Test Report

Date : 2017-06-22
No. : MH193439

Applicant	:	HUIZHOU QINGTENG ELECTRON TECHNOLOGY CO., LTD He-Bei Village. Lilin Town, Zhongkai Hi-tech Development Zone, Huizhou City, Guangdong China
Supplier / Manufacturer	:	HUIZHOU QINGTENG ELECTRON TECHNOLOGY CO., LTD He-Bei Village. Lilin Town, Zhongkai Hi-tech Development Zone, Huizhou City, Guangdong China
Description of Sample(s)	:	Submitted sample(s) said to be Product: FM Transmitter Brand Name: SAKAR Model No.: 21388 FCC ID: 2AAWN21388FMT
Date Samples Received	:	2017-06-02
Date Tested	:	2017-06-14 to 2017-06-21
Investigation Requested	:	Perform ElectroMagnetic Interference measurement in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15: 2015 and ANSI C63.10:2013 for FCC Certification.
Conclusions	:	The submitted product COMPLIED with the requirements of Federal Communications Commission [FCC] Rules and Regulations Part 15. The tests were performed in accordance with the standards described above and on Section 2.2 in this Test Report.
Remarks	:	---

Dr. LEE Kam Chuen
Authorized Signatory
ElectroMagnetic Compatibility Department
For and on behalf of
The Hong Kong Standards and Testing Centre Ltd.

The Hong Kong Standards and Testing Centre Limited
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Test Report

CONTENT:

1.0 General Details

1.1 Test Laboratory

The Hong Kong Standards and Testing Centre Ltd.
EMC Laboratory
Head Office: 10 Dai Wang Street, Taipo Industrial Estate, Tai Po, N.T., Hong Kong
Telephone: 852 2666 1888
Fax: 852 2664 4353

1.2 Equipment Under Test [EUT]

Description of Sample(s)

Product:	FM Transmitter
Manufacturer:	HUIZHOU QINGTENG ELECTRON TECHNOLOGY CO., LTD He-Bei Village. Lilin Town, Zhongkai Hi-tech Development Zone, Huizhou City, Guangdong China
Brand Name:	SAKAR
Model Number:	21388
Rating:	5Vd.c (Power by USB port)

1.2.1 Description of EUT Operation

The Equipment Under Test (EUT) is a FM Transmitter. The transmitter is a manually operated transmitter. It is FM transmitter. Modulation by IC; and type is FM modulation. The maximum tuning range 88.1MHz-107.9MHz.

1.3 Date of Order

2017-06-02

1.4 Submitted Sample(s):

1 Sample

1.5 Test Duration

2017-06-14 to 2017-06-21

1.6 Country of Origin

China

2.0 Technical Details

2.1 Investigations Requested

Perform ElectroMagnetic Interference measurement in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15: 2015 and ANSI C63.10: 2013 for FCC Certification.

2.2 Test Standards and Results Summary Tables

EMISSION Results Summary						
Test Condition	Test Requirement	Test Method	Class / Severity	Test Result		
				Pass	Failed	N/A
Field Strength of Fundamental Emissions & Spurious Emissions	FCC 47CFR 15.239	ANSI C63.10: 2013	N/A	☒	☐	☐
20dB Bandwidth of Fundamental Emission	FCC 47CFR 15.239	ANSI C63.10: 2013	N/A	☒	☐	☐
Radiated Emissions	FCC 47CFR 15.209	ANSI C63.10: 2013	N/A	☒	☐	☐

Note: N/A - Not Applicable

3.0 Test Results

3.1 Emission

3.1.1 Radiated Emissions

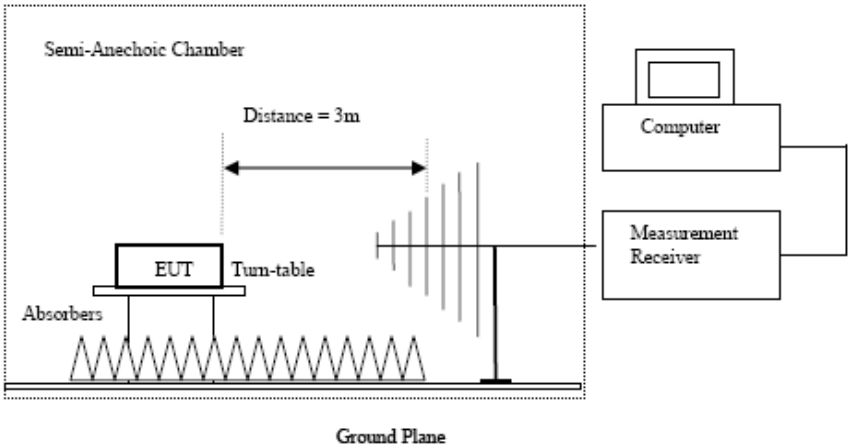
Test Requirement:	FCC 47CFR 15.239
Test Method:	ANSI C63.10:2013
Test Date:	2017-06-14
Mode of Operation:	Tx mode

Test Method:

For emission measurements at or below 1 GHz, the sample was placed 0.8m above the ground plane of semi-anechoic Chamber*. For emission measurements above 1 GHz, the sample was placed 1.5m above the ground plane of semi-anechoic Chamber*. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.

* Semi-Anechoic chamber located on the G/F of The Hong Kong Standards and Testing Centre Ltd. with a metal ground plane filed with the FCC pursuant to section 2.948 of the FCC rules, with Registration Number: 607756.

Test Setup:



- Absorbers placed on top of the ground plane are for measurements above 1000MHz only.
- Measurements between 30MHz to 1000MHz made with Bi-log antennas, above 1000MHz horn antennas are used, 9kHz to 30MHz loop antennas are used.

Limits for Field Strength of Fundamental Emissions [FCC 47CFR 15.239]:

Frequency Range of Fundamental [MHz]	Field Strength of Fundamental Emission [Average] [μV/m]
88-108	250

The field strength of any emissions within the permitted 200 kHz band shall not exceed 250 microvolts/meter at 3 meters. The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply

Results of Tx mode(88.1MHz): PASS

Field Strength of Fundamental Emissions Peak Value						
Frequency MHz	Measured Level @3m dBμV	Correction Factor dB/m	Field Strength dBμV/m	Field Strength μV/m	Limit @3m μV/m	E-Field Polarity
88.10	33.0	10.1	43.1	142.9	2,500.0	Vertical
88.10	39.5	10.0	49.5	298.5	2,500.0	Horizontal

Field Strength of Fundamental Emissions Average Value						
Frequency MHz	Average Value Level @3m dBμV	Duty Cycle Factor dB	Field Strength dBμV/m	Field Strength μV/m	Limit @3m μV/m	E-Field Polarity
88.10	30.6	10.1	40.7	108.4	250.0	Vertical
88.10	36.5	10.0	46.5	211.3	250.0	Horizontal

Results of Tx mode(98.1MHz): PASS

Field Strength of Fundamental Emissions Peak Value						
Frequency MHz	Measured Level @3m dBμV	Correction Factor dB/m	Field Strength dBμV/m	Field Strength μV/m	Limit @3m μV/m	E-Field Polarity
98.10	25.7	12.2	37.9	78.5	2,500.0	Vertical
98.10	35.4	12.8	48.2	257.0	2,500.0	Horizontal

Field Strength of Fundamental Emissions Average Value						
Frequency MHz	Average Value Level @3m dBμV	Duty Cycle Factor dB	Field Strength dBμV/m	Field Strength μV/m	Limit @3m μV/m	E-Field Polarity
98.10	23.2	12.2	35.4	58.9	250.0	Vertical
98.10	32.5	12.8	45.3	184.1	250.0	Horizontal

Results of Tx mode(107.9MHz): PASS

Field Strength of Fundamental Emissions Peak Value						
Frequency MHz	Measured Level @3m dBμV	Correction Factor dB/m	Field Strength dBμV/m	Field Strength μV/m	Limit @3m μV/m	E-Field Polarity
107.90	21.9	13.3	35.2	57.5	2,500.0	Vertical
107.90	34.9	13.5	48.4	263.0	2,500.0	Horizontal

Field Strength of Fundamental Emissions Average Value						
Frequency MHz	Average Value Level @3m dBμV	Duty Cycle Factor dB	Field Strength dBμV/m	Field Strength μV/m	Limit @3m μV/m	E-Field Polarity
107.90	19.4	13.3	32.7	43.2	250.0	Vertical
107.90	31.6	13.5	45.1	179.9	250.0	Horizontal

Remarks:
Correction Factor includes Antenna Factor and Cable Attenuation.
Calculated measurement uncertainty (30MHz – 1GHz): 4.6dB
Emissions in the vertical and horizontal polarizations have been investigated and the worst-case test results are recorded in this report.

Limits for Radiated Emissions FCC 47 CFR 15.209 Class B]:

Frequency Range	Quasi-Peak Limits
[MHz]	[µV/m]
0.009-0.490	2400/F (kHz)
0.490-1.705	24000/F (kHz)
1.705-30	30
30-88	100
88-216	150
216-960	200
Above960	500

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

Result of Tx mode (9kHz - 30MHz): PASS
Emissions detected are more than 20 dB below the limit line(s).

Results of Tx mode (88.1GHz): PASS

Radiated Emissions Quasi-Peak					
Emission Frequency MHz	E-Field Polarity	Level @3m dBµV/m	Limit @3m dBµV/m	Level @3m µV/m	Limit @3m µV/m
76.2	Vertical	23.7	40.0	15.3	100
30.7	Horizontal	31.5	40.0	37.6	100
324.7	Horizontal	31.2	46.0	36.3	200
87.9	Horizontal	38.1	40.0	80.4	100

Results of Tx mode (98.1GHz): PASS

Radiated Emissions Quasi-Peak					
Emission Frequency MHz	E-Field Polarity	Level @3m dBµV/m	Limit @3m dBµV/m	Level @3m µV/m	Limit @3m µV/m
347.1	Vertical	31.1	46.0	35.9	200
30.4	Horizontal	32.3	40.0	41.2	100
86.6	Horizontal	24.9	40.0	17.6	100

Results of Tx mode (107.9GHz): PASS

Radiated Emissions Quasi-Peak					
Emission Frequency MHz	E-Field Polarity	Level @3m dBµV/m	Limit @3m dBµV/m	Level @3m µV/m	Limit @3m µV/m
39.8	Vertical	25.6	40.0	19.1	100
519.0	Vertical	38.6	46.0	85.1	200
41.3	Horizontal	22.1	40.0	12.7	100
216.0	Horizontal	29.1	43.5	28.5	150
108.1	Horizontal	39.0	43.5	89.1	150

Remarks:

Correction Factor includes Antenna Factor and Cable Attenuation.
Calculated measurement uncertainty (30MHz – 1GHz): 4.6dB
Emissions in the vertical and horizontal polarizations have been investigated and the worst-case test results are recorded in this report.

3.2 20dB Bandwidth of Fundamental Emission

Test Requirement:	FCC 47 CFR 15.239
Test Method:	ANSI C63.10:2013
Test Date:	2017-06-21
Mode of Operation:	Tx mode

Test Method:

The bandwidth is measured at an amplitude level reduced from the reference level by a specified ratio. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst-case (i.e. the widest) bandwidth.

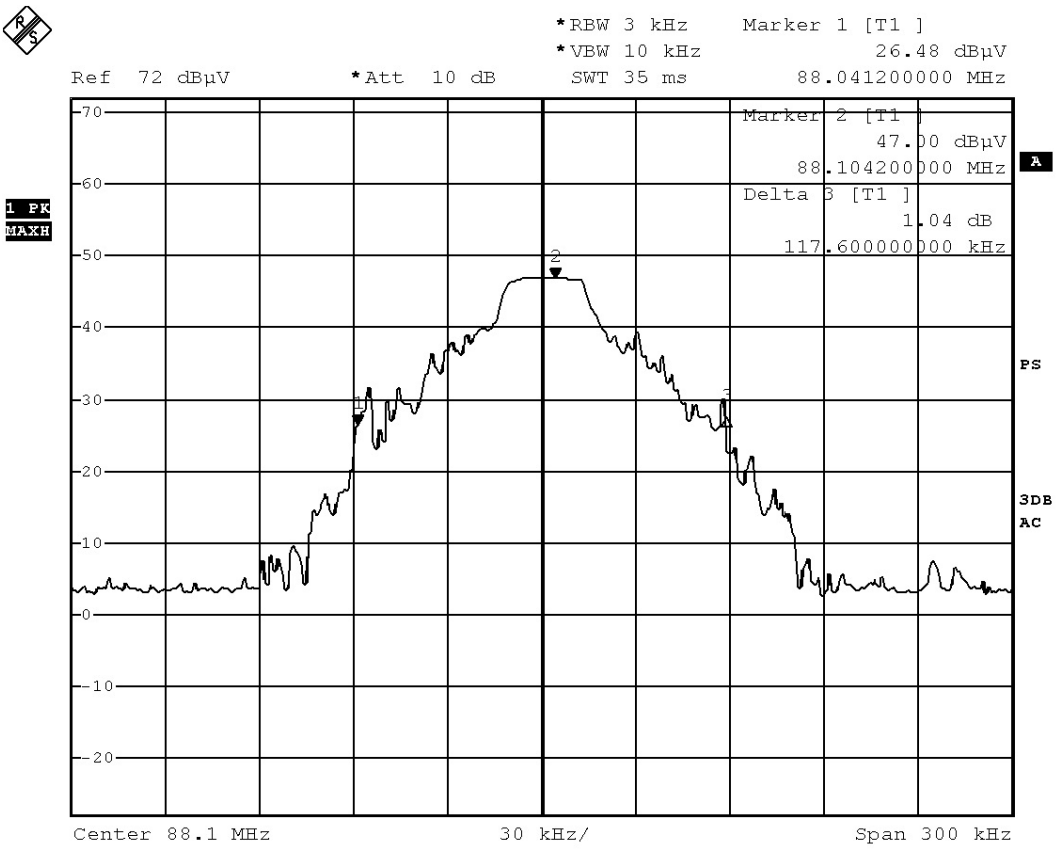
The Requirement For Section 15.239(a)

Emissions from the intentional radiator shall be confined within a band 200 kHz wide centered on the operating frequency. The 200 kHz band shall lie wholly within the frequency range of 88-108 MHz

Tx mode (88.1MHz) Emission Bandwidth:

Frequency Range [MHz]	20dB Bandwidth [kHz]	FCC Limits [kHz]
88-108	117.6	200

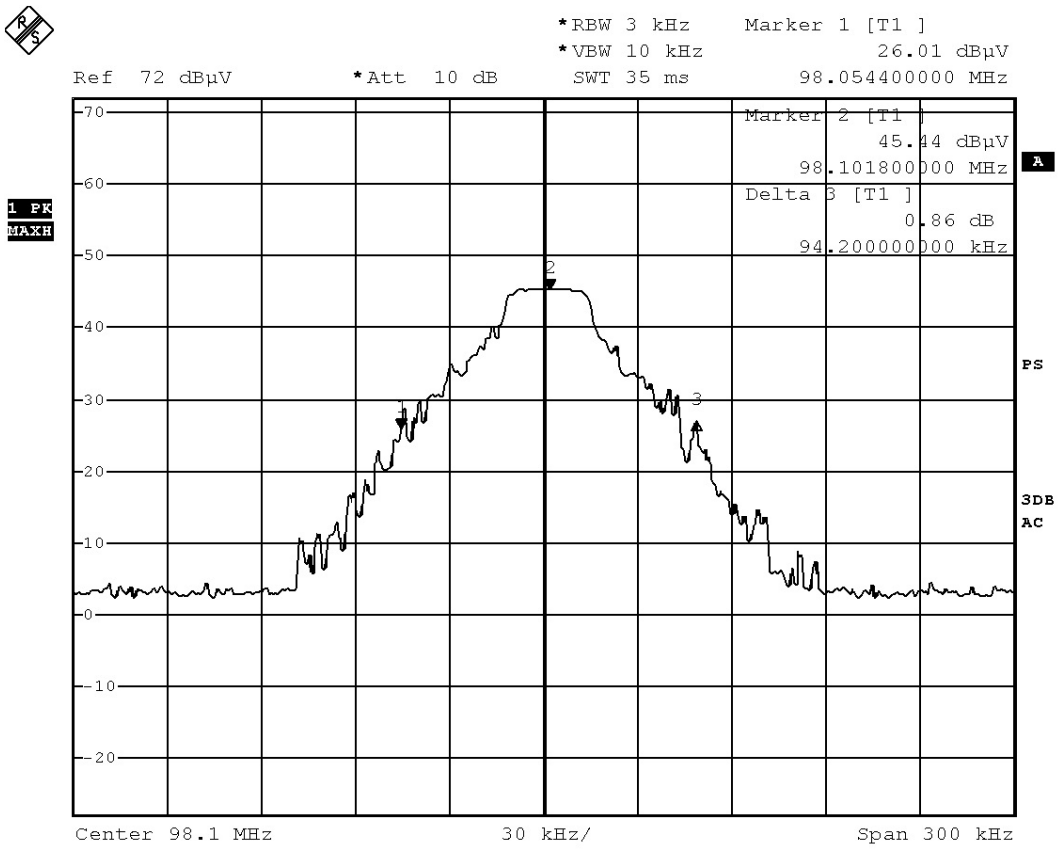
20dB Bandwidth of Fundamental Emission



Tx mode (98.1MHz) Emission Bandwidth:

Frequency Range [MHz]	20dB Bandwidth [kHz]	FCC Limits [kHz]
88-108	94.2	200

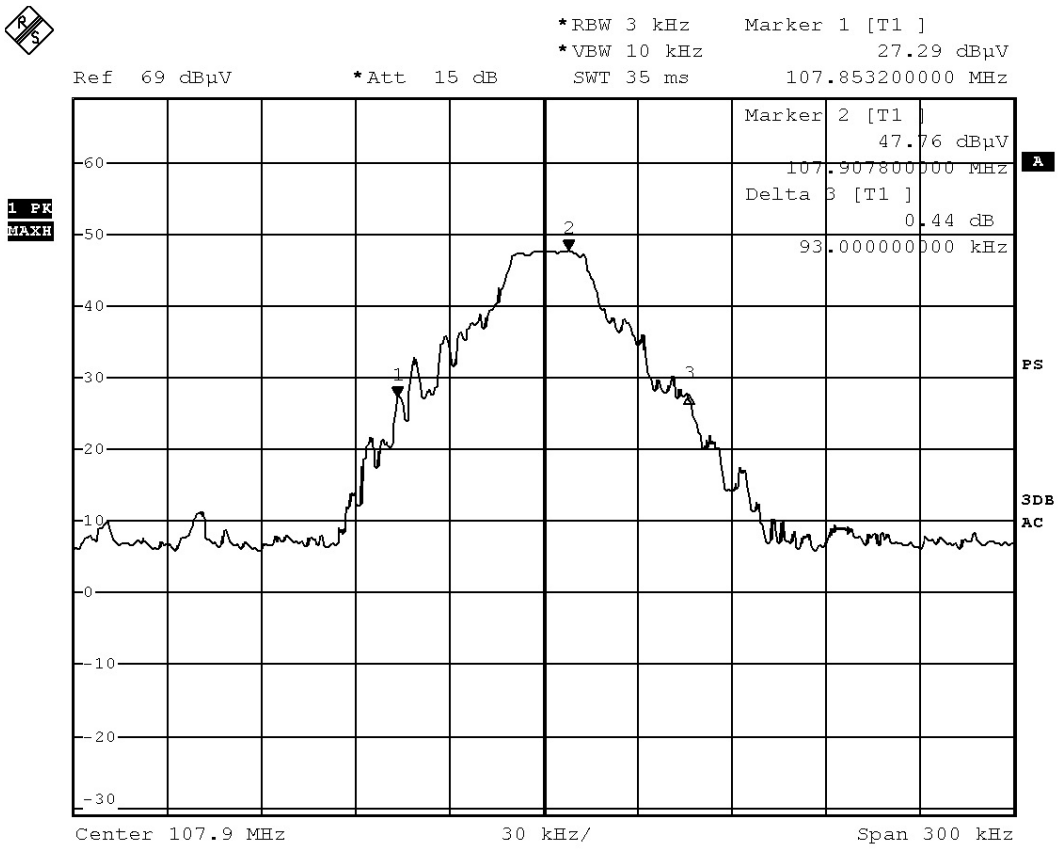
20dB Bandwidth of Fundamental Emission



Tx mode (107.9MHz) Emission Bandwidth:

Frequency Range [MHz]	20dB Bandwidth [kHz]	FCC Limits [kHz]
88-108	93.0	200

20dB Bandwidth of Fundamental Emission



Appendix A

List of Measurement Equipment

Radiated Emission

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL	DUE CAL
EM299	Double-Ridged Waveguide Horn Antenna	ETS-Lindgren	3115	00114120	2016/04/27	2018/04/27
EM300	Pyramidal Standard Gain Horn Antenna	ETS-Lindgren	3160-09	00130130	2016/05/13	2018/05/13
EM301	Pyramidal Standard Gain Horn Antenna	ETS-Lindgren	3160-10	00130988	2016/05/13	2018/05/13
EM215	MULTIDEVICE CONTROLLER	EMCO	2090	00024676	N/A	N/A
EM216	MINI MAST SYSTEM	EMCO	2075	00026842	N/A	N/A
EM217	ELECTRIC POWERED TURNTABLE	EMCO	2088	00029144	N/A	N/A
EM218	ANECHOIC CHAMBER	ETS-LINDGREN	FACT-3	--	2017/04/20	2018/04/20
EM355	Biconilog Antenna	ETS-Lindgren	3143B	00094856	2016/03/03	2018/03/03
EM353	LOOP ANTENNA	ETS_LINDGREN	6502	00206533	2016/03/16	2018/03/16
EM293	Spectrum Analyzer	Agilent Technologies	N9020A	MY50510152	2016/08/22	2017/08/22

Line Conducted

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL	DUE CAL
EM119	LISN	R & S	ESH3-Z5	0831.5518.52	2016/11/29	2017/11/29
EM145	EMI TEST RECEIVER	R & S	ESCS 30	830245/021	2017/06/01	2018/06/01
EM179	IMPULSE LIMITER	ROHDE & SCHWARZ	ESH3-Z2	357-8810.52/54	2017/01/11	2018/01/11
EM154	SHIELDING ROOM	SIEMENS MATSUSHITA COMPONENTS	N/A	803-740-057-99A	2017/02/02	2022/02/02

Remarks:-

CM Corrective Maintenance
N/A Not Applicable
TBD To Be Determined

Appendix B

Ancillary Equipment

ITEM NO.	DESCRIPTION	MODEL NO.	FCC ID	REMARK
1	iPod Touch	A1367	BCG-E2407	N/A

Appendix C

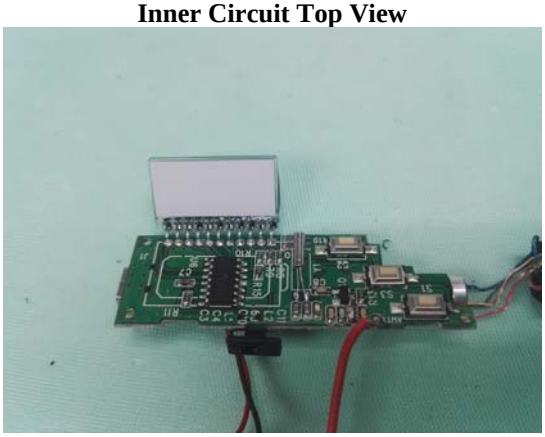
Photographs of EUT

Front View of the product

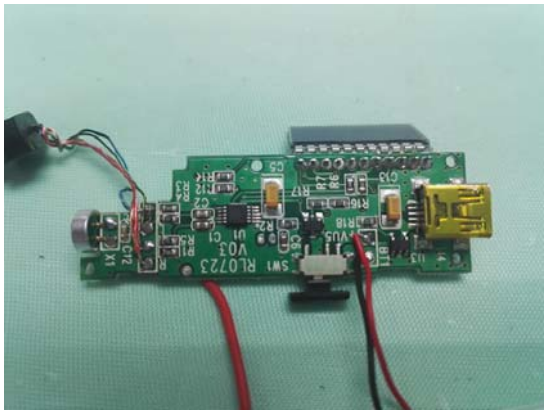
Rear View of the product

Inside View of the product

Inner Circuit Top View

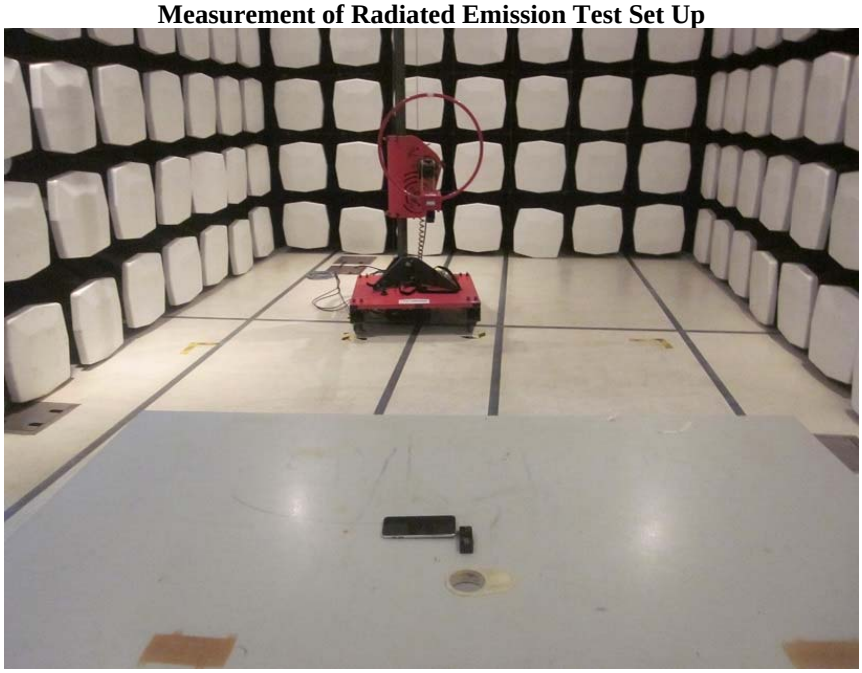


Inner Circuit Bottom View

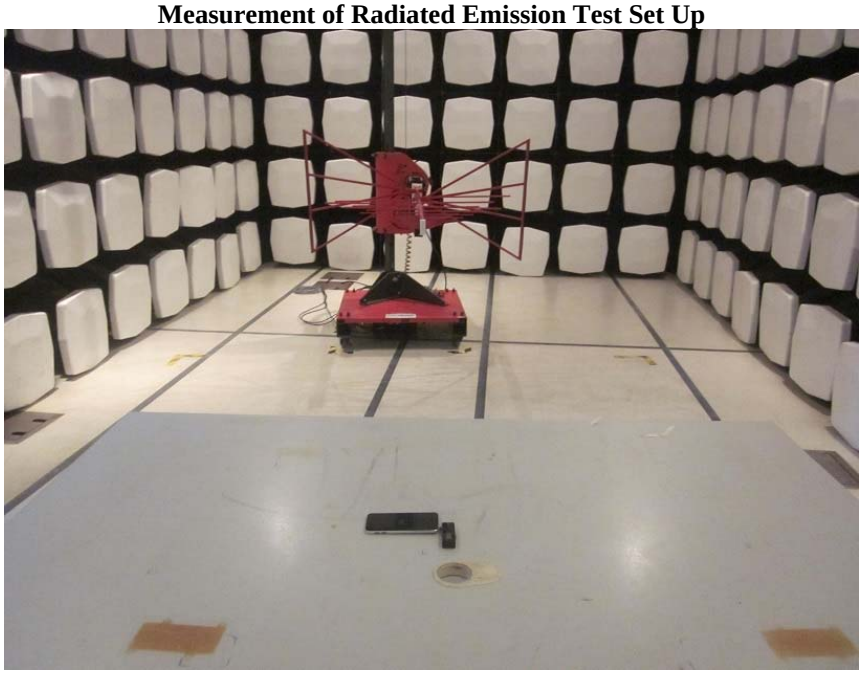


Photographs of EUT

Measurement of Radiated Emission Test Set Up



Measurement of Radiated Emission Test Set Up



******* End of Test Report *******

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