TEST REPORT

CERTIFICATE OF CONFORMITY

Standard:	**47 CFR FCC Part 15, Subpart C (Section 15.247)**
Report No.:	RFBEMI-WTW-P25020703-1
FCC ID:	NOIKBN367B
Product:	Electronic Display Device
Brand:	Rakuten kobo
Model No.:	N367B
Received Date:	2025/2/28
Test Date:	2025/3/18 ~ 2025/3/26
Issued Date:	2025/6/3
Applicant:	NETRONIX, INC.
Address:	No. 945, Boai St., Jubei City, Hsin-Chu, 30265, Taiwan
Factory:	(1) NETRONIX, INC. (2) NTX Electronics YANGZHOU CO., LTD.
Address:	(1) No. 945, Boai St., Jubei City, Hsin-Chu, 30265, Taiwan (2) No. 8, Wuzhou West Road, Economic and technological Development Zone, Yangzhou, Jiangsu Province, 225009, China
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Lin Kou Laboratories
Lab Address:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan
Test Location:	No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, Taiwan
FCC Registration / Designation Number:	788550 / TW0003

Approved by: Jeremy Lin , **Date:** 2025/6/3

Jeremy Lin / Project Engineer

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Prepared by : Polly Chien / Specialist

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Release Control Record

Issue No.	Description	Date Issued
RFBEMI-WTW-P25020703-1	Original release.	2025/6/3

1 Certificate

Product:	Electronic Display Device
Brand:	Rakuten kobo
Test Model:	N367B
Sample Status:	Engineering sample
Applicant:	NETRONIX, INC.
Test Date:	2025/3/18 ~ 2025/3/26
Standard:	47 CFR FCC Part 15, Subpart C (Section 15.247)
Measurement procedure:	ANSI C63.10-2013 KDB 558074 D01 15.247 Meas Guidance v05r02

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

47 CFR FCC Part 15, Subpart C (Section 15.247)			
Standard / Clause	Test Item	Result	Remark
15.247(b)	RF Output Power	Pass	Meet the requirement of limit.
15.247(e)	Power Spectral Density	Pass	Meet the requirement of limit.
15.247(a)(2)	6 dB Bandwidth	Pass	Meet the requirement of limit.
15.247(d)	Conducted Out of Band Emissions	Pass	Meet the requirement of limit.
15.207	AC Power Conducted Emissions	Pass	Minimum passing margin is -3.15 dB at 0.47400 MHz
15.205 / 15.209 / 15.247(d)	Unwanted Emissions below 1 GHz	Pass	Minimum passing margin is -6.4 dB at 55.22 MHz
15.205 / 15.209 / 15.247(d)	Unwanted Emissions above 1 GHz	Pass	Minimum passing margin is -4.6 dB at 2483.50 MHz
15.203	Antenna Requirement	Pass	No antenna connector is used.

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	Expanded Uncertainty (k=2) (±)
RF Output Power	-	1.371 dB
Power Spectral Density	-	1.017 dB
6 dB Bandwidth	-	206.5 Hz
Conducted Out of Band Emissions	9 kHz ~ 40 GHz	2.79 dB
AC Power Conducted Emissions	9 kHz ~ 30 MHz	2.90 dB
Unwanted Emissions below 1 GHz	9 kHz ~ 30 MHz	3.59 dB
	30 MHz ~ 1 GHz	3.6 dB
Unwanted Emissions above 1 GHz	1 GHz ~ 18 GHz	2.29 dB
	18 GHz ~ 40 GHz	2.29 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

Product	Electronic Display Device
Brand	Rakuten kobo
Test Model	N367B
Status of EUT	Engineering sample
Power Supply Rating	3.87 Vdc from battery 5 Vdc from adapter or host equipment
Modulation Type	GFSK
Modulation Technology	DTS
Transfer Rate	Up to 1 Mbps
Operating Frequency	2.402 GHz ~ 2.48 GHz
Number of Channel	40
Output Power	2.228 mW (3.48 dBm)

Note:

1. The EUT uses following accessories.

Item	Brand	Model	Supplier Model	Color	Specification	Material	TID number
1st source USB Cable	LUXSHARE-ICT	LB93US005-1H	-	Black	Signal Line : Shielded: Y, 1.0M, Core: N/A	TPE	-
		LB93US006-1H	-	White	Signal Line : Shielded: Y, 1.0M, Core: N/A	TPE	-
2nd source USB Cable	Yih Fone	SH-0846	YF-USB2-A-C-1M(K)	Black	Signal Line : Shielded: Y, 1.0M, Core: N/A	TPE	12574
		SH-0837	YF-USB2-A-C-1M-WH(K)	White	Signal Line : Shielded: Y, 1.0M, Core: N/A	TPE	12575

2. The EUT will be supported with the following eMMC and DRAM LP-DDR4 sources.

Item	Brand	Model
1st source eMMC	Phison	PTE7A0YJ-16GE
2nd source eMMC	Kingston	EMMC16G-PJ30-GA02
3rd source eMMC	FORESEE	FEMDNN016G-A3A55
1st source DRAM LP-DDR4	Nanya	NT6AN256M16AV-J2
2nd source DRAM LP-DDR4	Leahkinn	LTHS0005GS4-ZPI1
3rd source DRAM LP-DDR4	Micron	MT53E256M16D1DS-046

3. There are Bluetooth and WLAN (2.4 GHz & 5 GHz) technology used for the EUT.

4. Simultaneously transmission condition.

Condition	Technology	
1	WLAN (2.4 GHz)	Bluetooth
2	WLAN (5 GHz)	Bluetooth
Note: The emission of the simultaneous operation has been evaluated and no non-compliance was found.		

5. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

3.2 Antenna Description of EUT

1. The antenna information is listed as below.

Gain (dBi)	Antenna Type	Connector Type
3.91	Chip	N/A

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

3.3 Channel List

40 channels are provided for BT-LE:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	10	2422	20	2442	30	2462
1	2404	11	2424	21	2444	31	2464
2	2406	12	2426	22	2446	32	2466
3	2408	13	2428	23	2448	33	2468
4	2410	14	2430	24	2450	34	2470
5	2412	15	2432	25	2452	35	2472
6	2414	16	2434	26	2454	36	2474
7	2416	17	2436	27	2456	37	2476
8	2418	18	2438	28	2458	38	2478
9	2420	19	2440	29	2460	39	2480

3.4 Test Mode Applicability and Tested Channel Detail

Pre-Scan:	1. For Radiated, pre-scan Power from AC Adapter via USB Cable / Laptop via USB Cable / Battery and find the worst case as a representative test condition. 2. For AC conduction, pre-scan Power from AC Adapter via USB Cable / Laptop via USB Cable and find the worst case as a representative test condition. 3. EUT can be used in the following ways: X-axis/ Y-axis/ Z-axis. Pre-scan these ways and find the worst case as a representative test condition. 4. The USB Cable has the following models: LB93US005-1H(Black) / SH-0846(Black). Pre-scan these models of USB Cables and find the worst case as a representative test condition. 5. The DRAM LP-DDR4 has the following models: NT6AN256M16AV-J2 / LTHS0005GS4-ZPI1 / MT53E256M16D1DS-046. Pre-scan these models of DRAM LP-DDR4 and find the worst case as a representative test condition. 6. The eMMC has the following models: PTE7A0YJ-16GE / EMMC16G-PJ30-GA02 / FEMDNN016G-A3A55. Pre-scan these models of eMMC and find the worst case as a representative test condition. 7. 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. For Radiated Worst Condition: AC Adapter via USB Cable 2. For AC conduction Worst Condition: AC Adapter via USB Cable 3. X-axis/ Y-axis/ Z-axis Worst Condition: Y-axis 4. USB Cable Worst Condition: SH-0846(Black) 5. DRAM LP-DDR4 Worst Condition: MT53E256M16D1DS-046 6. eMMC Worst Condition: FEMDNN016G-A3A55

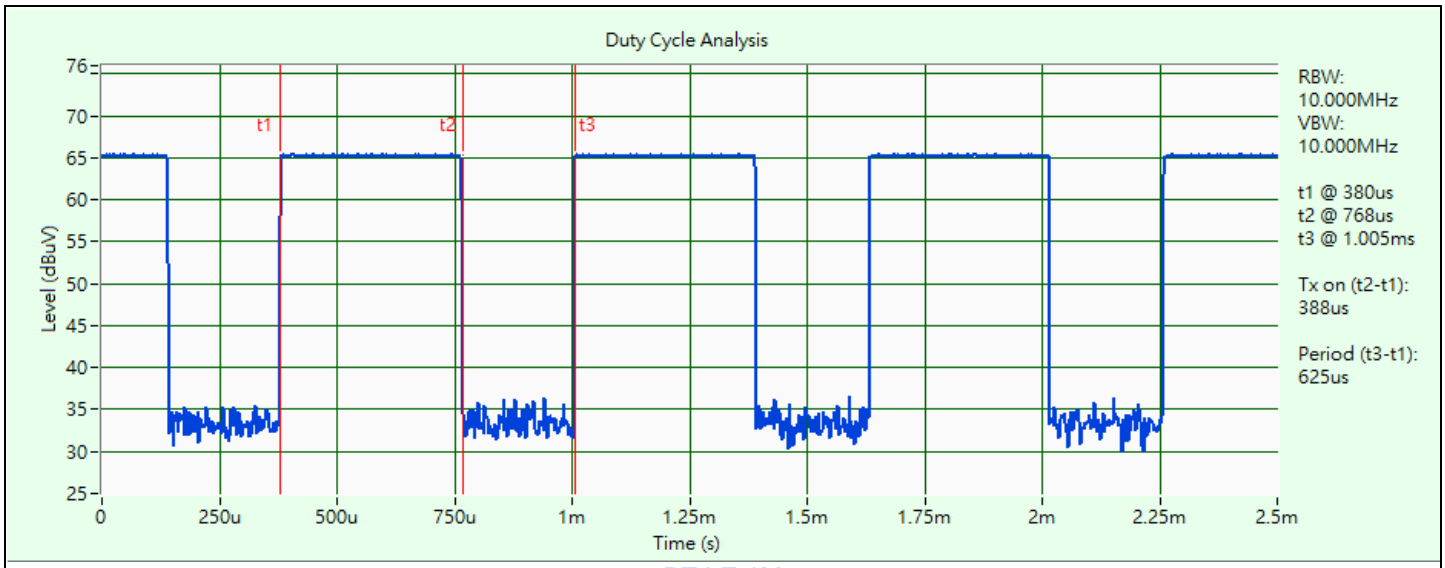
Note: Both USB cables are identical to each other except for exterior color and model names

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

Test Item	Mode	Tested Channel	Modulation	Data Rate Parameter
RF Output Power / Power Spectral Density	BT-LE 1M	0, 19, 39	GFSK	1Mb/s
6 dB Bandwidth / Conducted Out of Band Emissions	BT-LE 1M	0, 19, 39	GFSK	1Mb/s
AC Power Conducted Emissions	BT-LE 1M	0	GFSK	1Mb/s
Unwanted Emissions below 1 GHz	BT-LE 1M	0	GFSK	1Mb/s
Unwanted Emissions above 1 GHz	BT-LE 1M	0, 19, 39	GFSK	1Mb/s

3.5 Duty Cycle of Test Signal

BT-LE 1M: Duty cycle = 0.388 ms / 0.625 ms x 100% = 62.1%, duty factor = 10 * log (1/Duty cycle) = 2.07 dB

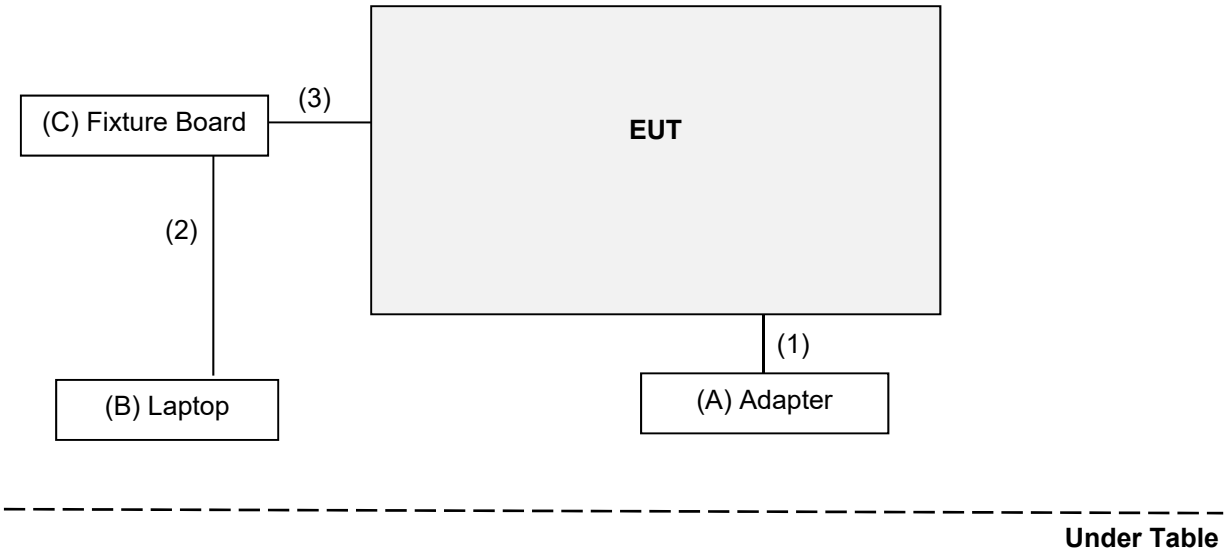


BT-LE 1M

3.6 Test Program Used and Operation Descriptions

Controlling software Terminal version 2.10 has been activated to set the EUT under transmission condition continuously at specific channel frequency.

3.7 Connection Diagram of EUT and Peripheral Devices



3.8 Configuration of Peripheral Devices and Cable Connections

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Adapter	LITEON	PA-1050-39	N/A	N/A	Provided by Lab
B.	Laptop	Lenovo	L470	PF0U96K5	N/A	Provided by Lab
C.	Fixture Board	Netronix	N367B console board(1.8V)	N/A	N/A	Supplied by applicant

No.	Cable Descriptions	Qty.	Length (m)	Shielded (Yes/ No)	Cores (Qty.)	Remark
1.	USB Cable	1	1	Yes	0	Accessory of EUT
2.	USB Cable	1	1	Yes	0	Supplied by applicant
3.	Console Cable	1	0.6	No	0	Supplied by applicant, Attached on Fixture Board

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 RF Output Power

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Peak Power Analyzer Keysight	8990B	MY51000538	2024/4/29	2025/4/28
Wideband Power Sensor Keysight	N1923A	MY58200003	2024/6/17	2025/6/16

Notes:

1. The test was performed in Oven room.
2. Tested Date: 2025/3/26

4.2 Power Spectral Density

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Signal & Spectrum Analyzer R&S	FSV3044	101504	2024/6/18	2025/6/17
Software BV	ADT_RF Test Software V7.6.5.4	N/A	N/A	N/A

Notes:

1. The test was performed in Oven room.
2. Tested Date: 2025/3/26

4.3 6 dB Bandwidth

Refer to section 4.2 to get the tested date and information of the instruments.

4.4 Conducted Out of Band Emissions

Refer to section 4.2 to get the tested date and information of the instruments.

4.5 AC Power Conducted Emissions

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
50 ohm terminal resistance	E1-011279	04	2024/11/28	2025/11/27
	E1-011280	05	2024/11/28	2025/11/27
	E1-011311	09	2024/11/28	2025/11/27
DC-LISN Schwarzbeck	NNBM 8126G	8126G-069	2024/11/5	2025/11/4
EMI Test Receiver R&S	ESR3	102783	2024/12/17	2025/12/16
Fixed Attenuator STI	BNC5W10dB	PAD-COND2-01	2024/8/25	2025/8/24
LISN R&S	ESH2-Z5	100100	2025/3/5	2026/3/4
	ESH3-Z5	100312	2024/9/9	2025/9/8
RF Coaxial Cable Woken	5D-FB	Cable-cond2-01	2024/8/25	2025/8/24
Software BVADT	BVADT_Cond_ V7.4.1.0	N/A	N/A	N/A
V-LISN Schwarzbeck	NNBL 8226-2	8226-142	2024/8/28	2025/8/27

Notes:

1. The test was performed in HY - Conduction 2.
2. Tested Date: 2025/3/19

4.6 Unwanted Emissions below 1 GHz

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Antenna Tower &Turn BV ADT	AT100	AT93021705	N/A	N/A
Bi_Log Antenna Schwarzbeck	VULB 9168	9168-160	2024/10/9	2025/10/8
Loop Antenna TESEQ	HLA 6121	45745	2024/8/21	2025/8/20
MXE EMI Receiver Agilent	N9038A	MY51210203	2024/8/27	2025/8/26
Preamplifier Agilent	8447D	2944A10638	2024/5/1	2025/4/30
RF Coaxial Cable Woken	8D-FB	Cable-CH9-01	2024/5/1	2025/4/30
Signal & Spectrum Analyzer R&S	FSW43	101866	2024/3/26	2025/3/25
Software BV ADT	ADT_Radiated_ V7.6.15.9.5	N/A	N/A	N/A
Turn Table BV ADT	TT100	TT93021705	N/A	N/A
Turn Table Controller BV ADT	SC100	SC93021705	N/A	N/A

Notes:

1. The test was performed in HY - 966 chamber 4.
2. Tested Date: 2025/3/20

4.7 Unwanted Emissions above 1 GHz

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Antenna Tower &Turn BV ADT	AT100	AT93021705	N/A	N/A
Boresight antenna tower fixture BV	BAF-02	5	N/A	N/A
Horn Antenna Schwarzbeck	BBHA 9120D	9120D-1169	2024/11/10	2025/11/9
	BBHA 9170	9170-480	2024/11/10	2025/11/9
		BBHA9170243	2024/11/10	2025/11/9
MXE EMI Receiver Agilent	N9038A	MY51210203	2024/8/27	2025/8/26
Preamplifier Agilent	8449B	3008A02367	2025/1/5	2026/1/4
Preamplifier EMCI	EMC 184045	980116	2024/9/24	2025/9/23
RF Coaxial Cable EMCI	EMC102-KM-KM-600	150928	2024/7/6	2025/7/5
	EMC102-KM-KM-3000	150929	2024/7/6	2025/7/5
RF Coaxial Cable HUBER+SUHNER	SUCOFLEX 104	CABLE-CH9-(250795/4)	2025/1/5	2026/1/4
RF Coaxial Cable HUBER+SUHNER&EMCI	SUCOFLEX 104& EMC104-SM-SM8000	CABLE-CH9-02 (248780+171006)	2025/1/5	2026/1/4
Signal & Spectrum Analyzer R&S	FSW43	101866	2024/3/26	2025/3/25
Software BV ADT	ADT_Radiated_ V7.6.15.9.5	N/A	N/A	N/A
Turn Table BV ADT	TT100	TT93021705	N/A	N/A
Turn Table Controller BV ADT	SC100	SC93021705	N/A	N/A

Notes:

1. The test was performed in HY - 966 chamber 4.
2. Tested Date: 2025/3/18

5 Limits of Test Items

5.1 RF Output Power

For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30 dBm)

5.2 Power Spectral Density

The Maximum of Power Spectral Density Measurement is 8 dBm in any 3 kHz.

5.3 6 dB Bandwidth

The minimum of 6 dB Bandwidth Measurement is 0.5 MHz.

5.4 Conducted Out of Band Emissions

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

5.5 AC Power Conducted Emissions

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15 - 0.5	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30.0	60	50

Notes:

1. The lower limit shall apply at the transition frequencies.
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.

5.6 Unwanted Emissions below 1 GHz

Radiated emissions up to 1 GHz which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 20 dB below the highest level of the desired power:

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).

5.7 Unwanted Emissions above 1 GHz

Radiated emissions above 1 GHz which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 20 dB below the highest level of the desired power:

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

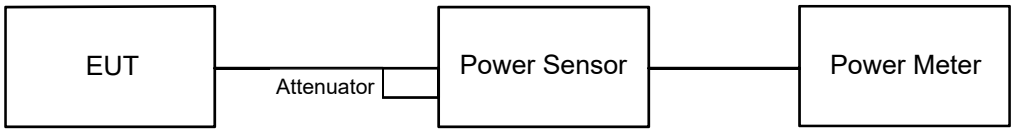
Notes:

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.

6 Test Arrangements

6.1 RF Output Power

6.1.1 Test Setup



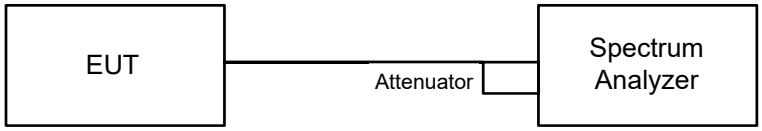
6.1.2 Test Procedure

Peak Power:
A peak power sensor was used on the output port of the EUT. A power meter was used to read the response of the peak power sensor. Record the power level.

Average Power:
Average power sensor was used to perform output power measurement, trigger and gating function of wide band power meter is enabled to measure max output power of TX on burst. Duty factor is not added to measured value.

6.2 Power Spectral Density

6.2.1 Test Setup

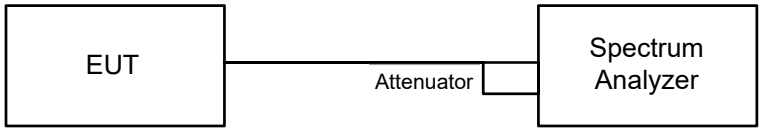


6.2.2 Test Procedure

a. Set analyzer center frequency to DTS channel center frequency.
b. Set the span to 1.5 times the DTS bandwidth.
c. Set the RBW to: 3 kHz.
d. Set the VBW ≥ 3 × RBW.
e. Detector = peak.
f. Sweep time = auto couple.
g. Trace mode = max hold.
h. Allow trace to fully stabilize.
i. Use the peak marker function to determine the maximum amplitude level within the RBW.

6.3 6 dB Bandwidth

6.3.1 Test Setup

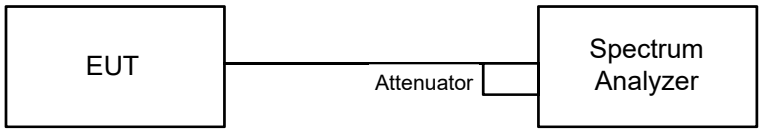


6.3.2 Test Procedure

a. Set resolution bandwidth (RBW) = 100 kHz.
b. Set the video bandwidth (VBW) ≥ 3 x RBW, Detector = Peak.
c. Trace mode = max hold.
d. Sweep = auto couple.
e. Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

6.4 Conducted Out of Band Emissions

6.4.1 Test Setup



6.4.2 Test Procedure

MEASUREMENT PROCEDURE REF

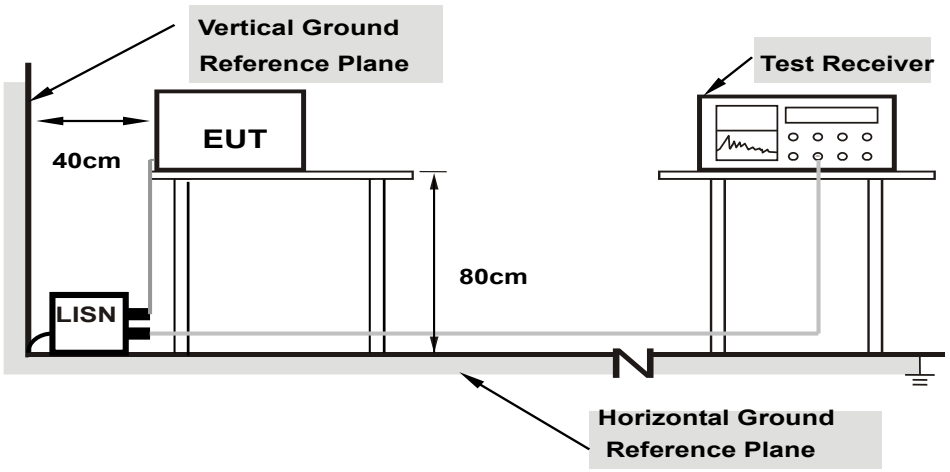
a. Set the RBW = 100 kHz.
b. Set the VBW ≥ 300 kHz.
c. Detector = peak.
d. Sweep time = auto couple.
e. Trace mode = max hold.
f. Allow trace to fully stabilize.
g. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.

MEASUREMENT PROCEDURE OOBE

a. Set RBW = 100 kHz.
b. Set VBW ≥ 300 kHz.
c. Detector = peak.
d. Sweep = auto couple.
e. Trace Mode = max hold.
f. Allow trace to fully stabilize.
g. Use the peak marker function to determine the maximum amplitude level.

6.5 AC Power Conducted Emissions

6.5.1 Test Setup



Note: 1.Support units were connected to second LISN.

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

6.5.2 Test Procedure

a. The EUT was placed on a 0.8 meter to the top of table and placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50 uH of coupling impedance for the measuring instrument.

b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

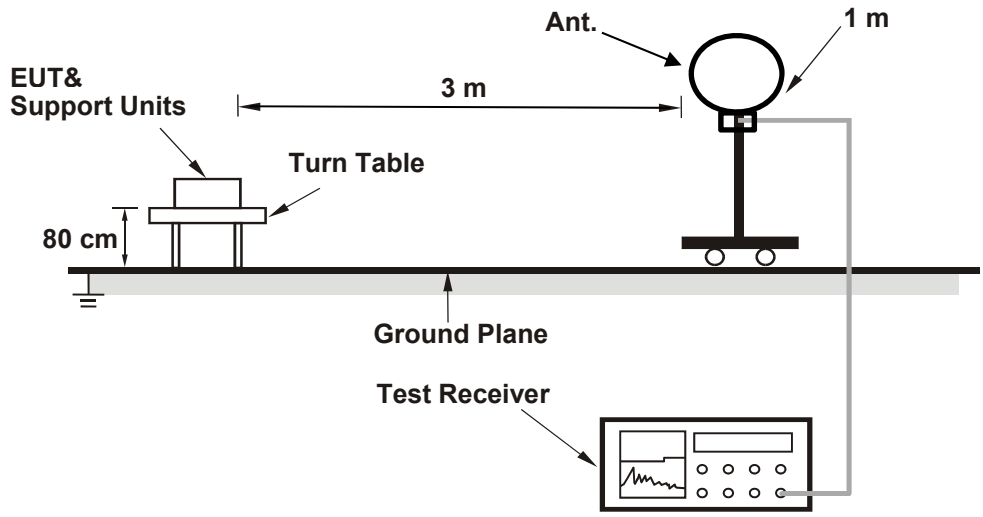
c. The frequency range from 150 kHz to 30 MHz was searched. Emission levels under (Limit – 20 dB) was not recorded.

Note: The resolution bandwidth and video bandwidth of test receiver is 9 kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15 MHz-30 MHz.

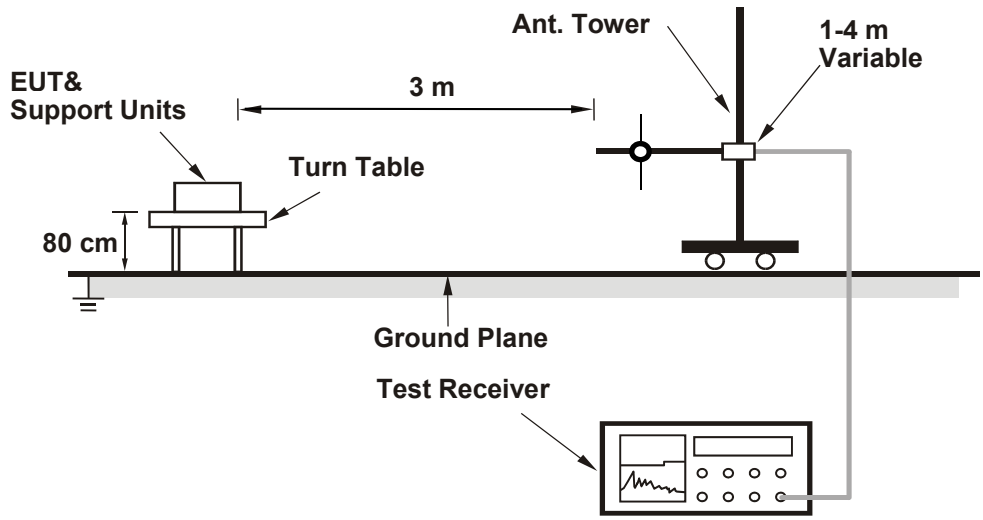
6.6 Unwanted Emissions below 1 GHz

6.6.1 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).

6.6.2 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.

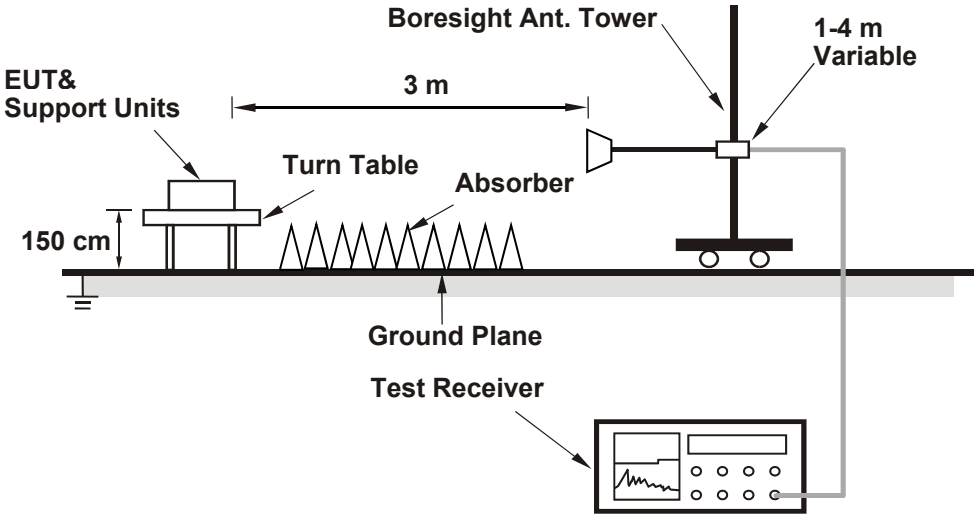
e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.

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.

6.7 Unwanted Emissions above 1 GHz

6.7.1 Test Setup



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

6.7.2 Test Procedure

a. 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.

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/spectrum analyzer 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:

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

7 Test Results of Test Item

7.1 RF Output Power

Input Power:	120 Vac, 60 Hz	Environmental Conditions:	25°C, 60% RH	Tested By:	Chris Lin

For Peak Power

Chan.	Chan. Freq. (MHz)	Peak Power (mW)	Peak Power (dBm)	Power Limit (dBm)	Test Result
0	2402	2.228	3.48	30	Pass
19	2440	2.084	3.19	30	Pass
39	2480	2.223	3.47	30	Pass

Note: The antenna gain is 3.91 dBi < 6 dBi, so the output power limit shall not be reduced.

For Average Power

Chan.	Chan. Freq. (MHz)	Average Power (mW)	Average Power (dBm)
0	2402	2.084	3.19
19	2440	2.061	3.14
39	2480	2.042	3.10

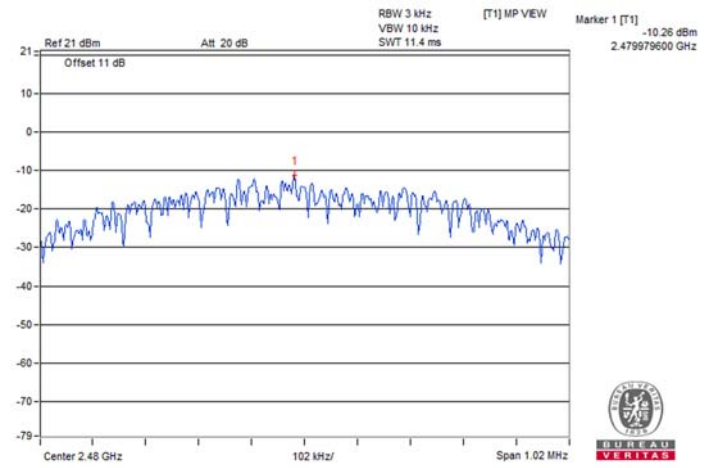
7.2 Power Spectral Density

Input Power:	120 Vac, 60 Hz	Environmental Conditions:	25°C, 60% RH	Tested By:	Chris Lin

Chan.	Chan. Freq. (MHz)	PSD (dBm/3kHz)	PSD Limit (dBm/3kHz)	Test Result
0	2402	-10.38	8	Pass
19	2440	-10.97	8	Pass
39	2480	-10.26	8	Pass

Note: The antenna gain is 3.91 dBi < 6 dBi, so the power density limit shall not be reduced.

Spectrum Plot of Maximum Value



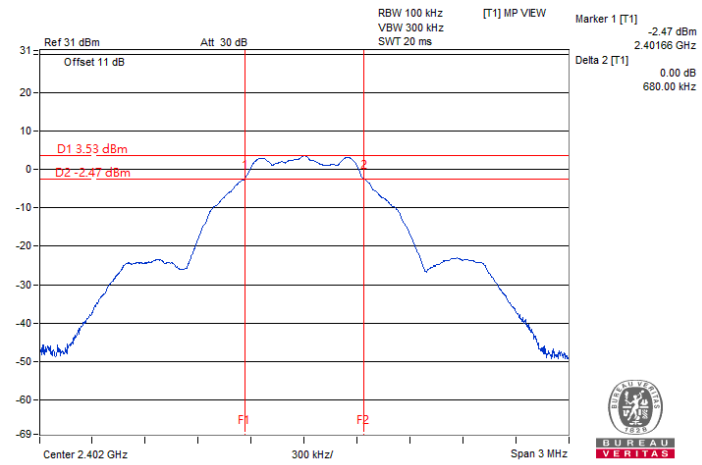
CH 39

7.3 6 dB Bandwidth

Input Power:	120 Vac, 60 Hz	Environmental Conditions:	25°C, 60% RH	Tested By:	Chris Lin

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)	Test Result
0	2402	0.68	0.5	Pass
19	2440	0.68	0.5	Pass
39	2480	0.68	0.5	Pass

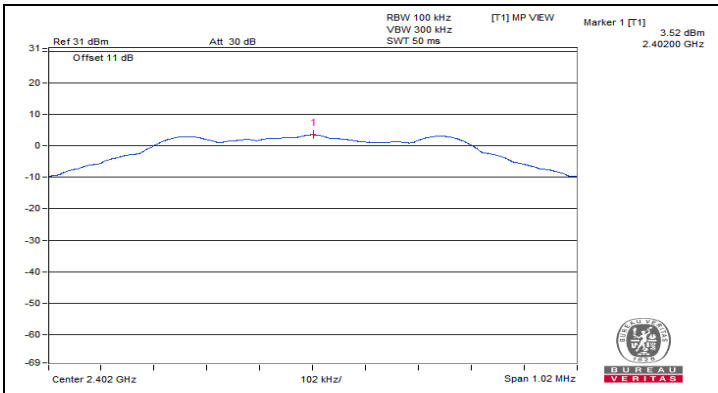
Spectrum Plot of Minimum Value



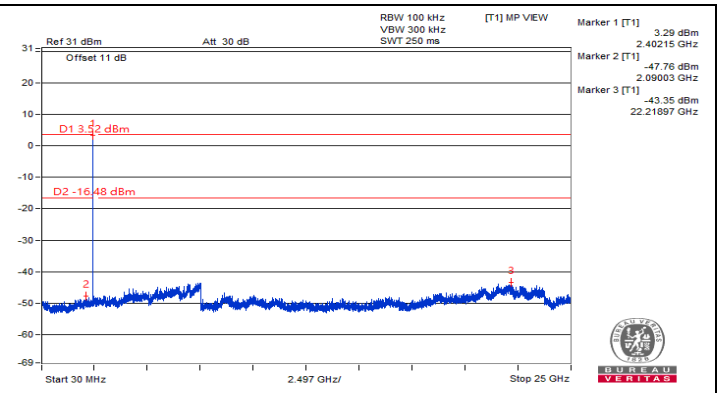
CH 0

7.4 Conducted Out of Band Emissions

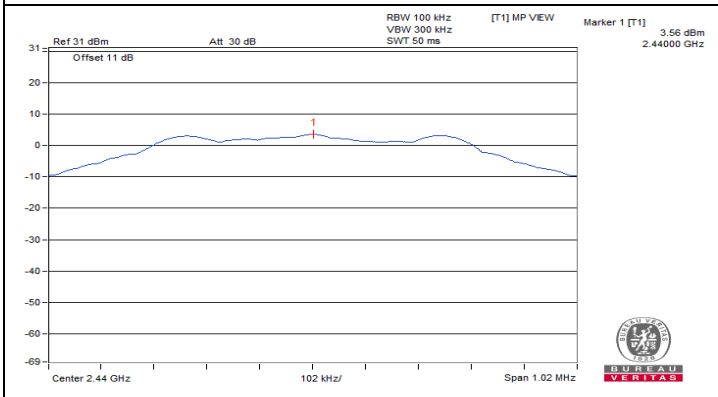
Input Power:	120 Vac, 60 Hz	Environmental Conditions:	25°C, 60% RH	Tested By:	Chris Lin



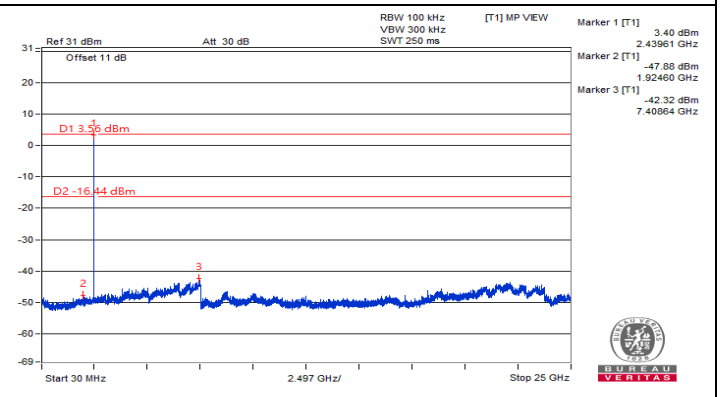
CH 0



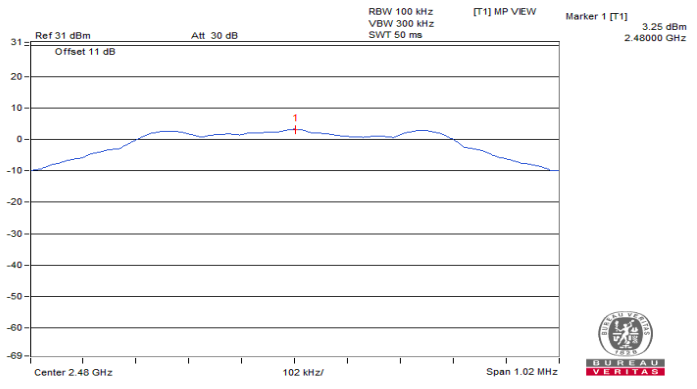
CH 0



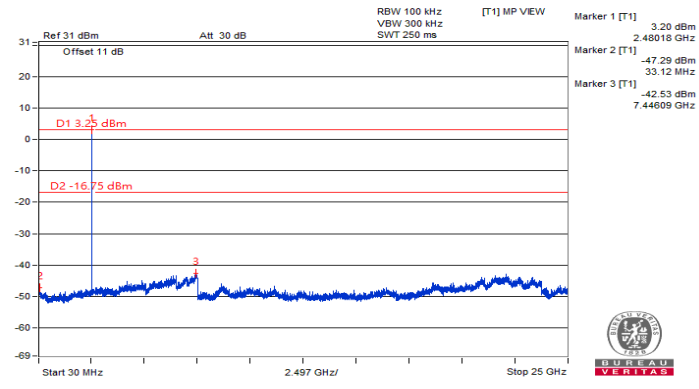
CH 19



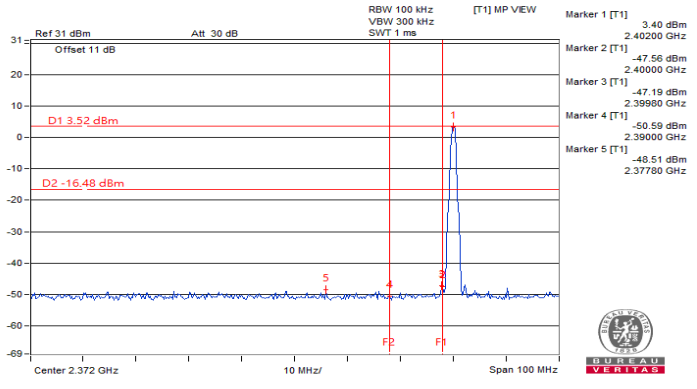
CH 19



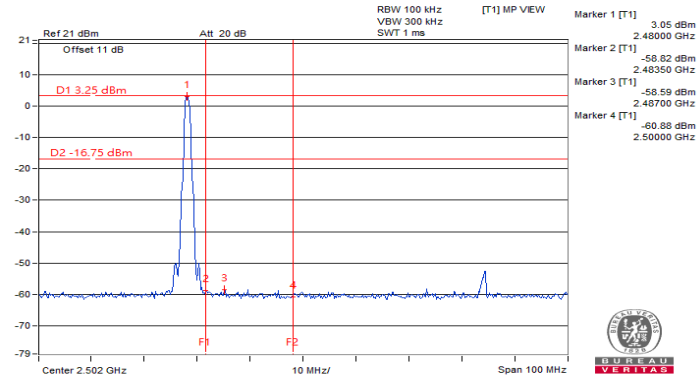
CH 39



CH 39



CH 0 Band edge



CH 39 Band edge

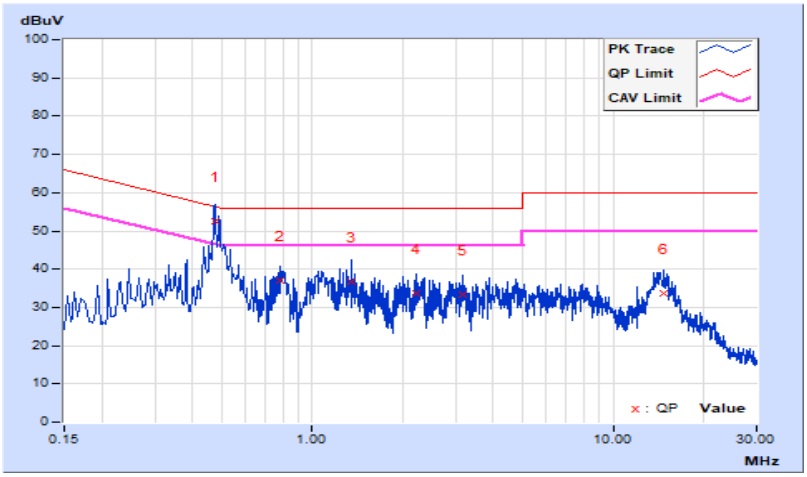
7.5 AC Power Conducted Emissions

RF Mode	BT-LE 1M	**Channel**	CH 0：2402 MHz
Frequency Range	150 kHz ~ 30 MHz	**Detector Function & Resolution Bandwidth**	Quasi-Peak (QP) / Average (AV), 9 kHz
Input Power	120 Vac, 60 Hz	**Environmental Conditions**	23 °C, 67 % RH
Tested By	Adair Peng		

Phase Of Power : Line (L)										
No	**Frequency (MHz)**	**Correction Factor (dB)**	**Reading Value (dBuV)**		**Emission Level (dBuV)**		**Limit (dBuV)**		**Margin (dB)**	
			Q.P.	**AV.**	**Q.P.**	**AV.**	**Q.P.**	**AV.**	**Q.P.**	**AV.**
1	**0.47400**	**10.21**	**42.25**	**33.08**	**52.46**	**43.29**	**56.44**	**46.44**	**-3.98**	**-3.15**
2	0.77800	10.24	26.88	16.25	37.12	26.49	56.00	46.00	-18.88	-19.51
3	1.35800	10.31	26.46	16.99	36.77	27.30	56.00	46.00	-19.23	-18.70
4	2.22200	10.38	23.36	14.24	33.74	24.62	56.00	46.00	-22.26	-21.38
5	3.17000	10.42	23.02	14.14	33.44	24.56	56.00	46.00	-22.56	-21.44
6	14.78200	10.56	22.95	10.44	33.51	21.00	60.00	50.00	-26.49	-29.00

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

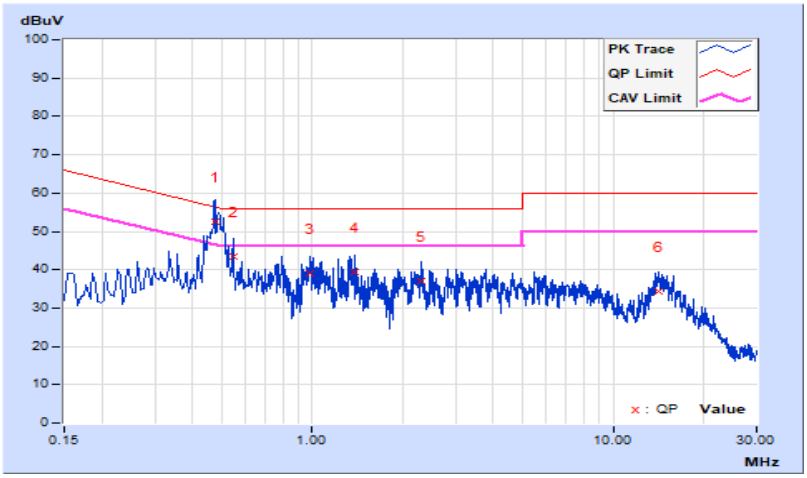


RF Mode	BT-LE 1M	Channel	CH 0：2402 MHz
Frequency Range	150 kHz ~ 30 MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
Input Power	120 Vac, 60 Hz	Environmental Conditions	23 °C, 67 % RH
Tested By	Adair Peng		

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.47400	10.24	42.29	32.23	52.53	42.47	56.44	46.44	-3.91	-3.97
2	0.54600	10.25	33.09	23.85	43.34	34.10	56.00	46.00	-12.66	-11.90
3	0.98600	10.31	28.58	18.80	38.89	29.11	56.00	46.00	-17.11	-16.89
4	1.39400	10.33	29.15	20.74	39.48	31.07	56.00	46.00	-16.52	-14.93
5	2.31800	10.39	26.65	19.00	37.04	29.39	56.00	46.00	-18.96	-16.61
6	14.11400	10.72	23.79	13.64	34.51	24.36	60.00	50.00	-25.49	-25.64

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value



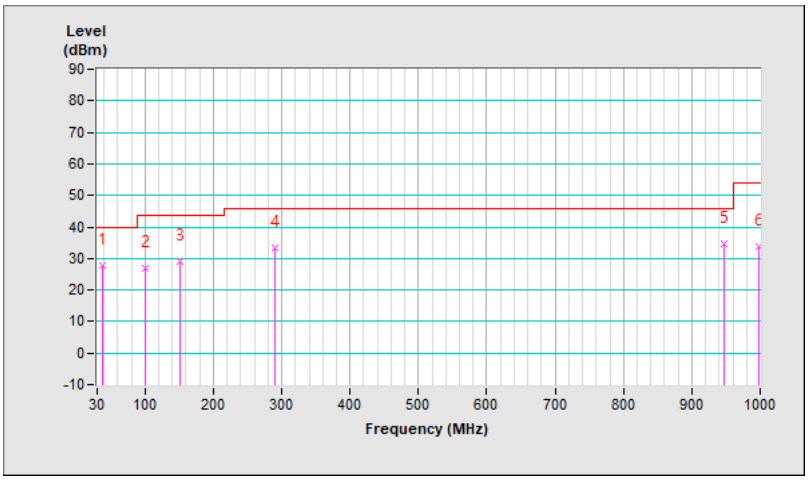
7.6 Unwanted Emissions below 1 GHz

RF Mode	BT-LE 1M	**Channel**	CH 0：2402 MHz
Frequency Range	30 MHz ~ 1 GHz	**Detector Function & Bandwidth**	QP: RB=120kHz, DET=Quasi-Peak
Input Power	120 Vac, 60 Hz	**Environmental Conditions**	24.1 °C, 74.3 % RH
Tested By	Rex Wang		

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	38.73	27.9 QP	40.0	-12.1	1.00 H	77	9.4	18.5
2	99.84	26.8 QP	43.5	-16.7	1.00 H	33	39.9	-13.1
3	151.25	29.2 QP	43.5	-14.3	1.00 H	198	9.6	19.6
4	289.96	33.5 QP	46.0	-12.5	2.00 H	137	13.0	20.5
5	946.65	34.6 QP	46.0	-11.4	1.00 H	132	1.5	33.1
6	998.06	33.8 QP	54.0	-20.2	1.00 H	316	0.6	33.2

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.

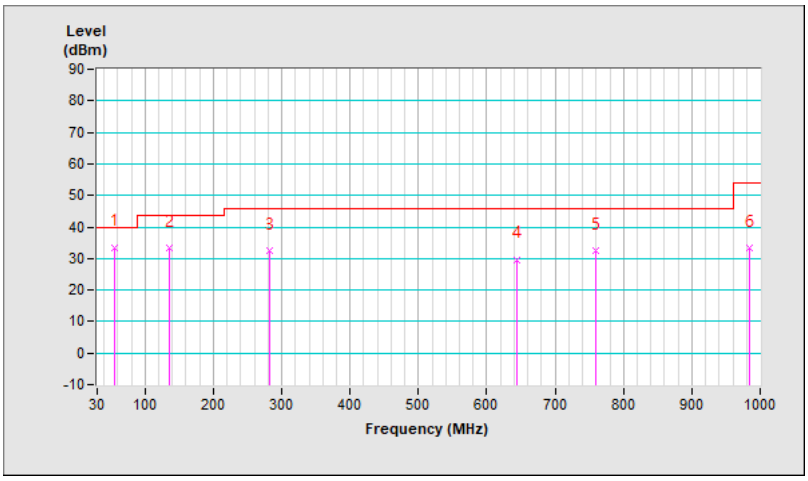


RF Mode	BT-LE 1M	Channel	CH 0：2402 MHz
Frequency Range	30 MHz ~ 1 GHz	Detector Function & Bandwidth	QP: RB=120kHz, DET=Quasi-Peak
Input Power	120 Vac, 60 Hz	Environmental Conditions	24.1 °C, 74.3 % RH
Tested By	Rex Wang		

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	**55.22**	**33.6 QP**	**40.0**	**-6.4**	**1.00 V**	**268**	**14.4**	**19.2**
2	135.73	33.4 QP	43.5	-10.1	1.50 V	179	42.5	-9.1
3	282.20	32.5 QP	46.0	-13.5	1.00 V	130	12.1	20.4
4	644.01	29.7 QP	46.0	-16.3	1.00 V	283	0.9	28.8
5	760.41	32.4 QP	46.0	-13.6	1.00 V	183	1.5	30.9
6	983.51	33.3 QP	54.0	-20.7	1.00 V	267	0.0	33.3

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.



7.7 Unwanted Emissions above 1 GHz

RF Mode	BT-LE 1M	**Channel**	CH 0：2402 MHz
Frequency Range	1 GHz ~ 25 GHz	**Detector Function & Bandwidth**	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=3 kHz, DET=Peak
Input Power	120 Vac, 60 Hz	**Environmental Conditions**	23 °C, 67 % RH
Tested By	Adair Peng		

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	2390.00	59.4 PK	74.0	-14.6	2.11 H	190	25.3	34.1
2	2390.00	47.3 AV	54.0	-6.7	2.11 H	190	13.2	34.1
3	*2402.00	99.8 PK			2.11 H	190	65.7	34.1
4	*2402.00	98.8 AV			2.11 H	190	64.7	34.1
5	4804.00	50.4 PK	74.0	-23.6	2.40 H	155	40.3	10.1
6	4804.00	37.5 AV	54.0	-16.5	2.40 H	155	27.4	10.1
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	2390.00	59.6 PK	74.0	-14.4	1.50 V	45	25.5	34.1
2	2390.00	47.5 AV	54.0	-6.5	1.50 V	45	13.4	34.1
3	*2402.00	105.1 PK			1.50 V	45	71.0	34.1
4	*2402.00	104.1 AV			1.50 V	45	70.0	34.1
5	4804.00	50.6 PK	74.0	-23.4	1.63 V	297	40.5	10.1
6	4804.00	37.7 AV	54.0	-16.3	1.63 V	297	27.6	10.1

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.
5. " * ": Fundamental frequency, the limit was restricted at the RF Output Power.

RF Mode	BT-LE 1M	**Channel**	CH 19：2440 MHz
Frequency Range	1 GHz ~ 25 GHz	**Detector Function & Bandwidth**	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=3 kHz, DET=Peak
Input Power	120 Vac, 60 Hz	**Environmental Conditions**	23 °C, 67 % RH
Tested By	Adair Peng		

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	*2440.00	100.4 PK			2.13 H	189	66.4	34.0
2	*2440.00	99.4 AV			2.13 H	189	65.4	34.0
3	4880.00	51.1 PK	74.0	-22.9	2.38 H	147	40.6	10.5
4	4880.00	38.0 AV	54.0	-16.0	2.38 H	147	27.5	10.5
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	*2440.00	105.5 PK			2.07 V	48	71.5	34.0
2	*2440.00	104.5 AV			2.07 V	48	70.5	34.0
3	4880.00	51.3 PK	74.0	-22.7	1.58 V	292	40.8	10.5
4	4880.00	38.2 AV	54.0	-15.8	1.58 V	292	27.7	10.5

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.
5. " * ": Fundamental frequency, the limit was restricted at the RF Output Power.

RF Mode	BT-LE 1M	Channel	CH 39：2480 MHz
Frequency Range	1 GHz ~ 25 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=3 kHz, DET=Peak
Input Power	120 Vac, 60 Hz	Environmental Conditions	23 °C, 67 % RH
Tested By	Adair Peng		

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	*2480.00	100.3 PK			1.99 H	187	66.2	34.1
2	*2480.00	99.3 AV			1.99 H	187	65.2	34.1
3	2483.50	59.5 PK	74.0	-14.5	1.99 H	187	25.4	34.1
4	2483.50	49.2 AV	54.0	-4.8	1.99 H	187	15.1	34.1
5	4960.00	51.9 PK	74.0	-22.1	2.30 H	152	40.8	11.1
6	4960.00	38.6 AV	54.0	-15.4	2.30 H	152	27.5	11.1
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	*2480.00	105.1 PK			2.05 V	100	71.0	34.1
2	*2480.00	104.1 AV			2.05 V	100	70.0	34.1
3	2483.50	59.7 PK	74.0	-14.3	2.05 V	100	25.6	34.1
4	**2483.50**	**49.4 AV**	**54.0**	**-4.6**	**2.05 V**	**100**	**15.3**	**34.1**
5	4960.00	52.1 PK	74.0	-21.9	1.60 V	297	41.0	11.1
6	4960.00	38.9 AV	54.0	-15.1	1.60 V	297	27.8	11.1

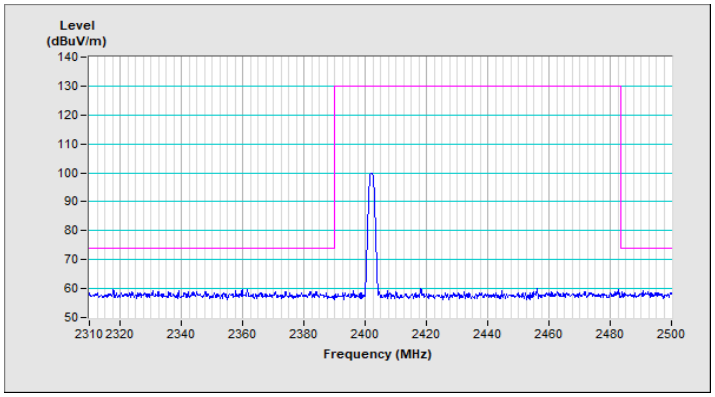
Remarks:

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.
5. " * ": Fundamental frequency, the limit was restricted at the RF Output Power.

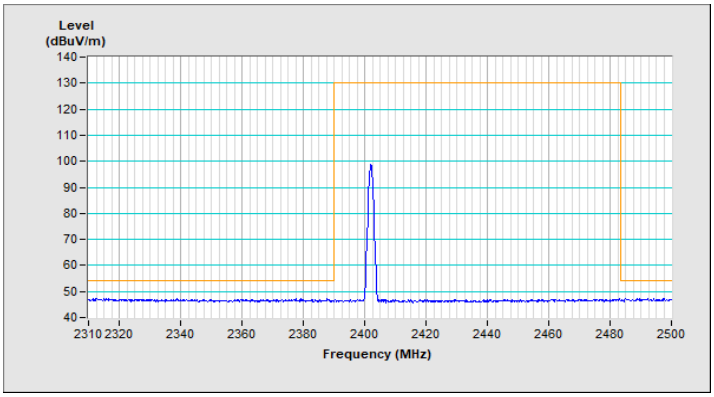
Plot of Band Edge

Frequency Range	2.31 GHz ~ 2.5 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=3 kHz, DET=Peak

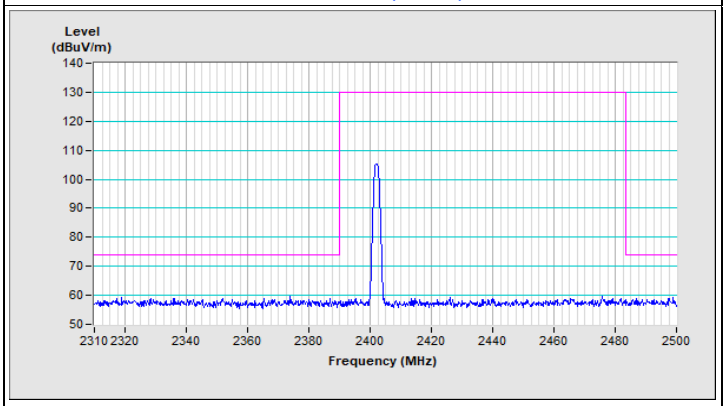
BT-LE 1M Channel 0



Horizontal (Peak)



Horizontal (Average)



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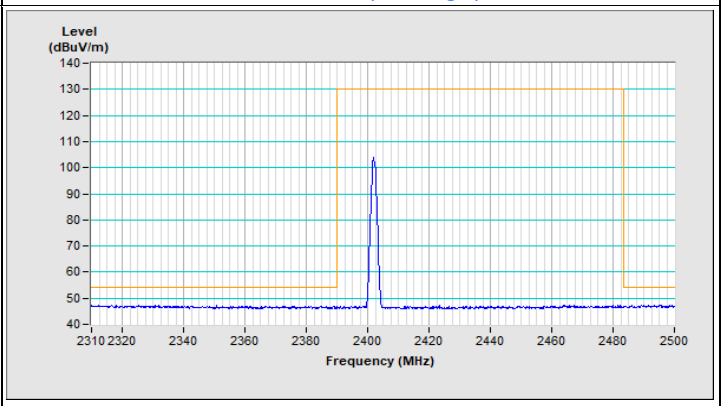

Vertical (Average)

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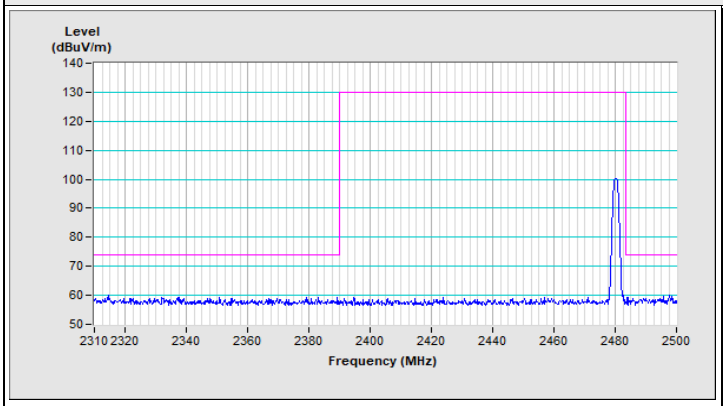
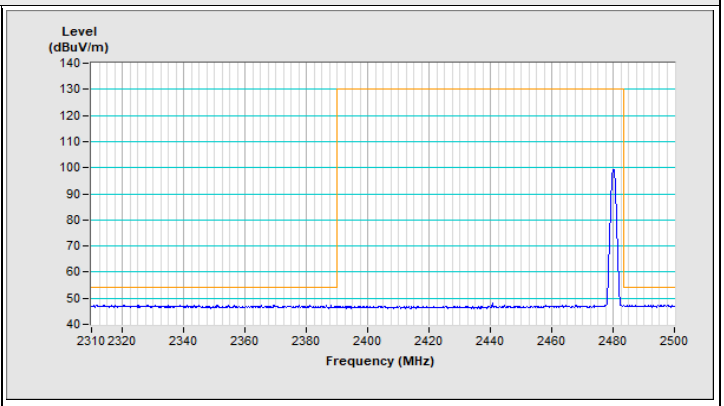


Horizontal (Peak)



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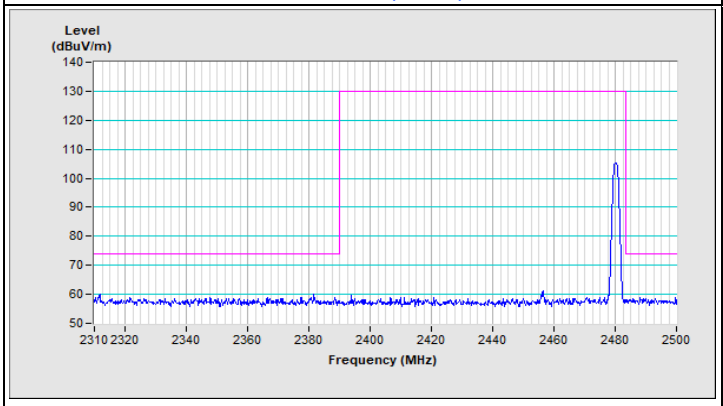
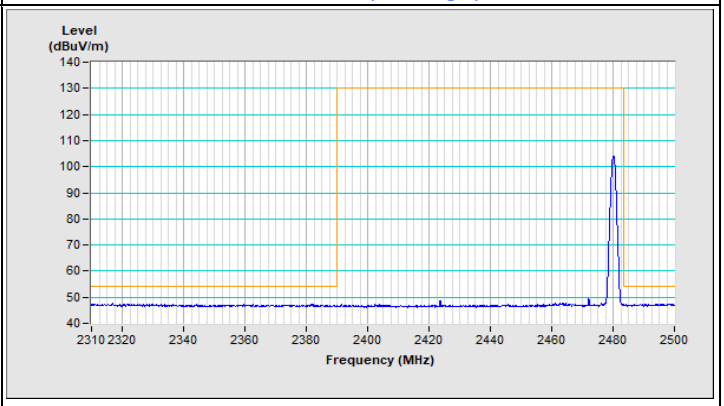


Vertical (Peak)



Vertical (Average)

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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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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