CONFORMANCE TEST REPORT
FOR
FCC 47 CFR, Part 15 Subpart C

Report No.: 17-07-MAS-053-01

Client:	POWERTEK HARDWARE CO., LTD.
Product:	POWERJACK
Model:	STA
Series Model No.:	STB
FCC ID:	2AOAQPJST112017
Manufacturer/supplier:	POWERTEK HARDWARE CO., LTD.
Date test item received:	2017/07/17
Date test campaign completed:	2018/09/14
Date of issue:	2018/09/14

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Total number of pages of this test report: 31 pages
Total number of pages of photos: External photos 6 pages
Internal photos 6 pages
Setup photos 4 pages

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Manufacturer	: POWERTEK HARDWARE CO., LTD.
Address	: No.119, Hexiang 6th St., Beitun Dist.40642, Taichung, Taiwan R.O.C.
EUT	: POWERJACK
Trade name	: POWERTEK
Model No.	: STA
Series Model No.	: STB
Power Source	: 24Vdc
Output Power	: 12Vdc/24Vdc
Regulations applied	: FCC 47 CFR, Part 15 Subpart C

The testing described in this report has been carried out to the best of our knowledge and ability, and our responsibility is limited to the exercise of reasonable care. This certification is not intended to believe the sellers from their legal and/or contractual obligations.

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⑤ FCC Registration Number: TW0371, TW1112
⑥ Industry Canada Site Registration Number: IC 2949A-2

NVLAP Lab Code 200133-0

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1 GENERAL INFORMATION

1.1 Product Description

a) Type of EUT : POWERJACK
b) Model No. : STA
c) Serial No. : STB
d) FCC ID : 2AOAQPJST112017
e) Working Frequency : Standby mode: 147.052 KHz
Charging mode DC 12V: 142.262 KHz
Charging mode DC 24V: 142.667 KHz

1.2 Characteristics of Device

This product is a wireless charger for electronic locks.

Model No. / Difference Item	Main Model STA	Series Model STB
PCB Layout and The Circuit Diagram	O	O
Components	O	O
Material	O	O
Function	O	O
Shape & Color	O	O
Front panel	O	O
Other	O	X (with a chargeable Li-ion battery at RX side to provide second power source.)

Notes: (1) " O " means the item is same with Main model.
(2) " X "means the item is different with main model. And please explain it.

1.3 Test Methodology

All testing were performed according to the procedures in ANSI C63.10 (2013) and FCC CFR Part 15.

1.4 Test Facility

The semi-anechoic chamber and conducted measurement facility used to collect the radiated and conducted data are located inside the Building at No.8, Lane 29, Wenming Rd. Guishan Dist. Taoyuan City 33383, Taiwan, R.O.C.
This site has been accreditation as a FCC filing site.

1.5 Test Summary

Requirement	FCC Paragraph #	Test Pass
Radiated Emission	15.209	Pass
Bandwidth of Emission	15.205	Pass
Conducted Emission	15.207	N/A

2. DEFINITION AND LIMITS

2.1 Definition

Intentional radiator:
A device that intentionally generates and emits radio frequency energy by radiation or induction.

2.2 Restricted Bands of Operation

Only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42-16.423	399.9-410	4.5-5.25
0.495 - 0.505 **	16.69475 - 16.69525	608-614	5.35-5.46
2.1735 - 2.1905	16.80425 - 16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475 - 156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	Above 38.6
13.36-13.41			

** : Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz

2.3 Limitation

(1) Conducted Emission Limits :

For an intentional radiator which is designed to be connected to the public utility (AC) power line, the conducted limit is the following:

Frequency MHz	Quasi Peak dB μV	Average dB μV
0.15 - 0.5	66-56	56-46
0.5 - 5.0	56	46
5.0 - 30.0	60	50

(2) Radiated Emission Limits :

According to §15.209, radiated emission limits; general requirements.

(a) Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (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	30	30
30 - 88	100**	3
88 - 216	150**	3
216 - 960	200**	3
Above 960	500	3

**Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permItted under other sections of this part, e.g., §§15.231 and 15.241.

(b) In the emission table above, the tighter limit applies at the band edges.

(c) The level of any unwanted emissions from an intentional radiator operating under these general provisions shall not exceed the level of the fundamental emission. For intentional radiators which operate under the provisions of other sections within this part and which are required to reduce their unwanted emissions to the limits specified in this table, the limits in this table are based on the frequency of the unwanted emission and not the fundamental frequency. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency.

(d) The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

(e) The provisions in §§15.31, 15.33, and 15.35 for measuring emissions at distances other than the distances specified in the above table, determining the frequency range over which radiated emissions are to be measured, and limiting peak emissions apply to all devices operated under this part.

(f) In accordance with §15.33(a), in some cases the emissions from an intentional radiator must be measured to beyond the tenth harmonic of the highest fundamental frequency designed to be emitted by the intentional radiator because of the incorporation of a digital device. If measurements above the tenth harmonic are so required, the radiated emissions above the tenth harmonic shall comply with the general radiated emission limits applicable to the incorporated digital device, as shown in §15.109 and as based on the frequency of the emission being measured, or, except for emissions contained in the restricted frequency bands shown in §15.205, the limit on spurious emissions specified for the intentional radiator, whichever is the higher limit. Emissions which must be measured above the tenth harmonic of the highest fundamental frequency designed to be emitted by the intentional radiator and which fall within the restricted bands shall comply with the general radiated emission limits in §15.109 that are applicable to the incorporated digital device.

(g) Perimeter protection systems may operate in the 54-72 MHz and 76-88 MHz bands under the provisions of this section. The use of such perimeter protection systems is limited to industrial, business and commercial applications.

2.4 Labeling Requirement

The device shall bear the following statement in a conspicuous location on the device :

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

2.5 User Information

The users manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

To comply with the FCC RF exposure compliance requirement, this device and its antenna must not be co-located or operating to conjunction with any other antenna or Driveway Monitor.

3. SYSTEM TEST CONFIGURATION

3.1 Justification

For the purposes of this test report ancillary equipment is defined as equipment which is used in conjunction with the EUT to provide operational and control features to the EUT during the test.

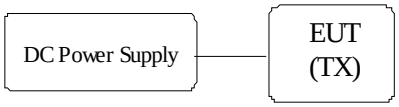
3.2 Devices for Tested System

Device	Manufacture	Model	Cable Description
* POWERJACK	POWERTEK HARDWARE CO., LTD.	STA	----
DC Power Supply	GW INSTEK	GPS-3030D	1.8m*1, Unshielded Power Line
Test Jig	N/A	N/A	0.1m*1 Unshielded Signal Line

Remark :

1."*" means equipment under test.

Standby mode:



Charging mode (Output DC 12V or DC 24V):

2. Test Mode:

Test Mode	Description	Note
Mode 1	Standby mode	-
Mode 2	Charging mode Output DC 12V	-
Mode 3	Charging mode Output DC 24V	-

4. RADIATED EMISSION MEASUREMENTS

4.1 Applicable Standard

According to §15.209, radiated emission limits, general requirements.

4.2 Measurement Procedure

1. Setup the configuration per figure 1 and 2 for frequencies measured below and above 30 MHz respectively. Turn on EUT and make sure that it is in continuous operating function.
2. Change the orientation of EUT on test table over a range from 0 ° to 360 ° with a speed as slow as possible, and keep the azimuth that highest emission is indicated on the spectrum analyzer. Vary the antenna position again and record the highest value as a final reading. A RF test receiver is also used to confirm emissions measured.

Figure 1: Frequencies measured Below 30MHz configuration

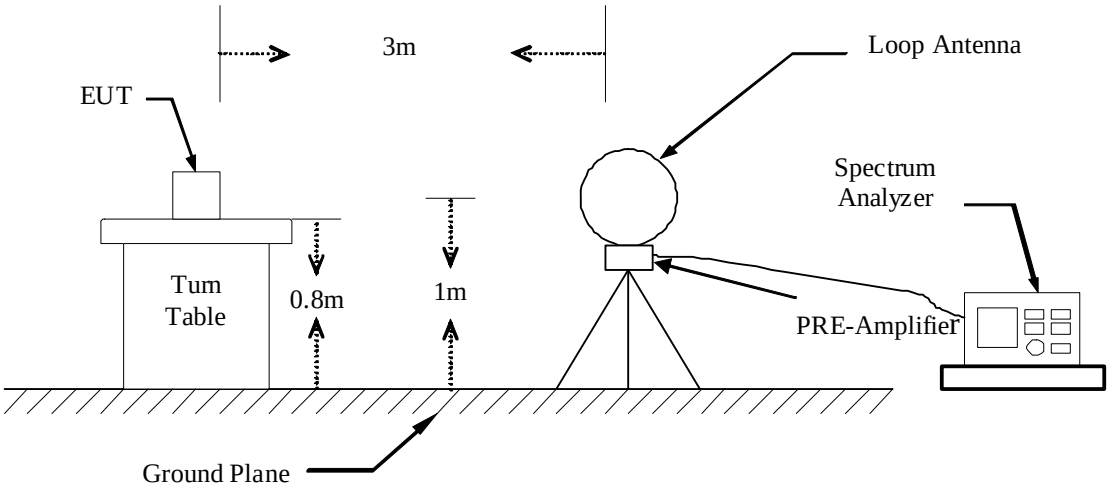
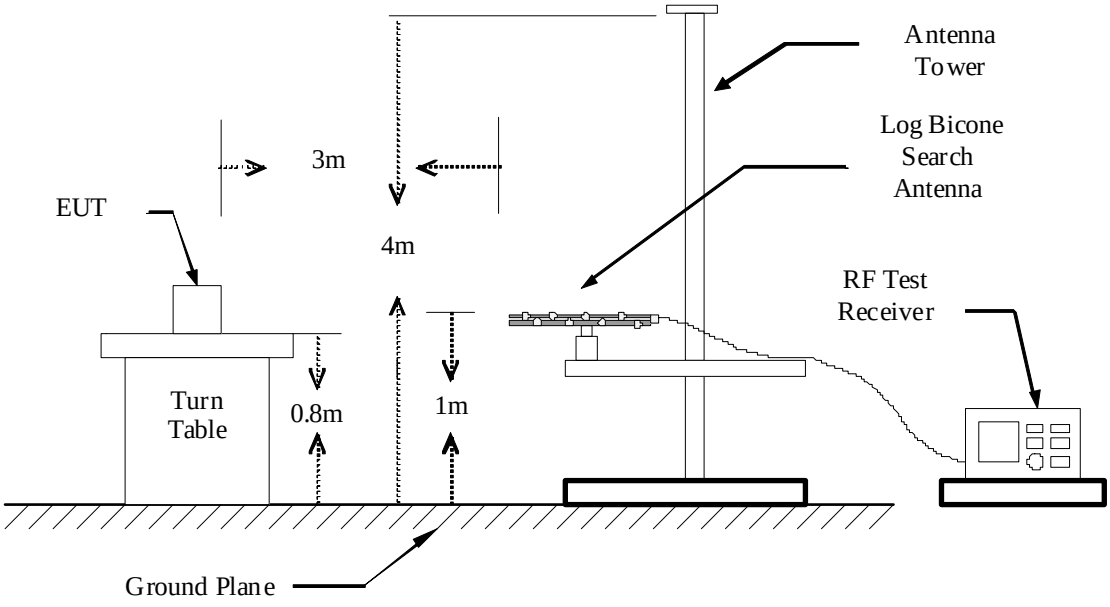


Figure 2: Frequencies measured 30 MHz to 1GHz configuration



4.3 Test Data

4.3.1 Fundamental and Harmonic of Transmitter

4.3.1.1 Mode 1

4.3.1.1.1 The loop antenna is facing the EUT.

Operated mode: Transmitting
Test Date : Jul. 27, 2018 Temperature : 21℃ Humidity : 63%

4.3.1.1.1.1 Fundamental

Frequency (kHz)	Reading (dBuV/m) Peak	Reading (dBuV/m) AV	Correct Factor (dB)	Result @3m (dBuV/m) Peak	Result @3m (dBuV/m) AV	Result @300m (uV/m) Peak	Result @300m (uV/m) AV	Limit @300m (uV/m) AV	Margin (uV/m)
147.052	34.4	----	37.7	72.1	----	0.4	----	16.3	-15.9

4.3.1.1.1.2 Harmonic

Frequency (kHz)	Reading (dBuV/m)		Correct Factor (dB)	Result @3m (dBuV/m)		Limit @3m (dBuV/m)		Margin @3m (dBuV/m)
294.104	---- PK	---- AV	30.1	---- PK	---- AV	118.2 PK	98.2 AV	----
441.156	---- PK	---- AV	26.1	---- PK	---- AV	114.7 PK	94.7 AV	----
588.208	----		23.5	----		72.2	QP	----
735.260	----		21.9	----		70.3	QP	----
882.312	----		20.2	----		68.7	QP	----
1029.364	----		18.8	----		67.4	QP	----
1176.416	----		18.1	----		66.2	QP	----
1323.468	----		17.5	----		65.2	QP	----
1470.520	----		16.9	----		64.3	QP	----

4.3.1.1.1.3 Other Emission

Frequency (kHz)	Reading (dBuV/m)	Correct Factor (dB)	Result @3m (dBuV/m)	Limit @3m (dBuV/m)		Margin @3m (dBuV/m)
11.1775	24.7	6.8	31.5	69.5	QP	-38.0
12.6186	24.5	6.8	31.3	69.5	QP	-38.2
19.8686	29.1	6.5	35.6	69.5	QP	-33.9
23.7000	34.7	6.4	41.1	69.5	QP	-28.4

4.3.1.1.2 The loop antenna is at an angle of 90 degrees to the EUT.

Operated mode: Transmitting
Test Date : Jul. 27, 2018 Temperature : 21℃ Humidity : 63%

4.3.1.1.2.1 Fundamental

Frequency (kHz)	Reading (dBuV/m) Peak	AV	Correct Factor (dB)	Result @3m (dBuV/m) Peak	AV	Result @300m (uV/m) Peak	AV	Limit @300m (uV/m) AV	Margin (uV/m)
147.052	33.0	----	37.7	70.7	----	0.3	----	16.3	-16.0

4.3.1.1.2.2 Harmonic

Frequency (kHz)	Reading (dBuV/m)		Correct Factor (dB)	Result @3m (dBuV/m)		Limit @3m (dBuV/m)		Margin @3m (dBuV/m)
294.104	---- PK	---- AV	30.1	---- PK	---- AV	118.2 PK	98.2 AV	----
441.156	---- PK	---- AV	26.1	---- PK	---- AV	114.7 PK	94.7 AV	----
588.208	----		23.5	----		72.2 QP		----
735.260	----		21.9	----		70.3 QP		----
882.312	----		20.2	----		68.7 QP		----
1029.364	----		18.8	----		67.4 QP		----
1176.416	----		18.1	----		66.2 QP		----
1323.468	----		17.5	----		65.2 QP		----
1470.520	----		16.9	----		64.3 QP		----

Note: *1. Peak Result =Peak Reading + Correct Factor*
2. If the result of peak value is under the limit of average, the average value doesn't need to be measured.
3. "" means the frequency is in the Restricted Bands.*
4. Remark "----" means that the emissions level is too low to be measured
5. In the case of insufficient space in the test site, the conversion formula for the limit value (measuring distance of more than 3 meters) is as follows:
(a) limit (300m) to limit (3m) (0.009MHz-0.490MHz):
frequency = 294.104kHz
limit (300m)=2400/frequency (uV/m)
*∴limit (3m)= 20*log(2400/294.104) + 40log(300m/3m) (dBuV/m)*
= 18.2 + 80 (dBuV/m)
= 98.2 (dBuV/m)
(b) limit (30m) to limit (3m) (0.490MHz-1.705MHz):
frequency = 1470.520 kHz
limit (30m)=24000/frequency (uV/m)
*∴limit (3m)= 20*log(24000/1470.520) + 40log(30m/3m) (dBuV/m)*
= 24.3 + 40 (dBuV/m)
= 64.3(dBuV/m)
(c) limit (30m) to limit (3m) (1.705MHz-30MHz):
limit (30m)=30 (uV/m)
*∴limit (3m)= 20*log(30) + 40log(30m/3m) (dBuV/m)*
= 29.5 + 40 (dBuV/m)
= 69.5(dBuV/m)
6. The estimated measurement uncertainty of the result measurement = ±4.2dB.

4.3.1.2 Mode 2

4.3.1.2.1 The loop antenna is facing the EUT.

Operated mode: Transmitting
Test Date : Jul. 27, 2018 Temperature : 21℃ Humidity : 63%

4.3.1.2.1.1 Fundamental

Frequency (kHz)	Reading (dBuV/m) Peak	Reading (dBuV/m) AV	Correct Factor (dB)	Result @3m (dBuV/m) Peak	Result @3m (dBuV/m) AV	Result @300m (uV/m) Peak	Result @300m (uV/m) AV	Limit @300m (uV/m) AV	Margin (uV/m)
142.262	34.1	----	38.0	72.1	----	0.4	----	16.9	-16.5

4.3.1.2.1.2 Harmonic

Frequency (kHz)	Reading (dBuV/m)		Correct Factor (dB)	Result @3m (dBuV/m)		Limit @3m (dBuV/m)		Margin @3m (dBuV/m)
284.524	---- PK	---- AV	30.6	---- PK	---- AV	118.5 PK	98.5 AV	----
426.786	---- PK	---- AV	26.4	---- PK	---- AV	115.0 PK	95.0 AV	----
569.048	----		23.7	----		72.5 QP		----
711.310	----		22.1	----		70.6 QP		----
853.572	----		20.5	----		69.0 QP		----
995.834	----		19.0	----		67.6 QP		----
1138.096	----		18.3	----		66.5 QP		----
1280.358	----		17.7	----		65.5 QP		----
1422.620	----		17.1	----		64.5 QP		----

4.3.1.2.1.3 Other Emission

Frequency (kHz)	Reading (dBuV/m)	Correct Factor (dB)	Result @3m (dBuV/m)	Limit @3m (dBuV/m)	Margin @3m (dBuV/m)
12.8045	24.0	6.7	30.7	69.5 QP	-38.8
19.7291	31.7	6.5	38.2	69.5 QP	-31.3
22.6106	35.9	6.5	42.4	69.5 QP	-27.1

4.3.1.2.2 The loop antenna is at an angle of 90 degrees to the EUT.

Operated mode: Transmitting
Test Date : Jul. 27, 2018 Temperature : 21℃ Humidity : 63%

4.3.1.2.2.1 Fundamental

Frequency (kHz)	Reading (dBuV/m) Peak	Reading (dBuV/m) AV	Correct Factor (dB)	Result @3m (dBuV/m) Peak	Result @3m (dBuV/m) AV	Result @300m (uV/m) Peak	Result @300m (uV/m) AV	Limit @300m (uV/m) AV	Margin (uV/m)
142.262	32.6	----	38.0	70.6	----	0.3	----	16.9	-16.6

4.3.1.2.2.2 Harmonic

Frequency (kHz)	Reading (dBuV/m)		Correct Factor (dB)	Result @3m (dBuV/m)		Limit @3m (dBuV/m)		Margin @3m (dBuV/m)
284.524	---- PK	---- AV	30.6	---- PK	---- AV	118.5 PK	98.5 AV	----
426.786	---- PK	---- AV	26.4	---- PK	---- AV	115.0 PK	95.0 AV	----
569.048	----		23.7	----		72.5	QP	----
711.310	----		22.1	----		70.6	QP	----
853.572	----		20.5	----		69.0	QP	----
995.834	----		19.0	----		67.6	QP	----
1138.096	----		18.3	----		66.5	QP	----
1280.358	----		17.7	----		65.5	QP	----
1422.620	----		17.1	----		64.5	QP	----

Note: *1. Peak Result =Peak Reading + Correct Factor*
2. If the result of peak value is under the limit of average, the average value doesn't need to be measured.
3. "" means the frequency is in the Restricted Bands.*
4. Remark "----" means that the emissions level is too low to be measured
5. In the case of insufficient space in the test site, the conversion formula for the limit value (measuring distance of more than 3 meters) is as follows:
(a) limit (300m) to limit (3m) (0.009MHz-0.490MHz):
frequency = 284.524kHz
limit (300m)=2400/frequency (uV/m)
*∴limit (3m)= 20*log(2400/284.524) + 40log(300m/3m) (dBuV/m)*
= 18.5+ 80 (dBuV/m)
= 98.5(dBuV/m)
(b) limit (30m) to limit (3m) (0.490MHz-1.705MHz):
frequency = 1422.620kHz
limit (30m)=24000/frequency (uV/m)
*∴limit (3m)= 20*log(24000/1422.620) + 40log(30m/3m) (dBuV/m)*
= 24.5 + 40 (dBuV/m)
= 64.5(dBuV/m)
(c) limit (30m) to limit (3m) (1.705MHz-30MHz):
limit (30m)=30 (uV/m)
*∴limit (3m)= 20*log(30) + 40log(30m/3m) (dBuV/m)*
= 29.5 + 40 (dBuV/m)
= 69.5(dBuV/m)
6. The estimated measurement uncertainty of the result measurement = ±4.2dB.

4.3.1.3 Mode 3

4.3.1.3.1 The loop antenna is facing the EUT.

Operated mode: Transmitting
Test Date : Jul. 27, 2018 Temperature : 21℃ Humidity : 63%

4.3.1.3.1.1 Fundamental

Frequency (kHz)	Reading (dBuV/m) Peak	Reading (dBuV/m) AV	Correct Factor (dB)	Result @3m (dBuV/m) Peak	Result @3m (dBuV/m) AV	Result @300m (uV/m) Peak	Result @300m (uV/m) AV	Limit @300m (uV/m) AV	Margin (uV/m)
142.667	33.8	----	38.0	71.8	----	0.4	----	16.8	-16.4

4.3.1.3.1.2 Harmonic

Frequency (kHz)	Reading (dBuV/m)		Correct Factor (dB)	Result @3m (dBuV/m)		Limit @3m (dBuV/m)		Margin @3m (dBuV/m)
285.334	---- PK	---- AV	30.6	---- PK	---- AV	118.5 PK	98.5 AV	----
428.001	---- PK	---- AV	26.4	---- PK	---- AV	115.0 PK	95.0 AV	----
570.668	----		23.7	----		72.5 QP		----
713.335	----		22.1	----		70.5 QP		----
856.002	----		20.5	----		69.0 QP		----
998.669	----		18.9	----		67.6 QP		----
1141.336	----		18.3	----		66.5 QP		----
1284.003	----		17.7	----		65.4 QP		----
1426.670	----		17.1	----		64.5 QP		----

4.3.1.3.1.3 Other Emission

Frequency (kHz)	Reading (dBuV/m)	Correct Factor (dB)	Result @3m (dBuV/m)	Limit @3m (dBuV/m)	Margin @3m (dBuV/m)
12.5256	24.1	6.8	30.9	69.5 QP	-38.6
20.0080	30.1	6.5	36.6	69.5 QP	-32.9
22.5641	35.2	6.5	41.7	69.5 QP	-27.8

4.3.1.3.2 The loop antenna is at an angle of 90 degrees to the EUT.

Operated mode: Transmitting
Test Date : Jul. 27, 2018 Temperature : 21℃ Humidity : 63%

4.3.1.3.2.1 Fundamental

Frequency (kHz)	Reading (dBuV/m) Peak	Reading (dBuV/m) AV	Correct Factor (dB)	Result @3m (dBuV/m) Peak	Result @3m (dBuV/m) AV	Result @300m (uV/m) Peak	Result @300m (uV/m) AV	Limit @300m (uV/m) AV	Margin (uV/m)
142.667	32.1	----	38.0	70.1	----	0.3	----	16.8	-16.5

4.3.1.3.2.2 Harmonic

Frequency (kHz)	Reading (dBuV/m)		Correct Factor (dB)	Result @3m (dBuV/m)		Limit @3m (dBuV/m)		Margin @3m (dBuV/m)
285.334	---- PK	---- AV	30.6	---- PK	---- AV	118.5 PK	98.5 AV	----
428.001	---- PK	---- AV	26.4	---- PK	---- AV	115.0 PK	95.0 AV	----
570.668	----		23.7	----		72.5 QP		----
713.335	----		22.1	----		70.5 QP		----
856.002	----		20.5	----		69.0 QP		----
998.669	----		18.9	----		67.6 QP		----
1141.336	----		18.3	----		66.5 QP		----
1284.003	----		17.7	----		65.4 QP		----
1426.670	----		17.1	----		64.5 QP		----

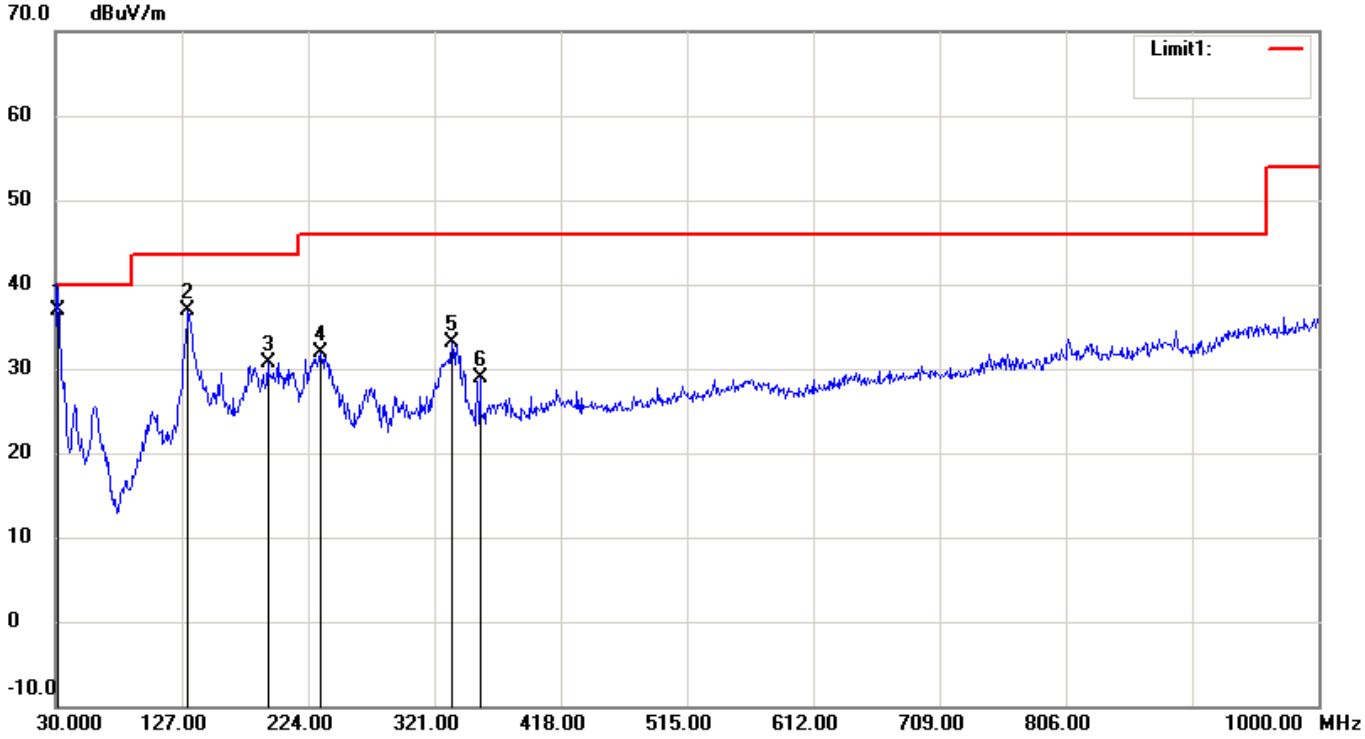
Note: *1. Peak Result =Peak Reading + Correct Factor*
2. If the result of peak value is under the limit of average, the average value doesn't need to be measured.
3. "" means the frequency is in the Restricted Bands.*
4. Remark "----" means that the emissions level is too low to be measured
5. In the case of insufficient space in the test site, the conversion formula for the limit value (measuring distance of more than 3 meters) is as follows:
(a) limit (300m) to limit (3m) (0.009MHz-0.490MHz):
frequency = 285.334kHz
limit (300m)=2400/frequency (uV/m)
*∴limit (3m)= 20*log(2400/285.334) + 40log(300m/3m) (dBuV/m)*
= 18.5 + 80 (dBuV/m)
= 98.5 (dBuV/m)
(b) limit (30m) to limit (3m) (0.490MHz-1.705MHz):
frequency = 1426.670 kHz
limit (30m)=24000/frequency (uV/m)
*∴limit (3m)= 20*log(24000/1426.670) + 40log(30m/3m) (dBuV/m)*
= 24.5 + 40 (dBuV/m)
= 64.5(dBuV/m)
(c) limit (30m) to limit (3m) (1.705MHz-30MHz):
limit (30m)=30 (uV/m)
*∴limit (3m)= 20*log(30) + 40log(30m/3m) (dBuV/m)*
= 29.5 + 40 (dBuV/m)
= 69.5(dBuV/m)
6. The estimated measurement uncertainty of the result measurement = ±4.2dB.

4.3.2 Other Emission

4.3.2.1 Mode 1

File: **2018_07_26_Debug** **Data:** **#29** **Date:** **2018/7/27** **Temperature:** **21 ℃**

Time: **AM 11:33:43** **Humidity:** **63 %**



Condition: **FCC_30-1000MHz** **Polarization:** **Horizontal**

EUT: **Distance:**

Model:

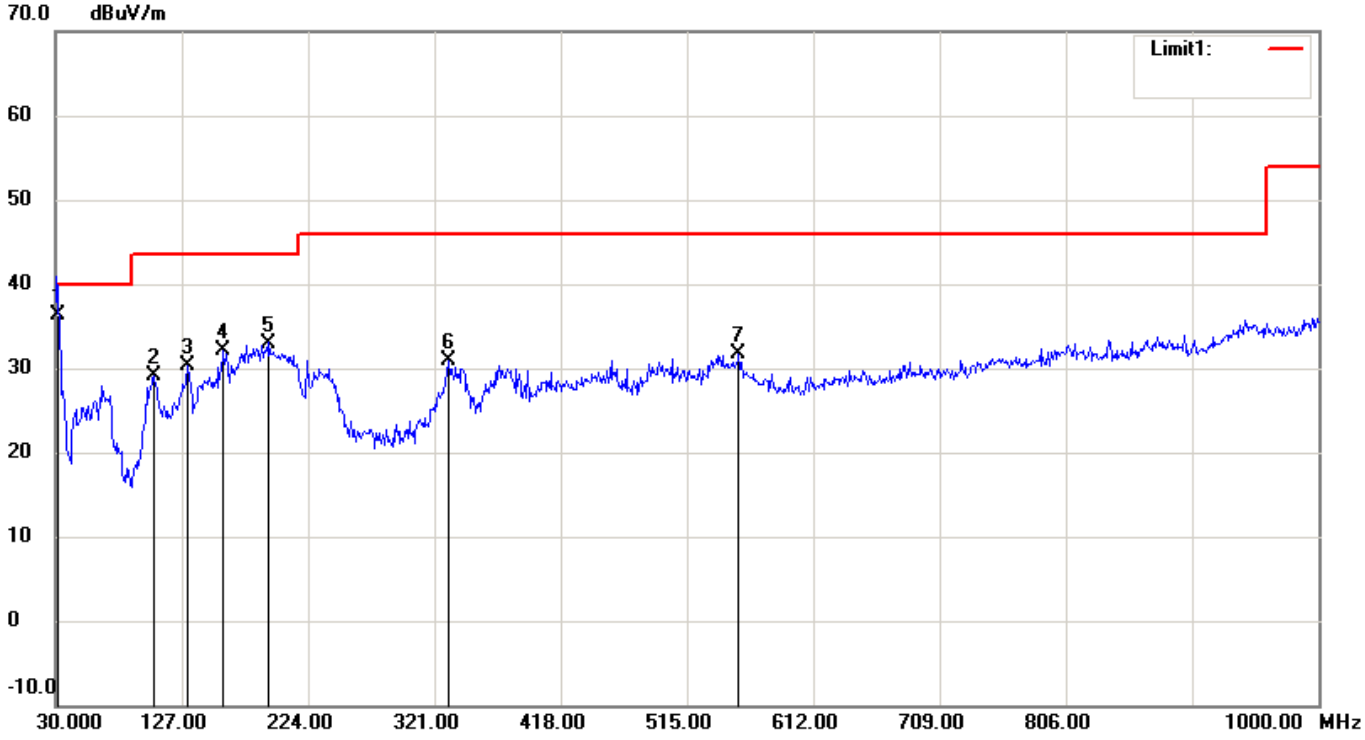
Test Mode:

Note:

No.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	31.3100	44.23	QP	-7.23	37.00	40.00	-3.00
2	131.8500	42.21	QP	-5.38	36.83	43.50	-6.67
3	192.9600	40.96	QP	-10.25	30.71	43.50	-12.79
4	233.7000	39.87	QP	-7.99	31.88	46.00	-14.12
5	334.5800	37.16	QP	-4.13	33.03	46.00	-12.97
6	355.9200	32.55	QP	-3.63	28.92	46.00	-17.08

File: **2018_07_26_Debug** **Data:** **#28** **Date:** **2018/7/27** **Temperature:** **21 ℃**

Time: **AM 11:14:29** **Humidity:** **63 %**



Condition: **FCC_30-1000MHz** **Polarization:** **Vertical**

EUT: **Distance:**

Model:

Test Mode:

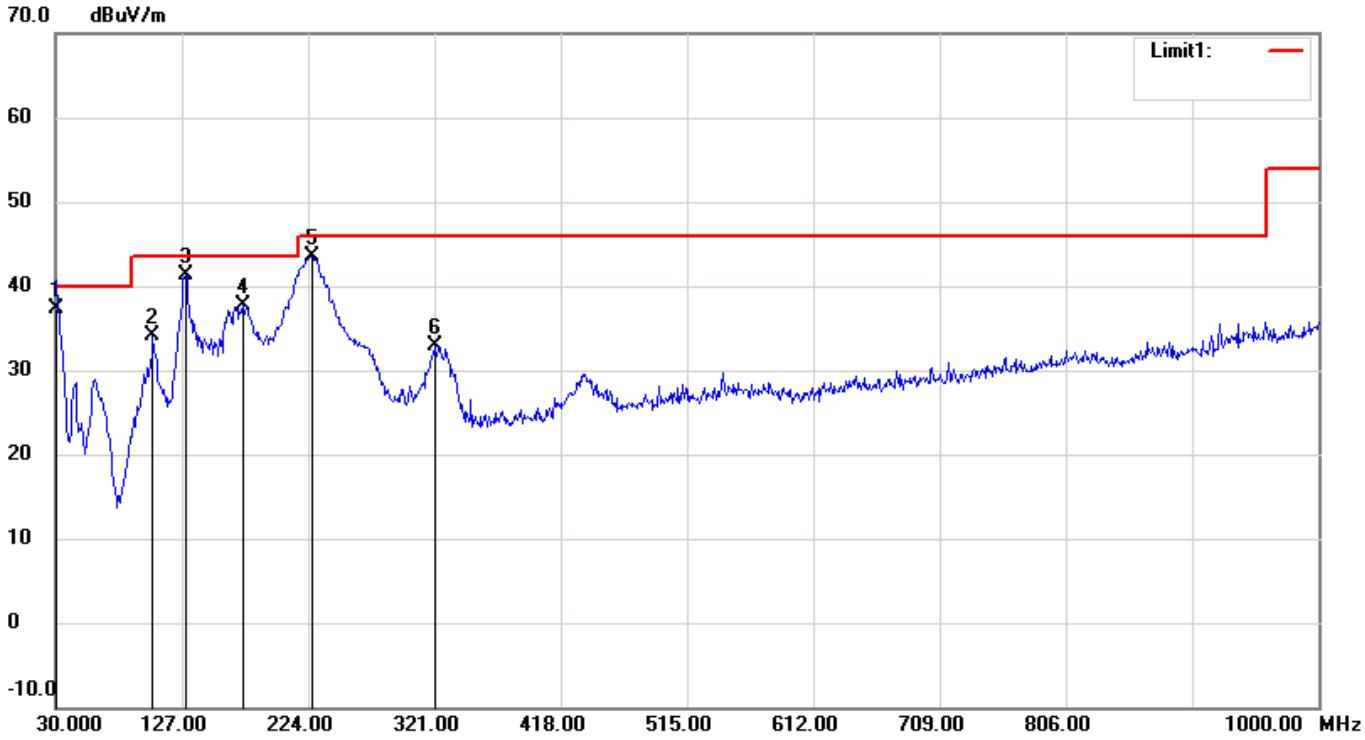
No.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	31.1600	43.61	QP	-7.21	36.40	40.00	-3.60
2	105.6600	36.20	QP	-7.09	29.11	43.50	-14.39
3	131.8500	35.69	QP	-5.38	30.31	43.50	-13.19
4	159.0100	40.05	QP	-7.97	32.08	43.50	-11.42
5	193.9300	43.19	QP	-10.19	33.00	43.50	-10.50
6	331.6700	35.18	QP	-4.18	31.00	46.00	-15.00
7	554.7700	31.65	QP	-0.03	31.62	46.00	-14.38

Note: *1. The test frequency range is 9kHz~1GHz.*
2. Remark "---" means that the emissions level is too low to be measured.
3. If the peak result is under the quasi-peak limit, that is deemed to meet the quasi-peak limit.
4. The estimated measurement uncertainty of the result measurement is:
±4.2dB (9kHz~30MHz)
±4.6dB (30MHz≦f<300MHz)
±4.4dB (300MHz≦f≦1GHz)

4.3.2.2 Mode 2

File: **2018_07_26_Debu g** **Data:** **#1** **Date:** **2018/7/26** **Temperature:** **21 ℃**

Time: **AM 11:27:34** **Humidity:** **63 %**



Condition: **FCC Part15 RE-Class B_30-1000MHz** **Polarization:** **Horizontal**

EUT: **Distance:**

Model:

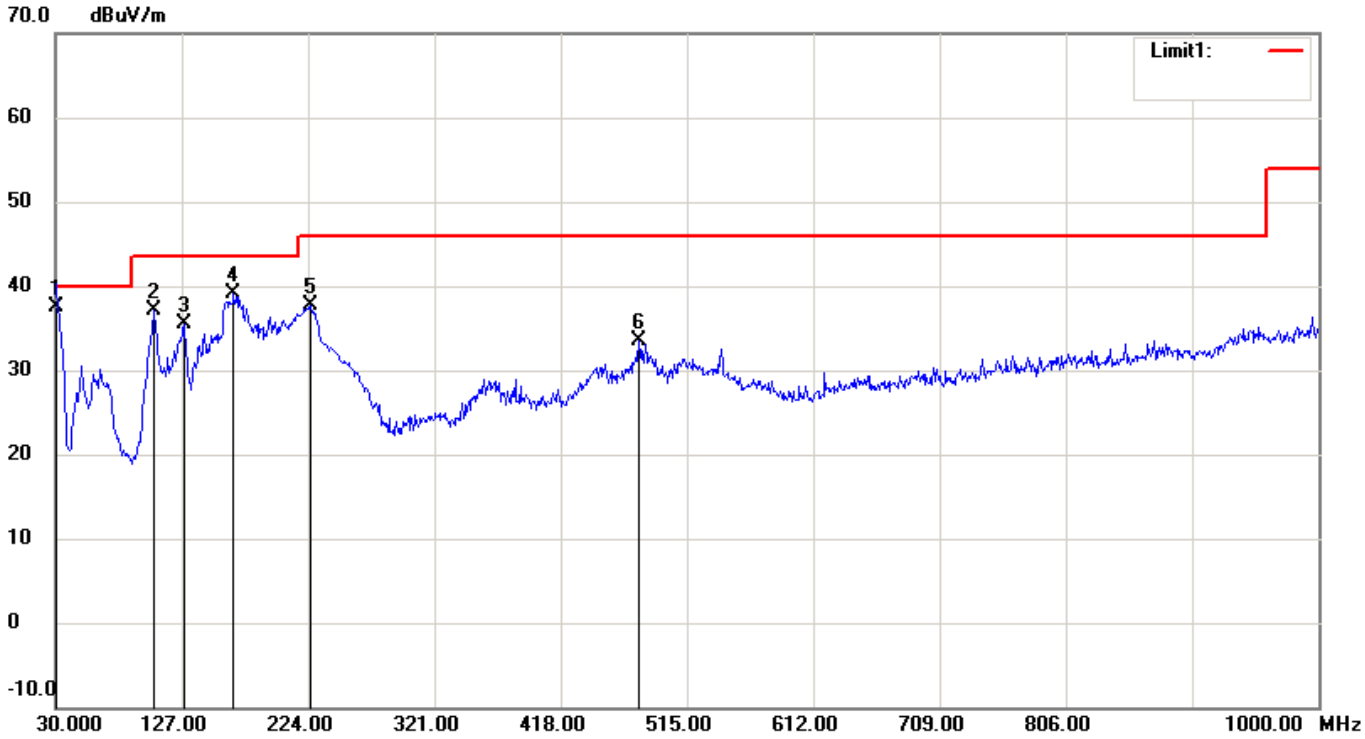
Test Mode:

Note: **DC12V**

No.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	30.1600	44.36	QP	-7.06	37.30	40.00	-2.70
2	104.6900	41.36	QP	-7.31	34.05	43.50	-9.45
3	129.9100	46.68	QP	-5.31	41.37	43.50	-2.13
4	173.5600	47.60	QP	-9.87	37.73	43.50	-5.77
5	226.9100	52.10	QP	-8.52	43.58	46.00	-2.42
6	321.0000	37.39	QP	-4.41	32.98	46.00	-13.02

File: **2018_07_26_Debug** **Data:** **#2** **Date:** **2018/7/26** **Temperature:** **21 ℃**

Time: **AM 11:42:26** **Humidity:** **63 %**



Condition: **FCC Part15 RE-Class B_30-1000MHz** **Polarization:** **Vertical**

EUT: **Distance:**

Model:

Test Mode:

Note: **DC12V**

No.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	30.0300	44.53	QP	-7.03	37.50	40.00	-2.50
2	105.6600	44.28	QP	-7.09	37.19	43.50	-6.31
3	128.9400	40.77	QP	-5.34	35.43	43.50	-8.07
4	166.7700	48.08	QP	-9.07	39.01	43.50	-4.49
5	225.9400	46.27	QP	-8.63	37.64	46.00	-8.36
6	478.1400	34.94	QP	-1.46	33.48	46.00	-12.52

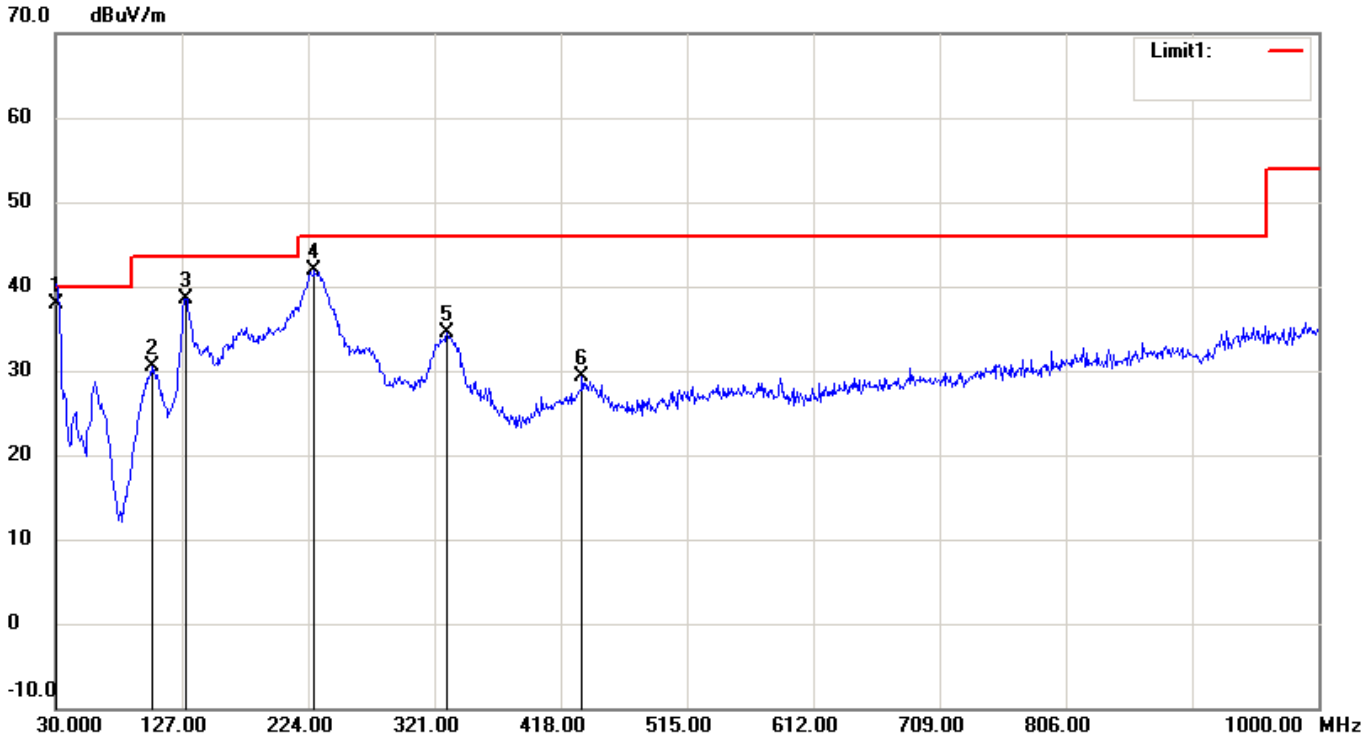
Note: *1. The test frequency range is 9kHz~1GHz.*
2. Remark "---" means that the emissions level is too low to be measured.
3. If the peak result is under the quasi-peak limit, that is deemed to meet the quasi-peak limit.
4. The estimated measurement uncertainty of the result measurement is:
±4.2dB (9kHz~30MHz)
±4.6dB (30MHz≦f<300MHz)
±4.4dB (300MHz≦f≦1GHz)

4.3.2.3 Mode 3

File: **2018_07_26_Debug** **Data:** **#3**

Date: **2018/7/26** **Temperature:** **21 ℃**

Time: **PM 01:09:40** **Humidity:** **63 %**



Condition: **FCC Part15 RE-Class B_30-1000MHz** **Polarization:** **Horizontal**

EUT: **Distance:**

Model:

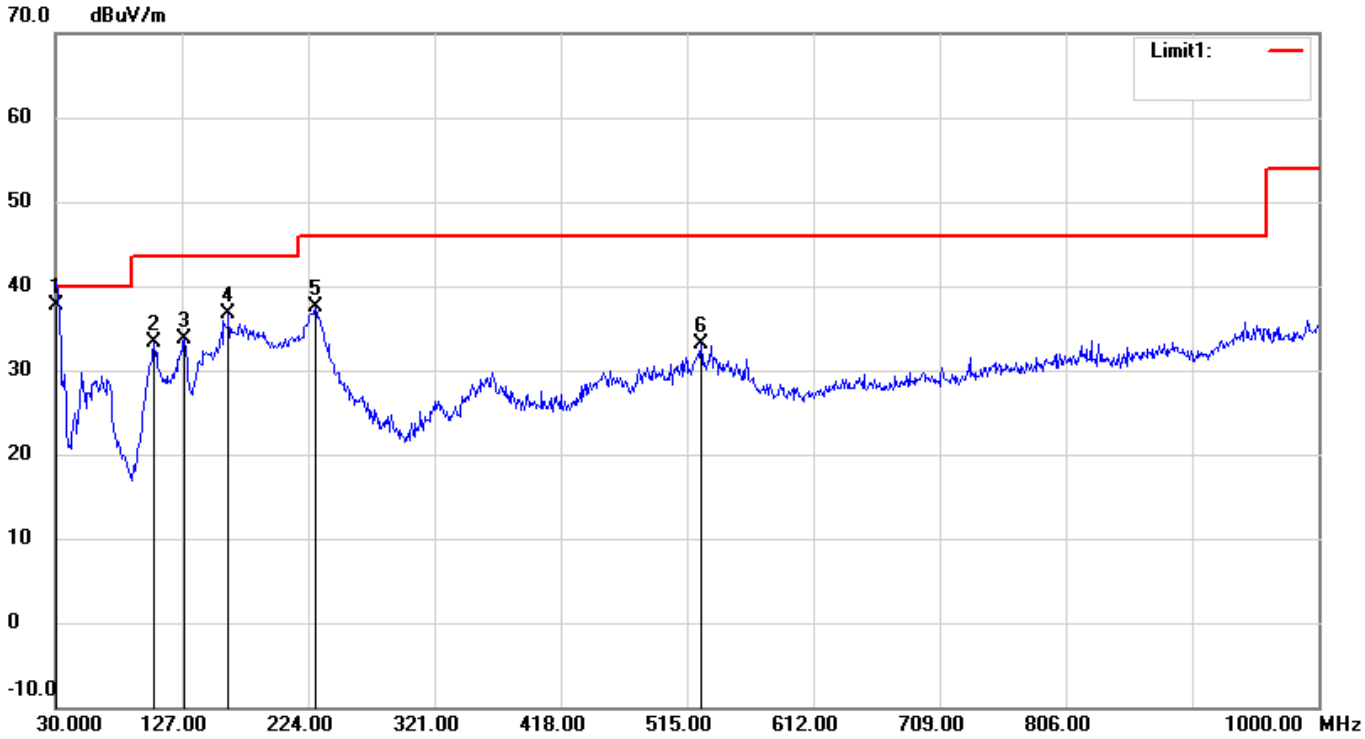
Test Mode:

Note: **DC24V**

No.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	30.7500	45.05	QP	-7.15	37.90	40.00	-2.10
2	103.7200	38.02	QP	-7.52	30.50	43.50	-13.00
3	129.9100	43.86	QP	-5.31	38.55	43.50	-4.95
4	228.8500	50.14	QP	-8.31	41.83	46.00	-4.17
5	330.7000	38.71	QP	-4.21	34.50	46.00	-11.50
6	434.4900	31.49	QP	-2.18	29.31	46.00	-16.69

File: 2018_07_26_Debug **Data:** #4 **Date:** 2018/7/26 **Temperature:** 21 ℃

Time: PM 01:23:32 **Humidity:** 63 %



Condition: FCC Part15 RE-Class B_30-1000MHz **Polarization:** Vertical

EUT: **Distance:**

Model:

Test Mode:

Note: DC24V

No.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	30.7500	44.95	QP	-7.15	37.80	40.00	-2.20
2	105.6600	40.42	QP	-7.09	33.33	43.50	-10.17
3	128.9400	39.06	QP	-5.34	33.72	43.50	-9.78
4	162.8900	45.31	QP	-8.52	36.79	43.50	-6.71
5	229.8200	45.67	QP	-8.20	37.47	46.00	-8.53
6	525.6700	33.70	QP	-0.62	33.08	46.00	-12.92

Note: *1. The test frequency range is 9kHz~1GHz.*

2. Remark "---" means that the emissions level is too low to be measured.

3. If the peak result is under the quasi-peak limit, that is deemed to meet the quasi-peak limit.

4. The estimated measurement uncertainty of the result measurement is:

±4.2dB (9kHz~30MHz)

±4.6dB (30MHz ≦f<300MHz)

±4.4dB (300MHz ≦f≦1GHz)

4.4 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

RESULT = READING + CORR. FACTOR

where CORR. FACTOR = Antenna FACTOR + Cable FACTOR

4.5 Radiated Test Equipment

The following instrument are used for radiated emissions measurement :

Equipment	Manufacturer	Model No.
EMI Receiver	R&S	ESCI
BiLog Antenna	ETC	MCTD 2786
Loop Antenna	EMCO	6512
PRE-Amplifier	Agilent	8449B
PRE-Amplifier	Agilent	8447D
Spectrum Analyzer	Rohde & Schwarz	FSU46

Note: The standards used to perform this calibration are traceable to NML/ROC, NIST/USA and NPL.

4.6 Measuring Instrument Setup

Measuring instrument setup in measured frequency band when specified detector function is used :

Frequency Band (MHz)	Instrument	Function	Resolution Bandwidth	Video Bandwidth
0.009 to 30	Spectrum Analyzer	Average	9 kHz	10 kHz
	Spectrum Analyzer	Peak	9 kHz	10 kHz
30 to 1000	RF Test Receiver	Quasi-Peak	120 kHz	300 kHz
	Spectrum Analyzer	Peak	120 kHz	300 kHz

5. CONDUCTED EMISSION MEASUREMENT

This EUT is excused from investigation of conducted emission, for it is powered by battery only. According to §15.207 (d), measurements to demonstrate compliance with the conducted limits are not required for devices which only employ battery power for operation and which do not operate from the AC power lines or contain provisions for operation while connected to the AC power lines.

6. MEASUREMENT OF OPERATING FREQUENCY RANGE

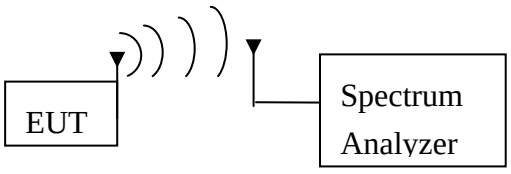
6.1 Applicable Standard

According to §15.205,Only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42-16.423	399.9-410	4.5-5.25
0.495 - 0.505 **	16.69475 - 16.69525	608-614	5.35-5.46
2.1735 - 2.1905	16.80425 - 16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475 - 156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2655-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	Above 38.6
13.36-13.41			

** : Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz

6.2 Operating frequency range measurement configuration



6.3 Operating frequency range Test Equipment

Equipment	Manufacturer	Model No.
Spectrum Analyzer	R&S	FSV

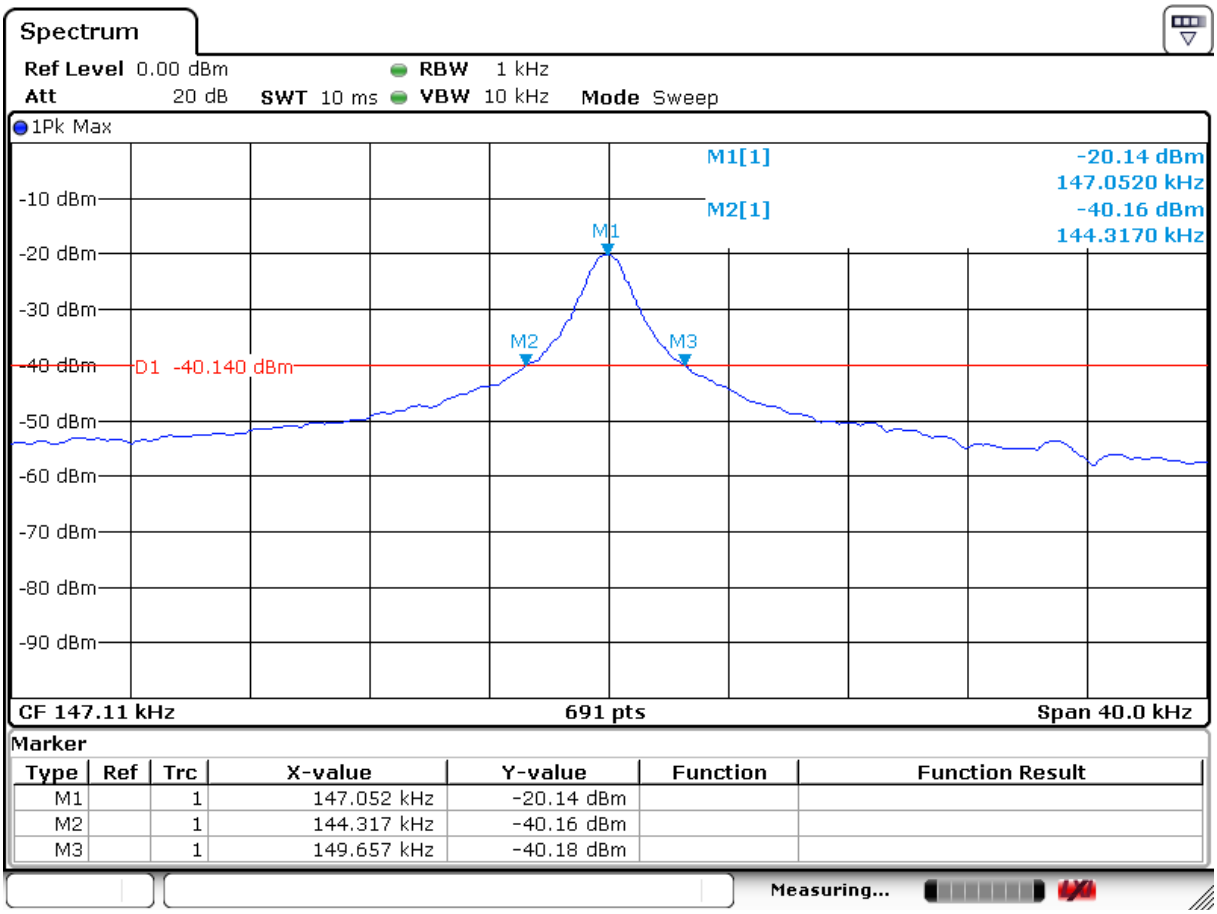
6.4 Test Result

Operated mode : Transmitting
Test Date : Jan. 16, 2018 Temperature : 21℃ Humidity : 63%

The operating frequency range is not within the restricted bands and meets the requirements of §15.205.

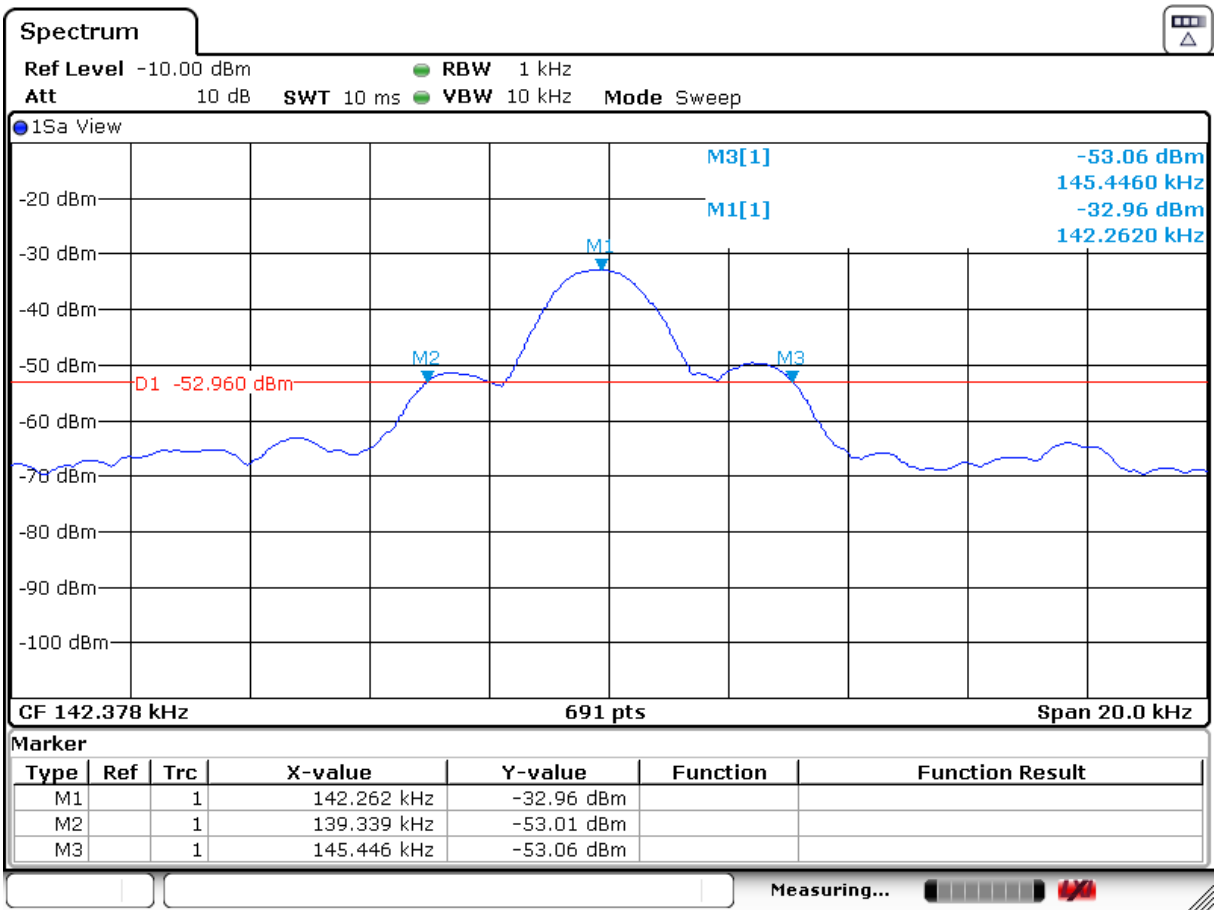
Note: *Please refer to page 28-30 for chart.*

Mode 1



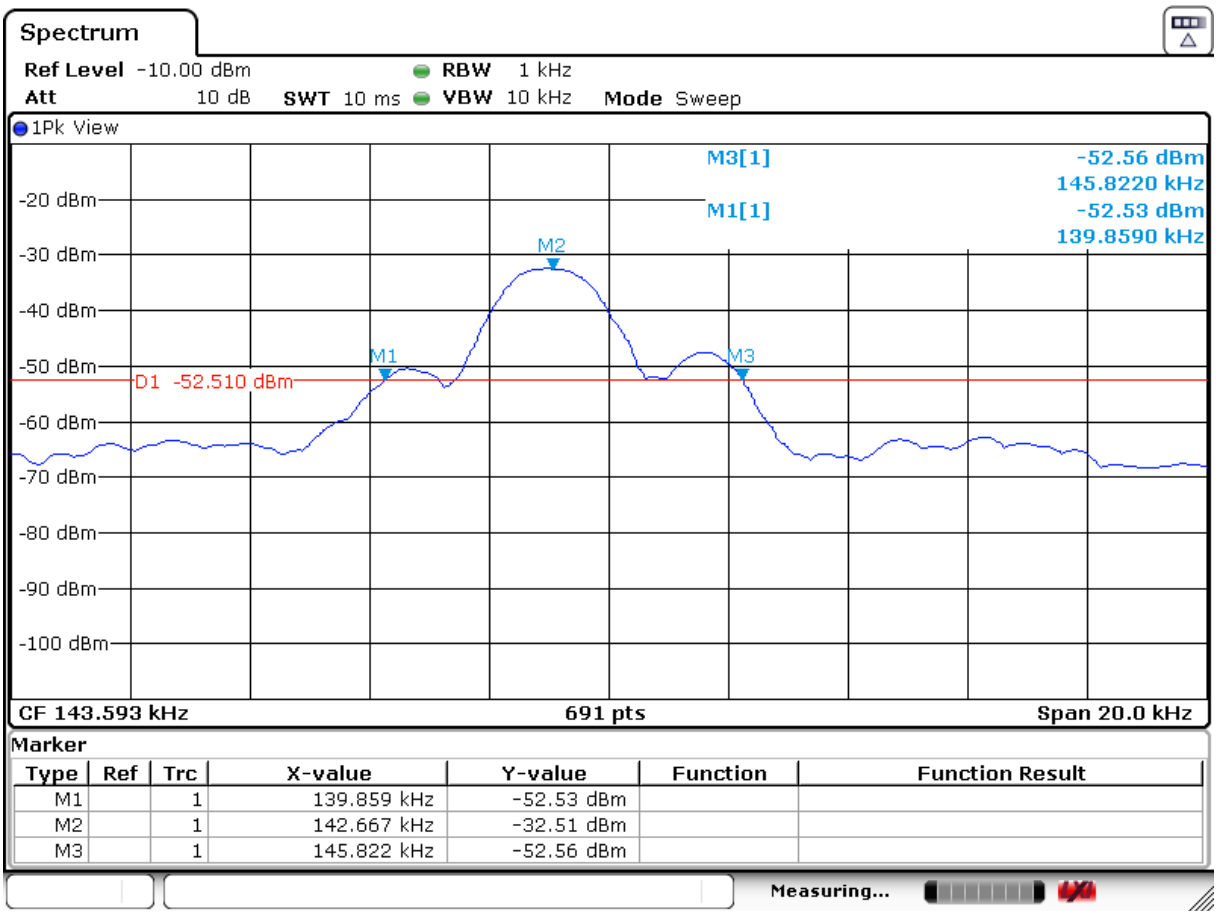
Date: 7.SEP.2018 16:30:03

Mode 2



Date: 7.SEP.2018 16:00:56

Mode 3



Date: 7.SEP.2018 15:46:47

7. EQUIPMENTS LIST FOR TESTING

Equipment	Manufacturer	Model No.	S/N	Calibration Date	Next Cal. Due
EMI Receiver	R&S	ESCI	13054423-001	01/19/2018	01/18/2019
BiLog Antenna	ETC	MCTD 2786	BL11M03003	05/12/2018	05/11/2019
Loop Antenna	EMCO	6512	13054104-001	01/04/2018	01/03/2019
PRE-Amplifier	Agilent	8449B	13040709-001	01/04/2018	01/03/2019
PRE-Amplifier	Agilent	8447D	13040715-002	04/23/2018	04/22/2019
Spectrum Analyzer	R&S	FSU46	13040904-001	01/08/2018	01/07/2019
Spectrum Analyzer	R&S	FSV	13052017-001	06/13/2018	06/12/2019