Shenzhen CTL Testing Technology Co., Ltd.
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TEST REPORT

Report Reference No.....:	**CTL1603040557-WF02**
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.....:	Apr. 06, 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.....:	**Guangxi Jiaway Technology Corporation Limited**
Address .....:	Building 5, China-Asean Enterprise headquarters, base(Phase 2), No.3 of Headquarters road, Nanning, 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 .....:	mini projector
FCC ID……..:	2AF6A-S6000
Trade Mark .....:	N/A
Model/Type reference .....:	S6000, i70, i120, AN300, S5000, S7000, H3000, Q20, A160, A162
Modulation .....:	OFDM
Work Frequency Range .....:	802.11a/n(20MHz): 5180MHz-5240MHz ; 5745MHz-5825MHz
Antenna Type .....:	internal
Antenna Gain.....:	0 dBi for 5180MHz-5240MHz ; 5745MHz-5825MHz
Result .....:	**Pass**

TEST REPORT

Test Report No. :	CTL1603040557-WF02	Apr. 06, 2016 Date of issue

Equipment under Test	:	mini projector
Model /Type	:	S6000
Listed Models	:	i70, i120, AN300, S5000, S7000, H3000, Q20, A160, A162
Difference Description	:	Only the color and model's name is different.
Applicant	:	**Guangxi Jiaway Technology Corporation Limited**
Address	:	Building 5, China-Asean Enterprise headquarters, base(Phase 2), No.3 of Headquarters road, Nanning, China
Manufacturer	:	**Guangxi Jiaway Technology Corporation Limited**
Address	:	Building 5, China-Asean Enterprise headquarters, base(Phase 2), No.3 of Headquarters road, Nanning, 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: American National Standard for Testing Unlicensed Wireless Devices.

ANSI C63.4-2014

2. SUMMARY

2.1. General Remarks

Date of receipt of test sample	:	Mar. 19, 2016
Testing commenced on	:	Mar. 19, 2016
Testing concluded on	:	Apr. 06, 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 3.7V from battery

Channel list:

IEEE 802.11a/n(HT20)

Channel	Frequency(MHz)
36	5180
38	5190
40	5200
42	5210
44	5220
46	5230
48	5240
149	5745
151	5755
153	5765
155	5775
157	5785
159	5795
161	5805
165	5825

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

mini projector, support 802.11a/n.

For more details, refer to the user's manual of the EUT.

Serial number: Prototype

2.4. EUT operation mode

Test Mode:

Test program used to control the EUT for staying in continuous transmitting mode is programmed.
Below Channels with highest data rate are chosen for full testing.

Test Mode(TM)	Description	Remark
1	Transmitting	802.11 a 5180MHz, 5200MHz, 5240MHz
2	Transmitting	802.11 a 5745MHz, 5785MHz, 5825MHz
3	Transmitting	802.11 n 5180MHz, 5200MHz, 5240MHz
4	Transmitting	802.11 n 5745MHz, 5785MHz, 5825MHz

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 : Guangxi Jiaway Technology Corporation Limited
Model No. : YNQX12L050200CU

2.6. NOTE

The EUT is a Mini projector,The functions of the EUT listed as below:

	Test Standards	Reference Report
WLAN 802.11a/b/g, 802.11n	FCC Part 15 Subpart C (Section15.247) FCC Part 15 Subpart E (Section15.407)	CTL1603040557-WF01 CTL1603040557-WF02
	FCC Per 47 CFR 2.1091(b)	CTL1603040557-WM

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

This submittal(s) (test report) is intended for FCCID: 2AF6A-S6000 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.

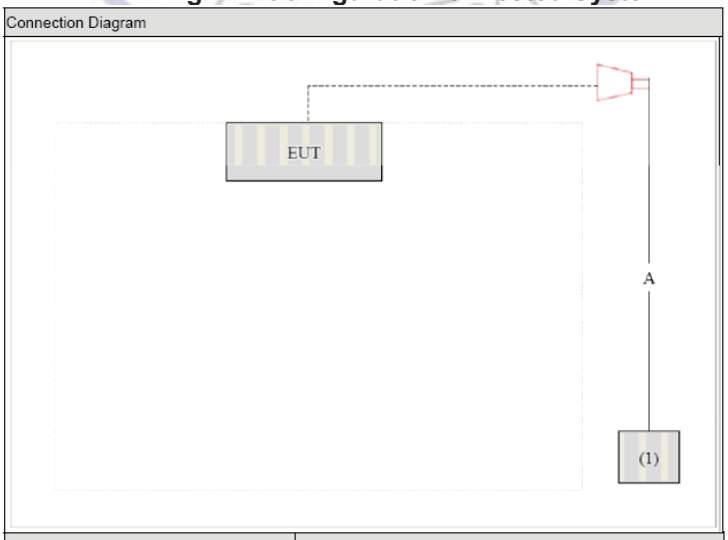
3.3. Environmental conditions

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
4	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	2015/06/02	2016/06/01
EMI Test Receiver	R&S	ESCI	103710	2015/06/02	2016/06/01
Spectrum Analyzer	Agilent	E4407B	MY41440676	2015/05/21	2016/05/20
Controller	EM Electronics	Controller EM 1000	N/A	2015/05/21	2016/05/20
Horn Antenna	Sunol Sciences Corp.	DRH-118	A062013	2015/05/19	2016/05/18
Active Loop Antenna	Daze	ZN30900A	N/A	2015/05/19	2016/05/18
LISN	R&S	ENV216	3560.6550.12	2015/06/02	2016/06/01
LISN	R&S	ESH2-Z5	860014/010	2015/06/02	2016/06/01
ISN	FCC	F-071115-1057-1-09	11229	2015/05/19	2016/05/18
Amplifier	Agilent	8349B	3008A02306	2015/05/19	2016/05/18
Amplifier	Agilent	8447D	2944A10176	2015/05/19	2016/05/18
Transient Limiter	SCHWARZCECK	VTSD 9561F	9666	2015/06/02	2016/06/01
Radio Communication Tester	R&S	CMU200	115419	2015/05/22	2016/05/21
Temperature/Humidity Meter	Gangxing	CTH-608	02	2015/05/20	2016/05/19
SIGNAL GENERATOR	Agilent	E4421B	US40051744	2015/05/20	2016/05/19
Power Meter	Agilent	U2531A	TW53323507	2015/05/21	2016/05/20
Power Sensor	Agilent	U2021XA	MY5365004	2015/05/21	2016/05/20
Climate Chamber	ESPEC	EL-10KA	A20120523	2015/05/20	2016/05/19
High-Pass Filter	K&L	9SH10-2700/X12750-O/O	N/A	2015/05/20	2016/05/19
High-Pass Filter	K&L	41H10-1375/U12750-O/O	N/A	2015/05/20	2016/05/19
RF Cable	HUBER+SUHNER	RG214	N/A	2015/05/20	2016/05/19

3.8. Summary of Test Result

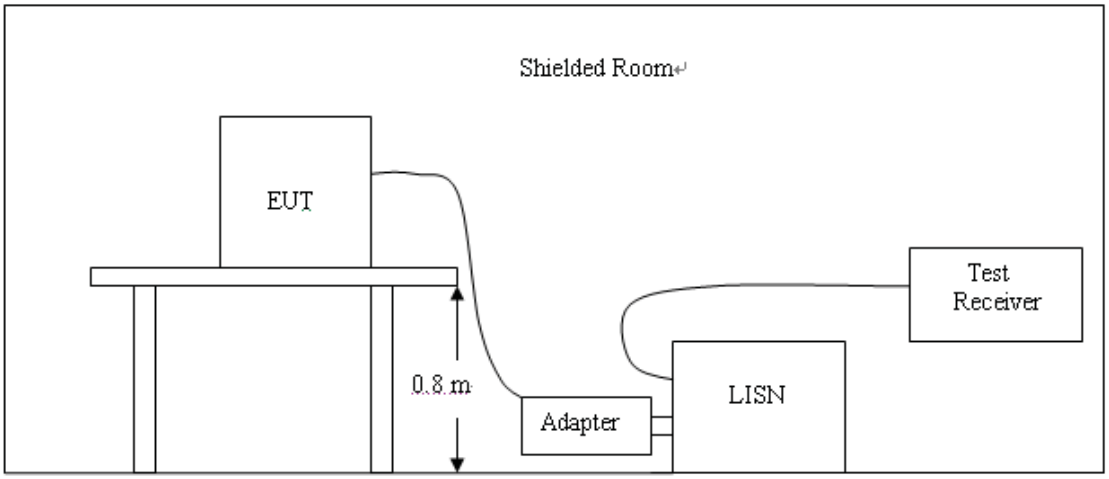
FCC PART 15		
FCC Part 15.207	AC Power Conducted Emission	PASS
FCC Part 15.407(e)	6dB Bandwidth	PASS
FCC Part 15.407 (a)	26dB Bandwidth and 99% Occupid Bandwidth	PASS
FCC Part 15.407 (a)	Maximum Conducted Output Power	PASS
FCC Part 15.407 (a)	Power Spectral Density	PASS
FCC Part 15.109/ 15.205/ 15.209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

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

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

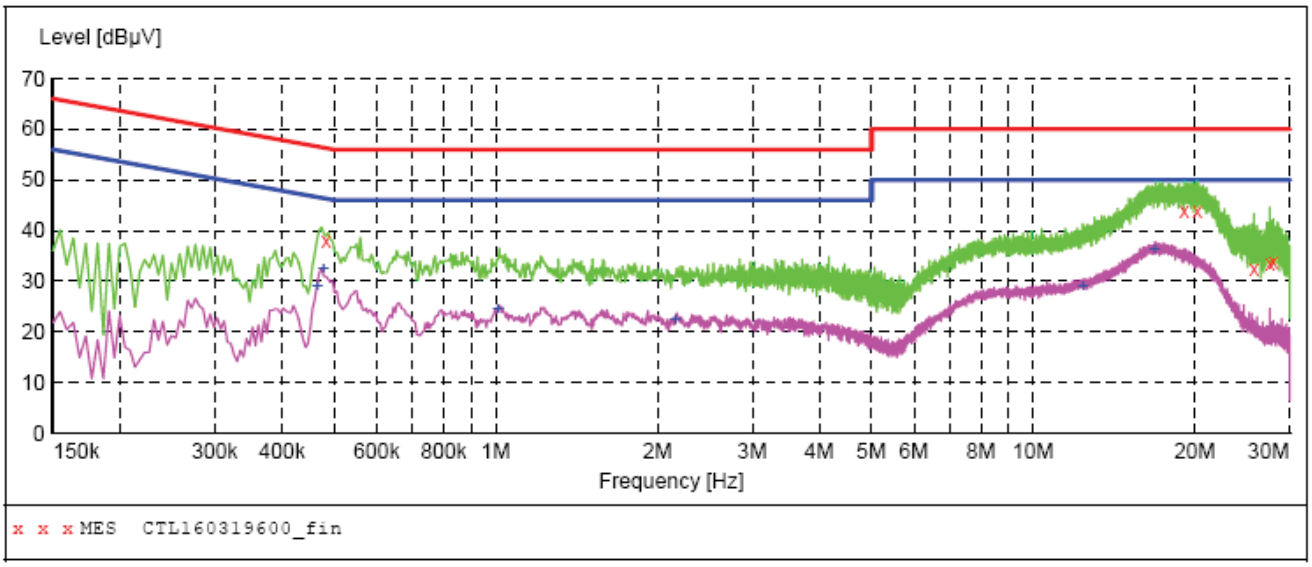
For intentional device, according to §15.207(a) Line Conducted Emission Limit is same as above table.

1. Please follow the guidelines in ANSI C63.4-2014.
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

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

Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "CTL160319600_fin"

3/19/2016 11:14AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.483001	37.90	10.2	56	18.4	QP	L1	GND
19.090501	44.00	10.9	60	16.0	QP	L1	GND
20.179501	43.90	11.0	60	16.1	QP	L1	GND
25.759501	32.40	11.1	60	27.6	QP	L1	GND
27.532501	33.50	11.2	60	26.5	QP	L1	GND
27.973501	33.70	11.2	60	26.3	QP	L1	GND

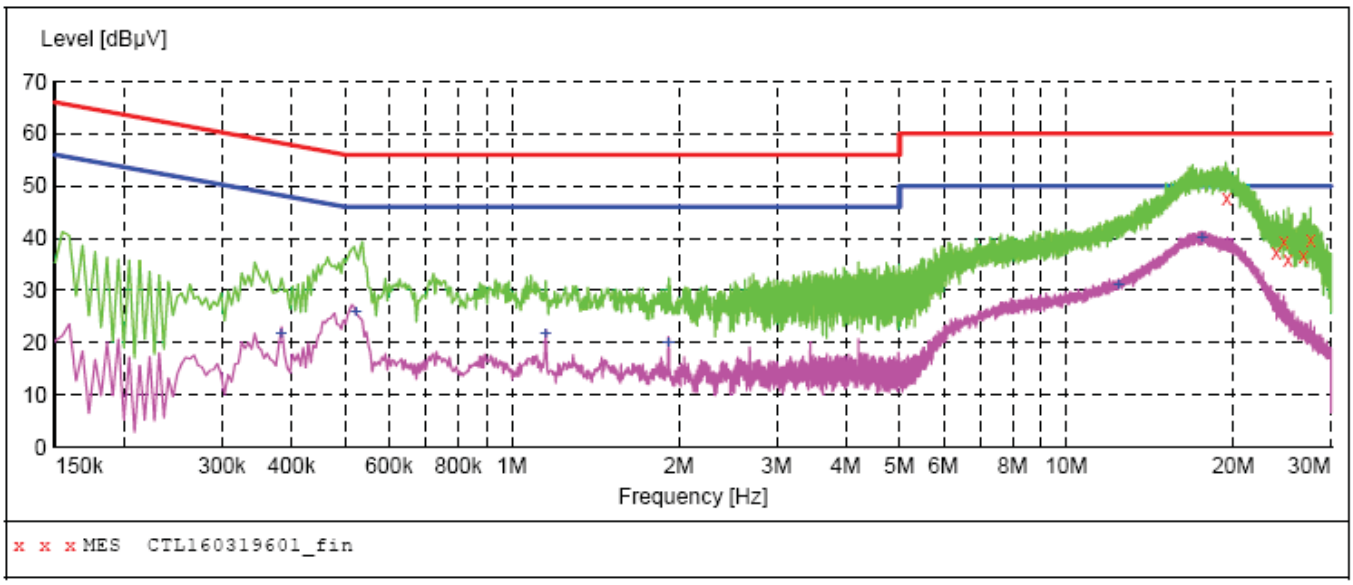
MEASUREMENT RESULT: "CTL160319600_fin2"

3/19/2016 11:14AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.465001	29.00	10.2	47	17.6	AV	L1	GND
0.478501	32.30	10.2	46	14.1	AV	L1	GND
1.009501	24.30	10.3	46	21.7	AV	L1	GND
2.161501	22.30	10.4	46	23.7	AV	L1	GND
12.394501	29.10	10.6	50	20.9	AV	L1	GND
16.854001	36.10	10.8	50	13.9	AV	L1	GND

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

Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "CTL160319601_fin"

3/19/2016 11:17AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
19.428001	47.80	10.9	60	12.2	QP	N	GND
23.856001	37.30	11.1	60	22.7	QP	N	GND
24.639001	39.40	11.1	60	20.6	QP	N	GND
25.057501	35.80	11.1	60	24.2	QP	N	GND
26.718001	36.50	11.2	60	23.5	QP	N	GND
27.550501	39.70	11.2	60	20.3	QP	N	GND

MEASUREMENT RESULT: "CTL160319601_fin2"

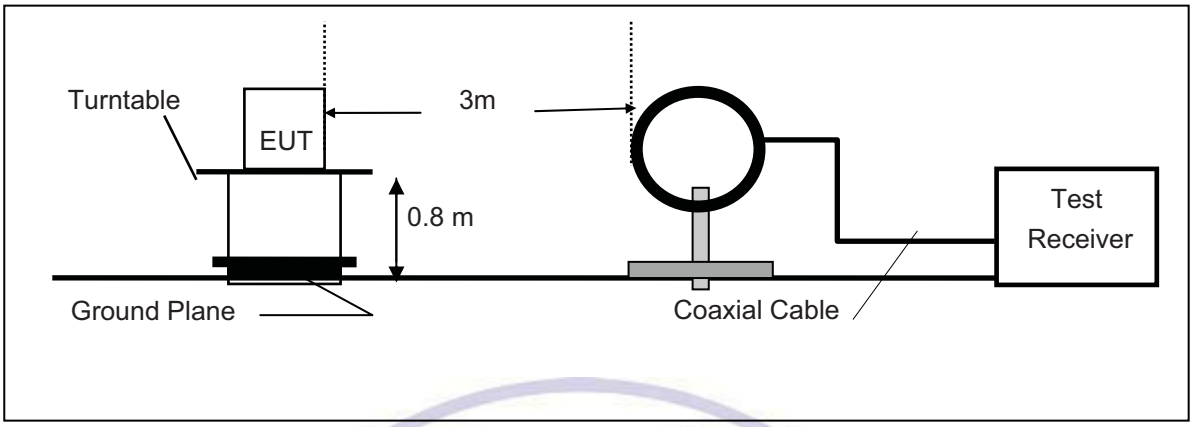
3/19/2016 11:17AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line	PE
0.384001	21.70	10.2	48	26.5	AV	N	GND
0.523501	25.80	10.2	46	20.2	AV	N	GND
1.149001	21.80	10.3	46	24.2	AV	N	GND
1.914001	20.10	10.3	46	25.9	AV	N	GND
12.426001	31.00	10.6	50	19.0	AV	N	GND
17.578501	39.90	10.8	50	10.1	AV	N	GND

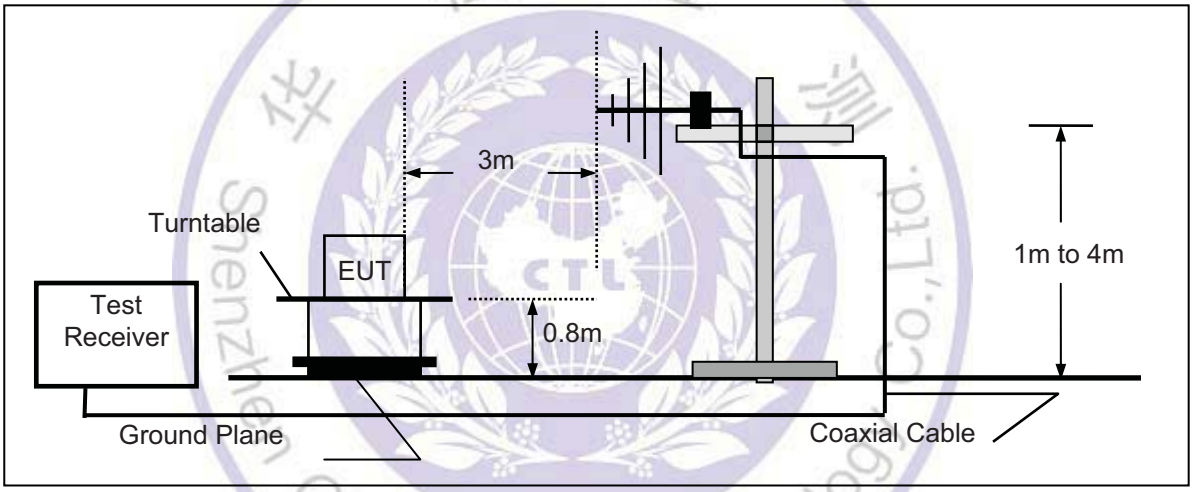
4.2. Radiated Emission and bandedge Test

TEST CONFIGURATION

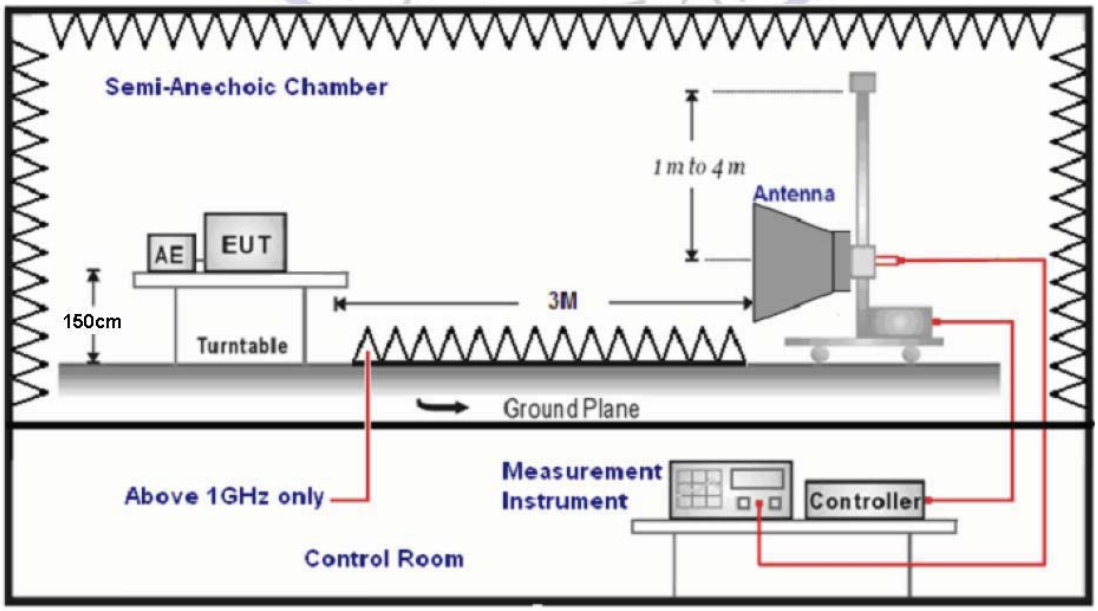
(A) Radiated Emission Test Set-Up, Frequency Below 30MHz



(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 25GHz per FCC PART 15.33(a).

Note:

Three axes are chosen for pretest, the X axis is the worst mode for final test.

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

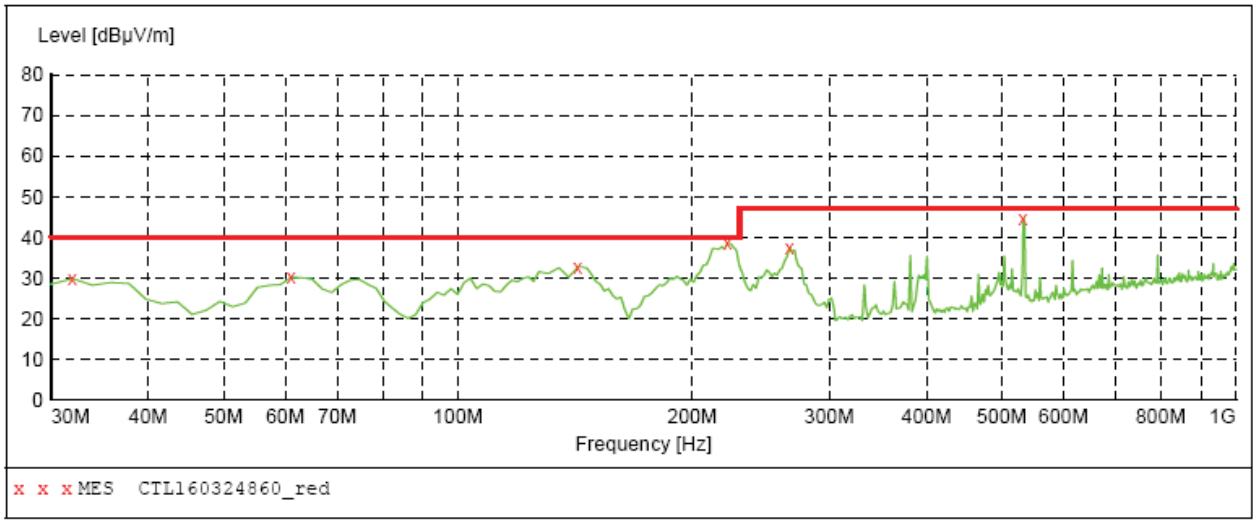
Note: The amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.

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



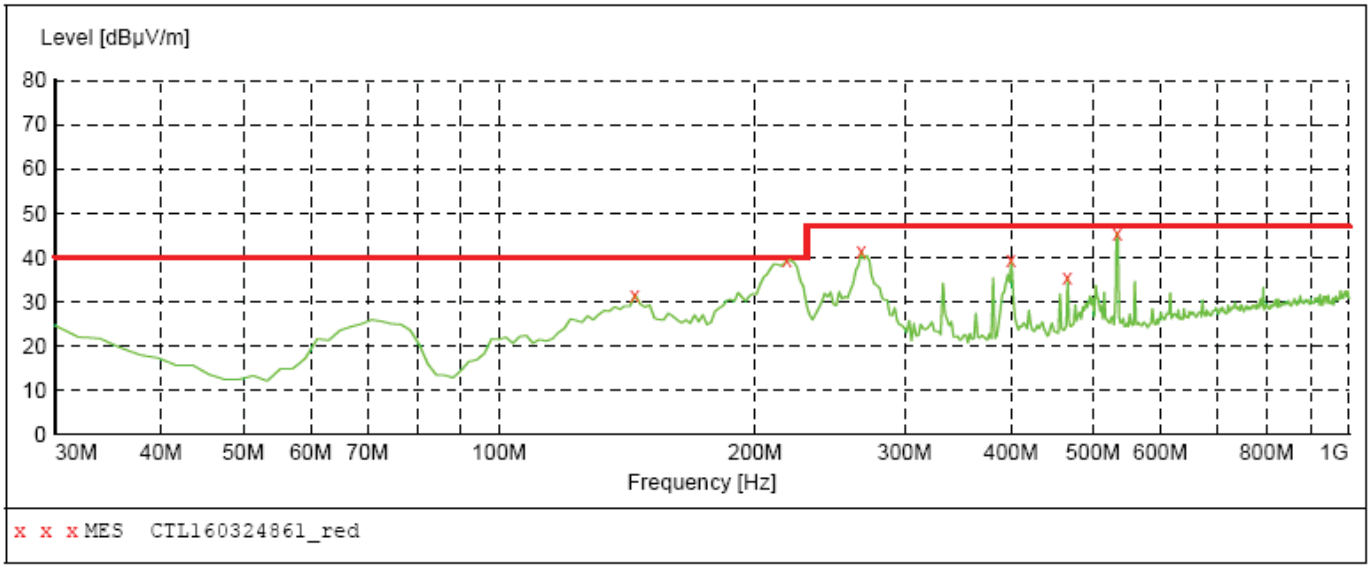
MEASUREMENT RESULT: "CTL160324860_red"

3/24/2016 9:07PM

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
31.940000	29.80	19.2	40.0	10.2	---	0.0	0.00	VERTICAL
61.040000	30.10	8.1	40.0	9.9	---	0.0	0.00	VERTICAL
142.520000	32.70	14.2	40.0	7.3	---	0.0	0.00	VERTICAL
222.060000	38.60	13.9	40.0	1.4	---	0.0	0.00	VERTICAL
266.680000	37.50	14.9	47.0	9.5	---	0.0	0.00	VERTICAL
532.460000	44.60	20.5	47.0	2.4	---	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: "CTL160324861_red"

3/24/2016 9:11PM

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
144.460000	31.60	14.1	40.0	8.4	---	0.0	0.00	HORIZONTAL
218.180000	39.30	13.9	40.0	0.7	---	0.0	0.00	HORIZONTAL
266.680000	41.40	14.9	47.0	5.6	---	0.0	0.00	HORIZONTAL
400.540000	39.50	17.9	47.0	7.5	---	0.0	0.00	HORIZONTAL
466.500000	35.50	19.6	47.0	11.5	---	0.0	0.00	HORIZONTAL
534.400000	45.60	20.5	47.0	1.4	---	0.0	0.00	HORIZONTAL

Above 1GHz:
802.11a

CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
36	V	5180	85.8	24.8	110.6	Fundamental	/	PK
	V	1600	20.6	22.1	42.7	54(note3)	11.3	PK
	V	5150	41.5	24.2	65.7	68.2	2.5	PK
	V	5150	25.4	24.2	49.6	54	4.4	AV
	V	10360	34.9	32.2	67.1	68.2	1.1	PK
	V	10360	17.3	32.2	49.5	54	4.5	AV
	V	15540	33.3	33.5	66.8	68.2	1.4	PK
	V	15540	14.8	33.5	48.3	54	5.7	AV
40	V	5200	85.1	24.2	109.3	Fundamental	/	PK
	V	1600	22.1	22.1	44.2	54(note3)	9.8	PK
	V	10400	34.4	32.5	66.9	68.2	1.3	PK
	V	10400	15.9	32.5	48.4	54	5.6	AV
	V	15600	33.7	33.7	67.4	68.2	0.8	PK
	V	15600	14.1	33.7	47.8	54	6.2	AV
48	V	5240	85.9	24.9	110.8	Fundamental	/	PK
	V	1600	22.4	22.1	44.5	54(note3)	9.5	PK
	V	5250	41.0	25.3	66.3	68.2	1.9	PK
	V	5250	25.1	25.3	50.4	54	3.6	AV
	V	5350	40.6	25.8	66.4	68.2	1.8	PK
	V	5350	23.5	25.8	49.3	54	4.7	AV
	V	10480	36.3	30.2	66.5	68.2	1.7	PK
	V	10480	18.4	30.2	48.6	54	5.4	AV
	V	15720	33.9	33.3	67.2	68.2	1.0	PK
	V	15720	15.3	33.3	48.6	54	5.4	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.
4.Both vertical and Horizontal have been tested, only the worst test data was recorded.
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
149	V	5745	88.9	24.9	113.8	Fundamental	/	PK
	V	1600	23.5	22.1	45.6	54(note3)	8.4	PK
	V	5715	42.2	25.1	67.3	68.2	0.9	PK
	V	5715	23.0	25.1	48.1	54	5.9	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	35.7	30.2	65.9	68.2	2.3	PK
	V	11490	18.5	30.2	48.7	54	5.3	AV
	V	17235	31.2	34.3	65.5	68.2	2.7	PK
	V	17235	13.5	34.3	47.8	54	6.2	AV
157	V	5785	87.9	24.9	112.8	Fundamental	/	PK
	V	1600	20.4	22.1	42.5	54(note3)	11.5	PK
	V	11570	37.3	30.3	67.6	68.2	0.6	PK
	V	11570	18.9	30.3	49.2	54	4.8	AV
	V	17355	33.5	34.3	67.8	68.2	0.4	PK
	V	17355	10.9	34.3	45.2	54	8.8	AV
169	V	5825	87.7	24.9	112.6	Fundamental	/	PK
	V	1600	18.5	22.1	40.6	54(note3)	13.4	PK
	V	5850	40.9	25.2	66.1	78.2	12.1	PK
	V	5850	19.1	25.2	44.3	54	9.7	AV
	V	5860	39.2	25.5	64.7	68.2	3.5	PK
	V	5860	19.9	25.5	45.4	54	8.6	AV
	V	11650	35.3	32.5	67.8	68.2	0.4	PK
	V	11650	14.0	32.5	46.5	54	7.5	AV
	V	17457	30.8	35.1	65.9	68.2	2.3	PK
	V	17457	13.4	35.1	48.5	54	5.5	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.
4.Both vertical and Horizontal have been tested, only the worst test data was recorded.
Remark: RBW 1MHz VBW 3MHz peak detector for PK value, RMS detector for AV value

802.11n(HT20)

CH	Antenna	Frequency (MHz)	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
36	V	5180	84.4	24.8	109.2	Fundamental	/	PK
	V	1600	21.5	22.1	43.6	54(note3)	10.4	PK
	V	5150	41.5	24.2	65.7	68.2	2.5	PK
	V	5150	23.9	24.2	48.1	54	5.9	AV
	V	10360	34.2	32.2	66.4	68.2	1.8	PK
	V	10360	17.5	32.2	49.7	54	4.3	AV
	V	15540	32.7	33.5	66.2	68.2	2.0	PK
	V	15540	15.2	33.5	48.7	54	5.3	AV
40	V	5200	84.6	24.2	108.8	Fundamental	/	PK
	V	1600	23.6	22.1	45.7	54(note3)	8.3	PK
	V	10400	34.5	32.5	67.0	68.2	1.2	PK
	V	10400	15.6	32.5	48.1	54	5.9	AV
	V	15600	32.0	33.7	65.7	68.2	2.5	PK
	V	15600	12.6	33.7	46.3	54	7.7	AV
48	V	5240	84.6	24.9	109.5	Fundamental	/	PK
	V	1600	18.6	22.1	40.7	54(note3)	13.3	PK
	V	5250	40.1	25.3	65.4	68.2	2.8	PK
	V	5250	24.3	25.3	49.6	54	4.4	AV
	V	5350	39.3	25.8	65.1	68.2	3.1	PK
	V	5350	24.0	25.8	49.8	54	4.2	AV
	V	10480	36.0	30.2	66.2	68.2	2.0	PK
	V	10480	17.6	30.2	47.8	54	6.2	AV
	V	15720	33.2	33.3	66.5	68.2	1.7	PK
	V	15720	12.4	33.3	45.7	54	8.3	AV

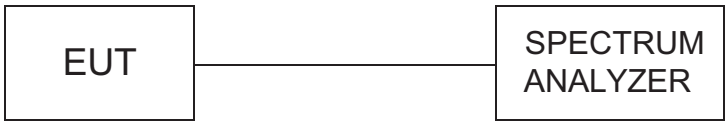
Note: 1. Measure Level = Reading Level + Factor.
2. The test results which are attenuated more than 20 dB below the permissible value limit (the test frequency range: 9kHz~30MHz, 18GHz~40GHz), therefore no data appear in the report.
3. This limit applies for using average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.
4.Both vertical and Horizontal have been tested, only the worst test data was recorded.
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
149	V	5745	87.5	24.9	112.4	Fundamental	/	PK
	V	1600	19.6	22.1	41.7	54(note3)	12.3	PK
	V	5715	42.0	25.1	67.1	68.2	1.1	PK
	V	5715	24.5	25.1	49.6	54	4.4	AV
	V	5725	42.8	25.7	68.5	78.2	9.7	PK
	V	5725	21.4	25.7	47.1	54	6.9	AV
	V	11490	34.5	30.2	64.7	68.2	3.5	PK
	V	11490	18.1	30.2	48.3	54	5.7	AV
	V	17235	32.5	34.3	66.8	68.2	1.4	PK
	V	17235	13.3	34.3	47.6	54	6.4	AV
157	V	5785	88.1	24.9	113.0	Fundamental	/	PK
	V	1600	20.8	22.1	42.9	54(note3)	11.1	PK
	V	11570	35.5	30.3	65.8	68.2	2.4	PK
	V	11570	18.3	30.3	48.6	54	5.4	AV
	V	17355	32.1	34.3	66.4	68.2	1.8	PK
	V	17355	11.8	34.3	46.1	54	7.9	AV
169	V	5825	87.2	24.9	112.1	Fundamental	/	PK
	V	1600	21.4	22.1	43.5	54(note3)	10.5	PK
	V	5850	41.1	25.2	66.3	78.2	11.9	PK
	V	5850	21.9	25.2	47.1	54	6.9	AV
	V	5860	38.3	25.5	63.8	68.2	4.4	PK
	V	5860	19.9	25.5	45.4	54	8.6	AV
	V	11650	33.1	32.5	65.6	68.2	2.6	PK
	V	11650	13.6	32.5	46.1	54	7.9	AV
	V	17457	30.3	35.1	65.4	68.2	2.8	PK
	V	17457	13.4	35.1	48.5	54	5.5	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.
4.Both vertical and Horizontal have been tested, only the worst test data was recorded.
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

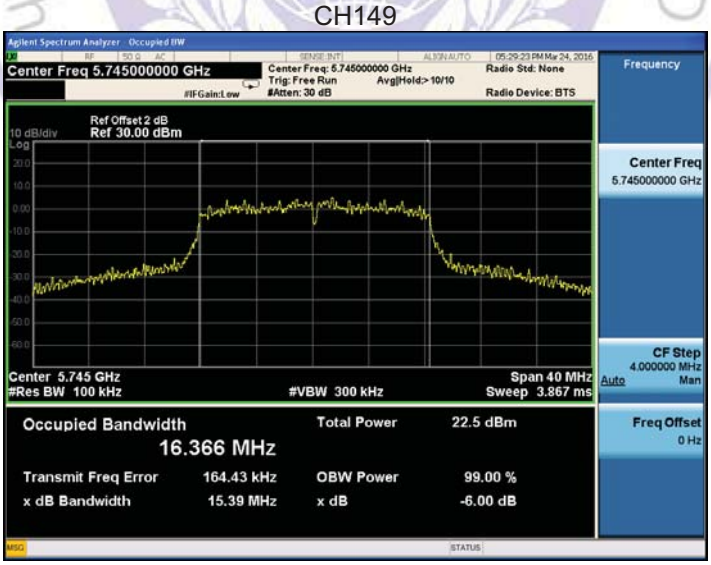
Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

TEST RESULTS

802.11a

CHANNEL	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
149	15.39	0.5	PASS
157	15.10	0.5	PASS
165	15.13	0.5	PASS

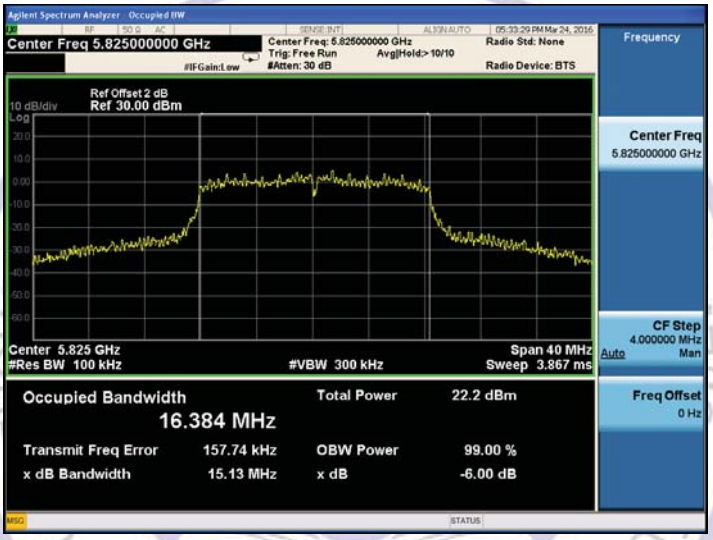
CH149



CH157


Agilent Spectrum Analyzer - Occupied BW
x dB -6.00 dB
Center Freq: 5.785000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 30 dB
Radio Std: None
Radio Device: BTS
Trace/Detector
Ref Offset 2 dB
10 dB/div
Ref 30.00 dBm
Log
Clear Write
Average
Max Hold
Min Hold
Center 5.785 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 40 MHz
Sweep 3.867 ms
Occupied Bandwidth
16.382 MHz
Total Power
22.4 dBm
Transmit Freq Error
157.87 kHz
OBW Power
99.00 %
x dB Bandwidth
15.10 MHz
x dB
-6.00 dB
Detector
Peak
Auto
Man

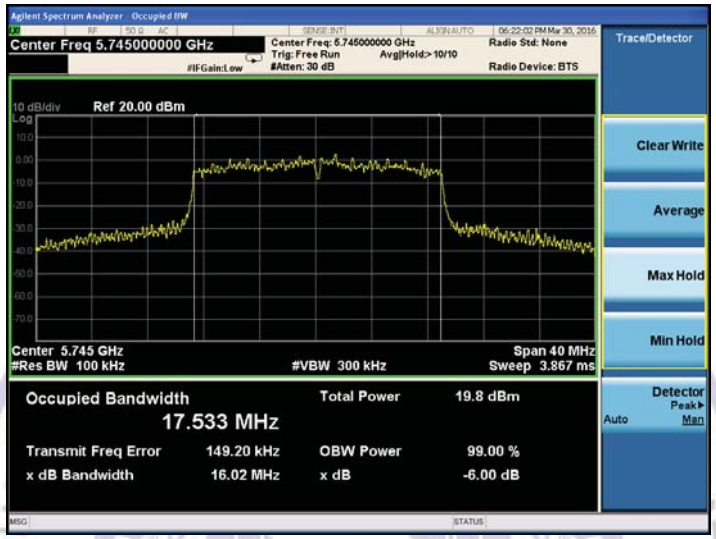
CH165


Agilent Spectrum Analyzer - Occupied BW
Center Freq 5.825000000 GHz
Center Freq: 5.825000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 30 dB
Radio Std: None
Radio Device: BTS
Frequency
Ref Offset 2 dB
10 dB/div
Ref 30.00 dBm
Log
Center Freq
5.825000000 GHz
CF Step
4.000000 MHz
Auto
Man
Center 5.825 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 40 MHz
Sweep 3.867 ms
Occupied Bandwidth
16.384 MHz
Total Power
22.2 dBm
Transmit Freq Error
157.74 kHz
OBW Power
99.00 %
x dB Bandwidth
15.13 MHz
x dB
-6.00 dB
Freq Offset
0 Hz

802.11n(HT20)

CHANNEL	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
149	16.02	0.5	PASS
157	17.31	0.5	PASS
165	17.53	0.5	PASS

CH149

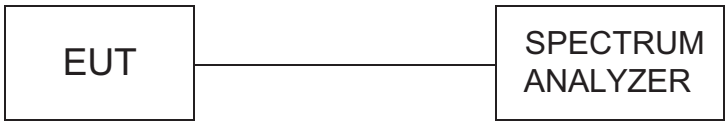


CH157

CH165

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

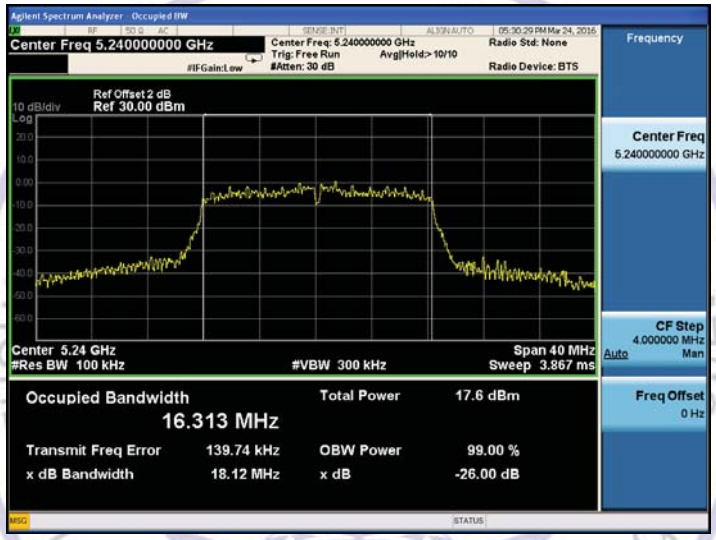
802.11a

Channel	26dB BANDWIDTH (MHz)	99% Occupid Bandwidth (MHz)
36	18.14	16.356
40	18.11	16.347
48	18.12	16.313
149	19.45	16.408
157	18.60	16.377
165	19.81	16.384

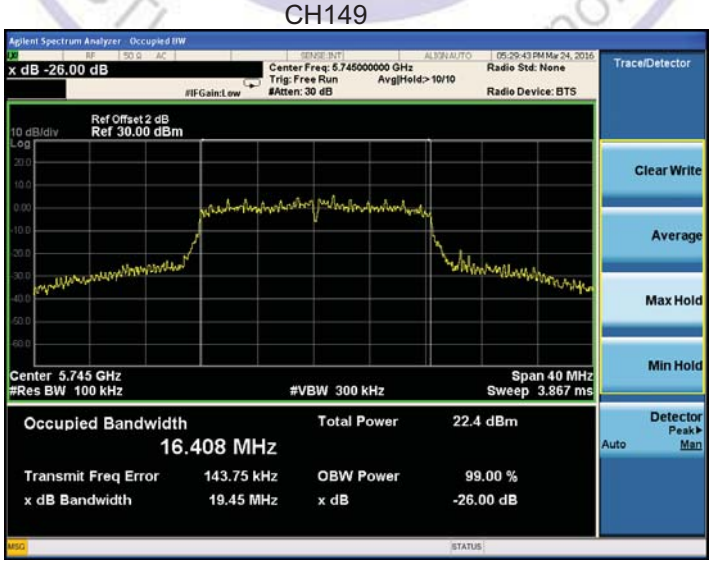
CH36

CH40

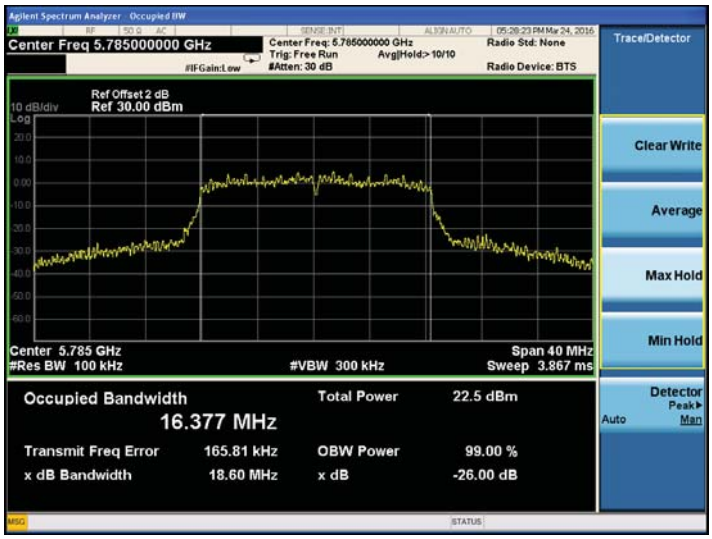
CH48



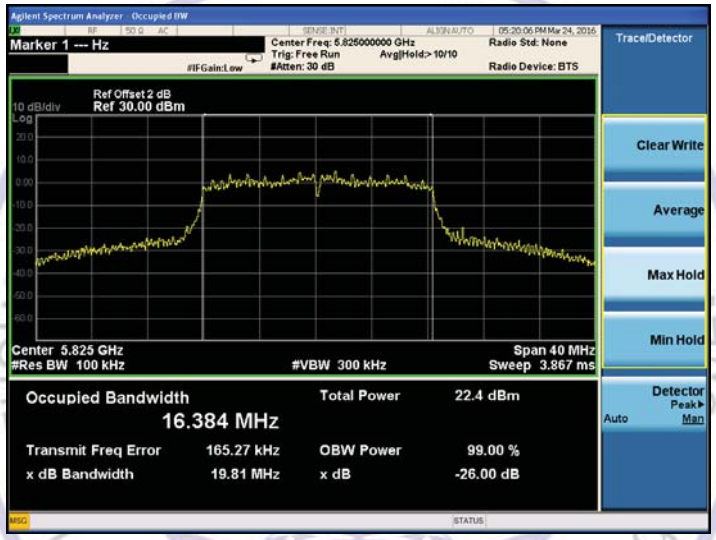
CH149



CH157


Agilent Spectrum Analyzer - Occupied BW
Center Freq 5.785000000 GHz
Center Freq: 5.785000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 30 dB
Radio Std: None
Radio Device: BTS
Trace/Detector
Ref Offset 2 dB
10 dB/div
Ref 30.00 dBm
Log
Clear Write
Average
Max Hold
Min Hold
Center 5.785 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 40 MHz
Sweep 3.867 ms
Occupied Bandwidth
16.377 MHz
Total Power
22.5 dBm
Transmit Freq Error
165.81 kHz
OBW Power
99.00 %
x dB Bandwidth
18.60 MHz
x dB
-26.00 dB
Detector
Peak
Auto
Man
MSG
STATUS

CH165


Agilent Spectrum Analyzer - Occupied BW
Marker 1 --- Hz
Center Freq: 5.825000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 30 dB
Radio Std: None
Radio Device: BTS
Trace/Detector
Ref Offset 2 dB
10 dB/div
Ref 30.00 dBm
Log
Clear Write
Average
Max Hold
Min Hold
Center 5.825 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 40 MHz
Sweep 3.867 ms
Occupied Bandwidth
16.384 MHz
Total Power
22.4 dBm
Transmit Freq Error
165.27 kHz
OBW Power
99.00 %
x dB Bandwidth
19.81 MHz
x dB
-26.00 dB
Detector
Peak
Auto
Man
MSG
STATUS

802.11n(HT20)

Channel	26dB BANDWIDTH (MHz)	99% Occupid Bandwidth (MHz)
36	18.76	17.540
40	18.62	17.529
48	18.52	17.507
149	18.49	17.551
157	18.67	17.534
165	18.66	17.561

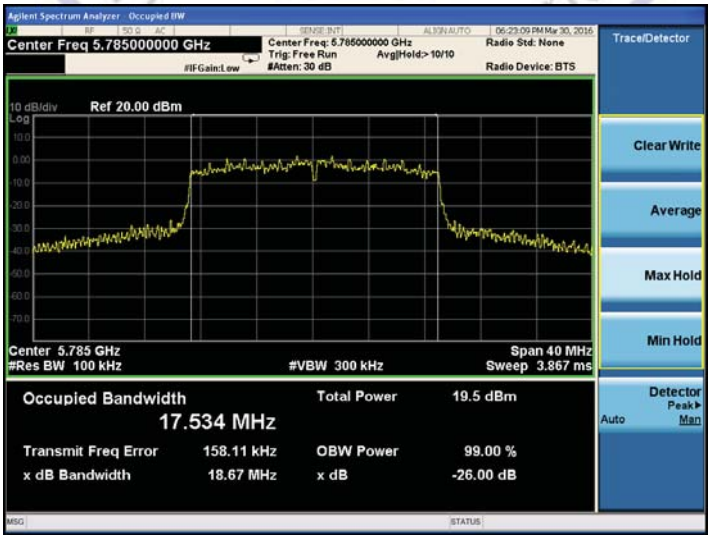
CH36

CH40

CH48

CH149

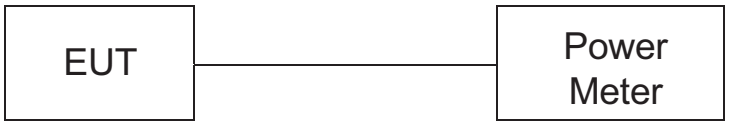
CH157



CH165

4.5. Maximum Peak Output Power

TEST CONFIGURATION



TEST PROCEDURE

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

Use the wideband power meter to test peak power and record the result.

LIMIT

The Peak Output Power Measurement limits are 30dBm.

TEST RESULTS

802.11a

Channel	Peak Power Output (dBm)	Peak Power Limit (dBm)	PASS / FAIL
36	14.86	24	PASS
40	14.71	24	PASS
48	14.80	24	PASS
149	18.02	30	PASS
157	18.17	30	PASS
165	18.15	30	PASS

Note: The test results including the cable lose.

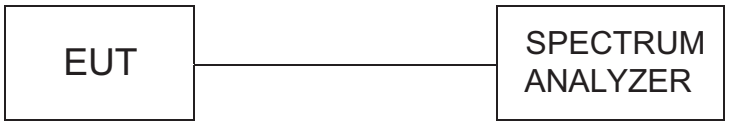
802.11n(HT20)

Channel	Peak Power Output (dBm)	Peak Power Limit (dBm)	PASS / FAIL
36	14.34	24	PASS
40	14.58	24	PASS
48	14.41	24	PASS
149	17.82	30	PASS
157	17.65	30	PASS
165	17.58	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/1MHz. 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

⩽17.00dBm/MHz for Operation in the band I(5150MHz-5250MHz)of device
⩽30.00dBm/500KHz for Operation in the band IV(5725MHz-5850MHz)of device

TEST RESULTS

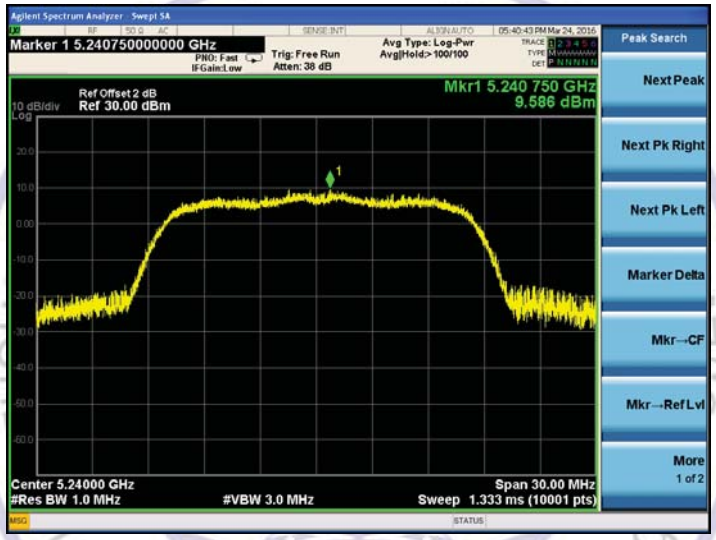
802.11a

Channel	PSD	Maximum limit	PASS / FAIL
36	10.592dBm/MHz	11.00dBm /MHz	PASS
40	10.462dBm/MHz	11.00dBm /MHz	PASS
48	9.586 dBm/MHz	11.00dBm /MHz	PASS
149	10.599dBm/500KHz	30.00dBm/500KHz	PASS
157	10.583dBm/500KHz	30.00dBm/500KHz	PASS
165	11.166dBm/500KHz	30.00dBm/500KHz	PASS

CH36

CH40

CH48



CH149

CH157


Agilent Spectrum Analyzer - Swept SA
Marker 1 5.783905000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 38 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
Ref Offset 2 dB
10 dB/div
Ref 30.00 dBm
Log
Mkr1 5.783 905 GHz
10.583 dBm
Center 5.78500 GHz
#Res BW 510 kHz
#VBW 1.6 MHz
Span 30.00 MHz
Sweep 1.333 ms (10001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

CH165


Agilent Spectrum Analyzer - Swept SA
Marker 1 5.826221000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 38 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
Ref Offset 2 dB
10 dB/div
Ref 30.00 dBm
Log
Mkr1 5.826 221 GHz
11.166 dBm
Center 5.82500 GHz
#Res BW 510 kHz
#VBW 1.6 MHz
Span 30.00 MHz
Sweep 1.333 ms (10001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

802.11n(HT20)

Channel	PSD	Maximum limit	PASS / FAIL
36	8.173dBm/MHz	11.00dBm /MHz	PASS
40	7.930dBm/MHz	11.00dBm /MHz	PASS
48	6.731dBm/MHz	11.00dBm /MHz	PASS
149	9.051dBm/500KHz	30.00dBm/500KHz	PASS
157	8.612dBm/500KHz	30.00dBm/500KHz	PASS
165	9.029dBm/500KHz	30.00dBm/500KHz	PASS

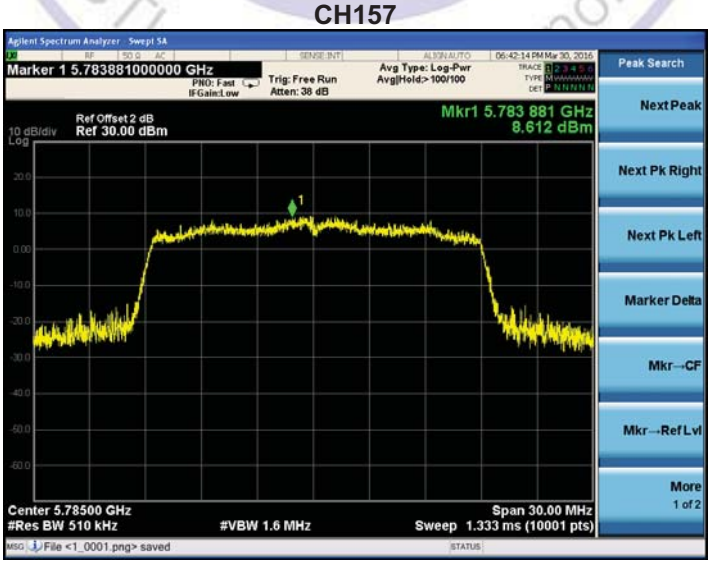
CH36

CH40

CH48

CH149

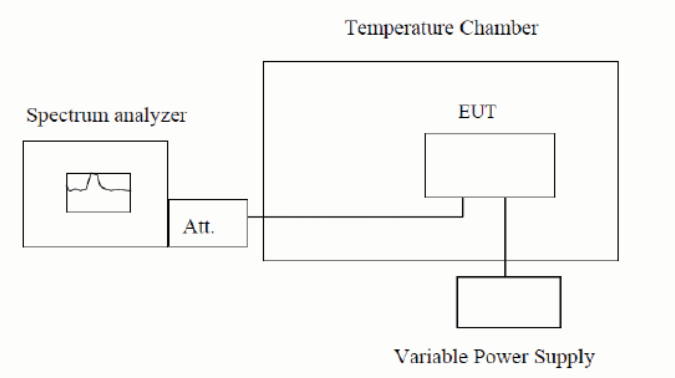
CH157



CH165

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

Measurement Data (the worst channel):

Frequency Stability under Temperature

Temperature Interval (℃)	Test Frequency (MHz)	Test Result (MHz)	Max. Deviation (ppm)
0	5180	5180.013500	2.606
10	5180	5180.012800	2.471
20	5180	5180.010500	2.027
30	5180	5180.014000	2.703
40	5180	5180.013800	2.664

Frequency Stability under Voltage

DC Voltage (V)	Test Frequency (MHz)	Test Result (MHz)	Max. Deviation (ppm)
3.7	5180	5180.010500	2.027
3.145	5180	5180.016100	3.108
4.255	5180	5180.015400	2.973

Frequency Stability under Temperature

Temperature Interval (℃)	Test Frequency (MHz)	Test Result (MHz)	Max. Deviation (ppm)
0	5825	5825.014400	2.47
10	5825	5825.012800	2.20
20	5825	5825.009100	1.56
30	5825	5825.016400	2.82
40	5825	5825.015500	2.66

Frequency Stability under Voltage

DC Voltage (V)	Test Frequency (MHz)	Test Result (MHz)	Max. Deviation (ppm)
3.7	5825	5825.010200	1.75
3.145	5825	5825.017400	2.99
4.255	5825	5825.018900	3.24

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.

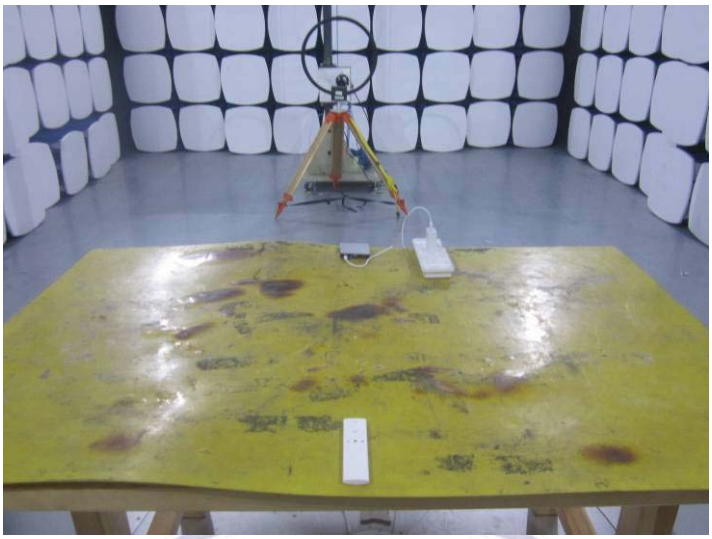
Refer to statement below for compliance.

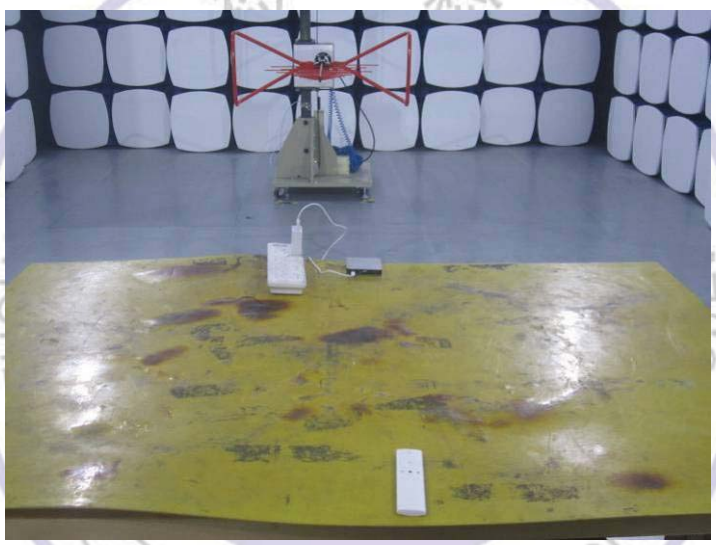
The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. Further, this requirement does not apply to intentional radiators that must be professionally installed.

ANTENNA CONNECTED CONSTRUCTION

The directional gains of antenna used for transmitting is -0.5dBi for 2412MHz~2462MHz and 0 dBi for 5150~5250MHz and 5725MHz~5850MHz, and the antenna connector is a non-standard and inverse spiral interface. Please see photo for details.

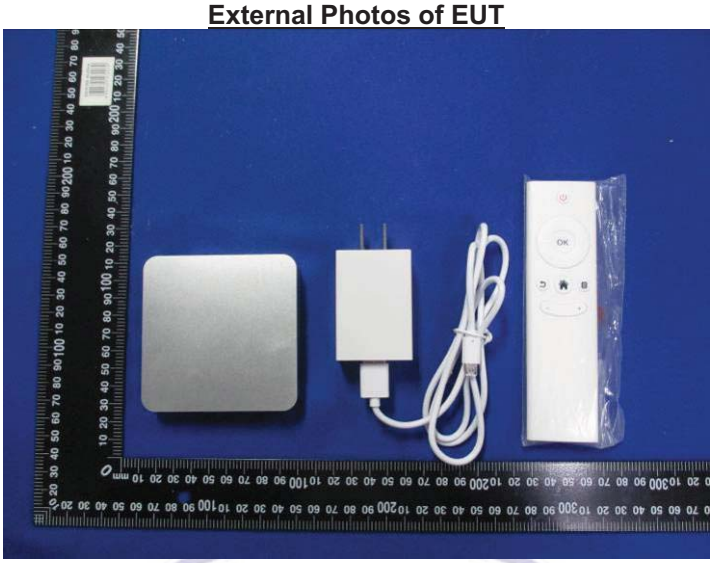
5. Test Setup Photos of the EUT

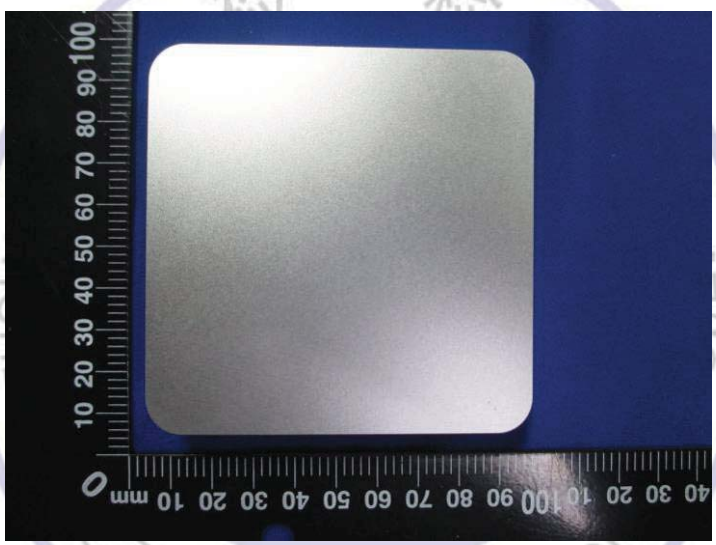




6. External and Internal Photos of the EUT

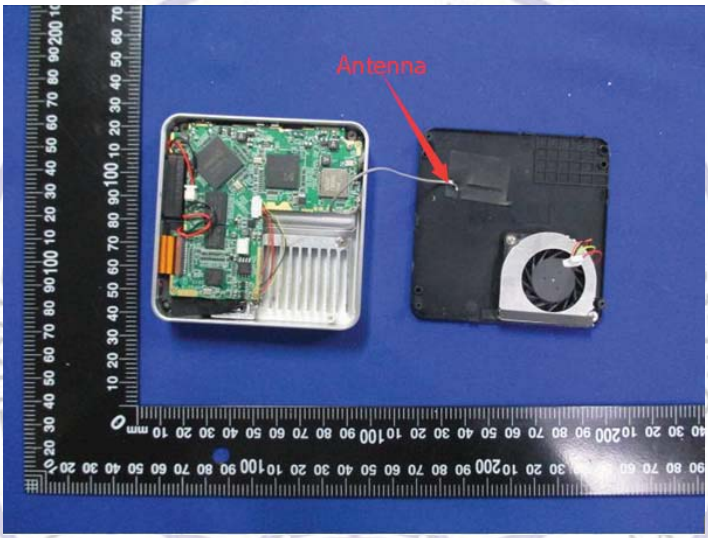
External Photos of EUT

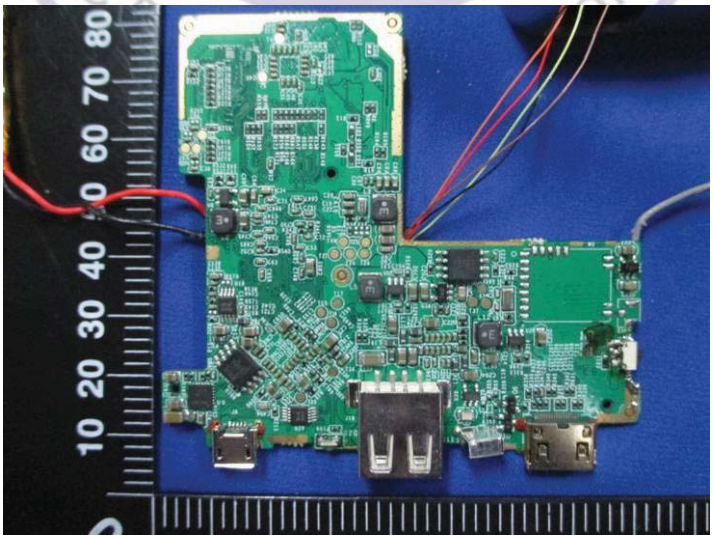


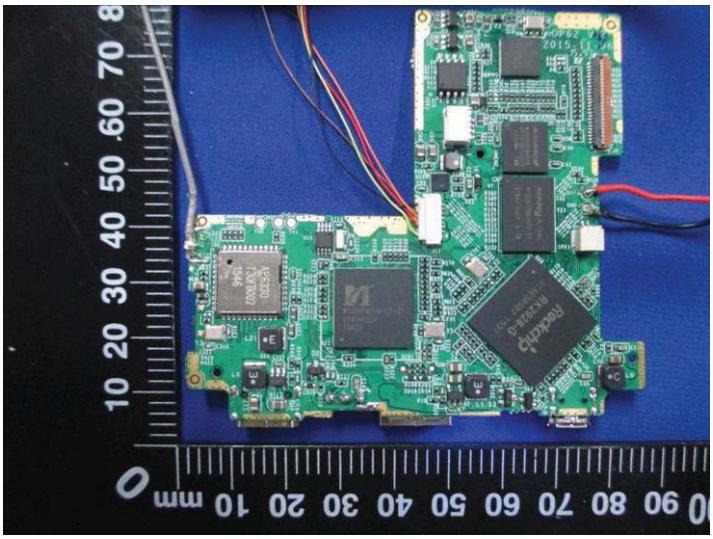


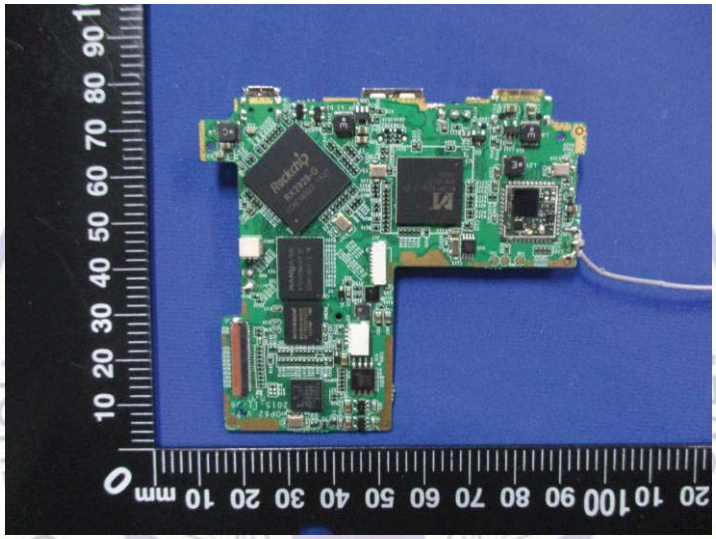

HDMI

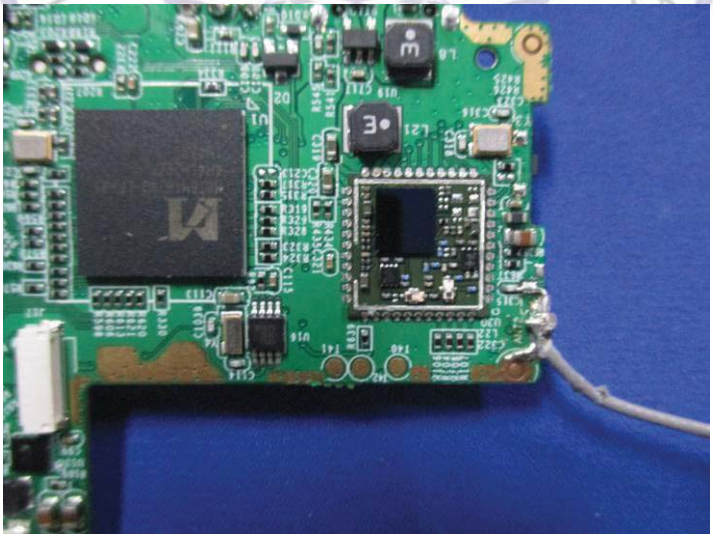
Internal Photos of EUT











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