RF TEST REPORT

SIEMIC
A Bureau Veritas Group Company

Report No.: FCC_IC_SL18041705-MED-027 Rev_1.0
Supersede Report No.: FCC_IC_SL18041705-MED-027

Applicant	:	Medtronic Inc.
Product Name	:	Percept PC (Sequentia™ LT/ Vanta™ with AdaptiveStim™)
Model No.	:	B35200/977005/977006
Test Standard	:	FCC Part 95I Medical Device Radio Communications Service RSS-Gen, RSS-243
Test Method	:	ANSI/TIA/EIA-603-D:2010 RSS-Gen, RSS-243
FCC ID	:	LF5B35200
IC	:	3408D-B35200
Dates of test	:	05/14/2018 to 05/18/2018
Issue Date	:	03/11/2021
Test Result	:	☒ Pass ☐ Fail

This Test Report is Issued Under the Authority of:

Cipher	**Chen Ge**
Test Engineer	Engineer Reviewer

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Test result presented in this test report is applicable to the tested sample only

Issued By:
SIEMIC Laboratories
775 Montague Expressway, Milpitas, CA 95035

ilac-MRA

A2LA ACCREDITED
TESTING CERT # 2742-01

Laboratory Introduction

SIEMIC, headquartered in the heart of Silicon Valley, with superior facilities in US and Asia, is one of the leading independent testing and certification facilities providing customers with one-stop shop services for Compliance Testing and Global Certifications.

In addition to testing and certification, SIEMIC provides initial design reviews and compliance management throughout a project. Our extensive experience with China, Asia Pacific, North America, European, and International compliance requirements, assures the fastest, most cost effective way to attain regulatory compliance for the global markets.

Accreditations for Conformity Assessment

Country/Region	Accreditation Body	Scope
USA	FCC, A2LA	EMC, RF/Wireless, Telecom
Canada	IC, A2LA, NIST	EMC, RF/Wireless, Telecom
Taiwan	BSMI, NCC, NIST	EMC, RF, Telecom, Safety
Hong Kong	OFTA, NIST	RF/Wireless, Telecom
Australia	NATA, NIST	EMC, RF, Telecom, Safety
Korea	KCC/RRA, NIST	EMI, EMS, RF, Telecom, Safety
Japan	VCCI, JATE, TELEC, RFT	EMI, RF/Wireless, Telecom
Mexico	NOM, COFETEL, Caniety	EMC, RF/Wireless, Telecom, Safety
Europe	A2LA, NIST	EMC, RF, Telecom, Safety
Israel	MOC, NIST	EMC, RF, Telecom, Safety

Accreditations for Product Certifications

Country	Accreditation Body	Scope
USA	FCC TCB, NIST	EMC, RF, Telecom
Canada	IC FCB, NIST	EMC, RF, Telecom
Singapore	iDA, NIST	EMC, RF, Telecom
EU	NB	EMC & R&TTE Directive
Japan	MIC (RCB 208)	RF, Telecom
Hong Kong	OFTA (US002)	RF, Telecom

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1 Report Revision History

Report No.	Report Version	Description	Issue Date
FCC_IC_SL18041705-MED-027	None	Original	05/29/2018
FCC_IC_SL18041705-MED-027 Rev_1.0	Rev_1.0	Update per client review	03/11/2021

2 Executive Summary

The purpose of this test program was to demonstrate compliance of following product

Company: Medtronic, Inc.
Product: Percept PC (Sequentia™ LT/ Vanta™ with AdaptiveStim™)
Model: B35200/977005/977006

against the current Stipulated Standards. The specified model product stated above has demonstrated compliance with the Stipulated Standard listed on 1st page.

3 Customer information

Applicant Name	:	Medtronic, Inc.
Applicant Address 1	:	710 Medtronic Parkway NE Minneapolis 55432 USA
Applicant Address 2	:	7000 Central Ave. NE, Minneapolis, MN 55432
Manufacturer Name	:	Medtronic, Inc.
Manufacturer Address 1	:	710 Medtronic Parkway NE Minneapolis 55432 USA
Manufacturer Address 2	:	7000 Central Ave. NE, Minneapolis, MN 55432

4 Test site information

Lab performing tests	:	SIEMIC Laboratories
Lab Address	:	775 Montague Expressway, Milpitas, CA 95035
FCC Test Site No.	:	540430
IC Test Site No.	:	4842D
VCCI Test Site No.	:	A0133

5 Modification

Index	Item	Description	Note
-	-	-	-

6 EUT Information

6.1 EUT Description

Product Name	:	Percept PC (Sequentia™ LT/ Vanta™ with AdaptiveStim™)
Model No.	:	B35200/977005/977006
Trade Name	:	Medtronic
Serial No.	:	NME402202N
Input Power	:	Battery Power 3.0V
Product Hardware version	:	1.8
Product Software version	:	1.8
Radio Hardware version	:	1.8
Radio Software version	:	1.8
Product Radio Test firmware	:	NRP1025-37052
Date of EUT received	:	04/28/2018
Equipment Class/ Category	:	MICS
Working Frequencies	:	402-405MHz (RX 175KHz)
Note	:	This product is an Ultra low Power Active Medical Implant (ULP-AMI)

6.2 Radio Description

Specifications for Radio:

Radio Type	MICS
Operating Frequency	402-405 MHz
Modulation	FSK
ULP-AMI	300 KHz
Antenna Type	Integral Loop Antenna
Antenna Gain	-28dBi (maximum output of -3.55dBi at the module to antenna)
N0. Of RF Channels	10
Antenna Connector Type	none. Antenna (dipole) encapsulated in the implant header.

6.3 EUT test modes/configuration Description

Mode	Note
RF test	Set the EUT to transmit continuously in different test modes and channels.
Note: None	

Test Item	Operating mode	Tested antenna port	Test frequencies
Antenna Requirement	N/A	-	-
Effective Radiated Power of the Fundamental Emission	Continuous Transmit	-	402.15 MHz (Low Channel 1),404.85 MHz (High Channel 10)
Radiated Measurements 30MHz to 1GHz	Continuous Transmit	-	402.15 MHz (Low Channel 1),404.85 MHz (High Channel 10)
Radiated Measurements above 1GHz	Continuous Transmit	-	402.15 MHz (Low Channel 1), 403.35MHz (Mid Channel 5), 404.85 MHz (High Channel 10)
Frequency Stability	Continuous Transmit	-	
Occupied Bandwidth	Continuous Transmit	-	
Note: Only radiated measurements were performed during the test.			

7 Supporting Equipment/Software and cabling Description

7.1 Supporting Equipment

Item	Support Equipment Description	Model	Serial Number	Manufacturer	Notes
1	LAPTOP	LATITUDE E6220	N/A	DELL	N/A
2	Medtronic TM91	TM91	NPE000046N	Medtronic	N/A

7.2 Cabling Description

Item	Connection Start		Connection Stop		Length / shielding Info		Note
	From	I/O Port	To	I/O Port	Length (m)	Shielding	
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

7.3 Test Software Description

Test Item	Software	Description
RF Testing	RF test software Xtm_facunal_test_App_exectable_V.6.0.exe	Provided by manufacturer to set EUT in continuous mode

8 Test Summary

Test Item	Test standard		Test Method/Procedure		Pass / Fail
Effective Radiated Power of the Fundamental Emission	FCC	47 CFR §95.2567	FCC	ANSI/TIA/EIA-603-D:2010	☒ Pass ☐ N/A
	IC	RSS-243	IC	RSS-243 3.1, 5.4	
Radiated Spurious Emissions	FCC	47 CFR §95.2569, §95.2579	FCC	ANSI/TIA/EIA-603-D:2010	☒ Pass ☐ N/A
	IC	RSS-243	IC	RSS-243 5.5	
Frequency Stability	FCC	47 CFR §95.2565	FCC	ANSI/TIA/EIA-603-D:2010	☒ Pass ☐ N/A
	IC	RSS-243	IC	RSS-243 3.3 b & 5.3	
Occupied Bandwidth	FCC	47 CFR §95.2573	FCC	ANSI/TIA/EIA-603-D:2010	☒ Pass ☐ N/A
	IC	RSS-Gen	IC	RSS Gen 4.6, RSS-293 5.1	
Remark	1. All measurement uncertainties are not taken into consideration for all presented test result. 2. The applicant shall ensure frequency stability by showing that an emission is maintained within the band of operation under all normal operating conditions as specified in the user's manual.				

9 Measurement Uncertainty

9.1 Conducted Emissions

The test is to measure the conducted emissions to the mains port of the EUT.

Some error sources that can contribute to the total uncertainty:
- Uncertainty of the receiver
- Uncertainty of the LISN
- Uncertainty of cables
- Uncertainty due to the mismatches
- Etc, see the below table for details

Source of Uncertainty	Value (dB)	Probability Distribution	Division	Sensitivity Coefficient	Expanded Uncertainty
Receiver Reading	0.12	Rectangular	1.732	1	0.069284
Cable Insertion Loss	0.21	Normal	2	1	0.105
Filter Insertion Loss	0.25	Normal	2	1	0.125
LISN Insertion Loss	0.40	Normal	2	1	0.20
Receiver CW accuracy	0.5	Rectangular	1.732	1	0.2886836
Pulse Amplitude Response	1.5	Rectangular	1.732	1	0.86605081
PRF Response	1.5	Rectangular	1.732	1	0.86605081
Mismatch LISN - Receiver	0.25	U-Shape	1.414	1	0.1768033
LISN Impedance	2.5	Triangular	2.449	1	1.0208248
Combined Standard Uncertainty					1.928133
Expanded Uncertainty (K=2)					**3.856266**

The total derived measurement uncertainty is +/- 3.86 dB.

9.2 Radiated Emissions (30MHz to 1GHz)

The test is to measure the radiated emissions of the EUT.

Some error sources that can contribute to the total uncertainty:
- Uncertainty of the receiver
- Uncertainty of the antenna
- Uncertainty of cables
- Uncertainty due to the mismatches
- NSA Calibration
- Etc., details see the below table

Source of Uncertainty	Value (dB)	Probability Distribution	Division	Sensitivity Coefficient	Expanded Uncertainty
Receiver Reading	0.12	Rectangular	1.732	1	0.069284
Cable Insertion Loss	0.21	Normal	2	1	0.105
Filter Insertion Loss	0.25	Normal	2	1	0.125
Antenna Factor	0.65	Normal	2	1	0.325
Receiver CW accuracy	0.5	Rectangular	1.732	1	0.2886836
Pulse Amplitude Response	1.5	Rectangular	1.732	1	0.86605081
PRF Response	1.5	Rectangular	1.732	1	0.86605081
Mismatch Filter - Receiver	0.25	U-Shape	1.414	1	0.1768033
NSA Calibration	4.0	U-Shape	1.414	1	2.8288543
Combined Standard Uncertainty					3.0059131
Expanded Uncertainty (K=2)					**6.0118262**

The total derived measurement uncertainty is +/- 6.00 dB.

9.3 Radiated Emissions (1GHz to 60GHz)

The test is to measure the radiated emissions of the EUT.

Some error sources that can contribute to the total uncertainty:

- Uncertainty of the receiver
- Uncertainty of the antenna
- Uncertainty of cables
- Uncertainty due to the mismatches
- VSWR Calibration
- Etc., details see the below table

Source of Uncertainty	Value (dB)	Probability Distribution	Division	Sensitivity Coefficient	Expanded Uncertainty
Receiver Reading	0.12	Rectangular	1.732	1	0.0692840
Cable Insertion Loss	0.21	Normal	2	1	0.1050000
Filter Insertion Loss	0.25	Normal	2	1	0.1250000
Antenna Factor	0.65	Normal	2	1	0.3250000
Receiver CW accuracy	0.5	Rectangular	1.732	1	0.2886836
Pulse Amplitude Response	1.5	Rectangular	1.732	1	0.8660508
PRF Response	1.5	Rectangular	1.732	1	0.8660508
Mismatch Filter - Receiver	0.25	U-Shape	1.414	1	0.1768033
VSWR Calibration	2.0	U-Shape	1.414	1	1.4144272
Combined Standard Uncertainty					4.2363
Expanded Uncertainty (K=2)					**8.4726**

The total derived measurement uncertainty is +/- 8.47 dB.

9.4 RF conducted measurement

The test is to measure the RF output power from the EUT.

Some error sources that can contribute to the total uncertainty:

- Uncertainty of the Reference Level Uncertainty
- Uncertainty of variable attenuators
- Uncertainty of cables
- Uncertainty due to the mismatches

Source of Uncertainty	Value (dB)	Probability Distribution	Division	Sensitivity Coefficient	Expanded Uncertainty
Reference Level	0.12	Rectangular	1.732	1	0.069284
Cable Insertion Loss	0.21	Normal	2	1	0.105
Attenuator	0.25	Normal	2	1	0.125
Mismatch	0.25	U-Shape	1.414	1	0.1768033
Combined Standard Uncertainty					0.476087
Expanded Uncertainty (K=2)					**0.952174**

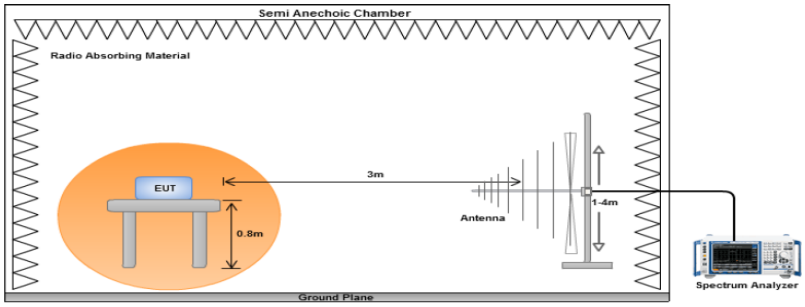
The total derived measurement uncertainty is +/- 0.95 dB.

10 Measurements, examination and derived results

10.1 EIRP of the Fundamental Emission

Requirement(s):

Spec	Requirement	Applicable
FCC 95.2567; & RSS-243 3.1, 5.4	Each MedRadio transmitter type must be designed such that the MedRadio equivalent isotropically radiated power (M-EIRP) does not exceed the limits in this section. Compliance with these limits must be determined as set forth in §95.2569. (a) Transmitters subject to frequency monitoring—401-406 MHz. For MedRadio transmitters that are not excepted under §95.2559(b) from the frequency monitoring requirements of §95.2559(a): (1) The M-EIRP within any 300 kHz bandwidth within the 402-405 MHz band must not exceed 25 microwatts. (2) The M-EIRP within any 100 kHz bandwidth within the 401-402 MHz or 405-406 MHz bands must not exceed 25 microwatts. (b) Transmitters excepted from frequency monitoring—401-402 MHz and 405-406 MHz. For MedRadio transmitters that are excepted under §95.2559(b)(2) or (3) from the frequency monitoring requirements of §95.2559(a): (1) The M-EIRP of any transmitter operating in the 401-401.85 MHz or 405-406 MHz bands must not exceed 250 nanowatts in any 100 kHz bandwidth. (2) The M-EIRP of any transmitter operating in the 401.85-402 MHz band must not exceed 25 microwatts in any 150 kHz bandwidth. (c) Transmitters excepted from frequency monitoring—403.65 MHz. For MedRadio transmitters that are excepted under §95.2559(b)(4) from the frequency monitoring requirements of §95.2559(a), the M-EIRP must not exceed 100 nanowatts in the 300 kHz bandwidth centered at 403.65 MHz. (d) Transmitters—other frequency bands. For MedRadio transmitters operating in the 413-419 MHz, 426-432 MHz, 438-444 MHz, or 451-457 MHz bands: (1) The peak M-EIRP over the frequency bands of operation must not exceed the lesser of zero dBm (1 mW) or 10 log (B)−7.782 dBm, where B is the MedRadio 20 dB emission bandwidth in megahertz. (2) The peak power spectral density must not exceed 800 microwatts per megahertz in any one megahertz band. (e) Transmitters—2360-2390 MHz band. For MedRadio transmitters operating in the 2360-2390 MHz band, the M-EIRP over the bands of operation must not exceed the lesser of zero dBm (1 mW) or 10 log (B) dBm, where B is the MedRadio 20 dB emission bandwidth in megahertz. (f) Transmitters—2390-2400 MHz band. For MedRadio transmitters operating in the 2390-2400 MHz band, the M-EIRP over the bands of operation must not exceed the lesser of 13 dBm (20 mW) or 16 + 10 log (B) dBm, where B is the MedRadio 20 dB emission bandwidth in megahertz.	☒

Test Setup			
Procedure	1. The EUT was switched on and allowed to warm up to its normal operating condition. 2. The test was carried out at the selected frequency points obtained from the EUT characterisation. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and adjusting the antenna height in the following manner: a. Vertical or horizontal polarisation (whichever gave the higher emission level over a full rotation of the EUT) was chosen. b. The EUT was then rotated to the direction that gave the maximum emission. c. Finally, the antenna height was adjusted to the height that gave the maximum emission.		
Test Date	05/14/2018 to 05/18/2018	Environmental conditions	Temperature 23°C Relative Humidity 48% Atmospheric Pressure 1026mbar
Result	☒ Pass ☐ Fail		

Test Data ☒ Yes (See below) ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

Test was done by Cipher at 10 meter chamber.

EIRP - 402.15 MHz

Indicated			Test Antenna		Substituted						
Frequency (MHz)	Raw (dBuV)	Degree	Height (cm)	Polarity	Frequency (MHz)	Level (dBm)	Ant Gain (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
402.15	80.66	36	157	V	402.2	-27.36	0	1	-28.36	-16	-12.36
402.15	78.64	185	157	H	402.2	-30.53	0	1	-31.53	-16	-15.53

EIRP - 404.85

Indicated			Test Antenna		Substituted						
Frequency (MHz)	Raw (dBuV)	Degree	Height (cm)	Polarity	Frequency (MHz)	Level (dBm)	Ant Gain (dBi)	Cable Loss (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
404.85	79.67	36	157	V	404.9	-28.35	0	1	-29.35	-16	-13.35
404.85	78.02	185	157	H	404.9	-31.15	0	1	-32.15	-16	-16.15

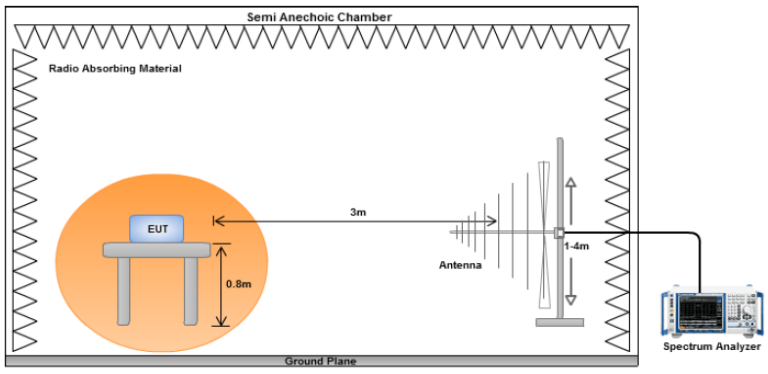
10.2 Radiated Measurements

10.2.1 Radiated Measurements 30MHz to 1GHz

Requirement(s):

Spec	Requirement	Applicable
FCC 95.2579 and RSS-243 5.5	(a) Field strength limits. The field strengths of unwanted emissions from each MedRadio transmitter type, measured at a distance of 3 meters, must not exceed the field strength limits shown in the table in this paragraph for the indicated frequency ranges, if the frequencies of these emissions are: (1) More than 250 kHz outside of the 402-405 MHz band (for devices designed to operate in the 402-405 MHz band); (2) More than 100 kHz outside of either the 401-402 MHz or 405-406 MHz bands (for devices designed to operate in the 401-402 MHz or 405-406 MHz bands); (3) In the 406.000-406.100 MHz band (for devices designed to operate in the 401-402 MHz or 405-406 MHz bands); or (4) More than 2.5 MHz outside of the 413-419 MHz, 426-432 MHz, 438-444 MHz or 451-457 MHz bands (for devices designed to operate in these four bands). (5) More than 2.5 MHz outside of the 2360-2400 MHz band (for devices designed to operate in the 2360-2400 MHz band).	☒

Frequency range (MHz)	Field Strength (uV/m)	Measurement Distance (meter)
30 – 88	100	3
88 – 216	150	3
216 960	200	3
Above 960	500	3

Test Setup	

Procedure	1. The EUT was switched on and allowed to warm up to its normal operating condition. 2. The test was carried out at the selected frequency points obtained from the EUT characterisation. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and adjusting the antenna height in the following manner: a. Vertical or horizontal polarisation (whichever gave the higher emission level over a full rotation of the EUT) was chosen. b. The EUT was then rotated to the direction that gave the maximum emission. c. Finally, the antenna height was adjusted to the height that gave the maximum emission. 3. A Quasi-peak measurement was then made for that frequency point. 4. Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were measured.		
Test Date	05/14/2018 to 05/18/2018	Environmental conditions	Temperature 23°C Relative Humidity 48% Atmospheric Pressure 1026mbar
Remark	-		
Result	☒ Pass ☐ Fail		

Test Data ☒ Yes (See below) ☐ N/A

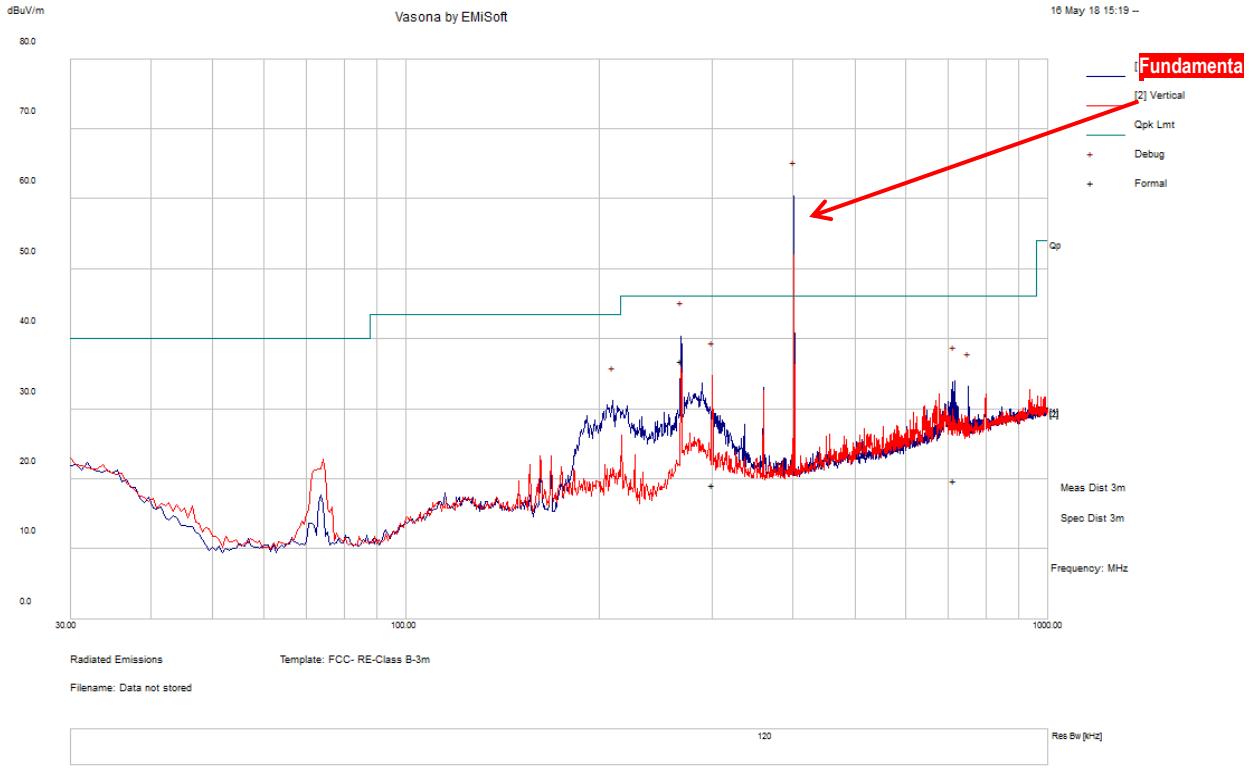
Test Plot ☒ Yes (See below) ☐ N/A

Test was done by Cipher at 10 meter chamber.

Radiated Emission Test Results (Below 1GHz)

Test specification:	Radiated Emissions		
Mains Power:	3.2 VDC	Result:	☒ Pass ☐ Fail
Tested by:	Cipher		
Test Date:	05/14/2018 to 05/18/2018		
Remarks:	402.15 MHz		

***f*=30MHz – 1000MHz plot and 3 meter distance measurement**

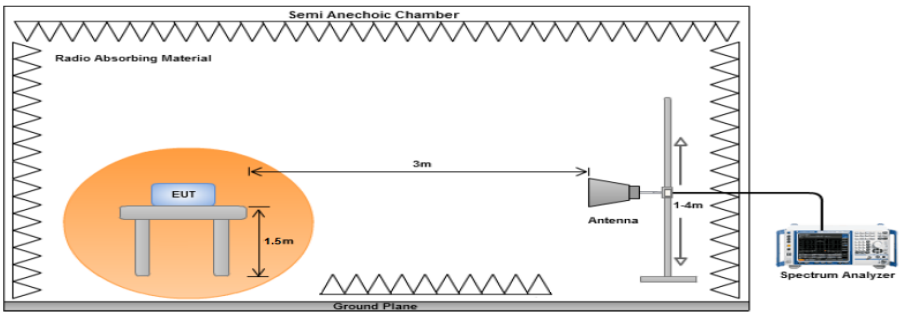


***f*=30MHz – 1000MHz and 3 meter distance measurement**

Frequency MHz	Raw dBµV/m	Cable Loss	AF dB	Level dBµV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBµV/m	Margin dB	Pass /Fail
268.23	47.21	13.08	-23.44	36.85	Quasi Max	H	114	296	46	-9.15	Pass
299.69	28.76	13.24	-22.82	19.18	Quasi Max	V	161	225	46	-26.82	Pass
714.28	19.83	15.2	-15.26	19.76	Quasi Max	H	204	50	46	-26.24	Pass

10.2.2 Radiated Spurious Emissions above 1GHz

Requirement(s):

Spec	Requirement	Applicable
FCC 95.2579 and RSS-243 5.5	For non-restricted band, In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB or 30dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, determined by the measurement method on output power to be used. ☐ 20 dB down ☒ 30 dB down	☒
Test Setup		
Procedure	1. The EUT was switched on and allowed to warm up to its normal operating condition. 2. The test was carried out at the selected frequency points obtained from the EUT characterisation. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and adjusting the antenna height in the following manner: a. Vertical or horizontal polarisation (whichever gave the higher emission level over a full rotation of the EUT) was chosen. b. The EUT was then rotated to the direction that gave the maximum emission. c. Finally, the antenna height was adjusted to the height that gave the maximum emission. 3. An average measurement was then made for that frequency point. 4. Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were measured.	
Remark	The EUT was scanned up to 6 GHz. Both horizontal and vertical polarities were investigated. The results show only the worst case which is vertical.	
Result	☒ Pass ☐ Fail	

Test Data ☒ Yes (See below) ☐ N/A

Test Plot ☐ Yes (See below) ☒ N/A

Test was done by *Cipher* at *3m chamber*.

Radiated Emission-3 meter distance Measurements Test Results (Above 1GHz)

Above 1GHz – 402.15 MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
3780.64	38.85	11.37	1.40	51.62	Peak Max	V	124	52	74	-22.38	Pass
2653.54	40.61	9.30	-4.89	45.01	Peak Max	V	115	291	74	-28.99	Pass
1635.43	43.40	7.21	-11.82	38.79	Peak Max	V	120	81	74	-35.21	Pass
3780.64	25.93	11.37	1.40	38.70	Average Max	V	124	52	54	-15.30	Pass
2653.54	27.52	9.30	-4.89	31.92	Average Max	V	115	291	54	-22.08	Pass
1635.43	30.34	7.21	-11.82	25.73	Average Max	V	120	81	54	-28.27	Pass

Above 1GHz –403.35 MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
1873.38	43.08	7.70	-9.01	41.77	Peak Max	V	148	264	74	-32.23	Pass
4873.57	38.92	13.2	3.76	55.88	Peak Max	V	138	87	74	-18.12	Pass
3797.79	39.58	11.41	1.55	52.54	Peak Max	V	183	15	74	-21.46	Pass
1873.38	29.88	7.70	-9.01	28.57	Average Max	V	148	264	54	-25.43	Pass
4873.57	25.04	13.2	3.76	42.01	Average Max	V	138	87	54	-11.99	Pass
3797.79	25.82	11.41	1.55	38.78	Average Max	V	183	15	54	-15.22	Pass

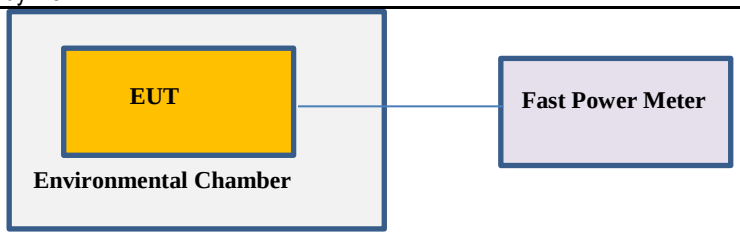
Above 1GHz – 404.85 MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
4715.91	40.12	13.03	2.86	56.01	Peak Max	V	101	202	74	-17.99	Pass
1877.62	44.18	7.70	-8.89	42.99	Peak Max	V	194	145	74	-31.01	Pass
2495.18	41.57	8.91	-6.20	44.28	Peak Max	V	186	213	74	-29.72	Pass
4715.91	24.95	13.03	2.86	40.84	Average Max	V	101	202	54	-13.16	Pass
1877.62	30.10	7.70	-8.89	28.91	Average Max	V	194	145	54	-25.09	Pass
2495.18	28.25	8.91	-6.20	30.96	Average Max	V	186	213	54	-23.04	Pass

10.2.3 Frequency Stability/Error

Requirement(s):

Spec	Requirement	Applicable
FCC 95.2565; RSS-243 3.3 b & 5.3	Each MedRadio transmitter type must be designed to maintain a frequency stability of ±100 ppm of the operating frequency over the applicable temperature range set forth in this section. Frequency stability testing shall be performed over the appropriate temperature range. (a) 25 °C to 45 °C in the case of medical implant transmitters; and (b) 0 °C to 55 °C in the case of MedRadio programmer/control transmitters and medical body-worn	☒

Test Setup	 1. The EUT was set up inside an environmental chamber. 2. The EUT was placed in the centre of the environmental.		
Procedure	Frequency Stability was measured according to 47 CFR §2.1055. Measurement was taken with spectrum analyzer. The spectrum analyzer bandwidth and span was set to read in hertz. A voltmeter was used to monitor when varying the voltage.		
Test Date	05/14/2018 to 05/18/2018	Environmental conditions	Temperature 23°C Relative Humidity 48% Atmospheric Pressure 1026mbar
Remark	None		
Result	☒ Pass ☐ Fail		

Test Data ☒ Yes (See below) ☐ N/A

Test Plot ☐ Yes (See below) ☒ N/A

Test was done by Cipher at RF test site.

Test Result for Frequency Stability

Channel 1: 402.15 MHz

Test Conditions	Measured Frequency Condition MHz	Frequency Error PPM	Limit PPM
T (+25°C)	402.149521	-1.19	+/-100
T max (55°C)	402.149521	-1.19	+/-100
T min (-10°C)	402.150364	0.90	+/-100

Channel 5: 403.35 MHz

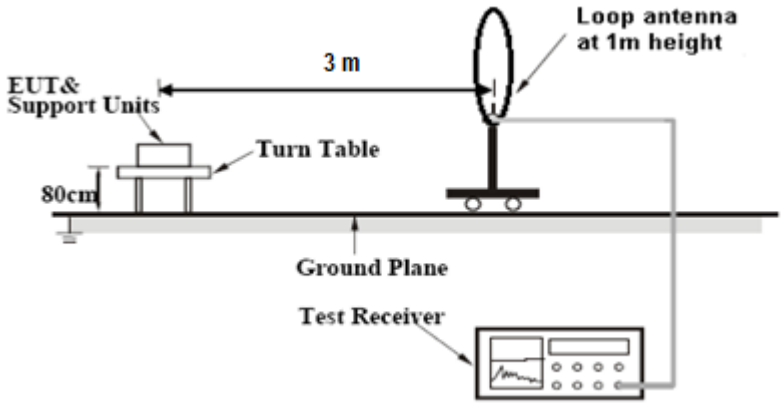
Test Conditions	Measured Frequency Condition MHz	Frequency Error PPM	Limit PPM
T (+25°C)	403.346170	-9.50	+/-100
T max (55°C)	403.350833	2.06	+/-100
T min (-10°C)	403.350120	0.30	+/-100

Channel 10: 404.85 MHz

Test Conditions	Measured Frequency Condition MHz	Frequency Error PPM	Limit PPM
T (+25°C)	404.849117	-2.18	+/-100
T max (55°C)	404.849117	-2.18	+/-100
T min (-10°C)	404.850021	0.05	+/-100

10.2.4 Occupied bandwidth

Requirement(s):

Spec	Requirement	Applicable
FCC 95.2573, RSS Gen 4.6, RSS-293 5.1	(a) For MedRadio transmitters operating in the 402-405 MHz band, the maximum authorized bandwidth is 300 kHz. Such transmitters must not use more than 300 kHz of bandwidth (total) during a MedRadio communications session. This provision does not preclude full duplex or half duplex communications provided that the total bandwidth of all of the channels employed in a MedRadio communications session does not exceed 300 kHz.	☒
Test Setup		
Procedure	1. The EUT was switched on and allowed to warm up to its normal operating condition. 2. To measure conducted, a SMA cable was used to replace the EUT antenna. To measure radiated, an external antenna was used to detect EUT transmission signal. 3. Measurement of the 99% Occupied Bandwidth of EUT transmission signal and make record.	

Test Date	05/14/2018 to 05/18/2018	Environmental conditions	Temperature 23°C Relative Humidity 48% Atmospheric Pressure 1025mbar
Remark	-		
Result	☒ Pass ☐ Fail		

Test Data ☐ Yes (See below) ☒ N/A

Test Plot ☒ Yes (See below) ☐ N/A

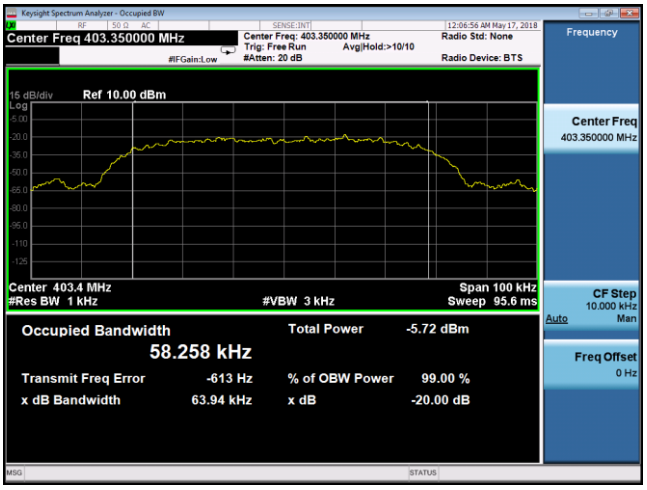
Test was done by Cipher at 10 meter chamber.

Test results:

402 MHz

Frequency (MHz)	Occupied Bandwidth (KHz)
402.15	58.15

403 MHz



Frequency (MHz)	Occupied Bandwidth (KHz)
403.35	58.26

405 MHz

Frequency (MHz)	Occupied Bandwidth (KHz)
404.85	58.21

Annex A. TEST INSTRUMENT

Instrument	Model	Serial #	Cal Date	Cal Cycle	Cal Due	In use
Radiated Emissions						
R & S Receiver	ESIB 40	100179	06/08/2017	1 Year	06/08/2018	☑
Pre-Amplifier (1-26.5GHz)	8449B	3008A00715	03/30/2018	1 Year	03/30/2019	☑
Preamplifier (100KHz-7GHz)	LPA-6-30	11140711	02/10/2018	1 Year	02/10/2019	☑
ETS-Lingren Loop Antenna	6512	49120	07/14/2017	1 Year	07/14/2018	☑
Bi-Log antenna (30MHz~2GHz)	JB1	A030702	07/08/2017	1 Year	07/08/2018	☑
Horn Antenna (18-40 GHz)	AH-840	101013	07/15/2017	1 Year	07/15/2018	☑
Spectrum Analyzer	N9010A	10SL0219	08/02/2017	1 Year	08/02/2018	☑
Agilent Signal Generator	N5182A	MY47071065	04/12/2018	1 Year	04/12/2019	☑
Test Equity Environment Chamber	1007H	61201	07/21/2017	1 Year	07/21/2018	☑

Annex B. SIEMIC Accreditation

Accreditations	Document	Scope / Remark
ISO 17025 (A2LA)		Please see the documents for the detailed scope
ISO Guide 65 (A2LA)		Please see the documents for the detailed scope
TCB Designation		A1, A2, A3, A4, B1, B2, B3, B4, C
FCC DoC Accreditation		FCC Declaration of Conformity Accreditation
FCC Site Registration		3 meter site
FCC Site Registration		10 meter site
IC Site Registration		3 meter site
IC Site Registration		10 meter site
EU NB		**Radio & Telecommunications Terminal Equipment:** EN45001 – EN ISO/IEC 17025
		Electromagnetic Compatibility: EN45001 – EN ISO/IEC 17025
Singapore iDA CB(Certification Body)		Phase I, Phase II
Vietnam MIC CAB Accreditation		Please see the document for the detailed scope
Hong Kong OFCA		**(Phase II)** OFCA Foreign Certification Body for Radio and Telecom
		(Phase I) Conformity Assessment Body for Radio and Telecom
Industry Canada CAB		**Radio:** Scope A – All Radio Standard Specification in Category I
		Telecom: CS-03 Part I, II, V, VI, VII, VIII

Japan Recognized Certification Body Designation		**Radio**: A1. Terminal equipment for purpose of calling **Telecom**: B1. Specified radio equipment specified in Article 38-2, Paragraph 1, Item 1 of the Radio Law
Korea CAB Accreditation		**EMI:** KCC Notice 2008-39, RRL Notice 2008-3: CA Procedures for EMI KN22: Test Method for EMI **EMS:** KCC Notice 2008-38, RRL Notice 2008-4: CA Procedures for EMS KN24, KN61000-4-2, -4-3, -4-4, -4-5, -4-6, -4-8, -4-11: Test Method for EMS
		Radio: RRL Notice 2008-26, RRL Notice 2008-2, RRL Notice 2008-10, RRL Notice 2007-49, RRL Notice 2007-20, RRL Notice 2007-21, RRL Notice 2007-80, RRL Notice 2004-68
		Telecom: President Notice 20664, RRL Notice 2007-30, RRL Notice 2008-7 with attachments 1, 3, 5, 6; President Notice 20664, RRL Notice 2008-7 with attachment 4
Taiwan NCC CAB Recognition		LP0002, PSTN01, ADSL01, ID0002, IS6100, CNS14336, PLMN07, PLMN01, PLMN08
Taiwan BSMI CAB Recognition		CNS 13438
Japan VCCI		R-3083: Radiation 3 meter site C-3421: Main Ports Conducted Interference Measurement T-1597: Telecommunication Ports Conducted Interference Measurements
Australia CAB Recognition		**EMC:** AS/NZS CISPR 11, AS/NZS CISPR 14.1, AS/NZS CISPR22, AS/NZS 61000.6.3, AS/NZS 61000.6.4
		Radio communications: AS/NZS 4281, AS/NZS 4268, AS/NZS 4280.1, AS/NZS 4280.2, AS/NZS 4295, AS/NZS 4582, AS/NZS 4583, AS/NZS 4769.1, AS/NZS 4769.2, AS/NZS 4770, AS/NZS 4771
		Telecommunications: AS/ACIF S002:05, AS/ACIF S003:06, AS/ACIF S004:06 AS/ACIF S006:01, AS/ACIF S016:01, AS/ACIF S031:01, AS/ACIF S038:01, AS/ACIF S040:01, AS/ACIF S041:05, AS/ACIF S043.2:06, AS/ACIF S60950.1
Australia NATA Recognition		AS/ACIF S002, AS/ACIF S003, AS/ACIF S004, AS/ACIF S006, AS/ACIF S016,AS/ACIF S031, AS/ACIF S038, AS/ACIF S040, AS/ACIF S041, AS/ACIF S043.2