MOTOROLA SOLUTIONS

SAMM 826

CERTIFICATE 2518.05

DECLARATION OF COMPLIANCE SAR ASSESSMENT PCII Report Part 1 of 2

Motorola Solutions Inc.
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Motorola Solutions Malaysia Sdn Bhd
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Date of Report: 04/01/2024
Report Revision: B

Responsible Engineer:	Alfred Hoe (EME Engineer)
Report Author:	Muhammad Hizami bin Ismail (EME Senior Technician)
Date/s Tested:	12/6/2023-12/17/2023,01/05/2024-01/17/2024, 02/24/2024-02/25/2024
Manufacturer:	Motorola Solutions Inc. (Schaumburg)
Manufacturer Location:	1301 E. ALGONQUIN ROAD, BLDG IL02 ROOM 3035, SCHAUMBURG, IL 60196
DUT Description:	Handheld Portable – APX NEXT XE ALL BAND MODEL 4.5, GRN, APX NEXT ALL-BAND MODEL 4.5 & APX NEXT XN model ALL-BAND MODEL 4.5
Test TX mode(s):	FM; LTE; WLAN
Max. Power output:	Refer table 3
Nominal Power:	Refer table 3
Tx Frequency Bands:	Refer table 3
Signaling type:	FM, TDMA, SC-FDMA, FHSS, DSSS, OFDM and NFC
Model(s) Tested:	H55TGT9PW8AN (FCC); NUW2100 (ISED), H55TGT9PW8AN (PNUW1100E) & H55TGU9PW8AN (PNUW3100B)
Model(s) Certified:	Refer to Section 1.0 Introduction
Serial Number(s):	437TZP0828, 437TZP0813, 437TZP0935, 437TZP0924, 437TZP0836, 437TZP0840
Classification:	Occupational/Controlled Environment
Firmware Version:	APX NEXT XE D05.75.53(BP), D00.00.14(AP) & APX NEXT D05.75.54 (BP), D00.00.14(AP) & APX NEXT XN D05.75.54 (BP), D00.00.14(AP)
Applicant Name:	Motorola Solutions Inc.
Applicant Address:	Plot 2A, Medan Bayan Lepas, Mukim 12 SWD, 11900 Bayan Lepas, Penang, Malaysia
FCC ID:	AZ489FT7119 This report contains results that are immaterial for FCC equipment approval, which are clearly identified.
FCC Test Firm Registration Number:	823256
IC:	109U-89FT7119 This report contains results that are immaterial for ISED equipment approval, which are clearly identified.
ISED Test Site registration:	24843

The test results clearly demonstrate compliance with 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 (Approval Signatory)
Approved Date: 04/02/2024

Part 1 of 2

APPENDICES

Part 2 of 2

APPENDICES

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
03/22/2024	A	PCII Initial release
04/01/2024	B	Update cover page and section 1.0 Introduction to include APX NEXT XN models.

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 H55TGT9PW8AN (FCC); NUW2100 (ISED), H55TGT9PW8AN (PNUW1100E) & H55TGU9PW8AN (PNUW3100B). The information herein is to show evidence of Class II Permissive Change compliance based on the new accelerometer circuit, NFC controller re-layout and dual source components changes. This device is classified as Occupational/Controlled Environment and model certified is listed as below.

Model	Description
H55TGT9PW8AN (FCC); NUW2100 (ISED)	APX NEXT XE model ALL-BAND MODEL 4.5 GRN
H45TGT9PW8AN (FCC); NUW2100-H45 (ISED)	APX NEXT XE model All Bands (bands driven by software options) MODEL 4.5 GRN
H45TGT9PW8AN (FCC); NUW2101-H45 (ISED)	APX NEXT XE model All Bands (bands driven by software options) MODEL 4.5 BLK
H55TGT9PW8AN (FCC); NUW2101 (ISED)	APX NEXT XE ALL BAND MODEL 4.5, BLK
H55TGT9PW8AN (PNUW1100E)	APX NEXT ALL-BAND MODEL 4.5
H45KGT9PW8AN (PNUW1100E)	APX NEXT 136-174 MHz; MODEL 4.5
H45TGT9PW8AN	APX NEXT ALL BAND; MODEL 4.5, (Bands controlled by options)
H45UCT9PW8AN	APX NEXT 7/800 MHz; MODEL 4.5
H45XDT9PW8AN	APX NEXT 380-520 MHz; MODEL 4.5
H55TGU9PW8AN (PNUW3100B)	APX NEXT XN model ALL-BAND MODEL 4.5
H45TGU9PW8AN (PNUW3100B)	APX NEXT XN model single band(s) Model 4.5

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
LMR	150.8-173.4	1.24*	1.19*
	406.125-470	6.89[1]	5.58[1]
	450-512	7.53[2]	4.58*
	769-775	4.57*	2.05[3]
	799-824	6.46*	2.65[4]
	851-869	6.37*	2.40[5]
LTE	LTE B2	0.082*	0.416*
	LTE B4	0.091[6]	0.365[6]
	LTE B5	0.067*	0.186[7]
	LTE B12	0.050*	0.160*
	LTE B13	0.086*	0.159[8]
	LTE B14	0.099*	0.186*
	LTE B17	0.033[9]	0.160*
WLAN	2.4 GHz	0.111*	0.262*
	5.0 GHz	0.059[10]	1.183*
Highest Simultaneous Transmission SAR	Sum of SAR (W/kg)	7.62**	5.63**

Notes:* SAR result from previous filling (FCC ID: AZ489FT7119)

**Simultaneous Transmission SAR result from previous filling remain the same and no degradation.

[1] New highest SAR value at 406.125-470 MHz for body & face is 6.89 & 5.58 W/kg compared to previous on file SAR value of 6.50 & 5.52 W/kg.

[2] New highest SAR value at 450-512 MHz for body is 7.53 W/kg compared to previous on file SAR value of 7.51 W/kg.

[3] New highest SAR value at 769-775 MHz for face is 2.05 W/kg compared to previous on file SAR value of 1.93 W/kg.

[4] New highest SAR value at 799-824 MHz for face is 2.65 W/kg compared to previous on file SAR value of 2.37 W/kg.

[5] New highest SAR value at 851-869 MHz for face is 2.40 W/kg compared to previous on file SAR value of 2.15 W/kg.

[6] New highest SAR value at LTE B4 for body & face is 0.091 & 0.365 W/kg compared to previous on file SAR value of 0.079 & 0.325 W/kg.

[7] New highest SAR value at LTE B5 for face is 0.186 W/kg compared to previous on file SAR value of 0.164 W/kg.

[8] New highest SAR value at LTE B13 for face is 0.159 W/kg compared to previous on file SAR value of 0.157 W/kg.

[9] New highest SAR value at LTE B17 for body is 0.033 W/kg compared to previous on file SAR value of 0.031 W/kg.

[10] New highest SAR value at 5.0 GHz for body is 0.059 W/kg compared to previous on file SAR value of 0.057 W/kg.

3.0 Abbreviations / Definitions

BT:	Bluetooth
CBE:	Citizens Band End User Devices
CNR:	Calibration Not Required
CW:	Continuous Wave
DSSS:	Direct Sequence Spread Spectrum
DUT:	Device Under Test
EME:	Electromagnetic Energy
FHSS:	Frequency Hopping Spread Spectrum
FM:	Frequency Modulation
GFSK:	Gaussian Frequency-Shift Keying
LMR:	Land Mobile Radio
LTE:	Long Term Evolution
NA:	Not Applicable
OFDM:	Orthogonal Frequency Division Multiplexing
PSM:	Public Safety Microphone
PTT:	Push to Talk
QPSK:	Quadrature Pulse Shift Key
RB:	Resource Blocks
SAR:	Specific Absorption Rate
SC-FDMA:	Single Carrier Frequency Division Multiple Access
TDMA:	Time Division Multiple Access
TNF:	Licensed Non-Broadcast Transmitter Held to Face

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

Body worn accessories: These accessories allow the DUT to be worn on the body of the user.

Maximum Power: Defined as the upper limit of the production line final test station

4.0 Referenced Standards and Guidelines

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

- 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 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 77.26%.

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 (%)	Nominal Power (W)	Max Power (W)
LMR	136-174	FM	*50	6.00	6.60
LMR	380-470	FM	*50	5.00	5.70
LMR	450-520	FM	*50	5.00	5.70
LMR	762-776; 792-806	FM	*50	2.50	2.99
LMR	806-825; 851-870	FM	*50	3.00	3.60
LTE Band 2	1850-1910	QPSK, 16QAM	100	0.200	0.252
LTE Band 4	1710-1755	QPSK, 16QAM	100	0.200	0.252
LTE Band 5	824-849	QPSK, 16QAM	100	0.200	0.252
LTE Band 12	699-716	QPSK, 16QAM	100	0.200	0.252
LTE Band 13	777-787	QPSK, 16QAM	100	0.200	0.252
LTE Band 14	788-798	QPSK, 16QAM	100	0.200	0.252
LTE Band 17	704-716	QPSK, 16QAM	100	0.200	0.252
Bluetooth	2400-2485	FHSS	77.26	0.009	0.0115
Bluetooth LE	2400-2485	FHSS	62.68	0.009	0.0115
NFC	13.56	NFC	100	0.035	0.035
WLAN 802.11 b	2412-2462	DSSS	99.20	0.178	0.200
WLAN 802.11 g /n (20 MHz)	2412-2462	OFDM	94.90 (802.11g) 94.36 (802.11n)	0.033 (CH 1) / 0.150 (CH 2-11)	0.045 (CH 1) / 0.158 (CH 2-11)
WLAN 802.11 n (40 MHz)	2412-2462	OFDM	89.08	0.100 (CH 3) / 0.063 (CH 9) / 0.150 (Other channels)	0.126 (CH 3) / 0.079 (CH 9) / 0.158 (Other channels)
WLAN 802.11 a / n / ac (20 MHz)	5180-5825	OFDM	96.30 (802.11a) 95.59 (802.11 n /ac)	0.089 (CH 140) / 0.126 (other Channels)	0.126 (CH 140) / 0.158 (other Channels)
WLAN 802.11 n / ac (40 MHz)	5180-5825	OFDM	90.94	0.089 (CH 38, CH 102) 0.112 (CH 62) 0.126 (other Channels)	0.100 (CH 38, CH 102) / 0.126 (CH 62) / 0.158 (other Channels)
WLAN 802.11 ac (80 MHz)	5180-5825	OFDM	80.27	0.063 (CH 42) 0.089 (CH 106) 0.100 (other Channels)	0.079 (CH 42) 0.100 (CH 106) 0.126 (other Channels)

Note - * includes 50% PTT operation

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

There are the batteries applicable for this PCII filing. The Table below lists their descriptions.

Table 4

Antenna No.	Antenna Models	Description	Selected for test	Tested
1	PMAD4094A	VHF Stubby Antenna, 147-160 MHz, ¼wave, -12.14dBd	Yes	Yes
2	PMAE4022B	UHF Whip Antenna, 380-480MHz, , ¼ wave, 0 dBi	Yes	Yes
3	PMAE4049A	UHF Whip Antenna, 450-527 MHz, , ¼ wave, 1.9 dBi	Yes	Yes
4	PMAE4102A	UHF Stubby Antenna, 450-527MHz, ¼ wave, 1.7 dBi	Yes	Yes
5	AN000296A01	7/800 Stubby Antenna, 760-870MHz, ¼ wave, -0.8 dBi	Yes	Yes
6	NAF5080A	7/800 Whip Antenna, 7/800MHz, ¼ wave, 0 dBi	Yes	Yes
7	PMAF4022A	7/800 Stubby Antenna, 7/800 MHz, ¼ wave, 0 dBi	Yes	Yes
8	AN000304A01	LTE Antenna, 699-798 MHz, 824-849 MHz, 1710-2155MHz, ¼ wave, Band 4 (1.02 dBi), Band 2 (2.15 dBi), Band 12 (-3.18 dBi), Band 13 (-3.00 dBi), Band 14 (-3.52 dBi), Band 5 (-2.34 dBi), Band 17 (-3.65 dBi)	Yes	Yes
9	AN000304A03	WiFi/BT Antenna, 2400-2480 MHz, 5150-5850 MHz, ¼ wave, 2400 MHz (3.1 dBi), 2440 MHz (3.2 dBi), 2480 MHz (2.9 dBi), 5150MHz (2.8 dBi), 5500MHz (4.0 dBi) , 5850MHz (1.9 dBi)	Yes	Yes
10	AN000369A01	UHF Stubby Antenna, 450-527 MHz, ¼ wave, 0.86dBi	Yes	Yes
11	AN000392A01	7/800 Whip Antenna, 762-870 MHz, ¼ wave, -1.4dBi	Yes	Yes

Table 4(Continued)

Antenna No.	Antenna Models	Description	Selected for test	Tested
12	AN000393A01	UHF Whip Antenna, 380-520 MHz, ½ wave, -0.8dBi	Yes	Yes
13	AN000392A01	7/800 Whip Antenna, 762-870 MHz, ¼ wave, -1.4dBi	Yes	Yes

7.2 Batteries

There are three batteries applicable for this PCII filing. The Table below lists their descriptions.

Table 5

Battery No.	Battery Models	Description	Selected for test	Tested
1	NNTN9087A	Standard Battery, IMPRES GEN2, Li-ion, IP68, 3800mAh Typical	Yes	Yes
2	NNTN9089B	Hi-Cap Batt, IMPRES GEN2, Li-ion, IP68, 5650T	Yes	Yes
3	NNTN9216A	Standard Battery Pack, IMPRES GEN2, Li-ion, IP68, 4400mAh Typical	Yes	Yes

7.3 Body worn Accessories

These are the body worn applicable for this PCII filing. The Table below lists their descriptions.

Table 6

Body worn No.	Body worn Models	Description	Selected for test	Tested	Comments
1	PMLN7947A	CARRY ACCESSORY-HOLSTER	Yes	Yes	Test w/ NTN8266B and PMLN7965A
2	NTN8266B	BELT CLIP KIT 2.5"	Yes	Yes	Tested w/ PMLN8208A and PMLN7947A
3	PMLN7965A	CARRY ACCESSORY-BELT CLIP, 3 BELT CLIP	Yes	Yes	Test w/ PMLN7947A and PMLN7948A
4	PMLN7948A	HYBRID CARRY CASE FOR STANDARD CAP BATTERY	Yes	Yes	Test with NTN8266B, PMLN7965A, PMLN5407A, PMLN5408A and PMLN5409A. Compatible with battery NNTN9087A only.
5	PMLN8208A	XE Classic Holster	Yes	Yes	Tested w/ NTN8266B, PMLN7965B, RLN6486A & RLN6488A
6	RLN6486A	Boston Leather Firemans Radio Strap	Yes	Yes	Tested w/ PMLN8208A, PMLN8209A & RLN6488A
7	RLN6488A	Boston Leather Anti-Sway Strap for Boston Leather Firemans Radio Strap	Yes	Yes	Tested w/ PMLN8208A, PMLN8209A & RLN6486A
8	PMLN8209B	XE Boston Leather Holster	Yes	Yes	Tested w/ RLN6486A & RLN6488A; Only compatible with standard batteries
9	PMLN7964A	HYBRID LEATHER CARRY CASE FOR HI-CAP BATTERY	Yes	Yes	Test w/ NTN8266B

7.4 Audio Accessories

These are the audio accessories applicable for this PCII filing. The Table below lists their descriptions.

Table 7

Audio No.	Audio Acc. Models	Description	Selected for test	Tested	Comments
1	BDN6783B	Audio ACCY adapter with PTT	Yes	Yes	
2	RLN5312B	CMFRT EARPC W/MIC & PTT BLK	Yes	Yes	
3	PMMN4061B	AUDIO ACCESSORY-HEADSET,PSM IP55 WITH 3.5MM JACK RX 30IN	Yes	Yes	
4	PMMN4123A	AUDIO ACCESSORY-REMOTE SPEAKER MICROPHONE,MC550 REMOTE SPEAKER MICROPHONE	Yes	Yes	

8.0 Description of Test System

DASY5™ Tesy 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	ES3DV3 (E-Field)
			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.

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. 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		450MHz		750MHz		835MHz	
	Head	Body	Head	Body	Head	Body	Head	Body
Sugar	55.4	49.7	56.0	46.5	57.0	46	57.0	44.9
Diacetin	0	0	0	0	0	0	NA	NA
De ionized - Water	38.35	46.2	39.1	50.53	40.12	51.8	40.45	53.06
Salt	5.15	3.00	3.8	1.87	1.78	1.1	1.45	0.94
HEC	1	1	1	1	1	1	1	1
Bact.	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

Table 10 (Continued)

Ingredients	1800MHz(1)		2450MHz(1)		5GHz (1)	
	Head	Body	Head	Body	Head	Body
Sugar	NA	NA	NA	NA	NA	NA
Diacetin	NA	NA	NA	NA	NA	NA
De ionized - Water	NA	NA	NA	NA	NA	NA
Salt	NA	NA	NA	NA	NA	NA
HEC	NA	NA	NA	NA	NA	NA
Bact.	0.1	0.1	0.1	0.1	NA	NA

Note: (1) SPEAG provides Motorola proprietary stimulant ingredients for the 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	7364	02/28/2022	02/28/2025
Speag Probe#	EX3DV4	7486	06/18/2022	06/18/2024
Speag Probe	ES3DV3	3122	05/10/2022	04/26/2025
Speag DAE	DAE4	1598	04/07/2021	04/07/2024
Speag DAE	DAE4	850	04/14/2022	04/14/2025
POWER AMPLIFIER	50W 1000A	14715	CNR	CNR
AMPLIFIER	5S1G4	313326	CNR	CNR
AMPLIFIER	5S4G11	312664	CNR	CNR
VECTOR SIGNAL GENERATOR	E4438C	MY42081753	08/30/2023	08/30/2024
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
POWER SENSOR	E4412A	MY61050006	04/12/2023	04/12/2024
POWER SENSOR	E4412A	MY61060011	04/10/2023	04/10/2024
POWER SENSOR	E9301B	MY55210006	05/18/2023	05/18/2024
POWER METER	E4416A	MY50001037	08/09/2023	08/09/2024
POWER METER	E4418B	MY45100911	08/11/2023	08/11/2024
POWER METER	E4418B	MY45107917	07/27/2023	07/27/2024
POWER SUORCE	SE UMS 160 CA	4251	04/04/2023	04/04/2024
THERMOMETER	HI98509	3CC770	05/30/2023	05/30/2024
THERMOMETER*	HH202A	35881	12/13/2022	12/13/2023
TEMPERATURE PROBE*	80PK-22	5032017	12/13/2022	12/13/2023
DATA LOGGER*	DSB	16398306	12/14/2022	12/14/2023
DATA LOGGER	DSB	16398050	08/11/2023	08/11/2024
NETWORK ANALYZER*	E5071B	MY42403147	02/21/2023	02/21/2024
DIELECTRIC ASSESSMENT KIT	DAK-12	1069	04/11/2023	04/11/2024
DIELECTRIC ASSESSMENT KIT	DAK-3.5	1156	04/11/2023	04/11/2024
SPEAG DIPOLE	CLA150	4016	01/06/2023	01/06/2026
SPEAG DIPOLE	D450V3	1077	07/09/2021	07/09/2024
SPEAG DIPOLE	D750V3	1142	10/24/2022	10/24/2025
SPEAG DIPOLE	D750V3	1098	08/10/2021	08/10/2024
SPEAG DIPOLE	D835V2	4D029	08/27/2021	08/27/2024
SPEAG DIPOLE	D1800V2	2D120	10/28/2022	10/28/2025
SPEAG DIPOLE	D1800V2	278	01/16/2023	01/16/2026
SPEAG DIPOLE	D2450V2	781	10/13/2021	10/13/2024
SPEAG DIPOLE	D2450V2	703	01/12/2023	01/12/2026
SPEAG DIPOLE	D5GHZV2	1026	09/24/2021	09/24/2024
SPEAG DIPOLE	D5GHzV2	1022	07/16/2021	07/16/2024

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 12

Dates	Probe Calibration Point		Probe SN	Measured Tissue Parameters		Validation		
				σ	ϵ_r	Sensitivity	Linearity	Isotropy
CW								
02/21/2023#	Body	150	7486	0.79	59.00	Pass	Pass	Pass
02/21/2023#	Head			0.77	51.80	Pass	Pass	Pass
02/22/2023#	Body	750		0.99	52.80	Pass	Pass	Pass
02/27/2023	Head			0.89	42.50	Pass	Pass	Pass
02/23/2023	Body	1800		1.51	52.30	Pass	Pass	Pass
02/28/2023	Head			1.37	40.20	Pass	Pass	Pass
02/24/2023	Body	2450		2.02	53.00	Pass	Pass	Pass
03/01/2023	Head			1.78	38.50	Pass	Pass	Pass
02/25/2023	Body	5250		5.53	48.20	Pass	Pass	Pass
03/02/2023	Head			4.42	35.40	Pass	Pass	Pass
02/26/2023	Body	5600		5.93	45.70	Pass	Pass	Pass
03/03/2023	Head			4.75	33.90	Pass	Pass	Pass
02/27/2023	Body	5750		6.14	45.40	Pass	Pass	Pass
03/04/2023	Head			4.91	33.70	Pass	Pass	Pass
03/31/2023	Body	150	7364	0.80	60.30	Pass	Pass	Pass
04/11/2023	Head			0.72	53.80	Pass	Pass	Pass
03/26/2023	Body	450		0.96	56.10	Pass	Pass	Pass
04/11/2023	Head			0.84	41.60	Pass	Pass	Pass
03/30/2023	Body	750		0.93	54.00	Pass	Pass	Pass
03/27/2023	Head			0.85	41.70	Pass	Pass	Pass
03/30/2023	Body	835		1.02	53.10	Pass	Pass	Pass
03/29/2023	Head			0.94	40.70	Pass	Pass	Pass
04/02/2023	Body	1800		1.47	54.40	Pass	Pass	Pass
04/01/2023	Head			1.38	38.30	Pass	Pass	Pass
04/04/2023	Body	2450		2.02	49.50	Pass	Pass	Pass
04/05/2023	Head			1.76	39.90	Pass	Pass	Pass
04/07/2023	Body	5250		5.68	46.80	Pass	Pass	Pass
04/09/2023	Head			4.48	36.60	Pass	Pass	Pass
04/08/2023	Body	5600		5.91	46.30	Pass	Pass	Pass
04/10/2023	Head			4.88	36.00	Pass	Pass	Pass
04/09/2023	Body	5750		6.13	46.00	Pass	Pass	Pass
04/10/2023	Head			5.07	34.30	Pass	Pass	Pass
08/20/2023	Body	450	3122	0.92	54.30	Pass	Pass	Pass
08/20/2023	Head			0.83	41.60	Pass	Pass	Pass

Note: "#" Equipment used for test dates prior to system validation due date.

Table 12(Continued)

Dates	Probe Calibration Point		Probe SN	Measured Tissue Parameters		Validation		
				σ	ϵ_r	Sensitivity	Linearity	Isotropy
LTE								
03/29/2023	Body	750 (1 RB)	7486	0.94	54.20	Pass	Pass	NA
03/24/2023	Head			0.91	39.90	Pass	Pass	NA
03/29/2023	Body	750 (50% RB)		0.94	54.20	Pass	Pass	NA
03/24/2023	Head			0.91	39.90	Pass	Pass	NA
03/29/2023	Body	835 (1 RB)		1.01	52.60	Pass	Pass	NA
03/25/2023	Head			0.91	39.70	Pass	Pass	NA
03/29/2023	Body	835 (50% RB)		1.01	52.60	Pass	Pass	NA
03/25/2023	Head			0.91	39.70	Pass	Pass	NA
03/30/2023	Body	1800 (1 RB)		1.47	52.80	Pass	Pass	NA
03/25/2023	Head			1.37	38.40	Pass	Pass	NA
03/30/2023	Body	1800 (50% RB)		1.47	52.80	Pass	Pass	NA
03/25/2023	Head			1.37	38.40	Pass	Pass	NA
03/30/2023	Body	750 (1 RB)	7364	0.93	54.00	Pass	Pass	NA
03/29/2023	Head			0.85	41.90	Pass	Pass	NA
03/30/2023	Body	750 (50% RB)		0.93	54.00	Pass	Pass	NA
03/29/2023	Head			0.85	41.90	Pass	Pass	NA
03/31/2023	Body	835 (1 RB)		1.02	53.10	Pass	Pass	NA
03/30/2023	Head			0.94	40.70	Pass	Pass	NA
03/31/2023	Body	835 (50% RB)		1.02	53.10	Pass	Pass	NA
03/30/2023	Head			0.94	40.70	Pass	Pass	NA
04/02/2023	Body	1800 (1 RB)		0.93	54.00	Pass	Pass	NA
04/01/2023	Head			0.85	41.90	Pass	Pass	NA
04/02/2023	Body	1800 (50% RB)		0.93	54.00	Pass	Pass	NA
04/01/2023	Head			0.85	41.90	Pass	Pass	NA
802.11								
02/26/2023	Body	5250	7486	5.53	48.20	Pass	Pass	NA
03/02/2023	Head			4.42	35.40	Pass	Pass	NA
02/26/2023	Body	5600		5.93	45.70	Pass	Pass	NA
03/04/2023	Head			4.75	33.90	Pass	Pass	NA
02/27/2023	Body	5750		6.14	45.40	Pass	Pass	NA
03/04/2023	Head			4.91	33.70	Pass	Pass	NA
04/09/2023	Body	5250	7364	5.46	47.00	Pass	Pass	NA
04/09/2023	Head			4.48	36.60	Pass	Pass	NA
04/09/2023	Body	5600		5.96	46.30	Pass	Pass	NA
04/10/2023	Head			4.88	36.00	Pass	Pass	NA
04/09/2023	Body	5750		6.13	46.00	Pass	Pass	NA
04/10/2023	Head			5.07	34.30	Pass	Pass	NA

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 (%)
7486	FCC Body	SPEAG D150V3 / 4016	3.86 +/- 10%	3.91	3.91	231211	1.3
	IEEE/IEC Head	SPEAG D750V3 / 1142	8.46 +/- 10%	0.271	8.58	231212	1.4
				0.261	8.26	231218@	**-2.4**
	IEEE/IEC Head	SPEAG D835V2 / 4d029	9.84 +/- 10%	0.291	9.21	231217	-6.4
				0.293	9.27	231211@	-5.8
	IEEE/IEC Head	SPEAG D1800V2 / 2d120	38.30 +/- 10%	1.23	38.92	231214	1.6
	IEEE/IEC Head	SPEAG D2450V2 / 781	52.70 +/- 10%	1.79	56.65	231214	**7.5**
	IEEE/IEC Head	SPEAG D5250V2 / 1026	80.60 +/- 10%	2.44	77.22	231215	-4.2
	FCC Body	SPEAG D5600V2 / 1026	79.50 +/- 10%	2.48	78.48	231216	-1.3
	IEEE/IEC Head		83.90 +/- 10%	7.66	76.60	231214	-8.7
	FCC Body	SPEAG D5750V2 / 1026	76.50 +/- 10%	2.40	75.95	231215	-0.7
	IEEE/IEC Head		79.70 +/- 10%	7.37	73.70	231215	-7.5
7364	FCC Body	SPEAG D150V3 / 4016	3.86 +/- 10%	3.97	3.97	240121	2.8
	IEEE/IEC Head		3.77 +/- 10%	4.09	4.09	240121@	**8.5**
	FCC Body	SPEAG D450V3 / 1077	4.64 +/- 10%	1.15	4.60	231207@	-0.9
				1.22	4.88	231208	5.2
				1.15	4.60	240105@	-0.9
				1.23	4.92	240124	6.0
	IEEE/IEC Head		4.63 +/- 10%	1.22	4.88	231215@	5.4
				1.13	4.52	240117	-2.4
				1.33	4.88	231216	5.4
	FCC Body	SPEAG D750V3 / 1098	8.67 +/- 10%	0.278	8.80	240223	3.0
				0.276	8.73	240225	0.7
	IEEE/IEC Head		8.54 +/- 10%	0.272	8.61	240222	0.8
				0.259	8.20	240224	**-4.0**
				0.263	8.32	240224@	-2.5
	FCC Body	SPEAG D750V3 / 1142	8.66 +/- 10%	0.275	8.70	240223@	0.5

Note: @ denotes that the tissue covers next testing day (within24 hours)

Table 13(Continued)

Probe Serial #	Tissue Type	Dipole Kit / Serial #	Ref SAR @ 1W (W/kg)	System Check Results Measured (W/kg)	System Check Test Results when normalized to 1W (W/kg)	Tested Date	Deviation (%)
7364	FCC Body	SPEAG D835V2 / 4d029	9.83 +/- 10%	0.306	9.68	231213	-1.5
				0.304	9.62	240125	-2.1
				0.313	9.91	240106@	0.8
				0.289	9.15	231224@	-7.0
				0.308	9.75	240122	-0.8
	IEEE/IEC Head		9.84 +/- 10%	0.296	9.37	240121	-4.8
				0.286	9.05	240117@	**-8.0**
	FCC Body	SPEAG D1800V2 / 2d120	38.10 +/- 10%	9.8	39.20	231223	2.9
				1.24	39.24	231224	3.0
	IEEE/IEC Head		38.30 +/- 10%	1.30	41.14	240118	**7.4**
	FCC Body	SPEAG D1800V2 / 278	38.60 +/- 10%	1.33	42.09	240108	**9.0**
	FCC Body	SPEAG D2450V2 / 703	49.40 +/- 10%	1.62	51.27	231227	**3.8**
				1.60	50.63	240107@	2.5
	IEEE/IEC Head	SPEAG D2450V2 / 781	52.70 +/- 10%	1.74	55.06	240118	4.5
	FCC Body	SPEAG D5250V2 / 1022	75.60 +/- 10%	2.38	75.32	240108	-0.4
	IEEE/IEC Head	SPEAG D5250V2 / 1026	80.60 +/- 10%	8.44	84.40	240119	4.7
	FCC Body	SPEAG D5600V2 / 1022	79.70 +/- 10%	7.65	76.50	240109	-4.0
				7.23	72.30	240127	**-9.3**
	IEEE/IEC Head	SPEAG D5600V2 / 1026	83.90 +/- 10%	7.78	77.80	240119	-7.3
	FCC Body	SPEAG D5750V2 / 1026	76.50 +/- 10%	6.94	69.40	240120	**-9.3**
	IEEE/IEC Head	SPEAG D5750V2 / 1026	79.70 +/- 10%	7.46	74.60	240119	-6.4
3122	FCC Body	SPEAG D450V3 / 1077	4.64 +/- 10%	1.22	4.88	231219	5.2
				1.19	4.76	231221	2.6
				1.24	4.96	240124	6.9
				1.22	4.88	240127	5.2
				1.24	4.96	240308	6.9
				1.26	5.04	240105@	**8.6**
				1.24	4.96	240307@	6.9
	IEEE/IEC Head	SPEAG D450V3 / 1077	4.63 +/- 10%	1.18	4.72	240117	1.9
				1.21	4.84	240308	4.5
				1.21	4.84	240309	4.5

Note: @ denotes that the tissue covers next testing day (within24 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
147	FCC Body	0.8 (0.76-0.84)	62.0 (58.9-65.1)	0.80	59.3	240121
	IEEE/IEC Head	0.76 (0.72-0.8)	52.4 (49.8-55.1)	0.73	50.4	240121@
150	FCC Body	0.8 (0.76-0.84)	61.9 (58.8-65)	0.78	59.6	231211
				0.80	59.2	240121@
	IEEE/IEC Head	0.76 (0.72-0.8)	52.3 (49.7-54.9)	0.73	50.3	240121@
155	FCC Body	0.8 (0.76-0.84)	61.8 (58.7-64.9)	0.78	59.5	231211
	IEEE/IEC Head	0.76 (0.73-0.8)	52.1 (49.5-54.7)	0.73	50.1	240121@
160	FCC Body	0.81 (0.77-0.85)	61.7 (58.6-64.7)	0.81	58.9	240121
	IEEE/IEC Head	0.77 (0.73-0.81)	51.8 (49.2-54.4)	0.74	49.8	240121@
406.125	FCC Body	0.93 (0.89-0.98)	57.1 (54.3-60)	0.89	55.5	231219
	IEEE/IEC Head	0.87 (0.83-0.91)	44 (41.8-46.2)	0.83	44.6	240308
422.1	FCC Body	0.94 (0.89-0.98)	57 (54.1-59.8)	0.91	55.2	231219
				0.90	55.3	240308
	IEEE/IEC Head	0.87 (0.83-0.91)	43.8 (41.6-46)	0.92	54.8	231221
430	FCC Body	0.94 (0.89-0.98)	56.9 (54.1-59.7)	0.90	54.8	240308
	IEEE/IEC Head	0.87 (0.83-0.91)	43.7 (41.6-45.9)	0.85	44.0	240308
450	Body	0.94 (0.89-0.99)	56.7 (53.9-59.5)	0.90	54.6	231207@
				0.91	54.6	231208
				0.93	54.8	231219
				0.94	54.3	231221
				0.93	55.6	240105@
				0.92	55.0	240124
				0.90	54.2	240127
				0.92	54.8	240308
	IEEE/IEC Head	0.87 (0.83-0.91)	43.5 (41.3-45.7)	0.85	42.1	231215@
				0.94	54.3	231221
				0.86	42.7	240117
				0.87	43.6	240308
				0.86	43.7	240309

Note: @ denotes that the tissue covers next testing day (within24 hours)

Table 14(Continued)

Frequency (MHz)	Tissue Type	Conductivity Target (S/m)	Dielectric Constant Target	Conductivity Meas. (S/m)	Dielectric Constant Meas.	Tested Date
460	FCC Body	0.94 (0.89-0.99)	56.7 (53.8-59.5)	0.94	54.5	231207@
				0.92	54.8	240124
				0.91	54.1	240127
	IEEE/IEC Head	0.87 (0.83-0.91)	43.4 (41.3-45.6)	0.87	42.5	240117
470	FCC Body	0.94 (0.89-0.99)	56.6 (53.8-59.5)	0.92	54.3	231208
				0.95	54.5	231219
				0.95	55.3	240105@
	IEEE/IEC Head	0.87 (0.83-0.91)	43.4 (41.2-45.6)	0.96	54.1	231221
				0.88	42.3	240117
496.5	IEEE/IEC Head	0.87 (0.83-0.92)	43.3 (41.1-45.4)	0.90	42.7	240309
				0.89	41.1	231215@
704	FCC Body	0.96 (0.91-1.01)	55.7 (52.9-58.5)	0.91	53.7	231224@
	IEEE/IEC Head	0.89 (0.84-0.93)	42.1 (40-44.3)	0.86	44.0	231218@
709	FCC Body	0.96 (0.91-1.01)	55.7 (52.9-58.5)	0.92	53.6	231224@
	IEEE/IEC Head	0.89 (0.84-0.93)	42.1 (40-44.2)	0.86	44.0	231212
750	FCC Body	0.96 (0.92-1.01)	55.5 (52.8-58.3)	0.93	56.5	240223
				0.93	55.8	240223@
				0.94	56.3	240225
				0.95	56.3	240226
	IEEE/IEC Head	0.89 (0.85-0.93)	41.9 (39.8-44)	0.90	43.4	231212
				0.90	43.4	231218@
				0.84	43.7	240222
				0.85	43.1	240224@
769.0875	FCC Body	0.96 (0.92-1.01)	55.5 (52.7-58.2)	0.96	55.6	240223@
	IEEE/IEC Head	0.89 (0.85-0.94)	41.8 (39.7-43.9)	0.86	43.0	240224@
772	FCC Body	0.97 (0.92-1.01)	55.4 (52.7-58.2)	0.96	55.6	240223@
	IEEE/IEC Head	0.89 (0.85-0.94)	41.8 (39.7-43.9)	0.86	43.0	240224@
774.9125	FCC Body	0.97 (0.92-1.01)	55.4 (52.7-58.2)	0.96	55.6	240223@
	IEEE/IEC Head	0.89 (0.85-0.94)	41.8 (39.7-43.9)	0.86	43.7	240222
782	FCC Body	0.97 (0.92-1.01)	55.4 (52.6-58.2)	0.94	53.4	231224@
	IEEE/IEC Head	0.89 (0.85-0.94)	41.7 (39.7-43.8)	0.88	40.6	231211@
793	FCC Body	0.97 (0.92-1.02)	55.4 (52.6-58.1)	0.94	53.5	231224@
	IEEE/IEC Head	0.9 (0.85-0.94)	41.7 (39.6-43.8)	0.89	40.4	231211@

Note: @ denotes that the tissue covers next testing day (within24 hours)

Table 14(Continued)

Frequency (MHz)	Tissue Type	Conductivity Target (S/m)	Dielectric Constant Target	Conductivity Meas. (S/m)	Dielectric Constant Meas.	Tested Date
799.0875	FCC Body	0.97 (0.92-1.02)	55.3 (52.6-58.1)	0.98	56.0	240223
	IEEE/IEC Head	0.9 (0.85-0.94)	41.7 (39.6-43.8)	0.87	42.9	240224
808.5	FCC Body	0.97 (0.92-1.02)	55.3 (52.5-58.1)	1.00	55.7	240225
				1.01	55.7	240226
	IEEE/IEC Head	0.9 (0.85-0.94)	41.6 (39.5-43.7)	0.92	41.0	240117@
823.9875	FCC Body	0.97 (0.92-1.02)	55.2 (52.5-58)	0.95	52.9	240106@
	IEEE/IEC Head	0.9 (0.85-0.94)	41.6 (39.5-43.6)	0.93	39.9	231217
835	FCC Body	0.97 (0.92-1.02)	55.2 (52.4-58)	1.01	52.9	231213
				0.96	53.4	231224@
				0.96	52.9	240106@
				1.01	54.3	240125
	IEEE/IEC Head	0.9 (0.86-0.95)	41.5 (39.4-43.6)	0.94	39.9	231211@
				0.94	39.8	231217
				0.95	40.6	240117@
				0.94	40.7	240121
836.5	IEEE/IEC Head	0.9 (0.86-0.95)	41.5 (39.4-43.6)	0.94	39.9	231211@
844	FCC Body	0.98 (0.93-1.03)	55.2 (52.4-57.9)	1.02	52.9	240122
851.0125	FCC Body	0.99 (0.94-1.04)	55.2 (52.4-57.9)	1.03	52.8	231213
	IEEE/IEC Head	0.92 (0.87-0.96)	41.5 (39.4-43.6)	0.96	40.4	240117@
860.5	FCC Body	1 (0.95-1.05)	55.1 (52.4-57.9)	0.97	52.9	240106@
	IEEE/IEC Head	0.93 (0.88-0.97)	41.5 (39.4-43.6)	0.96	40.4	240117@
868.9875	FCC Body	1.01 (0.96-1.06)	55.1 (52.3-57.9)	0.97	52.8	240106@
				1.05	53.9	240125
	IEEE/IEC Head	0.94 (0.89-0.98)	41.5 (39.4-43.6)	0.98	40.3	240121
1720	FCC Body	1.47 (1.4-1.54)	53.5 (50.8-56.2)	1.40	55.7	240108@
	IEEE/IEC Head	1.35 (1.29-1.42)	40.1 (38.1-42.1)	1.33	41.8	240118
1732.5	FCC Body	1.48 (1.4-1.55)	53.5 (50.8-56.2)	1.41	55.6	240108@
	IEEE/IEC Head	1.36 (1.29-1.43)	40.1 (38.1-42.1)	1.34	41.8	240118
1745	FCC Body	1.49 (1.41-1.56)	53.4 (50.8-56.1)	1.41	51.6	231224
	IEEE/IEC Head	1.37 (1.3-1.44)	40.1 (38.1-42.1)	1.31	41.5	231214

Note: @ denotes that the tissue covers next testing day (within24 hours)

Table 14(Continued)

Frequency (MHz)	Tissue Type	Conductivity Target (S/m)	Dielectric Constant Target	Conductivity Meas. (S/m)	Dielectric Constant Meas.	Tested Date
1800	FCC Body	1.52 (1.44-1.6)	53.3 (50.6-56)	1.47	51.6	231223
				1.45	51.6	231224
				1.46	55.5	240108@
	IEEE/IEC Head	1.4 (1.33-1.47)	40 (38-42)	1.35	41.5	231214
				1.38	41.7	240118
1860	FCC Body	1.52 (1.44-1.6)	53.3 (50.6-56)	1.50	55.5	240108@
	IEEE/IEC Head	1.4 (1.33-1.47)	40 (38-42)	1.38	41.4	231214
1880	FCC Body	1.52 (1.44-1.6)	53.3 (50.6-56)	1.53	51.5	231223
	IEEE/IEC Head	1.4 (1.33-1.47)	40 (38-42)	1.43	41.6	240118
1900	FCC Body	1.52 (1.44-1.6)	53.3 (50.6-56)	1.53	55.4	240108@
	IEEE/IEC Head	1.4 (1.33-1.47)	40 (38-42)	1.44	41.5	240118
2437	FCC Body	1.94 (1.84-2.03)	52.7 (47.4-58)	1.90	49.1	231227
	IEEE/IEC Head	1.79 (1.7-1.88)	39.2 (35.3-43.1)	1.77	37.5	240118
2412	FCC Body	1.91 (1.82-2.01)	52.8 (47.5-58)	1.87	51.1	240107@
	IEEE/IEC Head	1.77 (1.68-1.86)	39.3 (35.3-43.2)	1.75	37.5	240118
2450	FCC Body	1.95 (1.85-2.05)	52.7 (47.4-58)	1.90	49.1	231227
				1.90	51.0	240107@
	IEEE/IEC Head	1.8 (1.71-1.89)	39.2 (35.3-43.1)	1.82	40.1	231214
				1.78	37.5	240118
2462	FCC Body	1.97 (1.87-2.07)	52.7 (47.4-58)	1.91	51.0	240107@
	IEEE/IEC Head	1.81 (1.72-1.9)	39.2 (35.3-43.1)	1.83	40.1	231214
5250	FCC Body	5.36 (4.82-5.89)	48.9 (44.1-53.8)	5.25	44.2	240108
	IEEE/IEC Head	4.71 (4.24-5.18)	36 (32.4-39.5)	4.33	39.2	231214@
				4.27	39.2	240119
5270	FCC Body	5.38 (4.84-5.92)	48.9 (44-53.8)	5.28	44.2	240108
	IEEE/IEC Head	4.73 (4.26-5.2)	35.9 (32.3-39.5)	4.35	39.1	231214@
5310	FCC Body	5.43 (4.88-5.97)	48.9 (44-53.8)	5.33	44.1	240108
	IEEE/IEC Head	4.77 (4.29-5.25)	35.9 (32.3-39.5)	4.33	39.1	240119
5510	FCC Body	5.66 (5.1-6.23)	48.6 (43.7-53.5)	5.12	44.1	240126@
	IEEE/IEC Head	4.98 (4.48-5.47)	35.6 (32.1-39.2)	4.54	38.8	240119

Note: @ denotes that the tissue covers next testing day (within24 hours)

Table 14(Continued)

Frequency (MHz)	Tissue Type	Conductivity Target (S/m)	Dielectric Constant Target	Conductivity Meas. (S/m)	Dielectric Constant Meas.	Tested Date
2462	FCC Body	1.97 (1.87-2.07)	52.7 (47.4-58)	1.91	51.0	240107@
	IEEE/IEC Head	1.81 (1.72-1.9)	39.2 (35.3-43.1)	1.83	40.1	231214
5250	FCC Body	5.36 (4.82-5.89)	48.9 (44.1-53.8)	5.25	44.2	240108
	IEEE/IEC Head	4.71 (4.24-5.18)	36 (32.4-39.5)	4.33	39.2	231214@
				4.27	39.2	240119
5270	FCC Body	5.38 (4.84-5.92)	48.9 (44-53.8)	5.28	44.2	240108
	IEEE/IEC Head	4.73 (4.26-5.2)	35.9 (32.3-39.5)	4.35	39.1	231214@
5310	FCC Body	5.43 (4.88-5.97)	48.9 (44-53.8)	5.33	44.1	240108
	IEEE/IEC Head	4.77 (4.29-5.25)	35.9 (32.3-39.5)	4.33	39.1	240119
5510	FCC Body	5.66 (5.1-6.23)	48.6 (43.7-53.5)	5.12	44.1	240126@
	IEEE/IEC Head	4.98 (4.48-5.47)	35.6 (32.1-39.2)	4.54	38.8	240119
5590	FCC Body	5.75 (5.18-6.33)	48.5 (43.6-53.3)	5.66	45..8	240109
	IEEE/IEC Head	5.06 (4.55-5.57)	35.5 (32-39.1)	4.63	38.7	240119
5600	FCC Body	5.77 (5.19-6.34)	48.5 (43.6-53.3)	5.41	46.5	231215@
				5.67	45.8	240109
				5.24	44.0	240126@
	IEEE/IEC Head	5.07 (4.56-5.58)	35.5 (32-39.1)	4.71	38.6	231214
				4.65	38.6	240119
5630	FCC Body	5.8 (5.22-6.38)	48.4 (43.6-53.3)	5.45	46.3	231215@
	IEEE/IEC Head	5.1 (4.59-5.61)	35.5 (31.9-39)	4.75	38.5	231214
5670	FCC Body	5.85 (5.26-6.43)	48.4 (43.5-53.2)	5.77	45.7	240109
	IEEE/IEC Head	5.14 (4.63-5.65)	35.4 (31.9-39)	4.72	38.5	240119
5750	FCC Body	5.94 (5.35-6.54)	48.3 (43.4-53.1)	5.61	46.0	231215@
				6.19	44.1	240120
	IEEE/IEC Head	5.22 (4.7-5.74)	35.4 (31.8-38.9)	5.16	35.7	231215
				4.82	38.4	240119
5755	FCC Body	5.95 (5.35-6.54)	48.3 (43.4-53.1)	6.20	44.1	240120
	IEEE/IEC Head	5.23 (4.7-5.75)	35.3 (31.8-38.9)	4.82	38.4	240119
5795	FCC Body	5.99 (5.39-6.59)	48.2 (43.4-53)	5.72	46.1	231215@
	IEEE/IEC Head	5.27 (4.74-5.79)	35.3 (31.8-38.8)	5.22	35.6	231215

Note: @ denotes that the tissue covers next testing day (within24 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: 19.0 – 23.1˚C Avg. 21.0 ˚C
Tissue Temperature	18 – 25 ˚C	Range: 19.3-23.1˚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 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 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" 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 and LTE modes and 50% duty cycle was applied to PTT configurations in the final results.

Standalone BT testing were assessed in sections 13.7 per the guidelines of KDB 447498.

13.0 DUT Test Data

13.1 LMR assessments for FCC

13.1.1 Assessment for VHF (150.8-173.4MHz)

The DUT was assessed at the highest applicable configuration at the body and face found during the previous compliance assessment on file with FCC. The table below indicates the SAR results that have been performed and the SAR plots of the results (bolded) are presented in Appendix E.

Table 17

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#
Highest Body Configuration									
PMAD4094A	NNTN9087A	PMLN7948A w/ PMLN7965A	None	155.0000	6.36	-0.72	2.03	1.24	Previous Highest SAR at Body FD-AB-190104-06#
					6.60	-0.37	0.98	**0.53**	AR-AB-231211-09
Highest Face Configuration									
PMAD4094A	NNTN9087A	@ back	None	155.0000	6.41	-0.45	2.08	1.19	Previous Highest SAR at Face FD-FACE-181225-15
					6.60	0.12	0.69	**0.34**	MFR-FACE-240122-02@

13.1.2 Assessment for UHF1 (406.125-470MHz)

The DUT was assessed at the highest applicable configuration at the body and face found during the previous compliance assessment on file with FCC. The table below indicates the SAR results that have been performed and the SAR plots of the results (bolded) are presented in Appendix E.

Table 18

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Run#
Highest Body Configuration									
PMAE4049A	NNTN9087A	PMLN7947A w/ NTN8266B	PMMN4123A	470.0000	5.54	-0.41	11.50	6.50	Previous Highest SAR at Body AM-AB-181225-12
					5.70	-0.29	12.40	**6.63**	MIN-AB-231219-06
Highest Face Configuration									
PMAE4049A	NNTN9087A	@ back	None	470.0000	5.57	-0.47	9.68	5.52	Previous Highest SAR at Face LOH-FACE-190109-04#
					5.68	-0.27	10.40	**5.58**	MIN-FACE-231221-10

13.1.2 Assessment for UHF2 (450-512MHz)

The DUT was assessed at the highest applicable configuration at the body and face found during the previous compliance assessment on file with FCC. The table below indicates the SAR results that have been performed and the SAR plots of the results (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#
Highest Body Configuration									
PMAE4102A	NNTN9087A	PMLN8208A w/ RLN6486A w/ RLN6488A	PMMN4123A	460.0000	5.34	-0.31	13.10	7.51	Previous Highest SAR at Body AN-AB-200819-09#
					5.62	-0.61	12.90	**7.53**	MIN-AB-240124-12
Highest Face Configuration									
PMAE4049A	NNTN9087A	@ back	None	496.5000	5.50	-0.21	8.43	4.58	Previous Highest SAR at Face AN-FACE-200816-08
					5.70	-0.18	7.91	**4.12**	AR(JML)-FACE-231216-02@

13.1.3 Assessment for 769-775MHz

The DUT was assessed at the highest applicable configuration at the body and face found during the previous compliance assessment on file with FCC. The table below indicates the SAR results that have been performed and the SAR plots of the results (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#
Highest Body Configuration									
AN000296A01	NNTN9087A	PMLN7947A w/ PMLN7965A	PMMN4123A	774.9875	2.92	-0.87	7.30	4.57	Previous Highest SAR at Body FD(BL)-AB-190131-10
					2.98	-0.77	7.28	**4.36**	MFR-AB-240224-10@
Highest Face Configuration									
NAF5080A	NNTN9089A	None 2.5cm @ back	None	774.9875	2.76	-0.42	3.23	1.93	Previous Highest SAR at Face AN-FACE-200812-12
	NNTN9089B				2.98	-0.87	3.34	**2.05**	MIN-FACE-240222-10

13.1.4 Assessment for 799-824MHz

The DUT was assessed at the highest applicable configuration at the body and face found during the previous compliance assessment on file with FCC. The table below indicates the SAR results that have been performed and the SAR plots of the results (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#
Highest Body Configuration									
AN000296A01	NNTN9087A	PMLN8209A w/ RLN6486A w/ RLN6488A	PMMN4123A	808.5000	3.50	-0.20	12.00	6.46	Previous Highest SAR at Body AN-AB-200810-09
		PMLN8209B w/ RLN6486A w/ RLN6488A			3.54	-0.30	9.39	**5.12**	MFR-AB-240225-07
Highest Face Configuration									
NAF5080A	NNTN9089A	None 2.5cm @ back	None	823.9875	3.57	-0.34	4.35	2.37	Previous Highest SAR at Face ZR-FACE-190110-06
	NNTN9089B				3.46	-0.19	4.42	**2.40**	AR-FACE-231217-05

13.1.5 Assessment for 851-869MHz

The DUT was assessed at the highest applicable configuration at the body and face found during the previous compliance assessment on file with FCC. The table below indicates the SAR results that have been performed and the SAR plots of the results (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#
Highest Body Configuration									
AN000296A01	NNTN9216A	PMLN8209A w/ RLN6486A w/ RLN6488A	PMMN4123A	851.0125	3.45	-0.26	11.50	6.37	Previous Highest SAR at Body AN-AB-200918-01#
		PMLN8209B w/ RLN6486A w/ RLN6488A			3.56	-0.28	8.41	**4.54**	MIN-AB-231213-03
Highest Face Configuration									
NAF5080A	NNTN9087A	None 2.5cm @ back	None	868.9875	3.60	-0.43	3.90	2.15	Previous Highest SAR at Face AZ-FACE-190109-16
					3.46	-0.73	3.05	**1.88**	MIN-FACE-240121-02

13.2 LMR assessment for ISED, Canada

As per ISED Notice 2020-DRS0022, spot checks are performed on the worst-case test configurations identified for the reference model for each frequency band (VHF, UHF & 7/800 MHz) and since the worst-case reported SAR value in the original RF technical brief of the reference model for UHF is above 6W/kg, spot checks for each antenna at UHF band are performed as well.

13.2.1 VHF (138–174MHz) assessments.

As per ISED Notice 2020-DRS0022, spot checks are performed on the worst-case test configurations identified for the reference model for VHF band. 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#
Highest Body Configuration									
PMAD4094A	NNTN9087A	PMLN7948A w/ PMLN7965A	None	155.0000	6.36	-0.72	2.03	1.24	Previous Highest SAR at Body FD-AB-190104-06#
					6.60	-0.37	0.98	**0.53**	AR-AB-231211-09
Highest Face Configuration									
PMAD4094A	NNTN9087A	@ back	None	155.0000	6.41	-0.45	2.08	1.19	Previous Highest SAR at Face FD-FACE-181225-15
					6.60	0.12	0.69	**0.34**	MFR-FACE-240122-02@

13.2.2 UHF1 (406.125-430MHz, 450-470MHz) assessments.

As per ISED Notice 2020-DRS0022, spot checks are performed on the worst-case test configurations identified for the reference model for UHF1 band. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

Table 24

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Run#
406.1-430 MHz									
Highest Body Configuration									
PMAE4022B	NNTN9087A	PMLN7947A w/ NTN8266B	PMMN4123A	406.1250	5.52	-0.17	9.37	5.03	Previous Highest SAR at Body AM-AB-181225-09
					5.70	-0.24	9.70	**5.13**	MFR-AB-231219-08
Highest Face Configuration									
PMAE4022B	NNTN9089A	@ back	None	422.1000	5.57	-0.16	6.77	3.59	Previous Highest SAR at Face LOH-FACE-190108-16
	NNTN9089B				5.69	-0.27	6.67	**3.56**	MIN-FACE-231221-09
450-470 MHz									
Highest Body Configuration									
PMAE4049A	NNTN9087A	PMLN7947A w/ NTN8266B	PMMN4123A	470.0000	5.54	-0.41	11.50	6.50	Previous Highest SAR at Body AM-AB-181225-12
					5.70	-0.29	12.40	**6.63**	MIN-AB-231219-06
Highest Face Configuration									
PMAE4049A	NNTN9087A	@ back	None	470.0000	5.57	-0.47	9.68	5.52	Previous Highest SAR at Face LOH-FACE-190109-04#
					5.68	-0.27	10.40	**5.58**	MIN-FACE-231221-10

13.2.3 UHF2 (450-470MHz) assessments.

As per ISED Notice 2020-DRS0022, spot checks are performed on the worst-case test configurations identified for the reference model for UHF2 band. 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#
Highest Body Configuration									
PMAE4102A	NNTN9087A	PMLN8208A w/ RLN6486A w/ RLN6488A	PMMN4123A	460.0000	5.34	-0.31	13.10	7.51	Previous Highest SAR at Body AN-AB-200819-09#
					5.62	-0.61	12.90	**7.53**	MIN-AB-240124-12
Highest Face Configuration									
PMAE4049A	NNTN9089A	@ back	None	450.0000	5.37	-0.36	5.39	3.11	Previous Highest SAR at Face AN-FACE-200816-07
	NNTN9089B				5.70	-0.24	4.63	**2.45**	AR(JML)-FACE-231216-03@

13.2.4 768-776MHz assessments.

As per ISED Notice 2020-DRS0022, spot checks are performed on the worst-case test configurations identified for the reference model for 768-776MHz band. 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#
Highest Body Configuration									
AN000296A01	NNTN9087A	PMLN7947A w/ PMLN7965A	PMMN4123A	774.9875	2.92	-0.87	7.30	4.57	Previous Highest SAR at Body FD(BL)-AB-190131-10
					2.98	-0.77	7.28	**4.36**	MFR-AB-240224-10@
Highest Face Configuration									
NAF5080A	NNTN9089A	None 2.5cm @ back	None	774.9875	2.76	-0.42	3.23	1.93	Previous Highest SAR at Face AN-FACE-200812-12
	NNTN9089B				2.98	-0.87	3.34	**2.05**	MIN-FACE-240222-10

13.2.5 798-824MHz assessments.

As per ISED Notice 2020-DRS0022, spot checks are performed on the worst-case test configurations identified for the reference model for 798-824MHz band. 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#
Highest Body Configuration									
AN000296A01	NNTN9087A	PMLN8209A w/ RLN6486A w/ RLN6488A	PMMN4123A	808.5000	3.50	-0.20	12.00	6.46	Previous Highest SAR at Body AN-AB-200810-09
		PMLN8209B w/ RLN6486A w/ RLN6488A			3.54	-0.30	9.39	**5.12**	MFR-AB-240225-07
Highest Face Configuration									
NAF5080A	NNTN9089A	None 2.5cm @ back	None	823.9875	3.57	-0.34	4.35	2.37	Previous Highest SAR at Face ZR-FACE-190110-06
	NNTN9089B				3.46	-0.19	4.42	**2.40**	AR-FACE-231217-05

13.2.6 851-869MHz assessments.

As per ISED Notice 2020-DRS0022, spot checks are performed on the worst-case test configurations identified for the reference model for 851-869MHz band. 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#
Highest Body Configuration									
AN000296A01	NNTN9216A	PMLN8209A w/ RLN6486A w/ RLN6488A	PMMN4123A	851.0125	3.45	-0.26	11.50	6.37	Previous Highest SAR at Body AN-AB-200918-01#
		PMLN8209B w/ RLN6486A w/ RLN6488A			3.56	-0.28	8.41	**4.54**	MIN-AB-231213-03
Highest Face Configuration									
NAF5080A	NNTN9087A	None 2.5cm @ back	None	868.9875	3.60	-0.43	3.90	2.15	Previous Highest SAR at Face AZ-FACE-190109-16
					3.46	-0.73	3.05	**1.88**	MIN-FACE-240121-02

13.3 Additional assessments for each antenna

The worst-case reported SAR value in the original RF technical brief of the reference model for UHF1, UHF2, 798-824MHz, and 851-869MHz are above 6W/kg. As per ISED Notice 2020-DRS0022, spot checks for each antenna at UHF1, UHF2, 798-824MHz, and 851-869MHz were required.

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#
UHF 1									
PMAE4049A	NNTN9087A	PMLN7947A w/ NTN8266B	PMMN4123A	470.0000	5.54	-0.41	11.50	6.50	Previous Highest SAR config AM-AB-181225-12
					5.70	-0.29	12.40	**6.63**	MIN-AB-231219-06
UHF 2									
PMAE4049A	NNTN9087A	PMLN8208A w/ RLN6486A w/ RLN6488A	BDN6783B w/ RLN5312B	470.0000	5.41	-0.34	11.60	6.61	Previous Highest SAR config AN-AB-200814-07#
					5.70	-0.33	11.60	**6.26**	AR(JML)-AB-231208-05
PMAE4102A	NNTN9087A	PMLN8208A w/ RLN6486A w/ RLN6488A	PMMN4123A	460.0000	5.34	-0.31	13.10	7.51	Previous Highest SAR config AN-AB-200819-09#
					5.62	-0.61	12.90	**7.53**	MIN-AB-240124-12
AN000369A02	NNTN9087A	PMLN8208A w/ RLN6486A w/ RLN6488A	PMMN4123A	460.0000	5.56	-0.37	13.20	7.37	Previous Highest SAR config MA-AB-200922-12
					5.70	-0.47	13.00	**7.24**	MFR-AB-231208-01@
794-824 MHz									
AN000296A01	NNTN9087A	PMLN8209A w/ RLN6486A w/ RLN6488A	PMMN4123A	808.5000	3.50	-0.20	12.00	6.46	Previous Highest SAR config AN-AB-200810-09
		PMLN8209B w/ RLN6486A w/ RLN6488A			3.54	-0.30	9.39	**5.12**	MFR-AB-240225-07
851-869 MHz									
AN000296A01	NNTN9216A	PMLN8209A w/ RLN6486A w/ RLN6488A	PMMN4123A	851.0125	3.45	-0.26	11.50	6.37	Previous Highest SAR config AN-AB-200918-01#
		PMLN8209B w/ RLN6486A w/ RLN6488A			3.56	-0.28	8.41	**4.54**	MIN-AB-231213-03

13.4 Additional Assessments per ISED Notice 2016-DRS001

13.4.1 VHF (138–174MHz) assessments.

Additional tests were required for the low, mid and high frequency channels for the configuration with the highest SAR value. SAR plots of the highest results per Table (bolded) are presented in Appendix E.

Table 30

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Run#
Highest Body Configuration									
PMAD4094A	NNTN9087A	PMLN7948A w/ PMLN7965A	None	147.0000	6.58	0.02	0.12	0.06	MFR-AB-240121-13
				155.0000	6.60	-0.37	0.98	0.53	AR-AB-231211-09
				160.0000	6.60	-0.49	0.98	**0.55**	MFR-AB-240121-12
Highest Face Configuration									
PMAD4094A	NNTN9087A	@ back	None	147.0000	6.57	-0.02	0.09	0.05	MFR-FACE-240122-03@
				155.0000	6.60	0.12	0.69	0.34	MFR-FACE-240122-02@
				160.0000	6.60	-0.60	1.04	**0.60**	MFR-FACE-240122-04@

13.4.2 UHF1 (406.125-430MHz, 450-470MHz) assessments.

Additional tests were required for the low, mid and high frequency channels for the configuration with the highest SAR value. 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#
406.1-430 MHz									
Highest Body Configuration									
PMAE4022B	NNTN9087A	PMLN7947A w/ NTN8266B	PMMN4123A	406.1250	5.70	-0.24	9.70	5.13	MFR-AB-231219-08
				422.1000	5.64	-0.27	9.66	**5.19**	AR(JML)-AB-240308-02
				430.0000	5.65	-0.11	8.98	4.65	AR(JML)-AB-240308-03@
Highest Face Configuration									
PMAE4022B	NNTN9089B	@ back	None	406.1250	5.70	-0.45	7.34	**4.07**	AR(JML)-FACE-240308-05
				422.1000	5.69	-0.27	6.67	3.56	MIN-FACE-231221-09
				430.0000	5.67	0.00	5.71	2.87	AR(JML)-FACE-240308-06
450-470 MHz									
Highest Body Configuration									
PMAE4049A	NNTN9087A	PMLN7947A w/ NTN8266B	PMMN4123A	450.0000	5.69	-0.44	12.40	6.87	MFR-AB-240106-08@
				460.0000	5.68	-0.44	12.40	**6.89**	MFR-AB-240124-17
				470.0000	5.70	-0.29	12.40	6.63	MIN-AB-231219-06
Highest Face Configuration									
PMAE4049A	NNTN9087A	@ back	None	450.0000	5.69	-0.26	10.40	5.53	MFR-FACE-240117-09
				460.0000	5.67	-0.34	9.87	5.37	MFR-FACE-240117-10
				470.0000	5.68	-0.29	10.40	**5.58**	MIN-FACE-231221-10

13.4.3 UHF2 (450-470MHz) assessments.

Additional tests were required for the low, mid and high frequency channels for the configuration with the highest SAR value.

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#
Highest Body Configuration									
PMAE4102A	NNTN9087A	PMLN8208A w/ RLN6486A w/ RLN6488A	PMMN4123A	450.0000	5.62	-0.44	12.70	7.13	MIN-AB-240124-10
				460.0000	5.62	-0.61	12.90	**7.53**	MIN-AB-240124-12
				470.0000	5.69	-0.35	12.80	6.95	MFR-AB-240106-06@
Highest Face Configuration									
PMAE4049A	NNTN9089B	@ back	None	450.0000	5.70	-0.24	4.63	**2.45**	AR(JML)-FACE-231216-03@
				460.0000	5.65	-0.24	3.74	1.99	MFR-FACE-240117-06
				470.0000	5.68	-0.38	3.46	1.89	MFR-FACE-240117-07

13.4.4 768-776MHz assessments.

Additional tests were required for the low, mid and high frequency channels for the configuration with the highest SAR value. 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#
Highest Body Configuration									
AN000296A01	NNTN9087A	PMLN7947A w/ PMLN7965A	PMMN4123A	769.0875	2.95	-1.06	6.93	**4.48**	MFR-AB-240224-13@
				772.0000	2.97	-0.92	6.94	4.32	MFR-AB-240224-14@
				774.9125	2.98	-0.77	7.28	4.36	MFR-AB-240224-10@
Highest Face Configuration									
NAF5080A	NNTN9089B	None 2.5cm @ back	None	769.0875	2.98	-0.04	3.43	1.74	AR(JML)-FACE-240225-01@
				772.0000	2.99	-0.30	3.24	1.74	AR(JML)-FACE-240225-02@
				774.9125	2.98	-0.87	3.34	**2.05**	MIN-FACE-240222-11

13.4.5 798-824MHz assessments.

Additional tests were required for the low, mid and high frequency channels for the configuration with the highest SAR value. 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#
Highest Body Configuration									
AN000296A01	NNTN9087A	PMLN8209B w/ RLN6486A w/ RLN6488A	PMMN4123A	799.0875	2.99	-0.16	6.10	3.81	MFR-AB-240223-13
				808.5000	3.54	-0.30	9.39	**5.12**	MFR-AB-240225-07
				823.9875	3.60	-0.10	9.68	4.95	MFR-AB-240107-14@
Highest Face Configuration									
NAF5080A	NNTN9089B	None 2.5cm @ back	None	799.0875	2.99	-0.50	3.79	2.13	AR(JML)-FACE-240224-22
				808.5000	3.47	-0.44	4.62	**2.65**	MIN-FACE-240118-01@
				823.9875	3.46	-0.19	4.42	2.40	AR-FACE-231217-05

13.4.6 851-869MHz assessments.

Additional tests were required for the low, mid and high frequency channels for the configuration with the highest SAR value. 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#
Highest Body Configuration									
AN000296A01	NNTN9216A	PMLN8209B w/ RLN6486A w/ RLN6488A	PMMN4123A	851.0125	3.56	-0.28	8.41	4.54	MIN-AB-231213-03
				860.5000	3.58	0.12	9.93	4.99	MFR-AB-240107-08@
				868.9875	3.59	-0.01	10.9	**5.48**	MFR-AB-240107-09@
Highest Face Configuration									
NAF5080A	NNTN9087A	None 2.5cm @ back	None	851.0125	3.46	-0.12	4.49	**2.40**	MIN-FACE-240118-02@
				860.5000	3.45	-0.07	4.43	2.35	MIN-FACE-240118-03@
				868.9875	3.46	-0.73	3.05	1.88	MIN-FACE-240121-02

13.5 LTE assessments for FCC & ISED

13.5.1 LTE B2 (1850-1910MHz) assessments.

The new derivative model was assessed with the previous highest applicable configuration at the Body and Face. SAR plot of the highest result per Table 36 (bolded) are presented in Appendix E.

Table 36

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Run#
Highest Body Configuration (50% RB)									
AN000304A01	NNTN9089A	PMLN8208A w/ NTN8266B	None	1880.0000	0.170	0.13	0.056	0.082	Previous Highest SAR at Body AN-AB-200807-05#
	NNTN9089B				0.151	-0.09	0.037	**0.063**	AR(JML)-AB-231223-02
Highest Face Configuration (50% RB)									
AN000304A01	NNTN9089A	Non-Display side against the phantom	None	1860.0000	0.156	-0.04	0.256	0.416	Previous Highest SAR at Face LOH-FACE-190130-11
	NNTN9089B				0.152	-0.21	0.214	**0.371**	AR-FACE-231314-02

13.5.2 LTE B4 (1850-1910MHz) assessments.

The new derivative model was assessed with the previous highest applicable configuration at the Body and Face. SAR plot of the highest result per Table 37 (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#
Highest Body Configuration (1 RB)									
AN000304A01	NNTN9089A	PMLN8208A w/ NTN8266B	None	1745.0000	0.200	0.31	0.063	0.079	Previous Highest SAR at Body AN-AB-200807-04#
	NNTN9089B				0.201	0.02	0.061	**0.076**	MFR-AB-231224-02
Highest Face Configuration (1 RB)									
AN000304A01	NNTN9087A	Non-Display side against the phantom	None	1745.0000	0.195	-0.15	0.244	0.325	Previous Highest SAR at Face LOH-FACE-190129-02
					0.201	-0.23	0.277	0.**365**	AR-FACE-231314-03

13.5.3 LTE B5 (824-849MHz) assessments.

The new derivative model was assessed with the previous highest applicable configuration at the Body and Face. SAR plot of the highest result per Table 38 (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#
Highest Body Configuration (50% RB)									
AN000304A01	NNTN9087A	PMLN7947A w/ NTN8266B	None	844.0000	0.160	0.29	0.043	0.067	Previous Highest SAR at Body AM-AB-190201-14
					0.145	-0.10	0.033	**0.058**	MFR-AB-240122-06
Highest Face Configuration (1 RB)									
AN000304A01	NNTN9087A	Non-Display side against the phantom	None	836.5000	0.200	-0.15	0.126	0.164	Previous Highest SAR at Face AM-FACE-190210-05
					0.187	-0.34	0.128	**0.186**	EMR-FACE-231212-03@

13.5.4 LTE B12 (699-716MHz) assessments.

The new derivative model was assessed with the previous highest applicable configuration at the Body and Face. SAR plot of the highest result per Table 39 (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#
Highest Body Configuration (1 RB)									
AN000304A01	NNTN9087A	PMLN8209A w/ RLN6486A w/ RLN6488A	None	704.0000	0.174	0.03	0.035	0.050	Previous Highest SAR at Body AN-AB-200806-01#
		PMLN8209B w/ RLN6486A w/ RLN6488A			0.187	-0.07	0.028	**0.038**	MFR-AB-231225-06@
Highest Face Configuration (50% RB)									
AN000304A01	NNTN9087A	Non-Display side against the phantom	None	704.0000	0.154	-0.05	0.122	0.160	Previous Highest SAR at Face LOH-FACE-190127-05
					0.149	-0.43	0.076	**0.141**	EMR-FACE-231219-04@

13.5.5 LTE B13 (777-787MHz) assessments.

The new derivative model was assessed with the previous highest applicable configuration at the Body and Face. SAR plot of the highest result per Table 40 (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#
Highest Body Configuration (50% RB)									
AN000304A01	NNTN9087A	PMLN8209A w/ RLN6486A w/ RLN6488A	None	782.0000	0.145	0.17	0.050	0.086	Previous Highest SAR at Body FAZ-AB-200824-03
		PMLN8209B w/ RLN6486A w/ RLN6488A			0.152	-0.20	0.047	**0.081**	MIN-AB-231225-02@
Highest Face Configuration (50% RB)									
AN000304A01	NNTN9087A	Non-Display side against the phantom	None	782.0000	0.150	0.09	0.094	0.157	Previous Highest SAR at Face AM-FACE-190127-14
					0.152	-0.19	0.092	**0.159**	EMR-FACE-231212-02@

13.5.6 LTE B14 (788-798MHz) assessments.

The new derivative model was assessed with the previous highest applicable configuration at the Body and Face. SAR plot of the highest result per Table 41 (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#
Highest Body Configuration (1 RB)									
AN000304A01	NNTN9087A	PMLN8209A w/ RLN6486A w/ RLN6488A	None	793.0000	0.178	-0.23	0.067	0.099	Previous Highest SAR at Body AM(AMN)-AB-200806-09#
		PMLN8209B w/ RLN6486A w/ RLN6488A			0.192	-0.35	0.049	**0.069**	MIN-AB-231225-01@
Highest Face Configuration (1 RB)									
AN000304A01	NNTN9087A	Non-Display side against the phantom	None	793.0000	0.192	-0.17	0.137	0.186	Previous Highest SAR at Face LOH-FACE-190128-07
					0.192	-0.04	0.128	**0.169**	BL-FACE-231212-01@

13.5.7 LTE B17 (734-746MHz) assessments.

The new derivative model was assessed with the previous highest applicable configuration at the Body and Face. SAR plot of the highest result per Table 42 (bolded) are presented in Appendix E.

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#
Highest Body Configuration (1 RB)									
AN000304A01	NNTN9087A	PMLN8209A w/ RLN6486A w/ RLN6488A	None	709.0000	0.185	0.09	0.023	0.031	Previous Highest SAR at Body ZZ-AB-200823-06
		PMLN8209B w/ RLN6486A w/ RLN6488A			0.187	-0.08	0.024	**0.033**	MFR-AB-231225-07@
Highest Face Configuration (1 RB)									
AN000304A01	NNTN9087A	Non-Display side against the phantom	None	709.0000	0.187	-0.16	0.115	0.160	Previous Highest SAR at Face LOH-FACE-190131-08
					0.187	-0.20	0.094	**0.132**	EMR-FACE-231212-05

13.5.8 Additional Assessments per ISED Notice 2016-DRS001

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.

For LTE bands (B5, B12, B13, B14 and B17) with overlapping channels, only the middle channel are select.

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#
LTE B2 (1850-1910 MHz)									
Highest Body Configuration									
AN000304A01	NNTN9089B	PMLN8208A w/ NTN8266B	None	1860.0000	0.152	-0.25	0.033	0.058	AR(JML)-AB-240109-01@
				1880.0000	0.151	-0.09	0.037	**0.063**	AR(JML)-AB-231223-02
				1900.0000	0.149	-0.20	0.020	0.035	AR(JML)-AB-240109-02@
Highest Face Configuration									
AN000304A01	NNTN9089B	Non-Display side against the phantom	None	1860.0000	0.152	-0.21	0.214	**0.371**	AR-FACE-231314-02
				1880.0000	0.149	-0.14	0.189	0.329	MFR-FACE-240118-05
				1900.0000	0.149	-0.05	0.178	0.304	MFR-FACE-240118-06
LTE B4 (1850-1910 MHz)									
Highest Body Configuration									
AN000304A01	NNTN9089B	PMLN8208A w/ NTN8266B	None	1720.0000	0.202	-0.11	0.071	**0.091**	MIN-AB-230109-11@
				1732.5000	0.195	-0.04	0.037	0.048	AR(JML)-AB-240109-03@
				1745.0000	0.201	0.02	0.061	0.076	MFR-AB-231224-02
Highest Face Configuration									
AN000304A01	NNTN9087A	Non-Display side against the phantom	None	1720.0000	0.202	-0.38	0.265	0.360	MFR-FACE-240118-07
				1732.5000	0.195	-0.04	0.258	0.335	MFR-FACE-240118-08
				1745.0000	0.201	-0.23	0.277	**0.365**	AR-FACE-231314-03

13.6 WLAN assessment for FCC & ISED

13.6.1 WLAN 2.4GHz assessments.

The new derivative model was assessed with the previous highest applicable configuration at the Body and Face. SAR plot of the highest result per Table 44 (bolded) are presented in Appendix E

Table 44

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#
Highest Body Configuration									
AN000304A03	NNTN9087A	PMLN8208A w/ RLN6486A w/ RLN6488A	None	2437.0000	0.164	-0.23	0.086	0.111	Previous Highest SAR at Body AN-AB-200805-05#
					0.142	-0.38	0.060	**0.093**	AR(JML)-AB-231227-12
Highest Face Configuration									
AN000304A03	NNTN9087A	Non-Display side against the phantom	None	2462.0000	0.188	-0.51	0.218	0.262	Previous Highest SAR at Face ZZ-FACE-190206-03
					0.145	-0.26	0.110	**0.162**	EMR-FACE-231214-06

13.6.2 WLAN 5GHz assessments.

(U-NII-2A 5.25-5.35 GHz)

The new derivative model was assessed with the previous highest applicable configuration at the Body and Face. SAR plot of the highest result per Table 45 (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#
Highest Body Configuration									
AN000304A03	NNTN9087A	PMLN8209A w/ RLN6486A w/ RLN6488A	None	5270.0000	0.112	-0.32	0.035	0.059	Previous Highest SAR at Body ZZ-AB-200807-09
		PMLN8209B w/ RLN6486A w/ RLN6488A			0.152	0.12	0.011	**0.013**	MFR-AB-240108-09
Highest Face Configuration									
AN000304A03	NNTN9089A	Non-Display side against the phantom	None	5270.0000	0.117	-0.43	0.432	0.709	Previous Highest SAR at Face FD-FACE-190129-02#
	NNTN9089B				0.152	-0.21	0.208	**0.249**	AR-FACE-231215-02@

(U-NII-2C 5.47-5.65 GHz)

The new derivative model was assessed with the previous highest applicable configuration at the Body and Face. SAR plot of the highest result per Table 46 (bolded) are presented in Appendix E

Table 46

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Run#
Highest Body Configuration									
AN000304A03	NNTN9089A	PMLN7947A w/ PMLN7965A	None	5630.0000	0.122	-0.90	0.029	0.051	Previous Highest SAR at Body FD-AB-190125-06
	NNTN9089B				0.146	0.08	0.010	**0.012**	BL-AB-231216-04@
Highest Face Configuration									
AN000304A03	NNTN9089A	Non-Display side against the phantom	None	5630.0000	0.122	0.00	0.601	0.856	Previous Highest SAR at Face ZZ-FACE-190130-01#
	NNTN9089B				0.146	-0.40	0.361	**0.471**	EMR-FACE-231214-08

(U-NII-2C 5.47-5.65 GHz)

The new derivative model was assessed with the previous highest applicable configuration at the Body and Face. SAR plot of the highest result per Table 47 (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#
Highest Body Configuration									
AN000304A03	NNTN9089A	PMLN7964A w/ NTN8266B	None	5795.0000	0.117	-0.51	0.034	0.057	Previous Highest SAR at Body FD-AB-190122-01#
	NNTN9089B				0.128	-0.23	0.010	**0.014**	BL-AB-231216-06@
Highest Face Configuration									
AN000304A03	NNTN9089A	Non-Display side against the phantom	None	5795.0000	0.117	-0.19	0.762	1.183	Previous Highest SAR at Face ZZ-FACE-190206-06
	NNTN9089B				0.128	-0.32	0.451	**0.661**	EMR-FACE-231215-04

13.6.3 Additional Assessments per ISED Notice 2016-DRS001

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

Table 48

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Run#
WLAN 2.4GHz (802.11b – DSSS)									
Highest Body Configuration									
AN000304A03	NNTN9087A	PMLN8208A w/ RLN6486A w/ RLN6488A	None	2412.0000	0.128	0.06	0.053	0.083	AR(JML)-AB-240108-02@
				2437.0000	0.142	-0.38	0.060	**0.093**	AR(JML)-AB-231227-12
				2462.0000	0.145	0.01	0.065	0.090	AR(JML)-AB-240108-03@
Highest Face Configuration									
AN000304A03	NNTN9087A	Non-Display side against the phantom	None	2412.0000	0.128	-0.44	0.10	0.174	MFR-FACE-240118-10
				2437.0000	0.142	-0.09	0.12	**0.178**	AR(JML)-FACE-240118-12
				2462.0000	0.145	-0.26	0.11	0.162	EMR-FACE-231214-06
WLAN 5GHz (802.11n – U-NII-2A)									
Highest Body Configuration									
AN000304A03	NNTN9087A	PMLN8209B w/ RLN6486A w/ RLN6488A	None	5270.0000	0.152	0.12	0.011	0.013	MFR-AB-240108-09
				5310.0000	0.132	-0.23	0.015	**0.021**	MFR-AB-240108-07
Highest Face Configuration									
AN000304A03	NNTN9089B	Non-Display side against the phantom	None	5270.0000	0.152	-0.21	0.208	0.249	AR-FACE-231215-02@
				5310.0000	0.132	-0.10	0.256	**0.249**	AR(JML)-FACE-240119-03
WLAN 5GHz (802.11n – U-NII-2C)									
Highest Body Configuration									
AN000304A03	NNTN9089B	PMLN7947A w/ PMLN7965A	None	5510.0000	0.076	-3.36*	0.006	**0.032**	AR(JML)-AB-240127-09@
				5590.0000	0.135	0.10	0.022	0.028	MIN-AB-240109-10
				5630.0000	0.146	0.08	0.010	0.012	BL-AB-231216-04@
Highest Face Configuration									
AN000304A03	NNTN9089B	Non-Display side against the phantom	None	5510.0000	0.076	-0.27	0.171	0.418	MFR-FACE-240119-06
				5590.0000	0.135	-0.08	0.283	0.373	MFR-FACE-240119-07
				5630.0000	0.146	-0.40	0.361	**0.471**	EMR-FACE-231214-08

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

Table 48 (Continued)

Antenna	Battery	Carry Accessory	Cable Accessory	Test Freq (MHz)	Init Pwr (W)	SAR Drift (dB)	Meas. 1g-SAR (W/kg)	Max Calc. 1g-SAR (W/kg)	Run#
WLAN 5GHz (802.11n – U-NII-3)									
Highest Body Configuration									
AN000304A03	NNTN9089B	PMLN7964A w/ NTN8266B	None	5670.0000	0.149	0.12	0.025	**0.029**	AR(JML)-AB-240109-12
				5755.0000	0.138	0.26	0.014	0.018	MFR-AB-240109-06
				5795.0000	0.128	-0.23	0.010	0.014	BL-AB-231216-06@
Highest Face Configuration									
AN000304A03	NNTN9089B	Non-Display side against the phantom	None	5670.0000	0.149	-0.10	0.383	0.457	MFR-FACE-240119-08
				5755.0000	0.138	-0.23	0.416	0.551	MFR-FACE-240119-09
				5795.0000	0.128	-0.32	0.451	**0.661**	EMR-FACE-231215-04

13.7 Assessment at the Bluetooth band

13.7.1 FCC Requirement

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)] *[√ F(GHz)] = 2.8 W/kg, which is ≤ 3 W/kg (1g)

Where:

Max. Power = 8.89mW (11.5mW*77.26 % duty cycle)
Min. test separation distance = 5mm for actual test separation < 5mm
F(GHz) = 2.48 GHz

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

13.7.2 ISED Canada Requirement

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

Standalone Bluetooth transmitter operates at

Maximum conducted power:
= 11.5 mW * 77.26 %
= 8.89 mW or 9.49 dBm

Equivalent isotropically radiated power (EIRP):
= Maximum conducted power, dBm + Antenna gain, dBi
= 9.49 dBm + 3.2 dBi
= 12.69 dBm or 18.58 mW

Higher output power level, Equivalent isotropically radiated power (EIRP)
18.58 mW was below the threshold power level 20 mW. Hence SAR test was not required for Bluetooth band.

13.7 Assessment at the 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

13.8 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 provide in Appendix F.

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#
PMAE4102A	NNTN9087A	PMLN8208A w/ RLN6486A w/ RLN6488A	PMMN4123A	460.0000	5.61	-0.15	14.00	7.36	MIN-AB-240124-11

14.0 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 50 (FCC)

Equipment Class	Frequency band (MHz)	Max Calc at Body (W/kg)	Max Calc at Face (W/kg)
		1g-SAR	1g-SAR
LMR	150.8-173.4	1.24*	1.19*
	406.125-470	6.89[1]	5.58[1]
	450-512	7.53[2]	4.58*
	769-775	4.57*	2.05[3]
	799-824	6.46*	2.65[4]
	851-869	6.37*	2.40[5]
LTE	LTE B2	0.082*	0.416*
	LTE B4	0.091[6]	0.365[6]
	LTE B5	0.067*	0.186[7]
	LTE B12	0.050*	0.160*
	LTE B13	0.086*	0.159[8]
	LTE B14	0.099*	0.186*
	LTE B17	0.033[9]	0.160*
WLAN	2.4 GHz	0.111*	0.262*
	5.0 GHz	0.059[10]	1.183*
Highest Simultaneous Transmission SAR	Sum of SAR (W/kg)	7.62**	5.63**

All results are scaled to the maximum output power.

Notes:* SAR result from previous filling (FCC ID: AZ489FT7119)

**Simultaneous Transmission SAR result from previous filling

[1] New highest SAR value at 406.125-470 MHz for body & face is 6.89 & 5.58 W/kg compared to previous on file SAR value of 6.50 & 5.52 W/kg.

[2] New highest SAR value at 450-512 MHz for body is 7.53 W/kg compared to previous on file SAR value of 7.51 W/kg.

[3] New highest SAR value at 769-775 MHz for face is 2.05 W/kg compared to previous on file SAR value of 1.93 W/kg.

[4] New highest SAR value at 799-824 MHz for face is 2.65 W/kg compared to previous on file SAR value of 2.37 W/kg.

[5] New highest SAR value at 851-869 MHz for face is 2.40 W/kg compared to previous on file SAR value of 2.15 W/kg.

[6] New highest SAR value at LTE B4 for body & face is 0.091 & 0.365 W/kg compared to previous on file SAR value of 0.079 & 0.325 W/kg.

[7] New highest SAR value at LTE B5 for face is 0.186 W/kg compared to previous on file SAR value of 0.164 W/kg.

[8] New highest SAR value at LTE B13 for face is 0.159 W/kg compared to previous on file SAR value of 0.157 W/kg.

[9] New highest SAR value at LTE B17 for body is 0.033 W/kg compared to previous on file SAR value of 0.031 W/kg.

[10] New highest SAR value at 5.0 GHz for body is 0.059 W/kg compared to previous on file SAR value of 0.057 W/kg.

Table 51 (ISED)

Technologies	Frequency band (MHz)	Max Calc at Body (W/kg)	Max Calc at Face (W/kg)
		1g-SAR	1g-SAR
LMR	138-173.4	1.24*	1.19*
	406.125-430, 450-470	6.89[1]	5.58[1]
	450-512	7.53[2]	3.11*
	769-775	4.57*	2.05[3]
	799-824	6.46*	2.65[4]
	851-869	6.37*	2.40[5]
LTE	LTE B2	0.082*	0.416*
	LTE B4	0.091[6]	0.365[6]
	LTE B5	0.067*	0.186[7]
	LTE B12	0.050*	0.160*
	LTE B13	0.086*	0.159[8]
	LTE B14	0.099*	0.186*
	LTE B17	0.033[9]	0.160*
WLAN	2.4 GHz	0.111*	0.262*
	5.0 GHz	0.059[10]	1.183*
Highest Simultaneous Transmission SAR	Sum of SAR (W/kg)	7.62**	5.63**

All results are scaled to the maximum output power.

Notes:* SAR result from previous filling (ISED ID: 109U-89FT7119)

**Simultaneous Transmission SAR result from previous filling

[1] New highest SAR value at 406.125-470 MHz for body & face is 6.89 & 5.58 W/kg compared to previous on file SAR value of 6.50 & 5.52 W/kg.

[2] New highest SAR value at 450-512 MHz for body is 7.53 W/kg compared to previous on file SAR value of 7.51 W/kg.

[3] New highest SAR value at 769-775 MHz for face is 2.05 W/kg compared to previous on file SAR value of 1.93 W/kg.

[4] New highest SAR value at 799-824 MHz for face is 2.65 W/kg compared to previous on file SAR value of 2.37 W/kg.

[5] New highest SAR value at 851-869 MHz for face is 2.40 W/kg compared to previous on file SAR value of 2.15 W/kg.

[6] New highest SAR value at LTE B4 for body & face is 0.091 & 0.365 W/kg compared to previous on file SAR value of 0.079 & 0.325 W/kg.

[7] New highest SAR value at LTE B5 for face is 0.186 W/kg compared to previous on file SAR value of 0.164 W/kg.

[8] New highest SAR value at LTE B13 for face is 0.159 W/kg compared to previous on file SAR value of 0.157 W/kg.

[9] New highest SAR value at LTE B17 for body is 0.033 W/kg compared to previous on file SAR value of 0.031 W/kg.

[10] New highest SAR value at 5.0 GHz for body is 0.059 W/kg compared to previous on file SAR value of 0.057 W/kg.

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).

15.0 Variability Assessment

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

The Table below includes test results of the original measurement(s), the repeated measurement(s), and the ratio (SAR_{high}/SAR_{low}) for the applicable test configuration(s).

Table 52 (UHF1)

Run#	Antenna	Battery	Cable Accessory	Cable Accessory	Test Freq. (MHz)	Adj Calc. 1g-SAR (W/kg)	Ratio	Comments
MFR-AB-240124-17	PMAE4049A	NNTN9087A	PMLN7947A w/ NTN8266B	PMMN4123A	460.0000	6.86	1.11	No additional repeated scans is required due to the Ratio (SAR_{high}/SAR_{low}) < 1.20
AR(JML)-AB-240127-06						6.20		

Table 53 (UHF2)

Run#	Antenna	Battery	Cable Accessory	Cable Accessory	Test Freq. (MHz)	Adj Calc. 1g-SAR (W/kg)	Ratio	Comments
MIN-AB-240124-12	PMAE4102A	NNTN9087A	PMLN8208A w/ RLN6486A w/ RLN6488A	PMMN4123A	460.0000	7.42	1.02	No additional repeated scans is required due to the Ratio (SAR_{high}/SAR_{low}) < 1.20
MIN-AB-240124-11						7.25		

Table 54 (799-824 MHz)

Run#	Antenna	Battery	Cable Accessory	Cable Accessory	Test Freq. (MHz)	Adj Calc. 1g-SAR (W/kg)	Ratio	Comments
MFR-AB-240225-07	AN000296A01	NNTN9087A	PMLN8209B w/ RLN6486A w/ RLN6488A	PMMN4123A	808.5000	5.03	1.04	No additional repeated scans is required due to the Ratio (SAR_{high}/SAR_{low}) < 1.20
AR(JML)-AB-240226-13						5.23		

Table 55 (851-869 MHz)

Run#	Antenna	Battery	Cable Accessory	Cable Accessory	Test Freq. (MHz)	Adj Calc. 1g-SAR (W/kg)	Ratio	Comments
MFR-AB-240107-09@	AN000296A01	NNTN9216A	PMLN8209B w/ RLN6486A w/ RLN6488A	PMMN4123A	868.9875	5.46	1.03	No additional repeated scans is required due to the Ratio (SAR_{high}/SAR_{low}) < 1.20
MFR-AB-240125-04						5.60		

16.0 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/IEC 17025 a reported system uncertainty is required and therefore measurement uncertainty budget is included in Appendix A.