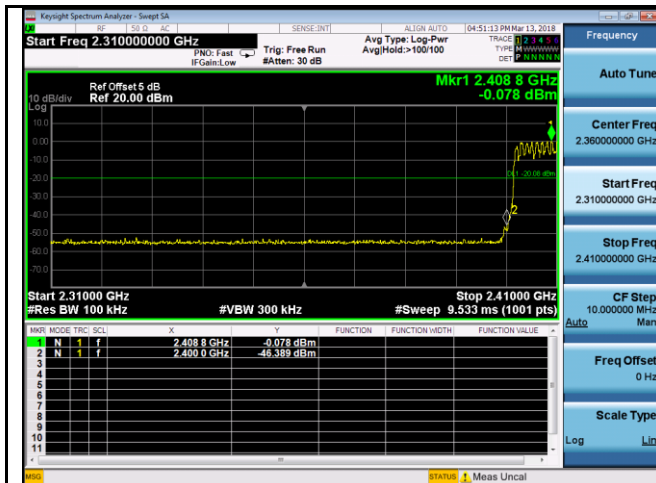
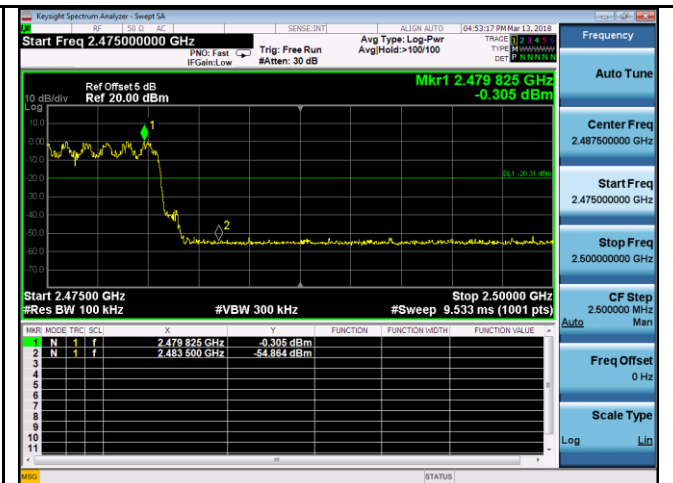


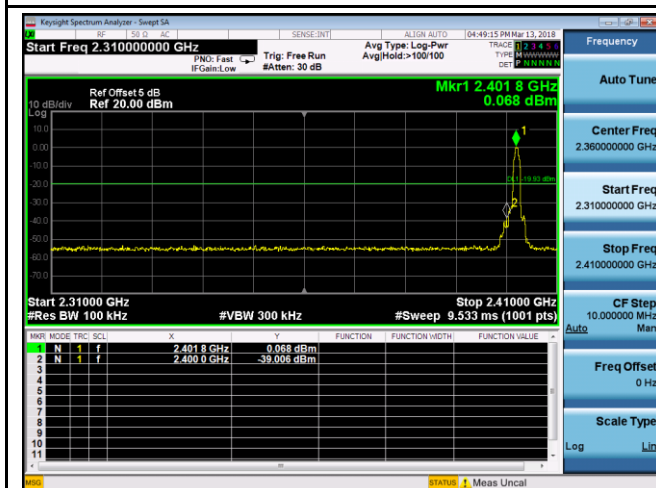
8-DPSK Mode:



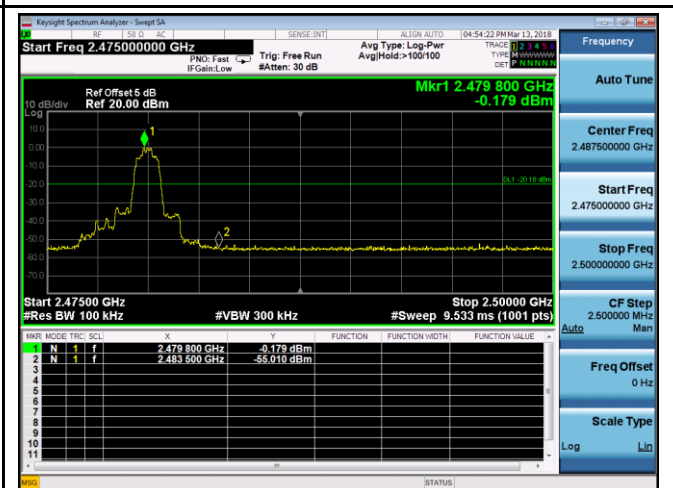
8DPSK-Hopping Left Side



8DPSK-Hopping Right Side



8DPSK-Left Side



8DPSK-Right Side

6.8 AC Power Line Conducted Emissions

Temperature	27 °C
Relative Humidity	55%
Atmospheric Pressure	1023mbar
Test date :	March 22, 2018
Tested By :	Aaron Liang

Requirement(s):

Spec	Item	Requirement	Applicable														
47CFR§15.207, RSS210 (A8.1)	a)	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>		Frequency ranges (MHz)	Limit (dBµV)		QP	Average	0.15 ~ 0.5	66 – 56	56 – 46	0.5 ~ 5	56	46	5 ~ 30	60	50
		Frequency ranges (MHz)			Limit (dBµV)												
				QP	Average												
		0.15 ~ 0.5		66 – 56	56 – 46												
		0.5 ~ 5		56	46												
5 ~ 30	60	50															

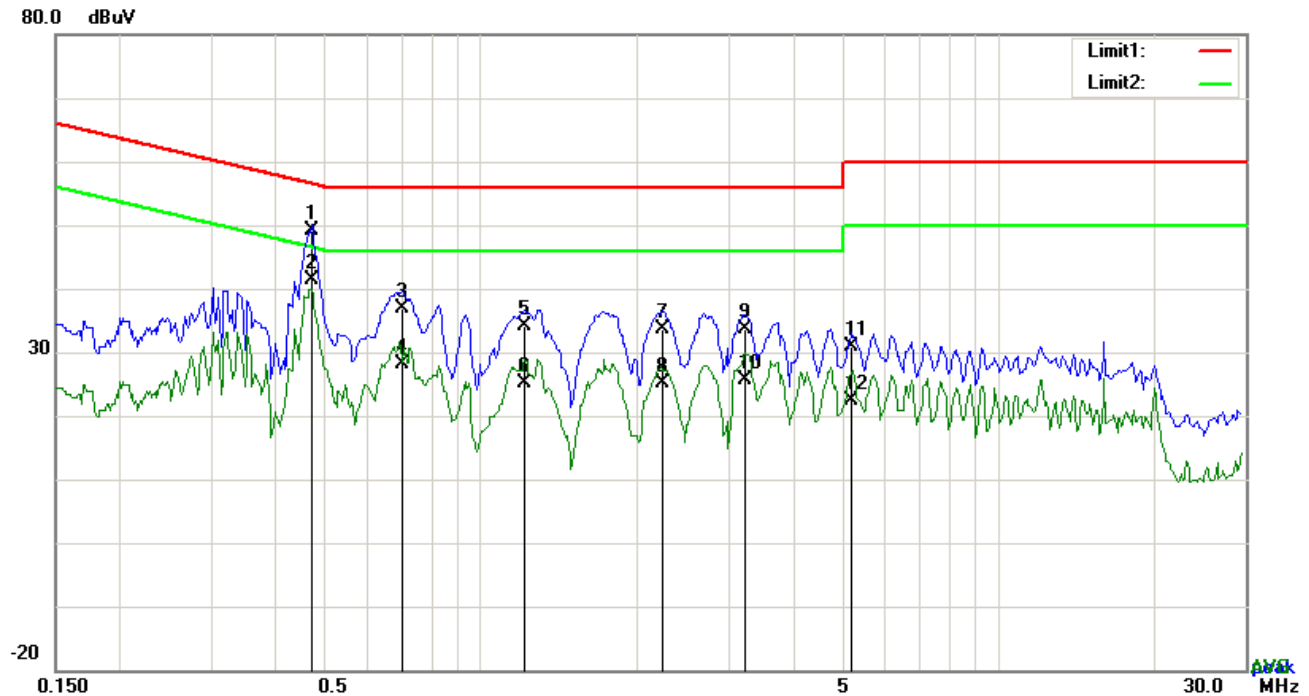
Test Setup	Note: 1. Support units were connected to second LISN. 2. Both of LISNs (AMN) are 80cm from EUT and at least 80cm from other units and other metal planes support units.
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Procedure	- The EUT and supporting equipment were set up in accordance 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. - The RF OUT of the EUT LISN was connected to the EMI test receiver via a low-loss
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	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	☒ Pass ☐ Fail

Test Data ☒ Yes ☐ N/A
 Test Plot ☒ Yes (See below) ☐ N/A

Test Mode: Bluetooth Mode

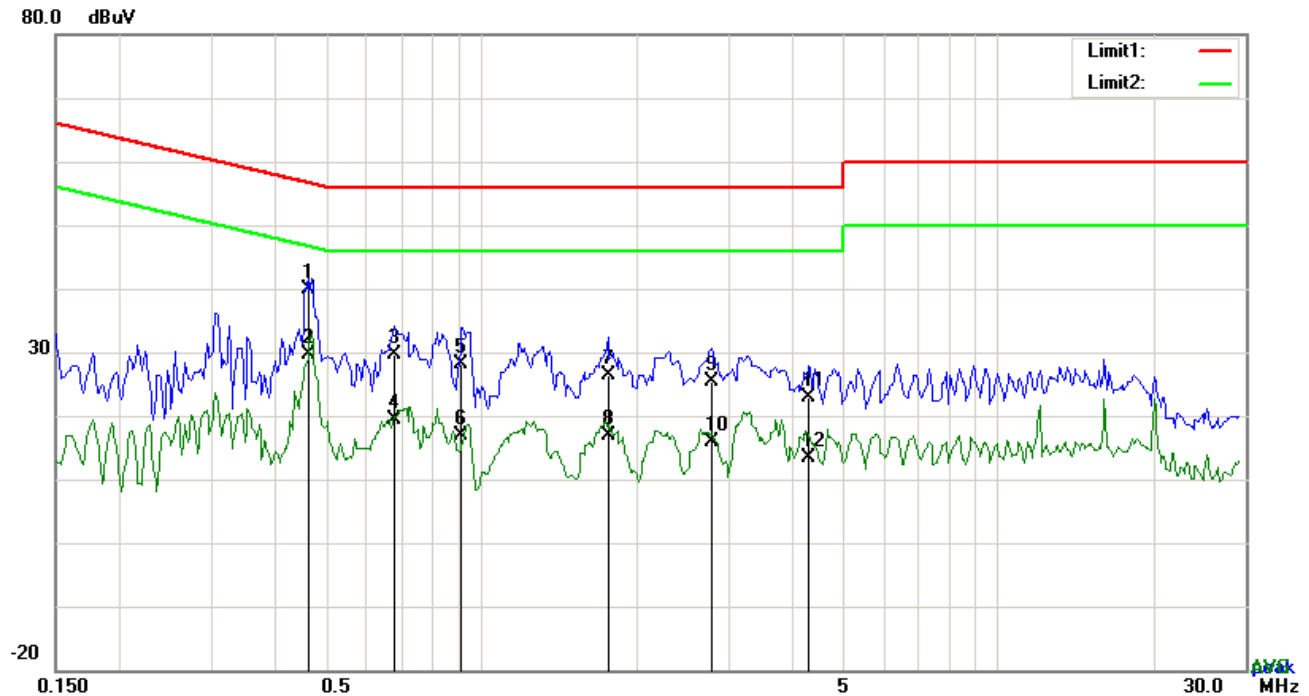


Test Data

Phase Line Plot at 120Vac, 60Hz

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
		(MHz)	(dBuV)		(dB)	(dBuV)	(dBuV)	(dB)
1	L1	0.4698	39.19	QP	10.03	49.22	56.52	-7.30
2	L1	0.4698	31.27	AVG	10.03	41.30	46.52	-5.22
3	L1	0.7038	26.95	QP	10.03	36.98	56.00	-19.02
4	L1	0.7038	18.06	AVG	10.03	28.09	46.00	-17.91
5	L1	1.2108	24.22	QP	10.03	34.25	56.00	-21.75
6	L1	1.2108	15.06	AVG	10.03	25.09	46.00	-20.91
7	L1	2.2404	23.68	QP	10.05	33.73	56.00	-22.27
8	L1	2.2404	15.13	AVG	10.05	25.18	46.00	-20.82
9	L1	3.2340	23.57	QP	10.06	33.63	56.00	-22.37
10	L1	3.2340	15.55	AVG	10.06	25.61	46.00	-20.39
11	L1	5.2074	20.76	QP	10.08	30.84	60.00	-29.16
12	L1	5.2074	12.26	AVG	10.08	22.34	50.00	-27.66

Test Mode: Bluetooth Mode

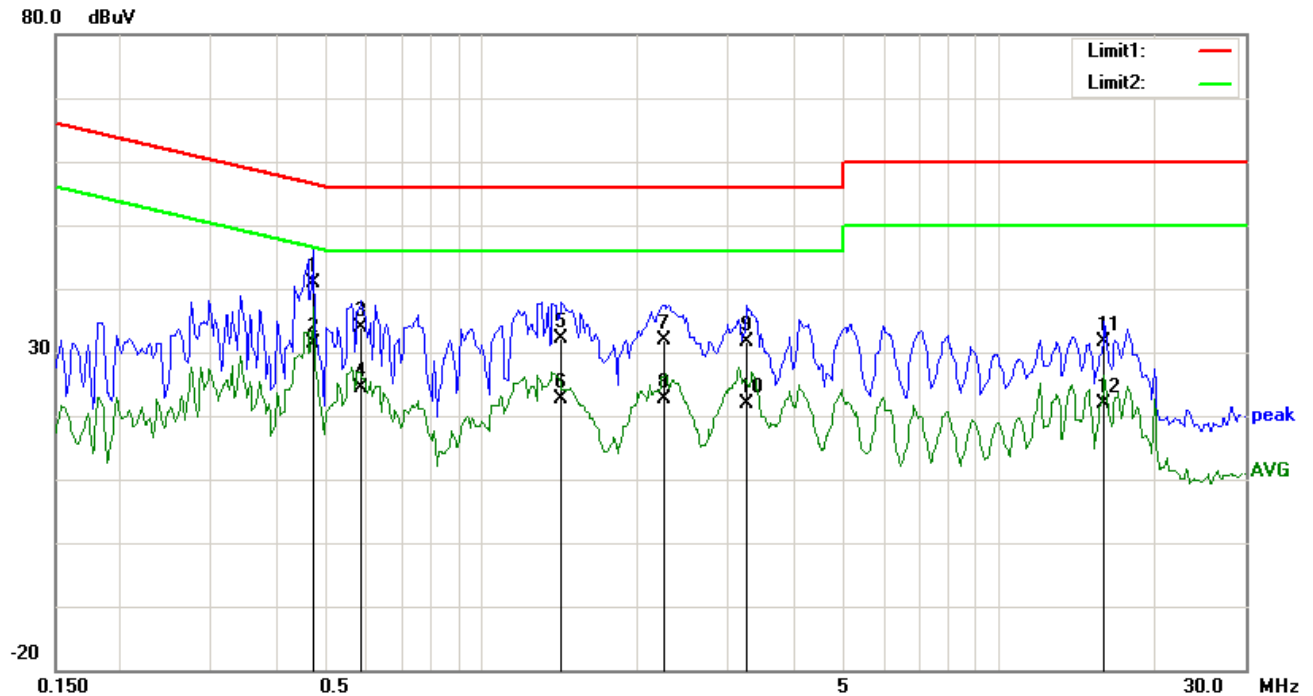


Test Data

Phase Neutral Plot at 120Vac, 60Hz

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
		(MHz)	(dBuV)		(dB)	(dBuV)	(dBuV)	(dB)
1	N	0.4620	29.84	QP	10.02	39.86	56.66	-16.80
2	N	0.4620	19.50	AVG	10.02	29.52	46.66	-17.14
3	N	0.6765	19.70	QP	10.02	29.72	56.00	-26.28
4	N	0.6765	9.42	AVG	10.02	19.44	46.00	-26.56
5	N	0.9183	18.17	QP	10.03	28.20	56.00	-27.80
6	N	0.9183	6.76	AVG	10.03	16.79	46.00	-29.21
7	N	1.7529	16.33	QP	10.04	26.37	56.00	-29.63
8	N	1.7529	6.94	AVG	10.04	16.98	46.00	-29.02
9	N	2.7825	15.38	QP	10.05	25.43	56.00	-30.57
10	N	2.7825	5.83	AVG	10.05	15.88	46.00	-30.12
11	N	4.3104	12.88	QP	10.06	22.94	56.00	-33.06
12	N	4.3104	3.28	AVG	10.06	13.34	46.00	-32.66

Test Mode: Bluetooth Mode

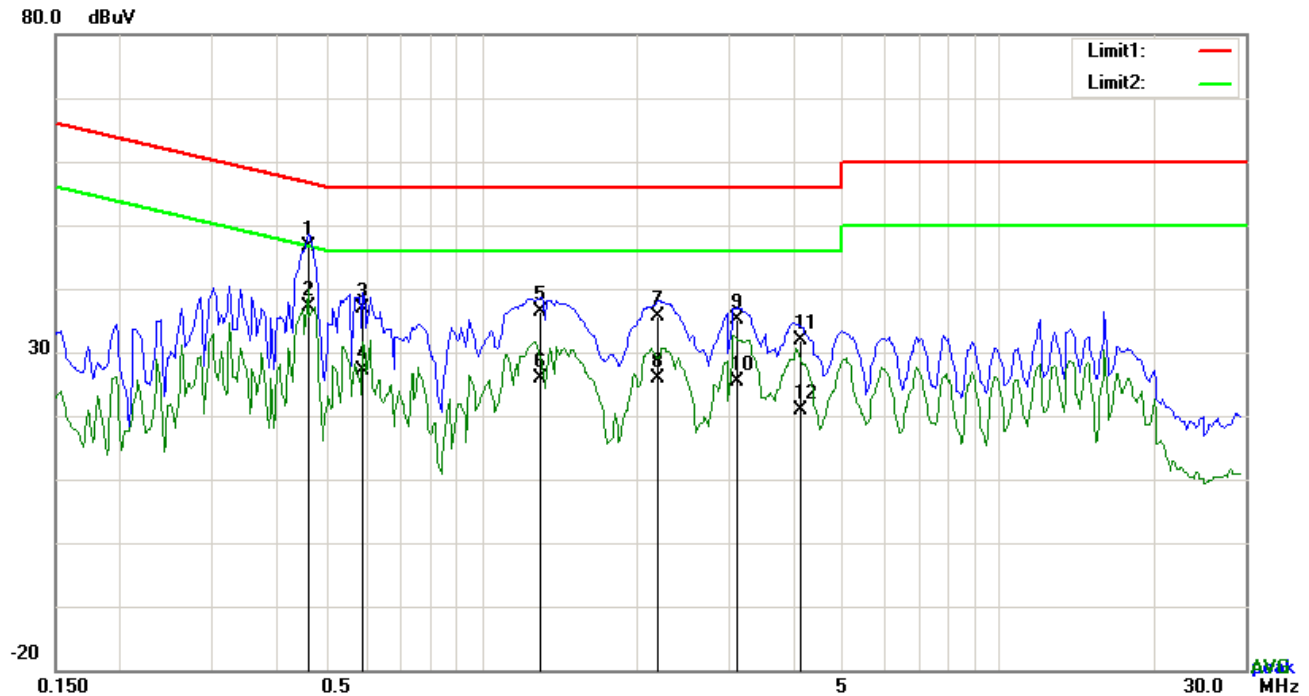


Test Data

Phase Line Plot at 240Vac, 60Hz

No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
		(MHz)	(dBuV)		(dB}	(dBuV)	(dBuV)	(dB)
1	L1	0.4737	30.85	QP	10.03	40.88	56.45	-15.57
2	L1	0.4737	21.26	AVG	10.03	31.29	46.45	-15.16
3	L1	0.5868	23.85	QP	10.03	33.88	56.00	-22.12
4	L1	0.5868	14.43	AVG	10.03	24.46	46.00	-21.54
5	L1	1.4292	22.14	QP	10.04	32.18	56.00	-23.82
6	L1	1.4292	12.70	AVG	10.04	22.74	46.00	-23.26
7	L1	2.2560	21.84	QP	10.05	31.89	56.00	-24.11
8	L1	2.2560	12.55	AVG	10.05	22.60	46.00	-23.40
9	L1	3.2583	21.64	QP	10.06	31.70	56.00	-24.30
10	L1	3.2583	11.77	AVG	10.06	21.83	46.00	-24.17
11	L1	16.0026	21.48	QP	10.24	31.72	60.00	-28.28
12	L1	16.0026	11.55	AVG	10.24	21.79	50.00	-28.21

Test Mode: Bluetooth Mode



Test Data

Phase Neutral Plot at 240Vac, 60Hz

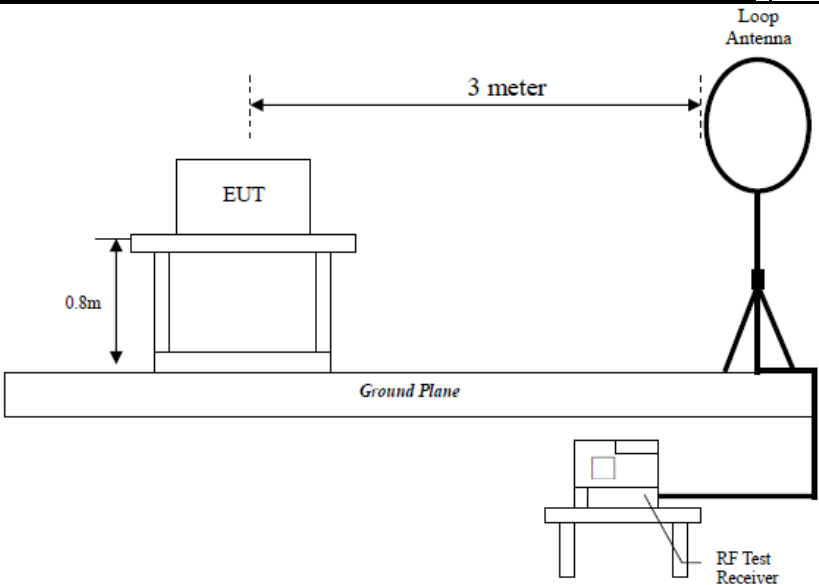
No.	P/L	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
		(MHz)	(dBuV)		(dB)	(dBuV)	(dBuV)	(dB)
1	N	0.4620	36.62	QP	10.02	46.64	56.66	-10.02
2	N	0.4620	27.05	AVG	10.02	37.07	46.66	-9.59
3	N	0.5907	26.94	QP	10.02	36.96	56.00	-19.04
4	N	0.5907	17.16	AVG	10.02	27.18	46.00	-18.82
5	N	1.2966	26.39	QP	10.03	36.42	56.00	-19.58
6	N	1.2966	15.73	AVG	10.03	25.76	46.00	-20.24
7	N	2.1975	25.71	QP	10.04	35.75	56.00	-20.25
8	N	2.1975	15.76	AVG	10.04	25.80	46.00	-20.20
9	N	3.1248	25.11	QP	10.05	35.16	56.00	-20.84
10	N	3.1248	15.31	AVG	10.05	25.36	46.00	-20.64
11	N	4.1356	21.89	QP	10.06	31.95	56.00	-24.05
12	N	4.1356	10.81	AVG	10.06	20.87	46.00	-25.13

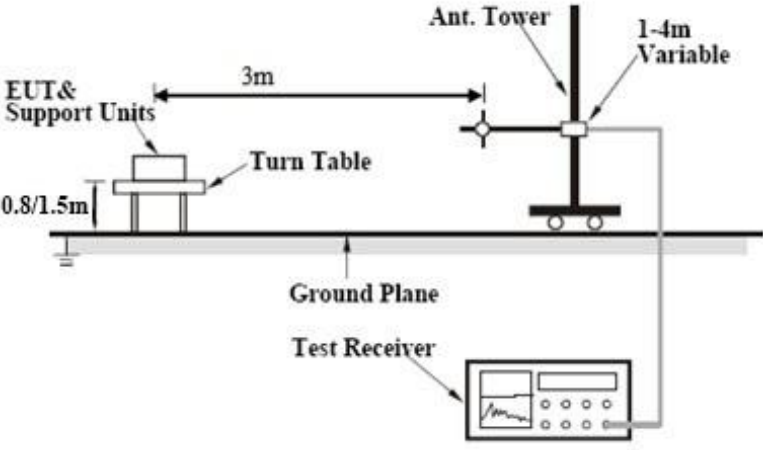
6.9 Radiated Emissions & Restricted Band

Temperature	27 °C
Relative Humidity	55%
Atmospheric Pressure	1023mbar
Test date :	March 22, 2018
Tested By :	Aaron Liang

Requirement(s):

Spec	Item	Requirement	Applicable																
47CFR§15.205, §15.209, §15.247(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																	
		<table><tr><th>Frequency range (MHz)</th><th>Field Strength (µV/m)</th></tr><tr><td>0.009~0.490</td><td>2400/F(KHz)</td></tr><tr><td>0.490~1.705</td><td>24000/F(KHz)</td></tr><tr><td>1.705~30.0</td><td>30</td></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>		Frequency range (MHz)	Field Strength (µV/m)	0.009~0.490	2400/F(KHz)	0.490~1.705	24000/F(KHz)	1.705~30.0	30	30 – 88	100	88 – 216	150	216 960	200	Above 960	500
		Frequency range (MHz)		Field Strength (µV/m)															
		0.009~0.490		2400/F(KHz)															
		0.490~1.705		24000/F(KHz)															
		1.705~30.0		30															
		30 – 88		100															
		88 – 216		150															
		216 960		200															
		Above 960		500															

Test Setup	 The diagram illustrates the test setup for radiated emissions. It shows an Equipment Under Test (EUT) placed on a stand that is 0.8 meters high. A Loop Antenna is positioned 3 meters away from the EUT. The entire setup is on a Ground Plane. An RF Test Receiver is connected to the antenna.
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Procedure	- The EUT was switched on and allowed to warm up to its normal operating condition. - 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: - Vertical or horizontal polarization (whichever gave the higher emission level over a full rotation of the EUT) was chosen. - The EUT was then rotated to the direction that gave the maximum emission. - Finally, the antenna height was adjusted to the height that gave the maximum emission. - The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasiy Peak detection at frequency below 1GHz. - 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 is 10Hz with Peak detection for Average Measurement as below at frequency above 1GHz. - Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were measured.
Remark	
Result	☒ Pass ☐ Fail

Test Data ☒ Yes ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

Test Result:

Test Mode:	Transmitting Mode
------------	-------------------

Frequency range: 9KHz - 30MHz

Freq.	Detection	Factor	Reading	Result	Limit@3m	Margin
(MHz)	value	(dB/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)
--	--	--	--	--	--	>20
--	--	--	--	--	--	>20

Note:

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

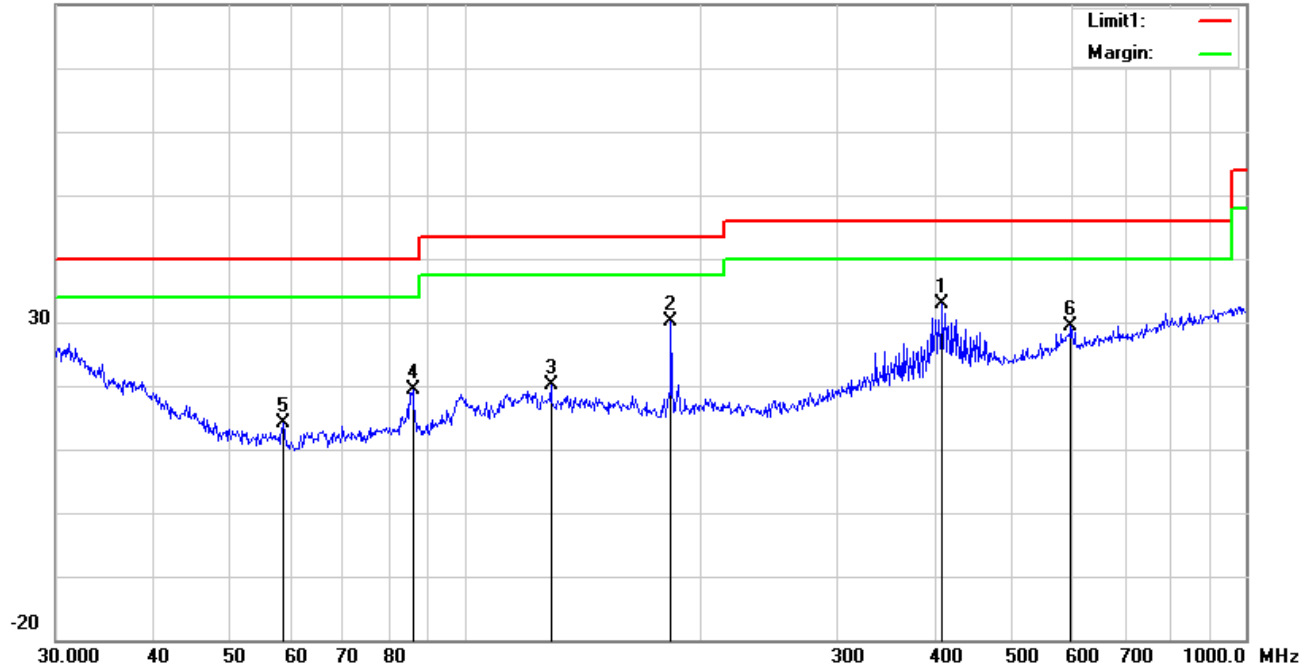
Distance extrapolation factor = $40 \log (\text{specific distance}/\text{test distance})$ (dB);

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

Test Mode: Bluetooth Mode

30MHz -1GHz

80.0 dBuV/m



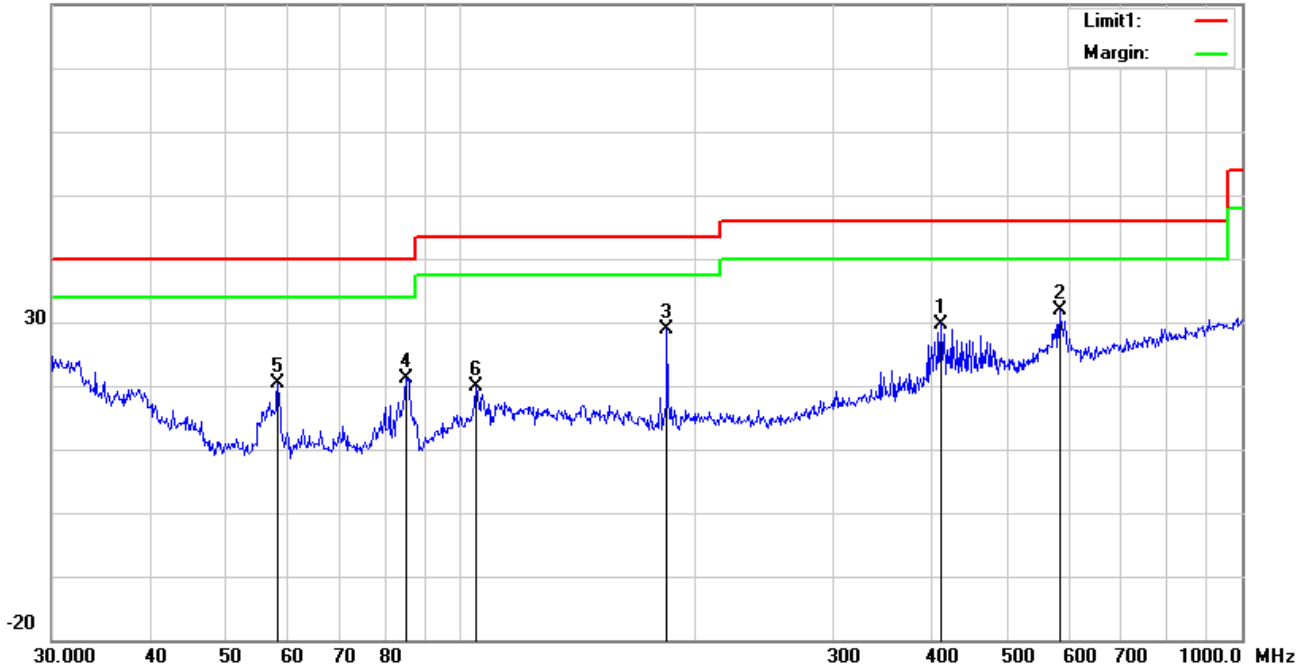
Test Data

Horizontal Polarity Plot @3m

No.	P/L	Frequency	Reading	Detect or	Ant_F	PA_G	Cab_L	Result	Limit	Margin	Height	Degr ee
		(MHz)	(dBuV/m)		(dB/m)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	()
1	H	408.9460	37.03	peak	15.88	21.99	2.03	32.95	46.00	-13.05	100	152
2	H	183.8440	39.73	peak	11.21	22.27	1.43	30.10	43.50	-13.40	100	356
3	H	129.0146	28.00	peak	13.31	22.38	1.20	20.13	43.50	-23.37	100	264
4	H	85.8984	32.88	peak	7.84	22.36	1.05	19.41	40.00	-20.59	100	160
5	H	58.6126	28.33	peak	7.45	22.41	0.76	14.13	40.00	-25.87	100	13
6	H	597.2234	29.32	peak	19.06	21.59	2.49	29.28	46.00	-16.72	100	33

30MHz -1GHz

80.0 dBuV/m



Test Data

Vertical Polarity Plot @3m

No.	P/L	Frequency	Reading	Detect or	Ant_F	PA_G	Cab_L	Result	Limit	Margin	Height	Degr ee
		(MHz)	(dBuV/m)		(dB/m)	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	()
1	V	411.8240	33.76	peak	15.94	21.99	2.04	29.75	46.00	-16.25	100	291
2	V	584.7895	32.20	peak	18.89	21.61	2.49	31.97	46.00	-14.03	100	124
3	V	183.8440	38.39	peak	11.21	22.27	1.43	28.76	43.50	-14.74	100	293
4	V	85.2981	34.54	peak	7.81	22.37	1.06	21.04	40.00	-18.96	100	194
5	V	58.4074	34.54	peak	7.48	22.41	0.76	20.37	40.00	-19.63	100	117
6	V	104.9033	29.82	peak	11.26	22.33	1.14	19.89	43.50	-23.61	100	254

Above 1GHz

Test Mode:	Transmitting Mode
------------	-------------------

Frequency	Meter Reading	Antenna Factor	Cable loss	Preamplifier factor	Emission Level	Limits	Margin	Detector	Polarity
(MHz)	(dBμV)	(dB)	(dB)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	(PK/AV)	(H/V)
Low Channel:GFSK Mode(Worst Case)-2402MHz									
2390	39.36	28.72	3.36	26.32	45.12	74	-28.88	peak	Vertical
4804	28.39	32.94	3.98	27.49	37.82	54	-16.18	Average	Vertical
4804	38.55	32.94	3.98	27.49	47.98	74	-26.02	peak	Vertical
7206	32.19	25.28	5.51	27.94	35.04	54	-18.96	Average	Vertical
7206	41.49	25.28	5.51	27.94	44.34	74	-29.66	peak	Vertical
2390	40.07	28.72	3.36	26.32	45.83	74	-28.17	peak	Horizontal
4804	30.68	32.94	3.98	27.49	40.11	54	-13.89	Average	Horizontal
4804	41.43	32.94	3.98	27.49	50.86	74	-23.14	peak	Horizontal
7206	31.81	25.28	5.51	27.94	34.66	54	-19.34	Average	Horizontal
7206	43.11	25.28	5.51	27.94	45.96	74	-28.04	peak	Horizontal
Middle Channel:GFSK Mode(Worst Case)-2441MHz									
4882	30.10	32.11	4.04	27.53	38.72	54	-15.28	Average	Vertical
4882	38.34	32.11	4.04	27.53	46.96	74	-27.04	peak	Vertical
7323	29.57	24.33	5.58	27.96	31.52	54	-22.48	Average	Vertical
7323	40.24	24.33	5.58	27.96	42.19	74	-31.81	peak	Vertical
4882	30.40	32.11	4.04	27.53	39.02	54	-14.98	Average	Horizontal
4882	40.47	32.11	4.04	27.53	49.09	74	-24.91	peak	Horizontal
7323	34.63	24.33	5.58	27.96	36.58	54	-17.42	Average	Horizontal
7323	40.45	24.33	5.58	27.96	42.40	74	-31.60	peak	Horizontal
High Channel:GFSK Mode(Worst Case)-2480MHz									
2483.5	37.84	28.79	3.48	26.34	43.77	74	-30.23	peak	Vertical
4960	29.46	31.32	4.12	27.58	37.32	54	-16.68	Average	Vertical
4960	38.64	31.32	4.12	27.58	46.50	74	-27.50	peak	Vertical
7440	29.42	24.38	5.68	27.99	31.49	54	-22.51	Average	Vertical
7440	40.27	24.38	5.68	27.99	42.34	74	-31.66	peak	Vertical
2483.5	39.70	28.79	3.48	26.34	45.63	74	-28.37	peak	Horizontal
4960	29.76	31.32	4.12	27.58	37.62	54	-16.38	Average	Horizontal
4960	40.76	31.32	4.12	27.58	48.62	74	-25.38	peak	Horizontal
7440	33.19	24.38	5.68	27.99	35.26	54	-18.74	Average	Horizontal

Note:

1, The testing has been conformed to $10 \times 2480\text{MHz} = 24,800\text{MHz}$

2, All other emissions more than 30 dB below the limit

3, X-Axis, Y-Axis and Z-Axis were investigated. The results above show only the worst case.

4, The radiated spurious test above 18GHz is subcontracted to SIEMIC (Nanjing-China) Laboratories. and found 30dB below the limit at least.

Annex A. TEST INSTRUMENT

Instrument	Model	Serial #	Cal Date	Cal Due	In use
AC Line Conducted					
EMI test receiver	ESCS30	8471241027	09/15/2017	09/14/2018	☒
Line Impedance	LI-125A	191106	09/23/2017	09/22/2018	☒
Line Impedance	LI-125A	191107	09/23/2017	09/22/2018	☒
ISN	ISN T800	34373	09/23/2017	09/22/2018	☐
Transient Limiter	LIT-153	531118	08/30/2017	08/29/2018	☐
RF conducted test					
Agilent ESA-E SERIES	E4407B	MY45108319	09/15/2017	09/14/2018	☒
Power Splitter	1#	1#	08/30/2017	08/29/2018	☒
DC Power Supply	E3640A	MY40004013	09/15/2017	09/14/2018	☒
Radiated Emissions					
EMI test receiver	ESL6	100262	09/15/2017	09/14/2018	☒
Positioning Controller	UC3000	MF780208282	11/17/2017	11/16/2018	☒
OPT 010 AMPLIFIER (0.1-1300MHz)	8447E	2727A02430	08/30/2017	08/29/2018	☒
Microwave Preamplifier (1 ~ 26.5GHz)	8449B	3008A02402	03/23/2017	03/22/2018	☒
Horn Antenna	BBHA9170	3145226D1	09/27/2017	09/26/2018	☒
Active Antenna (9kHz-30MHz)	AL-130	121031	10/12/2017	10/11/2018	☒
Bilog Antenna (30MHz~6GHz)	JB6	A110712	09/19/2017	09/18/2018	☒
Double Ridge Horn Antenna (1 ~18GHz)	AH-118	71283	09/22/2017	09/21/2018	☒
Universal Radio Communication Tester	CMU200	121393	09/23/2017	09/22/2018	☒

Annex B. EUT And Test Setup Photographs

Annex B.i. Photograph: EUT External Photo

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

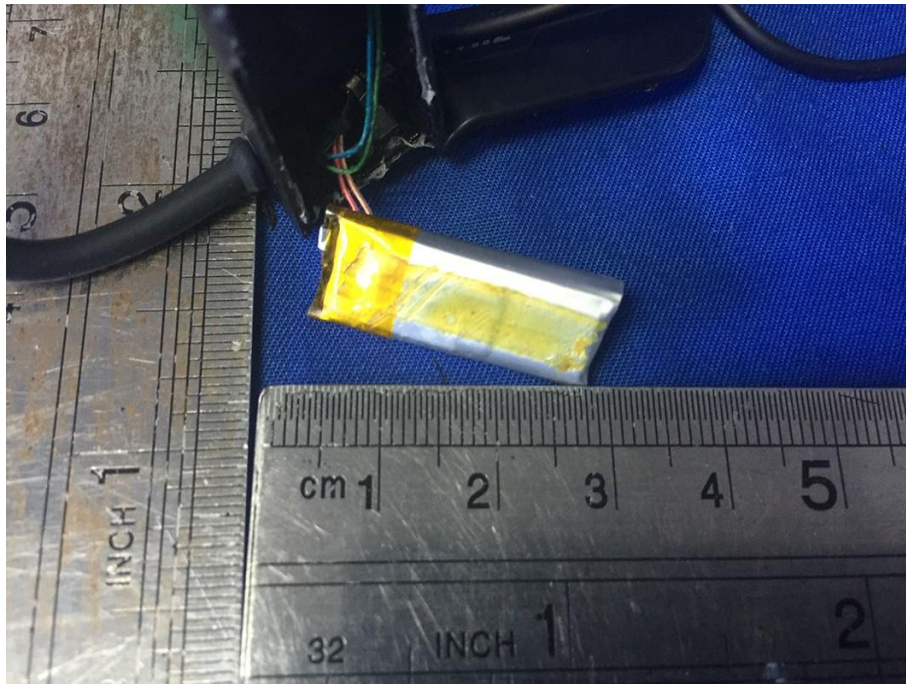
Cover Off - Top View



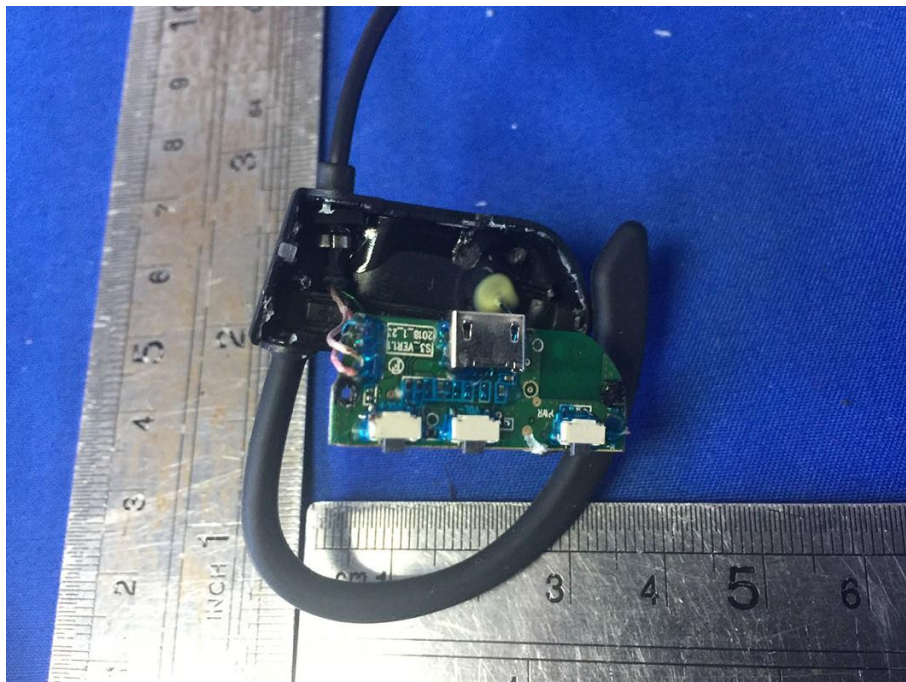
Battery - Front View



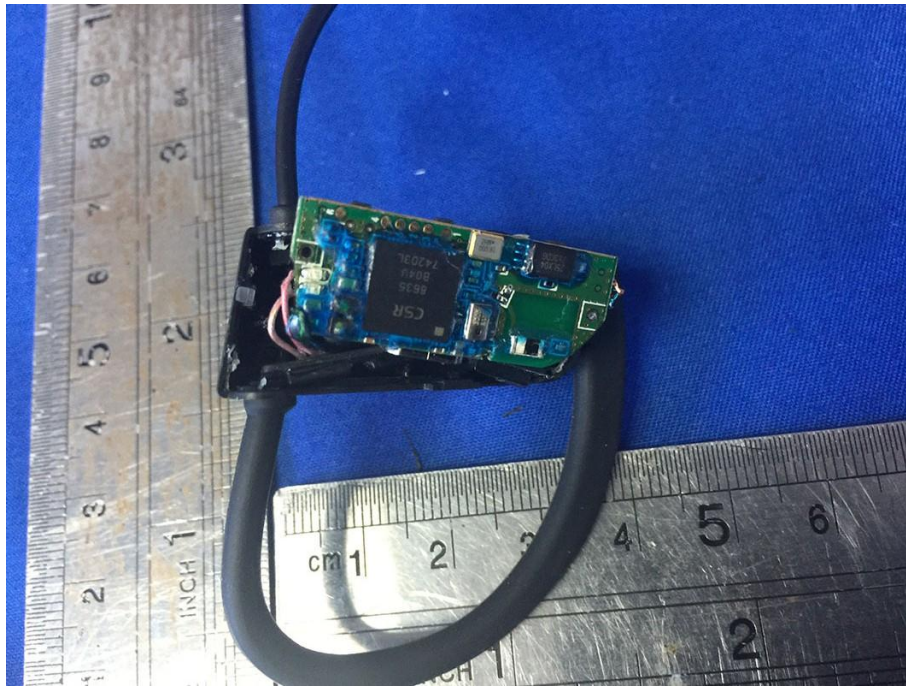
Battery - Rear View



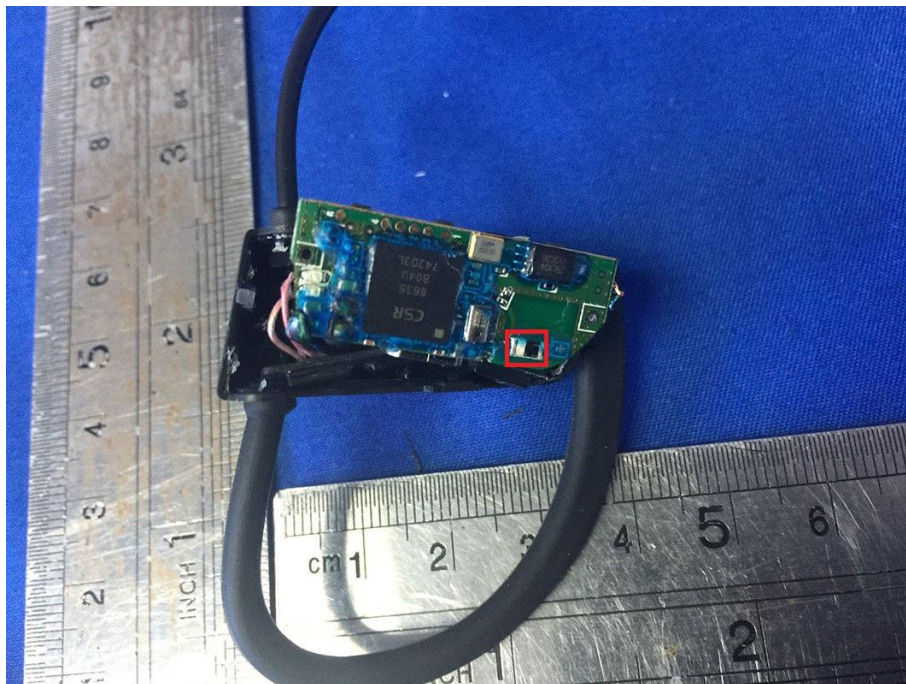
Mainboard - Front View



Mainboard – Rear View



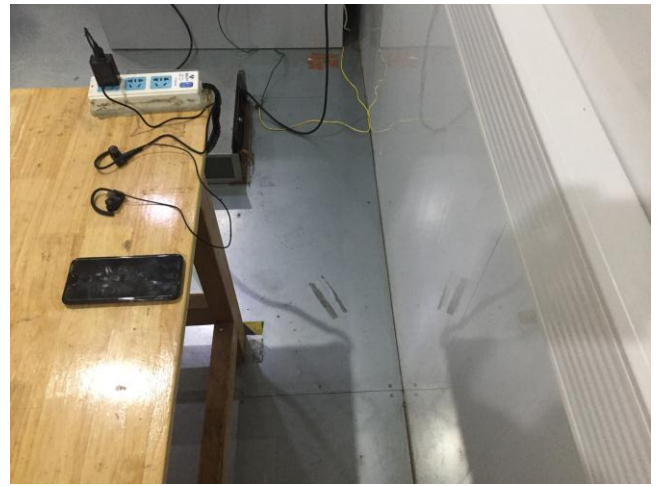
BT - Antenna View



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

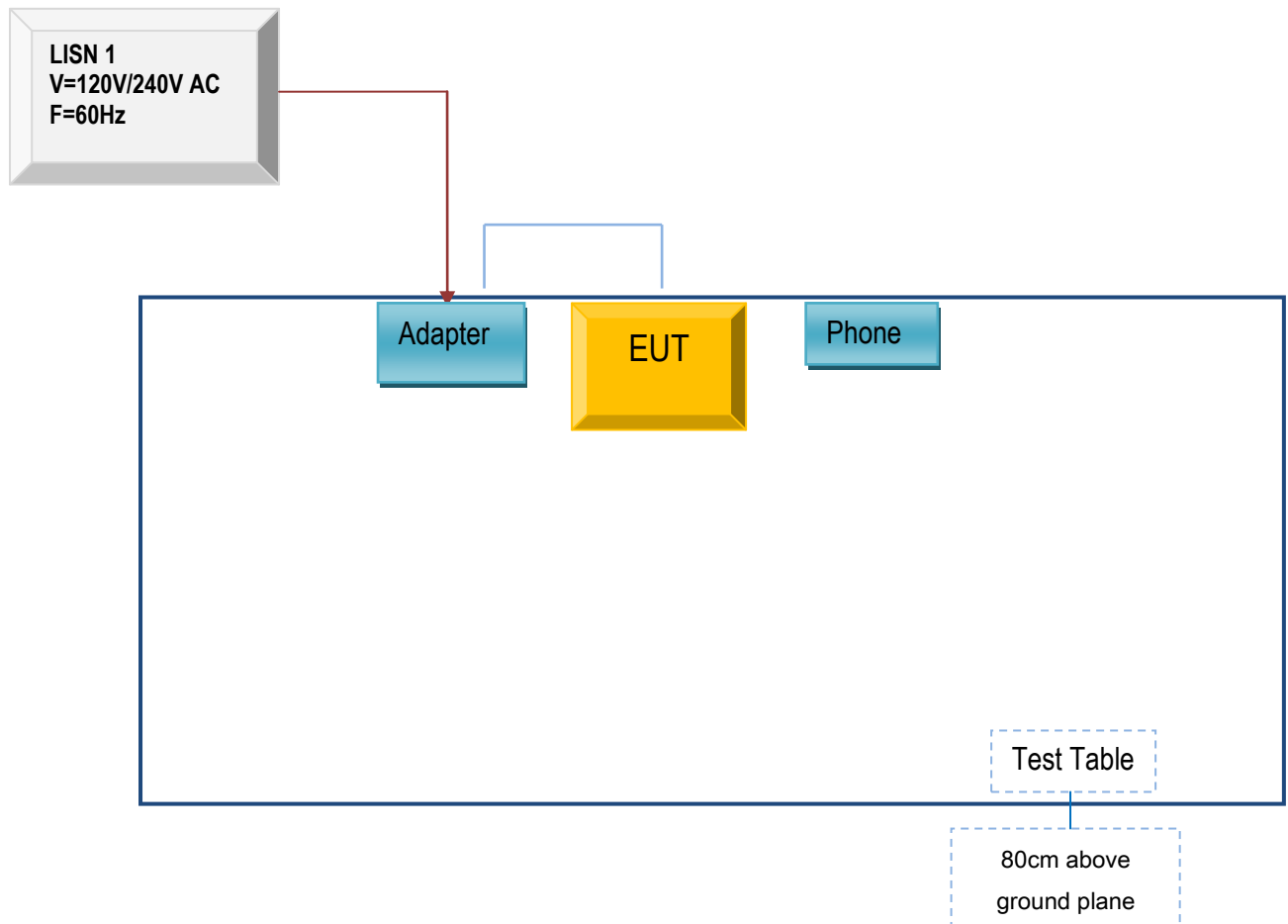


Radiated Spurious Emissions Test Setup Above
1GHz

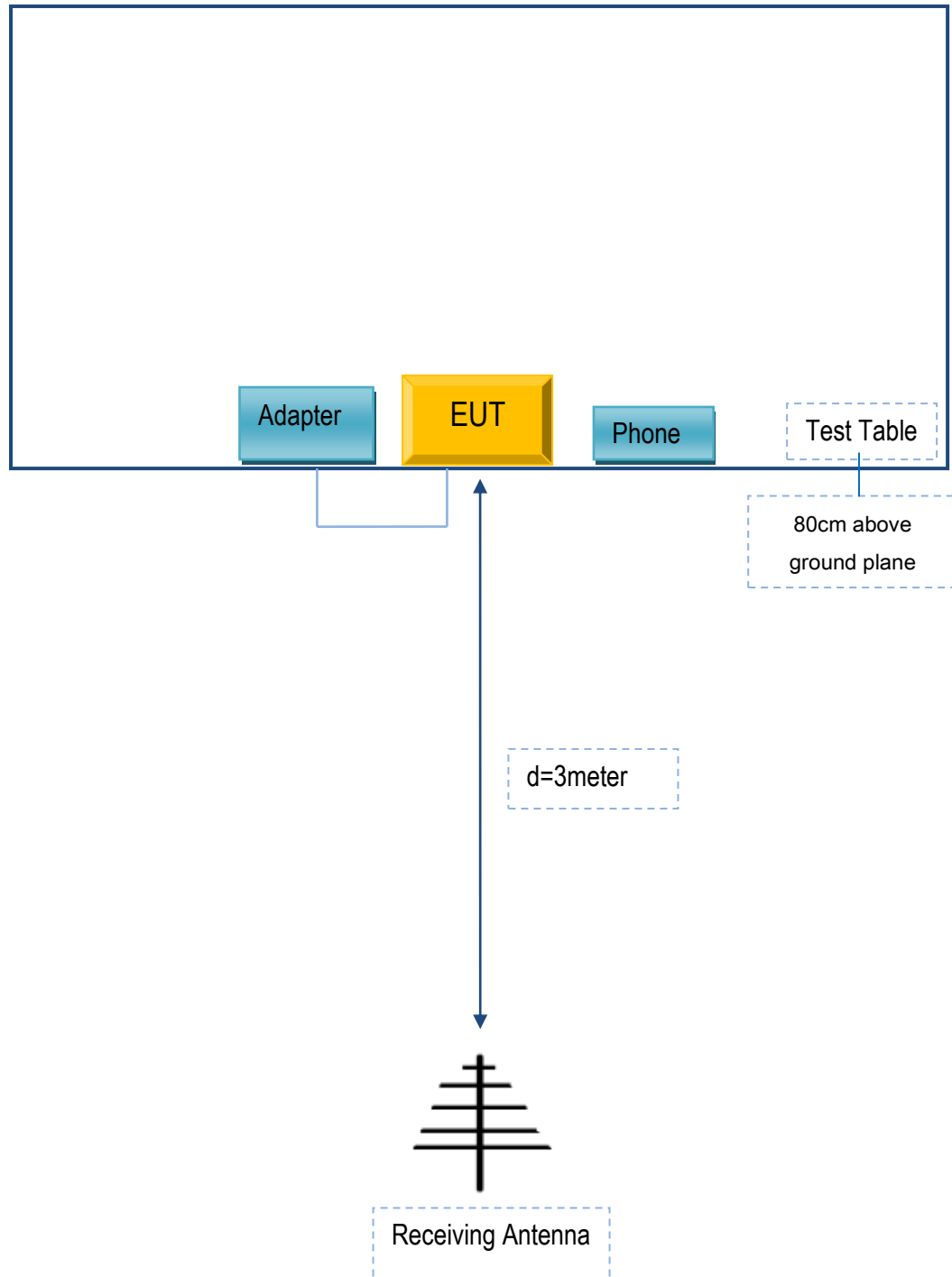
Annex C. TEST SETUP AND SUPPORTING EQUIPMENT

Annex C.ii. TEST SET UP BLOCK

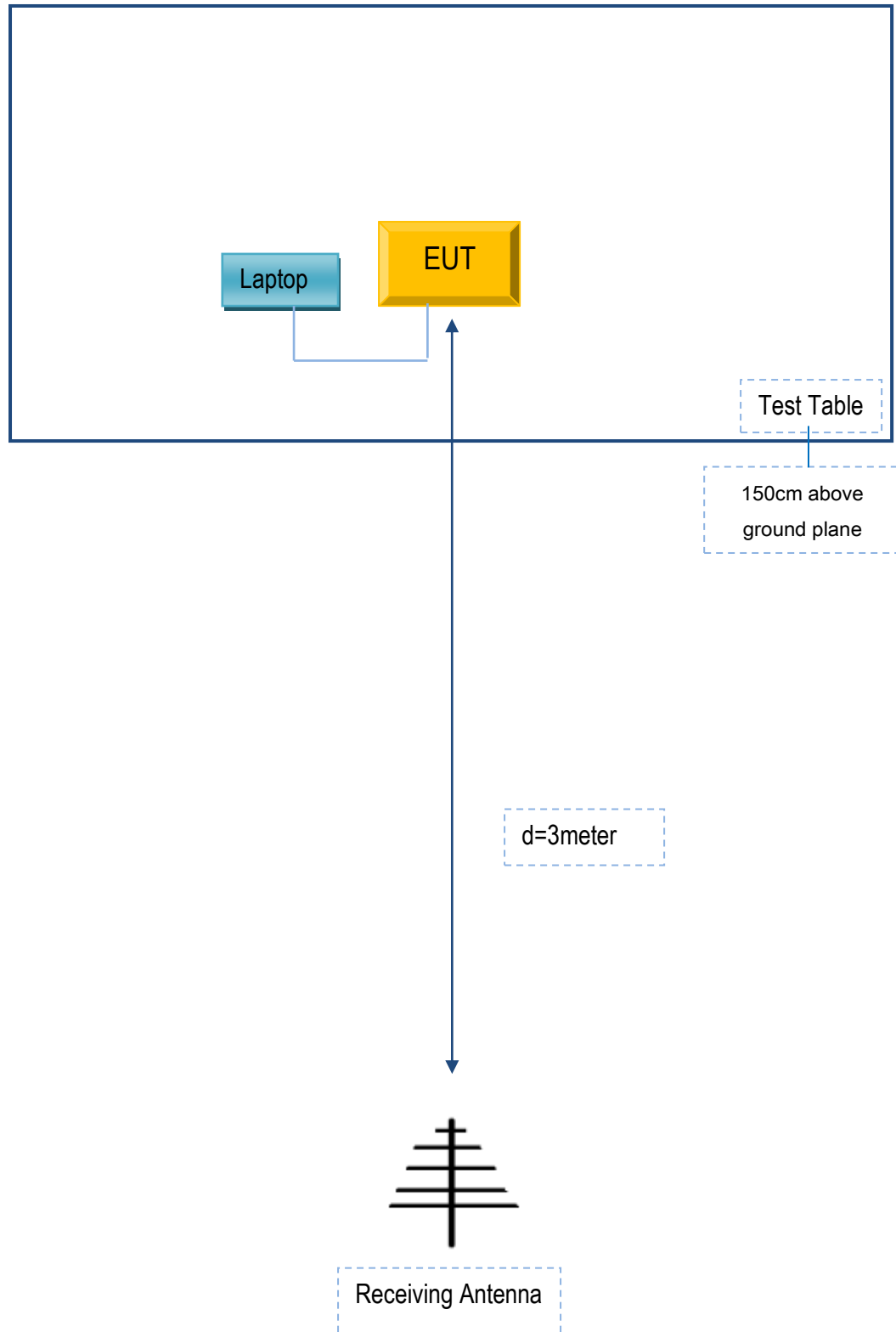
Block Configuration Diagram for AC Line Conducted Emissions



Block Configuration Diagram for Radiated Emissions (Below 1GHz) .



Block Configuration Diagram for Radiated Emissions (Above 1GHz) .



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
Lenovo	Laptop	thinkpad e40	N/A
MerryKing	Adapter	MKS-0501000	N/A
MEIZU	Phone	Y685Q	Y15QFBP922VGM

Supporting Cable:

Cable type	Shield Type	Ferrite Core	Length	Serial No
N/A	N/A	N/A	N/A	N/A

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

Please see the attachment

Annex E. DECLARATION OF SIMILARITY

Shenzhen Kesi E-commerce Co.,Ltd

Model Difference

FCC ID: 2APBQ-S3

Model : S3, S4, S5, S6, S7, S8, S9, S10, N3, N4, N5, N6, N7, N8, N9

All models have same circuits diagram, PCB Layout, construction and rated power, only different is the model name.

Regards

Sincerely

Client's signature



Client's name / title: Leo Hang / Manager
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