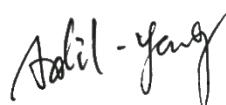


# Test Report

**Product name** ..... : WIRELESS VIDEO TRANSMISSION SYSTEM  
**Trademark** ..... : HOLLYLAND  
**Model no.** ..... : Pyro Ultra  
**Series Model(s).** ..... : N.A.  
**FCC ID** ..... : 2ADZC-9851T  
**IC** ..... : 29803-9851T  
**HVIN** ..... : 9851T  
**Report No** ..... : C250522101-RF02  
CFR47 FCC Part 15: Subpart E Section 15.407  
CFR47 FCC Part 15: Subpart C Section 15.207  
**Test Standards** ..... : CFR47 FCC Part 15: Subpart C Section 15.209  
RSS-247 Issue 3  
RSS-Gen Issue 5  
**Applicant** ..... : Shenzhen Hollyland Technology Co.,Ltd.  
**Address of applicant** ..... : 8F, Building 5D, Skyworth Innovation Valley, Tangtou Road, Shiyan Street, Baoan District Shenzhen, China  
**Manufacturer** ..... : Shenzhen Hollyland Technology Co.,Ltd.  
**Manufacturer Address** ..... : 8F, Building 5D, Skyworth Innovation Valley, Tangtou Road, Shiyan Street, Baoan District Shenzhen, China  
**Date of Test Date** ..... : May 22, 2025 to Sep 22, 2025  
**Date of issue.** ..... : Sep 22, 2025  
**Test result** ..... : Compliance

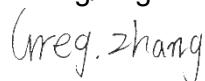
**Prepared By** ..... :



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Adil Yang/Engineer

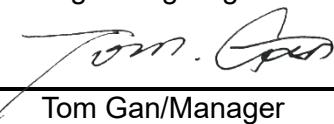
**Reviewed By** ..... :



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Greg Zhang/Engineer

**Approved By** ..... :



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Tom Gan/Manager

The test results in the report only apply to the tested sample. The test report shall be invalid without all the signatures of preparer, reviewer and approver. Any objections must be raised to CSIC within 15 days since the date when the report is received. It will not be taken into consideration beyond this limit.

Revision History

<b>Rev.</b>	<b>Issue Date</b>	<b>Revisions</b>	<b>Effect Page</b>	<b>Revised By</b>
00	Sep.22, 2025	Original Issue	ALL	Adil Yang

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## 1. TEST SUMMARY

### 1.1. TEST DESCRIPTION

Test procedures according to the technical standards:

Item	Clause	Result	Note
Conducted Emission on AC Mains	Part 15.207(a) RSS-GEN clause 8.8	PASS	
Radiated Spurious Emission	Part 15.407(b) Part 15.205 Part 15.209 RSS-247 clause 6.2 RSS-GEN clause 8.9 RSS-GEN clause 8.10	PASS	
Maximum Conducted Output Power	Part 15.407(a) RSS-247 clause 6.2	PASS	
Conducted Power Spectral Density	Part 15.407(a) RSS-247 clause 6.2	PASS	
6dB Bandwidth	Part 15.407(e) RSS-247 clause 6.2	PASS	
26dB Bandwidth	Part 15.407(e) RSS-Gen Clause 6.6	PASS	
99% Bandwidth	Part 15.407(a) RSS-Gen Clause 6.6	PASS	
Frequency Stability	Part 15.407(g) RSS-Gen Clause 6.11	PASS	
Dynamic Frequency Selection (DFS)	Part 15.407(h) RSS-247 clause 6.3	PASS	
Antenna Requirement	Part 15.407(b)(4) Part 15.203	PASS	

Note:

- 1) "N/A" denotes test is not applicable in this Test Report.
- 2) All tests are according to ANSI C63.10-2013 for FCC, and ANSI C63.10-2020 + Corrigendum 1-2023 + Amendment 1-2024 for IC.
- 3) The statements of test result on the above are decided by the request of test standard only; the measurement uncertainties are not factored into this compliance determination.
- 4) The information of measurement uncertainty is available upon the customer's request.

## 1.2. TEST FACILITY

Shenzhen Central Standard International Center Co., Ltd. (CSIC)

Room 201, Building 1, Mogen Fashion Industrial Park, No. 10, Shilongzai Road, Xinshi Community, Dalang Street, Longhua District, Shenzhen.

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

CNAS Registration No.: L11671  
FCC Registration No.: 0031378433 Designation Number: CN1317  
IC CAB identifier: CN0051  
A2LA Lab Cert. No.: 6426.01

## 1.3. MEASUREMENT UNCERTAINTY

The estimated combined standard uncertainty for radiated emissions and conducted emissions measurements as below table.

Below is the best measurement capability for Shenzhen Central Standard International Center Co., Ltd.

Test Items	Measurement Uncertainty	Notes
RF output power, conducted	±1.06dB	(1)
Unwanted Emissions, conducted	±1.32dB	(1)
All emissions, radiated 9KHz-30MHz	±4.86dB	(1)
All emissions, radiated 30-1GHz	±4.86dB	(1)
All emissions, radiated 1G-6GHz	±5.08dB	(1)
All emissions, radiated>6G	±5.30dB	(1)
Conducted Emission (9KHz-150KHz)	±3.18dB	(1)
Conducted Emission (150KHz-30MHz)	±3.20dB	(1)

**Note(1):** This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

## 2. GENERAL INFORMATION

### 2.1. GENERAL DESCRIPTION OF EUT

EUT(Product Specifications)	
Product Name:	WIRELESS VIDEO TRANSMISSION SYSTEM
Model No.:	Pyro Ultra
Series Models:	N.A.
Power supply:	DC 12.0V 2.0A by Adapter
Hardware version:	9851T
Software version:	V1.2.1.4
WIFI-5G (RF Specifications)	
Operating Frequency	5150-5250MHz, 5470-5725MHz, 5725-5850MHz
Channel number:	5180-5240MHz, 4CHs, 802.11 n20/ac20 5500-5700MHz, 12CHs, 802.11 n20/ac20 5745-5825MHz, 5CHs, 802.11 n20/ac20
Channel Spacing	20MHz
Modulation	OFDM (BPSK, QPSK, 16QAM, 64QAM,256QAM)
Type of Product	Adaptive equipment and does not support non-adaptive mode: LBT based Detect and Avoid (load-based equipment)
DFS function	Master
TX Power Control (TPC)	Not Supported
Antenna Type	<b>Ant1/2/3/4:</b> External antenna <b>Ant5:</b> Internal antenna( <b>only support receive mode</b> )
Antenna Gain	<b>Ant1/2/3/4:</b> 5150MHz to 5250MHz: 3.49 dBi, 5470MHz to 5725MHz: 4.91 dBi, 5725MHz to 5850MHz: 4.38 dBi <b>Ant5:</b> 5150MHz to 5250MHz: 2.21 dBi, 5470MHz to 5725MHz: 2.21 dBi, 5725MHz to 5850MHz: 2.12 dBi
Remark:	This is TX part of WIRELESS VIDEO TRANSMISSION SYSTEM

Adapter information	
Product Name:	Switching Adapter
Model No.:	GQ24-120200-AX
Input Power:	AC 100-240V 50/60Hz 1.0A
Output Power:	DC 12.0V 2.0A, 24.0W
Manufacturer:	Dong Guan City GangQi Electronic Co.,Ltd.

**Note:**1. The above information and materials are provided by the Manufacturer.  
2. Full tests were applied to sample C250522101-Y01/01 only in this document.

## 2.2. DESCRIPTION OF TEST MODES AND TEST FREQUENCY

The EUT has been tested under typical operating conditions. The Applicant provides communication tools software to control the EUT for staying in continuous transmitting mode for testing.

Operation Frequency List for WIFI:

Channel List for 802.11n20/ac20							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
<b>36</b>	<b>5180</b>	<b>40</b>	<b>5200</b>	44	5220	<b>48</b>	<b>5240</b>
<b>100</b>	<b>5500</b>	104	5520	108	5540	112	5560
<b>116</b>	<b>5580</b>	120	5600	124	5620	128	5640
132	5660	136	5680	<b>140</b>	<b>5700</b>	<b>149</b>	<b>5745</b>
153	5765	<b>157</b>	<b>5785</b>	159	5795	<b>165</b>	<b>5825</b>

Note: The channels in bold in the table are used for testing. Per RSS-247 section 6.2.3, transmission on channels which overlap 5600-5650MHz is prohibited.

## 2.3. MEASUREMENT INSTRUMENTS LIST

RF Connected Test					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	Spectrum Analyzer	Agilent	N9020A	MY50200391	May. 24, 2026
2	Spectrum Analyzer	R&S	FSV40	101401	Mar. 04, 2026
3	Vector Signal Generator	Agilent	N5182A	MY50140130	May. 24, 2026
4	Signal Generator	R&S	SMCV100 B	103780	May. 24, 2026
5	Automatic control unit	MW	MW100-RFCB	MY54250020	May. 24, 2026
6	EXTENDED RANGE DC POWER SUPPLY	TAKASAGO	ZX-400LA	428710060166	May. 24, 2026
7	Inverter power supply	AKE	AKE-2003-P2	N/A	May. 24, 2026
8	Programmable constant temperature and humidity chamber	Angui	AG1000L	2304061049	Jul. 24, 2026
9	MTS 8310E	MW		V2.0.0.0	

Radiation Test equipment					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	Spectrum Analyzer	Agilent	N9020A	MY50200391	May. 24, 2026
2	Spectrum Analyzer	R&S	FSV40	101401	Mar. 04, 2026
3	Amplifier	EMCO	EM330	980204	May. 24, 2026
4	Amplifier	COM-MW	DPA8-1000-18000-1012	8220837	Mar. 04, 2026
5	Amplifier	SKET	LNPA_1840-50	SK201801801	Feb. 21, 2026
6	Loop Antenna	Schwarzbeck	FMZB1519B	00023	Nov. 12, 2025
7	Bilog Antenna	Sunol Sciences	JB1	n.a.	Jun. 09, 2028
8	Horn Antenna	COM-MW	ZAB-1-18G-50	20171109	Jun. 02, 2027
9	Horn Antenna	COM-MW	ZLB7-18-40G-777	3231081	Mar. 27, 2026
10	3M Chamber	Maor	9*6*6	--	Apr. 02, 2026
11	EZ-EMC	Farad		V3.1	

Mains Terminal Disturbance Voltage Test equipment					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
1	EMI Test Receiver	R&S	ESCI3	101413	Mar. 04, 2026
2	LISN	R&S	ENV216	100002	Mar. 04, 2026
3	LISN	MEB	NNB 42	--	May. 24, 2026
4	Shielding Room	Maor	8*4*3	--	Apr. 14, 2026
8	EZ-EMC	Fara		V3.1	

**Note:**

- 1) The cable loss has calculated in test result which connection between each test instruments.

## 2.4. DESCRIPTION OF THE 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.

Worst Mode	Description	Data Rate
Mode 1	TX IEEE 802.11n HT20 CH36&CH40&CH48	6.5 Mbps
Mode 2	TX IEEE 802.11ac VHT20 CH36&CH40&CH48	6.5 Mbps
Mode 3	TX IEEE 802.11n HT20 CH100&CH116&CH140	6.5 Mbps
Mode 4	TX IEEE 802.11ac VHT20 CH100&CH116&CH140	6.5 Mbps
Mode 5	TX IEEE 802.11n HT20 CH149&CH157&CH165	6.5 Mbps
Mode 6	TX IEEE 802.11ac VHT20 CH149&CH157&CH165	6.5 Mbps

Note:

- 1) The measurements are performed at the high, middle, low available channels.
- 2) All the bit rate of transmitter have been tested and found the lowest rate is found to be the worst case and recorded.
- 3) This test was performed with EUT in X, Y, Z position and worst case was found when EUT in X position.
- 4) For radiated emission above 1 GHz test, 1GHz-40GHz have been pre-tested and in this report only recorded the worst case. The remaining spurious points are all below the limit value of 20dB.

For AC Conducted Emission

Test Case	
AC Conducted Emission	Working

## 2.5. TEST SOFTWARE AND POWER LEVEL

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level.

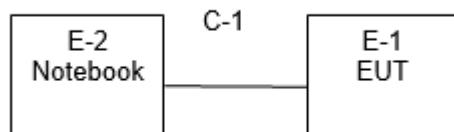
Test Software Version	QRCT v4.0		
Frequency(5180-5240MHz)	5180MHz	5200MHz	5240MHz
IEEE 802.11n(HT20)	12	14	12
IEEE 802.11ac(VHT20)	12	14	12
Frequency(5500-5700MHz)	5500MHz	5580MHz	5700MHz
IEEE 802.11n(HT20)	9	12	9
IEEE 802.11ac(VHT20)	9	12	9
Frequency(5745-5825MHz)	5500MHz	5785MHz	5825MHz
IEEE 802.11n(HT20)	12	12	12
IEEE 802.11ac(VHT20)	12	12	12

## 2.6. BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

a. Radiated Spurious Emission Test



b. Conducted Emission Test



## 2.7. DESCRIPTION OF NECESSARY ACCESSORIES AND SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Necessary accessories					
Item	Equipment	Mfr/Brand	Model/Type No.	Serial No.	Note
N/A	N/A	N/A	N/A	N/A	N/A

Support units					
Item	Equipment	Mfr/Brand	Model/Type No.	Serial No.	Note
E-2	Notebook	DELL	Vostro 3400	N/A	N/A
E-3	Router	GL iNet	GL-MT3000	N/A	N/A

Note:

- 1) The support equipment was authorized by Declaration of Confirmation.
- 2) For detachable type I/O cable should be specified the length in cm in [Length] column.
- 3) The Router FCC ID: 2AFIW-MT3000; IC ID: 23019-MT3000.

## 2.8. ENVIRONMENTAL CONDITIONS FOR TESTING

Test Item	Temperature (°C)	Relative Humidity (%)	Test Voltage	Tested by
Conducted Emission on AC Mains	22.6	62.0	AC 110V/60Hz	Rick Zou
Radiated Spurious Emission	22.8	61.0	AC 110V/60Hz	Rick Zou
Conducted Spurious Emissions Measured in 100 kHz Bandwidth	24.3	50.0	AC 110V/60Hz	Fiona Huang
Conducted Power Spectral Density	24.3	50.0	AC 110V/60Hz	Fiona Huang
99% Bandwidth	24.3	50.0	AC 110V/60Hz	Fiona Huang
6dB Bandwidth	24.3	50.0	AC 110V/60Hz	Fiona Huang
Maximum Conducted Output Power	24.3	50.0	AC 110V/60Hz	Fiona Huang

### 3. EMC TEST

#### 3.1. Conducted Emission on AC Mains Measurement

##### Limit

Operating frequency band. In case the emission fall within the restricted band specified on Part 207(a) and RSS-Gen 8.8 limit in the table below has to be followed.

FREQUENCY (MHz)	Conducted Emission limit (dBuV)	
	Quasi-peak	Average
0.15 - 0.5	66 - 56 *	56 - 46 *
0.5 - 5	56	46
5 - 30	60	50

Note:

- 1) The tighter limit applies at the band edges.
- 2) The limit of “ \* ” marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

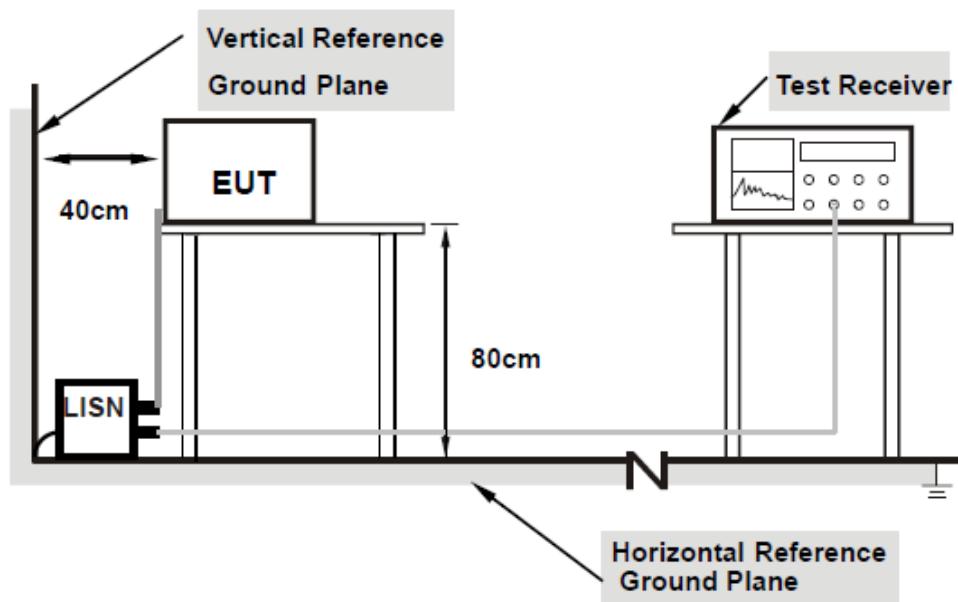
The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
RBW	9 kHz

##### Test Procedure

- a) The EUT was 0.8 meters from the horizontal ground plane and 0.4 meters from the vertical ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipment's powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b) Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- c) I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d) LISN at least 80 cm from nearest part of EUT chassis.
- e) For the actual test configuration, please refer to the related Item –EUT Test Photos.

### Test Setup



Note:

- 1) Support units were connected to second LISN.
- 2) Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

### EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

### Test Results

Pass

Please refer to Appendix A.

### 3.2. Radiated Spurious Emission Measurement

#### Limit

In any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the Restricted band specified on Part15.205 (a)&209(a) and RSS-247 3.3 limit in the table and according to ANSI C63.10-2013 and RSS-Gen below has to be followed.

#### LIMITS OF RADIATED EMISSION MEASUREMENT (0.009MHz - 1000MHz)

For FCC:

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

For IC:

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	6.37/F(KHz)	300
0.490~1.705	63.7/F(KHz)	30
1.705~30.0	0.08	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

#### LIMITS OF RADIATED EMISSION MEASUREMENT (1GHz-25 GHz)

FREQUENCY (MHz)	(dBuV/m) (at 3M)	
	PEAK	AVERAGE
Above 1000	74	54

#### Notes:

- 1) The limit for radiated test was performed according to FCC PART 15C.
- 2) The tighter limit applies at the band edges.
- 3) Emission level (dBuV/m)=20log Emission level (uV/m).

**LIMITS OF RESTRICTED FREQUENCY BANDS**
**For FCC:**

FREQUENCY (MHz)	FREQUENCY (MHz)	FREQUENCY (MHz)	FREQUENCY (GHz)
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	Above 38.6
13.36-13.41			

**For IC:**

FREQUENCY (MHz)	FREQUENCY (MHz)	FREQUENCY (MHz)	FREQUENCY (GHz)
0.090-0.110	13.36-13.41	960-1427	9.0-9.2
0.495-0.505	16.42-16.423	1435-1626.5	9.3-9.5
2.1735-2.1905	16.69475-16.69525	1645.5-1646.5	10.6-12.7
3.020-3.026	16.80425-16.80475	1660-1710	13.25-13.4
4.125-4.128	25.5-25.67	1718.8-1722.2	14.47-14.5
4.17725-4.17775	37.5-38.25	2200-2300	15.35-16.2
4.20725-4.20775	73-74.6	2310-2390	17.7-21.4
5.677-5.683	74.8-75.2	2483.5-2500	22.01-23.12
6.215-6.218	108-138	2655-2900	23.6-24.0
6.26775-6.26825	149.9-150.05	3260-3267	31.2-31.8
6.31175-6.31225	156.52475-156.52525	3332-3339	36.43-36.5
8.291-8.294	156.7-156.9	3345.8-3358	Above 38.6
8.362-8.366	162.0125-167.17	3500-4400	--
8.37625-8.38675	167.72-173.2	4500-5150	--
8.41425-8.41475	240-285	5350-5460	--
12.29-12.293	322-335.4	7250-7750	--
12.51975-12.52025	399.9-410	8025-8500	--
12.57675-12.57725	608-614	--	--

For Radiated Emission	
Spectrum Parameter	Setting
Attenuation	Auto
Detector	Peak/QP/AVG
Start Frequency	9 KHz/150KHz(Peak/QP/AVG)
Stop Frequency	150KHz/30MHz(Peak/QP/AVG)
RB / VB (emission in restricted band)	200Hz (From 9kHz to 0.15MHz)/
	9KHz (From 0.15MHz to 30MHz);
	200Hz (From 9kHz to 0.15MHz)/
	9KHz (From 0.15MHz to 30MHz)
<hr/>	
Attenuation	Auto
Detector	Peak/QP
Start Frequency	30 MHz(Peak/QP)
Stop Frequency	1000 MHz (Peak/QP)
RB / VB (emission in restricted band)	120 KHz / 300 KHz
<hr/>	
Attenuation	Auto
Detector	Peak/AVG
Start Frequency	1000 MHz(Peak/AVG)
Stop Frequency	10th carrier harmonic(Peak/AVG)
RB / VB (emission in restricted band)	1 MHz / 3 MHz(Peak)
	1 MHz/1/T MHz(AVG)
<hr/>	
For Restricted band	
Spectrum Parameter	Setting
Detector	Peak/AVG
Start/Stop Frequency	Lower Band Edge: 2310 to 2410 MHz
	Upper Band Edge: 2476 to 2500 MHz
RB / VB	1 MHz / 3 MHz(Peak)
	1 MHz/1/T MHz(AVG)
<hr/>	
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~90kHz / RB 200Hz for Peak & AVG
Start ~ Stop Frequency	90kHz~110kHz / RB 200Hz for QP
Start ~ Stop Frequency	110kHz~490kHz / RB 200Hz for Peak & AVG
Start ~ Stop Frequency	490kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

**Test Procedure**

- a) The measuring distance of at 3 m shall be used for measurements at frequency 0.009MHz up to 1GHz, and above 1GHz.
- b) The EUT was placed on the top of a rotating table 0.8 meters (above 1GHz is 1.5 m) above the ground at a 3 meter anechoic chamber test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- c) The height of the equipment shall be 0.8 m (above 1GHz is 1.5 m); the height of the test antenna shall vary between 1 m to 4 m. horizontal and vertical polarizations of the antenna are set to make the measurement.
- d) The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then QuasiPeak detector mode re-measured.
- e) If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- f) For the actual test configuration, please refer to the related Item –EUT Test Photos.

**Note:**

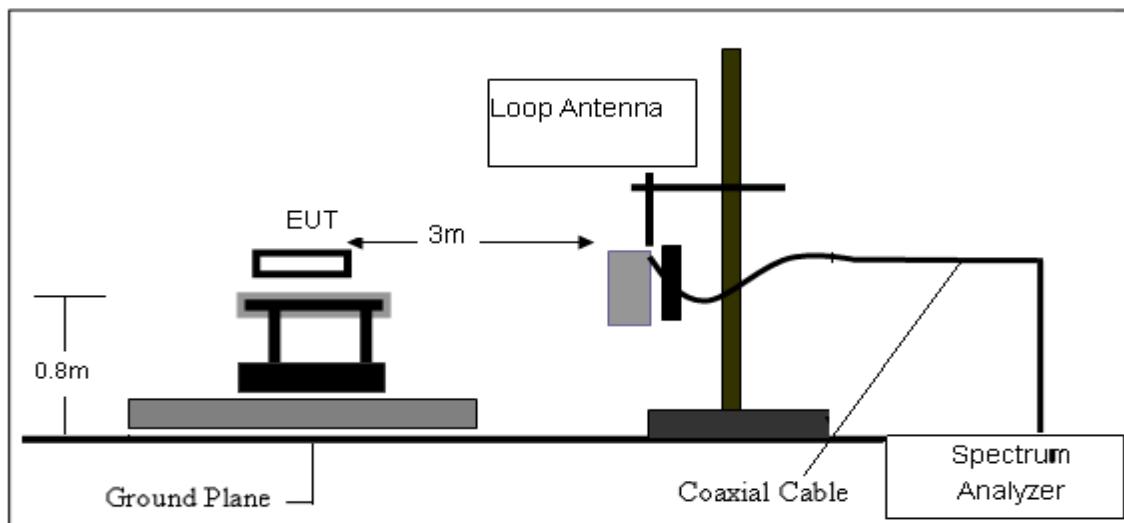
Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported.

**DEVIATION FROM TEST STANDARD**

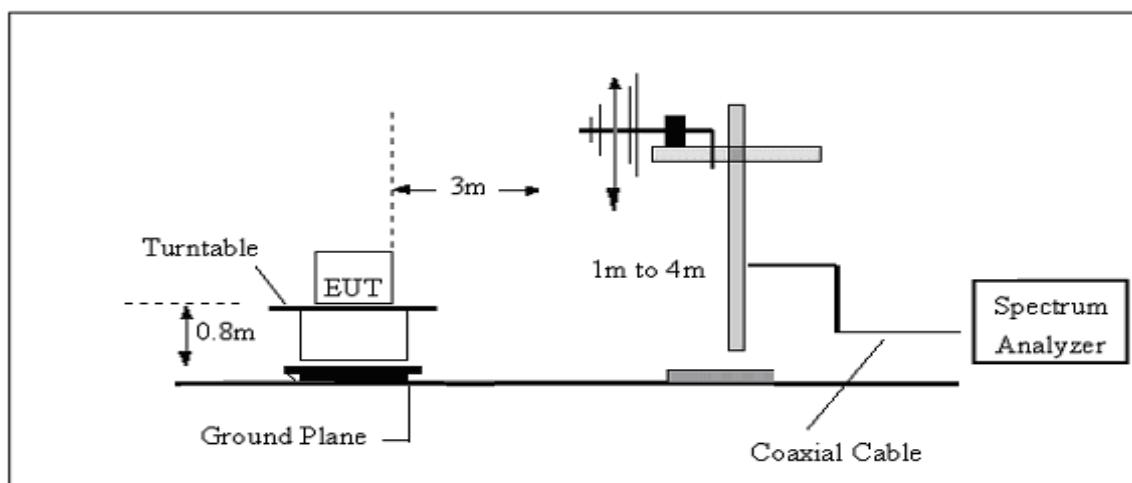
No deviation.

### Test Setup

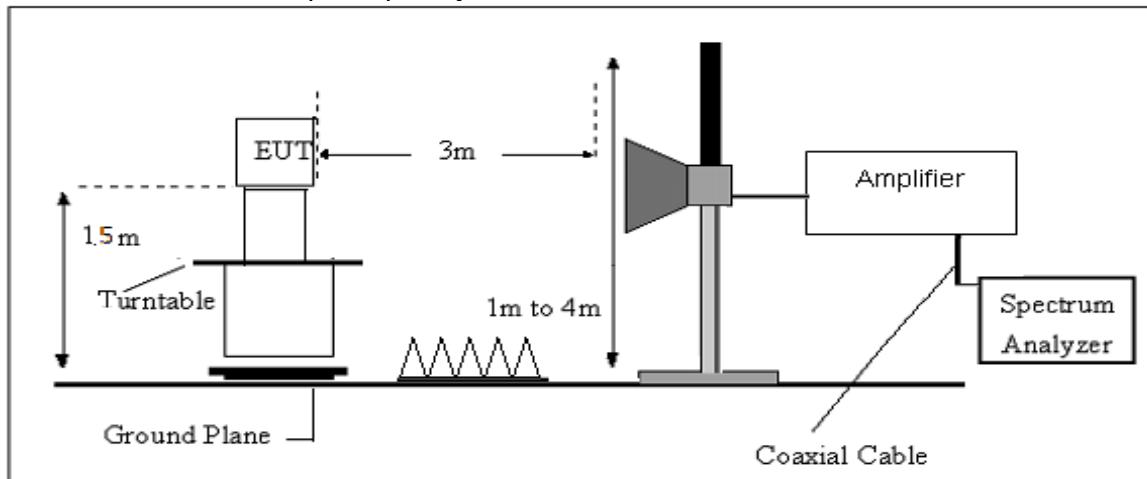
#### 1. Radiated Emission Test-Up Frequency Below 30MHz



#### 2. Radiated Emission Test-Up Frequency Below 1GHz



#### 3. Radiated Emission Test-Up Frequency Above 1GHz



**EUT OPERATING CONDITIONS**

The EUT tested system was configured as the statements of 2.5 Unless otherwise a special operating condition is specified in the follows during the testing.

**Test Result**

Pass

**Please refer to Appendix A.**

### 3.3. Maximum Conducted Output Power Measurement

#### Limit

Type	Test Item	Frequency [MHz]	Limit
FCC	Conducted Output Power	5150-5250	$\leq 250\text{mW (24dBm)}$
		5250-5350 5470-5725	$\leq 250\text{mW(24dBm)}$ or $11\text{dBm}+10\log B$ , where B is the 26 dB emission bandwidth in MHz, where is lesser.
		5725-5850	$\leq 1\text{W (30dBm)}$
IC	E.I.R.P	5150-5250	$\leq 200\text{mW (23dBm)}$ or $10\text{ dBm} + 10\log B$ , where B is the 99% emission bandwidth in MHz, where is lesser.
		5250-5350	$\leq 1\text{W (30dBm)}$ or $17 + 10 \log 10B$ , dBm, whichever is less. B is the 99% emission bandwidth in megahertz.
		5470-5600	
		5650-5725	
	Conducted Output Power	5725-5850	$\leq 1\text{W (30dBm)}$

#### Test Procedure

The EUT was directly connected to the Power Sensor & PC.

Some regulatory agencies permit the maximum conducted (average) output power to be measured as an alternative to the maximum peak conducted output power for determining compliance to the limit. When this option is exercised, the measured power is to be referenced to the OBW rather than to the DTS bandwidth (see 11.2 for definitions and 6.9.2 for measurement guidance).

When using a spectrum analyzer or EMI receiver to perform these measurements, it shall be capable of utilizing a number of measurement points in each sweep that is greater than or equal to twice the span / RBW, to set a bin-to-bin spacing of  $\leq \text{RBW} / 2$  so that narrowband signals are not lost between frequency bins. If possible, configure or modify the operation of the EUT so that it transmits continuously at its maximum power control level (see 11.6).

The intent is to test at 100% duty cycle; however, a small reduction in duty cycle (to no lower than 98%) is permitted, if required by the EUT for amplitude control purposes. Manufacturers are expected to provide software to the test laboratory to permit such continuous operation.

If continuous transmission (or at least 98% duty cycle) cannot be achieved because of hardware limitations (e.g., overheating), the EUT shall be operated at its maximum power control level, with the transmit duration as long as possible, and the duty cycle as high as possible during which sweep triggering/signal gating techniques may be used to perform the measurement over the transmission duration.

Measurement using a power meter (PM) :

##### 1. Method AVGPM :

Method AVGPM is a measurement using an RF average power meter, as follows:

a) As an alternative to spectrum analyzer or EMI receiver measurements, measurements may be performed using a wideband RF power meter with a thermocouple detector or equivalent if all of the conditions listed below are satisfied:

- 1) The EUT is configured to transmit continuously, or to transmit with a constant duty cycle.
- 2) At all times when the EUT is transmitting, it shall be transmitting at its maximum power control level.
- 3) The integration period of the power meter exceeds the repetition period of the transmitted signal by at least a factor of five.

b) If the transmitter does not transmit continuously, measure the duty cycle, D, of the transmitter

output signal as described in 11.6.

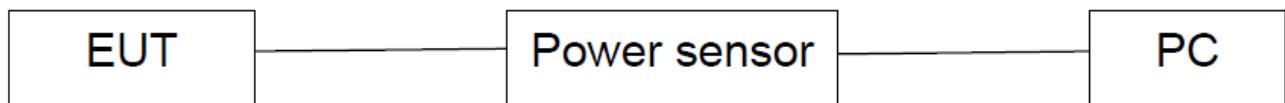
- c) Measure the average power of the transmitter. This measurement is an average over both the ON and OFF periods of the transmitter.
- d) Adjust the measurement in dBm by adding  $[10 \log (1 / D)]$ , where D is the duty cycle.

## 2. Method AVGPM-G :

Method AVGPM-G is a measurement using a gated RF average power meter.

Alternatively, measurements may be performed using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Because the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

### Test Configuration



### EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

### Test Results

Pass

Please refer to Appendix A.

### 3.4. Conducted Power Spectral Density Measurement

#### Limits

Type	Frequency [MHz]	Limit
FCC	5150-5250	$\leq 11\text{dBm}/\text{MHz}$
	5250-5350	
	5470-5725	$\leq 30\text{dBm}/500\text{KHz}$
	5725-5850	
IC	5150-5250	$\leq 10\text{dBm}/\text{MHz}$
	5250-5350	$\leq 11\text{dBm}/\text{MHz}$
	5470-5600	
	5650-5725	
	5725-5850	$\leq 30\text{dBm}/500\text{KHz}$

#### Test Procedure

1. The setting follows Method SA-1 of FCC KDB 789033 D02 General U-NII Test Procedures New Rules v02r01.

For devices operating in the band, the rules specify a measurement bandwidth of 500 kHz.

Many spectrum analyzers do not have 500 kHz RBW, thus a narrower RBW may need to be used. The rules permit the use of a RBWs less than 1 MHz, or 500 kHz, "provided that the measured power is integrated over the full reference bandwidth" to show the total power over the specified measurement bandwidth (i.e., 1 MHz, or 500 kHz). If measurements are performed using a reduced resolution bandwidth (< 1 MHz, or < 500 kHz) and integrated over 1 MHz, or 500 KHz bandwidth, the following adjustments to the procedures apply:

- Set RBW  $\geq 1/T$ , where T is defined in section II.B.I.a).
- Set VBW  $\geq 3$  RBW.
- If measurement bandwidth of Maximum PSD is specified in 500 kHz, add  $10 \log (500\text{kHz}/\text{RBW})$  to the measured result, whereas RBW (< 500 kHz) is the reduced resolution bandwidth of the spectrum analyzer set during measurement.
- If measurement bandwidth of Maximum PSD is specified in 1 MHz, add  $10 \log (1\text{MHz}/\text{RBW})$  to the measured result, whereas RBW (< 1 MHz) is the reduced resolution bandwidth of spectrum analyzer set during measurement.
- Care must be taken to ensure that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.

Note: As a practical matter, it is recommended to use reduced RBW of 100 kHz for the sections 5.c) and 5.d) above, since RBW=100 KHz is available on nearly all spectrum analyzers.

#### TEST SETUP



#### EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.5 Unless otherwise a special operating condition is specified in the follows during the testing.

#### Test Results

Pass

Please refer to Appendix A.

### 3.5. 6dB BANDWIDTH Measurement

#### Limits

Frequency Range (MHz)		Limit
FCC	5725-5850	>500KHz
IC	5725-5850	>500KHz

#### Test Procedure

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures v02r01.
  - a) Set RBW = 100 kHz.
  - b) Set the video bandwidth (VBW)  $\geq 3 \times \text{RBW}$ .
  - c) Detector = Peak.
  - d) Trace mode = max hold.
  - e) Sweep = auto couple.
  - f) Allow the trace to stabilize.
  - g) 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.

#### TEST SETUP



#### EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

#### Test Results

Pass

Please refer to Appendix A.

### 3.6. 26dB BANDWIDTH Measurement

#### Limits

Frequency Range (MHz)		Limit
FCC	5150-5250	/
	5250-5350	/
	5470-5725	/

#### Test Procedure

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
2. Set RBW = approximately 1% of the emission bandwidth.
3. Set the VBW  $\geq$  RBW.
4. Detector = Peak.
5. Trace mode = max hold.
6. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

#### TEST SETUP



#### EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

#### Test Results

Pass

Please refer to Appendix A.

### 3.7. 99% BANDWIDTH Measurement

#### Limits

Frequency Range (MHz)		Limit
IC	5150-5250	/
	5250-5350	/
	5470-5600	/
	5650-5725	/

#### Test Procedure

The testing follows FCC KDB 789033 D02 General UNII Test Procedures v02r01.

The following procedure shall be used for measuring (99 %) power bandwidth:

1. Set center frequency to the nominal EUT channel center frequency.
2. Set span = 1.5 times to 5.0 times the OBW.
3. Set RBW = 1 % to 5 % of the OBW
4. Set VBW  $\geq 3 \cdot RBW$
5. Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
6. Use the 99 % power bandwidth function of the instrument (if available).
7. If the instrument does not have a 99 % power bandwidth function, the trace data points are recovered and directly summed in power units. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5 % of the total is reached; that frequency is recorded as the upper frequency. The 99% occupied bandwidth is the difference between these two frequencies.

#### TEST SETUP



#### EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

#### Test Results

Pass

Please refer to Appendix A.

### 3.8. Frequency Stability Measurement

#### Limits

Frequency Range (MHz)		Limit
FCC	5150-5250	25ppm
	5250-5350	25ppm
	5470-5725	25ppm
	5725-5850	25ppm

#### Test Procedure

- (1) To ensure emission at the band edge is maintained within the authorized band, those values shall be measured by radiation emissions at upper and lower frequency points, and finally compensated by frequency deviation as procedures below.
- (2) The EUT was operated at the maximum output power, and connected to the spectrum analyzer, which is set to maximum hold function and peak detector. The peak value of the power envelope was measured and noted. The upper and lower frequency points were respectively measured relatively 10 dB lower than the measured peak value.
- (3) The frequency deviation was calculated by adding the upper frequency point and the lower frequency point divided by two. Those detailed values of frequency deviation are provided in table below.

#### TEST SETUP



#### EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

#### Test Results

Pass

Please refer to Appendix A.

### 3.9. ANTENNA REQUIREMENT

#### STANDARD REQUIREMENT

According to the manufacturer declared, the EUT has External antenna, the directional gain of antenna is 5150MHz to 5250MHz: 3.49 dBi, 5470MHz to 5725MHz: 4.91 dBi, 5725MHz to 5850MHz: 4.38 dBi (ANT1&2&3&4),, which that use of a non-standard antenna connector and no consideration of replacement. Therefore, the EUT is considered sufficient to comply with the provision. Therefore, the EUT is considered sufficient to comply with the provision.

#### EUT ANTENNA

The antenna is External antenna. It complies with the standard requirement.



## 4. TEST PHOTOS

Please refer to Appendix D Test Setup.

## 5. EUT PHOTOS

**External Photos Please refer to Appendix B and Internal Photos Please refer to Appendix C.**

\*\*\*\*\*THE END\*\*\*\*\*