EMC TEST REPORT

Report No.: 17020789-FCC-E1
Supersede Report No.: N/A

Applicant	RayMeasure Medical Technology Co., Ltd
Product Name	Digital PET detector
Model No.	E102
Serial No.	N/A
Test Standard	FCC Part 15 Subpart B Class B:2016, ANSI C63.4: 2014
Test Date	July 25, 2017
Issue Date	July 28, 2017
Test Result	☒ Pass ☐ Fail
Equipment complied with the specification	☒
Equipment did not comply with the specification	☐

peter Wei	Deon Dai	
Peter Wei Test Engineer	Deon Dai Engineer Reviewer	

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Test result presented in this test report is applicable to the tested sample only

Issued by:
SIEMIC (Nanjing-China) Laboratories
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Laboratories Introduction

SIEMIC, headquartered in the heart of Silicon Valley, with superior facilities in US and Asia, is one of the leading independent testing and certification facilities providing customers with one-stop shop services for Compliance Testing and Global Certifications.

In addition to testing and certification, SIEMIC provides initial design reviews and compliance management throughout a project. Our extensive experience with China, Asia Pacific, North America, European, and International compliance requirements, assures the fastest, most cost effective way to attain regulatory compliance for the global markets.

Accreditations for Conformity Assessment

Country/Region	Scope
USA	EMC, RF/Wireless, SAR, Telecom
Canada	EMC, RF/Wireless, SAR, Telecom
Taiwan	EMC, RF, Telecom, SAR, Safety
Hong Kong	RF/Wireless, SAR, Telecom
Australia	EMC, RF, Telecom, SAR, Safety
Korea	EMI, EMS, RF, SAR, Telecom, Safety
Japan	EMI, RF/Wireless, SAR, Telecom
Singapore	EMC, RF, SAR, Telecom
Europe	EMC, RF, SAR, Telecom, Safety

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1. Report Revision History

Report No.	Report Version	Description	Issue Date
17020789-FCC-E1	NONE	Original	July 28, 2017

2. Customer information

Applicant Name	RayMeasure Medical Technology Co., Ltd
Applicant Add	2F Building 17, 8 Jinfeng Road. Suzhou New District, Suzhou, Jiangsu province, China
Manufacturer	RayMeasure Medical Technology Co., Ltd
Manufacturer Add	2F Building 17, 8 Jinfeng Road. Suzhou New District, Suzhou, Jiangsu province, China

3. Test site information

Lab performing tests	SIEMIC (Nanjing-China) Laboratories
Lab Address	2-1 Longcang Avenue Yuhua Economic and Technology Development Park, Nanjing, China
FCC Test Site No.	694825
IC Test Site No.	4842B-1
Test Software	EZ_EMC

4. Equipment under Test (EUT) Information

Description of EUT:	Digital PET detector
Date EUT received:	June 30, 2017
Test Date(s):	July 25, 2017
Main Model:	E102
Serial Model:	N/A
Power:	XP Power: Model:VEP36US12 Input Power:100-240V~0.9A,50/60Hz Output:12V,3A
Port:	Power Port、LAN Port、USB Port
Trade Name :	DexScanner
Test Software Version	V2.0.0.0
FCC ID:	2AMPU-000100

5. T st Summary

The product was tested in accordance with the following specifications.
All testing has been performed according to below product classification:

FCC Rules	Description of Test	Result
§15.107; ANSI C63.4: 2014	AC Power Line Conducted Emissions	Compliance
§15.109; ANSI C63.4: 2014	Radiated Emissions	Compliance

Measurement Uncertainty

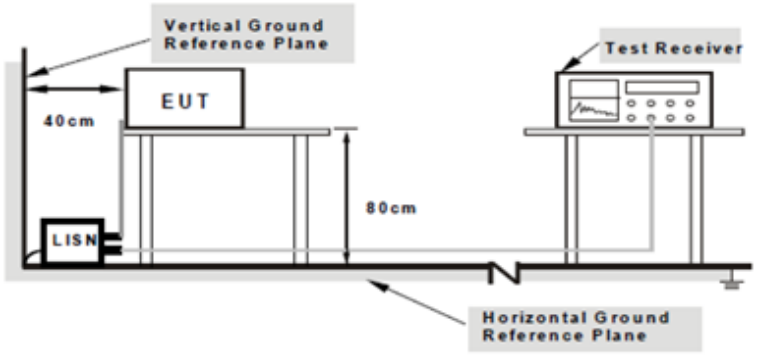
Emissions		
Test Item	Description	Uncertainty
Band Edge and Radiated Spurious Emissions	Confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2 (for EUTs < 0.5m X 0.5m X 0.5m)	+5.6dB/-4.5dB

6. Measurements, Examination And Derived Results

6.1 AC Power Line Conducted Emissions

Temperature	24℃
Relative Humidity	56%
Atmospheric Pressure	1023mbar
Test date :	July 25, 2017
Tested By :	Peter Wei

Requirement(s):

<table>
<tr><th>Spec</th><th>Item</th><th>Requirement</th><th>Applicable</th></tr>
<tr><td>47CFR§15.107</td><td>a)</td><td>For Low-power radio-frequency devices that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 [mu] H/50 ohms line impedance stabilization network (LISN). The lower limit applies at the boundary between the frequencies ranges.
<table>
<tr><th rowspan="2">Frequency ranges (MHz)</th><th colspan="2">Limit (dBμV)</th></tr>
<tr><th>QP</th><th>Average</th></tr>
<tr><td>0.15 ~ 0.5</td><td>66 – 56</td><td>56 – 46</td></tr>
<tr><td>0.5 ~ 5</td><td>56</td><td>46</td></tr>
<tr><td>5 ~ 30</td><td>60</td><td>50</td></tr>
</table></td><td>☒</td></tr>
<tr><td>Test Setup</td><td colspan="3"> 

Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80cm from EUT and at least 80cm from other units and other metal planes support units.</td></tr>
<tr><td>Procedure</td><td colspan="3">1. The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m x 1m x 0.8m high, non-metallic table.
2. The power supply for the EUT was fed through a 50Ω/50mH EUT LISN, connected to filtered mains.
3. The RF OUT of the EUT LISN was connected to the EMI test receiver via a low-loss coaxial cable.
4. All other supporting equipment were powered separately from another main supply.
5. The EUT was switched on and allowed to warm up to its normal operating condition.
6. A scan was made on the NEUTRAL line (for AC mains) or Earth line (for DC power) over the required frequency range using an EMI test receiver.
7. High peaks, relative to the limit line, The EMI test receiver was then tuned to the selected frequencies and the necessary measurements made with a receiver bandwidth setting of 10 kHz.
8. Step 7 was then repeated for the LIVE line (for AC mains) or DC line (for DC power).</td></tr>
<tr><td>Remark</td><td colspan="3"></td></tr>
<tr><td>Result</td><td colspan="3">☒ Pass ☐ Fail</td></tr>
</table>

Test Data ☒Yes ☐N/A

Test Plot ☒Yes (See below) ☐N/A

Data sample

No.	Frequency	Reading	Detector	Lisn/Isn	Ps_Lmt	Cab_L	Result	Limit	Margin
	(MHz)	(dBμV)		(dB}	(dB)	(dB)	(dBμV)	(dBμV)	(dB)

Frequency (MHz) = Emission frequency in MHz

Reading (dBμV) = Receiver Reading Value

Detector=Quasi Peak Detector or Average Detector

Lisn/ISN= Insertion loss of LISN

Ps_Lmt= Insertion loss of transient limiter (The transient limiter included 10dB attenuation)

Cab_L= cable loss

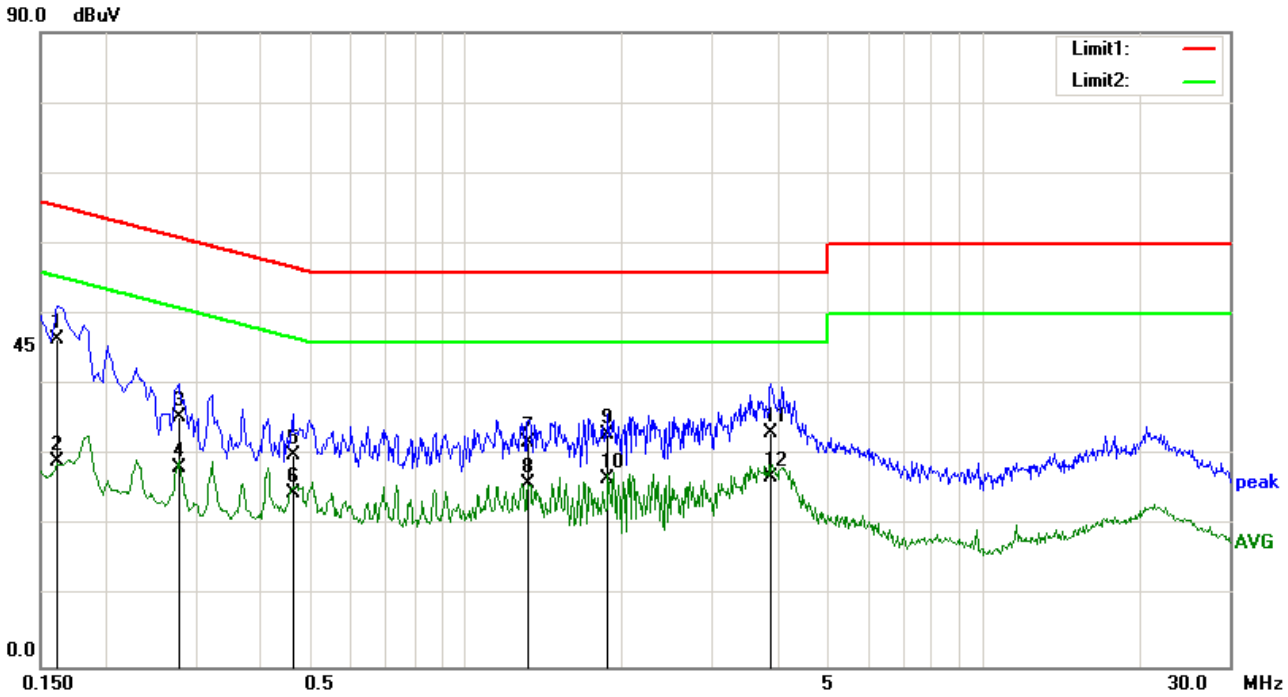
Result (dBμV) = Reading Value + Corrected Value

Limit (dBμV) = Limit stated in standard

Calculation Formula:

Margin (dB) = Result (dBμV) – limit (dBμV)

Test Mode :	Normal Working Mode

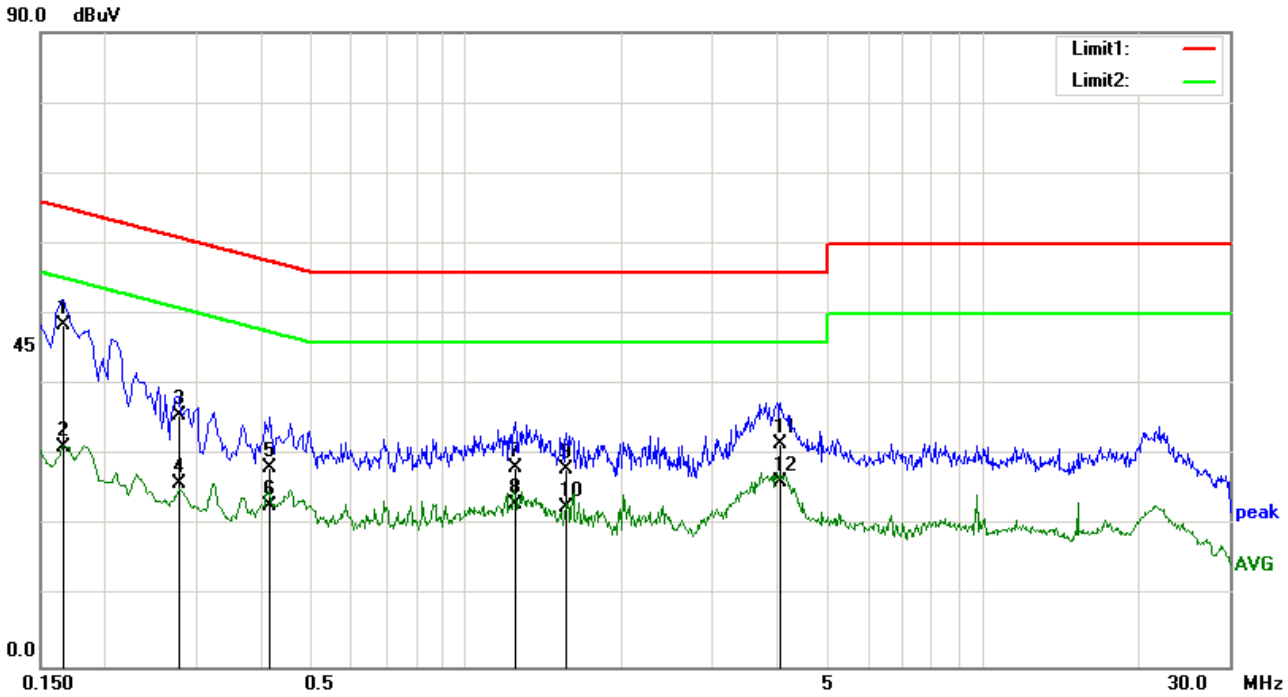


Test Data

Phase Line Plot at 120Vac, 60Hz

No.	Frequency (MHz)	Reading (dBuV)	Detector	Lisn/Isn (dB}	Ps_Lmt (dB)	Cab_L (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)
1	0.1620	35.93	QP	0.10	-10.00	0.34	46.37	65.36	-18.99
2	0.1620	18.78	AVG	0.10	-10.00	0.34	29.22	55.36	-26.14
3	0.2780	25.16	QP	0.11	-10.00	0.20	35.47	60.88	-25.41
4	0.2780	18.00	AVG	0.11	-10.00	0.20	28.31	50.88	-22.57
5	0.4620	19.62	QP	0.12	-10.00	0.21	29.95	56.66	-26.71
6	0.4620	14.35	AVG	0.12	-10.00	0.21	24.68	46.66	-21.98
7	1.3180	21.43	QP	0.15	-10.00	0.21	31.79	56.00	-24.21
8	1.3180	15.62	AVG	0.15	-10.00	0.21	25.98	46.00	-20.02
9	1.8860	22.60	QP	0.16	-10.00	0.19	32.95	56.00	-23.05
10	1.8860	16.38	AVG	0.16	-10.00	0.19	26.73	46.00	-19.27
11	3.8900	22.64	QP	0.23	-10.00	0.26	33.13	56.00	-22.87
12	3.8900	16.32	AVG	0.23	-10.00	0.26	26.81	46.00	-19.19

Test Mode :	Normal Working Mode

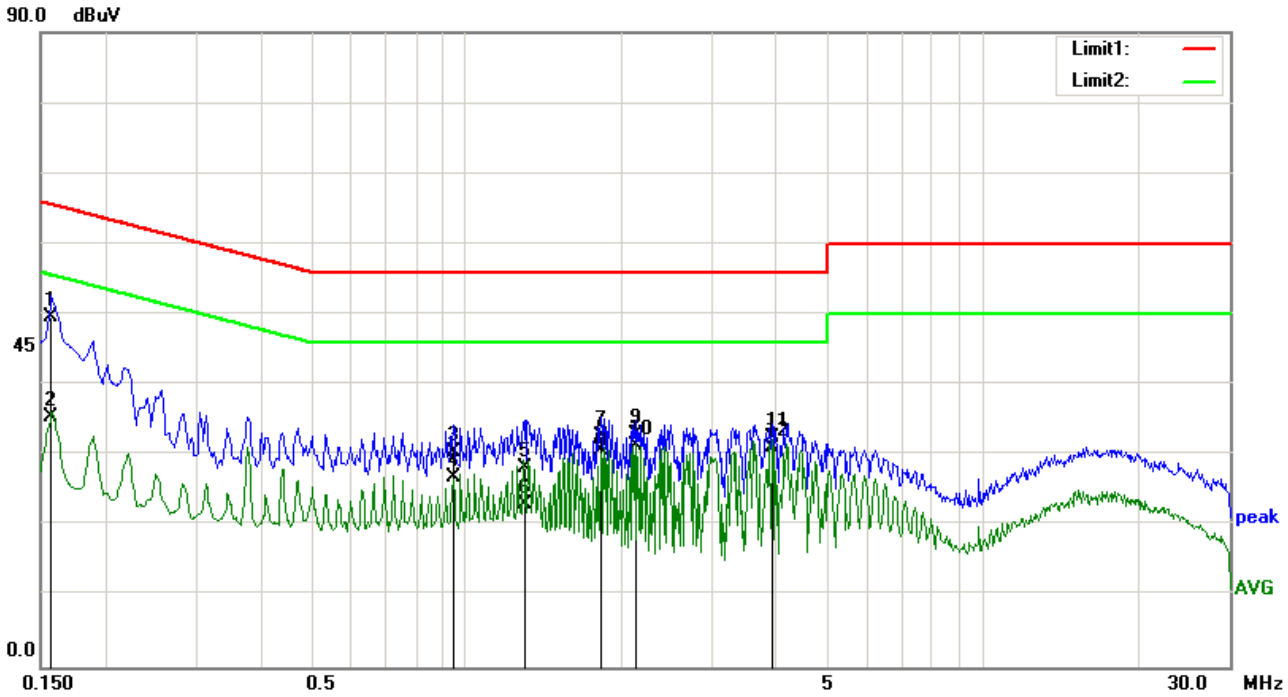


Test Data

Phase Neutral Plot at 120Vac, 60Hz

No.	Frequency (MHz)	Reading (dBuV)	Detector	Lisn/Isn (dB}	Ps_Lmt (dB)	Cab_L (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)
1	0.1660	38.11	QP	0.11	-10.00	0.33	48.55	65.16	-16.61
2	0.1660	20.67	AVG	0.11	-10.00	0.33	31.11	55.16	-24.05
3	0.2780	25.41	QP	0.10	-10.00	0.20	35.71	60.88	-25.17
4	0.2780	15.62	AVG	0.10	-10.00	0.20	25.92	50.88	-24.96
5	0.4180	17.95	QP	0.11	-10.00	0.21	28.27	57.49	-29.22
6	0.4180	12.62	AVG	0.11	-10.00	0.21	22.94	47.49	-24.55
7	1.2460	17.84	QP	0.14	-10.00	0.21	28.19	56.00	-27.81
8	1.2460	12.66	AVG	0.14	-10.00	0.21	23.01	46.00	-22.99
9	1.5660	17.77	QP	0.15	-10.00	0.20	28.12	56.00	-27.88
10	1.5660	12.33	AVG	0.15	-10.00	0.20	22.68	46.00	-23.32
11	4.0540	21.16	QP	0.25	-10.00	0.26	31.67	56.00	-24.33
12	4.0540	15.59	AVG	0.25	-10.00	0.26	26.10	46.00	-19.90

Test Mode :	Normal Working Mode

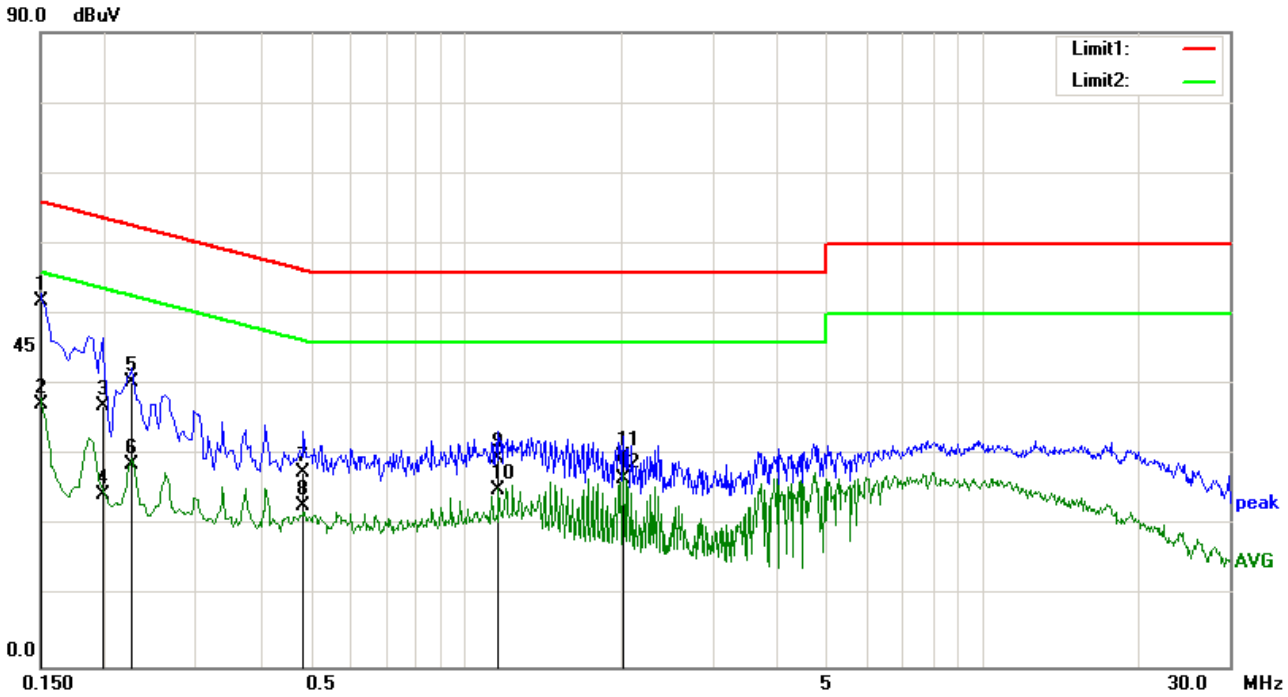


Test Data

Phase Line Plot at 230Vac, 50Hz

No.	Frequency (MHz)	Reading (dBuV)	Detector	Lisn/Isn (dB}	Ps_Lmt (dB)	Cab_L (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)
1	0.1580	39.10	QP	0.10	-10.00	0.35	49.55	65.57	-16.02
2	0.1580	25.05	AVG	0.10	-10.00	0.35	35.50	55.57	-20.07
3	0.9460	20.08	QP	0.14	-10.00	0.19	30.41	56.00	-25.59
4	0.9460	16.47	AVG	0.14	-10.00	0.19	26.80	46.00	-19.20
5	1.2980	17.81	QP	0.15	-10.00	0.21	28.17	56.00	-27.83
6	1.2980	12.70	AVG	0.15	-10.00	0.21	23.06	46.00	-22.94
7	1.8260	22.34	QP	0.16	-10.00	0.20	32.70	56.00	-23.30
8	1.8260	20.27	AVG	0.16	-10.00	0.20	30.63	46.00	-15.37
9	2.1420	22.59	QP	0.17	-10.00	0.20	32.96	56.00	-23.04
10	2.1420	21.07	AVG	0.17	-10.00	0.20	31.44	46.00	-14.56
11	3.9060	22.01	QP	0.23	-10.00	0.26	32.50	56.00	-23.50
12	3.9060	20.66	AVG	0.23	-10.00	0.26	31.15	46.00	-14.85

Test Mode :	Normal Working Mode



Test Data

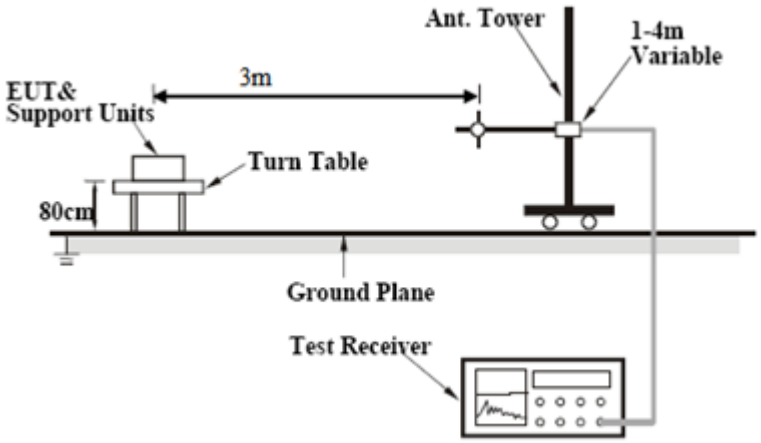
Phase Neutral Plot at 230Vac, 50Hz

No.	Frequency	Reading	Detector	Lisn/Isn	Ps_Lmt	Cab_L	Result	Limit	Margin
	(MHz)	(dBuV)		(dB}	(dB)	(dB)	(dBuV)	(dBuV)	(dB)
1	0.1500	41.40	QP	0.11	-10.00	0.36	51.87	66.00	-14.13
2	0.1500	26.84	AVG	0.11	-10.00	0.36	37.31	56.00	-18.69
3	0.1980	26.73	QP	0.10	-10.00	0.28	37.11	63.69	-26.58
4	0.1980	14.01	AVG	0.10	-10.00	0.28	24.39	53.69	-29.30
5	0.2260	30.07	QP	0.10	-10.00	0.24	40.41	62.60	-22.19
6	0.2260	18.43	AVG	0.10	-10.00	0.24	28.77	52.60	-23.83
7	0.4860	17.35	QP	0.11	-10.00	0.21	27.67	56.24	-28.57
8	0.4860	12.49	AVG	0.11	-10.00	0.21	22.81	46.24	-23.43
9	1.1580	19.29	QP	0.14	-10.00	0.20	29.63	56.00	-26.37
10	1.1580	14.78	AVG	0.14	-10.00	0.20	25.12	46.00	-20.88
11	2.0180	19.41	QP	0.17	-10.00	0.18	29.76	56.00	-26.24
12	2.0180	16.26	AVG	0.17	-10.00	0.18	26.61	46.00	-19.39

6.2 Radiated Emissions

Temperature	24℃
Relative Humidity	56%
Atmospheric Pressure	1023mbar
Test date :	July 25, 2017
Tested By :	Peter Wei

Requirement(s):

<table>
<tr><th>Spec</th><th>Item</th><th>Requirement</th><th>Applicable</th></tr>
<tr><td>47CFR§15.109(d)</td><td>a)</td><td>Except higher limit as specified elsewhere in other section, the emissions from the low-power radio-frequency devices shall not exceed the field strength levels specified in the following table and the level of any unwanted emissions shall not exceed the level of the fundamental emission. The tighter limit applies at the band edges
<table>
<tr><th>Frequency range (MHz)</th><th>Field Strength (μV/m)</th></tr>
<tr><td>30 – 88</td><td>100</td></tr>
<tr><td>88 – 216</td><td>150</td></tr>
<tr><td>216 960</td><td>200</td></tr>
<tr><td>Above 960</td><td>500</td></tr>
</table></td><td>☒</td></tr>
<tr><td>Test Setup</td><td colspan="3"> 
</td></tr>
<tr><td>Procedure</td><td colspan="3">1. The EUT was switched on and allowed to warm up to its normal operating condition.
2. The test was carried out at the selected frequency points obtained from the EUT characterization. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and adjusting the antenna height in the following manner:
a. Vertical or horizontal polarization (whichever gave the higher emission level over a full rotation of the EUT) was chosen.
b. The EUT was then rotated to the direction that gave the maximum emission.
c. Finally, the antenna height was adjusted to the height that gave the maximum emission.
3. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasiy Peak detection at frequency below 1GHz.
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz with Peak detection for Peak measurement at frequency above 1GHz.
The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth with Peak detection for Average Measurement as below at frequency above 1GHz.
■ 1 kHz (Duty cycle < 98%) □ 10 Hz (Duty cycle > 98%)
5. Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were measured.</td></tr>
<tr><td>Remark</td><td colspan="3"></td></tr>
</table>

Result	☒ Pass ☐ Fail

Test Data ☒Yes ☐N/A

Test Plot ☒Yes (See below) ☐N/A

Data sample

No.	Frequency	Reading	Detector	Ant_F	PA_G	Cab_L	Result	Limit	Margin	Height	Degree
	(MHz)	(dBμV/m)		(dB/m)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(cm)	(°)

Frequency (MHz) = Emission frequency in MHz

Reading (dBμV/m) = Receiver Reading Value

Detector= Peak Detector or Quasi Peak Detector

Ant_F=Antenna Factor

PA_G=Pre-Amplifier Gain

Cab_L=Cable Loss

Result (dBμV/m) = Read ing Value + Corrected Value

Limit (dBμV/m) = Limit stated in standard

Height (cm) = Height of Receiver antenna

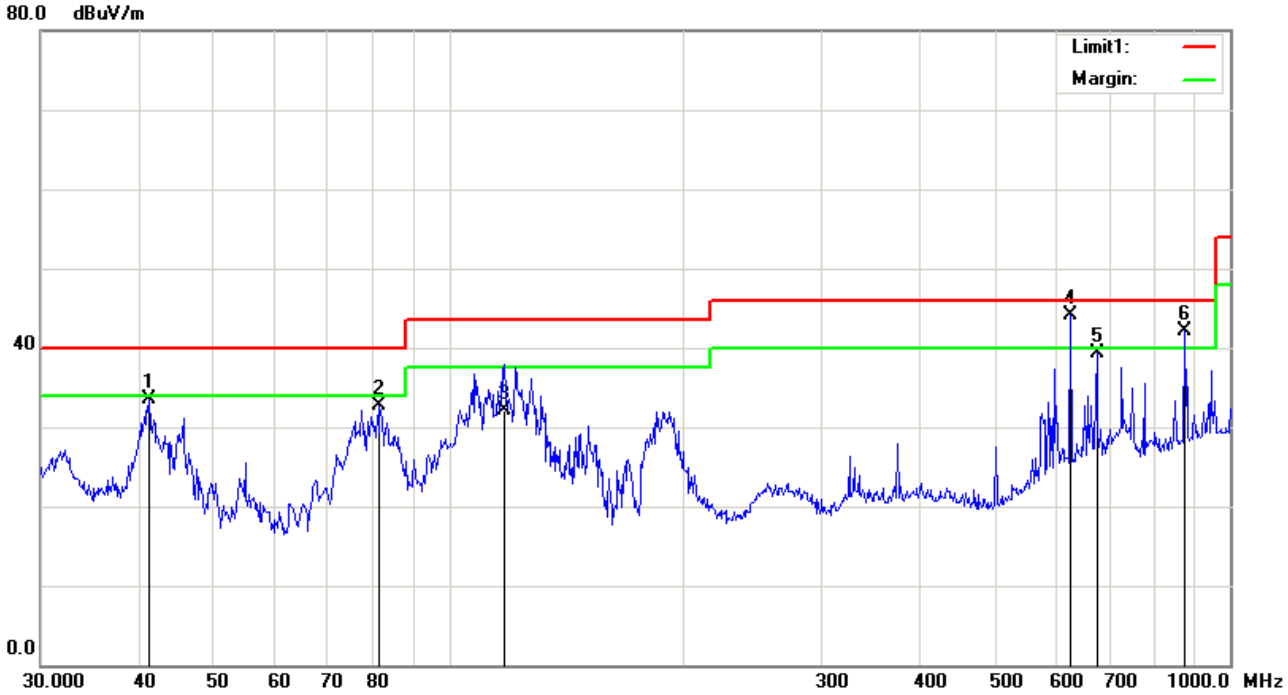
Degree = Turn table degree

Calculation Formula:

Margin (dB) = Result (dBμV/m) – limit (dBμV/m)

Test Mode :	Normal Working Mode

Below 1GHz



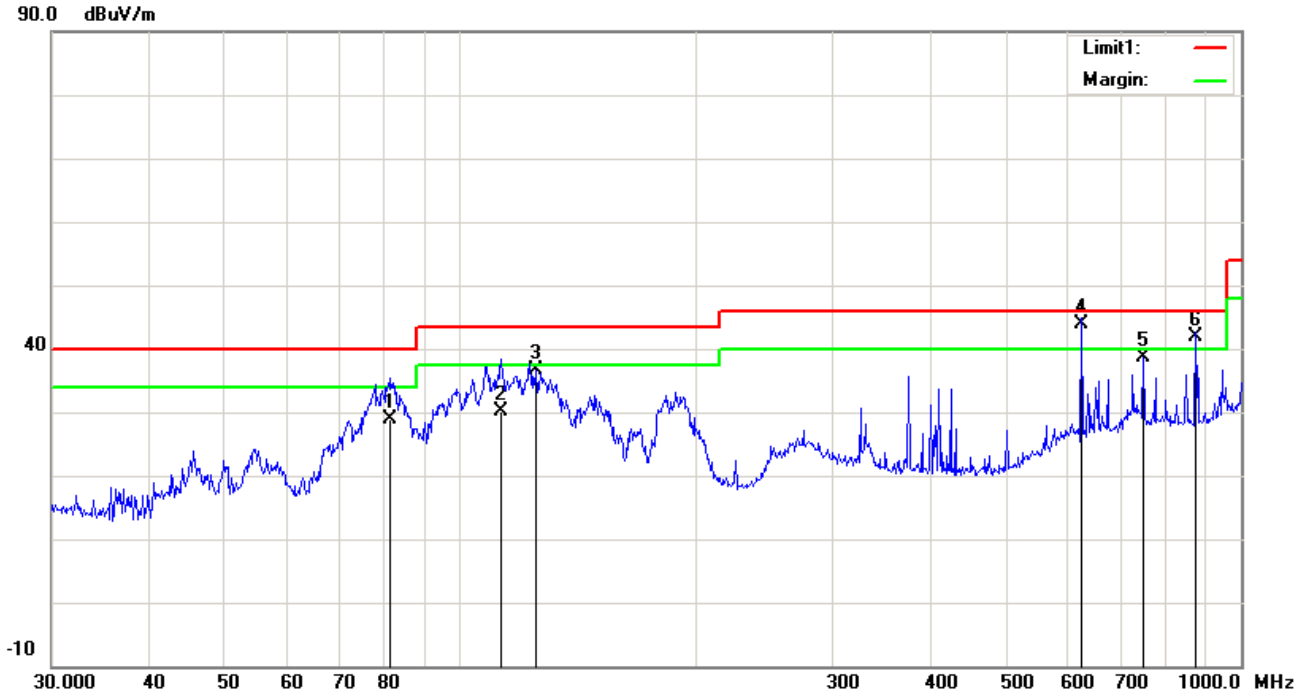
Test Data

Vertical Polarity Plot @3m

No.	Frequency	Reading	Detector	Ant_F	PA_G	Cab_L	Result	Limit	Margin	Height	Degree
	(MHz)	(dBuV/m)		(dB/m)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(°)
1	41.2765	63.27	peak	14.92	45.78	1.08	33.49	40.00	-6.51	200	1
2	81.4970	71.29	peak	7.60	47.70	1.45	32.64	40.00	-7.36	200	147
3	117.7725	61.43	QP	15.40	46.49	1.76	32.10	43.50	-11.40	200	150
4	625.0780	66.22	QP	20.84	46.97	4.01	44.10	46.00	-1.90	100	44
5	675.2080	60.42	peak	22.01	47.36	4.17	39.24	46.00	-6.76	100	122
6	875.2470	60.17	QP	23.15	46.00	4.78	42.10	46.00	-3.90	200	311

Test Mode :	Normal Working Mode

Below 1GHz



Test Data

Horizontal Polarity Plot @3m

No.	Frequency (MHz)	Reading (dBuV/m)	Detector	Ant_F (dB/m)	PA_G (dB)	Cab_L (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)
1	81.4970	65.49	QP	9.56	47.70	1.45	28.80	40.00	-11.20	200	124
2	112.9196	59.51	QP	15.31	46.33	1.71	30.20	43.50	-13.30	300	280
3	125.0066	65.98	peak	15.72	46.93	1.82	36.59	43.50	-6.91	200	264
4	625.0780	65.41	QP	21.55	46.97	4.01	44.00	46.00	-2.00	200	310
5	750.1083	56.62	peak	22.70	45.02	4.40	38.70	46.00	-7.30	200	192
6	875.2470	60.35	QP	22.77	46.00	4.78	41.90	46.00	-4.10	200	215

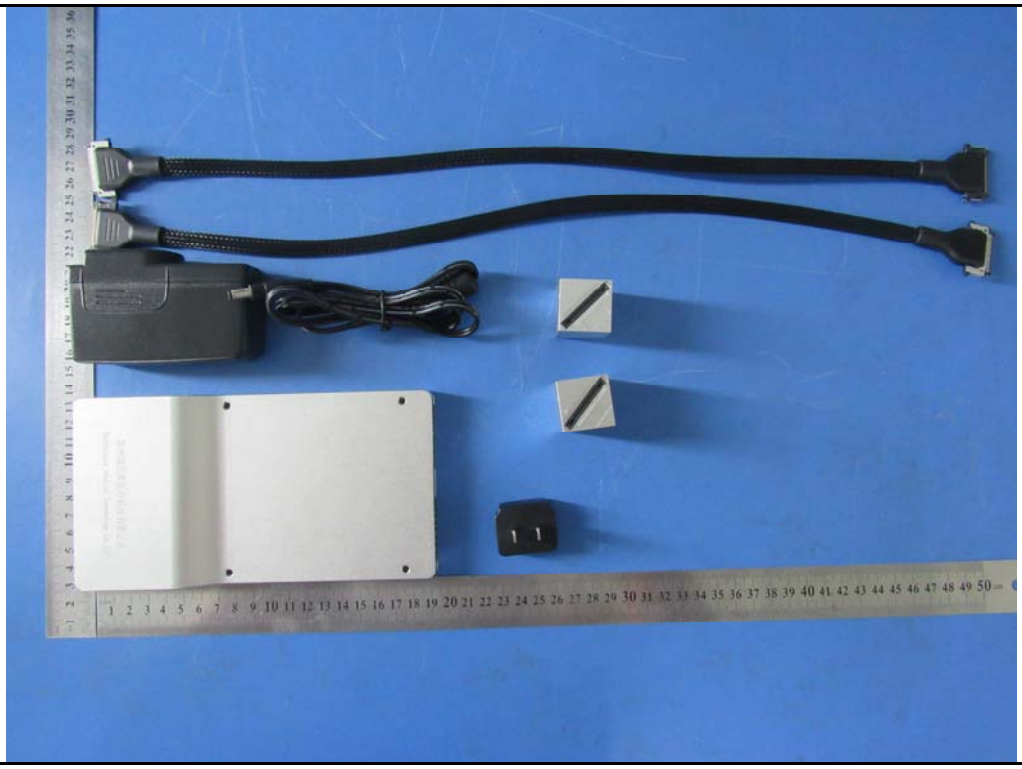
Note: The highest frequency of the internal sources of the EUT is less than 108MHz, so the measurement shall only be made up to 1GHz.

Annex A. TEST INSTRUMENT

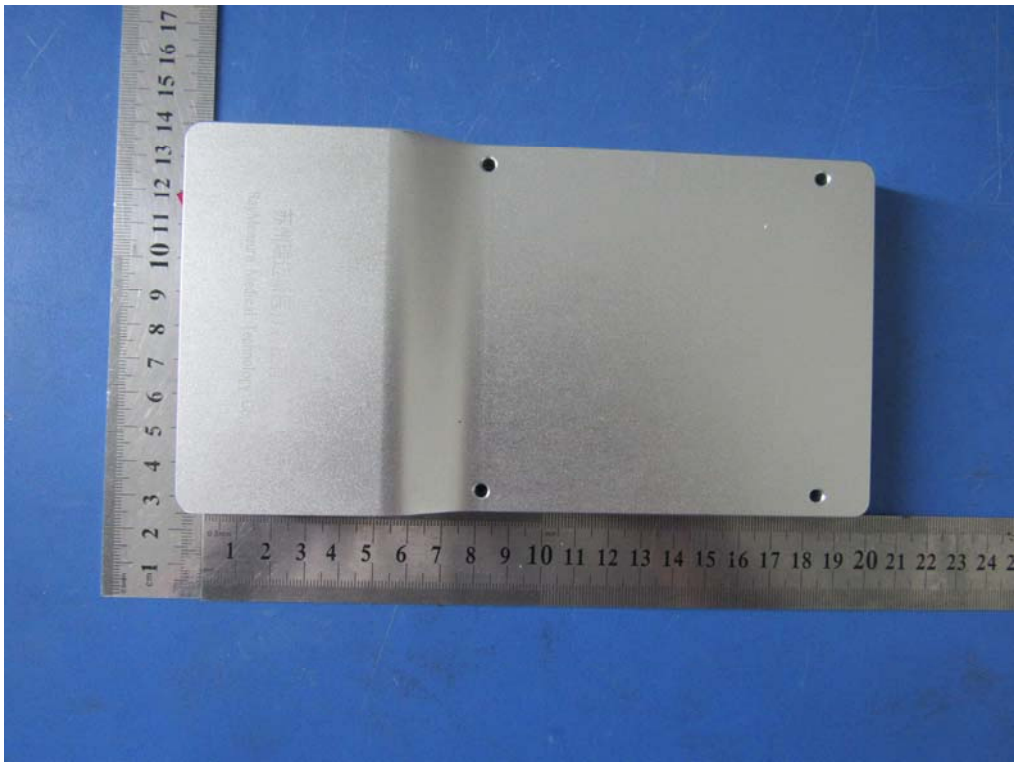
Instrument	Model	Serial #	Cal Date	Cal Due	In use
AC Line Conducted Emissions					
R&S EMI Test Receiver	ESPI3	101216	05/03/2017	05/02/2018	☒
V-LISN	ESH3-Z5	838979/005	05/15/2017	05/14/2018	☒
SIEMIC EZ_EMC Conducted Emissions	Ver.ICP-03A1	N/A	N/A	N/A	☒
Radiated Emissions					
Spectrum Analyzer	N9010A	MY47191130	05/03/2017	05/02/2018	☐
R&S EMI Receiver	ESPI3	101216	05/03/2017	05/02/2018	☒
Antenna (30MHz~6GHz)	JB6	A121411	10/31/2016	10/31/2017	☒
EMCO Horn Antenna (1 ~18GHz)	3115	N/A	11/15/2016	11/14/2017	☐
Hp Pre-Amplifier	8447F	1937A01160	10/31/2016	10/30/2017	☒
Agilent Pre-Amplifier	8449B	N/A	10/31/2016	10/30/2017	☐
SIEMIC EZ_EMC Radiated Emissions software	Ver.ICP-03A1	N/A	N/A	N/A	☒

Annex B. EUT And Test Setup Photographs

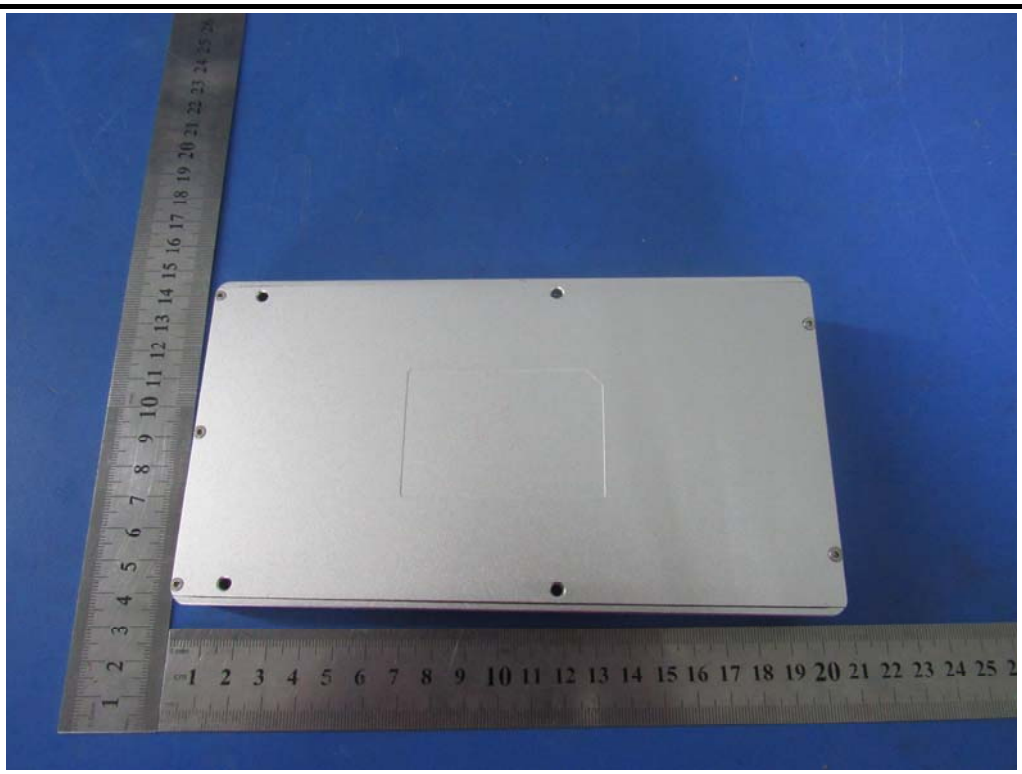
Annex B.i. Photograph: EUT External Photo



The Whole of EUT - Front View



EUT - Top View



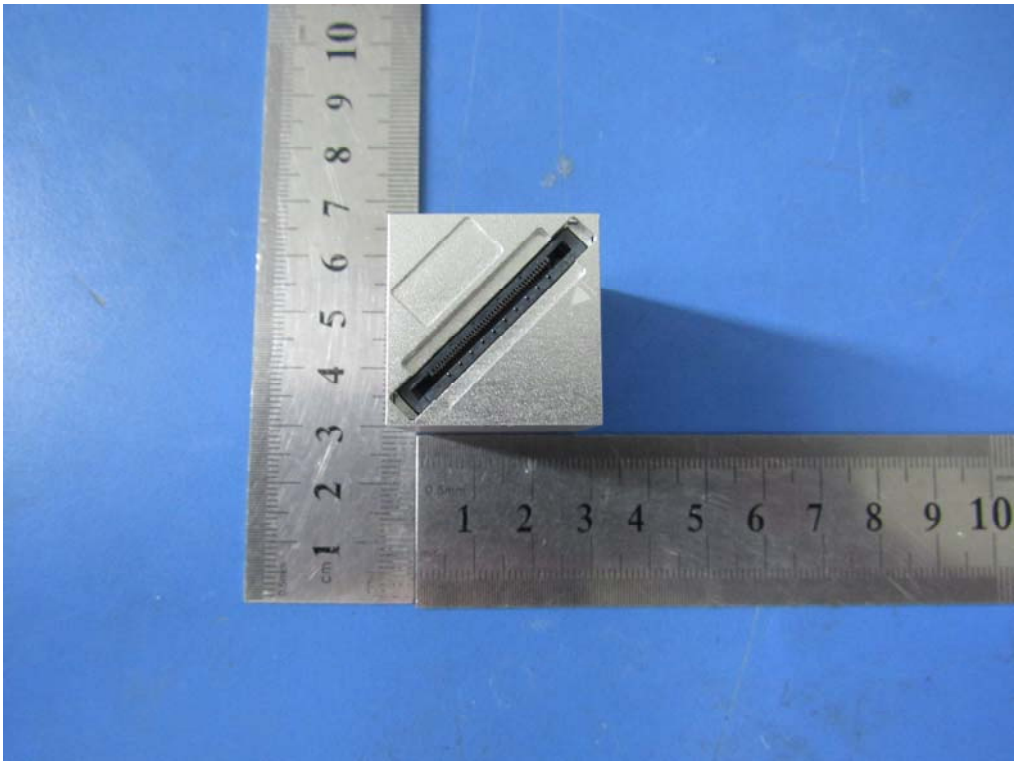
EUT - Bottom View

EUT - Front View

EUT - Rear View

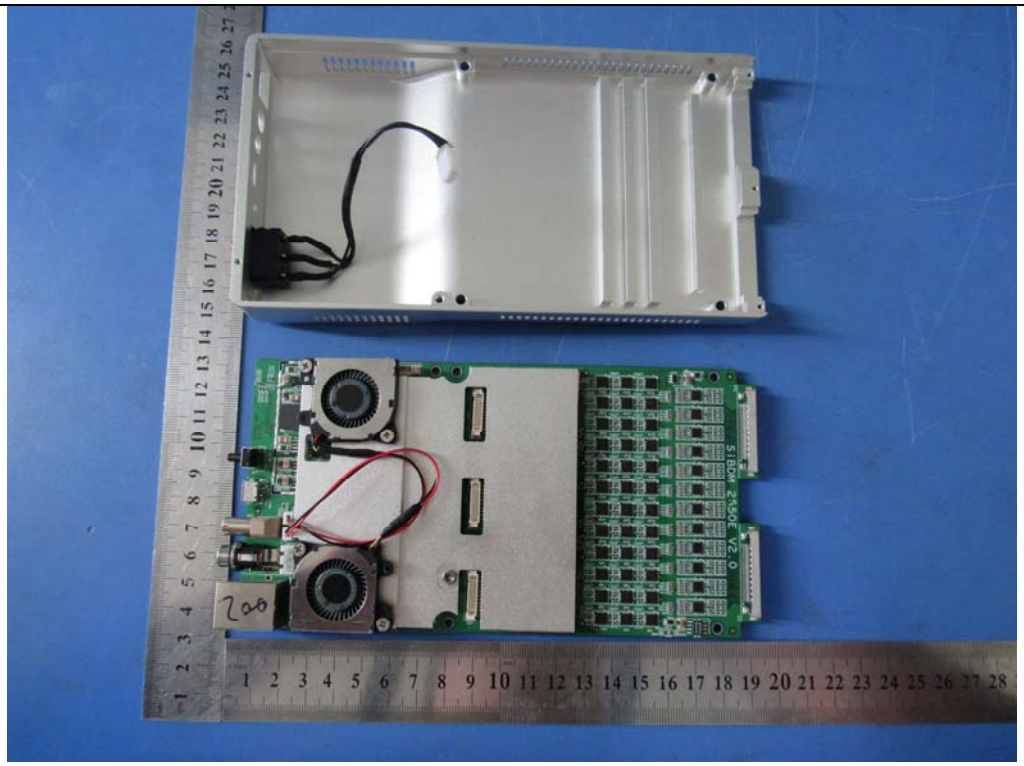
EUT - Left View

EUT - Right View

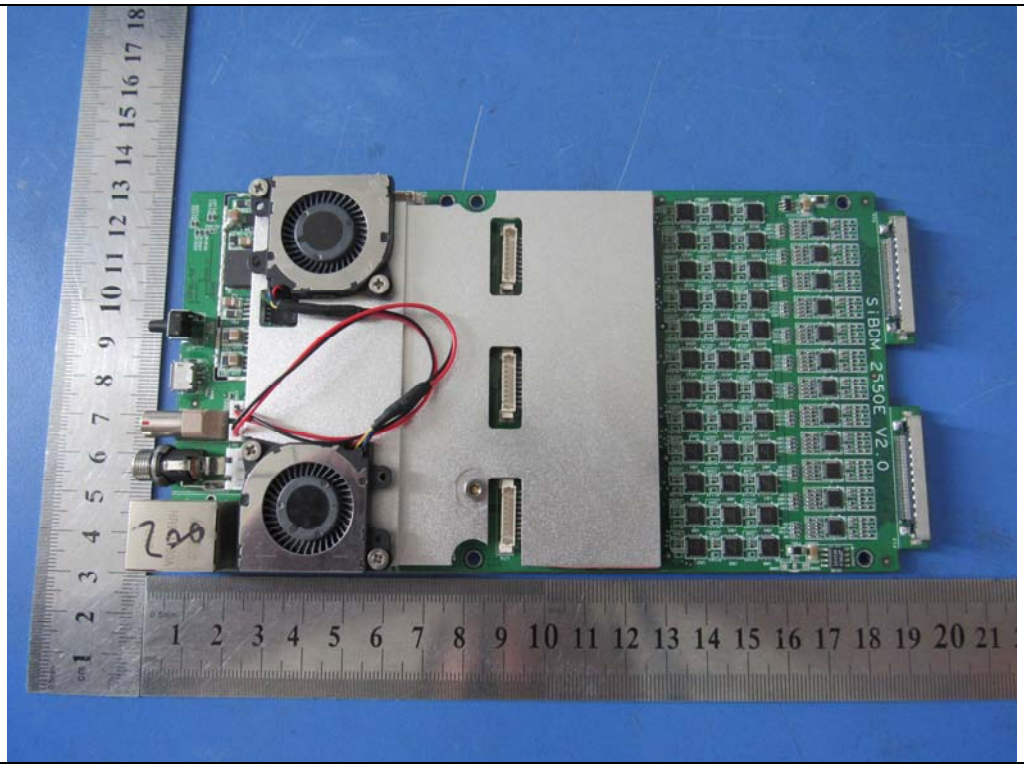


EUT Sensor- Top View

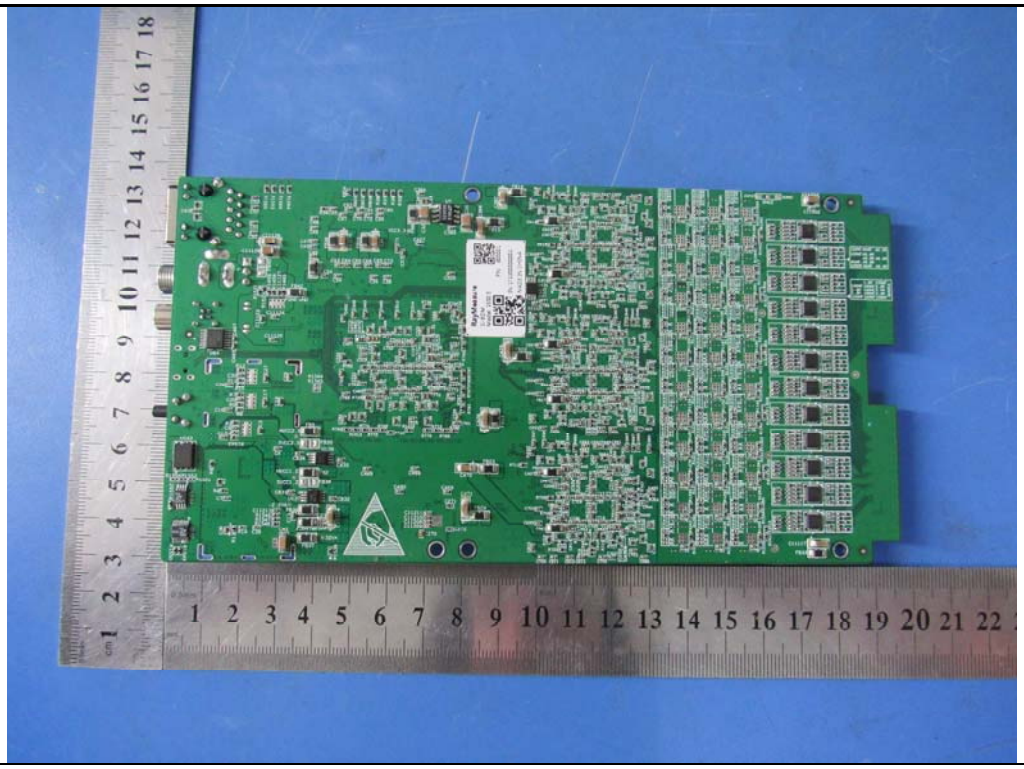
Annex B.ii. Photograph: EUT Internal Photo



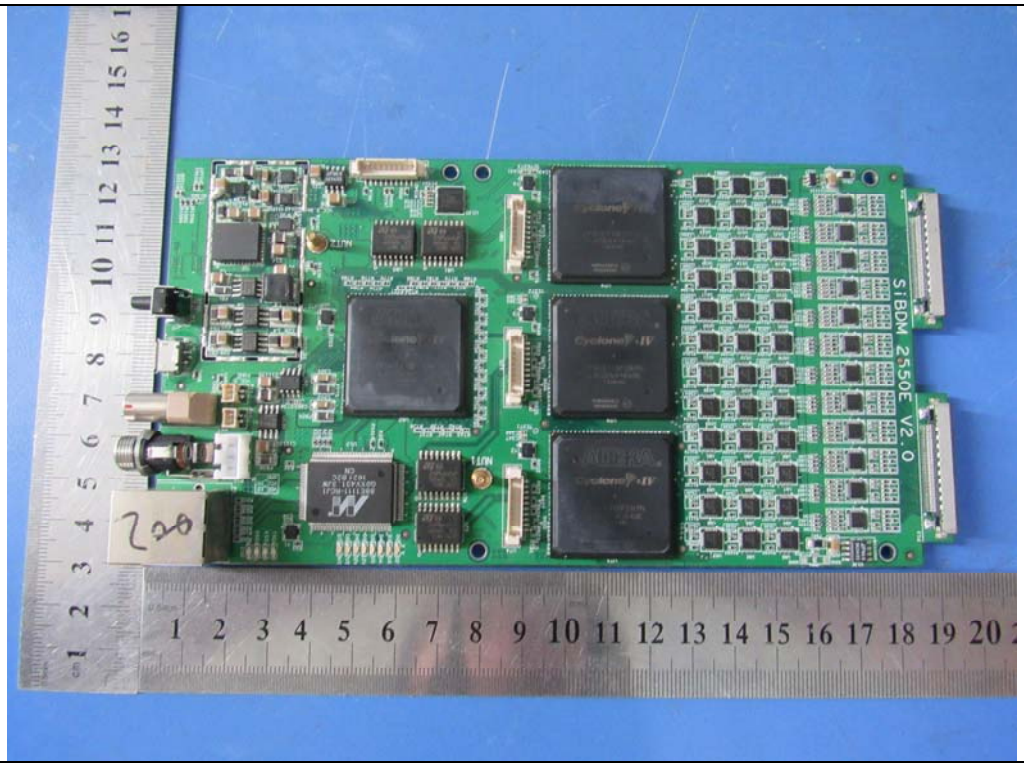
EUT Uncover – Front View



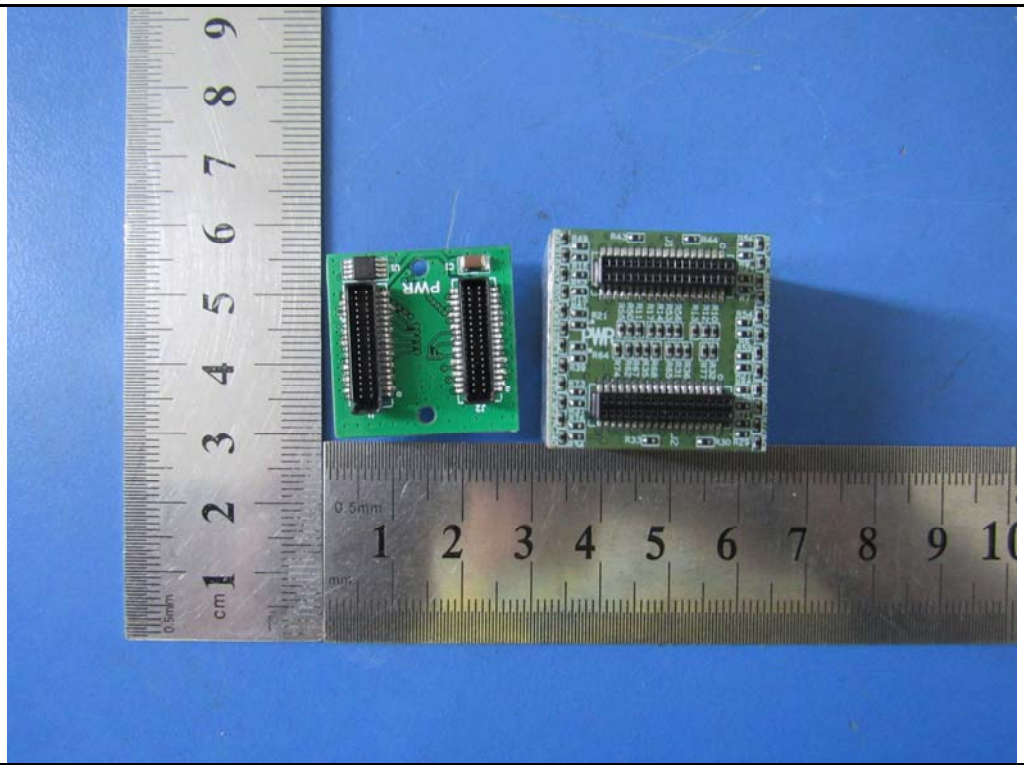
EUT PCBA – Front View



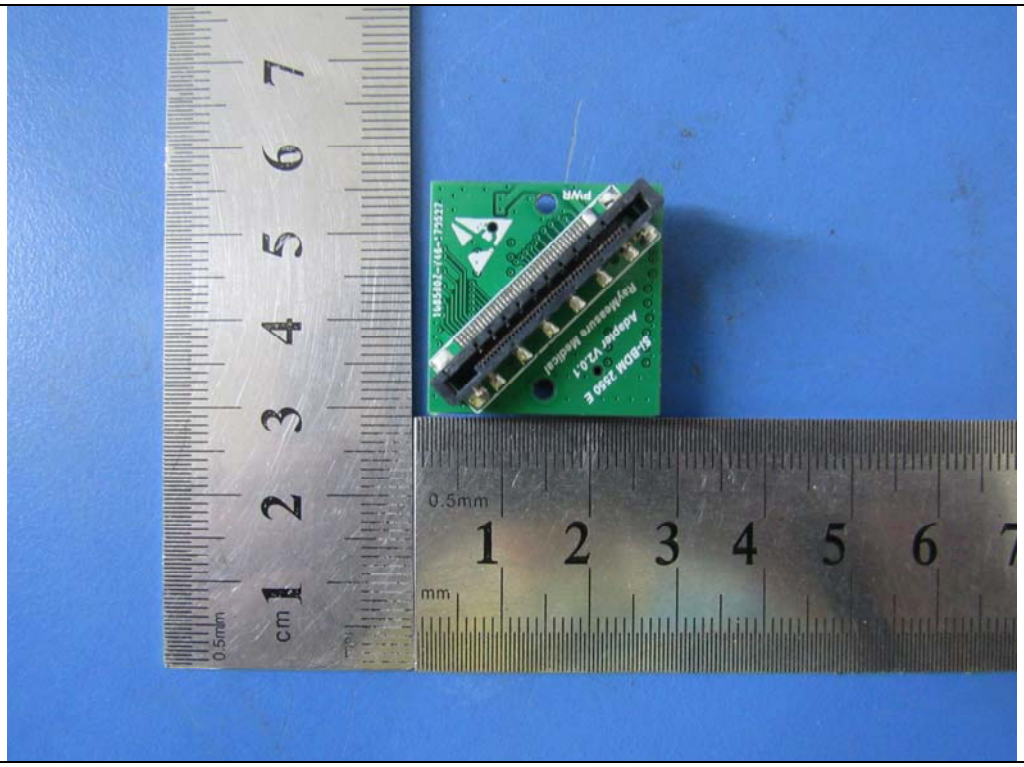
EUT PCBA – Rear View



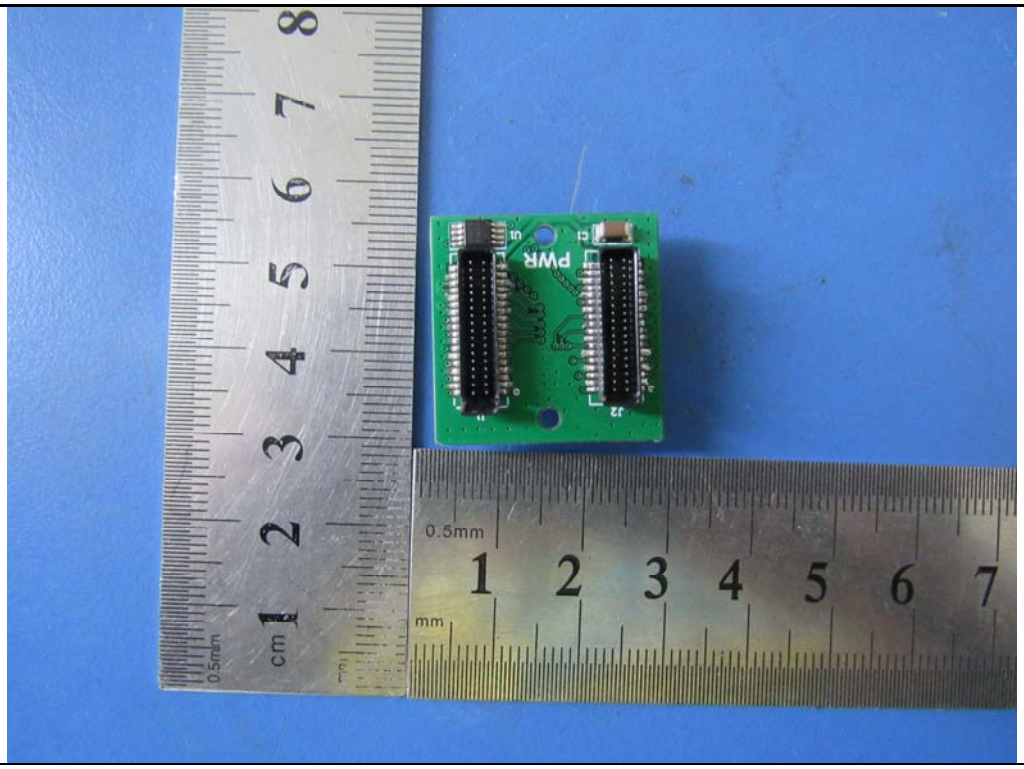
EUT PCBA Shielding Off – Front View



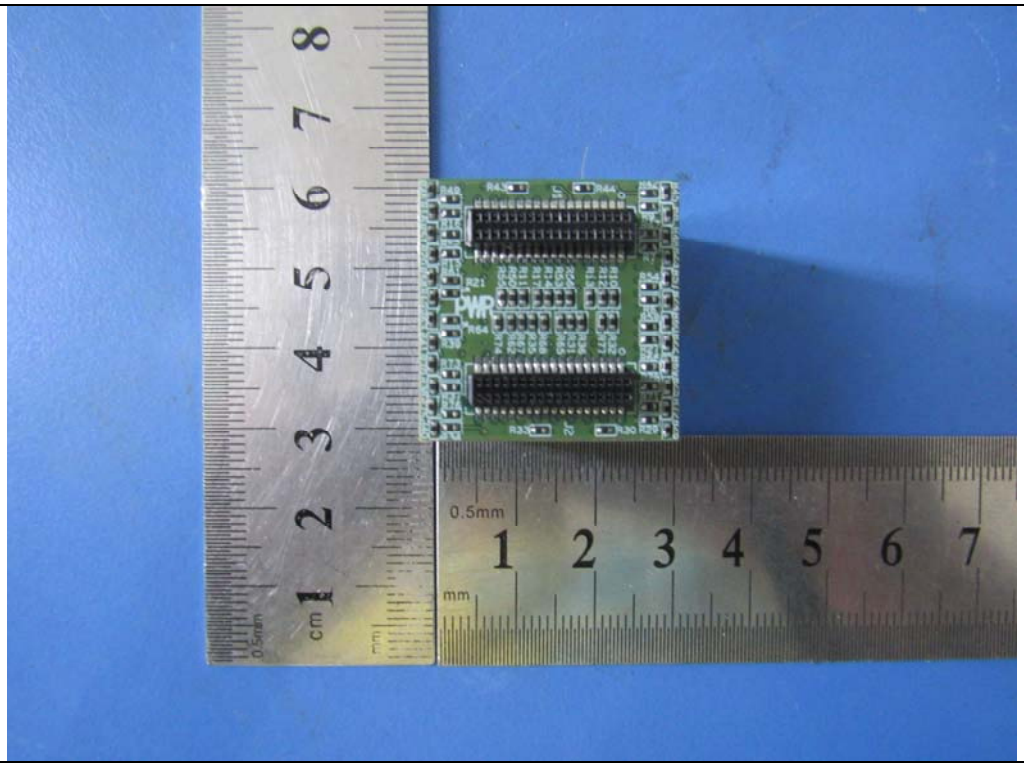
EUT Sensor Uncover – Front View



EUT Sensor PCBA 1 – Front View



EUT Sensor PCBA 1 – Rear View

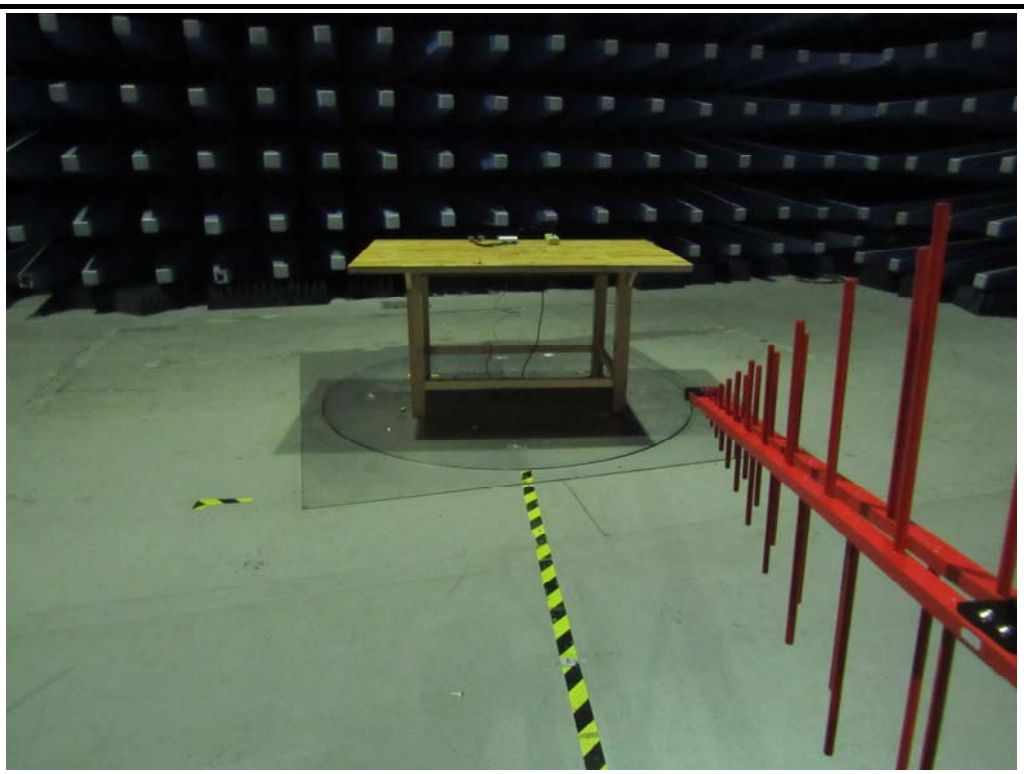


EUT Sensor PCBA 2 – Front View

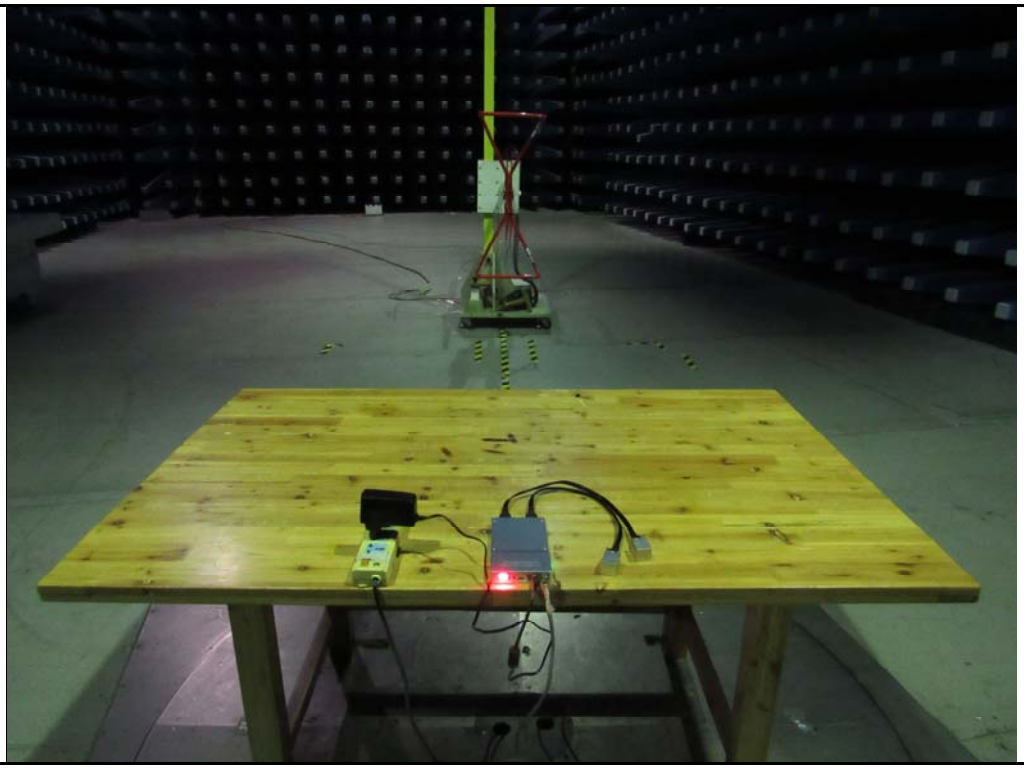
Annex B.iii. Photograph: Test Setup Photo

Conducted Emissions Test Setup Front View

Conducted Emissions Test Setup Side View



Radiated Spurious Emissions Test Setup Below 1GHz

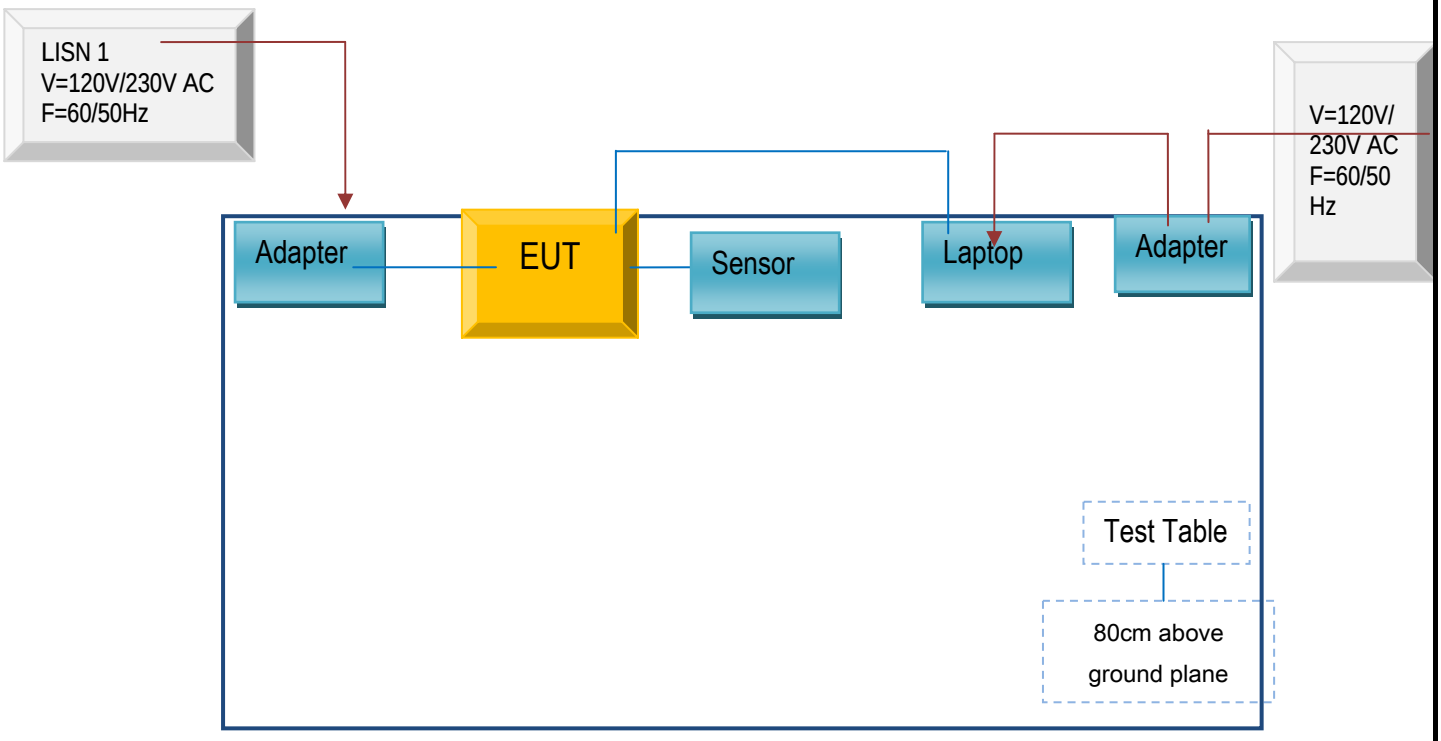


Radiated Spurious Emissions Test Setup Below 1GHz

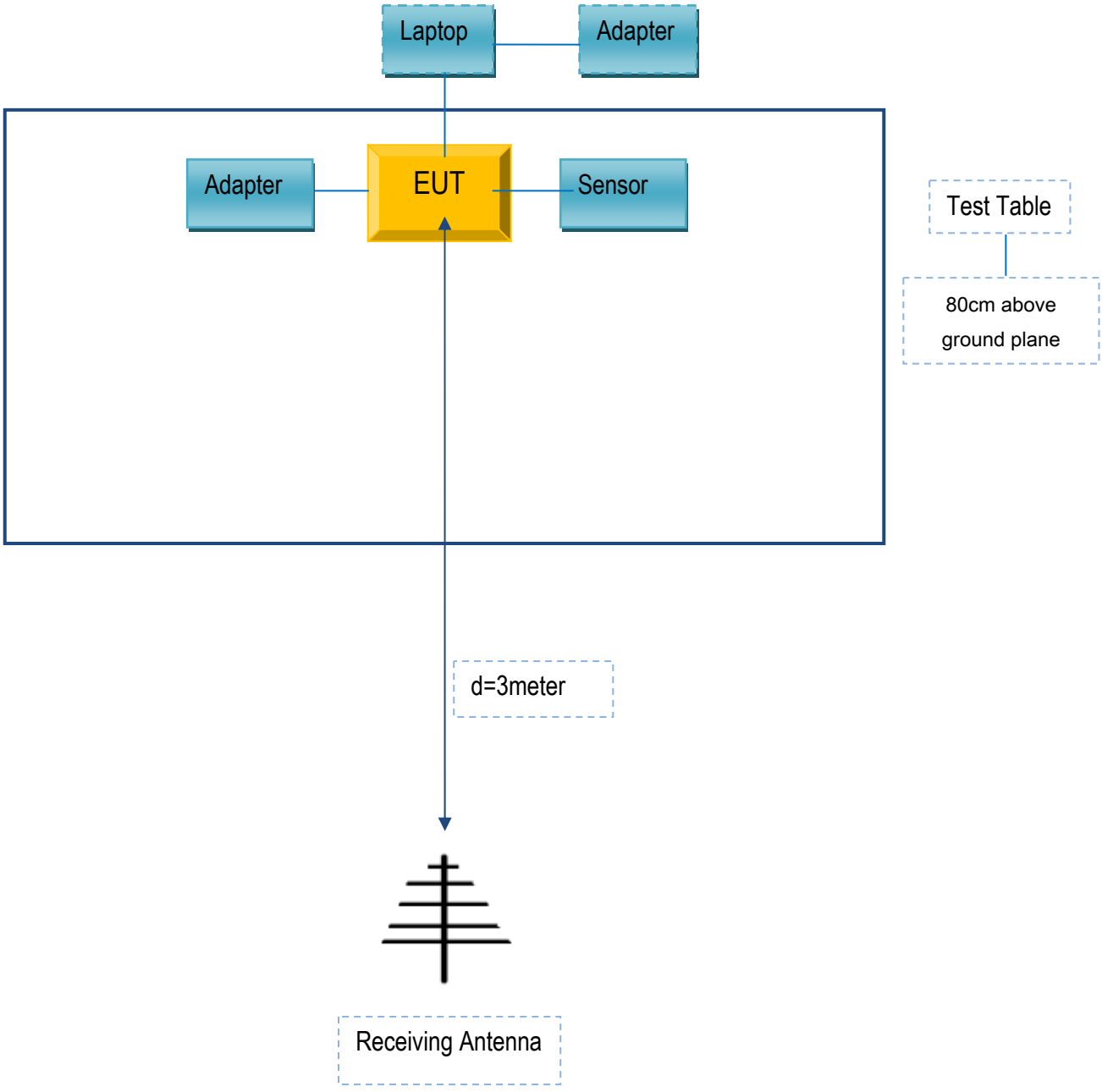
Annex C. TEST SETUP AND SUPPORTING EQUIPMENT

Annex C.ii. TEST SET UP BLOCK

Block Configuration Diagram for Conducted Emissions



Block Configuration Diagram for Radiated Emissions



Annex C. ii. SUPPORTING EQUIPMENT DESCRIPTION

The following is a description of supporting equipment and details of cables used with the EUT.

Supporting Equipment:

Manufacturer	Equipment Description	Model	Serial No
DELL	Laptop	4321S	N/A

Supporting Cable:

Cable type	Shield Type	Ferrite Core	Length	Serial No
Power Cable	Un-shielding	No	0.8m	N/A

Annex D. User Manual / Block Diagram / Schematics / Partlist

See attachment

Annex E. DECLARATION OF SIMILARITY

N/A