TEST REPORT

CERTIFICATE OF CONFORMITY

Standard:	**47 CFR FCC Part 15, Subpart C (Section 15.247)**
Report No.:	RFBCKS-WTW-P22080716B-2
FCC ID:	NKR-WNXL11BWL
Product:	AP
Brand:	WNC, Comcast, Cox, Charter
Model No.:	WNXL11BWL
Received Date:	2024/8/12
Test Date:	2024/8/15
Issued Date:	2024/8/29
Applicant:	Wistron NeWeb Corp.
Address:	20 Park Avenue II, Hsinchu Science Park, Hsinchu 308, Taiwan, R.O.C.
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory
Lab Address:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan
Test Location:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan
FCC Registration / Designation Number:	723255 / TW2022

Approved by: _____ , **Date:** **2024/8/29**

May Chen / Manager

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Prepared by: Vito Lung / Specialist

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Release Control Record

Issue No.	Description	Date Issued
RFBCKS-WTW-P22080716B-2	Original release.	2024/8/29

1 Certificate

Product:	AP
Brand:	WNC, Comcast, Cox, Charter
Test Model:	WNXL11BWL
Sample Status:	Engineering sample
Applicant:	Wistron NeWeb Corp.
Test Date:	2024/8/15
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	N/A	Refer to Note 1 below
15.247(e)	Power Spectral Density	N/A	Refer to Note 1 below
15.247(a)(2)	6 dB Bandwidth	N/A	Refer to Note 1 below
15.247(d)	Conducted Out of Band Emissions	N/A	Refer to Note 1 below
15.207	AC Power Conducted Emissions	Pass	Minimum passing margin is -14.28 dB at 0.15000 MHz
15.205 / 15.209 / 15.247(d)	Unwanted Emissions below 1 GHz	Pass	Minimum passing margin is -4.2 dB at 35.75 MHz
15.205 / 15.209 / 15.247(d)	Unwanted Emissions above 1 GHz	N/A	Refer to Note 1 below
15.203	Antenna Requirement	Pass	Antenna connector is ipex(MHF) not a standard connector.

Notes:
1. Only AC Power Conducted Emissions and Unwanted Emissions below 1 GHz test items were performed for this addendum. The others testing data refer to original test report.
2. 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 (±)
AC Power Conducted Emissions	150 kHz ~ 30 MHz	1.9 dB
Unwanted Emissions below 1 GHz	9 kHz ~ 30 MHz	3.1 dB
	30 MHz ~ 1 GHz	5.1 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	AP
Brand	WNC, Comcast, Cox, Charter
Test Model	WNXL11BWL
Status of EUT	Engineering sample
Power Supply Rating	Refer to Note
Modulation Type	GFSK
Modulation Technology	DTS
Transfer Rate	Up to 2 Mbps
Operating Frequency	2.402 GHz ~ 2.48 GHz
Number of Channel	40
Output Power	11.588 mW (10.64 dBm)

Note:

1. This report is prepared for FCC Class II permissive change. The difference compared with the Report No.: RFBCKS-WTW-P22080716-2 R1 design is as the following information:
   - ◆ Changed LTE module from QUECTEL EM06-A to Telit Cinterion LN920A6-NA (WWAN module FCC ID: RI7LN920NA).
2. According to above condition, only AC Power Conducted Emissions and Unwanted Emissions below 1 GHz needs to be performed. All data for meeting the requirement is verified.
3. The EUT contains certified WWAN module which FCC ID: RI7LN920NA (Brand: Telit Cinterion; Model: LN920A6-NA)
4. The EUT uses following accessories.

Item	Brand	Model	Specification
AC Adapter 1	EPS3	ML36-7120300-A1	AC Input: 100-120V, 50/60Hz, 1A DC Output: 12V, 3.0A DC Output Cable: 1.8m Plug: US
AC Adapter 2	EPS3	NBC36G120300VU	AC Input: 100-120V, 50/60Hz, 1A DC Output: 12V, 3.0A DC Output Cable: 1.8m Plug: US

5. The EUT has below radios as following table:

Radio 1	Radio 2	Radio 3
WLAN 2.4GHz + BT-LE	WLAN 5GHz (Low Band)	WLAN 5GHz (High Band)

6. Simultaneously transmission combination.

Combination	Technology				
1	WLAN 2.4GHz	WLAN 5GHz (Low Band)	WLAN 5GHz (High Band)	BT-LE	LTE
Note: The emission of the simultaneous operation has been evaluated and no non-compliance was found.					

7. 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.

Antenna NO.	RF Chain NO.	Brand	Model	Antenna Net Gain(dBi)	Frequency range (GHz)	Antenna Type	Connector Type
2G ANT	Chain 0	WNC	XLE	4.00	2.4~2.4835	Dipole	ipex(MHF)
	Chain 1	WNC	XLE	3.20	2.4~2.4835	Dipole	ipex(MHF)
5GL ANT	Chain 0	WNC	XLE	4.60	5.15~5.35	Dipole	ipex(MHF)
	Chain 1	WNC	XLE	4.70	5.15~5.35	Dipole	ipex(MHF)
5GH ANT	Chain 0	WNC	XLE	4.90	5.47~5850	Dipole	ipex(MHF)
	Chain 1	WNC	XLE	4.50	5.47~5850	Dipole	ipex(MHF)
	Chain 2	WNC	XLE	5.00	5.47~5850	Dipole	ipex(MHF)
	Chain 3	WNC	XLE	4.80	5.47~5850	Dipole	ipex(MHF)
BLE ANT	Chain 0	WNC	XLE	4.10	2.4~2.4835	PCB	ipex(MHF)

* 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. The AC Adapter has the following models: EPS3 ML36-7120300-A1/ EPS3 NBC36G120300VU. Pre-scan these models of AC Adapters and find the worst case as a representative test condition.
Worst Case:	1. AC Adapter Worst Condition:EPS3 ML36-7120300-A1

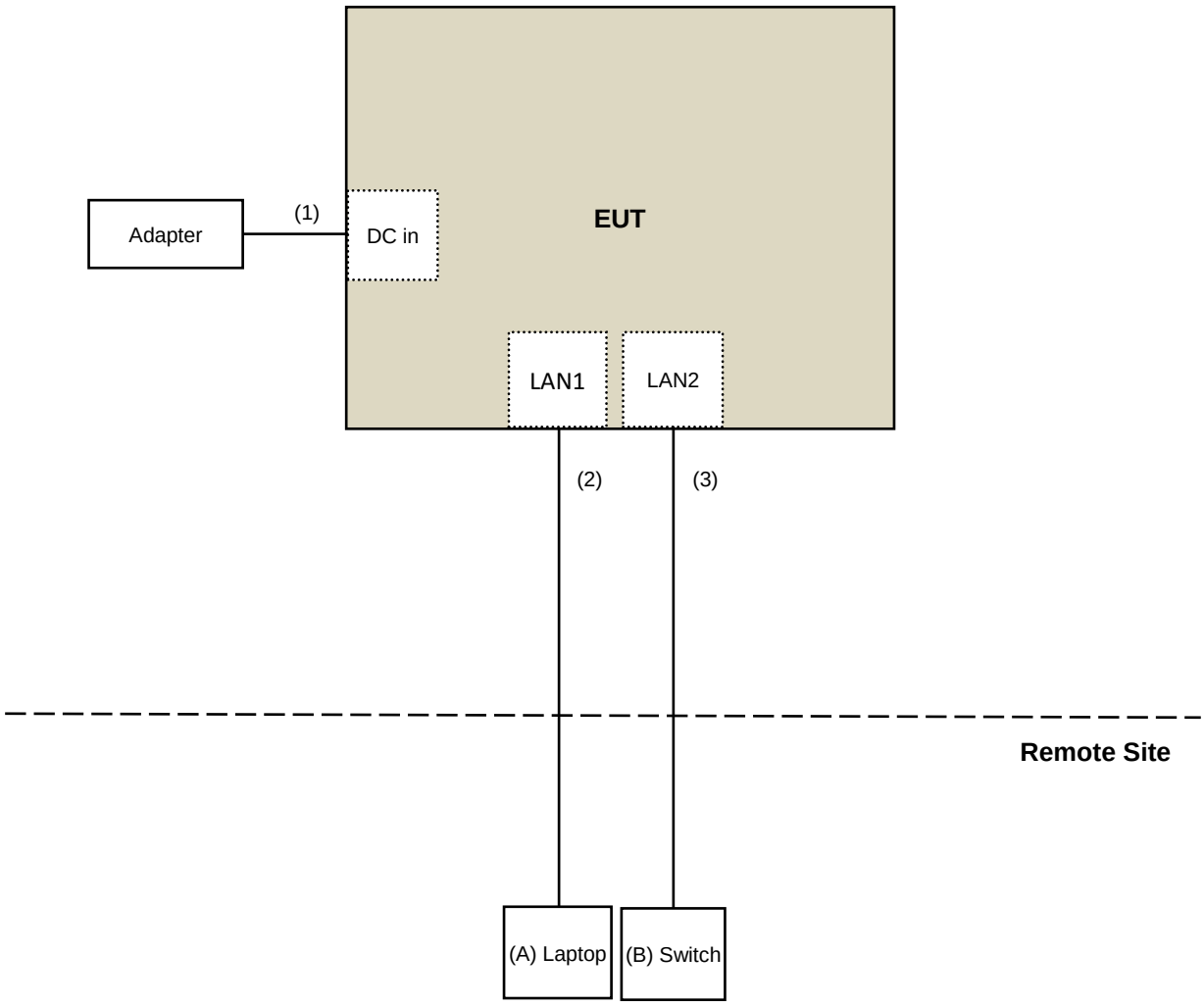
Following channel(s) was (were) selected for the final test as listed below:

Test Item	Mode	Tested Channel	Modulation	Data Rate Parameter
AC Power Conducted Emissions	BT-LE 1M	0	GFSK	1Mb/s
Unwanted Emissions below 1 GHz	BT-LE 1M	0	GFSK	1Mb/s

3.5 Test Program Used and Operation Descriptions

Controlling software (Telnet paste BT cmd.txt) has been activated to set the EUT under transmission condition continuously at specific channel frequency.

3.6 Connection Diagram of EUT and Peripheral Devices



3.7 Configuration of Peripheral Devices and Cable Connections

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A	Laptop	Dell	P92G	BM6Q4P2	N/A	Provided by Lab
B	Switch	D-Link	DGS-1005D	DR8WC92000523	N/A	Provided by Lab

ID	Cable Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1	DC Cable	1	1.8	No	0	Supplied by applicant
2	RJ-45 Cable	1	10	No	0	Provided by Lab
3	RJ-45 Cable	1	10	No	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 AC Power Conducted Emissions

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
50 ohm terminal resistance Telegartner	50 ohm	3	2023/10/20	2024/10/19
EMI Test Receiver R&S	ESCS 30	847124/029	2023/10/18	2024/10/17
Fixed Attenuator STI	STI02-2200-10	005	2024/2/19	2025/2/18
LISN R&S	ESH3-Z5	835239/001	2024/4/3	2025/4/2
		848773/004	2023/10/13	2024/10/12
RF Coaxial Cable JYEBAO	5D-FB	COCCAB-001	2024/2/19	2025/2/18
Software BVADT	BVADT_Cond_V7.3.7.4	N/A	N/A	N/A

Notes:

1. The test was performed in Conduction 1
2. Tested Date: 2024/8/15

4.2 Unwanted Emissions below 1 GHz

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Bi_Log Antenna Schwarzbeck	VULB 9168	9168-0942	2023/10/12	2024/10/11
Boresight Antenna Tower & Turn Table Max-Full	MF-7802BS	MF780208530	N/A	N/A
Fixed Attenuator Mini-Circuits	UNAT-5+	PAD-ATT5-01	2024/5/16	2025/5/15
Loop Antenna Electro-Metrics	EM-6879	264	2024/2/23	2025/2/22
MXA Signal Analyzer Keysight	N9020B	MY60112410	2024/3/13	2025/3/12
MXE EMI Receiver Keysight	N9038A	MY59050100	2024/6/19	2025/6/18
Preamplifier EMCI	EMC330N	980852	2024/2/17	2025/2/16
	EMC001340	980142	2024/2/19	2025/2/18
RF Coaxial Cable JYEBAO	5D-FB	LOOPCAB-001	2024/2/19	2025/2/18
		LOOPCAB-002	2024/2/19	2025/2/18
RF Coaxial Cable PEWC	8D	966-6-1	2024/5/16	2025/5/15
		966-6-2	2024/5/16	2025/5/15
		966-6-3	2024/5/16	2025/5/15
Software	ADT_Radiated_V8.7.08	N/A	N/A	N/A

Notes:

1. The test was performed in 966 Chamber No. 6.
2. Tested Date: 2024/8/15

5 Limits of Test Items

5.1 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.

5.2 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

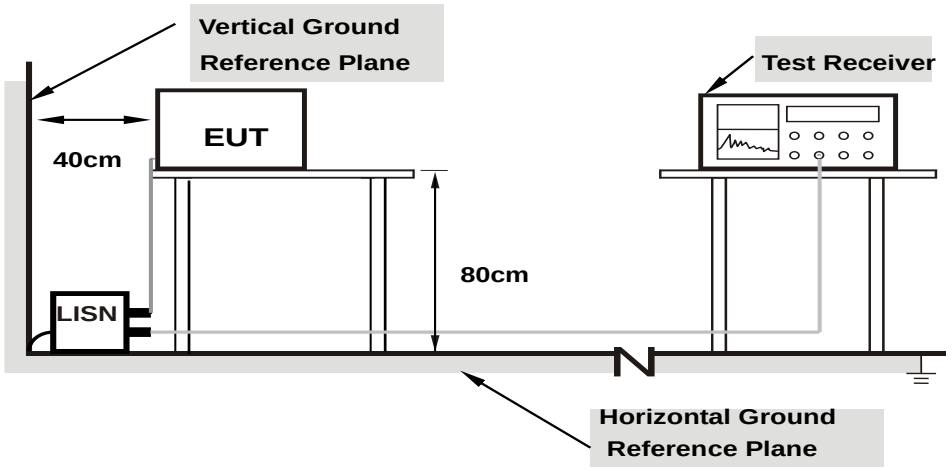
Notes:

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

6 Test Arrangements

6.1 AC Power Conducted Emissions

6.1.1 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).

6.1.2 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.

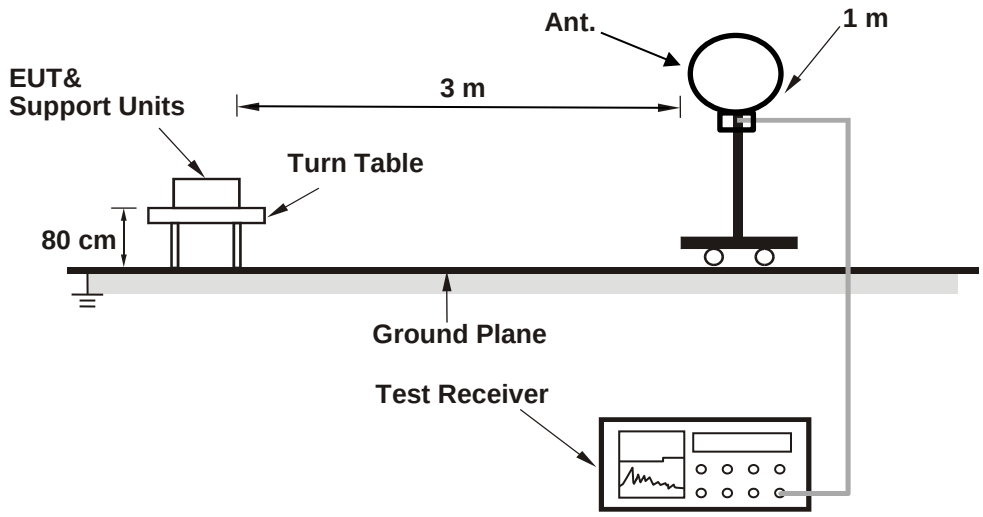
c. The frequency range from 150 kHz to 30 MHz was searched. Emission levels under (Limit – 20 dB) was not recorded.

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.

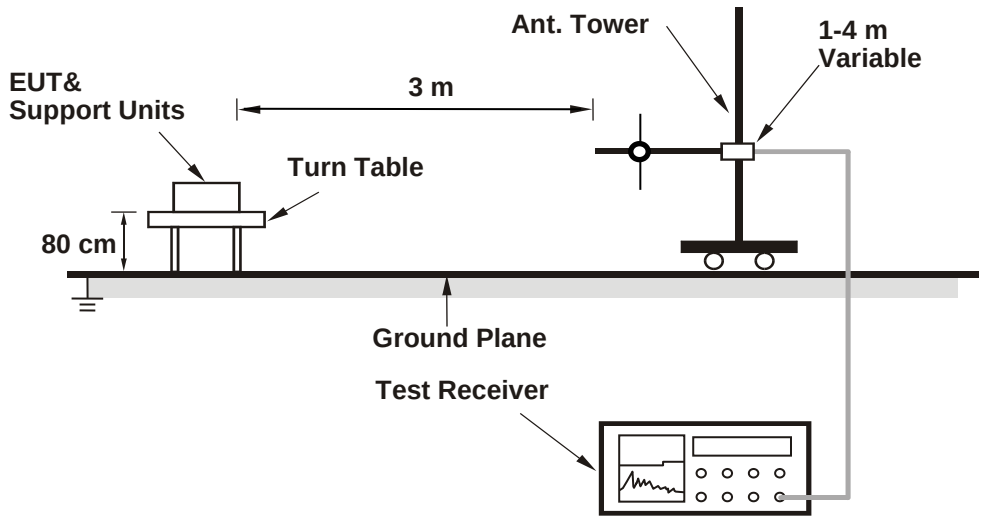
6.2 Unwanted Emissions below 1 GHz

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

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.

7 Test Results of Test Item

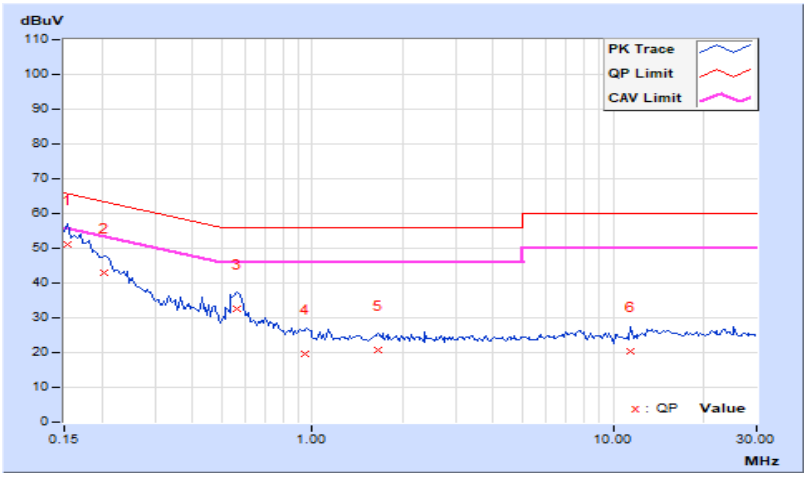
7.1 AC Power Conducted Emissions

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, 62 % RH
Tested By	Willy Lin		

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	0.15391	10.03	41.14	24.44	51.17	34.47	65.79	55.79	-14.62	-21.32
2	0.20469	10.03	32.88	18.30	42.91	28.33	63.42	53.42	-20.51	-25.09
3	0.56016	10.04	22.59	14.42	32.63	24.46	56.00	46.00	-23.37	-21.54
4	0.94297	10.07	9.46	3.99	19.53	14.06	56.00	46.00	-36.47	-31.94
5	1.66016	10.10	10.73	3.18	20.83	13.28	56.00	46.00	-35.17	-32.72
6	11.42578	10.77	9.54	5.85	20.31	16.62	60.00	50.00	-39.69	-33.38

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

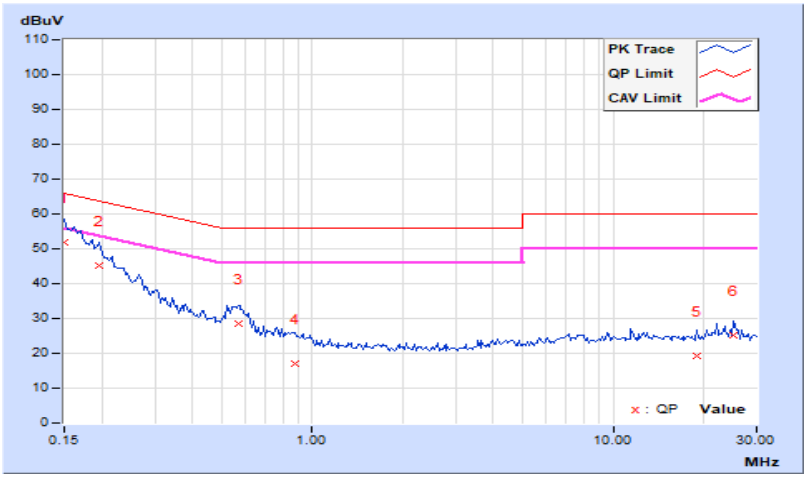


RF Mode	BT-LE 1M	**Channel**	CH 0：2402 MHz
Frequency Range	150 kHz ~ 30 MHz	**Detector Function & Resolution Bandwidth**	Quasi-Peak (QP) / Average (AV), 9 kHz
Input Power	120 Vac, 60 Hz	**Environmental Conditions**	23 °C, 62 % RH
Tested By	Willy Lin		

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	**0.15000**	**10.02**	**41.70**	**23.00**	**51.72**	**33.02**	**66.00**	**56.00**	**-14.28**	**-22.98**
2	0.19687	10.03	35.16	19.07	45.19	29.10	63.74	53.74	-18.55	-24.64
3	0.56797	10.04	18.60	12.07	28.64	22.11	56.00	46.00	-27.36	-23.89
4	0.87266	10.05	6.99	-1.77	17.04	8.28	56.00	46.00	-38.96	-37.72
5	19.05469	10.95	8.45	6.78	19.40	17.73	60.00	50.00	-40.60	-32.27
6	25.15234	11.11	14.12	11.34	25.23	22.45	60.00	50.00	-34.77	-27.55

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



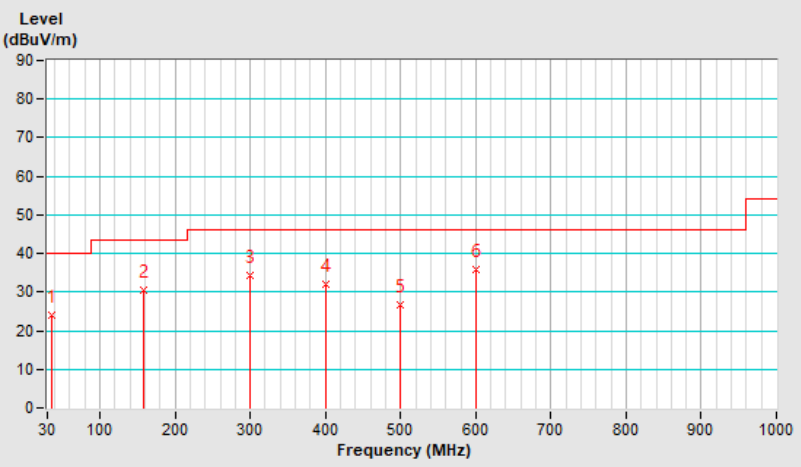
7.2 Unwanted Emissions below 1 GHz

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**	21 °C, 62 % RH
Tested By	Willy 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	35.71	24.0 QP	40.0	-16.0	1.50 H	221	37.5	-13.5
2	158.24	30.5 QP	43.5	-13.0	2.00 H	87	43.1	-12.6
3	300.13	34.2 QP	46.0	-11.8	1.00 H	131	46.5	-12.3
4	400.51	32.1 QP	46.0	-13.9	1.00 H	151	41.9	-9.8
5	500.01	26.8 QP	46.0	-19.2	1.50 H	106	34.3	-7.5
6	600.12	35.7 QP	46.0	-10.3	1.00 H	11	40.8	-5.1

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.

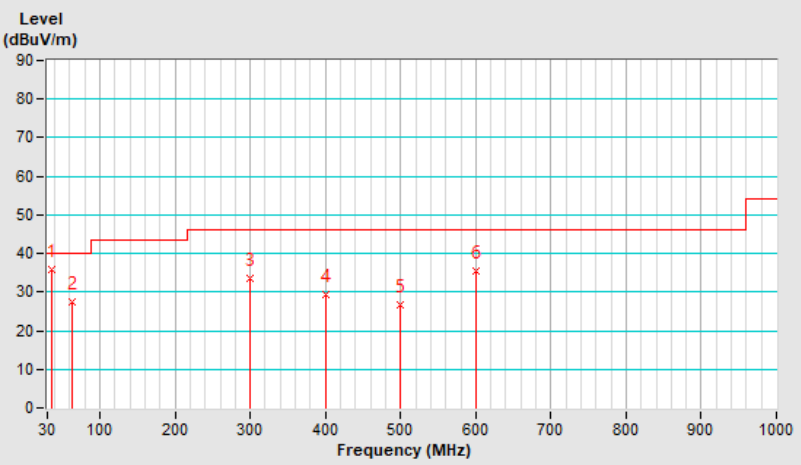


RF Mode	BT-LE 1M	**Channel**	CH 0：2402 MHz
Frequency Range	30 MHz ~ 1 GHz	**Detector Function & Bandwidth**	QP: RB=120kHz, DET=Quasi-Peak
Input Power	120 Vac, 60 Hz	**Environmental Conditions**	21 °C, 62 % RH
Tested By	Willy Lin		

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	**35.75**	**35.8 QP**	**40.0**	**-4.2**	**1.00 V**	**351**	**49.3**	**-13.5**
2	63.91	27.6 QP	40.0	-12.4	1.50 V	224	41.4	-13.8
3	300.12	33.6 QP	46.0	-12.4	1.00 V	100	45.9	-12.3
4	400.01	29.5 QP	46.0	-16.5	1.00 V	184	39.3	-9.8
5	500.13	26.8 QP	46.0	-19.2	2.00 V	266	34.3	-7.5
6	600.11	35.4 QP	46.0	-10.6	1.00 V	105	40.5	-5.1

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.



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

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