



FCC RADIO TEST REPORT

FCC ID: XHWEGM002

Product : MID

Trade Name : E-matic

Model Name : EGM002

Serial Model : EGB103

Report No. : NTEK-2013NT0523514F

Prepared for

E-matic

3435 Ocean Park Blvd #107 PMB# 444, Santa Monica CA90405,
Los Angeles, California, USA

Prepared by

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TEST RESULT CERTIFICATION

Applicant's name : E-matic
Address : 3435 Ocean Park Blvd #107 PMB# 444, Santa Monica CA90405,
Los Angeles, California, USA

Manufacturer's Name..... : Shenzhen Sungworld Electronics Co., Ltd.
Address : 4#, North Zone, Shangxue Industrial Park, Bantian, Longgang
District, Shenzhen, China

Product description

Product name : MID
Model and/or type reference : EGM002
Serial Model : EGB103

Standards : FCC Part15.247

Test procedure ANSI C63.4-2003

This device described above has been tested by NTEK, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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Date of Test :
Date (s) of performance of tests : 23 May 2013 ~31 May 2013
Date of Issue..... : 31 May 2013
Test Result..... : **Pass**

Testing Engineer : Apple Huang
(Apple Huang)

Technical Manager : Tom Zhang
(Tom Zhang)

Authorized Signatory : Bovey Yang
(Bovey Yang)

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1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15 (15.247) , Subpart C			
Standard Section	Test Item	Judgment	Remark
15.207	Conducted Emission	PASS	
15.247 (a)(2)	6dB Bandwidth	PASS	
15.247 (b)	Peak Output Power	PASS	
15.247 (c)	Radiated Spurious Emission	PASS	
15.247 (d)	Power Spectral Density	PASS	
15.205	Band Edge Emission	PASS	
15.203	Antenna Requirement	PASS	

NOTE:

(1) "N/A" denotes test is not applicable in this Test Report

1.1 TEST FACILITY

NTEK Testing Technology Co., Ltd
 Add.:1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street, Bao'an District, Shenzhen P.R. China.
 FCC Registration No.:238937; IC Registration No.:9270A-1
 CNAS Registration No.:L5516

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %.

No.	Item	Uncertainty
1	Conducted Emission Test	$\pm 1.38\text{dB}$
2	RF power,conducted	$\pm 0.16\text{dB}$
3	Spurious emissions,conducted	$\pm 0.21\text{dB}$
4	All emissions,radiated(<1G)	$\pm 4.68\text{dB}$
5	All emissions,radiated(>1G)	$\pm 4.89\text{dB}$
6	Temperature	$\pm 0.5^\circ\text{C}$
7	Humidity	$\pm 2\%$

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	MID	
Trade Name	E-matic	
Model Name	EGM002	
Serial Model	EGB103	
Model Difference	All the models are the same circuit and RF module, except the mode names.	
Product Description	The EUT is a MID	
	Operation Frequency:	802.11b/g/n:2412~2462 MHz
	Modulation Type:	CCK/OFDM/DBPSK/DAPSK
	Bit Rate of Transmitter	802.11b:11/5.5/2/1 Mbps
		802.11g:54/48/36/24/18/12/9/6Mbps
		802.11n:150/144.44/130/17/115.56/104/86.67/78/52/6.5Mbps
	Number Of Channel	802.11b/g/n: 11CH
	Antenna Designation:	Please see Note 3.
Output Power(Conducted):	802.11b: 9.40 dBm (Max.) 802.11g: 7.95 dBm (Max.) 802.11n: 7.87 dBm (Max.)	
	Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual.	
Channel List	Please refer to the Note 2.	
Ratings	DC 5V from adapter AC120V/60Hz	
Adapter	Model:ASSAIA-050200 AC Power Input: 100-240V~, 50/60Hz, 0.45A Output: 5V $\overline{\text{---}}$, 2000mA	
Battery	DC 3.7V, 3000mAh	
Connecting I/O Port(s)	Please refer to the User's Manual	

Note:

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

2.

Channel List for 802.11b/g/n							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2412	04	2427	07	2442	10	2457
02	2417	05	2432	08	2447	11	2462
03	2422	06	2437	09	2452		

3.

Table for Filed Antenna

Ant	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
A	N/A	N/A	FPCB Antenna	N/A	0.85	Wifi Antenna

2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	802.11b CH1/ CH6/ CH11
Mode 2	802.11g CH1/ CH6/ CH11
Mode 3	802.11n CH1/ CH6/ CH11
Mode 4	Link Mode

For Conducted Emission	
Final Test Mode	Description
Mode 1	Link Mode

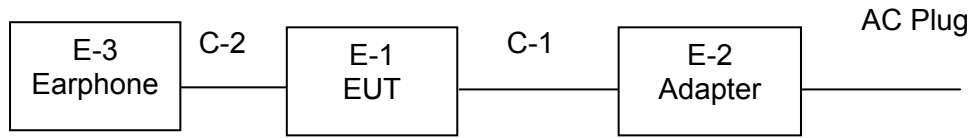
For Radiated Emission	
Final Test Mode	Description
Mode 1	802.11b CH1/ CH6/ CH11
Mode 2	802.11g CH1/ CH6/ CH11
Mode 3	802.11n CH1/ CH6/ CH11
Mode 4	Link Mode

Note:

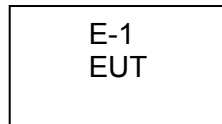
- (1) The measurements are performed at the highest, middle, lowest available channels.
- (2) The measurements are performed at all Bit Rate of Transmitter, the worst data was reported

2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

Conducted Emission Test



Radiated Spurious Emission Test



2.4 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Brand	Model/Type No.	Series No.	Note
E-1	MID	E-matic	EGM002	N/A	EUT
E-2	Adapter	N/A	ASSAIA-050200	N/A	
E-3	Earphone	N/A	2366	N/A	

Item	Shielded Type	Ferrite Core	Length	Note
C-1	NO	NO	1.2m	
C-2	NO	NO	0.8m	

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.

2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

Radiation Test equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Spectrum Analyzer	Agilent	E4407B	MY45108040	2012.07.06	2013.07.05	1 year
2	Test Receiver	R&S	ESPI	101318	2012.06.07	2013.06.06	1 year
3	Bilog Antenna	TESEQ	CBL6111D	31216	2012.07.06	2013.07.05	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	6200264416	2012.06.07	2013.06.06	1 year
5	Spectrum Analyzer	ADVANTEST	R3132	150900201	2012.06.07	2013.06.06	1 year
6	Horn Antenna	EM	EM-AH-10180	2011071402	2012.07.06	2013.07.05	1 year
7	Horn Ant	Schwarzbeck	BBHA 9170	9170-181	2012.07.06	2013.07.05	1 year
8	Amplifier	EM	EM-30180	060538	2012.12.22	2013.12.21	1 year
9	Loop Antenna	ARA	PLA-1030/B	1029	2012.06.08	2013.06.07	1 year
10	Power Meter	R&S	NRVS	100696	2012.07.06	2013.07.05	1 year
11	Power Sensor	R&S	URV5-Z4	0395.1619.05	2012.07.06	2013.07.05	1 year

Conduction Test equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Test Receiver	R&S	ESCI	101160	2012.06.06	2013.06.05	1 year
2	LISN	R&S	ENV216	101313	2012.08.24	2013.08.23	1 year
3	LISN	EMCO	3816/2	00042990	2012.08.24	2013.08.23	1 year
4	50Ω Coaxial Switch	Anritsu	MP59B	6200264417	2012.06.07	2013.06.06	1 year
5	Passive Voltage Probe	R&S	ESH2-Z3	100196	2012.06.07	2013.06.06	1 year
6	Absorbing clamp	R&S	MOS-21	100423	2012.06.08	2013.06.07	1 year

3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION Limits (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)		Standard
	Quasi-peak	Average	Quasi-peak	Average	
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	CISPR
0.50 -5.0	73.00	60.00	56.00	46.00	CISPR
5.0 -30.0	73.00	60.00	60.00	50.00	CISPR

0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	73.00	60.00	56.00	46.00	FCC
5.0 -30.0	73.00	60.00	60.00	50.00	FCC

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

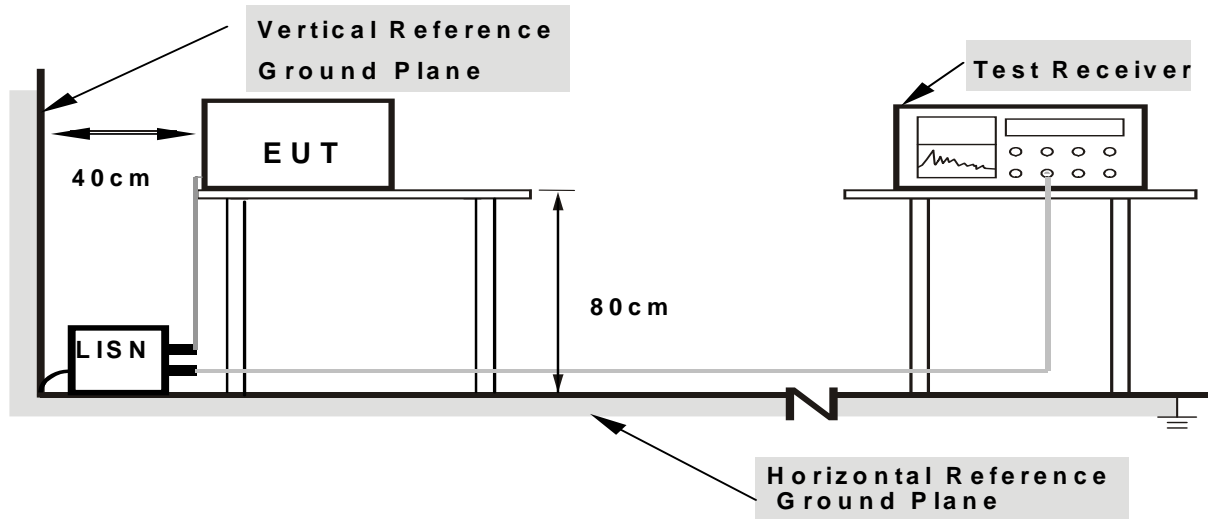
3.1.2 TEST PROCEDURE

- a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d. LISN at least 80 cm from nearest part of EUT chassis.
- e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.1.3 DEVIATION FROM TEST STANDARD

No deviation

3.1.4 TEST SETUP



- Note:**
- 1. Support units were connected to second LISN.
 - 2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

3.1.5 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

3.1.6 TEST RESULTS

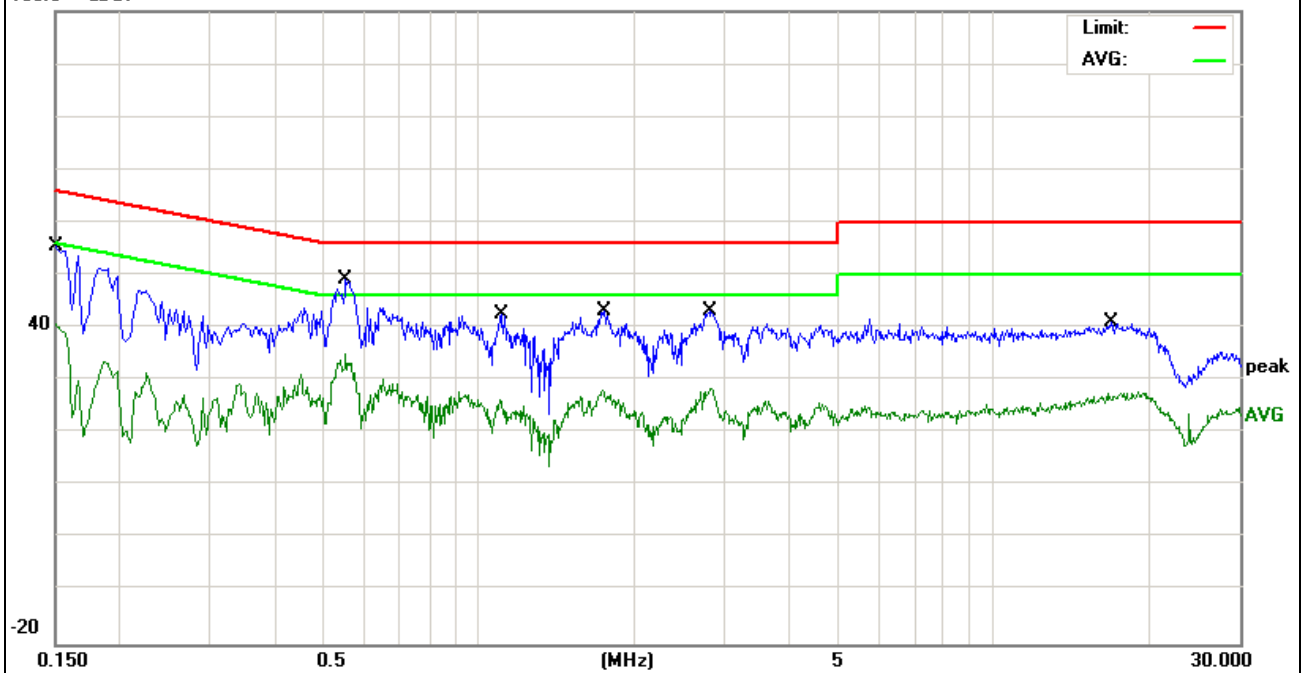
EUT :	MID	Model Name. :	EGM002
Temperature :	26 °C	Relative Humidity :	54%
Pressure :	1010hPa	Phase :	L
Test Voltage :	DC 5V from adapter AC120V/60Hz	Test Mode :	Mode 1

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV)	Limits (dBμV)	Margin (dB)	Detector Type
0.1500	43.68	11.63	55.31	66.00	-10.69	QP
0.5500	38.65	10.56	49.21	56.00	-6.79	QP
0.5500	24.50	10.56	35.06	46.00	-10.94	AVG
1.1019	31.88	10.52	42.40	56.00	-13.60	QP
1.7500	32.75	10.52	43.27	56.00	-12.73	QP
2.8020	32.72	10.55	43.27	56.00	-12.73	QP
16.9139	30.08	10.99	41.07	60.00	-18.93	QP

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

100.0 dBμV

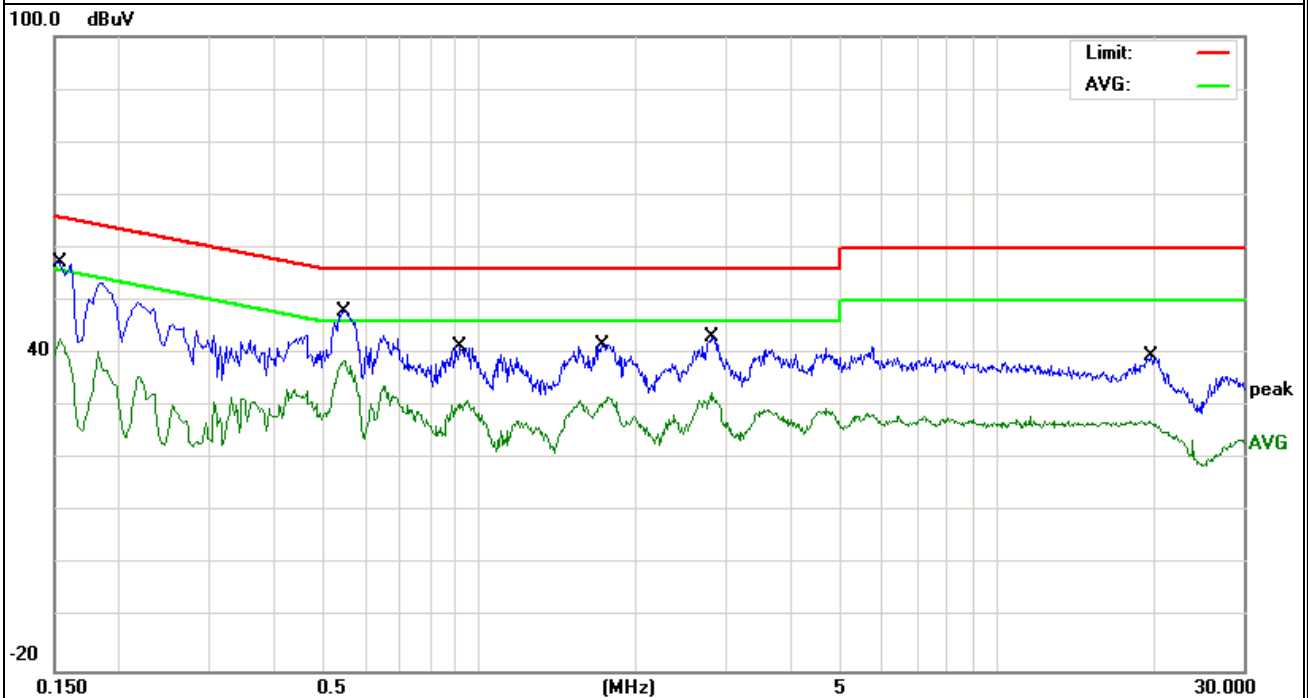


EUT :	MID	Model Name. :	EGM002
Temperature :	26 °C	Relative Humidity :	54%
Pressure :	1010hPa	Phase :	N
Test Voltage :	DC 5V from adapter AC120V/60Hz	Test Mode :	Mode 1

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV)	Limits (dBμV)	Margin (dB)	Detector Type
0.1539	45.61	11.59	57.20	65.78	-8.58	QP
0.1539	31.20	11.59	42.79	55.78	-12.99	AVG
0.5460	37.38	10.57	47.95	56.00	-8.05	QP
0.5460	28.07	10.57	38.64	46.00	-7.36	AVG
0.9180	30.72	10.53	41.25	56.00	-14.75	QP
1.7180	31.09	10.52	41.61	56.00	-14.39	QP
2.8020	32.48	10.55	43.03	56.00	-12.97	QP
19.9219	28.36	11.11	39.47	60.00	-20.53	QP

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.



3.2 RADIATED EMISSION MEASUREMENT

3.2.1 RADIATED EMISSION LIMITS (Frequency Range 9kHz-1000MHz)

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (microrvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	Class A (dBuV/m) (at 3M)		Class B (dBuV/m) (at 3M)	
	PEAK	AVERAGE	PEAK	AVERAGE
Above 1000	80	60	74	54

Notes:

- (1) The limit for radiated test was performed according to FCC PART 15C.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (emission in restricted band)	1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

3.2.2 TEST PROCEDURE

- a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note:

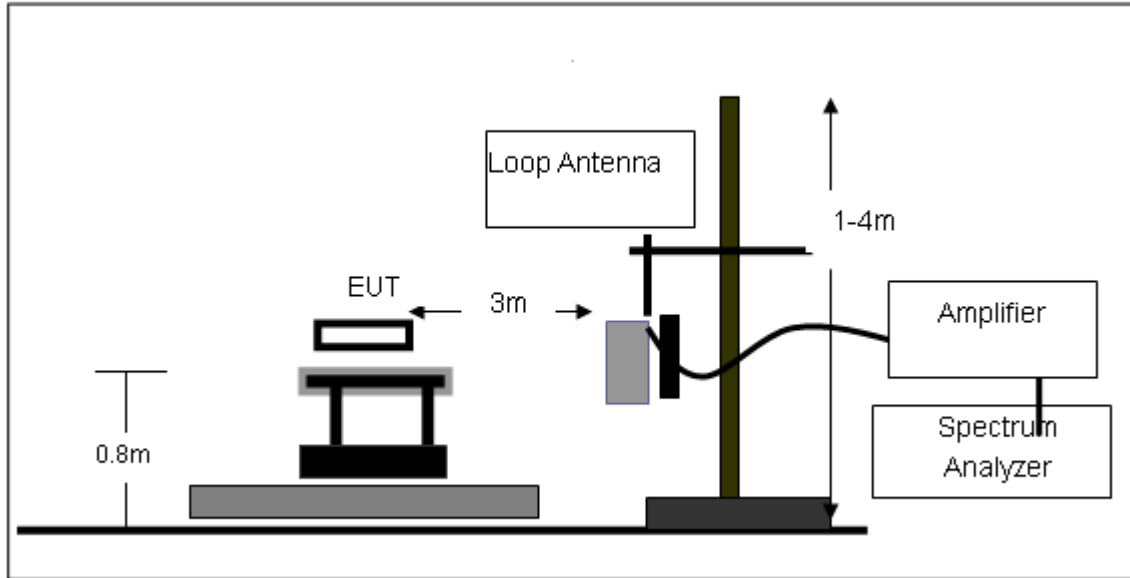
Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported

3.2.3 DEVIATION FROM TEST STANDARD

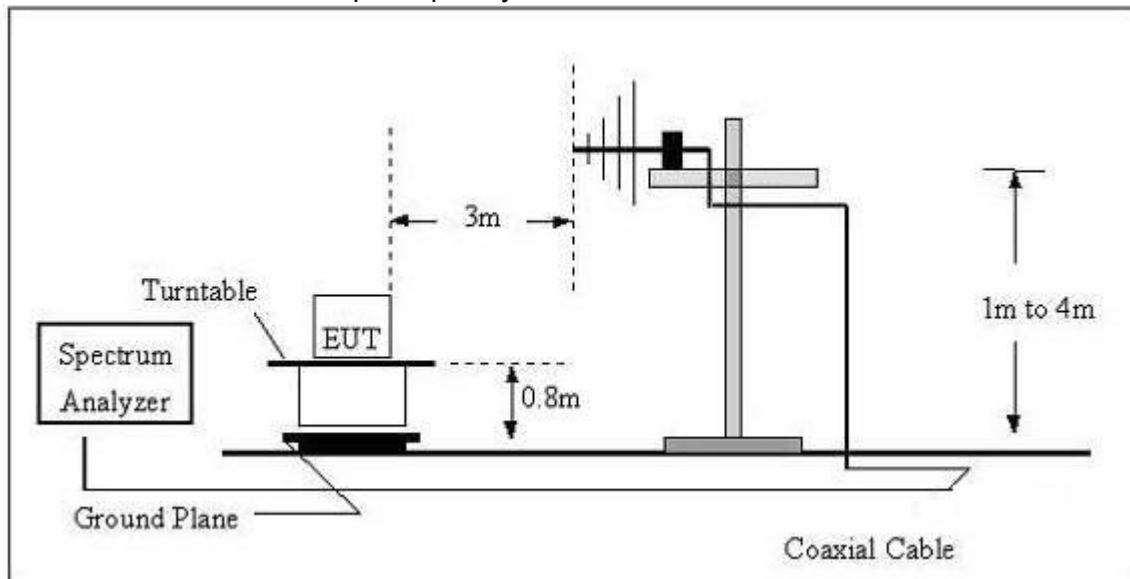
No deviation

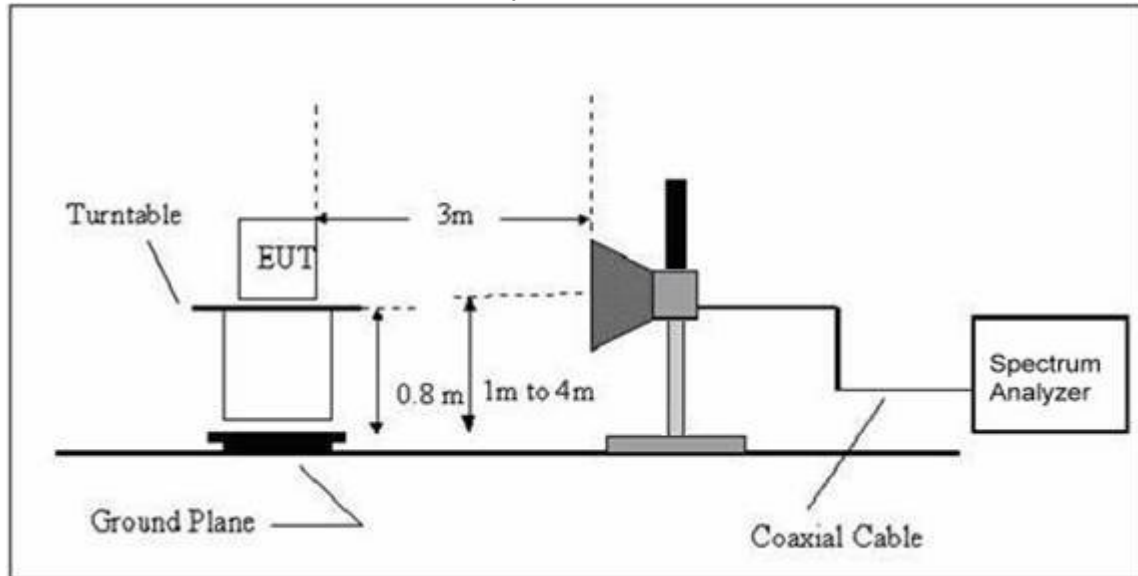
3.2.4 TEST SETUP

(A) Radiated Emission Test-Up Frequency Below 30MHz



(B) Radiated Emission Test-Up Frequency 30MHz~1GHz



(C) Radiated Emission Test-Up Frequency Above 1GHz**3.2.5 EUT OPERATING CONDITIONS**

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

3.2.6 TEST RESULTS

Radiated Spurious Emission (Transmitting)

30MHz~25GHz:(Scan with 802.11b, 802.11g,802.11n),the worst case is 802.11b.

Frequency (MHz)	Meter Reading (dBµV)	Factor (dB)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Detect or Type	Comment
Low Channel (2412 MHz)-Below 1G-802.11b							
135.0319	15.26	12.25	27.51	43.5	-15.99	QP	Vertical
239.9874	13.69	11.65	25.34	46.0	-20.66	QP	Vertical
406.088	15.21	18.54	33.75	46.0	-12.25	QP	Vertical
495.9343	14.76	20.59	35.35	46.0	-10.65	QP	Vertical
528.2458	15.19	21.12	36.31	46.0	-9.69	QP	Vertical
815.9678	8.62	26.46	35.08	46.0	-10.92	QP	Vertical
125.0066	15.62	12.21	27.83	43.5	-15.67	QP	Horizontal
164.9071	15.69	10.81	26.5	43.5	-17.00	QP	Horizontal
287.9904	15.60	14.30	29.9	46.0	-16.10	QP	Horizontal
528.2458	15.56	21.12	36.68	46.0	-9.32	QP	Horizontal
721.7259	9.49	25.59	35.08	46.0	-10.92	QP	Horizontal
815.9678	11.96	26.46	38.42	46.0	-7.58	QP	Horizontal
Low Channel (2412 MHz)-Above 1G-802.11b							
1464.692	60.60	-17.01	43.59	74.0	-30.41	Pk	Vertical
2004.115	58.05	-13.21	44.84	74.0	-29.16	Pk	Vertical
4824.125	49.71	-3.60	46.11	74.0	-27.89	pk	Vertical
1336.782	60.15	-17.51	42.64	74.0	-31.36	pk	Horizontal
1651.514	68.94	-15.93	53.01	74.0	-20.99	pk	Horizontal
1993.371	55.68	-13.42	42.26	74.0	-31.74	pk	Horizontal
4824.250	48.84	-3.6	45.24	74.0	-28.76	Pk	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detect or Type	Comment
Middel Channel (2437 MHz)-Below 1G-802.11b							
135.0319	14.68	12.25	26.93	43.5	-16.57	QP	Vertical
225.3077	14.63	10.73	25.36	46.0	-20.64	QP	Vertical
263.819	12.16	14.62	26.78	46.0	-19.22	QP	Vertical
315.4806	14.66	15.26	29.92	46.0	-16.08	QP	Vertical
528.2458	14.61	21.12	35.73	46.0	-10.27	QP	Vertical
815.9678	8.04	26.46	34.5	46.0	-11.50	QP	Vertical
125.0066	15.04	12.21	27.25	43.5	-16.25	QP	Horizontal
263.819	15.03	14.62	29.65	46.0	-16.35	QP	Horizontal
432.5457	15.05	18.82	33.87	46.0	-12.13	QP	Horizontal
528.2458	14.98	21.12	36.10	46.0	-9.90	QP	Horizontal
721.7259	8.91	25.59	34.5	46.0	-11.50	QP	Horizontal
815.9678	11.38	26.46	37.84	46.0	-8.16	QP	Horizontal
Middel Channel (2437 MHz)-Above 1G-802.11b							
1329.615	58.63	-17.59	41.04	74.0	-32.96	Pk	Vertical
1501.898	60.59	-17.15	43.44	74.0	-30.56	pk	Vertical
1663.393	59.55	-15.86	43.69	74.0	-30.31	pk	Vertical
1996.946	56.39	-13.36	43.03	74.0	-30.97	pk	Vertical
4874.125	49.01	-3.60	45.41	74.0	-28.59	pk	Vertical
1107.528	65.32	-19.40	45.92	74.0	-28.08	Pk	Horizontal
1334.389	65.62	-17.53	48.09	74.0	-25.91	pk	Horizontal
1663.393	61.42	-15.86	45.56	74.0	-28.44	Pk	Horizontal
1993.371	59.3	-13.42	45.88	74.0	-28.12	Pk	Horizontal
4874.250	48.78	-3.6	45.18	74.0	-28.82	Pk	Horizontal

Frequency (MHz)	Meter Reading (dBµV)	Factor (dB)	Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)	Detect or Type	Comment
High Channel (2462 MHz)-Below 1G-802.11b							
98.8324	13.54	10.51	24.05	43.5	-19.45	QP	Vertical
143.8291	13.31	12.06	25.37	43.5	-18.13	QP	Vertical
336.035	11.4	16.03	27.43	46.0	-18.57	QP	Vertical
383.9318	8.17	17.38	25.55	46.0	-20.45	QP	Vertical
528.2458	13.45	21.12	34.57	46.0	-11.43	QP	Vertical
815.9678	6.88	26.46	33.34	46.0	-12.66	QP	Vertical
131.7572	14.51	12.22	26.73	43.5	-16.77	QP	Horizontal
197.8925	14.38	8.99	23.37	43.5	-20.13	QP	Horizontal
287.9904	14.44	14.3	28.74	46.0	-17.26	QP	Horizontal
462.3455	9.56	19.5	29.06	46.0	-16.94	QP	Horizontal
625.0778	7.74	23.6	31.34	46.0	-14.66	QP	Horizontal
721.7259	8.33	25.59	33.92	46.0	-12.08	QP	Horizontal
High Channel (2462 MHz)-Above 1G-802.11b							
1329.615	66.23	-17.59	48.64	74.0	-25.36	pk	Vertical
1663.393	63.20	-15.86	47.34	74.0	-26.66	pk	Vertical
1829.098	58.45	-14.78	43.67	74.0	-30.33	pk	Vertical
1993.371	57.90	-13.42	44.48	74.0	-29.52	pk	Vertical
4924.350	48.83	-3.6	45.23	74.0	-28.77	pk	Vertical
1329.615	61.12	-17.59	43.53	74.0	-30.47	pk	Horizontal
1663.393	57.49	-15.86	41.63	74.0	-32.37	pk	Horizontal
1993.371	55.77	-13.42	42.35	74.0	-31.65	pk	Horizontal
2806.824	54.49	-11.69	42.80	74.0	-31.20	pk	Horizontal
4924.167	48.40	-3.60	44.80	74.0	-29.20	pk	Horizontal

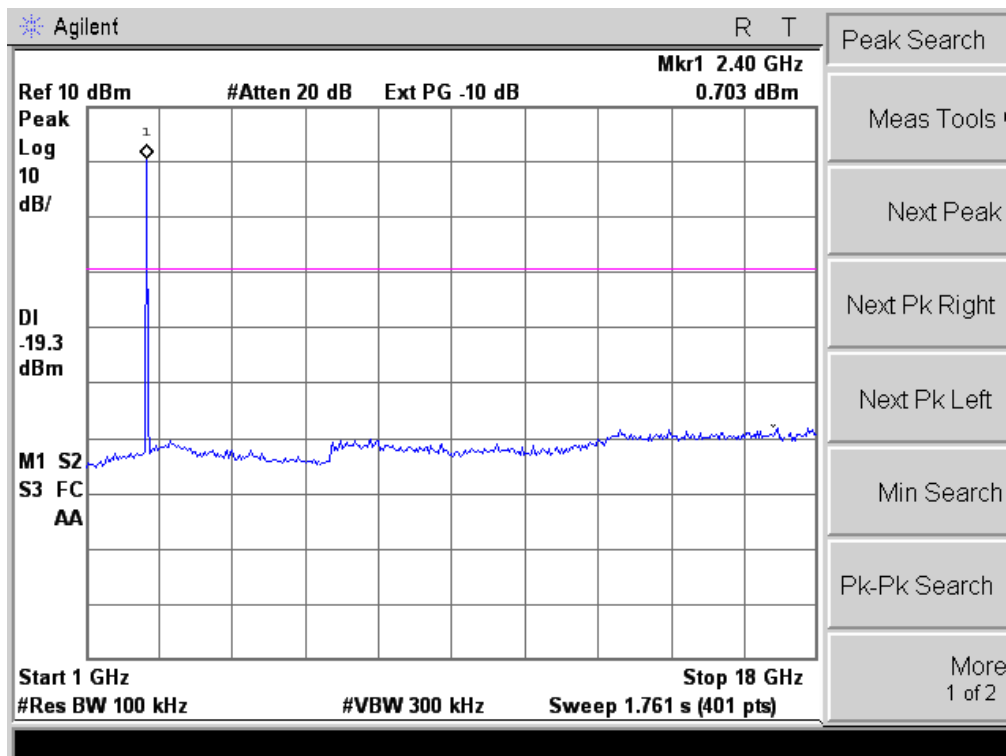
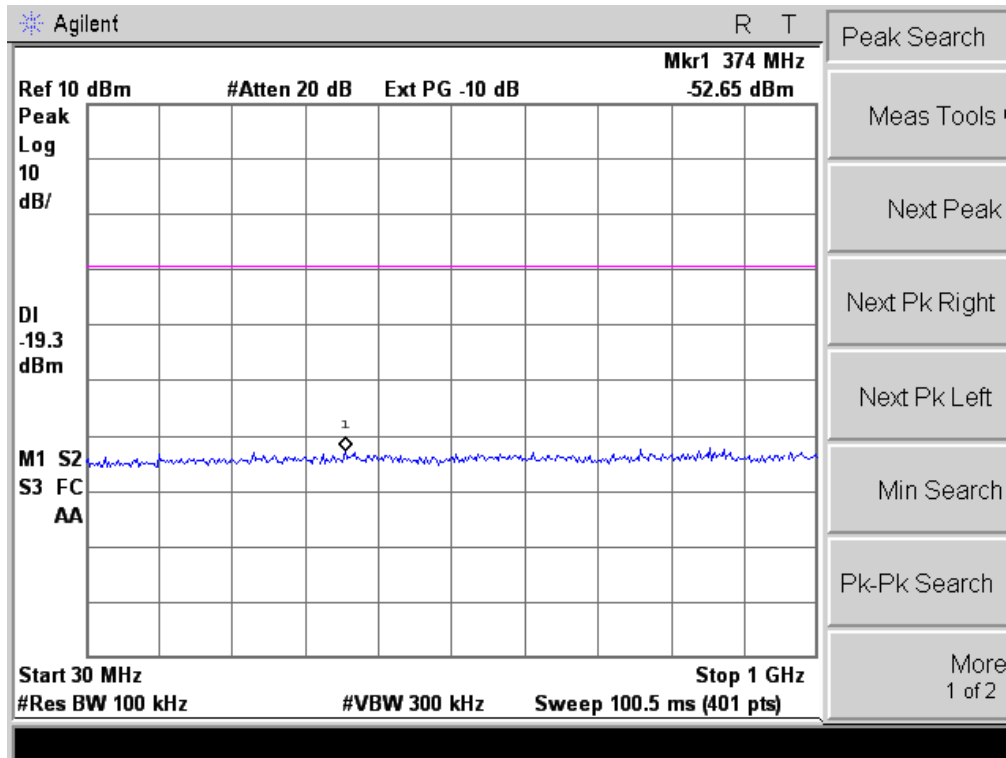
Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

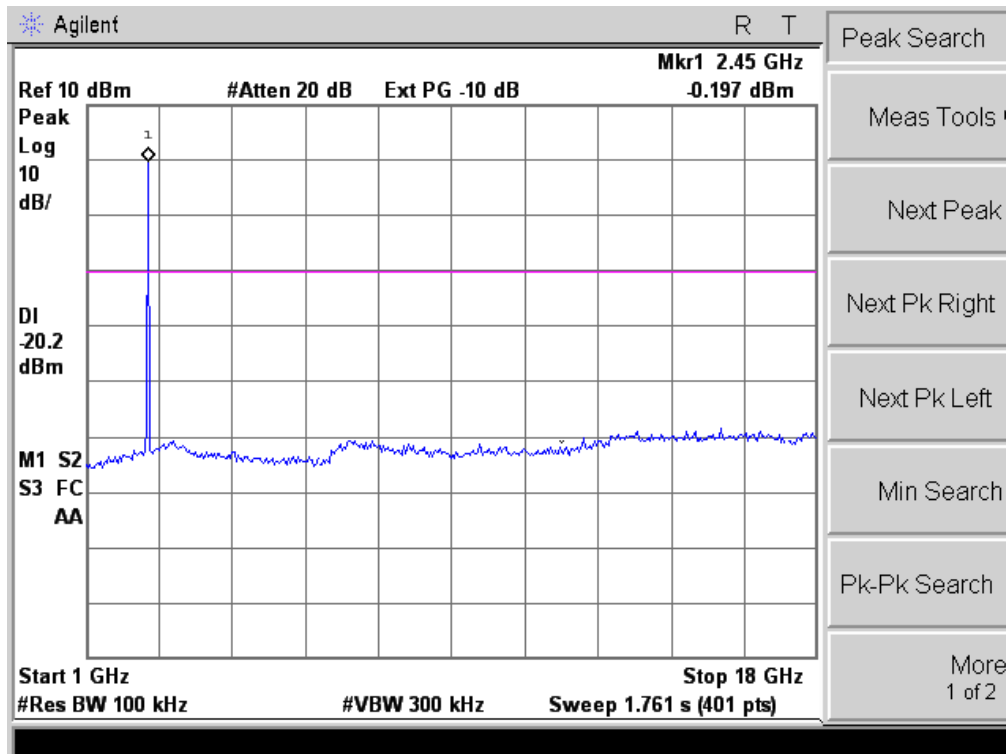
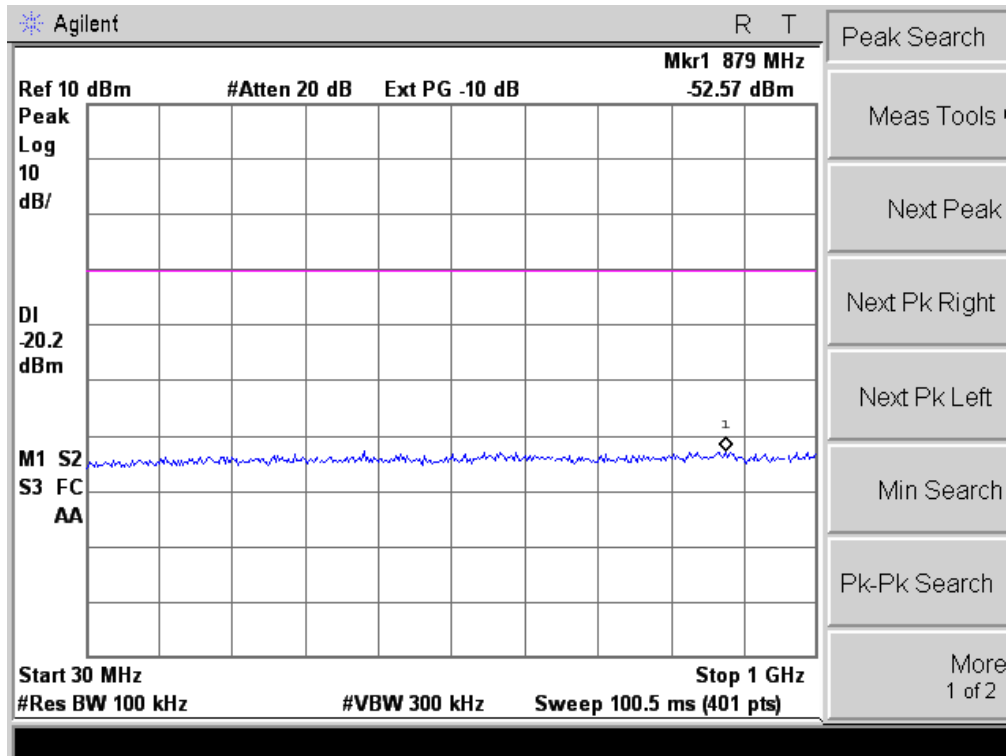
Emission Level = Meter Reading + Factor

Margin = Limit - Emission Level

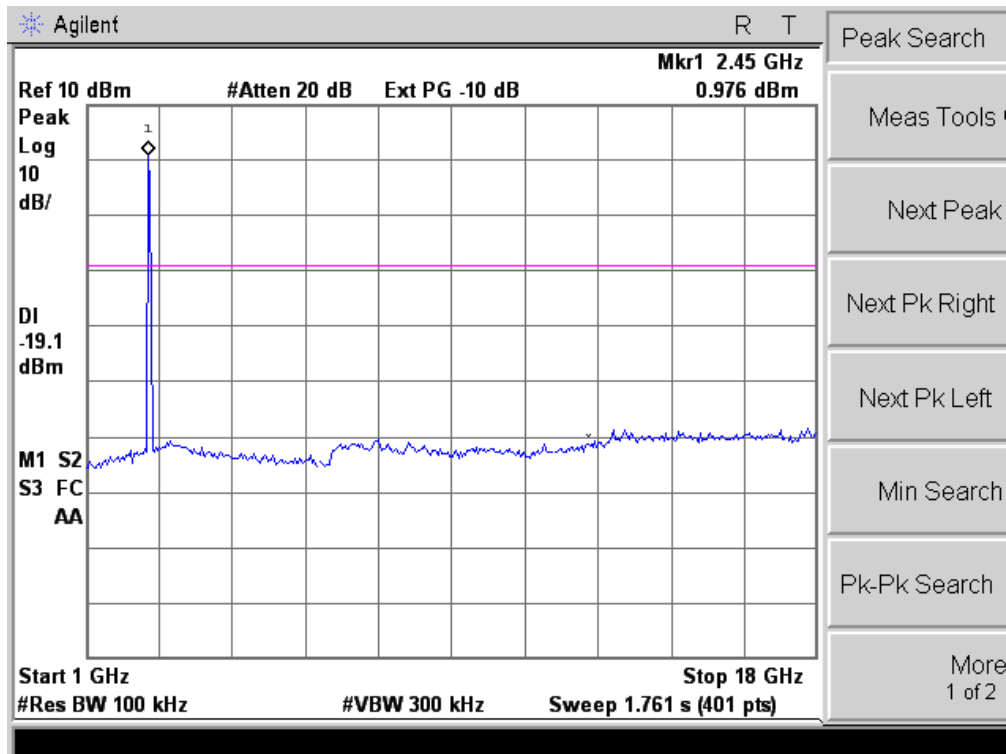
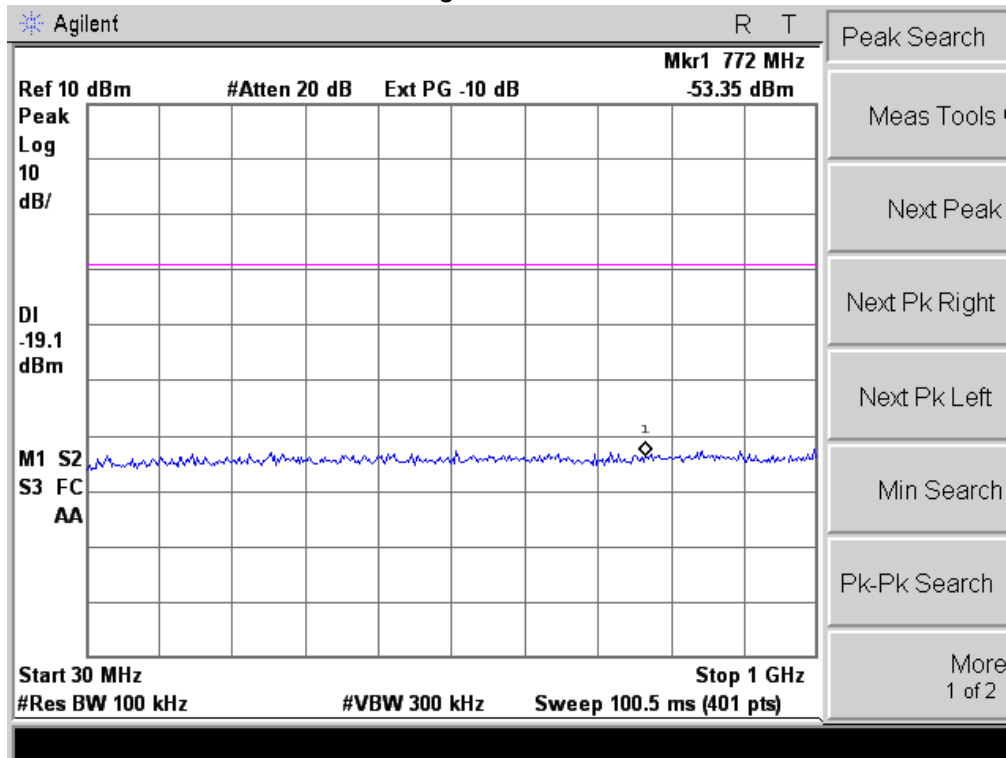
Conducted Spurious Emissions at Antenna Port:
802.11b Low Channel-2412MHz



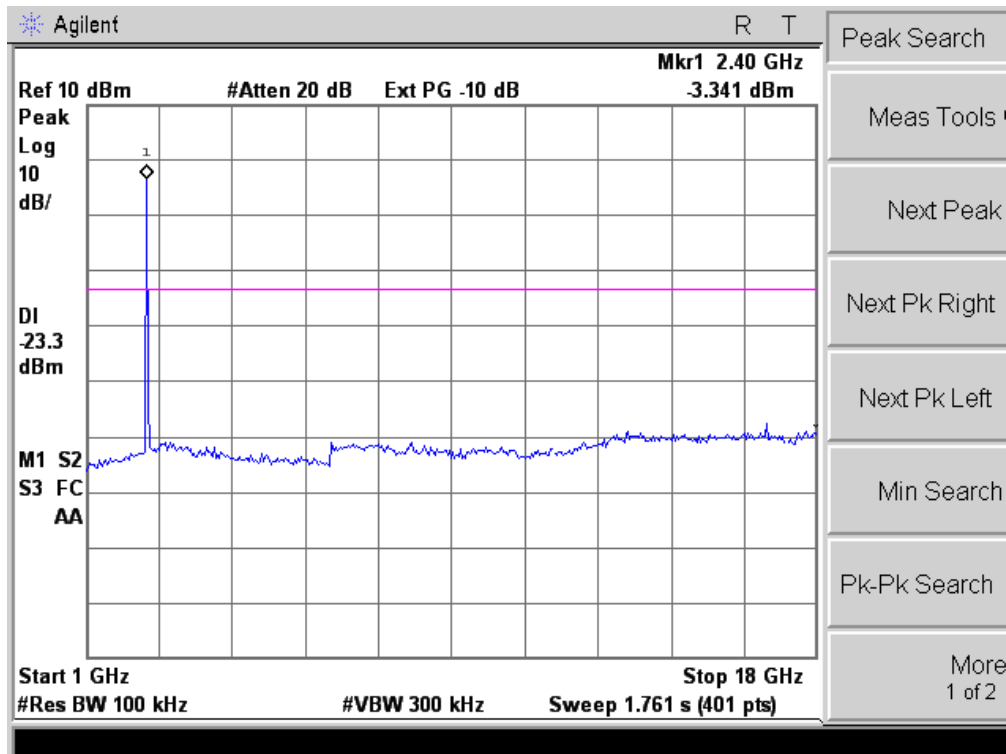
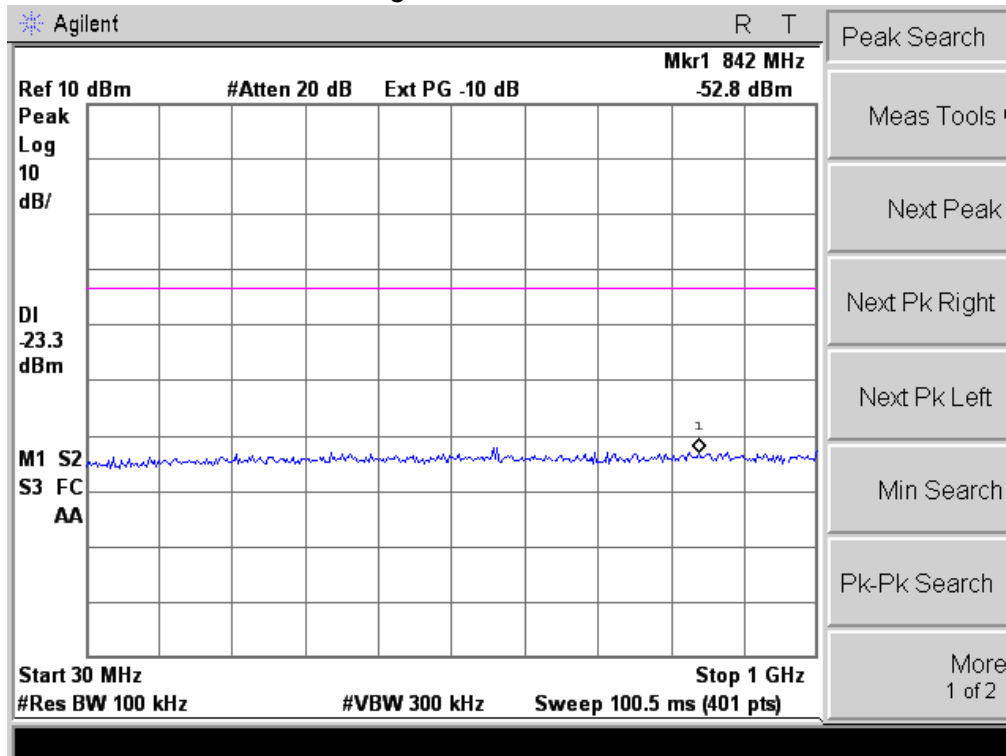
802.11b Middle Channel-2437MHz



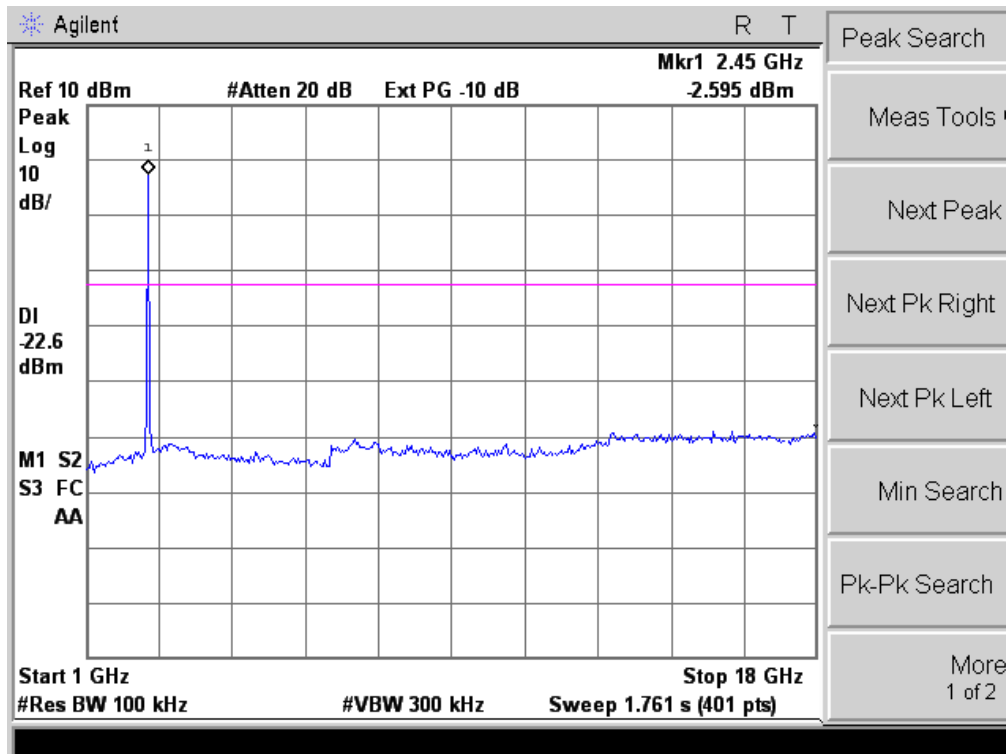
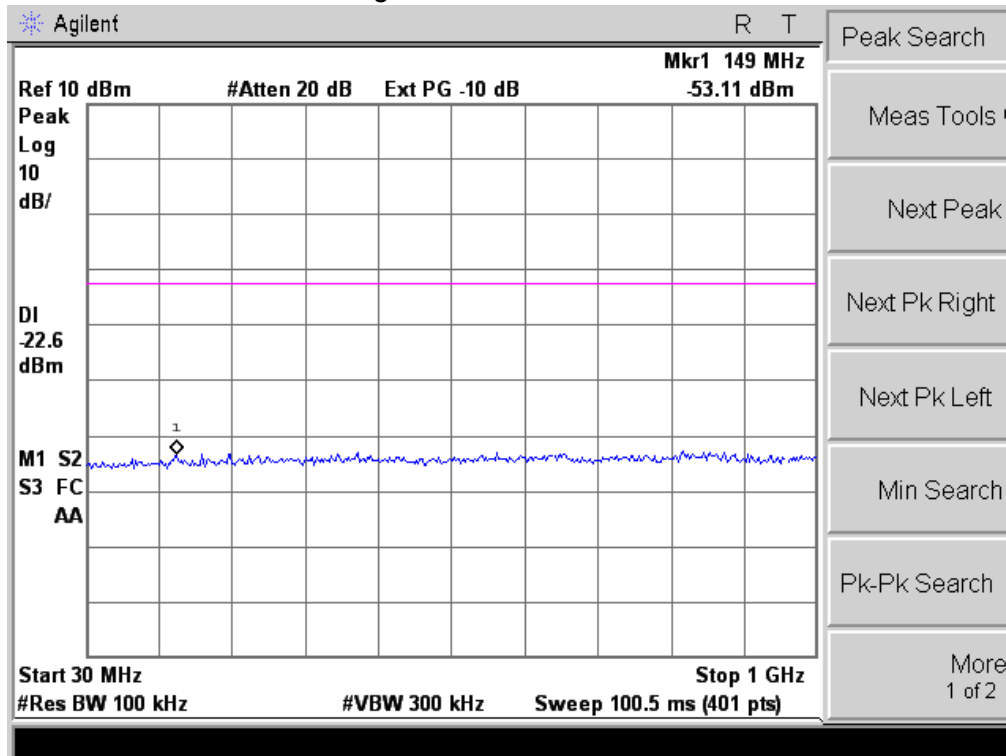
802.11b High Channel-2462MHz



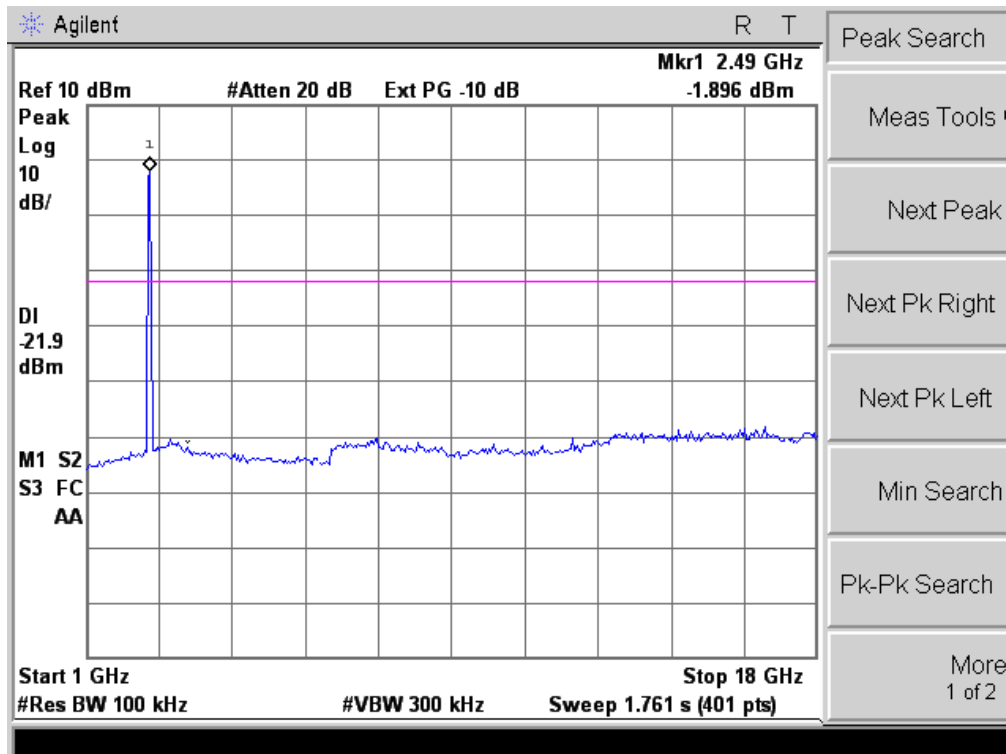
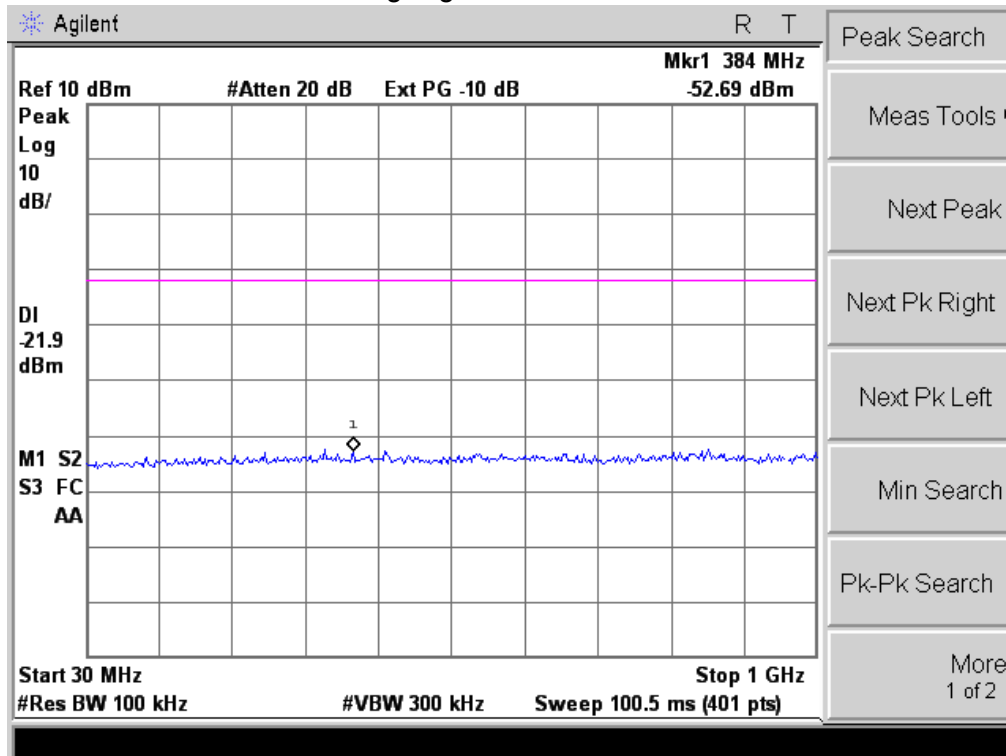
802.11g Low Channel-2412MHz



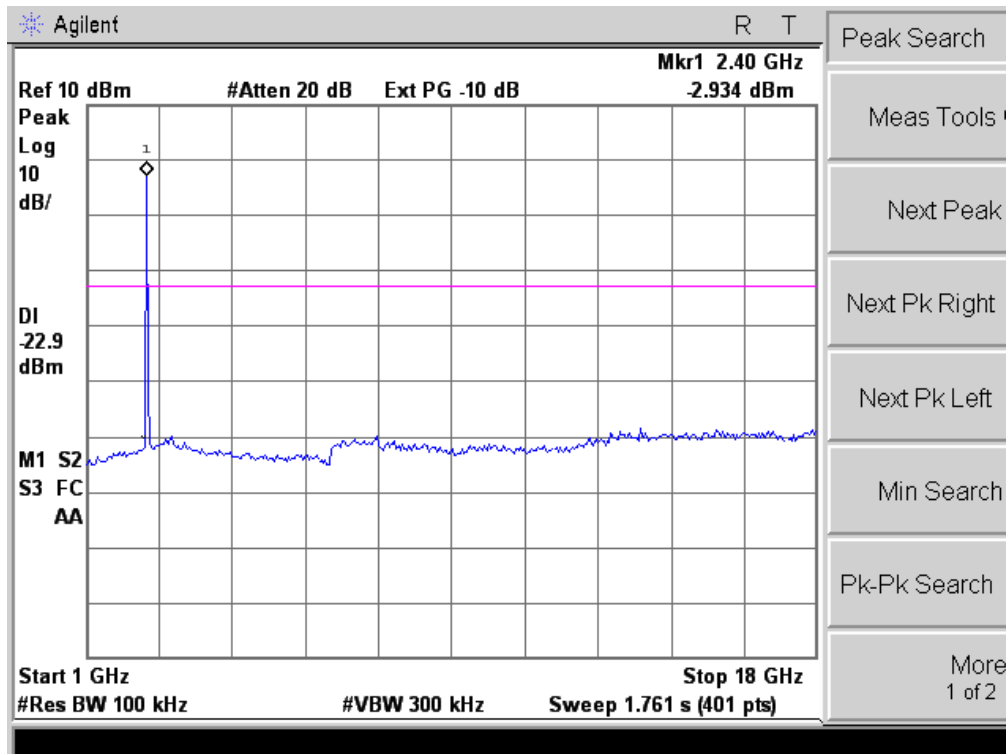
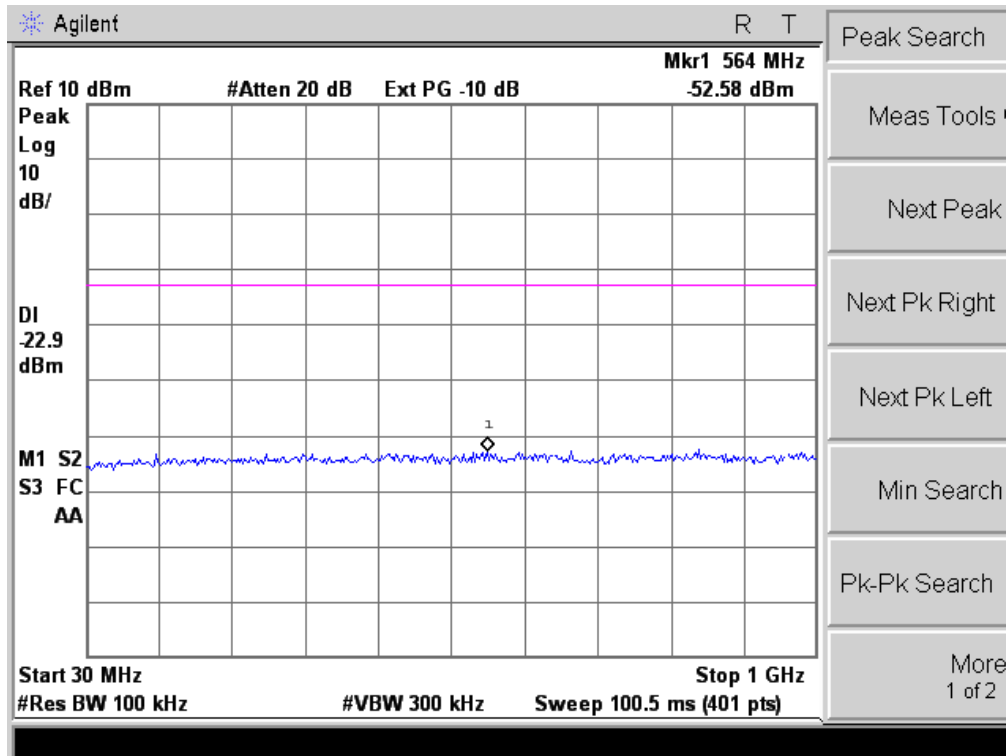
802.11g Middle Channel-2437MHz



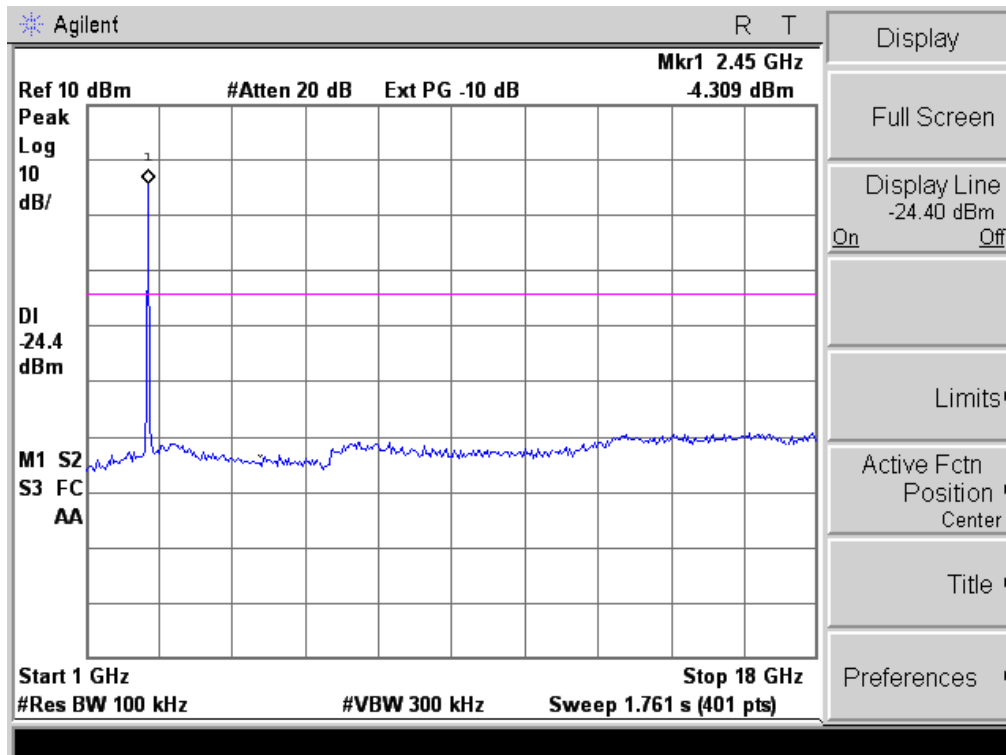
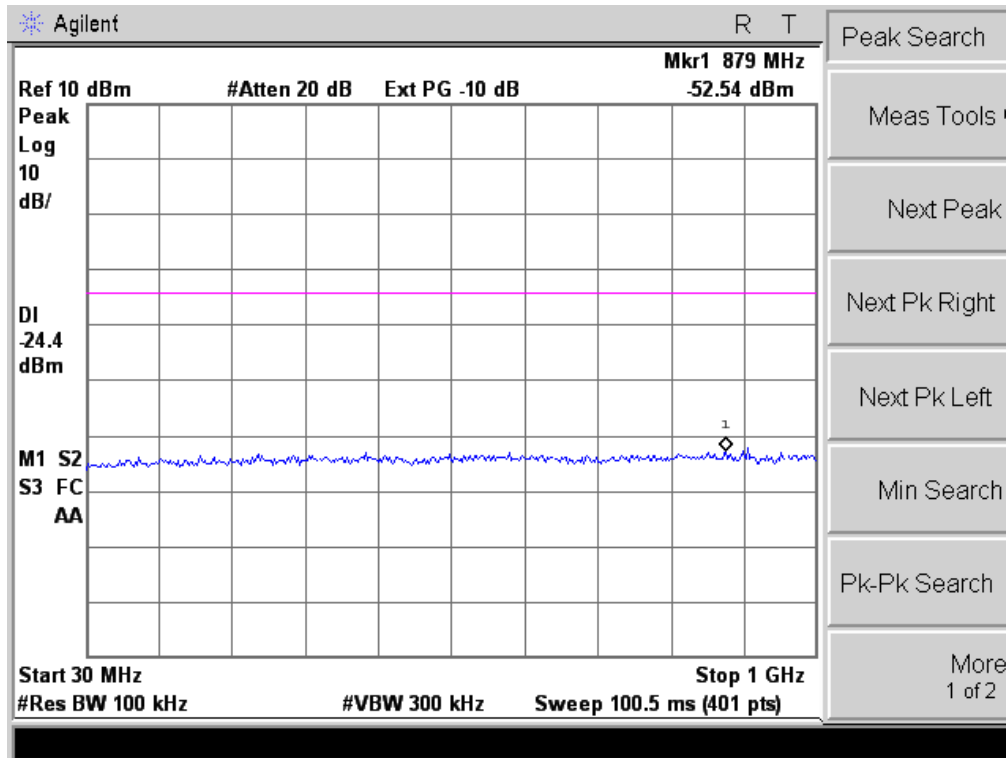
802.11g High Channel-2462MHz



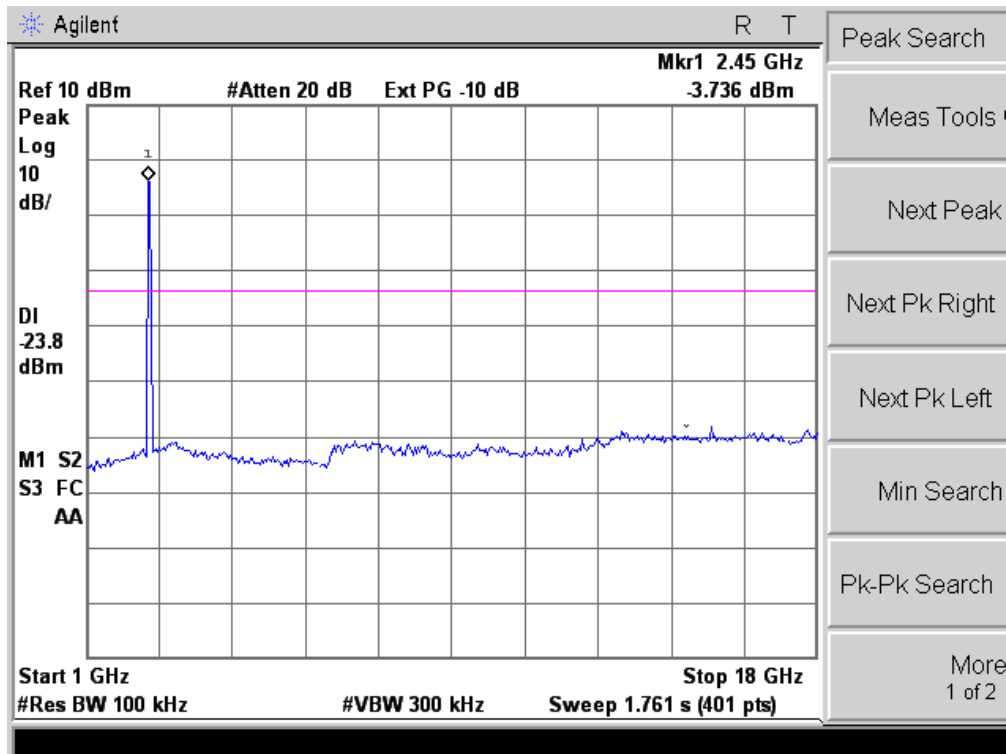
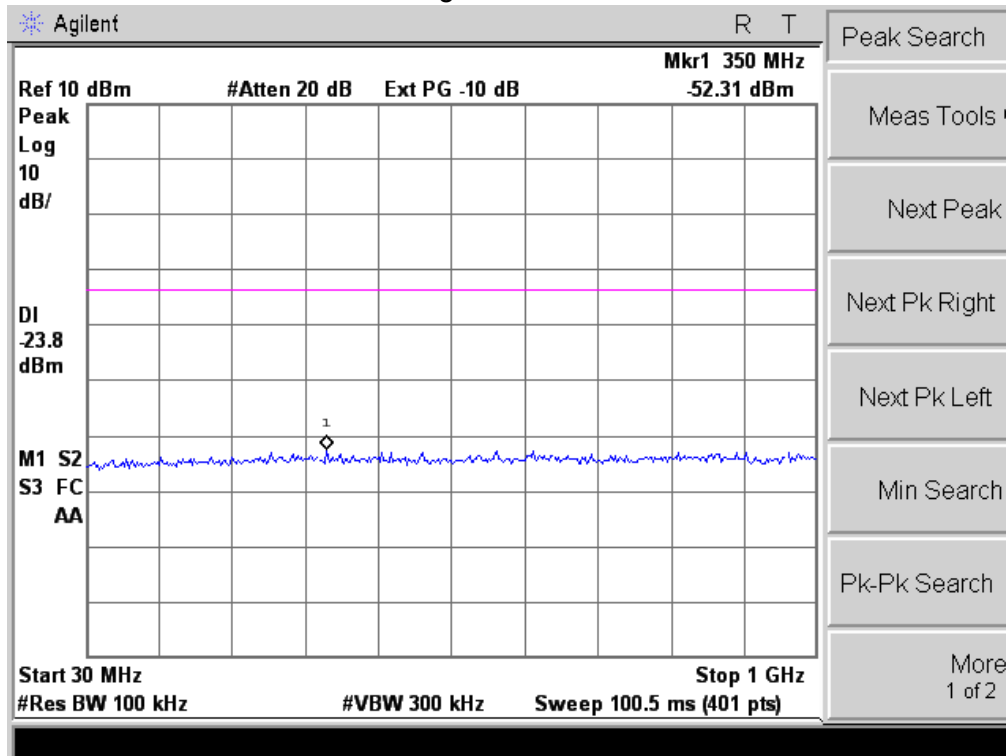
802.11n Low Channel-2412MHz



802.11n Middle Channel-2437MHz



802.11n High Channel-2462MHz



Radiated band edge:

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type	Comment
802.11b							
2390	38.61	-13.06	25.55	74	-48.45	peak	Vertical
2390	40.26	-13.06	27.20	74	-46.80	peak	Horizontal
2483.5	40.04	-12.78	27.26	74	-46.74	peak	Vertical
2483.5	48.28	-12.78	35.50	74	-38.50	peak	Horizontal
802.11g							
2390	40.58	-13.06	27.52	74	-46.48	peak	Vertical
2390	39.64	-13.06	26.58	74	-47.42	peak	Horizontal
2483.5	47.96	-12.78	35.18	74	-38.82	peak	Vertical
2483.5	40.35	-12.78	27.57	74	-46.43	peak	Horizontal
802.11n							
2390	39.68	-13.06	26.62	74	-47.38	peak	Vertical
2390	38.82	-13.06	25.76	74	-48.24	peak	Horizontal
2483.5	48.02	-12.78	35.24	74	-38.76	peak	Vertical
2483.5	40.82	-12.78	28.04	74	-45.96	peak	Horizontal

NOTE: The result(PK) less than AV limite,No need shown AV result.

4. POWER SPECTRAL DENSITY TEST

4.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247	Power Spectral Density	8 dBm (in any 3KHz)	2400-2483.5	PASS

4.1.1 TEST PROCEDURE

1. Set analyzer center frequency to DTS channel center frequency.
2. Set the span to 1.5 times the DTS channel bandwidth.
3. Set the RBW \geq 3 kHz.
4. Set the VBW \geq 3 x RBW.
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 amplitude level.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

4.1.2 DEVIATION FROM STANDARD

No deviation.

4.1.3 TEST SETUP



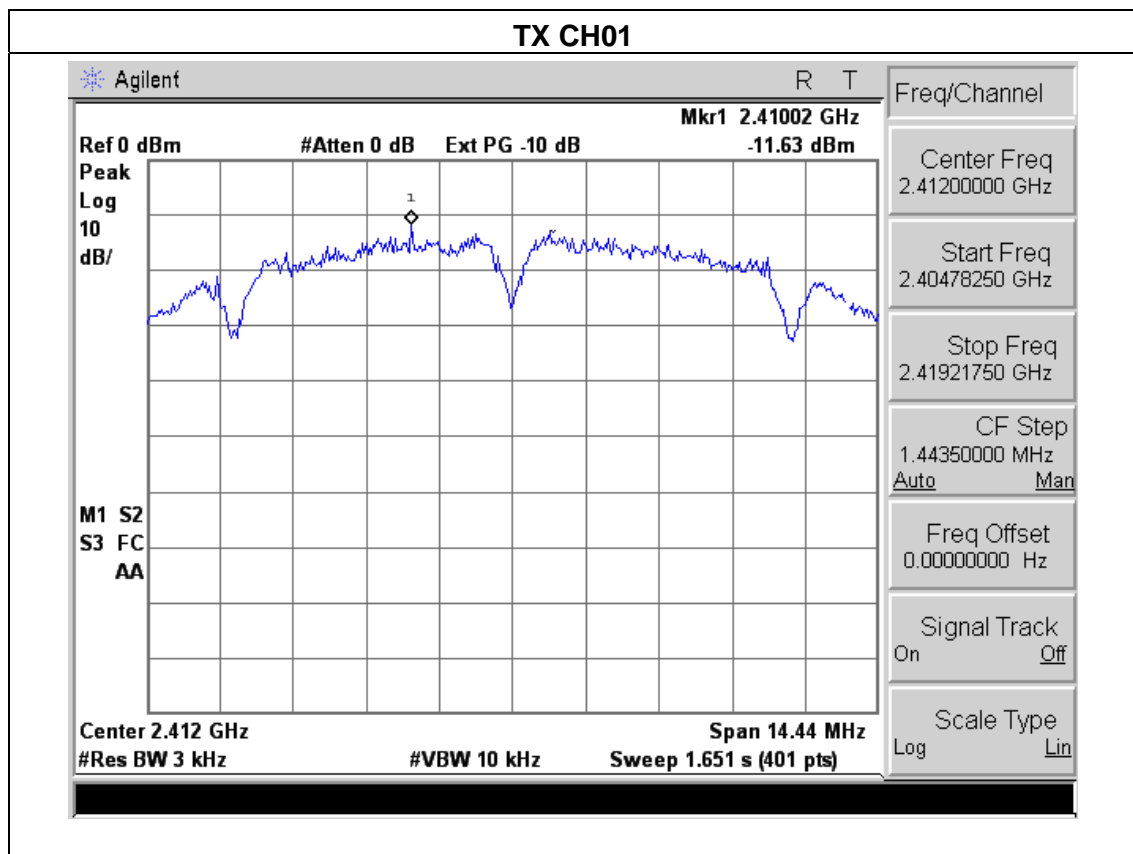
4.1.4 EUT OPERATION CONDITIONS

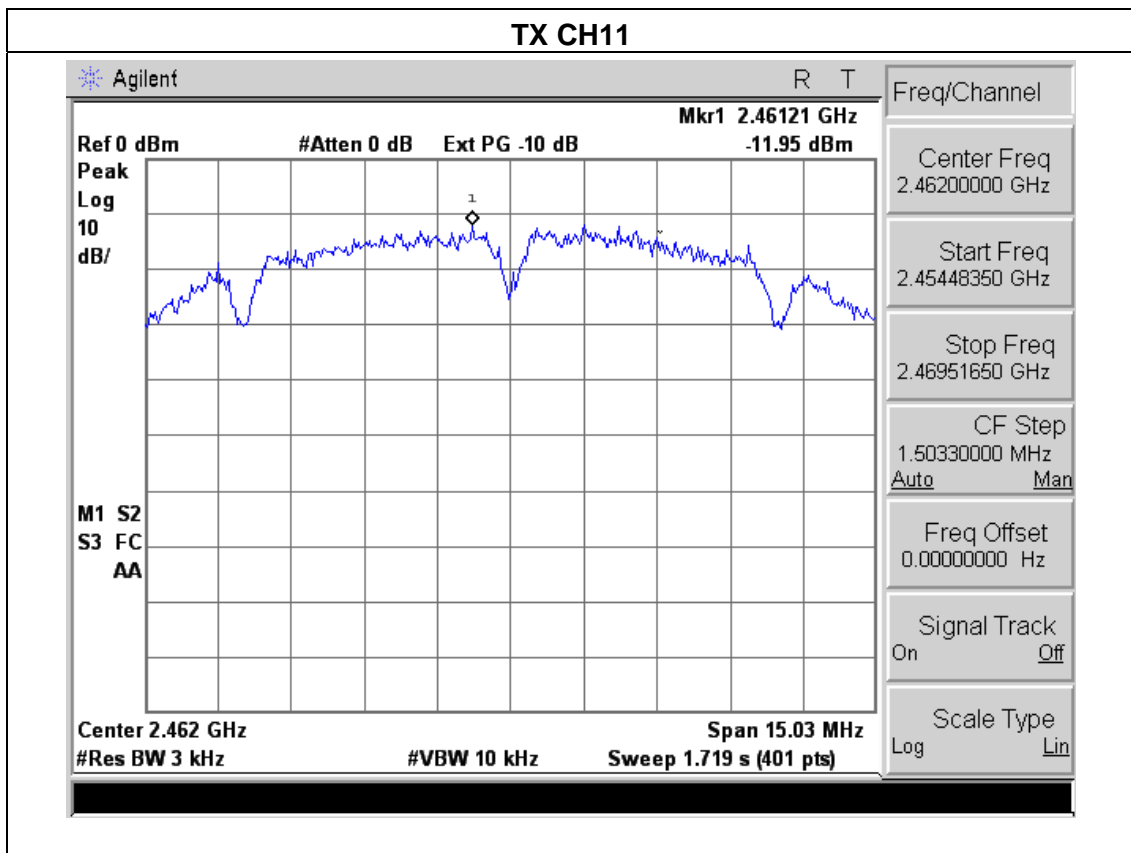
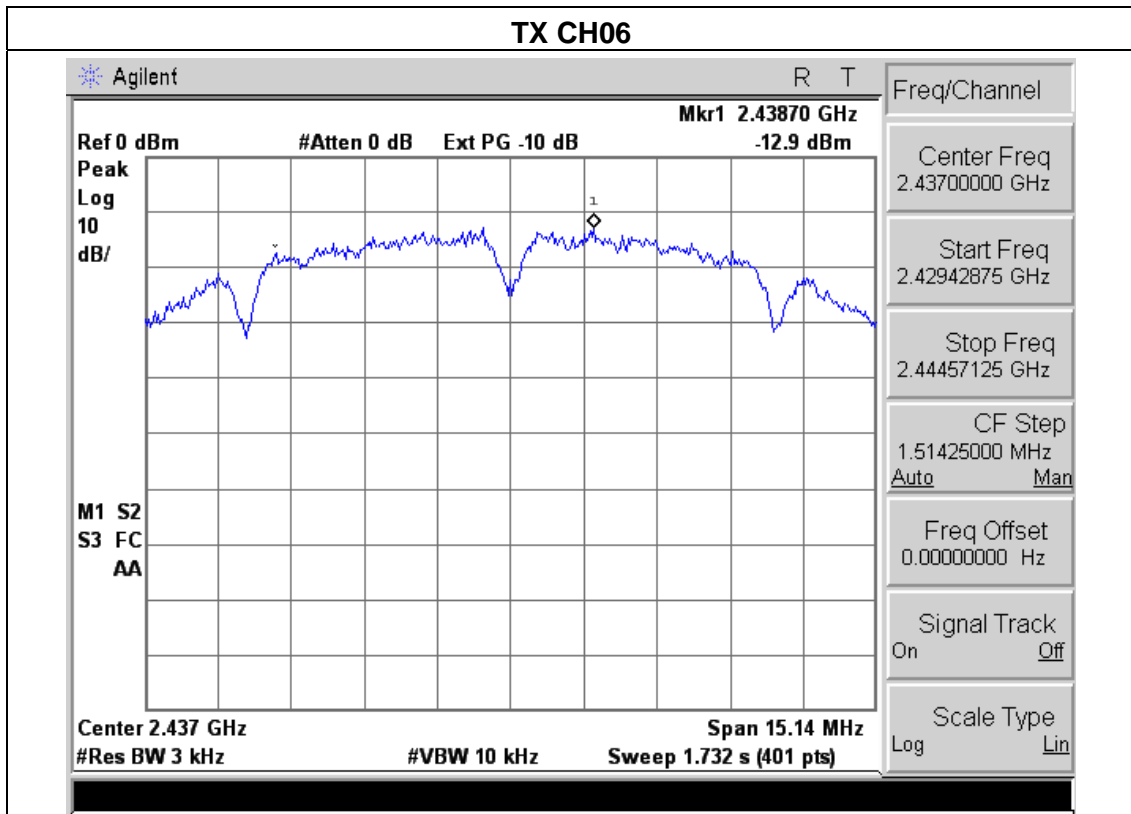
The EUT tested system was configured as the statements of 2.1 Unless otherwise a special operating condition is specified in the follows during the testing.

4.1.5 TEST RESULTS

EUT :	MID	Model Name :	EGM002
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1015 hPa	Test Voltage :	DC 5V from adapter AC120V/60Hz
Test Mode :	TX b Mode /CH01, CH06, CH11		

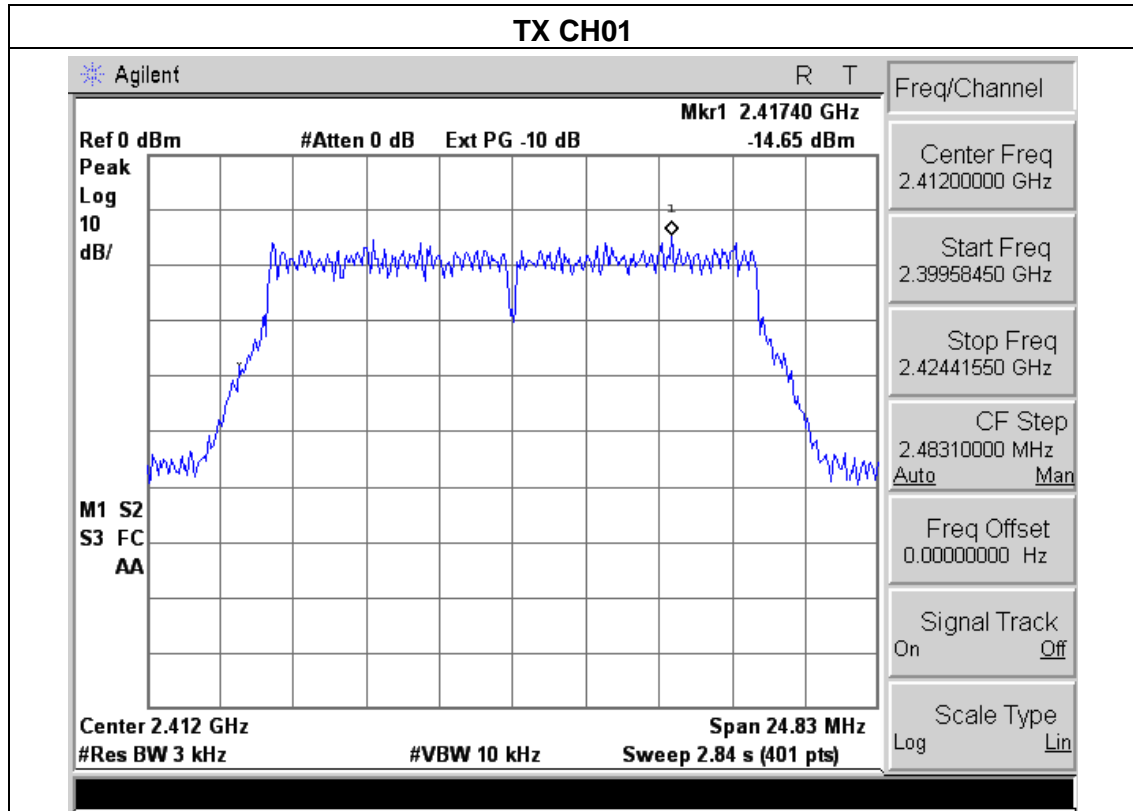
Frequency	Power Density (dBm)	Limit (dBm)	Result
2412 MHz	-11.63	8	PASS
2437 MHz	-12.90	8	PASS
2462 MHz	-11.95	8	PASS

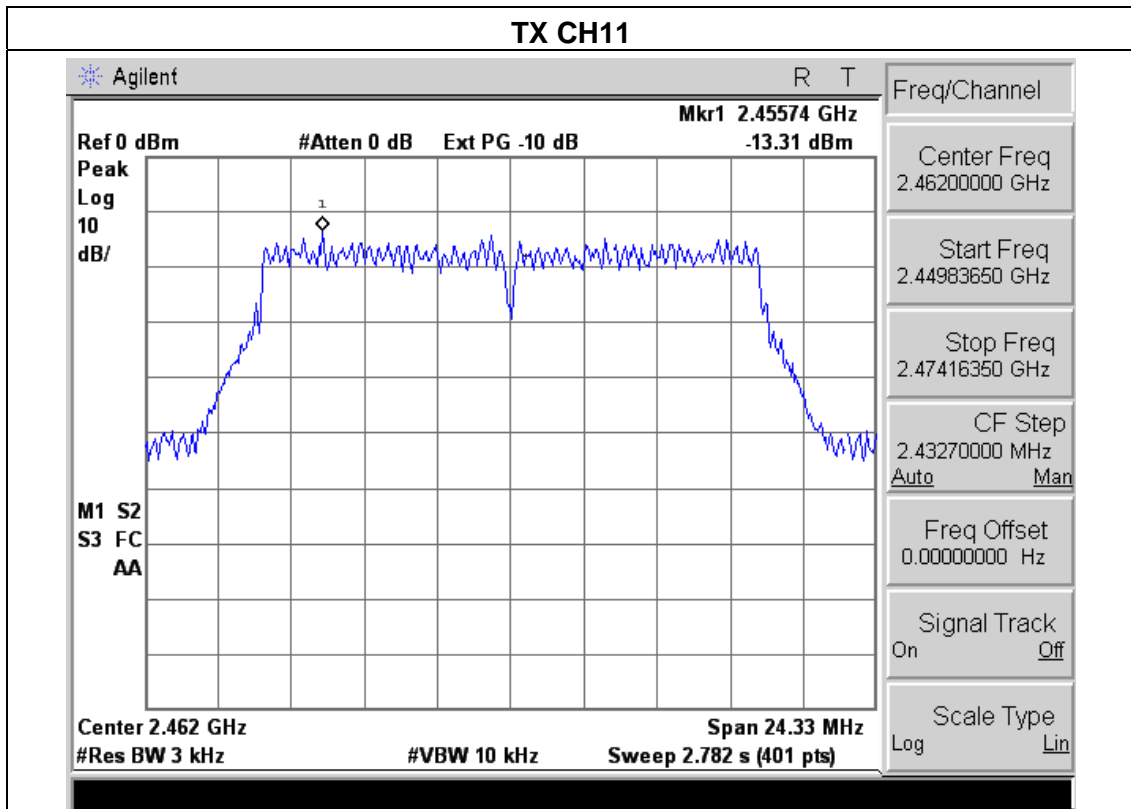
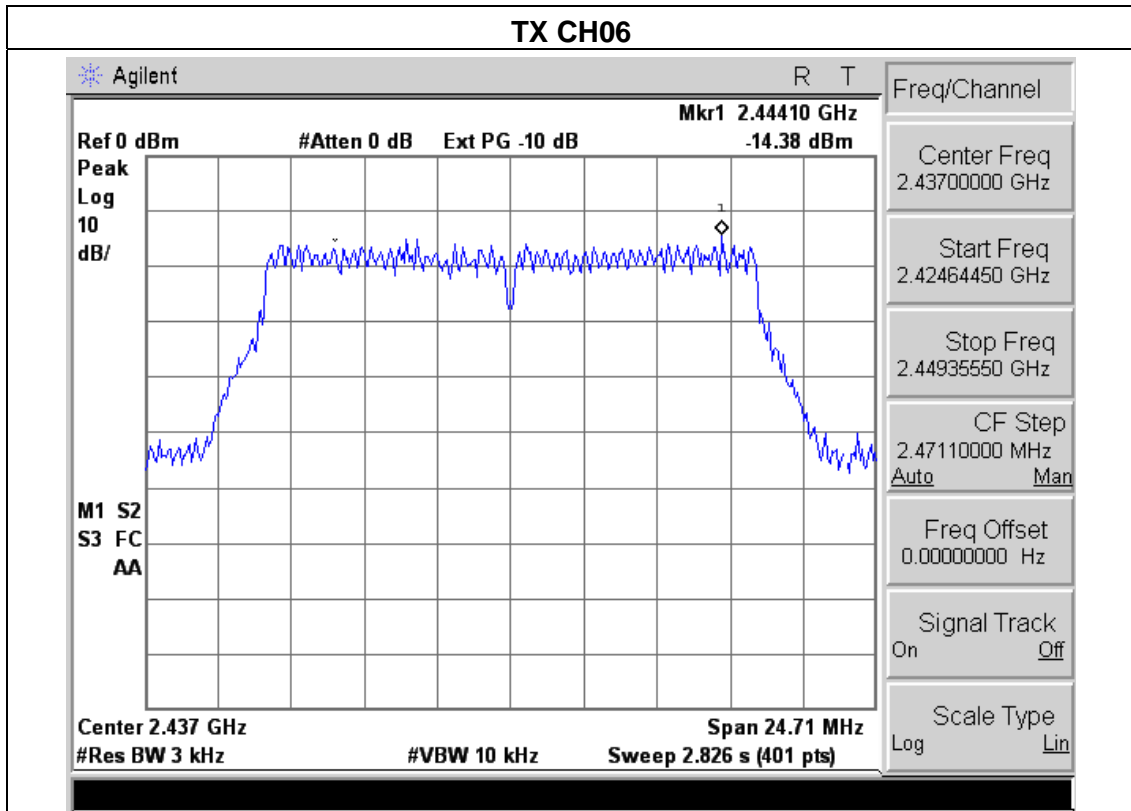




EUT :	MID	Model Name :	EGM002
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1015 hPa	Test Voltage :	DC 5V from adapter AC120V/60Hz
Test Mode :	TX g Mode /CH01, CH06, CH11		

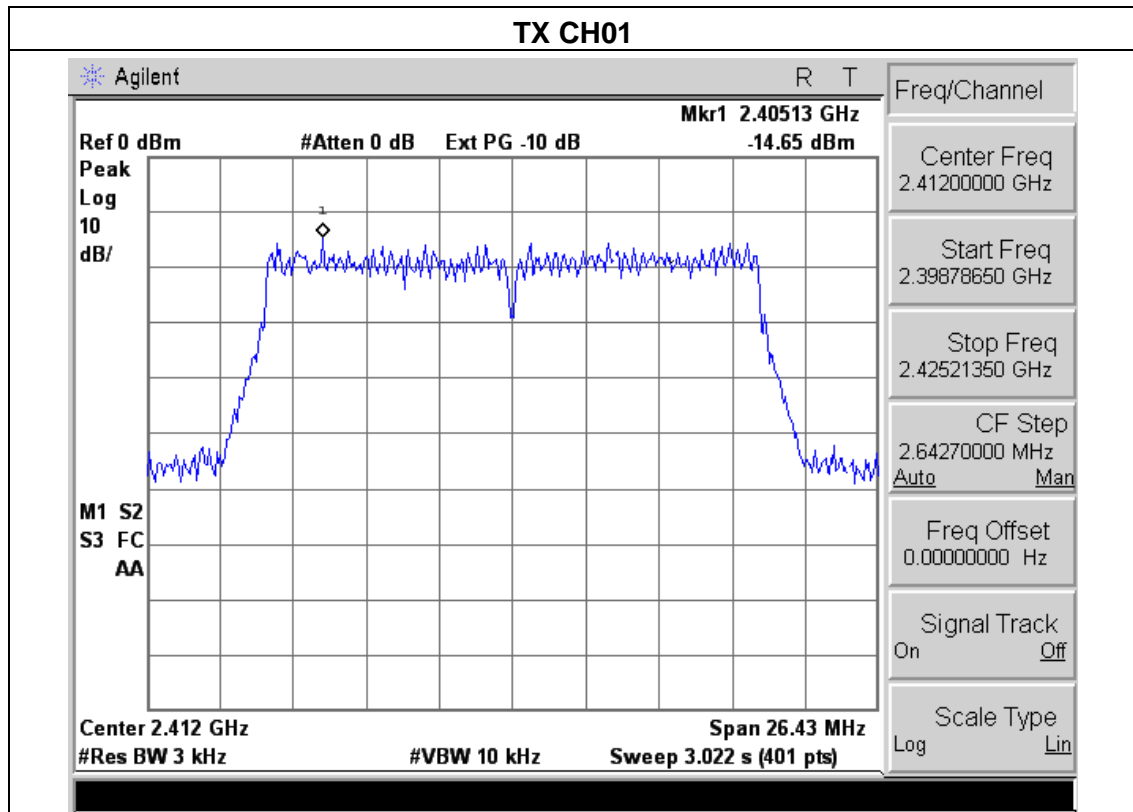
Frequency	Power Density (dBm)	Limit (dBm)	Result
2412 MHz	-14.65	8	PASS
2437 MHz	-14.38	8	PASS
2462 MHz	-13.31	8	PASS

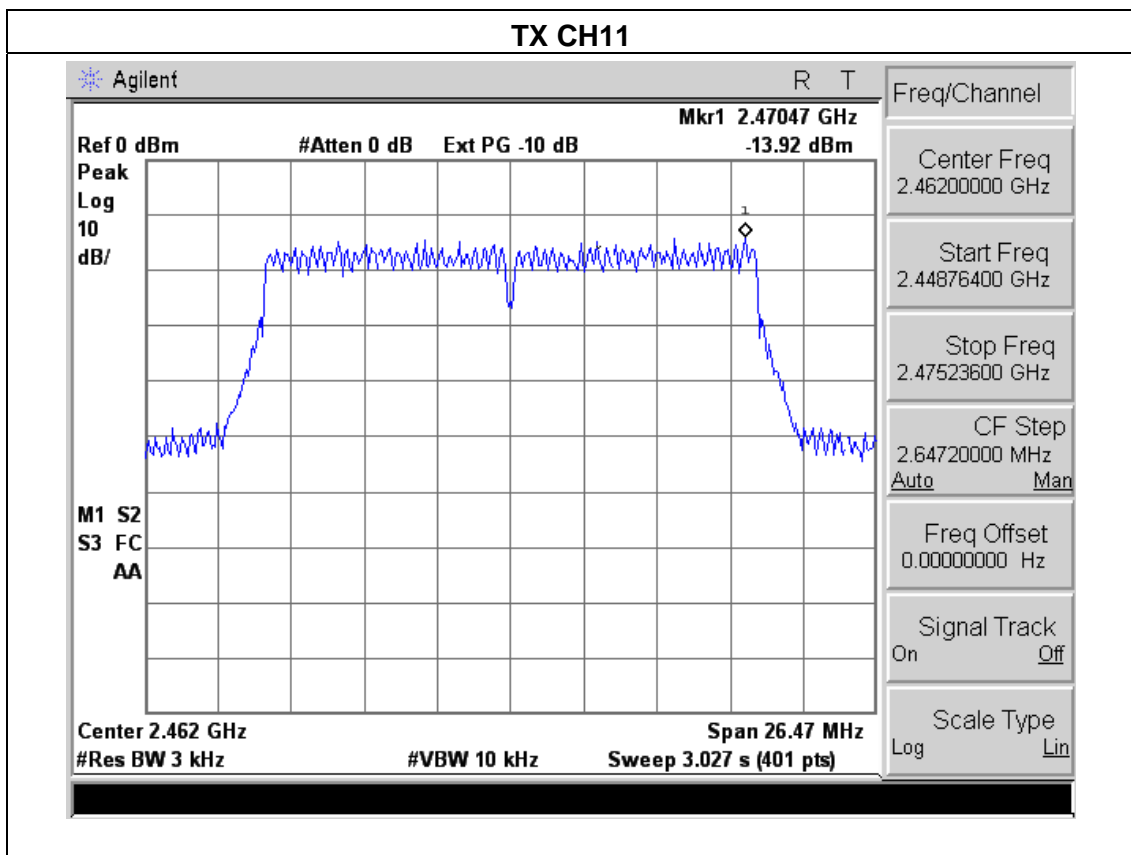
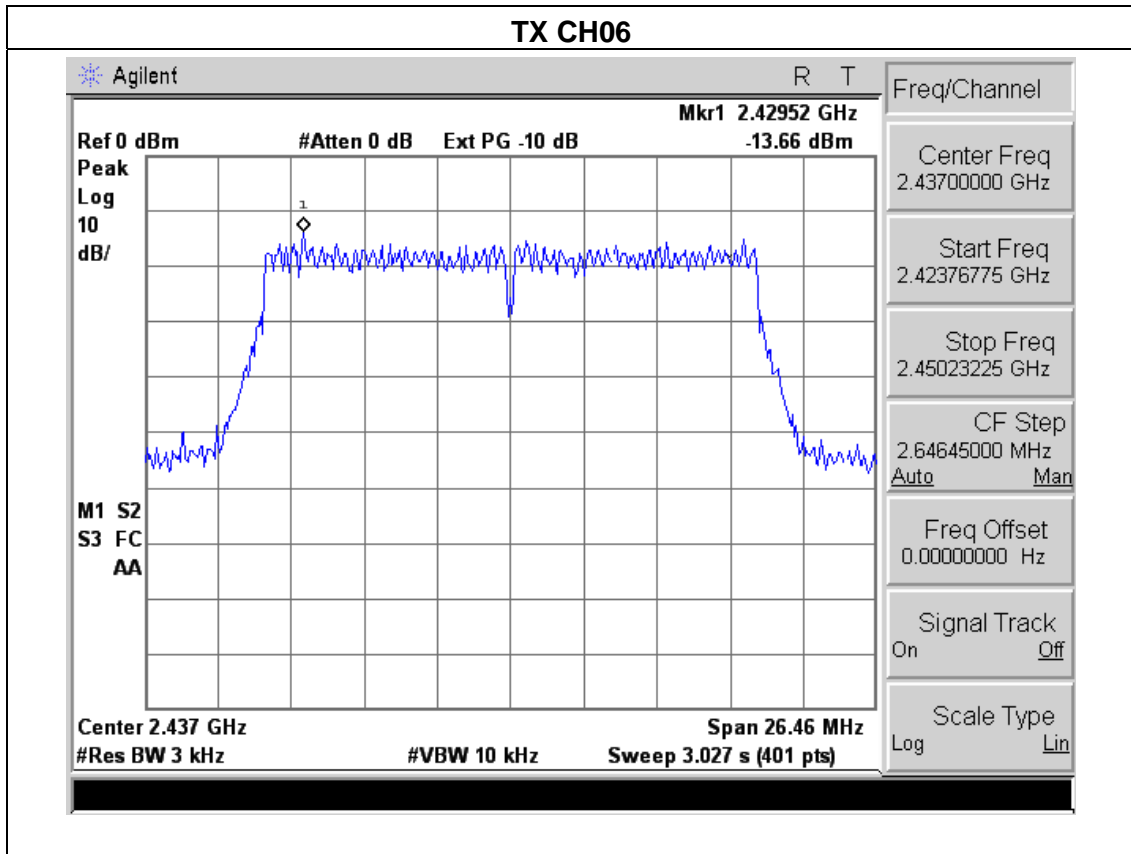




EUT :	MID	Model Name :	EGM002
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1015 hPa	Test Voltage :	DC 5V from adapter AC120V/60Hz
Test Mode :	TX n Mode /CH01, CH06, CH11		

Frequency	Power Density (dBm)	Limit (dBm)	Result
2412 MHz	-14.65	8	PASS
2437 MHz	-13.66	8	PASS
2462 MHz	-13.92	8	PASS





5. BANDWIDTH TEST

5.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(a)(2)	Bandwidth	$\geq 500\text{KHz}$ (6dB bandwidth)	2400-2483.5	PASS

5.1.1 TEST PROCEDURE

1. Set RBW= 100 kHz.
2. Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

5.1.2 DEVIATION FROM STANDARD

No deviation.

5.1.3 TEST SETUP



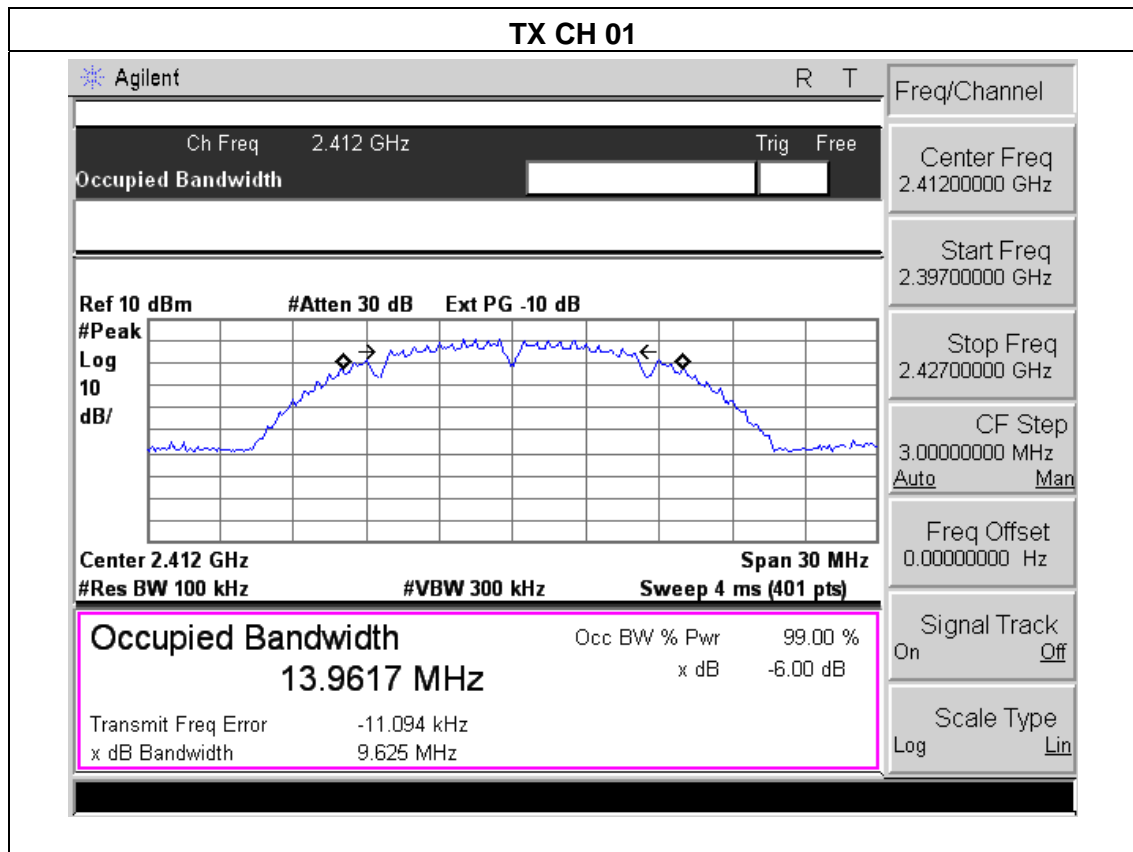
5.1.4 EUT OPERATION CONDITIONS

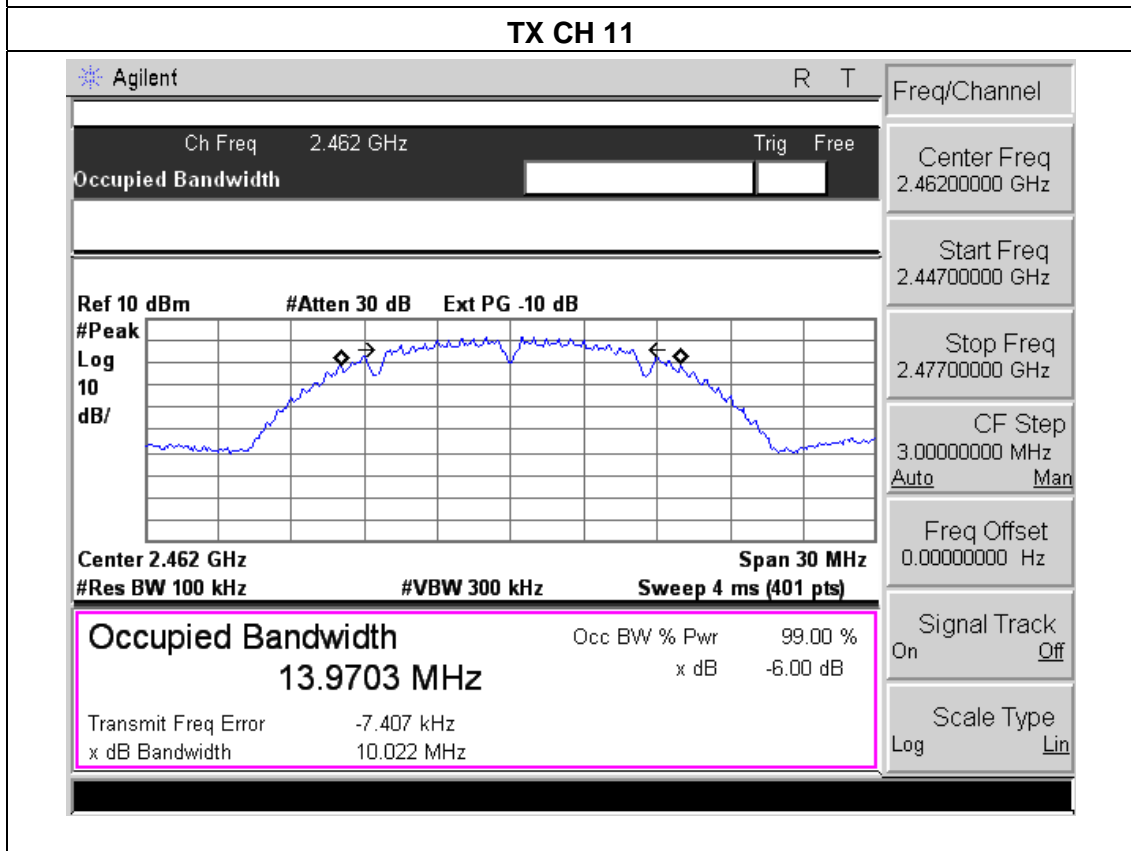
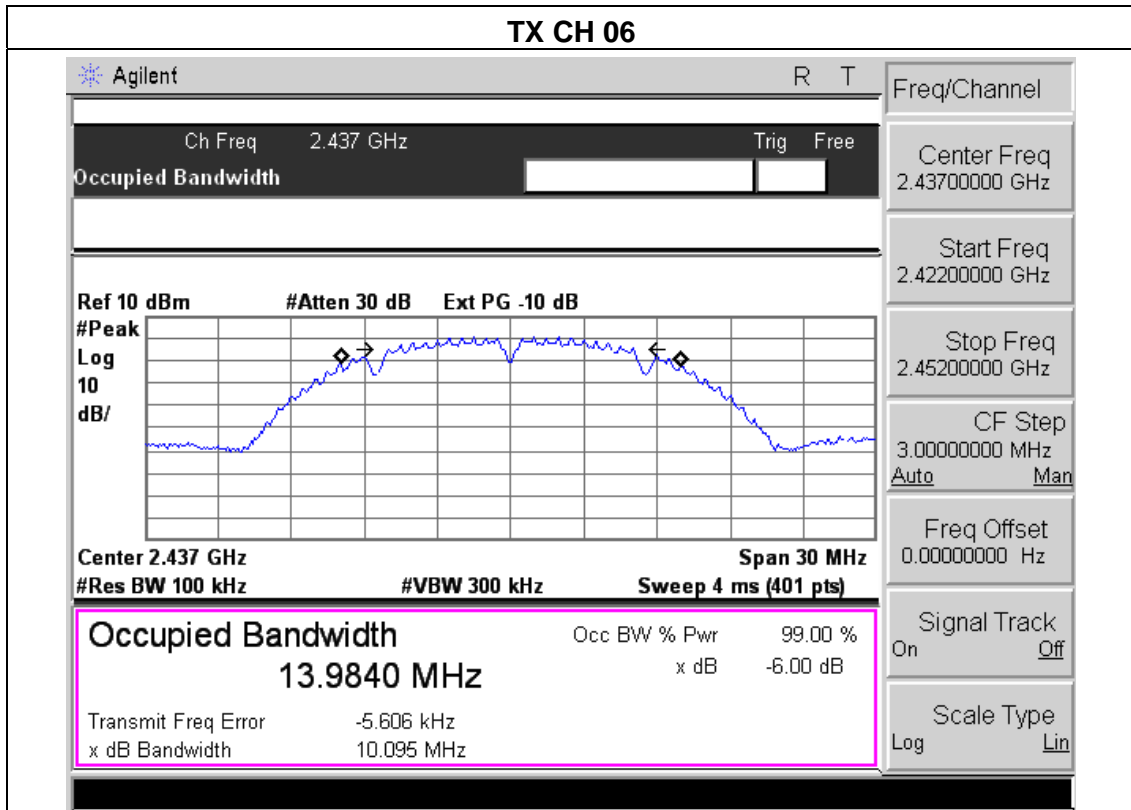
The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

5.1.5 TEST RESULTS

EUT :	MID	Model Name :	EGM002
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 5V from adapter AC120V/60Hz
Test Mode :	TX b Mode /CH01, CH06, CH11		

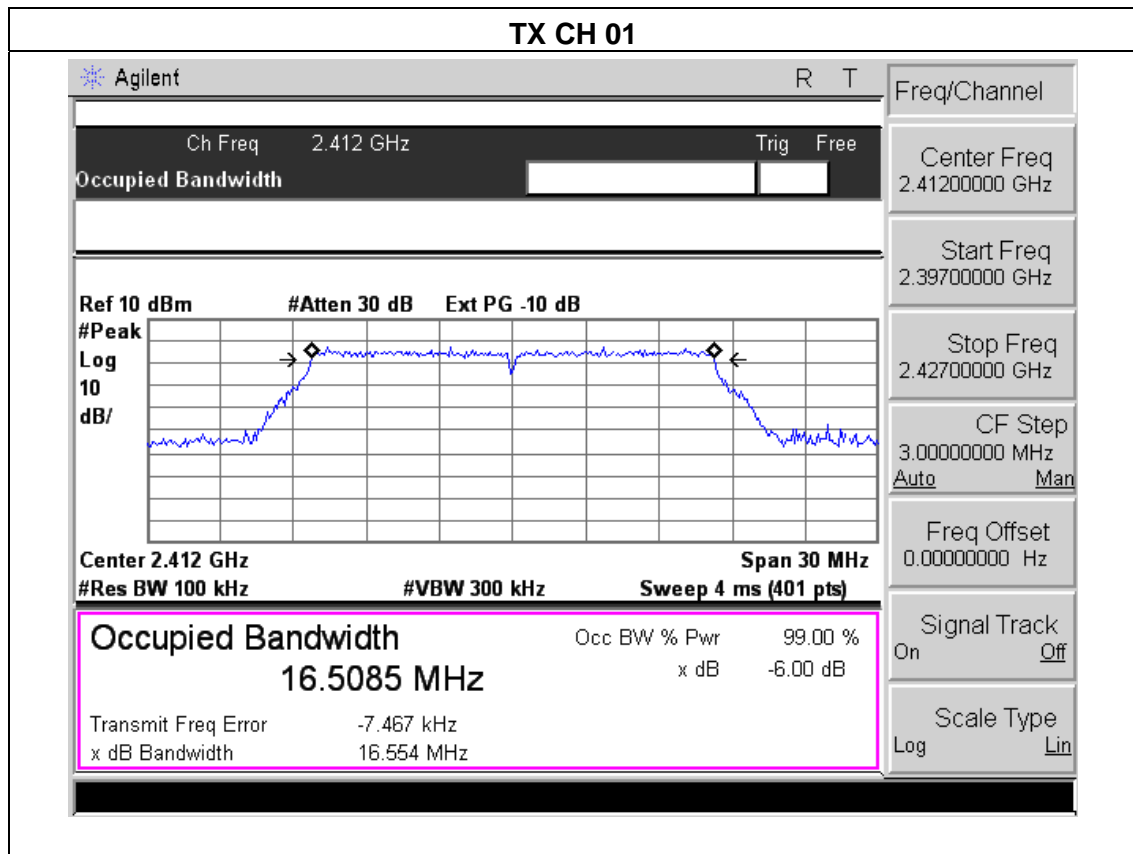
Channel	Frequency (MHz)	Data Rate (Mbps)	Antenna port	6dB bandwidth (MHz)	Limit (kHz)	Result
802.11b mode						
Low	2412	1	Chain 0	9.63	500	Pass
Middle	2437	1	Chain 0	10.10	500	Pass
High	2462	1	Chain 0	10.02	500	Pass

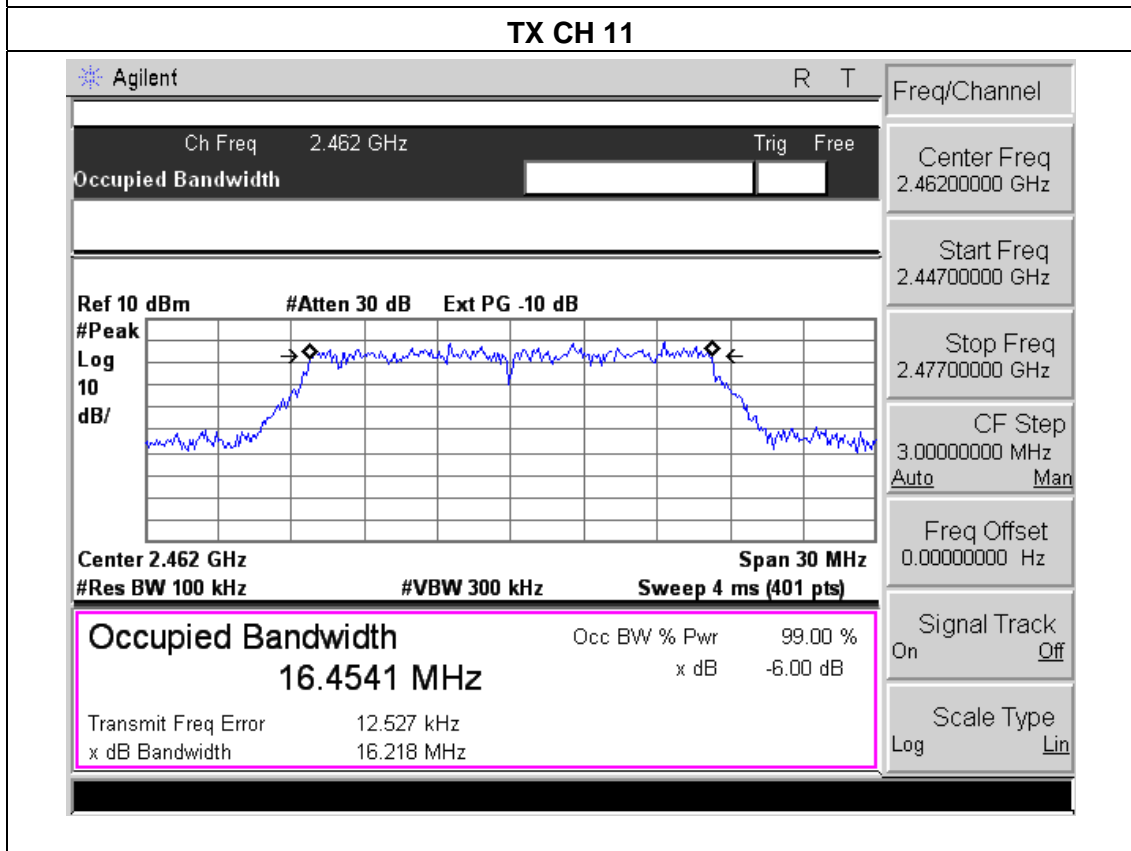
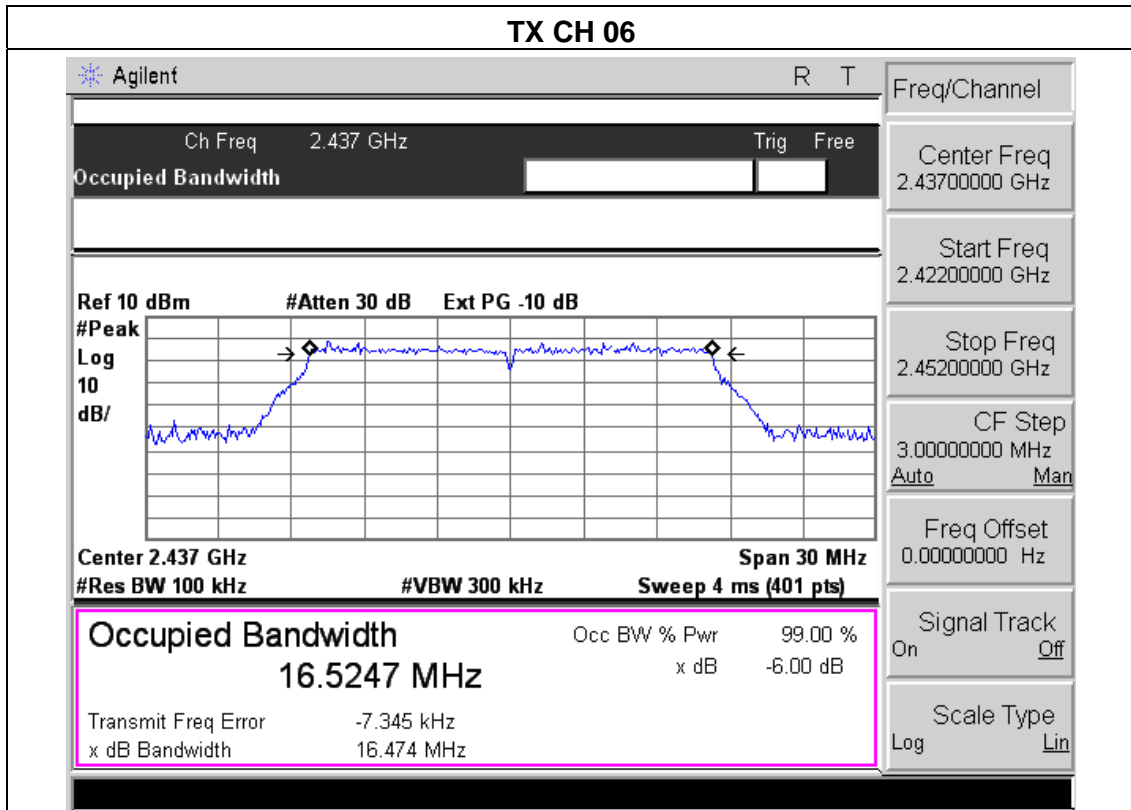




EUT :	MID	Model Name :	EGM002
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 5V from adapter AC120V/60Hz
Test Mode :	TX g Mode /CH01, CH06, CH11		

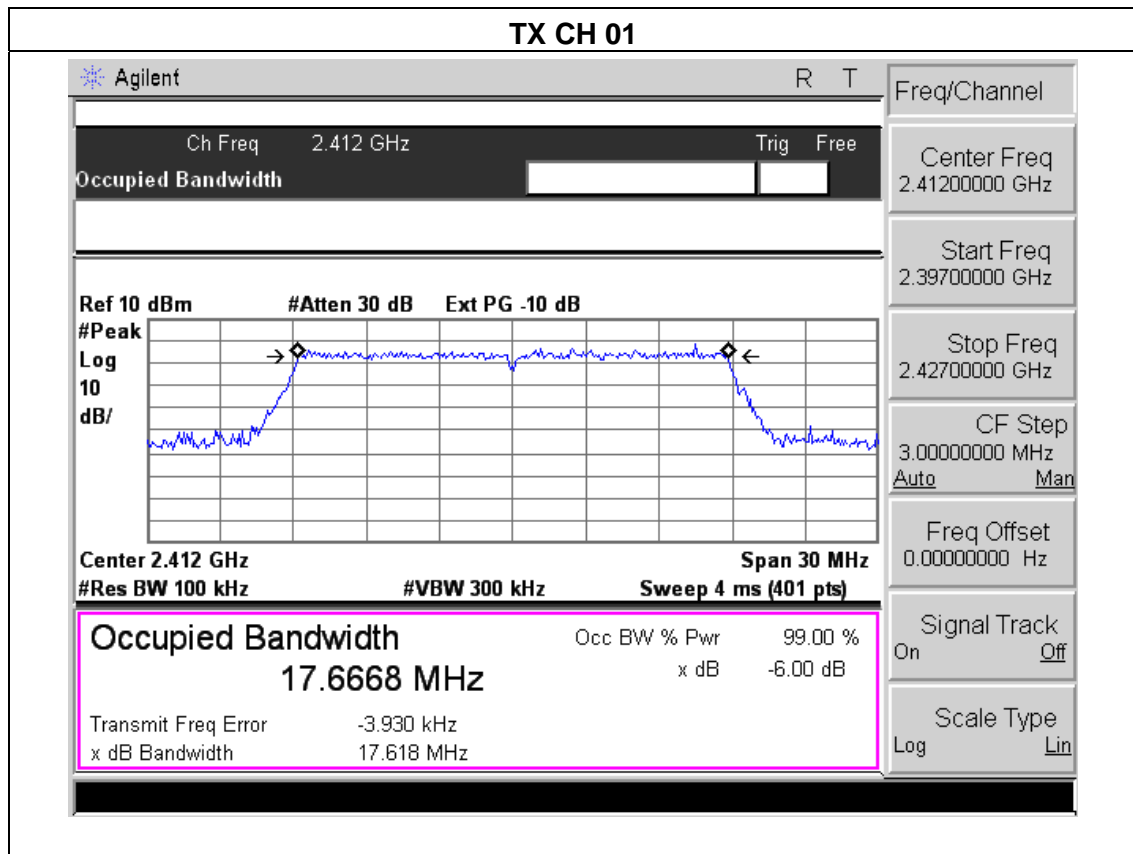
Channel	Frequency (MHz)	Data Rate (Mbps)	Antenna port	6dB bandwidth (MHz)	Limit (kHz)	Result
802.11b mode						
Low	2412	6	Chain 0	16.55	500	Pass
Middle	2437	6	Chain 0	16.47	500	Pass
High	2462	6	Chain 0	16.22	500	Pass

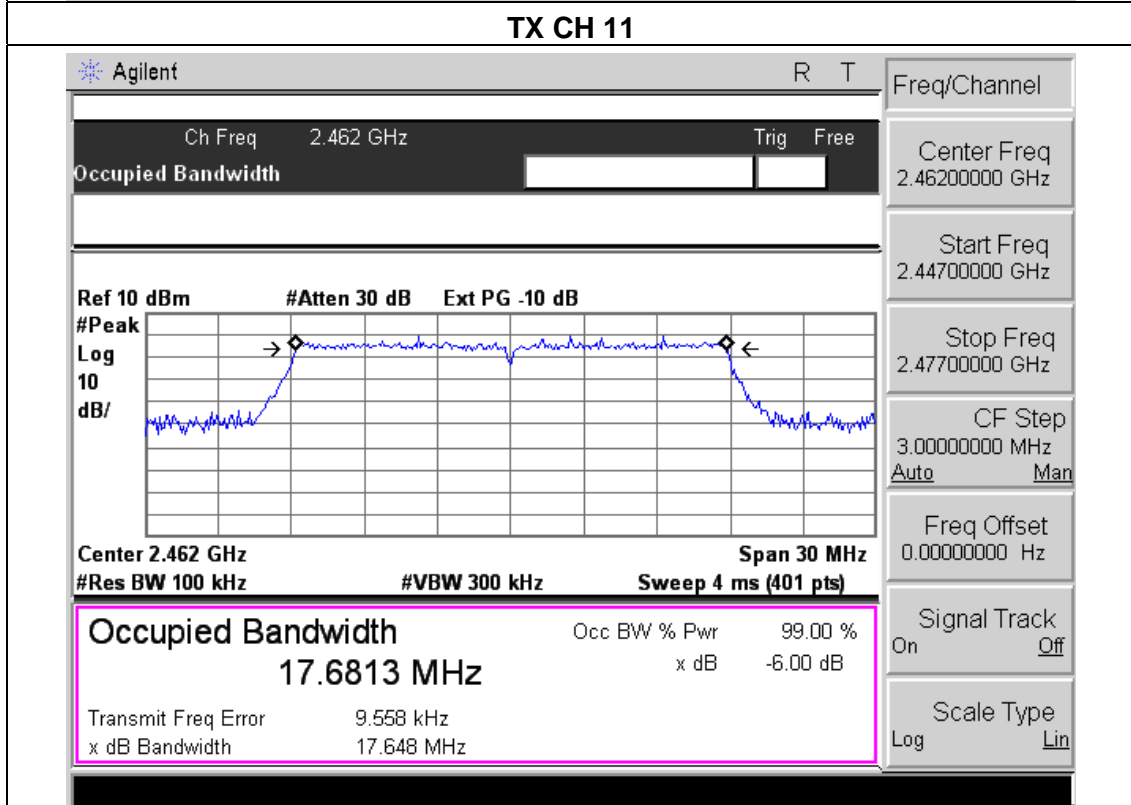
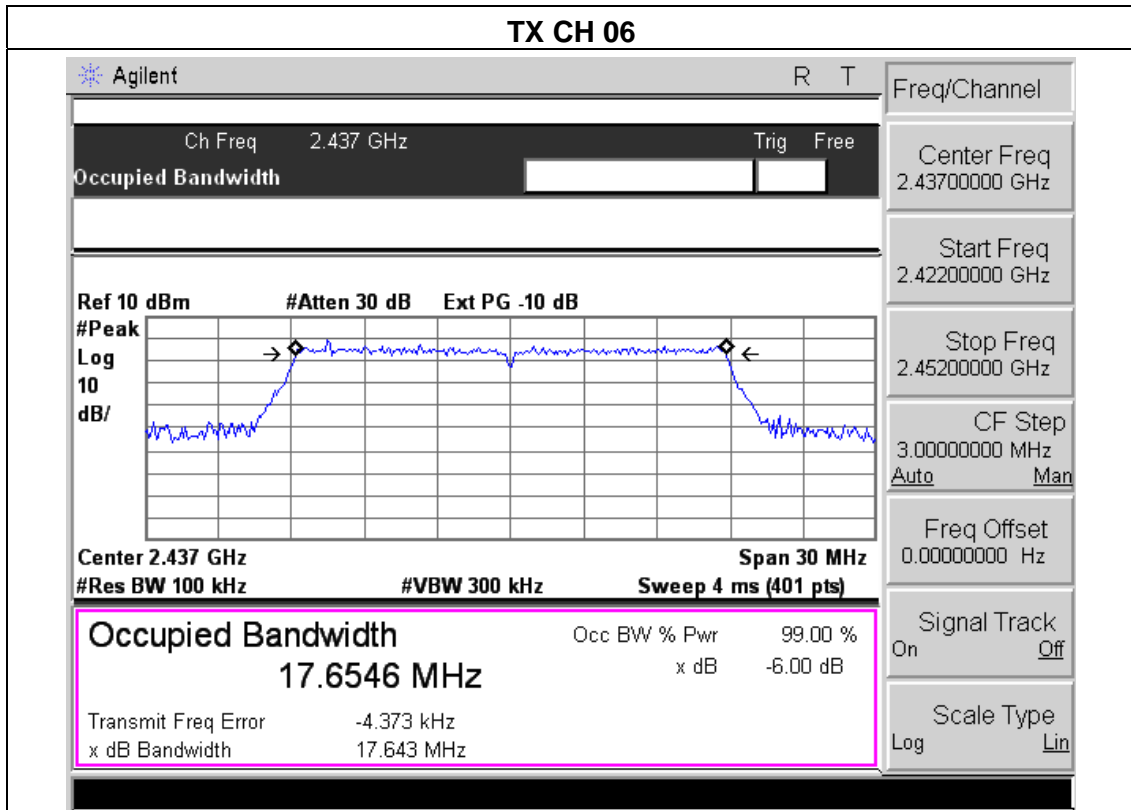




EUT :	MID	Model Name :	EGM002
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 5V from adapter AC120V/60Hz
Test Mode :	TX n Mode /CH01, CH06, CH11		

Channel	Frequency (MHz)	Data Rate (Mbps)	Antenna port	6dB bandwidth (MHz)	Limit (kHz)	Result
802.11b mode						
Low	2412	Msc7	Chain 0	17.62	500	Pass
Middle	2437	Msc7	Chain 0	17.64	500	Pass
High	2462	Msc7	Chain 0	17.65	500	Pass





6. PEAK OUTPUT POWER TEST

6.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(b)(3)	Peak Output Power	1 watt or 30dBm	2400-2483.5	PASS

6.1.1 TEST PROCEDURE

- a. The EUT was directly connected to the Power meter

6.1.2 DEVIATION FROM STANDARD

No deviation.

6.1.3 TEST SETUP



6.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

6.1.5 TEST RESULTS

EUT :	MID	Model Name :	EGM002
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 5V from adapter AC120V/60Hz
Test Mode :	TX b/g/n Mode /CH01, CH06, CH11		

TX 802.11b Mode			
Test Channel	Frequency	Maximum Peak Conducted Output Power	LIMIT
	(MHz)	(dBm)	dBm
CH01	2412	9.40	30
CH06	2437	9.22	30
CH11	2462	9.14	30
TX 802.11g Mode			
CH01	2412	7.01	30
CH06	2437	7.71	30
CH11	2462	7.95	30
TX 802.11n Mode			
CH01	2412	7.87	30
CH06	2437	7.53	30
CH11	2462	7.08	30

7. 100 KHZ BANDWIDTH OF FREQUENCY BAND EDGE

APPLICABLE STANDARD

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)).

TEST PROCEDURE

- a) Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- b) Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
- c) Set RBW to 100 kHz and VBW of spectrum analyzer to 300 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
- d) Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
- e) Repeat above procedures until all measured frequencies were complete.

7.1 DEVIATION FROM STANDARD

No deviation.

7.2 TEST SETUP



7.3 EUT OPERATION CONDITIONS

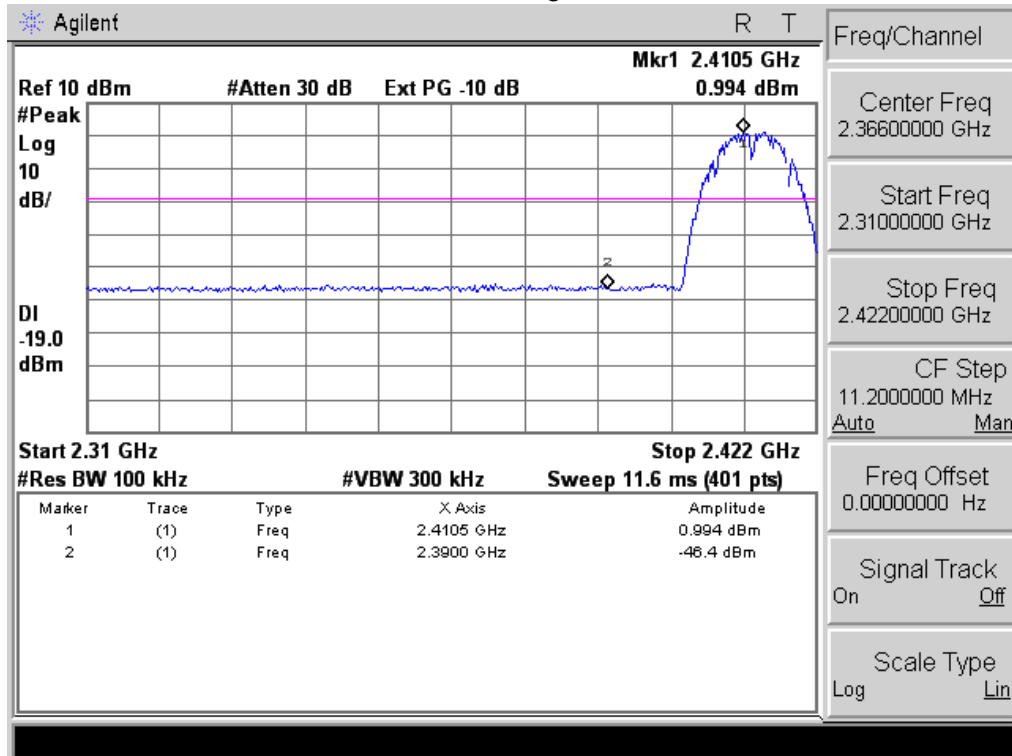
The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

7.4 TEST RESULTS

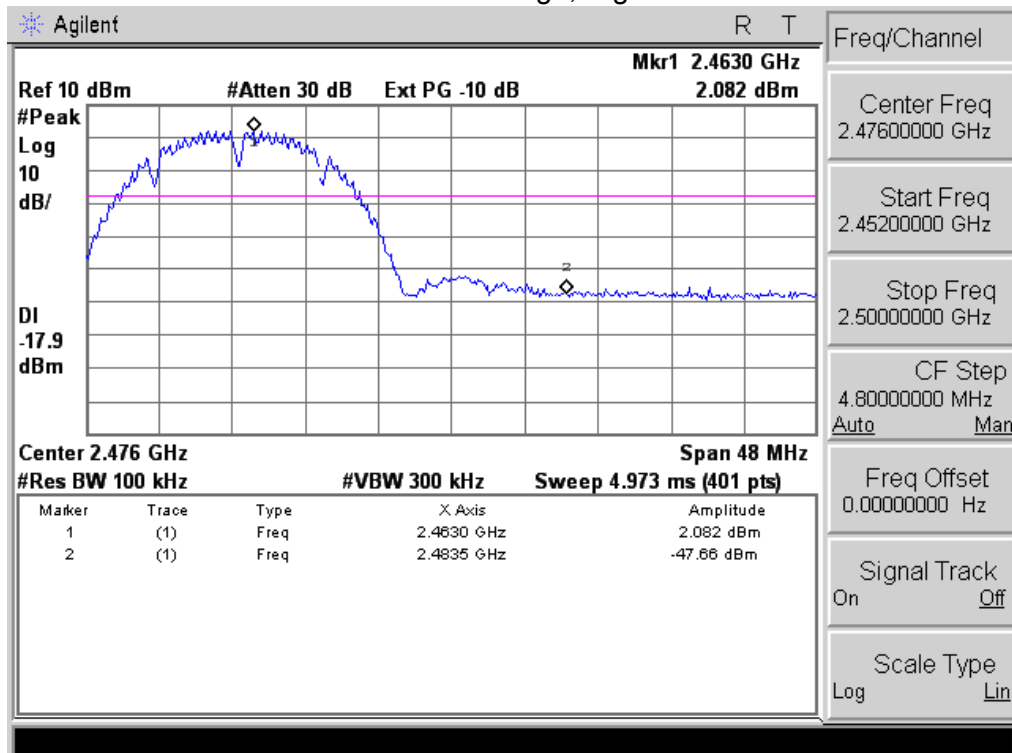
EUT :	MID	Model Name :	EGM002
Temperature :	25 °C	Relative Humidity :	60%
Pressure :	1012 hPa	Test Voltage :	DC 5V from adapter AC120V/60Hz

Frequency Band	Delta Peak to band emission (dBc)	> Limit (dBc)	Result
802.11b mode			
Left-band	47.39	20	Pass
Right-band	49.74	20	Pass
802.11g mode			
Left-band	46.11	20	Pass
Right-band	41.33	20	Pass
802.11n-HT20 mode			
Left-band	45.44	20	Pass
Right-band	39.98	20	Pass

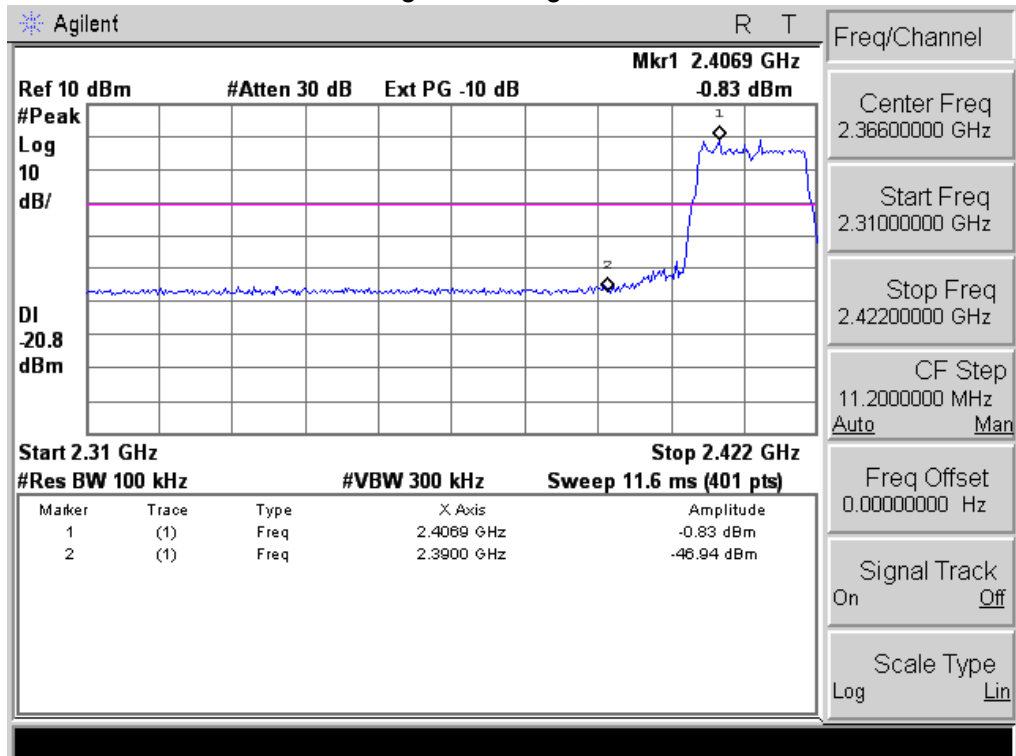
802.11b: Band Edge, Left Side



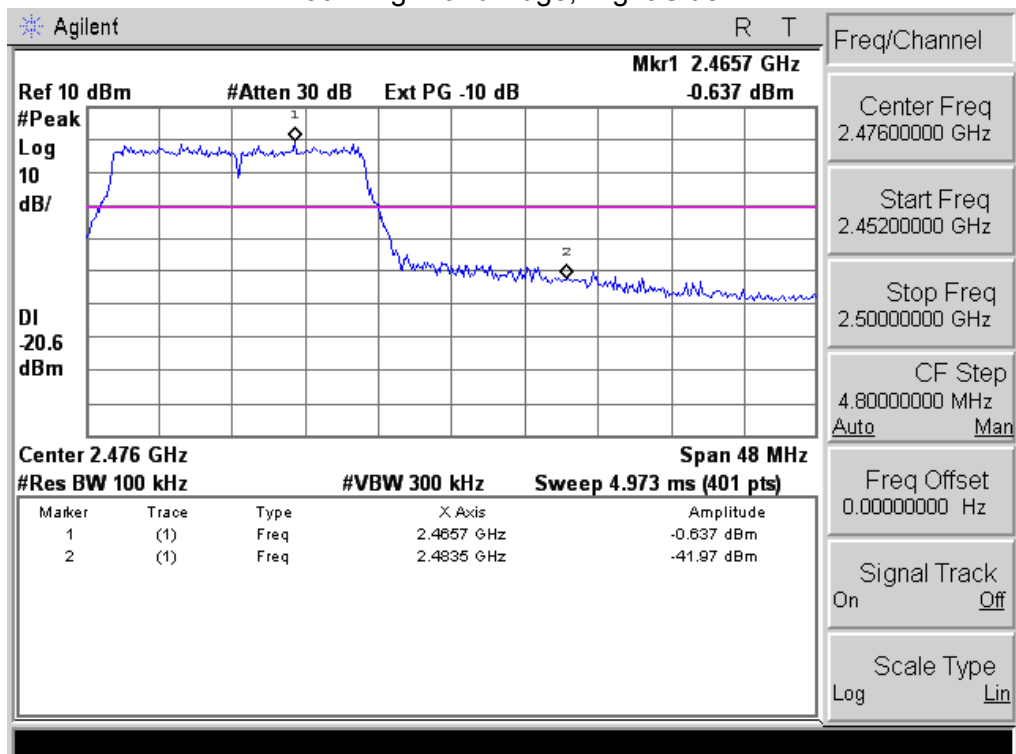
802.11b: Band Edge, Right Side



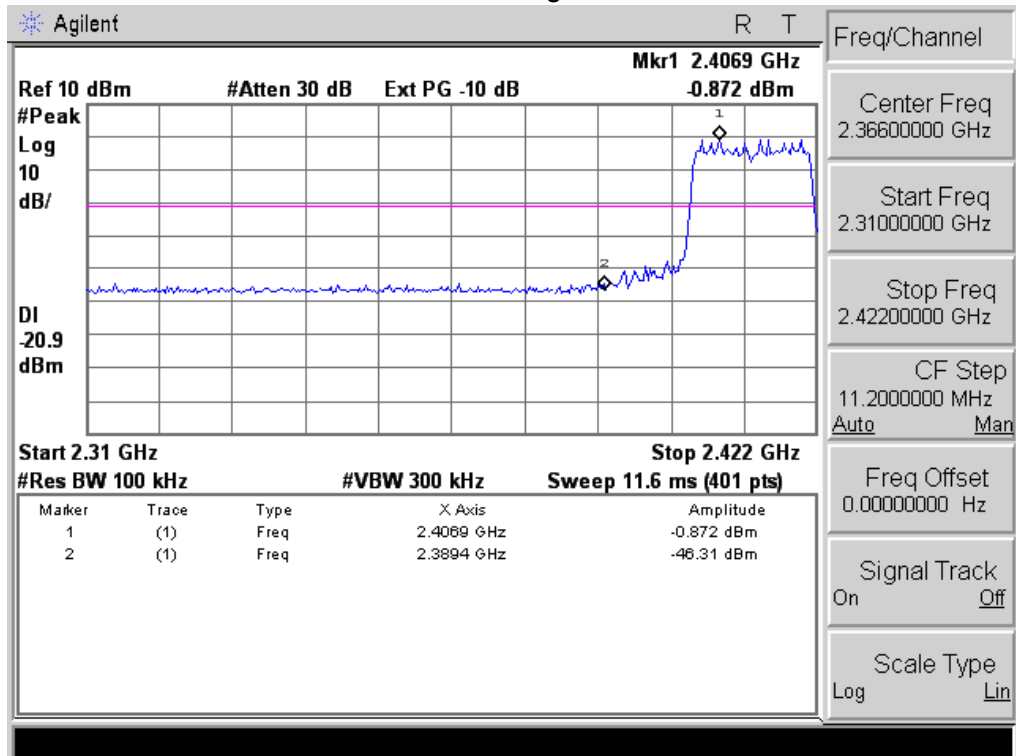
802.11g: Band Edge, Left Side



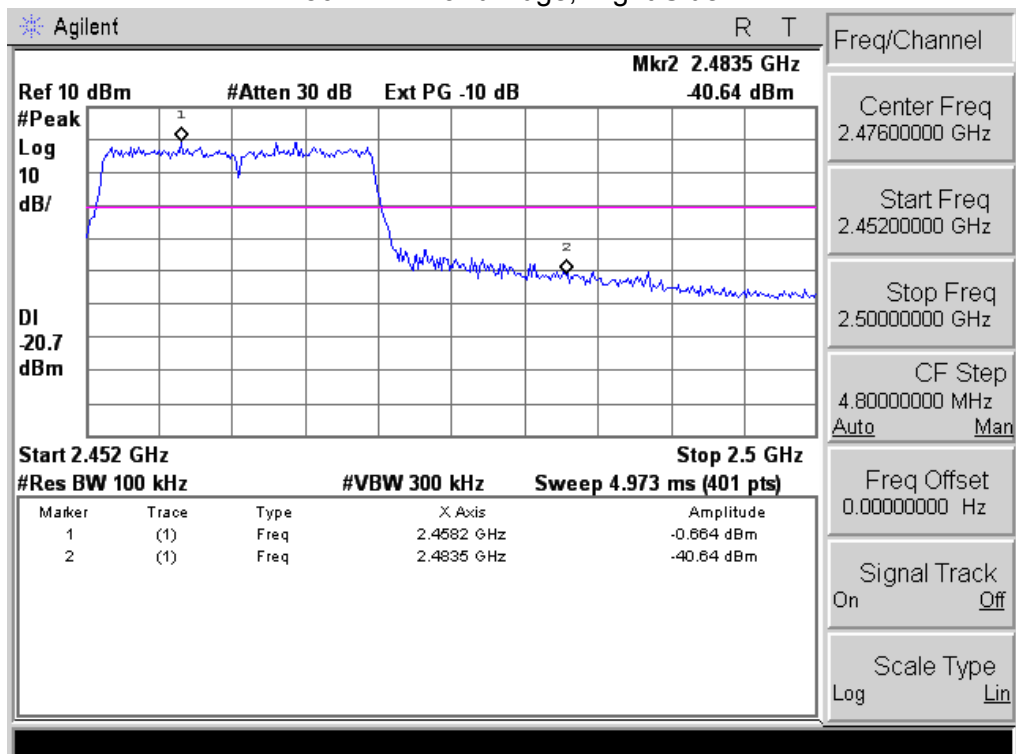
802.11g: Band Edge, Right Side



802.11n: Band Edge, Left Side



802.11n: Band Edge, Right Side



8. ANTENNA REQUIREMENT

8.1 STANDARD REQUIREMENT

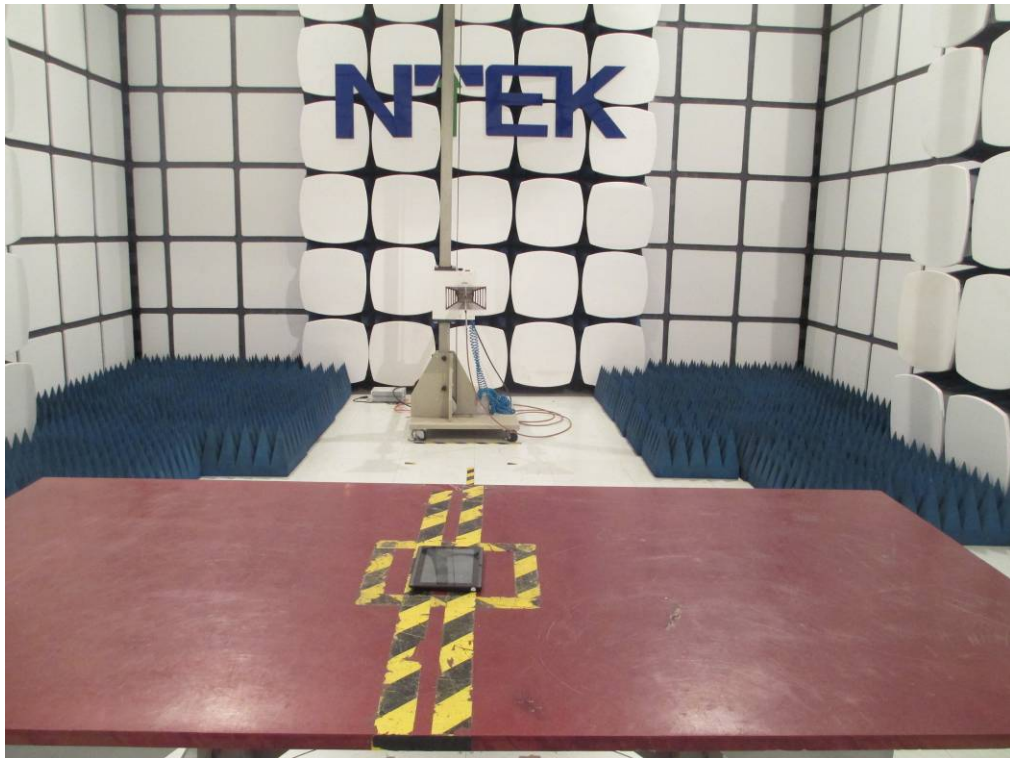
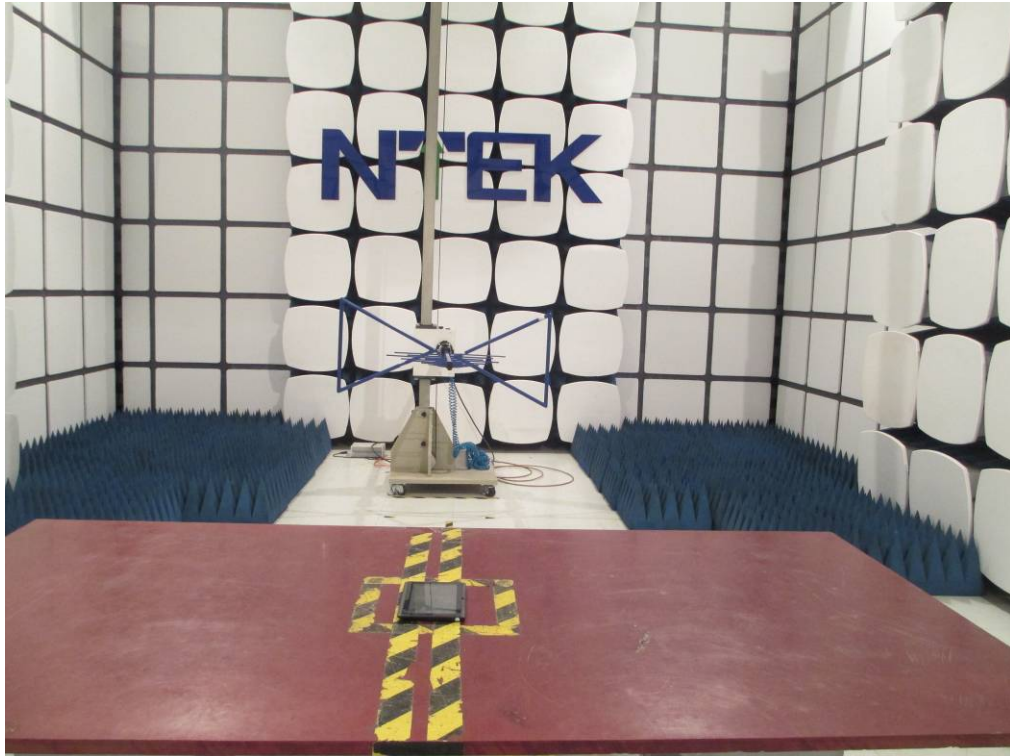
15.203 requirement: For intentional device, according to 15.203: an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

8.2 EUT ANTENNA

The EUT antenna is Integrated(FPCB) antenna. It comply with the standard requirement.

9. EUT TEST PHOTO

Radiated Measurement Photos



Conducted Measurement Photos

