



FCC RADIO TEST REPORT

Applicant : Shuttle Inc.

Address : No. 30, Lane 76, Rui Guang Rd. Nei-Hu Dist.,
Taipei, Taiwan

Equipment : XPC nano

Model No. : NS03

Trade Name : Shuttle

FCC ID : S8CNS03

I HEREBY CERTIFY THAT :

The sample was received on May. 26, 2022 and the testing was completed on Jun. 21, 2022 at Cerpass Technology Corp. The test result refers exclusively to the test presented test model / sample. Without written approval of Cerpass Technology Corp., the test report shall not be reproduced except in full.

Approved by:

Vic Hsiao / Supervisor

Laboratory Accreditation:

Cerpass Technology Corporation Test Laboratory





Contents

1. Summary of Test Procedure and Test Results	5
1.1 Applicable Standards	5
2. Test Configuration of Equipment under Test	6
2.1 Feature of Equipment.....	6
2.2 Carrier Frequency of Channels	7
2.3 Test Mode and Test Software	8
2.4 Description of Test System.....	10
2.5 General Information of Test.....	12
2.6 Measurement Uncertainty	13
3. Test Equipment and Ancillaries Used for Tests	14
4. Antenna Requirements.....	16
4.1 Antenna Construction and Directional Gain.....	16
5. Test of AC Power Line Conducted Emission	17
5.1 Test Limit	17
5.2 Test Procedures	17
5.3 Typical Test Setup	18
5.4 Test Result and Data.....	19
5.5 Test Photographs	23
6. Test of Radiated Spurious Emission.....	24
6.1 Test Limit	24
6.2 Test Procedures	25
6.3 Typical Test Setup	26
6.4 Test Result and Data (9KHz ~ 30MHz)	27
6.5 Test Result and Data (30MHz ~ 1GHz)	27
6.6 Test Result and Data (1GHz ~ 25GHz).....	31
6.7 Restricted Bands of Operation	49
6.8 Test Photographs (30MHz ~ 1GHz)	50
6.9 Test Photographs (1GHz ~ 25GHz)	51
7. Test of Conducted Spurious Emission	53
7.1 Test Limit	53
7.2 Test Procedure	53
7.3 Test Setup Layout	53
7.4 Test Result and Data.....	53
8. On Time, Duty Cycle and Measurement methods	60
8.1 Test Limit	60
8.2 Test Procedure	60
8.3 Test Setup Layout	60
8.4 Test Result and Data.....	60
9. 6dB Bandwidth Measurement Data.....	62
9.1 Test Limit	62
9.2 Test Procedures	62
9.3 Test Setup Layout	62



9.4	Test Result and Data.....	63
10.	Maximum Peak and Average Output Power	66
10.1	Test Limit	66
10.2	Test Procedures	66
10.3	Test Setup Layout	66
10.4	Test Result and Data.....	67
11.	Power Spectral Density	69
11.1	Test Limit	69
11.2	Test Procedures	69
11.3	Test Setup Layout	69
11.4	Test Result and Data.....	70
12.	Radio Frequency Exposure	73
12.1	Applicable Standards	73
12.2	EUT Specification.....	73
12.3	Test Results.....	74
12.4	Calculation.....	74
12.5	Maximum Permissible Exposure.....	75



History of this test report

Report No.	Issued Date	Description
22050246-TRFCC01	Jul. 04, 2022	Original



1. Summary of Test Procedure and Test Results

1.1 Applicable Standards

ANSI C63.10:2013

FCC Rules and Regulations Part 15 Subpart C §15.247

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 lab has reduced the uncertainty risk factor from test equipment, environment and staff technicians which according to the standard on contract. Therefore, the test result will only be determined by standard requirement.



2. Test Configuration of Equipment under Test

2.1 Feature of Equipment

Operation Frequency Range	BT / BLE: 2400-2483.5MHz 802.11b/g/n: 2400-2483.5MHz 802.11a/n/ac: 5150-5250MHz, 5250-5350MHz, 5470-5725MHz, 5725-5850MHz
Center Frequency Range	BT / BLE: 2402MHz-2480MHz 802.11b/g/n: 2412MHz-2462MHz 802.11a/n/ac: 5180-5240MHz, 5260-5320MHz, 5500-5700MHz, 5745-5825MHz
Modulation Type	BT: GFSK, $\pi/4$ -DQPSK, 8DPSK BLE: GFSK WLAN: 2.4GHz: 802.11b: CCK, DQPSK, DBPSK 802.11g/n: BPSK, QPSK, 16QAM, 64QAM 5GHz: 802.11n/a: BPSK, QPSK, 16QAM, 64QAM 802.11ac: BPSK, QPSK, 16QAM, 64QAM, 256QAM
Modulation Technology	DSSS, OFDM, FHSS, DTS
Data Rate	BT: GFSK: 1Mbps, $\pi/4$ -DQPSK: 2Mbps, 8DPSK: 3Mbps BLE: GFSK: 1Mbps GFSK: 2 Mbps WLAN: 2.4GHz: 802.11b: 1, 2, 5.5, 11Mbps 802.11g: 6, 9, 12, 18, 24, 36, 48, 54Mbps 802.11n: MCS0 – MCS7, HT20 5GHz: 802.11a: 6, 9, 12, 18, 24, 36, 48, 54Mbps 802.11n: MCS0 – MCS7, HT20/40 802.11ac: MCS0 – MCS9, VHT20/40/80
Antenna Type	PIFA Antenna
Antenna Gain	For BT: 2400-2500MHz: 1.11dBi For WLAN: 2400-2500MHz: 1.11dBi 5150-5250MHz: 3.20dBi 5250-5350MHz: 3.20dBi 5470-5725MHz: 2.47dBi 5725-5850MHz: 2.69dBi
Adapter	Brand: APD Model: WA-36N12R
Battery	Brand: VIC-DAWN ENTERPRISE CO LTD Model: CR2032
Firmware Number	NS03_Series_STD_1.0.7_20220503
Serial Number	NS03000201M14F00008

Note:

1. EUT support TPC Function.
2. EUT support Client Mode without radar detection.
3. For more details, please refer to the User's manual of the EUT.



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	---	---

Note: Channels remarked * are selected to perform test.



2.3 Test Mode and Test Software

- During testing, the interface cables and equipment positions were varied according to ANSI C63.10.
- The complete test system included Remote workstation and EUT for RF test. The Remote workstation included Notebook.
- An executive program, " Ampak RFTTestTool ver.7.0" under Android system was executed to transmit and receive data via WLAN.
- 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) , From Adapter (AC 120V/60Hz)
2	802.11g (6Mbps) , From Adapter (AC 120V/60Hz)
3	802.11n HT20 (6.5Mbps) , From Adapter (AC 120V/60Hz)
4	802.11b (1Mbps) , From Adapter (AC 240V/60Hz)
5	802.11g (6Mbps) , From Adapter (AC 240V/60Hz)
6	802.11n HT20 (6.5Mbps) , From Adapter (AC 240V/60Hz)
7	Normal Mode ,From Adapter(AC 120V / 60Hz)
8	Normal Mode ,From Adapter (AC 240V / 60Hz)
9	Normal Mode ,From PoE (AC 120V / 60Hz)
10	Normal Mode ,From PoE(AC 240V / 60Hz)
caused "Test Mode 3,8" generated the worst case, it was reported as the final data.	
Radiation Emissions (BELOW1G)	
Test Mode	Operating Description
1	802.11b (1Mbps) , From Adapter (AC 120V/60Hz)
2	802.11g (6Mbps) , From Adapter (AC 120V/60Hz)
3	802.11n HT20 (6.5Mbps) , From Adapter (AC 120V/60Hz)
4	802.11b (1Mbps) , From Adapter (AC 240V/60Hz)
5	802.11g (6Mbps) , From Adapter (AC 240V/60Hz)
6	802.11n HT20 (6.5Mbps) , From Adapter (AC 240V/60Hz)
7	Normal Mode ,From Adapter(AC 120V / 60Hz)
8	Normal Mode ,From Adapter (AC 240V / 60Hz)
9	Normal Mode ,From PoE (AC 120V / 60Hz)
10	Normal Mode ,From PoE(AC 240V / 60Hz)
caused "Test Mode 3,7" generated the worst case, it was reported as the final data.	
Radiation Emissions (ABOVE1G)	
Test Mode	Operating Description
1	802.11b (1Mbps) , From Adapter (AC 120V/60Hz)
2	802.11g (6Mbps) , From Adapter (AC 120V/60Hz)
3	802.11n HT20 (6.5Mbps) , From Adapter (AC 120V/60Hz)
4	802.11b (1Mbps) , From Adapter (AC 240V/60Hz)
5	802.11g (6Mbps) , From Adapter (AC 240V/60Hz)
6	802.11n HT20 (6.5Mbps) , From Adapter (AC 240V/60Hz)
caused "Test Mode 1~3" generated the worst case, they were reported as the final data.	



Modulation Type	TX CONFIGURATION
802.11b	1TX
802.11g	1TX
802.11n HT20	1TX



2.4 Description of Test System

RF Conducted				
Equipment	Brand	Model	Length/Type	Power cord/Length/Type
Notebook	lenovo	S1GL2W	N/A	N/A
USB Cable (A to A)	BENEVO	E210567AWM	1m / NS	N/A
HDMI Cable	YD-TECH	H1	1.8m / S	N/A
Monitor	ViewSonic	VS16024	NA	N/A
Radiated Emissions(ABOVE1G)				
Equipment	Brand	Model	Length/Type	Power cord/Length/Type
Notebook	ASUS	P2430U	N/A	Adapter / 1.8m / NS
USB Cable (A to A)	BENEVO	E210567AWM	1m / NS	N/A
HDMI Cable*2	YD-TECH	H2	1.8m / S	N/A
Monitor	ViewSonic	VS16024	NA	N/A
Transcend Dongle*2	TranScend	USB3.0 16GB	N/A	N/A
RJ45 Cable	TE CONNECTIVITY	CAT5E	1.2m / NS	N/A
Mouse	DELL	MS116t1	2m / NS	N/A
SD Card	TranScend	16GB	N/A	N/A
Earphone	Apple	Earpods	1.2m / NS	N/A
Radiated Emissions(BELOW1G)				
Equipment	Brand	Model	Length/Type	Power cord/Length/Type
Notebook	ASUS	P2430U	N/A	Adapter / 1.8m / NS
USB Cable (A to A)	BENEVO	E210567AWM	1m / NS	N/A
HDMI Cable*2	YD-TECH	H2	1.8m / S	N/A
Monitor	ViewSonic	VS16024	NA	N/A
RJ45 Cable	TE CONNECTIVITY	CAT5E	1.2m / NS	N/A
Transcend Dongle*2	TranScend	USB3.0 16GB	N/A	N/A
Mouse	DELL	MS116t	1.8m / NS	N/A
Mobile Phone	MI	M1906G7G	N/A	N/A
Earphone	Apple	Earpods	1.2m / NS	N/A
POE converter	Silvertel	PSR-1922503	N/A	N/A
Adapter	APD	PA-1650-65	1.8m/NS	N/A
Power cord	I-SHENG	spt-2	1.8m/NS	N/A
Power cord(2)	FlyingWay	FWAT-001	0.3m/NS	N/A
SD Card	TranScend	16GB	N/A	N/A



AC Power Line Conducted Emission				
Equipment	Brand	Model	Length/Type	Power cord/Length/Type
Notebook	ASUS	P2430U	N/A	Adapter / 1.8m / NS
USB Cable (A to A)	BENEVO	E210567AWM	1m / NS	N/A
HDMI Cable*2	YD-TECH	H2	1.8m / S	N/A
Monitor	DELL	U2410f	NA	N/A
Transcend Dongle*2	TranScend	USB3.0 16GB	N/A	N/A
RJ45 Cable	TE CONNECTIVITY	CAT5E	1.2m / NS	N/A
Mouse	DELL	MS116t1	2m / NS	N/A
Earphone	Apple	Earpods	1.2m / NS	N/A
Mobile Phone	MI	M1906G7G	N/A	N/A
SD Card	TranScend	16GB	N/A	N/A
POE converter	Silvertel	PSR-1922503	N/A	N/A
Adapter	APD	PA-1650-65	1.8m/NS	N/A
Power cord	I-SHENG	spt-2	1.8m/NS	N/A
Power cord(2)	FlyingWay	FWAT-001	0.3m/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	
	FCC	TW1079, TW1439
	IC	4934E-1, 4934E-2
	VCCI	T-2205 for Telecommunication test C-4663 for Conducted emission test 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	Test period	Environmental Conditions	Tested By
RF Conducted	RFCON01-NK	2022/6/6~2022/6/10	26~28℃ / 40~45%	Dian Chen
Radiated Emissions	3M02-NK	2022/06/05~2022/06/19	20~25℃ / 42~55%	Dian Chen
AC Power Line Conducted Emission	CON01-NK	2022/06/10~2022/06/21	24~27℃ / 47~60%	Dian Chen



2.6 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2))

Measurement Item	Uncertainty
AC Power Line Conduction(150K~30MHz)	±3.12dB
Radiated Spurious Emission(9KHz~30MHz)	±3.4dB
Radiated Spurious Emission(30MHz~1GHz)	±5.7dB
Radiated Spurious Emission(1GHz~25GHz)	±6.8dB
Conducted Spurious Emission	±1.8dB
6dB Bandwidth	±4.4%
20dB Bandwidth	±4.4%
Occupied Bandwidth	±4.4%
Peak Output Power(Conducted Power Meter)	±1.1dB
Dwell Time / Deactivation Time	±1.2%
Power Spectral Density	±1.8dB
Duty Cycle	±1.2%



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	2021/11/05	2022/11/04
Horn Antenna	EMCO	3115	31601	2021/10/14	2022/10/13
Horn Antenna	EMCO	3116	31974	2021/10/04	2022/10/03
Active Loop Antenna	Schwarzbeck	FMZB 1513	414	2022/01/07	2023/01/06
EMI Receiver	ROHDE & SCHWARZ	ESCI	100821	2021/11/16	2022/11/15
Spectrum Analyzer	ROHDE & SCHWARZ	FSV 40-N	102151	2021/08/06	2022/08/05
Preamplifier	Agilent	8449B	3008A01954	2022/03/17	2023/03/16
Preamplifier	EMC INSTRUMENTS	EMC184045	980065	2021/11/16	2022/11/15
Preamplifier	EM Electronics corp.	EM330	60658	2021/10/13	2022/10/12
Cable-6m(9k~300M)	NA	EMC5D-BM-BM-6	130605	2021/09/22	2022/09/21
Cable-3in1(30M-1G)	HARBOUR INDUSTRIES	LL142	CCE1315	2022/03/21	2023/03/20
Cable-0.5m(1G-40G)	HUBER SUHNER	SUCOFLEX 102	MY4569/2	2021/09/03	2022/09/02
Cable-1m(1G-40G)	HUBER SUHNER	SUCOFLEX 102	MY5739/2	2021/09/03	2022/09/02
Cable-6m(1G-40G)	HUBER SUHNER	SUCOFLEX 102	MY5740/2	2021/09/03	2022/09/02
Cable-0.5m(1G-40G)	HUBER SUHNER	SUCOFLEX 104	805443/4	2022/01/11	2023/01/10
Cable-3m(1G-40G)	HUBER SUHNER	SUCOFLEX 104	805796/4	2022/01/11	2023/01/10
Cable-8m(1G-26.5G)	WOKEN	WCBA-WCA203SM	CCE1374	2022/04/25	2023/04/24
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	100047	2022/03/04	2023/03/03
Attenuator	KEYSIGHT	8491B	MY39250703	2022/04/12	2023/04/11
Cable-0.5m(1G-26.5G)	HUBER SUHNER	SUCOFLEX 102	28422/2	2022/04/09	2023/04/08
Power Meter	Anritsu	ML2495A	1224005	2022/04/12	2023/04/11
Power Sensor	Anritsu	MA2411B	1207295	2022/04/12	2023/04/11
Switch Box	Theda	1-4	TW5451159	NA	NA
MXG-B RF Vector Signal Generator	KEYSIGHT	N5182B	MY53051383	2021/06/30	2022/06/29



Test Item	AC Power Line Conducted Emission				
Test Site	CON01-NK				
Instrument	Manufacturer	Model No	Serial No	Calibration Date	Valid Date
EMI Receiver	ROHDE & SCHWARZ	ESCI	101200	2021/08/30	2022/08/29
Line Impedance Stabilization Network	Schwarzbeck	NSLK 8127	8127-516	2021/10/05	2022/10/04
Pulse Limiter	ROHDE & SCHWARZ	ESH3-Z2	101933	2021/09/15	2022/09/14
Cable-6m(9k~300M)	NA	EMC5D-BM-BM-6	130605	2021/09/22	2022/09/21
E3	AUDIX	v8.2014-8-6	RK-000531	NA	NA



4. Antenna Requirements

4.1 Antenna Construction and Directional Gain

Antenna Type	PIFA Antenna
Antenna Gain	2400-2500MHz: 1.11dBi



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 C63.10-2013. 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

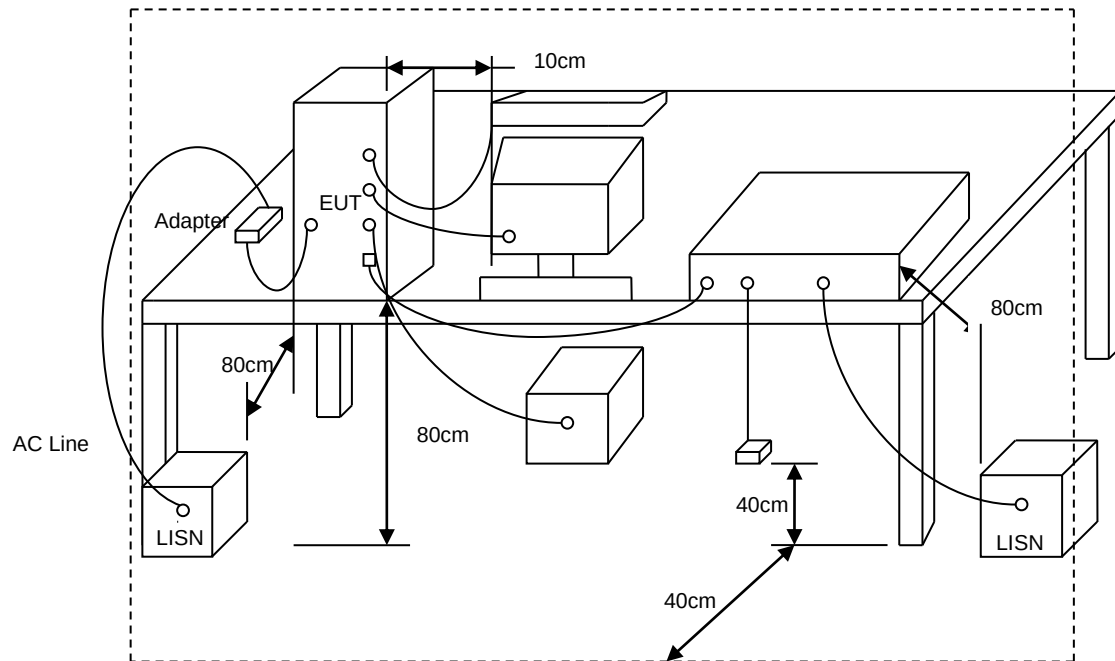
*Decreases with the logarithm of the frequency.

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.



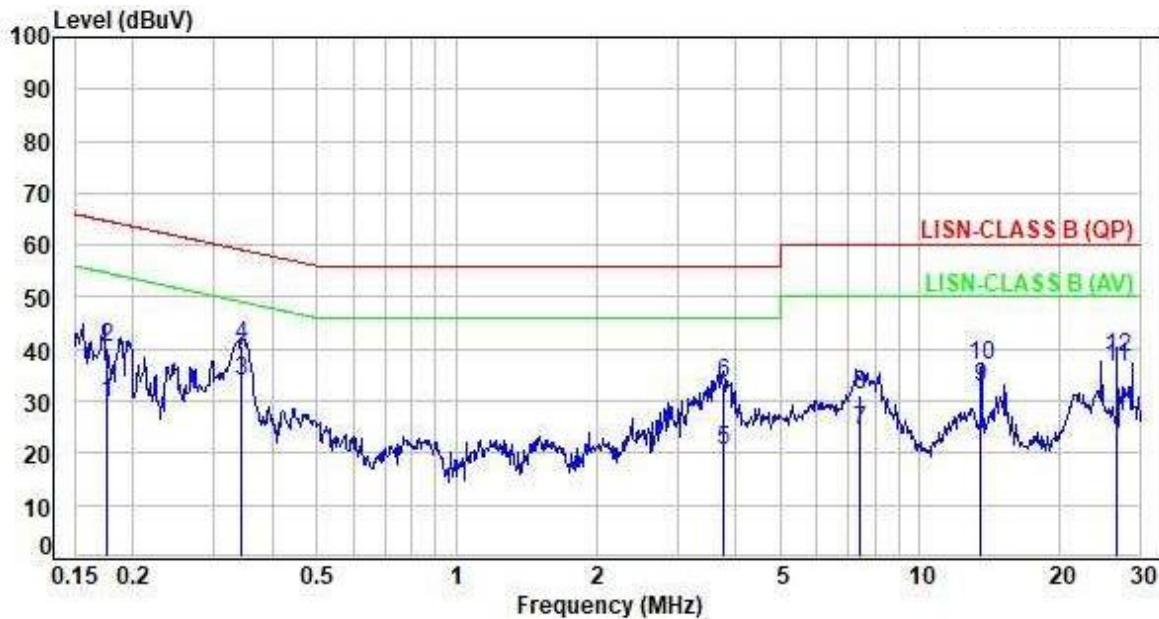
5.3 Typical Test Setup





5.4 Test Result and Data

Power	:	DC 12V From Adapter (AC 120V / 60Hz)	Pol/Phase	:	LINE
Test Mode	:	Mode 3		:	



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.18	9.95	19.89	29.84	54.71	-24.87	Average	P
2	0.18	9.95	30.33	40.28	64.71	-24.43	QP	P
3	0.34	9.95	23.83	33.78	49.10	-15.32	Average	P
4	0.34	9.95	30.73	40.68	59.10	-18.42	QP	P
5	3.76	10.20	10.16	20.36	46.00	-25.64	Average	P
6	3.76	10.20	23.42	33.62	56.00	-22.38	QP	P
7	7.40	10.37	13.83	24.20	50.00	-25.80	Average	P
8	7.40	10.37	20.99	31.36	60.00	-28.64	QP	P
9	13.56	10.57	22.07	32.64	50.00	-17.36	Average	P
10	13.56	10.57	26.16	36.73	60.00	-23.27	QP	P
11	26.62	10.90	25.75	36.65	50.00	-13.35	Average	P
12	26.62	10.90	27.47	38.37	60.00	-21.63	QP	P

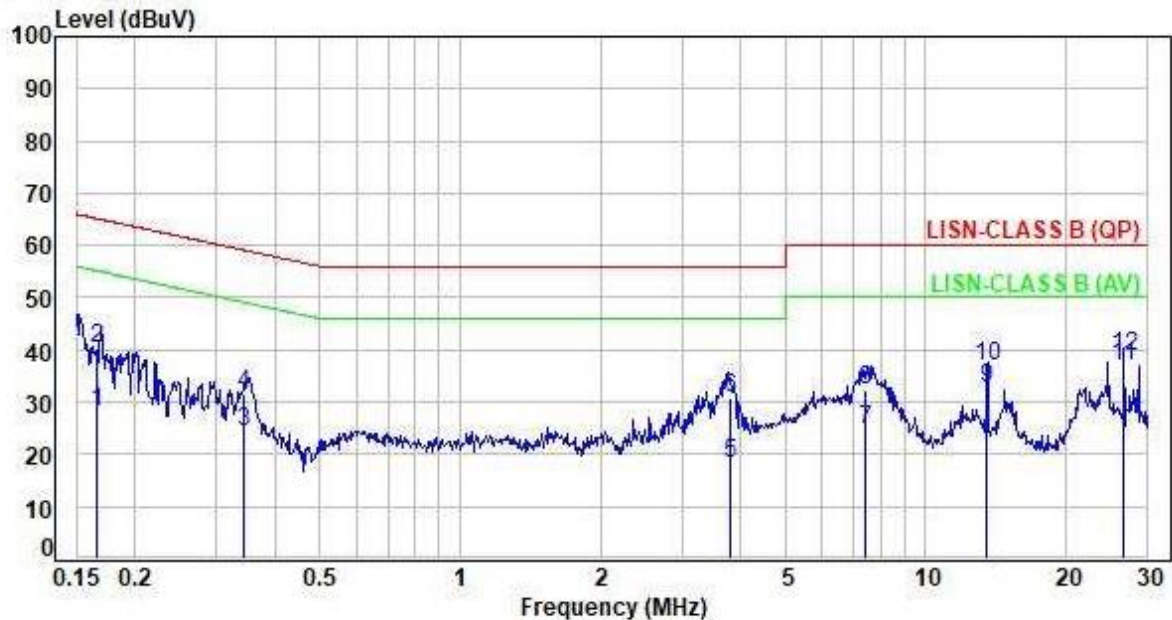
Note: Level=Reading+Factor

Margin=Level-Limit

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



Power	: DC 12V From Adapter (AC 120V / 60Hz)	Pol/Phase	: NEUTRAL
Test Mode	: Mode 3		:



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.17	9.94	18.04	27.98	55.20	-27.22	Average	P
2	0.17	9.94	30.30	40.24	65.20	-24.96	QP	P
3	0.34	9.93	14.58	24.51	49.11	-24.60	Average	P
4	0.34	9.93	21.46	31.39	59.11	-27.72	QP	P
5	3.80	10.12	8.01	18.13	46.00	-27.87	Average	P
6	3.80	10.12	20.72	30.84	56.00	-25.16	QP	P
7	7.40	10.26	14.53	24.79	50.00	-25.21	Average	P
8	7.40	10.26	22.02	32.28	60.00	-27.72	QP	P
9	13.56	10.46	22.21	32.67	50.00	-17.33	Average	P
10	13.56	10.46	26.25	36.71	60.00	-23.29	QP	P
11	26.62	10.81	26.23	37.04	50.00	-12.96	Average	P
12	26.62	10.81	27.88	38.69	60.00	-21.31	QP	P

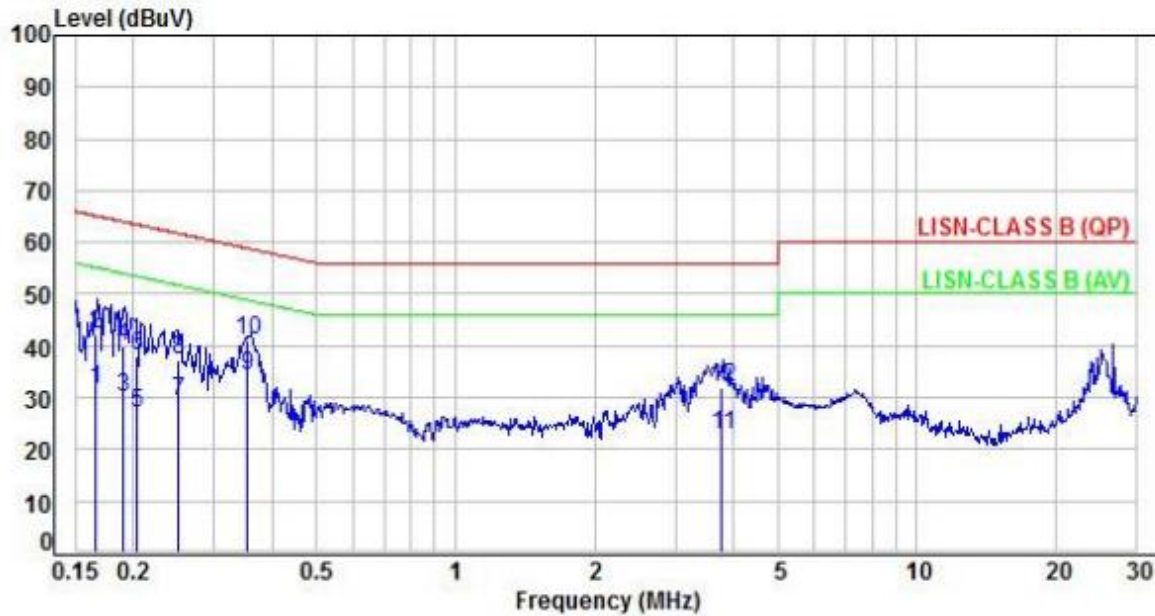
Note: Level=Reading+Factor

Margin=Level-Limit

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



Power	:	DC 12V From Adapter (AC 240V / 60Hz)	Pol/Phase	:	LINE
Test Mode	:	Mode 8		:	



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.17	9.96	21.79	31.75	55.15	-23.40	Average	P
2	0.17	9.96	32.18	42.14	65.15	-23.01	QP	P
3	0.19	9.95	20.26	30.21	54.03	-23.82	Average	P
4	0.19	9.95	29.85	39.80	64.03	-24.23	QP	P
5	0.20	9.95	17.17	27.12	53.49	-26.37	Average	P
6	0.20	9.95	28.26	38.21	63.49	-25.28	QP	P
7	0.25	9.95	19.33	29.28	51.78	-22.50	Average	P
8	0.25	9.95	27.30	37.25	61.78	-24.53	QP	P
9	0.35	9.96	24.33	34.29	48.87	-14.58	Average	P
10	0.35	9.96	31.01	40.97	58.87	-17.90	QP	P
11	3.77	10.20	12.63	22.83	46.00	-23.17	Average	P
12	3.77	10.20	21.57	31.77	56.00	-24.23	QP	P

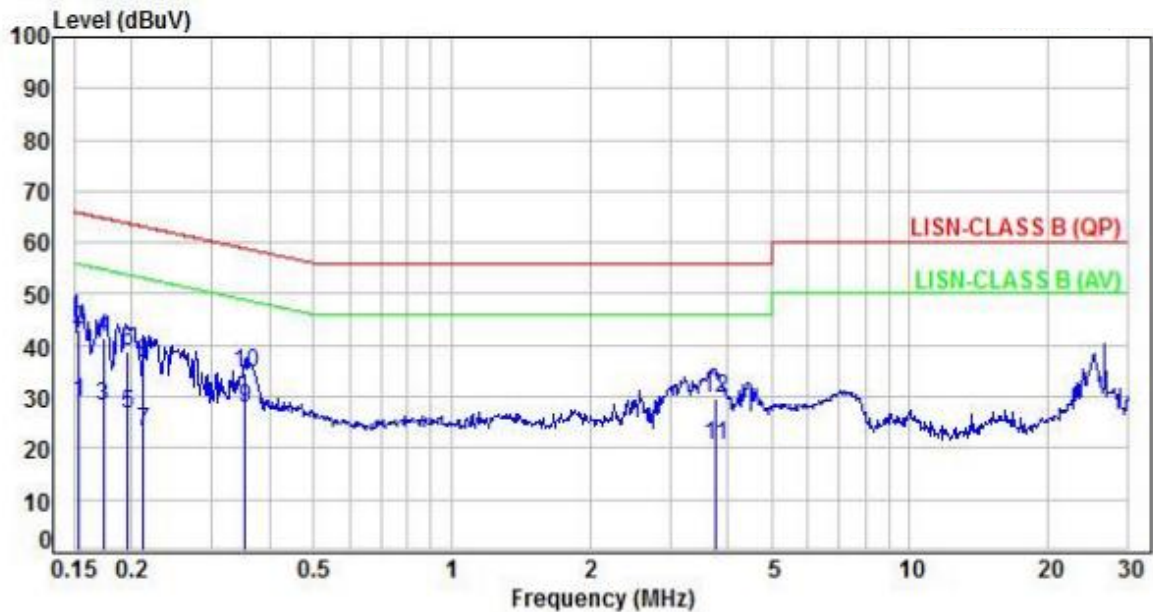
Note: Level=Reading+Factor

Margin=Level-Limit

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



Power	: DC 12V From Adapter (AC 240V / 60Hz)	Pol/Phase	: NEUTRAL
Test Mode	: Mode 8		:



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.15	9.94	19.03	28.97	55.85	-26.88	Average	P
2	0.15	9.94	33.10	43.04	65.85	-22.81	QP	P
3	0.17	9.93	18.02	27.95	54.80	-26.85	Average	P
4	0.17	9.93	31.37	41.30	64.80	-23.50	QP	P
5	0.20	9.93	16.74	26.67	53.78	-27.11	Average	P
6	0.20	9.93	28.86	38.79	63.78	-24.99	QP	P
7	0.21	9.93	13.19	23.12	53.14	-30.02	Average	P
8	0.21	9.93	26.51	36.44	63.14	-26.70	QP	P
9	0.35	9.94	17.67	27.61	48.85	-21.24	Average	P
10	0.35	9.94	24.76	34.70	58.85	-24.15	QP	P
11	3.75	10.12	10.35	20.47	46.00	-25.53	Average	P
12	3.75	10.12	19.36	29.48	56.00	-26.52	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

- a. The EUT was placed on a rotatable table top 0.8 meter above ground.
- b. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
- c. The table was rotated 360 degrees to determine the position of the highest radiation.
- d. 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.
- e. 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.
- f. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function and specified bandwidth with Maximum Hold Mode.
- g. 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.
- h. 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.
- i. "Cone of radiation" has been considered to be 3dB bandwidth of the measurement antenna.

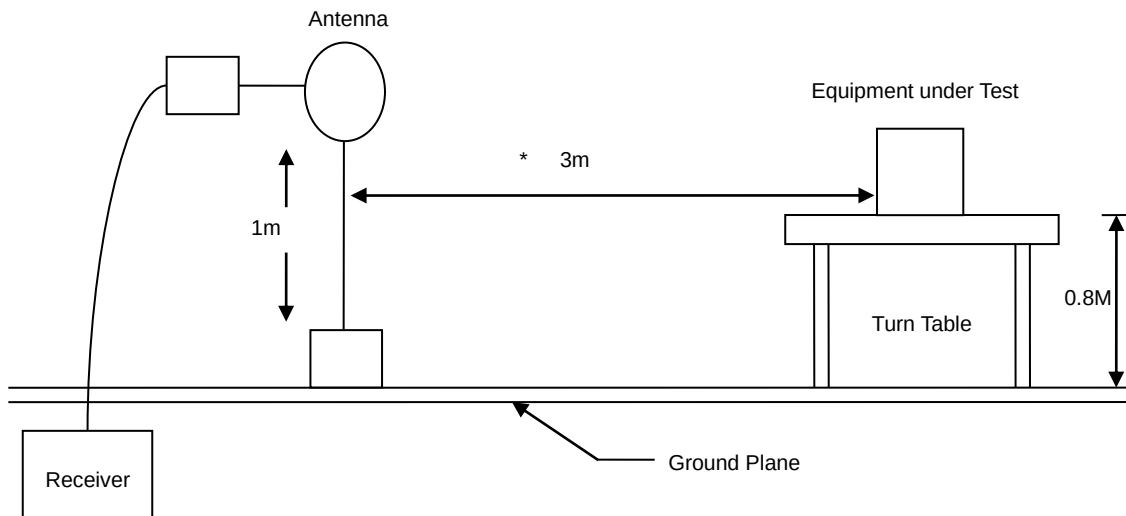
Note:

- 1.The supporting fixture shall permit orientation of the EUT in each of three orthogonal axis positions such that emissions from the EUT are maximized.
- 2.Due to the test software function limit the operation band setting(200dBuV/m).
There's no corresponding limitation in the actual test item.

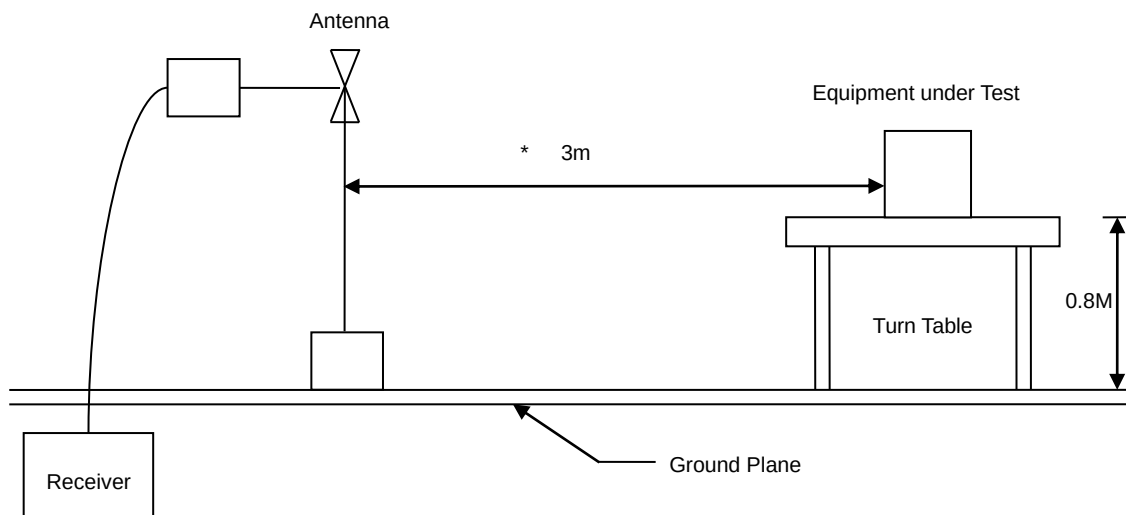


6.3 Typical Test Setup

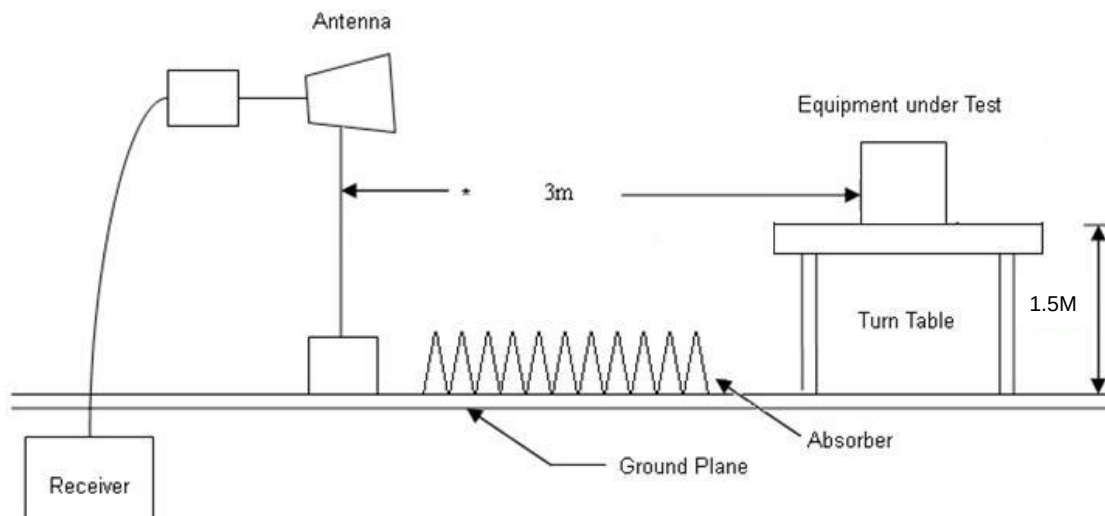
Below 30MHz test setup



30MHz- 1GHz Test Setup



Above 1GHz Test Setup



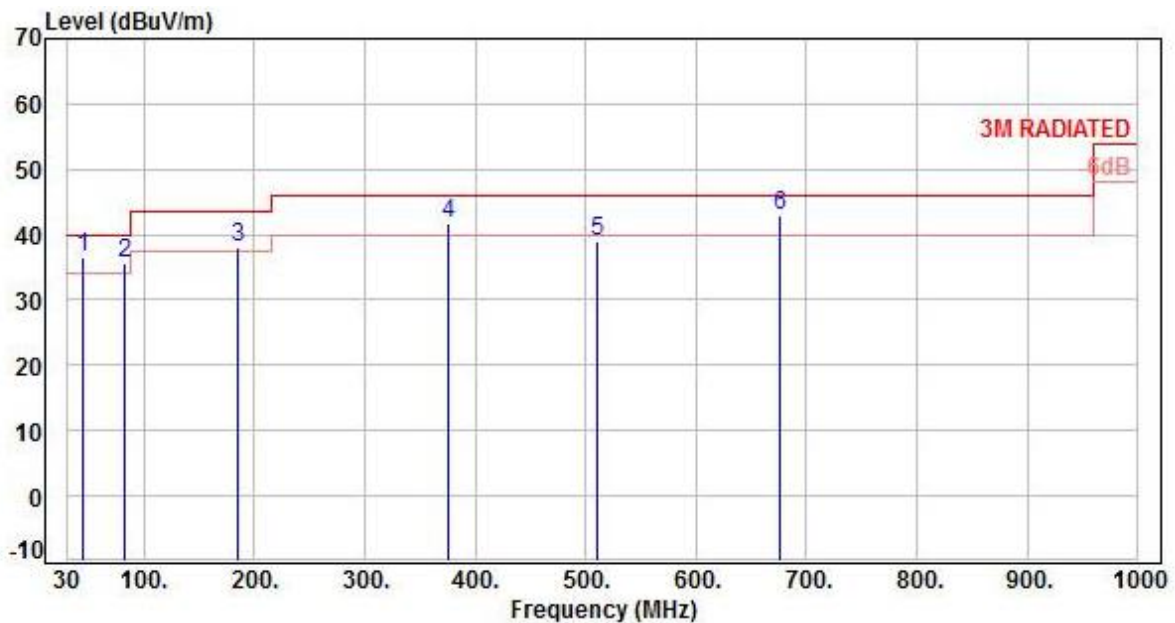


6.4 Test Result and Data (9KHz ~ 30MHz)

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

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

Power	:	DC 12V From Adapter (AC 120V / 60Hz)	Pol/Phase	:	VERTICAL
Test Mode	:	Mode 3		:	



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	45.52	-11.14	47.61	36.47	40.00	-3.53	Peak	400	360	P
2	82.38	-16.32	51.83	35.51	40.00	-4.49	Peak	400	360	P
3	185.20	-13.22	51.35	38.13	43.50	-5.37	Peak	400	360	P
4	375.32	-8.25	49.89	41.64	46.00	-4.36	Peak	400	360	P
5	511.12	-4.91	43.85	38.94	46.00	-7.06	Peak	400	360	P
6	676.02	-1.63	44.56	42.93	46.00	-3.07	Peak	400	360	P

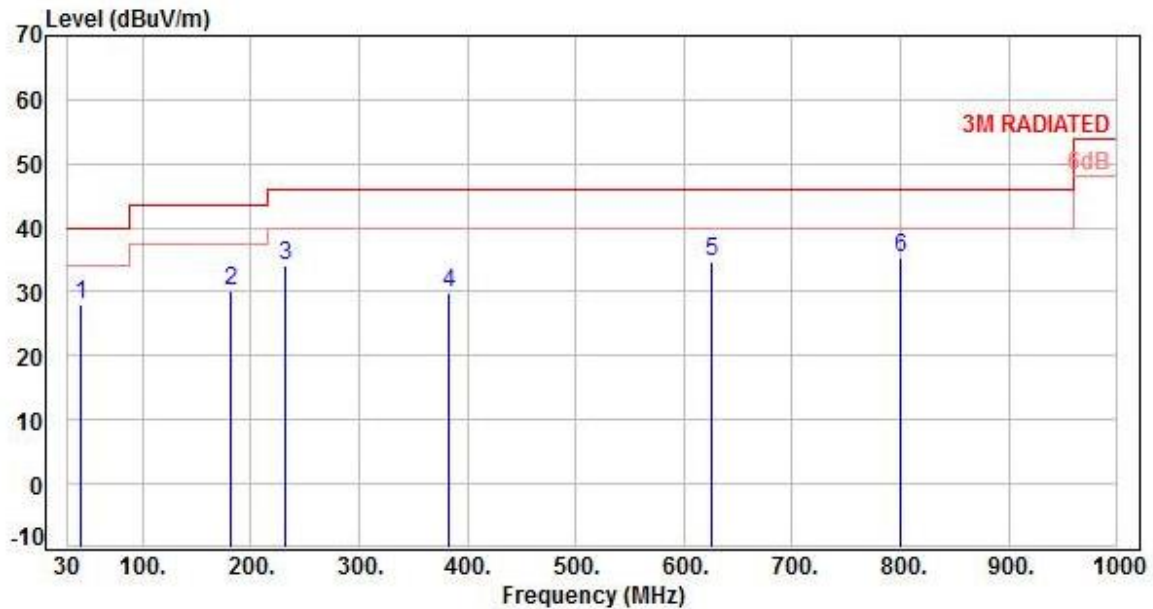
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: DC 12V From Adapter (AC 120V / 60Hz)	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 3		:



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	43.58	-11.48	39.42	27.94	40.00	-12.06	Peak	400	360	P
2	181.32	-13.00	43.28	30.28	43.50	-13.22	Peak	400	360	P
3	231.76	-13.68	47.69	34.01	46.00	-11.99	Peak	400	360	P
4	383.08	-8.06	37.77	29.71	46.00	-16.29	Peak	400	360	P
5	625.58	-2.29	36.86	34.57	46.00	-11.43	Peak	400	360	P
6	800.18	0.47	34.73	35.20	46.00	-10.80	Peak	400	360	P

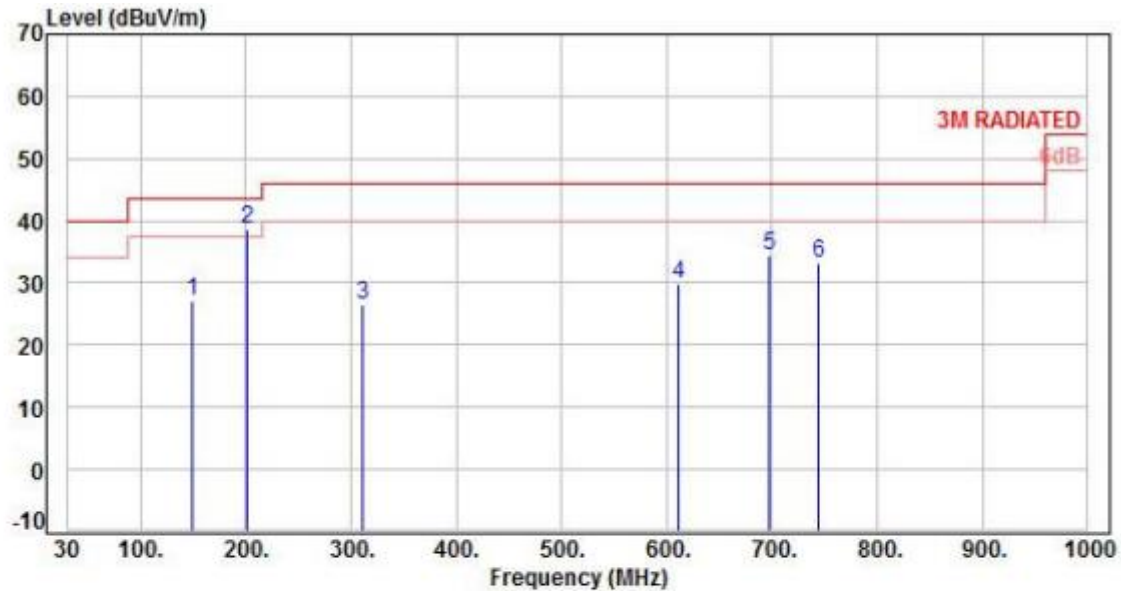
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	:	DC 12V From Adapter (AC 120V / 60Hz)	Pol/Phase	:	VERTICAL
Test Mode	:	Mode 7		:	



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	148.34	-11.51	38.60	27.09	43.50	-16.41	Peak	100	0	P
2	200.72	-13.27	52.07	38.80	43.50	-4.70	Peak	100	0	P
3	311.30	-9.77	36.19	26.42	46.00	-19.58	Peak	100	0	P
4	612.00	-2.63	32.57	29.94	46.00	-16.06	Peak	100	0	P
5	697.36	-1.31	35.66	34.35	46.00	-11.65	Peak	100	0	P
6	743.92	-0.41	33.52	33.11	46.00	-12.89	Peak	100	0	P

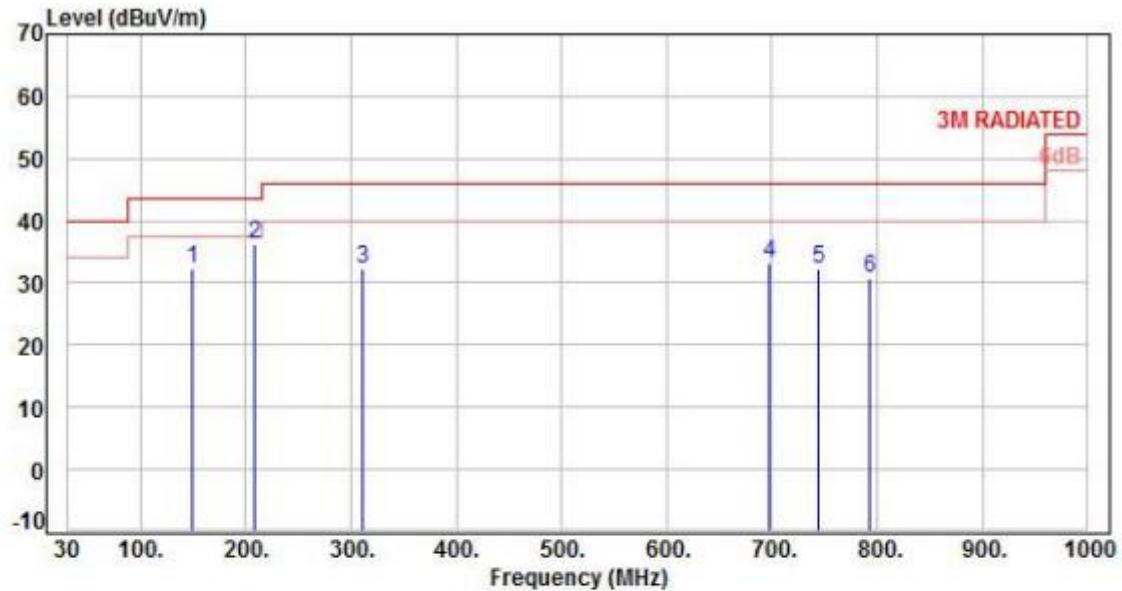
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: DC 12V From Adapter (AC 120V / 60Hz)	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 7		:



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	148.34	-11.51	43.71	32.20	43.50	-11.30	Peak	100	0	P
2	208.48	-13.52	49.74	36.22	43.50	-7.28	Peak	100	0	P
3	311.30	-9.77	41.95	32.18	46.00	-13.82	Peak	100	0	P
4	697.36	-1.31	34.61	33.30	46.00	-12.70	Peak	100	0	P
5	743.92	-0.41	32.81	32.40	46.00	-13.60	Peak	100	0	P
6	792.42	0.44	30.33	30.77	46.00	-15.23	Peak	100	0	P

Note: Level=Reading+Factor

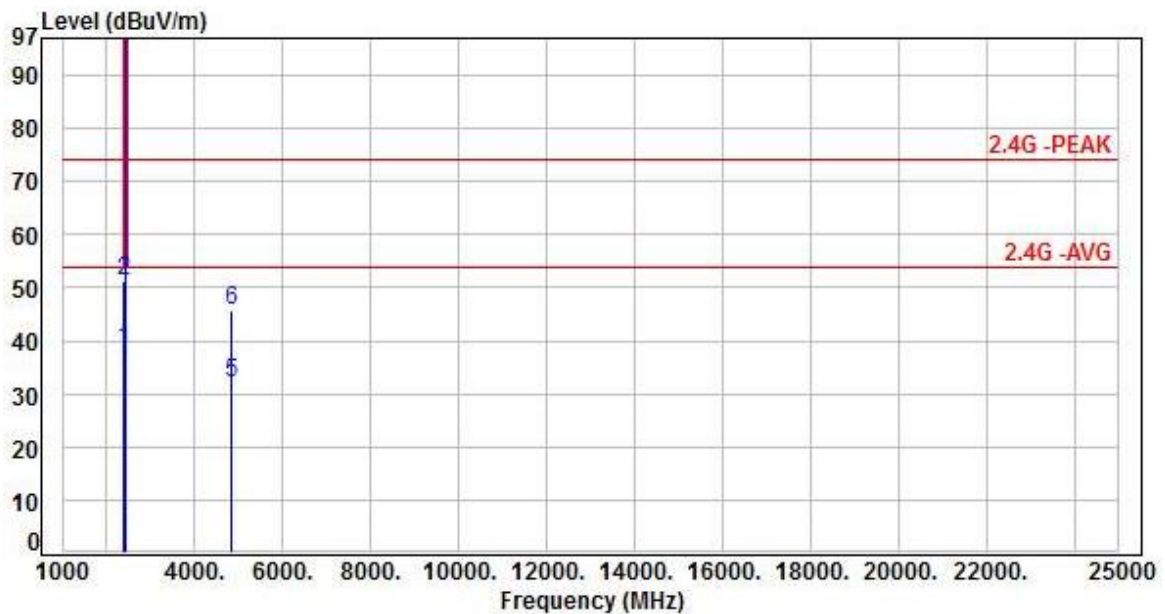
Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



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

Power	:	DC 12V From Adapter (AC 120V / 60Hz)	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	-2.64	41.06	38.42	54.00	-15.58	Average	100	18	P
2	2390.00	-2.64	54.06	51.42	74.00	-22.58	Peak	100	18	P
3	2412.00	-2.60	101.44	98.84	200.00	-101.16	Average	100	18	P
4	2412.00	-2.60	104.22	101.62	200.00	-98.38	Peak	100	18	P
5	4824.00	5.03	27.15	32.18	54.00	-21.82	Average	100	114	P
6	4824.00	5.03	40.57	45.60	74.00	-28.40	Peak	100	114	P

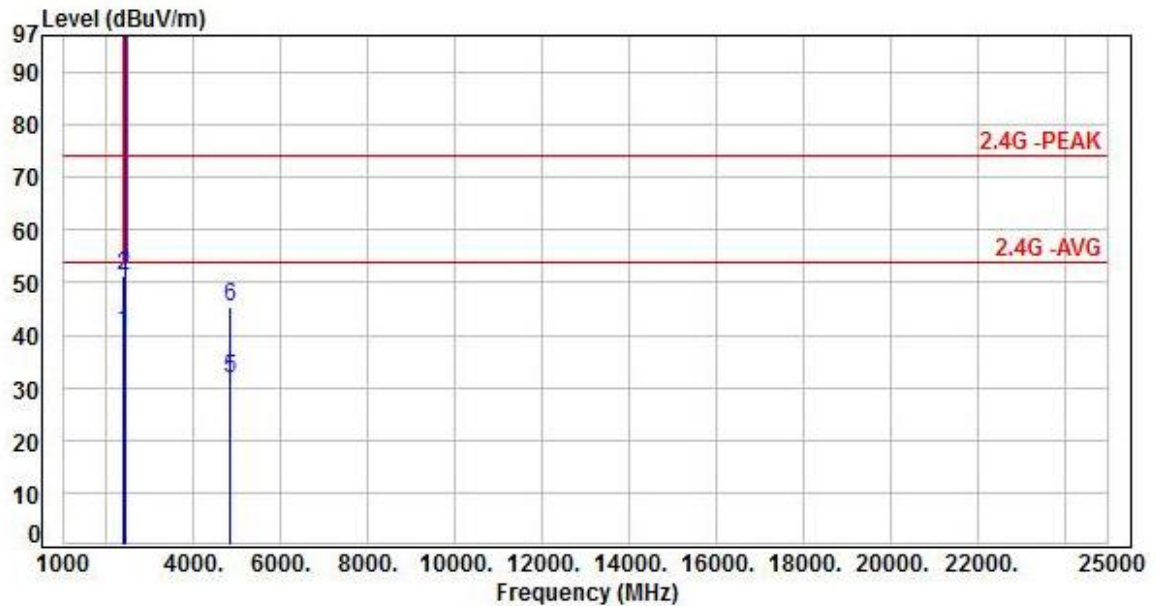
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	:	DC 12V From Adapter (AC 120V / 60Hz)	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	-2.64	43.19	40.55	54.00	-13.45	Average	100	45	P
2	2390.00	-2.64	53.94	51.30	74.00	-22.70	Peak	100	45	P
3	2412.00	-2.60	99.81	97.21	200.00	-102.79	Average	100	45	P
4	2412.00	-2.60	102.59	99.99	200.00	-100.01	Peak	100	45	P
5	4824.00	5.03	26.83	31.86	54.00	-22.14	Average	100	279	P
6	4824.00	5.03	40.34	45.37	74.00	-28.63	Peak	100	279	P

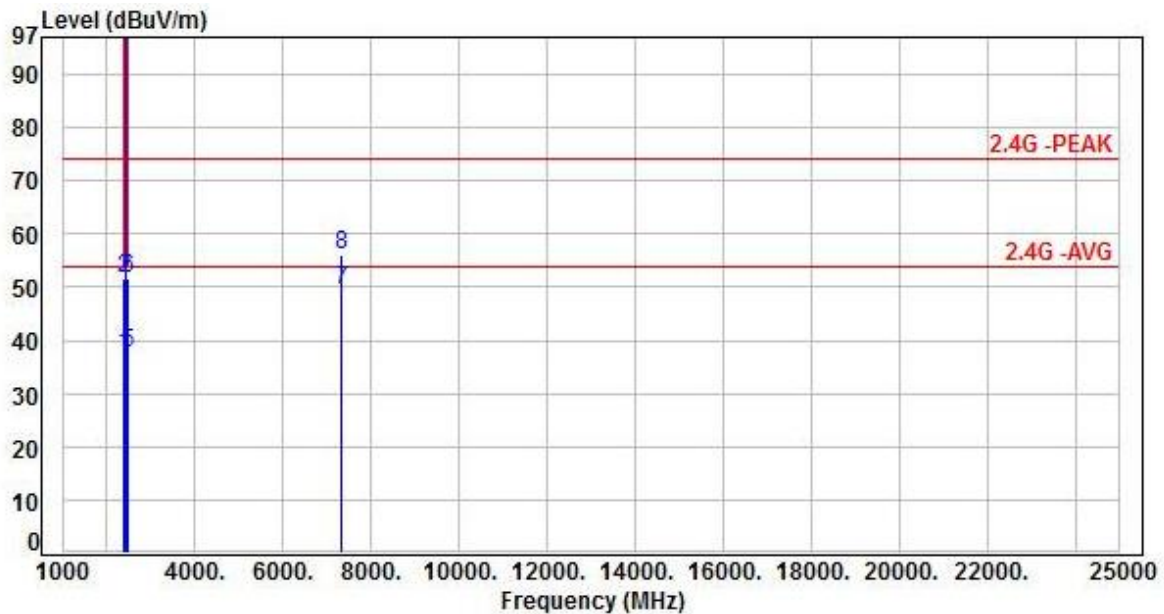
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	:	DC 12V From Adapter (AC 120V / 60Hz)	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	-2.64	39.79	37.15	54.00	-16.85	Average	100	19	P
2	2390.00	-2.64	54.10	51.46	74.00	-22.54	Peak	100	19	P
3	2437.00	-2.57	103.28	100.71	200.00	-99.29	Average	100	19	P
4	2437.00	-2.57	106.01	103.44	200.00	-96.56	Peak	100	19	P
5	2483.50	-2.39	40.05	37.66	54.00	-16.34	Average	100	19	P
6	2483.50	-2.39	53.87	51.48	74.00	-22.52	Peak	100	19	P
7	7311.00	10.16	39.28	49.44	54.00	-4.56	Average	100	112	P
8	7311.00	10.16	45.96	56.12	74.00	-17.88	Peak	100	112	P

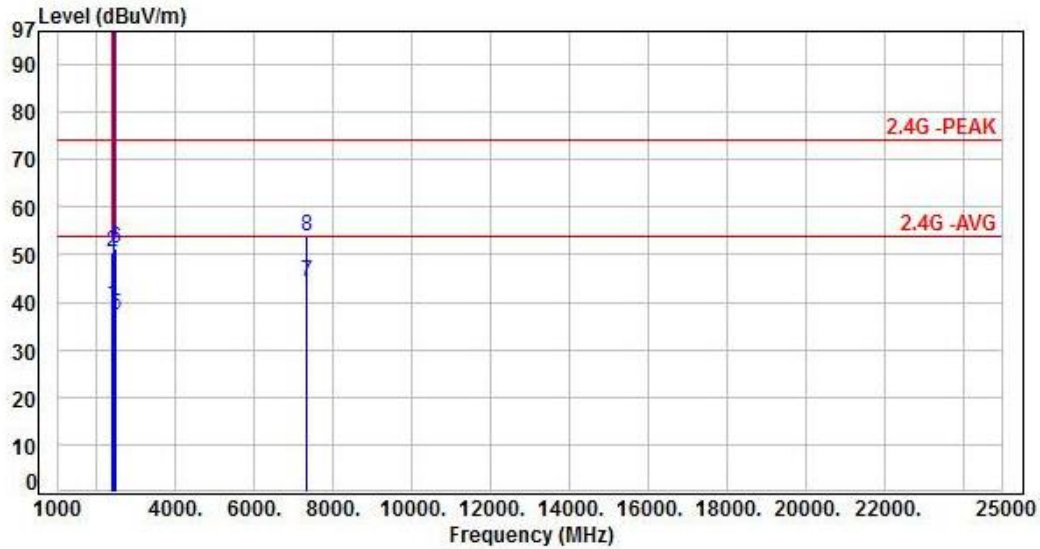
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	:	DC 12V From Adapter (AC 120V / 60Hz)	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	-2.64	41.94	39.30	54.00	-14.70	Average	100	42	P
2	2390.00	-2.64	53.29	50.65	74.00	-23.35	Peak	100	42	P
3	2437.00	-2.57	100.84	98.27	200.00	-101.73	Average	100	42	P
4	2437.00	-2.57	103.61	101.04	200.00	-98.96	Peak	100	42	P
5	2483.50	-2.39	39.79	37.40	54.00	-16.60	Average	100	42	P
6	2483.50	-2.39	53.72	51.33	74.00	-22.67	Peak	100	42	P
7	7311.00	10.16	34.16	44.32	54.00	-9.68	Average	100	85	P
8	7311.00	10.16	43.87	54.03	74.00	-19.97	Peak	100	85	P

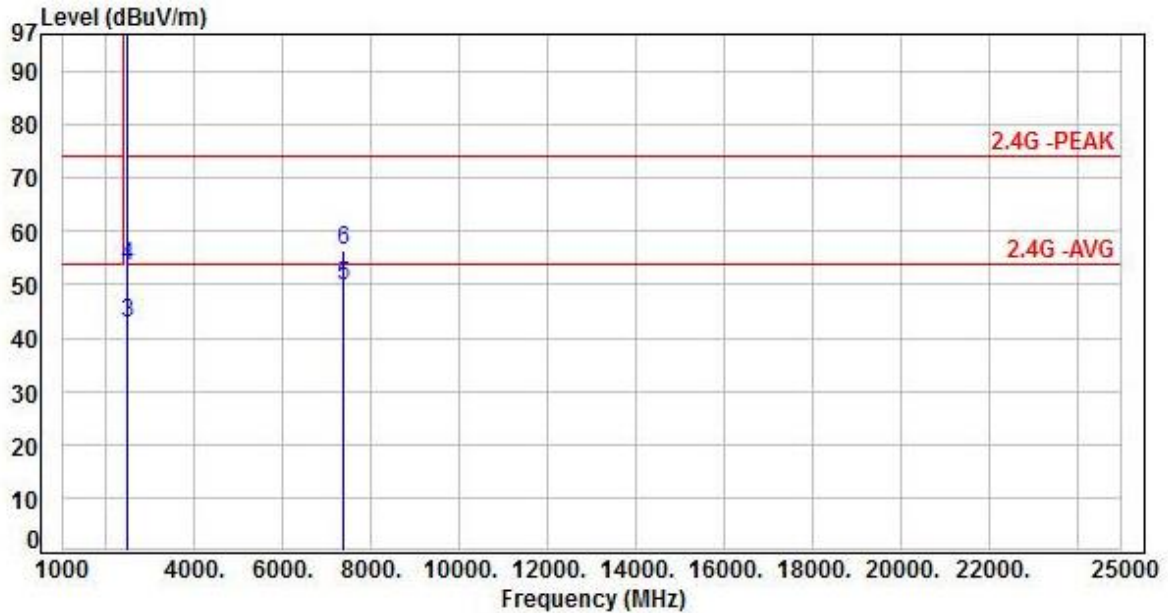
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	:	DC 12V From Adapter (AC 120V / 60Hz)	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	2462.00	-2.49	104.53	102.04	200.00	-97.96	Average	100	22	P
2	2462.00	-2.49	107.32	104.83	200.00	-95.17	Peak	100	22	P
3	2483.50	-2.39	45.00	42.61	54.00	-11.39	Average	100	22	P
4	2483.50	-2.39	55.86	53.47	74.00	-20.53	Peak	100	22	P
5	7386.00	10.18	39.58	49.76	54.00	-4.24	Average	100	118	P
6	7386.00	10.18	46.40	56.58	74.00	-17.42	Peak	100	118	P

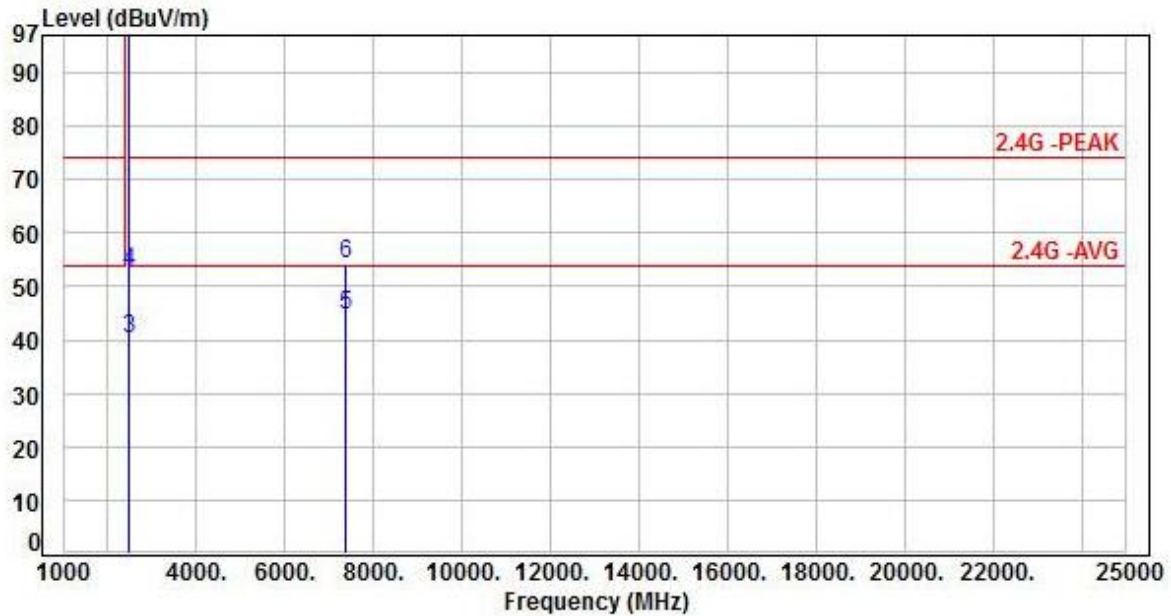
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	:	DC 12V From Adapter (AC 120V / 60Hz)	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	2462.00	-2.49	101.15	98.66	200.00	-101.34	Average	118	48	P
2	2462.00	-2.49	103.91	101.42	200.00	-98.58	Peak	118	48	P
3	2483.50	-2.39	42.57	40.18	54.00	-13.82	Average	118	48	P
4	2483.50	-2.39	55.30	52.91	74.00	-21.09	Peak	118	48	P
5	7386.00	10.18	34.57	44.75	54.00	-9.25	Average	100	83	P
6	7386.00	10.18	44.04	54.22	74.00	-19.78	Peak	100	83	P

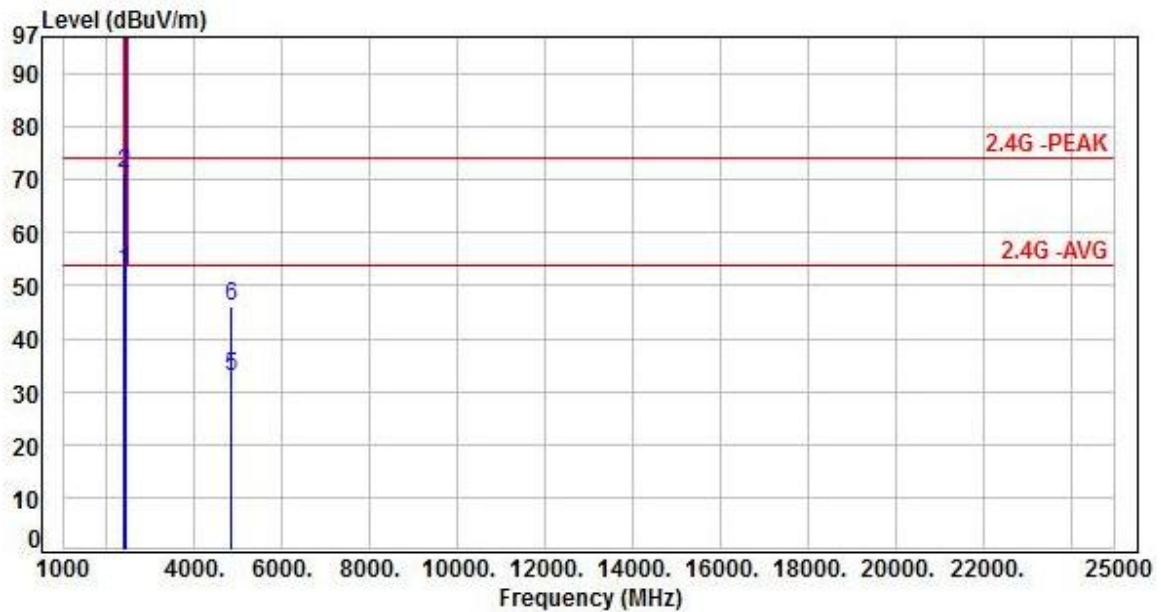
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	:	DC 12V From Adapter (AC 120V / 60Hz)	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	-2.64	55.45	52.81	54.00	-1.19	Average	100	16	P
2	2390.00	-2.64	73.75	71.11	74.00	-2.89	Peak	100	16	P
3	2412.00	-2.60	99.86	97.26	200.00	-102.74	Average	100	16	P
4	2412.00	-2.60	108.98	106.38	200.00	-93.62	Peak	100	16	P
5	4824.00	5.03	27.80	32.83	54.00	-21.17	Average	100	115	P
6	4824.00	5.03	41.16	46.19	74.00	-27.81	Peak	100	115	P

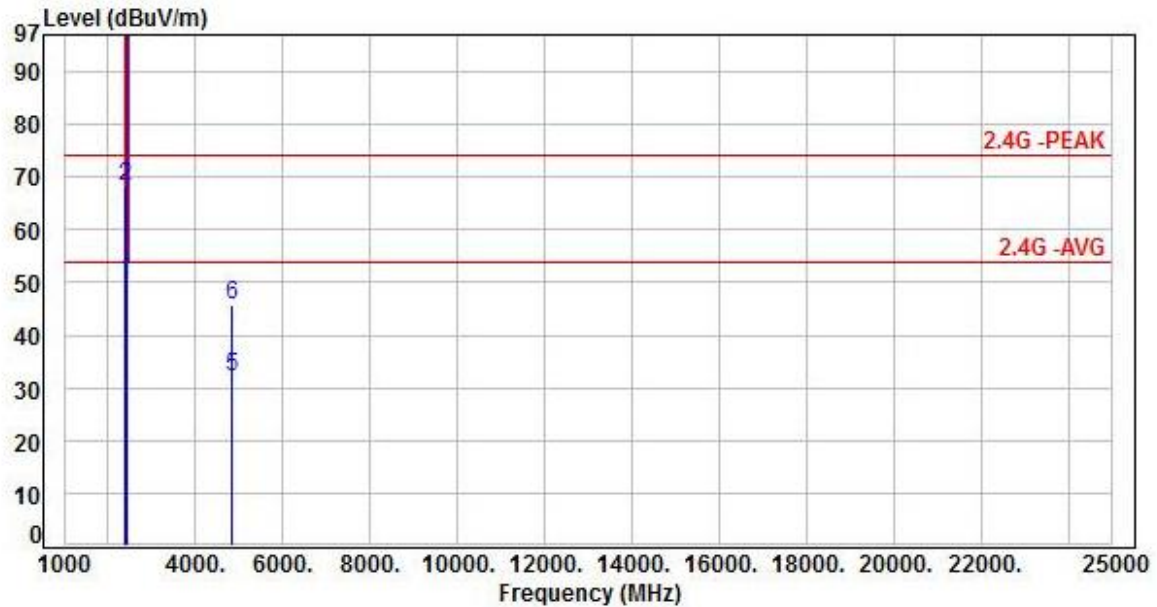
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	:	DC 12V From Adapter (AC 120V / 60Hz)	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	-2.64	52.94	50.30	54.00	-3.70	Average	100	44	P
2	2390.00	-2.64	70.95	68.31	74.00	-5.69	Peak	100	44	P
3	2412.00	-2.60	98.03	95.43	200.00	-104.57	Average	100	44	P
4	2412.00	-2.60	107.45	104.85	200.00	-95.15	Peak	100	44	P
5	4824.00	5.03	27.23	32.26	54.00	-21.74	Average	100	277	P
6	4824.00	5.03	40.71	45.74	74.00	-28.26	Peak	100	277	P

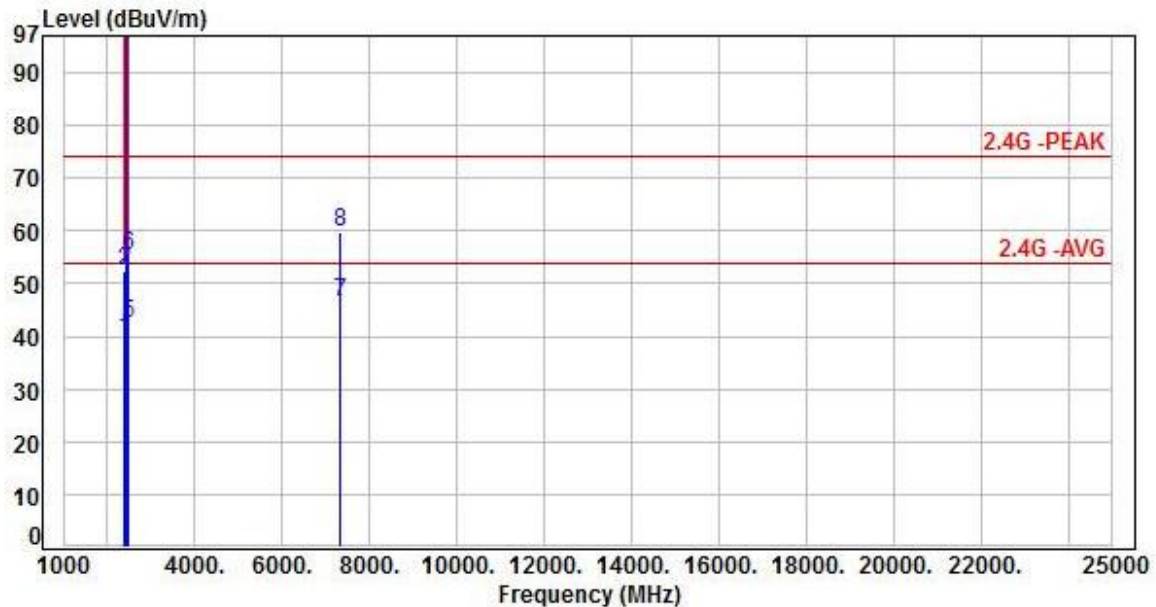
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	:	DC 12V From Adapter (AC 120V / 60Hz)	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	-2.64	42.20	39.56	54.00	-14.44	Average	100	21	P
2	2390.00	-2.64	54.93	52.29	74.00	-21.71	Peak	100	21	P
3	2437.00	-2.57	102.03	99.46	200.00	-100.54	Average	100	21	P
4	2437.00	-2.57	111.17	108.60	200.00	-91.40	Peak	100	21	P
5	2483.50	-2.39	44.87	42.48	54.00	-11.52	Average	100	21	P
6	2483.50	-2.39	57.65	55.26	74.00	-18.74	Peak	100	21	P
7	7311.00	10.16	36.34	46.50	54.00	-7.50	Average	100	100	P
8	7311.00	10.16	49.75	59.91	74.00	-14.09	Peak	100	100	P

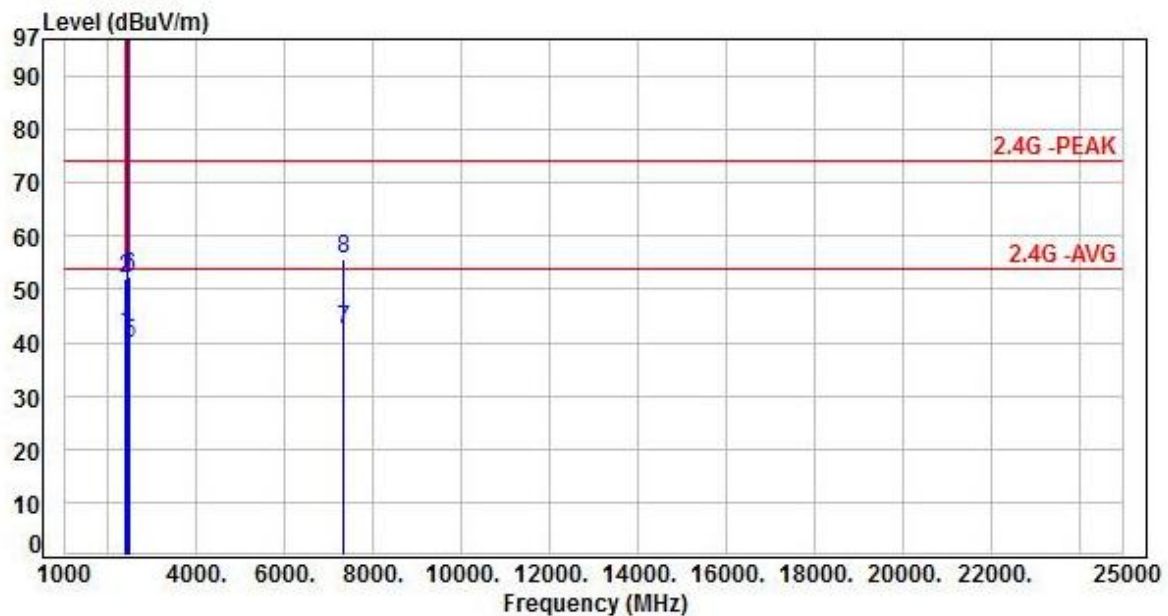
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: DC 12V From Adapter (AC 120V / 60Hz)	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	-2.64	44.41	41.77	54.00	-12.23	Average	100	44	P
2	2390.00	-2.64	54.80	52.16	74.00	-21.84	Peak	100	44	P
3	2437.00	-2.57	99.14	96.57	200.00	-103.43	Average	100	44	P
4	2437.00	-2.57	108.61	106.04	200.00	-93.96	Peak	100	44	P
5	2483.50	-2.39	42.33	39.94	54.00	-14.06	Average	100	44	P
6	2483.50	-2.39	54.71	52.32	74.00	-21.68	Peak	100	44	P
7	7311.00	10.16	32.36	42.52	54.00	-11.48	Average	100	83	P
8	7311.00	10.16	45.43	55.59	74.00	-18.41	Peak	100	83	P

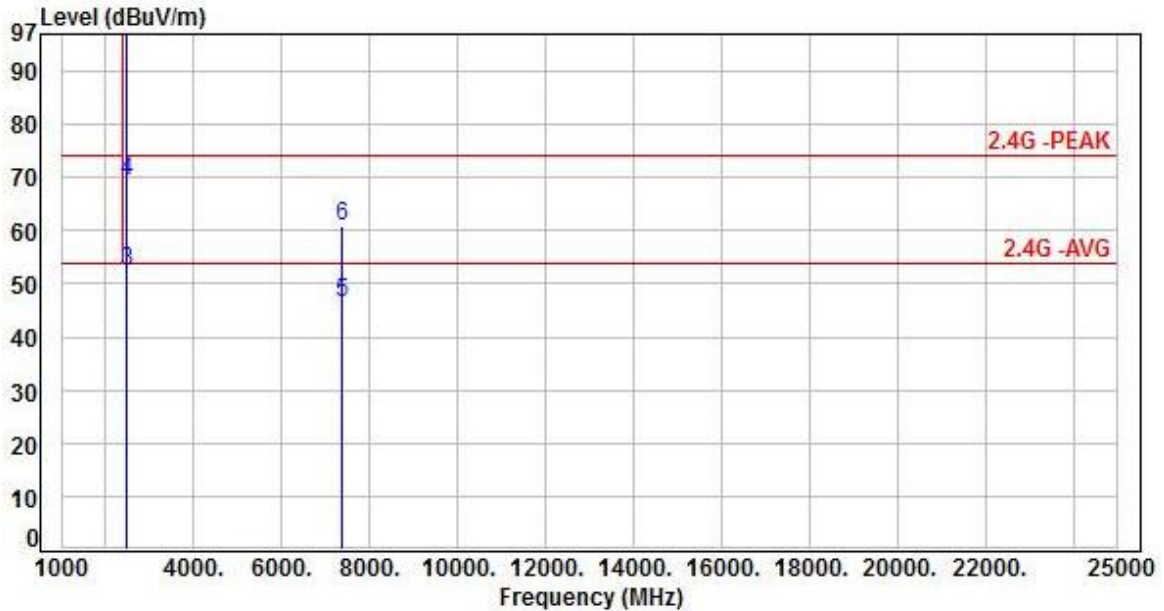
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	:	DC 12V From Adapter (AC 120V / 60Hz)	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	2462.00	-2.49	101.39	98.90	200.00	-101.10	Average	100	31	P
2	2462.00	-2.49	110.82	108.33	200.00	-91.67	Peak	100	31	P
3	2483.50	-2.39	54.86	52.47	54.00	-1.53	Average	100	31	P
4	2483.50	-2.39	71.63	69.24	74.00	-4.76	Peak	100	31	P
5	7386.00	10.18	36.30	46.48	54.00	-7.52	Average	100	116	P
6	7386.00	10.18	50.76	60.94	74.00	-13.06	Peak	100	116	P

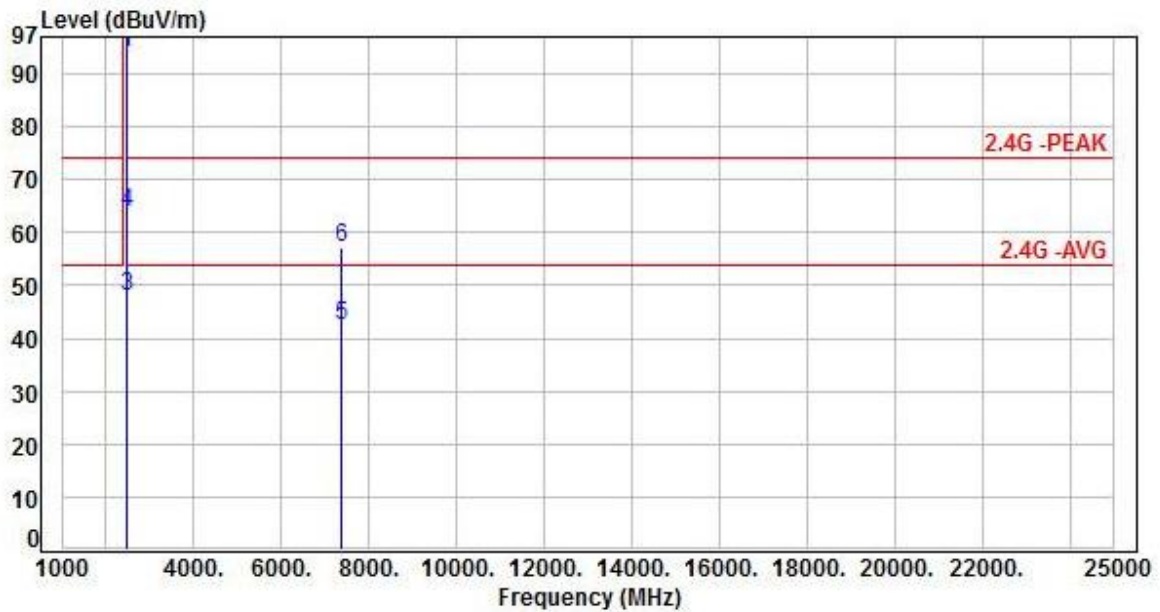
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: DC 12V From Adapter (AC 120V / 60Hz)	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	2462.00	-2.49	96.70	94.21	200.00	-105.79	Average	100	78	P
2	2462.00	-2.49	106.24	103.75	200.00	-96.25	Peak	100	78	P
3	2483.50	-2.39	50.20	47.81	54.00	-6.19	Average	100	78	P
4	2483.50	-2.39	66.37	63.98	74.00	-10.02	Peak	100	78	P
5	7386.00	10.18	32.36	42.54	54.00	-11.46	Average	100	296	P
6	7386.00	10.18	46.99	57.17	74.00	-16.83	Peak	100	296	P

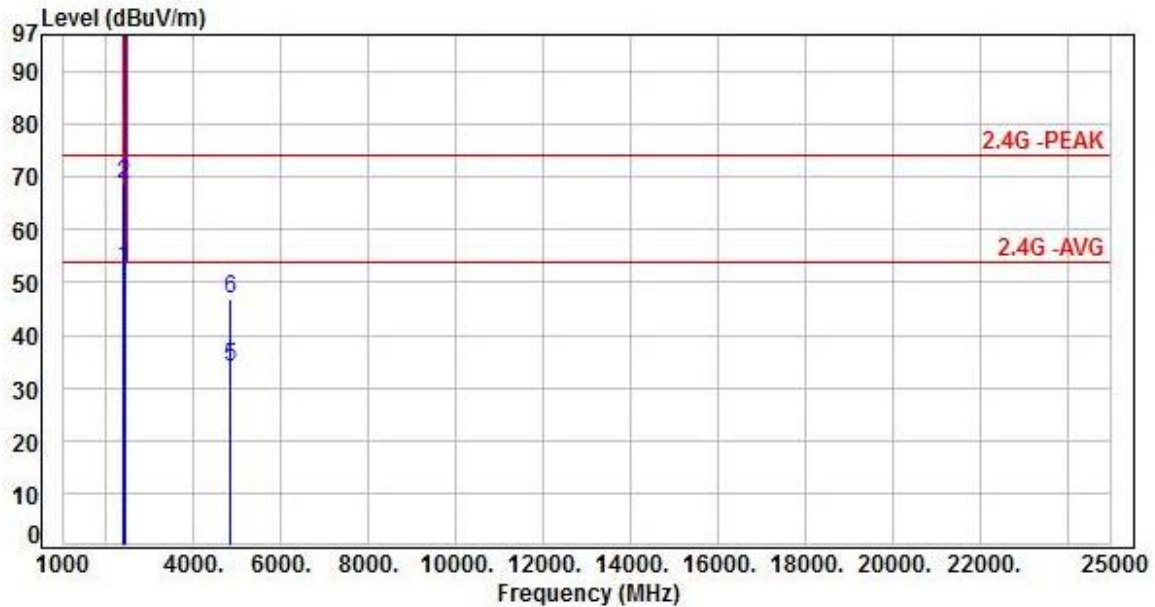
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	:	DC 12V From Adapter (AC 120V / 60Hz)	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	-2.64	55.54	52.90	54.00	-1.10	Average	100	27	P
2	2390.00	-2.64	71.25	68.61	74.00	-5.39	Peak	100	27	P
3	2412.00	-2.60	101.33	98.73	200.00	-101.27	Average	100	27	P
4	2412.00	-2.60	111.57	108.97	200.00	-91.03	Peak	100	27	P
5	4824.00	5.03	28.84	33.87	54.00	-20.13	Average	100	133	P
6	4824.00	5.03	41.68	46.71	74.00	-27.29	Peak	100	133	P

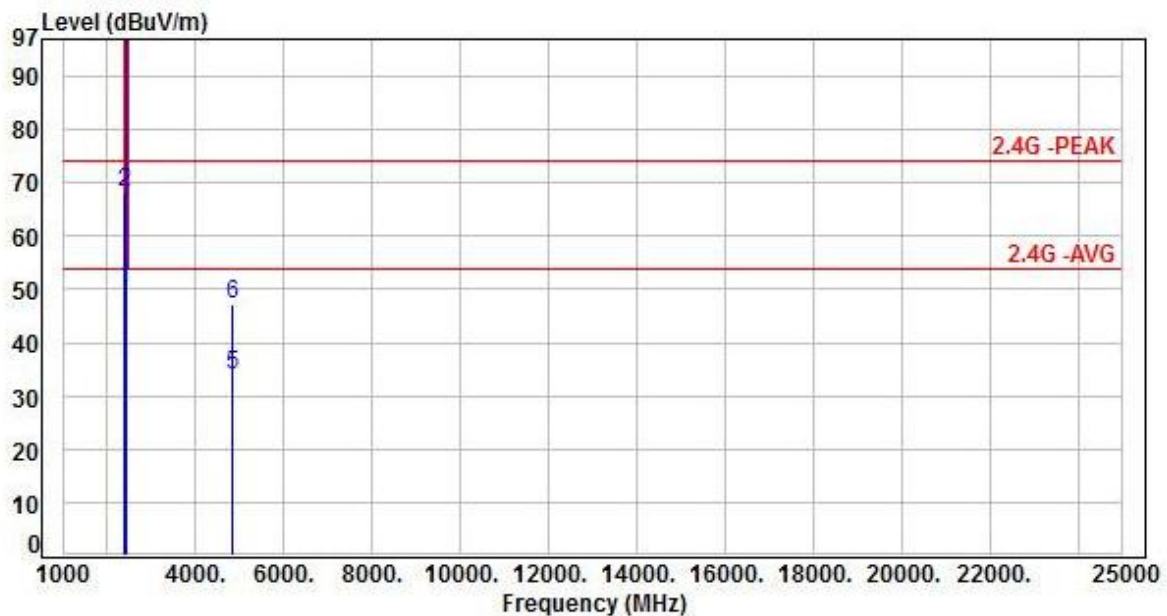
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	:	DC 12V From Adapter (AC 120V / 60Hz)	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	-2.64	52.77	50.13	54.00	-3.87	Average	120	40	P
2	2390.00	-2.64	70.92	68.28	74.00	-5.72	Peak	120	40	P
3	2412.00	-2.60	98.40	95.80	200.00	-104.20	Average	120	40	P
4	2412.00	-2.60	108.22	105.62	200.00	-94.38	Peak	120	40	P
5	4824.00	5.03	28.78	33.81	54.00	-20.19	Average	100	109	P
6	4824.00	5.03	42.28	47.31	74.00	-26.69	Peak	100	109	P

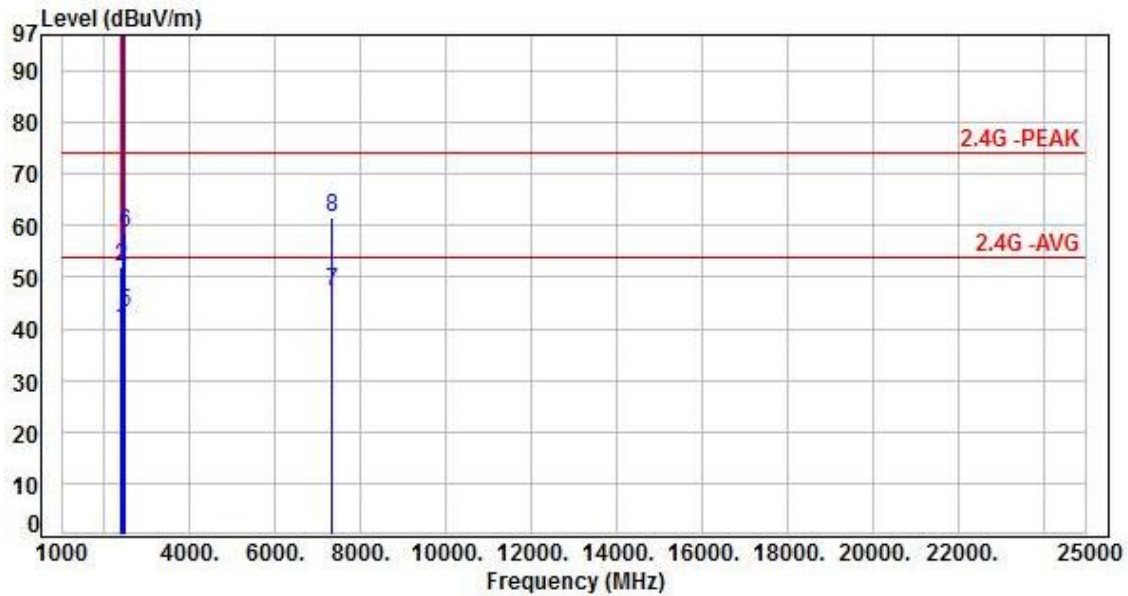
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	:	DC 12V From Adapter (AC 120V / 60Hz)	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	-2.64	42.41	39.77	54.00	-14.23	Average	100	19	P
2	2390.00	-2.64	54.68	52.04	74.00	-21.96	Peak	100	19	P
3	2437.00	-2.57	102.55	99.98	200.00	-100.02	Average	100	19	P
4	2437.00	-2.57	111.92	109.35	200.00	-90.65	Peak	100	19	P
5	2483.50	-2.39	45.39	43.00	54.00	-11.00	Average	100	19	P
6	2483.50	-2.39	60.89	58.50	74.00	-15.50	Peak	100	19	P
7	7311.00	10.16	37.08	47.24	54.00	-6.76	Average	100	103	P
8	7311.00	10.16	51.35	61.51	74.00	-12.49	Peak	100	103	P

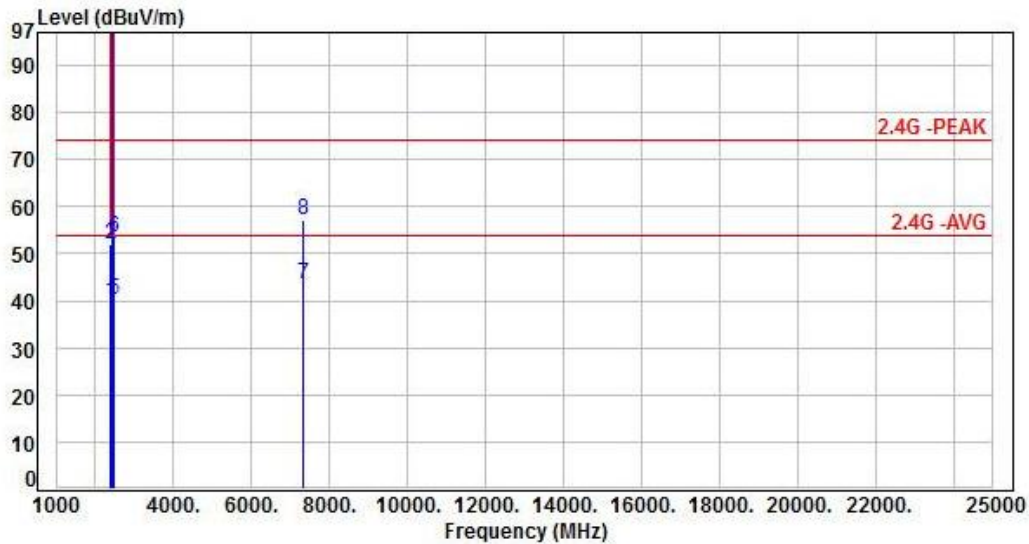
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	:	DC 12V From Adapter (AC 120V / 60Hz)	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	-2.64	42.29	39.65	54.00	-14.35	Average	100	41	P
2	2390.00	-2.64	54.82	52.18	74.00	-21.82	Peak	100	41	P
3	2437.00	-2.57	100.05	97.48	200.00	-102.52	Average	100	41	P
4	2437.00	-2.57	109.45	106.88	200.00	-93.12	Peak	100	41	P
5	2483.50	-2.39	42.60	40.21	54.00	-13.79	Average	100	41	P
6	2483.50	-2.39	55.93	53.54	74.00	-20.46	Peak	100	41	P
7	7311.00	10.16	33.19	43.35	54.00	-10.65	Average	100	86	P
8	7311.00	10.16	46.94	57.10	74.00	-16.90	Peak	100	86	P

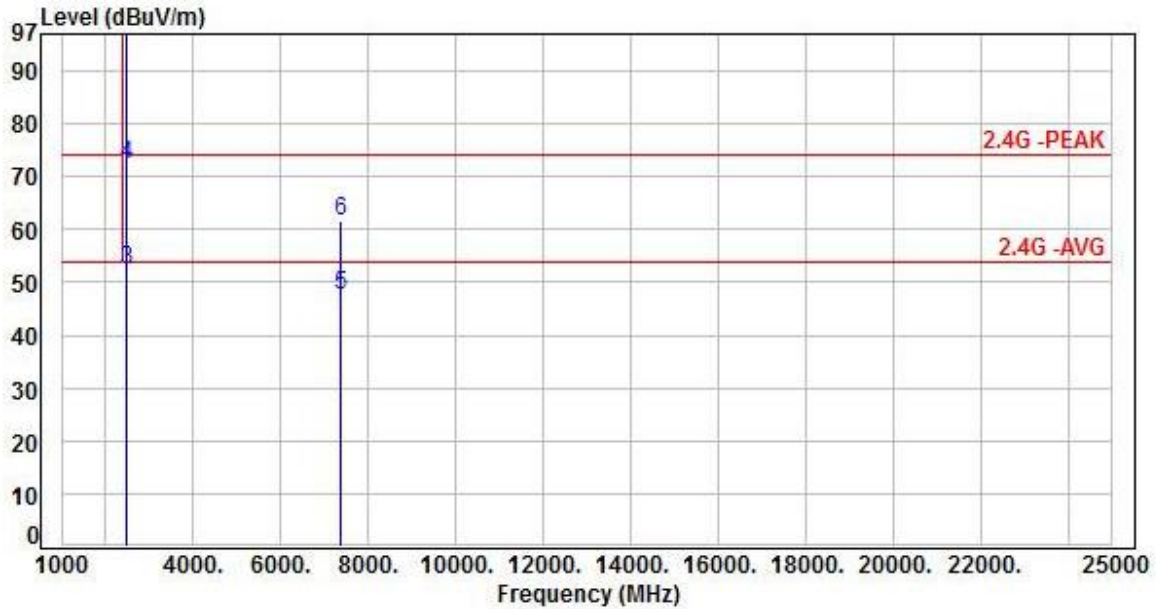
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	:	DC 12V From Adapter (AC 120V / 60Hz)	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	2462.00	-2.49	102.76	100.27	200.00	-99.73	Average	100	25	P
2	2462.00	-2.49	112.88	110.39	200.00	-89.61	Peak	100	25	P
3	2483.50	-2.39	54.74	52.35	54.00	-1.65	Average	100	25	P
4	2483.50	-2.39	74.51	72.12	74.00	-1.88	Peak	100	25	P
5	7386.00	10.18	37.22	47.40	54.00	-6.60	Average	100	113	P
6	7386.00	10.18	51.42	61.60	74.00	-12.40	Peak	100	113	P

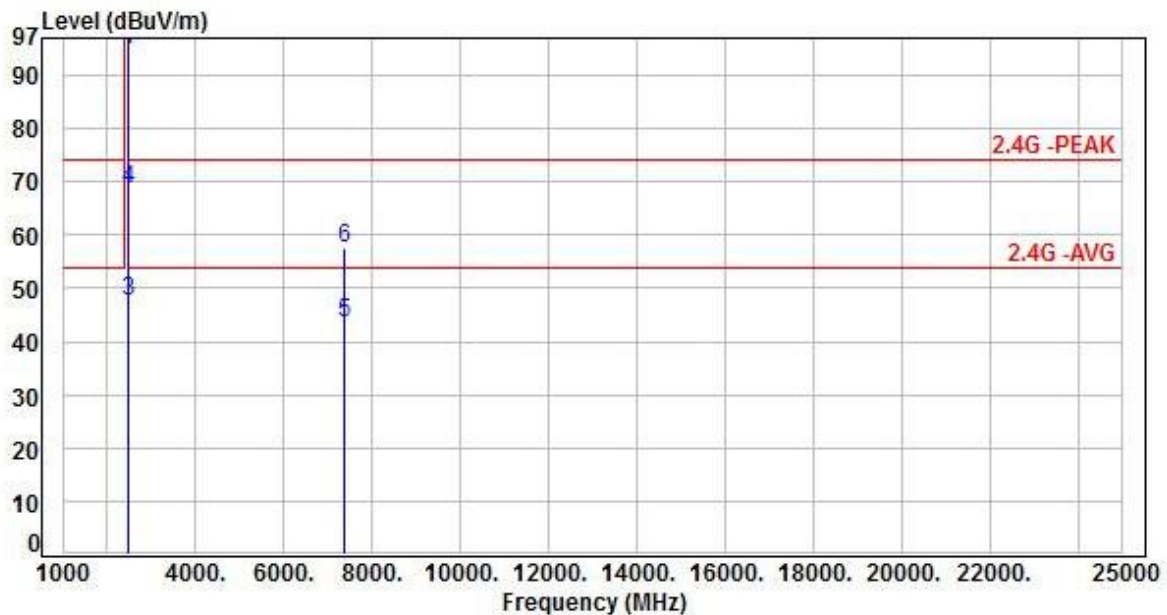
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	:	DC 12V From Adapter (AC 120V / 60Hz)	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	2462.00	-2.49	97.15	94.66	200.00	-105.34	Average	100	78	P
2	2462.00	-2.49	106.96	104.47	200.00	-95.53	Peak	100	78	P
3	2483.50	-2.39	50.10	47.71	54.00	-6.29	Average	100	78	P
4	2483.50	-2.39	71.08	68.69	74.00	-5.31	Peak	100	78	P
5	7386.00	10.18	33.26	43.44	54.00	-10.56	Average	100	290	P
6	7386.00	10.18	47.34	57.52	74.00	-16.48	Peak	100	290	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

According to the methods defined in ANSI C63.10-2013 Section 11.11.1

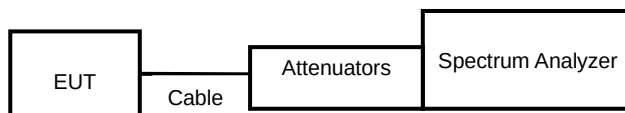
Below -20dB of the highest emission level of operating band (In 100 kHz Resolution Bandwidth)

7.2 Test Procedure

According to the methods defined in ANSI C63.10-2013 Section 11.11.2 & 11.11.3

- 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

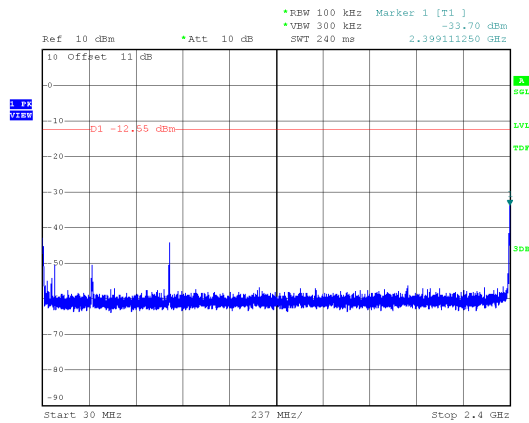


7.4 Test Result and Data

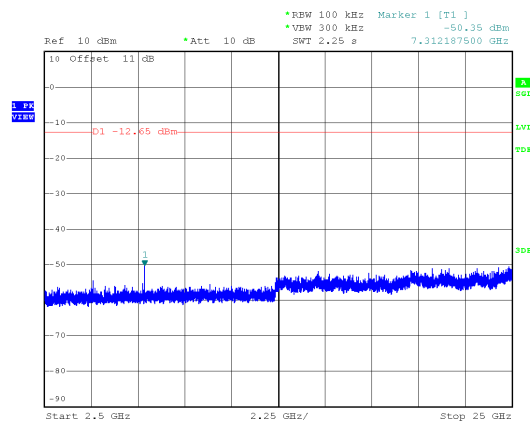
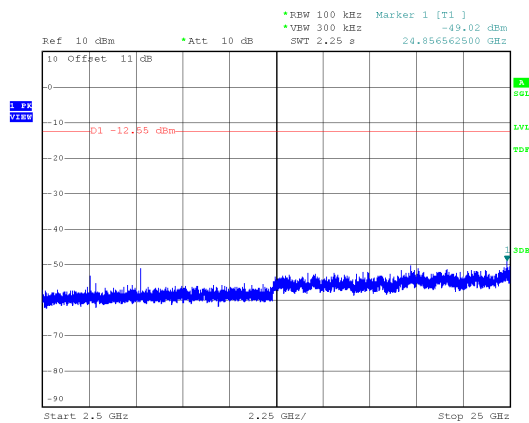
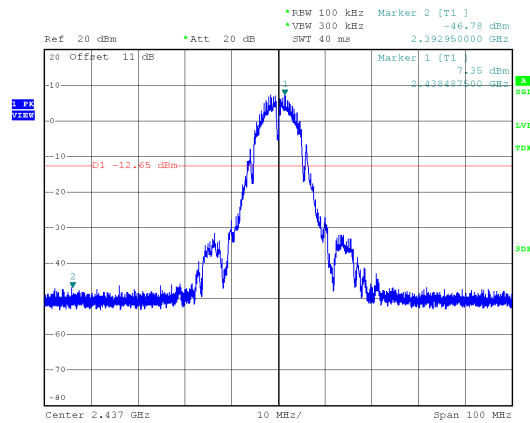
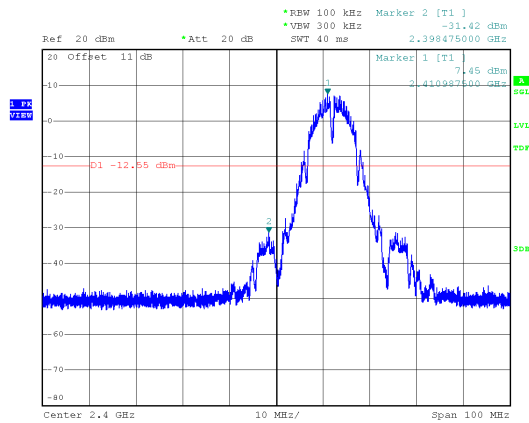
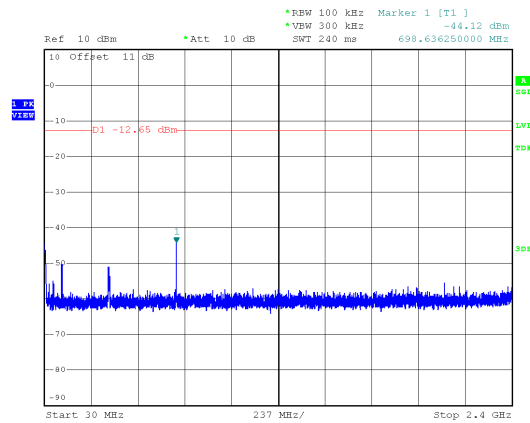
Note: Test plots refers to the following pages.



Modulation Type: 802.11b, CH 01

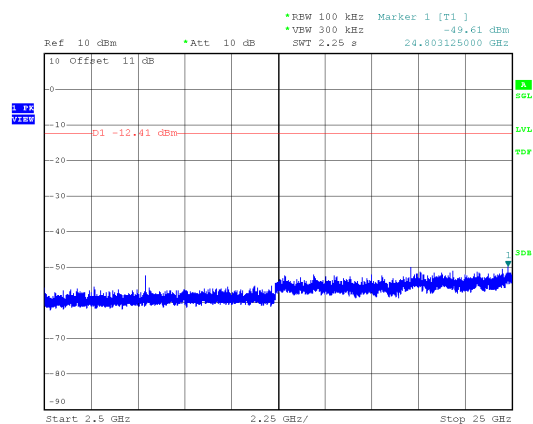
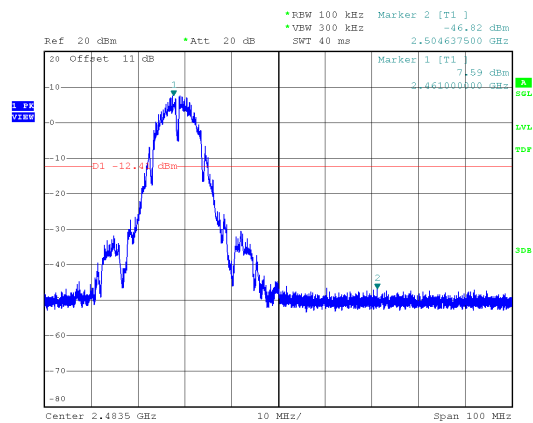
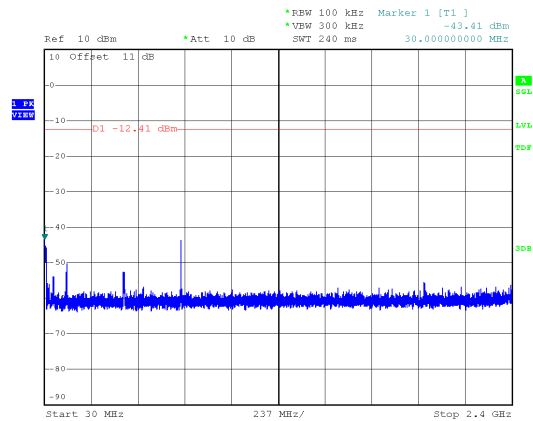


Modulation Type: 802.11b, CH 06



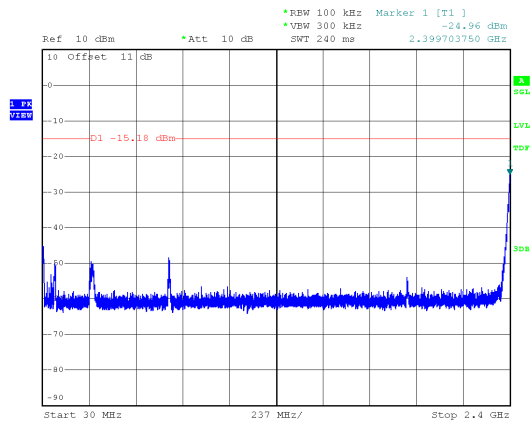


Modulation Type: 802.11b, CH 11

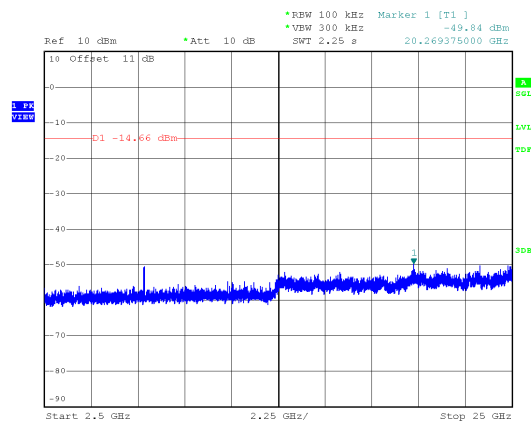
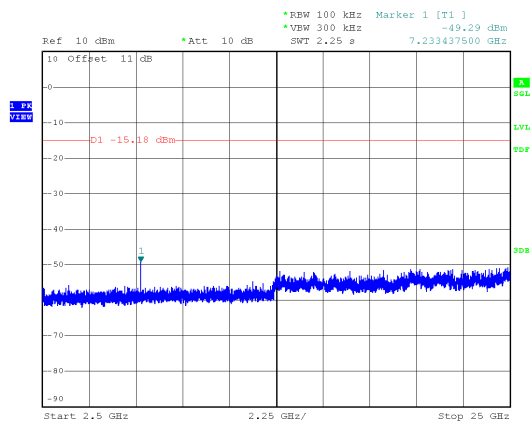
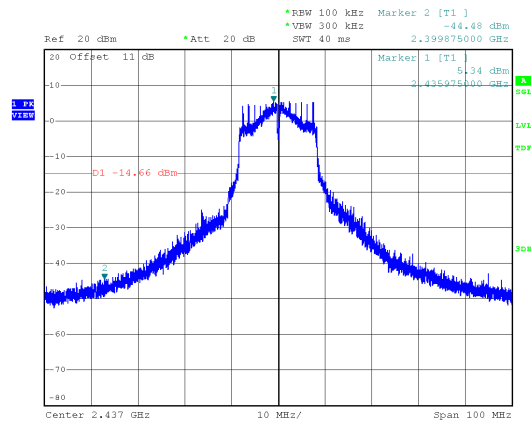
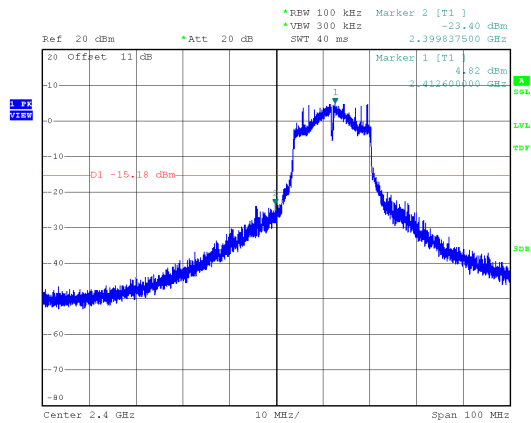
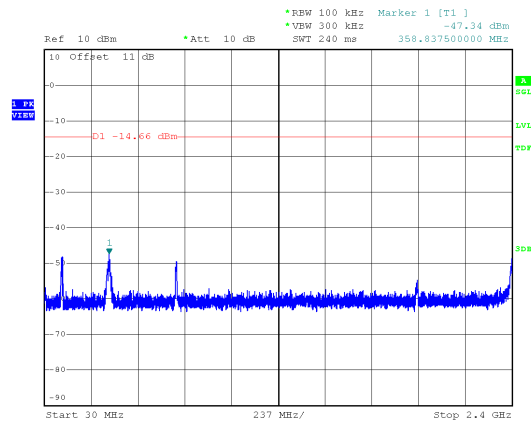




Modulation Type: 802.11g, CH01

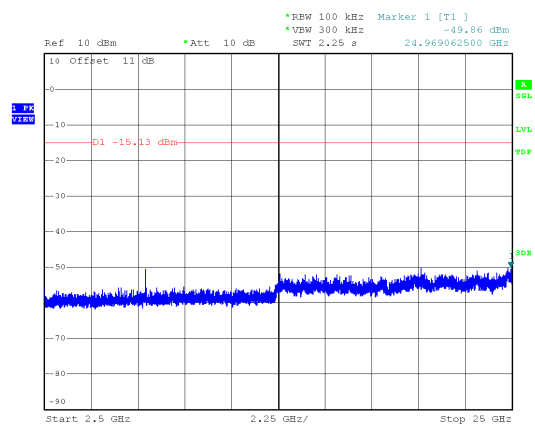
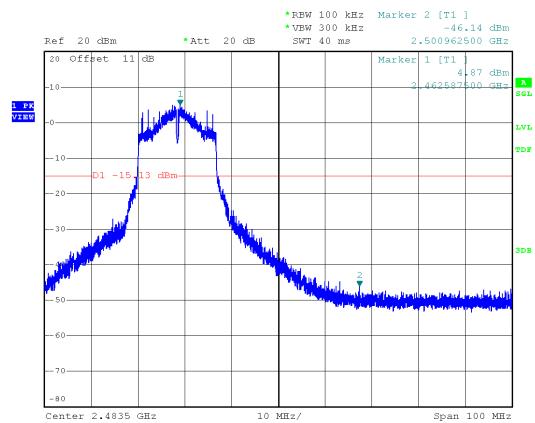
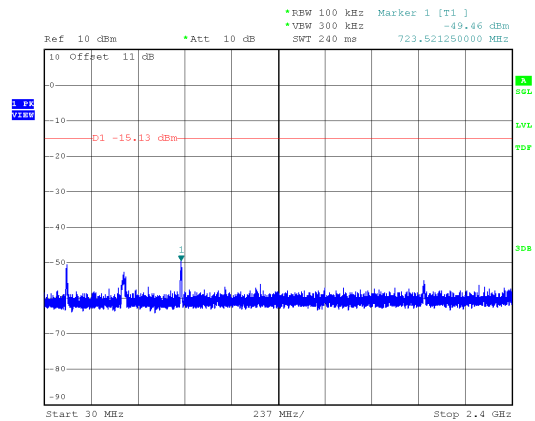


Modulation Type: 802.11g, CH06



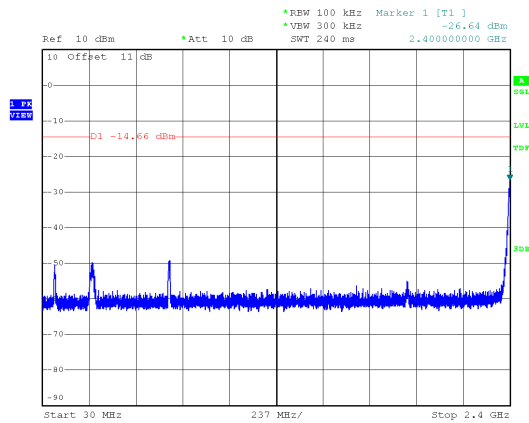


Modulation Type: 802.11g, CH11

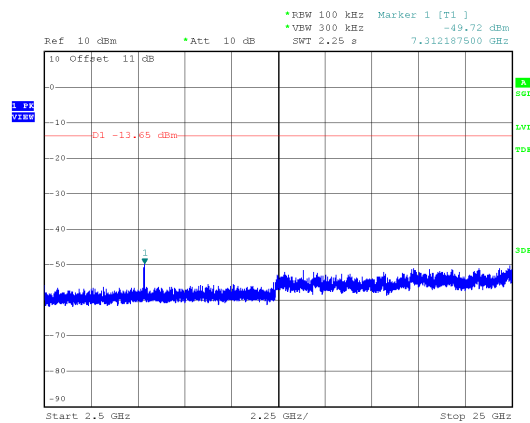
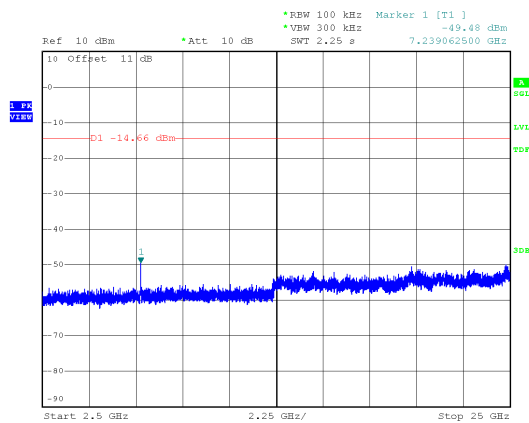
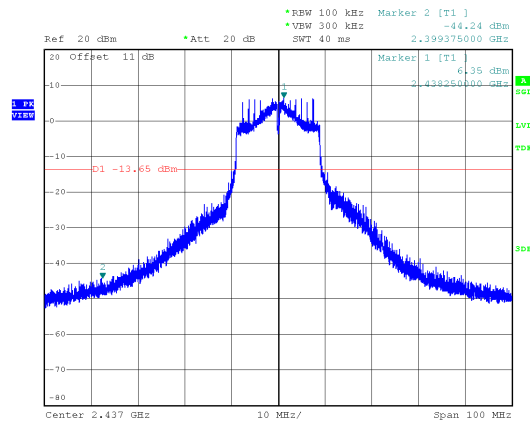
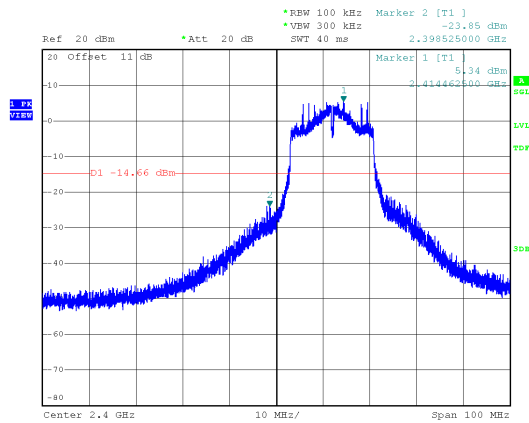
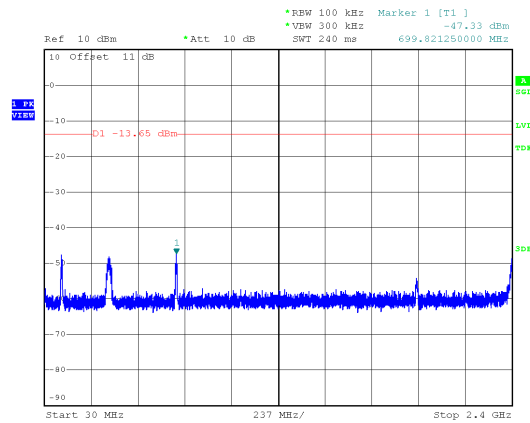




Modulation Type: 802.11n HT20, CH01

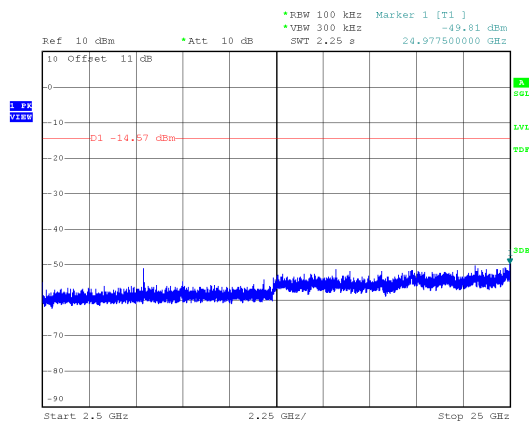
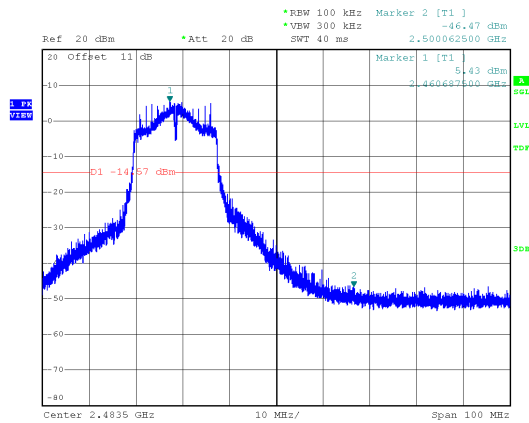
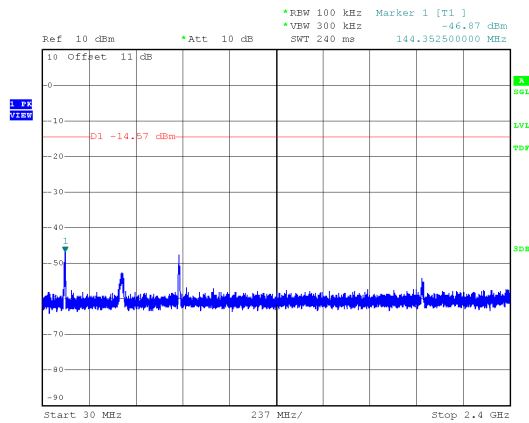


Modulation Type: 802.11n HT20, CH06





Modulation Type: 802.11n HT20, CH11





8. On Time, Duty Cycle and Measurement methods

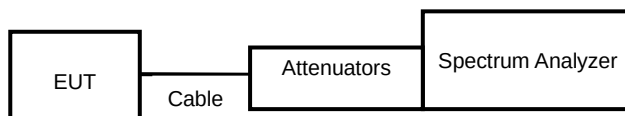
8.1 Test Limit

None; for reporting purposes only.

8.2 Test Procedure

According to the methods defined in ANSI C63.10-2013 Section 11.6
Zero-Span Spectrum Analyzer Method.

8.3 Test Setup Layout

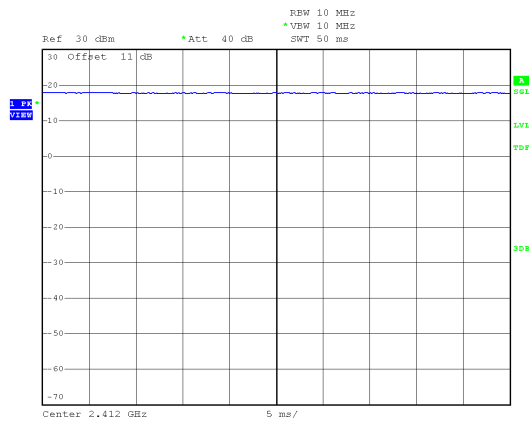


8.4 Test Result and Data

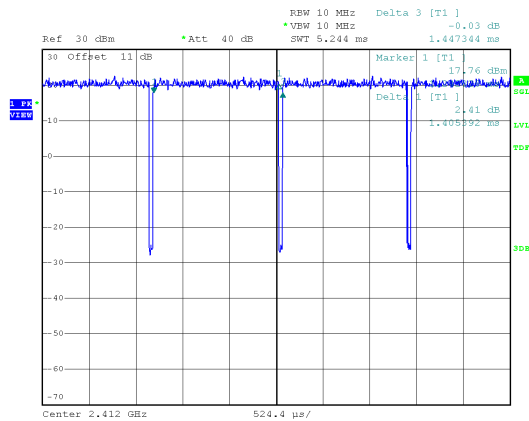
Modulation Type	On Time (ms)	Period Time (ms)	Duty Cycle (%)
11b,1M	100.00	100.00	100.00%
11g,6M	1.41	1.45	97.10%
11n HT20	1.32	1.36	96.91%



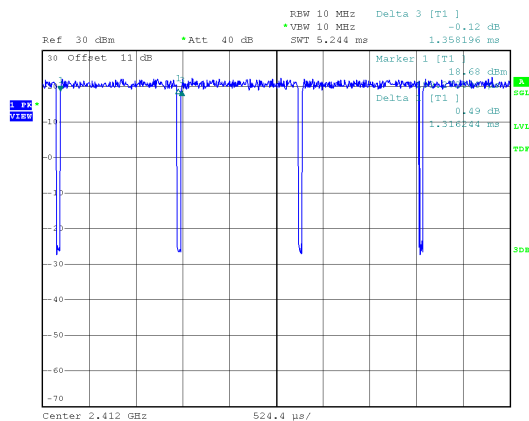
Modulation Type: 802.11b(1Mbps)



Modulation Type: 802.11g(6Mbps)



Modulation Type: 802.11n HT20(6.5Mbps)





9. 6dB Bandwidth Measurement Data

9.1 Test Limit

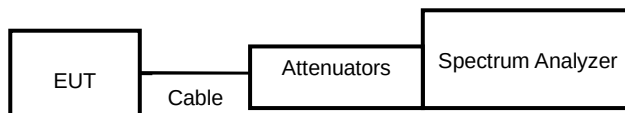
The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

9.2 Test Procedures

According to the methods defined in ANSI C63.10-2013 Section 11.8

- The transmitter output was connected to the spectrum analyzer.
- Set RBW of spectrum analyzer to 100 KHz and VBW to 300 KHz.
- 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.

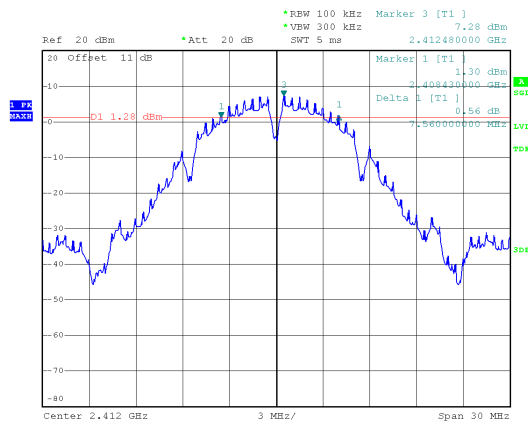
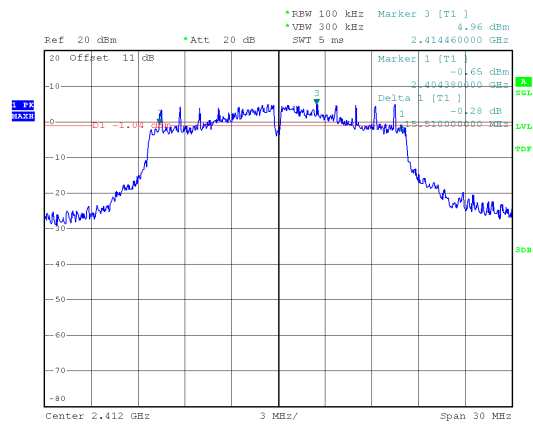
9.3 Test Setup Layout



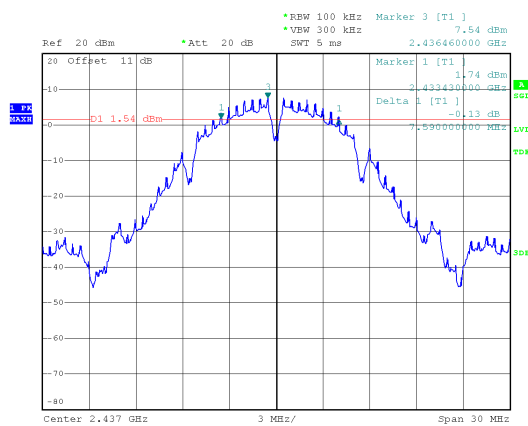


9.4 Test Result and Data

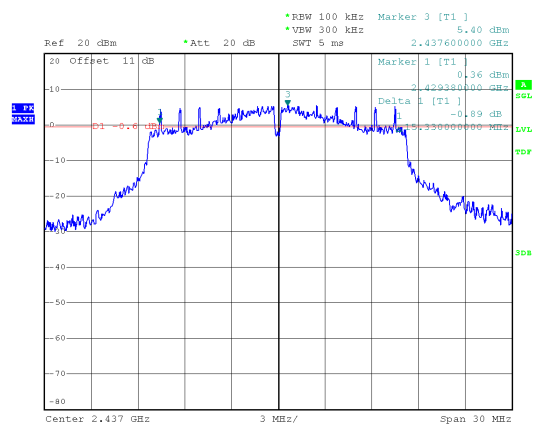
Modulation Type	Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)
			ANT A	
11b	1	2412	7.56	0.5
	6	2437	7.59	0.5
	11	2462	7.56	0.5
11g	1	2412	15.51	0.5
	6	2437	15.33	0.5
	11	2462	15.18	0.5
11n HT20	1	2412	15.18	0.5
	6	2437	15.15	0.5
	11	2462	15.15	0.5

Modulation Type: 802.11b
CH01Modulation Type: 802.11g
CH01

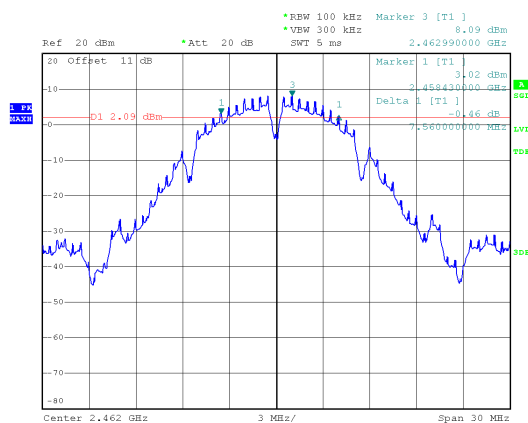
CH06



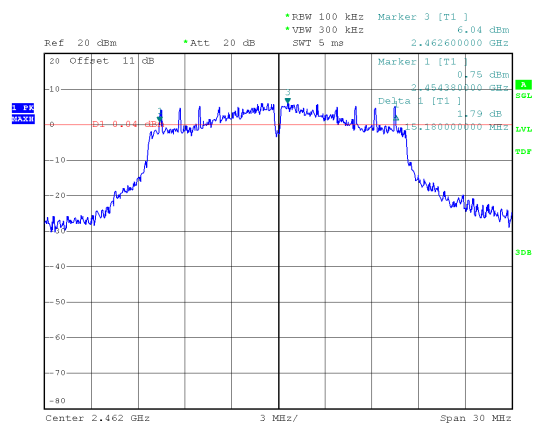
CH06

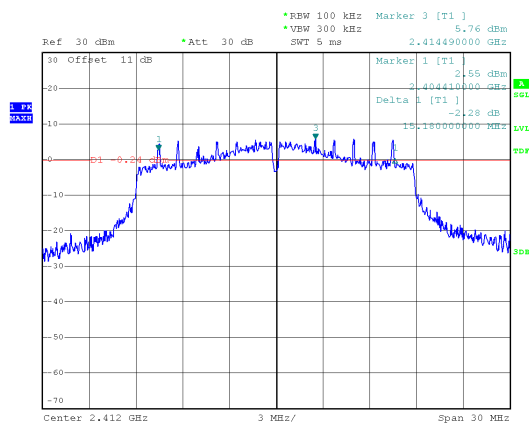


CH11

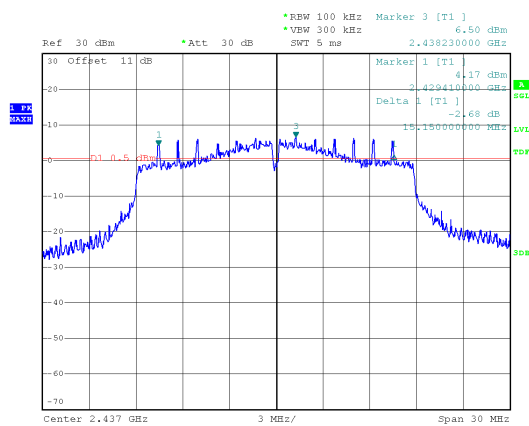


CH11

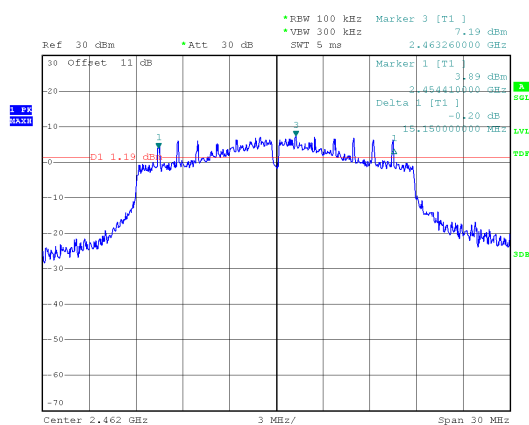


Modulation Type: 802.11n HT20
CH01

CH06



CH11





10. Maximum Peak and Average Output Power

10.1 Test Limit

The Maximum Peak Output Power Measurement is 30dBm.

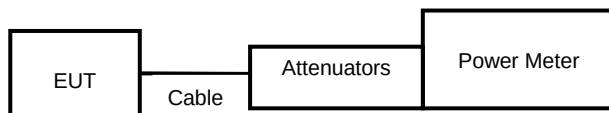
If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi

10.2 Test Procedures

According to the methods defined in ANSI C63.10-2013 Section 11.9.2.3.2

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**
Non Beamforming

Modulation Mode	Channel	Frequency (MHz)	Conducted(peak) output power (dBm)	Total PK power (dBm)	Total PK power (mW)	Power Limit (dBm)
			ANT A			
11b	1	2412	18.63	18.63	72.946	30.00
	6	2437	19.07	19.07	80.724	30.00
	11	2462	19.35	19.35	86.099	30.00
11g	1	2412	22.42	22.42	174.582	30.00
	6	2437	23.05	23.05	201.837	30.00
	11	2462	23.69	23.69	233.884	30.00
11n HT20	1	2412	22.75	22.75	188.365	30.00
	6	2437	23.19	23.19	208.449	30.00
	11	2462	23.82	23.82	240.991	30.00

**Non Beamforming**

Modulation Mode	Channel	Frequency (MHz)	Conducted(average) output power (dBm)	Total AV power (dBm)	Total AV power (mW)	Powe Limit (dBm)
			ANT A			
11b	1	2412	15.41	15.41	34.754	NA
	6	2437	15.90	15.90	38.905	NA
	11	2462	16.15	16.15	41.210	NA
11g	1	2412	16.75	16.75	47.315	NA
	6	2437	17.13	17.13	51.642	NA
	11	2462	16.59	16.59	45.604	NA
11n HT20	1	2412	16.86	16.86	48.529	NA
	6	2437	17.75	17.75	59.566	NA
	11	2462	17.05	17.05	50.699	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.

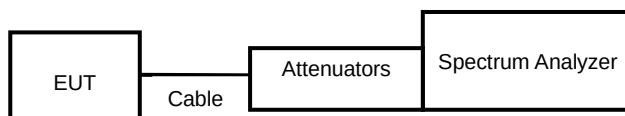
If transmitting antennas of directional gain greater than 6 dBi are used, the power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi

11.2 Test Procedures

According to the methods defined in ANSI C63.10-2013 Section 11.10

- The transmitter output was connected to spectrum analyzer.
- The spectrum analyzer's resolution bandwidth were set at 3kHz RBW and 10KHz 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

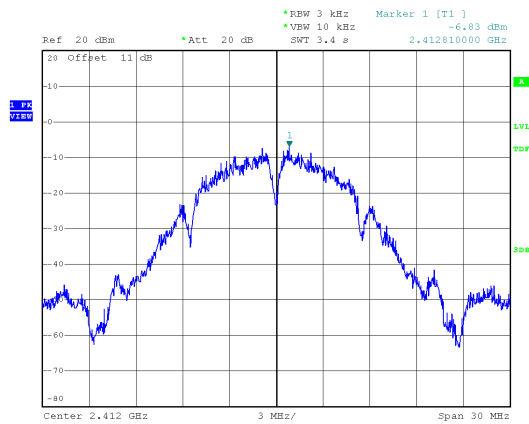


**11.4 Test Result and Data**

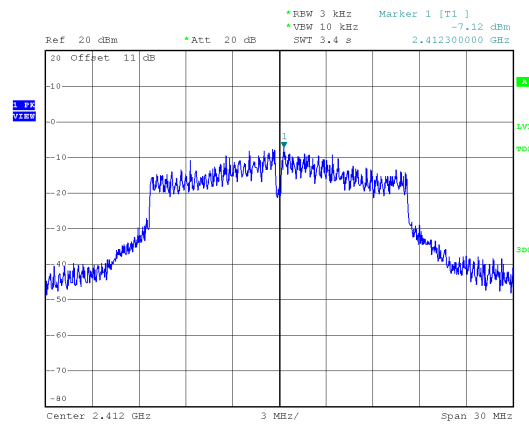
Modulation Type	Channel	Frequency (MHz)	Maximum Power Density of 3KHz Bandwidth(dBm)	Sum chain (dBm)	Duty Cycle CF(dB)	Total PSD (dBm)	Limit (dBm)
			ANT A				
11b	1	2412	-6.83	-6.83	0.00	-6.83	8.00
	6	2437	-6.91	-6.91	0.00	-6.91	8.00
	11	2462	-5.77	-5.77	0.00	-5.77	8.00
11g	1	2412	-7.12	-7.12	0.00	-7.12	8.00
	6	2437	-6.22	-6.22	0.00	-6.22	8.00
	11	2462	-6.24	-6.24	0.00	-6.24	8.00
11n HT20	1	2412	-8.15	-8.15	0.00	-8.15	8.00
	6	2437	-4.9	-4.90	0.00	-4.90	8.00
	11	2462	-6.98	-6.98	0.00	-6.98	8.00



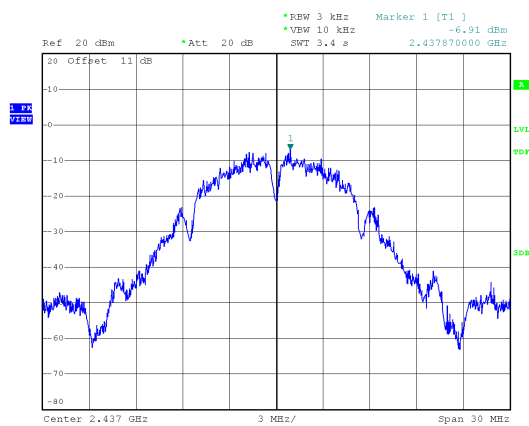
Modulation Type: 802.11b
CH01



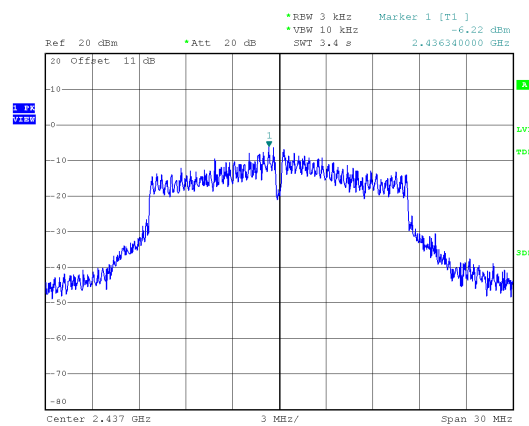
Modulation Type: 802.11g
CH01



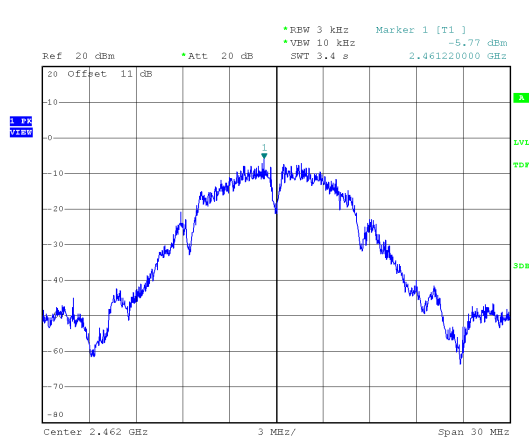
CH06



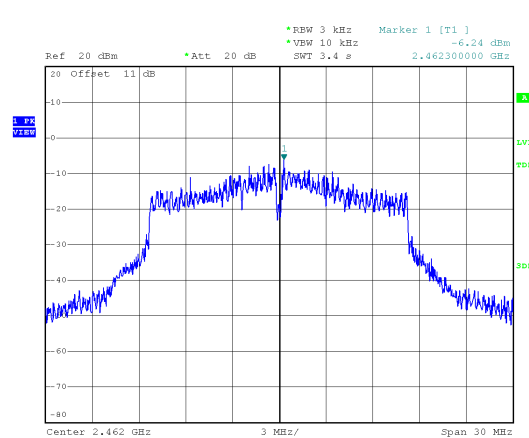
CH06



CH11

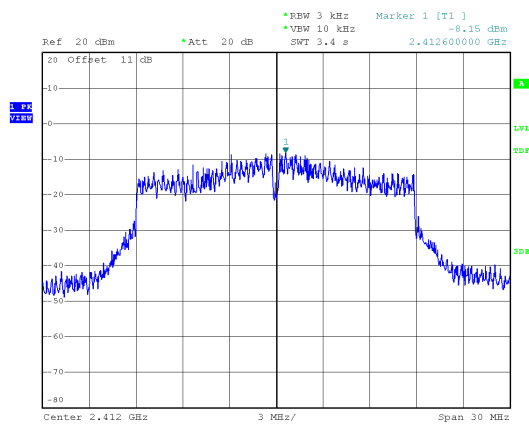


CH11

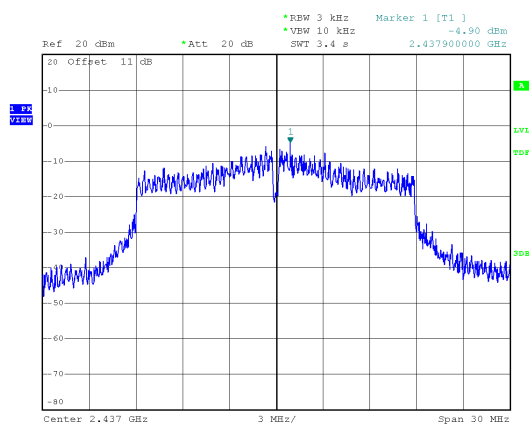




Modulation Type: 802.11n HT20
CH01



CH06



CH11

