

EMC TEST REPORT

Report Number: 102368130LAX-011
Project Number: G102368130

Report Issue Date: October 4, 2016

Model Tested: I-0025

Standards: **FCC CFR47 Part 15 Subpart C, 2016**

Intentional Radiator

§15.247, *Operation within the bands 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz*

ISED RSS-247 Issue 1, May 2015

Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHS) and Licence-Exempt Local Area Network (LE-LAN) Devices

Tested by:

Intertek

25791 Commercentre Drive
Lake Forest, CA 92630
USA

Client:

Branchpoint Technologies
1 Technology Drive, Suite I-811
Irvine, CA 92618
USA

Report prepared by



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EMC Staff Engineer

Report reviewed by



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1 Introduction and Conclusion

The tests indicated in section 2.0 were performed on the product constructed as described in section 4.0. The remaining test sections are the verbatim text from the actual data sheets used during the investigation. These test sections include the test name, the specified test Method, a list of the actual Test Equipment Used, documentation Photos, Results and raw Data. No additions, deviations, or exclusions have been made from the standard(s) unless specifically noted.

Based on the results of our investigation, we have concluded the product tested comply with the requirements of the standard(s) indicated. The results obtained in this test report pertain only to the item(s) tested. Intertek does not make any claims of compliance for samples or variants which were not tested.

2 Test Summary

Test	Rule Section		Results
	US FCC	Canada ISED	
6 dB Bandwidth	§15.247(a)(2)	RSS-247, §5.2(1)	Complies
99% Occupied Bandwidth	-	RSS-Gen, §4.6.1	(for reporting purpose)
Output Power	§15.247(b)(3)	RSS-247, §5.4(4)	Complies
Power Spectral Density	§15.247(e)	RSS-247, §5.2(2)	Complies
Band-edge	§15.247(d)	RSS-247, §5.5	Complies
Radiated Spurious Emissions	§15.247(d), §15.209, §15.205	RSS-Gen	Complies

3 Client Information

This EUT was tested at the request of:

Client: Branchpoint Technologies
1 Technology Drive, Suite I-811
Irvine, CA 92618
USA

Contact: Nicholas Hu
Telephone: (949) 356-8613
Fax:
Email: n.hu@branchpt.com

4 Description of Equipment Under Test and Variant Models

Equipment Under Test			
Description	Manufacturer	Model Number	Serial Number
AURA™ ICP Sensor	Branchpoint Technologies	I-0025	A-0090-01

Receive Date:	9/13/2016
Received Condition:	Good
Type:	Production

Dates of Tests:	09/26/2016, 09/29/2016 – 10/03/2016
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Description of Equipment Under Test	
The equipment under test (EUT) is an AURA™ ICP Sensor with one Bluetooth Low Energy transceivers operating in the 2.4 GHz frequency band. Power is obtained through inductive coupling operating at 13.56 MHz.	
The AURA™ ICP Sensor is a short-term implantable Intracranial Pressure (ICP) sensor device that is placed between a patient's skull and scalp with skin sutured over it. The pressure sensing catheter extends through a burr hole into the patient's brain tissue. The device is powered through inductive coupling driven by the AURA Antenna device, which is placed directly above the implanted Sensor. Power is only available when the AURA Antenna is in range and delivering energy. At startup, the device identification and the voltage out of the inductive coil are transmitted to the AURA Antenna through impedance modulation of the AURA™ ICP Sensor's inductive coil matching network. This transmission contains only data required for power delivery control. Bluetooth Low Energy (BLE) is used after startup to transmit data between the AURA™ ICP Sensor and the AURA Antenna including system state, sensor data, etc.	
A special version of the AURA™ ICP Sensor (PN A-0090) was produced to enable continuous transmission radio test modes to exercise the BLE radio in the device.	

Equipment Under Test Power Configuration			
Rated Voltage	Rated Current	Rated Frequency	Number of Phases
5 – 15 Vdc through inductive coupling	Less than 0.5 A	-	-

Operating modes of the EUT:

No.	Descriptions of EUT Operating Mode
1	Test Mode – Continuously Transmit

Software used by the EUT:

No.	Descriptions of EUT Exercising
1	The EUT was programmed to transmit continuously during testing.

Radio Characteristics	
Frequency Range	2402-2480 MHz
Type of Transmission	Digital Transmission System (DTS)
IEEE Reference Standard	802.15.1 Bluetooth Low Energy (BLE)
Modes	Single Mode (Classic Bluetooth mode is not supported)
Number of Channels	40 (from 0 to 39)
Test Channels	2402 MHz, 2440 MHz, 2480 MHz
Duty Cycle (during testing)	> 98%
Type of Modulation	GFSK
Data Rate	1 Mbps
Maximum Output Power	-6.27 dBm (0.236 mW)
Equipment Type	Standalone
Antenna Type and Gain	Integral Antenna in circular shape, -23.8 dBi

5 System Setup and Method

Cables					
ID	Description	Length (m)	Shielding	Ferrites	Termination
1	Power Cord	1.2	No	No	-
2	Alligator Wires (a pair)	1.0	No	No	-

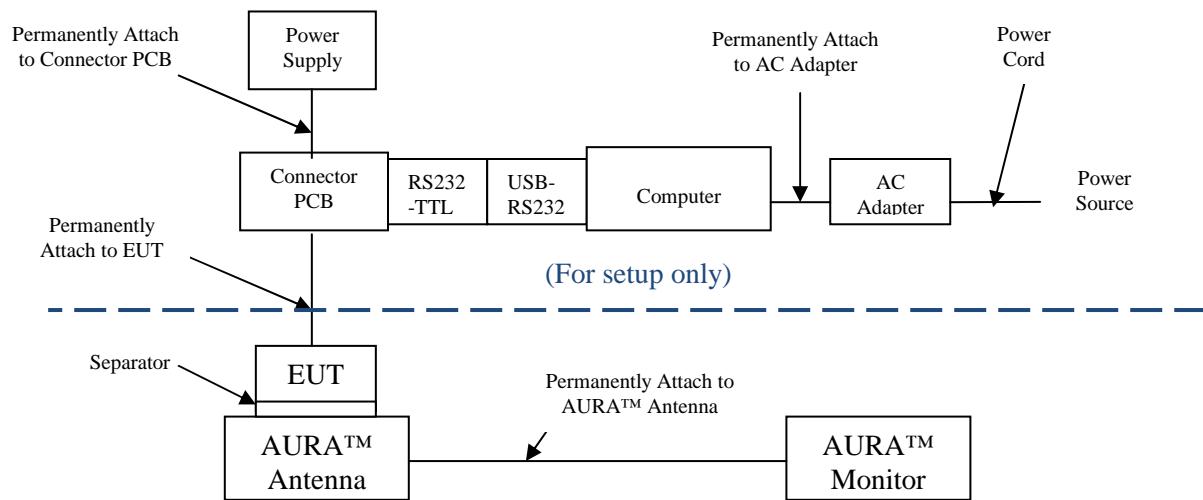
Support Equipment				
Description	Manufacturer	Model Number	Serial Number	
AURA™ Antenna	Branchpoint Technologies	T-0010	A-0091 r.A	
AURA™ Monitor	Branchpoint Technologies	T-0011	A-0092 r.A	
Separator	Branchpoint Technologies	5 mm	N/A	
Connector PCB (for setup only)	Branchpoint Technologies	A-0083	A-0083 r.A	
Power Supply (for setup only)	KORAD	KA3005D	08250069239	
RS232 to TTL Converter (for setup only)	SerialComm	TTL-232-33P	N/A	
USB to RS232 Converter (for setup only)	IOGEAR	GUC232A	Z3G3-109D0-0514	
Computer (for setup only)	Lenovo	20388	CB34777312	
AC Adapter (for setup only)	Lenovo	ADLX65NLC3A	8S5A10J75114 L1CZ5C402Y7	
DC Power Supply	B&K Precision	1671A	249D15133	

5.1 Method:

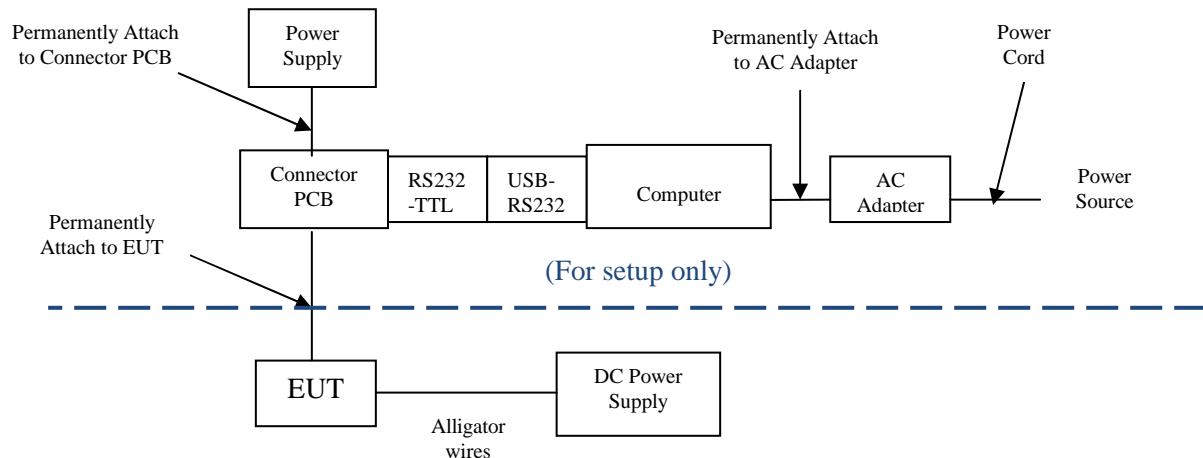
Configuration as required by ANSI C63.10-2013.

5.2 EUT Block Diagram:

Configuration 1 (Using inductive coupling to supply power to the EUT):



Configuration 2 (Using a DC Power Supply to supply power to the EUT):



6 6 dB Bandwidth

6.1 Requirement(s)

The minimum 6 dB bandwidth shall be at least 500 kHz

6.2 Method

The procedure described in Section 11.8 of ANSI C63.10-2013 was used.

- a) Set RBW = 100 kHz.
- b) Set the VBW $\geq [3 \times \text{RBW}]$.
- c) Detector = Peak.
- d) Trace mode = max hold.
- e) Sweep =auto couple.
- f) Allow the trace to stabilize.
- g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outmost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

TEST SITE:

The test is performed in the 3 meter semi-anechoic chamber located at 25791 Commercentre Drive, Lake Forest, California 92630 USA. This test facility meets the requirements of CISPR 16-1-4 and has been accredited by A2LA. IC test site registration number is 2042T.

6.3 Test Equipment Used:

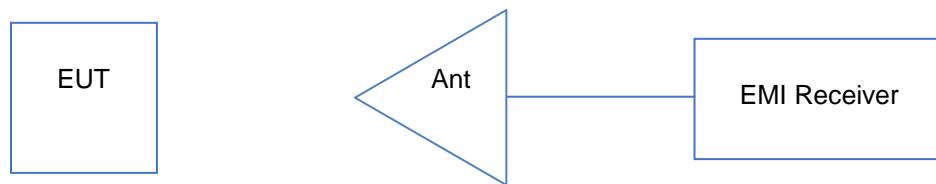
Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
637	3m Semi-anechoic Chamber	Panashield	3 meter	25 331-D-Z	August 2015	August 2018
1140	EMI Test Receiver	Rohde & Schwarz	ESCI7	100825	02/22/2016	02/22/2017
1093	Horn Antenna	A.H. Systems	SAS-571	1513	02/12/2016	02/12/2017
1001	Barometer/Humidity	Omega	iBTHX-W	0440775	04/22/2016	04/22/2017

Software Utilized:

Name	Manufacturer	Version	Profile
N/A	N/A	N/A	N/A

6.4 Results:

The sample tested was found to comply.

6.5 Setup Diagram:**6.6 Plots/Data:**

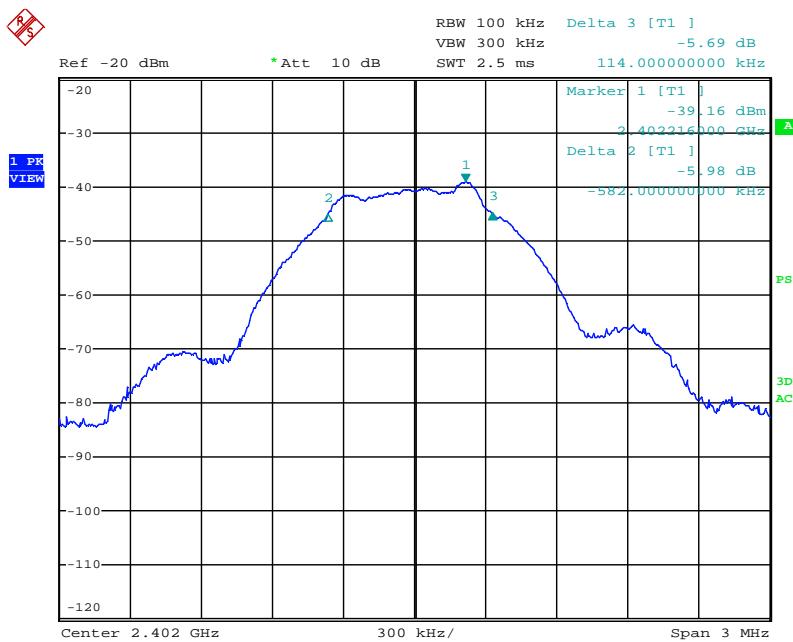
Test Personnel: Grace Lin
Product Standard: FCC 15.247, ISED RSS-247
Input Voltage: Inductive Coupling
Pretest Verification with BB Source: N/A

Test Date: 09/29/2016
Limit Applied: FCC 15.247, ISED RSS-247
Ambient Temperature: 22.7 °C
Relative Humidity: 49.9 %
Atmospheric Pressure: 992.5 mbars

Frequency (MHz)	6 dB Bandwidth (kHz)
2402	696
2440	714
2480	750

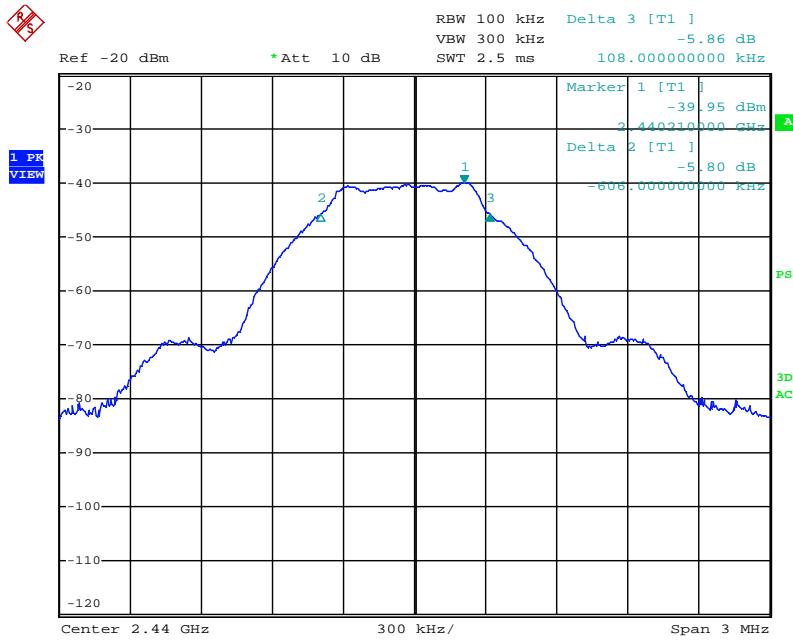
Deviations, Additions, or Exclusions: None

Channel 2402 MHz:



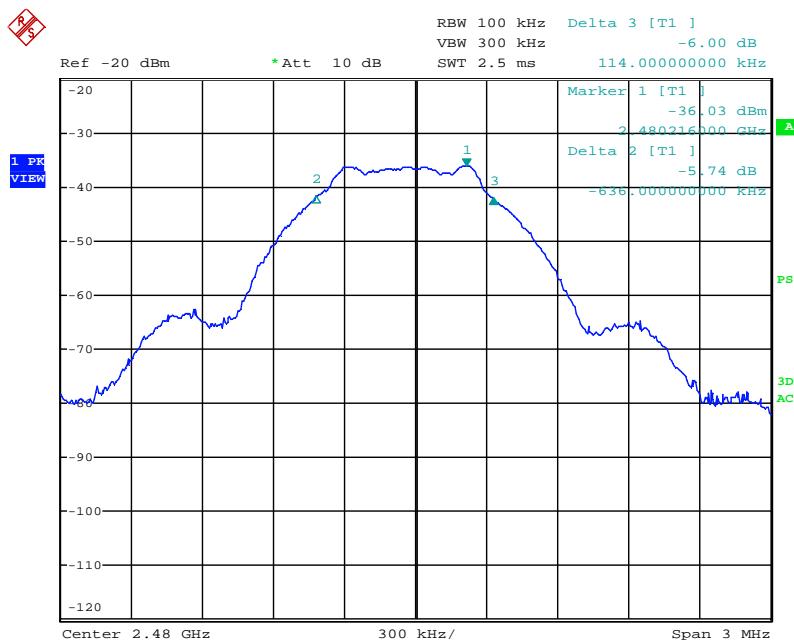
Date: 29.SEP.2016 15:27:04

Channel 2440 MHz:



Date: 29.SEP.2016 15:24:53

Channel 2480 MHz:



Date: 29.SEP.2016 15:21:32

7 99% Occupied Bandwidth

7.1 Requirement(s)

The transmitted signal bandwidth shall be reported as the 99% emission bandwidth, as calculated or measured. (ISED RSS-Gen Issue 4 §6.6)

7.2 Method

The procedure described in Section 6.9.3 of ANSI C63.10-2013 was used.

TEST SITE:

The test is performed in the 3 meter semi-anechoic chamber located at 25791 Commercentre Drive, Lake Forest, California 92630 USA. This test facility meets the requirements of CISPR 16-1-4 and has been accredited by A2LA. IC test site registration number is 2042T.

7.3 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
637	3m Semi-anechoic Chamber	Panashield	3 meter	25 331-D-Z	August 2015	August 2018
1140	EMI Test Receiver	Rohde & Schwarz	ESCI7	100825	02/22/2016	02/22/2017
1093	Horn Antenna	A.H. System2	SAS-571	1513	02/12/2016	02/12/2017
1001	Barometer/Humidity	Omega	iBTHX-W	0440775	04/22/2016	04/22/2017

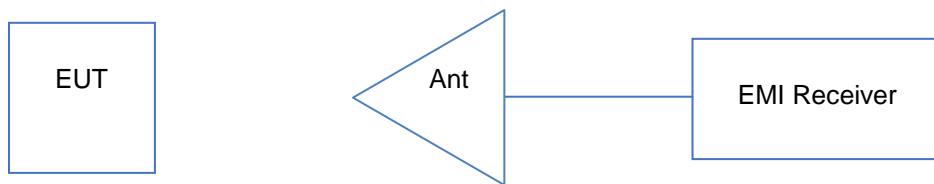
Software Utilized:

Name	Manufacturer	Version	Profile
N/A	N/A	N/A	N/A

7.4 Results:

The sample tested was found to comply.

7.5 Setup Diagram:



7.6 Plots/Data:

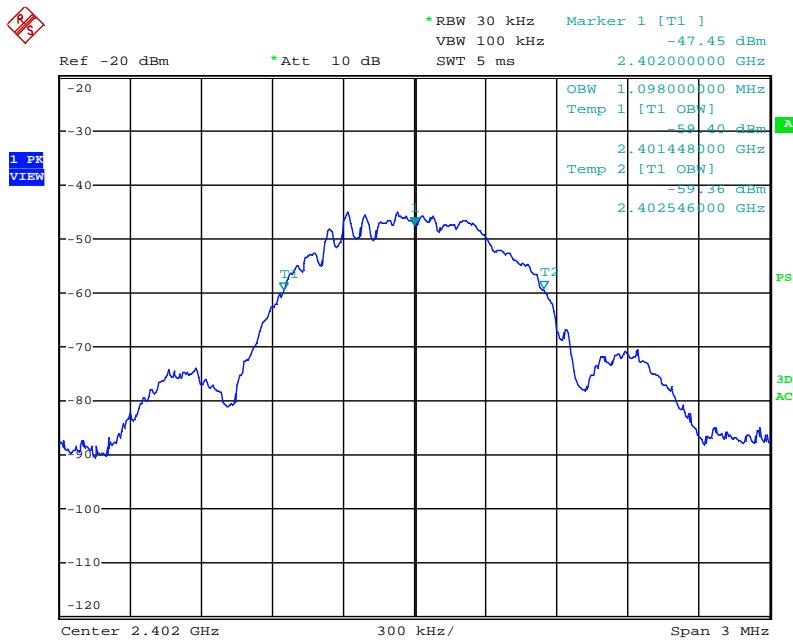
Test Personnel: Grace Lin
Product Standard: FCC 15.247, ISED RSS-247
Input Voltage: Inductive Coupling
Pretest Verification with BB Source: N/A

Test Date: 09/29/2016
Limit Applied: FCC 15.247, ISED RSS-247
Ambient Temperature: 22.7 °C
Relative Humidity: 49.9 %
Atmospheric Pressure: 992.5 mbars

Frequency (MHz)	99% Occupied Bandwidth (MHz)
2402	1.098
2440	1.086
2480	1.086

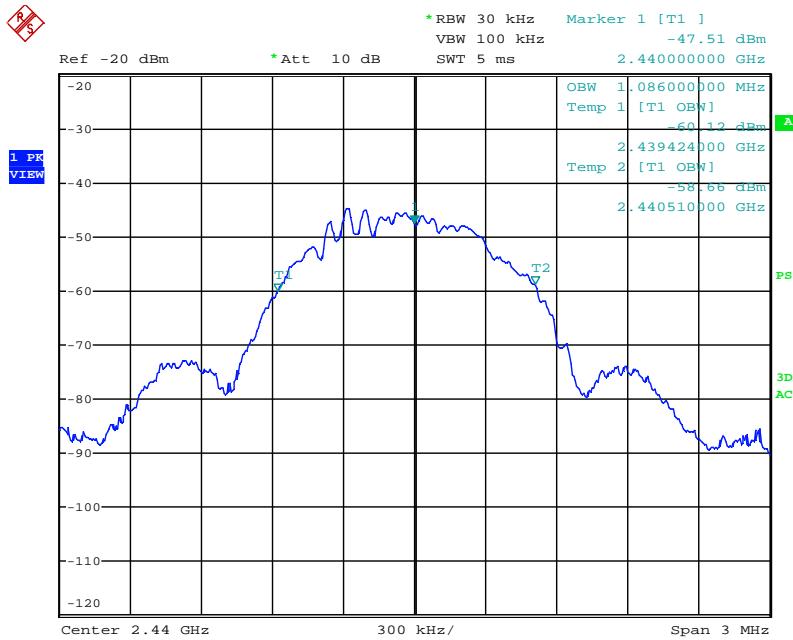
Deviations, Additions, or Exclusions: None

Channel 2402 MHz:



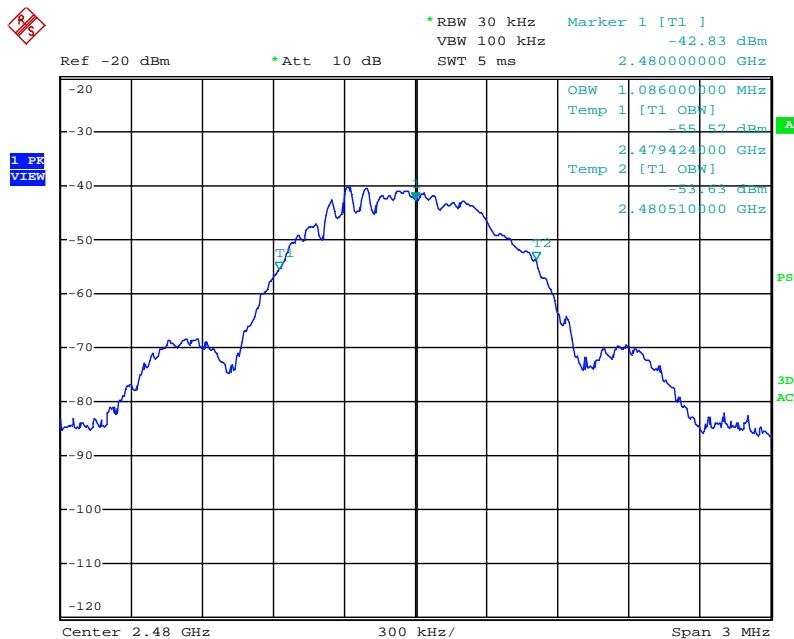
Date: 29.SEP.2016 15:35:49

Channel 2440 MHz:



Date: 29.SEP.2016 15:33:23

Channel 2480 MHz:



Date: 29.SEP.2016 15:38:28

8 Output Power

8.1 Requirement(s)

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, the maximum peak output power is 1 watt (30 dBm). For all other frequency hopping systems operating in the 2400-2483.5 MHz band, the maximum peak output power is 0.125 watts.

8.2 Method

The procedure described in Section 11.9 of ANSI C63.10-2013 was used.

- a) Set the RBW \geq DTS bandwidth.
- b) Set VBW \geq [3 x RBW].
- c) Set span \geq [3 x RBW].
- d) Sweep =auto couple.
- e) Detector = Peak.
- f) Trace mode = max hold.
- g) Allow trace to fully stabilize.
- h) Use peak marker function to determine the peak amplitude level.

Additional procedures and sample calculation are described in Section 11.2 of this test report.

TEST SITE:

The test is performed in the 3 meter semi-anechoic chamber located at 25791 Commercentre Drive, Lake Forest, California 92630 USA. This test facility meets the requirements of CISPR 16-1-4 and has been accredited by A2LA. IC test site registration number is 2042T.

8.3 Test Equipment Used:

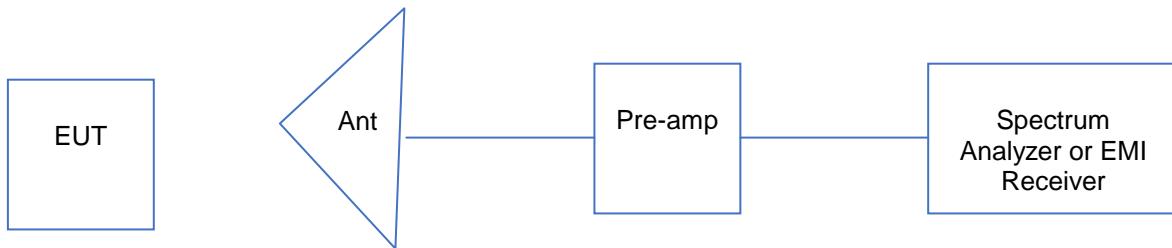
Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
637	3m Semi-anechoic Chamber	Panashield	3 meter	25 331-D-Z	August 2015	August 2018
690	Spectrum Analyzer, 9 KHz - 40 GHz	Rohde & Schwarz	FSP40	100027	01/11/2016	01/11/2017
1515	Horn Antenna	ETS-Lindgren	3115	00161631	11/05/2015	11/05/2016
1135	Preamplifier	Miteq	AMF-6D-00501800-24-10P	1685147	04/15/2016	04/15/2017
1518	Cable	Rohde & Schwarz	TSPR-B7	101529	07/01/2016	07/01/2017
1564	Cable	Rohde & Schwarz	TSPR-B8	101526	10/14/2015	10/14/2016
1001	Barometer/ Humidity	Omega	iBTHX-W	0440775	04/22/2016	04/22/2017

Software Utilized:

Name	Manufacturer	Version	Profile
N/A	N/A	N/A	N/A

8.4 Results:

The sample tested was found to comply.

8.5 Setup Diagram:**8.6 Plots/Data:**

Test Personnel: Grace Lin
 Product Standard: FCC 15.247, IC RSS-247
 Input Voltage: Inductive Coupling
 Pretest Verification w/ BB Source: Yes

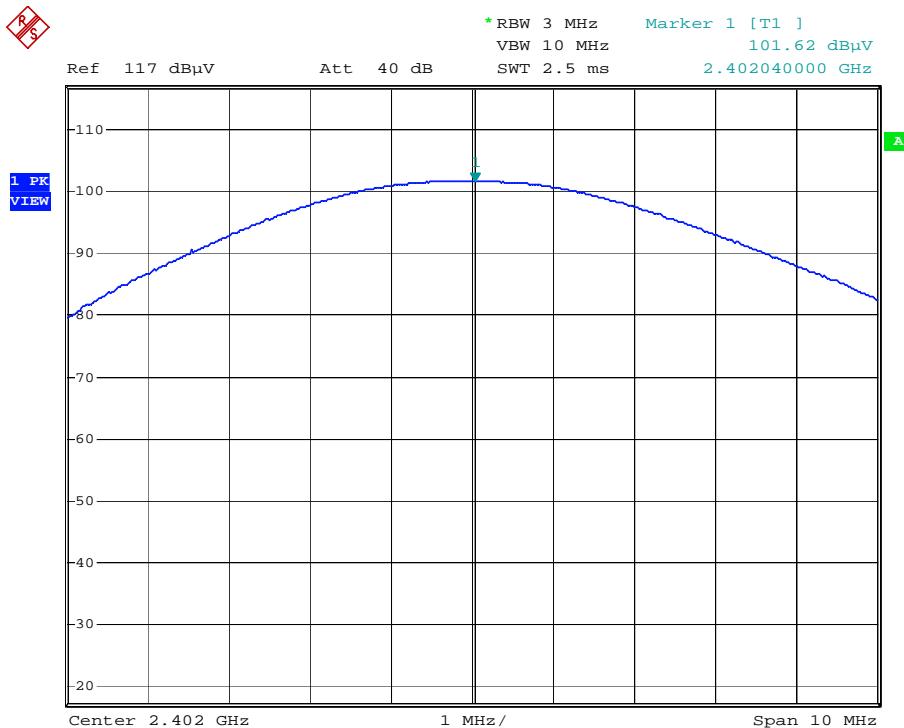
Test Date: 10/02/2016
 Limit Applied: FCC 15.247, IC RSS-247
 Ambient Temperature: 23.4 °C
 Relative Humidity: 52.5 %
 Atmospheric Pressure: 990.1 mbars

Antenna Polarization	Frequency (MHz)	Measured Raw Data (dBuV/m)	Antenna Factor	Cable Loss (dB)	Pre-amp (dB)	E (dBuV/m)	Output Power (dBm)	Limit (dBm)	Margin (dB)
H	2402	101.62	28.15	2.53	44.72	87.58	-7.72	30	-37.72
H	2440	102.14	28.30	2.55	44.69	88.30	-7.00	30	-37.00
H	2480	102.65	28.45	2.57	44.64	89.03	-6.27	30	-36.27

Output Power (dBm) = E (dBuV/m) -95.3

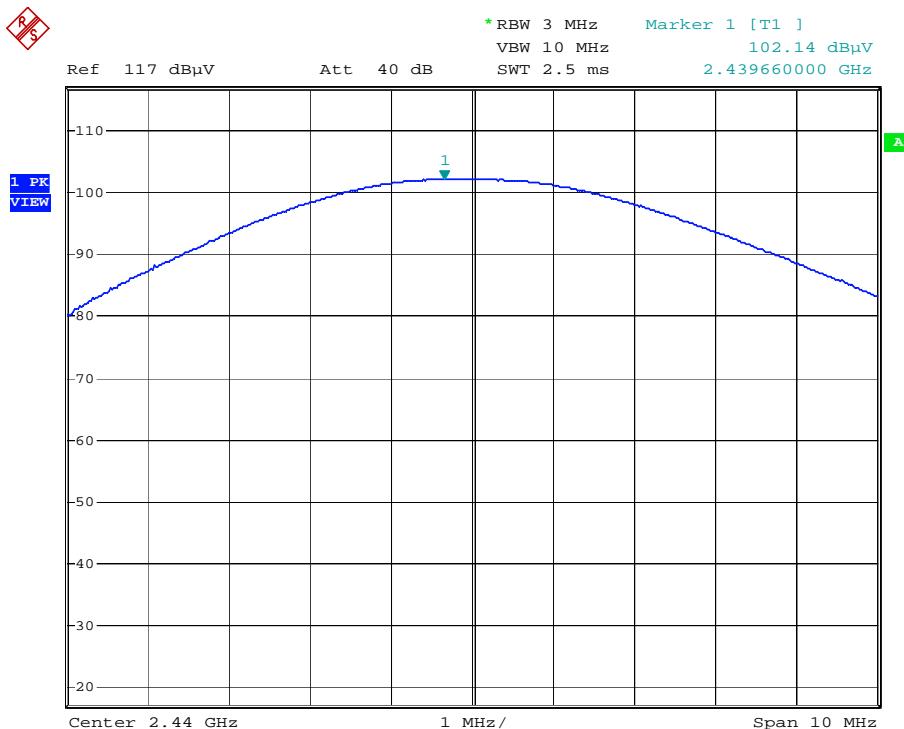
Deviations, Additions, or Exclusions: None

Channel 2402 MHz:



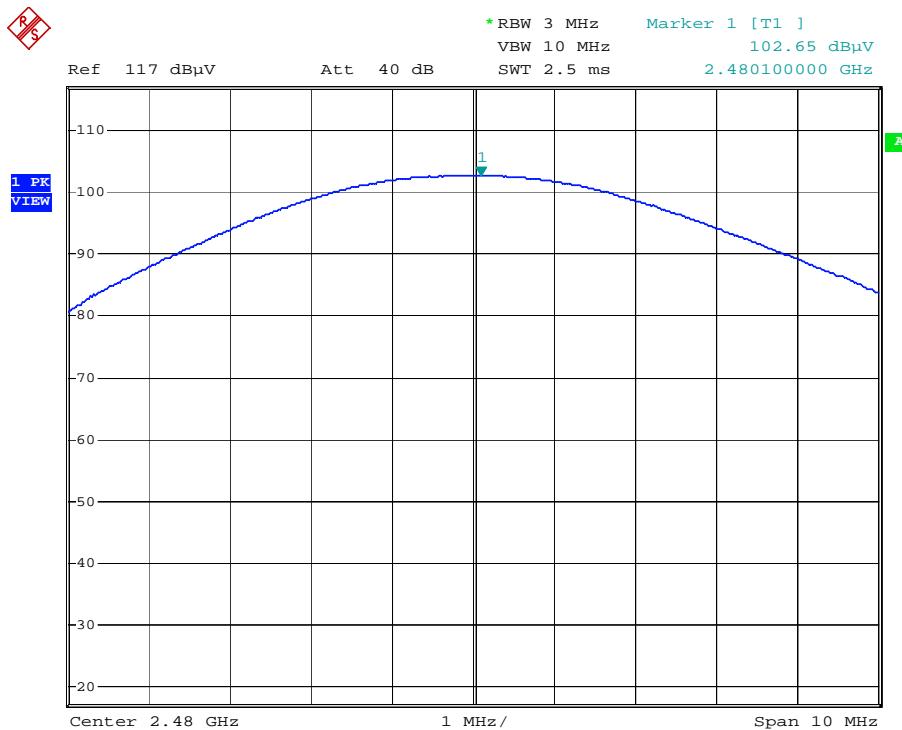
Date: 1.JAN.2000 04:23:36

Channel 2440 MHz:



Date: 1.JAN.2000 04:00:05

Channel 2480 MHz:



Date: 1.JAN.2000 03:41:44

9 Power Spectral Density

9.1 Requirement(s)

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna should not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

9.2 Method

The procedure described in Section 11.10 of ANSI C63.10-2013 was used.

- a) Set analyzer center frequency to DTS channel center frequency.
- b) Set the span to 1.5 times the DTS bandwidth.
- c) Set the RBW to $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
- d) Set VBW $\geq [3 \times \text{RBW}]$.
- e) Detector = Peak.
- f) Sweep item = auto couple.
- g) Trace mode = max hold.
- h) Allow trace to fully stabilize.
- i) Use the peak marker function to determine the maximum amplitude level within the RBW.
- j) If measured value exceeds requirement, then reduce RBW (but no less than 3 kHz) and repeat.

Additional procedures and sample calculation are described in Section 11.2 of this test report.

TEST SITE:

The test is performed in the 3 meter semi-anechoic chamber located at 25791 Commercentre Drive, Lake Forest, California 92630 USA. This test facility meets the requirements of CISPR 16-1-4 and has been accredited by A2LA. IC test site registration number is 2042T.

9.3 Test Equipment Used:

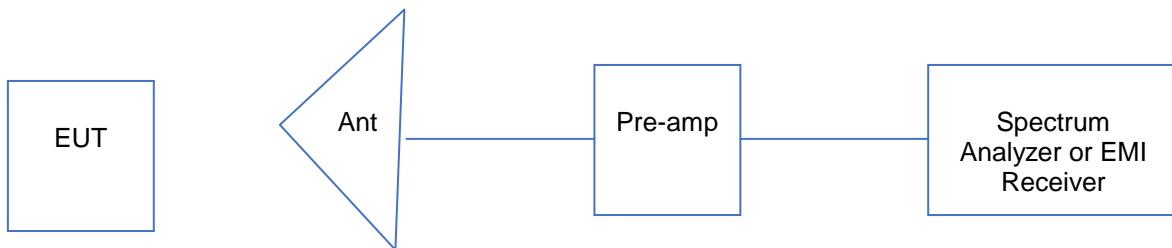
Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
637	3m Semi-anechoic Chamber	Panashield	3 meter	25 331-D-Z	August 2015	August 2018
690	Spectrum Analyzer, 9 KHz - 40 GHz	Rohde & Schwarz	FSP40	100027	01/11/2016	01/11/2017
1515	Horn Antenna	ETS-Lindgren	3115	00161631	11/05/2015	11/05/2016
1135	Preamplifier	Miteq	AMF-6D-00501800-24-10P	1685147	04/15/2016	04/15/2017
1518	Cable	Rohde & Schwarz	TSPR-B7	101529	07/01/2016	07/01/2017
1564	Cable	Rohde & Schwarz	TSPR-B8	101526	10/14/2015	10/14/2016
1001	Barometer/ Humidity	Omega	iBTHX-W	0440775	04/22/2016	04/22/2017

Software Utilized:

Name	Manufacturer	Version	Profile
N/A	N/A	N/A	N/A

9.4 Results:

The sample tested was found to comply.

9.5 Setup Diagram:**9.6 Plots/Data:**

Test Personnel: Grace Lin
 Product Standard: FCC 15.247, IC RSS-247
 Input Voltage: Inductive Coupling
 Pretest Verification
 w/ BB Source: N/A

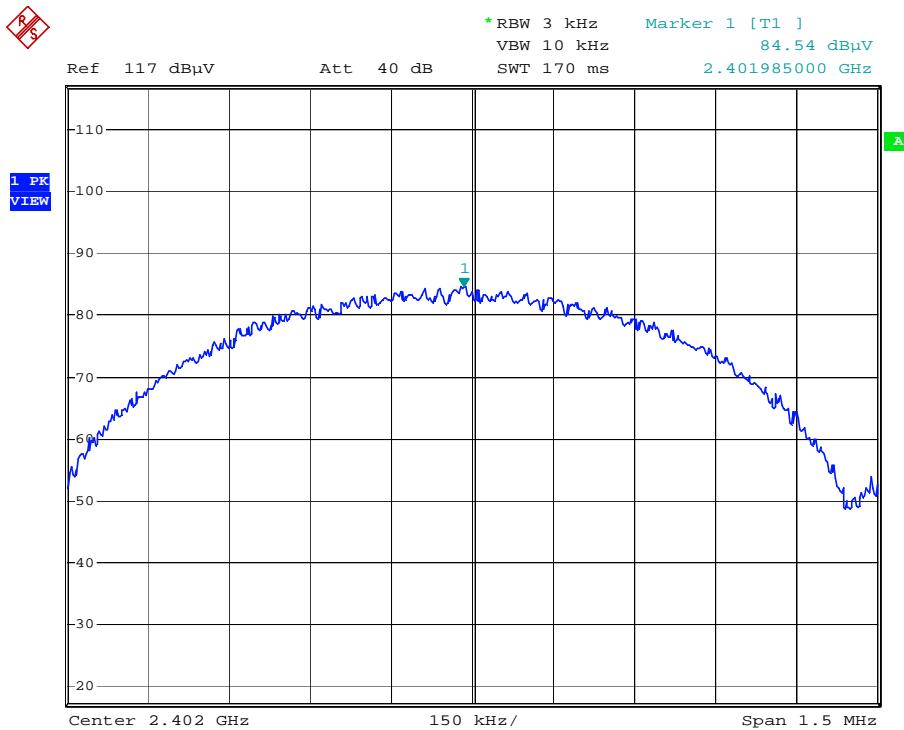
Test Date: 10/02/2016
 Limit Applied: FCC 15.247, IC RSS-247
 Ambient Temperature: 23.4 °C
 Relative Humidity: 52.5 %
 Atmospheric Pressure: 990.1 mbars

Antenna Polarization	Frequency (MHz)	Measured Raw Data (dBuV/m)	Antenna Factor	Cable Loss (dB)	Pre-amp (dB)	E (dBuV/m)	PSD (dBm)	Limit (dBm)	Margin (dB)
H	2402	84.5	28.15	2.53	44.72	70.50	-24.80	8	-32.80
H	2440	84.9	28.30	2.55	44.69	71.08	-24.22	8	-32.22
H	2480	85.4	28.45	2.57	44.64	71.80	-23.50	8	-31.50

PSD (dBm) = E (dBuV/m) -95.3

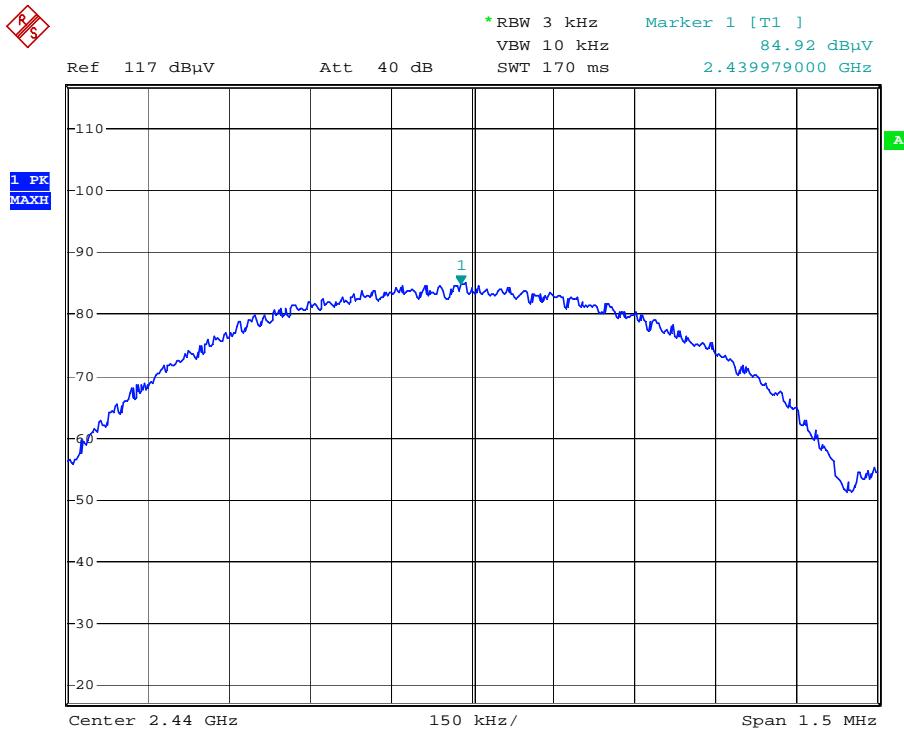
Deviations, Additions, or Exclusions: None

Channel 2402 MHz:



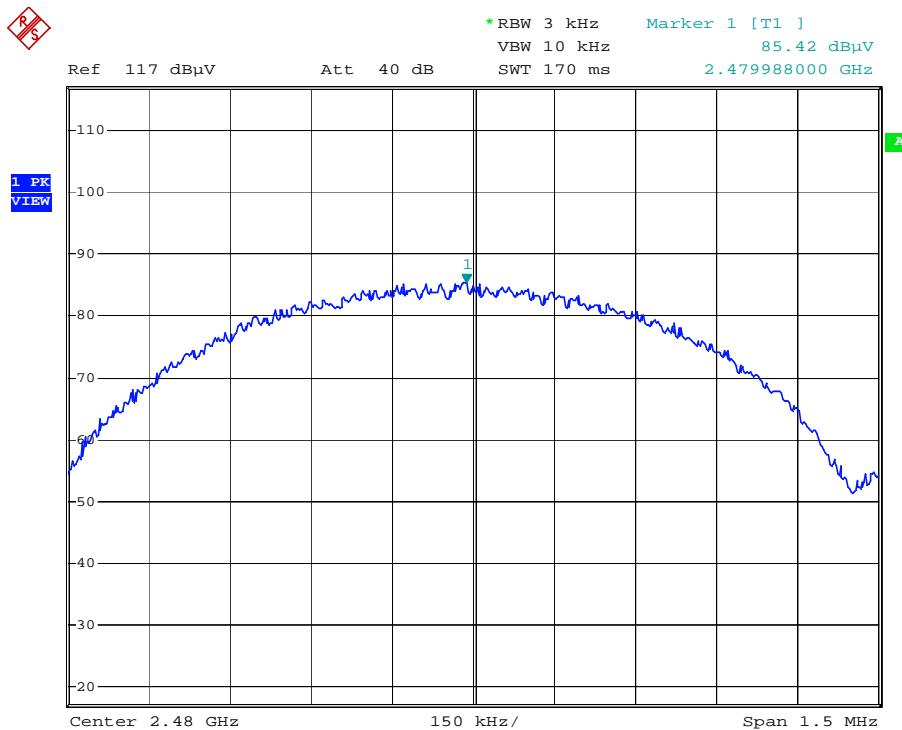
Date: 1.JAN.2000 04:24:45

Channel 2440 MHz:



Date: 1.JAN.2000 04:01:12

Channel 2480 MHz:



Date: 1.JAN.2000 03:51:11

10 Band-edge

10.1 Requirement(s)

In any 100 kHz bandwidth outside the frequency band, the RF power shall be at least 20 dB below that in the 100 kHz bandwidth within the band.

10.2 Method

The procedure described in Section 6.10.4 of ANSI C63.10-2013 was used.

TEST SITE:

The test is performed in the 3 meter semi-anechoic chamber located at 25791 Commercentre Drive, Lake Forest, California 92630 USA. This test facility meets the requirements of CISPR 16-1-4 and has been accredited by A2LA. IC test site registration number is 2042T.

10.3 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
637	3m Semi-anechoic Chamber	Panashield	3 meter	25 331-D-Z	August 2015	August 2018
1140	EMI Test Receiver	Rohde & Schwarz	ESCI7	100825	02/22/2016	02/22/2017
1093	Horn Antenna	A.H. System2	SAS-571	1513	02/12/2016	02/12/2017
1001	Barometer/Humidity	Omega	iBTHX-W	0440775	04/22/2016	04/22/2017

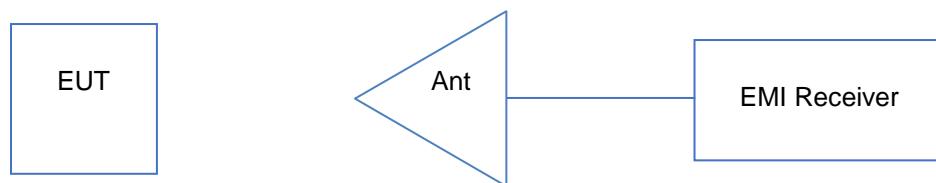
Software Utilized:

Name	Manufacturer	Version	Profile
N/A	N/A	N/A	N/A

10.4 Results:

The sample tested was found to comply.

10.5 Setup Diagram:

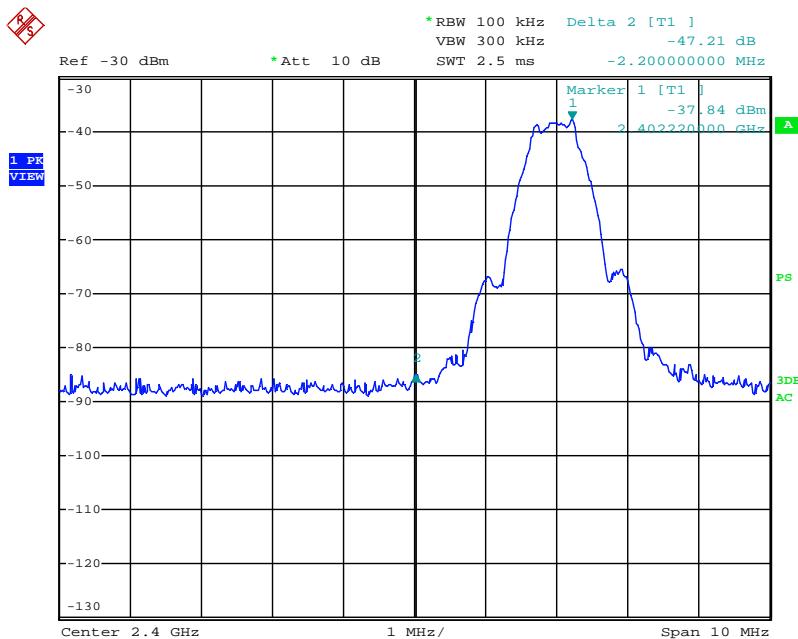


10.6 Plots/Data:

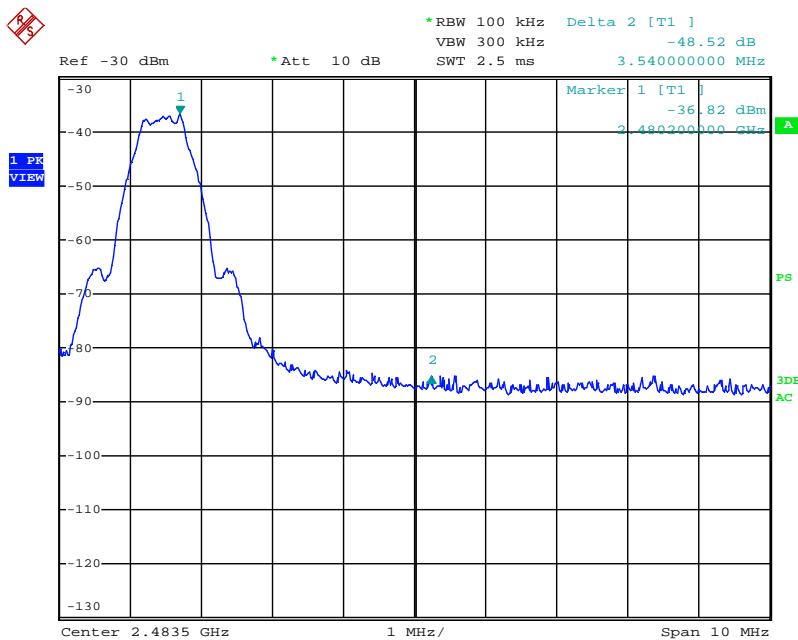
Test Personnel: Grace Lin
Product Standard: FCC 15.247, ISED RSS-247
Input Voltage: Inductive Coupling
Pretest Verification with BB Source: N/A

Test Date: 09/29/2016
Limit Applied: FCC 15.247, ISED RSS-247
Ambient Temperature: 22.7 °C
Relative Humidity: 49.9 %
Atmospheric Pressure: 992.5 mbars

Deviations, Additions, or Exclusions: None

Band-edge at 2400 MHz:

Date: 29.SEP.2016 15:51:29

Band-edge at 2483.5 MHz:

Date: 29.SEP.2016 15:49:40

11 Radiated Spurious Emissions

11.1 Requirement(s)

Radiated emissions which fall in the restricted bands, as defined in §15.205(a), must comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

In any 100 kHz bandwidth outside the EUT pass-band, the RF power shall be below the maximum in-band 100 kHz emissions by at least 20 dB (if peak power of in-band emission is measured) or 30 dB (if average power of in-band emission is measured).

The field strength of emissions from intentional radiators operated within the frequency band shall comply with the following:

11.2 Method

EUT was configured to transmit continuously. Radiated emission measurements were performed from 150 kHz to 25 GHz according to the procedure described in ANSI C63.10. Spectrum analyzer resolution bandwidth is 9 kHz for frequencies 150 kHz to 30 MHz, 120 kHz for frequencies 30 MHz to 1000 MHz, and 1 MHz for frequencies above 1 GHz. Above 1 GHz, both Peak and Average measurements were performed. The peak level of radiated emissions was measured with a video bandwidth (VBW) of 3 MHz. The average level of radiated emissions was measured with a video bandwidth (VBW) of 10 Hz.

The EUT is placed on a plastic turntable that is 80 cm in height for frequencies 150 kHz to 1000 MHz, 1.5 meters for frequency above 1000 MHz. If the EUT attaches to peripherals, they are connected and operational (as typical as possible). During testing, all cables were manipulated to produce worst-case emissions. The signal is maximized through rotation. The antenna height and polarization are varied during the search for maximum signal level. The antenna height is varied from 1 to 4 meters.

Radiated emissions are taken at 3 meters for frequencies below 18 GHz and 1 meter for frequencies above 18 GHz. A new fully charged battery was used by the support equipment to provide power to the EUT through inductive coupling.

Radiated emissions were investigated in three orientations. Data included is representative of the worst-case configuration (the configuration which resulted in the highest emission levels).

TEST SITE:

The test is performed in the 3 meter semi-anechoic chamber located at 25791 Commercentre Drive, Lake Forest, California 92630 USA. This test facility meets the requirements of CISPR 16-1-4 and has been accredited by A2LA. IC test site registration number is 2042T.

Measurement Uncertainty

Measurement	Frequency Range	Expanded Uncertainty (k=2)	Ucispr
Radiated Emissions, 3m	30-1000 MHz	4.3	6.3 dB
Radiated Emissions, 3m	1-18 GHz	5.5	5.2 dB

As shown in the table above our radiated emissions U_{lab} is less than the corresponding U_{CISPR} reference value in CISPR 16-4-2 Table 1, hence the compliance of the product is only based on the measured value, and no measurement uncertainty correction is required.

Sample Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CF - AG$$

Where

FS = Field Strength in dB μ V/m

RA = Receiver Amplitude (including preamplifier) in dB μ V

CF = Cable Attenuation Factor in dB

AF = Antenna Factor in dB

AG = Amplifier Gain in dB

In the following table(s), the reading shown on the data table reflects the preamplifier gain. An example for the calculations in the following table is as follows.

Assume a receiver reading of 52.0 dB μ V is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted, giving a field strength of 32 dB μ V/m. This value in dB μ V/m was converted to its corresponding level in μ V/m.

$$RA = 52.0 \text{ dB}\mu\text{V}$$

$$AF = 7.4 \text{ dB/m}$$

$$CF = 1.6 \text{ dB}$$

$$AG = 29.0 \text{ dB}$$

$$FS = 32 \text{ dB}\mu\text{V/m}$$

To convert from dB μ V to μ V or mV the following was used:

$$UF = 10^{(NF/20)} \text{ where } UF = \text{Net Reading in } \mu\text{V}$$

$$NF = \text{Net Reading in dB}\mu\text{V}$$

Example:

$$FS = RA + AF + CF - AG = 52.0 + 7.4 + 1.6 - 29.0 = 32.0$$

$$UF = 10^{(32 \text{ dB}\mu\text{V} / 20)} = 39.8 \mu\text{V/m}$$

11.3 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
637	3m Semi-anechoic Chamber	Panashield	3 meter	25 331-D-Z	August 2015	August 2018
1140	EMI Test Receiver	Rohde & Schwarz	ESCI7	100825	02/22/2016	02/22/2017
690	Spectrum Analyzer, 9 KHz - 40 GHz	Rohde & Schwarz	FSP40	100027	01/11/2016	01/11/2017
1147	Bilog Antenna	Teseq	CBL 6112D	32852	10/28/2015	10/28/2016
1515	Horn Antenna	ETS-Lindgren	3115	00161631	11/05/2015	11/05/2016
880	Horn Antenna	ETS-Lindgren	3116C	00153521	11/09/2015	11/09/2016
1135	Preamplifier	Miteq	AMF-6D-00501800-24-10P	1685147	04/15/2016	04/15/2017
1470	Cable	MegaPhase	TM18-N1N1-600	-	06/15/2016	06/15/2017
1518	Cable	Rohde & Schwarz	TSPR-B7	101529	07/01/2016	07/01/2017
1564	Cable	Rohde & Schwarz	TSPR-B8	101526	10/14/2015	10/14/2016
1001	Barometer/ Humidity	Omega	iBTHX-W	0440775	04/22/2016	04/22/2017

Software Utilized:

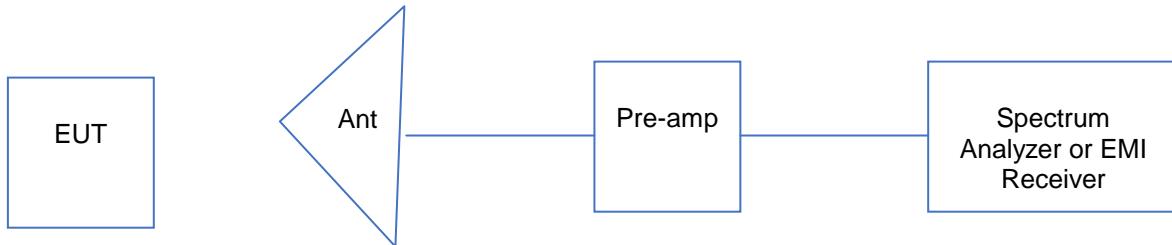
Name	Manufacturer	Version	Profile
Tile	Quantum Change	4.1, 3.4.K.29	<ul style="list-style-type: none"> FCC 30 to 1000 FCC Part 15 FSP 1-18GHz

11.4 Results:

The data on the following pages list the significant emission frequencies, the limit and the margin of compliance.

Radiated emission measurements were performed up to 25GHz. Peak emissions that were identified were measured to be greater than 20dB below 74dB μ V peak limits. No Emissions were identified when scanned from 18-25 GHz.

11.5 Setup Diagram:



11.6 Plots/Data:

Test Personnel: Grace Lin

Product Standard: FCC 15.247, IC RSS-247

Inductive Coupling;

Input Voltage: 5.5 Vdc (30 MHz – 1 GHz)

Pretest Verification w/ BB Source: Yes

Test Date: 10/02/2016 – 10/03/2016

Limit Applied: FCC 15.247, FCC 15.209, IC RSS-247, IC RSS-Gen

Ambient Temperature: 23.4 °C; 21.4 °C

Relative Humidity: 52.5 %; 48.1 %

Atmospheric Pressure: 990.1 mbar; 991.9 mbar

Frequency (MHz)	Channel	EUT Orientation	Measured Raw Data (dBuV/m)	Antenna Factor	Cable Loss (dB)	Pre-amp (dB)	Field Strength (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Turntable Degree	Antenna Height (cm)	Detector
2390	Lo	Sideward	53.01	28.15	2.52	44.73	38.95	54	-15.05	50	175	AVE
2390	Lo	Sideward	65.15	28.15	2.52	44.73	51.09	74	-22.91	50	175	PK
4804	Lo	Sideward	59.35	33.26	3.70	43.41	52.90	54	-1.10	60.0	112.0	AVE
4804	Lo	Sideward	63.22	33.26	3.70	43.41	56.77	74	-17.23	60.0	112.0	PK
12010*	Lo	Sideward	38.57	38.74	5.99	45.34	37.96	54	-16.04	0.0	100.0	AVE
12010*	Lo	Sideward	51.48	38.74	5.99	45.34	50.87	74	-23.13	0.0	100.0	PK
4880	Mid	Sideward	59.13	33.42	3.74	43.34	52.95	54	-1.05	57.0	144.0	AVE
4880	Mid	Sideward	63.02	33.42	3.74	43.34	56.84	74	-17.16	57.0	144.0	PK
7320	Mid	Sideward	39.67	38.26	4.20	43.00	39.13	54	-14.87	37.0	128.0	AVE
7320	Mid	Sideward	52.31	38.26	4.20	43.00	51.77	74	-22.23	37.0	128.0	PK
12200*	Mid	Sideward	38.47	38.61	6.15	45.48	37.75	54	-16.25	0.0	100.0	AVE
12200*	Mid	Sideward	52.87	38.61	6.15	45.48	52.15	74	-21.85	0.0	100.0	PK
2483.5	Hi	Sideward	60.60	28.46	2.57	44.64	46.99	54	-7.01	54.0	124.0	AVE
2483.5	Hi	Sideward	68.27	28.46	2.57	44.64	54.66	74	-19.34	54.0	124.0	PK
4960	Hi	Sideward	59.50	33.55	3.78	43.32	53.51	54	-0.49	51.0	106.0	AVE
4960	Hi	Sideward	63.92	33.55	3.78	43.32	57.93	74	-16.07	51.0	106.0	PK
7440	Hi	Sideward	36.86	38.07	4.28	42.70	36.51	54	-17.49	42.0	123.0	AVE
7440	Hi	Sideward	49.97	38.07	4.28	42.70	49.62	74	-24.38	42.0	123.0	PK
12400*	Hi	Sideward	38.04	38.85	6.39	45.31	37.97	54	-16.03	0.0	100.0	AVE
12400*	Hi	Sideward	50.50	38.85	6.39	45.31	50.43	74	-23.57	0.0	100.0	PK

All other radiated emissions were at least 20 dB below the limits.

Deviations, Additions, or Exclusions: None

12 Revision History

Revision Level	Date	Report Number	Prepared By	Reviewed By	Notes
0	10/04/2016	102368130LAX-011	GL	BT	Initial Release
1	06/29/2017	102368130LAX-011	GL	BT	Photos on Page 28 were removed