TEST REPORT

Product	:	Mobile Data Terminal
Trade mark	:	Howen
Model/Type reference	:	Hero-MDT-AT2, Hero-MDT-AT1, Hero-MDT-WT1, Hero-MDT-WT2, Hero-MDT Series
Serial Number	:	N/A
Report Number	:	EED32H00105102
FCC ID	:	2AGBD-HERO-MDT
Date of Issue	:	Oct. 22, 2015
Test Standards	:	47 CFR Part 15 Subpart C (2014)
Test result	:	PASS

Prepared for:

Howen Technologies Co., Ltd.
No. 201, 2/F, B Zone, Hivac Building, Langshan 2nd Rd., North Zone of Technology Park, Nanshan, Shenzhen, Guangdong, China

Prepared by:

Centre Testing International Group Co., Ltd.
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Tested by: Ware Xin Reviewed by: Eman_Li

Approved by: Sheek.Luo Date: Oct. 22, 2015

Sheek Luo
Lab supervisor

Check No.:2211408689

2 Version

Version No.	Date	Description
00	Oct. 22, 2015	Original

3 Test Summary

Test Item	Test Requirement	Test method	Result
Antenna Requirement	47 CFR Part 15, Subpart C Section 15.203/15.247 (c)	ANSI C63.10-2013	PASS
AC Power Line Conducted Emission	47 CFR Part 15, Subpart C Section 15.207	ANSI C63.10-2013	N/A
Conducted Peak Output Power	47 CFR Part 15, Subpart C Section 15.247 (b)(3)	ANSI C63.10-2013	PASS
6dB Occupied Bandwidth	47 CFR Part 15, Subpart C Section 15.247 (a)(2)	ANSI C63.10-2013	PASS
Power Spectral Density	47 CFR Part 15, Subpart C Section 15.247 (e)	ANSI C63.10-2013	PASS
Band-edge for RF Conducted Emissions	47 CFR Part 15, Subpart C Section 15.247(d)	ANSI C63.10-2013	PASS
RF Conducted Spurious Emissions	47 CFR Part 15, Subpart C Section 15.247(d)	ANSI C63.10-2013	PASS
Radiated Spurious Emissions	47 CFR Part 15, Subpart C Section 15.205/15.209	ANSI C63.10-2013	PASS
Restricted bands around fundamental frequency (Radiated Emission)	47 CFR Part 15, Subpart C Section 15.205/15.209	ANSI C63.10-2013	PASS

Remark:

The tested sample(s) and the sample information are provided by the client.

Model No.: Hero-MDT-AT2, Hero-MDT-AT1, Hero-MDT-WT1, Hero-MDT-WT2, Hero-MDT Series

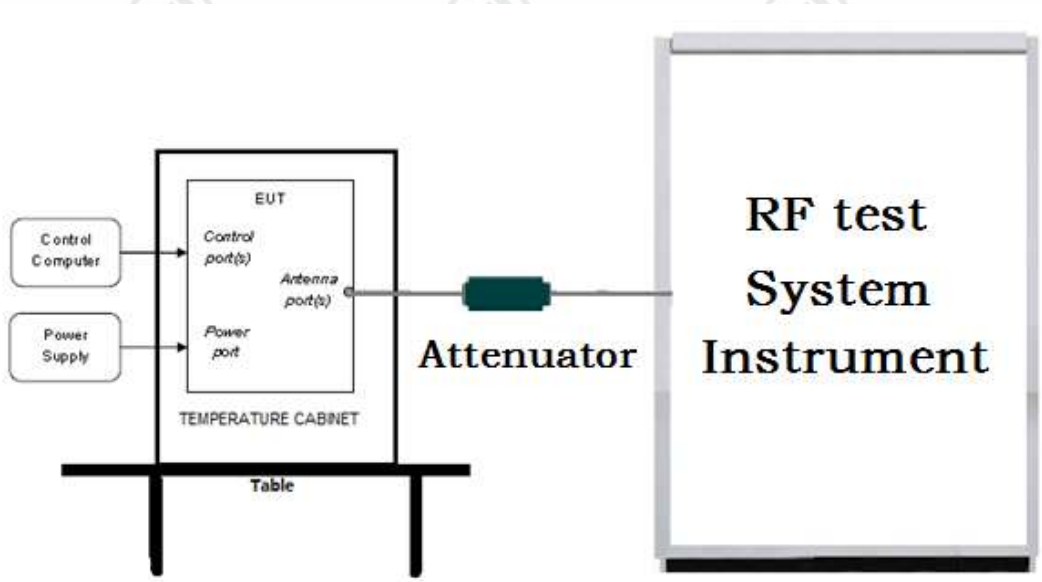
Only the model Hero-MDT-AT2 was tested, since the electrical circuit design, layout, components used and internal wiring were identical for the above models, with difference being model name.

4 Content

5 Test Requirement

5.1 Test setup

5.1.1 For Conducted test setup



5.1.2 For Radiated Emissions test setup

Radiated Emissions setup:

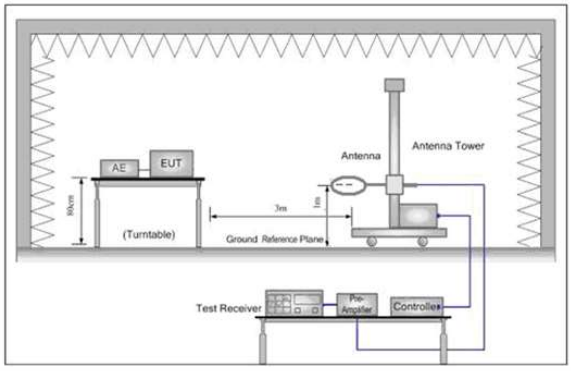


Figure 1. Below 30MHz

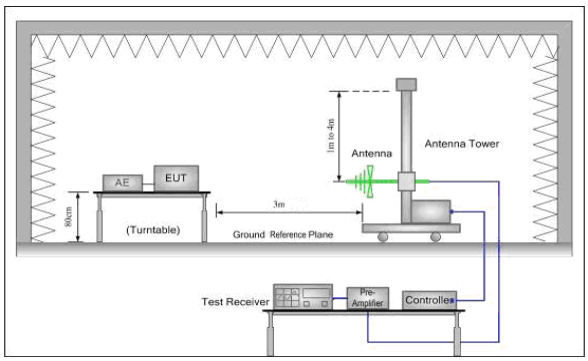


Figure 2. 30MHz to 1GHz

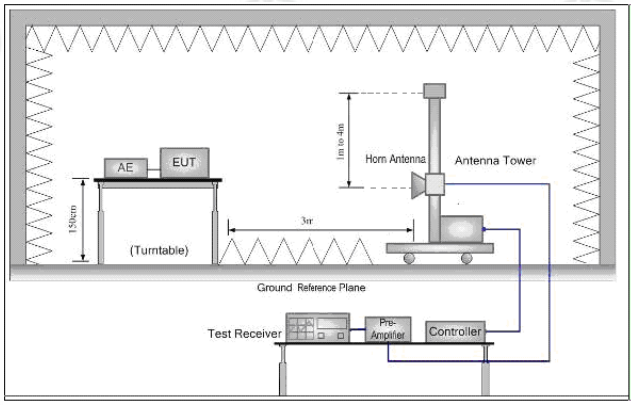
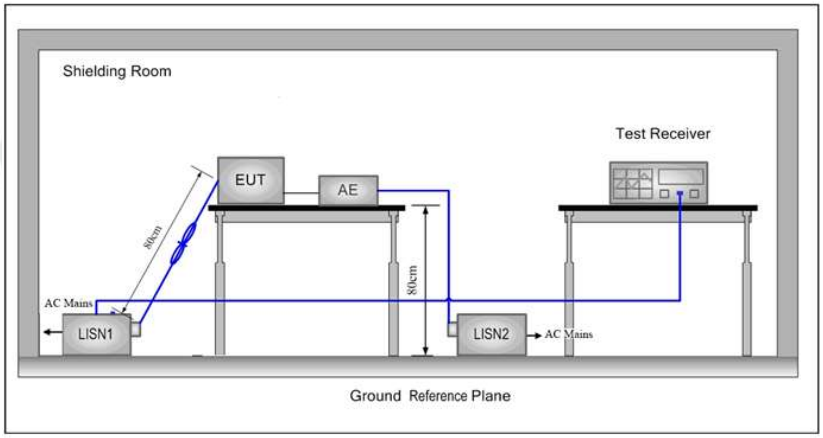


Figure 3. Above 1GHz

5.1.3 For Conducted Emissions test setup

Conducted Emissions setup



5.2 Test Environment

Operating Environment:	
Temperature:	25.0 °C
Humidity:	53 % RH
Atmospheric Pressure:	1010mbar

5.3 Test Condition

Test channel:

Test Mode	Tx/Rx	RF Channel		
		Low(L)	Middle(M)	High(H)
802.11b/g/n(HT20)	2412MHz ~2462 MHz	Channel 1	Channel 6	Channel11
		2412MHz	2437MHz	2462MHz
802.11n(HT40)	2422MHz ~2452 MHz	Channel 1	Channel 4	Channel7
		2422MHz	2437MHz	2452MHz
Transmitting mode:	Keep the EUT in transmitting mode.			

Test mode:

Pre-scan under all rate at lowest channel 1

Mode	802.11b				
Data Rate	1Mbps	2Mbps	5.5Mbps	11Mbps	
EIRP(dBm)	9.44	10.23	10.44	10.74	

Mode	802.11g							
Data Rate	6Mbps	9Mbps	12Mbps	18Mbps	24Mbps	36Mbps	48Mbps	54Mbps
EIRP(dBm)	9.47	9.12	9.00	8.98	8.80	8.80	8.71	8.68

Mode	802.11n (HT20)							
Data Rate	6.5Mbps	13Mbps	19.5Mbps	26Mbps	39Mbps	52Mbps	58.5Mbps	65Mbps
EIRP(dBm)	9.55	9.51	9.44	9.40	9.38	9.11	9.02	9.00
Mode	802.11n (HT40)							
Data Rate	13.5Mbps	27Mbps	40.5Mbps	54Mbps	81Mbps	108Mbps	121.5Mbps	135Mbps
EIRP(dBm)	9.36	9.26	9.15	9.10	9.00	8.99	8.46	8.05

Through Pre-scan, 11Mbps of rate is the worst case of 802.11b; 6Mbps of rate is the worst case of 802.11g; 6.5Mbps of rate is the worst case of 802.11n (HT20); 13.5Mbps of rate is the worst case of 802.11n (HT40).

6 General Information

6.1 Client Information

Applicant:	Howen Technologies Co., Ltd.
Address of Applicant:	No. 201, 2/F, B Zone, Hivac Building, Langshan 2nd Rd., North Zone of Technology Park, Nanshan, Shenzhen, Guangdong, China
Manufacturer:	Howen Technologies Co., Ltd.
Address of Manufacturer:	No. 201, 2/F, B Zone, Hivac Building, Langshan 2nd Rd., North Zone of Technology Park, Nanshan, Shenzhen, Guangdong, China
Factory:	Howen Technologies Co., Ltd.
Address of Factory:	No. 201, 2/F, B Zone, Hivac Building, Langshan 2nd Rd., North Zone of Technology Park, Nanshan, Shenzhen, Guangdong, China

6.2 General Description of EUT

Product Name:	Mobile Data Terminal
Model No.:	Hero-MDT-AT2, Hero-MDT-AT1, Hero-MDT-WT1, Hero-MDT-WT2, Hero-MDT Series
Test Model No.:	Hero-MDT-AT2
Trade Mark:	HOwen
EUT Supports Radios application	Wlan 2.4GHz 802.11b/g/n(HT20&HT40)
Power Supply:	DC 12V
Sample Received Date:	Aug. 04, 2015
Sample tested Date:	Aug. 04, 2015 to Oct. 22, 2015

6.3 Product Specification subjective to this standard

Operation Frequency:	IEEE 802.11b/g/n(HT20): 2412MHz to 2462MHz IEEE 802.11n(HT40): 2422MHz to 2452MHz
Channel Numbers:	IEEE 802.11b/g, IEEE 802.11n HT20: 11 Channels IEEE 802.11n HT40: 7 Channels
Channel Separation:	5MHz
Type of Modulation:	IEEE for 802.11b: DSSS(CCK,DQPSK,DBPSK) IEEE for 802.11g : OFDM(64QAM, 16QAM, QPSK, BPSK) IEEE for 802.11n(HT20 and HT40) : OFDM (64QAM, 16QAM, QPSK, BPSK)
Sample Type:	Fixed productio
Antenna Type and Gain:	Type: Integral antenna Gain:0dBi
Test Voltage:	DC 12V

Operation Frequency each of channel(802.11b/g/n HT20)							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2412MHz	4	2427MHz	7	2442MHz	10	2457MHz
2	2417MHz	5	2432MHz	8	2447MHz	11	2462MHz
3	2422MHz	6	2437MHz	9	2452MHz		

Operation Frequency each of channel(802.11n HT40)					
Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2422MHz	4	2437MHz	7	2452MHz
2	2427MHz	5	2442MHz		
3	2432MHz	6	2447MHz		

6.4 Description of Support Units

The EUT has been tested independently.

6.5 Test Location

All tests were performed at:

Centre Testing International Group Co., Ltd.

Hongwei Industrial Zone, Bao'an 70 District, Shenzhen, Guangdong, China518101

Telephone: +86 (0) 755 3368 3668 Fax:+86 (0) 755 3368 3385

No tests were sub-contracted.

6.6 Test Facility

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

CNAS-Lab Code: L1910

Centre Testing International Group Co., Ltd.has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories..

A2LA-Lab Cert. No. 3061.01

Centre Testing International Group Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

FCC-Registration No.: 565659

Centre Testing International Group 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 565659.

IC-Registration No.: 7408A

The 3m Alternate Test Site of Centre Testing International Group Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 7408A .

IC-Registration No.: 7408B

The 10m Alternate Test Site of Centre Testing International Group Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 7408B.

NEMKO-Aut. No.: ELA503

Centre Testing International Group Co., Ltd. has been assessed the quality assurance system, the testing facilities, qualifications and testing practices of the relevant parts of the organization. The quality assurance system of the Laboratory has been validated against ISO/IEC 17025 or equivalent. The laboratory also fulfils the conditions described in Nemko Document NLA-10.

VCCI

The Radiation 3 &10 meters site of Centre Testing International Group Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-4096.

Main Ports Conducted Interference Measurement of Centre Testing International Group Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: C-4563.

Telecommunication Ports Conducted Disturbance Measurement of Centre Testing International Group Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: T-2146.

The Radiation 3 meters site of Centre Testing International Group Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-758

6.7 Deviation from Standards

None.

6.8 Abnormalities from Standard Conditions

None.

6.9 Other Information Requested by the Customer

None.

6.10 MeasurementUncertainty(95% confidence levels, k=2)

No.	Item	Measurement Uncertainty
1	Radio Frequency	7.9×10^{-8}
2	RF power, conducted	0.31dB (30MHz-1GHz)
		0.57dB(1GHz-18GHz)
3	Radiated Spurious emission test	4.5dB (30MHz-1GHz)
		4.8dB(1GHz-12.75GHz)
4	Conduction emission	3.6dB (9kHz to 150kHz)
		3.2dB (150kHz to 30MHz)
5	Temperature test	0.64°C
6	Humidity test	2.8%
7	DC power voltages	0.025%

7 Equipment List

RF test system					
Equipment	**Manufacturer**	**Mode No.**	**Serial Number**	**Cal. Date (mm-dd-yyyy)**	**Cal. Due date (mm-dd-yyyy)**
Signal Generator	Keysight	E8257D	MY53401106	04-14-2015	04-13-2016
Communication test set test set	Agilent	N4010A	MY47230124	04-02-2015	04-01-2016
Spectrum Analyzer	Keysight	N9010A	MY54510339	04-01-2015	03-31-2016
Attenuator	HuaXiang	SHX370	15040701	04-01-2015	03-31-2016
Signal Generator	Keysight	N5182B	MY53051549	03-31-2015	03-30-2016
High-pass filter(3-18GHz)	Sinoscite	FL3CX03WG18 NM12-0398-002	---	01-13-2015	01-12-2016
High-pass filter(5-18GHz)	MICRO-TRONICS	SPA-F-63029-4	---	01-13-2015	01-12-2016
band rejection filter (GSM900)	Sinoscite	FL5CX01CA09C L12-0395-001	---	01-13-2015	01-12-2016
band rejection filter (GSM850)	Sinoscite	FL5CX01CA08C L12-0393-001	---	01-13-2015	01-12-2016
band rejection filter (GSM1800)	Sinoscite	FL5CX02CA04C L12-0396-002	---	01-13-2015	01-12-2016
band rejection filter (GSM1900)	Sinoscite	FL5CX02CA03C L12-0394-001	---	01-13-2015	01-12-2016
DC Power	Keysight	E3642A	MY54436035	03-31-2015	03-30-2016
PC-1	Lenovo	R4960d	---	04-01-2015	03-31-2016
BT&WI-FI Automatic control	R&S	OSPB157	101374	04-01-2015	03-31-2016
RF control unit	JS Tonscend	JS0806-2	2015860006	04-01-2015	03-31-2016
BT&WI-FI Automatic test software	JS Tonscend	JSTS1120-2	---	04-01-2015	03-31-2016

3M Semi/full-anechoic Chamber					
Equipment	**Manufacturer**	**Mode No.**	**Serial Number**	**Cal. date (mm-dd-yyyy)**	**Cal. Due date (mm-dd-yyyy)**
3M Chamber	TDK	SAC-3	---	06-02-2013	06-01-2016
TRILOG Broadband Antenna	schwarzbeck	VULB9163	9163-617	07-13-2015	07-29-2016
Microwave Preamplifier	Agilent	8449B	3008A02425	02-05-2015	02-04-2016
Horn Antenna	ETS-LINDGREN	3117	00057410	06-30-2015	06-28-2018
Loop Antenna	ETS	6502	00071730	07-30-2015	07-28-2017
Spectrum Analyzer	R&S	FSP40	100416	06-30-2015	06-28-2016
Receiver	R&S	ESCI	100435	06-30-2015	06-28-2016
Multi device Controller	maturo	NCD/070/10711112	---	01-13-2015	01-12-2016
LISN	schwarzbeck	NNBM8125	81251547	06-30-2015	06-28-2016
LISN	schwarzbeck	NNBM8125	81251548	06-30-2015	06-28-2016
Signal Generator	Agilent	E4438C	MY45095744	04-19-2015	04-18-2016
Signal Generator	Keysight	E8257D	MY53401106	04-14-2015	04-13-2016
Temperature/ Humidity Indicator	TAYLOR	1451	1905	07-08-2015	07-06-2016
Communication test set	Agilent	E5515C	GB47050533	01-13-2015	01-12-2016
Cable line	Fulai(7M)	SF106	5219/6A	01-13-2015	01-12-2016
Cable line	Fulai(6M)	SF106	5220/6A	01-13-2015	01-12-2016
Cable line	Fulai(3M)	SF106	5216/6A	01-13-2015	01-12-2016
Cable line	Fulai(3M)	SF106	5217/6A	01-13-2015	01-12-2016
Communication test set	R&S	CMW500	152394	04-19-2015	04-18-2016
High-pass filter(3-18GHz)	Sinoscite	FL3CX03WG18NM 12-0398-002	---	01-13-2015	01-12-2016
High-pass filter(5-18GHz)	MICRO-TRONICS	SPA-F-63029-4	---	01-13-2015	01-12-2016
band rejection filter	Sinoscite	FL5CX01CA09CL1 2-0395-001	---	01-13-2015	01-12-2016
band rejection filter	Sinoscite	FL5CX01CA08CL1 2-0393-001	---	01-13-2015	01-12-2016
band rejection filter	Sinoscite	FL5CX02CA04CL1 2-0396-002	---	01-13-2015	01-12-2016
band rejection filter	Sinoscite	FL5CX02CA03CL1 2-0394-001	---	01-13-2015	01-12-2016

8 Radio Technical Requirements Specification

Reference documents for testing:

No.	Identity	Document Title
1	FCC Part15C (2014)	Subpart C-Intentional Radiators
2	ANSI C63.10-2013	American National Standard for Testing Unlicesed Wireless Devices

Test Results List:

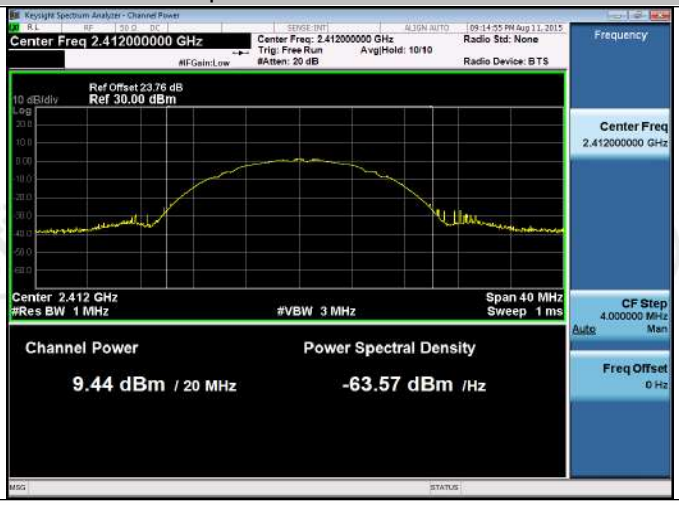
Test Requirement	Test method	Test item	Verdict	Note
Part15C Section 15.247 (b)(3)	ANSI C63.10	Conducted Peak Output Power	PASS	Appendix A)
Part15C Section 15.247 (a)(2)	ANSI C63.10	6dB Occupied Bandwidth	PASS	Appendix B)
Part15C Section 15.247(d)	ANSI C63.10	Band-edge for RF Conducted Emissions	PASS	Appendix C)
Part15C Section 15.247(d)	ANSI C63.10	RF Conducted Spurious Emissions	PASS	Appendix D)
Part15C Section 15.247 (e)	ANSI C63.10	Power Spectral Density	PASS	Appendix E)
Part15C Section 15.203/15.247 (c)	ANSI C63.10	Antenna Requirement	PASS	Appendix F)
Part15C Section 15.207	ANSI C63.10	AC Power Line Conducted Emission	PASS	N/A
Part15C Section 15.205/15.209	ANSI C63.10	Restricted bands around fundamental frequency (Radiated Emission)	PASS	Appendix G)
Part15C Section 15.205/15.209	ANSI C63.10	Radiated Spurious Emissions	PASS	Appendix G)

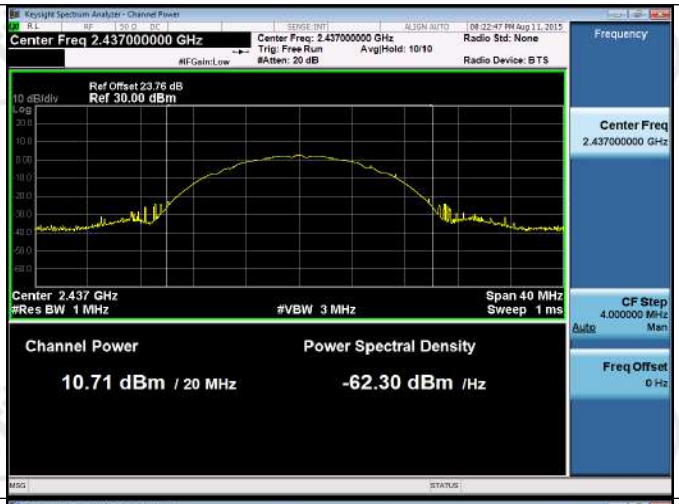
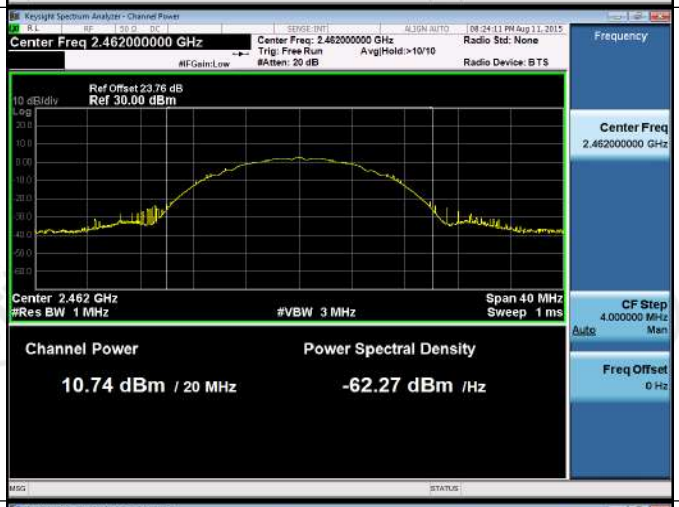
Appendix A) Conducted Peak Output Power

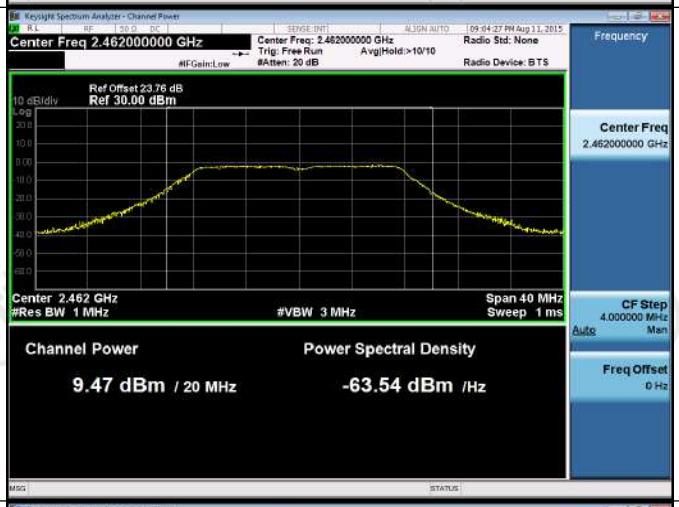
Result Table

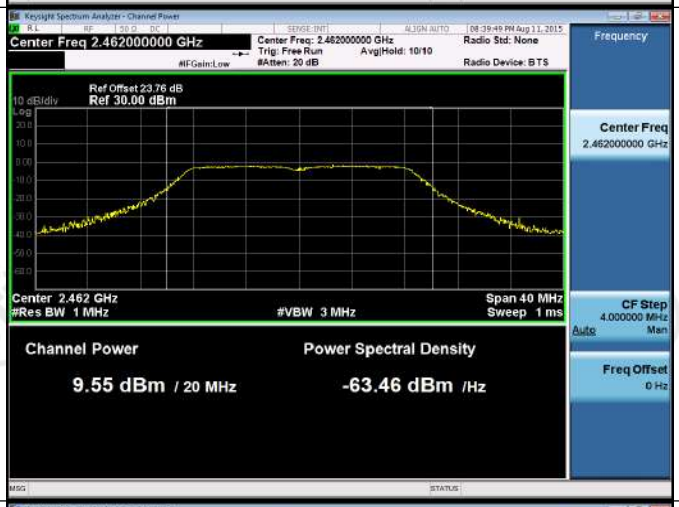
Mode	Channel	Conducted Peak Output Power [dBm]	Verdict
11B	LCH	9.44	PASS
11B	MCH	10.71	PASS
11B	HCH	10.74	PASS
11G	LCH	8.29	PASS
11G	MCH	9.11	PASS
11G	HCH	9.47	PASS
11N20SISO	LCH	8.16	PASS
11N20SISO	MCH	9.13	PASS
11N20SISO	HCH	9.55	PASS
11N40SISO	LCH	8.58	PASS
11N40SISO	MCH	9.01	PASS
11N40SISO	HCH	9.36	PASS

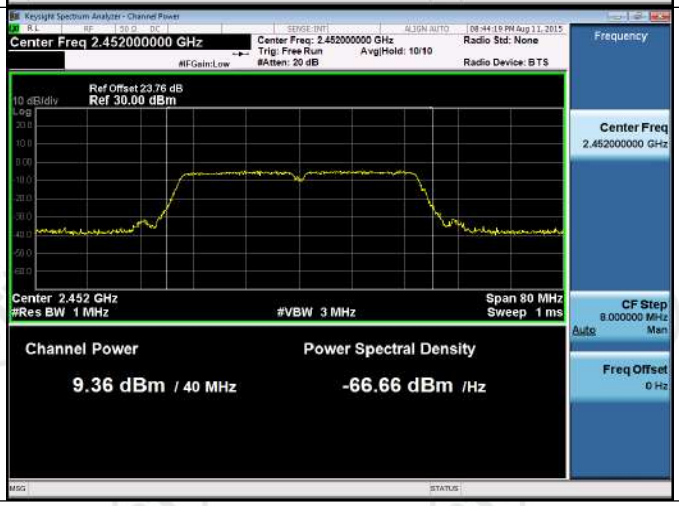
Test Graph

Graphs			
11B/LCH			

11B/MCH		
11B/HCH		
11G/LCH		

11G/MCH			
11G/HCH			
11N20SISO/LCH			

11N20SISO/MCH		
11N20SISO/HCH		
11N40SISO/LCH		

11N40SISO/MCH		
11N40SISO/HCH		

Appendix B) 6dB Occupied Bandwidth

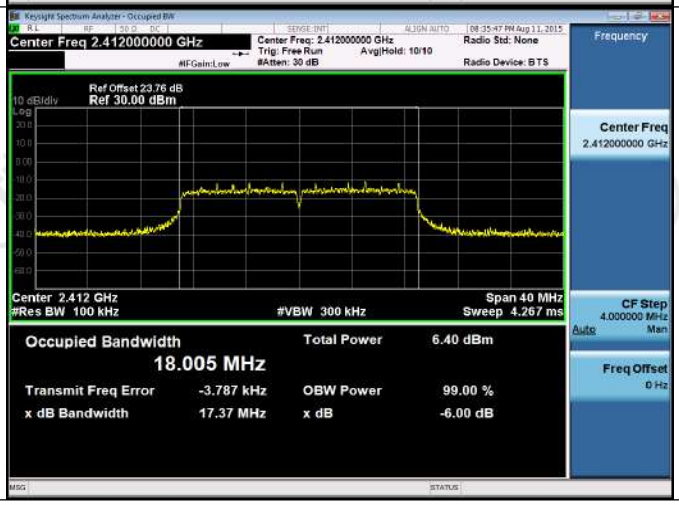
Result Table

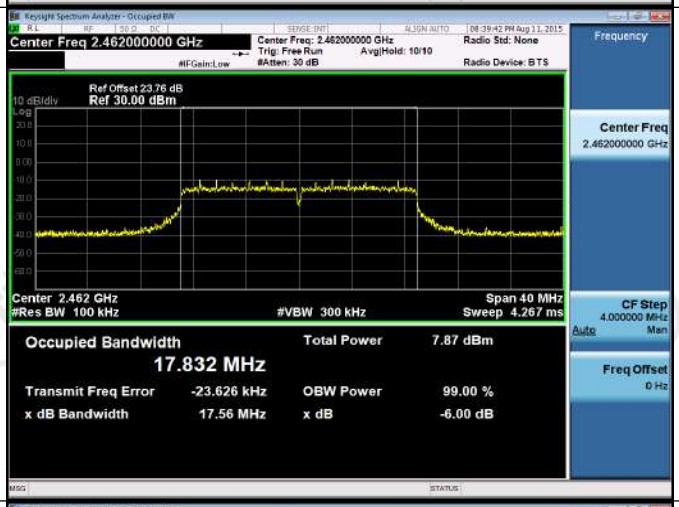
Mode	Channel	6dB Bandwidth [MHz]	99% OBW [MHz]	Verdict
11B	LCH	10.07	15.174	PASS
11B	MCH	10.07	15.069	PASS
11B	HCH	10.07	15.089	PASS
11G	LCH	16.35	17.074	PASS
11G	MCH	16.36	16.983	PASS
11G	HCH	16.34	16.925	PASS
11N20SISO	LCH	17.37	18.005	PASS
11N20SISO	MCH	17.55	17.865	PASS
11N20SISO	HCH	17.56	17.832	PASS
11N40SISO	LCH	35.45	37.621	PASS
11N40SISO	MCH	35.46	36.959	PASS
11N40SISO	HCH	35.36	36.594	PASS

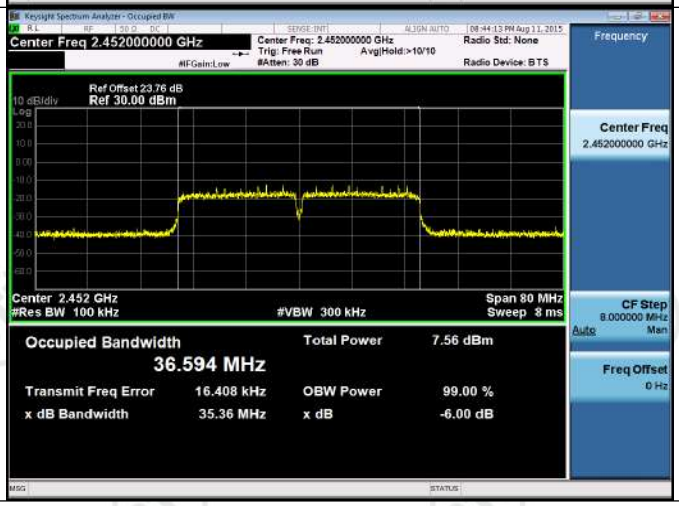
Test Graph

Graphs	
11B/LCH	

11B/MCH			
11B/HCH			
11G/LCH			

11G/MCH			
11G/HCH			
11N20SISO/LCH			

11N20SISO/MCH			
11N20SISO/HCH			
11N40SISO/LCH			

11N40SISO/MCH			
11N40SISO/HCH			

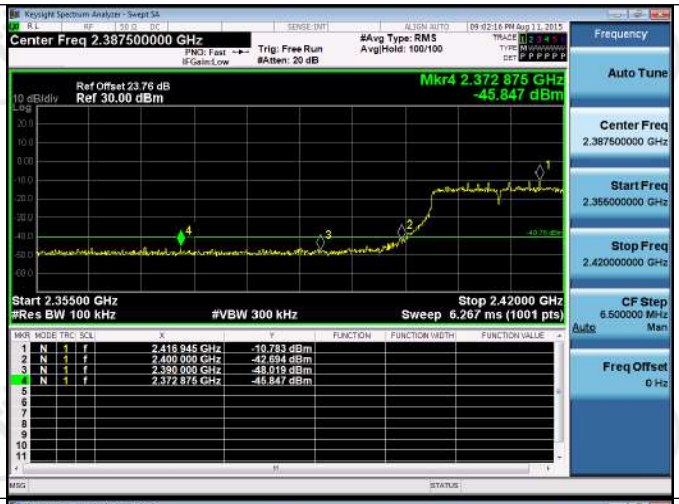
Appendix C) Band-edge for RF Conducted Emissions

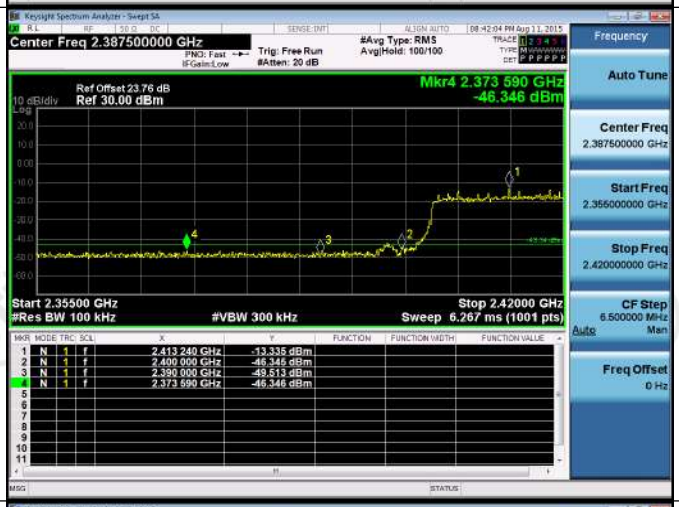
Result Table

Mode	Channel	Carrier Power[dBm]	Max.Spurious Level [dBm]	Limit [dBm]	Verdict
11B	LCH	-1.965	-45.741	-31.97	PASS
11B	HCH	-1.766	-46.205	-31.77	PASS
11G	LCH	-10.783	-45.847	-40.78	PASS
11G	HCH	-9.566	-45.807	-39.57	PASS
11N20SISO	LCH	-11.050	-45.815	-41.05	PASS
11N20SISO	HCH	-9.408	-45.350	-39.41	PASS
11N40SISO	LCH	-13.335	-46.346	-43.34	PASS
11N40SISO	HCH	-12.374	-45.878	-42.37	PASS

Test Graph

Graphs		
11B/LCH		
11B/HCH		

11G/LCH			
11G/HCH			
11N20SISO/LCH			

11N20SISO/HCH			
11N40SISO/LCH			
11N40SISO/HCH			

Appendix D) RF Conducted Spurious Emissions

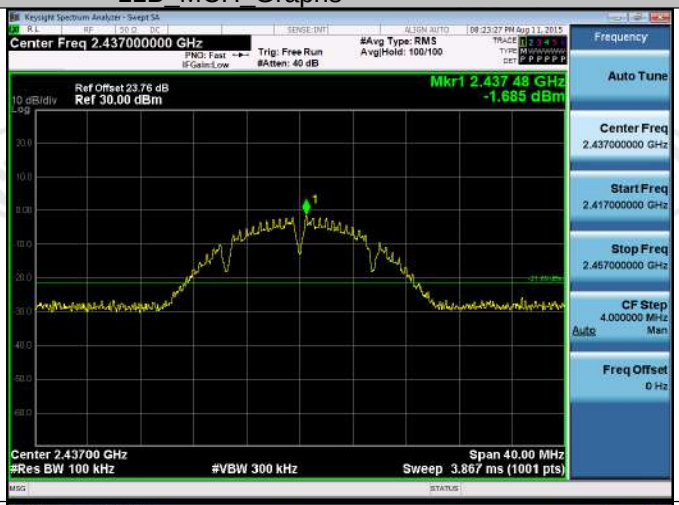
Result Table

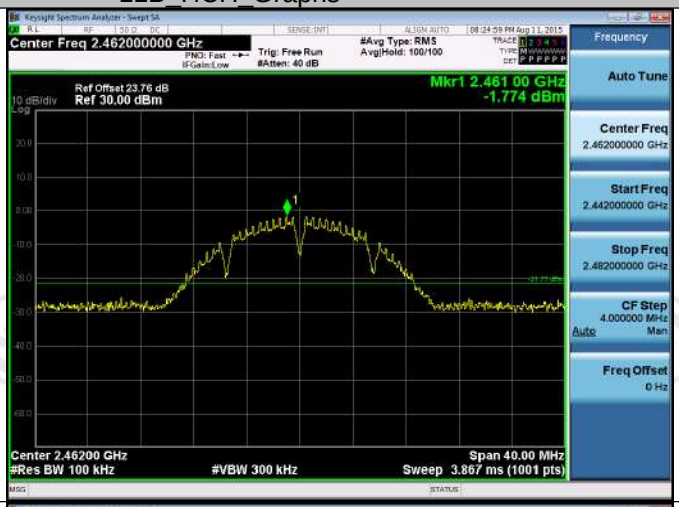
Mode	Channel	Pref [dBm]	Puw[dBm]	Verdict
11B	LCH	-2.295	<Limit	PASS
11B	MCH	-1.685	<Limit	PASS
11B	HCH	-1.774	<Limit	PASS
11G	LCH	-10.541	<Limit	PASS
11G	MCH	-9.789	<Limit	PASS
11G	HCH	-9.971	<Limit	PASS
11N20SISO	LCH	-10.752	<Limit	PASS
11N20SISO	MCH	-9.589	<Limit	PASS
11N20SISO	HCH	-9.505	<Limit	PASS
11N40SISO	LCH	-13.053	<Limit	PASS
11N40SISO	MCH	-12.802	<Limit	PASS
11N40SISO	HCH	-11.697	<Limit	PASS

Test Graph

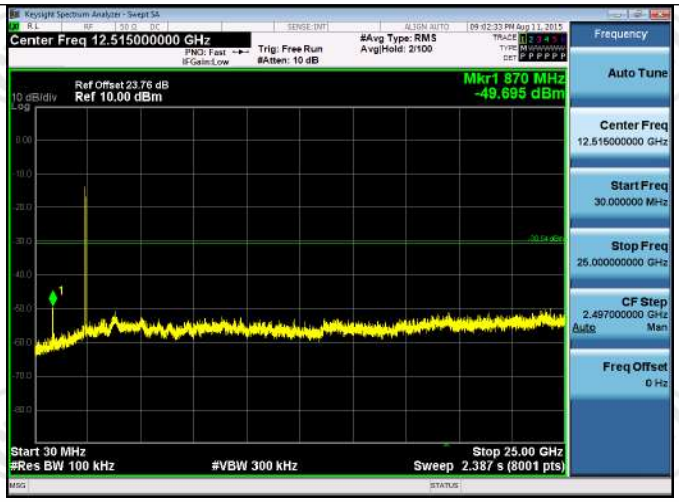
11B_LCH_Graphs		
Pref/11B/LCH		

Puw/11B/LCH	

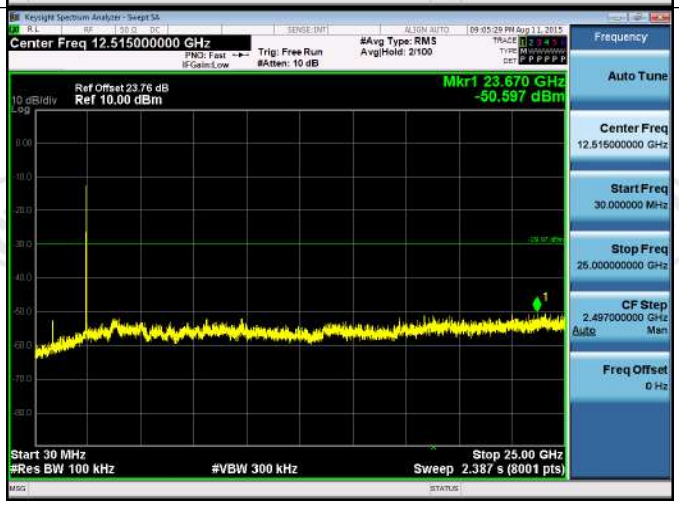
11B_MCH_Graphs	
Pref/11B/MCH	
Puw/11B/MCH	

11B_HCH_Graphs	
Pref/11B/HCH	
Puw/11B/HCH	

11G_LCH_Graphs	
Pref/11G/LCH	

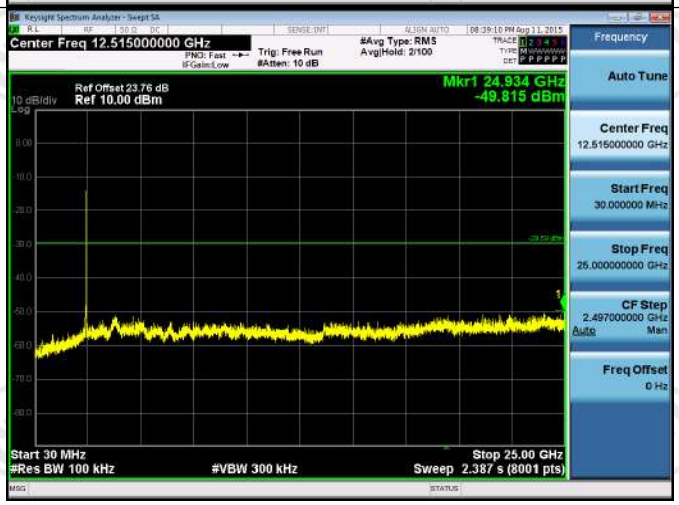
Puw/11G/LCH	

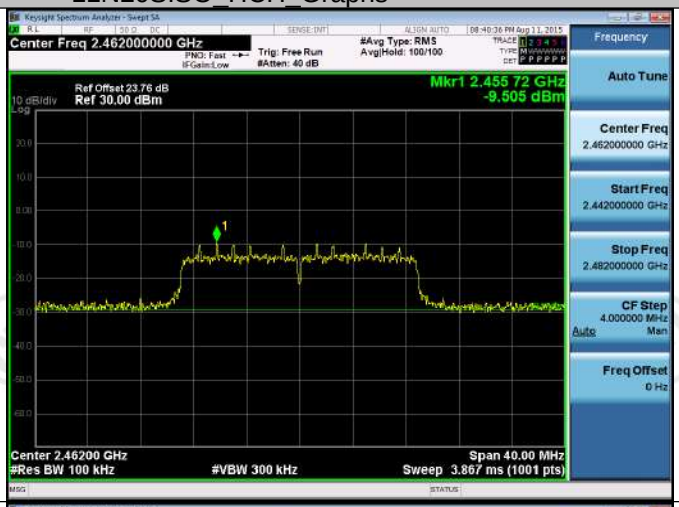
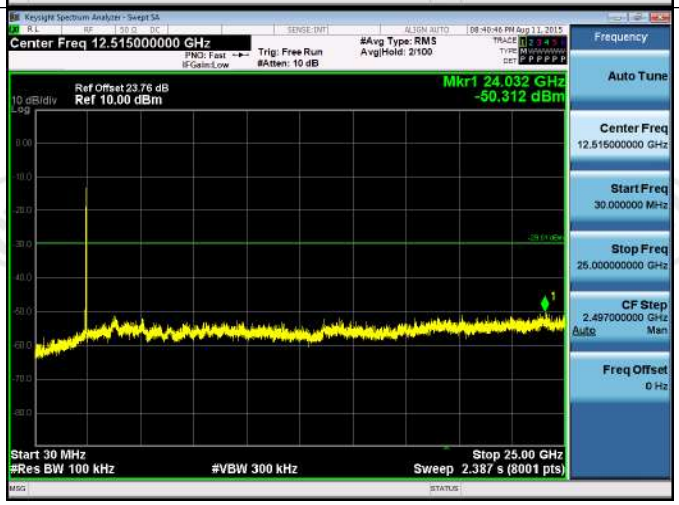
11G_MCH_Graphs	
Pref/11G/MCH	
Puw/11G/MCH	

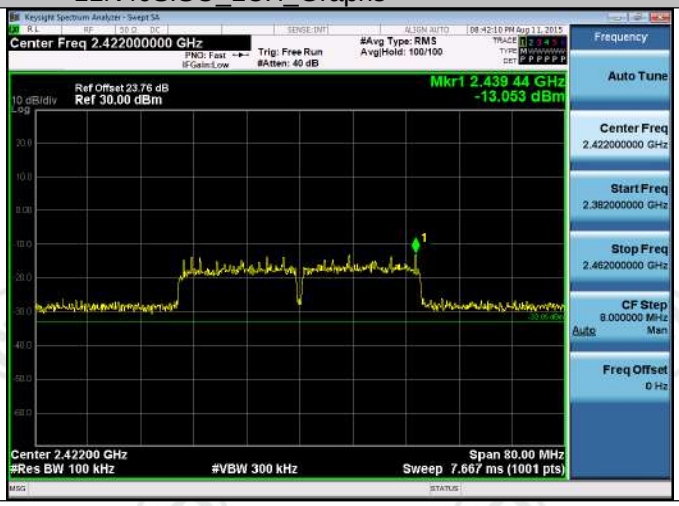
11G_HCH_Graphs	
Pref/11G/HCH	
Puw/11G/HCH	

11N20SISO_LCH_Graphs	
Pref/11N20SISO/LCH	

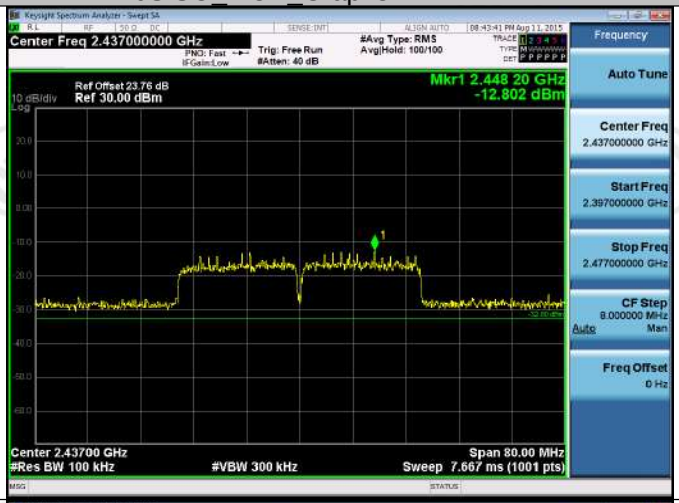
/11N20SISO/LCH	

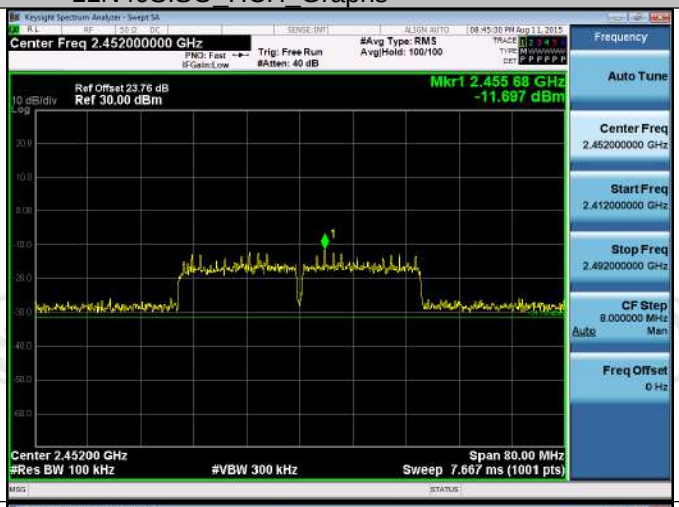
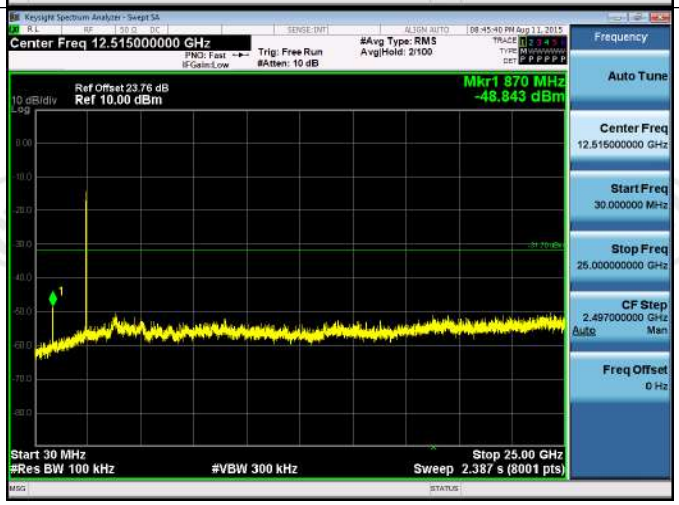
11N20SISO_MCH_Graphs	
Pref/11N20SISO/MCH	
Puw/11N20SISO/MCH	

11N20SISO_HCH_Graphs	
Pref/11N20SISO/HCH	
Puw/11N20SISO/HCH	

11N40SISO_LCH_Graphs	
Pref/11N40SISO/LCH	

Puw/11N40SISO/LCH	

11N40SISO_MCH_Graphs	
Pref/11N40SISO/MCH	
Puw/11N40SISO/MCH	

11N40SISO_HCH_Graphs		
Pref/11N40SISO/HCH		
Puw/11N40SISO/HCH		

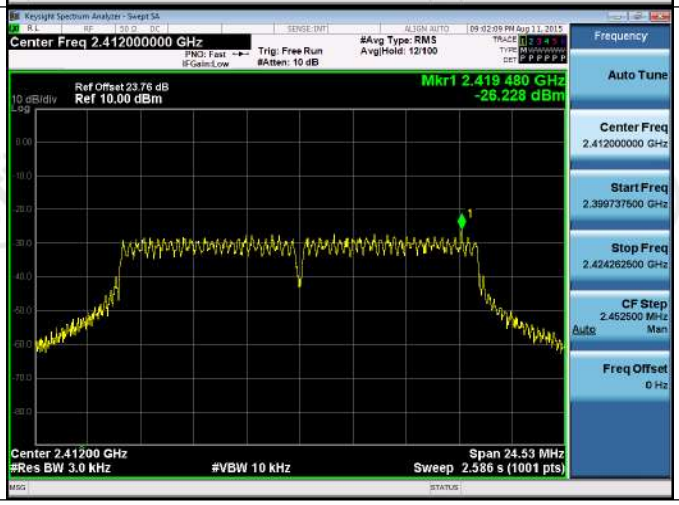
Appendix E) Power Spectral Density

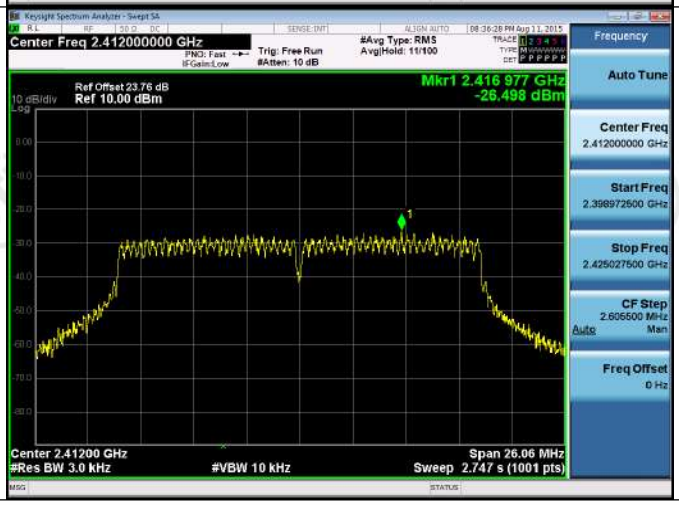
Result Table

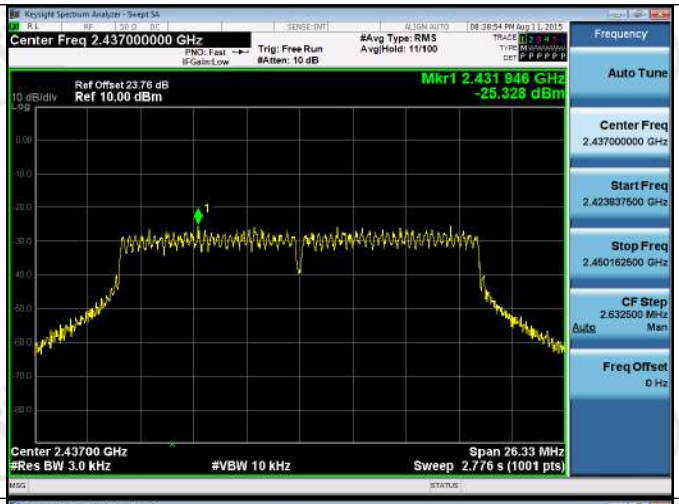
Mode	Channel	Power Spectral Density [dBm]	Verdict
11B	LCH	-11.759	PASS
11B	MCH	-9.536	PASS
11B	HCH	-7.995	PASS
11G	LCH	-26.228	PASS
11G	MCH	-25.436	PASS
11G	HCH	-25.199	PASS
11N20SISO	LCH	-26.498	PASS
11N20SISO	MCH	-25.328	PASS
11N20SISO	HCH	-25.779	PASS
11N40SISO	LCH	-29.550	PASS
11N40SISO	MCH	-28.420	PASS
11N40SISO	HCH	-27.766	PASS

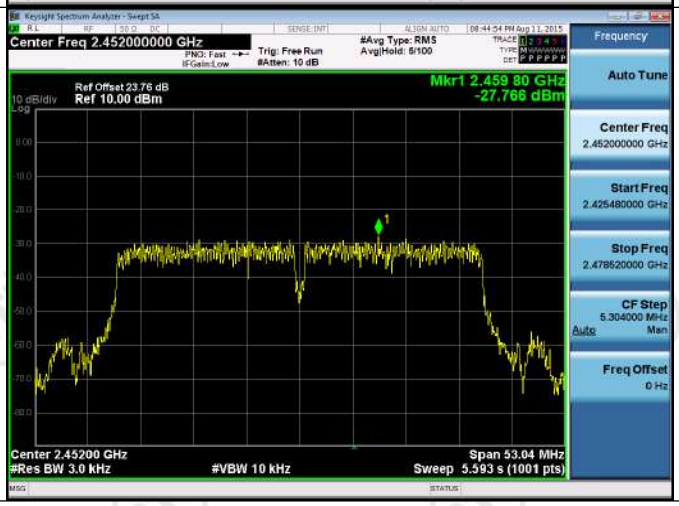
Test Graph

Graphs		
11B/LCH		

11B/MCH		
11B/HCH		
11G/LCH		

11G/MCH		
11G/HCH		
11N20SISO/LCH		

11N20SISO/MCH			
11N20SISO/HCH			
11N40SISO/LCH			

11N40SISO/MCH			
11N40SISO/HCH			

Appendix F) Antenna Requirement

15.203 requirement:

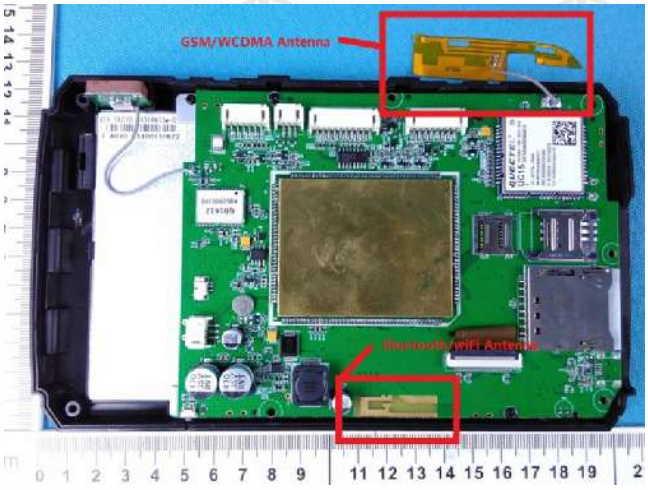
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit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

15.247(b) (4) requirement:

The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

EUT Antenna:	

The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 0dBi.



Appendix G) Restricted bands around fundamental frequency (Radiated)/Radiated Spurious Emissions

Receiver Setup:

Frequency	Detector	RBW	VBW	Remark
0.009MHz-0.090MHz	Peak	10kHz	30kHz	Peak
0.009MHz-0.090MHz	Average	10kHz	30kHz	Average
0.090MHz-0.110MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
0.110MHz-0.490MHz	Peak	10kHz	30kHz	Peak
0.110MHz-0.490MHz	Average	10kHz	30kHz	Average
0.490MHz -30MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
30MHz-1GHz	Quasi-peak	100 kHz	300kHz	Quasi-peak
Above 1GHz	Peak	1MHz	3MHz	Peak
	Peak	1MHz	10Hz	Average

Test Procedure:

Below 1GHz test procedure as below:

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.
b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

Above 1GHz test procedure as below:

g. Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber and change form table 0.8 metre to 1.5 metre(Above 18GHz the distance is 1 meter and table is 1.5 metre)..
h. Test the EUT in the lowest channel ,the middle channel ,the Highest channel
i. Repeat above procedures until all frequencies measured was complete.

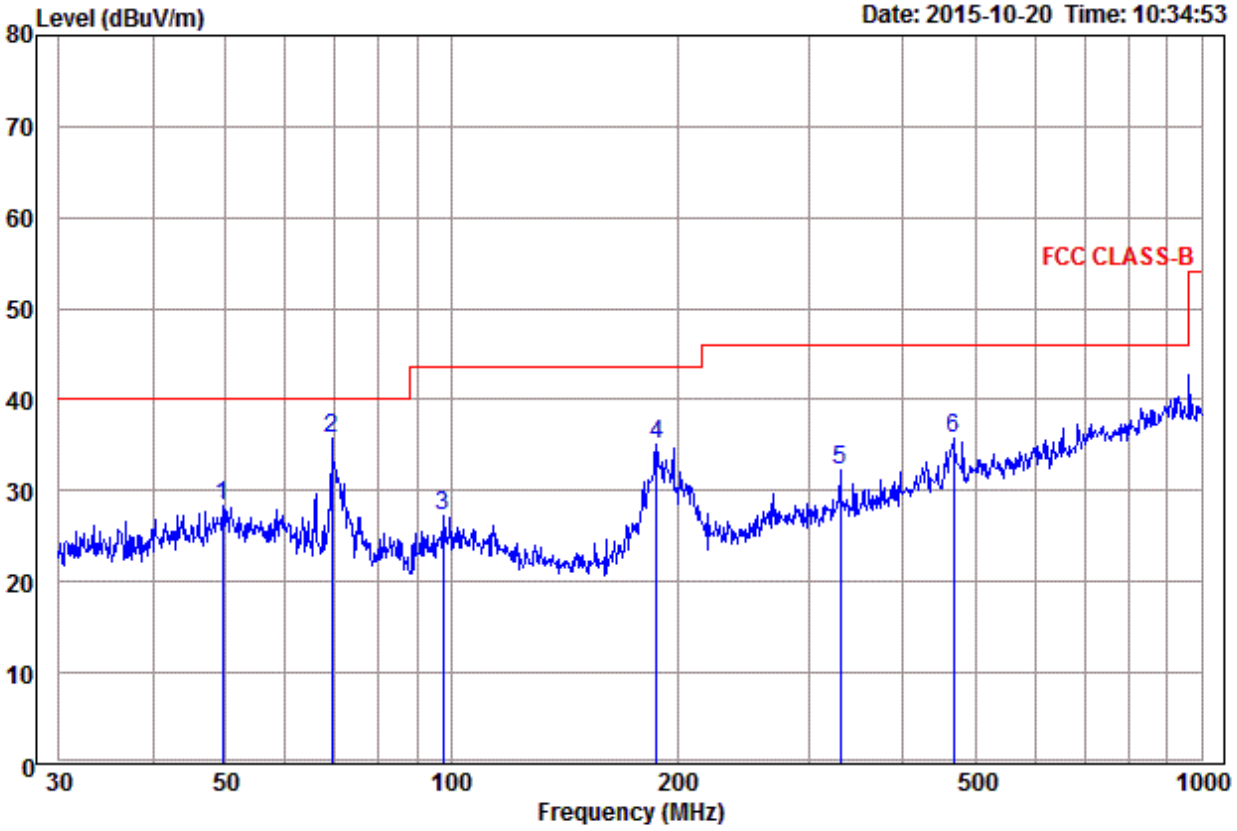
Limit:

Frequency	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)
0.009MHz-0.490MHz	2400/F(kHz)	-	-	300
0.490MHz-1.705MHz	24000/F(kHz)	-	-	30
1.705MHz-30MHz	30	-	-	30
30MHz-88MHz	100	40.0	Quasi-peak	3
88MHz-216MHz	150	43.5	Quasi-peak	3
216MHz-960MHz	200	46.0	Quasi-peak	3
960MHz-1GHz	500	54.0	Quasi-peak	3
Above 1GHz	500	54.0	Average	3

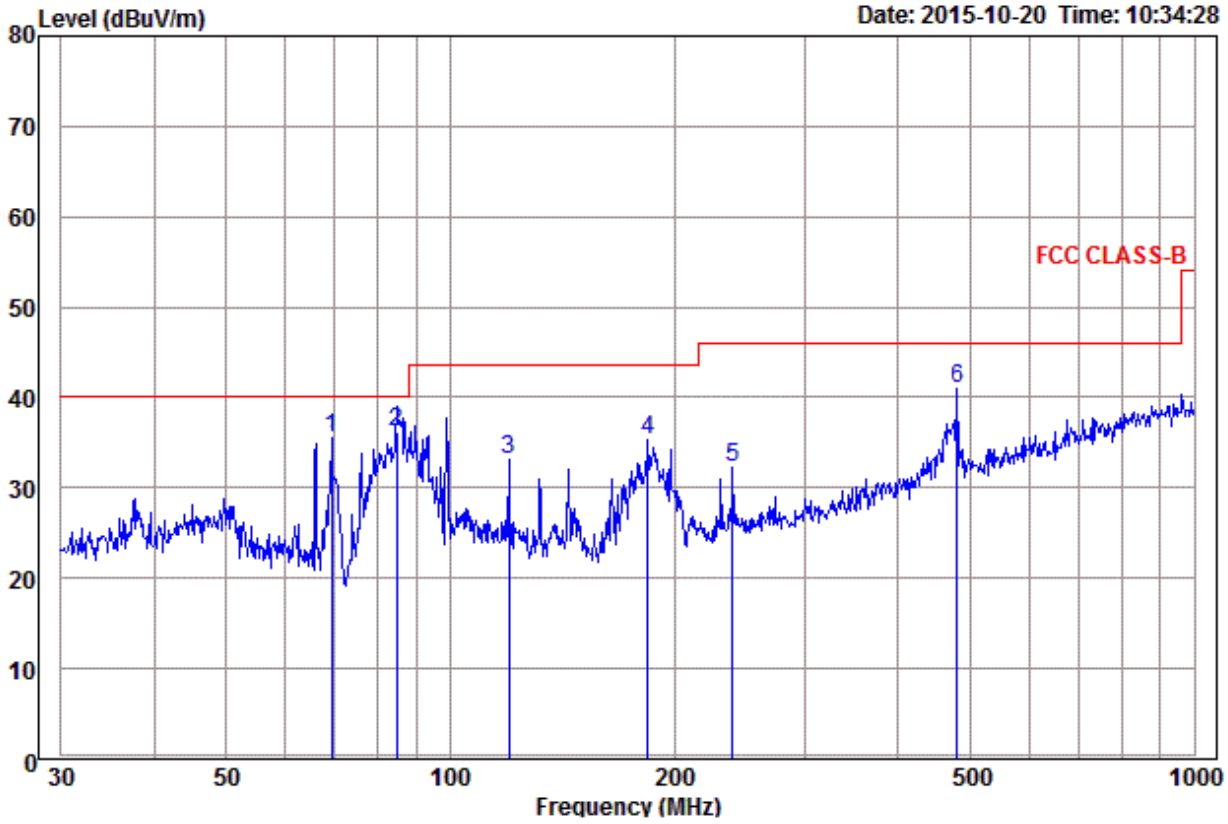
Note: 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.

Radiated Spurious Emissions test Data:

Radiated Emission below 1GHz



	Freq	Ant Factor	Cable Loss	Read Level	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		
1	49.53	15.06	1.36	11.85	28.27	40.00	-11.73	Horizontal	
2 pp	69.36	10.60	1.45	23.64	35.69	40.00	-4.31	Horizontal	
3	97.46	12.71	1.57	12.96	27.24	43.50	-16.26	Horizontal	
4	187.75	11.18	2.07	21.82	35.07	43.50	-8.43	Horizontal	
5	330.19	14.31	2.59	15.28	32.18	46.00	-13.82	Horizontal	
6	467.24	17.56	3.04	15.20	35.80	46.00	-10.20	Horizontal	



	Freq	Ant Factor	Cable Loss	Read Level	Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		
1	69.36	10.60	1.45	23.48	35.53	40.00	-4.47	Vertical	
2 pp	84.70	9.86	1.58	24.68	36.12	40.00	-3.88	Vertical	
3	119.86	11.64	1.57	19.82	33.03	43.50	-10.47	Vertical	
4	184.49	11.07	2.03	22.23	35.33	43.50	-8.17	Vertical	
5	239.99	12.25	2.32	17.65	32.22	46.00	-13.78	Vertical	
6	480.53	17.91	3.08	20.03	41.02	46.00	-4.98	Vertical	

Transmitter Emission above 1GHz

Test mode:	802.11b	Test channel:	Lowest	Remark:	Peak

Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level(dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis
2390.00	150	51	46.21	74	-27.79	Pass	H
4824.00	150	23	52.43	74	-21.57	Pass	H
7236.00	150	121	53.11	74	-20.89	Pass	H
8134.21	150	306	52.13	74	-21.87	Pass	H
2390.00	150	61	47.12	74	-26.88	Pass	V
4824.00	150	91	51.47	74	-22.53	Pass	V
7236.00	150	57	50.82	74	-23.18	Pass	V
8351.32	150	162	52.71	74	-21.29	Pass	V

Test mode:	802.11b	Test channel:	Middle	Remark:	Average

Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level(dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis
4874.00	150	62	52.91	74	-21.09	Pass	H
7311.00	150	129	53.13	74	-20.87	Pass	H
8134.76	150	92	52.98	74	-21.02	Pass	H
4874.00	150	115	51.02	74	-22.98	Pass	V
7311.00	150	50	52.81	74	-21.19	Pass	V
8410.51	150	82	53.06	74	-20.94	Pass	V

Test mode:	802.11b	Test channel:	Highest	Remark:	Peak

Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level(dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis
2483.50	150	42	48.72	74	-25.28	Pass	H
4924.00	150	183	51.09	74	-22.91	Pass	H
7386.00	150	216	52.11	74	-21.89	Pass	H
9137.41	150	82	52.78	74	-21.22	Pass	H
2483.50	150	38	48.94	74	-25.06	Pass	V
4924.00	150	52	52.18	74	-21.82	Pass	V
7386.00	150	162	52.89	74	-21.11	Pass	V
8917.23	150	218	53.1	74	-20.90	Pass	V

Test mode:	802.11g	Test channel:	Lowest	Remark:	Average

Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level(dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis
2390.00	150	72	47.82	74	-26.18	Pass	H
4824.00	150	108	50.81	74	-23.19	Pass	H
7236.00	150	82	51.34	74	-22.66	Pass	H
7914.71	150	91	52.38	74	-21.62	Pass	H
2390.00	150	128	48.18	74	-25.82	Pass	V
4824.00	150	7	51.67	74	-22.33	Pass	V
7236.00	150	172	52.94	74	-21.06	Pass	V
8632.65	150	81	53.48	74	-20.52	Pass	V

Test mode:	802.11g	Test channel:	Middle	Remark:	Peak

Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level(dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis
4874.00	150	63	48.25	74	-25.75	Pass	H
7311.00	150	104	50.14	74	-23.86	Pass	H
8952.83	150	215	52.43	74	-21.57	Pass	H
4874.00	150	5	47.12	74	-26.88	Pass	V
7311.00	150	301	51.31	74	-22.69	Pass	V
9016.42	150	59	53.06	74	-20.94	Pass	V

Test mode:	802.11g	Test channel:	Highest	Remark:	Average

Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level(dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis
2483.50	150	43	48.32	74	-25.68	Pass	H
4924.00	150	6	51.43	74	-22.57	Pass	H
7386.00	150	251	52.18	74	-21.82	Pass	H
8967.42	150	52	52.87	74	-21.13	Pass	H
2483.50	150	26	49.11	74	-24.89	Pass	V
4924.00	150	82	50.62	74	-23.38	Pass	V
7386.00	150	5	51.25	74	-22.75	Pass	V
8167.34	150	152	52.88	74	-21.12	Pass	V

Test mode:	802.11n(HT20)	Test channel:	Lowest	Remark:	Peak

Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level(dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis
2390.00	150	46	47.27	74	-26.73	Pass	H
4824.00	150	136	50.31	74	-23.69	Pass	H
7236.00	150	6	53.24	74	-20.76	Pass	H
8932.11	150	248	53.17	74	-20.83	Pass	H
2390.00	150	52	48.03	74	-25.97	Pass	V
4824.00	150	166	49.81	74	-24.19	Pass	V
7236.00	150	48	52.15	74	-21.85	Pass	V
9056.52	150	82	52.9	74	-21.10	Pass	V

Test mode:	802.11n(HT20)	Test channel:	Middle	Remark:	Average

Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level(dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis
4874.00	150	3	50.43	74	-23.57	Pass	H
7311.00	150	315	51.82	74	-22.18	Pass	H
8834.51	150	57	52.05	74	-21.95	Pass	H
4874.00	150	102	49.82	74	-24.18	Pass	V
7311.00	150	143	50.62	74	-23.38	Pass	V
8944.31	150	188	52.33	74	-21.67	Pass	V

Test mode:	802.11n(HT20)	Test channel:	Highest	Remark:	Peak

Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level(dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis
2483.50	150	46	48.61	74	-25.39	Pass	H
4924.00	150	112	49.52	74	-24.48	Pass	H
7386.00	150	83	50.43	74	-23.57	Pass	H
8773.90	150	34	52.18	74	-21.82	Pass	H
2483.50	150	69	48.92	74	-25.08	Pass	V
4924.00	150	53	51.25	74	-22.75	Pass	V
7386.00	150	143	51.66	74	-22.34	Pass	V
8634.70	150	168	53.01	74	-20.99	Pass	V

Test mode:	802.11n(HT40)	Test channel:	Lowest	Remark:	Peak

Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level(dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis
2390.00	150	142	47.8	74	-26.20	Pass	H
4844.00	150	127	49.2	74	-24.80	Pass	H
7266.00	150	56	50.24	74	-23.76	Pass	H
8455.52	150	92	51.03	74	-22.97	Pass	H
2390.00	150	152	48.77	74	-25.23	Pass	V
4844.00	150	83	50.13	74	-23.87	Pass	V
7266.00	150	25	52.07	74	-21.93	Pass	V
8661.62	150	114	52.72	74	-21.28	Pass	V

Test mode:	802.11n(HT40)	Test channel:	Middle	Remark:	Average

Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level(dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis
4874.00	150	87	49.02	74	-24.98	Pass	H
7311.00	150	55	50.53	74	-23.47	Pass	H
8900.31	150	137	52.78	74	-21.22	Pass	H
4874.00	150	173	50.05	74	-23.95	Pass	H
7311.00	150	186	52.18	74	-21.82	Pass	V
9433.50	150	166	53.18	74	-20.82	Pass	V

Test mode:	802.11n(HT40)	Test channel:	Highest	Remark:	Peak

Frequency (MHz)	Height (cm)	Azimuth (deg)	Spurious Emission Level(dBm)	Limit (dBm)	Over Limit (dB)	Result	Antenna Polaxis
2483.50	150	53	48.89	74	-25.11	Pass	H
4904.00	150	162	50.31	74	-23.69	Pass	H
7356.00	150	188	51.29	74	-22.71	Pass	H
8562.10	150	162	52.36	74	-21.64	Pass	H
2483.50	150	182	49.08	74	-24.92	Pass	V
4904.00	150	43	51.08	74	-22.92	Pass	V
7356.00	150	74	52.68	74	-21.32	Pass	V
9902.56	150	216	53.12	74	-20.88	Pass	V

Note:

1)The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

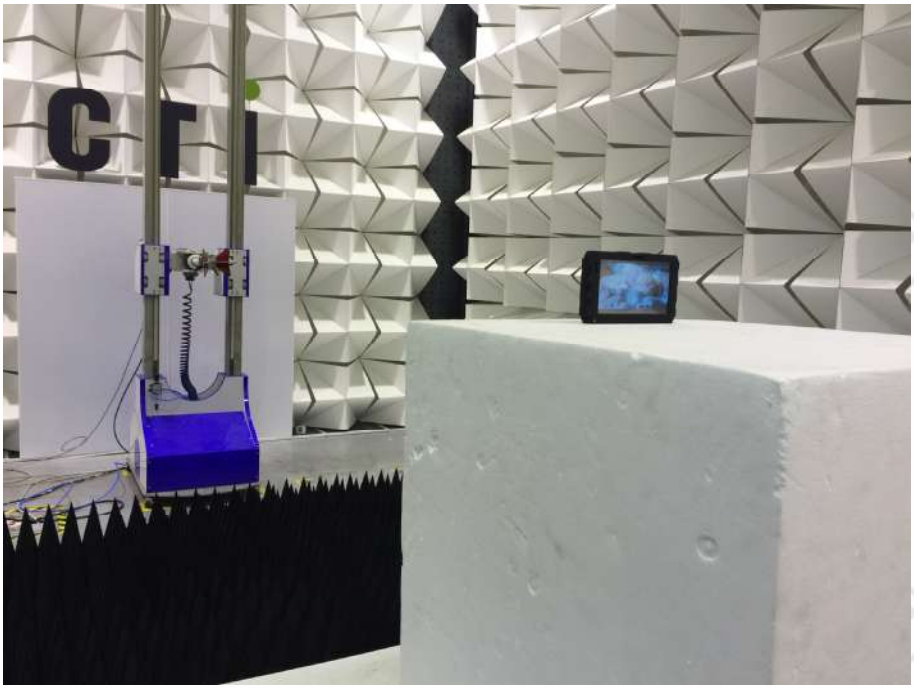
Final Test Level =Receiver Reading - Correct Factor

Correct Factor = *Preamplifier Factor– Antenna Factor–Cable Factor*

PHOTOGRAPHS OF TEST SETUP

Test mode No.: Hero-MDT-AT2

Radiated spurious emission Test Setup-1 (Below 1GHz)



Radiated spurious emission Test Setup-2(Above 1GHz)

PHOTOGRAPHS OF EUT Constructional Details

Test mode No.: Hero-MDT-AT2

View of Product-1

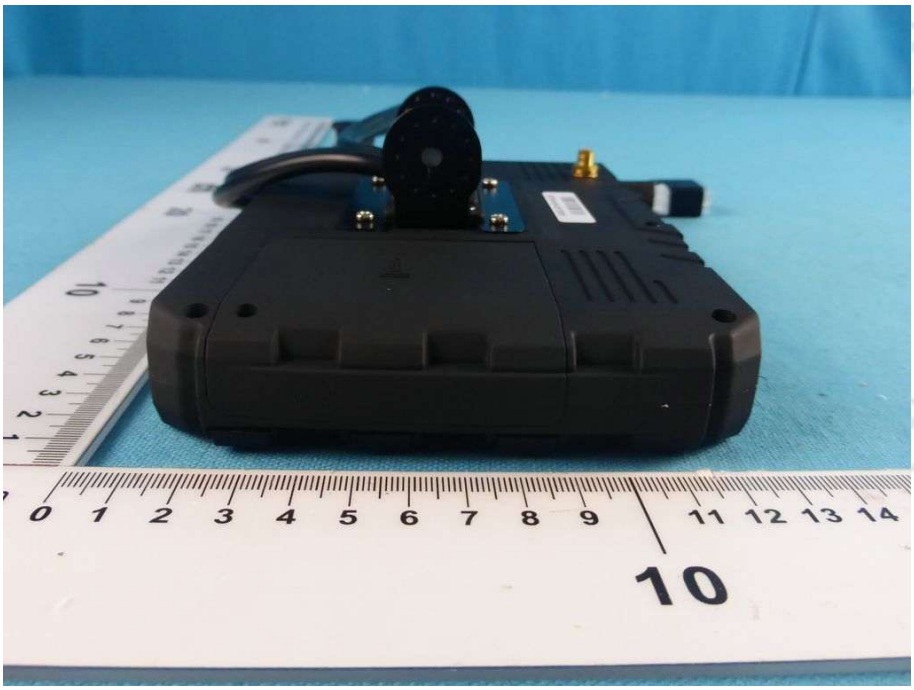
View of Product-2

View of Product-3

View of Product-4

View of Product-5

View of Product-6



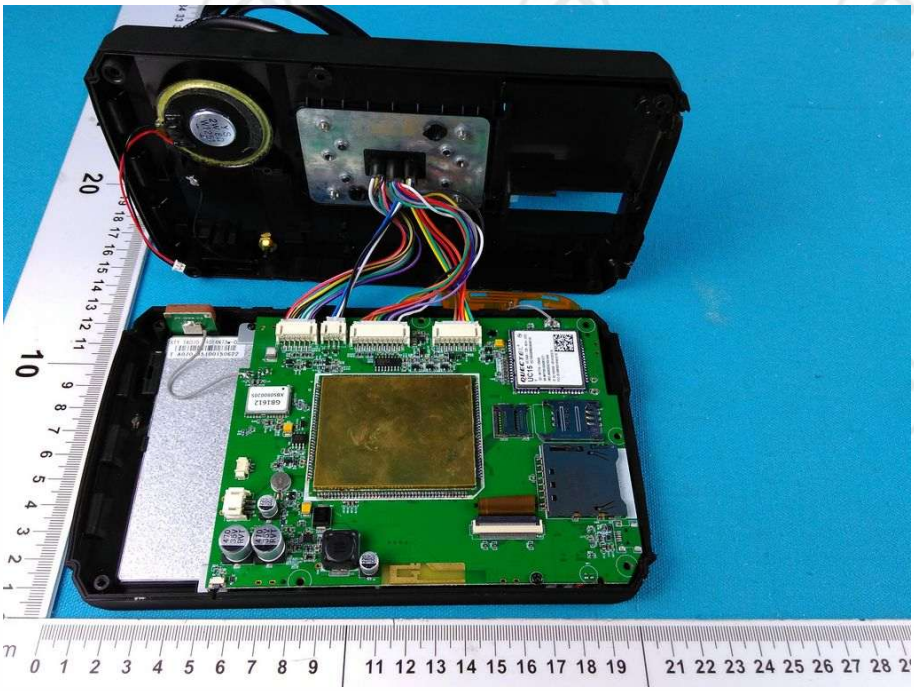
View of Product-7

View of Product-8

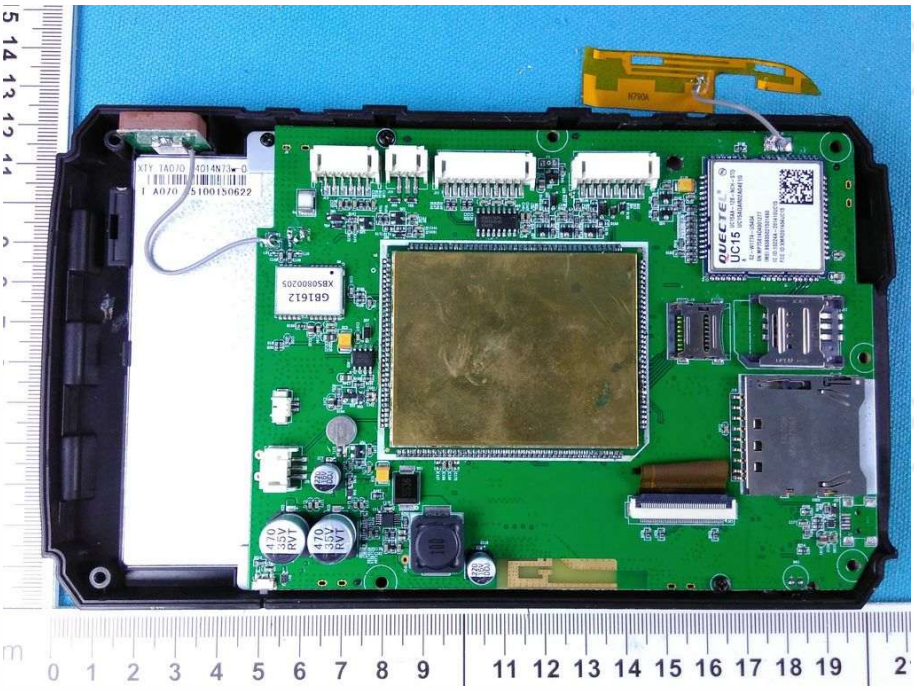
View of Product-9

View of Product-10

View of Product-11

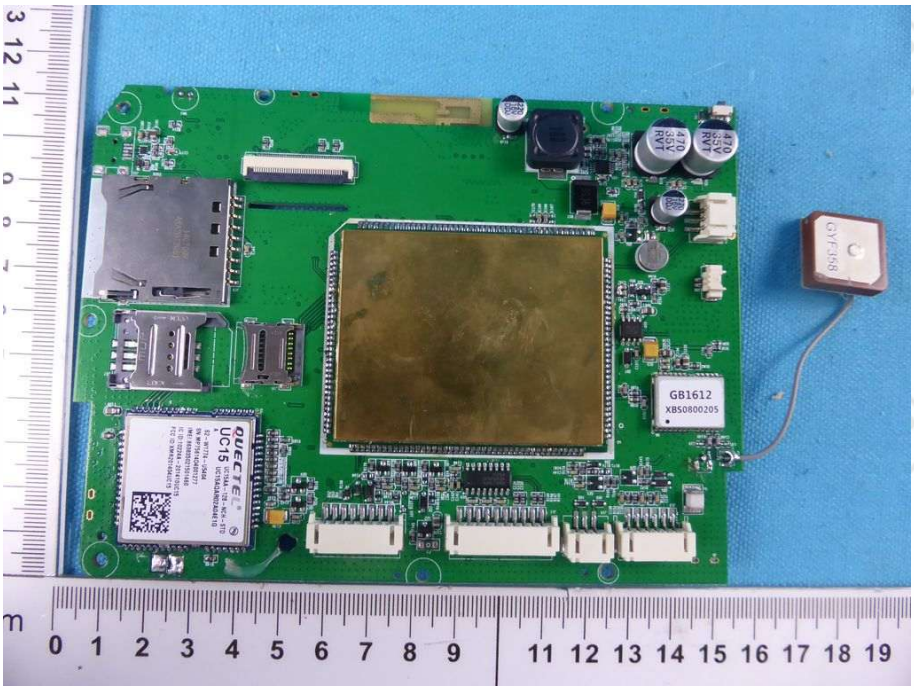


View of Product-12

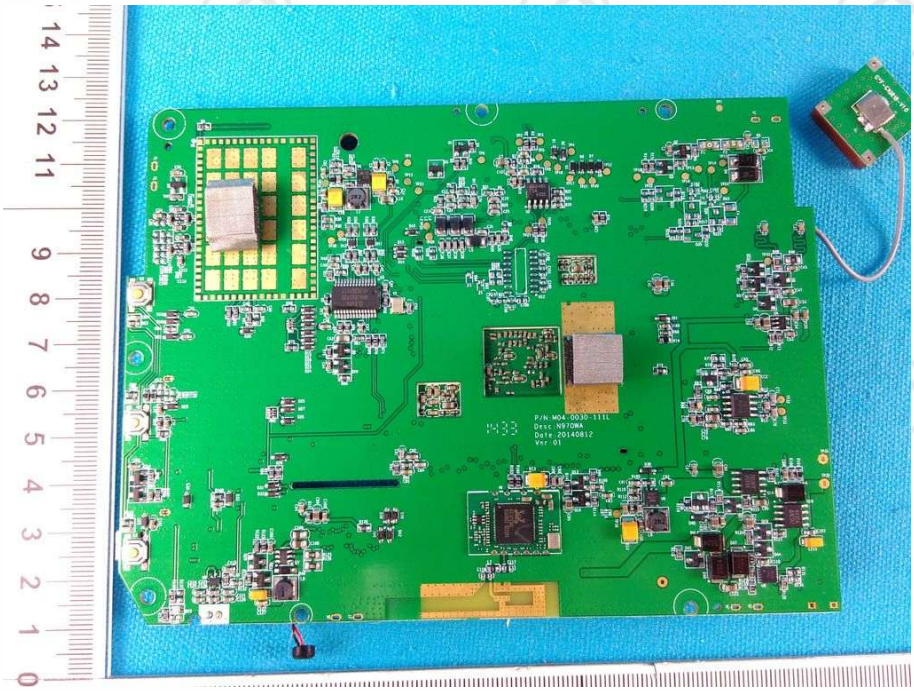


View of Product-13

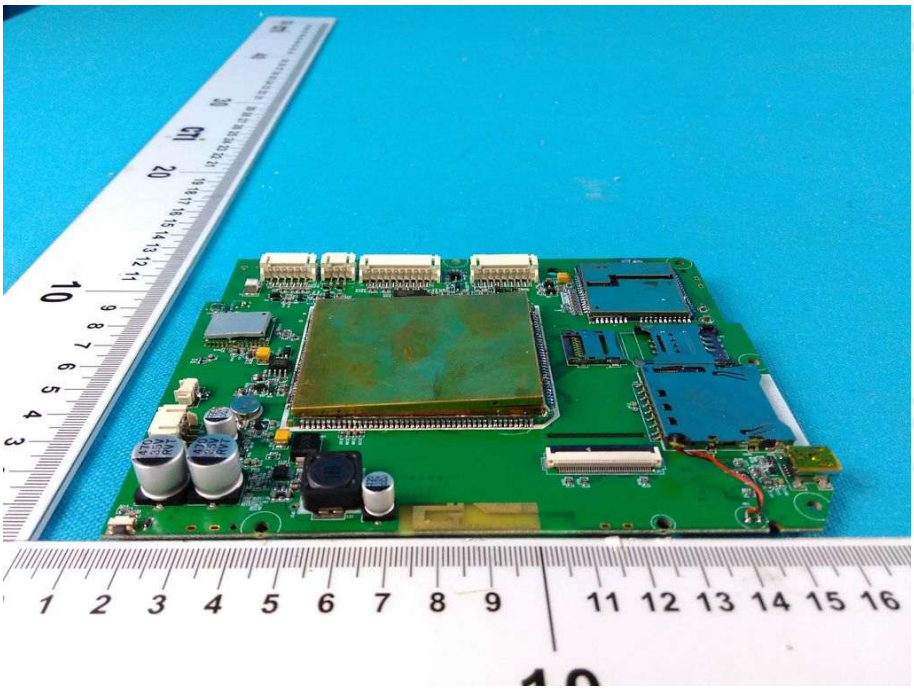
View of Product-14



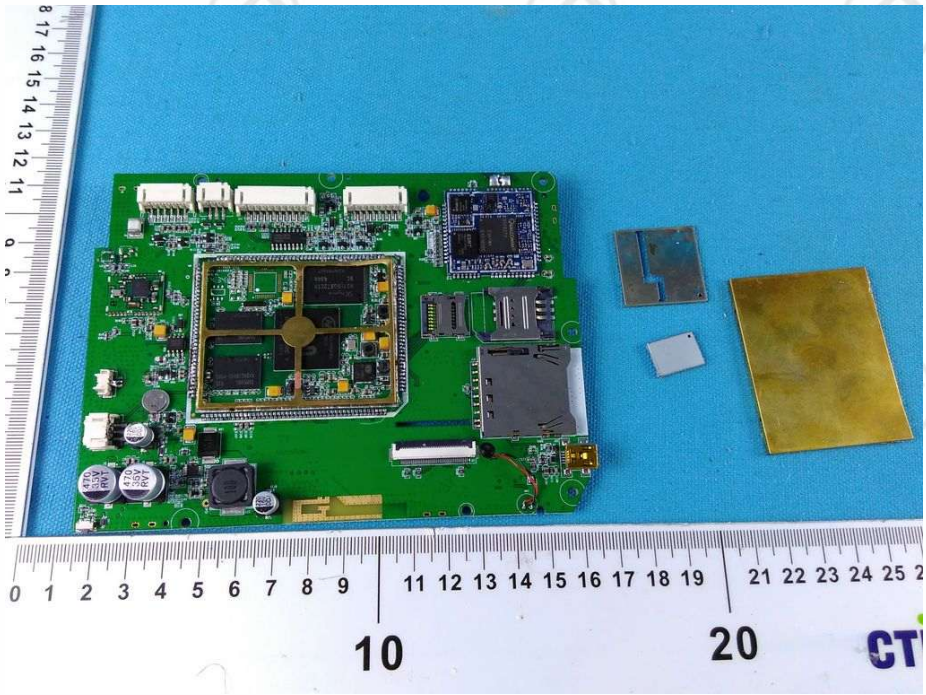
View of Product-15



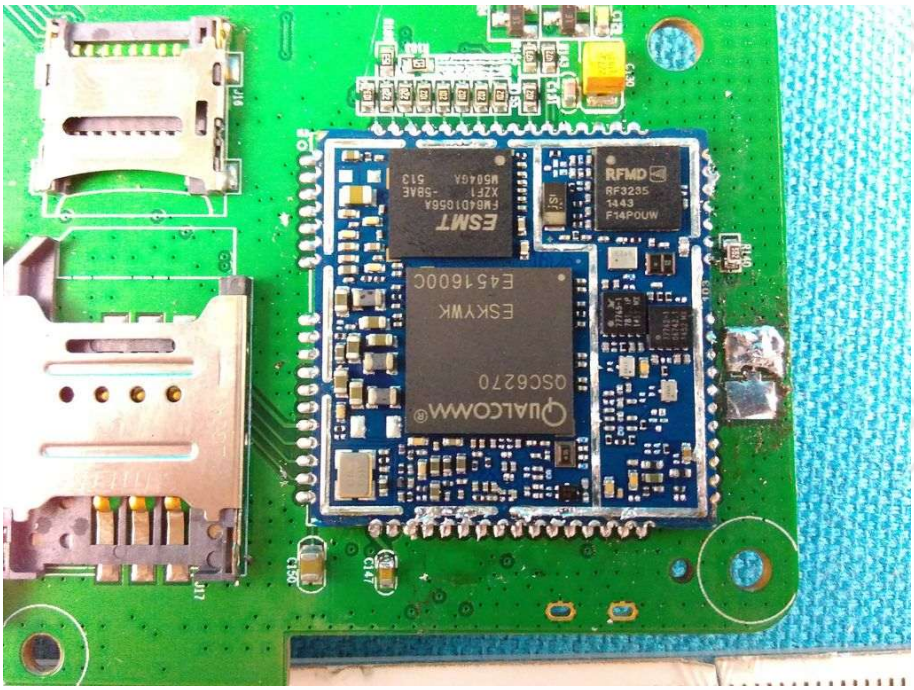
View of Product-16



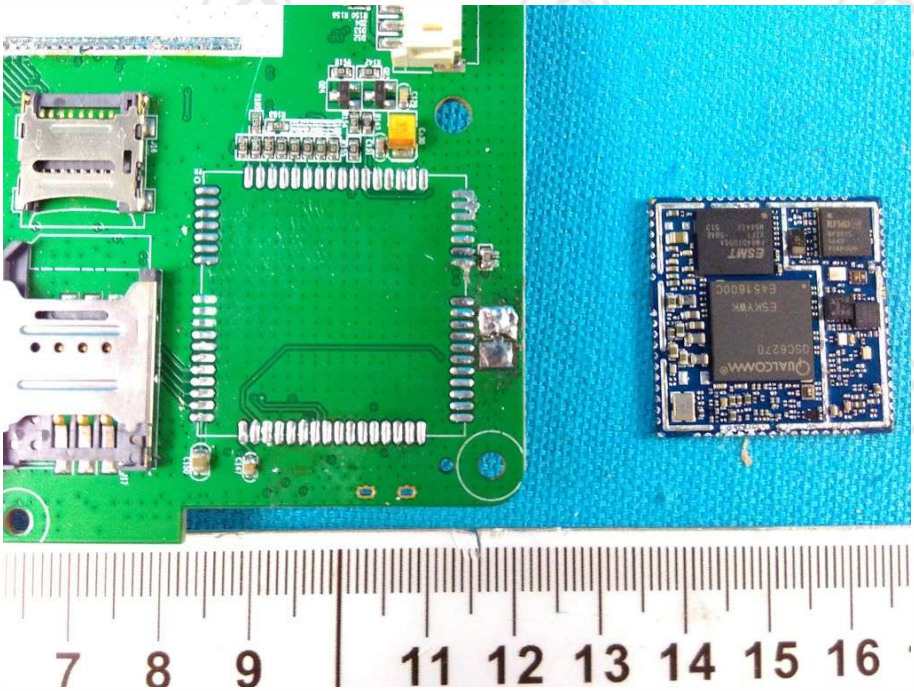
View of Product-17



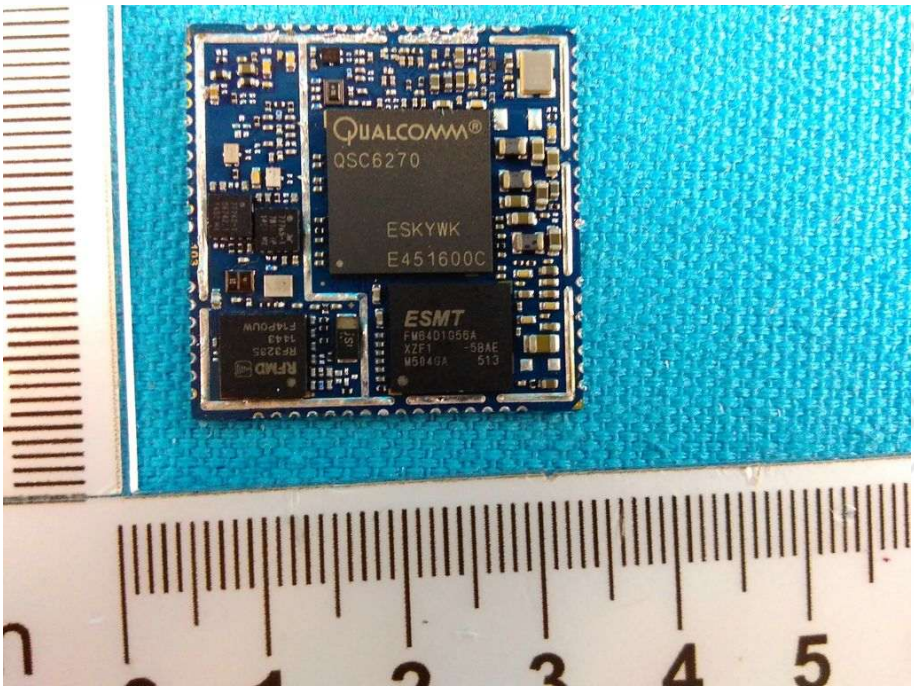
View of Product-18



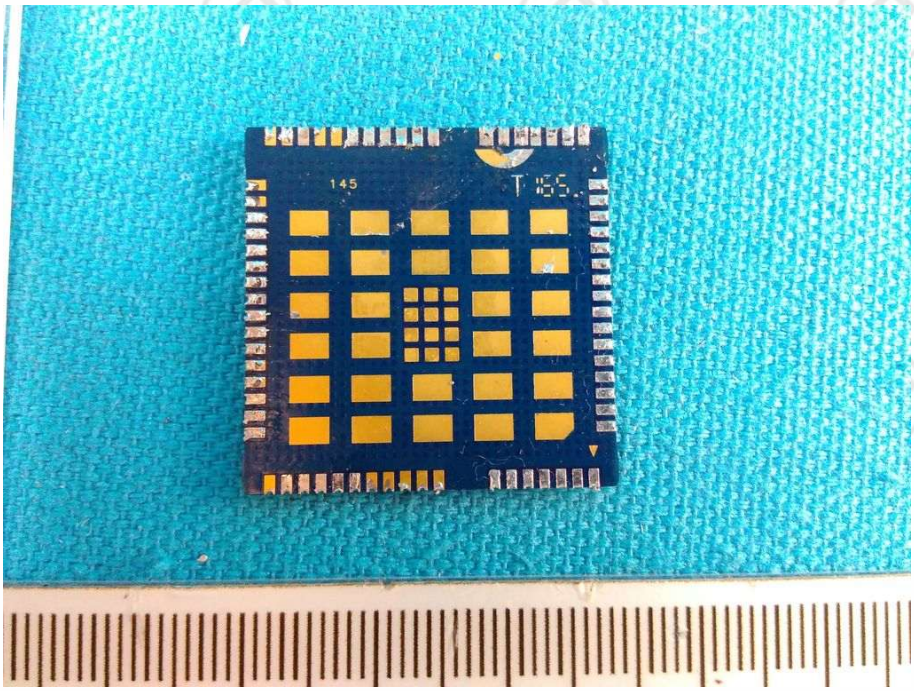
View of Product-19



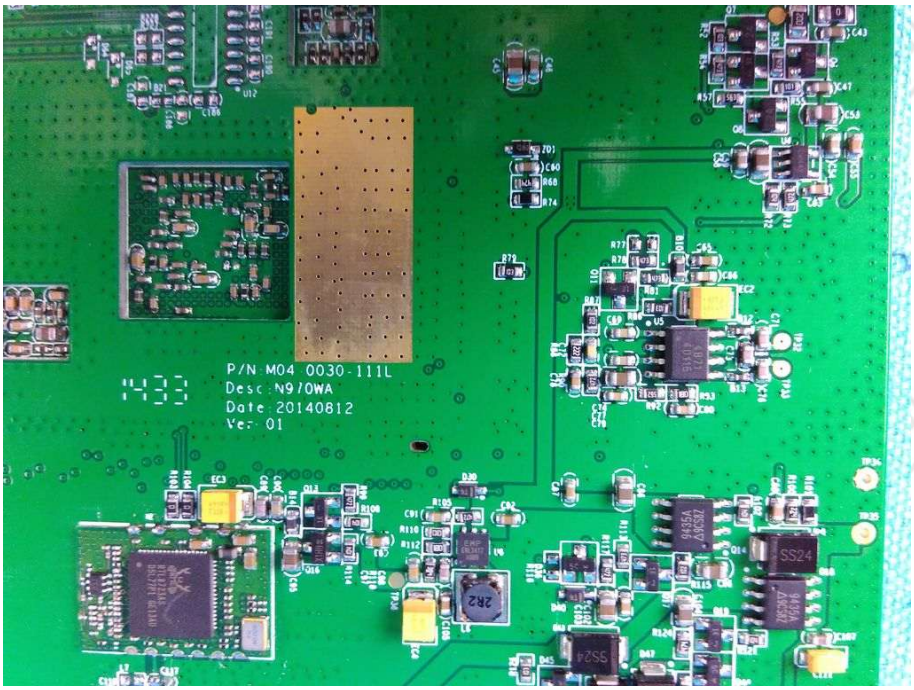
View of Product-20



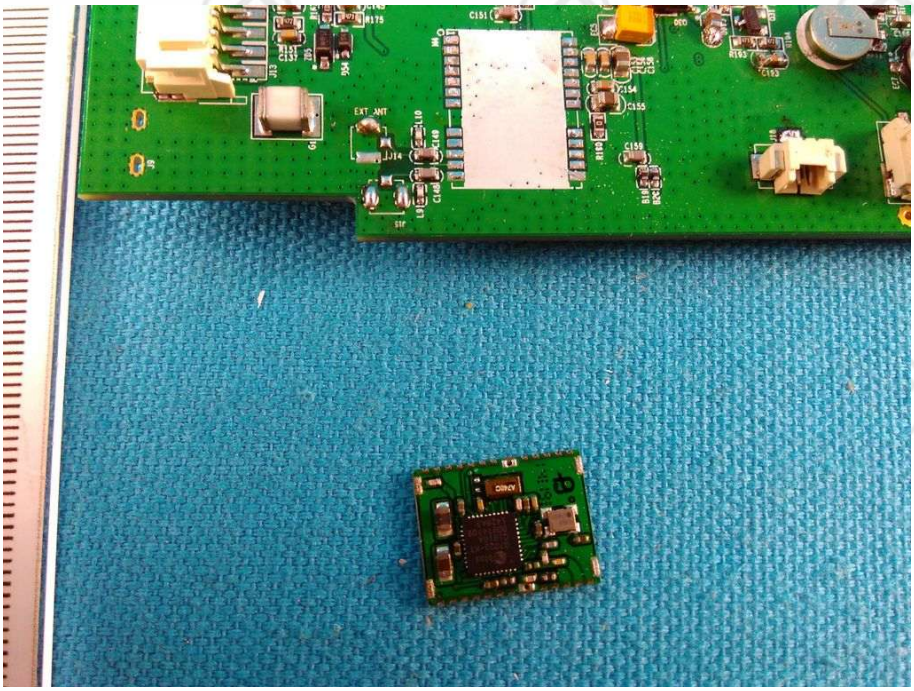
View of Product-21



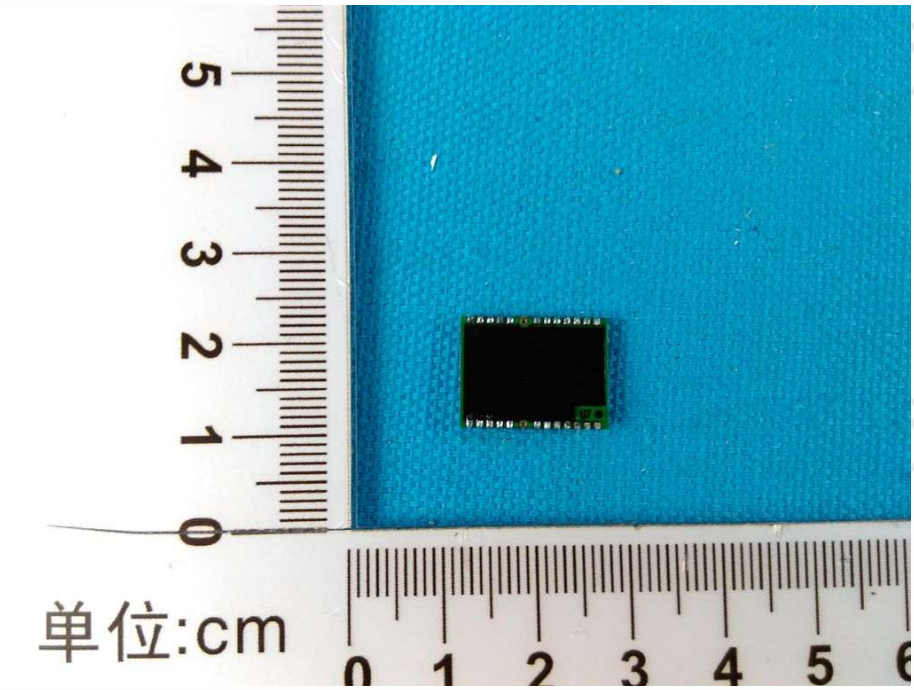
View of Product-22



View of Product-23



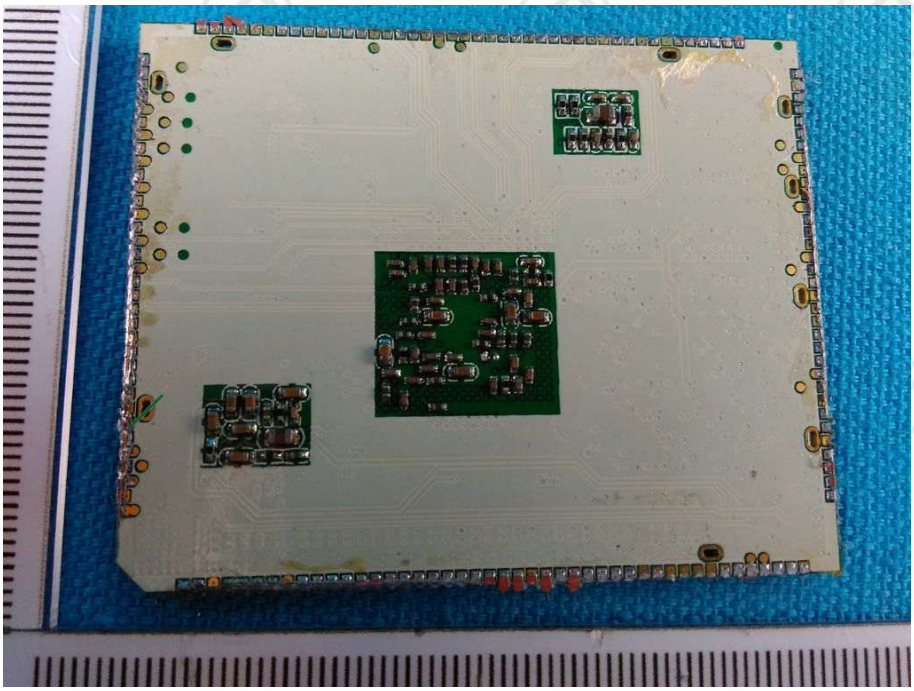
View of Product-24



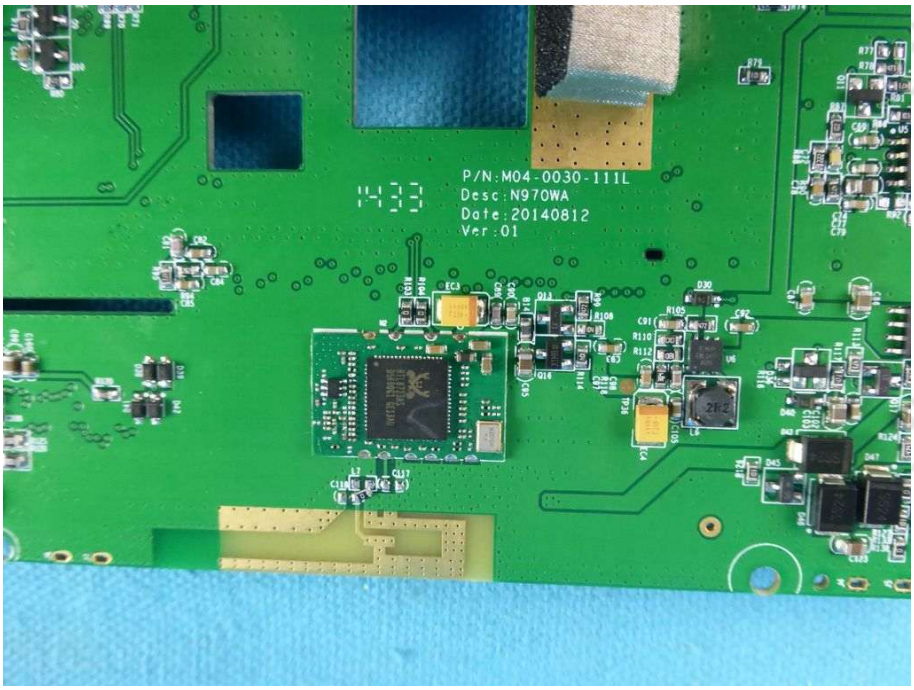
View of Product-25

View of Product-26

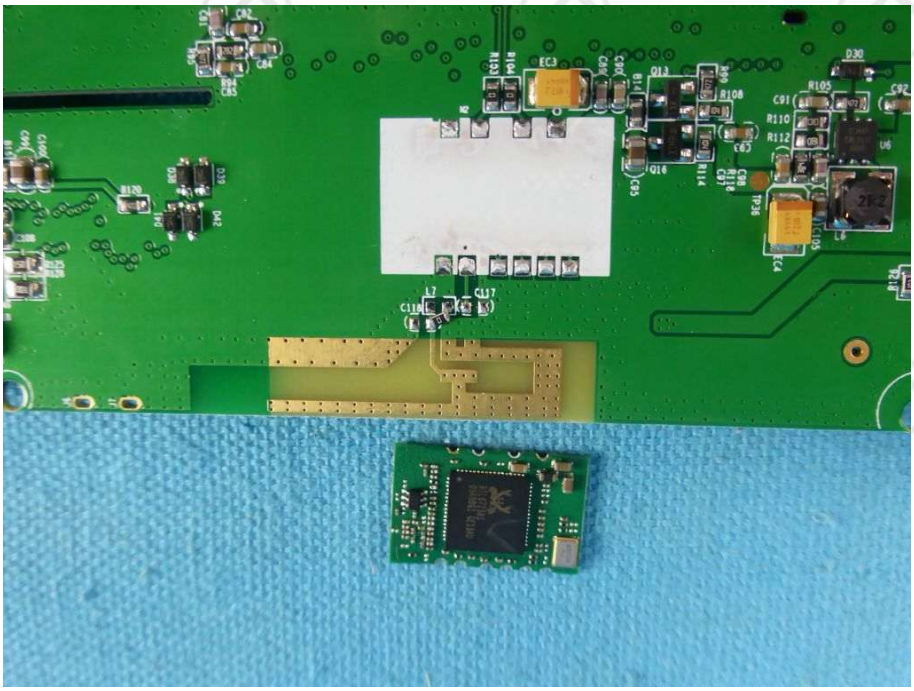
View of Product-27



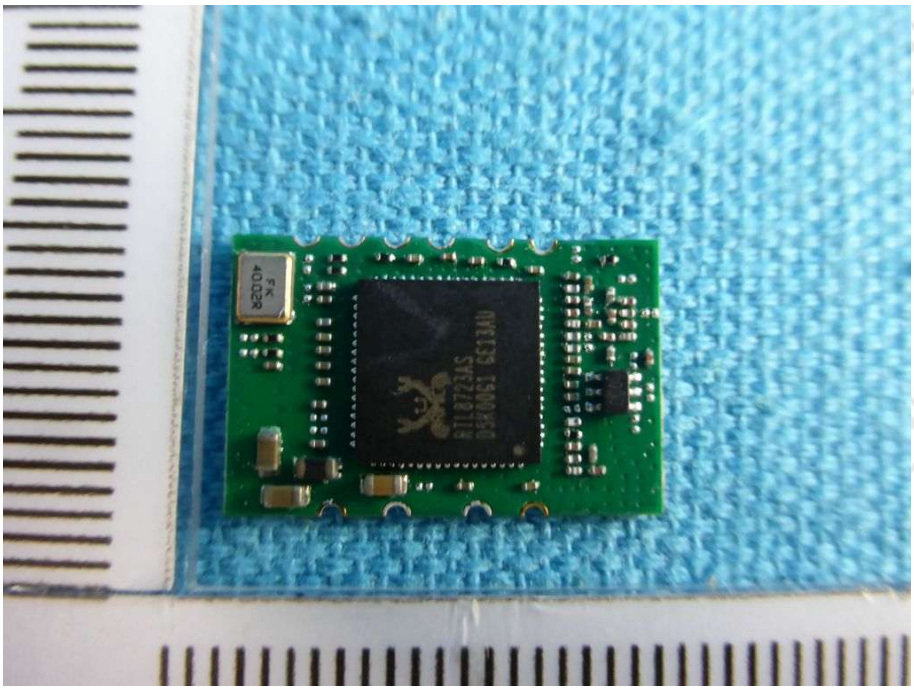
View of Product-28



View of Product-29



View of Product-30



View of Product-31

View of Product-32

*** End of Report ***