MOTOROLA SOLUTIONS

MS ISO/IEC 17025 TESTING SAMM No. 0826

ACCREDITED CERTIFICATE 2518.05

DECLARATION OF COMPLIANCE SAR ASSESSMENT Part 1 of 2

Motorola Solutions Inc.
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Date of Report: 08/25/2022
Report Revision: D

Responsible Engineer:	Ch'ng Jian Sheng (EME Engineer)
Report Author:	Muhammad Zakwan Bin Zaidi (EME Senior Technicain)
Date/s Tested:	03/28/2022 – 04/27/2022, 05/10/2022 – 05/11/2022, 5/25/2022
Manufacturer:	Motorola Solutions Inc.
DUT Description:	Handheld Portable – MOTOTRBO ION 8/900 2.5W LTE CBRS GNSS BT WiFi
Test TX mode(s):	FM; LTE; WLAN
Max. Power output:	Refer table 3, 3a
Tx Frequency Bands:	Refer table 3
Signaling type:	FM, TDMA, FHSS, DSSS and OFDM
Model(s) Tested:	AAH90UCU9RH1AN (PMUF5678A)
Model(s) Certified:	AAH90UCU9RH1AN (PMUF5678A)
Serial Number(s):	734TYF0018 & 734TYF0025
Classification:	Occupational/Controlled
Applicant Name:	Motorola Solutions Inc.
Applicant Address:	8000 West Sunrise Boulevard, Fort Lauderdale, Florida 33322
FCC ID:	AZ489FT7151; This report contains results that are immaterial for FCC equipment approval, which are clearly identified.
IC:	109U-89FT7151; 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: 08/25/2022

Part 1 of 2

Part 2 of 2

APPENDICES

Exhibit 7B

Report Revision History

Date	Revision	Comments
05/28/2022	A	Initial release
06/24/2022	B	Updated max power for LTE B4, 12, 13, 14, 17 & 48 at Table 3a
07/18/2022	C	Updated max power for LTE bands in Table 3
08/25/2022	D	Updated Table 1 to separate B48 into Equipment Class - CBE

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 handheld portable model number AAH90UCU9RH1AN (PMUF5678A). 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)
		1g-SAR	1g-SAR
TNF	806-824	0.84	1.73
	851-869	0.85	1.89
	896-901	0.75	1.64
	935-940	0.58	1.61
PCF	LTE B2	0.260	0.127
	LTE B4	0.155	0.069
	LTE B5	0.338	0.221
	LTE B7	0.122	0.060
	LTE B12**	0.216	0.179
	LTE B13	0.225	0.162
	LTE B14	0.221	0.167
	LTE B30	0.113	0.048
CBE	LTE B48	0.052	0.053
DTS	2412 – 2462 (WLAN 2.4 GHz)	0.051	0.026
NII	5180 – 5845 WLAN 5 GHz	0.025	0.019
*DSS	BT LE	NA	NA
Highest Simultaneous Transmission SAR	Sum of SAR (W/kg)	1.19	2.11

*Results not required per KDB (refer to sections 14.1)
** LTE Band 17 covered within band 12 (refer to Part 2 section 7.8)

3.0 Abbreviations / Definitions

BT: Bluetooth
CNR: Calibration Not Required
CW: Continuous Wave
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
OFDM: Orthogonal Frequency Division Multiplexing
PTT: Push to Talk
QPSK: Quadrature Pulse Shift Key
RB: Resource Blocks
RSM: Remote Speaker Microphone
SAR: Specific Absorption Rate
TDMA: Time Division Multiple Access
TNF: Licensed Non-Broadcast Transmitter Held to Face
16QAM: 16 State Quadrature Amplitude Modulation

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 D04 Interim General RF Exposure Guidance v01
- FCC KDB – 941225 D05 SAR for LTE Devices v02r05
- FCC KDB – 941225 D01 3G SAR Procedures v03r01
- FCC KDB – 248227 D01 802.11 Wi-Fi SAR v02r02
- FCC KDB - 648474 D04 Handset SAR v01r03

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 the LMR bands using either frequency modulation (FM) with 100% transmit duty cycle or TDMA signals with maximum of 50% transmit duty cycle. For conservative assessment, FM signal was tested. It also contains LTE and WLAN technologies for data application, Bluetooth for short range wireless devices.

The LMR bands in this device operate in a half duplex system. A half duplex system only allows the user to transmit or receive. This device cannot transmit and receive simultaneously. The user must stop transmitting in order to receive a signal or listen for a response, regardless of PTT button or use of voice activated audio accessories. This type of operation, along with the RF safety booklet, which instructs the user to transmit no more than 50% of the time, justifies the use of 50% duty factor for this device.

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 77.44% and BT LE is 86%.

The intended operating positions are “at the face” with the DUT at least 2.5 cm from the mouth, and “at the body” 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

Technologies	Tx Band (MHz)	Transmission	Duty Cycle (%)	Max Power (W)
LMR	806-825, 851-870, 896-902, 935-941	FM	50*	3.00
LTE Band 2	1850-1910	QPSK, 16QAM	100	0.317
LTE Band 4	1710-1755	QPSK, 16QAM	100	0.317
LTE Band 5	824-849	QPSK, 16QAM	100	0.270
LTE Band 7	2500-2570	QPSK, 16QAM	100	0.252
LTE Band 12	699-716	QPSK, 16QAM	100	0.317
LTE Band 13	777-787	QPSK, 16QAM	100	0.317
LTE Band 14	788-798	QPSK, 16QAM	100	0.317
LTE Band 17	704-716	QPSK, 16QAM	100	0.317
LTE Band 30	2305-2315	QPSK, 16QAM	100	0.252
LTE Band 48	3550-3700	QPSK, 16QAM	63.33	0.252
Bluetooth	2400-2485	FHSS	77.44	0.00501
Bluetooth LE	2400-2485	FHSS	86.00	0.00501
WLAN 802.11 b	2412-2472	DSSS	98.77	0.05623
WLAN 802.11 g /n (20 MHz)	2412-2472	OFDM	98.45 (802.11g) 98.34 (802.11 n)	0.05623
WLAN 802.11 n (40 MHz)	2412-2472	OFDM	95.10	0.05623
WLAN 802.11 a / n / ac (20 MHz)	5180-5825	OFDM	98.54 (802.11a) 98.39 (802.11 n) 98.35 (802.11 ac)	UNII 1, 2A: 0.02512 UNII 2C, 3: 0.03981
WLAN 802.11 n / ac (40 MHz)	5180-5825	OFDM	96.54 (802.11 n) 96.75 (802.11 ac)	UNII 1, 2A : 0.02512 UNII 2C, 3: 0.03981
WLAN 802.11 ac (80 MHz)	5180-5825	OFDM	93.09	UNII 1, 2A: 0.02512 UNII 2C, 3: 0.03981

Note *: includes 50% PTT operation

For LTE B4, 12, 13, 14, 17 & 48, the max power has been reduced in the final production units. Table 3a below shows the new max power for these bands. Since SAR evaluation for these bands were done at a higher max power, no additional tests were required.

Table 3a

Technologies	Tx Band (MHz)	Transmission	Duty Cycle (%)	Max Power (W)
LTE Band 4	1710-1755	QPSK, 16QAM	100	0.282
LTE Band 12	699-716	QPSK, 16QAM	100	0.282
LTE Band 13	777-787	QPSK, 16QAM	100	0.282
LTE Band 14	788-798	QPSK, 16QAM	100	0.282
LTE Band 17	704-716	QPSK, 16QAM	100	0.282
LTE Band 48	3550-3600	QPSK, 16QAM	63.33	0.126
	3600.1-3650			0.214
	3650.1-3700			0.191

7.0 Optional Accessories and Test Criteria

This device is offered with optional accessories. All accessories were individually evaluated during the test plan creation to determine if testing was required per the guidelines outlined in "SAR Test Reduction Considerations for Occupational PTT Radios" FCC KDB 643646 to assess compliance of this device. 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 antenna and internal LTE, WLAN/BT antennas offered for this product. The Table below lists their descriptions.

Table 4

Antenna No.	Antenna Models	Description	Selected for test	Tested
1	AN000343A01	LTE LOW BAND MAIN ANTENNA LB: 0.699 - 0.960GHz, B48: 3.55 - 3.75GHz, ¼ wave, Gain: 0.29 dBi (LB), -0.6 dBi (B48)	Yes	Yes
2	AN000345A01	BT/WIFI ANTENNA 2.4 - 2.48GHz, 5.15 - 5.85GHz, ¼ wave, Gain: 1.41 dBi (2.4G), 5.04 dBi (5G, UNII-1&2A), 2.46 dBi (UNII-2C&3)	Yes	Yes
3	AN000346A01	LTE MID-HIGH BAND MAIN ANTENNA MB/HB: 1.7 - 2.7GHz, ¼ wave, 2.81 dBi gain	Yes	Yes
4	AN000415A01	ANTENNA, WHIP, 806-941MHz, 140MM, FERRULE 806-870MHz 896-941MHz, ¼ wave, -1 dBi gain	Yes	Yes

7.2 Battery

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

Table 5

Battery No.	Battery Models	Description	Selected for test	Tested
1	PMNN4803A	BATTERY PACK, BATTERY PACK, IMPRES GEN2, Li-ion, IP68, 2820mAh T	Yes	Yes
2	PMNN4804A	BATTERY PACK, BATTERY PACK, IMPRES GEN2, Li-ion, IP68, 2900mAh T, TIA4950	Yes	Yes
3	PMNN4805A	BATTERY PACK,BATTERY PACK, IMPRES GEN2, LIION, IP68, 4400mAh T, TIA4950	Yes	Yes

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	PMLN4651A	BELT CLIP 2"	Yes	Yes	Tested with PMLN8126A
2	PMLN7008A	CARRY ACCESSORY-BELT CLIP, 2.5-INCH BELT CLIP	Yes	Yes	Tested with PMLN8126A
3	PMLN5407A	2.5" REPLACEMENT SWIVEL BELT LOOP	Yes	Yes	Tested with PMLN8127A
4	PMLN5409A	3" REPLACEMENT SWIVEL BELT LOOP	Yes	Yes	Tested with PMLN8127A
5	PMLN8126A	CARRY ACCESSORY-HOLSTER, PLASTIC CARRY HOLSTER WITH BELT CLIP	Yes	Yes	Tested with PMLN4651A and PMLN7008A
6	PMLN8127A	CARRY ACCESSORY-HOLSTER, PLASTIC CARRY HOLSTER WITH BELT LOOP	Yes	Yes	Tested with PMLN5407A and PMLN5409A

7.4 Audio Accessories

All audio accessories were considered. The Table below lists the offered audio accessories and their descriptions. Exhibit 7B illustrates photos of the tested audio accessories.

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	PMLN8085A	BEHIND-THE-HEAD HEADSET	No	No	By similarity to PMLN8086A
3	PMLN8086A	OVER-THE-HEAD HEADSET	Yes	No*	
4	PMMN4131A	RM730 IMPRES WINDPORTING REMOTE SPEAKER MICROPHONE, SMALL (IP68)	No	No	By similarity to PMLN4128A
5	PMLN8341A	1-WIRE SURVEILLANCE KIT WITH LOUD AUDIO TRANSLUCENT TUBE	Yes	No*	
6	PMLN8342A	2-WIRE SURVEILLANCE KIT WITH LOUD AUDIO TRANSLUCENT TUBE	Yes	No*	
7	PMLN8343A	3-WIRE SURVEILLANCE KIT WITH LOUD AUDIO TRANSLUCENT TUBE	Yes	No*	

Note:- * Intended for test. Per KDB provision tests not required

8.0 Description of Test System

8.1 Descriptions of Robotics/Probes/Readout Electronics DASY 5

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 Descriptions of Robotics/Probes/Readout Electronics DASY 6

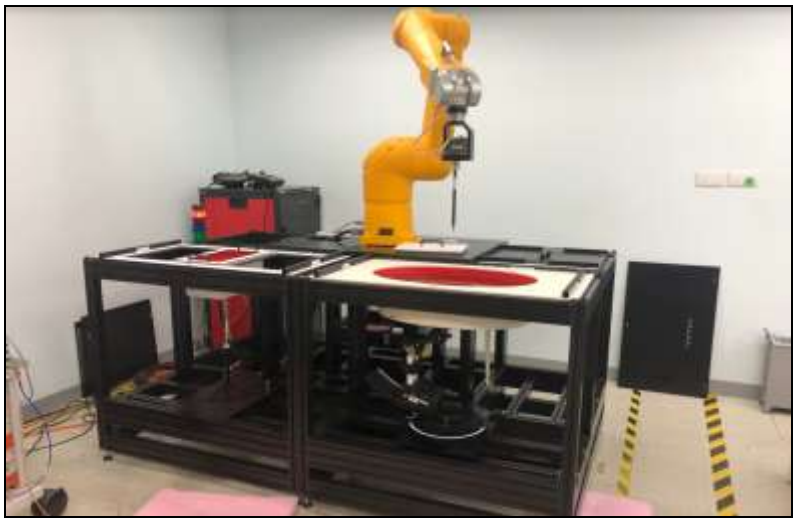

Table 9

Dosimetric System type	System version	DAE type	Probe Type
Schmid & Partner Engineering AG SPEAG DASY 6	V16.0.2.136	DAE4	EX3DV4 (E-Field)

The DASY6™ system is operated per the instructions in the DASY6™ 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.

8.3 Description of Phantom(s)

Table 10

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	NA	300MHz -6GHz; Er = < 5, Loss Tangent = ≤0.05	Human Model			
Oval Flat	√	300MHz -6GHz; Er = 4+/- 1, Loss Tangent = ≤0.05	600x400x190			

8.4 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 11. 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 11

Ingredients	750MHz	835MHz	900MHz	1800MHz(1)	1900MHz(1)	2300MHz(1)
	Head	Head	Head	Head	Head	Head
Sugar	57.0	57.0	56.5	NA	NA	NA
Diacetin	0	NA	NA	NA	NA	NA
De ionized Water	40.12	40.45	40.95	NA	NA	NA
Salt	1.78	1.45	1.45	NA	NA	NA
HEC	1	1	1	NA	NA	NA
Bact.	0.1	0.1	0.1	NA	NA	NA

Table 11 (Continue)

Ingredients	2450MHz(1)	2600MHz(1)	3500MHz(1)	3700MHz(1)	5GHz (1)
	Head	Head	Head	Head	Head
Sugar	NA	NA	NA	NA	NA
Diacetin	NA	NA	NA	NA	NA
De ionized -Water	NA	NA	NA	NA	NA
Salt	NA	NA	NA	NA	NA
HEC	NA	NA	NA	NA	NA
Bact.	NA	NA	NA	NA	NA

Note: (1) SPEAG provides Motorola proprietary stimulant ingredients for the frequencies from 1.8GHz to 5.0GHz.

9.0 Additional Test Equipment

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

Table 12

Equipment Type	Model Number	Serial Number	Calibration Date	Calibration Due Date
Speag Probe*	EXDV4	7534	04/19/2021	04/19/2022
Speag Probe	EX3DV4	7533	04/19/2021	04/19/2024
Speag Probe	EX3DV4	7511	06/18/2021	06/18/2024
Speag DAE*	DAE4	1598	04/07/2021	04/07/2022
Speag DAE	DAE3	374	04/08/2021	04/08/2024
Speag DAE	DAE4	729	06/09/2021	06/09/2024
AMPLIFIER	5S1G4	313326	CNR	CNR
POWER AMPLIFIER	50W 1000A	14715	CNR	CNR
POWER AMPLIFIER	50W100D	0357646	CNR	CNR
POWER AMPLIFIER	5S4G11	312664	CNR	CNR
AMPLIFIER	5S1G4	312988	CNR	CNR
VECTOR SIGNAL GENERATOR	E4438C	MY42081753	08/27/2021	08/27/2022
VECTOR SIGNAL GENERATOR	E4438C	MY45091270	09/09/2021	09/09/2022
POWER METER	E4419B	MY45103725	06/29/2021	06/29/2022
POWER METER	E4418B	MY45100911	08/20/2021	08/20/2022
POWER METER	E4416A	MY50001037	08/16/2020	08/16/2022
POWER METER	E4418B	MY45107917	07/23/2021	07/23/2022
POWER SENSOR	E9301B	MY55210003	05/29/2021	05/29/2022
POWER SENSOR	E9301B	MY41495733	05/29/2021	05/29/2022
POWER SENSOR*	E4412A	MY61050006	04/21/2021	04/21/2022
POWER SENSOR	E4412A	MY61060015	04/07/2022	04/07/2023
POWER SENSOR	8481B	3318A10982	01/07/2022	01/07/2023
POWER SENSOR	E9301B	MY41495594	05/29/2021	05/29/2022
BI-DIRECTIONAL COUPLER	3020A	41931	07/27/2021	07/27/2022
BI-DIRECTIONAL COUPLER	3020A	40295	07/08/2021	07/08/2022
BI-DIRECTIONAL COUPLER	3024	61182	08/07/2021	08/07/2022
BI-DIRECTIONAL COUPLER	3022	81640	07/08/2021	07/08/2022
DATA LOGGER	DSB	16398050	08/18/2021	08/18/2022
THERMOMETER	HH806AU	080307	08/18/2021	08/18/2022
TEMPERATURE PROBE	80PK-22	06032017	11/26/2021	11/26/2022
DIGITAL THERMOMETER	1523	3492108	09/28/2021	09/28/2022
TEMPERATURE PROBE	PR-10L-4-100-1/4-6-BX	WNWR037791	09/17/2021	09/17/2022
NETWORK ANALYZER	E5071B	MY42403218	09/13/2021	09/13/2022
NETWORK ANALYZER	E5071B	MY42403147	02/14/2022	02/14/2023
DIELECTRIC ASSESSMENT KIT	DAK-3.5	1120	10/06/2021	10/06/2022
DIELECTRIC ASSESSMENT KIT*	DAK-3.5	1156	04/07/2021	04/07/2022
DIGITAL THERMOMETER	1523	3492108	09/28/2021	09/28/2022
TEMPERATURE PROBE	PR-10L-4-100-1/4-6-BX	WNWR037791	09/17/2021	09/17/2022
NETWORK ANALYZER	E5071B	MY42403218	09/13/2021	09/13/2022

Note - * Equipment used for test dates prior to equipment calibration due date.

Table 12 (Continue)

Equipment Type	Model Number	Serial Number	Calibration Date	Calibration Due Date
SPEAG DIPOLE	D750V3	1142	11/20/2019	11/20/2022
SPEAG DIPOLE	D835V2	4D029	08/27/2021	08/27/2024
SPEAG DIPOLE	D900V2	1D025	09/20/2021	09/20/2024
SPEAG DIPOLE	D1800V2	2D119	07/12/2021	07/12/2024
SPEAG DIPOLE	D1900V2	5D064	09/18/2019	09/18/2022
SPEAG DIPOLE	D2300V2	1003	01/15/2020	01/15/2023
SPEAG DIPOLE	D2450V2	782	02/20/2020	02/20/2023
SPEAG DIPOLE	D2600V2	1011	04/20/2020	04/20/2023
SPEAG DIPOLE	D3500V2	1008	10/12/2021	10/12/2024
SPEAG DIPOLE	D3700V2	1028	10/12/2021	10/12/2024
SPEAG DIPOLE	D5GHzV2	1022	07/16/2021	07/16/2024
SPEAG DIPOLE	D5GHZV2	1026	09/24/2021	09/24/2024
POWER METER*	E9301B	MY55210006	05/07/2021	05/07/2022
POWER SENSOR	E4418B	GB40206480	11/24/2021	11/24/2022
WIDEBAND RADIO COMMUNICATION TESTER	CMW500	153169	08/28/2020	08/28/2022
WIDEBAND RADIO COMMUNICATION TESTER	CMW500	153170	11/10/2020	11/10/2022
WIFI POWER SENSOR	NRP-Z11	120907	08/19/2020	08/19/2022

Note - * Equipment used for test dates prior to equipment 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 13

Dates	Probe Calibration Point		Probe SN	Measured Tissue Parameters		Validation		
				σ	ϵ_r	Sensitivity	Linearity	Isotropy
CW								
08/16/2021	Head	835	7534	0.93	40.2	Pass	Pass	Pass
08/15/2021	Head	900		1.00	39.4	Pass	Pass	Pass
05/06/2021	Head	5250		4.47	33.3	Pass	Pass	Pass
05/11/2021	Head	835	7533	0.94	41.4	Pass	Pass	Pass
05/11/2021	Head	900		1.00	40.5	Pass	Pass	Pass
05/25/2021	Head	2300		1.73	36.4	Pass	Pass	Pass
06/01/2021	Head	3700		2.89	38.7	Pass	Pass	Pass
08/09/2021	Head	5250		4.29	36.9	Pass	Pass	Pass
08/10/2021	Head	5600		4.72	37.1	Pass	Pass	Pass
08/11/2021	Head	5750		4.85	36.5	Pass	Pass	Pass
07/08/2021	Head	750	7511	0.85	41.5	Pass	Pass	Pass
07/08/2021	Head	835		0.94	40.3	Pass	Pass	Pass

Table 13 (Continue)

Dates	Probe Calibration Point		Probe SN	Measured Tissue Parameters		Validation		
				σ	ϵ_r	Sensitivity	Linearity	Isotropy
CW								
08/09/2021	Head	1800	7511	1.42	40.7	Pass	Pass	Pass
08/07/2021	Head	1900		1.36	38.9	Pass	Pass	Pass
08/05/2021	Head	2300		1.70	38.1	Pass	Pass	Pass
07/09/2021	Head	2450		1.88	35.8	Pass	Pass	Pass
08/05/2021	Head	2600		2.01	37.0	Pass	Pass	Pass
08/05/2021	Head	3500		2.67	39.4	Pass	Pass	Pass
08/05/2021	Head	3700		2.83	39.2	Pass	Pass	Pass
WLAN								
07/09/2021	Head	2450	7511	1.88	35.8	Pass	Pass	Pass
05/05/2021	Head	5250	7534	4.47	33.3	Pass	Pass	Pass
08/09/2021	Head	5250	7533	4.29	36.9	Pass	Pass	Pass
08/11/2021	Head	5600		4.66	36.7	Pass	Pass	Pass
08/12/2021	Head	5750		4.87	36.0	Pass	Pass	Pass
LTE								
06/01/2021	Head	3700 (1 RB)	7533	2.89	38.7	Pass	Pass	Pass
06/01/2021	Head	3700 (50% RB)		2.89	38.7	Pass	Pass	Pass
07/26/2021	Head	750 (1 RB)	7511	0.85	41.7	Pass	Pass	Pass
07/26/2021	Head	750 (50% RB)		0.85	41.7	Pass	Pass	Pass
07/26/2021	Head	835 (1 RB)		0.93	40.6	Pass	Pass	Pass
07/26/2021	Head	835 (50% RB)		0.93	40.6	Pass	Pass	Pass
08/09/2021	Head	1800 (1 RB)		1.42	40.7	Pass	Pass	Pass
08/09/2021	Head	1800 (50% RB)		1.42	40.7	Pass	Pass	Pass
08/07/2021	Head	1900 (1 RB)		1.36	38.9	Pass	Pass	Pass
08/07/2021	Head	1900 (50% RB)		1.36	38.9	Pass	Pass	Pass
08/05/2021	Head	2300 (1 RB)		1.70	38.1	Pass	Pass	Pass
08/05/2021	Head	2300 (50% RB)		1.70	38.1	Pass	Pass	Pass
08/05/2021	Head	2600 (1 RB)		2.01	37.0	Pass	Pass	Pass
08/06/2021	Head	2600 (50% RB)		1.98	36.8	Pass	Pass	Pass
08/04/2021	Head	3500 (1 RB)		2.67	39.4	Pass	Pass	Pass
08/04/2021	Head	3500 (50% RB)		2.67	39.4	Pass	Pass	Pass
08/05/2021	Head	3700 (1 RB)	7511	2.83	39.2	Pass	Pass	Pass
08/05/2021	Head	3700 (50% RB)		2.83	39.2	Pass	Pass	Pass

10.2 System Verification for LMR

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 14

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
7534	IEEE/IEC Head	SPEAG D835V2 / 4D029	9.84 ± 10%	2.32	9.28	03/28/2022#
				2.34	9.36	03/29/2022#
				2.50	10.00	03/30/2022#
		SPEAG D900V2 / 1D025	11.30 ± 10%	2.85	11.40	03/31/2022#
				2.81	11.24	04/01/2022#
				2.83	11.32	04/02/2022
7533	IEEE/IEC Head	SPEAG D835V2 / 4D029	9.84 ± 10%	2.45	9.80	04/12/2022#
		SPEAG D900V2 / 1D025	11.30 ± 10%	2.83	11.32	05/10/2022#

Note: '#' indicates that system verification check covers next test day

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 15

Frequency (MHz)	Tissue Type	Conductivity Target (S/m)	Dielectric Constant Target	Conductivity Meas. (S/m)	Dielectric Constant Meas.	Tested Date
806	IEEE/ IEC Head	0.90 (0.85–0.94)	41.6 (39.6–43.7)	0.90	40.8	03/28/2022#
				0.91	40.5	03/29/2022
815		0.90 (0.85–0.94)	41.6 (39.5–43.7)	0.91	40.7	03/28/2022#
				0.92	40.3	03/29/2022
824		0.90 (0.85–0.94)	41.6 (39.5–43.6)	0.93	40.2	03/28/2022#
				0.93	40.2	03/29/2022
835		0.90 (0.86–0.95)	41.5 (39.4–43.6)	0.93	40.4	03/28/2022#
				0.94	40.0	03/29/2022#
				0.94	39.9	03/30/2022#
				0.94	39.9	04/12/2022#
851		0.92 (0.87–0.96)	41.5 (39.4–43.6)	0.96	39.8	03/29/2022#
				0.96	39.7	03/30/2022
				0.95	39.7	04/12/2022#

Note: '#' indicates that tissue test result covers next test day (within 24 hours)

Table 15 (Continue)

Frequency (MHz)	Tissue Type	Conductivity Target (S/m)	Dielectric Constant Target	Conductivity Meas. (S/m)	Dielectric Constant Meas.	Tested Date
860	IEEE/ IEC Head	0.93 (0.88–0.97)	41.5 (39.4–43.6)	0.92	40.1	05/10/2022
869		0.94 (0.89–0.98)	41.5 (39.4–43.6)	0.97	39.5	03/30/2022#
896		0.97 (0.92–1.01)	41.5 (39.4–43.6)	0.99	40.0	03/31/2022#
899		0.97 (0.92–1.02)	41.5 (39.4–43.6)	0.93	40.0	05/10/2022
900		0.97 (0.92–1.02)	41.5 (39.4–43.6)	0.99	40.0	03/31/2022#
				0.99	39.9	04/01/2022#
				1.00	42.8	04/02/2022
				0.93	40.0	05/10/2022#
901		0.97 (0.92–1.02)	41.5 (39.4–43.6)	0.99	40.0	03/31/2022
935		0.99 (0.94–1.04)	41.5 (39.4–43.5)	1.03	39.5	04/01/2022#
938		0.99 (0.94–1.04)	41.5 (39.4–43.5)	0.95	40.0	05/10/2022#
940		0.99 (0.94–1.04)	41.5 (39.4–43.5)	1.03	39.5	04/01/2022
				1.04	42.4	04/02/2022

Note: '#' indicates that tissue test result covers next test day (within 24 hours)

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^{o}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 16

	Target	Measured
Ambient Temperature	18 – 25 ˚C	Range: 18.3 - 25.0˚C Avg. 22.3 ˚C
Tissue Temperature	18 – 25 ˚C	Range: 18.8 – 23.2˚C Avg. 21.2˚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 17

Description		≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface		5 ± 1 mm	½·δ·ln(2) ± 0.5 mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location		30° ± 1°	20° ± 1°
Maximum area scan spatial resolution: ΔxArea, ΔyArea		≤ 2 GHz: ≤ 15 mm 2 – 3 GHz: ≤ 12 mm	3 – 4 GHz: ≤ 12 mm 4 – 6 GHz: ≤ 10 mm
		When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.	
Maximum zoom scan spatial resolution: ΔxZoom, ΔyZoom		≤ 2 GHz: ≤ 8 mm 2 – 3 GHz: ≤ 5 mm*	3 – 4 GHz: ≤ 5 mm* 4 – 6 GHz: ≤ 4 mm*
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: ΔzZoom(n)	≤ 5 mm	3 – 4 GHz: ≤ 4 mm 4 – 5 GHz: ≤ 3 mm 5 – 6 GHz: ≤ 2 mm
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.			

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. KDB 941225 was applied to LTE test configurations. CMW500 Communication Test set was used for LTE testing.

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

Not applicable.

12.3.3 Face

The DUT was positioned with its' front side 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 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" is 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 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

The guidelines and requirements outlined in section 4.0 were used to assess compliance of this device. All modes of operation identified in section 6.0 were considered during the development of the test plan.

Refer to following parts of the reports for SAR assessment results on respective technologies.

Part 1 for LMR (8/900MHz)

Part 2 for WLAN (2.4GHz and 5GHz) and LTE (band 2, 4, 5, 7, 12, 13, 14, 17, 30 and 48)

13.0 DUT Test Data for LMR

13.1 LMR assessments at the Body for 806-824MHz band

Battery PMNN4803A 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 (806-824MHz) which are listed in Table 18. 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 18

Test Freq (MHz)	Power (W)
806.0000	2.950
824.0000	3.000

Assessments at the Body with Body worn PMLN8126A w/ PMLN4651A
DUT assessment with offered antenna, default battery and above mentioned body worn accessory per KDB 643646. Optional batteries were tested per the requirements of KDB 643646. Refer to Table 18 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#
AN000415A01	PMNN4803A	PMLN8126A w/ PMLN4651A	PMMN4128A	806.0000					
				824.0000	2.98	-0.18	1.30	**0.68**	SAN-AB-220329-04#
Assessment of Additional Batteries									
AN000415A01	PMNN4804A	PMLN8126A w/ PMLN4651A	PMMN4128A	806.0000					
				824.0000	2.98	-0.24	1.25	0.66	SAN-AB-220329-05#
	PMNN4805A			806.0000					
				824.0000	3.00	-0.20	1.25	0.65	SAN-AB-220329-06#

Assessments at the Body with Body worn PMLN8126A w/ PMLN7008A

DUT assessment with offered antenna, default battery and above mentioned body worn accessory per KDB 643646. Optional batteries were tested per the requirements of KDB 643646. Refer to Table 18 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#
AN000415A01	PMNN4803A	PMLN8126A w/ PMLN7008A	PMMN4128A	806.0000					
				824.0000	3.00	-0.19	1.31	0.68	SAN-AB-220329-07#
Assessment of Additional Batteries									
AN000415A01	PMNN4804A	PMLN8126A w/ PMLN7008A	PMMN4128A	806.0000					
				824.0000	2.99	-0.30	1.15	0.62	SAN-AB-220329-08#
	PMNN4805A			806.0000					
				824.0000	3.00	-0.26	1.37	**0.73**	SAN-AB-220329-09#

Assessments at the Body with Body worn PMLN8127A w/ PMLN5407A

DUT assessment with offered antenna, default battery and above mentioned body worn accessory per KDB 643646. Optional batteries were tested per the requirements of KDB 643646. Refer to Table 18 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#
AN000415A01	PMNN4803A	PMLN8127A w/ PMLN5407A	PMMN4128A	806.0000					
				824.0000	3.00	-0.21	0.87	**0.46**	MFR(AMF)-AB-220329-12
Assessment of Additional Batteries									
AN000415A01	PMNN4804A	PMLN8127A w/ PMLN5407A	PMMN4128A	806.0000					
				824.0000	3.00	-0.35	0.59	0.32	MFR-AB-220329-13
	PMNN4805A			806.0000					
				824.0000	3.00	-0.24	0.65	0.34	MFR-AB-220329-14

Assessments at the Body with Body worn PMLN8127A w/ PMLN5409A

DUT assessment with offered antenna, default battery and above mentioned body worn accessory per KDB 643646. Optional batteries were tested per the requirements of KDB 643646. Refer to Table 18 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#
AN000415A01	PMNN4803A	PMLN8127A w/ PMLN5409A	PMMN4128A	806.0000					
				824.0000	3.00	-0.20	0.69	**0.36**	MFR-AB-220329-15
Assessment of Additional Batteries									
AN000415A01	PMNN4804A	PMLN8127A w/ PMLN5409A	PMMN4128A	806.0000					
				824.0000	3.00	-0.32	0.60	0.32	MFR-AB-220329-16
	PMNN4805A			806.0000					
				824.0000	3.00	-0.34	0.57	0.31	AF-AB-220329-17

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 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#
AN000415A01	PMNN4803A	PMLN8126A w/ PMLN7008A	None	806.0000					
				824.0000	3.00	-0.20	1.61	**0.84**	AF-AB-220329-18

13.2 LMR assessments at the Body for 851-869MHz band

Battery PMNN4803A 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 (851-869MHz) which are listed in Table 24. 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 24

Test Freq (MHz)	Power (W)
851.0000	3.000
869.0000	3.000

Assessments at the Body with Body worn PMLN8126A w/ PMLN4651A

DUT assessment with offered antenna, default battery and above mentioned body worn accessory per KDB 643646. Optional batteries were tested per the requirements of KDB 643646. Refer to Table 24 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#
AN000415A01	PMNN4803A	PMLN8126A w/ PMLN4651A	PMMN4128A	851.0000	3.00	-0.30	1.44	**0.77**	AF-AB-220330-05#
				869.0000					
Assessment of Additional Batteries									
AN000415A01	PMNN4804A	PMLN8126A w/ PMLN4651A	PMMN4128A	851.0000	3.00	-0.40	1.33	0.73	AF-AB-220330-06#
				869.0000					
	PMNN4805A			851.0000	3.00	-0.30	1.39	0.74	AF-AB-220330-07#
				869.0000					

Assessments at the Body with Body worn PMLN8126A w/ PMLN7008A

DUT assessment with offered antenna, default battery and above mentioned body worn accessory per KDB 643646. Optional batteries were tested per the requirements of KDB 643646. Refer to Table 24 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#
AN000415A01	PMNN4803A	PMLN8126A w/ PMLN7008A	PMMN4128A	851.0000	2.99	-0.25	1.30	0.69	MFR-AB-220330-08#
				869.0000					
Assessment of Additional Batteries									
AN000415A01	PMNN4804A	PMLN8126A w/ PMLN7008A	PMMN4128A	851.0000	2.91	-0.42	1.25	**0.71**	MFR(AMF)-AB-220330-10
				869.0000					
	PMNN4805A			851.0000	2.92	-0.27	1.23	0.67	MFR(AMF)-AB-220330-11
				869.0000					

Assessments at the Body with Body worn PMLN8127A w/ PMLN5407A

DUT assessment with offered antenna, default battery and above mentioned body worn accessory per KDB 643646. Optional batteries were tested per the requirements of KDB 643646. Refer to Table 24 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#
AN000415A01	PMNN4803A	PMLN8127A w/ PMLN5407A	PMMN4128A	851.0000	2.92	-0.36	0.92	0.52	MFR(AMF)-AB-220330-12
				869.0000					
Assessment of Additional Batteries									
AN000415A01	PMNN4804A	PMLN8127A w/ PMLN5407A	PMMN4128A	851.0000	2.99	-0.42	0.94	**0.52**	MFR(AMF)-AB-220330-13
				869.0000					
	PMNN4805A			851.0000	3.00	-0.36	0.91	0.50	MFR(AMF)-AB-220330-14
				869.0000					

Assessments at the Body with Body worn PMLN8127A w/ PMLN5409A

DUT assessment with offered antenna, default battery and above mentioned body worn accessory per KDB 643646. Optional batteries were tested per the requirements of KDB 643646. Refer to Table 24 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#
AN000415A01	PMNN4803A	PMLN8127A w/ PMLN5409A	PMMN4128A	851.0000	3.00	-0.34	0.68	**0.37**	MFR(AMF)-AB-220330-15
				869.0000					
Assessment of Additional Batteries									
AN000415A01	PMNN4804A	PMLN8127A w/ PMLN5409A	PMMN4128A	851.0000	3.00	-0.45	0.54	0.30	MFR-AB-220330-16
				869.0000					
	PMNN4805A			851.0000	2.99	-0.32	0.59	0.32	MFR-AB-220330-17
				869.0000					

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 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#
AN000415A01	PMNN4803A	PMLN8126A w/ PMLN4651A	None	851.0000	3.00	-0.33	1.57	**0.85**	MFR-AB-220330-18
				869.0000					

13.3 LMR assessments at the Body for 869-901MHz band

Battery PMNN4803A 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 (869-901MHz) which are listed in Table 30. 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 30

Test Freq (MHz)	Power (W)
896.0000	2.980
901.0000	3.000

Assessments at the Body with Body worn PMLN8126A w/ PMLN4651A

DUT assessment with offered antenna, default battery and above mentioned body worn accessory per KDB 643646. Optional batteries were tested per the requirements of KDB 643646. Refer to Table 30 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#
AN000415A01	PMNN4803A	PMLN8126A w/ PMLN4651A	PMMN4128A	896.0000					
				901.0000	3.00	-0.69	1.13	**0.66**	AF-AB-220331-06
Assessment of Additional Batteries									
AN000415A01	PMNN4804A	PMLN8126A w/ PMLN4651A	PMMN4128A	896.0000					
				901.0000	2.98	-0.78	0.95	0.57	AF-AB-220331-07
	PMNN4805A			896.0000					
				901.0000	2.99	-0.47	0.97	0.54	AF-AB-220331-08

Assessments at the Body with Body worn PMLN8126A w/ PMLN7008A

DUT assessment with offered antenna, default battery and above mentioned body worn accessory per KDB 643646. Optional batteries were tested per the requirements of KDB 643646. Refer to Table 30 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#
AN000415A01	PMNN4803A	PMLN8126A w/ PMLN7008A	PMMN4128A	896.0000					
				901.0000	2.91	-0.65	0.91	**0.55**	MFR-AB-220331-09
Assessment of Additional Batteries									
AN000415A01	PMNN4804A	PMLN8126A w/ PMLN7008A	PMMN4128A	896.0000					
				901.0000	2.94	-0.86	0.84	0.52	MFR(AMF)-AB-220331-10
	PMNN4805A			896.0000					
				901.0000	2.93	-0.64	0.89	0.53	MFR(AMF)-AB-220331-11

Assessments at the Body with Body worn PMLN8127A w/ PMLN5407A

DUT assessment with offered antenna, default battery and above mentioned body worn accessory per KDB 643646. Optional batteries were tested per the requirements of KDB 643646. Refer to Table 30 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#
AN000415A01	PMNN4803A	PMLN8127A w/ PMLN5407A	PMMN4128A	896.0000					
				901.0000	2.94	-0.55	0.55	0.32	MFR(AMF)-AB-220331-12
Assessment of Additional Batteries									
AN000415A01	PMNN4804A	PMLN8127A w/ PMLN5407A	PMMN4128A	896.0000					
				901.0000	2.99	-0.85	0.52	**0.32**	MFR(AMF)-AB-220331-13
	PMNN4805A			896.0000					
				901.0000	2.99	-0.87	0.50	0.31	MFR(AMF)-AB-220331-14

Assessments at the Body with Body worn PMLN8127A w/ PMLN5409A

DUT assessment with offered antenna, default battery and above mentioned body worn accessory per KDB 643646. Optional batteries were tested per the requirements of KDB 643646. Refer to Table 30 for highest output power channel. 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#
AN000415A01	PMNN4803A	PMLN8127A w/ PMLN5409A	PMMN4128A	896.0000					
				901.0000	3.00	-0.64	0.51	**0.29**	MFR(AMF)-AB-220331-15
Assessment of Additional Batteries									
AN000415A01	PMNN4804A	PMLN8127A w/ PMLN5409A	PMMN4128A	896.0000					
				901.0000	2.96	-0.77	0.48	0.29	MFR(AMF)-AB-220331-16
	PMNN4805A			896.0000					
				901.0000	2.99	-0.59	0.44	0.25	MFR(AMF)-AB-220331-17

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 35

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#
AN000415A01	PMNN4803A	PMLN8126A w/ PMLN4651A	None	896.0000					
				901.0000	2.99	-0.66	1.26	**0.74**	MFR(AMF)-AB-220331-18

13.4 LMR assessments at the Body for 935-940MHz band

Battery PMNN4803A 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 (935-940MHz) which are listed in Table 36. 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 36

Test Freq (MHz)	Power (W)
935.0000	2.980
940.0000	2.920

Assessments at the Body with Body worn PMLN8126A w/ PMLN4651A

DUT assessment with offered antenna, default battery and above mentioned body worn accessory per KDB 643646. Optional batteries were tested per the requirements of KDB 643646. Refer to Table 36 for highest output power channel. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

Table 37

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#
AN000415A01	PMNN4803A	PMLN8126A w/ PMLN4651A	PMMN4128A	935.0000	2.96	-0.72	0.77	0.46	SAN(AMF)-AB-220401-10
				940.0000					
Assessment of Additional Batteries									
AN000415A01	PMNN4804A	PMLN8126A w/ PMLN4651A	PMMN4128A	935.0000	2.96	-1.09	0.78	**0.51**	SAN(AMF)-AB-220401-11
				940.0000					
	PMNN4805A			935.0000	2.95	-0.71	0.72	0.43	SAN(AMF)-AB-220401-12
				940.0000					

Assessments at the Body with Body worn PMLN8126A w/ PMLN7008A

DUT assessment with offered antenna, default battery and, above mentioned body worn accessory per KDB 643646. Optional batteries were tested per the requirements of KDB 643646. Refer to Table 36 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#
AN000415A01	PMNN4803A	PMLN8126A w/ PMLN7008A	PMMN4128A	935.0000	2.93	-0.77	0.77	**0.47**	SAN(AMF)-AB-220401-14
				940.0000					
Assessment of Additional Batteries									
AN000415A01	PMNN4804A	PMLN8126A w/ PMLN7008A	PMMN4128A	935.0000	2.93	-0.96	0.68	0.44	SAN-AB-220401-16
				940.0000					
	PMNN4805A			935.0000	2.95	-0.63	0.70	0.41	AF-AB-220401-17
				940.0000					

Assessments at the Body with Body worn PMLN8127A w/ PMLN5407A

DUT assessment with offered antenna, default battery and, above mentioned body worn accessory per KDB 643646. Optional batteries were tested per the requirements of KDB 643646. Refer to Table 36 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#
AN000415A01	PMNN4803A	PMLN8127A w/ PMLN5407A	PMMN4128A	935.0000	2.97	-0.86	0.34	0.21	AF-AB-220401-18
				940.0000					
Assessment of Additional Batteries									
AN000415A01	PMNN4804A	PMLN8127A w/ PMLN5407A	PMMN4128A	935.0000	2.96	-0.97	0.34	**0.22**	AF-AB-220401-19
				940.0000					
	PMNN4805A			935.0000	2.94	-0.56	0.35	0.20	AF-AB-220402-01#
				940.0000					

Assessments at the Body with Body worn PMLN8127A w/ PMLN5409A

DUT assessment with offered antenna, default battery and, above mentioned body worn accessory per KDB 643646. Optional batteries were tested per the requirements of KDB 643646. Refer to Table 36 for highest output power channel. SAR plots of the highest results per Table (bolded) are presented in Appendix E

Table 40

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#
AN000415A01	PMNN4803A	PMLN8127A w/ PMLN5409A	PMMN4128A	935.0000	2.97	-0.60	0.35	**0.20**	AF-AB-220402-02#
				940.0000					
Assessment of Additional Batteries									
AN000415A01	PMNN4804A	PMLN8127A w/ PMLN5407A	PMMN4128A	935.0000	2.94	-0.88	0.31	0.19	AF-AB-220402-03#
				940.0000					
	PMNN4805A			935.0000	2.98	-0.58	0.31	0.18	AF-AB-220402-04#
				940.0000					

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 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#
AN000415A01	PMNN4803A	PMLN8126A w/ PMLN4651A	None	935.0000	2.96	-0.76	0.94	**0.57**	AF-AB-220402-05#
				940.0000					

13.5 LMR assessments at the Face for 806-824MHz band

Battery PMNN4805A 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 (806-824MHz) which are listed in Table 42. 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 42

Test Freq (MHz)	Power (W)
806.0000	2.940
824.0000	3.000

DUT assessment with offered antenna, 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 42 for highest output power channel. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

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#
AN000415A01	PMNN4805A	Radio @ front 2.5cm	None	806.0000					
				824.0000	2.91	-0.09	3.28	**1.73**	SAN-FACE-220328-09
Assessment of Additional Batteries									
AN000415A01	PMNN4803A	Radio @ front 2.5cm	None	806.0000					
				824.0000	2.98	-0.13	2.85	1.48	SAN-FACE-220328-10
	PMNN4804A			806.0000					
				824.0000	3.00	-0.21	3.14	1.65	SAN-FACE-220329-01#

13.6 LMR assessment at the Face for 851-869MHz band

Battery PMNN4805A 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 (851-869MHz) which are listed in Table 44. 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 44

Test Freq (MHz)	Power (W)
851.0000	2.960
869.0000	2.960

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 44 for highest output power channel. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

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#
AN000415A01	PMNN4805A	Radio @ front 2.5cm	None	851.0000	3.00	-0.16	3.40	1.76	AF-FACE-220330-20
				869.0000					
Assessment of Additional Batteries									
AN000415A01	PMNN4803A	Radio @ front 2.5cm	None	851.0000	3.00	-0.60	3.18	**1.83**	AF-FACE-220330-21
				869.0000					
	PMNN4804A			851.0000	2.99	-0.37	2.90	1.58	AF-FACE-220330-22
				869.0000					

13.7 LMR assessments at the Face for 896-901MHz band

Battery PMNN4805A was selected as the default battery for assessments at the Body 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 (896-901MHz) which are listed in Table 46. 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 46

Test Freq (MHz)	Power (W)
896.0000	2.900
901.0000	2.980

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 46 for highest output power channel. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

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#
AN000415A01	PMNN4805A	Radio @ front 2.5cm	None	896.0000					
				901.0000	2.98	-0.45	2.33	1.30	AF-FACE-220331-20
Assessment of Additional Batteries									
AN000415A01	PMNN4803A	Radio @ front 2.5cm	None	896.0000					
				901.0000	2.98	-0.68	2.79	**1.64**	AF-FACE-220331-21
	PMNN4804A			896.0000					
				901.0000	2.96	-0.71	2.64	1.58	AF-FACE-220331-22

13.8 LMR assessments at the Face for 935-940MHz band

Battery PMNN4805A was selected as the default battery for assessments at the Body 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 (935-940MHz) which are listed in Table 48. 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 48

Test Freq (MHz)	Power (W)
935.0000	2.930
940.0000	2.880

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 48 for highest output power channel. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

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#
AN000415A01	PMNN4805A	Radio @ front 2.5cm	None	935.0000	2.95	-0.73	2.47	1.49	AF-FACE-220401-06
				940.0000					
Assessment of Additional Batteries									
AN000415A01	PMNN4803A	Radio @ front 2.5cm	None	935.0000	2.98	-0.78	2.68	**1.61**	AF-FACE-220401-07
				940.0000					
	PMNN4804A			935.0000	2.93	-0.85	1.96	1.22	SAN(AMF)-FACE-220401-08
				940.0000					

13.9 Assessment for ISED, Canada

Based on the assessment results for body and face per KDB643646 D01, additional tests were not required for the Industry Canada frequency range (8/900 MHz) as the testing performed is in compliance with Industry Canada frequency range.

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. The SAR results are in the Tables below. SAR plot is included in Appendix E for the highest configurations.

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#
Body (806-824MHz)									
AN000415A01	PMNN4805A	PMLN8126A w/ PMLN7008A	None	806.0000	3.00	-0.23	1.43	0.75	AF-AB-220329-19
				815.0000	3.00	-0.26	1.56	0.83	AF-AB-220329-20
				824.0000	3.00	-0.20	1.61	**0.84**	AF-AB-220329-18
Face (806-824MHz)									
AN000415A01	PMNN4805A	Radio @ front 2.5cm	None	806.0000	3.00	-0.18	2.77	1.44	SAN-FACE-220329-02#
				815.0000	3.00	-0.18	2.79	1.45	SAN-FACE-220329-03#
				824.0000	2.91	-0.09	3.28	**1.73**	SAN-FACE-220328-09

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#
Body (851-869MHz)									
AN000415A01	PMNN4803A	PMLN8126A w/ PMLN4651A	None	851.0000	3.00	-0.33	1.57	**0.85**	MFR-AB-220330-18
				860.0000	3.00	-0.48	1.38	0.77	SAN(IRA)-AB-220510-05
				869.0000	3.00	-0.47	1.45	0.81	AF-AB-220330-19
Face (851-869MHz)									
AN000415A01	PMNN4803A	Radio @ front 2.5cm	None	851.0000	3.00	-0.60	3.18	**1.83**	AF-FACE-220330-21
				860.0000	3.00	-0.37	2.94	1.60	MFR(DAN)-FACE-220510-06
				869.0000	2.98	-0.32	2.73	1.48	AF-FACE-220331-01#

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#
Body (896-901MHz)									
AN000415A01	PMNN4803A	PMLN8126A w/ PMLN4651A	None	896.0000	2.96	-0.56	1.30	**0.75**	MFR(AMF)-AB-220331-19
				898.5000	2.99	-0.86	1.08	0.66	MFR(DAN)-AB-220510-09
				901.0000	2.99	-0.66	1.26	0.74	MFR(AMF)-AB-220331-18
Face (896-901MHz)									
AN000415A01	PMNN4803A	Radio @ front 2.5cm	None	896.0000	2.95	-0.65	2.53	1.49	AF-FACE-220401-01#
				898.5000	3.00	-0.61	2.43	1.40	MFR(DAN)-FACE-220510-07
				901.0000	2.98	-0.68	2.79	**1.64**	AF-FACE-220331-21

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#
Body (935-940MHz)									
AN000415A01	PMNN4804A	PMLN8126A w/ PMLN4651A	None	935.0000	2.96	-0.76	0.94	0.57	AF-AB-220402-05#
				937.5000	2.92	-0.85	0.81	0.51	MFR(DAN)-AB-220511-02#
				940.0000	2.92	-1.03	0.90	**0.58**	SAN-AB-220402-08
Face (935-940MHz)									
AN000415A01	PMNN4803A	Radio @ front 2.5cm	None	935.0000	2.98	-0.78	2.68	**1.61**	AF-FACE-220401-07
				937.5000	2.93	-0.81	1.88	1.16	MFR(DAN)-FACE-220510-08
				940.0000	2.95	-0.96	2.10	1.33	SAN(AMF)-FACE-220401-09

13.10 Assessment at the Bluetooth LE band

13.10.1 FCC Requirement

Per guidelines in KDB 447498 D04 Interim General RF Exposure Guidance v01, SAR-based thresholds are derived based on frequency, power and separation distance of the RF source.

The SAR-based exemption formula indicated below, applies for single fixed, mobile, and portable RF sources with available maximum time-averaged power or effective radiated power (ERP), whichever is greater, or less than or equal to the threshold *P*th (mW) refer to Table B.2.

*P*th (mW) = $ERP_{20cm}(\frac{d}{20})^x \ for\ distance\ d \leq 20\ cm$

Where $x = -log10\ \left(\frac{60}{ERP_{20}\sqrt{f}}\right)$

This method shall only be used at separation distances from 0.5 cm to 40 cm and at frequencies from 0.3 GHz to 6 GHz (inclusive).

Table B.2—Example Power Thresholds (mW)

Frequency (MHz)	Distance (mm)										
	5	10	15	20	25	30	35	40	45	50
300	39	65	88	110	129	148	166	184	201	217
450	22	44	67	89	112	135	158	180	203	226
835	9	25	44	66	90	116	145	175	207	240
1900	3	12	26	44	66	92	122	157	195	236
2450	3	10	22	38	59	83	111	143	179	219
3600	2	8	18	32	49	71	96	125	158	195
5800	1	6	14	25	40	58	80	106	136	169

The closest separation distance from the outer housing (location of the antenna will be indicated in Ex7B) to the phantom is 2.5 cm with a carry holster and belt clip, as indicated in the picture below.

The BT LE maximum power of the device is 5.01 mW with 86% duty cycle, therefore the standalone Bluetooth LE transmitter operates at maximum time-averaged power:
= 5.01 mW * 86%
= 4.31 mW or 6.34 dBm

According to Table B.2, at the distance 25 mm, the power threshold, *P*th at frequency 2450 MHz is 59 mW.

Since the maximum time-averaged power of the device is lower than the power threshold, routine evaluation can be exempted.

13.10.2 ISED Canada Requirement

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

Standalone Bluetooth LE transmitter operates at maximum time-averaged power:
= 5.01 mW * 86%
= 4.31 mW or 6.34 dBm

Equivalent isotropically radiated power (EIRP):
= Maximum conducted power, dBm + Antenna gain, dBi
= 6.34 dBm + (1.41 dBi)
= 7.75 dBm or 5.96 mW

Since the output power level, 5.96 mW is below the threshold power level of 20 mW, SAR test is not required for Bluetooth LE.

13.11 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 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#
AN000415A01	PMNN4803A	Radio @ front 2.5cm	None	851.0000	3.00	-0.15	3.65	**1.89**	BAD-AB-220412-02#

14.0 Simultaneous Transmission

The Table below summarizes the simultaneous transmissions conditions for this device.

Table 55

Exposure Conditions	Item	Capable Simultaneous Transmit Configurations
Body-Worn	1	LMR + WLAN 2.4 GHz
	2	LMR + WLAN 5 GHz
	3	LMR + WLAN 2.4 GHz + BT
	4	LMR + WLAN 5 GHz + BT
	5	LMR + BT
	6	LMR + LTE
	7	LMR + LTE + BT
Face	1	LMR + WLAN 2.4 GHz
	2	LMR + WLAN 5 GHz
	3	LMR + WLAN 2.4 GHz + BT
	4	LMR + WLAN 5 GHz + BT
	5	LMR + BT
	6	LMR + LTE
	7	LMR + LTE + BT

WLAN 2.4 GHz and 5GHz share the same antenna, only one technology to transmit at a single time.

14.1 Simultaneous transmission exclusion for BT LE

Per guidelines in KDB 447498 D04 Interim General RF Exposure Guidance v01, SAR-based exemption may be considered for test exemption for portable device exposure conditions; therefore, the following formula was used to determine exemption for simultaneous transmission:

$$[(P_i / P_{th}) + (Evaluated_k / Exposure\ Limit_k)] = 0.31, \text{ which is } < 1$$

where:
the available maximum time-averaged power (P_i)
= 4.31 mW (5.01 mW * 86% duty cycle)

the exemption threshold power (Pth) according to Table B.2 in 13.10 = 59 mW

the maximum reported SAR portable RF source k in the device from an existing evaluation ($Evaluated_k$) = 1.89 W/kg

the occupational/controlled specific absorption rate (SAR) limit for portable sources ($Exposure\ Limit_k$) = 8 W/kg

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

14.2 Simultaneous Transmission between LMR, WLAN 2.4GHz, WLAN 5GHz and LTE.

Table 56

Exposure condition	Standalone SAR (W/kg)				Sum of SAR (W/kg)		
	LMR	2.4GHz	5GHz	LTE	LMR + 2.4GHz	LMR + 5GHz	LMR + LTE
Body worn Exposure	0.85	0.051	0.025	0.338	0.90	0.88	1.19
Face Exposure	1.89	0.026	0.019	0.221	1.92	1.91	2.11

15.0 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 57

Designator	Frequency band	Max Calc at Body (W/kg)	Max Calc at Face (W/kg)
		1g-SAR	1g-SAR
FCC US			
LMR	8/900 MHz	0.85	1.89
LTE	B2, 4, 5, 7, 12, 13, 14, 17, 30, 48	0.338	0.221
WLAN	2412-2462 MHz	0.051	0.026
	5180-5825 MHz	0.025	0.019
BT LE	2402-2485 MHz	NA	NA
Simultaneous Results		1.19	2.11
ISED Canada			
LMR	8/900 MHz	0.85	1.89
LTE	B2, 4, 5, 7, 12, 13, 14, 17, 30, 48	0.338	0.221
WLAN	2412-2462 MHz	0.051	0.026
	5180-5825 MHz	0.025	0.019
BT LE	2402-2485 MHz	NA	NA
Simultaneous Results		1.19	2.11
Overall			
LMR	8/900 MHz	0.85	1.89
LTE	B2, 4, 5, 7, 12, 13, 14, 17, 30, 48	0.338	0.221
WLAN	2412-2472 MHz	0.051	0.026
	5180-5825 MHz	0.025	0.019
BT LE	2400-2485 MHz	NA	NA
Simultaneous Results		1.19	2.11

All results are scaled to the maximum output power.

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).

16.0 Variability Assessment

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

17.0 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.

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 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

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 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	9999 9
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