

RF TEST REPORT



Report No.: FCC_IC_RF_SL16042101-MED-007-97715 Rev 2.0
Supersede Report No.: FCC_IC_RF_SL16042101-MED-007-97715 Rev 1.0

Applicant	:	Medtronic Inc.
Product Name	:	Implantable Neurostimulator
Model No.	:	97715 , B35300R
Test Standard	:	47 CFR FCC Part 95 RSS-Gen, RSS-243
Test Method	:	FCC 95.628, FCC 95.639, FCC 95.635, ANSI/TIA/EIA-603-C:2004 RSS-Gen, RSS-243
FCC ID	:	LF597715
IC ID	:	3408D-97715
Dates of test	:	09/27/2016 – 09/28/2016
Issue Date	:	04/24/2017
Test Result	:	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail

This Test Report is Issued Under the Authority of:	
Rachana Khanduri	Chen Ge
Test Engineer	Engineer Reviewer
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Issued By:
SIEMIC Laboratories
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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.



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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_RF_SL16042101-MED-007-97715	None	Original	02/10/2017
FCC_IC_RF_SL16042101-MED-007-97715 Rev 1.0	Rev 1.0	Updated EIRP	04/04/2017
FCC_IC_RF_SL16042101-MED-007-97715 Rev 2.0	Rev 2.0	Updated model no.	04/24/2017

2 Executive Summary

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

Company: Medtronic, Inc.
Product: Implantable Neurostimulator
Model: 97715 , B35300R

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	:	8200 Coral Sea St. NE, Mounds View, MN 55112
Applicant Address 2	:	7000 Central Ave. NE, Minneapolis, MN 55432
Manufacturer Name	:	Medtronic, Inc.
Manufacturer Address 1	:	8200 Coral Sea St. NE, Mounds View, MN 55112
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.	:	881796
IC Test Site No.	:	4842D-2
VCCI Test Site No.	:	A0133

5 Modification

Index	Item	Description	Note
-	-	-	-

6 EUT Information

6.1 EUT Description

Product Name	:	Implantable Neurostimulator
Model No.	:	97715, B35300R
Trade Name	:	Medtronic
Serial No.	:	NME402205N
Input Power	:	BATTERY 3.2VDC
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	:	09/26/2016
Equipment Class/ Category	:	MICS
Working Frequencies	:	402-405MHz
Port/Connectors	:	-
Remark	:	Model difference is based on therapy delivery firmware. All hardware, firmware and antenna are identical
Note	:	The product is a Active implantable Medical Device

6.2 Radio Description

Specifications for Radio:

Radio Type	MICS
Operating Frequency	402-405 MHz
Modulation	FSK
Channel Spacing	300 KHz
Antenna Type	Integral Loop Antenna
Antenna Gain	Gain under implant condition: -32 dBi Gain in air medium condition: -35 dBi
NO. Of RF Channels	10
Antenna Connector Type	N/A

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),
Frequency Stability	Continuous Transmit	-	403.35MHz (Mid Channel 5), 404.85 MHz (High Channel 10)
Occupied Bandwidth	Continuous Transmit	-	

Note: Only radiated measurements were performed during the test.

6.4 EUT Photos – External



Front Side



Back Side



Bottom Side View



Top Side View



Right Side View



Left Side View

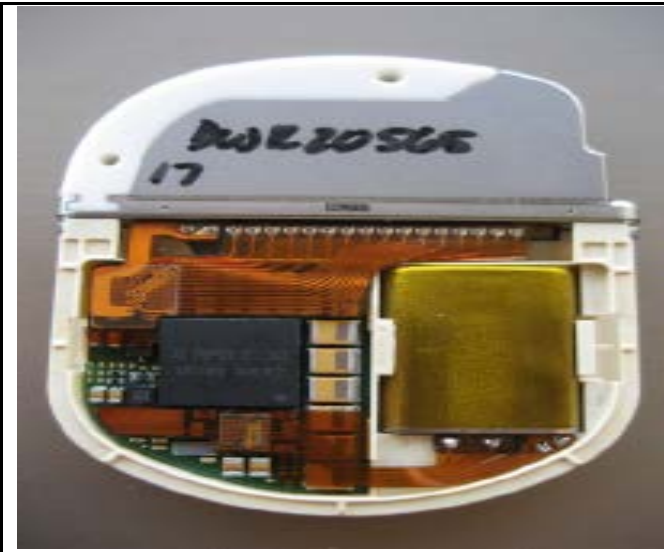


Asymmetric Left Side View

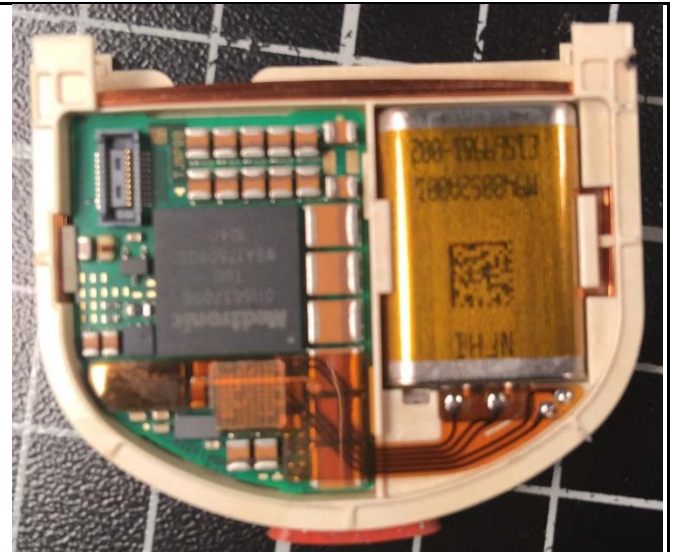


Asymmetric Right Side View

6.5 EUT Photos – Internal



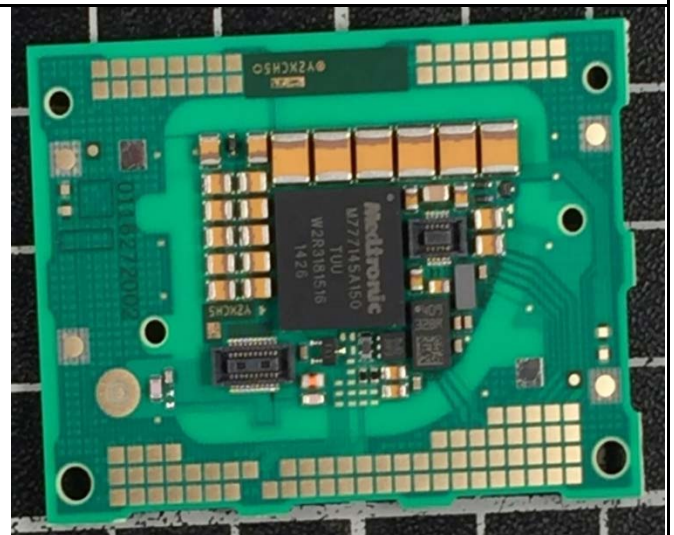
EUT – Internal Assembly Top View



EUT – Hybrid Assembly

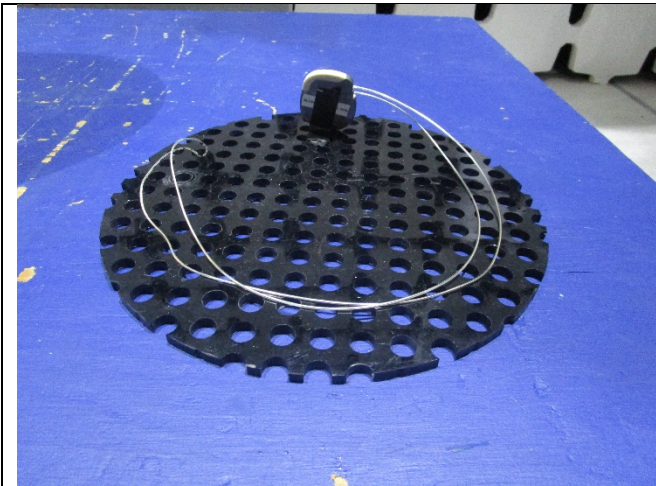


EUT – Hybrid Top View

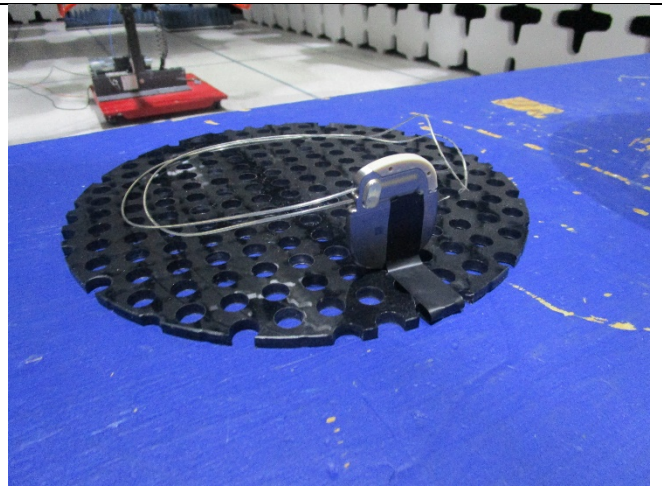


EUT – Hybrid Bottom View

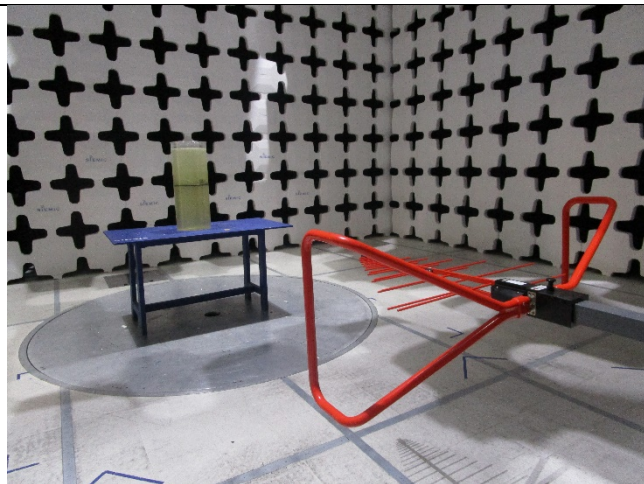
6.6 EUT Test Setup Photos



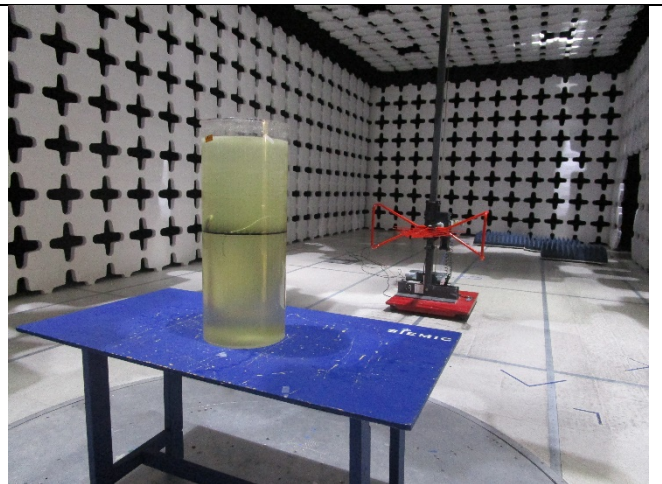
EUT Setup – Front View



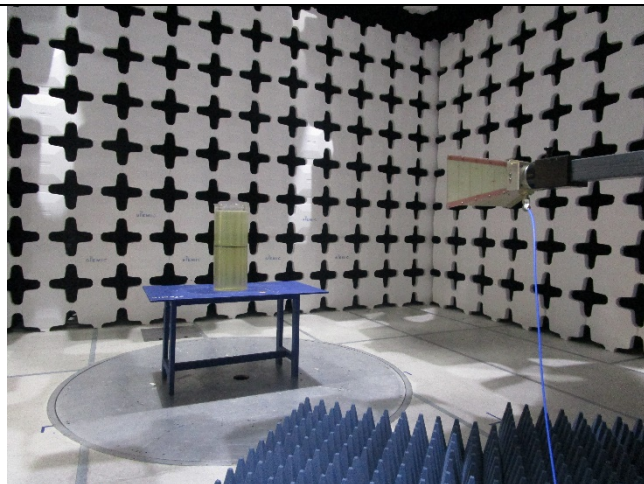
EUT Setup – Rear View



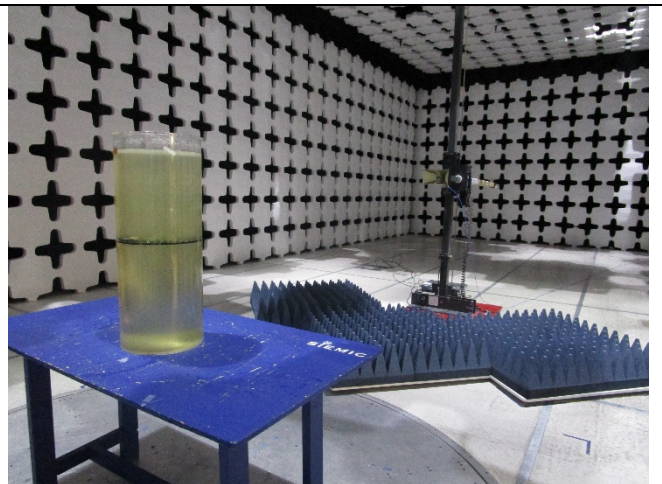
Radiated Emissions (<1GHz) – Front View



Radiated Emissions (<1GHz) – Rear View



Radiated Emissions (>1 GHz) – Front View



Radiated Emissions (>1 GHz) – Rear View

7 Supporting Equipment/Software and cabling Description

7.1 Supporting Equipment

Index	Supporting Equipment Description	Model	Serial No	Manu	Note
1	Laptop	LATITUDE E7440	N/A	Dell	-
2	TMTI (Telemetry M Test Instrument)	TMTI-11-RC-F-D-P	11C0505	Medtronic	-

7.2 Cabling Description

Name	Connection Start		Connection Stop		Length / shielding Info		Note
	From	I/O Port	To	I/O Port	Length (m)	Shielding	
USB	TMTI	USB	Laptop	USB	1	Unshielded	-

7.3 Test Software Description

Test Item	Software	Description
RF Testing	TMTI_GUI.exe (NRP1025-37052)	Set the EUT to transmit continuously in different test modes and channels

8 Test Summary

Test Item	Test standard		Test Method/Procedure		Pass / Fail
Effective Radiated Power of the Fundamental Emission	FCC	47 CFR FCC Part 95	FCC	FCC 95.639f	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> N/A
	IC	RSS-243	IC	RSS-243 3.1, 5.4	
Radiated Spurious Emissions	FCC	47 CFR FCC Part 95	FCC	FCC 95.635d	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> N/A
	IC	RSS-243	IC	RSS-243 5.5	
Frequency Stability	FCC	47 CFR FCC Part 95	FCC	FCC 95.628e	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> N/A
	IC	RSS-243	IC	RSS-243 3.3 b & 5.3	
Occupied Bandwidth	FCC	47 CFR FCC Part 95	FCC	FCC 95.628d, 95.633e	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> N/A
	IC	RSS-Gen	IC	RSS Gen 4.6, RSS-293 5.1	
Remark	<ol style="list-style-type: none"> All measurement uncertainties are not taken into consideration for all presented test result. 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. 				

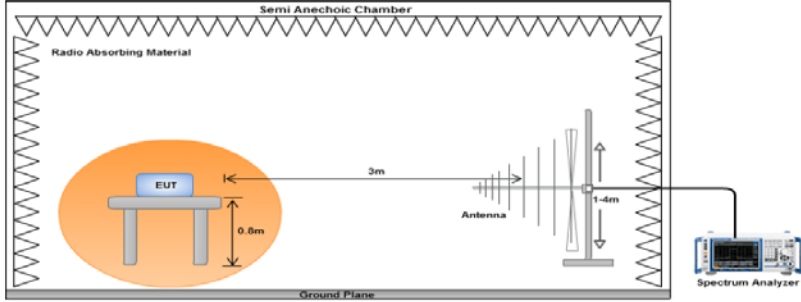
9 Measurement Uncertainty

Emissions			
Test Item	Frequency Range	Description	Uncertainty
Radiated Spurious Emissions	30MHz – 1GHz	Confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2 (for EUTs < 0.5m X 0.5m X 0.5m)	+5.6dB/-4.5dB
Radiated Spurious Emissions	1GHz – 6GHz	Confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2 (for EUTs < 0.5m X 0.5m X 0.5m)	+4.3dB/-4.1dB

10 Measurements, examination and derived results

10.1 EIRP of the Fundamental Emission

Requirement(s):

Spec	Requirement	Applicable	
FCC 95.639f; & RSS-243 3.1, 5.4	<p>Determine the ERP measurements by measuring the radiated field from the DUT at 3 meters and calculating the Effective Isotropic Radiated Power (EIRP). The equivalent radiated field strength at 3 meters for 25μW, 250 nW, and 100 nW EIRP is 18.2, 1.8, and 1.2 mV/meter, respectively, when measured on an open area test site; or 9.1, 0.9, and 0.6 mV/meter, respectively, when measured on a test site equivalent to free space such as a fully anechoic test chamber.</p> <p>Requirements:</p> <ul style="list-style-type: none"> The ERP of the DUT transmitter that operates as part of a system that incorporates a monitoring system to select the frequency of operation using Listen before Transmit (LBT) and Adaptive Frequency Agility (AFA) shall not exceed 25 μW. This is applicable to devices operating in the MICS band and the MEDS band. For a DUT transmitter operating on any frequency in the band 403.5 MHz to 403.8 MHz and the operation frequency in this band has been selected by a monitoring system other than LBT and AFA, the ERP of the DUT transmitter shall not exceed 100nW. For a DUT transmitter operating on the MEDS band and the operation frequency in this band has been selected by a monitoring system other than LBT and AFA, the ERP of the DUT transmitter shall not exceed 250nW. 	<input checked="" type="checkbox"/>	
Test Setup			
Procedure	<ol style="list-style-type: none"> The EUT was switched on and allowed to warm up to its normal operating condition. 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: <ol style="list-style-type: none"> Vertical or horizontal polarisation (whichever gave the higher emission level over a full rotation of the EUT) was chosen. The EUT was then rotated to the direction that gave the maximum emission. Finally, the antenna height was adjusted to the height that gave the maximum emission. 		
Test Date	09/27/2016	Environmental conditions	Temperature 23°C Relative Humidity 48% Atmospheric Pressure 1026mbar
Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail		

Test Data Yes (See below) N/A

Test Plot Yes (See below) N/A

Test was done by Rachana Khanduri at 10 meter chamber.

Effective Radiated Power - 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 (dBm)
402.15	47.42	73	159	V	402.15	-29.05	0	1	-30.05	-16	-14.05
402.15	46.78	351	157	H	402.15	-30.43	0	1	-31.43	-16	-15.43

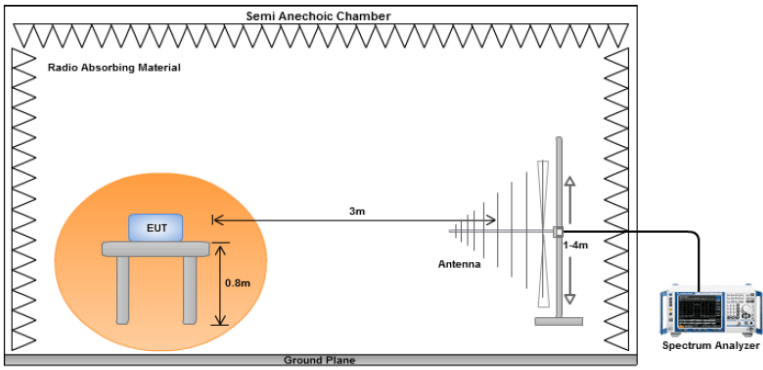
Effective Radiated Power - 404.85 MHz

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 (dBm)
404.90	47.58	73	159	V	404.9	-29.89	0	1	-30.89	-16	-14.89
404.90	48.21	351	157	H	404.9	-30.00	0	1	-31.00	-16	-15.00

Frequency (MHz)	ERP (dBm)	EIRP (dBm)
402.15	-30.05	-27.90
404.90	-30.89	-28.74

10.2 Radiated Measurements

10.2.1 Radiated Measurements 30MHz to 1GHz Requirement(s):

Spec	Requirement	Applicable															
FCC 95.635d and RSS- 243 5.5	<p>Transmitter unwanted emissions per FCC and Canadian regulations emissions more than 250 kHz outside of the MICS band (402–405 MHz) or 100 kHz outside of the MEDS band (401–402 MHz and 405-406 MHz) shall be attenuated to a level no greater than the following field strength limits.</p> <table border="1"> <thead> <tr> <th>Frequency range (MHz)</th> <th>Field Strength (uV/m)</th> <th>Measurement Distance (meter)</th> </tr> </thead> <tbody> <tr> <td>30 – 88</td> <td>100</td> <td>3</td> </tr> <tr> <td>88 – 216</td> <td>150</td> <td>3</td> </tr> <tr> <td>216 960</td> <td>200</td> <td>3</td> </tr> <tr> <td>Above 960</td> <td>500</td> <td>3</td> </tr> </tbody> </table>	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	<input checked="" type="checkbox"/>
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	<ol style="list-style-type: none"> The EUT was switched on and allowed to warm up to its normal operating condition. 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: <ol style="list-style-type: none"> Vertical or horizontal polarisation (whichever gave the higher emission level over a full rotation of the EUT) was chosen. The EUT was then rotated to the direction that gave the maximum emission. Finally, the antenna height was adjusted to the height that gave the maximum emission. A Quasi-peak measurement was then made for that frequency point. Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were measured. 																
Test Date	09/27/2016	<table border="1"> <tr> <td>Environmental conditions</td> <td> Temperature 23°C Relative Humidity 48% Atmospheric Pressure 1026mbar </td> </tr> </table>	Environmental conditions	Temperature 23°C Relative Humidity 48% Atmospheric Pressure 1026mbar													
Environmental conditions	Temperature 23°C Relative Humidity 48% Atmospheric Pressure 1026mbar																
Remark	-																
Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail																

Test Data Yes (See below) N/A

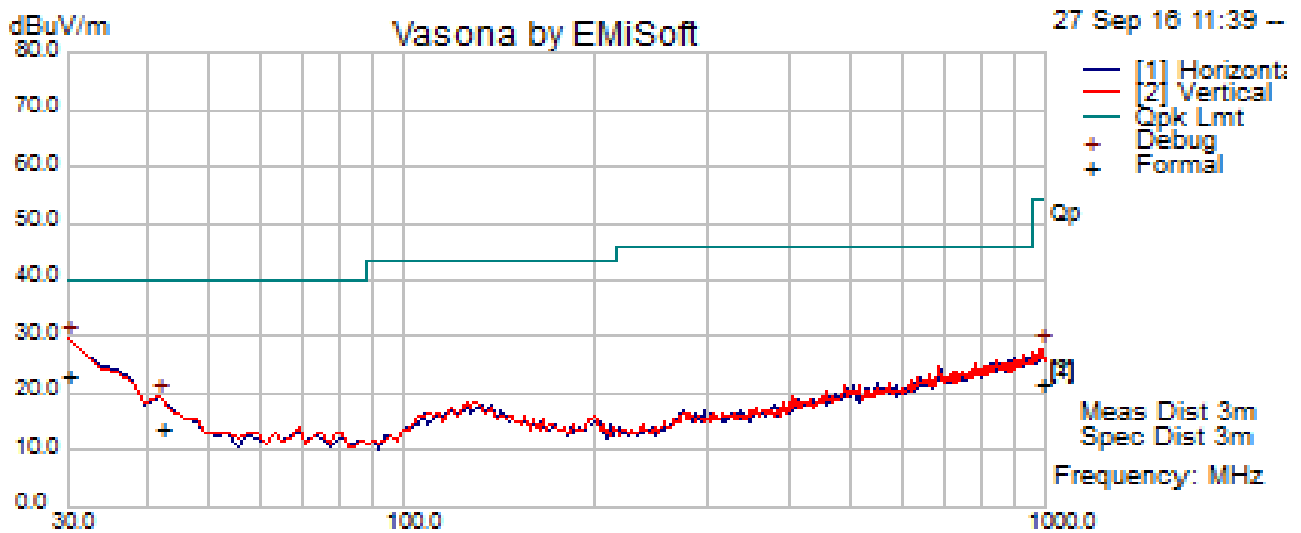
Test Plot Yes (See below) N/A

Test was done by Rachana Khanduri at 10 meter chamber.

Radiated Emission Test Results (Below 1GHz)

Test specification:	Radiated Emissions		
Mains Power:	3.2 VDC	Result:	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail
Tested by:	Rachana Khanduri		
Test Date:	09/27/2016		
Remarks:	402.15 MHz- Horizontal Configuration		

$f=30\text{MHz} - 1000\text{MHz}$ plot and 3 meter distance measurement

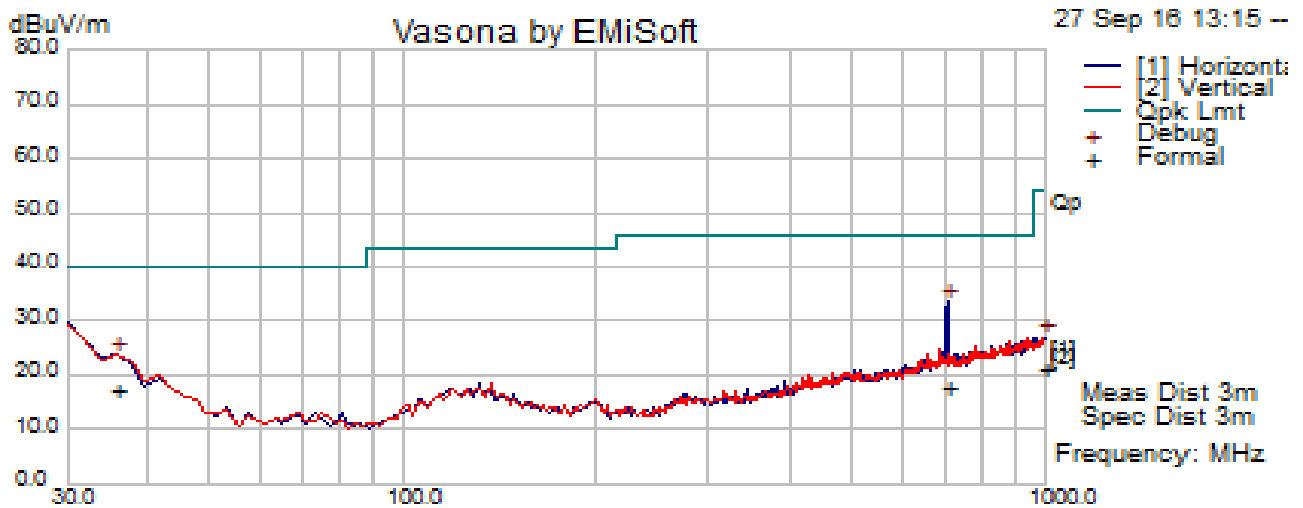


$f=30\text{MHz} - 1000\text{MHz}$ and 3 meter distance measurement

Frequency MHz	Raw dB μ V/m	Cable Loss	AF dB	Level dB μ V/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dB μ V/m	Margin dB	Pass /Fail
30.00	37.83	0.93	-15.88	22.88	Quasi Max	H	145	86	40.00	-17.12	Pass
41.84	37.94	1.11	-25.38	13.67	Quasi Max	V	360	157	40.00	-26.33	Pass
986.41	31.69	5.38	-15.65	21.42	Quasi Max	V	177	79	53.98	-32.56	Pass

Test specification:	Radiated Emissions		
Mains Power:	3.2 VDC	Result:	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail
Tested by:	Rachana Khanduri		
Test Date:	09/27/2016		
Remarks:	404.85 MHz- Horizontal Configuration		

$f=30\text{MHz} - 1000\text{MHz}$ plot and 3 meter distance measurement



$f=30\text{MHz} - 1000\text{MHz}$ and 3 meter distance Measurements

Frequency MHz	Raw dB μ V/m	Cable Loss	AF dB	Level dB μ V/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dB μ V/m	Margin dB	Pass /Fail
704.55	32.07	4.50	-18.86	17.71	Quasi Max	H	153	35	46.02	-28.31	Pass
35.61	37.09	1.06	-20.78	17.37	Quasi Max	H	252	35	40.00	-22.63	Pass
999.76	31.42	5.48	-15.57	21.33	Quasi Max	H	227	235	53.98	-32.65	Pass

10.2.2 Radiated Spurious Emissions above 1GHz

Requirement(s):

Spec	Requirement	Applicable
FCC 95.635d and RSS-243 5.5	<p>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.</p> <p><input type="checkbox"/> 20 dB down <input checked="" type="checkbox"/> 30 dB down</p>	☒
Test Setup		
Procedure	<ol style="list-style-type: none"> The EUT was switched on and allowed to warm up to its normal operating condition. 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: <ol style="list-style-type: none"> Vertical or horizontal polarisation (whichever gave the higher emission level over a full rotation of the EUT) was chosen. The EUT was then rotated to the direction that gave the maximum emission. Finally, the antenna height was adjusted to the height that gave the maximum emission. An average measurement was then made for that frequency point. 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	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail	

Test Data Yes (See below) N/A

Test Plot Yes (See below) N/A

Test was done by *Rachana Khanduri* 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

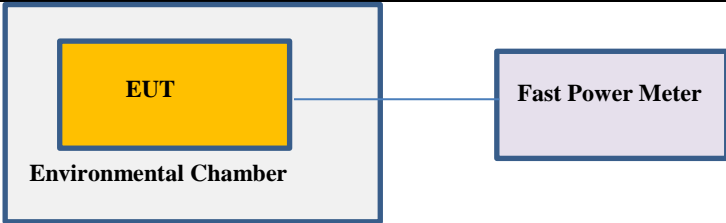
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
1873.38	43.08	7.70	-9.01	41.77	Peak Max	V	148	264	74	-32.23	Pass
4873.57	38.92	13.2	3.76	55.88	Peak Max	V	138	87	74	-18.12	Pass
3797.79	39.58	11.41	1.55	52.54	Peak Max	V	183	15	74	-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 95.628e; RSS-243 3.3 b & 5.3	The frequency error for DUT transmitters operating in the 401 MHz to 406 MHz band shall not exceed ± 100 ppm under normal, extreme, or any intermediate set of conditions.	<input checked="" type="checkbox"/>									
Test Setup	 <ol style="list-style-type: none"> The EUT was set up inside an environmental chamber. 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	09/27/2016	<table border="0"> <tr> <td>Environmental conditions</td> <td>Temperature</td> <td>23°C</td> </tr> <tr> <td></td> <td>Relative Humidity</td> <td>48%</td> </tr> <tr> <td></td> <td>Atmospheric Pressure</td> <td>1026mbar</td> </tr> </table>	Environmental conditions	Temperature	23°C		Relative Humidity	48%		Atmospheric Pressure	1026mbar
Environmental conditions	Temperature	23°C									
	Relative Humidity	48%									
	Atmospheric Pressure	1026mbar									
Remark	None										
Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail										

Test Data Yes (See below) N/A

Test Plot Yes (See below) N/A

Test was done by Rachana Khanduri 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

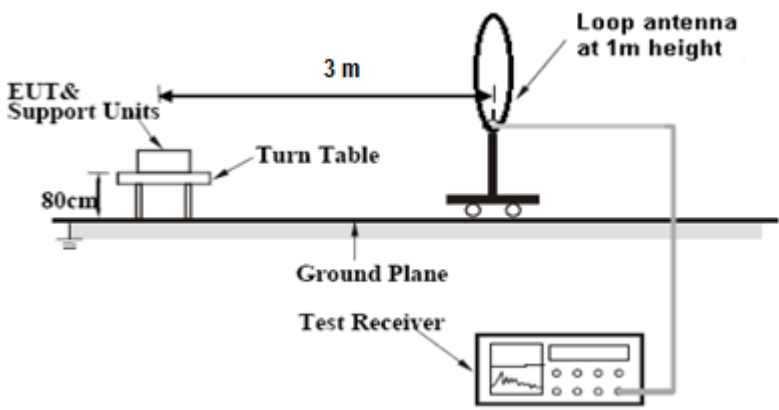
Test Conditions	Measured Frequency Condition MHz	Frequency Error PPM	Limit PPM
T (+25°C)	403.346170	-9.50	+/-100
T max (55°C)	403.350833	2.06	+/-100
T min (-10°C)	403.350120	0.30	+/-100

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 95.628d, 95.633e, RSS Gen 4.6, RSS-293 5.1	<p>The transmitted signal bandwidth to be reported is to be its 99% emission bandwidth. The transmitter shall be operated at its maximum carrier power measured under normal test conditions. The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts. The resolution bandwidth shall be set to as close to 1% of the selected span as is possible without being below 1%. The video bandwidth shall be set to 3 times the resolution bandwidth. Video averaging is not permitted. See RSS-GEN 4.6.1 for detailed method of measurement.</p> <ul style="list-style-type: none"> The maximum permitted emission bandwidth shall be 300 kHz in MICS band 	<input checked="" type="checkbox"/>									
Test Setup											
Procedure	<ol style="list-style-type: none"> The EUT was switched on and allowed to warm up to its normal operating condition. 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. Measurement of the 99% Occupied Bandwidth of EUT transmission signal and make record. 										
Test Date	09/27/2016	<table border="1"> <tr> <td>Environmental conditions</td> <td>Temperature</td> <td>23°C</td> </tr> <tr> <td></td> <td>Relative Humidity</td> <td>48%</td> </tr> <tr> <td></td> <td>Atmospheric Pressure</td> <td>1025mbar</td> </tr> </table>	Environmental conditions	Temperature	23°C		Relative Humidity	48%		Atmospheric Pressure	1025mbar
Environmental conditions	Temperature	23°C									
	Relative Humidity	48%									
	Atmospheric Pressure	1025mbar									
Remark	-										
Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail										

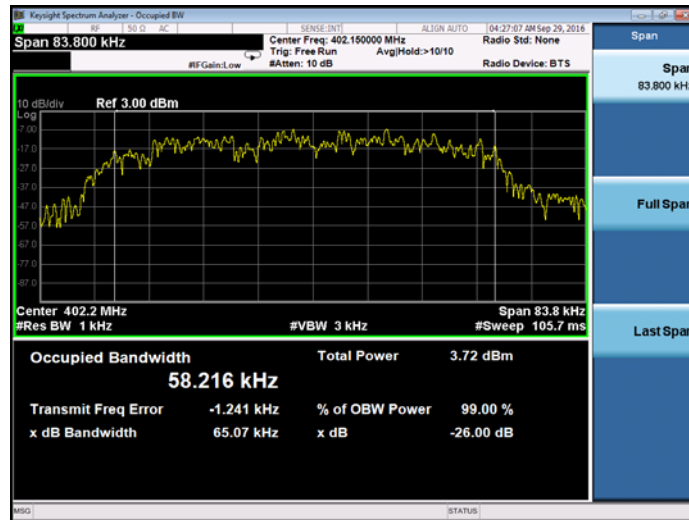
Test Data Yes (See below) N/A

Test Plot Yes (See below) N/A

Test was done by Rachana Khanduri at 10 meter chamber.

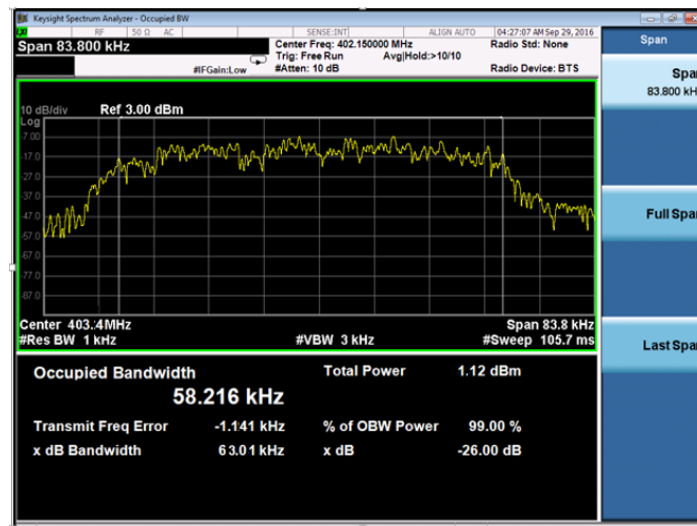
Test results:

402 MHz



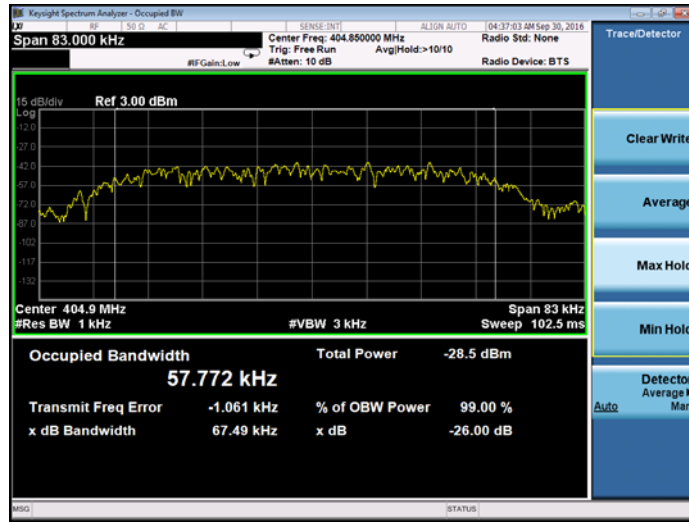
Frequency (MHz)	Occupied Bandwidth (KHz)
402.15	58.22

403 MHz



Frequency (MHz)	Occupied Bandwidth (KHz)
403.35	58.22

405 MHz


























Frequency (MHz)	Occupied Bandwidth (KHz)
404.85	57.77

Annex A. TEST INSTRUMENT

Instrument	Model	Serial #	Cal Date	Cal Cycle	Cal Due	In use
Radiated Emissions						
R & S Receiver	ESIB 40	100179	06/08/2016	1 Year	06/08/2017	<input checked="" type="checkbox"/>
Pre-Amplifier (1-26.5GHz)	8449B	3008A00715	03/30/2016	1 Year	03/30/2017	<input type="checkbox"/>
Preamplifier (100KHz-7GHz)	LPA-6-30	11140711	02/10/2016	1 Year	02/10/2017	<input checked="" type="checkbox"/>
ETS-Lingren Loop Antenna	6512	49120	07/14/2016	1 Year	07/14/2017	<input type="checkbox"/>
Bi-Log antenna (30MHz-2GHz)	JB1	A030702	07/08/2016	1 Year	07/08/2017	<input checked="" type="checkbox"/>
Horn Antenna (18-40 GHz)	AH-840	101013	07/15/2016	1 Year	07/15/2017	<input checked="" type="checkbox"/>
3 Meters SAC	3M	N/A	06/09/2016	1 Year	06/09/2017	<input type="checkbox"/>
10 Meters SAC	10M	N/A	07/06/2016	1 Year	07/06/2017	<input checked="" type="checkbox"/>
Spectrum Analyzer	N9010A	10SL0219	08/02/2016	1 Year	08/02/2017	<input checked="" type="checkbox"/>
Agilent Signal Generator	N5182A	MY47071065	04/12/2016	1 Year	04/12/2017	<input checked="" type="checkbox"/>
Test Equity Environment Chamber	1007H	61201	07/21/2016	1 Year	07/21/2017	<input checked="" type="checkbox"/>

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		<p>Radio: A1. Terminal equipment for purpose of calling</p> <p>Telecom: B1. Specified radio equipment specified in Article 38-2, Paragraph 1, Item 1 of the Radio Law</p>
Korea CAB Accreditation		<p>EMI: KCC Notice 2008-39, RRL Notice 2008-3: CA Procedures for EMI KN22: Test Method for EMI</p> <p>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</p>
		<p>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</p> <p>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</p>
Taiwan NCC CAB Recognition		LP0002, PSTN01, ADSL01, ID0002, IS6100, CNS14336, PLMN07, PLMN01, PLMN08
Taiwan BSMI CAB Recognition		CNS 13438
Japan VCCI		<p>R-3083: Radiation 3 meter site</p> <p>C-3421: Main Ports Conducted Interference Measurement</p> <p>T-1597: Telecommunication Ports Conducted Interference Measurements</p>
Australia CAB Recognition		<p>EMC: AS/NZS CISPR 11, AS/NZS CISPR 14.1, AS/NZS CISPR22, AS/NZS 61000.6.3, AS/NZS 61000.6.4</p>
		<p>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</p>
		<p>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</p>
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