MOTOROLA SOLUTIONS

SAMM 826

CERTIFICATE 2518.05

DECLARATION OF COMPLIANCE SAR ASSESSMENT Part 1 of 3

Motorola Solutions Inc.
EME Test Laboratory
Motorola Solutions Malaysia Sdn Bhd
Plot 2A, Medan Bayan Lepas,
Mukim 12 SWD 11900 Bayan Lepas Penang, Malaysia.

Date of Report: 07/30/2024
Report Revision: C

Responsible Engineer:	Alfred Hoe Kean Loon (EME Engineer)
Report Author:	Alfred Hoe Kean Loon (EME Engineer)
Date/s Tested:	4/8/2024 – 4/10/2024, 4/18/2024 - 4/22/2024, 4/25/2024-5/6/2024, 5/09/2024, 5/15/2024, 5/17/2024 – 5/22/2024, 5/31/2024-6/3/2024, 6/8/2024
Manufacturer:	Motorola Solutions Malaysia Sdn. Bhd.
Manufacturer Location:	Plot 2A, Medan Bayan Lepas, Mukim 12 SWD, 11900 Bayan Lepas, Penang, Malaysia
DUT Description:	Handheld Portable – APX N70 Single Band VHF Portable Radio, Model 4.5
Test TX mode(s):	CW (PTT), WLAN2.4GHz, WLAN5GHz, LTE, NFC
Max. Power output:	Refer table 3
Nominal Power:	Refer table 3
Tx Frequency Bands:	Refer table 3
Signaling type:	Refer table 3
Model(s) Tested:	H35KET9PW8AN
Model(s) Certified: (HVIN/PMN)	Refer 1.0 Introduction
Serial Number(s):	022TAF1517, 022TAF1510
Classification:	Occupational/Controlled Environment
Firmware Version (FVIN):	D03.75.46
Applicant Name:	Motorola Solutions Inc.
Applicant Address:	Plot 2A, Medan Bayan Lepas, Mukim 12 SWD, 11900 Bayan Lepas, Penang, Malaysia
FCC ID:	AZ489FT7149 This report contains results that are immaterial for FCC equipment approval, which are clearly identified.
FCC Test Firm Registration Number:	823256
IC:	109U-89FT7149 This report contains results that are immaterial for ISED equipment approval, which are clearly identified.
IC Test Site registration:	24843

The test results clearly demonstrate compliance with Occupational/Controlled Environment 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 (Approval Signatory)
Approved Date: 07/30/2024

Part 1 of 3

APPENDICES

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1.0 System Validation for LTE
2.0 System Verification for LTE
3.0 Equivalent Tissue Test Results for LTE
4.0 DUT Test Positions Photos
- 4.1 SAR Assessments for LTE band 12 (699-716 MHz)
- 4.2 SAR Assessments for LTE band 13 (777-787 MHz)
- 4.3 SAR Assessments for LTE band 14 (788-798 MHz)
- 4.4 SAR Assessments for LTE band 4 (1710-1755 MHz)
- 4.5 SAR Assessments for LTE band 2 (1850-1910 MHz)

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D System Verification Check Scans
E DUT Scans
F Shorten Scan of Highest SAR Configuration
G DUT Test Position Photos
H DUT, Body worn and audio accessories Photos

Report Revision History

Date	Revision	Comments
07/03/2024	A	Initial release
07/12/2024	B	Update Firmware Version (FVIN)
07/30/2024	C	Update Manufacturer Name

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 H35KET9PW8AN. This device is classify as Occupational/Controlled Environment and models certified are list as below:

Model / Hardware Version ID Number (HVIN)	Product Marketing Name (PMN)	Description
H35KET9PW8AN	APX N70	APX N70 VHF MODEL 4.5 PORTABLE
H35KET9PW8AN-H	APX N70	APX N70 VHF MODEL 4.5 PORTABLE (UL Model)

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	150.8 – 173.4MHz (LMR)	1.91	1.62
PCF	LTE B12	0.091	0.057
	LTE B13	0.081	0.064
	LTE B14	0.102	0.068
	LTE B4	0.025	0.146
	LTE B2	0.091	0.057
*DSS	2402-2480MHz (Bluetooth)	NA	NA
DTS	2412-2462MHz (WLAN 2.4GHz)	0.035	0.217
NII	5180 – 5825MHz (WLAN 5GHz)	0.036	0.677
Highest Simultaneous Results		2.01	2.30

*Results not required per KDB (refer to sections 14.3 and 16.1)

3.0 Abbreviations / Definitions

BT: Bluetooth
CNR: Calibration Not Required
CW: Continuous Wave
DSS Part 15 Spread Spectrum Transmitter
DUT: Device Under Test
DTS Digital Transmission System
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
NFC:	Near Field Communication

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.

- Federal Communications Commission, "Evaluating Compliance with FCC Guidelines for Human Exposure to Radio frequency Electromagnetic Fields", OET Bulletin 65, FCC, Washington, D.C.: 1997.
- Institute of Electrical and Electronics Engineers (IEEE) C95.1-2019
- International Commission on Non-Ionizing Radiation Protection (ICNIRP) 2020
- 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 700 of September 28, 2018 "Approves the Regulation on the Assessment of Human Exposure to Electric, Magnetic and Electromagnetic Fields Associated with the Operation of Radio communication Transmitting Stations.
- IEC/IEEE 62209-1528-2020- Measurement procedure for the assessment of specific absorption rate of human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices - Part 1528: Human models, instrumentation, and procedures (Frequency range of 4 MHz to 10 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 – 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 frequency modulation (FM) incorporating traditional simplex two-way radio transmission protocol. This device also contains WLAN, LTE technologies for data applications and Bluetooth technology 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 GFSK Bluetooth transmission device, which is a Frequency Hopping Spread Spectrum (FHSS) technology. The Bluetooth radio modem is used to wireless link audio accessories. The Bluetooth imposes the maximum actual transmission duty cycle.

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	Band (MHz)	Transmission	Duty Cycle (%)	Conducted (Average Detector) Power	
				Nominal Power	Max Power
LMR	136-174	FM	*50	6 W	6.6 W
WLAN 802.11 b (22 MHz)	2412-2462	DSSS	99.97	125.9 mW	141.25 mW
(1)WLAN 802.11 g (20 MHz)		OFDM	99.80	79.4 mW	89.1 mW
(1)WLAN 802.11 n (20 MHz)			94.36		
(1)WLAN 802.11 n (40 MHz)	2422-2452		99.80		
WLAN 802.11 a (20 MHz)	5180-5825	OFDM	99.80	(UNII-1, UNII-2A, UNII-2C, UNII-3) 63.09 mW	(UNII-1, UNII-2A, UNII-2C, UNII-3) 79.43mW
WLAN 802.11 n/ac (20 MHz)			95.59	(UNII-1, UNII-2A, UNII-2C, UNII-3) 63.09 mW	(UNII-1, UNII-2A, UNII-2C, UNII-3) 79.43mW
WLAN 802.11 n/ac (40 MHz)			99.60	(UNII-1) 63.09mW (Chn 38 – 15.85mW) (UNII-2A) 63.09mW (Chn 62 – 12.59mW) (UNII-2C) 63.09mW (Chn 104 – 25.12mW) (UNII-3) 63.09mW	(UNII-1) 79.43mW (Chn 38 – 19.95mW) (UNII-2A) 79.43mW (Chn 62 – 15.84mW) (UNII-2C) 79.43mW(Chn 104 – 31.62mW (UNII-3) 79.43mW
(4)WLAN 802.11 ac (80 MHz)			96.15	(UNII-1) 15.84mW (UNII-2A) 7.94mW (UNII-2C) 63.09mW (Chn 106 – 15.84mW) (UNII-3) 63.09mW	(UNII-1) 19.95mW (UNII-2A) 10mW (UNII-2C) 79.43mW (Chn 106 - 19.95mW) (UNII-3) 79.43mW
LTE Band 2	1850-1910	QPSK, 16QAM	100	199.53 mW	252 mW
LTE Band 4	1710-1755	QPSK, 16QAM	100		
LTE Band 12	699-716	QPSK, 16QAM	100		
LTE Band 13	777-787	QPSK, 16QAM	100		
LTE Band 14	788-798	QPSK, 16QAM	100		
LTE Band 17	704-716	QPSK, 16QAM	100		
NFC	13.56	NFC	100	NA	35 mW

Table 3 (Continued)

Technologies	Band (MHz)	Transmission	Duty Cycle (%)	Conducted (Average Detector) Power	
				Nominal Power	Max Power
BT 1.5	2400-2485	GFSK	78	15.8 mW	19.95 mW
BT LE	2400-2485	GFSK	62.68	4 mW	5.01 mW

Note –

* includes 50% PTT operation

(1) EME tested WLAN 2.4 GHz 802.11b (22MHz) at 141.25 mW (Highest max conducted average power as stated in the table above). The new power of WLAN 802.11b/g/n will be implement in Production unit are 802.11b is 56.2 mW, 802.11g/n (20MHz) is 44.6 mW and 802.11n (40MHz) is 56.2 mW for Low and Mid channel while 28.2 mW for High channel.

The intended operating positions are “at the face” with the DUT at least 1 inch 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.

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

Table 4

Antenna No.	Antenna Models	Description	Selected for test	Tested
1	AN000414A01	VHF ¼ Wave Antenna (136-174MHz), -10dBi gain	Yes	Yes
2	AN000413A01	Antenna LTE Main, Low Band, Mid Band 699 - 2155 MHz, 699-716MHz (-2.9dBi), 777-787MHz (-1.5dBi), 788-798MHz (-1.7dBi), 1850-1910MHz (1.1dBi), 1710-1755MHz (1.9dBi)	Yes	Yes
3	AN000413A03	Antenna Wifi/BT 2400 - 2480MHz, 5150 - 5850 MHz, 2412MHz (0.10dBi), 2437MHz (0.20dBi), 2462MHz (0.40dBi), 2402MHz (0.60dBi), 2438MHz (0.60dBi), 2480MHz (1.10dBi), 5180MHz (4.60dBi), 5500MHz (3.30dBi), 5825MHz (3.10dBi)	Yes	Yes

7.2 Battery

Table 5

Battery No.	Battery Models	Description	Selected for test	Tested	Comments
1	PMNN4816A	Standard 3200mAh (new 18650 Li-Ion cell) Non-UL battery	Yes	Yes	Default battery for body configuration
2	PMNN4817A	High Capacity 4400mAH (using RN 2170 Li-Ion cell) Non-UL battery	Yes	Yes	Default battery for face configuration
3	PMNN4818A	UL 3650mAH (using RN 2170 Li-Ion cell) UL battery	Yes	Yes	

7.3 Body worn Accessories

Table 6

Body worn No.	Body worn Models	Description	Selected for test	Tested	Comments
1	PMLN5407A	2.5" replacement belt loop	Yes	Yes	Paired with PMLN8372A, PMLN8373A and PMLN8374A
2	PMLN5408A	2.75" replacement belt loop	Yes	Yes	Paired with PMLN8372A, PMLN8373A and PMLN8374A
3	PMLN5409A	3" replacement belt loop	Yes	Yes	Paired with PMLN8372A, PMLN8373A and PMLN8374A
4	PMLN8371A	Aloha Standard plastic carry holster	Yes	Yes	Paired with PMLN8507A and PMLN8508A
5	PMLN8372A	Hybrid Case (Similar to APX NEXT)	Yes	Yes	Only compatible with battery PMNN4816A. Paired with PMLN5407A, PMLN5408A, PMLN5409A, PMLN8507A and PMLN8508A
6	PMLN8373A	Hybrid Case (Similar to APX NEXT)	Yes	Yes	Only compatible with battery PMNN4817A. Paired with PMLN5407A, PMLN5408A, PMLN5409A, PMLN8507A and PMLN8508A

Table 6 (Continued)

Body worn No.	Body worn Models	Description	Selected for test	Tested	Comments
7	PMLN8374A	Hybrid Case (Similar to APX NEXT)	Yes	Yes	Only compatible with battery PMNN4818A. Paired with PMLN5407A, PMLN5408A, PMLN5409A, PMLN8507A and PMLN8508A
8	PMLN8507A	Carry Accessory - Belt clip, APX N70 2.5" belt clip	Yes	Yes	Paired with PMLN8371A, PMLN8372A and PMLN8373A
9	PMLN8508A	Carry Accessory - Belt clip, APX N70 3" belt clip	Yes	Yes	Paired with PMLN8371A, PMLN8372A and PMLN8373A

7.4 Audio Accessories

Table 7

Audio No.	Audio Acc. Models	Description	Selected for test	Tested	Comments
1	PMMN4128A	UL RM 780 Gcai mini RSM , wind porting RSM with buttons	Yes	Yes	Default audio
2	NMN6271A	AUDIO ACCESSORY-REMOTE SPEAKER MICROPHONE,IMPRES XP RSM FOR APX W/ DUAL MIC NOISE SUPPRESSION.	Yes	Yes	Paired with PMLN8334A
3	NMN6274B	AUDIO ACCESSORY-REMOTE SPEAKER MICROPHONE,IMPRES XP RSM FOR APX W/ DUAL MIC NOISE SUPPRESSION, 3.5MM THRD JACK	No	No	By similarity to NMN6271A
4	PMLN6827A	ACCESSORY KIT,TACTICAL GCAI PTT INTERFACE MODULE	Yes	Yes	Paired with PMLN8334A, PMLN6828A and PMLN6829A
5	PMLN6828A	ACCESSORY KIT,TACTICAL THROAT MICROPHONE	Yes	Yes	Paired with PMLN8334A and PMLN6827A
6	PMLN6829A	TACTICAL EAR MICROPHONE	Yes	Yes	Paired with PMLN8334A and PMLN6827A
7	PMLN8085A	*BTH heavy duty headset,BEHIND-THE-HEAD HEADSET	Yes	Yes	
8	PMLN8086A	OTH heavy duty headset,Over-the-head headset	No	No	By Similarity to PMLN8085A
9	PMLN8265A	OTH headset CH-3, Nexus	Yes	Yes	Paired with PMLN8297A
10	PMLN8266A	*BTH headset CH-3, Nexus	Yes	Yes	Paired with PMLN8297A
11	PMLN8267A	*Hard hat mount headset CH-3, Nexus	Yes	Yes	Paired with PMLN8297A

Table 7 (Continued)

Audio No.	Audio Acc. Models	Description	Selected for test	Tested	Comments
12	PMLN8297A	3M Nexus body PTT	Yes	Yes	Paired with PMLN8265A, PMLN8266A, PMLN8267A
13	PMLN8341A	1-Wire Surveillance Kit with Loud Audio Translucent Tube	Yes	Yes	
14	PMLN8342A	2-Wire Surveillance Kit with Loud Audio Translucent Tube	Yes	Yes	
15	PMLN8343A	3-Wire Surveillance Kit with Loud Audio Translucent Tube	Yes	Yes	
16	PMMN4132A	Accessory Kit, XVE500 Remote Speaker Mic, High Impact Green with knob	Yes	Yes	
17	PMMN4132A BLK	Accessory Kit, XVE500 Remote Speaker Microphone, Black with knob	No	No	By Similarity to PMLN4132A
18	PMMN4137A	Accessory Kit, XVE500 Remote Speaker Mic, High Impact Green with no knob	Yes	Yes	
19	PMMN4137A BLK	Accessory Kit, XVE500 Remote Speaker Microphone, Black with no knob	No	No	By Similarity to PMLN4137A
20	PMMN4140A	UL RM760 Gcai mini RSM	Yes	Yes	
21	PMMN4141A	XVP750 Remote Speaker Microphone, with channel knob	Yes	Yes	
22	PMMN4142A	XVP730 Remote Speaker Microphone, without channel knob	Yes	Yes	
23	PMLN8334A	GCAI-mini to GCAI Adaptor	Yes	Yes	Paired with NMN6271A, PMLN6827A, PMLN6828A, PMLN6829A, PMLN4132A and PMLN4137A
24	PMLN8120A	Receive-only Extra Loud Clear tube earpiece, 3.5mm Jack compatible with PMMN4128A	No	No	Receive only
25	PMLN8295A	2-Wire Extra Loud Earhook w/ optional earbud earpiece	No	No	Receive only
26	PMLN8337A	1-Wire Single Earbud w/ Removable Earhook Load Audio Earpiece	No	No	Receive only
27	PMLN8625A	Earpiece, Receive only Extra Loud Earpiece, 3.5mm Jack	No	No	Receive only

8.0 Description of Test System

DASY5™ 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™** 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.

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	NA	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	150MHz Head	750MHz(1) Head	1800MHz (1) Head	2450MHz (1) Head	5Hz (1) Head
Sugar	55.4	NA	NA	NA	NA
Diacetin	NA	NA	NA	NA	NA
De ionized -Water	38.35	NA	NA	NA	NA
Salt	5.15	NA	NA	NA	NA
HEC	1	NA	NA	NA	NA
Bact.	0.1	NA	NA	NA	NA

Note: (1) SPEAG provides Motorola proprietary stimulant ingredients for the 750MHz, 1800MHz, 2450GHz and 5GHz 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	7594	12/07/2023	12/07/2026
SPEAG PROBE	EX3DV4	7364	02/28/2022	02/28/2025
SPEAG PROBE	EX3DV4	7486	01/19/2024	01/19/2024
SPEAG DAE	DAE4	850	04/14/2022	04/14/2022
SPEAG DAE	DAE4	1294	12/08/2023	12/08/2026
SPEAG DAE	DAE4	684	02/22/2022	02/22/2025
POWER AMPLIFIER	50W 1000A	14715	CNR	CNR
AMPLIFIER	5S1G4	313326	CNR	CNR
AMPLIFIER	5S4G11	312664	CNR	CNR
AMPLIFIER	5S4G11	312663	CNR	CNR
VECTOR SIGNAL GENERATOR	E4438C	MY42081753	08/30/2023	08/30/2024
SIGNAL GENERATOR (VECTOR ESG 250KHZ-6GHZ)	E4438C	MY45091093	06/26/2023	06/26/2024
BI-DIRECTIONAL COUPLER	3020A	40295	06/09/2023	06/09/2024
BI-DIRECTIONAL COUPLER	3022	81640	06/09/2023	06/09/2024
BI-DIRECTIONAL COUPLER	3024	61136	07/18/2023	07/18/2024
BI-DIRECTIONAL COUPLER	3024	61182	06/09/2023	06/09/2024
POWER METER	E4418B	MY45100911	08/11/2023	08/11/2024
POWER METER	E4416A	MY50001037	08/09/2023	08/09/2024
POWER METER	E4417A	GB41292245	12/09/2023	12/09/2024
POWER METER	E4419B	GB42420608	12/10/2023	12/10/2024
POWER SENSOR	E9301B	MY50290001	06/16/2023	06/16/2024
POWER SENSOR	E9301B	MY50280001	05/19/2023	05/19/2024
POWER SENSOR	E4412A	MY61020016	08/21/2023	08/21/2024
POWER SENSOR	E9301B	MY41495594	11/02/2023	11/02/2024
POWER SENSOR	E9301B	MY41495733	08/21/2023	08/21/2024
POWER SOURCE	SE UMS 160 CA	4302	10/16/2023	10/16/2024
POWER SOURCE	SE UMS 160 CB	4320	10/12/2023	10/12/2024
DIGITAL THERMOMETER WITH PROBE	HI98509	3CC770	05/30/2023	05/30/2024
DATA LOGGER	DSB	16326820	11/26/2023	11/26/2024
DATA LOGGER	DSB	16326831	11/26/2023	11/26/2024
THERMOMETER	HH806AU	080307	12/15/2023	12/15/2024
TEMPERATURE PROBE	80PK-22	06032017	12/15/2023	12/15/2024
NETWORK ANALYZER	E5071B	MY42403218	09/15/2023	09/15/2024
NETWORK ANALYZER	E5071B	MY42403147	02/21/2023	02/21/2024
DIGITAL THERMOMETER WITH PROBE	HI98509	3CC770	05/30/2023	05/30/2024
DIELECTRIC ASSESSMENT KIT	DAK-12	1051	10/16/2023	10/16/2024
DIELECTRIC ASSESSMENT KIT	DAK-3.5	1120	10/16/2023	10/16/2024

Table 11 (Continued)

Equipment Type	Model Number	Serial Number	Calibration Date	Calibration Due Date
DATA LOGGER	DSB	16398306	12/31/2023	12/31/2024
SPEAG DIPOLE	CLA150	4016	01/06/2023	01/06/2026
SPEAG DIPOLE	D2450V2	781	10/13/2021	10/13/2024
SPEAG DIPOLE	D5GHZV2	1026	09/24/2021	09/24/2024
SPEAG DIPOLE	D1800V2	2D120	10/28/2022	10/28/2025
SPEAG DIPOLE	D750V3	1098	10/08/2021	10/08/2024

10.0 SAR Measurement System Validation and Verification for LMR and WLAN

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								
12/27/23	Head	150	7594	0.74	50.08	Pass	Pass	Pass
01/06/24	Head	2450		1.80	38.21	Pass	Pass	Pass
03/23/24	Head	2450	7364	1.83	42.80	Pass	Pass	Pass
03/25/24	Head	5250		4.39	35.70	Pass	Pass	Pass
03/26/24	Head	5600		4.79	35.50	Pass	Pass	Pass
03/26/24	Head	5750		4.96	35.24	Pass	Pass	Pass
04/28/24	Head	5250	7486	4.69	37.62	Pass	Pass	Pass
04/28/24	Head	5600		5.15	38.25	Pass	Pass	Pass
04/29/24	Head	5750		5.33	37.99	Pass	Pass	Pass
WLAN								
03/23/24	Head	2450	7364	1.83	42.80	Pass	Pass	Pass
03/25/24	Head	5250		4.39	35.70	Pass	Pass	Pass
03/26/24	Head	5600		4.79	35.50	Pass	Pass	Pass
03/26/24	Head	5750		4.96	35.24	Pass	Pass	Pass
04/28/24	Head	5250	7486	4.69	37.62	Pass	Pass	Pass
04/28/24	Head	5600		5.15	38.25	Pass	Pass	Pass
04/29/24	Head	5750		5.33	37.99	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 with the largest deviation from the qualified source SAR target for each dipole (Bolded). 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	Deviation (%)
7594	IEEE/IEC Head	SPEAG CL150 / 4016	3.77 +/- 10%	4.13	4.13	4/8/2024	**9.5**
				4.08	4.08	4/9/2024	8.2
				4.08	4.08	4/10/2024	8.2
		SPEAG D2450V2 / 781	52.70 +/- 10%	1.68	53.16	5/10/2024	0.9
				1.70	53.80	5/15/2024	**2.1**
		SPEAG D5600V2 / 1026	83.90 +/- 10%	8.17	81.70	5/9/2024	-2.6
7364	IEEE/IEC Head	SPEAG D2450V2 / 781	52.70 +/- 10%	1.69	53.48	4/18/2024	1.5
				1.67	52.85	4/20/2024@	0.3
		SPEAG D2450V2 / 703	52.30 +/- 10%	1.64	51.90	4/19/2024@	-0.8
				1.71	54.11	4/21/2024	**3.5**
		SPEAG D5250V2 / 1026	80.60 +/- 10%	7.55	75.50	4/22/2024@	-6.3
				2.5	79.11	4/25/2024	-1.8
				7.88	78.80	5/18/2024	-2.2
				7.94	79.40	5/19/2024@	-1.5
		SPEAG D5600V2 / 1026	83.90 +/- 10%	8.34	83.40	4/27/2024	-0.6
				8.10	81.00	4/27/2024@	-3.5
7486	IEEE/IEC Head	SPEAG D5600V2 / 1026	83.90 +/- 10%	7.59	75.90	5/20/2024@	**-9.5**
				7.59	75.90	5/21/2024@	-9.5
		SPEAG D5750V2 / 1026	79.70 +/- 10%	7.97	79.70	5/31/2024@	0.0
				7.85	78.50	6/1/2024 @	-1.5
				7.75	77.50	6/2/2024 @	-2.8
				7.46	74.60	6/8/2024	-6.4

"@" indicated the 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
138.0000	IEEE/ IEC Head	0.75 (0.71-0.79)	52.9 (50.2-55.5)	0.764	51.074	04/10/2024
144.4000		0.76 (0.72-0.79)	52.6 (49.9-55.2)	0.768	50.794	04/10/2024
150.0000		0.76 (0.72-0.8)	52.3 (49.6-54.9)	0.787	51.405	04/08/2024
				0.783	51.496	04/09/2024
				0.772	50.520	04/10/2024
				0.777	50.249	04/15/2024
158.3000		0.77 (0.73-0.8)	51.9 (49.3-54.5)	0.793	51.055	04/08/2024
				0.789	51.179	04/09/2024
173.4000		0.78 (0.74-0.82)	51.2 (48.6-53.8)	0.790	49.491	04/10/2024
2412.0000		1.77 (1.68-1.86)	39.3 (35.3-43.2)	1.728	37.188	05/10/2024
				1.735	37.698	05/15/2024
2450.0000		1.80 (1.71-1.89)	39.2 (35.3-43.1)	1.720	40.800	04/19/2024@
				1.720	40.800	04/20/2024
				1.711	39.115	04/21/2024
				1.756	37.133	05/10/2024
				1.763	37.633	05/15/2024
2437.0000		1.79 (1.7-1.88)	39.2 (35.3-43.1)	1.775	41.667	04/18/2024
				1.710	40.813	04/19/2024
				1.710	40.813	04/20/2024@
				1.701	39.135	04/21/2024
2462.0000		1.81 (1.72-1.9)	39.2 (35.3-43.1)	1.764	37.118	05/10/2024
				1.772	37.624	05/15/2024

Table 14 (Continued)

Frequency (MHz)	Tissue Type	Conductivity Target (S/m)	Dielectric Constant Target	Conductivity Meas. (S/m)	Dielectric Constant Meas.	Tested Date
5250.0000	IEEE/ IEC Head	4.71 (4.24-5.18)	36 (32.4-39.5)	4.250	34.675	04/21/2024@
				4.287	35.498	04/25/2024
				4.530	33.818	05/18/2024
				4.453	36.814	05/19/2024
5270.0000		4.73 (4.26-5.2)	35.9 (32.3-39.5)	4.271	34.643	04/21/2024@
				4.308	35.467	04/25/2024
				4.552	33.786	05/18/2024
				4.474	36.786	05/19/2024
5310.0000		4.77 (4.29-5.25)	35.9 (32.3-39.5)	4.515	36.721	05/19/2024@
5530.0000		5.00 (4.5-5.5)	35.6 (32-39.2)	4.606	32.786	05/21/2024@
5600.0000		5.07 (4.56-5.58)	35.5 (32-39.1)	5.412	39.013	04/26/2024@
				4.955	32.554	05/08/2024
				5.038	36.563	05/20/2024
				4.663	33.710	05/21/2024
5610.0000		5.08 (4.57-5.59)	35.5 (31.9-39)	5.425	39.014	04/26/2024@
				4.884	36.094	04/27/2024@
				4.965	32.537	05/08/2024
				5.049	36.545	05/20/2024@
				4.691	32.645	05/21/2024
5750.0000		5.22 (4.7-5.74)	35.4 (31.8-38.9)	4.920	32.961	05/31/2024
				4.946	32.082	06/01/2024
				5.049	31.894	06/02/2024
				4.880	34.907	06/07/2024
5775.0000		5.25 (4.72-5.77)	35.3 (31.8-38.9)	4.947	32.910	05/31/2024@
				4.976	32.037	06/01/2024@
				5.076	31.848	06/02/2024@
				4.908	34.877	06/07/2024@

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 +/ - 2ºC 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: 21.3 – 23.4˚C Avg. 22.0 ˚C
Tissue Temperature	18 – 25 ˚C	Range: 19.8-20.8˚C Avg. 20.3˚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

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.

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 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 IEC/IEEE 66209-1528 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

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. All tests were performed in CW for LMR, WLAN modes and LTE modes and 50% duty cycle was applied to PTT configurations in the final results.

Standalone and simultaneous BT testing were assessed in sections 14.3 and 16.1 per the guidelines of KDB 447498.

13.0 DUT Test Data for LMR

13.1 LMR assessments at the Body for 150.8-173.4MHz band

Battery PMNN4816A 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 (150.8-173.4MHz) 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).

Table 17

Test Freq (MHz)	Power (W)
150.8000	6.410
158.3000	6.420
165.9000	6.420
173.4000	6.420

Assessments at the Body with Body worn PMLN8371A w/ PMLN8507A

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.

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#
AN000414A01	PMNN4816A	PMLN8371A w/ PMLN8507A	PMMN4128A	150.8000					
				158.3000	6.58	0.08	3.09	1.55	BL-AB-240408-10
				165.9000					
				173.4000					
Assessment of Additional Batteries									
AN000414A01	PMNN4817A	PMLN8371A w/ PMLN8507A	PMMN4128A	158.3000	6.60	0.08	3.24	1.62	BL-AB-240408-11
	PMNN4818A			158.3000	6.60	0.07	3.47	1.74	BL-AB-240408-12

Assessments at the Body with Body worn PMLN8371A w/ PMLN8508A

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.

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#
AN000414A01	PMNN4816A	PMLN8371A w/ PMLN8508A	PMMN4128A	150.8000					
				158.3000	6.52	0.03	3.24	1.64	BL-AB-240408-13
				165.9000					
				173.4000					
Assessment of Additional Batteries									
AN000414A01	PMNN4817A	PMLN8371A w/ PMLN8508A	PMMN4128A	158.3000	6.60	0.04	3.29	1.65	BL-AB-240408-14
	PMNN4818A			158.3000	6.55	0.06	3.55	1.79	BL-AB-240408-15

Assessments at the Body with Body worn PMLN8372A w/ PMLN8507A

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.

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#
AN000414A01	PMNN4816A	PMLN8372A w/ PMLN8507A	PMMN4128A	150.8000					
				158.3000	6.58	-0.12	3.36	1.73	BL-AB-240408-16
				165.9000					
				173.4000					

Assessments at the Body with Body worn PMLN8372A w/ PMLN8508A

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.

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#
AN000414A01	PMNN4816A	PMLN8372A w/ PMLN8508A	PMMN4128A	150.8000					
				158.3000	6.60	-0.10	3.56	1.82	BL-AB-240408-17
				165.9000					
				173.4000					

Assessments at the Body with Body worn PMLN8372A w/ PMLN5408A

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.

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#
AN000414A01	PMNN4816A	PMLN8372A w/ PMLN5408A	PMMN4128A	150.8000					
				158.3000	6.53	-0.09	1.20	0.62	BL-AB-240408-18
				165.9000					
				173.4000					

Assessments at the Body with Body worn PMLN8373A w/ PMLN8507A

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.

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#
AN000414A01	PMNN4817A	PMLN8373A w/ PMLN8507A	PMMN4128A	150.8000					
				158.3000	6.60	-0.10	3.54	1.81	AR-AB-240409-04
				165.9000					
				173.4000					

Assessments at the Body with Body worn PMLN8373A w/ PMLN8508A

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.

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#
AN000414A01	PMNN4817A	PMLN8373A w/ PMLN8508A	PMMN4128A	150.8000					
				158.3000	6.60	-0.10	3.71	1.90	AR-AB-240409-03
				165.9000					
				173.4000					

Assessments at the Body with Body worn PMLN8373A w/ PMLN5408A

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.

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#
AN000414A01	PMNN4817A	PMLN8373A w/ PMLN5408A	PMMN4128A	150.8000					
				158.3000	6.59	-0.04	1.35	0.68	AR-AB-240409-05
				165.9000					
				173.4000					

Assessments at the Body with Body worn PMLN8374A w/ PMLN8507A

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 below (bolded) are present in the 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#
AN000414A01	PMNN4818A	PMLN8374A w/ PMLN8507A	PMMN4128A	150.8000					
				158.3000	6.59	-0.06	3.76	**1.91**	AR-AB-240409-06
				165.9000					
				173.4000					

Assessments at the Body with Body worn PMLN8374A w/ PMLN8508A

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.

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#
AN000414A01	PMNN4818A	PMLN8374A w/ PMLN8508A	PMMN4128A	150.8000					
				158.3000	6.60	0.07	3.79	1.90	AR-AB-240409-07
				165.9000					
				173.4000					

Assessments at the Body with Body worn PMLN8374A w/ PMLN5408A

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.

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#
AN000414A01	PMNN4818A	PMLN8374A w/ PMLN5408A	PMMN4128A	150.8000					
				158.3000	6.52	0.07	1.56	0.79	BL-AB-240409-08
				165.9000					
				173.4000					

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.

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#
AN000414A01	PMNN4818A	PMLN8374A w/ PMLN8507A	None	158.3000	6.58	0.01	3.14	1.57	BL-AB-240409-09

13.2 LMR assessments at the Face for 150.8-173.4MHz band

Battery PMNN4817A 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 (150.8-173.4MHz) 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).

Table 30

Test Freq (MHz)	Power (W)
150.8000	6.430
158.3000	6.490
165.9000	6.540
173.4000	6.590

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 30 for highest output power channel.

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#
AN000414A01	PMNN4817A	None (front)	None	150.8000					
				158.3000	6.56	0.03	1.17	0.59	BL-FACE-240409-10
				165.9000					
				173.4000					
Assessment of Additional Batteries									
AN000414A01	PMNN4816A	None (front)	None	158.3000	6.58	0.06	1.41	0.71	BL-FACE-240409-11
	PMNN4818A			158.3000	6.57	0.10	1.32	0.66	BL-FACE-240409-12

DUT assessment with offered antennas, default battery with back of DUT positioned 2.5cm facing phantom per KDB 643646. Optional batteries were tested per the requirements of KDB 643646. Refer to Table 30 for highest output power channel. The SAR plots of the highest results per Table (bolded) are presented in the 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#
AN000414A01	PMNN4817A	None (back)	None	150.8000					
				158.3000	6.60	0.18	2.43	1.22	BL-FACE-240409-13
				165.9000					
				173.4000					
Assessment of Additional Batteries									
AN000414A01	PMNN4816A	None (back)	None	158.3000	6.52	0.24	2.17	1.10	BL-FACE-240409-14
	PMNN4818A			158.3000	6.50	0.32	3.19	**1.62**	BL-FACE-240410-08

13.3 Assessment for outside FCC Frequency range

Additional assessment of outside FCC frequency range using highest SAR configuration from above. The SAR plots of the highest result per Table (bolded) are presented in the 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#
Body									
AN000414A01	PMNN4818A	PMLN8374 w/ PMLN8507 A	PMMN4128 A	138.0000	6.54	0.04	0.90	0.45	BL-AB-240410-04
				144.4000	6.56	-0.08	1.03	**0.53**	BL-AB-240410-06
Face									
AN000414A01	PMNN4816A	None @ back	None	138.0000	6.56	-0.01	2.33	1.17	BL-FACE-240410-02
				144.4000	6.60	0.04	2.79	**1.40**	BL-FACE-240410-07

13.4 Assessment for ISED, Canada

Based on the assessment results for body and face per KDB643646, additional tests were not required for ISED, Canada frequency range (138-174MHz) 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 plots of the highest results per Table (bolded) are presented in the 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#
Body									
AN000414A01	PMNN4818A	PMLN8374 w/ PMLN8507A	PMMN4128A	138.0000	6.54	0.04	0.90	0.45	BL-AB-240410-04
				158.3000	6.59	-0.06	3.76	**1.91**	AR-AB-240409-06
				173.4000	6.57	0.13	2.09	1.05	BL-AB-240410-05
Face									
AN000414A01	PMNN4816A	None @ back	None	138.0000	6.56	-0.01	2.33	1.17	BL-FACE-240410-02
				158.3000	6.50	0.32	3.19	**1.62**	BL-FACE-240409-15
				173.4000	6.52	0.16	2.46	1.25	BL-FACE-240410-03

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 assessments for WLAN 2.4GHz (802.11 b/g/n)

Output Power Data

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

Table 35

Band	802.11	Ch. BW	Ch.	Freq. (MHz)	Measured conducted power (W)
2.4 GHz	b	20	1	2412	0.1210
			6	2437	0.1310
			11	2462	0.1300
	g	20	1	2412	0.0710
			6	2437	0.0766
			11	2462	0.0721
	n	20	1	2412	0.0682
			6	2437	0.0724
			11	2462	0.0692
	n	40	6	2437	0.0855

Assessments at the Body with offered body worn accessories

DUT assessment with WLAN internal antenna, offered battery and without any cable accessory attached against the phantom with the offered body worn accessories. SAR plots of the highest results per Table (bolded) are presented in the 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#
AN000413A03	PMNN4816A	PMLN8371A w/ PMLN8507A	None	2437.0000	0.131	-0.21	0.022	0.025	JML-AB-240418-06
		PMLN8371A w/ PMLN8508A				-0.17	0.020	0.022	JML-AB-240418-07
		PMLN8372A w/ PMLN8507A				-0.12	0.024	0.027	JML-AB-240418-08
		PMLN8372A w/ PMLN8508A				-0.10	0.028	0.031	JML-AB-240419-03
		PMLN8372A w/ PMLN5407A				-0.33	0.019	0.022	JML-AB-240419-04
		PMLN8372A w/ PMLN5408A				-0.16	0.030	0.034	JML-AB-240419-05
		PMLN8372A w/ PMLN5409A				-0.19	0.030	0.034	JML-AB-240419-07
Assessment of Additional Battery									
AN000413A03	PMNN4817A	PMLN8373A w/ PMLN5409A	None	2437.0000	0.131	-0.22	0.028	0.032	MIN-AB-240420-02@
	PMNN4818A				0.132	-0.21	0.031	**0.035**	JML-AB-240420-08

Assessments at the Face

DUT assessment with WLAN internal antenna and offered battery with front of DUT positioned 2.5cm facing phantom. SAR plots of the highest results per Table (bolded) are presented in the 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#
AN000413A03	PMNN4817A	Radio @ front 2.5cm	None	2437.0000	0.131	-0.04	0.158	0.172	JML-FACE-240421-11
Assessment of Additional Battery									
AN000413A03	PMNN4816A	Radio @ front 2.5cm	None	2437.0000	0.131	-0.21	0.192	**0.217**	MIN-FACE-240421-02@
	PMNN4818A			2437.0000	0.132	-0.17	0.155	0.173	MIN-FACE-240421-05@

DUT assessment with WLAN internal antenna and offered battery with back of DUT positioned 2.5cm facing phantom.

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#
AN000413A03	PMNN4817A	Radio @ Back 2.5cm	None	2437.0000	0.131	-0.21	0.021	0.024	JML-FACE-240421-10
Assessment of Additional Battery									
AN000413A03	PMNN4816A	Radio @ Back 2.5cm	None	2437.0000	0.131	-0.40	0.020	0.024	MIN-FACE-240421-01@
	PMNN4818A			2437.0000	0.132	0.41	0.024	0.026	MIN-FACE-240421-04@

Assessments 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 (2412-2462 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 Tables below. SAR plot is included in Appendix for the highest configuration.

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#
Body									
AN000413A03	PMNN4818A	PMLN8374A w/ PMLN5409A	None	2412.0000	0.121	0.16	0.020	0.023	EMR-AB-240515-06
				2437.0000	0.132	-0.21	0.031	**0.035**	JML-AB-240420-08
				2462.0000	0.130	0.11	0.026	0.028	EMR-AB-240515-07
Face									
AN000414A01	PMNN4816A	Radio @ front 2.5cm	None	2412.0000	0.119	-0.14	0.155	0.189	BL-FACE-240510-05
				2437.0000	0.131	-0.21	0.192	**0.217**	MIN-FACE-240421-02@
				2462.0000	0.130	-0.31	0.163	0.191	BL-FACE-240510-06

14.2 WLAN assessments for WLAN 5.0 GHz (802.11 a/n/ac)

Output Power Data

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

Table 40

Band	802.11	Ch. BW (MHz)	Ch.	Freq. (MHz)	Measured conducted power (W)
U-NII-1 (5.15-5.25GHz)	a	20	36	5180	0.0740
			40	5200	0.0729
			44	5220	0.0729
			48	5240	0.0724
	n	20	36	5180	0.0721
			40	5200	0.0731
			44	5220	0.0728
			48	5240	0.0714
		40	38	5190	0.0127
			46	5230	0.0618
	ac	20	36	5180	0.0597
			40	5200	0.0600
			44	5220	0.0607
			48	5240	0.0608
		40	38	5190	0.0131
			46	5230	0.0637
		80	42	5210	0.0152

Table 40 (Continued)

Band	802.11	Ch. BW (MHz)	Ch.	Freq. (MHz)	Measured conducted power (W)
U-NII-2A (5.25-5.35GHz)	a	20	52	5260	0.0714
			56	5280	0.0714
			60	5300	0.0719
			64	5320	0.0698
	n	20	52	5260	0.0610
			56	5280	0.0618
			60	5300	0.0632
			64	5320	0.0611
		40	54	5270	0.076
			62	5310	0.015
	ac	20	52	5260	0.0615
			56	5280	0.0631
			60	5300	0.0630
			64	5320	0.0621
		40	54	5270	0.0755
			62	5310	0.0149
		80	58	5290	0.0080
U-NII-2C (5.47-5.65 GHz)	a	20	100	5500	0.0793
			120	5600	0.0726
			140	5720	0.0678
	n	20	100	5500	0.0649
			120	5600	0.0603
			140	5720	0.0574
		40	102	5510	0.0736
			118	5590	0.0721
			134	5670	0.0656
	ac	20	100	5500	0.0656
			120	5600	0.0610
			140	5720	0.0579
		40	102	5510	0.0675
			118	5590	0.0661
			134	5670	0.0612
		80	106	5530	0.0180
			122	5610	0.0660
U-NII-3 (5.65-5.85 GHz)	a	20	149	5745	0.0741
			157	5785	0.0700
			165	5825	0.0745
	n	20	149	5745	0.0731
			149	5785	0.0700
			165	5825	0.0750
		40	151	5755	0.0644
			159	5795	0.0610
	ac	20	149	5745	0.0612
			157	5785	0.0617
			165	5825	0.0578
		40	151	5755	0.0617
			159	5795	0.0582
		80	155	5775	0.0610

Assessments for U-NII-2A (5.25-5.35GHz), U-NII-2C (5.47-5.65 GHz) and U-NII-3 (5.65-5.85 GHz)

DUT assessment with WLAN internal antenna, offered battery and without any cable accessory attached against the phantom with the offered body worn accessories. SAR plots of the highest results per Table (bolded) are presented in the 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#
UNII-2A: 802.11n, 40MHz BW - Body									
AN000413A03	PMNN4816A	PMLN8371A w/ PMLN8507A	None	5270.0000	0.075	-0.41	0.022	**0.026**	MIN-AB-240422-01@
		PMLN8371A w/ PMLN8508A				-0.11	0.017	0.018	MIN-AB-240422-03@
		PMLN8372A w/ PMLN8507A				-0.31	0.020	0.023	MFR-AB-240422-04@
		PMLN8372A w/ PMLN8508A				0.02	0.012	0.013	MFR-AB-240422-05@
		PMLN8372A w/ PMLN5407A				-3.06**	0.006	0.012	MFR-AB-240422-06@
		PMLN8372A w/ PMLN5408A				-0.99**	0.003	0.004	MFR-AB-240422-07@
		PMLN8372A w/ PMLN5409A				1.07**	0.004	0.004	MFR-AB-240422-08@
Assessment of Additional Battery									
AN000413A03	PMNN4817A	PMLN8371A w/ PMLN8507A	None	5270.0000	0.075	-0.39	0.021	0.024	MFR-AB-240425-04
	PMNN4818A					-0.19	0.016	0.018	MFR-AB-240425-05

Note:

** Measured SAR value is low enough where a SAR drift measurement was not practical

Table 41 (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#
UNII-2A: 802.11n, 40MHz BW - Face									
Radio @ front									
AN000413A03	PMNN4817A	Radio @ front 2.5cm	None	5270.0000	0.076	-0.08	0.506	0.543	MHN-FACE-240518-02
Assessment of Additional Battery									
AN000413A03	PMNN4816A	Radio @ front 2.5cm	None	5270.0000	0.075	-0.35	0.590	**0.677**	ZIQ-FACE-240518-04
	PMNN4818A				0.076	-0.25	0.409	0.457	ZIQ-FACE-240518-05
Radio @ back									
AN000413A03	PMNN4817A	Radio @ Back 2.5cm	None	5270.0000	0.076	-0.54**	0.009	0.001	MHN-FACE-240519-07
Assessment of Additional Battery									
AN000413A03	PMNN4816A	Radio @ Back 2.5cm	None	5270.0000	0.076	-0.37	0.023	0.026	ZIQ-FACE-240520-01@
	PMNN4818A				0.075	-0.23	0.017	0.019	MHN-FACE-240519-08
UNII-2C: 802.11ac, 80MHz BW - Body									
AN000413A03	PMNN4816A	PMLN8371A w/ PMLN8507A	None	5610.000	0.066	-1.05**	0.011	**0.018**	JML-AB-240427-03@
		PMLN8371A w/ PMLN8508A			0.066	-0.15	0.011	0.014	MIN-AB-240427-05@
		PMLN8372A w/ PMLN8507A			0.066	-1.80**	0.008	0.015	MIN-AB-240427-06@
		PMLN8372A w/ PMLN8508A			0.066	0.12	0.009	0.011	MFR-AB-240427-07@
		PMLN8372A w/ PMLN5407A			0.066	0.64**	0.002	0.002	MIN-AB-240428-07@
		PMLN8372A w/ PMLN5408A			0.066	-1.59**	0.002	0.004	MFR-AB-240428-02@
		PMLN8372A w/ PMLN5409A			0.066	-2.83**	0.007	0.017	MIN-AB-240428-04@

Note:

** Measured SAR value is low enough where a SAR drift measurement was not practical

Table 41 (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#
Assessment of Additional Battery									
AN000413A03	PMNN4817A	PMLN8371A w/ PMLN8507A	None	5610.0000	0.059	-1.74**	0.012	0.024	MHN-AB-240520-09
	PMNN4818A				0.065	-1.76**	0.013	0.024	MHN-AB-240521-02@
UNII-2C: 802.11ac, 80MHz BW - Face									
Radio @ front									
AN000413A03	PMNN4817A	Radio @ front 2.5cm	None	5610.0000	0.059	-0.11	0.246	0.354	BL-FACE-240509-04@
Assessment of Additional Battery									
AN000413A03	PMNN4816A	Radio @ front 2.5cm	None	5610.0000	0.066	-0.43	0.291	**0.388**	MHN-FACE-240521-08
	PMNN4818A				0.065	-0.18	0.199	0.256	MHN-FACE-240521-07
Radio @ back									
AN000413A03	PMNN4817A	Radio @ Back 2.5cm	None	5610.0000	0.059	-0.64**	0.009	0.015	ZIQ-FACE-240521-03@
Assessment of Additional Battery									
AN000413A03	PMNN4816A	Radio @ Back 2.5cm	None	5610.0000	0.066	-1.38**	0.011	0.018	ZIQ-FACE-240521-04
	PMNN4818A				0.065	-1.25**	0.010	0.016	ZIQ-FACE-240521-06
UNII-3: 802.11ac, 80MHz BW - Body									
AN000413A03	PMNN4816A	PMLN8371A w/ PMLN8507A	None	5775.000	0.061	-2.88**	0.014	**0.036**	SAN-AB-240608-18@
		PMLN8371A w/ PMLN8508A				-0.62**	0.010	0.015	ZIQ-AB-240531-16
		PMLN8372A w/ PMLN8507A				-0.89**	0.007	0.011	ZIQ-AB-240601-01@
		PMLN8372A w/ PMLN8508A				-1.15**	0.008	0.013	ZIQ-AB-240601-02@
		PMLN8372A w/ PMLN5407A				0.80**	0.003	0.004	ZIQ-AB-240601-03@

Note:

** Measured SAR value is low enough where a SAR drift measurement was not practical

Table 41 (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#
AN000413A03	PMNN4816A	PMLN8372A w/ PMLN5408A	None	5775.0000	0.061	-2.29**	0.004	0.009	ZIQ-AB-240601-05
		PMLN8372A w/ PMLN5409A				-0.75**	0.012	0.019	ZIQ-AB-240601-06
Assessment of Additional Battery									
AN000413A03	PMNN4817A	PMLN8371A w/ PMLN8507A	None	5775.0000	0.058	0.40	0.011	0.015	ZIQ-AB-240601-08
	PMNN4818A				0.063	1.83**	0.008	0.010	ZIQ-AB-240601-09@
UNII-3: 802.11ac, 80MHz BW - Face									
Radio @ front									
AN000413A03	PMNN4817A	Radio @ front 2.5cm	None	5775.0000	0.058	-0.14	0.277	0.394	ZIQ-FACE-240602-11
Assessment of Additional Battery									
AN000413A03	PMNN4816A	Radio @ front 2.5cm	None	5775.0000	0.061	-0.21	0.320	**0.441**	ZIQ-FACE-240603-02@
	PMNN4818A				0.063	-0.08	0.316	0.405	ZIQ-FACE-240603-03@
Radio @ back									
AN000413A03	PMNN4817A	Radio @ Back 2.5cm	None	5775.0000	0.058	-0.65**	0.014	0.022	ZIQ-FACE-240602-12
Assessment of Additional Battery									
AN000413A03	PMNN4816A	Radio @ Back 2.5cm	None	5775.0000	0.061	0.49**	0.001	0.001	ZIQ-FACE-240603-01@
	PMNN4818A				0.063	-0.05	0.014	0.018	ZIQ-FACE-240602-13

Note:

** Measured SAR value is low enough where a SAR drift measurement was not practical

Assessments 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 (U-NII-2A, U-NII-2C and U-NII-3) as the testing performed complies 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 Tables below. SAR plot (bolded) is included in Appendix for the highest configuration.

Table 42

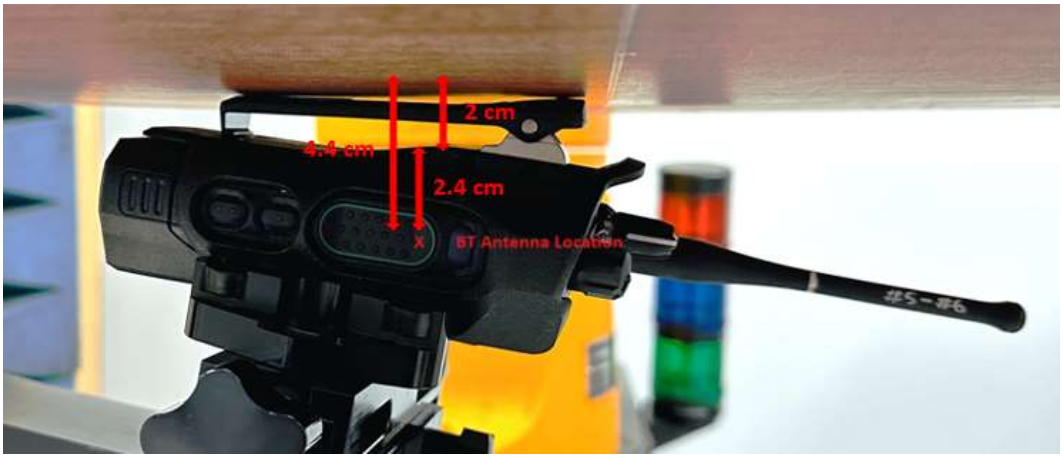
Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Run#
UNII-2A									
Body									
AN000413A03	PMNN4816A	PMLN8371A w/ PMLN8507A	None	5270.0000	0.075	-0.41	0.022	**0.026**	MIN-AB-240422-01@
				5310.0000	0.015	-0.80**	0.000	0.000*	ZIQ-AB-240520-03@
Face									
AN000413A03	PMNN4816A	Radio @ front 2.5cm	None	5270.0000	0.075	-0.35	0.590	**0.677**	ZIQ-FACE-240518-04
				5310.0000	0.015	-0.29	0.117	0.132	ZIQ-FACE-240520-02@
UNII-2C									
Body									
AN000413A03	PMNN4816A	PMLN8371A w/ PMLN8507A	None	5530.0000	0.018	-3.94**	0.000	0.000*	ZIQ-AB-240522-03@
				5610.0000	0.066	-1.05**	0.011	**0.018**	JML-AB-240427-03@
Face									
AN000413A03	PMNN4816A	Radio @ front 2.5cm	None	5530.0000	0.018	-0.32	0.056	0.069	MHN-FACE-240522-02@
				5610.0000	0.066	-0.43	0.291	**0.387**	MHN-FACE-240521-08
UNII-3									
Body									
AN000413A03	PMNN4816A	PMLN8371A w/ PMLN8507A	None	5775.0000	0.061	2.88**	0.014	**0.036**	SAN-AB-240608-18@
Face									
AN000413A03	PMNN4816A	Radio @ front 2.5cm	None	5775.0000	0.061	-0.21	0.320	**0.441**	ZIQ-FACE-240603-02@

Note: * SAR result lower than the ambient noise level

** Measured SAR value is low enough where a SAR drift measurement was not practical

14.3 Assessment exclusion for BT

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)] *[$\sqrt{F_{(GHz)}}$] = 0.6, which is ≤ 3 for 1-g SAR or 7.5 for 10-g extremity

Where:

Max. power = 15.56mW (19.95mW*78% duty cycle)
Min. test separation distance = 44mm
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.

14.4 Assessment exclusion for NFC

Based on below calculation, SAR test exclusion power threshold at 13.56 MHz is 443 mW. Maximum power for NFC is 35 mW, hence SAR test was not required for NFC.

KDB 447498 4.3.1, b.1) for 100 MHz to 6 GHz and test separation distances > 50 mm, the 1-g test exclusion thresholds are determined by following:
For 100 MHz to 1500 MHz:
{[Power allowed at numeric threshold for 50 mm at 100 MHz] + [(test separation distance – 50 mm) · (f(MHz)/150)]} mW
= 474.3 mW

Where:
Power allowed at numeric threshold for 50 mm at 100 MHz = 474.3 mW
Test separation distance = 50 mm

KDB 447498 4.3.1, c.1) for below 100 MHz and test separation distances >50 mm and <200 mm,
Power threshold at the corresponding test separation distance at 100 MHz in step b) is multiply by [1+log (100/f (MHz))]
= 474.3 mW * [1+log (100/13.56 MHz)]
= 885.9 mW

Where:
f (MHz)= 13.56 MHz

KDB 447498 4.3.1, c.2) for below 100 MHz and test separation distances ⩽ 50 mm,
Power threshold determined by equation in c) 1) is multiplied by ½
= 885.9 mW * 0.5
= 443.0 mW

15.0 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 (bolded) is provided 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#
AN000414A01	PMNN4818A	PMLN8374 w/ PMLN8507A	PMMN4128A	158.3000	6.57	-0.13	3.64	**1.88**	BL-AB-240410-10

16.0 Simultaneous Transmission

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

Table 44

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

BT, WLAN 2.4 GHz and 5GHz are sharing the same antenna, only one technology to transmit at a single time. Except the WLAN 5GHz with BT.

16.1 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:

The closest separation distance from the Bluetooth Antenna to the phantom is 44mm with a belt clip, as indicated in the picture below.

[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] *[√F(GHz)/X] = 0.1 W/kg, which is ≤ 0.4 W/kg (1g)

Where:

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

Max. Power = 15.56 mW (19.95 mW*78% duty cycle)

Min. test separation distance = 44mm

F(GHz) = 2.48 GHz

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

16.2 Simultaneous Transmission for LMR, BT, WLAN 2.4GHz and 5GHz

Table 45

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	1.91	0.035	0.036	0.102	1.945	1.946	2.012
Face Exposure	1.62	0.217	0.677	0.202	1.837	2.297	1.822

17.0 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 and 10-gram average SAR values found for this filing:

Table 46

Designator	Frequency band (MHz)	Max Calc at Body (W/kg)	Max Calc at Face (W/kg)
		1g-SAR	1g-SAR
FCC US			
LMR	150.8 – 173.4	1.91	1.62
LTE B12	699 – 716	0.091	0.057
LTE B13	777 – 787	0.081	0.064
LTE B14	788 - 798	0.102	0.068
LTE B4	1710 – 1755	0.019	0.202
LTE B2	1850 - 1910	0.025	0.146
WLAN 2.4 GHz	2412 - 2462	0.035	0.217
WLAN 5 GHz	5180 - 5825	0.036	0.677
BT	2402 - 2480	NA	NA
Highest Simultaneous Transmission SAR	Sum of SAR (W/kg)	2.01	2.30

All results are scaled to the maximum output power

Table 47 (Continued)

Designator	Frequency band (MHz)	Max Calc at Body (W/kg)	Max Calc at Face (W/kg)
		1g-SAR	1g-SAR
ISED Canada			
LMR	150.8 – 173.4	1.91	1.62
LTE B12	699 – 716	0.091	0.057
LTE B13	777 – 787	0.081	0.064
LTE B14	788 - 798	0.102	0.068
LTE B4	1710 – 1755	0.019	0.202
LTE B2	1850 - 1910	0.025	0.146
WLAN 2.4 GHz	2412 - 2462	0.035	0.217
WLAN 5 GHz	5180 - 5825	0.036	0.677
BT	2402 - 2480	NA	NA
Highest Simultaneous Transmission SAR	Sum of SAR (W/kg)	2.01	2.30
Overall			
LMR	150.8 – 173.4	1.91	1.62
LTE B12	699 – 716	0.091	0.057
LTE B13	777 – 787	0.081	0.064
LTE B14	788 - 798	0.102	0.068
LTE B4	1710 – 1755	0.019	0.202
LTE B2	1850 - 1910	0.025	0.146
WLAN 2.4 GHz	2412 - 2462	0.035	0.217
WLAN 5 GHz	5180 - 5825	0.036	0.677
BT	2402 - 2485	NA	NA
Highest Simultaneous Transmission SAR	Sum of SAR (W/kg)	2.01	2.30

All results are scaled to the maximum output power.

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

18.0 Variability Assessment

Per the guidelines in KDB 865664 SAR variability assessment is required because SAR results are above 4.0W/kg (Occupational).

19.0 System Uncertainty

A system uncertainty analysis is not required for this report per KDB 865664 because the highest report SAR value 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.