Shenzhen GTI Technology Co., Ltd.

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TEST REPORT

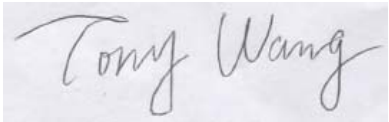
Product Name	:	3G smart phone
Trademark	:	stk
Model/Type reference	:	Sync 5c
Listed Model(s)	:	/
FCC ID	:	**2AE7RSANTOKSYNC5C**
Test Standards	:	**FCC Part 15.247: Operation within the bands 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz**
Applicant	:	Santok Limited
Address of applicant	:	Santok house,Unit L, Braintree Industrial Estate Braintree Road, South Ruislip,Middlesex, HA4 0EJ United Kingdom
Date of Receipt	:	Nov. 13, 2015
Date of Test Date	:	Nov. 16, 2015 - Dec. 03, 2015
Data of issue.	:	Dec. 03, 2015

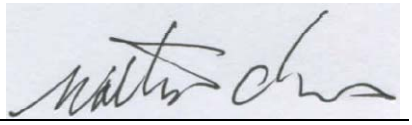
Test result	**Pass ***

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

GENERAL DESCRIPTION OF EUT	
Equipment:	3G smart phone
Model Name:	Sync 5c
Manufacturer:	Santok Limited
Manufacturer Address:	Santok house,Unit L, Braintree Industrial Estate Braintree Road, South Ruislip,Middlesex, HA4 0EJ United Kingdom
Power Rating:	DC 3.7V form 2000mAh by rechargeable battery or DC 5.0V form Input:100-240V~,50/60Hz,0.2A Output: 5.0V⎓1A adapter

Compiled By: 
(Thomas Morgan)

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 C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices

KDB558074 D01 V03r03: 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 Conducted Output Power	PASS
FCC Part 15.247(e)	Power Spectral Density	PASS
FCC Part 15.109/ 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:	3G smart phone
Model/Type reference:	Sync 5c
Power supply:	DC 3.7V from battery
Adapter information :	Model:D12-501000F Input: 100-240V, 50/60Hz 0.2A Output:DC5V⎓1 A
Hardware version:	FS031-MB-V0.3A
Software version:	STK_Sync5c_MY27_20150929_V1.0
WIFI :	
Supported type:	802.11b/802.11g/802.11n(H20)
Modulation:	802.11b: DSSS 802.11g/802.11n(H20): OFDM
Operation frequency:	802.11b/802.11g/802.11n(H20): 2412MHz~2462MHz
Channel number:	802.11b/802.11g/802.11n(H20): 11
Channel separation:	5MHz
Antenna type:	PIFA Antenna
Antenna gain:	-3 dBi

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

Peripherals Devices:

OUTSIDE SUPPORT EQUIPMENT						
No.	Equipment	Model	Serial No.	Manufacture	Trade name	Remark
1.	PC Note	1717-A31	L3-M1102	Lenovo	IBM	N/A
2.	AC adapter	PA-1650-161	Qzp1158	Lenovo	Lenovo	Input: AC 100-240V,50-60Hz Output: DC 20V, 3.25A

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

WIFI Operation Frequency

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

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
Band Edge	11b/DSSS	1 Mbps	1/11
	11g/OFDM	6 Mbps	1/11
	11n(20MHz)/OFDM	6.5Mbps	1/11

2.1. Measurement Instruments List

Maximum Peak Output Power					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSU26	100105	Jan 07,2016

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	R&S	FSU26	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	100658	Jan 07,2016
2	High pass filter	micro-tranics	HPM50111	34202	Jan 07,2016
3	Log-Bicon Antenna	Schwarzbeck	CBL6141A	4180	Jan 07,2016
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	647	Jan 14,2016
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.

2.2. TEST CONDITIONS AND RESULTS

2.3. Conducted Emission (AC Main)

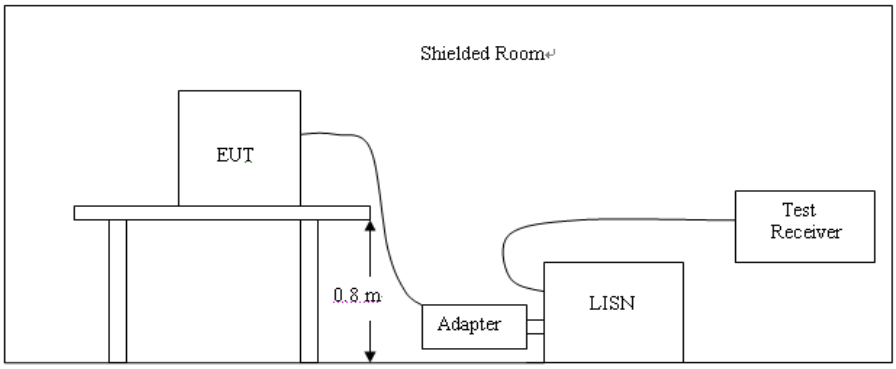
LIMIT

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 C63.10:2013.
2. Support equipment, if needed, was placed as per ANSI C63.10:2013
3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10:2013
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.

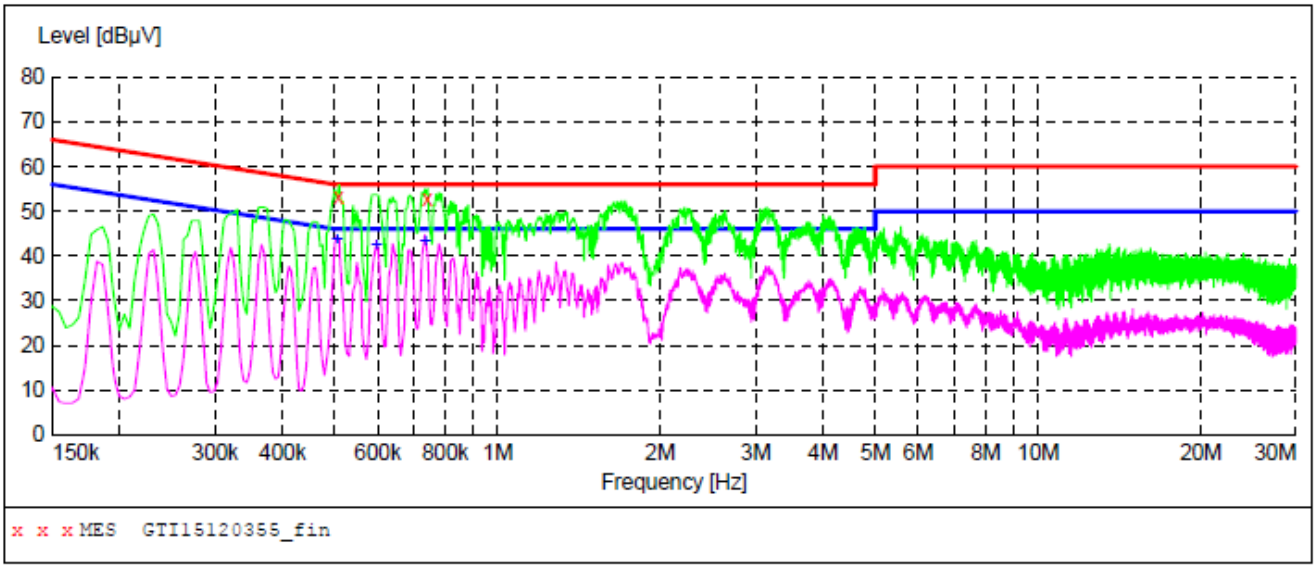
TEST RESULTS

Note: We tested all modes, recorded the worst case at wifi 802.11b mode

LINE	L	Voltage/Frequency	240V/60Hz

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

Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "GTI15120355_fin"

12/3/2015 4:44PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.506000	53.30	9.8	56	2.7	QP	L1	GND
0.740000	52.90	9.9	56	3.1	QP	L1	GND

MEASUREMENT RESULT: "GTI15120355_fin2"

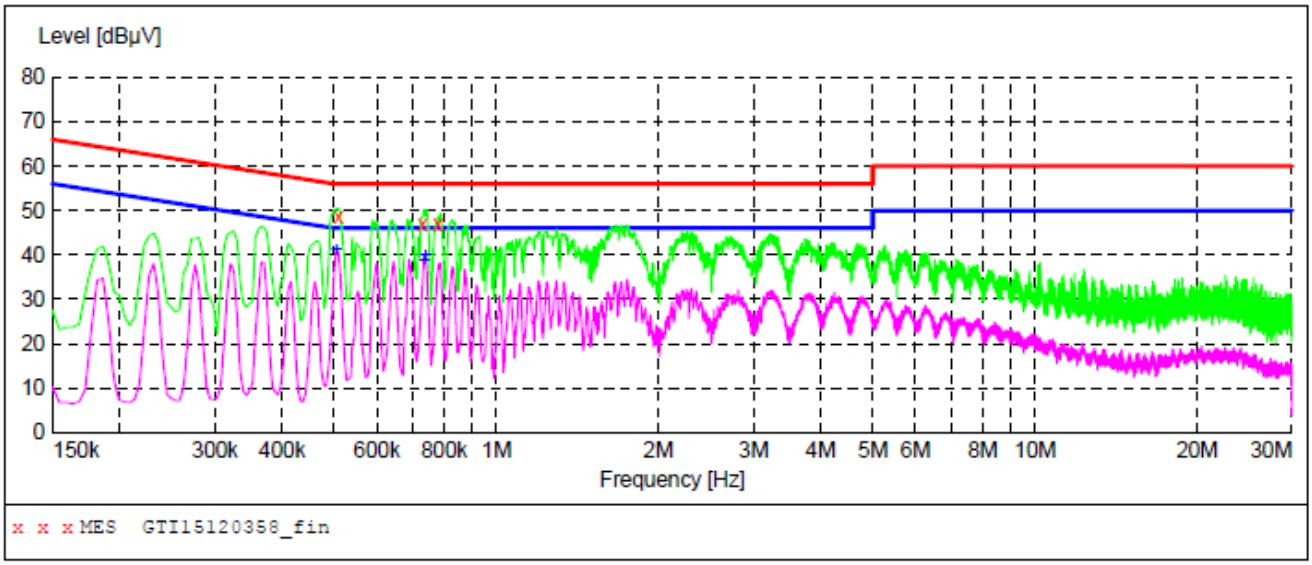
12/3/2015 4:44PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.506000	43.90	9.8	46	2.1	AV	L1	GND
0.596000	42.30	9.8	46	3.7	AV	L1	GND
0.734000	43.30	9.9	46	2.7	AV	L1	GND

LINE	N	Voltage/Frequency	240V/60Hz

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

Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "GTI15120358_fin"

12/3/2015 4:56PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.509000	48.70	9.5	56	7.3	QP	N	GND
0.729500	47.00	9.6	56	9.0	QP	N	GND
0.779000	46.90	9.7	56	9.1	QP	N	GND

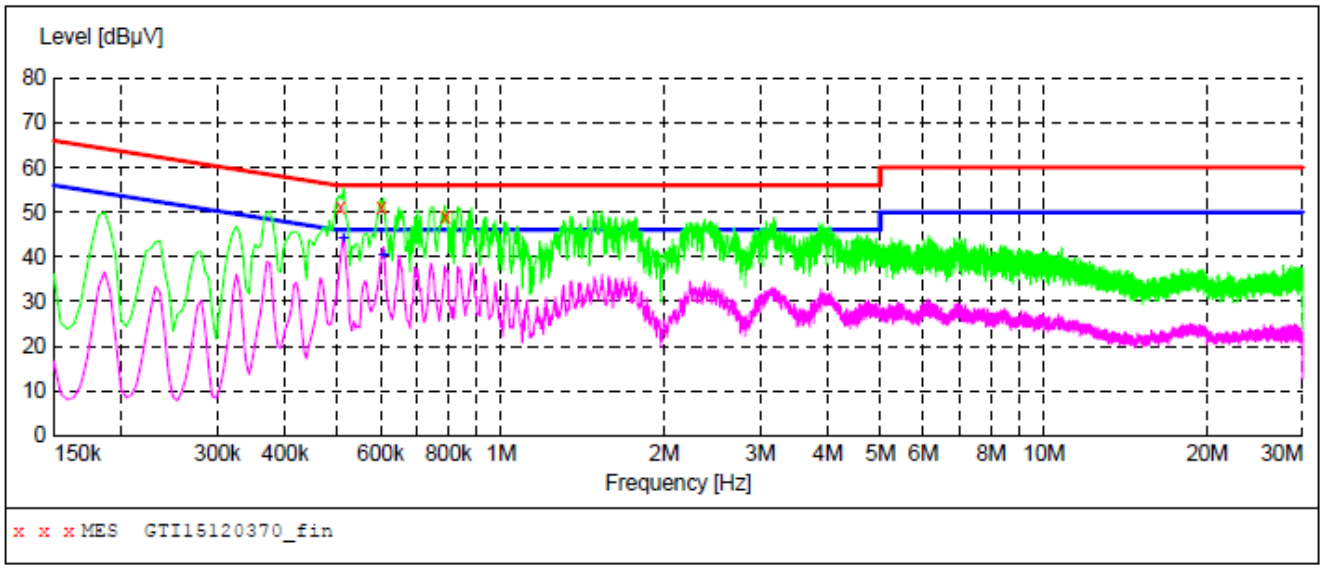
MEASUREMENT RESULT: "GTI15120358_fin2"

12/3/2015 4:56PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.504500	41.00	9.5	46	5.0	AV	N	GND
0.734000	38.50	9.6	46	7.5	AV	N	GND
0.738500	39.80	9.7	46	6.2	AV	N	GND

LINE	L	Voltage/Frequency	120V/60Hz

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



MEASUREMENT RESULT: "GTI15120370_fin"

12/3/2015 1:56PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.506000	51.00	9.8	56	5.0	QP	L1	GND
0.602000	51.20	9.8	56	4.8	QP	L1	GND
0.788000	49.00	9.9	56	7.0	QP	L1	GND

MEASUREMENT RESULT: "GTI15120370_fin2"

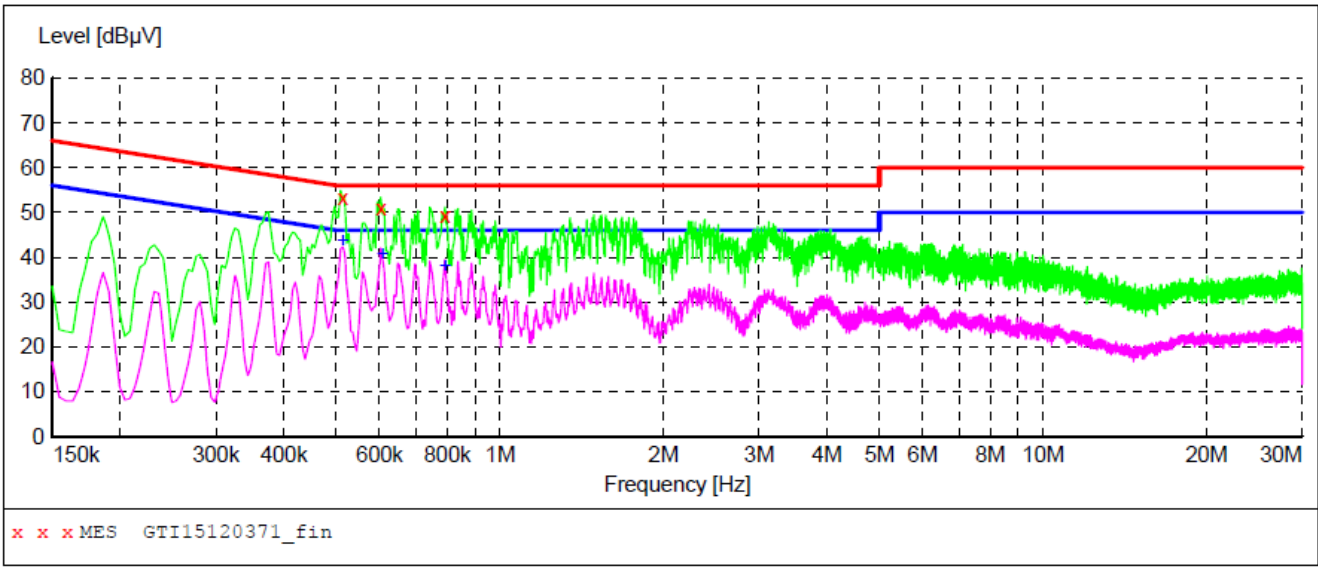
12/3/2015 1:56PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.512000	44.00	9.8	46	2.0	AV	L1	GND
0.608000	40.20	9.8	46	5.8	AV	L1	GND

LINE	N	Voltage/Frequency	120V/60Hz

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

Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "GTI15120371_fin"

12/3/2015 1:58PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.513500	53.30	9.5	56	2.7	QP	N	GND
0.603500	51.10	9.6	56	4.9	QP	N	GND
0.792500	49.20	9.7	56	6.8	QP	N	GND

MEASUREMENT RESULT: "GTI15120371_fin2"

12/3/2015 1:58PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.513500	43.50	9.5	46	2.5	AV	N	GND
0.608000	40.70	9.6	46	5.3	AV	N	GND
0.792500	38.10	9.7	46	7.9	AV	N	GND

2.4. 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

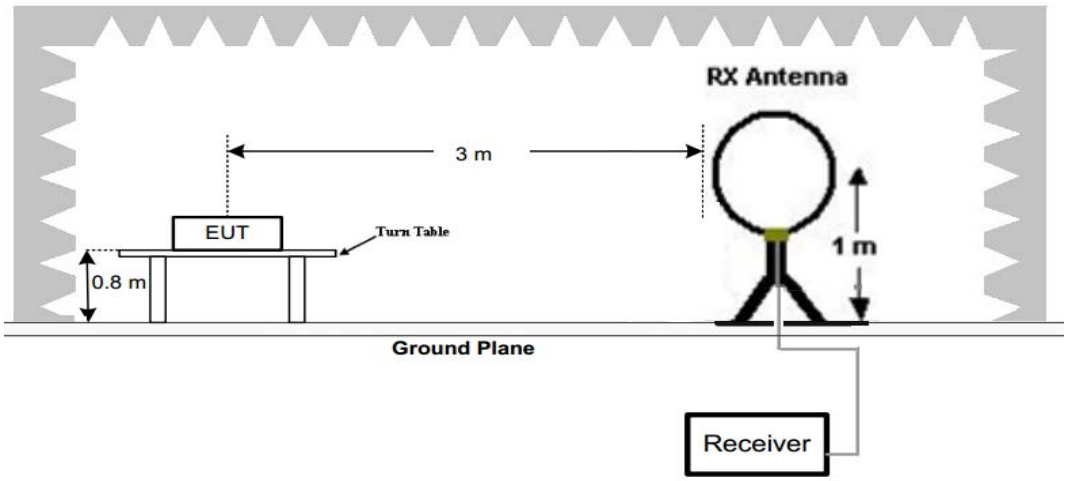
Frequency (MHz)	FS (dBμV/m)	RA (dBμV/m)	AF (dB)	CL (dB)	AG (dB)	Transd (dB)
150.00	40	58.1	12.2	1.6	31.90	-18.1

Transd=AF +CL-AG

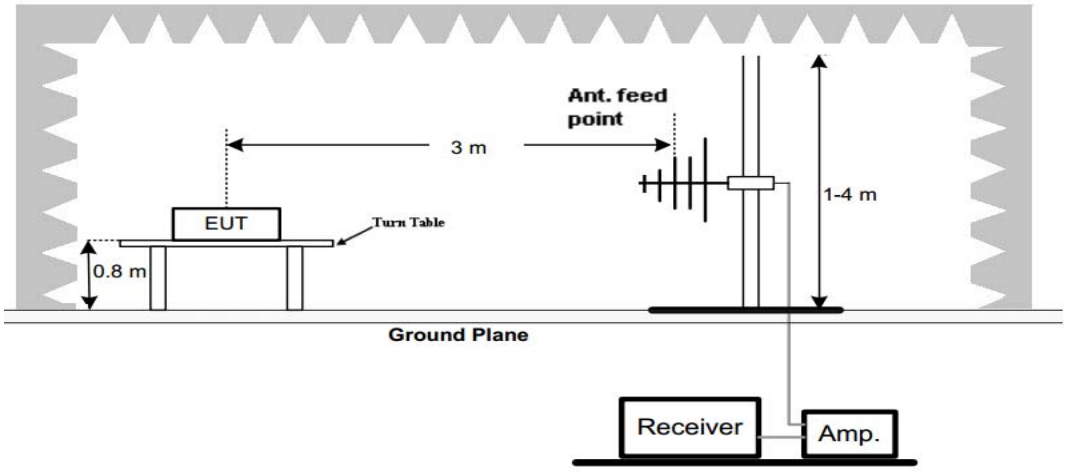
Test Configuration

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

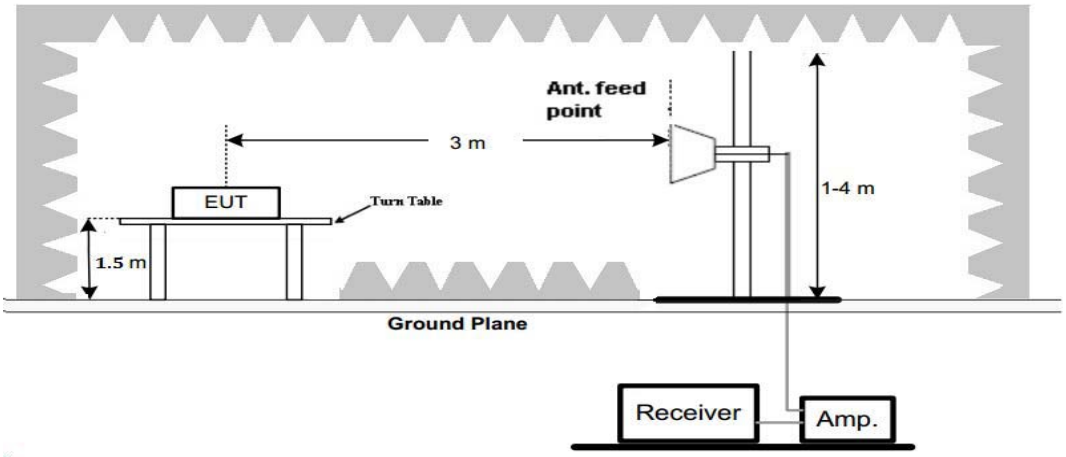
Frequency range 9 KHz – 30MHz



Frequency range 30MHz – 1000MHz



Frequency range above 1GHz-25GHz



Test Results

Remark:

1. We tested three channels for each mode and recorded worst case at low channel of 802.11b Mode below 1GHz

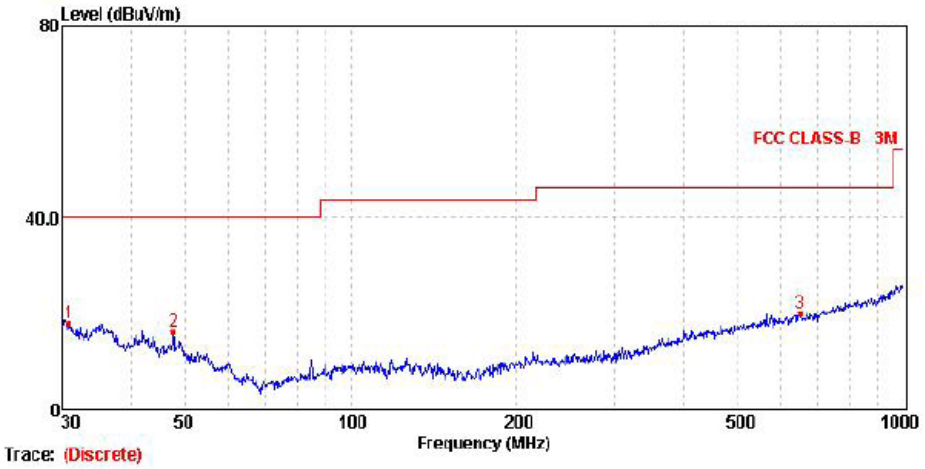
For 9 KHz-30MHz

Frequency (MHz)	Corrected Reading (dBuV/m)@3m	FCC Limit (dBuV/m) @3m	Margin (dB)	Detector	Result
0.25	55.32	99.65	44.33	QP	PASS
1.34	48.39	65.06	16.67	QP	PASS
14.36	31.85	69.54	37.69	QP	PASS
22.58	46.47	69.54	23.07	QP	PASS

For 30MHz-1GHz

For 802.11b Low Channel

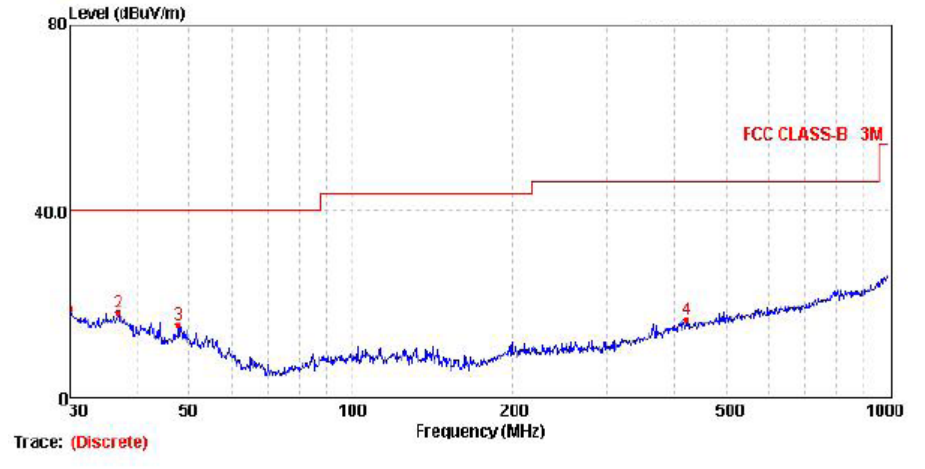
Horizontal



Trace: (Discrete)

Mark	Frequency MHz	Level dBuV/m	Factor dB/m	Reading dBuV	Limit dBuV/m	Margin dB	Polarization	Detector
1	30.96	17.70	-8.89	26.59	40.00	22.30	HORIZONTAL	Peak
2	47.83	15.76	-14.58	30.34	40.00	24.24	HORIZONTAL	Peak
3	649.66	19.65	-9.76	29.41	46.00	26.35	HORIZONTAL	Peak

Vertical



Trace: (Discrete)

Mark	Frequency MHz	Level dBuV/m	Factor dB/m	Reading dBuV	Limit dBuV/m	Margin dB	Polarization	Detector
1	30.11	18.84	-8.49	27.33	40.00	21.16	VERTICAL	Peak
2	36.90	17.78	-11.28	29.06	40.00	22.22	VERTICAL	Peak
3	47.83	15.11	-14.58	29.69	40.00	24.89	VERTICAL	Peak
4	422.06	16.25	-12.84	29.09	46.00	29.75	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	51.44	PK	74.00	22.56	1.00	48	49.34	31.6	7.00	36.5	2.10
1	4824	46.37	AV	54.00	7.63	1.00	48	44.27	31.6	7.00	36.5	2.10
2	7236	46.22	PK	74.00	27.78	1.00	48	35.29	37.33	8.90	35.3	10.93
2	7236	38.39	AV	54.00	15.61	1.00	48	27.46	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	52.69	PK	74.00	21.31	1.00	158	50.59	31.60	7.00	36.50	2.10
1	4824	47.24	AV	54.00	6.76	1.00	158	45.14	31.60	7.00	36.50	2.10
2	7236	44.64	PK	74.00	29.36	1.00	158	33.71	37.33	8.90	35.30	10.93
2	7236	38.50	AV	54.00	15.50	1.00	158	27.57	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	51.98	PK	74.00	22.02	1.00	42	49.86	31.02	7.60	36.5	2.12
1	4874.00	45.73	AV	54.00	8.27	1.00	42	43.61	31.02	7.60	36.5	2.12
2	7311.00	45.62	PK	74.00	28.38	1.00	42	34.54	37.28	8.60	34.8	11.08
2	7311.00	37.07	AV	54.00	16.93	1.00	42	25.99	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	51.36	PK	74.00	22.64	1.00	168	49.24	31.02	7.60	36.5	2.12
1	4874.00	45.76	AV	54.00	8.24	1.00	168	43.64	31.02	7.60	36.5	2.12
2	7311.00	45.13	PK	74.00	28.87	1.00	168	34.05	37.28	8.60	34.8	11.08
2	7311.00	39.85	AV	54.00	14.15	1.00	168	28.77	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	51.60	PK	74.00	22.40	1.00	60	48.40	31.58	7.82	36.2	3.20
1	4924.00	46.42	AV	54.00	7.58	1.00	60	43.22	31.58	7.82	36.2	3.20
2	7386.00	45.39	PK	74.00	28.61	1.00	60	33.45	38.51	8.73	35.3	11.94
2	7386.00	38.41	AV	54.00	15.59	1.00	60	26.47	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	53.29	PK	74.00	20.71	1.00	154	50.09	31.58	7.82	36.2	3.20
1	4924.00	47.02	AV	54.00	6.98	1.00	154	43.82	31.58	7.82	36.2	3.20
2	7386.00	46.79	PK	74.00	27.21	1.00	154	34.85	38.51	8.73	35.3	11.94
2	7386.00	37.52	AV	54.00	16.48	1.00	154	25.58	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	49.79	PK	74.00	24.21	1.00	48	47.69	31.6	7.00	36.5	2.10
1	4824	44.49	AV	54.00	9.51	1.00	48	42.39	31.6	7.00	36.5	2.10
2	7236	43.81	PK	74.00	30.19	1.00	48	32.88	37.33	8.90	35.3	10.93
2	7236	35.31	AV	54.00	18.69	1.00	48	24.38	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	52.58	PK	74.00	21.42	1.00	158	50.48	31.60	7.00	36.50	2.10
1	4824	42.09	AV	54.00	11.91	1.00	158	39.99	31.60	7.00	36.50	2.10
2	7236	46.43	PK	74.00	27.57	1.00	158	35.50	37.33	8.90	35.30	10.93
2	7236	38.94	AV	54.00	15.06	1.00	158	28.01	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	52.06	PK	74.00	21.94	1.00	42	49.94	31.02	7.60	36.5	2.12
1	4874.00	41.76	AV	54.00	12.24	1.00	42	39.64	31.02	7.60	36.5	2.12
2	7311.00	45.33	PK	74.00	28.67	1.00	42	34.25	37.28	8.60	34.8	11.08
2	7311.00	36.36	AV	54.00	17.64	1.00	42	25.28	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	52.55	PK	74.00	21.45	1.00	168	50.43	31.02	7.60	36.5	2.12
1	4874.00	41.90	AV	54.00	12.10	1.00	168	39.78	31.02	7.60	36.5	2.12
2	7311.00	46.11	PK	74.00	27.89	1.00	168	35.03	37.28	8.60	34.8	11.08
2	7311.00	36.99	AV	54.00	17.01	1.00	168	25.91	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	52.28	PK	74.00	21.72	1.00	168	49.08	31.58	7.82	36.2	3.20
1	4924.00	43.05	AV	54.00	10.95	1.00	168	39.85	31.58	7.82	36.2	3.20
2	7386.00	46.36	PK	74.00	27.64	1.00	168	34.42	38.51	8.73	35.3	11.94
2	7386.00	37.08	AV	54.00	16.92	1.00	168	25.14	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	51.83	PK	74.00	22.17	1.00	154	48.63	55.70	7.82	36.2	3.20
1	4924.00	42.13	AV	54.00	11.87	1.00	154	38.93	49.20	7.82	36.2	3.20
2	7386.00	47.30	PK	74.00	26.70	1.00	154	35.36	50.45	8.73	35.3	11.94
2	7386.00	37.83	AV	54.00	16.17	1.00	154	25.89	41.28	8.73	35.3	11.94

802.11n20 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	49.40	PK	74.00	24.60	1.00	36	47.30	31.6	7.00	36.5	2.10
1	4824	41.75	AV	54.00	12.25	1.00	36	39.65	31.6	7.00	36.5	2.10
2	7236	44.42	PK	74.00	29.58	1.00	36	33.49	37.33	8.90	35.3	10.93
2	7236	35.74	AV	54.00	18.26	1.00	36	24.81	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	51.35	PK	74.00	22.65	1.00	143	49.25	31.60	7.00	36.50	2.10
1	4824	42.42	AV	54.00	11.58	1.00	143	40.32	31.60	7.00	36.50	2.10
2	7236	43.62	PK	74.00	30.38	1.00	143	32.69	37.33	8.90	35.30	10.93
2	7236	38.89	AV	54.00	15.11	1.00	143	27.96	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	49.89	PK	74.00	24.11	1.00	36	47.77	56.38	7.60	36.5	2.12
1	4874.00	41.29	AV	54.00	12.71	1.00	36	39.17	48.60	7.60	36.5	2.12
2	7311.00	45.15	PK	74.00	28.85	1.00	36	34.07	51.34	8.60	34.8	11.08
2	7311.00	36.45	AV	54.00	17.55	1.00	36	25.37	43.25	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	49.94	PK	74.00	24.06	1.00	173	47.82	31.02	7.60	36.5	2.12
1	4874.00	42.87	AV	54.00	11.13	1.00	173	40.75	31.02	7.60	36.5	2.12
2	7311.00	45.52	PK	74.00	28.48	1.00	173	34.44	37.28	8.60	34.8	11.08
2	7311.00	36.06	AV	54.00	17.94	1.00	173	24.98	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	50.22	PK	74.00	23.78	1.00	178	47.02	31.58	7.82	36.2	3.20
1	4924.00	42.67	AV	54.00	11.33	1.00	178	39.47	31.58	7.82	36.2	3.20
2	7386.00	45.13	PK	74.00	28.87	1.00	178	33.19	38.51	8.73	35.3	11.94
2	7386.00	36.92	AV	54.00	17.08	1.00	178	24.98	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	50.38	PK	74.00	23.62	1.00	148	47.18	31.58	7.82	36.2	3.20
1	4924.00	42.21	AV	54.00	11.79	1.00	148	39.01	31.58	7.82	36.2	3.20
2	7386.00	47.44	PK	74.00	26.56	1.00	148	35.50	38.51	8.73	35.3	11.94
2	7386.00	37.56	AV	54.00	16.44	1.00	148	25.62	38.51	8.73	35.3	11.94

2.5. Maximum Conducted Output Power

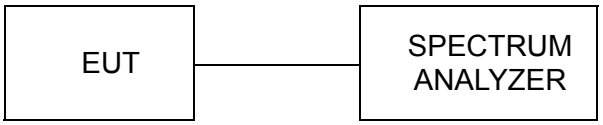
Limit

30dBm for digital modulation systems.

Test Procedure

- For Maximum conducted (average) output power
  1. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the SPECTRUM.
  2. Ensure EUT transmitting with a duty cycle ≥ 98 %.
  3. Set SA as fellow:
     a) Center frequency: frequency to be tested.
     b) Span: ≥1.5 times the OBW.
     c) RBW:= 1-5% of the OBW, not to exceed 1 MHz.
     d) VBW: ≥ 3 x RBW.
     e) Sweep points: 8001
     f) Sweep time: auto
     g) Detector: RMS
     h) Trace: Average(100 traces)
  4. Allow trace to fully stabilize
  5. Use instrument's band power measurement function to integrate power in this band across a bandwidth OBW.
     Note: OBW test data please see the section 3.6

Test Configuration



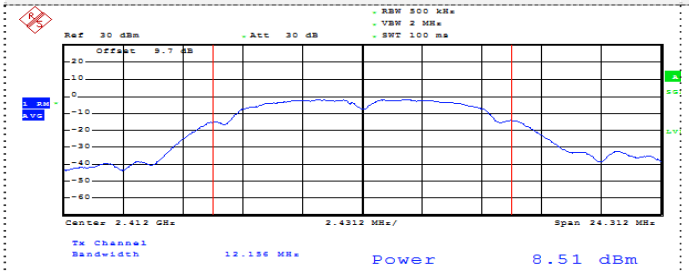
Test Results

WIFI

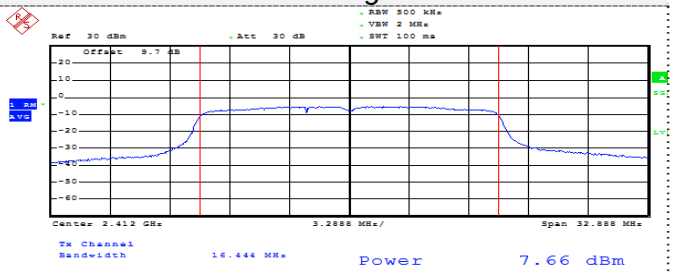
Type	Channel	Output power AV(dBm)	Limit (dBm)	Result
802.11b	01	8.51	30.00	Pass
	06	9.32		
	11	7.86		
802.11g	01	7.66	30.00	Pass
	06	8.61		
	11	7.26		
802.11n(H20)	01	6.69	30.00	Pass
	06	7.88		
	11	6.18		

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

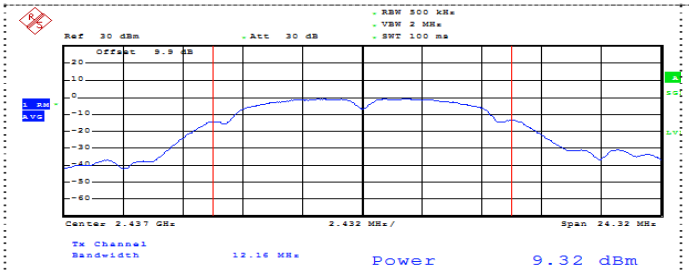
802.11b



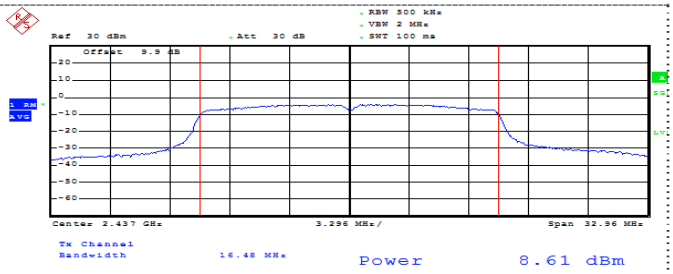
802.11g



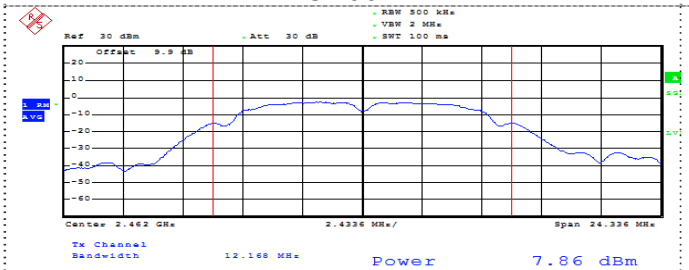
CH01



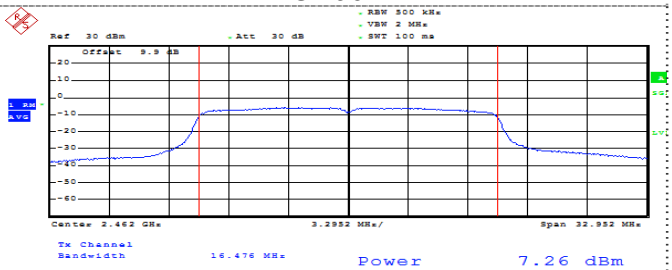
CH01



CH06



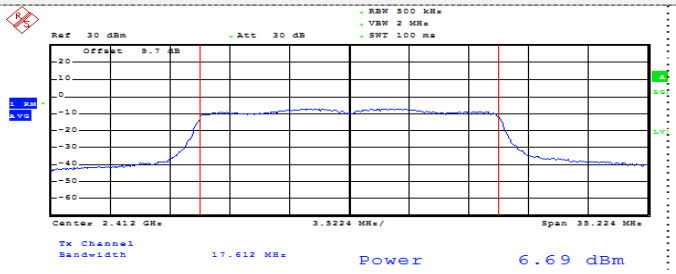
CH06



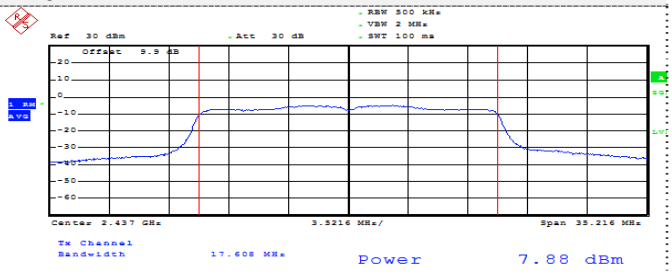
CH11

CH11

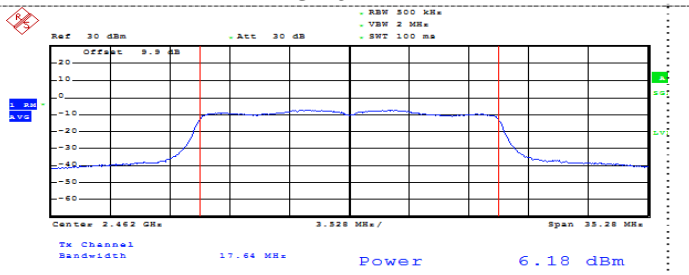
802.11n20



CH01



CH06



CH11

2.6. Power Spectral Density

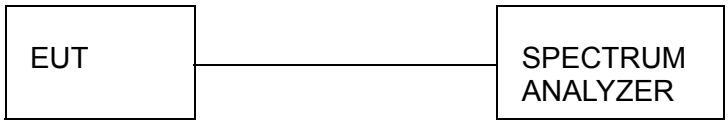
Limit

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

- Use this procedure when the maximum (average) conducted output power was used to demonstrate compliance to the output power limit.
  1. Set analyzer center frequency to DTS channel center frequency.
  2. Set span to at least 1.5 times the OBW
  3. RBW: 3 kHz ≤ RBW ≤ 100 kHz.
  4. VBW: ≥3 x RBW.
  5. Detector: power averaging (RMS)
  6. Sweep time: Auto couple.
  7. Swoop points: ≥ 8001.
  8. Trace mode = Average (100 traces)
  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.
      Note: The OBW test data please see the section 3.5

Test Configuration



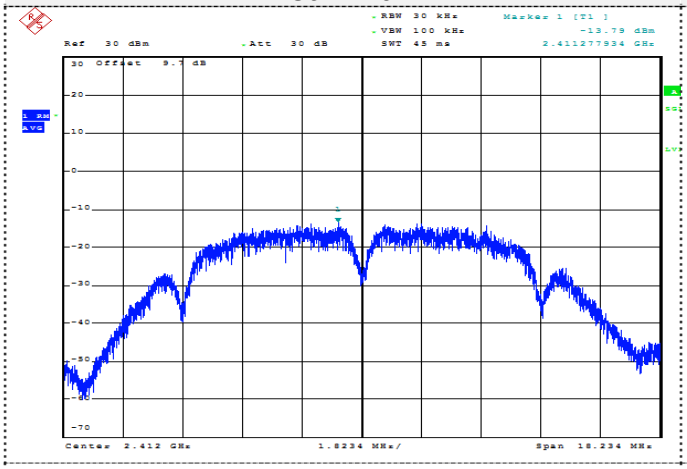
Test Results

WIFI

Type	Channel	Power Spectral Density (dBm/30KHz)	Limit (dBm/3KHz)	Result
802.11b	01	-13.79	8.00	Pass
	06	-12.40		
	11	-14.42		
802.11g	01	-16.14	8.00	Pass
	06	-13.73		
	11	-16.27		
802.11n(HT20)	01	-18.85	8.00	Pass
	06	-16.58		
	11	-19.82		

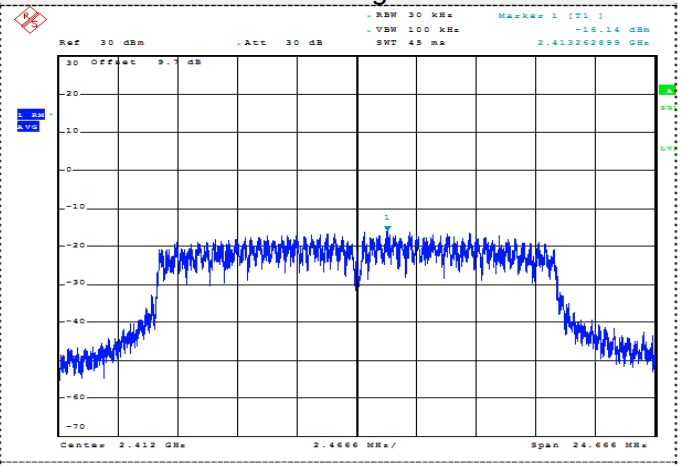
Test plot as follows:

802.11b

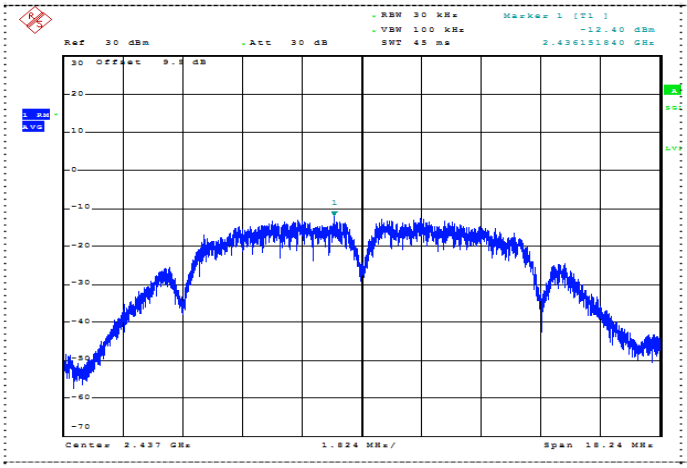


CH01

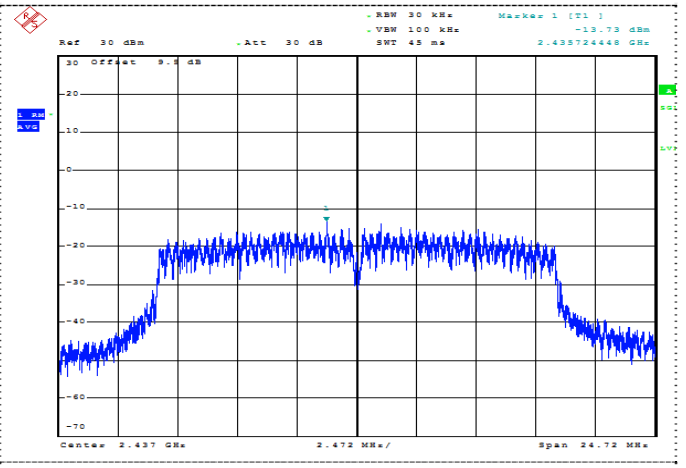
802.11g



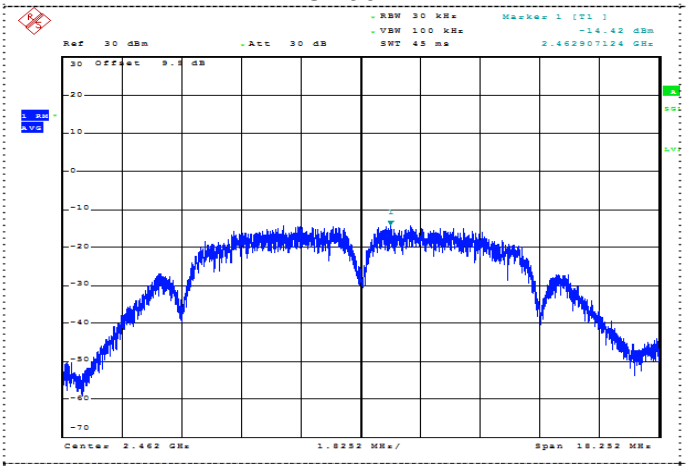
CH01



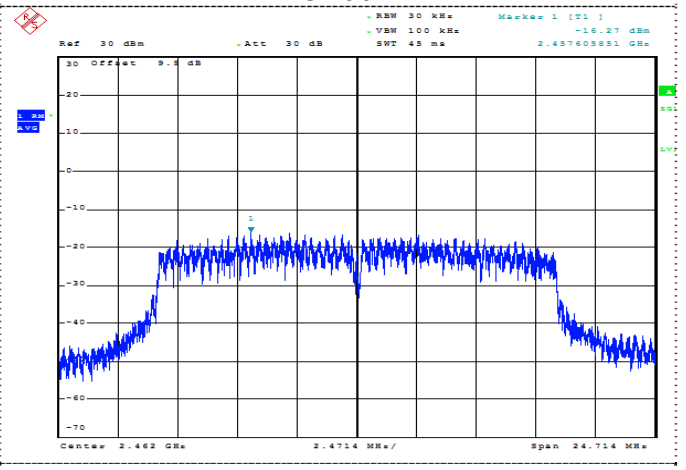
CH06



CH06

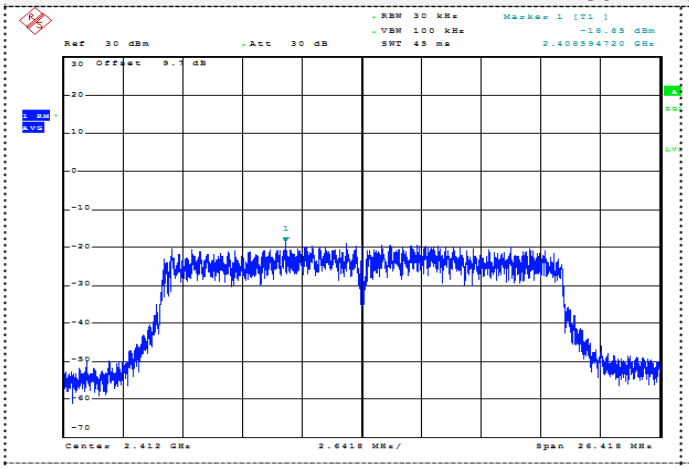


CH11

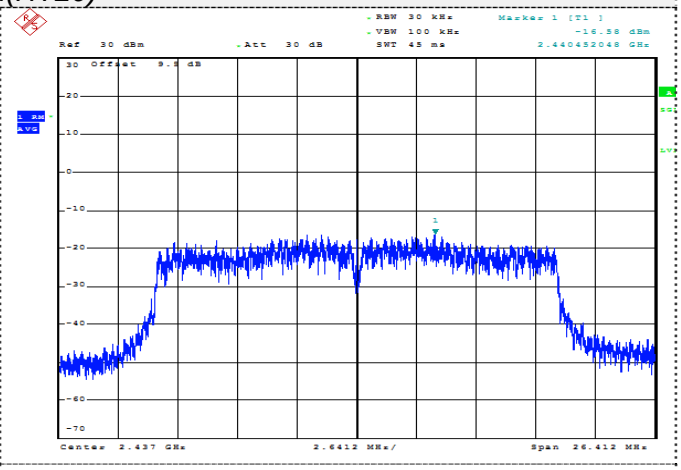


CH11

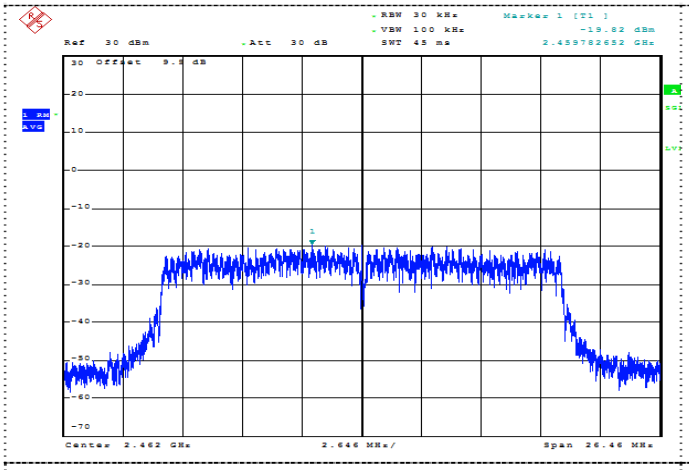
802.11n(HT20)



CH01



CH06



CH11

2.7. 6dB Bandwidth

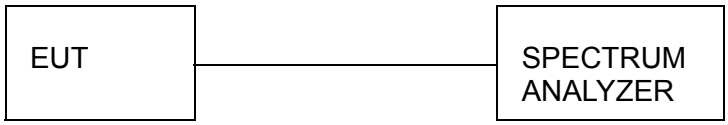
Limit

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

Test Procedure

1. The transmitter output was connected to the spectrum analyzer.
2. Set SA as follow:
   a) RBW: 100 kHz.
   b) VBW: ≥ 3 × RBW.
   c) Detector: Peak.
   d) Trace mode: max hold.
   e) Sweep: auto couple.
3. Allow the trace to stabilize.
4. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

Test Configuration



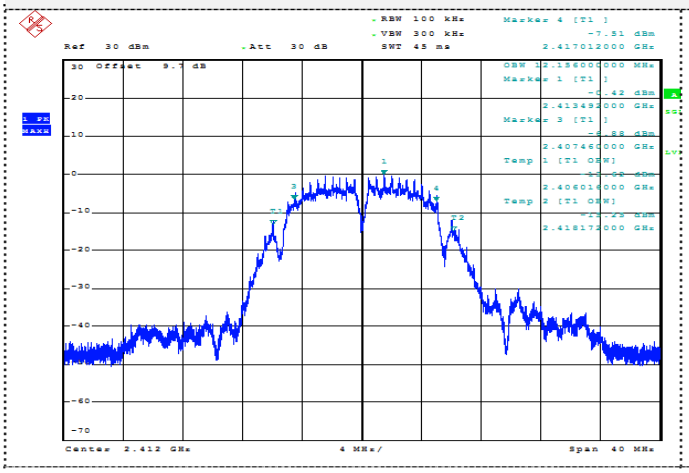
Test Results

WIFI

Type	Channel	6dB Bandwidth (MHz)	99% OBW (MHz)	Limit (KHz)	Result
802.11b	01	9.552	12.156	≥500	Pass
	06	9.064	12.160		
	11	9.560	12.168		
802.11g	01	15.480	16.444	≥500	Pass
	06	15.100	16.480		
	11	15.340	16.476		
802.11n(HT20)	01	16.544	17.612	≥500	Pass
	06	16.260	17.608		
	11	17.064	17.640		

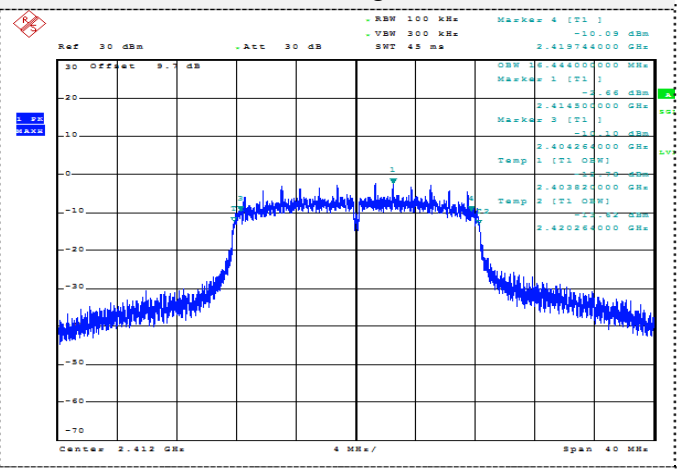
Test plot as follows:

802.11b

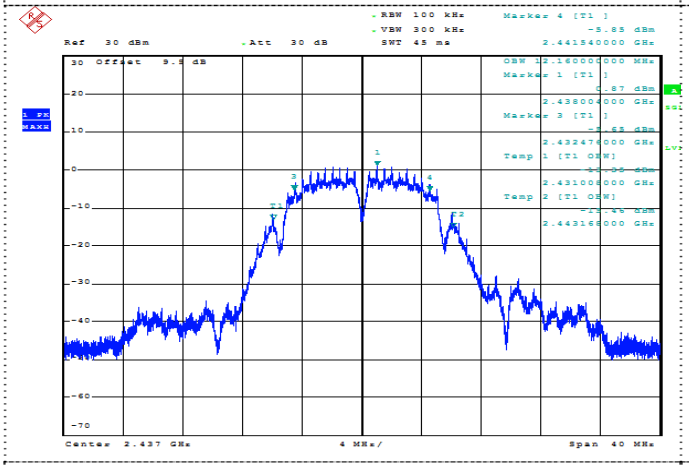


CH01

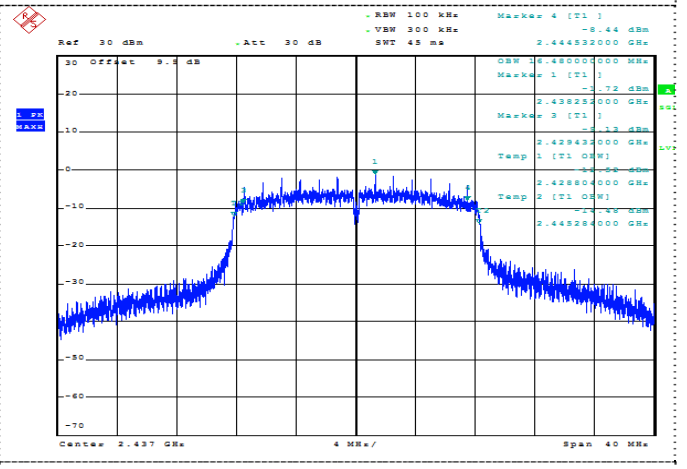
802.11g



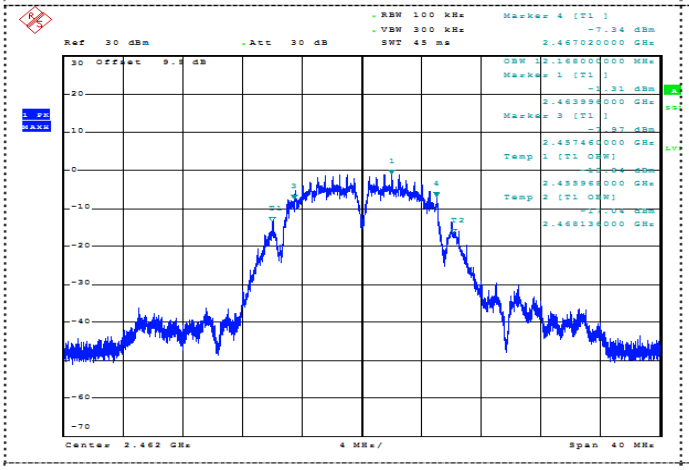
CH01



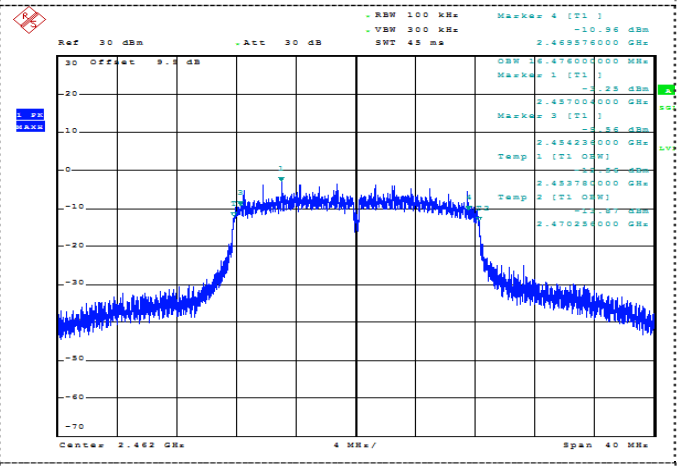
CH06



CH06

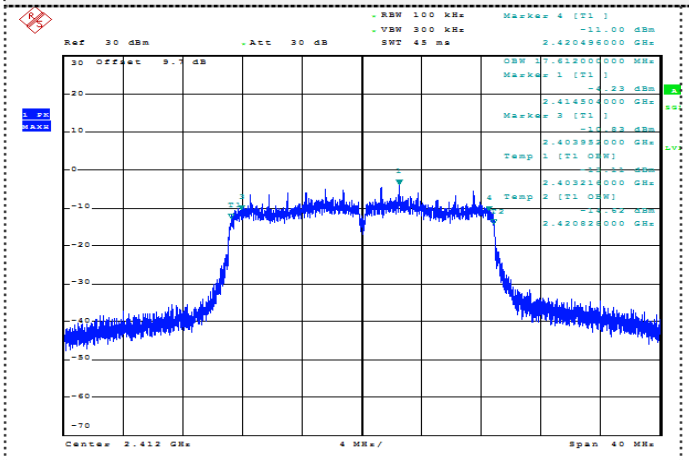


CH11

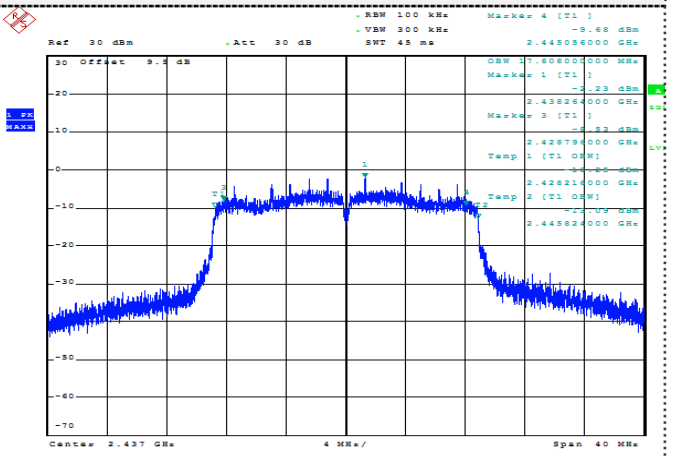


CH11

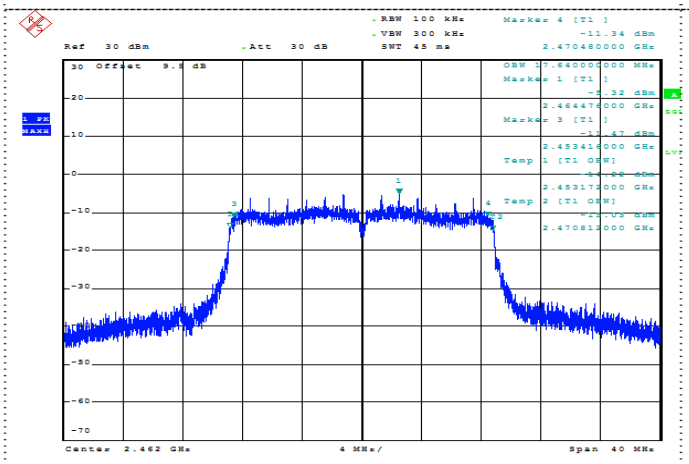
802.11n(HT20)



CH01



CH06



CH11

2.8. 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)).

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

- Use this procedure when the maximum (average) conducted output power was used to demonstrate compliance to the output power limit.
  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, VBW=300 kHz, Detector=RMS, Sweep point=≥8001, Sweep time=Auto, trace= Average(100 traces)
  4. Marker the highest point which fall into restricted frequency bands
  5. Repeat above procedures until all measured frequencies were complete.

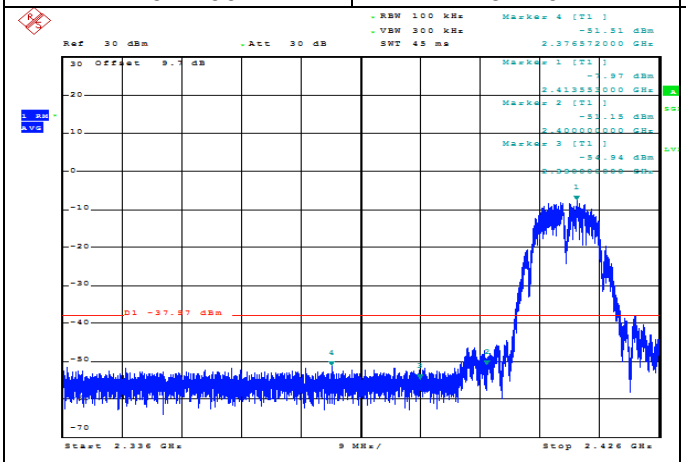
Test Procedure tor radiated method

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.

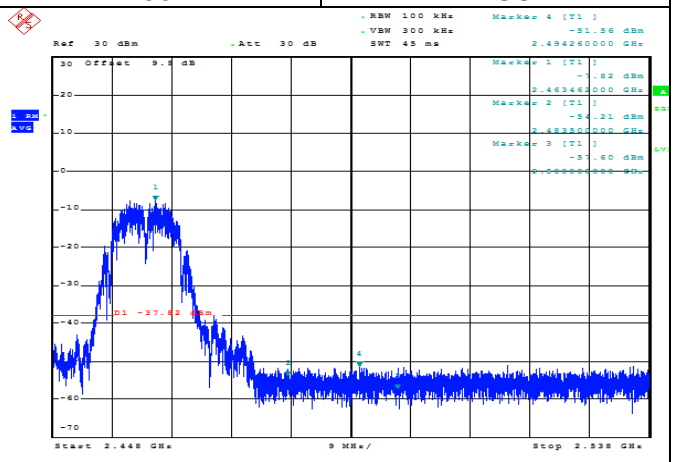
Test Results

A. Conducted measurements

802.11b			
Frequency (MHz)	**Delta Peak to Band emission (dBc)**	**Limit (dBc)**	**Verdict**
2376.572	43.540	30	PASS
2494.260	43.740	30	PASS

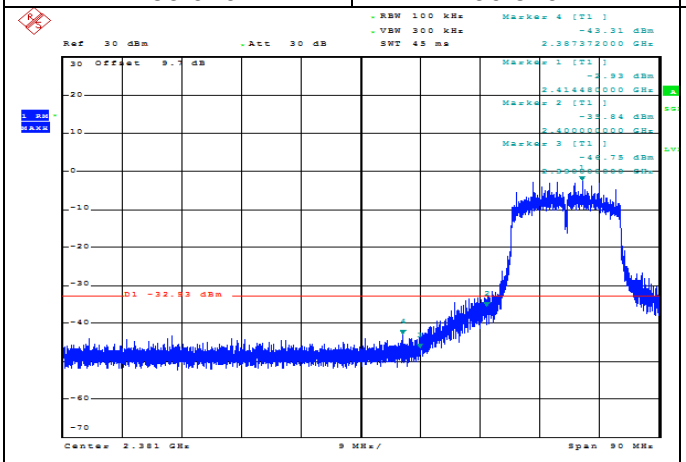


2412

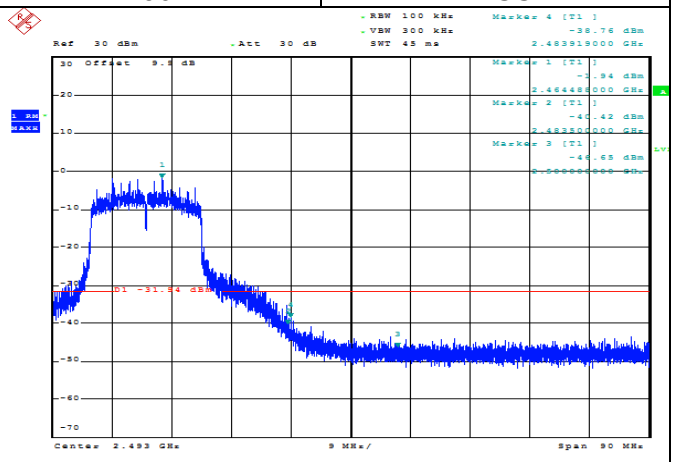


2462

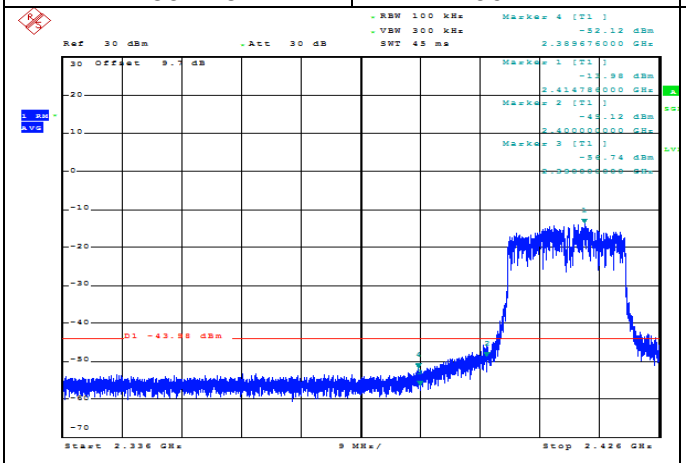
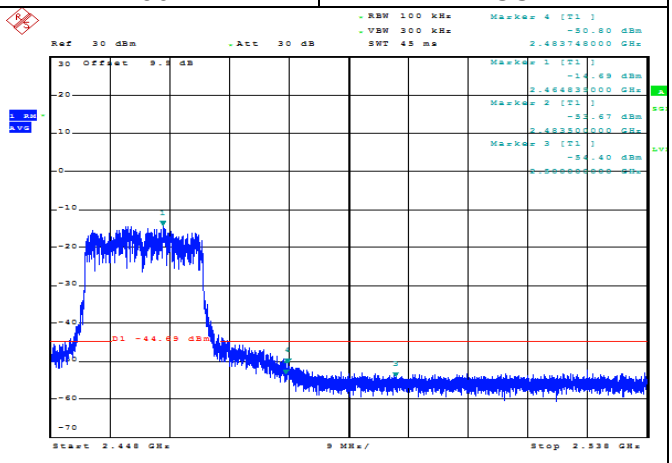
802.11g			
Frequency (MHz)	**Delta Peak to Band emission (dBc)**	**Limit (dBc)**	**Verdict**
2387.372	40.381	30	PASS
2483.919	36.819	30	PASS



2412



2462

802.11n20			
Frequency (MHz)	**Delta Peak to Band emission (dBc)**	**Limit (dBc)**	**Verdict**
2389.676	38.140	30	PASS
2483.748	36.114	30	PASS
			
2412		2462	

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	54.62	PK	74.00	19.38	1.00	49	59.93	27.49	3.32	36.12	-5.31
2390.00	46.37	AV	54.00	7.63	1.00	49	51.68	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	54.42	PK	74.00	19.58	1.00	220	59.73	27.49	3.32	36.12	-5.31
2390.00	41.93	AV	54.00	12.07	1.00	220	47.24	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	54.94	PK	74.00	19.06	1.00	54	60.66	27.45	3.38	36.55	-5.72
2483.50	45.22	AV	54.00	8.78	1.00	54	50.94	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	52.41	PK	74.00	21.59	1.00	210	58.13	27.45	3.38	36.55	-5.72
2483.50	43.52	AV	54.00	10.48	1.00	210	49.24	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	54.69	PK	74.00	19.31	1.00	44	60.00	27.49	3.32	36.12	-5.31
2390.00	43.76	AV	54.00	10.24	1.00	44	49.07	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	52.31	PK	74.00	21.69	1.00	215	57.62	27.49	3.32	36.12	-5.31
2390.00	44.70	AV	54.00	9.30	1.00	215	50.01	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	54.07	PK	74.00	19.93	1.00	54	59.79	27.45	3.38	36.55	-5.72
2483.50	44.52	AV	54.00	9.48	1.00	54	50.24	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	54.14	PK	74.00	19.86	1.00	230	59.86	27.45	3.38	36.55	-5.72
2483.50	43.12	AV	54.00	10.88	1.00	230	48.84	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	54.03	PK	74.00	19.97	1.00	69	59.34	27.49	3.32	36.12	-5.31
2390.00	44.14	AV	54.00	9.86	1.00	69	49.45	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	52.68	PK	74.00	21.32	1.00	232	57.99	27.49	3.32	36.12	-5.31
2390.00	44.33	AV	54.00	9.67	1.00	232	49.64	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	54.45	PK	74.00	19.55	1.00	64	60.17	27.45	3.38	36.55	-5.72
2483.50	43.27	AV	54.00	10.73	1.00	64	48.99	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	53.96	PK	74.00	20.04	1.00	240	59.68	27.45	3.38	36.55	-5.72
2483.50	43.2	AV	54.00	10.80	1.00	240	48.92	27.45	3.38	36.55	-5.72

2.9. Spurious RF Conducted Emission

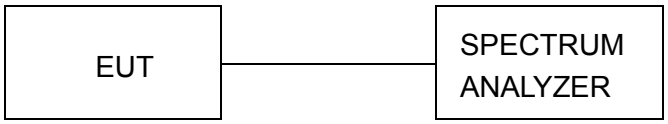
Limit

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 C63.10:2013 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

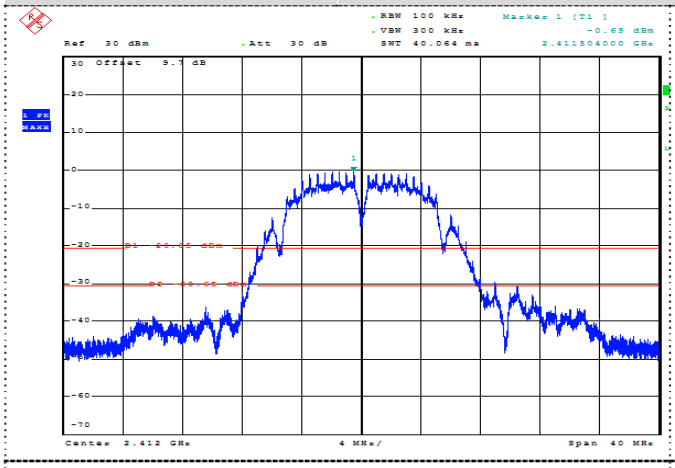


Test Results

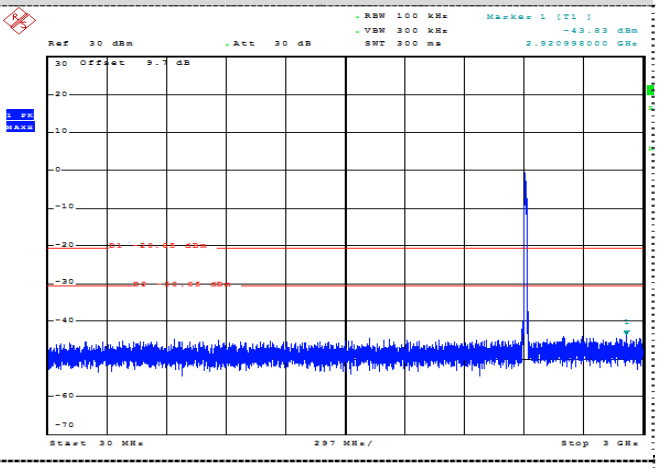
Remark: The measurement frequency range is from 30MHz to the 10th harmonic of the fundamental frequency. The lowest, middle and highest channels are tested to verify the spurious emissions and bandage measurement data.

Test plot as follows:

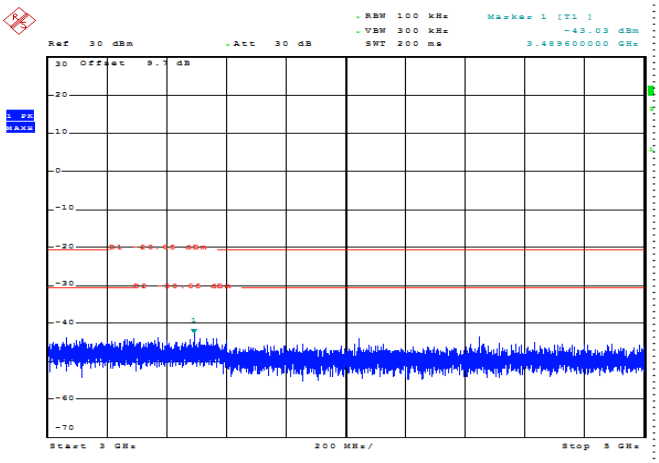
Test Mode:	802.11b	Test channel :	01



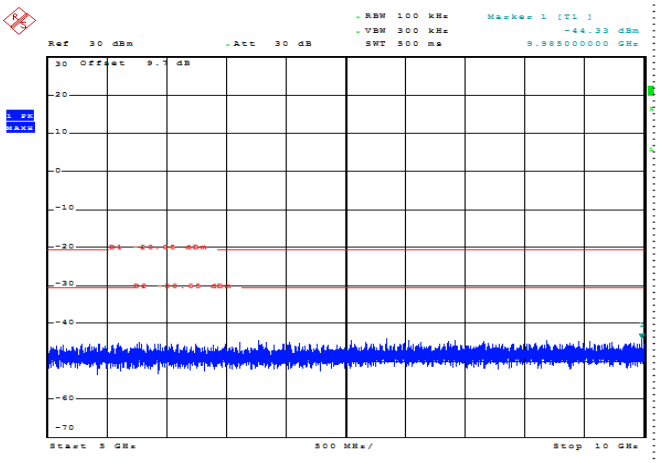
Reference level



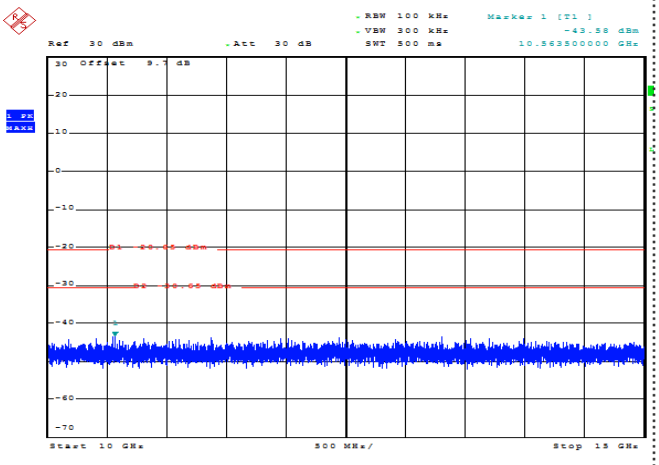
30MHz-3GHz



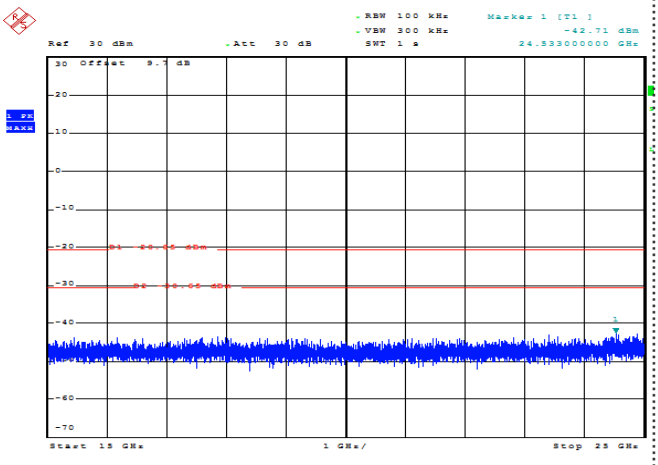
3GHz-5GHz



5GHz-10GHz

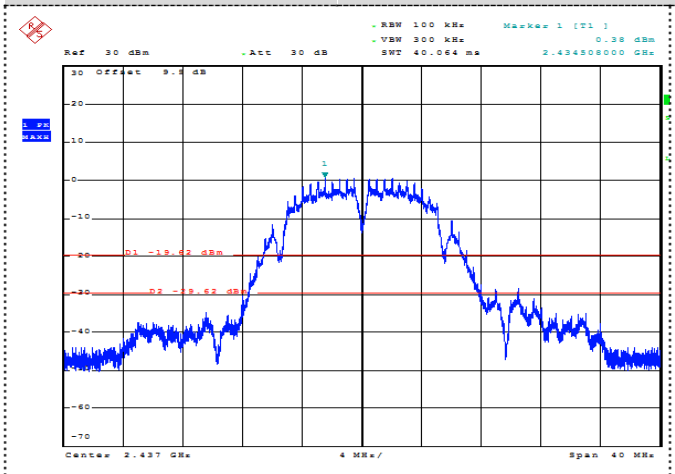


10GHz-15GHz

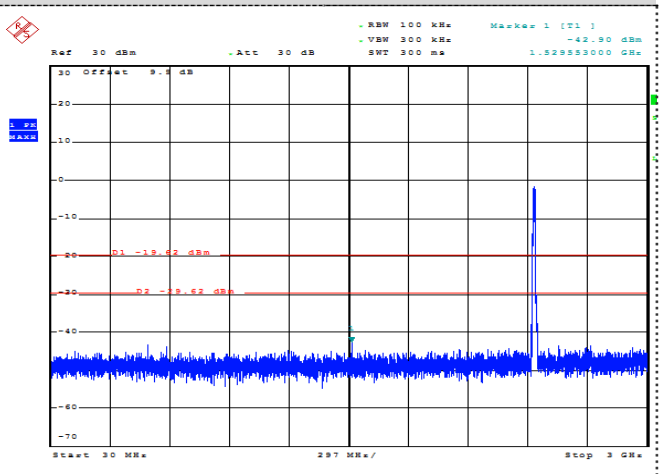


15GHz-25GHz

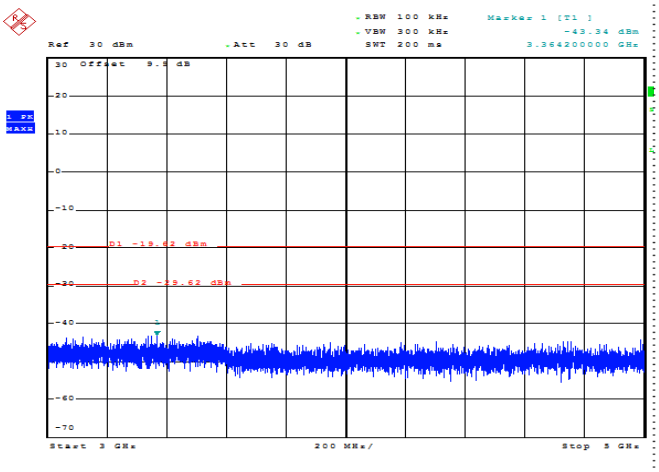
Test Mode:	802.11b	Test channel :	06



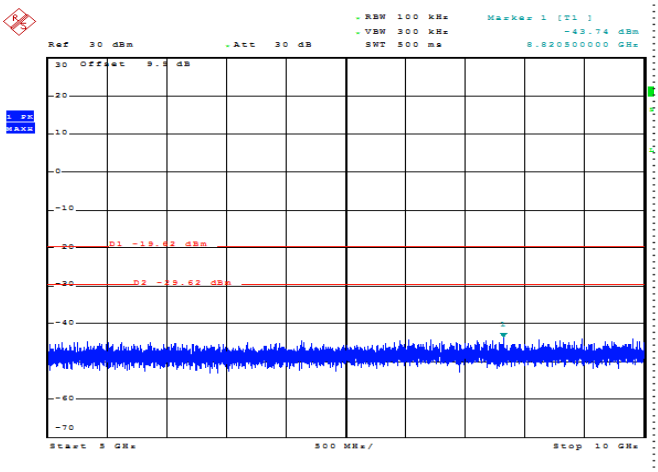
Reference level



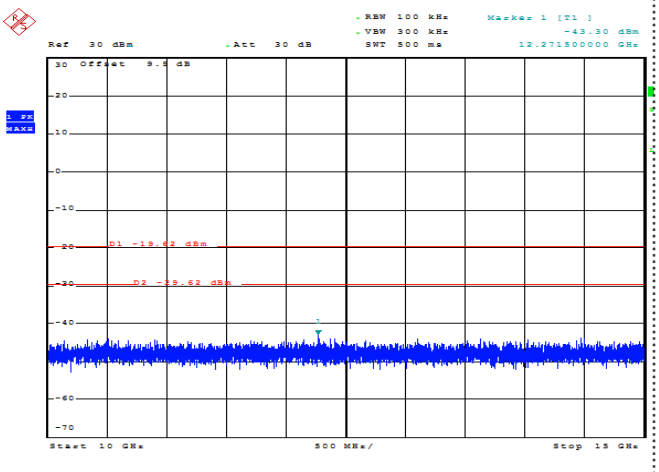
30MHz-3GHz



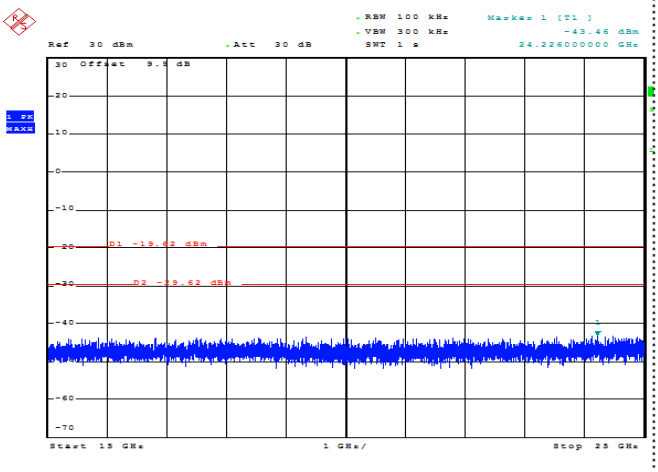
3GHz-5GHz



5GHz-10GHz

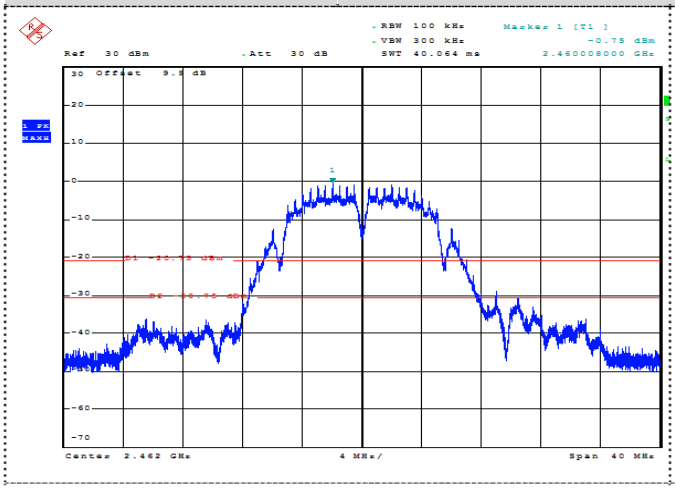


10GHz-15GHz

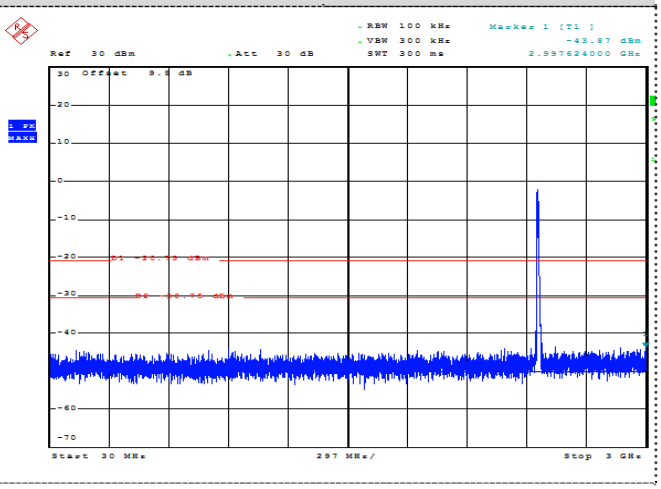


15GHz-25GHz

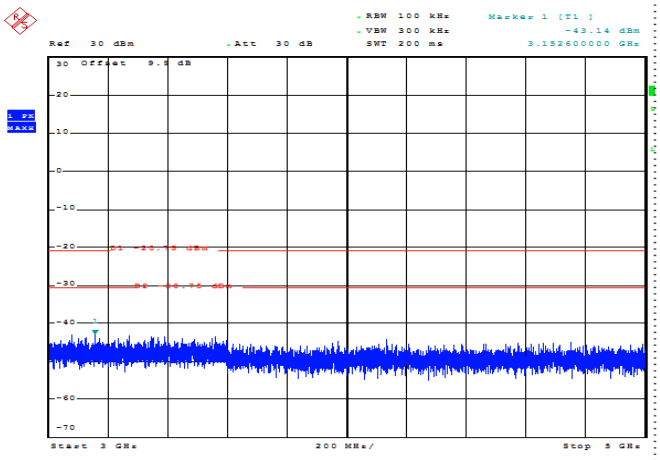
Test Mode:	802.11b	Test channel :	11



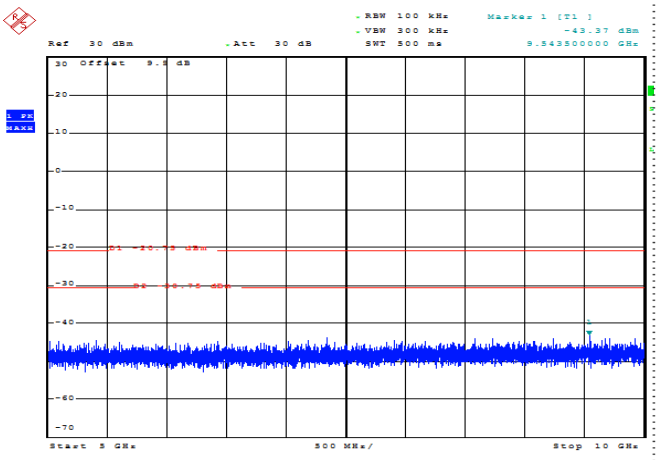
Reference level



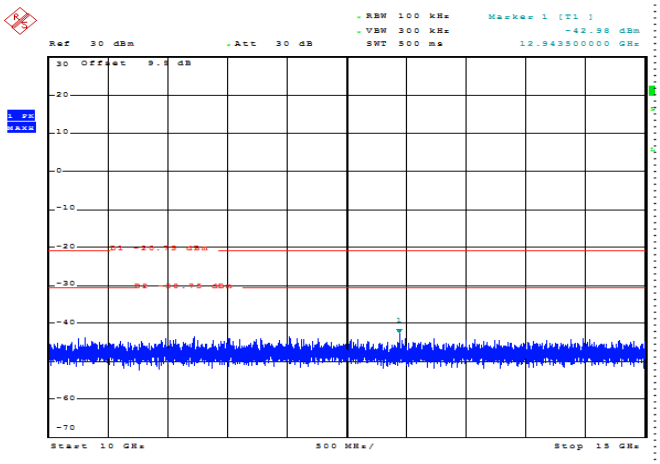
30MHz-3GHz



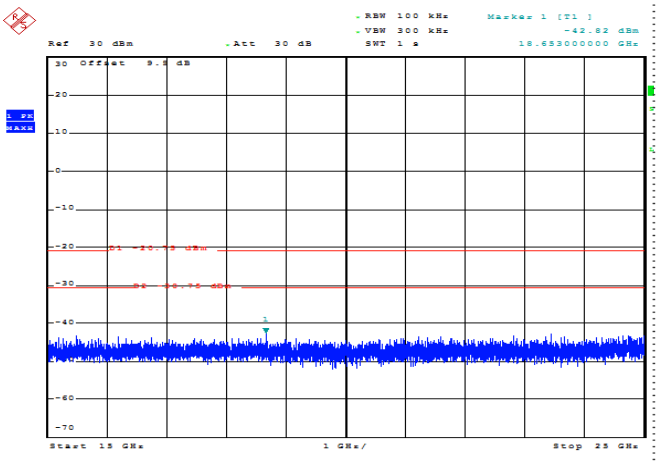
3GHz-5GHz



5GHz-10GHz

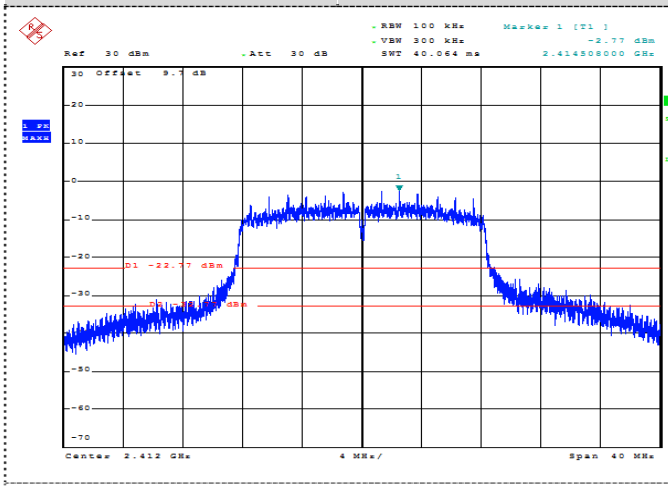


10GHz-15GHz

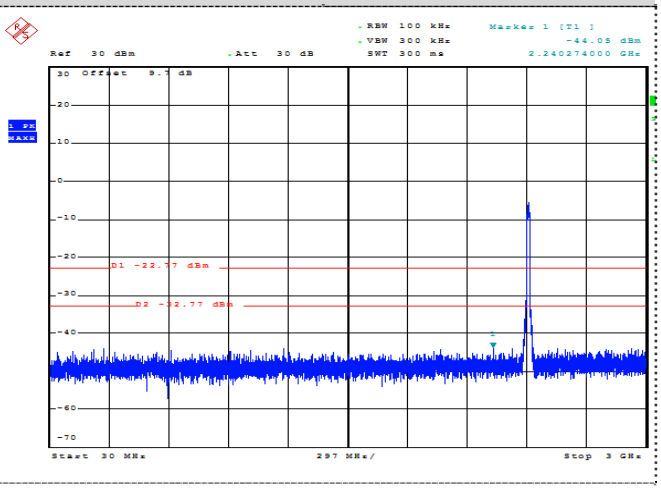


15GHz-25GHz

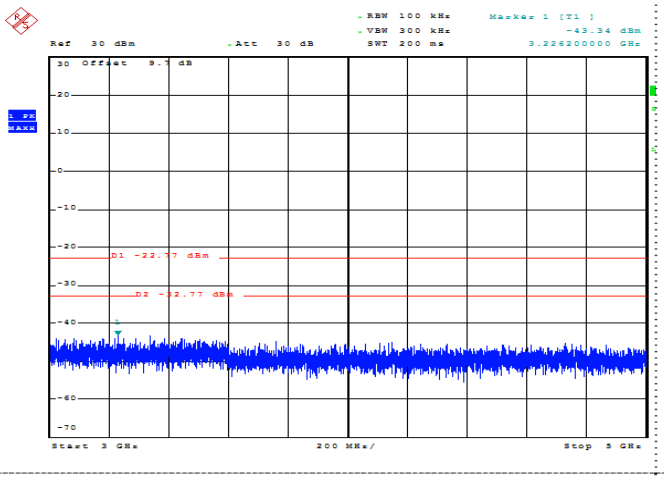
Test Mode:	802.11g	Test channel :	01



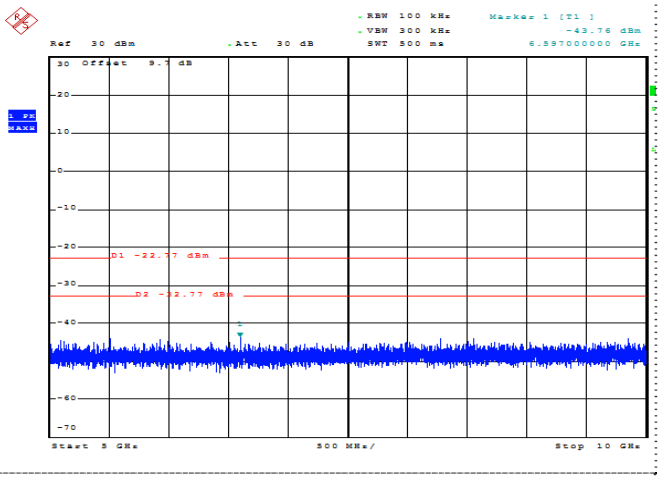
Reference level



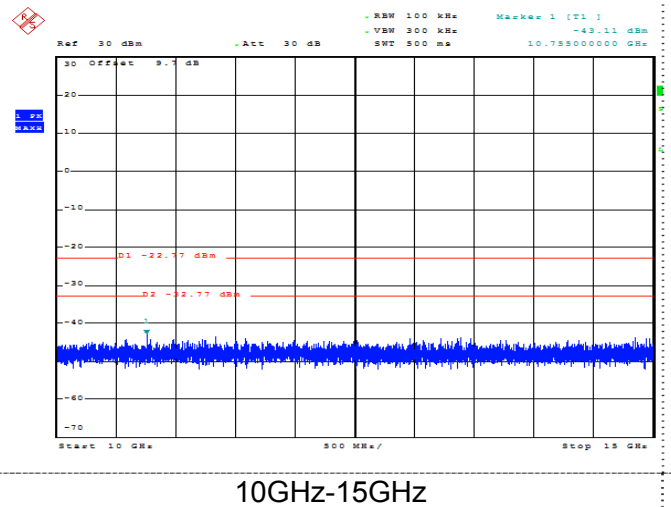
30MHz-3GHz



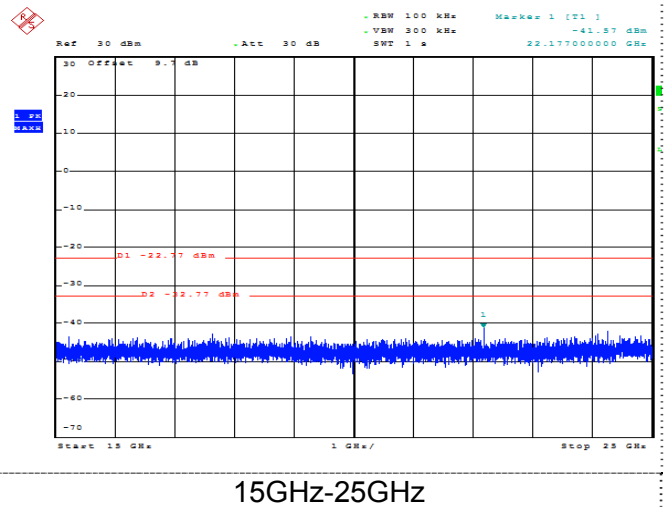
3GHz-5GHz



5GHz-10GHz

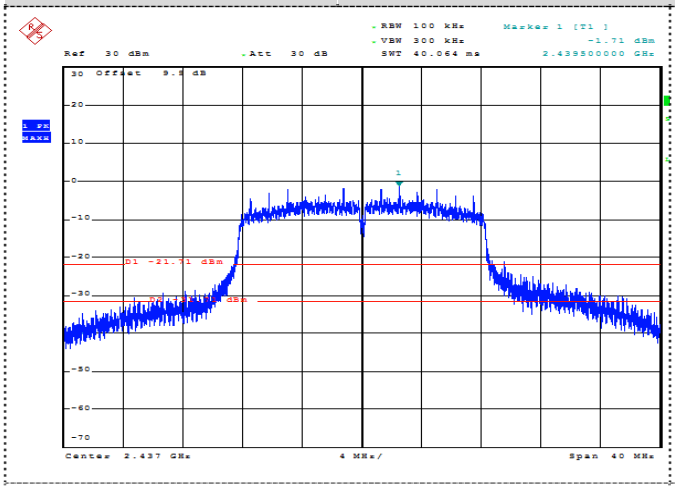


10GHz-15GHz

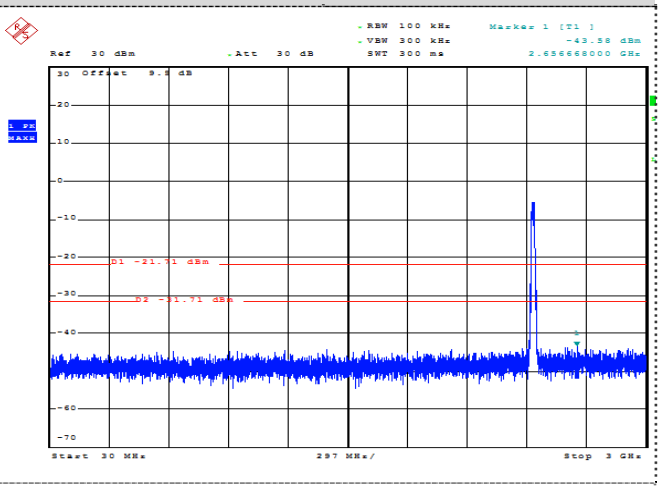


15GHz-25GHz

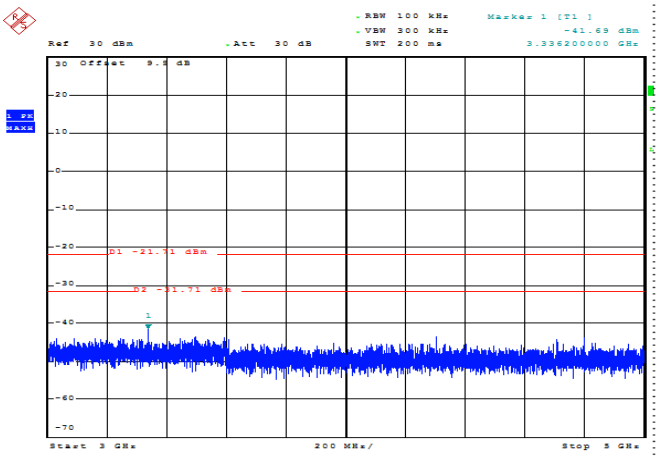
Test Mode:	802.11g	Test channel :	06



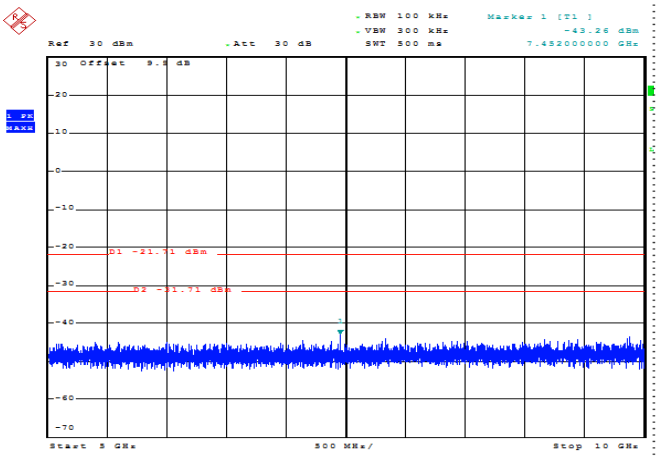
Reference level



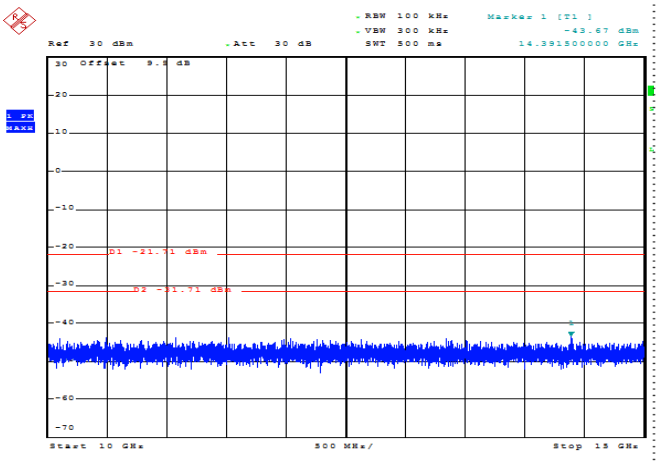
30MHz-3GHz



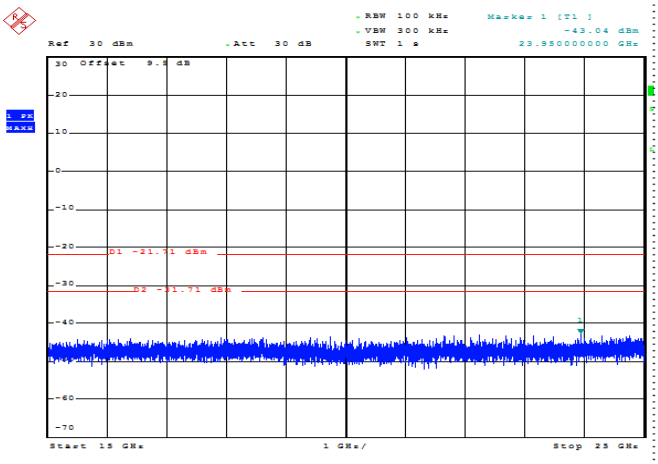
3GHz-5GHz



5GHz-10GHz

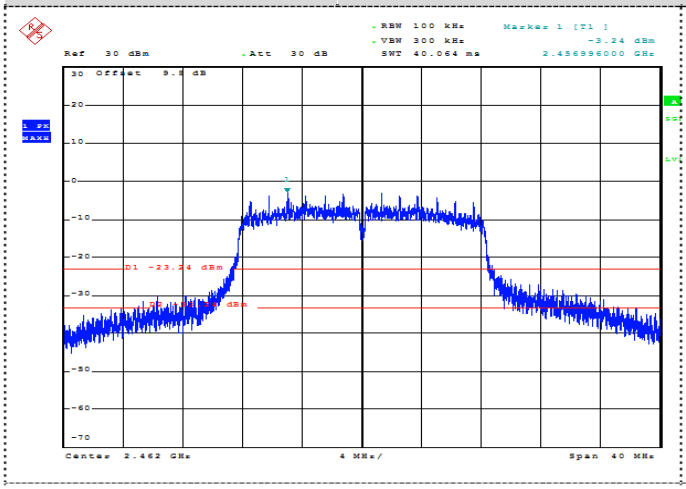


10GHz-15GHz

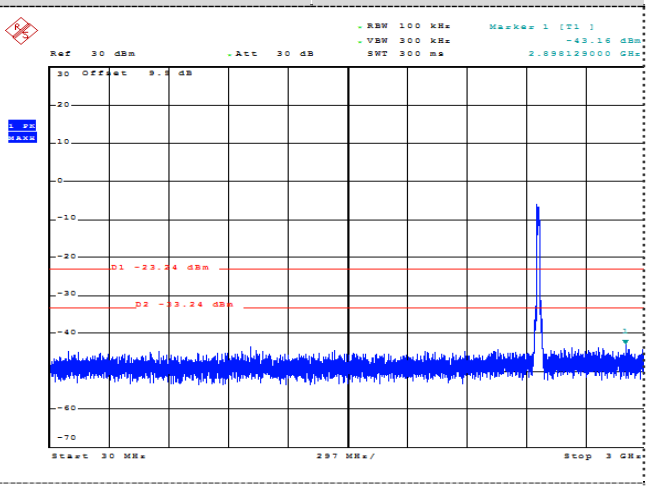


15GHz-25GHz

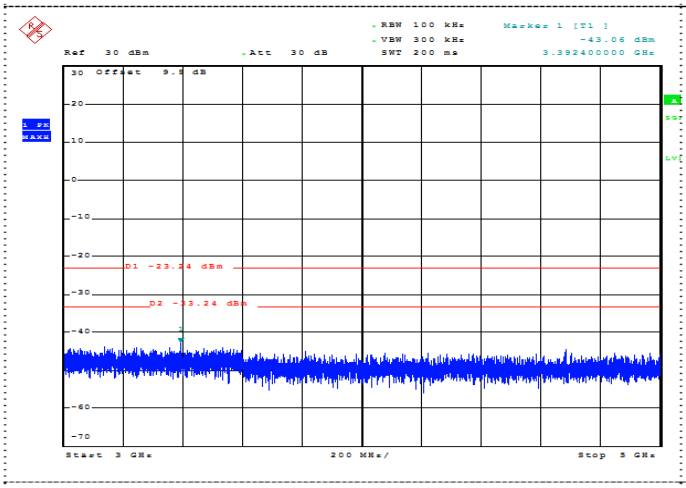
Test Mode:	802.11g	Test channel :	11



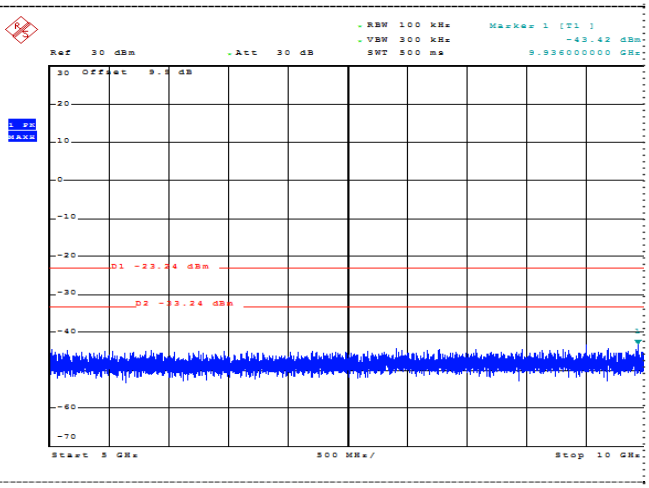
Reference level



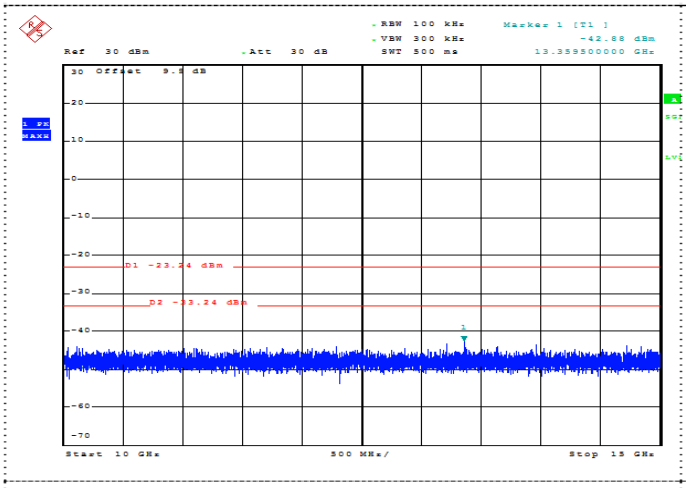
30MHz-3GHz



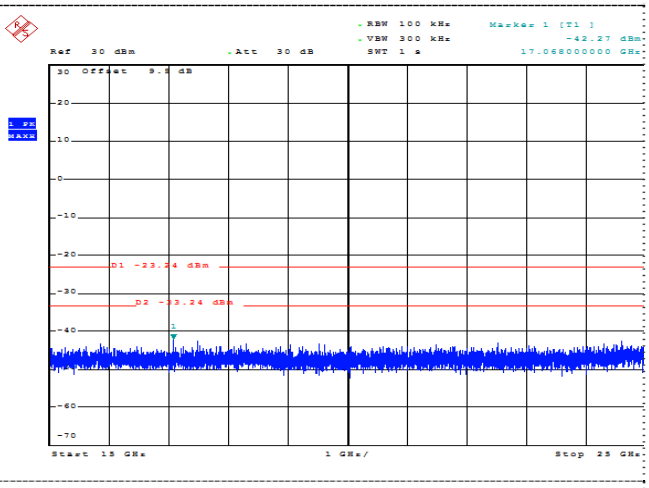
3GHz-5GHz



5GHz-10GHz

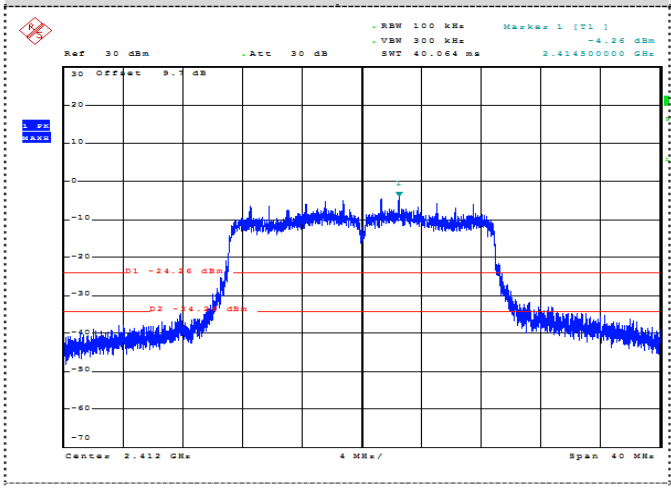


10GHz-15GHz

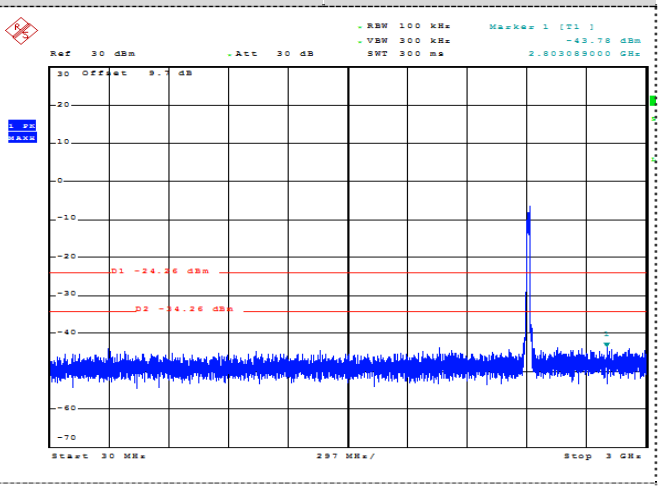


15GHz-25GHz

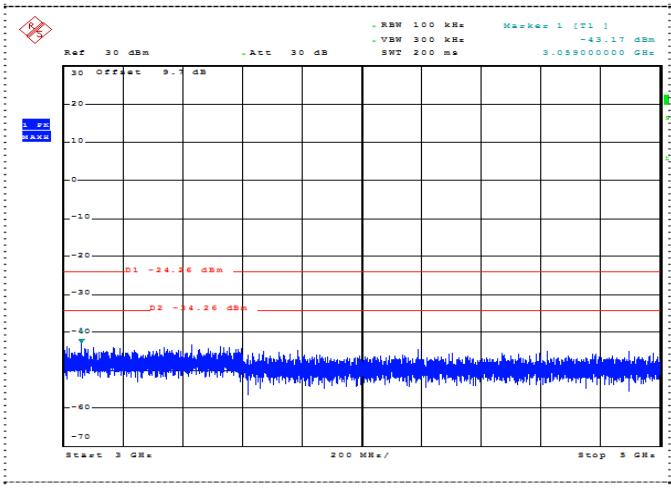
Test Mode:	802.11n(HT20)	Test channel :	01



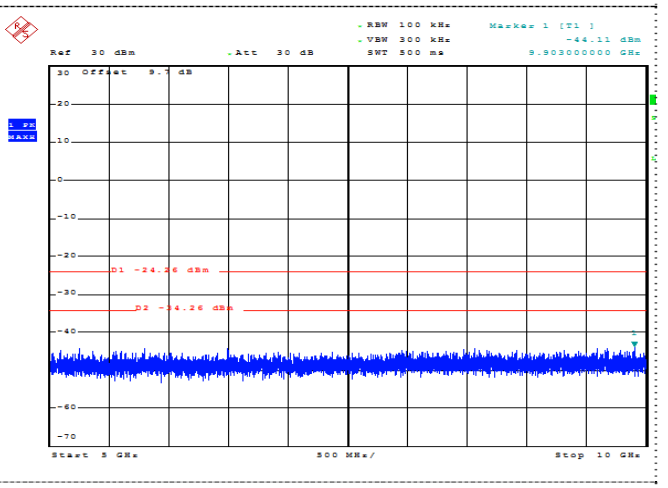
Reference level



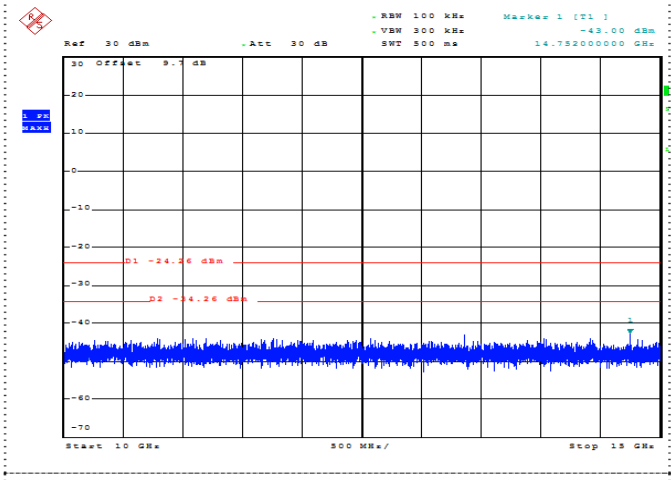
30MHz-3GHz



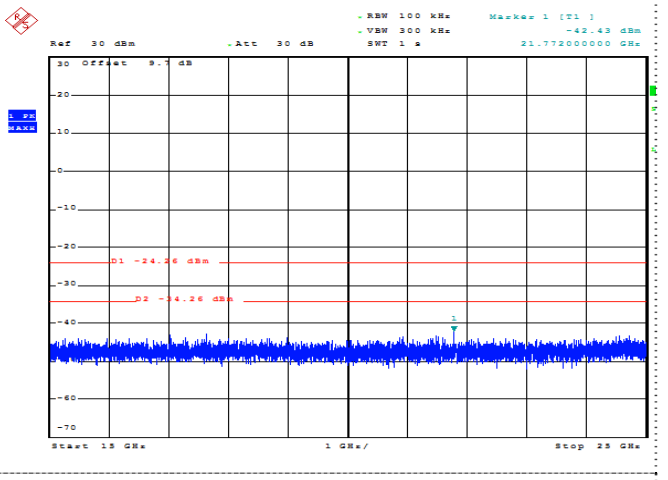
3GHz-5GHz



5GHz-10GHz

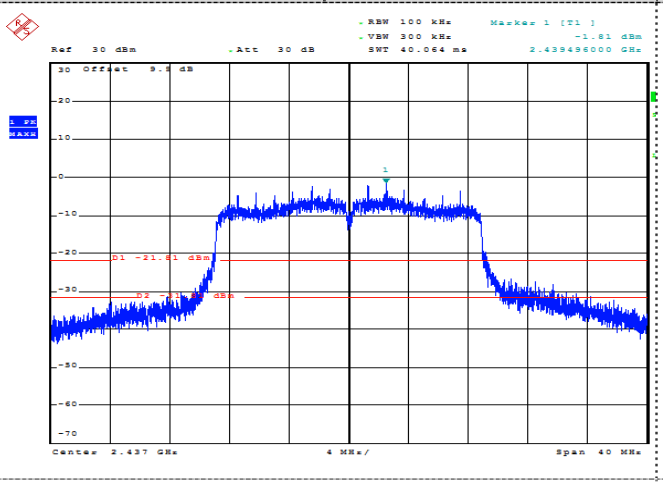


10GHz-15GHz

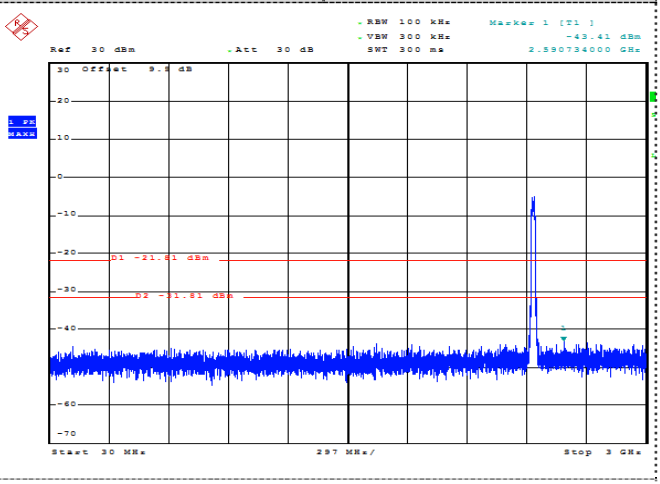


15GHz-25GHz

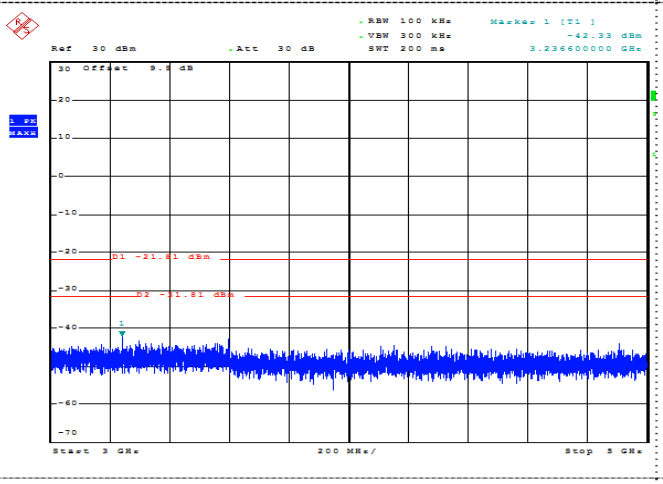
Test Mode:	802.11n(HT20)	Test channel :	06



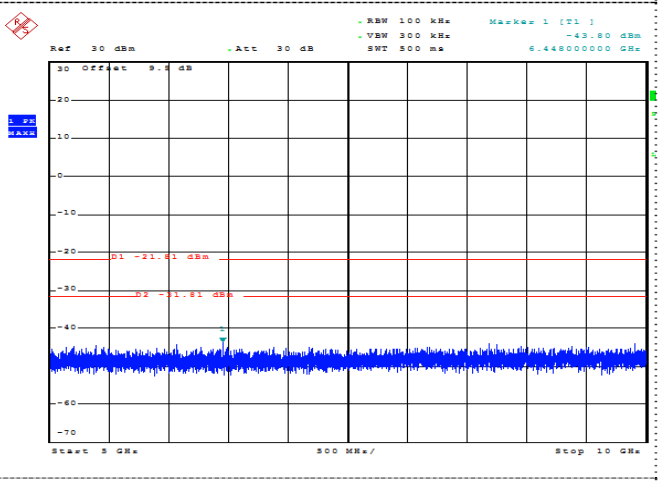
Reference level



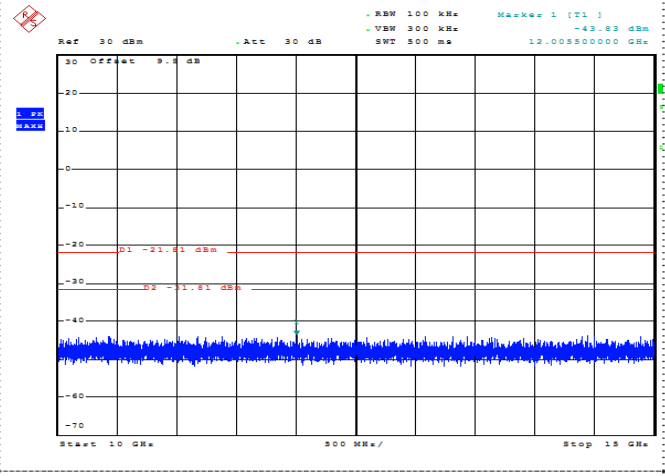
30MHz-3GHz



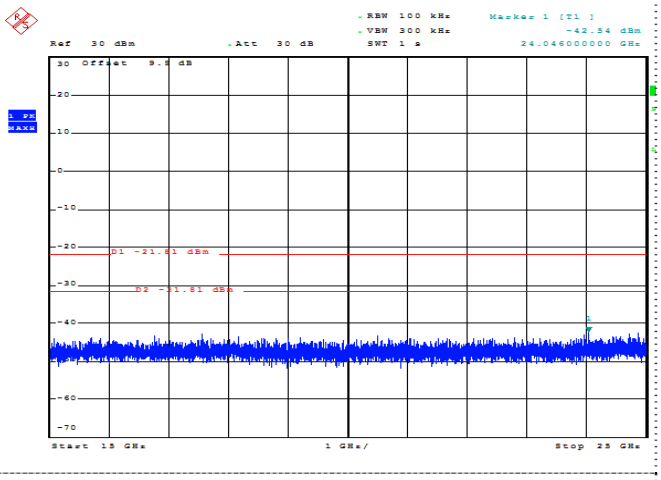
3GHz-5GHz



5GHz-10GHz

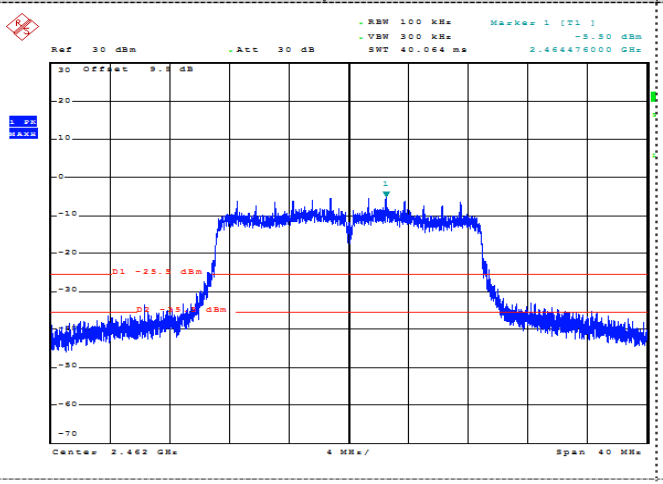


10GHz-15GHz

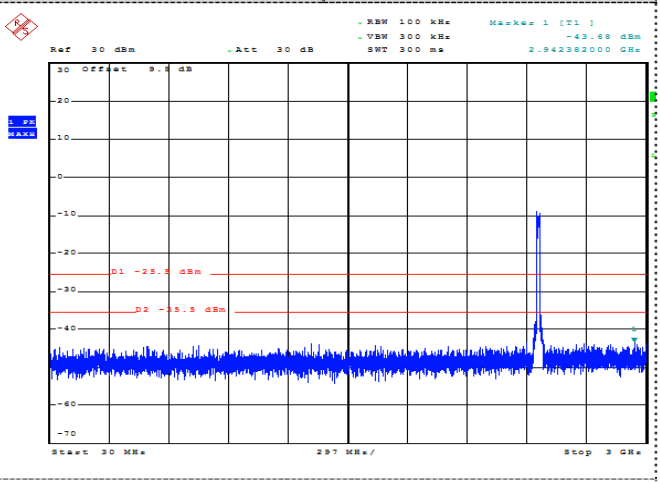


15GHz-25GHz

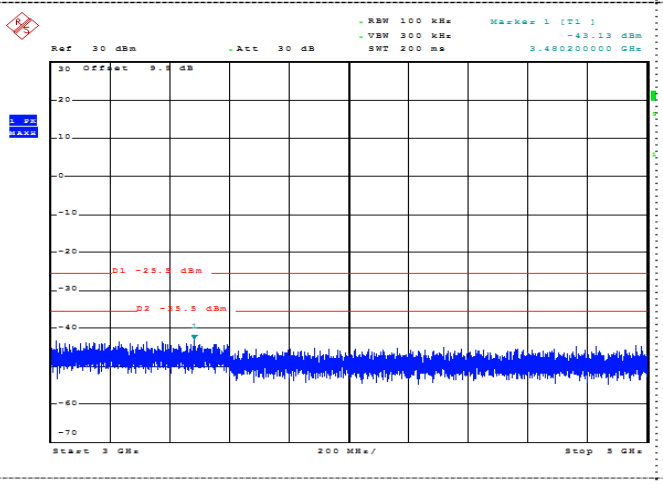
Test Mode:	802.11n(HT20)	Test channel :	11



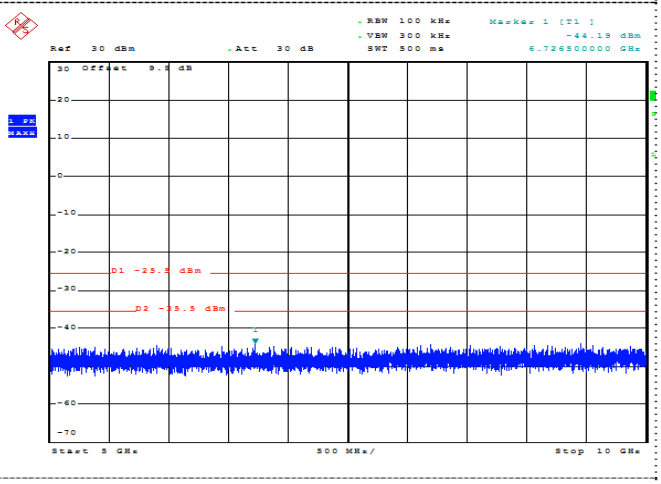
Reference level



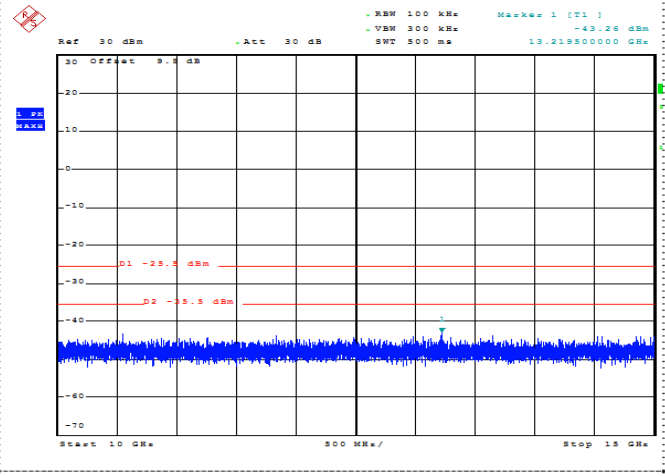
30MHz-3GHz



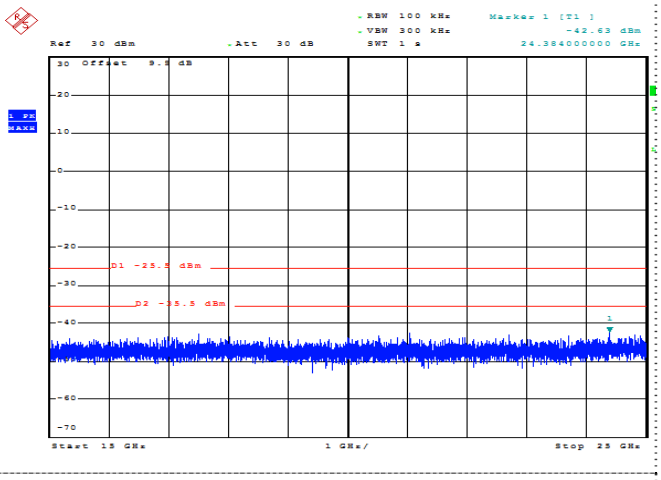
3GHz-5GHz



5GHz-10GHz



10GHz-15GHz



15GHz-25GHz

2.10. 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):

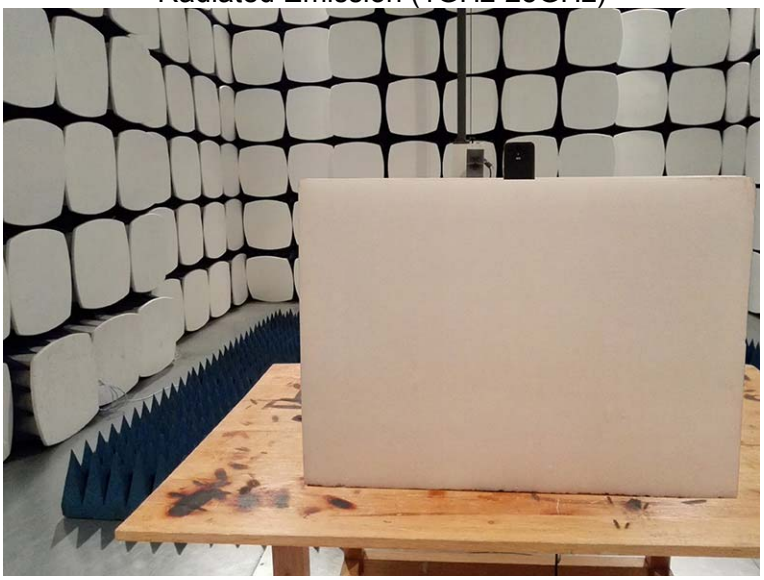
(i) Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional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

Test Result:
The maximum gain of WiFi antenna was -3 dBi.

3. EUT TEST PHOTO

Radiated Emission (30MHz-1GHz)

Radiated Emission (1GHz-25GHz)



Conducted Emission

4. PHOTOGRAPHS OF EUT CONSTRUCTIONAL

Please reference to the test report No.: GTI20150681F-1

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