



**FCC 47 CFR PART 15 SUBPART C
TEST REPORT**

FOR

Outdoor shower

Model : PSG-20

Issued to

GDL International Ltd.

Room 701, 7F, No.18, Sec.1, Chang'an E. Rd., Zhongshan Dist., Taipei City,
Taiwan

Issued by

WH Technology Corp.



Open Site		No.120, Ln. 5, Hudong St., Xizhi Dist., New Taipei City 221, Taiwan (R.O.C.)
EMC Test Site	Xizhi Office and Lab	4F., No.27-1, Ln. 169, Kangning St., Xizhi Dist., New Taipei City 221, Taiwan (R.O.C.)
Tel.: +886-2-7729-7707 Fax: +886-2- 8648-1311		

Note: This test refers exclusively to the test presented test model and sample. This report shall not be reproduced except in full, without the written approval of WH Technology Corp. This document may be altered or revised by WH Technology Corp. Personnel only, and shall be noted in the revision section of the document.



TABLE OF CONTENTS	2
1. GENERAL INFORMATION	3
1.1 DESCRIPTION OF THE TESTED SAMPLES	4
2. TEST METHODOLOGY	5
2.1 GENERAL TEST PROCEDURES	5
2.2 FCC PART 15.205 RESTRICTED BANDS OF OPERATIONS	6
2.3 DESCRIPTION OF TEST MODES	6
2.4 DESCRIPTION OF THE SUPPORT EQUIPMENTS	7
3. TEST AND MEASUREMENT EQUIPMENT	9
3.1 CALIBRATION	9
3.2 EQUIPMENT	9
4. SECTION 15.249 REQUIREMENTS (FUNDAMENTAL/ HARMONICS)	10
4.1 TEST SETUP	10
4.2 LIMIT	10
4.3 RESULT: PASSED	10
4.4 TEST DATA:	10
5. SECTION 15.205 REQUIREMENTS (BAND EDGE)	16
5.1 TEST SETUP	16
5.2 LIMIT	16
5.3 RESULT: PASSED	16
5.4 TEST DATA:	17
6. SECTION 15.209 REQUIREMENTS (GENERAL RADIATED EMISSION)	18
6.1 TEST SETUP	18
6.2 LIMIT	19
6.3 TEST PROCEDURE	20
6.4 RESULT: PASSED	20
6.5 TEST DATA:	21
7. 20DB BANDWIDTH MEASUREMENT	24
7.1 TEST SETUP	24
7.2 LIMIT	24
7.3 TEST PROCEDURE	24
7.4 RESULT: PASSED	24
7.5 TEST DATA	25



1. GENERAL INFORMATION

Applicant : GDL International Ltd.

Address : Room 701, 7F, No.18, Sec.1, Chang'an E. Rd., Zhongshan Dist., Taipei City

Manufacturer : GDL International Ltd.

Address : Room 701, 7F, No.18, Sec.1, Chang'an E. Rd., Zhongshan Dist., Taipei City

EUT : Outdoor shower

Model Name : PSG-20

Model Differences : N/A

Is here with confirmed to comply with the requirements set out in the FCC Rules and Regulations Part 15 Subpart C and the measurement procedures were according to ANSI C63.4-2009. The said equipment in the configuration described in this report shows the maximum emission levels emanating from equipment are within the compliance requirements.

FCC part 15 subpart C

Receipt Date : 07/02/2015

Final Test Date : 09/30/2015

Tested By:

Reviewed by:

Sep. 30, 2015

(Date)

Bell Wei/ Engineer

Sep. 30, 2015

(Date)

Mike Lee / Manager

Designation Number: TW1083



1.1 DESCRIPTION OF THE TESTED SAMPLES

EUT Name : Outdoor shower

Model Number :: PSG-20

FCCID Number 2AFRYPSG20

Receipt Date : 07/02/2015

Input Voltage : DC 12 V, 2.5 A

Power From ☒Inside ☐Outside
☐Adaptor ☐BATTERY ☐AC Power Source
☒DC Power : DC 12 V, 2.5 A ☐Support Unit PC or NB

Operate Frequency : 2410 MHz

Modulation Technique : GFSK

Number of Channels : 1

Channel spacing : ☒N/A ☐_____MHz

Operating Mode : ☐Simplex ☒Half Duplex

Antenna Type : ☒integral antenna: Chip Antenna
☐a dedicated antenna

Antenna gain 1.5 dBi



2. TEST METHODOLOGY

All testing as described bellowed were performed in accordance with ANSI C63.4:2009 and FCC CFR 47 Part 15 Subpart C.

2.1 GENERAL TEST PROCEDURES

Conducted Emissions

The EUT is placed on a wood table, which is at 0.8 m above ground plane acceding to clause 15.207 and requirements of ANSI C63.4:2009. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz are using CISPR Quasi-Peak / Average detectors.

Radiated Emissions

The EUT is a placed on a turn table, which is 0.8 m above ground plane. The turntable was rotated through 360 degrees to determine the position of maximum emission level. The EUT is placed at 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.



2.2 FCC PART 15.205 RESTRICTED BANDS OF OPERATIONS

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
10.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	(²)
13.36 - 13.41			

¹ Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

² Above 38.6

(b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

2.3 DESCRIPTION OF TEST MODES

The EUT was tested under following modes:

Modes:

1. Continuous transmitting
2. Receiving

Channels:

1. 2410 MHz



2.4 DESCRIPTION OF THE SUPPORT EQUIPMENTS

Setup Diagram

See test photographs attached in appendix 1 for the actual connections between EUT and support equipment.



**Support Equipment**

Peripherals Devices:

OUTSIDE SUPPORT EQUIPMENT							
No.	Equipment	Model	Serial No.	FCC ID/ BSMI ID	Trade name	Data Cable	Power Cord
1.	N/A	N/A	N/A	N/A	N/A	N/A	N/A
EUT							
No.	Equipment	Model	Serial No.	FCC ID/ BSMI ID	Trade name	Data Cable	Power Cord
1.	Car charger	N/A	N/A	N/A	N/A	N/A	N/A

Note: All the above equipment /cable were placed in worse case position to maximize emission signals during emission test

Grounding: Grounding was in accordance with the manufacturer's requirement and conditions for the intended use.



3. TEST AND MEASUREMENT EQUIPMENT

3.1 CALIBRATION

The measuring equipment utilized to perform the tests documented in the report has been calibrated once a year or in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

3.2 EQUIPMENT

The following list contains measurement equipment used for testing. The equipment conforms to the requirement of CISPR 16-1, ANSI C63.2 and. Other required standards.

Calibration of all test and measurement, including any accessories that may effect such calibration, is checked frequently to ensure the accuracy. Adjustments are made and correction factors are applied in accordance with the instructions contained in the respective.

List of Test and Measurement Equipment

Test Site	Instrument	Manufacturer	Model No.	S/N	Next Cal. Date
Conduction	Receiver	R&S	ESHS10	830223/008	Nov. 23, 2015
	Spectrum Analyzer	ADVANTEST	R3261C	87120343	Mar. 18, 2016
	RF Cable	MIYAZAKI & Anritsu	RG58A0 & MP59B	M79094	Apr. 08, 2016
	L.I.S.N	Rolf Heine Hochfrequenztechnik	NNB-2/16z	98062	Jan. 16, 2016
	EMI Test Receiver	R&S	EAHS-10	1093.4495.03	Mar. 21, 2016
	Click Analyzer	Schaffner	DIA1512C	5218	June 15, 2016
Radiation	Spectrum Analyzer	Nex1	NS-265	NO5044006	Aug. 04, 2016
	Antenna	Schwarzbeck	VULB 9161	4077	Feb. 02, 2016
	RF Cable	N/A	N/A	N/A	Jan.18, 2016
	Pre-Amp	Schaffner	CPA-9232	1012	Jan. 20, 2016
	1GHz~18GHz RF Cable	EMCI	N/A	N/A	July 30, 2016
	Horn Antenna 1GHZ~18GHZ	COM-POWER	AH-118	10056	Mar. 12, 2016
	Pre-Amplifier 500M~18G	EMCI	EMC051845	980108	Oct. 08, 2015

● CALIBRATION INTERVAL OF INSTRUMENTS LISTED ABOVE IS ONE YEAR

**4. SECTION 15.249 REQUIREMENTS (FUNDAMENTAL/ HARMONICS)****4.1 TEST SETUP**

Refer to paragraph 6.1.

4.2 LIMIT

Fundamental Frequency (MHz)	Field Strength of Fundamental (dBμV/m at 3-meter)	Detector
902 - 928 2400 – 2483 5725 - 5875	114	Peak
902 - 928 2400 – 2483 5725 - 5875	94	AV

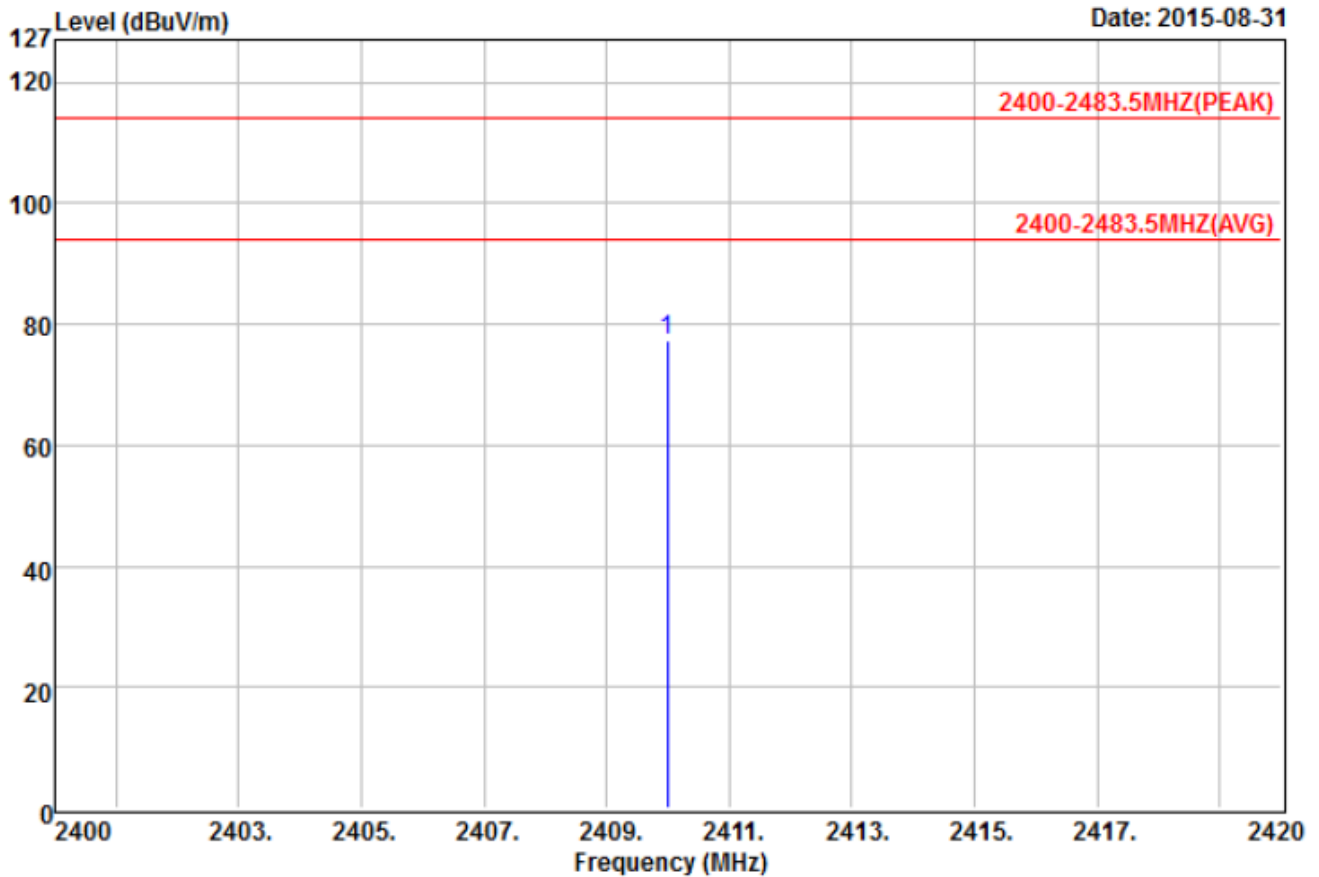
Fundamental Frequency (MHz)	Field Strength of Harmonics (dBμV/m at 3-meter)	Detector
902 - 928 2400 – 2483 5725 - 5875	74	Peak
902 - 928 2400 – 2483 5725 - 5875	54	AV

4.3 RESULT: PASSED**4.4 TEST DATA:**



Fundamental

Vertical



Remarks:

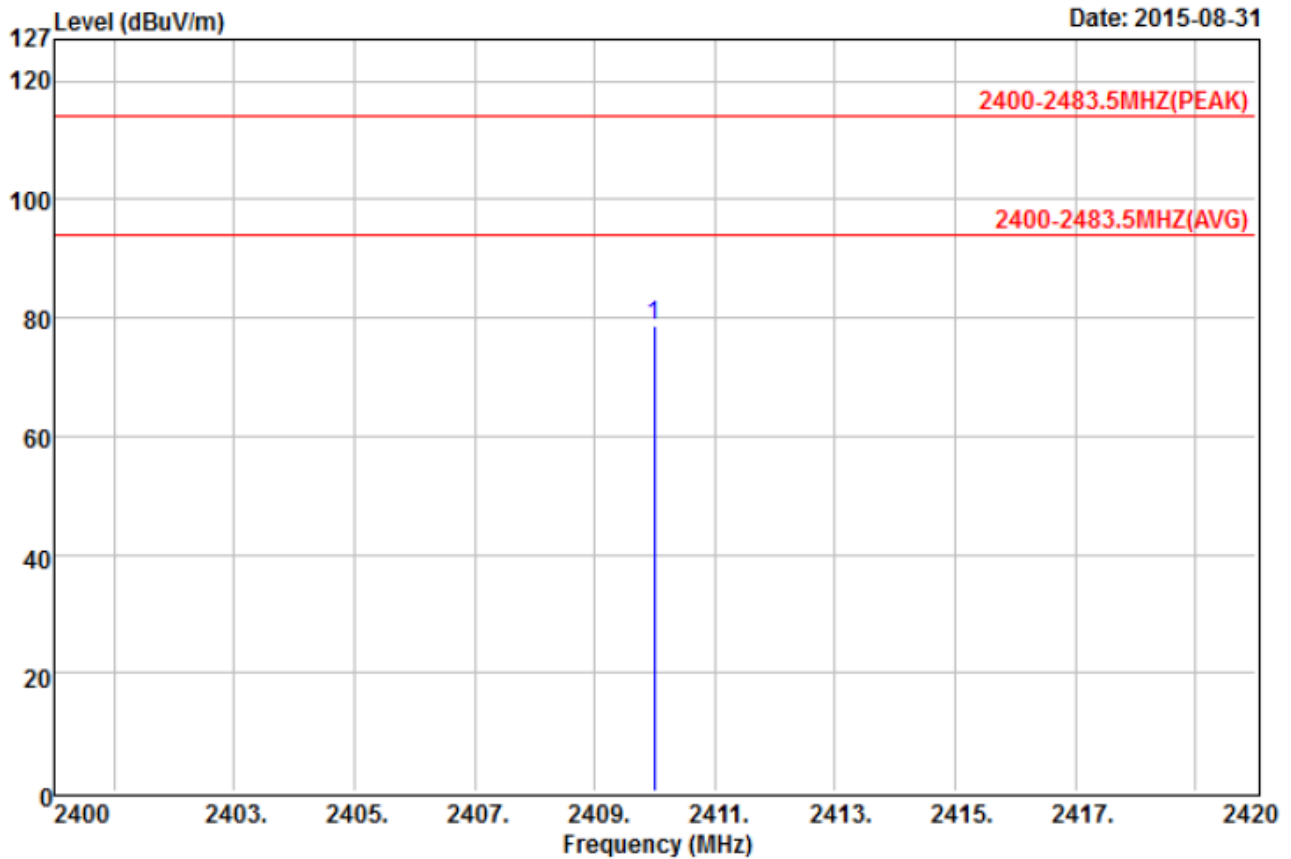
: 1.Result=Read Value+Factor
: 2.Factor=Antenna Factor+Cable loss-
: Amplifier Factor

		Read		Over	Limit	
	Freq	Level	Factor	Level	Limit	Line Remark
	MHz	dBuV	dB/m	dBuV/m	dB	dBuV/m
1	2410.00	92.56	-15.19	77.37	-36.63	114.00 Peak



Fundamental

Horizontal



Remarks:

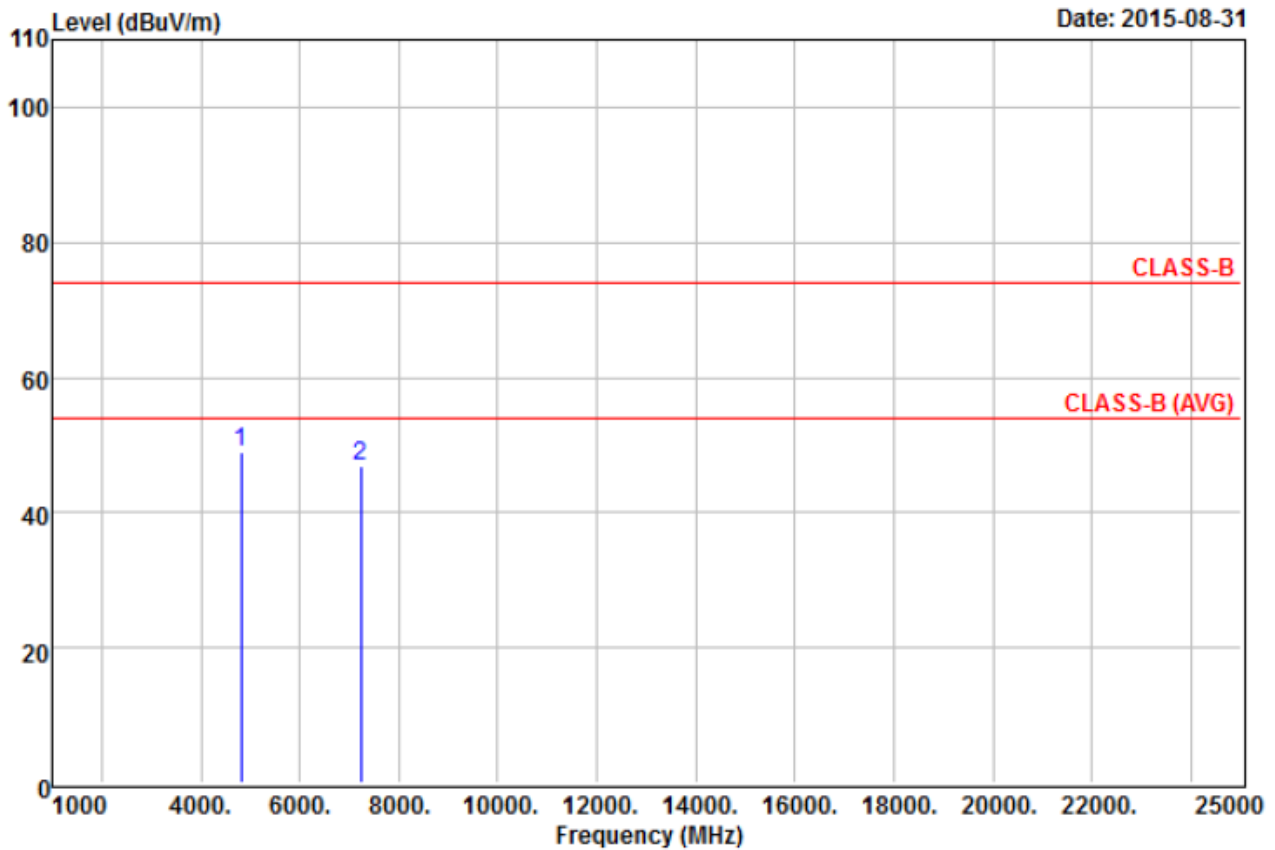
1.Result=Read Value+Factor
2.Factor=Antenna Factor+Cable loss-
Amplifier Factor

		Read		Over	Limit	
	Freq	Level	Factor	Level	Limit	Line Remark
	MHz	dBuV	dB/m	dBuV/m	dB	dBuV/m
1	2410.00	93.89	-15.19	78.70	-35.30	114.00 Peak



Harmonics

Vertical



Remarks:

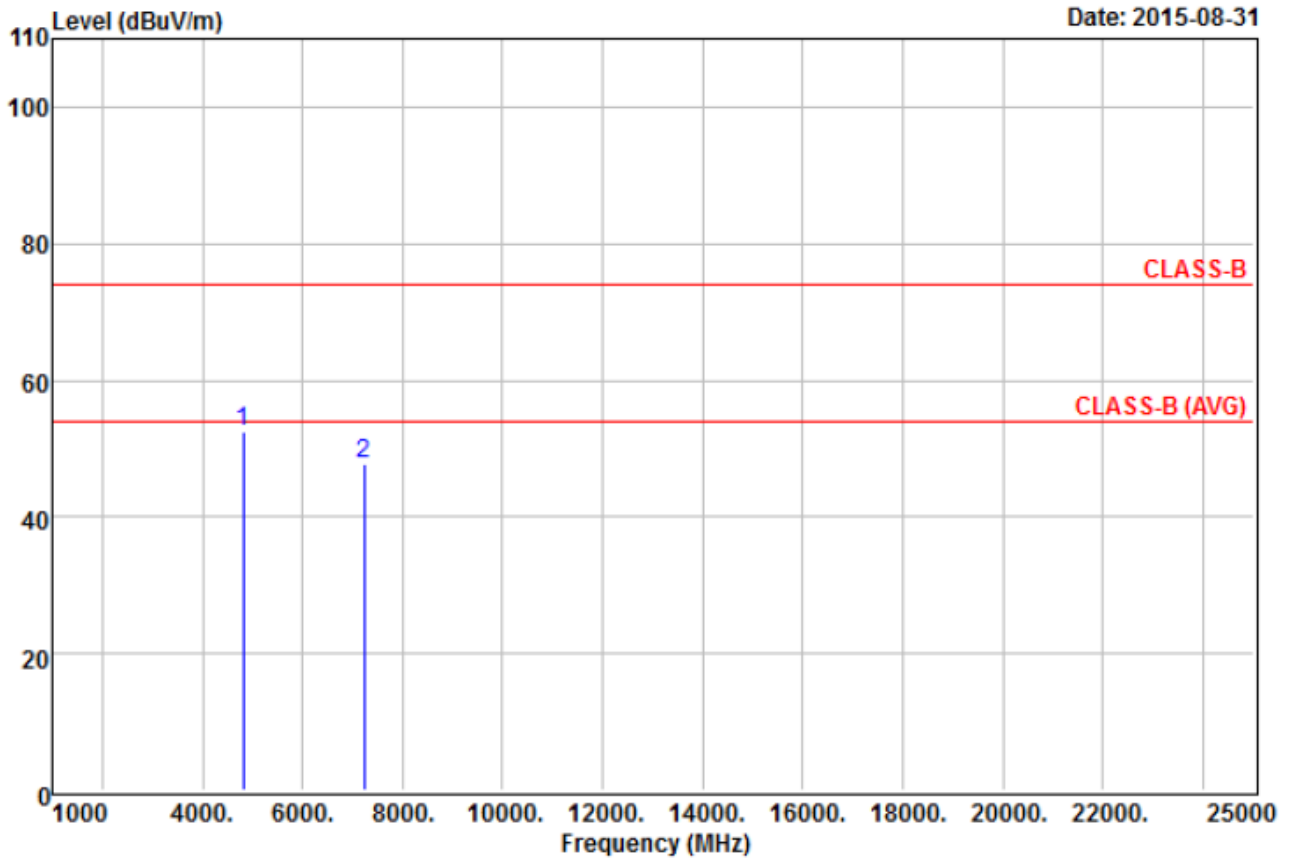
- : 1.Result=Read Value+Factor
- : 2.Factor=Antenna Factor+Cable loss-
- : Amplifier Factor

	Freq	Read Level	Factor	Level	Over Limit	Limit Line	Remark
	MHz	dBuV	dB/m	dBuV/m	dB	dBuV/m	
1	4810.00	56.37	-7.48	48.89	-25.11	74.00	QP
2	7230.00	47.35	-0.52	46.83	-27.17	74.00	QP



Harmonics

Horizontal



Remarks:

1.Result=Read Value+Factor
2.Factor=Antenna Factor+Cable loss-
Amplifier Factor

	Freq	Read Level	Factor	Level	Over Limit	Limit Line	Remark
	MHz	dBuV	dB/m	dBuV/m	dB	dBuV/m	
1	4810.00	60.01	-7.48	52.53	-21.47	74.00	QP
2	7230.00	48.34	-0.52	47.82	-26.18	74.00	QP



Note:

1. Emission level = Reading level + Correction factor
2. Correction factor : Antenna factor, Cable loss, Pre-Amp, etc.
3. All emissions as described above were determining by rotating the EUT through three orthogonal axes to maximizing the emissions if the EUT belongs to hand-held or body-worn devices.
4. Measurements above 1000 MHz, Peak detector setting:
1 MHz RBW with 1 MHz VBW (Peak Detector).
5. Measurements above 1000 MHz, Average detector setting:
1 MHz RBW with 1 MHz VBW (RMS Detector).
6. Peak detector measurement data will represent the worst case results.
7. "---" denotes the data which is not available.



5. SECTION 15.205 REQUIREMENTS (BAND EDGE)

5.1 TEST SETUP

Refer to paragraph 6.1.

5.2 LIMIT

Restricted Bands:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	(²)
13.36 - 13.41			

Operation within the bands:

902 - 928 MHz, 2400 - 2483.5 MHz, 5725 - 5875 MHz, and 24.0 - 24.25 GHz.

Frequency (Hz)	Field Strength ($\mu\text{V/m}$ at 3-meter)	Field Strength (dB $\mu\text{V/m}$ at 3-meter)
1.705-30	30 (at 30-meter)	49.5
30-88	100	40
88-216	150	43
216-960	200	46
Above 960	500	54

5.3 RESULT: PASSED

**5.4 TEST DATA:**

<2400 MHz						Fundamental Frequency: 2410 MHz				
Frequency (MHz)	Ant-Pol H/V	Meter Reading (dBuV)	Corrected Factor (dB)	Result (dBuV/m)	Remark	Limit (dBuV/m)		Margin (dB)	Table Deg.	Ant High (m)
						Peak	Ave			
2399.47	H	67.89	-15.02	52.86	Peak	74	54	-21.14	140	1.00
---	H	---	---	---	Ave	74	54	---	---	---
2376.43	V	57.35	-15.10	42.25	Peak	74	54	-31.75	153	1.00
---	V	---	---	---	Ave	74	54	---	---	---
>2483.5 MHz						Fundamental Frequency: 2410 MHz				
Frequency (MHz)	Ant-Pol H/V	Meter Reading (dBuV)	Corrected Factor (dB)	Result (dBuV/m)	Remark	Limit (dBuV/m)		Margin (dB)	Table Deg.	Ant High (m)
						Peak	Ave			
2483.54	H	67.43	-14.77	52.66	Peak	74	54	-21.34	143	1.00
---	H	---	---	---	Ave	74	54	---	---	---
2483.81	V	62.30	14.77	47.54	Peak	74	54	-26.46	159	1.00
---	V	---	---	---	Ave	74	54	---	---	---

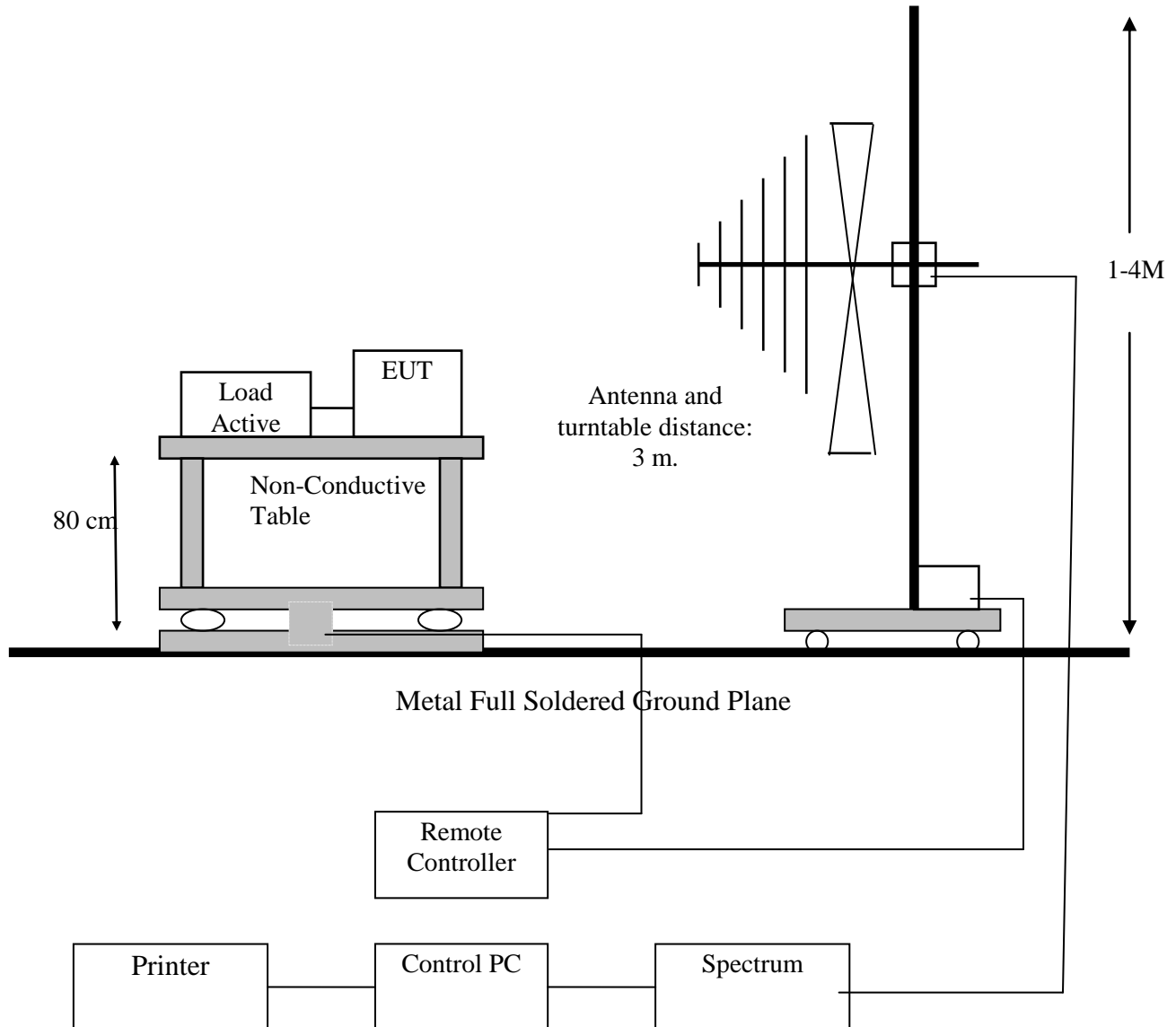
Note:

1. Emission level = Reading level + Correction factor
2. Correction factor : Antenna factor, Cable loss, Pre-Amp, etc.
3. All emissions as described above were determining by rotating the EUT through three orthogonal axes to maximizing the emissions if the EUT belongs to hand-held or body-worn devices.
4. Measurements above 1000 MHz, Peak detector setting:
1 MHz RBW with 1 MHz VBW (Peak Detector).
5. Measurements above 1000 MHz, Average detector setting:
1 MHz RBW with 1 MHz VBW (RMS Detector).
6. Peak detector measurement data will represent the worst case results.



6. SECTION 15.209 REQUIREMENTS (GENERAL RADIATED EMISSION)

6.1 TEST SETUP





6.2 LIMIT

The field strength of any emissions which appear outside of this band shall not exceed the general radiated emission limits in section 15.209 as below.

Frequency (MHz)	Field Strength (mV/m)	Measurement Distance (m)
1.705-30	30	30
30-88	100*	3
88-216	150*	3
216-960	200*	3
Above 960	500*	3

**Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.*

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

Frequency (Hz)	Field Strength (μ V/m at 3-meter)	Field Strength (dB μ V/m at 3-meter)
1.705-30	30 (at 30-meter)	49.5
30-88	100	40
88-216	150	43
216-960	200	46
Above 960	500	54



6.3 TEST PROCEDURE

1. The EUT was placed on a turntable, which was 0.8m above ground plane.
2. The turntable was rotated for 360 degrees to determine the position of maximum emission level.
3. EUT was set at 3m away from the receiving antenna, which was varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was maximized by changing the polarization of receiving antenna, both horizontal and vertical.
6. Repeated above procedures until the measurements for all frequencies are completed.

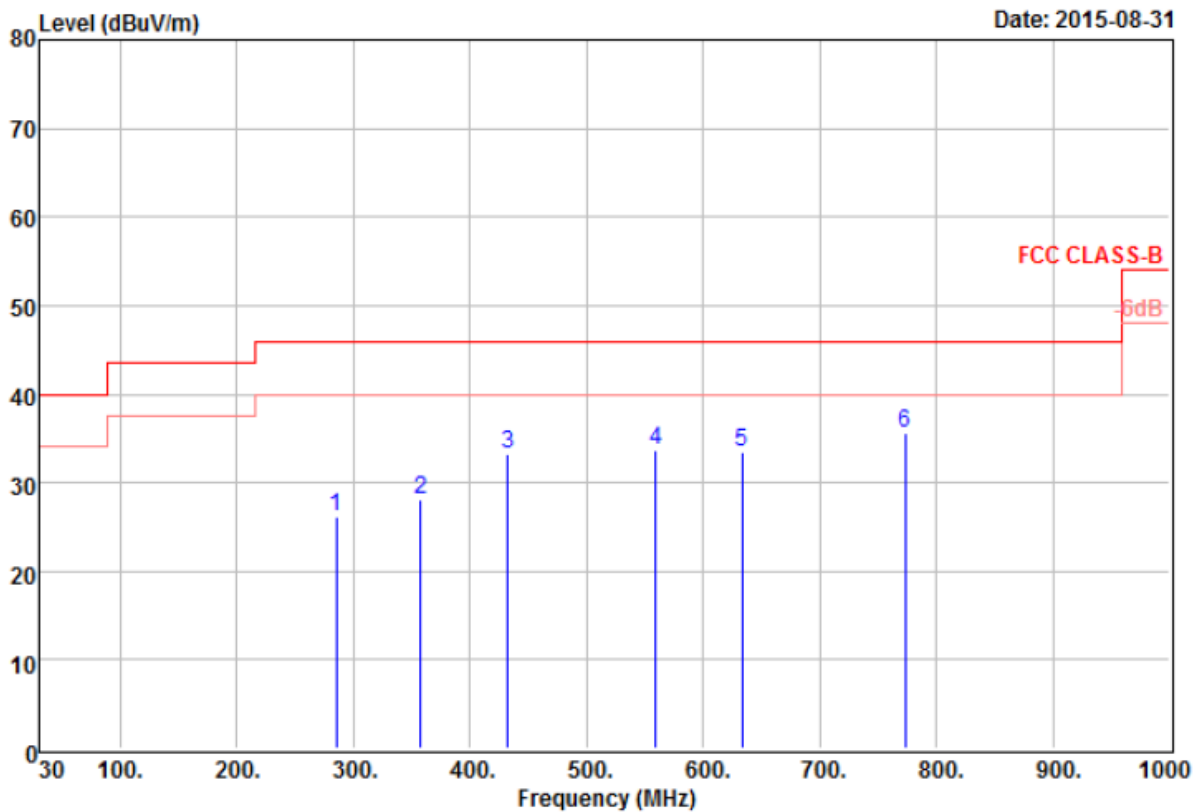
6.4 RESULT: PASSED



6.5 TEST DATA:

All frequencies not described in this test report and within the range of the general radiated emission limits are not detectable significantly. The table as below is representing worst emissions found.

Vertical



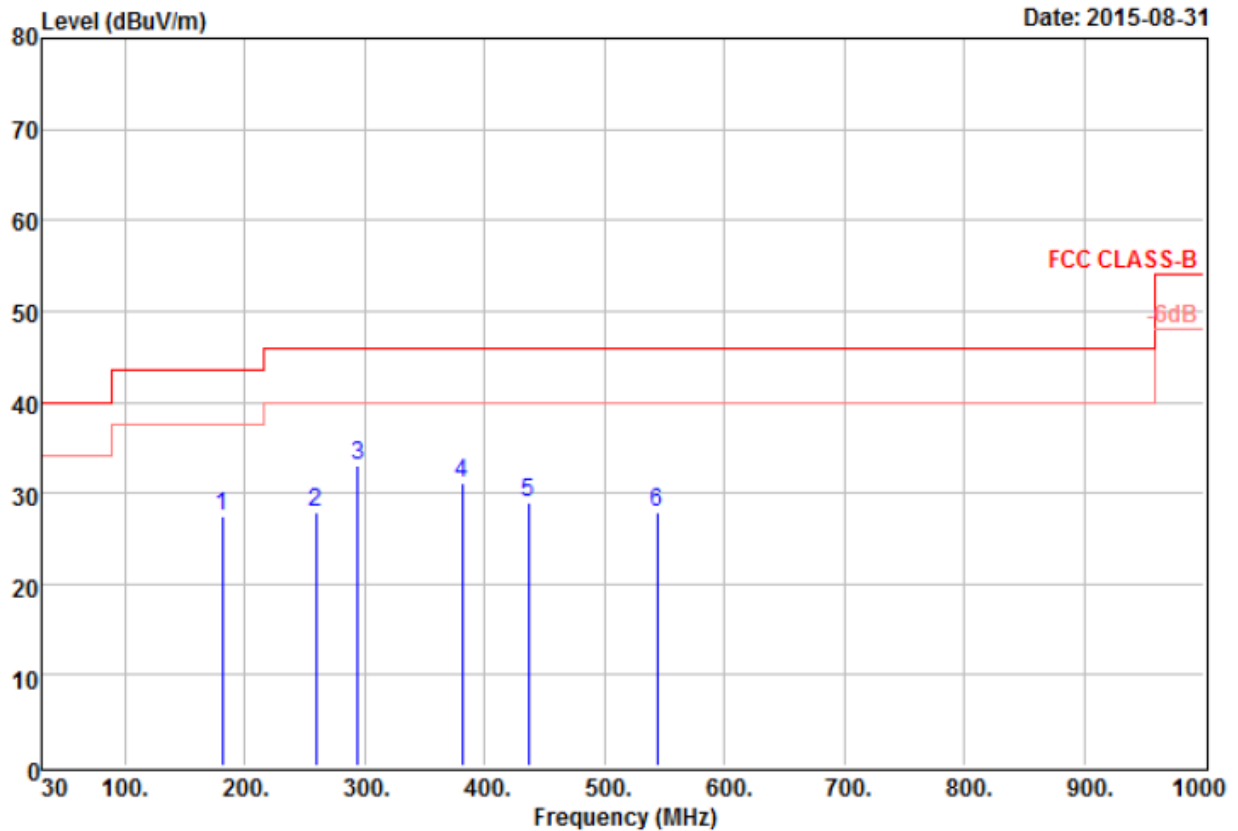
Remarks:

- : 1.Result=Read Value+Factor
- : 2.Factor=Antenna Factor+Cable loss-
- : Amplifier Factor

	Freq	Read			Over	Limit	
	MHz	Level	Factor	Level	Limit	Line	Remark
	MHz	dBuV	dB/m	dBuV/m	dB	dBuV/m	
1	285.11	40.46	-14.29	26.17	-19.83	46.00	QP
2	357.86	40.44	-12.40	28.04	-17.96	46.00	QP
3	432.55	43.37	-10.08	33.29	-12.71	46.00	QP
4	559.62	41.54	-7.86	33.68	-12.32	46.00	QP
5	633.34	39.24	-5.78	33.46	-12.54	46.00	QP
6	773.02	38.64	-3.08	35.56	-10.44	46.00	QP



Horizontal



Remarks:

- : 1.Result=Read Value+Factor
- : 2.Factor=Antenna Factor+Cable loss-
- : Amplifier Factor

		Read			Over	Limit	
	Freq	Level	Factor	Level	Limit	Line	Remark
	MHz	dBuV	dB/m	dBuV/m	dB	dBuV/m	
1	181.33	43.69	-16.20	27.49	-16.01	43.50	QP
2	258.92	43.10	-15.22	27.88	-18.12	46.00	QP
3	293.84	47.07	-13.94	33.13	-12.87	46.00	QP
4	381.14	42.94	-11.75	31.19	-14.81	46.00	QP
5	436.43	38.96	-9.93	29.03	-16.97	46.00	QP
6	544.10	36.14	-8.15	27.99	-18.01	46.00	QP



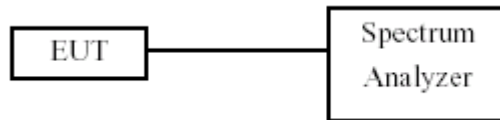
Note:

1. Emission level = Reading level + Correction factor
2. Correction factor : Antenna factor, Cable loss, Pre-Amp, etc.
3. All emissions as described above were determining by rotating the EUT through three orthogonal axes to maximizing the emissions if the EUT belongs to hand-held or body-worn devices.
4. Measurements from 9 kHz to 150 kHz, Peak detector setting: 100 Hz RBW
5. Measurements from 150 kHz to 30MHz, Peak detector setting: 10 kHz RBW
6. Measurements from 30 MHz to 1000 MHz, Peak detector setting: 100 kHz RBW
7. Measurements from 9 kHz to 150 kHz, CISPR Quasi-Peak detector: 200 Hz RBW
8. Measurements from 150 kHz to 30MHz, CISPR Quasi-Peak detector: 9 kHz RBW
9. Measurements from 30 MHz to 1000 MHz, CISPR Quasi-Peak detector: 120 kHz RBW
10. Peak detector measurement data will represent the worst case results.



7. 20DB BANDWIDTH MEASUREMENT

7.1 TEST SETUP



7.2 LIMIT N/A

7.3 TEST PROCEDURE

- The transmitter output was connected to the spectrum analyzer.
- Set RBW=30KHz and VBW=100KHz.
- The 20 dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20 dB.
- The 20 dB Bandwidth was measured and recorded.

7.4 RESULT: PASSED



7.5 TEST DATA

Test Date: Aug. 31, 2015

Temperature: 34°C

Atmospheric pressure: 1010 hPa

Humidity: 38%

Modulation Standard	Channel	Frequency (MHz)	20dB Bandwidth (MHz)
GFSK	1	2410	0.138

Modulation Standard: GFSK
Channel: 1

