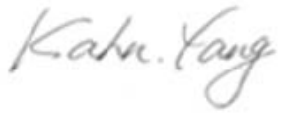




EMC TEST REPORT



Report No.: 14070689-FCC-E1

Supersede Report No.: N/A

Applicant	STAR MICRONICS CO., LTD.	
Product Name	Thermal Printer	
Model No.	SM-L204	
Serial No.	SM-L200	
Test Standard	FCC Part 15 Subpart B Class B:2014, ANSI C63.4: 2014	
Test Date	February 25 to 27, 2015	
Issue Date	March 24, 2015	
Test Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail	
Equipment complied with the specification	<input checked="" type="checkbox"/>	
Equipment did not comply with the specification	<input type="checkbox"/>	
		
Kahn Yang Test Engineer	Alex Liu Checked By	
This test report may be reproduced in full only Test result presented in this test report is applicable to the tested sample only		

Issued by:

SIEMIC (SHENZHEN-CHINA) LABORATORIES

Zone A, Floor 1, Building 2 Wan Ye Long Technology Park

South Side of Zhoushi Road, Bao' an District, Shenzhen, Guangdong China 518108

Phone: +86 0755 2601 4629801 Email: China@siemic.com.cn

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

Test Report	14070689-FCC-E1
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1. Report Revision History

Report No.	Report Version	Description	Issue Date
14070689-FCC-E1	NONE	Original	March 24, 2015

2. Customer information

Applicant Name	STAR MICRONICS CO., LTD.
Applicant Add	20-10 NAKAYOSHIDA, SURUGA-ku, SHIZUOKA-shi, SHIZUOKA 422-8654, JAPAN
Manufacturer	Xiamen PRT Technology Co.,Ltd
Manufacturer Add	4, 5/f, #8, gaoqi Nan Shi'er Road(Aide Airport Industrial Park), Xiamen, Fujian

3. Test site information

Lab performing tests	SIEMIC (Shenzhen-China) LABORATORIES
Lab Address	Zone A, Floor 1, Building 2 Wan Ye Long Technology Park South Side of Zhoushi Road, Bao'an District, Shenzhen, Guangdong China 518108
FCC Test Site No.	718246
IC Test Site No.	4842E-1
Test Software	Radiated Emission Program-To Shenzhen v2.0

4. Equipment under Test (EUT) Information

Description of EUT:	Thermal Printer
Main Model:	SM-L204
Serial Model:	SM-L200
Date EUT received:	December 15, 2014
Test Date(s):	February 25 to 27, 2015
Equipment Category :	JBP
Antenna Gain:	Bluetooth/BLE: 2 dBi
Type of Modulation:	Bluetooth: GFSK, π /4DQPSK, 8DPSK BLE: GFSK
RF Operating Frequency (ies):	Bluetooth& BLE: 2402-2480 MHz
Number of Channels:	Bluetooth: 79CH BLE: 40CH
Port:	Power Port, USB Port
Input Power:	Battery: Model: X000-001 Spec: 3.7V 1700mAh Adapter (<i>Optional on sale</i>): Model: ETPCA-050050U3W Input: AC 100-240V; 50/60Hz 0.2A Output: DC 5.0V; 0.5A
Trade Name :	STAR MICRONICS CO., LTD. / STAR
GPRS/EGPRS Multi-slot class	N/A
FCC ID:	R49SM-L200

5. Test 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: 2009	AC Power Line Conducted Emissions	Compliance
§15.109; ANSI C63.4: 2009	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	23°C
Relative Humidity	59%
Atmospheric Pressure	1009mbar
Test date :	February 25, 2015
Tested By :	Kahn Yang

Requirement(s):

Spec	Item	Requirement	Applicable														
47CFR§15.107	a)	<p>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 [μ] H/50 ohms line impedance stabilization network (LISN). The lower limit applies at the boundary between the frequencies ranges.</p> <table border="1"> <thead> <tr> <th rowspan="2">Frequency ranges (MHz)</th> <th colspan="2">Limit (dBμV)</th> </tr> <tr> <th>QP</th> <th>Average</th> </tr> </thead> <tbody> <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> </tbody> </table>	Frequency ranges (MHz)	Limit (dBμV)		QP	Average	0.15 ~ 0.5	66 – 56	56 – 46	0.5 ~ 5	56	46	5 ~ 30	60	50	<input checked="" type="checkbox"/>
Frequency ranges (MHz)	Limit (dBμV)																
	QP	Average															
0.15 ~ 0.5	66 – 56	56 – 46															
0.5 ~ 5	56	46															
5 ~ 30	60	50															

Test Setup	<p style="text-align: center;"> 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. </p>
------------	---

Procedure	<ol style="list-style-type: none"> 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. The power supply for the EUT was fed through a 50W/50mH EUT LISN, connected to filtered mains.
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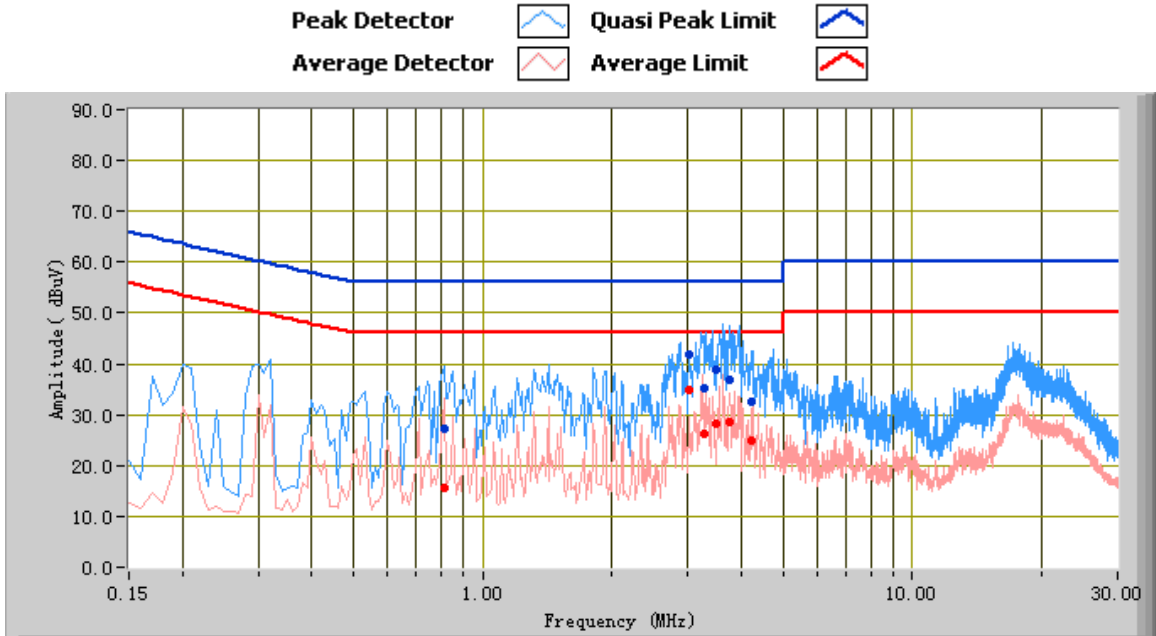
Test Report	14070689-FCC-E1
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	<ol style="list-style-type: none"> 3. The RF OUT of the EUT LISN was connected to the EMI test receiver via a low-loss coaxial cable. 4. All other supporting equipment were powered separately from another main supply. 5. 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).
Remark	
Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail

Test Data Yes N/A

Test Plot Yes (See below) N/A

Test Mode 1: Transmitting for USB Mode



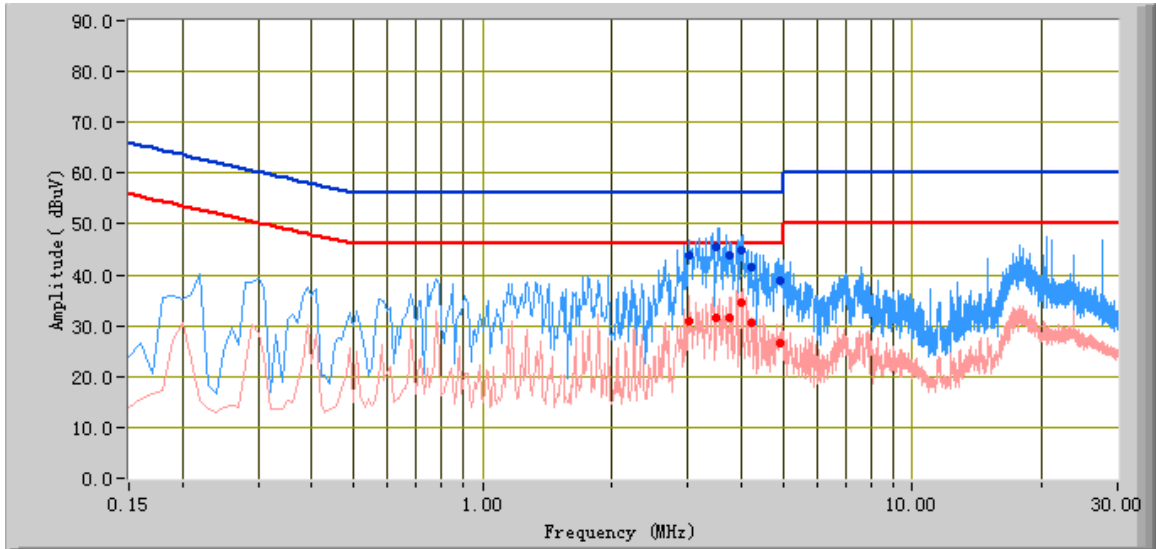
Test Data

Phase Line Plot at 120Vac, 60Hz

Frequency (MHz)	Quasi Peak (dBµV)	Limit (dBµV)	Margin (dB)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Factors (dB)
3.74	36.77	56.00	-19.23	28.62	46.00	-17.38	11.79
3.26	35.09	56.00	-20.91	26.13	46.00	-19.87	11.58
4.22	32.42	56.00	-23.58	24.79	46.00	-21.21	11.98
3.50	38.86	56.00	-17.14	28.20	46.00	-17.80	11.69
3.02	41.96	56.00	-14.04	34.87	46.00	-11.13	11.45
0.81	27.26	56.00	-28.74	15.46	46.00	-30.54	10.79

Test Mode 1: Transmitting for USB Mode

Peak Detector  Quasi Peak Limit 
 Average Detector  Average Limit 



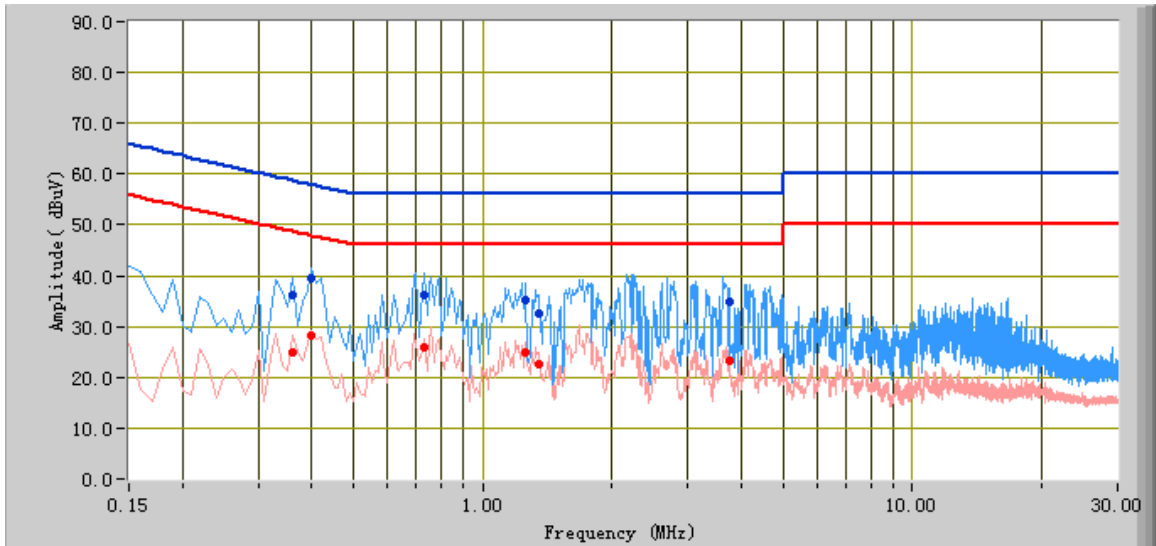
Test Data

Phase Neutral Plot at 120Vac, 60Hz

Frequency (MHz)	Quasi Peak (dBµV)	Limit (dBµV)	Margin (dB)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Factors (dB)
3.98	44.99	56.00	-11.01	34.45	46.00	-11.55	12.78
3.74	43.69	56.00	-12.31	31.69	46.00	-14.31	12.75
4.22	41.42	56.00	-14.58	30.52	46.00	-15.48	12.81
3.02	43.85	56.00	-12.15	30.88	46.00	-15.12	12.65
3.50	45.60	56.00	-10.40	31.64	46.00	-14.36	12.72
4.94	39.00	56.00	-17.00	26.49	46.00	-19.51	12.89

Test Mode 2: Transmitting for BT Mode

Peak Detector  Quasi Peak Limit 
 Average Detector  Average Limit 



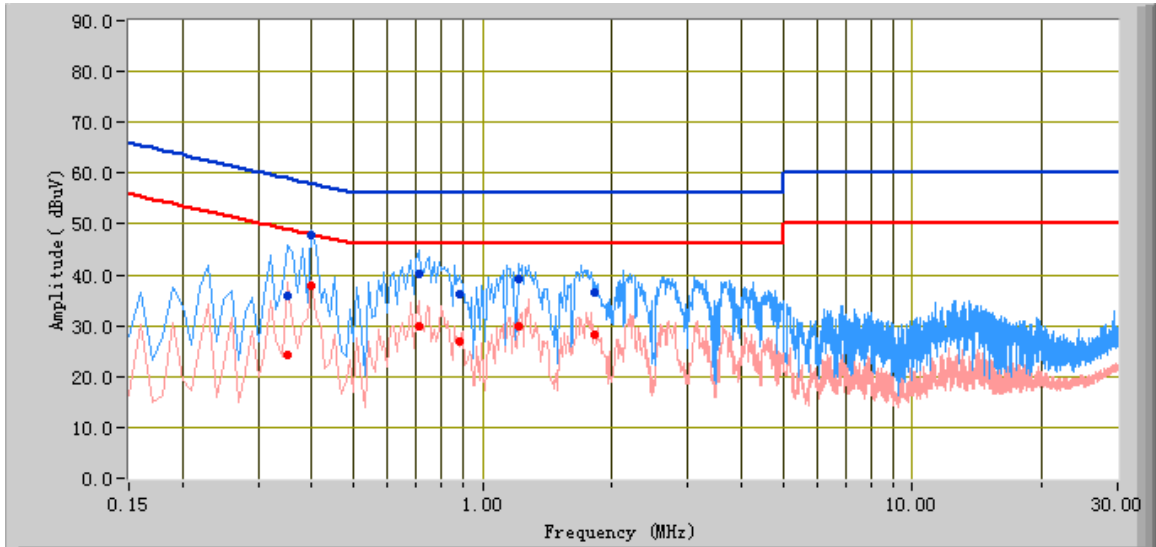
Test Data

Phase Line Plot at 120Vac, 60Hz

Frequency (MHz)	Quasi Peak (dBµV)	Limit (dBµV)	Margin (dB)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Factors (dB)
0.73	36.22	56.00	-19.78	25.87	46.00	-20.13	10.83
0.40	39.67	57.85	-18.18	28.17	47.85	-19.68	11.34
1.26	35.20	56.00	-20.80	24.96	46.00	-21.04	10.64
3.74	34.92	56.00	-21.08	23.19	46.00	-22.81	11.79
0.36	36.32	58.73	-22.41	24.84	48.73	-23.89	11.52
1.35	32.60	56.00	-23.40	22.70	46.00	-23.30	10.65

Test Mode 2: Transmitting for BT Mode

Peak Detector ▲ Quasi Peak Limit ▲
 Average Detector ▲ Average Limit ▲



Test Data

Phase Neutral Plot at 120Vac, 60Hz

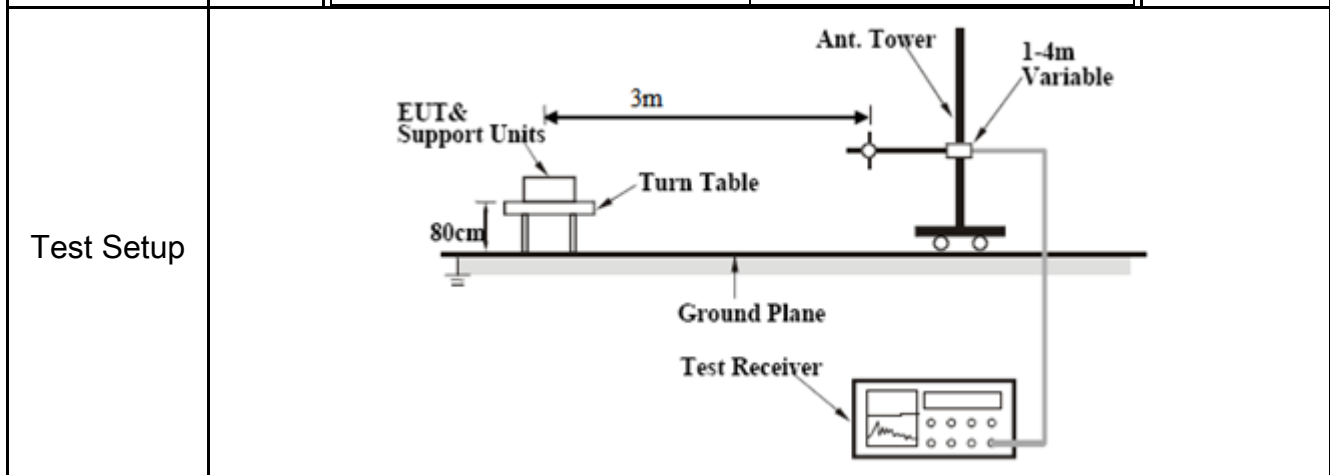
Frequency (MHz)	Quasi Peak (dBµV)	Limit (dBµV)	Margin (dB)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Factors (dB)
0.40	47.93	57.85	-9.92	37.96	47.85	-9.89	13.37
0.71	40.15	56.00	-15.85	29.82	46.00	-16.18	12.65
0.35	35.88	58.96	-23.08	24.09	48.96	-24.87	13.69
1.21	39.11	56.00	-16.89	29.89	46.00	-16.11	12.36
0.88	36.15	56.00	-19.85	26.92	46.00	-19.08	12.50
1.82	36.54	56.00	-19.46	28.14	46.00	-17.86	12.45

6.2 Radiated Emissions

Temperature	24°C
Relative Humidity	61%
Atmospheric Pressure	1008mbar
Test date :	February 27, 2015
Tested By :	Kahn Yang

Requirement(s):

Spec	Item	Requirement	Applicable										
47CFR§15.107(d)	a)	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	<input checked="" type="checkbox"/>										
		<table border="1"> <thead> <tr> <th>Frequency range (MHz)</th> <th>Field Strength ($\mu\text{V/m}$)</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">30 – 88</td> <td style="text-align: center;">100</td> </tr> <tr> <td style="text-align: center;">88 – 216</td> <td style="text-align: center;">150</td> </tr> <tr> <td style="text-align: center;">216 960</td> <td style="text-align: center;">200</td> </tr> <tr> <td style="text-align: center;">Above 960</td> <td style="text-align: center;">500</td> </tr> </tbody> </table>		Frequency range (MHz)	Field Strength ($\mu\text{V/m}$)	30 – 88	100	88 – 216	150	216 960	200	Above 960	500
		Frequency range (MHz)		Field Strength ($\mu\text{V/m}$)									
		30 – 88		100									
		88 – 216		150									
216 960	200												
Above 960	500												



Procedure	<ol style="list-style-type: none"> 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: <ol style="list-style-type: none"> a. Vertical or horizontal polarization (whichever gave the higher emission level
-----------	---

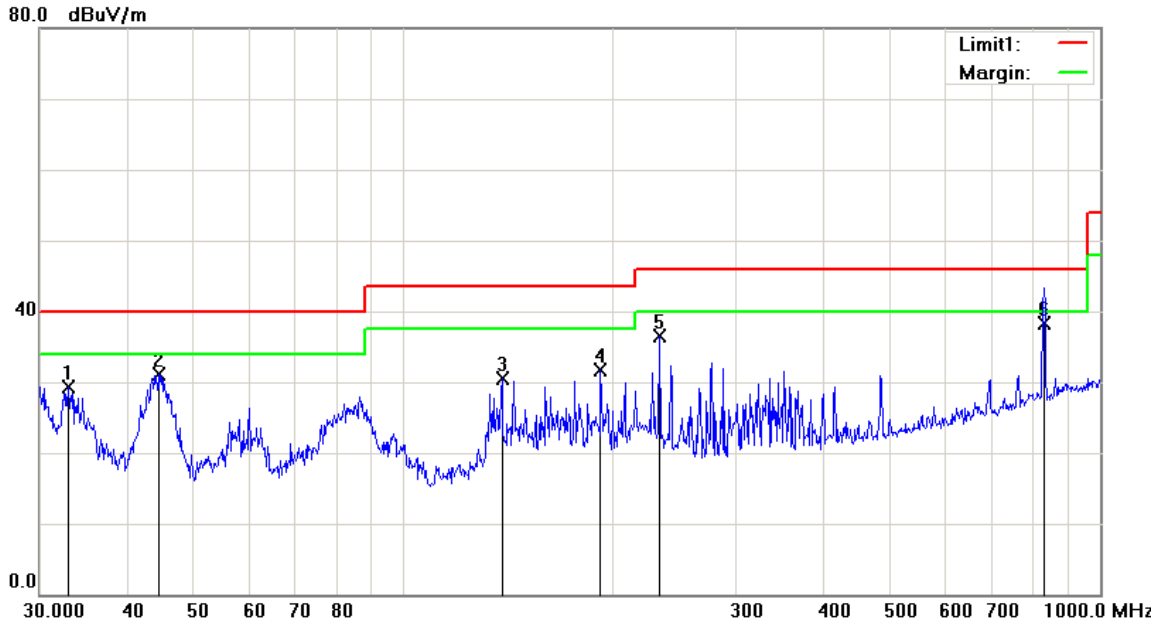
	<p>over a full rotation of the EUT) was chosen.</p> <p>b. The EUT was then rotated to the direction that gave the maximum emission.</p> <p>c. Finally, the antenna height was adjusted to the height that gave the maximum emission.</p> <p>3. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasiy Peak detection at frequency below 1GHz.</p> <p>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%)</p> <p>5. Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were measured.</p>
Remark	
Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail

Test Data Yes N/A

Test Plot Yes (See below) N/A

Test Mode 1: Transmitting for USB Mode

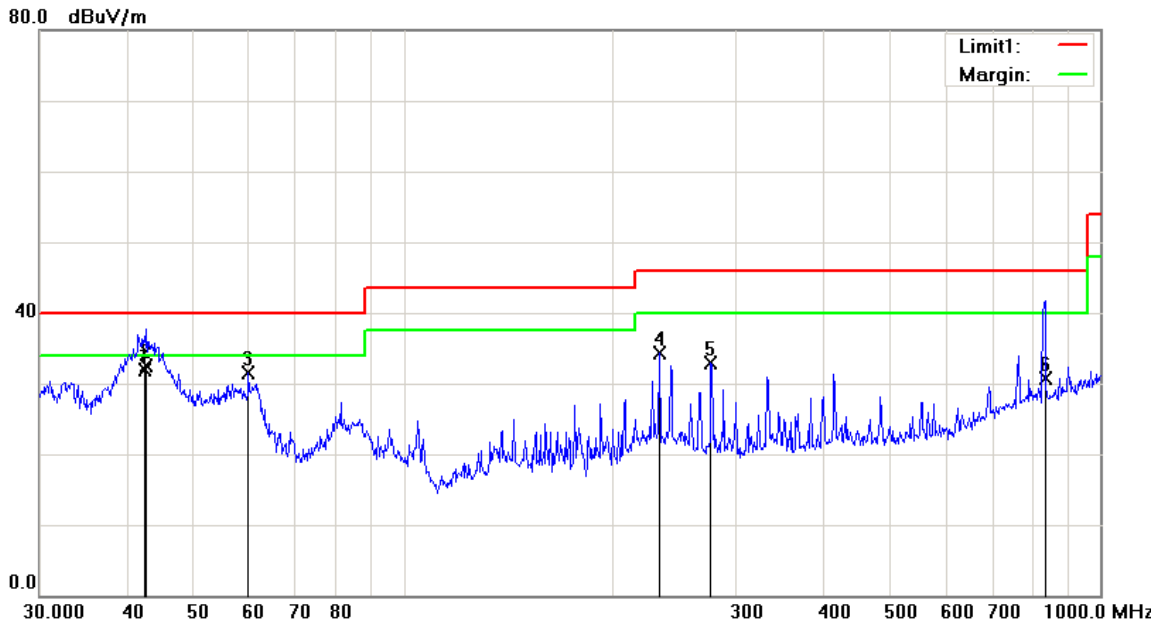
(Below 1GHz)



Test Data

Horizontal Polarity Plot @3m

No.	P/L	Frequency (MHz)	Reading (dBμV/m)	Detector	Corrected (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Degree (°)
1	H	32.9791	31.66	peak	-2.45	29.21	40.00	-10.79	200	297
2	H	44.4308	32.34	peak	-1.17	31.17	40.00	-8.83	200	229
3	H	138.3873	39.01	peak	-8.45	30.56	43.50	-12.94	200	192
4	H	191.7450	40.77	peak	-9.14	31.63	43.50	-11.87	200	19
5	H	232.5318	45.54	peak	-9.04	36.50	46.00	-9.50	100	269
6	H	831.1175	34.79	QP	3.57	38.36	46.00	-7.64	200	229



Test Data

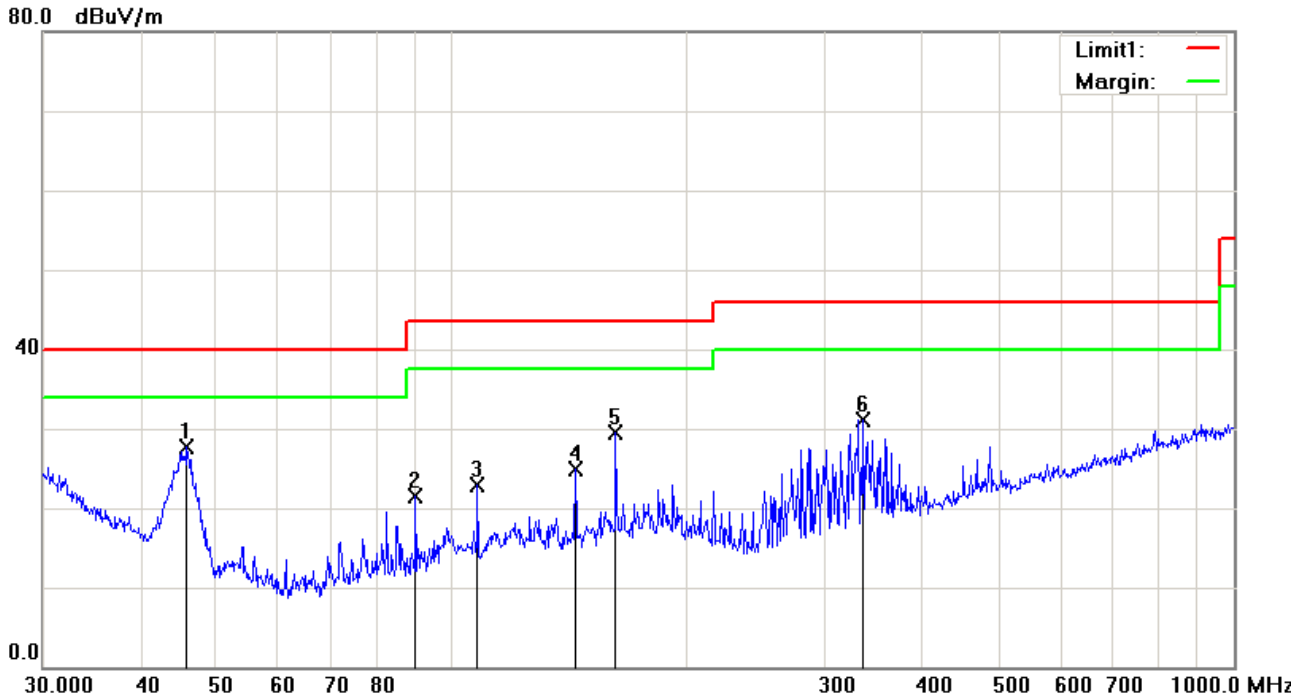
Vertical Polarity Plot @3m

No.	P/L	Frequency (MHz)	Reading (dBµV/m)	Detector	Corrected (dB/m)	Result (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Degree (°)
1	V	42.4182	41.37	QP	-9.44	31.93	40.00	-8.07	100	334
2	V	42.6996	42.24	QP	-9.68	32.56	40.00	-7.44	100	207
3	V	59.8588	45.73	peak	-14.16	31.57	40.00	-8.43	100	8
4	V	233.3487	41.82	peak	-7.44	34.38	46.00	-11.62	200	179
5	V	276.1236	39.82	peak	-6.88	32.94	46.00	-13.06	200	51
6	V	832.4160	26.80	QP	3.83	30.63	46.00	-15.37	200	51

Note: The above 1GHz frequency was pre-scanned and the result which was 20dB lower than the limit line per 15.109 was not recorded.

Test Mode 2: Transmitting for BT Mode

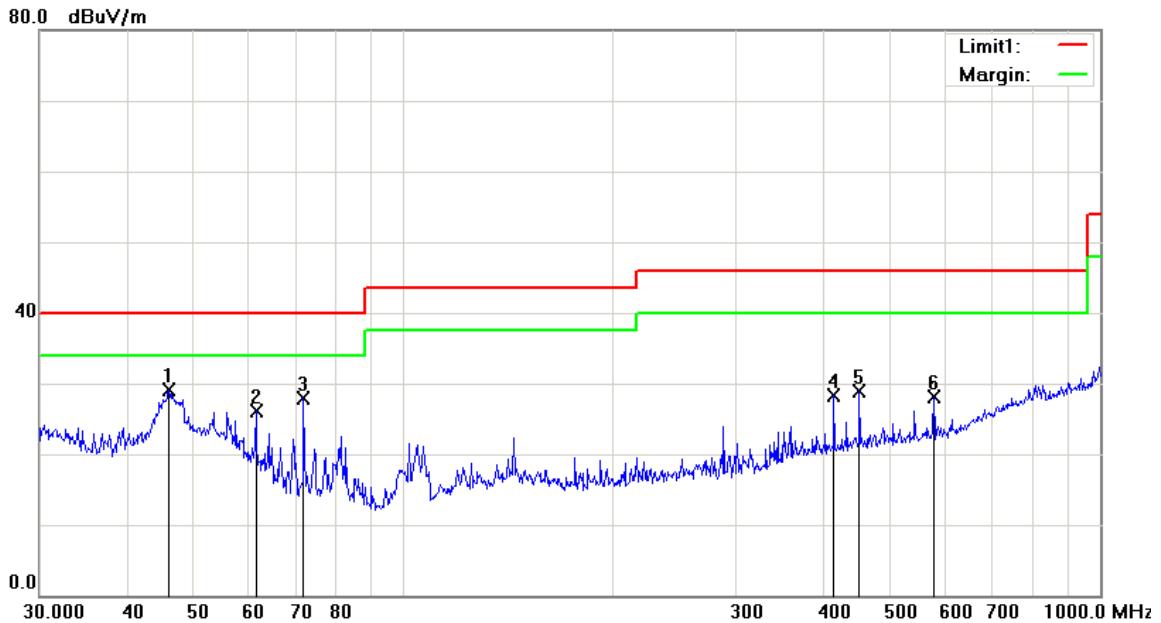
(Below 1GHz)



Test Data

Horizontal Polarity Plot @3m

No.	P/L	Frequency (MHz)	Reading (dBμV/m)	Detector	Corrected (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Degree (°)
1	H	45.8553	30.30	peak	-2.54	27.76	40.00	-12.24	200	218
2	H	89.9047	34.92	peak	-13.37	21.55	43.50	-21.95	200	1
3	H	107.8877	32.26	peak	-9.40	22.86	43.50	-20.64	200	143
4	H	143.8295	33.33	peak	-8.48	24.85	43.50	-18.65	200	203
5	H	162.0414	37.93	peak	-8.45	29.48	43.50	-14.02	200	49
6	H	336.0352	37.00	peak	-5.86	31.14	46.00	-14.86	100	280



Test Data

Vertical Polarity Plot @3m

No.	P/L	Frequency (MHz)	Reading (dBμV/m)	Detector	Corrected (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Degree (°)
1	V	46.0164	41.17	peak	-12.06	29.11	40.00	-10.89	100	169
2	V	61.3463	40.19	peak	-14.08	26.11	40.00	-13.89	100	334
3	V	71.8320	41.59	peak	-13.66	27.93	40.00	-12.07	100	15
4	V	414.7223	31.94	peak	-3.61	28.33	46.00	-17.67	100	229
5	V	451.1350	31.97	peak	-3.16	28.81	46.00	-17.19	100	124
6	V	576.6443	29.85	peak	-1.76	28.09	46.00	-17.91	100	150

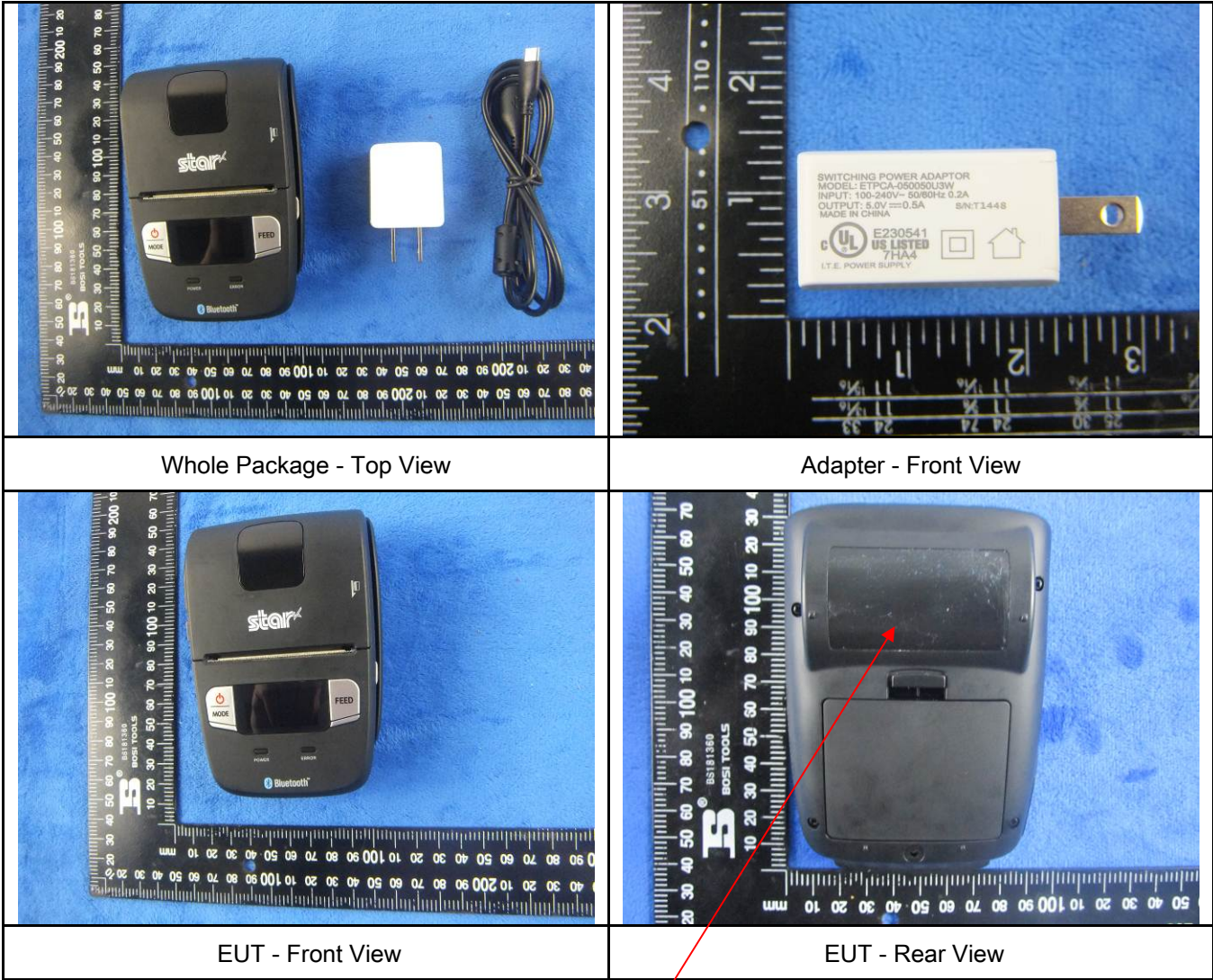
Note: The above 1GHz frequency was pre-scanned and the result which was 20dB lower than the limit line per 15.109 was not recorded.

Annex A. TEST INSTRUMENT

Instrument	Model	Serial #	Cal Date	Cal Due	In use
AC Line Conducted Emissions					
EMI test receiver	ESCS30	8471241027	09/18/2014	09/17/2015	<input checked="" type="checkbox"/>
Line Impedance Stabilization Network	LI-125A	191106	09/26/2014	09/25/2015	<input checked="" type="checkbox"/>
Line Impedance Stabilization Network	LI-125A	191107	09/26/2014	09/25/2015	<input checked="" type="checkbox"/>
LISN	ISN T800	34373	09/26/2014	09/25/2015	<input checked="" type="checkbox"/>
Transient Limiter	LIT-153	531118	09/02/2014	09/01/2015	<input checked="" type="checkbox"/>
Radiated Emissions					
EMI test receiver	ESL6	100262	09/18/2014	09/17/2015	<input checked="" type="checkbox"/>
OPT 010 AMPLIFIER (0.1-1300MHz)	8447E	2727A02430	09/02/2014	09/01/2015	<input checked="" type="checkbox"/>
Microwave Preamplifier (0.5 ~ 18GHz)	PAM-118	443008	09/02/2014	09/01/2015	<input checked="" type="checkbox"/>
Bilog Antenna (30MHz~6GHz)	JB6	A110712	09/22/2014	09/21/2015	<input checked="" type="checkbox"/>
Double Ridge Horn Antenna	AH-118	71259	09/25/2014	09/24/2015	<input checked="" type="checkbox"/>

Annex B. EUT And Test Setup Photographs

Annex B.i. Photograph: EUT External Photo

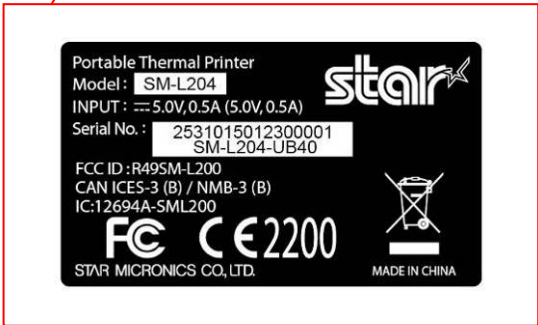


Whole Package - Top View

Adapter - Front View

EUT - Front View

EUT - Rear View





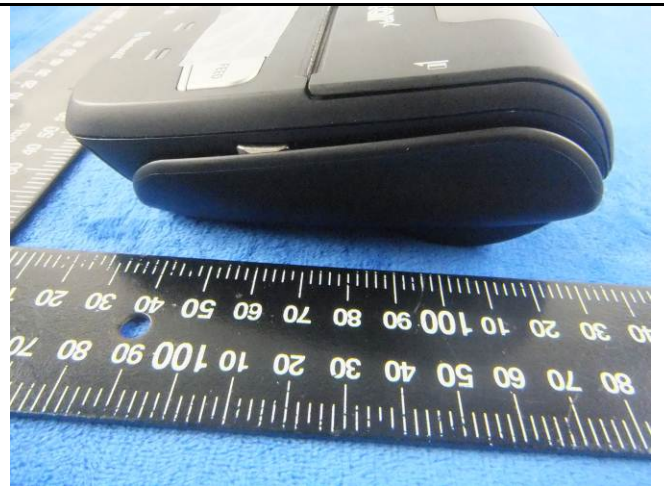
EUT - Top View



EUT - Bottom View



EUT - Left View



EUT - Right View

Annex B.ii. Photograph: EUT Internal Photo



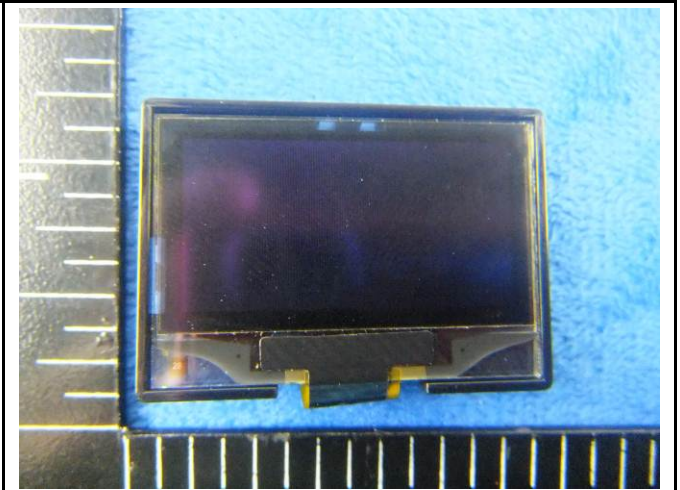
Cover Off - Top View 1



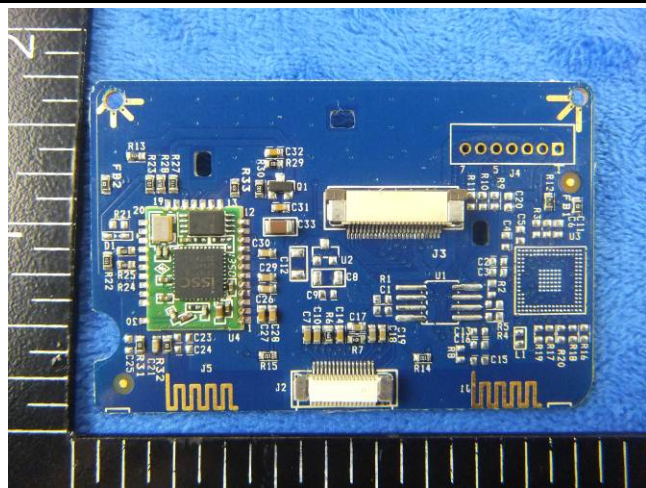
Cover Off - Top View 2



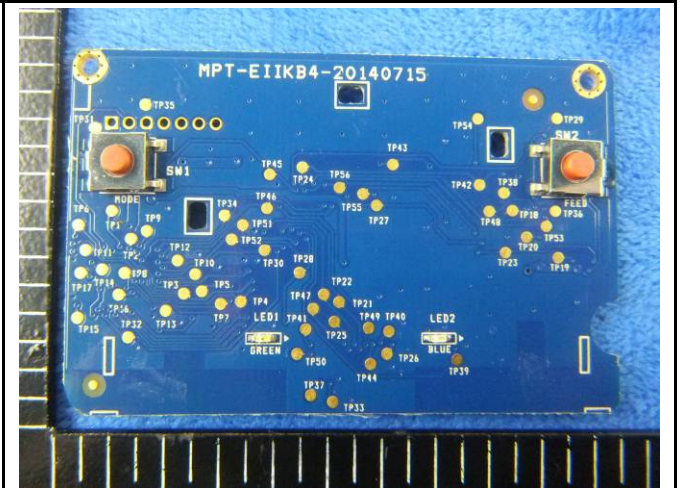
Battery - Top View



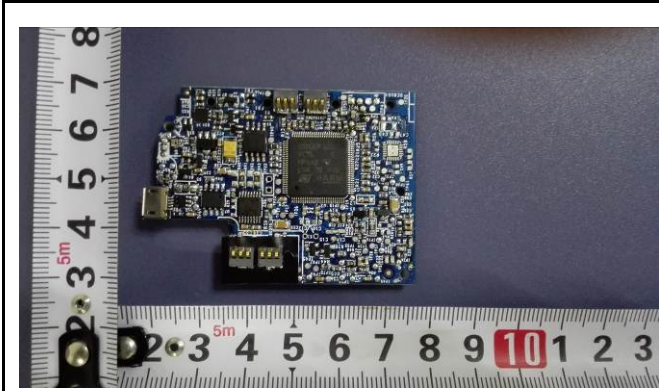
LCD - Front View



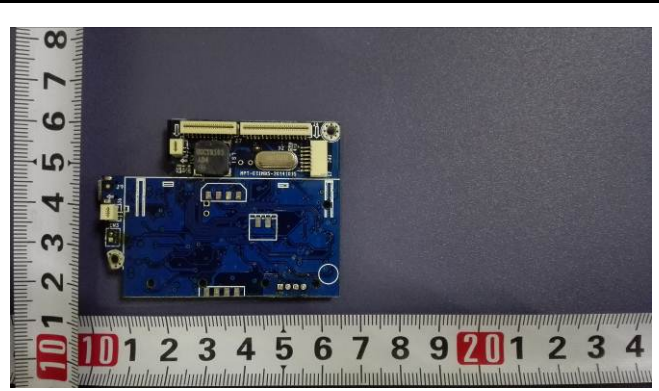
Mainboard 1 - Front View



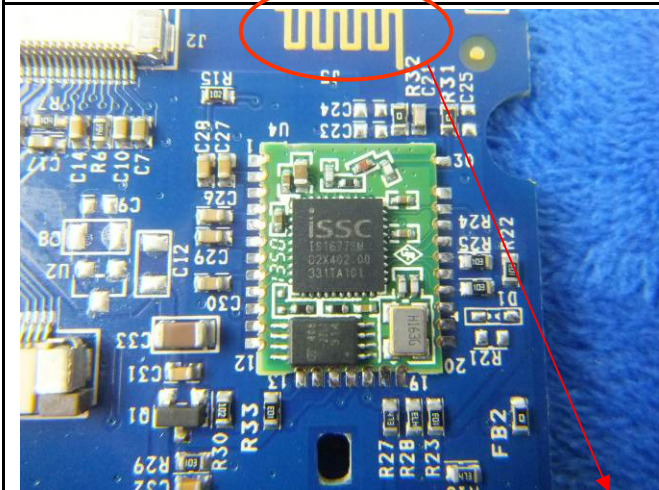
Mainboard 1 - Rear View



Mainboard 2 - Front View



Mainboard 2 - Rear View



RF Module - Front View

BT/BLE
 Antenna



Motor - Front View

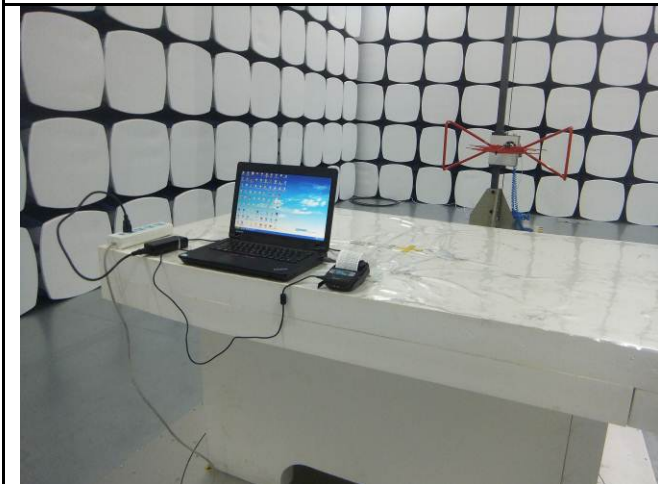
Annex B.iii. Photograph: Test Setup Photo



Conducted Emissions Test Setup – Front View



Conducted Emissions Test Setup – Side View



Radiated Spurious Emissions Test Setup Below 1GHz

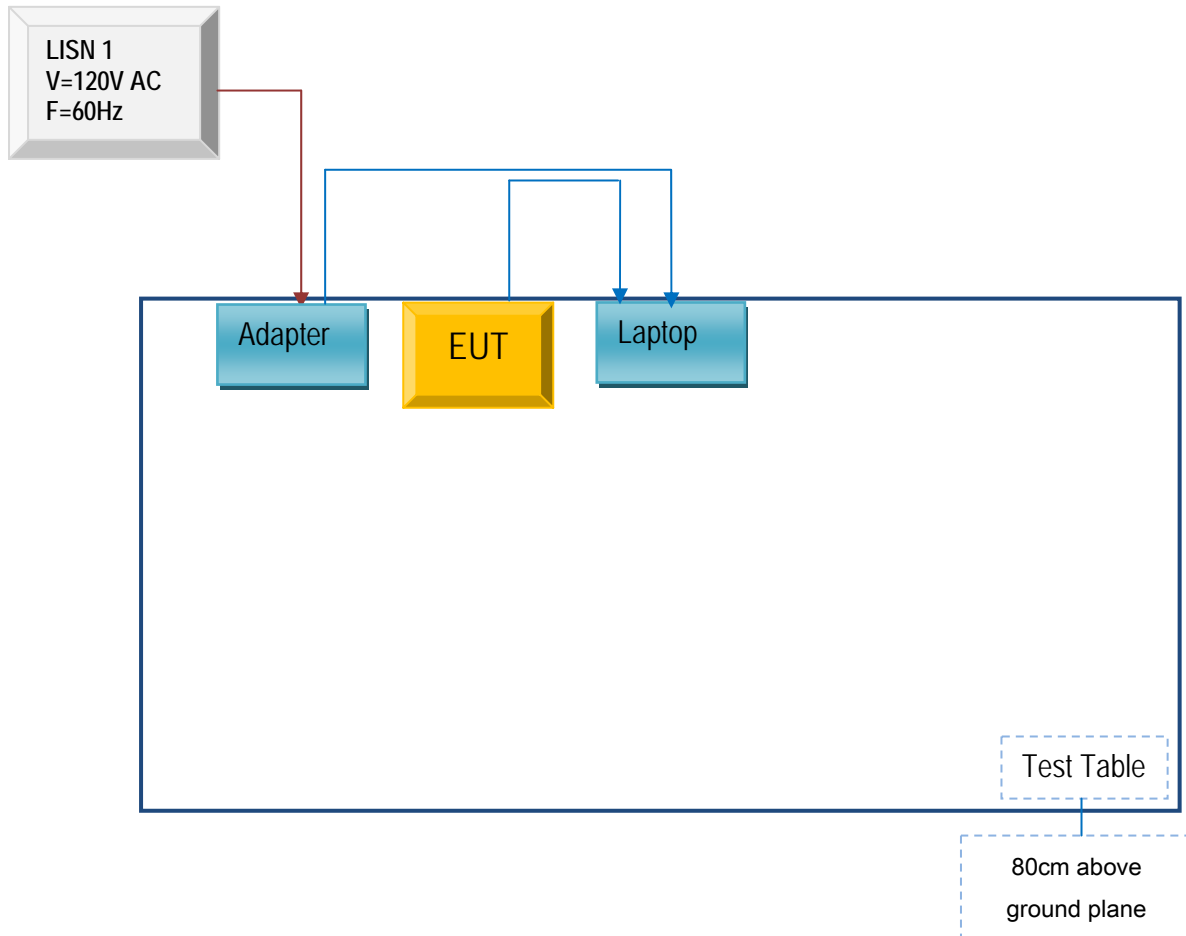


Radiated Spurious Emissions Test Setup Above
1GHz

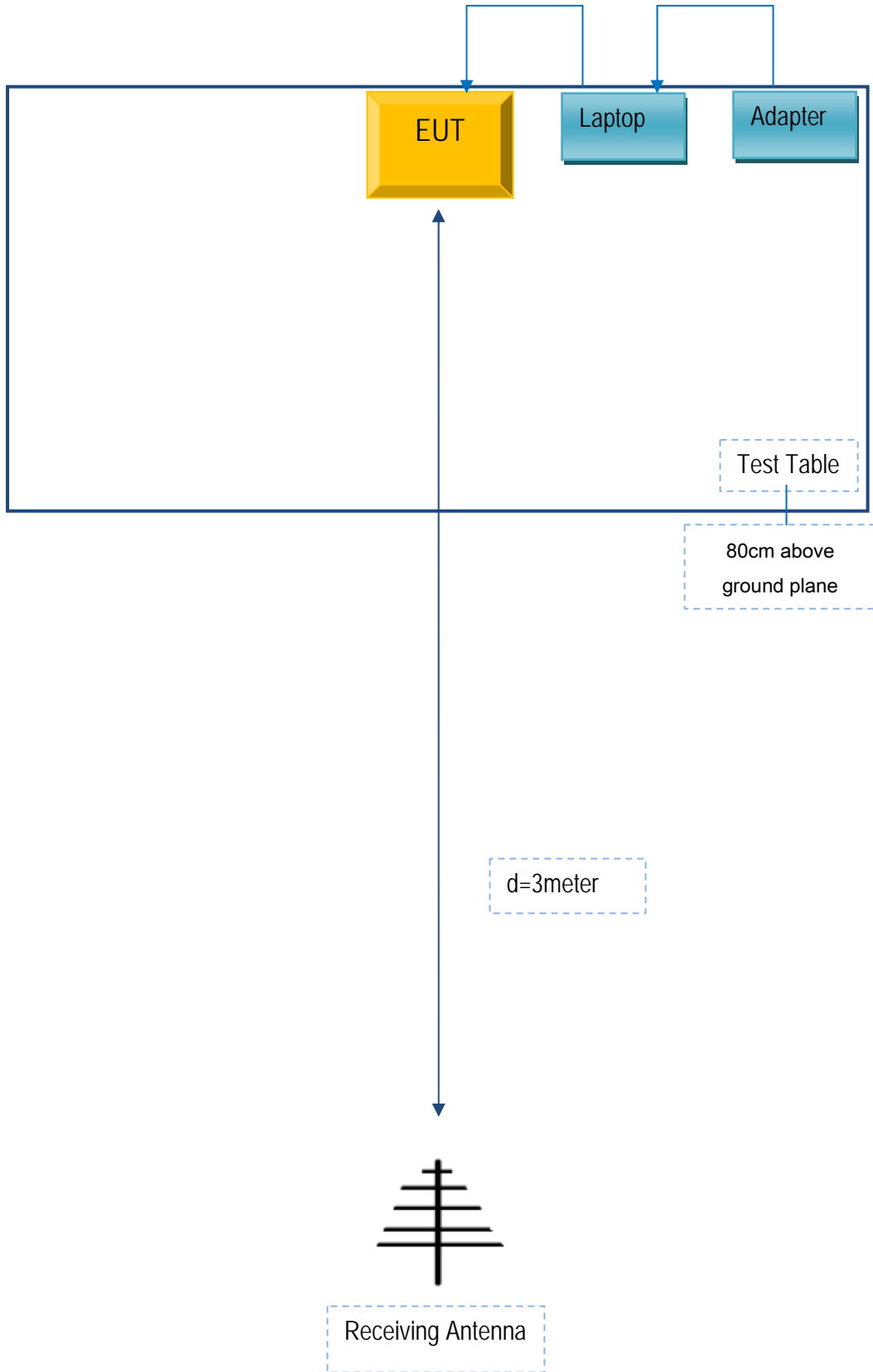
Annex C. TEST SETUP AND SUPPORTING EQUIPMENT

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.

Manufacturer	Equipment Description	Model	Calibration Date	Calibration Due Date
Lenovo	Lenovo Laptop	E40& 0579A52	N/A	N/A

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

Please see Attachment

Annex E. DECLARATION OF SIMILARITY

STAR MICRONICS CO., LTD.

To: SIEMIC , 775 Montague Expressway, Milpitas, CA 95035,USA

Declaration Letter

Dear Sir,

For our business issue and marketing requirement, we would like to list 2 model numbers on the **FCC/TELEC** certificates and reports, as following:

Model No.: SM-L204 / SM-L200

We declare that the difference of these is listed as below:

Main Model No	Serial Model No	Difference
SM-L204	SM-L200	SM-L204 has magnetic reader head ; There's no magnetic reader head in SM-L200.

Thank you!

Signature:

Tana

Printed name/title: Tsuyoshi Tanamori

Tel: +81-54-347-2107

Fax:+ 81-54-347-0121

Address: 20-10 NAKAYOSHIDA SURUGA-ku SHIZUOKA-shi SHIZUOKA JAPAN