

FCC Test Report

Report No.: RFBCKS-WTW-P25030622-5

FCC ID: 2AAAS-CP08

Test Model: CP08

Received Date: 2025/2/27

Test Date: 2025/4/7 ~ 2025/4/10

Issued Date: 2025/5/15

Applicant: Vivint, Inc.

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Hsin Chu Laboratory

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Taiwan

Test Location: E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300,
Taiwan

FCC Registration / 723255 / TW2022
Designation Number:



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Release Control Record

Issue No.	Description	Date Issued
RFBCKS-WTW-P25030622-5	Original release	2025/5/15

1 Certificate of Conformity

Product: Smart Hub Pro (Gen 2)

Brand: Vivint

Test Model: CP08

Sample Status: Engineering sample

Applicant: Vivint, Inc.

Test Date: 2025/4/7 ~ 2025/4/10

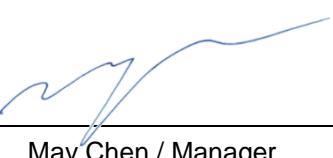
Standards: 47 CFR FCC Part 15, Subpart C (Section 15.247)

ANSI C63.10:2013

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.

Prepared by :  , **Date:** 2025/5/15

Claire Kuan / Specialist

Approved by :  , **Date:** 2025/5/15

May Chen / Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart C (Section 15.247)			
FCC Clause	Test Item	Result	Remarks
15.207	AC Power Conducted Emission	Pass	Meet the requirement of limit. Minimum passing margin is -7.63 dB at 0.3906 MHz
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -3.9 dB at 860.47 MHz
15.247(d)	Antenna Port Emission	Pass	Meet the requirement of limit.
15.247(a)(2)	6dB bandwidth	Pass	Meet the requirement of limit.
15.247(b)	Conducted power	Pass	Meet the requirement of limit.
15.247(e)	Power Spectral Density	Pass	Meet the requirement of limit.
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:

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
RF Output Power	-	1.1 dB
Power Spectral Density	-	1.3 dB
6 dB Bandwidth	-	1050.00 Hz
Conducted Out of Band Emissions	9 kHz ~ 40 GHz	2.79 dB
Conducted Emissions at mains ports	150 kHz ~ 30 MHz	1.9 dB
Radiated Emissions up to 1 GHz	30 MHz ~ 1 GHz	5.4 dB
Radiated Emissions above 1 GHz	1 GHz ~ 18 GHz	5.0 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Smart Hub Pro (Gen 2)
Brand	Vivint
Test Model	CP08
Sample Status	Engineering sample
Power Supply Rating	12Vdc from adapter or 4 ~ 4.48 Vdc from battery
Modulation Type	FSK
Operating Frequency	912 MHz, 920 MHz
Transfer Rate	100 kbps
Number of Channel	2
Output Power	52 mW
Antenna Type	Refer to note
Antenna Connector	Refer to note
Accessory Device	Refer to note
Cable Supplied	Refer to note

Note:

1. The EUT uses following accessories.

Item	Brand	Model	Specification	P/N
AC Adapter	HONOTO	ADS-24FUD-12 12024EPCU	AC Input: 100-240V, 50/60Hz, 0.6A DC Output: 12V, 2A	-
Battery	Shanghai BYD Co., Ltd	10-600026-001	Power Rating: Nominal Voltage: 4.0V Min Capacity: 5280mAh 20.5Wh Typ Capacity: 5395mAh 21.0Wh Maximum Charge Voltage: 4.48V	16251678-00

2. The EUT contains certified LTE module (FCC ID: XMR201909EG91NAX).

3. The EUT has below radios as following table:

Radio 1	Radio 2	Radio 3	Radio 4
Z-wave	WWAN(LTE)	WLAN (2.4 GHz + 5 GHz)	Bluetooth

4. Simultaneously transmission combination.

Combination	Technology			
1	WLAN (2.4 GHz)	Bluetooth	Z-wave	WWAN
2	WLAN (5 GHz)	Bluetooth	Z-wave	WWAN

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

5. The antenna information is listed as below.

Antenna Net Gain(dBi)	Frequency range	Antenna Type	Connector Type
1.2	880 ~ 920 MHz	PIFA	None

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

6. 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 Description of Test Modes

2 channels are provided to this EUT:

Channel	Freq. (MHz)
US11, CH3	912
US12, CH3	920

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable to				Description
	RE≥1G	RE<1G	PLC	APCM	
-	√	√	√	√	-

Where RE≥1G: Radiated Emission above 1GHz & Bandedge

Measurement

PLC: Power Line Conducted Emission

RE<1G: Radiated Emission below 1GHz

APCM: Antenna Port Conducted Measurement

Note:

1. The EUT had been pre-tested on the Lying, Standing and Wall Mount. The worst case was found when positioned on Wall Mount.

Radiated Emission Test (Above 1GHz):

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

EUT Configure Mode	Available Channel	Operating Frequency	Modulation Type
-	US11, CH3	912 MHz	FSK
-	US12, CH3	920 MHz	FSK

Radiated Emission Test (Below 1GHz):

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

EUT Configure Mode	Available Channel	Tested Channel	Modulation Type
-	US11, CH3	912 MHz	FSK
-	US12, CH3	920 MHz	FSK

Power Line Conducted Emission Test:

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

EUT Configure Mode	Available Channel	Tested Channel	Modulation Type
-	US11, CH3	912 MHz	FSK

Antenna Port Conducted Measurement:

- This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
- 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).
- Following channel(s) was (were) selected for the final test as listed below.

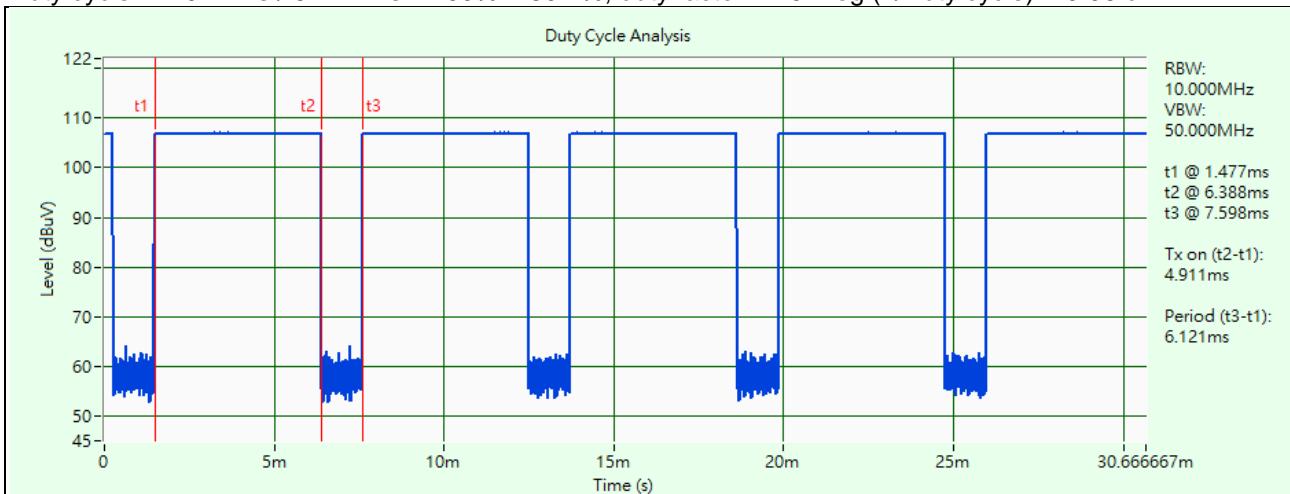
EUT Configure Mode	Available Channel	Tested Channel	Modulation Type
-	US11, CH3	912 MHz	FSK
-	US12, CH3	920 MHz	FSK

Test Condition:

Applicable to	Environmental Conditions	Input Power	Tested by
RE \geq 1G	23 deg. C, 73% RH	120 Vac, 60 Hz	Louis Yang
RE<1G	25 deg. C, 67% RH 23 deg. C, 67% RH	120 Vac, 60 Hz	Louis Yang
PLC	21 deg. C, 66% RH	120 Vac, 60 Hz	Louis Yang
APCM	25 deg. C, 60% RH	120 Vac, 60 Hz	Louis Yang

3.3 Duty Cycle of Test Signal

Duty cycle = $4.911 \text{ ms} / 6.121 \text{ ms} \times 100\% = 80.2\%$, duty factor = $10 * \log (1/\text{Duty cycle}) = 0.96 \text{ dB}$



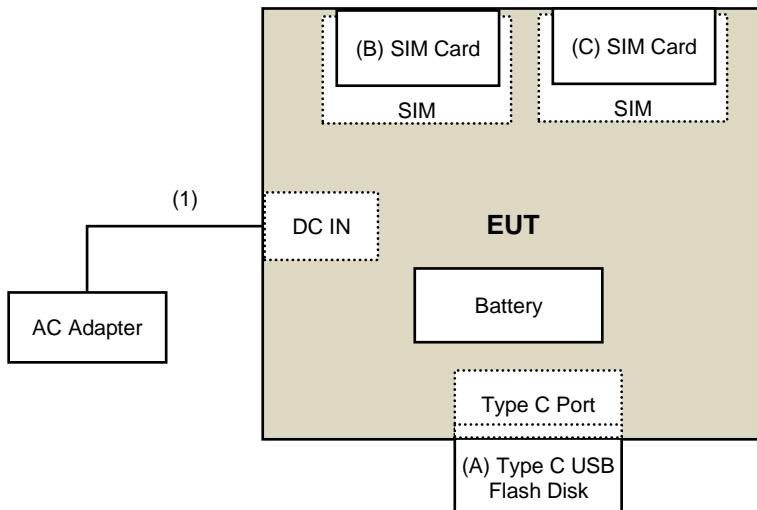
3.4 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A	Type C USB Flash Disk	Sandisk	Ultra Go	NA	NA	Provided by Lab
B	SIM Card	R&S	CRT-Z3	NA	NA	Provided by Lab
C	SIM Card	R&S	CRT-Z3	NA	NA	Provided by Lab

ID	Cable Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1	DC Cable	1	1.4	No	0	Supplied by applicant

3.4.1 Configuration of System under Test



3.5 General Description of Applied Standards and References

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards and references:

Test standard:

FCC Part 15, Subpart C (15.247)

ANSI C63.10:2013

All test items have been performed and recorded as per the above standards.

References Test Guidance:

KDB 558074 D01 15.247 Meas Guidance v05r02

All test items have been performed as a reference to the above KDB test guidance.

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 20dB 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

Note:

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 1000MHz, 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 20dB under any condition of modulation.

4.1.2 Test Instruments

Unwanted Emissions below 1 GHz

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208406	N/A	N/A
Bi_Log Antenna Schwarzbeck	VULB 9168	9168-361	2024/10/8	2025/10/7
Fix tool for Boresight antenna tower BV	FBA-01	FBA_SIP01	N/A	N/A
Fixed Attenuator Mini-Circuits	UNAT-5+	PAD-3m-3-01	2025/2/8	2026/2/7
Loop Antenna TESEQ	HLA 6121	63620	2024/10/17	2025/10/16
MXE EMI Receiver Agilent	N9038A	MY50010156	2024/6/5	2025/6/4
Preamplifier EMCI	EMC330N	980852	2025/2/8	2026/2/7
	EMC001340	980142	2025/2/17	2026/2/16
RF Coaxial Cable PEWC	8D	001	2025/2/8	2026/2/7
		966-3-2	2025/2/8	2026/2/7
		966-3-3	2025/2/8	2026/2/7
Software	ADT_Radiated_V8.7.08	N/A	N/A	N/A

Notes:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in 966 Chamber No. 3.
3. Tested Date: 2025/4/7 ~ 2025/4/9

Unwanted Emissions above 1 GHz

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208406	N/A	N/A
Fix tool for Boresight antenna tower BV	FBA-01	FBA_SIP01	N/A	N/A
Horn Antenna Schwarzbeck	BBHA 9120D	9120D-406	2024/11/10	2025/11/9
MXE EMI Receiver Agilent	N9038A	MY50010156	2024/6/5	2025/6/4
Preamplifier EMCI	EMC12630SE	980384	2025/1/14	2026/1/13
RF Coaxial Cable EMCI	EMC104-SM-SM-1500	180504	2025/1/18	2026/1/17
	EMC104-SM-SM-2000	180601	2025/1/18	2026/1/17
	EMC104-SM-SM-6000	210201	2025/1/18	2026/1/17
Software	ADT_Radiated_V8.7.08	N/A	N/A	N/A

Notes:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in 966 Chamber No. 3.
3. Tested Date: 2025/4/8 ~ 2025/4/9

4.1.3 Test Procedures

For Radiated emission below 30MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. 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.

Note:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency below 30MHz.

For Radiated emission above 30MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) 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.
- f. The test-receiver system was set to peak and average detect 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.

Note:

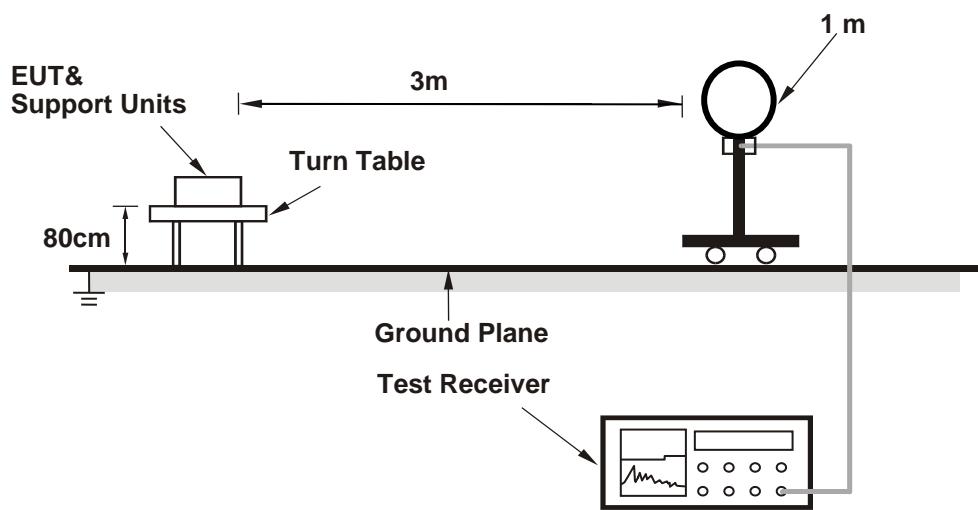
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is $\geq 1/T$ (Duty cycle < 98%) or 10Hz (Duty cycle $\geq 98\%$) for Average detection (AV) at frequency above 1GHz. (RBW = 1MHz, VBW = 1kHz)
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

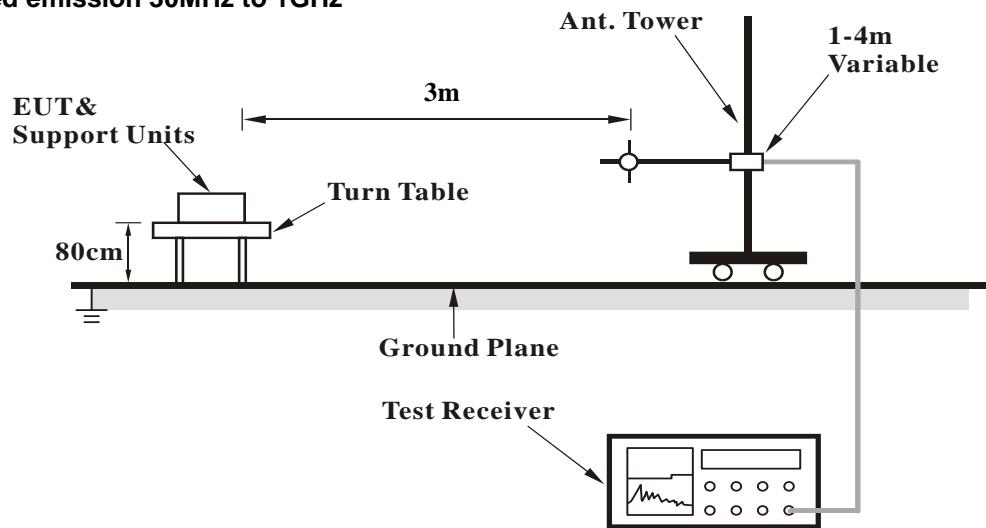
No deviation.

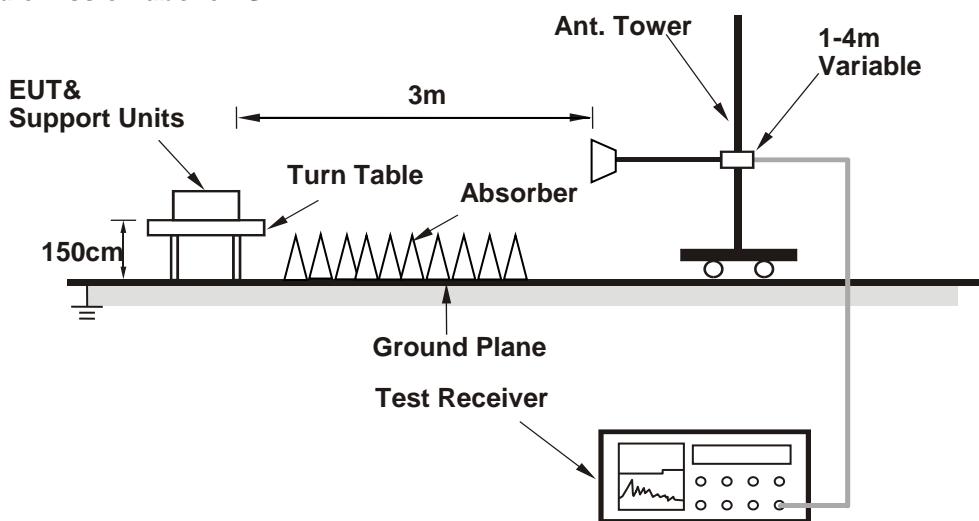
4.1.5 Test Setup

For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz

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

4.1.6 EUT Operating Conditions

- Set the EUT under transmission condition continuously at specific channel frequency.

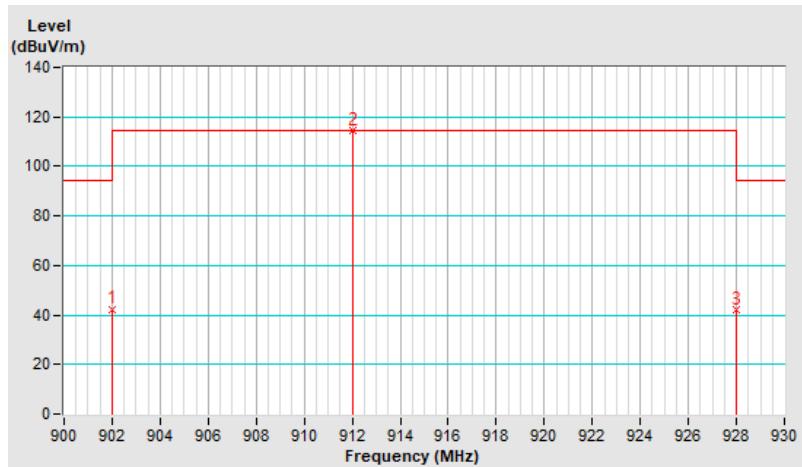
4.1.7 Test Results

RF Mode	Zwave	Channel	US11, CH3 : 912 MHz
Frequency Range	902 MHz ~ 928 MHz	Detector Function & Bandwidth	QP: RB=120kHz, DET=Quasi-Peak
Input Power	120 Vac, 60 Hz	Environmental Conditions	25 °C, 67 % RH
Tested By	Louis Yang		

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	902.00	42.4 QP	94.4	-52.0	2.00 H	360	11.1	31.3
2	*912.00	114.4 QP			2.00 H	360	82.5	31.9
3	928.00	42.1 QP	94.4	-52.3	2.00 H	360	10.2	31.9

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

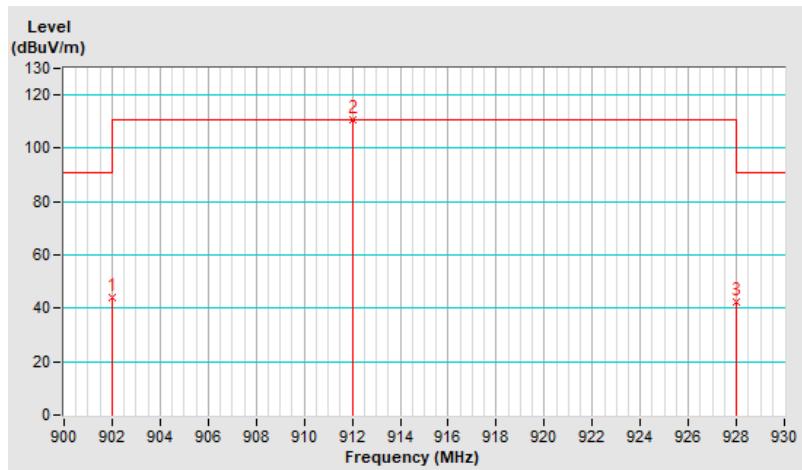


RF Mode	Zwave	Channel	US11, CH3 : 912 MHz
Frequency Range	902 MHz ~ 928 MHz	Detector Function & Bandwidth	QP: RB=120kHz, DET=Quasi-Peak
Input Power	120 Vac, 60 Hz	Environmental Conditions	25 °C, 67 % RH
Tested By	Louis Yang		

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	902.00	44.0 QP	90.7	-46.7	1.00 V	112	12.7	31.3
2	*912.00	110.7 QP			1.00 V	112	78.8	31.9
3	928.00	42.4 QP	90.7	-48.3	1.00 V	112	10.5	31.9

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



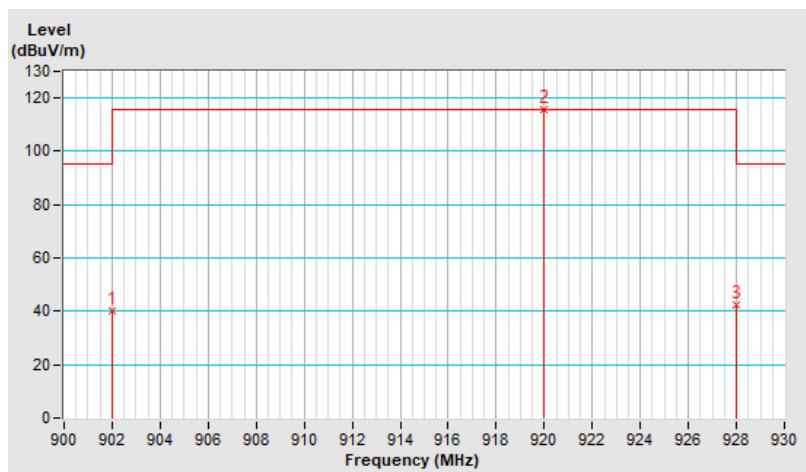
RF Mode	Zwave	Channel	US12, CH3 : 920 MHz
Frequency Range	902 MHz ~ 928 MHz	Detector Function & Bandwidth	QP: RB=120kHz, DET=Quasi-Peak
Input Power	120 Vac, 60 Hz	Environmental Conditions	23 °C, 67 % RH
Tested By	Louis Yang		

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	902.00	40.4 QP	95.5	-55.1	1.44 H	5	9.1	31.3
2	*920.00	115.5 QP			1.44 H	5	83.4	32.1
3	928.00	42.2 QP	95.5	-53.3	1.44 H	5	10.3	31.9

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

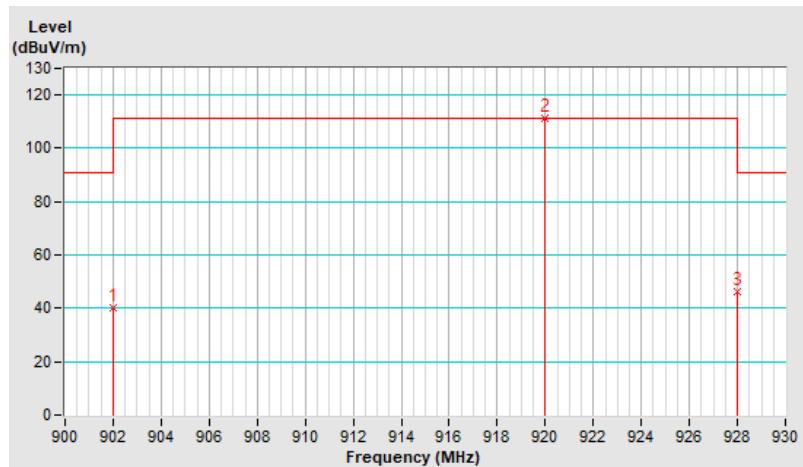


RF Mode	Zwave	Channel	US12, CH3 : 920 MHz
Frequency Range	902 MHz ~ 928 MHz	Detector Function & Bandwidth	QP: RB=120kHz, DET=Quasi-Peak
Input Power	120 Vac, 60 Hz	Environmental Conditions	23 °C, 67 % RH
Tested By	Louis Yang		

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	902.00	40.3 QP	91.0	-50.7	1.05 V	120	9.0	31.3
2	*920.00	111.0 QP			1.05 V	120	78.9	32.1
3	928.00	46.2 QP	91.0	-44.8	1.05 V	120	14.3	31.9

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



Above 1 GHz Data:

RF Mode	Zwave	Channel	US11, CH3 : 912 MHz
Frequency Range	1 GHz ~ 10 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=300 Hz, DET=Peak
Input Power	120 Vac, 60 Hz	Environmental Conditions	23 °C, 73 % RH
Tested By	Louis Yang		

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	2736.00	38.5 PK	74.0	-35.5	2.44 H	13	40.0	-1.5
2	2736.00	30.9 AV	54.0	-23.1	2.44 H	13	32.4	-1.5
3	3648.00	39.0 PK	74.0	-35.0	2.45 H	24	39.8	-0.8
4	3648.00	31.7 AV	54.0	-22.3	2.45 H	24	32.5	-0.8
5	4560.00	38.7 PK	74.0	-35.3	3.60 H	121	37.5	1.2
6	4560.00	25.3 AV	54.0	-28.7	3.60 H	121	24.1	1.2
7	7296.00	42.6 PK	74.0	-31.4	1.52 H	360	35.8	6.8
8	7296.00	30.6 AV	54.0	-23.4	1.52 H	360	23.8	6.8
9	8208.00	49.0 PK	74.0	-25.0	3.90 H	318	41.4	7.6
10	8208.00	43.5 AV	54.0	-10.5	3.90 H	318	35.9	7.6
11	9120.00	43.7 PK	74.0	-30.3	3.70 H	128	35.5	8.2
12	9120.00	32.3 AV	54.0	-21.7	3.70 H	128	24.1	8.2

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	2736.00	39.4 PK	74.0	-34.6	1.53 V	85	40.9	-1.5
2	2736.00	32.8 AV	54.0	-21.2	1.53 V	85	34.3	-1.5
3	3648.00	39.4 PK	74.0	-34.6	1.43 V	97	40.2	-0.8
4	3648.00	32.9 AV	54.0	-21.1	1.43 V	97	33.7	-0.8
5	4560.00	39.7 PK	74.0	-34.3	2.26 V	110	38.5	1.2
6	4560.00	29.5 AV	54.0	-24.5	2.26 V	110	28.3	1.2
7	7296.00	43.4 PK	74.0	-30.6	2.85 V	24	36.6	6.8
8	7296.00	31.9 AV	54.0	-22.1	2.85 V	24	25.1	6.8
9	8208.00	48.3 PK	74.0	-25.7	2.42 V	360	40.7	7.6
10	8208.00	43.5 AV	54.0	-10.5	2.42 V	360	35.9	7.6
11	9120.00	43.3 PK	74.0	-30.7	1.61 V	99	35.1	8.2
12	9120.00	32.5 AV	54.0	-21.5	1.61 V	99	24.3	8.2

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.

RF Mode	Zwave	Channel	US11, CH3 : 912 MHz
Frequency Range	1 GHz ~ 10 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=300 Hz, DET=Peak
Input Power	120 Vac, 60 Hz	Environmental Conditions	23 °C, 73 % RH
Tested By	Louis Yang		

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	2760.00	38.5 PK	74.0	-35.5	2.44 H	13	39.9	-1.4
2	2760.00	30.9 AV	54.0	-23.1	2.44 H	13	32.3	-1.4
3	3680.00	39.0 PK	74.0	-35.0	2.45 H	24	39.8	-0.8
4	3680.00	31.7 AV	54.0	-22.3	2.45 H	24	32.5	-0.8
5	4600.00	38.7 PK	74.0	-35.3	3.60 H	121	37.5	1.2
6	4600.00	25.3 AV	54.0	-28.7	3.60 H	121	24.1	1.2
7	7360.00	42.6 PK	74.0	-31.4	1.52 H	360	35.5	7.1
8	7360.00	30.6 AV	54.0	-23.4	1.52 H	360	23.5	7.1
9	8280.00	49.0 PK	74.0	-25.0	3.90 H	318	41.6	7.4
10	8280.00	43.5 AV	54.0	-10.5	3.90 H	318	36.1	7.4
11	9200.00	43.7 PK	74.0	-30.3	3.70 H	128	35.1	8.6
12	9200.00	32.3 AV	54.0	-21.7	3.70 H	128	23.7	8.6

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	2760.00	39.4 PK	74.0	-34.6	1.53 V	85	40.8	-1.4
2	2760.00	32.8 AV	54.0	-21.2	1.53 V	85	34.2	-1.4
3	3680.00	39.4 PK	74.0	-34.6	1.43 V	97	40.2	-0.8
4	3680.00	32.9 AV	54.0	-21.1	1.43 V	97	33.7	-0.8
5	4600.00	39.7 PK	74.0	-34.3	2.26 V	110	38.5	1.2
6	4600.00	29.5 AV	54.0	-24.5	2.26 V	110	28.3	1.2
7	7360.00	43.4 PK	74.0	-30.6	2.85 V	24	36.3	7.1
8	7360.00	31.9 AV	54.0	-22.1	2.85 V	24	24.8	7.1
9	8280.00	48.3 PK	74.0	-25.7	2.42 V	360	40.9	7.4
10	8280.00	43.5 AV	54.0	-10.5	2.42 V	360	36.1	7.4
11	9200.00	43.3 PK	74.0	-30.7	1.61 V	99	34.7	8.6
12	9200.00	32.5 AV	54.0	-21.5	1.61 V	99	23.9	8.6

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.

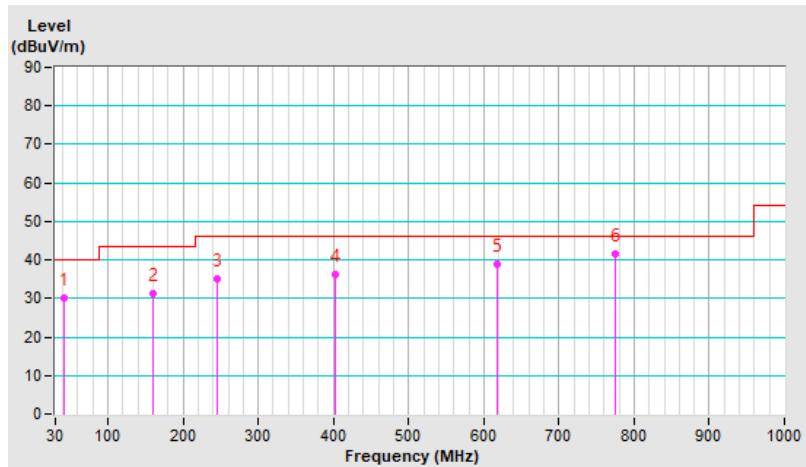
Below 1GHz data:

RF Mode	Zwave	Channel	US11, CH3 : 912 MHz
Frequency Range	30 MHz ~ 1 GHz	Detector Function & Bandwidth	QP: RB=120kHz, DET=Quasi-Peak
Input Power	120 Vac, 60 Hz	Environmental Conditions	23 °C, 66 % RH
Tested By	Louis Yang		

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	41.96	30.1 QP	40.0	-9.9	2.00 H	221	32.5	-2.4
2	159.52	31.4 QP	43.5	-12.1	3.00 H	0	33.6	-2.2
3	245.46	35.0 QP	46.0	-11.0	1.00 H	78	38.5	-3.5
4	401.53	36.1 QP	46.0	-9.9	3.00 H	278	35.1	1.0
5	617.29	39.0 QP	46.0	-7.0	3.00 H	110	32.8	6.2
6	775.64	41.4 QP	46.0	-4.6	1.00 H	171	31.8	9.6

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.

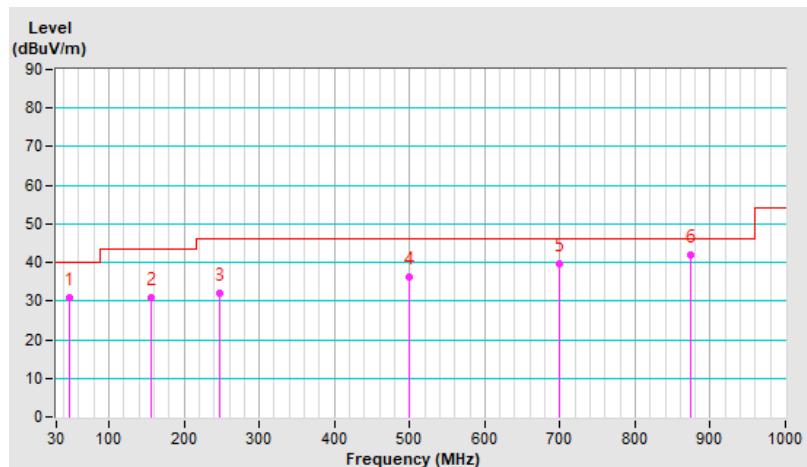


RF Mode	Zwave	Channel	US11, CH3 : 912 MHz
Frequency Range	30 MHz ~ 1 GHz	Detector Function & Bandwidth	QP: RB=120kHz, DET=Quasi-Peak
Input Power	120 Vac, 60 Hz	Environmental Conditions	23 °C, 66 % RH
Tested By	Louis Yang		

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	46.78	30.8 QP	40.0	-9.2	3.00 V	360	33.1	-2.3
2	156.63	30.9 QP	43.5	-12.6	2.00 V	68	33.1	-2.2
3	246.79	32.0 QP	46.0	-14.0	2.00 V	59	35.5	-3.5
4	499.92	36.3 QP	46.0	-9.7	2.00 V	354	33.0	3.3
5	698.96	39.7 QP	46.0	-6.3	3.00 V	193	32.1	7.6
6	874.36	42.0 QP	46.0	-4.0	3.00 V	123	32.0	10.0

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.

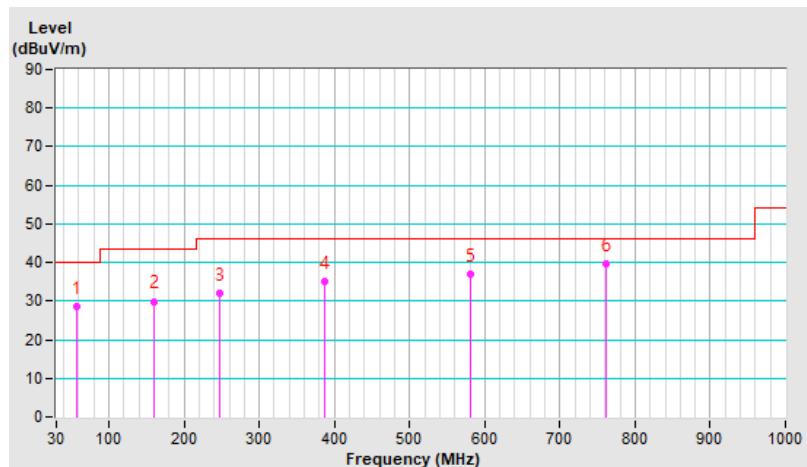


RF Mode	Zwave	Channel	US12, CH3 : 920 MHz
Frequency Range	30 MHz ~ 1 GHz	Detector Function & Bandwidth	QP: RB=120kHz, DET=Quasi-Peak
Input Power	120 Vac, 60 Hz	Environmental Conditions	23 °C, 67 % RH
Tested By	Louis Yang		

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	56.94	28.5 QP	40.0	-11.5	3.00 H	347	31.3	-2.8
2	159.33	29.9 QP	43.5	-13.6	3.00 H	50	32.1	-2.2
3	247.67	32.1 QP	46.0	-13.9	1.00 H	352	35.5	-3.4
4	387.25	34.9 QP	46.0	-11.1	3.00 H	289	34.3	0.6
5	581.76	36.8 QP	46.0	-9.2	2.00 H	360	31.6	5.2
6	761.62	39.8 QP	46.0	-6.2	2.00 H	101	30.6	9.2

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.

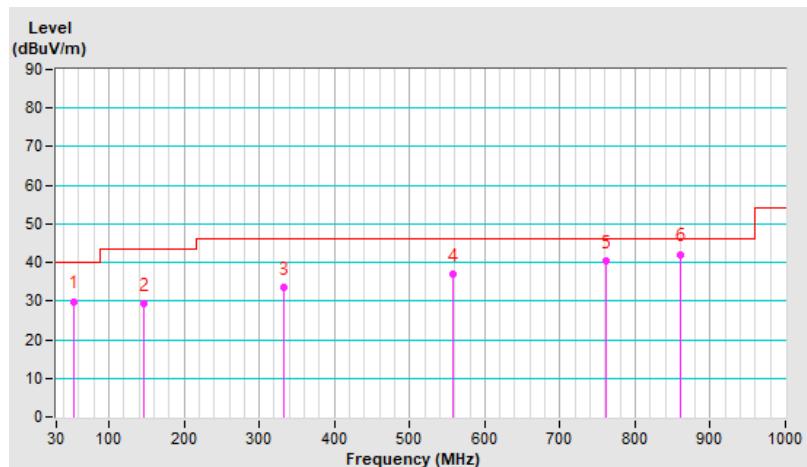


RF Mode	Zwave	Channel	US12, CH3 : 920 MHz
Frequency Range	30 MHz ~ 1 GHz	Detector Function & Bandwidth	QP: RB=120kHz, DET=Quasi-Peak
Input Power	120 Vac, 60 Hz	Environmental Conditions	23 °C, 70 % RH
Tested By	Louis Yang		

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	53.47	29.9 QP	40.0	-10.1	2.00 V	107	32.4	-2.5
2	146.06	29.5 QP	43.5	-14.0	1.00 V	178	31.5	-2.0
3	333.03	33.6 QP	46.0	-12.4	1.00 V	27	34.2	-0.6
4	558.43	37.1 QP	46.0	-8.9	3.00 V	4	32.7	4.4
5	762.20	40.3 QP	46.0	-5.7	3.00 V	84	31.0	9.3
6	860.47	42.1 QP	46.0	-3.9	1.00 V	360	31.9	10.2

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.



4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

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

Note: 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 0.50MHz.

4.2.2 Test Instruments

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
50 ohm terminal resistance Telegartner	50 ohm	3	2024/11/1	2025/10/31
EMI Test Receiver R&S	ESCS 30	100375	2024/5/20	2025/5/19
Fixed Attenuator STI	STI02-2200-10	005	2025/2/17	2026/2/16
LISN R&S	ESH3-Z5	835239/001	2025/3/27	2026/3/26
		848773/004	2024/10/7	2025/10/6
RF Coaxial Cable JYEBAO	5D-FB	COCCAB-001	2025/2/17	2026/2/16
Software BVADT	BVADT_Cond_V7.3.7.4	N/A	N/A	N/A

Notes:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Conduction 1
3. Tested Date: 2025/4/8

4.2.3 Test Procedures

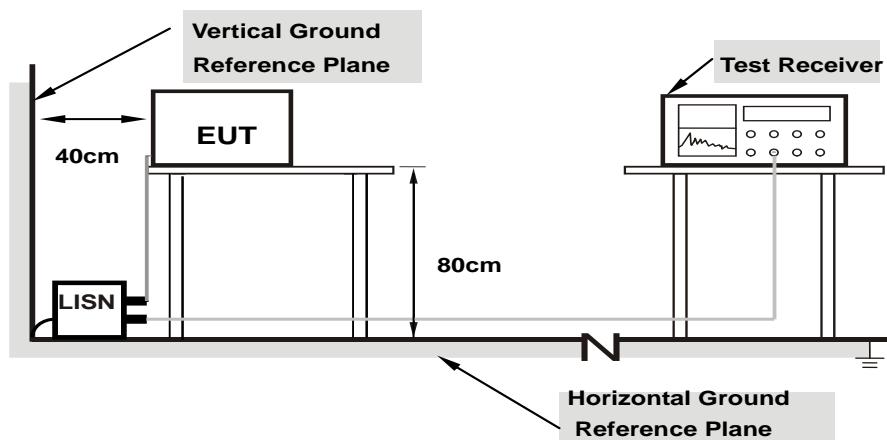
- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling 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 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 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).

4.2.6 EUT Operating Conditions

Same as 4.1.6.

4.2.7 Test Results

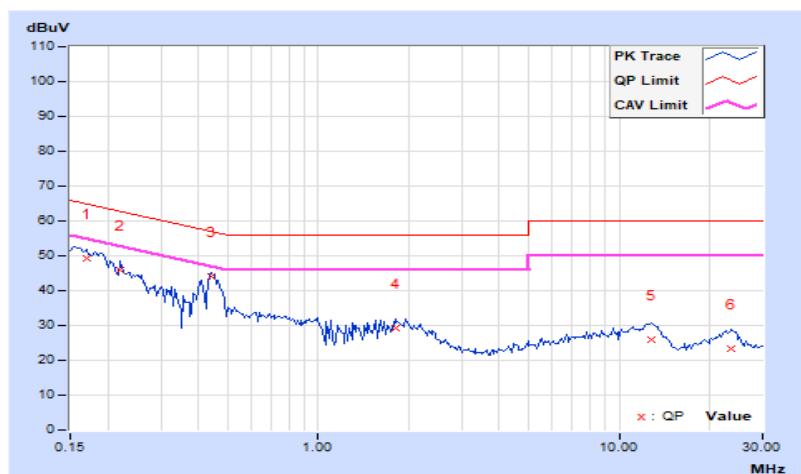
Worst-case data:

RF Mode	Zwave	Channel	US11, CH3 : 912 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	21 °C, 66 % RH
Tested By	Louis Yang		

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	0.16953	10.01	39.36	22.03	49.37	32.04	64.98	54.98	-15.61	-22.94
2	0.22031	10.03	35.74	22.22	45.77	32.25	62.81	52.81	-17.04	-20.56
3	0.43906	10.04	33.88	29.41	43.92	39.45	57.08	47.08	-13.16	-7.63
4	1.80469	10.15	18.99	12.28	29.14	22.43	56.00	46.00	-26.86	-23.57
5	12.75781	10.82	15.02	9.79	25.84	20.61	60.00	50.00	-34.16	-29.39
6	23.68750	11.18	12.26	7.44	23.44	18.62	60.00	50.00	-36.56	-31.38

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

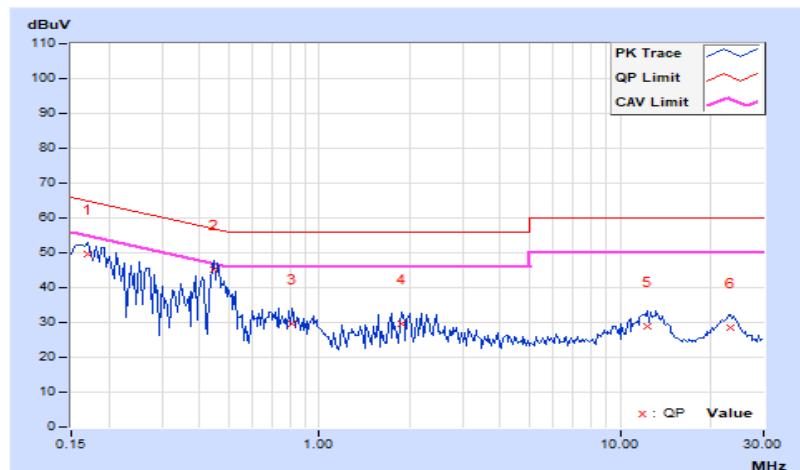


RF Mode	Zwave	Channel	US11, CH3 : 912 MHz
Frequency Range	150 kHz ~ 30 MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
Input Power	120 Vac, 60 Hz	Environmental Conditions	21 °C, 66 % RH
Tested By	Louis Yang		

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	0.16953	10.02	39.56	20.89	49.58	30.91	64.98	54.98	-15.40	-24.07
2	0.44688	10.02	35.00	24.58	45.02	34.60	56.93	46.93	-11.91	-12.33
3	0.81406	10.06	19.45	9.19	29.51	19.25	56.00	46.00	-26.49	-26.75
4	1.89063	10.13	19.56	11.40	29.69	21.53	56.00	46.00	-26.31	-24.47
5	12.29688	10.71	18.12	11.42	28.83	22.13	60.00	50.00	-31.17	-27.87
6	23.23828	11.00	17.57	11.98	28.57	22.98	60.00	50.00	-31.43	-27.02

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

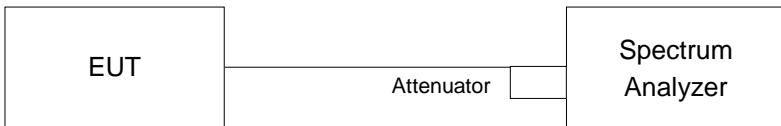


4.3 6dB Bandwidth Measurement

4.3.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.3.2 Test Setup



4.3.3 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
PXA Signal Analyzer Keysight	N9030A	MY55410176	2024/6/12	2025/6/11
Software	ADT_RF Test Software V7.6.5.4	NA	NA	NA

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
 2. The test was performed in Oven room 2.
 3. Tested Date: 2025/4/10

4.3.4 Test Procedure

- Set resolution bandwidth (RBW) = 100kHz.
- Set the video bandwidth (VBW) $\geq 3 \times$ RBW, Detector = peak.
- Trace mode = max hold.
- Sweep = auto couple.
- 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.

4.3.5 Deviation from Test Standard

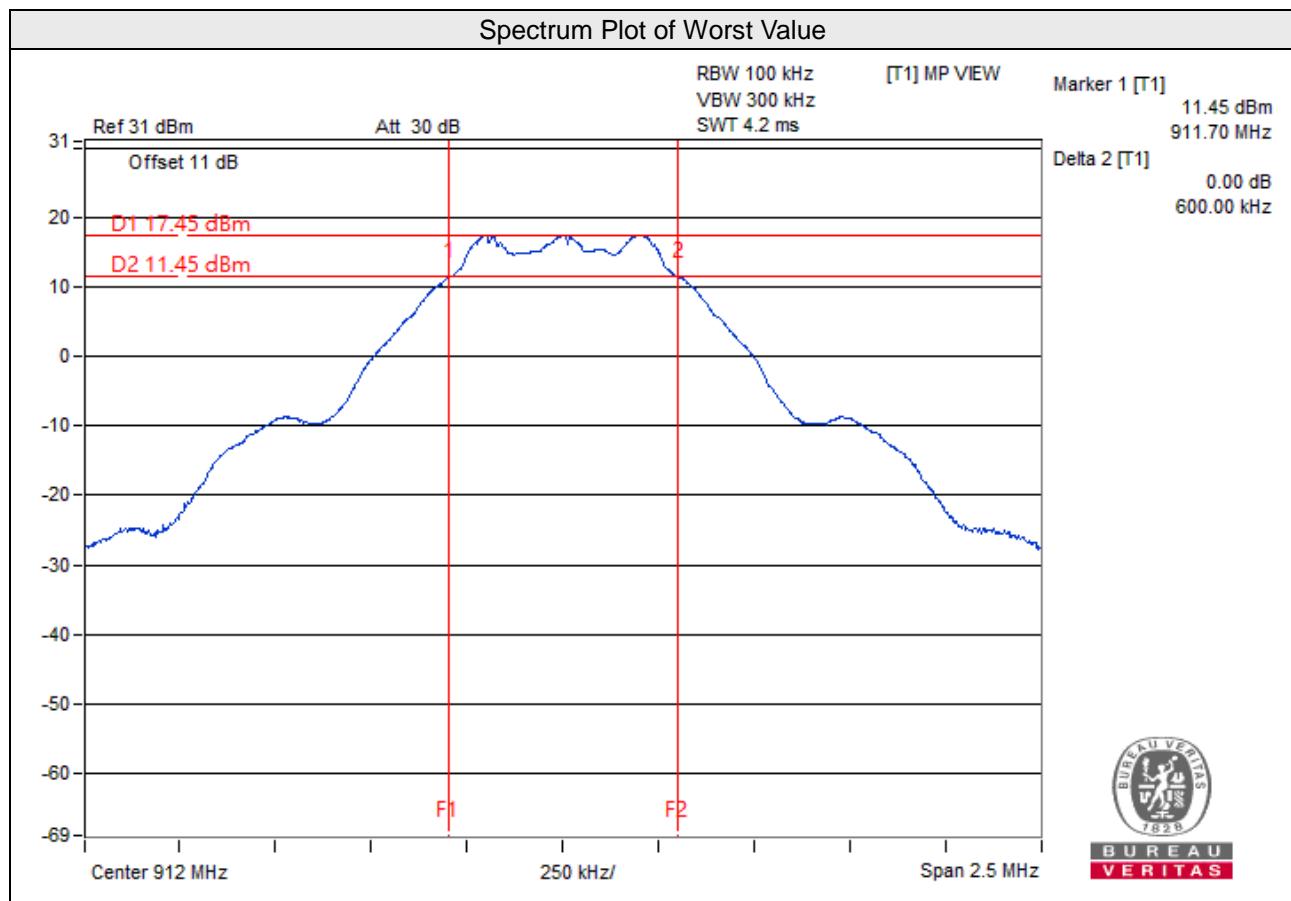
No deviation.

4.3.6 EUT Operating Conditions

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.3.7 Test Result

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
3	912	0.6	0.5	Pass
3	920	0.6	0.5	Pass

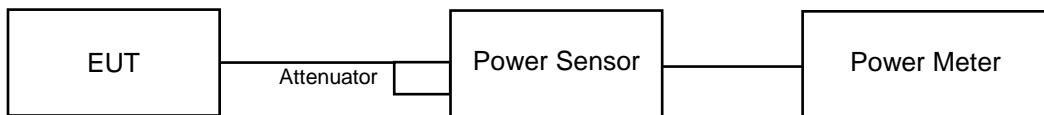


4.4 Conducted Output Power Measurement

4.4.1 Limits of Conducted Output Power Measurement

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

4.4.2 Test Setup



4.4.3 Test Instruments

Refer to section 4.3.3 to get information of above instrument.

4.4.4 Test Procedures

For 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.

For 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.

4.4.5 Deviation from Test Standard

No deviation.

4.4.6 EUT Operating Conditions

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
RF Power Meter Anritsu	ML2495A	1529002	2024/6/7	2025/6/6
Pulse Power Sensor Anritsu	MA2411B	1726434	2024/6/7	2025/6/6

Notes:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Oven room 2.
3. Tested Date: 2025/4/10

4.4.7 Test Results

For Peak Power

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass/Fail
3	912	52	17.16	30.00	Pass
3	920	50.699	17.05	30.00	Pass

For Average Power

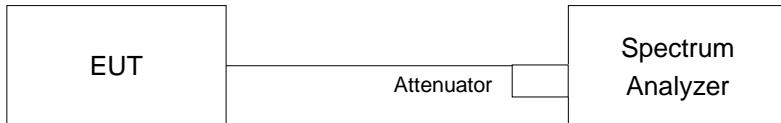
Channel	Frequency (MHz)	Average Power (mW)	Average Power (dBm)
3	912	51.642	17.13
3	920	50.119	17.00

4.5 Power Spectral Density Measurement

4.5.1 Limits of Power Spectral Density Measurement

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

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.3.3 to get information of above instrument.

4.5.4 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: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
- d. Set the VBW $\geq 3 \times \text{RBW}$.
- 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.

4.5.5 Deviation from Test Standard

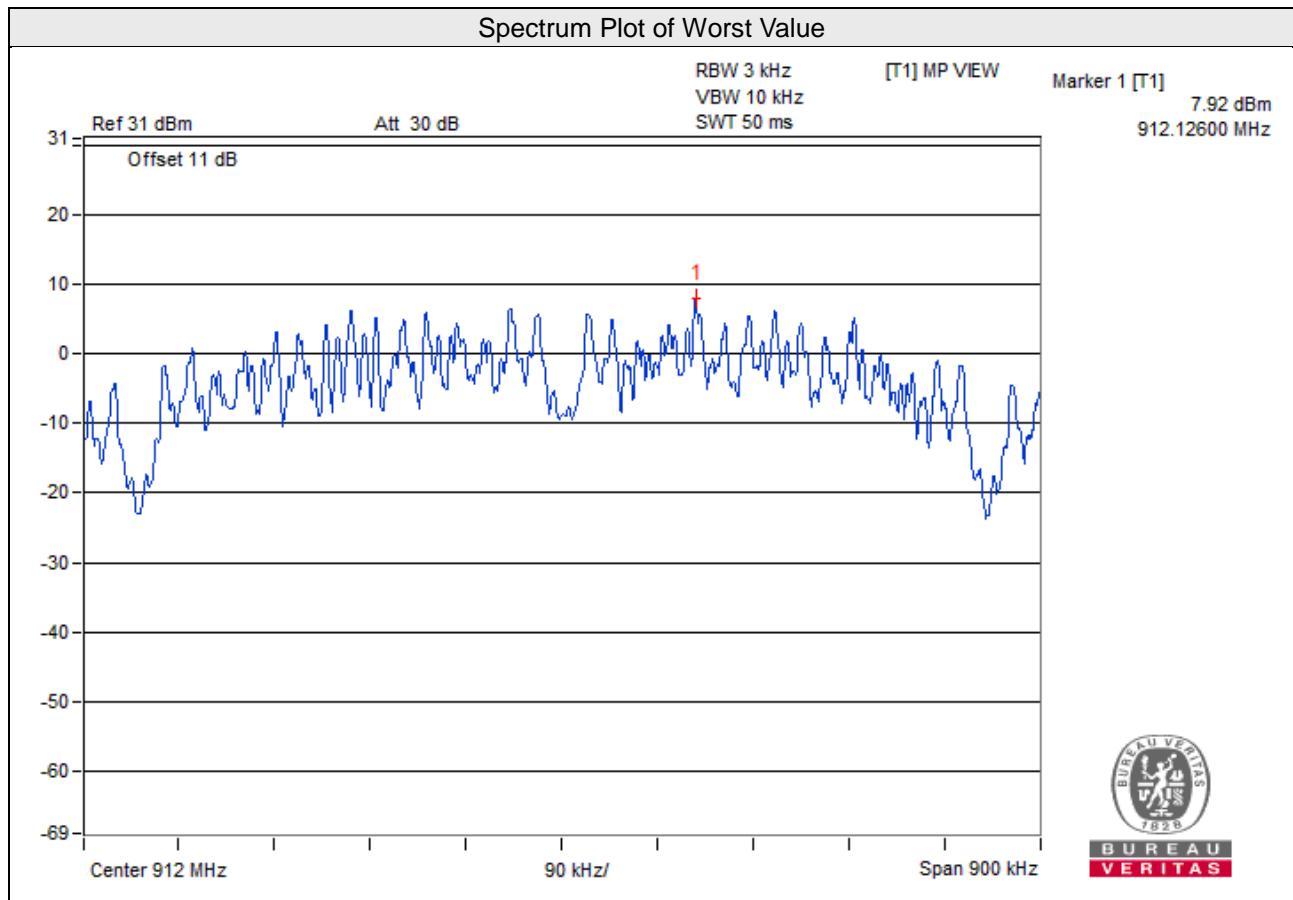
No deviation.

4.5.6 EUT Operating Condition

Same as item 4.3.6

4.5.7 Test Results

Channel	Freq. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Pass / Fail
3	912	7.92	8.00	Pass
3	920	7.83	8.00	Pass

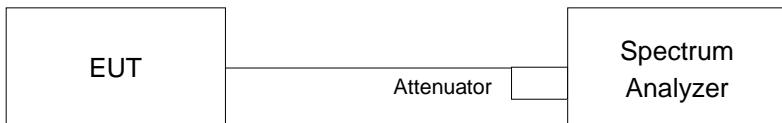


4.6 Conducted Out of Band Emission Measurement

4.6.1 Limits of Conducted Out of Band Emission Measurement

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

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.3.3 to get information of above instrument.

4.6.4 Test Procedure

MEASUREMENT PROCEDURE REF

- Set the RBW = 100 kHz.
- Set the VBW \geq 300 kHz.
- Detector = peak.
- Sweep time = auto couple.
- Trace mode = max hold.
- Allow trace to fully stabilize.
- Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.

MEASUREMENT PROCEDURE OOB

- Set RBW = 100 kHz.
- Set VBW \geq 300 kHz.
- Detector = peak.
- Sweep = auto couple.
- Trace Mode = max hold.
- Allow trace to fully stabilize.
- Use the peak marker function to determine the maximum amplitude level.

4.6.5 Deviation from Test Standard

No deviation.

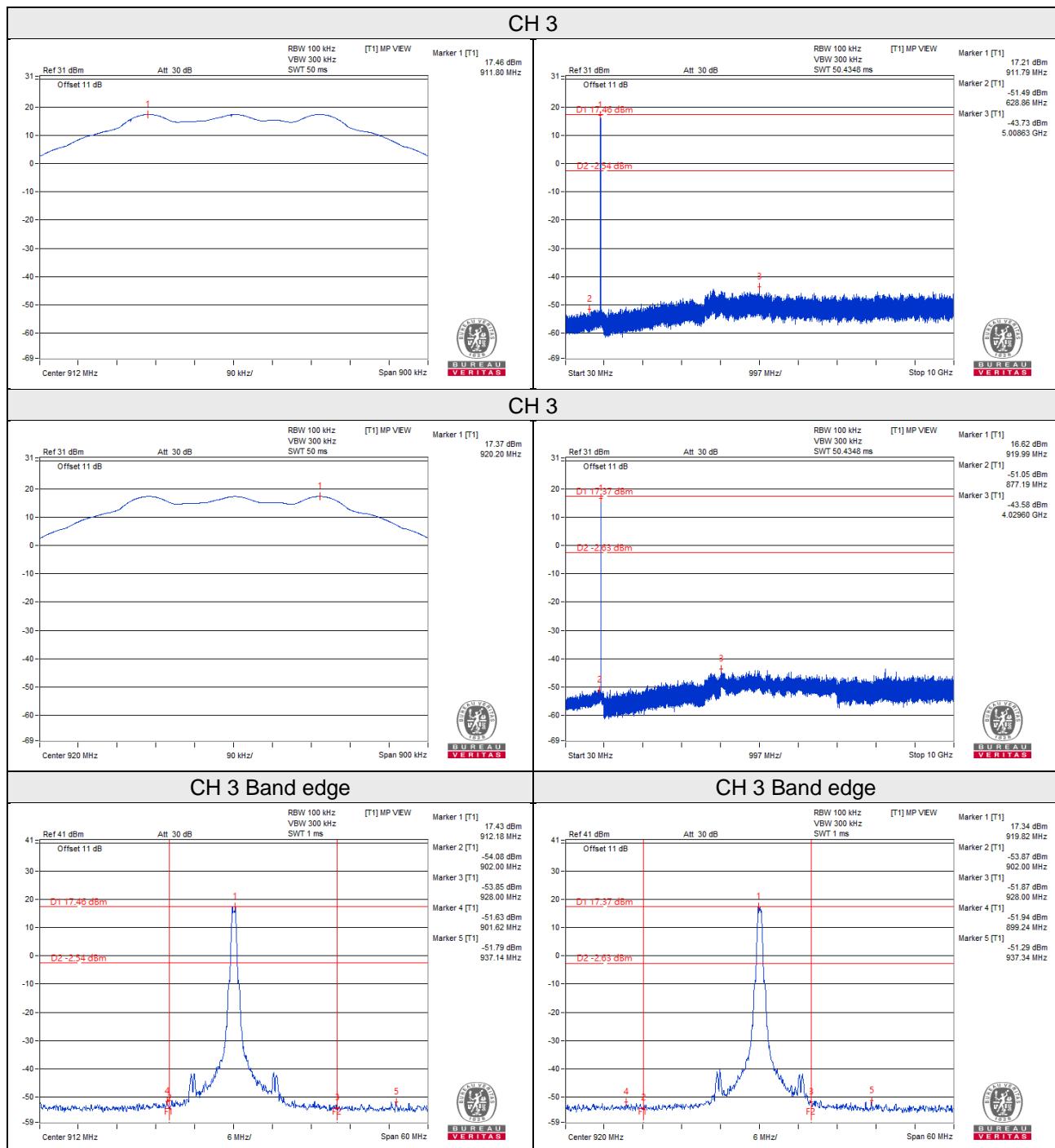
4.6.6 EUT Operating Condition

Same as item 4.3.6

4.6.7 Test Results

The conducted emission test is performed on each TX port of operating mode without summing or adding $10\log(N)$ since the limit is relative emission limit.

The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.



5 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo).

Appendix – 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 and approved 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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