

TEST REPORT

FCC ID: 2ACMLT201502

Applicant : Condeco Ltd
Address : 8th Floor, Exchange Tower, 2 Harbour Exchange Square, London E14 9GE UK

Equipment under Test (EUT):

Name	:	V2 Touch Screen
Model	:	T201502
Trademark	:	CONDECO

Standards : FCC PART 15, SUBPART C : 2014 (Section 15.247)
ANSI C63.4:2014

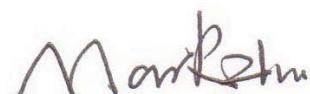
Report No. : C1850317 06

Date of Test : August 04, 2015- August 11, 2015

Date of Issue : August 12, 2015

Test Result :	PASS *
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* In the configuration tested, the EUT complied with the standards specified above
Authorized Signature



(Mark Zhu)
Manager

The manufacturer should ensure that all the products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of Shenzhen Certification Technology Service Co., Ltd. Or test done by Shenzhen Certification Technology Service Co., Ltd. Approvals in connection with, distribution or use of the product described in this report must be approved by Shenzhen Certification Technology Service Co., Ltd. Approvals in writing.

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1 General Information

1.1 Description of Device (EUT)

Trade Name : CONDECO
EUT : V2 Touch Screen

Model No. T201502
DIFF : N/A

Antenna Type : Integrated Antenna, Maximum Gain is 2.95dBi for WLAN

Operation : IEEE 802.11b/g: 2412MHz-2462MHz
Frequency : IEEE 802.11n HT20: 2412MHz-2462MHz
Channel number : EEE 802.11b/g:11Channels
IEEE 802.11n HT20: 11 Channels
IEEE 802.11b: DSSS(CCK,DQPSK,DBPSK)
Modulation type : IEEE 802.11g: OFDM(64QAM, 16QAM, QPSK, BPSK)
IEEE 802.11n :OFDM(64QAM, 16QAM, QPSK, BPSK)
Power Supply : DC 48V from POE or DC 12V from adapter.

Applicant : Condeco Ltd

Address : 8th Floor, Exchange Tower, 2 Harbour Exchange Square, London E14 9GE UK

Manufacturer : NOTE Electronics (Dongguan) Ltd

Address : 6 Lindong Third Road, Lincun Industrial Center, Tangxia, Dongguan 523710, P. R. China

1.2 Description of Test Facility

Shenzhen Certification Technology Service Co., Ltd.
 2F, Building B, East Area of Nanchang Second Industrial Zone,
 Gushu 2nd Road, Bao'an District, Shenzhen 518126, P.R. China
 FCC Registered No.:197647

2 EMC Equipment List

Equipment	Manufacture	Model No.	Serial No.	Last cal.	Cal Interval
3m Semi-Anechoic	ETS-LINDGREN	N/A	SEL0017	2015.01.19	1 Year
Spectrum analyzer	Agilent	E4407B	MY46185649	2015.01.19	1 Year
Receiver	R&S	ESCI	1166.5950K03-1 011	2015.01.19	1 Year
Receiver	R&S	ESCI	101202	2015.01.19	1 Year
Bilog Antenna	Schwarzbeck	VULB 9168	VULB9168-438	2015.01.21	1 Year
Horn Antenna	EMCO	3115	640201028-06	2015.01.21	1 Year
Active Loop Antenna	Beijing Daze	ZN30900A	SEL0097	2015.01.21	1 Year
Cable	Resenberger	N/A	No.1	2015.01.19	1 Year
Cable	SCHWARZBECK	N/A	No.2	2015.01.19	1 Year
Cable	SCHWARZBECK	N/A	No.3	2015.01.19	1 Year
Pre-amplifier	Schwarzbeck	BBV9743	9743-019	2015.01.19	1 Year
Pre-amplifier	R&S	AFS33-18002650 -30-8P-44	SEL0080	2015.01.19	1 Year
Base station	Agilent	E5515C	GB44300243	2015.01.19	1 Year
Temperature controller	Terchy	MHQ	120	2015.01.19	1 Year
Power divider	Anritsu	K240C	020346	2015.01.19	1 Year
Signal Generator	HP	83732B	VS3449051	2015.01.19	1 Year

Power Meter	Anritsu	ML2487A	6K00001491	2015.01.19	1 Year
Power sensor	Anritsu	ML2491A	32516	2015.01.19	1 Year
L.I.S.N.#1	Schwarzbeck	NSLK8126	8126466	2015.01.19	1 Year
L.I.S.N.#2	ROHDE&SCHWARZ	ENV216	101043	2015.01.19	1 Year

3 Test Procedure

POWER LINE CONDUCTED INTERFERENCE: The test procedure used was ANSI Standard ANSI C63.4:2014 using a 50 μ H LISN. Both Lines were observed. The bandwidth of the receiver was 10kHz with an appropriate sweep speed. The ambient temperature of the EUT was 25°C with a humidity of 58%.

RADIATION INTERFERENCE: The test procedure used was ANSI Standard ANSI C63.4:2014 using a ANRITSU spectrum analyzer with a pre-selector. The analyzer was calibrated in dB above a micro volt at the output of the antenna. The resolution bandwidth was 100kHz and the video bandwidth was 300 kHz up to 1 GHz and 1 MHz with a video BW of 3MHz above 1 GHz. The ambient temperature of the EUT was 25°C with a humidity of 58%.

FORMULA OF CONVERSION FACTORS: The Field Strength at 3m was established by adding the meter reading of the spectrum analyzer (which is set to read in units of dBuV) to the antenna correction factor supplied by the antenna manufacturer and cable loss. The antenna correction factors and cable loss are stated in terms of dB. The gain of the Pre-selector was accounted for in the Spectrum Analyzer Meter Reading.

Example:

Freq (MHz) METER READING + ACF + CABLE = FS

33.20 dBuV + 10.36 dB + 0.9 dB = 44.46 dBuV/m @ 3m

ANSI STANDARD ANSI C63.4:2014 10.1.7 MEASUREMENT PROCEDURES: The EUT was placed on a table 80 cm high and with dimensions of 1m by 1.5m. The EUT was placed in the center of the table (1.5m side). The table used for radiated measurements is capable of continuous rotation. When an emission was found, the table was rotated to produce the maximum signal strength. At this point, the antenna was raised and lowered from 1m to 4m. The antenna was placed in both the horizontal and vertical planes. The situation was similar for the conducted measurement except that the table did not rotate. The EUT was setup as described in ANSI Standard ANSI C63.4:2014 10.1.7 with the EUT 40 cm from the vertical ground wall.

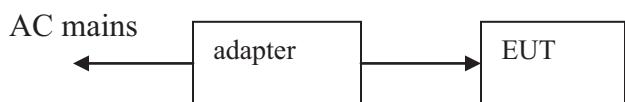
4 Summary of Measurement

4.1 Summary of test result

Test Item	Test Requirement	Standards Paragraph	Result
Spurious Emission	FCC PART 15:2014	Section 15.247	Compliance
Conduction Emission	FCC PART 15:2014	Section 15.207	Compliance
Bandwidth Test	FCC PART 15:2014	Section 15.247	Compliance
Peak Power	FCC PART 15:2014	Section 15.247	Compliance
Power Density	FCC PART 15:2014	Section 15.247	Compliance
Band Edge	FCC PART 15:2014	Section 15.247	Compliance
Antenna Requirement	FCC PART 15:2014	Section 15.203	Compliance

Note: The EUT has been tested as an independent unit. And Continual Transmitting in maximum power (The adapter be used during Test)

4.2 Test connection



4.3 Assistant equipment used for test

Description	:	POE Switch
Manufacturer	:	NET GEAR
Model No.	:	FS116P
FCC DOC approved		

Description	:	POE Switch adapter
Manufacturer	:	NET GEAR
Model No.	:	NU80-6480166-I2
FCC DOC approved		

Description	:	Test PC, Notebook
Manufacturer	:	Dell
Model No.	:	D430
FCC DOC approved		

4.4 Test mode

Dutycycle :100% Keeping TX			
Mode	data rate (Mbps)(see Note)	Channel	Frequency (MHz)
IEEE 802.11b	1	Low :CH1	2412
	1	Middle: CH6	2437
	1	High: CH11	2462
IEEE 802.11g	6	Low :CH1	2412
	6	Middle: CH6	2437
	6	High: CH11	2462
IEEE 802.11 n/HT20 with 2.4G	6.5	Low :CH1	2412
	6.5	Middle: CH6	2437
	6.5	High: CH11	2462
Note: According exploratory test, EUT will have maximum output power in those data rate. so those data rate were used for all test.			

4.5 Channel list

For IEEE 802.11b/g and IEEE 802.11n/HT20 with 2.4G					
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
CH1	2412	CH5	2432	CH9	2452
CH2	2417	CH6	2437	CH10	2457
CH3	2422	CH7	2442	CH11	2462
CH4	2427	CH8	2447		

4.6 Test Conditions

Temperature range	21-25°C
Humidity range	40-75%
Pressure range	86-106kPa

4.7 Measurement Uncertainty (95% confidence levels, k=2)

Item	MU	Remark
Uncertainty for Power point Conducted Emissions Test	2.42dB	
Uncertainty for Radiation Emission test in 3m chamber (below 30MHz)	2.13 dB	Polarize: V
	2.57dB	Polarize: H
Uncertainty for Radiation Emission test in 3m chamber (30MHz to 1GHz)	3.54dB	Polarize: V
	4.1dB	Polarize: H
Uncertainty for Radiation Emission test in 3m chamber (1GHz to 25GHz)	2.08dB	Polarize: H
	2.56dB	Polarize: V
Uncertainty for radio frequency	1×10^{-9}	
Uncertainty for conducted RF Power	0.65dB	
Uncertainty for temperature	0.2 °C	
Uncertainty for humidity	1%	
Uncertainty for DC and low frequency voltages	0.06%	

5 Spurious Emission

5.1 Radiation Emission

5.1.1 Radiation Emission Limits(15.209)

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

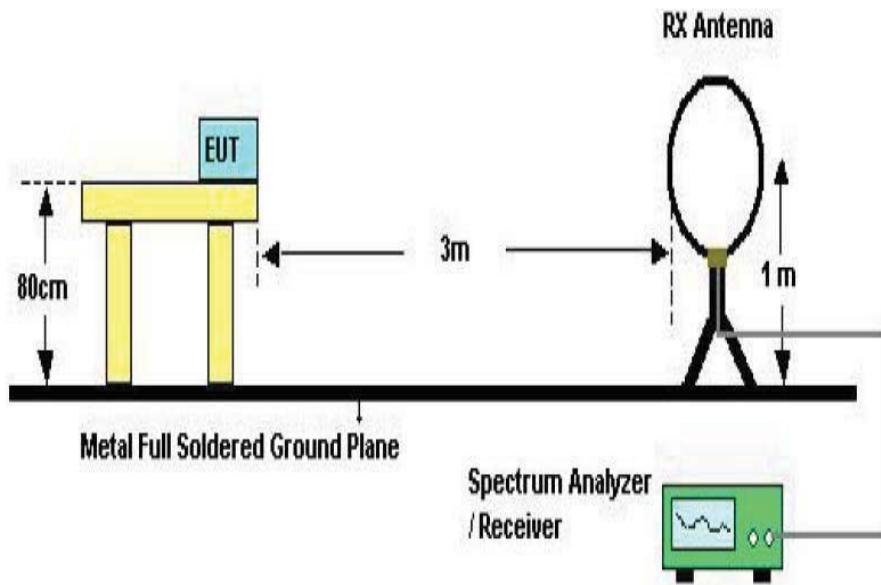
Harmonic emissions limits comply with below 54 dBuV/m at 3m. Other emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or comply with the radiated emissions limits specified in section 15.209(a) limit in the table below has to be followed.

NOTE:

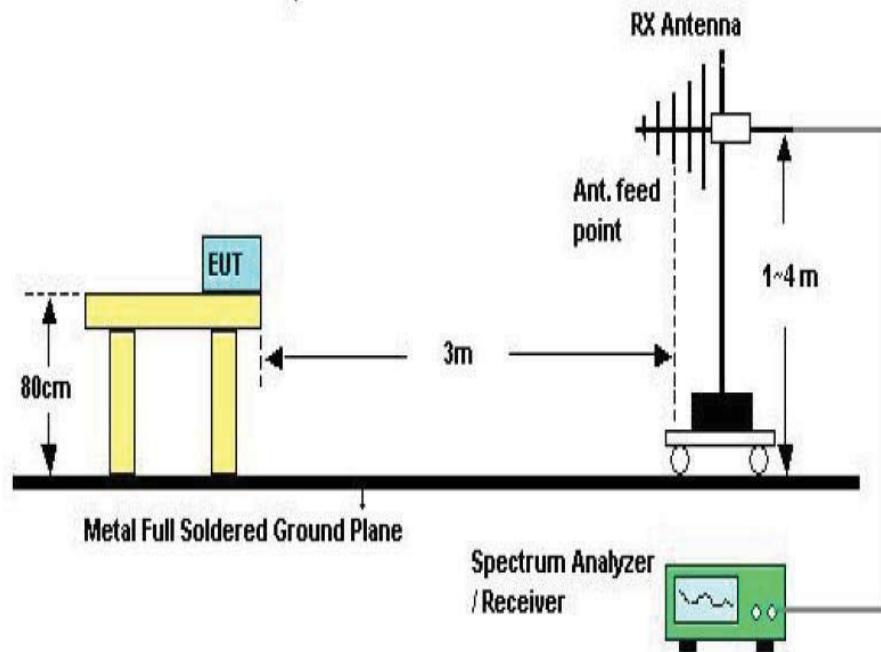
- a) The tighter limit applies at the band edges.
- b) Emission Level(dB uV/m)=20log Emission Level(uV/m)

5.1.2 Test Setup

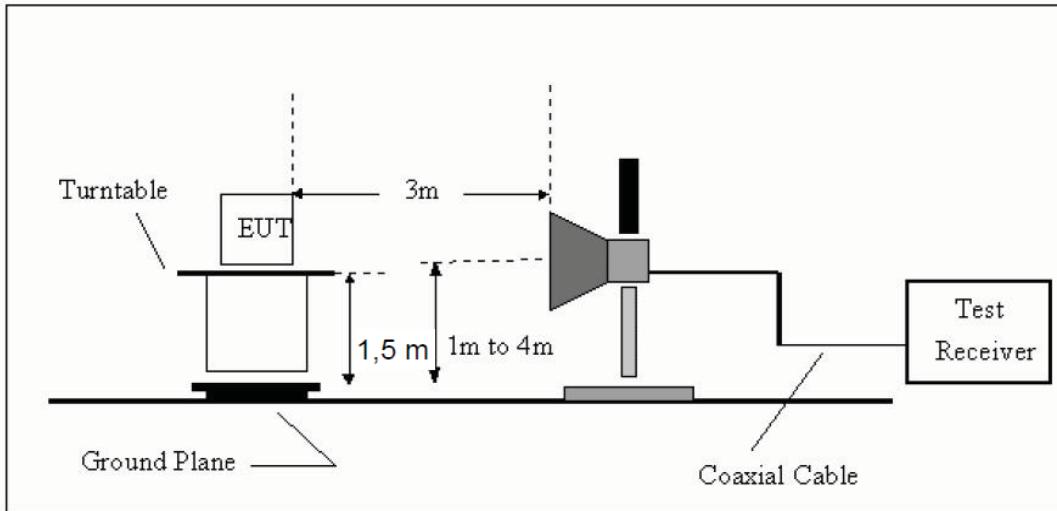
See the next page



Below 30MHz Test Setup



Above 30MHz Test Setup



Above 1GHz Test Setup

5.1.3 Test Procedure

- a) The measuring distance of 3m shall be used for measurements at frequency up to 1GHz and above 1GHz, The EUT was placed on a rotating 0.8 m high above ground for below 1GHz and 1.5m high for above 1GHz testing, The table was rotated 360 degrees to determine the position of the highest radiation
- b) The Test antenna shall vary between 1m and 4m, Both Horizontal and Vertical antenna are set of make measurement.
- c) 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 Qusia Peak Detector mode premeasured
- d) If Peak value comply with QP limit Below 1GHz. The EUT deemed to comply with QP limit. But the Peak value and average value both need to comply with applicable limit above 1GHz.
- e) For the actual test configuration, please see the test setup photo.

5.1.4 Test Equipment Setting For emission test Result

9KHz~150KHz	RBW 200Hz	VBW1KHz
150KHz~30MHz	RBW 9KHz	VBW 30KHz
30MHz~1GHz	RBW 120KHz	VBW 300KHz

Above 1GHz RBW 1MHz VBW 3MHz

5.1.5 Test Condition

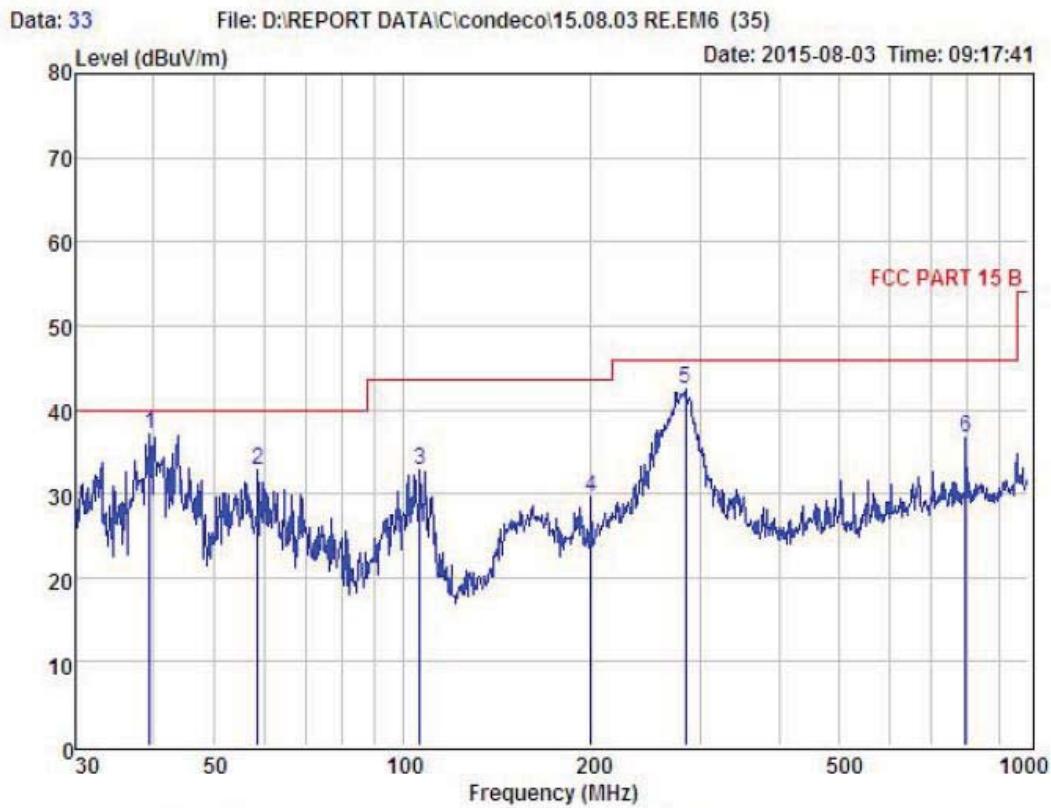
Continual Transmitting in maximum power.

5.1.6 Test Result

We have scanned the 9KHz from 25GHz to the EUT.
Detailed information please see the following page.

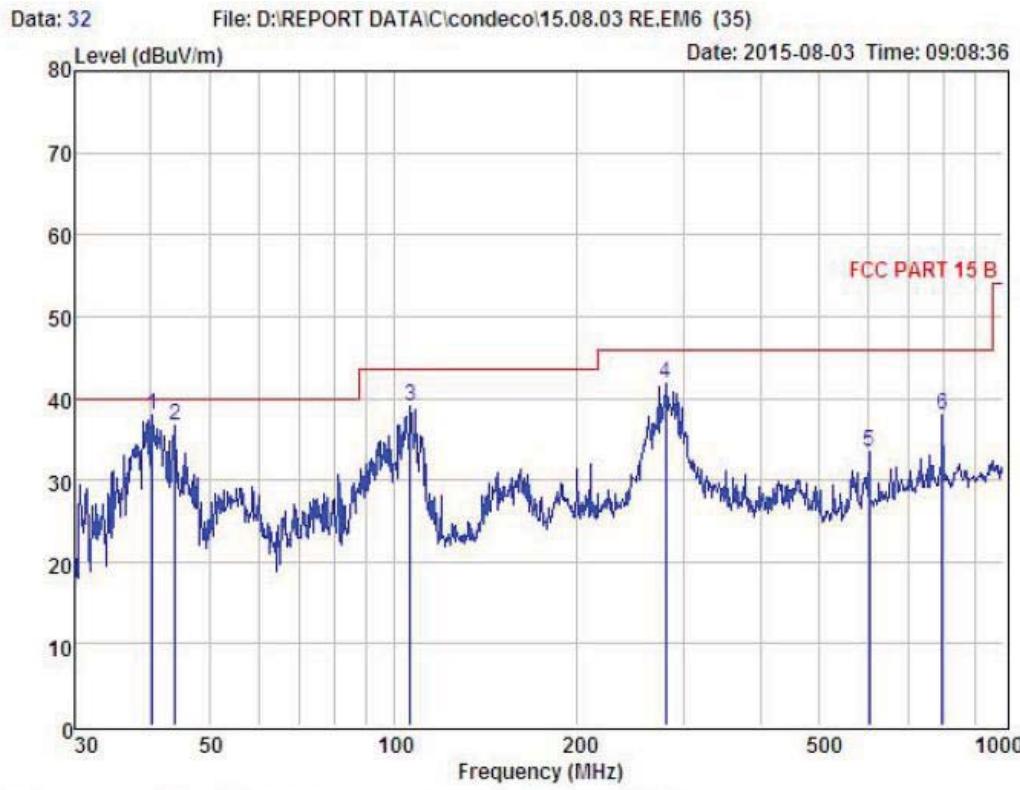
From 9KHz to 30MHz: Conclusion: PASS

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



Condition	FCC PART 15 B			3m	POL: HORIZONTAL				
	EUT	Model No	Test Mode						
Power	: DC 48V From POE								
Test Engineer	:								
Remark	: WIFI								
Temp	: 24°C								
Hum	: 32%								
Item	Freq	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	39.44	54.74	14.07	31.89	0.17	37.09	40.00	-2.91	Peak
2	58.61	51.54	12.75	31.75	0.23	32.77	40.00	-7.23	Peak
3	106.76	52.77	10.93	31.35	0.42	32.77	43.50	-10.73	Peak
4	199.99	50.27	9.90	30.94	0.43	29.66	43.50	-13.84	Peak
5	282.99	60.06	12.45	30.62	0.56	42.45	46.00	-3.55	Peak
6	793.40	43.66	20.66	29.10	1.35	36.57	46.00	-9.43	Peak

Remark: Level = Read Level + Antenna Factor - Preamp Factor + Cable Loss



Condition : FCC PART 15 B 3m POL: VERTICAL

EUT :

Model No :

Test Mode :

Power : DC 48V From POE

Test Engineer :

Remark : WIFI

Temp : 24°C

Hum : 32%

Item	Freq	Read Level	Antenna Factor	Preamp Factor	Cable Loss	Level	Limit	Margin	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dBuV	
1	40.28	55.53	14.07	31.89	0.18	37.89	40.00	-2.11	Peak
2	43.81	54.56	13.79	31.85	0.09	36.59	40.00	-3.41	Peak
3	106.76	59.04	10.93	31.35	0.42	39.04	43.50	-4.46	Peak
4	280.02	59.50	12.37	30.63	0.60	41.84	46.00	-4.16	Peak
5	603.54	43.45	18.39	29.41	1.13	33.56	46.00	-12.44	Peak
6	793.40	45.06	20.66	29.10	1.35	37.97	46.00	-8.03	Peak

Remark: Level = Read Level + Antenna Factor - Preamp Factor + Cable Loss

From 1G-25GHz

EUT	V2 Touch Screen	Model Name	T201502
Temperature	26°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC48V from POE
Test Mode	TX Low		

IEEE 802.11b

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1103	V	42.97	---	-11.24	31.73	---	74	54	42.27	Peak
4824	V	35.59	---	0.64	36.23	---	74	54	37.77	Peak
N/A										

EUT	V2 Touch Screen	Model Name	T201502
Temperature	26°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC48V from POE
Test Mode	TX Low		

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1103	H	42.74	---	-11.24	31.5	---	74	54	42.5	Peak
4824	H	35.47	---	0.64	36.11	---	74	54	37.89	Peak
N/A										

Notes: AV Means AV detector test data, Peak Means Peak detector test data.

Emissions attenuated more than 20 dB below the permissible value are not reported.

EUT	V2 Touch Screen	Model Name	T201502
Temperature	26°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC48V from POE
Test Mode	TX Mid		

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1103	V	42.85	---	-11.24	31.61	---	74	54	42.39	Peak
4874	V	38.27	---	0.76	39.03	---	74	54	34.97	Peak

EUT	V2 Touch Screen	Model Name	T201502
Temperature	26°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC48V from POE
Test Mode	TX Mid		

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1103	H	42.7	---	-11.24	31.46	---	74	54	42.54	Peak
4874	H	39.42	---	0.76	40.18	---	74	54	33.82	Peak

Notes: AV Means AV detector test data, Peak Means Peak detector test data.

Emissions attenuated more than 20 dB below the permissible value are not reported.

EUT	V2 Touch Screen	Model Name	T201502
Temperature	26°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC48V from POE
Test Mode	TX High		

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1103	V	42.21	---	-11.24	30.97	---	74	54	43.03	Peak
4924	V	35.33	---	0.87	36.2	---	74	54	37.8	Peak

EUT	V2 Touch Screen	Model Name	T201502
Temperature	26°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC48V from POE
Test Mode	TX High		

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1103	H	42.93	---	-11.24	31.69	---	74	54	42.31	Peak
4924	H	32.82	---	0.87	33.69	---	74	54	40.31	Peak

Notes: AV Means AV detector test data, Peak Means Peak detector test data.

Emissions attenuated more than 20 dB below the permissible value are not reported.

IEEE 802.11 g:

EUT	V2 Touch Screen	Model Name	T201502
Temperature	26°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC48V from POE
Test Mode	TX Low		

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1145	V	43.26	---	-11.24	32.02	---	74	54	41.98	Peak
2586	V	45.86	---	-7.13	38.73	---	74	54	35.27	Peak
3062	V	43.91	---	-5.74	38.17	---	74	54	35.83	Peak
4824	V	42.96	---	0.64	43.6	---	74	54	30.4	Peak
N/A										

EUT	V2 Touch Screen	Model Name	T201502
Temperature	26°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC48V from POE
Test Mode	TX Low		

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1294	H	43.7	---	-10.96	32.74	---	74	54	41.26	Peak
2038	H	42.83	---	-8.58	34.25	---	74	54	39.75	Peak
3483	H	41.68	---	-4.95	36.73	---	74	54	37.27	Peak
4824	H	40.35	---	0.64	40.99	---	74	54	33.01	Peak
N/A										

Notes: AV Means AV detector test data, Peak Means Peak detector test data.

Emissions attenuated more than 20 dB below the permissible value are not reported.

EUT	V2 Touch Screen	Model Name	T201502
Temperature	26°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC48V from POE
Test Mode	TX Mid		

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1374	V	43.07	---	-10.43	32.64	---	74	54	41.36	Peak
2589	V	43.32	---	-7.13	36.19	---	74	54	37.81	Peak
3365	V	42.86	---	-5.18	37.68	---	74	54	36.32	Peak
4874	V	42.04	---	0.76	42.8	---	74	54	31.2	Peak

EUT	V2 Touch Screen	Model Name	T201502
Temperature	26°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC48V from POE
Test Mode	TX Mid		

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1321	H	42.64	---	-10.84	31.8	---	74	54	42.2	Peak
2314	H	43.27	---	-7.46	35.81	---	74	54	38.19	Peak
3577	H	41.51	---	-4.76	36.75	---	74	54	37.25	Peak
4874	H	39.41	---	0.76	40.17	---	74	54	33.83	Peak

Notes: AV Means AV detector test data, Peak Means Peak detector test data.

Emissions attenuated more than 20 dB below the permissible value are not reported.

EUT	V2 Touch Screen	Model Name	T201502
Temperature	26°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC48V from POE
Test Mode	TX High		

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1302	V	42.61	---	-10.84	31.77	---	74	54	42.23	Peak
2982	V	43.09	---	-5.86	37.23	---	74	54	36.77	Peak
3831	V	42.14	---	-3.96	38.18	---	74	54	35.82	Peak
4924	V	40.24	---	0.87	41.11	---	74	54	32.89	Peak

EUT	V2 Touch Screen	Model Name	T201502
Temperature	26°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC48V from POE
Test Mode	TX High		

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1446	H	42.25	---	-10.29	31.96	---	74	54	42.04	Peak
2198	H	42.34	---	-8.24	34.1	---	74	54	39.9	Peak
3905	H	42.47	---	-3.68	38.79	---	74	54	35.21	Peak
4924	H	39.88	---	0.87	40.75	---	74	54	33.25	Peak

Notes: AV Means AV detector test data, Peak Means Peak detector test data.

Emissions attenuated more than 20 dB below the permissible value are not reported.

IEEE 802.11n/HT20 with 2.4G

EUT	V2 Touch Screen	Model Name		T201502
Temperature	26°C	Relative Humidity		56%
Pressure	960hPa	Test voltage		DC48V from POE
Test Mode	TX Low			

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1492	V	43.22	---	-10.27	32.95	---	74	54	41.05	Peak
2671	V	42.58	---	-6.94	35.64	---	74	54	38.36	Peak
3948	V	43.06	---	-3.68	39.38	---	74	54	34.62	Peak
4824	V	42.04	---	0.64	42.68	---	74	54	31.32	Peak
N/A										

EUT	V2 Touch Screen	Model Name		T201502
Temperature	26°C	Relative Humidity		56%
Pressure	960hPa	Test voltage		DC48V from POE
Test Mode	TX Low			

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1451	H	42.55	---	-10.27	32.28	---	74	54	41.72	Peak
2839	H	42.82	---	-6.17	36.65	---	74	54	37.35	Peak
3607	H	42.39	---	-4.52	37.87	---	74	54	36.13	Peak
4824	H	41.31	---	0.64	41.95	---	74	54	32.05	Peak
N/A										

Notes: AV Means AV detector test data, Peak Means Peak detector test data.

Emissions attenuated more than 20 dB below the permissible value are not reported.

EUT	V2 Touch Screen	Model Name	T201502
Temperature	26°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC48V from POE
Test Mode	TX Mid		

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1262	V	42.53	---	-10.96	31.57	---	74	54	42.43	Peak
2013	V	42.97	---	-8.58	34.39	---	74	54	39.61	Peak
3798	V	42.21	---	-4.07	38.14	---	74	54	35.86	Peak
4874	V	41.33	---	0.76	42.09	---	74	54	31.91	Peak

EUT	V2 Touch Screen	Model Name	T201502
Temperature	26°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC48V from POE
Test Mode	TX Mid		

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1511	H	42.43	---	-10.14	32.29	---	74	54	41.71	Peak
2353	H	42.59	---	-7.59	35	---	74	54	39	Peak
3266	H	42.86	---	-5.39	37.47	---	74	54	36.53	Peak
4874	H	41.6	---	0.76	42.36	---	74	54	31.64	Peak

Notes: AV Means AV detector test data, Peak Means Peak detector test data.

Emissions attenuated more than 20 dB below the permissible value are not reported.

EUT	V2 Touch Screen	Model Name	T201502
Temperature	26°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC48V from POE
Test Mode	TX High		

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1477	V	43.53	---	-10.27	33.26	---	74	54	40.74	Peak
2703	V	42.41	---	-6.43	35.98	---	74	54	38.02	Peak
3561	V	42.3	---	-4.76	37.54	---	74	54	36.46	Peak
4924	V	41.13	---	0.87	42	---	74	54	32	Peak

EUT	V2 Touch Screen	Model Name	T201502
Temperature	26°C	Relative Humidity	56%
Pressure	960hPa	Test voltage	DC48V from POE
Test Mode	TX High		

Freq. (MHz)	Ant. Pol H/V	Peak Reading (dBuV)	AV Reading (dBuV)	Ant. / CL CF (dB)	Actual Fs		Peak Limit (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Remark
					Peak (dBuV/m)	AV (dBuV/m)				
1503	H	41.97	---	-10.14	31.83	---	74	54	42.17	Peak
3588	H	42.27	---	-4.96	37.31	---	74	54	36.69	Peak
4153	H	42.08	---	-2.48	39.6	---	74	54	34.4	Peak
4924	H	40.13	---	0.87	41	---	74	54	33	Peak

Notes: AV Means AV detector test data, Peak Means Peak detector test data.

Emissions attenuated more than 20 dB below the permissible value are not reported.

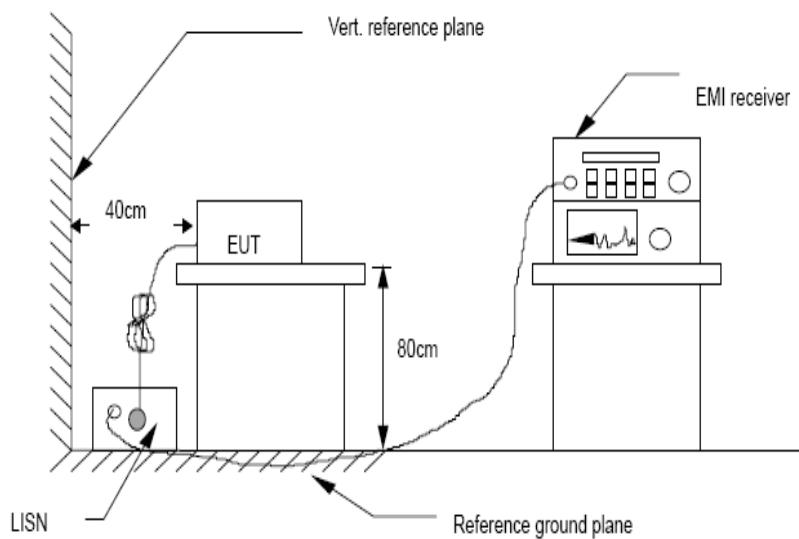
6 POWER LINE CONDUCTED EMISSION

6.1 Conducted Emission Limits(15.207)

Frequency MHz	Limits dB(μ V)	
	Quasi-peak Level	Average Level
0.15 -0.50	66 -56*	56 - 46*
0.50 -5.00	56	46
5.00 -30.00	60	50

- Notes:
1. *Decreasing linearly with logarithm of frequency.
 2. The lower limit shall apply at the transition frequencies.
 3. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.

6.2 Test Setup



6.3 Test Procedure

The EUT is put on the plane 0.8m high above the ground by insulating support and is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC lines are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to ANSI ANSI C63.4:2014 on Conducted Emission Measurement.

The bandwidth of test receiver (R & S ESCI) is set at 9 kHz.

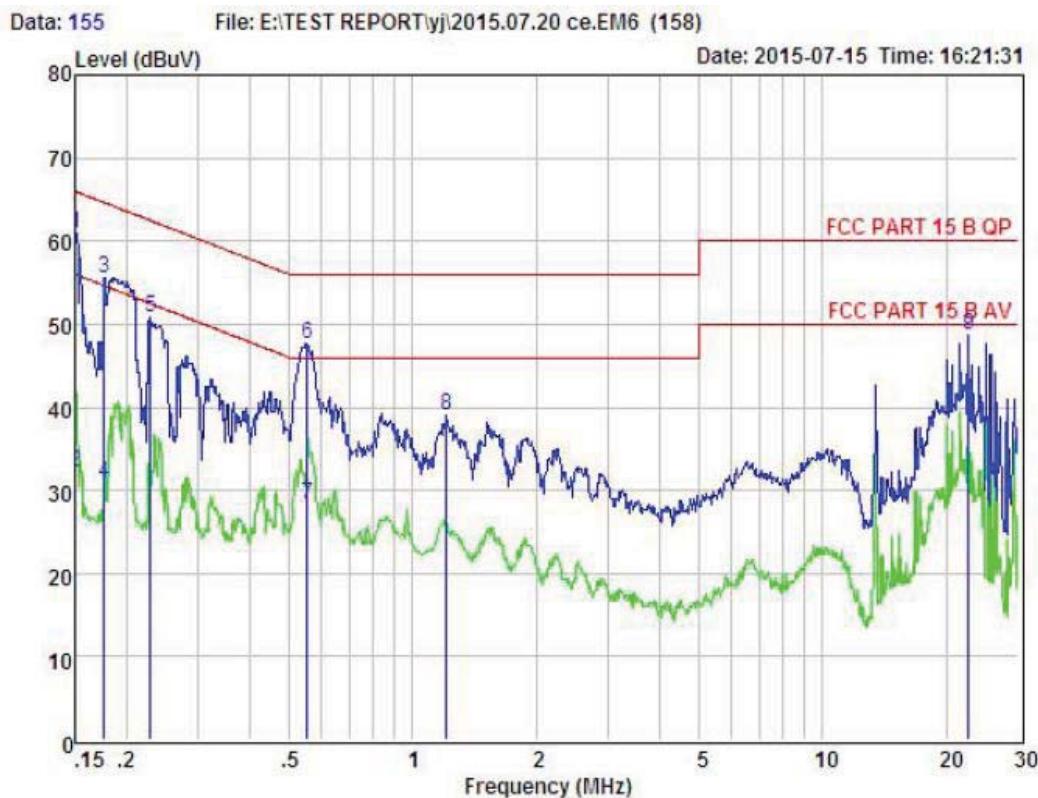
6.4 Test Results

TX MODE

Worse case is reported only

PASS

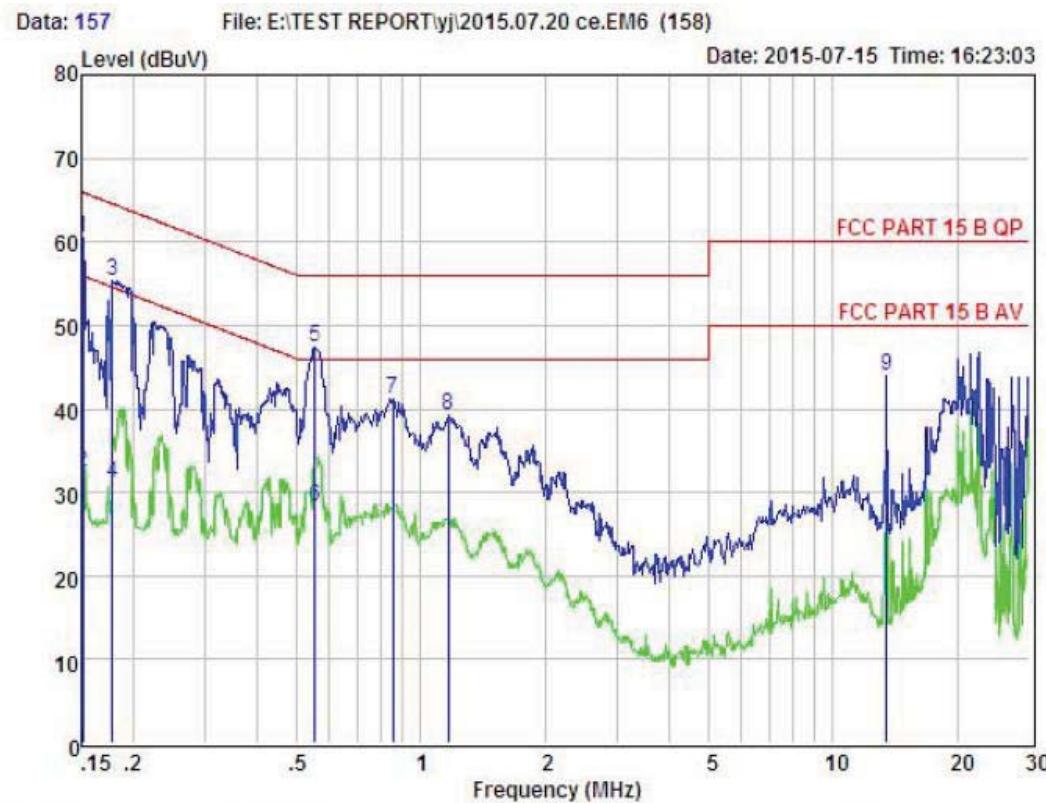
Detailed information please see the following page.



Condition : FCC PART 15 B QP POL: LINE Temp: 24 °C Hum: 56 %
 EUT :
 Model No : M15T
 Test Mode :
 Power : DC 48V from POE
 Test Engineer:
 Remark :

Item	Freq	Read	LISN	Preamp	Cable	Level	Limit	Margin	Remark
			Factor	Factor	Lose	dBuV	dBuV	dBuV	
	MHz	dBuV	dB	dB	dB				
1	0.150	51.10	0.03	-9.72	0.10	60.95	66.00	-5.05	Peak
2	0.150	22.28	0.03	-9.72	0.10	32.13	56.00	-23.87	Average
3	0.177	45.73	0.03	-9.72	0.10	55.58	64.64	-9.06	Peak
4	0.177	21.13	0.03	-9.72	0.10	30.98	54.64	-23.66	Average
5	0.229	41.03	0.03	-9.72	0.10	50.88	62.48	-11.60	Peak
6	0.552	37.83	0.03	-9.72	0.10	47.68	56.00	-8.32	Peak
7	0.552	18.51	0.03	-9.72	0.10	28.36	46.00	-17.64	Average
8	1.210	29.16	0.04	-9.71	0.10	39.01	56.00	-16.99	Peak
9	22.775	38.39	0.41	-9.55	0.42	48.77	60.00	-11.23	Peak

Remarks: Level = Read + LISN Factor - Preamp Factor + Cable loss



Item	Freq	Read	LISN	Preamp	Cable	Level	Limit	Margin	Remark
			Factor	Factor	Loss	dBuV	dBuV	dBuV	
	MHz	dBuV	dB	dB	dB				
1	0.151	50.64	0.03	-9.72	0.10	60.49	65.96	-5.47	Peak
2	0.151	22.60	0.03	-9.72	0.10	32.45	55.96	-23.51	Average
3	0.179	45.58	0.03	-9.72	0.10	55.43	64.55	-9.12	Peak
4	0.179	21.33	0.03	-9.72	0.10	31.18	54.55	-23.37	Average
5	0.552	37.60	0.03	-9.72	0.10	47.45	56.00	-8.55	Peak
6	0.552	18.39	0.03	-9.72	0.10	28.24	46.00	-17.76	Average
7	0.853	31.38	0.04	-9.71	0.10	41.23	56.00	-14.77	Peak
8	1.166	29.34	0.04	-9.71	0.10	39.19	56.00	-16.81	Peak
9	13.479	34.15	0.23	-9.42	0.22	44.02	60.00	-15.98	Peak

Remarks: Level = Read + LISN Factor - Preamp Factor + Cable loss

7 Conducted Maximum Output Power

7.1 Test limit

Please refer section 15.247.

7.2 Test Procedure

Details see the KDB558074 Meas Guidance V03

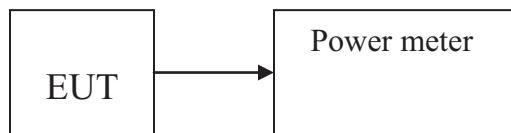
7.2.1 Place the EUT on the table and set it in transmitting mode.

7.2.2 Measure out each mode and each bands peak output power of EUT.

Note: The cable loss and attenuator loss were offset into measure device as amplitude offset.

Details see the KDB558074 DTS Meas Guidance V03

7.3 Test Setup



7.4 Test Results

PASS

Detailed information please see the following page.

EUT: V2 Touch Screen		M/N: T201502		
Test date: 2015-08-10		Test site: RF site	Tested by: Eric Huang	
Mode	Frequency (MHz)	PK Output power(dBm)	Limit (dBm)	Margin (dB)
IEEE 802.11 b	CH1: 2412	13.48	30	12.92
	CH6: 2437	12.93	30	13.49
	CH11: 2462	12.68	30	13.81
IEEE 802.11 g	CH1: 2412	16.21	30	11.83
	CH6: 2437	15.64	30	12.6
	CH11: 2462	15.01	30	12.78
IEEE 802.11 n/HT20 with 2.4G	CH1: 2412	15.98	30	12.82
	CH6: 2437	15.92	30	13.06
	CH11: 2462	15.02	30	13.58
Conclusion: PASS				

8 PEAK POWER SPECTRAL DENSITY

8.1 Test limit

- 8.1.1 Please refer section 15.247.
- 8.1.2 For direct sequence systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3kHz band during any time interval of continuous transmission.
- 8.1.3 The direct sequence operating of the hybrid system, with the frequency hopping operation turned off, shall comply with the power density requirements of paragraph (d) of this section.

8.2 Method of measurement

Details see the KDB558074 DTS Meas Guidance V03

- 8.2.1 Place the EUT on the table and set it in transmitting mode.
- 8.2.2 Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 8.2.3 Set the spectrum analyzer as RBW = 3kHz, VBW = 10kHz, span=5-30%EBW, detail see the test plot.
- 8.2.4 Record the max reading.
- 8.2.5 Repeat the above procedure until the measurements for all frequencies are completed.

8.3 Test Setup



8.4 Test Results

PASS.

Detailed information please see the following page.

EUT: V2 Touch Screen		M/N: T201502		
Test date: 2015-08-10		Test site: RF site	Tested by: Eric Huang	
Mode	Frequency (MHz)	PK Output power(dBm)	Limit (dBm)	Result
IEEE 802.11 b	CH1: 2412	-14. 031	8	PASS
	CH6: 2437	-14. 174	8	PASS
	CH11: 2462	-13. 370	8	PASS
IEEE 802.11 g	CH1: 2412	-17. 395	8	PASS
	CH6: 2437	-17. 666	8	PASS
	CH11: 2462	-17. 313	8	PASS
IEEE 802.11 n/HT20 with 2.4G	CH1: 2412	-15. 914	8	PASS
	CH6: 2437	-16. 698	8	PASS
	CH11: 2462	-18. 123	8	PASS
Conclusion: PASS				

IEEE 802.11b :

CH Low :



CH Mid:

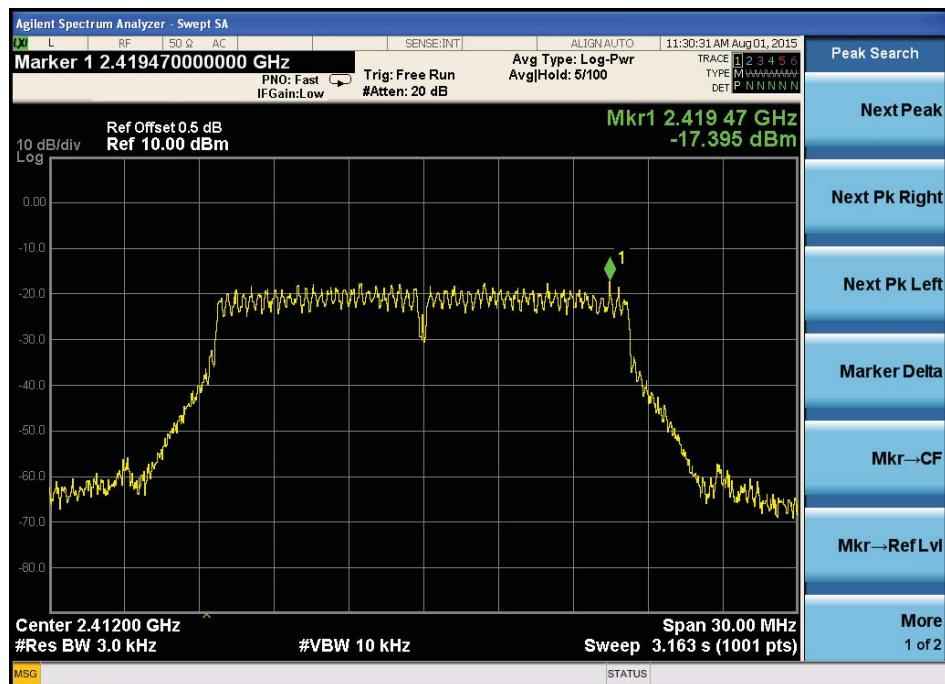


CH Hig:

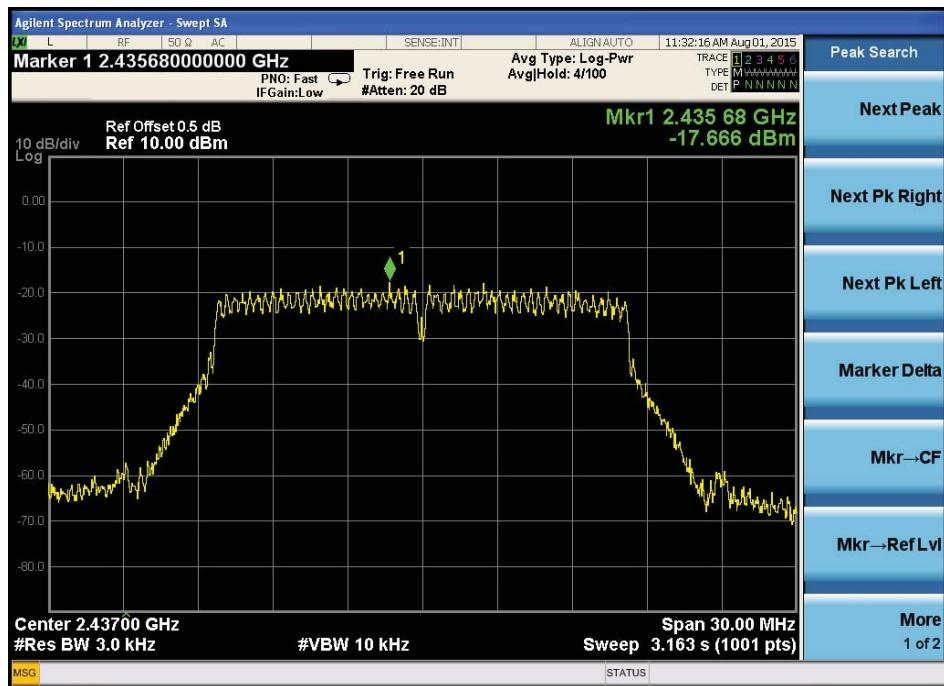


IEEE 802.11g :

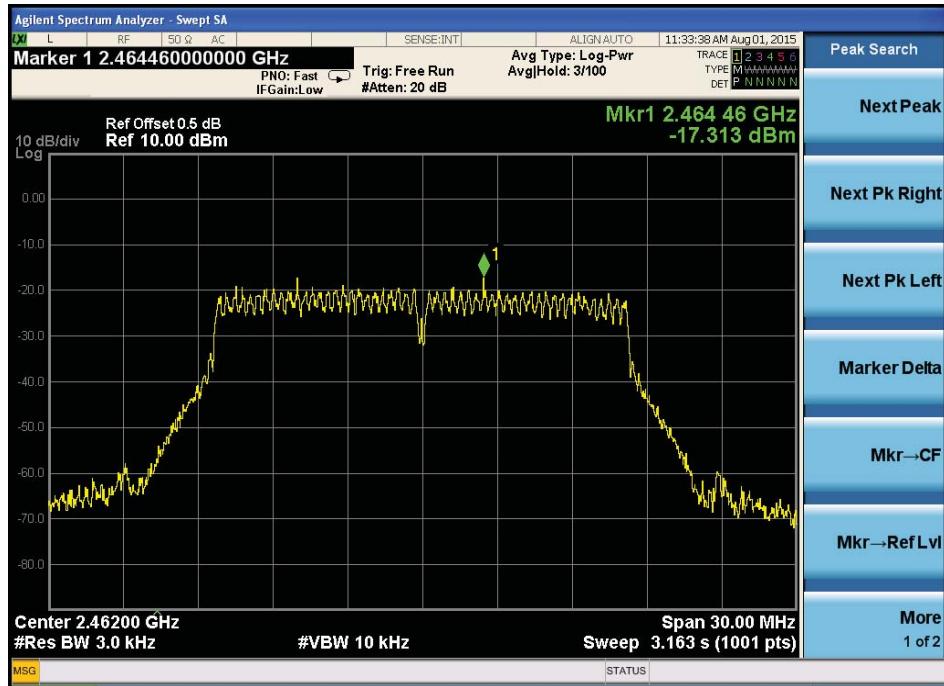
CH Low



CH Mid:

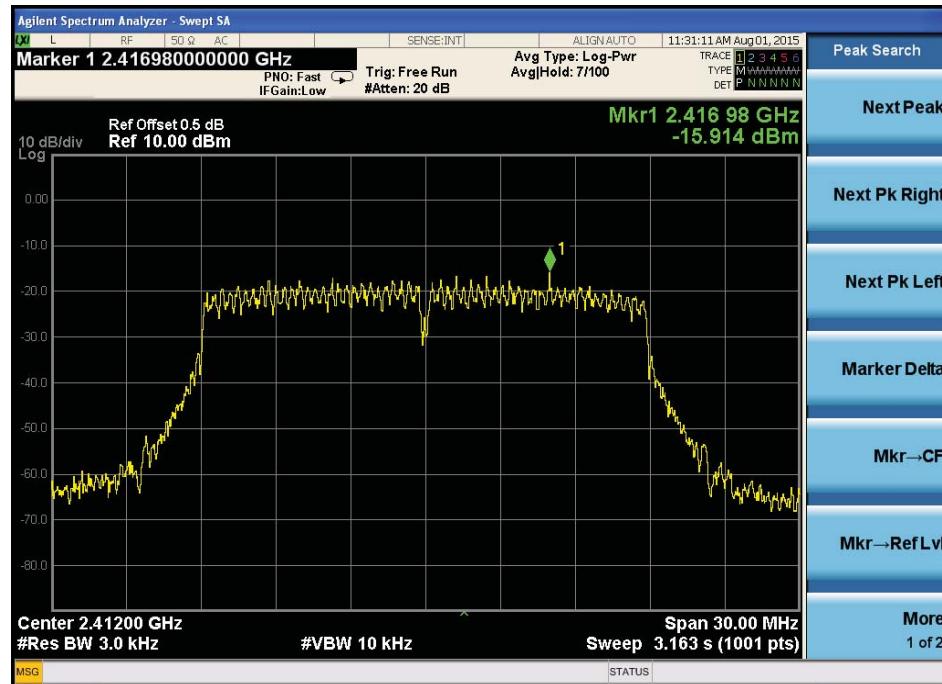


CH Hig:

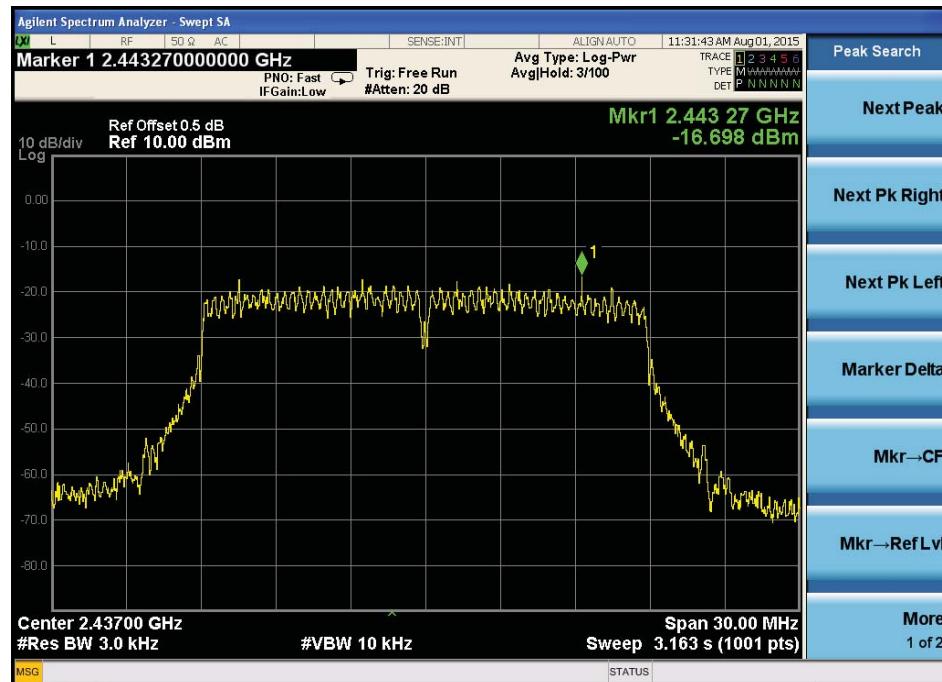


IEEE 802.11n HT20 :

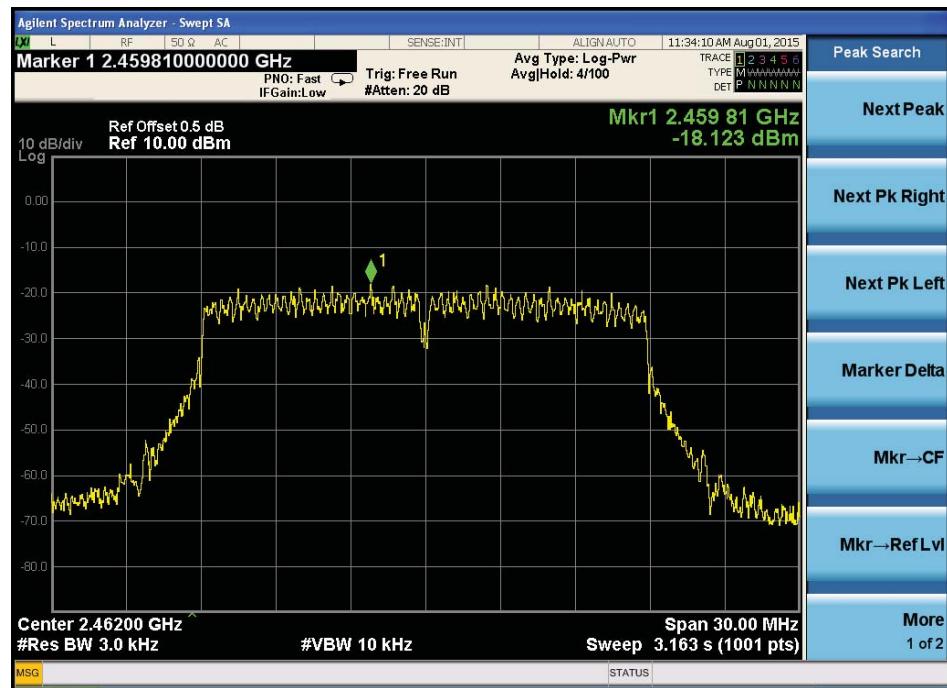
CH Low :



CH Mid:



CH Hig:



9 Bandwidth

9.1 Test limit

Please refer section 15.247

For direct sequence systems, the minimum 6dB bandwidth shall be at least 500 kHz.

9.2 Method of measurement

Details see the KDB558074 D01 Meas Guidance

- a) The bandwidth is measured at an amplitude level reduced 20dB from the reference level. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst-case (i.e. the widest) bandwidth.
- b) The test receiver set RBW = 1-5 % EBW, VBW \geq 3RBW, Sweep time set auto, detail see the test plot.

9.3 Test Setup



9.4 Test Results

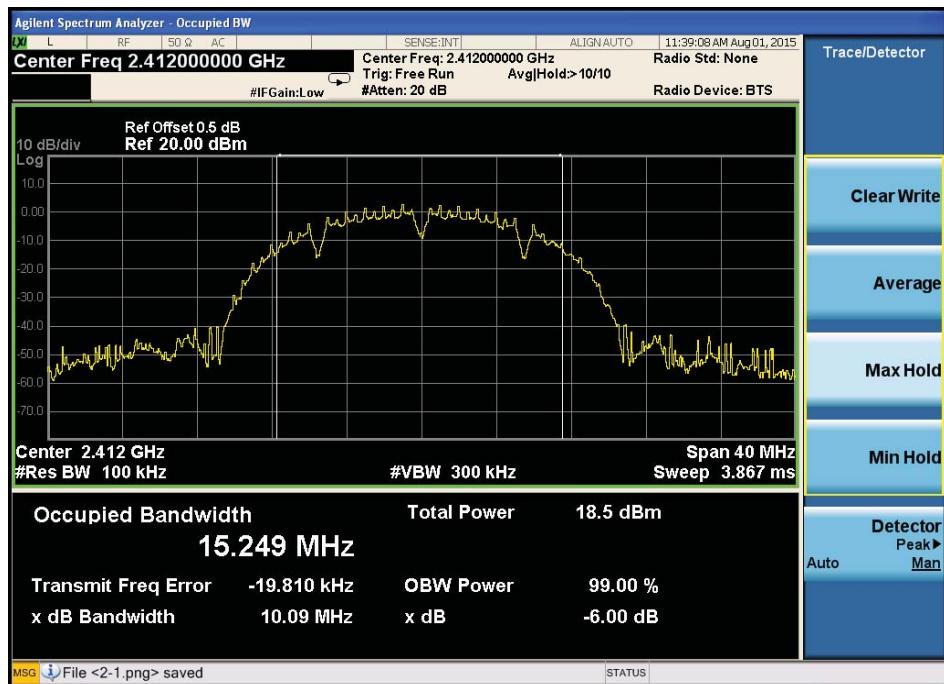
PASS.

Detailed information please see the following page.

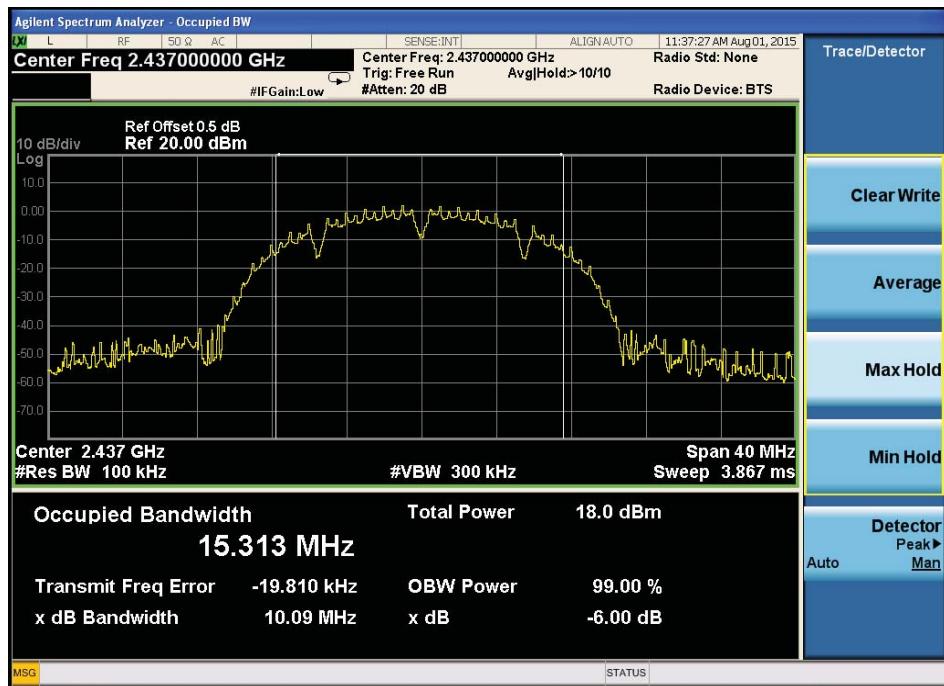
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Limit (MHz)	Result
IEEE 802.11b:					
Low	2412	10.09	/	0.5	PASS
Mid	2437	10.09	/	0.5	PASS
High	2462	10.11	/	0.5	PASS
IEEE 802.11g					
Low	2412	16.41	/	0.5	PASS
Mid	2437	16.41	/	0.5	PASS
High	2462	16.39	/	0.5	PASS
IEEE 802.11n/HT20:					
Low	2412	17.61	/	0.5	PASS
Mid	2437	17.61	/	0.5	PASS
High	2462	17.59	/	0.5	PASS

IEEE 802.11b:

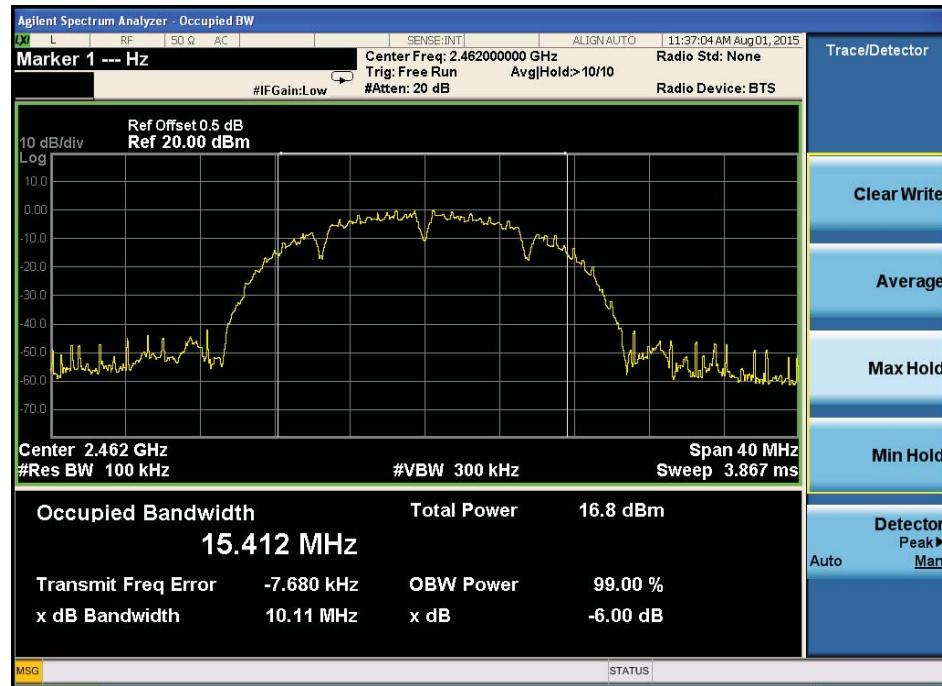
CH Low :



CH Mid :



CH High :

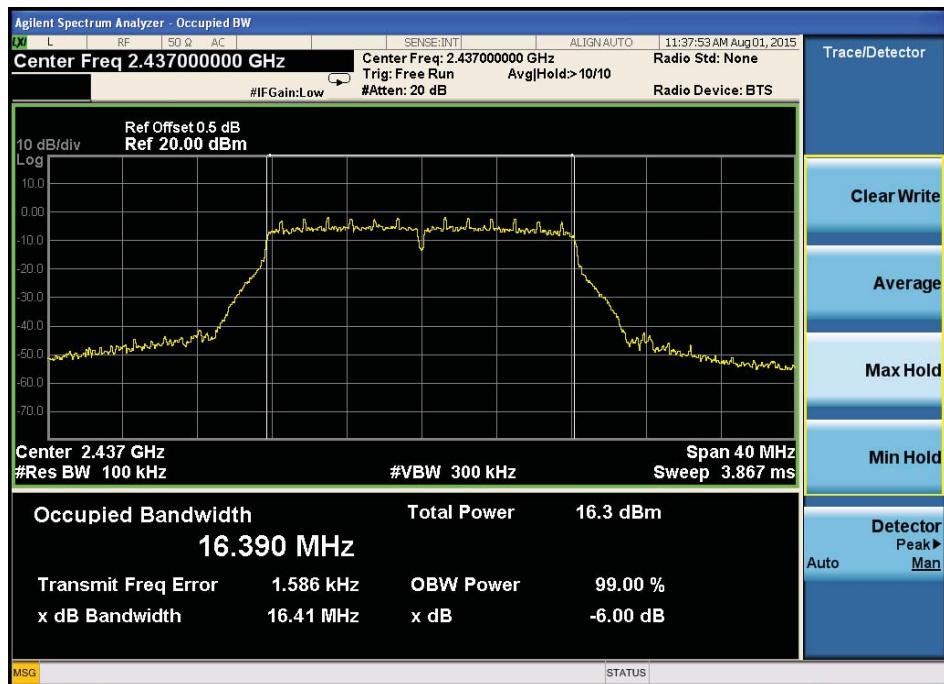


IEEE 802.11g:

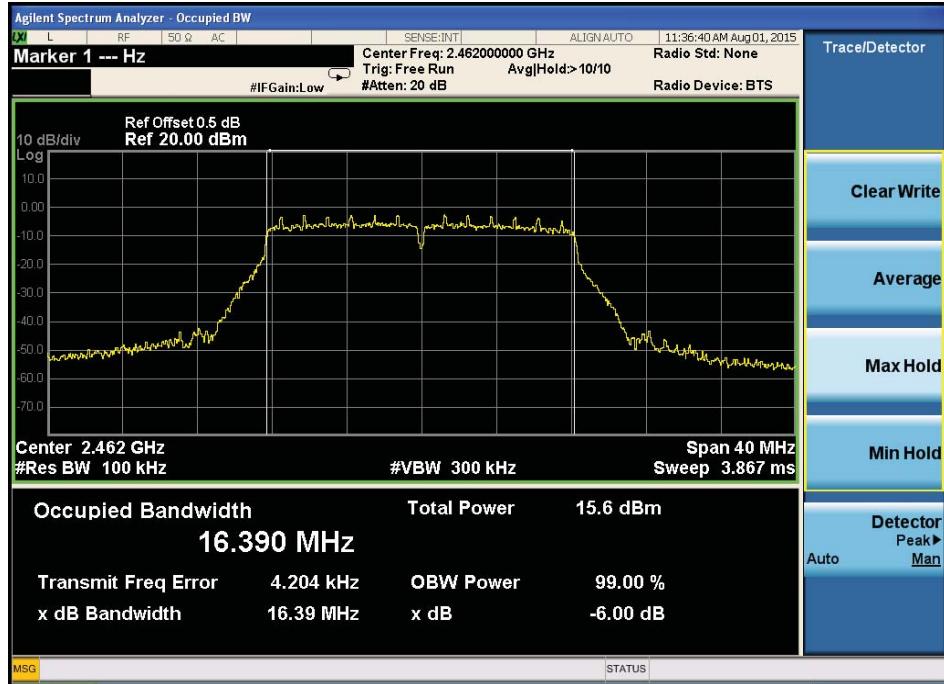
CH Low :



CH Mid:



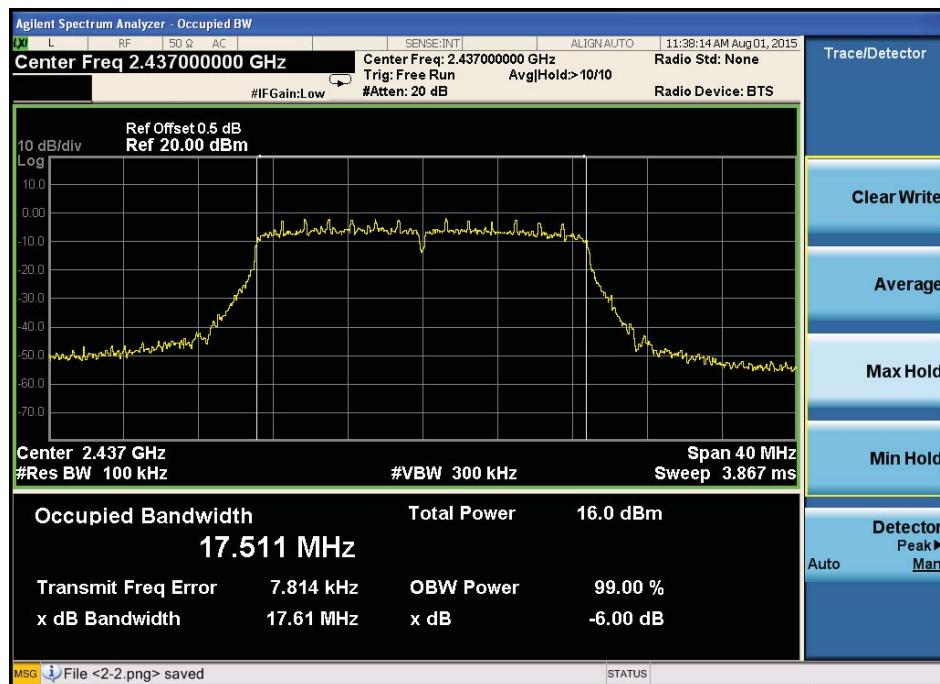
CH Hig:



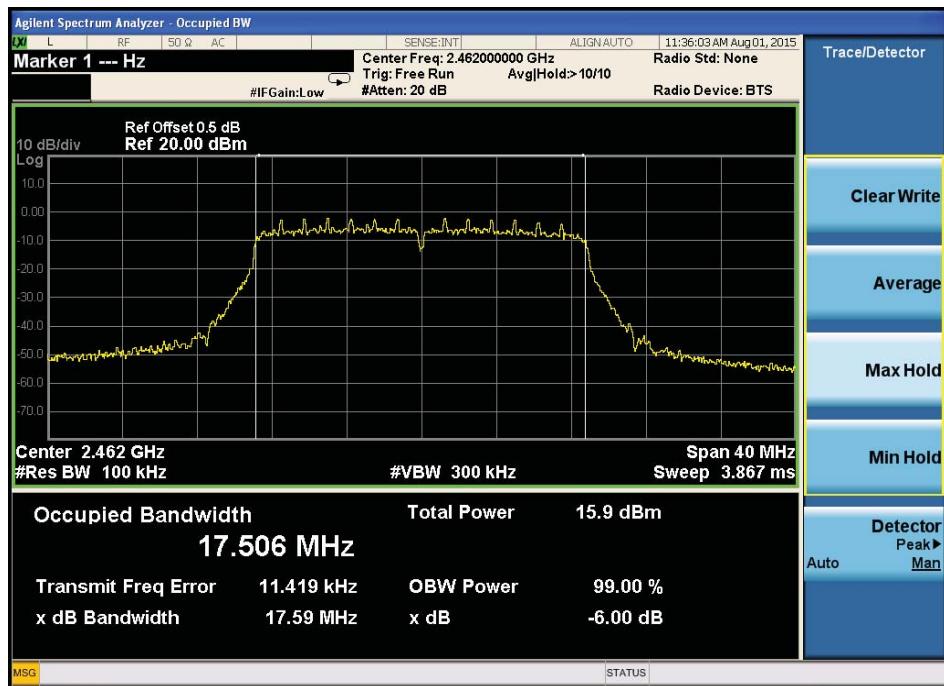
IEEE 802.11n HT20:
CH Low :



CH Mid :



CH High :



10 Band Edge Check

10.1 Test limit

Please refer section RSS-GEN&15.247.

10.2 Test Procedure

- 12.2.1 Put the EUT on a 0.8m high table, power on the EUT. Emissions were scanned and measured rotating the EUT to 360 degrees, Find the maximum Emission
- 12.2.2 Check the spurious emissions out of band.
- 12.2.3 RBW 1MHz ,VBW 3MHz ,peak detector for peak value , RBW 1MHz ,VBW 3MHz ,RMS detector for AV value.

10.3 Test Setup

Same as 5.2.2.

10.4 Test Result

PASS.

Detailed information please see the following page.

Radiated Method:
802.11b

Band Edge Test result														
EUT: V2 Touch Screen			M/N: T201502											
Power: DC48V from POE														
Test date: 2015-06-06 Test site: 3m Chamber Tested by: Eric Huang														
Test mode: Tx Low														
Antenna polarity: Vertical														
Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss(d B)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)		Remark						
2390	41.32	27.62	3.92	34.97	37.89	74		PK						
2390	--	27.62	3.92	34.97	--	54		AV						
2400	52.42	27.62	3.94	34.97	49.01	74		PK						
2400	--	27.62	3.94	34.97	--	54		AV						
Antenna Polarity: Horizontal														
2390	43.25	27.62	3.92	34.97	39.82	74		PK						
2390	--	27.62	3.92	34.97	--	54		AV						
2400	56.35	27.62	3.94	34.97	52.94	74		PK						
2400	--	27.62	3.94	34.97	--	54		AV						
Note:														
1, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK														
2, Spectrum Set for AV measure: RBW=1MHz, VBW=3MHz, Sweep time=Auto, Detector: RMS														
3, Result = Read level + Antenna factor + cable loss-Amp factor														
4, All the other emissions not reported were too low to read and deemed to comply with FCC limit.														

Band Edge Test result								
EUT: V2 Touch Screen	M/N: T201502							
Power: DC48V from POE								
Test date: 2015-06-06	Test site: 3m Chamber Tested by: Eric Huang							
Test mode: Tx High								
Antenna polarity: Vertical								
Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss(dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2483.5	43.28	27.89	4	34.97	40.2	74	33.8	PK
2483.5	--	--	--	--	--	54	--	AV
Antenna Polarity: Horizontal								
2483.5	46.71	27.89	4	34.97	43.63	74	30.37	PK
2483.5	--	--	--	--	--	54	--	AV
Note:								
1, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK								
2, Spectrum Set for AV measure: RBW=1MHz, VBW=3MHz, Sweep time=Auto, Detector: RMS								
3, Result = Read level + Antenna factor + cable loss-Amp factor								
4, All the other emissions not reported were too low to read and deemed to comply with FCC limit.								

802.11g

Band Edge Test result														
EUT: V2 Touch Screen	M/N: T201502													
Power: DC48V from POE														
Test date: 2015-06-06	Test site: 3m Chamber		Tested by: Eric Huang											
Test mode: Tx Low														
Antenna polarity: Vertical														
Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss(d B)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark						
2390	41.55	27.62	3.92	34.97	38.12	74	35.88	PK						
--	--	--	--	--	--	--	--	--						
Antenna Polarity: Horizontal														
2390	42.57	27.62	3.92	34.97	39.14	74	34.86	PK						
--	--	--	--	--	--	--	--	--						
Note:														
1, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK														
2, Spectrum Set for AV measure: RBW=1MHz, VBW=3MHz, Sweep time=Auto, Detector: RMS														
3, Result = Read level + Antenna factor + cable loss-Amp factor														
4, All the other emissions not reported were too low to read and deemed to comply with FCC limit.														

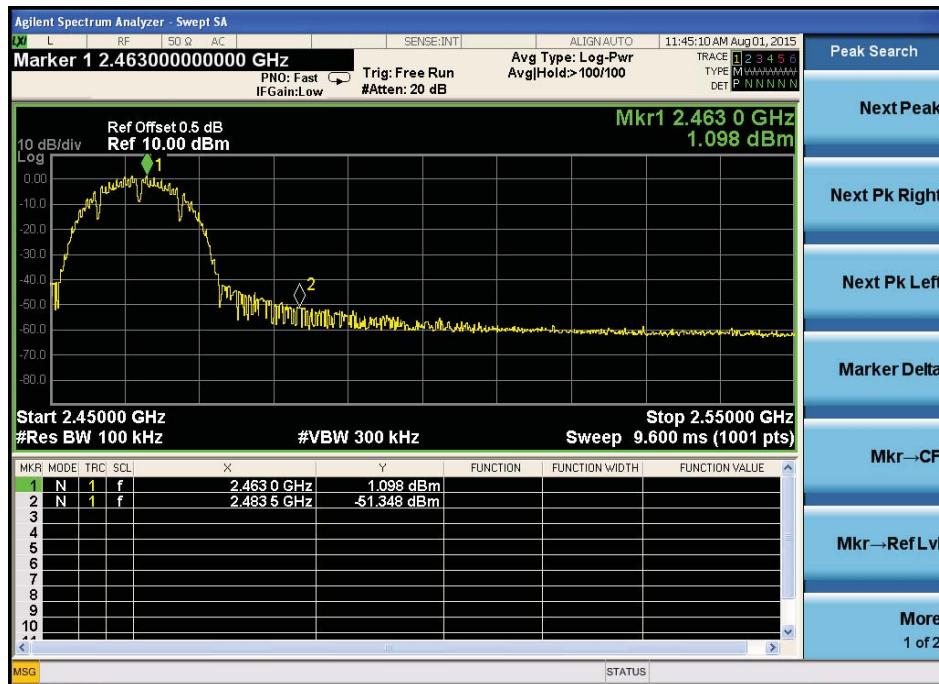
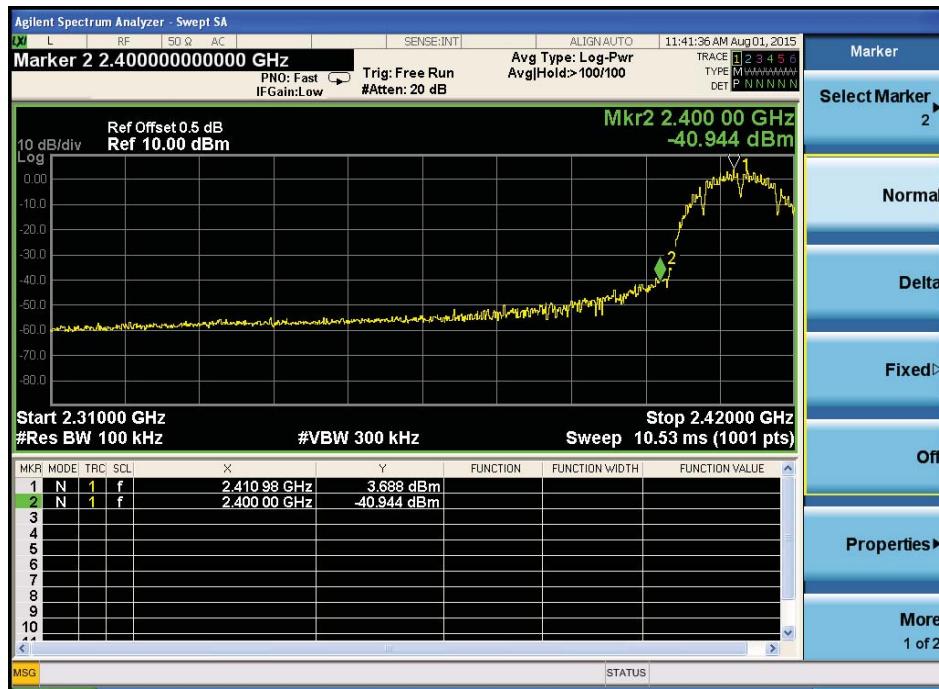
Band Edge Test result								
EUT: V2 Touch Screen	M/N: T201502							
Power: DC48V from POE								
Test date: 2015-06-06	Test site: 3m Chamber Tested by: Eric Huang							
Test mode: Tx High								
Antenna polarity: Vertical								
Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss(dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2483.5	42.68	27.89	4	34.97	39.6	74	34.4	PK
--	--	--	--	--	--	--	--	--
Antenna Polarity: Horizontal								
2483.5	45.32	27.89	4	34.97	42.24	74	31.76	PK
--	--	--	--	--	--	--	--	--
Note:								
1, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK								
2, Spectrum Set for AV measure: RBW=1MHz, VBW=3MHz, Sweep time=Auto, Detector: RMS								
3, Result = Read level + Antenna factor + cable loss-Amp factor								
4, All the other emissions not reported were too low to read and deemed to comply with FCC limit.								

802.11n20

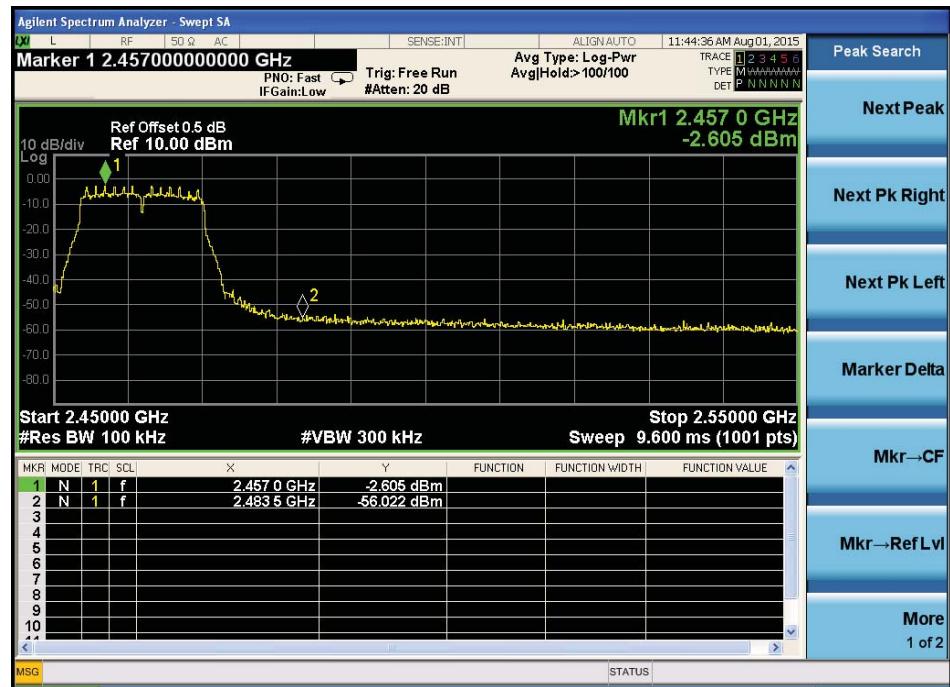
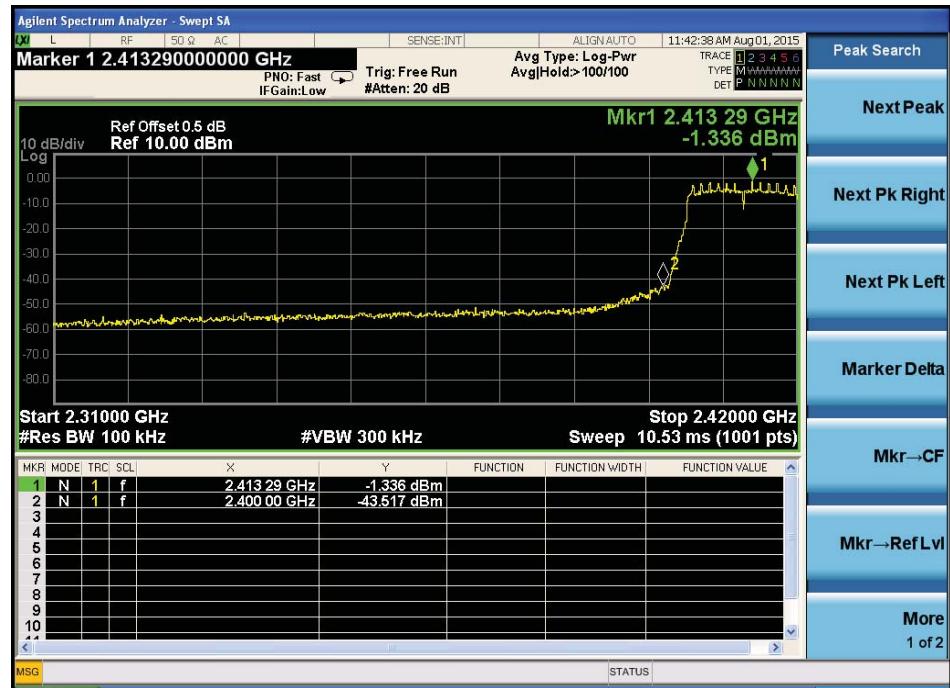
Band Edge Test result													
EUT: V2 Touch Screen	M/N: T201502												
Power: DC48V from POE													
Test date: 2015-06-06	Test site: 3m Chamber			Tested by: Eric Huang									
Test mode: Tx Low													
Antenna polarity: Vertical													
Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss(d B)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark					
2390	41.86	27.62	3.92	34.97	38.43	74	35.57	PK					
--	--	--	--	--	--	--	--	--					
Antenna Polarity: Horizontal													
2390	43.27	27.62	3.92	34.97	39.84	74	34.16	PK					
--	--	--	--	--	--	--	--	--					
Note:													
1, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK													
2, Spectrum Set for AV measure: RBW=1MHz, VBW=3MHz, Sweep time=Auto, Detector: RMS													
3, Result = Read level + Antenna factor + cable loss-Amp factor													
4, All the other emissions not reported were too low to read and deemed to comply with FCC limit.													

Band Edge Test result								
EUT: V2 Touch Screen	M/N: T201502							
Power: DC48V from POE								
Test date: 2015-06-06	Test site: 3m Chamber Tested by: Eric Huang							
Test mode: Tx High								
Antenna polarity: Vertical								
Freq (MHz)	Read Level (dBuV/m)	Antenna Factor (dB/m)	Cable loss(dB)	Amp Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2483.5	42.51	27.89	4	34.97	39.43	74	34.57	PK
--	--	--	--	--	--	--	--	--
Antenna Polarity: Horizontal								
2483.5	44.12	27.89	4	34.97	41.04	74	32.96	PK
--	--	--	--	--	--	--	--	--
Note:								
1, Spectrum Set for PK measure: RBW=1MHz, VBW=1MHz, Sweep time=Auto, Detector: PK								
2, Spectrum Set for AV measure: RBW=1MHz, VBW=3MHz, Sweep time=Auto, Detector: RMS								
3, Result = Read level + Antenna factor + cable loss-Amp factor								
4, All the other emissions not reported were too low to read and deemed to comply with FCC limit.								

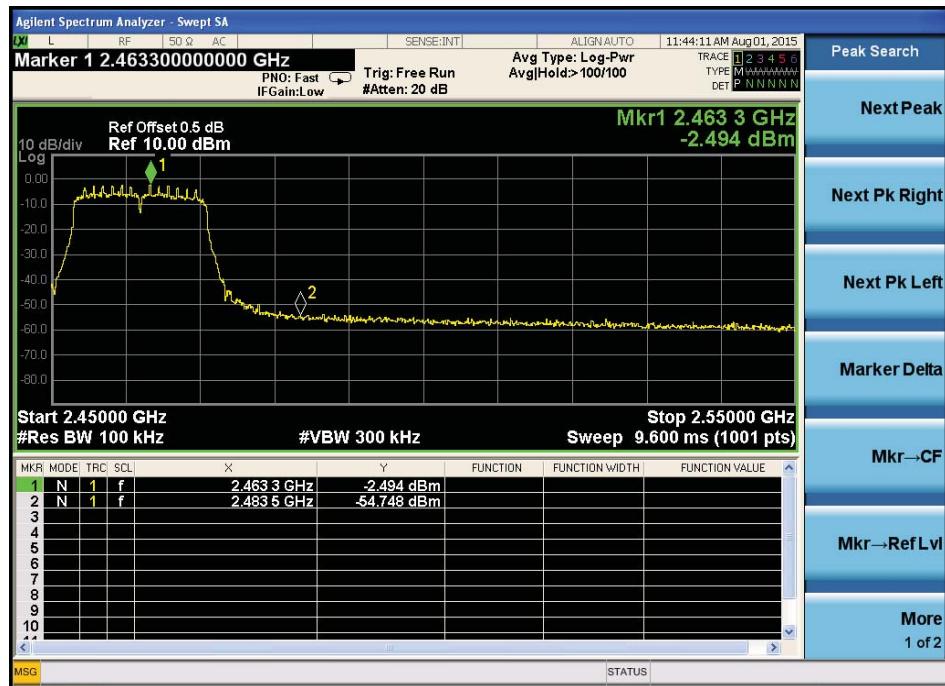
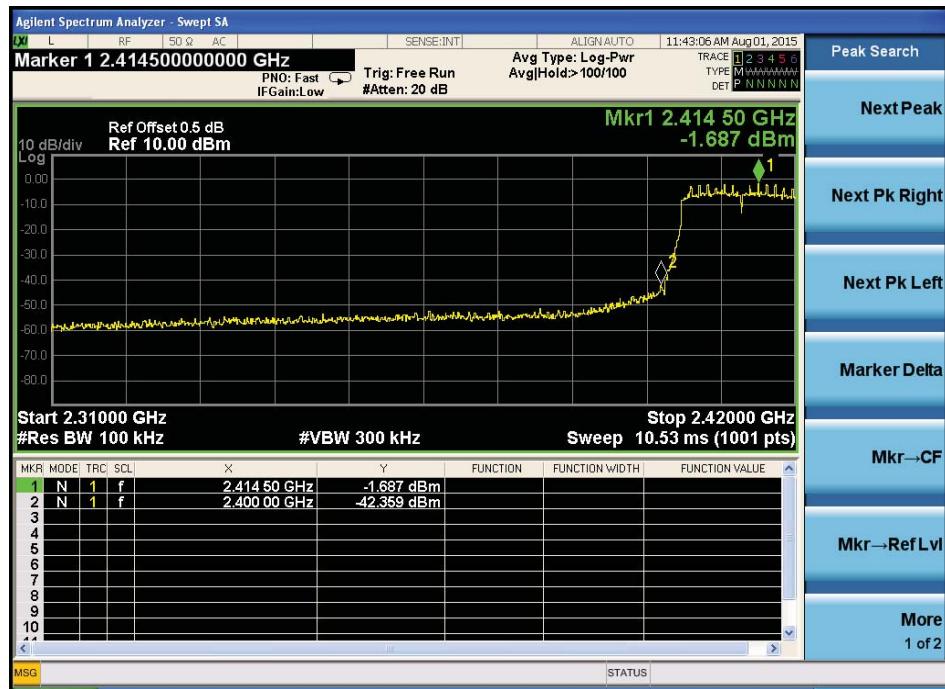
Conducted Method:
802.11b



802.11g



802.11n HT20



11 Antenna Requirement

11.1 Standard Requirement

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

11.2 Antenna Connected Construction

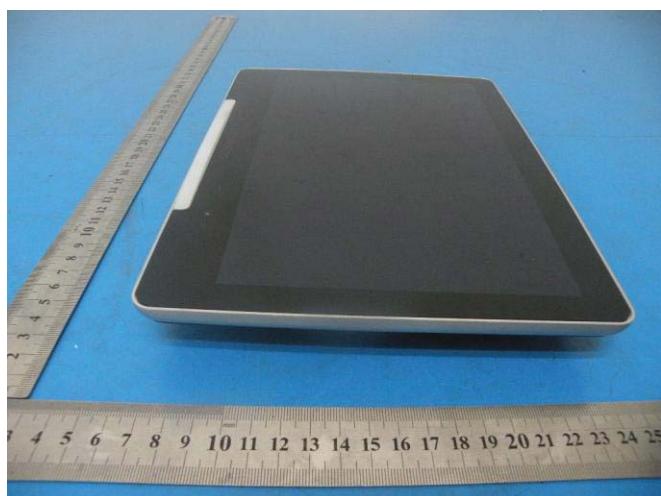
The antenna connector is unique antenna and no consideration of replacement. Please see EUT photo for details.

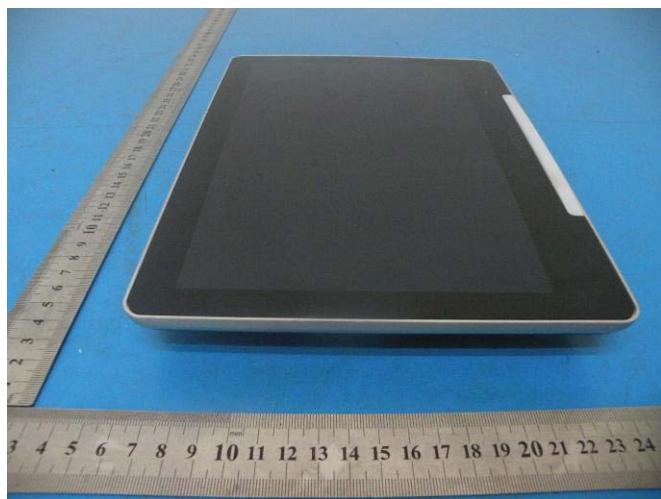
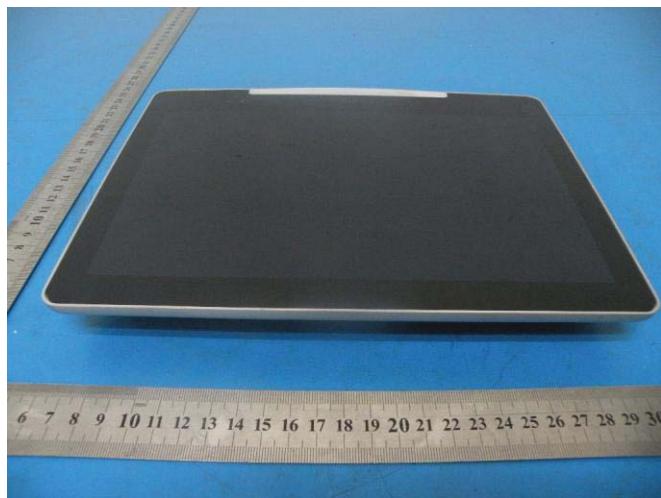
11.3 Result

The EUT antenna is Integrated Antenna Antenna. It comply with the standard requirement.

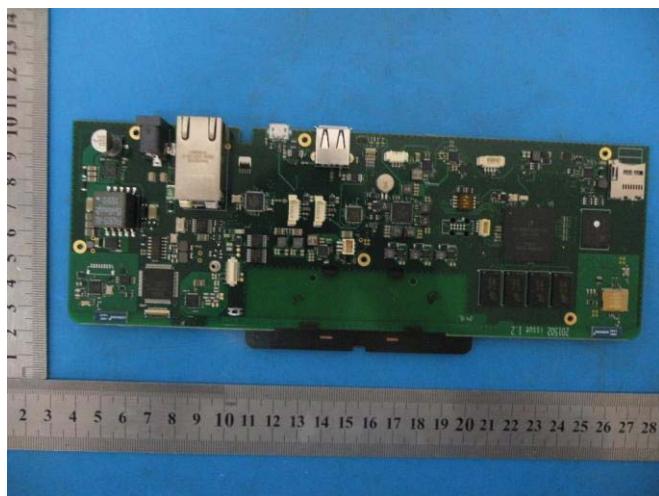
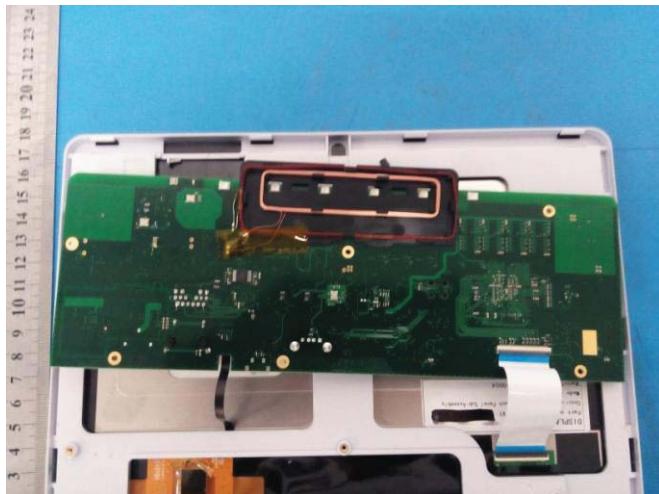
12 Photographs of EUT













-----END OF THE REPORT-----