MOTOROLA SOLUTIONS

SAMM 826

CERTIFICATE 2518.05

DECLARATION OF COMPLIANCE SAR ASSESSMENT Part 1 of 2

Motorola Solutions Inc.
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Date of Report: 10/6/2022
Report Revision: C

Responsible Engineer:	Ch'ng Jian Sheng (EME Engineer)
Report Author:	Muhammad Akmal Naim Kasim (EME Technician)
Date/s Tested:	5/31/2020-6/13/2020, 6/15/2020-6/19/2020, 6/24/2020-6/30/2020, 7/1/2020-7/2/2020, 7/6/2020-7/17/2020, 7/30/2020-8/6/2020, 1/21/2021, 1/10/2022 – 1/12/2022, 2/21/2022
Manufacturer:	Motorola Solutions Inc.
DUT Description:	Handheld Portable – MXP600 350-470 ROM CLR
Test TX mode(s):	MSPD(5:8), SSPD (1:4.55), Bluetooth, Bluetooth LE, WLAN 2.4GHz and WLAN 5.0GHz
Max. Power output:	Refer to Table 3
Tx Frequency Bands:	Refer to Table 3
Signaling type:	TDMA (PTT), FHSS (Bluetooth), WLAN 2.4GHz and WLAN 5.0GHz
Model(s) Tested:	AZH77PCN6TZ5AN (PMUE5551A)
Model(s) Certified:	AZH77PCN6TZ5AN (PMUE5551B)
Serial Number(s):	767TWK0012, 767TWK0013, 767TWK0017
Classification:	Occupational/Controlled
Applicant Name:	Motorola Solutions Inc.
Applicant Address:	8000 West Sunrise Boulevard, Fort Lauderdale, Florida 33322
FCC ID:	AZ489FT7150 This report contains results that are immaterial for FCC equipment approval, which are clearly identified.
IC:	109U-89FT7150 This report contains results that are immaterial for ISED equipment approval, which are clearly identified.
ISED Test Site registration:	24843
FCC Test Firm Registration Number:	823256

The test results clearly demonstrate compliance with FCC Occupational/Controlled RF Exposure limits of 8 W/kg averaged over 1 gram per the requirements of FCC 47 CFR § 2.1093 and RSS-102 (Issue 5).

Based on the information and the testing results provided herein, the undersigned certifies that when used as stated in the operating instructions supplied, said product complies with the national and international reference standards and guidelines listed in section 4.0 of this report (no deviation from standard methods). This report shall not be reproduced without written approval from an officially designated representative of the Motorola Solutions Inc EME Laboratory.
I attest to the accuracy of the data and assume full responsibility for the completeness of these measurements. This reporting format is consistent with the suggested guidelines of the TIA TSB-150 December 2004. The results and statements contained in this report pertain only to the device(s) evaluated.

Saw Sun Hock (Approved Signatory)
Approval Date: 10/6/2022

Part 1 of 2

APPENDICES

Part 5 of 5

APPENDICES

Report Revision History

Date	Revision	Comments
02/24/2022	A	Initial release
08/17/2022	B	Update the Table 3 WLAN 5GHz Frequency Range
10/6/2022	C	Update the WLAN 2.4GHz power

1.0 Introduction

This report details the utilization, test setup, test equipment, and test results of the Specific Absorption Rate (SAR) measurements performed at the Motorola Solutions Inc. EME Test Laboratory for model number AZH77PCN6TZ5AN (PMUE5551A). This device is classified as Occupational/Controlled.

2.0 FCC SAR Summary

Table 1

Equipment Class	Frequency band (MHz)	Max Calc at Body (W/kg)	Max Calc at Face (W/kg)	Max Calc at Head (W/kg)
		1g-SAR	1g-SAR	1g-SAR
TNF	450-470 (LMR)	3.44	0.43	3.50
*DSS	2402-2480 (BT/BT LE)	NA	NA	NA
DTS	2412-2462 (WLAN 2.4GHz)	0.089	0.037	0.351
NII	5180-5825 (WLAN 5GHz)	0.569	0.107	0.727
Simultaneous Results		4.01	0.54	4.23

*Results not required per KDB (refer to sections 15.1 and 16.0)

3.0 Abbreviations / Definitions

BT: Bluetooth
CNR: Calibration Not Required
CW: Continuous Wave
DSP: Digital Signal Processor
DSS: Direct Spread Spectrum
DUT: Device Under Test
EME: Electromagnetic Energy
FHSS: Frequency Hopping Spread Spectrum
FM: Frequency Modulation
LMR: Land Mobile Radio
LTE: Long Term Evolution
NA: Not Applicable
PSM: Public Safety Microphone
PTT: Push to Talk
RSM: Remote Speaker Microphone
SAR: Specific Absorption Rate

TDMA: Time Division Multiple Access
TNF: Licensed Non-Broadcast Transmitter Held to Face

Audio accessories: These accessories allow communication while the DUT is worn on the body.

Body worn accessories: These accessories allow the DUT to be worn on the body of the user.
Maximum Power: Defined as the upper limit of the production line final test station.

4.0 Referenced Standards and Guidelines

This product is designed to comply with the following applicable national and international standards and guidelines.

- IEC62209-1 (2016) Procedure to determine the specific absorption rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)
- Federal Communications Commission, “Evaluating Compliance with FCC Guidelines for Human Exposure to Radio frequency Electromagnetic Fields”, OET Bulletin 65, FCC, Washington, D.C.: 1997.
- IEEE 1528 (2013), Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques
- American National Standards Institute (ANSI) / Institute of Electrical and Electronics Engineers (IEEE) C95. 1-1992
- Institute of Electrical and Electronics Engineers (IEEE) C95.1-2005
- International Commission on Non-Ionizing Radiation Protection (ICNIRP) 1998
- Ministry of Health (Canada) Safety Code 6 (2015), Limits of Human Exposure to Radio frequency Electromagnetic Fields in the Frequency Range from 3 kHz to 300 GHz
- RSS-102 (Issue 5) – Radio Frequency (RF) Exposure Compliance of Radio communication Apparatus (All Frequency Bands)
- Australian Communications Authority Radio communications (Electromagnetic Radiation - Human Exposure) Standard (2014)
- ANATEL, Brazil Regulatory Authority, Resolution No. 303 of July 2, 2002 "Regulation of the limitation of exposure to electrical, magnetic, and electromagnetic fields in the radio frequency range between 9 kHz and 300 GHz." and “Attachment to resolution # 303 from July 2, 2002”
- IEC62209-2 Edition 1.0 2010-03, Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices – Human models, instrumentation, and procedures – Part 2: Procedure to determine the specific absorption rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz).

- FCC KDB – 643646 D01 SAR Test for PTT Radios v01r03
- FCC KDB – 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04
- FCC KDB – 865664 D02 RF Exposure Reporting v01r02
- FCC KDB – 447498 D01 General RF Exposure Guidance v06
- FCC KDB – 248227 D01 802.11 Wi-Fi SAR v02r02

5.0 SAR Limits

Table 2

EXPOSURE LIMITS	SAR (W/kg)	
	(General Population / Uncontrolled Exposure Environment)	(Occupational / Controlled Exposure Environment)
Spatial Average - ANSI - (averaged over the whole body)	0.08	0.4
Spatial Peak - ANSI - (averaged over any 1-g of tissue)	1.6	8.0
Spatial Peak – ICNIRP/ANSI - (hands/wrists/feet/ankles averaged over 10-g)	4.0	20.0
Spatial Peak - ICNIRP - (Head and Trunk 10-g)	2.0	10.0

6.0 Description of Device Under Test (DUT)

This portable device operates in dispatch, phone and packet data modes. It uses one digital technology: Time Division Multiple Access (TDMA). This device also contains WLAN technology for data capabilities and Bluetooth technology for short range wireless devices.

The TDMA technique requires sophisticated algorithms and a digital signal processor (DSP) to perform voice compressions/decompressions and RF modulation/demodulation. The radios can be used by transmitting Multi Slot Packed Data (MSPD) with 5:8 (62.5%) duty cycle and Single Slot Packed Data (SSPD) with 1:4.55 (22%) duty cycle at maximum transmit power.

This device also incorporates a Class 1 Bluetooth device which is a Frequency Hopping Spread Spectrum (FHSS) technology. The Bluetooth radio modem is used to wireless link audio accessories. The maximum actual transmission duty cycle is imposed by the Bluetooth standard. The maximum duty cycle for BT is 77.0% and BT LE is 63.0%.

WLAN 2.4GHz 802.11 b/g/n operate using Direct Sequence Spread Spectrum (DSSS) and Orthogonal Frequency-Division Multiplexing (OFDM). WLAN 5 GHz 802.11 a/n/ac operates using Orthogonal Frequency-Division Multiplexing (OFDM).

The intended operating positions are “against the head” in the phone mode, “in front of the face” in PTT mode with front/back of the DUT at least 2.5 cm from the mouth, and “against the body” in data, phone or PTT mode by means of the offered body worn accessories. Body worn audio and PTT operation is accomplished by means of optional remote accessories that

are connected to the radio. Operation at the body without an audio accessory attached is possible by means of BT accessories.

Table 3 below summarizes the technologies, bands, maximum duty cycles and maximum output powers. Maximum output powers are defined as upper limit of the production line final test station.

Table 3

Radio Type	Band (MHz)	Transmission	Duty Cycle (%)	Max Power (W)
LMR	350-470	MSPD	62.5	2.51
LMR	350-470	SSPD	22	3.00
BT	2402-2480	FHSS	77	0.0025
BT LE	2402-2480	FHSS	63	0.0025
WLAN 2.4GHz	2412-2462	802.11b/g/n	97	0.0224(2)
WLAN 5GHz	5180-5825	802.11a/n/ac	97	0.0200(1)

(1) For WLAN 5 GHZ 802.11a/n/ac. EME tested WLAN 5 GHz 802.11a/n/ac at max power 0.0200W (Highest power as stated in the table above). However, maximum power of WLAN 802.11a/n/ac change for U-NII-1, U-NII-2A, U-NII-2C and U-NII-3 are 0.0158W, except channel 116 is 0.0100W, it was implement later at PP vintage radio after fix the failure in FCC EMC test.

(2) For WLAN 2.4 GHZ 802.11b. EME tested WLAN 2.4 GHz 802.13c1b at max power 0.0224W (Highest power as stated in the table above). However, maximum power of WLAN 2.4 GHz 802.11b will be change to 0.0178W at PP vintage radio.

7.0 Optional Accessories and Test Criteria

These devices are offered with optional accessories. All accessories were individually evaluated during the test plan creation to determine if testing was required. The following sections identify the test criteria and details for each accessory category. Refer to Exhibit 7B for antenna separation distances.

7.1 Antennas

There are optional removable antennas and one internal WiFi/BT antenna offered for this product. The Table below lists their descriptions

Table 4

Antenna No.	Antenna Models	Description	Selected for test	Tested
1	AN000354A01	ANTENNA, STUBBY,ANTENNA, STUBBY, SLIM, 60MM (380 - 430MHZ) 380-430MHz	Yes	Yes
2	PMAE4022B	DMR UHF WHIP ANTENNA(380-480MHZ)	Yes	Yes
3	PMAE4100A	ANTENNA, STUBBY,ANTENNA, STUBBY, SLIM, 90MM (380 - 470MHZ) 380-470MHz	Yes	Yes
4	AN000256A01	ANTENNA, CHIP,CHIP CERAMIC ANTENNA, GNSS, DUAL BAND WIFI. DUAL FEED. 1560-1610MHz, 2400-2485MHz, 5150-5850MHz	Yes	Yes; only for WLAN

7.2 Battery

There are optional batteries offered for this product. The Table below lists their descriptions.

Table 5

Battery No.	Battery Models	Description	Selected for test	Tested	Comments
1	PMNN4801A	BATT LION IMPRES 2 IP68 1900T	Yes	Yes	Default battery for body testing
2	PMNN4802A	BATT LION IMPRES 2 IP68 3400T	Yes	Yes	Default battery for face testing

7.3 Body worn Accessories

All body worn accessories were considered. The Table below lists the body worn accessories, and body worn accessory descriptions.

Table 6

Body worn No.	Body worn Models	Description	Selected for test	Tested	Comments
1	NTN5243A	Strap	Yes	Yes	Tested with PMLN8184A
2	GMDN0386A	Carry case Assembly, Clamshell, Plas, Sew-On Dock	Yes	Yes	Tested with PMLN5004B, PMLN8025A, & PMLN8185A
3	GMDN0445AA	Peter Jones RSM Tag	Yes	Yes	Tested with PMLN5004B, PMLN8025A, & PMLN8185A
4	GMDN0445AC	Peter Jones Belt Loop 50mm w/Dock Low Hang	Yes	Yes	Tested with PMLN5004B, PMLN8025A, & PMLN8185A
5	GMDN0566AC	Peter Jones Belt Loop 50mm and Dock	Yes	Yes	Tested with PMLN5004B, PMLN8025A, & PMLN8185A
6	HLN6602A	Universal Chest pack	Yes	Yes	
7	PMLN5616B	Tetra MTP850 S Belt Clip 2 inch	Yes	Yes	
8	PMLN8025A	Carry Accessory-Belt Clip, Peter Jones Stud Version 2	Yes	Yes	Tested with GMDN0386A, GMDN0445AA, GMDN0445AC, GMDN0566AC, WALN4307A & PMLN8185A

Table 6 (Continued)

Body worn No.	Body worn Models	Description	Selected for test	Tested	Comments
9	PMLN5004B	Shoulder Wearing Device	Yes	Yes	Tested with GMDN0386A, GMDN0445AA, GMDN0445AC, GMDN0566AC, WALN4307A & PMLN8185A
10	RLN4570A	Breakaway Chest Pack	Yes	Yes	
11	RLN4815A	Fanny Pack Carry Accessory	Yes	Yes	
12	WALN4307A	Peter Jones Screw Mount	Yes	Yes	Tested with PMLN5004B, PMLN8025A, & PMLN8185A
13	PMLN8181A	2.5 Inch Belt Clip	Yes	Yes	
14	PMLN8184A	Lightweight Leather Case with 2.5 Inch Swivel Belt Loop	Yes	Yes	Tested with NTN5243A
15	PMLN8185A	Carry Accessory-Case, Lightweight Leather Case For Peter Jones Klickfast Clip	Yes	Yes	Tested with GMDN0386A, GMDN0445AA, GMDN0445AC, GMDN0566AC, WALN4307A, PMLN5004B & PMLN8025A
16	GMDN0497A	Peter Jones Belt Dock 38mm	No	No	Non-metallic, assess with closer distance part GMDN3086A
17	GMDN0547A	Double Tongue Tag Dock	No	No	Non-metallic, assess with closer distance part GMDN0445AA
18	GMLN4488A	Peter Jones Belt Dock 50mm	No	No	Non-metallic, assess with closer distance part GMDN3086A
19	HLN9767C	Carry Accessory-Strap, Wrist Strap	No	No	For hand carry purpose only
20	PMLN8183A	Lightweight Leather Case With 3 Inch Swivel Belt Loop	No	No	By similarity to PMLN8184A

7.4 Audio Accessories

All offered audio accessories were evaluated during the test plan generation. The table below lists the audio accessories, and their descriptions.

Table 7

Audio No.	Audio Acc. Models	Description	Selected for test	Tested	Comments
1	PMMN4128A	RM780 IMPRES Windporting Remote Speaker Microphone,Large (IP68)	Yes	Yes	Default Audio
2	PMLN8082A	1-Wire XL Clear Tube Earpiece	Yes	Yes	
3	PMLN8083A	2-Wire XL Clear Tube Earpiece	Yes	Yes	
4	PMLN8084A	3-Wire XL Clear Tube Earpiece	Yes	Yes	
5	PMLN8085A	Behind the Head Headset	Yes	Yes	
6	PMLN8086A	Over the Head Headset	Yes	Yes	

8.0 Description of Test System

8.1 Descriptions of Robotics/Probes/Readout Electronics

Table 8

Dosimetric System type	System version	DAE type	Probe Type
Schmid & Partner Engineering AG SPEAG DASY 5	52.10.4.1527	DAE4	EX3DV4 (E-Field)

The DASY5™ system is operated per the instructions in the DASY5™ Users Manual. The complete manual is available directly from SPEAG™. All measurement equipment used to assess SAR compliance was calibrated according to ISO/IEC 17025 A2LA guidelines. Section 9.0 presents additional test equipment information. Appendices B and C present the applicable calibration certificates. The E-field probe first scans a coarse grid over a large area inside the phantom in order to locate the interpolated maximum SAR distribution. After the coarse scan measurement, the probe is automatically moved to a position at the interpolated maximum. The subsequent scan can directly use this position as reference for the cube evaluations.

8.2 Description of Phantom(s)

Table 9

Phantom Type	Phantom(s) Used	Material Parameters	Phantom Dimensions LxWxD (mm)	Material Thickness (mm)	Support Structure Material	Loss Tangent (wood)
Triple Flat	NA	200MHz -6GHz; Er = 3-5, Loss Tangent = ≤0.05	280x175x175	2mm +/- 0.2mm	Wood	< 0.05
SAM	√	300MHz -6GHz; Er = < 5, Loss Tangent = ≤0.05	Human Model			
Oval Flat	√	300MHz -6GHz; Er = 4+/- 1, Loss Tangent = ≤0.05	600x400x190			

8.3 Description of Simulated Tissue

The sugar based simulate tissue is produced by placing the correct measured amount of De-ionized water into a large container. Each of the dried ingredients are weighed and added to the water carefully to avoid clumping. If the solution has a high sugar concentration the water is pre-heated to aid in dissolving the ingredients. For Diacetin and similar type simulates, sugar and HEC ingredients are not needed. The solution is mixed thoroughly, covered, and allowed to sit overnight prior to use.

The simulated tissue mixture was mixed based on the Simulated Tissue Composition indicated in Table 10. During the daily testing of this product, the applicable mixture was used to measure the Di-electric parameters at each of the tested frequencies to verify that the Di-electric parameters were within the tolerance of the tissue specifications.

Simulated Tissue Composition (percent by mass)
Table 10

Ingredients	450MHz	2450MHz	*5GHz
Sugar	56.0	0	NA
Diacetin	0	51.0	NA
De ionized – Water	39.1	48.75	NA
Salt	3.8	0.15	NA
HEC	1.0	0	NA
Bact.	0.1	0.1	NA

Note: * SPEAG provides Motorola proprietary stimulant ingredients for the 5 GHz band

9.0 Additional Test Equipment

The Table below lists additional test equipment used during the SAR assessment.

Table 11

Equipment Type	Model Number	Serial Number	Calibration Date	Calibration Due Date
Speag Probe	EX3DV4	7511	10/24/2019	10/24/2020
Speag Probe	EX3DV4	7486	10/24/2019	*10/24/2020
Speag Probe	EX3DV4	7533	11/6/2019	*11/6/2020
Speag Probe	EX3DV4	7534	4/19/2021	4/19/2022
Speag Probe	EX3DV4	7486	6/18/2021	6/18/2022
Speag Probe	EX3DV4	7519	5/29/2020	5/29/2021
Speag Probe	EX3DV4	7533	4/19/2021	4/19/2022
Speag DAE	DAE4	729	10/16/2019	10/16/2020
Speag DAE	DAE4	850	10/16/2019	10/16/2020
Speag DAE	DAE4	1488	7/23/2019	*7/23/2020
Speag DAE	DAE4	684	5/26/2020	5/26/2021
Speag DAE	DAE4	1598	4/7/2021	4/7/2022
Speag DAE	DAE4	1488	4/7/2021	4/7/2022
Speag DAE	DAE4	1294	5/27/2020	5/27/2021
Speag DAE	DAE3	374	4/8/2021	4/8/2022
Amplifier Power	50W 1000A	14715	CNR	CNR
Amplifier Power	10W1000C	312859	CNR	CNR
Amplifier Power	5S1G4	313326	CNR	CNR
Amplifier Power	5S4G11	312663	CNR	CNR
Amplifier Power	5S1G4	312988	CNR	CNR
Amplifier Power	50W100D	0357646	CNR	CNR
Power Meter	E4419B	MY45103725	6/10/2019	*6/10/2021
Power Meter	E4418B	MY45100911	8/30/2019	*8/30/2021
Power Meter	E4418B	MY45100739	12/9/2019	*12/9/2020
Power Meter	E4418B	MY45100739	12/3/2020	12/3/2021
Power Meter	E4419B	MY45103725	6/29/2021	6/29/2022
Power Meter	E4418B	MY45107917	7/1/2019	7/1/2021
Power Meter	E4416A	MY50001037	8/30/2019	8/30/2021
Power Meter	E4418B	MY45100911	8/20/2021	8/20/2022
Power Meter	E4416A	MY50001037	8/16/2020	8/16/2022
Power Sensor	E4412A	US38488023	4/23/2020	4/23/2021
Power Sensor	8481B	3318A10982	2/5/2020	2/5/2021
Power Sensor	8481B	MY41091243	12/17/2019	12/17/2020
Power Sensor	E4418B	MY45107917	7/1/2019	7/1/2021
Power Sensor	E9301B	MY50280001	4/22/2020	*4/22/2021
Power Sensor	8481B	MY41091243	11/3/2020	11/3/2021
Power Sensor	8481B	3318A10982	11/3/2020	11/3/2021
Power Sensor	E9301B	MY55210003	5/29/2021	5/29/2022

Table 11 (Continued)

Equipment Type	Model Number	Serial Number	Calibration Date	Calibration Due Date
Power Sensor	E9301B	MY41495733	5/29/2021	5/29/2022
Power Sensor	E9301B	MY50280001	5/7/2021	5/7/2022
Power Sensor	E4412A	MY61060015	4/24/2021	4/21/2020
Power Sensor	E9301B	MY41495594	5/29/2021	5/29/2022
Power Sensor	E4412A	MY61050006	4/21/2021	4/21/2022
Bi-Directional Coupler	3020A	40295	9/12/2019	*9/12/2020
Bi-Directional Coupler	3022	81640	9/22/2019	9/22/2020
Bi-Directional Coupler	3020A	41931	7/9/2020	*7/9/2021
Bi-Directional Coupler	3020A	41931	7/27/2021	7/27/2022
Bi-Directional Coupler	3022	81640	7/8/2021	7/8/2022
Bi-Directional Coupler	3020A	40295	7/8/2021	7/8/2022
POWER SENSOR	NRP-Z11	120907	8/19/2020	8/19/2022
Vector Signal Generator	E4438C	MY42081753	9/5/2019	9/5/2021
Vector Signal Generator	E9301B	MY55210006	4/22/2020	4/22/2021
Vector Signal Generator	E4438C	MY45091270	8/13/2018	8/13/2020
Vector Signal Generator	E4438C	MY45091270	9/9/2021	9/9/2022
Vector Signal Generator	E4438C	MY47272101	10/29/2019	10/29/2021
Data Logger	DSB	16326820	11/25/2019	11/25/2020
Data Logger	DSB	16398050	8/3/2020	*8/3/2021
Data Logger	DSB	16398306	11/24/2021	11/24/2022
Data Logger	DSB	16398050	8/18/2021	8/18/2022
Thermometer	HH202A	35881	12/24/2019	*12/24/2020
Thermometer	HH202A	35881	12/3/2020	12/3/2021
Thermometer	HH806AU	080307	11/25/2020	*11/25/2021
Thermometer	HH806AU	080307	11/26/2021	11/26/2022
Digital Thermometer	1523	3492108	9/28/2021	9/28/2022
Temperature Probe	PR-10-3-100-1/4-6-E	WNWR020579	7/6/2019	*7/6/2020
Temperature Probe	80PK-22	05032017	12/24/2019	*12/24/2020
Temperature Probe	80PK-22	05032017	12/3/2020	12/3/2021
Temperature Probe	80PK-22	06032017	11/25/2020	*11/25/2021
Temperature Probe	80PK-22	06032017	11/26/2021	11/26/2022
Temperature Probe	PR-10L-4-100-1/4-6-BX	WNWR037791	9/17/2021	9/17/2022
Network Analyzer	E5071B	MY42403147	12/27/2019	*12/27/2020
Network Analyzer	E5071B	MY42403218	9/13/2019	*9/13/2020
Network Analyzer	E5071B	MY42403147	12/1/2020	12/1/2021
Network Analyzer	E5071B	MY42403218	9/13/2021	9/13/2022
Dielectric Assessment Kit	DAK-3.5	1120	8/12/2020	8/12/2021
Dielectric Assessment Kit	DAK-3.5	1120	7/11/2019	*7/11/2020
Dielectric Assessment Kit	DAK-3.5	1156	2/25/2020	*2/25/2021
Dielectric Assessment Kit	DAK-3.5	1156	4/7/2021	4/7/2022
Speag Dipole	D450V3	1053	10/19/2018	10/19/2020
Speag Dipole	D450V3	1054	3/11/2019	3/11/2022
Power Meter	E9301B	MY55210006	5/7/2021	5/7/2022

Table 11 (Continued)

Equipment Type	Model Number	Serial Number	Calibration Date	Calibration Due Date
Power Sensor	E4418B	GB40206480	11/24/2021	11/24/2022
Speag Dipole	D2450V2	703	10/16/2018	10/16/2020
Speag Dipole	D2450V2	782	2/20/2020	2/20/2023
Speag Dipole	D2450V2	781	4/11/2018	4/11/2021
Speag Dipole	D5GHzV2	1026	10/18/2018	10/18/2020
Speag Dipole	D5GHzV2	1022	2/13/2018	2/13/2021
Speag Dipole	D5GHzV2	1027	1/31/2020	1/31/2023

Note: * Indicated equipment used for SAR assessment before calibration due date

10.0 SAR Measurement System Validation and Verification

DASY output files of the probe/dipole calibration certificates and system verification test results are included in appendices B, C & D respectively.

10.1 System Validation

The SAR measurement system was validated according to procedures in KDB 865664. The validation status summary Table is below.

Table 12

Dates	Probe Calibration Point		Probe SN	Measured Tissue Parameters		Validation		
				σ	ϵ_r	Sensitivity	Linearity	Isotropy
CW								
11/27/2019	Body	450	7511	0.93	54.8	Pass	Pass	Pass
11/26/2019	Head	450		0.89	42.3	Pass	Pass	Pass
11/22/2019	Body	450	7533	0.95	54.4	Pass	Pass	Pass
11/22/2019	Head	450		0.86	42.8	Pass	Pass	Pass
5/10/2021	Body	450		0.93	55.1	Pass	Pass	Pass
5/8/2021	Head	450		0.84	43.8	Pass	Pass	Pass
7/1/2020	Body	450	7519	0.99	56.6	Pass	Pass	Pass
7/2/2020	Head	450		0.89	42.3	Pass	Pass	Pass
7/7/2021	Body	450	7486	0.97	54.9	Pass	Pass	Pass
7/8/2021	Head	450		0.86	43.6	Pass	Pass	Pass
WLAN								
12/9/2019	Body	2450	7533	2.02	50.8	Pass	Pass	Pass
11/26/2019	Head	2450		1.87	35.5	Pass	Pass	Pass
5/31/2021	Body	2450		2.01	51.9	Pass	Pass	Pass
5/23/2021	Head	2450		1.89	39.6	Pass	Pass	Pass
11/13/2019	Body	2450	7486	1.99	47.8	Pass	Pass	Pass
11/15/2019	Head	2450		1.75	36.0	Pass	Pass	Pass
11/18/2019	Body	5250		5.50	45.2	Pass	Pass	Pass
12/16/2019	Head	5250		4.26	33.0	Pass	Pass	Pass
11/18/2019	Body	5600		5.94	44.6	Pass	Pass	Pass
11/17/2019	Head	5600		4.74	32.3	Pass	Pass	Pass
12/19/2019	Body	5750		6.07	44.2	Pass	Pass	Pass
11/17/2019	Head	5750		4.89	32.1	Pass	Pass	Pass
7/27/2021	Body	5750		6.24	43.9	Pass	Pass	Pass
7/22/2021	Head	5750		4.78	37.0	Pass	Pass	Pass
5/19/2021	Body	5750	7534	6.22	43.5	Pass	Pass	Pass
5/8/2021	Head	5750		4.80	38.3	Pass	Pass	Pass

10.2 System Verification

System verification checks were conducted each day during the SAR assessment. The results are normalized to 1W. Appendix D includes DASY plots for each day during the SAR assessment. The Table below summarizes the daily system check results used for the SAR assessment.

Table 13

Probe Serial #	Tissue Type	Dipole Kit / Serial #	Ref SAR @ 1W (W/kg)	System Check Results Measured (W/kg)	System Check Test Results when normalized to 1W (W/kg)	Tested Date
7533	IEEE/IEC Head	SPEAG D450V3 / 1053	4.57 +/- 10%	1.10	4.40	7/14/2020
				1.15	4.60	7/30/2020
				1.17	4.68	#8/3/2020
				1.19	4.76	#8/4/2020
				1.04	4.16	8/5/2020
		SPEAG D2450V3 / 782	52.90 +/- 10%	12.7	50.80	7/14/2020
7511	IEEE/IEC Head	SPEAG D450V3 / 1053	4.57 +/- 10%	1.09	4.36	#5/31/2020
				1.12	4.48	#6/1/2020
				1.09	4.36	#6/3/2020
				1.11	4.44	#6/4/2020
				1.03	4.12	6/5/2020
				1.07	4.28	#6/7/2020
				1.10	4.40	#6/8/2020
				1.05	4.20	#6/9/2020
				1.11	4.44	6/10/2020
				1.10	4.40	6/17/2020
				1.14	4.56	6/25/2020
				1.10	4.40	7/17/2020
7486	IEEE/IEC Head	SPEAG D2450V3 / 703	52.90 +/- 10%	13.7	54.80	#6/11/2020
				12.8	51.20	#6/12/2020
				13.1	52.40	7/3/2020
				13.0	52.00	7/6/2020
				13.5	54.00	8/5/2020
		SPEAG D5GHzV2_ 5250MHz / 1026	81.00 +/- 10%	7.64	76.40	6/12/2020
				7.29	72.90	6/15/2020
				7.67	76.70	#6/17/2020
				7.70	77.00	#6/18/2020
				7.67	76.70	6/19/2020
				7.91	79.10	#6/21/2020
				7.68	76.80	#6/22/2020
				7.46	74.60	6/23/2020
				8.11	81.10	6/26/2020
				7.66	76.60	6/29/2020
				8.65	86.50	#7/1/2020
				8.01	80.10	7/2/2020
				8.05	80.50	7/6/2020
		SPEAG D5GHzV2_ 5500MHz / 1026	84.70 +/- 10%	8.49	84.90	6/13/2020
				7.87	78.70	6/15/2020
				8.86	88.60	#6/24/2020
				8.17	81.70	6/252020
				8.39	83.90	6/29/2020
				8.77	87.70	7/6/2020
				9.24	92.40	6/28/2020

Table 13 (Continued)

Probe Serial #	Tissue Type	Dipole Kit / Serial #	Ref SAR @ 1W (W/kg)	System Check Results Measured (W/kg)	System Check Test Results when normalized to 1W (W/kg)	Tested Date
7486	IEEE/IEC Head	SPEAG D5GHzV2_ 5600MHz / 1026	85.90 +/- 10%	8.62	86.20	6/16/2020
				8.86	88.60	6/26/2020
				9.24	92.40	6/28/2020
				8.77	87.70	#7/1/2020
				8.71	87.10	7/2/2020
				8.47	84.70	8/6/2020
				8.28	82.80	8/10/2020
7534	IEEE/IEC Head	SPEAG D5GHzV2_ 5750MHz / 1027	79.70 +/- 10%	7.67	76.70	#6/16/2021
				7.49	74.90	#6/17/2021
				8.11	81.10	#6/18/2021
				8.14	81.40	#6/19/2021
				7.90	79.00	#6/20/2021
				7.58	75.80	#6/21/2021
				8.24	82.40	6/22/2021
7519	IEEE/IEC Head	SPEAG D450V3 / 1054	4.57 +/- 10%	1.17	4.68	#1/20/2021
7533	IEEE/IEC Head	SPEAG D450V3 / 1054	4.57 +/- 10%	1.15	4.60	#1/10/2022
				1.21	4.84	1/12/2022
		SPEAG D2450V3 / 782	54.40 +/- 10%	13.4	53.60	1/11/2022
7486	IEEE/IEC Head	SPEAG D450V3 / 1054	4.57 +/- 10%	1.18	4.72	2/21/2022

#System verification covered for next test day (within 24 hours)

10.3 Equivalent Tissue Test Results

Simulated tissue prepared for SAR measurements is measured daily and within 24 hours prior to actual SAR testing to verify that the tissue is within +/- 5% of target parameters at the center of the transmit band. This measurement is done using the applicable equipment indicated in section 9.0. The Table below summarizes the measured tissue parameters used for the SAR assessment.

Table 14

Frequency (MHz)	Tissue Type	Conductivity Target (S/m)	Dielectric Constant Target	Conductivity Meas. (S/m)	Dielectric Constant Meas.	Tested Date
380	IEEE/IEC Head	0.87 (0.83-0.91)	44.3 (42.1-46.6)	0.84	44.3	#8/5/2020
				0.83	44.9	6/8/2020
				0.84	43.8	#8/4/2020
				0.83	45.3	6/7/2020
				0.83	46.1	6/9/2020
				0.83	44.8	6/10/2020
				0.84	44.3	6/11/2020
392.5		0.87 (0.83-0.91)	44.2 (42.0-46.4)	0.85	43.9	8/5/2020
				0.84	44.6	6/8/2020
397.5		0.87 (0.83-0.91)	44.1 (41.9-46.3)	0.85	43.8	8/5/2020
				0.84	44.5	6/8/2020
				0.85	45.7	6/9/2020
				0.84	44.4	#6/11/2020
406		0.87 (0.83-0.91)	44.0 (41.8-46.2)	0.86	43.6	8/5/2020
				0.85	44.3	#6/8/2020
				0.83	42.7	1/10/2022
				0.85	44.3	2/21/2022
416.3		0.87 (0.83-0.91)	43.9 (41.7-46.1)	0.87	43.4	8/5/2020
				0.86	44.1	6/8/2020
				0.87	42.9	#8/5/2020
				0.86	44.6	6/7/2020
				0.86	45.3	6/9/2020
				0.84	43.2	7/17/2020
430		0.87 (0.83-0.91)	43.7 (41.6-45.9)	0.88	43.1	8/5/2020
				0.87	43.8	8/6/2020
				0.88	42.6	#8/5/2020
				0.88	44.3	6/7/2020
				0.87	44.9	6/9/2020
450		0.87 (0.83-0.91)	43.5 (41.3-45.7)	0.89	42.4	#7/30/2020
				0.91	42.2	#8/3/2020
				0.90	42.2	#8/4/2020
				0.90	44.3	6/5/2020
				0.89	43.8	#6/7/2020
				0.89	43.1	6/17/2020

Table 14 (Continued)

Frequency (MHz)	Tissue Type	Conductivity Target (S/m)	Dielectric Constant Target	Conductivity Meas. (S/m)	Dielectric Constant Meas.	Tested Date
450	IEEE/ IEC Head	0.87 (0.83-0.91)	43.5 (41.3-45.7)	0.89	43.2	#6/10/2020
				0.89	41.8	7/14/2020
				0.90	42.6	8/5/2020
				0.90	42.8	6/11/2020
				0.90	43.6	#1/20/2021
460		0.87 (0.83-0.91)	43.4 (41.3-45.6)	0.90	43.0	6/10/2020
				0.90	41.6	7/14/2020
				0.88	41.5	#1/10/2022
470		0.87 (0.83-0.91)	43.4 (41.2-45.6)	0.91	42.8	6/10/2020
				0.91	41.4	7/14/2020
				0.89	41.3	#1/10/2022
2412		1.77 (1.68-1.86)	39.3 (35.3-43.2)	1.74	36.0	6/8/2020
				1.83	35.4	#6/9/2020
				1.75	35.5	#6/10/2020
				1.76	35.9	7/3/2020
				1.77	36.4	8/5/2020
				1.84	35.6	7/6/2020
				1.76	35.6	6/11/2020
2437		1.79 (1.70-1.88)	39.2 (35.3-43.1)	1.85	41.0	1/11/2022
2442		1.79 (1.70-1.88)	39.2 (35.3-43.1)	1.81	35.4	#7/14/2020
2462		1.81 (1.72-1.90)	39.2 (35.3-43.1)	1.87	41.0	1/11/2022
2472		1.82 (1.73-1.91)	39.2 (35.3-43.1)	1.80	35.3	6/10/2020
				1.85	35.3	7/17/2020
5260		4.72 (4.25-5.19)	35.9 (32.3-39.5)	4.26	33.2	6/12/2020
				4.31	32.6	6/15/2020
				4.25	33.0	#6/18/2020
				4.27	33.0	6/19/2020
				4.33	34.0	#6/21/2020
				4.33	32.6	6/22/2020
				4.30	33.5	7/2/2020
				4.29	32.7	6/17/2020
5280		4.74 (4.27-5.21)	35.9 (32.3-39.5)	4.29	32.9	6/26/2020
				4.35	32.6	#6/22/2020
				4.33	32.5	6/15/2020
5300		4.76 (4.28-5.24)	35.9 (32.3-39.5)	4.31	32.9	#6/26/2020
				4.37	32.5	#6/22/2020
				4.35	32.5	6/15/2020
5320		4.78 (4.30-5.26)	35.9 (32.3-39.5)	4.32	32.5	#6/29/2020
				4.38	32.8	6/23/2020
				4.37	32.5	6/15/2020

Table 14 (Continued)

Frequency (MHz)	Tissue Type	Conductivity Target (S/m)	Dielectric Constant Target	Conductivity Meas. (S/m)	Dielectric Constant Meas.	Tested Date
5500	IEEE/ IEC Head	4.97 (4.47-5.46)	35.7 (32.1-39.2)	4.50	32.5	8/10/2020
				4.58	32.5	#6/16/2020
				4.49	32.9	#6/12/2020
				4.48	32.6	#8/7/2020
				4.54	32.6	#6/23/2020
				4.68	32.2	6/24/2020
				4.61	32.8	6/25/2020
				4.49	32.2	6/29/2020
5580		5.05 (4.54-5.55)	35.5 (32.0-39.1)	4.71	32.7	#6/25/2020
				4.58	32.1	#6/29/2020
				4.58	32.4	8/10/2020
5640		5.11 (4.60-5.62)	35.5 (31.9-39.0)	5.01	36.0	6/28/2020
				4.63	32.3	#8/10/2020
				4.90	33.8	#6/30/2020
				4.75	33.0	#8/5/2020
				4.72	33.3	7/2/2020
5720		5.19 (4.67-5.71)	35.4 (31.8-38.9)	5.10	35.9	6/28/2020
				5.10	32.2	8/11/2020
5745		5.22 (4.69-5.74)	35.4 (31.8-38.9)	4.82	34.9	#6/18/2021
				4.71	33.8	#6/19/2021
				4.98	37.6	6/16/2021
				4.78	38.6	6/17/2021
				4.70	34.1	#6/20/2021
				4.76	36.5	#6/21/2021
				4.85	34.9	6/23/2021
5785		5.26 (4.73-5.78)	35.3 (31.8-38.8)	4.81	36.5	6/21/2021
				4.74	34.1	6/20/2021
				4.75	33.8	#6/19/2021
5825		5.30 (4.77-5.83)	35.3 (31.7-38.8)	4.85	36.4	6/21/2021
				4.78	34.0	#6/20/2021
				4.79	33.7	#6/19/2021
				5.00	37.9	#7/29/2021

Tissue sheet date cover next testing day (within 24 hrs)

11.0 Environmental Test Conditions

The EME Laboratory's ambient environment is well controlled resulting in very stable simulated tissue temperature and therefore stable dielectric properties. Simulated tissue temperature is measured prior to each scan to insure it is within +/ - 2°C of the temperature at which the dielectric properties were determined. The liquid depth within the phantom used for measurements was at least 15cm. Additional precautions are routinely taken to ensure the stability of the simulated tissue such as covering the phantoms when scans are not actively in process in order to minimize evaporation. The lab environment is continuously monitored. The Table below presents the range and average environmental conditions during the SAR tests reported herein:

Table 15

	Target	Measured
Ambient Temperature	18 – 25 ˚C	Range: 19.9 – 24.3˚C Avg. 22.1 ˚C
Tissue Temperature	18 – 25 ˚C	Range: 19.9 - 23.2˚C Avg. 21.6˚C

Relative humidity target range is a recommended target

The EME Lab RF environment uses a Spectrum Analyzer to monitor for extraneous large signal RF contaminants that could possibly affect the test results. If such unwanted signals are discovered the SAR scans are repeated.

12.0 DUT Test Setup and Methodology

12.1 Measurements

SAR measurements were performed using the DASY system described in section 8.0 using zoom scans. Oval flat phantoms filled with applicable simulated tissue were used for body and face testing.

The Table below includes the step sizes and resolution of area and zoom scans per KDB 865664 requirements.

Table 16

<table>
<tr><th colspan="2">Description</th><th>≤ 3 GHz</th><th>> 3 GHz</th></tr>
<tr><td colspan="2">Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface</td><td>5 ± 1 mm</td><td>½·δ·ln(2) ± 0.5 mm</td></tr>
<tr><td colspan="2">Maximum probe angle from probe axis to phantom surface normal at the measurement location</td><td>30° ± 1°</td><td>20° ± 1°</td></tr>
<tr><td colspan="2" rowspan="2">Maximum area scan spatial resolution: ΔxArea, ΔyArea</td><td>≤ 2 GHz: ≤ 15 mm
2 – 3 GHz: ≤ 12 mm</td><td>3 – 4 GHz: ≤ 12 mm
4 – 6 GHz: ≤ 10 mm</td></tr>
<tr><td colspan="2">When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.</td></tr>
<tr><td colspan="2">Maximum zoom scan spatial resolution: ΔxZoom, ΔyZoom</td><td>≤ 2 GHz: ≤ 8 mm
2 – 3 GHz: ≤ 5 mm*</td><td>3 – 4 GHz: ≤ 5 mm*
4 – 6 GHz: ≤ 4 mm*</td></tr>
<tr><td>Maximum zoom scan spatial resolution, normal to phantom surface</td><td>uniform grid: ΔzZoom(n)</td><td>≤ 5 mm</td><td>3 – 4 GHz: ≤ 4 mm
4 – 5 GHz: ≤ 3 mm
5 – 6 GHz: ≤ 2 mm</td></tr>
<tr><td colspan="4">Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details.
* When zoom scan is required and the reported SAR from the area scan based 1-g SAR estimation procedures of KDB 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.</td></tr>
</table>

12.2 DUT Configuration(s)

The DUT is a portable device operational at the body and face as described in section 6.0 while using the applicable accessories listed in section 7.0. All accessories listed in section 7.0 of this report were considered when implementing the guidelines specified in KDB 643646.

12.3 DUT Positioning Procedures

The positioning of the device for each body location is described below and illustrated in Appendix G.

12.3.1 Body

The DUT was positioned in normal use configuration against the phantom with the offered body worn accessory as well as with and without the offered audio accessories as applicable.

12.3.2 Head

The DUT was placed against the right and left heads of the SAM phantom in the cheek touch and 15° tilt positions.

12.3.3 Face

The DUT was positioned with its' front and back sides separated 2.5cm from the phantom.

12.4 DUT Test Channels

The number of test channels was determined by using the following IEEE 1528 equation. The use of this equation produces the same or more test channels compared to the FCC KDB 447498 number of test channels formula.

$$N_c = 2 * roundup[10 * (f_{high} - f_{low}) / f_c] + 1$$

Where
N_c = Number of channels
F_{high} = Upper channel
F_{low} = Lower channel
F_c = Center channel

12.5 SAR Result Scaling Methodology

The calculated 1-gram and 10-gram averaged SAR results indicated as "Max Calc. 1g-SAR" in the data Tables is determined by scaling the measured SAR to account for power leveling variations and drift. Appendix F includes a shortened scan to justify SAR scaling for drift. For this device the "Max Calc. 1g-SAR" are scaled using the following formula:

$$Max\_Calc = SAR\_meas \cdot 10^{\frac{-Drift}{10}} \cdot \frac{P\_\max}{P\_\text{int}} \cdot DC$$

P_max = Maximum Power (W)
P_int = Initial Power (W)
Drift = DASY drift results (dB)
SAR_meas = Measured 1-g or 10-g Avg. SAR (W/kg)
DC = Transmission mode duty cycle in % where applicable
50% duty cycle is applied for PTT operation

Note: for conservative results, the following are applied:
If P_int > P_max, then P_max/P_int = 1.
Drift = 1 for positive drift

Additional SAR scaling was applied using the methodologies outlined in FCC KDB 865664 using tissue sensitivity values. SAR was scaled for conditions where the tissue permittivity was measured above the nominal target and for tissue conductivity that was measured below the nominal target. Negative or reduced SAR scaling is not permitted.

12.6 DUT Test Plan

All modes of operation identified in section 6.0 were considered during the development of the test plan. All accessories listed in section 7.0 of this report were evaluated and only those identified for testing were used to develop the SAR test plan for this product.
For conservative assessment, MSPD 5:8 (62.5%) data transmission was tested for body exposure; SSPD 1:4.55 (22%) phone mode was tested for head exposure and SSPD 1:4.55 (22%) PTT mode was tested for face exposure. A 50% duty cycle was applied to PTT configuration in the final results. WLAN tests were performed in 2.4 GHz 802.11b and 5 GHz 802.11a mode.

13.0 DUT Test Data

13.1 LMR assessments at the Body for 450-470MHz band

Battery PMNN4801A was selected as the default battery for assessments at the Body because it is the thinnest battery (refer to Exhibit 7B for battery illustration). The default battery was used during conducted power measurements for all test channels within FCC allocated frequency range (450-470MHz) which are listed in Table 17. The channel with the highest conducted power will be identified as the default channel per KDB 643646 (SAR Test for PTT Radios). SAR plots of the highest results per Table (bolded) are presented in Appendix E.

Table 17

Test Freq (MHz)	Power (W)	
	SSPD	MSPD
450.0000	2.90	2.43
460.0000	2.90	2.41
470.0000	2.90	2.39

Assessments at the Body with Body worn HLN6602A
DUT assessment with offered antennas, default battery and, default body worn accessory per KDB 643646. Optional batteries were tested per the requirements of KDB 643646. Refer to Table 17 for highest output power channel. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

Table 18

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Run#
PMAE4022B	PMNN4801A	HLN6602A	None	450.0000	2.44	-0.42	1.45	**1.64**	AM(AR)-AB-200730-02#
PMAE4100A				450.0000	2.43	-0.14	1.54	1.64	AM(AR)-AB-200730-03#
Assessment of Additional Batteries									
PMAE4022B	PMNN4802A	HLN6602A	None	450.000	2.45	-0.52	1.29	1.49	AM(AR)-AB-200730-04#

Assessments at the Body with Body worn PMLN8181A

DUT assessment with offered antennas, default battery and, optional body worn accessory per KDB 643646. Optional batteries were tested per the requirements of KDB 643646. Refer to Table 17 for highest output power channel. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

Table 19

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Run#
PMAE4022B	PMNN4801A	PMLN8181A	None	450.0000	2.44	0.00	1.89	1.94	AM(AR)-AB-200730-05#
PMAE4100A				450.0000	2.43	0.05	2.62	**2.71**	ZZ-AB-200730-06#
Assessment of Additional Batteries									
PMAE4100A	PMNN4802A	PMLN8181A	None	450.000	2.32	0.00	1.62	1.75	ZZ-AB-200730-10#

Assessments at the Body with Body worn PMLN8184A w/o belt loop w/ NTN5243A

DUT assessment with offered antennas, default battery and, optional body worn accessory per KDB 643646. Optional batteries were tested per the requirements of KDB 643646. Refer to Table 17 for highest output power channel. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

Table 20

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Run#
PMAE4022B	PMNN4801A	PMLN8184A w/o belt loop w/NTN5243A	None	450.0000	2.49	0.13	1.49	1.50	ZZ-AB-200730-09#
PMAE4100A				450.0000	2.39	0.10	1.44	**1.51**	ZZ-AB-200730-11#
Assessment of Additional Batteries									
PMAE4100A	PMNN4802A	PMLN8184A w/o belt loop	None	450.000	2.40	0.11	1.35	1.41	ZZ-AB-200730-12#

		w/NTN5243A							

Assessments at the Body with Body worn RLN4570A

DUT assessment with offered antennas, default battery and, optional body worn accessory per KDB 643646. Optional batteries were tested per the requirements of KDB 643646. Refer to Table 17 for highest output power channel. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

Table 21

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Run#
PMAE4022B	PMNN4801A	RLN4570A	None	450.0000	2.49	0.07	3.41	**3.44**	ZZ-AB-200730-14#
PMAE4100A				450.0000	2.49	0.11	3.06	3.08	ZZ-AB-200730-15#
Assessment of Additional Batteries									
PMAE4022B	PMNN4802A	RLN4570A	None	450.000	2.50	0.05	2.94	2.95	ZZ-AB-200730-16#

Assessments at the Body with Body worn RLN4815A

DUT assessment with offered antennas, default battery and, optional body worn accessory per KDB 643646. Optional batteries were tested per the requirements of KDB 643646. Refer to Table 17 for highest output power channel. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

Table 22

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Run#
PMAE4022B	PMNN4801A	RLN4815A	None	450.0000	2.50	-0.41	0.97	**1.07**	AM(AR)-AB-200803-02
PMAE4100A				450.0000	2.49	-0.37	0.91	1.00	AM(AR)-AB-200803-03
Assessment of Additional Batteries									
PMAE4022B	PMNN4802A	RLN4815A	None	450.000	2.40	-0.42	0.85	0.97	AM(AR)-AB-200803-04

Assessments at the Body with Body worn PMLN5616B

DUT assessment with offered antennas, default battery and, optional body worn accessory per KDB 643646. Optional batteries were tested per the requirements of KDB 643646. Refer to Table 17 for highest output power channel. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

Table 23

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Run#
PMAE4022B	PMNN4801A	PMLN5616B	None	450.0000	2.49	-0.24	1.54	**1.64**	AM(AR)-AB-200803-05
PMAE4100A				450.0000	2.50	-0.19	1.29	1.35	AM(AR)-AB-200803-06
Assessment of Additional Batteries									
PMAE4022B	PMNN4802A	PMLN5616B	None	450.000	2.40	-0.31	1.30	1.46	AM(AR)-AB-200803-07

Assessments at the Body with Body worn PMLN8185A w/PMLN8025A w/GMDN0386A

DUT assessment with offered antennas, default battery and, optional body worn accessory per KDB 643646. Optional batteries were tested per the requirements of KDB 643646. Refer to Table 17 for highest output power channel. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

Table 24

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Run#
PMAE4022B	PMNN4801A	PMLN8185A w/PMLN8025A w/GMDN0386A	None	450.0000	2.51	-0.98	1.43	**1.79**	AM(AR)-AB-200803-08
PMAE4100A				450.0000	2.50	-0.39	1.20	1.32	AM(AR)-AB-200803-09
Assessment of Additional Batteries									
PMAE4022B	PMNN4802A	PMLN8185A w/PMLN8025A w/GMDN0386A	None	450.0000	2.39	-0.48	0.94	1.10	AM(AR)-AB-200803-10

Assessments at the Body with Body worn PMLN8185A w/PMLN8025A w/GMDN0445AA

DUT assessment with offered antennas, default battery and, optional body worn accessory per KDB 643646. Optional batteries were tested per the requirements of KDB 643646. Refer to Table 17 for highest output power channel. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

Table 25

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Run#
PMAE4022B	PMNN4801A	PMLN8185A w/PMLN8025A w/GMDN0445AA	None	450.0000	2.41	-0.10	2.61	**2.78**	ZZ-AB-200804-07#
PMAE4100A				450.0000	2.45	0.05	2.06	2.11	ZZ-AB-200803-15
Assessment of Additional Batteries									
PMAE4022B	PMNN4802A	PMLN8185A	None	450.0000	2.40	0.09	1.60	1.67	AM(AR)-AB-

		w/PMLN8025A w/GMDN0445AA							200804-08#

Assessments at the Body with Body worn PMLN8185A w/PMLN8025A w/GMDN0445AC

DUT assessment with offered antennas, default battery and, optional body worn accessory per KDB 643646. Optional batteries were tested per the requirements of KDB 643646. Refer to Table 17 for highest output power channel. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

Table 26

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Run#
PMAE4022B	PMNN4801A	PMLN8185A w/PMLN8025A w/GMDN0445AC	None	450.0000	2.43	0.08	1.78	**1.84**	ZZ-AB-200803-16
PMAE4100A				450.0000	2.47	0.09	1.53	1.55	ZZ-AB-200803-17
Assessment of Additional Batteries									
PMAE4022B	PMNN4802A	PMLN8185A w/PMLN8025A w/GMDN0445AC	None	450.0000	2.48	0.14	1.52	1.54	ZZ-AB-200803-18

Assessments at the Body with Body worn PMLN8185A w/PMLN8025A w/GMDN0566AC

DUT assessment with offered antennas, default battery and, optional body worn accessory per KDB 643646. Optional batteries were tested per the requirements of KDB 643646. Refer to Table 17 for highest output power channel. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

Table 27

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Run#
PMAE4022B	PMNN4801A	PMLN8185A w/PMLN8025A w/GMDN0566AC	None	450.0000	2.39	0.09	1.00	**1.05**	ZZ-AB-200804-01#
PMAE4100A				450.0000	2.43	0.10	0.96	0.99	ZZ-AB-200804-02#
Assessment of Additional Batteries									
PMAE4022B	PMNN4802A	PMLN8185A w/PMLN8025A w/GMDN0566AC	None	450.0000	2.45	0.09	0.84	0.86	ZZ-AB-200804-03#

Assessments at the Body with Body worn PMLN8185A w/PMLN8025A w/WALN4307

DUT assessment with offered antennas, default battery and, optional body worn accessory per KDB 643646. Optional batteries were tested per the requirements of KDB 643646. Refer to Table 17 for highest output power channel. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

Table 28

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Run#
PMAE4022B	PMNN4801A	PMLN8185A w/PMLN8025A w/WALN4307	None	450.0000	2.48	-0.04	2.17	**2.22**	ZZ-AB-200804-04#
PMAE4100A				450.0000	2.46	0.09	1.91	1.95	ZZ-AB-200804-05#
Assessment of Additional Batteries									
PMAE4022B	PMNN4802A	PMLN8185A w/PMLN8025A w/WALN4307	None	450.0000	2.44	0.13	1.88	1.93	ZZ-AB-200804-06#

Assessments at the Body with Body worn PMLN8185A w/PMLN5004B w/GMDN0386A

DUT assessment with offered antennas, default battery and, optional body worn accessory per KDB 643646. Optional batteries were tested per the requirements of KDB 643646. Refer to Table 17 for highest output power channel. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

Table 29

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Run#
PMAE4022B	PMNN4801A	PMLN8185A w/PMLN5004B w/GMDN0386A	None	450.0000	2.49	0.09	2.44	**2.46**	AM(AR)-AB-200804-10
PMAE4100A				450.0000	2.45	0.12	2.02	2.07	AM(AR)-AB-200804-11
Assessment of Additional Batteries									
PMAE4022B	PMNN4802A	PMLN8185A w/PMLN5004B w/GMDN0386A	None	450.0000	2.48	0.06	2.06	2.08	AM(AR)-AB-200804-12

Assessments at the Body with Body worn PMLN8185A w/PMLN5004B w/GMDN0445AA

DUT assessment with offered antennas, default battery and, optional body worn accessory per KDB 643646. Optional batteries were tested per the requirements of KDB 643646. Refer to Table 17 for highest output power channel. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

Table 30

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Run#
PMAE4022B	PMNN4801A	PMLN8185A w/PMLN5004B w/GMDN0445AA	None	450.0000	2.43	0.09	1.67	**1.72**	AM(AR)-AB-200804-13
PMAE4100A				450.0000	2.42	0.07	1.50	1.56	AM(AR)-AB-200804-14
Assessment of Additional Batteries									
PMAE4022B	PMNN4802A	PMLN8185A w/PMLN5004B w/GMDN0445AA	None	450.0000	2.49	0.10	1.50	1.51	AM(AR)-AB-200804-15

Assessments at the Body with Body worn PMLN8185A w/PMLN5004B w/GMDN0445AC

DUT assessment with offered antennas, default battery and, optional body worn accessory per KDB 643646. Optional batteries were tested per the requirements of KDB 643646. Refer to Table 17 for highest output power channel. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

Table 31

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Run#
PMAE4022B	PMNN4801A	PMLN8185A w/PMLN5004B w/GMDN0445AC	None	450.0000	2.44	0.10	1.57	**1.62**	AM(AR)-AB-200804-16
PMAE4100A				450.0000	2.43	0.14	1.31	1.35	AM(AR)-AB-200804-17
Assessment of Additional Batteries									
PMAE4022B	PMNN4802A	PMLN8185A w/PMLN5004B w/GMDN0445AC	None	450.0000	2.48	0.07	1.28	1.30	AM(AR)-AB-200804-18

Assessments at the Body with Body worn PMLN8185A w/PMLN5004B w/GMDN0566AC

DUT assessment with offered antennas, default battery and, optional body worn accessory per KDB 643646. Optional batteries were tested per the requirements of KDB 643646. Refer to Table 17 for highest output power channel. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

Table 32

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Run#
PMAE4022B	PMNN4801A	PMLN8185A w/PMLN5004B w/GMDN0566AC	None	450.0000	2.39	0.14	0.95	**1.00**	AM(AR)-AB-200804-19
PMAE4100A				450.0000	2.45	0.14	0.95	0.98	AM(AR)-AB-200804-20
Assessment of Additional Batteries									
PMAE4022B	PMNN4802A	PMLN8185A w/PMLN5004B w/GMDN0566AC	None	450.0000	2.40	0.07	0.86	0.89	AM(AR)-AB-200804-21

Assessments at the Body with Body worn PMLN8185A w/PMLN5004B w/WALN4307

DUT assessment with offered antennas, default battery and, optional body worn accessory per KDB 643646. Optional batteries were tested per the requirements of KDB 643646. Refer to Table 17 for highest output power channel. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

Table 33

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Run#
PMAE4022B	PMNN4801A	PMLN8185A w/PMLN5004B w/WALN4307	None	450.0000	2.38	0.19	2.01	**2.12**	AM(AR)-AB-200804-22
PMAE4100A				450.0000	2.40	0.16	1.72	1.80	AM(AR)-AB-200804-23
Assessment of Additional Batteries									
PMAE4022B	PMNN4802A	PMLN8185A w/PMLN5004B w/WALN4307	None	450.0000	2.40	0.09	1.78	1.86	AM(AR)-AB-200804-24

Assessment at the Body with other audio accessories

Assessment per "KDB 643646 Body SAR Test Consideration for Audio Accessories without Built-in Antenna; Sec 1, A. when overall < 4.0 W/kg, SAR tested for that audio accessory is not necessary." This was applicable to all remaining accessories.

Assessment of wireless BT configuration

Assessment using the overall highest SAR configuration at the body from above without an audio accessory attached. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

Table 34

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Run#
PMAE4022B	PMNN4801A	RLN4570A	None (BT)	450.0000	2.90	-0.15	1.31	**0.70**	ZZ-AB-200805-01#

13.2 LMR assessments at the Face for 450-470MHz band

Battery PMNN4802A was selected as the default battery for assessments at the Face because it has the highest capacity (refer to Exhibit 7B for battery illustration). The default battery was used during conducted power measurements for all test channels within FCC allocated frequency range (450-470MHz) which are listed in Table 35. The channel with the highest conducted power will be identified as the default channel per KDB 643646 (SAR Test for PTT Radios). SAR plots of the highest results per Table (bolded) are presented in Appendix E.

Table 35

Test Freq (MHz)	Power (W)
	SSPD
450.0000	2.95
460.0000	2.93
470.0000	2.93

DUT assessment with offered antennas, default battery with front of DUT positioned 2.5cm facing phantom per KDB 643646. Optional batteries were tested per the requirements of KDB 643646. Refer to Table 35 for highest output power channel. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

Table 36

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Run#
@ Front									
PMAE4022B	PMNN4802A	@ front	None	450.0000	2.91	0.06	0.80	0.41	ZZ(MA)-FACE-200605-10
PMAE4100A				450.0000	2.90	0.17	0.62	0.32	NZ-FACE-200605-11
Assessment of Additional Batteries									
PMAE4022B	PMNN4801A	@ front	None	450.0000	2.88	0.09	0.83	**0.43**	NZ-FACE-200605-12
@ Back									
PMAE4022B	PMNN4802A	@ back	None	450.0000	2.90	0.07	0.55	0.28	NZ-FACE-200605-14
PMAE4100A				450.0000	2.87	0.07	0.38	0.20	NZ-FACE-200605-15
Assessment of Additional Batteries									
PMAE4022B	PMNN4801A	@ back	None	450.0000	2.89	0.01	0.65	0.34	NZ-FACE-200605-16

13.3 LMR assessments at the Head for 450-470MHz band

Battery PMNN4802A was selected as the default battery for assessments at the Head because it has the highest capacity (refer to Exhibit 7B for battery illustration). The default battery was used during conducted power measurements for all test channels within FCC allocated frequency range (450-470MHz) which are listed in Table 37. The channel with the highest conducted power will be identified as the default channel per KDB 643646 (SAR Test for PTT Radios). SAR plots of the highest results per Table (bolded) are presented in Appendix E.

Table 37

Test Freq (MHz)	Power (W)	
	SSPD	MSPD
450.0000	2.95	2.47
460.0000	2.93	2.48
470.0000	2.93	2.46

Assessment at the Left ear with Cheek Touch and 15° Tilt positions

Left ear position assessment with offered antennas and default battery with the DUT in both the cheek touch and tilt positions per KDB 643646. Refer to Table 37 for highest output power channel. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

Table 38

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Run#
PMAE4022B	PMNN4802A	Touch	None	450.0000	2.94	-0.12	2.03	2.13	ZZ(MA)-LEAR-200607-12
		Tilt		450.0000	2.92	-0.24	3.22	**3.50**	ZZ(MA)-LEAR-200607-13
PMAE4100A		Touch		450.0000	2.93	-0.01	1.56	1.60	ZZ(MA)-LEAR-200607-14
		Tilt		450.0000	2.90	0.07	1.69	1.75	ZZ(MA)-LEAR-200607-15
Assessment of Additional Batteries									
PMAE4022B	PMNN4801A	Tilt	None	450.0000	2.89	0.05	3.36	3.49	ZZ(MA)-LEAR-200608-01#

Assessment at the Right ear with Cheek Touch and 15° Tilt positions

Right ear position assessment with offered antennas and default battery with the DUT in both the cheek touch and tilt positions per KDB 643646. Refer to Table 37 for highest output power channel. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

Table 39

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Run#
PMAE4022B	PMNN4802A	Touch	None	450.0000	2.94	-0.07	1.54	1.60	ZZ(MA)-REAR-200608-02#
		Tilt		450.0000	2.91	0.14	2.47	2.55	ZZ(MA)-REAR-200608-03#
PMAE4100A		Touch		450.0000	2.92	0.04	1.31	1.35	ZZ(MA)-REAR-200608-04#
		Tilt		450.0000	2.92	0.12	1.61	1.65	ZZ(MA)-REAR-200608-05#
Assessment of Additional Batteries									
PMAE4022B	PMNN4801A	Tilt	None	450.0000	2.92	0.25	2.77	**2.85**	NZ-REAR-200617-14

14.0 DUT Test Data for WLAN

SAR test reduction is applied using the following criteria according to KDB 248227 D01:

a. For 2.4GHz 802.11 g/n SAR testing is not required when then highest reported SAR for DSSS is adjusted by ratio of OFDM to DSSS specified maximum output power and adjusted SAR is ≤1.2 W/kg.

b. U-NII-1 SAR testing not required when U-NII-2A band highest reported SAR for a test Configuration is ≤1.2 W/kg.

c. For all positions/configurations, when reported SAR is >0.8W/kg, SAR is measured for these test positions/configurations on the subsequent next highest measured output power channel(s) until the reported SAR is ≤1.2 W/kg or all required test positions/ configurations are tested.

14.1 WLAN 2.4GHz assessments for 802.11b/g/n (2.412-2.462GHz)

Output Power Data

These power measurements were used to determine the necessary modes for SAR testing according to KDB 248227.

Table 40

Mode	Channel #	Channel Frequency	Modulation	Battery: PMNN4801A Antenna port[mW]	Antenna Max Power [mW]
802.11b (1Mbps)	1	2412	DSSS	15.0	22.4
	6	2437		14.9	
	11	2462		14.5	
802.11g (6Mbps)	1	2412	OFDM	15.3	
	6	2437		15.2	
	11	2462		15.2	
802.11n (MCS0)	1	2412	OFDM	16.4	
	6	2437		16.3	
	11	2462		16.3	

Assessments at the WLAN 2.4GHz Body

DUT assessment with WLAN internal antenna, all offered batteries without any cable accessory attachment against phantom with all offered body worn. Refer to Table 40 for highest output power channel. SAR plots of the highest results per Table (bolded) are presented in Appendix F.

Table 41

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Run#
WLAN ant AN000256A01	PMNN4801A	HLN6602A	None	2412.0000	0.0150	0.41	0.054	0.083	AM-AB-200608-02
		PMLN8181A				0.28	0.020	0.031	AM-AB-200608-03
		PMLN8184A w/o belt loop w/ NTN5243A				-0.31	0.046	0.076	FAZ-AB-200609-13
		RLN4570A				0.39	0.056	0.086	AM-AB-200608-04
		PMLN5616B				0.40	0.022	0.034	AM-AB-200608-05
		RLN4815A				0.04	0.019	0.029	AM-AB-200608-06
		PMLN8185A w/PMLN8025A w/GMDN0386A				0.16	0.019	0.029	AM-AB-200609-01#
		PMLN8185A w/PMLN8025A w/GMDN0445AA				0.15	0.023	0.035	AM-AB-200609-02#
		PMLN8185A w/PMLN8025A w/GMDN0445AC				-0.27	0.010	0.016	AM-AB-200609-03#
		PMLN8185A w/PMLN8025A w/GMDN0566AC				0.04	0.007	0.011	FAZ-AB-200609-04#
		PMLN8185A w/PMLN8025A w/WALN4307				0.28	0.013	0.020	FAZ-AB-200609-05#
		PMLN8185A w/PMLN5004B w/GMDN0386A				0.26	0.043	0.066	AM-AB-200609-14
		PMLN8185A w/PMLN5004B w/GMDN0445AA				0.25	0.025	0.038	AM-AB-200609-15
		PMLN8185A w/PMLN5004B w/GMDN0445AC				-0.05	0.014	0.022	AM-AB-200609-17
		PMLN8185A w/PMLN5004B w/GMDN0566AC				-0.03	0.008	0.012	AM-AB-200609-18
		PMLN8185A w/PMLN5004B w/WALN4307				-0.05	0.013	0.020	AM-AB-200610-01#
Additional batteries									
WLAN ant AN000256A01	PMNN4802A	RLN4570A	None	2412.0000	0.0148	0.32	0.057	**0.089**	AM-AB-200610-02#

Assessments at the WLAN 2.4GHz Face

DUT assessment with WLAN internal antenna using all offered batteries with front and back of the DUT 2.5 cm from the phantom. Refer to Table 40 for highest output power channel. SAR plots of the highest results per Table (bolded) are presented in Appendix F.

Table 42

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Run#
WLAN ant AN000256A01	PMNN4802A	@ front	None	2412.0000	0.0148	-0.13	0.014	**0.023**	AM-FACE-200612-02
		@ back				0.07	0.007	0.011	FAZ-FACE-200610-10#
Additional batteries									
WLAN ant AN000256A01	PMNN4801A	@ front	None	2412.0000	0.0150	-0.19	0.010	0.016	FAZ-FACE-200610-11#

Assessments at the WLAN 2.4GHz Head

DUT assessment with WLAN internal antenna using all offered batteries with the DUT was placed against the right and left heads of the SAM phantom in the cheek touch and 15° tilt positions. Refer to Table 40 for highest output power channel. SAR plots of the highest results per Table (bolded) are presented in Appendix F.

Table 43

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Run#
WLAN ant AN000256A01	PMNN4802A	Touch	None	2412.0000	0.0148	-0.15	0.102	0.165	AM-LEAR-200611-02#
		Tilt				-0.04	0.145	**0.228**	AM-LEAR-200611-17
		Touch				-0.13	0.074	0.119	AM-REAR-200611-04#
		Tilt				-0.38	0.109	0.185	FAZ-REAR-200611-05#
Additional batteries									
WLAN ant AN000256A01	PMNN4801A	Tilt	None	2412.0000	0.0150	-0.20	0.109	0.176	FAZ-LEAR-200703-05

14.2 WLAN 5GHz assessments for 802.11a/n/ac (5.180-5.825GHz)

Output Power Data

These power measurements were used to determine the necessary modes for SAR testing according to KDB 248227.

Table 44

Band	802.11	Ch. BW	Ch.	Freq. (MHz)	Measured conducted power (W)
U-NII-1 (5.15-5.25GHz)	a	20	36	5180	0.0160
			40	5200	0.0161
			44	5220	0.0158
			48	5240	0.0160
	n		36	5180	0.0174
			40	5200	0.0174
			44	5220	0.0177
			48	5240	0.0171
	ac		36	5180	0.0185
			40	5200	0.0178
			44	5220	0.0173
			48	5240	0.0170
UNII-2A (5.25-5.35GHz)	a	20	52	5260	0.0155
			56	5280	0.0153
			60	5300	0.0151
			64	5320	0.0150
	n		52	5260	0.0167
			56	5280	0.0162
			60	5300	0.0160
			64	5320	0.0158
	ac		52	5260	0.0165
			56	5280	0.0164
			60	5300	0.0163
			64	5320	0.0158
U-NII-2C (5.47-5.65 GHz)	a	20	100	5500	0.0145
			116	5580	0.0135
			128	5640	0.0141
			144	5720	0.0134
	n		100	5500	0.0129
			116	5580	0.0131
			128	5640	0.0132
			144	5720	0.0143
	ac		100	5500	0.0141
			116	5580	0.0129
			128	5640	0.0132
			144	5720	0.0143
UNII-3 (5.65-5.85 GHz)	a	20	149	5745	0.0157
			157	5785	0.0141
			165	5825	0.0133
	n		149	5745	0.0166
			157	5785	0.0149
			165	5825	0.0141
	ac		149	5745	0.0164
			157	5785	0.0149
			165	5825	0.0141

Assessments at the Body U-NII-2A (5.25-5.35GHz)

Table below presents the data of the body assessment.

Table 45

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Run#
WLAN ant AN000256A01	PMNN4801A	HLN6602A	None	5260.0000	0.0155	0.04	0.142	0.189	AM-AB-200618-02
		PMLN8181A				0.03	0.065	0.086	AM-AB-200618-05
		PMLN8184A w/o belt loop w/ NTN5243A				0.03	0.017	0.023	AM-AB-200618-06
		RLN4570A				-0.32	0.207	**0.296**	AM-AB-200618-08
		PMLN5616B				0.41	0.063	0.084	AM-AB-200618-07
		RLN4815A				-0.08	0.084	0.114	AM-AB-200619-01#
		PMLN8185A w/PMLN8025A w/GMDN0386A				-0.09	0.102	0.138	AM-AB-200619-04
		PMLN8185A w/PMLN8025A w/GMDN0445AA				0.16	0.138	0.183	FAZ-AB-200619-05
		PMLN8185A w/PMLN8025A w/GMDN0445AC				-0.07	0.071	0.096	FAZ-AB-200619-06
		PMLN8185A w/PMLN8025A w/GMDN0566AC				0.21	0.024	0.032	FAZ-AB-200619-07
		PMLN8185A w/PMLN8025A w/WALN4307				0.45	0.084	0.112	FAZ-AB-200619-08
		PMLN8185A w/PMLN5004B w/GMDN0386A				0.44	0.071	0.094	FAZ-AB-200619-09
		PMLN8185A w/PMLN5004B w/GMDN0445AA				-0.14	0.117	0.161	FAZ-AB-200619-10
		PMLN8185A w/PMLN5004B w/GMDN0445AC				0.30	0.094	0.125	FAZ-AB-200619-11
		PMLN8185A w/PMLN5004B w/GMDN0566AC				0.04	0.030	0.040	FAZ-AB-200619-12
		PMLN8185A w/PMLN5004B w/WALN4307				-0.13	0.078	0.107	AM-AB-200619-13
Additional batteries									
WLAN ant AN000256A01	PMNN4802A	RLN4570A	None	5260.0000	0.0155	0.27	0.116	0.154	AM-AB-200619-14

Assessments at the Face U-NII-2A (5.25-5.35GHz)

Table below presents the data of the face assessment.

Table 46

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Run#
WLAN ant AN000256A01	PMNN4802A	@ front	None	5260.0000	0.0155	-0.37	0.026	0.038	AM-FACE-200622-10#
		@ back				0.37	0.036	**0.048**	AM-FACE-200622-11#
Additional batteries									
WLAN ant AN000256A01	PMNN4801A	@ back	None	5260.0000	0.0155	0.00	0.029	0.039	AM-FACE-200622-13

Assessments at the Head U-NII-2A (5.25-5.35GHz)

Table below presents the data of the head assessment.

Table 47

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Run#
WLAN ant AN000256A01	PMNN4802A	Touch	None	5260.0000	0.0155	0.03	0.279	0.371	FAZ-LEAR-200612-10
		Tilt				-0.44	0.351	0.516	AM-LEAR-200612-11
		Touch				-0.04	0.321	0.431	AM-LEAR-200612-12
		Tilt				-0.13	0.410	**0.561**	FAZ-REAR-200617-07
Additional batteries									
WLAN ant AN000256A01	PMNN4801A	Tilt	None	5260.0000	0.0155	0.04	0.370	0.492	AM-REAR-200612-14

Assessments at the Body U-NII-2C (5.47-5.65 GHz)

Table below presents the data of the body assessment

Table 48

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Run#
WLAN ant AN000256A01	PMNN4801A	HLN6602A	None	5500.0000	0.0145	0.33	0.257	0.365	FAZ-AB-200624-05#
		PMLN8181A				0.15	0.126	0.179	FAZ-AB-200624-06#
		PMLN8184A w/o belt loop w/ NTN5243A				0.09	0.030	0.043	FAZ-AB-200624-07#
		RLN4570A				0.43	0.292	**0.415**	AM-AB-200624-09
		PMLN5616B				0.34	0.124	0.176	AM-AB-200624-10
		RLN4815A				0.23	0.195	0.277	AM-AB-200624-11
		PMLN8185A w/PMLN8025A w/GMDN0386A				0.19	0.166	0.236	AM-AB-200624-12
		PMLN8185A w/PMLN8025A w/GMDN0445AA				0.14	0.169	0.240	AM-AB-200625-01#
		PMLN8185A w/PMLN8025A w/GMDN0445AC				0.28	0.143	0.203	AM-AB-200625-02#
		PMLN8185A w/PMLN8025A w/GMDN0566AC				-0.03	0.061	0.087	FAZ-AB-200625-03#
		PMLN8185A w/PMLN8025A w/WALN4307				-0.02	0.130	0.186	FAZ-AB-200625-04#
		PMLN8185A w/PMLN5004B w/GMDN0386A				0.21	0.130	0.185	FAZ-AB-200625-05#
		PMLN8185A w/PMLN5004B w/GMDN0445AA				0.29	0.176	0.250	FAZ-AB-200625-06#
		PMLN8185A w/PMLN5004B w/GMDN0445AC				0.27	0.109	0.155	FAZ-AB-200625-07#
		PMLN8185A w/PMLN5004B w/GMDN0566AC				0.08	0.051	0.072	FAZ-AB-200625-08#
		PMLN8185A w/PMLN5004B w/WALN4307				-0.20	0.132	0.196	AM-AB-200625-12
Additional batteries									
WLAN ant AN000256A01	PMNN4802A	RLN4570A	None	5500.0000	0.0145	0.25	0.228	0.324	AM-AB-200625-13

Assessments at the Face U-NII-2C (5.47-5.65 GHz)

Table below presents the data of the face assessment.

Table 49

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Run#
WLAN ant AN000256A01	PMNN4802A	@ front	None	5500.0000	0.0145	0.16	0.033	0.047	FAZ-FACE-200626-06#
		@ back				-0.05	0.046	0.066	AM-FACE-200629-03
Additional batteries									
WLAN ant AN000256A01	PMNN4801A	@ back	None	5500.0000	0.0145	0.06	0.064	**0.091**	AM-FACE-200629-04

Assessments at the Head U-NII-2C (5.47-5.65 GHz)

Table below presents the data of the head assessment.

Table 50

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Run#
WLAN ant AN000256A01	PMNN4802A	Touch	None	5500.0000	0.0145	0.14	0.337	0.479	BL-LEAR-200810-11
		Tilt				-0.19	0.424	0.629	BL-LEAR-200810-12
		Touch				-0.10	0.431	0.627	BL-LEAR-200810-13
		Tilt				-0.33	0.474	**0.727**	BL-REAR-200810-14
Additional batteries									
WLAN ant AN000256A01	PMNN4801A	Tilt	None	5500.0000	0.0145	-0.25	0.463	0.697	MA-REAR-200808-04#

Assessments at the Body U-NII-3 (5.65-5.85 GHz)

Table below presents the data of the body assessment.

Table 51

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Run#
WLAN ant AN000256A01	PMNN4801A	HLN6602A	None	5745.0000	0.0157	-0.07	0.150	0.200	BL(AF)-AB-210616-05
		PMLN8181A				0.00	0.066	0.087	MA(RY)-AB-210616-06
		PMLN8184A w/o belt loop w/ NTN5243A				-0.13	0.043	0.058	MA(RY)-AB-210616-07
		RLN4570A				-0.26	0.153	**0.213**	MA(RY)-AB-210617-01#
		PMLN5616B				-0.23	0.057	0.079	MA(MHI)-AB-210617-02#
		RLN4815A				-0.37	0.135	0.193	MA(RY)-AB-210617-03#
		PMLN8185A w/PMLN8025A w/GMDN0386A				0.07	0.077	0.101	MA(MHI)-AB-210617-04#
		PMLN8185A w/PMLN8025A w/GMDN0445AA				-0.12	0.106	0.143	MA(RY)-AB-210621-08
		PMLN8185A w/PMLN8025A w/GMDN0445AC				0.09	0.093	0.122	BL(AF)-AB-210617-13
		PMLN8185A w/PMLN8025A w/GMDN0566AC				0.12	0.029	0.038	BL(AF)-AB-210617-05#
		PMLN8185A w/PMLN8025A w/WALN4307				-0.01	0.065	0.085	BL(AF)-AB-210617-06#
		PMLN8185A w/PMLN5004B w/GMDN0386A				0.08	0.063	0.083	BL(AF)-AB-210617-07#
		PMLN8185A w/PMLN5004B w/GMDN0445AA				-0.21	0.107	0.147	MA(MFR)-AB-210621-04#
		PMLN8185A w/PMLN5004B w/GMDN0445AC				0.36	0.043	0.056	MA(RY)-AB-210617-14
		PMLN8185A w/PMLN5004B w/GMDN0566AC				0.43	0.040	0.052	BL(AF)-AB-210617-08#
		PMLN8185A w/PMLN5004B w/WALN4307				-0.01	0.069	0.091	BL(AF)-AB-210617-09#
Additional batteries									
WLAN ant AN000256A01	PMNN4802A	RLN4570A	None	5745.0000	0.0157	-0.20	0.053	0.073	BL(SAN)-AB-210622-04#

Assessments at the Face U-NII-3 (5.65-5.85 GHz)

Table below presents the data of the face assessment.

Table 52

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Run#
WLAN ant AN000256A01	PMNN4802A	@ front	None	5745.0000	0.0157	-0.45	0.011	0.016	MA(MHI)-FACE-210618-05#
		@ back				0.16	0.016	0.021	AM(SAN)-FACE-210618-06#
Additional batteries									
WLAN ant AN000256A01	PMNN4801A	@ back	None	5745.0000	0.0157	-0.27	0.017	**0.024**	BL(SAN)-FACE-210618-07#

Assessments at the Head U-NII-3 (5.65-5.85 GHz)

Table below presents the data of the head assessment.

Table 53

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Run#
WLAN ant AN000256A01	PMNN4802A	Touch	None	5745.0000	0.0157	-0.37	0.069	0.099	AM(SAN)-LEAR-210619-07#
		Tilt				0.15	0.075	0.098	AM(SAN)-LEAR-210619-08#
		Touch				-0.40	0.090	0.129	MA(MFR)-REAR-210620-01#
		Tilt				0.11	0.099	**0.130**	MA(MFR)-REAR-210620-02#
Additional batteries									
WLAN ant AN000256A01	PMNN4801A	Tilt	None	5745.0000	0.0157	0.03	0.087	0.114	MA(MFR)-REAR-210620-03#

14.3 Assessment for outside FCC

Based on the assessment results for body, face and head per KDB643646, additional test need to cover the frequency range from (380-450MHz) for outside FCC. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

Table 54

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Run#
LMR Body									
AN000354A01	PMNN4801A	RLN4570A	None	380.0000	2.48	0.40	5.45	**5.52**	AM-AB-200805-09
				392.5000	2.46	0.27	4.91	5.01	AM-AB-200805-10
				406.0000	2.49	0.39	3.44	3.47	AM-AB-200805-11
				416.3000	2.42	0.19	2.76	2.86	AM-AB-200805-12
				430.0000	2.45	0.17	2.33	2.39	AM-AB-200805-13
PMAE4022B	PMNN4801A	RLN4570A	None	380.0000	2.48	0.12	4.46	4.51	ZZ-AB-200805-03#
				397.5000	2.46	0.01	4.26	4.35	AM-AB-200805-14
				416.3000	2.43	0.06	3.74	3.86	ZZ-AB-200805-06#
				430.0000	2.45	0.09	3.69	3.78	ZZ-AB-200805-07#
LMR Face									
AN000354A01	PMNN4801A	@ front	None	380.0000	2.88	0.09	0.81	0.42	NZ-FACE-200608-13
				392.5000	2.90	0.16	1.06	0.55	NZ-FACE-200608-14
				406.0000	2.87	0.07	0.98	0.51	NZ-FACE-200608-15
				416.3000	2.89	0.03	0.79	0.41	NZ-FACE-200608-16
				430.0000	2.91	0.05	0.59	0.31	NZ-FACE-200608-17
PMAE4022B	PMNN4801A	@ front	None	380.0000	2.87	0.05	0.91	0.48	NZ-FACE-200607-07
				397.5000	2.90	0.02	1.01	0.52	ZZ(MA)-FACE-200608-19
				416.3000	2.90	0.08	1.10	**0.57**	NZ-FACE-200607-10
				430.0000	2.88	0.07	1.04	0.54	NZ-FACE-200607-11
LMR Head									
AN000354A01	PMNN4802A	Tilt	None	380.0000	2.95	-0.21	3.99	**4.26**	ZZ(MA)-LEAR-200608-20
				392.5000	2.91	0.03	3.08	3.18	ZZ(MA)-LEAR-200608-22
				406.0000	2.94	0.06	2.65	2.70	ZZ(MA)-LEAR-200609-02#
				416.3000	2.91	0.09	2.12	2.19	ZZ(MA)-LEAR-200609-03#
				430.0000	2.91	0.04	1.79	1.85	ZZ(MA)-LEAR-200609-05#

Table 54 (Continued)

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Run#
LMR Head									
PMAE4022B	PMNN4802A	Tilt	None	380.0000	2.96	-0.01	3.01	3.06	ZZ(MA)-LEAR-200609-16
				397.5000	2.94	0.07	3.34	3.41	ZZ(MA)-LEAR-200609-17
				416.3000	2.95	0.11	3.64	3.70	ZZ(MA)-LEAR-200609-18
				430.0000	2.94	0.05	3.59	3.66	ZZ(MA)-LEAR-200609-19

14.4 Assessment for ISED, Canada frequency range

Based on the assessment results for body, face and head per KDB643646, additional tests were not required for ISED, Canada frequency range (406.1-430MHz, 450-470MHz) as the testing performed is in compliance with Industry Canada frequency range.

Table 55

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Run#
LMR Body									
PMAE4022B	PMNN4801A	RLN4570A	None	416.3000	2.43	0.06	3.74	3.86	ZZ-AB-200805-06#
				450.0000	2.49	0.07	3.41	3.44	ZZ-AB-200730-14#
LMR Face									
PMAE4022B	PMNN4801A	@ front	None	416.3000	2.90	0.08	1.10	0.57	NZ-FACE-200607-10
				450.0000	2.88	0.09	0.83	0.43	NZ-FACE-200605-12
LMR Head									
PMAE4022B	PMNN4801A	Tilt	None	416.3000	2.95	0.11	3.64	3.70	ZZ(MA)-LEAR-200609-18
				450.0000	2.92	-0.24	3.22	3.50	ZZ(MA)-LEAR-200607-13
WLAN 2.4GHz Body									
WLAN ant AN000256A01	PMNN4802A	RLN4570A	None	2412.0000	0.0148	0.32	0.057	0.089	AM-AB-200610-02#
WLAN 2.4GHz Face									
WLAN ant AN000256A01	PMNN4802A	@ front	None	2412.0000	0.0148	-0.13	0.014	0.023	AM-FACE-200612-02
WLAN 2.4GHz Head									
WLAN ant AN000256A01	PMNN4802A	Tilt	None	2412.0000	0.0148	-0.04	0.145	0.228	AM-LEAR-200611-17

Table 55 (Continued)

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Run#
WLAN 5GHz U-NII-2A Body									
WLAN ant AN000256A01	PMNN4801A	RLN4570A	None	5260.0000	0.0155	-0.32	0.207	0.296	AM-AB-200618-08
WLAN 5GHz U-NII-2A Face									
WLAN ant AN000256A01	PMNN4802A	@ back	None	5260.0000	0.0155	0.37	0.036	0.048	AM-FACE-200622-11#
WLAN 5GHz U-NII-2A Head									
WLAN ant AN000256A01	PMNN4802A	Tilt	None	5260.0000	0.0155	-0.13	0.410	0.561	FAZ-REAR-200617-07
WLAN 5GHz U-NII-2C Body									
WLAN ant AN000256A01	PMNN4801A	RLN4570A	None	5500.0000	0.0145	0.43	0.292	0.415	AM-AB-200624-09
WLAN 5GHz U-NII-2C Face									
WLAN ant AN000256A01	PMNN4801A	@ back	None	5500.0000	0.0145	0.06	0.064	0.091	AM-FACE-200629-04
WLAN 5GHz U-NII-2C Head									
WLAN ant AN000256A01	PMNN4802A	Tilt	None	5500.0000	0.0145	-0.33	0.474	0.727	BL-LEAR-200810-14
WLAN 5GHz U-NII-3 Body									
WLAN ant AN000256A01	PMNN4801A	RLN4570A	None	5745.0000	0.0157	-0.26	0.153	0.213	MA(RY)-AB-210617-01#
WLAN 5GHz U-NII-3 Face									
WLAN ant AN000256A01	PMNN4801A	@ back	None	5745.0000	0.0157	-0.27	0.017	0.024	AM(SAN)-FACE-210618-07#
WLAN 5GHz U-NII-3 Head									
WLAN ant AN000256A01	PMNN4802A	Tilt	None	5745.0000	0.0157	0.11	0.099	0.130	MA(MFR)-REAR-210620-02#

As per ISED Notice 2016-DRS001, additional tests were required for the low, mid and high frequency channels for the configuration with the highest SAR value.

Table 56

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Run#
LMR Body									
PMAE4022B	PMNN4801A	RLN4570A	None	406.0000	2.45	0.11	4.27	**4.37**	BAD(DAN)-AB-220110-02
				416.3000	2.43	0.06	3.74	3.86	ZZ-AB-200805-06#
				430.0000	2.45	0.09	3.69	3.78	ZZ-AB-200805-07#
LMR Face									
PMAE4022B	PMNN4801A	@ front	None	406.0000	2.86	-0.02	1.10	**0.58**	BAD(DAN)-FACE-220110-03
				416.3000	2.90	0.08	1.10	0.57	NZ-FACE-200607-10
				430.0000	2.88	0.07	1.04	0.54	NZ-FACE-200607-11

Table 56 (Continued)

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Run#
LMR Head									
PMAE4022B	PMNN4802A	Tilt	None	406.0000	2.94	0.00	3.33	3.40	BL-LEAR-220221-08
				416.3000	2.95	0.11	3.64	**3.70**	ZZ(MA)-LEAR-200609-18
				430.0000	2.94	0.05	3.59	3.66	ZZ(MA)-LEAR-200609-19
WLAN 2.4GHz Body									
AN000256A01	PMNN4802A	RLN4570A	None	2412.0000	0.0148	0.32	0.057	**0.089**	AM-AB-200610-02#
				2437.0000	0.0151	0.20	0.034	0.052	BAD(DAN)-AB-220111-06
				2462.0000	0.0148	0.06	0.035	0.055	BAD(DAN)-AB-220111-07
WLAN 2.4GHz Face									
AN000256A01	PMNN4802A	@ front	None	2412.0000	0.0148	-0.14	0.014	0.023	AM-FACE-200612-02
				2437.0000	0.0151	-0.28	0.016	0.026	BAD(DAN)-FACE-220111-08
				2462.0000	0.0148	-0.34	0.022	**0.037**	BAD(DAN)-FACE-220111-09
WLAN 2.4GHz Head									
AN000256A01	PMNN4802A	Tilt	None	2412.0000	0.0148	-0.04	0.145	0.228	AM-LEAR-200611-17
				2437.0000	0.0151	-0.21	0.154	0.247	BAD(DAN)-LEAR-220111-10
				2462.0000	0.0148	0.02	0.225	**0.351**	BAD(DAN)-LEAR-220111-11
WLAN 5GHz U-NII-2A Body									
AN000256A01	PMNN4801A	RLN4570A	None	5260.0000	0.0155	-0.32	0.207	**0.296**	AM-AB-200618-08
				5280.0000	0.0153	-0.19	0.175	0.246	AM-AB-200626-14
				5320.0000	0.0150	0.02	0.158	0.217	AM-AB-200630-03#
WLAN 5GHz U-NII-2A Face									
AN000256A01	PMNN4802A	@ back	None	5260.0000	0.0155	0.37	0.036	**0.048**	AM-FACE-200622-11#
				5280.0000	0.0153	0.34	0.026	0.035	AM-FACE-200623-01#
				5320.0000	0.0150	-0.10	0.019	0.027	AM-FACE-200623-06
WLAN 5GHz U-NII-2A Head									
AN000256A01	PMNN4802A	Tilt	None	5260.0000	0.0155	-0.13	0.410	**0.561**	FAZ-REAR-200617-07
				5280.0000	0.0153	-0.44	0.276	0.411	FAZ-REAR-200615-02
				5320.0000	0.0150	-0.18	0.323	0.462	FAZ-REAR-200615-04
WLAN 5GHz U-NII-2C Body									
AN000256A01	PMNN4801A	RLN4570A	None	5500.0000	0.0145	0.43	0.292	0.415	AM-AB-200624-09
				5640.0000	0.0141	-0.38	0.357	**0.569**	AM-AB-200628-02
				5720.0000	0.0134	0.40	0.233	0.358	AM-AB-200628-06
WLAN 5GHz U-NII-2C Face									
AN000256A01	PMNN4801A	@ back	None	5500.0000	0.0145	0.06	0.064	0.091	AM-FACE-200629-04
				5640.0000	0.0141	0.44	0.073	**0.107**	AM-FACE-200628-03
				5720.0000	0.0134	-0.04	0.035	0.054	AM-FACE-200628-05

Table 56 (Continued)

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Run#
WLAN 5GHz U-NII-2C Head									
AN000256A01	PMNN4802A	Tilt	None	5500.0000	0.0145	-0.33	0.474	**0.727**	BL-REAR-200810-14
				5640.0000	0.0141	-0.41	0.316	0.507	MA-REAR-200811-02#
				5720.0000	0.0134	0.00	0.152	0.234	BL-REAR-200811-10
WLAN 5GHz U-NII-3 Body									
AN000256A01	PMNN4801A	RLN4570A	None	5745.0000	0.0157	-0.26	0.153	**0.213**	MA(RY)-AB-210617-01#
				5785.0000	0.0141	0.07	0.111	0.162	BL(SAN)-AB-210621-10
				5825.0000	0.0133	-0.01	0.084	0.130	BL(SAN)-AB-210621-11
WLAN 5GHz U-NII-3 Face									
AN000256A01	PMNN4801A	@ back	None	5745.0000	0.0157	-0.27	0.017	0.024	AM(SAN)-FACE-210618-07#
				5785.0000	0.0141	-0.18	0.018	0.027	MA(MFR)-FACE-210620-16
				5825.0000	0.0133	-0.16	0.018	**0.029**	MA(MFR)-FACE-210621-01#
WLAN 5GHz U-NII-3 Head									
AN000256A01	PMNN4802A	Tilt	None	5745.0000	0.0157	0.11	0.099	0.130	MA(MFR)-REAR-210620-02#
				5785.0000	0.0141	-0.15	0.079	0.119	MA(MFR)-REAR-210620-04#
				5825.0000	0.0133	-0.33	0.085	**0.142**	MA(MFR)-REAR-210620-05#

15.0 Assessment at the Bluetooth band

15.1 FCC Bluetooth band

Per guidelines in KDB 447498, the following formula was used to determine the test exclusion for standalone Bluetooth transmitter;

[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] *[$\sqrt{F_{(GHz)}}$] = 0.61, which is ≤ 3 for 1-g SAR

Where:

Max. power = 1.925 mW (2.5 mW*77.0 % duty cycle)
Min. test separation distance = 5mm for actual test separation < 5mm
F(GHz) = 2.48 GHz

Per the result from the calculation above, the standalone SAR assessment was not required for Bluetooth band. Therefore, SAR results for Bluetooth are not reported herein.

15.2 ISED Bluetooth band

Based on RSS-102 Issue 5, exemption limits for SAR evaluation for controlled devices at Bluetooth frequency band with separation distance ≤ 5mm was 20 mW.

Standalone Bluetooth transmitter operates at
Maximum conducted power:
= 2.5 mW * 77.0%
= 1.925 mW or 2.84 dBm
Equivalent isotropically radiated power (EIRP):
= Maximum conducted power, dBm + Antenna gain, dBi
= 2.84 dBm + (2.0 dBi)
= 4.84 dBm or 3.047 mW

Higher output power level, maximum power 3.047 mW was below the threshold power level 20 mW. Hence SAR test was not required for Bluetooth band.

15.3 Shortened Scan Assessment

A "shortened" scan using the highest SAR configuration overall from above was performed to validate the SAR drift of the full DASY5™ coarse and zoom scans. Note that the shortened scan represents the zoom scan performance result; this is obtained by first running a coarse scan to find the peak area and then, using a newly charged battery, a zoom scan only was performed. The results of the shortened cube scan presented in Appendix D demonstrate that the scaling methodology used to determine the calculated SAR results presented herein are valid. The SAR result from the Table below is provided in Appendix F.

Table 57

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Run#
PMAE4022B	PMNN4801A	RLN4570A	None	460.0000	2.23	0.03	2.82	**3.17**	MFR(DAN)-AB-220211-08#

16.0 Simultaneous Transmission Exclusion for BT

Per guidelines in KDB 447498, the following formula was used to determine the test exclusion to an antenna that transmits simultaneously with other antennas for test distances ≤ 50mm:

[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] *[√F(GHz)/X] = 0.08W/kg, which is ≤ 0.4 W/kg (1g)

Where:

X = 7.5 for 1g-SAR; 18.75 for 10g

Max. power = 1.925 mW (2.5 mW*77 % duty cycle)
Min. test separation distance = 5mm for actual test separation < 5mm
F(GHz) = 2.48 GHz

Per the result from the calculation above, simultaneous exclusion is applied and therefore SAR results are not reported herein.

17.0 Simultaneous Transmission between LMR and WLAN

This device uses a single transmitter module and antenna for both WLAN and BT. WLAN and BT cannot transmit simultaneously. The maximum sourced-based time-averaged output power for testing 802.11b/g/n is 22.39mW, and 802.11a/n/ac is 19.95mW while the BT is 2.5mW. Therefore the measured SAR from WLAN is used in conjunction with LMR for simultaneous results.

The Table below summarizes the simultaneous transmissions between LMR and WLAN bands.

Table 58

		LMR Bands
	Freq. (MHz)	UHF (450-470 MHz)
WLAN Band	2412 - 2462	√
WLAN Band	5180 - 5825	√

18.0 Results Summary

Based on the test guidelines from section 4.0 and satisfying frequencies within FCC bands and ISED Canada Frequency bands, the highest Operational Maximum Calculated 1-gram average SAR values found for this filing:

Table 59

Designator	Frequency band (MHz)	Max Calc at Body (W/kg)	Max Calc at Face (W/kg)	Max Calc at Head (W/kg)
		1g-SAR	1g-SAR	1g-SAR
FCC				
LMR	450-470	3.44	0.43	3.50
WLAN	2412-2462	0.089	0.037	0.351
WLAN	5250-5350	0.296	0.048	0.561
WLAN	5470-5725	0.569	0.107	0.727
WLAN	5725-5825	0.213	0.029	0.142
ISED				
LMR	406.1-430; 450-470	4.37	0.58	
WLAN	2412-2462	0.089	0.037	0.351
WLAN	5250-5350	0.296	0.048	0.561
WLAN	5470-5725	0.569	0.107	0.727
WLAN	5725-5825	0.213	0.029	0.142

All results are scaled to the maximum output power.

The highest combined 1g-SAR results for simultaneous is indicated in the following Table:

Table 60

Designator	Frequency band (MHz)	Max Calc at Body (W/kg)	Max Calc at Face (W/kg)	Max Calc at Head (W/kg)
		1g-SAR	1g-SAR	1g-SAR
FCC US				
LMR	450-470	3.44	0.43	3.50
WLAN	2412-2462	0.089	0.037	0.351
	5180 - 5825	0.569	0.107	0.727
Simultaneous Results		4.01	0.54	4.23
ISED Canada				
LMR	406.1-430; 450-470	4.37	0.58	
WLAN	2412-2462	0.089	0.037	0.351
	5180 - 5825	0.569	0.107	0.727
Simultaneous Results		4.94	0.69	

The test results clearly demonstrate compliance with FCC Occupational/Controlled RF Exposure limits of 8 W/kg averaged over 1 gram per the requirements of FCC 47 CFR § 2.1093 and RSS-102 (Issue 5).

19.0 Variability Assessment

Per the guidelines in KDB 865664 SAR variability assessment is not required because SAR results are below 4.0W/kg (Occupational)

20.0 System Uncertainty

A system uncertainty analysis is not required for this report per KDB 865664 because the highest report SAR value for Occupational exposure is less than 7.5W/kg.

Per the guidelines of ISO 17025 a reported system uncertainty is required and therefore measurement uncertainty budget is included in Appendix A.

Appendix A
Measurement Uncertainty Budget

Uncertainty Budget for System Validation (Dipole & Flat Phantom) for 450 MHz

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 section	**Tol. (± %)**	**Prob. Dist.**	**Div.**	**c_i (1 g)**	**c_i (10 g)**	**1 g u_i (±%)**	**10 g u_i (±%)**	**v_i**
Measurement System									
Probe Calibration	E.2.1	6.7	N	1.00	1	1	6.7	6.7	∞
Axial Isotropy	E.2.2	4.7	R	1.73	1	1	2.7	2.7	∞
Spherical Isotropy	E.2.2	9.6	R	1.73	0	0	0.0	0.0	∞
Boundary Effect	E.2.3	1.0	R	1.73	1	1	0.6	0.6	∞
Linearity	E.2.4	4.7	R	1.73	1	1	2.7	2.7	∞
System Detection Limits	E.2.5	1.0	R	1.73	1	1	0.6	0.6	∞
Readout Electronics	E.2.6	0.3	N	1.00	1	1	0.3	0.3	∞
Response Time	E.2.7	1.1	R	1.73	1	1	0.6	0.6	∞
Integration Time	E.2.8	0.0	R	1.73	1	1	0.0	0.0	∞
RF Ambient Conditions - Noise	E.6.1	3.0	R	1.73	1	1	1.7	1.7	∞
RF Ambient Conditions - Reflections	E.6.1	0.0	R	1.73	1	1	0.0	0.0	∞
Probe Positioner Mechanical Tolerance	E.6.2	0.4	R	1.73	1	1	0.2	0.2	∞
Probe Positioning w.r.t. Phantom	E.6.3	1.4	R	1.73	1	1	0.8	0.8	∞
Max. SAR Evaluation (ext., int., avg.)	E.5	3.4	R	1.73	1	1	2.0	2.0	∞
Dipole									
Dipole Axis to Liquid Distance	8, E.4.2	2.0	R	1.73	1	1	1.2	1.2	∞
Input Power and SAR Drift Measurement	8, 6.6.2	5.0	R	1.73	1	1	2.9	2.9	∞
Phantom and Tissue Parameters									
Phantom Uncertainty	E.3.1	4.0	R	1.73	1	1	2.3	2.3	∞
Liquid Conductivity (target)	E.3.2	5.0	R	1.73	0.64	0.43	1.8	1.2	∞
Liquid Conductivity (measurement)	E.3.3	3.3	R	1.73	0.64	0.43	1.2	0.8	∞
Liquid Permittivity (target)	E.3.2	5.0	R	1.73	0.6	0.49	1.7	1.4	∞
Liquid Permittivity (measurement)	E.3.3	1.9	R	1.73	0.6	0.49	0.6	0.5	∞
Combined Standard Uncertainty			RSS				10	9	99999
Expanded Uncertainty (95% CONFIDENCE LEVEL)			*k*=2				19	18	

Notes for uncertainty budget Tables:
a) Column headings *a-k* are given for reference.
b) Tol. - tolerance in influence quantity.
c) Prob. Dist. – Probability distribution
d) N, R - normal, rectangular probability distributions
e) Div. - divisor used to translate tolerance into normally distributed standard uncertainty
f) *ci* - sensitivity coefficient that should be applied to convert the variability of the uncertainty component into a variability of SAR.
g) *ui* – SAR uncertainty
h) *vi* - degrees of freedom for standard uncertainty and effective degrees of freedom for the expanded uncertainty

Uncertainty Budget for Device Under Test, for 450 MHz

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 section	Tol. (± %)	Prob Dist	Div.	c_i (1 g)	c_i (10 g)	1 g u_i (±%)	10 g u_i (±%)	v_i
Measurement System									
Probe Calibration	E.2.1	6.7	N	1.00	1	1	6.7	6.7	∞
Axial Isotropy	E.2.2	4.7	R	1.73	0.707	0.707	1.9	1.9	∞
Hemispherical Isotropy	E.2.2	9.6	R	1.73	0.707	0.707	3.9	3.9	∞
Boundary Effect	E.2.3	1.0	R	1.73	1	1	0.6	0.6	∞
Linearity	E.2.4	4.7	R	1.73	1	1	2.7	2.7	∞
System Detection Limits	E.2.5	1.0	R	1.73	1	1	0.6	0.6	∞
Readout Electronics	E.2.6	0.3	N	1.00	1	1	0.3	0.3	∞
Response Time	E.2.7	1.1	R	1.73	1	1	0.6	0.6	∞
Integration Time	E.2.8	1.1	R	1.73	1	1	0.6	0.6	∞
RF Ambient Conditions - Noise	E.6.1	3.0	R	1.73	1	1	1.7	1.7	∞
RF Ambient Conditions - Reflections	E.6.1	0.0	R	1.73	1	1	0.0	0.0	∞
Probe Positioner Mech. Tolerance	E.6.2	0.4	R	1.73	1	1	0.2	0.2	∞
Probe Positioning w.r.t Phantom	E.6.3	1.4	R	1.73	1	1	0.8	0.8	∞
Max. SAR Evaluation (ext., int., avg.)	E.5	3.4	R	1.73	1	1	2.0	2.0	∞
Test sample Related									
Test Sample Positioning	E.4.2	3.2	N	1.00	1	1	3.2	3.2	29
Device Holder Uncertainty	E.4.1	4.0	N	1.00	1	1	4.0	4.0	8
SAR drift	6.6.2	5.0	R	1.73	1	1	2.9	2.9	∞
Phantom and Tissue Parameters									
Phantom Uncertainty	E.3.1	4.0	R	1.73	1	1	2.3	2.3	∞
Liquid Conductivity (target)	E.3.2	5.0	R	1.73	0.64	0.43	1.8	1.2	∞
Liquid Conductivity (measurement)	E.3.3	3.3	N	1.00	0.64	0.43	2.1	1.4	∞
Liquid Permittivity (target)	E.3.2	5.0	R	1.73	0.6	0.49	1.7	1.4	∞
Liquid Permittivity (measurement)	E.3.3	1.9	N	1.00	0.6	0.49	1.1	0.9	∞
Combined Standard Uncertainty			RSS				12	11	482
Expanded Uncertainty (95% CONFIDENCE LEVEL)			*k*=2				23	23	

Notes for uncertainty budget Tables:
a) Column headings *a*-*k* are given for reference.
b) Tol. - tolerance in influence quantity.
c) Prob. Dist. – Probability distribution
d) N, R - normal, rectangular probability distributions
e) Div. - divisor used to translate tolerance into normally distributed standard uncertainty
f) *ci* - sensitivity coefficient that should be applied to convert the variability of the uncertainty component into a variability of SAR.
g) *ui* – SAR uncertainty
h) *vi* - degrees of freedom for standard uncertainty and effective degrees of freedom for the expanded uncertainty

Uncertainty Budget for System Validation (dipole & flat phantom) for 800 MHz to 3 GHz

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 section	Tol. (± %)	Prob. Dist.	Div.	c_i (1 g)	c_i (10 g)	1 g u_i (±%)	10 g u_i (±%)	v_i
Measurement System									
Probe Calibration	E.2.1	6.0	N	1.00	1	1	6.0	6.0	∞
Axial Isotropy	E.2.2	4.7	R	1.73	1	1	2.7	2.7	∞
Spherical Isotropy	E.2.2	9.6	R	1.73	0	0	0.0	0.0	∞
Boundary Effect	E.2.3	1.0	R	1.73	1	1	0.6	0.6	∞
Linearity	E.2.4	4.7	R	1.73	1	1	2.7	2.7	∞
System Detection Limits	E.2.5	1.0	R	1.73	1	1	0.6	0.6	∞
Readout Electronics	E.2.6	0.3	N	1.00	1	1	0.3	0.3	∞
Response Time	E.2.7	1.1	R	1.73	1	1	0.6	0.6	∞
Integration Time	E.2.8	0.0	R	1.73	1	1	0.0	0.0	∞
RF Ambient Conditions - Noise	E.6.1	3.0	R	1.73	1	1	1.7	1.7	∞
RF Ambient Conditions - Reflections	E.6.1	0.0	R	1.73	1	1	0.0	0.0	∞
Probe Positioner Mechanical Tolerance	E.6.2	0.4	R	1.73	1	1	0.2	0.2	∞
Probe Positioning w.r.t. Phantom	E.6.3	1.4	R	1.73	1	1	0.8	0.8	∞
Max. SAR Evaluation (ext., int., avg.)	E.5	3.4	R	1.73	1	1	2.0	2.0	∞
Dipole									
Dipole Axis to Liquid Distance	8, E.4.2	2.0	R	1.73	1	1	1.2	1.2	∞
Input Power and SAR Drift Measurement	8, 6.6.2	5.0	R	1.73	1	1	2.9	2.9	∞
Phantom and Tissue Parameters									
Phantom Uncertainty	E.3.1	4.0	R	1.73	1	1	2.3	2.3	∞
Liquid Conductivity (target)	E.3.2	5.0	R	1.73	0.64	0.43	1.8	1.2	∞
Liquid Conductivity (measurement)	E.3.3	3.3	R	1.73	0.64	0.43	1.2	0.8	∞
Liquid Permittivity (target)	E.3.2	5.0	R	1.73	0.6	0.49	1.7	1.4	∞
Liquid Permittivity (measurement)	E.3.3	1.9	R	1.73	0.6	0.49	0.6	0.5	∞
Combined Standard Uncertainty			RSS				9	9	99999
Expanded Uncertainty (95% CONFIDENCE LEVEL)			*k*=2				18	17	

Notes for uncertainty budget Tables:
a) Column headings *a-k* are given for reference.
b) Tol. - tolerance in influence quantity.
c) Prob. Dist. – Probability distribution
d) N, R - normal, rectangular probability distributions
e) Div. - divisor used to translate tolerance into normally distributed standard uncertainty
f) *ci* - sensitivity coefficient that should be applied to convert the variability of the uncertainty component into a variability of SAR.
g) *ui* – SAR uncertainty
h) *vi* - degrees of freedom for standard uncertainty and effective degrees of freedom for the expanded uncertainty

Uncertainty Budget for Device Under Test, for 800 MHz to 3 GHz

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 section	Tol. (± %)	Prob Dist	Div.	c_i (1 g)	c_i (10 g)	1 g u_i (±%)	10 g u_i (±%)	v_i
Measurement System									
Probe Calibration	E.2.1	6.0	N	1.00	1	1	6.0	6.0	∞
Axial Isotropy	E.2.2	4.7	R	1.73	0.707	0.707	1.9	1.9	∞
Hemispherical Isotropy	E.2.2	9.6	R	1.73	0.707	0.707	3.9	3.9	∞
Boundary Effect	E.2.3	1.0	R	1.73	1	1	0.6	0.6	∞
Linearity	E.2.4	4.7	R	1.73	1	1	2.7	2.7	∞
System Detection Limits	E.2.5	1.0	R	1.73	1	1	0.6	0.6	∞
Readout Electronics	E.2.6	0.3	N	1.00	1	1	0.3	0.3	∞
Response Time	E.2.7	1.1	R	1.73	1	1	0.6	0.6	∞
Integration Time	E.2.8	1.1	R	1.73	1	1	0.6	0.6	∞
RF Ambient Conditions - Noise	E.6.1	3.0	R	1.73	1	1	1.7	1.7	∞
RF Ambient Conditions - Reflections	E.6.1	0.0	R	1.73	1	1	0.0	0.0	∞
Probe Positioner Mech. Tolerance	E.6.2	0.4	R	1.73	1	1	0.2	0.2	∞
Probe Positioning w.r.t Phantom	E.6.3	1.4	R	1.73	1	1	0.8	0.8	∞
Max. SAR Evaluation (ext., int., avg.)	E.5	3.4	R	1.73	1	1	2.0	2.0	∞
Test sample Related									
Test Sample Positioning	E.4.2	3.2	N	1.00	1	1	3.2	3.2	29
Device Holder Uncertainty	E.4.1	4.0	N	1.00	1	1	4.0	4.0	8
SAR drift	6.6.2	5.0	R	1.73	1	1	2.9	2.9	∞
Phantom and Tissue Parameters									
Phantom Uncertainty	E.3.1	4.0	R	1.73	1	1	2.3	2.3	∞
Liquid Conductivity (target)	E.3.2	5.0	R	1.73	0.64	0.43	1.8	1.2	∞
Liquid Conductivity (measurement)	E.3.3	3.3	N	1.00	0.64	0.43	2.1	1.4	∞
Liquid Permittivity (target)	E.3.2	5.0	R	1.73	0.6	0.49	1.7	1.4	∞
Liquid Permittivity (measurement)	E.3.3	1.9	N	1.00	0.6	0.49	1.1	0.9	∞
Combined Standard Uncertainty			RSS				11	11	419
Expanded Uncertainty (95% CONFIDENCE LEVEL)			*k*=2				22	22	

Notes for uncertainty budget Tables:
a) Column headings *a-k* are given for reference.
b) Tol. - tolerance in influence quantity.
c) Prob. Dist. – Probability distribution
d) N, R - normal, rectangular probability distributions
e) Div. - divisor used to translate tolerance into normally distributed standard uncertainty
f) *ci* - sensitivity coefficient that should be applied to convert the variability of the uncertainty component into a variability of SAR.
g) *ui* – SAR uncertainty
h) *vi* - degrees of freedom for standard uncertainty and effective degrees of freedom for the expanded uncertainty

Uncertainty Budget for System Validation (dipole & flat phantom) for 3 to 6 GHz

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 section	**Tol. (± %)**	**Prob. Dist.**	**Div.**	c_i **(1 g)**	c_i **(10 g)**	**1 g** u_i **(±%)**	**10 g** u_i **(±%)**	v_i
Measurement System									
Probe Calibration	E.2.1	7.0	N	1.00	1	1	7.0	7.0	∞
Axial Isotropy	E.2.2	4.7	R	1.73	1	1	2.7	2.7	∞
Spherical Isotropy	E.2.2	9.6	R	1.73	0	0	0.0	0.0	∞
Boundary Effect	E.2.3	2.0	R	1.73	1	1	1.2	1.2	∞
Linearity	E.2.4	4.7	R	1.73	1	1	2.7	2.7	∞
System Detection Limits	E.2.5	1.0	R	1.73	1	1	0.6	0.6	∞
Readout Electronics	E.2.6	0.3	N	1.00	1	1	0.3	0.3	∞
Response Time	E.2.7	1.1	R	1.73	1	1	0.6	0.6	∞
Integration Time	E.2.8	0.0	R	1.73	1	1	0.0	0.0	∞
RF Ambient Conditions - Noise	E.6.1	3.0	R	1.73	1	1	1.7	1.7	∞
RF Ambient Conditions - Reflections	E.6.1	0.0	R	1.73	1	1	0.0	0.0	∞
Probe Positioner Mechanical Tolerance	E.6.2	1.0	R	1.73	1	1	0.6	0.6	∞
Probe Positioning w.r.t. Phantom	E.6.3	4.0	R	1.73	1	1	2.3	2.3	∞
Max. SAR Evaluation (ext., int., avg.)	E.5	2.1	R	1.73	1	1	1.2	1.2	∞
Dipole									
Dipole Axis to Liquid Distance	8, E.4.2	2.0	R	1.73	1	1	1.2	1.2	∞
Input Power and SAR Drift Measurement	8, 6.6.2	5.0	R	1.73	1	1	2.9	2.9	∞
Phantom and Tissue Parameters									
Phantom Uncertainty	E.3.1	4.0	R	1.73	1	1	2.3	2.3	∞
Dielectric Parameter Correction	--	1.4	N	1.00	1	0.79	1.4	1.1	∞
Liquid Conductivity (measurement)	E.3.3	3.3	R	1.73	0.64	0.43	1.2	0.8	∞
Liquid Permittivity (measurement)	E.3.3	1.9	R	1.73	0.6	0.49	0.6	0.5	∞
Combined Standard Uncertainty			RSS				10	10	99999
Expanded Uncertainty (95% CONFIDENCE LEVEL)			*k*=2				19	19	

Notes for uncertainty budget Tables:
a) Column headings *a-k* are given for reference.
b) Tol. - tolerance in influence quantity.
c) Prob. Dist. – Probability distribution
d) N, R - normal, rectangular probability distributions
e) Div. - divisor used to translate tolerance into normally distributed standard uncertainty
f) *ci* - sensitivity coefficient that should be applied to convert the variability of the uncertainty component into a variability of SAR.
g) *ui* – SAR uncertainty
h) *vi* - degrees of freedom for standard uncertainty and effective degrees of freedom for the expanded uncertainty

Uncertainty Budget for Device Under Test for 3 to 6 GHz

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 section	Tol. (± %)	Prob Dist	Div.	c_i (1 g)	c_i (10 g)	1 g u_i (±%)	10 g u_i (±%)	v_i
Measurement System									
Probe Calibration	E.2.1	7.0	N	1.00	1	1	7.0	7.0	∞
Axial Isotropy	E.2.2	4.7	R	1.73	0.707	0.707	1.9	1.9	∞
Hemispherical Isotropy	E.2.2	9.6	R	1.73	0.707	0.707	3.9	3.9	∞
Boundary Effect	E.2.3	2.0	R	1.73	1	1	1.2	1.2	∞
Linearity	E.2.4	4.7	R	1.73	1	1	2.7	2.7	∞
System Detection Limits	E.2.5	1.0	R	1.73	1	1	0.6	0.6	∞
Readout Electronics	E.2.6	0.3	N	1.00	1	1	0.3	0.3	∞
Response Time	E.2.7	1.1	R	1.73	1	1	0.6	0.6	∞
Integration Time	E.2.8	1.1	R	1.73	1	1	0.6	0.6	∞
RF Ambient Conditions - Noise	E.6.1	3.0	R	1.73	1	1	1.7	1.7	∞
RF Ambient Conditions - Reflections	E.6.1	0.0	R	1.73	1	1	0.0	0.0	∞
Probe Positioner Mech. Tolerance	E.6.2	1.0	R	1.73	1	1	0.6	0.6	∞
Probe Positioning w.r.t Phantom	E.6.3	4.0	R	1.73	1	1	2.3	2.3	∞
Max. SAR Evaluation (ext., int., avg.)	E.5	2.1	R	1.73	1	1	1.2	1.2	∞
Test sample Related									
Test Sample Positioning	E.4.2	3.2	N	1.00	1	1	3.2	3.2	29
Device Holder Uncertainty	E.4.1	4.0	N	1.00	1	1	4.0	4.0	8
SAR drift	6.6.2	5.0	R	1.73	1	1	2.9	2.9	∞
Phantom and Tissue Parameters									
Phantom Uncertainty	E.3.1	4.0	R	1.73	1	1	2.3	2.3	∞
Dielectric Parameter Correction	--	1.4	N	1.00	1	0.79	1.4	1.1	∞
Liquid Conductivity (measurement)	E.3.3	3.3	N	1.00	0.64	0.43	2.1	1.4	∞
Liquid Permittivity (measurement)	E.3.3	1.9	N	1.00	0.6	0.49	1.1	0.9	∞
Combined Standard Uncertainty			RSS				12	12	504
Expanded Uncertainty (95% CONFIDENCE LEVEL)			*k*=2				23	23	

Notes for uncertainty budget Tables:
a) Column headings *a-k* are given for reference.
b) Tol. - tolerance in influence quantity.
c) Prob. Dist. – Probability distribution
d) N, R - normal, rectangular probability distributions
e) Div. - divisor used to translate tolerance into normally distributed standard uncertainty
f) *ci* - sensitivity coefficient that should be applied to convert the variability of the uncertainty component into a variability of SAR.
g) *ui* – SAR uncertainty
h) *vi* - degrees of freedom for standard uncertainty and effective degrees of freedom for the expanded uncertainty