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TEST REPORT

Report Reference No.....:	**CTL1607182706-WF**
Compiled by (position+printed name+signature) .:	File administrators Happy Guo
Name of the organization performing the tests (position+printed name+signature) .:	Test Engineer Nice Nong
Approved by (position+printed name+signature) .:	Manager Tracy Qi
Date of issue.....:	Sept. 05, 2016
Test Laboratory Name .....:	**Shenzhen CTL Testing Technology Co., Ltd.**
Address .....:	Floor 1-A, Baisha Technology Park, No.3011, Shahexi Road, Nanshan District, Shenzhen, China 518055
Applicant's name.....:	**Hunan GM Innovation Technology Co., Ltd**
Address .....:	No. 46, Jiefang East Road, Furong District, Changsha City, Hunan Province, China
Test specification:	
Standard .....:	FCC CFR Title 47 Part 15 Subpart E Section 15.407
TRF Originator.....:	Shenzhen CTL Testing Technology Co., Ltd.
Master TRF.....:	Dated 2015-10

Test item description .....:	Digital Transmission System
FCC ID……..:	2AJOF-SL-1620
Trade Mark .....:	VAXIS
Model/Type reference .....:	SL-1620, SM-1610, SP-1618, SJ-1621, SD-1622, SE-1630, SX-1640
Difference Description .....:	Only the color and model's name is different
Modulation .....:	OFDM 16QAM
Work Frequency Range .....:	5745MHz~5825MHz
Antenna Type .....:	External
Antenna Gain.....:	2.5dBi
Result .....:	**Pass**

TEST REPORT

Test Report No. :	CTL1607182706-WF	Sept. 05, 2016 Date of issue

Equipment under Test	:	Digital Transmission System
Type / Model(s)	:	SL-1620, SM-1610, SP-1618, SJ-1621, SD-1622, SE-1630, SX-1640
Applicant	:	**Hunan GM Innovation Technology Co., Ltd**
Address	:	No. 46, Jiefang East Road, Furong District, Changsha City, Hunan Province, China
Manufacturer	:	**Hunan GM Innovation Technology Co., Ltd**
Address	:	No. 46, Jiefang East Road, Furong District, Changsha City, Hunan Province, China

Test Result according to the standards on page 4:	**Pass**

The test report merely corresponds to the test sample.
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

Contents

1. TEST STANDARDS

The tests were performed according to following standards:

FCC CFR Title 47 Part 15 Subpart E Section 15.407

ANSI C63.10-2013

2 . SUMMARY

2.1. General Remarks

Date of receipt of test sample	:	Aug. 15, 2016
Testing commenced on	:	Aug. 15, 2016
Testing concluded on	:	Sept. 02, 2016

2.2. Equipment Under Test

Power supply system utilised

Power supply voltage	:	●	120V / 60 Hz	○	115V / 60Hz
		○	12 V DC	○	24 V DC
		●	Other (specified in blank below)		

DC 7.4V from battery

Channel list:

Channel	Frequency(MHz)
1	5745
2	5785
3	5825

2.3. Short description of the Equipment under Test (EUT)

Name of EUT	Digital Transmission System
Model Number	SL-1620
Modilation Type	OFDM 16QAM
Antenna Type	External
Antenna Gain	2.5dBi
Operation frequency	5745MHz~5825MHz
Channel number	3
Max.data rate	300Mbps
Hardware version	HLWH003_F782108058
Software version	HLWH003_V1.0.1.11_2016.1.22

2.4. EUT operation mode

Test Mode:

The channel switch can be used to control the EUT for staying in continuous transmitting mode in the
Below Channels with highest data rate and highest output power level (output power level=25)are chosen for full testing.

Test Mode(TM)	Description	Remark
1	Transmitting	5745
2	Transmitting	5785
3	Transmitting	5825

2.5. EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

● - supplied by the manufacturer

○- supplied by the lab

AC adapter	Manufacturer:	DVE
	Model:	DSA-0151A-12S
Battery	Manufacturer:	RUIBO
	Model:	NP- F960/F970

2.6. NOTE

The EUT is a Wireless Video Transmission System,The functions of the EUT listed as below:

	Test Standards	Reference Report
Wireless Video Transmission System	FCC Part 15 Subpart E (Section15.407)	CTL1607182706-WF
	FCC Per 47 CFR 2.1091(b)	CTL1607182706-WM

2.7. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCCID: 2AJOF-SL-1620 filing to comply with of the FCC part15.407 Rules.

2.8. Modifications

No modifications were implemented to meet testing criteria.

3. TEST ENVIRONMENT

3.1. Address of the test laboratory

Shenzhen CTL Testing Technology Co., Ltd.
Floor 1-A, Baisha Technology Park, No.3011, Shahexi Road, Nanshan District, Shenzhen, China 518055

The sites are constructed in conformance with the requirements of ANSI C63.7 ANSI C63.10 (2013) and CISPR Publication 22.

3.2. Test Facility

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

IC Registration No.: 9618B

The 3m alternate test site of Shenzhen CTL Testing Technology Co., Ltd. EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration No.: 9618B on November 13, 2013.

FCC-Registration No.: 970318

Shenzhen CTL Testing Technology Co., Ltd. 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 970318, December 19, 2013.

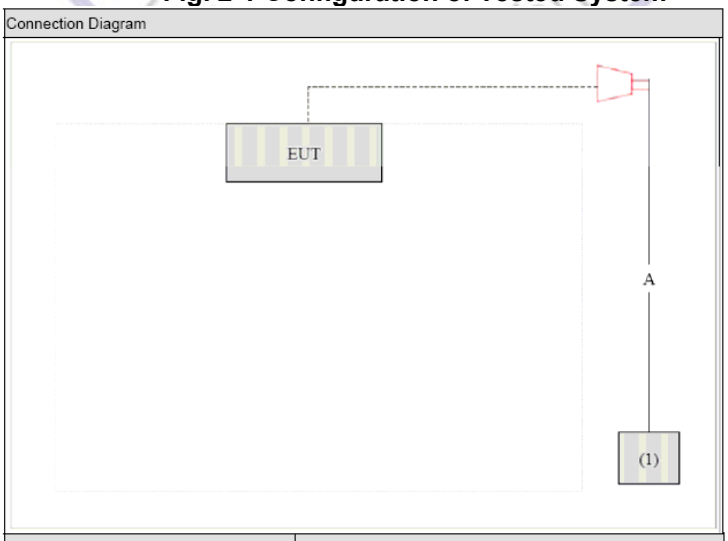
3.3. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15-35 ° C
Humidity:	30-60 %
Atmospheric pressure:	950-1050mbar

3.4. Configuration of Tested System

Fig. 2-1 Configuration of Tested System



Signal Cable Type		Signal cable Description
A	Coaxial Cable	Shielded, >5m

3.5. Duty Cycle

Operated Mode for Worst Duty Cycle		
☐ Operated normally mode for worst duty cycle		
☒ Operated test mode for worst duty cycle		
Test Mode	Duty Cycle (%)	Duty Factor (dB)
1	100	0
2	100	0
3	100	0

3.6. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 „Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ and is documented in the Shenzhen CTL Testing Technology Co., Ltd. quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for CTL laboratory is reported:

Test	Range	Measurement Uncertainty	Notes
Radiated Emission	30~1000MHz	4.10dB	(1)
Radiated Emission	1~12.75GHz	4.32dB	(1)
Radiated Emission	12.75GHz-25 GHz	4.68dB	(1)
Conducted Disturbance	0.15~30MHz	3.20dB	(1)

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

3.7. Equipments Used during the Test

Test Equipment	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Due Date
ULTRA-ROADBAND ANTENNA	Sunol Sciences Corp.	JB1	A061713	2016/06/02	2017/06/01
EMI Test Receiver	R&S	ESCI	103710	2016/06/02	2017/06/01
Spectrum Analyzer	Agilent	E4407B	MY41440676	2016/05/21	2017/05/20
Controller	EM Electronics	Controller EM 1000	N/A	2016/05/21	2017/05/20
Horn Antenna	Sunol Sciences Corp.	DRH-118	A062013	2016/05/19	2017/05/18
Horn Antenna	SCHWARZBACK	BBHA 9170	BBHA9170184	2016/05/19	2017/05/18
Active Loop Antenna	Daze	ZN30900A	N/A	2016/05/19	2017/05/18
LISN	R&S	ENV216	3560.6550.12	2016/06/02	2017/06/01
LISN	R&S	ESH2-Z5	860014/010	2016/06/02	2017/06/01
Amplifier	Agilent	8349B	3008A02306	2016/05/19	2017/05/18
Amplifier	Agilent	8447D	2944A10176	2016/05/19	2017/05/18
Temperature/Humidity Meter	Gangxing	CTH-608	02	2016/05/20	2017/05/19
Power Meter	Agilent	U2531A	TW53323507	2016/05/21	2017/05/20
Power Sensor	Agilent	U2021XA	MY5365004	2016/05/21	2017/05/20
Climate Chamber	ESPEC	EL-10KA	A20120523	2016/05/20	2017/05/19
High-Pass Filter	K&L	9SH10-2700/X12750-O/O	N/A	2016/05/20	2017/05/19
High-Pass Filter	K&L	41H10-1375/U12750-O/O	N/A	2016/05/20	2017/05/19
RF Cable(1-40GHz)	HUBER+SUHNER	RG214	N/A	2016/05/20	2017/05/19
RF Cable(1-40GHz)	HUBER+SUHNER	RG214	N/A	2016/05/20	2017/05/19
RF Cable(0-1GHz)	HUBER+SUHNER	RG174	N/A	2016/05/20	2017/05/19
RF Cable(0-1GHz)	HUBER+SUHNER	RG174	N/A	2016/05/20	2017/05/19

3.8. Summary of Test Result

FCC PART 15		
FCC Part 15.207	AC Power Conducted Emission	PASS
FCC Part 15.407(e)	6dB Bandwidth	PASS
FCC Part 15.407 (a)	26dB Bandwidth and 99% Occupid Bandwidth	PASS
FCC Part 15.407 (a)	Maximum Conducted Output Power	PASS
FCC Part 15.407 (a)	Power Spectral Density	PASS
FCC Part 15.109/ 15.205/ 15.209	Spurious Emission	PASS
FCC Part 15.407(b)	Band Edge	PASS
FCC Part 15.407(g)	Frequency Stability	PASS
FCC Part 15.203	Antenna Requirement	PASS

Remark: The measurement uncertainty is not included in the test result.

Preliminary tests were performed in different data rate to find the worst radiated emission. The data rate shown in the table below is the worst-case rate with respect to the specific test item. Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

Test Items	Test Mode	Data Rate	Channel
Maximum Conducted Output Power Power Spectral Density 6dB Bandwidth 26dB Bandwidth Spurious emission	1	300Mbps	1/2/3
	2	300Mbps	1/2/3
	3	300Mbps	1/2/3
Radiated Emission 30MHz~1GHz	1	300Mbps	1/2/3
	2	300Mbps	1/2/3
	3	300Mbps	1/2/3
Radiated Emission 1GHz~10th Harmonic	1	300Mbps	1/2/3
	2	300Mbps	1/2/3
	3	300Mbps	1/2/3
Band Edge	1	300Mbps	1/3
	2	300Mbps	1/3
	3	300Mbps	1/3

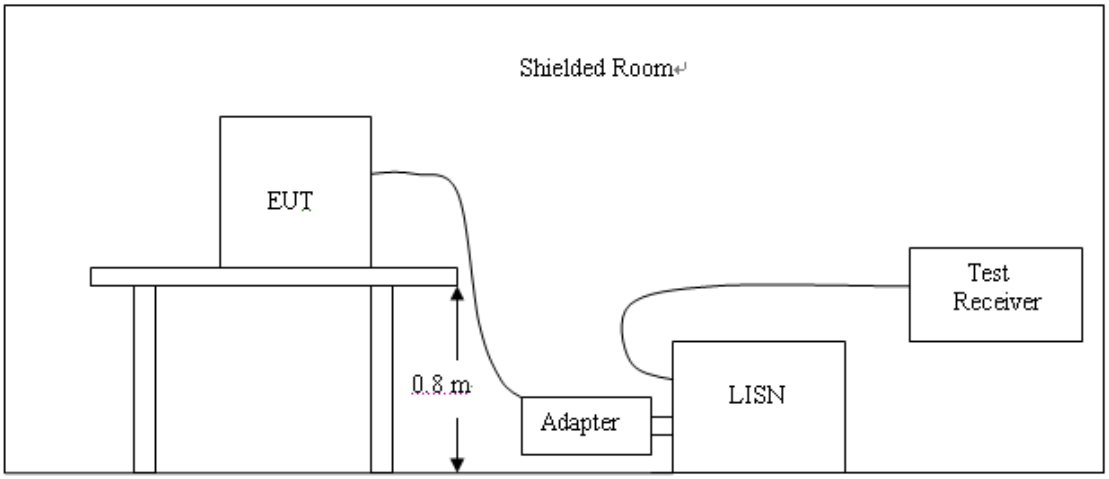
Note1: According exploratory test, EUT will have maximum output power in those data rate, so those data rate were used for all test.

Note2: This device use MIMO 2X2 antennas, all the radiated spurious emissions and band edge test were performed with two antennas transmit synchronous.

4. TEST CONDITIONS AND RESULTS

4.1. Conducted Emissions Test

TEST CONFIGURATION



TEST PROCEDURE

For unintentional device, according to § 15.107(a) Line Conducted Emission Limits is as following：

Frequency (MHz)	Maximum RF Line Voltage (dBμv)			
	CLASS A		CLASS B	
	Q.P.	Ave.	Q.P.	Ave.
0.15 - 0.50	79	66	66-56*	56-46*
0.50 - 5.00	73	60	56	46
5.00 - 30.0	73	60	60	50

* Decreasing linearly with the logarithm of the frequency

For intentional device, according to §15.207(a) Line Conducted Emission Limit is same as above table.

1. Please follow the guidelines in ANSI C63.10-2013.
2. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
3. Connect EUT to the power mains through a line impedance stabilization network (LISN).
4. All the support units are connecting to the other LISN.
5. The LISN provides 50 ohm coupling impedance for the measuring instrument.
6. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
7. Both sides of AC line were checked for maximum conducted interference.
8. The frequency range from 150 kHz to 30 MHz was searched.
9. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

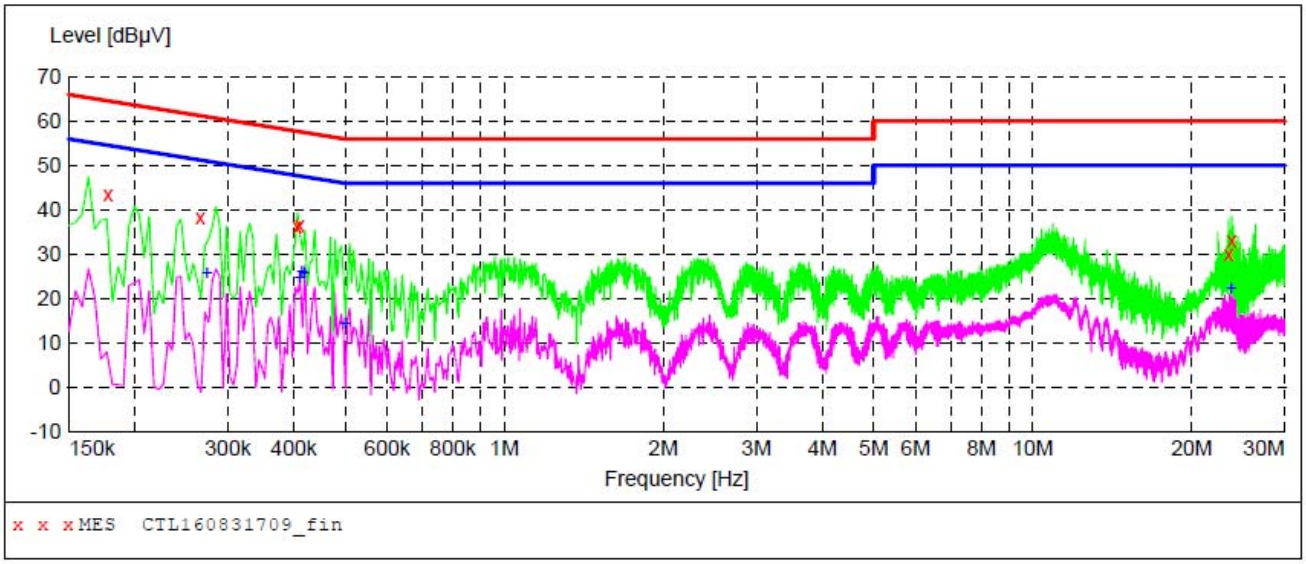
TEST RESULTS

The Conducted Emissions measurement are performed the each test mode, the datum recorded below (mode1) is the worst case for all the test mode and channel.

test voltage 120V/60Hz :

SCAN TABLE: "Voltage (9K-30M)FIN"

Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "CTL160831709_fin"

8/31/2016 10:26AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.178000	43.40	10.2	65	21.2	QP	N	GND
0.266000	38.30	10.2	61	22.9	QP	N	GND
0.406000	36.20	10.2	58	21.5	QP	N	GND
0.410000	36.70	10.2	58	20.9	QP	N	GND
23.522000	30.00	11.1	60	30.0	QP	N	GND
23.822000	33.00	11.1	60	27.0	QP	N	GND

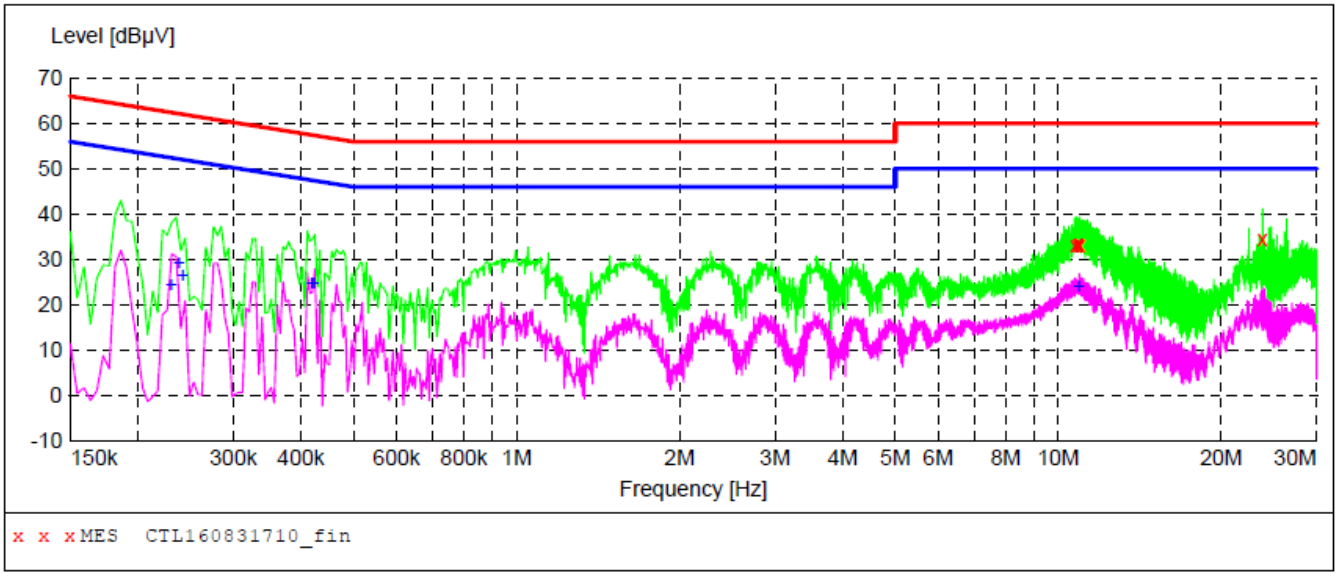
MEASUREMENT RESULT: "CTL160831709_fin2"

8/31/2016 10:26AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.274000	25.80	10.2	51	25.2	AV	N	GND
0.410000	24.80	10.2	48	22.8	AV	N	GND
0.414000	26.20	10.2	48	21.4	AV	N	GND
0.418000	25.80	10.2	48	21.7	AV	N	GND
0.500000	14.40	10.2	46	31.6	AV	N	GND
23.762000	22.40	11.1	50	27.6	AV	N	GND

SCAN TABLE: "Voltage (9K-30M)FIN"

Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "CTL160831710_fin"

8/31/2016 10:29AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
10.736000	33.20	10.6	60	26.8	QP	L1	GND
10.838000	33.20	10.6	60	26.8	QP	L1	GND
10.880000	33.40	10.6	60	26.6	QP	L1	GND
10.928000	33.30	10.6	60	26.7	QP	L1	GND
10.958000	33.10	10.6	60	26.9	QP	L1	GND
23.828000	34.60	11.1	60	25.4	QP	L1	GND

MEASUREMENT RESULT: "CTL160831710_fin2"

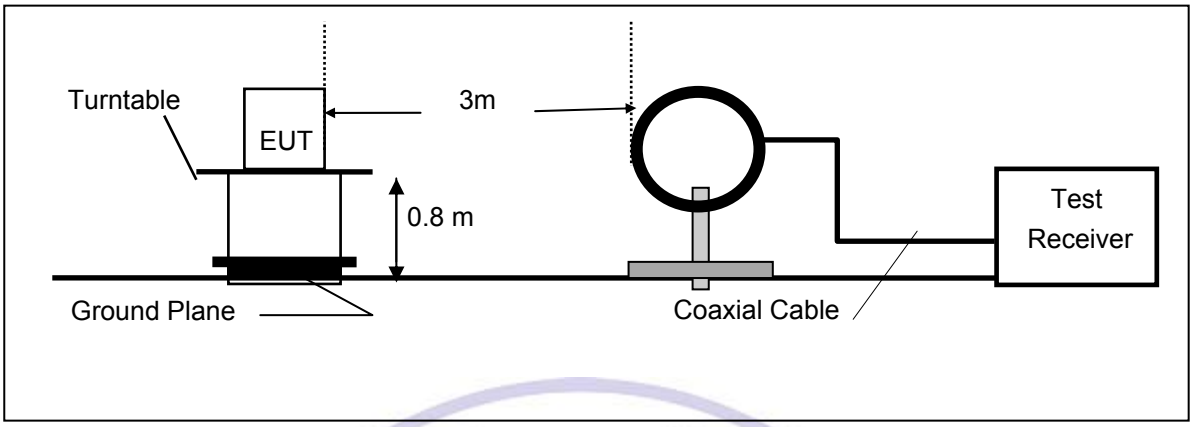
8/31/2016 10:29AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.230000	24.40	10.2	52	28.0	AV	L1	GND
0.238000	29.20	10.2	52	23.0	AV	L1	GND
0.242000	26.40	10.2	52	25.6	AV	L1	GND
0.418000	24.90	10.2	48	22.6	AV	L1	GND
0.422000	24.70	10.2	47	22.7	AV	L1	GND
10.904000	24.10	10.6	50	25.9	AV	L1	GND

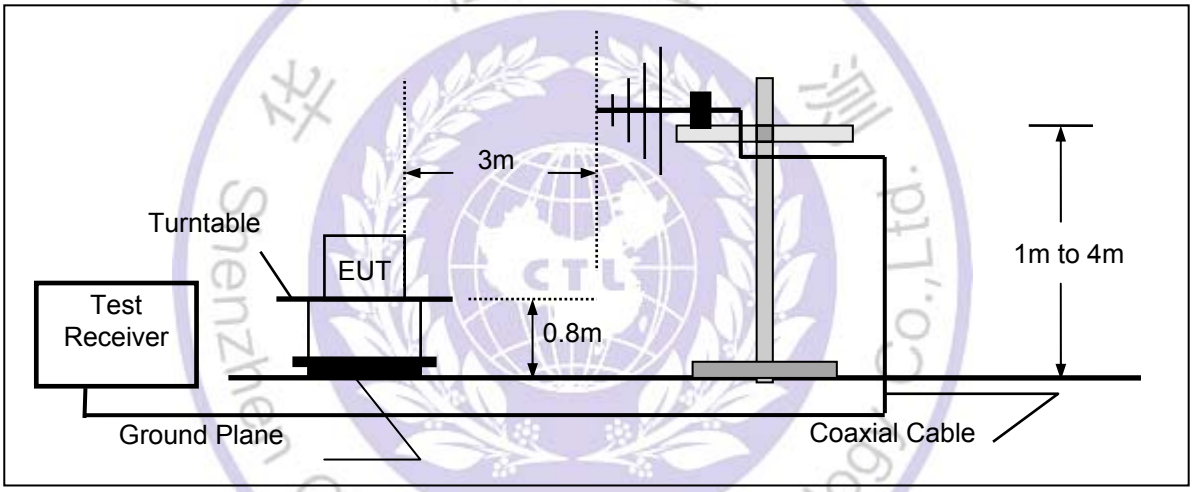
4.2. Radiated Emission and bandedge Test

TEST CONFIGURATION

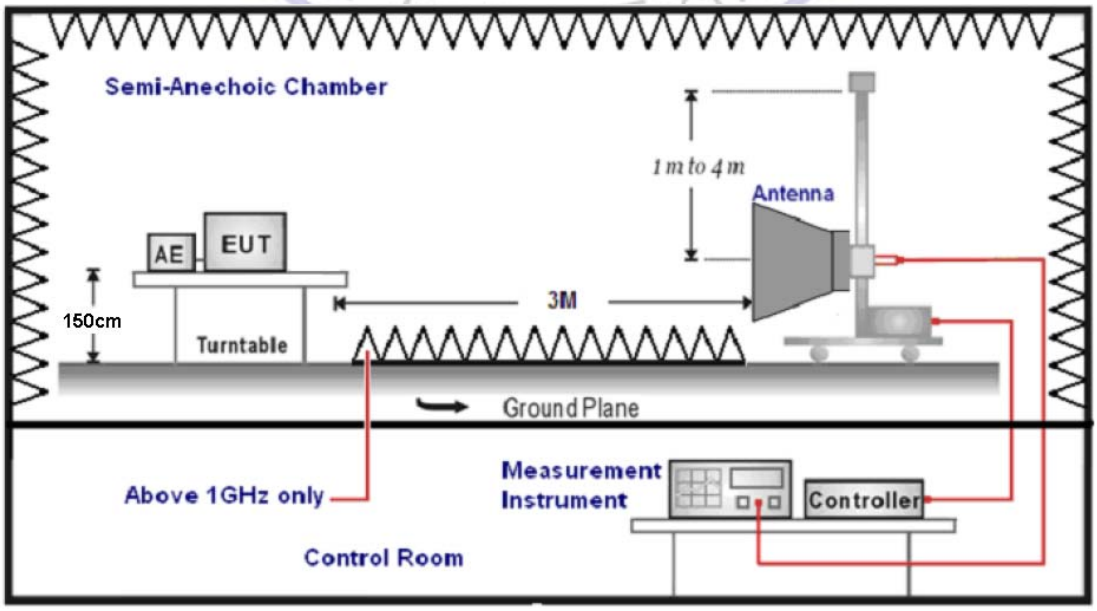
(A) Radiated Emission Test Set-Up, Frequency Below 30MHz



(B) Radiated Emission Test Set-Up, Frequency Below 1000MHz



(C) Radiated Emission Test Set-Up, Frequency above 1000MHz



FIELD STRENGTH CALCULATION

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor(if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CL - AG

Where FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
RA = Reading Amplitude	AG = Amplifier Gain
AF = Antenna Factor	

TEST PROCEDURE

1. The EUT is placed on a turntable, which is 0.8m above ground plane below 1GHz and 1.5m above ground plane above 1GHz.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. For the radiated emission test above 1GHz: Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.
5. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
6. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
7. Repeat above procedures until the measurements for all frequencies are complete.
8. Based on the Frequency Generator in the device include 16MHz.The test frequency range from 9KHz to 40GHz per FCC PART 15.33(a).

Note: For battery operated equipment, the equipment tests shall be performed using a fully-charged battery.

LIMIT

For unintentional device, according to § 15.109(a), except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values：

Frequency (MHz)	Distance (Meters)	Radiated (dBμV/m)	Radiated (μV/m)
30-88	3	40.0	100
88-216	3	43.5	150
216-960	3	46.0	200
Above 960	3	54.0	500

For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emissions from intentional radiators at a distance of 3 meters shall not exceed the above table. According to § 15.247(d), in any 100kHz bandwidth outside the frequency band in which the EUT is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the100kHz bandwidth within the band that contains the highest level of desired power.

For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz

For transmitters operating in the 5.725-5.85 GHz band: All emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of −17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an e.i.r.p. of −27 dBm/MHz.

Remark:

1. limit 1:
E[dBμV/m] = EIRP[dBm] + 95.2=68.2 dBuV/m, for EIPR[dBm]=-27dBm.
2. limit 2:
E[dBμV/m] = EIRP[dBm] + 95.2=78.2 dBuV/m, for EIPR[dBm]=-17dBm.

TEST RESULTS

9KHz-30MHz:

Freq. (MHz)	Level (dBuV)	Over Limit (dB)	Limit Line (dBuV)	Remark
-	-	-	-	See Note

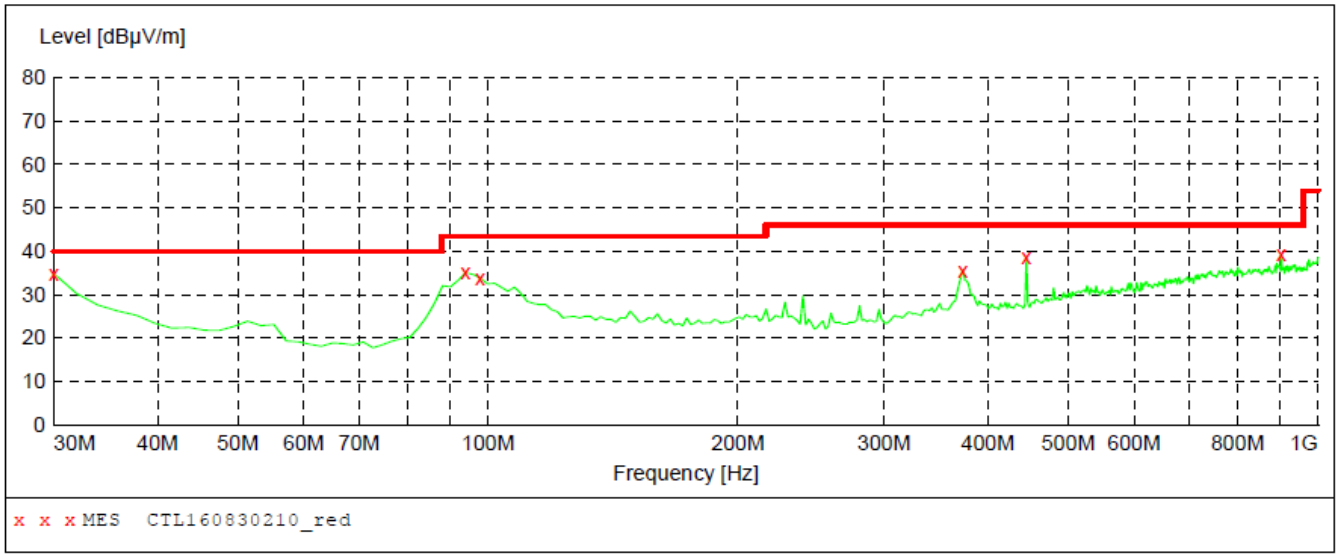
Note: The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.

Distance extrapolation factor= 40 log (specific distance/ test distance) (dB);
Limit line= specific limits (dBuV) + distance extrapolation factor.

Below 1GHz:
The radiated measurement are performed the each test mode, the datum recorded below (mode1) is the worst case for all the test mode and channel.

SWEEP TABLE: "test (30M-1G)"

Short Description:			Field Strength		
Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
30.0 MHz	1.0 GHz	MaxPeak	300.0 ms	120 kHz	JB1



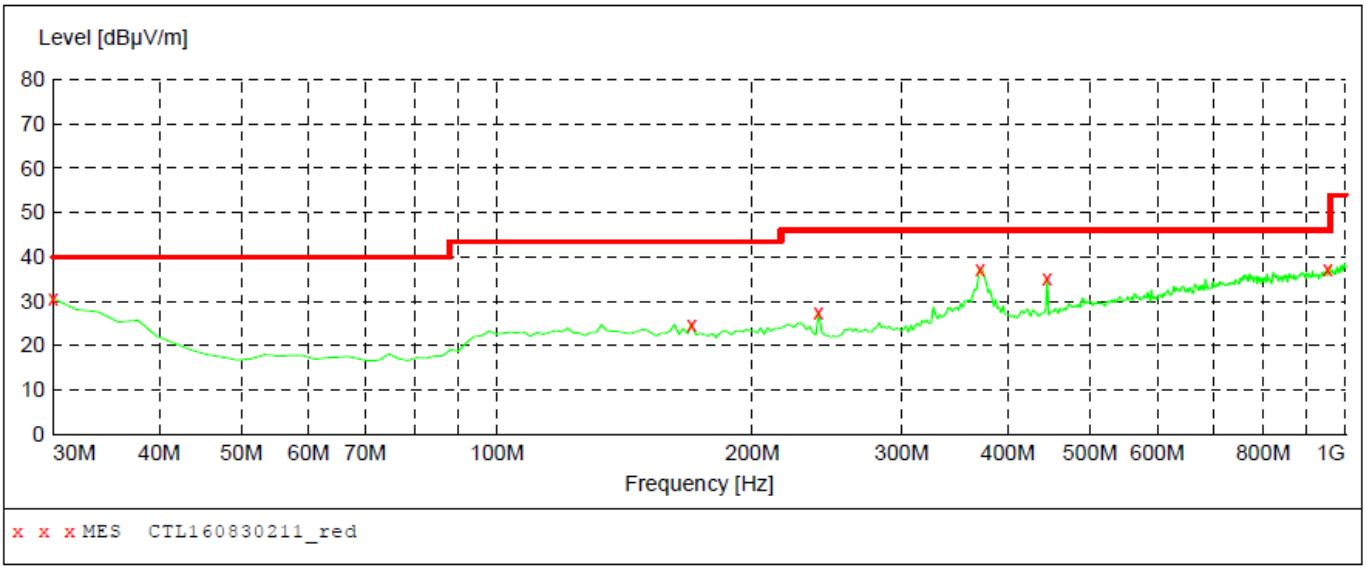
MEASUREMENT RESULT: "CTL160830210_red"

8/30/2016 3:04PM

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
30.000000	34.80	20.8	40.0	5.2	---	0.0	0.00	VERTICAL
94.020000	35.00	9.9	43.5	8.5	---	0.0	0.00	VERTICAL
97.900000	33.90	10.7	43.5	9.6	---	0.0	0.00	VERTICAL
373.380000	35.70	17.5	46.0	10.3	---	0.0	0.00	VERTICAL
445.160000	38.60	19.0	46.0	7.4	---	0.0	0.00	VERTICAL
903.000000	39.30	26.0	46.0	6.7	---	0.0	0.00	VERTICAL

SWEEP TABLE: "test (30M-1G)"

Short Description:			Field Strength		
Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
30.0 MHz	1.0 GHz	MaxPeak	300.0 ms	120 kHz	JB1



MEASUREMENT RESULT: "CTL160830211_red"

8/30/2016 3:06PM

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
30.000000	30.60	20.8	40.0	9.4	---	0.0	0.00	HORIZONTAL
169.680000	24.80	13.3	43.5	18.7	---	0.0	0.00	HORIZONTAL
239.520000	27.50	13.7	46.0	18.5	---	0.0	0.00	HORIZONTAL
371.440000	37.40	17.5	46.0	8.6	---	0.0	0.00	HORIZONTAL
445.160000	35.10	19.0	46.0	10.9	---	0.0	0.00	HORIZONTAL
953.440000	37.30	26.6	46.0	8.7	---	0.0	0.00	HORIZONTAL

Above 1GHz:

CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	V	5745	85.7	24.9	110.6	Fundamental	/	**PK**
	V	1600	19.6	22.1	41.7	54(note3)	12.3	**PK**
	V	5715	41.0	25.1	66.1	68.2	2.1	**PK**
	V	5715	24.1	25.1	49.2	54	4.8	**AV**
	V	5725	41.2	25.7	66.9	78.2	11.3	**PK**
	V	5725	21.0	25.7	46.7	54	7.3	**AV**
	V	11490	38.5	30.2	68.7	74	5.3	**PK**
	V	11490	19.9	30.2	50.1	54	3.9	**AV**
	V	17235	33.1	34.3	67.4	74	6.6	**PK**
	V	17235	15.5	34.3	49.8	54	4.2	**AV**
2	V	5785	86.0	24.9	110.9	Fundamental	/	**PK**
	V	1600	20.4	22.1	42.5	54(note3)	11.5	**PK**
	V	11570	36.9	30.3	67.2	74	6.8	**PK**
	V	11570	20.5	30.3	50.8	54	3.2	**AV**
	V	17355	34.0	34.3	68.3	74	5.7	**PK**
	V	17355	13.6	34.3	47.9	54	6.1	**AV**
3	V	5825	85.3	24.9	110.2	Fundamental	/	**PK**
	V	1600	18.6	22.1	40.7	54(note3)	13.3	**PK**
	V	5850	45.2	25.2	70.4	78.2	7.8	**PK**
	V	5850	22.0	25.2	47.2	54	6.8	**AV**
	V	5860	40.4	25.5	65.9	68.2	2.3	**PK**
	V	5860	21.1	25.5	46.6	54	7.4	**AV**
	V	11650	36.2	32.5	68.7	74	5.3	**PK**
	V	11650	15.9	32.5	48.4	54	5.6	**AV**
	V	17457	32.1	35.1	67.2	74	6.8	**PK**
	V	17457	13.8	35.1	48.9	54	5.1	**AV**

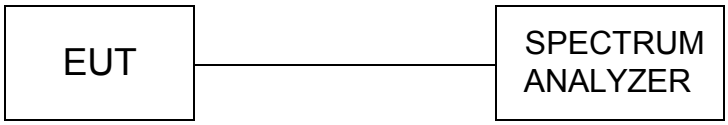
Note: 1. Measure Level = Reading Level + Factor.
2. The test results which are attenuated more than 20 dB below the permissible value limit (the test frequency range: 9kHz~30MHz, 18GHz~40GHz), therefore no data appear in the report.
3. This limit applies for using average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.
Remark: RBW 1MHz VBW 3MHz peak detector for PK value, RMS detector for AV value

CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	H	5745	84.9	24.9	109.8	Fundamental	/	PK
	H	1600	18.1	22.1	40.2	54(note3)	13.8	PK
	H	5715	40.8	25.1	65.9	68.2	2.3	PK
	H	5715	22.3	25.1	47.4	54	6.6	AV
	H	5725	44.1	25.7	69.8	78.2	8.4	PK
	H	5725	19.4	25.7	45.1	54	8.9	AV
	H	11490	38.5	30.2	68.7	74	5.3	PK
	H	11490	19.4	30.2	49.6	54	4.4	AV
	H	17235	33.1	34.3	67.4	74	6.6	PK
	H	17235	11.8	34.3	46.1	54	7.9	AV
2	H	5785	84.7	24.9	109.6	Fundamental	/	PK
	H	1600	19.1	22.1	41.2	54(note3)	12.8	PK
	H	11570	35.6	30.3	65.9	74	8.1	PK
	H	11570	18.1	30.3	48.4	54	5.6	AV
	H	17355	33.2	34.3	67.5	74	6.5	PK
	H	17355	8.8	34.3	43.1	54	10.9	AV
3	H	5825	85.2	24.9	110.1	Fundamental	/	PK
	H	1600	19.4	22.1	41.5	54(note3)	12.5	PK
	H	5850	44.0	25.2	69.2	78.2	9.0	PK
	H	5850	22.4	25.2	47.6	54	6.4	AV
	H	5860	37.9	25.5	63.4	68.2	4.8	PK
	H	5860	21.4	25.5	46.9	54	7.1	AV
	H	11650	35.9	32.5	68.4	74	5.6	PK
	H	11650	14.6	32.5	47.1	54	6.9	AV
	H	17457	31.1	35.1	66.2	74	7.8	PK
	H	17457	12.6	35.1	47.7	54	6.3	AV

Note: 1. Measure Level = Reading Level + Factor.
2. The test results which are attenuated more than 20 dB below the permissible value limit (the test frequency range: 9kHz~30MHz, 18GHz~40GHz), therefore no data appear in the report.
3. This limit applies for using average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.
Remark: RBW 1MHz VBW 3MHz peak detector for PK value, RMS detector for AV value

4.3. 6dB Bandwidth Measurement

TEST CONFIGURATION



TEST PROCEDURE

1. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
2. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. In order to make an accurate measurement, set the span greater than RBW.
3. The marker-delta reading at this point is the 6 dB bandwidth of the emission.

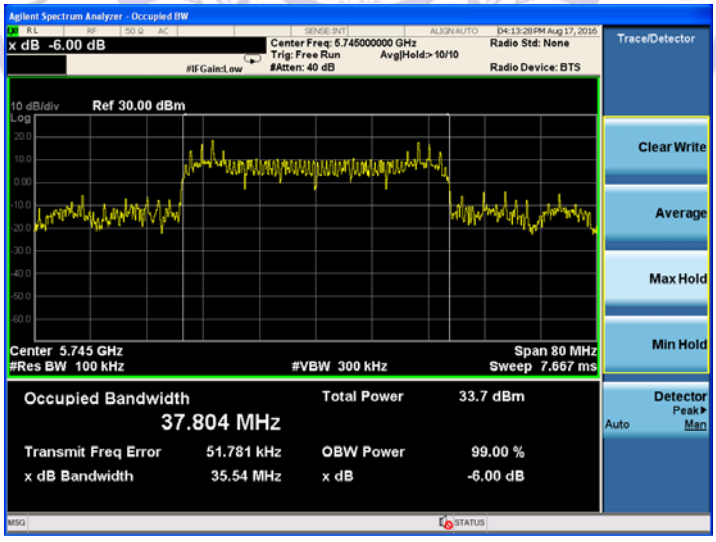
LIMIT

Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

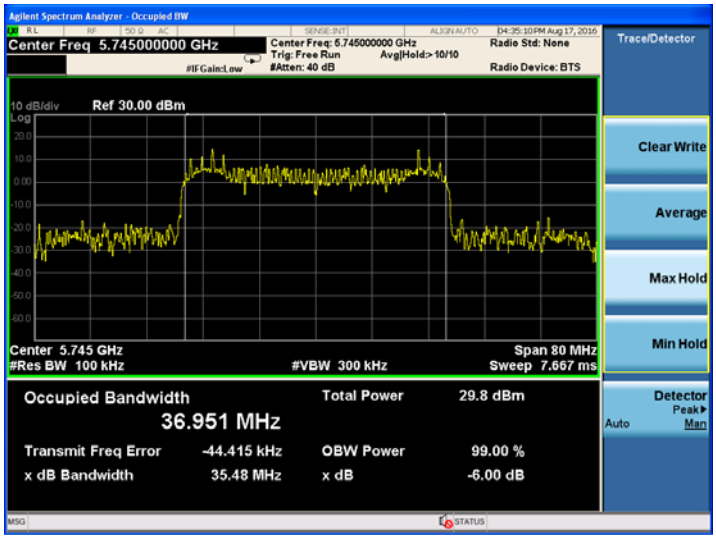
TEST RESULTS

CHANNEL	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS/FAIL
	Ant 1 6dB	Ant 2 6dB		
1	35.54	35.48	0.5	PASS
2	35.59	33.98	0.5	PASS
3	32.57	33.96	0.5	PASS

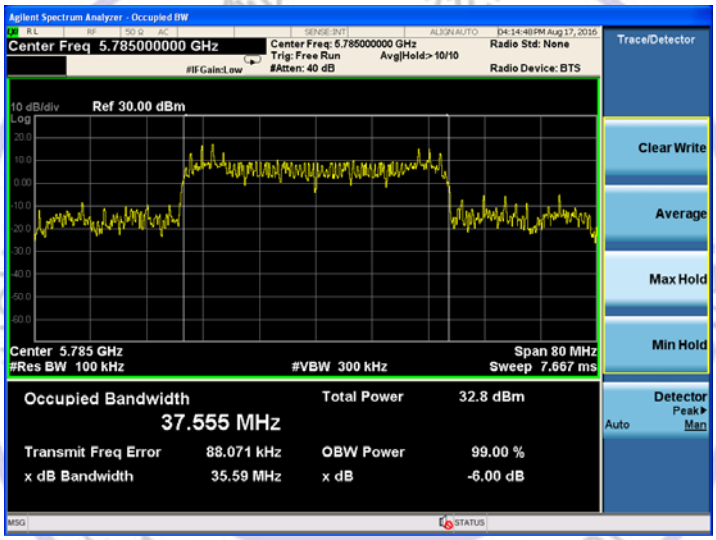
CH1 @ANT 1



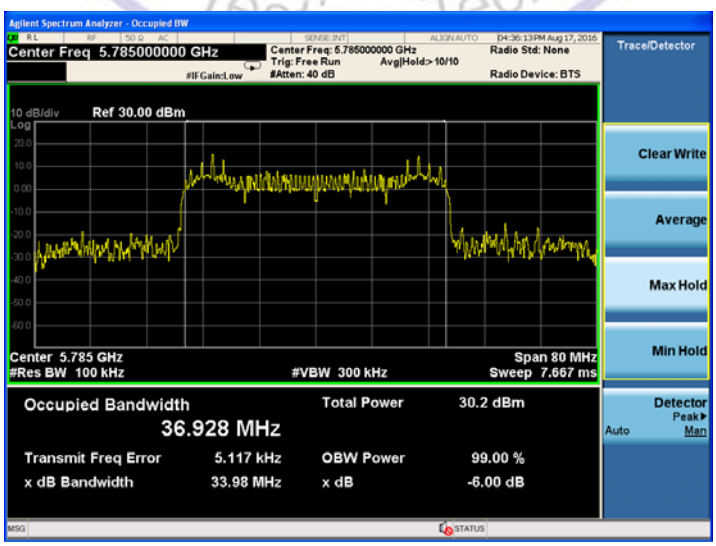
CH1 @ANT 2



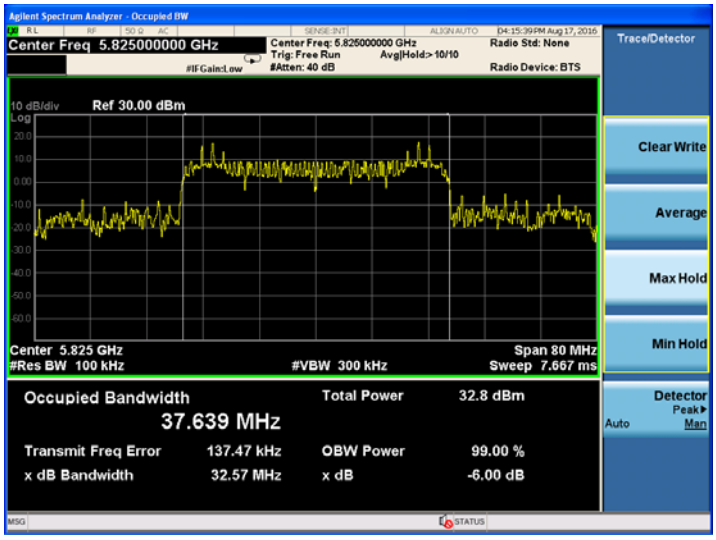
CH2 @ANT 1



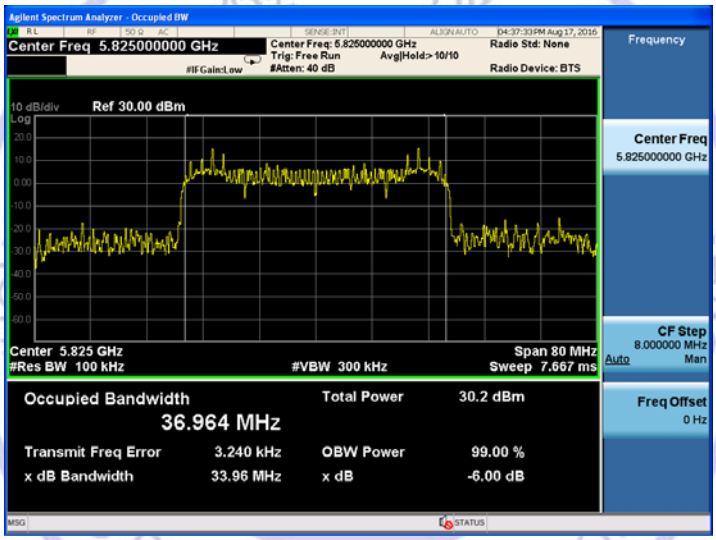
CH2 @ANT 2



CH3 @ANT 1

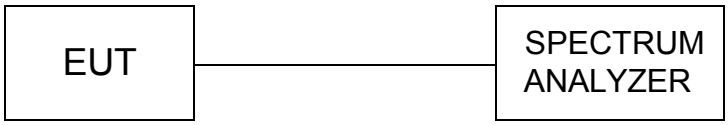


CH3 @ANT 2



4.4. 26dB Bandwidth and 99% Occupid Bandwidth Measurement

TEST CONFIGURATION



TEST PROCEDURE

1. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
2. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. In order to make an accurate measurement, set the span greater than RBW..
3. The marker-delta reading at this point is the 26 dB bandwidth and 99% Occupid Bandwidth of the emission.

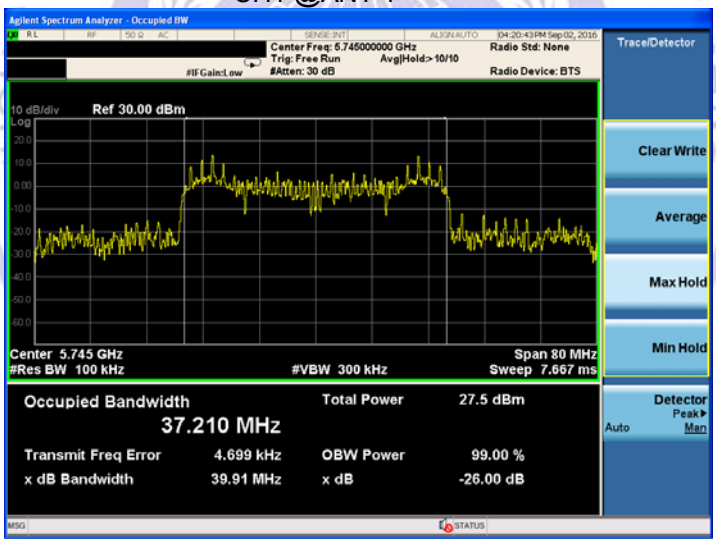
LIMIT

N/A

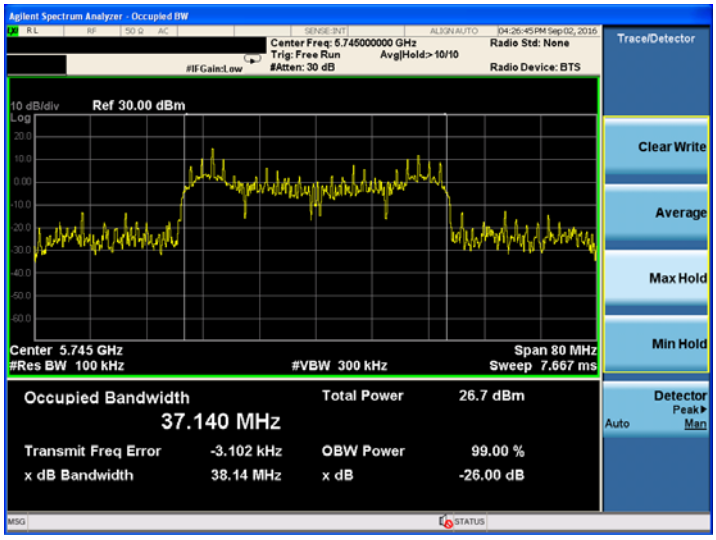
TEST RESULTS

Channel	26dB BANDWIDTH (MHz)		99% Occupid Bandwidth (MHz)	
	Ant 1	**Ant 2**	**Ant 1**	**Ant 2**
1	39.91	38.14	37.210	37.140
2	39.81	38.17	37.020	37.142
3	38.15	39.92	37.150	37.112

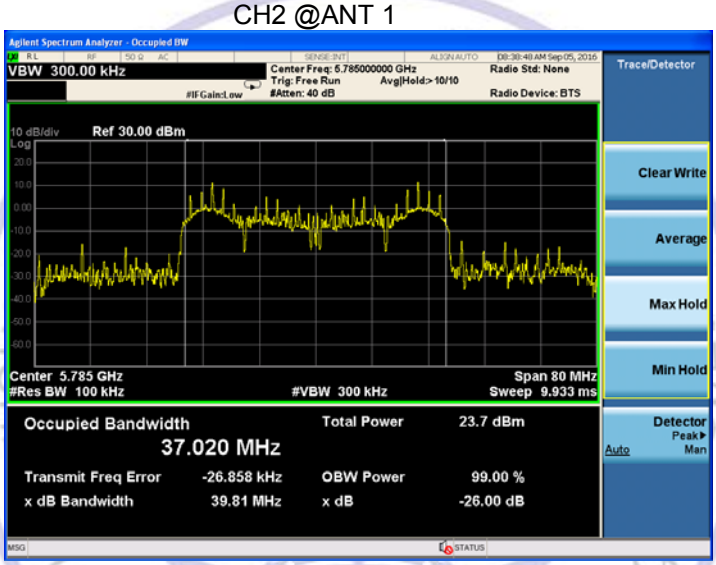
CH1 @ANT 1



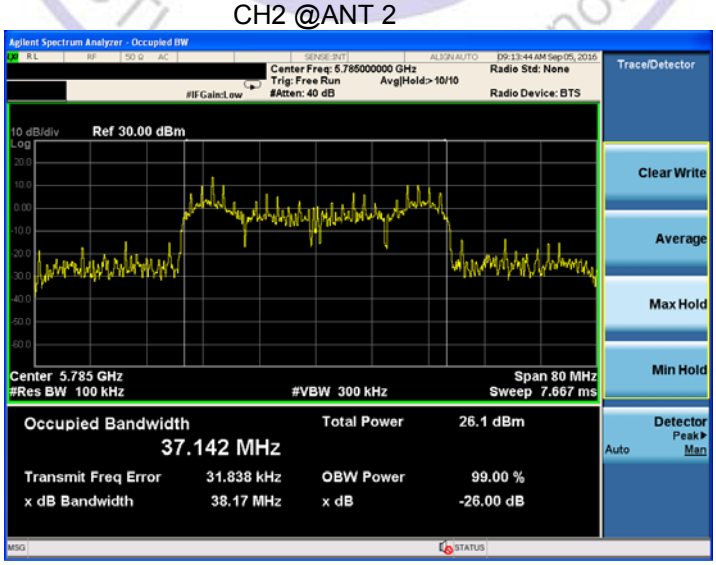
CH1 @ANT 2



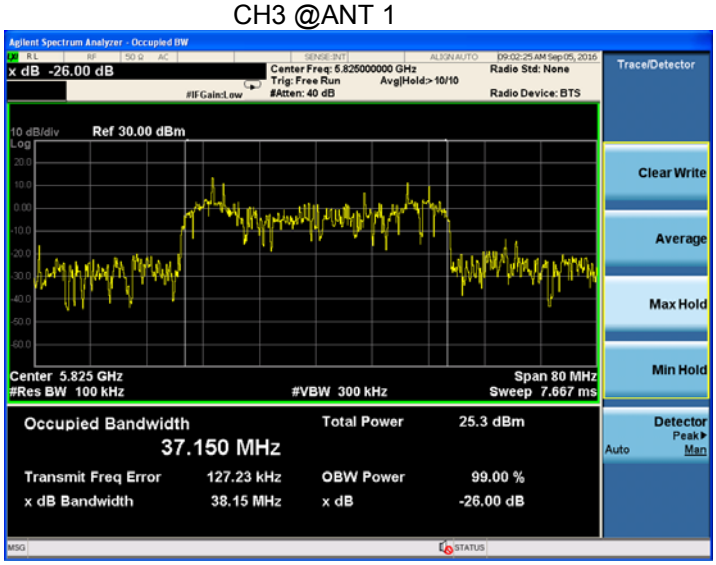
CH2 @ANT 1



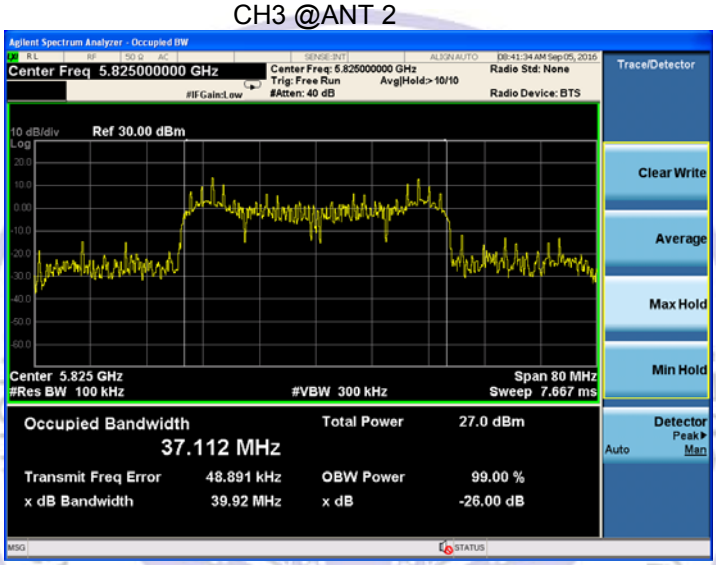
CH2 @ANT 2



CH3 @ANT 1

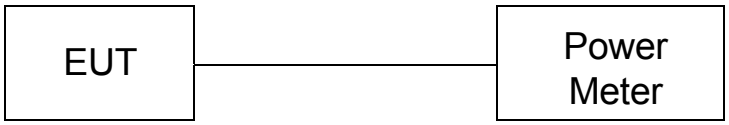


CH3 @ANT 2



4.5. Maximum Conducted Output Power

TEST CONFIGURATION



TEST PROCEDURE

The EUT was directly connected to the power meter and antenna output port as show in the block diagram as TEST CONFIGURATION shows.

Use the wideband average power meter to test conducted output power and record the result.

LIMIT

The Conducted Output Power Measurement limits are 30dBm.

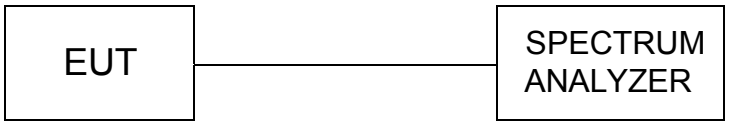
TEST RESULTS

Channel	Conducted Power Output (dBm)			Conducted Power Limit (dBm)	PASS / FAIL
	Ant1	Ant 2	Total		
1	23.14	24.29	26.76	30	PASS
2	23.79	23.84	26.83	30	PASS
3	23.74	23.09	26.44	30	PASS

Note: The test results including the cable lose.

4.6. Power Spectral Density Measurement

TEST CONFIGURATION



TEST PROCEDURE

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 510kHz. VBW ⩾3 RBW Sweep = auto; Detector Function = Peak. Trace = Max hold.
3. Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels. The limit is specified in one of the subparagraphs of this Section Submit this plot.

LIMIT

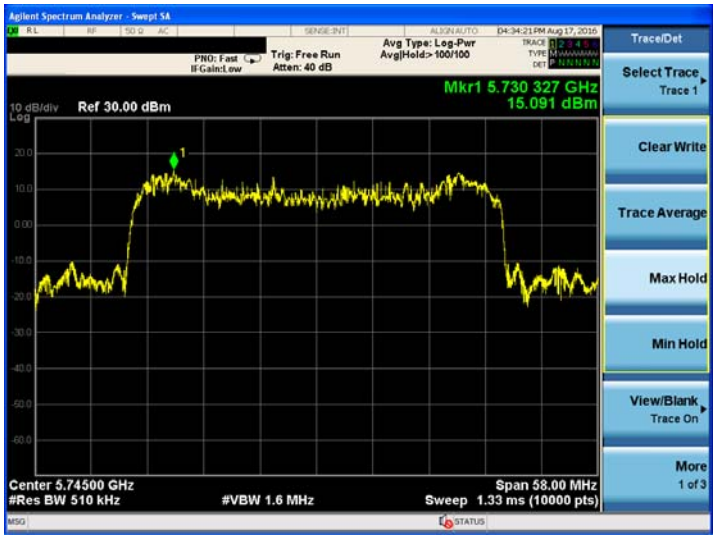
⩽30.00dBm/KHz for Operation in the band IV(5725MHz-5850MHz)of device

TEST RESULTS

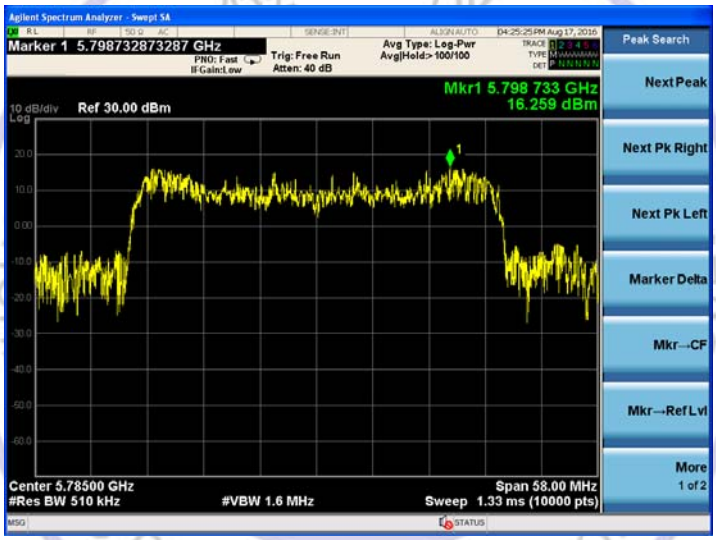
Channel	PSD			Maximum limit	PASS / FAIL
	Ant1	Ant 2	Total		
1	14.240dBm/510KHz	15.091dBm/510KHz	17.697dBm/510KHz	30.00dBm/500KHz	PASS
2	16.259dBm/510KHz	13.661dBm/510KHz	18.162dBm/510KHz	30.00dBm/500KHz	PASS
3	16.786dBm/510KHz	16.333dBm/510KHz	19.576dBm/510KHz	30.00dBm/500KHz	PASS

CH1 @ANT 1

CH1 @ANT 2

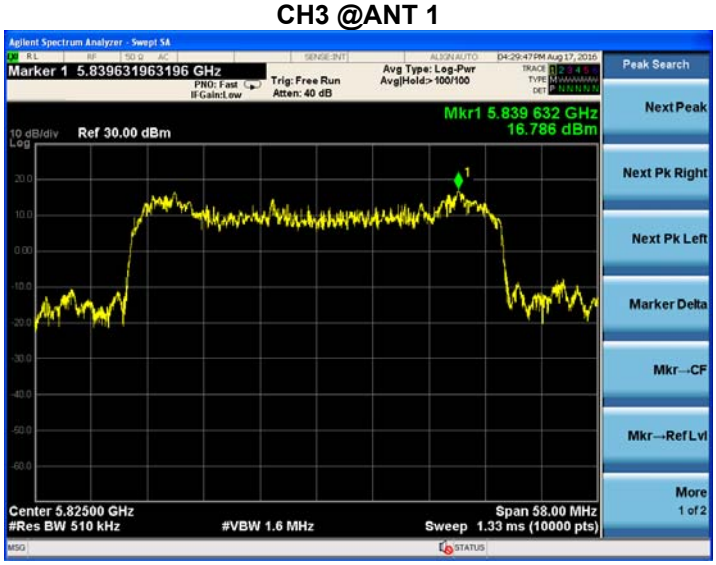


CH2 @ANT 1

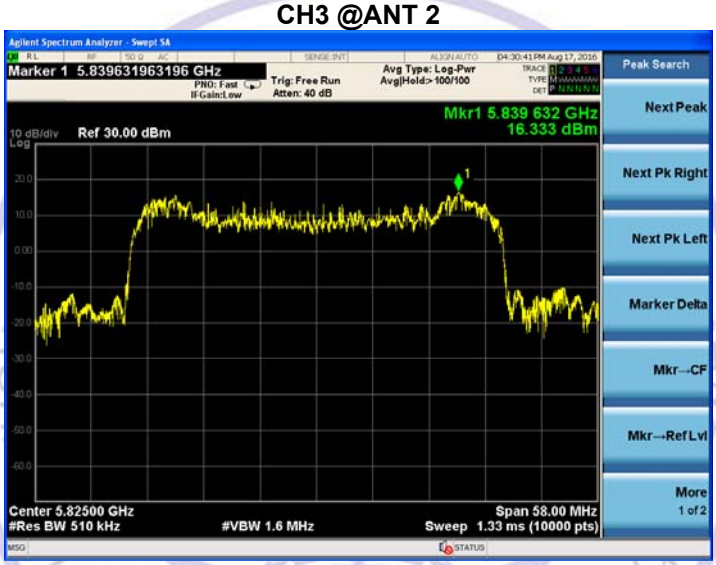


CH2 @ANT 2

CH3 @ANT 1

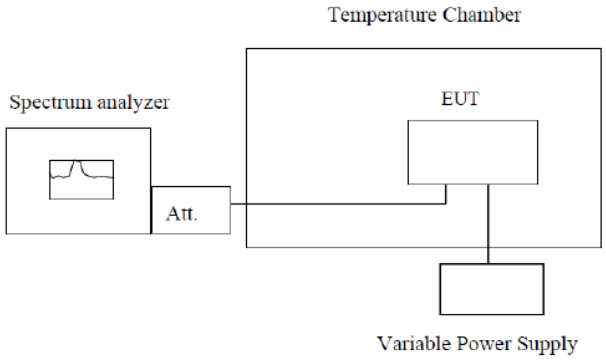


CH3 @ANT 2



4.7. Frequency stability

TEST CONFIGURATION



TEST PROCEDURE

1. The EUT is installed in an environment test chamber with external power source.
2. Set the chamber to operate at 40 centigrade and external power source to output at nominal voltage of EUT.
3. A sufficient stabilization period at each temperature is used prior to each frequency measurement.
4. When temperature is stabled, measure the frequency stability.
5. The test shall be performed under 0 to 40 centigrade and 85 to 115 percent of the nominal voltage. Change setting of chamber and external power source to complete all conditions.

LIMIT

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the users manual.

TEST RESULTS

EUT Work Temperature: 0~40°C

Battery Work voltage: 85 to 115 percent of the nominal voltage(DC7.4V)

DC12V AC adapter Work voltage: DC 12V from AC adapter

For Battery Powered Measurement Data (the worst channel):

Frequency Stability under Temperature

Temperature Interval (℃)	Test Frequency (MHz)	Test Result (MHz)	Max. Deviation (ppm)
0	5745	5745.010900	1.897
10	5745	5745.011100	1.932
20	5745	5745.008200	1.427
30	5745	5745.010300	1.793
40	5745	5745.012800	2.228

Frequency Stability under Voltage

DC Voltage (V)	Test Frequency (MHz)	Test Result (MHz)	Max. Deviation (ppm)
7.40	5745	5745.015900	2.768
6.29	5745	5745.013800	2.402
8.51	5745	5745.012500	2.176

Frequency Stability under Temperature

Temperature Interval (℃)	Test Frequency (MHz)	Test Result (MHz)	Max. Deviation (ppm)
0	5825	5825.011100	1.906
10	5825	5825.013400	2.300
20	5825	5825.014900	2.558
30	5825	5825.016300	2.798
40	5825	5825.017500	3.004

Frequency Stability under Voltage

DC Voltage (V)	Test Frequency (MHz)	Test Result (MHz)	Max. Deviation (ppm)
7.40	5825	5825.018300	3.142
6.29	5825	5825.018900	3.245
8.51	5825	5825.019700	3.382

For DC12V from AC adapter Powered Measurement Data (the worst channel):

Frequency Stability under Temperature

Temperature Interval (℃)	Test Frequency (MHz)	Test Result (MHz)	Max. Deviation (ppm)
0	5745	5745.011600	2.019
10	5745	5745.011800	2.054
20	5745	5745.010000	1.741
30	5745	5745.012400	2.158
40	5745	5745.013100	2.280

Frequency Stability under Voltage

DC Voltage (V)	Test Frequency (MHz)	Test Result (MHz)	Max. Deviation (ppm)
12.0	5745	5745.013900	2.419
10.2	5745	5745.014200	2.472
13.8	5745	5745.010500	1.828

Frequency Stability under Temperature

Temperature Interval (℃)	Test Frequency (MHz)	Test Result (MHz)	Max. Deviation (ppm)
0	5825	5825.011200	1.923
10	5825	5825.012900	2.215
20	5825	5825.014200	2.438
30	5825	5825.015800	2.712
40	5825	5825.016100	2.764

Frequency Stability under Voltage

DC Voltage (V)	Test Frequency (MHz)	Test Result (MHz)	Max. Deviation (ppm)
12.0	5825	5825.017700	3.039
10.2	5825	5825.018400	3.159
13.8	5825	5825.018900	3.245

4.8. Antenna Requirement

STANDARD APPLICABLE

For intentional device, according to FCC 47 CFR Section 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.

And according to FCC 47 CFR Section 15.407 (a), if 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 6dBi.

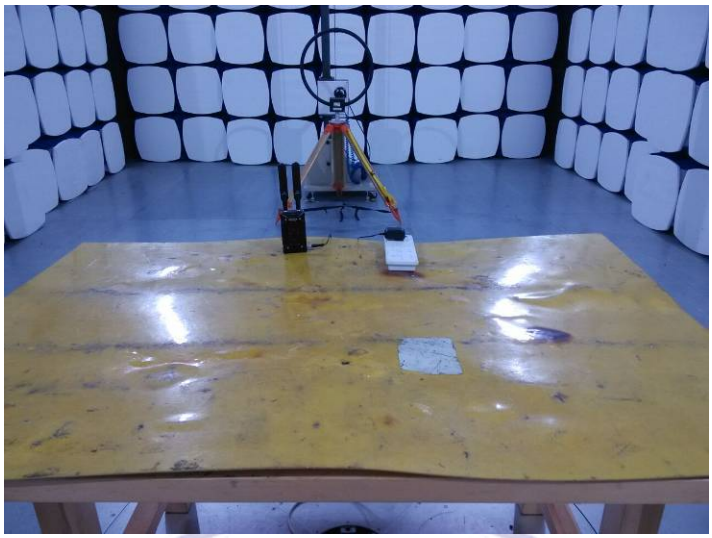
Refer to statement below for compliance.

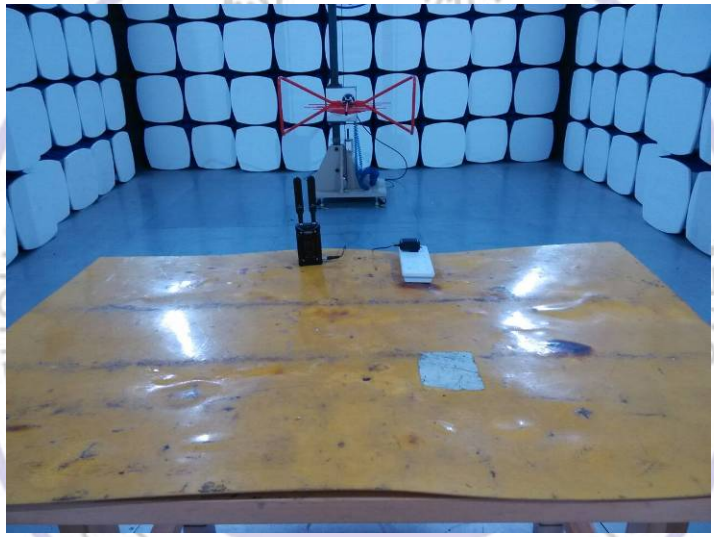
The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. Further, this requirement does not apply to intentional radiators that must be professionally installed.

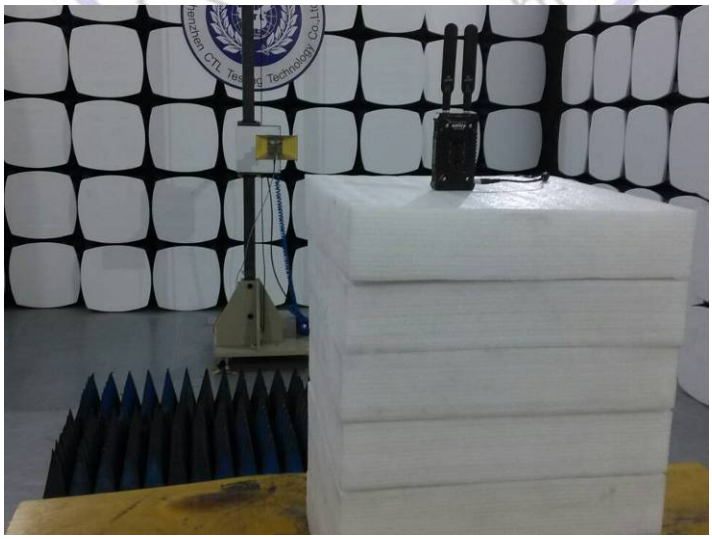
ANTENNA CONNECTED CONSTRUCTION

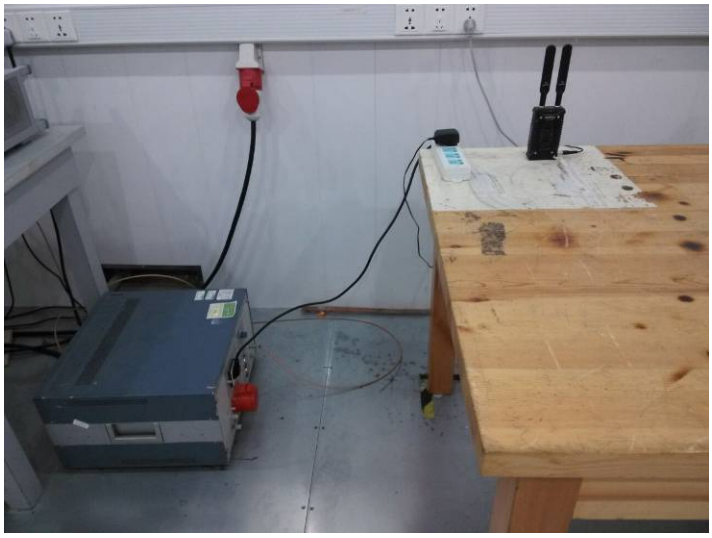
The directional gains of antenna used for transmitting is 2.5 dBi, and the antenna connector is a non-standard and inverse spiral interface. Please see photo for details.

5. Test Setup Photos of the EUT





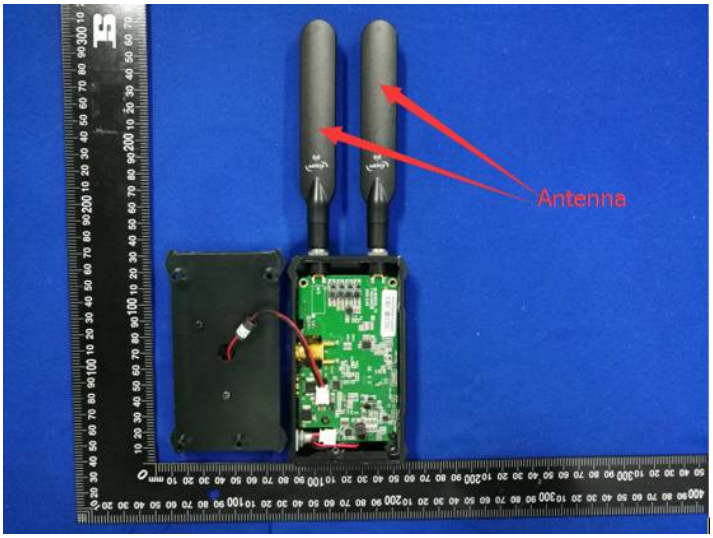


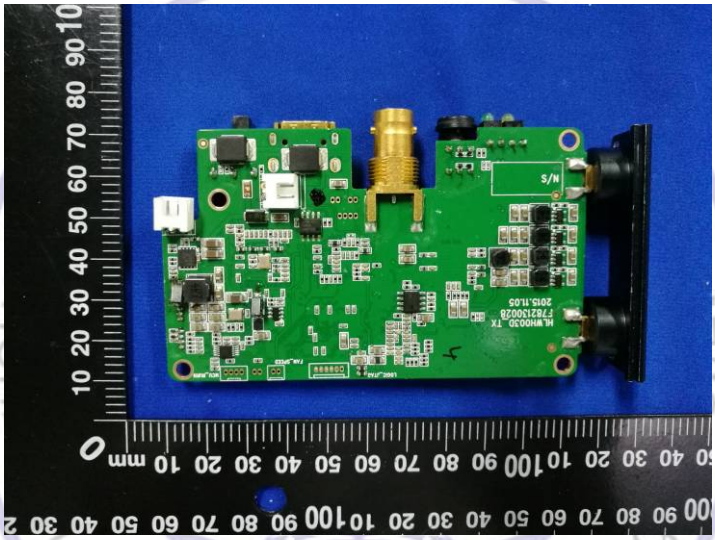


6. External and Internal Photos of the EUT

External Photos of EUT

Internal Photos of EUT





.....End of Report.....