FCC Test Report

Report No.:	RF180524C35
FCC ID:	B32QI7
Test Model:	QI7
Received Date:	May 24, 2018
Test Date:	Jun. 28 ~ Jun. 29, 2018
Issued Date:	Jul. 09, 2018
Applicant:	Verifone, Inc.
Address:	1400 West Stanford Ranch Road Suite 200 Rocklin CA 95765 USA
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Lab Address:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan, R.O.C.
Test Location:	No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, TAIWAN (R.O.C.)
FCC Registration / Designation Number:	788550 / TW0003

Testing Laboratory
2021

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Release Control Record

Issue No.	Description	Date Issued
RF180524C35	Original release	Jul. 09, 2018

1 Certificate of Conformity

Product:	Cup
Brand:	Verifone
Model No.:	QI7
Sample Status:	Identical Prototype
Applicant:	Verifone, Inc.
Test Date:	Jun. 28 ~ Jun. 29, 2018
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 : Pettie Chen , **Date:** Jul. 09, 2018

Pettie Chen / Senior Specialist

Approved by : Bruce Chen , **Date:** Jul. 09, 2018

Bruce Chen / 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 -17.63dB at 20.19266MHz.
15.209	Radiated Emission Test	Pass	Meet the requirement of limit. Minimum passing margin is -11.3dB at 729.84MHz.

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	2.94 dB
Radiated Emissions up to 1 GHz	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	Cup
Brand	Verifone
Test Model	QI7
Sample Status	Identical Prototype
Power Supply Rating	12Vdc (Charger)
Modulation Type	FSK
Operating Frequency	135kHz~176kHz
Antenna Type	Loop antenna
Field Strength	88.0dBuV/m
Accessory Device	Smart Charger, Adapter
Data Cable Supplied	NA

Note:

1. The EUT was tested with the following Charger and adapter.

Smart Charger (Support unit only)	
Brand	Verifone
Model	e355 Smart charger
Power Rating	12Vdc, 5.0A

Adapter (Smart Charger use)	
Brand	Verifone
Model	AU1601201n
Input Power	100-240Vac, 50/60Hz, 1.6A
Output Power	12Vdc, 5.0A

3.2 Description of Test Modes

1 channel is provided to this EUT

Channel	Freq. (kHz)
1	135

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT CONFIGURE MODE	APPLICABLE TO		DESCRIPTION
	RE<1G	PLC	
A	√	√	Charging Mode: 135kHz
B	√	√	Standby Mode

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

Note:
1. The EUT is designed to be positioned on the X-plane only.
2. "-" means no effect.

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	24 deg. C, 67% RH	120Vac, 60Hz	Willy Cheng
PLC	21 deg. C, 66% RH	120Vac, 60Hz	Willy Cheng

3.3 Description of Support Units

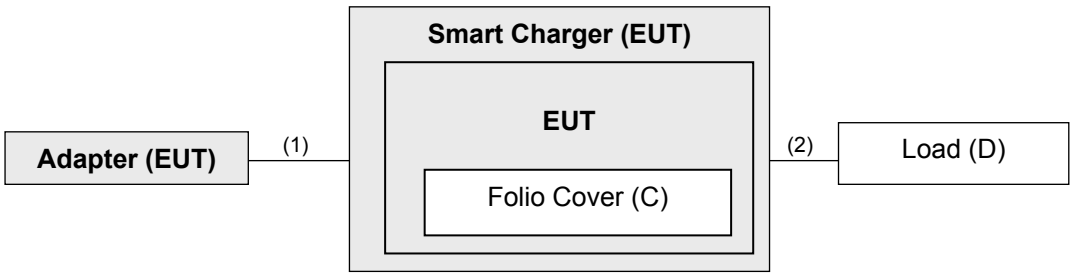
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Smart Charger	Verifone	e355 Smart charger	NA	NA	Accessory
B.	Adapter	Verifone	AU1601201n	NA	NA	Accessory
C.	Folio Cover	Verifone	e285 Folio	NA	NA	Provided by manufacturer
D.	Load	NA	NA	NA	NA	-

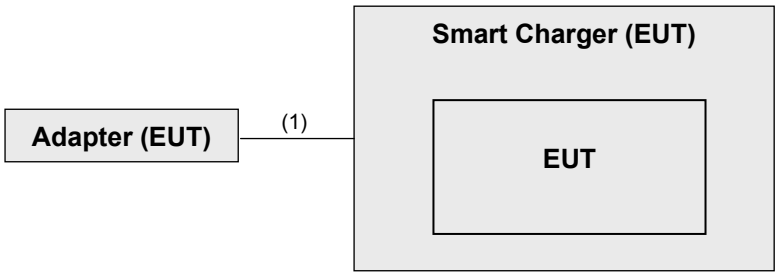
ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	Power cable	1	0.8	N	0	-
2.	DC cable	2	0.3	-	0	-

3.3.1 Configuration of System under Test

Test Mode A



Test 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)	Class A (at 10m)		Class B (at 3m)	
	uV/m	dBuV/m	uV/m	dBuV/m
30-88	90	39.1	100	40.0
88-216	150	43.5	150	43.5
216-960	210	46.4	200	46.0
Above 960	300	49.5	500	54.0

4.1.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESIB7	100187	May 29, 2018	May 28, 2019
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100041	Dec. 12, 2017	Dec. 11, 2018
BILOG Antenna SCHWARZBECK	VULB9168	9168-171	Dec. 11, 2017	Dec. 10, 2018
Loop Antenna EMCI	EM-6879	269	Aug. 11, 2017	Aug. 10, 2018
Preamplifier Agilent (Below 1GHz)	8447D	2944A10738	Aug. 21, 2017	Aug. 20, 2018
RF signal cable HUBER+SUHNER	SUCOFLEX 104	Cable-CH3-03 (223653/4)	Aug. 21, 2017	Aug. 20, 2018
RF signal cable HUBER+SUHNER& EMCI	SUCOFLEX 104&EMC104-SM-SM-8000	Cable-CH3-03 (309224+170907)	Sep.11, 2017	Sep. 10, 2018
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
Pre_Amplifier EMCI	EMC001340	980201	Nov. 01, 2017	Oct. 31, 2018

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.
3. The horn antenna and preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
4. The FCC Designation Number is TW0003. The number will be varied with the Lab location and scope as attached.
5. The IC Site Registration No. is IC 7450F-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.

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) / 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.

Note:

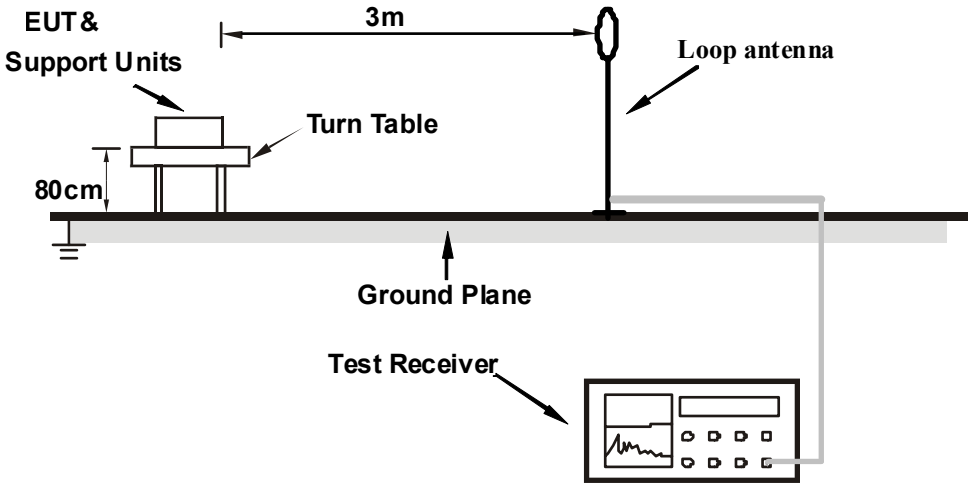
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

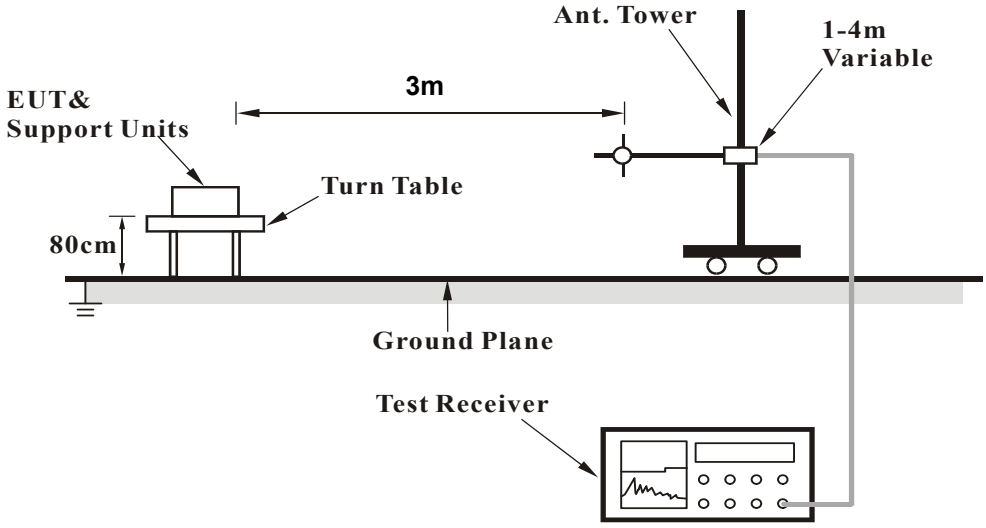
No deviation.

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

a. The Smart Charger powered by adapter
b. Put the EUT on the Smart Charger during the test.

4.1.7 Test Results

Below 30MHz Data:

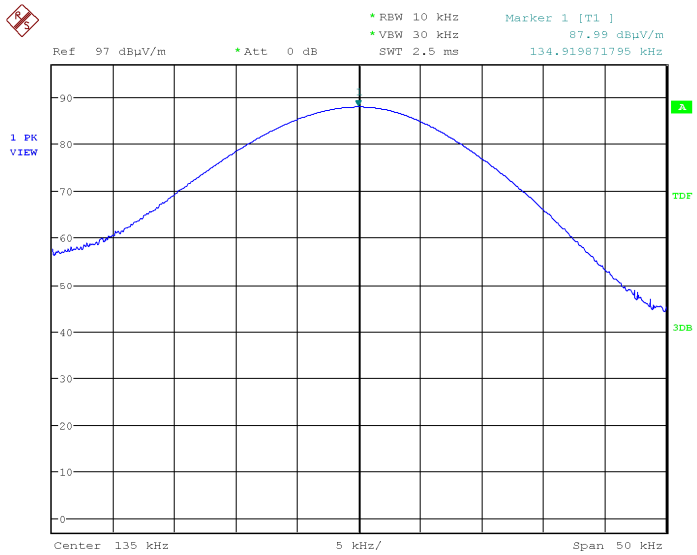
Charging Mode

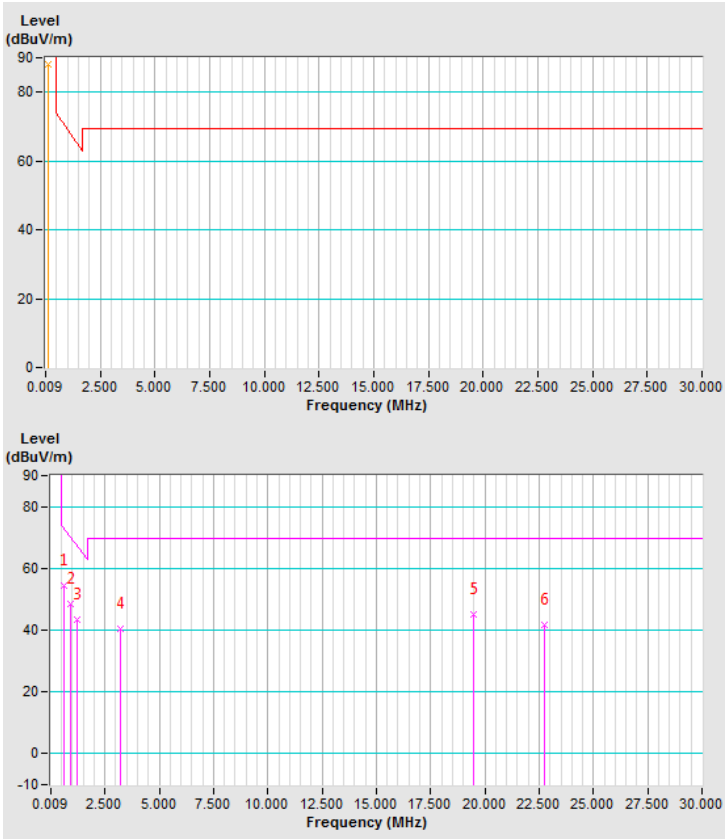
Channel	TX Channel 1	Detector Function	Quasi-Peak
Frequency Range	9 kHz ~ 30 MHz		
Test Mode	A		

ANTENNA POLARITY & TEST DISTANCE: LOOP ANTENNA OPEN 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	*0.135	88.0	105.0	-17.0	1.00	185	67.7	20.3
2	0.634	54.5	71.6	-17.1	1.00	186	34.2	20.3
3	0.922	48.4	68.3	-19.9	1.00	186	28.1	20.3
4	1.211	43.6	65.9	-22.3	1.00	205	23.3	20.3
5	3.229	40.3	69.5	-29.2	1.00	24	19.9	20.4
6	19.474	45.1	69.5	-24.4	1.00	330	24.7	20.4
7	22.743	41.7	69.5	-27.8	1.00	314	21.2	20.5

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. 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. Limit @3m=Limit@300m+40log(300 / 3)=Limit@300m+80
8. Limit @3m=Limit@30m+40log(30 / 3)=Limit@30m+40



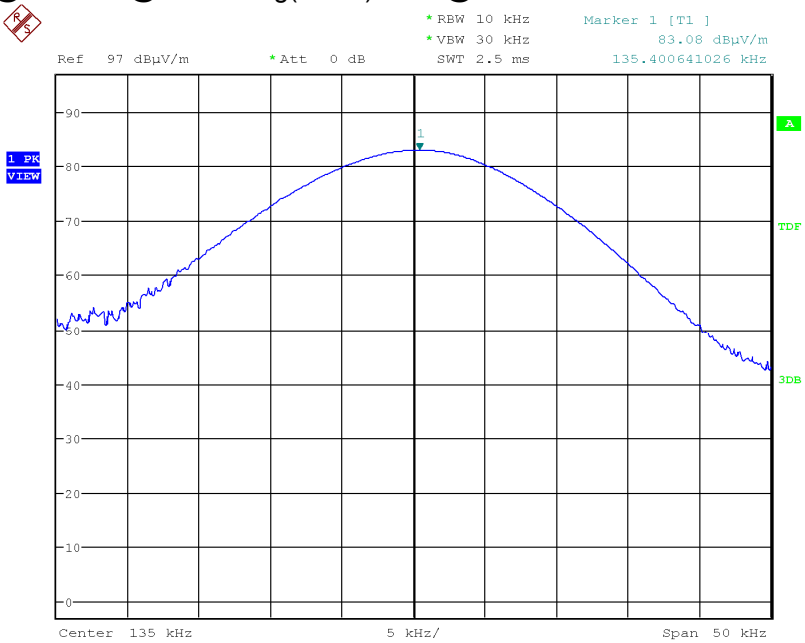

Level
(dBuV/m)
90
80
60
40
20
0
0.009
2.500
5.000
7.500
10.000
12.500
15.000
17.500
20.000
22.500
25.000
27.500
30.000
Frequency (MHz)
Level
(dBuV/m)
90
80
60
40
20
0
-10
1
2
3
4
5
6
0.009
2.500
5.000
7.500
10.000
12.500
15.000
17.500
20.000
22.500
25.000
27.500
30.000
Frequency (MHz)

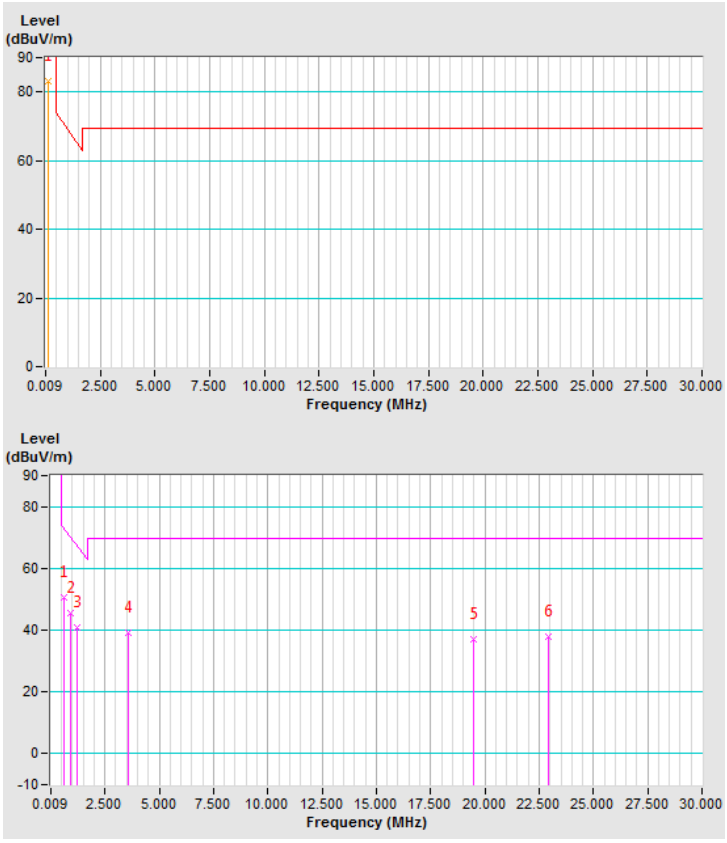
Channel	TX Channel 1	Detector Function	Quasi-Peak
Frequency Range	9 kHz ~ 30 MHz		
Test Mode	A		

ANTENNA POLARITY & TEST DISTANCE: LOOP ANTENNA CLOSE 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	*0.135	83.1	105.0	-21.9	1.00	110	62.8	20.3
2	0.634	50.8	71.6	-20.8	1.00	114	30.5	20.3
3	0.922	45.6	68.3	-22.7	1.00	126	25.3	20.3
4	1.211	40.7	65.9	-25.2	1.00	118	20.4	20.3
5	3.566	39.3	69.5	-30.2	1.00	174	18.9	20.4
6	19.474	37.1	69.5	-32.4	1.00	237	16.7	20.4
7	22.935	38.0	69.5	-31.5	1.00	206	17.5	20.5

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. 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. Limit @3m=Limit@300m+40log(300 / 3)=Limit@300m+80
8. Limit @3m=Limit@30m+40log(30 / 3)=Limit@30m+40



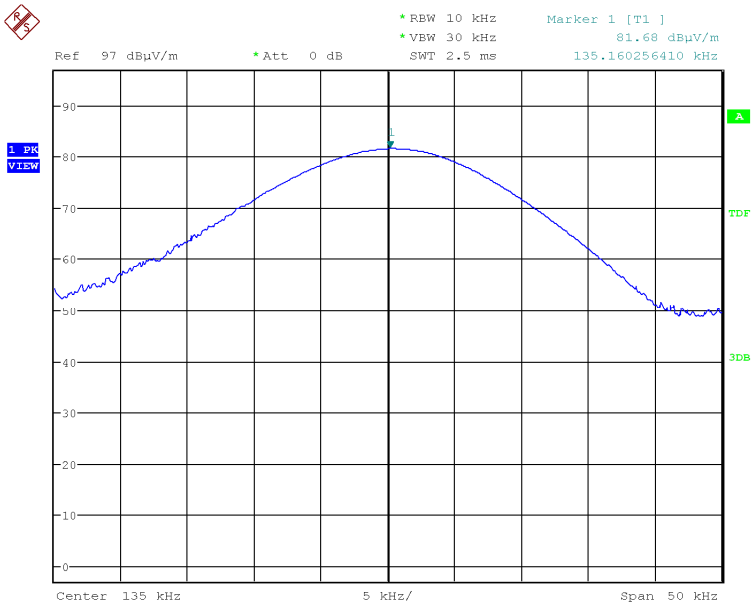

Level
(dBuV/m)
90
80
60
40
20
0
0.009
2.500
5.000
7.500
10.000
12.500
15.000
17.500
20.000
22.500
25.000
27.500
30.000
Frequency (MHz)
Level
(dBuV/m)
90
80
60
40
20
0
-10
1
2
3
4
5
6
0.009
2.500
5.000
7.500
10.000
12.500
15.000
17.500
20.000
22.500
25.000
27.500
30.000
Frequency (MHz)

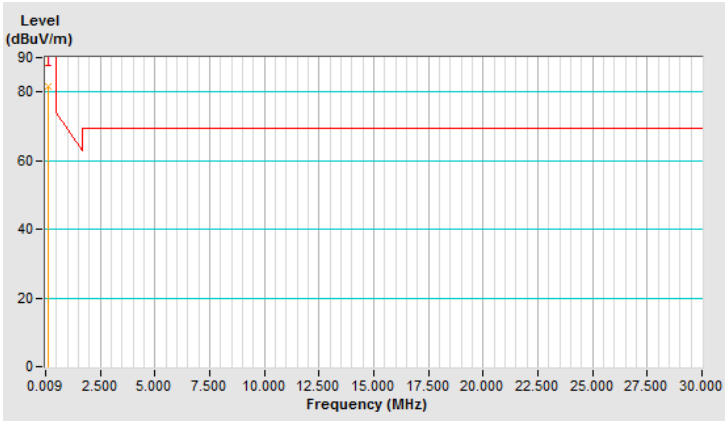
Channel	TX Channel 1	Detector Function	Quasi-Peak
Frequency Range	9 kHz ~ 30 MHz		
Test Mode	A		

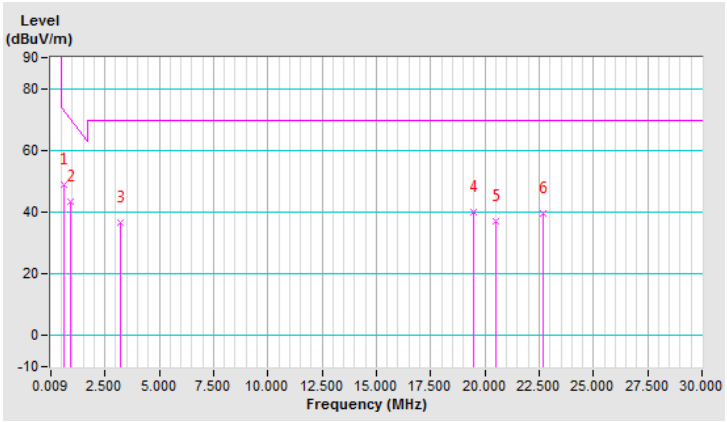
ANTENNA POLARITY & TEST DISTANCE: LOOP ANTENNA GROUND-PARALLEL AT 3m								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*0.135	81.7	105.0	-23.3	1.00	184	61.4	20.3
2	0.634	48.7	71.6	-22.9	1.00	188	28.4	20.3
3	0.922	43.5	68.3	-24.8	1.00	180	23.2	20.3
4	3.229	36.6	69.5	-32.9	1.00	210	16.2	20.4
5	19.474	40.1	69.5	-29.4	1.00	229	19.7	20.4
6	20.532	36.9	69.5	-32.6	1.00	147	16.5	20.4
7	22.695	39.7	69.5	-29.8	1.00	326	19.2	20.5

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. 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. Limit @3m=Limit@300m+40log(300 / 3)=Limit@300m+80
8. Limit @3m=Limit@30m+40log(30 / 3)=Limit@30m+40




Level
(dBuV/m)
90
80
60
40
20
0
1
0.009
2.500
5.000
7.500
10.000
12.500
15.000
17.500
20.000
22.500
25.000
27.500
30.000
Frequency (MHz)


Level
(dBuV/m)
90
80
60
40
20
0
-10
1
2
3
4
5
6
0.009
2.500
5.000
7.500
10.000
12.500
15.000
17.500
20.000
22.500
25.000
27.500
30.000
Frequency (MHz)

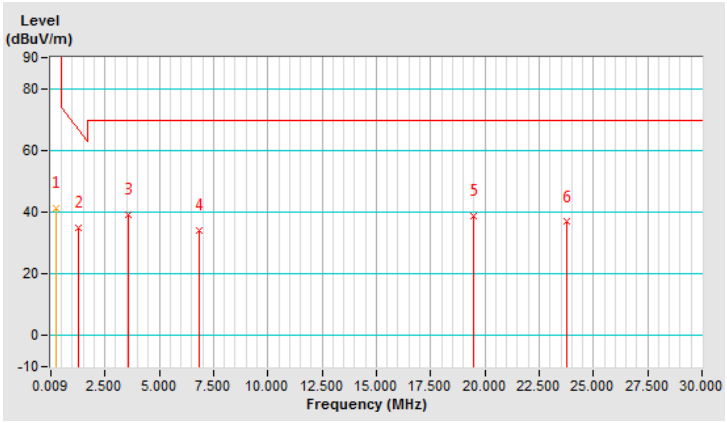
Standby Mode

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

ANTENNA POLARITY & TEST DISTANCE: LOOP ANTENNA OPEN 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	0.270	41.4	99.0	-57.6	1.00	139	21.1	20.3
2	1.307	34.8	65.3	-30.5	1.00	6	14.5	20.3
3	3.566	39.2	69.5	-30.3	1.00	309	18.8	20.4
4	6.834	34.2	69.5	-35.3	1.00	354	13.8	20.4
5	19.474	38.9	69.5	-30.6	1.00	273	18.5	20.4
6	23.800	36.8	69.5	-32.7	1.00	182	16.3	20.5

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. 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. Limit @3m=Limit@300m+40log(300 / 3)=Limit@300m+80
8. Limit @3m=Limit@30m+40log(30 / 3)=Limit@30m+40

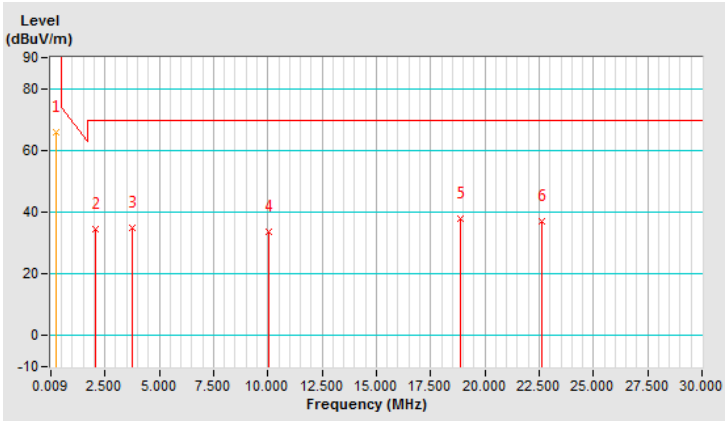


Channel	TX Channel 1	Detector Function	Quasi-Peak
Frequency Range	9 kHz ~ 30 MHz		
Test Mode	B		

ANTENNA POLARITY & TEST DISTANCE: LOOP ANTENNA CLOSE 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	0.270	65.7	99.0	-33.3	1.00	139	45.4	20.3
2	2.076	34.7	69.5	-34.8	1.00	56	14.4	20.3
3	3.758	35.1	69.5	-34.4	1.00	140	14.7	20.4
4	10.054	33.7	69.5	-35.8	1.00	271	13.2	20.5
5	18.898	37.7	69.5	-31.8	1.00	19	17.2	20.5
6	22.646	37.0	69.5	-32.5	1.00	60	16.5	20.5

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. 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. Limit @3m=Limit@300m+40log(300 / 3)=Limit@300m+80
8. Limit @3m=Limit@30m+40log(30 / 3)=Limit@30m+40

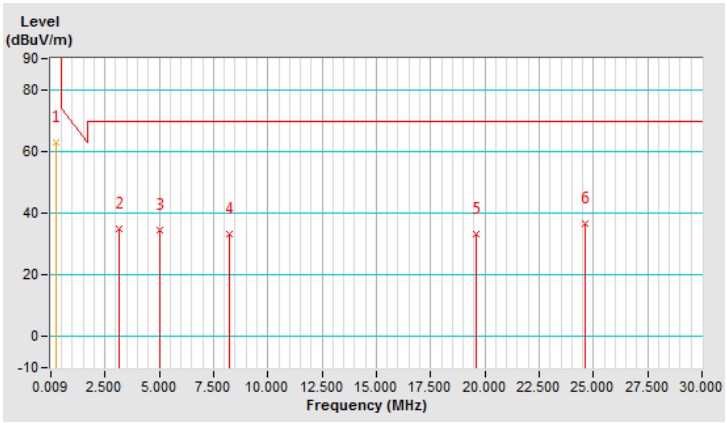


Channel	TX Channel 1	Detector Function	Quasi-Peak
Frequency Range	9 kHz ~ 30 MHz		
Test Mode	B		

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	0.270	62.7	99.0	-36.3	1.00	167	42.4	20.3
2	3.181	34.8	69.5	-34.7	1.00	126	14.4	20.4
3	5.056	34.5	69.5	-35.0	1.00	180	14.0	20.5
4	8.228	33.1	69.5	-36.4	1.00	241	12.7	20.4
5	19.570	33.3	69.5	-36.2	1.00	320	12.9	20.4
6	24.617	36.6	69.5	-32.9	1.00	186	16.0	20.6

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. 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. Limit @3m=Limit@300m+40log(300 / 3)=Limit@300m+80
8. Limit @3m=Limit@30m+40log(30 / 3)=Limit@30m+40



Below 1GHz Data:

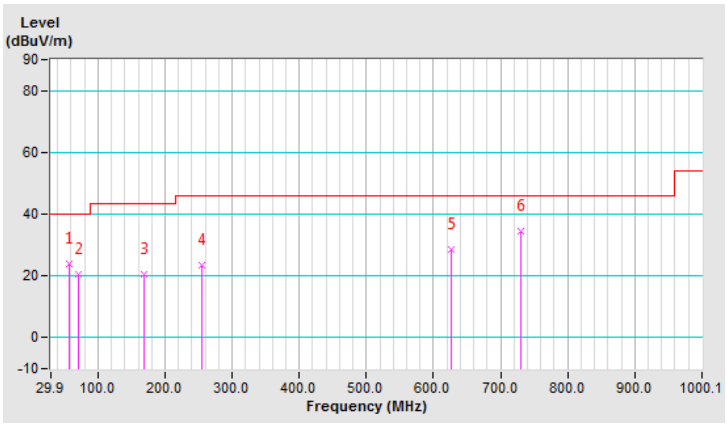
Charging Mode

Channel	TX Channel 1	Detector Function	Quasi-Peak
Frequency Range	30 MHz ~ 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	57.12	23.8 QP	40.0	-16.2	1.00 H	229	33.3	-9.5
2	70.73	20.6 QP	40.0	-19.4	1.00 H	145	31.9	-11.3
3	167.94	20.3 QP	43.5	-23.2	1.99 H	11	29.3	-9.0
4	255.44	23.4 QP	46.0	-22.6	1.00 H	35	32.2	-8.8
5	626.80	28.5 QP	46.0	-17.5	1.00 H	15	28.4	0.1
6	**729.84**	**34.7 QP**	**46.0**	**-11.3**	**1.49 H**	**15**	**32.7**	**2.0**

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

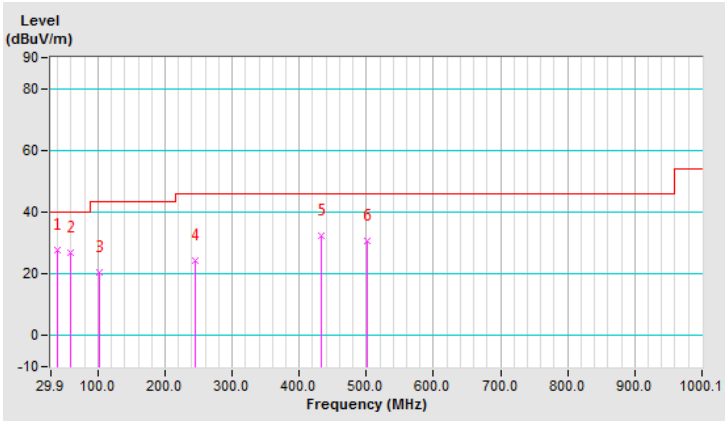


Channel	TX Channel 1	Detector Function	Quasi-Peak
Frequency Range	30 MHz ~ 1GHz		
Test Mode	A		

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	39.62	27.9 QP	40.0	-12.1	1.00 V	5	38.0	-10.1
2	59.06	26.8 QP	40.0	-13.2	1.99 V	335	36.3	-9.5
3	101.84	20.6 QP	43.5	-22.9	1.00 V	160	34.0	-13.4
4	245.72	24.3 QP	46.0	-21.7	1.49 V	296	33.5	-9.2
5	432.37	32.4 QP	46.0	-13.6	1.99 V	127	36.5	-4.1
6	500.42	30.5 QP	46.0	-15.5	1.00 V	59	33.4	-2.9

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



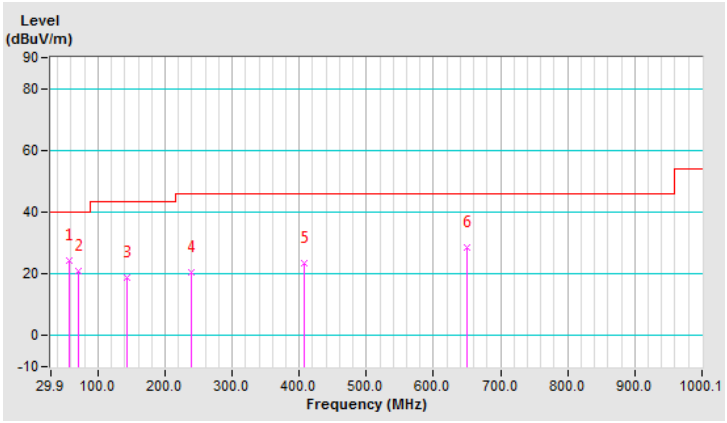
Standby Mode

Channel	TX Channel 1	Detector Function	Quasi-Peak
Frequency Range	30 MHz ~ 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	57.12	24.3 QP	40.0	-15.7	1.00 H	4	33.8	-9.5
2	70.73	21.0 QP	40.0	-19.0	1.00 H	272	32.3	-11.3
3	142.67	19.0 QP	43.5	-24.5	1.00 H	269	28.1	-9.1
4	239.88	20.5 QP	46.0	-25.5	1.99 H	278	30.1	-9.6
5	407.09	23.4 QP	46.0	-22.6	1.49 H	324	28.4	-5.0
6	650.13	28.4 QP	46.0	-17.6	1.00 H	175	28.1	0.3

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

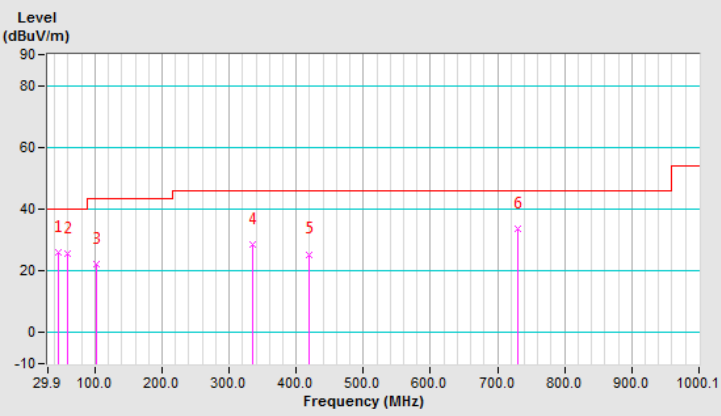


Channel	TX Channel 1	Detector Function	Quasi-Peak
Frequency Range	30 MHz ~ 1GHz		
Test Mode	B		

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	45.45	26.1 QP	40.0	-13.9	1.00 V	64	35.6	-9.5
2	59.06	25.4 QP	40.0	-14.6	1.00 V	313	34.9	-9.5
3	101.84	22.2 QP	43.5	-21.3	2.00 V	147	35.6	-13.4
4	335.15	28.4 QP	46.0	-17.6	1.50 V	249	34.8	-6.4
5	418.76	25.4 QP	46.0	-20.6	1.00 V	193	30.1	-4.7
6	729.84	33.5 QP	46.0	-12.5	1.00 V	124	31.5	2.0

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. 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

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESCI	100613	Nov. 23, 2017	Nov. 22, 2018
RF signal cable (with 10dB PAD) Woken	5D-FB	Cable-cond1-01	Sep. 05, 2017	Sep. 04, 2018
LISN ROHDE & SCHWARZ (EUT)	ESH3-Z5	835239/001	Mar. 06, 2018	Mar. 05, 2019
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Aug. 15, 2017	Aug. 14, 2018
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 1.
3. The VCCI Site Registration No. is C-2040.

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.

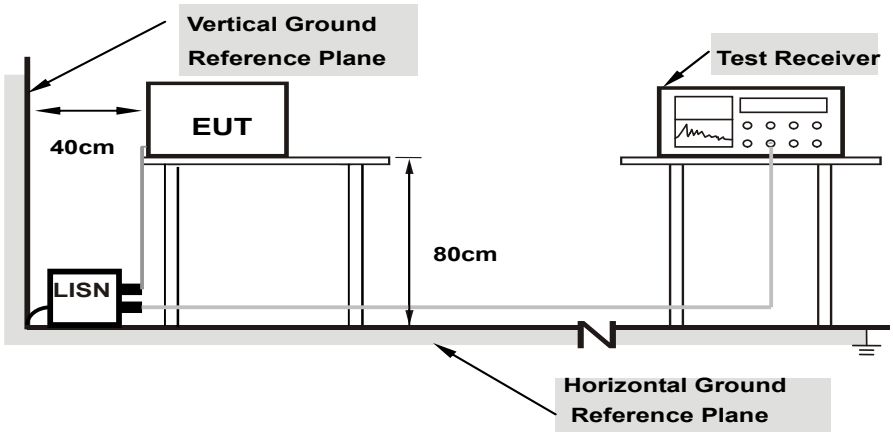
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) were not recorded.

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

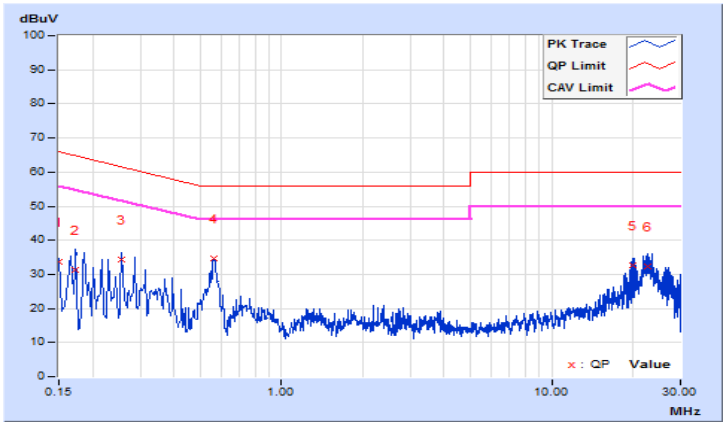
Charging Mode

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	0.15000	9.67	23.88	8.85	33.55	18.52	66.00	56.00	-32.45	-37.48
2	0.17346	9.67	21.61	4.03	31.28	13.70	64.79	54.79	-33.51	-41.09
3	0.25557	9.67	24.77	9.61	34.44	19.28	61.57	51.57	-27.13	-32.29
4	0.56121	9.67	25.03	16.29	34.70	25.96	56.00	46.00	-21.30	-20.04
5	19.98543	9.95	22.63	16.07	32.58	26.02	60.00	50.00	-27.42	-23.98
6	22.60904	9.96	22.40	18.03	32.36	27.99	60.00	50.00	-27.64	-22.01

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.

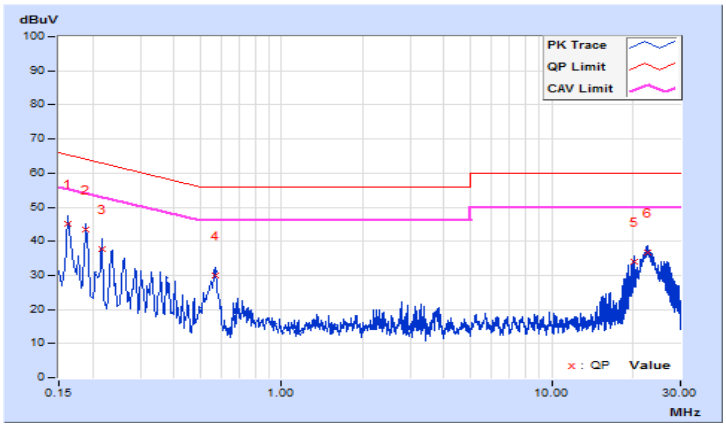


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	A		

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	0.16181	9.68	35.29	22.84	44.97	32.52	65.37	55.37	-20.40	-22.85
2	0.18910	9.68	33.71	21.25	43.39	30.93	64.08	54.08	-20.69	-23.15
3	0.21647	9.68	27.99	13.34	37.67	23.02	62.95	52.95	-25.28	-29.93
4	0.57228	9.68	20.36	9.95	30.04	19.63	56.00	46.00	-25.96	-26.37
5	**20.19266**	**10.05**	**24.00**	**22.32**	**34.05**	**32.37**	**60.00**	**50.00**	**-25.95**	**-17.63**
6	22.80454	10.07	26.52	21.88	36.59	31.95	60.00	50.00	-23.41	-18.05

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.



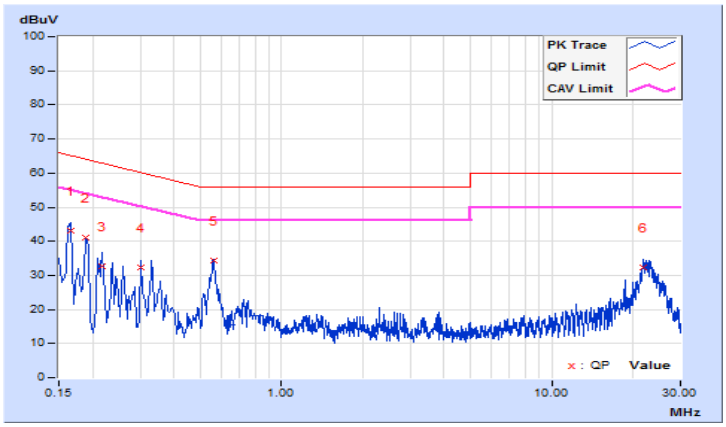
Standby Mode

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	0.16564	9.67	33.53	15.82	43.20	25.49	65.18	55.18	-21.98	-29.69
2	0.18910	9.67	31.34	12.42	41.01	22.09	64.08	54.08	-23.07	-31.99
3	0.21647	9.67	22.83	4.17	32.50	13.84	62.95	52.95	-30.45	-39.11
4	0.30249	9.67	22.55	8.57	32.22	18.24	60.17	50.17	-27.95	-31.93
5	0.55974	9.67	24.81	15.20	34.48	24.87	56.00	46.00	-21.52	-21.13
6	21.85832	9.95	22.32	16.16	32.27	26.11	60.00	50.00	-27.73	-23.89

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.

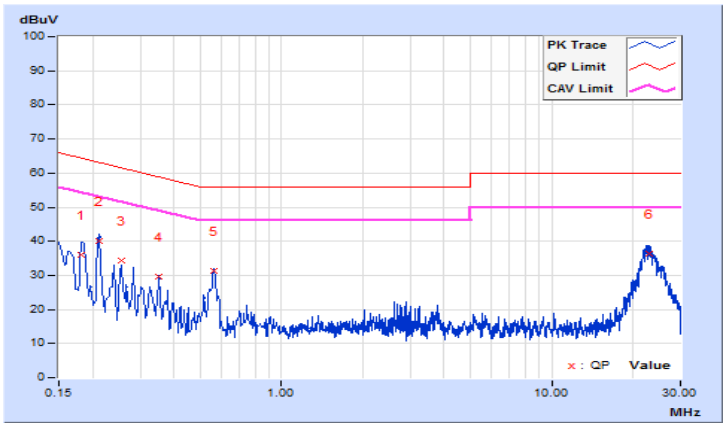


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	B		

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	0.18170	9.68	26.28	11.09	35.96	20.77	64.41	54.41	-28.45	-33.64
2	0.21226	9.68	30.22	14.46	39.90	24.14	63.12	53.12	-23.22	-28.98
3	0.25526	9.68	24.62	9.70	34.30	19.38	61.58	51.58	-27.28	-32.20
4	0.35332	9.68	19.94	7.38	29.62	17.06	58.88	48.88	-29.26	-31.82
5	0.56055	9.68	21.65	12.44	31.33	22.12	56.00	46.00	-24.67	-23.88
6	22.86570	10.07	26.28	16.32	36.35	26.39	60.00	50.00	-23.65	-23.61

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 on 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:

Linko EMC/RF Lab
Tel: 886-2-26052180
Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab
Tel: 886-3-6668565
Fax: 886-3-6668323

Hwa Ya EMC/RF/Safety Lab
Tel: 886-3-3183232
Fax: 886-3-3270892

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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