FCC Test Report

Report No.:	RF210128C01
FCC ID:	PZWCHM80W
Test Model:	CH-M80W
Received Date:	Jan. 28, 2021
Test Date:	Feb. 22 ~ Mar. 05, 2021
Issued Date:	Mar. 23, 2021
Applicant:	DENSO WAVE INCORPORATED
Address:	1 Yoshiike Kusagi Agui-cho,Chita-gun Aichi 470-2297, Japan
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

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Release Control Record

Issue No.	Description	Date Issued
RF210128C01	Original release	Mar. 23, 2021

1 Certificate of Conformity

Product:	Charger
Brand:	DENSO
Test Model:	CH-M80W
Sample Status:	Engineering sample
Applicant:	DENSO WAVE INCORPORATED
Test Date:	Feb. 22 ~ Mar. 05, 2021
Standards:	47 CFR FCC Part 15, Subpart C (Section 15.209) 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:** Mar. 23, 2021

Polly Chien / Specialist

Approved by : _____ , **Date:** Mar. 23, 2021

Bruce Chen / Senior Project Engineer

2 Summary of Test Results

47 CFR FCC Part 15, Subpart C (Section 15.209)			
FCC Clause	Test Item	Result	Remarks
15.207	AC Power Conducted Emission	Pass	Meet the requirement of limit. Minimum passing margin is -16.46dB at 24.05800MHz.
15.209	Radiated Emission Test	Pass	Meet the requirement of limit. Minimum passing margin is -0.8dB at 299.94MHz

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) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.79 dB
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	3.04 dB
	30MHz ~ 200MHz	3.86 dB
	200MHz ~ 1000MHz	3.87 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Charger
Brand	DENSO
Test Model	CH-M80W
Sample Status	Engineering sample
Power Supply Rating	12.0Vdc (from adapter)
Modulation Type	FSK/ASK
Operating Frequency	144kHz
Antenna Type	Coil antenna (The Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible)
Field Strength	-2.5dBuV/m
Accessory Device	NA
Data Cable Supplied	NA

Note:

1. The EUT uses following adapter and battery.

Adapter (Option)	
Brand	Sunny
Model	SYS1548-5012-T3
Input Power	100-240Vac, 1.5A MAX, 50-60Hz
Output Power	+12.0Vdc, 4.16A
Power cable	DC: 1.16m cable with one core AC: 1.71m non-shielded cable without core

Battery (Support unit)	
Brand	DENSO
Model	BT1S-W
Rating	3.85Vdc, 2900mAh, 11.16Wh

3.2 Description of Test Modes

1 channel is provided to this EUT

Channel	Freq. (kHz)
1	144

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT configure mode	Applicable to		Description
	RE<1G	PLC	
A	√	√	Charging Mode
B	√	√	Standby Mode

Where **RE<1G:** Radiated Emission below 1GHz **PLC:** Power Line Conducted Emission

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
A, B	1	1

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
A, B	1	1

Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested by
RE<1G	23 deg. C, 66% RH	120Vac, 60Hz	Titan Hsu
PLC	25 deg. C, 75% RH	120Vac, 60Hz	Rex Wang

3.3 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.

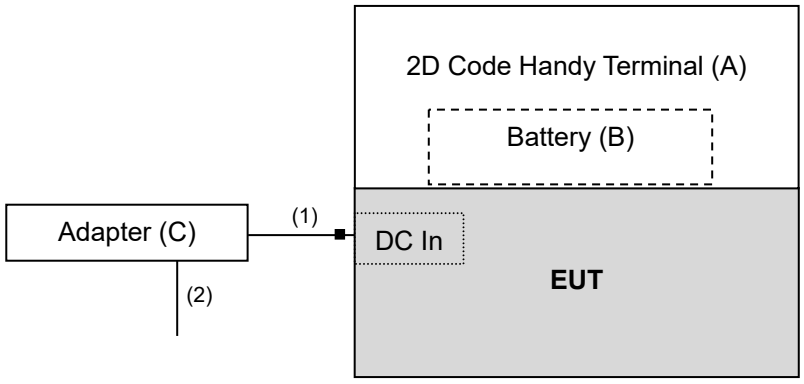
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	2D Code Handy Terminal	DENSO	BHT-M80-QWG	NA	PZWBHTM80QWG	Provided by manufacturer
B.	Battery	DENSO	BT1S-W	NA	NA	Provided by manufacturer
C.	Adapter	Sunny	SYS1548-5012-T3	NA	NA	Option

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	Power cable	1	1.16	-	1	Option
2.	Power cable	1	1.71	N	0	Option

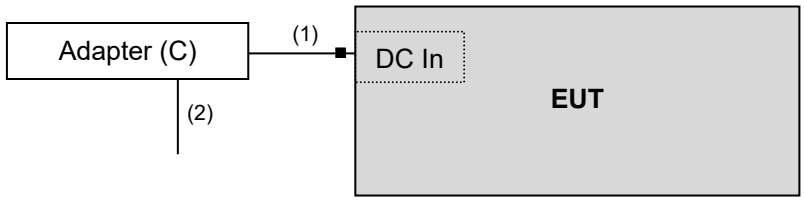
Note: The core(s) is(are) originally attached to the cable(s).

3.3.1 Configuration of System under Test

Charging Mode:
Mode A



Standby Mode:
Mode B



3.4 General Description of Applied Standards

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

FCC Part 15, Subpart C (15.209)

ANSI C63.10-2013

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

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

FOR FREQUENCY BELOW 30MHz

Frequency (MHz)	Field Strength (dBuV/m)		Measurement Distance (meters)
	uV/m	dBuV/m	
0.009 – 0.490	2400 / F (kHz)	48.52-13.80	300
0.490 – 1.705	24000 / F (kHz)	33.80-22.97	30
1.705 – 30.0	30	29.54	30

FOR FREQUENCY BETWEEN 30-1000MHz

Frequency (MHz)	Measurement Distance (at 3m)	
	uV/m	dBuV/m
30-88	100	40.0
88-216	150	43.5
216-960	200	46.0
Above 960	500	54.0

4.1.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESR3	102579	Jul. 07, 2020	Jul. 06, 2021
BILOG Antenna SCHWARZBECK	VULB9168	9168-171	Nov. 04, 2020	Nov. 03, 2021
HORN Antenna SCHWARZBECK	9120D	209	Nov. 22, 2020	Nov. 21, 2021
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Nov. 22, 2020	Nov. 21, 2021
Loop Antenna TESEQ	HLA 6121	45745	Jul. 06, 2020	Jul. 05, 2021
Preamplifier Agilent (Below 1GHz)	8447D	2944A10738	Aug. 16, 2020	Aug. 15, 2021
Preamplifier Agilent (Above 1GHz)	8449B	3008A02465	Mar. 23, 2020	Mar. 22, 2021
RF Coaxial Cable WOKEN With 5dB PAD	8D-FB	Cable-CH3-01	Aug. 16, 2020	Aug. 15, 2021
RF signal cable HUBER+SUHNER	SUCOFLEX 104	Cable-CH3-03 (223653/4)	Aug. 16, 2020	Aug. 15, 2021
RF signal cable HUBER+SUHNER& EMCI	SUCOFLEX 104&EMC104-SM-S M-8000	Cable-CH3-03 (309224+170907)	Aug. 16, 2020	Aug. 15, 2021
Software BV ADT	ADT_Radiated_ V7.6.15.9.5	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA	NA
Antenna Tower Controller BV ADT	AT100	AT93021702	NA	NA
Turn Table BV ADT	TT100	TT93021702	NA	NA
Turn Table Controller BV ADT	SC100	SC93021702	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	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 HwaYa Chamber 3.

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, except for the frequency band (9kHz-90kHz, 110kHz-490kHz) set to average detect function and peak detect function.

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 below 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.

Note:

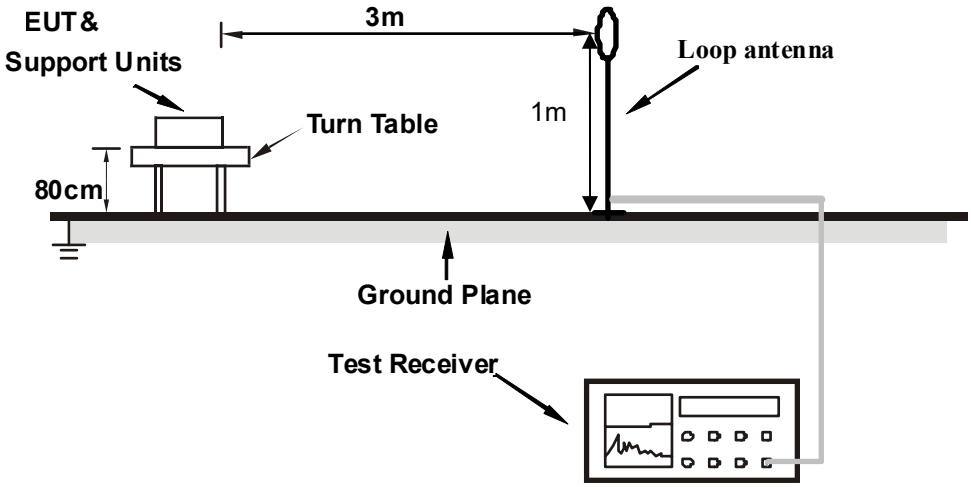
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

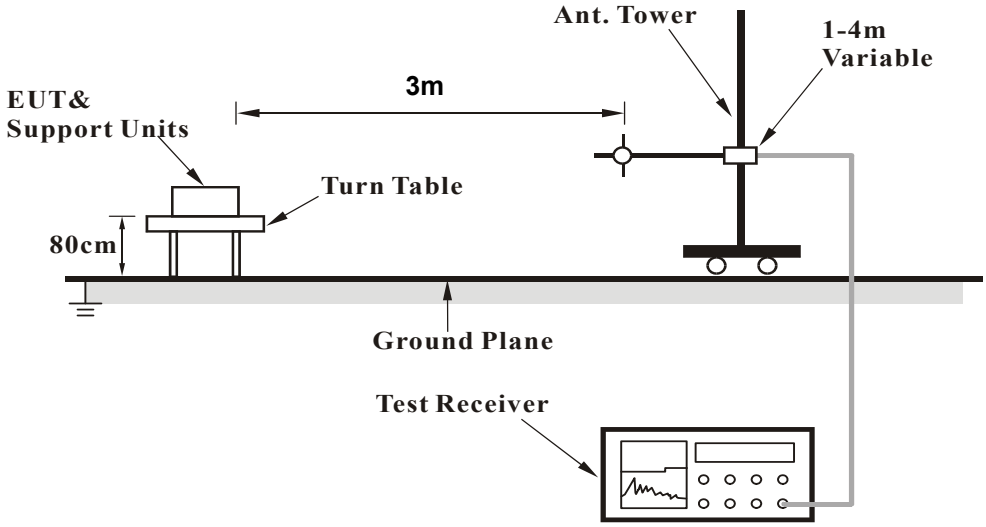
No deviation.

4.1.5 Test Set Up

For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



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

4.1.6 EUT Operating Conditions

Charging Mode:

Mode A

a. The EUT powered by adapter.

b. Put the 2D Code Handy Terminal on the EUT during the test.

Standby Mode:

Mode B

a. The EUT powered by adapter.

4.1.7 Test Results

Below 30MHz Data:

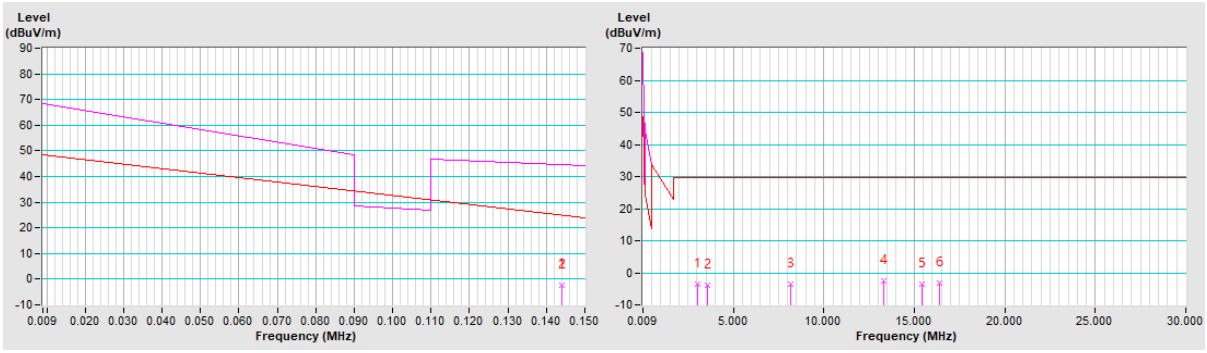
Charging Mode

Channel	TX Channel 1	Detector Function	Average (AV) Peak (PK) Quasi-Peak (QP)
Frequency Range	9 kHz ~ 30 MHz		
Test Mode	A		

Antenna Polarity & Test Distance: Loop antenna Parallel at 3m								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*0.144	-2.3 PK	44.4	-46.7	1.00	179	58.3	-60.6
2	*0.144	-2.5 AV	24.4	-26.9	1.00	179	58.1	-60.6
3	3.05	-3.5 QP	29.5	-33.0	1.00	13	17.2	-20.7
4	3.57	-3.9 QP	29.5	-33.4	1.00	267	16.6	-20.5
5	8.18	-3.5 QP	29.5	-33.0	1.00	18	15.7	-19.2
6	13.31	-2.4 QP	29.5	-31.9	1.00	1	16.3	-18.7
7	15.40	-3.4 QP	29.5	-32.9	1.00	269	15.2	-18.6
8	16.40	-3.3 QP	29.5	-32.8	1.00	223	15.2	-18.5

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) +Distance Factor
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. Loop antenna was used for all radiated emission below 30MHz.
7. 0.009 ~ 0.49MHz, the measured field strength was extrapolated to distance 300 meters Distance factor@3m = 40*log(3/300) = -80dB
   For 0.49 ~ 30MHz, the measured field strength was extrapolated to distance 30 meters Distance factor@3m = 40*log(3/30) = -40dB

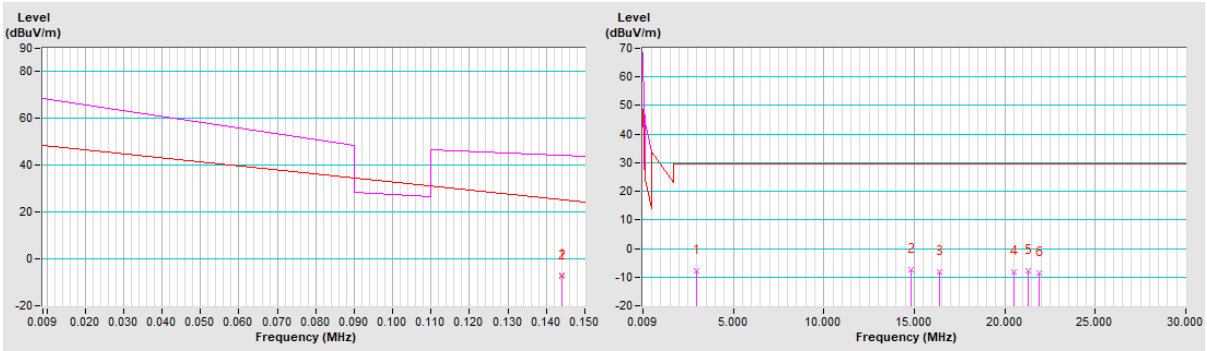


Channel	TX Channel 1	Detector Function	Average (AV) Peak (PK) Quasi-Peak (QP)
Frequency Range	9 kHz ~ 30 MHz		
Test Mode	A		

Antenna Polarity & Test Distance: Loop antenna Perpendicular at 3m								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*0.144	-7.0 PK	44.4	-51.4	1.00	263	53.6	-60.6
2	*0.144	-7.3 AV	24.4	-31.7	1.00	263	53.3	-60.6
3	2.96	-7.9 QP	29.5	-37.4	1.00	243	12.8	-20.7
4	14.83	-7.3 QP	29.5	-36.8	1.00	97	11.3	-18.6
5	16.40	-8.2 QP	29.5	-37.7	1.00	231	10.3	-18.5
6	20.48	-8.0 QP	29.5	-37.5	1.00	138	10.4	-18.4
7	21.31	-7.7 QP	29.5	-37.2	1.00	233	10.7	-18.4
8	21.92	-8.4 QP	29.5	-37.9	1.00	210	10.0	-18.4

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB) +Distance Factor
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. Loop antenna was used for all radiated emission below 30MHz.
7. 0.009 ~ 0.49MHz, the measured field strength was extrapolated to distance 300 meters Distance factor@3m = 40*log(3/300) = -80dB
   For 0.49 ~ 30MHz, the measured field strength was extrapolated to distance 30 meters Distance factor@3m = 40*log(3/30) = -40dB

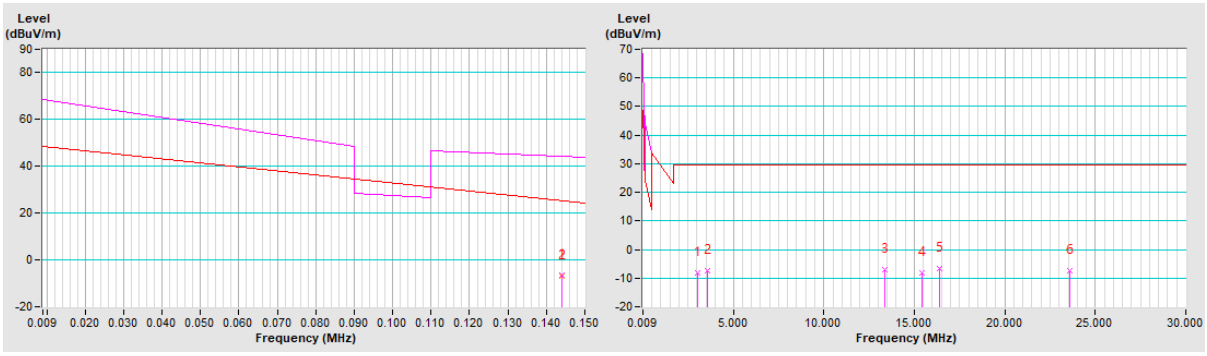


Channel	TX Channel 1	Detector Function	Average (AV) Peak (PK) Quasi-Peak (QP)
Frequency Range	9 kHz ~ 30 MHz		
Test Mode	A		

Antenna Polarity & Test Distance: Loop antenna Ground-Parallel at 3m								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*0.144	-6.6 PK	44.4	-51.0	1.00	162	54.0	-60.6
2	*0.144	-6.9 AV	24.4	-31.3	1.00	162	53.7	-60.6
3	3.05	-8.0 QP	29.5	-37.5	1.00	91	12.7	-20.7
4	3.57	-7.3 QP	29.5	-36.8	1.00	223	13.2	-20.5
5	13.35	-6.9 QP	29.5	-36.4	1.00	79	11.8	-18.7
6	15.40	-8.0 QP	29.5	-37.5	1.00	221	10.6	-18.6
7	16.40	-6.7 QP	29.5	-36.2	1.00	254	11.8	-18.5
8	23.61	-7.6 QP	29.5	-37.1	1.00	54	10.7	-18.3

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) +Distance Factor
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. Loop antenna was used for all radiated emission below 30MHz.
7. 0.009 ~ 0.49MHz, the measured field strength was extrapolated to distance 300 meters Distance factor@3m = 40*log(3/300) = -80dB
   For 0.49 ~ 30MHz, the measured field strength was extrapolated to distance 30 meters Distance factor@3m = 40*log(3/30) = -40dB



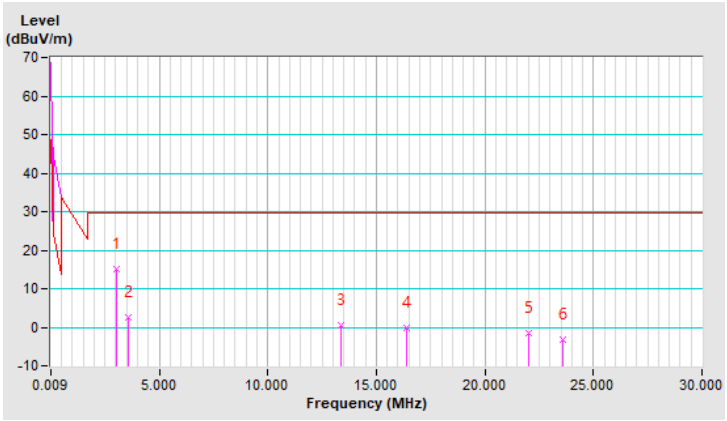
Standby Mode

Channel	Channel 1	Detector Function	Quasi-Peak (QP)
Frequency Range	9 kHz ~ 30 MHz		
Test Mode	B		

Antenna Polarity & Test Distance: Loop antenna Parallel at 3m								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3.05	15.0 QP	29.5	-14.5	1.00	225	35.7	-20.7
2	3.57	2.6 QP	29.5	-26.9	1.00	235	23.1	-20.5
3	13.35	0.5 QP	29.5	-29.0	1.00	237	19.2	-18.7
4	16.40	0.0 QP	29.5	-29.5	1.00	18	18.5	-18.5
5	22.00	-1.5 QP	29.5	-31.0	1.00	151	16.9	-18.4
6	23.61	-3.1 QP	29.5	-32.6	1.00	240	15.2	-18.3

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) +Distance Factor
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. Loop antenna was used for all radiated emission below 30MHz.
7. 0.009 ~ 0.49MHz, the measured field strength was extrapolated to distance 300 meters Distance factor@3m = 40*log(3/300) = -80dB
   For 0.49 ~ 30MHz, the measured field strength was extrapolated to distance 30 meters Distance factor@3m = 40*log(3/30) = -40dB

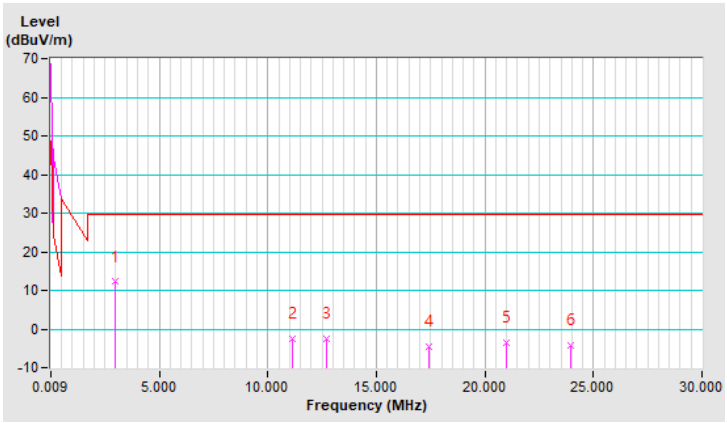


Channel	Channel 1	Detector Function	Quasi-Peak (QP)
Frequency Range	9 kHz ~ 30 MHz		
Test Mode	B		

Antenna Polarity & Test Distance: Loop antenna Perpendicular at 3m								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2.96	12.2 QP	29.5	-17.3	1.00	27	32.9	-20.7
2	11.14	-2.5 QP	29.5	-32.0	1.00	234	16.3	-18.8
3	12.70	-2.5 QP	29.5	-32.0	1.00	31	16.2	-18.7
4	17.44	-4.5 QP	29.5	-34.0	1.00	26	14.0	-18.5
5	21.00	-3.7 QP	29.5	-33.2	1.00	150	14.7	-18.4
6	23.96	-4.4 QP	29.5	-33.9	1.00	216	13.9	-18.3

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) +Distance Factor
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. Loop antenna was used for all radiated emission below 30MHz.
7. 0.009 ~ 0.49MHz, the measured field strength was extrapolated to distance 300 meters Distance factor@3m = 40*log(3/300) = -80dB
   For 0.49 ~ 30MHz, the measured field strength was extrapolated to distance 30 meters Distance factor@3m = 40*log(3/30) = -40dB

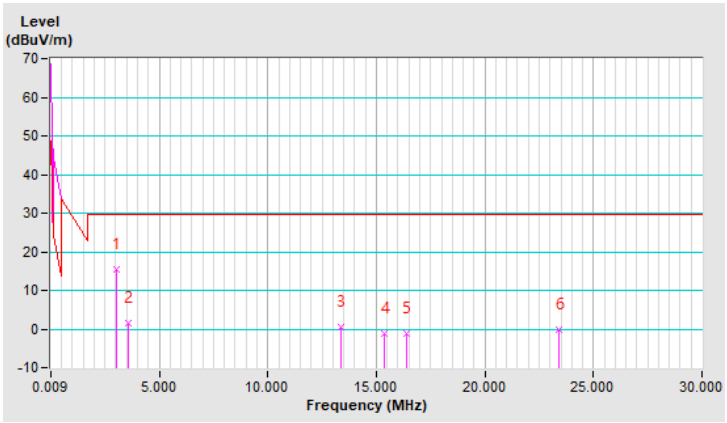


Channel	Channel 1	Detector Function	Quasi-Peak (QP)
Frequency Range	9 kHz ~ 30 MHz		
Test Mode	B		

Antenna Polarity & Test Distance: Loop antenna Ground-Parallel at 3m								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3.05	15.3 QP	29.5	-14.2	1.00	124	36.0	-20.7
2	3.57	1.4 QP	29.5	-28.1	1.00	4	21.9	-20.5
3	13.35	0.5 QP	29.5	-29.0	1.00	145	19.2	-18.7
4	15.40	-1.3 QP	29.5	-30.8	1.00	227	17.3	-18.6
5	16.40	-1.2 QP	29.5	-30.7	1.00	265	17.3	-18.5
6	23.44	-0.2 QP	29.5	-29.7	1.00	226	18.1	-18.3

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) +Distance Factor
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. Loop antenna was used for all radiated emission below 30MHz.
7. 0.009 ~ 0.49MHz, the measured field strength was extrapolated to distance 300 meters Distance factor@3m = 40*log(3/300) = -80dB
   For 0.49 ~ 30MHz, the measured field strength was extrapolated to distance 30 meters Distance factor@3m = 40*log(3/30) = -40dB



Below 1GHz Data:

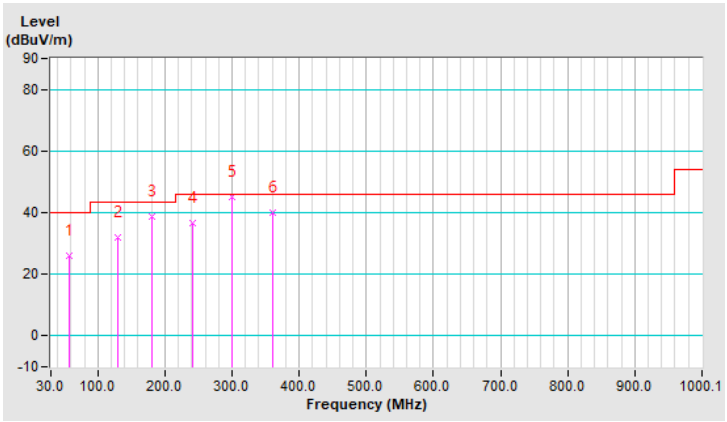
Charging Mode

Channel	TX Channel 1	Detector Function	Quasi-Peak (QP)
Frequency Range	30MHz ~ 1GHz		
Test Mode	A		

Antenna Polarity & Test Distance: Horizontal At 3m								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	56.71	26.1 QP	40.0	-13.9	1.00 H	9	35.4	-9.3
2	129.82	31.9 QP	43.5	-11.6	1.49 H	63	41.9	-10.0
3	180.44	38.8 QP	43.5	-4.7	1.49 H	240	48.8	-10.0
4	240.89	36.7 QP	46.0	-9.3	1.00 H	106	45.8	-9.1
5	**299.94**	**45.2 QP**	**46.0**	**-0.8**	**1.00 H**	**236**	**51.8**	**-6.6**
6	360.40	39.8 QP	46.0	-6.2	1.00 H	151	45.2	-5.4

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

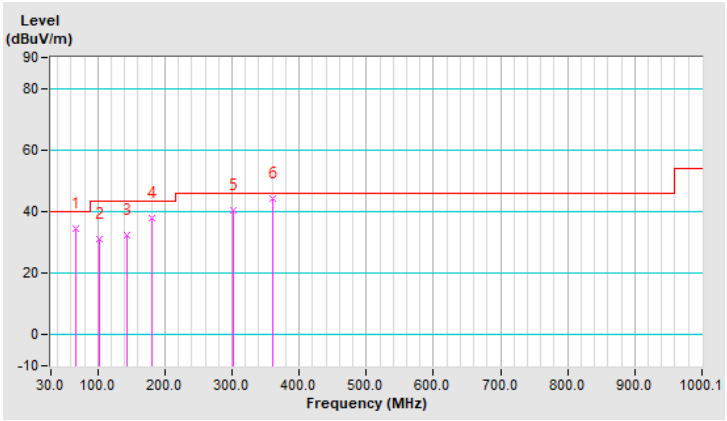


Channel	TX Channel 1	Detector Function	Quasi-Peak (QP)
Frequency Range	30MHz ~ 1GHz		
Test Mode	A		

Antenna Polarity & Test Distance: Vertical At 3m								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	67.96	34.4 QP	40.0	-5.6	1.00 V	17	44.9	-10.5
2	103.11	31.1 QP	43.5	-12.4	1.00 V	162	43.8	-12.7
3	143.88	32.4 QP	43.5	-11.1	1.00 V	17	41.2	-8.8
4	180.44	38.0 QP	43.5	-5.5	1.00 V	139	48.0	-10.0
5	301.35	40.6 QP	46.0	-5.4	1.50 V	6	47.2	-6.6
6	360.40	44.2 QP	46.0	-1.8	1.50 V	130	49.6	-5.4

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value



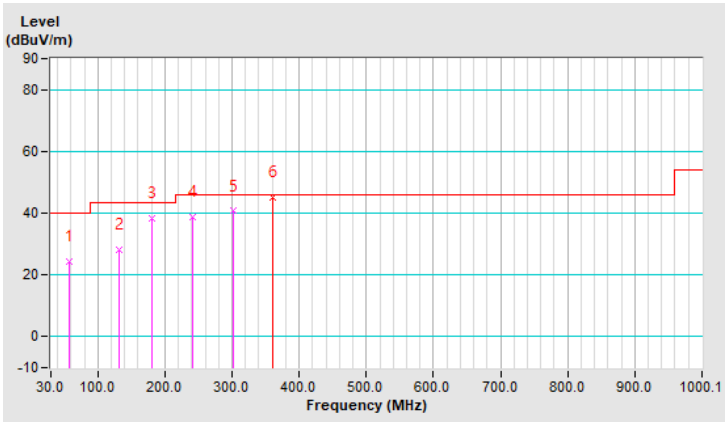
Standby Mode

Channel	Channel 1	Detector Function	Quasi-Peak (QP)
Frequency Range	30MHz ~ 1GHz		
Test Mode	B		

Antenna Polarity & Test Distance: Horizontal At 3m								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	56.71	24.4 QP	40.0	-15.6	1.00 H	243	33.7	-9.3
2	131.23	28.0 QP	43.5	-15.5	1.50 H	232	37.9	-9.9
3	180.44	38.2 QP	43.5	-5.3	1.50 H	231	48.2	-10.0
4	240.89	38.6 QP	46.0	-7.4	1.50 H	74	47.7	-9.1
5	301.35	40.6 QP	46.0	-5.4	1.00 H	223	47.2	-6.6
6	361.22	45.0 QP	46.0	-1.0	1.00 H	147	50.3	-5.3

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

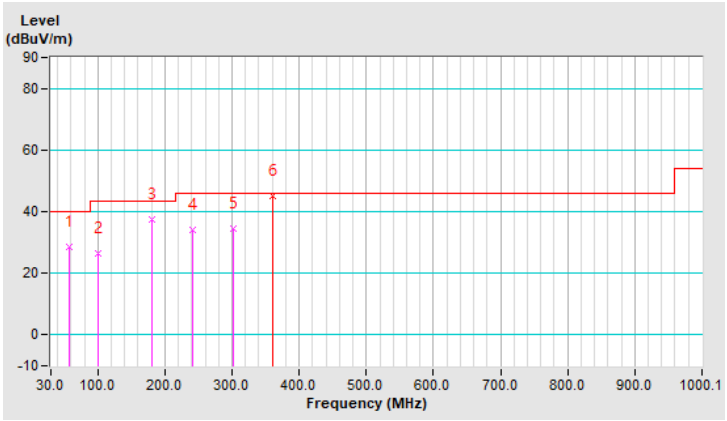


Channel	Channel 1	Detector Function	Quasi-Peak (QP)
Frequency Range	30MHz ~ 1GHz		
Test Mode	B		

Antenna Polarity & Test Distance: Vertical At 3m								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	56.71	28.7 QP	40.0	-11.3	1.00 V	98	38.0	-9.3
2	100.30	26.5 QP	43.5	-17.0	1.49 V	89	39.7	-13.2
3	180.44	37.4 QP	43.5	-6.1	1.00 V	134	47.4	-10.0
4	240.89	34.2 QP	46.0	-11.8	1.00 V	330	43.3	-9.1
5	301.35	34.6 QP	46.0	-11.4	1.49 V	10	41.2	-6.6
6	361.24	45.0 QP	46.0	-1.0	1.50 V	15	50.3	-5.3

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value



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

Tested date: Feb. 22, 2021

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESR3	102412	Jan. 29, 2021	Jan. 28, 2022
RF signal cable (with 10dB PAD) Woken	5D-FB	Cable-cond2-01	Sep. 04, 2020	Sep. 03, 2021
LISN ROHDE & SCHWARZ (EUT)	ESH2-Z5	100100	Jan. 18, 2021	Jan. 17, 2022
V-LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100312	Aug. 18, 2020	Aug. 17, 2021
Software ADT	BV ADT_Cond_ V7.3.7.4	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 HwaYa Shielded Room 2 (Conduction 2).
3. The VCCI Site Registration No. is C-12047.

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.

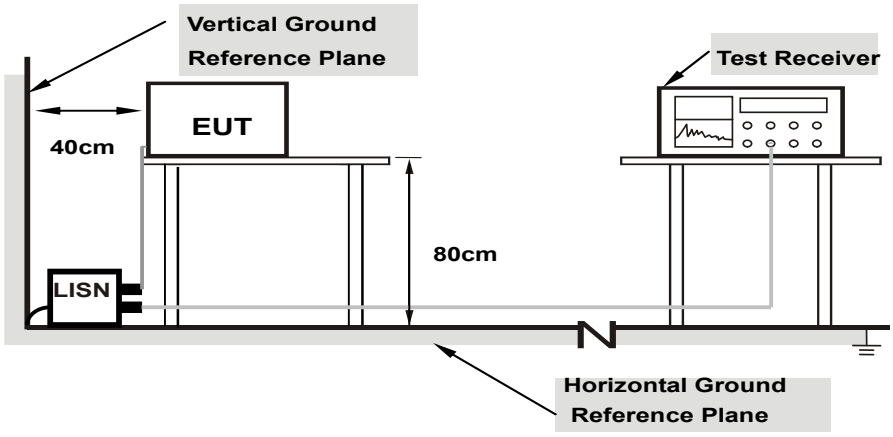
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) were not recorded.

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

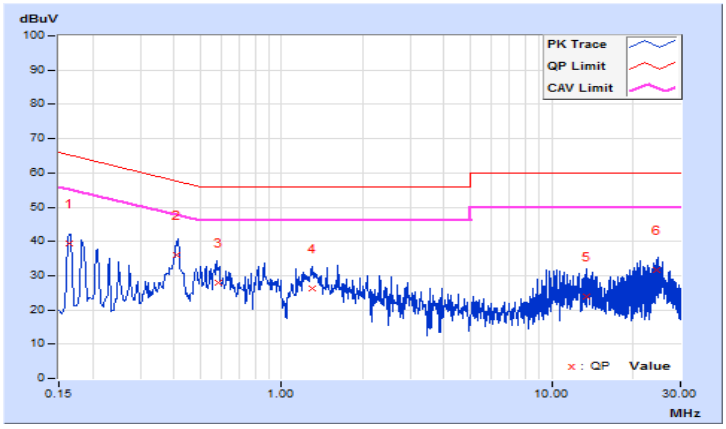
Charging Mode

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	A		

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16319	10.09	29.16	7.66	39.25	17.75	65.30	55.30	-26.05	-37.55
2	0.40712	10.18	25.86	16.42	36.04	26.60	57.71	47.71	-21.67	-21.11
3	0.58409	10.20	17.75	9.65	27.95	19.85	56.00	46.00	-28.05	-26.15
4	1.29400	10.27	15.98	5.77	26.25	16.04	56.00	46.00	-29.75	-29.96
5	13.42944	10.54	13.21	8.87	23.75	19.41	60.00	50.00	-36.25	-30.59
6	24.42238	10.57	21.16	18.23	31.73	28.80	60.00	50.00	-28.27	-21.20

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.

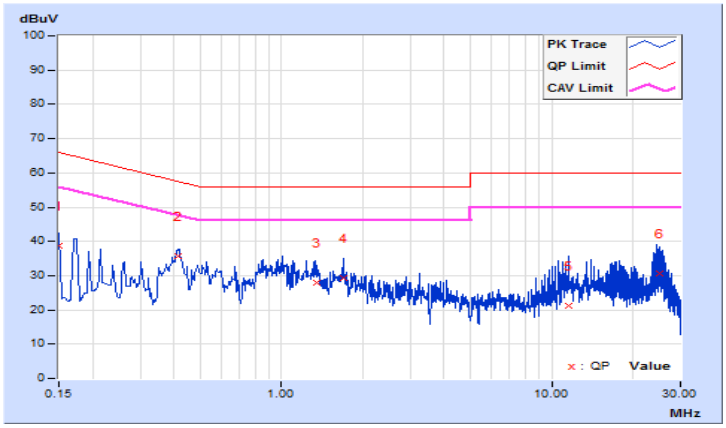


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	A		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	10.10	28.72	8.34	38.82	18.44	66.00	56.00	-27.18	-37.56
2	0.41252	10.20	25.35	16.03	35.55	26.23	57.60	47.60	-22.05	-21.37
3	1.34289	10.29	17.68	7.42	27.97	17.71	56.00	46.00	-28.03	-28.29
4	1.68883	10.31	18.88	14.15	29.19	24.46	56.00	46.00	-26.81	-21.54
5	11.54200	10.64	10.46	0.23	21.10	10.87	60.00	50.00	-38.90	-39.13
6	24.97000	10.80	19.75	13.31	30.55	24.11	60.00	50.00	-29.45	-25.89

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.



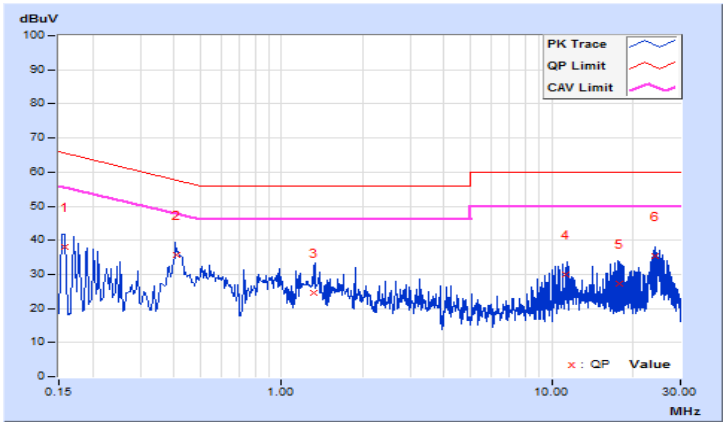
Standby Mode

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	B		

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15800	10.09	27.79	5.69	37.88	15.78	65.57	55.57	-27.69	-39.79
2	0.41143	10.18	25.48	16.01	35.66	26.19	57.62	47.62	-21.96	-21.43
3	1.31400	10.27	14.25	4.49	24.52	14.76	56.00	46.00	-31.48	-31.24
4	11.24200	10.51	19.59	17.75	30.10	28.26	60.00	50.00	-29.90	-21.74
5	17.73800	10.61	16.61	11.36	27.22	21.97	60.00	50.00	-32.78	-28.03
6	**24.05800**	**10.58**	**24.67**	**22.96**	**35.25**	**33.54**	**60.00**	**50.00**	**-24.75**	**-16.46**

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.

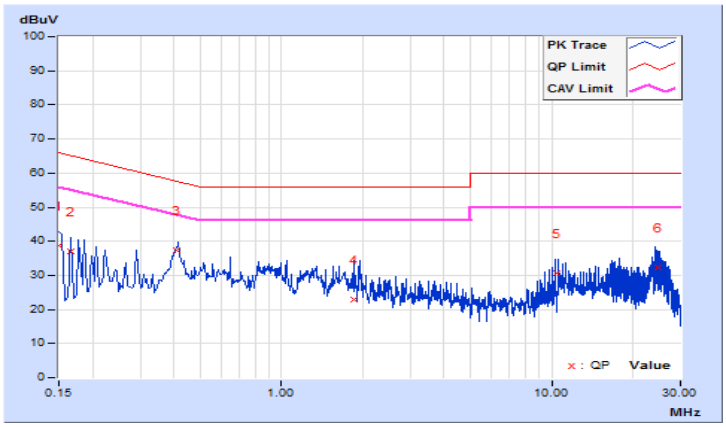


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	B		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	10.10	28.50	7.98	38.60	18.08	66.00	56.00	-27.40	-37.92
2	0.16535	10.10	27.08	6.64	37.18	16.74	65.19	55.19	-28.01	-38.45
3	0.41143	10.20	27.13	16.88	37.33	27.08	57.62	47.62	-20.29	-20.54
4	1.84600	10.31	12.46	0.62	22.77	10.93	56.00	46.00	-33.23	-35.07
5	10.39800	10.61	19.94	16.15	30.55	26.76	60.00	50.00	-29.45	-23.24
6	24.73400	10.80	21.43	18.43	32.23	29.23	60.00	50.00	-27.77	-20.77

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.



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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Email: service.adt@tw.bureauveritas.com
Web Site: www.bureauveritas-adt.com

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

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