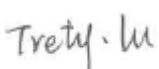


RF TEST REPORT



Report No.: 17021187-FCC-R1

Supersede Report No.: N/A

Applicant	Radiocontrolli S.R.L.	
Product Name	Transceiver Module	
Model No.	RC-CC1310-915	
Serial No.	N/A	
Test Standard	FCC Part 15.247: 2017, ANSI C63.10: 2013	
Test Date	September 14 to November 02, 2017	
Issue Date	November 03, 2017	
Test Result	☒ Pass ☐ Fail	
Equipment complied with the specification	☒	
Equipment did not comply with the specification	☐	
		
Trety Lu Test Engineer	Deon Dai Engineer Reviewer	
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 (Nanjing-China) Laboratories

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Technology Development Park, Nanjing, China

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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
17021187-FCC-R1	NONE	Original	November 03, 2017

2. Customer information

Applicant Name	Radiocontrolli S.R.L.
Applicant Add	Via Carditello 10, P.co Nuovo Villaggio int. 6, 81050 San Tammaro (CE) ITALY,P.IVA 03939360610 ITALY
Manufacturer	Beijing Jia An Electronics Technology Co., Ltd.
Manufacturer Add	Main building, No.19, Gucheng West Street, Shijingshan District, Beijing, 100043, 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 (Ver.ICP-03A1)

4. Equipment under Test (EUT) Information

Description of EUT:	Transceiver Module
Main Model:	RC-CC1310-915
Serial Model:	N/A
Date EUT received:	September 12, 2017
Test Date(s):	September 14 to November 02, 2017
Antenna Gain:	2 dBi
Type of Modulation:	GFSK/FSK/OOK
RF Operating Frequency (ies):	913 MHz (Tx/Rx) 915 MHz (Tx/Rx) 917 MHz (Tx/Rx)
Number of Channels:	3 CH
Port:	Power Port
Power:	1.8V to 3.8V
Trade Name :	N/A
FCC ID:	2ANH5-RC-CC1310-915

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
§15.203	Antenna Requirement	Compliance
§15.247 (a)(2)	DTS (6 dB) CHANNEL BANDWIDTH	Compliance
§15.247(b)(3)	Conducted Maximum Output Power	Compliance
§15.247(e)	Power Spectral Density	Compliance
§15.247(d)	Band-Edge & Unwanted Emissions into Restricted Frequency Bands	Compliance
§15.207 (a),	AC Power Line Conducted Emissions	Compliance
§15.205, §15.209, §15.247(d)	Radiated Spurious Emissions & Unwanted Emissions into Restricted Frequency Bands	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 Antenna Requirement

Applicable Standard

According to § 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the user of a standard antenna jack or electrical connector is prohibited. The structure and application of the EUT were analyzed to determine compliance with section §15.203 of the rules. §15.203 state that the subject device must meet the following criteria:

- a. Antenna must be permanently attached to the unit.
- b. Antenna must use a unique type of connector to attach to the EUT.

Unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit. And according to FCC 47 CFR section 15.247 (b), if the transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Antenna Connector Construction

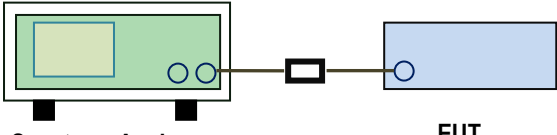
EUT antenna port is a unique type of connector to attach to the EUT, please refer to the internal photos.

The antenna meets up with the ANTENNA REQUIREMENT.

Result: Compliance.

6.2 DTS (6 dB) Channel Bandwidth

Temperature	23°C
Relative Humidity	55%
Atmospheric Pressure	1022mbar
Test date :	November 02, 2017
Tested By :	Trety Lu

Spec	Item	Requirement	Applicable
§ 15.247(a)(2) RSS Gen(4.6.1)	a)	6dB BW≥500kHz;	☒
	b)	99% BW: For FCC reference only; required by IC.	☒
Test Setup	 Spectrum Analyzer EUT		
Test Procedure	558074 D01 DTS MEAS Guidance v04, 8.1 DTS bandwidth 6dB Emission bandwidth measurement procedure - Set RBW = 100 kHz. - Set the video bandwidth (VBW) ≥ 3 RBW. - Detector = Peak. - Trace mode = max hold. - Sweep = auto couple. - Allow the trace to stabilize. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.		
Remark			
Result	☒ Pass ☐ Fail		

Test Data ☒ Yes ☐ N/A

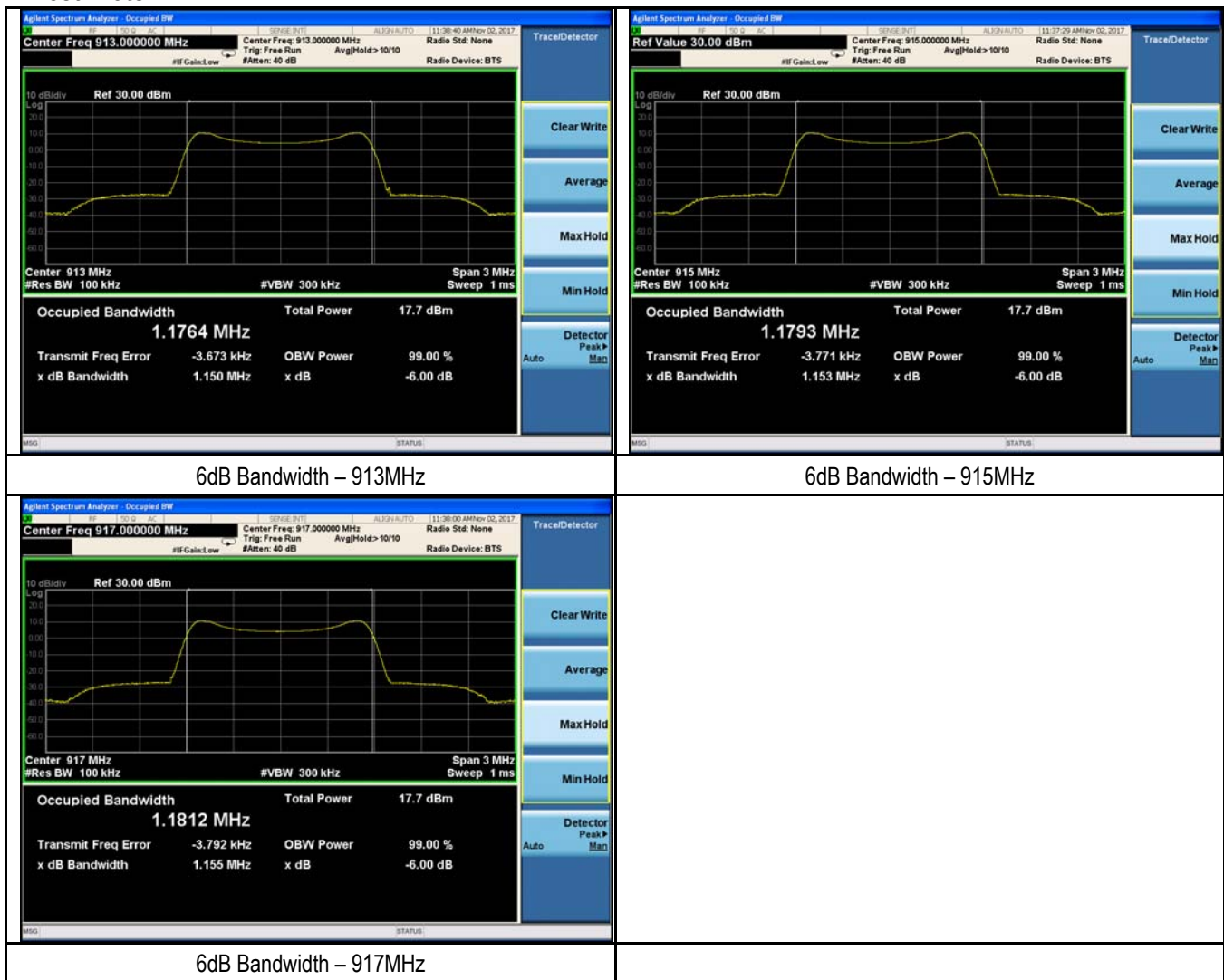
Test Plot ☒ Yes (See below) ☐ N/A

6dB Bandwidth measurement result

Test Data

CH	Frequency (MHz)	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
Low	913	1.150	1.1764
Mid	915	1.153	1.1793
High	917	1.155	1.1812

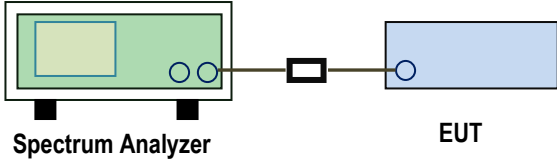
Test Plots



6.3 Maximum Output Power

Temperature	23°C
Relative Humidity	55%
Atmospheric Pressure	1022mbar
Test date :	November 02, 2017
Tested By :	Trety Lu

Requirement(s):

Spec	Item	Requirement	Applicable
§15.247(b) (3),RSS210 (A8.4)	a)	FHSS in 2400-2483.5MHz with ≥ 75 channels: ≤ 1 Watt	☐
	b)	FHSS in 5725-5850MHz: ≤ 1 Watt	☐
	c)	For all other FHSS in the 2400-2483.5MHz band: ≤ 0.125 Watt.	☐
	d)	FHSS in 902-928MHz with ≥ 50 channels: ≤ 1 Watt	☐
	e)	FHSS in 902-928MHz with ≥ 25 & < 50 channels: ≤ 0.25 Watt	☐
	f)	DTS in 902-928MHz, 2400-2483.5MHz: ≤ 1 Watt	☒
Test Setup	 Spectrum Analyzer EUT		
Test Procedure	558074 D01 DTS MEAS Guidance v04, 9.1.2 Integrated band power method Maximum output power measurement procedure a) Set the RBW $\geq$ DTS bandwidth. b) Set VBW $\geq 3 \times$ RBW. c) Set span $\geq 3 \times$ RBW d) Sweep time = auto couple. e) Detector = peak. f) Trace mode = max hold. g) Allow trace to fully stabilize. h) Use peak marker function to determine the peak amplitude level.		
Remark			
Result	☒ Pass ☐ Fail		

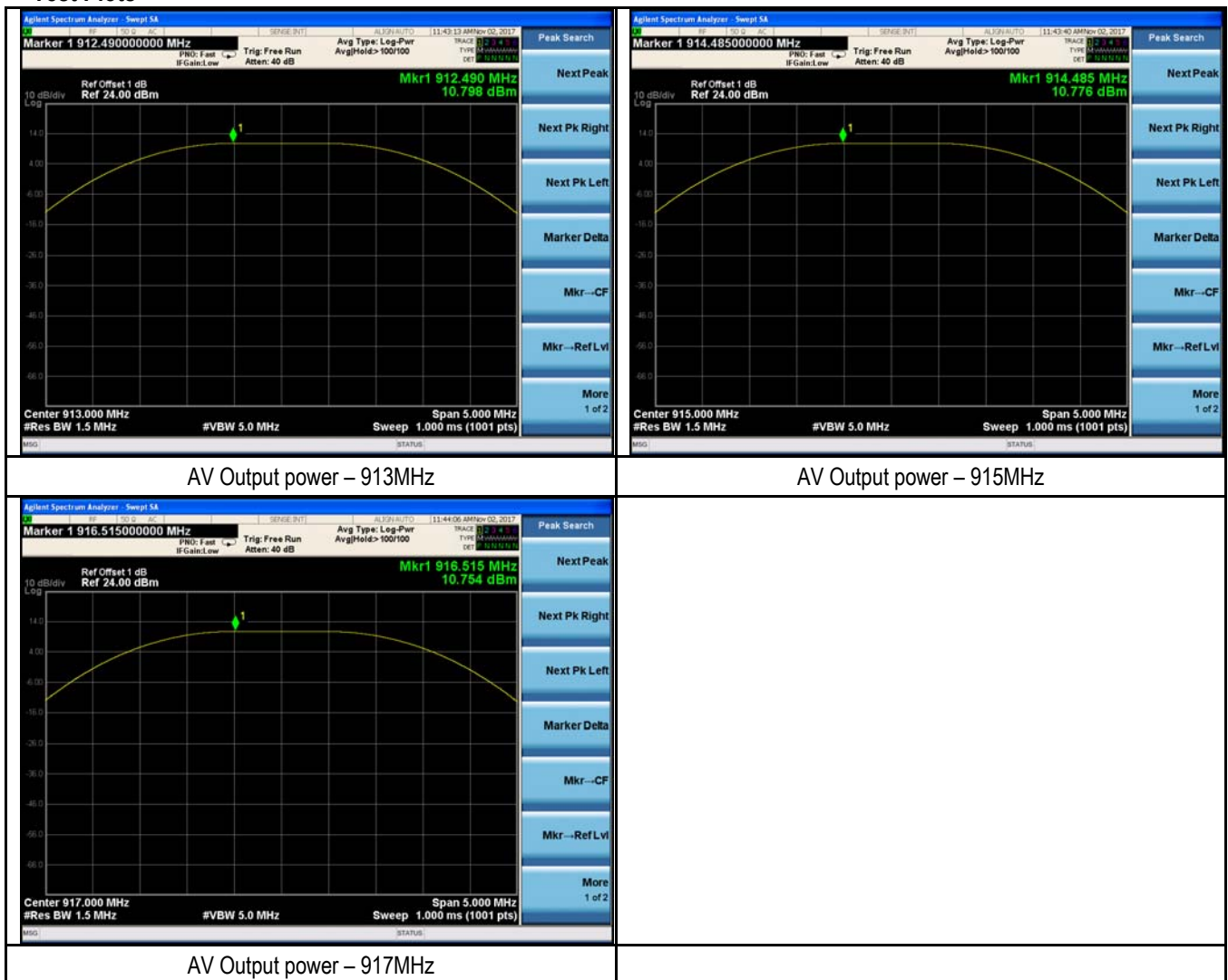
Test Data ☒ Yes ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

Output Power measurement result Test Data

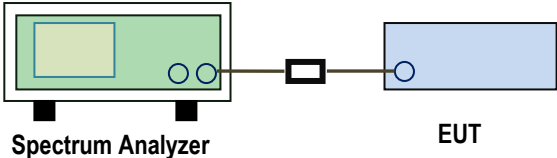
Type	CH	Frequency (MHz)	Conducted Power (dBm)	Limit (dBm)	Result
Output power	Low	913	10.798	30	Pass
	Mid	915	10.776	30	Pass
	High	917	10.754	30	Pass

Test Plots



6.4 Power Spectral Density

Temperature	23°C
Relative Humidity	55%
Atmospheric Pressure	1022mbar
Test date :	November 02, 2017
Tested By :	Trety Lu

Spec	Item	Requirement	Applicable
§15.247(e)	a)	The power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.	☒
Test Setup	 Spectrum Analyzer EUT		
Test Procedure	558074 D01 DTS MEAS Guidance v04, 10.2 power spectral density method power spectral density measurement procedure - a) Set analyzer center frequency to DTS channel center frequency. - b) Set the span to 1.5 times the DTS bandwidth. - c) Set the RBW to: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$. - d) Set the VBW $\geq 3 \times \text{RBW}$. - e) Detector = peak. - f) Sweep time = auto couple. - g) Trace mode = max hold. - h) Allow trace to fully stabilize. - i) Use the peak marker function to determine the maximum amplitude level within the RBW. - j) If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.		
Remark			
Result	☒ Pass ☐ Fail		

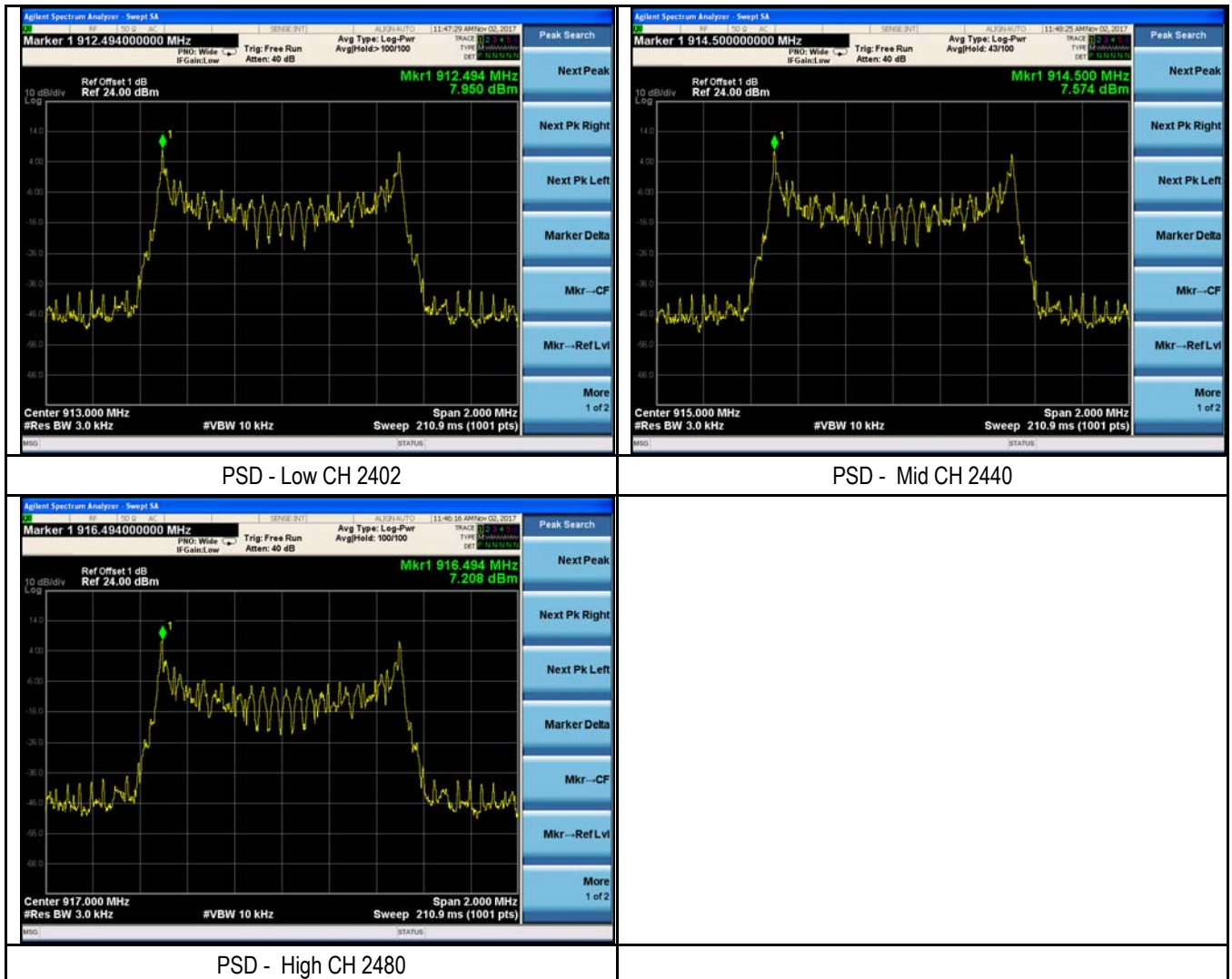
Test Data ☒ Yes ☐ N/A
Test Plot ☒ Yes (See below) ☐ N/A

Power Spectral Density measurement result

Test Data

Type	CH	Freq (MHz)	Result (dBm)	Limit (dBm)	Result
PSD	Low	913	7.950	8	Pass
	Mid	915	7.574	8	Pass
	High	917	7.208	8	Pass

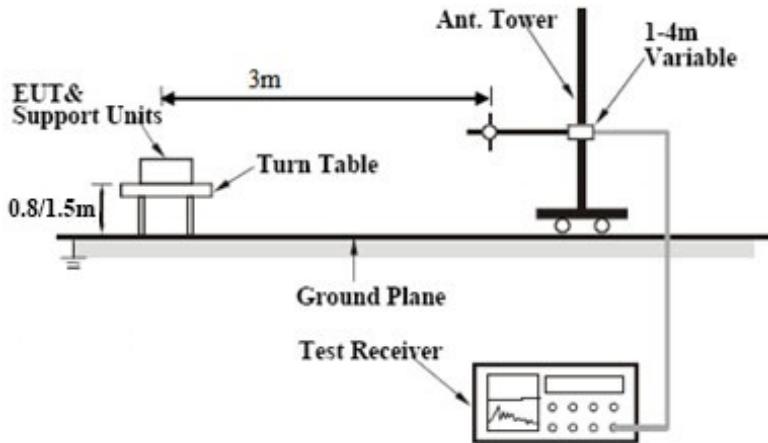
Test Plots



6.5 Band-Edge & Unwanted Emissions into Restricted Frequency Bands

Temperature	23°C
Relative Humidity	55%
Atmospheric Pressure	1022mbar
Test date :	September 14, 2017
Tested By :	Trety Lu

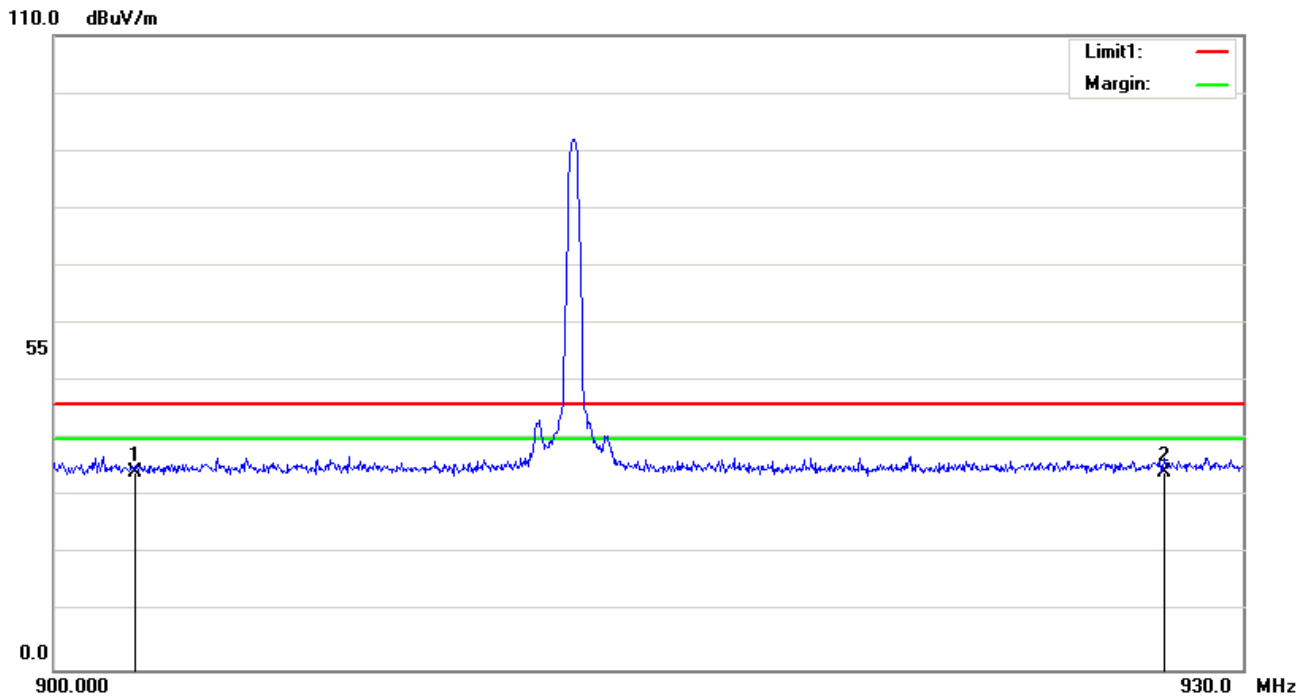
Requirement(s):

Spec	Item	Requirement	Applicable
§15.247(d)	a)	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.	☒
Test Setup			
Test Procedure	Radiated Method Only 1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator. 2. Position the EUT without connection to measurement instrument. Put it on the Rotated table and turn on the EUT and make it operate in transmitting mode. Then set it to Low Channel and High Channel within its operating range, and make sure the instrument is operated in its linear range. 3. First, set both RBW and VBW of spectrum analyzer to 100 kHz with a convenient frequency span including 100kHz bandwidth from band edge, check the emission of EUT, if pass then set Spectrum Analyzer as below: a. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasiy Peak detection at frequency below 1GHz. b. 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. c. 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. 4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency. 5. Repeat above procedures until all measured frequencies were complete.		
Remark			
Result	☒ Pass ☐ Fail		

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

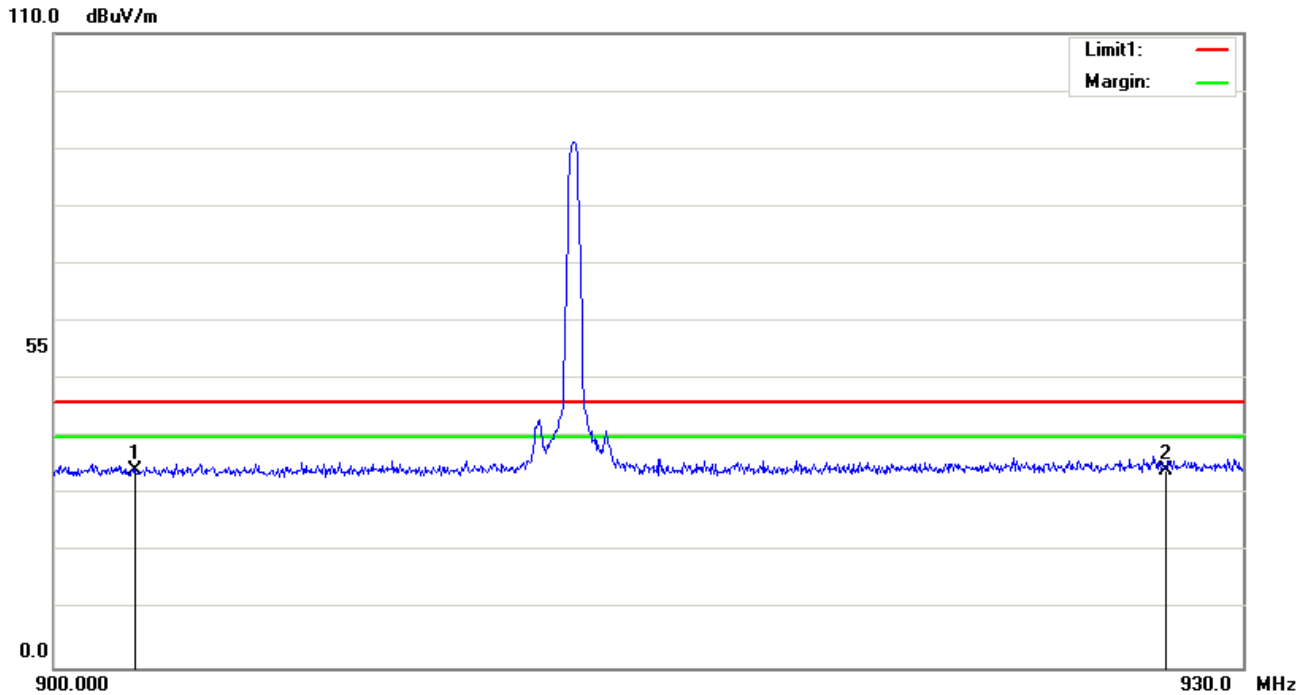
Test Mode:	Transmitting Mode-913MHz
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Vertical Polarity Plot @3m

No.	Frequency (MHz)	Reading (dBμV/m)	Detector	Ant. F (dB/m)	PA. G (dB)	Cab. L (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Degree (°)
1	902.0000	52.32	QP	23.67	46.64	4.86	34.21	46.00	-11.79	100	165
2	928.0000	51.99	QP	23.66	46.31	4.92	34.26	46.00	-11.74	100	213

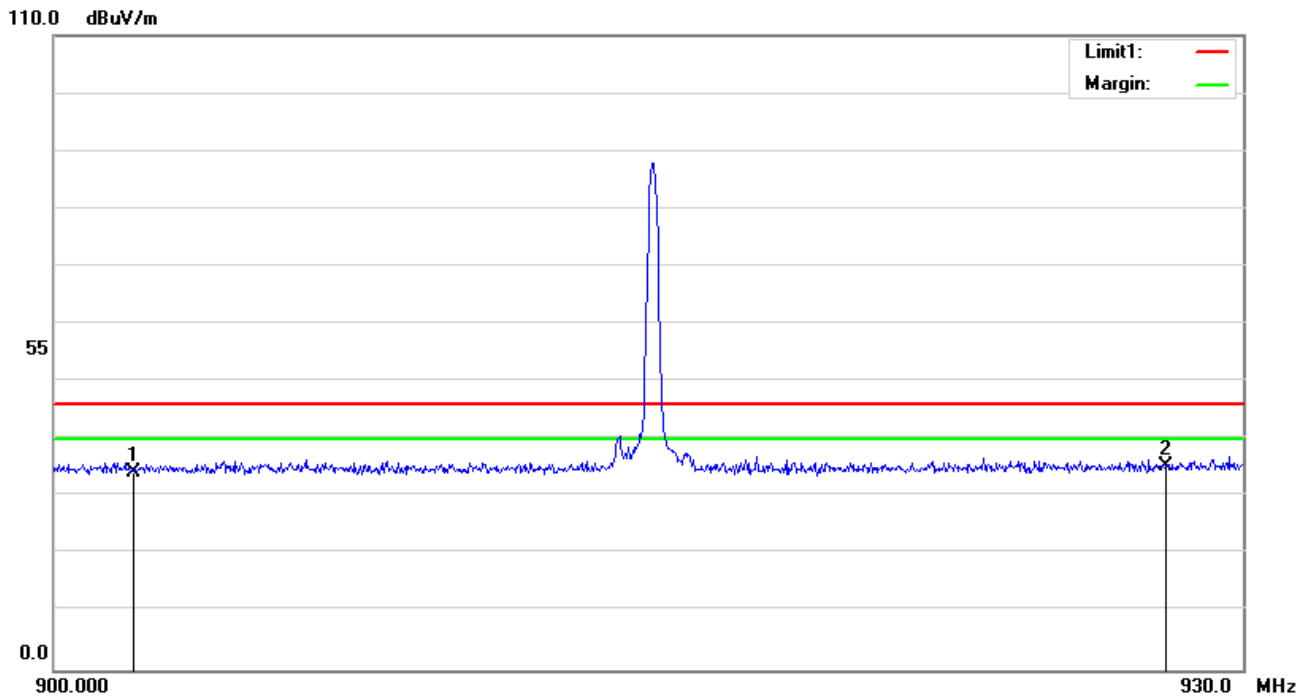
Test Mode:	Transmitting Mode-913MHz
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Horizontal Polarity Plot @3m

No.	Frequency (MHz)	Reading (dBμV/m)	Detector	Ant_F (dB/m)	PA_G (dB)	Cab_L (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Degree (°)
1	902.0000	53.14	QP	22.75	46.64	4.86	34.11	46.00	-11.89	100	117
2	928.0000	52.25	QP	23.37	46.31	4.92	34.23	46.00	-11.77	100	248

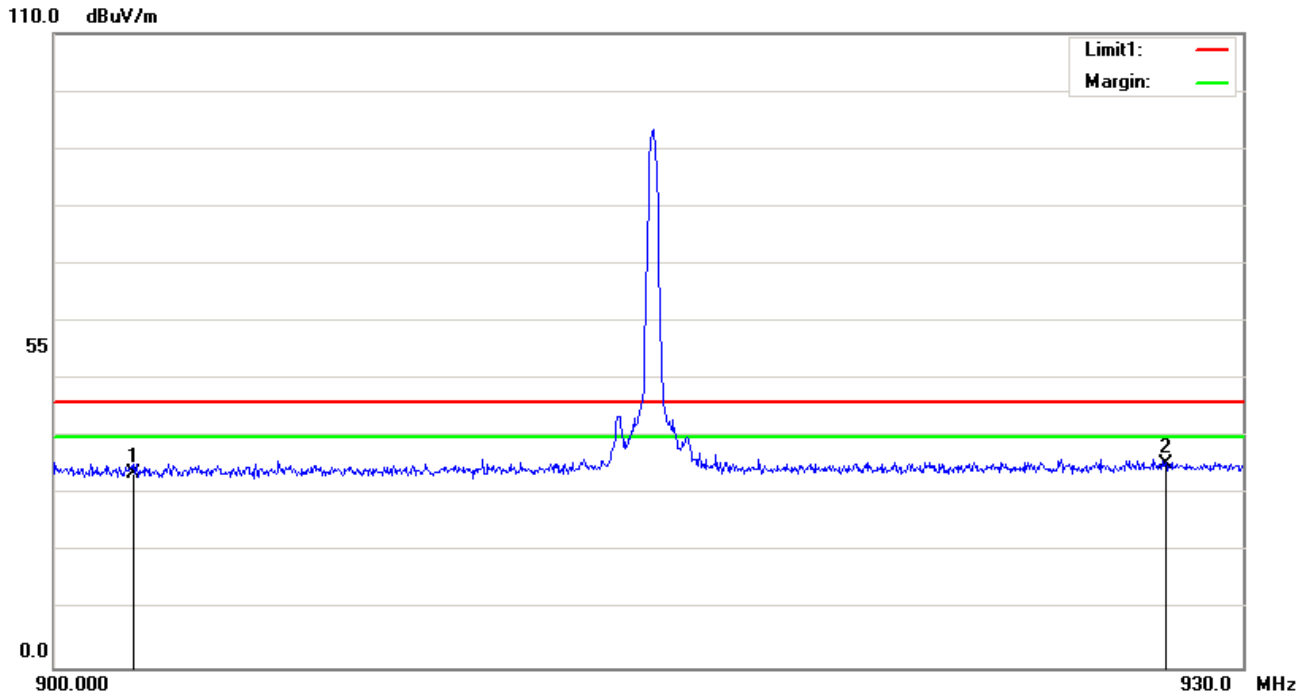
Test Mode:	Transmitting Mode-915MHz
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Vertical Polarity Plot @3m

No.	Frequency (MHz)	Reading (dB μ V/m)	Detector	Ant_F (dB/m)	PA_G (dB)	Cab_L (dB)	Result (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Height (cm)	Degree (°)
1	902.0000	52.30	QP	23.67	46.64	4.86	34.19	46.00	-11.81	100	272
2	928.0000	53.04	QP	23.66	46.31	4.92	35.31	46.00	-10.69	100	296

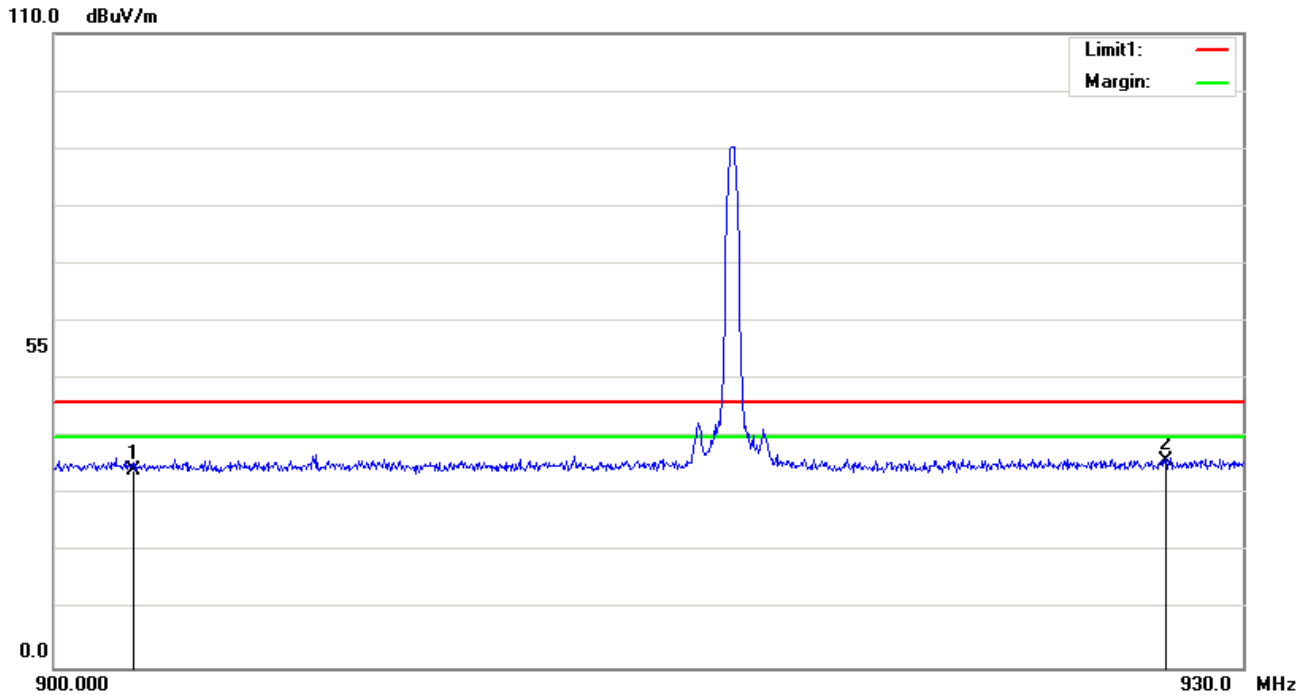
Test Mode:	Transmitting Mode-915MHz
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Horizontal Polarity Plot @3m

No.	Frequency (MHz)	Reading (dBμV/m)	Detector	Ant_F (dB/m)	PA_G (dB)	Cab_L (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Degree (°)
1	902.0000	52.64	QP	22.75	46.64	4.86	33.61	46.00	-12.39	100	321
2	928.0000	53.30	QP	23.37	46.31	4.92	35.28	46.00	-10.72	100	225

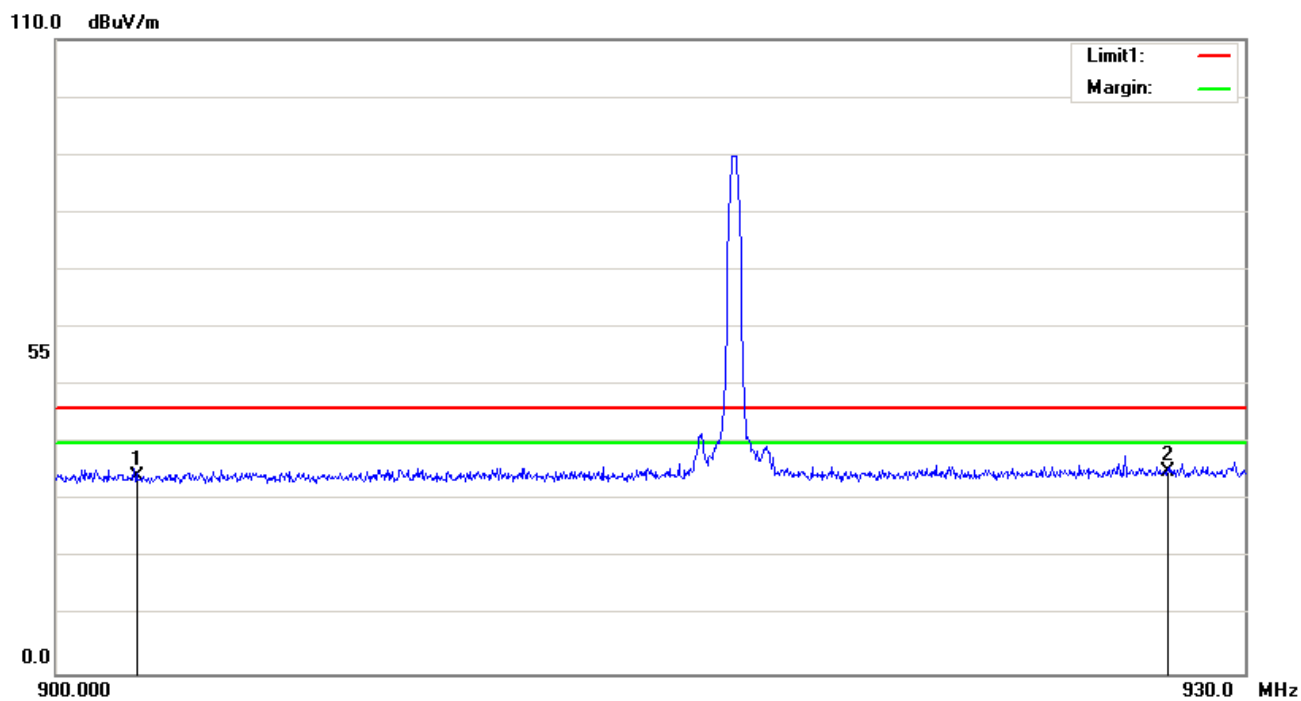
Test Mode:	Transmitting Mode-917MHz
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Vertical Polarity Plot @3m

No.	Frequency (MHz)	Reading (dBμV/m)	Detector	Ant_F (dB/m)	PA_G (dB)	Cab_L (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Degree (°)
1	902.0000	52.22	QP	23.67	46.64	4.86	34.11	46.00	-11.89	100	100
2	928.0000	53.62	QP	23.66	46.31	4.92	35.89	46.00	-10.11	100	297

Test Mode:	Transmitting Mode-917MHz
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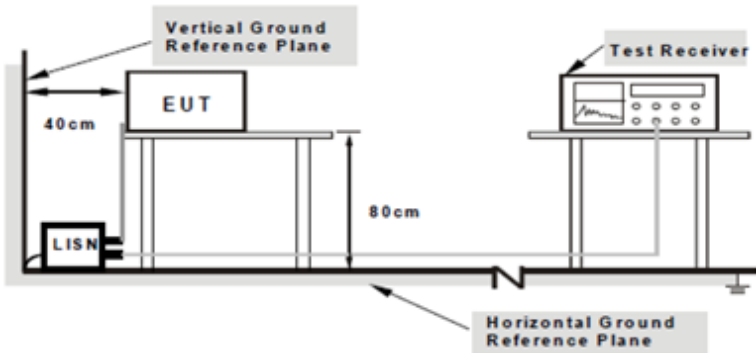
Horizontal Polarity Plot @3m

No.	Frequency (MHz)	Reading (dB μ V/m)	Detector	Ant_F (dB/m)	PA_G (dB)	Cab_L (dB)	Result (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Height (cm)	Degree (°)
1	902.0000	53.18	QP	22.75	46.64	4.86	34.15	46.00	-11.85	100	142
2	928.0000	53.19	QP	23.37	46.31	4.92	35.17	46.00	-10.83	100	142

6.6 AC Power Line Conducted Emissions

Temperature	23°C
Relative Humidity	55%
Atmospheric Pressure	1022mbar
Test date :	September 18, 2017
Tested By :	Trety Lu

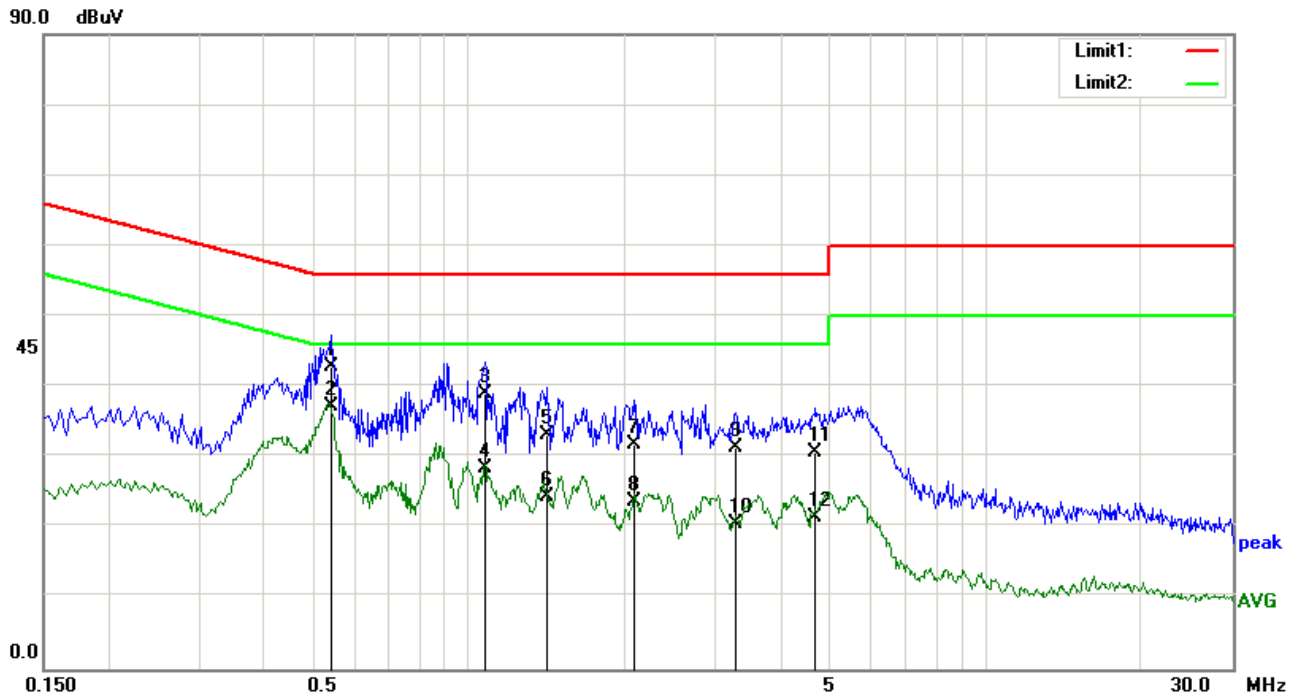
Requirement(s):

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.																
		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 coaxial cable. - All other supporting equipment were powered separately from another main supply. - The EUT was switched on and allowed to warm up to its normal operating condition. - 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. - 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. - 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: Transmitting Mode

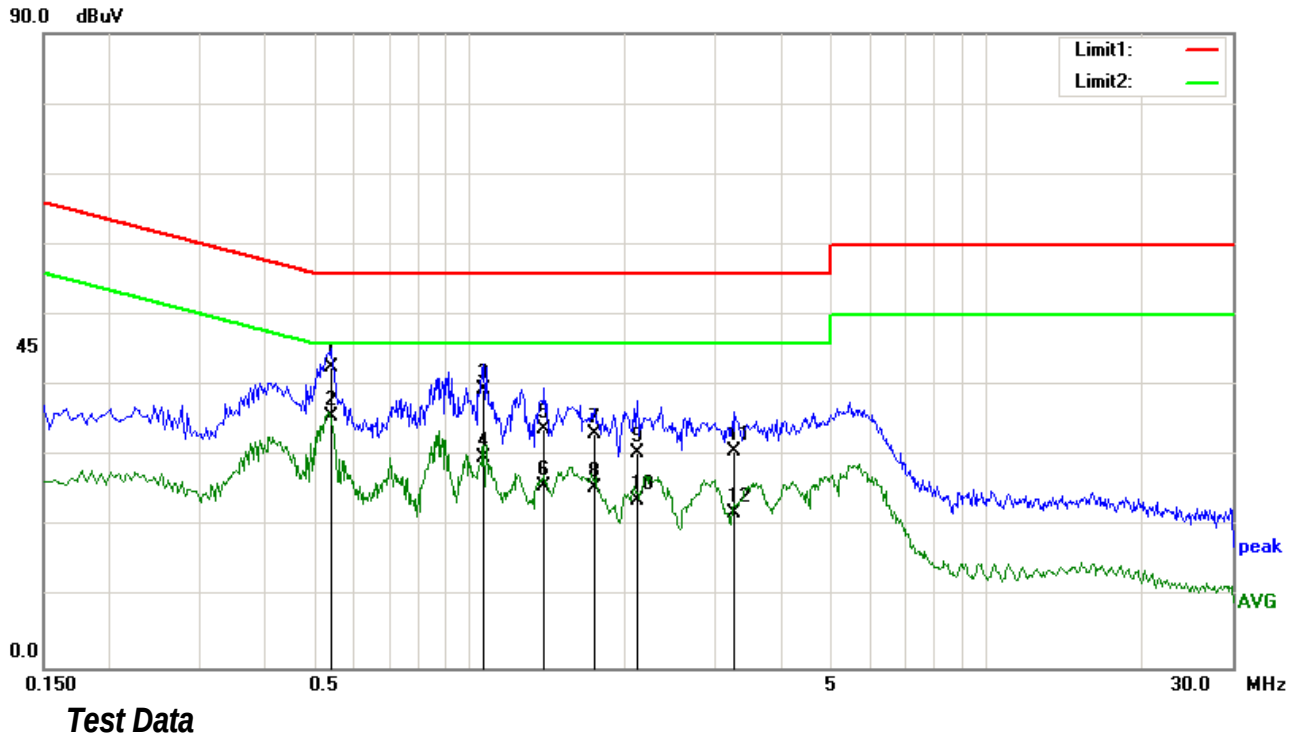


Test Data

Phase Line Plot at 120Vac, 60Hz

No.	Frequency (MHz)	Reading (dBμV)	Detector	Lisn/Isn (dB)	Ps Lmt (dB)	Cab L (dB)	Result (dBμV)	Limit (dBμV)	Margin (dB)
1	0.5420	32.55	QP	0.12	-10.00	0.21	42.88	56.00	-13.12
2	0.5420	26.84	AVG	0.12	-10.00	0.21	37.17	46.00	-8.83
3	1.0740	28.66	QP	0.14	-10.00	0.20	39.00	56.00	-17.00
4	1.0740	18.13	AVG	0.14	-10.00	0.20	28.47	46.00	-17.53
5	1.4140	22.79	QP	0.15	-10.00	0.20	33.14	56.00	-22.86
6	1.4140	14.09	AVG	0.15	-10.00	0.20	24.44	46.00	-21.56
7	2.0860	21.60	QP	0.16	-10.00	0.19	31.95	56.00	-24.05
8	2.0860	13.35	AVG	0.16	-10.00	0.19	23.70	46.00	-22.30
9	3.2780	20.92	QP	0.21	-10.00	0.24	31.37	56.00	-24.63
10	3.2780	10.18	AVG	0.21	-10.00	0.24	20.63	46.00	-25.37
11	4.6860	20.20	QP	0.26	-10.00	0.28	30.74	56.00	-25.26
12	4.6860	10.91	AVG	0.26	-10.00	0.28	21.45	46.00	-24.55

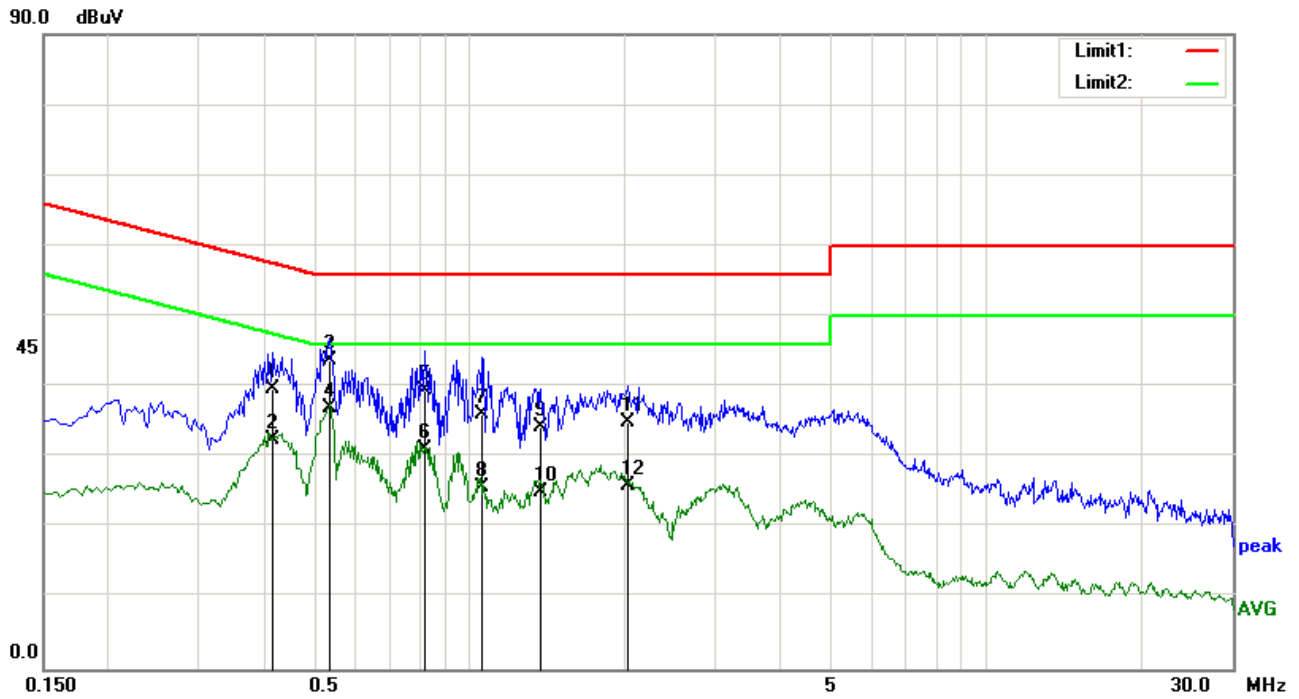
Test Mode: Transmitting Mode



Phase Neutral Plot at 120Vac, 60Hz

No.	Frequency (MHz)	Reading (dBμV)	Detector	Lisn/Isn (dB)	Ps_Lmt (dB)	Cab_L (dB)	Result (dBμV)	Limit (dBμV)	Margin (dB)
1	0.5420	32.38	QP	0.11	-10.00	0.21	42.70	56.00	-13.30
2	0.5420	25.32	AVG	0.11	-10.00	0.21	35.64	46.00	-10.36
3	1.0700	29.11	QP	0.13	-10.00	0.20	39.44	56.00	-16.56
4	1.0700	19.57	AVG	0.13	-10.00	0.20	29.90	46.00	-16.10
5	1.3980	23.55	QP	0.15	-10.00	0.20	33.90	56.00	-22.10
6	1.3980	15.42	AVG	0.15	-10.00	0.20	25.77	46.00	-20.23
7	1.7500	22.89	QP	0.16	-10.00	0.21	33.26	56.00	-22.74
8	1.7500	15.20	AVG	0.16	-10.00	0.21	25.57	46.00	-20.43
9	2.1180	20.05	QP	0.17	-10.00	0.20	30.42	56.00	-25.58
10	2.1180	13.44	AVG	0.17	-10.00	0.20	23.81	46.00	-22.19
11	3.2620	20.28	QP	0.22	-10.00	0.24	30.74	56.00	-25.26
12	3.2620	11.54	AVG	0.22	-10.00	0.24	22.00	46.00	-24.00

Test Mode: Transmitting Mode

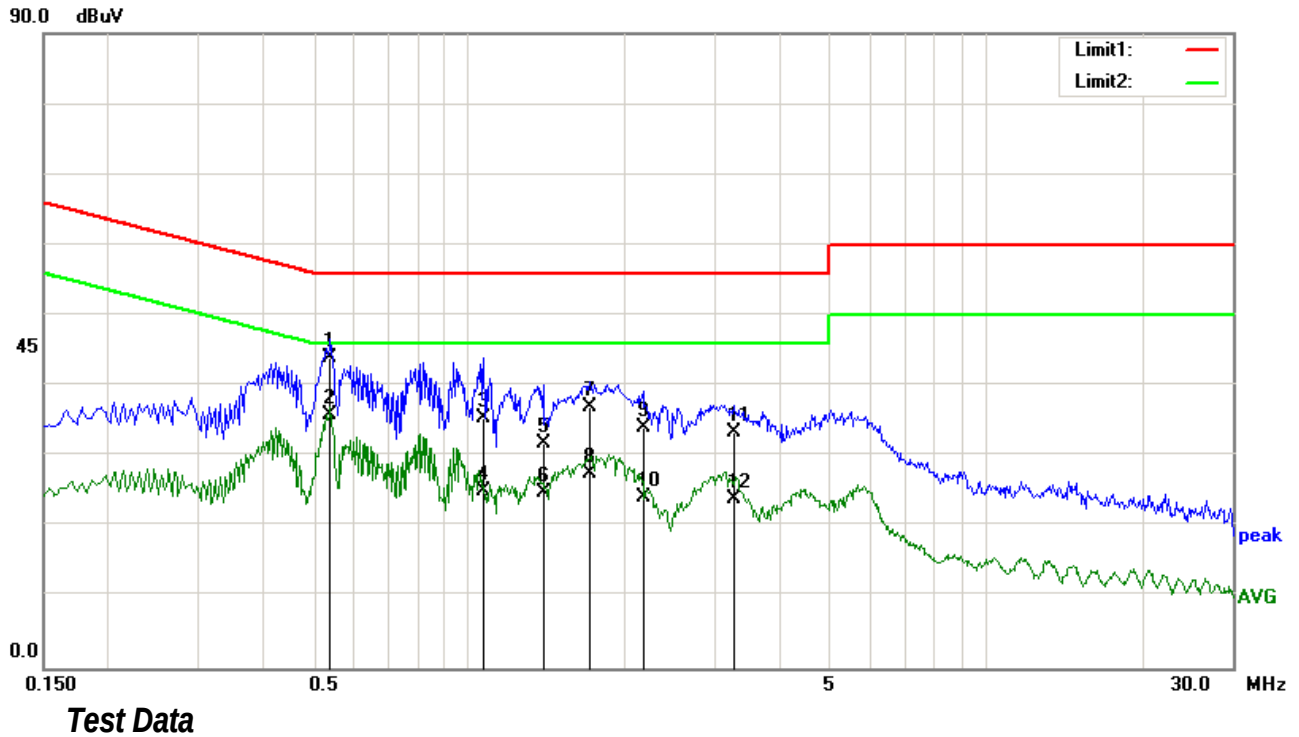


Test Data

Phase Line Plot at 230Vac, 50Hz

No.	Frequency (MHz)	Reading (dBμV)	Detector	Lisn/Isn (dB)	Ps Lmt (dB)	Cab L (dB)	Result (dBμV)	Limit (dBμV)	Margin (dB)
1	0.4180	29.38	QP	0.11	-10.00	0.21	39.70	57.49	-17.79
2	0.4180	22.29	AVG	0.11	-10.00	0.21	32.61	47.49	-14.88
3	0.5380	33.33	QP	0.12	-10.00	0.21	43.66	56.00	-12.34
4	0.5380	26.76	AVG	0.12	-10.00	0.21	37.09	46.00	-8.91
5	0.8180	29.17	QP	0.13	-10.00	0.20	39.50	56.00	-16.50
6	0.8180	20.82	AVG	0.13	-10.00	0.20	31.15	46.00	-14.85
7	1.0620	25.86	QP	0.14	-10.00	0.19	36.19	56.00	-19.81
8	1.0620	15.44	AVG	0.14	-10.00	0.19	25.77	46.00	-20.23
9	1.3740	24.06	QP	0.15	-10.00	0.21	34.42	56.00	-21.58
10	1.3740	14.65	AVG	0.15	-10.00	0.21	25.01	46.00	-20.99
11	2.0260	24.54	QP	0.16	-10.00	0.18	34.88	56.00	-21.12
12	2.0260	15.58	AVG	0.16	-10.00	0.18	25.92	46.00	-20.08

Test Mode: Transmitting Mode



Phase Neutral Plot at 230Vac, 50Hz

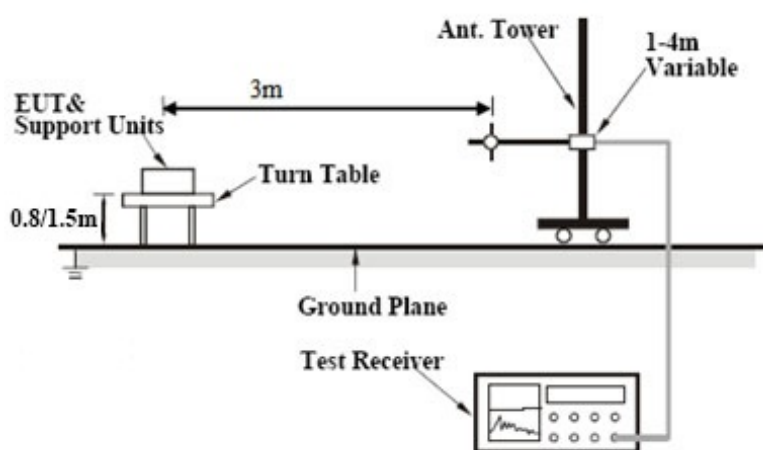
No.	Frequency (MHz)	Reading (dBμV)	Detector	Lisn/Isn (dB)	Ps_Lmt (dB)	Cab_L (dB)	Result (dBμV)	Limit (dBμV)	Margin (dB)
1	0.5380	33.56	QP	0.11	-10.00	0.21	43.88	56.00	-12.12
2	0.5380	25.56	AVG	0.11	-10.00	0.21	35.88	46.00	-10.12
3	1.0660	25.12	QP	0.13	-10.00	0.20	35.45	56.00	-20.55
4	1.0660	14.73	AVG	0.13	-10.00	0.20	25.06	46.00	-20.94
5	1.3940	21.56	QP	0.15	-10.00	0.20	31.91	56.00	-24.09
6	1.3940	14.46	AVG	0.15	-10.00	0.20	24.81	46.00	-21.19
7	1.7100	26.63	QP	0.16	-10.00	0.21	37.00	56.00	-19.00
8	1.7100	17.20	AVG	0.16	-10.00	0.21	27.57	46.00	-18.43
9	2.1700	23.70	QP	0.18	-10.00	0.21	34.09	56.00	-21.91
10	2.1700	13.90	AVG	0.18	-10.00	0.21	24.29	46.00	-21.71
11	3.2420	22.96	QP	0.22	-10.00	0.24	33.42	56.00	-22.58
12	3.2420	13.56	AVG	0.22	-10.00	0.24	24.02	46.00	-21.98

6.7 Radiated Spurious Emissions & Restricted Band

Temperature	23°C
Relative Humidity	55%
Atmospheric Pressure	1022mbar
Test date :	September 14, 2017
Tested By :	Trety Lu

Requirement(s):

Spec	Item	Requirement	Applicable										
47CFR§15.24 7(d), RSS210 (A8.5)	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>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)	30 – 88	100	88 – 216	150	216 960	200	Above 960	500	☒
	Frequency range (MHz)	Field Strength (µV/m)											
	30 – 88	100											
	88 – 216	150											
216 960	200												
Above 960	500												
b)	For non-restricted band, In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB or 30dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, determined by the measurement method on output power to be used. Attenuation below the general limits specified in § 15.209(a) is not required ☒ 20 dB down ☐ 30 dB down	☒											
c)	or restricted band, emission must also comply with the radiated emission limits specified in 15.209	☒											

Test Setup	 The diagram illustrates the test setup. On the left, the 'EUT & Support Units' are placed on a 'Turn Table' which is 0.8/1.5m high. A '3m' distance is marked between the turn table and the 'Ant. Tower'. The antenna is a '1-4m Variable' type. Both are positioned above a 'Ground Plane'. A 'Test Receiver' is connected to the antenna system.
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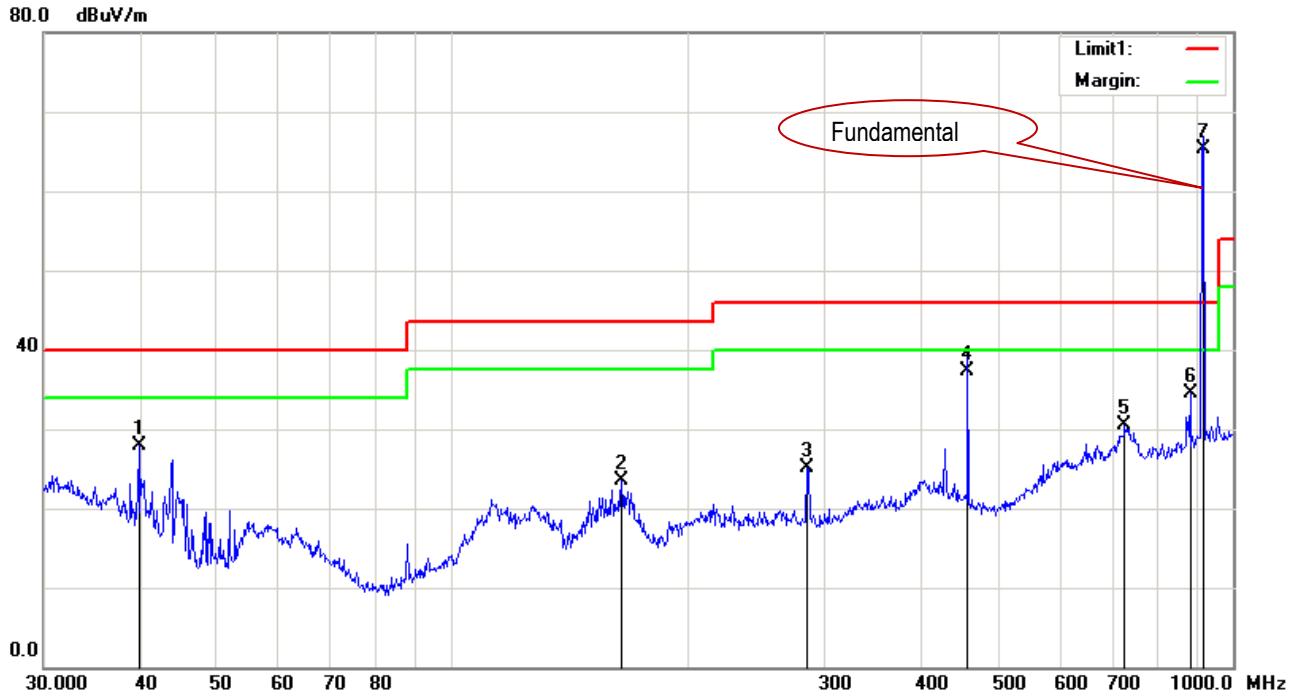
Procedure	- The EUT was switched on and allowed to warm up to its normal operating condition. - The test was carried out at the selected frequency points obtained from the EUT characterization. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and 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 Quasi
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	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 is 10Hz with Peak detection for Average Measurement as below at frequency above 1GHz. 5. 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 Mode: Transmitting Mode-913MHz

(30MHz - 1GHz)



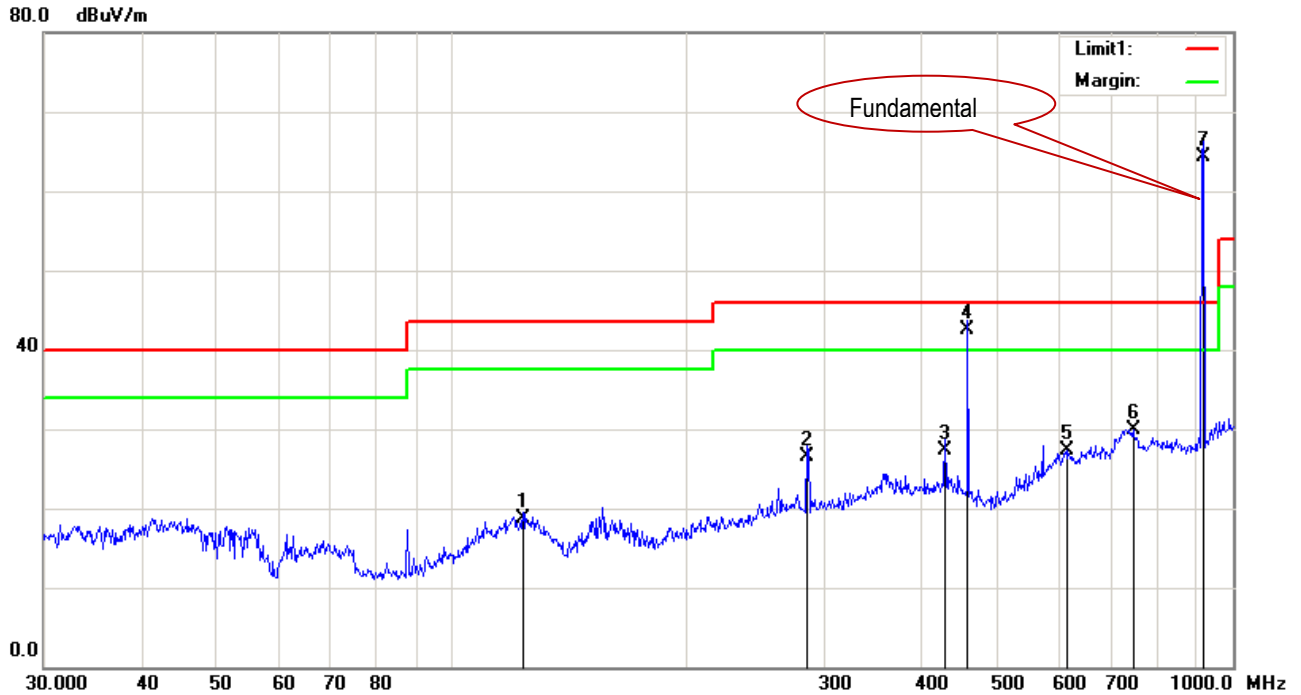
Test Data

Vertical Polarity Plot @3m

No.	Frequency (MHz)	Reading (dBμV/m)	Detector	Ant_F (dB/m)	PA_G (dB)	Cab_L (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Degree (°)
1	39.7147	56.63	QP	15.95	45.70	1.04	27.92	40.00	-12.08	100	114
2	164.9075	54.48	QP	13.86	46.89	2.08	23.53	43.50	-19.97	100	0
3	284.9767	55.82	QP	14.93	48.41	2.69	25.03	46.00	-20.97	100	39
4	457.5073	66.97	QP	16.03	49.17	3.42	37.25	46.00	-8.75	99	155
5	726.8052	49.47	QP	22.31	45.55	4.33	30.56	46.00	-15.44	100	0
6	881.4067	52.28	QP	23.28	45.95	4.80	34.41	46.00	-11.59	200	258
7	913.0000	83.45	QP	23.66	46.63	4.89	65.37	46.00	19.37	200	61

Test Mode: Transmitting Mode-913MHz

(30MHz - 1GHz)



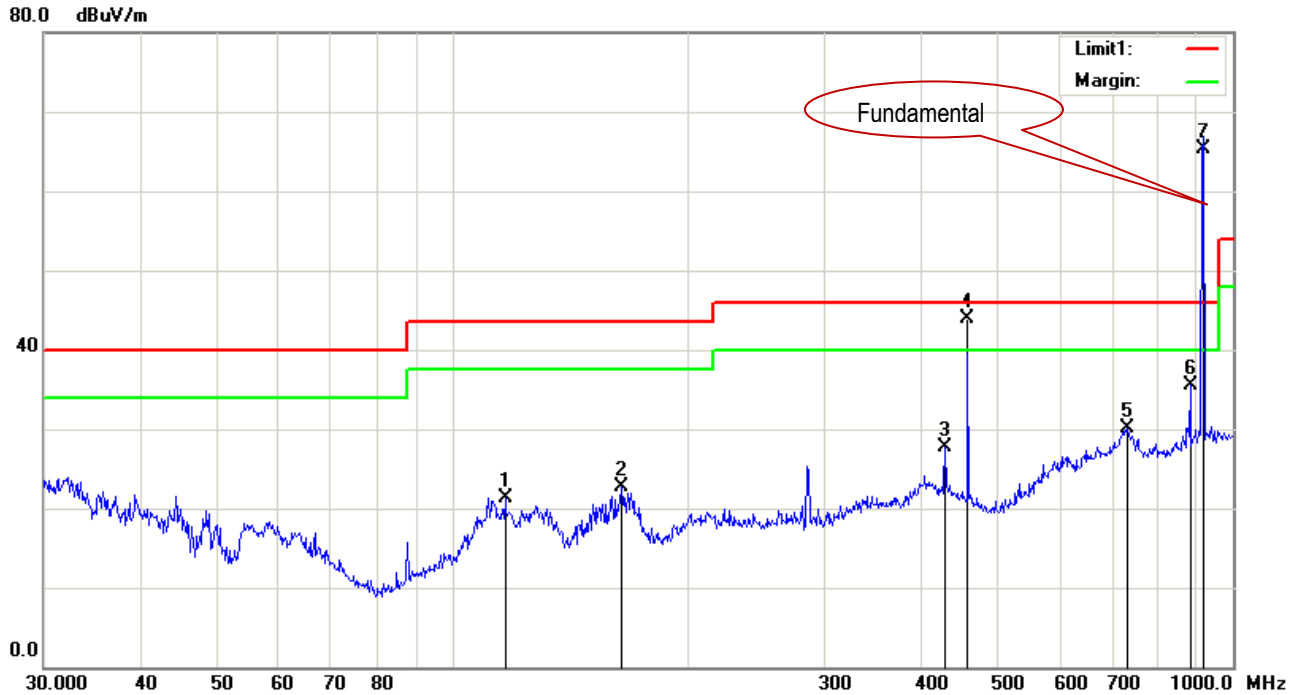
Test Data

Horizontal Polarity Plot @3m

No.	Frequency (MHz)	Reading (dBμV/m)	Detector	Ant_F (dB/m)	PA_G (dB)	Cab_L (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Degree (°)
1	123.2655	47.92	QP	15.84	46.80	1.81	18.77	43.50	-24.73	200	350
2	284.9767	55.86	QP	16.37	48.41	2.69	26.51	46.00	-19.49	200	121
3	428.0193	57.17	QP	16.00	49.10	3.32	27.39	46.00	-18.61	300	85
4	457.5073	72.34	QP	16.00	49.17	3.42	42.59	46.00	-3.41	200	249
5	612.0642	49.54	QP	21.40	47.66	3.97	27.25	46.00	-18.75	200	57
6	744.8661	48.02	QP	22.67	45.07	4.38	30.00	46.00	-16.00	300	271
7	913.0000	83.00	QP	23.01	46.63	4.89	64.27	46.00	18.27	300	35

Test Mode:	Transmitting Mode-915MHz
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(30MHz - 1GHz)



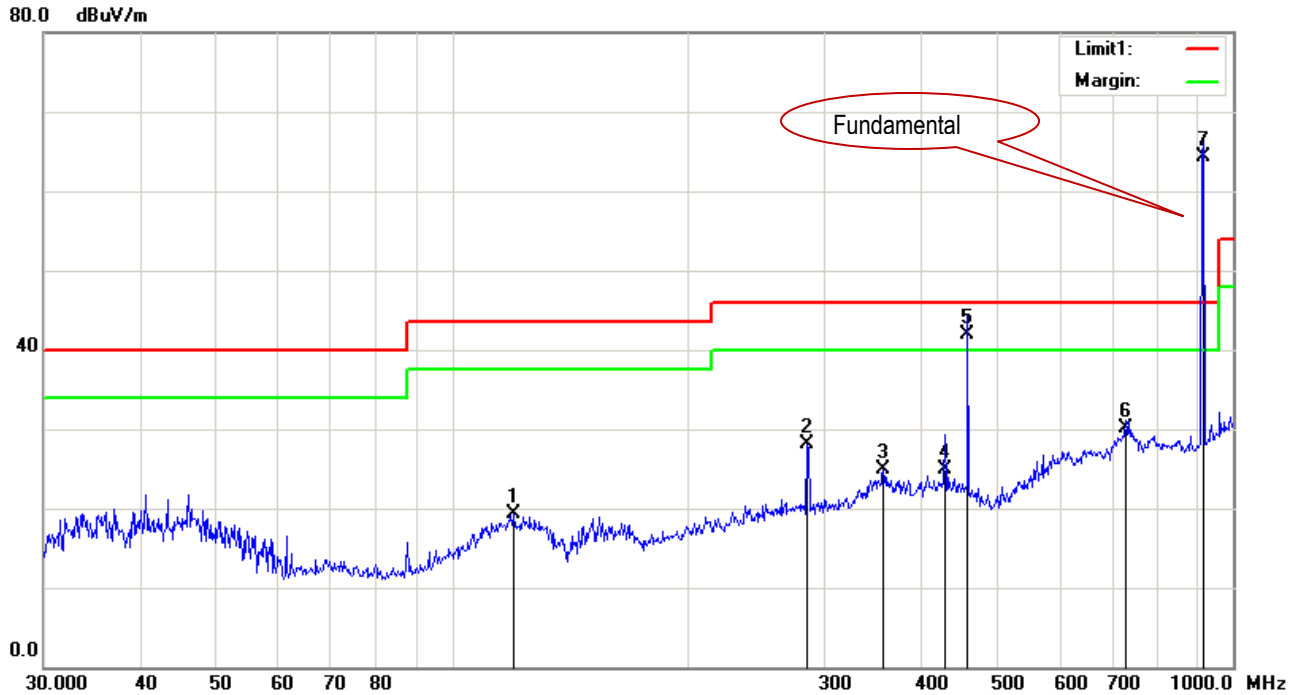
Test Data

Vertical Polarity Plot @3m

No.	Frequency (MHz)	Reading (dBμV/m)	Detector	Ant_F (dB/m)	PA_G (dB)	Cab_L (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Degree (°)
1	116.9495	50.72	QP	15.24	46.46	1.75	21.25	43.50	-22.25	100	233
2	164.9075	53.64	QP	13.86	46.89	2.08	22.69	43.50	-20.81	100	8
3	428.0193	57.02	QP	16.53	49.10	3.32	27.77	46.00	-18.23	200	170
4	457.5073	73.53	QP	16.03	49.17	3.42	43.81	46.00	-2.19	100	153
5	731.9203	48.79	QP	22.26	45.38	4.34	30.01	46.00	-15.99	300	312
6	881.4067	53.34	QP	23.28	45.95	4.80	35.47	46.00	-10.53	100	336
7	915.0000	83.34	QP	23.66	46.63	4.89	65.26	46.00	19.26	100	98

Test Mode:	Transmitting Mode-915MHz
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(30MHz - 1GHz)



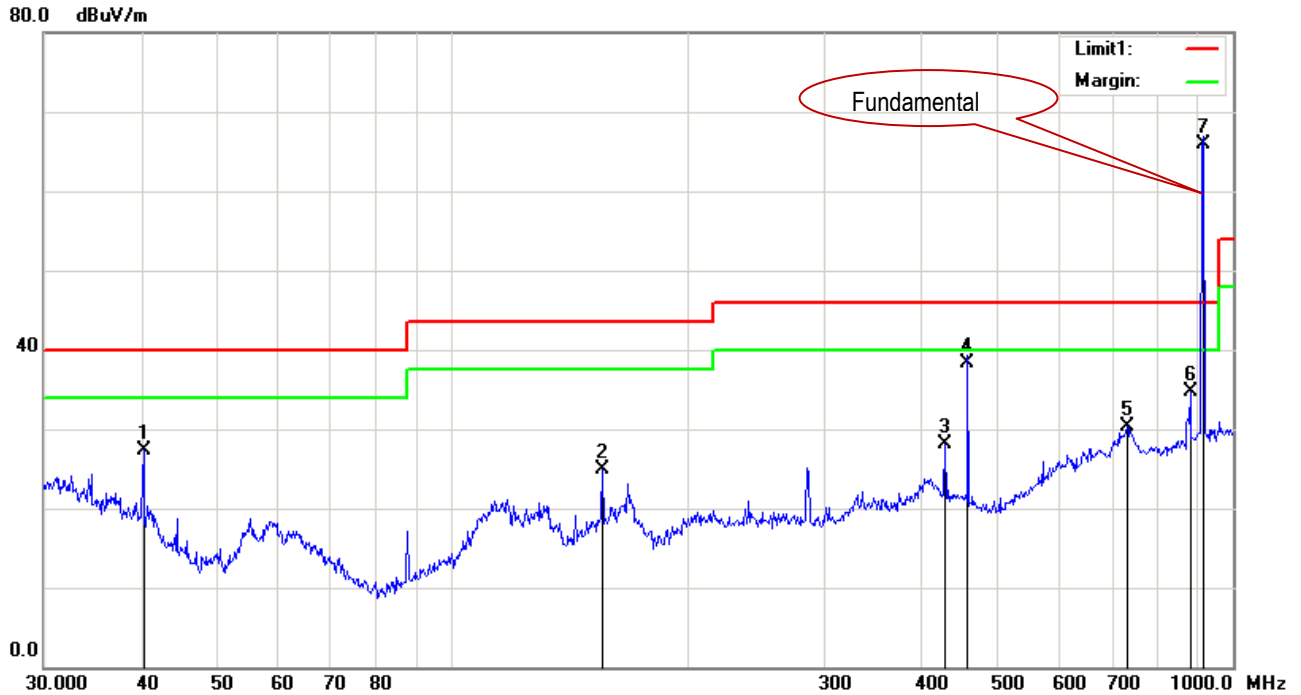
Test Data

Horizontal Polarity Plot @3m

No.	Frequency (MHz)	Reading (dBμV/m)	Detector	Ant_F (dB/m)	PA_G (dB)	Cab_L (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Degree (°)
1	119.8556	47.98	QP	16.03	46.56	1.78	19.23	43.50	-24.27	300	323
2	284.9767	57.37	QP	16.37	48.41	2.69	28.02	46.00	-17.98	200	100
3	356.6758	54.33	QP	16.39	48.78	3.03	24.97	46.00	-21.03	300	276
4	428.0193	54.75	QP	16.00	49.10	3.32	24.97	46.00	-21.03	200	242
5	457.5073	71.71	QP	16.00	49.17	3.42	41.96	46.00	-4.04	200	242
6	729.3583	48.57	QP	22.58	45.46	4.34	30.03	46.00	-15.97	300	341
7	915.0000	82.94	QP	23.06	46.63	4.89	64.26	46.00	18.26	300	168

Test Mode:	Transmitting Mode-917MHz
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(30MHz - 1GHz)



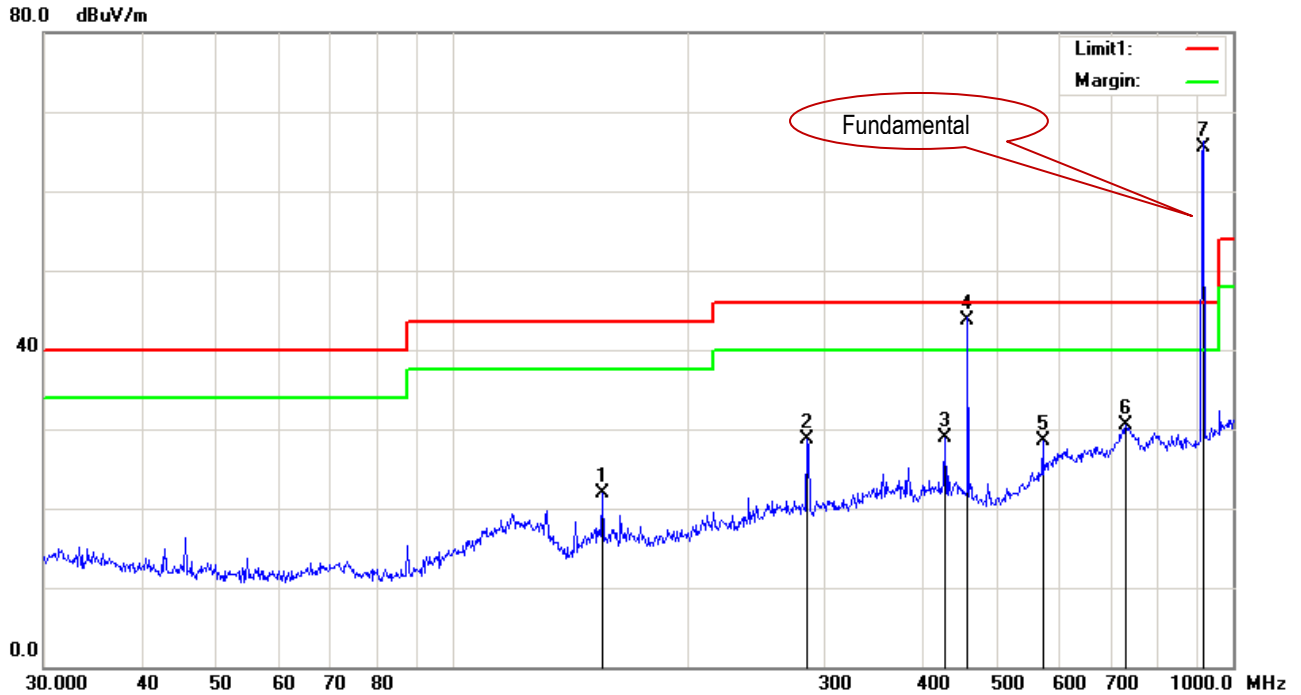
Test Data

Vertical Polarity Plot @3m

No.	Frequency (MHz)	Reading (dBμV/m)	Detector	Ant_F (dB/m)	PA_G (dB)	Cab_L (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Degree (°)
1	40.2757	56.45	QP	15.59	45.72	1.06	27.38	40.00	-12.62	100	315
2	155.9101	56.72	QP	13.60	47.57	2.08	24.83	43.50	-18.67	108	360
3	428.0193	57.33	QP	16.53	49.10	3.32	28.08	46.00	-17.92	200	189
4	457.5073	67.97	QP	16.03	49.17	3.42	38.25	46.00	-7.75	200	159
5	731.9203	49.04	QP	22.26	45.38	4.34	30.26	46.00	-15.74	200	24
6	881.4067	52.60	QP	23.28	45.95	4.80	34.73	46.00	-11.27	300	191
7	917.0000	83.91	QP	23.66	46.62	4.89	65.84	46.00	19.84	100	64

Test Mode:	Transmitting Mode-917MHz
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(30MHz - 1GHz)



Test Data

Horizontal Polarity Plot @3m

No.	Frequency (MHz)	Reading (dBμV/m)	Detector	Ant_F (dB/m)	PA_G (dB)	Cab_L (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Degree (°)
1	155.9101	54.63	QP	12.70	47.57	2.08	21.84	43.50	-21.66	200	106
2	284.9767	58.11	QP	16.37	48.41	2.69	28.76	46.00	-17.24	300	94
3	428.0193	58.78	QP	16.00	49.10	3.32	29.00	46.00	-17.00	200	239
4	457.5073	73.55	QP	16.00	49.17	3.42	43.80	46.00	-2.20	200	246
5	570.6100	53.35	QP	19.71	48.43	3.82	28.45	46.00	-17.55	200	118
6	729.3583	48.96	QP	22.58	45.46	4.34	30.42	46.00	-15.58	200	291
7	917.0000	84.05	QP	23.11	46.62	4.89	65.43	46.00	19.43	200	251

Test Mode:	Transmitting Mode-913MHz
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(Above 1GHz)

Vertical Polarity Plot @3m

No.	Frequency (MHz)	Reading (dBμV/m)	Detector	Ant_F (dB/m)	PA_G (dB)	Cab_L (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Degree (°)
1	1826.000	64.24	peak	30.29	51.41	4.01	47.13	74.00	-26.87	100	130
2	2411.000	68.01	peak	31.55	52.57	4.02	51.01	74.00	-22.99	100	290
3	2734.000	70.25	peak	31.58	52.72	4.21	53.32	74.00	-20.68	200	181
4	4502.000	56.74	peak	32.50	51.99	5.85	43.10	74.00	-30.90	200	25
5	5811.000	55.87	peak	33.44	52.12	6.06	43.25	74.00	-30.75	300	39
6	6457.000	55.93	peak	34.13	52.70	5.84	43.20	74.00	-30.80	300	148

Horizontal Polarity Plot @3m

No.	Frequency (MHz)	Reading (dBμV/m)	Detector	Ant_F (dB/m)	PA_G (dB)	Cab_L (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Degree (°)
1	1826.000	64.01	peak	30.29	51.41	4.01	46.90	74.00	-27.10	200	119
2	2411.000	68.86	peak	31.55	52.57	4.02	51.86	74.00	-22.14	294	360
3	2734.000	70.29	peak	31.58	52.72	4.21	53.36	74.00	-20.64	200	175
4	4145.000	57.26	peak	31.72	52.69	6.07	42.36	74.00	-31.64	100	100
5	5233.000	56.85	peak	33.55	53.88	6.29	42.81	74.00	-31.19	100	237
6	5981.000	56.48	peak	33.40	51.36	5.87	44.39	74.00	-29.61	100	100

Note: The AV measurement performed, more than 20dB below limit so AV test data was not presented.

Test Mode:	Transmitting Mode-915MHz
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(Above 1GHz)

Vertical Polarity Plot @3m

No.	Frequency (MHz)	Reading (dBμV/m)	Detector	Ant_F (dB/m)	PA_G (dB)	Cab_L (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Degree (°)
1	1830.000	64.80	peak	30.31	51.43	4.01	47.69	74.00	-26.31	100	321
2	2411.000	64.84	peak	31.55	52.57	4.02	47.84	74.00	-26.16	231	360
3	2751.000	70.25	peak	31.57	52.73	4.22	53.31	74.00	-20.69	200	9
4	4876.000	56.94	peak	33.33	53.66	6.00	42.61	74.00	-31.39	100	138
5	6151.000	55.91	peak	33.64	51.75	5.85	43.65	74.00	-30.35	200	102
6	7970.000	55.42	peak	36.51	54.74	7.82	45.01	74.00	-28.99	100	248

Horizontal Polarity Plot @3m

No.	Frequency (MHz)	Reading (dBμV/m)	Detector	Ant_F (dB/m)	PA_G (dB)	Cab_L (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Degree (°)
1	1830.000	64.11	peak	30.31	51.43	4.01	47.00	74.00	-27.00	100	322
2	2411.000	67.58	peak	31.55	52.57	4.02	50.58	74.00	-23.42	100	350
3	2751.000	70.15	peak	31.57	52.73	4.22	53.21	74.00	-20.79	100	100
4	4502.000	56.67	peak	32.50	51.99	5.85	43.03	74.00	-30.97	100	100
5	5794.000	56.04	peak	33.44	52.19	6.07	43.36	74.00	-30.64	200	26
6	7749.000	55.40	peak	35.85	54.77	7.63	44.11	74.00	-29.89	200	108

Note: The AV measurement performed, more than 20dB below limit so AV test data was not presented.

Test Mode:	Transmitting Mode-917MHz
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(Above 1GHz)

Vertical Polarity Plot @3m

No.	Frequency (MHz)	Reading (dBμV/m)	Detector	Ant. F (dB/m)	PA. G (dB)	Cab. L (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Degree (°)
1	1833.000	64.48	peak	30.33	51.45	4.01	47.37	74.00	-26.63	100	277
2	2411.000	68.38	peak	31.55	52.57	4.02	51.38	74.00	-22.62	200	192
3	2751.000	70.47	peak	31.57	52.73	4.22	53.53	74.00	-20.47	200	169
4	4519.000	56.76	peak	32.54	52.06	5.90	43.14	74.00	-30.86	200	0
5	5964.000	55.53	peak	33.41	51.44	5.89	43.39	74.00	-30.61	100	147
6	7817.000	56.63	peak	36.05	54.76	7.69	45.61	74.00	-28.39	100	237

Horizontal Polarity Plot @3m

No.	Frequency (MHz)	Reading (dBμV/m)	Detector	Ant. F (dB/m)	PA. G (dB)	Cab. L (dB)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Degree (°)
1	1833.000	64.79	peak	30.33	51.45	4.01	47.68	74.00	-26.32	359	360
2	2411.000	67.72	peak	31.55	52.57	4.02	50.72	74.00	-23.28	100	327
3	2751.000	70.55	peak	31.57	52.73	4.22	53.61	74.00	-20.39	200	169
4	3516.000	58.01	peak	31.59	52.88	4.89	41.61	74.00	-32.39	200	108
5	4859.000	57.43	peak	33.29	53.58	6.03	43.17	74.00	-30.83	100	172
6	5828.000	56.10	peak	33.43	52.04	6.04	43.53	74.00	-30.47	100	100

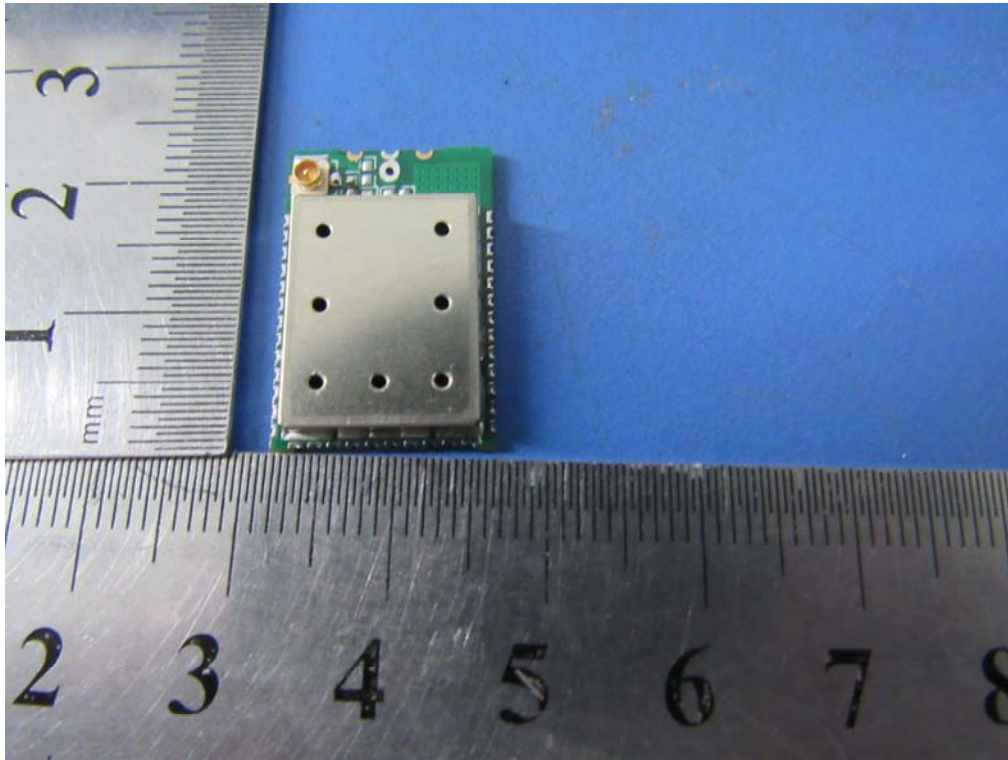
Note: The AV measurement performed, more than 20dB below limit so AV test data was not presented.

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	☒
Com-Power Transient Limiter	LIT-153	531021	05/15/2017	05/14/2018	☒
SIEMIC EZ_EMC Conducted Emissions software	Ver.ICP-03A1	N/A	N/A	N/A	☒
RF conducted test					
Agilent Technologies Spectrum Analyzer	N9010A	MY47191130	05/03/2017	05/02/2018	☒
Radiated Emissions					
Agilent Technologies 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	10/20/2017	10/20/2018	☒
EMCO Horn Antenna (1 ~18GHz)	3115	N/A	10/09/2017	10/08/2018	☒
Agilent Pre-Amplifier	8449B	N/A	10/20/2017	10/20/2018	☒
Hp Agilent Pre-Amplifier	8447F	1937A01160	10/20/2017	10/20/2018	☒
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 Photos

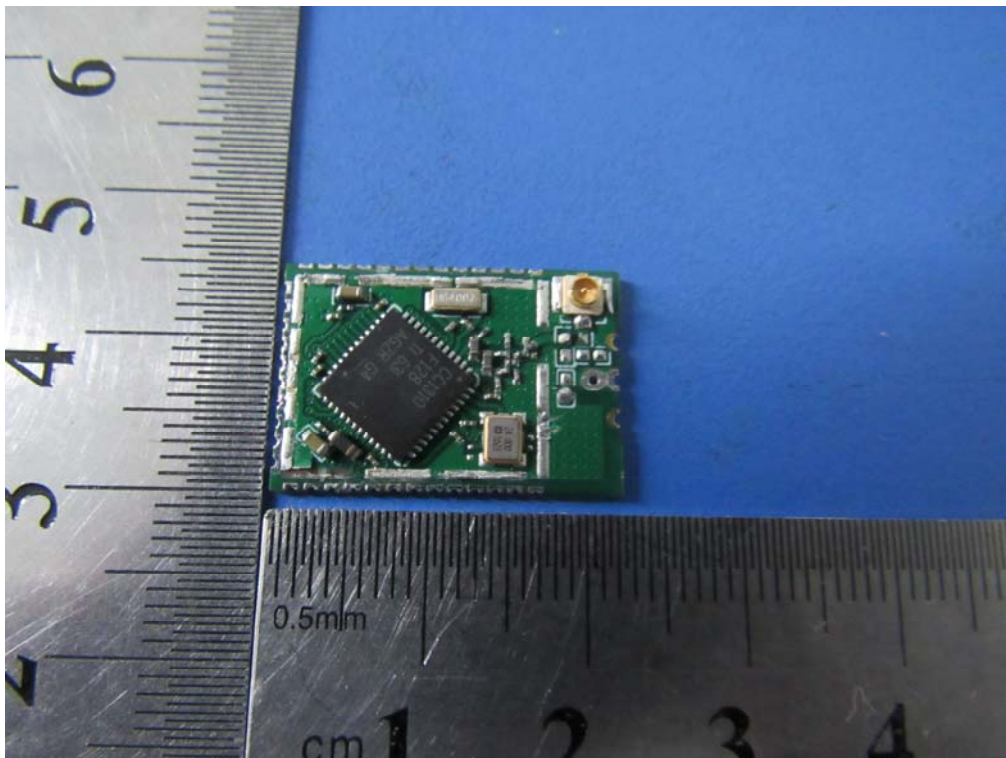


Top View of EUT



Bottom View of EUT

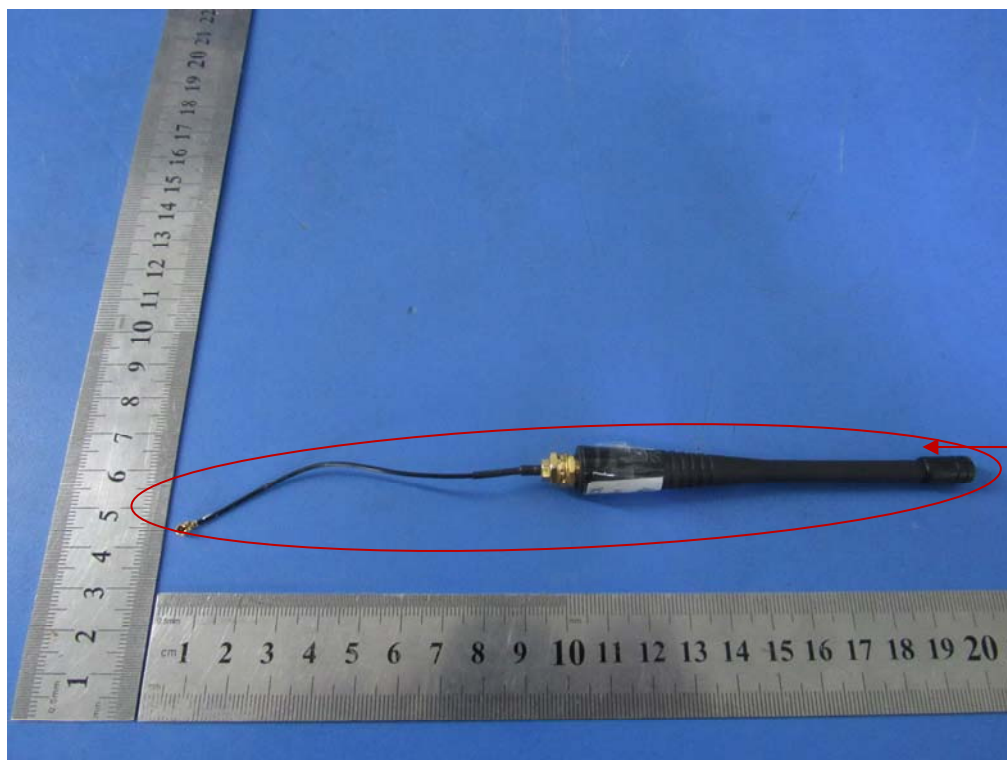
Annex B.ii. Photograph EUT Internal Photos



EUT PCBA – Front View



EUT PCBA 1 – Rear View



Antenna

Antenna- Front View

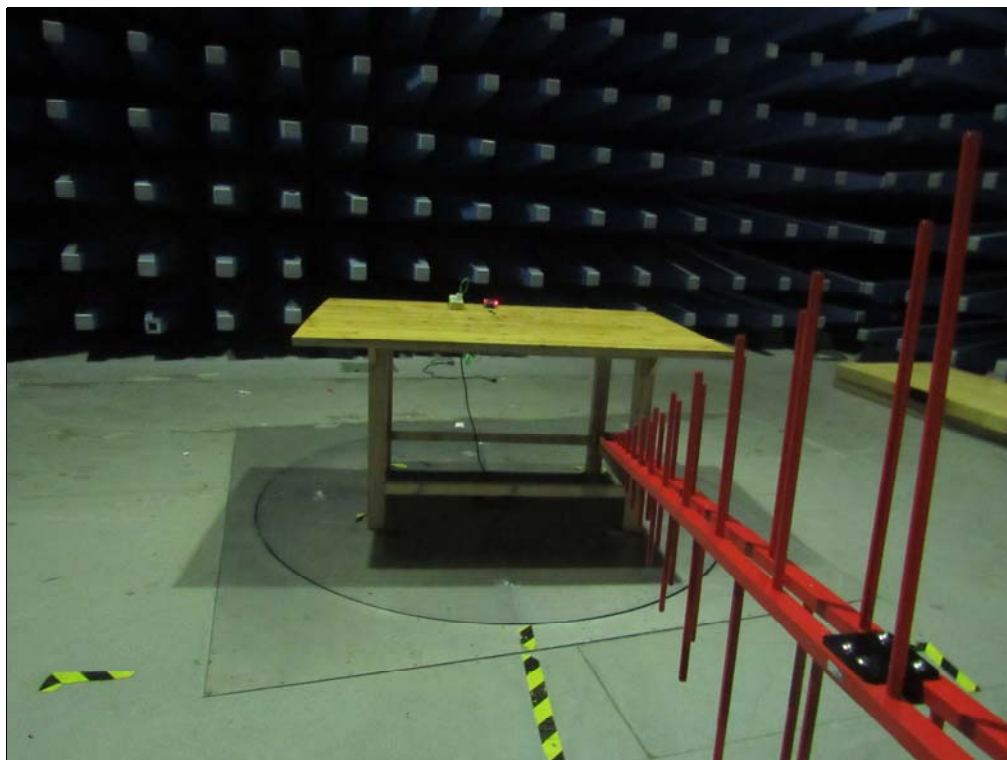
Annex B.iii. Photograph Test Setup Photo



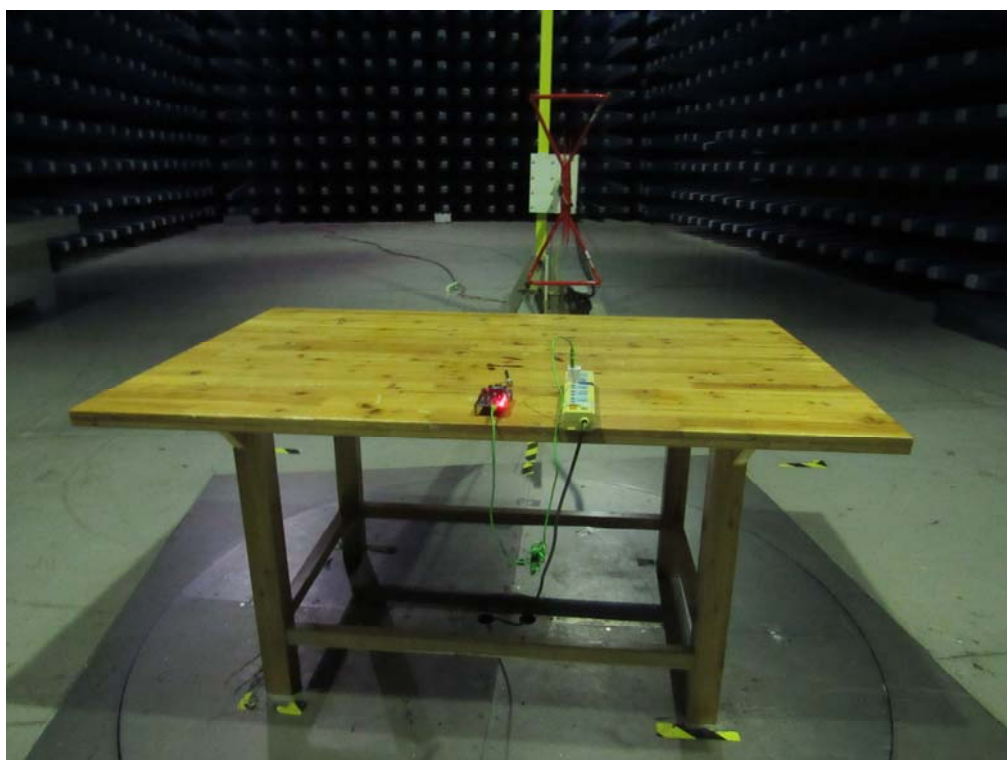
Conducted Emissions Setup Front View



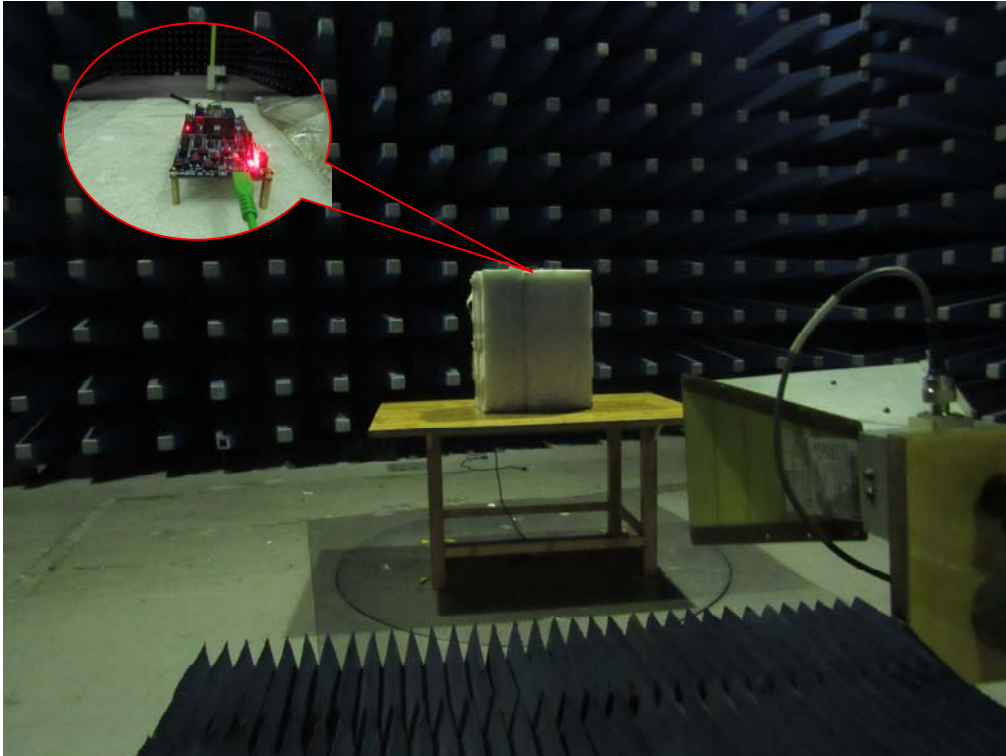
Conducted Emissions Setup Side View



Front View of Radiated Emissions Test Setup below 30MHz



Rear View of Radiated Emissions Test Setup below 30MHz

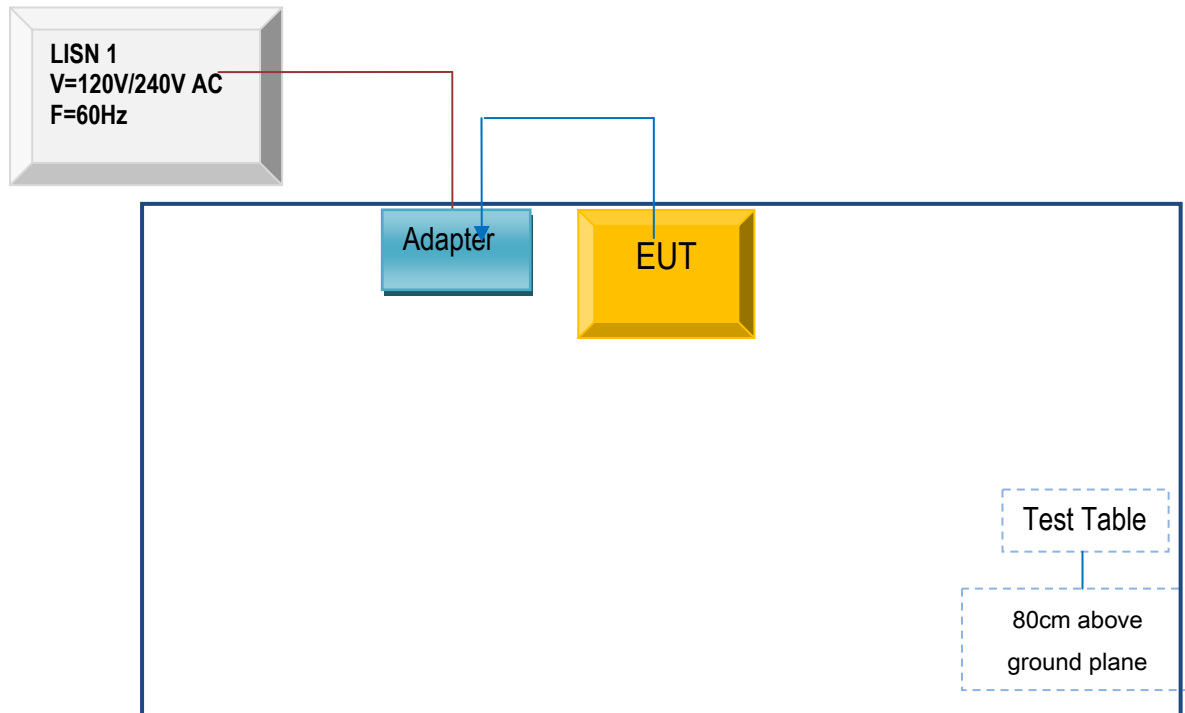


Radiated Emissions Setup Below 1GHz Front View

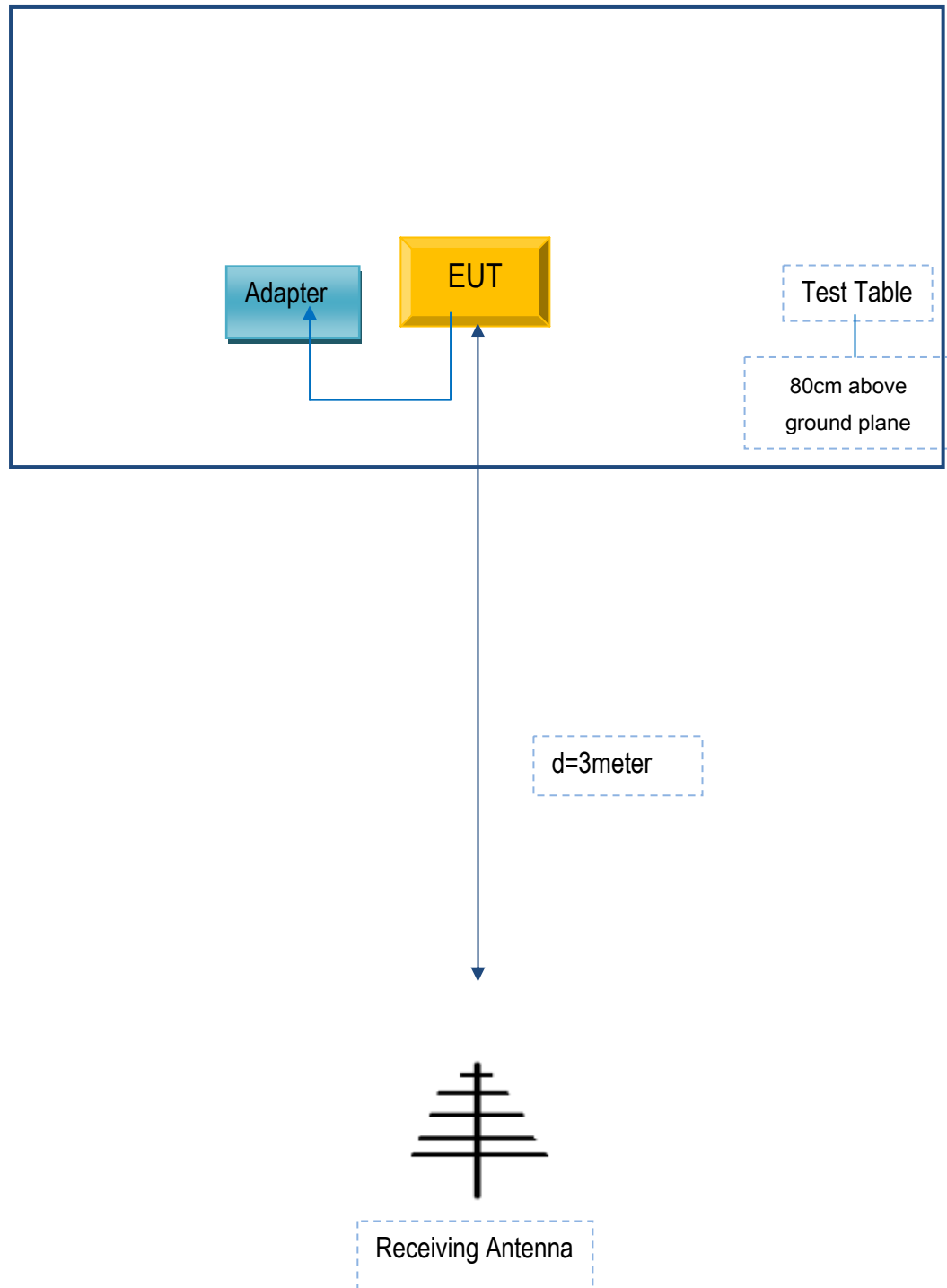
Annex C. TEST SETUP AND SUPPORTING EQUIPMENT

Annex C.i. TEST SET UP BLOCK

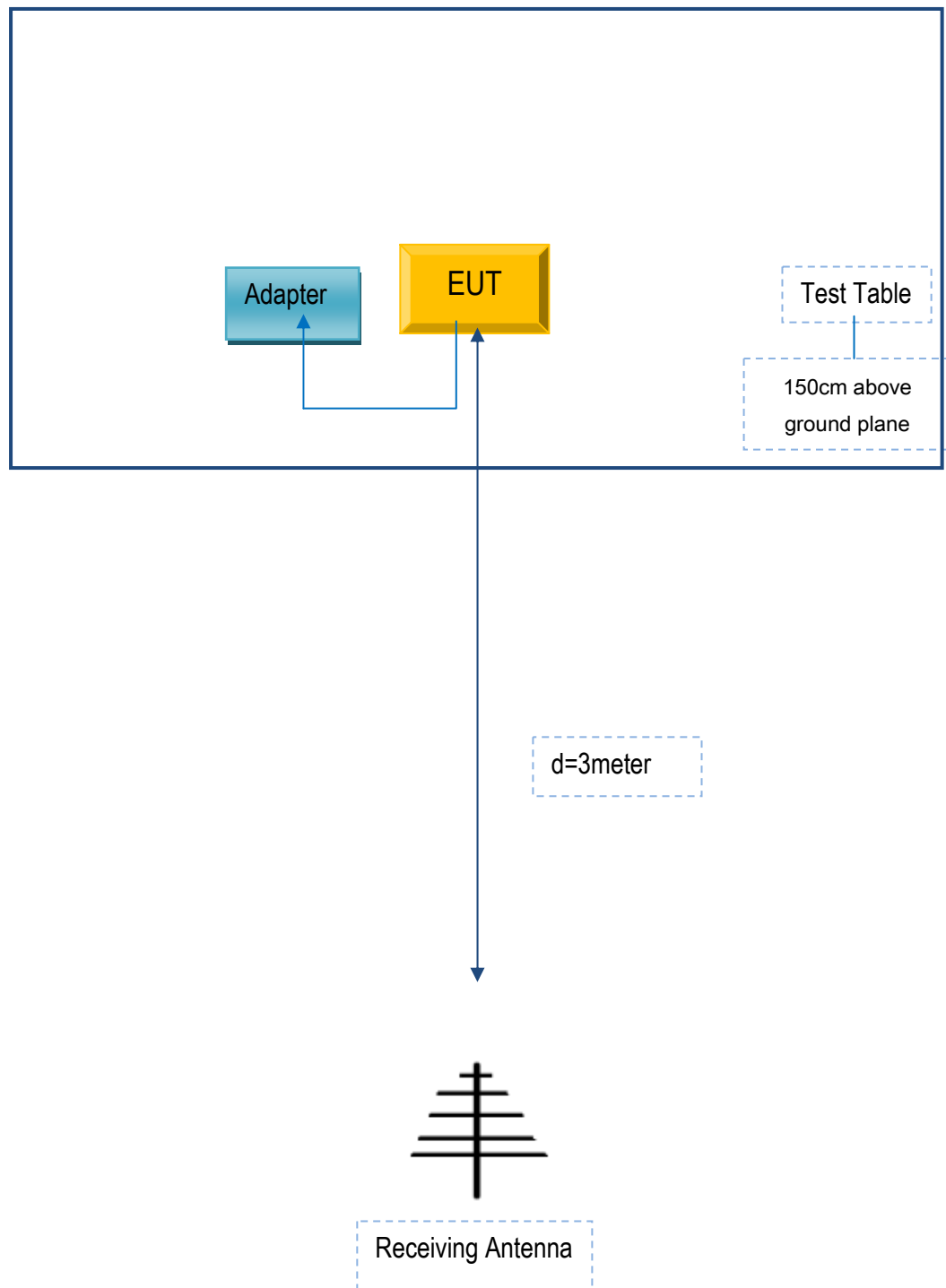
Block Configuration Diagram for AC Line Conducted Emissions



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
FUJIA	Adapter	FJ-SW266B50501000C	FUJIA
N/A	PCBA	N/A	N/A

Supporting Cable:

Cable type	Shield Type	Ferrite Core	Length	Serial No
USB Cable	Un-shielding	No	0.8m	YK84201153021

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

See attachment

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Annex E. DECLARATION OF SIMILARITY

N/A