

TEST REPORT

CERTIFICATE OF CONFORMITY

Standard: 47 CFR FCC Part 15, Subpart C (Section 15.247)
47 CFR FCC Part 15, Subpart E (Section 15.407)
47 CFR FCC Part 27
47 CFR FCC Part 2

Report No.: RFBCIC-WTW-P24100659-2 R1

FCC ID: U8G-P1MT01

Product: Peplink Pepwave Wireless Product

Brand:  **PEP WAVE**

Model No.: MAX BR1 Mini

Series Model: MAX-BR1-MINI-LTE-US-T-PRM, MAX-BR1-MINI-LTEA-US-T-PRM,
MAX-BR1-MINI-LTE-US-DC-T-PRM, MAX-BR1-MINI-LTEA-US-DC-T-PRM, AP One
Rugged, APO-AC-RUG
(refer to item 3.1 for more details)

Received Date: 2024/10/29

Test Date: 2024/11/21

Issued Date: 2024/12/23

Applicant: PISMO LABS TECHNOLOGY LIMITED

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Lin Kou Laboratories

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Test Location: No. 70, Wenming Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)

FCC Registration / 281270 / TW0032

Designation Number:

Approved by: _____

Jeremy Lin

, Date: _____

2024/12/23

Jeremy Lin / Project Engineer

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Prepared by : Lena Wang / Specialist



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Table of Contents

Release Control Record	3
1 Certificate.....	4
2 Summary of Test Results	5
2.1 Measurement Uncertainty	5
2.2 Supplementary Information	5
3 General Information	6
3.1 General Description of EUT	6
3.2 Antenna Description of EUT	7
3.3 Test Mode Applicability and Tested Channel Detail.....	8
3.4 Test Program Used and Operation Descriptions	9
3.5 Connection Diagram of EUT and Peripheral Devices	9
3.6 Configuration of Peripheral Devices and Cable Connections	10
4 Test Instruments	11
4.1 Unwanted Emissions below 1 GHz	11
4.2 Radiated Spurious Emissions below 1GHz.....	11
4.3 Unwanted Emissions above 1 GHz.....	12
4.4 Radiated Spurious Emissions above 1GHz	12
5 Limits of Test Items.....	13
5.1 Unwanted Emissions below 1 GHz	13
5.2 Radiated Spurious Emissions below 1GHz.....	13
5.3 Unwanted Emissions above 1 GHz.....	14
5.4 Radiated Spurious Emissions above 1GHz	15
6 Test Arrangements.....	16
6.1 Unwanted Emissions below 1 GHz	16
6.1.1 Test Setup	16
6.1.2 Test Procedure	17
6.2 Radiated Spurious Emissions below 1GHz.....	18
6.2.1 Test Setup	18
6.2.2 Test Procedure	19
6.3 Unwanted Emissions above 1 GHz.....	20
6.3.1 Test Setup	20
6.3.2 Test Procedure	20
6.4 Radiated Spurious Emissions above 1GHz	21
6.4.1 Test Setup	21
6.4.2 Test Procedure	21
7 Test Results of Test Item	22
7.1 Unwanted Emissions below 1 GHz	22
7.2 Radiated Spurious Emissions below 1GHz.....	30
7.3 Unwanted Emissions above 1 GHz.....	34
7.4 Radiated Spurious Emissions above 1GHz	42
8 Pictures of Test Arrangements	46
9 Information of the Testing Laboratories	47

Release Control Record

Issue No.	Description	Date Issued
RFBCIC-WTW-P24100659-2	Original release.	2024/12/11
RFBCIC-WTW-P24100659-2 R1	Revise LTE Band 43 antenna gain	2024/12/23

1 Certificate

Product: Peplink Pepwave Wireless Product

Brand: 

Test Model: MAX BR1 Mini

Series Model: MAX-BR1-MINI-LTE-US-T-PRM, MAX-BR1-MINI-LTEA-US-T-PRM,
MAX-BR1-MINI-LTE-US-DC-T-PRM, MAX-BR1-MINI-LTEA-US-DC-T-PRM, AP One Rugged,
APO-AC-RUG
(refer to item 3.1 for more details)

Sample Status: Engineering sample

Applicant: PISMO LABS TECHNOLOGY LIMITED

Test Date: 2024/11/21

Standard: 47 CFR FCC Part 15, Subpart C (Section 15.247)
47 CFR FCC Part 15, Subpart E (Section 15.407)
47 CFR FCC Part 27
47 CFR FCC Part 2

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's RF characteristics under the conditions specified in this report.

2 Summary of Test Results

Standard / Clause	Test Item	Result	Remark
15.205 /15.209 /15.247(d) 15.407(b)(9)	Unwanted Emissions below 1 GHz	Pass	Meet the requirement of limit.
Part 2.1053 Part 27.53(c) Part 27.53(h)	Radiated Spurious Emissions below 1GHz	Pass	Meet the requirement of limit.
15.205 /15.209 /15.247(d) 15.407(b) (1/2/3/4(i)/10)	Unwanted Emissions above 1 GHz	Pass	Meet the requirement of limit.
Part 2.1053 Part 27.53(c) Part 27.53(h)	Radiated Spurious Emissions above 1GHz	Pass	Meet the requirement of limit.

Note: Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Parameter	Specification	Uncertainty (±)
Radiated Spurious Emissions below 1GHz	9 kHz ~ 30 MHz	3 dB
	30 MHz ~ 1 GHz	2.93 dB
Radiated Spurious Emissions above 1GHz	1 GHz ~ 18 GHz	1.76 dB
	18 GHz ~ 40 GHz	1.77 dB

The other instruments specified are routine verified to remain within the calibrated levels, no measurement uncertainty is required to be calculated.

2.2 Supplementary Information

There is not any deviation from the test standards for the test method, and no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Peplink Pepwave Wireless Product	
Brand		
Test Model	MAX BR1 Mini	
Series Model	MAX-BR1-MINI-LTE-US-T-PRM, MAX-BR1-MINI-LTEA-US-T-PRM, MAX-BR1-MINI-LTE-US-DC-T-PRM, MAX-BR1-MINI-LTEA-US-DC-T-PRM, AP One Rugged, APO-AC-RUG	
Model Difference	Refer to Note as below	
Modulation Technology	WLAN	DSSS, OFDM
	WWAN	The EUT contains two certified WWAN modules: WWAN_1 Model name: EM7411 WWAN_2 Model name: EC25-AFXD (For detailed information about WWAN, please refer to FCC ID: N7NEM74B & FCC ID: XMR202008EC25AFXD).
Operating Frequency	WLAN	2412 ~ 2462 MHz 5180 ~ 5240 MHz 5745 ~ 5825 MHz
	WWAN	The EUT contains two certified WWAN modules: WWAN_1 Model name: EM7411 WWAN_2 Model name: EC25-AFXD (For detailed information about WWAN, please refer to FCC ID: N7NEM74B & FCC ID: XMR202008EC25AFXD).

Note:

1. All models are listed as below.

Brand	Model	Difference
	MAX BR1 Mini	The differences are only the model and market segmentation. (with Cellular & GPS feature)
	MAX-BR1-MINI-LTE-US-T-PRM	
	MAX-BR1-MINI-LTEA-US-T-PRM	
	MAX-BR1-MINI-LTE-US-DC-T-PRM	
	MAX-BR1-MINI-LTEA-US-DC-T-PRM	For marketing purpose (without Cellular & GPS feature)
	AP One Rugged	
	APO-AC-RUG	

2. The EUT uses following accessories.

Item	Brand	Model	AC Input	DC Output	DC Output Cable
Adapter	LEI	MU24D1120200-A1	100-240Vac 50/60Hz 0.7A	12Vdc 2.0A	Non-Shielded, 1.5m

3. There are WLAN (2.4 GHz/5 GHz) and WWAN (LTE) technology used for the EUT.

4. Simultaneously transmission combination.

Combination	Technology		
1	WLAN 2.4 GHz	WLAN 5 GHz	LTE (WWAN module: EM7411)
2	WLAN 2.4 GHz	WLAN 5 GHz	LTE (WWAN module: EC25-AFXD)

Note: The emission of the simultaneous operation has been evaluated and no non-compliance was found.

3.2 Antenna Description of EUT

1. The antenna information is listed as below.

The WLAN antenna information of EUT is listed as below.

Antenna NO.	RF Chain NO.	Brand	Model	Antenna Net Gain(dBi)	Frequency range	Antenna Type	Connector Type
WiFi_2-1 / WiFi_2-2 (Newly)	0/1	WIESON	ARY121-1976-001-00	2.25	2.4 GHz ~ 2.4835 GHz	Omni-directional	RP-SMA
				2.55	5.15 GHz ~ 5.25 GHz		
				3.36	5.725 GHz ~ 5.85 GHz		
WiFi_1-1 / WiFi_1-2 (Original)	0/1	YUAN CHEN	ACA-0040-6G1A1-A10	3.15	2.4 GHz ~ 2.4835 GHz	Omni-directional	RP-SMA
				3.29	5.15 GHz ~ 5.25 GHz		
				4.76	5.725 GHz ~ 5.85 GHz		

* Detail antenna specification please refer to antenna datasheet and/or antenna measurement report.

The WWAN antenna information of EUT is listed as below.

Antenna NO.	RF Chain NO.	Brand	Model	Antenna Net Gain(dBi)	Frequency range	Antenna Type	Connector Type
WWAN_2-1 / WWAN_2-2 (Newly)	0/1	peplink PEPWAVE	04-410188-00	1.65	1850~1910MHz	Omni-directional	SMA
				1.71	1710~1755MHz		
				1.62	824~849 MHz		
				3.12	2500~2570MHz		
				0.65	699~716MHz		
				0.11	777~787MHz		
				0.64	788~798MHz		
				1.65	1850~1915MHz		
				1.62	814~849MHz		
				-4.5	2305~2315MHz		
				1.5	2570~2620MHz		
					2496~2690MHz		
				-8.5	3400~3600MHz		
				-1.5	3600~3800MHz		
				-5.5	3550~3700MHz		
				1.71	1710~1780 MHz		
				1.49	663 to 698MHz		
WWAN_1-1 / WWAN_1-2 (original)	0/1	INPAQ	DAM-D13-S1-N0-000-08-20	3.87	1850~1910MHz	Omni-directional	SMA
				4.03	1710~1755MHz		
				2.94	824~849MHz		
				2.66	2500~2570 MHz		
				3.44	698~716MHz		
				3.78	777~787MHz		
				3.78	788~798MHz		
				3.87	1850~1915 MHz		
				2.94	814~849 MHz		
				2.77	2496~2690 MHz		
				-1.95	3400~3600 MHz		
				-1.9	3600~3800 MHz		
				-1.95	3550~3700 MHz		
				4.03	1710 ~1780 MHz		
				3.44	663~698MHz		

* Detail antenna specification please refer to antenna datasheet and/or antenna measurement report.

3.3 Test Mode Applicability and Tested Channel Detail

Pre-Scan:	1. EUT has the following operations/ usages: 10Vdc from Terminal Block / 30Vdc from Terminal Block / 12Vdc from Adapter / POE. Pre-scan these operations/ usages and find the worst case as a representative test condition. 2. EUT has the following operations/ usages: eSIM_1 WP68-M002C-MFOCMW / eSIM_2 MFXS-M006b-MFOCMW. Pre-scan these operations/ usages and find the worst case as a representative test condition. 3. EUT can be used in the following ways: Lying/ Wall Mount. Pre-scan these ways and find the worst case as a representative test condition. 4. Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
Worst Case:	1. 10Vdc from Terminal Block / 30Vdc from Terminal Block / 12Vdc from Adapter / POE Worst Condition: 12Vdc from Adapter 2. eSIM_1 WP68-M002C-MFOCMW / eSIM_2 MFXS-M006b-MFOCMW Worst Condition: eSIM_1 WP68-M002C-MFOCMW 3. Lying/ Wall Mount Worst Condition: Wall Mount

Following channel(s) was (were) selected for the final test as listed below:

Test Item	EUT Configure Mode	Combination	Mode	Tested Channel
Unwanted Emissions below 1 GHz	A	1	802.11g	6
			802.11a	157
	B	2	802.11g	6
			802.11a	157
Radiated Spurious Emissions below 1GHz	A	1	LTE B13 10MHz	5230(751 MHz)
	B	2	LTE B4 20MHz	20175(1732.5 MHz)
Unwanted Emissions above 1 GHz	A	1	802.11g	6
			802.11a	157
	B	2	802.11g	6
			802.11a	157
Radiated Spurious Emissions above 1GHz	A	1	LTE B13 10MHz	5230 (751 MHz)
	B	2	LTE B4 20MHz	20175(1732.5 MHz)
EUT Configure Mode:	A	EUT with WWAN module: EM7411 with the below antennas: WiFi antennas: ACA-0040-6G1A1-A10 WWAN antennas: DAM-D13-S1-N0-000-08-20		
	B	EUT with WWAN module: EC25-AFXD with the below antennas: WiFi antennas: ACA-0040-6G1A1-A10 WWAN antennas: DAM-D13-S1-N0-000-08-20		

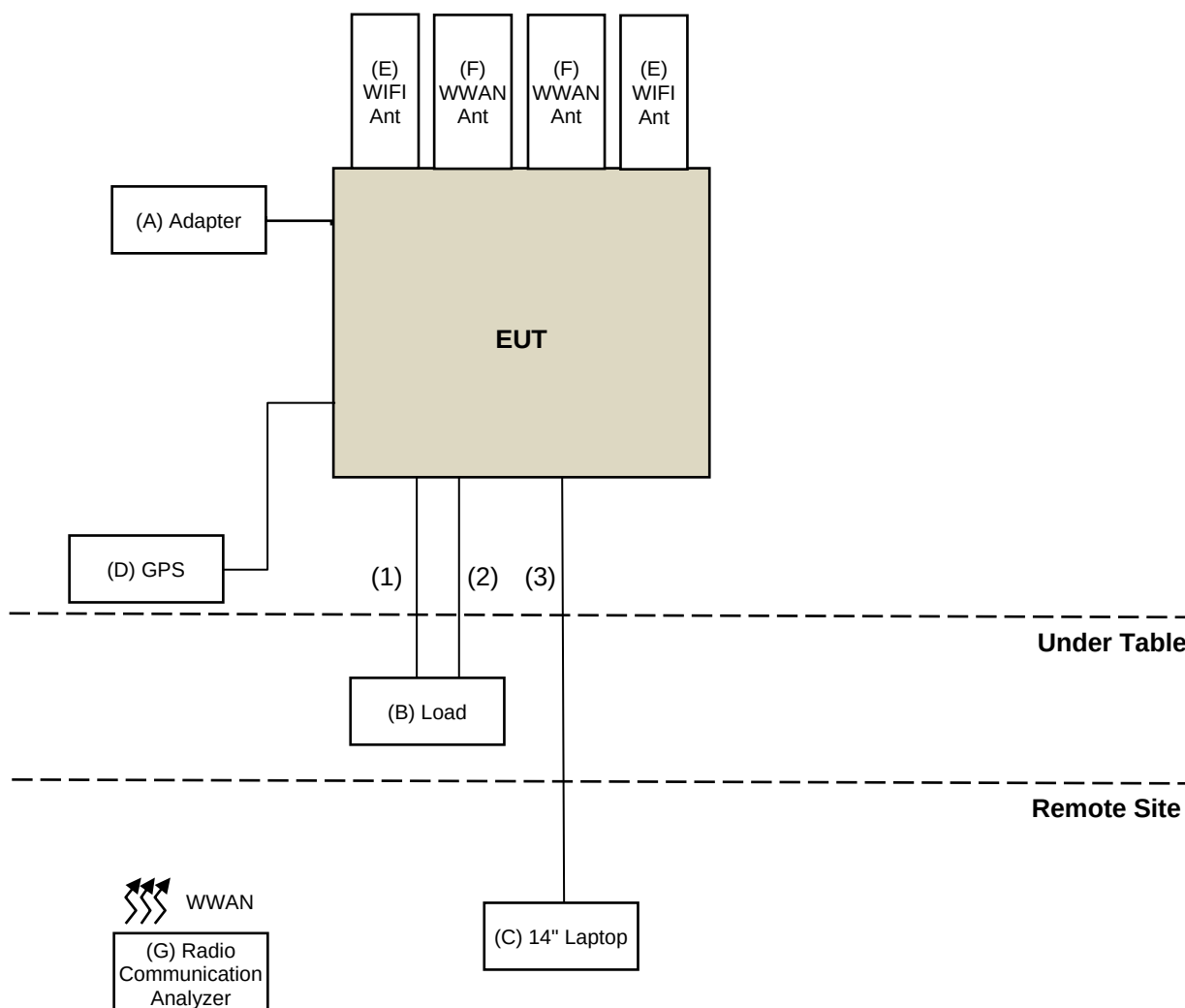
Note:

- The above evaluation models and related information are based on the original WiFi certification report and the information provided by the manufacturer.
- After evaluation, the WiFi/WWAN antennas was used with the highest gain as the representative antenna for testing.

3.4 Test Program Used and Operation Descriptions

Controlling software WWAN: EUT link Simulator, WIFI: QA Tx tool has been activated to set the EUT under transmission condition continuously at specific channel frequency.

3.5 Connection Diagram of EUT and Peripheral Devices



3.6 Configuration of Peripheral Devices and Cable Connections

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A	Adapter	LEI	MU24D1120200-A1	N/A	N/A	Accessory of the EUT
B	Load	N/A	N/A	N/A	N/A	Provided by Lab
C	14" Laptop	Lenovo	L440	R9-0GFJKK	N/A	Supplied by applicant (for RF Setup)
D	GPS	YUAN CHEN TECH CO., LTD	A400-00001-01	N/A	N/A	Supplied by applicant
E	WIFI ANT	YUAN CHEN	ACA-0040-6G1A1- A10	N/A	N/A	Supplied by applicant
F	WWAN ANT	INPAQ	DAM-D13-S1-N0- 000-08-20	N/A	N/A	Supplied by applicant
G	Radio Communication Analyzer	Anritsu	MT8821C	6201462755	N/A	Provided by Lab (for RF Setup)

ID	Cable Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1	RJ-45 Cable	1	1.5	N	0	Provided by Lab
2	RJ-45 Cable	1	1.5	N	0	Provided by Lab
3	RJ-45 Cable	1	10	N	0	Provided by Lab

4 Test Instruments

The calibration interval of the all test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.1 Unwanted Emissions below 1 GHz

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Antenna Tower Max-Full	MFA-515BSN	N/A	N/A	N/A
Bi_Log Antenna Schwarzbeck	VULB 9168	9168-1214	2024/10/15	2025/10/14
EXA Signal Analyzer Agilent	N9010A	MY52220207	2023/12/28	2024/12/27
Loop Antenna TESEQ	HLA 6121	45745	2024/8/21	2025/8/20
MXE EMI Receiver Agilent	N9038A	MY52260177	2024/9/19	2025/9/18
Preamplifier EMCI	EMC330N	980798	2024/1/15	2025/1/14
	EMC001340	980201	2024/9/24	2025/9/23
RF Coaxial Cable EMCI	EMCCFD400-NM-NM-500	201248	2024/1/15	2025/1/14
	EMCCFD400-NM-NM-3000	201249	2024/1/15	2025/1/14
	EMCCFD400-NM-NM-9000	201251(with PAD)	2024/1/15	2025/1/14
Software BV ADT	ADT_Radiated_ V7.6.15.9.5	N/A	N/A	N/A
Turn Table Max-Full	MFT-201SS	N/A	N/A	N/A
Turn Table Controller Max-Full	MF-7802BS	MF780208676	N/A	N/A

Notes:

1. The test was performed in WM - 966 chamber 9.
2. Tested Date: 2024/11/21

4.2 Radiated Spurious Emissions below 1GHz

Refer to section 4.1 to get the tested date and information of the instruments.

4.3 Unwanted Emissions above 1 GHz

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Antenna Tower Max-Full	MFA-515BSN	N/A	N/A	N/A
EXA Signal Analyzer Agilent	N9010A	MY52220207	2023/12/28	2024/12/27
Horn Antenna RFSPIN	DRH18-E	210104A18E	2024/11/10	2025/11/9
Horn Antenna Schwarzbeck	BBHA 9170	9170-1049	2024/11/10	2025/11/9
MXE EMI Receiver Agilent	N9038A	MY52260177	2024/9/19	2025/9/18
Preamplifier Agilent	83017A	MY39501357	2024/6/12	2025/6/11
Preamplifier EMCI	EMC184045SE	980788	2024/1/15	2025/1/14
RF Coaxial Cable EMCI	EMC101G-KM-KM-2000	201254	2024/1/15	2025/1/14
	EMC101G-KM-KM-3000	201258	2024/1/15	2025/1/14
	EMC101G-KM-KM-5000	201261	2024/1/15	2025/1/14
	EMC104-SM-SM-1000	210103	2024/1/15	2025/1/14
	EMC104-SM-SM-3000	201241	2024/1/15	2025/1/14
	EMC104-SM-SM-9000	201244	2024/1/15	2025/1/14
Software BV ADT	ADT_Radiated_ V7.6.15.9.5	N/A	N/A	N/A
Turn Table Max-Full	MFT-201SS	N/A	N/A	N/A
Turn Table Controller Max-Full	MF-7802BS	MF780208676	N/A	N/A

Notes:

1. The test was performed in WM - 966 chamber 9.
2. Tested Date: 2024/11/21

4.4 Radiated Spurious Emissions above 1GHz

Refer to section 4.3 to get the tested date and information of the instruments.

5 Limits of Test Items

5.1 Unwanted Emissions below 1 GHz

For FCC 15.247:

Frequencies (MHz)	Field Strength (microvolts/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

Notes:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).

For FCC 15.407:

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table.

Frequencies (MHz)	Field Strength (microvolts/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

Notes:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).

5.2 Radiated Spurious Emissions below 1GHz

For LTE Band 13:

According to FCC 27.53(c)(2), for on any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least $43 + 10 \log (P)$ dB. The limit of emissions is equal to -13 dBm.

For operations in the 775-788 MHz, emissions in the band 1559-1610 MHz shall be limited to -70 dBW/MHz (EIRP). The limit of emissions is equal to -40 dBm.

For LTE Band 4:

According to FCC 27.53(h), for operations in the 1695-1710MHz, 1710-1755MHz, 1755-1780 MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log (P)$ dB.

5.3 Unwanted Emissions above 1 GHz

For FCC 15.247:

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
Above 960	500	3

Notes:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000 MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20 dB under any condition of modulation.

For FCC 15.407 transmitters operating in the 5.150-5.850 GHz band:

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table.

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
Above 960	500	3

Notes:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000 MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20 dB under any condition of modulation.

Limits of unwanted emission out of the restricted bands

Applicable To	Limit	
789033 D02 General UNII Test Procedure New Rules v02r01	Field Strength at 3 m	
	PK: 74 (dBμV/m)	AV: 54 (dBμV/m)

Applicable To	EIRP Limit	Equivalent Field Strength at 3 m
15.407(b)(1)	PK: -27 (dBm/MHz)	PK: 68.2 (dBμV/m) *
15.407(b)(2)	PK: -27 (dBm/MHz)	PK: 68.2 (dBμV/m) *
15.407(b)(3)	PK: -27 (dBm/MHz)	PK: 68.2 (dBμV/m) *
15.407(b)(4)(i)	PK: -27 (dBm/MHz) ^{*1} PK: 10 (dBm/MHz) ^{*2} PK: 15.6 (dBm/MHz) ^{*3} PK: 27 (dBm/MHz) ^{*4}	PK: 68.2 (dBμV/m) ^{*1} PK: 105.2 (dBμV/m) ^{*2} PK: 110.8 (dBμV/m) ^{*3} PK: 122.2 (dBμV/m) ^{*4}

^{*1} beyond 75 MHz or more above of the band edge.

^{*2} below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above.

^{*3} below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above.

^{*4} from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

Note: The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength:

$$E = \frac{1000000\sqrt{30P}}{3} \mu\text{V/m, where P is the eirp (Watts).}$$

5.4 Radiated Spurious Emissions above 1GHz

For LTE Band 13:

According to FCC 27.53(c)(2), for on any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least $43 + 10 \log (P)$ dB. The limit of emissions is equal to -13 dBm.

For operations in the 775-788 MHz, emissions in the band 1559-1610 MHz shall be limited to -70 dBW/MHz (EIRP). The limit of emissions is equal to -40 dBm.

For LTE Band 4:

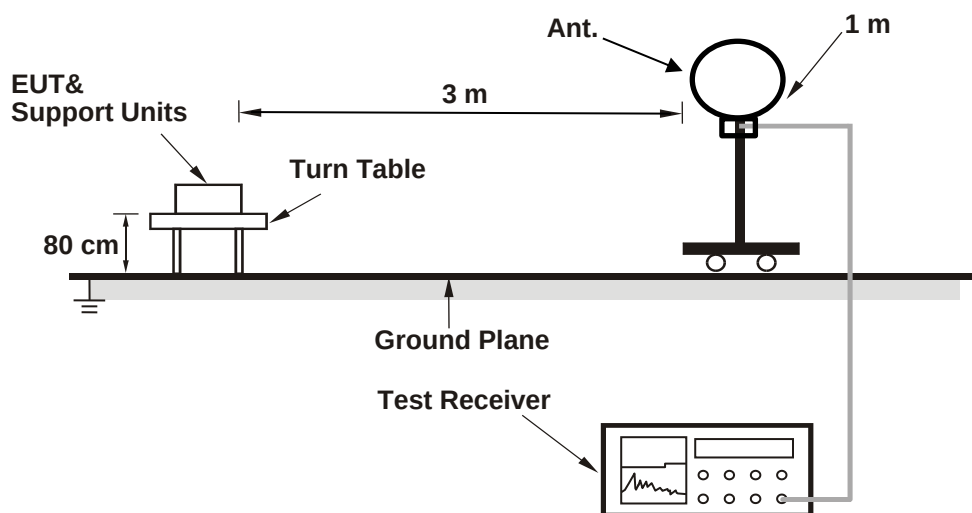
According to FCC 27.53(h), for operations in the 1695-1710MHz, 1710-1755MHz, 1755-1780 MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log (P)$ dB.

6 Test Arrangements

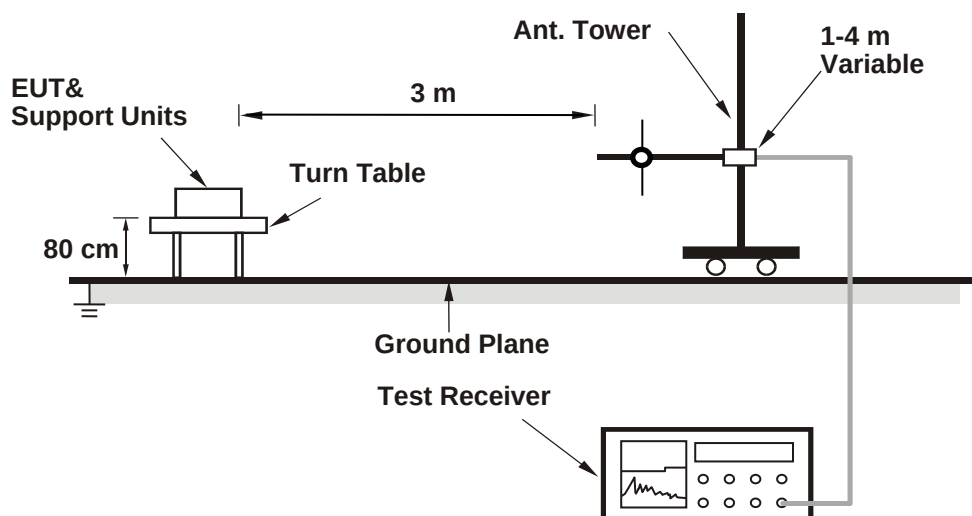
6.1 Unwanted Emissions below 1 GHz

6.1.1 Test Setup

For Radiated emission below 30 MHz



For Radiated emission above 30 MHz



For the actual test configuration, please refer to the attached file (Test Setup Photo).

6.1.2 Test Procedure

For Radiated emission below 30 MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode, except for the frequency band (9 kHz to 90 kHz and 110 kHz to 490 kHz) set to average detect function and peak detect function.

Notes:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 200 Hz at frequency below 150 kHz.
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9 kHz or 10 kHz at frequency (150 kHz to 30 MHz).
3. All modes of operation were investigated and the worst-case emissions are reported.

For Radiated emission above 30 MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.

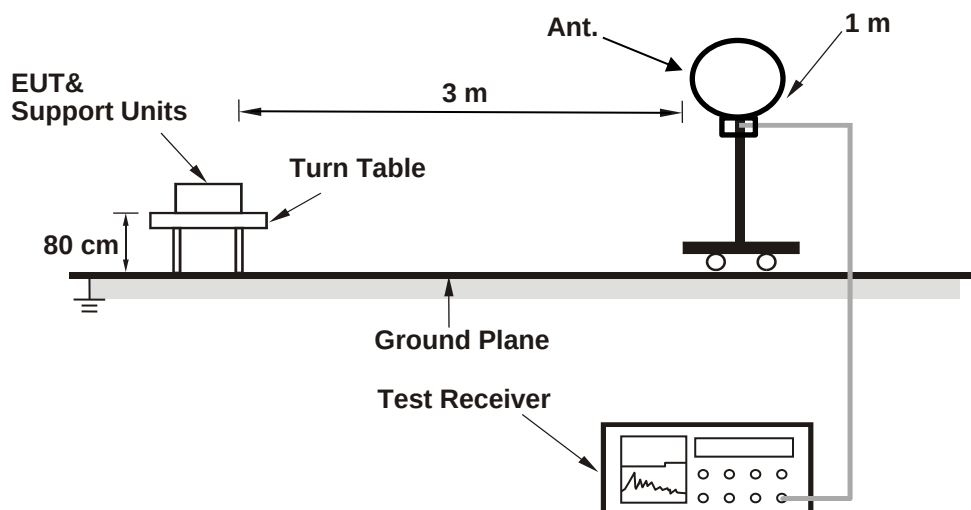
Notes:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection (QP) at frequency below 1 GHz.
2. All modes of operation were investigated and the worst-case emissions are reported.

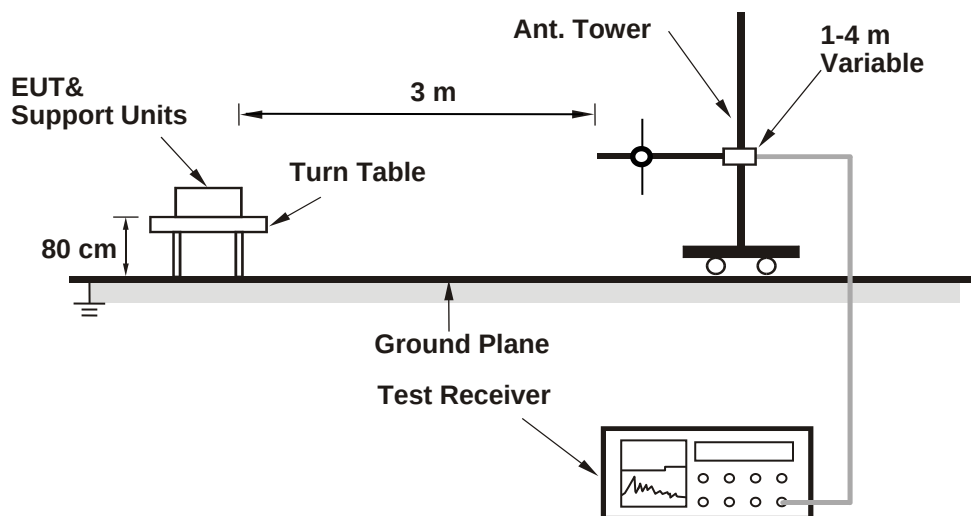
6.2 Radiated Spurious Emissions below 1GHz

6.2.1 Test Setup

For Radiated emission below 30 MHz



For Radiated emission above 30 MHz



For the actual test configuration, please refer to the attached file (Test Setup Photo).

6.2.2 Test Procedure

The EUT is configured to set data modulation and maximum power using WWAN technology.

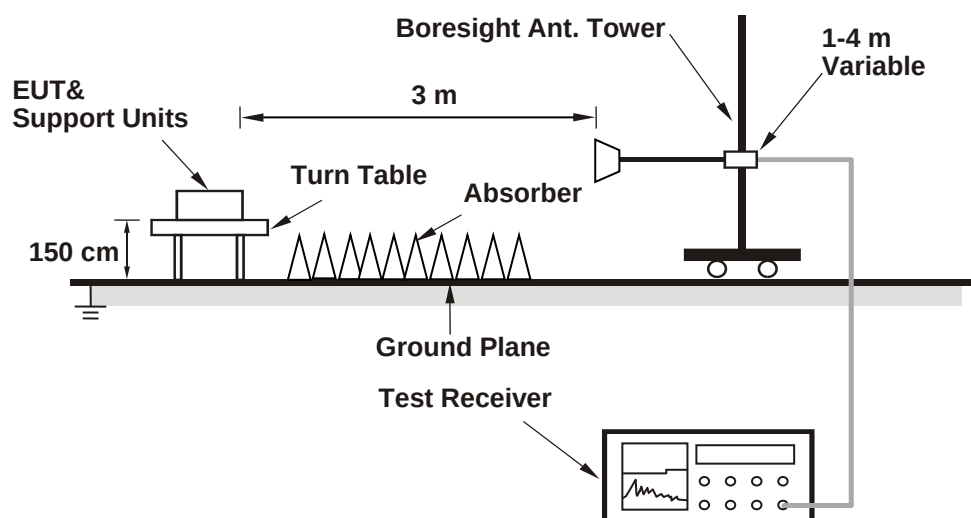
- a. In the semi-anechoic chamber, EUT placed on the 0.8 m (below or equal 1 GHz) height of turn table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1 m to 4 m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.
- b. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- c. Perform a field strength measurement and record the worse read value, is the field strength value via a spectrum reading obtained corrected for antenna factor, cable loss and pre-amplifier factor and then mathematically convert the measured field strength level to EIRP/ERP level.
- d. Following ANSI C63.26 section 5.5 and 5.2.7
- e. $EIRP (dBm) = E (dB\mu V/m) + 20\log(D) - 104.8$; where D is the measurement distance (in the far field region) in m.
- f. $ERP (dBm) = E (dB\mu V/m) + 20\log(D) - 104.8 - 2.15$; where D is the measurement distance (in the far field region) in m.

Note:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz/3 MHz. Set detector = average.
2. The amplitude of spurious emissions in the range 9 kHz to 30 MHz which are attenuated more than 20 dB below the permissible value need not be reported.

6.3 Unwanted Emissions above 1 GHz

6.3.1 Test Setup



For the actual test configuration, please refer to the attached file (Test Setup Photo).

6.3.2 Test Procedure

- The EUT was placed on the top of a rotating table 1.5 meters above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to peak and average detects function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

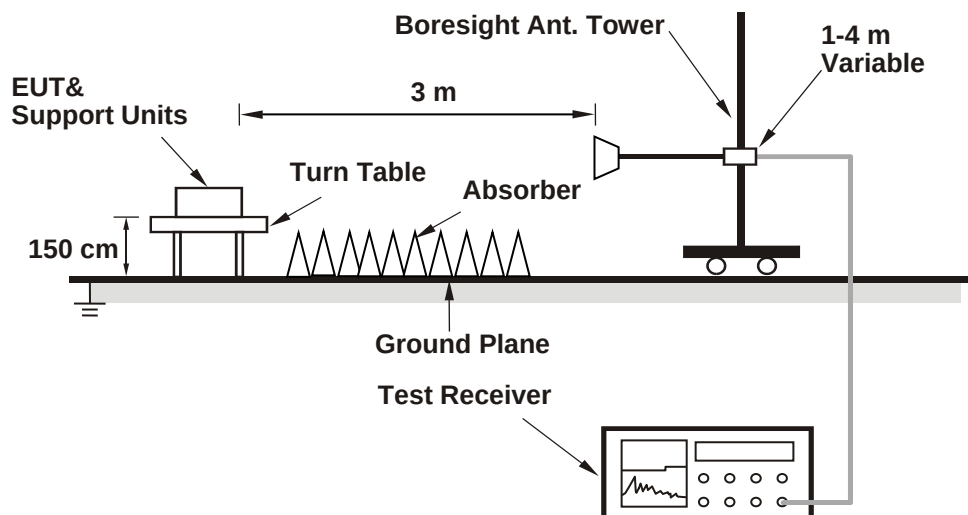
Notes:

- The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) and Average detection (AV) at frequency above 1 GHz.
- For fundamental and harmonic signal measurement, the resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is $\geq 1/T$ (Duty cycle $< 98\%$) or 10 Hz (Duty cycle $\geq 98\%$) for Average detection (AV) at frequency above 1 GHz.
- All modes of operation were investigated and the worst-case emissions are reported.

6.4 Radiated Spurious Emissions above 1GHz

6.4.1 Test Setup

For radiated emission above 1 GHz



For the actual test configuration, please refer to the attached file (Test Setup Photo).

6.4.2 Test Procedure

The EUT is configured to set data modulation and maximum power using WWAN technology.

- In the semi-anechoic chamber, EUT placed on the 1.5 m height of turn table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1 m to 4 m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.
- The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- Perform a field strength measurement and record the worse read value, is the field strength value via a spectrum reading obtained corrected for antenna factor, cable loss and pre-amplifier factor and then mathematically convert the measured field strength level to EIRP/ERP level.
- Following ANSI C63.26 section 5.5 and 5.2.7
- $EIRP \text{ (dBm)} = E \text{ (dB}\mu\text{V/m)} + 20\log(D) - 104.8$; where D is the measurement distance (in the far field region) in m.
- $ERP \text{ (dBm)} = E \text{ (dB}\mu\text{V/m)} + 20\log(D) - 104.8 - 2.15$; where D is the measurement distance (in the far field region) in m.

Note: The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz/3 MHz. Set detector = average.

7 Test Results of Test Item

7.1 Unwanted Emissions below 1 GHz

Mode A

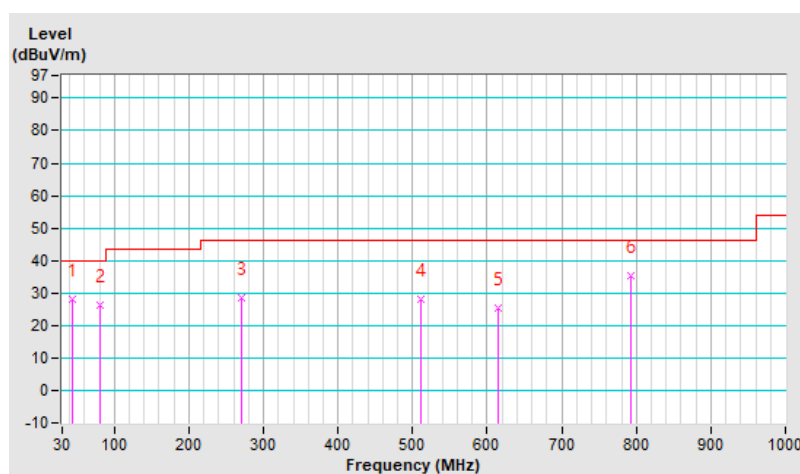
FCC 15.247

Combination	1		
Frequency Range	30 MHz ~ 1 GHz	Detector Function & Bandwidth	QP: RB=120kHz, DET=Quasi-Peak
Input Power	120 Vac, 60 Hz	Environmental Conditions	21 °C, 69 % RH
Tested By	Edison Lee		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	43.58	28.3 QP	40.0	-11.7	1.50 H	14	41.5	-13.2
2	80.44	26.4 QP	40.0	-13.6	1.00 H	234	44.5	-18.1
3	269.59	28.5 QP	46.0	-17.5	2.00 H	163	41.8	-13.3
4	510.15	27.9 QP	46.0	-18.1	1.00 H	42	35.2	-7.3
5	614.91	25.5 QP	46.0	-20.5	1.50 H	26	30.4	-4.9
6	792.42	35.5 QP	46.0	-10.5	1.00 H	174	37.6	-2.1

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30 MHz ~ 1 GHz.
5. The frequency range 9 kHz ~ 30 MHz: all emissions are more than 20 dB below the limit, therefore do not be recorded in this report.

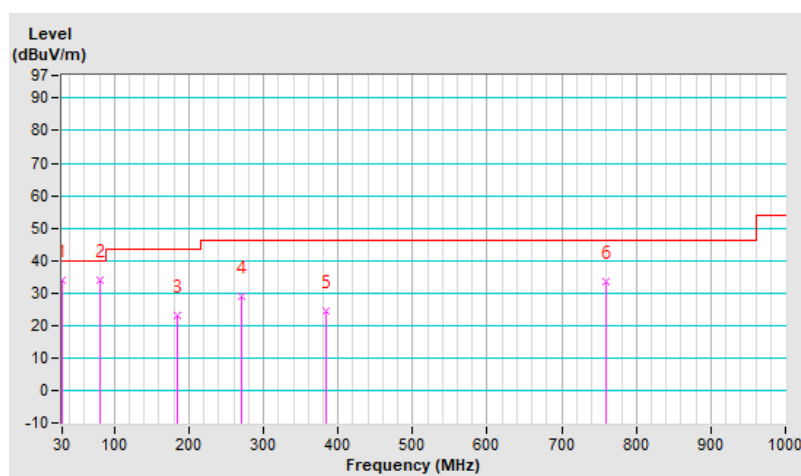


Combination	1		
Frequency Range	30 MHz ~ 1 GHz	Detector Function & Bandwidth	QP: RB=120kHz, DET=Quasi-Peak
Input Power	120 Vac, 60 Hz	Environmental Conditions	21 °C, 69 % RH
Tested By	Edison Lee		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	30	34.0 QP	40.0	-6.0	1.00 V	4	48.2	-14.2
2	80.44	34.2 QP	40.0	-5.8	1.50 V	357	52.3	-18.1
3	185.2	23.0 QP	43.5	-20.5	2.00 V	334	38.3	-15.3
4	269.59	29.1 QP	46.0	-16.9	1.00 V	277	42.4	-13.3
5	384.05	24.4 QP	46.0	-21.6	2.00 V	200	34.6	-10.2
6	759.44	33.7 QP	46.0	-12.3	1.00 V	2	36.2	-2.5

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30 MHz ~ 1 GHz.
5. The frequency range 9 kHz ~ 30 MHz: all emissions are more than 20 dB below the limit, therefore do not be recorded in this report.



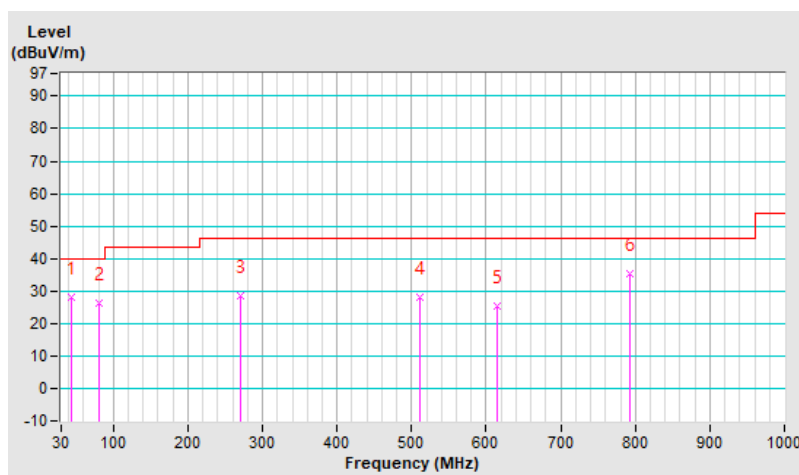
FCC 15.407

Combination	1		
Frequency Range	30 MHz ~ 1 GHz	Detector Function & Bandwidth	QP: RB=120kHz, DET=Quasi-Peak
Input Power	120 Vac, 60 Hz	Environmental Conditions	21 °C, 69 % RH
Tested By	Edison Lee		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	43.58	28.3 QP	40.0	-11.7	1.50 H	14	41.5	-13.2
2	80.44	26.4 QP	40.0	-13.6	1.00 H	234	44.5	-18.1
3	269.59	28.5 QP	46.0	-17.5	2.00 H	163	41.8	-13.3
4	510.15	27.9 QP	46.0	-18.1	1.00 H	42	35.2	-7.3
5	614.91	25.5 QP	46.0	-20.5	1.50 H	26	30.4	-4.9
6	792.42	35.5 QP	46.0	-10.5	1.00 H	174	37.6	-2.1

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30 MHz ~ 1 GHz.
5. The frequency range 9 kHz ~ 30 MHz: all emissions are more than 20 dB below the limit, therefore do not be recorded in this report.

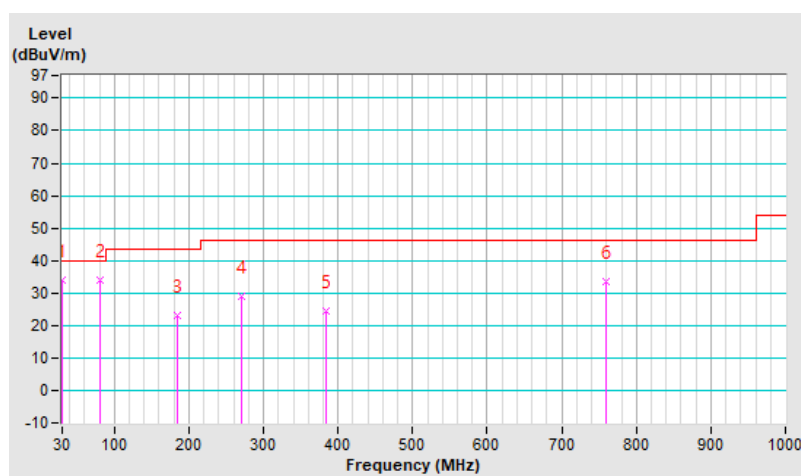


Combination	1		
Frequency Range	30 MHz ~ 1 GHz	Detector Function & Bandwidth	QP: RB=120kHz, DET=Quasi-Peak
Input Power	120 Vac, 60 Hz	Environmental Conditions	21 °C, 69 % RH
Tested By	Edison Lee		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	30	34.0 QP	40.0	-6.0	1.00 V	4	48.2	-14.2
2	80.44	34.2 QP	40.0	-5.8	1.50 V	357	52.3	-18.1
3	185.2	23.0 QP	43.5	-20.5	2.00 V	334	38.3	-15.3
4	269.59	29.1 QP	46.0	-16.9	1.00 V	277	42.4	-13.3
5	384.05	24.4 QP	46.0	-21.6	2.00 V	200	34.6	-10.2
6	759.44	33.7 QP	46.0	-12.3	1.00 V	2	36.2	-2.5

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30 MHz ~ 1 GHz.
5. The frequency range 9 kHz ~ 30 MHz: all emissions are more than 20 dB below the limit, therefore do not be recorded in this report.



Mode B

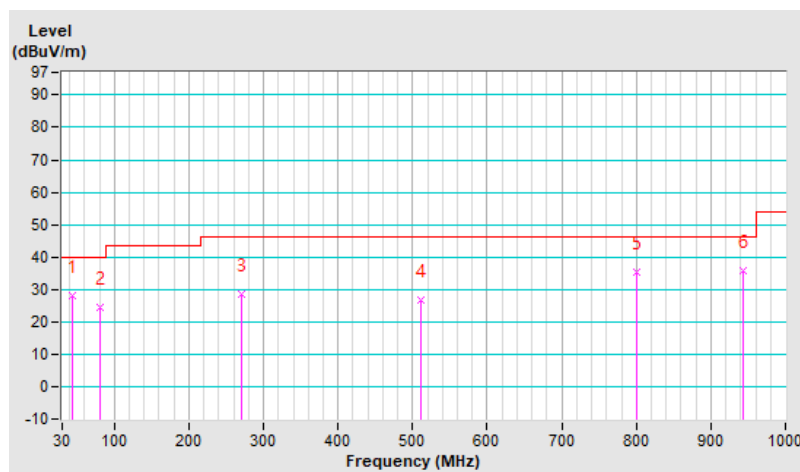
FCC 15.247

Combination	2		
Frequency Range	30 MHz ~ 1 GHz	Detector Function & Bandwidth	QP: RB=120kHz, DET=Quasi-Peak
Input Power	120 Vac, 60 Hz	Environmental Conditions	21 °C, 69 % RH
Tested By	Edison Lee		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	43.58	28.1 QP	40.0	-11.9	1.50 H	73	41.3	-13.2
2	80.44	24.3 QP	40.0	-15.7	1.00 H	309	42.4	-18.1
3	269.59	28.5 QP	46.0	-17.5	1.50 H	156	41.8	-13.3
4	510.15	26.9 QP	46.0	-19.1	1.00 H	10	34.2	-7.3
5	801.15	35.5 QP	46.0	-10.5	2.00 H	222	37.5	-2.0
6	943.74	36.0 QP	46.0	-10.0	2.00 H	2	35.9	0.1

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30 MHz ~ 1 GHz.
5. The frequency range 9 kHz ~ 30 MHz: all emissions are more than 20 dB below the limit, therefore do not be recorded in this report.

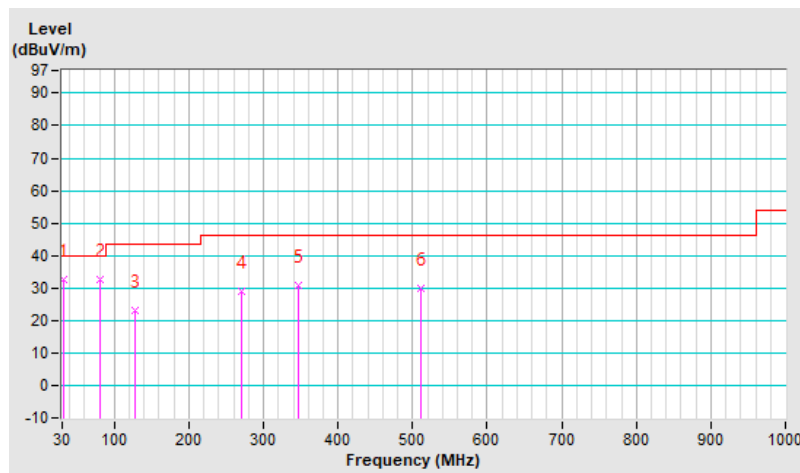


Combination	2		
Frequency Range	30 MHz ~ 1 GHz	Detector Function & Bandwidth	QP: RB=120kHz, DET=Quasi-Peak
Input Power	120 Vac, 60 Hz	Environmental Conditions	21 °C, 69 % RH
Tested By	Edison Lee		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	31.94	32.6 QP	40.0	-7.4	1.00 V	90	46.8	-14.2
2	80.44	32.8 QP	40.0	-7.2	2.00 V	87	50.9	-18.1
3	127	23.3 QP	43.5	-20.2	1.00 V	321	37.9	-14.6
4	269.59	28.8 QP	46.0	-17.2	1.00 V	269	42.1	-13.3
5	347.19	31.0 QP	46.0	-15.0	1.50 V	233	42.3	-11.3
6	510.15	30.0 QP	46.0	-16.0	2.00 V	19	37.3	-7.3

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30 MHz ~ 1 GHz.
5. The frequency range 9 kHz ~ 30 MHz: all emissions are more than 20 dB below the limit, therefore do not be recorded in this report.



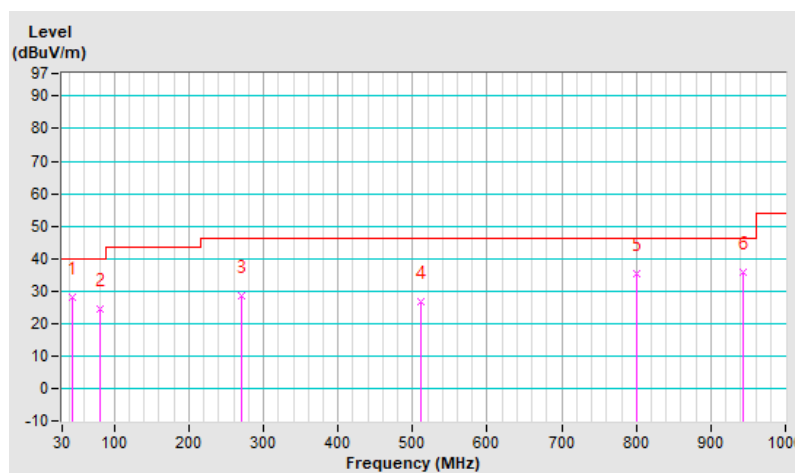
FCC 15.407

Combination	2		
Frequency Range	30 MHz ~ 1 GHz	Detector Function & Bandwidth	QP: RB=120kHz, DET=Quasi-Peak
Input Power	120 Vac, 60 Hz	Environmental Conditions	21 °C, 69 % RH
Tested By	Edison Lee		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	43.58	28.1 QP	40.0	-11.9	1.50 H	73	41.3	-13.2
2	80.44	24.3 QP	40.0	-15.7	1.00 H	309	42.4	-18.1
3	269.59	28.5 QP	46.0	-17.5	1.50 H	156	41.8	-13.3
4	510.15	26.9 QP	46.0	-19.1	1.00 H	10	34.2	-7.3
5	801.15	35.5 QP	46.0	-10.5	2.00 H	222	37.5	-2.0
6	943.74	36.0 QP	46.0	-10.0	2.00 H	2	35.9	0.1

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30 MHz ~ 1 GHz.
5. The frequency range 9 kHz ~ 30 MHz: all emissions are more than 20 dB below the limit, therefore do not be recorded in this report.

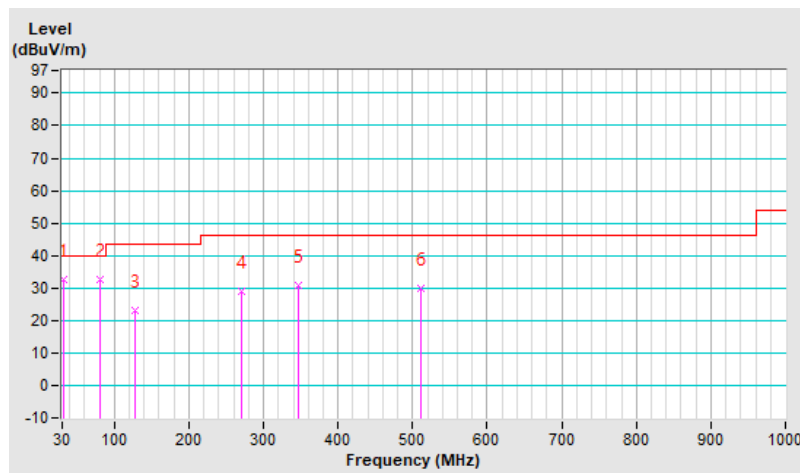


Combination	2		
Frequency Range	30 MHz ~ 1 GHz	Detector Function & Bandwidth	QP: RB=120kHz, DET=Quasi-Peak
Input Power	120 Vac, 60 Hz	Environmental Conditions	21 °C, 69 % RH
Tested By	Edison Lee		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	31.94	32.6 QP	40.0	-7.4	1.00 V	90	46.8	-14.2
2	80.44	32.8 QP	40.0	-7.2	2.00 V	87	50.9	-18.1
3	127	23.3 QP	43.5	-20.2	1.00 V	321	37.9	-14.6
4	269.59	28.8 QP	46.0	-17.2	1.00 V	269	42.1	-13.3
5	347.19	31.0 QP	46.0	-15.0	1.50 V	233	42.3	-11.3
6	510.15	30.0 QP	46.0	-16.0	2.00 V	19	37.3	-7.3

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30 MHz ~ 1 GHz.
5. The frequency range 9 kHz ~ 30 MHz: all emissions are more than 20 dB below the limit, therefore do not be recorded in this report.



7.2 Radiated Spurious Emissions below 1GHz

Mode A

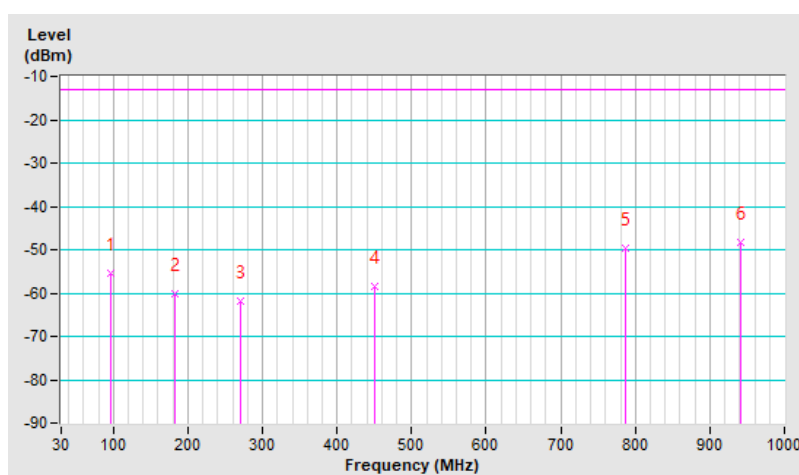
FCC Part 27

Combination	1		
Frequency Range	30 MHz ~ 1 GHz	Detector Function & Bandwidth	1 MHz/3 MHz (RMS)
Input Power	120 Vac, 60 Hz	Environmental Conditions	21 °C, 69 % RH
Tested By	Edison Lee		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	95.96	-55.46	-13.00	-42.46	1.50 H	224	60.25	-115.71
2	182.29	-60.29	-13.00	-47.29	1.00 H	254	51.99	-112.28
3	270.56	-62.00	-13.00	-49.00	1.50 H	142	48.69	-110.69
4	450.98	-58.47	-13.00	-45.47	1.00 H	221	47.22	-105.69
5	786.6	-49.50	-13.00	-36.50	2.00 H	74	49.89	-99.39
6	941.8	-48.30	-13.00	-35.30	1.00 H	176	49.05	-97.35

Remarks:

1. $ERP(dBm) = Raw\ Value(dBuV) + Correction\ Factor(dB/m)$
2. $Correction\ Factor(dB/m) = Antenna\ Factor(dB/m) + Cable\ Factor(dB) - Pre-Amplifier\ Factor(dB) + 20\log(D) - 104.8 - 2.15$
3. $Margin\ value = ERP - Limit\ value$
4. The other ERP levels were very low against the limit of frequency range 30 MHz ~ 1 GHz.
5. The frequency range 9 kHz ~ 30 MHz: all emissions are more than 20 dB below the limit, therefore do not be recorded in this report.

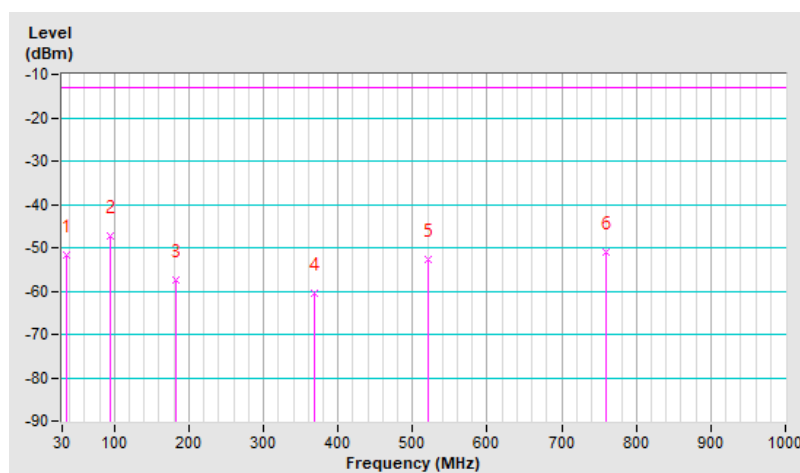


Combination	1		
Frequency Range	30 MHz ~ 1 GHz	Detector Function & Bandwidth	1 MHz/3 MHz (RMS)
Input Power	120 Vac, 60 Hz	Environmental Conditions	21 °C, 69 % RH
Tested By	Edison Lee		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	36.79	-51.67	-13.00	-38.67	2.00 V	190	59.59	-111.26
2	94.99	-47.21	-13.00	-34.21	1.00 V	282	68.60	-115.81
3	182.29	-57.29	-13.00	-44.29	1.00 V	299	54.99	-112.28
4	368.53	-60.52	-13.00	-47.52	1.50 V	229	47.62	-108.14
5	520.82	-52.61	-13.00	-39.61	1.00 V	12	51.89	-104.50
6	760.41	-51.05	-13.00	-38.05	1.50 V	12	48.82	-99.87

Remarks:

1. $ERP(dBm) = Raw\ Value(dBuV) + Correction\ Factor(dB/m)$
2. $Correction\ Factor(dB/m) = Antenna\ Factor(dB/m) + Cable\ Factor(dB) - Pre-Amplifier\ Factor(dB) + 20\log(D) - 104.8 - 2.15$
3. $Margin\ value = ERP - Limit\ value$
4. The other ERP levels were very low against the limit of frequency range 30 MHz ~ 1 GHz.
5. The frequency range 9 kHz ~ 30 MHz: all emissions are more than 20 dB below the limit, therefore do not be recorded in this report.



Mode B

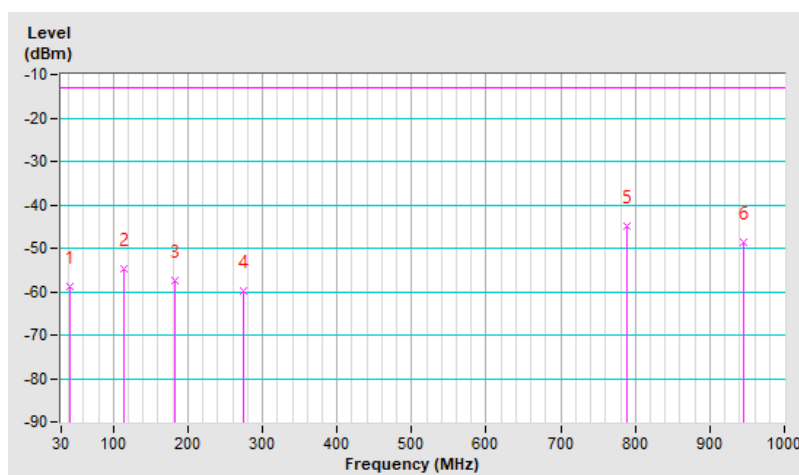
FCC Part 27

Combination	2		
Frequency Range	30 MHz ~ 1 GHz	Detector Function & Bandwidth	1 MHz/3 MHz (RMS)
Input Power	120 Vac, 60 Hz	Environmental Conditions	21 °C, 69 % RH
Tested By	Edison Lee		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	42.61	-58.76	-13.00	-45.76	2.00 H	4	49.75	-108.51
2	114.39	-54.62	-13.00	-41.62	1.00 H	249	56.40	-111.02
3	182.29	-57.60	-13.00	-44.60	1.50 H	242	52.53	-110.13
4	275.41	-59.94	-13.00	-46.94	1.00 H	157	48.37	-108.31
5	789.51	-44.85	-13.00	-31.85	1.50 H	180	52.45	-97.30
6	945.68	-48.73	-13.00	-35.73	1.00 H	42	46.39	-95.12

Remarks:

1. $EIRP(dBm) = Raw\ Value(dBuV) + Correction\ Factor(dB/m)$
2. $Correction\ Factor(dB/m) = Antenna\ Factor(dB/m) + Cable\ Factor(dB) - Pre-Amplifier\ Factor(dB) + 20\log(D) - 104.8$
3. $Margin\ value = EIRP - Limit\ value$
4. The other EIRP levels were very low against the limit of frequency range 30 MHz ~ 1 GHz.
5. The frequency range 9 kHz ~ 30 MHz: all emissions are more than 20 dB below the limit, therefore do not be recorded in this report.

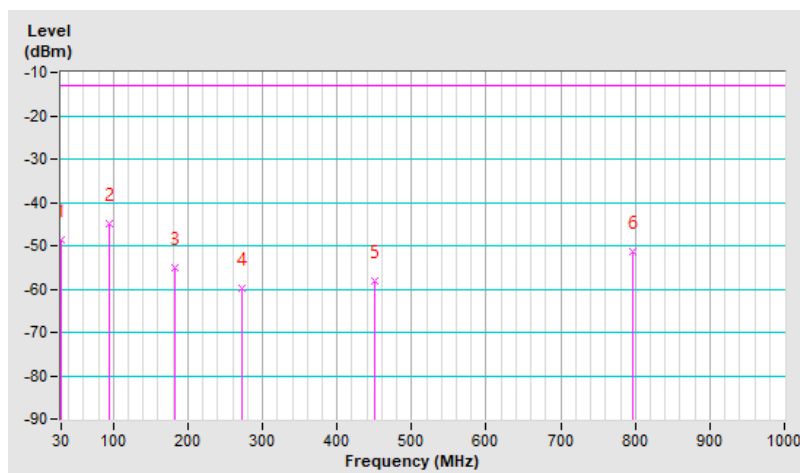


Combination	2		
Frequency Range	30 MHz ~ 1 GHz	Detector Function & Bandwidth	1 MHz/3 MHz (RMS)
Input Power	120 Vac, 60 Hz	Environmental Conditions	21 °C, 69 % RH
Tested By	Edison Lee		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	30	-48.64	-13.00	-35.64	1.50 V	3	60.84	-109.48
2	94.02	-44.92	-13.00	-31.92	1.00 V	97	68.83	-113.75
3	183.26	-55.21	-13.00	-42.21	1.00 V	299	55.01	-110.22
4	272.5	-59.72	-13.00	-46.72	1.00 V	125	48.72	-108.44
5	450.01	-58.06	-13.00	-45.06	2.00 V	229	45.50	-103.56
6	797.27	-51.27	-13.00	-38.27	1.50 V	2	45.99	-97.26

Remarks:

1. $EIRP(dBm) = Raw\ Value(dBuV) + Correction\ Factor(dB/m)$
2. $Correction\ Factor(dB/m) = Antenna\ Factor(dB/m) + Cable\ Factor(dB) - Pre-Amplifier\ Factor(dB) + 20\log(D) - 104.8$
3. $Margin\ value = EIRP - Limit\ value$
4. The other EIRP levels were very low against the limit of frequency range 30 MHz ~ 1 GHz.
5. The frequency range 9 kHz ~ 30 MHz: all emissions are more than 20 dB below the limit, therefore do not be recorded in this report.



7.3 Unwanted Emissions above 1 GHz

Mode A

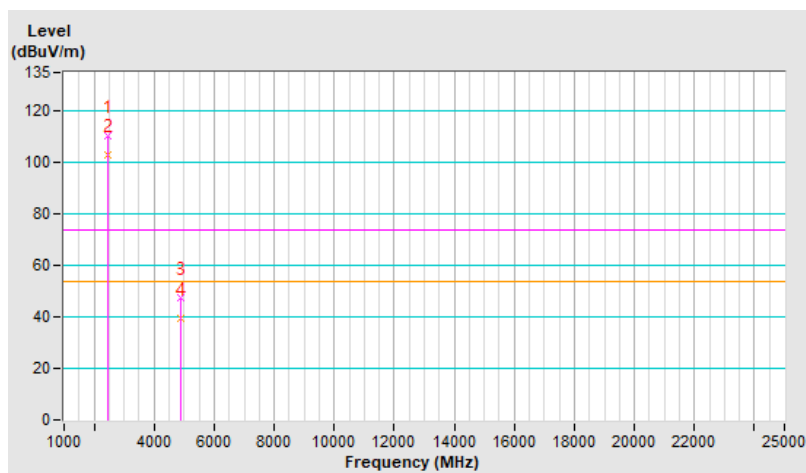
FCC 15.247

Combination	1		
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=1 kHz, DET=Peak
Input Power	120 Vac, 60 Hz	Environmental Conditions	21 °C, 69 % RH
Tested By	Greg Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2437	110.2 PK			1.39 H	201	78.1	32.1
2	*2437	103.0 AV			1.39 H	201	70.9	32.1
3	4874	47.4 PK	74.0	-26.6	1.89 H	124	44.1	3.3
4	4874	39.7 AV	54.0	-14.3	1.89 H	124	36.4	3.3

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * " : Fundamental frequency, the limit was restricted at the RF Output Power.

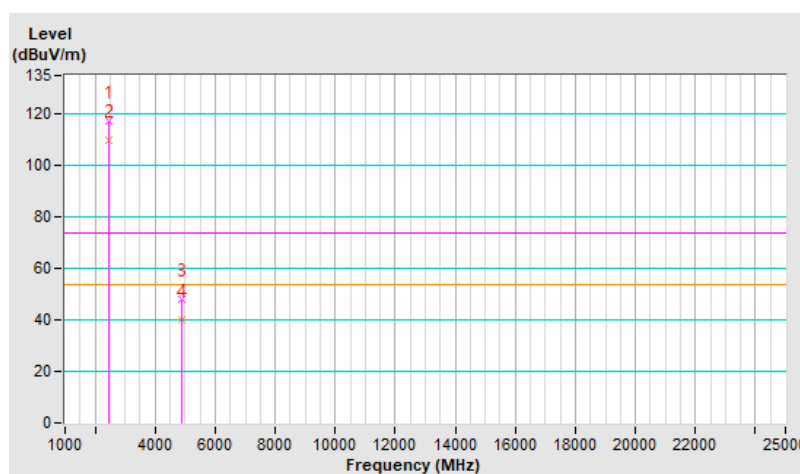


Combination	1		
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=1 kHz, DET=Peak
Input Power	120 Vac, 60 Hz	Environmental Conditions	21 °C, 69 % RH
Tested By	Greg Lin		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2437	117.3 PK			2.91 V	163	85.2	32.1
2	*2437	110.0 AV			2.91 V	163	77.9	32.1
3	4874	47.9 PK	74.0	-26.1	2.97 V	138	44.6	3.3
4	4874	39.9 AV	54.0	-14.1	2.97 V	138	36.6	3.3

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * " : Fundamental frequency, the limit was restricted at the RF Output Power.



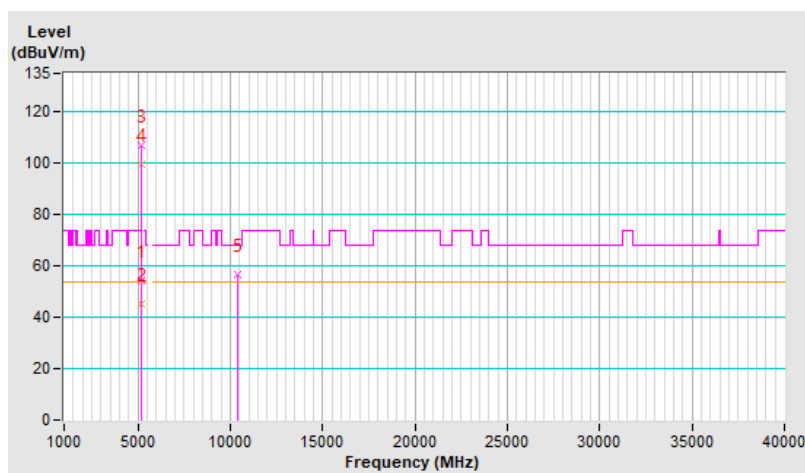
FCC 15.407

Combination	1		
Frequency Range	1 GHz ~ 40 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=1 kHz, DET=Peak
Input Power	120 Vac, 60 Hz	Environmental Conditions	21 °C, 69 % RH
Tested By	Greg Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150	54.3 PK	74.0	-19.7	3.77 H	80	51.5	2.8
2	5150	45.0 AV	54.0	-9.0	3.77 H	80	42.2	2.8
3	*5180	106.8 PK			3.77 H	80	66.0	40.8
4	*5180	99.3 AV			3.77 H	80	58.5	40.8
5	#10360	56.4 PK	68.2	-11.8	1.77 H	225	47.0	9.4

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency, the limit was restricted at the RF Output Power.
6. " # ": The radiated frequency is out of the restricted band.

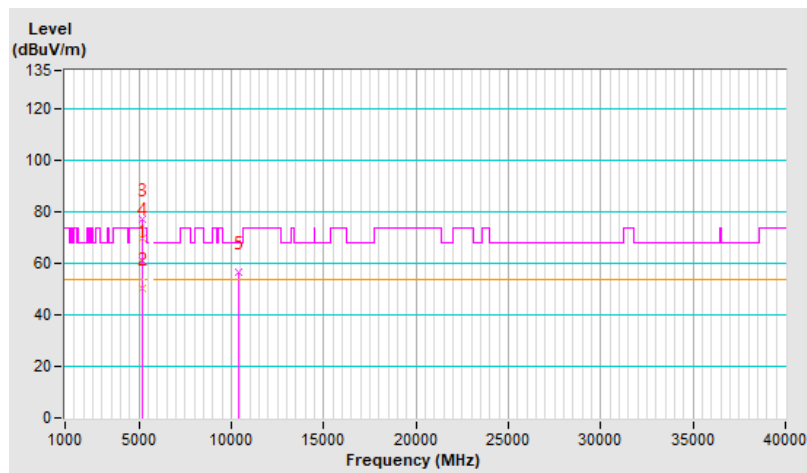


Combination	1		
Frequency Range	1 GHz ~ 40 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=1 kHz, DET=Peak
Input Power	120 Vac, 60 Hz	Environmental Conditions	21 °C, 69 % RH
Tested By	Greg Lin		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150	61.3 PK	74.0	-12.7	3.01 V	137	58.5	2.8
2	5150	50.5 AV	54.0	-3.5	3.01 V	137	47.7	2.8
3	*5180	77.3 PK			3.01 V	137	74.5	2.8
4	*5180	69.9 AV			3.01 V	137	67.1	2.8
5	#10360	56.6 PK	68.2	-11.6	3.00 V	155	47.2	9.4

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * " : Fundamental frequency, the limit was restricted at the RF Output Power.
6. " # " : The radiated frequency is out of the restricted band.



Mode B

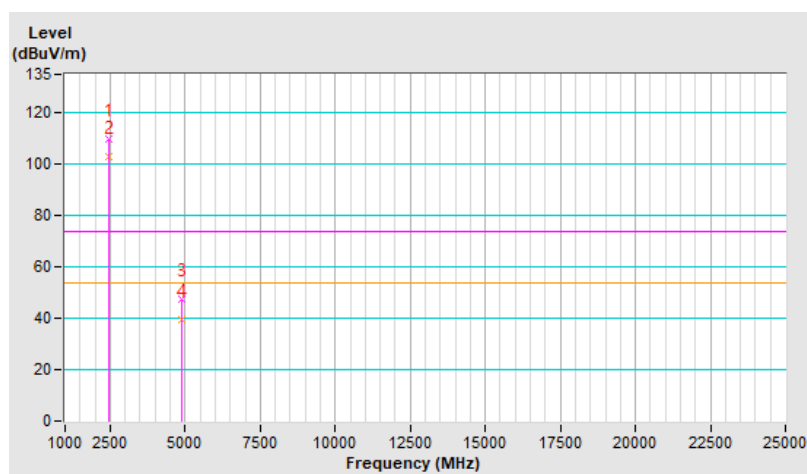
FCC 15.247

Combination	2		
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=1 kHz, DET=Peak
Input Power	120 Vac, 60 Hz	Environmental Conditions	21 °C, 69 % RH
Tested By	Greg Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2437	110.0 PK			1.43 H	208	77.9	32.1
2	*2437	102.8 AV			1.43 H	208	70.7	32.1
3	4874	47.2 PK	74.0	-26.8	1.97 H	136	43.9	3.3
4	4874	39.6 AV	54.0	-14.4	1.97 H	136	36.3	3.3

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency, the limit was restricted at the RF Output Power.

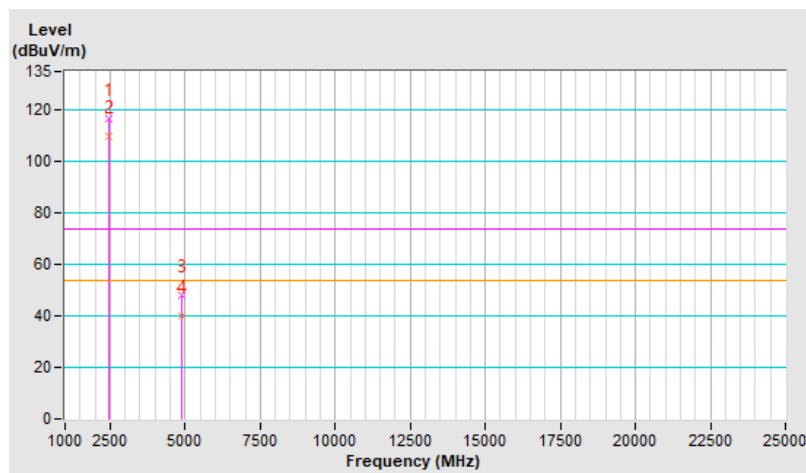


Combination	2		
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=1 kHz, DET=Peak
Input Power	120 Vac, 60 Hz	Environmental Conditions	21 °C, 69 % RH
Tested By	Greg Lin		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2437	116.8 PK			3.03 V	168	84.7	32.1
2	*2437	109.6 AV			3.03 V	168	77.5	32.1
3	4874	47.8 PK	74.0	-26.2	2.93 V	142	44.5	3.3
4	4874	39.8 AV	54.0	-14.2	2.93 V	142	36.5	3.3

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency, the limit was restricted at the RF Output Power.



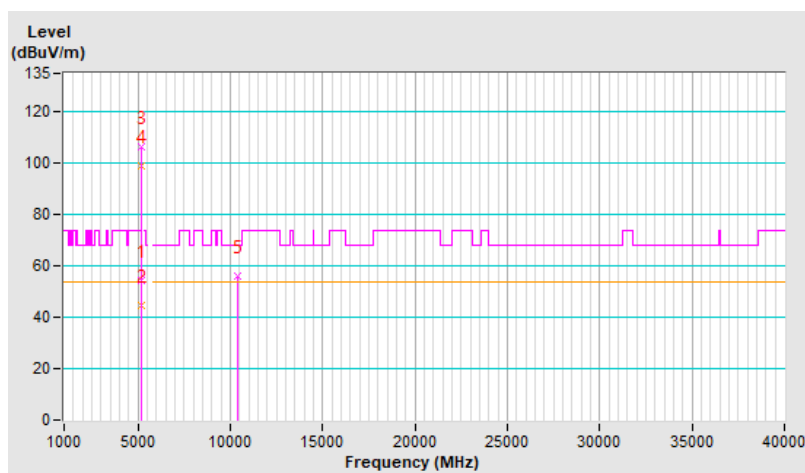
FCC 15.407

Combination	2		
Frequency Range	1 GHz ~ 40 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=1 kHz, DET=Peak
Input Power	120 Vac, 60 Hz	Environmental Conditions	21 °C, 69 % RH
Tested By	Greg Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150	54.2 PK	74.0	-19.8	3.80 H	75	51.4	2.8
2	5150	44.9 AV	54.0	-9.1	3.80 H	75	42.1	2.8
3	*5180	106.5 PK			3.80 H	75	65.7	40.8
4	*5180	99.0 AV			3.80 H	75	58.2	40.8
5	#10360	56.2 PK	68.2	-12.0	1.73 H	230	46.8	9.4

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency, the limit was restricted at the RF Output Power.
6. " # ": The radiated frequency is out of the restricted band.

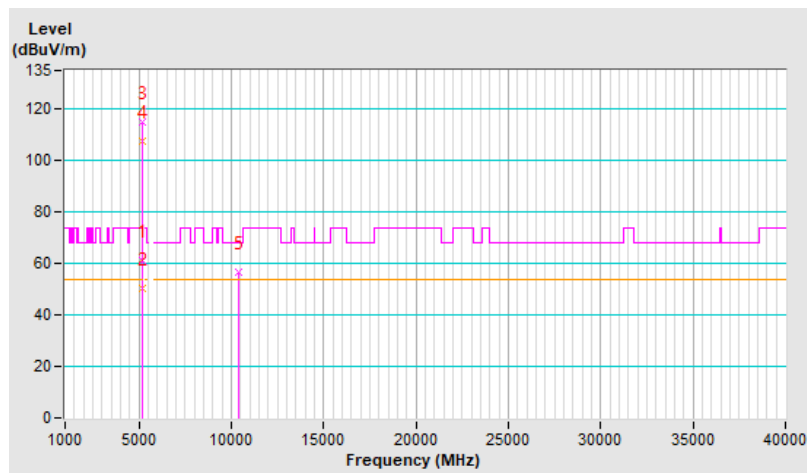


Combination	2		
Frequency Range	1 GHz ~ 40 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=1 kHz, DET=Peak
Input Power	120 Vac, 60 Hz	Environmental Conditions	21 °C, 69 % RH
Tested By	Greg Lin		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150	61.2 PK	74.0	-12.8	2.99 V	140	58.4	2.8
2	5150	50.3 AV	54.0	-3.7	2.99 V	140	47.5	2.8
3	*5180	115.0 PK			2.99 V	140	74.2	40.8
4	*5180	107.8 AV			2.99 V	140	67.0	40.8
5	#10360	56.4 PK	68.2	-11.8	3.01 V	156	47.0	9.4

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency, the limit was restricted at the RF Output Power.
6. " # ": The radiated frequency is out of the restricted band.



7.4 Radiated Spurious Emissions above 1GHz

Mode A

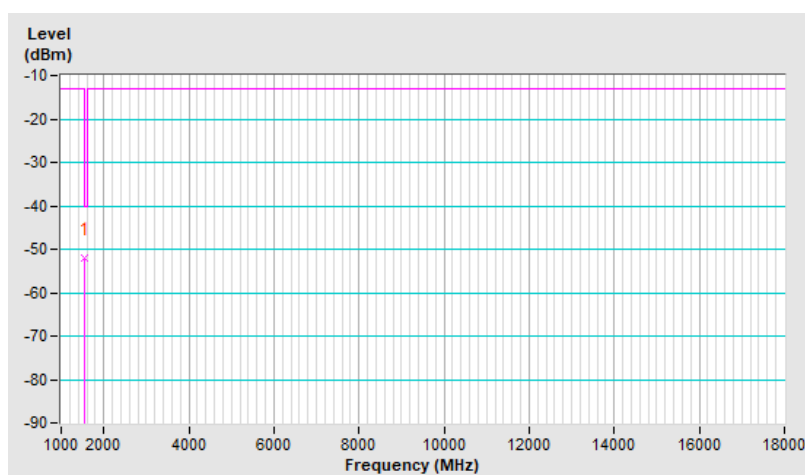
FCC Part 27

Combination	1		
Frequency Range	1 GHz ~ 40 GHz	Detector Function & Bandwidth	1 MHz/3 MHz (RMS)
Input Power	120 Vac, 60 Hz	Environmental Conditions	21 °C, 69 % RH
Tested By	Greg Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1564	-51.95	-40.00	-11.95	3.51 H	189	50.10	-102.05

Remarks:

1. $EIRP(dBm) = Raw\ Value(dBuV) + Correction\ Factor(dB/m)$
2. $Correction\ Factor(dB/m) = Antenna\ Factor(dB/m) + Cable\ Factor(dB) - Pre-Amplifier\ Factor(dB) + 20\log(D) - 104.8$
3. Margin value = EIRP – Limit value
4. The other EIRP levels were very low against the limit.

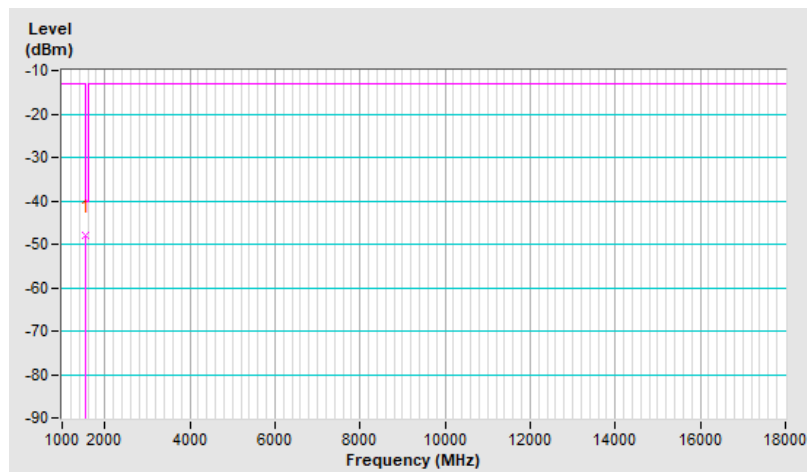


Combination	1		
Frequency Range	1 GHz ~ 40 GHz	Detector Function & Bandwidth	1 MHz/3 MHz (RMS)
Input Power	120 Vac, 60 Hz	Environmental Conditions	21 °C, 69 % RH
Tested By	Greg Lin		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1564	-47.85	-40.00	-7.85	3.83 V	286	54.20	-102.05

Remarks:

1. $EIRP(dBm) = Raw\ Value(dBuV) + Correction\ Factor(dB/m)$
2. $Correction\ Factor(dB/m) = Antenna\ Factor(dB/m) + Cable\ Factor(dB) - Pre-Amplifier\ Factor(dB) + 20\log(D) - 104.8$
3. $Margin\ value = EIRP - Limit\ value$
4. The other EIRP levels were very low against the limit.



Mode B

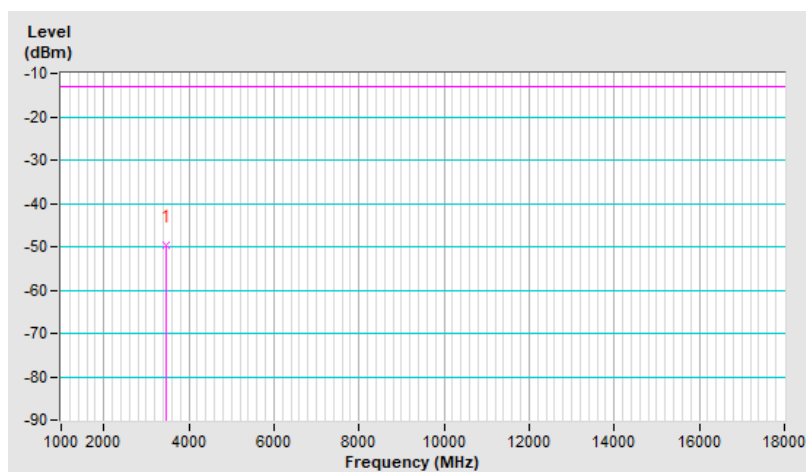
FCC Part 27

Combination	2		
Frequency Range	1 GHz ~ 40 GHz	Detector Function & Bandwidth	1 MHz/3 MHz (RMS)
Input Power	120 Vac, 60 Hz	Environmental Conditions	21 °C, 69 % RH
Tested By	Greg Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3465	-49.50	-13.00	-36.50	3.45 H	64	47.10	-96.60

Remarks:

1. $EIRP(dBm) = Raw\ Value(dBuV) + Correction\ Factor(dB/m)$
2. $Correction\ Factor(dB/m) = Antenna\ Factor(dB/m) + Cable\ Factor(dB) - Pre-Amplifier\ Factor(dB) + 20\log(D) - 104.8$
3. $Margin\ value = EIRP - Limit\ value$
4. The other EIRP levels were very low against the limit.

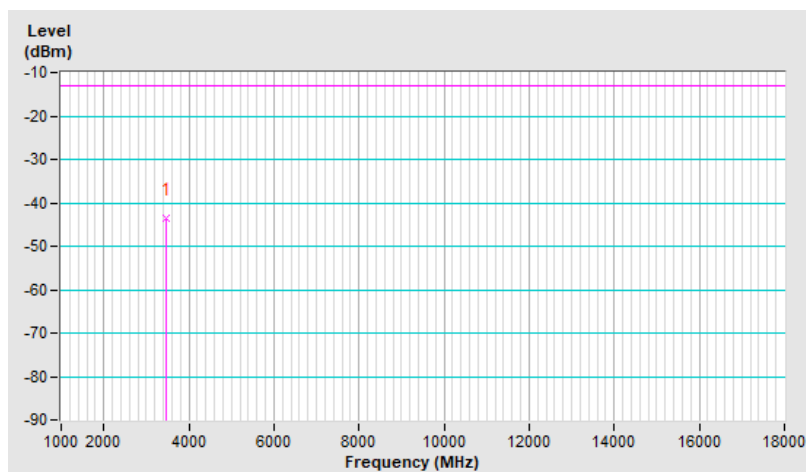


Combination	2		
Frequency Range	1 GHz ~ 40 GHz	Detector Function & Bandwidth	1 MHz/3 MHz (RMS)
Input Power	120 Vac, 60 Hz	Environmental Conditions	21 °C, 69 % RH
Tested By	Greg Lin		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3465	-43.48	-13.00	-30.48	2.59 V	108	53.12	-96.60

Remarks:

1. $EIRP(dBm) = Raw\ Value(dBuV) + Correction\ Factor(dB/m)$
2. $Correction\ Factor(dB/m) = Antenna\ Factor(dB/m) + Cable\ Factor(dB) - Pre-Amplifier\ Factor(dB) + 20\log(D) - 104.8$
3. Margin value = EIRP – Limit value
4. The other EIRP levels were very low against the limit.



8 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo)

9 Information of the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are FCC recognized accredited test firms and accredited according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

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Email: service.adt@bureauveritas.com

Web Site: <http://ee.bureauveritas.com.tw>

The address and road map of all our labs can be found in our web site also.

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