



FCC RADIO TEST REPORT

Applicant	: Ubiquiti Networks, Inc.
Address	: 685 Third Avenue, 27th Floor New York, New York 10017 USA
Equipment	: UniFi Dream Machine PRO
Model No.	: UDM-Pro
Trade Name	: UBIQUITI
FCC ID	: SWX-UDMPRO

I HEREBY CERTIFY THAT :

The sample was received on Jun. 27, 2019 and the testing was completed on Jul. 11, 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
TEFC1906225	Jul. 12, 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 §15.249

FCC Rule	Description of Test	Result
15.203	. Antenna Requirement	PASS
15.207	. AC Power Line Conducted Emission	PASS
15.249(a)	. Radiated Spurious Emission	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(TEFV1906225).



2. Test Configuration of Equipment under Test

2.1 Feature of Equipment under Test

Frequency Range	2402MHz~2480MHz
Modulation Type	GFSK
Modulation Technology	DTS
Data Rate	GFSK: 1Mbps
Antenna Type	Internal Antenna
Antenna Gain	2402MHz~2480MHz: 0dBi

Note:

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

2.2 Carrier Frequency of Channels

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
*00	2402	14	2430	28	2458
01	2404	15	2432	29	2460
02	2406	16	2434	30	2462
03	2408	17	2436	31	2464
04	2410	18	2438	32	2466
05	2412	*19	2440	33	2468
06	2414	20	2442	34	2470
07	2416	21	2444	35	2472
08	2418	22	2446	36	2474
09	2420	23	2448	37	2476
10	2422	24	2450	38	2478
11	2424	25	2452	*39	2480
12	2426	26	2454	--	--
13	2428	27	2456	--	--

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 Notebook and EUT for RF test.
- An executive program, " HCI command " underwin7 was executed to transmit and receive data via Bluetooth.
- The following test modes were performed for the test:
Test Mode 1. GFSK (1Mbps)



2.4 Description of Test System

Radiated Emissions				
Equipment	Brand	Model	Length/Type	Power cord/Length/Type
Notebook	ASUS	P2430U	N/A	Adapter / 1.8m / NS
Network cable	N/A	N/A	15m / NS	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
Network cable	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
Radiated Emissions	3M02-NK	2019/07/11	23°C / 61%	Nick Guan
RF Conduction	CON01-NK	2019/07/11	22°C / 63%	Leon Huang



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)	$\pm 5.918\text{dB}$
20dB Bandwidth	$\pm 4.40\%$
Occupied Bandwidth	$\pm 4.41\%$
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	2019/05/24	2020/05/23
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	2019/05/14	2020/05/13
Spectrum Analyzer	ROHDE & SCHWARZ	FSP 40	100047	2019/03/28	2020/03/27
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	100047	2019/03/28	2020/03/27
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	CON01-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	2019/5/22	2020/05/21
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 Standard Applicable

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

4.2 Antenna Construction and Directional Gain

Antenna Type	Internal Antenna
Antenna Gain	0 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

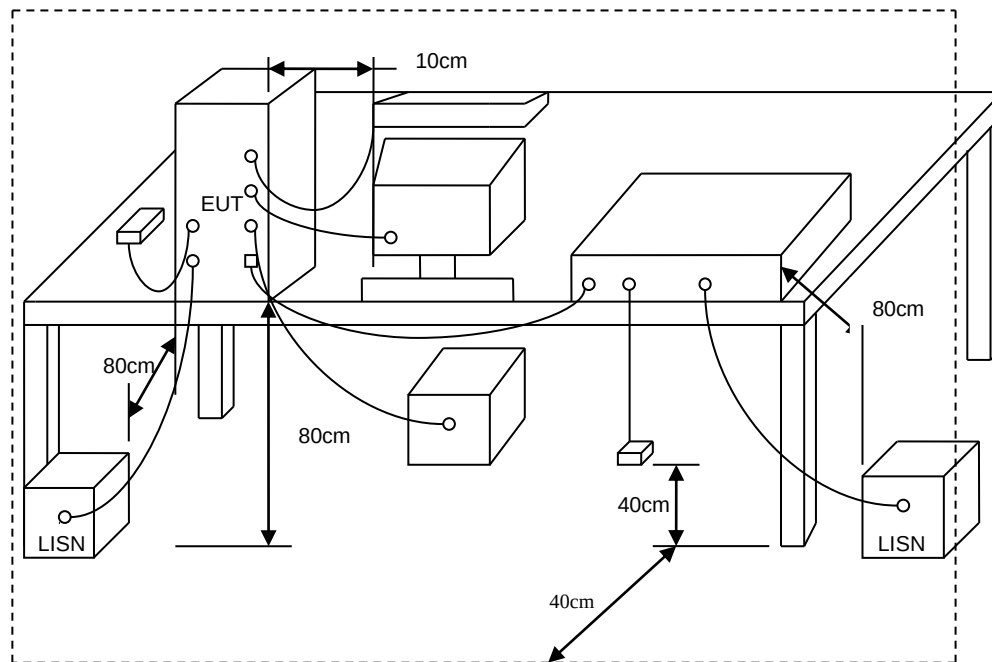
*Decreases with the logarithm of the frequency.

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.



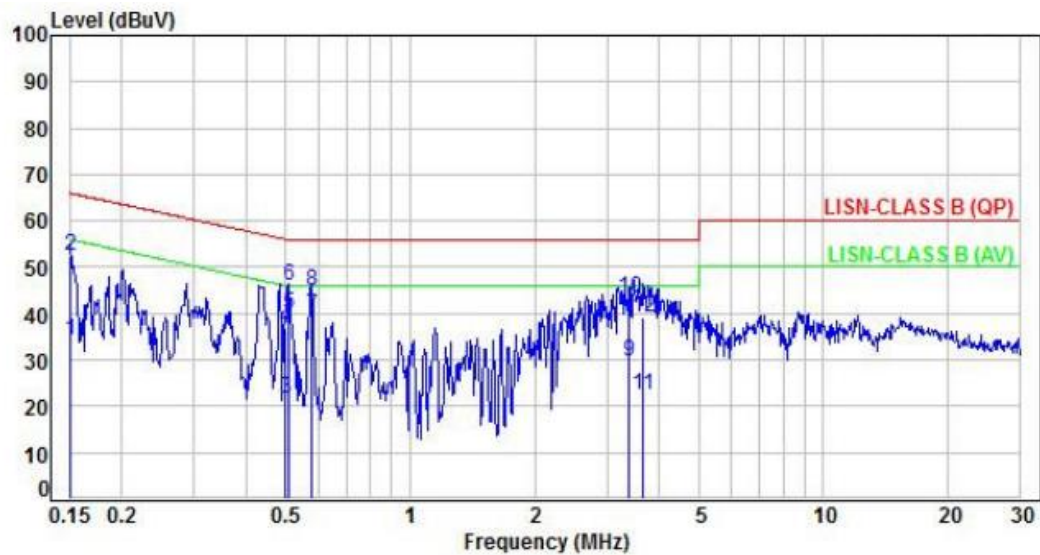
5.3 Typical Test Setup





5.4 Test Result and Data

Power	: AC120V / 60Hz	Pol/Phase	: LINE
Test Mode	: Mode 1		:



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.15	9.92	24.35	34.27	55.98	-21.71	Average	P
2	0.15	9.92	42.43	52.35	65.98	-13.63	QP	P
3	0.50	9.94	11.78	21.72	46.06	-24.34	Average	P
4	0.50	9.94	26.82	36.76	56.06	-19.30	QP	P
5	0.51	9.95	29.97	39.92	46.00	-6.08	Average	P
6	0.51	9.95	36.00	45.95	56.00	-10.05	QP	P
7	0.58	9.95	29.64	39.59	46.00	-6.41	Average	P
8	0.58	9.95	35.01	44.96	56.00	-11.04	QP	P
9	3.38	10.07	19.58	29.65	46.00	-16.35	Average	P
10	3.38	10.07	33.28	43.35	56.00	-12.65	QP	P
11	3.66	10.09	12.45	22.54	46.00	-23.46	Average	P
12	3.66	10.09	29.12	39.21	56.00	-16.79	QP	P

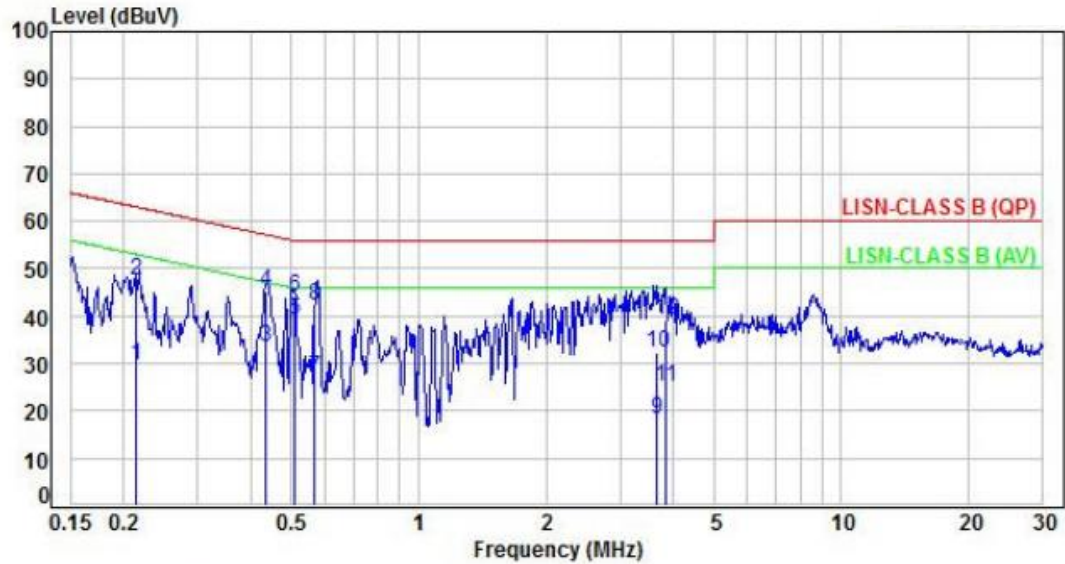
Note: Level=Reading+Factor

Margin=Level-Limit

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



Power	: AC120V / 60Hz	Pol/Phase	: NEUTRAL
Test Mode	: Mode 1		:



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.21	9.95	19.55	29.50	53.07	-23.57	Average	P
2	0.21	9.95	37.50	47.45	63.07	-15.62	QP	P
3	0.43	9.96	23.58	33.54	47.17	-13.63	Average	P
4	0.43	9.96	35.18	45.14	57.17	-12.03	QP	P
5	0.51	9.96	29.12	39.08	46.00	-6.92	Average	P
6	0.51	9.96	34.30	44.26	56.00	-11.74	QP	P
7	0.56	9.96	16.97	26.93	46.00	-19.07	Average	P
8	0.56	9.96	32.06	42.02	56.00	-13.98	QP	P
9	3.66	10.10	8.01	18.11	46.00	-27.89	Average	P
10	3.66	10.10	22.33	32.43	56.00	-23.57	QP	P
11	3.83	10.11	15.09	25.20	46.00	-20.80	Average	P
12	3.83	10.11	28.98	39.09	56.00	-16.91	QP	P

Note: Level=Reading+Factor

Margin=Level-Limit

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



6. Test of Spurious Emission (Radiated)

6.1 Test Limit

The field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental frequency	Field strength of fundamental (millivolts/meter)	Field strength of harmonics (microvolts/meter)	Measurement Distance (meters)
902-928 MHz	50	500	3
2400-2483.5 MHz	50	500	3
5725-5875 MHz	50	500	3
24.0-24.25 GHz	250	2500	3

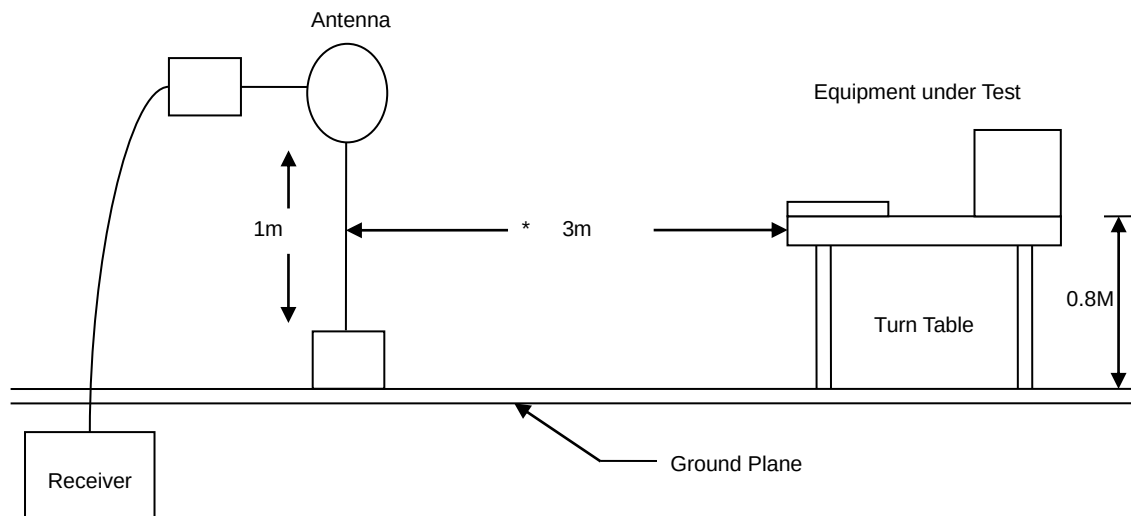
6.2 Test Procedures

- 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.

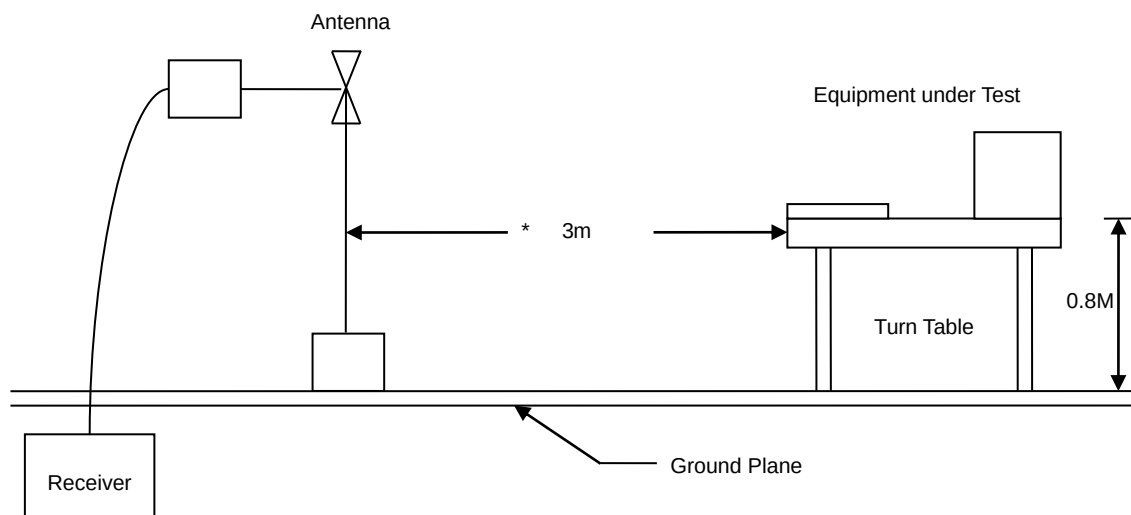


6.3 Typical Test Setup

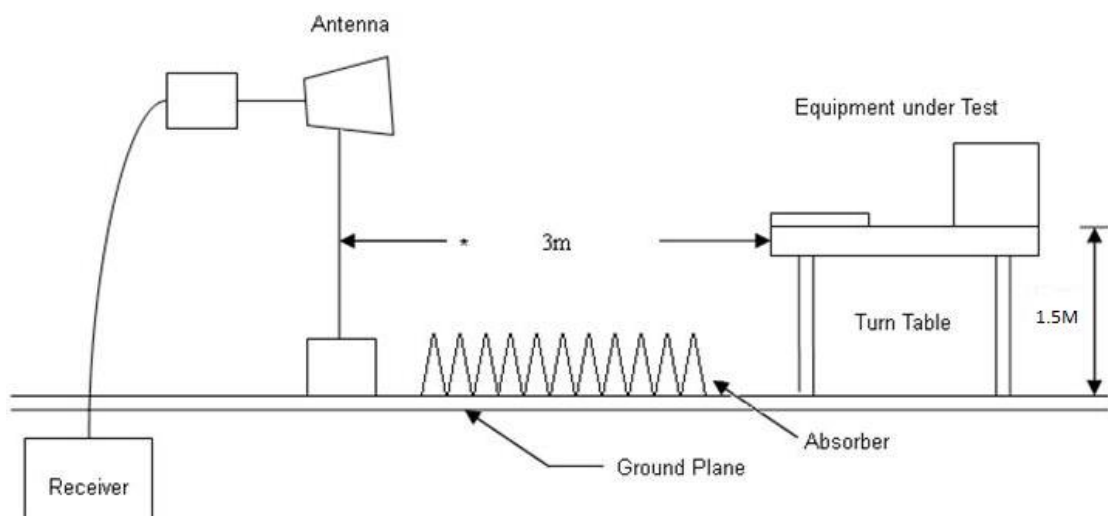
Below 30MHz test setup



30MHz- 1GHz Test Setup



Above 1GHz Test Setup

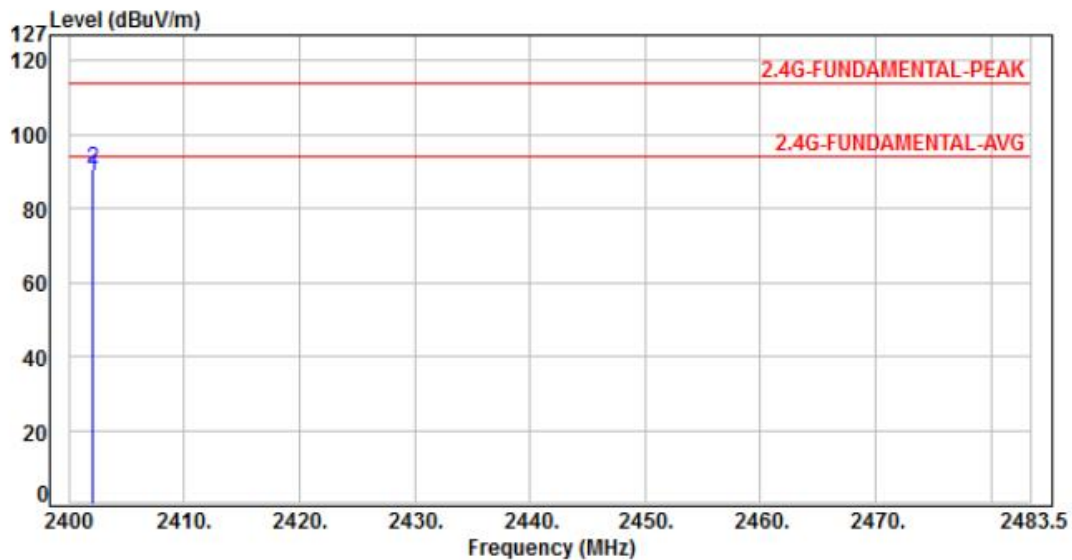




6.4 Test Result and Data

6.4.1 Test Result of Fundamental Emission

Power	: AC120V / 60Hz	Pol/Phase	: VERTICAL
Test Mode	: Mode 1, CH00		:



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2402.00	-18.17	106.92	88.75	94.00	-5.25	Average	100	146	P
2	2402.00	-18.17	108.77	90.60	114.00	-23.40	Peak	100	146	P

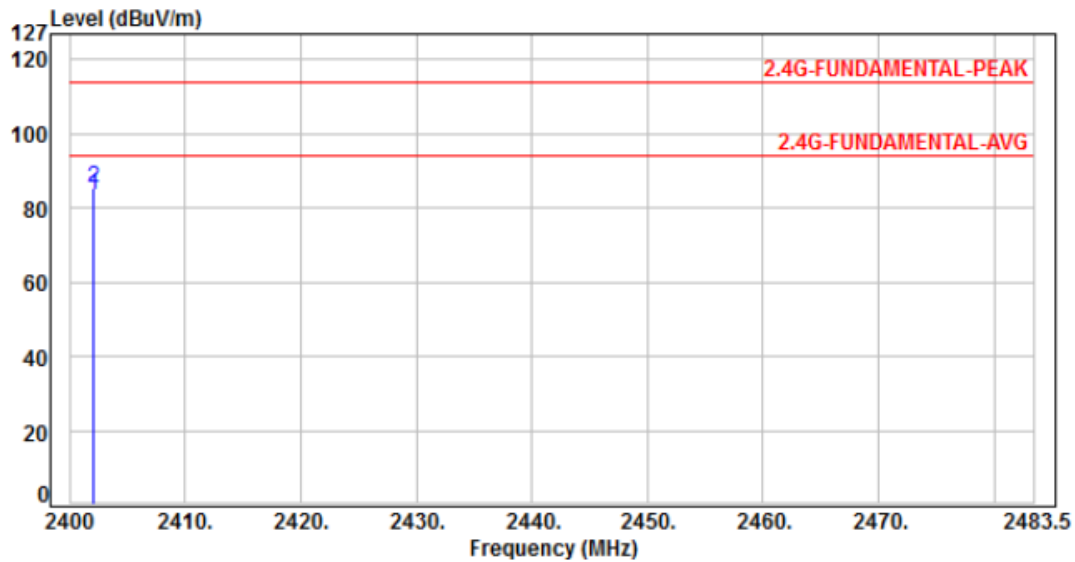
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	:	AC120V / 60Hz	Pol/Phase	:	HORIZONTAL
Test Mode	:	Mode 1, CH00		:	



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2402.00	-18.17	101.89	83.72	94.00	-10.28	Average	100	107	P
2	2402.00	-18.17	103.63	85.46	114.00	-28.54	Peak	100	107	P

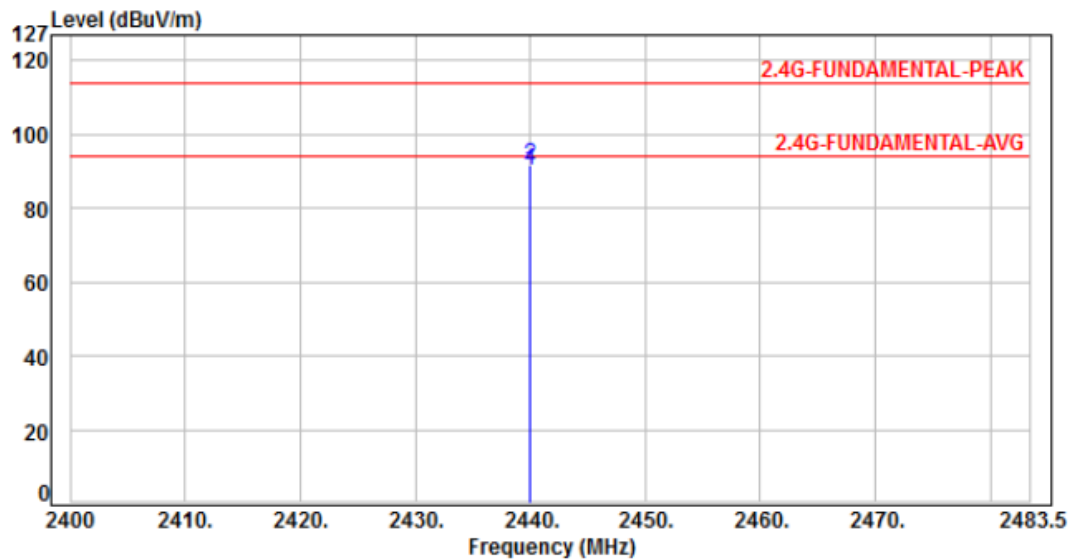
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	:	AC120V / 60Hz	Pol/Phase	:	VERTICAL
Test Mode	:	Mode 1, CH19		:	



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2440.00	-17.99	108.15	90.16	94.00	-3.84	Average	117	145	P
2	2440.00	-17.99	109.89	91.90	114.00	-22.10	Peak	117	145	P

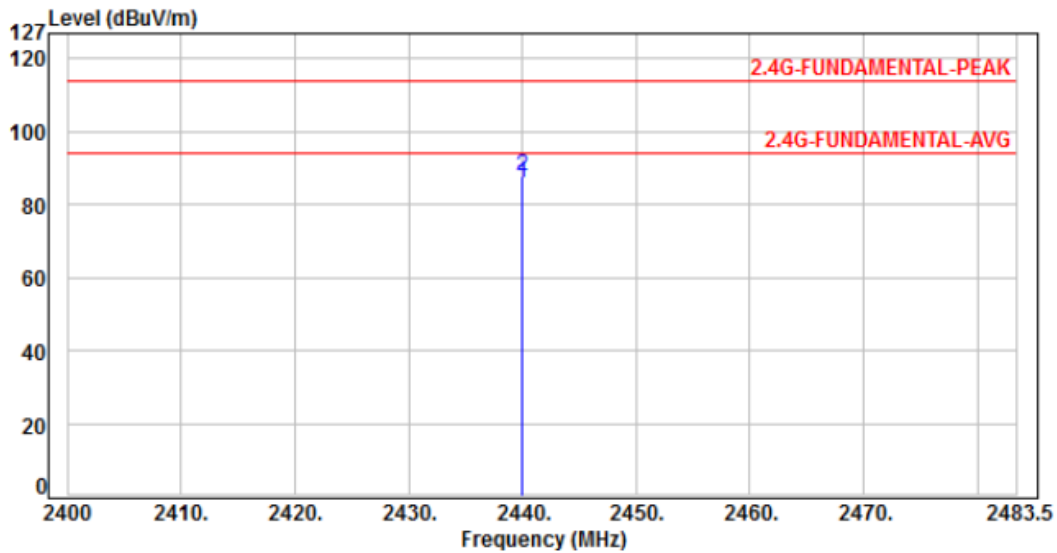
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	:	AC120V / 60Hz	Pol/Phase	:	HORIZONTAL
Test Mode	:	Mode 1, CH19		:	



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2440.00	-17.99	103.84	85.85	94.00	-8.15	Average	100	103	P
2	2440.00	-17.99	105.81	87.82	114.00	-26.18	Peak	100	103	P

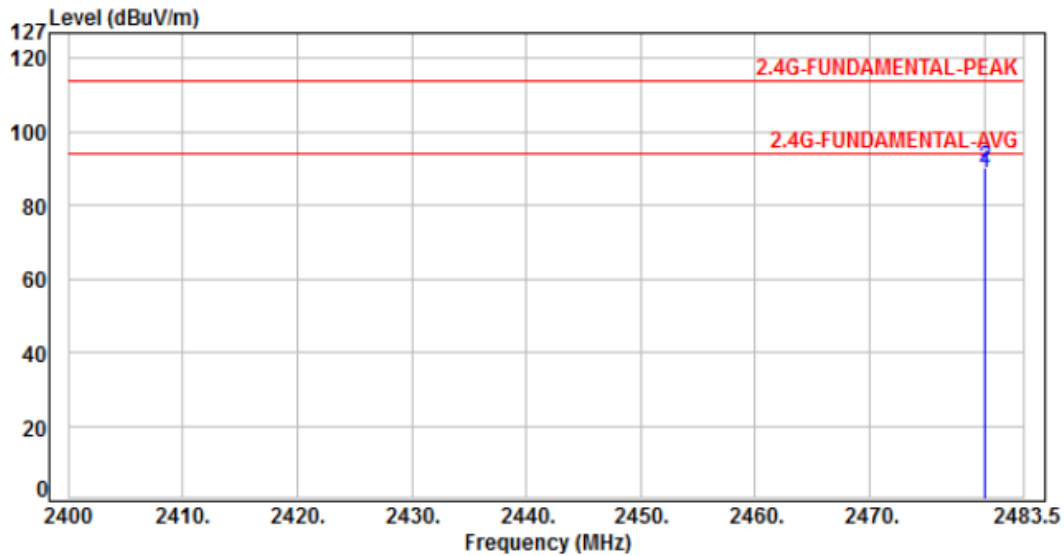
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	:	AC120V / 60Hz	Pol/Phase	:	VERTICAL
Test Mode	:	Mode 1, CH39		:	



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2480.00	-17.87	106.75	88.88	94.00	-5.12	Average	122	160	P
2	2480.00	-17.87	108.20	90.33	114.00	-23.67	Peak	122	160	P

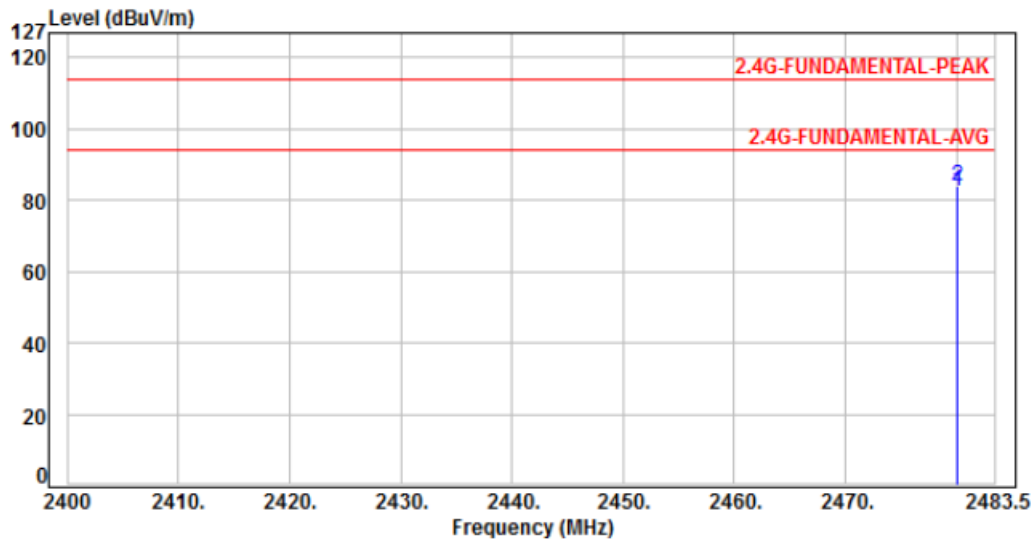
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	:	AC120V / 60Hz	Pol/Phase	:	HORIZONTAL
Test Mode	:	Mode 1,CH39		:	



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2480.00	-17.87	100.25	82.38	94.00	-11.62	Average	100	108	P
2	2480.00	-17.87	101.97	84.10	114.00	-29.90	Peak	100	108	P

Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor

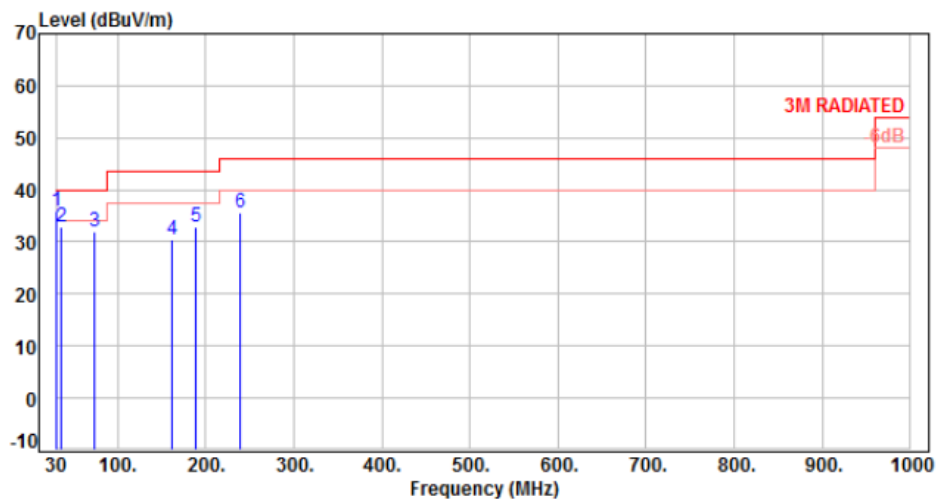


6.5 Test Result and Data (9kHz ~ 30MHz)

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

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

Power	:	AC120V / 60Hz	Pol/Phase	:	VERTICAL
Test Mode	:	Mode 1		:	



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	30.55	-10.54	46.39	35.85	40.00	-4.15	QP	100	290	P
2	36.39	-10.16	43.00	32.84	40.00	-7.16	QP	100	300	P
3	72.92	-12.12	44.09	31.97	40.00	-8.03	QP	100	360	P
4	160.95	-9.42	39.89	30.47	43.50	-13.03	Peak	400	0	P
5	189.08	-11.88	44.69	32.81	43.50	-10.69	Peak	400	0	P
6	238.55	-10.83	46.32	35.49	46.00	-10.51	Peak	400	0	P

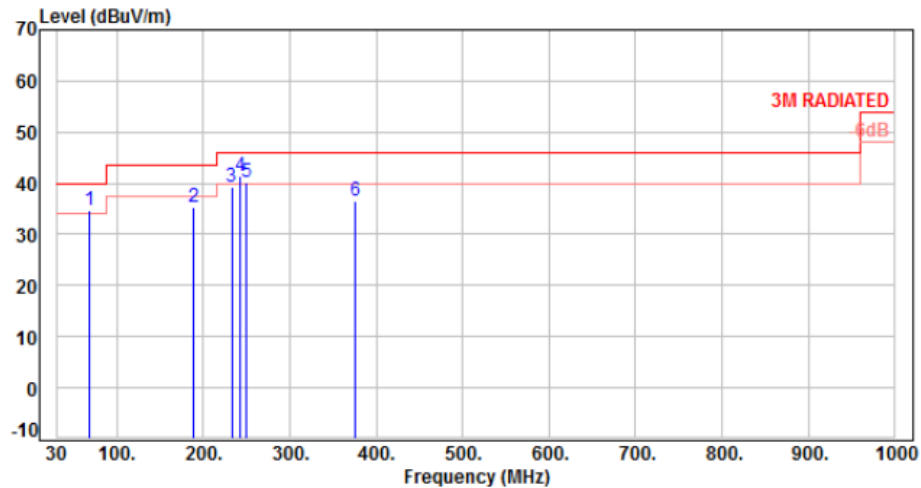
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC120V / 60Hz	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 1		:



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	67.83	-11.24	46.00	34.76	40.00	-5.24	Peak	100	0	P
2	189.08	-11.88	47.10	35.22	43.50	-8.28	Peak	100	0	P
3	232.73	-11.37	50.69	39.32	46.00	-6.68	Peak	100	0	P
4	243.40	-10.55	52.04	41.49	46.00	-4.51	Peak	100	0	P
5	249.22	-10.40	50.47	40.07	46.00	-5.93	Peak	100	0	P
6	375.32	-6.51	43.14	36.63	46.00	-9.37	Peak	100	0	P

Note: Level=Reading+Factor

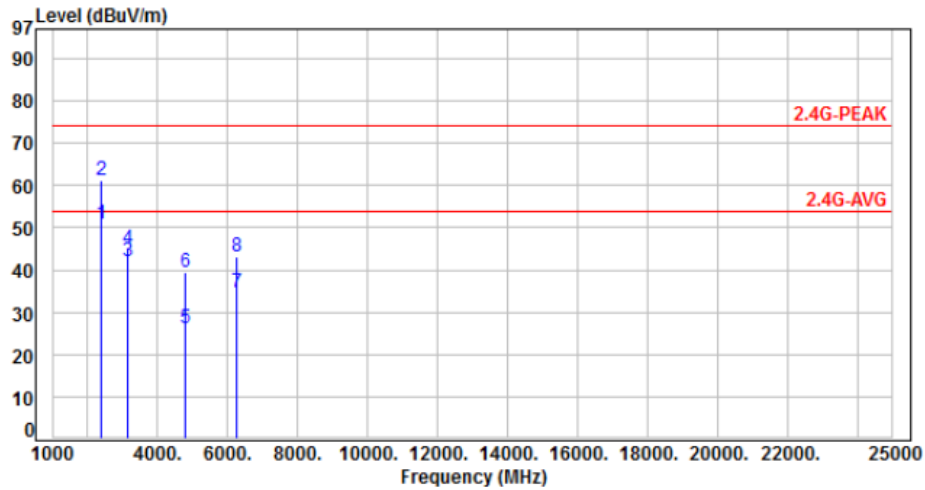
Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



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

Power	:	AC120V / 60Hz	Pol/Phase	:	VERTICAL
Test Mode	:	Mode 1, CH00		:	



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2400.00	-18.18	69.04	50.86	54.00	-3.14	Average	100	146	P
2	2400.00	-18.18	79.29	61.11	74.00	-12.89	Peak	100	146	P
3	3125.00	-15.20	57.40	42.20	54.00	-11.80	Average	124	173	P
4	3125.00	-15.20	60.33	45.13	74.00	-28.87	Peak	124	173	P
5	4804.00	-12.12	38.46	26.34	54.00	-27.66	Average	100	179	P
6	4804.00	-12.12	51.55	39.43	74.00	-34.57	Peak	100	179	P
7	6250.00	-10.46	45.24	34.78	54.00	-19.22	Average	266	166	P
8	6250.00	-10.46	53.79	43.33	74.00	-30.67	Peak	266	166	P

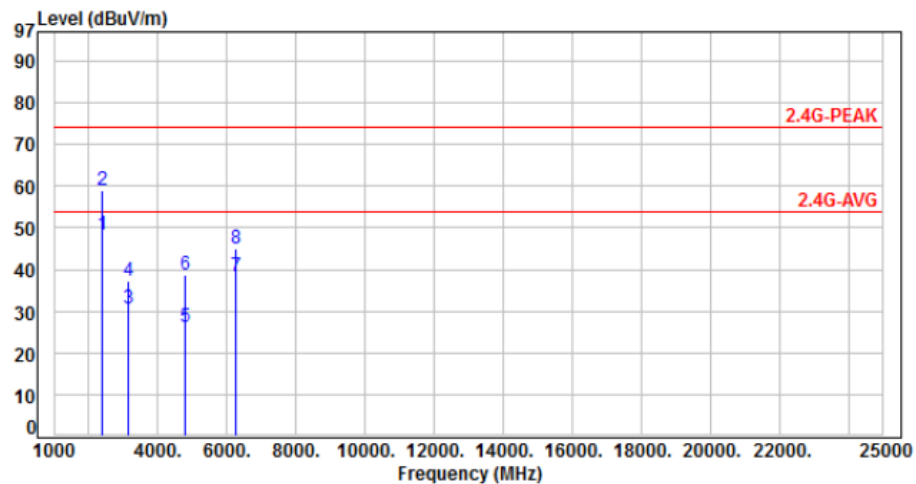
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC120V / 60Hz	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 1, CH00		:



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2400.00	-18.18	66.34	48.16	54.00	-5.84	Average	100	107	P
2	2400.00	-18.18	77.22	59.04	74.00	-14.96	Peak	100	107	P
3	3125.00	-15.20	45.84	30.64	54.00	-23.36	Average	100	116	P
4	3125.00	-15.20	52.53	37.33	74.00	-36.67	Peak	100	116	P
5	4804.00	-12.12	38.41	26.29	54.00	-27.71	Average	100	123	P
6	4804.00	-12.12	50.83	38.71	74.00	-35.29	Peak	100	123	P
7	6250.00	-10.46	48.90	38.44	54.00	-15.56	Average	113	339	P
8	6250.00	-10.46	55.63	45.17	74.00	-28.83	Peak	113	339	P

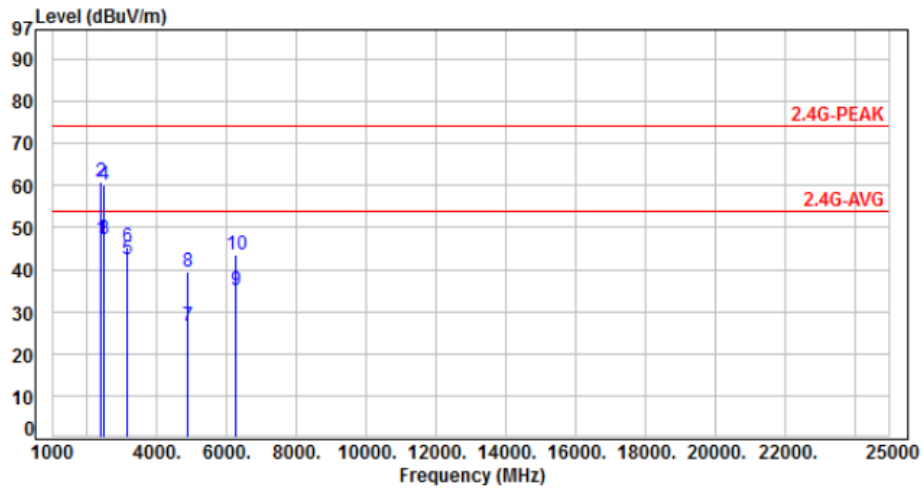
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC120V / 60Hz	Pol/Phase	: VERTICAL
Test Mode	: Mode 1, CH19		:

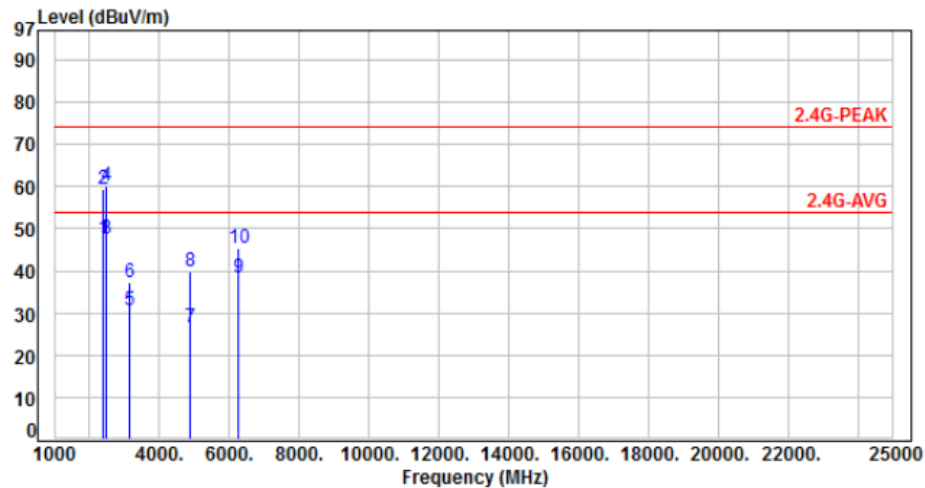


No.	Frequency (MHz)	Factor (dB)	Reading (dBUV)	Level (dBUV/m)	Limit (dBUV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2400.00	-18.18	65.34	47.16	54.00	-6.84	Average	117	145	P
2	2400.00	-18.18	78.91	60.73	74.00	-13.27	Peak	117	145	P
3	2483.50	-17.85	65.10	47.25	54.00	-6.75	Average	117	145	P
4	2483.50	-17.85	77.89	60.04	74.00	-13.96	Peak	117	145	P
5	3125.00	-15.20	57.46	42.26	54.00	-11.74	Average	122	174	P
6	3125.00	-15.20	60.47	45.27	74.00	-28.73	Peak	122	174	P
7	4880.00	-11.86	38.58	26.72	54.00	-27.28	Average	100	182	P
8	4880.00	-11.86	51.19	39.33	74.00	-34.67	Peak	100	182	P
9	6250.00	-10.46	45.31	34.85	54.00	-19.15	Average	263	169	P
10	6250.00	-10.46	53.86	43.40	74.00	-30.60	Peak	263	169	P

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



Power	: AC120V / 60Hz	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 1, CH19		:



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	2400.00	-18.18	65.75	47.57	54.00	-6.43	Average	100	103	P
2	2400.00	-18.18	77.52	59.34	74.00	-14.66	Peak	100	103	P
3	2483.50	-17.85	65.53	47.68	54.00	-6.32	Average	100	103	P
4	2483.50	-17.85	77.86	60.01	74.00	-13.99	Peak	100	103	P
5	3125.00	-15.20	45.79	30.59	54.00	-23.41	Average	100	123	P
6	3125.00	-15.20	52.31	37.11	74.00	-36.89	Peak	100	123	P
7	4880.00	-11.86	38.45	26.59	54.00	-27.41	Average	100	131	P
8	4880.00	-11.86	51.52	39.66	74.00	-34.34	Peak	100	131	P
9	6250.00	-10.46	48.77	38.31	54.00	-15.69	Average	112	341	P
10	6250.00	-10.46	55.70	45.24	74.00	-28.76	Peak	112	341	P

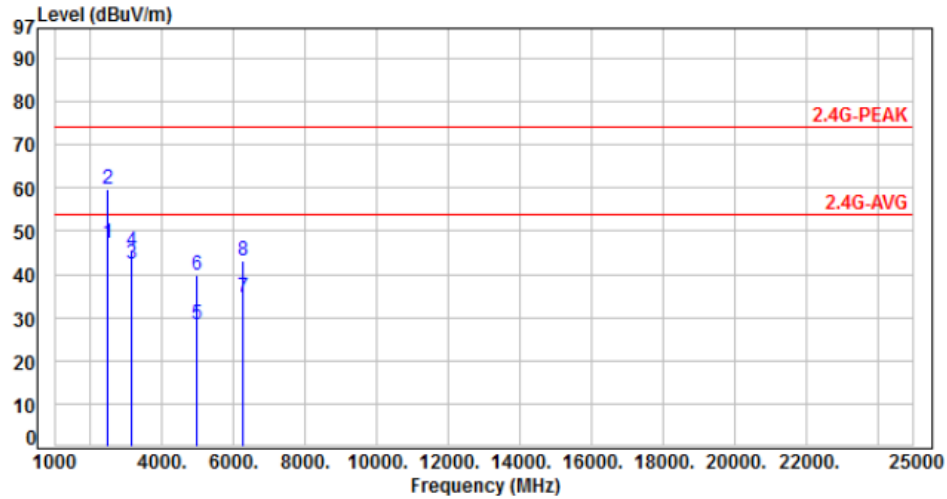
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC120V / 60Hz	Pol/Phase	: VERTICAL
Test Mode	: Mode 1, CH39		:



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	-17.85	65.14	47.29	54.00	-6.71	Average	122	160	P
2	2483.50	-17.85	77.48	59.63	74.00	-14.37	Peak	122	160	P
3	3125.00	-15.20	57.59	42.39	54.00	-11.61	Average	119	172	P
4	3125.00	-15.20	60.58	45.38	74.00	-28.62	Peak	119	172	P
5	4960.00	-11.68	39.92	28.24	54.00	-25.76	Average	171	168	P
6	4960.00	-11.68	51.64	39.96	74.00	-34.04	Peak	171	168	P
7	6250.00	-10.46	45.29	34.83	54.00	-19.17	Average	261	163	P
8	6250.00	-10.46	53.78	43.32	74.00	-30.68	Peak	261	163	P

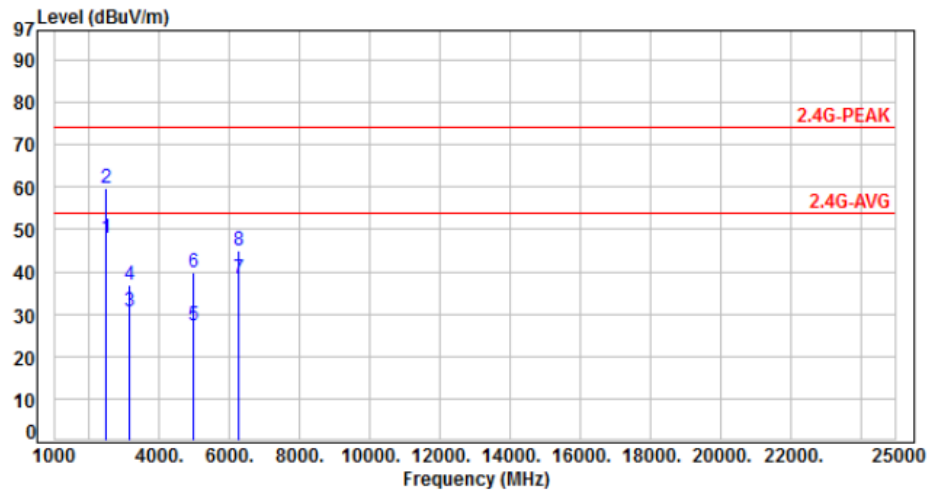
Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



Power	: AC120V / 60Hz	Pol/Phase	: HORIZONTAL
Test Mode	: Mode 1, CH39		:



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	-17.85	65.83	47.98	54.00	-6.02	Average	100	108	P
2	2483.50	-17.85	77.73	59.88	74.00	-14.12	Peak	100	108	P
3	3125.00	-15.20	45.71	30.51	54.00	-23.49	Average	100	121	P
4	3125.00	-15.20	52.24	37.04	74.00	-36.96	Peak	100	121	P
5	4960.00	-11.68	38.86	27.18	54.00	-26.82	Average	100	129	P
6	4960.00	-11.68	51.61	39.93	74.00	-34.07	Peak	100	129	P
7	6250.00	-10.46	48.69	38.23	54.00	-15.77	Average	114	339	P
8	6250.00	-10.46	55.61	45.15	74.00	-28.85	Peak	114	339	P

Note: Level=Reading+Factor

Margin=Level-Limit

Factor=Antenna Factor + cable loss - Amplifier Factor



6.8 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			

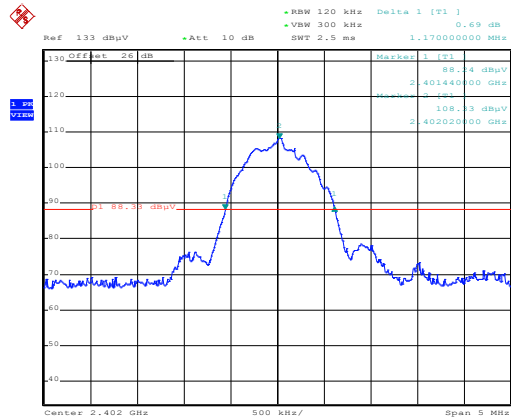
** : Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz

**6.9 20dB Bandwidth Measurement Data**

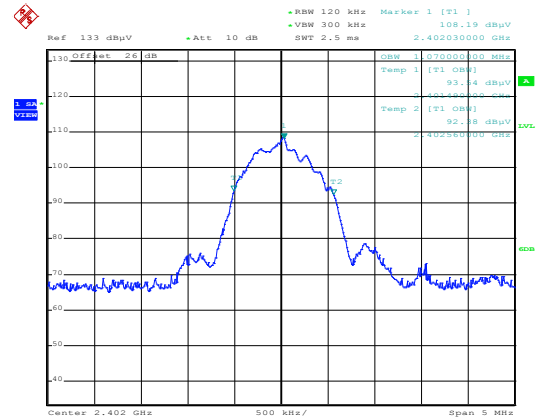
Frequency (MHz)	20dB Bandwidth (MHz)	99% Occupied BW(MHz)	Frequency range MHz (20dB Down) fL > 902 MHz	Frequency range MHz (20dB Down) fH < 928 MHz
2402.000	1.17	1.07	2401.4400	-
2440.000	1.16	1.08	-	-
2480.000	1.17	1.07	-	2480.6100



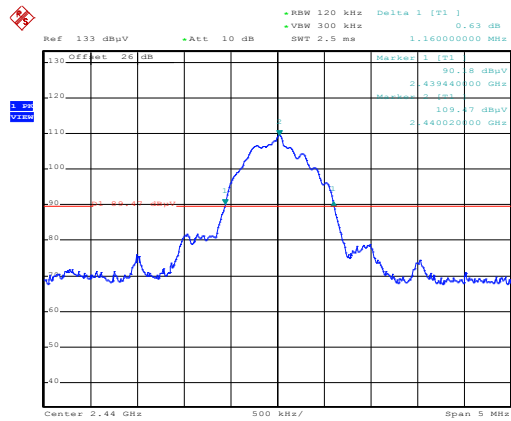
20dB Bandwidth
2402 MHz
CH00



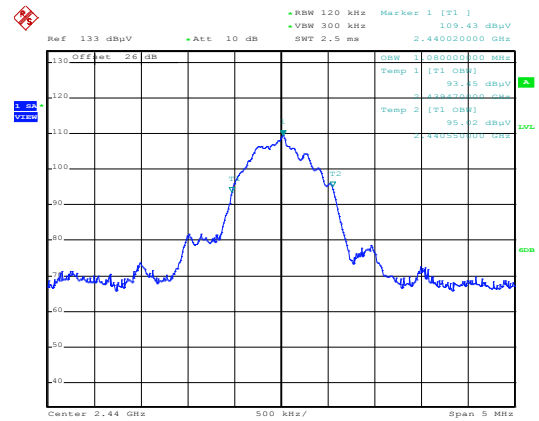
99% OBW
2402 MHz
CH00



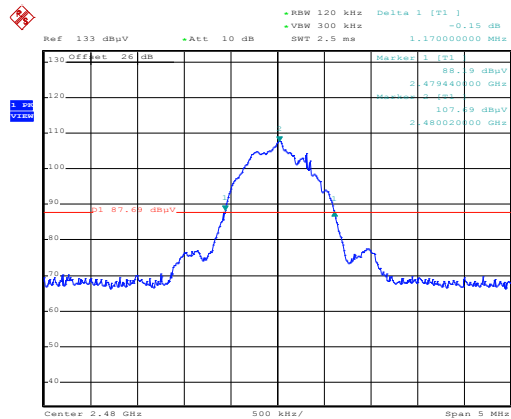
2440 MHz
CH19



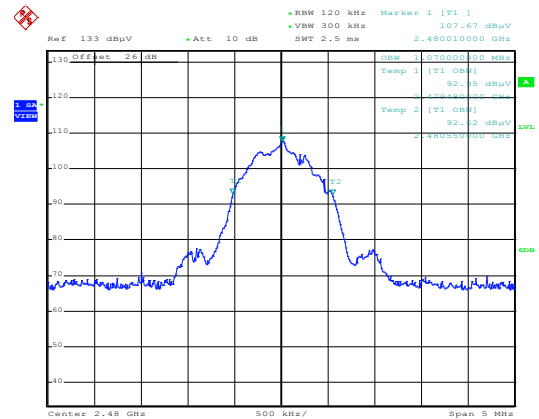
2440 MHz
CH19



2480 MHz
C39



2480 MHz
C39





7. Radio Frequency Exposure

7.1 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

7.2 EUT Specification

Frequency band (Operating)	2402MHz~2480MHz
Device category	☐ Portable (<20cm separation) ☒ Mobile (>20cm separation)
Exposure classification	☐ Occupational/Controlled exposure ☒ General Population/Uncontrolled exposure
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 Fundamental Emission is 91.9dBuV/m at 2440MHz (with 0dBi antenna gain.)
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.



7.3 Test Results

No non-compliance noted.

7.4 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

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

Where d = Distance in cm

P = Power in mW

G = Numeric antenna gain

S = Power density in mW / cm²

**7.5 Maximum Permissible Exposure**

Antenna Gain (dBi)	Antenna Gain (linear)	Test distance (m)	Fundamental Emission (dBuV/m)	Fundamental Emission (V/m)	Fundamental Power (W)	Fundamental Power (dBm)
0	1	3	91.9	0.039355	0.000464645	-3.328787

Max. Fundamental Power (dBm)	Antenna Gain(dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
-3.33	0	20	0.00009	1