FCC Test Report

Product Name	AI Camera
Model No.	AICAMX2
FCC ID.	2ACQ9-16880002

Applicant	altek Corporation
Address	No.12, Li-Hsin Road, Science-based Industrial Park, Hsin-Chu City, Taiwan

Date of Receipt	Mar. 12, 2019
Issued Date	Apr. 19, 2019
Report No.	1930148R-RFUSP23V00
Report Version	V1.0

Testing Laboratory
3023

Test Report

Issued Date: Apr. 19, 2019
Report No.: 1930148R-RFUSP23V00

Product Name	AI Camera
Applicant	altek Corporation
Address	No.12, Li-Hsin Road, Science-based Industrial Park, Hsin-Chu City, Taiwan
Manufacturer	Altek (Kunshan) Co., Ltd.
Model No.	AICAMX2
FCC ID.	2ACQ9-16880002
EUT Rated Voltage	DC 3.8V by Battery or DC 5V by USB
EUT Test Voltage	DC 5V by USB
Trade Name	Altek
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C: 2017 ANSI C63.4: 2014, ANSI C63.10: 2013 KDB 558074 D01 DTS Meas Guidance v05
Test Result	Complied

Documented By : April Chen

(Senior Adm. Specialist / April Chen)

Tested By : Yun Che Chen

(Engineer / Yunche Chen)

Approved By :

(Director / Vincent Lin)

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1. GENERAL INFORMATION

1.1. EUT Description

Product Name	AI Camera
Trade Name	Altek
Model No.	AICAMX2
FCC ID.	2ACQ9-16880002
Frequency Range	2402 – 2480MHz
Channel Number	V5.0: 40CH
Type of Modulation	V5.0: GFSK(1Mbps)/ GFSK(2Mbps)
Antenna Type	PIFA Antenna
Channel Control	Auto
Antenna Gain	Refer to the table “Antenna List”
USB Cable	Shielded, 0.6m, with one ferrite core bonded.

Antenna List

No.	Manufacturer	Part No.	Antenna Type	Peak Gain
1	INPAQ	WAG-F-LB-00-030	PIFA	3.01dBi For 2.4GHz

Note: The antenna of EUT is conforming to FCC 15.203.

Center Frequency of Each Channel: (For V5.0)

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 00:	2402 MHz	Channel 01:	2404 MHz	Channel 02:	2406 MHz	Channel 03:	2408 MHz
Channel 04:	2410 MHz	Channel 05:	2412 MHz	Channel 06:	2414 MHz	Channel 07:	2416 MHz
Channel 08:	2418 MHz	Channel 09:	2420 MHz	Channel 10:	2422 MHz	Channel 11:	2424 MHz
Channel 12:	2426 MHz	Channel 13:	2428 MHz	Channel 14:	2430 MHz	Channel 15:	2432 MHz
Channel 16:	2434 MHz	Channel 17:	2436 MHz	Channel 18:	2438 MHz	Channel 19:	2440 MHz
Channel 20:	2442 MHz	Channel 21:	2444 MHz	Channel 22:	2446 MHz	Channel 23:	2448 MHz
Channel 24:	2450 MHz	Channel 25:	2452 MHz	Channel 26:	2454 MHz	Channel 27:	2456 MHz
Channel 28:	2458 MHz	Channel 29:	2460 MHz	Channel 30:	2462 MHz	Channel 31:	2464 MHz
Channel 32:	2466 MHz	Channel 33:	2468 MHz	Channel 34:	2470 MHz	Channel 35:	2472 MHz
Channel 36:	2474 MHz	Channel 37:	2476 MHz	Channel 38:	2478 MHz	Channel 39:	2480 MHz

Note:

1. The EUT is a AI Camera with a built-in Bluetooth V3.0, V2.1+EDR,V5.0 transceiver, this report for Bluetooth V5.0.
2. These tests were conducted on a sample for the purpose of demonstrating compliance of Bluetooth transmitter with Part 15 Subpart C Paragraph 15.247 for spread spectrum devices.
3. Regarding to the operation frequency, the lowest, middle and highest frequency are selected to perform the test.

Test Mode	Mode 1: Transmit - BLE (GFSK)

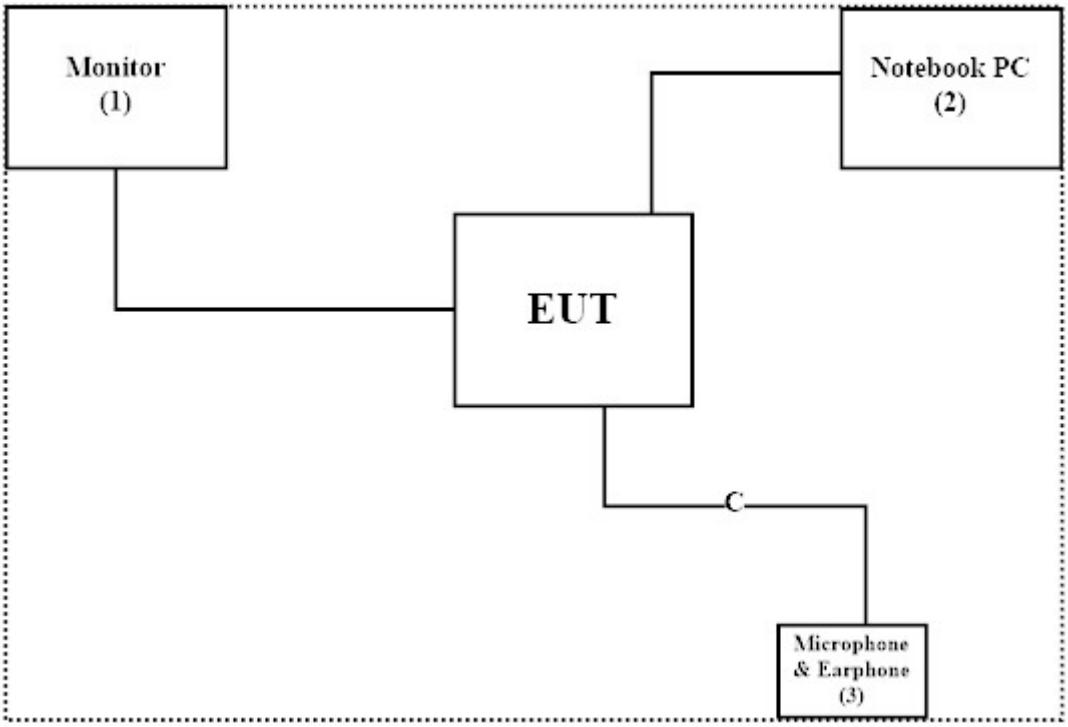
1.3. Tested System Details

The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product		Manufacturer	Model No.	Serial No.	Power Cord
1	LCD Monitor	ASUS	VS229HA	F4LMQS135395	Non-Shielded, 1.8m
2	Notebook PC	DELL	Latitude 5580	2HRD7H2	Non-Shielded, 0.8m
3	Microphone & Earphone	Ergotech	ET-E201	N/A	Non-Shielded, 2.0m

Signal Cable Type		Signal cable Description
A	USB Cable	Non-Shielded, 1.0m
B	HDMI Cable	Non-Shielded, 1.5m
C	Microphone & Earphone Cable	Non-Shielded, 2.0m

1.4. Configuration of Tested System



1.5. EUT Exercise Software

1. Setup the EUT as shown in Section 1.4.
2. Execute software ” QRCT, Ver. 3.0.303.0” on the Notebook PC.
3. Configure the test mode, the test channel, and the data rate.
4. Press “OK” to start the continuous Transmit.
5. Verify that the EUT works properly.

1.6. Test Facility

Ambient conditions in the laboratory:

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	20-35
Humidity (%RH)	25-75	30-65
Barometric pressure (mbar)	860-1060	950-1000

The related certificate for our laboratories about the test site and management system can be downloaded from DEKRA Testing and Certification Co., Ltd. Web Site:
http://www.dekra.com.tw/english/about/certificates.aspx?bval=5
The address and introduction of DEKRA Testing and Certification Co., Ltd. laboratories can be founded in our Web site: http://www.dekra.com.tw/index_en.aspx

Site Description: Accredited by TAF
Accredited Number: 3023

Site Name: DEKRA Testing and Certification Co., Ltd
Site Address: No.5-22, Ruishukeng, Linkou Dist., New Taipei City 24451, Taiwan, R.O.C.
TEL : 886-2-8601-3788 / FAX : 886-2-8601-3789
E-Mail : info.tw@dekra.com

FCC Accreditation Number: TW3023

1.7. List of Test Equipment

For Conducted measurements /CB3/SR8

	Equipment	Manufacturer	Model No.	Serial No.	Cali. Date	Due. Date
	Temperature Chamber	WIT GROUP	TH-1S-B	EQ-201-00146	2019/2/26	2020/2/25
X	Spectrum Analyzer	Agilent	N9010A	MY53470892	2018/09/27	2019/09/26
X	Peak Power Analyzer	Keysight	8990B	MY51000410	2018/08/01	2019/07/31
X	Wideband Power Sensor	Keysight	N1923A	MY56080003	2018/07/25	2019/07/24
X	Wideband Power Sensor	Keysight	N1923A	MY56080004	2018/07/25	2019/07/24
X	EMI Test Receiver	R&S	ESCS 30	100369	2018/11/19	2019/11/18
X	LISN	R&S	ENV216	101105	2019/03/30	2020/03/29
X	LISN	R&S	ESH3-Z5	836679/014	2018/04/02	2019/04/01
X	Coaxial Cable	DEKRA	RG 400	LC018-RG	2018/06/21	2019/06/20

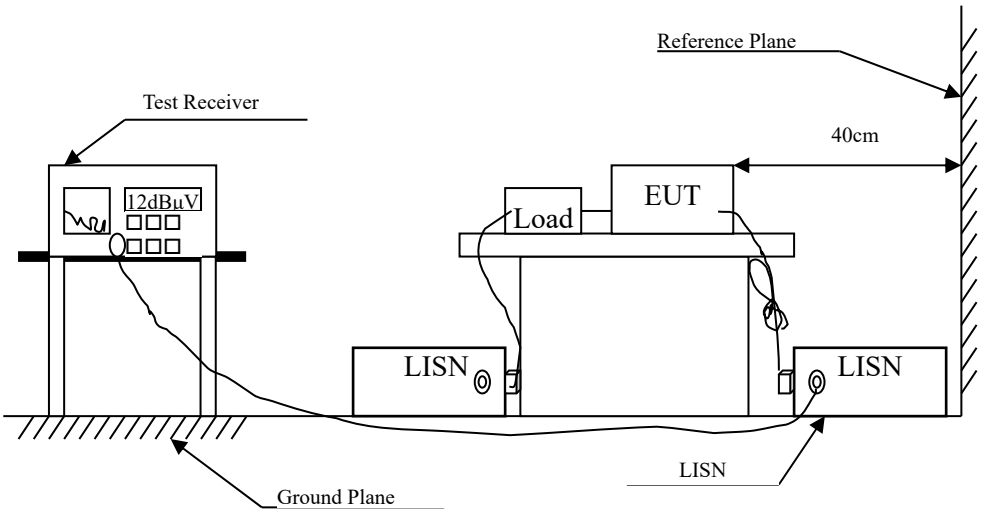
For Radiated measurements /Site3/CB8

	Equipment	Manufacturer	Model No.	Serial No.	Cali. Date	Due. Date
X	Spectrum Analyzer	R&S	FSP40	100170	2019/3/11	2020/3/10
X	Loop Antenna	Teseq	HLA6121	37133	2017/10/13	2019/10/12
X	Bilog Antenna	Schaffner Chase	CBL6112B	2707	2018/06/24	2019/06/23
X	Coaxial Cable	DEKRA	RG 214	LC003-RG	2018/06/14	2019/06/13
X	Pre-Amplifier	Jet-Power	JPA-10M1G33	170101000330010	2018/06/14	2019/06/13
X	Horn Antenna	ETS-Lindgren	3117	00135205	2018/05/03	2019/05/02
X	Horn Antenna	SCHWARZBECK	9120D	576	2018/12/18	2019/12/17
X	Pre-Amplifier	EMCI	EMC012630SE	980210	2018/04/10	2019/04/09
X	Horn Antenna	Com-Power	AH-840	101043	2019/01/19	2020/01/18
X	Amplifier + Cable	EMCI	EMC184045SE	980370	2019/3/21	2020/3/20
X	Filter	MICRO-TRONICS	BRM50702	G270	2018/08/06	2019/08/05
X	Filter	MICRO-TRONICS	BRM50716	G196	2018/08/06	2019/08/05

Note:
1. All equipments are calibrated every one year.
2. The test instruments marked with “X” are used to measure the final test results.
3. Test Software version :QuieTek EMI 2.0 V2.1.113.

2. Conducted Emission

2.1. Test Setup



2.2. Limits

FCC Part 15 Subpart C Paragraph 15.207 (dBµV) Limit		
Frequency MHz	Limits	
	QP	AV
0.15 - 0.50	66-56	56-46
0.50-5.0	56	46
5.0 - 30	60	50

Remarks: In the above table, the tighter limit applies at the band edges.

2.3. Test Procedure

The EUT and Peripherals are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm /50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs.)

Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all the interface cables must be changed according to ANSI C63.4: 2014 on conducted measurement.

Conducted emissions were invested over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

The EUT was setup to ANSI C63.4, 2014; tested to DTS test procedure of FCC KDB-558074 for compliance to FCC 47CFR Subpart C requirements.

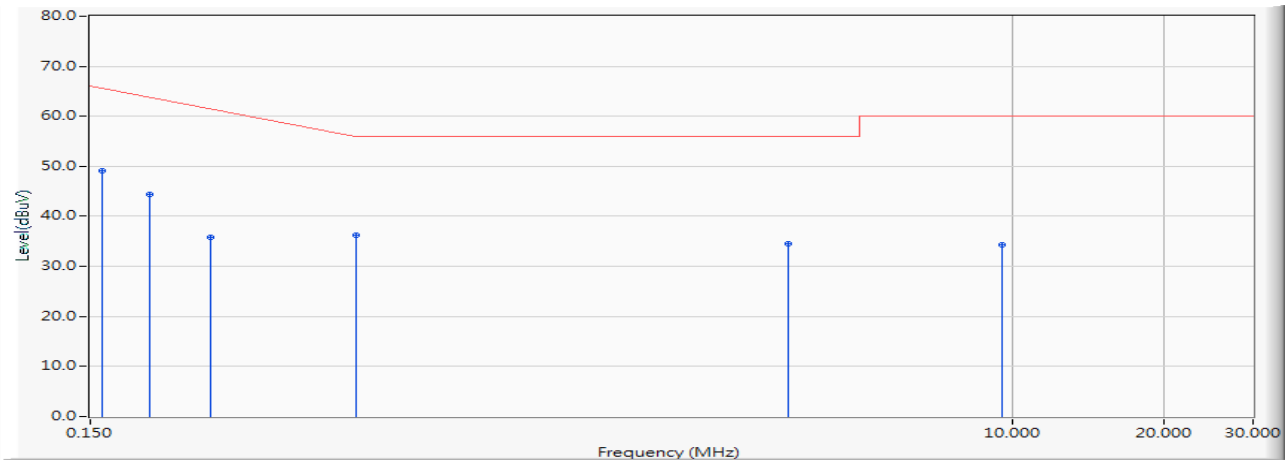
2.4. Uncertainty

± 2.26 dB

2.5. Test Result of Conducted Emission

Product	:	AICAMX2
Test Item	:	Conducted Emission Test
Power Line	:	Line 1
Test date	:	2019/04/19
Test Mode	:	Mode 1: Transmit - BLE (GFSK) (2440MHz)

Line 1



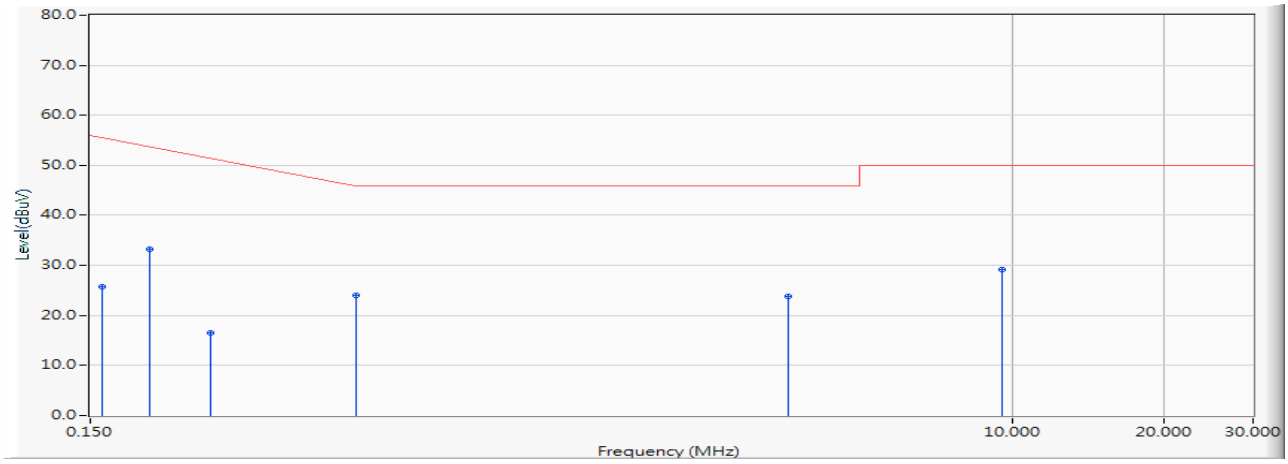
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1	*	0.158	9.746	39.450	49.196	-16.575	65.771	QUASIPEAK
2		0.197	9.738	34.700	44.438	-20.219	64.657	QUASIPEAK
3		0.259	9.740	26.050	35.790	-27.096	62.886	QUASIPEAK
4		0.502	9.750	26.420	36.170	-19.830	56.000	QUASIPEAK
5		3.615	9.882	24.660	34.542	-21.458	56.000	QUASIPEAK
6		9.576	10.064	24.190	34.254	-25.746	60.000	QUASIPEAK

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " " means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : AICAMX2
Test Item : Conducted Emission Test
Power Line : Line 1
Test date : 2019/04/19
Test Mode : Mode 1: Transmit - BLE (GFSK) (2440MHz)

Line 1



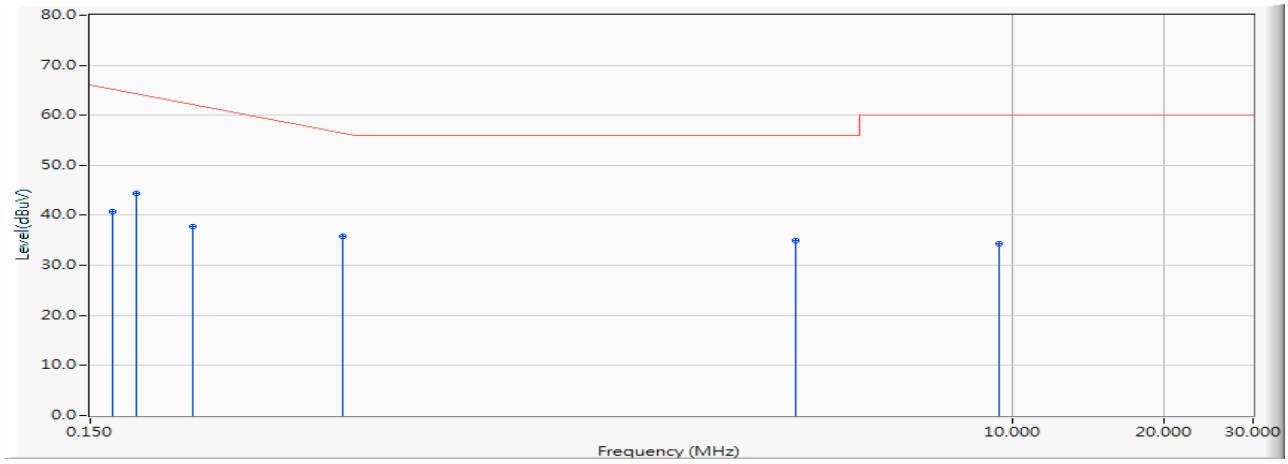
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1		0.158	9.746	15.910	25.656	-30.115	55.771	AVERAGE
2		0.197	9.738	23.490	33.228	-21.429	54.657	AVERAGE
3		0.259	9.740	6.770	16.510	-36.376	52.886	AVERAGE
4		0.502	9.750	14.270	24.020	-21.980	46.000	AVERAGE
5		3.615	9.882	13.960	23.842	-22.158	46.000	AVERAGE
6	*	9.576	10.064	19.000	29.064	-20.936	50.000	AVERAGE

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " " means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : AICAMX2
Test Item : Conducted Emission Test
Power Line : Line 2
Test date : 2019/04/19
Test Mode : Mode 1: Transmit - BLE (GFSK) (2440MHz)

Line 2



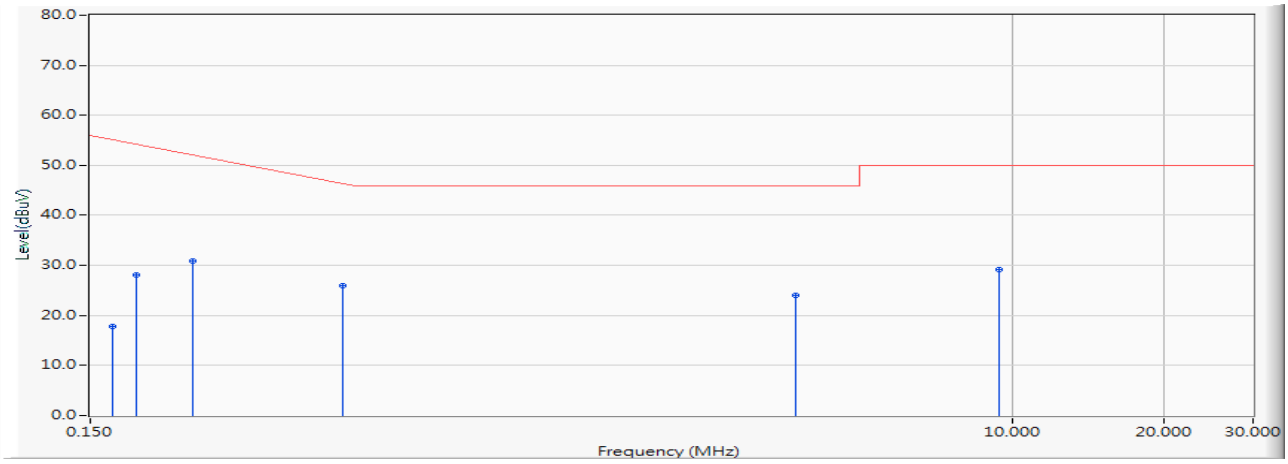
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1		0.166	9.736	30.970	40.706	-24.837	65.543	QUASIPEAK
2	*	0.185	9.737	34.560	44.297	-20.703	65.000	QUASIPEAK
3		0.240	9.739	27.980	37.719	-25.710	63.429	QUASIPEAK
4		0.474	9.739	26.180	35.919	-20.824	56.743	QUASIPEAK
5		3.724	9.874	24.990	34.864	-21.136	56.000	QUASIPEAK
6		9.416	10.071	24.180	34.251	-25.749	60.000	QUASIPEAK

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " " means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

Product : AICAMX2
Test Item : Conducted Emission Test
Power Line : Line 2
Test date : 2019/04/19
Test Mode : Mode 1: Transmit - BLE (GFSK) (2440MHz)

Line 2



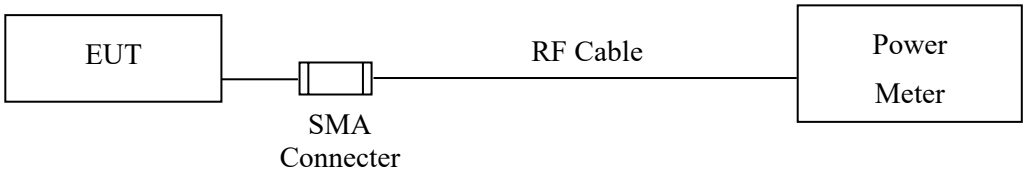
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1		0.166	9.736	8.160	17.896	-37.647	55.543	AVERAGE
2		0.185	9.737	18.400	28.137	-26.863	55.000	AVERAGE
3		0.240	9.739	21.200	30.939	-22.490	53.429	AVERAGE
4	*	0.474	9.739	16.280	26.019	-20.724	46.743	AVERAGE
5		3.724	9.874	14.200	24.074	-21.926	46.000	AVERAGE
6		9.416	10.071	19.010	29.081	-20.919	50.000	AVERAGE

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " " means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor

3. Peak Power Output

3.1. Test Setup



3.2. Limit

The maximum peak power shall be less 1Watt.

3.3. Test Procedure

Tested according to DTS test procedure of KDB 558074 for compliance to FCC 47CFR 15.247 requirements. The maximum peak conducted output power using KDB 558074 section 9.1.3 PKPM1 Peak power meter method.

3.4. Uncertainty

± 1.19 dB

3.5. Test Result of Peak Power Output

Product : AICAMX2
Test Item : Peak Power Output
Test Site : No.3 OATS
Test date : 2019/03/25
Test Mode : Mode 1: Transmit - BLE (GFSK) -1M

Channel No.	Frequency (MHz)	Measurement (dBm)	Required Limit	Result
Channel 00	2402.00	5.23	1 Watt= 30 dBm	Pass
Channel 19	2440.00	5.02	1 Watt= 30 dBm	Pass
Channel 39	2480.00	7.18	1 Watt= 30 dBm	Pass

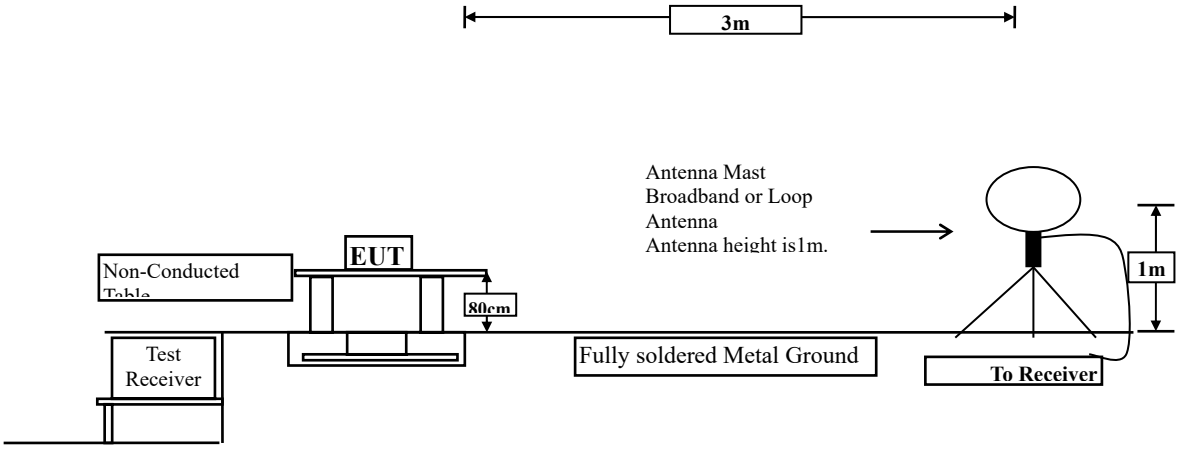
Product : AICAMX2
Test Item : Peak Power Output
Test Site : No.3 OATS
Test date : 2019/03/25
Test Mode : Mode 1: Transmit - BLE (GFSK) -2M

Channel No.	Frequency (MHz)	Measurement (dBm)	Required Limit	Result
Channel 00	2402.00	5.18	1 Watt= 30 dBm	Pass
Channel 19	2440.00	5.24	1 Watt= 30 dBm	Pass
Channel 39	2480.00	7.46	1 Watt= 30 dBm	Pass

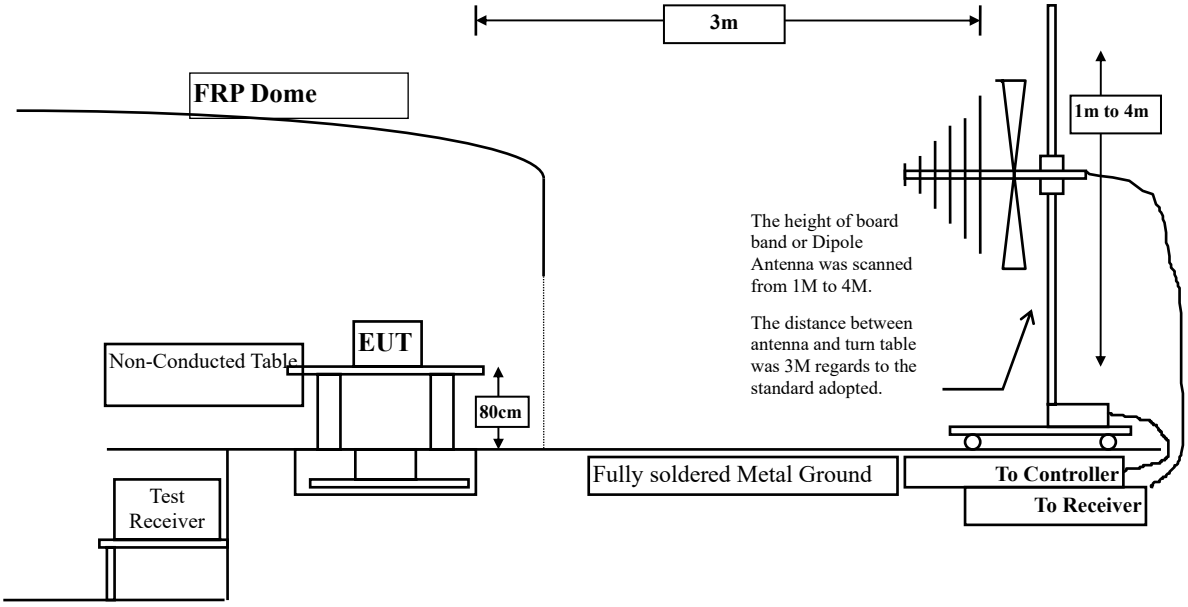
4. Radiated Emission

4.1. Test Setup

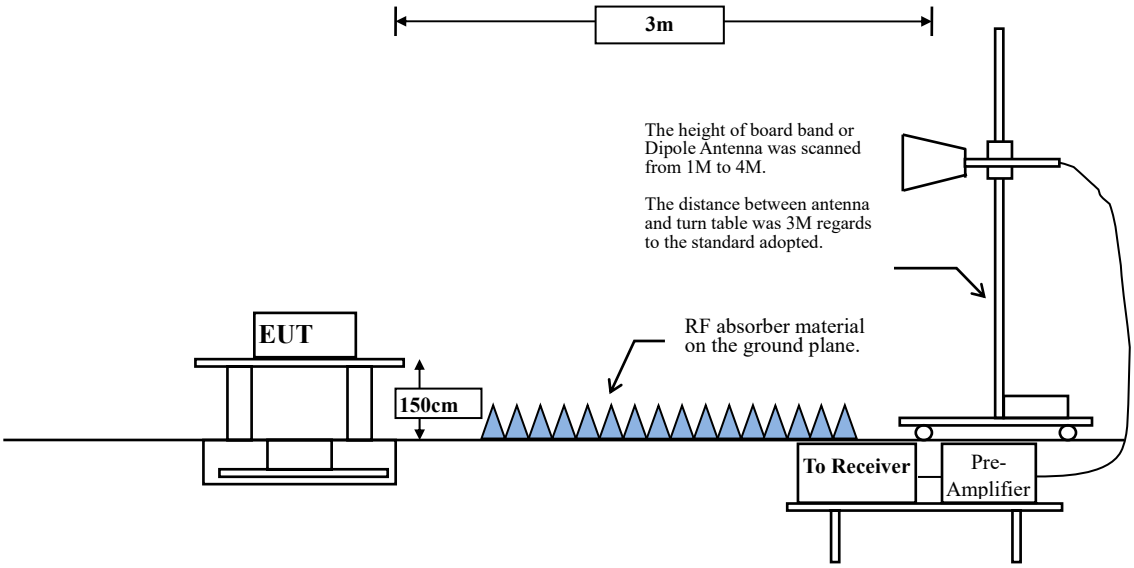
Under 30MHz



Below 1GHz



Above 1GHz



4.2. Limits

➢ **General Radiated Emission Limits**

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 20dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

FCC Part 15 Subpart C Paragraph 15.209 Limits		
Frequency MHz	Field strength (microvolts/meter)	Measurement distance (meter)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remarks: 1. RF Voltage (dBμV) = 20 log RF Voltage (uV)
2. In the Above Table, the tighter limit applies at the band edges.
3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

4.3. Test Procedure

The EUT was setup according to ANSI C63.10: 2013 and tested according to DTS test procedure of KDB558074 for compliance to FCC 47CFR 15.247 requirements.

Measuring the frequency range below 1GHz, the EUT is placed on a turn table which is 0.8 meter above ground,when measuring the frequency range above 1GHz, the EUT is placed on a turn table which is 1.5 meter above ground.

The turn table is rotated 360 degrees to determine the position of the maximum emission level.

The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna is scanned between 1 meter and 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10: 2013 on radiated measurement.

The resolution bandwidth below 30MHz setting on the field strength meter is 9kHz and 30MHz~1GHz is 120kHz and above 1GHz is 1MHz.

Radiated emission measurements below 30MHz are made using Loop Antenna and 30MHz~1GHz are made using broadband Bilog antenna and above 1GHz are made using Horn Antennas.

The measurement is divided into the Preliminary Measurement and the Final Measurement.

The suspected frequencies are searched for in Preliminary Measurement with the measurement antenna kept pointed at the source of the emission both in azimuth and elevation, with the polarization of the antenna oriented for maximum response. The antenna is pointed at an angle towards the source of the emission, and the EUT is rotated in both height and polarization to maximize the measured emission. The emission is kept within the illumination area of the 3 dB bandwidth of the antenna.

The worst radiated emission is measured in the Open Area Test Site on the Final Measurement.

The measurement frequency range form 9kHz - 10th Harmonic of fundamental was investigated.

RBW and VBW Parameter setting:

According to KDB 558074 section 12.2.4. Peak power measurement procedure

RBW = as specified in Table 1.

VBW ≥ 3 x RBW.

Table 1 —RBW as a function of frequency

Frequency	RBW
9-150 kHz	200-300 Hz
0.15-30 MHz	9-10 kHz
30-1000 MHz	100-120 kHz
> 1000 MHz	1 MHz

According to KDB 558074 section 12.2.5. Average power measurement procedure

RBW = 1MHz.

VBW = 10Hz, when duty cycle ≥ 98 %

VBW ≥ 1/T, when duty cycle < 98 %

(T refers to the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.)

2.4GHz band	Duty Cycle (%)	T (ms)	1/T (Hz)	VBW (Hz)
BLE5.0_1M	85.06	2.1449	466	500
BLE5.0_2M	57.37	1.0725	932	1000

Note: Duty Cycle Refer to Section 9

4.4. Uncertainty

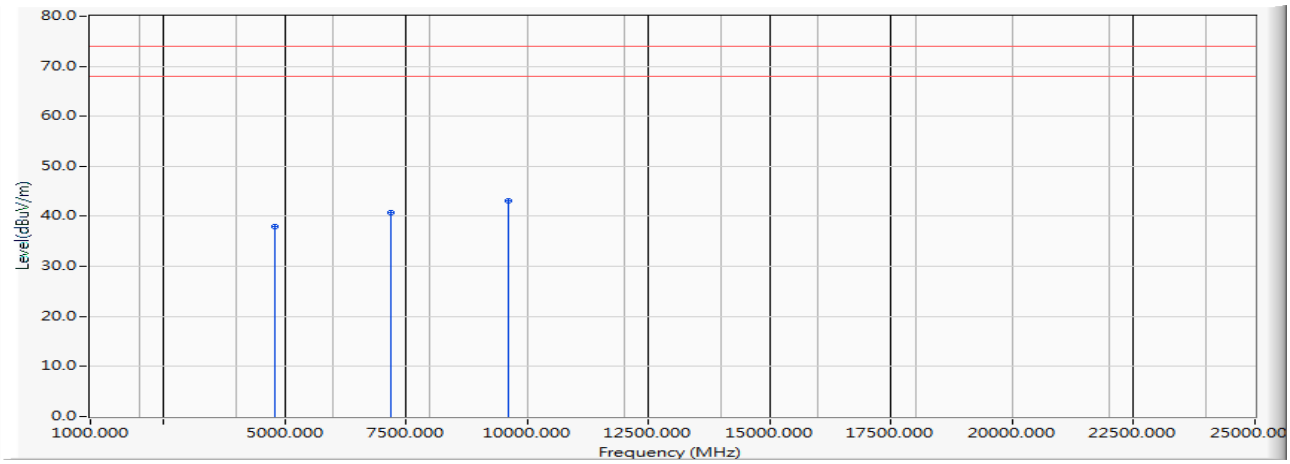
± 4.08 dB above 1GHz

± 4.22 dB below 1GHz

4.5. Test Result of Radiated Emission

Product : AICAMX2
Test Item : Harmonic Radiated Emission
Test Site : No.3 OATS
Test date : 2019/03/26
Test Mode : Mode 1: Transmit - BLE (GFSK)(2402MHz) -1M

Horizontal



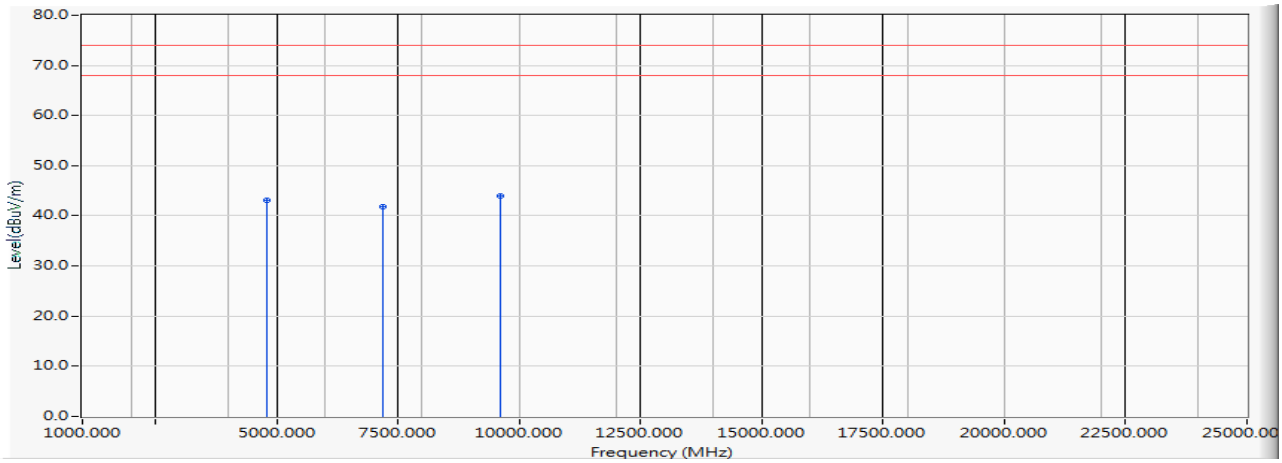
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBµV)	Measure Level (dBµV/m)	Margin (dB)	Limit (dBµV/m)	Detector Type
1		4804.000	6.787	31.254	38.041	-35.959	74.000	PEAK
2		7206.000	11.333	29.491	40.824	-33.176	74.000	PEAK
3	*	9608.000	14.713	28.430	43.143	-30.857	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report..

Product : AICAMX2
Test Item : Harmonic Radiated Emission
Test Site : No.3 OATS
Test date : 2019/03/26
Test Mode : Mode 1: Transmit - BLE (GFSK)(2402MHz) -1M

Vertical



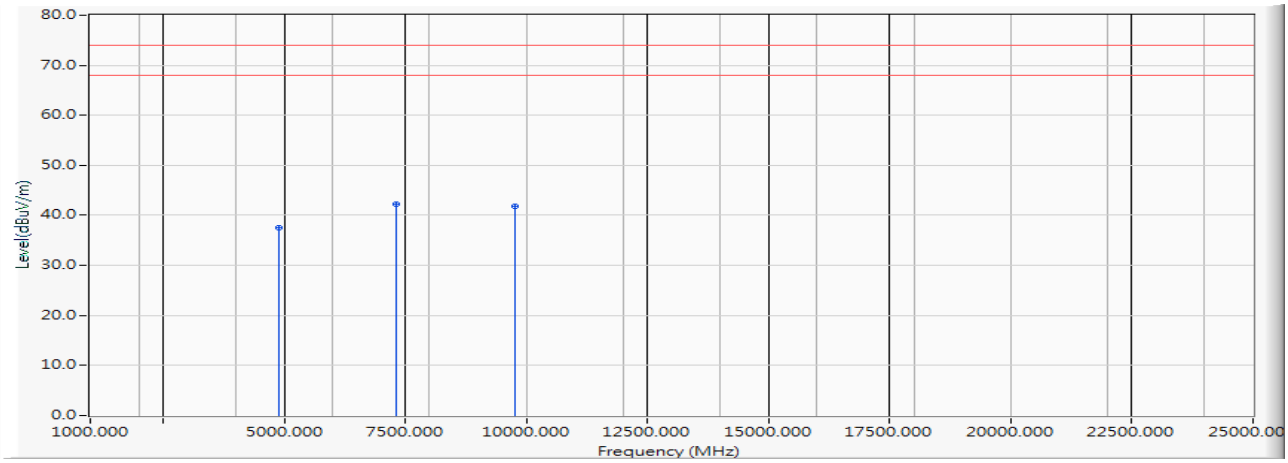
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4804.000	6.787	36.285	43.072	-30.928	74.000	PEAK
2		7206.000	11.333	30.531	41.864	-32.136	74.000	PEAK
3	*	9608.000	14.713	29.227	43.940	-30.060	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report..

Product : AICAMX2
Test Item : Harmonic Radiated Emission
Test Site : No.3 OATS
Test date : 2019/03/26
Test Mode : Mode 1: Transmit - BLE (GFSK) (2440MHz) -1M

Horizontal



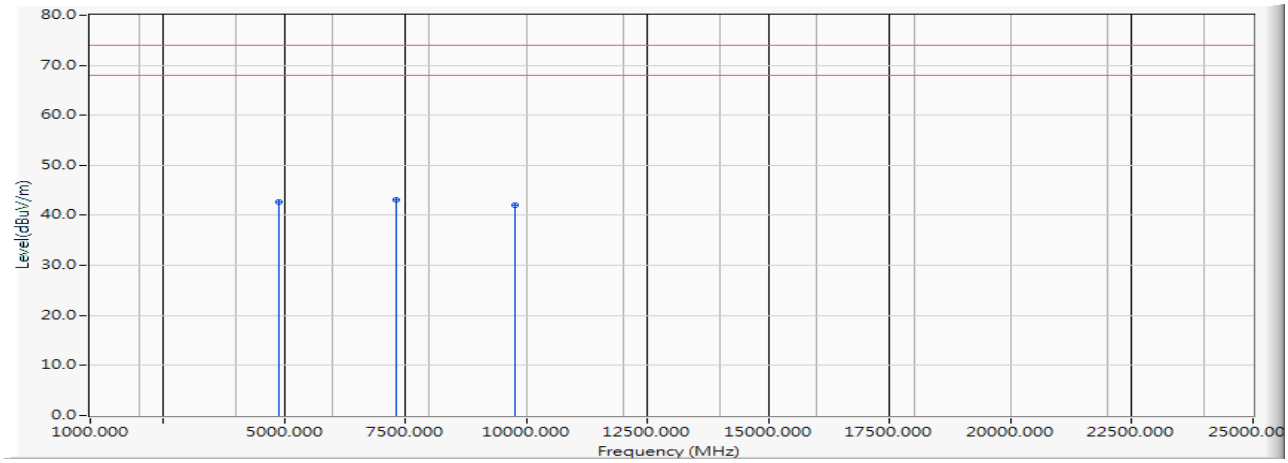
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBµV)	Measure Level (dBµV/m)	Margin (dB)	Limit (dBµV/m)	Detector Type
1		4880.000	6.907	30.714	37.622	-36.378	74.000	PEAK
2	*	7320.000	11.400	30.952	42.353	-31.647	74.000	PEAK
3		9760.000	15.113	26.743	41.856	-32.144	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : AICAMX2
Test Item : Harmonic Radiated Emission
Test Site : No.3 OATS
Test date : 2019/03/26
Test Mode : Mode 1: Transmit - BLE (GFSK) (2440MHz) -1M

Vertical



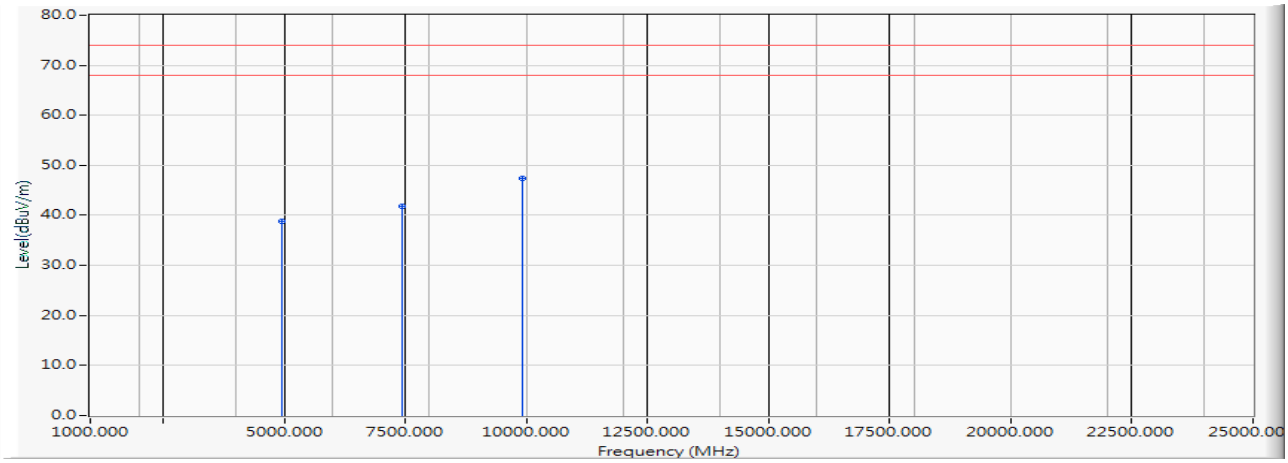
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4880.000	6.907	35.812	42.720	-31.280	74.000	PEAK
2	*	7320.000	11.400	31.782	43.183	-30.817	74.000	PEAK
3		9760.000	15.113	27.015	42.128	-31.872	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : AICAMX2
Test Item : Harmonic Radiated Emission
Test Site : No.3 OATS
Test date : 2019/03/26
Test Mode : Mode 1: Transmit - BLE (GFSK) (2480MHz) -1M

Horizontal



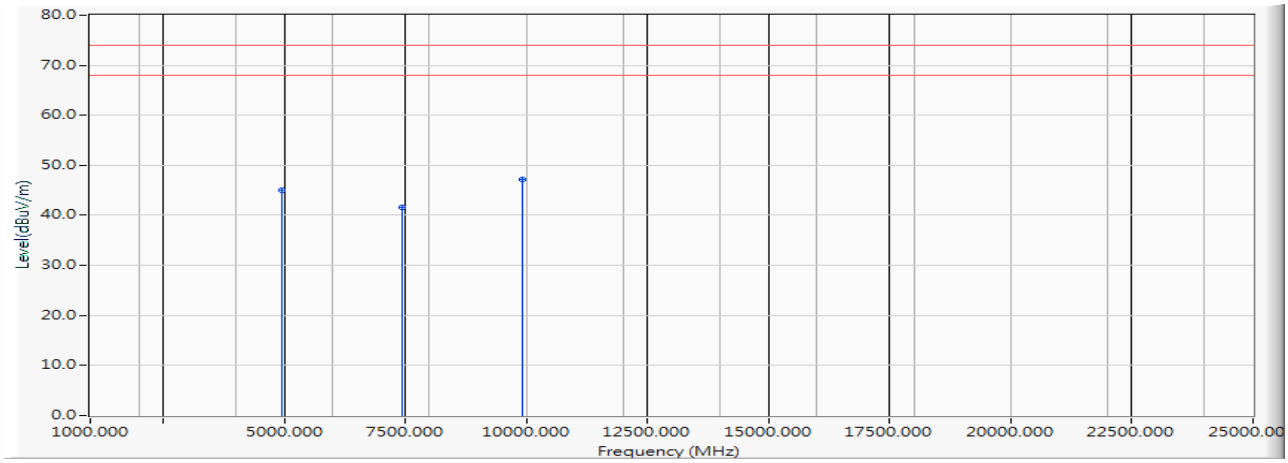
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBµV)	Measure Level (dBµV/m)	Margin (dB)	Limit (dBµV/m)	Detector Type
1		4960.000	7.008	31.857	38.865	-35.135	74.000	PEAK
2		7440.000	11.485	30.393	41.878	-32.122	74.000	PEAK
3	*	9920.000	15.146	32.350	47.496	-26.504	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : AICAMX2
Test Item : Harmonic Radiated Emission
Test Site : No.3 OATS
Test date : 2019/03/26
Test Mode : Mode 1: Transmit - BLE (GFSK) (2480MHz) -1M

Vertical



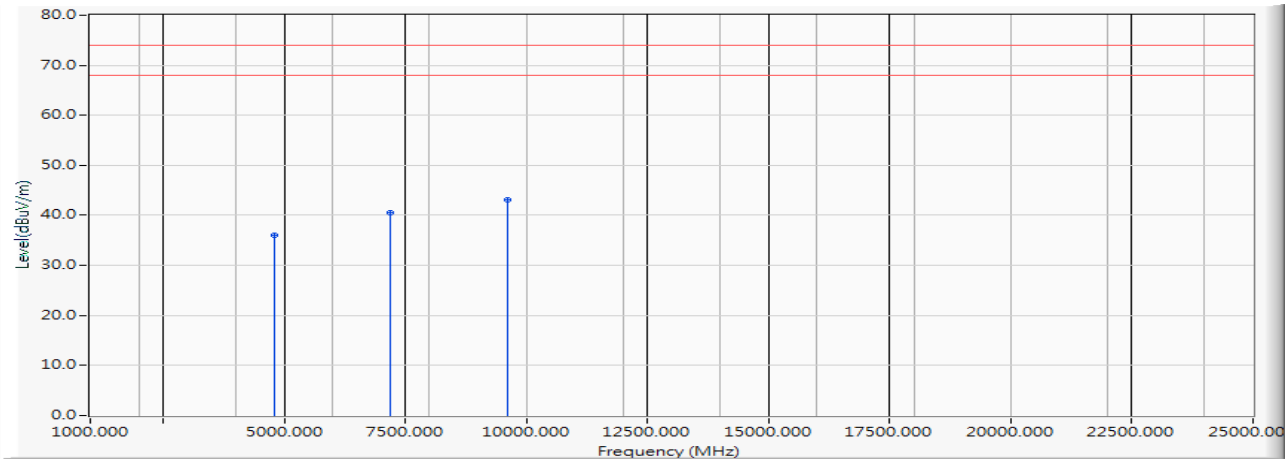
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4960.000	7.008	38.057	45.065	-28.935	74.000	PEAK
2		7440.000	11.485	30.023	41.508	-32.492	74.000	PEAK
3	*	9920.000	15.146	31.992	47.138	-26.862	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : AICAMX2
Test Item : Harmonic Radiated Emission
Test Site : No.3 OATS
Test date : 2019/03/26
Test Mode : Mode 1: Transmit - BLE (GFSK)(2402MHz) -2M

Horizontal



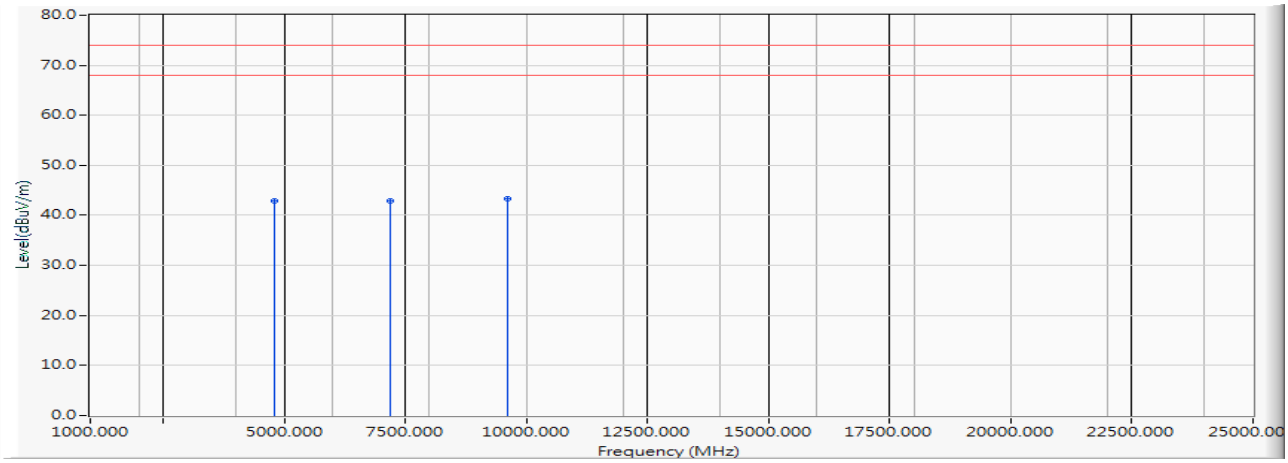
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBµV)	Measure Level (dBµV/m)	Margin (dB)	Limit (dBµV/m)	Detector Type
1		4804.000	6.787	29.194	35.981	-38.019	74.000	PEAK
2		7206.000	11.333	29.161	40.494	-33.506	74.000	PEAK
3	*	9608.000	14.713	28.400	43.113	-30.887	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report..

Product : AICAMX2
Test Item : Harmonic Radiated Emission
Test Site : No.3 OATS
Test date : 2019/03/26
Test Mode : Mode 1: Transmit - BLE (GFSK)(2402MHz) -2M

Vertical



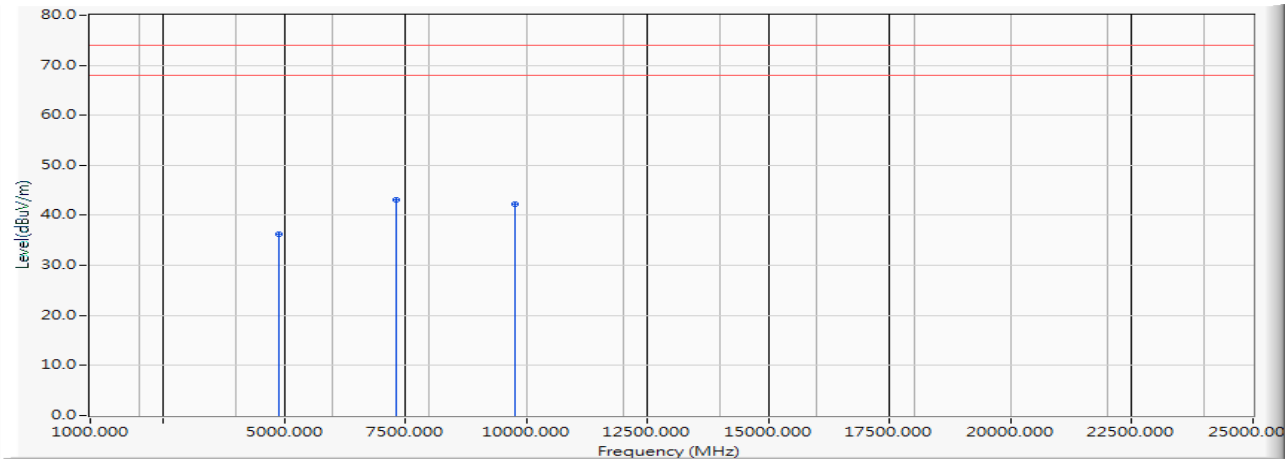
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4804.000	6.787	36.125	42.912	-31.088	74.000	PEAK
2		7206.000	11.333	31.501	42.834	-31.166	74.000	PEAK
3	*	9608.000	14.713	28.508	43.221	-30.779	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report..

Product : AICAMX2
Test Item : Harmonic Radiated Emission
Test Site : No.3 OATS
Test date : 2019/03/26
Test Mode : Mode 1: Transmit - BLE (GFSK) (2440MHz) -2M

Horizontal



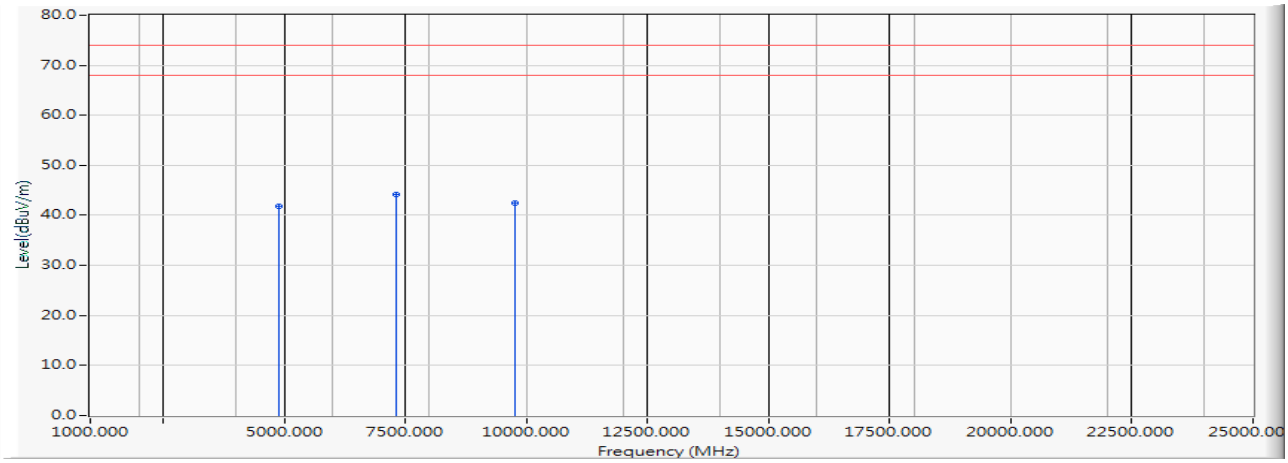
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBµV)	Measure Level (dBµV/m)	Margin (dB)	Limit (dBµV/m)	Detector Type
1		4880.000	6.907	29.314	36.222	-37.778	74.000	PEAK
2	*	7320.000	11.400	31.632	43.033	-30.967	74.000	PEAK
3		9760.000	15.113	27.245	42.358	-31.642	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : AICAMX2
Test Item : Harmonic Radiated Emission
Test Site : No.3 OATS
Test date : 2019/03/26
Test Mode : Mode 1: Transmit - BLE (GFSK) (2440MHz) -2M

Vertical



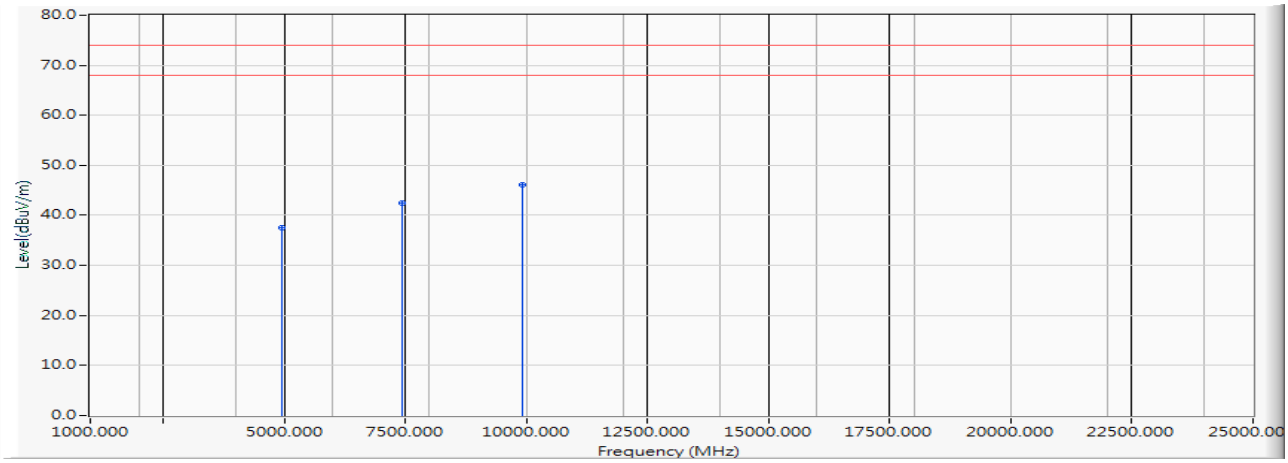
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4880.000	6.907	34.872	41.780	-32.220	74.000	PEAK
2	*	7320.000	11.400	32.732	44.133	-29.867	74.000	PEAK
3		9760.000	15.113	27.325	42.438	-31.562	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : AICAMX2
Test Item : Harmonic Radiated Emission
Test Site : No.3 OATS
Test date : 2019/03/26
Test Mode : Mode 1: Transmit - BLE (GFSK) (2480MHz) -2M

Horizontal



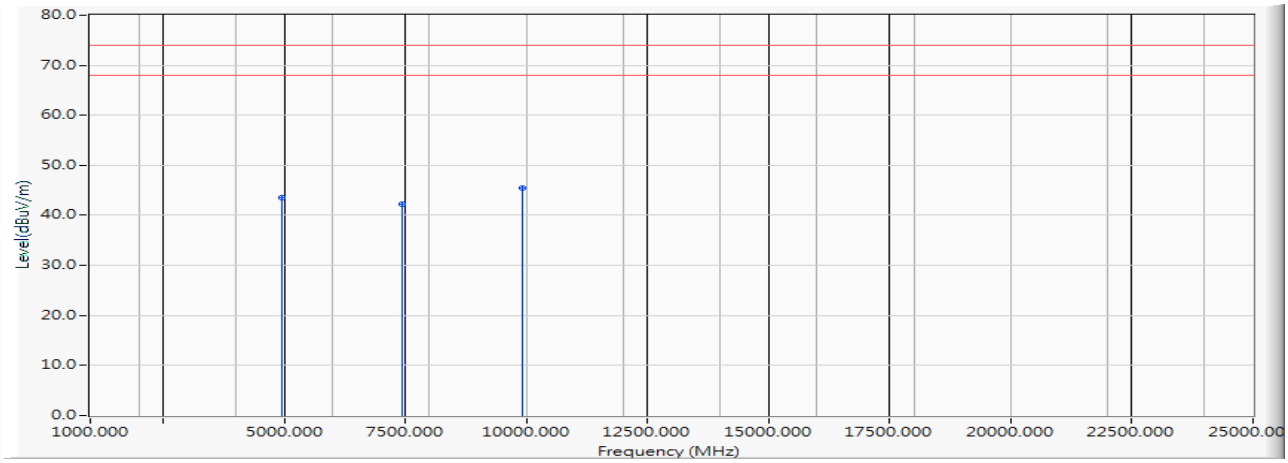
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBµV)	Measure Level (dBµV/m)	Margin (dB)	Limit (dBµV/m)	Detector Type
1		4960.000	7.008	30.447	37.455	-36.545	74.000	PEAK
2		7440.000	11.485	30.963	42.448	-31.552	74.000	PEAK
3	*	9920.000	15.146	31.040	46.186	-27.814	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product : AICAMX2
Test Item : Harmonic Radiated Emission
Test Site : No.3 OATS
Test date : 2019/03/26
Test Mode : Mode 1: Transmit - BLE (GFSK) (2480MHz) -2M

Vertical



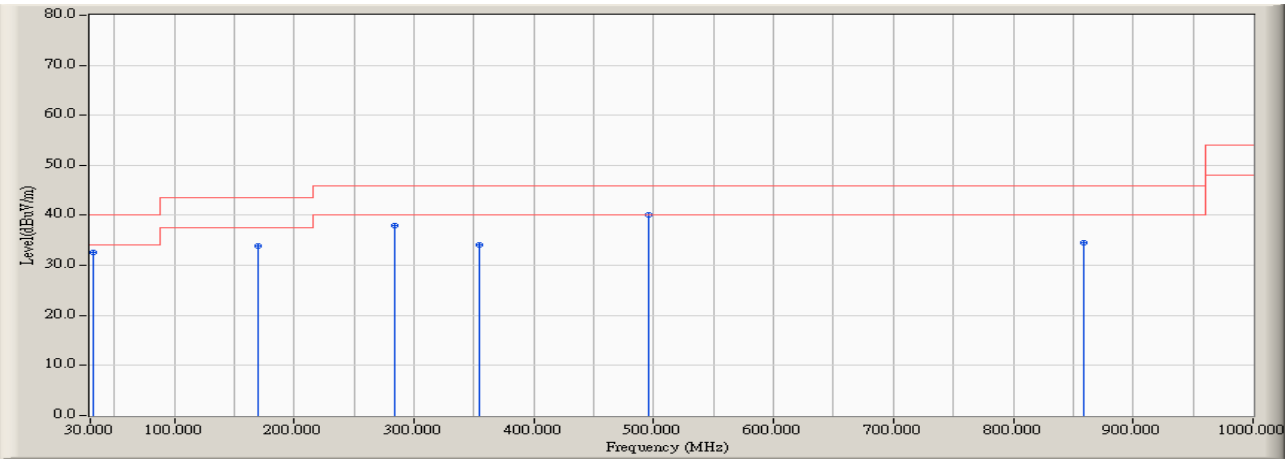
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		4960.000	7.008	36.437	43.445	-30.555	74.000	PEAK
2		7440.000	11.485	30.832	42.317	-31.683	74.000	PEAK
3	*	9920.000	15.146	30.252	45.398	-28.602	74.000	PEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
4. The average measurement was not performed when the peak measured data under the limit of average detection.
5. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product	:	AICAMX2
Test Item	:	General Radiated Emission
Test Site	:	No.3 OATS
Test date	:	2019/03/27
Test Mode	:	Mode 1: Transmit - BLE (GFSK) (2440MHz) -1M

Horizontal



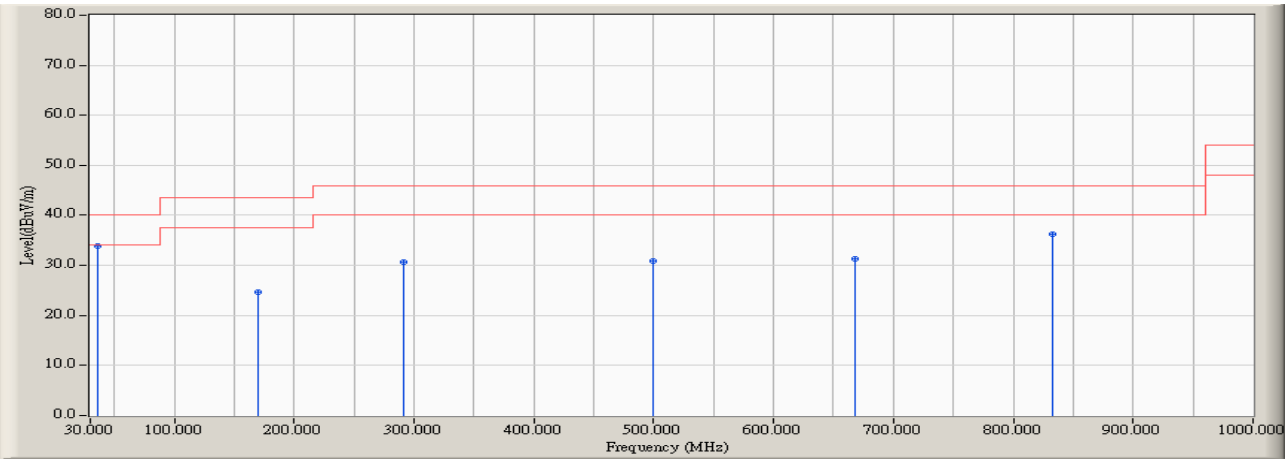
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBµV)	Measure Level (dBµV/m)	Margin (dB)	Limit (dBµV/m)	Detector Type
1		31.940	5.185	27.413	32.598	-7.402	40.000	QUASIPEAK
2		169.680	-2.789	36.710	33.921	-9.579	43.500	QUASIPEAK
3		284.140	1.280	36.602	37.882	-8.118	46.000	QUASIPEAK
4		353.980	3.532	30.624	34.156	-11.844	46.000	QUASIPEAK
5	*	495.600	6.615	33.451	40.066	-5.934	46.000	QUASIPEAK
6		858.380	11.811	22.803	34.614	-11.386	46.000	QUASIPEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
4. The emission levels of other frequencies are very lower than the limit and not show in test report.
5. No emission found between lowest internal used/generated frequency to 30MHz.

Product	:	AICAMX2
Test Item	:	General Radiated Emission
Test Site	:	No.3 OATS
Test date	:	2019/03/27
Test Mode	:	Mode 1: Transmit - BLE (GFSK) (2440MHz) -1M

Vertical



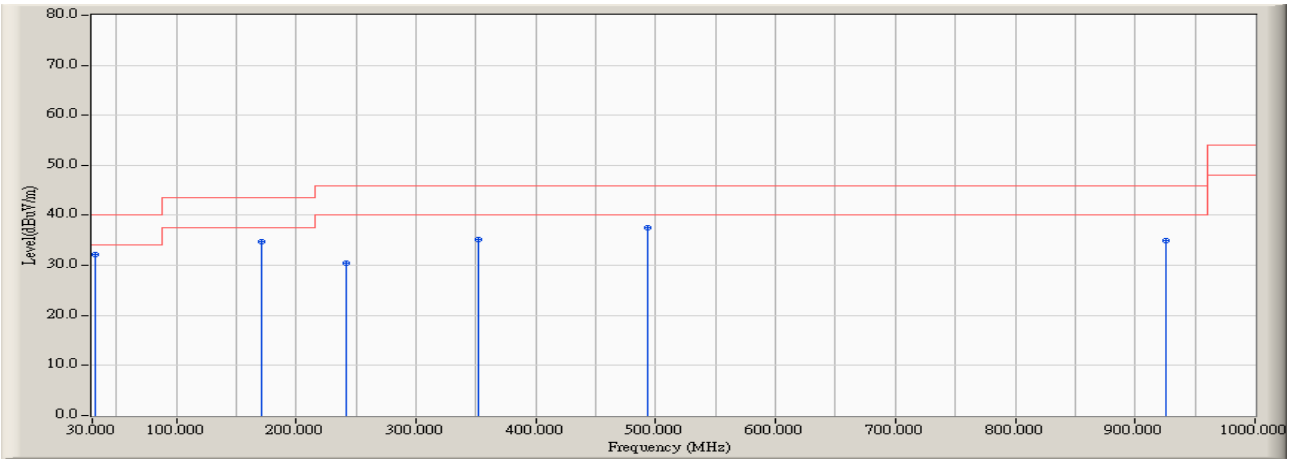
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBµV)	Measure Level (dBµV/m)	Margin (dB)	Limit (dBµV/m)	Detector Type
1	*	35.820	4.005	29.926	33.931	-6.069	40.000	QUASIPEAK
2		169.680	-2.789	27.382	24.593	-18.907	43.500	QUASIPEAK
3		291.900	1.460	29.231	30.691	-15.309	46.000	QUASIPEAK
4		499.480	6.683	24.205	30.888	-15.112	46.000	QUASIPEAK
5		668.260	9.221	22.081	31.302	-14.698	46.000	QUASIPEAK
6		833.160	11.404	24.881	36.285	-9.715	46.000	QUASIPEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
4. The emission levels of other frequencies are very lower than the limit and not show in test report.
5. No emission found between lowest internal used/generated frequency to 30MHz.

Product	:	AICAMX2
Test Item	:	General Radiated Emission
Test Site	:	No.3 OATS
Test date	:	2019/03/27
Test Mode	:	Mode 1: Transmit - BLE (GFSK) (2440MHz) -2M

Horizontal



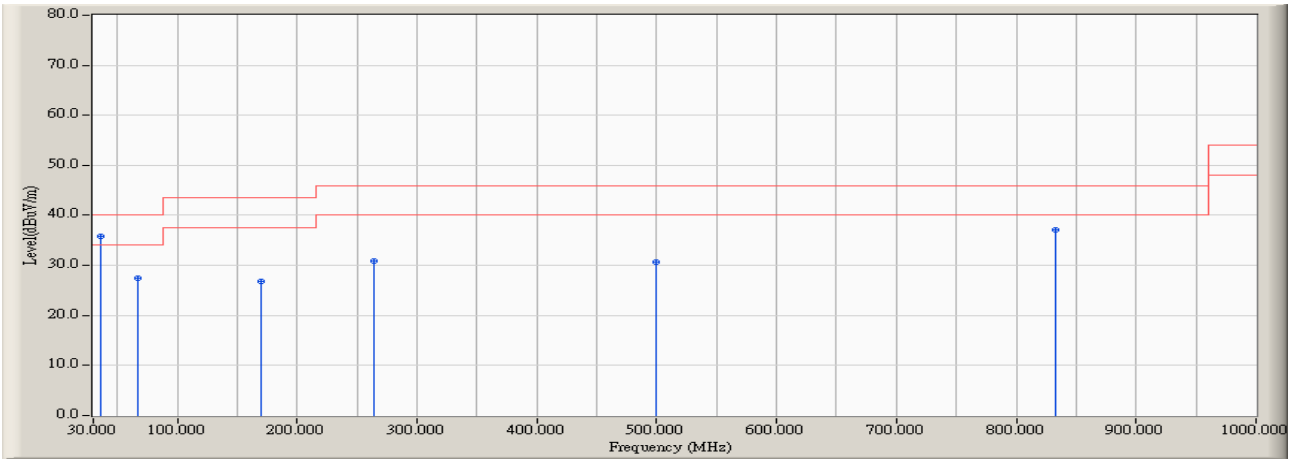
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBµV)	Measure Level (dBµV/m)	Margin (dB)	Limit (dBµV/m)	Detector Type
1	*	31.940	5.185	27.086	32.271	-7.729	40.000	QUASIPEAK
2		171.620	-2.855	37.547	34.692	-8.808	43.500	QUASIPEAK
3		241.460	-0.139	30.655	30.516	-15.484	46.000	QUASIPEAK
4		352.040	3.477	31.687	35.164	-10.836	46.000	QUASIPEAK
5		493.660	6.580	30.942	37.522	-8.478	46.000	QUASIPEAK
6		926.280	12.556	22.509	35.065	-10.935	46.000	QUASIPEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
4. The emission levels of other frequencies are very lower than the limit and not show in test report.
5. No emission found between lowest internal used/generated frequency to 30MHz.

Product : AICAMX2
Test Item : General Radiated Emission
Test Site : No.3 OATS
Test date : 2019/03/27
Test Mode : Mode 1: Transmit - BLE (GFSK) (2440MHz) -2M

Vertical



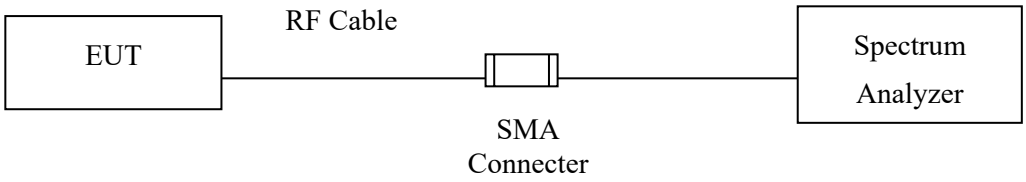
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBµV)	Measure Level (dBµV/m)	Margin (dB)	Limit (dBµV/m)	Detector Type
1	*	35.820	4.005	31.724	35.729	-4.271	40.000	QUASIPEAK
2		66.860	-7.075	34.490	27.415	-12.585	40.000	QUASIPEAK
3		169.680	-2.789	29.579	26.790	-16.710	43.500	QUASIPEAK
4		264.740	1.344	29.492	30.836	-15.164	46.000	QUASIPEAK
5		499.480	6.683	23.884	30.567	-15.433	46.000	QUASIPEAK
6		833.160	11.404	25.692	37.096	-8.904	46.000	QUASIPEAK

Note:

1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. Correct Factor = Antenna factor + Cable loss –Amplifier gain.
4. The emission levels of other frequencies are very lower than the limit and not show in test report.
5. No emission found between lowest internal used/generated frequency to 30MHz.

5. RF Antenna Conducted Test

5.1. Test Setup



5.2. Limits

According to FCC Section 15.247(d). 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 below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

5.3. Test Procedure

The EUT was tested according to DTS test procedure of KDB558074 for compliance to FCC 47CFR 15.247 requirements.

5.4. Uncertainty

± 1.20dB

5.5. Test Result of RF Antenna Conducted Test

Product	:	AICAMX2
Test Item	:	RF Antenna Conducted Test
Test Site	:	No.3 OATS
Test date	:	2019/03/27
Test Mode	:	Mode 1: Transmit - BLE (GFSK) -1M

Figure Channel 00:

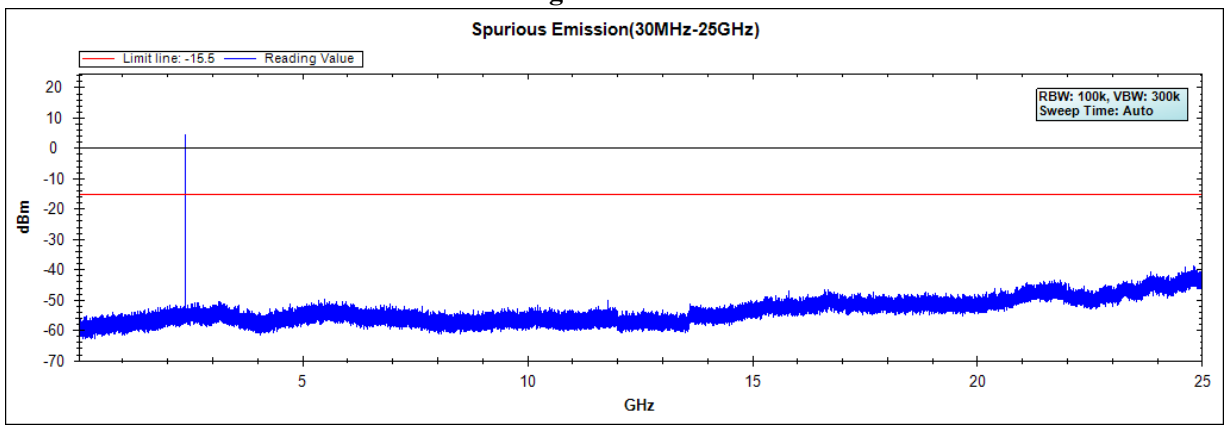


Figure Channel 19:

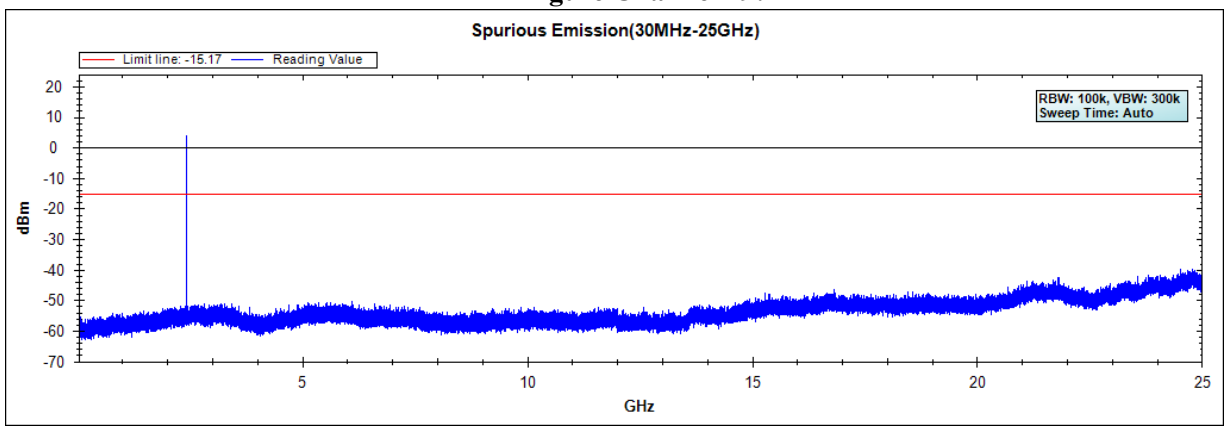
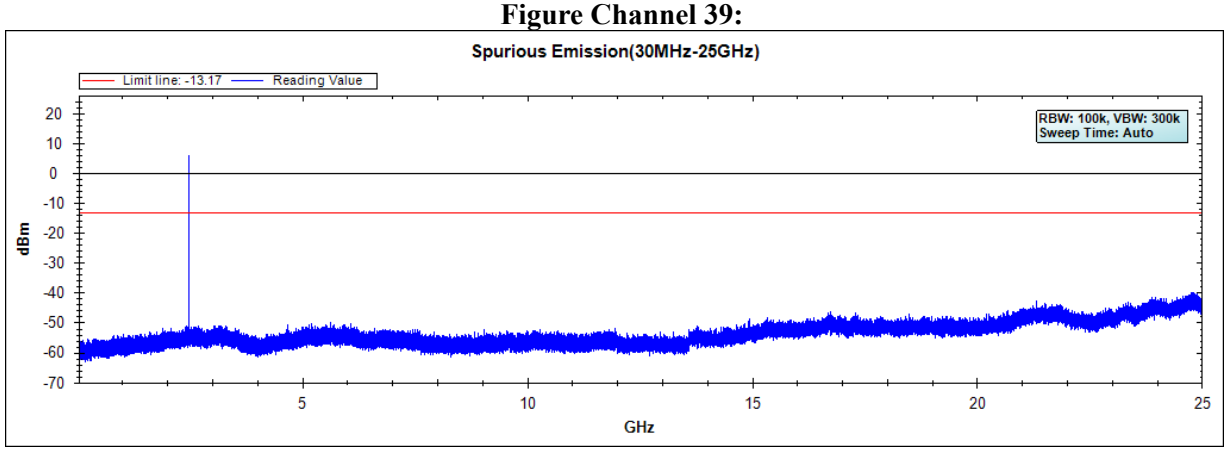


Figure Channel 39:



Product	:	AICAMX2
Test Item	:	RF Antenna Conducted Test
Test Site	:	No.3 OATS
Test date	:	2019/03/27
Test Mode	:	Mode 1: Transmit - BLE (GFSK) -2M

Figure Channel 00:

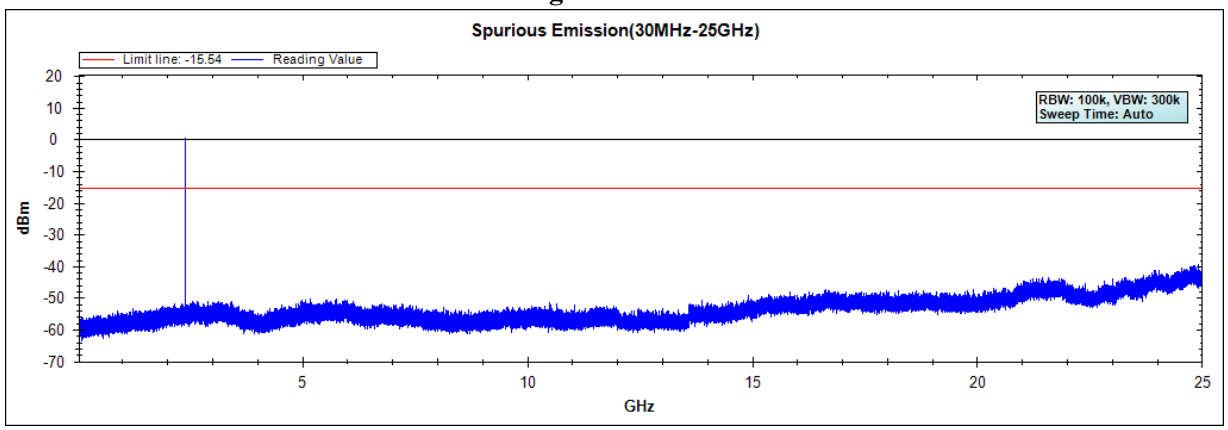


Figure Channel 19:

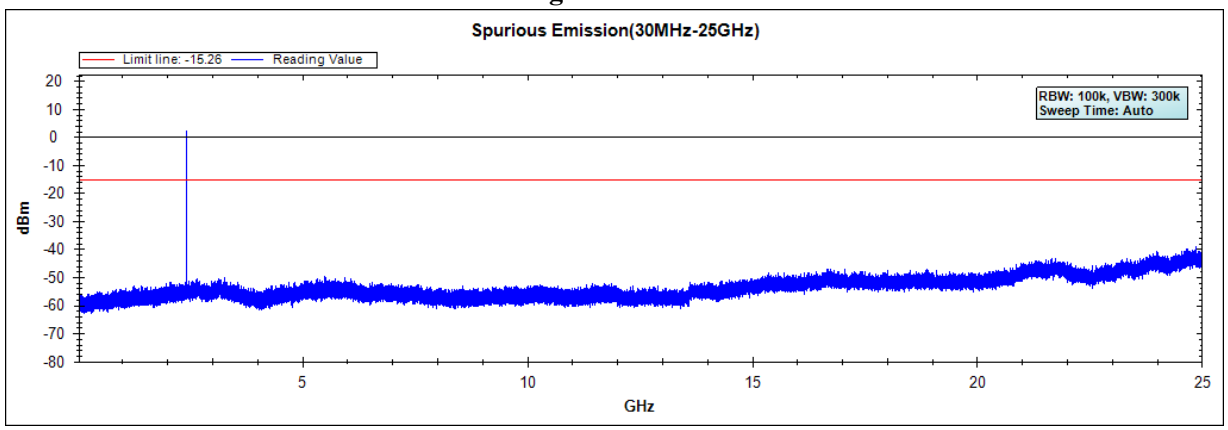
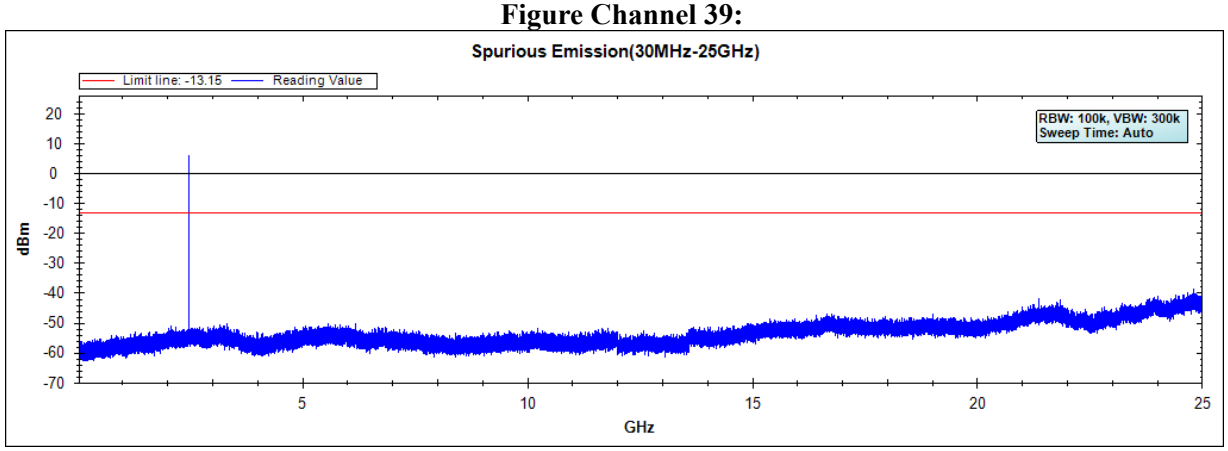


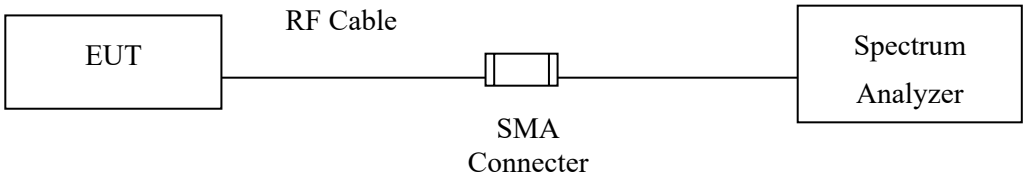
Figure Channel 39:



6. Band Edge

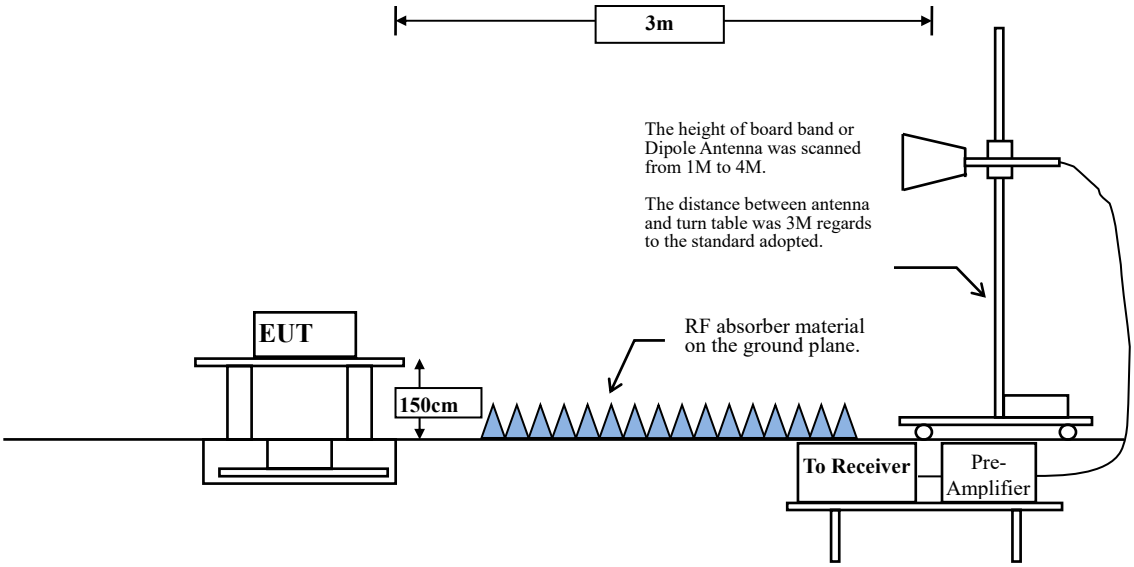
6.1. Test Setup

RF Conducted Measurement



RF Radiated Measurement:

Above 1GHz



6.2. Limit

According to FCC Section 15.247(d). 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 below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

6.3. Test Procedure

The EUT was setup according to ANSI C63.10, 2013 and tested according to DTS test procedure of KDB558074 for compliance to FCC 47CFR 15.247 requirements.
The EUT is placed on a turn table which is 1.5 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.
The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10:2013 on radiated measurement.

RBW and VBW Parameter setting:

According to KDB 558074 section 12.2.4. Peak power measurement procedure

RBW = as specified in Table 1.

VBW ≥ 3 x RBW.

Table 1 —RBW as a function of frequency

Frequency	RBW
9-150 kHz	200-300 Hz
0.15-30 MHz	9-10 kHz
30-1000 MHz	100-120 kHz
> 1000 MHz	1 MHz

According to KDB 558074 section 12.2.5. Average power measurement procedure

RBW = 1MHz.

VBW = 10Hz, when duty cycle ≥ 98 %

VBW ≥ 1/T, when duty cycle < 98 %

(T refers to the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.)

2.4GHz band	Duty Cycle (%)	T (ms)	1/T (Hz)	VBW (Hz)
BLE5.0_1M	85.06	2.1449	466	500
BLE5.0_2M	57.37	1.0725	932	1000

Note: Duty Cycle Refer to Section 9

6.4. Uncertainty

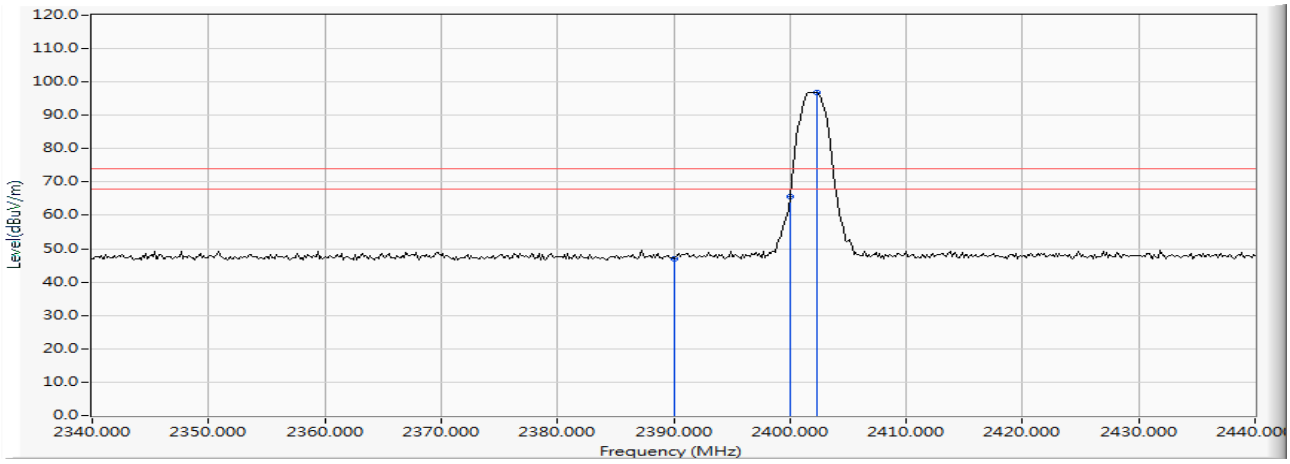
± 4.08 dB above 1GHz

± 4.22 dB below 1GHz

6.5. Test Result of Band Edge

Product : AICAMX2
Test Item : Band Edge
Test Site : No.3 OATS
Test date : 2019/03/18
Test Mode : Mode 1: Transmit - BLE (GFSK) (2402MHz) -1M

Horizontal



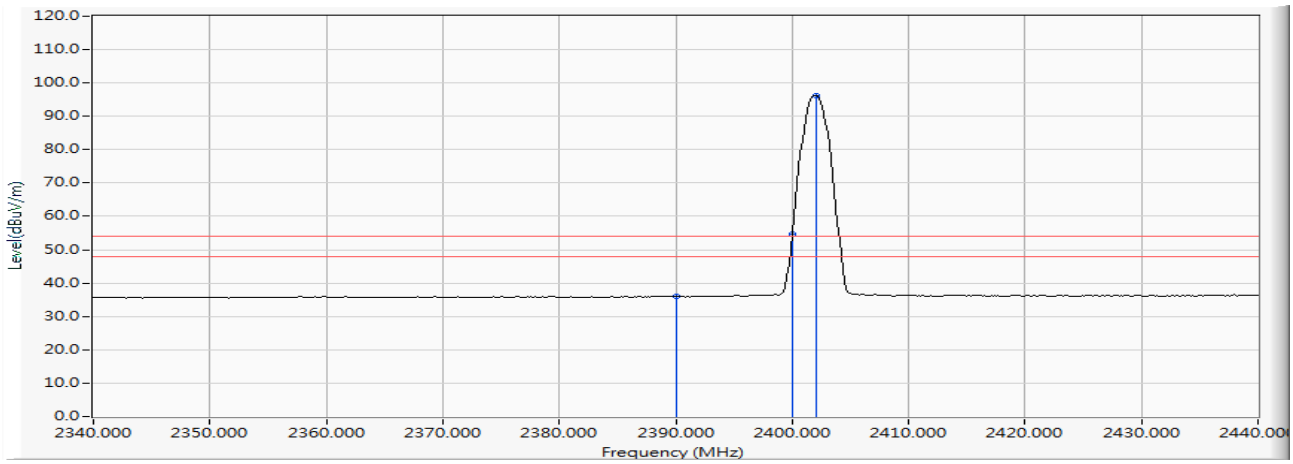
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2390.000	6.474	40.606	47.081	-26.919	74.000	PEAK
2		2400.000	6.528	58.942	65.470	-8.530	74.000	PEAK
3	*	2402.319	6.542	90.350	96.892	22.892	74.000	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : AICAMX2
Test Item : Band Edge
Test Site : No.3 OATS
Test date : 2019/03/18
Test Mode : Mode 1: Transmit - BLE (GFSK) (2402MHz) -1M

Horizontal



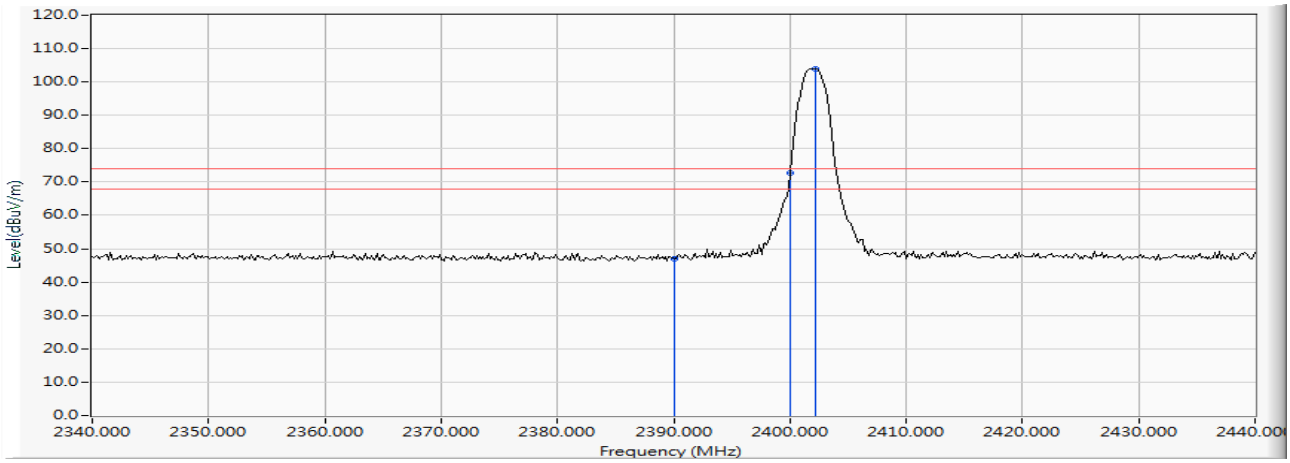
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2390.000	6.474	29.491	35.966	-18.034	54.000	AVERAGE
2		2400.000	6.528	48.251	54.779	0.779	54.000	AVERAGE
3	*	2402.029	6.540	89.720	96.260	42.260	54.000	AVERAGE

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : AICAMX2
Test Item : Band Edge
Test Site : No.3 OATS
Test date : 2019/03/22
Test Mode : Mode 1: Transmit - BLE (GFSK) (2402MHz) -1M

Vertical



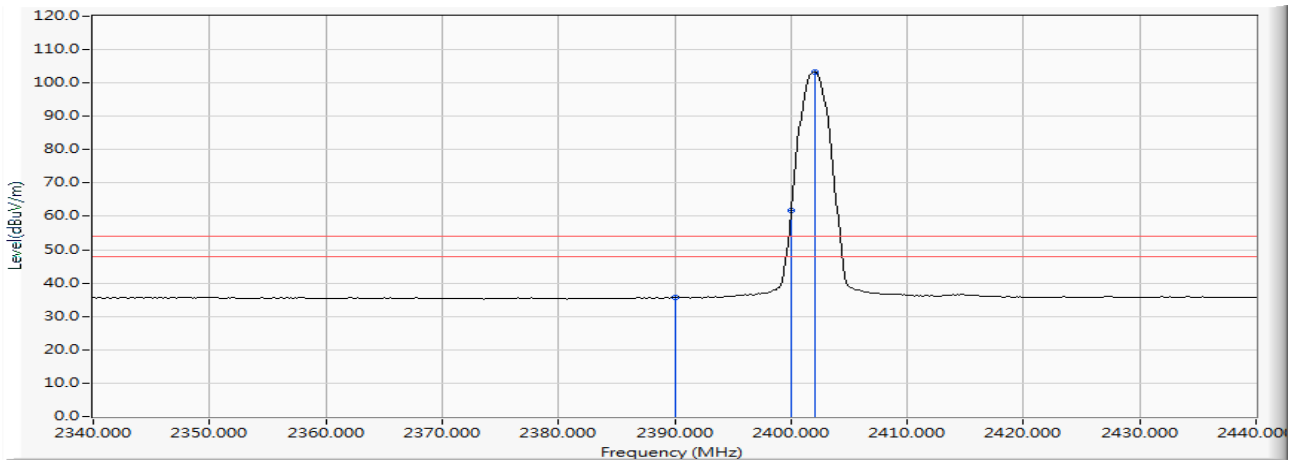
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2390.000	5.880	41.203	47.084	-26.916	74.000	PEAK
2		2400.000	5.879	66.738	72.617	-1.383	74.000	PEAK
3	*	2402.174	5.884	98.028	103.912	29.912	74.000	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : AICAMX2
Test Item : Band Edge
Test Site : No.3 OATS
Test date : 2019/03/22
Test Mode : Mode 1: Transmit - BLE (GFSK) (2402MHz) -1M

Vertical



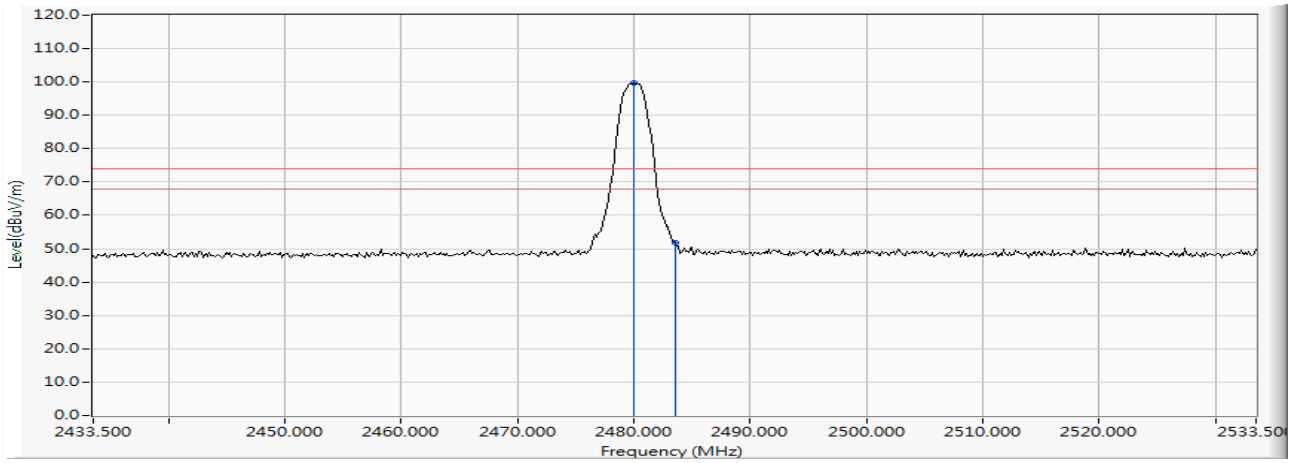
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2390.000	5.880	29.808	35.689	-18.311	54.000	AVERAGE
2		2400.000	5.879	55.743	61.622	7.622	54.000	AVERAGE
3	*	2402.029	5.884	97.350	103.234	49.234	54.000	AVERAGE

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : AICAMX2
Test Item : Band Edge
Test Site : No.3 OATS
Test date : 2019/03/22
Test Mode : Mode 1: Transmit - BLE (GFSK) (2480MHz) -1M

Horizontal



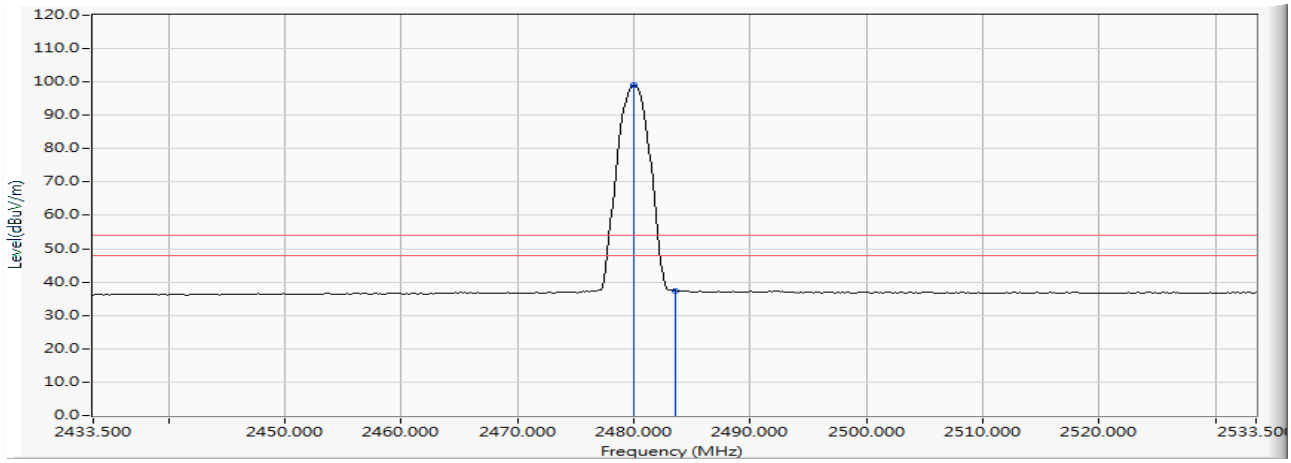
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2480.022	7.086	92.487	99.572	25.572	74.000	PEAK
2		2483.500	7.110	44.766	51.876	-22.124	74.000	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : AICAMX2
Test Item : Band Edge
Test Site : No.3 OATS
Test date : 2019/03/22
Test Mode : Mode 1: Transmit - BLE (GFSK) (2480MHz) -1M

Horizontal



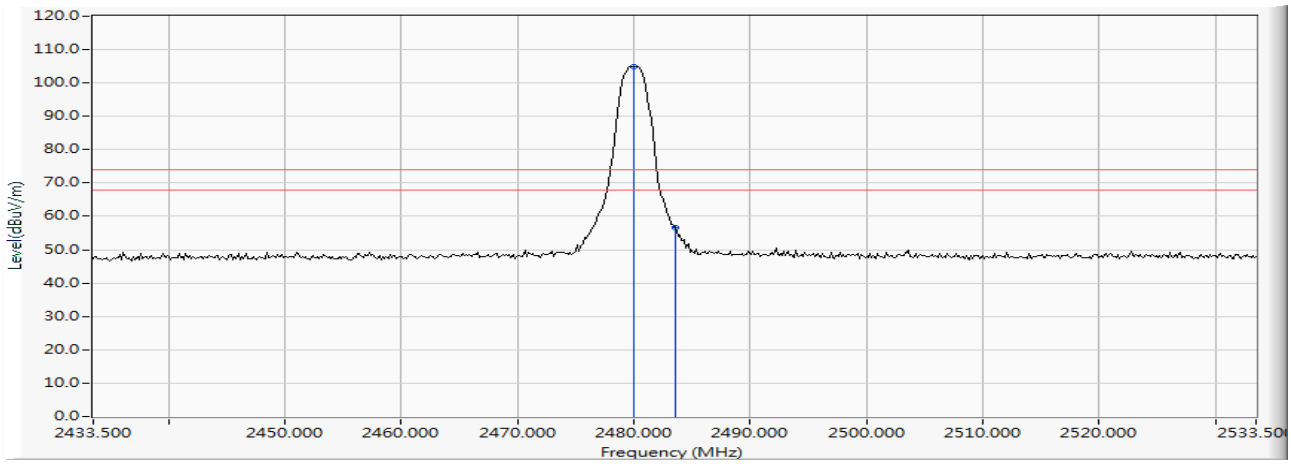
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2480.022	7.086	91.847	98.932	44.932	54.000	AVERAGE
2		2483.500	7.110	30.361	37.471	-16.529	54.000	AVERAGE

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : AICAMX2
Test Item : Band Edge
Test Site : No.3 OATS
Test date : 2019/03/22
Test Mode : Mode 1: Transmit - BLE (GFSK) (2480MHz) -1M

Vertical



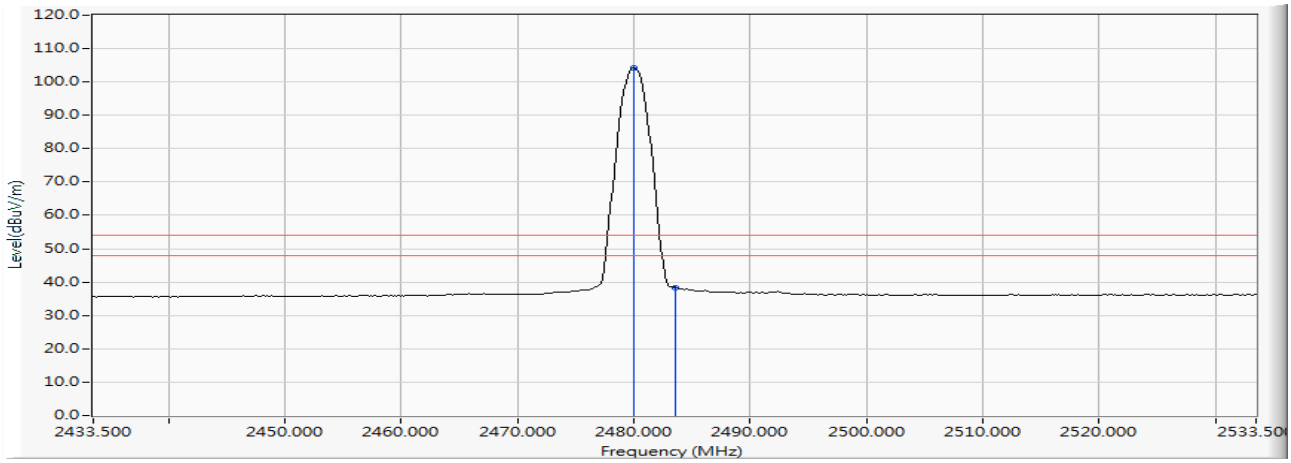
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2480.022	6.342	98.647	104.989	30.989	74.000	PEAK
2		2483.500	6.363	50.236	56.599	-17.401	74.000	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : AICAMX2
Test Item : Band Edge
Test Site : No.3 OATS
Test date : 2019/03/22
Test Mode : Mode 1: Transmit - BLE (GFSK) (2480MHz) -1M

Vertical



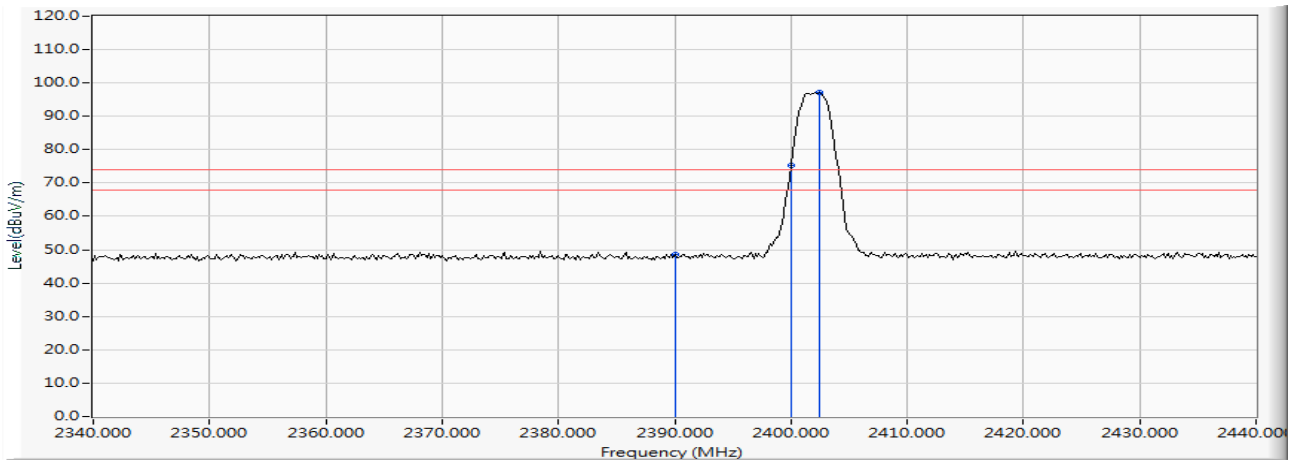
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2480.022	6.342	97.911	104.253	50.253	54.000	AVERAGE
2		2483.500	6.363	31.893	38.256	-15.744	54.000	AVERAGE

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : AICAMX2
Test Item : Band Edge
Test Site : No.3 OATS
Test date : 2019/03/22
Test Mode : Mode 1: Transmit - BLE (GFSK) (2402MHz) -2M

Horizontal



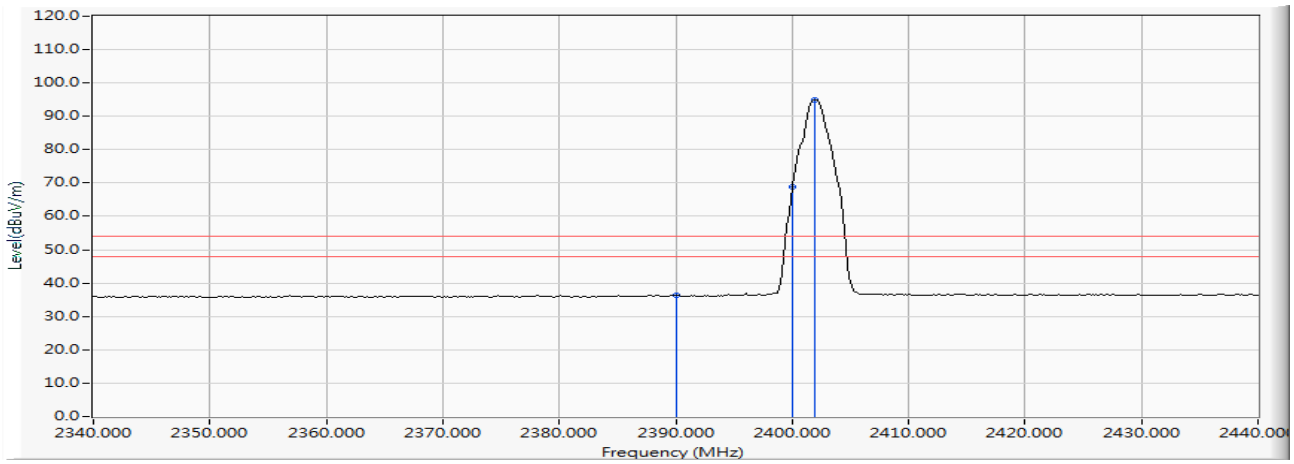
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2390.000	6.474	42.042	48.517	-25.483	74.000	PEAK
2		2400.000	6.528	68.824	75.352	1.352	74.000	PEAK
3	*	2402.464	6.543	90.494	97.037	23.037	74.000	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : AICAMX2
Test Item : Band Edge
Test Site : No.3 OATS
Test date : 2019/03/22
Test Mode : Mode 1: Transmit - BLE (GFSK) (2402MHz) -2M

Horizontal



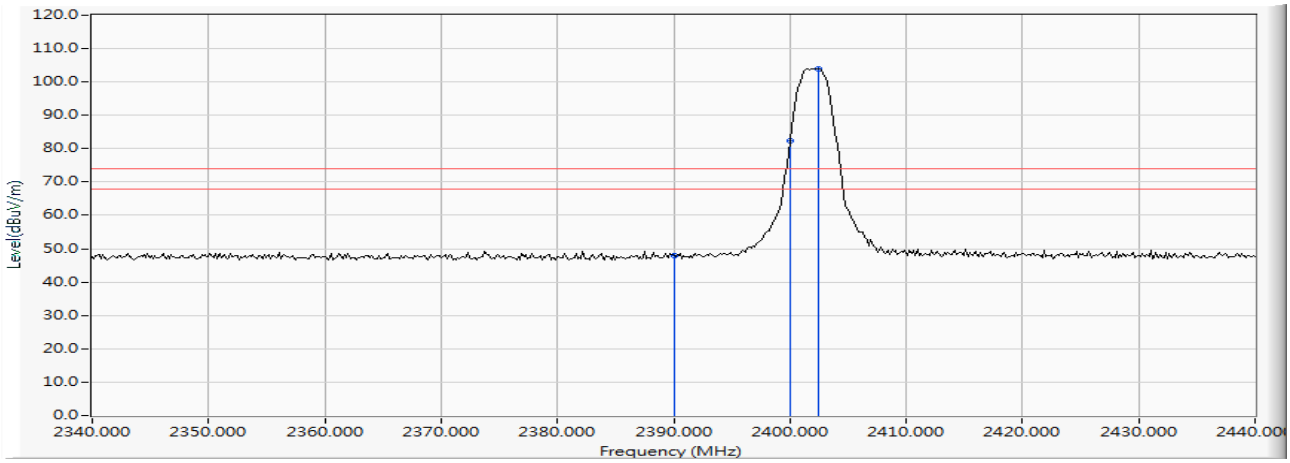
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2390.000	6.474	29.764	36.239	-17.761	54.000	AVERAGE
2		2400.000	6.528	62.163	68.691	14.691	54.000	AVERAGE
3	*	2401.884	6.540	88.515	95.055	41.055	54.000	AVERAGE

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : AICAMX2
Test Item : Band Edge
Test Site : No.3 OATS
Test date : 2019/03/22
Test Mode : Mode 1: Transmit - BLE (GFSK) (2402MHz) -2M

Vertical



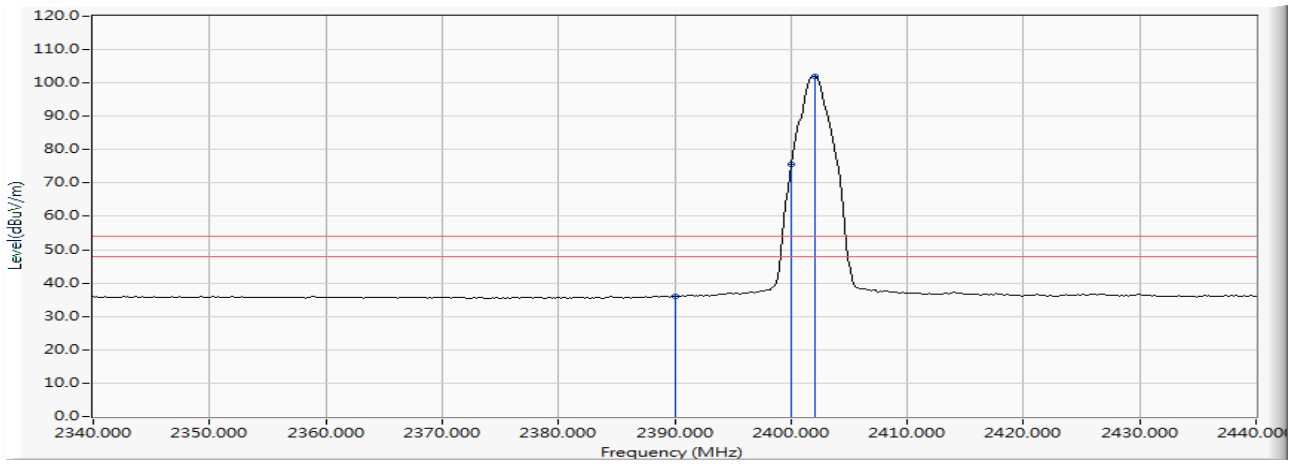
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2390.000	5.880	42.031	47.912	-26.088	74.000	PEAK
2		2400.000	5.879	76.446	82.325	8.325	74.000	PEAK
3	*	2402.464	5.885	98.039	103.924	29.924	74.000	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : AICAMX2
Test Item : Band Edge
Test Site : No.3 OATS
Test date : 2019/03/22
Test Mode : Mode 1: Transmit - BLE (GFSK) (2402MHz) -2M

Vertical



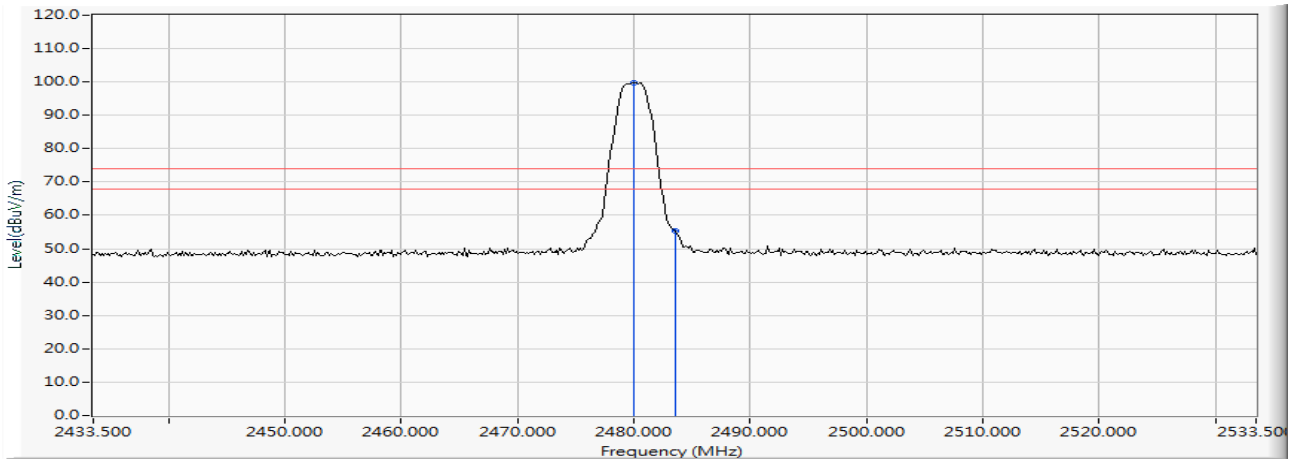
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1		2390.000	5.880	30.216	36.097	-17.903	54.000	AVERAGE
2		2400.000	5.879	69.618	75.497	21.497	54.000	AVERAGE
3	*	2402.029	5.884	96.186	102.070	48.070	54.000	AVERAGE

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : AICAMX2
Test Item : Band Edge
Test Site : No.3 OATS
Test date : 2019/03/22
Test Mode : Mode 1: Transmit - BLE (GFSK) (2480MHz) -2M

Horizontal



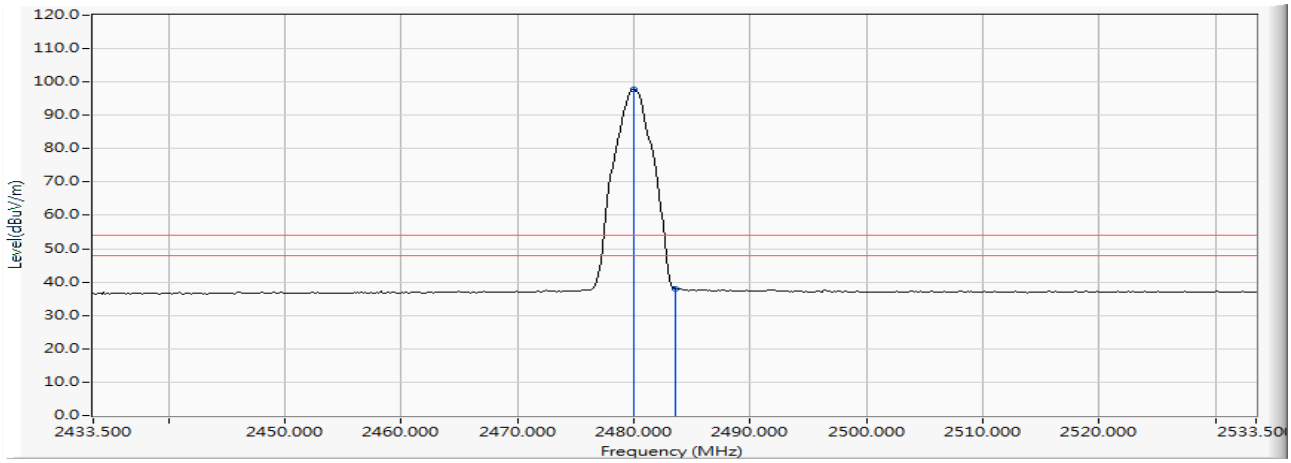
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2480.022	7.086	92.649	99.734	25.734	74.000	PEAK
2		2483.500	7.110	48.094	55.204	-18.796	74.000	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : AICAMX2
Test Item : Band Edge
Test Site : No.3 OATS
Test date : 2019/03/22
Test Mode : Mode 1: Transmit - BLE (GFSK) (2480MHz) -2M

Horizontal



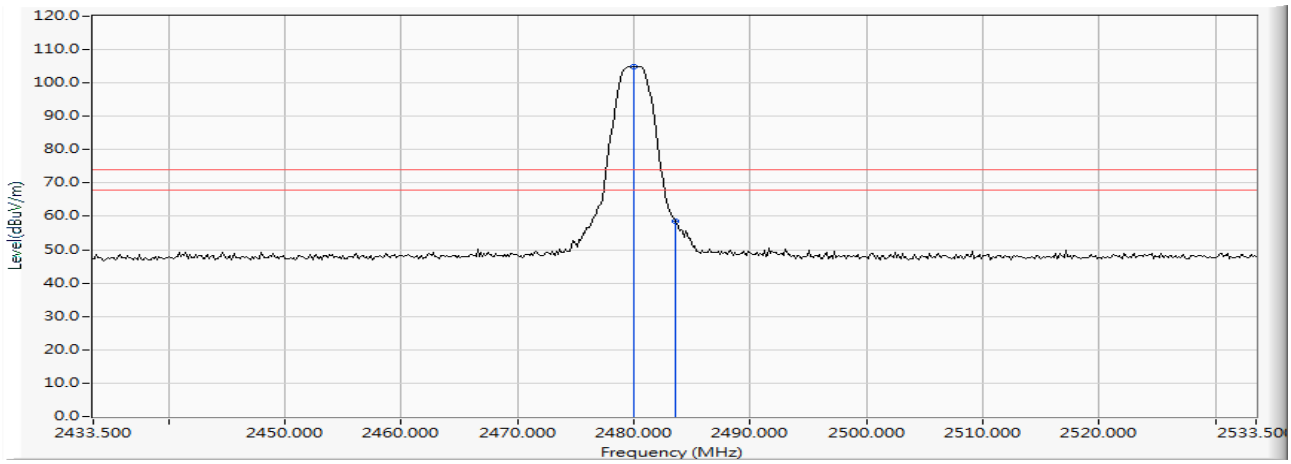
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2480.022	7.086	90.660	97.745	43.745	54.000	AVERAGE
2		2483.500	7.110	30.697	37.807	-16.193	54.000	AVERAGE

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : AICAMX2
Test Item : Band Edge
Test Site : No.3 OATS
Test date : 2019/03/22
Test Mode : Mode 1: Transmit - BLE (GFSK) (2480MHz) -2M

Vertical



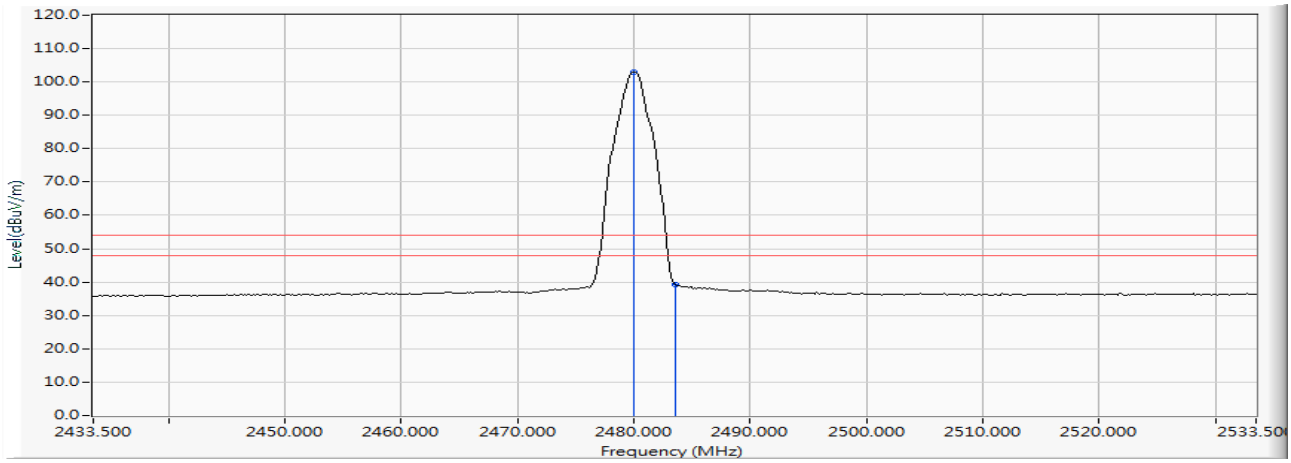
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2480.022	6.342	98.696	105.038	31.038	74.000	PEAK
2		2483.500	6.363	52.222	58.585	-15.415	74.000	PEAK

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

Product : AICAMX2
Test Item : Band Edge
Test Site : No.3 OATS
Test date : 2019/03/22
Test Mode : Mode 1: Transmit - BLE (GFSK) (2480MHz) -2M

Vertical



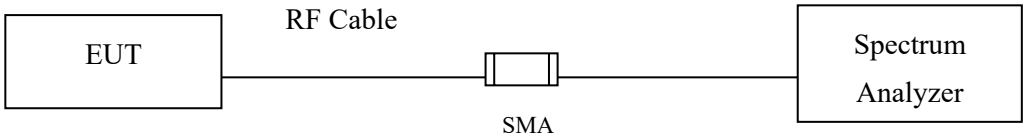
		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type
1	*	2480.022	6.342	96.686	103.028	49.028	54.000	AVERAGE
2		2483.500	6.363	32.934	39.297	-14.703	54.000	AVERAGE

Note:

1. All readings above 1GHz are performed with peak and/or average measurements as necessary.
2. Measurement Level = Reading Level + Correct Factor.
3. The average measurement was not performed when the peak measured data under the limit of average detection.

7. 6dB Bandwidth

7.1. Test Setup



7.2. Limits

The minimum bandwidth shall be at least 500 kHz.

7.3. Test Procedure

The EUT was setup according to ANSI C63.10 2013; tested according to DTS test procedure of KDB558074 for compliance to FCC 47CFR 15.247 requirements.

Set RBW = 1-5% of the emission bandwidth, VBW≥3*RBW

7.4. Uncertainty

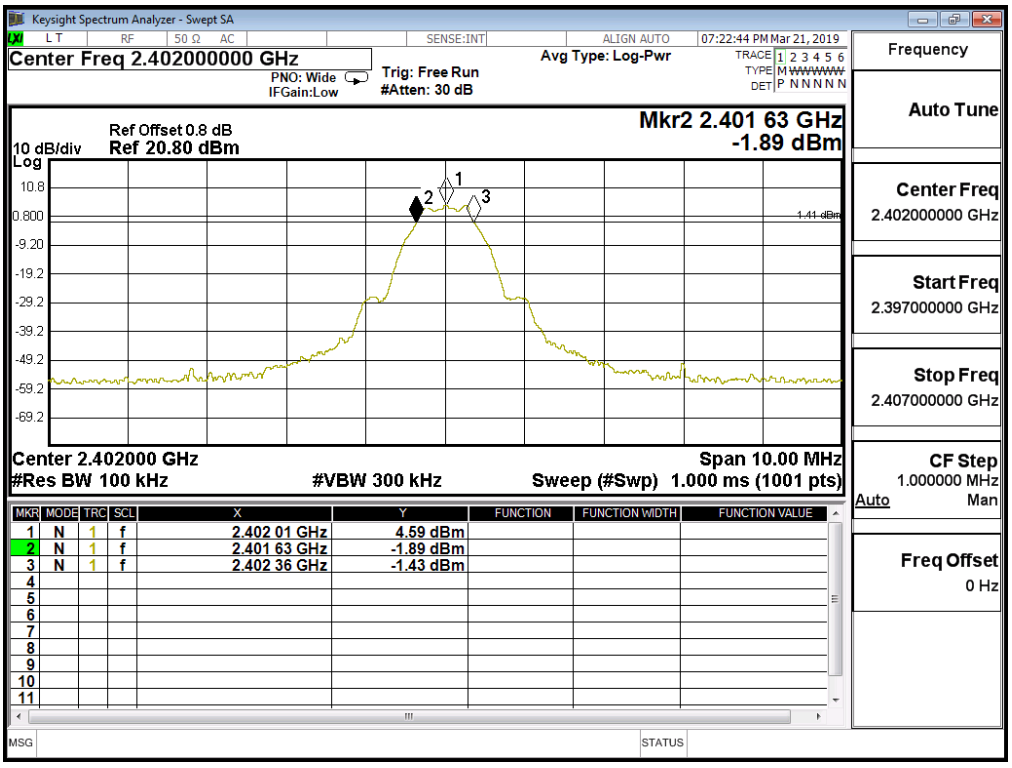
± 283Hz

7.5. Test Result of 6dB Bandwidth

Product : AICAMX2
Test Item : 6dB Bandwidth Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit - BLE (GFSK) (2402MHz) -1M

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
00	2402	730	>500	Pass

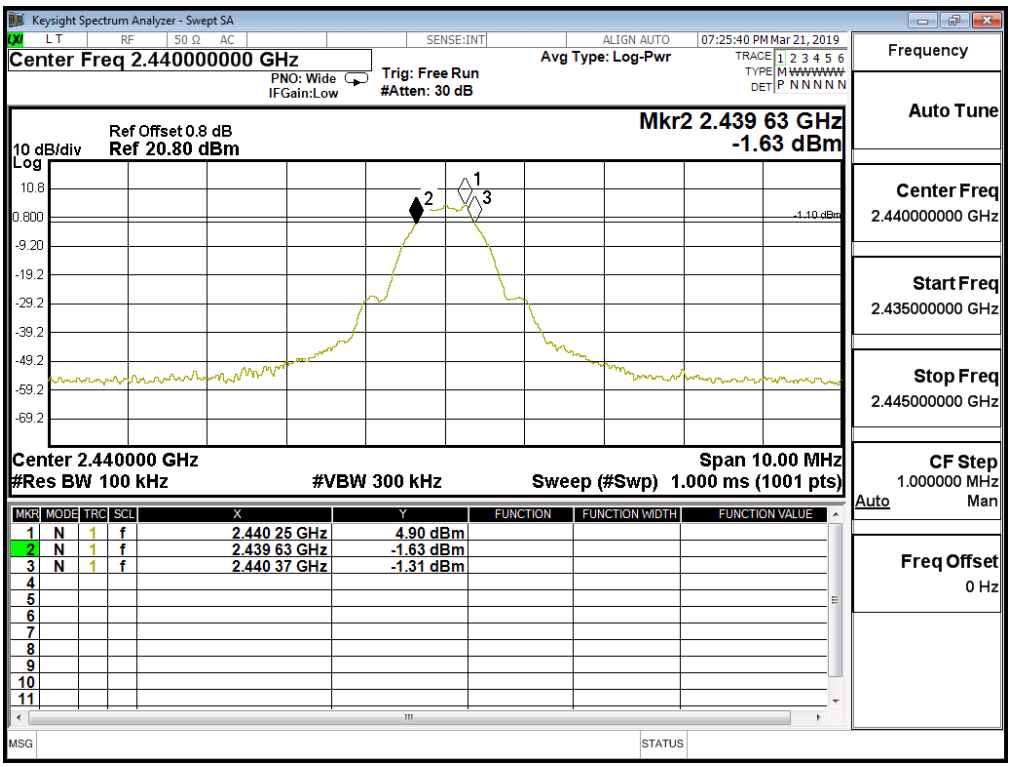
Figure Channel 00:



Product : AICAMX2
Test Item : 6dB Bandwidth Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit - BLE (GFSK) (2440MHz) -1M

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
19	2440	730	>500	Pass

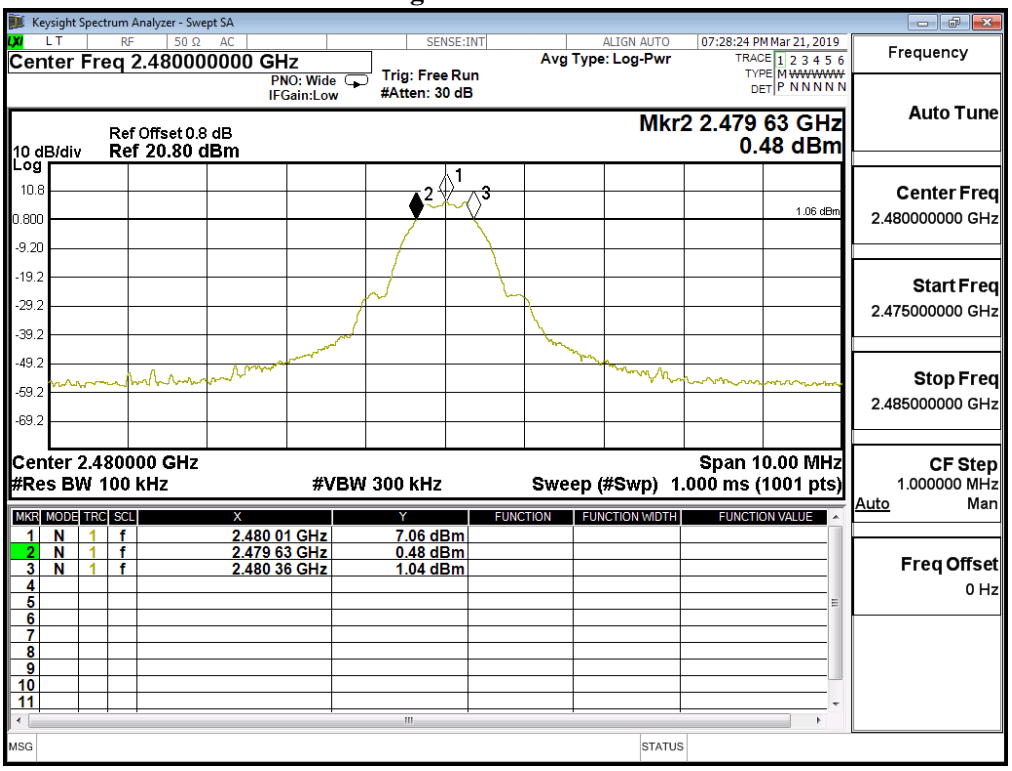
Figure Channel 19:



Product : AICAMX2
Test Item : 6dB Bandwidth Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit - BLE (GFSK) (2480MHz) -1M

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
39	2480	730	>500	Pass

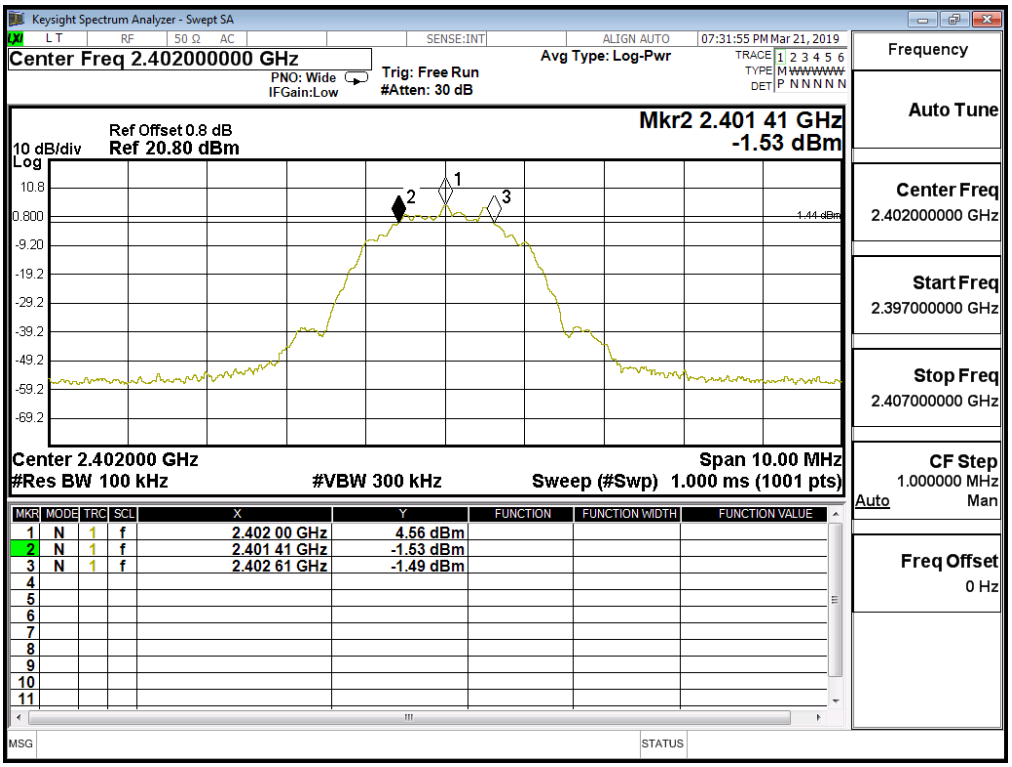
Figure Channel 39:



Product : AICAMX2
Test Item : 6dB Bandwidth Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit - BLE (GFSK) (2402MHz) -2M

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
00	2402	1200	>500	Pass

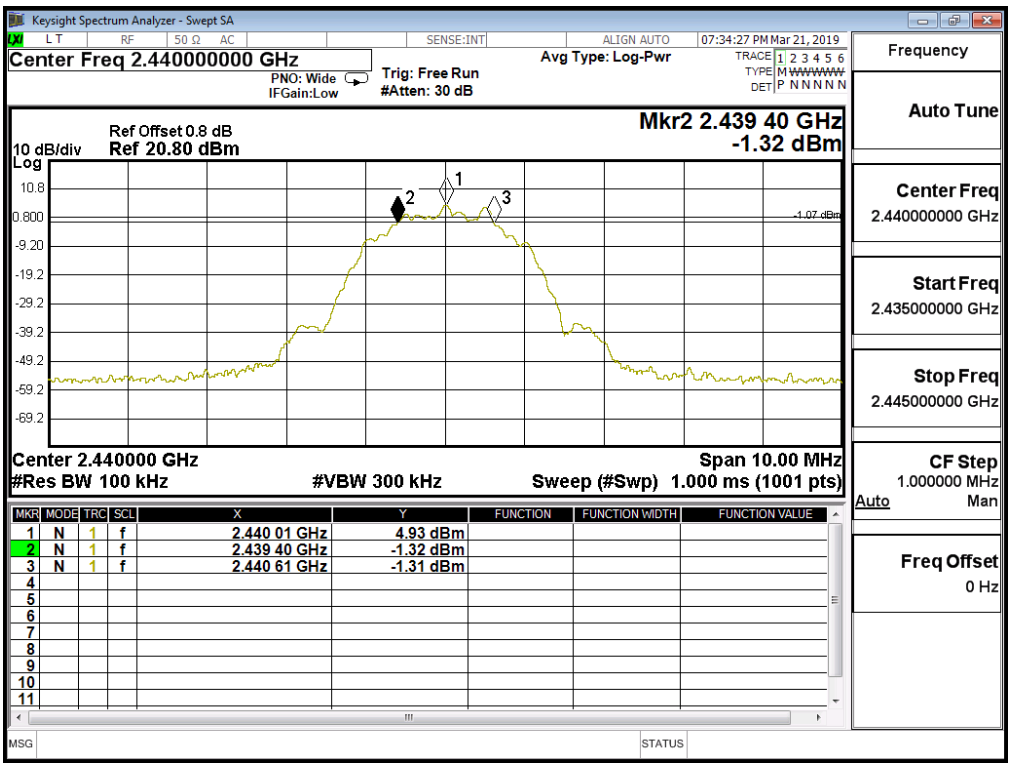
Figure Channel 00:



Product : AICAMX2
Test Item : 6dB Bandwidth Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit - BLE (GFSK) (2440MHz) -2M

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
19	2440	1210	>500	Pass

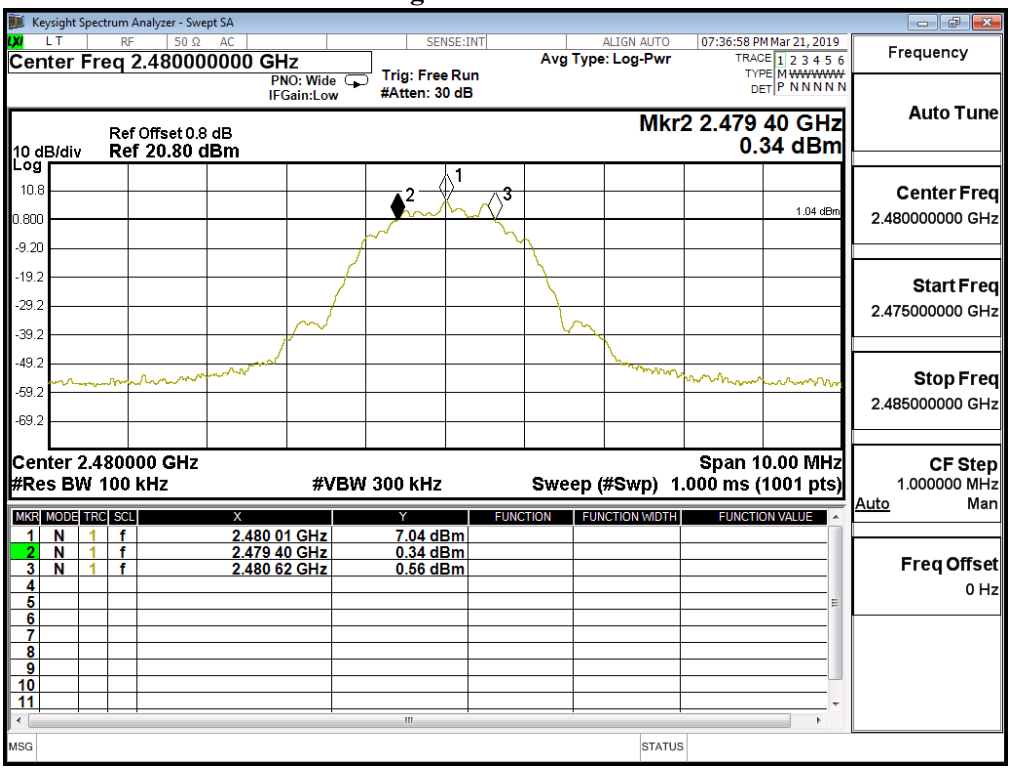
Figure Channel 19:



Product : AICAMX2
Test Item : 6dB Bandwidth Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit - BLE (GFSK) (2480MHz) -2M

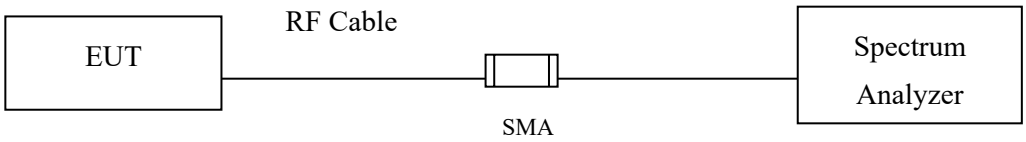
Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
39	2480	1220	>500	Pass

Figure Channel 39:



8. Power Density

8.1. Test Setup



8.2. Limits

The transmitted power density averaged over any 1 second interval shall not be greater +8dBm in any 3kHz bandwidth.

8.3. Test Procedure

The EUT was setup according to ANSI C63.10: 2013, the maximum power spectral density using KDB 558074 section 10.2 PKPSD (peak PSD) method.

8.4. Uncertainty

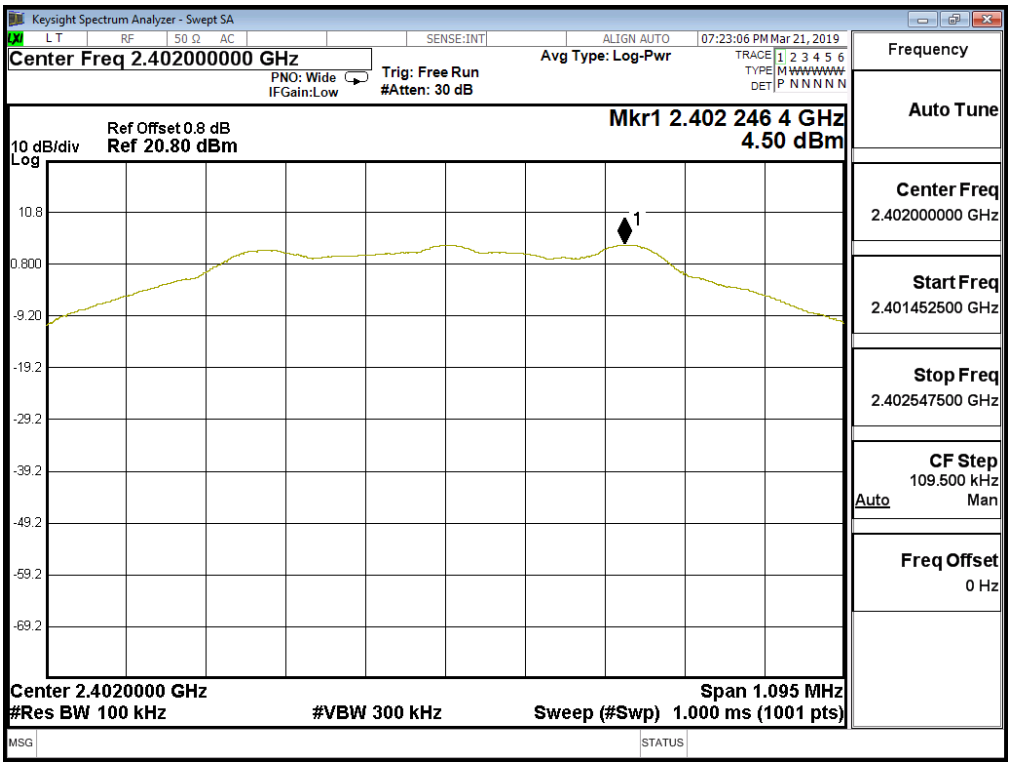
± 1.20 dB

8.5. Test Result of Power Density

Product : AICAMX2
Test Item : Power Density Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit - BLE (GFSK) (2402MHz) -1M

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
00	2402	4.500	≦8dBm	Pass

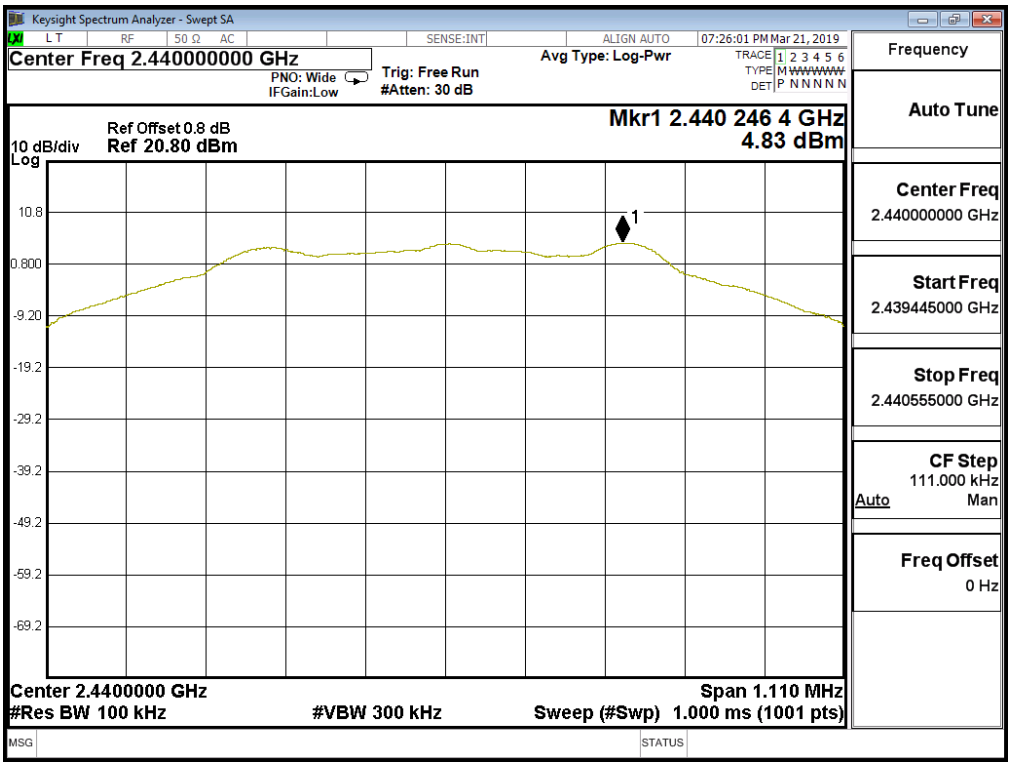
Figure Channel 00:



Product : AICAMX2
Test Item : Power Density Data
Test Site : No.3OATS
Test Mode : Mode 1: Transmit - BLE (GFSK) (2440MHz) -1M

Channel No.	Frequency (MHz)	Measurement Level (dBm)	Required Limit (dBm)	Result
19	2440	4.830	≦8dBm	Pass

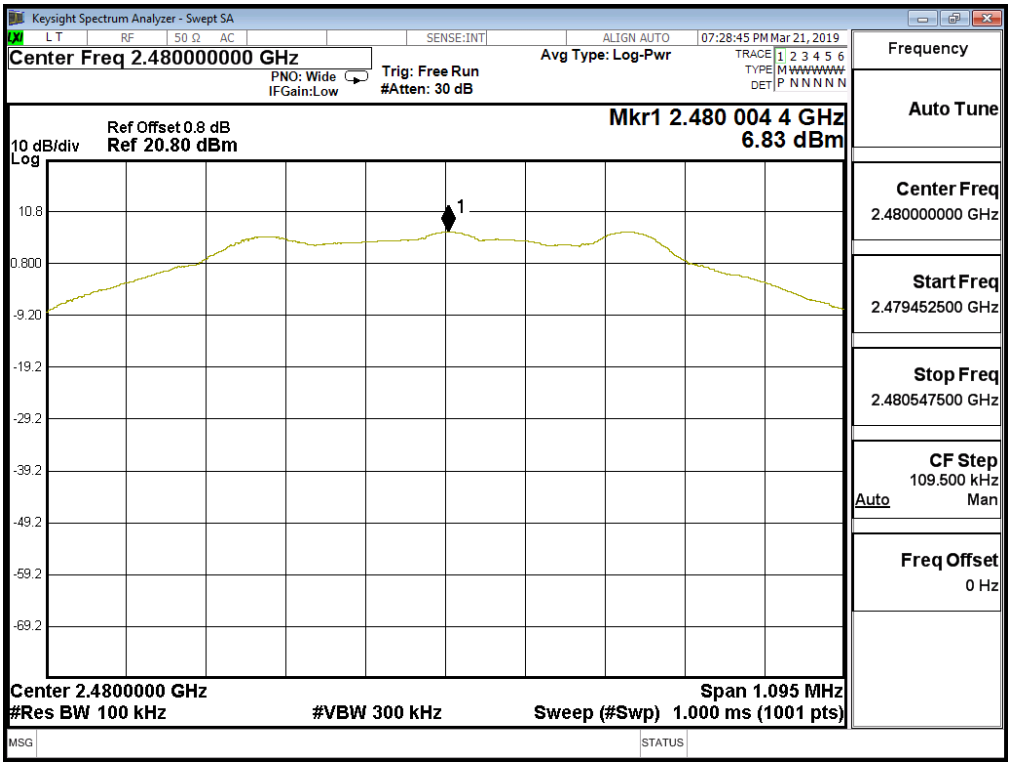
Figure Channel 19:



Product : AICAMX2
Test Item : Power Density Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit - BLE (GFSK) (2480MHz) -1M

Channel No.	Frequency (MHz)	Measurement Level (dBm)	Required Limit (dBm)	Result
39	2480	6.830	≦8dBm	Pass

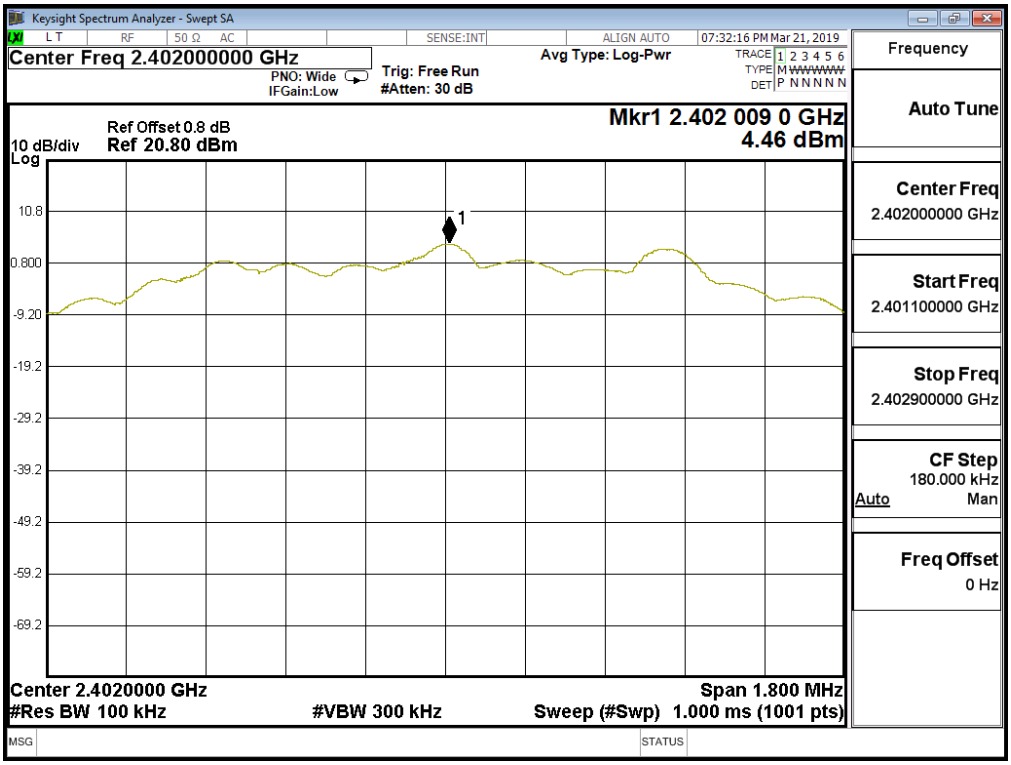
Figure Channel 39:



Product : AICAMX2
Test Item : Power Density Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit - BLE (GFSK) (2402MHz) -2M

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
00	2402	4.460	≦8dBm	Pass

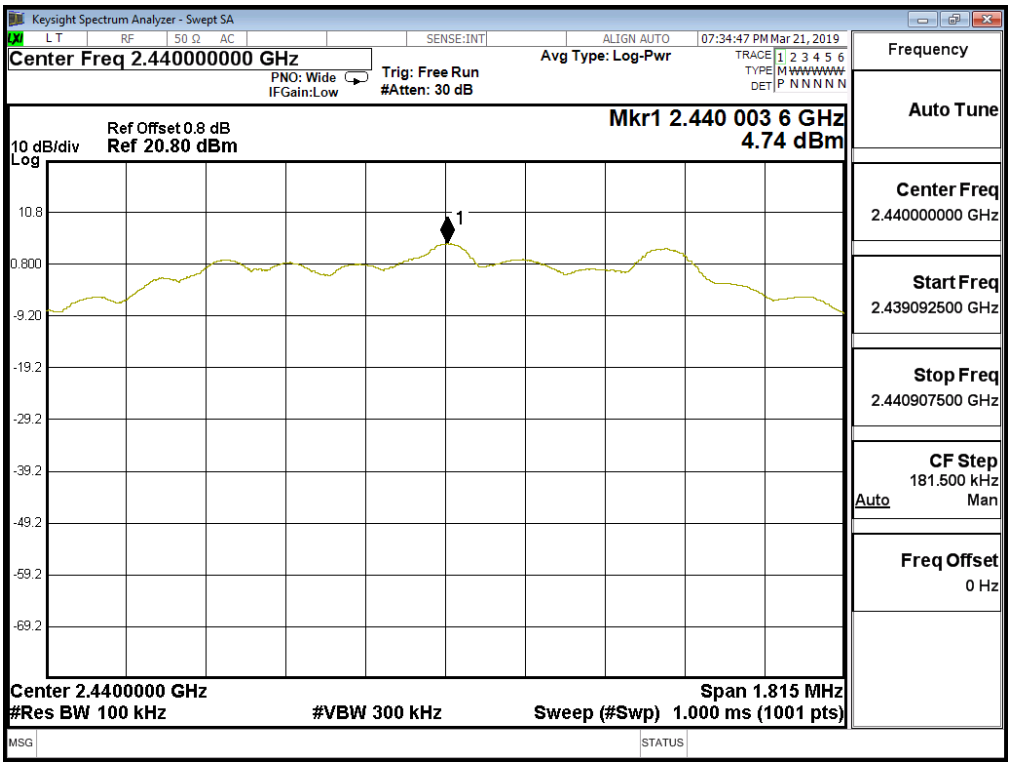
Figure Channel 00:



Product : AICAMX2
Test Item : Power Density Data
Test Site : No.3OATS
Test Mode : Mode 1: Transmit - BLE (GFSK) (2440MHz) -2M

Channel No.	Frequency (MHz)	Measurement Level (dBm)	Required Limit (dBm)	Result
19	2440	4.740	≦8dBm	Pass

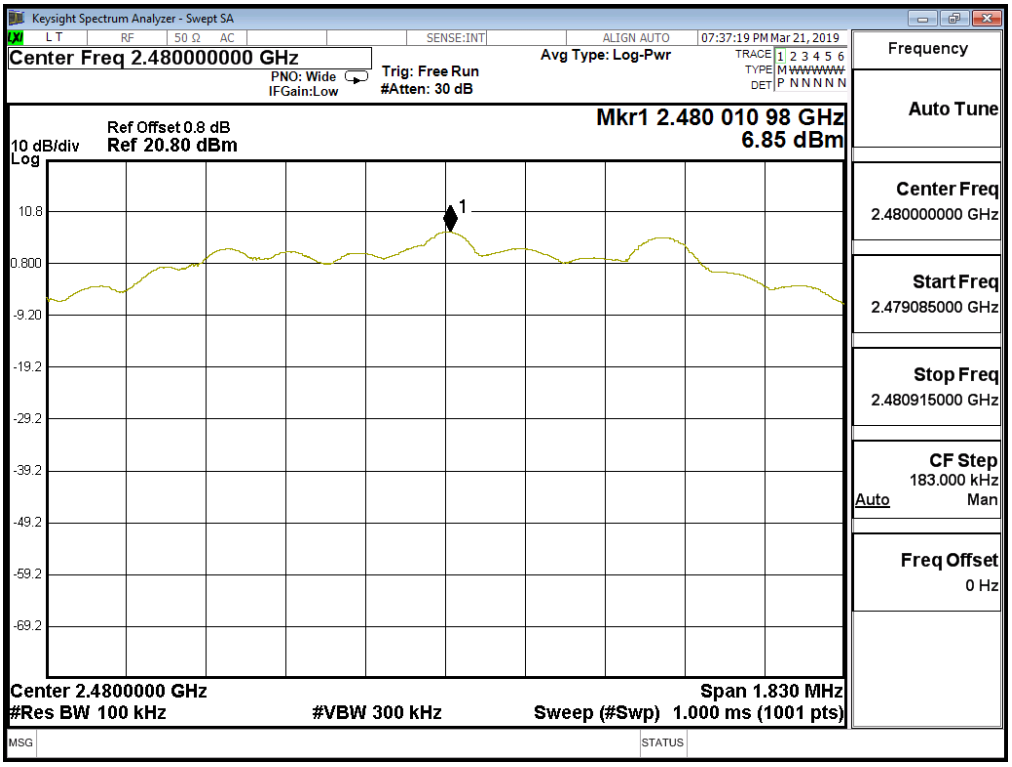
Figure Channel 19:



Product : AICAMX2
Test Item : Power Density Data
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit - BLE (GFSK) (2480MHz) -2M

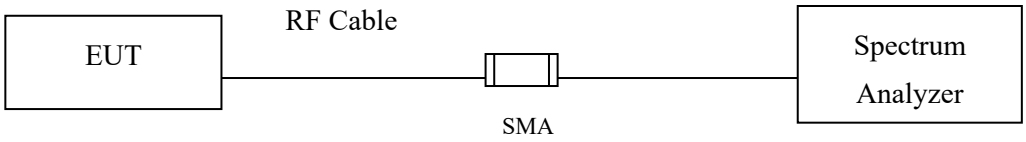
Channel No.	Frequency (MHz)	Measurement Level (dBm)	Required Limit (dBm)	Result
39	2480	6.850	≦8dBm	Pass

Figure Channel 39:



9. Duty Cycle

9.1. Test Setup



9.2. Test Procedure

The EUT was setup according to ANSI C63.10 2013; tested according to DTS test procedure of KDB558074 for compliance to FCC 47CFR 15.247 requirements.

9.3. Uncertainty

± 2.31msec

9.4. Test Result of Duty Cycle

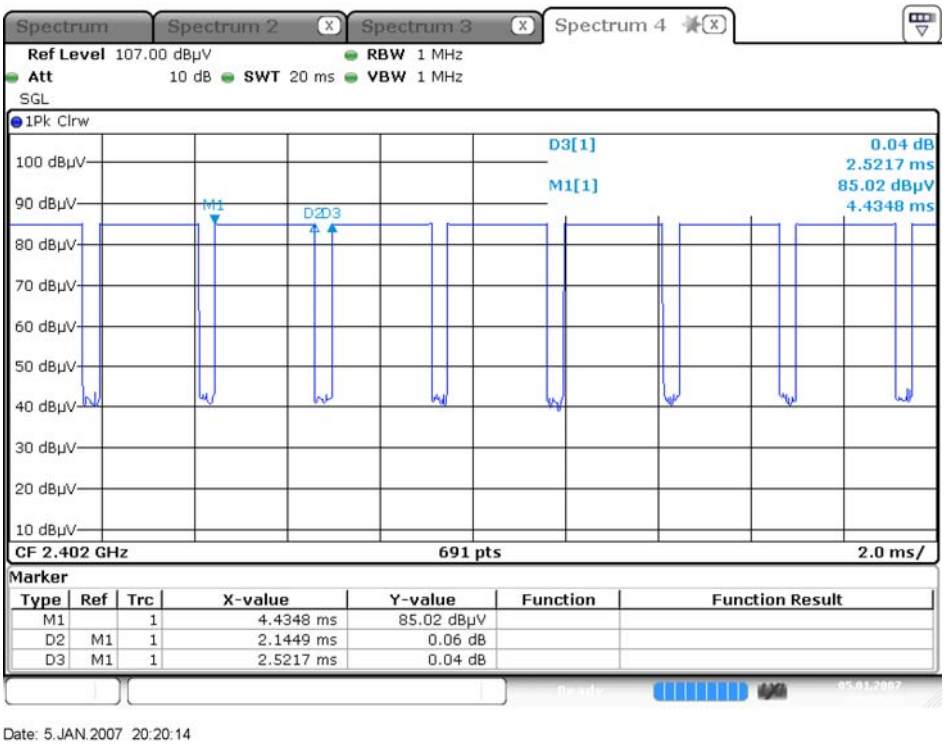
Product : AICAMX2
Test Item : Duty Cycle
Test Mode : Mode 1: Transmit - BLE (GFSK)

Duty Cycle Formula:
Duty Cycle = Ton / (Ton + Toff)
Duty Factor = 10 Log (1/Duty Cycle)

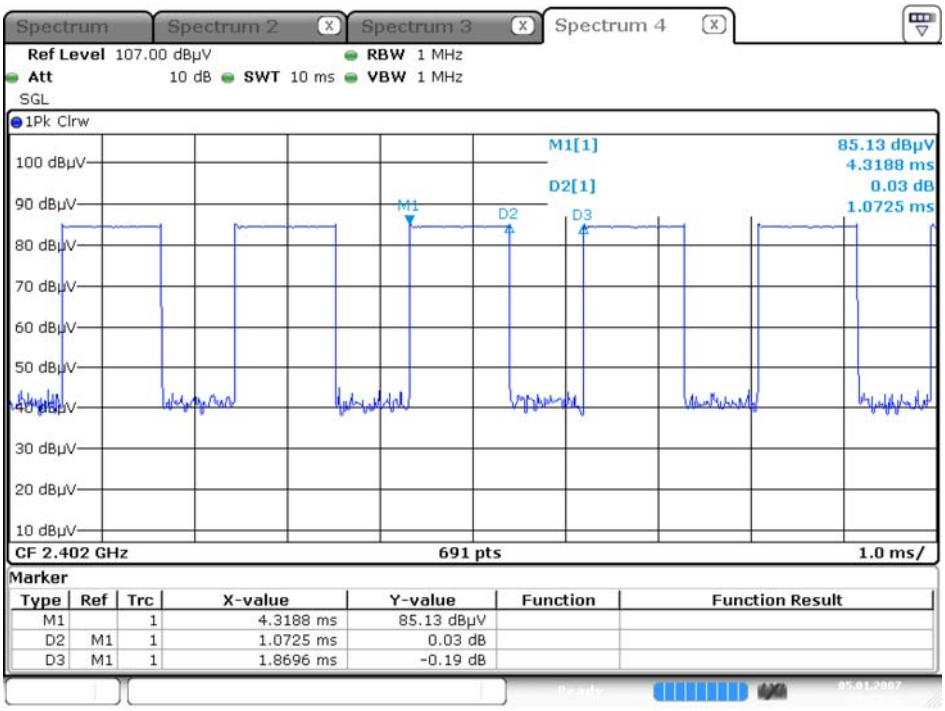
Results:

2.4GHz band	Ton (ms)	Ton + Toff (ms)	Duty Cycle (%)	Duty Factor (dB)
BLE5.0_1M	2.1449	2.5217	85.06	0.70
BLE5.0_2M	1.0725	1.8696	57.37	2.41

BLE5.0_1M



BLE5.0_2M


Spectrum
Spectrum 2
Spectrum 3
Spectrum 4
Ref Level 107.00 dBµV
RBW 1 MHz
Att 10 dB SWT 10 ms VBW 1 MHz
SGL
1Pk Clrw
M1[1] 85.13 dBµV
4.3188 ms
D2[1] 0.03 dB
1.0725 ms
100 dBµV
90 dBµV
80 dBµV
70 dBµV
60 dBµV
50 dBµV
40 dBµV
30 dBµV
20 dBµV
10 dBµV
CF 2.402 GHz
691 pts
1.0 ms/
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 4.3188 ms 85.13 dBµV
D2 M1 1 1.0725 ms 0.03 dB
D3 M1 1 1.8696 ms -0.19 dB
Date: 5.JAN.2007 20:23:22

10. EMI Reduction Method During Compliance Testing

No modification was made during testing.