



FCC RADIO TEST REPORT

Applicant : COMTREND CORPORATION

Address : 3F-1, No. 10, Lane 609, Chung Hsin Road, Section 5,
SanChung District, New Taipei City, Taiwan 241

Equipment : Home Gateway

Model No. : VR-3053

Trade Name : COMTREND

FCC ID. : L9VVR3053

I HEREBY CERTIFY THAT :

The sample was received on Apr. 16, 2019 and the testing was completed on May. 10, 2019 at CerpPASS Technology Corp. The test result refers exclusively to the test presented test model / sample. Without written approval of CerpPASS Technology Corp., the test report shall not be reproduced except in full.

Approved by:

Mark Liao / Supervisor

Laboratory Accreditation:

CerpPASS Technology Corporation Test Laboratory





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History of this test report

Report No.	Issue Date	Description
TEF1901103	May. 13, 2019	Original



1. Summary of Test Procedure and Test Results

1.1 Applicable Standards

ANSI C63.4:2014

ANSI C63.10:2013

FCC Rules and Regulations Part 15 Subpart C §15.247

KDB558074

KDB662911

KDB447498

FCC Rule	Description of Test	Result
15.203	. Antenna Requirement	PASS
15.207	. AC Power Line Conducted Emission	PASS
15.209 15.205	. Radiated Spurious Emission	PASS
15.247(d)	. Conducted Spurious Emission	PASS
15.247(a)(2)	. 6dB Bandwidth	PASS
15.247(b)	. Maximum Peak and Average Output Power	PASS
15.247(e)	. Power Spectral Density	PASS
2.1091	. Radio Frequency Exposure	PASS

*The principle of judgment is made according to the laboratory's reporting control and measurement uncertainty standard procedures.

*This EUT has been also tested and compiled with the requirement of FCC Part 15, Subpart B, recorded in a separate test report(TEFD1901103).



2. Test Configuration of Equipment under Test

2.1 Feature of Equipment

Model No.	VR-3053
Brand Name	COMTREND
Product Description	Please refer to User's Manual.
Connecting I/O Port(s)	Please refer to User's Manual.
AC ADAPTER	Adapter Brand: AMIGO Model No.: AMS115-1202000FU I/P: AC 100-240V~, 50-60Hz, 0.8A MAX. ; O/P: DC 12V, 2.0A
Frequency Range	802.11b/g/n: 2400MHz-2483.5MHz 802.11a/n/ac: 5150MHz-5250MHz, 5725MHz-5850MHz
Modulation Type	OFDM, DSSS
Data Rate	2.4GHz: 802.11b: 1, 2, 5.5, 11Mbps 802.11g: 6, 9, 12, 18, 24, 36, 48, 54Mbps 802.11n: MCS0 – MCS15, HT20/40 5GHz: 802.11a: 6, 9, 12, 18, 24, 36, 48, 54Mbps 802.11n: MCS0 – MCS15, HT20/40 802.11ac: MCS0 – MCS9, VHT20/40/80
Antenna Type	PCB Antenna
Antenna Gain	2400MHz-2483.5MHz: ANT A: 3.90 dBi ; ANT B: 3.58 dBi 5150MHz-5250MHz: ANT A: 3.53 dBi ; ANT B: 3.41 dBi 5725MHz-5850MHz: ANT A: 3.32 dBi ; ANT B: 3.59 dBi

Note:

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



2.2 Carrier Frequency of Channels

802.11b, 802.11g, 802.11n HT20, (2412MHz~2462MHz)

Channel	Frequency(MHz)	Channel	Frequency(MHz)
*01	2412	07	2442
02	2417	08	2447
03	2422	09	2452
04	2427	10	2457
05	2432	*11	2462
*06	2437	---	---

802.11n HT40, (2422MHz~2452MHz)

Channel	Frequency(MHz)	Channel	Frequency(MHz)
---	---	07	2442
---	---	08	2447
*03	2422	*09	2452
04	2427	---	---
05	2432	---	---
*06	2437	---	---

Note: Channels remarked * are selected to perform test.



2.3 Test Mode and Test Software

- a. During testing, the interface cables and equipment positions were varied according to ANSI C63.10.
- b. The complete test system included Remote workstation and EUT for RF test. The Remote workstation included Notebook.
- c. An executive program, "Lantiq DUT v1.1" under WIN 7 was executed to transmit and receive data via WLAN.
- d. The following test modes were performed for the test:

Conducted Emissions from the AC mains power ports	
Test Mode	Operating Description
1	802.11b (1Mbps)
2	802.11g (6Mbps)
3	802.11n HT20 (6.5Mbps)
4	802.11n HT40 (13.5Mbps)
caused "Test Mode 4" generated the worst case, it was reported as the final data.	
Radiation Emissions (30MHz ~ 1GHz)	
Test Mode	Operating Description
1	802.11b (1Mbps)
2	802.11g (6Mbps)
3	802.11n HT20 (6.5Mbps)
4	802.11n HT40 (13.5Mbps)
caused "Test Mode 4" generated the worst case, they were reported as the final data.	
Radiation Emissions (1GHz ~ 25GHz)	
Test Mode	Operating Description
1	802.11b (1Mbps)
2	802.11g (6Mbps)
3	802.11n HT20 (6.5Mbps)
4	802.11n HT40 (13.5Mbps)
caused "Test Mode 1~4" generated the worst case, they were reported as the final data.	



2.4 Description of Test System

RF Conducted						
Equipment	Brand	Model	Serial No	Inspection mark	Length/Type	Power cord/Length/Type
Notebook	ASUS	P2430U	GBNXCV13M066465	R31018	N/A	Adapter / 1.8m / NS
Network cable	N/A	N/A		N/A	1.2m / NS	N/A

Radiated Emissions						
Equipment	Brand	Model	Serial No	Inspection mark	Length/Type	Power cord/Length/Type
Notebook	ASUS	P2430U	GBNXCV13M066465	R31018	N/A	Adapter / 1.8m / NS
Network cable	N/A	N/A		N/A	1.2m / NS	N/A

AC Power Line Conducted Emission						
Equipment	Brand	Model	Serial No	Inspection mark	Length/Type	Power cord/Length/Type
Notebook	ASUS	P2430U	GBNXCV13M066465	R31018	N/A	Adapter / 1.8m / NS
Network cable	N/A	N/A		N/A	15m / NS	N/A



2.5 General Information of Test

Test Site	Cerpass Technology Corporation Test Laboratory Address: No.10, Ln. 2, Lianfu St., Luzhu Dist., Taoyuan City 33848, Taiwan (R.O.C.) Tel:+886-3-3226-888 Fax:+886-3-3226-881 Address: No.68-1, Shihbachongsi, Shihding Township, New Taipei City 223, Taiwan, R.O.C. Tel: +886-2-2663-8582	
	FCC	TW1079, TW1061, TW1439
	IC	4934E-1, 4934E-2
	VCCI	T-2205 for Telecommunication test C-4663 for Conducted emission test R-4399, R-4218 for Radiated emission test G-10812, G-10813 for radiated disturbance above 1GHz
Frequency Range Investigated:	Conducted: from 150kHz to 30 MHz Radiation: from 30 MHz to 25,000MHz	
Test Distance:	The test distance of radiated emission from antenna to EUT is 3 M.	

Test Item	Test Site	Tested Date	Environmental Conditions	Tested By
RF Conducted	RFCON01-NK	2019/05/10	22°C / 63%	Spree Yeh
Radiated Emissions	3M02-NK	2019/05/06	22°C / 50%	Spree Yeh
RF Conduction	CON02-NK	2019/05/04	22°C / 47%	Spree Yeh



2.6 Measurement Uncertainty

Measurement Item	Uncertainty
Radiated Spurious Emission(9KHz~30MHz)	$\pm 3.405\text{dB}$
Radiated Spurious Emission(30MHz~1GHz)	$\pm 5.326\text{dB}$
Radiated Spurious Emission(1GHz~25GHz)	$\pm 5.918\text{dB}$
Conducted Spurious Emission	$\pm 2.156\text{dB}$
6dB Bandwidth	$\pm 4.401\%$
20dB Bandwidth	$\pm 4.40\%$
Occupied Bandwidth	$\pm 4.41\%$
Peak Output Power(Conducted Power Meter)	$\pm 1.31\text{dB}$
Dwell Time	$\pm 0.11\%$
Power Spectral Density	$\pm 2.146\text{dB}$
Duty Cycle	$\pm 0.17\%$



3. Test Equipment and Ancillaries Used for Tests

Test Item	Radiated Emissions				
Test Site	Semi Anechoic Room(3M02-NK)				
Instrument	Manufacturer	Model No	Serial No	Calibration Date	Valid Date
Bilog Antenna	Schwarzbeck	VULB9168	275	2018/09/17	2019/09/16
Active Loop Antenna	EMCO	6507	40855	2018/05/22	2019/05/21
Horn Antenna	EMCO	3115	31589	2019/04/01	2020/03/31
Horn Antenna	EMCO	3116	31974	2018/09/07	2019/09/06
EMI Receiver	ROHDE & SCHWARZ	ESCI	101423	2018/06/11	2019/06/10
Spectrum Analyzer	ROHDE & SCHWARZ	FSP 40	100219	2018/07/03	2019/07/02
Preamplifier	EM Electronics corp.	EM330	60660	2019/03/11	2020/03/10
Preamplifier	EMC INSTRUMENTS	EMC051845SE	980333	2018/09/18	2019/09/17
Bluetooth Tester	ROHDE & SCHWARZ	CBT	101133	2019/04/07	2020/04/06
Cable-3in1(30M-1G)	HARBOUR INDUSTRIES	LL142	CCE1316	2018/09/12	2019/09/11
Cable-0.5m(1G-40G)	Rapidtek	40GHZ 50CM	38MS-38MS50314	2019/04/09	2020/04/08
Cable-3m(1G-40G)	Rapidtek	40GHZ 300CM	38MS-38MS300314	2019/04/09	2020/04/08
Cable-8m(1G-40G)	Rapidtek	40GHZ 800CM	38MS-38MS800314	2019/04/10	2020/04/09
E3	AUDIX	v8.2014-8-6	RK-000529	NA	NA

Test Item	RF Conducted				
Test Site	RFCON01-NK				
Instrument	Manufacturer	Model No	Serial No	Calibration Date	Valid Date
Spectrum Analyzer	ROHDE & SCHWARZ	FSP 40	100219	2018/07/03	2019/07/02
Bluetooth Tester	ROHDE & SCHWARZ	CBT	101133	2019/04/07	2020/04/06
Attenuator	KEYSIGHT	8491B	MY39250705	2018/09/04	2019/09/03
TEMP & HUMIDITY CHAMBER	T-MACHINE	TMJ-9712	T-12-040111	2018/08/30	2019/08/29
Power Sensor	Anritsu	MA2411B	1207295	2019/04/11	2020/04/10

Test Item	AC Power Line Conducted Emission				
Test Site	CON02-NK				
Instrument	Manufacturer	Model No	Serial No	Calibration Date	Valid Date
EMI Receiver	ROHDE & SCHWARZ	ESCI	100821	2018/9/12	2019/09/11
Line Impedance Stabilization Network	Schwarzbeck	NSLK 8127	8127-740	2018/6/13	2019/06/12
Pulse Limiter	ROHDE & SCHWARZ	ESH3-Z2	101933	2018/9/4	2019/09/03
E3	AUDIX	v8.2014-8-6	RK-000531	NA	NA



4. Antenna Requirements

4.1 Antenna Construction and Directional Gain

Antenna Type	PCB Antenna
Antenna Gain	2400MHz-2483.5MHz: ANT A: 3.90 dBi ; ANT B: 3.58 dBi 5150MHz-5250MHz: ANT A: 3.53 dBi ; ANT B: 3.41 dBi 5725MHz-5850MHz: ANT A: 3.32 dBi ; ANT B: 3.59 dBi

2412-2462MHz

802.11b

For Power directional gain= G_{ant} = 3.9 dBi

For PSD directional gain = G_{ant} = 3.9 dBi

802.11g/n

For Power directional gain= G_{ant} = 3.9 dBi

For PSD directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / NANT]$
= 6.75 (dBi)

5150MHz-5250MHz

For Power directional gain= G_{ant} = 3.53 dBi

For PSD directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / NANT]$
= 6.48 (dBi)

5725MHz -5850MHz

For Power directional gain= G_{ant} = 3.59 dBi

For PSD directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / NANT]$
= 6.47 (dBi)



5. Test of AC Power Line Conducted Emission

5.1 Test Limit

Conducted Emissions were measured from 150 kHz to 30 MHz with a bandwidth of 9 KHz, according to the methods defined in ANSI C63.4-2014. The EUT was placed on a nonmetallic stand in a shielded room 0.8 meters above the ground plane. The interface cables and equipment positioning were varied within limits of reasonable applications to determine the position produced maximum conducted emissions.

Frequency (MHz)	Quasi Peak (dB μ V)	Average (dB μ V)
0.15 – 0.5	66-56*	56-46*
0.5 – 5.0	56	46
5.0 – 30.0	60	50

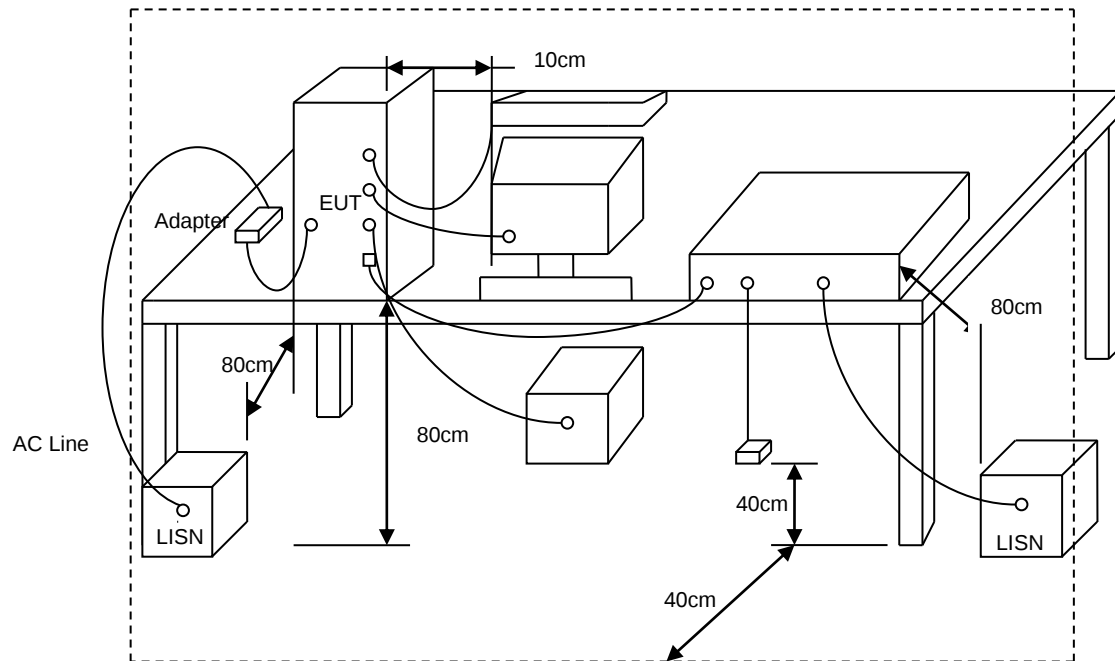
*Decreases with the logarithm of the frequency.

5.2 Test Procedures

- The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
- Connect EUT to the power mains through a line impedance stabilization network (LISN).
- All the support units are connecting to the other LISN.
- The LISN provides 50 ohm coupling impedance for the measuring instrument.
- The FCC states that a 50 ohm, 50 micro-Henry LISN should be used.
- Both sides of AC line were checked for maximum conducted interference.
- The frequency range from 150 kHz to 30 MHz was searched.
- Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.



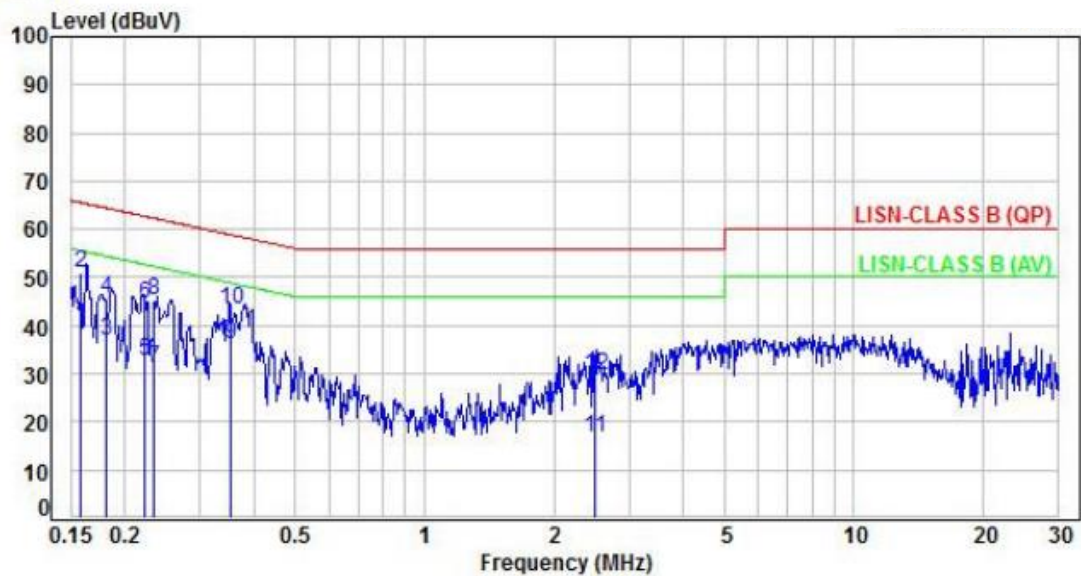
5.3 Typical Test Setup





5.4 Test Result and Data

Power	: AC 120V/60Hz	Pol/Phase	: LINE
Test Mode	: Mode 4		:



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.16	9.92	29.99	39.91	55.54	-15.63	Average	P
2	0.16	9.92	41.22	51.14	65.54	-14.40	QP	P
3	0.18	9.92	26.90	36.82	54.42	-17.60	Average	P
4	0.18	9.92	35.73	45.65	64.42	-18.77	QP	P
5	0.22	9.92	22.75	32.67	52.69	-20.02	Average	P
6	0.22	9.92	34.75	44.67	62.69	-18.02	QP	P
7	0.23	9.92	21.43	31.35	52.27	-20.92	Average	P
8	0.23	9.92	35.45	45.37	62.27	-16.90	QP	P
9	0.35	9.94	26.02	35.96	48.90	-12.94	Average	P
10	0.35	9.94	33.56	43.50	58.90	-15.40	QP	P
11	2.48	10.03	6.63	16.66	46.00	-29.34	Average	P
12	2.48	10.03	19.56	29.59	56.00	-26.41	QP	P

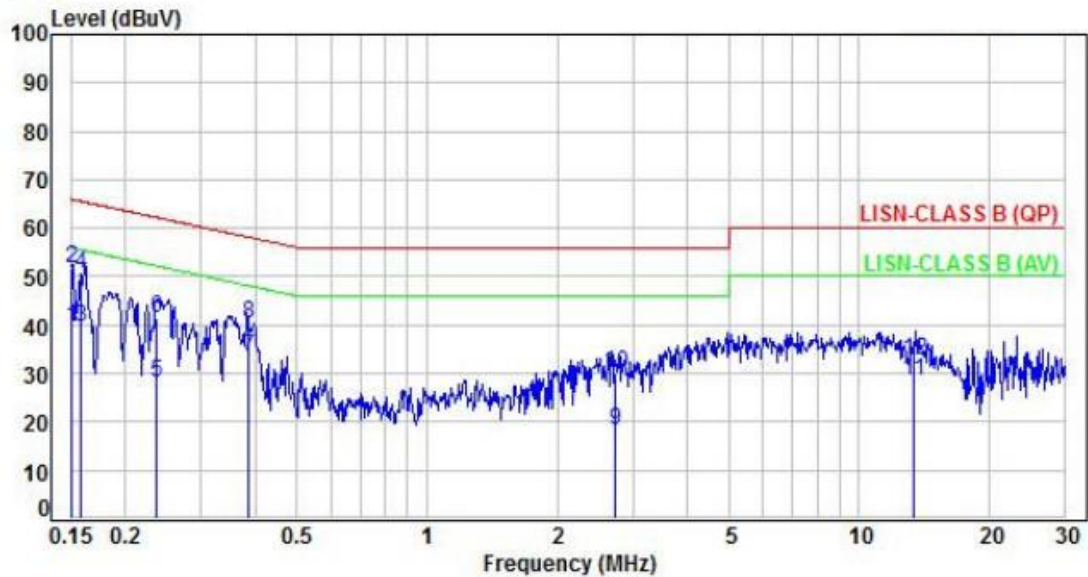
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=(LISN or ISN or Current Probe)Factor + Cable Loss



Power	: AC 120V/60Hz	Pol/Phase	: NEUTRAL
Test Mode	: Mode 4		



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.15	9.95	29.50	39.45	55.99	-16.54	Average	P
2	0.15	9.95	41.87	51.82	65.99	-14.17	QP	P
3	0.16	9.95	29.70	39.65	55.59	-15.94	Average	P
4	0.16	9.95	40.46	50.41	65.59	-15.18	QP	P
5	0.24	9.95	18.02	27.97	52.25	-24.28	Average	P
6	0.24	9.95	31.57	41.52	62.25	-20.73	QP	P
7	0.39	9.96	23.34	33.30	48.15	-14.85	Average	P
8	0.39	9.96	30.33	40.29	58.15	-17.86	QP	P
9	2.73	10.05	8.02	18.07	46.00	-27.93	Average	P
10	2.73	10.05	20.06	30.11	56.00	-25.89	QP	P
11	13.36	10.44	18.01	28.45	50.00	-21.55	Average	P
12	13.36	10.44	22.19	32.63	60.00	-27.37	QP	P

Note: Level=Reading+Factor

Margin=Level-Limit

Factor=(LISN or ISN or Current Probe)Factor + Cable Loss



6. Test of Radiated Spurious Emission

6.1 Test Limit

In any 100kHz 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 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. If the transmitter measurement is based on the maximum conducted output power, the attenuation required under this paragraph shall be 30dB instead of 20dB. In addition, radiated emissions which fall in section 15.205(a) the restricted bands must also comply with the radiated emission limit specified in section 15.209(a).

Frequency (MHz)	Field Strength (microvolt/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

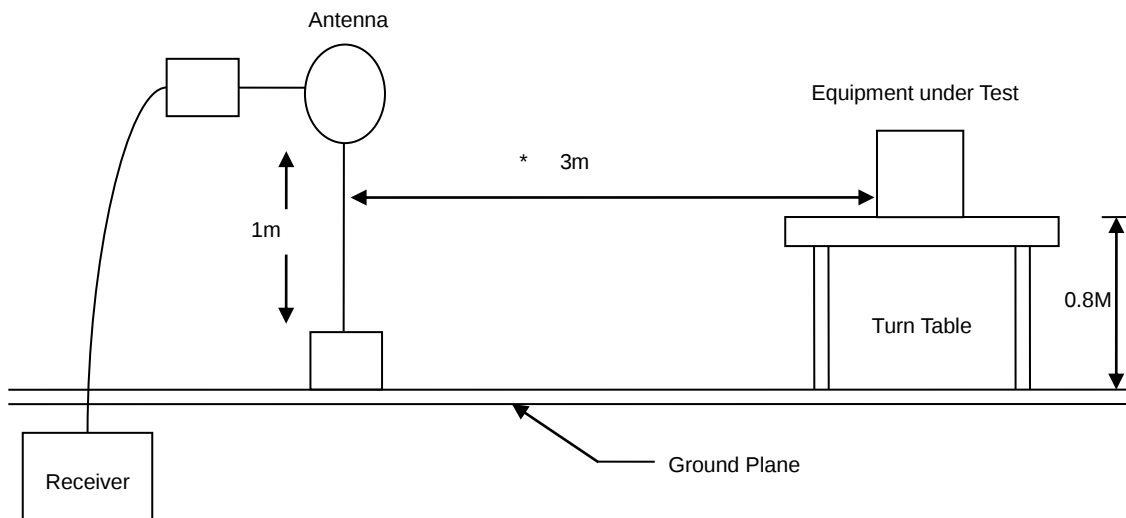
6.2 Test Procedures

- The EUT was placed on a rotatable table top 0.8 meter above ground.
- The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
- The table was rotated 360 degrees to determine the position of the highest radiation.
- The antenna is a broadband antenna and its height is varied between one meter and four meters above ground to find the maximum value of the field strength both horizontal polarization and vertical polarization of the antenna are set to make the measurement.
- For each suspected emission the EUT was arranged to its worst case and then tune the antenna tower (from 1 M to 4 M) and turn table (from 0 degree to 360 degrees) to find the maximum reading.
- Set the test-receiver system to Peak or CISPR quasi-peak Detect Function and specified bandwidth with Maximum Hold Mode.
- If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method and reported.
- For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
- "Cone of radiation" has been considered to be 3dB bandwidth of the measurement antenna.

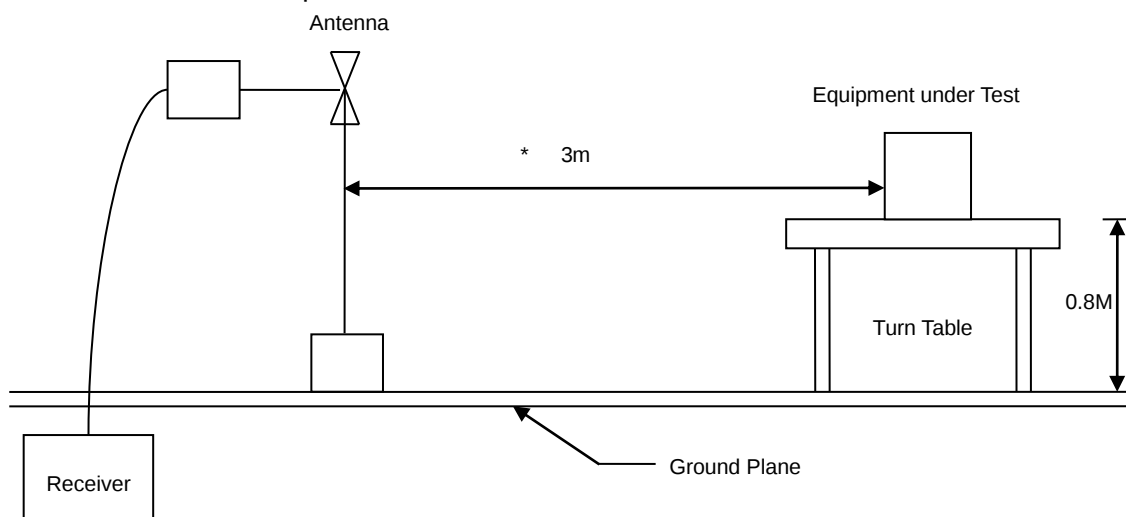


6.3 Typical Test Setup

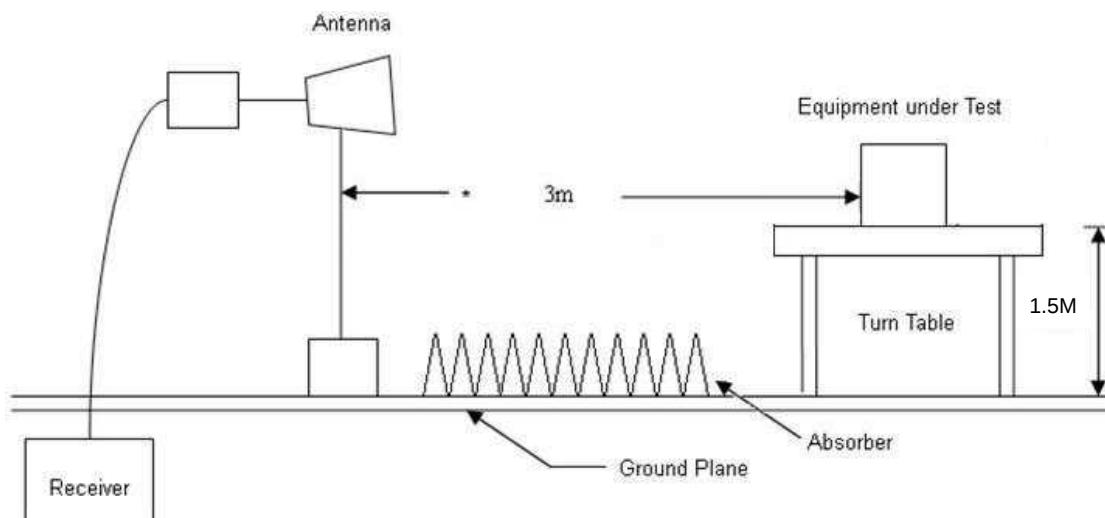
Below 30MHz test setup



30MHz- 1GHz Test Setup



Above 1GHz Test Setup



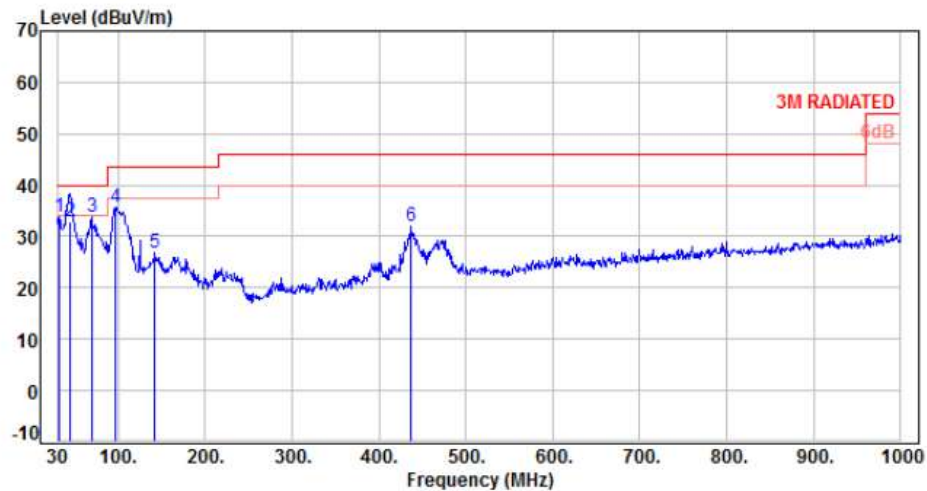


6.4 Test Result and Data (9KHz ~ 30MHz)

The 9kHz - 30MHz spurious emission is under limit 20dB more.

6.5 Test Result and Data (30MHz ~ 1GHz)

Power	:	AC 120V/60Hz	Pol/Phase	:	VERTICAL
Test Mode	:	Mode 4		:	



No.	Frequency (MHz)	Factor (dB)	Reading (dBUV)	Level (dBUV/m)	Limit (dBUV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	31.94	-10.57	44.44	33.87	40.00	-6.13	Peak	400	0	P
2	45.52	-9.40	42.30	32.90	40.00	-7.10	QP	100	211	P
3	69.77	-11.61	45.43	33.82	40.00	-6.18	Peak	400	0	P
4	96.93	-15.10	50.74	35.64	43.50	-7.86	Peak	400	0	P
5	142.52	-9.76	36.45	26.69	43.50	-16.81	Peak	400	0	P
6	437.40	-5.08	36.95	31.87	46.00	-14.13	Peak	400	0	P

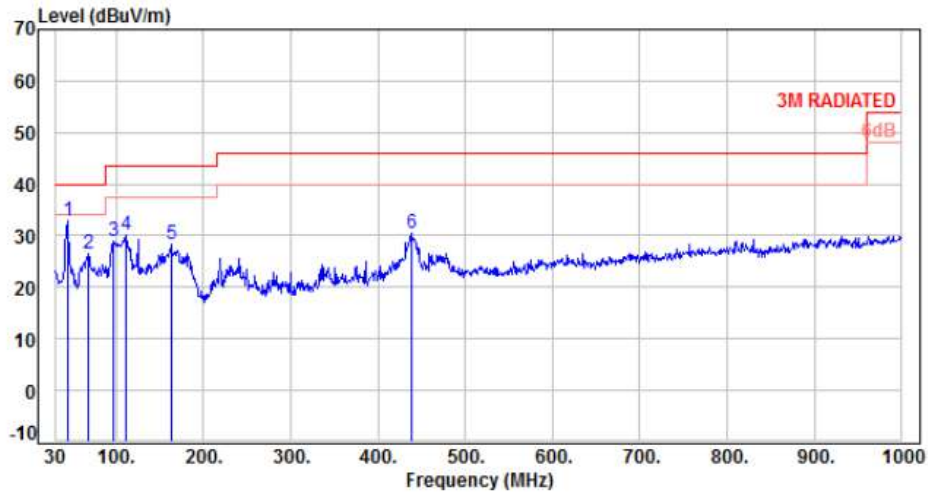
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V/60Hz	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 4		:



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	44.55	-9.44	42.18	32.74	40.00	-7.26	Peak	100	0	P
2	68.80	-11.42	38.04	26.62	40.00	-13.38	Peak	100	0	P
3	96.93	-15.10	44.00	28.90	43.50	-14.60	Peak	100	0	P
4	110.51	-12.81	42.98	30.17	43.50	-13.33	Peak	100	0	P
5	162.89	-9.40	37.78	28.38	43.50	-15.12	Peak	100	0	P
6	438.37	-5.05	35.56	30.51	46.00	-15.49	Peak	100	0	P

Note: Level=Reading+Factor

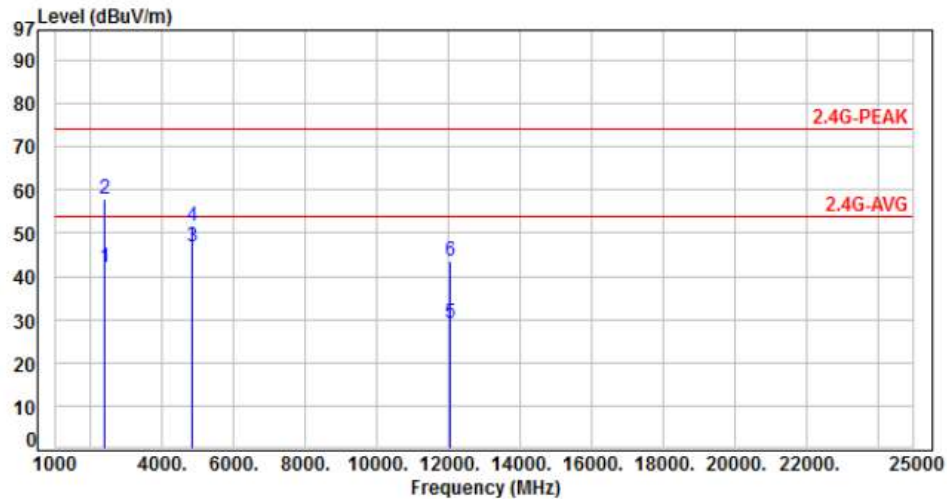
Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



6.6 Test Result and Data (1GHz ~ 25GHz)

Power	:	AC 120V	Pol/Phase	:	VERTICAL
Test Mode	:	Mode 1, CH01		:	



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-15.68	57.80	42.12	54.00	-11.88	Average	367	340	P
2	2390.00	-15.68	73.70	58.02	74.00	-15.98	Peak	367	340	P
3	4824.00	-8.47	55.30	46.83	54.00	-7.17	Average	200	290	P
4	4824.00	-8.47	60.20	51.73	74.00	-22.27	Peak	200	290	P
5	12060.00	1.79	27.52	29.31	54.00	-24.69	Average	100	277	P
6	12060.00	1.79	41.56	43.35	74.00	-30.65	Peak	100	277	P

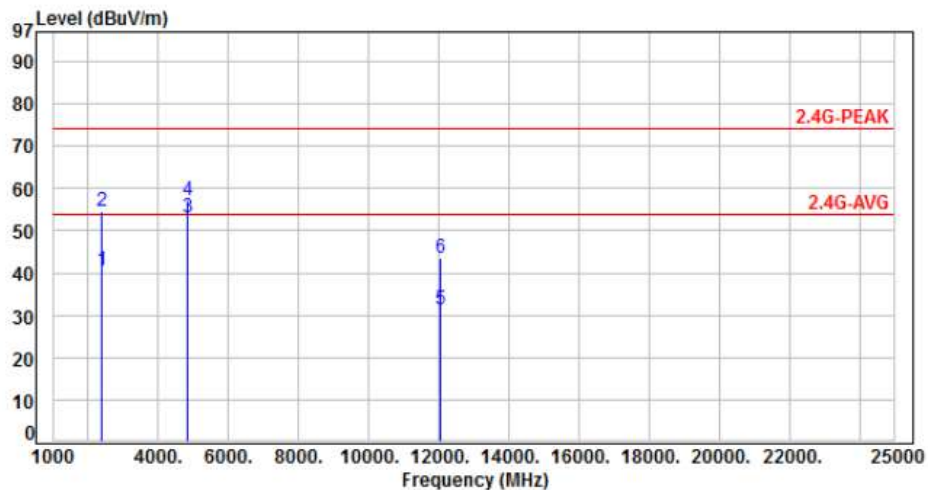
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 1, CH01		:

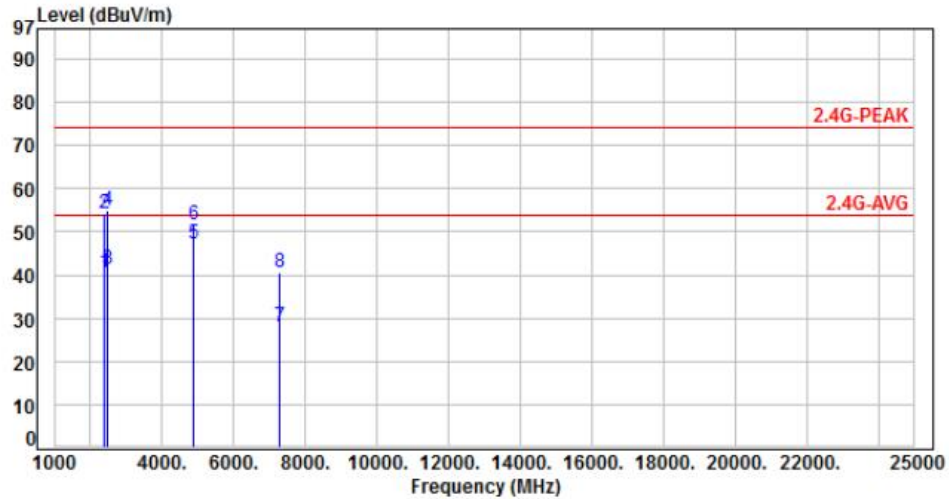


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-15.68	56.30	40.62	54.00	-13.38	Average	240	241	P
2	2390.00	-15.68	70.20	54.52	74.00	-19.48	Peak	240	241	P
3	4824.00	-8.47	61.40	52.93	54.00	-1.07	Average	200	310	P
4	4824.00	-8.47	65.60	57.13	74.00	-16.87	Peak	200	310	P
5	12060.00	1.79	29.50	31.29	54.00	-22.71	Average	100	180	P
6	12060.00	1.79	41.80	43.59	74.00	-30.41	Peak	100	180	P

Note: Level=Reading+Factor
Margin=Level-Limit
Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 1, CH06		:



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-15.68	56.33	40.65	54.00	-13.35	Average	374	280	P
2	2390.00	-15.68	69.84	54.16	74.00	-19.84	Peak	374	280	P
3	2483.50	-15.36	56.50	41.14	54.00	-12.86	Average	374	280	P
4	2483.50	-15.36	70.40	55.04	74.00	-18.96	Peak	374	280	P
5	4874.00	-8.33	55.49	47.16	54.00	-6.84	Average	193	290	P
6	4874.00	-8.33	60.10	51.77	74.00	-22.23	Peak	193	290	P
7	7266.00	-3.99	31.89	27.90	54.00	-26.10	Average	100	284	P
8	7266.00	-3.99	44.58	40.59	74.00	-33.41	Peak	100	284	P

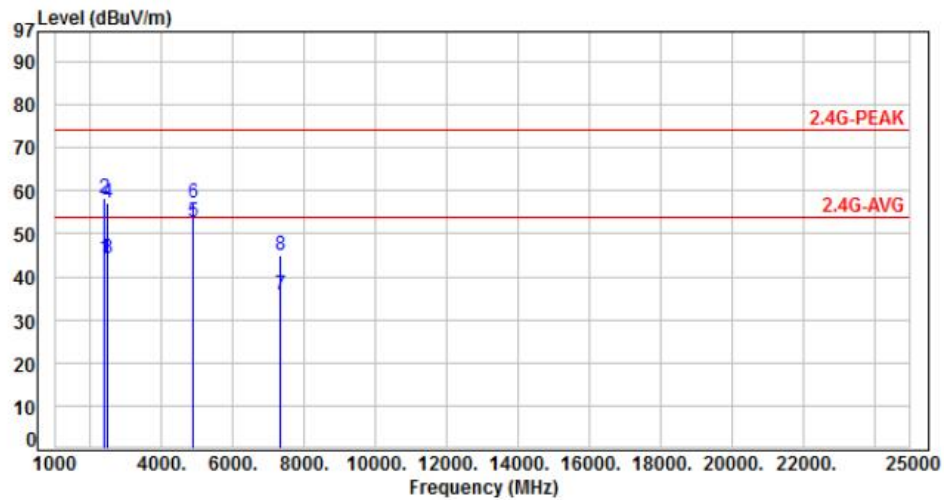
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 1, CH06		:



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-15.68	59.80	44.12	54.00	-9.88	Average	387	240	P
2	2390.00	-15.68	73.90	58.22	74.00	-15.78	Peak	387	240	P
3	2483.50	-15.36	59.60	44.24	54.00	-9.76	Average	387	240	P
4	2483.50	-15.36	72.70	57.34	74.00	-16.66	Peak	387	240	P
5	4874.00	-8.33	61.05	52.72	54.00	-1.28	Average	180	311	P
6	4874.00	-8.33	65.43	57.10	74.00	-16.90	Peak	180	311	P
7	7311.00	-3.86	39.50	35.64	54.00	-18.36	Average	140	260	P
8	7311.00	-3.86	48.70	44.84	74.00	-29.16	Peak	140	260	P

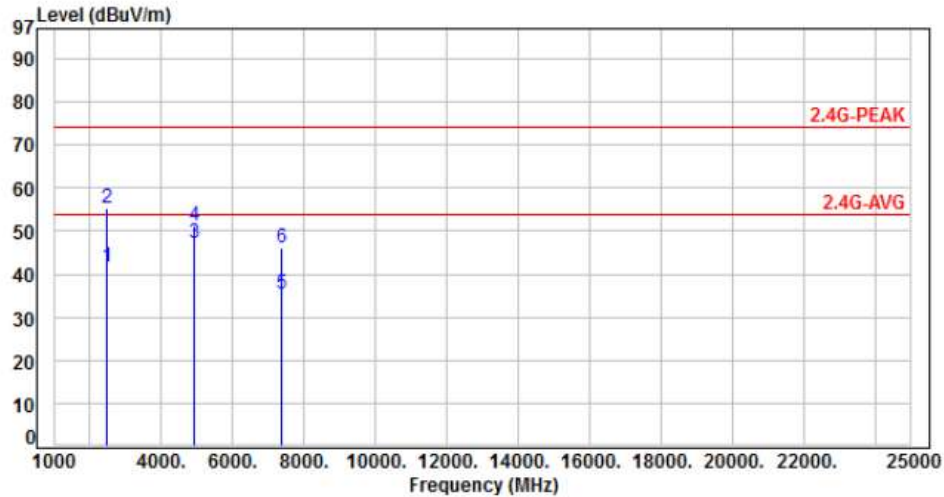
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 1, CH11		:



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2483.50	-15.36	57.10	41.74	54.00	-12.26	Average	375	230	P
2	2483.50	-15.36	70.80	55.44	74.00	-18.56	Peak	375	230	P
3	4924.00	-8.18	55.50	47.32	54.00	-6.68	Average	166	291	P
4	4924.00	-8.18	59.50	51.32	74.00	-22.68	Peak	166	291	P
5	7386.00	-3.67	38.91	35.24	54.00	-18.76	Average	338	270	P
6	7386.00	-3.67	49.81	46.14	74.00	-27.86	Peak	338	270	P

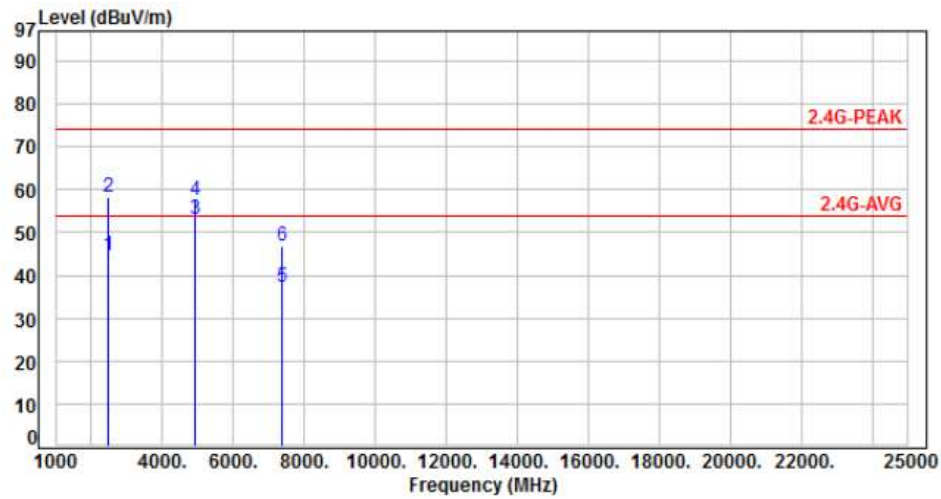
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 1, CH11		:



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2483.50	-15.36	59.80	44.44	54.00	-9.56	Average	130	265	P
2	2483.50	-15.36	73.50	58.14	74.00	-15.86	Peak	130	265	P
3	4924.00	-8.18	61.16	52.98	54.00	-1.02	Average	198	304	P
4	4924.00	-8.18	65.56	57.38	74.00	-16.62	Peak	198	304	P
5	7386.00	-3.67	41.01	37.34	54.00	-16.66	Average	170	260	P
6	7386.00	-3.67	50.51	46.84	74.00	-27.16	Peak	170	260	P

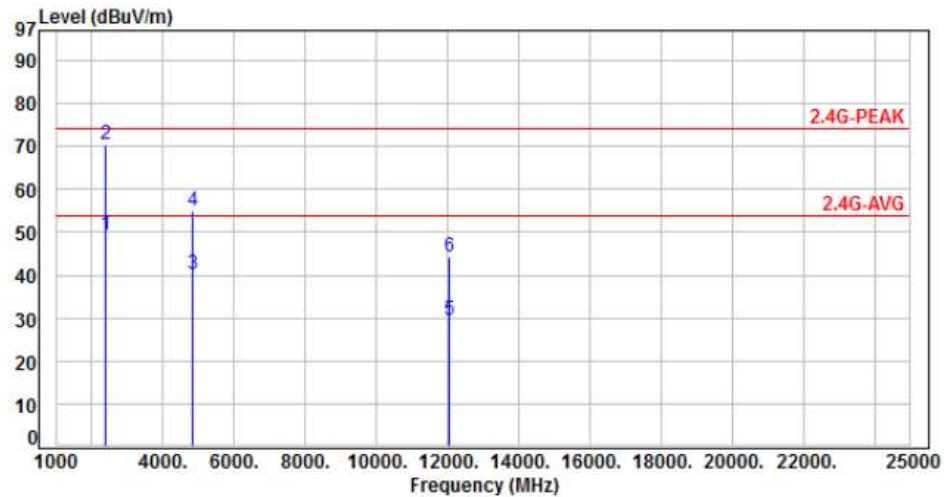
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 2, CH01		:



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-15.68	64.95	49.27	54.00	-4.73	Average	400	230	P
2	2390.00	-15.68	86.30	70.62	74.00	-3.38	Peak	400	230	P
3	4824.00	-8.47	48.80	40.33	54.00	-13.67	Average	359	289	P
4	4824.00	-8.47	63.50	55.03	74.00	-18.97	Peak	359	289	P
5	12060.00	1.79	27.89	29.68	54.00	-24.32	Average	100	188	P
6	12060.00	1.79	42.51	44.30	74.00	-29.70	Peak	100	188	P

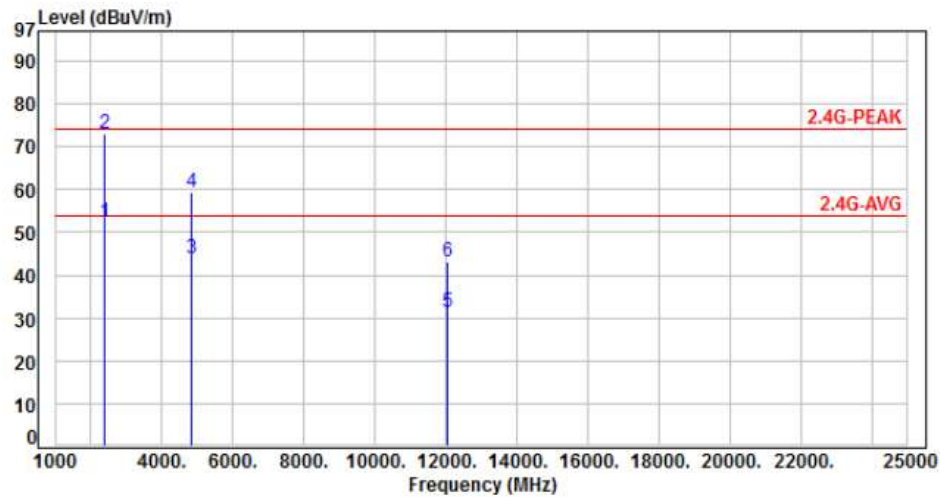
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 2, CH01		:



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-15.68	67.90	52.22	54.00	-1.78	Average	371	245	P
2	2390.00	-15.68	88.60	72.92	74.00	-1.08	Peak	371	245	P
3	4824.00	-8.47	52.50	44.03	54.00	-9.97	Average	100	210	P
4	4824.00	-8.47	67.80	59.33	74.00	-14.67	Peak	100	210	P
5	12060.00	1.79	29.50	31.29	54.00	-22.71	Average	100	182	P
6	12060.00	1.79	41.50	43.29	74.00	-30.71	Peak	100	182	P

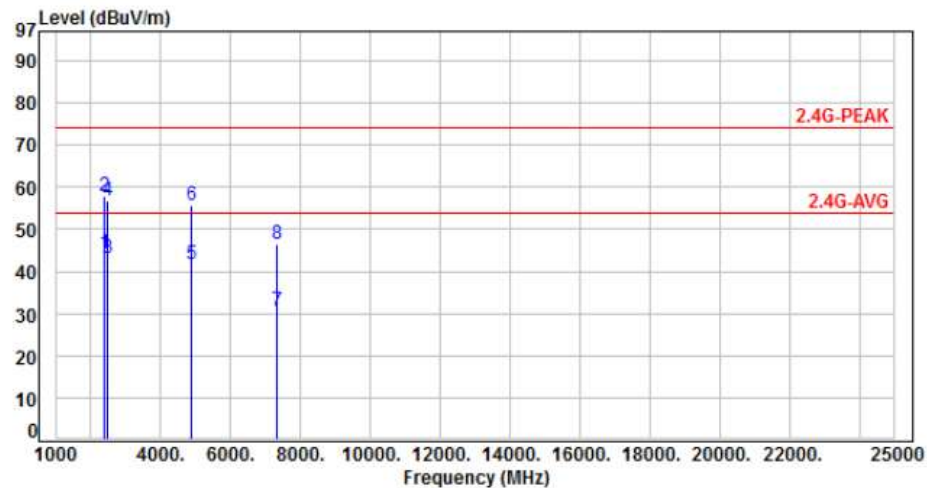
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 2, CH06		:



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-15.68	59.90	44.22	54.00	-9.78	Average	373	287	P
2	2390.00	-15.68	73.40	57.72	74.00	-16.28	Peak	373	287	P
3	2483.50	-15.36	58.58	43.22	54.00	-10.78	Average	373	287	P
4	2483.50	-15.36	72.10	56.74	74.00	-17.26	Peak	373	287	P
5	4874.00	-8.33	50.10	41.77	54.00	-12.23	Average	377	247	P
6	4874.00	-8.33	64.20	55.87	74.00	-18.13	Peak	377	247	P
7	7311.00	-3.86	34.50	30.64	54.00	-23.36	Average	100	230	P
8	7311.00	-3.86	50.20	46.34	74.00	-27.66	Peak	100	230	P

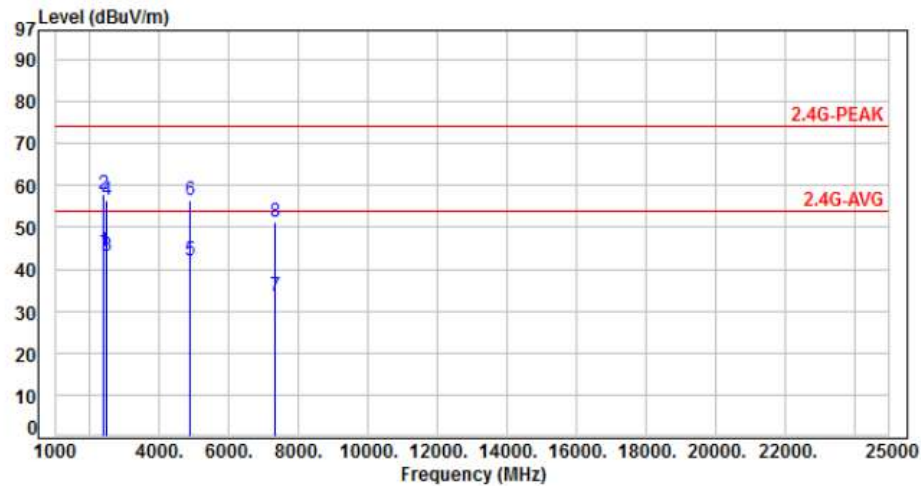
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 2, CH06		:



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-15.68	59.80	44.12	54.00	-9.88	Average	376	260	P
2	2390.00	-15.68	73.70	58.02	74.00	-15.98	Peak	376	260	P
3	2483.50	-15.36	58.60	43.24	54.00	-10.76	Average	376	260	P
4	2483.50	-15.36	71.90	56.54	74.00	-17.46	Peak	376	260	P
5	4874.00	-8.33	50.50	42.17	54.00	-11.83	Average	100	211	P
6	4874.00	-8.33	64.60	56.27	74.00	-17.73	Peak	100	211	P
7	7311.00	-3.86	37.50	33.64	54.00	-20.36	Average	100	264	P
8	7311.00	-3.86	55.20	51.34	74.00	-22.66	Peak	100	264	P

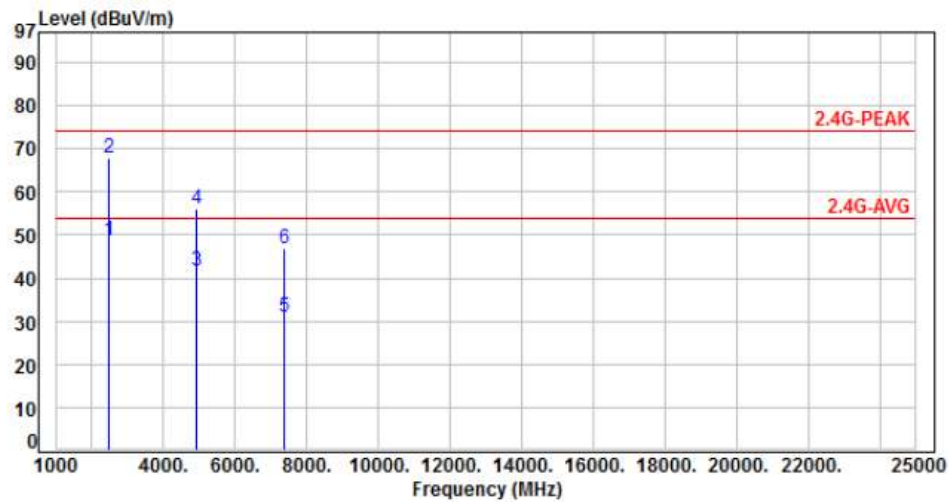
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 2, CH11		:



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2483.50	-15.36	64.20	48.84	54.00	-5.16	Average	147	288	P
2	2483.50	-15.36	83.25	67.89	74.00	-6.11	Peak	147	288	P
3	4924.00	-8.18	49.98	41.80	54.00	-12.20	Average	362	290	P
4	4924.00	-8.18	64.40	56.22	74.00	-17.78	Peak	362	290	P
5	7386.00	-3.67	34.59	30.92	54.00	-23.08	Average	100	274	P
6	7386.00	-3.67	50.68	47.01	74.00	-26.99	Peak	100	274	P

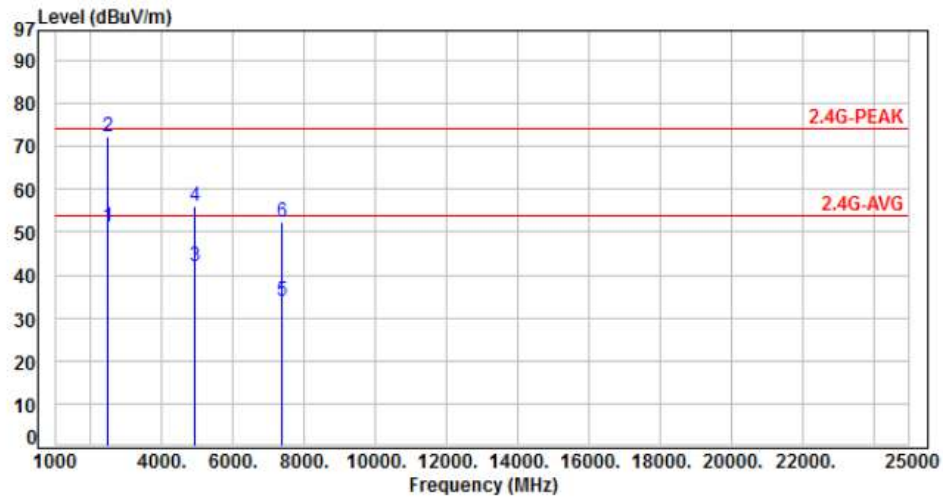
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 2, CH11		:



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2483.50	-15.36	66.70	51.34	54.00	-2.66	Average	362	249	P
2	2483.50	-15.36	87.80	72.44	74.00	-1.56	Peak	362	249	P
3	4924.00	-8.18	50.30	42.12	54.00	-11.88	Average	100	199	P
4	4924.00	-8.18	64.20	56.02	74.00	-17.98	Peak	100	199	P
5	7386.00	-3.67	37.43	33.76	54.00	-20.24	Average	100	258	P
6	7386.00	-3.67	56.11	52.44	74.00	-21.56	Peak	100	258	P

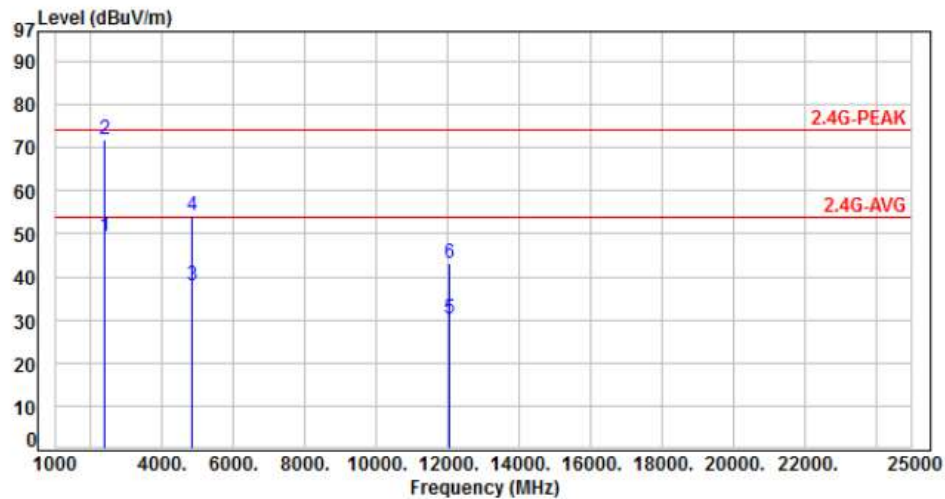
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 3, CH01		:



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-15.68	65.10	49.42	54.00	-4.58	Average	369	282	P
2	2390.00	-15.68	87.43	71.75	74.00	-2.25	Peak	369	282	P
3	4824.00	-8.47	46.40	37.93	54.00	-16.07	Average	363	277	P
4	4824.00	-8.47	62.80	54.33	74.00	-19.67	Peak	363	277	P
5	12060.00	1.79	28.41	30.20	54.00	-23.80	Average	100	173	P
6	12060.00	1.79	41.53	43.32	74.00	-30.68	Peak	100	173	P

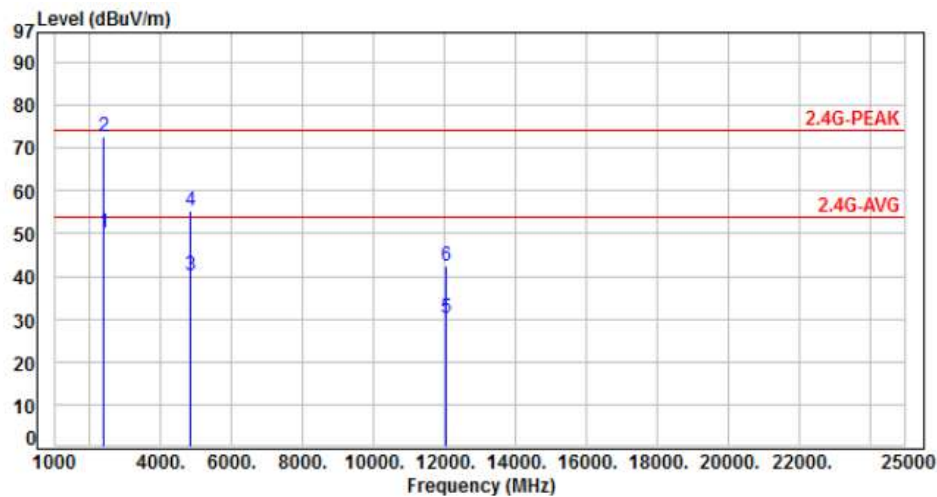
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 3, CH01		:



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-15.68	65.80	50.12	54.00	-3.88	Average	375	258	P
2	2390.00	-15.68	88.40	72.72	74.00	-1.28	Peak	375	258	P
3	4824.00	-8.47	48.60	40.13	54.00	-13.87	Average	100	202	P
4	4824.00	-8.47	63.70	55.23	74.00	-18.77	Peak	100	202	P
5	12060.00	1.79	28.55	30.34	54.00	-23.66	Average	100	166	P
6	12060.00	1.79	40.57	42.36	74.00	-31.64	Peak	100	166	P

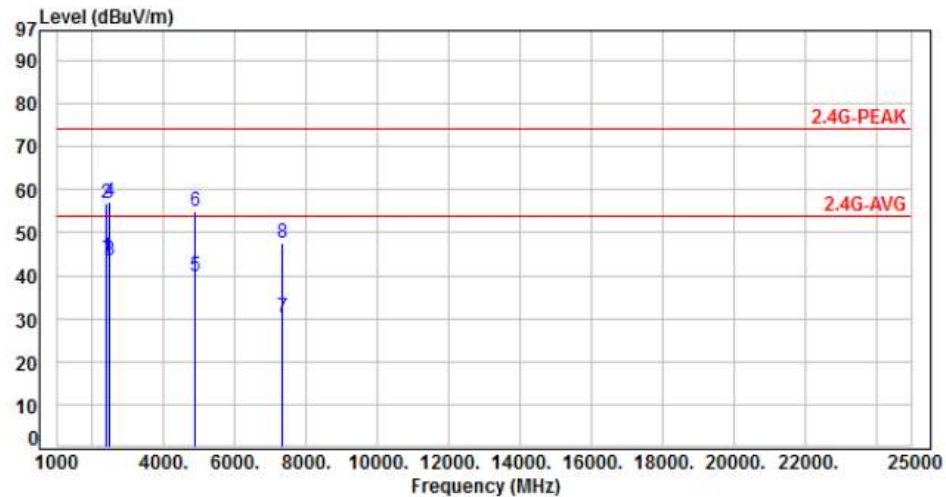
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 3, CH06		:



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-15.68	59.78	44.10	54.00	-9.90	Average	370	290	P
2	2390.00	-15.68	72.50	56.82	74.00	-17.18	Peak	370	290	P
3	2483.50	-15.36	58.80	43.44	54.00	-10.56	Average	370	290	P
4	2483.50	-15.36	72.69	57.33	74.00	-16.67	Peak	370	290	P
5	4874.00	-8.33	48.15	39.82	54.00	-14.18	Average	398	250	P
6	4874.00	-8.33	63.11	54.78	74.00	-19.22	Peak	398	250	P
7	7311.00	-3.86	34.28	30.42	54.00	-23.58	Average	100	237	P
8	7311.00	-3.86	51.30	47.44	74.00	-26.56	Peak	100	237	P

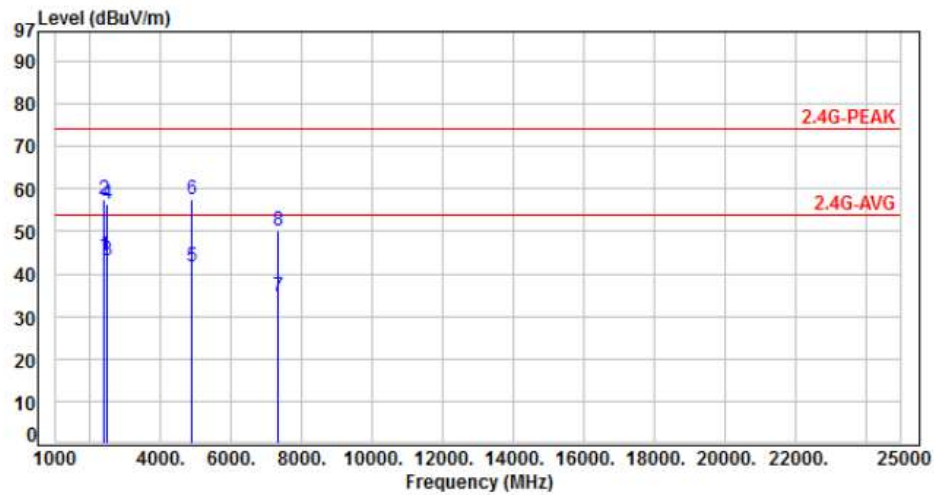
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 3, CH06		:



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-15.68	60.10	44.42	54.00	-9.58	Average	372	268	P
2	2390.00	-15.68	73.30	57.62	74.00	-16.38	Peak	372	268	P
3	2483.50	-15.36	58.60	43.24	54.00	-10.76	Average	372	268	P
4	2483.50	-15.36	71.90	56.54	74.00	-17.46	Peak	372	268	P
5	4874.00	-8.33	50.10	41.77	54.00	-12.23	Average	100	206	P
6	4874.00	-8.33	65.80	57.47	74.00	-16.53	Peak	100	206	P
7	7311.00	-3.86	38.45	34.59	54.00	-19.41	Average	108	266	P
8	7311.00	-3.86	54.10	50.24	74.00	-23.76	Peak	108	266	P

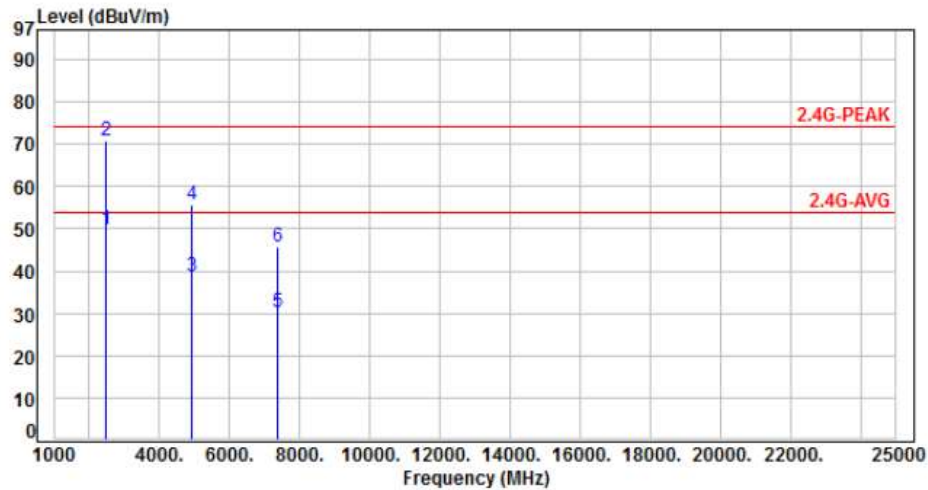
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 3, CH11		:



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2483.50	-15.36	65.10	49.74	54.00	-4.26	Average	367	250	P
2	2483.50	-15.36	86.20	70.84	74.00	-3.16	Peak	367	250	P
3	4924.00	-8.18	46.90	38.72	54.00	-15.28	Average	363	280	P
4	4924.00	-8.18	63.70	55.52	74.00	-18.48	Peak	363	280	P
5	7386.00	-3.67	33.77	30.10	54.00	-23.90	Average	100	282	P
6	7386.00	-3.67	49.47	45.80	74.00	-28.20	Peak	100	282	P

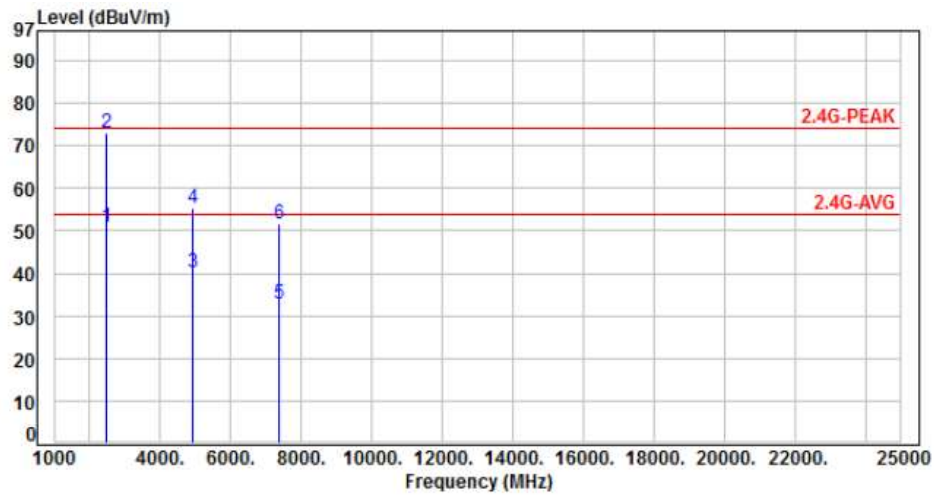
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 3, CH11		:

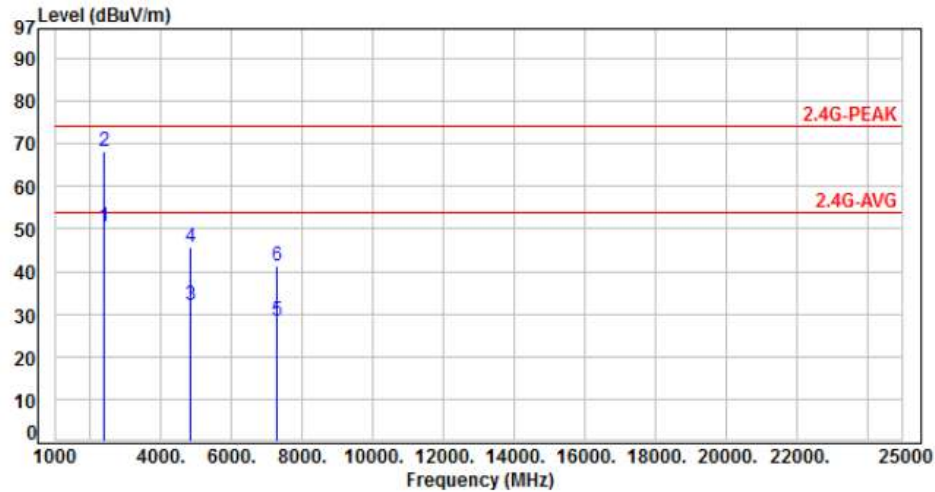


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2483.50	-15.36	66.12	50.76	54.00	-3.24	Average	400	238	P
2	2483.50	-15.36	88.33	72.97	74.00	-1.03	Peak	400	238	P
3	4924.00	-8.18	48.50	40.32	54.00	-13.68	Average	100	203	P
4	4924.00	-8.18	63.40	55.22	74.00	-18.78	Peak	100	203	P
5	7386.00	-3.67	36.55	32.88	54.00	-21.12	Average	100	267	P
6	7386.00	-3.67	55.13	51.46	74.00	-22.54	Peak	100	267	P

Note: Level=Reading+Factor
Margin=Level-Limit
Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 4, CH03		:



No.	Frequency (MHz)	Factor (dB)	Reading (dBUV)	Level (dBUV/m)	Limit (dBUV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-15.68	66.10	50.42	54.00	-3.58	Average	330	277	P
2	2390.00	-15.68	83.80	68.12	74.00	-5.88	Peak	330	277	P
3	4844.00	-8.41	40.50	32.09	54.00	-21.91	Average	394	250	P
4	4844.00	-8.41	54.20	45.79	74.00	-28.21	Peak	394	250	P
5	7266.00	-3.99	32.52	28.53	54.00	-25.47	Average	100	237	P
6	7266.00	-3.99	45.48	41.49	74.00	-32.51	Peak	100	237	P

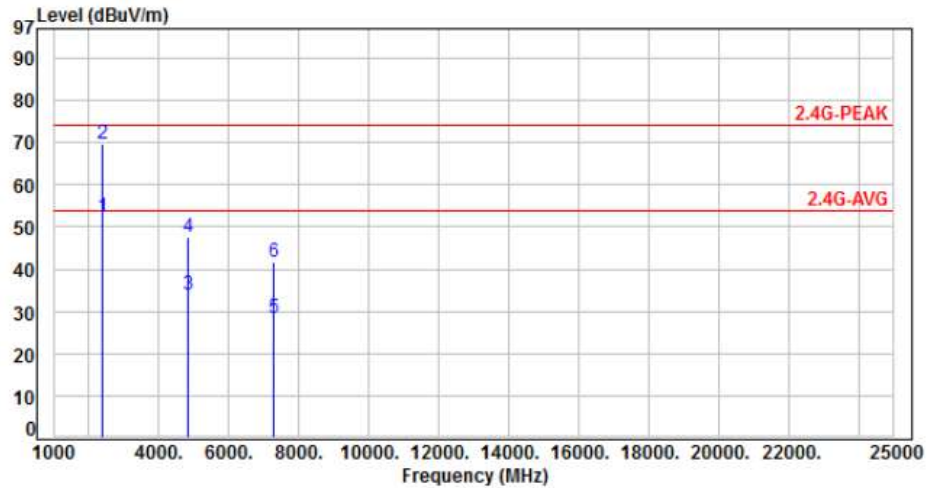
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 4, CH03		:



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-15.68	67.92	52.24	54.00	-1.76	Average	332	260	P
2	2390.00	-15.68	85.20	69.52	74.00	-4.48	Peak	332	260	P
3	4844.00	-8.41	42.50	34.09	54.00	-19.91	Average	100	210	P
4	4844.00	-8.41	55.90	47.49	74.00	-26.51	Peak	100	210	P
5	7266.00	-3.99	32.56	28.57	54.00	-25.43	Average	100	263	P
6	7266.00	-3.99	45.62	41.63	74.00	-32.37	Peak	100	263	P

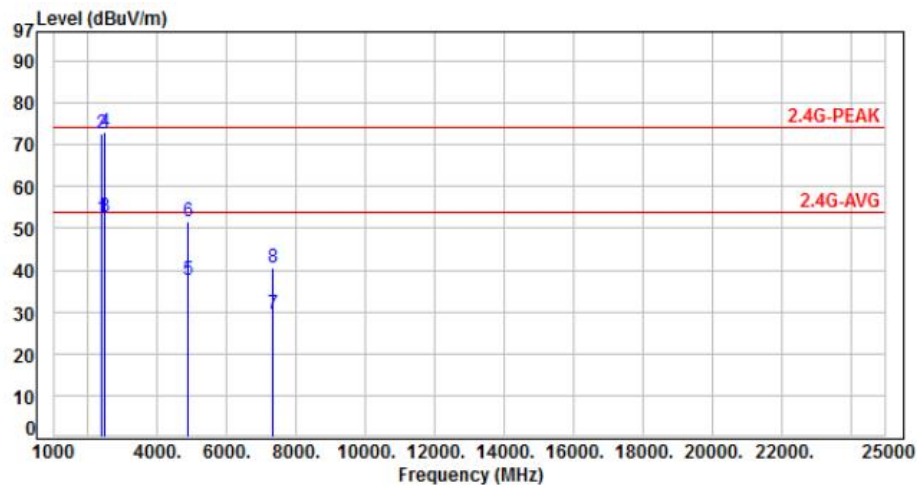
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 4, CH06		:



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-15.68	67.95	52.27	54.00	-1.73	Average	366	300	P
2	2390.00	-15.68	88.50	72.82	74.00	-1.18	Peak	366	300	P
3	2483.50	-15.36	68.20	52.84	54.00	-1.16	Average	366	300	P
4	2483.50	-15.36	88.31	72.95	74.00	-1.05	Peak	366	300	P
5	4874.00	-8.33	45.90	37.57	54.00	-16.43	Average	385	245	P
6	4874.00	-8.33	59.95	51.62	74.00	-22.38	Peak	385	245	P
7	7311.00	-3.86	33.49	29.63	54.00	-24.37	Average	100	275	P
8	7311.00	-3.86	44.25	40.39	74.00	-33.61	Peak	100	275	P

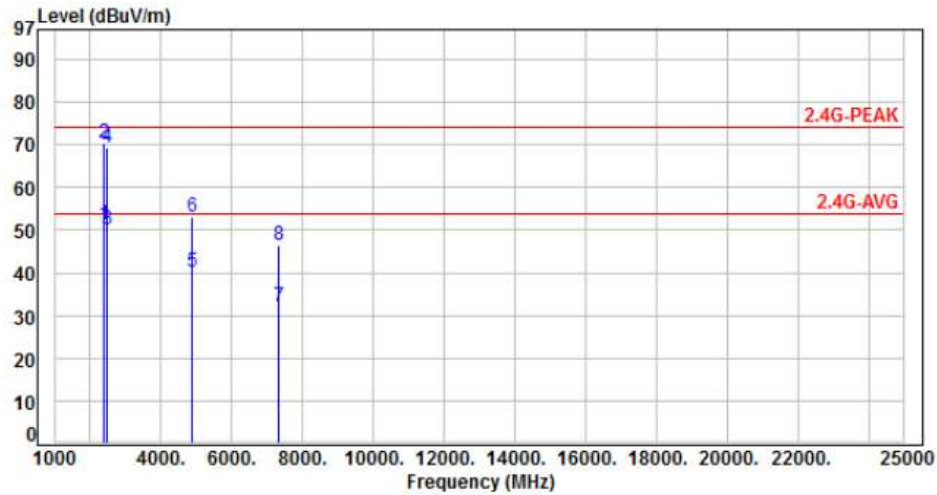
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 4, CH06		:



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2390.00	-15.68	66.80	51.12	54.00	-2.88	Average	373	239	P
2	2390.00	-15.68	86.10	70.42	74.00	-3.58	Peak	373	239	P
3	2483.50	-15.36	65.45	50.09	54.00	-3.91	Average	373	239	P
4	2483.50	-15.36	84.63	69.27	74.00	-4.73	Peak	373	239	P
5	4874.00	-8.33	48.54	40.21	54.00	-13.79	Average	100	202	P
6	4874.00	-8.33	61.50	53.17	74.00	-20.83	Peak	100	202	P
7	7311.00	-3.86	35.80	31.94	54.00	-22.06	Average	100	263	P
8	7311.00	-3.86	50.20	46.34	74.00	-27.66	Peak	100	263	P

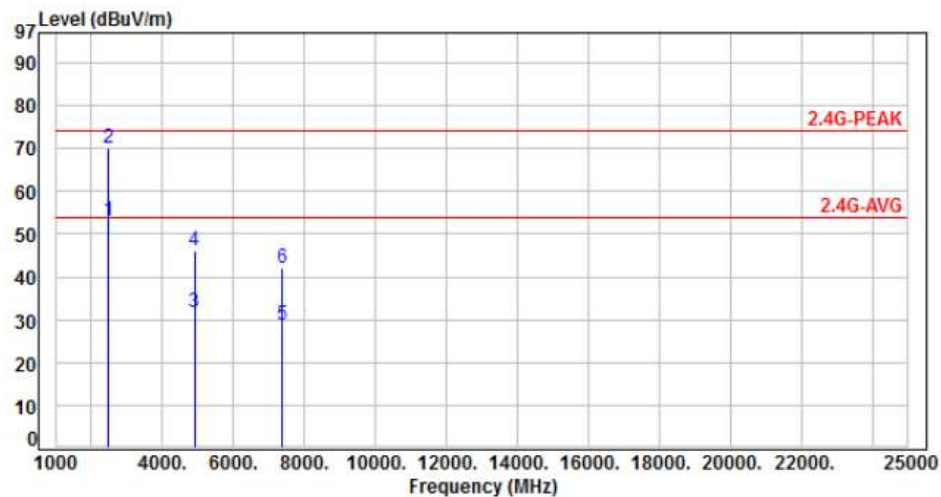
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: VERTICAL
Test Mode	: Mode 4, CH09		:



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2483.50	-15.36	68.34	52.98	54.00	-1.02	Average	349	309	P
2	2483.50	-15.36	85.60	70.24	74.00	-3.76	Peak	349	309	P
3	4904.00	-8.24	40.10	31.86	54.00	-22.14	Average	388	261	P
4	4904.00	-8.24	54.21	45.97	74.00	-28.03	Peak	388	261	P
5	7356.00	-3.74	32.51	28.77	54.00	-25.23	Average	100	236	P
6	7356.00	-3.74	45.65	41.91	74.00	-32.09	Peak	100	236	P

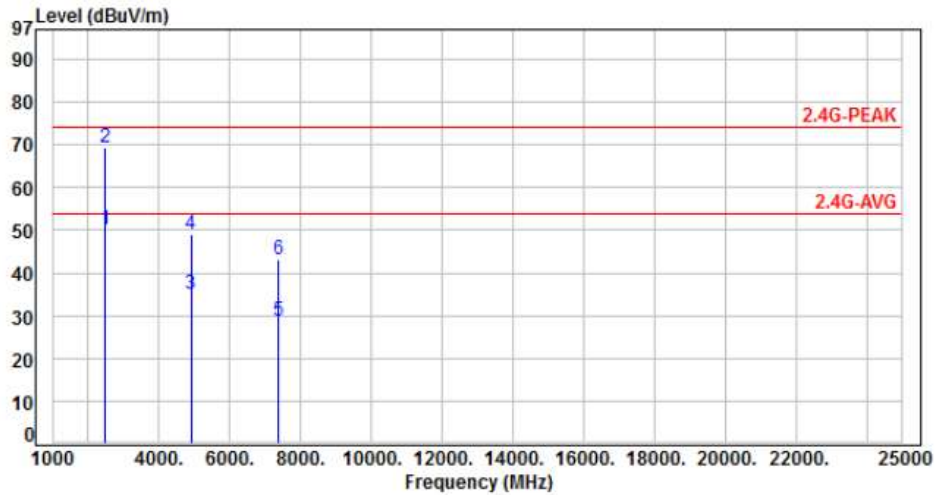
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC 120V	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 4, CH09		:



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2484.70	-15.35	65.50	50.15	54.00	-3.85	Average	358	235	P
2	2484.70	-15.35	84.60	69.25	74.00	-4.75	Peak	358	235	P
3	4904.00	-8.24	43.20	34.96	54.00	-19.04	Average	100	207	P
4	4904.00	-8.24	57.20	48.96	74.00	-25.04	Peak	100	207	P
5	7356.00	-3.74	32.51	28.77	54.00	-25.23	Average	100	281	P
6	7356.00	-3.74	46.77	43.03	74.00	-30.97	Peak	100	281	P

Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



6.7 Restricted Bands of Operation

Only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.09000 – 0.11000	16.42000 – 16.42300	399.9 – 410.0	4.500 – 5.250
0.49500 – 0.505**	16.69475 – 16.69525	608.0 – 614.0	5.350 – 5.460
2.17350 – 2.19050	16.80425 – 16.80475	960.0 – 1240.0	7.250 – 7.750
4.12500 – 4.12800	25.50000 – 25.67000	1300.0 – 1427.0	8.025 – 8.500
4.17725 – 4.17775	37.50000 – 38.25000	1435.0 – 1626.5	9.000 – 9.200
4.20725 – 4.20775	73.00000 – 74.60000	1645.5 – 1646.5	9.300 – 9.500
6.21500 – 6.21800	74.80000 – 75.20000	1660.0 – 1710.0	10.600 – 12.700
6.26775 – 6.26825	108.00000 – 121.94000	1718.8 – 1722.2	13.250 – 13.400
6.31175 – 6.31225	123.00000 – 138.00000	2200.0 – 2300.0	14.470 – 14.500
8.29100 – 8.29400	149.90000 – 150.05000	2310.0 – 2390.0	15.350 – 16.200
8.36200 – 8.36600	156.52475 – 156.52525	2483.5 – 2500.0	17.700 – 21.400
8.37625 – 8.38675	156.70000 – 156.90000	2655.0 – 2900.0	22.010 – 23.120
8.41425 – 8.41475	162.01250 – 167.17000	3260.0 – 3267.0	23.600 – 24.000
12.29000 – 12.29300	167.72000 – 173.20000	3332.0 – 3339.0	31.200 – 31.800
12.51975 – 12.52025	240.00000 – 285.00000	3345.8 – 3358.0	36.430 – 36.500
12.57675 – 12.57725	322.00000 – 335.40000	3600.0 – 4400.0	Above 38.6
13.36000 – 13.41000			

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



7. Test of Conducted Spurious Emission

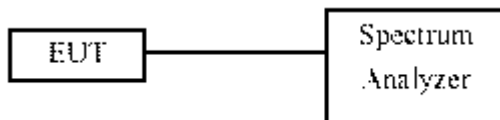
7.1 Test Limit

Below -20dB of the highest emission level of operating band (In 100 kHz Resolution Bandwidth)

7.2 Test Procedure

- The transmitter output was connected to the spectrum analyzer via a low loss cable.
- Set RBW of spectrum analyzer to 100 KHz and VBW of spectrum analyzer to 300 KHz with convenient frequency span including 100 KHz bandwidth from band edge.
- Peak conducted output power measured within any 100 kHz outside the authorized frequency band shall be attenuated by at least 20dB relative to the maximum measured in-band peak PSD level.
- The band edges was measured and recorded.

7.3 Test Setup Layout



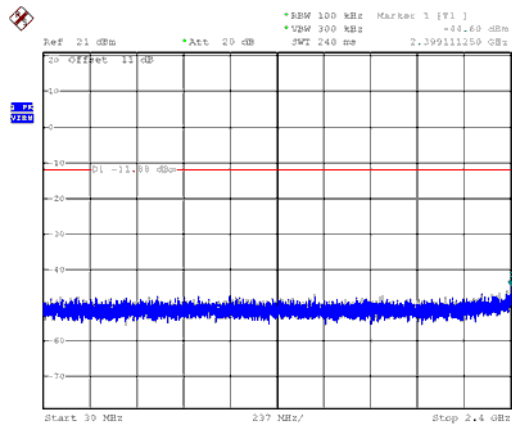
7.4 Test Result and Data

Note: Test plots refers to the following pages.

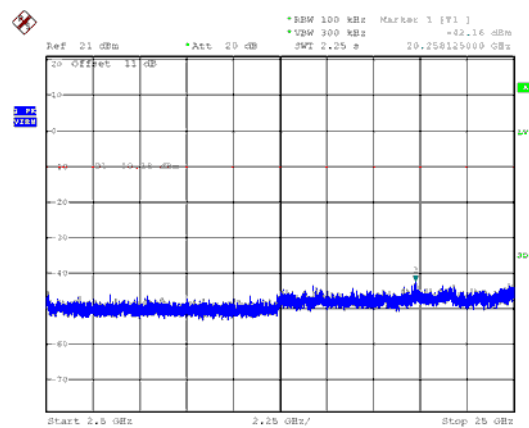
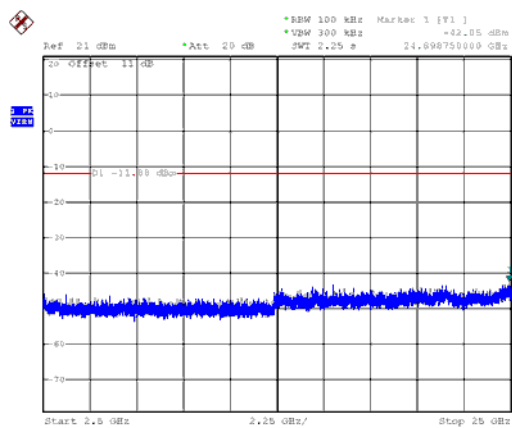
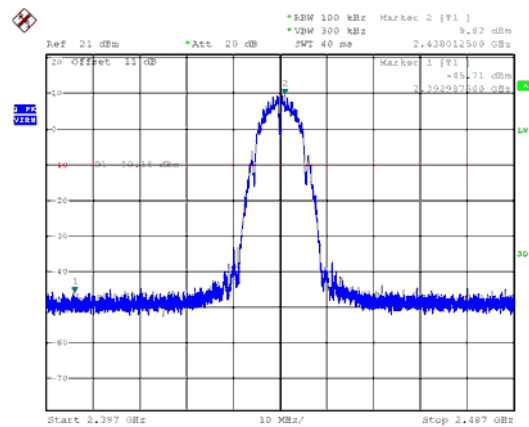
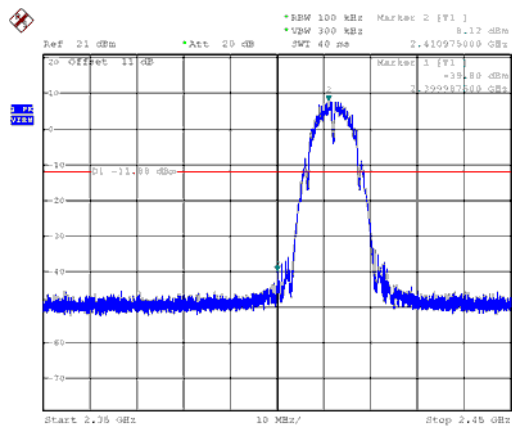
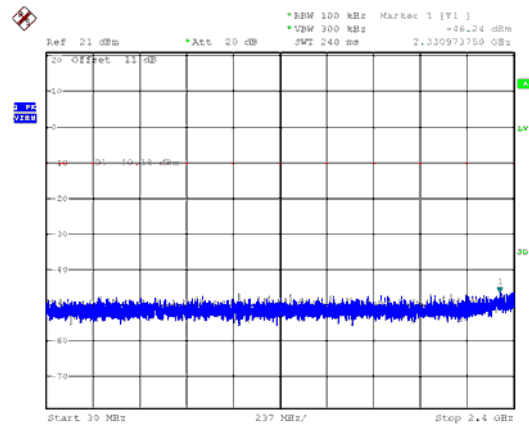


ANT A

Modulation Type: 802.11b, CH 01



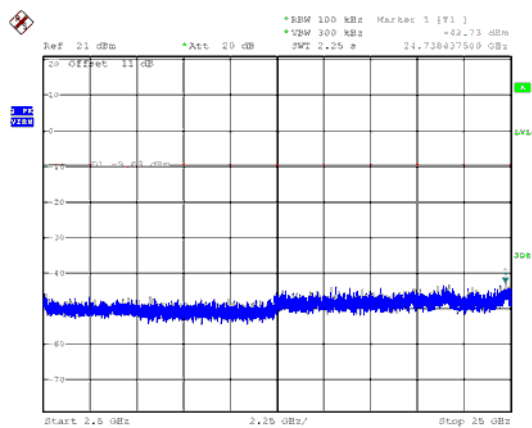
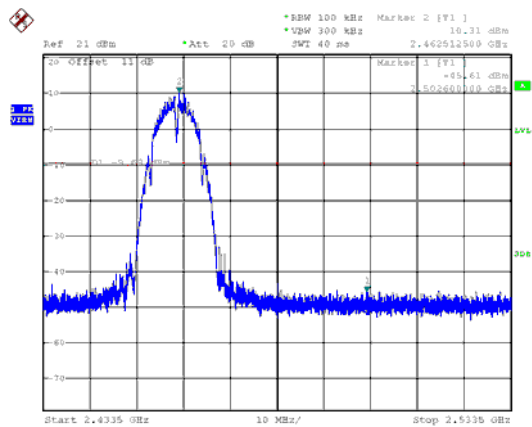
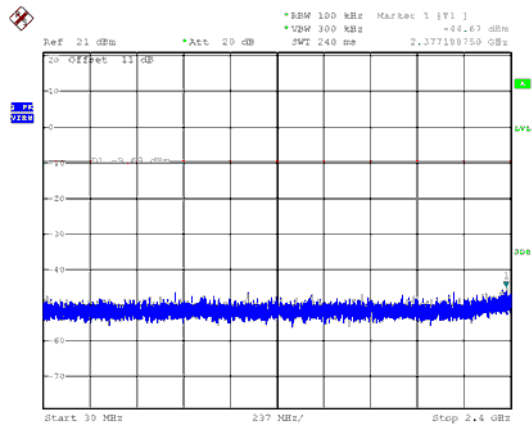
Modulation Type: 802.11b, CH 06





ANT A

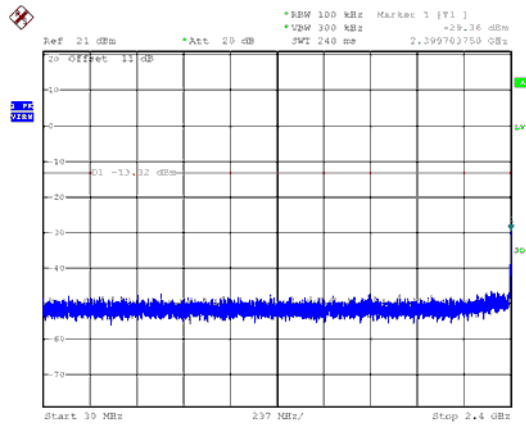
Modulation Type: 802.11b, CH 11



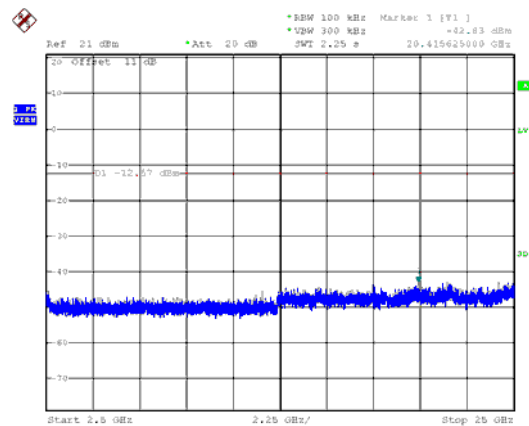
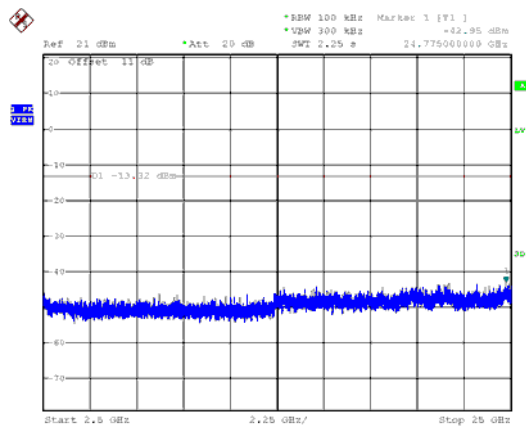
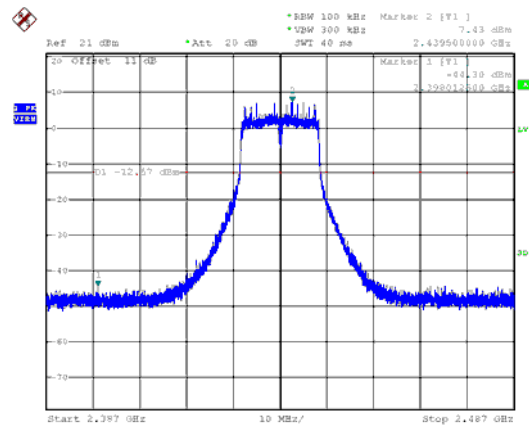
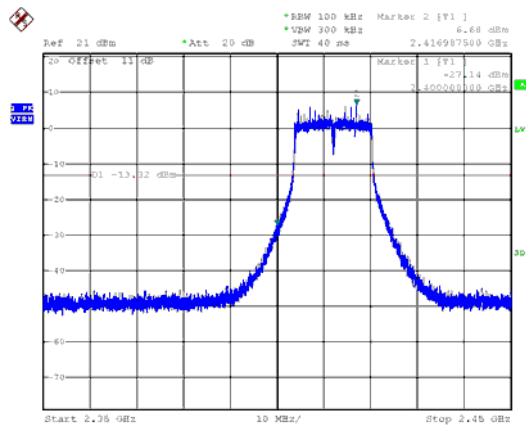
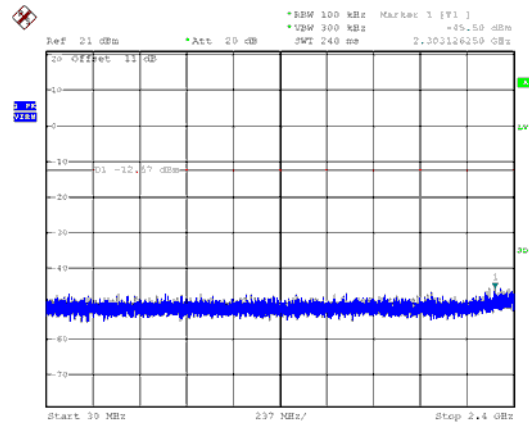


ANT A

Modulation Type: 802.11g, CH 01



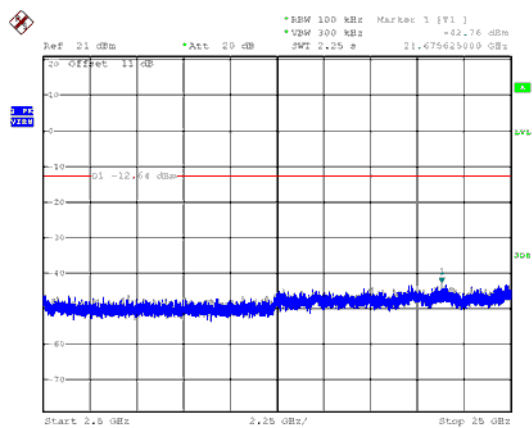
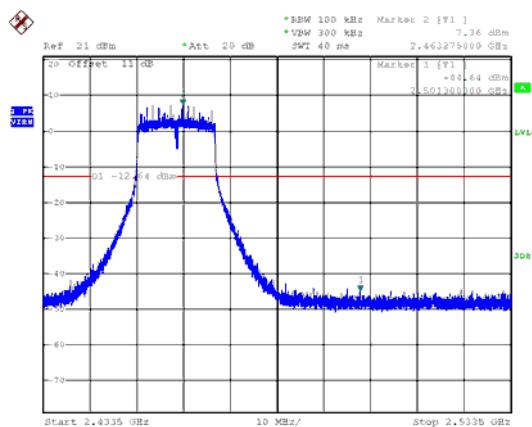
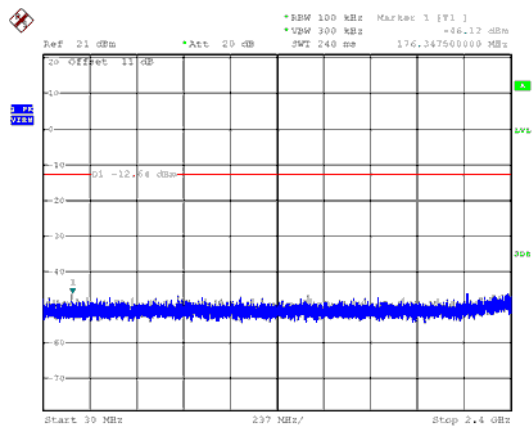
Modulation Type: 802.11g, CH 06





ANT A

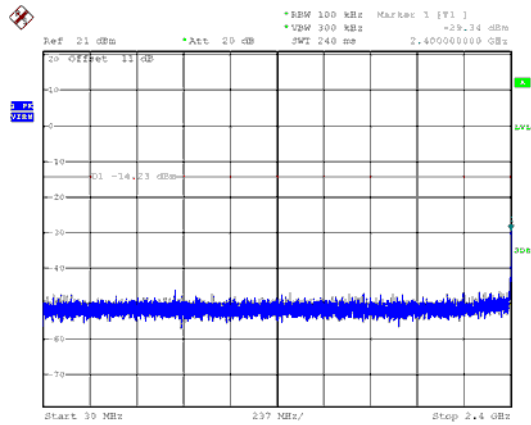
Modulation Type: 802.11g, CH 11



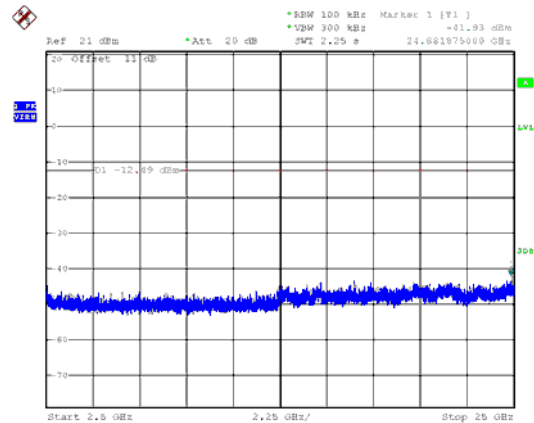
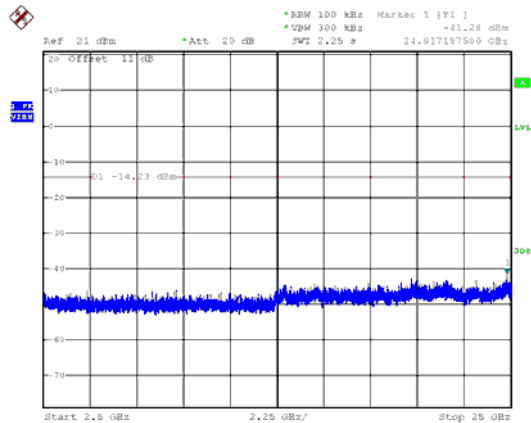
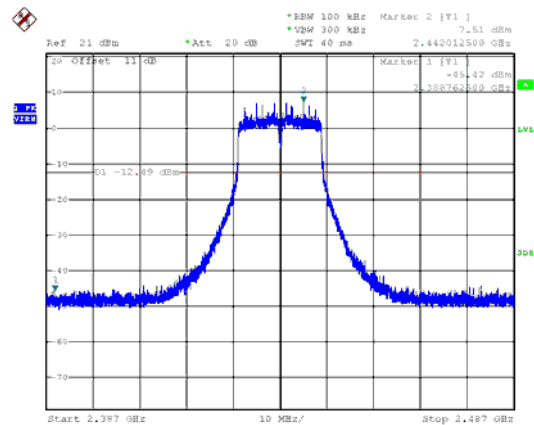
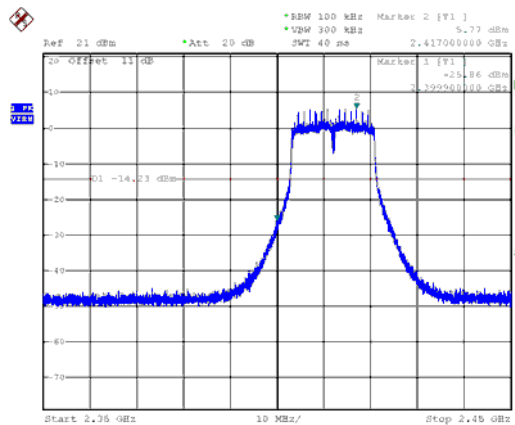
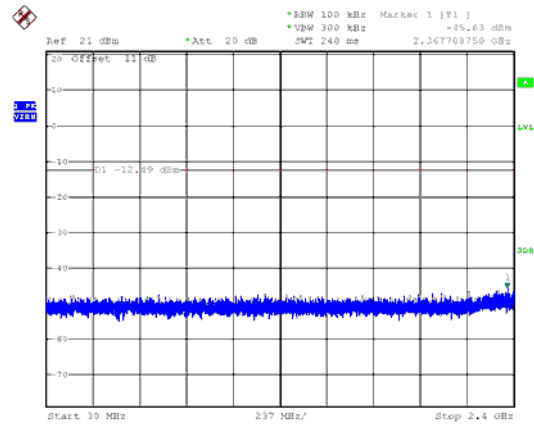


ANT A

Modulation Type: 802.11n HT20, CH01



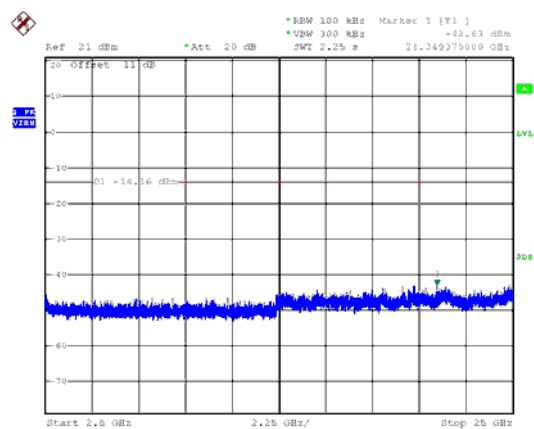
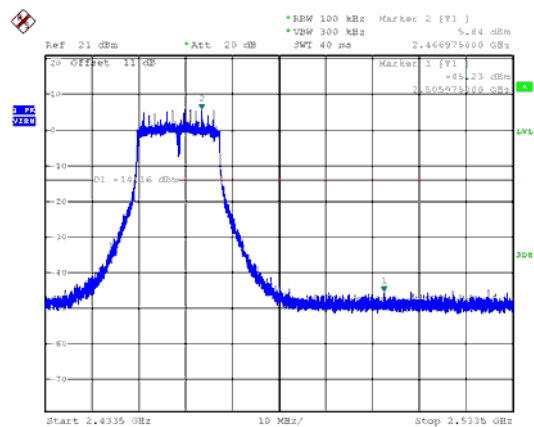
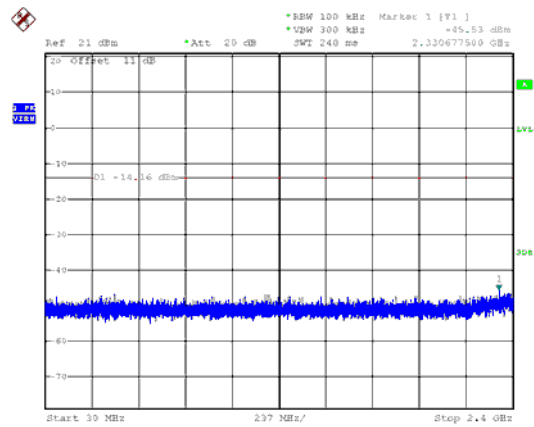
Modulation Type: 802.11n HT20, CH06





ANT A

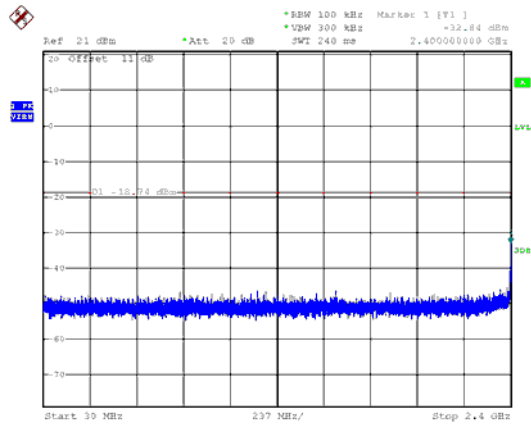
Modulation Type: 802.11n HT20, CH11



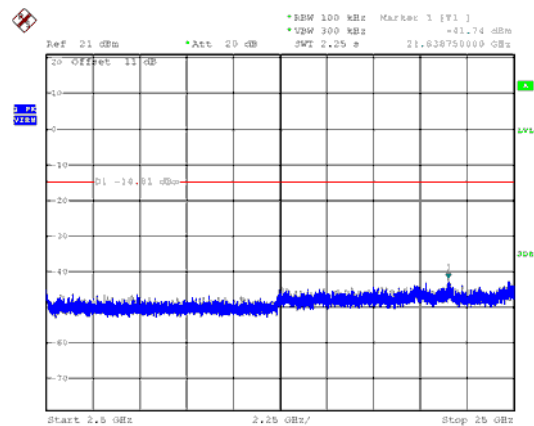
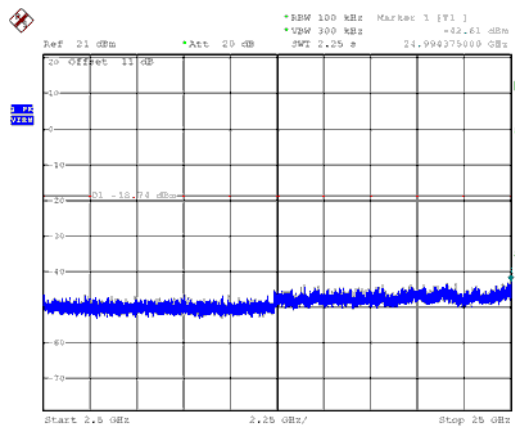
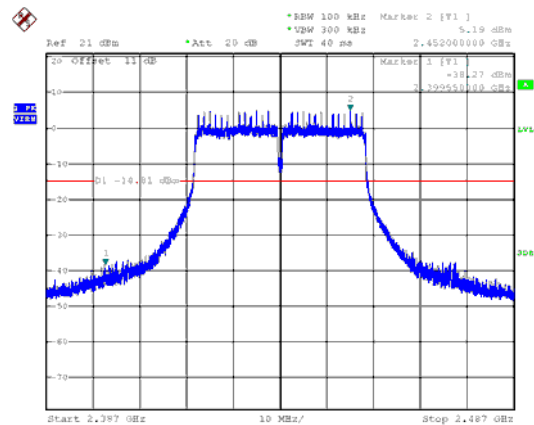
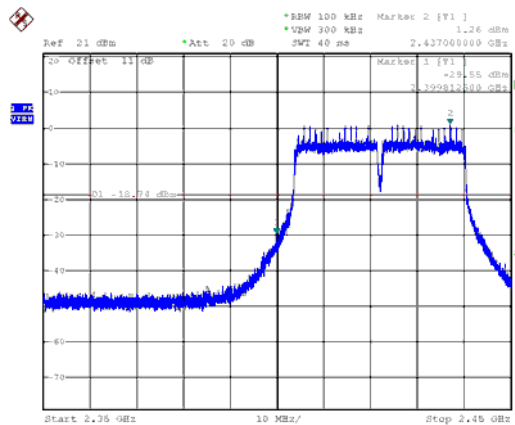
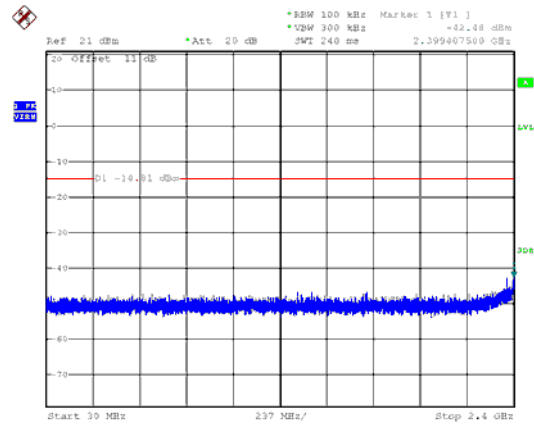


ANT A

Modulation Type: 802.11n HT40, CH03



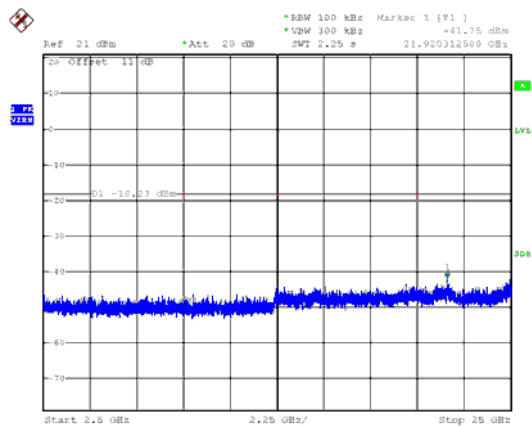
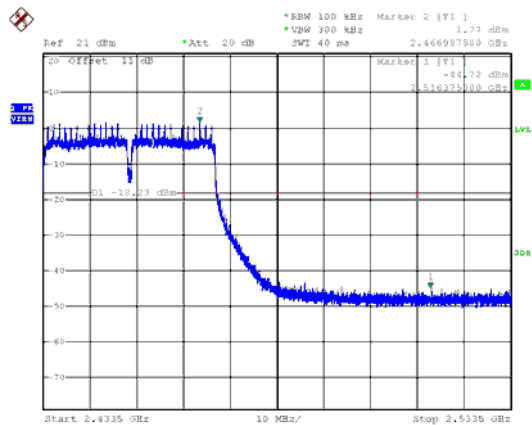
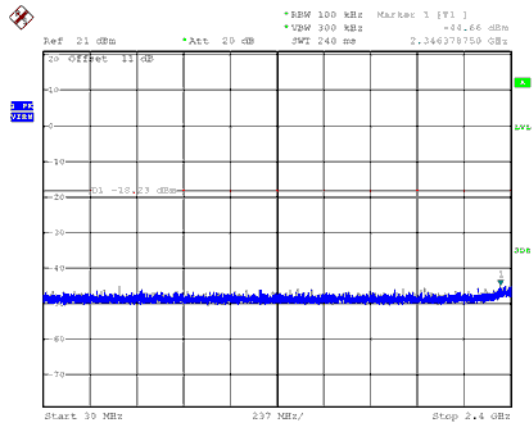
Modulation Type: 802.11n HT40, CH06





ANT A

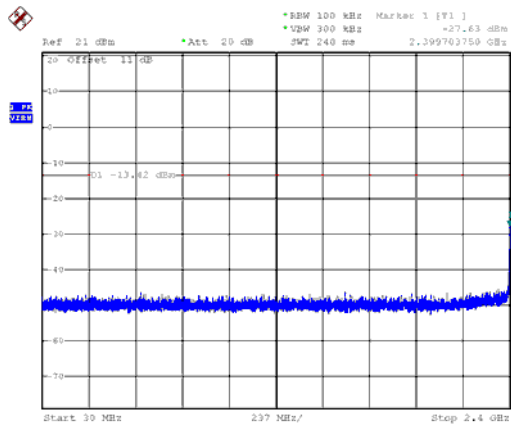
Modulation Type: 802.11n HT40, CH09



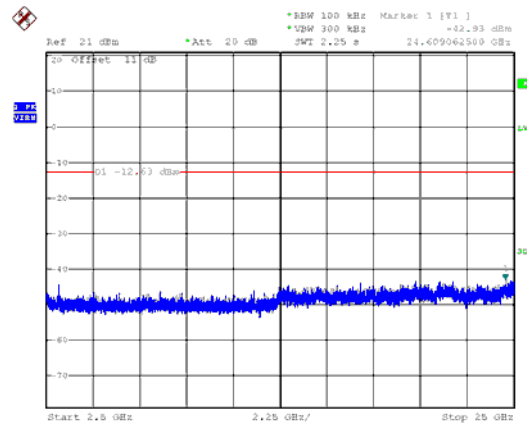
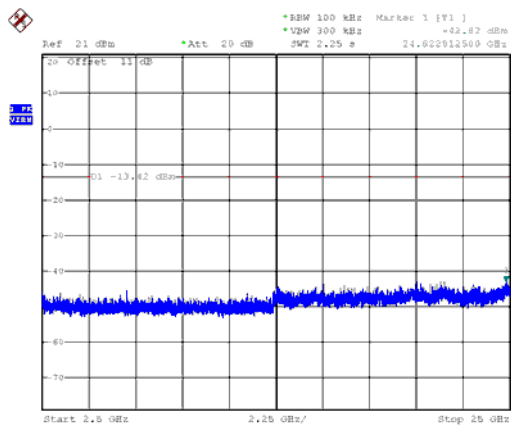
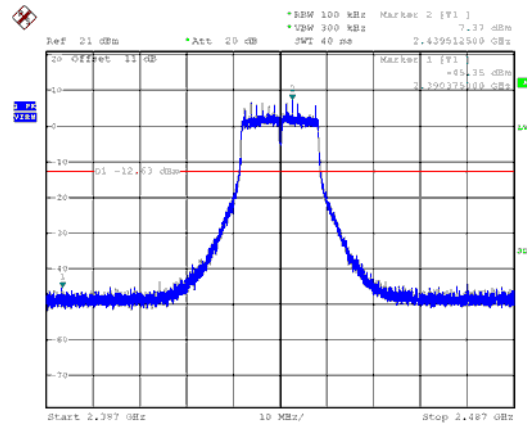
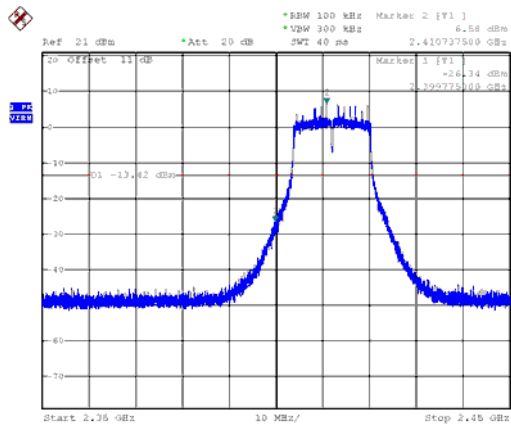
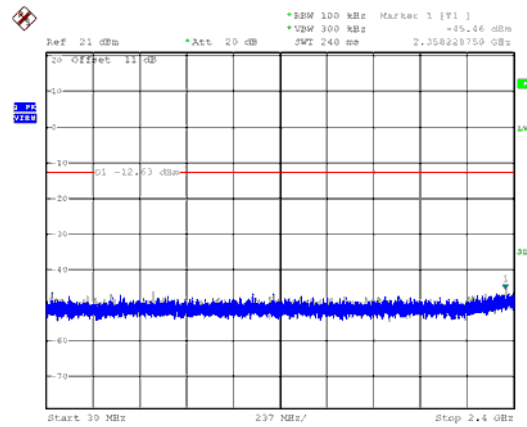


ANT B

Modulation Type: 802.11g, CH 01



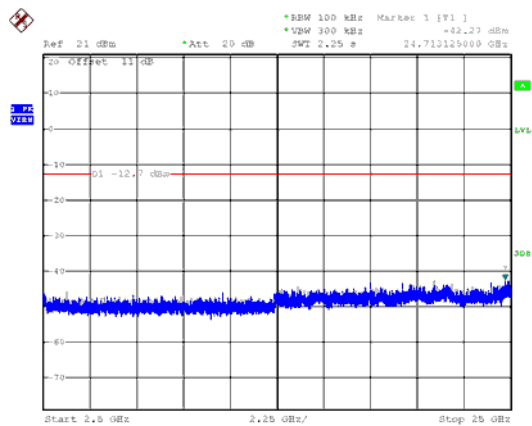
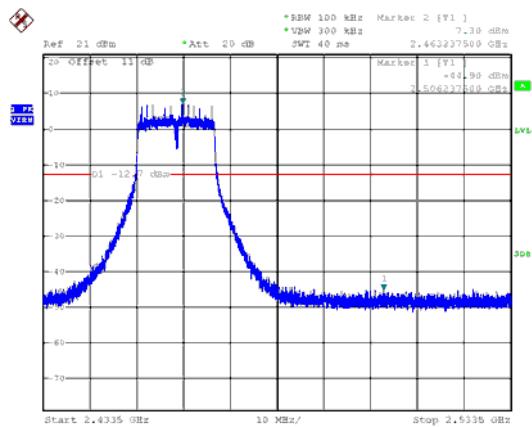
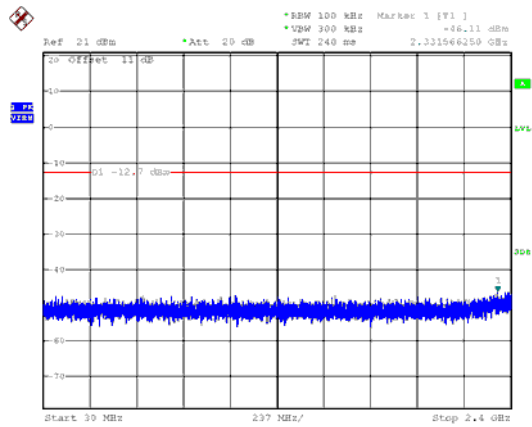
Modulation Type: 802.11g, CH 06





ANT B

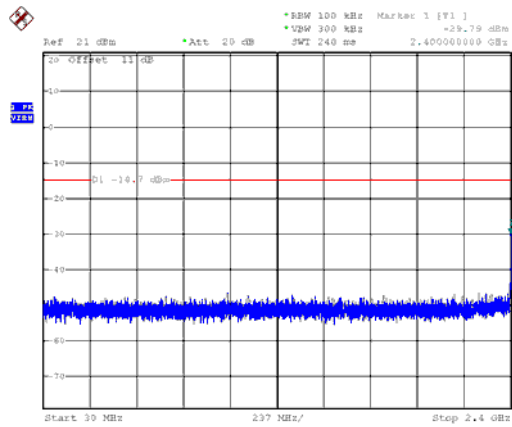
Modulation Type: 802.11g, CH 11



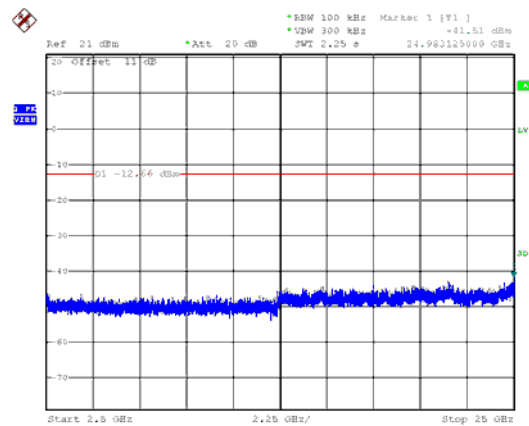
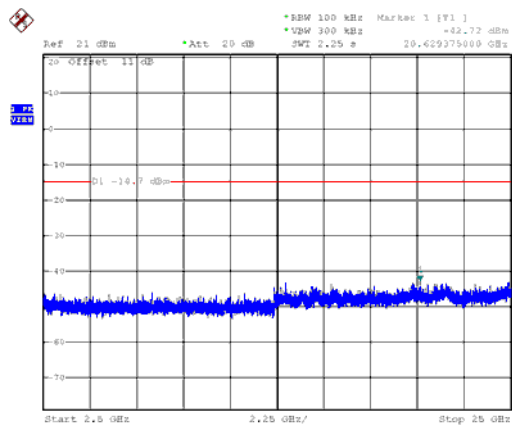
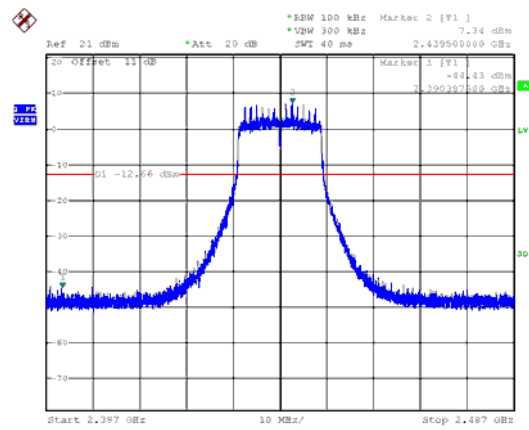
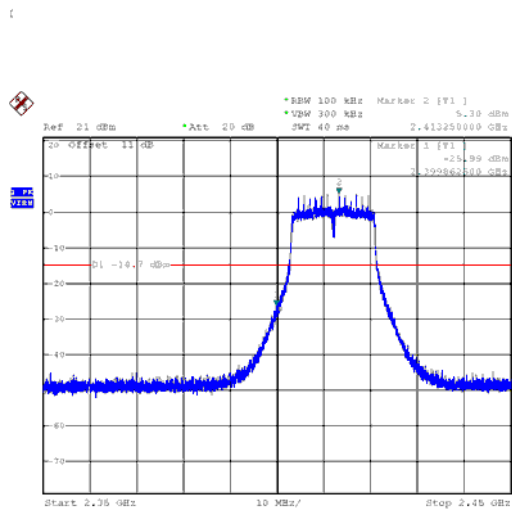
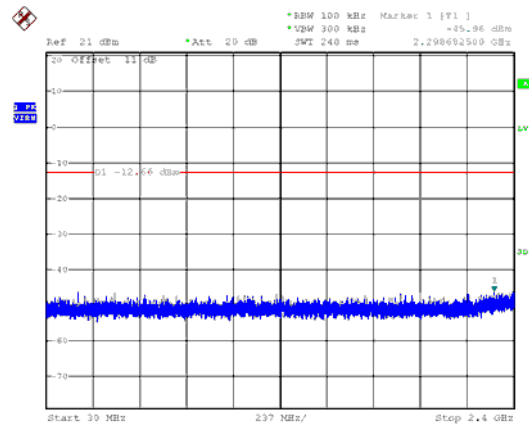


ANT B

Modulation Type: 802.11n HT20, CH01



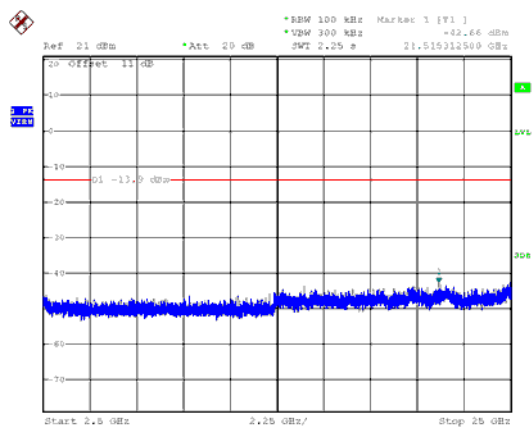
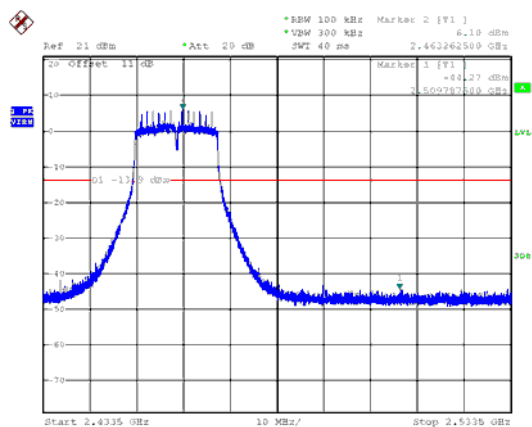
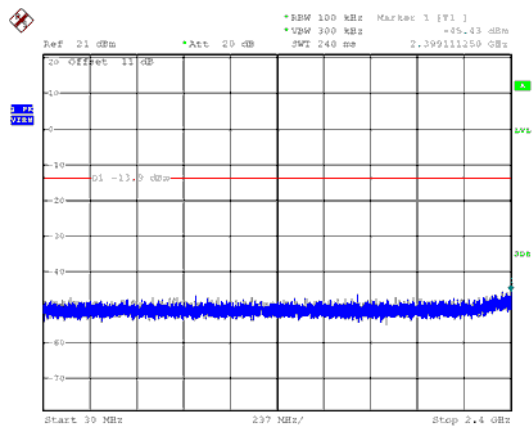
Modulation Type: 802.11n HT20, CH06





ANT B

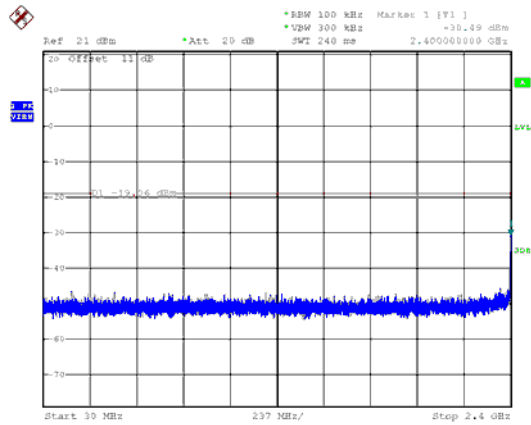
Modulation Type: 802.11n HT20, CH11



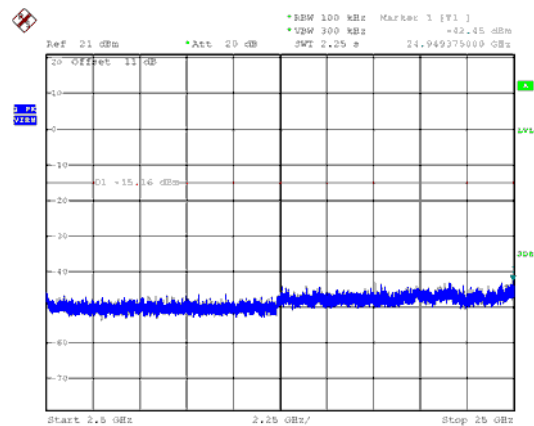
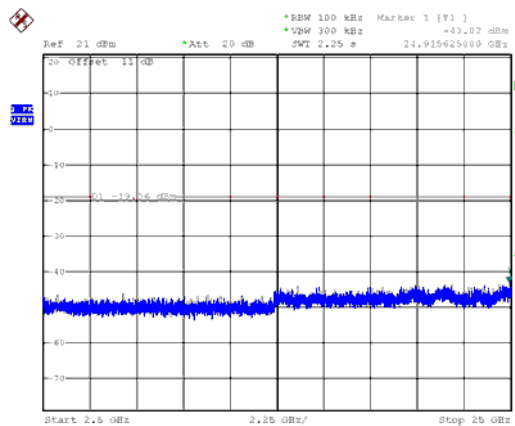
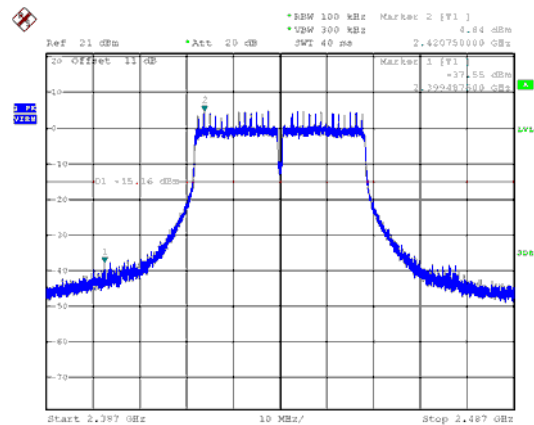
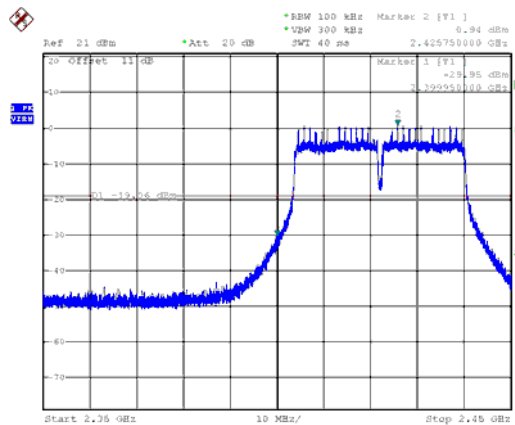
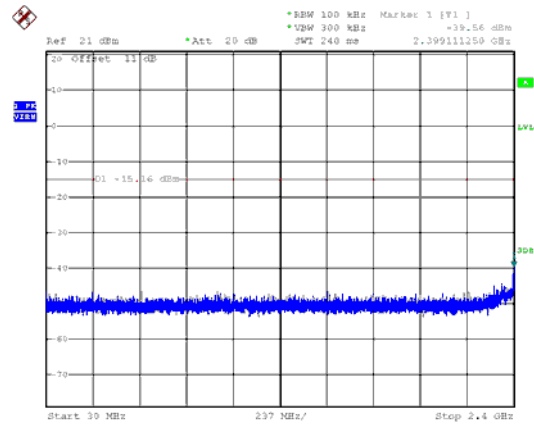


ANT B

Modulation Type: 802.11n HT40, CH03



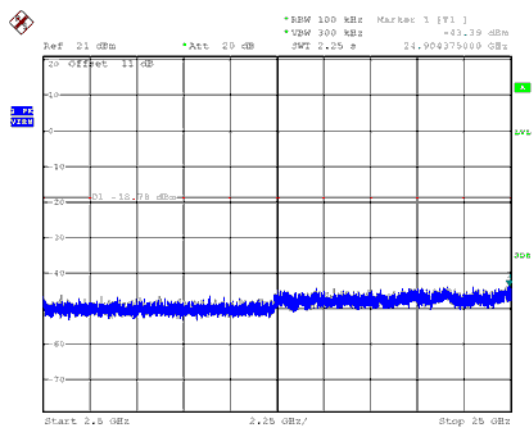
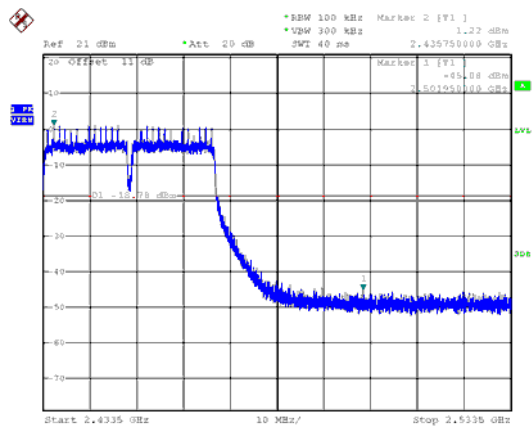
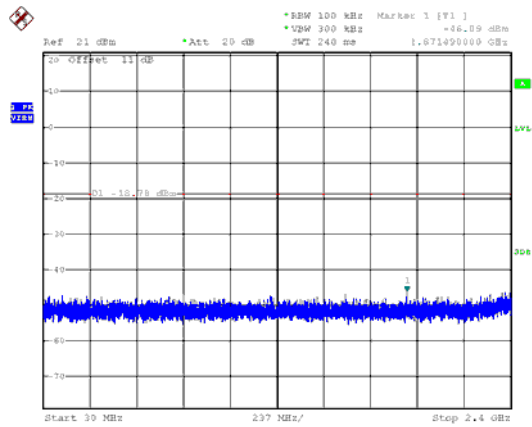
Modulation Type: 802.11n HT40, CH06





ANT B

Modulation Type: 802.11n HT40, CH09





8. On Time, Duty Cycle and Measurement methods

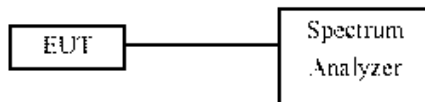
8.1 Test Limit

None; for reporting purposes only.

8.2 Test Procedure

KDB 558074 Zero-Span Spectrum Analyzer Method.

8.3 Test Setup Layout

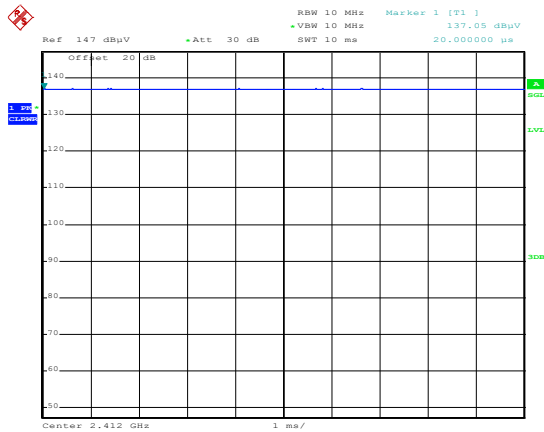


8.4 Test Result and Data

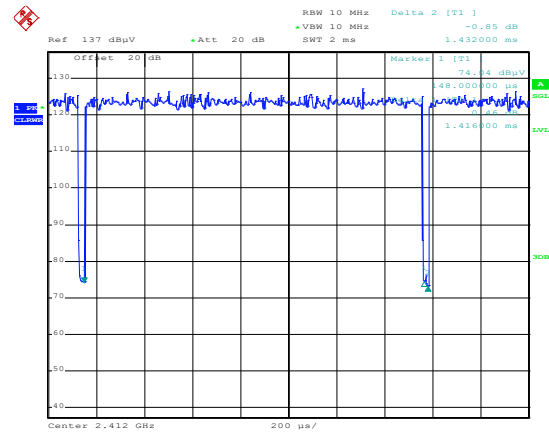
Modulation Type	On Time (msec)	Period Time(msec)	Duty Cycle (%)
11b,1M	100.00	100.00	100.00%
11g,6M	1.42	1.43	98.88%
11n HT20	1.33	1.35	98.81%
11n HT40	0.67	0.68	98.24%



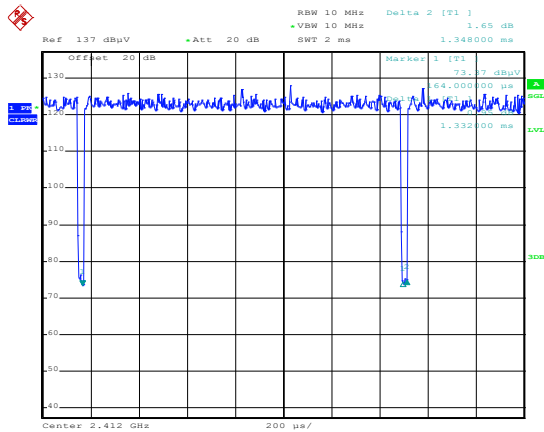
Modulation Type: 802.11b (1Mbps)



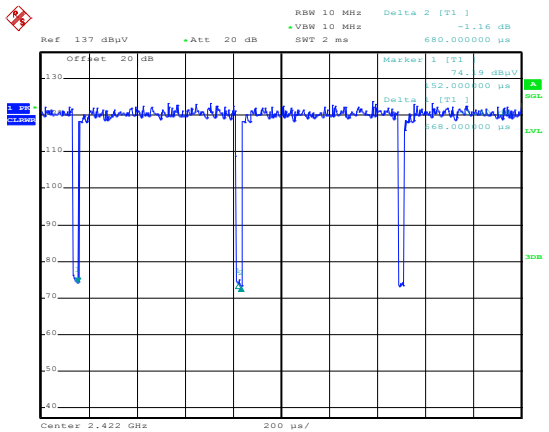
Modulation Type: 802.11g (6Mbps)



Modulation Type: 802.11n HT20 (6.5Mbps)



Modulation Type: 802.11n HT40 (13.5Mbps)





9. 6dB Bandwidth Measurement Data

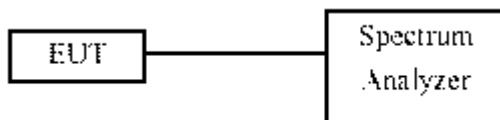
9.1 Test Limit

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

9.2 Test Procedures

- The transmitter output was connected to the spectrum analyzer.
- Set RBW of spectrum analyzer to 1~5% of the emission bandwidth and VBW $\geq 3 \times$ RBW.
- The 6 dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6 dB.
- The 6dB Bandwidth was measured and recorded.

9.3 Test Setup Layout

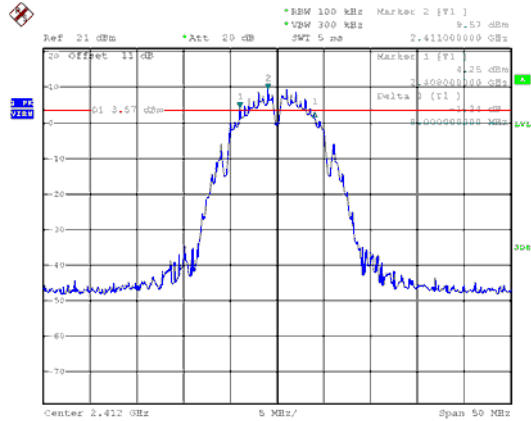


9.4 Test Result and Data

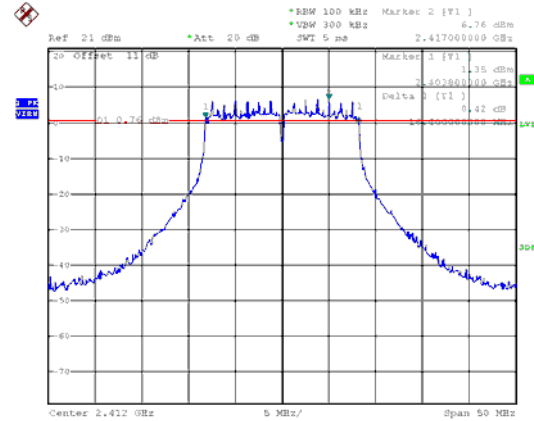
Modulation Type	Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Limit (MHz)
			ANT A	ANT B	
11b	01	2412	8.00		0.5
	06	2437	7.80		0.5
	11	2462	7.70		0.5
11g	01	2412	16.40	16.40	0.5
	06	2437	16.40	16.40	0.5
	11	2462	16.40	16.20	0.5
11n HT20	01	2412	17.50	17.60	0.5
	06	2437	17.60	17.50	0.5
	11	2462	17.60	17.50	0.5
11n HT40	03	2422	36.00	36.00	0.5
	06	2437	36.40	36.20	0.5
	09	2452	36.00	36.20	0.5



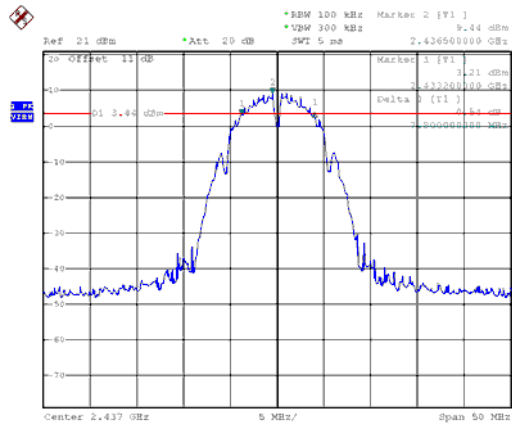
ANT A

Modulation Type: 802.11b
CH01

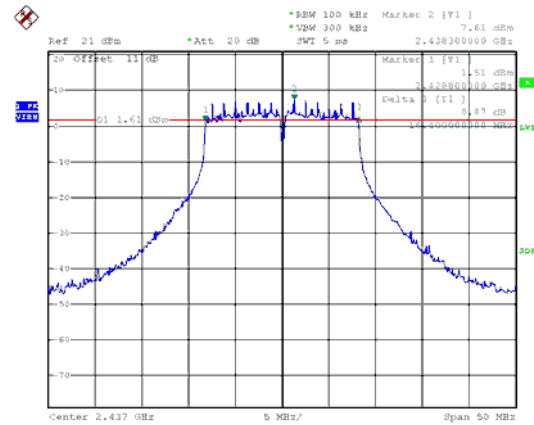
Modulation Type: 802.11g
CH01



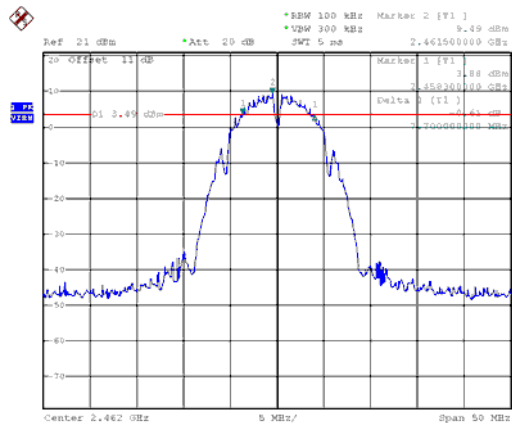
CH06



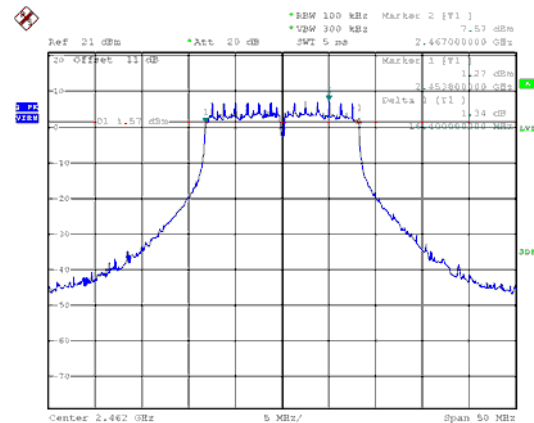
CH06



CH11



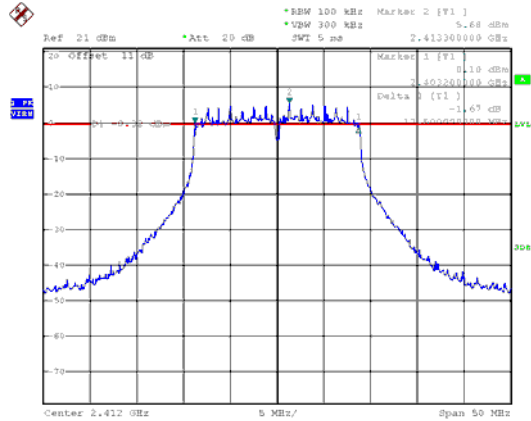
CH11



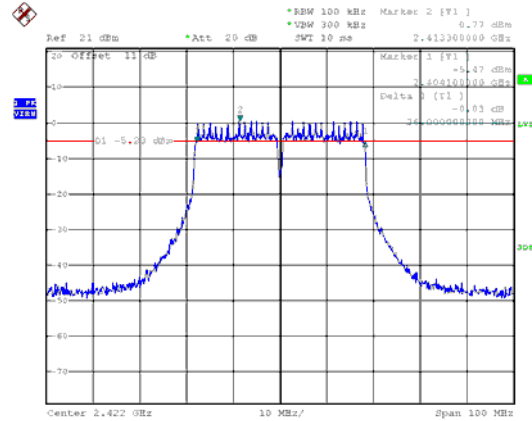


ANT A

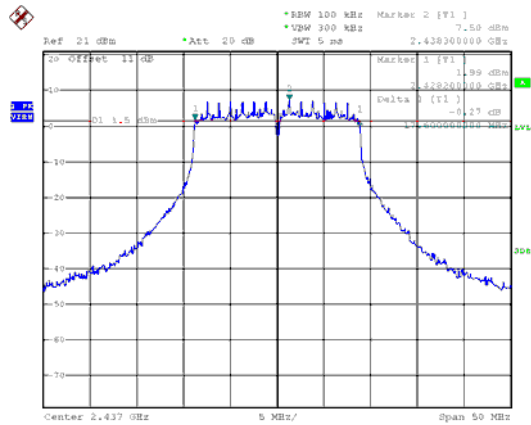
Modulation Type: 802.11n HT20
CH01



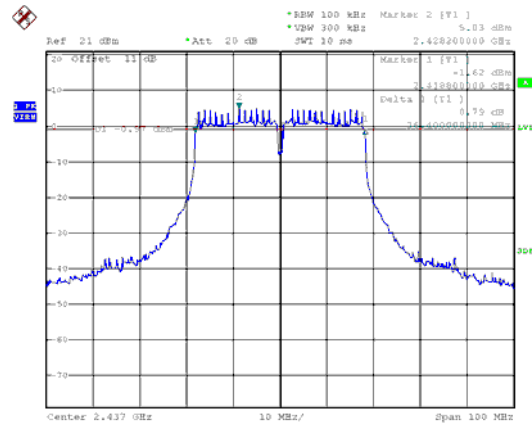
Modulation Type: 802.11n HT40
CH03



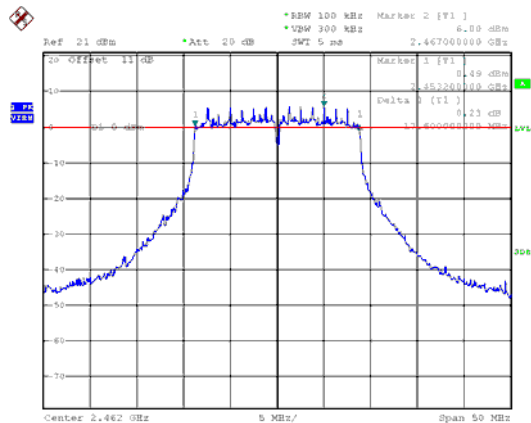
CH06



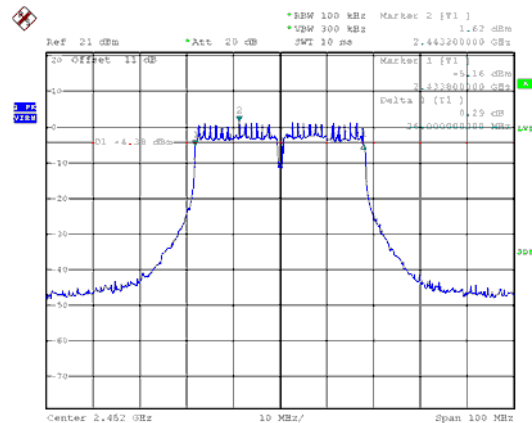
CH06



CH11



CH09

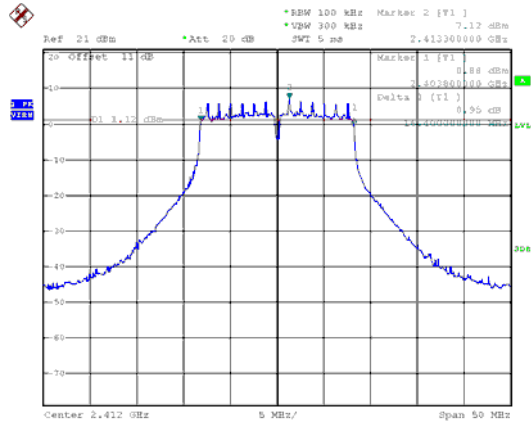




ANT B

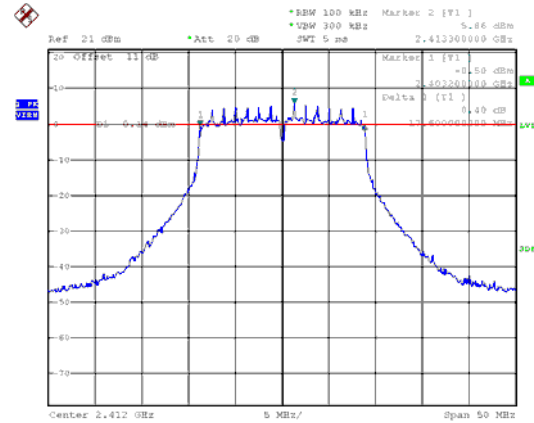
Modulation Type: 802.11g

CH01

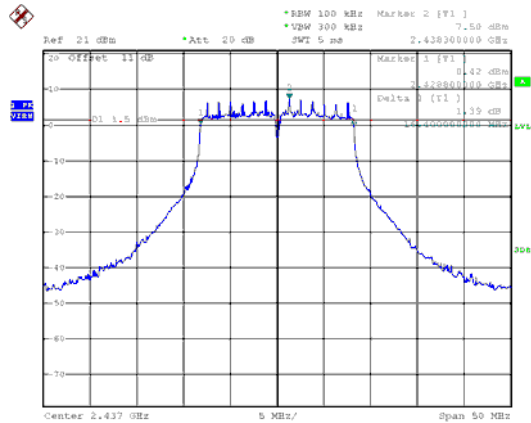


Modulation Type: 802.11n HT20

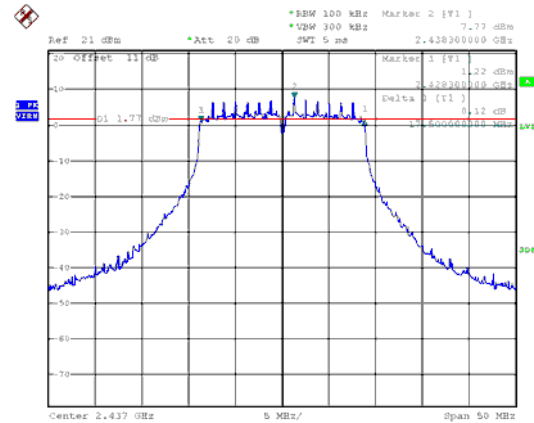
CH01



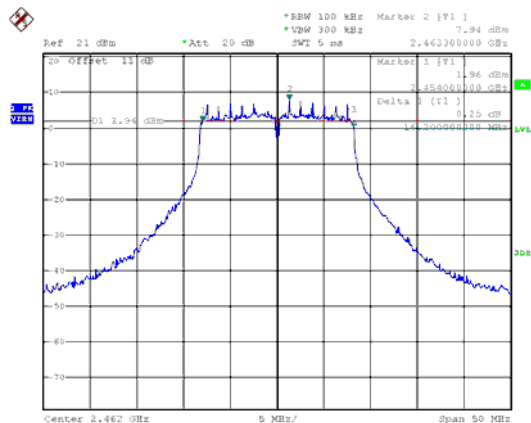
CH06



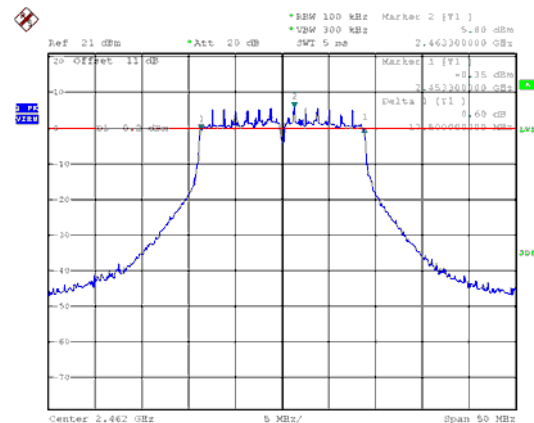
CH06



CH11



CH11

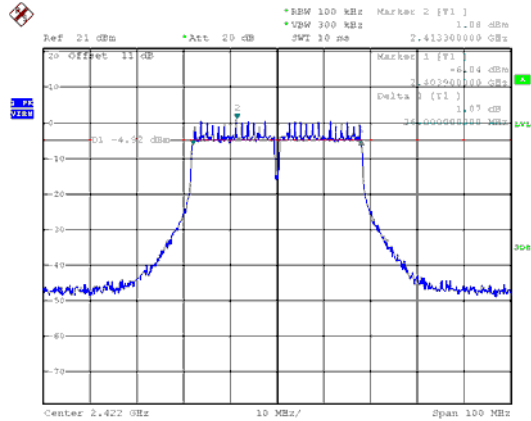




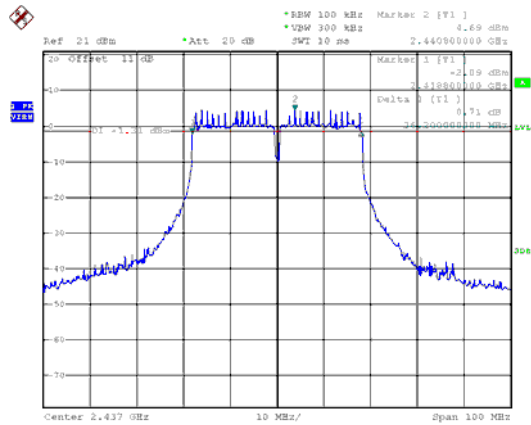
ANT B

Modulation Type: 802.11n HT40

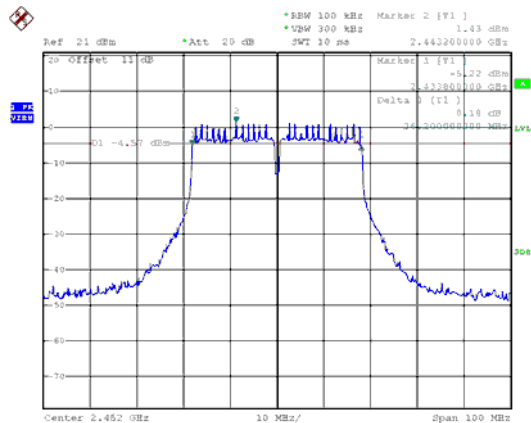
CH03



CH06



CH09





10. Maximum Peak and Average Output Power

10.1 Test Limit

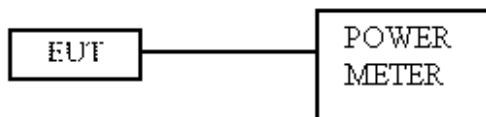
The Maximum Peak Output Power Measurement is 30dBm.

If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi

10.2 Test Procedures

The antenna port (RF output) of the EUT was connected to the input (RF input) of a power meter. Power was read directly from the meter and cable loss connection was added to the reading to obtain power at the EUT antenna terminal. The EUT Output Power was set to maximum to produce the worse case test result.

10.3 Test Setup Layout



10.4 Test Result and Data

Modulation Type	Channel	Frequency (MHz)	Conducted(peak) output power (dBm)		Total PK power (dBm)	Total PK power (mW)	Power Limit (dBm)
			ANT A	ANT B			
11b	1	2412	20.34		20.34	108.143	30.00
	6	2437	21.78		21.78	150.661	30.00
	11	2462	21.88		21.88	154.170	30.00
11g	1	2412	26.26	26.31	29.30	850.232	30.00
	6	2437	26.30	26.31	29.32	854.142	30.00
	11	2462	26.45	26.41	29.44	879.093	30.00
11n HT20	1	2412	26.41	26.47	29.45	881.131	30.00
	6	2437	26.29	26.32	29.32	854.147	30.00
	11	2462	25.29	25.36	28.34	681.623	30.00
11n HT40	3	2422	23.06	23.12	26.10	407.418	30.00
	6	2437	26.65	26.58	29.63	917.369	30.00
	9	2452	23.01	23.48	26.26	422.830	30.00



Modulation Type	Channel	Frequency (MHz)	Conducted(average) output power (dBm)		Total AV power (dBm)	Total AV power (mW)	Power Limit (dBm)
			ANT A	ANT B			
11b	1	2412	17.11		17.11	51.404	NA
	6	2437	18.54		18.54	71.450	NA
	11	2462	18.65		18.65	73.282	NA
11g	1	2412	17.32	17.33	20.34	108.026	NA
	6	2437	17.90	17.81	20.87	122.054	NA
	11	2462	18.01	17.87	20.95	124.476	NA
11n HT20	1	2412	16.13	16.04	19.10	81.199	NA
	6	2437	17.96	17.80	20.89	122.773	NA
	11	2462	16.73	16.61	19.68	92.912	NA
11n HT40	3	2422	14.71	14.77	17.75	59.572	NA
	6	2437	18.39	18.19	21.30	134.941	NA
	9	2452	14.62	14.81	17.73	59.243	NA

Note: Average power is for reference only.



11. Power Spectral Density

11.1 Test Limit

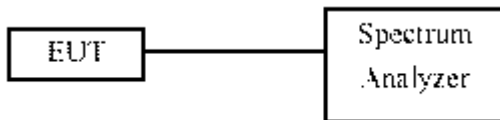
The Maximum of Power Spectral Density Measurement is 8dBm.

If transmitting antennas of directional gain greater than 6 dBi are used, the power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi

11.2 Test Procedures

- The transmitter output was connected to spectrum analyzer.
- The spectrum analyzer's resolution bandwidth were set at 3kHz RBW and 30KHz VBW as that of the fundamental frequency. Set the sweep time=auto couple.
- The power spectral density was measured and recorded.

11.3 Test Setup Layout

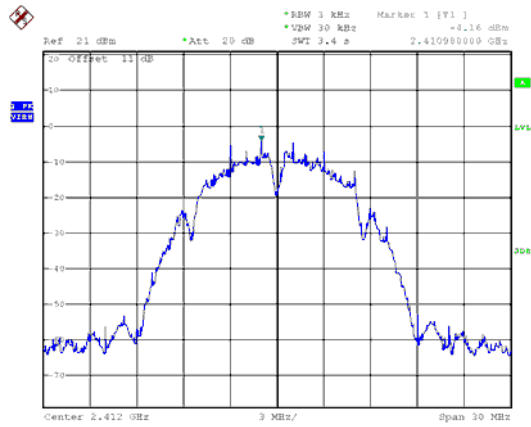


11.4 Test Result and Data

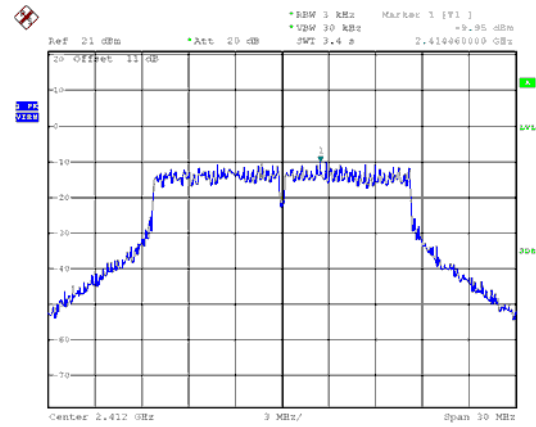
Modulation Type	Channel	Frequency (MHz)	Maximum Power Density of 3KHz Bandwidth(dBm)		Sum chain (dBm)	Duty Cycle CF(dB)	Total PSD (dBm)	Limit (dBm)
			ANT A	ANT B				
11b	1	2412	-4.16		-4.16	0.00	-4.16	8.00
	6	2437	-4.94		-4.94	0.00	-4.94	8.00
	11	2462	-4.94		-4.94	0.00	-4.94	8.00
11g	1	2412	-9.95	-9.68	-6.80	0.00	-6.80	7.25
	6	2437	-8.8	-8.85	-5.81	0.00	-5.81	7.25
	11	2462	-8.37	-7.91	-5.12	0.00	-5.12	7.25
11n HT20	1	2412	-9.96	-10.25	-7.09	0.00	-7.09	7.25
	6	2437	-8.11	-8.43	-5.26	0.00	-5.26	7.25
	11	2462	-9.81	-9.24	-6.51	0.00	-6.51	7.25
11n HT40	3	2422	-13.59	-14.77	-11.13	0.00	-11.13	7.25
	6	2437	-9.96	-11.07	-7.47	0.00	-7.47	7.25
	9	2452	-14.79	-13.7	-11.20	0.00	-11.20	7.25



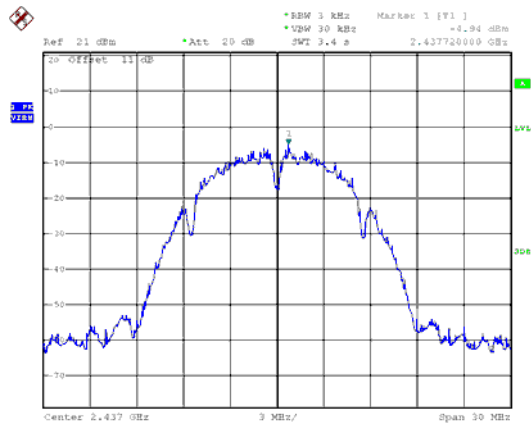
ANT A
Modulation Type: 802.11b
CH01



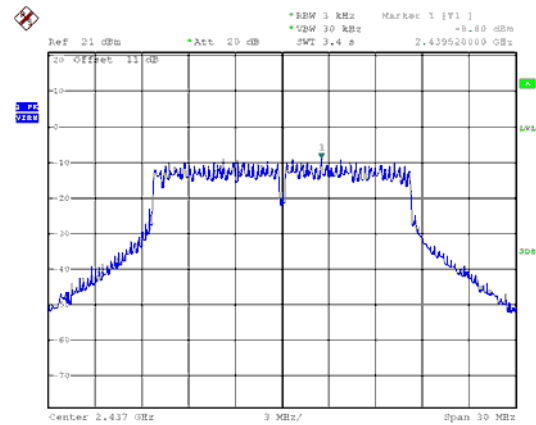
Modulation Type: 802.11g
CH01



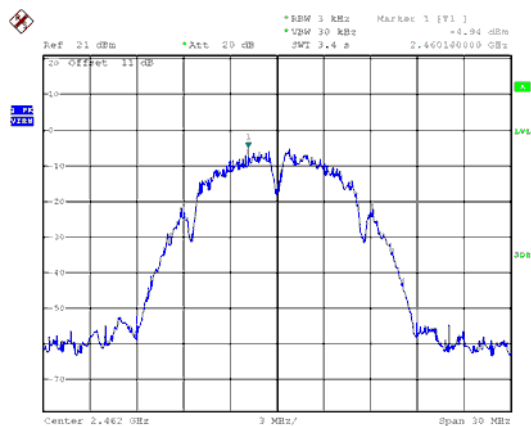
CH06



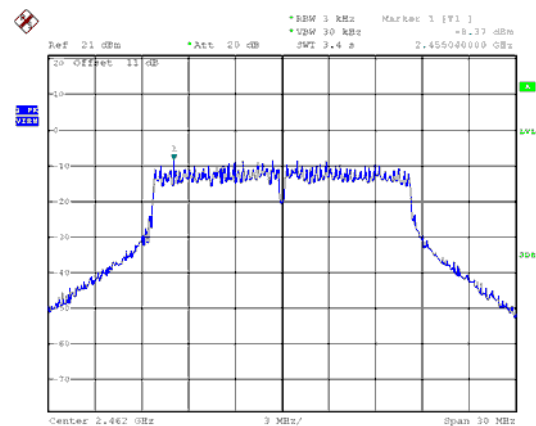
CH06



CH11

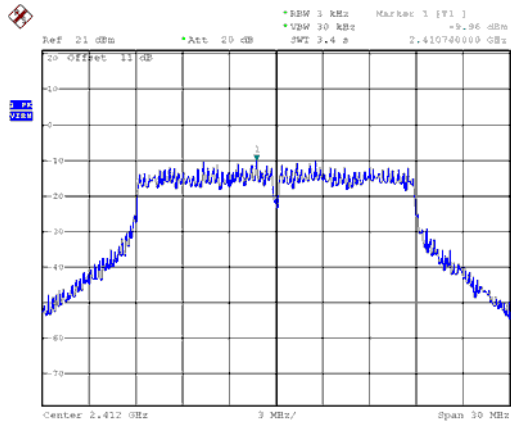


CH11

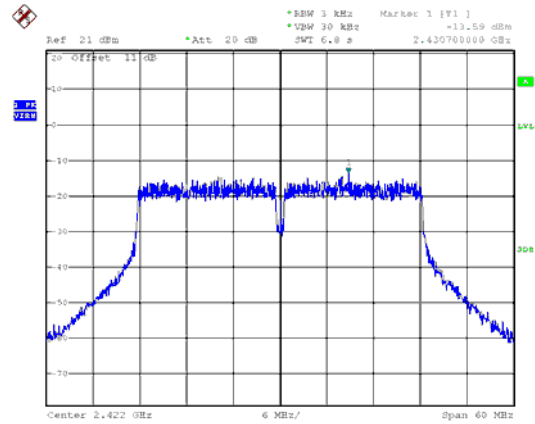




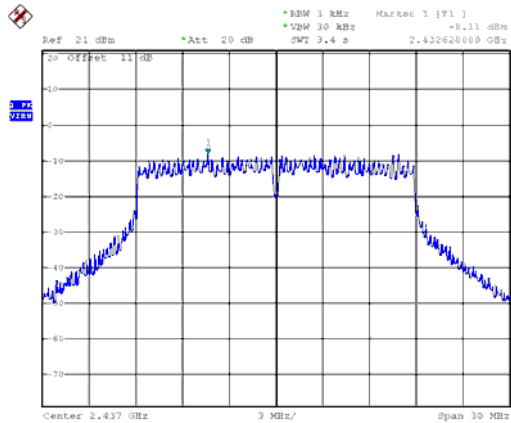
ANT A
Modulation Type: 802.11n HT20
CH01



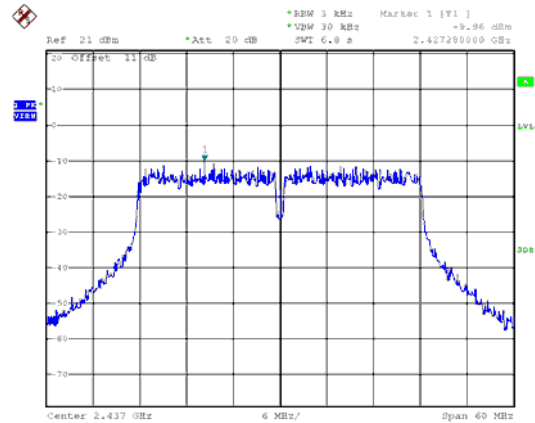
Modulation Type: 802.11n HT40
CH03



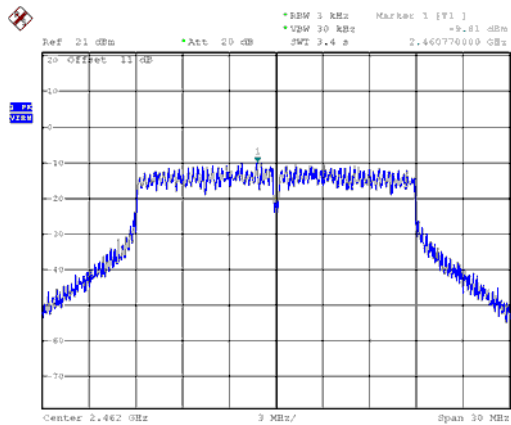
CH06



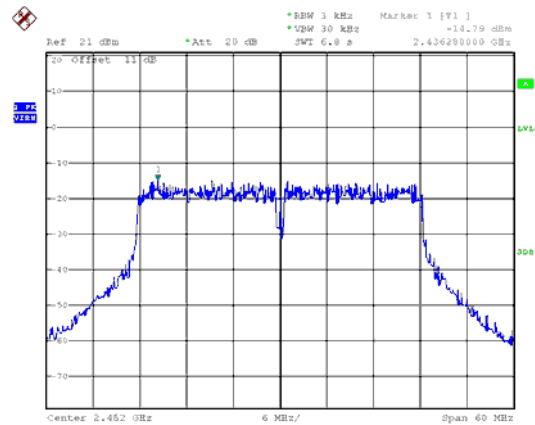
CH06



CH11

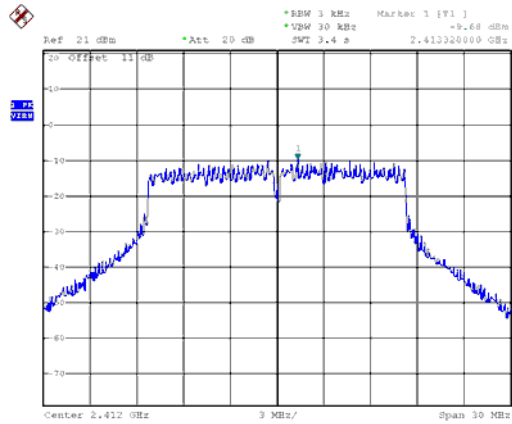


CH09

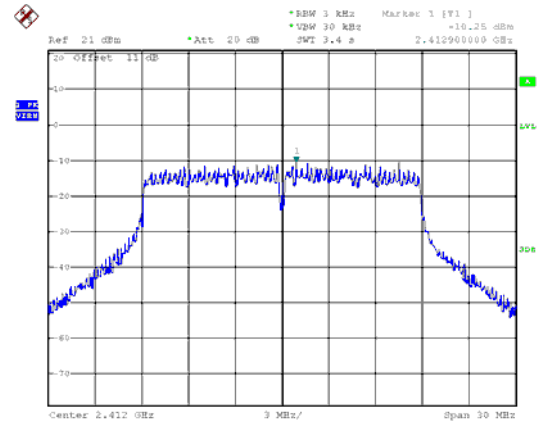




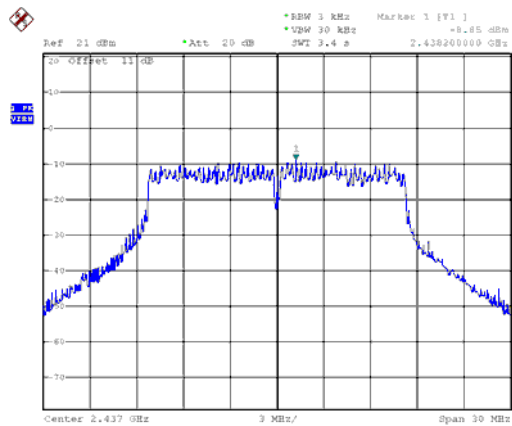
ANT B
Modulation Type: 802.11g
CH01



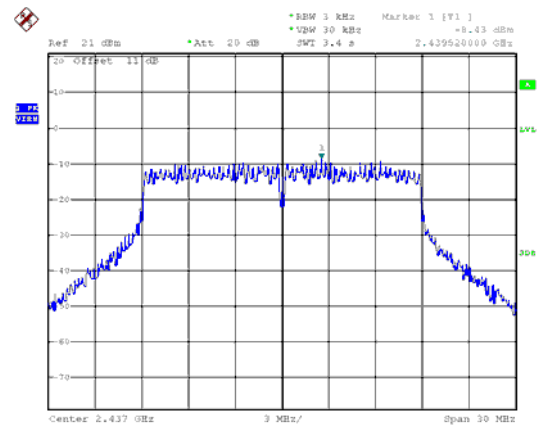
Modulation Type: 802.11n HT20
CH01



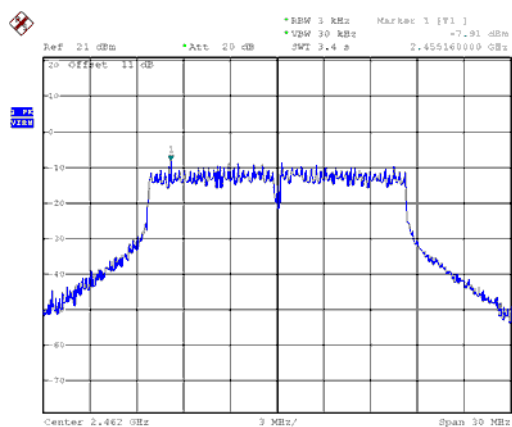
CH06



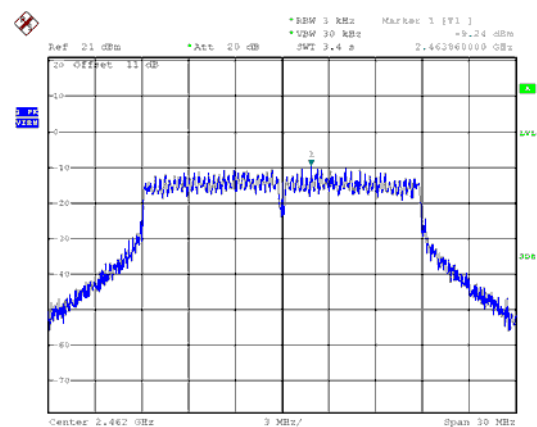
CH06



CH11

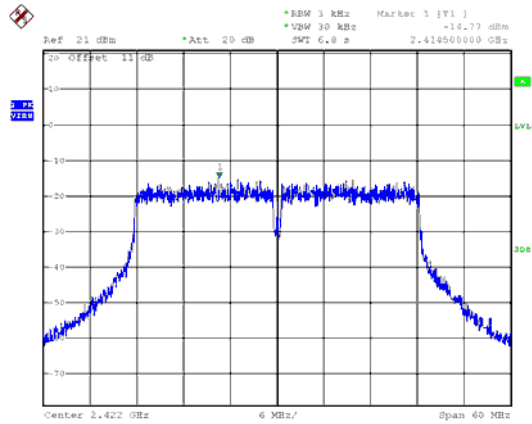


CH11

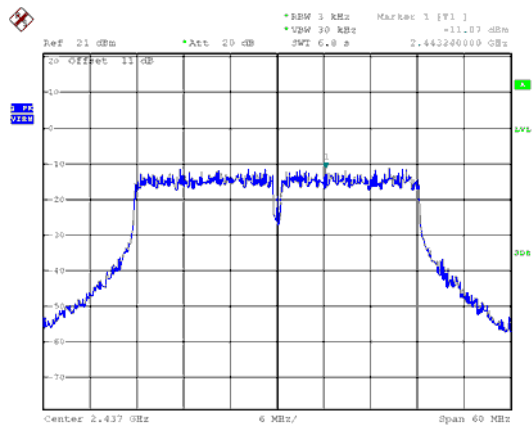




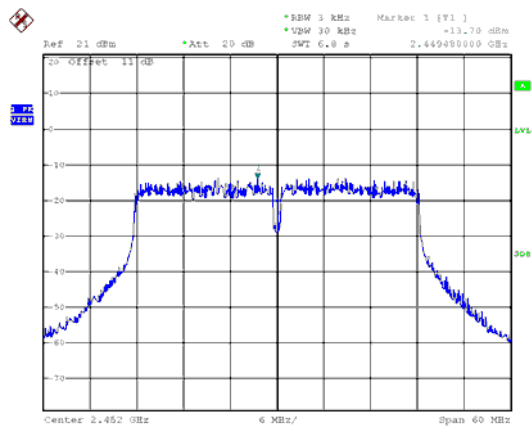
ANT B
Modulation Type: 802.11n HT40
CH03



CH06



CH09





12. Radio Frequency Exposure

12.1 Applicable Standards

The measurements shown in this test report were made in accordance with the procedures given in FCC Part 2 (Section 2.1091)

KDB 447498

IEEE C95.1:2005

12.2 EUT Specification

Frequency band (Operating)	☒ WLAN: 2412MHz ~ 2462MHz ☒ WLAN: 5150MHz ~ 5250MHz ☐ WLAN: 5250MHz ~ 5350MHz ☐ WLAN: 5470MHz ~ 5725MHz ☒ WLAN: 5725MHz ~ 5850MHz ☐ Bluetooth: 2402MHz ~ 2480MHz
Device category	☐ Portable (<20cm separation) ☒ Mobile (>20cm separation)
Exposure classification	☐ Occupational/Controlled exposure (S = 5mW/cm ²) ☒ General Population/Uncontrolled exposure (S=1mW/cm ²)
Antenna diversity	☐ Single antenna ☒ Multiple antennas ☐ Tx diversity ☐ Rx diversity ☒ Tx/Rx diversity
Evaluation applied	☒ MPE Evaluation* ☐ SAR Evaluation ☐ N/A
Remark: 1. The maximum conducted output power is <u>29.63dBm (917.369mW)</u> at <u>2437MHz</u> (with <u>3.9dBi antenna gain.</u>) 2. DTS device is not subject to routine RF evaluation; MPE estimate is used to justify the compliance. 3. For mobile or fixed location transmitters, no SAR consideration applied. The maximum power density is 1.0 mW/cm ² even if the calculation indicates that the power density would be larger.	



12.3 Test Results

No non-compliance noted.

12.4 Calculation

$$\text{Given } E = \frac{\sqrt{30 \times P \times G}}{d} \quad \& \quad S = \frac{E^2}{3770}$$

Where E = Field strength in Volts / meter

P = Power in Watts

G = Numeric antenna gain

d = Distance in meters

S = Power density in milliwatts / square centimeter

Combining equations and re-arranging the terms to express the distance as a function of the remaining variables yields:

$$S = \frac{30 \times P \times G}{3770 d^2}$$

Changing to units of mW and cm, using:

$P \text{ (mW)} = P \text{ (W)} / 1000$ and

$d \text{ (cm)} = d \text{ (m)} / 100$

Yields

$$S = \frac{30 \times (P/1000) \times G}{3770 \times (d/100)^2} = 0.0796 \times \frac{P \times G}{d^2} \quad \text{Equation 1}$$

Where d = Distance in cm

P = Power in mW

G = Numeric antenna gain

S = Power density in mW / cm²



12.5 Maximum Permissible Exposure

Max. output power	Band: 2412MHz ~ 2462MHz 802.11b: 21.88dBm 802.11g: 29.44dBm 802.11n HT20: 29.45dBm 802.11n HT40: 29.63dBm
Antenna gain (Max)	3.9dBi

Maximum Permissible Exposure

Channel Frequency (MHz)	Max. Conducted output power(dBm)	Antenna Gain(dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
2412-2462	29.63	3.9	20	0.448	1

Maximum Permissible Exposure(Co-location)

Modulation Mode	Channel Frequency (MHz)	Max. Conducted output power (dBm)	Antenna Gain(dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)	MPE Ratio
11n40	2412-2462	29.63	3.9	20	0.448	1.000	0.448
11ac80	5725-5850	25.04	3.59	20	0.145	1.000	0.145
Co-location Total							0.593
Σ MPE ratios Limit							1