Shenzhen GTI Technology Co., Ltd.

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TEST REPORT

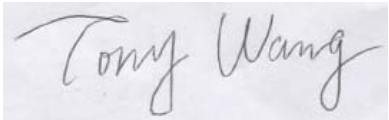
Product Name	:	Mobile Phone
Trademark	:	elementt
Model/Type reference	:	Torch ES-F641
Listed Model(s)	:	/
FCC ID	:	**2AEMYESF641**
Test Standards	:	**FCC Part 15.247: Operation within the bands 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz**
Applicant	:	South Mobile Ltda
Address of applicant	:	Avenida Apoquindo 6410, Of. 803. Las Condes. Santiago – Chile
Date of Receipt	:	Apr. 15, 2015
Date of Test Date	:	Apr. 15, 2015 - Apr. 29, 2015
Data of issue.	:	Apr. 30, 2015

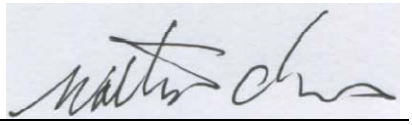
Test result	**Pass ***

* In the configuration tested, the EUT complied with the standards specified above

GENERAL DESCRIPTION OF EUT	
Equipment:	Mobile Phone
Model Name:	Torch ES-F641
Manufacturer:	South Mobile Ltda
Manufacturer Address:	Avenida Apoquindo 6410, Of. 803. Las Condes. Santiago – Chile
Power Rating:	DC 3.7V form 1700mAh by rechargeable battery or DC 5.0V form Input:100-240V~,50/60Hz Output: 5.0V⎓1000mA adapter

Compiled By: 
(Allen Wang)

Reviewed By: 
(Tony Wang)

Approved By: 
(Walter Chen)

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1. SUMMARY

1.1. Test Standards

The tests were performed according to following standards:

FCC Rules Part 15.247: Frequency Hopping, Direct Spread Spectrum and Hybrid Systems that are in operation within the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz

ANSI C63.4-2003: American National Standard for Testing Unlicensed Wireless Devices

KDB558074 D01 V03r02: Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247

1.2. Test Description

FCC PART 15 15.247		
FCC Part 15.207	AC Power Conducted Emission	PASS
FCC Part 15.247(a)(2)	6dB Bandwidth	PASS
FCC Part 15.247(d)	Spurious RF Conducted Emission	PASS
FCC Part 15.247(b)	Maximum Peak Output Power	PASS
FCC Part 15.247(e)	Power Spectral Density	PASS
FCC Part 15.205/ 15.209	Radiated Emissions	PASS
FCC Part 15.247(d)	Band Edge	PASS
FCC Part 15.203/15.247 (b)	Antenna Requirement	PASS

Remark: The measurement uncertainty is not included in the test result.

1.3. Test Facility

1.3.1 Address of the test laboratory

Shenzhen General Testing & Inspection Technology Co., Ltd.

Add: 1F, 2 Block,Jiaquan Building, Guanlan High-tech Park Baoan District, Shenzhen, Guangdong,China

1.3.2 Laboratory accreditation

The test facility is recognized, certified, or accredited by the following organizations:

IC Registration No.: 9783A

The 3m alternate test site of Shenzhen GTI Technology Co., Ltd.EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration NO.: 9783A on Aug, 2011.

FCC-Registration No.: 214666

Shenzhen GTI Technology Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 214666, Sep 19, 2011

1.4. Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements and is documented in the Shenzhen General Testing & Inspection Technology Co., Ltd quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for General Testing & Inspection laboratory is reported:

Test Items	Measurement Uncertainty	Notes
Transmitter power conducted	0.57 dB	(1)
Transmitter power Radiated	2.20 dB	(1)
Conducted spurious emission 9KHz-40 GHz	1.60 dB	(1)
Radiated spurious emission 9KHz-40 GHz	2.20 dB	(1)
Conducted Emission 9KHz-30MHz	3.39 dB	(1)
Radiated Emission 30~1000MHz	4.24 dB	(1)
Radiated Emission 1~18GHz	5.16 dB	(1)
Radiated Emission 18-40GHz	5.54 dB	(1)
Occupied Bandwidth	---------	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.

2. GENERAL INFORMATION

2.1. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15~35°C
Relative Humidity:	30~60 %
Air Pressure:	950~1050mba

2.2. General Description of EUT

Product Name:	Mobile Phone
Model/Type reference:	Torch ES-F641
Power supply:	DC 3.7V from battery
Adapter information :	Model:C1000 Input: 100-240V, 50/60Hz 0.2A Output:DC5V⎓1000m A
Hardware version:	B808-MB-V0.2
Software version:	WCDMA-20150407
WIFI :	
Supported type:	802.11b/802.11g/802.11n(H20)/802.11n(H40)
Modulation:	802.11b: DSSS 802.11g/802.11n(H20)/802.11n(H40): OFDM
Operation frequency:	802.11b/802.11g/802.11n(H20): 2412MHz~2462MHz 802.11n(H40): 2422MHz~2452MHz
Channel number:	802.11b/802.11g/802.11n(H20): 11 802.11n(H40): 7
Channel separation:	5MHz
Antenna type:	FPC Antenna
Antenna gain:	1.0dBi
Bluetooth:	
Supported type:	Version 4.0 for low Energy
Modulation:	GFSK
Operation frequency:	2402MHz to 2480MHz
Channel number:	40
Channel separation:	2 MHz
Antenna type:	FPC Antenna
Antenna gain:	1.0dBi

Note: For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

2.3. Description of Test Modes

The Applicant provides communication tools software to control the EUT for staying in continuous transmitting (Duty Cycle more than 98%) and receiving mode for testing.

BT 4.0 Operation Frequency：

Channel	Frequency (MHz)
00	**2402**
02	2404
03	2406
⋮	⋮
19	**2440**
⋮	⋮
37	2476
38	2478
39	**2480**

WIFI Operation Frequency：

Channel	Frequency(MHz)	Channel	Frequency(MHz)
1	**2412**	8	2447
2	2417	**9**	**2452**
3	**2422**	10	2457
4	2427	**11**	**2462**
5	2432		
6	**2437**		
7	2442		

Data Rate Used:

Preliminary tests were performed in different data rate to find the worst radiated emission. The data rate shown in the table below is the worst-case rate with respect to the specific test item. Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

Test Items	Mode	Data Rate	Channel
Maximum Peak Conducted Output Power Power Spectral Density 6dB Bandwidth Spurious RF conducted emission Radiated Emission 9kHz~1GHz& Radiated Emission 1GHz~10th Harmonic	11b/DSSS	1 Mbps	1/6/11
	11g/OFDM	6 Mbps	1/6/11
	11n(20MHz)/OFDM	6.5Mbps	1/6/11
	11n(40MHz)/OFDM	13.5 Mbps	3/6/9
Band Edge	11b/DSSS	1 Mbps	1/11
	11g/OFDM	6 Mbps	1/11
	11n(20MHz)/OFDM	6.5Mbps	1/11
	11n(40MHz)/OFDM	13.5 Mbps	3//9

2.4. Measurement Instruments List

Maximum Peak Output Power					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	Power Meter	Anritsu	ML2487B	110553	July 10,2015
2	Power Sensor	Anritsu	MA2411B	100345	July 10,2015

Power Spectral Density / 6dB Bandwidth / Band Edge Compliance of RF Emission / Spurious RF Conducted Emission					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	Spectrum Analyzer	Rohde & Schwarz	FSU	100105	Jan 07,2016

Conducted Emission					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrate until
1	LISN	R&S	ENV216	101112	Jan. 07, 2016
2	LISN	R&S	ENV216	101113	Jan. 07, 2016
3	EMI Test Receiver	R&S	ESCI	100920	Jan. 07, 2016
4	Cable	Schwarzbeck	AK9515E	33156	Jan. 07, 2016

Radiated Emission					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	EMI Test Receiver	R&S	ESCI	100967	Jan 07,2016
2	High pass filter	micro-tranics	HPM50111	34202	Jan 07,2016
3	Log-Bicon Antenna	Schwarzbeck	CBL6141A	4180	Jan. 10,2016
4	Ultra-Broadband Antenna	ShwarzBeck	BBHA9170	25841	Jan. 10,2016
5	Loop Antenna	LAPLAC	RF300	9138	Jan. 10,2016
6	Spectrum Analyzer	Rohde & Schwarz	FSU	100105	Jan 07,2016
7	Horn Antenna	Schwarzbeck	BBHA 9120D	648	Jan. 10,2016
8	Pre-Amplifier	HP	8447D	1937A03050	Jan. 07,2016
9	Pre-Amplifier	EMCI	EMC051835	980075	Jan. 07,2016
10	Antenna Mast	UC	UC3000	N/A	N/A
11	Turn Table	UC	UC3000	N/A	N/A
12	Cable Below 1GHz	Schwarzbeck	AK9515E	33155	Jan. 07,2016
13	Cable Above 1GHz	Hubersuhner	SUCOFLEX102	DA1580	Jan. 07,2016

Note: 1. The Cal.Interval was one year.
2. The cable loss has calculated in test result which connection between each test instruments.

3. TEST CONDITIONS AND RESULTS

3.1. Conducted Emission (AC Main)

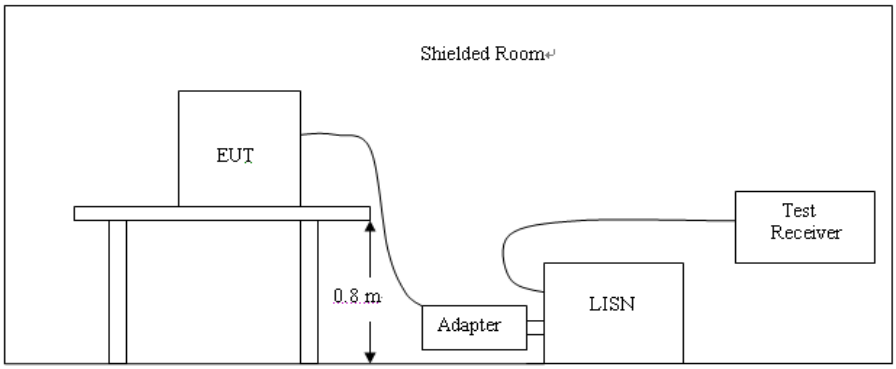
LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.207

Frequency range (MHz)	Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

TEST CONFIGURATION



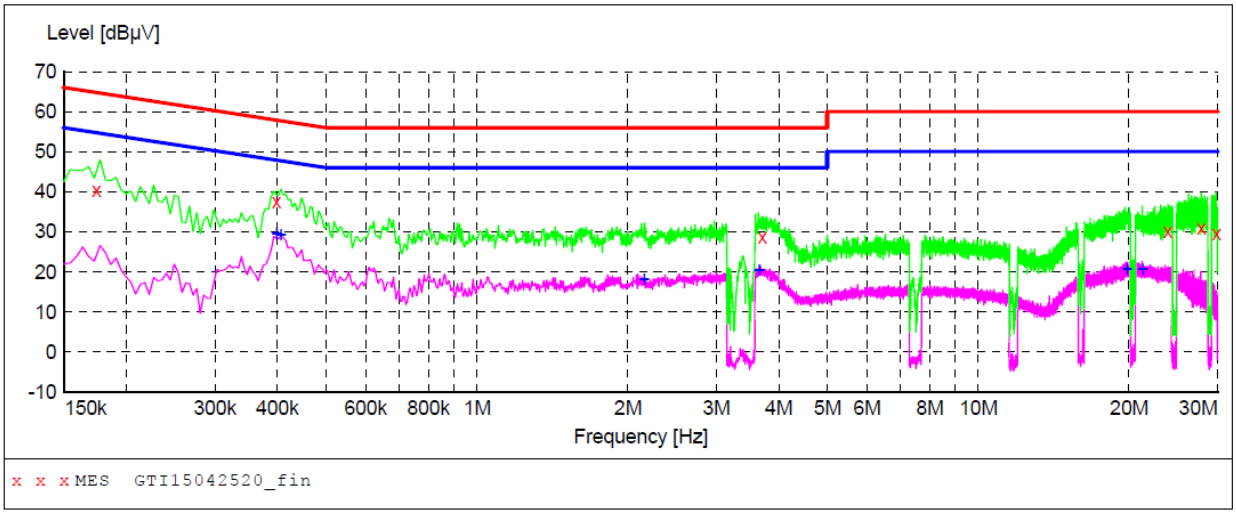
TEST PROCEDURE

1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system; a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.4-2003.
2. Support equipment, if needed, was placed as per ANSI C63.4-2003
3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4-2003
4. The EUT received DC5V power from the adapter, the adapter received AC120V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
5. All support equipments received AC power from a second LISN, if any.
6. The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7. Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.
8. During the above scans, the emissions were maximized by cable manipulation.

TEST RESULTS

LINE	L

SCAN TABLE: "Voltage (9K-30M)FIN"
Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "GTI15042520_fin"

4/25/2015 4:41PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.174000	40.40	9.9	65	24.4	QP	L1	GND
0.398000	37.50	9.9	58	20.4	QP	L1	GND
3.704000	28.80	10.5	56	27.2	QP	L1	GND
23.888000	30.00	10.9	60	30.0	QP	L1	GND
27.860000	30.90	11.1	60	29.1	QP	L1	GND
29.858000	29.40	11.1	60	30.6	QP	L1	GND

MEASUREMENT RESULT: "GTI15042520_fin2"

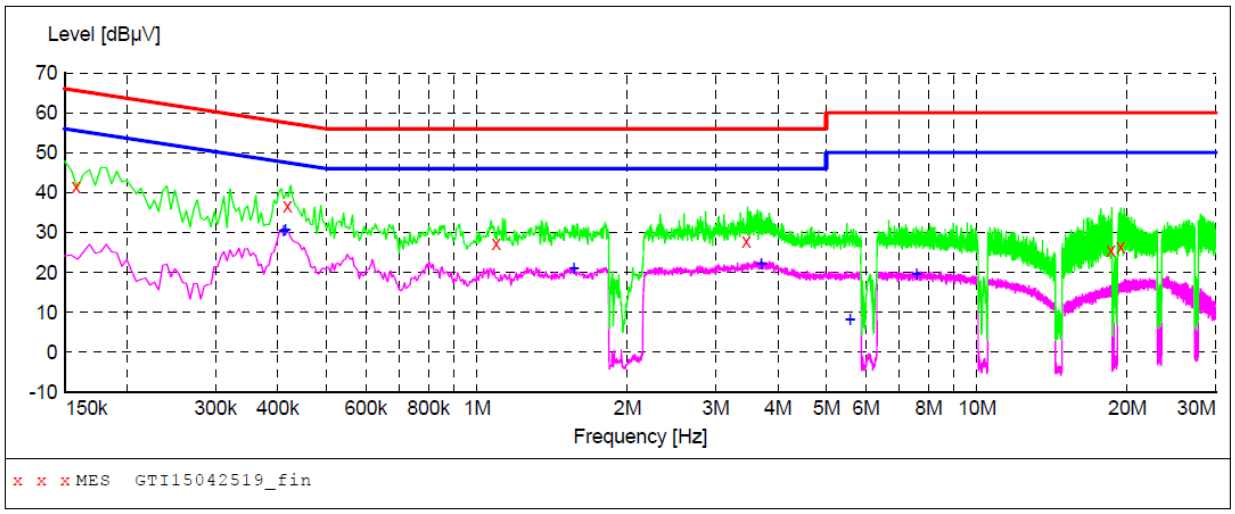
4/25/2015 4:41PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.398000	29.60	9.9	48	18.3	AV	L1	GND
0.406000	29.30	9.9	48	18.4	AV	L1	GND
2.156000	18.30	10.4	46	27.7	AV	L1	GND
3.650000	20.50	10.5	46	25.5	AV	L1	GND
19.796000	20.70	10.8	50	29.3	AV	L1	GND
21.284000	20.60	10.9	50	29.4	AV	L1	GND

LINE	N

SCAN TABLE: "Voltage (9K-30M)FIN"

Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "GTI15042519_fin"

4/25/2015 4:38PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.158000	41.60	9.9	66	24.0	QP	N	GND
0.418000	36.60	9.9	58	20.9	QP	N	GND
1.094000	27.20	10.2	56	28.8	QP	N	GND
3.458000	27.90	10.5	56	28.1	QP	N	GND
18.542000	25.70	10.8	60	34.3	QP	N	GND
19.412000	26.30	10.8	60	33.7	QP	N	GND

MEASUREMENT RESULT: "GTI15042519_fin2"

4/25/2015 4:38PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.410000	30.40	9.9	48	17.2	AV	N	GND
0.414000	30.60	9.9	48	17.0	AV	N	GND
1.562000	20.90	10.3	46	25.1	AV	N	GND
3.704000	22.10	10.5	46	23.9	AV	N	GND
5.570000	8.30	10.6	50	41.7	AV	N	GND
7.574000	19.50	10.6	50	30.5	AV	N	GND

3.2. Radiated Emission

Limit

For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emission from intentional radiators at a distance of 3 meters shall not exceed the following table. According to § 15.247(d), in any 100kHz bandwidth outside the frequency band in which the EUT is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the100kHz bandwidth within the band that contains the highest level of desired power.

The frequency spectrum above 1 GHz for Transmitter was investigated. All emission not reported are much lower than the prescribed limits. Set the RBW=1MHz, VBW=3MHz for Peak Detector while the RBW=1MHz, VBW=10Hz for Average Detector, Readings are both peak and average values. The pre-test have done for the EUT in three axes and found the worst emission at position shown in test setup photos.

Frequency (MHz)	Distance (Meters)	Radiated (dBuV/m)	Radiated (μV/m)
0.009-0.49	3	20log(2400/F(KHz))+40log(300/3)	2400/F(KHz)
0.49-1.705	3	20log(24000/F(KHz))+ 40log(30/3)	24000/F(KHz)
1.705-30	3	20log(30)+ 40log(30/3)	30
30-88	3	40.0	100
88-216	3	43.5	150
216-960	3	46.0	200
Above 960	3	54.0	500

Test Procedure

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0℃ to 360℃ to acquire the highest emissions from EUT
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measurements have been completed.

Field Strength Calculation

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

FS = RA + AF + CL – AG

Where	FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
	RA = Reading Amplitude	AG = Amplifier Gain
	AF = Antenna Factor	

For example

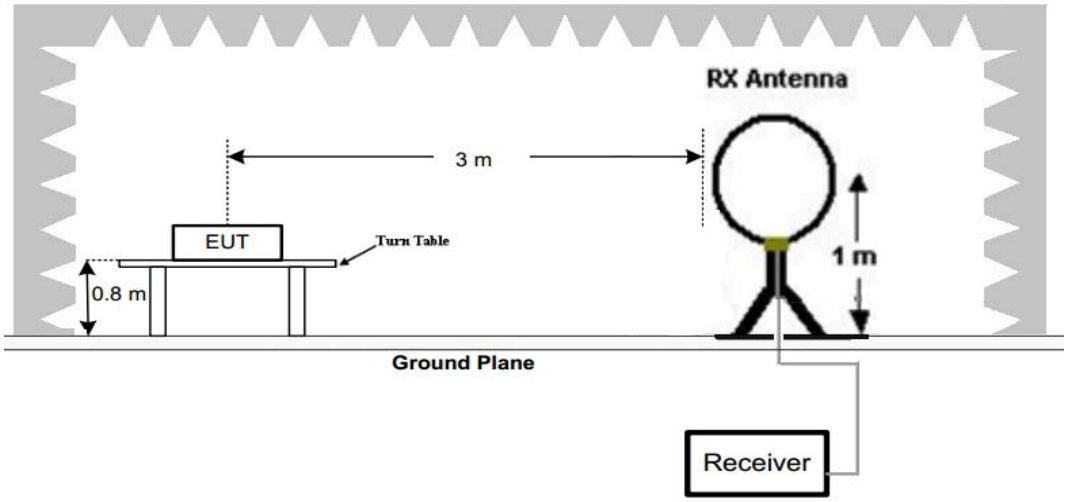
Frequency (MHz)	FS (dBμV/m)	RA (dBμV/m)	AF (dB)	CL (dB)	AG (dB)	Transd (dB)
150.00	40	58.1	12.2	1.6	31.90	-18.1

Transd=AF +CL-AG

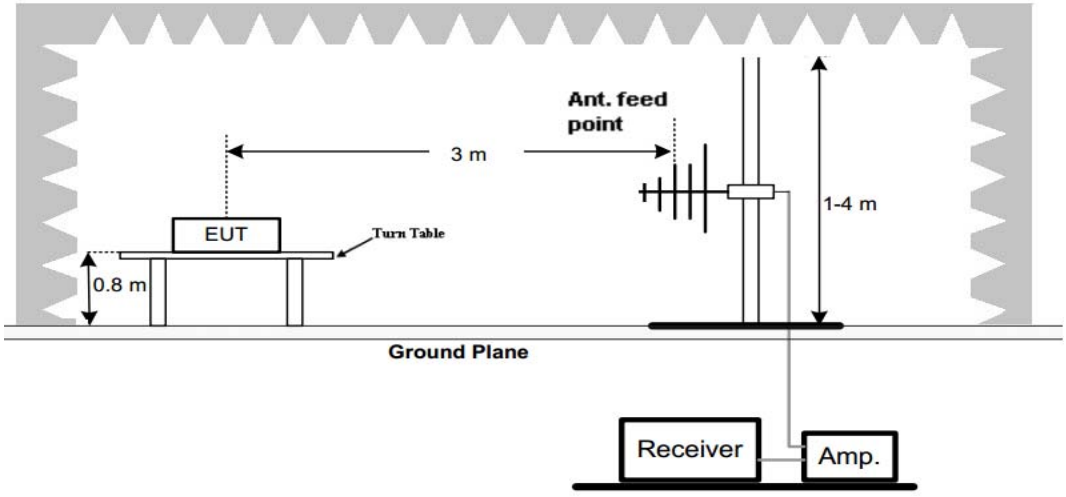
Test Configuration

For the actual test configuration, please refer to the related Item –EUT Test Photos.

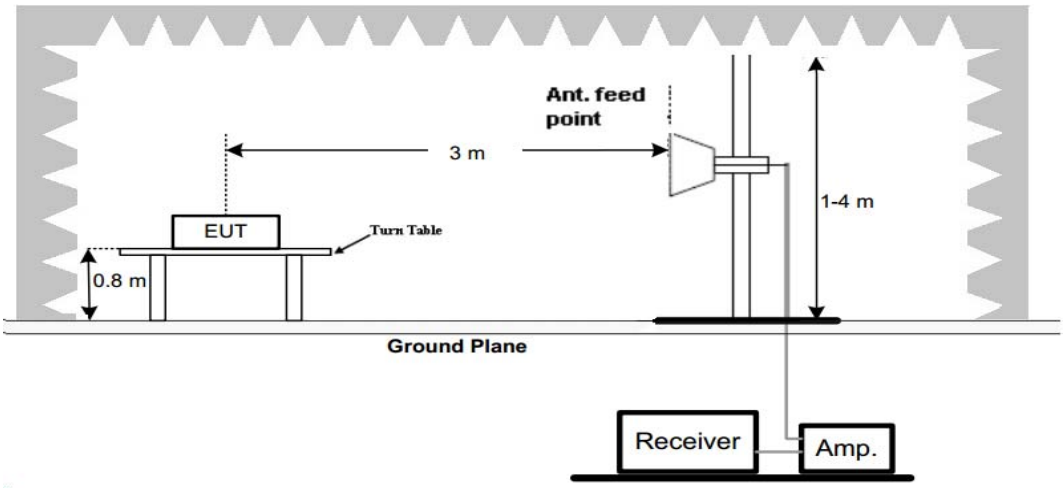
Frequency range 9 KHz – 30MHz



Frequency range 30MHz – 1000MHz



Frequency range above 1GHz-25GHz



Test Results

Remark:

1. By preliminary testing and verifying three axis (X, Y and Z) position of EUT transmitted status, it was found that “Z axis” position was the worst, and test data recorded in this report.

For 9 KHz-30MHz

WIFI

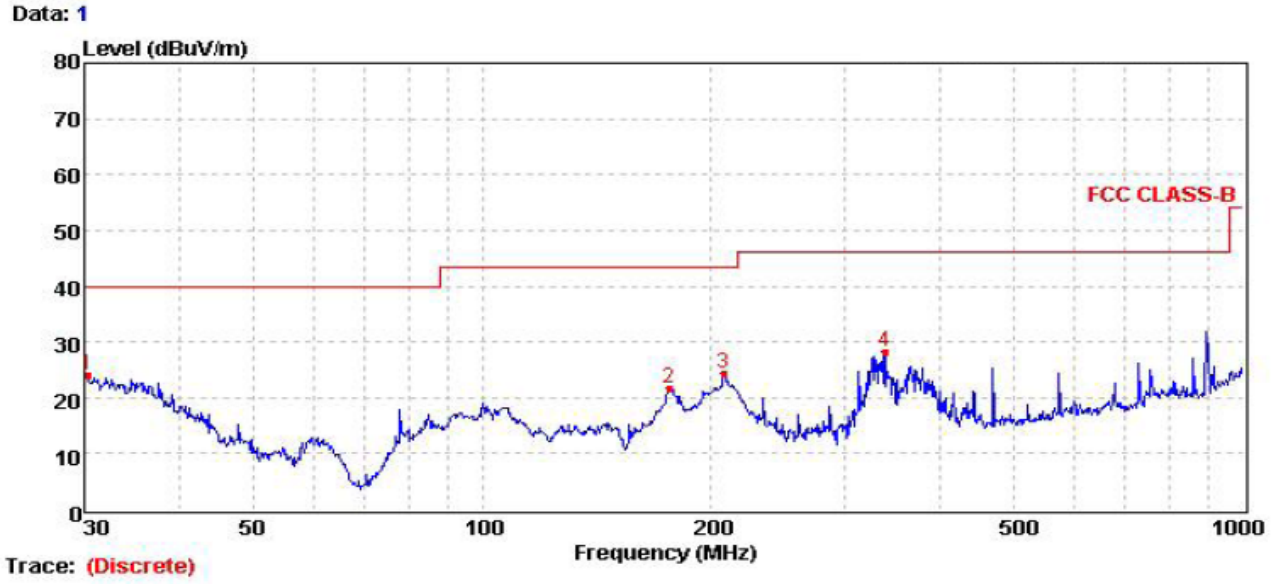
Frequency (MHz)	Corrected Reading (dBuV/m)@3m	FCC Limit (dBuV/m) @3m	Margin (dB)	Detector	Result
0.36	53.69	96.48	42.79	QP	PASS
1.65	42.57	63.25	20.68	QP	PASS
20.51	53.34	69.54	16.20	QP	PASS
25.77	50.78	69.54	18.76	QP	PASS

BT4.0

Frequency (MHz)	Corrected Reading (dBuV/m)@3m	FCC Limit (dBuV/m) @3m	Margin (dB)	Detector	Result
0.39	52.69	95.78	43.09	QP	PASS
1.54	43.69	63.85	20.16	QP	PASS
20.27	53.47	69.54	16.07	QP	PASS
25.69	50.10	69.54	19.44	QP	PASS

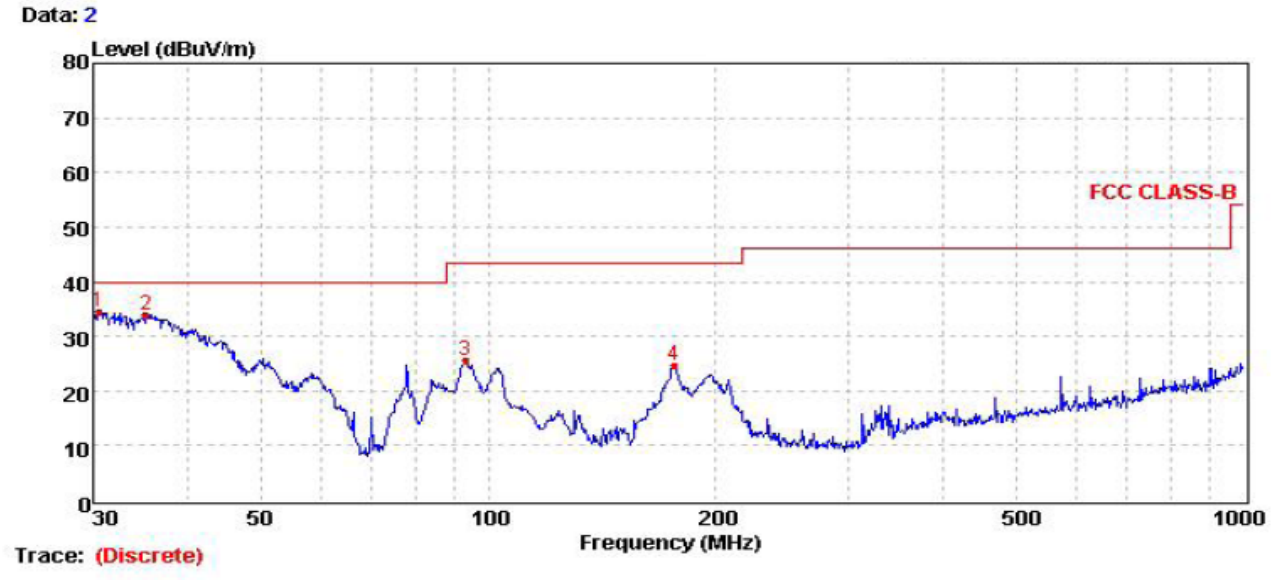
For 30MHz-1GHz

Test mode:	WIFI	Polarization:	Horizontal



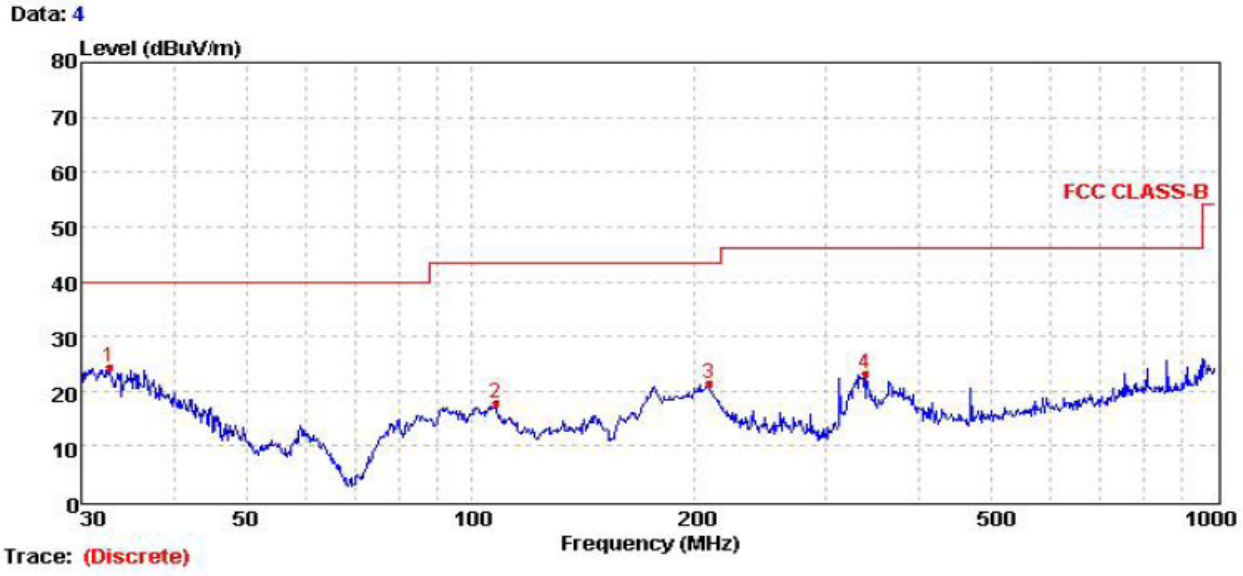
Mark	Frequency MHz	Level dBuV/m	Factor dB/m	Reading dBuV	Limit dBuV/m	Margin dB	Polarization	Detector
1	30.32	24.00	-8.49	32.49	40.00	16.00	HORIZONTAL	Peak
2	176.27	21.80	-19.98	41.78	43.50	21.70	HORIZONTAL	Peak
3	207.85	24.38	-17.82	42.20	43.50	19.12	HORIZONTAL	Peak
4	338.40	28.15	-15.72	43.87	46.00	17.85	HORIZONTAL	Peak

Test mode:	WIFI	Polarization:	Vertical



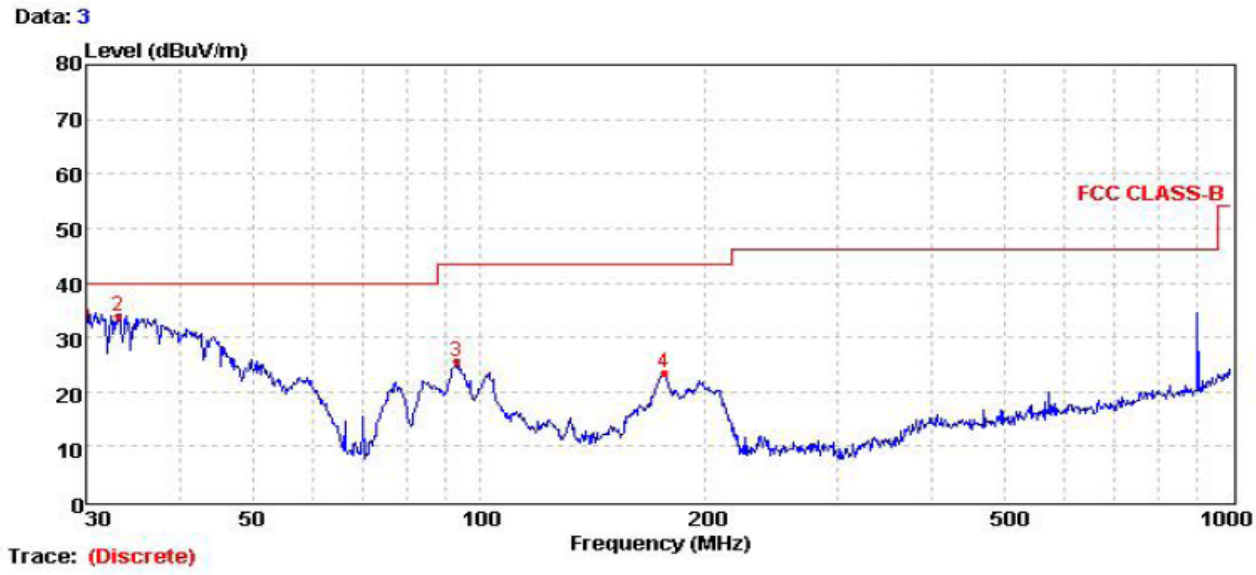
Mark	Frequency MHz	Level dBuV/m	Factor dB/m	Reading dBuV	Limit dBuV/m	Margin dB	Polarization	Detector
1	30.53	34.36	-8.89	43.25	40.00	5.64	VERTICAL	Peak
2	35.25	33.89	-10.48	44.37	40.00	6.11	VERTICAL	Peak
3	93.11	25.48	-19.97	45.45	43.50	18.02	VERTICAL	Peak
4	176.27	24.67	-19.98	44.65	43.50	18.83	VERTICAL	Peak

Test mode:	BT4.0	Polarization:	Horizontal



Mark	Frequency MHz	Level dBuV/m	Factor dB/m	Reading dBuV	Limit dBuV/m	Margin dB	Polarization	Detector
1	32.75	24.52	-9.68	34.20	40.00	15.48	HORIZONTAL	Peak
2	107.89	17.98	-19.12	37.10	43.50	25.52	HORIZONTAL	Peak
3	208.58	21.30	-17.81	39.11	43.50	22.20	HORIZONTAL	Peak
4	338.40	23.34	-15.72	39.06	46.00	22.66	HORIZONTAL	Peak

Test mode:	BT4.0	Polarization:	Vertical



Mark	Frequency MHz	Level dBuV/m	Factor dB/m	Reading dBuV	Limit dBuV/m	Margin dB	Polarization	Detector
1	30.00	34.83	-8.49	43.32	40.00	5.17	VERTICAL	Peak
2	33.09	34.04	-9.68	43.72	40.00	5.96	VERTICAL	Peak
3	93.11	25.59	-19.97	45.56	43.50	17.91	VERTICAL	Peak
4	176.27	23.55	-19.98	43.53	43.50	19.95	VERTICAL	Peak

For 1GHz to 25GHz

802.11b Mode (above 1GHz)

Frequency(MHz):				2412			Polarity:			HORIZONTAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	4824	66.87	PK	74	7.13	1.00	48	64.77	31.6	7.00	36.5	2.10
1	4824	47.48	AV	54	6.52	1.00	48	45.38	31.6	7.00	36.5	2.10
2	7236	58.69	PK	74	15.31	1.00	110	47.76	37.33	8.90	35.3	10.93
2	7236	39.62	AV	54	14.38	1.00	110	28.69	37.33	8.90	35.3	10.93

Frequency(MHz):				2412			Polarity:			VERTICAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	4824	67.98	PK	74	6.02	1.00	120	65.88	31.60	7.00	36.50	2.10
1	4824	46.91	AV	54	7.09	1.00	120	44.81	31.60	7.00	36.50	2.10
2	7236	60.54	PK	74	13.46	1.00	145	49.61	37.33	8.90	35.30	10.93
2	7236	41.52	AV	54	12.48	1.00	145	30.59	37.33	8.90	35.30	10.93

Frequency(MHz):				2437			Polarity:			HORIZONTAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	4874.00	66.47	PK	74.00	7.53	1.00	110	64.35	31.02	7.60	36.5	2.12
1	4874.00	47.84	AV	54.00	6.16	1.00	110	45.72	31.02	7.60	36.5	2.12
2	7311.00	58.26	PK	74.00	15.74	1.00	181	47.18	37.28	8.60	34.8	11.08
2	7311.00	39.79	AV	54.00	14.21	1.00	181	28.71	37.28	8.60	34.8	11.08

Frequency(MHz):				2437			Polarity:			VERTICAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	4874.00	67.76	PK	74.00	6.24	1.00	105	65.64	31.02	7.60	36.5	2.12
1	4874.00	48.69	AV	54.00	5.31	1.00	105	46.57	31.02	7.60	36.5	2.12
2	7311.00	60.15	PK	74.00	13.85	1.00	75	49.07	37.28	8.60	34.8	11.08
2	7311.00	41.36	AV	54.00	12.64	1.00	75	30.28	37.28	8.60	34.8	11.08

Frequency(MHz):				2462			Polarity:			HORIZONTAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	4924.00	66.87	PK	74.00	7.13	1.00	130	63.67	31.58	7.82	36.2	3.20
1	4924.00	48.96	AV	54.00	5.04	1.00	130	45.76	31.58	7.82	36.2	3.20
2	7386.00	58.48	PK	74.00	15.52	1.00	120	46.54	38.51	8.73	35.3	11.94
2	7386.00	39.23	AV	54.00	14.77	1.00	120	27.29	38.51	8.73	35.3	11.94

Frequency(MHz):				2462			Polarity:			VERTICAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	4924.00	67.69	PK	74.00	6.31	1.00	25	64.49	31.58	7.82	36.2	3.20
1	4924.00	49.87	AV	54.00	4.13	1.00	25	46.67	31.58	7.82	36.2	3.20
2	7386.00	60.23	PK	74.00	13.77	1.00	78	48.29	38.51	8.73	35.3	11.94
2	7386.00	42.48	AV	54.00	11.52	1.00	78	30.54	38.51	8.73	35.3	11.94

802.11g Mode (above 1GHz)

Frequency(MHz):				2412			Polarity:			HORIZONTAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	4824	66.47	PK	74	7.53	1.00	50	64.37	31.6	7.00	36.5	2.10
1	4824	47.50	AV	54	6.50	1.00	50	45.40	31.6	7.00	36.5	2.10
2	7236	57.52	PK	74	16.48	1.00	115	46.59	37.33	8.90	35.3	10.93
2	7236	39.21	AV	54	14.79	1.00	115	28.28	37.33	8.90	35.3	10.93

Frequency(MHz):				2412			Polarity:			VERTICAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	4824	66.58	PK	74	7.42	1.00	125	64.48	31.60	7.00	36.50	2.10
1	4824	46.54	AV	54	7.46	1.00	125	44.44	31.60	7.00	36.50	2.10
2	7236	60.34	PK	74	13.66	1.00	140	49.41	37.33	8.90	35.30	10.93
2	7236	41.42	AV	54	12.58	1.00	140	30.49	37.33	8.90	35.30	10.93

Frequency(MHz):				2437			Polarity:			HORIZONTAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	4874.00	66.40	PK	74.00	7.60	1.00	105	64.28	31.02	7.60	36.5	2.12
1	4874.00	47.80	AV	54.00	6.20	1.00	105	45.68	31.02	7.60	36.5	2.12
2	7311.00	58.10	PK	74.00	15.90	1.00	180	47.02	37.28	8.60	34.8	11.08
2	7311.00	38.74	AV	54.00	15.26	1.00	180	27.66	37.28	8.60	34.8	11.08

Frequency(MHz):				2437			Polarity:			VERTICAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	4874.00	66.47	PK	74.00	7.53	1.00	95	65.64	31.02	7.60	36.5	2.12
1	4874.00	48.41	AV	54.00	5.59	1.00	95	46.57	31.02	7.60	36.5	2.12
2	7311.00	60.32	PK	74.00	13.68	1.00	125	49.07	37.28	8.60	34.8	11.08
2	7311.00	40.14	AV	54.00	13.86	1.00	125	30.28	37.28	8.60	34.8	11.08

Frequency(MHz):				2462			Polarity:			HORIZONTAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	4924.00	66.85	PK	74.00	7.15	1.00	135	63.65	31.58	7.82	36.2	3.20
1	4924.00	48.90	AV	54.00	5.10	1.00	135	45.70	31.58	7.82	36.2	3.20
2	7386.00	58.47	PK	74.00	15.53	1.00	121	46.53	38.51	8.73	35.3	11.94
2	7386.00	39.10	AV	54.00	14.90	1.00	121	27.16	38.51	8.73	35.3	11.94

Frequency(MHz):				2462			Polarity:			VERTICAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	4924.00	67.20	PK	74.00	6.80	1.00	45	64.00	31.58	7.82	36.2	3.20
1	4924.00	49.11	AV	54.00	4.89	1.00	45	45.91	31.58	7.82	36.2	3.20
2	7386.00	60.10	PK	74.00	13.90	1.00	110	48.16	38.51	8.73	35.3	11.94
2	7386.00	42.08	AV	54.00	11.92	1.00	110	30.14	38.51	8.73	35.3	11.94

802.11n (HT20) Mode (above 1GHz)

Frequency(MHz):				2412			Polarity:			HORIZONTAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	4824	58.69	PK	74	15.31	1.00	55	56.59	31.6	7.00	36.5	2.10
1	4824	45.25	AV	54	8.75	1.00	55	43.15	31.6	7.00	36.5	2.10
2	7236	55.41	PK	74	18.59	1.00	110	44.48	37.33	8.90	35.3	10.93
2	7236	40.24	AV	54	13.76	1.00	110	29.31	37.33	8.90	35.3	10.93

Frequency(MHz):				2412			Polarity:			VERTICAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	4824	57.87	PK	74	16.13	1.00	135	55.77	31.60	7.00	36.50	2.10
1	4824	46.58	AV	54	7.42	1.00	135	44.48	31.60	7.00	36.50	2.10
2	7236	56.41	PK	74	17.59	1.00	145	45.48	37.33	8.90	35.30	10.93
2	7236	40.25	AV	54	13.75	1.00	145	29.32	37.33	8.90	35.30	10.93

Frequency(MHz):				2437			Polarity:			HORIZONTAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	4874.00	58.15	PK	74.00	15.85	1.00	100	56.03	31.02	7.60	36.5	2.12
1	4874.00	46.36	AV	54.00	7.64	1.00	100	44.24	31.02	7.60	36.5	2.12
2	7311.00	56.40	PK	74.00	17.60	1.00	175	45.32	37.28	8.60	34.8	11.08
2	7311.00	40.26	AV	54.00	13.74	1.00	175	29.18	37.28	8.60	34.8	11.08

Frequency(MHz):				2437			Polarity:			VERTICAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	4874.00	58.11	PK	74.00	15.89	1.00	100	55.99	31.02	7.60	36.5	2.12
1	4874.00	46.26	AV	54.00	7.74	1.00	100	44.14	31.02	7.60	36.5	2.12
2	7311.00	56.41	PK	74.00	17.59	1.00	120	45.33	37.28	8.60	34.8	11.08
2	7311.00	40.69	AV	54.00	13.31	1.00	120	29.61	37.28	8.60	34.8	11.08

Frequency(MHz):				2462			Polarity:			HORIZONTAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	4924.00	57.41	PK	74.00	16.59	1.00	125	54.21	31.58	7.82	36.2	3.20
1	4924.00	46.15	AV	54.00	7.85	1.00	125	42.95	31.58	7.82	36.2	3.20
2	7386.00	55.69	PK	74.00	18.31	1.00	120	43.75	38.51	8.73	35.3	11.94
2	7386.00	41.50	AV	54.00	12.50	1.00	120	29.56	38.51	8.73	35.3	11.94

Frequency(MHz):				2462			Polarity:			VERTICAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	4924.00	53.20	PK	74.00	20.80	1.00	95	50.00	31.58	7.82	36.2	3.20
1	4924.00	46.36	AV	54.00	7.64	1.00	95	43.16	31.58	7.82	36.2	3.20
2	7386.00	56.39	PK	74.00	17.61	1.00	115	44.45	38.51	8.73	35.3	11.94
2	7386.00	38.54	AV	54.00	15.46	1.00	115	26.60	38.51	8.73	35.3	11.94

802.11n (HT40) Mode (above 1GHz)

Frequency(MHz):				2422			Polarity:			HORIZONTAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	4844	58.47	PK	74	15.53	1.00	48	56.33	31.62	7.02	36.5	2.14
1	4844	45.66	AV	54	8.34	1.00	48	43.52	31.62	7.02	36.5	2.14
2	7266	55.36	PK	74	18.64	1.00	132	44.38	37.35	8.93	35.3	10.98
2	7266	40.98	AV	54	13.02	1.00	132	30.00	37.35	8.93	35.3	10.98

Frequency(MHz):				2422			Polarity:			VERTICAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	4844	57.74	PK	74	16.26	1.00	130	55.60	31.62	7.02	36.50	2.14
1	4844	46.26	AV	54	7.74	1.00	130	44.12	31.62	7.02	36.50	2.14
2	7266	56.36	PK	74	17.64	1.00	175	45.38	37.35	8.93	35.30	10.98
2	7266	40.72	AV	54	13.28	1.00	175	29.74	37.35	8.93	35.30	10.98

Frequency(MHz):				2437			Polarity:			HORIZONTAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	4874.00	58.30	PK	74.00	15.70	1.00	105	56.18	31.02	7.60	36.5	2.12
1	4874.00	46.20	AV	54.00	7.80	1.00	105	44.08	31.02	7.60	36.5	2.12
2	7311.00	56.35	PK	74.00	17.65	1.00	180	45.27	37.28	8.60	34.8	11.08
2	7311.00	40.24	AV	54.00	13.76	1.00	180	29.16	37.28	8.60	34.8	11.08

Frequency(MHz):				2437			Polarity:			VERTICAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	4874.00	58.15	PK	74.00	15.85	1.00	120	56.03	31.02	7.60	36.5	2.12
1	4874.00	46.29	AV	54.00	7.71	1.00	120	44.17	31.02	7.60	36.5	2.12
2	7311.00	56.40	PK	74.00	17.60	1.00	125	45.32	37.28	8.60	34.8	11.08
2	7311.00	40.57	AV	54.00	13.43	1.00	125	29.49	37.28	8.60	34.8	11.08

Frequency(MHz):				2452			Polarity:			HORIZONTAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	4904.00	57.48	PK	74.00	16.52	1.00	137	54.33	31.55	7.80	36.2	3.15
1	4904.00	46.19	AV	54.00	7.81	1.00	137	43.04	31.55	7.80	36.2	3.15
2	7356.00	55.70	PK	74.00	18.30	1.00	129	43.84	38.47	8.69	35.3	11.86
2	7356.00	41.54	AV	54.00	12.46	1.00	129	29.68	38.47	8.69	35.3	11.86

Frequency(MHz):				2452			Polarity:			VERTICAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	4904.00	53.25	PK	74.00	20.75	1.00	110	50.10	31.55	7.80	36.2	3.15
1	4904.00	46.39	AV	54.00	7.61	1.00	110	43.24	31.55	7.80	36.2	3.15
2	7356.00	56.45	PK	74.00	17.55	1.00	185	44.59	38.47	8.69	35.3	11.86
2	7356.00	38.53	AV	54.00	15.47	1.00	185	26.67	38.47	8.69	35.3	11.86

BT4.0 Mode (above 1GHz)

Frequency(MHz):				2402			Polarity:			HORIZONTAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	4804.00	55.57	PK	74.00	18.43	1.00 H	90	53.67	31.42	6.98	36.5	1.90
1	4804.00	40.26	AV	54.00	13.74	1.00 H	90	38.36	31.42	6.98	36.5	1.90
2	7206.00	45.15	PK	74.00	28.85	1.00 H	100	34.55	37.03	8.87	35.3	10.60
2	7206.00	--	AV	--	--	--	--	--	--	--	--	--

Frequency(MHz):				2402			Polarity:			VERTICAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	4804.00	55.69	PK	74.00	18.31	1.00 V	120	53.79	31.42	6.98	36.5	1.90
1	4804.00	42.35	AV	54.00	11.65	1.00 V	120	40.45	31.42	6.98	36.5	1.90
2	7206.00	43.12	PK	74.00	30.88	1.00 V	115	32.52	37.03	8.87	35.3	10.60
2	7206.00	--	AV	--	--	--	--	--	--	--	--	--

Frequency(MHz):				2440			Polarity:			HORIZONTAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	4882.00	57.78	PK	74.00	16.22	1.00 H	170	55.72	30.98	7.58	36.5	2.06
1	4882.00	45.23	AV	54.00	8.77	1.00 H	170	43.17	30.98	7.58	36.5	2.06
2	7323.00	42.95	PK	74.00	31.05	1.00 H	95	32.03	37.66	8.56	35.3	10.92
2	7323.00	--	AV	--	--	--	--	--	--	--	--	--

Frequency(MHz):				2440			Polarity:			VERTICAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	4882.00	55.74	PK	74.00	18.26	1.00 V	180	53.68	30.98	7.58	36.5	2.06
1	4882.00	45.12	AV	54.00	8.88	1.00 V	180	43.06	30.98	7.58	36.5	2.06
2	7323.00	40.96	PK	74.00	33.04	1.00 V	95	30.04	37.66	8.56	35.3	10.92
2	7323.00	--	AV	--	--	--	--	--	--	--	--	--

Frequency(MHz):				2480			Polarity:			HORIZONTAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	4960.00	57.54	PK	74.00	16.46	1.00 H	79	54.47	31.47	7.80	36.2	3.07
1	4960.00	46.36	AV	54.00	7.64	1.00 H	79	43.29	31.47	7.80	36.2	3.07
2	7340.00	44.20	PK	74.00	29.80	1.00 H	125	32.46	38.32	8.72	35.3	11.74
2	7340.00	--	AV	--	--	--	--	--	--	--	--	--

Frequency(MHz):				2480			Polarity:			VERTICAL		
No.	Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
1	4960.00	57.35	PK	74.00	16.65	1.00 V	125	54.28	31.47	7.80	-36.2	3.07
1	4960.00	44.30	AV	54.00	9.70	1.00 V	125	41.23	31.47	7.80	-36.2	3.07
2	7340.00	46.37	PK	74.00	27.63	1.00 V	130	34.63	38.32	8.72	-35.3	11.74
2	7340.00	--	AV	--	--	--	--	--	--	--	--	--

REMARKS:

1. Emission level (dBuV/m) =Raw Value (dBuV)+Correction Factor (dB/m)
2. Correction Factor (dB/m) = Antenna Factor (dB/m)+Cable Factor (dB)-Pre-amplifier Factor
3. Margin value = Limit value- Emission level.
4. -- Mean the PK detector measured value is below average limit.
5. The other emission levels were very low against the limit.

3.3. Maximum Peak Output Power

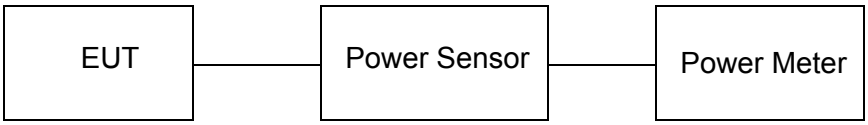
Limit

The Maximum Peak Output Power Measurement is 30dBm.

Test Procedure

Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power sensor.

Test Configuration



Test Results

WIFI

Type	Channel	Output power PK (dBm)	Output power AV (dBm)	Limit (dBm)	Result
802.11b	01	22.45	17.54	30.00	Pass
	06	22.50	17.64		
	11	22.15	17.41		
802.11g	01	23.54	15.34	30.00	Pass
	06	23.65	15.65		
	11	23.15	15.62		
802.11n(H20)	01	23.24	14.21	30.00	Pass
	06	23.34	14.34		
	11	23.10	14.11		
802.11n(H40)	03	21.15	13.12	30.00	Pass
	06	21.32	13.32		
	09	21.26	13.20		

Note: 1.The test results including the cable lose.

BT4.0

Type	Channel	Output power (dBm)	Limit (dBm)	Result
GFSK	00	-1.43	30.00	Pass
	19	-1.63		
	39	-2.19		

Note: The test results including the cable loss.

3.4. Power Spectral Density

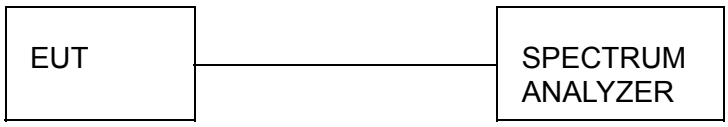
Limit

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

Test Procedure

1. Use this procedure when the maximum peak conducted output power in the fundamental emission is used to demonstrate compliance.
2. Set the RBW ≥ 3 kHz.
3. Set the VBW ≥ 3× RBW.
4. Set the span to 1.5 times the DTS channel bandwidth.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum power level.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.
11. The resulting peak PSD level must be 8dBm.

Test Configuration



Test Results

WIFI

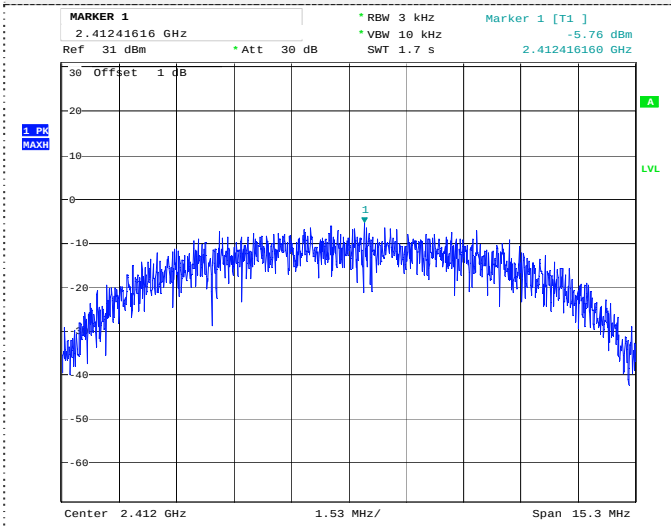
Type	Channel	Power Spectral Density (dBm/3KHz)	Limit (dBm/3KHz)	Result
802.11b	01	-5.76	8.00	Pass
	06	-6.14		
	11	-6.43		
802.11g	01	-9.55	8.00	Pass
	06	-9.95		
	11	-10.24		
802.11n(HT20)	01	-11.95	8.00	Pass
	06	-12.08		
	11	-12.47		
802.11n(HT40)	03	-16.07	8.00	Pass
	06	-17.10		
	09	-16.66		

BT4.0

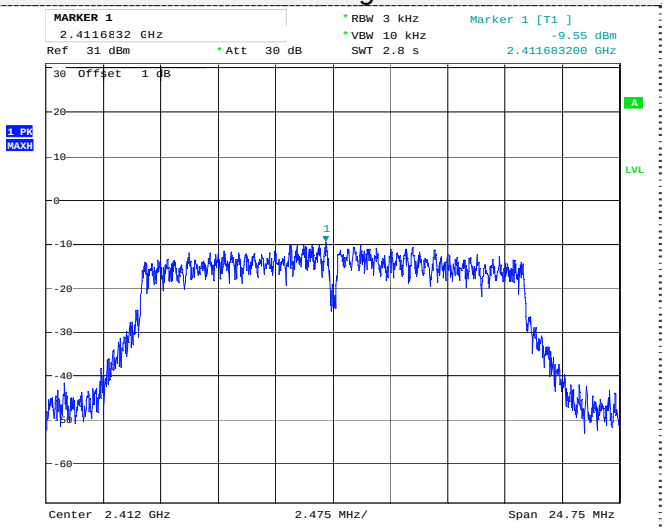
Type	Channel	Power Spectral Density (dBm/3KHz)	Limit (dBm/3KHz)	Result
BT4.0	00	-17.13	8.00	Pass
	19	-17.26		
	39	-17.93		

Test plot as follows:

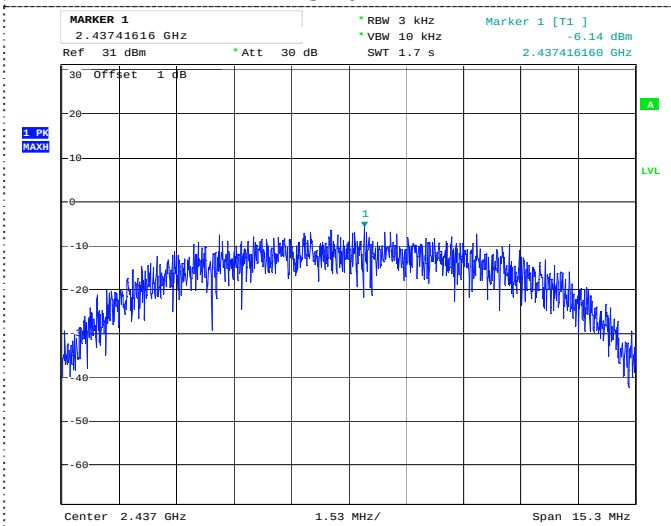
802.11b



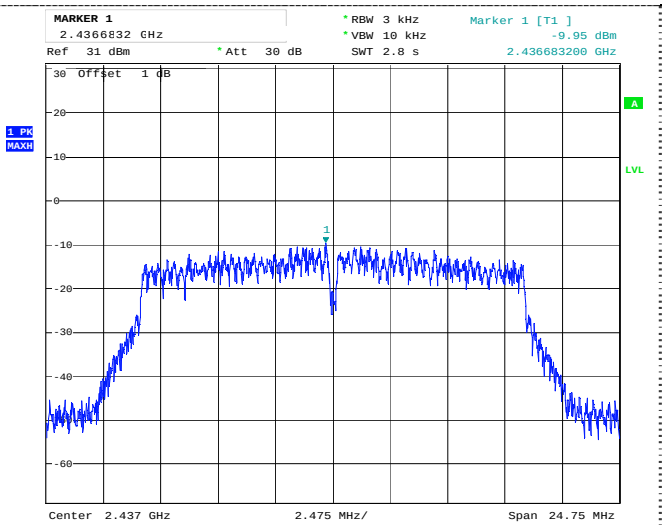
802.11g



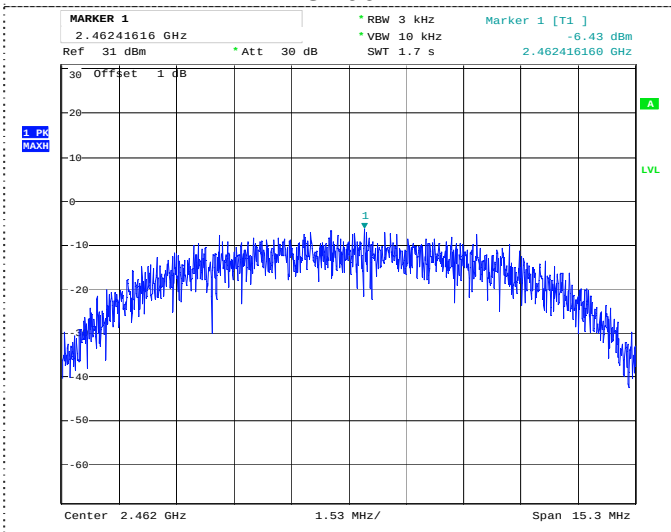
CH01



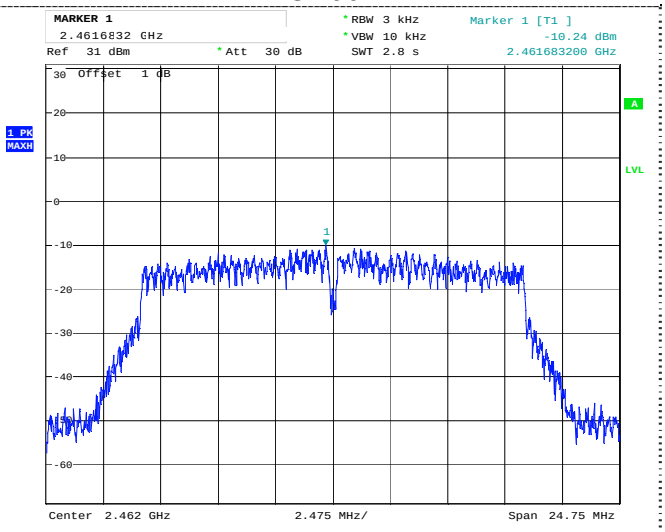
CH01



CH06



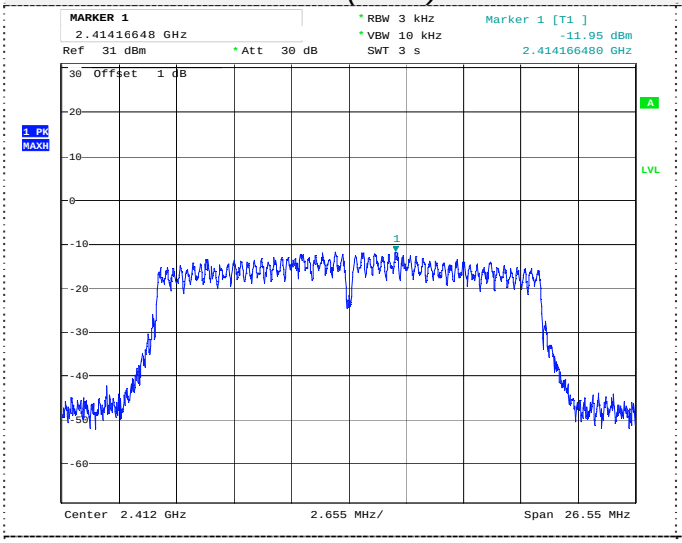
CH06



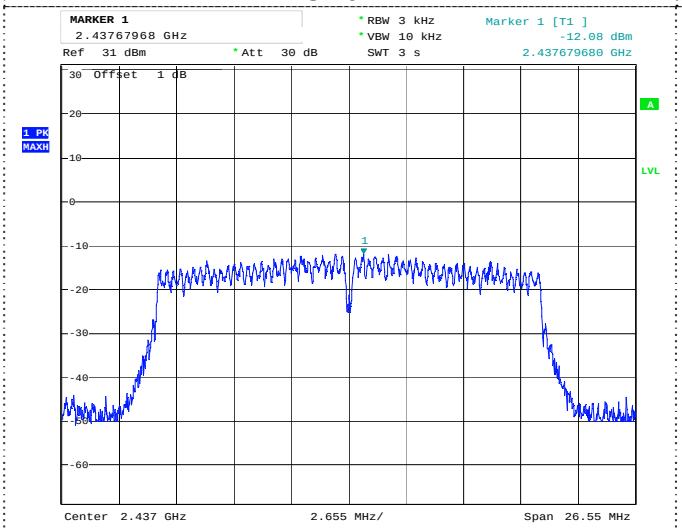
CH11

CH11

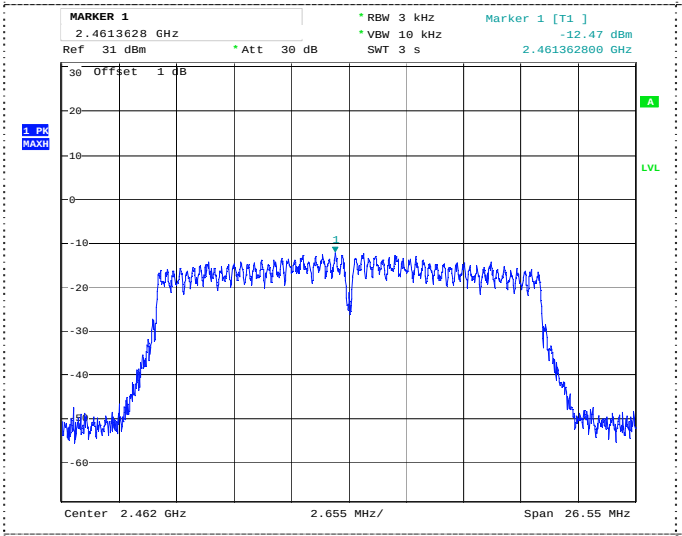
802.11n(HT20)



CH01

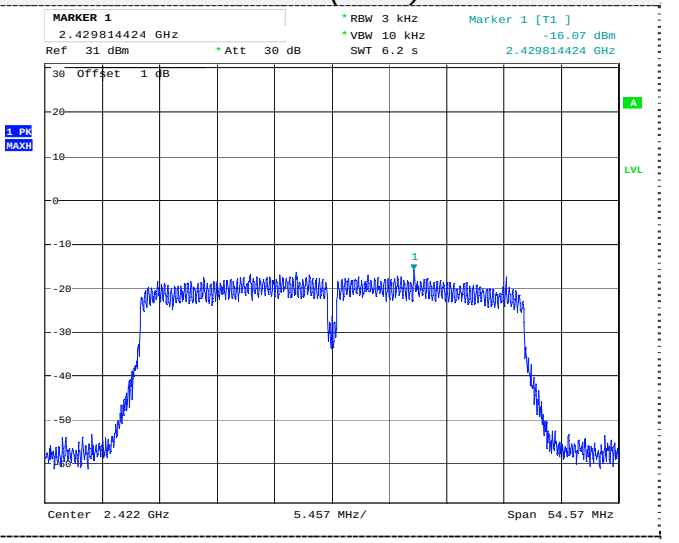


CH06

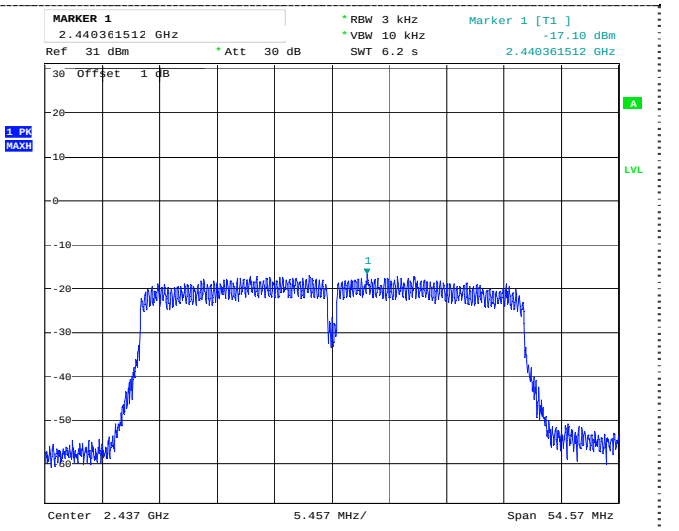


CH11

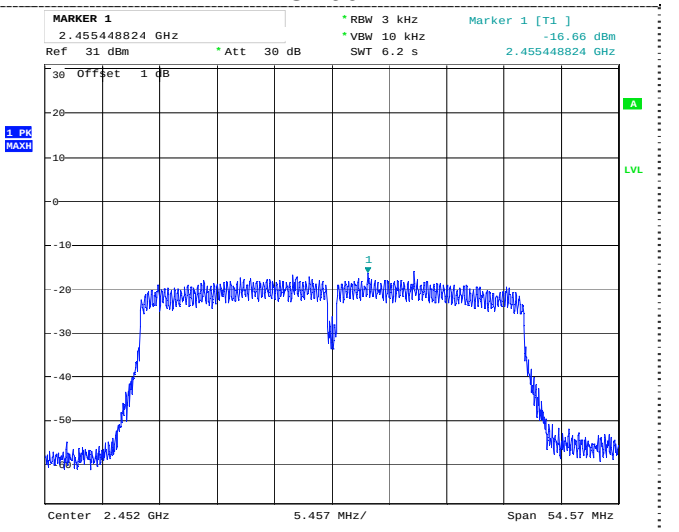
802.11n(HT40)



CH03

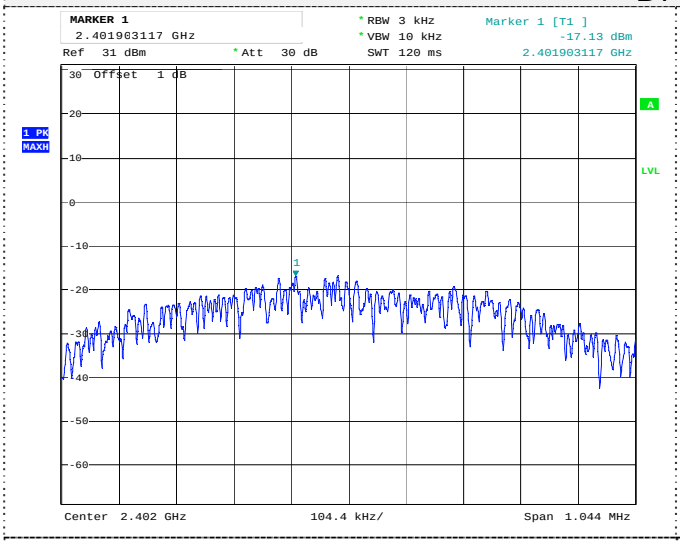


CH06

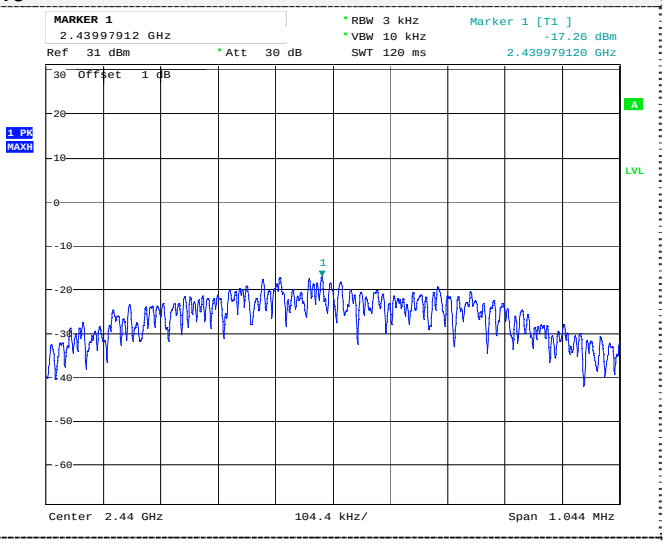


CH09

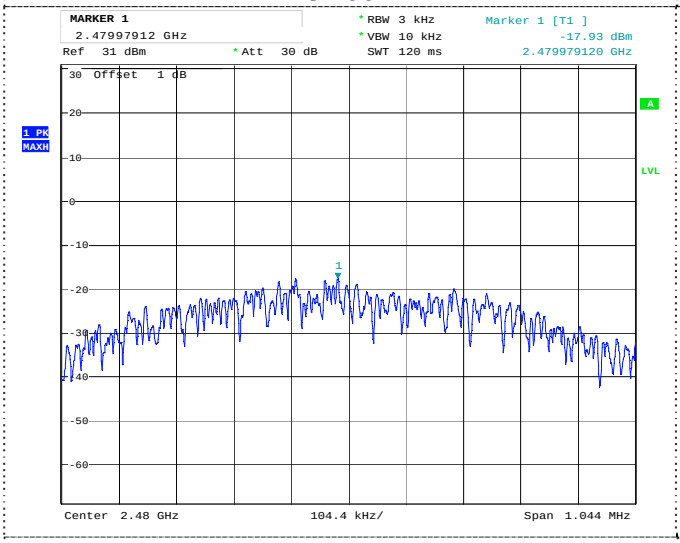
BT4.0



CH00



CH19



CH39

3.5. 6dB Bandwidth

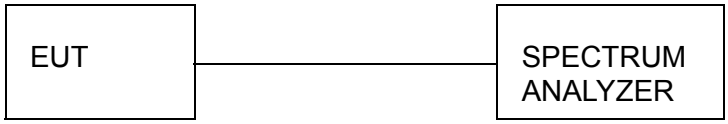
Limit

For digital modulation systems, the minimum 6 dB bandwidth shall be at least 500 kHz

Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100 KHz RBW and 300 KHz VBW. The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.

Test Configuration



Test Results

WIFI

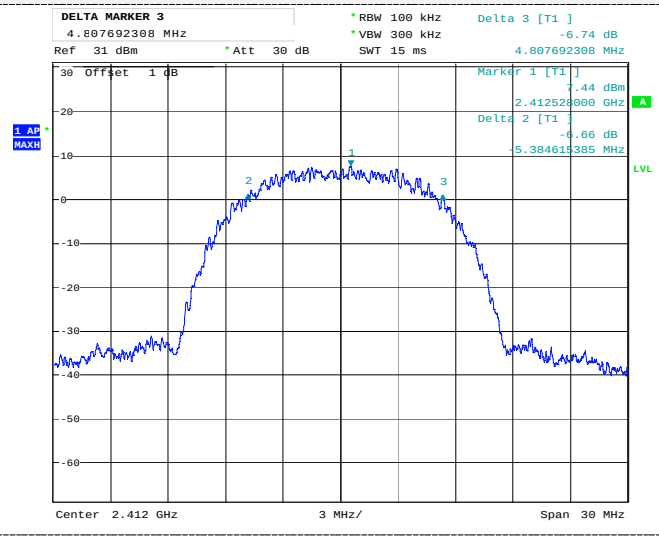
Type	Channel	6dB Bandwidth (MHz)	Limit (KHz)	Result
802.11b	01	10.29	≥500	Pass
	06	10.29		
	11	10.29		
802.11g	01	16.44	≥500	Pass
	06	16.49		
	11	16.49		
802.11n(HT20)	01	17.69	≥500	Pass
	06	17.69		
	11	17.69		
802.11n(HT40)	03	36.39	≥500	Pass
	06	36.38		
	09	36.37		

BT4.0

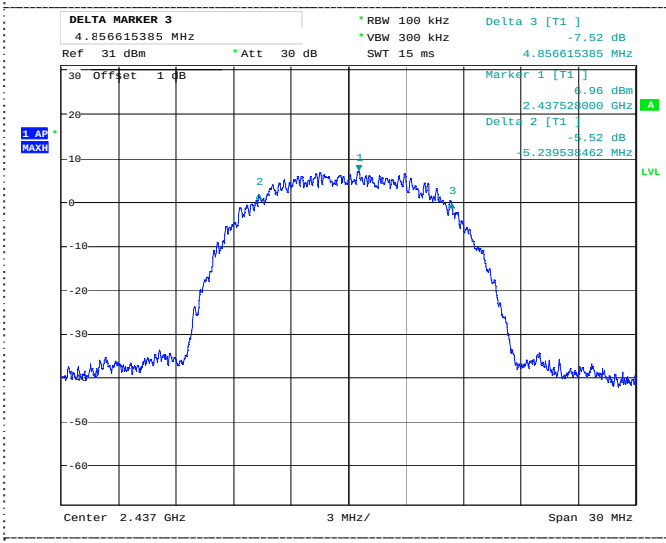
Type	Channel	6dB Bandwidth (MHz)	Limit (KHz)	Result
GFSK	00	0.684	≥500	Pass
	19	0.694		
	39	0.696		

Test plot as follows:

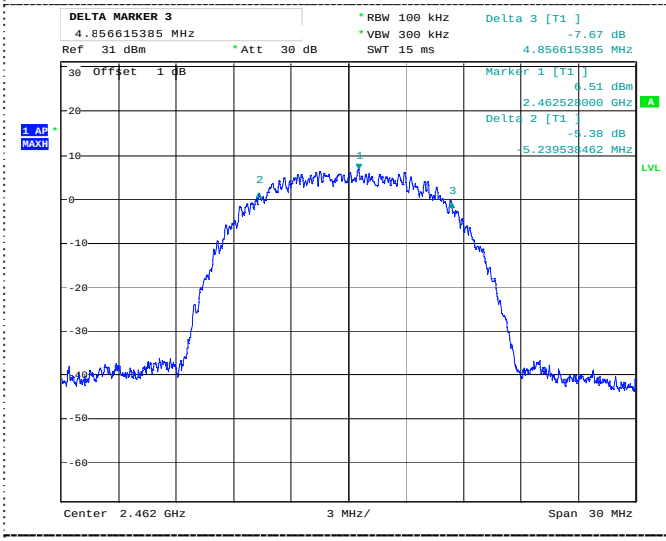
802.11b



CH01

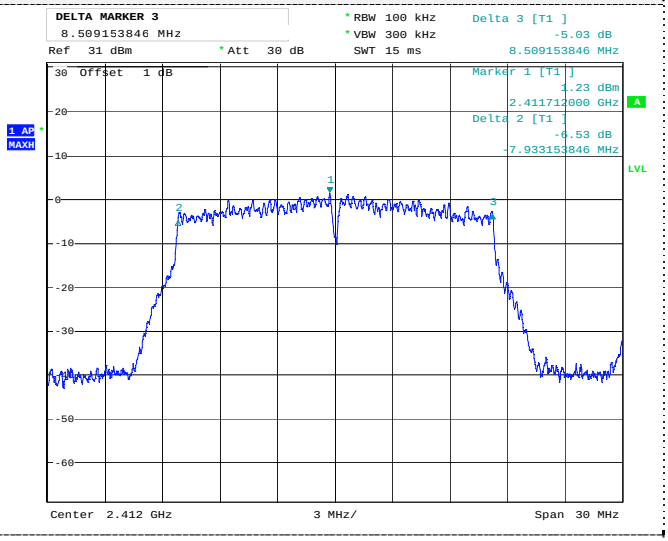


CH06

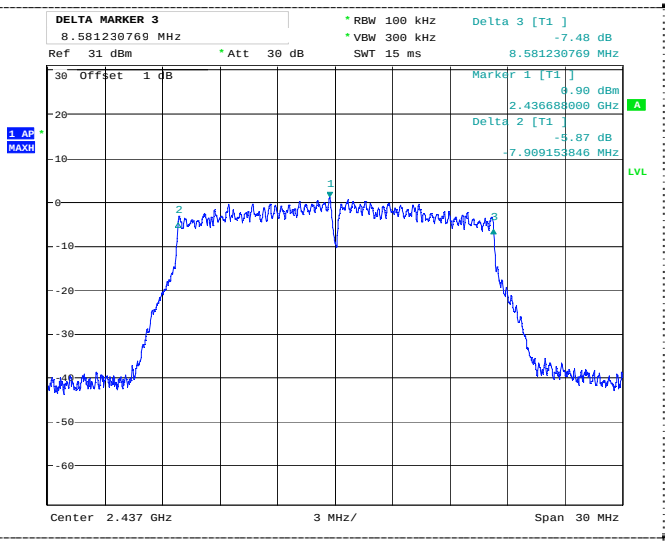


CH11

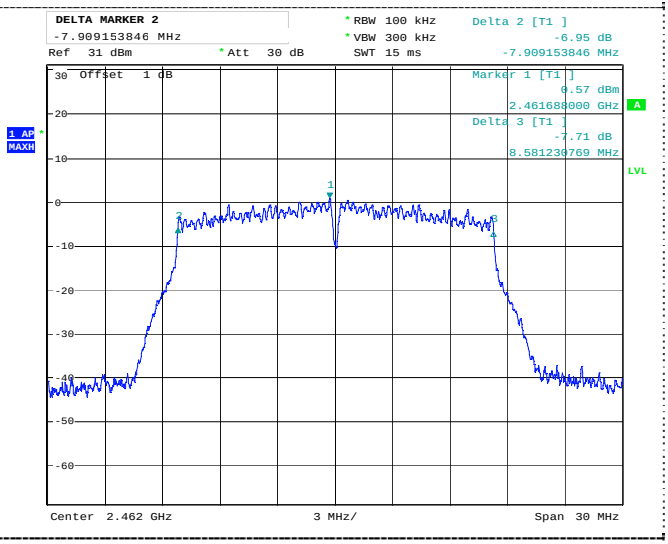
802.11g



CH01

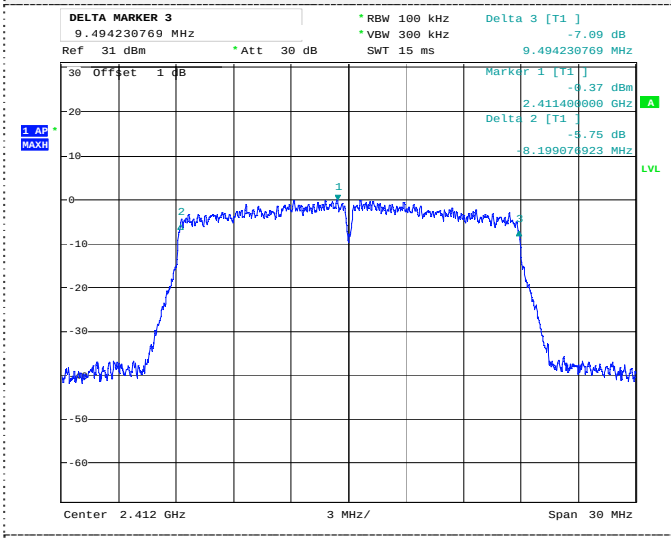


CH06

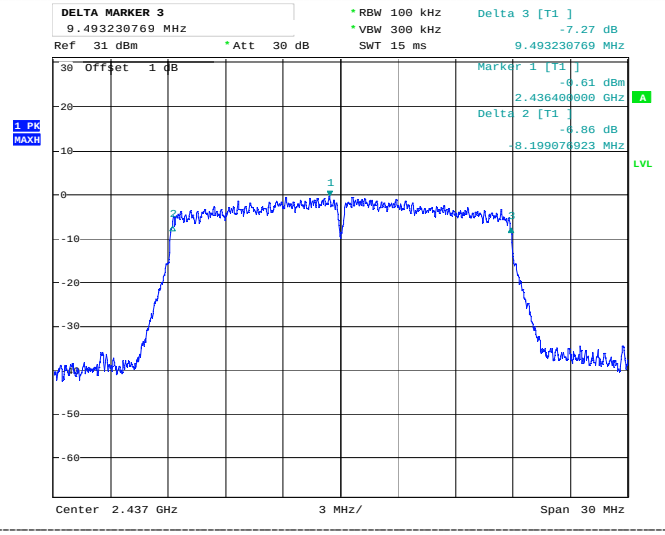


CH11

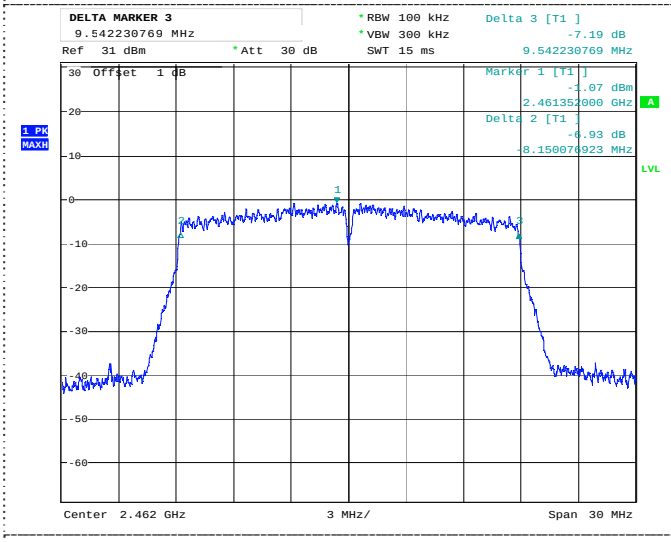
802.11n(HT20)



CH01

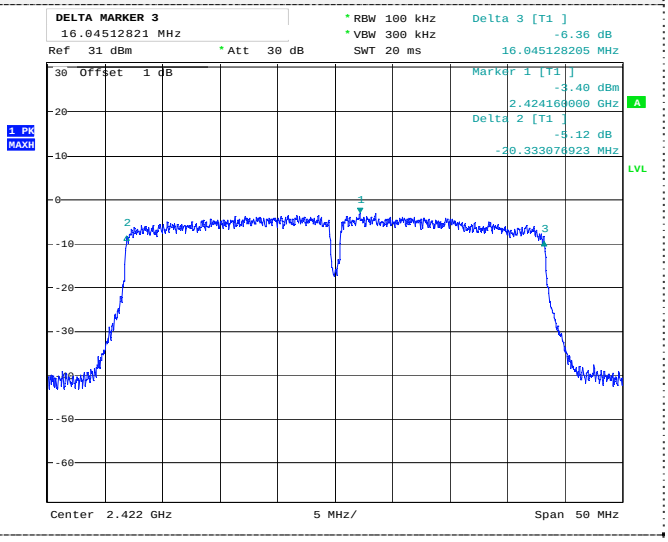


CH06

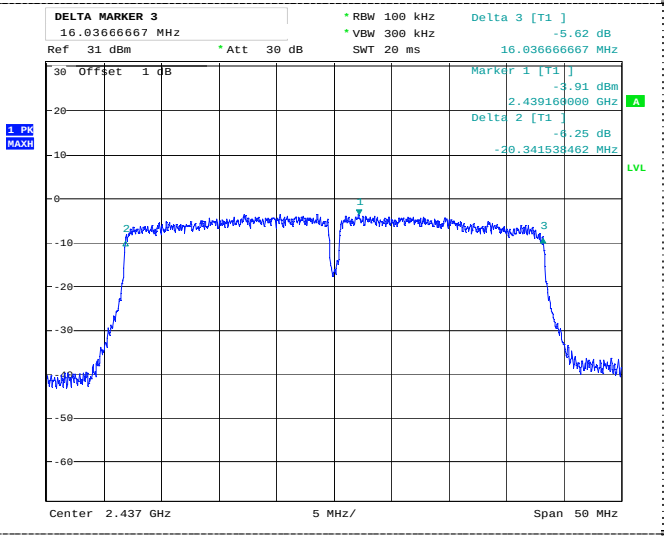


CH11

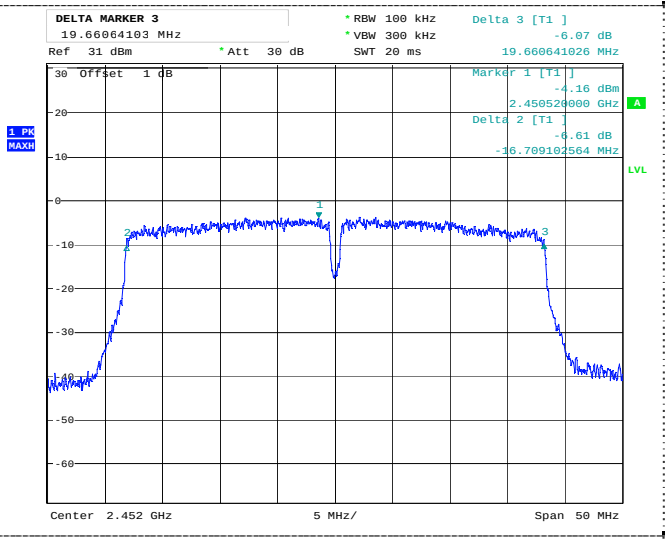
802.11n(HT40)



CH00

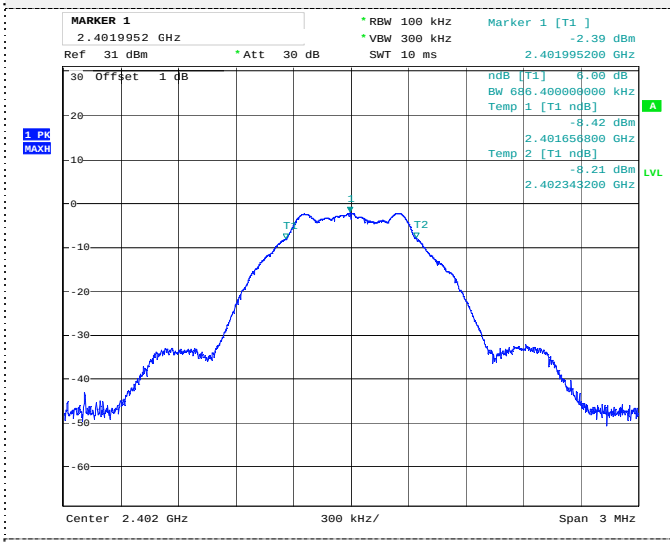


CH06

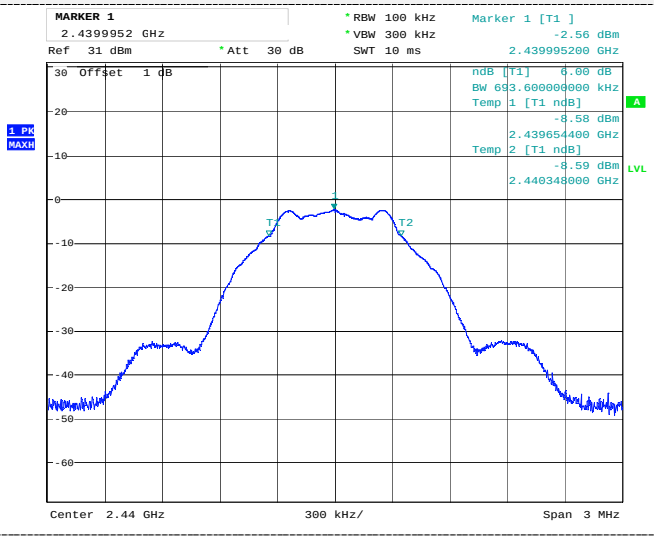


CH09

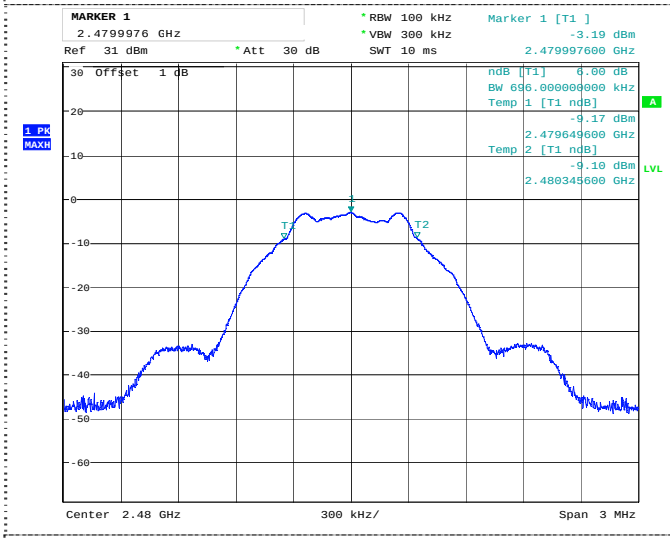
BT4.0



CH00



CH19



CH39

3.6. Band Edge Compliance of RF Emission

Limit

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 a radiated 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, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

Below -20dB of the highest emission level in operating band.

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

Test Procedure

Test Procedure tor conducted method

1. Remove the antenna from the EUT and then connect to a low loss RF cable from the antenna port to a spectrum analyzer
2. Turn on the EUT and make it operate in transmitting mode. Then set it to Low Channel and High Channel within its operating range, and make sure the instrument is operated in its linear range.
3. Set spectrum analyzer RBW =100 kHz and VBW=300 kHz
4. Use spectrum analyzer Maxhold function to allow trace to fully stabilize
5. Marker the highest point which fall into restricted frequency bands
6. Repeat above procedures until all measured frequencies were complete.

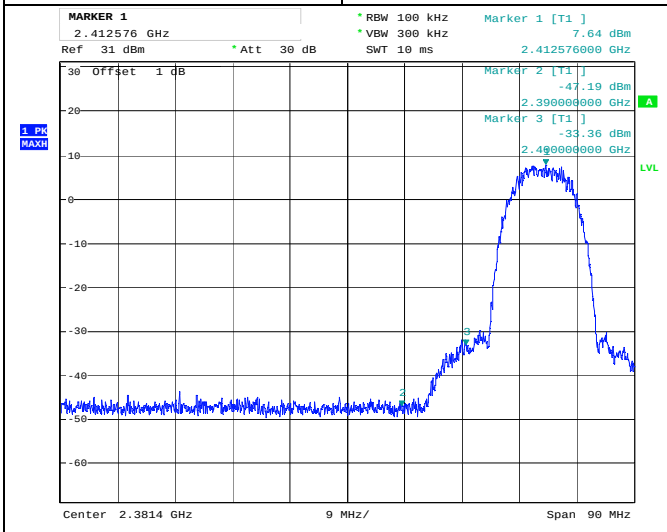
Test Procedure tor radiated method

1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.
2. The EUT was set 3 meters away from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. Place a marker at the end of the restricted band closest to the transmit frequency to show compliance. Also measure any emissions in the restricted bands. Save the spectrum analyzer plot. Repeat for each power and modulation for lowest and highest channel
7. Test the EUT in the lowest channel, the highest channel
8. The radiation measurements are performed in X, Y, Z axis positioning. And found the X axis positioning which it is worse case, only the test worst case mode is recorded in the report.
9. Repeat above procedures until all frequencies measured was complete.

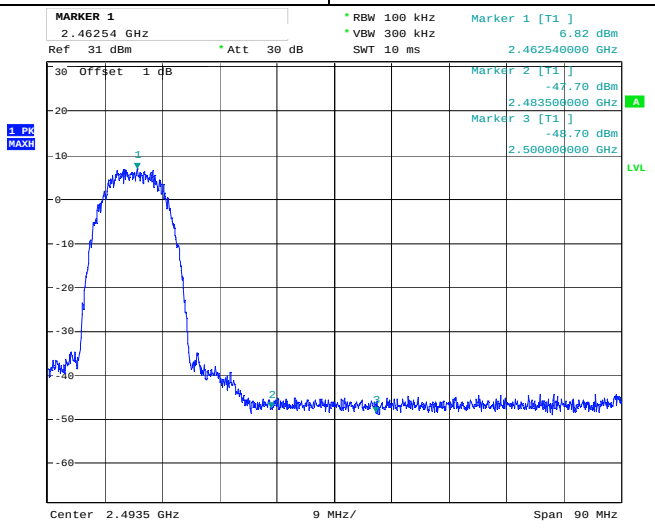
Test Results

A. Conducted measurements

802.11b			
Frequency (MHz)	**Delta Peak to Band emission (dBc)**	**Limit (dBc)**	**Verdict**
2390.00	54.83	20	PASS
2483.50	54.52	20	PASS

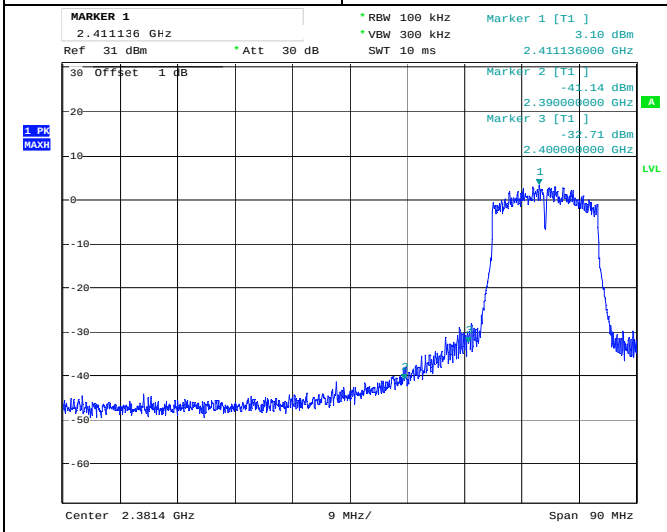


2412

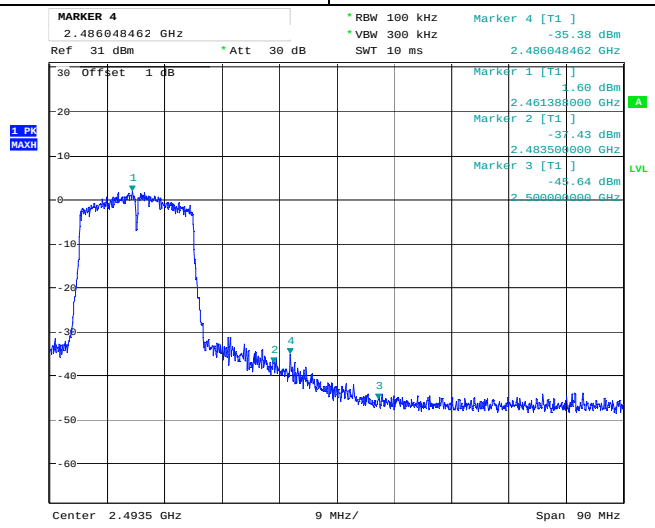


2462

802.11g			
Frequency (MHz)	**Delta Peak to Band emission (dBc)**	**Limit (dBc)**	**Verdict**
2390.00	44.24	20	PASS
2486.05	36.99	20	PASS

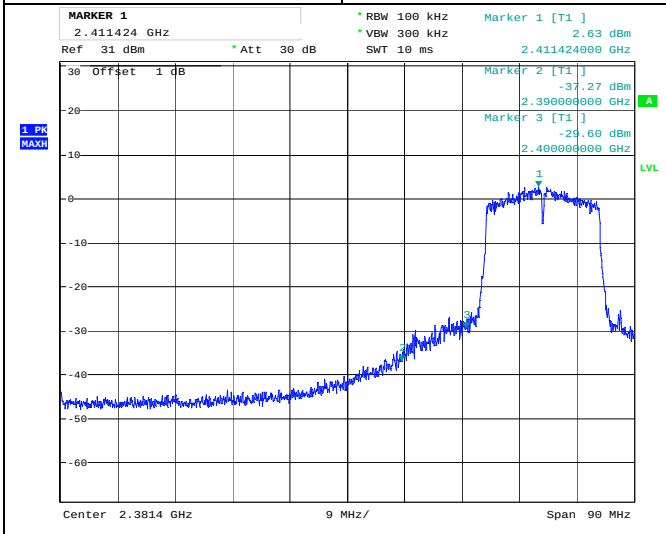


2412

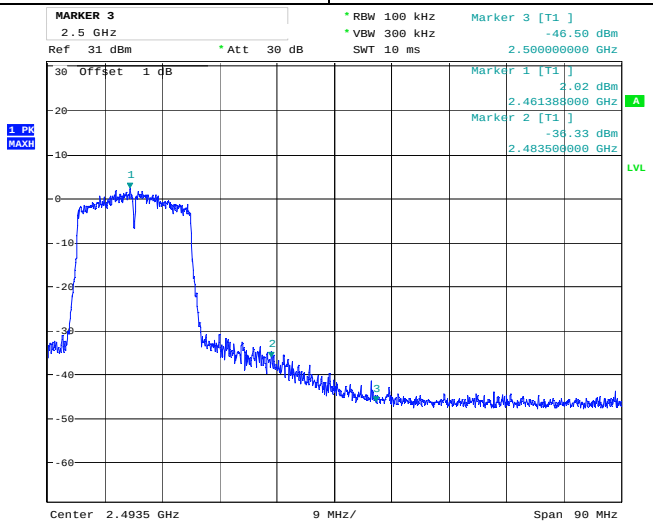


2462

802.11n20			
Frequency (MHz)	Delta Peak to Band emission (dBc)	Limit (dBc)	Verdict
2400.00	39.90	20	PASS
2483.50	38.35	20	PASS

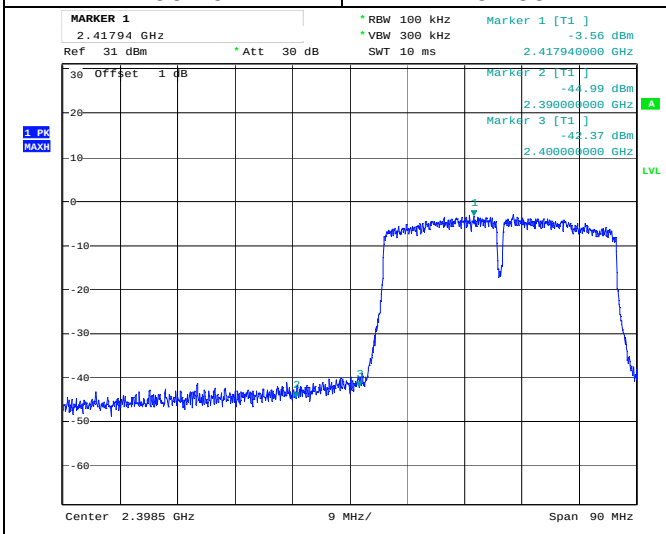


2412

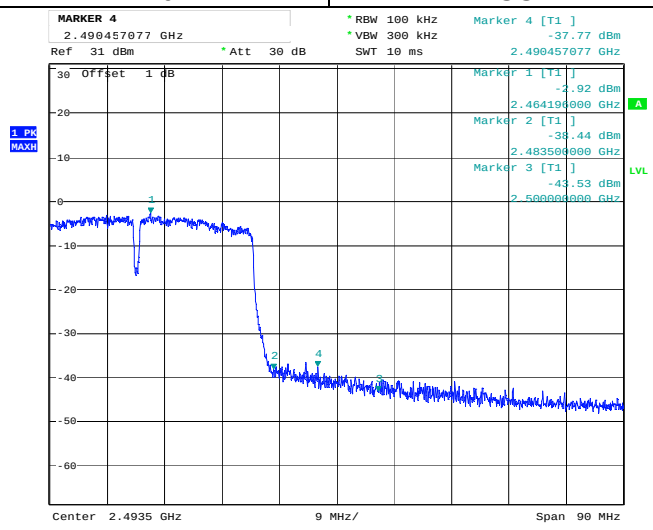


2462

802.11n40			
Frequency (MHz)	Delta Peak to Band emission (dBc)	Limit (dBc)	Verdict
2400.00	41.43	20	PASS
2490.46	34.85	20	PASS

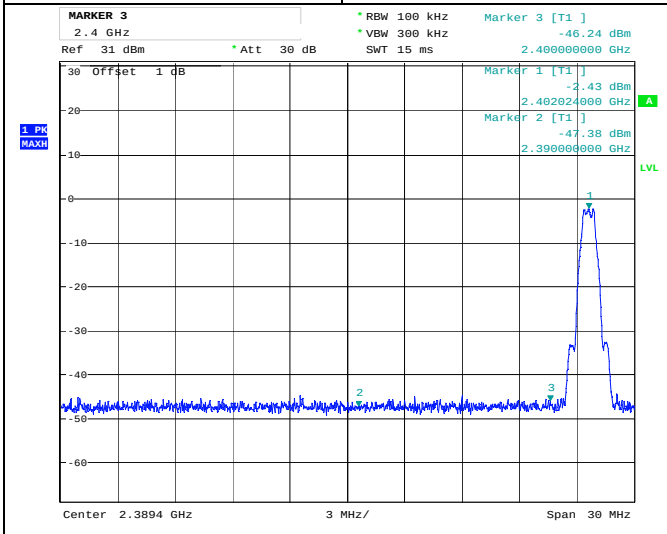


2422

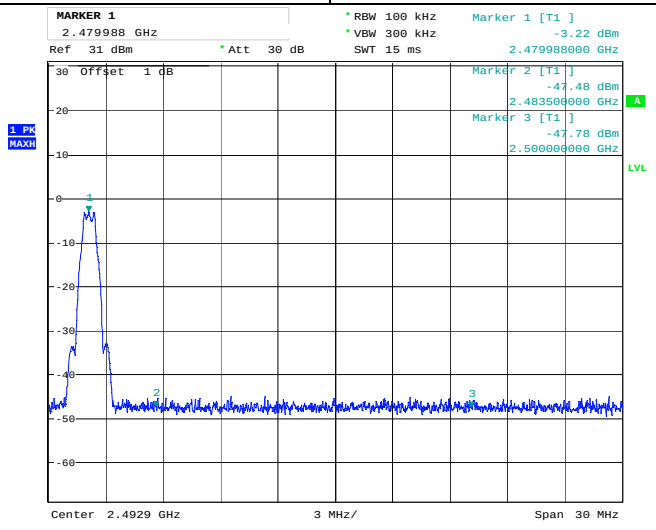


2452

BT4.0			
Frequency (MHz)	**Delta Peak to Band emission (dBc)**	**Limit (dBc)**	**Verdict**
2400.00	45.56	20	PASS
2483.50	44.92	20	PASS



2402



2480

B. **Radiated measurements**

802.11b

Frequency(MHz):			**2412**			**Polarity:**			**HORIZONTAL**		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2390.00	63.65	PK	74.00	10.35	1.00	135	68.96	27.49	3.32	36.12	-5.31
2390.00	45.87	AV	54.00	8.13	1.00	135	51.18	27.49	3.32	36.12	-5.31
Frequency(MHz):			**2412**			**Polarity:**			**VERTICAL**		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2390.00	64.55	PK	74.00	9.45	1.00	50	69.86	27.49	3.32	36.12	-5.31
2390.00	47.36	AV	54.00	6.64	1.00	50	52.67	27.49	3.32	36.12	-5.31
Frequency(MHz):			**2462**			**Polarity:**			**HORIZONTAL**		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2483.50	65.63	PK	74.00	8.37	1.00	175	71.35	27.45	3.38	36.55	-5.72
2483.50	46.47	AV	54.00	7.53	1.00	175	52.19	27.45	3.38	36.55	-5.72
Frequency(MHz):			**2462**			**Polarity:**			**VERTICAL**		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2483.50	63.64	PK	74.00	10.36	1.00	138	69.36	27.45	3.38	36.55	-5.72
2483.50	47.48	AV	54.00	6.52	1.00	138	53.20	27.45	3.38	36.55	-5.72

802.11g

Frequency(MHz):			2412			Polarity:			HORIZONTAL		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2390.00	65.68	PK	74.00	8.32	1.00	140	70.99	27.49	3.32	36.12	-5.31
2390.00	48.41	AV	54.00	5.59	1.00	140	53.72	27.49	3.32	36.12	-5.31
Frequency(MHz):			**2412**			**Polarity:**			**VERTICAL**		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2390.00	66.98	PK	74.00	7.02	1.00	33	72.29	27.49	3.32	36.12	-5.31
2390.00	49.21	AV	54.00	4.79	1.00	33	54.52	27.49	3.32	36.12	-5.31
Frequency(MHz):			**2462**			**Polarity:**			**HORIZONTAL**		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2483.50	66.98	PK	74.00	7.02	1.00	48	72.70	27.45	3.38	36.55	-5.72
2483.50	51.36	AV	54.00	2.64	1.00	48	57.08	27.45	3.38	36.55	-5.72
Frequency(MHz):			**2462**			**Polarity:**			**VERTICAL**		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2483.50	65.42	PK	74.00	8.58	1.00	121	71.14	27.45	3.38	36.55	-5.72
2483.50	50.24	AV	54.00	3.76	1.00	121	55.96	27.45	3.38	36.55	-5.72

802.11n20

Frequency(MHz):			2412			Polarity:			HORIZONTAL		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2390.00	64.33	PK	74.00	9.67	1.00	140	69.64	27.49	3.32	36.12	-5.31
2390.00	49.36	AV	54.00	4.64	1.00	140	54.67	27.49	3.32	36.12	-5.31
Frequency(MHz):			**2412**			**Polarity:**			**VERTICAL**		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2390.00	65.63	PK	74.00	8.37	1.00	55	70.94	27.49	3.32	36.12	-5.31
2390.00	50.14	AV	54.00	3.86	1.00	55	55.45	27.49	3.32	36.12	-5.31
Frequency(MHz):			**2462**			**Polarity:**			**HORIZONTAL**		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2483.50	66.41	PK	74.00	7.59	1.00	125	72.13	27.45	3.38	36.55	-5.72
2483.50	50.21	AV	54.00	3.79	1.00	125	55.93	27.45	3.38	36.55	-5.72
Frequency(MHz):			**2462**			**Polarity:**			**VERTICAL**		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2483.50	65.54	PK	74.00	8.46	1.00	78	71.26	27.45	3.38	36.55	-5.72
2483.50	50.32	AV	54.00	3.68	1.00	78	56.04	27.45	3.38	36.55	-5.72

802.11n40

Frequency(MHz):			2422			Polarity:			HORIZONTAL		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2390.00	64.54	PK	74.00	9.46	1.00	131	69.85	27.49	3.32	36.12	-5.31
2390.00	48.31	AV	54.00	5.69	1.00	131	53.62	27.49	3.32	36.12	-5.31
Frequency(MHz):			**2422**			**Polarity:**			**VERTICAL**		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2390.00	66.74	PK	74.00	7.26	1.00	125	72.05	27.49	3.32	36.12	-5.31
2390.00	48.98	AV	54.00	5.02	1.00	125	54.29	27.49	3.32	36.12	-5.31
Frequency(MHz):			**2452**			**Polarity:**			**HORIZONTAL**		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2483.50	66.36	PK	74.00	7.64	1.00	45	72.08	27.45	3.38	36.55	-5.72
2483.50	47.14	AV	54.00	6.86	1.00	45	52.86	27.45	3.38	36.55	-5.72
Frequency(MHz):			**2452**			**Polarity:**			**VERTICAL**		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2483.50	66.74	PK	74.00	7.26	1.00	130	72.46	27.45	3.38	36.55	-5.72
2483.50	47.64	AV	54.00	6.36	1.00	130	53.36	27.45	3.38	36.55	-5.72

BT4.0

Frequency(MHz):			2402			Polarity:			HORIZONTAL		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2390.00	58.64	PK	74.00	15.36	1.00	145	63.95	27.49	3.32	36.12	-5.31
2390.00	39.14	AV	54.00	14.86	1.00	145	44.45	27.49	3.32	36.12	-5.31
Frequency(MHz):			**2402**			**Polarity:**			**VERTICAL**		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2390.00	57.36	PK	74.00	16.64	1.00	110	62.67	27.49	3.32	36.12	-5.31
2390.00	41.74	AV	54.00	12.26	1.00	110	47.05	27.49	3.32	36.12	-5.31
Frequency(MHz):			**2480**			**Polarity:**			**HORIZONTAL**		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2483.50	57.98	PK	74.00	16.02	1.00	255	63.70	27.45	3.38	36.55	-5.72
2483.50	41.41	AV	54.00	12.59	1.00	255	47.13	27.45	3.38	36.55	-5.72
Frequency(MHz):			**2480**			**Polarity:**			**VERTICAL**		
Frequency (MHz)	Emission Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-amplifier (dB)	Correction Factor (dB/m)
2483.50	58.32	PK	74.00	15.68	1.00	170	64.04	27.45	3.38	36.55	-5.72
2483.50	41.74	AV	54.00	12.26	1.00	170	47.46	27.45	3.38	36.55	-5.72

3.7. Spurious RF Conducted Emission

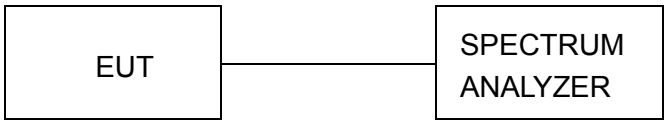
Limit

1. Below -20dB of the highest emission level in operating band.
2. Fall in the restricted bands listed in section 15.205. The maximum permitted average field strength is listed in section 15.209.

Test Procedure

The Spurious RF conducted emissions compliance of RF radiated emission should be measured by following the guidance in ANSI C63.4-2003 with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization etc. Set RBW=100 kHz and VBM= 300 KHz to measure the peak field strength, and measured frequency range from 30MHz to 26.5GHz.

Test Configuration

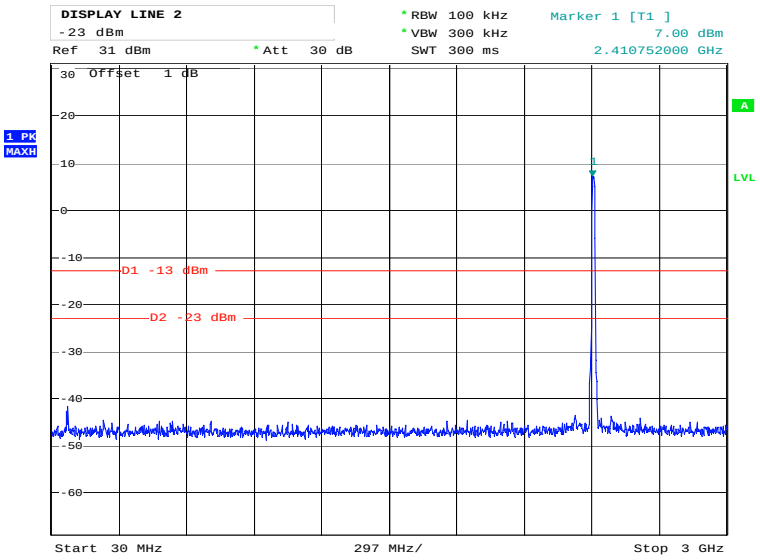


Test Results

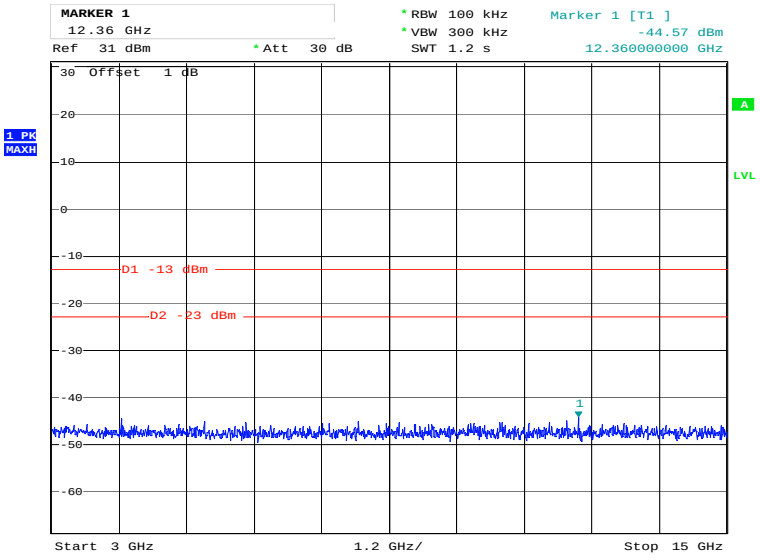
Remark: The measurement frequency range is from 30MHz to the 10th harmonic of the fundamental frequency. The lowest, middle and highest channels are tested to verify the spurious emissions and bandage measurement data.

Test plot as follows:

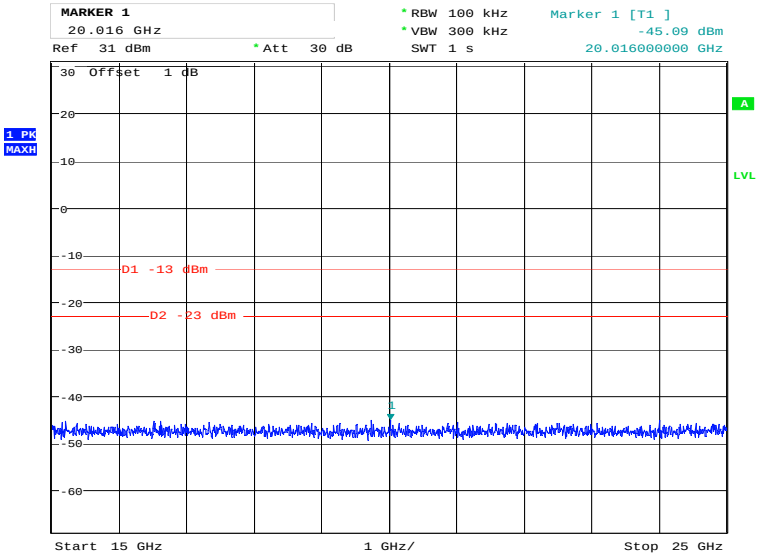
Test Mode:	802.11b	Test channel :	01



30MHz~3GHz

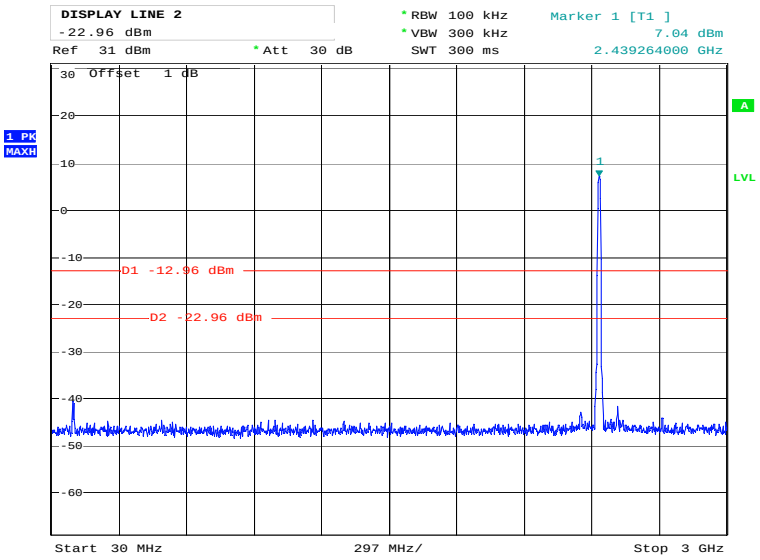


3GHz~15GHz

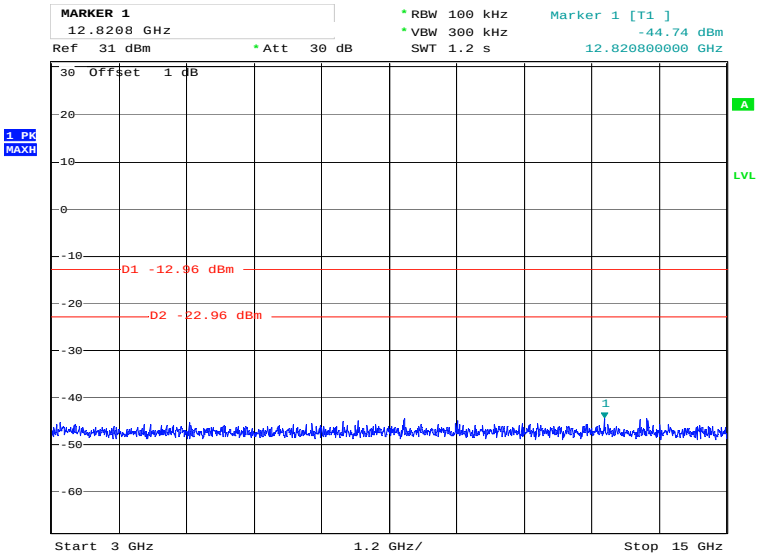


15GHz~25GHz

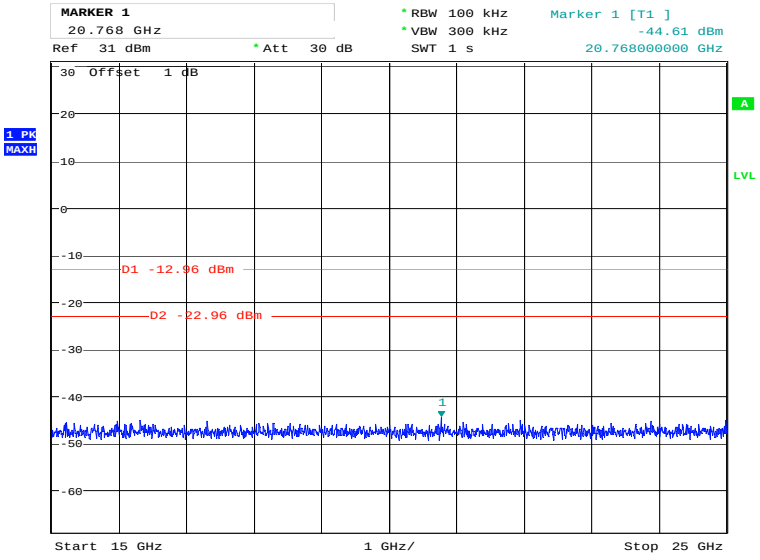
Test Mode:	802.11b	Test channel :	06



30MHz~3GHz

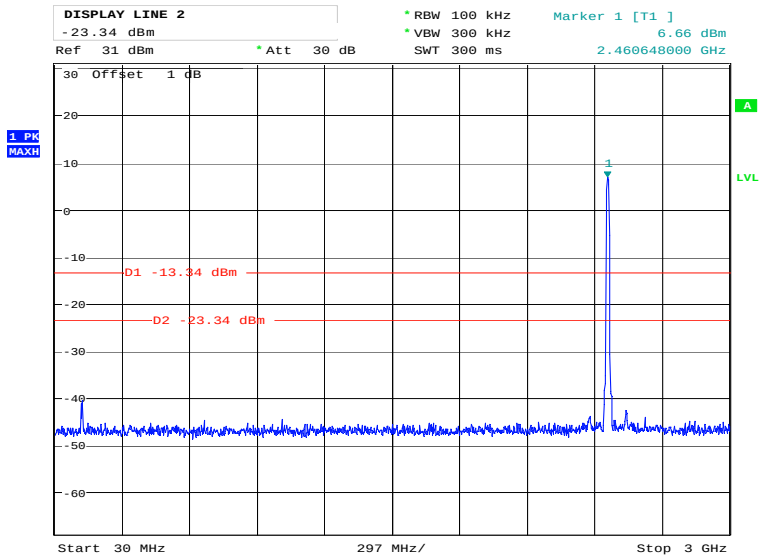


3GHz~15GHz

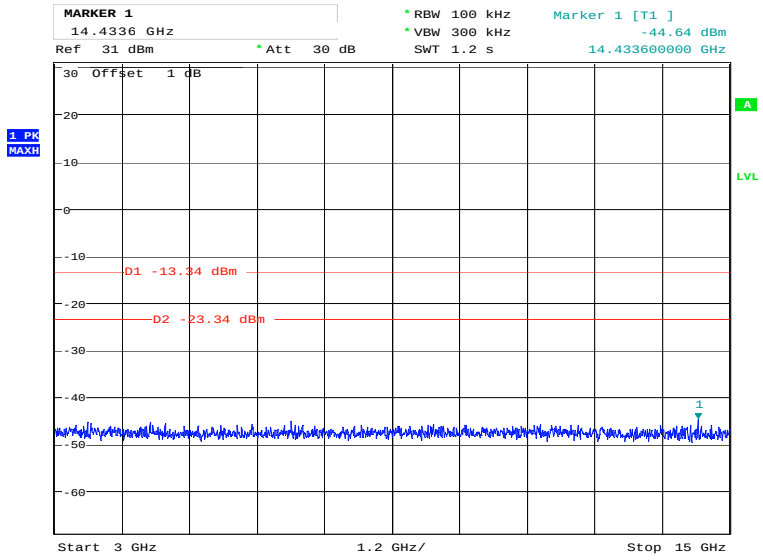


15GHz~25GHz

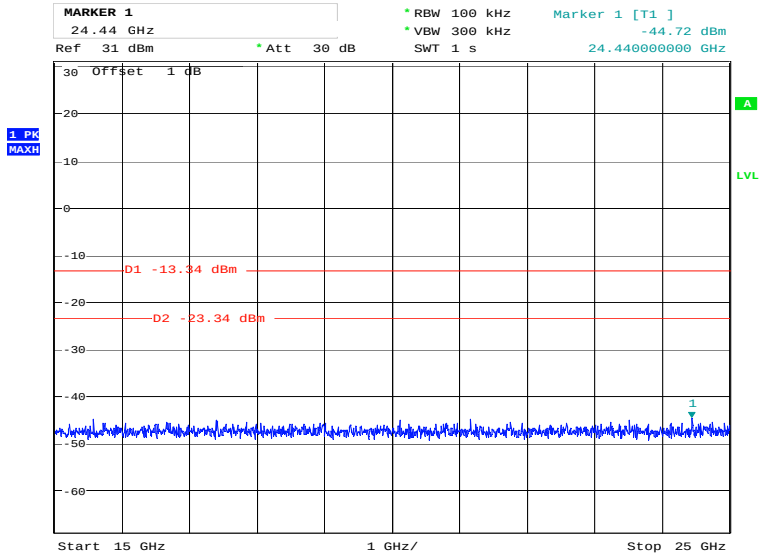
Test Mode:	802.11b	Test channel :	11



30MHz~3GHz

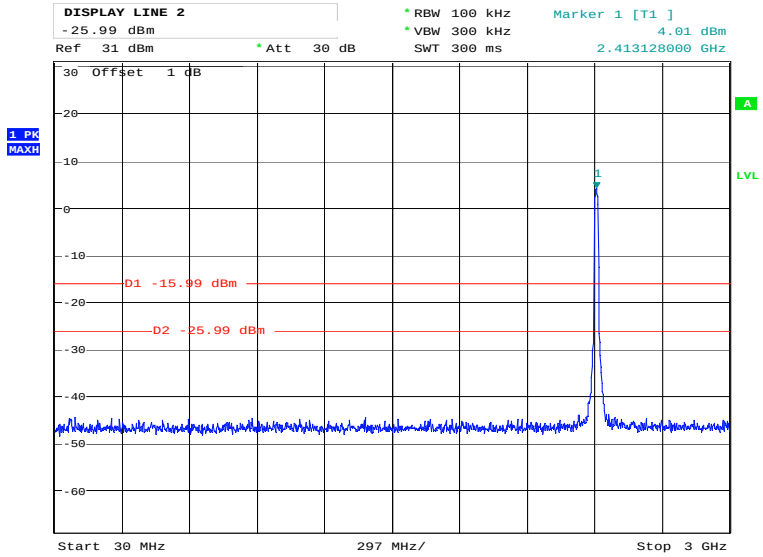


3GHz~15GHz

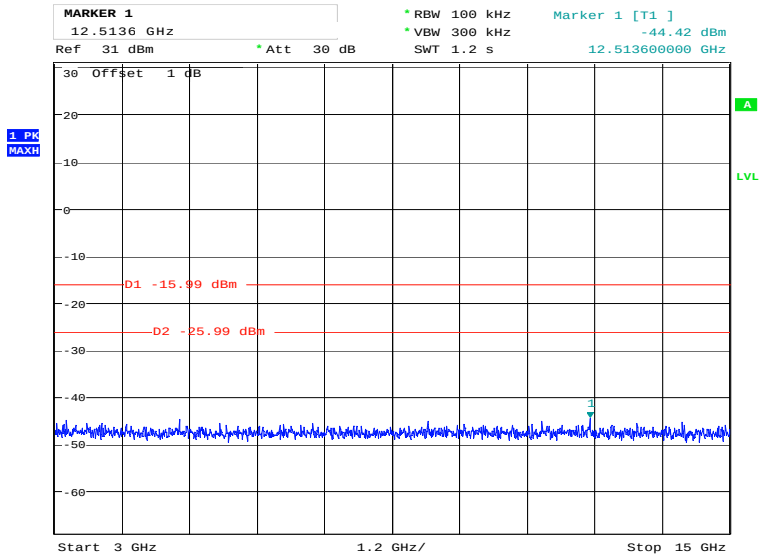


15GHz~25GHz

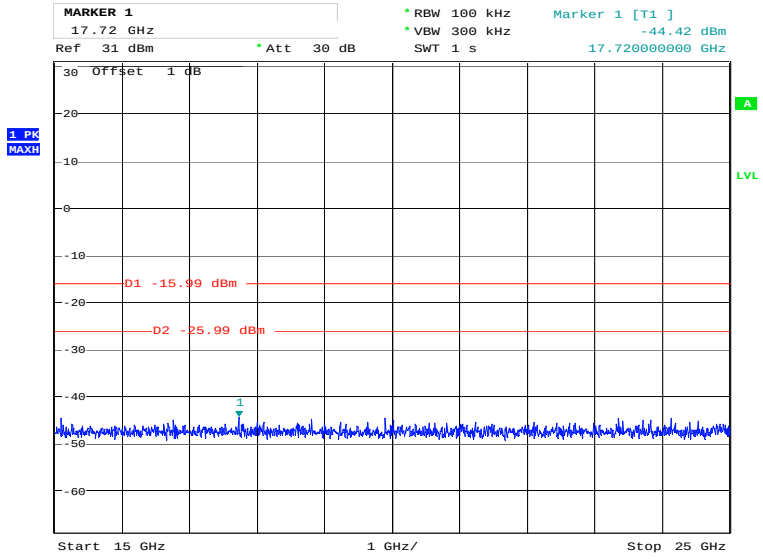
Test Mode:	802.11g	Test channel :	01



30MHz~3GHz

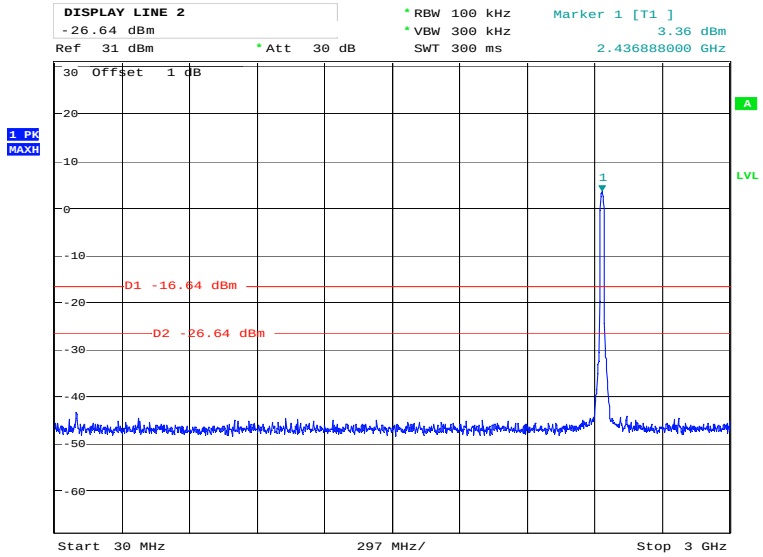


3GHz~15GHz

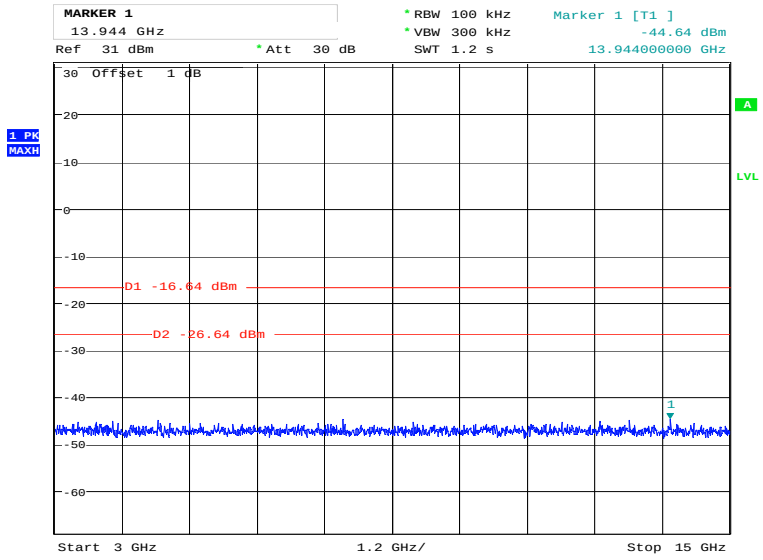


15GHz~25GHz

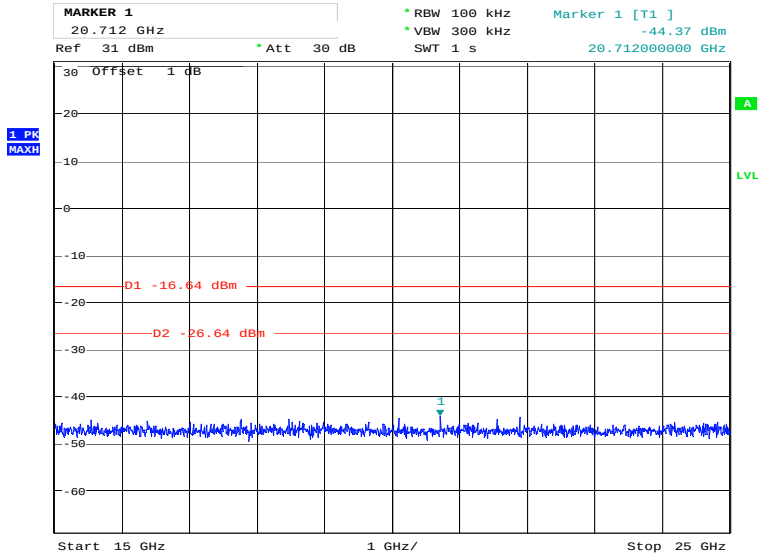
Test Mode:	802.11g	Test channel :	06



30MHz~3GHz

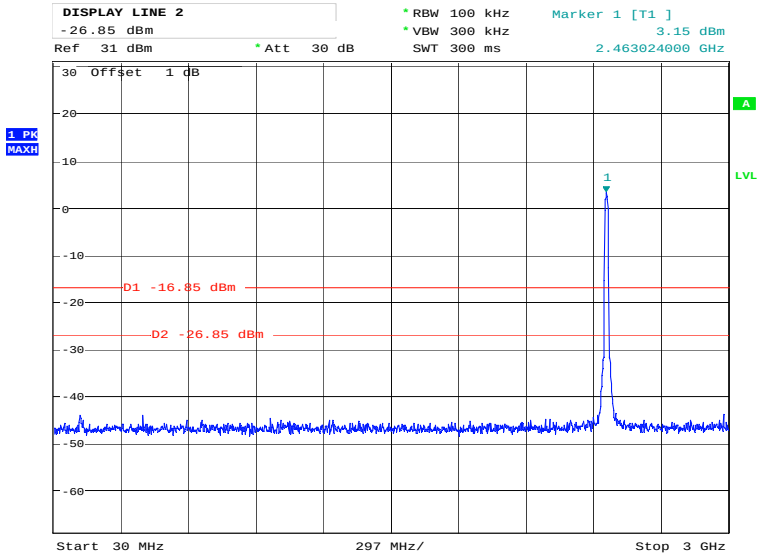


3GHz~15GHz

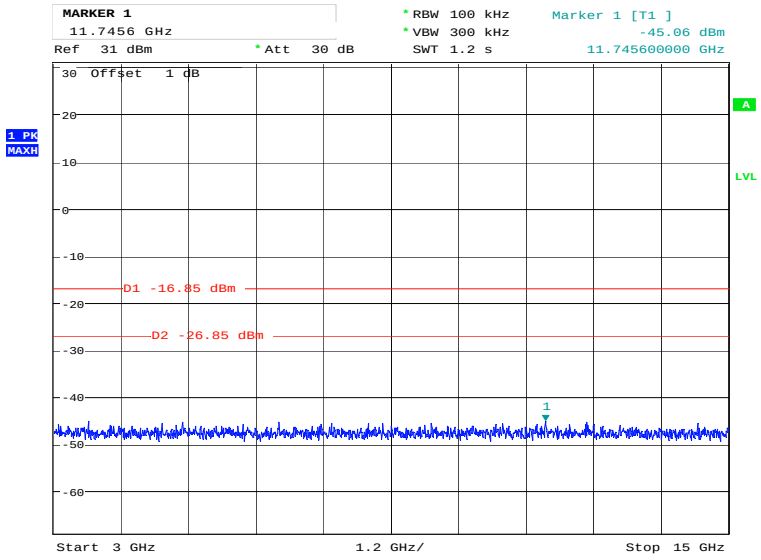


15GHz~25GHz

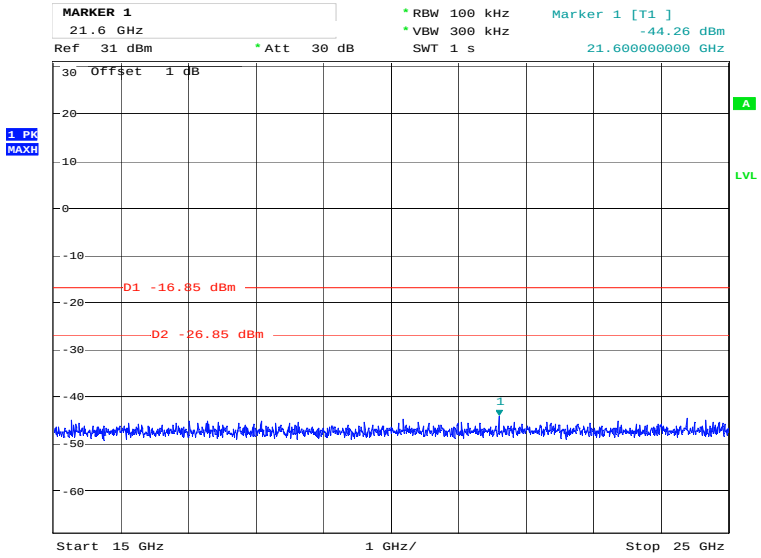
Test Mode:	802.11g	Test channel :	11



30MHz~3GHz

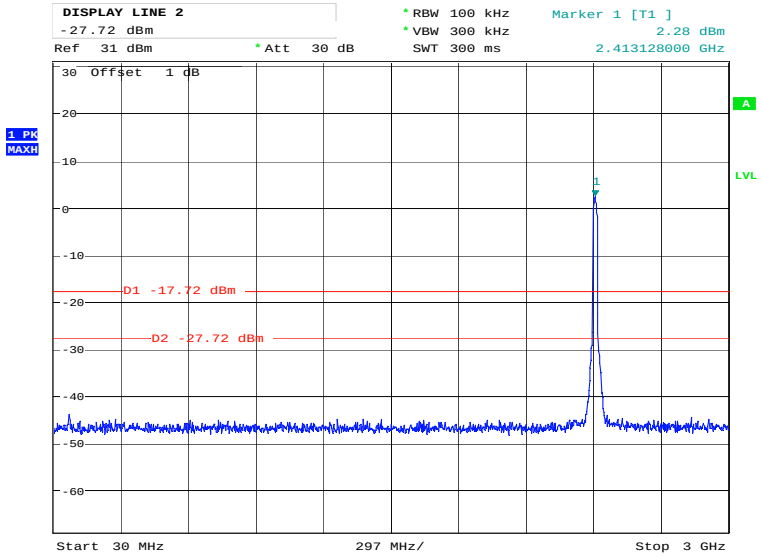


3GHz~15GHz

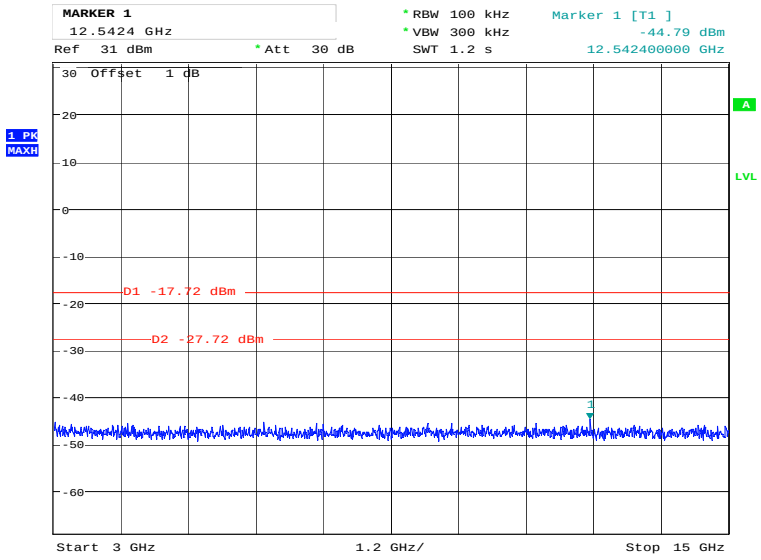


15GHz~25GHz

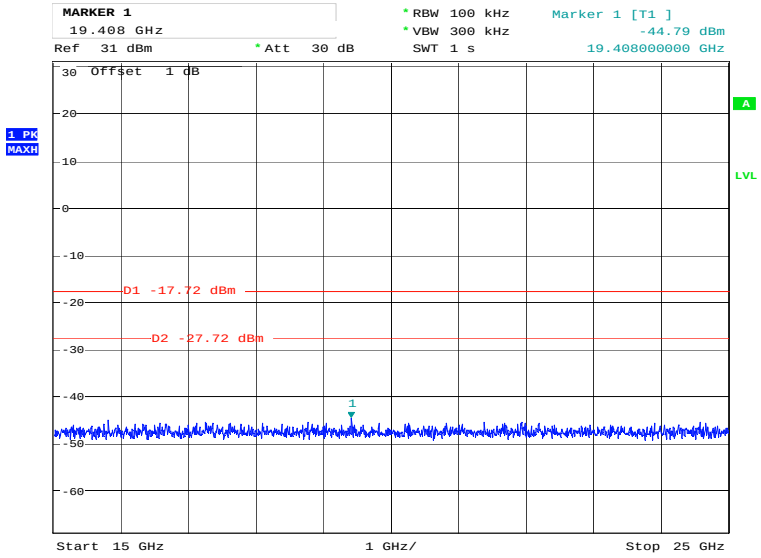
Test Mode:	802.11n(HT20)	Test channel :	01



30MHz~3GHz

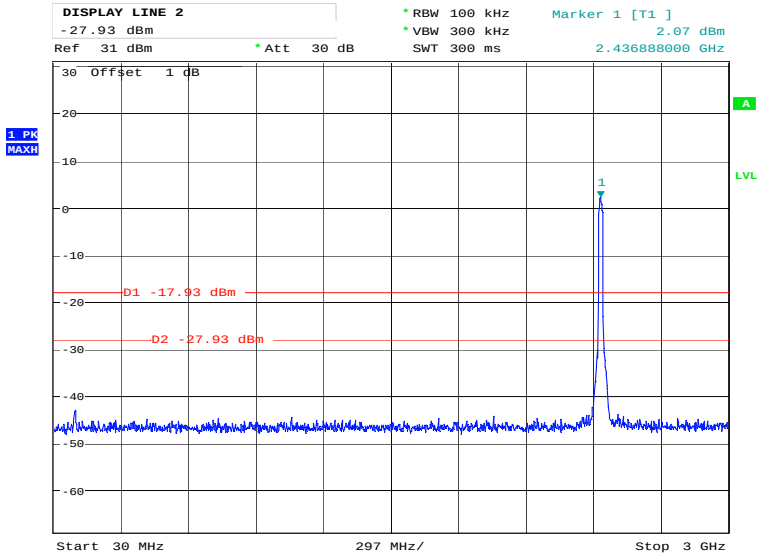


3GHz~15GHz

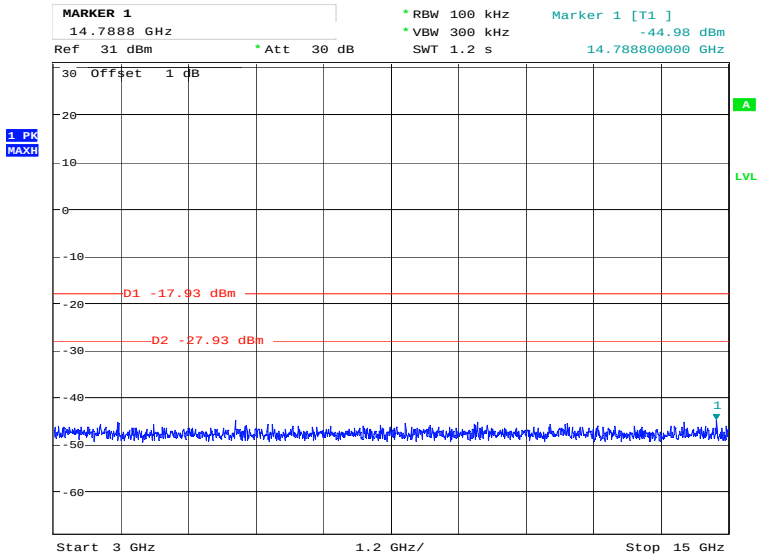


15GHz~25GHz

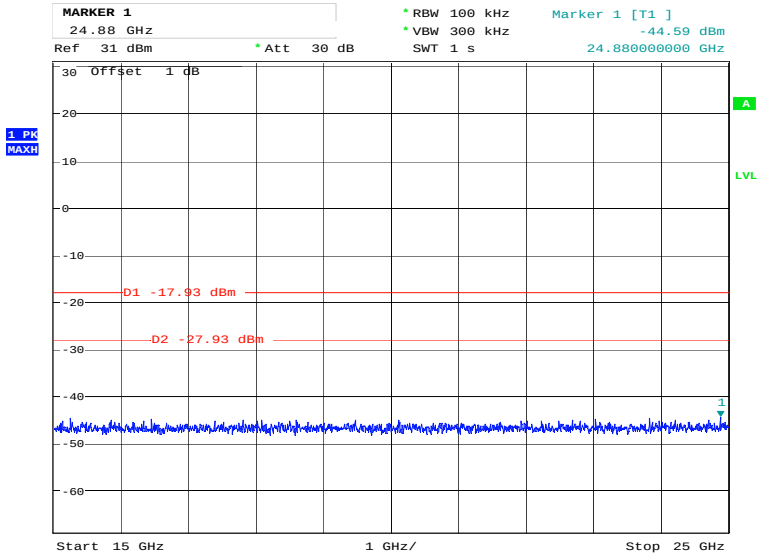
Test Mode:	802.11n(HT20)	Test channel :	06



30MHz~3GHz

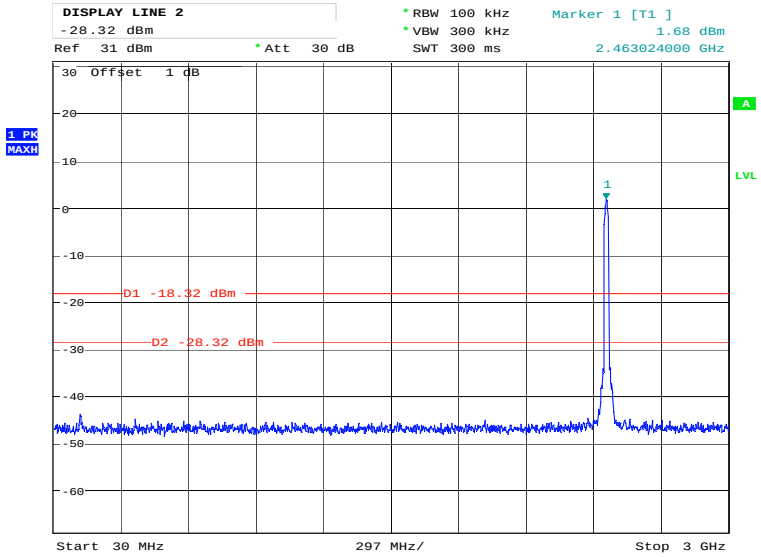


3GHz~15GHz

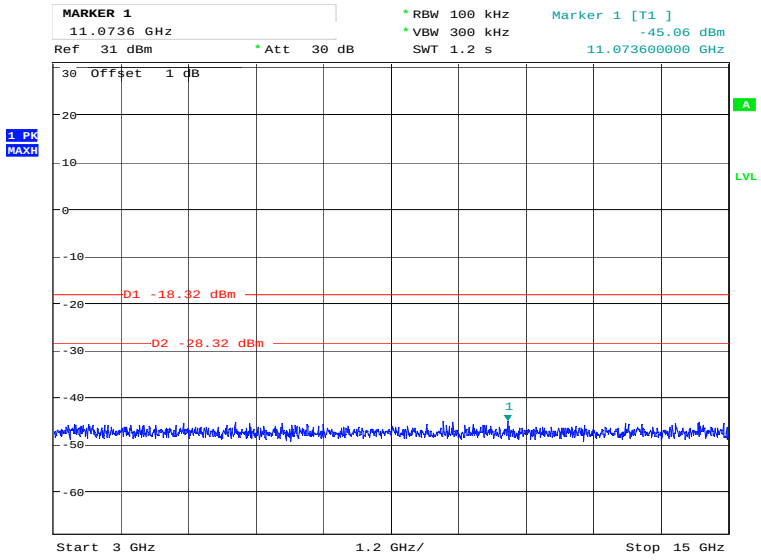


15GHz~25GHz

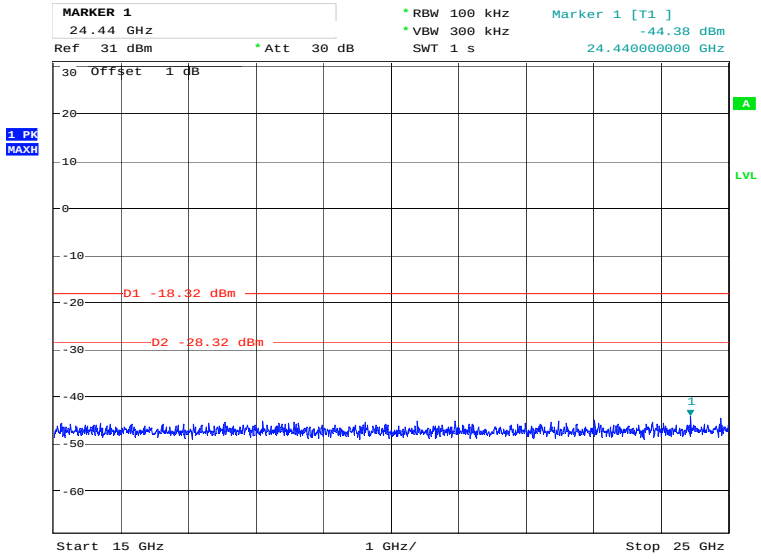
Test Mode:	802.11n(HT20)	Test channel :	11



30MHz~3GHz

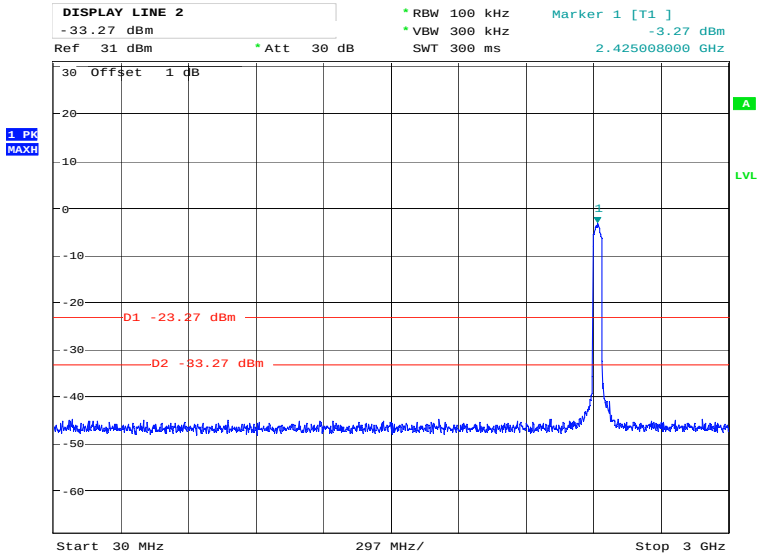


3GHz~15GHz

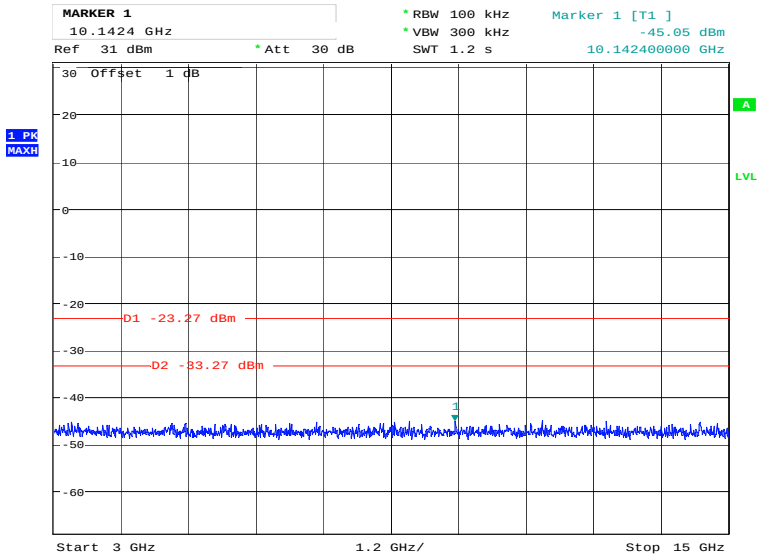


15GHz~25GHz

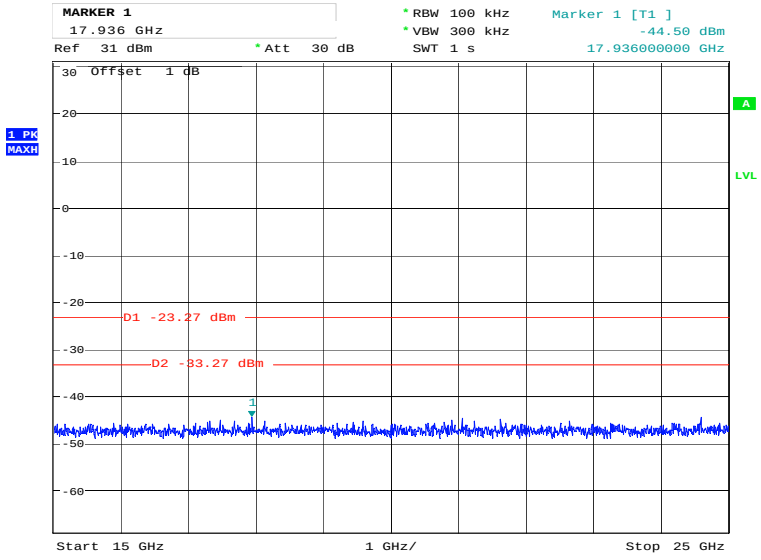
Test Mode:	802.11n(HT40)	Test channel :	03



30MHz~3GHz

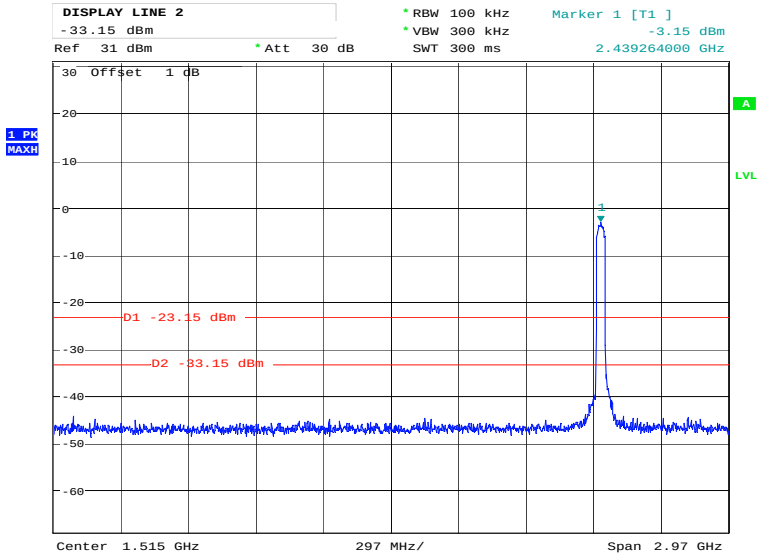


3GHz~15GHz

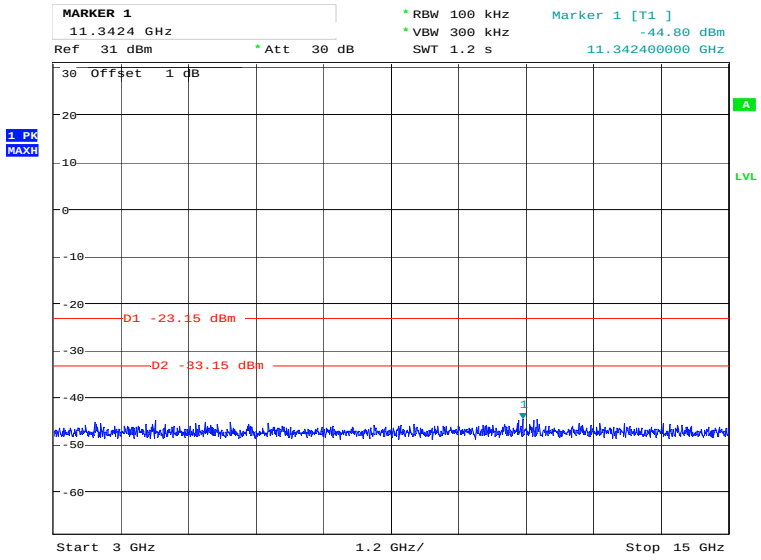


15GHz~25GHz

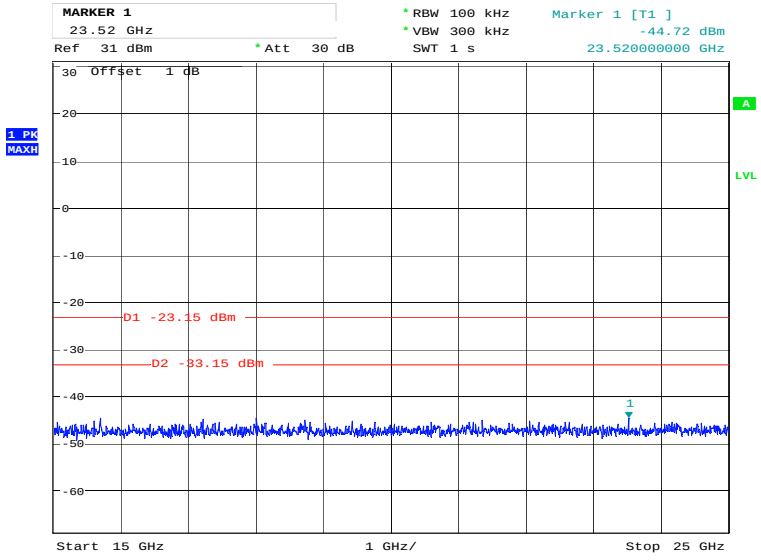
Test Mode:	802.11n(HT40)	Test channel :	06



30MHz~3GHz

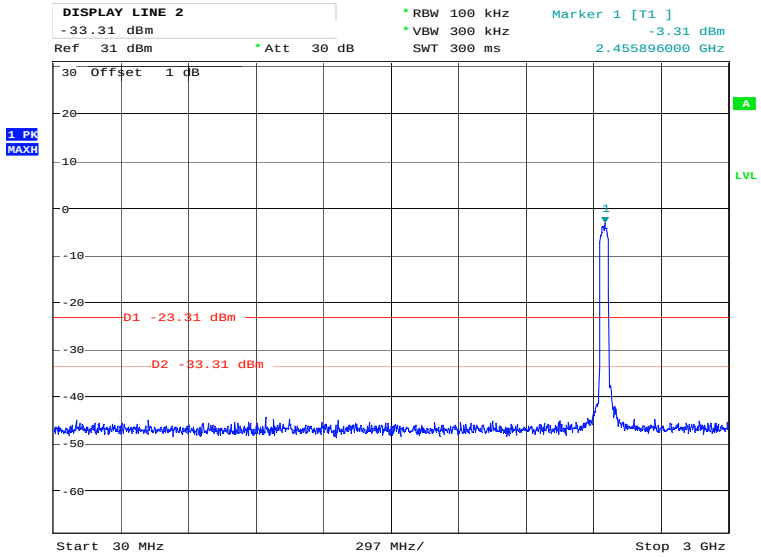


3GHz~15GHz

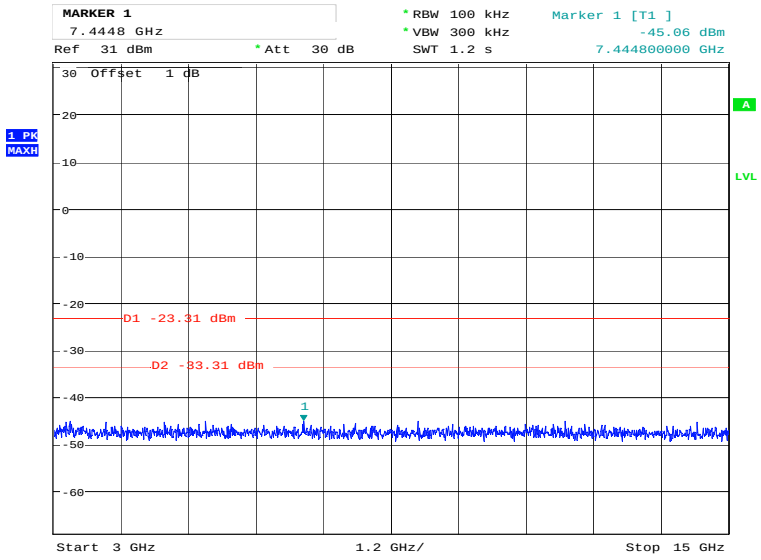


15GHz~25GHz

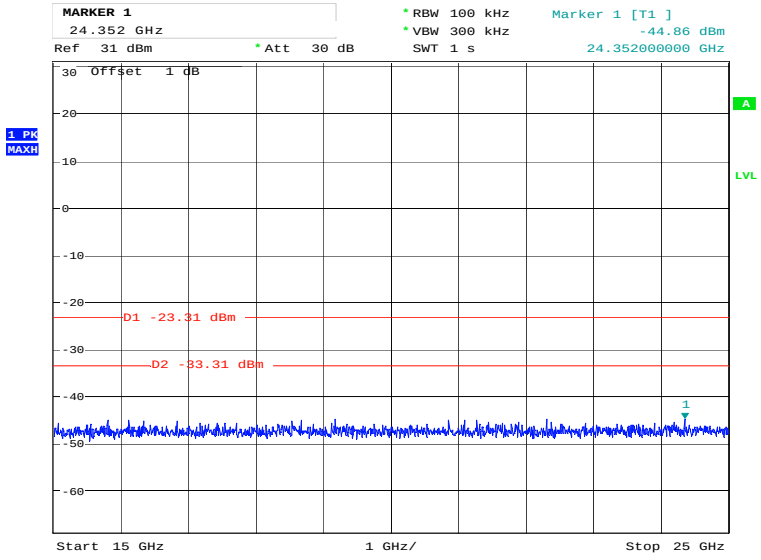
Test Mode:	802.11n(HT40)	Test channel :	09



30MHz~3GHz

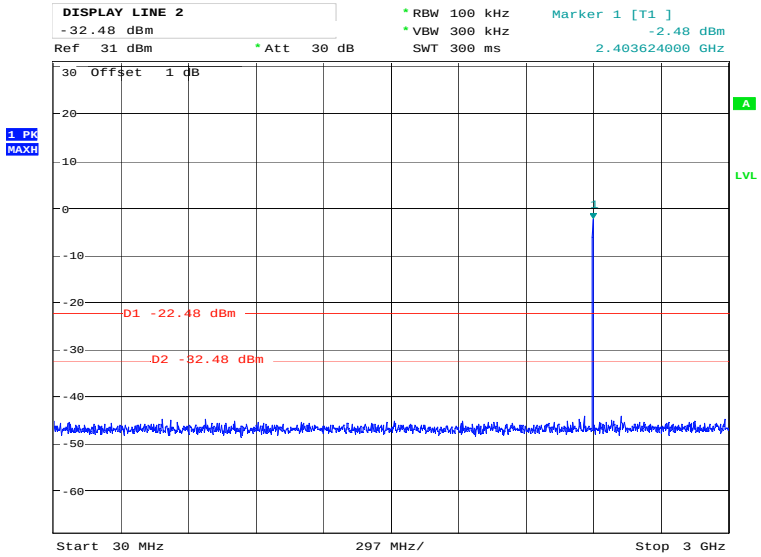


3GHz~15GHz

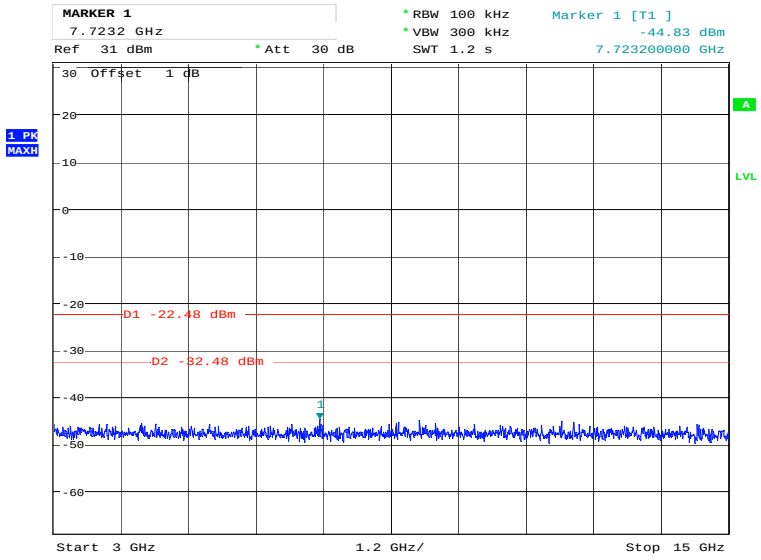


15GHz~25GHz

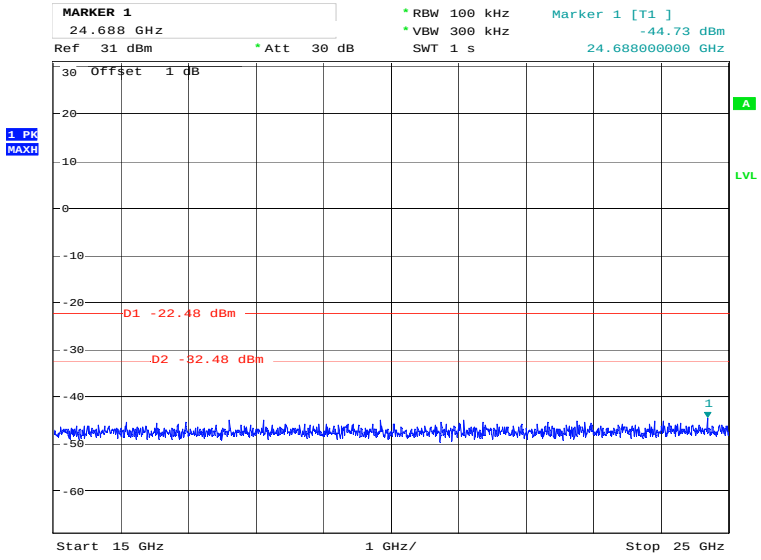
Test Mode:	BT4.0	Test channel :	00



30MHz~3GHz

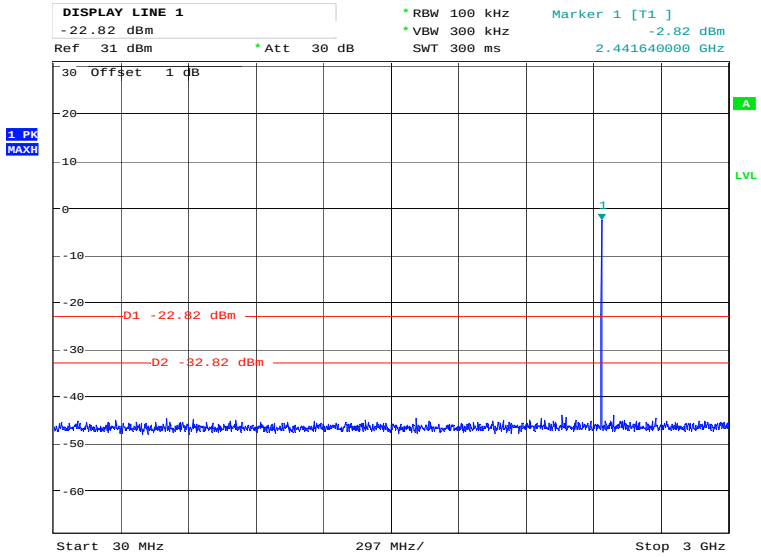


3GHz~15GHz

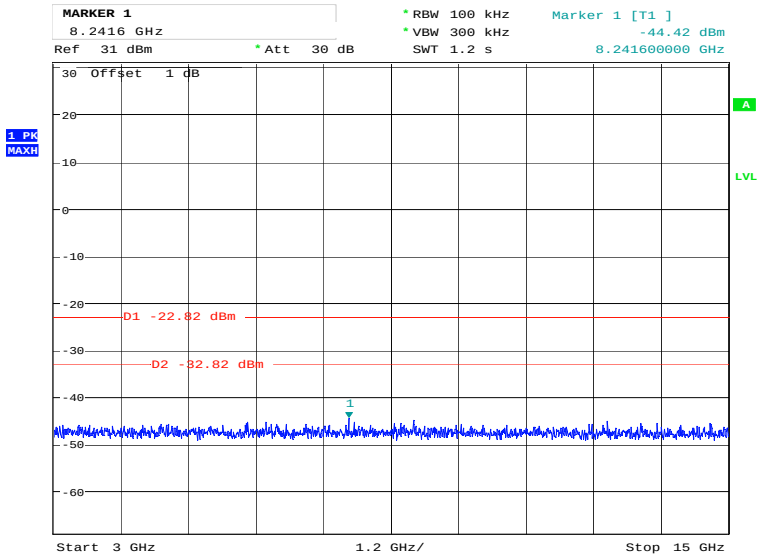


15GHz~25GHz

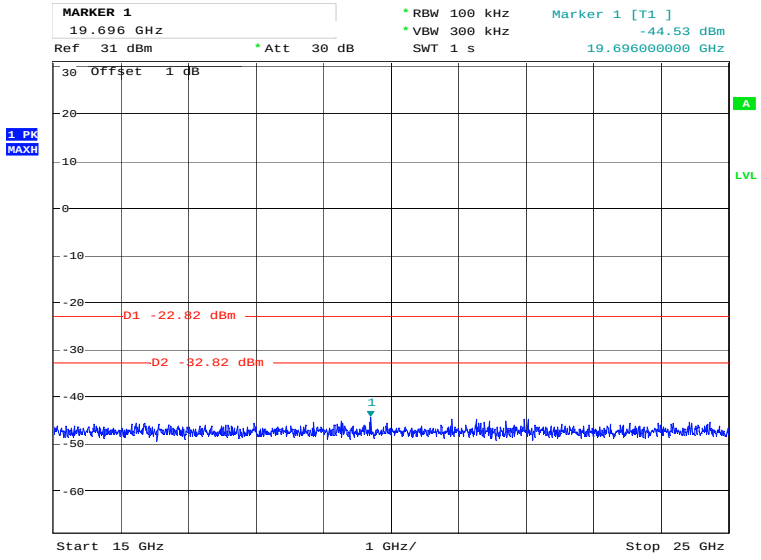
Test Mode:	BT4.0	Test channel :	19



30MHz~3GHz

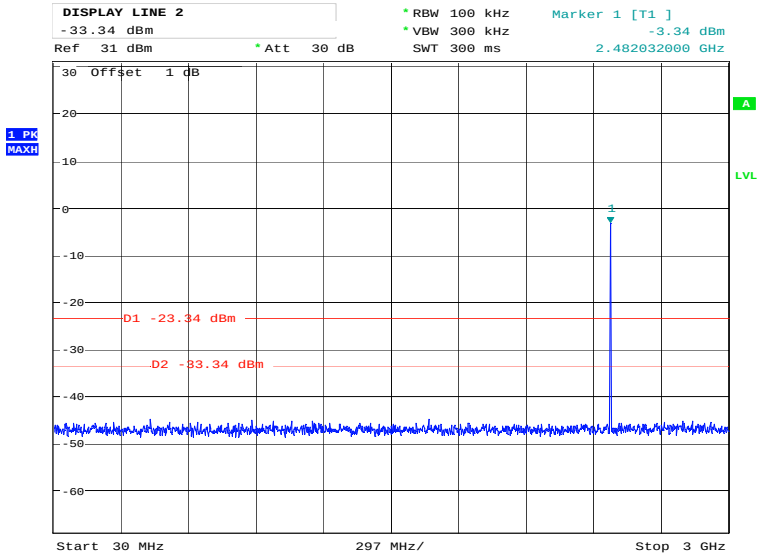


3GHz~15GHz

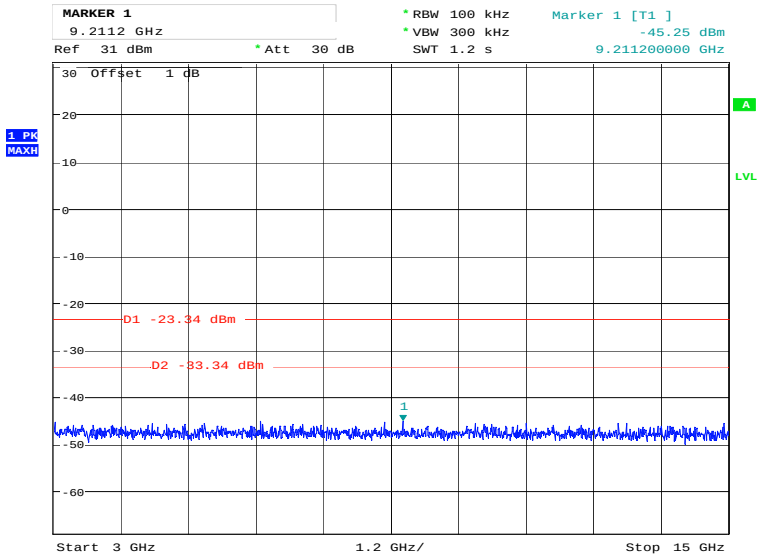


15GHz~25GHz

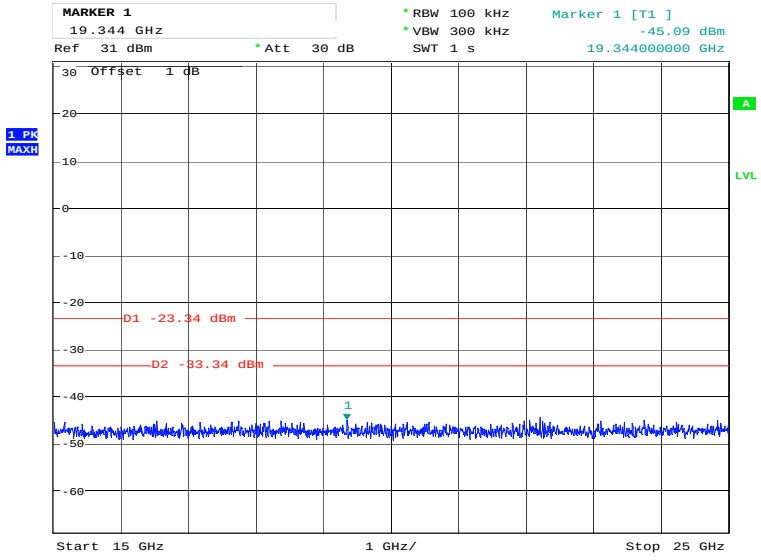
Test Mode:	BT4.0	Test channel :	39



30MHz~3GHz



3GHz~15GHz



15GHz~25GHz

3.8. Antenna Requirement

Standard Applicable

For intentional device, according to FCC 47 CFR Section 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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited

FCC CFR Title 47 Part 15 Subpart C Section 15.247(c) (1) (I):

(i) Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.

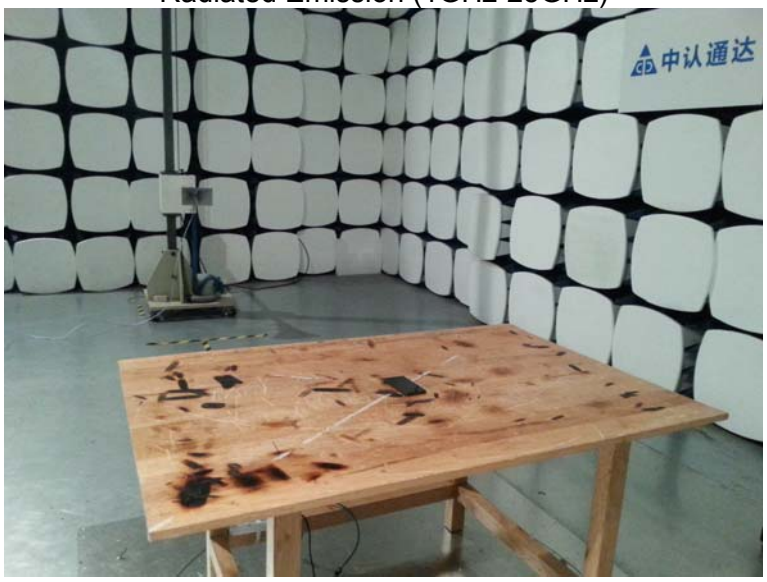
Test Result:

The maximum gain of WIFI/BT antenna was 1.00dBi.

4. EUT TEST PHOTO

Radiated Emission (30MHz-1GHz)

Radiated Emission (1GHz-25GHz)



Conducted Emission

5. PHOTOGRAPHS OF EUT CONSTRUCTIONAL

Please reference to the test report No.: GTI20150167F-1

**********THE END**********