

FCC TEST REPORT

Client Name : Launch Tech Co., Ltd.

Address : Launch Industrial Park, North of Wuhe Rd. Banxuegang,
Longgang, Shenzhen, China

Product Name : SMART TPMS DIAGNOSTIC TOOL

Date : Mar. 25, 2022

Shenzhen Anbotech Compliance Laboratory Limited



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TEST REPORT

Applicant : Launch Tech Co., Ltd.
Manufacturer : Launch Tech Co., Ltd.
Product Name : SMART TPMS DIAGNOSTIC TOOL
Model No. : CRT 711, CRT 7xx, CRT 7xy, CRT 7xxx, CRT 7xxxY
("xx"=01-99, "xxx"=001-999, "Y"=A~Z)
Trade Mark : LAUNCH
Rating(s) : Input: AC100-240V,50/60HZ (with DC 3.7V, 6100 mAh Battery inside)

Test Standard(s) : FCC Part15 Subpart C, Paragraph 15.209

Test Method(s) : ANSI C63.10: 2020

The device described above is tested by Shenzhen Anbotek Compliance Laboratory Limited to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and Shenzhen Anbotek Compliance Laboratory Limited is assumed full of responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT (Equipment Under Test) is technically compliant with the FCC Part 15 Subpart C requirements.

This report applies to above tested sample only and shall not be reproduced in part without written approval of Shenzhen Anbotek Compliance Laboratory Limited.

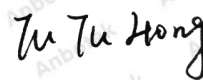
Date of Receipt

Feb. 16, 2022

Date of Test

Feb. 16~Mar. 11, 2022

Prepared By



(TuTu Hong)

Approved & Authorized Signer



(Kingkong Jin)

1. General Information

1.1. Client Information

Applicant	:	Launch Tech Co., Ltd.
Address	:	Launch Industrial Park, North of Wuhe Rd. Banxuegang, Longgang, Shenzhen, China
Manufacturer	:	Launch Tech Co., Ltd.
Address	:	Launch Industrial Park, North of Wuhe Rd. Banxuegang, Longgang, Shenzhen, China
Factory	:	Launch Tech Co., Ltd.
Address	:	Launch Industrial Park, North of Wuhe Rd. Banxuegang, Longgang, Shenzhen, China

1.2. Description of Device (EUT)

Product Name	:	SMART TPMS DIAGNOSTIC TOOL	
Model No.	:	CRT 711, CRT 7xx, CRT 7xxy, CRT 7xxx, CRT 7xxxY ("xx"=01-99,"xxx"=001-999, "Y"=A~Z) (Note:All samples are the same except the model number, appearance color,Key decorative ring color and deagnostic function, so we prepare "CRT 711"for test only.)	
Trade Mark	:	LAUNCH	
Test Power Supply	:	AC 120V, 60Hz for Adapter/DC 3.7V Battery inside	
Test Sample No.	:	1-2-1(Normal Sample), 1-2-2(Engineering Sample)	
Product Description	:	Operation Frequency:	125KHz
	:	Number of Channel:	1 Channel
	:	Modulation Type:	ASK
	:	Antenna Type:	FPC antenna
	:	Antenna Gain(Peak):	0 dBi (Provided by customer)
	:	Adapter:	Model:FY0502500 Input:100-240V~50/60Hz 0.6A Max Output:DC 5V.2.5A
Remark: 1) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual. 2) This report is for 125KHz module.			

1.3. Auxiliary Equipment Used During Test.

N/A

1.4. Description of Test Modes

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

For Conducted Emission	
Final Test Mode	Description
125KHz	TX

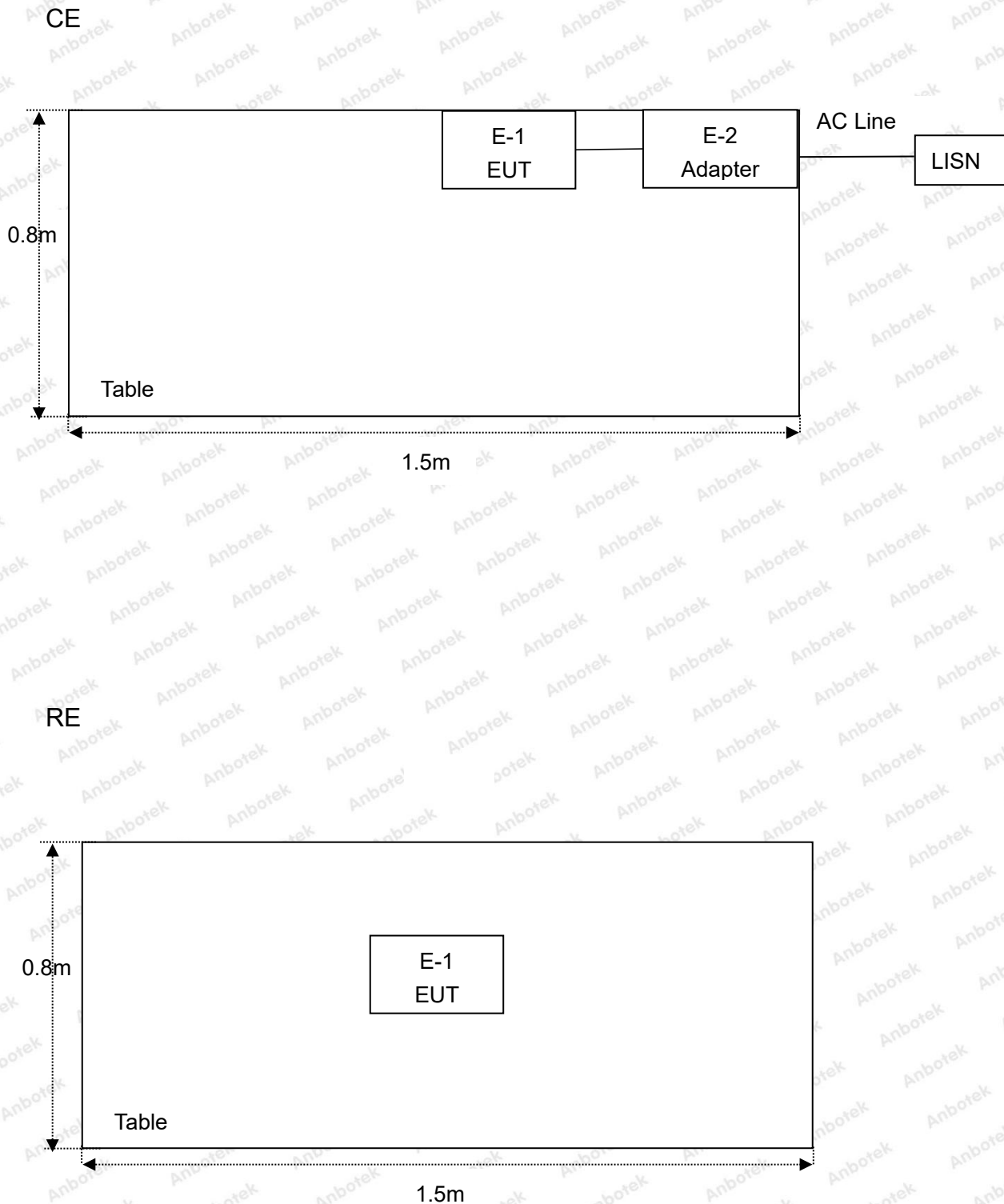
For Radiated Emission	
Final Test Mode	Description
125KHz	TX

1.5. List of Channels

Channel	Freq. (MHz)
01	0.125



1.5. Description Of Test Setup



1.6. Test Equipment List

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Three Phase V-type Artificial Power Network	CYBERTEK	EM5040DT	E215040DT001	Jul 05, 2021	1 Year
2.	EMI Test Receiver	Rohde & Schwarz	ESCI	100627	Oct. 22, 2021	1 Year
3.	EMI Test Receiver	Rohde & Schwarz	ESR26	101481	Oct. 22, 2021	1 Year
4.	RF Switching Unit	Compliance Direction	RSU-M2	38303	Oct. 22, 2021	1 Year
5.	MAX Spectrum Analysis	Agilent	N9020A	MY51170037	Oct. 22, 2021	1 Year
6.	Preamplifier	SKET Electronic	BK1G18G30 D	KD17503	Oct. 22, 2021	1 Year
7.	Double Ridged Horn Antenna	Instruments corporation	GTH-0118	351600	Oct. 22, 2021	2 Year
8.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	VULB 9163-289	Oct. 22, 2021	2 Year
9.	Loop Antenna	Schwarzbeck	FMZB1519B	00053	Oct. 22, 2021	2 Year
10.	Horn Antenna	A-INFO	LB-180400-K F	J211060628	Oct. 22, 2021	2 Year
11.	Pre-amplifier	SONOMA	310N	186860	Oct. 22, 2021	1 Year
12.	EMI Test Software EZ-EMC	SHURPLE	N/A	N/A	N/A	N/A
13.	RF Test Control System	YIHENG	YH3000	2017430	Oct. 22, 2021	1 Year
14.	Power Sensor	DAER	RPR3006W	15100041SN045	Oct. 22, 2021	1 Year
15.	Power Sensor	DAER	RPR3006W	15100041SN046	Oct. 22, 2021	1 Year
16.	MXA Spectrum Analysis	KEYSIGHT	N9020A	MY53280032	Oct. 22, 2021	1 Year
17.	MXG RF Vector Signal Generator	Agilent	N5182A	MY48180656	Oct. 22, 2021	1 Year
18.	Signal Generator	Agilent	E4421B	MY41000743	Oct. 22, 2021	1 Year
19.	DC Power Supply	IVYTECH	IV3605	1804D360510	Oct. 22, 2021	1 Year
20.	Constant Temperature Humidity Chamber	ZHONGJIAN	ZJ-KHWS80 B	N/A	Oct. 22, 2021	1 Year

1.7. Description of Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

FCC-Registration No.: 184111

Shenzhen Anbotech Compliance Laboratory Limited, EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No. 184111.

ISED-Registration No.: 8058A-1

Shenzhen Anbotech Compliance Laboratory Limited, EMC Laboratory has been registered and fully described in a report filed with the (ISED) Innovation, Science and Economic Development Canada. The acceptance letter from the ISED is maintained in our files. Registration 8058A.

Test Location

Shenzhen Anbotech Compliance Laboratory Limited.

1/F, Building D, Sogood Science and Technology Park, Sanwei community, Hangcheng Street, Bao'an District, Shenzhen, Guangdong, China.518102



2. Summary of Test Results

Standard Section	Test Item	Result
FCC Part 15, Paragraph 15.207	Conducted Emission Test	PASS
FCC Part 15, Paragraph 15.209(a)(f)	Spurious Emission	PASS
FCC Part 15, Paragraph 15.203	Antenna Requirement	PASS
FCC Part 15, Paragraph 15.215 (c)	20dB Emission Bandwidth	PASS

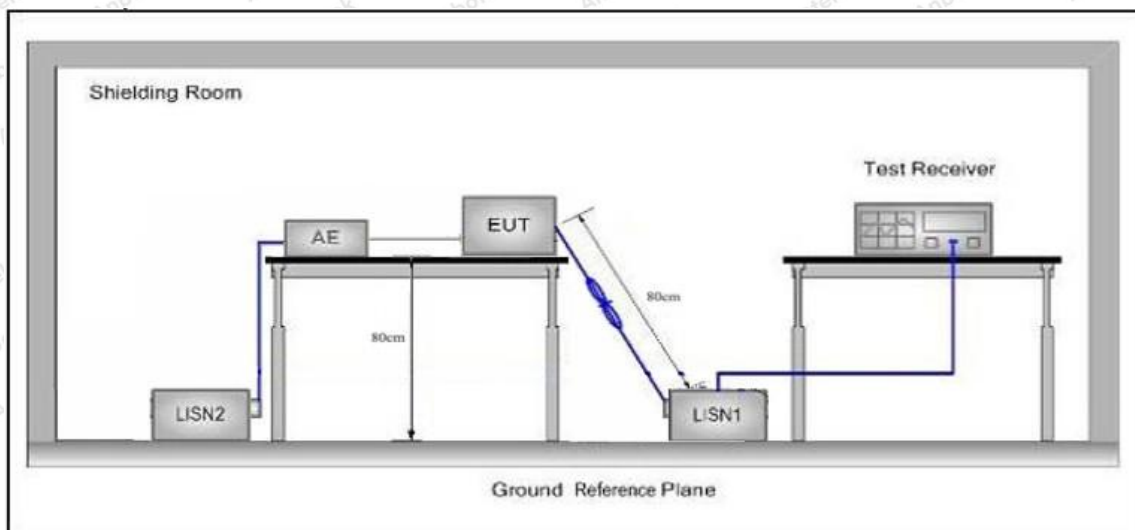


3. Conducted Emission Test

3.1. Test Standard and Limit

Test Standard	FCC Part15 Section 15.207		
Test Limit	Frequency	Maximum RF Line Voltage (dBuV)	
		Quasi-peak Level	Average Level
	150kHz~500kHz	66 ~ 56 *	56 ~ 46 *
	500kHz~5MHz	56	46
	5MHz~30MHz	60	50
Remark: (1) *Decreasing linearly with logarithm of the frequency. (2) The lower limit shall apply at the transition frequency.			

3.2. Test Setup



3.3. Test Procedure

The EUT system is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC line are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to FCC ANSI C63.10: 2020 on Conducted Emission Measurement.

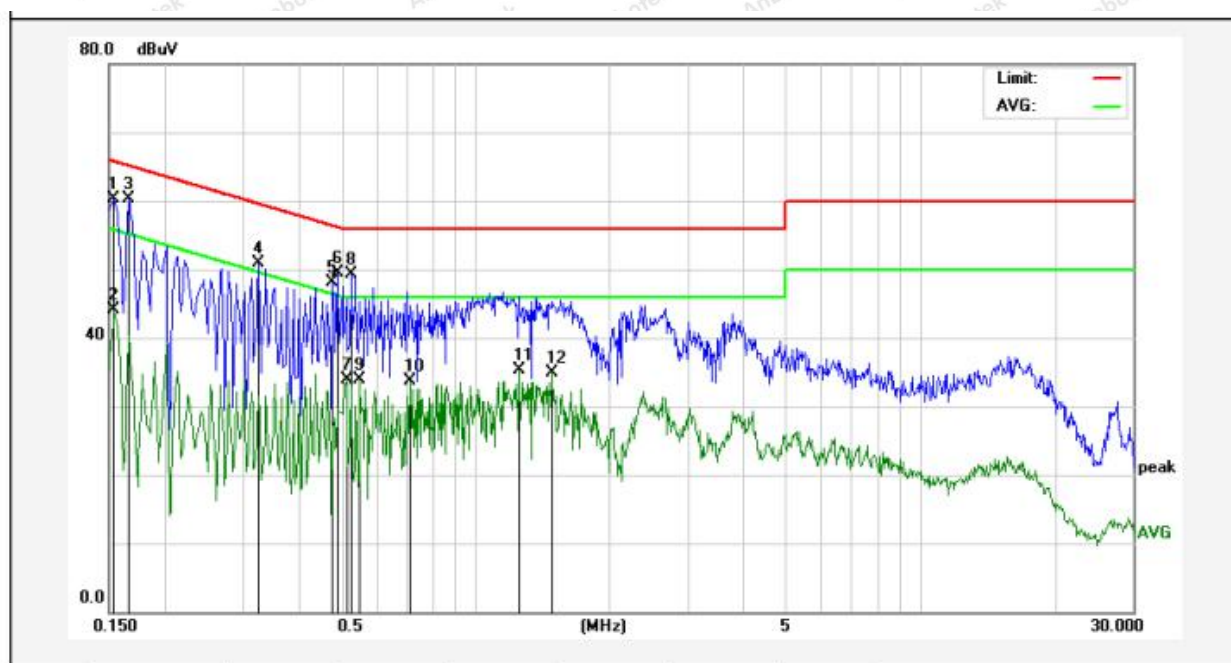
The bandwidth of test receiver (ESCI) set at 9kHz.

The frequency range from 150kHz to 30MHz is checked.

3.4. Test Data

Please to see the following pages. **Conducted Emission Test Data**

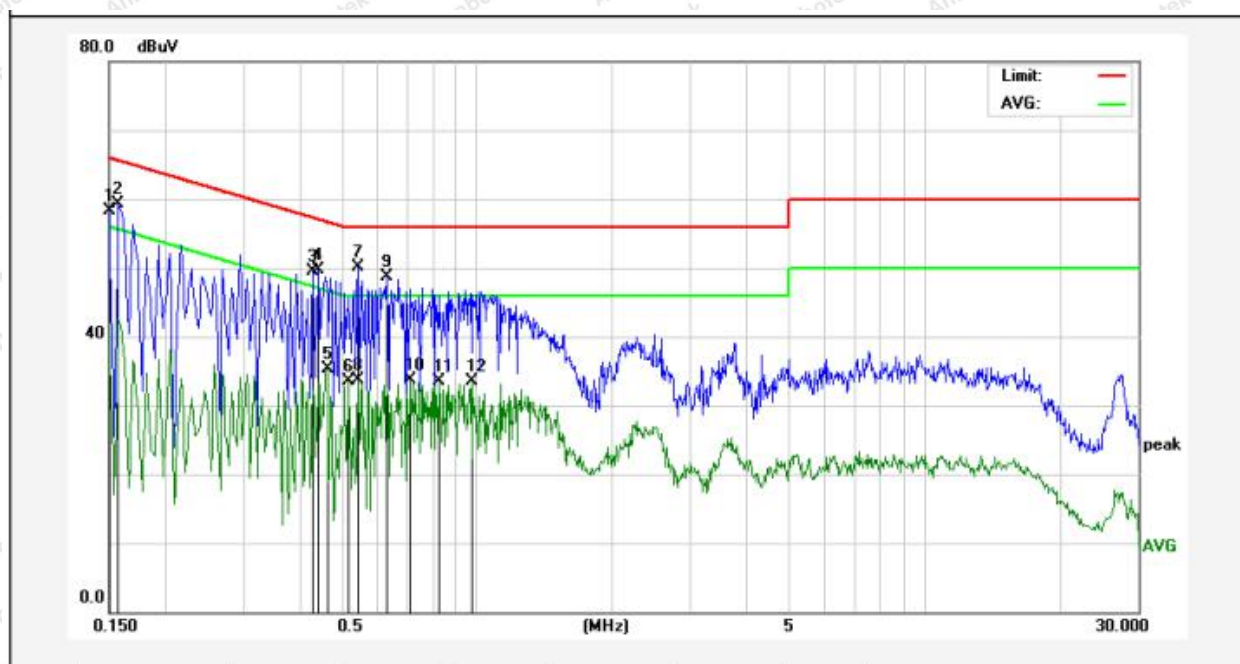
Test Site: 1# Shielded Room
 Operating Condition: 125KHz
 Test Specification: AC 120V, 60Hz for adapter
 Comment: Live Line
 Tem.: 24.4℃ Hum.: 49%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Over Limit (dB)	Detector	Remark
1	0.1539	60.27	0.12	60.39	65.78	-5.39	QP	
2	0.1539	43.92	0.12	44.04	55.78	-11.74	AVG	
3	0.1660	60.27	0.12	60.39	65.15	-4.76	QP	
4	0.3260	50.82	0.12	50.94	59.55	-8.61	QP	
5	0.4780	47.95	0.14	48.09	56.37	-8.28	QP	
6	0.4900	49.26	0.15	49.41	56.17	-6.76	QP	
7	0.5140	33.72	0.15	33.87	46.00	-12.13	AVG	
8	0.5260	49.22	0.15	49.37	56.00	-6.63	QP	
9	0.5500	33.72	0.15	33.87	46.00	-12.13	AVG	
10	0.7140	33.49	0.15	33.64	46.00	-12.36	AVG	
11	1.2500	35.08	0.14	35.22	46.00	-10.78	AVG	
12	1.4819	34.73	0.14	34.87	46.00	-11.13	AVG	

Conducted Emission Test Data

Test Site: 1# Shielded Room
 Operating Condition: 125KHz
 Test Specification: AC 120V, 60Hz for adapter
 Comment: Neutral Line
 Tem.: 24.4℃ Hum.: 49%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Over Limit (dB)	Detector	Remark
1	0.1500	58.27	0.11	58.38	65.99	-7.61	QP	
2	0.1580	59.10	0.12	59.22	65.56	-6.34	QP	
3	0.4300	49.36	0.12	49.48	57.25	-7.77	QP	
4	0.4420	49.49	0.13	49.62	57.02	-7.40	QP	
5	0.4620	35.25	0.13	35.38	46.66	-11.28	AVG	
6	0.5140	33.44	0.15	33.59	46.00	-12.41	AVG	
7	0.5420	49.99	0.15	50.14	56.00	-5.86	QP	
8	0.5420	33.47	0.15	33.62	46.00	-12.38	AVG	
9	0.6300	48.56	0.15	48.71	56.00	-7.29	QP	
10	0.7060	33.50	0.15	33.65	46.00	-12.35	AVG	
11	0.8180	33.30	0.15	33.45	46.00	-12.55	AVG	
12	0.9740	33.32	0.15	33.47	46.00	-12.53	AVG	

4. Radiation Spurious Emission and Band Edge

4.1. Test Standard and Limit

Test Standard	FCC Part15 C Section 15.209 and 15.205				
Test Limit	Frequency (MHz)	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)
	0.009MHz~0.490MHz	2400/F(kHz)	-	-	300
	0.490MHz~1.705MHz	24000/F(kHz)	-	-	30
	1.705MHz~30MHz	30	-	-	30
	30MHz~88MHz	100	40.0	Quasi-peak	3
	88MHz~216MHz	150	43.5	Quasi-peak	3
	216MHz~960MHz	200	46.0	Quasi-peak	3
	960MHz~1000MHz	500	54.0	Quasi-peak	3
	Above 1000MHz	500	54.0	Average	3
		-	74.0	Peak	3

Remark:

(1) The lower limit shall apply at the transition frequency.

(2) 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.

4.2. Test Setup

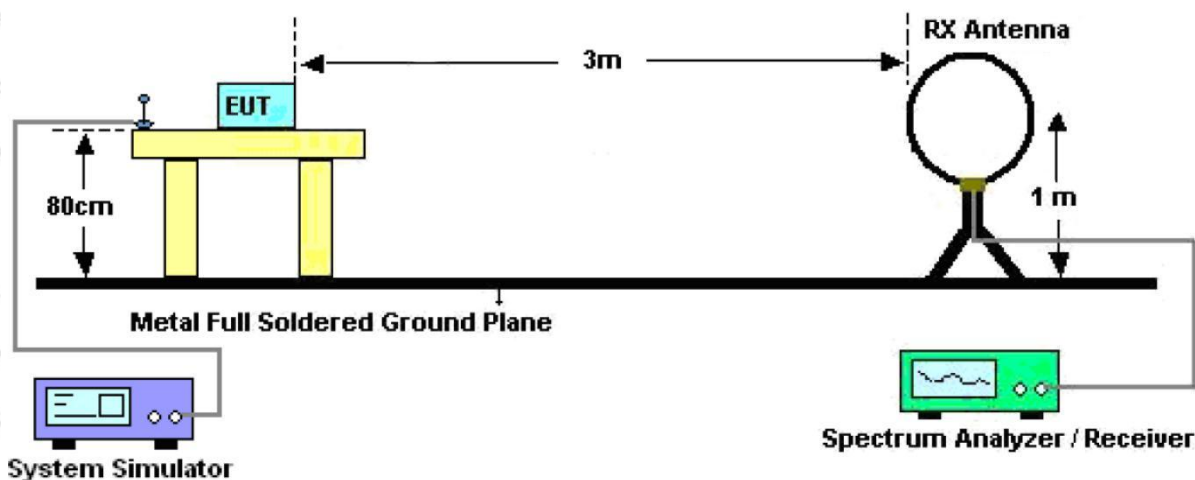


Figure 1. Below 30MHz

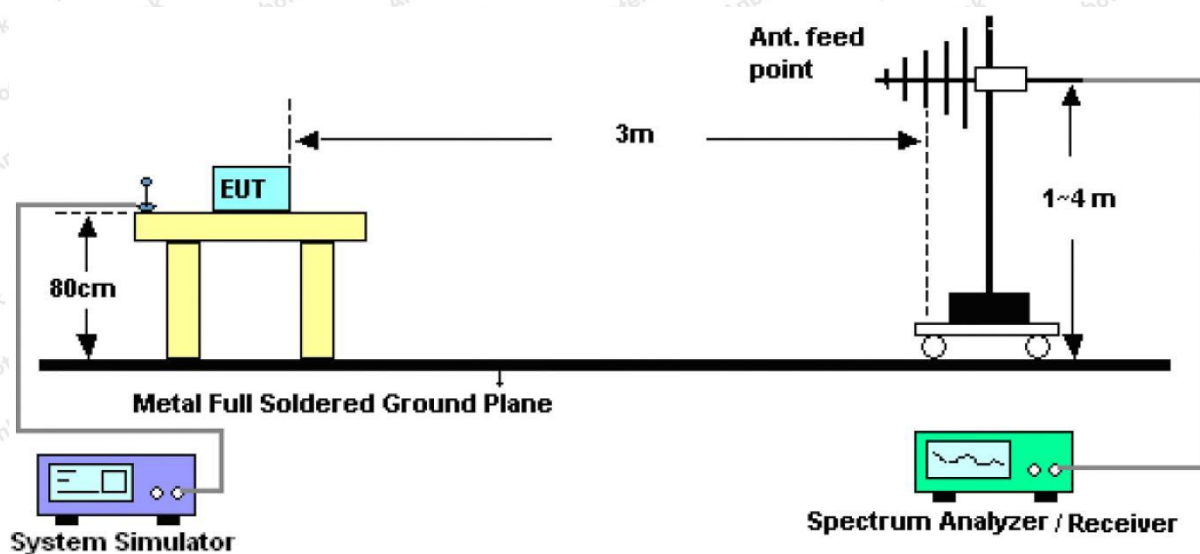


Figure 2. 30MHz to 1GHz

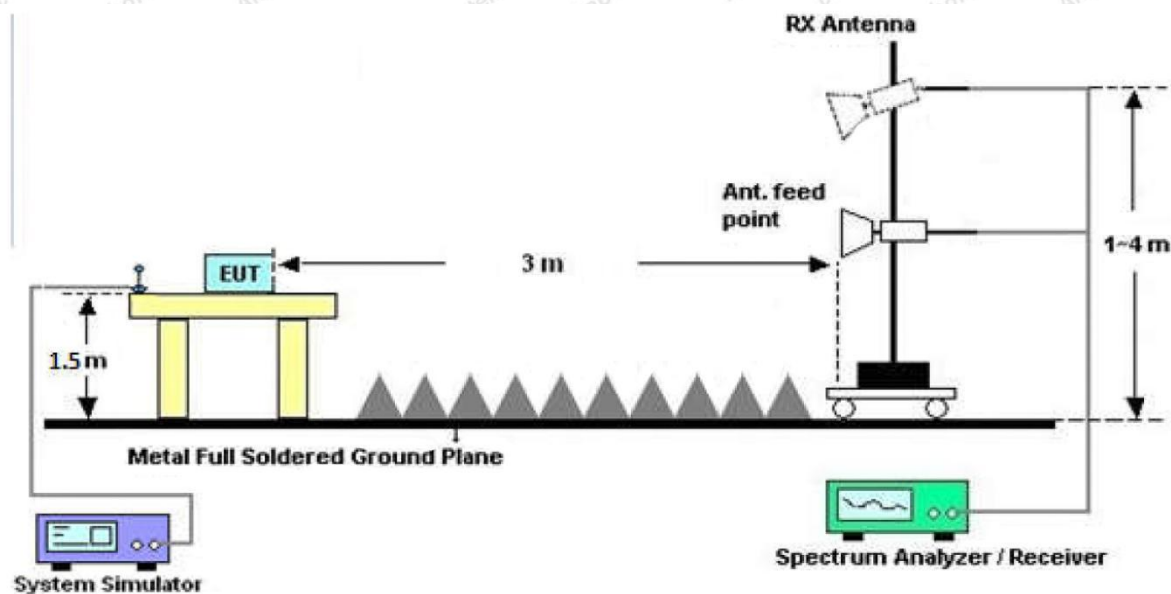


Figure 3. Above 1 GHz

4.3. Test Procedure

For below 1GHz: The EUT is placed on a turntable, which is 0.8m above the ground plane.

For above 1GHz: The EUT is placed on a turntable, which is 1.5m above the ground plane.

The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna which is mounted on a antenna tower. The antenna can be moved up and down from 1 to 4 meters to find out the maximum emission level. Rotated the EUT through three orthogonal axes to determine the maximum emissions, both horizontal and vertical polarization of the antenna are set on test. The EUT is tested in 9*6*6 Chamber. The device is evaluated in xyz orientation.

For 9kHz to 150kHz, Set the spectrum analyzer as:

RBW = 200Hz, VBW = 1kHz, Detector= Quasi-Peak, Trace mode= Max hold, Sweep- auto couple.

For 150kHz to 30MHz, Set the spectrum analyzer as:

RBW = 9KHz, VBW = 30kHz, Detector= Quasi-Peak, Trace mode= Max hold, Sweep- auto couple.

For 30MHz to 1000MHz, Set the spectrum analyzer as:

RBW = 100kHz, VBW = 300kHz, Detector= Quasi-Peak, Trace mode= Max hold, Sweep- auto couple.

4.4. Test Data

PASS

During the test, Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the X-axis is the worst case.

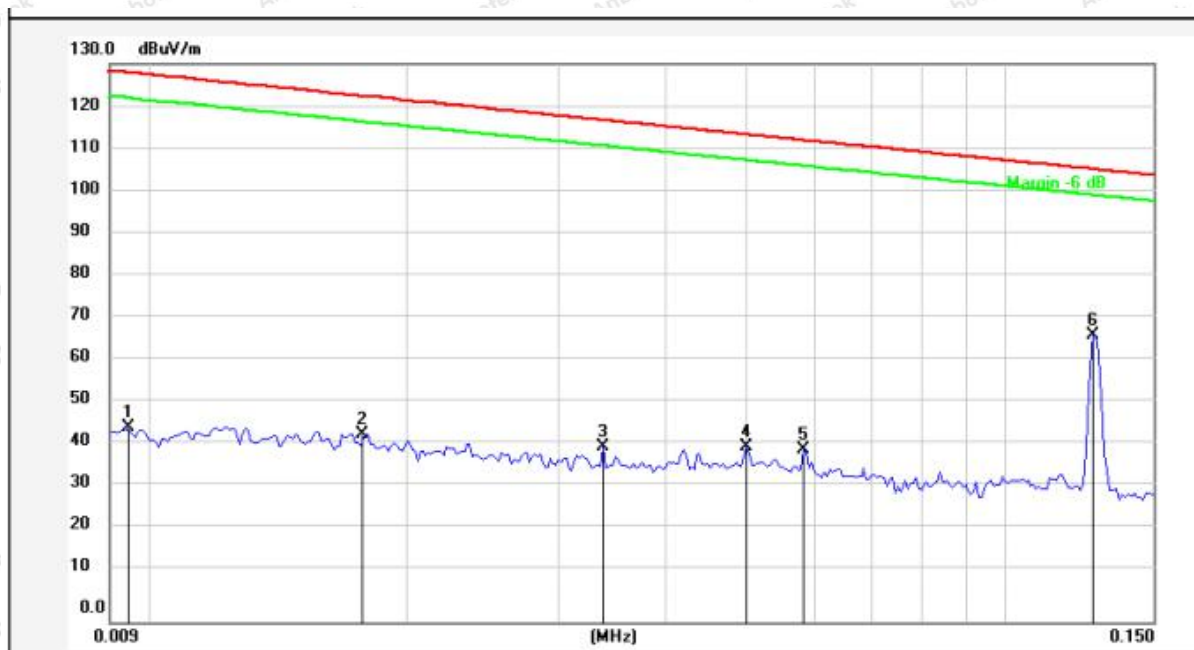
Note: The data is in TX mode, and this is the worst mode.



Test Results

(Between 9KHz – 30MHz)

Standard:	FCC PART15 C _3m	Power Source:	DC 3.7V Battery inside
Test item:	Radiation Test	Temp.(C)/Hum.(%RH):	24.3°C/54%RH
Test Mode:	125KHz	Distance:	3m



No.	Freq. (MHz)	Reading (dBuV)	Factor ()	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	0.0094	25.07	20.11	45.18	128.03	-82.85	AV			
2	0.0177	23.52	20.15	43.67	122.55	-78.88	AV			
3	0.0340	20.08	20.55	40.63	116.90	-76.27	AV			
4	0.0500	20.45	20.42	40.87	113.56	-72.69	AV			
5	0.0584	19.91	20.36	40.27	112.21	-71.94	AV			
6	0.1275	46.43	20.34	66.77	105.45	-38.68	AV			

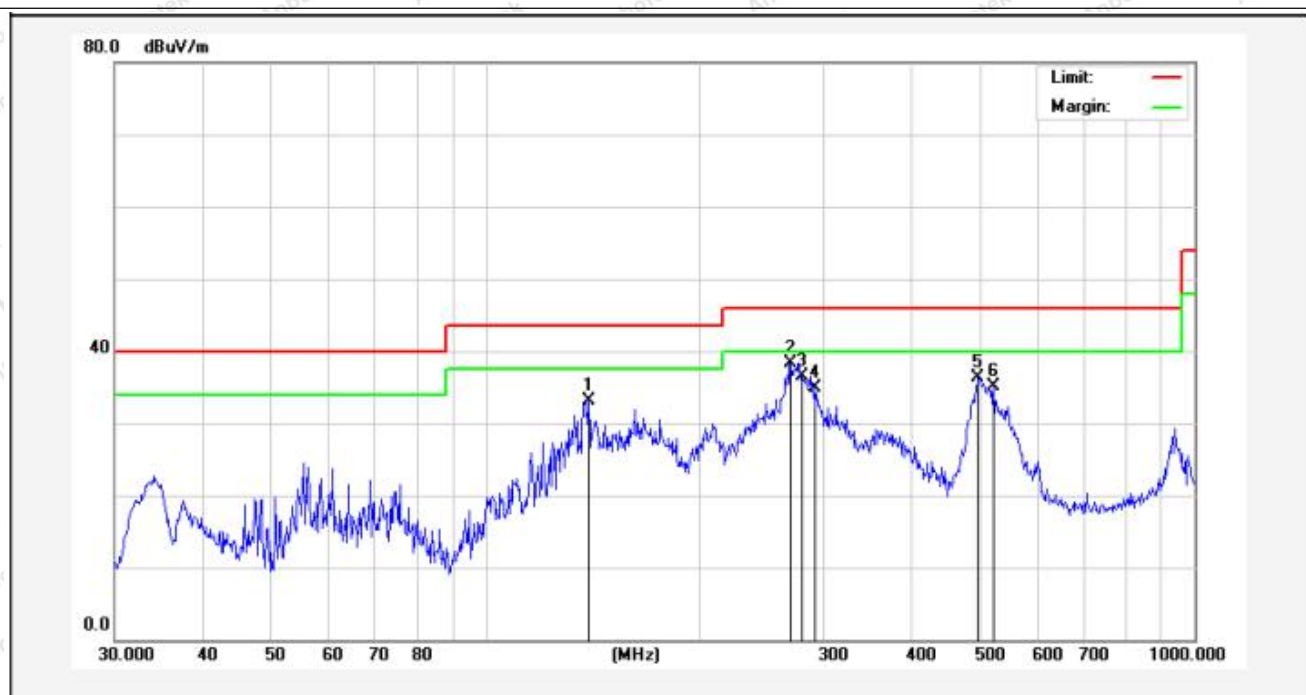




No.	Freq. (MHz)	Reading (dBuV)	Factor ()	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	0.1733	25.32	20.32	45.64	102.80	-57.16	AV			
2	0.2548	24.05	20.30	44.35	99.46	-55.11	AV			
3	0.3790	21.72	20.28	42.00	96.02	-54.02	AV			
4	0.6351	20.66	20.27	40.93	71.55	-30.62	QP			
5	0.8968	20.00	20.26	40.26	68.56	-28.30	QP			
6	1.4069	17.97	20.27	38.24	64.66	-26.42	QP			

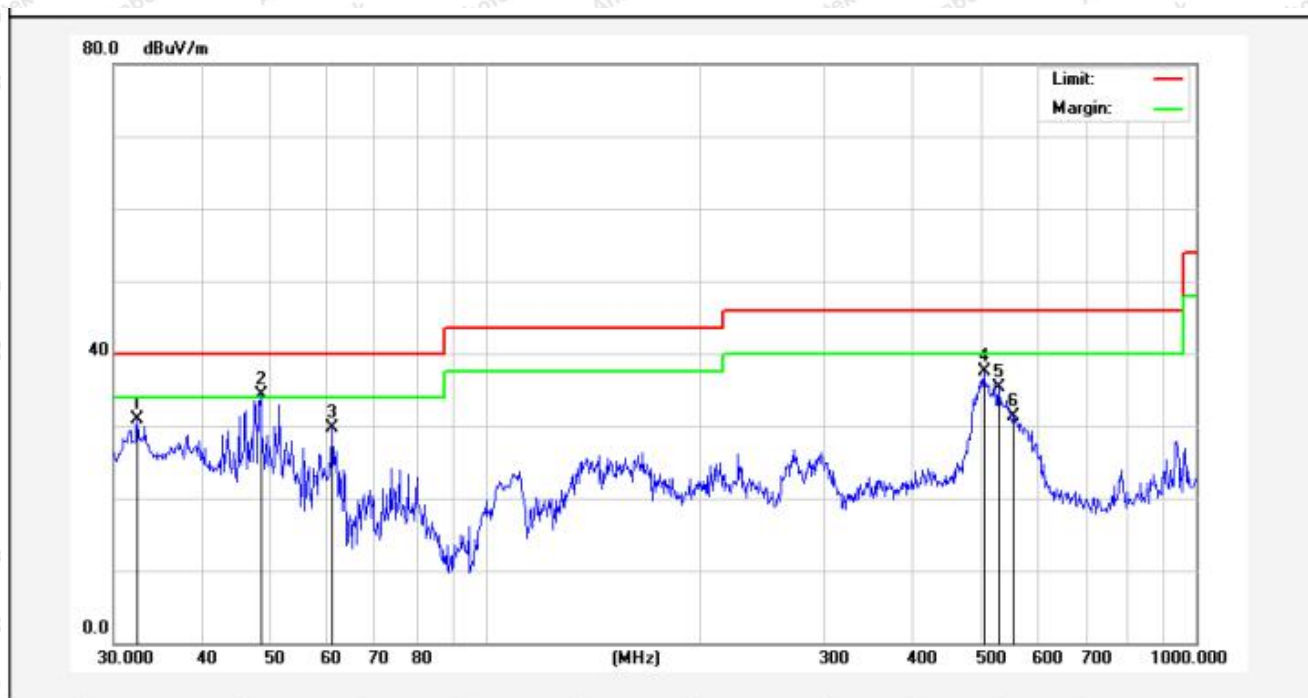
Remark: According to FCC PART 15.209 (d), the emission limits for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz, Radiated emission limits in these three bands are based on measurements employing an average detector.

(Between 30MHz –1000 MHz)

Standard: FCC PART15 C _3m**Polarization:****Horizontal****Test Mode:** 125KHz**Power Source:****DC 3.7V Battery inside****Distance:** 3m**Temp.(C)/Hum.(%RH):****24.4°C/47%RH**

No.	Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	139.8508	56.12	-23.06	33.06	43.50	-10.44	QP			
2	269.4284	58.12	-19.82	38.30	46.00	-7.70	QP			
3	280.0237	55.46	-18.89	36.57	46.00	-9.43	QP			
4	291.0360	52.86	-17.94	34.92	46.00	-11.08	QP			
5	494.1984	50.29	-13.96	36.33	46.00	-9.67	QP			
6	520.8882	47.99	-12.93	35.06	46.00	-10.94	QP			



Standard: FCC PART15 C _3m**Polarization:****Vertical****Test Mode:** 125KHz**Power Source:****DC 3.7V Battery inside****Distance:** 3m**Temp.(C)/Hum.(%RH):****24.4°C/47%RH**

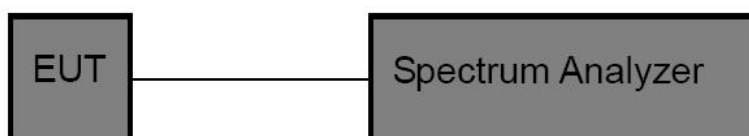
No.	Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	32.4059	48.47	-17.57	30.90	40.00	-9.10	QP			
2	48.3318	49.76	-15.53	34.23	40.00	-5.77	QP			
3	60.9176	47.62	-17.82	29.80	40.00	-10.20	QP			
4	502.9395	49.61	-12.19	37.42	46.00	-8.58	QP			
5	528.2458	47.21	-11.97	35.24	46.00	-10.76	QP			
6	552.8832	42.92	-11.69	31.23	46.00	-14.77	QP			

5. 20dB Emission Bandwidth

5.1. Test Standard

Test Standard	FCC Part15 C Section 15.247 (a)(1)
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5.2. Test Setup



5.3. Test Procedure

Using the following spectrum analyzer settings:

1. Span= approximately 2 to 3 times the 20dB bandwidth, centered on a hopping channel.
2. Set the RBW = 220 Hz.
3. Set the VBW = set approximately 3 x RBW.
4. Sweep time = auto couple.
5. Detector function = peak.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.

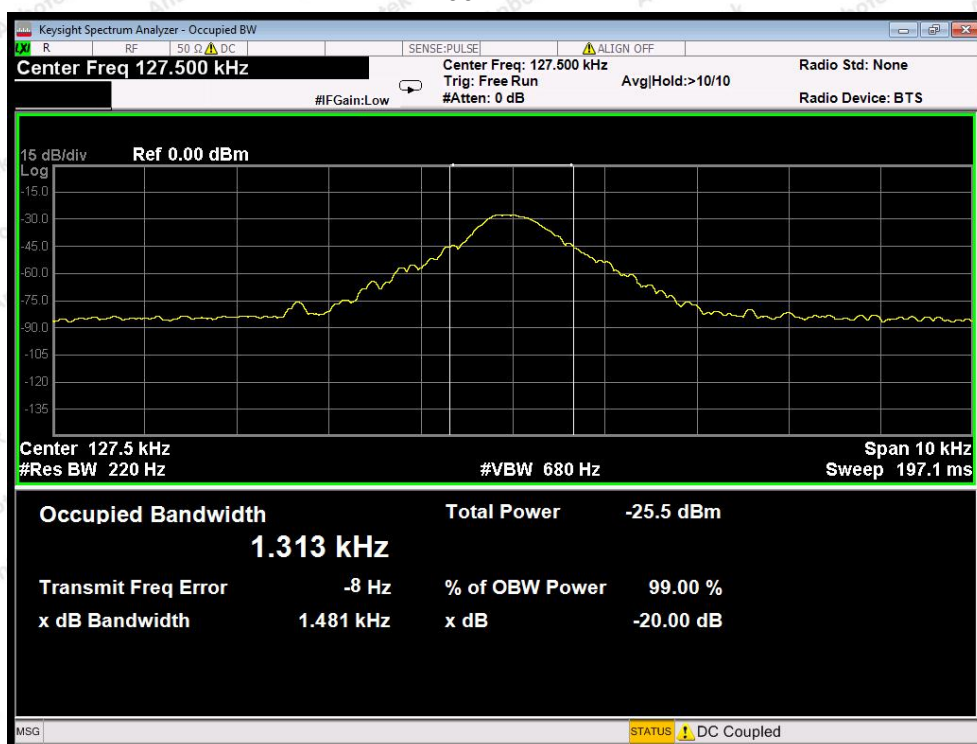
5.4. Test Data

Test Item	: 20dB Bandwidth
Test Voltage	: DC 3.85V Battery inside
Test Result	: PASS

Test Mode	: 125KHz
Temperature	: 23.6° C
Humidity	: 49 %

20dB Down BW (KHz)	99% BW (KHz)	Modulation Mode
1.481	1.313	ASK

Plot of 99% Bandwidth



6. Antenna Requirement

5.1. Test Standard and Requirement

Test Standard	FCC Part15 Section 15.203
Requirement	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, the manufacturer may design the unit so that a broken antenna can

6.2. Antenna Connected Construction

The antenna is a FPC antenna which permanently attached, and the best case gain of the antenna is 0 dBi. It complies with the standard requirement.



APPENDIX I -- TEST SETUP PHOTOGRAPH

Photo of Conducted Emission Measurement



Photo of Radiation Emission Test





APPENDIX II -- EXTERNAL PHOTOGRAPH

Reference to the test report 18220WC20019101.

APPENDIX III -- INTERNAL PHOTOGRAPH

Reference to the test report 18220WC20019101.

----- End of Report -----

