54	15.31	16.20	16.26		0.0
	90	0	15.20	14.69	15.12	15.72	0-0.5	0.5
	90	50	15.65	15.14	15.97	16.53	0	0.0
	90	99	15.15	14.80	15.61	15.97	0-0.5	0.5
180	0	15.12	14.90	15.42	15.91	0.5		
DFT-s-OFDM QPSK	1	1	15.52	15.51	15.31	15.87	0	0.0
	1	95	15.78	15.12	16.04	16.53		0.0
	1	187	15.56	15.34	16.20	16.40		0.0
	90	0	14.73	14.30	14.71	15.28	0-1	1.0
	90	50	15.70	15.36	16.01	16.58	0	0.0
	90	99	14.80	14.35	15.19	15.62	0-1	1.0
180	0	14.71	14.36	14.95	15.51	1.0		
DFT-s-OFDM 16QAM	1	1	14.67	14.85	14.50	15.10	0-1	1.0
CP-OFDM QPSK	1	1	14.10	13.99	13.80	14.45	0-1.5	1.5

Table F-52

NR Band n77 Antenna D Measured P_{Limit} for DSI = 0 (Body-worn, or Phablet with grip sensor inactive), or DSI = 1 (Phablet with grip sensor active) and/or DSI = 4 (Earjack Active) - 60 MHz Bandwidth

NR Band n77 60 MHz Bandwidth								
Modulation	RB Size	RB Offset	Channel				MPR Allowed per 3GPP [dB]	MPR [dB]
			648668 (3730.02 MHz)	653556 (3803.34 MHz)	658444 (3876.66 MHz)	663332 (3949.98 MHz)		
			Conducted Power [dBm]					
DFT-s-OFDM $\pi/2$ BPSK	1	1	15.80	15.35	15.42	15.92	0	0.0
	1	81	15.75	15.23	15.80	16.39		0.0
	1	160	15.75	15.20	16.21	16.20		0.0
	81	0	15.38	14.71	15.62	15.77	0-0.5	0.5
	81	41	15.89	15.20	15.84	16.43	0	0.0
	81	81	15.32	14.74	15.88	15.90	0-0.5	0.5
162	0	15.29	14.75	15.83	15.89	0.5		
DFT-s-OFDM QPSK	1	1	15.75	15.44	15.38	16.06	0	0.0
	1	81	15.78	15.22	15.88	16.58		0.0
	1	160	15.79	15.42	16.38	16.30		0.0
	81	0	14.90	14.29	14.70	15.35	0-1	1.0
	81	41	15.86	15.31	15.96	16.57	0	0.0
	81	81	14.91	14.33	15.15	15.54	0-1	1.0
162	0	14.82	14.34	14.94	15.28	1.0		
DFT-s-OFDM 16QAM	1	1	14.85	14.65	14.62	15.34	0-1	1.0
CP-OFDM QPSK	1	1	14.23	13.90	13.90	14.65	0-1.5	1.5




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Table F-53

NR Band n77 Antenna D Measured P_{Limit} for DSI = 0 (Body-worn, or Phablet with grip sensor inactive), or DSI = 1 (Phablet with grip sensor active) and/or DSI = 4 (Earjack Active) - 50 MHz Bandwidth

NR Band n77 50 MHz Bandwidth									
Modulation	RB Size	RB Offset	Channel					MPR Allowed per 3GPP [dB]	MPR [dB]
			648334 (3725.01 MHz)	652166 (3782.49 MHz)	656000 (3840 MHz)	659834 (3897.51 MHz)	663666 (3954.99 MHz)		
			Conducted Power [dBm]						
DFT-s-OFDM $\pi/2$ BPSK	1	1	16.00	15.60	15.08	15.92	15.80	0	0.0
	1	67	15.95	15.44	15.50	16.27	15.93		0.0
	1	131	16.00	15.35	16.01	16.78	15.71		0.0
	64	0	15.65	15.16	14.98	15.65	15.47	0-0.5	0.5
	64	35	16.07	15.50	15.66	16.34	15.91	0	0.0
	64	69	15.56	14.94	15.34	16.11	15.38	0-0.5	0.5
DFT-s-OFDM QPSK	128	0	15.58	15.00	15.11	15.91	15.38	0	0.5
	1	1	15.99	15.70	15.30	15.98	15.94	0	0.0
	1	67	16.04	15.51	15.64	16.40	15.95		0.0
	1	131	15.98	15.47	16.00	16.59	15.79		0.0
	64	0	15.12	14.72	14.49	15.25	14.96	0-1	1.0
	64	35	15.99	15.53	15.74	16.45	15.94	0	0.0
64	69	15.11	14.50	14.97	15.66	14.94	0-1	1.0	
128	0	15.06	14.56	14.69	15.60	14.96	0-1	1.0	
DFT-s-OFDM 16QAM	1	1	15.23	14.99	14.33	15.40	15.05	0-1	1.0
CP-OFDM QPSK	1	1	14.43	14.50	13.60	14.78	14.30	0-1.5	1.5

Table F-54

NR Band n77 Antenna D Measured P_{Limit} for DSI = 0 (Body-worn, or Phablet with grip sensor inactive), or DSI = 1 (Phablet with grip sensor active) and/or DSI = 4 (Earjack Active) - 40 MHz Bandwidth

NR Band n77 40 MHz Bandwidth										
Modulation	RB Size	RB Offset	Channel						MPR Allowed per 3GPP [dB]	MPR [dB]
			648000 (3720 MHz)	651200 (3768 MHz)	654400 (3816 MHz)	657600 (3864 MHz)	660800 (3912 MHz)	664000 (3960 MHz)		
			Conducted Power [dBm]							
DFT-s-OFDM $\pi/2$ BPSK	1	1	15.99	15.99	15.62	15.24	16.30	16.00	0	0.0
	1	53	16.14	15.90	15.37	15.46	16.56	15.78		0.0
	1	104	16.20	15.72	15.76	15.95	17.11	15.73		0.0
	50	0	15.11	15.51	15.00	14.95	15.95	15.35	0-0.5	0.5
	50	28	15.85	16.00	15.50	15.59	16.63	15.75	0	0.0
	50	56	15.13	15.36	15.19	15.36	16.47	15.25	0-0.5	0.5
DFT-s-OFDM QPSK	100	0	15.15	15.43	14.95	15.11	16.20	15.33	0-0.5	0.5
	1	1	16.12	16.12	15.61	15.41	16.53	16.03	0	0.0
	1	53	16.17	15.75	15.52	15.75	16.60	15.79		0.0
	1	104	16.27	15.67	15.86	16.00	17.21	15.80		0.0
	50	0	15.20	14.97	14.56	14.48	15.54	15.04	0-1	1.0
	50	28	16.15	15.97	15.50	15.65	16.73	15.87	0	0.0
DFT-s-OFDM 16QAM	50	56	15.15	14.86	14.70	14.95	16.07	14.90	0-1	1.0
	100	0	15.19	14.93	14.57	14.61	15.78	14.92	0-1	1.0
	1	1	15.45	15.40	14.80	15.02	15.81	14.90	0-1	1.0
CP-OFDM QPSK	1	1	14.57	14.50	14.04	13.80	15.00	14.55	0-1.5	1.5




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Table F-55

NR Band n77 Antenna D Measured P_{Limit} for DSI = 0 (Body-worn, or Phablet with grip sensor inactive), or DSI = 1 (Phablet with grip sensor active) and/or DSI = 4 (Earjack Active) - 30 MHz Bandwidth

NR Band n77 30 MHz Bandwidth										
Modulation	RB Size	RB Offset	Channel						MPR Allowed per 3GPP [dB]	MPR [dB]
			647668 (3715.02 MHz)	651000 (3765 MHz)	654334 (3815.01 MHz)	657666 (3864.99 MHz)	661000 (3915 MHz)	664332 (3964.98 MHz)		
			Conducted Power [dBm]							
DFT-s-OFDM $\pi/2$ BPSK	1	1	15.97	15.89	15.97	15.63	16.42	16.04	0	0.0
	1	39	16.04	16.01	15.99	15.90	16.58	15.76		0.0
	1	76	16.17	16.27	16.30	16.01	16.83	15.82		0.0
	36	0	15.37	15.58	15.56	15.55	16.69	15.59	0-0.5	0.5
	36	21	16.16	16.01	15.79	16.11	16.85	15.77	0	0.0
	36	42	15.44	15.65	15.61	15.87	16.66	15.42	0-0.5	0.5
DFT-s-OFDM QPSK	75	0	15.46	15.58	15.53	15.77	16.44	15.42		0.5
	1	1	16.14	15.82	16.11	16.17	16.68	15.85	0	0.0
	1	39	16.00	16.03	15.99	16.22	16.90	16.00		0.0
	1	76	16.09	16.16	16.15	16.40	16.83	15.93		0.0
	36	0	15.08	15.06	15.05	15.22	15.28	15.09	0-1	1.0
	36	21	16.12	16.07	16.05	16.28	16.44	16.05	0	0.0
DFT-s-OFDM 16QAM	36	42	15.10	15.19	15.11	15.40	16.10	14.89	0-1	1.0
	75	0	15.16	15.12	15.07	15.32	15.73	14.92		1.0
	1	1	15.07	15.00	15.01	15.25	15.51	15.09	0-1	1.0
	CP-OFDM QPSK	1	1	14.65	14.42	14.58	14.52	14.84	14.58	0-1.5

Table F-56

NR Band n77 Antenna D Measured P_{Limit} for DSI = 0 (Body-worn, or Phablet with grip sensor inactive), or DSI = 1 (Phablet with grip sensor active) and/or DSI = 4 (Earjack Active) - 20 MHz Bandwidth

NR Band n77 20 MHz Bandwidth										
Modulation	RB Size	RB Offset	Channel						MPR Allowed per 3GPP [dB]	MPR [dB]
			647334 (3710.01 MHz)	650800 (3762 MHz)	654266 (3813.99 MHz)	657734 (3866.01 MHz)	661200 (3918 MHz)	664666 (3969.99 MHz)		
			Conducted Power [dBm]							
DFT-s-OFDM $\pi/2$ BPSK	1	1	16.02	15.97	15.93	16.08	16.77	15.88	0	0.0
	1	26	16.00	16.13	16.00	16.05	16.84	15.84		0.0
	1	49	16.28	16.17	16.04	16.16	17.34	15.77		0.0
	25	0	15.82	15.52	15.57	15.55	16.60	15.37	0-0.5	0.5
	25	13	15.94	15.93	15.89	16.13	16.74	15.88	0	0.0
	25	26	15.60	15.89	15.75	15.96	16.81	15.37	0-0.5	0.5
DFT-s-OFDM QPSK	50	0	15.53	15.58	15.58	15.70	16.60	15.42		0.5
	1	1	16.08	16.09	15.68	16.11	16.85	15.95	0	0.0
	1	26	16.14	16.06	15.91	16.24	17.04	15.81		0.0
	1	49	16.18	16.21	16.07	16.32	17.22	15.80		0.0
	25	0	15.06	15.51	14.98	15.13	15.98	14.81	0-1	1.0
	25	13	15.98	15.78	15.77	16.16	16.95	15.78	0	0.0
DFT-s-OFDM 16QAM	25	26	15.21	15.65	15.58	15.25	16.30	14.77	0-1	1.0
	50	0	14.99	15.13	15.12	15.24	16.10	14.73		1.0
	1	1	15.21	14.96	15.05	15.25	16.15	15.10	0-1	1.0
CP-OFDM QPSK	1	1	14.71	14.70	14.65	14.83	15.49	14.44	0-1.5	1.5




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Table F-57
NR Band n77 Antenna D Measured P_{Limit} for DSI = 2 (Head) - 90 MHz Bandwidth

NR Band n77 90 MHz Bandwidth								
Modulation	RB Size	RB Offset	Channel			MPR Allowed per 3GPP [dB]	MPR [dB]	
			649668 (3745.02 MHz)	656000 (3840 MHz)	662332 (3934.98 MHz)			
			Conducted Power [dBm]					
DFT-s-OFDM $\pi/2$ BPSK	1	1	10.94	10.53	11.00	0	0.0	
	1	123	10.91	10.69	12.00		0.0	
	1	243	10.90	10.73	11.80		0.0	
		120	0	11.03	10.77	11.58	0-0.5	0.0
		120	63	10.86	10.78	11.95	0	0.0
		120	125	11.00	10.78	11.97	0-0.5	0.0
		243	0	11.00	10.82	11.80		0.0
DFT-s-OFDM QPSK	1	1	11.08	10.77	11.00	0	0.0	
	1	123	11.04	10.85	12.00		0.0	
	1	243	10.97	10.89	11.85		0.0	
		120	0	11.09	10.85	11.64	0-1	0.0
		120	63	10.91	10.85	11.96	0	0.0
		120	125	11.05	10.86	12.00	0-1	0.0
		243	0	11.04	10.90	11.81		0.0
DFT-s-OFDM 16QAM	1	1	11.22	10.78	11.10	0-1	0.0	
CP-OFDM QPSK	1	1	11.10	10.76	11.00	0-1.5	0.0	

Table F-58
NR Band n77 Antenna D Measured P_{Limit} for DSI = 2 (Head) - 80 MHz Bandwidth

NR Band n77 80 MHz Bandwidth								
Modulation	RB Size	RB Offset	Channel			MPR Allowed per 3GPP [dB]	MPR [dB]	
			649334 (3740.01 MHz)	656000 (3840 MHz)	662666 (3939.99 MHz)			
			Conducted Power [dBm]					
DFT-s-OFDM $\pi/2$ BPSK	1	1	11.13	10.76	11.13	0	0.0	
	1	109	11.89	10.79	12.13		0.0	
	1	215	11.03	10.77	11.75		0.0	
		108	0	11.18	10.85	11.63	0-0.5	0.0
		108	55	11.01	10.86	12.03	0	0.0
		108	109	11.10	10.87	11.96	0-0.5	0.0
		216	0	11.10	10.87	11.86		0.0
DFT-s-OFDM QPSK	1	1	11.24	10.88	11.21	0	0.0	
	1	109	10.96	10.90	12.09		0.0	
	1	215	11.15	10.93	11.80		0.0	
		108	0	11.12	10.95	11.66	0-1	0.0
		108	55	11.04	10.94	12.13	0	0.0
		108	109	11.13	11.00	12.00	0-1	0.0
		216	0	11.09	11.01	11.86		0.0
DFT-s-OFDM 16QAM	1	1	11.41	11.06	11.17	0-1	0.0	
CP-OFDM QPSK	1	1	11.21	10.99	11.35	0-1.5	0.0	




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Table F-59
NR Band n77 Antenna D Measured P_{Limit} for DSI = 2 (Head) - 70 MHz Bandwidth

NR Band n77 70 MHz Bandwidth								
Modulation	RB Size	RB Offset	Channel				MPR Allowed per 3GPP [dB]	MPR [dB]
			649000 (3735 MHz)	653666 (3804.99 MHz)	658334 (3875.01 MHz)	663000 (3945 MHz)		
			Conducted Power [dBm]					
DFT-s-OFDM $\pi/2$ BPSK	1	1	11.13	10.81	10.58	11.48	0	0.0
	1	95	11.20	10.59	11.12	12.17		0.0
	1	187	11.02	10.70	11.57	11.87		0.0
	90	0	11.08	10.61	10.85	11.88	0-0.5	0.0
	90	50	11.10	10.50	11.10	12.11	0	0.0
	90	99	11.17	10.53	11.26	12.18	0-0.5	0.0
	180	0	11.12	10.63	11.11	12.00	0	0.0
DFT-s-OFDM QPSK	1	1	11.19	10.80	10.58	11.60	0	0.0
	1	95	11.13	10.54	11.20	12.18		0.0
	1	187	10.91	10.59	11.58	11.93		0.0
	90	0	11.05	10.66	10.92	12.01	0-1	0.0
	90	50	11.15	10.50	11.18	12.13	0	0.0
	90	99	11.18	10.61	11.35	12.20	0	0.0
	180	0	11.13	10.66	11.18	12.08	0-1	0.0
DFT-s-OFDM 16QAM	1	1	11.00	10.62	10.70	11.45	0-1	0.0
CP-OFDM QPSK	1	1	10.97	10.90	10.61	11.65	0-1.5	0.0

Table F-60
NR Band n77 Antenna D Measured P_{Limit} for DSI = 2 (Head) - 60 MHz Bandwidth

NR Band n77 60 MHz Bandwidth								
Modulation	RB Size	RB Offset	Channel				MPR Allowed per 3GPP [dB]	MPR [dB]
			648668 (3730.02 MHz)	653556 (3803.34 MHz)	658444 (3876.66 MHz)	663332 (3949.98 MHz)		
			Conducted Power [dBm]					
DFT-s-OFDM $\pi/2$ BPSK	1	1	11.11	10.70	10.65	11.66	0	0.0
	1	81	11.10	10.54	11.25	12.00		0.0
	1	160	11.25	10.62	11.52	11.99		0.0
	81	0	11.04	10.54	10.92	11.94	0-0.5	0.0
	81	41	11.10	10.57	11.15	12.08	0	0.0
	81	81	11.10	10.51	11.32	12.05	0-0.5	0.0
	162	0	11.16	10.61	11.11	12.03	0	0.0
DFT-s-OFDM QPSK	1	1	11.05	10.80	10.68	11.70	0	0.0
	1	81	11.10	10.50	11.13	12.12		0.0
	1	160	11.07	10.54	11.56	11.90		0.0
	81	0	11.08	10.64	10.95	11.89	0-1	0.0
	81	41	11.16	10.57	11.13	12.04	0	0.0
	81	81	11.14	10.53	11.40	12.13	0-1	0.0
	162	0	11.11	10.66	11.18	12.00	0	0.0
DFT-s-OFDM 16QAM	1	1	11.00	10.75	10.63	11.78	0-1	0.0
CP-OFDM QPSK	1	1	11.20	10.80	10.68	11.81	0-1.5	0.0




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Table F-61
NR Band n77 Antenna D Measured P_{Limit} for DSI = 2 (Head) - 50 MHz Bandwidth

NR Band n77 50 MHz Bandwidth									
Modulation	RB Size	RB Offset	Channel					MPR Allowed per 3GPP [dB]	MPR [dB]
			648334 (3725.01 MHz)	652166 (3782.49 MHz)	656000 (3840 MHz)	659834 (3897.51 MHz)	663666 (3954.99 MHz)		
			Conducted Power [dBm]						
DFT-s-OFDM $\pi/2$ BPSK	1	1	11.40	11.18	10.56	11.22	12.30	0	0.0
	1	67	11.35	10.86	10.95	11.55	12.40		0.0
	1	131	11.51	10.65	11.20	12.00	12.26		0.0
	64	0	11.25	11.05	10.63	11.42	12.38	0-0.5	0.0
	64	35	11.40	10.89	10.90	11.63	12.45	0	0.0
	64	69	11.31	10.78	11.10	11.74	12.15	0-0.5	0.0
DFT-s-OFDM QPSK	128	0	11.37	10.90	10.90	11.60	12.31	0	0.0
	1	1	11.30	10.99	10.50	11.15	12.16	0	0.0
	1	67	11.30	10.75	10.78	11.50	12.37		0.0
	1	131	11.42	10.77	11.27	12.00	12.16		0.0
	64	0	11.32	11.15	10.75	11.48	12.38	0-1	0.0
	64	35	11.38	10.91	10.97	11.61	12.42	0	0.0
DFT-s-OFDM 16QAM	64	69	11.25	10.82	11.05	11.85	12.34	0-1	0.0
	128	0	11.30	10.93	10.89	11.61	12.39		0.0
	1	1	11.30	11.15	10.55	11.05	12.21		0-1
CP-OFDM QPSK	1	1	11.45	11.05	10.52	11.05	12.22	0-1.5	0.0

Table F-62
NR Band n77 Antenna D Measured P_{Limit} for DSI = 2 (Head) - 40 MHz Bandwidth

NR Band n77 40 MHz Bandwidth										
Modulation	RB Size	RB Offset	Channel						MPR Allowed per 3GPP [dB]	MPR [dB]
			648000 (3720 MHz)	651200 (3768 MHz)	654400 (3816 MHz)	657600 (3864 MHz)	660800 (3912 MHz)	664000 (3960 MHz)		
			Conducted Power [dBm]							
DFT-s-OFDM $\pi/2$ BPSK	1	1	11.48	11.45	10.81	11.05	11.55	12.50	0	0.0
	1	53	11.21	11.20	10.68	11.20	11.75	12.28		0.0
	1	104	11.60	11.08	10.95	11.45	12.30	12.24		0.0
	50	0	11.30	11.25	10.75	10.98	11.60	12.37	0-0.5	0.0
	50	28	11.34	11.18	10.75	11.22	11.78	12.27	0	0.0
	50	56	11.33	11.02	10.81	11.37	12.09	12.25	0-0.5	0.0
DFT-s-OFDM QPSK	100	0	11.40	11.22	10.75	11.25	11.80	12.33	0	0.0
	1	1	11.51	11.35	10.63	11.05	11.60	12.44	0	0.0
	1	53	11.36	11.12	10.61	11.22	11.83	12.27		0.0
	1	104	11.47	11.05	10.99	11.75	12.40	12.20		0.0
	50	0	11.32	11.24	10.81	11.02	11.65	12.43	0-1	0.0
	50	28	11.35	11.17	10.71	11.22	11.95	12.29	0	0.0
DFT-s-OFDM 16QAM	50	56	11.40	10.99	10.84	11.41	12.10	12.30	0-1	0.0
	100	0	11.39	11.18	10.73	11.20	11.81	12.39		0.0
	1	1	11.52	11.15	10.86	11.00	11.50	12.45		0-1
CP-OFDM QPSK	1	1	11.40	11.40	10.91	11.06	11.56	12.50	0-1.5	0.0




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Table F-63
NR Band n77 Antenna D Measured P_{Limit} for DSI = 2 (Head) - 30 MHz Bandwidth

NR Band n77 30 MHz Bandwidth										
Modulation	RB Size	RB Offset	Channel						MPR Allowed per 3GPP [dB]	MPR [dB]
			647668 (3715.02 MHz)	651000 (3765 MHz)	654334 (3815.01 MHz)	657666 (3864.99 MHz)	661000 (3915 MHz)	664332 (3964.98 MHz)		
			Conducted Power [dBm]							
DFT-s-OFDM $\pi/2$ BPSK	1	1	11.07	10.83	11.16	10.95	11.44	12.38	0	0.0
	1	39	11.05	10.60	11.20	11.10	11.78	12.10		0.0
	1	76	11.13	10.77	11.25	11.56	12.17	12.12		0.0
	36	0	11.01	10.80	11.24	11.00	11.59	12.14	0-0.5	0.0
	36	21	10.90	10.70	11.21	11.17	11.75	12.04	0	0.0
	36	42	11.06	10.69	11.27	11.40	11.90	12.12	0-0.5	0.0
DFT-s-OFDM QPSK	75	0	10.96	10.74	11.26	11.13	11.77	12.13		0.0
	1	1	11.13	10.84	11.24	10.95	11.53	12.40	0	0.0
	1	39	11.12	10.87	11.28	11.18	11.87	11.99		0.0
	1	76	11.25	10.84	11.21	11.45	12.26	12.04		0.0
	36	0	10.85	10.78	11.28	11.00	11.65	12.13	0-1	0.0
	36	21	10.89	10.75	11.22	11.15	11.92	12.16	0	0.0
DFT-s-OFDM 16QAM	1	1	11.10	11.17	11.35	11.35	11.62	12.38	0-1	0.0
CP-OFDM QPSK	1	1	11.04	10.87	11.38	10.85	11.74	12.48	0-1.5	0.0

Table F-64
NR Band n77 Antenna D Measured P_{Limit} for DSI = 2 (Head) - 20 MHz Bandwidth

NR Band n77 20 MHz Bandwidth										
Modulation	RB Size	RB Offset	Channel						MPR Allowed per 3GPP [dB]	MPR [dB]
			647334 (3710.01 MHz)	650800 (3762 MHz)	654266 (3813.99 MHz)	657734 (3866.01 MHz)	661200 (3918 MHz)	664666 (3969.99 MHz)		
			Conducted Power [dBm]							
DFT-s-OFDM $\pi/2$ BPSK	1	1	11.40	10.95	11.27	11.15	12.00	12.42	0	0.0
	1	26	11.23	10.76	11.30	11.17	12.00	12.30		0.0
	1	49	11.24	10.93	11.35	11.50	12.25	12.39		0.0
	25	0	11.22	11.06	11.33	11.09	11.86	12.31	0-0.5	0.0
	25	13	11.19	10.95	11.26	11.20	11.93	12.25	0	0.0
	25	26	11.20	10.79	11.28	11.27	12.11	12.30	0-0.5	0.0
DFT-s-OFDM QPSK	50	0	11.25	11.00	11.30	11.22	11.92	12.32		0.0
	1	1	11.31	11.17	11.29	11.24	11.80	12.45	0	0.0
	1	26	11.16	11.11	11.22	11.16	12.06	12.45		0.0
	1	49	11.30	10.89	11.27	11.50	12.21	12.22		0.0
	25	0	11.22	11.07	11.33	11.12	11.90	12.42	0-1	0.0
	25	13	11.17	11.01	11.29	11.23	11.98	12.29	0	0.0
DFT-s-OFDM 16QAM	1	1	11.68	11.31	11.28	11.46	12.12	12.40	0-1	0.0
CP-OFDM QPSK	1	1	11.25	11.18	11.33	11.19	12.06	12.45	0-1.5	0.0




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Table F-65
NR Band n77 Antenna D Measured P_{Limit} for DSI = 3 (Hotspot Mode) - 90 MHz Bandwidth

NR Band n77 90 MHz Bandwidth								
Modulation	RB Size	RB Offset	Channel			MPR Allowed per 3GPP [dB]	MPR [dB]	
			649668 (3745.02 MHz)	656000 (3840 MHz)	662332 (3934.98 MHz)			
			Conducted Power [dBm]					
DFT-s-OFDM $\pi/2$ BPSK	1	1	13.53	13.14	13.60	0	0.0	
	1	123	13.77	13.14	14.56		0.0	
	1	243	13.06	13.75	14.43		0.0	
		120	0	13.75	13.02	14.23	0-0.5	0.0
		120	63	13.77	13.21	14.54	0	0.0
		120	125	13.49	13.48	14.60	0-0.5	0.0
		243	0	13.72	13.26	14.46		0.0
DFT-s-OFDM QPSK	1	1	13.70	13.31	13.60	0	0.0	
	1	123	13.72	13.30	14.60		0.0	
	1	243	13.20	13.69	14.51		0.0	
		120	0	13.84	13.09	14.31	0-1	0.0
		120	63	13.75	13.21	14.60	0	0.0
		120	125	13.47	13.60	14.60	0-1	0.0
		243	0	13.74	13.30	14.51		0.0
DFT-s-OFDM 16QAM	1	1	13.85	13.35	13.80	0-1	0.0	
CP-OFDM QPSK	1	1	13.50	12.92	13.93	0-1.5	0.5	

Table F-66
NR Band n77 Antenna D Measured P_{Limit} for DSI = 3 (Hotspot Mode) - 80 MHz Bandwidth

NR Band n77 80 MHz Bandwidth								
Modulation	RB Size	RB Offset	Channel			MPR Allowed per 3GPP [dB]	MPR [dB]	
			649334 (3740.01 MHz)	656000 (3840 MHz)	662666 (3939.99 MHz)			
			Conducted Power [dBm]					
DFT-s-OFDM $\pi/2$ BPSK	1	1	13.72	13.04	13.84	0	0.0	
	1	109	13.63	13.12	14.71		0.0	
	1	215	13.40	13.61	14.42		0.0	
		108	0	13.72	13.00	14.27	0-0.5	0.0
		108	55	13.79	13.18	14.65	0	0.0
		108	109	13.55	13.53	14.68	0-0.5	0.0
		216	0	13.61	13.28	14.51		0.0
DFT-s-OFDM QPSK	1	1	13.83	13.22	14.07	0	0.0	
	1	109	13.78	13.30	14.82		0.0	
	1	215	13.42	13.75	14.63		0.0	
		108	0	13.77	13.02	14.43	0-1	0.0
		108	55	13.76	13.27	14.63	0	0.0
		108	109	13.60	13.57	14.69	0-1	0.0
		216	0	13.70	13.35	14.54		0.0
DFT-s-OFDM 16QAM	1	1	13.90	13.10	14.06	0-1	0.0	
CP-OFDM QPSK	1	1	13.28	12.80	13.92	0-1.5	0.5	




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Table F-67

NR Band n77 Antenna D Measured P_{Limit} for DSI = 3 (Hotspot Mode) - 70 MHz Bandwidth

NR Band n77 70 MHz Bandwidth								
Modulation	RB Size	RB Offset	Channel				MPR Allowed per 3GPP [dB]	MPR [dB]
			649000 (3735 MHz)	653666 (3804.99 MHz)	658334 (3875.01 MHz)	663000 (3945 MHz)		
			Conducted Power [dBm]					
DFT-s-OFDM $\pi/2$ BPSK	1	1	13.76	13.25	13.10	13.92	0	0.0
	1	95	13.85	13.05	13.76	14.74		0.0
	1	187	13.57	13.09	14.09	14.47		0.0
	90	0	13.82	13.23	13.40	14.37	0-0.5	0.0
	90	50	13.66	13.24	13.75	14.78	0	0.0
	90	99	13.65	13.19	13.93	14.62	0-0.5	0.0
	180	0	13.78	13.21	13.66	14.55		0.0
DFT-s-OFDM QPSK	1	1	13.88	13.31	13.15	14.17	0	0.0
	1	95	13.91	13.15	13.77	14.81		0.0
	1	187	13.35	13.30	14.09	14.50		0.0
	90	0	13.85	13.24	13.46	14.46	0-1	0.0
	90	50	13.77	13.15	13.75	14.72	0	0.0
	90	99	13.71	13.14	14.00	14.70	0-1	0.0
	180	0	13.74	13.23	13.76	14.59		0.0
DFT-s-OFDM 16QAM	1	1	14.15	13.25	13.10	14.40	0-1	0.0
CP-OFDM QPSK	1	1	13.21	13.42	13.15	14.31	0-1.5	0.5

Table F-68

NR Band n77 Antenna D Measured P_{Limit} for DSI = 3 (Hotspot Mode) - 60 MHz Bandwidth

NR Band n77 60 MHz Bandwidth								
Modulation	RB Size	RB Offset	Channel				MPR Allowed per 3GPP [dB]	MPR [dB]
			648668 (3730.02 MHz)	653556 (3803.34 MHz)	658444 (3876.66 MHz)	663332 (3949.98 MHz)		
			Conducted Power [dBm]					
DFT-s-OFDM $\pi/2$ BPSK	1	1	13.63	13.30	13.11	14.06	0	0.0
	1	81	13.64	13.05	13.66	14.61		0.0
	1	160	13.52	13.15	14.10	14.41		0.0
	81	0	13.79	13.06	13.44	14.45	0-0.5	0.0
	81	41	13.72	13.05	13.74	14.64	0	0.0
	81	81	13.67	13.12	13.87	14.63	0-0.5	0.0
	162	0	13.70	13.12	13.66	14.60		0.0
DFT-s-OFDM QPSK	1	1	13.67	13.35	13.30	14.11	0	0.0
	1	81	13.72	13.24	13.68	14.75		0.0
	1	160	13.65	13.45	14.10	14.50		0.0
	81	0	13.79	13.17	13.51	14.58	0-1	0.0
	81	41	13.75	13.08	13.79	14.74	0	0.0
	81	81	13.72	13.11	14.02	14.67	0-1	0.0
	162	0	13.75	13.14	13.72	14.65		0.0
DFT-s-OFDM 16QAM	1	1	13.88	13.42	13.24	14.45	0-1	0.0
CP-OFDM QPSK	1	1	13.56	13.50	13.11	14.30	0-1.5	0.5




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Table F-69
NR Band n77 Antenna D Measured P_{Limit} for DSI = 3 (Hotspot Mode) - 50 MHz Bandwidth

NR Band n77 50 MHz Bandwidth									
Modulation	RB Size	RB Offset	Channel					MPR Allowed per 3GPP [dB]	MPR [dB]
			648334 (3725.01 MHz)	652166 (3782.49 MHz)	656000 (3840 MHz)	659834 (3897.51 MHz)	663666 (3954.99 MHz)		
			Conducted Power [dBm]						
DFT-s-OFDM $\pi/2$ BPSK	1	1	13.99	13.38	13.05	13.75	14.75	0	0.0
	1	67	13.93	13.22	13.35	14.17	14.81		0.0
	1	131	13.86	13.39	13.48	14.70	14.75		0.0
	64	0	14.00	13.56	13.18	14.07	14.88	0-0.5	0.0
	64	35	13.95	13.45	13.38	14.25	14.84	0	0.0
	64	69	13.94	13.34	13.58	14.47	14.79	0-0.5	0.0
DFT-s-OFDM QPSK	128	0	13.90	13.33	13.41	14.25	14.81	0	0.0
	1	1	14.00	13.71	13.13	13.85	14.99		0.0
	1	67	14.01	13.50	13.45	14.12	14.98		0.0
	1	131	13.97	13.45	13.75	14.70	14.84	0.0	
	64	0	14.02	13.55	13.38	14.14	14.97	0-1	0.0
	64	35	14.04	13.45	13.60	14.35	14.89	0	0.0
DFT-s-OFDM 16QAM	64	69	13.95	13.36	13.67	14.51	14.83	0-1	0.0
	128	0	13.97	13.47	13.51	14.32	14.95		0.0
	1	1	14.00	13.71	13.33	14.00	14.97		0-1
CP-OFDM QPSK	1	1	14.00	13.48	13.41	13.88	14.80	0-1.5	0.5

Table F-70
NR Band n77 Antenna D Measured P_{Limit} for DSI = 3 (Hotspot Mode) - 40 MHz Bandwidth

NR Band n77 40 MHz Bandwidth										
Modulation	RB Size	RB Offset	Channel						MPR Allowed per 3GPP [dB]	MPR [dB]
			648000 (3720 MHz)	651200 (3768 MHz)	654400 (3816 MHz)	657600 (3864 MHz)	660800 (3912 MHz)	664000 (3960 MHz)		
			Conducted Power [dBm]							
DFT-s-OFDM $\pi/2$ BPSK	1	1	13.99	14.05	13.25	13.82	14.92	15.41	0	0.0
	1	53	14.01	13.72	13.34	14.25	14.95	15.12		0.0
	1	104	14.30	13.65	13.71	14.62	14.60	15.10		0.0
	50	0	13.95	13.82	13.35	14.04	14.88	15.21	0-0.5	0.0
	50	28	14.00	13.78	13.47	14.25	14.97	15.19	0	0.0
	50	56	14.00	13.88	13.49	14.45	15.35	15.15	0-0.5	0.0
DFT-s-OFDM QPSK	100	0	13.97	13.82	13.40	14.38	15.03	15.20	0	0.0
	1	1	13.91	14.00	13.53	14.17	14.80	15.45		0.0
	1	53	14.00	13.81	13.37	14.43	15.00	15.05		0.0
	1	104	14.30	13.80	13.69	13.93	14.79	15.06	0.0	
	50	0	13.95	13.91	13.50	14.37	14.90	15.32	0-1	0.0
	50	28	14.01	13.82	13.40	14.55	15.02	15.10	0	0.0
DFT-s-OFDM 16QAM	50	56	14.12	13.83	13.52	14.78	15.33	15.13	0-1	0.0
	100	0	14.02	13.87	13.43	14.61	15.05	15.19		0.0
	1	1	14.13	14.00	13.64	14.22	14.72	15.25		0-1
CP-OFDM QPSK	1	1	14.08	13.76	13.65	13.52	14.81	14.83	0-1.5	0.5







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Table F-71
NR Band n77 Antenna D Measured P_{Limit} for DSI = 3 (Hotspot Mode) - 30 MHz Bandwidth

NR Band n77 30 MHz Bandwidth										
Modulation	RB Size	RB Offset	Channel						MPR Allowed per 3GPP [dB]	MPR [dB]
			647668 (3715.02 MHz)	651000 (3765 MHz)	654334 (3815.01 MHz)	657666 (3864.99 MHz)	661000 (3915 MHz)	664332 (3964.98 MHz)		
			Conducted Power [dBm]							
DFT-s-OFDM $\pi/2$ BPSK	1	1	13.43	13.82	13.81	13.77	14.32	15.08	0	0.0
	1	39	13.41	13.82	13.89	13.87	14.45	15.37		0.0
	1	76	13.48	14.20	14.03	14.19	14.66	15.34		0.0
	36	0	13.46	13.98	13.84	14.13	14.83	15.35	0-0.5	0.0
	36	21	13.49	13.90	13.80	13.97	14.64	15.39	0	0.0
	36	42	13.49	13.93	13.87	14.15	14.74	15.34	0-0.5	0.0
DFT-s-OFDM QPSK	75	0	13.54	13.90	13.83	14.12	14.87	15.39	0	0.0
	1	1	13.49	13.97	13.86	14.05	14.64	15.49	0	0.0
	1	39	13.51	13.87	13.76	14.06	14.58	15.48		0.0
	1	76	13.64	14.17	14.04	14.11	14.91	15.40		0.0
	36	0	13.60	14.05	13.88	13.92	14.81	15.41	0-1	0.0
	36	21	13.48	13.93	13.87	14.03	14.65	15.45	0	0.0
DFT-s-OFDM 16QAM	36	42	13.52	13.97	13.84	14.11	14.74	15.39	0-1	0.0
	75	0	13.57	14.03	13.86	14.18	14.93	15.40	0	0.0
	1	1	13.48	13.84	13.80	14.11	14.68	15.49	0-1	0.0
CP-OFDM QPSK	1	1	13.34	13.86	13.90	13.80	14.58	14.72	0-1.5	0.5

Table F-72
NR Band n77 Antenna D Measured P_{Limit} for DSI = 3 (Hotspot Mode) - 20 MHz Bandwidth

NR Band n77 20 MHz Bandwidth										
Modulation	RB Size	RB Offset	Channel						MPR Allowed per 3GPP [dB]	MPR [dB]
			647334 (3710.01 MHz)	650800 (3762 MHz)	654266 (3813.99 MHz)	657734 (3866.01 MHz)	661200 (3918 MHz)	664666 (3969.99 MHz)		
			Conducted Power [dBm]							
DFT-s-OFDM $\pi/2$ BPSK	1	1	13.94	13.90	13.88	13.37	14.13	15.11	0	0.0
	1	26	13.72	13.92	13.86	13.45	14.26	15.10		0.0
	1	49	13.80	13.99	13.90	13.76	14.59	15.13		0.0
	25	0	13.94	13.95	13.97	13.56	14.26	15.12	0-0.5	0.0
	25	13	13.82	13.92	13.93	13.63	14.36	15.10	0	0.0
	25	26	13.84	14.02	13.94	13.65	14.55	15.19	0-0.5	0.0
DFT-s-OFDM QPSK	50	0	13.91	14.01	13.93	13.70	14.41	15.11	0	0.0
	1	1	14.18	13.80	14.07	13.75	14.40	15.23	0	0.0
	1	26	13.92	13.87	14.04	13.73	14.43	15.25		0.0
	1	49	14.07	13.98	14.00	13.92	14.74	15.26		0.0
	25	0	14.03	13.90	13.93	13.72	14.44	15.12	0-1	0.0
	25	13	13.94	13.92	13.92	13.78	14.48	15.16	0	0.0
DFT-s-OFDM 16QAM	25	26	13.93	13.97	13.99	13.75	14.69	15.12	0-1	0.0
	50	0	13.98	13.99	13.97	13.76	14.48	15.19	0	0.0
	1	1	14.25	13.95	14.04	13.83	14.46	14.94	0-1	0.0
CP-OFDM QPSK	1	1	14.11	13.86	13.92	13.69	14.41	14.73	0-1.5	0.5

FCC ID: A3LSMG998U	 PCTEST Proud to be part of 	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Test Dates: 01/22/21 - 02/22/21	DUT Type: Portable Handset			APPENDIX F: Page 36 of 36

APPENDIX G: PROBE AND DIPOLE CALIBRATION CERTIFICATES



Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Client **PC Test**

Certificate No: **D3700V2-1067_Jan20**

CALIBRATION CERTIFICATE

Object **D3700V2 - SN:1067**

Calibration procedure(s) **QA CAL-22.v4
Calibration Procedure for SAR Validation Sources between 3-6 GHz**

Calibration date: **January 21, 2020**

*BNV
02-02-2020*

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

*BNV
01-23-21*

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	03-Apr-19 (No. 217-02892/02893)	Apr-20
Power sensor NRP-Z91	SN: 103244	03-Apr-19 (No. 217-02892)	Apr-20
Power sensor NRP-Z91	SN: 103245	03-Apr-19 (No. 217-02893)	Apr-20
Reference 20 dB Attenuator	SN: 5058 (20k)	04-Apr-19 (No. 217-02894)	Apr-20
Type-N mismatch combination	SN: 5047.2 / 06327	04-Apr-19 (No. 217-02895)	Apr-20
Reference Probe EX3DV4	SN: 3503	31-Dec-19 (No. EX3-3503_Dec19)	Dec-20
DAE4	SN: 601	27-Dec-19 (No. DAE4-601_Dec19)	Dec-20

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter E4419B	SN: GB39512475	30-Oct-14 (in house check Feb-19)	In house check: Oct-20
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-18)	In house check: Oct-20
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-18)	In house check: Oct-20
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-18)	In house check: Oct-20
Network Analyzer Agilent E8358A	SN: US41080477	31-Mar-14 (in house check Oct-19)	In house check: Oct-20

Calibrated by:	Name Jeton Kastrati	Function Laboratory Technician	Signature
Approved by:	Name Katja Pokovic	Function Technical Manager	Signature

Issued: January 22, 2020

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



Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
- IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
- KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

- DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:* SAR measured at the stated antenna input power.
- SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

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

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.10.3
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy = 4 mm, dz = 1.4 mm	Graded Ratio = 1.4 (Z direction)
Frequency	3700 MHz \pm 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	37.7	3.12 mho/m
Measured Head TSL parameters	(22.0 \pm 0.2) °C	36.8 \pm 6 %	3.05 mho/m \pm 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	6.72 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	67.2 W/kg \pm 19.9 % (k=2)

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.44 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	24.3 W/kg \pm 19.5 % (k=2)

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	51.0	3.55 mho/m
Measured Body TSL parameters	(22.0 \pm 0.2) °C	49.5 \pm 6 %	3.54 mho/m \pm 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm³ (1 g) of Body TSL	Condition	
SAR measured	100 mW input power	6.56 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	65.2 W/kg \pm 19.9 % (k=2)

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	100 mW input power	2.34 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	23.3 W/kg \pm 19.5 % (k=2)

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	48.7 Ω - 0.4 j Ω
Return Loss	- 37.4 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	47.6 Ω + 1.9 j Ω
Return Loss	- 30.2 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.141 ns
----------------------------------	----------

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
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DASY5 Validation Report for Head TSL

Date: 21.01.2020

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 3700 MHz; Type: D3700V2; Serial: D3700V2 - SN:1067

Communication System: UID 0 - CW; Frequency: 3700 MHz

Medium parameters used: $f = 3700$ MHz; $\sigma = 3.05$ S/m; $\epsilon_r = 36.8$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN3503; ConvF(7.73, 7.73, 7.73) @ 3700 MHz; Calibrated: 31.12.2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 27.12.2019
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474)

Dipole Calibration for Head Tissue/Pin=100 mW, d=10mm/Zoom Scan, dist=1.4mm

(8x8x8)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 70.34 V/m; Power Drift = -0.05 dB

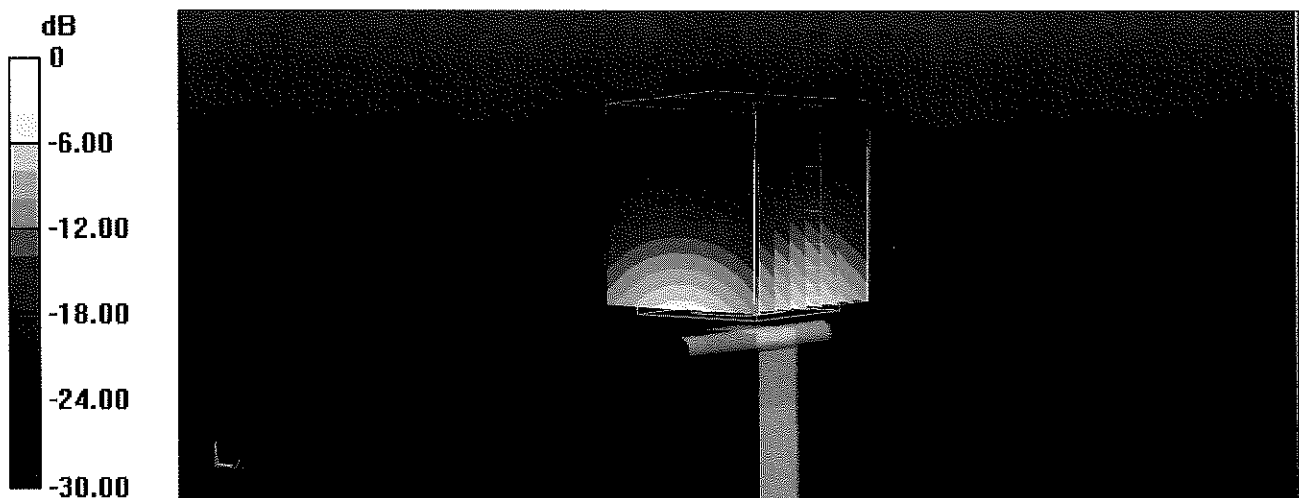
Peak SAR (extrapolated) = 19.4 W/kg

SAR(1 g) = 6.72 W/kg; SAR(10 g) = 2.44 W/kg

Smallest distance from peaks to all points 3 dB below = 8.4 mm

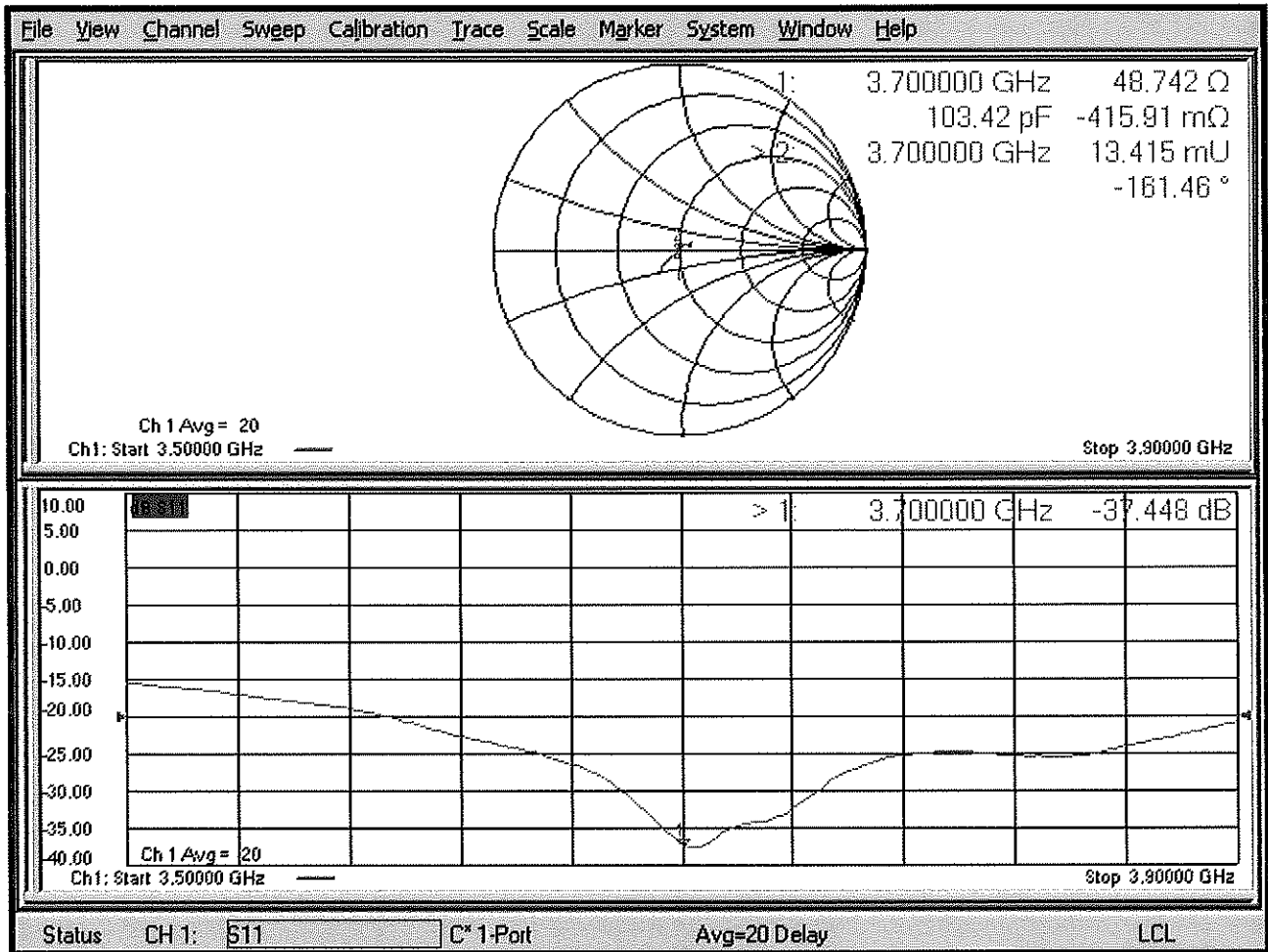
Ratio of SAR at M2 to SAR at M1 = 72.9%

Maximum value of SAR (measured) = 13.4 W/kg



0 dB = 13.4 W/kg = 11.27 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 21.01.2020

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 3700 MHz; Type: D3700V2; Serial: D3700V2 - SN:1067

Communication System: UID 0 - CW; Frequency: 3700 MHz

Medium parameters used: $f = 3700$ MHz; $\sigma = 3.54$ S/m; $\epsilon_r = 49.5$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN3503; ConvF(7.31, 7.31, 7.31) @ 3700 MHz; Calibrated: 31.12.2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 27.12.2019
- Phantom: Flat Phantom 5.0 (back); Type: QD 000 P50 AA; Serial: 1002
- DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474)

Dipole Calibration for Body Tissue/Pin=100 mW, d=10mm/Zoom Scan , dist=1.4mm

(9x9x8)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 63.54 V/m; Power Drift = -0.07 dB

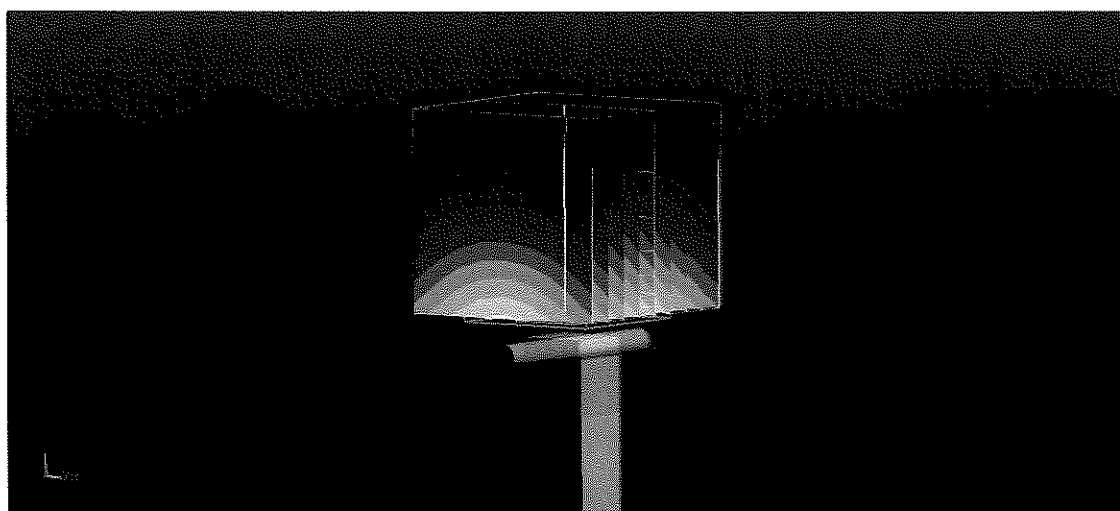
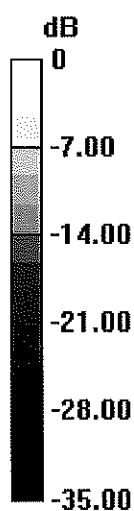
Peak SAR (extrapolated) = 18.1 W/kg

SAR(1 g) = 6.56 W/kg; SAR(10 g) = 2.34 W/kg

Smallest distance from peaks to all points 3 dB below = 7.9 mm

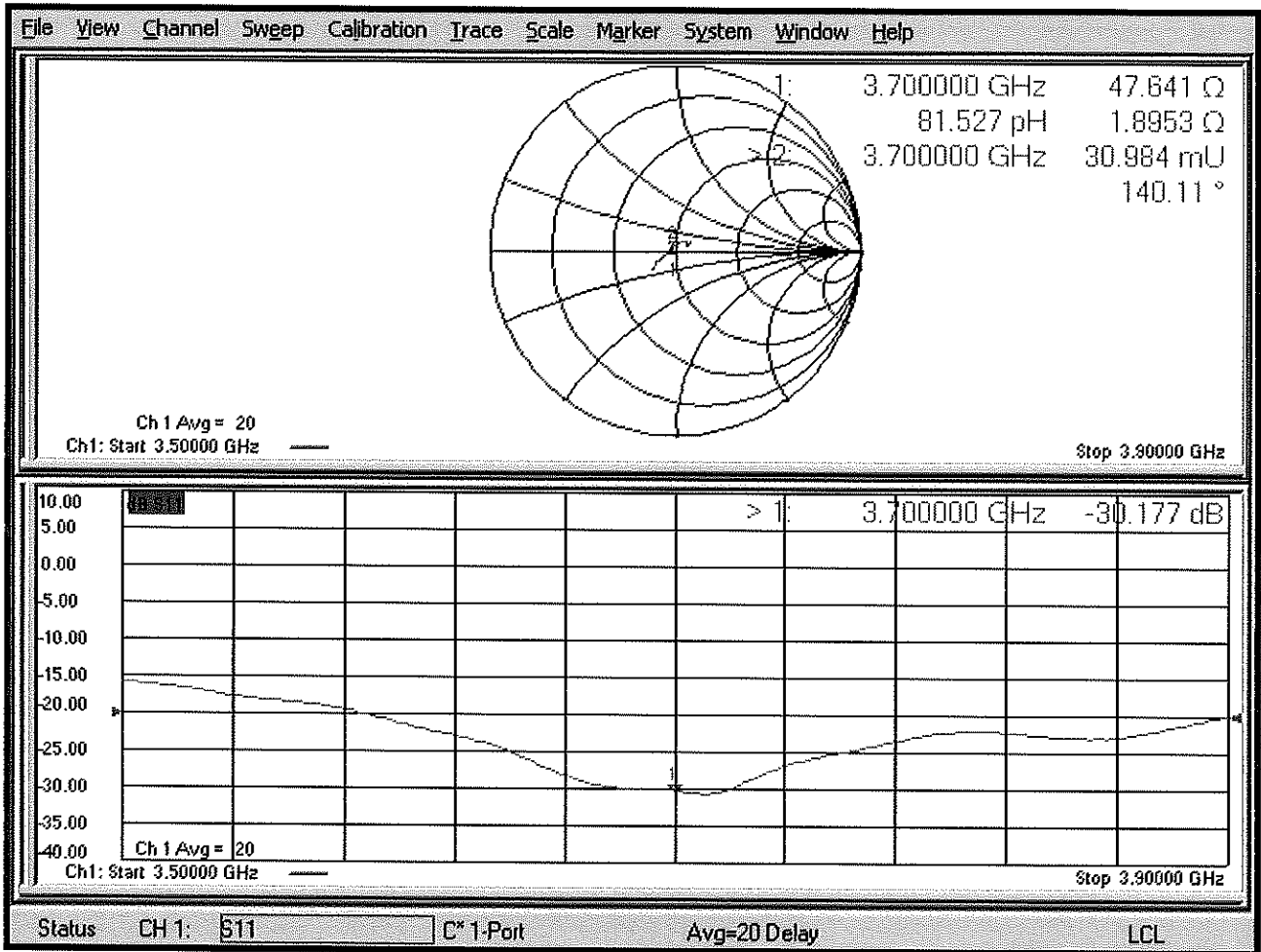
Ratio of SAR at M2 to SAR at M1 = 74.3%

Maximum value of SAR (measured) = 13.3 W/kg



0 dB = 13.3 W/kg = 11.24 dBW/kg

Impedance Measurement Plot for Body TSL



Certification of Calibration

Object: D3700V2 – SN: 1067

Calibration procedure(s): Procedure for Calibration Extension for SAR Dipoles.

Extension Calibration date: 1/21/2021

Description: SAR Validation Dipole at 3700 MHz.

Calibration Equipment used:

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Control Company	4040	Therm./Clock/Humidity Monitor	6/29/2019	Biennial	6/29/2021	192291470
Control Company	4353	Long Stem Thermometer	10/28/2020	Biennial	10/28/2022	200670623
Amplifier Research	15S1G6	Amplifier	CBT	N/A	CBT	433971
Narda	4772-3	Attenuator (3dB)	CBT	N/A	CBT	9406
Agilent	85033E	3.5mm Standard Calibration Kit	6/6/2020	Annual	6/6/2021	MY53402352
Rohde & Schwarz	ZNLE6	Vector Network Analyzer	9/29/2020	Annual	9/29/2021	101307
Mini-Circuits	BW-N20W5+	DC to 18 GHz Precision Fixed 20 dB Attenuator	CBT	N/A	CBT	N/A
SPEAG	DAK-3.5	Dielectric Assessment Kit	5/12/2020	Annual	5/12/2021	1070
Anritsu	MA2411B	Pulse Power Sensor	8/12/2020	Annual	8/12/2021	1207364
Anritsu	MA2411B	Pulse Power Sensor	9/22/2020	Annual	9/22/2021	1315051
Anritsu	ML2495A	Power Meter	11/3/2020	Annual	11/3/2021	1039008
Anritsu	ML2495A	Power Meter	1/18/2021	Annual	1/18/2022	941001
Agilent	N5182A	MXG Vector Signal Generator	5/13/2020	Annual	5/13/2021	MY47420603
Pasternack	NC-100	Torque Wrench	8/4/2020	Biennial	8/4/2022	N/A
MiniCircuits	ZHDC-16-63-S+	Bidirectional Coupler	CBT	N/A	CBT	N/A
MiniCircuits	VLF-6000+	Low Pass Filter	CBT	N/A	CBT	N/A
SPEAG	EX3DV4	SAR Probe	10/20/2020	Annual	10/20/2021	7551
SPEAG	EX3DV4	SAR Probe	10/20/2020	Annual	10/20/2021	7539
SPEAG	DAE4	Dasy Data Acquisition Electronics	10/16/2020	Annual	10/16/2021	1333
SPEAG	DAE4	Dasy Data Acquisition Electronics	5/20/2020	Annual	5/20/2021	728

Measurement Uncertainty = $\pm 23\%$ (k=2)

	Name	Function	Signature
Calibrated By:	Brodie Halfoster	Test Engineer	<i>BRODIE HALFOSTER</i>
Approved By:	Kaitlin O'Keefe	Senior Technical Manager	<i>KOK</i>

DIPOLE CALIBRATION EXTENSION

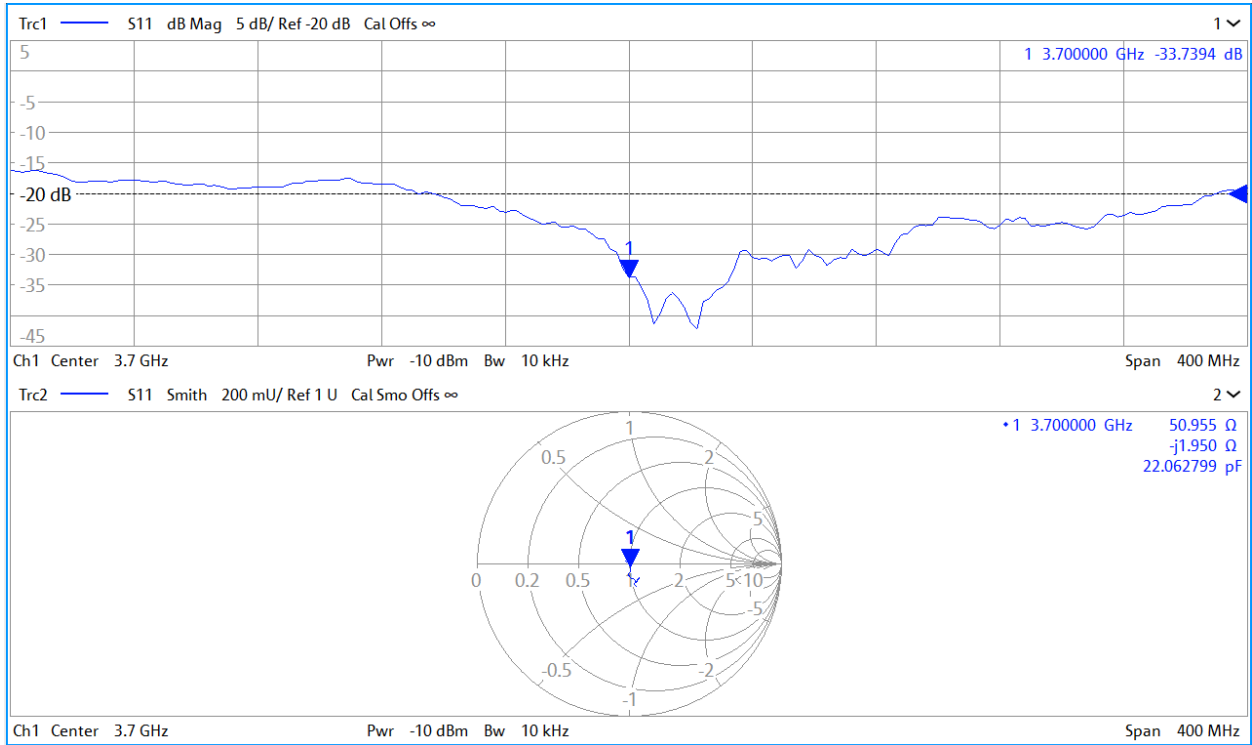
Per KDB 865664 D01, calibration intervals of up to three years may be considered for reference dipoles when it is demonstrated that the SAR target, impedance and return loss of a dipole have remained stable according to the following requirements:

1. The measured SAR does not deviate more than 10% from the target on the calibration certificate.
2. The return-loss does not deviate more than 20% from the previous measurement and meets the required 20dB minimum return-loss requirement.
3. The measurement of real or imaginary parts of impedance does not deviate more than 5Ω from the previous measurement.

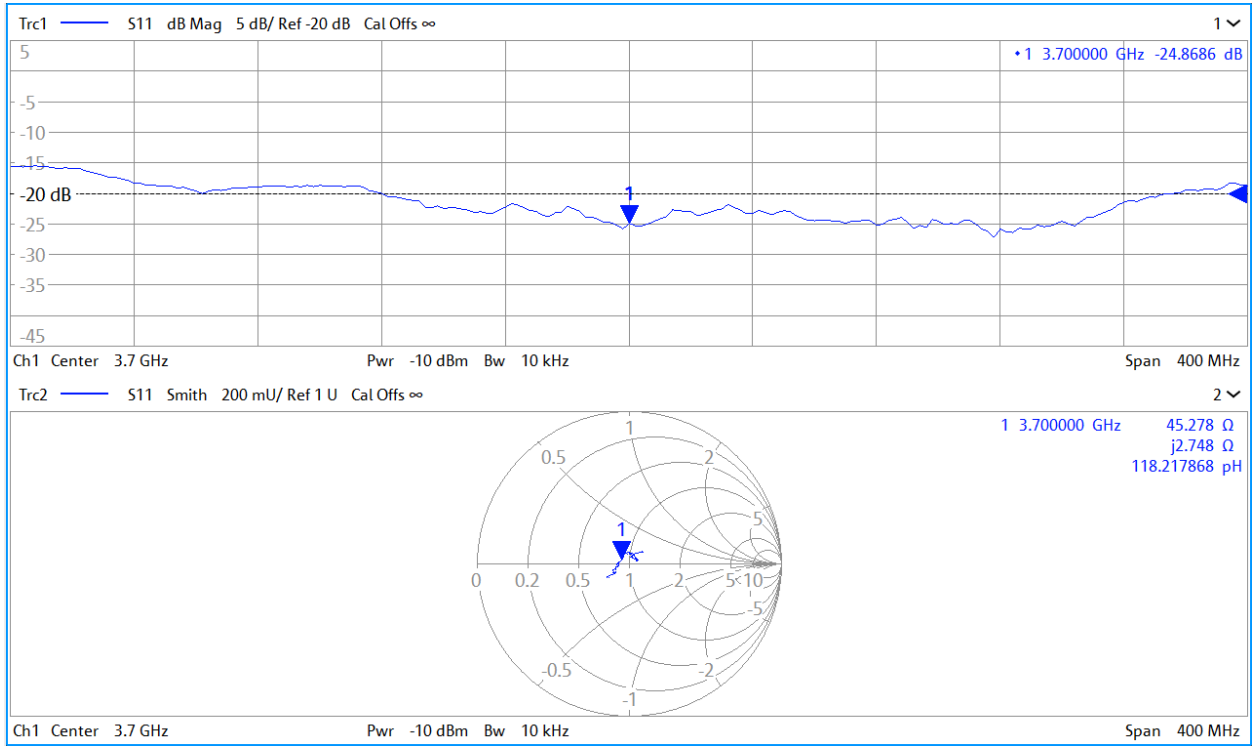
The following dipole was checked to pass the above 3 requirements to have 2-year calibration period from the calibration date:

Calibration Date	Extension Date	Certificate Electrical Delay (ns)	Certificate SAR Target Head (1g) W/kg @ 20.0 dBm	Measured Head SAR (1g) W/kg @ 20.0 dBm	Deviation 1g (%)	Certificate SAR Target Head (10g) W/kg @ 20.0 dBm	Measured Head SAR (10g) W/kg @ 20.0 dBm	Deviation 10g (%)	Certificate Impedance Head (Ohm) Real	Measured Impedance Head (Ohm) Real	Difference (Ohm) Real	Certificate Impedance Head (Ohm) Imaginary	Measured Impedance Head (Ohm) Imaginary	Difference (Ohm) Imaginary	Certificate Return Loss Head (dB)	Measured Return Loss Head (dB)	Deviation (%)	PASS/FAIL
1/21/2020	1/21/2021	1.141	6.72	7.11	5.80%	2.43	2.6	7.00%	46.7	51	2.3	-0.4	-2	1.6	-37.4	-33.7	9.80%	PASS
Calibration Date	Extension Date	Certificate Electrical Delay (ns)	Certificate SAR Target Body (1g) W/kg @ 20.0 dBm	Measured Body SAR (1g) W/kg @ 20.0 dBm	Deviation 1g (%)	Certificate SAR Target Body (10g) W/kg @ 20.0 dBm	Measured Body SAR (10g) W/kg @ 20.0 dBm	Deviation 10g (%)	Certificate Impedance Body (Ohm) Real	Measured Impedance Body (Ohm) Real	Difference (Ohm) Real	Certificate Impedance Body (Ohm) Imaginary	Measured Impedance Body (Ohm) Imaginary	Difference (Ohm) Imaginary	Certificate Return Loss Body (dB)	Measured Return Loss Body (dB)	Deviation (%)	PASS/FAIL
1/21/2020	1/21/2021	1.141	6.52	6.48	-0.61%	2.33	2.34	0.43%	47.6	45.3	2.3	1.9	2.7	0.8	-30.2	-24.9	17.70%	PASS

Impedance & Return-Loss Measurement Plot for Head TSL



Impedance & Return-Loss Measurement Plot for Body TSL





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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Client **PC Test**

Certificate No: **D3900V2-1056_Oct20**

CALIBRATION CERTIFICATE

Object **D3900V2 - SN:1056**

Calibration procedure(s) **QA CAL-22.v5
Calibration Procedure for SAR Validation Sources between 3-10 GHz**

Calibration date: **October 09, 2020**

*BNV
11/04/20*

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	01-Apr-20 (No. 217-03100/03101)	Apr-21
Power sensor NRP-Z91	SN: 103244	01-Apr-20 (No. 217-03100)	Apr-21
Power sensor NRP-Z91	SN: 103245	01-Apr-20 (No. 217-03101)	Apr-21
Reference 20 dB Attenuator	SN: BH9394 (20k)	31-Mar-20 (No. 217-03106)	Apr-21
Type-N mismatch combination	SN: 310982 / 06327	31-Mar-20 (No. 217-03104)	Apr-21
Reference Probe EX3DV4	SN: 3503	31-Dec-19 (No. EX3-3503_Dec19)	Dec-20
DAE4	SN: 601	27-Dec-19 (No. DAE4-601_Dec19)	Dec-20

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter E4419B	SN: GB39512475	30-Oct-14 (in house check Oct-20)	In house check: Oct-22
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-20)	In house check: Oct-22
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-20)	In house check: Oct-22
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-20)	In house check: Oct-22
Network Analyzer Agilent E8358A	SN: US41080477	31-Mar-14 (in house check Oct-20)	In house check: Oct-21

	Name	Function	Signature
Calibrated by:	Leif klysnér	Laboratory Technician	<i>Leif Klysnér</i>
Approved by:	Katja Pokovic	Technical Manager	<i>Katja Pokovic</i>

Issued: October 12, 2020

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



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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
- IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
- KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

- DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions:** Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:** The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:** These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:** One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:** SAR measured at the stated antenna input power.
- SAR normalized:** SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:** The measured TSL parameters are used to calculate the nominal SAR result.

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

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.10.4
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V5.0	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy = 4.0 mm, dz = 1.4 mm	Graded Ratio = 1.4 (Z direction)
Frequency	3900 MHz \pm 1 MHz 4100 MHz \pm 1 MHz	

Head TSL parameters at 3900 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	37.5	3.32 mho/m
Measured Head TSL parameters	(22.0 \pm 0.2) °C	36.4 \pm 6 %	3.24 mho/m \pm 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL at 3900 MHz

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	6.91 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	68.9 W/kg \pm 19.9 % (k=2)

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.42 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	24.1 W/kg \pm 19.5 % (k=2)

Head TSL parameters at 4100 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	37.2	3.53 mho/m
Measured Head TSL parameters	(22.0 \pm 0.2) °C	36.2 \pm 6 %	3.42 mho/m \pm 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL at 4100 MHz

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	6.84 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	68.3 W/kg \pm 19.9 % (k=2)

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.39 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	23.7 W/kg \pm 19.5 % (k=2)

Body TSL parameters at 3900 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	50.8	3.78 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	49.8 ± 6 %	3.71 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL at 3900 MHz

SAR averaged over 1 cm ³ (1 g) of Body TSL	Condition	
SAR measured	100 mW input power	6.64 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	66.3 W/kg ± 19.9 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	100 mW input power	2.31 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	23.0 W/kg ± 19.5 % (k=2)

Body TSL parameters at 4100 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	50.5	4.01 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	49.5 ± 6 %	3.95 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL at 4100 MHz

SAR averaged over 1 cm ³ (1 g) of Body TSL	Condition	
SAR measured	100 mW input power	6.51 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	64.9 W/kg ± 19.9 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	100 mW input power	2.26 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	22.5 W/kg ± 19.5 % (k=2)

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL at 3900 MHz

Impedance, transformed to feed point	49.0 Ω - 6.7 j Ω
Return Loss	- 23.4 dB

Antenna Parameters with Head TSL at 4100 MHz

Impedance, transformed to feed point	60.7 Ω - 2.3 j Ω
Return Loss	- 20.1 dB

Antenna Parameters with Body TSL at 3900 MHz

Impedance, transformed to feed point	49.2 Ω - 3.5 j Ω
Return Loss	- 28.9 dB

Antenna Parameters with Body TSL at 4100 MHz

Impedance, transformed to feed point	60.9 Ω - 1.4 j Ω
Return Loss	- 20.1 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.102 ns
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After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
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DASY5 Validation Report for Head TSL

Date: 09.10.2020

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 3900 MHz; Type: D3900V2; Serial: D3900V2 - SN:1056

Communication System: UID 0 - CW; Frequency: 3900 MHz, Frequency: 4100 MHz

Medium parameters used: $f = 3900$ MHz; $\sigma = 3.24$ S/m; $\epsilon_r = 36.4$; $\rho = 1000$ kg/m³, Medium parameters used: $f = 4100$ MHz; $\sigma = 3.42$ S/m; $\epsilon_r = 36.2$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN3503; ConvF(7.39, 7.39, 7.39) @ 3900 MHz, ConvF(7.26, 7.26, 7.26) @ 4100 MHz; Calibrated: 31.12.2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 27.12.2019
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1003
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

Dipole Calibration for Head Tissue/Pin=100 mW, d=10mm, f=3900MHz/Zoom Scan, dist=1.4mm (8x8x8)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 71.83 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 20.0 W/kg

SAR(1 g) = 6.91 W/kg; SAR(10 g) = 2.42 W/kg

Smallest distance from peaks to all points 3 dB below = 8.2 mm

Ratio of SAR at M2 to SAR at M1 = 73.5%

Maximum value of SAR (measured) = 13.9 W/kg

Dipole Calibration for Head Tissue/Pin=100 mW, d=10mm, f=4100MHz/Zoom Scan, dist=1.4mm (8x8x8)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 70.34 V/m; Power Drift = -0.03 dB

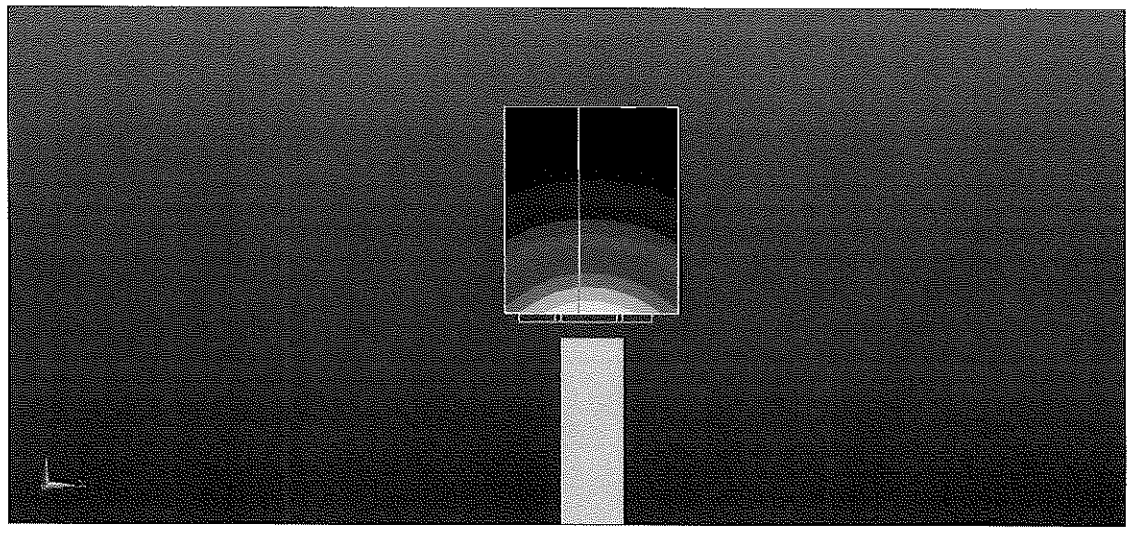
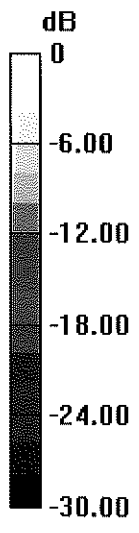
Peak SAR (extrapolated) = 19.8 W/kg

SAR(1 g) = 6.84 W/kg; SAR(10 g) = 2.39 W/kg

Smallest distance from peaks to all points 3 dB below = 8.2 mm

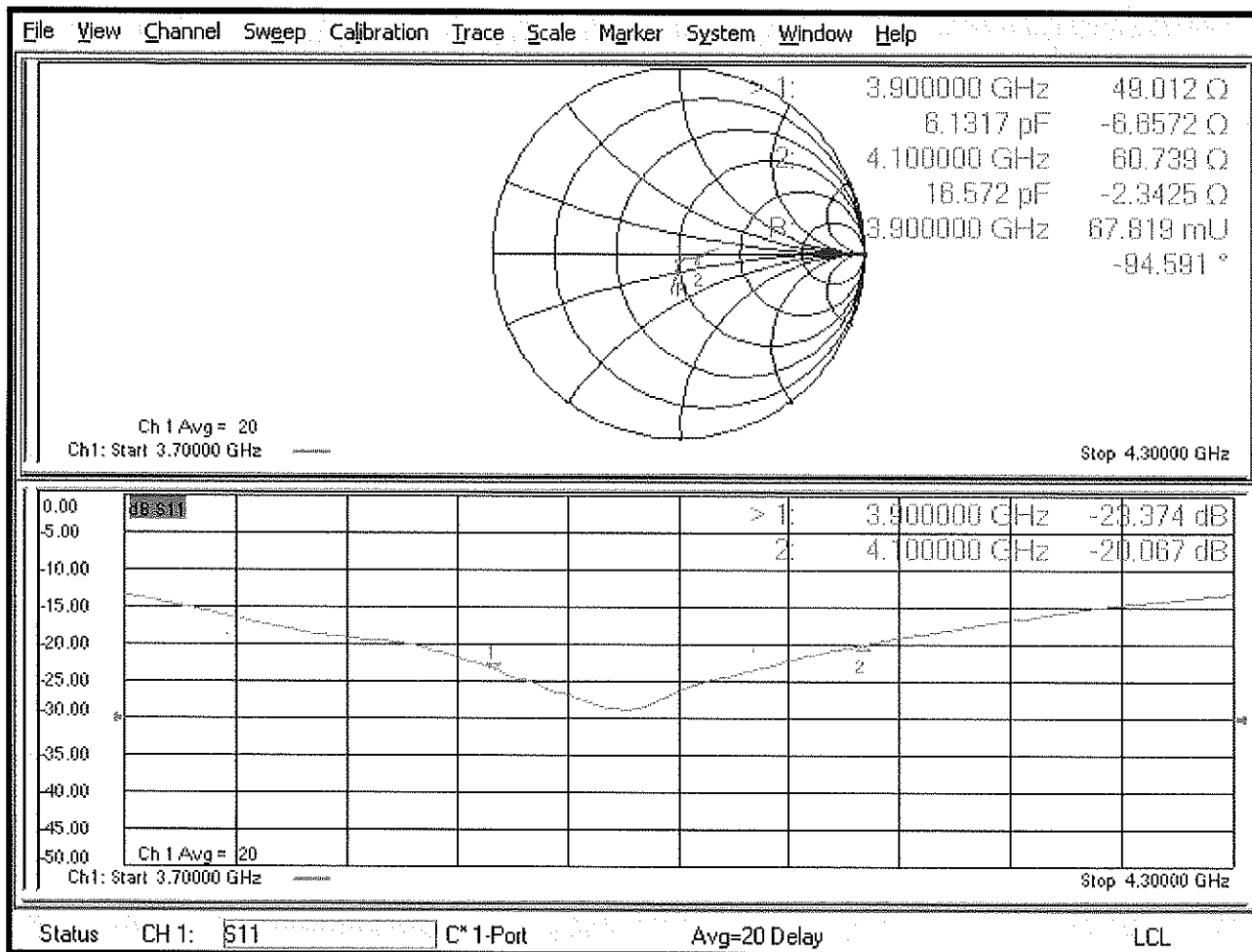
Ratio of SAR at M2 to SAR at M1 = 73.6%

Maximum value of SAR (measured) = 13.8 W/kg



0 dB = 13.8 W/kg = 11.40 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 09.10.2020

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 3900 MHz; Type: D3900V2; Serial: D3900V2 - SN:1056

Communication System: UID 0 - CW; Frequency: 3900 MHz, Frequency: 4100 MHz

Medium parameters used: $f = 3900$ MHz; $\sigma = 3.71$ S/m; $\epsilon_r = 49.8$; $\rho = 1000$ kg/m³,

Medium parameters used: $f = 4100$ MHz; $\sigma = 3.95$ S/m; $\epsilon_r = 49.5$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN3503; ConvF(7.18, 7.18, 7.18) @ 3900 MHz, ConvF(6.88, 6.88, 6.88) @ 4100 MHz; Calibrated: 31.12.2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 27.12.2019
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1002
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

Dipole Calibration for Body Tissue/Pin=100 mW, d=10mm, f=3900MHz/Zoom Scan, dist=1.4mm (8x8x8)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 65.43 V/m; Power Drift = -0.09 dB

Peak SAR (extrapolated) = 19.4 W/kg

SAR(1 g) = 6.64 W/kg; SAR(10 g) = 2.31 W/kg

Smallest distance from peaks to all points 3 dB below = 7.9 mm

Ratio of SAR at M2 to SAR at M1 = 73.1%

Maximum value of SAR (measured) = 13.2 W/kg

Dipole Calibration for Body Tissue/Pin=100 mW, d=10mm, f=4100MHz/Zoom Scan, dist=1.4mm (8x8x8)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 63.30 V/m; Power Drift = -0.07 dB

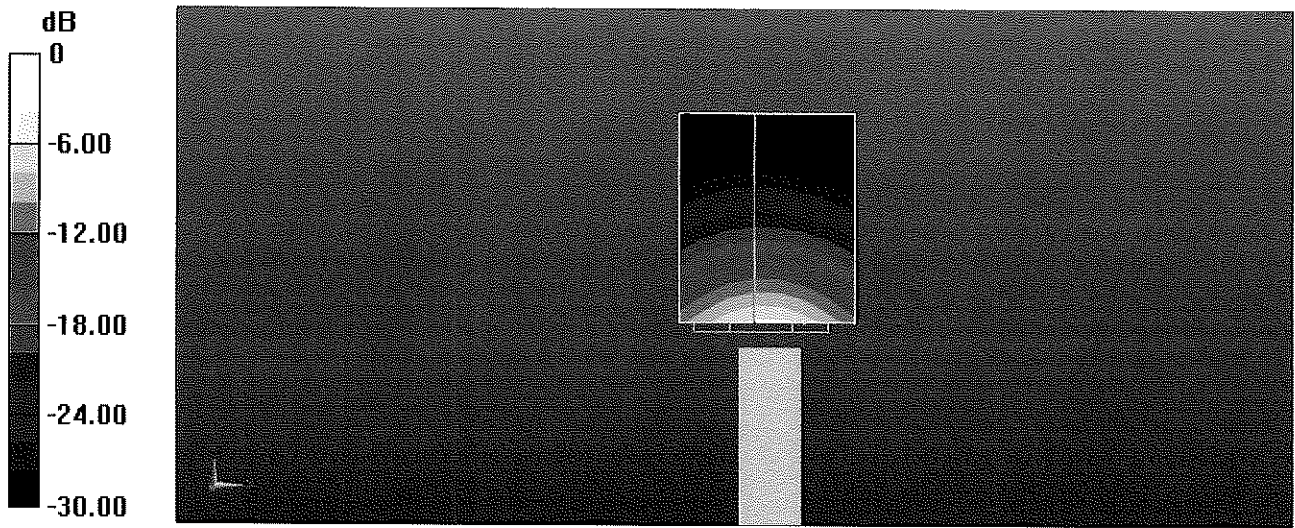
Peak SAR (extrapolated) = 19.6 W/kg

SAR(1 g) = 6.51 W/kg; SAR(10 g) = 2.26 W/kg

Smallest distance from peaks to all points 3 dB below = 8 mm

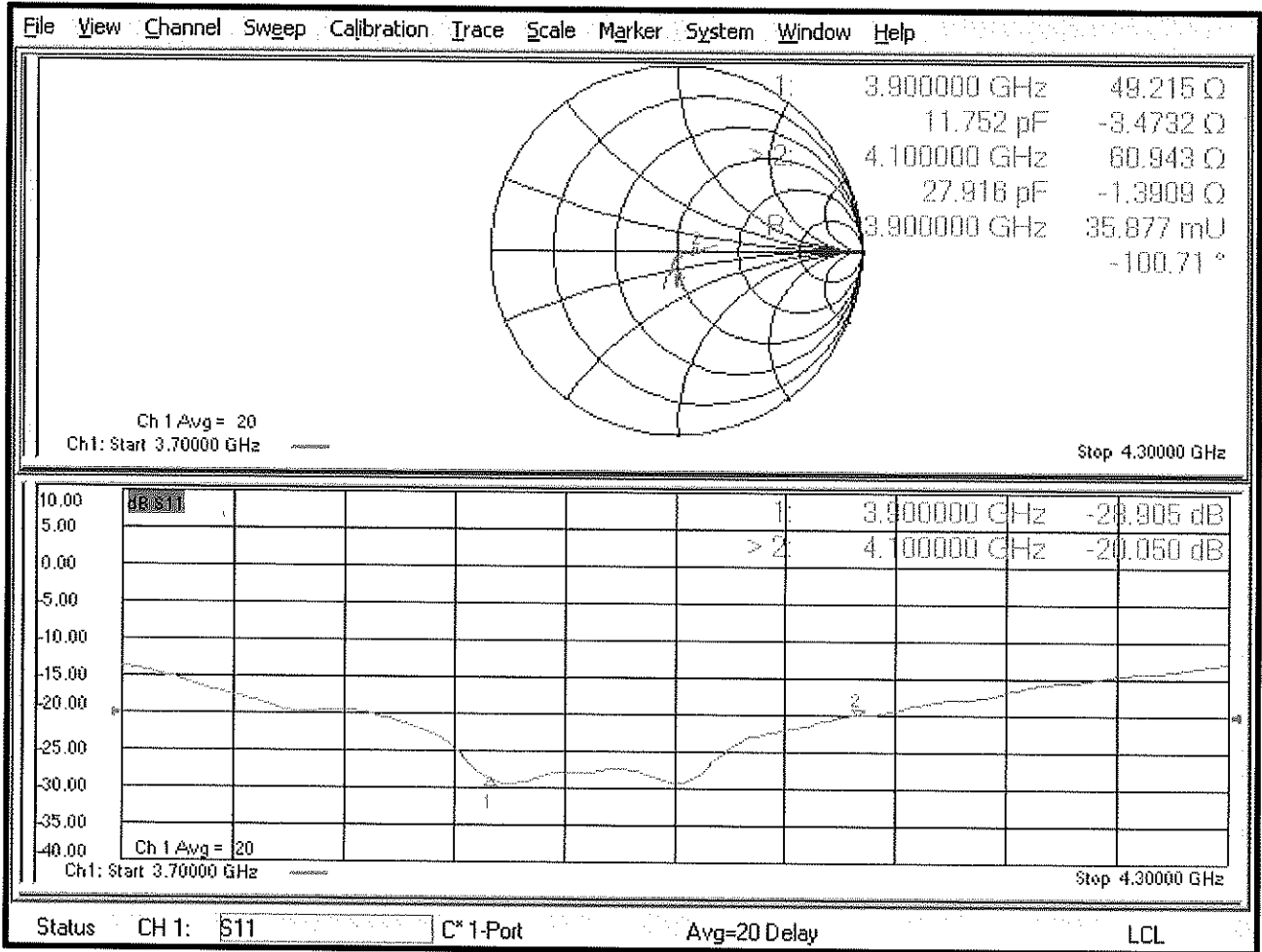
Ratio of SAR at M2 to SAR at M1 = 71.9%

Maximum value of SAR (measured) = 13.2 W/kg



0 dB = 13.2 W/kg = 11.21 dBW/kg

Impedance Measurement Plot for Body TSL





Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Client **PC Test**

Certificate No: **EX3-3589_Jan21**

CALIBRATION CERTIFICATE

Object **EX3DV4 - SN:3589**

Calibration procedure(s) **QA CAL-01.v9, QA CAL-12.v9, QA CAL-14.v6, QA CAL-23.v5,
QA CAL-25.v7
Calibration procedure for dosimetric E-field probes**

Calibration date: **January 20, 2021**

*BNV
01-27-2021*

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	01-Apr-20 (No. 217-03100/03101)	Apr-21
Power sensor NRP-Z91	SN: 103244	01-Apr-20 (No. 217-03100)	Apr-21
Power sensor NRP-Z91	SN: 103245	01-Apr-20 (No. 217-03101)	Apr-21
Reference 20 dB Attenuator	SN: CC2552 (20x)	31-Mar-20 (No. 217-03106)	Apr-21
DAE4	SN: 660	23-Dec-20 (No. DAE4-660_Dec20)	Dec-21
Reference Probe ES3DV2	SN: 3013	30-Dec-20 (No. ES3-3013_Dec20)	Dec-21
Secondary Standards	ID	Check Date (in house)	Scheduled Check
Power meter E4419B	SN: GB41293874	06-Apr-16 (in house check Jun-20)	In house check: Jun-22
Power sensor E4412A	SN: MY41498087	06-Apr-16 (in house check Jun-20)	In house check: Jun-22
Power sensor E4412A	SN: 000110210	06-Apr-16 (in house check Jun-20)	In house check: Jun-22
RF generator HP 8648C	SN: US3642U01700	04-Aug-99 (in house check Jun-20)	In house check: Jun-22
Network Analyzer E8358A	SN: US41080477	31-Mar-14 (in house check Oct-20)	In house check: Oct-21

Calibrated by:	Name Jeton Kastrati	Function Laboratory Technician	Signature
Approved by:	Name Katja Pokovic	Function Technical Manager	Signature

Issued: January 20, 2021

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



Accredited by the Swiss Accreditation Service (SAS)

Accreditation No.: **SCS 0108**

The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Glossary:

TSL	tissue simulating liquid
NORM _{x,y,z}	sensitivity in free space
ConvF	sensitivity in TSL / NORM _{x,y,z}
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A, B, C, D	modulation dependent linearization parameters
Polarization φ	φ rotation around probe axis
Polarization ϑ	ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., ϑ = 0 is normal to probe axis
Connector Angle	information used in DASY system to align probe sensor X to the robot coordinate system

Calibration is Performed According to the Following Standards:

- a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- b) IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
- c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
- d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Methods Applied and Interpretation of Parameters:

- *NORM_{x,y,z}*: Assessed for E-field polarization ϑ = 0 (f ≤ 900 MHz in TEM-cell; f > 1800 MHz: R22 waveguide). *NORM_{x,y,z}* are only intermediate values, i.e., the uncertainties of *NORM_{x,y,z}* does not affect the E²-field uncertainty inside TSL (see below *ConvF*).
- *NORM(f)_{x,y,z}* = *NORM_{x,y,z}* * *frequency_response* (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of *ConvF*.
- *DCP_{x,y,z}*: DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- *PAR*: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- *A_{x,y,z}*; *B_{x,y,z}*; *C_{x,y,z}*; *D_{x,y,z}*; *VR_{x,y,z}*: *A, B, C, D* are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. *VR* is the maximum calibration range expressed in RMS voltage across the diode.
- *ConvF and Boundary Effect Parameters*: Assessed in flat phantom using E-field (or Temperature Transfer Standard for f ≤ 800 MHz) and inside waveguide using analytical field distributions based on power measurements for f > 800 MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to *NORM_{x,y,z}* * *ConvF* whereby the uncertainty corresponds to that given for *ConvF*. A frequency dependent *ConvF* is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- *Spherical isotropy (3D deviation from isotropy)*: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- *Sensor Offset*: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.
- *Connector Angle*: The angle is assessed using the information gained by determining the *NORM_x* (no uncertainty required).

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3589

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu\text{V}/(\text{V}/\text{m})^2$) ^A	0.45	0.39	0.38	$\pm 10.1 \%$
DCP (mV) ^B	100.3	102.0	100.4	

Calibration Results for Modulation Response

UID	Communication System Name		A dB	B dB $\sqrt{\mu\text{V}}$	C	D dB	VR mV	Max dev.	Max Unc ^E (k=2)
0	CW	X	0.00	0.00	1.00	0.00	138.8	$\pm 1.7 \%$	$\pm 4.7 \%$
		Y	0.00	0.00	1.00		148.7		
		Z	0.00	0.00	1.00		141.5		
10352-AAA	Pulse Waveform (200Hz, 10%)	X	20.00	93.34	23.41	10.00	60.0	$\pm 2.4 \%$	$\pm 9.6 \%$
		Y	20.00	95.68	24.17		60.0		
		Z	20.00	93.02	23.02		60.0		
10353-AAA	Pulse Waveform (200Hz, 20%)	X	20.00	93.06	21.98	6.99	80.0	$\pm 1.2 \%$	$\pm 9.6 \%$
		Y	20.00	96.04	23.32		80.0		
		Z	20.00	92.66	21.50		80.0		
10354-AAA	Pulse Waveform (200Hz, 40%)	X	20.00	94.42	21.15	3.98	95.0	$\pm 1.3 \%$	$\pm 9.6 \%$
		Y	20.00	99.56	23.72		95.0		
		Z	20.00	93.39	20.34		95.0		
10355-AAA	Pulse Waveform (200Hz, 60%)	X	20.00	97.46	21.32	2.22	120.0	$\pm 1.4 \%$	$\pm 9.6 \%$
		Y	20.00	105.29	25.17		120.0		
		Z	16.69	93.53	19.53		120.0		
10387-AAA	QPSK Waveform, 1 MHz	X	1.63	64.01	13.95	1.00	150.0	$\pm 1.8 \%$	$\pm 9.6 \%$
		Y	1.74	65.75	14.94		150.0		
		Z	1.50	63.48	13.28		150.0		
10388-AAA	QPSK Waveform, 10 MHz	X	2.07	65.94	14.50	0.00	150.0	$\pm 1.1 \%$	$\pm 9.6 \%$
		Y	2.28	67.85	15.60		150.0		
		Z	1.94	65.07	13.94		150.0		
10396-AAA	64-QAM Waveform, 100 kHz	X	3.08	69.41	17.93	3.01	150.0	$\pm 0.6 \%$	$\pm 9.6 \%$
		Y	3.22	71.48	19.12		150.0		
		Z	2.98	68.91	17.52		150.0		
10399-AAA	64-QAM Waveform, 40 MHz	X	3.43	66.27	15.17	0.00	150.0	$\pm 0.8 \%$	$\pm 9.6 \%$
		Y	3.42	66.52	15.42		150.0		
		Z	3.33	65.80	14.86		150.0		
10414-AAA	WLAN CCDF, 64-QAM, 40MHz	X	4.89	65.27	15.18	0.00	150.0	$\pm 1.9 \%$	$\pm 9.6 \%$
		Y	4.81	65.24	15.23		150.0		
		Z	4.77	65.03	15.02		150.0		

Note: For details on UID parameters see Appendix

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

^A The uncertainties of Norm X,Y,Z do not affect the E^2 -field uncertainty inside TSL (see Pages 5, 6 and 7).

^B Numerical linearization parameter: uncertainty not required.

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

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3589

Sensor Model Parameters

	C1 fF	C2 fF	α V^{-1}	T1 $ms.V^{-2}$	T2 $ms.V^{-1}$	T3 ms	T4 V^{-2}	T5 V^{-1}	T6
X	53.9	395.40	34.33	22.56	1.03	5.04	1.18	0.39	1.01
Y	49.6	360.80	33.87	22.92	0.38	5.10	1.45	0.23	1.01
Z	45.9	340.59	34.97	19.65	1.02	5.04	1.45	0.34	1.01

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	147.5
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	9 mm
Tip Diameter	2.5 mm
Probe Tip to Sensor X Calibration Point	1 mm
Probe Tip to Sensor Y Calibration Point	1 mm
Probe Tip to Sensor Z Calibration Point	1 mm
Recommended Measurement Distance from Surface	1.4 mm

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

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3589

Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) ^C	Relative Permittivity ^F	Conductivity (S/m) ^F	ConvF X	ConvF Y	ConvF Z	Alpha ^G	Depth (mm) ^G	Unc (k=2)
30	55.0	0.75	13.12	13.12	13.12	0.00	1.00	± 13.3 %
64	54.2	0.75	11.57	11.57	11.57	0.00	1.00	± 13.3 %
750	41.9	0.89	8.75	8.75	8.75	0.45	0.89	± 12.0 %
835	41.5	0.90	8.57	8.57	8.57	0.42	0.80	± 12.0 %
1750	40.1	1.37	7.66	7.66	7.66	0.37	0.86	± 12.0 %
1900	40.0	1.40	7.27	7.27	7.27	0.39	0.86	± 12.0 %
2300	39.5	1.67	7.10	7.10	7.10	0.39	0.95	± 12.0 %
2450	39.2	1.80	6.92	6.92	6.92	0.39	0.95	± 12.0 %
2600	39.0	1.96	6.68	6.68	6.68	0.38	0.95	± 12.0 %
3500	37.9	2.91	6.27	6.27	6.27	0.30	1.30	± 13.1 %
3700	37.7	3.12	6.05	6.05	6.05	0.30	1.30	± 13.1 %
3900	37.5	3.32	5.93	5.93	5.93	0.35	1.50	± 13.1 %

^C Frequency validity above 300 MHz of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is ± 10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Validity of ConvF assessed at 6 MHz is 4-9 MHz, and ConvF assessed at 13 MHz is 9-19 MHz. Above 5 GHz frequency validity can be extended to ± 110 MHz.

^F At frequencies below 3 GHz, the validity of tissue parameters (ϵ and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ϵ and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

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

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3589

Calibration Parameter Determined in Body Tissue Simulating Media

f (MHz) ^C	Relative Permittivity ^F	Conductivity (S/m) ^F	ConvF X	ConvF Y	ConvF Z	Alpha ^G	Depth ^G (mm)	Unc (k=2)
750	55.5	0.96	8.48	8.48	8.48	0.47	0.80	± 12.0 %
835	55.2	0.97	8.31	8.31	8.31	0.42	0.80	± 12.0 %
1750	53.4	1.49	7.00	7.00	7.00	0.44	0.86	± 12.0 %
1900	53.3	1.52	6.84	6.84	6.84	0.37	0.86	± 12.0 %
2300	52.9	1.81	6.65	6.65	6.65	0.35	0.95	± 12.0 %
2450	52.7	1.95	6.60	6.60	6.60	0.35	0.95	± 12.0 %
2600	52.5	2.16	6.46	6.46	6.46	0.36	0.95	± 12.0 %
3500	51.3	3.31	6.00	6.00	6.00	0.40	1.35	± 13.1 %
3700	51.0	3.55	5.96	5.96	5.96	0.45	1.35	± 13.1 %
3900	51.2	3.78	5.55	5.55	5.55	0.40	1.50	± 13.1 %

^C Frequency validity above 300 MHz of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is ± 10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 128, 150 and 220 MHz respectively. Validity of ConvF assessed at 6 MHz is 4-9 MHz, and ConvF assessed at 13 MHz is 9-19 MHz. Above 5 GHz frequency validity can be extended to ± 110 MHz.

^F At frequencies below 3 GHz, the validity of tissue parameters (ϵ and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ϵ and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

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

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3589

Calibration Parameter Determined in Head Tissue Simulating Media

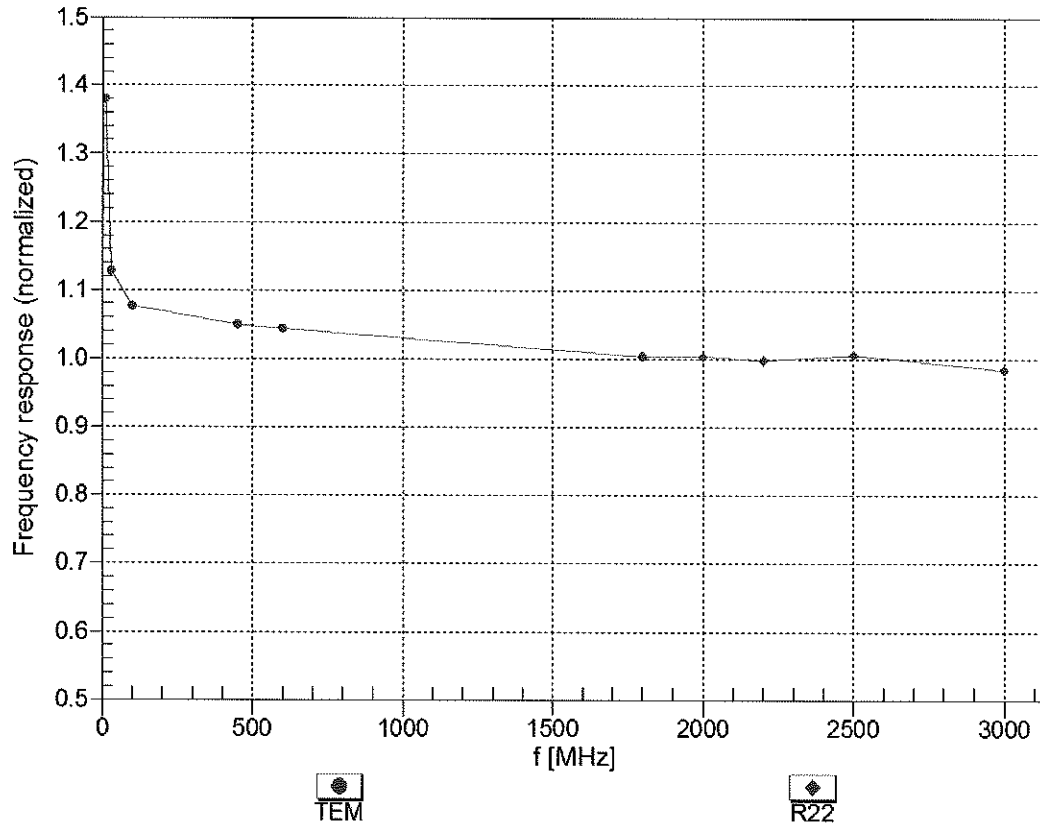
f (MHz) ^C	Relative Permittivity ^F	Conductivity (S/m) ^F	ConvF X	ConvF Y	ConvF Z	Alpha ^G	Depth ^G (mm)	Unc (k=2)
6500	34.5	6.07	5.20	5.20	5.20	0.20	2.50	± 18.6 %

^C Frequency validity above 6GHz is ± 700 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

^F At frequencies 6-10 GHz, the validity of tissue parameters (ϵ and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

^G Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz; below ± 2% for frequencies between 3-6 GHz; and below ± 4% for frequencies between 6-10 GHz at any distance larger than half the probe tip diameter from the boundary.

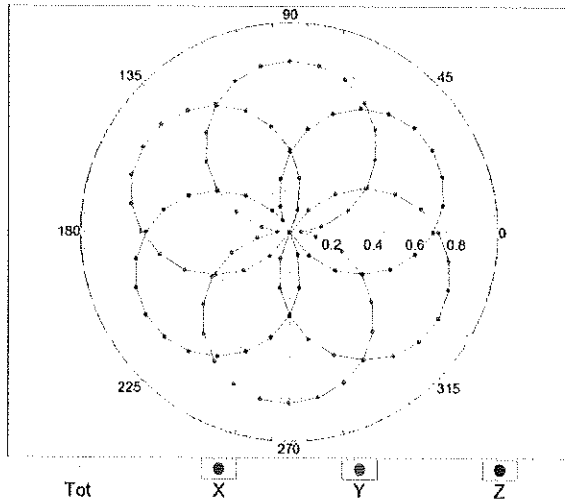
Frequency Response of E-Field (TEM-Cell:ifi110 EXX, Waveguide: R22)



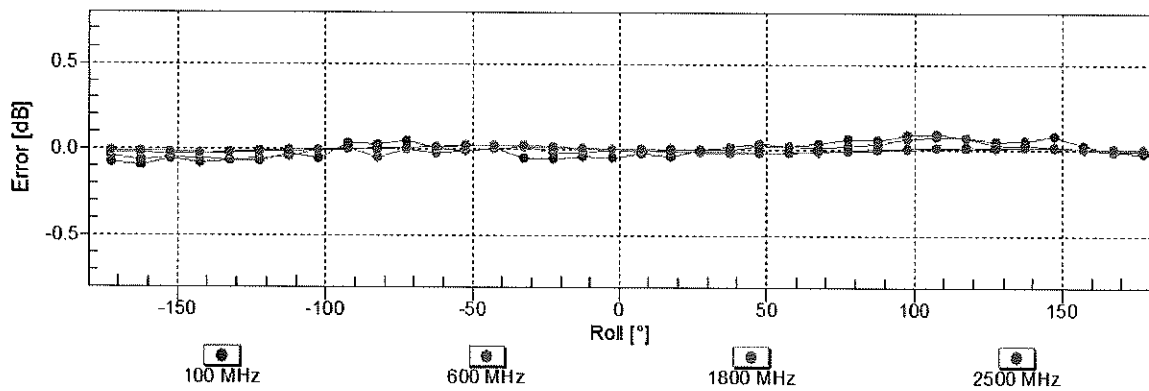
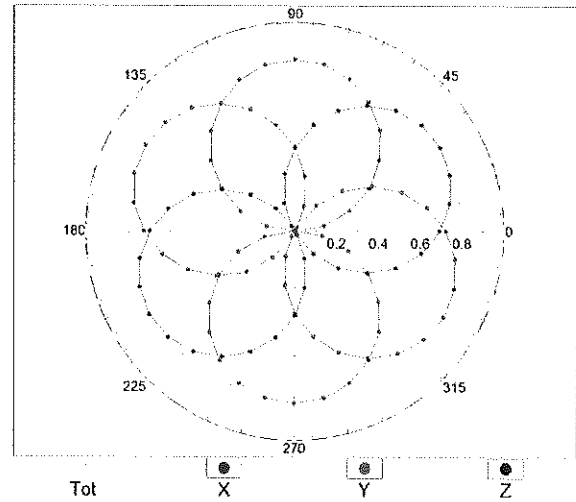
Uncertainty of Frequency Response of E-field: $\pm 6.3\%$ ($k=2$)

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

f=600 MHz, TEM

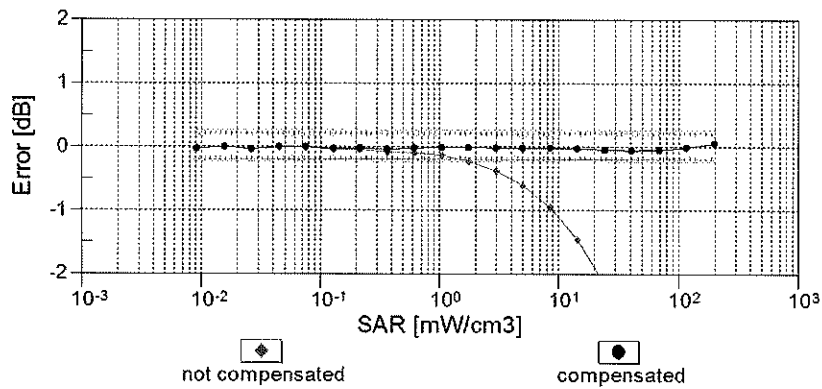
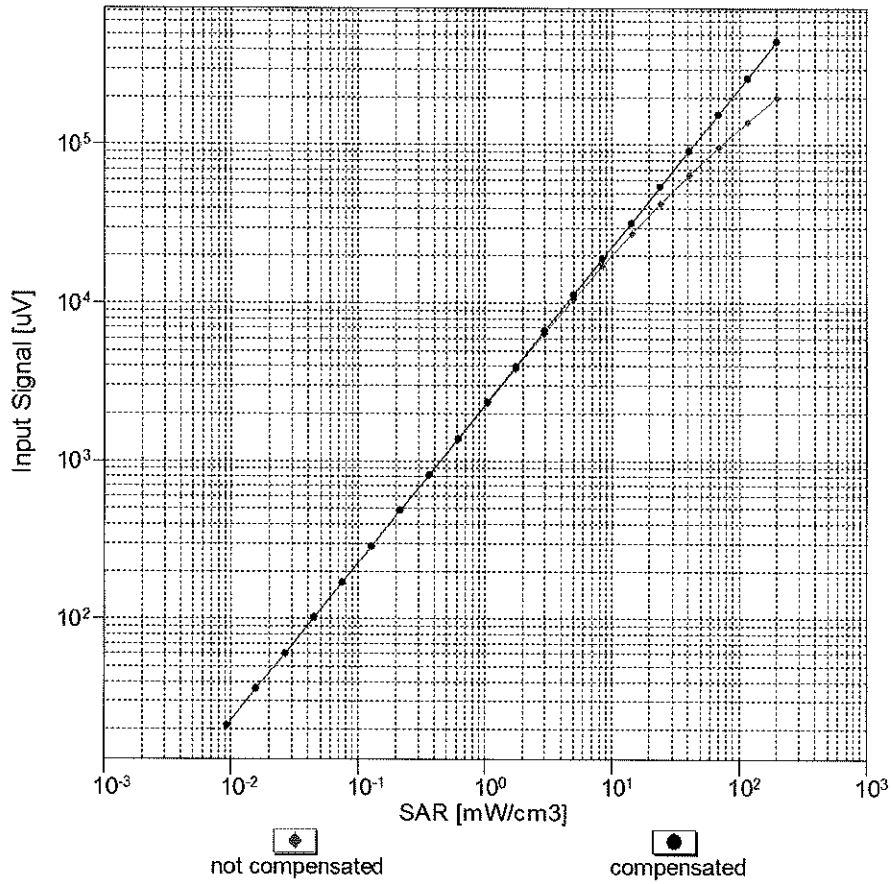


f=1800 MHz, R22



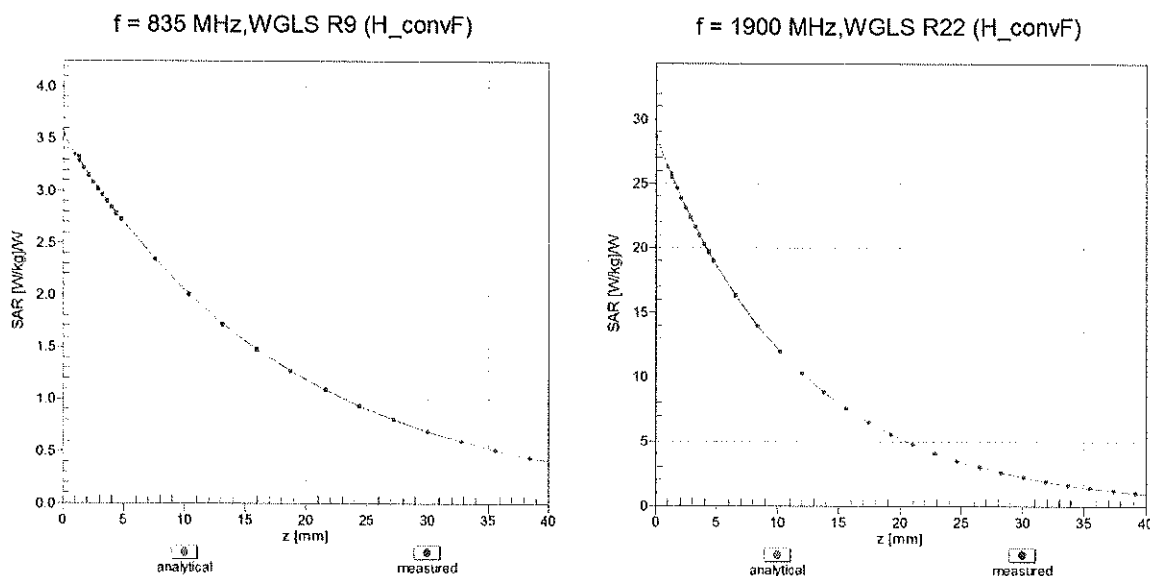
Uncertainty of Axial Isotropy Assessment: $\pm 0.5\%$ ($k=2$)

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

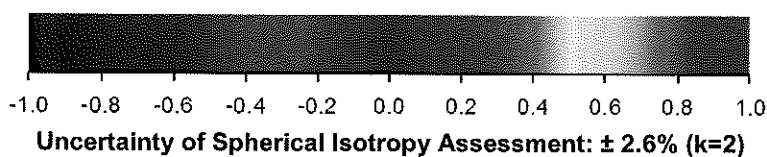
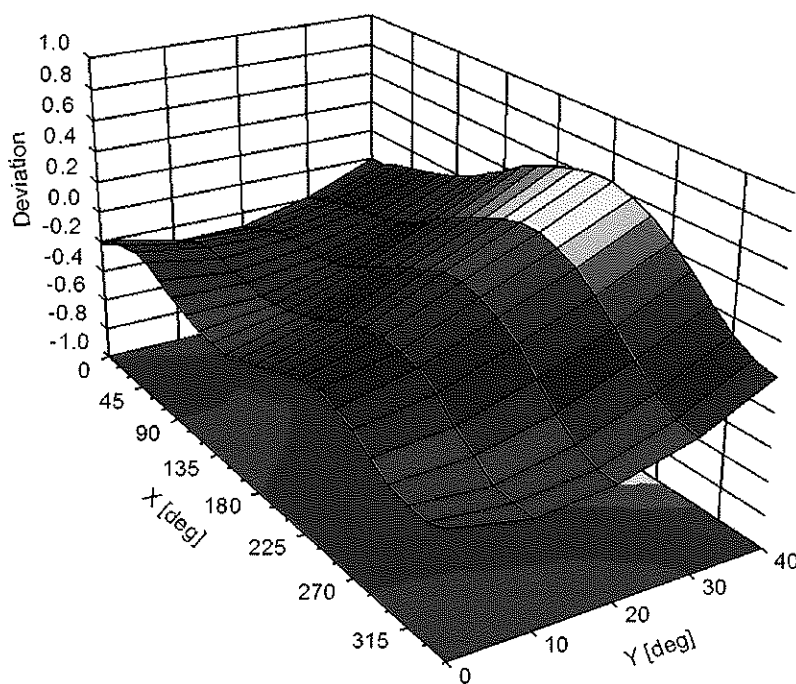


Uncertainty of Linearity Assessment: ± 0.6% (k=2)

Conversion Factor Assessment



Deviation from Isotropy in Liquid Error (ϕ, ϑ), f = 900 MHz



Appendix: Modulation Calibration Parameters

UID	Rev	Communication System Name	Group	PAR (dB)	Unc ^E (k=2)
0		CW	CW	0.00	± 4.7 %
10010	CAA	SAR Validation (Square, 100ms, 10ms)	Test	10.00	± 9.6 %
10011	CAB	UMTS-FDD (WCDMA)	WCDMA	2.91	± 9.6 %
10012	CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps)	WLAN	1.87	± 9.6 %
10013	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps)	WLAN	9.46	± 9.6 %
10021	DAC	GSM-FDD (TDMA, GMSK)	GSM	9.39	± 9.6 %
10023	DAC	GPRS-FDD (TDMA, GMSK, TN 0)	GSM	9.57	± 9.6 %
10024	DAC	GPRS-FDD (TDMA, GMSK, TN 0-1)	GSM	6.56	± 9.6 %
10025	DAC	EDGE-FDD (TDMA, 8PSK, TN 0)	GSM	12.62	± 9.6 %
10026	DAC	EDGE-FDD (TDMA, 8PSK, TN 0-1)	GSM	9.55	± 9.6 %
10027	DAC	GPRS-FDD (TDMA, GMSK, TN 0-1-2)	GSM	4.80	± 9.6 %
10028	DAC	GPRS-FDD (TDMA, GMSK, TN 0-1-2-3)	GSM	3.55	± 9.6 %
10029	DAC	EDGE-FDD (TDMA, 8PSK, TN 0-1-2)	GSM	7.78	± 9.6 %
10030	CAA	IEEE 802.15.1 Bluetooth (GFSK, DH1)	Bluetooth	5.30	± 9.6 %
10031	CAA	IEEE 802.15.1 Bluetooth (GFSK, DH3)	Bluetooth	1.87	± 9.6 %
10032	CAA	IEEE 802.15.1 Bluetooth (GFSK, DH5)	Bluetooth	1.16	± 9.6 %
10033	CAA	IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH1)	Bluetooth	7.74	± 9.6 %
10034	CAA	IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH3)	Bluetooth	4.53	± 9.6 %
10035	CAA	IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH5)	Bluetooth	3.83	± 9.6 %
10036	CAA	IEEE 802.15.1 Bluetooth (8-DPSK, DH1)	Bluetooth	8.01	± 9.6 %
10037	CAA	IEEE 802.15.1 Bluetooth (8-DPSK, DH3)	Bluetooth	4.77	± 9.6 %
10038	CAA	IEEE 802.15.1 Bluetooth (8-DPSK, DH5)	Bluetooth	4.10	± 9.6 %
10039	CAB	CDMA2000 (1xRTT, RC1)	CDMA2000	4.57	± 9.6 %
10042	CAB	IS-54 / IS-136 FDD (TDMA/FDM, PI/4-DQPSK, Halfrate)	AMPS	7.78	± 9.6 %
10044	CAA	IS-91/EIA/TIA-553 FDD (FDMA, FM)	AMPS	0.00	± 9.6 %
10048	CAA	DECT (TDD, TDMA/FDM, GFSK, Full Slot, 24)	DECT	13.80	± 9.6 %
10049	CAA	DECT (TDD, TDMA/FDM, GFSK, Double Slot, 12)	DECT	10.79	± 9.6 %
10056	CAA	UMTS-TDD (TD-SCDMA, 1.28 Mcps)	TD-SCDMA	11.01	± 9.6 %
10058	DAC	EDGE-FDD (TDMA, 8PSK, TN 0-1-2-3)	GSM	6.52	± 9.6 %
10059	CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps)	WLAN	2.12	± 9.6 %
10060	CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps)	WLAN	2.83	± 9.6 %
10061	CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps)	WLAN	3.60	± 9.6 %
10062	CAD	IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps)	WLAN	8.68	± 9.6 %
10063	CAD	IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps)	WLAN	8.63	± 9.6 %
10064	CAD	IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps)	WLAN	9.09	± 9.6 %
10065	CAD	IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps)	WLAN	9.00	± 9.6 %
10066	CAD	IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps)	WLAN	9.38	± 9.6 %
10067	CAD	IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps)	WLAN	10.12	± 9.6 %
10068	CAD	IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps)	WLAN	10.24	± 9.6 %
10069	CAD	IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps)	WLAN	10.56	± 9.6 %
10071	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 9 Mbps)	WLAN	9.83	± 9.6 %
10072	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 12 Mbps)	WLAN	9.62	± 9.6 %
10073	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 18 Mbps)	WLAN	9.94	± 9.6 %
10074	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 24 Mbps)	WLAN	10.30	± 9.6 %
10075	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 36 Mbps)	WLAN	10.77	± 9.6 %
10076	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 48 Mbps)	WLAN	10.94	± 9.6 %
10077	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 54 Mbps)	WLAN	11.00	± 9.6 %
10081	CAB	CDMA2000 (1xRTT, RC3)	CDMA2000	3.97	± 9.6 %
10082	CAB	IS-54 / IS-136 FDD (TDMA/FDM, PI/4-DQPSK, Fullrate)	AMPS	4.77	± 9.6 %
10090	DAC	GPRS-FDD (TDMA, GMSK, TN 0-4)	GSM	6.56	± 9.6 %
10097	CAC	UMTS-FDD (HSDPA)	WCDMA	3.98	± 9.6 %
10098	DAC	UMTS-FDD (HSUPA, Subtest 2)	WCDMA	3.98	± 9.6 %