



SAR EVALUATION REPORT

Applicant Name:
Samsung Electronics Co., Ltd.
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Yeongtong-gu, Suwon-si
Gyeonggi-do, 16677, Korea

Date of Testing:
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PCTEST Lab, Columbia, MD, USA
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1M2106280072-01.A3L (Rev 1)

FCC ID: **A3LSMA528B**

APPLICANT: **SAMSUNG ELECTRONICS CO., LTD.**

DUT Type: Portable Handset
Application Type: Certification
FCC Rule Part(s): CFR §2.1093
Model: SM-A528B/DS
Additional Models: SM-A528B

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	GSM/GPRS/EDGE 850	824.20 - 848.80 MHz	0.31	0.27	0.41	N/A
PCE	GSM/GPRS/EDGE 1900	1850.20 - 1909.80 MHz	< 0.1	< 0.1	0.28	1.03
PCE	UMTS 850	826.40 - 848.60 MHz	0.36	0.37	0.42	N/A
PCE	UMTS 1750	1712.4 - 1752.6 MHz	0.14	0.21	0.37	1.36
PCE	UMTS 1900	1852.4 - 1907.6 MHz	0.20	0.22	0.45	1.95
PCE	LTE Band 12	699.7 - 715.3 MHz	0.33	0.40	0.46	N/A
PCE	LTE Band 17	706.5 - 713.5 MHz	N/A	N/A	N/A	N/A
PCE	LTE Band 26 (Cell)	814.7 - 848.3 MHz	0.31	0.35	0.41	N/A
PCE	LTE Band 5 (Cell)	824.7 - 848.3 MHz	N/A	N/A	N/A	N/A
PCE	LTE Band 66 (AWS)	1710.7 - 1779.3 MHz	0.18	0.21	0.36	1.88
PCE	LTE Band 4 (AWS)	1710.7 - 1754.3 MHz	N/A	N/A	N/A	N/A
PCE	LTE Band 2 (PCS)	1850.7 - 1909.3 MHz	0.17	0.25	0.45	2.00
PCE	LTE Band 41	2496.5 - 2597.5 MHz	0.26	0.12	0.31	N/A
PCE	NR Band n5 (Cell)	826.5 - 846.5 MHz	0.35	0.34	0.39	N/A
PCE	NR Band n66 (AWS)	1712.5 - 1777.5 MHz	< 0.1	0.22	0.41	2.02
DTS	2.4 GHz WLAN	2412 - 2472 MHz	0.46	0.11	0.28	N/A
NII	U-NII-1	5180 - 5240 MHz	N/A	N/A	N/A	N/A
NII	U-NII-2A	5260 - 5320 MHz	0.67	0.26	N/A	1.41
NII	U-NII-2C	5500 - 5720 MHz	0.41	0.12	N/A	1.16
NII	U-NII-3	5745 - 5825 MHz	0.63	0.26	0.72	N/A
DSS/DTS	Bluetooth	2402 - 2480 MHz	0.43	0.10	0.25	N/A
Simultaneous SAR per KDB 690783 D01v01r03:			1.59	0.94	1.57	3.41

Note: This revised Test Report supersedes and replaces the previously issued test report on the same subject device for the same type of testing as indicated. Please discard or destroy the previously issued test report(s) and dispose of it accordingly.
This wireless portable device has been shown to be capable of compliance for localized specific absorption rate (SAR) for uncontrolled environment/general population exposure limits specified in ANSI/IEEE C95.1-1992 and has been tested in accordance with the measurement procedures specified in Section 1.8 of this report; for North American frequency bands only.

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


Randy Ortaez
President



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FCC ID: A3LSMA528B		SAR EVALUATION REPORT		Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset	Page 1 of 86	

TABLE OF CONTENTS

1	DEVICE UNDER TEST	3
2	LTE INFORMATION	14
3	INTRODUCTION	16
4	DOSIMETRIC ASSESSMENT	17
5	DEFINITION OF REFERENCE POINTS.....	18
6	TEST CONFIGURATION POSITIONS.....	19
7	RF EXPOSURE LIMITS	23
8	FCC MEASUREMENT PROCEDURES.....	24
9	RF CONDUCTED POWERS	30
10	SYSTEM VERIFICATION.....	44
11	SAR DATA SUMMARY	50
12	FCC MULTI-TX AND ANTENNA SAR CONSIDERATIONS.....	67
13	SAR MEASUREMENT VARIABILITY	81
14	EQUIPMENT LIST.....	82
15	MEASUREMENT UNCERTAINTIES.....	83
16	CONCLUSION.....	84
17	REFERENCES	85
APPENDIX A: SAR TEST PLOTS		
APPENDIX B: SAR DIPOLE VERIFICATION PLOTS		
APPENDIX C: SAR TISSUE SPECIFICATIONS		
APPENDIX D: SAR SYSTEM VALIDATION		
APPENDIX E: DUT ANTENNA DIAGRAM & SAR TEST SETUP PHOTOGRAPHS		
APPENDIX F: DOWNLINK LTE CA RF CONDUCTED POWERS		
APPENDIX G: POWER REDUCTION VERIFICATION		
APPENDIX H: LTE AND NR LOWER BANDWIDTH RF CONDUCTED POWERS		
APPENDIX I: 802.11ax RU SAR EXCLUSION		
APPENDIX J: PROBE AND DIPOLE CALIBRATION CERTIFICATES		

FCC ID: A3LSMA528B	 PCTEST Proud to be part of 	SAR EVALUATION REPORT		Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset	Page 2 of 86	

1 DEVICE UNDER TEST

1.1 Device Overview

Band & Mode	Operating Modes	Tx Frequency
GSM/GPRS/EDGE 850	Voice/Data	824.20 - 848.80 MHz
GSM/GPRS/EDGE 1900	Voice/Data	1850.20 - 1909.80 MHz
UMTS 850	Voice/Data	826.40 - 846.60 MHz
UMTS 1750	Voice/Data	1712.4 - 1752.6 MHz
UMTS 1900	Voice/Data	1852.4 - 1907.6 MHz
LTE Band 12	Voice/Data	699.7 - 715.3 MHz
LTE Band 17	Voice/Data	706.5 - 713.5 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 2 (PCS)	Voice/Data	1850.7 - 1909.3 MHz
LTE Band 41	Voice/Data	2498.5 - 2687.5 MHz
NR Band n5 (Cell)	Data	826.5 - 846.5 MHz
NR Band n66 (AWS)	Data	1712.5 - 1777.5 MHz
2.4 GHz WLAN	Voice/Data	2412 - 2472 MHz
U-NII-1	Voice/Data	5180 - 5240 MHz
U-NII-2A	Voice/Data	5260 - 5320 MHz
U-NII-2C	Voice/Data	5500 - 5720 MHz
U-NII-3	Voice/Data	5745 - 5825 MHz
Bluetooth	Data	2402 - 2480 MHz
NFC	Data	13.56 MHz

1.2 Power Reduction for SAR

This device utilizes a power reduction mechanism for some wireless modes and bands for SAR compliance under portable hotspot conditions and under some conditions when the device is being used in close proximity to the user's hand. All hotspot SAR evaluations for this device were performed at the maximum allowed output power when hotspot is enabled. FCC KDB Publication 616217 D04v01r02 Section 6 was used as a guideline for selecting SAR test distances for this device when being used in phablet use conditions. Detailed descriptions of the power reduction mechanism are included in the operational description.

This device uses an independent fixed level power reduction mechanism for WLAN/BT operations during voice or VoIP held to ear scenarios. Per FCC Guidance, the held-to-ear exposure conditions were evaluated at reduced power according to the head SAR positions described in IEEE 1528-2013. Detailed descriptions of the power reduction mechanism are included in the operational description.

FCC ID: A3LSMA528B	 PCTEST Proud to be part of 	SAR EVALUATION REPORT		Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset		Page 3 of 86

1.3 Nominal and Maximum Output Power Specifications

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

1.3.1 Maximum Output Power

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	4 TX Slots
Max	Max allowed power	33.0	33.0	32.5	30.5	28.0	26.5	26.0	24.0	23.0
	Nominal	32.0	32.0	31.5	29.5	27.0	25.5	25.0	23.0	22.0
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	4 TX Slots
Max	Max allowed power	30.5	30.5	29.5	27.0	25.5	26.0	25.5	23.0	22.0
	Nominal	29.5	29.5	28.5	26.0	24.5	25.0	24.5	22.0	21.0
Hotspot Mode Active, Proximity Sensor and/or Earjack Mode Active	Max allowed power	28.5	28.5	27.5	25.0	23.5	25.5	23.5	22.0	20.0
	Nominal	27.5	27.5	26.5	24.0	22.5	24.5	22.5	21.0	19.0
	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	
	Max	Max allowed power	25.0		24.5		24.5		24.5	
		Nominal	24.0		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	
	Max	Max allowed power	24.5		24.0		24.0		24.0	
		Nominal	23.5		23.0		23.0		23.0	
	Hotspot Mode Active, Proximity Sensor and/or Earjack Mode Active	Max allowed power	23.5		23.0		23.0		23.0	
		Nominal	22.5		22.0		22.0		22.0	
	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	
	Max	Max allowed power	24.5		24.0		24.0		24.0	
		Nominal	23.5		23.0		23.0		23.0	
	Hotspot Mode Active, Proximity Sensor and/or Earjack Mode Active	Max allowed power	23.5		23.0		23.0		23.0	
		Nominal	22.5		22.0		22.0		22.0	

FCC ID: A3LSMA528B		SAR EVALUATION REPORT		Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset		Page 4 of 86

Mode / Band		Modulated Average Output Power (in dBm)	
		Max	Hotspot Mode Active, Proximity Sensor and/or Earjack Mode Active
LTE FDD Band 12	Max allowed power	25.5	25.5
	Nominal	24.5	24.5
LTE FDD Band 17	Max allowed power	25.5	25.5
	Nominal	24.5	24.5
LTE FDD Band 5	Max allowed power	25.0	25.0
	Nominal	24.0	24.0
LTE FDD Band 26	Max allowed power	25.0	25.0
	Nominal	24.0	24.0
LTE FDD Band 4	Max allowed power	24.5	23.5
	Nominal	23.5	22.5
LTE FDD Band 66	Max allowed power	24.5	23.5
	Nominal	23.5	22.5
LTE FDD Band 2	Max allowed power	24.0	23.0
	Nominal	23.0	22.0
LTE TDD Band 41 (PC3)	Max allowed power	24.5	24.5
	Nominal	23.5	23.5
Mode / Band		Modulated Average Output Power (in dBm)	
		Max	Hotspot Mode Active, Proximity Sensor and/or Earjack Mode Active
NR FDD Band n5	Max allowed power	25.0	25.0
	Nominal	24.0	24.0
NR FDD Band n66	Max allowed power	25.0	23.5
	Nominal	24.0	22.5

FCC ID: A3LSMA528B	 PCTEST Proud to be part of 	SAR EVALUATION REPORT		Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset		Page 5 of 86

1.3.2 2.4 GHz Maximum Bluetooth and WLAN Output Power

Note: Targets for 802.11ax RU operations can be found in Appendix I

Mode	Band	IEEE 802.11 (in dBm)							
		SISO							
		b		g		n		ax (SU)	
Maximum / Nominal Power		Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.
2.4 GHz WIFI	2.45 GHz	19.5	18.5	18.0	17.0	19.0	18.0	16.0	15.0
		ch. 12: 8.0	7.0	ch. 12: 8.0	7.0	ch. 12: 8.0	7.0	ch. 12: 8.0	7.0
		ch. 13: 2.0	1.0	ch. 13: 2.0	1.0	ch. 13: 2.0	1.0	ch. 13: 2.0	1.0
Mode / Band					Modulated Average (dBm)				
Bluetooth (1 Mbps)			Maximum		19.0				
			Nominal		18.0				
Bluetooth EDR			Maximum		16.0				
			Nominal		15.0				
Bluetooth LE			Maximum		7.0				
			Nominal		6.0				

1.3.3 2.4 GHz Reduced Bluetooth and WLAN Output Power

Note: Targets for 802.11ax RU operations can be found in Appendix I

The Below table is applicable in the following conditions:

- RCV active

Mode	Band	IEEE 802.11 (in dBm)							
		SISO							
		b		g		n		ax (SU)	
Maximum / Nominal Power		Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.
2.4 GHz WIFI	2.45 GHz	17.0	16.0	17.0	16.0	17.0	16.0	16.0	15.0
		ch. 12: 8.0	7.0	ch. 12: 8.0	7.0	ch. 12: 8.0	7.0	ch. 12: 8.0	7.0
		ch. 13: 2.0	1.0	ch. 13: 2.0	1.0	ch. 13: 2.0	1.0	ch. 13: 2.0	1.0

FCC ID: A3LSMA528B	 PCTEST Proud to be part of 	SAR EVALUATION REPORT		Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset	Page 6 of 86	

Mode / Band		Modulated Average (dBm)
Bluetooth (1 Mbps)	Maximum	16.0
	Nominal	15.0

1.3.4 5 GHz Maximum WLAN Output Power

Note: Targets for 802.11ax RU operations can be found in Appendix I

Mode	Band	IEEE 802.11 (in dBm)							
		SISO							
		a		n		ac		ax (SU)	
Maximum / Nominal Power		Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.
5 GHz WIFI (20MHz BW)	5200 MHz	17.0 ch. 48: 14.0	16.0 13.0	17.0 ch. 48: 14.0	16.0 13.0	17.0 ch. 48: 14.0	16.0 13.0	15.0 ch. 48: 14.0	14.0 13.0
	5300 MHz	17.0 ch. 64: 16.0	16.0 15.0	17.0 ch. 64: 16.0	16.0 15.0	17.0 ch. 64: 16.0	16.0 15.0	15.0	14.0
	5500 MHz	17.0	16.0	17.0	16.0	17.0	16.0	15.0	14.0
	5800 MHz	17.0	16.0	17.0	16.0	17.0	16.0	15.0	14.0
5 GHz WIFI (40MHz BW)	5200 MHz			14.0	13.0	14.0	13.0	14.0	13.0
	5300 MHz			15.0 ch. 62: 13.0	14.0 12.0	15.0 ch. 62: 13.0	14.0 12.0	15.0 ch. 62: 13.0	14.0 12.0
	5500 MHz			15.0	14.0	15.0	14.0	15.0	14.0
	5800 MHz			15.0	14.0	15.0	14.0	15.0	14.0
5 GHz WIFI (80MHz BW)	5200 MHz					13.0	12.0	13.0	12.0
	5300 MHz					13.0	12.0	13.0	12.0
	5500 MHz					13.0	12.0	13.0	12.0
	5800 MHz					13.0	12.0	13.0	12.0

FCC ID: A3LSMA528B	 PCTEST Proud to be part of 	SAR EVALUATION REPORT		Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset		Page 7 of 86

1.3.5 5 GHz Reduced WLAN Output Power

Note: Targets for 802.11ax RU operations can be found in Appendix I

The Below table is applicable in the following conditions:

- RCV active

Mode	Band	IEEE 802.11 (in dBm)							
		SISO							
		a		n		ac		ax (SU)	
Maximum / Nominal Power		Max	Nom.	Max	Nom.	Max	Nom.	Max	Nom.
5 GHz WIFI (20MHz BW)	5200 MHz	14.0	13.0	14.0	13.0	14.0	13.0	14.0	13.0
	5300 MHz	14.0	13.0	14.0	13.0	14.0	13.0	14.0	13.0
	5500 MHz	14.0	13.0	14.0	13.0	14.0	13.0	14.0	13.0
	5800 MHz	14.0	13.0	14.0	13.0	14.0	13.0	14.0	13.0
5 GHz WIFI (40MHz BW)	5200 MHz			14.0	13.0	14.0	13.0	14.0	13.0
	5300 MHz			14.0 ch. 62 13.0	13.0 12.0	14.0 ch. 62 13.0	13.0 12.0	14.0 ch. 62 13.0	13.0 12.0
	5500 MHz			14.0	13.0	14.0	13.0	14.0	13.0
	5800 MHz			14.0 ch. 159 13.0	13.0 12.0	13.0 ch. 159 13.0	13.0 12.0	14.0 ch.159 13.0	13.0 12.0
5 GHz WIFI (80MHz BW)	5200 MHz					13.0	12.0	13.0	12.0
	5300 MHz					13.0	12.0	13.0	12.0
	5500 MHz					13.0	12.0	13.0	12.0
	5800 MHz					13.0	12.0	13.0	12.0

FCC ID: A3LSMA528B	 PCTEST Proud to be part of  HPE	SAR EVALUATION REPORT		Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset		Page 8 of 86

1.4 DUT Antenna Locations

The overall dimensions of this device are > 9 x 5 cm. A diagram showing the location of the device antennas can be found in Appendix 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
GPRS 850	Yes	Yes	No	Yes	Yes	No
GPRS 1900	Yes	Yes	No	Yes	No	Yes
UMTS 850	Yes	Yes	No	Yes	Yes	No
UMTS 1750	Yes	Yes	No	Yes	No	Yes
UMTS 1900	Yes	Yes	No	Yes	No	Yes
LTE Band 12	Yes	Yes	No	Yes	Yes	No
LTE Band 26 (Cell)	Yes	Yes	No	Yes	Yes	No
LTE Band 66 (AWS)	Yes	Yes	No	Yes	No	Yes
LTE Band 2 (PCS)	Yes	Yes	No	Yes	No	Yes
LTE Band 41	Yes	Yes	No	Yes	No	Yes
NR Band n5 (Cell)	Yes	Yes	No	Yes	Yes	No
NR Band n66 (AWS)	Yes	Yes	No	Yes	No	Yes
2.4 GHz WLAN	Yes	Yes	Yes	No	No	Yes
5 GHz WLAN	Yes	Yes	Yes	No	No	Yes
Bluetooth	Yes	Yes	Yes	No	No	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. When wireless router mode is enabled, U-NII-1, U-NII-2A, U-NII-2C operations are disabled.

1.5 Near Field Communications (NFC) Antenna

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

FCC ID: A3LSMA528B	 PCTEST Proud to be part of 	SAR EVALUATION REPORT		Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset		Page 9 of 86

1.6 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	GSM voice + 2.4 GHz Bluetooth	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered
2	GSM voice + 2.4 GHz WLAN	Yes	Yes	N/A	Yes	
3	GSM voice + 5 GHz WLAN	Yes	Yes	N/A	Yes	
4	GSM voice + 2.4 GHz Bluetooth + 5 GHz WLAN	Yes^	Yes	N/A	Yes	^ Bluetooth Tethering is considered
5	UMTS + 2.4 GHz Bluetooth	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
6	UMTS + 2.4 GHz WLAN	Yes	Yes	Yes	Yes	
7	UMTS + 5 GHz WLAN	Yes	Yes	Yes	Yes	
8	UMTS + 2.4 GHz Bluetooth + 5 GHz WLAN	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
9	LTE + 2.4 GHz Bluetooth	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
10	LTE + 2.4 GHz WLAN	Yes	Yes	Yes	Yes	
11	LTE + 5 GHz WLAN	Yes	Yes	Yes	Yes	
12	LTE + 2.4 GHz Bluetooth + 5 GHz WLAN	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
13	LTE + NR	Yes	Yes	N/A	Yes	
14	LTE + NR + 2.4 GHz Bluetooth	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
15	LTE + NR + 2.4 GHz WLAN	Yes	Yes	Yes	Yes	
16	LTE + NR + 5 GHz WLAN	Yes	Yes	Yes	Yes	
17	LTE + NR + 2.4 GHz Bluetooth + 5 GHz WLAN	Yes^	Yes	Yes^	Yes	^ Bluetooth Tethering is considered
18	GPRS/EDGE + 2.4 GHz Bluetooth	N/A	N/A	Yes^	Yes	^ Bluetooth Tethering is considered
19	GPRS/EDGE + 2.4 GHz WLAN	N/A	N/A	Yes	Yes	
20	GPRS/EDGE + 5 GHz WLAN	N/A	N/A	Yes	Yes	
21	GPRS/EDGE + 2.4 GHz Bluetooth + 5 GHz WLAN	N/A	N/A	Yes^	Yes	^ Bluetooth Tethering is considered

- 2.4 GHz WLAN and 2.4 GHz Bluetooth share the same antenna path and cannot transmit simultaneously.
- All licensed modes share the same antenna path and cannot transmit simultaneously.
- LTE + 5G NR FR1 Scenarios are limited to EN-DC combinations with anchor bands as shown in the NR FR1 checklist
- When the user utilizes multiple services in UMTS 3G mode it uses multi-Radio Access Bearer or multi-RAB. The power control is based on a physical control channel (Dedicated Physical Control Channel [DPCCH]) and power control will be adjusted to meet the needs of both services. Therefore, the UMTS+WLAN scenario also represents the UMTS Voice/DATA + WLAN Hotspot scenario.
- Per the manufacturer, WIFI Direct is 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.
- 5 GHz Wireless Router is only supported for the U-NII-3 by S/W, therefore U-NII-1, U-NII-2A, and U-NII-2C were not evaluated for wireless router conditions.
- This device supports VOLTE.
- This device supports VOWIFI.
- This device supports Bluetooth Tethering.

FCC ID: A3LSMA528B	 PCTEST Proud to be part of  Hillstream	SAR EVALUATION REPORT		Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset		Page 10 of 86

1.7 Miscellaneous SAR Test Considerations

(A) WIFI/BT

This device supports channel 1-13 for 2.4 GHz WLAN. Because channel 12/13 targets are not higher than that of channels 1-11, channels 1, 6, and 11 were considered for SAR testing per FCC KDB 248227 D01V02r02.

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

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

This device supports IEEE 802.11ax with the following features:

- a) Up to 80 MHz Bandwidth only for 5 GHz
- b) Up to 20 MHz Bandwidth only for 2.4 GHz
- c) No aggregate channel configurations
- d) 1 Tx antenna output for single antenna
- e) Up to 1024 QAM is supported
- f) TDWR and Band gap channels are supported for 5 GHz
- g) MU-MIMO UL Operations are not supported

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

Per April 2019 TCB Workshop Notes, SAR testing was not required for 802.11ax when applying the initial test configuration procedures of KDB 248227, with 802.11ax considered a higher order 802.11 mode.

(B) Licensed Transmitter(s)

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

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

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

This device supports LTE Carrier Aggregation (CA) in the downlink. All uplink communications are identical to Release 8 specifications. Per FCC KDB Publication 941225 D05A v01r02, SAR for LTE CA operations was not needed since the maximum average output power in LTE CA mode was not >0.25 dB higher than the

FCC ID: A3LSMA528B	 PCTEST Proud to be part of 	SAR EVALUATION REPORT		Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset	Page 11 of 86	

maximum output power when downlink carrier aggregation was inactive. The downlink carrier aggregation exclusion analysis can be found in Appendix F.

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

This device supports downlink 4x4 MIMO operations for some LTE Bands. Per May 2017 TCB Workshop Notes, SAR for 4x4 DL MIMO was not needed since the maximum average output power in 4x4 DL MIMO mode was not more than 0.25 dB higher than the maximum output power with 4x4 DL MIMO inactive. Additionally, SAR for 4x4 MIMO Downlink Carrier Aggregation was not needed since the maximum average output power in 4x4 MIMO Downlink Carrier Aggregation mode was not more than 0.25 dB higher than the maximum output power with 4x4 MIMO Downlink and downlink carrier aggregation inactive.

This device supports LTE capabilities with overlapping transmission frequency ranges. When the supported frequency range of an LTE Band falls completely within an LTE band with a larger transmission frequency range, both LTE bands have the same target power (or the band with the larger transmission frequency range has a higher target power), and both LTE 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 NSA mode only. 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 per FCC guidance:

1. 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.
2. 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.
3. All available SCS settings for this device were evaluated. The NR checklist contains information about the SCS settings per band.

1.8 Guidance Applied

- IEC/IEEE 62209-1528:2020
- 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)
- October 2013 TCB Workshop Notes (GPRS Testing Considerations)
- May 2017 TCB Workshop Notes (LTE 4x4 Downlink MIMO, LTE Band 41 Power Class 3)
- April 2019 TCB Workshop Notes (IEEE 802.11ax)
- April 2018 TCB Workshop Notes (LTE Carrier Aggregation)

FCC ID: A3LSMA528B	 PCTEST Proud to be part of  Samsung	SAR EVALUATION REPORT		Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset		Page 12 of 86

1.9 Device Serial Numbers

Several samples with identical hardware were used to support SAR testing. The manufacturer has confirmed that the device(s) tested have the same physical, mechanical and thermal characteristics and are within operational tolerances expected for production units. The serial numbers used for each test are indicated alongside the results in Section 11.

FCC ID: A3LSMA528B	 PCTEST Proud to be part of 	SAR EVALUATION REPORT	 Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset	Page 13 of 86

LTE Information					
Form Factor	Portable Handset				
Frequency Range of each LTE transmission band	LTE Band 12 (699.7 - 715.3 MHz)				
	LTE Band 17 (706.5 - 713.5 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 2 (PCS) (1850.7 - 1909.3 MHz)				
Channel Bandwidths	LTE Band 41 (2498.5 - 2687.5 MHz)				
	LTE Band 12: 1.4 MHz, 3 MHz, 5 MHz, 10 MHz				
	LTE Band 17: 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				
Channel Numbers and Frequencies (MHz)	LTE Band 2 (PCS): 1.4 MHz, 3 MHz, 5 MHz, 10 MHz, 15 MHz, 20 MHz				
	LTE Band 41: 5 MHz, 10 MHz, 15 MHz, 20 MHz				
	Low	Low-Mid	Mid	Mid-High	High
LTE Band 12: 1.4 MHz	699.7 (23017)		707.5 (23095)	715.3 (23173)	
LTE Band 12: 3 MHz	700.5 (23025)		707.5 (23095)	714.5 (23165)	
LTE Band 12: 5 MHz	701.5 (23035)		707.5 (23095)	713.5 (23155)	
LTE Band 12: 10 MHz	704 (23060)		707.5 (23095)	711 (23130)	
LTE Band 17: 5 MHz	706.5 (23755)		710 (23790)	713.5 (23825)	
LTE Band 17: 10 MHz	709 (23780)		710 (23790)	711 (23800)	
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 (19957)		1732.5 (20175)	1754.3 (20393)	
LTE Band 4 (AWS): 3 MHz	1711.5 (19965)		1732.5 (20175)	1753.5 (20385)	
LTE Band 4 (AWS): 5 MHz	1712.5 (19975)		1732.5 (20175)	1752.5 (20375)	
LTE Band 4 (AWS): 10 MHz	1715 (20000)		1732.5 (20175)	1750 (20350)	
LTE Band 4 (AWS): 15 MHz	1717.5 (20025)		1732.5 (20175)	1747.5 (20325)	
LTE Band 4 (AWS): 20 MHz	1720 (20050)		1732.5 (20175)	1745 (20300)	
LTE Band 2 (PCS): 1.4 MHz	1850.7 (18607)		1880 (18900)	1909.3 (19193)	
LTE Band 2 (PCS): 3 MHz	1851.5 (18615)		1880 (18900)	1908.5 (19185)	
LTE Band 2 (PCS): 5 MHz	1852.5 (18625)		1880 (18900)	1907.5 (19175)	
LTE Band 2 (PCS): 10 MHz	1855 (18650)		1880 (18900)	1905 (19150)	
LTE Band 2 (PCS): 15 MHz	1857.5 (18675)		1880 (18900)	1902.5 (19125)	
LTE Band 2 (PCS): 20 MHz	1860 (18700)		1880 (18900)	1900 (19100)	
LTE Band 41: 5 MHz	2506 (39750)	2549.5 (40185)	2593 (40620)	2636.5 (41055)	2680 (41490)
LTE Band 41: 10 MHz	2506 (39750)	2549.5 (40185)	2593 (40620)	2636.5 (41055)	2680 (41490)
LTE Band 41: 15 MHz	2506 (39750)	2549.5 (40185)	2593 (40620)	2636.5 (41055)	2680 (41490)
LTE Band 41: 20 MHz	2506 (39750)	2549.5 (40185)	2593 (40620)	2636.5 (41055)	2680 (41490)
UE Category	DL UE Cat 18, UL UE Cat 5				
Modulations Supported in UL	QPSK, 16QAM, 64QAM				
LTE MPR Permanently implemented per 3GPP TS 36.101 section 6.2.3-6.2.5? (manufacturer attestation to be provided)	YES				
A-MPR (Additional MPR) disabled for SAR Testing?	YES				
LTE Carrier Aggregation Possible Combinations	The technical description includes all the possible carrier aggregation combinations				
LTE Additional Information	This device does not support full CA features on 3GPP Release 15. It supports carrier aggregation, downlink MIMO features as shown in Appendix F. All uplink communications are identical to the Release 8 Specifications. Uplink communications are done on the PCC. The following LTE Release 15 Features are not supported: WlFI Offloading, Relay, HetNet, Enhanced MIMO, eICIC, eMBMS, Cross-Carrier Scheduling, Enhanced SC-FDMA.				

FCC ID: A3LSMA528B		SAR EVALUATION REPORT			Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset		Page 14 of 86	

NR Information			
Form Factor	Portable Handset		
Frequency Range of each NR transmission band	NR Band n5 (Cell) (826.5 - 846.5 MHz)		
	NR Band n66 (AWS) (1712.5 - 1777.5 MHz)		
Channel Bandwidths	NR Band n5 (Cell): 5 MHz, 10MHz, 15MHz, 20 MHz		
	NR Band n66 (AWS): 5 MHz, 10 MHz, 15 MHz, 20 MHz		
Channel Numbers and Frequencies (MHz)			
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)
SCS for NR Band n5/n66	15 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 n5 (Cell)	LTE Band 66		
LTE Anchor Bands for NR Band n66 (AWS)	LTE Band 5		

FCC ID: A3LSMA528B	 SAR EVALUATION REPORT 		Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset	Page 15 of 86

3 INTRODUCTION

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

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

3.1 SAR Definition

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

Equation 3-1
SAR Mathematical Equation

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

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

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

where:

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

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

FCC ID: A3LSMA528B	 PCTEST Proud to be part of the	SAR EVALUATION REPORT		Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset		Page 16 of 86

4

DOSIMETRIC ASSESSMENT

4.1 Measurement Procedure

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

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

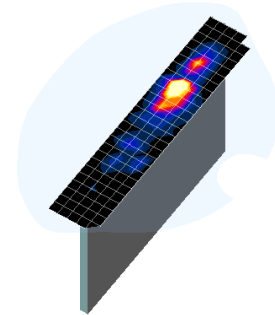


Figure 4-1 point
Sample SAR Area
Scan

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		
				$\Delta z_{\text{zoom}}(n)$	$\Delta z_{\text{zoom}}(1)^*$	
≤2 GHz	≤15	≤8	≤5	≤4	$\leq 1.5^* \Delta z_{\text{zoom}}(n-1)$	≥30
2-3 GHz	≤12	≤5	≤5	≤4	$\leq 1.5^* \Delta z_{\text{zoom}}(n-1)$	≥30
3-4 GHz	≤12	≤5	≤4	≤3	$\leq 1.5^* \Delta z_{\text{zoom}}(n-1)$	≥28
4-5 GHz	≤10	≤4	≤3	≤2.5	$\leq 1.5^* \Delta z_{\text{zoom}}(n-1)$	≥25
5-6 GHz	≤10	≤4	≤2	≤2	$\leq 1.5^* \Delta z_{\text{zoom}}(n-1)$	≥22

*Also compliant to IEEE 1528-2013 Table 6

FCC ID: A3LSMA528B		SAR EVALUATION REPORT			Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset			Page 17 of 86

5.1 EAR REFERENCE POINT

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

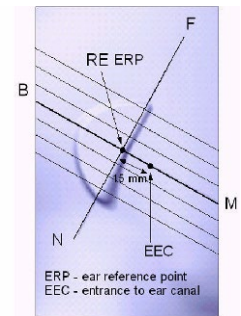


Figure 5-1
Close-Up Side view
of ERP

5.2 HANDSET REFERENCE POINTS

Two imaginary lines on the handset were established: the vertical centerline and the horizontal line. The test device was placed in a normal operating position with the acoustic output located along the “vertical centerline” on the front of the device aligned to the “ear reference point” (See Figure 5-3). The acoustic output was then located at the same level as the center of the ear reference point. The test device was positioned so that the “vertical centerline” was bisecting the front surface of the handset at its top and bottom edges, positioning the “ear reference point” on the outer surface of the both the left and right head phantoms on the ear reference point.

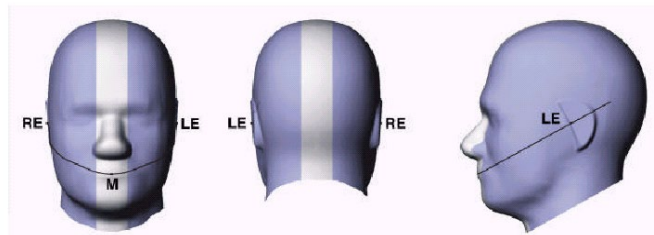


Figure 5-2
Front, back and side view of SAM Twin Phantom

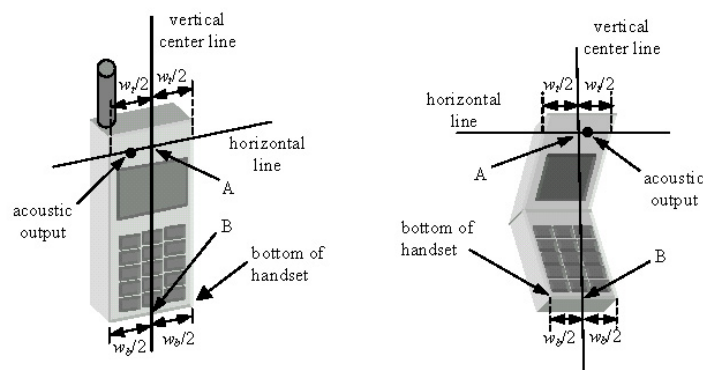


Figure 5-3
Handset Vertical Center & Horizontal Line Reference Points

FCC ID: A3LSMA528B	 PCTEST Proud to be part of 	SAR EVALUATION REPORT		Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset		Page 18 of 86

6 TEST CONFIGURATION POSITIONS

6.1 Device Holder

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

6.2 Positioning for Cheek

1. The test device was positioned with the device close to the surface of the phantom such that point A is on the (virtual) extension of the line passing through points RE and LE on the phantom (see Figure 6-1), such that the plane defined by the vertical center line and the horizontal line of the phone is approximately parallel to the sagittal plane of the phantom.

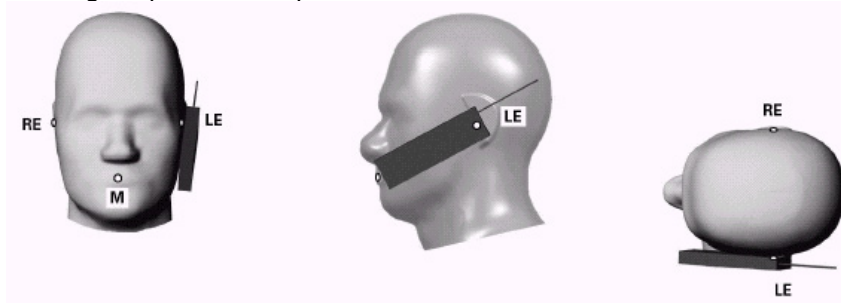


Figure 6-1 Front, Side and Top View of Cheek Position

2. The handset was translated towards the phantom along the line passing through RE & LE until the handset touches the pinna.
3. While maintaining the handset in this plane, the handset was rotated around the LE-RE line until the vertical centerline was in the reference plane.
4. The phone was then rotated around the vertical centerline until the phone (horizontal line) was symmetrical with respect to the line NF.
5. While maintaining the vertical centerline in the reference plane, keeping point A on the line passing through RE and LE, and maintaining the device contact with the ear, the device was rotated about the NF line until any point on the handset made contact with a phantom point below the ear (cheek) (See Figure 6-2).

6.3 Positioning for Ear / 15° Tilt

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

1. While maintaining the orientation of the phone, the phone was retracted parallel to the reference plane far enough to enable a rotation of the phone by 15 degrees.
2. The phone was then rotated around the horizontal line by 15 degrees.
3. While maintaining the orientation of the phone, the phone was moved parallel to the reference plane until any part of the handset touched the head. (In this position, point A was located on the line RE-LE). The tilted position is obtained when the contact is on the pinna. If the contact was at any location other than the pinna, the angle of the phone would then be reduced. In this situation, the tilted position was obtained when any part of the phone was in contact of the ear as well as a second part of the phone was in contact with the head (see Figure 6-2).

FCC ID: A3LSMA528B	 PCTEST Proud to be part of 	SAR EVALUATION REPORT	 Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset	Page 19 of 86

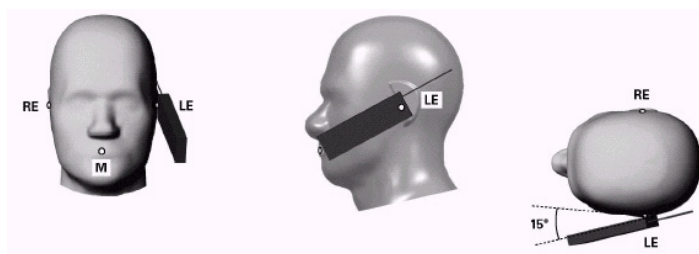


Figure 6-2 Front, Side and Top View of Ear/15° Tilt Position

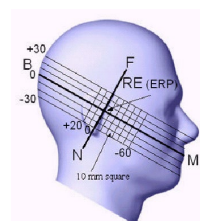


Figure 6-3 Side view w/ relevant markings

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.

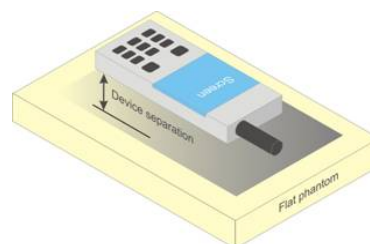


Figure 6-4 Sample Body-Worn Diagram

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

FCC ID: A3LSMA528B	 PCTEST Proud to be part of 	SAR EVALUATION REPORT		Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset		Page 20 of 86

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

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

6.8 Phablet Configurations

For smart phones with a display diagonal dimension > 150 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

FCC ID: A3LSMA528B	 PCTEST Proud to be part of 	SAR EVALUATION REPORT	 Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset	Page 21 of 86

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.

FCC ID: A3LSMA528B	 PCTEST Proud to be part of  Samsung	SAR EVALUATION REPORT		Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset		Page 22 of 86

7 RF EXPOSURE LIMITS

7.1 Uncontrolled Environment

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

7.2 Controlled Environment

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

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

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

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

FCC ID: A3LSMA528B	 PCTEST Proud to be part of 	SAR EVALUATION REPORT		Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset		Page 23 of 86

8 FCC MEASUREMENT PROCEDURES

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

8.1 Measured and Reported SAR

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

8.2 3G SAR Test Reduction Procedure

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

8.3 Procedures Used to Establish RF Signal for SAR

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

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

8.4 SAR Measurement Conditions for UMTS

8.4.1 Output Power Verification

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

FCC ID: A3LSMA528B	 PCTEST Proud to be part of 	SAR EVALUATION REPORT	 Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset	Page 24 of 86

8.4.2 Head SAR Measurements

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

8.4.3 Body SAR Measurements

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

8.4.4 SAR Measurements with Rel 5 HSDPA

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

8.4.5 SAR Measurements with Rel 6 HSUPA

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

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

8.4.6 SAR Measurement Conditions for DC-HSDPA

SAR is required for Rel. 8 DC-HSDPA when SAR is required for Rel. 5 HSDPA; otherwise, the 3G SAR test reduction procedure is applied to DC-HSDPA with 12.2 kbps RMC as the primary mode. Power is measured for DC-HSDPA according to the H-Set 12, FRC configuration in Table C.8.1.12 of 3GPP TS 34.121-1 to determine SAR test reduction. A primary and a secondary serving HS-DSCH Cell are required to perform the power measurement and for the results to be acceptable.

8.5 SAR Measurement Conditions for LTE

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

FCC ID: A3LSMA528B	 PCTEST Proud to be part of 	SAR EVALUATION REPORT		Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset		Page 25 of 86

8.5.1 Spectrum Plots for RB Configurations

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

8.5.2 MPR

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

8.5.3 A-MPR

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

8.5.4 Required RB Size and RB Offsets for SAR Testing

According to FCC KDB 941225 D05v02r04:

- a. Per Section 5.2.1, SAR is required for QPSK 1 RB Allocation for the largest bandwidth
 - i. The required channel and offset combination with the highest maximum output power is required for SAR.
 - ii. When the reported SAR is ≤ 0.8 W/kg, testing of the remaining RB offset configurations and required test channels is not required. Otherwise, SAR is required for the remaining required test channels using the RB offset configuration with highest output power for that channel.
 - iii. When the reported SAR for a required test channel is > 1.45 W/kg, SAR is required for all RB offset configurations for that channel.
- b. Per Section 5.2.2, SAR is required for 50% RB allocation using the largest bandwidth following the same procedures outlined in Section 5.2.1.
- c. Per Section 5.2.3, QPSK SAR is not required for the 100% allocation when the highest maximum output power for the 100% allocation is less than the highest maximum output power of the 1 RB and 50% RB allocations and the reported SAR for the 1 RB and 50% RB allocations is < 0.8 W/kg.
- d. Per Section 5.2.4 and 5.3, SAR tests for higher order modulations and lower bandwidths configurations are not required when the conducted power of the required test configurations determined by Sections 5.2.1 through 5.2.3 is less than or equal to $\frac{1}{2}$ dB higher than the equivalent configuration using QPSK modulation and when the QPSK SAR for those configurations is < 1.45 W/kg.

8.5.5 TDD

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

8.5.6 Downlink Only Carrier Aggregation

Conducted power measurements with LTE Carrier Aggregation (CA) (downlink only) active are made in accordance to KDB Publication 941225 D05Av01r02. The RRC connection is only handled by one cell, the primary component carrier (PCC) for downlink and uplink communications. After making a data connection to the PCC, the UE device adds secondary component carrier(s) (SCC) on the downlink only. All uplink communications and acknowledgements remain identical to specifications when downlink

FCC ID: A3LSMA528B	 PCTEST Proud to be part of 	SAR EVALUATION REPORT	 Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset	Page 26 of 86

carrier aggregation is inactive on the PCC. Additional conducted output powers are measured with the downlink carrier aggregation active for the configuration with highest measured maximum conducted power with downlink carrier aggregation inactive measured among the channel bandwidth, modulation, and RB combinations in each frequency band. Per FCC KDB Publication 941225 D05Av01r02, no SAR measurements are required for downlink only carrier aggregation configurations when the average output power with downlink only carrier aggregation active is not more than 0.25 dB higher than the average output power with downlink only carrier aggregation inactive.

8.6 SAR Testing with 802.11 Transmitters

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

8.6.1 General Device Setup

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

A periodic duty factor is required for current generation SAR systems to measure SAR. When 802.11 frame gaps are accounted for in the transmission, a maximum transmission duty factor of 92 - 96% is typically achievable in most test mode configurations. A minimum transmission duty factor of 85% is required to avoid certain hardware and device implementation issues related to wide range SAR scaling. The reported SAR is scaled to 100% transmission duty factor to determine compliance at the maximum tune-up tolerance limit.

8.6.2 U-NII-1 and U-NII-2A

For devices that operate in both U-NII-1 and U-NII-2A bands, when the same maximum output power is specified for both bands, SAR measurement using OFDM SAR test procedures is not required for U-NII-1 unless the highest reported SAR for U-NII-2A is > 1.2 W/kg. When different maximum output powers are specified for the bands, SAR measurement for the U-NII band with the lower maximum output power is not required unless the highest reported SAR for the U-NII band with the higher maximum output power, adjusted by the ratio of lower to higher specified maximum output power for the two bands, is > 1.2 W/kg. When 10g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.

8.6.3 U-NII-2C and U-NII-3

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

8.6.4 Initial Test Position Procedure

For exposure conditions with multiple test positions, such as handset operating next to the ear, devices with hotspot mode or UMPC mini-tablet, procedures for initial test position can be applied. Using the transmission

FCC ID: A3LSMA528B	 PCTEST Proud to be part of 	SAR EVALUATION REPORT	 Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset	Page 27 of 86

mode determined by the DSSS procedure or initial test configuration, area scans are measured for all positions in an exposure condition. The test position with the highest extrapolated (peak) SAR is used as the initial test position. When reported SAR for the initial test position is ≤ 0.4 W/kg, no additional testing for the remaining test positions is required. Otherwise, SAR is evaluated at the subsequent highest peak SAR positions until the reported SAR result is ≤ 0.8 W/kg or all test positions are measured. When 10g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.

8.6.5 2.4 GHz SAR Test Requirements

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

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

2.4 GHz 802.11 g/n/ax OFDM are additionally evaluated for SAR if the highest reported SAR for 802.11b, adjusted by the ratio of the OFDM to DSSS specified maximum output power, is > 1.2 W/kg. When SAR is required for OFDM modes in 2.4 GHz band, the Initial Test Configuration Procedures should be followed. When 10g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.

8.6.6 OFDM Transmission Mode and SAR Test Channel Selection

When the same maximum output power was specified for multiple OFDM transmission mode configurations in a frequency band or aggregated band, SAR is measured using the configuration with the largest channel bandwidth, lowest order modulation and lowest data rate. When the maximum output power of a channel is the same for equivalent OFDM configurations; for example, 802.11a, 802.11n and 802.11ac or 802.11g and 802.11n with the same channel bandwidth, modulation and data rate etc., the lower order 802.11 mode i.e., 802.11a, then 802.11n and 802.11ac or 802.11g then 802.11n, is used for SAR measurement. Per April 2019 TCB Workshop guidance, 802.11ax was considered the highest order 802.11 mode. When the maximum output power are the same for multiple test channels, either according to the default or additional power measurement requirements, SAR is measured using the channel closest to the middle of the frequency band or aggregated band. When there are multiple channels with the same maximum output power, SAR is measured using the higher number channel.

8.6.7 Initial Test Configuration Procedure

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

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

FCC ID: A3LSMA528B	 PCTEST Proud to be part of Samsung	SAR EVALUATION REPORT		Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset		Page 28 of 86

802.11 mode is considered for SAR measurements (See Section 8.6.6). When 10g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.

8.6.8 Subsequent Test Configuration Procedures

For OFDM configurations in each frequency band and aggregated band, SAR is evaluated for initial test configuration using the fixed test position or the initial test position procedure. When the highest reported SAR (for the initial test configuration), adjusted by the ratio of the specified maximum output power of the subsequent test configuration to initial test configuration, is ≤ 1.2 W/kg, no additional SAR tests for the subsequent test configurations are required. When 10g SAR measurement is considered, a factor of 2.5 is applied to the thresholds above.

FCC ID: A3LSMA528B	 PCTEST Proud to be part of 	SAR EVALUATION REPORT		Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset		Page 29 of 86

9 RF CONDUCTED POWERS

9.1 GSM Conducted Powers

Table 9-1
Maximum Conducted Power

Maximum Burst-Averaged Output Power										
		Voice	GPRS/EDGE Data (GMSK)				EDGE Data (8-PSK)			
Band	Channel	GSM [dBm] CS (1 Slot)	GPRS [dBm] 1 Tx Slot	GPRS [dBm] 2 Tx Slot	GPRS [dBm] 3 Tx Slot	GPRS [dBm] 4 Tx Slot	EDGE [dBm] 1 Tx Slot	EDGE [dBm] 2 Tx Slot	EDGE [dBm] 3 Tx Slot	EDGE [dBm] 4 Tx Slot
GSM 850	128	31.67	31.89	31.11	29.17	27.38	26.26	24.70	22.78	21.63
	190	31.87	32.09	31.44	29.31	27.53	26.28	24.68	22.85	21.70
	251	31.92	32.08	31.47	29.29	27.50	26.20	24.65	22.86	21.74
GSM 1900	512	29.76	29.85	28.54	26.00	24.37	25.52	24.28	22.05	21.28
	661	29.45	29.50	28.56	26.05	24.54	25.33	24.15	21.91	21.58
	810	29.42	29.45	28.62	26.14	24.46	25.45	24.23	22.04	21.27
Calculated Maximum Frame-Averaged Output Power										
		Voice	GPRS/EDGE Data (GMSK)				EDGE Data (8-PSK)			
Band	Channel	GSM [dBm] CS (1 Slot)	GPRS [dBm] 1 Tx Slot	GPRS [dBm] 2 Tx Slot	GPRS [dBm] 3 Tx Slot	GPRS [dBm] 4 Tx Slot	EDGE [dBm] 1 Tx Slot	EDGE [dBm] 2 Tx Slot	EDGE [dBm] 3 Tx Slot	EDGE [dBm] 4 Tx Slot
GSM 850	128	22.47	22.69	24.92	24.74	24.20	17.06	18.51	18.35	18.45
	190	22.67	22.89	25.25	24.88	24.35	17.08	18.49	18.42	18.52
	251	22.72	22.88	25.28	24.86	24.32	17.00	18.46	18.43	18.56
GSM 1900	512	20.56	20.65	22.35	21.57	21.19	16.32	18.09	17.62	18.10
	661	20.25	20.30	22.37	21.62	21.36	16.13	17.96	17.48	18.40
	810	20.22	20.25	22.43	21.71	21.28	16.25	18.04	17.61	18.09
GSM 850	Frame	22.80	22.80	25.31	25.07	23.82	16.30	18.81	18.57	18.82
GSM 1900	Avg.Targets:	20.30	20.30	22.31	21.57	21.32	15.80	18.31	17.57	17.82

FCC ID: A3LSMA528B	 PCTEST Proud to be part of 	SAR EVALUATION REPORT		Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset		Page 30 of 86

Table 9-2
Reduced Hotspot/Proximity Sensor and/or Earjack Active

Maximum Burst-Averaged Output Power										
		Voice	GPRS/EDGE Data (GMSK)				EDGE Data (8-PSK)			
Band	Channel	GSM [dBm] CS (1 Slot)	GPRS [dBm] 1 Tx Slot	GPRS [dBm] 2 Tx Slot	GPRS [dBm] 3 Tx Slot	GPRS [dBm] 4 Tx Slot	EDGE [dBm] 1 Tx Slot	EDGE [dBm] 2 Tx Slot	EDGE [dBm] 3 Tx Slot	EDGE [dBm] 4 Tx Slot
GSM 1900	512	28.18	28.28	26.92	24.57	23.08	25.40	22.70	20.80	19.52
	661	28.14	28.21	27.10	24.72	23.12	25.18	22.60	21.30	19.94
	810	28.26	28.39	27.14	24.62	23.09	25.31	22.63	20.75	19.70
Calculated Maximum Frame-Averaged Output Power										
		Voice	GPRS/EDGE Data (GMSK)				EDGE Data (8-PSK)			
Band	Channel	GSM [dBm] CS (1 Slot)	GPRS [dBm] 1 Tx Slot	GPRS [dBm] 2 Tx Slot	GPRS [dBm] 3 Tx Slot	GPRS [dBm] 4 Tx Slot	EDGE [dBm] 1 Tx Slot	EDGE [dBm] 2 Tx Slot	EDGE [dBm] 3 Tx Slot	EDGE [dBm] 4 Tx Slot
GSM 1900	512	18.98	19.08	20.73	20.14	19.90	16.20	16.51	16.37	16.34
	661	18.94	19.01	20.91	20.29	19.94	15.98	16.41	16.87	16.76
	810	19.06	19.19	20.95	20.19	19.91	16.11	16.44	16.32	16.52
GSM 1900	Frame Avg. Targets:	18.30	18.30	20.31	19.57	19.32	15.30	16.31	16.57	15.82

Note:

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

GSM Class: B
GPRS Multislot class: 33 (Max 4 Tx uplink slots)
EDGE Multislot class: 33 (Max 4 Tx uplink slots)
DTM Multislot Class: N/A



Figure 9-1
Power Measurement Setup

FCC ID: A3LSMA528B	 PCTEST Proud to be part of  Hewlett-Packard	SAR EVALUATION REPORT		Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset	Page 31 of 86	

9.2 UMTS Conducted Powers

Table 9-3
Maximum Conducted Power

3GPP Release Version	Mode	3GPP 34.121 Subtest	Cellular Band [dBm]			AWS Band [dBm]			PCS Band [dBm]			3GPP MPR [dB]
			4132	4183	4233	1312	1412	1513	9262	9400	9538	
99	WCDMA	12.2 kbps RMC	23.58	23.50	23.46	23.27	23.23	22.99	23.09	23.07	23.03	-
99		12.2 kbps AMR	23.53	23.54	23.57	23.27	23.27	23.05	23.09	23.11	23.06	-
6	HSDPA	Subtest 1	22.67	22.70	22.65	22.29	22.06	22.09	22.05	22.01	22.12	0
6		Subtest 2	22.69	22.71	22.67	22.31	22.06	22.11	22.05	22.00	22.04	0
6		Subtest 3	22.16	22.18	22.18	21.78	21.54	21.61	21.56	21.51	21.56	0.5
6		Subtest 4	22.17	22.20	22.17	21.81	21.56	21.58	21.56	21.51	21.56	0.5
6	HSUPA	Subtest 1	22.67	22.70	22.70	22.32	22.03	22.09	22.04	22.00	22.06	0
6		Subtest 2	20.73	20.72	20.71	20.36	20.04	20.08	20.06	20.01	20.05	2
6		Subtest 3	21.66	21.68	21.67	21.30	21.04	21.09	21.05	21.04	21.08	1
6		Subtest 4	20.68	20.71	20.69	20.30	20.06	20.10	20.06	20.01	20.05	2
6		Subtest 5	22.66	22.72	22.71	22.32	22.05	22.09	22.07	22.01	22.09	0
8	DC-HSDPA	Subtest 1	22.64	22.69	22.71	22.32	22.08	22.13	22.08	22.02	22.12	0
8		Subtest 2	22.66	22.72	22.70	22.32	22.06	22.11	22.07	22.01	22.07	0
8		Subtest 3	22.18	22.21	22.21	21.83	21.55	21.62	21.58	21.51	21.58	0.5
8		Subtest 4	22.15	22.21	22.18	21.83	21.56	21.61	21.58	21.52	21.58	0.5

Table 9-4
Reduced Hotspot/Proximity Sensor and/or Earjack Active

3GPP Release Version	Mode	3GPP 34.121 Subtest	AWS Band [dBm]			PCS Band [dBm]			3GPP MPR [dB]
			1312	1412	1513	9262	9400	9538	
99	WCDMA	12.2 kbps RMC	23.00	22.82	22.90	22.81	22.72	22.86	-
99		12.2 kbps AMR	23.00	22.78	22.81	22.79	22.71	22.75	-
6	HSDPA	Subtest 1	21.82	21.58	21.60	21.55	21.46	21.57	0
6		Subtest 2	21.77	21.54	21.60	21.55	21.46	21.51	0
6		Subtest 3	21.31	21.03	21.07	21.03	20.93	21.06	0.5
6		Subtest 4	21.29	21.02	21.07	21.04	20.95	21.03	0.5
6	HSUPA	Subtest 1	21.80	21.53	21.56	21.51	21.45	21.53	0
6		Subtest 2	19.79	19.51	19.55	19.52	19.46	19.51	2
6		Subtest 3	20.79	20.52	20.56	20.53	20.46	20.55	1
6		Subtest 4	20.00	20.03	20.08	20.02	19.95	20.03	2
6		Subtest 5	21.82	21.52	21.55	21.53	21.44	21.55	0
8	DC-HSDPA	Subtest 1	21.80	21.52	21.57	21.54	21.48	21.56	0
8		Subtest 2	21.82	21.54	21.58	21.58	21.46	21.50	0
8		Subtest 3	21.33	21.03	21.08	21.06	20.94	21.02	0.5
8		Subtest 4	21.31	21.05	21.09	21.06	20.98	21.04	0.5

DC-HSDPA considerations

- 3GPP Specification 34.121-1 Release 8 Ver 8.10.0 was used for DC-HSDPA guidance
- H-Set 12 (QPSK) was confirmed to be used during DC-HSDPA measurements
- The DUT supports UE category 24 for HSDPA

It is expected by the manufacturer that MPR for some HSPA subtests may be up to 2 dB more than specified by 3GPP, but also as low as 0 dB according to the chipset implementation in this model.



Figure 9-2
Power Measurement Setup

FCC ID: A3LSMA528B	 PCTEST Proud to be part of 	SAR EVALUATION REPORT		Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset		Page 32 of 86

9.3 LTE Conducted Powers

Note: Per FCC KDB Publication 941225 D05v02r05, LTE SAR for the lower bandwidths was not required for testing since the maximum average output power of all required channels and configurations was not more than 0.5 dB higher than the highest bandwidth and the reported LTE SAR for the highest bandwidth was less than 1.45W/kg. Lower bandwidth conducted powers for all LTE bands can be found in Appendix H.

9.3.1

LTE Band 12

Table 9-5
LTE Band 12 Maximum Conducted Power – 10 MHz Bandwidth

LTE Band 12 10 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			23095 (707.5 MHz)		
			Conducted Power [dBm]		
QPSK	1	0	24.19	0	0
	1	25	24.21		0
	1	49	24.36		0
	25	0	23.30	0-1	1
	25	12	23.26		1
	25	25	23.37		1
	50	0	23.20		1
16QAM	1	0	23.69	0-1	1
	1	25	23.79		1
	1	49	23.68		1
	25	0	22.23	0-2	2
	25	12	22.35		2
	25	25	22.30		2
	50	0	22.25		2
64QAM	1	0	22.47	0-2	2
	1	25	22.39		2
	1	49	22.59		2
	25	0	21.29	0-3	3
	25	12	21.39		3
	25	25	21.43		3
	50	0	21.33		3

Note: LTE Band 12 at 10 MHz bandwidth does not support three non-overlapping channels. Per KDB Publication 941225 D05v02, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.

FCC ID: A3LSMA528B	 PCTEST Proud to be part of 	SAR EVALUATION REPORT		Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset		Page 33 of 86

9.3.2

LTE Band 26 (Cell)

Table 9-6
LTE Band 26 (Cell) Maximum Conducted Power – 15 MHz Bandwidth

LTE Band 26 (Cell) 15 MHz Bandwidth					
Modulation	RB Size	RB Offset	Mid Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			26865 (831.5 MHz)		
			Conducted Power [dBm]		
QPSK	1	0	23.18	0	0
	1	36	23.12		0
	1	74	23.08		0
	36	0	22.00	0-1	1
	36	18	22.04		1
	36	37	22.05		1
	75	0	22.04		1
16QAM	1	0	22.54	0-1	1
	1	36	22.37		1
	1	74	22.34		1
	36	0	21.05	0-2	2
	36	18	21.05		2
	36	37	21.09		2
	75	0	20.97		2
64QAM	1	0	21.32	0-2	2
	1	36	21.31		2
	1	74	21.22		2
	36	0	20.01	0-3	3
	36	18	20.03		3
	36	37	20.04		3
	75	0	20.03		3

Note: LTE Band 26 (Cell) at 15 MHz bandwidth does not support three non-overlapping channels. Per KDB Publication 941225 D05v02, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.

FCC ID: A3LSMA528B	 PCTEST Proud to be part of  Hewlett-Packard	SAR EVALUATION REPORT		Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset		Page 34 of 86

9.3.3

LTE Band 66 (AWS)

Table 9-7
LTE Band 66 (AWS) Maximum Conducted Power – 20 MHz Bandwidth

LTE Band 66 (AWS) 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			132072 (1720.0 MHz)	132322 (1745.0 MHz)	132572 (1770.0 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	23.23	22.97	23.13	0	0
	1	50	23.47	23.18	23.05		0
	1	99	23.17	23.06	23.00		0
	50	0	22.50	22.27	22.10	0-1	1
	50	25	22.52	22.35	22.17		1
	50	50	22.35	22.22	22.12		1
	100	0	22.45	22.29	22.10		1
16QAM	1	0	22.54	22.21	22.49	0-1	1
	1	50	22.69	22.56	22.43		1
	1	99	22.56	22.28	22.42		1
	50	0	21.50	21.32	21.09	0-2	2
	50	25	21.50	21.32	21.17		2
	50	50	21.33	21.20	21.15		2
	100	0	21.42	21.23	21.07		2
64QAM	1	0	21.45	21.08	21.26	0-2	2
	1	50	21.69	21.54	21.34		2
	1	99	21.37	21.25	21.27		2
	50	0	20.55	20.34	20.15	0-3	3
	50	25	20.48	20.41	20.20		3
	50	50	20.41	20.28	20.19		3
	100	0	20.48	20.29	20.11		3

Table 9-8
LTE Band 66 (AWS) Reduced Hotspot/Proximity Sensor and/or Earjack Active – 20 MHz Bandwidth

LTE Band 66 (AWS) 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			132072 (1720.0 MHz)	132322 (1745.0 MHz)	132572 (1770.0 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	21.99	21.78	22.15	0	0
	1	50	22.22	22.04	22.02		0
	1	99	22.01	21.80	22.00		0
	50	0	22.29	22.03	22.07	0-1	0
	50	25	22.36	22.07	22.13		0
	50	50	22.28	22.07	22.01		0
	100	0	22.21	22.02	22.04		0
16QAM	1	0	22.31	22.27	22.51	0-1	0
	1	50	22.62	22.50	22.39		0
	1	99	22.41	22.35	22.39		0
	50	0	21.28	21.00	21.09	0-2	1
	50	25	21.36	21.03	21.12		1
	50	50	21.24	21.07	21.00		1
	100	0	21.29	21.02	21.09		1
64QAM	1	0	21.35	20.76	21.29	0-2	1
	1	50	21.64	21.05	21.13		1
	1	99	21.49	20.87	21.08		1
	50	0	20.42	20.10	20.18	0-3	2
	50	25	20.46	20.20	20.21		2
	50	50	20.35	20.08	20.08		2
	100	0	20.33	20.07	20.11		2

FCC ID: A3LSMA528B



SAR EVALUATION REPORT



Approved by:
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Document S/N:

1M2106280072-01.A3L (Rev 1)

Test Dates:

07/04/2021 – 07/25/2021

DUT Type:

Portable Handset

Page 35 of 86

9.3.4

LTE Band 2 (PCS)

Table 9-9
LTE Band 2 (PCS) Maximum Conducted Power – 20 MHz Bandwidth

LTE Band 2 (PCS) 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			18700 (1860.0 MHz)	18900 (1880.0 MHz)	19100 (1900.0 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	22.99	22.86	22.86	0	0
	1	50	22.92	22.82	22.92		0
	1	99	22.88	22.91	22.92		0
	50	0	21.92	21.82	21.83	0-1	1
	50	25	22.09	21.96	21.98		1
	50	50	22.11	21.90	21.95		1
	100	0	21.99	21.95	21.95		1
16QAM	1	0	22.33	22.23	22.15	0-1	1
	1	50	22.32	22.17	22.26		1
	1	99	22.37	22.21	22.21		1
	50	0	20.94	20.88	20.90	0-2	2
	50	25	21.10	20.97	21.06		2
	50	50	21.01	20.97	20.99		2
	100	0	21.04	20.91	21.01		2
64QAM	1	0	21.29	21.14	21.10	0-2	2
	1	50	21.07	21.09	21.13		2
	1	99	21.29	21.09	21.17		2
	50	0	19.90	19.85	19.97	0-3	3
	50	25	20.14	20.02	20.13		3
	50	50	20.05	20.00	20.03		3
	100	0	20.05	19.95	19.97		3

Table 9-10
LTE Band 2 (PCS) Reduced Hotspot/Proximity Sensor and/or Earjack Active – 20 MHz Bandwidth

LTE Band 2 (PCS) 20 MHz Bandwidth							
Modulation	RB Size	RB Offset	Low Channel	Mid Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			18700 (1860.0 MHz)	18900 (1880.0 MHz)	19100 (1900.0 MHz)		
			Conducted Power [dBm]				
QPSK	1	0	21.76	21.67	21.60	0	0
	1	50	21.71	21.64	21.63		0
	1	99	21.70	21.64	21.69		0
	50	0	21.74	21.66	21.53	0-1	0
	50	25	21.84	21.76	21.80		0
	50	50	21.82	21.73	21.76		0
	100	0	21.73	21.71	21.69		0
16QAM	1	0	21.96	21.85	21.90	0-1	0
	1	50	22.00	21.92	21.98		0
	1	99	21.92	21.95	21.95		0
	50	0	20.71	20.62	20.57	0-2	1
	50	25	20.82	20.74	20.81		1
	50	50	20.80	20.69	20.75		1
	100	0	20.78	20.76	20.74		1
64QAM	1	0	20.99	20.91	20.85	0-2	1
	1	50	21.03	20.89	20.87		1
	1	99	20.95	20.84	20.86		1
	50	0	19.81	19.65	19.62	0-3	2
	50	25	19.88	19.77	19.84		2
	50	50	19.89	19.74	19.81		2
	100	0	19.82	19.72	19.76		2

FCC ID: A3LSMA528B	 SAR EVALUATION REPORT 		Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset	Page 36 of 86

9.3.5

LTE Band 41

Table 9-11
LTE Band 41 Maximum Conducted Power – 20 MHz Bandwidth

LTE Band 41 20 MHz Bandwidth									
Modulation	RB Size	RB Offset	Low Channel	Low-Mid Channel	Mid Channel	Mid-High Channel	High Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			39750 (2506.0 MHz)	40185 (2549.5 MHz)	40620 (2593.0 MHz)	41055 (2636.5 MHz)	41490 (2680.0 MHz)		
			Conducted Power [dBm]						
QPSK	1	0	22.71	23.10	22.83	22.98	22.73	0	0
	1	50	22.86	22.97	23.28	23.12	23.15		0
	1	99	23.00	22.96	23.02	22.68	23.10		0
	50	0	22.01	22.16	22.24	22.20	22.07	0-1	1
	50	25	22.09	22.12	22.36	22.34	22.34		1
	50	50	22.14	22.11	22.32	22.12	22.35		1
	100	0	22.01	22.06	22.22	22.26	22.27		1
16QAM	1	0	21.90	22.18	21.96	22.05	21.80	0-1	1
	1	50	22.03	22.07	22.36	22.27	22.37		1
	1	99	22.18	22.02	22.09	21.76	22.27		1
	50	0	21.00	21.20	21.34	21.23	21.14	0-2	2
	50	25	21.12	21.16	21.37	21.36	21.37		2
	50	50	21.17	21.14	21.34	21.19	21.43		2
	100	0	21.00	21.08	21.28	21.25	21.23		2
64QAM	1	0	20.50	20.87	20.60	20.65	20.53	0-2	2
	1	50	20.71	20.78	21.04	20.88	20.97		2
	1	99	20.83	20.68	20.71	20.50	20.88		2
	50	0	20.21	20.24	20.35	20.31	20.17	0-3	3
	50	25	20.14	20.19	20.43	20.45	20.44		3
	50	50	20.21	20.16	20.37	20.22	20.43		3
	100	0	20.04	20.08	20.26	20.35	20.32		3

FCC ID: A3LSMA528B	 PCTEST Proud to be part of 	SAR EVALUATION REPORT		Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset		Page 37 of 86

9.4 NR Conducted Powers

Note: 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 H.

9.4.1 NR Band n5

Table 9-12
NR Band n5 Maximum Conducted Power – 20 MHz Bandwidth

NR Band n5 20 MHz Bandwidth					
Modulation	RB Size	RB Offset	Channel	MPR Allowed per 3GPP [dB]	MPR [dB]
			167300 (836.5 MHz) Conducted Power [dBm]		
DFT-s-OFDM $\pi/2$ BPSK	1	1	23.57	0	0.0
	1	53	23.63		0.0
	1	104	23.58		0.0
	50	0	23.72	0-0.5	0.5
	50	28	23.64	0	0.0
	50	56	23.60	0-0.5	0.5
	100	0	23.75		0.5
DFT-s-OFDM QPSK	1	1	23.82	0	0.0
	1	53	23.74		0.0
	1	104	23.59		0.0
	50	0	23.04	0-1	1.0
	50	28	23.80	0	0.0
	50	56	23.05	0-1	1.0
	100	0	23.04		1.0
DFT-s-OFDM 16QAM	1	1	23.01	0-1	1.0
CP-OFDM QPSK	1	1	22.84	0-1.5	1.5

Note: NR Band n5 (Cell) at 20 MHz bandwidth does not support non-overlapping channels. Per FCC Guidance, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.

FCC ID: A3LSMA528B	 PCTEST Proud to be part of 	SAR EVALUATION REPORT		Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset		Page 38 of 86

9.4.2

NR Band n66

Table 9-13
NR Band n66 Maximum Conducted Power – 20 MHz Bandwidth

NR Band n66 20 MHz Bandwidth							
			Channel			MPR Allowed per 3GPP [dB]	MPR [dB]
Modulation	RB Size	RB Offset	344000 (1720 MHz)	349000 (1745 MHz)	354000 (1770 MHz)		
			Conducted Power [dBm]				
DFT-s-OFDM $\pi/2$ BPSK	1	1	24.67	24.56	24.45	0	0.0
	1	53	24.73	24.45	24.35		0.0
	1	104	24.64	24.41	24.46		0.0
	50	0	24.15	24.04	24.00	0-0.5	0.5
	50	28	24.66	24.52	24.42	0	0.0
	50	56	24.15	24.01	23.94	0-0.5	0.5
100	0	24.17	23.99	23.94	0.5		
DFT-s-OFDM QPSK	1	1	24.54	24.44	24.36	0	0.0
	1	53	24.68	24.41	24.31		0.0
	1	104	24.71	24.45	24.44		0.0
	50	0	23.69	23.56	23.44	0-1	1.0
	50	28	24.61	24.51	24.44	0	0.0
	50	56	23.67	23.51	23.41	0-1	1.0
100	0	23.68	23.62	23.43	1.0		
DFT-s-OFDM 16QAM	1	1	23.25	23.47	23.22	0-1	1.0
CP-OFDM QPSK	1	1	23.03	23.15	22.94	0-1.5	1.5

Table 9-14
NR Band n66 Reduced Hotspot/Proximity Sensor and/or Earjack Active – 20 MHz Bandwidth

NR Band n66 20 MHz Bandwidth							
			Channel			MPR Allowed per 3GPP [dB]	MPR [dB]
Modulation	RB Size	RB Offset	344000 (1720 MHz)	349000 (1745 MHz)	354000 (1770 MHz)		
			Conducted Power [dBm]				
DFT-s-OFDM $\pi/2$ BPSK	1	1	22.79	22.65	22.62	0	0.0
	1	53	22.96	22.77	22.72		0.0
	1	104	22.81	22.65	22.61		0.0
	50	0	22.92	22.77	22.76	0-0.5	0.0
	50	28	22.98	22.78	22.78	0	0.0
	50	56	22.94	22.73	22.75	0-0.5	0.0
100	0	22.95	22.79	22.74	0.0		
DFT-s-OFDM QPSK	1	1	22.86	22.69	22.68	0	0.0
	1	53	22.99	22.78	22.76		0.0
	1	104	22.77	22.67	22.62		0.0
	50	0	22.97	22.84	22.76	0-1	0.0
	50	28	22.99	22.85	22.79	0	0.0
	50	56	22.91	22.78	22.76	0-1	0.0
100	0	22.94	22.82	22.76	0.0		
DFT-s-OFDM 16QAM	1	1	22.84	22.64	22.69	0-1	0.0
CP-OFDM QPSK	1	1	22.85	22.65	22.65	0-1.5	0.0

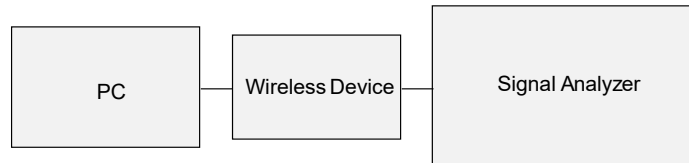


Figure 9-3
Power Measurement Setup

FCC ID: A3LSMA528B		SAR EVALUATION REPORT		Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset	Page 39 of 86	

9.5 WLAN Conducted Powers

Table 9-15
2.4 GHz WLAN Maximum Average RF Power

2.4GHz Conducted Power [dBm]					
Freq [MHz]	Channel	IEEE Transmission Mode			
		802.11b	802.11g	802.11n	802.11ax
		Average	Average	Average	Average
2412	1	19.07	17.84	18.69	15.67
2437	6	19.14	17.59	18.72	15.71
2462	11	19.21	17.98	18.71	15.63

Table 9-16
5 GHz WLAN Maximum Average RF Power

5GHz (20MHz) Conducted Power [dBm]					
Freq [MHz]	Channel	IEEE Transmission Mode			
		802.11a	802.11n	802.11ac	802.11ax
		Average	Average	Average	Average
5180	36	16.62	16.22	16.31	14.92
5200	40	16.55	16.90	16.80	14.92
5220	44	16.87	16.63	16.58	14.54
5240	48	13.89	13.98	13.95	13.67
5260	52	16.75	16.98	16.94	14.99
5280	56	16.95	16.94	16.55	14.68
5300	60	16.91	16.96	16.91	14.63
5320	64	15.62	15.68	15.74	14.90
5500	100	16.87	16.87	16.99	14.99
5600	120	16.59	16.85	16.80	14.91
5620	124	16.93	16.99	16.99	14.98
5720	144	16.82	16.61	16.88	14.98
5745	149	16.96	16.66	16.94	14.71
5785	157	16.78	16.97	16.98	14.99
5825	165	16.98	16.73	16.61	14.70

Table 9-17
2.4 GHz WLAN Reduced Average RF Power

2.4GHz Conducted Power [dBm]					
Freq [MHz]	Channel	IEEE Transmission Mode			
		802.11b	802.11g	802.11n	802.11ax
		Average	Average	Average	Average
2412	1	16.92	16.69	16.64	15.69
2437	6	16.84	16.33	16.67	15.52
2462	11	16.79	16.47	16.66	15.59

FCC ID: A3LSMA528B	 SAR EVALUATION REPORT 		Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset	Page 40 of 86

Table 9-18
5 GHz WLAN Reduced Average RF Power

5GHz (40MHz) Conducted Power [dBm]				
Freq [MHz]	Channel	IEEE Transmission Mode		
		802.11n	802.11ac	802.11ax
		Average	Average	Average
5190	38	13.57	13.61	13.39
5230	46	13.87	13.86	13.64
5270	54	13.51	13.69	13.52
5310	62	12.45	12.41	12.44
5510	102	13.79	13.78	13.64
5590	118	13.52	13.51	13.27
5630	126	13.99	13.99	13.79
5710	142	13.72	13.75	13.52
5755	151	13.69	13.66	13.99
5795	159	12.43	12.82	12.77

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

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

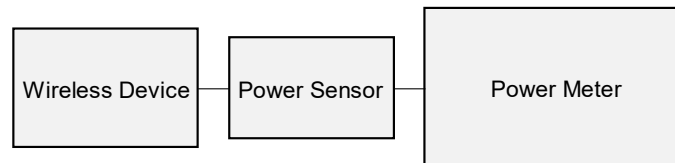


Figure 9-4
Power Measurement Setup

FCC ID: A3LSMA528B	 PCTEST Proud to be part of 	SAR EVALUATION REPORT		Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset	Page 41 of 86	

9.6 Bluetooth Conducted Powers

Table 9-19
Bluetooth Maximum Average RF Power

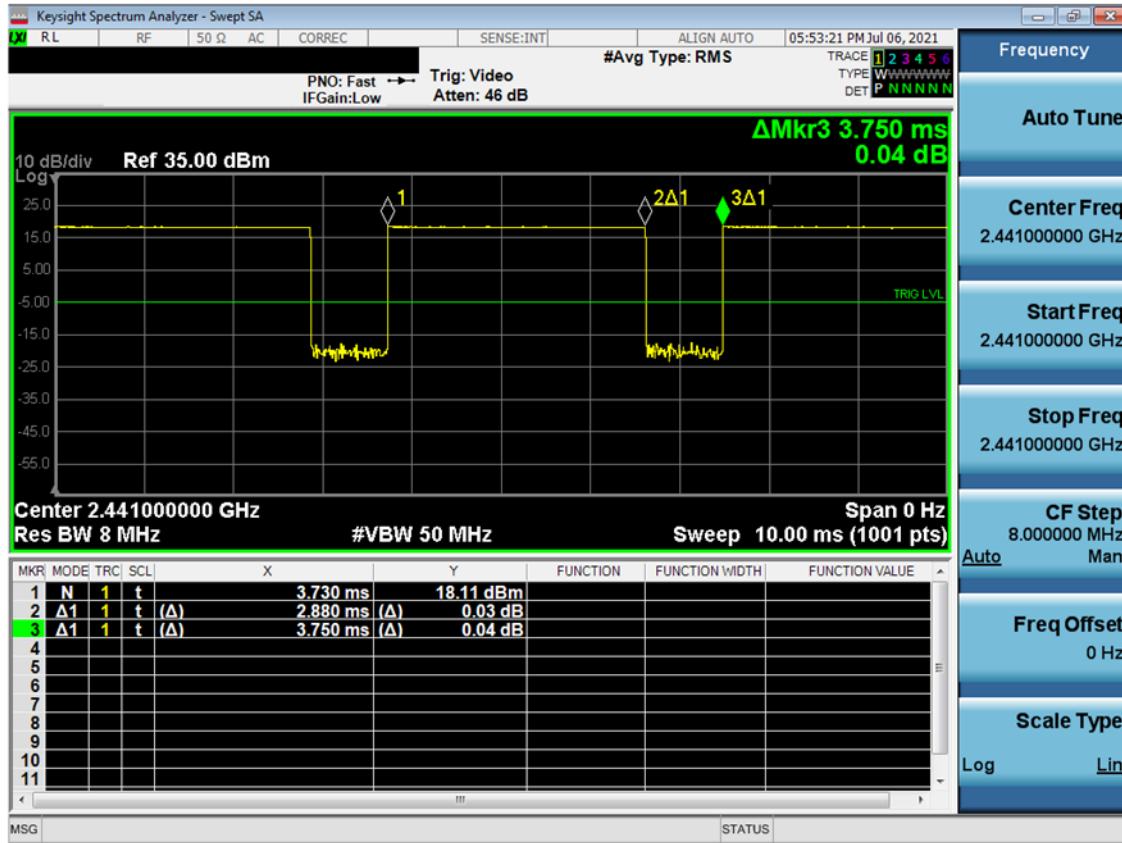
Frequency [MHz]	Data Rate [Mbps]	Mod.	Power Scheme	Channel No.	Avg Conducted Power	
					[dBm]	[mW]
2402	1.0	GFSK	ePA	0	17.09	51.200
2441	1.0	GFSK	ePA	39	18.94	78.261
2480	1.0	GFSK	ePA	78	18.01	63.176
2402	2.0	$\pi/4$ -DQPSK	ePA	0	13.16	20.682
2441	2.0	$\pi/4$ -DQPSK	ePA	39	15.76	37.636
2480	2.0	$\pi/4$ -DQPSK	ePA	78	14.69	29.455
2402	3.0	8DPSK	ePA	0	13.85	24.237
2441	3.0	8DPSK	ePA	39	15.82	38.162
2480	3.0	8DPSK	ePA	78	14.74	29.771

Table 9-20
Bluetooth Reduced Average RF Power

Frequency [MHz]	Data Rate [Mbps]	Mod.	Power Scheme	Channel No.	Avg Conducted Power	
					[dBm]	[mW]
2402	1.0	GFSK	ePA	0	14.02	25.206
2441	1.0	GFSK	ePA	39	15.76	37.627
2480	1.0	GFSK	ePA	78	14.77	29.957

FCC ID: A3LSMA528B	 PCTEST Proud to be part of 	SAR EVALUATION REPORT		Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset		Page 42 of 86

Figure 9-5
Bluetooth Transmission Plot



Equation 9-1
Bluetooth Duty Cycle Calculation

$$Duty\ Cycle = \frac{Pulse\ Width}{Period} * 100\% = \frac{2.88ms}{3.75ms} * 100\% = 76.8\%$$

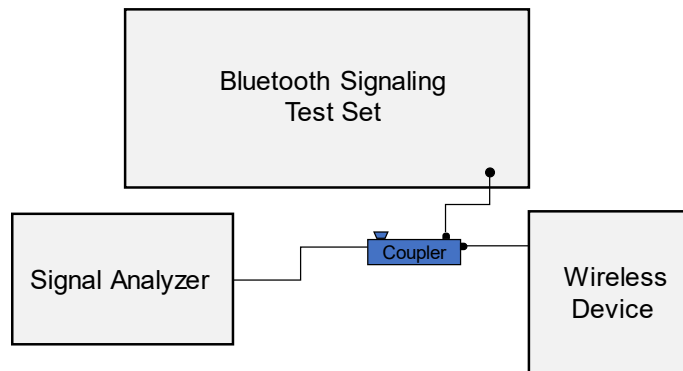


Figure 9-6
Power Measurement Setup

FCC ID: A3LSMA528B	 PCTEST Proud to be part of	SAR EVALUATION REPORT		Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset		Page 43 of 86

10 SYSTEM VERIFICATION

10.1 Tissue Verification

Table 10-1
Measured Tissue Properties - Head

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
07/05/2021	750 Head	20.7	680	0.867	41.498	0.888	42.305	-2.36%	-1.91%
			695	0.873	41.440	0.889	42.227	-1.80%	-1.86%
			700	0.875	41.418	0.889	42.201	-1.57%	-1.86%
			710	0.878	41.368	0.890	42.149	-1.35%	-1.85%
			725	0.883	41.301	0.891	42.071	-0.90%	-1.83%
			750	0.892	41.239	0.894	41.942	-0.22%	-1.68%
			770	0.900	41.227	0.895	41.838	0.56%	-1.46%
			785	0.906	41.188	0.896	41.760	1.12%	-1.37%
07/07/2021	835 Head	20.8	800	0.912	41.122	0.897	41.682	1.67%	-1.34%
			820	0.907	42.528	0.899	41.578	0.89%	2.28%
			835	0.923	42.345	0.900	41.500	2.56%	2.04%
07/18/2021	835 Head	22.3	850	0.938	42.155	0.916	41.500	2.40%	1.58%
			820	0.868	40.537	0.899	41.578	-3.45%	-2.50%
			835	0.883	40.346	0.900	41.500	-1.89%	-2.78%
07/06/2021	1750 Head	19.6	850	0.897	40.162	0.916	41.500	-2.07%	-3.22%
			1710	1.370	39.245	1.348	40.142	1.63%	-2.23%
			1720	1.380	39.201	1.354	40.126	1.92%	-2.31%
			1745	1.405	39.078	1.368	40.087	2.70%	-2.52%
			1750	1.410	39.053	1.371	40.079	2.84%	-2.56%
07/18/2021	1750 Head	21.6	1770	1.431	38.956	1.383	40.047	3.47%	-2.72%
			1790	1.453	38.861	1.394	40.016	4.23%	-2.89%
			1710	1.329	38.555	1.348	40.142	-1.41%	-3.95%
			1720	1.335	38.540	1.354	40.126	-1.40%	-3.95%
			1745	1.348	38.501	1.368	40.087	-1.46%	-3.96%
07/12/2021	1900 Head	22.1	1750	1.351	38.494	1.371	40.079	-1.46%	-3.95%
			1770	1.361	38.460	1.383	40.047	-1.59%	-3.96%
			1790	1.372	38.427	1.394	40.016	-1.58%	-3.97%
			1850	1.395	39.674	1.400	40.000	-0.36%	-0.82%
			1860	1.405	39.628	1.400	40.000	0.36%	-0.93%
07/07/2021	2450 Head	24.0	1880	1.426	39.541	1.400	40.000	1.86%	-1.15%
			1900	1.448	39.462	1.400	40.000	3.43%	-1.34%
			1905	1.453	39.441	1.400	40.000	3.79%	-1.40%
			1910	1.458	39.421	1.400	40.000	4.14%	-1.45%
			2400	1.784	37.366	1.756	39.289	1.59%	-4.89%
			2450	1.820	37.301	1.800	39.200	1.11%	-4.84%
			2480	1.841	37.270	1.833	39.162	0.44%	-4.83%
			2500	1.856	37.248	1.855	39.136	0.05%	-4.82%
			2510	1.864	37.235	1.866	39.123	-0.11%	-4.83%
			2535	1.884	37.199	1.893	39.092	-0.48%	-4.84%
			2550	1.895	37.179	1.909	39.073	-0.73%	-4.85%
			2560	1.903	37.167	1.920	39.060	-0.89%	-4.85%
			2600	1.934	37.112	1.964	39.009	-1.53%	-4.86%
			2650	1.972	37.039	2.018	38.945	-2.28%	-4.89%
			2680	1.995	36.992	2.051	38.907	-2.73%	-4.92%
			2700	2.009	36.958	2.073	38.882	-3.09%	-4.95%

FCC ID: A3LSMA528B	 PCTEST Proud to be part of 	SAR EVALUATION REPORT		Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset		Page 44 of 86

Table 10-2
Measured Tissue Properties – Head Continued

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
07/16/2021	2450 Head	22.2	2300	1.735	38.533	1.670	39.500	3.89%	-2.45%
			2310	1.741	38.511	1.679	39.480	3.69%	-2.45%
			2320	1.749	38.494	1.687	39.460	3.68%	-2.45%
			2400	1.808	38.416	1.756	39.289	2.96%	-2.22%
			2450	1.847	38.317	1.800	39.200	2.61%	-2.25%
			2480	1.873	38.301	1.833	39.162	2.18%	-2.20%
			2500	1.887	38.282	1.855	39.136	1.73%	-2.18%
			2510	1.894	38.262	1.866	39.123	1.50%	-2.20%
			2535	1.911	38.207	1.893	39.092	0.95%	-2.26%
			2550	1.925	38.180	1.909	39.073	0.84%	-2.29%
			2560	1.935	38.164	1.920	39.060	0.78%	-2.29%
			2600	1.971	38.126	1.964	39.009	0.36%	-2.26%
			2650	2.007	38.019	2.018	38.945	-0.55%	-2.38%
			2680	2.035	37.962	2.051	38.907	-0.78%	-2.43%
07/09/2021	5200-5800 Head	21.0	2700	2.053	37.938	2.073	38.882	-0.96%	-2.43%
			5180	4.484	34.671	4.635	36.009	-3.26%	-3.72%
			5190	4.493	34.651	4.645	35.998	-3.27%	-3.74%
			5200	4.502	34.631	4.655	35.986	-3.29%	-3.77%
			5210	4.514	34.605	4.666	35.975	-3.26%	-3.81%
			5220	4.526	34.580	4.676	35.963	-3.21%	-3.85%
			5240	4.551	34.543	4.696	35.940	-3.09%	-3.89%
			5250	4.561	34.526	4.706	35.929	-3.08%	-3.90%
			5260	4.573	34.509	4.717	35.917	-3.05%	-3.92%
			5270	4.585	34.488	4.727	35.906	-3.00%	-3.95%
			5280	4.597	34.472	4.737	35.894	-2.96%	-3.96%
			5290	4.607	34.463	4.748	35.883	-2.97%	-3.96%
			5300	4.615	34.462	4.758	35.871	-3.01%	-3.93%
			5310	4.626	34.452	4.768	35.860	-2.98%	-3.93%
			5320	4.639	34.433	4.778	35.849	-2.91%	-3.95%
			5500	4.835	34.138	4.963	35.643	-2.58%	-4.22%
			5510	4.849	34.124	4.973	35.632	-2.49%	-4.23%
			5520	4.862	34.110	4.983	35.620	-2.43%	-4.24%
			5530	4.876	34.097	4.994	35.609	-2.36%	-4.25%
			5540	4.887	34.086	5.004	35.597	-2.34%	-4.24%
			5550	4.898	34.075	5.014	35.586	-2.31%	-4.25%
			5560	4.909	34.068	5.024	35.574	-2.29%	-4.23%
			5580	4.927	34.032	5.045	35.551	-2.34%	-4.27%
			5600	4.949	33.982	5.065	35.529	-2.29%	-4.35%
			5610	4.963	33.963	5.076	35.518	-2.23%	-4.38%
			5620	4.976	33.946	5.086	35.506	-2.16%	-4.39%
			5640	4.999	33.916	5.106	35.483	-2.10%	-4.42%
			5660	5.021	33.906	5.127	35.460	-2.07%	-4.38%
			5670	5.029	33.898	5.137	35.449	-2.10%	-4.38%
			5680	5.037	33.885	5.147	35.437	-2.14%	-4.38%
			5690	5.046	33.863	5.158	35.426	-2.17%	-4.41%
			5700	5.057	33.840	5.168	35.414	-2.15%	-4.44%
			5710	5.068	33.819	5.178	35.403	-2.12%	-4.47%
			5720	5.079	33.794	5.188	35.391	-2.10%	-4.51%
			5745	5.109	33.743	5.214	35.363	-2.01%	-4.58%
			5750	5.114	33.737	5.219	35.357	-2.01%	-4.58%
			5755	5.120	33.733	5.224	35.351	-1.99%	-4.58%
			5765	5.129	33.727	5.234	35.340	-2.01%	-4.56%
			5775	5.136	33.719	5.245	35.329	-2.08%	-4.56%
			5785	5.144	33.703	5.255	35.317	-2.11%	-4.57%
			5795	5.153	33.685	5.265	35.305	-2.13%	-4.59%
			5805	5.162	33.670	5.275	35.294	-2.14%	-4.60%
			5825	5.182	33.618	5.296	35.271	-2.15%	-4.69%

FCC ID: A3LSMA528B	PCTEST Proud to be part of  SAR EVALUATION REPORT 		Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset	Page 45 of 86

Table 10-3
Measured Tissue Properties - Body

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
07/06/2021	750 Body	22.1	680	0.966	54.228	0.958	55.804	0.84%	-2.82%
			695	0.971	54.187	0.959	55.745	1.25%	-2.79%
			700	0.973	54.174	0.959	55.726	1.46%	-2.79%
			710	0.976	54.148	0.960	55.687	1.67%	-2.76%
			725	0.982	54.111	0.961	55.629	2.19%	-2.73%
			750	0.991	54.057	0.964	55.531	2.80%	-2.65%
			770	0.998	54.005	0.965	55.453	3.42%	-2.61%
			785	1.004	53.963	0.966	55.395	3.93%	-2.59%
07/06/2021	835 Body	23.4	800	1.010	53.927	0.967	55.336	4.45%	-2.55%
			820	0.923	52.714	0.969	55.258	-4.75%	-4.60%
			835	0.938	52.574	0.970	55.200	-3.30%	-4.76%
07/13/2021	1750 Body	23.5	850	0.954	52.435	0.988	55.154	-3.44%	-4.93%
			1710	1.414	52.329	1.463	53.537	-3.35%	-2.26%
			1720	1.425	52.294	1.469	53.511	-3.00%	-2.27%
			1745	1.451	52.198	1.485	53.445	-2.29%	-2.33%
			1750	1.456	52.178	1.488	53.432	-2.15%	-2.35%
			1770	1.477	52.102	1.501	53.379	-1.60%	-2.39%
07/16/2021	1750 Body	22.6	1790	1.497	52.033	1.514	53.326	-1.12%	-2.42%
			1710	1.425	51.657	1.463	53.537	-2.60%	-3.51%
			1720	1.436	51.618	1.469	53.511	-2.25%	-3.54%
			1745	1.462	51.519	1.485	53.445	-1.55%	-3.60%
			1750	1.468	51.499	1.488	53.432	-1.34%	-3.62%
			1770	1.488	51.418	1.501	53.379	-0.87%	-3.67%
07/21/2021	1750 Body	22.0	1790	1.510	51.338	1.514	53.326	-0.26%	-3.73%
			1710	1.492	52.097	1.463	53.537	1.98%	-2.69%
			1720	1.502	52.048	1.469	53.511	2.25%	-2.73%
			1745	1.532	51.968	1.485	53.445	3.16%	-2.76%
			1750	1.539	51.957	1.488	53.432	3.43%	-2.76%
			1770	1.562	51.913	1.501	53.379	4.06%	-2.75%
07/25/2021	1750 Body	22.1	1790	1.582	51.843	1.514	53.326	4.49%	-2.78%
			1710	1.496	51.978	1.463	53.537	2.26%	-2.91%
			1720	1.506	51.944	1.469	53.511	2.52%	-2.93%
			1745	1.535	51.855	1.485	53.445	3.37%	-2.98%
			1750	1.540	51.837	1.488	53.432	3.49%	-2.99%
			1770	1.563	51.761	1.501	53.379	4.13%	-3.03%
07/07/2021	1900 Body	22.4	1790	1.586	51.684	1.514	53.326	4.76%	-3.08%
			1850	1.506	51.850	1.520	53.300	-0.92%	-2.72%
			1860	1.517	51.817	1.520	53.300	-0.20%	-2.78%
			1880	1.539	51.752	1.520	53.300	1.25%	-2.90%
			1900	1.562	51.686	1.520	53.300	2.76%	-3.03%
			1905	1.568	51.668	1.520	53.300	3.16%	-3.06%
07/09/2021	1900 Body	22.6	1910	1.574	51.650	1.520	53.300	3.55%	-3.10%
			1850	1.502	53.015	1.520	53.300	-1.18%	-0.53%
			1860	1.513	52.983	1.520	53.300	-0.46%	-0.59%
			1880	1.535	52.923	1.520	53.300	0.99%	-0.71%
			1900	1.557	52.863	1.520	53.300	2.43%	-0.82%
			1905	1.563	52.847	1.520	53.300	2.83%	-0.85%
07/09/2021	1900 Body	22.6	1910	1.569	52.832	1.520	53.300	3.22%	-0.88%

FCC ID: A3LSMA528B	PCTEST Proud to be part of  SAR EVALUATION REPORT 		Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset	Page 46 of 86

Table 10-4
Measured Tissue Properties – Body Continued

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
07/06/2021	2450 Body	24.5	2300	1.741	52.641	1.809	52.900	-3.76%	-0.49%
			2310	1.754	52.601	1.816	52.887	-3.41%	-0.54%
			2320	1.768	52.568	1.826	52.873	-3.18%	-0.58%
			2400	1.872	52.308	1.902	52.767	-1.58%	-0.87%
			2450	1.940	52.122	1.950	52.700	-0.51%	-1.10%
			2480	1.982	52.033	1.993	52.662	-0.55%	-1.19%
			2500	2.007	51.959	2.021	52.636	-0.69%	-1.29%
			2510	2.019	51.916	2.035	52.623	-0.79%	-1.34%
			2535	2.051	51.804	2.071	52.592	-0.97%	-1.50%
			2550	2.073	51.749	2.092	52.573	-0.91%	-1.57%
			2560	2.088	51.715	2.106	52.560	-0.85%	-1.61%
			2600	2.142	51.597	2.163	52.509	-0.97%	-1.74%
			2650	2.205	51.383	2.234	52.445	-1.30%	-2.02%
			2680	2.250	51.281	2.277	52.407	-1.19%	-2.15%
			2700	2.278	51.227	2.305	52.382	-1.17%	-2.20%
07/04/2021	5200-5800 Body	24.5	5180	5.215	48.069	5.276	49.041	-1.16%	-1.98%
			5190	5.228	48.047	5.288	49.028	-1.13%	-2.00%
			5200	5.241	48.023	5.299	49.014	-1.09%	-2.02%
			5210	5.254	48.000	5.311	49.001	-1.07%	-2.04%
			5220	5.270	47.989	5.323	48.987	-1.00%	-2.04%
			5240	5.300	47.947	5.346	48.960	-0.86%	-2.07%
			5250	5.311	47.917	5.358	48.947	-0.88%	-2.10%
			5260	5.321	47.907	5.369	48.933	-0.89%	-2.10%
			5270	5.337	47.901	5.381	48.919	-0.82%	-2.08%
			5280	5.353	47.890	5.393	48.906	-0.74%	-2.08%
			5290	5.367	47.878	5.404	48.892	-0.68%	-2.07%
			5300	5.383	47.868	5.416	48.879	-0.61%	-2.07%
			5310	5.399	47.860	5.428	48.865	-0.53%	-2.06%
			5320	5.417	47.837	5.439	48.851	-0.40%	-2.08%
			5500	5.668	47.542	5.650	48.607	0.32%	-2.19%
			5510	5.683	47.527	5.661	48.594	0.39%	-2.20%
			5520	5.701	47.517	5.673	48.580	0.49%	-2.19%
			5530	5.718	47.506	5.685	48.566	0.58%	-2.18%
			5540	5.732	47.500	5.696	48.553	0.63%	-2.17%
			5550	5.747	47.490	5.708	48.539	0.68%	-2.16%
			5560	5.762	47.475	5.720	48.526	0.73%	-2.17%
			5580	5.786	47.428	5.743	48.499	0.75%	-2.21%
			5600	5.814	47.383	5.766	48.471	0.83%	-2.24%
			5610	5.828	47.365	5.778	48.458	0.87%	-2.26%
			5620	5.845	47.346	5.790	48.444	0.95%	-2.27%
			5640	5.875	47.321	5.813	48.417	1.07%	-2.26%
			5660	5.901	47.310	5.837	48.390	1.10%	-2.23%
			5670	5.913	47.299	5.848	48.376	1.11%	-2.23%
			5680	5.925	47.280	5.860	48.363	1.11%	-2.24%
			5690	5.939	47.251	5.872	48.349	1.14%	-2.27%
			5700	5.952	47.226	5.883	48.336	1.17%	-2.30%
			5710	5.965	47.208	5.895	48.322	1.19%	-2.31%
			5720	5.980	47.190	5.907	48.309	1.24%	-2.32%
			5745	6.019	47.142	5.936	48.275	1.40%	-2.35%
			5750	6.026	47.137	5.942	48.268	1.41%	-2.34%
			5755	6.031	47.136	5.947	48.261	1.41%	-2.33%
			5765	6.041	47.131	5.959	48.248	1.38%	-2.32%
			5775	6.052	47.117	5.971	48.234	1.36%	-2.32%
			5785	6.065	47.104	5.982	48.220	1.39%	-2.31%
			5795	6.079	47.084	5.994	48.207	1.42%	-2.33%
			5800	6.088	47.078	6.000	48.200	1.47%	-2.33%
			5805	6.095	47.068	6.006	48.193	1.48%	-2.33%
			5825	6.119	47.004	6.029	48.166	1.49%	-2.41%

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

FCC ID: A3LSMA528B	 PCTEST Proud to be part of the Microsoft ecosystem	SAR EVALUATION REPORT		Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset		Page 47 of 86

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 10-5
System Verification Results – 1g

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 SAR1g (W/kg)	1W Target SAR1g (W/kg)	1W Normalized SAR 1g (W/kg)	Deviation1g (%)
E	750	HEAD	07/05/2021	22.2	20.7	0.2	1161	7571	1.68	8.03	8.400	4.61%
I	835	HEAD	07/07/2021	21.6	20.8	0.2	4d133	7551	1.95	9.43	9.750	3.39%
D	835	HEAD	07/18/2021	23.9	22.3	0.2	4d133	3589	1.90	9.43	9.500	0.74%
P	1750	HEAD	07/06/2021	21.5	20.2	0.1	1148	7308	3.31	35.90	33.100	-7.80%
J	1750	HEAD	07/18/2021	21.3	21.6	0.1	1150	7526	3.56	36.50	35.600	-2.47%
I	1900	HEAD	07/12/2021	22.0	21.7	0.1	5d149	7551	3.98	39.30	39.800	1.27%
E	2450	HEAD	07/07/2021	25.0	24.0	0.1	719	7571	5.28	51.40	52.800	2.72%
E	2450	HEAD	07/16/2021	24.7	23.7	0.1	719	7571	5.49	51.40	54.900	6.81%
E	2600	HEAD	07/07/2021	25.0	24.0	0.1	1064	7571	6.00	58.10	60.000	3.27%
K	5250	HEAD	07/09/2021	23.5	21.0	0.1	1191	7538	3.82	79.80	76.400	-4.26%
K	5600	HEAD	07/09/2021	23.5	21.0	0.1	1191	7538	4.18	81.80	83.600	2.20%
K	5750	HEAD	07/09/2021	23.5	21.0	0.1	1191	7538	3.81	79.30	76.200	-3.91%
G	750	BODY	07/06/2021	23.2	22.1	0.2	1161	7357	1.78	8.43	8.900	5.58%
H	835	BODY	07/06/2021	24.4	22.7	0.2	4d133	7409	2.00	9.75	10.000	2.56%
D	1750	BODY	07/13/2021	24.1	23.5	0.1	1150	3589	3.86	36.60	38.600	5.46%
P	1750	BODY	07/21/2021	21.5	20.3	0.1	1148	7308	3.85	36.30	38.500	6.06%
D	1900	BODY	07/07/2021	23.7	22.4	0.1	5d080	3589	4.06	39.20	40.600	3.57%
D	1900	BODY	07/09/2021	23.9	22.6	0.1	5d080	3589	3.92	39.20	39.200	0.00%
L	2450	BODY	07/06/2021	21.0	24.5	0.1	981	7539	4.80	50.10	48.000	-4.19%
L	2600	BODY	07/06/2021	21.0	24.5	0.1	1071	7539	5.16	54.30	51.600	-4.97%
J	5250	BODY	07/04/2021	21.3	22.5	0.1	1191	7526	3.52	74.60	70.400	-5.63%
J	5600	BODY	07/04/2021	21.3	22.5	0.1	1191	7526	3.62	78.10	72.400	-7.30%
J	5750	BODY	07/04/2021	21.3	22.5	0.1	1191	7526	3.59	74.90	71.800	-4.14%

FCC ID: A3LSMA528B	 PCTEST Proud to be part of 	SAR EVALUATION REPORT		Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset		Page 48 of 86

Table 10-6
System Verification Results – 10g

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 SAR10g (W/kg)	1W Target SAR10g (W/kg)	1W Normalized SAR10g (W/kg)	Deviation10g (%)
D	1750	BODY	07/16/2021	23.1	22.6	0.1	1150	3589	2.020	19.40	20.200	4.12%
P	1750	BODY	07/21/2021	21.5	20.3	0.1	1148	7308	2.000	19.30	20.000	3.63%
P	1750	BODY	07/25/2021	21.5	22.1	0.1	1150	7308	1.920	19.40	19.200	-1.03%
D	1900	BODY	07/07/2021	23.7	22.4	0.1	5d080	3589	2.080	20.60	20.800	0.97%
D	1900	BODY	07/09/2021	23.9	22.6	0.1	5d080	3589	2.020	20.60	20.200	-1.94%
J	5250	BODY	07/04/2021	21.3	22.5	0.1	1191	7526	0.990	21.00	19.800	-5.71%
J	5600	BODY	07/04/2021	21.3	22.5	0.1	1191	7526	1.000	21.70	20.000	-7.83%
J	5750	BODY	07/04/2021	21.3	22.5	0.1	1191	7526	1.010	20.80	20.200	-2.88%

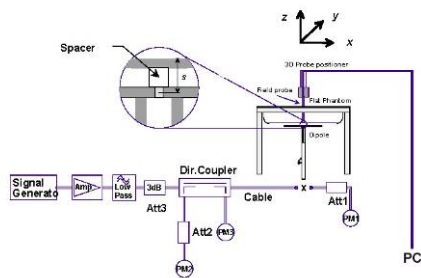


Figure 10-1
System Verification Setup Diagram



Figure 10-2
System Verification Setup Photo

FCC ID: A3LSMA528B	 Proud to be part of 	SAR EVALUATION REPORT		Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset		Page 49 of 86

11 SAR DATA SUMMARY

11.1 Standalone Head SAR Data

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

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	# of Time Slots	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
848.80	251	GSM 850	GSM	33.0	31.92	0.06	Right	Cheek	28261	1	1:8.3	0.240	1.282	0.308	A1
848.80	251	GSM 850	GSM	33.0	31.92	-0.08	Right	Tilt	28261	1	1:8.3	0.113	1.282	0.145	
848.80	251	GSM 850	GSM	33.0	31.92	0.08	Left	Cheek	28261	1	1:8.3	0.190	1.282	0.244	
848.80	251	GSM 850	GSM	33.0	31.92	0.03	Left	Tilt	28261	1	1:8.3	0.097	1.282	0.124	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Head 1.6 W/kg (mW/g) averaged over 1 gram								

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

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	# of Time Slots	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
1850.20	512	GSM 1900	GSM	30.5	29.76	0.11	Right	Cheek	25440	1	1:8.3	0.056	1.186	0.066	
1850.20	512	GSM 1900	GSM	30.5	29.76	0.02	Right	Tilt	25440	1	1:8.3	0.049	1.186	0.058	
1850.20	512	GSM 1900	GSM	30.5	29.76	0.15	Left	Cheek	25440	1	1:8.3	0.073	1.186	0.087	A2
1850.20	512	GSM 1900	GSM	30.5	29.76	-0.10	Left	Tilt	25440	1	1:8.3	0.058	1.186	0.069	
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
UMTS 850 Head SAR**

MEASUREMENT RESULTS														
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
826.40	4132	UMTS 850	RMC	25.0	23.58	-0.03	Right	Cheek	28261	1:1	0.257	1.387	0.356	A3
826.40	4132	UMTS 850	RMC	25.0	23.58	-0.08	Right	Tilt	28261	1:1	0.114	1.387	0.158	
826.40	4132	UMTS 850	RMC	25.0	23.58	0.06	Left	Cheek	28261	1:1	0.225	1.387	0.312	
826.40	4132	UMTS 850	RMC	25.0	23.58	0.02	Left	Tilt	28261	1:1	0.115	1.387	0.160	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Head 1.6 W/kg (mW/g) averaged over 1 gram							

FCC ID: A3LSMA528B		SAR EVALUATION REPORT		Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset		Page 50 of 86

Table 11-4
UMTS 1750 Head SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
1712.40	1312	UMTS 1750	RMC	24.5	23.27	0.10	Right	Cheek	30747	1:1	0.100	1.327	0.133	
1712.40	1312	UMTS 1750	RMC	24.5	23.27	-0.12	Right	Tilt	30747	1:1	0.074	1.327	0.098	
1712.40	1312	UMTS 1750	RMC	24.5	23.27	0.19	Left	Cheek	30747	1:1	0.105	1.327	0.139	A4
1712.40	1312	UMTS 1750	RMC	24.5	23.27	-0.11	Left	Tilt	30747	1:1	0.101	1.327	0.134	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Head 1.6 W/kg (mW/g) averaged over 1 gram							

Table 11-5
UMTS 1900 Head SAR

MEASUREMENT RESULTS														
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.										(W/kg)		(W/kg)	
1852.40	9262	UMTS 1900	RMC	24.5	23.09	0.03	Right	Cheek	25440	1:1	0.120	1.384	0.166	
1852.40	9262	UMTS 1900	RMC	24.5	23.09	0.15	Right	Tilt	25440	1:1	0.101	1.384	0.140	
1852.40	9262	UMTS 1900	RMC	24.5	23.09	0.05	Left	Cheek	25440	1:1	0.147	1.384	0.203	A5
1852.40	9262	UMTS 1900	RMC	24.5	23.09	0.08	Left	Tilt	25440	1:1	0.135	1.384	0.187	
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 11-6
LTE Band 12 Head SAR

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
MHz	Ch.														(W/kg)		(W/kg)		
707.50	23095	Mid	LTE Band 12	10	25.5	24.36	-0.08	0	Right	Cheek	QPSK	1	49	26133	1:1	0.252	1.300	0.328	A6
707.50	23095	Mid	LTE Band 12	10	24.5	23.37	-0.05	1	Right	Cheek	QPSK	25	25	26133	1:1	0.177	1.297	0.230	
707.50	23095	Mid	LTE Band 12	10	25.5	24.36	0.05	0	Right	Tilt	QPSK	1	49	26133	1:1	0.102	1.300	0.133	
707.50	23095	Mid	LTE Band 12	10	24.5	23.37	0.09	1	Right	Tilt	QPSK	25	25	26133	1:1	0.067	1.297	0.087	
707.50	23095	Mid	LTE Band 12	10	25.5	24.36	0.06	0	Left	Cheek	QPSK	1	49	26133	1:1	0.181	1.300	0.235	
707.50	23095	Mid	LTE Band 12	10	24.5	23.37	0.07	1	Left	Cheek	QPSK	25	25	26133	1:1	0.129	1.297	0.167	
707.50	23095	Mid	LTE Band 12	10	25.5	24.36	0.07	0	Left	Tilt	QPSK	1	49	26133	1:1	0.079	1.300	0.103	
707.50	23095	Mid	LTE Band 12	10	24.5	23.37	0.06	1	Left	Tilt	QPSK	25	25	26133	1:1	0.053	1.297	0.069	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Head 1.6 W/kg (mW/g) averaged over 1 gram									

FCC ID: A3LSMA528B	 PCTEST Proud to be part of 	SAR EVALUATION REPORT		Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset	Page 51 of 86	

Table 11-7
LTE Band 26 (Cell) Head SAR

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
MHz	Ch.														(W/kg)		(W/kg)		
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.0	23.18	-0.03	0	Right	Cheek	QPSK	1	0	28261	1:1	0.205	1.521	0.312	A7
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.0	22.05	0.00	1	Right	Cheek	QPSK	36	37	28261	1:1	0.182	1.567	0.285	
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.0	23.18	0.04	0	Right	Tilt	QPSK	1	0	28261	1:1	0.092	1.521	0.140	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.0	22.05	0.11	1	Right	Tilt	QPSK	36	37	28261	1:1	0.081	1.567	0.127	
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.0	23.18	0.12	0	Left	Cheek	QPSK	1	0	28261	1:1	0.196	1.521	0.298	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.0	22.05	0.07	1	Left	Cheek	QPSK	36	37	28261	1:1	0.147	1.567	0.230	
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.0	23.18	-0.01	0	Left	Tilt	QPSK	1	0	28261	1:1	0.099	1.521	0.151	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.0	22.05	0.11	1	Left	Tilt	QPSK	36	37	28261	1:1	0.075	1.567	0.118	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Head 1.6 W/kg (mW/g) averaged over 1 gram									

Table 11-8
LTE Band 66 (AWS) Head SAR

MEASUREMENT RESULTS																			
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
1720.00	132072	Low	LTE Band 66 (AWS)	20	24.5	23.47	-0.07	0	Right	Cheek	QPSK	1	50	30747	1:1	0.113	1.268	0.143	
1720.00	132072	Low	LTE Band 66 (AWS)	20	23.5	22.52	0.16	1	Right	Cheek	QPSK	50	25	30747	1:1	0.091	1.253	0.114	
1720.00	132072	Low	LTE Band 66 (AWS)	20	24.5	23.47	0.03	0	Right	Tilt	QPSK	1	50	30747	1:1	0.109	1.268	0.138	
1720.00	132072	Low	LTE Band 66 (AWS)	20	23.5	22.52	-0.10	1	Right	Tilt	QPSK	50	25	30747	1:1	0.083	1.253	0.104	
1720.00	132072	Low	LTE Band 66 (AWS)	20	24.5	23.47	0.02	0	Left	Cheek	QPSK	1	50	30747	1:1	0.117	1.268	0.148	
1720.00	132072	Low	LTE Band 66 (AWS)	20	23.5	22.52	0.10	1	Left	Cheek	QPSK	50	25	30747	1:1	0.097	1.253	0.122	
1720.00	132072	Low	LTE Band 66 (AWS)	20	24.5	23.47	-0.18	0	Left	Tilt	QPSK	1	50	30747	1:1	0.144	1.268	0.183	A8
1720.00	132072	Low	LTE Band 66 (AWS)	20	23.5	22.52	0.06	1	Left	Tilt	QPSK	50	25	30747	1:1	0.108	1.253	0.135	
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 11-9
LTE Band 2 (PCS) Head SAR

MEASUREMENT RESULTS																			
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
1860.00	18700	Low	LTE Band 2 (PCS)	20	24.0	22.99	-0.04	0	Right	Cheek	QPSK	1	0	25440	1:1	0.119	1.262	0.150	
1860.00	18700	Low	LTE Band 2 (PCS)	20	23.0	22.11	0.05	1	Right	Cheek	QPSK	50	50	25440	1:1	0.096	1.227	0.118	
1860.00	18700	Low	LTE Band 2 (PCS)	20	24.0	22.99	0.08	0	Right	Tilt	QPSK	1	0	25440	1:1	0.093	1.262	0.117	
1860.00	18700	Low	LTE Band 2 (PCS)	20	23.0	22.11	0.11	1	Right	Tilt	QPSK	50	50	25440	1:1	0.087	1.227	0.107	
1860.00	18700	Low	LTE Band 2 (PCS)	20	24.0	22.99	0.13	0	Left	Cheek	QPSK	1	0	25440	1:1	0.137	1.262	0.173	A9
1860.00	18700	Low	LTE Band 2 (PCS)	20	23.0	22.11	0.06	1	Left	Cheek	QPSK	50	50	25440	1:1	0.118	1.227	0.145	
1860.00	18700	Low	LTE Band 2 (PCS)	20	24.0	22.99	-0.04	0	Left	Tilt	QPSK	1	0	25440	1:1	0.125	1.262	0.158	
1860.00	18700	Low	LTE Band 2 (PCS)	20	23.0	22.11	-0.02	1	Left	Tilt	QPSK	50	50	25440	1:1	0.120	1.227	0.147	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population											Head 1.6 W/kg (mW/g) averaged over 1 gram								

FCC ID: A3LSMA528B		SAR EVALUATION REPORT		Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset		Page 52 of 86

Table 11-10
LTE Band 41 Head SAR

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Modulation	RB Size	RB Offset	Device Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
MHz	Ch.														(W/kg)		(W/kg)		
2593.00	40620	Mid	LTE Band 41	20	24.5	23.28	0.16	0	Right	Cheek	QPSK	1	50	26349	1:1.58	0.133	1.324	0.176	
2593.00	40620	Mid	LTE Band 41	20	23.5	22.36	0.02	1	Right	Cheek	QPSK	50	25	26349	1:1.58	0.106	1.300	0.138	
2593.00	40620	Mid	LTE Band 41	20	24.5	23.28	0.15	0	Right	Tilt	QPSK	1	50	26349	1:1.58	0.087	1.324	0.115	
2593.00	40620	Mid	LTE Band 41	20	23.5	22.36	0.03	1	Right	Tilt	QPSK	50	25	26349	1:1.58	0.074	1.300	0.096	
2593.00	40620	Mid	LTE Band 41	20	24.5	23.28	-0.09	0	Left	Cheek	QPSK	1	50	26349	1:1.58	0.193	1.324	0.256	A10
2593.00	40620	Mid	LTE Band 41	20	23.5	22.36	-0.02	1	Left	Cheek	QPSK	50	25	26349	1:1.58	0.151	1.300	0.196	
2593.00	40620	Mid	LTE Band 41	20	24.5	23.28	0.07	0	Left	Tilt	QPSK	1	50	26349	1:1.58	0.086	1.324	0.114	
2593.00	40620	Mid	LTE Band 41	20	23.5	22.36	0.13	1	Left	Tilt	QPSK	50	25	26349	1:1.58	0.065	1.300	0.085	
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 11-11
NR Band n5 (Cell) Head SAR

MEASUREMENT RESULTS																				
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Waveform	Modulation	RB Size	RB Offset	Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
MHz	Ch.															(W/kg)		(W/kg)		
836.50	167300	Mid	NR Band n5 (Cell)	20	25.0	23.82	0.03	0	Right	Cheek	DFT-S-OFDM	QPSK	1	1	30598	1:1	0.249	1.312	0.327	A11
836.50	167300	Mid	NR Band n5 (Cell)	20	25.0	23.80	-0.01	0	Right	Cheek	DFT-S-OFDM	QPSK	50	28	30598	1:1	0.265	1.318	0.349	
836.50	167300	Mid	NR Band n5 (Cell)	20	23.5	22.84	0.01	1.5	Right	Cheek	CP-OFDM	QPSK	1	1	30598	1:1	0.189	1.164	0.220	
836.50	167300	Mid	NR Band n5 (Cell)	20	25.0	23.82	0.02	0	Right	Tilt	DFT-S-OFDM	QPSK	1	1	30598	1:1	0.124	1.312	0.163	
836.50	167300	Mid	NR Band n5 (Cell)	20	25.0	23.80	0.04	0	Right	Tilt	DFT-S-OFDM	QPSK	50	28	30598	1:1	0.135	1.318	0.178	
836.50	167300	Mid	NR Band n5 (Cell)	20	25.0	23.82	-0.03	0	Left	Cheek	DFT-S-OFDM	QPSK	1	1	30598	1:1	0.191	1.312	0.251	
836.50	167300	Mid	NR Band n5 (Cell)	20	25.0	23.80	-0.04	0	Left	Cheek	DFT-S-OFDM	QPSK	50	28	30598	1:1	0.214	1.318	0.282	
836.50	167300	Mid	NR Band n5 (Cell)	20	25.0	23.82	0.12	0	Left	Tilt	DFT-S-OFDM	QPSK	1	1	30598	1:1	0.102	1.312	0.134	
836.50	167300	Mid	NR Band n5 (Cell)	20	25.0	23.80	0.01	0	Left	Tilt	DFT-S-OFDM	QPSK	50	28	30598	1:1	0.114	1.318	0.150	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Head 1.6 W/kg (mW/g) averaged over 1 gram										

Table 11-12
NR Band n66 (AWS) Head SAR

MEASUREMENT RESULTS																				
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Side	Test Position	Waveform	Modulation	RB Size	RB Offset	Serial Number	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
MHz	Ch.															(W/kg)		(W/kg)		
1720.00	344000	Low	NR Band n66 (AWS)	20	25.0	24.71	-0.10	0	Right	Cheek	DFT-S-OFDM	QPSK	1	104	30747	1:1	0.059	1.069	0.063	A12
1720.00	344000	Low	NR Band n66 (AWS)	20	25.0	24.61	0.05	0	Right	Cheek	DFT-S-OFDM	QPSK	50	28	30747	1:1	0.056	1.094	0.061	
1720.00	344000	Low	NR Band n66 (AWS)	20	25.0	24.71	-0.12	0	Right	Tilt	DFT-S-OFDM	QPSK	1	104	30747	1:1	0.056	1.069	0.060	
1720.00	344000	Low	NR Band n66 (AWS)	20	25.0	24.61	0.12	0	Right	Tilt	DFT-S-OFDM	QPSK	50	28	30747	1:1	0.057	1.094	0.062	
1720.00	344000	Low	NR Band n66 (AWS)	20	25.0	24.71	-0.10	0	Left	Cheek	DFT-S-OFDM	QPSK	1	104	30747	1:1	0.083	1.069	0.089	
1720.00	344000	Low	NR Band n66 (AWS)	20	25.0	24.61	-0.02	0	Left	Cheek	DFT-S-OFDM	QPSK	50	28	30747	1:1	0.070	1.094	0.077	
1745.00	349000	Md	NR Band n66 (AWS)	20	23.5	23.15	0.12	1.5	Left	Cheek	CP-OFDM	QPSK	1	1	30747	1:1	0.058	1.084	0.063	
1720.00	344000	Low	NR Band n66 (AWS)	20	25.0	24.71	-0.01	0	Left	Tilt	DFT-S-OFDM	QPSK	1	104	30747	1:1	0.071	1.069	0.076	
1720.00	344000	Low	NR Band n66 (AWS)	20	25.0	24.61	0.07	0	Left	Tilt	DFT-S-OFDM	QPSK	50	28	30747	1:1	0.062	1.094	0.068	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population										Head 1.6 W/kg (mW/g) averaged over 1 gram										

FCC ID: A3LSMA528B		SAR EVALUATION REPORT		Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset		Page 53 of 86

**Table 11-13
DTS Head SAR**

MEASUREMENT RESULTS																		
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Data Rate (Mbps)	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.												W/kg	(W/kg)			(W/kg)	
2412	1	802.11b	DSSS	22	17.0	16.92	0.07	Right	Cheek	25580	1	98.9	0.712	0.450	1.019	1.011	0.464	A13
2412	1	802.11b	DSSS	22	17.0	16.92	0.15	Right	Tilt	25580	1	98.9	0.572	0.404	1.019	1.011	0.416	
2412	1	802.11b	DSSS	22	17.0	16.92	0.03	Left	Cheek	25580	1	98.9	0.391	-	1.019	1.011	-	
2412	1	802.11b	DSSS	22	17.0	16.92	0.13	Left	Tilt	25580	1	98.9	0.564	-	1.019	1.011	-	
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 11-14
NII Head SAR**

MEASUREMENT RESULTS																		
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Data Rate (Mbps)	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.												W/kg	(W/kg)			(W/kg)	
5270	54	802.11n	OFDM	40	14.0	13.51	-0.02	Right	Cheek	25580	13.5	96.1	0.807	0.575	1.119	1.041	0.670	A14
5270	54	802.11n	OFDM	40	14.0	13.51	0.03	Right	Tilt	25580	13.5	96.1	0.498	0.317	1.119	1.041	0.369	
5270	54	802.11n	OFDM	40	14.0	13.51	0.06	Left	Cheek	25580	13.5	96.1	0.140	-	1.119	1.041	-	
5270	54	802.11n	OFDM	40	14.0	13.51	0.09	Left	Tilt	25580	13.5	96.1	0.150	-	1.119	1.041	-	
5630	126	802.11n	OFDM	40	14.0	13.99	-0.03	Right	Cheek	25580	13.5	96.1	0.429	0.396	1.002	1.041	0.413	
5630	126	802.11n	OFDM	40	14.0	13.99	0.00	Right	Tilt	25580	13.5	96.1	0.257	0.241	1.002	1.041	0.251	
5630	126	802.11n	OFDM	40	14.0	13.99	-0.03	Left	Cheek	25580	13.5	96.1	0.110	-	1.002	1.041	-	
5630	126	802.11n	OFDM	40	14.0	13.99	0.03	Left	Tilt	25580	13.5	96.1	0.083	-	1.002	1.041	-	
5755	151	802.11n	OFDM	40	14.0	13.69	0.02	Right	Cheek	25580	13.5	96.1	0.796	0.563	1.074	1.041	0.629	
5755	151	802.11n	OFDM	40	14.0	13.69	0.08	Right	Tilt	25580	13.5	96.1	0.525	0.377	1.074	1.041	0.421	
5755	151	802.11n	OFDM	40	14.0	13.69	0.01	Left	Cheek	25580	13.5	96.1	0.180	-	1.074	1.041	-	
5755	151	802.11n	OFDM	40	14.0	13.69	0.09	Left	Tilt	25580	13.5	96.1	0.134	-	1.074	1.041	-	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT																		
Spatial Peak									Head									
Uncontrolled Exposure/General Population									1.6 W/kg (mW/g)									
									averaged over 1 gram									

**Table 11-15
DSS Head SAR**

MEASUREMENT RESULTS																
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Side	Test Position	Device Serial Number	Data Rate (Mbps)	Duty Cycle (%)	SAR (1g)	Scaling Factor (Cond Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.											(W/kg)			(W/kg)	
2441.00	39	Bluetooth	FHSS	16.0	15.76	0.02	Right	Cheek	27099	1	76.80	0.314	1.057	1.302	0.432	A15
2441.00	39	Bluetooth	FHSS	16.0	15.76	0.03	Right	Tilt	27099	1	76.80	0.303	1.057	1.302	0.417	
2441.00	39	Bluetooth	FHSS	16.0	15.76	0.02	Left	Cheek	27099	1	76.80	0.193	1.057	1.302	0.266	
2441.00	39	Bluetooth	FHSS	16.0	15.76	0.03	Left	Tilt	27099	1	76.80	0.251	1.057	1.302	0.345	
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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Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset		Page 54 of 86

11.2 Standalone Body-Worn SAR Data

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

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	# of Time Slots	Duty Cycle	Side	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
848.80	251	GSM 850	GSM	33.0	31.92	0.04	15 mm	29202	1	1:8.3	back	0.209	1.282	0.268	A16
1850.20	512	GSM 1900	GSM	30.5	29.76	0.05	15 mm	26349	1	1:8.3	back	0.077	1.186	0.091	A18
826.40	4132	UMTS 850	RMC	25.0	23.58	0.02	15 mm	29202	N/A	1:1	back	0.265	1.387	0.368	A20
1712.40	1312	UMTS 1750	RMC	24.5	23.27	0.05	15 mm	26398	N/A	1:1	back	0.158	1.327	0.210	A22
1852.40	9262	UMTS 1900	RMC	24.5	23.09	0.03	15 mm	26398	N/A	1:1	back	0.161	1.384	0.223	A24
ANSI / IEEE C95.1 1992 - SAFETY LIMIT							Body								
Spatial Peak							1.6 W/kg (mW/g)								
Uncontrolled Exposure/General Population							averaged over 1 gram								

Table 11-17
LTE Body-Worn SAR Data

MEASUREMENT RESULTS																			
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.	(W/kg)														(W/kg)			
707.50	23095	Mid	LTE Band 12	10	25.5	24.36	0.01	0	26349	QPSK	1	49	15 mm	back	1:1	0.304	1.300	0.395	A26
707.50	23095	Mid	LTE Band 12	10	24.5	23.37	0.03	1	26349	QPSK	25	25	15 mm	back	1:1	0.235	1.297	0.305	
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.0	23.18	-0.01	0	29202	QPSK	1	0	15 mm	back	1:1	0.231	1.521	0.351	A28
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.0	22.05	0.00	1	29202	QPSK	36	37	15 mm	back	1:1	0.185	1.567	0.290	
1720.00	132072	Low	LTE Band 66 (AWS)	20	24.5	23.47	0.02	0	26398	QPSK	1	50	15 mm	back	1:1	0.162	1.268	0.205	A30
1720.00	132072	Low	LTE Band 66 (AWS)	20	23.5	22.52	-0.02	1	26398	QPSK	50	25	15 mm	back	1:1	0.138	1.253	0.173	
1860.00	18700	Low	LTE Band 2 (PCS)	20	24.0	22.99	-0.04	0	26349	QPSK	1	0	15 mm	back	1:1	0.195	1.262	0.246	A32
1860.00	18700	Low	LTE Band 2 (PCS)	20	23.0	22.11	0.03	1	26349	QPSK	50	50	15 mm	back	1:1	0.154	1.227	0.189	
2593.00	40620	Mid	LTE Band 41	20	24.5	23.28	0.11	0	27784	QPSK	1	50	15 mm	back	1:1.58	0.088	1.324	0.117	A34
2593.00	40620	Mid	LTE Band 41	20	23.5	22.36	-0.12	1	27784	QPSK	50	25	15 mm	back	1:1.58	0.071	1.300	0.092	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT									Body										
Spatial Peak									1.6 W/kg (mW/g)										
Uncontrolled Exposure/General Population									averaged over 1 gram										

Table 11-18
NR Body-Worn SAR Data

MEASUREMENT RESULTS																				
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	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)		
836.50	167300	Mid	NR Band n5 (Cell)	20	25.0	23.82	-0.03	0	29202	DFT-S-OFDM	QPSK	1	1	15 mm	back	1:1	0.255	1.312	0.335	A36
836.50	167300	Mid	NR Band n5 (Cell)	20	25.0	23.80	0.04	0	29202	DFT-S-OFDM	QPSK	50	28	15 mm	back	1:1	0.247	1.318	0.326	
836.50	167300	Mid	NR Band n5 (Cell)	20	23.5	22.84	0.00	1.5	29202	CP-OFDM	QPSK	1	1	15 mm	back	1:1	0.191	1.164	0.222	
1720.00	344000	Low	NR Band n66 (AWS)	20	25.0	24.71	0.03	0	30598	DFT-S-OFDM	QPSK	1	104	15 mm	back	1:1	0.209	1.069	0.223	A56
1720.00	344000	Low	NR Band n66 (AWS)	20	25.0	24.61	-0.02	0	30598	DFT-S-OFDM	QPSK	50	28	15 mm	back	1:1	0.192	1.094	0.210	
1745.00	349000	Mid	NR Band n66 (AWS)	20	23.5	23.15	0.06	1.5	30598	CP-OFDM	QPSK	1	1	15 mm	back	1:1	0.153	1.084	0.166	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT									Body											
Spatial Peak									1.6 W/kg (mW/g)											
Uncontrolled Exposure/General Population									averaged over 1 gram											

FCC ID: A3LSMA528B		SAR EVALUATION REPORT		Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset		Page 55 of 86

Table 11-19
DTS Body-Worn SAR Data

MEASUREMENT RESULTS																		
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.												W/kg	(W/kg)			(W/kg)	
2462	11	802.11b	DSSS	22	19.5	19.21	0.01	15 mm	26679	1	back	98.9	0.123	0.102	1.069	1.011	0.110	A40
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Body 1.6 W/kg (mW/g) averaged over 1 gram										

Table 11-20
NII Body-Worn SAR Data

MEASUREMENT RESULTS																		
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.												W/kg	(W/kg)			(W/kg)	
5280	56	802.11a	OFDM	20	17.0	16.95	0.00	15 mm	25580	6	back	96.6	0.349	0.252	1.012	1.035	0.264	A42
5620	124	802.11a	OFDM	20	17.0	16.93	-0.16	15 mm	25580	6	back	96.6	0.156	0.115	1.016	1.035	0.121	
5825	165	802.11a	OFDM	20	17.0	16.98	0.06	15 mm	25580	6	back	96.6	0.335	0.251	1.005	1.035	0.261	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT								Body										
Spatial Peak								1.6 W/kg (mW/g)										
Uncontrolled Exposure/General Population								averaged over 1 gram										

Table 11-21
DSS Body-Worn SAR Data

MEASUREMENT RESULTS																
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	SAR (1g)	Scaling Factor (Cond Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.											(W/kg)			(W/kg)	
2441	39	Bluetooth	FHSS	19.0	18.94	0.00	15 mm	26679	1	back	76.8	0.078	1.014	1.302	0.103	A44
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Body 1.6 W/kg (mW/g) averaged over 1 gram								

FCC ID: A3LSMA528B		SAR EVALUATION REPORT		Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset		Page 56 of 86

11.3 Standalone Hotspot SAR Data

Table 11-22
GPRS/UMTS Hotspot SAR Data

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	# of Time Slots	Duty Cycle	Side	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
836.60	190	GSM 850	GPRS	30.5	29.31	-0.14	10 mm	29202	3	1:2.76	back	0.313	1.315	0.412	A17
836.60	190	GSM 850	GPRS	30.5	29.31	-0.05	10 mm	29202	3	1:2.76	front	0.249	1.315	0.327	
836.60	190	GSM 850	GPRS	30.5	29.31	0.16	10 mm	29202	3	1:2.76	bottom	0.080	1.315	0.105	
836.60	190	GSM 850	GPRS	30.5	29.31	-0.03	10 mm	29202	3	1:2.76	right	0.291	1.315	0.383	
1909.80	810	GSM 1900	GPRS	27.5	27.14	-0.04	10 mm	26349	2	1:4.15	back	0.210	1.086	0.228	
1909.80	810	GSM 1900	GPRS	27.5	27.14	-0.10	10 mm	26349	2	1:4.15	front	0.190	1.086	0.206	
1909.80	810	GSM 1900	GPRS	27.5	27.14	-0.01	10 mm	26349	2	1:4.15	bottom	0.257	1.086	0.279	A19
1909.80	810	GSM 1900	GPRS	27.5	27.14	0.12	10 mm	26349	2	1:4.15	left	0.121	1.086	0.131	
826.40	4132	UMTS 850	RMC	25.0	23.58	-0.01	10 mm	29202	N/A	1:1	back	0.299	1.387	0.415	
826.40	4132	UMTS 850	RMC	25.0	23.58	0.19	10 mm	29202	N/A	1:1	front	0.244	1.387	0.338	
826.40	4132	UMTS 850	RMC	25.0	23.58	0.08	10 mm	29202	N/A	1:1	bottom	0.071	1.387	0.098	
826.40	4132	UMTS 850	RMC	25.0	23.58	-0.02	10 mm	29202	N/A	1:1	right	0.301	1.387	0.417	A21
1712.40	1312	UMTS 1750	RMC	23.5	23.00	0.04	10 mm	26398	N/A	1:1	back	0.218	1.122	0.245	
1712.40	1312	UMTS 1750	RMC	23.5	23.00	0.02	10 mm	26398	N/A	1:1	front	0.259	1.122	0.291	
1712.40	1312	UMTS 1750	RMC	23.5	23.00	0.01	10 mm	26398	N/A	1:1	bottom	0.326	1.122	0.366	A23
1712.40	1312	UMTS 1750	RMC	23.5	23.00	0.03	10 mm	26398	N/A	1:1	left	0.156	1.122	0.175	
1907.60	9538	UMTS 1900	RMC	23.5	22.86	0.01	10 mm	26398	N/A	1:1	back	0.311	1.159	0.360	
1907.60	9538	UMTS 1900	RMC	23.5	22.86	0.00	10 mm	26398	N/A	1:1	front	0.299	1.159	0.347	
1907.60	9538	UMTS 1900	RMC	23.5	22.86	-0.02	10 mm	26398	N/A	1:1	bottom	0.384	1.159	0.445	A25
1907.60	9538	UMTS 1900	RMC	23.5	22.86	0.01	10 mm	26398	N/A	1:1	left	0.199	1.159	0.231	
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 11-23
LTE Band 12 Hotspot SAR Data

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
MHz	Ch.														(W/kg)		(W/kg)		
707.50	23095	Mid	LTE Band 12	10	25.5	24.36	-0.01	0	26349	QPSK	1	49	10 mm	back	1:1	0.350	1.300	0.455	A27
707.50	23095	Mid	LTE Band 12	10	24.5	23.37	-0.02	1	26349	QPSK	25	25	10 mm	back	1:1	0.271	1.297	0.351	
707.50	23095	Mid	LTE Band 12	10	25.5	24.36	0.04	0	26349	QPSK	1	49	10 mm	front	1:1	0.285	1.300	0.371	
707.50	23095	Mid	LTE Band 12	10	24.5	23.37	0.01	1	26349	QPSK	25	25	10 mm	front	1:1	0.217	1.297	0.281	
707.50	23095	Mid	LTE Band 12	10	25.5	24.36	0.14	0	26349	QPSK	1	49	10 mm	bottom	1:1	0.100	1.300	0.130	
707.50	23095	Mid	LTE Band 12	10	24.5	23.37	-0.12	1	26349	QPSK	25	25	10 mm	bottom	1:1	0.081	1.297	0.105	
707.50	23095	Mid	LTE Band 12	10	25.5	24.36	0.09	0	26349	QPSK	1	49	10 mm	right	1:1	0.304	1.300	0.395	
707.50	23095	Mid	LTE Band 12	10	24.5	23.37	0.03	1	26349	QPSK	25	25	10 mm	right	1:1	0.234	1.297	0.303	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Body 1.6 W/kg (mW/g) averaged over 1 gram											

FCC ID: A3LSMA528B		SAR EVALUATION REPORT		Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset		Page 57 of 86

Table 11-24
LTE Band 26 (Cell) Hotspot SAR Data

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
MHz	Ch.														(W/kg)		(W/kg)		
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.0	23.18	0.03	0	29202	QPSK	1	0	10 mm	back	1:1	0.261	1.521	0.397	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.0	22.05	0.01	1	29202	QPSK	36	37	10 mm	back	1:1	0.211	1.567	0.331	
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.0	23.18	0.01	0	29202	QPSK	1	0	10 mm	front	1:1	0.211	1.521	0.321	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.0	22.05	-0.01	1	29202	QPSK	36	37	10 mm	front	1:1	0.172	1.567	0.270	
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.0	23.18	0.07	0	29202	QPSK	1	0	10 mm	bottom	1:1	0.068	1.521	0.103	
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.0	22.05	0.09	1	29202	QPSK	36	37	10 mm	bottom	1:1	0.060	1.567	0.094	
831.50	26865	Mid	LTE Band 26 (Cell)	15	25.0	23.18	0.00	0	29202	QPSK	1	0	10 mm	right	1:1	0.267	1.521	0.406	A29
831.50	26865	Mid	LTE Band 26 (Cell)	15	24.0	22.05	-0.01	1	29202	QPSK	36	37	10 mm	right	1:1	0.217	1.567	0.340	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Body 1.6 W/kg (mW/g) averaged over 1 gram											

Table 11-25
LTE Band 66 (AWS) Hotspot SAR Data

MEASUREMENT RESULTS																			
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.	(W/kg)														(W/kg)			
1720.00	132072	Low	LTE Band 66 (AWS)	20	23.5	22.22	-0.07	0	26398	QPSK	1	50	10 mm	back	1:1	0.263	1.343	0.353	
1720.00	132072	Low	LTE Band 66 (AWS)	20	23.5	22.36	0.02	0	26398	QPSK	50	25	10 mm	back	1:1	0.275	1.300	0.358	
1720.00	132072	Low	LTE Band 66 (AWS)	20	23.5	22.22	-0.11	0	26398	QPSK	1	50	10 mm	front	1:1	0.262	1.343	0.352	
1720.00	132072	Low	LTE Band 66 (AWS)	20	23.5	22.36	-0.02	0	26398	QPSK	50	25	10 mm	front	1:1	0.278	1.300	0.361	A31
1720.00	132072	Low	LTE Band 66 (AWS)	20	23.5	22.22	-0.06	0	26398	QPSK	1	50	10 mm	bottom	1:1	0.238	1.343	0.320	
1720.00	132072	Low	LTE Band 66 (AWS)	20	23.5	22.36	-0.01	0	26398	QPSK	50	25	10 mm	bottom	1:1	0.244	1.300	0.317	
1720.00	132072	Low	LTE Band 66 (AWS)	20	23.5	22.22	-0.04	0	26398	QPSK	1	50	10 mm	left	1:1	0.153	1.343	0.205	
1720.00	132072	Low	LTE Band 66 (AWS)	20	23.5	22.36	0.06	0	26398	QPSK	50	25	10 mm	left	1:1	0.151	1.300	0.196	
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 11-26
LTE Band 2 (PCS) Hotspot SAR Data

MEASUREMENT RESULTS																			
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
1860.00	18700	Low	LTE Band 2 (PCS)	20	23.0	21.76	0.05	0	26349	QPSK	1	0	10 mm	back	1:1	0.329	1.330	0.438	
1860.00	18700	Low	LTE Band 2 (PCS)	20	23.0	21.84	-0.02	0	26349	QPSK	50	25	10 mm	back	1:1	0.343	1.306	0.448	A33
1860.00	18700	Low	LTE Band 2 (PCS)	20	23.0	21.76	-0.02	0	26349	QPSK	1	0	10 mm	front	1:1	0.280	1.330	0.372	
1860.00	18700	Low	LTE Band 2 (PCS)	20	23.0	21.84	0.00	0	26349	QPSK	50	25	10 mm	front	1:1	0.279	1.306	0.364	
1860.00	18700	Low	LTE Band 2 (PCS)	20	23.0	21.76	0.05	0	26349	QPSK	1	0	10 mm	bottom	1:1	0.334	1.330	0.444	
1860.00	18700	Low	LTE Band 2 (PCS)	20	23.0	21.84	0.00	0	26349	QPSK	50	25	10 mm	bottom	1:1	0.337	1.306	0.440	
1860.00	18700	Low	LTE Band 2 (PCS)	20	23.0	21.76	0.04	0	26349	QPSK	1	0	10 mm	left	1:1	0.195	1.330	0.259	
1860.00	18700	Low	LTE Band 2 (PCS)	20	23.0	21.84	0.04	0	26349	QPSK	50	25	10 mm	left	1:1	0.205	1.306	0.268	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Body 1.6 W/kg (mW/g) averaged over 1 gram											

FCC ID: A3LSMA528B	 PCTEST Proud to be part of 	SAR EVALUATION REPORT		Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset		Page 58 of 86

Table 11-27
LTE Band 41 Hotspot SAR Data

MEASUREMENT RESULTS																			
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Device Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (1g)	Scaling Factor	Reported SAR (1g)	Plot #	
MHz	Ch.														(W/kg)		(W/kg)		
2593.00	40620	Mid	LTE Band 41	20	24.5	23.28	-0.05	0	27784	QPSK	1	50	10 mm	back	1:1.58	0.190	1.324	0.252	
2593.00	40620	Mid	LTE Band 41	20	23.5	22.36	0.08	1	27784	QPSK	50	25	10 mm	back	1:1.58	0.154	1.300	0.200	
2593.00	40620	Mid	LTE Band 41	20	24.5	23.28	0.00	0	27784	QPSK	1	50	10 mm	front	1:1.58	0.231	1.324	0.306	A35
2593.00	40620	Mid	LTE Band 41	20	23.5	22.36	0.02	1	27784	QPSK	50	25	10 mm	front	1:1.58	0.184	1.300	0.239	
2593.00	40620	Mid	LTE Band 41	20	24.5	23.28	-0.05	0	27784	QPSK	1	50	10 mm	bottom	1:1.58	0.181	1.324	0.240	
2593.00	40620	Mid	LTE Band 41	20	23.5	22.36	-0.09	1	27784	QPSK	50	25	10 mm	bottom	1:1.58	0.152	1.300	0.198	
2593.00	40620	Mid	LTE Band 41	20	24.5	23.28	-0.02	0	27784	QPSK	1	50	10 mm	left	1:1.58	0.156	1.324	0.207	
2593.00	40620	Mid	LTE Band 41	20	23.5	22.36	-0.01	1	27784	QPSK	50	25	10 mm	left	1:1.58	0.127	1.300	0.165	
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 11-28
NR Band n5 (Cell) Hotspot SAR Data

MEASUREMENT RESULTS																				
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	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)		
836.50	167300	Mid	NR Band n5 (Cell)	20	25.0	23.82	0.01	0	29202	DFT-S-OFDM	QPSK	1	1	10 mm	back	1:1	0.295	1.312	0.387	A37
836.50	167300	Mid	NR Band n5 (Cell)	20	25.0	23.80	0.00	0	29202	DFT-S-OFDM	QPSK	50	28	10 mm	back	1:1	0.286	1.318	0.377	
836.50	167300	Mid	NR Band n5 (Cell)	20	23.5	22.84	-0.02	1.5	29202	CP-OFDM	QPSK	1	1	10 mm	back	1:1	0.219	1.164	0.255	
836.50	167300	Mid	NR Band n5 (Cell)	20	25.0	23.82	0.03	0	29202	DFT-S-OFDM	QPSK	1	1	10 mm	front	1:1	0.241	1.312	0.316	
836.50	167300	Mid	NR Band n5 (Cell)	20	25.0	23.80	0.03	0	29202	DFT-S-OFDM	QPSK	50	28	10 mm	front	1:1	0.235	1.318	0.310	
836.50	167300	Mid	NR Band n5 (Cell)	20	25.0	23.82	0.06	0	29202	DFT-S-OFDM	QPSK	1	1	10 mm	bottom	1:1	0.070	1.312	0.092	
836.50	167300	Mid	NR Band n5 (Cell)	20	25.0	23.80	0.09	0	29202	DFT-S-OFDM	QPSK	50	28	10 mm	bottom	1:1	0.083	1.318	0.109	
836.50	167300	Mid	NR Band n5 (Cell)	20	25.0	23.82	-0.01	0	29202	DFT-S-OFDM	QPSK	1	1	10 mm	right	1:1	0.286	1.312	0.375	
836.50	167300	Mid	NR Band n5 (Cell)	20	25.0	23.80	0.00	0	29202	DFT-S-OFDM	QPSK	50	28	10 mm	right	1:1	0.271	1.318	0.357	
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 11-29
NR Band n66 (AWS) Hotspot SAR Data

MEASUREMENT RESULTS																				
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	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)		
1720.00	344000	Low	NR Band n66 (AWS)	20	23.5	22.99	0.05	0	30598	DFT-S-OFDM	QPSK	1	53	10 mm	back	1:1	0.275	1.125	0.309	
1720.00	344000	Low	NR Band n66 (AWS)	20	23.5	22.99	0.08	0	30598	DFT-S-OFDM	QPSK	50	28	10 mm	back	1:1	0.280	1.125	0.315	
1720.00	344000	Low	NR Band n66 (AWS)	20	23.5	22.99	0.03	0	30598	DFT-S-OFDM	QPSK	1	53	10 mm	front	1:1	0.333	1.125	0.375	
1720.00	344000	Low	NR Band n66 (AWS)	20	23.5	22.99	0.04	0	30598	DFT-S-OFDM	QPSK	50	28	10 mm	front	1:1	0.339	1.125	0.381	
1720.00	344000	Low	NR Band n66 (AWS)	20	23.5	22.85	0.06	0	30598	CP-OFDM	QPSK	1	1	10 mm	front	1:1	0.357	1.161	0.414	A39
1720.00	344000	Low	NR Band n66 (AWS)	20	23.5	22.99	-0.04	0	30598	DFT-S-OFDM	QPSK	1	53	10 mm	bottom	1:1	0.308	1.125	0.347	
1720.00	344000	Low	NR Band n66 (AWS)	20	23.5	22.99	0.09	0	30598	DFT-S-OFDM	QPSK	50	28	10 mm	bottom	1:1	0.308	1.125	0.347	
1720.00	344000	Low	NR Band n66 (AWS)	20	23.5	22.99	0.02	0	30598	DFT-S-OFDM	QPSK	1	53	10 mm	left	1:1	0.213	1.125	0.240	
1720.00	344000	Low	NR Band n66 (AWS)	20	23.5	22.99	-0.07	0	30598	DFT-S-OFDM	QPSK	50	28	10 mm	left	1:1	0.201	1.125	0.226	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT								Body												
Spatial Peak								1.6 W/kg (mW/g)												
Uncontrolled Exposure/General Population								averaged over 1 gram												

FCC ID: A3LSMA528B		SAR EVALUATION REPORT					Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset				Page 59 of 86	

Table 11-30
WLAN Hotspot SAR Data

MEASUREMENT RESULTS																		
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan	SAR (1g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.												W/kg	(W/kg)			(W/kg)	
2462	11	802.11b	DSSS	22	19.5	19.21	-0.03	10 mm	26679	1	back	98.9	0.232	-	1.069	1.011	-	
2462	11	802.11b	DSSS	22	19.5	19.21	-0.04	10 mm	26679	1	front	98.9	0.156	-	1.069	1.011	-	
2462	11	802.11b	DSSS	22	19.5	19.21	-0.04	10 mm	26679	1	top	98.9	0.325	0.263	1.069	1.011	0.284	A41
2462	11	802.11b	DSSS	22	19.5	19.21	-0.02	10 mm	26679	1	left	98.9	0.053	-	1.069	1.011	-	
5825	165	802.11a	OFDM	20	17.0	16.98	-0.03	10 mm	25580	6	back	96.6	0.494	0.392	1.005	1.035	0.408	
5825	165	802.11a	OFDM	20	17.0	16.98	-0.02	10 mm	25580	6	front	96.6	0.290	-	1.005	1.035	-	
5825	165	802.11a	OFDM	20	17.0	16.98	0.01	10 mm	25580	6	top	96.6	0.186	-	1.005	1.035	-	
5745	149	802.11a	OFDM	20	17.0	16.96	0.00	10 mm	25580	6	left	96.6	0.890	0.650	1.009	1.035	0.679	
5785	157	802.11a	OFDM	20	17.0	16.78	-0.02	10 mm	25580	6	left	96.6	0.910	0.665	1.052	1.035	0.724	
5825	165	802.11a	OFDM	20	17.0	16.98	-0.02	10 mm	25580	6	left	96.6	0.959	0.681	1.005	1.035	0.708	A43
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 11-31
DSS Hotspot SAR Data

MEASUREMENT RESULTS																
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	SAR (1g)	Scaling Factor (Cond Power)	Scaling Factor (Duty Cycle)	Reported SAR (1g)	Plot #
MHz	Ch.											(W/kg)			(W/kg)	
2441	39	Bluetooth	FHSS	19.0	18.94	-0.03	10 mm	26679	1	back	76.80	0.133	1.014	1.302	0.176	
2441	39	Bluetooth	FHSS	19.0	18.94	-0.08	10 mm	26679	1	front	76.80	0.086	1.014	1.302	0.114	
2441	39	Bluetooth	FHSS	19.0	18.94	0.00	10 mm	26679	1	top	76.80	0.188	1.014	1.302	0.248	A45
2441	39	Bluetooth	FHSS	19.0	18.94	0.01	10 mm	26679	1	left	76.80	0.023	1.014	1.302	0.030	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Body 1.6 W/kg (mW/g) averaged over 1 gram								

FCC ID: A3LSMA528B		SAR EVALUATION REPORT		Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset		Page 60 of 86

11.4 Standalone Phablet SAR Data

Table 11-32
GPRS/UMTS Phablet SAR Data

MEASUREMENT RESULTS															
FREQUENCY		Mode	Service	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	# of Time Slots	Duty Cycle	Side	SAR (10g)	Scaling Factor	Reported SAR (10g)	Plot #
MHz	Ch.											(W/kg)		(W/kg)	
1909.80	810	GSM 1900	GPRS	29.5	28.62	0.00	9 mm	26349	2	1:4.15	back	0.182	1.225	0.223	
1909.80	810	GSM 1900	GPRS	29.5	28.62	-0.07	5 mm	26349	2	1:4.15	front	0.365	1.225	0.447	
1909.80	810	GSM 1900	GPRS	29.5	28.62	-0.09	9 mm	26349	2	1:4.15	bottom	0.217	1.225	0.266	
1909.80	810	GSM 1900	GPRS	29.5	28.62	-0.03	0 mm	26349	2	1:4.15	left	0.839	1.225	1.028	
1909.80	810	GSM 1900	GPRS	27.5	27.14	0.02	0 mm	26349	2	1:4.15	back	0.812	1.086	0.882	
1909.80	810	GSM 1900	GPRS	27.5	27.14	0.03	0 mm	26349	2	1:4.15	front	0.856	1.086	0.930	A46
1909.80	810	GSM 1900	GPRS	27.5	27.14	0.00	0 mm	26349	2	1:4.15	bottom	0.771	1.086	0.837	
1712.40	1312	UMTS 1750	RMC	24.5	23.27	0.00	9 mm	26398	N/A	1:1	back	0.178	1.327	0.236	
1712.40	1312	UMTS 1750	RMC	24.5	23.27	-0.04	5 mm	26398	N/A	1:1	front	0.396	1.327	0.525	
1712.40	1312	UMTS 1750	RMC	24.5	23.27	0.01	9 mm	26398	N/A	1:1	bottom	0.243	1.327	0.322	
1712.40	1312	UMTS 1750	RMC	24.5	23.27	0.03	0 mm	26398	N/A	1:1	left	0.791	1.327	1.050	
1712.40	1312	UMTS 1750	RMC	23.5	23.00	-0.06	0 mm	26398	N/A	1:1	back	1.190	1.122	1.335	
1712.40	1312	UMTS 1750	RMC	23.5	23.00	0.03	0 mm	26398	N/A	1:1	front	1.210	1.122	1.358	A47
1712.40	1312	UMTS 1750	RMC	23.5	23.00	-0.05	0 mm	26398	N/A	1:1	bottom	1.130	1.122	1.268	
1852.40	9262	UMTS 1900	RMC	24.5	23.09	-0.01	9 mm	26398	N/A	1:1	back	0.206	1.384	0.285	
1852.40	9262	UMTS 1900	RMC	24.5	23.09	-0.09	5 mm	26398	N/A	1:1	front	0.489	1.384	0.677	
1852.40	9262	UMTS 1900	RMC	24.5	23.09	-0.01	9 mm	26349	N/A	1:1	bottom	0.264	1.384	0.365	
1852.40	9262	UMTS 1900	RMC	24.5	23.09	0.07	0 mm	26398	N/A	1:1	left	1.050	1.384	1.453	
1907.60	9538	UMTS 1900	RMC	23.5	22.86	-0.01	0 mm	26398	N/A	1:1	back	1.340	1.159	1.553	
1852.40	9262	UMTS 1900	RMC	23.5	22.81	0.03	0 mm	26398	N/A	1:1	front	1.660	1.172	1.946	A48
1880.00	9400	UMTS 1900	RMC	23.5	22.72	0.06	0 mm	26398	N/A	1:1	front	1.570	1.197	1.879	
1907.60	9538	UMTS 1900	RMC	23.5	22.86	0.03	0 mm	26398	N/A	1:1	front	1.410	1.159	1.634	
1907.60	9538	UMTS 1900	RMC	23.5	22.86	-0.07	0 mm	26398	N/A	1:1	bottom	1.300	1.159	1.507	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population							Phablet 4.0 W/kg (mW/g) averaged over 10 grams								

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Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset		Page 61 of 86

Table 11-33
LTE Phablet SAR Data

MEASUREMENT RESULTS																			
FREQUENCY			Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Serial Number	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (10g)	Scaling Factor	Reported SAR (10g)	Plot #
MHz	Ch.															(W/kg)		(W/kg)	
1720.00	132072	Low	LTE Band 66 (AWS)	20	24.5	23.47	-0.15	0	26398	QPSK	1	50	9 mm	back	1:1	0.181	1.268	0.230	
1720.00	132072	Low	LTE Band 66 (AWS)	20	23.5	22.52	-0.01	1	26398	QPSK	50	25	9 mm	back	1:1	0.148	1.253	0.185	
1720.00	132072	Low	LTE Band 66 (AWS)	20	24.5	23.47	-0.04	0	26398	QPSK	1	50	5 mm	front	1:1	0.439	1.268	0.557	
1720.00	132072	Low	LTE Band 66 (AWS)	20	23.5	22.52	-0.08	1	26398	QPSK	50	25	5 mm	front	1:1	0.360	1.253	0.451	
1720.00	132072	Low	LTE Band 66 (AWS)	20	24.5	23.47	-0.01	0	26398	QPSK	1	50	9 mm	bottom	1:1	0.223	1.268	0.283	
1720.00	132072	Low	LTE Band 66 (AWS)	20	23.5	22.52	-0.07	1	26398	QPSK	50	25	9 mm	bottom	1:1	0.184	1.253	0.231	
1720.00	132072	Low	LTE Band 66 (AWS)	20	24.5	23.47	0.12	0	26398	QPSK	1	50	0 mm	left	1:1	0.946	1.268	1.200	
1720.00	132072	Low	LTE Band 66 (AWS)	20	23.5	22.52	0.05	1	26398	QPSK	50	25	0 mm	left	1:1	0.775	1.253	0.971	
1720.00	132072	Low	LTE Band 66 (AWS)	20	23.5	22.22	-0.01	0	26398	QPSK	1	50	0 mm	back	1:1	1.260	1.343	1.692	
1720.00	132072	Low	LTE Band 66 (AWS)	20	23.5	22.36	-0.02	0	26398	QPSK	50	25	0 mm	back	1:1	1.330	1.300	1.729	
1745.00	132322	Mid	LTE Band 66 (AWS)	20	23.5	22.07	-0.05	0	26398	QPSK	50	25	0 mm	back	1:1	1.350	1.390	1.877	A49
1770.00	132572	High	LTE Band 66 (AWS)	20	23.5	22.13	-0.05	0	26398	QPSK	50	25	0 mm	back	1:1	1.160	1.371	1.590	
1720.00	132072	Low	LTE Band 66 (AWS)	20	23.5	22.22	0.05	0	26398	QPSK	1	50	0 mm	front	1:1	1.240	1.343	1.665	
1720.00	132072	Low	LTE Band 66 (AWS)	20	23.5	22.36	0.02	0	26398	QPSK	50	25	0 mm	front	1:1	1.290	1.300	1.677	
1720.00	132072	Low	LTE Band 66 (AWS)	20	23.5	22.22	-0.01	0	26398	QPSK	1	50	0 mm	bottom	1:1	1.090	1.343	1.464	
1720.00	132072	Low	LTE Band 66 (AWS)	20	23.5	22.36	-0.03	0	26398	QPSK	50	25	0 mm	bottom	1:1	1.140	1.300	1.482	
1860.00	18700	Low	LTE Band 2 (PCS)	20	24.0	22.99	-0.04	0	26349	QPSK	1	0	9 mm	back	1:1	0.241	1.262	0.304	
1860.00	18700	Low	LTE Band 2 (PCS)	20	23.0	22.11	0.00	1	26349	QPSK	50	50	9 mm	back	1:1	0.198	1.227	0.243	
1860.00	18700	Low	LTE Band 2 (PCS)	20	24.0	22.99	-0.05	0	26349	QPSK	1	0	5 mm	front	1:1	0.516	1.262	0.651	
1860.00	18700	Low	LTE Band 2 (PCS)	20	23.0	22.11	-0.03	1	26349	QPSK	50	50	5 mm	front	1:1	0.420	1.227	0.515	
1860.00	18700	Low	LTE Band 2 (PCS)	20	24.0	22.99	-0.01	0	26349	QPSK	1	0	9 mm	bottom	1:1	0.251	1.262	0.317	
1860.00	18700	Low	LTE Band 2 (PCS)	20	23.0	22.11	-0.01	1	26349	QPSK	50	50	9 mm	bottom	1:1	0.216	1.227	0.265	
1860.00	18700	Low	LTE Band 2 (PCS)	20	24.0	22.99	-0.07	0	26349	QPSK	1	0	0 mm	left	1:1	1.210	1.262	1.527	
1860.00	18700	Low	LTE Band 2 (PCS)	20	23.0	22.11	-0.10	1	26349	QPSK	50	50	0 mm	left	1:1	0.973	1.227	1.194	
1860.00	18700	Low	LTE Band 2 (PCS)	20	23.0	21.76	0.01	0	26349	QPSK	1	0	0 mm	back	1:1	1.410	1.330	1.875	
1860.00	18700	Low	LTE Band 2 (PCS)	20	23.0	21.84	0.01	0	26349	QPSK	50	25	0 mm	back	1:1	1.420	1.306	1.855	
1860.00	18700	Low	LTE Band 2 (PCS)	20	23.0	21.76	0.01	0	26349	QPSK	1	0	0 mm	front	1:1	1.500	1.330	1.995	A50
1880.00	18900	Mid	LTE Band 2 (PCS)	20	23.0	21.67	-0.04	0	26349	QPSK	1	0	0 mm	front	1:1	1.460	1.358	1.983	
1900.00	19100	High	LTE Band 2 (PCS)	20	23.0	21.69	0.02	0	26349	QPSK	1	99	0 mm	front	1:1	1.210	1.352	1.636	
1860.00	18700	Low	LTE Band 2 (PCS)	20	23.0	21.84	0.01	0	26349	QPSK	50	25	0 mm	front	1:1	1.490	1.306	1.946	
1860.00	18700	Low	LTE Band 2 (PCS)	20	23.0	21.76	0.05	0	26349	QPSK	1	0	0 mm	bottom	1:1	1.240	1.330	1.649	
1860.00	18700	Low	LTE Band 2 (PCS)	20	23.0	21.84	0.01	0	26349	QPSK	50	25	0 mm	bottom	1:1	1.250	1.306	1.633	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Phablet 4.0 W/kg (mW/g) averaged over 10 grams											

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Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset		Page 62 of 86

Table 11-34
NR Band n66 (AWS) Phablet SAR Data

MEASUREMENT RESULTS																				
FREQUENCY		Mode	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	MPR [dB]	Serial Number	Waveform	Modulation	RB Size	RB Offset	Spacing	Side	Duty Cycle	SAR (10g)	Scaling Factor	Reported SAR (10g)	Plot #	
MHz	Ch.															(W/kg)		(W/kg)		
1720.00	344000	Low	NR Band n66 (AWS)	20	25.0	24.71	-0.14	0	30598	DFT-S-OFDM	QPSK	1	104	9 mm	back	1:1	0.230	1.069	0.246	
1720.00	344000	Low	NR Band n66 (AWS)	20	25.0	24.61	0.09	0	30598	DFT-S-OFDM	QPSK	50	28	9 mm	back	1:1	0.200	1.094	0.219	
1720.00	344000	Low	NR Band n66 (AWS)	20	25.0	24.71	-0.11	0	30598	DFT-S-OFDM	QPSK	1	104	5 mm	front	1:1	0.541	1.069	0.578	
1720.00	344000	Low	NR Band n66 (AWS)	20	25.0	24.61	-0.03	0	30598	DFT-S-OFDM	QPSK	50	28	5 mm	front	1:1	0.495	1.094	0.542	
1720.00	344000	Low	NR Band n66 (AWS)	20	25.0	24.71	-0.01	0	30598	DFT-S-OFDM	QPSK	1	104	9 mm	bottom	1:1	0.382	1.069	0.408	
1720.00	344000	Low	NR Band n66 (AWS)	20	25.0	24.61	0.01	0	30598	DFT-S-OFDM	QPSK	50	28	9 mm	bottom	1:1	0.380	1.094	0.416	
1720.00	344000	Low	NR Band n66 (AWS)	20	25.0	24.71	0.01	0	30598	DFT-S-OFDM	QPSK	1	104	0 mm	left	1:1	1.400	1.069	1.497	
1745.00	349000	Mid	NR Band n66 (AWS)	20	25.0	24.45	-0.02	0	30598	DFT-S-OFDM	QPSK	1	104	0 mm	left	1:1	1.480	1.135	1.680	
1770.00	354000	High	NR Band n66 (AWS)	20	25.0	24.44	-0.06	0	30598	DFT-S-OFDM	QPSK	1	104	0 mm	left	1:1	1.530	1.138	1.741	
1720.00	344000	Low	NR Band n66 (AWS)	20	25.0	24.61	-0.01	0	30598	DFT-S-OFDM	QPSK	50	28	0 mm	left	1:1	1.280	1.094	1.400	
1720.00	344000	Low	NR Band n66 (AWS)	20	23.5	22.99	0.08	0	30598	DFT-S-OFDM	QPSK	1	53	0 mm	back	1:1	1.650	1.125	1.856	
1745.00	349000	Mid	NR Band n66 (AWS)	20	23.5	22.78	0.16	0	30598	DFT-S-OFDM	QPSK	1	53	0 mm	back	1:1	1.710	1.180	2.018	A51
1770.00	354000	High	NR Band n66 (AWS)	20	23.5	22.76	0.18	0	30598	DFT-S-OFDM	QPSK	1	53	0 mm	back	1:1	1.650	1.186	1.957	
1720.00	344000	Low	NR Band n66 (AWS)	20	23.5	22.99	0.03	0	30598	DFT-S-OFDM	QPSK	50	28	0 mm	back	1:1	1.710	1.125	1.924	
1720.00	344000	Low	NR Band n66 (AWS)	20	23.5	22.94	0.15	0	30598	DFT-S-OFDM	QPSK	100	0	0 mm	back	1:1	1.700	1.138	1.935	
1720.00	344000	Low	NR Band n66 (AWS)	20	23.5	22.85	0.07	0	30598	CP-OFDM	QPSK	1	1	0 mm	back	1:1	1.630	1.161	1.892	
1720.00	344000	Low	NR Band n66 (AWS)	20	23.5	22.99	-0.09	0	30598	DFT-S-OFDM	QPSK	1	53	0 mm	front	1:1	1.550	1.125	1.744	
1720.00	344000	Low	NR Band n66 (AWS)	20	23.5	22.99	-0.04	0	30598	DFT-S-OFDM	QPSK	50	28	0 mm	front	1:1	1.570	1.125	1.766	
1720.00	344000	Low	NR Band n66 (AWS)	20	23.5	22.99	-0.01	0	30598	DFT-S-OFDM	QPSK	1	53	0 mm	bottom	1:1	1.190	1.125	1.339	
1720.00	344000	Low	NR Band n66 (AWS)	20	23.5	22.99	-0.07	0	30598	DFT-S-OFDM	QPSK	50	28	0 mm	bottom	1:1	1.190	1.125	1.339	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT																				
Spatial Peak								Extremity												
Uncontrolled Exposure/General Population								4.0 W/kg (mW/g)												
								averaged over 10 grams												

Table 11-35
WLAN Phablet SAR Data

MEASUREMENT RESULTS																		
FREQUENCY		Mode	Service	Bandwidth [MHz]	Maximum Allowed Power [dBm]	Conducted Power [dBm]	Power Drift [dB]	Spacing	Device Serial Number	Data Rate (Mbps)	Side	Duty Cycle (%)	Peak SAR of Area Scan	SAR (10g)	Scaling Factor (Power)	Scaling Factor (Duty Cycle)	Reported SAR (10g)	Plot #
MHz	Ch.												W/kg	(W/kg)			(W/kg)	
5280	56	802.11a	OFDM	20	17.0	16.95	0.02	0 mm	25580	6	back	96.6	3.960	0.775	1.012	1.035	0.812	
5280	56	802.11a	OFDM	20	17.0	16.95	-0.02	0 mm	25580	6	front	96.6	5.430	1.200	1.012	1.035	1.257	
5280	56	802.11a	OFDM	20	17.0	16.95	0.00	0 mm	25580	6	top	96.6	1.250	-	1.012	1.035	-	
5280	56	802.11a	OFDM	20	17.0	16.95	-0.05	0 mm	25580	6	left	96.6	5.650	1.350	1.012	1.035	1.414	A52
5620	124	802.11a	OFDM	20	17.0	16.93	-0.03	0 mm	25580	6	back	96.6	1.210	0.295	1.016	1.035	0.310	
5620	124	802.11a	OFDM	20	17.0	16.93	-0.01	0 mm	25580	6	front	96.6	3.860	0.657	1.016	1.035	0.691	
5620	124	802.11a	OFDM	20	17.0	16.93	0.05	0 mm	25580	6	top	96.6	0.846	-	1.016	1.035	-	
5620	124	802.11a	OFDM	20	17.0	16.93	-0.01	0 mm	25580	6	left	96.6	6.170	1.100	1.016	1.035	1.157	
ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak Uncontrolled Exposure/General Population								Phablet 4.0 W/kg (mW/g) averaged over 10 grams										

FCC ID: A3LSMA528B	 Proud to be part of 	SAR EVALUATION REPORT		Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset		Page 63 of 86

11.5 SAR Test Notes

General Notes:

1. The test data reported are the worst-case SAR values according to test procedures specified in IEEE 1528-2013, and FCC KDB Publication 447498 D01v06.
2. Batteries are fully charged at the beginning of the SAR measurements.
3. Liquid tissue depth was at least 15.0 cm for all frequencies.
4. 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.
5. SAR results were scaled to the maximum allowed power to demonstrate compliance per FCC KDB Publication 447498 D01v06.
6. 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.
7. Per FCC KDB Publication 648474 D04v01r03, body-worn SAR was evaluated without a headset connected to the device. Since the standalone reported body-worn SAR was ≤ 1.2 W/kg, no additional body-worn SAR evaluations using a headset cable were required.
8. Per FCC KDB 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. Additional SAR tests for phablet SAR were evaluated per KDB 616217 Section 6 (See Section 6.9 for more information)
11. This device utilizes power reduction for some wireless modes and technologies, as outlined in Section 1.3. The maximum output power allowed for each transmitter and exposure condition was evaluated for SAR compliance based on expected use conditions and simultaneous transmission scenarios.
12. Unless otherwise noted, when 10g SAR measurement is considered, a factor of 2.5 is applied to the thresholds below.

GSM Test Notes:

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

UMTS Notes:

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

FCC ID: A3LSMA528B	 PCTEST Proud to be part of Samsung	SAR EVALUATION REPORT		Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset		Page 64 of 86

LTE Notes:

1. LTE test configurations are determined according to SAR Evaluation Considerations for LTE Devices in FCC KDB Publication 941225 D05v02r04. The general test procedures used for testing can be found in Section 8.5.4.
2. MPR is permanently implemented for this device by the manufacturer. The specific manufacturer target MPR is indicated alongside the SAR results. MPR is enabled for this device, according to 3GPP TS36.101 Section 6.2.3 – 6.2.5 under Table 6.2.3-1.
3. A-MPR was disabled for all SAR tests by setting NS=01 and MCC=001 on the base station simulator. SAR tests were performed with the same number of RB and RB offsets transmitting on all TTI frames (maximum TTI).
4. Per FCC KDB Publication 447498 D01v06, when the reported LTE Band 41 SAR measured at the highest output power channel in a given a test configuration was > 0.6 W/kg for 1g evaluations, testing at the other channels was required for such test configurations.
5. TDD LTE was tested per the guidance provided in FCC KDB Publication 941225 D05v02r04. Testing was performed using UL-DL configuration 0 with 6 UL subframes and 2 S subframes using extended cyclic prefix only and special subframe configuration 6. SAR tests were performed at maximum output power and worst-case transmission duty factor in extended cyclic prefix. Per 3GPP 36.211 Section 4, the duty factor for special subframe configuration 6 using extended cyclic prefix is 0.633.
6. Per KDB Publication 941225 D05Av01r02, SAR for downlink only LTE CA operations was not needed since the maximum average output power in LTE CA mode was not >0.25 dB higher than the maximum output power when downlink carrier aggregation was inactive.

NR Notes:

1. NR implementation supports 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. Simultaneous transmission analysis for EN-DC operations is included in Section 12. This device additionally supports some EN-DC conditions where additional LTE carriers are added on the downlink only. Per FCC guidance, all unique uplink combinations were assessed.
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.

WLAN Notes:

1. For held-to-ear, and hotspot, and phablet operations, the initial test position procedures were applied. The test position with the highest extrapolated peak SAR will be used as the initial test position. When reported SAR for the initial test position is ≤ 0.4 W/kg for 1g evaluations, no additional testing for the remaining test positions was required. Otherwise, SAR is evaluated at the subsequent highest peak SAR positions until the reported SAR result is ≤ 0.8 W/kg or all test positions are measured.
2. Justification for test configurations for WLAN per KDB Publication 248227 D01v02r02 for 2.4 GHz WIFI single transmission chain operations, the highest measured maximum output power channel for DSSS was selected for SAR measurement. SAR for OFDM modes (2.4 GHz 802.11g/n/ax) was not required due to the maximum allowed powers and the highest reported DSSS SAR. See Section 8.6.5 for more information.
3. Justification for test configurations for WLAN per KDB Publication 248227 D01v02r02 for 5 GHz WIFI single transmission chain operations, the initial test configuration was selected according to the transmission mode with the highest maximum allowed powers. Other transmission modes were not investigated since the highest reported SAR for initial test configuration adjusted by the ratio of maximum output powers is less than 1.2 W/kg for 1g evaluations. See Section 8.6.6 for more information.
4. When the maximum reported 1g averaged SAR is ≤ 0.8 W/kg, SAR testing on additional channels was not required. Otherwise, SAR for the next highest output power channel was required until the reported SAR result was ≤ 1.20 W/kg for 1g evaluations or all test channels were measured.

FCC ID: A3LSMA528B	 PCTEST Proud to be part of 	SAR EVALUATION REPORT		Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset		Page 65 of 86

5. The device was configured to transmit continuously at the required data rate, channel bandwidth and signal modulation, using the highest transmission duty factor supported by the test mode tools. The reported SAR was scaled to the 100% transmission duty factor to determine compliance. Procedures used to measure the duty factor are identical to that in the associated EMC test reports.

Bluetooth Notes

1. Bluetooth SAR was measured with the device connected to a call box with hopping disabled with DH5 operation and Tx Tests test mode type. Per October 2016 TCB Workshop Notes, the reported SAR was scaled to the 100% transmission duty factor to determine compliance. See Section 9.6 for the time domain plot and calculation for the duty factor of the device.
2. Head and Hotspot Bluetooth SAR were evaluated for BT BR tethering applications.

FCC ID: A3LSMA528B	 PCTEST Proud to be part of 	SAR EVALUATION REPORT	 Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset	Page 66 of 86

12 FCC MULTI-TX AND ANTENNA SAR CONSIDERATIONS

12.1 Introduction

The following procedures adopted from FCC KDB Publication 447498 D01v06 are applicable to devices with built-in unlicensed transmitters such as 802.11 and Bluetooth devices which may simultaneously transmit with the licensed transmitter.

12.2 Simultaneous Transmission Procedures

This device contains transmitters that may operate simultaneously. Therefore, simultaneous transmission analysis is required. Per FCC KDB Publication 447498 D01v06 4.3.2 and IEEE 1528-2013 Section 6.3.4.1.2, simultaneous transmission SAR test exclusion may be applied when the sum of the 1g SAR for all the simultaneous transmitting antennas in a specific physical test configuration is ≤ 1.6 W/kg. The different test positions in an exposure condition may be considered collectively to determine SAR test exclusion according to the sum of 1g or 10g SAR.

LTE B26 SAR was used for EN-DC simultaneous analysis since the transmission frequency range of LTE B26 and B5 are overlapped and they share the same transmission path and signal characteristics.

For SAR summation, the highest reported SAR across all test distances was used as the most conservative evaluation for simultaneous transmission analysis for each device edge.

(*) 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.

FCC ID: A3LSMA528B	 PCTEST Proud to be part of 	SAR EVALUATION REPORT		Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset		Page 67 of 86

12.3 Head SAR Simultaneous Transmission Analysis

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

Configuration	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Head SAR	GSM 850	0.308	0.464	0.772
	GSM 1900	0.087	0.464	0.551
	UMTS 850	0.356	0.464	0.820
	UMTS 1750	0.139	0.464	0.603
	UMTS 1900	0.203	0.464	0.667
	LTE Band 12	0.328	0.464	0.792
	LTE Band 26 (Cell)	0.312	0.464	0.776
	LTE Band 66 (AWS)	0.183	0.464	0.647
	LTE Band 2 (PCS)	0.173	0.464	0.637
	LTE Band 41	0.256	0.464	0.720

Configuration	LTE Anchor Band	4G SAR (W/kg)	NR Band n5 (Cell) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Head SAR	LTE Band 66 (AWS)	0.183	0.349	0.464	0.996
Configuration	LTE Anchor Band	4G SAR (W/kg)	NR Band n66 (AWS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Head SAR	LTE Band 26 (Cell)	0.312	0.089	0.464	0.865

FCC ID: A3LSMA528B	 PCTEST Proud to be part of 	SAR EVALUATION REPORT		Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset		Page 68 of 86

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

Configuration	Mode	2G/3G/4G SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Head SAR	GSM 850	0.308	0.670	0.978
	GSM 1900	0.087	0.670	0.757
	UMTS 850	0.356	0.670	1.026
	UMTS 1750	0.139	0.670	0.809
	UMTS 1900	0.203	0.670	0.873
	LTE Band 12	0.328	0.670	0.998
	LTE Band 26 (Cell)	0.312	0.670	0.982
	LTE Band 66 (AWS)	0.183	0.670	0.853
	LTE Band 2 (PCS)	0.173	0.670	0.843
	LTE Band 41	0.256	0.670	0.926

Configuration	LTE Anchor Band	4G SAR (W/kg)	NR Band n5 (Cell) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Head SAR	LTE Band 66 (AWS)	0.183	0.349	0.670	1.202
Configuration	LTE Anchor Band	4G SAR (W/kg)	NR Band n66 (AWS) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Head SAR	LTE Band 26 (Cell)	0.312	0.089	0.670	1.071

FCC ID: A3LSMA528B		SAR EVALUATION REPORT		Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset		Page 69 of 86

Table 12-3
Simultaneous Transmission Scenario with 2.4 GHz Bluetooth (Held to Ear)

Configuration	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz Bluetooth SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Head SAR	GSM 850	0.308	0.432	0.740
	GSM 1900	0.087	0.432	0.519
	UMTS 850	0.356	0.432	0.788
	UMTS 1750	0.139	0.432	0.571
	UMTS 1900	0.203	0.432	0.635
	LTE Band 12	0.328	0.432	0.760
	LTE Band 26 (Cell)	0.312	0.432	0.744
	LTE Band 66 (AWS)	0.183	0.432	0.615
	LTE Band 2 (PCS)	0.173	0.432	0.605
	LTE Band 41	0.256	0.432	0.688

Configuration	LTE Anchor Band	4G SAR (W/kg)	NR Band n5 (Cell) SAR (W/kg)	2.4 GHz Bluetooth SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Head SAR	LTE Band 66 (AWS)	0.183	0.349	0.432	0.964
Configuration	LTE Anchor Band	4G SAR (W/kg)	NR Band n66 (AWS) SAR (W/kg)	2.4 GHz Bluetooth SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Head SAR	LTE Band 26 (Cell)	0.312	0.089	0.432	0.833

FCC ID: A3LSMA528B		SAR EVALUATION REPORT		Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset		Page 70 of 86

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

Configuration	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz Bluetooth SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Head SAR	GSM 850	0.308	0.432	0.670	1.410
	GSM 1900	0.087	0.432	0.670	1.189
	UMTS 850	0.356	0.432	0.670	1.458
	UMTS 1750	0.139	0.432	0.670	1.241
	UMTS 1900	0.203	0.432	0.670	1.305
	LTE Band 12	0.328	0.432	0.670	1.430
	LTE Band 26 (Cell)	0.312	0.432	0.670	1.414
	LTE Band 66 (AWS)	0.183	0.432	0.670	1.285
	LTE Band 2 (PCS)	0.173	0.432	0.670	1.275
	LTE Band 41	0.256	0.432	0.670	1.358

Simult Tx	Configuration	LTE Band 66 (AWS) SAR (W/kg)	NR Band n5 (Cell) SAR (W/kg)	2.4 GHz Bluetooth SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	4	1+2+3+4
Head SAR	Right Cheek	0.143	0.349	0.432	0.670	1.594
	Right Tilt	0.138	0.178	0.417	0.421	1.154
	Left Cheek	0.148	0.282	0.266	0.670*	1.366
	Left Tilt	0.183	0.150	0.345	0.670*	1.348

Configuration	LTE Anchor Band	4G SAR (W/kg)	NR Band n66 (AWS) SAR (W/kg)	2.4 GHz Bluetooth SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	4	1+2+3+4
Head SAR	LTE Band 26 (Cell)	0.312	0.089	0.432	0.670	1.503

FCC ID: A3LSMA528B	 PCTEST Proud to be part of 	SAR EVALUATION REPORT		Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset		Page 71 of 86

12.4 Body-Worn Simultaneous Transmission Analysis

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

Configuration	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Body - Worn SAR	GSM 850	0.268	0.110	0.378
	GSM 1900	0.091	0.110	0.201
	UMTS 850	0.368	0.110	0.478
	UMTS 1750	0.210	0.110	0.320
	UMTS 1900	0.223	0.110	0.333
	LTE Band 12	0.395	0.110	0.505
	LTE Band 26 (Cell)	0.351	0.110	0.461
	LTE Band 66 (AWS)	0.205	0.110	0.315
	LTE Band 2 (PCS)	0.246	0.110	0.356
	LTE Band 41	0.117	0.110	0.227

Configuration	LTE Anchor Band	4G SAR (W/kg)	NR Band n5 (Cell) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Body - Worn	LTE Band 66 (AWS)	0.205	0.335	0.110	0.650
Configuration	LTE Anchor Band	4G SAR (W/kg)	NR Band n66 (AWS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Body - Worn	LTE Band 26 (Cell)	0.351	0.223	0.110	0.684

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Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset	Page 72 of 86	

Table 12-6
Simultaneous Transmission Scenario with 5 GHz WLAN (Body-Worn at 1.5 cm)

Configuration	Mode	2G/3G/4G SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Body - Worn SAR	GSM 850	0.268	0.264	0.532
	GSM 1900	0.091	0.264	0.355
	UMTS 850	0.368	0.264	0.632
	UMTS 1750	0.210	0.264	0.474
	UMTS 1900	0.223	0.264	0.487
	LTE Band 12	0.395	0.264	0.659
	LTE Band 26 (Cell)	0.351	0.264	0.615
	LTE Band 66 (AWS)	0.205	0.264	0.469
	LTE Band 2 (PCS)	0.246	0.264	0.510
	LTE Band 41	0.117	0.264	0.381

Configuration	LTE Anchor Band	4G SAR (W/kg)	NR Band n5 (Cell) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Body - Worn	LTE Band 66 (AWS)	0.205	0.335	0.264	0.804
Configuration	LTE Anchor Band	4G SAR (W/kg)	NR Band n66 (AWS) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Body - Worn	LTE Band 26 (Cell)	0.351	0.223	0.264	0.838

FCC ID: A3LSMA528B	 PCTEST Proud to be part of 	SAR EVALUATION REPORT		Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset	Page 73 of 86	

Table 12-7
Simultaneous Transmission Scenario with 2.4 GHz Bluetooth (Body-Worn at 1.5 cm)

Configuration	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz Bluetooth SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Body - Worn SAR	GSM 850	0.268	0.103	0.371
	GSM 1900	0.091	0.103	0.194
	UMTS 850	0.368	0.103	0.471
	UMTS 1750	0.210	0.103	0.313
	UMTS 1900	0.223	0.103	0.326
	LTE Band 12	0.395	0.103	0.498
	LTE Band 26 (Cell)	0.351	0.103	0.454
	LTE Band 66 (AWS)	0.205	0.103	0.308
	LTE Band 2 (PCS)	0.246	0.103	0.349
	LTE Band 41	0.117	0.103	0.220

Configuration	LTE Anchor Band	4G SAR (W/kg)	NR Band n5 (Cell) SAR (W/kg)	2.4 GHz Bluetooth SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Body - Worn	LTE Band 66 (AWS)	0.205	0.335	0.103	0.643

Configuration	LTE Anchor Band	4G SAR (W/kg)	NR Band n66 (AWS) SAR (W/kg)	2.4 GHz Bluetooth SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Body - Worn	LTE Band 26 (Cell)	0.351	0.223	0.103	0.677

FCC ID: A3LSMA528B	 PCTEST Proud to be part of 	SAR EVALUATION REPORT		Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset		Page 74 of 86

Table 12-8

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

Configuration	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz Bluetooth SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Body - Worn SAR	GSM 850	0.268	0.103	0.264	0.635
	GSM 1900	0.091	0.103	0.264	0.458
	UMTS 850	0.368	0.103	0.264	0.735
	UMTS 1750	0.210	0.103	0.264	0.577
	UMTS 1900	0.223	0.103	0.264	0.590
	LTE Band 12	0.395	0.103	0.264	0.762
	LTE Band 26 (Cell)	0.351	0.103	0.264	0.718
	LTE Band 66 (AWS)	0.205	0.103	0.264	0.572
	LTE Band 2 (PCS)	0.246	0.103	0.264	0.613
	LTE Band 41	0.117	0.103	0.264	0.484

Configuration	LTE Anchor Band	4G SAR (W/kg)	NR Band n5 (Cell) SAR (W/kg)	2.4 GHz Bluetooth SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	4	1+2+3+4
Body - Worn	LTE Band 66 (AWS)	0.205	0.335	0.103	0.264	0.907
Configuration	LTE Anchor Band	4G SAR (W/kg)	NR Band n66 (AWS) SAR (W/kg)	2.4 GHz Bluetooth SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	4	1+2+3+4
Body - Worn	LTE Band 26 (Cell)	0.351	0.223	0.103	0.264	0.941

FCC ID: A3LSMA528B	 PCTEST Proud to be part of  Hewlett-Packard	SAR EVALUATION REPORT		Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset		Page 75 of 86

12.5 Hotspot SAR Simultaneous Transmission Analysis

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 (“-”).

Table 12-9
Simultaneous Transmission Scenario with 2.4 GHz WLAN (Hotspot at 1.0 cm)

Configuration	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Hotspot SAR	GPRS 850	0.412	0.284	0.696
	GPRS 1900	0.279	0.284	0.563
	UMTS 850	0.417	0.284	0.701
	UMTS 1750	0.366	0.284	0.650
	UMTS 1900	0.445	0.284	0.729
	LTE Band 12	0.455	0.284	0.739
	LTE Band 26 (Cell)	0.406	0.284	0.690
	LTE Band 66 (AWS)	0.361	0.284	0.645
	LTE Band 2 (PCS)	0.448	0.284	0.732
	LTE Band 41	0.306	0.284	0.590

Configuration	LTE Anchor Band	4G SAR (W/kg)	NR Band n5 (Cell) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Hotspot SAR	LTE Band 66 (AWS)	0.361	0.387	0.284	1.032
Configuration	LTE Anchor Band	4G SAR (W/kg)	NR Band n66 (AWS) SAR (W/kg)	2.4 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Hotspot SAR	LTE Band 26 (Cell)	0.406	0.414	0.284	1.104

FCC ID: A3LSMA528B	 PCTEST Proud to be part of 	SAR EVALUATION REPORT			Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset			Page 76 of 86

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

Configuration	Mode	2G/3G/4G SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Hotspot SAR	GPRS 850	0.412	0.724	1.136
	GPRS 1900	0.279	0.724	1.003
	UMTS 850	0.417	0.724	1.141
	UMTS 1750	0.366	0.724	1.090
	UMTS 1900	0.445	0.724	1.169
	LTE Band 12	0.455	0.724	1.179
	LTE Band 26 (Cell)	0.406	0.724	1.130
	LTE Band 66 (AWS)	0.361	0.724	1.085
	LTE Band 2 (PCS)	0.448	0.724	1.172
	LTE Band 41	0.306	0.724	1.030

Configuration	LTE Anchor Band	4G SAR (W/kg)	NR Band n5 (Cell) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Hotspot SAR	LTE Band 66 (AWS)	0.361	0.387	0.724	1.472

Configuration	LTE Anchor Band	4G SAR (W/kg)	NR Band n66 (AWS) SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Hotspot SAR	LTE Band 26 (Cell)	0.406	0.414	0.724	1.544

FCC ID: A3LSMA528B		SAR EVALUATION REPORT		Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset		Page 77 of 86

Table 12-11
Simultaneous Transmission Scenario with 2.4 GHz Bluetooth (Hotspot at 1.0 cm)

Configuration	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz Bluetooth SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Hotspot SAR	GPRS 850	0.412	0.248	0.660
	GPRS 1900	0.279	0.248	0.527
	UMTS 850	0.417	0.248	0.665
	UMTS 1750	0.366	0.248	0.614
	UMTS 1900	0.445	0.248	0.693
	LTE Band 12	0.455	0.248	0.703
	LTE Band 26 (Cell)	0.406	0.248	0.654
	LTE Band 66 (AWS)	0.361	0.248	0.609
	LTE Band 2 (PCS)	0.448	0.248	0.696
	LTE Band 41	0.306	0.248	0.554

Configuration	LTE Anchor Band	4G SAR (W/kg)	NR Band n5 (Cell) SAR (W/kg)	2.4 GHz Bluetooth SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Hotspot SAR	LTE Band 66 (AWS)	0.361	0.387	0.248	0.996

Configuration	LTE Anchor Band	4G SAR (W/kg)	NR Band n66 (AWS) SAR (W/kg)	2.4 GHz Bluetooth SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	1+2+3
Hotspot SAR	LTE Band 26 (Cell)	0.406	0.414	0.248	1.068

FCC ID: A3LSMA528B		SAR EVALUATION REPORT		Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset		Page 78 of 86

Table 12-12
Simultaneous Transmission Scenario with 2.4 GHz Bluetooth and 5 GHz WLAN (Hotspot at 1.0 cm)

Configuration	Mode	2G/3G/4G SAR (W/kg)	2.4 GHz Bluetooth SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
		1	2	2	1+2+3
Hotspot SAR	GPRS 850	0.412	0.248	0.724	1.384
	GPRS 1900	0.279	0.248	0.724	1.251
	UMTS 850	0.417	0.248	0.724	1.389
	UMTS 1750	0.366	0.248	0.724	1.338
	UMTS 1900	0.445	0.248	0.724	1.417
	LTE Band 12	0.455	0.248	0.724	1.427
	LTE Band 26 (Cell)	0.406	0.248	0.724	1.378
	LTE Band 66 (AWS)	0.361	0.248	0.724	1.333
	LTE Band 2 (PCS)	0.448	0.248	0.724	1.420
	LTE Band 41	0.306	0.248	0.724	1.278

Simult Tx	Configuration	LTE Band 66 (AWS) SAR (W/kg)	NR Band n5 (Cell) SAR (W/kg)	2.4 GHz Bluetooth SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)	Simult Tx	Configuration	LTE Band 26 (Cell) SAR (W/kg)	NR Band n66 (AWS) SAR (W/kg)	2.4 GHz Bluetooth SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
		1	2	3	4	1+2+3+4			1	2	3	2	1+2+3+4
Body SAR	Back	0.358	0.387	0.176	0.408	1.329	Body SAR	Back	0.397	0.315	0.176	0.408	1.296
	Front	0.361	0.316	0.114	0.724*	1.515		Front	0.321	0.414	0.114	0.724*	1.573
	Top	-	-	0.248	0.724*	0.972		Top	-	-	0.248	0.724*	0.972
	Bottom	0.320	0.109	-	-	0.429		Bottom	0.103	0.347	-	-	0.450
	Right	-	0.375	-	-	0.375		Right	0.406	-	-	-	0.406
	Left	0.205	-	0.030	0.724	0.959		Left	-	0.240	0.030	0.724	0.994

12.6 Phablet Simultaneous Transmission Analysis

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 (“-”).

Per FCC KDB Publication 648474 D04 Handset SAR, Phablet SAR tests were not required if wireless router 1g SAR (scaled to the maximum output power, including tolerance) < 1.2 W/kg. Therefore, no further analysis beyond the tables included in this section was required to determine that possible simultaneous transmission scenarios would not exceed the SAR limit.

For SAR summation, the highest reported SAR across all test distances was used as the most conservative evaluation for simultaneous transmission analysis for each device edge.

FCC ID: A3LSMA528B	 SAR EVALUATION REPORT 	Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset
Page 79 of 86		

Table 12-13
Simultaneous Transmission Scenario with 5 GHz WLAN (Phablet)

Configuration	Mode	2G/3G/4G SAR (W/kg)	5 GHz WLAN SAR (W/kg)	Σ SAR (W/kg)
		1	2	1+2
Phablet SAR	GPRS 1900	1.028	1.414	2.442
	UMTS 1750	1.358	1.414	2.772
	UMTS 1900	1.946	1.414	3.360
	LTE Band 66 (AWS)	1.877	1.414	3.291
	LTE Band 2 (PCS)	1.995	1.414	3.409

12.7 Simultaneous Transmission Conclusion

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

FCC ID: A3LSMA528B	 PCTEST Proud to be part of 	SAR EVALUATION REPORT	Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset	Page 80 of 86

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.

FCC ID: A3LSMA528B	 PCTEST Proud to be part of 	SAR EVALUATION REPORT	 Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset	Page 81 of 86

14 EQUIPMENT LIST

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent	85033E	3.5mm Standard Calibration Kit	7/7/2021	Annual	7/7/2022	MY53402352
Agilent	8594A	(9kHz-2.9GHz) Spectrum Analyzer	N/A	N/A	N/A	3051A00187
Agilent	8753ES	Network Analyzer	2/19/2021	Annual	2/19/2022	MY40001472
Agilent	8753ES	S-Parameter Network Analyzer	4/14/2021	Annual	4/14/2022	US39170118
Agilent	8753ES	S-Parameter Vector Network Analyzer	12/15/2020	Annual	12/15/2021	MY40003841
Agilent	E4438C	ESG Vector Signal Generator	9/8/2020	Biennial	9/8/2022	MY45090700
Agilent	E4438C	ESG Vector Signal Generator	12/14/2020	Biennial	12/14/2022	MY42082385
Agilent	E4440A	PSA Series Spectrum Analyzer	1/29/2021	Annual	1/29/2022	MY46186272
Agilent	E5515C	Wireless Communications Test Set	5/6/2021	Annual	5/6/2022	GB44400860
Agilent	E5515C	Wireless Communications Test Set	1/14/2020	Triennial	1/14/2023	GB43304447
Agilent	N4010A	Wireless Connectivity Test Set	N/A	N/A	N/A	GB46170464
Agilent	N5182A	MXG Vector Signal Generator	6/15/2021	Annual	6/15/2022	MY47420800
Agilent	N5182A	MXG Vector Signal Generator	6/21/2021	Annual	6/21/2022	MY47420603
Agilent	N9202A	MXA Signal Analyzer	13/12/2020	Annual	12/13/2021	MY50200571
Amplifier Research	155106	Amplifier	CBT	N/A	CBT	343972
Amplifier Research	155106	Amplifier	CBT	N/A	CBT	343971
Anritsu	MA24106A	USB Power Sensor	5/3/2021	Annual	5/3/2022	1349514
Anritsu	MA24106A	USB Power Sensor	5/17/2021	Annual	5/17/2022	1349501
Anritsu	MA24106A	USB Power Sensor	6/25/2021	Annual	6/25/2022	1520504
Anritsu	MA24106A	USB Power Sensor	6/29/2021	Annual	6/29/2022	1349513
Anritsu	MA2411B	Pulse Power Sensor	3/8/2021	Annual	3/8/2022	1339020
Anritsu	MA2411B	Pulse Power Sensor	3/9/2021	Annual	3/9/2022	1207470
Anritsu	ML2496A	Power Meter	3/3/2021	Annual	3/3/2022	1306009
Anritsu	ML2496A	Power Meter	4/21/2021	Annual	4/21/2022	1351001
Anritsu	MT8821C	Radio Communication Analyzer	2/1/2021	Annual	2/1/2022	6201664756
Anritsu	MT8821C	Radio Communication Analyzer	3/2/2021	Annual	3/2/2022	6262044715
Anritsu	MT8821C	Radio Communication Analyzer	3/23/2021	Annual	3/23/2022	6201144418
Anritsu	MT8821C	Radio Communication Analyzer	4/14/2021	Annual	4/14/2022	6261895213
Anritsu	MT8821C	Radio Communication Analyzer	4/16/2021	Annual	4/16/2022	6202001190
Anritsu	MT8821C	Radio Communication Analyzer	5/21/2021	Annual	5/21/2022	6201144419
Anritsu	MT8862A	Wireless Connectivity Test Set	10/29/2020	Annual	10/29/2021	6261782395
Anritsu	MG3710A	Vector Signal Generator	6/14/2021	Annual	6/14/2022	6262084847
Control Company	4040	Therm./ Clock/ Humidity Monitor	3/6/2020	Biennial	3/6/2022	2001703113
Control Company	4040	Therm./ Clock/ Humidity Monitor	3/6/2020	Biennial	3/6/2022	200170296
Control Company	4040	Therm./ Clock/ Humidity Monitor	3/6/2020	Biennial	3/6/2022	200170289
Control Company	4352	Long Stem Thermometer	5/16/2020	Biennial	5/16/2022	200294416
Control Company	4352	Long Stem Thermometer	5/16/2020	Biennial	5/16/2022	200294416
Control Company	4352	Ultra Long Stem Thermometer	3/2/2021	Annual	3/2/2022	160508122
HEWLETT PACKARD	8753E	Network Analyzer	12/10/2020	Annual	12/10/2021	US38161081
Insite	1108-150	Digital Caliper	1/17/2020	Biennial	1/17/2022	409193536
Keysight	772D	Dual Directional Coupler	CBT	N/A	CBT	MY52180215
Keysight Technologies	85033E	Standard Mechanical Calibration Kit (DC to 9GHz, 3.5mm)	9/1/2020	Annual	9/1/2021	MY53401181
Keysight Technologies	N6705B	DC to RF Power Analyzer	5/5/2021	Triennial	5/5/2024	MY53004059
Keysight Technologies	N9202A	MXA Signal Analyzer	2/24/2021	Annual	2/24/2022	MY48010233
Keysight Technologies	N9030A	PKA Signal Analyzer (44GHz)	8/17/2020	Annual	8/17/2021	MY52350166
Keysight Technologies	U3401A	Digital Multimeter	5/14/2020	Biennial	5/14/2022	MY57201470
MCL	BW-N6W5+	6dB Attenuator	CBT	N/A	CBT	1139
MiniCircuits	VLF-6000+	Low Pass Filter	CBT	N/A	CBT	N/A
MiniCircuits	VLF-6000+	Low Pass Filter	CBT	N/A	CBT	N/A
Mini-Circuits	BW-N20W5+	Power Attenuator	CBT	N/A	CBT	1226
Mini-Circuits	BW-N20W5+	DC to 18 GHz Precision Fixed 20 dB Attenuator	CBT	N/A	CBT	N/A
Mini-Circuits	NLP-1200+	Low Pass Filter DC to 1000 MHz	CBT	N/A	CBT	N/A
Mini-Circuits	NLP-2950+	Low Pass Filter DC to 2700 MHz	CBT	N/A	CBT	N/A
Narda	4014C-6	4 - 8 GHz SMA 6 dB Directional Coupler	CBT	N/A	CBT	N/A
Narda	4772-3	Attenuator (3dB)	CBT	N/A	CBT	9406
Narda	BW-S3W2	Attenuator (3dB)	CBT	N/A	CBT	120
Pasternack	NC-100	Torque Wrench	8/4/2020	Biennial	8/4/2022	N/A
Pasternack	NC-100	Torque Wrench	8/4/2020	Biennial	8/4/2022	N/A
Pasternack	NC-100	Torque Wrench (Bin-lbs)	8/5/2020	Biennial	8/5/2022	47639-47
Pasternack	PE2208-6	Bidirectional Coupler	CBT	N/A	CBT	N/A
Pasternack	PE2209-10	Bidirectional Coupler	CBT	N/A	CBT	N/A
Rohde & Schwarz	CMW500	Radio Communication Tester	3/22/2021	Annual	3/22/2022	167283
Rohde & Schwarz	CMW500	Radio Communication Tester	4/13/2021	Annual	4/13/2022	167284
Rohde & Schwarz	CMW500	Radio Communication Tester	5/11/2021	Annual	5/11/2022	128636
Rohde & Schwarz	ZAL165	Vector Network Analyzer	9/29/2020	Annual	9/29/2021	101307
SPEAG	D1750V2	1750 MHz SAR Dipole	10/23/2018	Triennial	10/23/2021	1150
SPEAG	D1750V2	1750 MHz SAR Dipole	5/12/2020	Biennial	5/12/2022	1148
SPEAG	D1900V2	1900 MHz SAR Dipole	10/23/2018	Triennial	10/23/2021	50800
SPEAG	D1900V2	1900 MHz SAR Dipole	10/23/2018	Triennial	10/23/2021	50149
SPEAG	D2450V2	2450 MHz SAR Dipole	8/14/2020	Annual	8/14/2021	719
SPEAG	D2450V2	2450 MHz SAR Dipole	1/19/2021	Annual	1/19/2022	981
SPEAG	D2600V2	2600 MHz SAR Dipole	11/12/2019	Biennial	11/12/2021	1071
SPEAG	D2600V2	2600 MHz SAR Dipole	6/14/2019	Triennial	6/14/2022	1064
SPEAG	D5GHV2	5 GHz SAR Dipole	9/10/2020	Annual	9/10/2021	1191
SPEAG	D750V3	750 MHz SAR Dipole	10/19/2018	Triennial	10/19/2021	1161
SPEAG	D835V2	835 MHz SAR Dipole	10/19/2018	Triennial	10/19/2021	40133
SPEAG	DAE4	Dasy Data Acquisition Electronics	8/11/2020	Annual	8/11/2021	1450
SPEAG	DAE4	Dasy Data Acquisition Electronics	9/10/2020	Annual	9/10/2021	1449
SPEAG	DAE4	Dasy Data Acquisition Electronics	10/16/2020	Annual	10/16/2021	1333
SPEAG	DAE4	Dasy Data Acquisition Electronics	1/13/2021	Annual	1/13/2022	1558
SPEAG	DAE4	Dasy Data Acquisition Electronics	3/10/2021	Annual	3/10/2022	1415
SPEAG	DAE4	Dasy Data Acquisition Electronics	3/18/2021	Annual	3/18/2022	1272
SPEAG	DAE4	Dasy Data Acquisition Electronics	4/7/2021	Annual	4/7/2022	1407
SPEAG	DAE4	Dasy Data Acquisition Electronics	6/15/2021	Annual	6/15/2022	1334
SPEAG	DAE4	Data Acquisition Electronics	12/7/2020	Annual	12/7/2021	1533
SPEAG	DAK-3.5	Dielectric Assessment Kit	5/12/2021	Annual	5/12/2022	1070
SPEAG	EX30V4	SAR Probe	7/31/2020	Annual	7/31/2021	7308
SPEAG	EX30V4	SAR Probe	10/20/2020	Annual	10/20/2021	7551
SPEAG	EX30V4	SAR Probe	10/20/2020	Annual	10/20/2021	7539
SPEAG	EX30V4	SAR Probe	11/23/2020	Annual	11/23/2021	7538
SPEAG	EX30V4	SAR Probe	12/11/2020	Annual	12/11/2021	7571
SPEAG	EX30V4	SAR Probe	1/20/2021	Annual	1/20/2022	3589
SPEAG	EX30V4	SAR Probe	3/16/2021	Annual	3/16/2022	7526
SPEAG	EX30V4	SAR Probe	4/19/2021	Annual	4/19/2022	7357
SPEAG	EX30V4	SAR Probe	6/21/2021	Annual	6/21/2022	7409
SPEAG	MAIA	Modulation and Audio Interference Analyzer	N/A	N/A	N/A	1237

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. Each equipment item was used solely within its respective calibration period.

FCC ID: A3LSMA528B		SAR EVALUATION REPORT		Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset		Page 82 of 86

15 MEASUREMENT UNCERTAINTIES

a	b	c	d	e= f(d,k)	f	g	h = c x f/e	i = c x g/e	k
Uncertainty Component	IEEE 1528 Sec.	Tol. (± %)	Prob. Dist.	Div.	c _i 1gm	c _i 10 gms	1gm u _i (± %)	10gms u _i (± %)	v _i
Measurement System									
Probe Calibration	E.2.1	7	N	1	1	1	7.0	7.0	∞
Axial Isotropy	E.2.2	0.25	N	1	0.7	0.7	0.2	0.2	∞
Hemishperical Isotropy	E.2.2	1.3	N	1	0.7	0.7	0.9	0.9	∞
Boundary Effect	E.2.3	2	R	1.732	1	1	1.2	1.2	∞
Linearity	E.2.4	0.3	N	1	1	1	0.3	0.3	∞
System Detection Limits	E.2.4	0.25	R	1.732	1	1	0.1	0.1	∞
Modulation Response	E.2.5	4.8	R	1.732	1	1	2.8	2.8	∞
Readout Electronics	E.2.6	0.3	N	1	1	1	0.3	0.3	∞
Response Time	E.2.7	0.8	R	1.732	1	1	0.5	0.5	∞
Integration Time	E.2.8	2.6	R	1.732	1	1	1.5	1.5	∞
RF Ambient Conditions - Noise	E.6.1	3	R	1.732	1	1	1.7	1.7	∞
RF Ambient Conditions - Reflections	E.6.1	3	R	1.732	1	1	1.7	1.7	∞
Probe Positioner Mechanical Tolerance	E.6.2	0.8	R	1.732	1	1	0.5	0.5	∞
Probe Positioning w/ respect to Phantom	E.6.3	6.7	R	1.732	1	1	3.9	3.9	∞
Extrapolation, Interpolation & Integration algorithms for Max. SAR Evaluation	E.5	4	R	1.732	1	1	2.3	2.3	∞
Test Sample Related									
Test Sample Positioning	E.4.2	3.12	N	1	1	1	3.1	3.1	35
Device Holder Uncertainty	E.4.1	1.67	N	1	1	1	1.7	1.7	5
Output Power Variation - SAR drift measurement	E.2.9	5	R	1.732	1	1	2.9	2.9	∞
SAR Scaling	E.6.5	0	R	1.732	1	1	0.0	0.0	∞
Phantom & Tissue Parameters									
Phantom Uncertainty (Shape & Thickness tolerances)	E.3.1	7.6	R	1.73	1.0	1.0	4.4	4.4	∞
Liquid Conductivity - measurement uncertainty	E.3.3	4.3	N	1	0.78	0.71	3.3	3.0	76
Liquid Permittivity - measurement uncertainty	E.3.3	4.2	N	1	0.23	0.26	1.0	1.1	75
Liquid Conductivity - Temperature Uncertainty	E.3.4	3.4	R	1.732	0.78	0.71	1.5	1.4	∞
Liquid Permittivity - Temperature Uncertainty	E.3.4	0.6	R	1.732	0.23	0.26	0.1	0.1	∞
Liquid Conductivity - deviation from target values	E.3.2	5.0	R	1.73	0.64	0.43	1.8	1.2	∞
Liquid Permittivity - deviation from target values	E.3.2	5.0	R	1.73	0.60	0.49	1.7	1.4	∞
Combined Standard Uncertainty (k=1)							RSS	12.2	12.0
Expanded Uncertainty							k=2	24.4	24.0
(95% CONFIDENCE LEVEL)									

FCC ID: A3LSMA528B	 PCTEST Proud to be part of  hewlett-packard	SAR EVALUATION REPORT		Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset		Page 83 of 86

16 CONCLUSION

16.1 Measurement Conclusion

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

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

FCC ID: A3LSMA528B	 PCTEST Proud to be part of 	SAR EVALUATION REPORT	 Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset	Page 84 of 86

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Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset		Page 85 of 86

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FCC ID: A3LSMA528B	 SAR EVALUATION REPORT 		Approved by: Quality Manager
Document S/N: 1M2106280072-01.A3L (Rev 1)	Test Dates: 07/04/2021 – 07/25/2021	DUT Type: Portable Handset	Page 86 of 86