

FCC – Test report

Report Number : **60.790.14.002.02** Date of Issue: 13th February 2014

Model : **BAR218HG**

Product Type : BLE connected weather station

Applicant : IDT Technology Limited

Address : Block C,9/F., Kaiser Estate,Phase1,41 Man Yue Street, Hunghom,
Kowloon , Hong Kong

Production Facility : IDT Technology Limited

Address : Block C,9/F., Kaiser Estate,Phase1,41 Man Yue Street, Hunghom,
Kowloon , Hong Kong

Test Result : ☒ **Positive** ☐ **Negative**

Total pages including Appendices : 29

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2. Details about the Test Laboratory

Details about the Test Laboratory

Test site 1

Company name: TÜV SÜD HONG KONG LTD.
3/F, West Wing, Lakeside 2,
10 Science Park West Avenue,
Science Park, Shatin
HK.

Telephone: 852 2776 1323
Fax: 852 2776 1372

Test site 2

Company name: Audix Technology(Shenzhen) Co., Ltd.
No.6,Ke Feng Road,Block 52,Shenzhen Science & Industry
Park,Nanshan,Shenzhen,Guangdong,China (518057)

Test site 3

Company name: TMC-Telecommunication Metrology Center of M.I.I.T
No 52 Hua Yuanbei Road, Haidian District, Beijing, P.R.China

3. Description of the Equipment Under Test

Description of the Equipment Under Test

Product:	BLE connected weather station
Model no.:	BAR218HG
Serial number:	NIL
Options and accessories:	NIL
FCC ID:	NMTBAR218HG-01
Rated Voltage:	4.5 VDC
Rated Current:	NIL
Rated Power:	NIL
Frequency:	2402-2480MHz
RF Transmission Frequency:	2402-2480MHz
Antenna gain:	0 dBi
No. of Operated Channel:	40
Modulation:	GFSK
Description of the EUT:	Battery operated – 3x 1.5V AA battery

4. Summary of Test Standards

Test Standards	
FCC Part 15 Subpart C, Intentional Radiators, 10-1-12 Edition	PART 15 – RADIO FREQUENCY DEVICES Subpart C – Intentional Radiators

5. Summary of Test Standards and Results

Emission Tests					
Test Condition	Pages	Test site	Test Result		
			Pass	Fail	N/A
FCC§15.207(a) – AC Line Conducted Emissions	8	Site 2	☐	☐	☒
FCC §2.1051 & §15.247(d) – Spurious Emissions at Antenna Terminals	11	Site 2	☒	☐	☐
FCC §15.205, §15.209 & §15.247(d) – Spurious Radiated Emissions	14	Site 3	☒	☐	☐
FCC §15.247(a)(2) – 6 dB Bandwidth	18	Site 2	☒	☐	☐
FCC §15.247(b) – Peak Output Power	21	Site 2	☒	☐	☐
FCC §15.247(d) – 100 kHz Bandwidth of Band Edges	24	Site 2	☒	☐	☐
FCC §15.247(e) – Power Spectral Density	26	Site 2	☒	☐	☐
FCC §15.203 – Antenna Requirements	29	Site 2	☒	☐	☐

6. General Remarks

Remarks

This submittal(s) (test report) is intended for FCC ID: NMTBAR218HG-01 complies with the FCC Part 15, Subpart C Rules.

All the configurations of the product were tested and only the worst test results are listed in the report.

SUMMARY:

All tests according to the regulations cited on page 6 were

- - Performed
- - **Not** Performed

The Equipment Under Test

- - **Fulfills** the general approval requirements.
- - **Does not** fulfill the general approval requirements.

Sample Received Date: 03rd January 2014

Testing Start Date: 04th January 2014

Testing End Date: 20th January 2014

- TÜV SÜD HONG KONG LTD. -

Reviewed by:


Edmond FUNG

Prepared by:


CHAN Kwong Ngai



7. Emission Test Results

7.1 AC Line Conducted Emissions

Date of test : 15th January 2014

Test requirement : FCC §2.1051 & §15.247(d)

Test method : Conducted

Operating mode : Transmit mode

Remarks : NIL(Battery operated only)

7.2 Spurious Emissions at Antenna Terminals

Date of test : 15th January 2014

Test requirement : FCC §2.1051 & §15.247(d)

Test method : Conducted

Operating mode : Transmit mode

Frequency channel : 2402MHz

Remarks : 30MHz-25GHz



Remark: No emission were detected below 30MHz.

Date of test : 15th January 2014

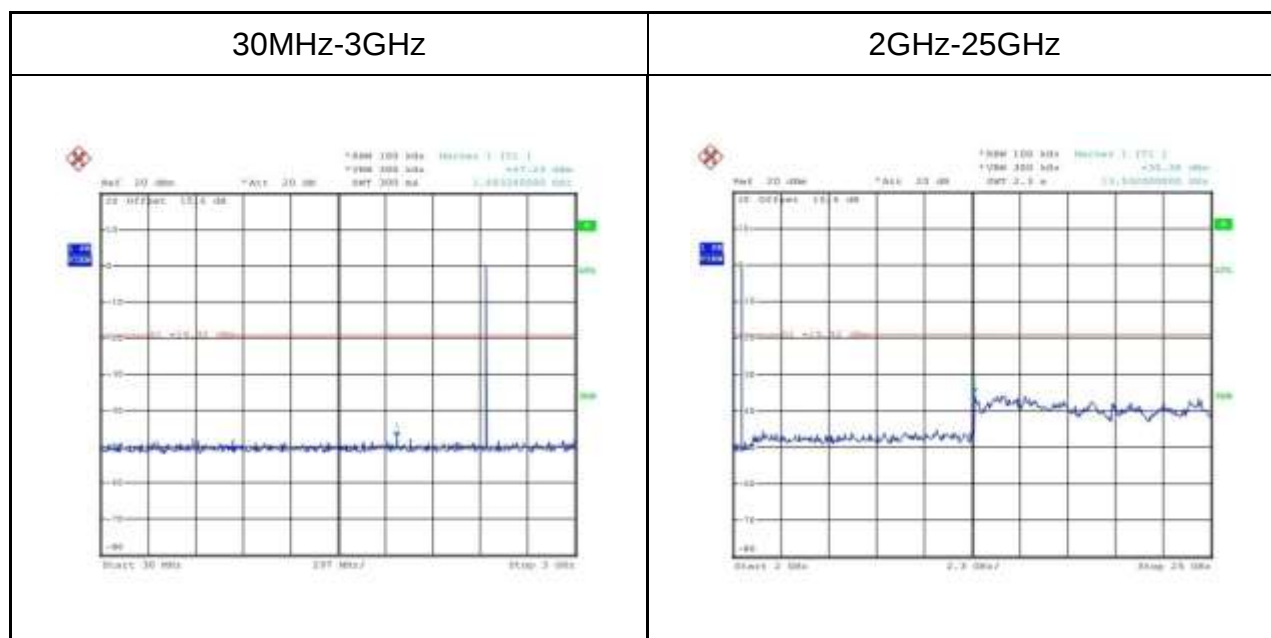
Test requirement : FCC §2.1051 & §15.247(d)

Test method : Conducted

Operating mode : Transmit mode

Frequency channel : 2440MHz

Remarks : 30MHz-25GHz



Remark: No emission were detected below 30MHz.

Date of test : 15th January 2014

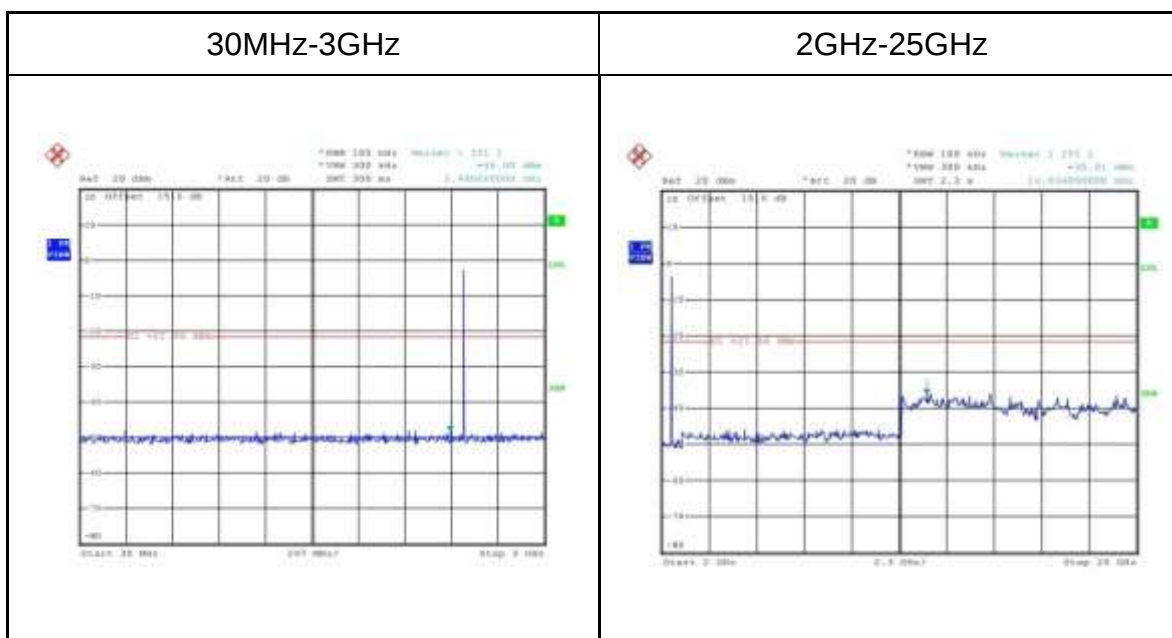
Test requirement : FCC §2.1051 & §15.247(d)

Test method : Conducted

Operating mode : Transmit mode

Frequency channel : 2480MHz

Remarks : 30MHz-25GHz



Remark: No emission were detected below 30MHz.

7.3 Spurious Radiated Emissions

Date of test : 06th January 2014

Test requirement : FCC §15.205, §15.209 & §15.247(d)

Test method : Radiated

Operating mode : Transmit mode

Frequency channel : 2402MHz(worst case)

Remarks : 9kHz-1GHz

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
49.26	43.17	-33.4	9.77	40.0	-30.23	QP	H
93.60	42.49	-35.7	6.79	43.5	-36.71	QP	H
135.00	46.79	-38.9	7.89	43.5	-35.61	QP	H
319.08	49.72	-33.0	16.72	46.0	-29.28	QP	H
490.92	53.38	-28.9	24.48	46.0	-21.52	QP	H
750.12	47.74	-24.2	23.54	46.0	-22.46	QP	H
37.56	47.12	-35.4	11.72	40.0	-28.28	QP	V
115.98	54.68	-35.8	18.88	43.5	-24.62	QP	V
220.92	52.51	-35.6	16.91	46.0	-29.09	QP	V
417.24	50.26	-30.8	19.46	46.0	-26.54	QP	V
490.92	54.24	-29.7	24.54	46.0	-21.46	QP	V
662.76	54.71	-26.5	28.21	46.0	-17.79	QP	V

Remark: All three frequencys (2042MHz、2440MHz and 2480MHz) were performed test, and the 2402MHz was the worst case.

Date of test : 06th January 2014
 Test requirement : FCC §15.205, §15.209 & §15.247(d)
 Test method : Radiated
 Operating mode : Transmit mode
 Frequency channel : 2402MHz
 Remarks : 1GHz-25GHz

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2402	79.7	1.8	81.5	/	/	/	H
2402	71.6	1.8	73.4	/	/	/	H
4804	43.9	5.8	49.7	74.0	-24.3	peak	H
4804	35.6	5.8	41.4	54.0	-12.6	Average	H
7206	38.0	6.8	44.8	74.0	-29.2	peak	H
7206	25.6	6.8	32.4	54.0	-21.6	Average	H
2402	77.8	1.8	79.6	/	/	/	V
2402	71.4	1.8	73.2	/	/	/	V
4804	40.1	5.8	45.9	74.0	-28.1	peak	V
4804	32.6	5.8	38.4	54.0	-15.6	Average	V
7206	36.7	6.8	43.5	74.0	-30.5	peak	V
7206	24.9	6.8	31.7	54.0	-22.3	Average	V

Date of test : 06th January 2014
 Test requirement : FCC §15.205, §15.209 & §15.247(d)
 Test method : Radiated
 Operating mode : Transmit mode
 Frequency channel : 2440MHz
 Remarks : 1GHz-25GHz

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2440	80.7	1.8	82.5	/	/	/	H
2440	71.8	1.8	73.6	/	/	/	H
4880	42.5	5.9	48.4	74.0	-25.6	peak	H
4880	36.4	5.9	42.3	54.0	-11.7	Average	H
7320	35.7	6.8	42.5	74.0	-31.5	peak	H
7320	25	6.8	31.8	54.0	-22.2	Average	H
2440	80.9	1.8	82.7	/	/	/	V
2440	73.7	1.8	75.5	/	/	/	V
4880	43.7	5.9	49.6	74.0	-24.4	peak	V
4880	35.9	5.9	41.8	54.0	-12.2	Average	V
7320	36.8	6.8	43.6	74.0	-30.4	peak	V
7320	26.9	6.8	33.7	54.0	-20.3	Average	V

Date of test : 06th January 2014
 Test requirement : FCC §15.205, §15.209 & §15.247(d)
 Test method : Radiated
 Operating mode : Transmit mode
 Frequency channel : 2480MHz
 Remarks : 1GHz-25GHz

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark	Ant.Polar. H / V
2480	78.8	1.9	80.7	/	/	/	H
2480	69.7	1.9	71.6	/	/	/	H
4960	43.7	5.9	49.6	74.0	-24.4	peak	H
4960	36.6	5.9	42.5	54.0	-11.5	Average	H
7440	35.9	6.8	42.7	74.0	-31.3	peak	H
7440	28.7	6.8	35.5	54.0	-18.5	Average	H
2480	76.8	1.9	78.7	/	/	/	V
2480	68.6	1.9	70.5	/	/	/	V
4960	40.9	5.9	46.8	74.0	-27.2	peak	V
4960	33.8	5.9	39.7	54.0	-14.3	Average	V
7440	36.7	6.8	43.5	74.0	-30.5	peak	V
7440	28.0	6.8	34.8	54.0	-19.2	Average	V

7.4 6dB Bandwidth

Date of test : 15th January 2014

Test requirement : FCC §15.247(a)(2)

Test method : Conducted

Operating mode : Transmit mode

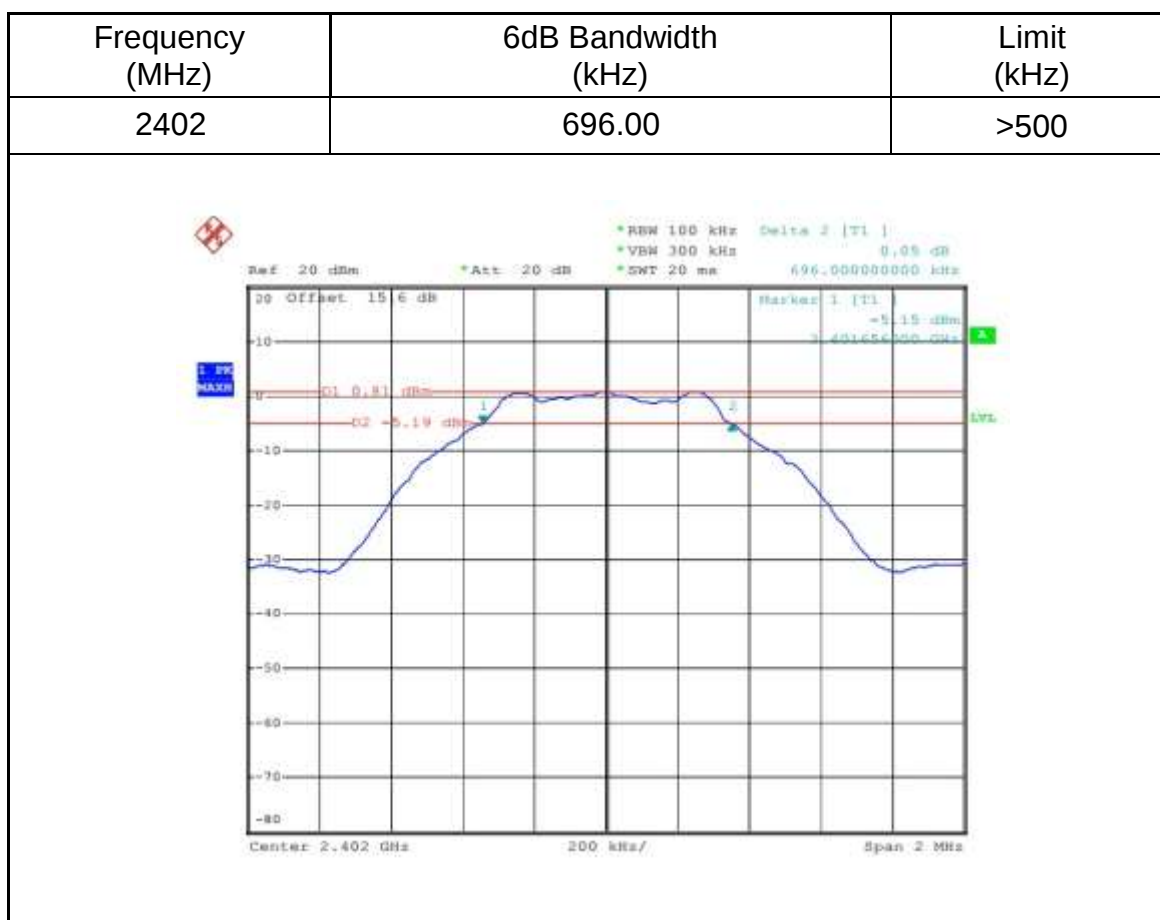
Frequency channel : 2402MHz

Remarks : NIL

Test Result

☒ Passed

☐ Not Passed



Date of test : 15th January 2014

Test requirement : FCC §15.247(a)(2)

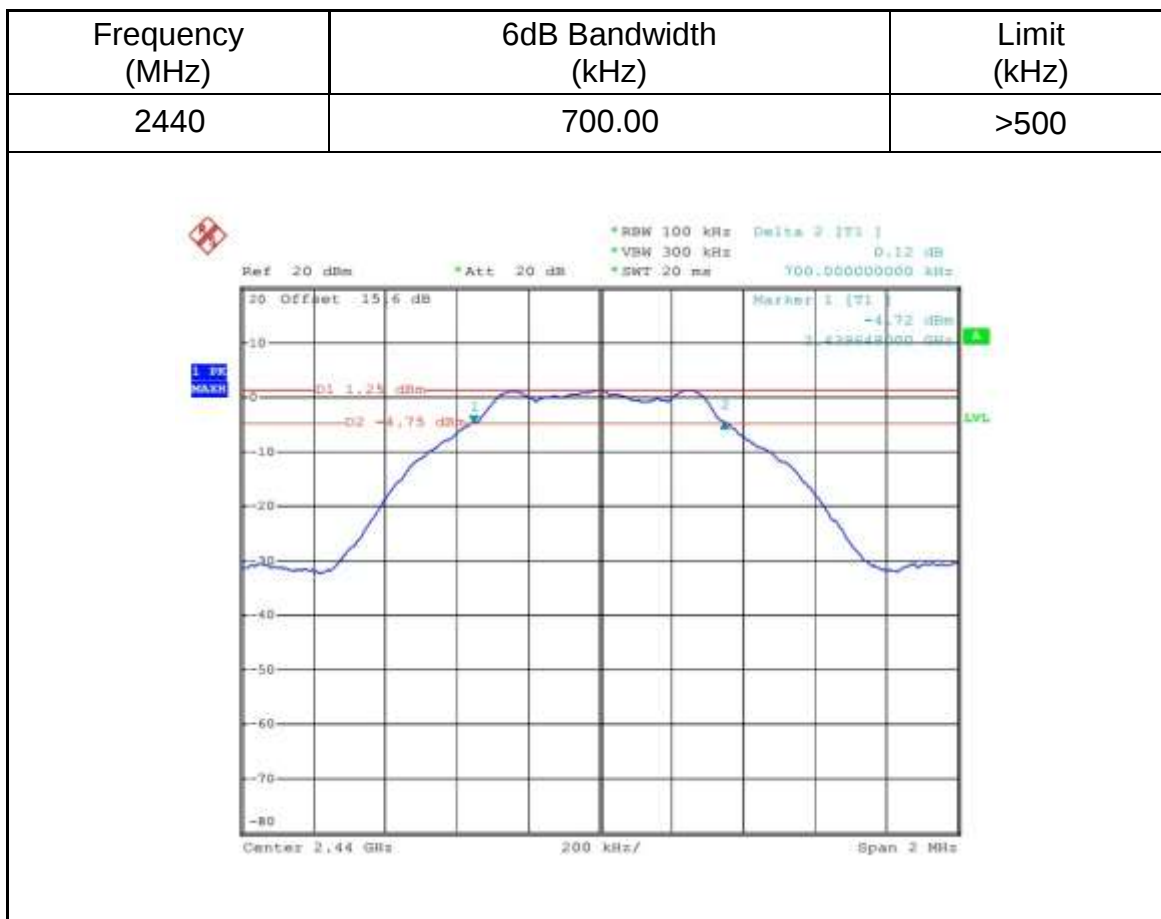
Test method : Conducted

Operating mode : Transmit mode

Frequency channel : 2440MHz

Remarks : NIL

Test Result	
☒	Passed
☐	Not Passed



Date of test : 15th January 2014

Test requirement : FCC §15.247(a)(2)

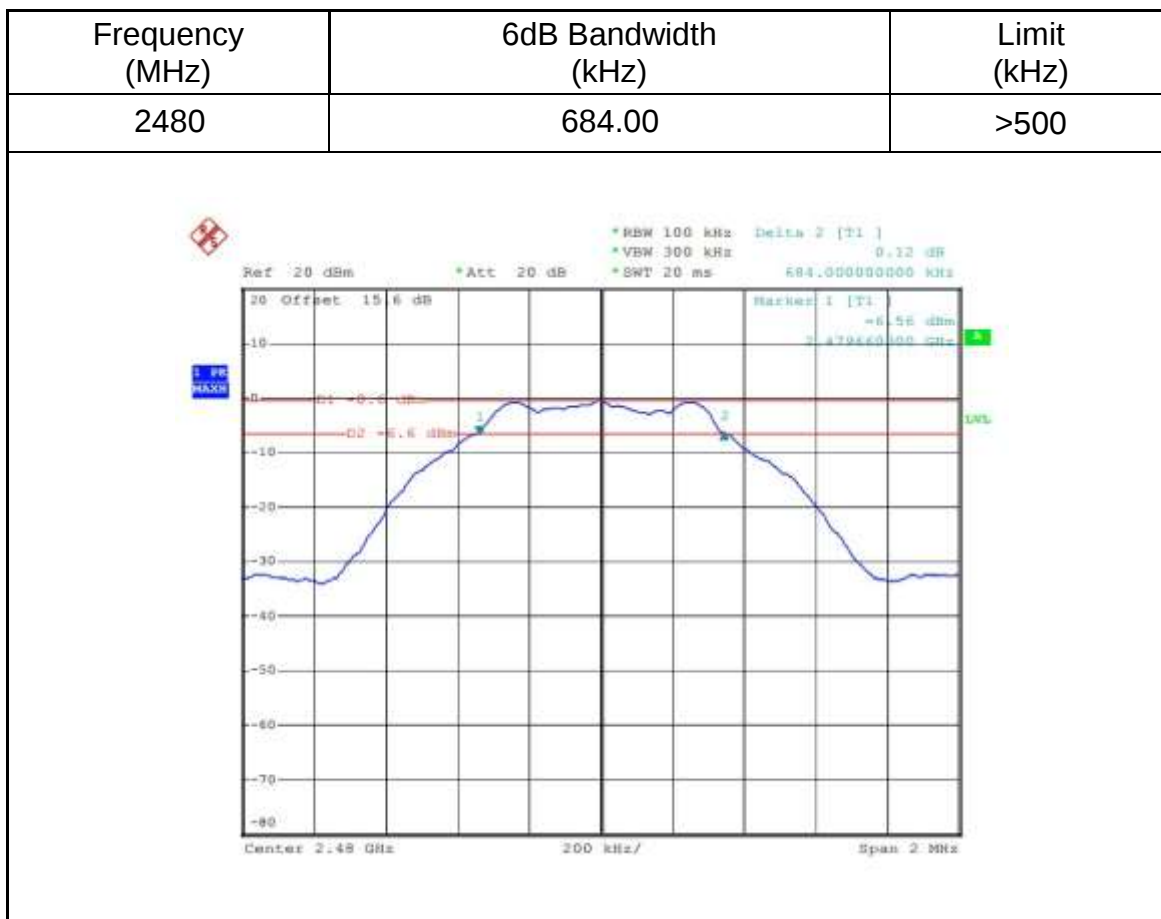
Test method : Conducted

Operating mode : Transmit mode

Frequency channel : 2480MHz

Remarks : NIL

Test Result	
☒	Passed
☐	Not Passed



7.5 Peak Output Power Measurements

Date of test : 15th January 2014

Test requirement : FCC §15.247(b)

Test method : Conducted

Operating mode : Transmit mode

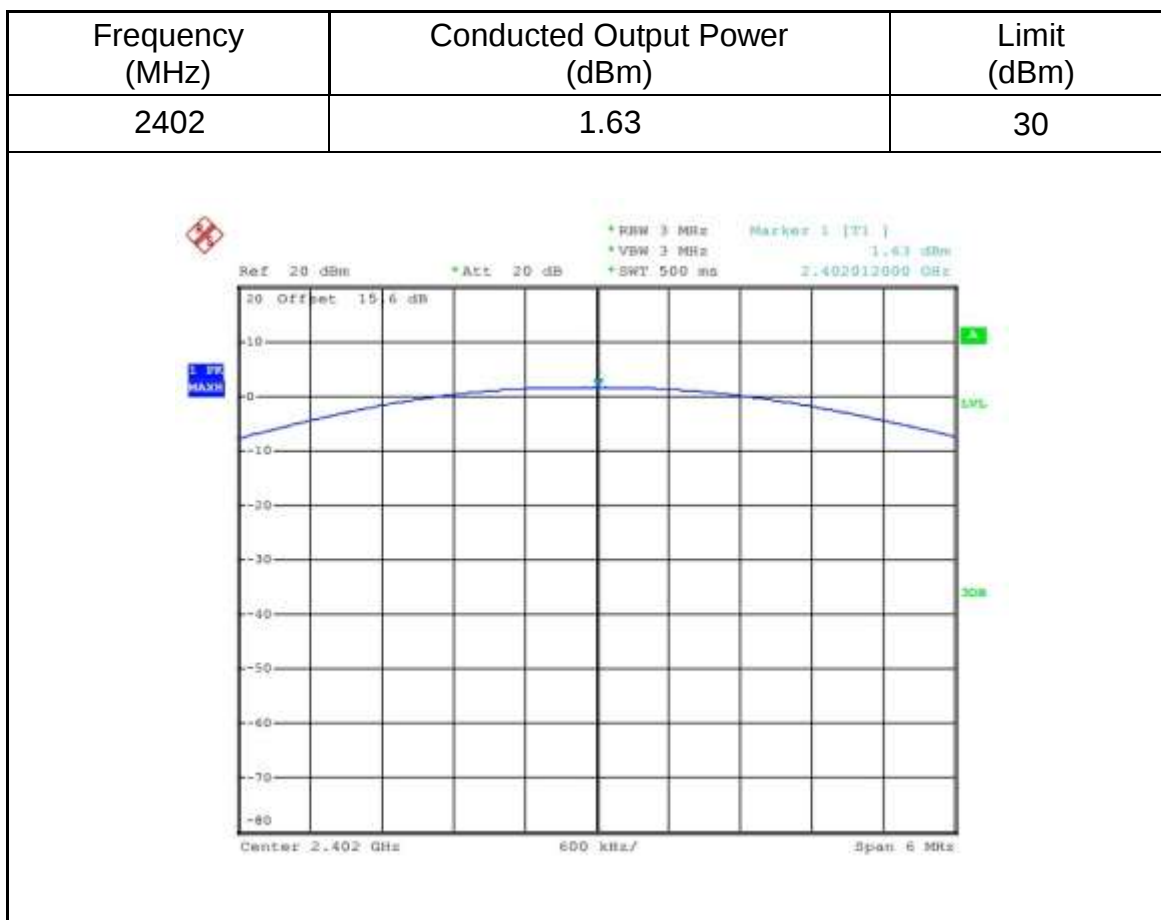
Frequency channel : 2402MHz

Remarks :

Test Result

☒ Passed

☐ Not Passed



Date of test : 15th January 2014

Test requirement : FCC §15.247(b)

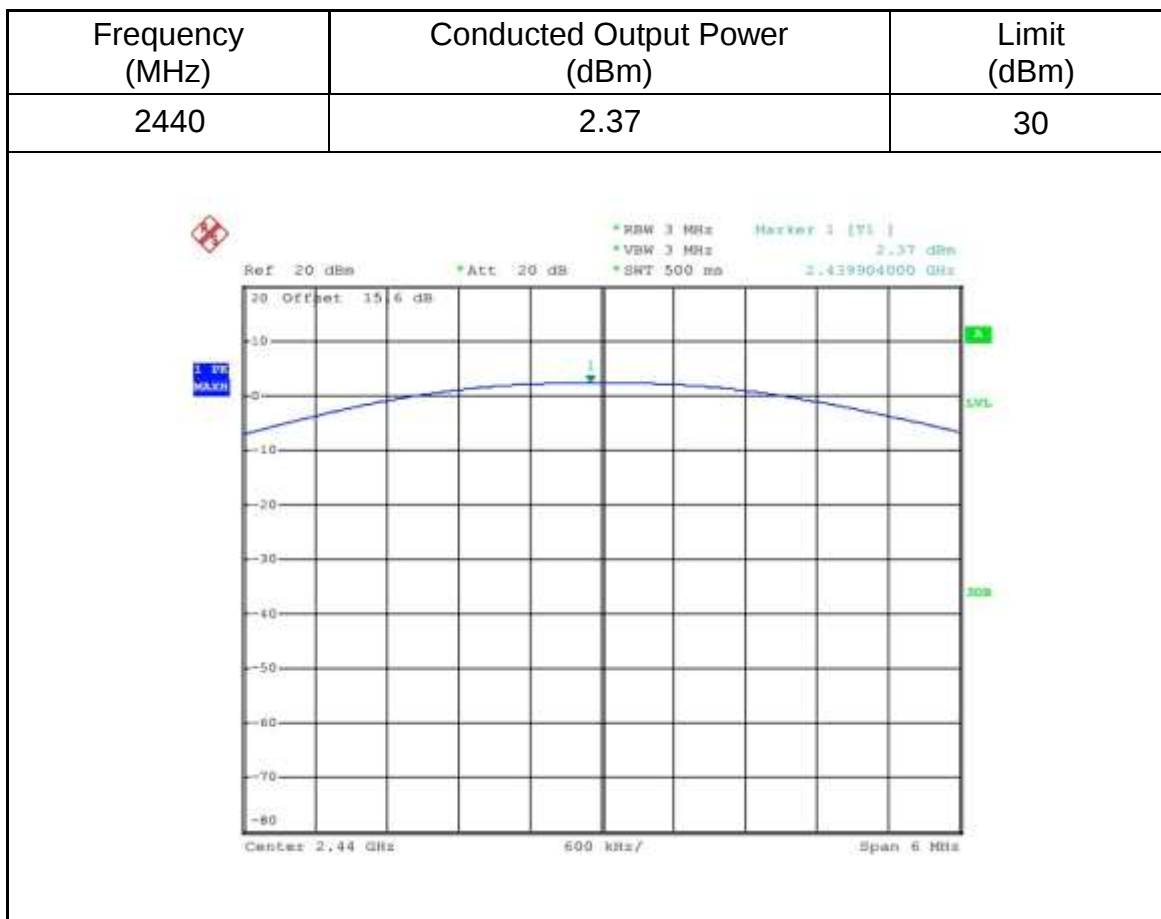
Test method : Conducted

Operating mode : Transmit mode

Frequency channel : 2440MHz

Remarks :

Test Result	
☒	Passed
☐	Not Passed



Date of test : 15th January 2014

Test requirement : FCC §15.247(b)

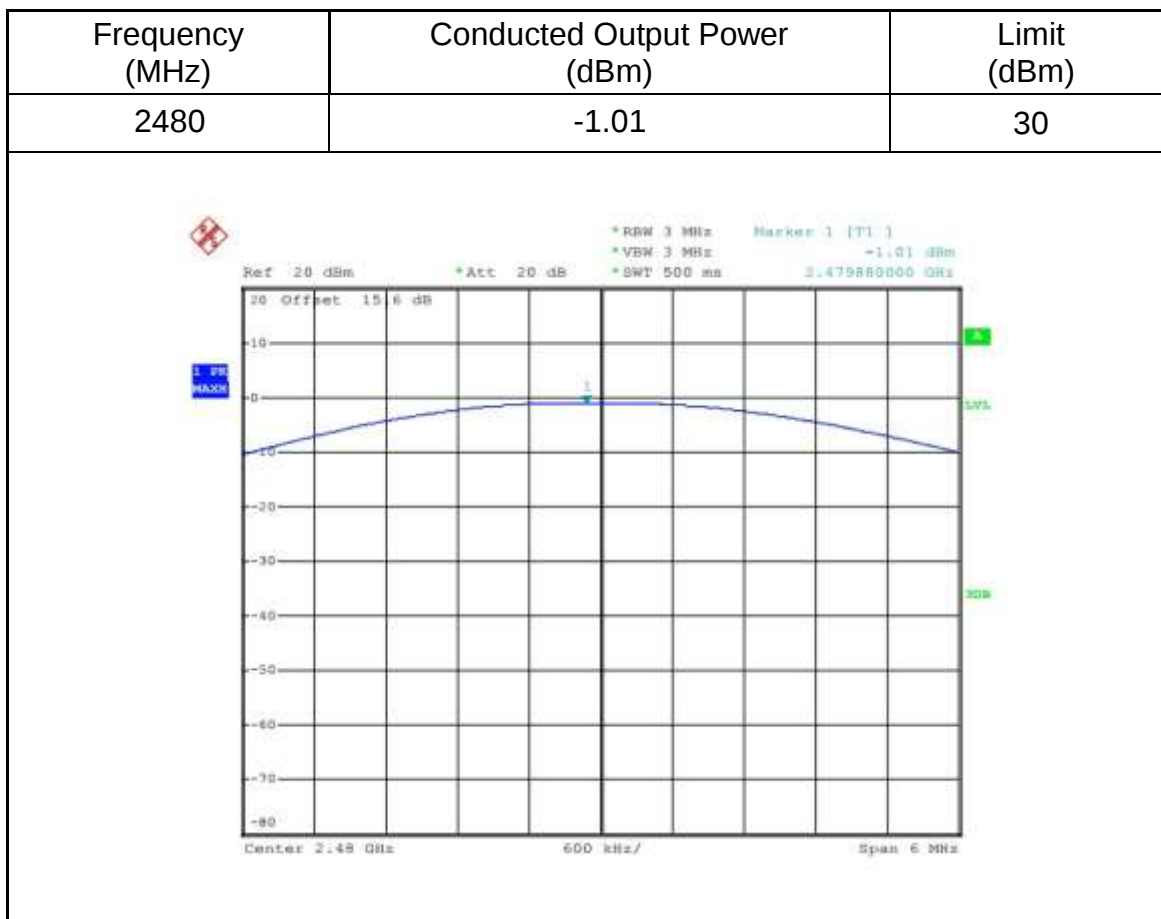
Test method : Conducted

Operating mode : Transmit mode

Frequency channel : 2480MHz

Remarks :

Test Result	
☒	Passed
☐	Not Passed



7.6 100 kHz Bandwidth of Band Edges

Date of test : 15th January 2014

Test requirement : FCC §15.247(d)

Test method : Conducted

Operating mode : Transmit mode

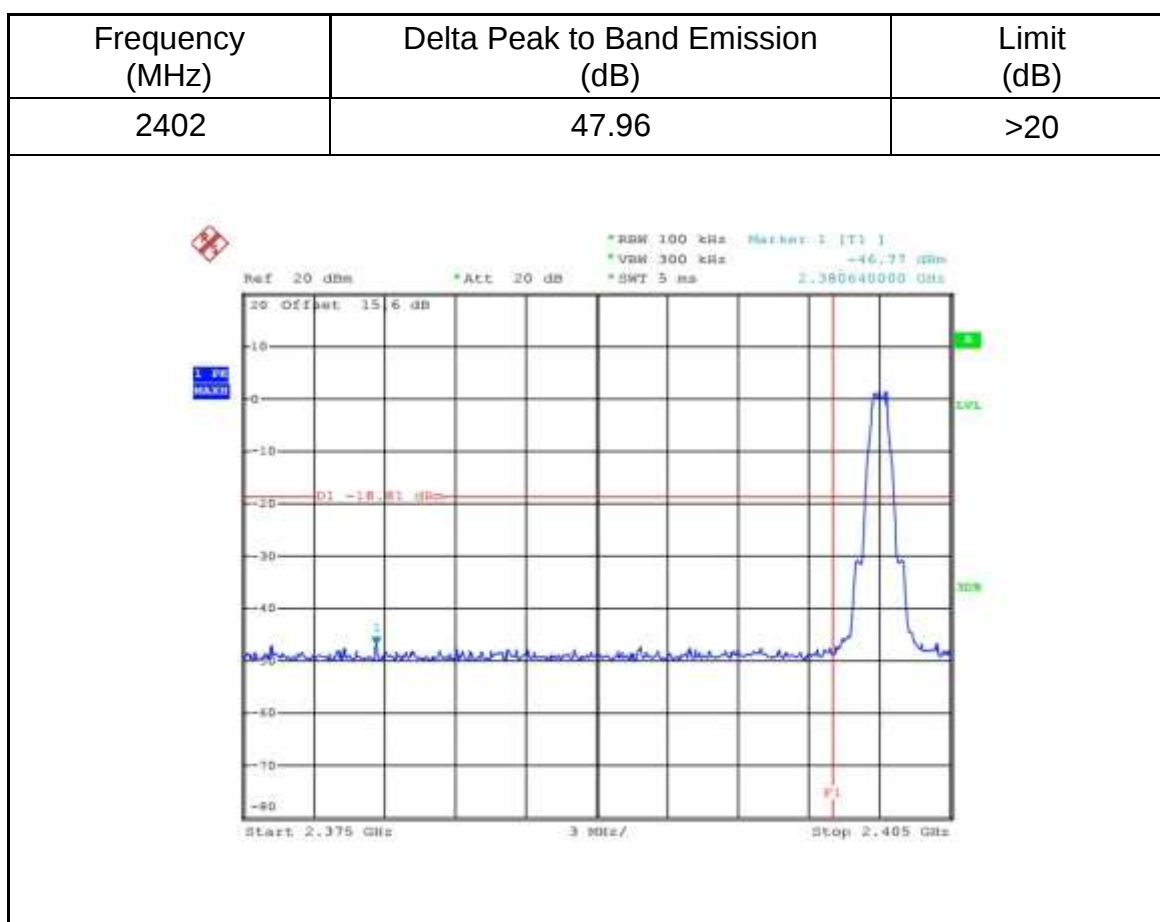
Frequency channel : 2402MHz

Remarks :

Test Result

☒ Passed

☐ Not Passed



Date of test : 15th January 2014

Test requirement : FCC §15.247(d)

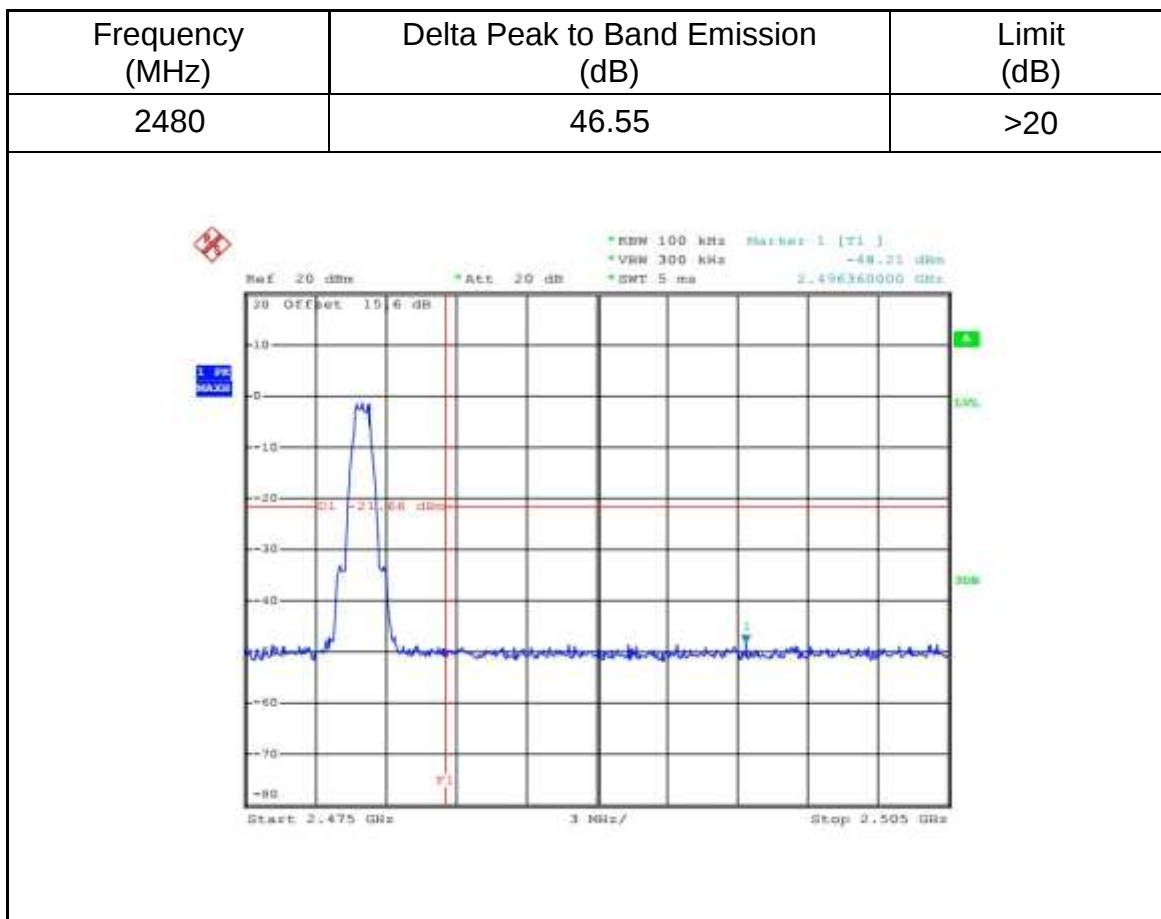
Test method : Conducted

Operating mode : Transmit mode

Frequency channel : 2480MHz

Remarks :

Test Result	
☒	Passed
☐	Not Passed



7.7 Power Spectral Density

Date of test : 15th January 2014

Test requirement : FCC §15.247(e)

Test method : Conducted

Operating mode : Transmit mode

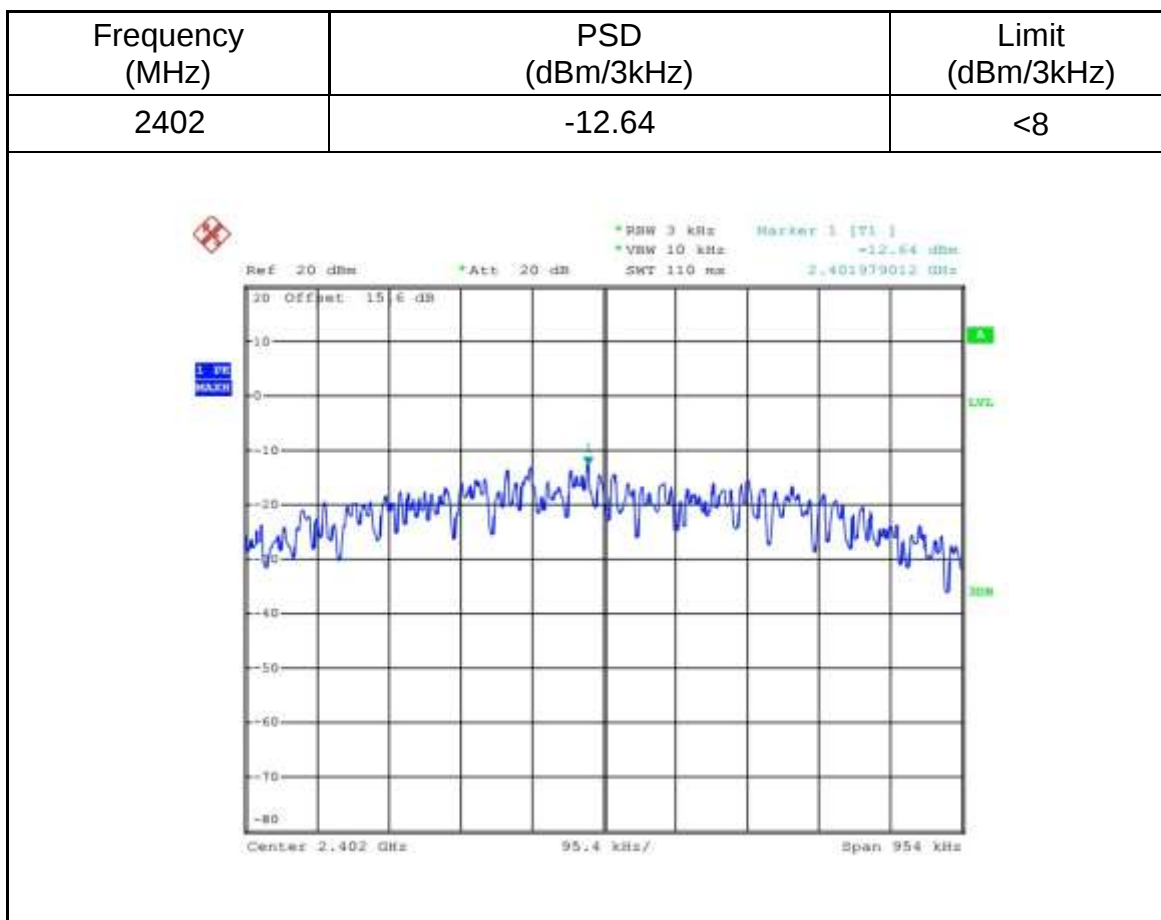
Frequency channel : 2402MHz

Remarks :

Test Result

☒ Passed

☐ Not Passed



Date of test : 15th January 2014

Test requirement : FCC §15.247(e)

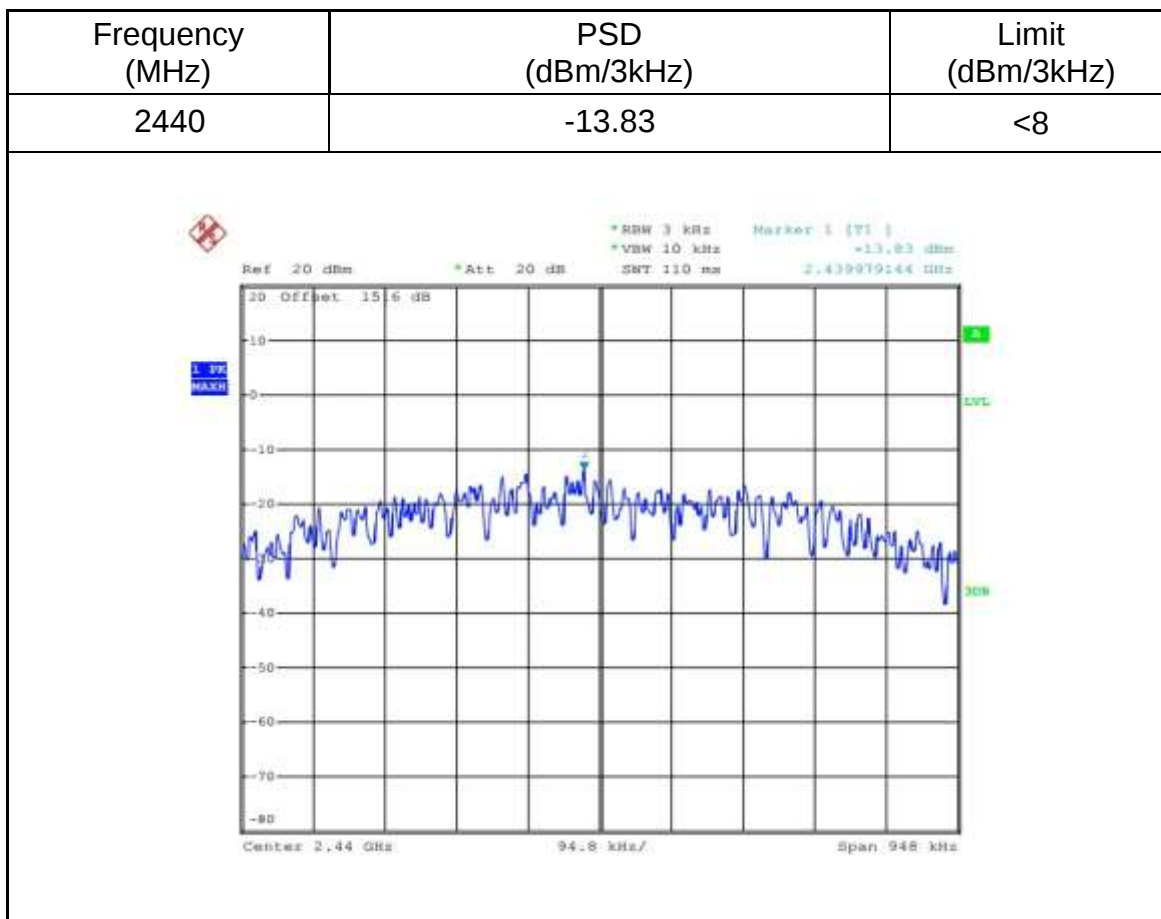
Test method : Conducted

Operating mode : Transmit mode

Frequency channel : 2440MHz

Remarks :

Test Result	
☒	Passed
☐	Not Passed



Date of test : 15th January 2014

Test requirement : FCC §15.247(e)

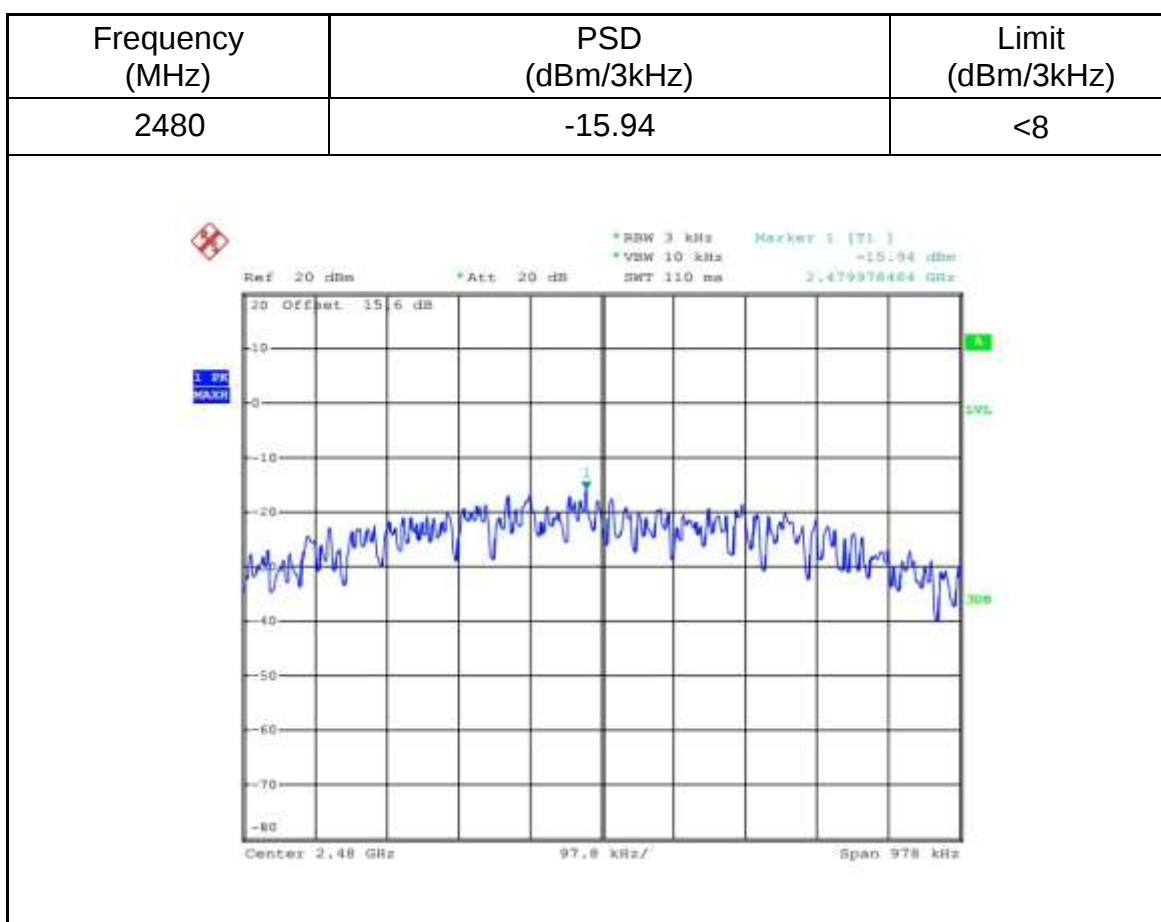
Test method : Conducted

Operating mode : Transmit mode

Frequency channel : 2480MHz

Remarks :

Test Result	
☒	Passed
☐	Not Passed



7.8 Antenna Requirement

Limit

For intentional device, according to 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And According to 15.247 (b), if transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

Antenna Connector Construction

The antenna used in this product is PCB antenna. And the maximum Gain of this antenna is 0.0 dBi.

8. Test Equipment List

Radiated Emission Test

DESCRIPTION	Type No.	Serial No.	Calibrated date	Calibrated until
Antenna	VULB9163	9163 330	2013.02.25	2014.02.24
Antenna	3117	00066577	2013.04.02	2014.04.01
Antenna	3160-09	00118388	2013.09.06	2014.09.05
Loop Antenna	6512	29604	2013.09.25	2014.09.24
Spectrum Analyzer	E4440A	US42220815	2013.06.14	2014.06.13
Spectrum Analyzer	FSP 40	100378	2013.12.23	2014.12.22
EMI Test Receiver	ESCI	100701	2013.08.04	2014.08.03
Spectrum Analyzer	FSV40	100903	2013.01.27	2014.01.26
Test Cable	SUCOFLEX 104	MY2320/4	2013.02.18	2014.02.17
Amplifier	150A250	326446	2013.03.19	2014.03.17
Temp. & Humid. Chamber	FACT5-2.0	4166	2013.11.22	2014.11.21

9. System Measurement Uncertainty

For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 were:

System Measurement Uncertainty

Items		Extended Uncertainty
RE	Field strength (dB μ V/m)	U=3.59dB (9kHz-30MHz)
		U=5.08dB (30MHz-1GHz)
		U=4.56dB (1GHz-18GHz)
		U=4.42dB (18GHz-25GHz)
CE	Disturbance Voltage (dB μ V)	U=2.7dB