

TEST REPORT

FCC ID: 2AF3W-1082250

Product Name: Electrical Powder Dropper
Trademark: N/A
Model Number: 1082250
Prepared For: Battenfeld Acquisition Company Inc.&Subsidiary
Address: 2501 LeMone Industrial Blvd. Columbia MO. 65201, USA
Manufacturer: Fujian Henglong Plastic industrial Co.,Ltd
Address: HengSiRoad, LongchiDevelopmentZone, JiaoMeiTown,
LonghaiCity, Fujian, China, 363107
Prepared By: Shenzhen BCTC Testing Co., Ltd.
Address: BCTC Building & 1-2F, East of B Building, Pengzhou
Industrial, Fuyuan 1st Road, Qiaotou Community, Fuyong
Street, Bao'an District, Shenzhen, China
Sample Received Date: Mar. 12, 2020
Sample tested Date: Mar. 12, 2020-Mar. 16, 2020
Issue Date: Mar. 16, 2020
Report No.: BCTC2003000719E
Test Standards FCC Part15.247
ANSI C63.10-2013
Test Results PASS

Prepared by(Engineer):

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Reviewer(Supervisor):

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Approved(Manager):

Zero Zhou

Zero Zhou



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(Note: N/A means not applicable)



1. VERSION

Report No.	Issue Date	Description	Approved
BCTC2003000719E	Mar. 16, 2020	Revised	Valid

2. TEST SUMMARY

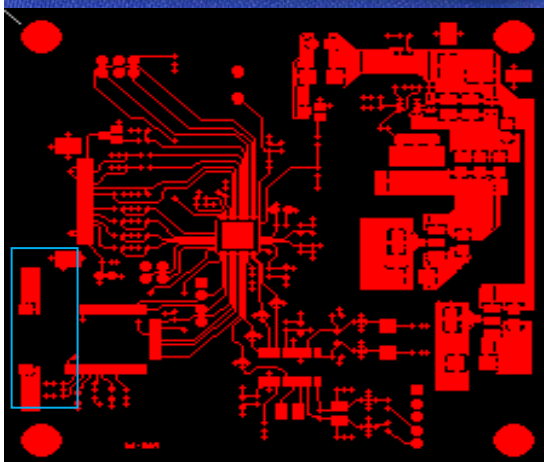
The Product has been tested according to the following specifications:

No.	Test Parameter	Clause No	Results
1	Radiated Emissions	15.209	PASS
2	Conducted emissions	15.207	PASS

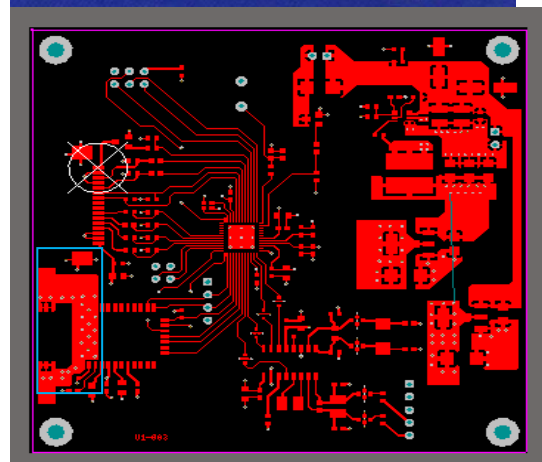
Remark: Based on the following changes in the product, the RF chip remains unchanged. So the report is only updated Conducted emissions and Radiated Emissions for the original report (BCTC-LH180802182E) .

Changes : PCB Layout just add and remove internal grounding through hole.

Original:



New:



3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the Product as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

No.	Item	Uncertainty
1	humidity uncertainty	U=5.3%
2	Temperature uncertainty	U=0.59°C
3	Conducted Emission (150kHz-30MHz)	U=3.2dB
4	Radiated disturbance(30MHz-1000MHz)	U=4.8dB
5	Radiated disturbance(1GHz-6GHz)	U=4.9dB
6	Radiated disturbance(1GHz-18GHz)	U=5.0dB

4. PRODUCT INFORMATION AND TEST SETUP

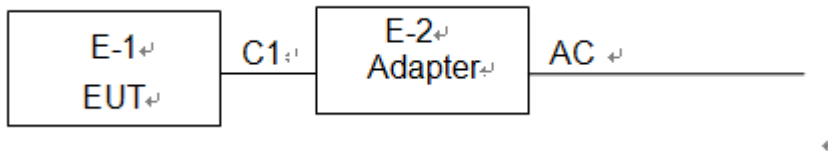
4.1 Product Information

Model(s):	1082250
Model Description:	N/A
Operation Frequency:	Bluetooth: 2402-2480MHz
Max. RF output power:	Bluetooth :-2.62dBm
Type of Modulation:	Bluetooth: GFSK
Antenna installation:	Bluetooth: Ceramic Antenna
Antenna Gain:	Bluetooth:0dBi
Power Source:	DC 12V
Adapter:	Input: 100-240V~50/60Hz 0.8A Output: 12.0V-1.0A

4.2 Test Setup Configuration

See test photographs attached in *EUT TEST SETUP PHOTOGRAPHS* for the actual connections between Product and support equipment.

Conducted Emission/Radiated Emissions



4.3 Support Equipment

No.	Device Type	Brand	Model	Series No.	Data Cable
E-1	Electrical Powder Dropper	ZAGG	1082250	N/A	EUT
E-2	Adapter	N/A	TY1200100Z1mn	N/A	EUT

Item	Shielded Type	Ferrite Core	Length	Note
C-1	NO	NO	1.2M	DC cable unshielded

Notes:

- All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
- Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.



4.4 Channel List

Channel List					
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2402	11	2422	21	2442
02	2404	12	2424	22	2444
03	2406	13	2426	23	2446
~	~	~	~	~	~
09	2418	19	2438	39	2478
10	2420	20	2440	40	2480

4.5 Test Mode

Test mode	Test mode	Low channel	Middle channel	High channel
1	Link mode(conducted emission and Radiated emission)			

5. TEST FACILITY AND TEST INSTRUMENT USED

5.1 Test Facility

All measurement facilities used to collect the measurement data are located at BCTC Building & 1-2F, East of B Building, Pengzhou Industrial, Fuyuan 1st Road, Qiaotou Community, Fuyong Street, Bao'an District, Shenzhen, China. The site and apparatus are constructed in conformance with the requirements of ANSI C63.4 and CISPR 16-1-1 other equivalent standards.

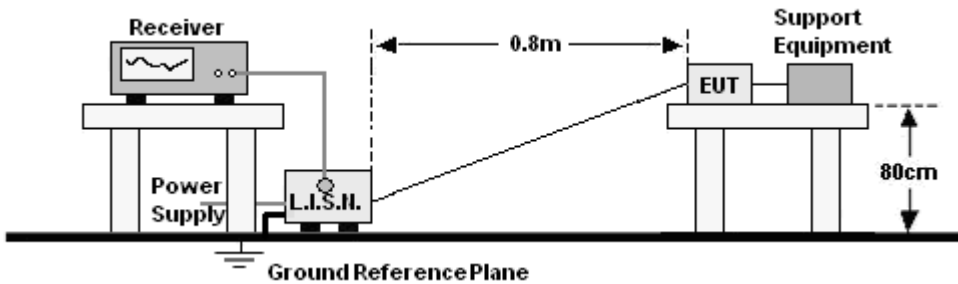
5.2 Test Instrument Used

Conducted emissions Test					
Equipment	Manufacturer	Model#	Serial#	Last Cal.	Next Cal.
Receiver	R&S	ESR3	102075	Jun. 13, 2019	Jun.12, 2020
LISN	R&S	ENV216	101375	Jun. 13, 2019	Jun.12, 2020
ISN	HPX	ISN T800	S1509001	Jun. 13, 2019	Jun.12, 2020
Software	Frad	EZ-EMC	EMC-CON 3A1	\	\

Radiated emissions Test (966 chamber)					
Equipment	Manufacturer	Model#	Serial#	Last Cal.	Next Cal.
966 chamber	ChengYu	966 Room	966	Jun. 19, 2018	Jun. 18, 2021
Receiver	R&S	ESR3	102075	Jun. 13, 2019	Jun. 12, 2020
Receiver	R&S	ESRP	101154	Jun. 13, 2019	Jun. 12, 2020
Amplifier	Schwarzbeck	BBV9718	9718-309	Jun. 25, 2019	Jun. 24, 2020
Amplifier	Schwarzbeck	BBV9744	9744-0037	Jun. 25, 2019	Jun. 24, 2020
TRILOG Broadband Antenna	schwarzbeck	VULB 9163	VULB9163- 942	Jun. 22, 2019	Jun. 21, 2020
Horn Antenna	SCHWARZBEC K	BBHA9120 D	1201	Jun. 22, 2019	Jun. 21, 2020
Software	Frad	EZ-EMC	FA-03A2 RE	\	\

6. CONDUCTED EMISSIONS

6.1 Block Diagram Of Test Setup



6.2 Limit

FREQUENCY (MHz)	Limit (dBuV)	
	Quas-peak	Average
0.15 -0.5	66 - 56 *	56 - 46 *
0.50 -5.0	56.00	46.00
5.0 -30.0	60.00	50.00

Notes:
 1. *Decreasing linearly with logarithm of frequency.
 2. The lower limit shall apply at the transition frequencies.

6.3 Test procedure

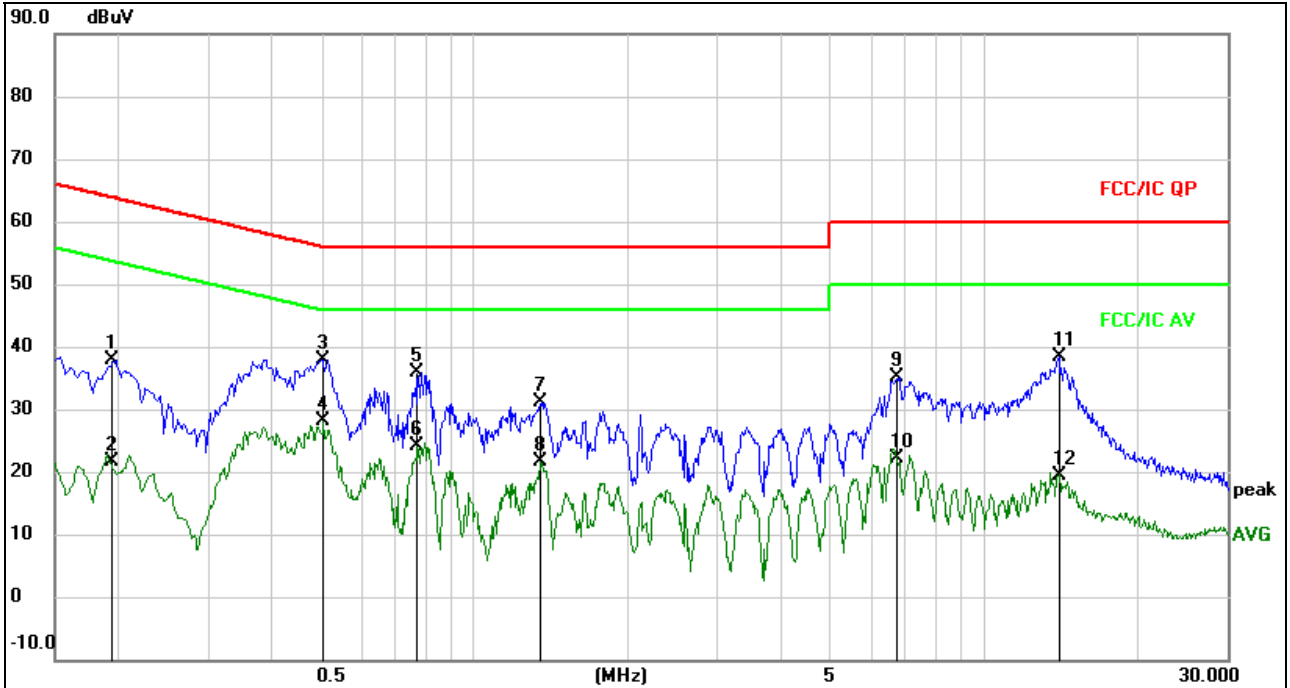
Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

- The Product was placed on a nonconductive table 0.8 m above the horizontal ground reference plane, and 0.4 m from the vertical ground reference plane, and connected to the main through Line Impedance Stability Network (L.I.S.N).
- The RBW of the receiver was set at 9 kHz in 150 kHz ~ 30MHz with Peak and AVG detector in Max Hold mode. Run the receiver's pre-scan to record the maximum disturbance generated from Product in all power lines in the full band.
- For each frequency whose maximum record was higher or close to limit, measure its QP and AVG values and record.



6.4 Test Result

Temperature :	25 °C	Relative Humidity :	54%
Pressure :	1010hPa	Phase :	L
Test Voltage :	AC 120V/60Hz	Test Mode :	Mode 1



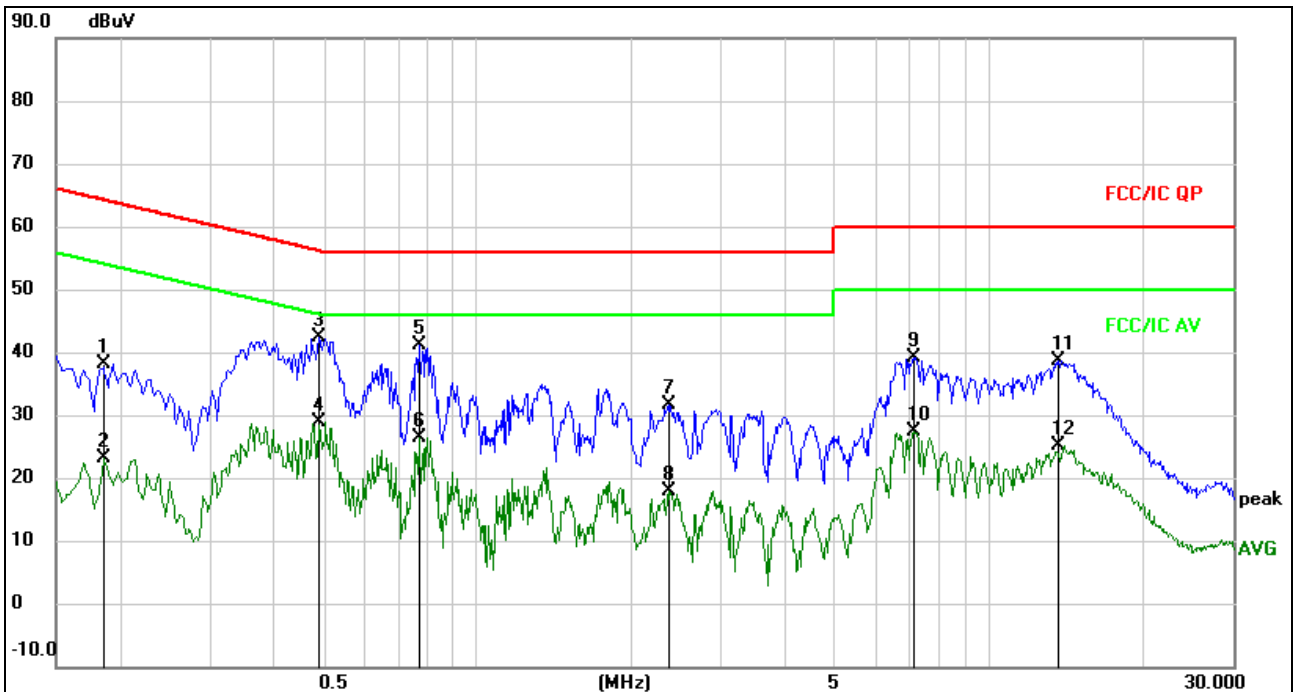
Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

No. Mk.	Freq. MHz	Reading Level dBuV	Correct Factor	Measurement dBuV	Limit dBuV	Over dB	Detector	Comment
1	0.1924	28.42	9.47	37.89	63.93	-26.04	QP	
2	0.1924	12.21	9.47	21.68	53.93	-32.25	AVG	
3	0.5020	28.37	9.60	37.97	56.00	-18.03	QP	
4 *	0.5020	18.54	9.60	28.14	46.00	-17.86	AVG	
5	0.7740	26.15	9.64	35.79	56.00	-20.21	QP	
6	0.7740	14.39	9.64	24.03	46.00	-21.97	AVG	
7	1.3460	21.61	9.58	31.19	56.00	-24.81	QP	
8	1.3460	11.94	9.58	21.52	46.00	-24.48	AVG	
9	6.7420	25.41	9.73	35.14	60.00	-24.86	QP	
10	6.7420	12.46	9.73	22.19	50.00	-27.81	AVG	
11	14.0180	28.76	9.70	38.46	60.00	-21.54	QP	
12	14.0180	9.80	9.70	19.50	50.00	-30.50	AVG	



Temperature :	25 °C	Relative Humidity :	54%
Pressure :	1010hPa	Phase :	N
Test Voltage :	AC 120V/60Hz	Test Mode :	Mode 1



Remark:

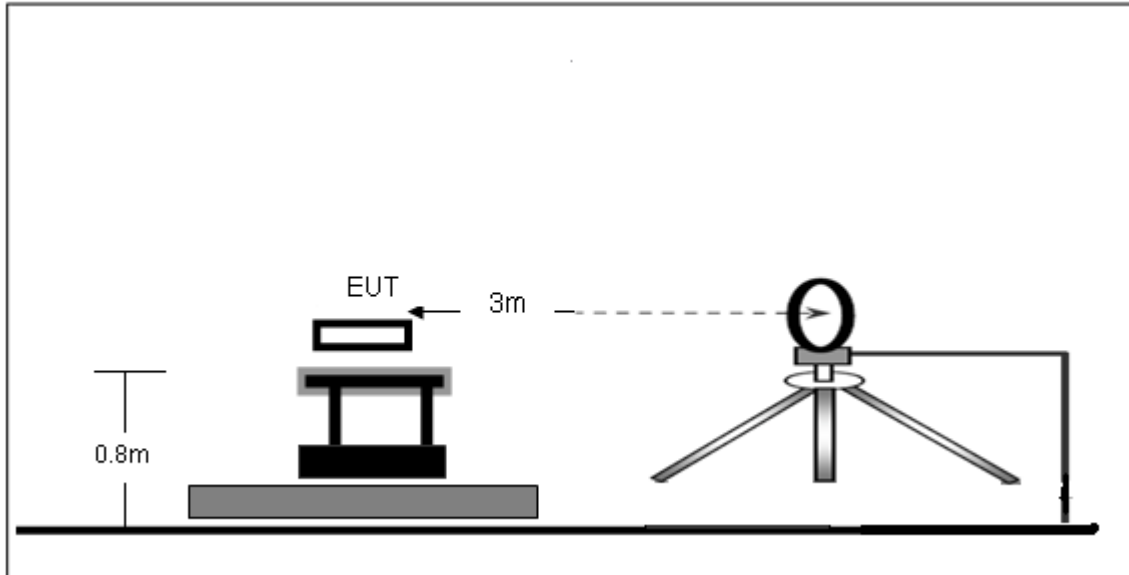
1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV		dBuV	dBuV	dB		
1		0.1860	28.60	9.48	38.08	64.21	-26.13	QP	
2		0.1860	13.62	9.48	23.10	54.21	-31.11	AVG	
3	*	0.4900	32.75	9.58	42.33	56.17	-13.84	QP	
4		0.4900	19.31	9.58	28.89	46.17	-17.28	AVG	
5		0.7700	31.42	9.64	41.06	56.00	-14.94	QP	
6		0.7700	16.79	9.64	26.43	46.00	-19.57	AVG	
7		2.3699	22.08	9.62	31.70	56.00	-24.30	QP	
8		2.3699	8.29	9.62	17.91	46.00	-28.09	AVG	
9		7.1220	29.52	9.72	39.24	60.00	-20.76	QP	
10		7.1220	17.72	9.72	27.44	50.00	-22.56	AVG	
11		13.6260	28.87	9.70	38.57	60.00	-21.43	QP	
12		13.6260	15.50	9.70	25.20	50.00	-24.80	AVG	

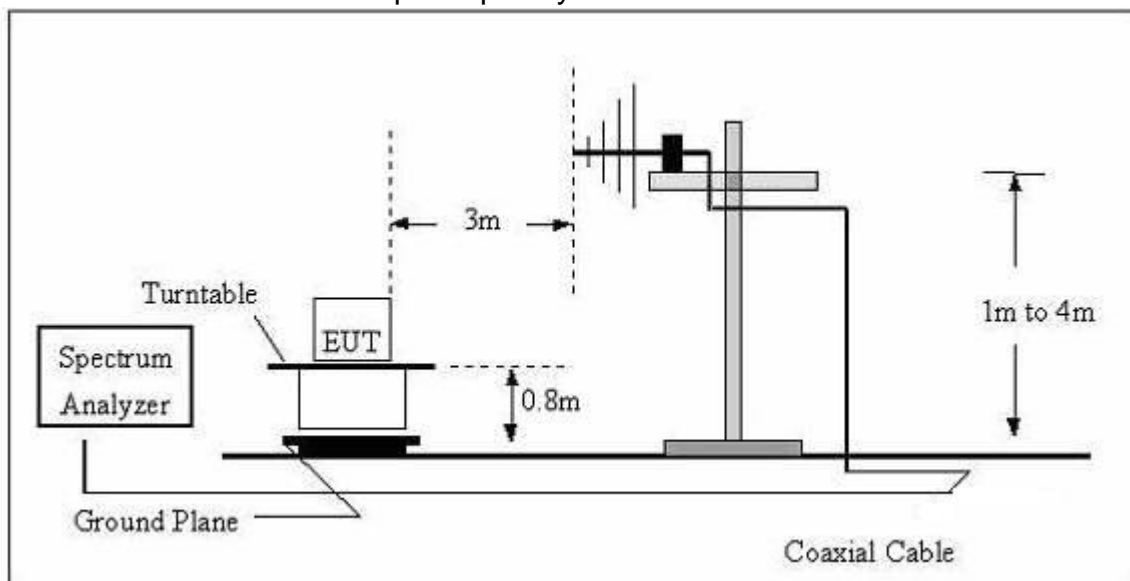
7. RADIATED EMISSIONS

7.1 Block Diagram Of Test Setup

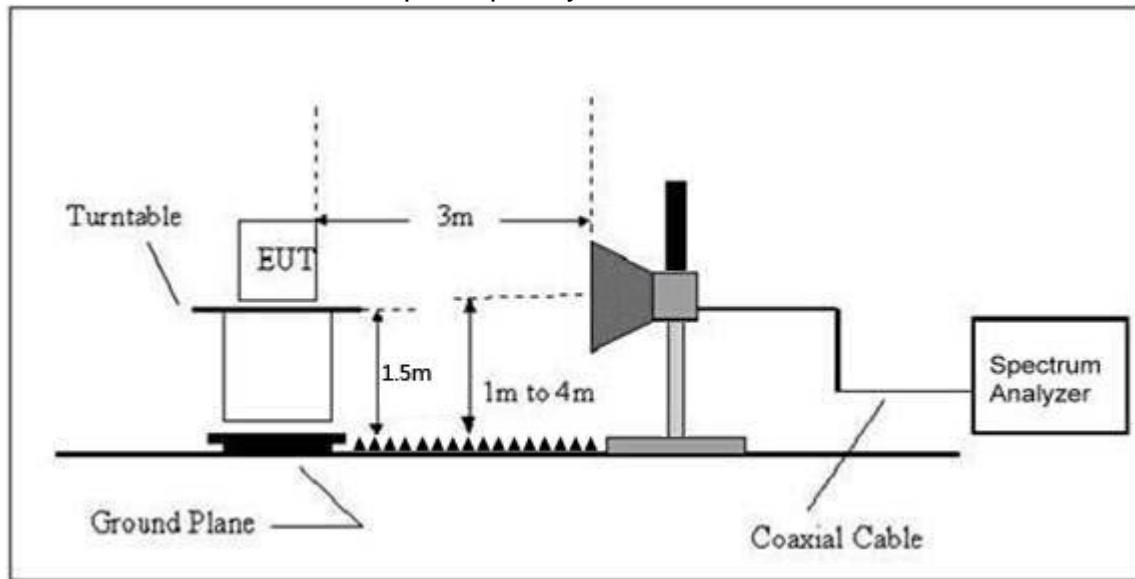
(A) Radiated Emission Test-Up Frequency Below 30MHz



(B) Radiated Emission Test-Up Frequency 30MHz~1GHz



(C) Radiated Emission Test-Up Frequency Above 1GHz



7.2 Limit

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequency (MHz)	Field Strength uV/m	Distance (m)	Field Strength Limit at 3m Distance	
			uV/m	dBuV/m
0.009 ~ 0.490	2400/F(kHz)	300	10000 * 2400/F(kHz)	$20\log^{(2400/F(kHz))} + 80$
0.490 ~ 1.705	24000/F(kHz)	30	100 * 24000/F(kHz)	$20\log^{(24000/F(kHz))} + 40$
1.705 ~ 30	30	30	100 * 30	$20\log^{(30)} + 40$
30 ~ 88	100	3	100	$20\log^{(100)}$
88 ~ 216	150	3	150	$20\log^{(150)}$
216 ~ 960	200	3	200	$20\log^{(200)}$
Above 960	500	3	500	$20\log^{(500)}$

7.3 Test procedure

Receiver Parameter	Setting
Attenuation	Auto
9kHz~150kHz	RBW 200Hz for QP
150kHz~30MHz	RBW 9kHz for QP
30MHz~1000MHz	RBW 120kHz for QP

Spectrum Parameter	Setting
1-25GHz	RBW 1 MHz /VBW 1 MHz for Peak, RBW 1 MHz / VBW 10Hz for Average

Below 1GHz test procedure as below:

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. 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 antenna height 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 (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) 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 Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

Above 1GHz test procedure as below:

- g. Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber and change form table 0.8 metre to 1.5 metre(Above 18GHz the distance is 1 meter and table is 1.5 metre).
- h. Test the EUT in the lowest channel ,the middle channel ,the Highest channel.

Note:

Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported.

Above 1GHz test procedure as below:

- a.The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter chamber. 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 antenna height 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 rota table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

g. Test the EUT in the lowest channel, the Highest channel.

Note:

Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported.



7.4 Test Result

Below 30MHz

Temperature:	26°C	Relative Humidity:	24%
Pressure:	101 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	Mode 1	Polarization :	--

Freq. (MHz)	Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	State P/F
--	--	--	--	PASS
--	--	--	--	PASS

Note:

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

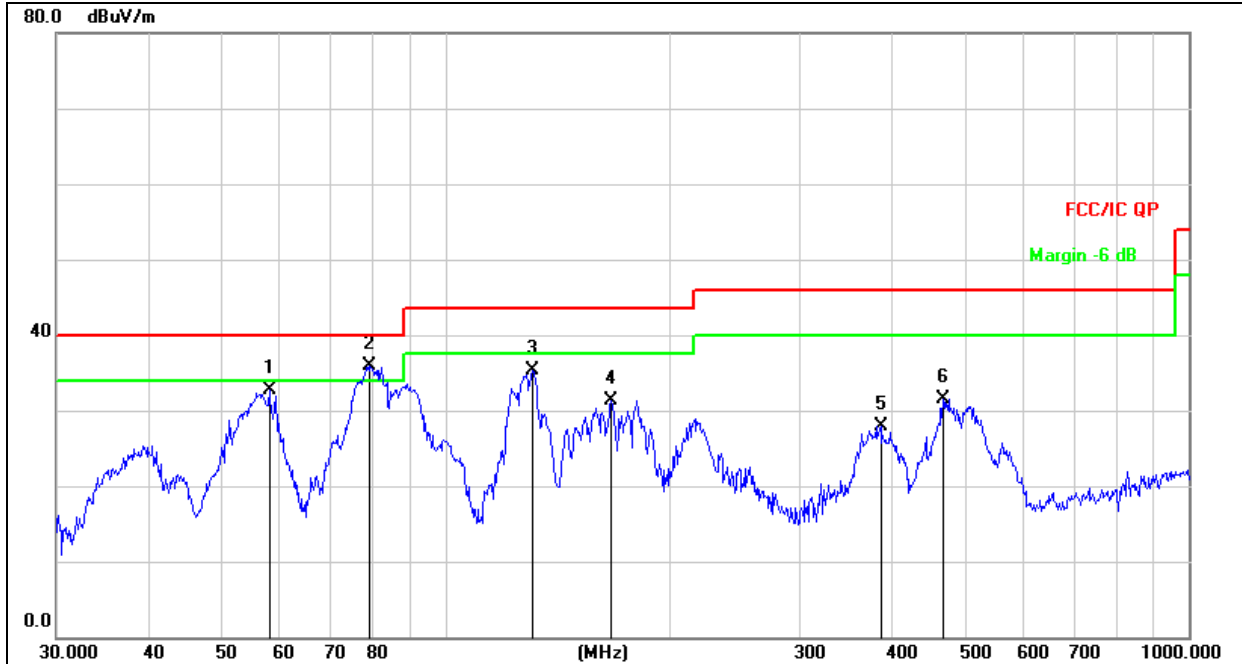
Distance extrapolation factor = 40 log (specific distance/test distance)(dB);

Limit line = specific limits(dBuv) + distance extrapolation factor.



Between 30MHz – 1GHz

Temperature:	26°C	Relative Humidity:	54%
Pressure:	101 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	Mode 1	Polarization :	Horizontal

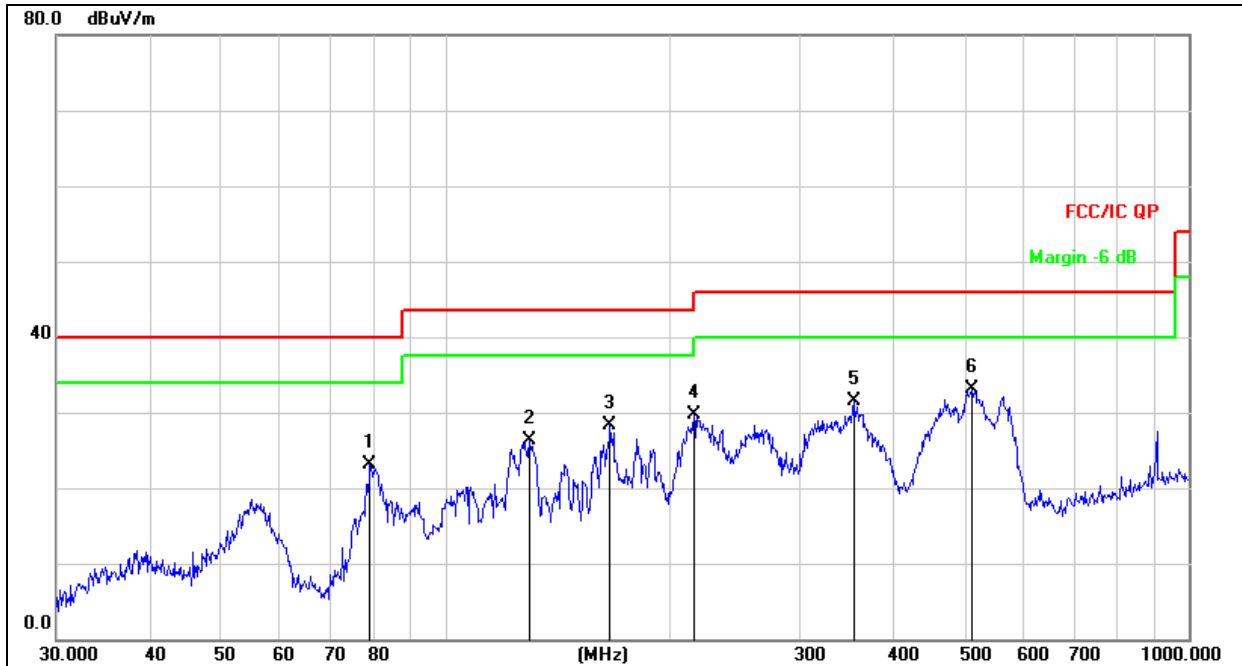


Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dB/m	Over dB	Detector
1		57.9992	48.33	-15.70	32.63	40.00	-7.37	QP
2	*	79.2425	56.17	-20.24	35.93	40.00	-4.07	QP
3		131.2965	53.67	-18.30	35.37	43.50	-8.13	QP
4		167.2366	49.76	-18.40	31.36	43.50	-12.14	QP
5		385.2805	39.31	-11.43	27.88	46.00	-18.12	QP
6		467.2348	41.13	-9.61	31.52	46.00	-14.48	QP



Temperature:	26°C	Relative Humidity:	54%
Pressure:	101 hPa	Test Voltage :	AC 120V/60Hz
Test Mode :	Mode 1	Polarization :	Vertical



Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.

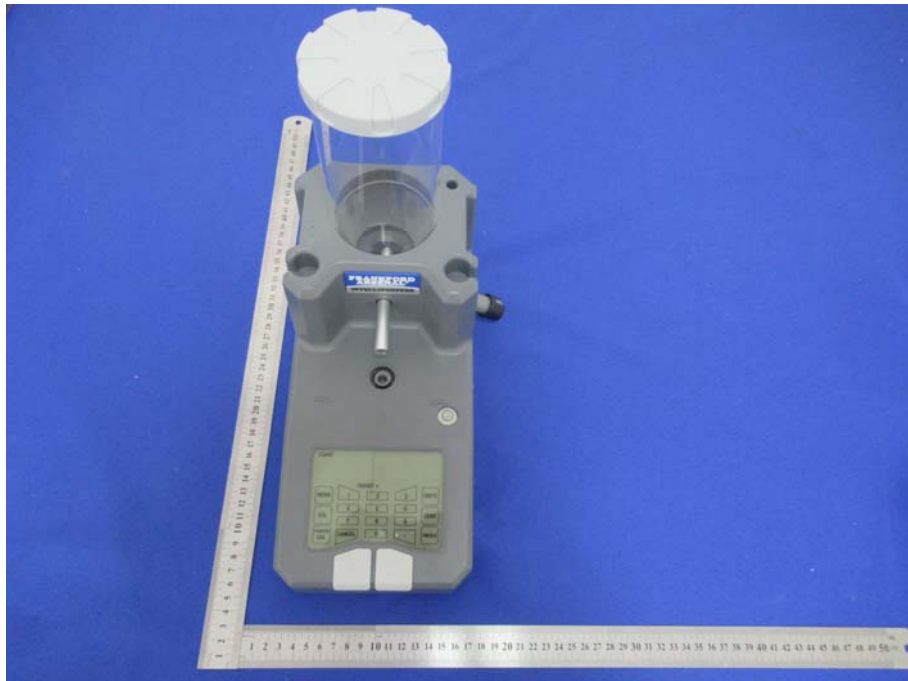
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector
		MHz	dBuV	dB	dBuV/m	dB/m	dB	
1		79.2426	43.28	-20.24	23.04	40.00	-16.96	QP
2		129.9226	44.43	-18.21	26.22	43.50	-17.28	QP
3		166.6514	46.69	-18.43	28.26	43.50	-15.24	QP
4		216.0240	45.54	-15.93	29.61	46.00	-16.39	QP
5		354.1831	43.66	-12.13	31.53	46.00	-14.47	QP
6	*	511.8352	41.81	-8.64	33.17	46.00	-12.83	QP

8. EUT PHOTOGRAPHS

EUT Photo 1



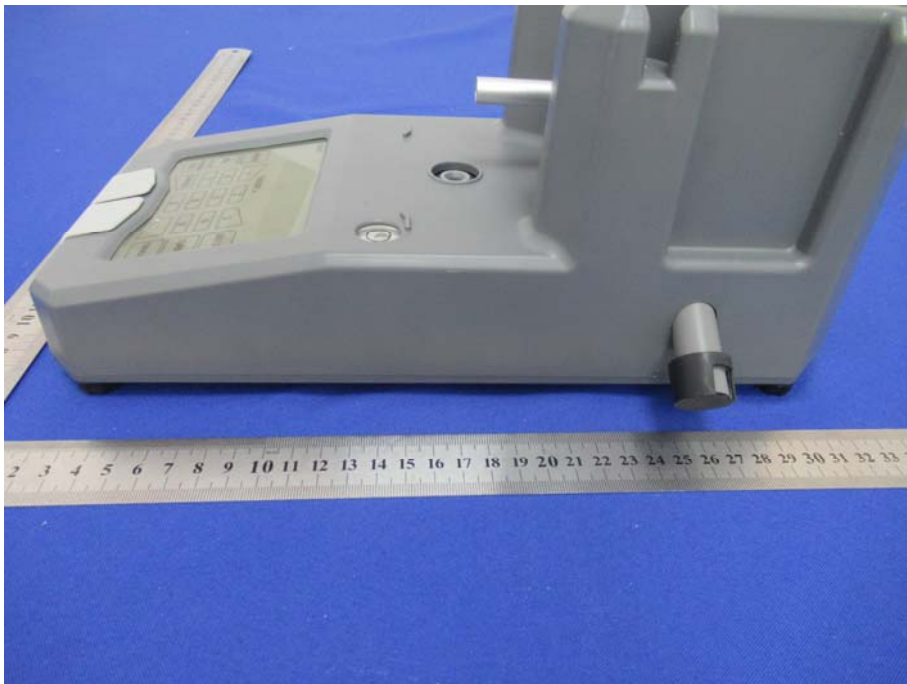
EUT Photo 2



EUT Photo 3



EUT Photo 4



9. EUT TEST SETUP PHOTOGRAPHS

Conducted emissions



Radiated emission



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