TCT 通测检测 TESTING CENTRE TECHNOLOGY

TEST REPORT

FCC ID: PJH-IA9Q5S83F

Product: RF 5G Wireless Module

Model No.: IA9Q5 S83F

Additional Model No.: N/A

Trade Mark: N/A

Report No.: TCT170905E007

Issued Date: Sep. 18, 2017

Issued for:

Syncomm Technology Corp.

10F., No. 101, Sec.2, Gongdao 5th Rd., Hsinchu City, 30070 Taiwan

Issued By:

Shenzhen Tongce Testing Lab.

1B/F., Building 1, Yibaolai Industrial Park, Qiaotou, Fuyong, Baoan District, Shenzhen, Guangdong, China

TEL: +86-755-27673339

FAX: +86-755-27673332

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Hotline: 400-6611-140 Tel: 86-755-27673339 Fax: 86-755-27673332 http://www.tct-lab.com

1. Test Certification

Product:	RF 5G Wireless Module
Model No.:	IA9Q5 S83F
Additional Model No.:	N/A
Trade Mark:	**N/A**
Applicant:	Syncomm Technology Corp.
Address:	10F., No. 101, Sec.2, Gongdao 5th Rd., Hsinchu City, 30070 Taiwan
Manufacturer:	Syncomm Technology Corp.
Address:	10F., No. 101, Sec.2, Gongdao 5th Rd., Hsinchu City, 30070 Taiwan
Date of Test:	Sep. 06, 2017 - Sep. 15, 2017
Applicable Standards:	FCC CFR Title 47 Part 15 Subpart E Section 15.407: 2016 KDB662911 D01 Multiple Transmitter Output v02r01 KDB789033 D02 General U-NII Test Procedures New Rules v01r04

The above equipment has been tested by Shenzhen Tongce Testing Lab. and found compliance with the requirements set forth in the technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Tested By:	Garen	***Date:***	***Sep. 15, 2017***
	Garen		
Reviewed By:	Joe Zhou	***Date:***	***Sep. 18, 2017***
	Joe Zhou		
Approved By:	Tomsin	***Date:***	***Sep. 18, 2017***
	Tomsin		

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2. Test Result Summary

Requirement	CFR 47 Section	Result
Antenna requirement	§15.203	PASS
AC Power Line Conducted Emission	§15.207	PASS
Maximum Conducted Output Power	§15.407(a) §2.1046	PASS
6dB Emission Bandwidth	§15.407(a) §2.1049	PASS
26dB Emission Bandwidth& 99% Occupied Bandwidth	§15.407(a) §2.1049	PASS
Power Spectral Density	§15.407(a)	PASS
Restricted Bands around fundamental frequency	§15.407(a)	PASS
Radiated Emission	§15.407(a) §2.1053	PASS
Frequency Stability	§15.407(g) §2.1055	PASS

Note:

1. PASS: Test item meets the requirement.

2. Fail: Test item does not meet the requirement.

3. N/A: Test case does not apply to the test object.

4. The test result judgment is decided by the limit of test standard.

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3. EUT Description

Product:	RF 5G Wireless Module
Model No.:	IA9Q5 S83F
Additional Model No.:	N/A
Trade Mark:	**N/A**
Hardware Version:	V1.1
Software Version:	V1.00E1
Operation Frequency:	Band I: 5165MHz~5200MHz Band II: 5740MHz~5840MHz
Channel Bandwidth:	2.5MHz
Modulation Type	GFSK
Antenna Type:	PCB antenna
Antenna Gain:	2.85dBi
Power Supply:	DC 3.3V from PCB board

Band I (5165MHz - 5200MHz) Power level setup in software

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
0	5165MHz	2	5175MHz	4	5185MHz	6	5195MHz
1	5170MHz	3	5180MHz	5	5190MHz	7	5200MHz

Band II (5740MHz - 5840MHz) Power level setup in software

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
0	5740MHz	6	5770MHz	12	5800MHz	18	5830MHz
1	5745MHz	7	5775MHz	13	5805MHz	19	5835MHz
2	5750MHz	8	5780MHz	14	5810MHz	20	5840MHz
3	5755MHz	9	5785MHz	15	5815MHz	-	-
4	5760MHz	10	5790MHz	16	5820MHz	-	-
5	5765MHz	11	5795MHz	17	5825MHz	-	-

Note: The Soft set value is the internal setting required to meet the requirements and does not necessarily mean the 'dBm' value

Operation Frequency each of channel

Band I (5165 - 5200 MHz)			Band II (5740 - 5840 MHz)		
Channel Number	Channel	Frequency (MHz)	Channel Number	Channel	Frequency (MHz)
0	Low	5165	0	Low	5740
3	Mid	5180	10	Mid	5790
7	High	5200	20	High	5840

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

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4. Genera Information

4.1. Test environment and mode

Operating Environment:	
Temperature:	25.0 °C
Humidity:	56 % RH
Atmospheric Pressure:	1010 mbar
Test Mode:	
Engineering mode:	Keep the EUT in continuous transmitting by select channel and modulations(The value of duty cycle is 100%)
The sample was placed 0.8m/1.5m for blow/above 1GHz above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.	

We have verified the construction and function in typical operation. All the test modes were carried out with the EUT in transmitting operation, which was shown in this test report and defined as follows:	
Per-scan all kind of data rate in lowest channel, and found the follow list which it was worst case.	
Mode	Data rate
GFSK	2.0 Mbps
Final Test Mode:	
Operation mode:	Keep the EUT in continuous transmitting with modulation
Remark:	Full test was applied on all test modes, but only worst case was shown (ANT0) , the two antennas cannot be transmitted simultaneously.

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4.2. Description of Support Units

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

Equipment	Model No.	Serial No.	FCC ID	Trade Name
Test board	R00001	/	/	/
Adapter	LTE12WS·S1	/	/	/

Note:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.

2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

3. For conducted measurements (Output Power, Emission Bandwidth, Power Spectral Density, Spurious Emissions), the antenna of EUT is connected to the test equipment via temporary antenna connector, the antenna connector is soldered on the antenna port of EUT, and the temporary antenna connector is listed in the Test Instruments.

5. Facilities and Accreditations

5.1. Facilities

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

- FCC - Registration No.: 645098
  Shenzhen Tongce Testing Lab
  The 3m Semi-anechoic chamber has been registered and fully described in a report with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files.
- IC - Registration No.: 10668A-1
  The 3m Semi-anechoic chamber of Shenzhen TCT Testing Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing

5.2. Location

Shenzhen Tongce Testing Lab
Address: 1B/F., Building 1, Yibaolai Industrial Park, Qiaotou, Fuyong, Baoan District, Shenzhen, Guangdong, China
TEL: +86-755-27673339

5.3. Measurement Uncertainty

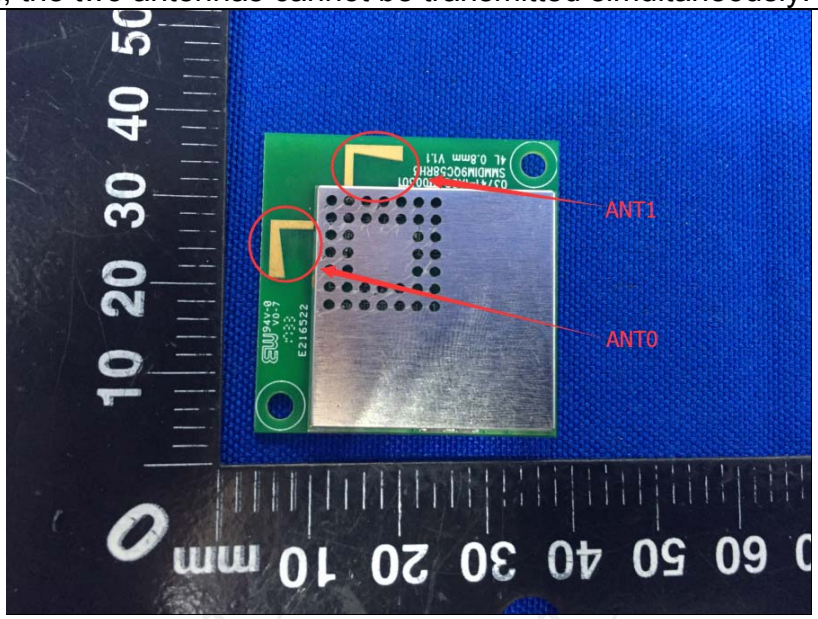
The reported uncertainty of measurement y ± U, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95 %.

No.	Item	MU
1	Conducted Emission	±2.56dB
2	RF power, conducted	±0.12dB
3	Spurious emissions, conducted	±0.11dB
4	All emissions, radiated(<1G)	±3.92dB
5	All emissions, radiated(>1G)	±4.28dB
6	Temperature	±0.1°C
7	Humidity	±1.0%

6. Test Results and Measurement Data

6.1. Antenna requirement

Standard requirement:	FCC Part15 C Section 15.203 /247(c)
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.	
E.U.T Antenna:	
The antenna is PCB antenna which permanently attached, and the best case gain of the antenna is 2.85dBi. Full test was applied on all test modes, but only worst case was shown (ANT0), the two antennas cannot be transmitted simultaneously.	



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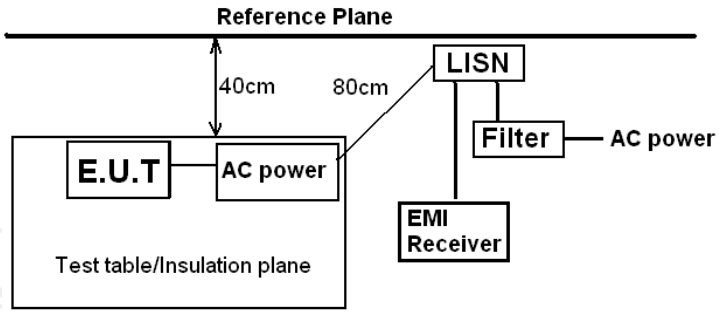
6.2. Conducted Emission

6.2.1. Test Specification

<table>
<tr><td>Test Requirement:</td><td>FCC Part15 C Section 15.207</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.10:2013</td></tr>
<tr><td>Frequency Range:</td><td>150 kHz to 30 MHz</td></tr>
<tr><td>Receiver setup:</td><td>RBW=9 kHz, VBW=30 kHz, Sweep time=auto</td></tr>
<tr><td>Limits:</td><td>
<table>
<tr><td rowspan="2">Frequency range (MHz)</td><td colspan="2">Limit (dBuV)</td></tr>
<tr><td>Quasi-peak</td><td>Average</td></tr>
<tr><td>0.15-0.5</td><td>66 to 56*</td><td>56 to 46*</td></tr>
<tr><td>0.5-5</td><td>56</td><td>46</td></tr>
<tr><td>5-30</td><td>60</td><td>50</td></tr>
</table>
</td></tr>
<tr><td>Test Setup:</td><td> 

Remark:
E.U.T: Equipment Under Test
LISN: Line Impedence Stabilization Network
Test table height=0.8m</td></tr>
<tr><td>Test Mode:</td><td>Tx Mode</td></tr>
<tr><td>Test Procedure:</td><td>1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment.
2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs).
3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement.</td></tr>
<tr><td>Test Result:</td><td>PASS</td></tr>
</table>

6.2.2. Test Instruments

Conducted Emission Shielding Room Test Site (843)				
Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
Test Receiver	R&S	ESPI	101401	Jun. 12, 2018
LISN	Schwarzbeck	NSLK 8126	8126453	Oct. 13, 2017
Coax cable (9KHz-30MHz)	TCT	CE-05	N/A	Oct. 13, 2017
EMI Test Software	Shurple Technology	EZ-EMC	N/A	N/A

Note: *The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).*

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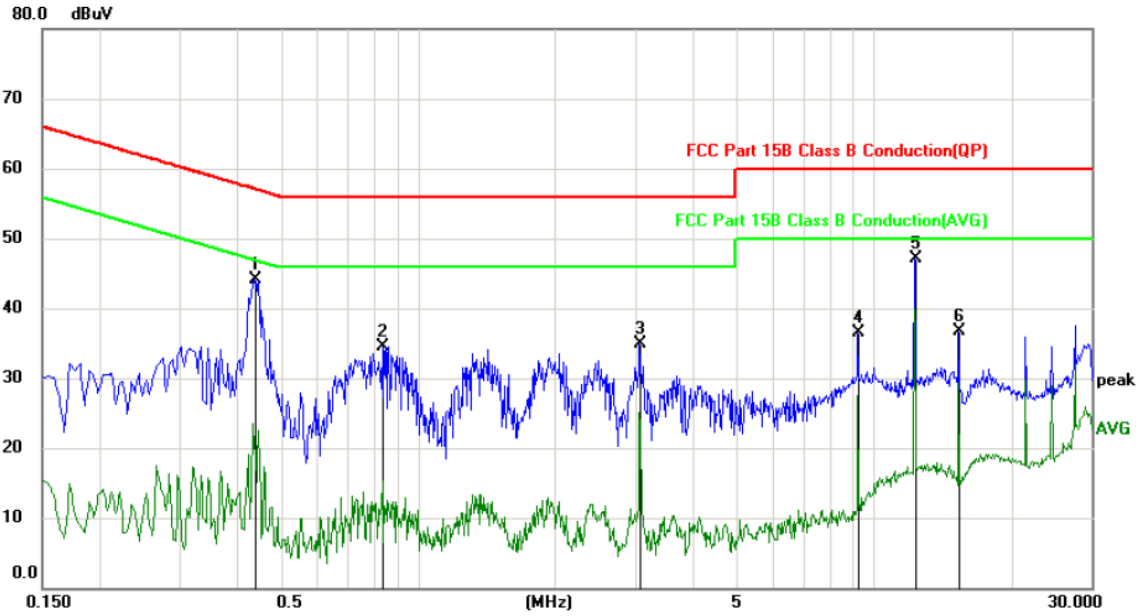
6.2.3. Test data

Please refer to following diagram for individual

Conducted Emission on Line Terminal of the power line (150 kHz to 30MHz)



Site
Limit: FCC Part 15B Class B Conduction(QP)

Phase: *L1*
Power: AC 120V/60Hz

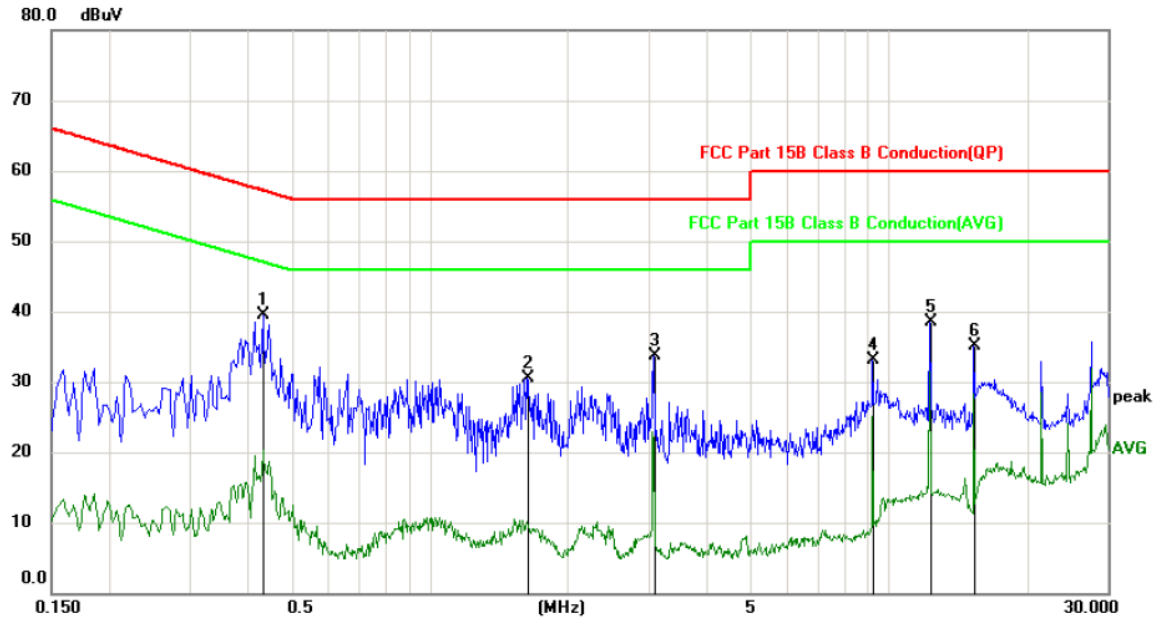
Temperature: 25
Humidity: 55 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.4380	32.82	11.33	44.15	57.10	-12.95	peak	
2		0.8385	23.35	11.22	34.57	56.00	-21.43	peak	
3		3.0705	23.64	11.31	34.95	56.00	-21.05	peak	
4		9.2175	25.24	11.23	36.47	60.00	-23.53	peak	
5		12.2865	35.60	11.42	47.02	60.00	-12.98	peak	
6		15.3600	25.10	11.60	36.70	60.00	-23.30	peak	

Note:

Freq. = Emission frequency in MHz
Reading level (dBµV) = Receiver reading
Corr. Factor (dB) = Antenna factor + Cable loss
Measurement (dBµV) = Reading level (dBµV) + Corr. Factor (dB)
Limit (dBµV) = Limit stated in standard
Margin (dB) = Measurement (dBµV) – Limits (dBµV)
Q.P. =Quasi-Peak
AVG =average
** is meaning the worst frequency has been tested in the frequency range 150 kHz to 30MHz*

Conducted Emission on Neutral Terminal of the power line (150 kHz to 30MHz)



Site	Phase:	*N*	Temperature: 25
Limit: FCC Part 15B Class B Conduction(QP)	Power:	AC 120V/60Hz	Humidity: 55 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.4335	28.08	11.33	39.41	57.19	-17.78	peak	
2		1.6350	19.03	11.51	30.54	56.00	-25.46	peak	
3		3.0750	22.40	11.31	33.71	56.00	-22.29	peak	
4		9.2175	21.87	11.23	33.10	60.00	-26.90	peak	
5		12.2865	27.00	11.42	38.42	60.00	-21.58	peak	
6		15.3600	23.47	11.60	35.07	60.00	-24.93	peak	

Note:

Freq. = Emission frequency in MHz
Reading level (dBμV) = Receiver reading
Corr. Factor (dB) = attenuator factor + Cable loss
Measurement (dBμV) = Reading level (dBμV) + Corr. Factor (dB)
Limit (dBμV) = Limit stated in standard
Margin (dB) = Measurement (dBμV) – Limits (dBμV)
Q.P. =Quasi-Peak
AVG =average
** is meaning the worst frequency has been tested in the frequency range 150 kHz to 30MHz.*

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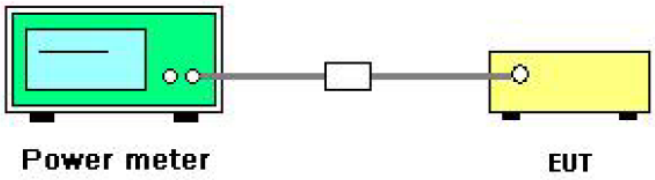
6.3. Maximum Conducted Output Power

6.3.1. Test Specification

<table>
<tr><td>Test Requirement:</td><td>FCC Part15 E Section 15.407(a)& Part 2 J Section 2.1046</td></tr>
<tr><td>Test Method:</td><td>KDB662911 D01 Multiple Transmitter Output v02r01
KDB789033 D02 General UNII Test Procedures New Rules v01r04 Section E</td></tr>
<tr><td>Limit:</td><td>
<table>
<tr><td>Frequency Band (MHz)</td><td>Limit</td></tr>
<tr><td>5150-5250</td><td>1W for indoor access point</td></tr>
<tr><td>5725-5850</td><td>1 W</td></tr>
<tr><td colspan="2">Note: Where “B” is the 26 dB emissions bandwidth in MHz.</td></tr>
</table>
</td></tr>
<tr><td>Test Setup:</td><td> 
</td></tr>
<tr><td>Test Mode:</td><td>Transmitting mode with modulation</td></tr>
<tr><td>Test Procedure:</td><td>1. The testing follows the Measurement Procedure of KDB789033 D02 General UNII Test Procedures New Rules v01r04 Section E, 3, a
2. The RF output of EUT was connected to the power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
5. Measure the conducted output power and record the results in the test report.</td></tr>
<tr><td>Test Result:</td><td>PASS</td></tr>
<tr><td>Remark:</td><td>Conducted output power= measurement power +10log(1/x) X is duty cycle=1, so 10log(1/1)=0
Conducted output power= measurement power</td></tr>
</table>

6.3.2. Test Instruments

RF Test Room				
Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
Spectrum Analyzer	Agilent	N9020A	MY49100060	Oct. 13, 2017
Power Meter	Agilent	N1911A	MY45101557	Oct. 13, 2017
Power Sensor	Agilent	N1922A	MY44124432	Oct. 13, 2017
RF Cable (9KHz-40GHz)	TCT	RE-03	N/A	Oct. 13, 2017
Antenna Connector	TCT	RFC-03	N/A	Oct. 13, 2017

Note: *The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).*

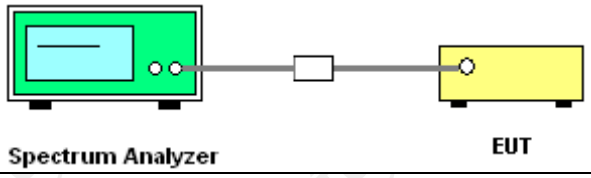
6.3.3. Test Data

Configuration Band I (5165 - 5200 MHz)				
Mode	Test channel	Maximum Conducted (Average) Output Power (dBm)	FCC Limit (dBm)	Result
GFSK	0	12.52	30	PASS
GFSK	3	12.69	30	PASS
GFSK	7	12.22	30	PASS

Configuration Band II (5740 - 5840 MHz)				
Mode	Test channel	Maximum Conducted (Average) Output Power (dBm)	FCC Limit (dBm)	Result
GFSK	0	9.15	30	PASS
GFSK	10	9.43	30	PASS
GFSK	20	9.81	30	PASS

6.4. 6dB Emission Bandwidth

6.4.1. Test Specification

Test Requirement:	FCC CFR47 Part 15 Section 15.407(e)& Part 2 J Section 2.1049
Test Method:	KDB662911 D01 Multiple Transmitter Output v02r01 KDB789033 D02 General UNII Test Procedures New Rules v01r04 Section C
Limit:	>500kHz
Test Setup:	
Test Mode:	Transmitting mode with modulation
Test Procedure:	1. KDB789033 D02 General UNII Test Procedures New Rules v01r04 Section C 2. Set to the maximum power setting and enable the EUT transmit continuously. 3. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6dB bandwidth must be greater than 500 kHz. 4. Measure and record the results in the test report.
Test Result:	PASS

6.4.2. Test Instruments

RF Test Room				
Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
Spectrum Analyzer	Agilent	N9020A	MY49100060	Oct. 13, 2017
RF Cable (9KHz-40GHz)	TCT	RE-03	N/A	Oct. 13, 2017
Antenna Connector	TCT	RFC-03	N/A	Oct. 13, 2017

Note: *The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).*

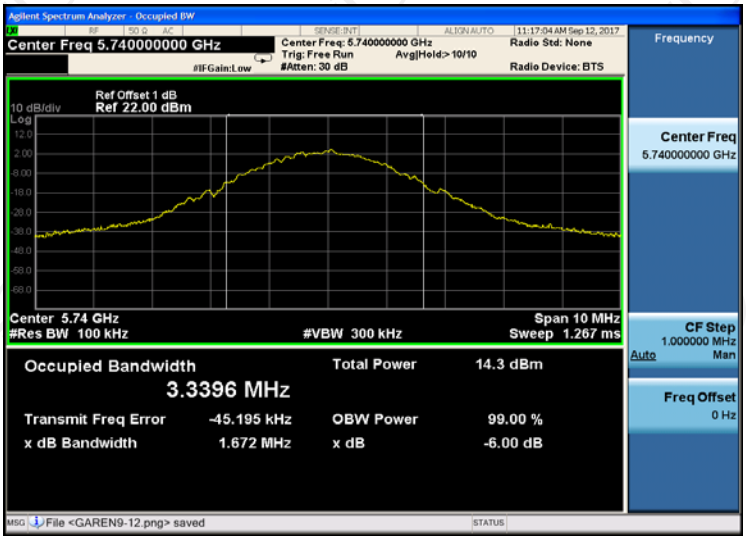
6.4.3. Test data

Band II (5740 - 5840 MHz)					
Mode	Test channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limit (MHz)	Result
GFSK	0	5740	1.672	0.5	PASS
GFSK	10	5790	1.676	0.5	PASS
GFSK	20	5840	1.692	0.5	PASS

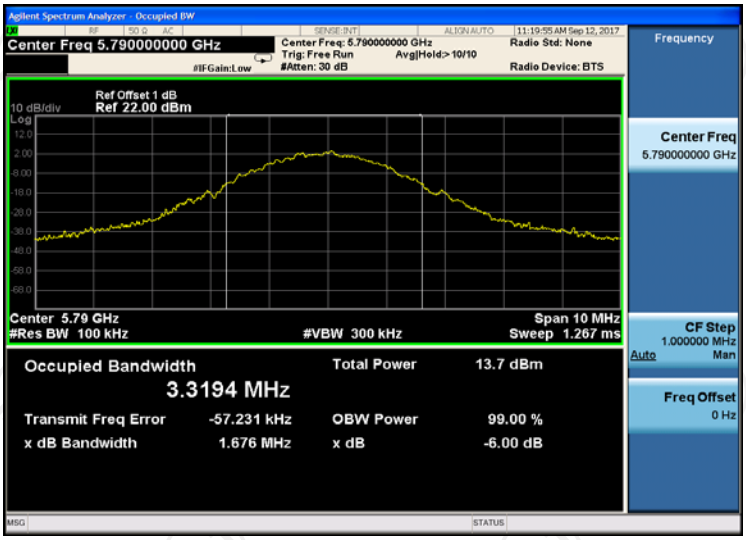
Test plots as follows:

Band II (5740 – 5840 MHz)

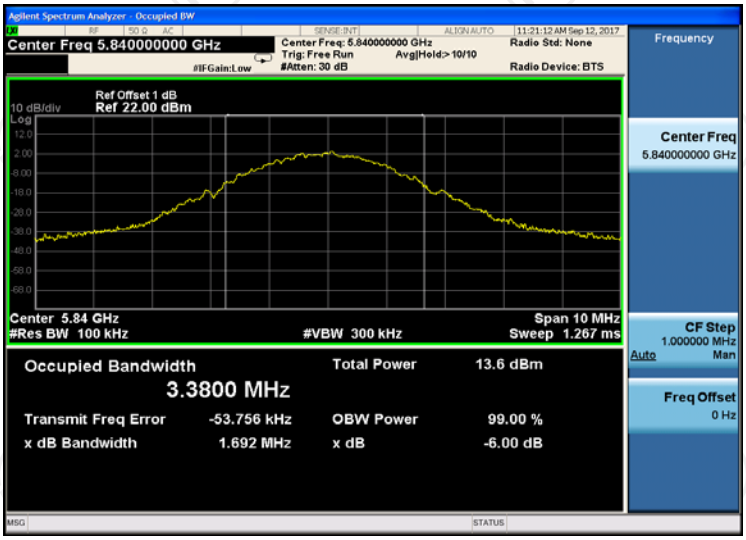
CH0



CH10

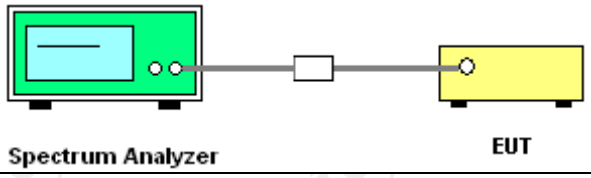


CH20



6.5. 26dB Bandwidth and 99% Occupied Bandwidth

6.5.1. Test Specification

Test Requirement:	47 CFR Part 15C Section 15.407 (a)& Part 2 J Section 2.1049
Test Method:	KDB662911 D01 Multiple Transmitter Output v02r01 KDB789033 D02 General UNII Test Procedures New Rules v01r04 Section D
Limit:	No restriction limits
Test Setup:	
Test Mode:	Transmitting mode with modulation
Test Procedure:	1. KDB789033 D02 General UNII Test Procedures New Rules v01r04 Section D 2. Set to the maximum power setting and enable the EUT transmit continuously. 3. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. 4. Measure and record the results in the test report.
Test Result:	PASS

6.5.2. Test Instruments

RF Test Room				
Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
Spectrum Analyzer	Agilent	N9020A	MY49100060	Oct. 13, 2017
RF Cable (9KHz-26.5GHz)	TCT	RE-06	N/A	Oct. 13, 2017
Antenna Connector	TCT	RFC-01	N/A	Oct. 13, 2017

Note: *The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).*

6.5.3. Test data

Band I

Mode	Test channel	Frequency (MHz)	26 dB Bandwidth (MHz)	99% Bandwidth (MHz)
GFSK	0	5165	3.381	2.622
GFSK	3	5180	3.395	2.656
GFSK	7	5200	3.373	2.600

Band II

Mode	Test channel	Frequency (MHz)	99% Bandwidth (MHz)
GFSK	0	5740	3.215
GFSK	10	5790	3.324
GFSK	20	5840	3.373

Test plots as follows:

Band I (5165 - 5200 MHz)

CH0

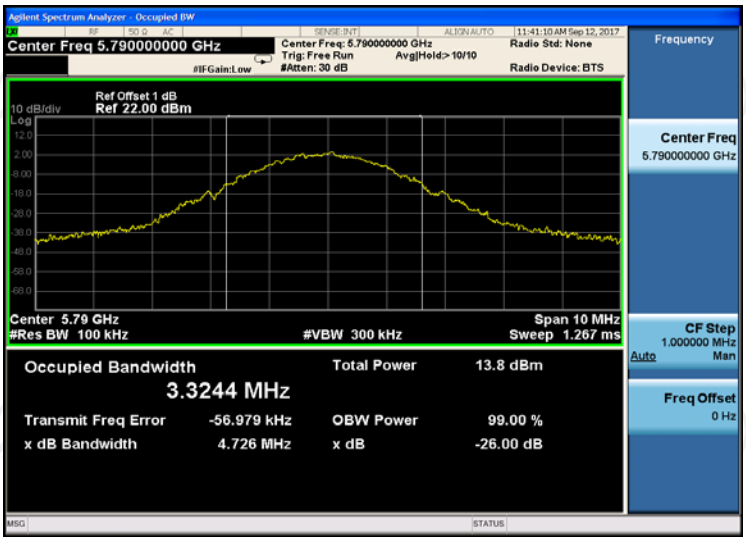
CH3

CH7

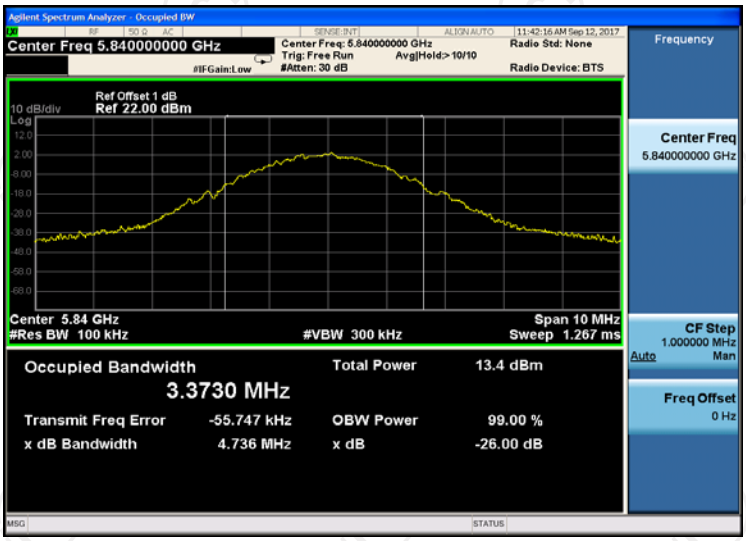
Band II (5740 - 5840 MHz)

CH0

CH10



CH20



6.6. Power Spectral Density

6.6.1. Test Specification

Test Requirement:	FCC Part15 E Section 15.407 (a)
Test Method:	KDB662911 D01 Multiple Transmitter Output v02r01 KDB789033 D02 General UNII Test Procedures New Rules v01r04 Section F
Limit:	≤17.00dBm/MHz for Band I 5150MHz-5250MHz ≤30.00dBm/500KHz for Band II 5725MHz-5850MHz
Test Setup:	
Test Mode:	Transmitting mode with modulation
Test Procedure:	1. Set the spectrum analyzer or EMI receiver span to view the entire emission bandwidth. 1. Set RBW = 510 kHz/1 MHz, VBW ≥ 3*RBW, Sweep time = Auto, Detector = RMS. 2. Allow the sweeps to continue until the trace stabilizes. 3. Use the peak marker function to determine the maximum amplitude level.
Test Result:	PASS

6.6.2. Test Instruments

RF Test Room				
Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
Spectrum Analyzer	Agilent	N9020A	MY49100060	Oct. 13, 2017
RF Cable (9KHz-40GHz)	TCT	RE-03	N/A	Oct. 13, 2017
Antenna Connector	TCT	RFC-03	N/A	Oct. 13, 2017

Note: *The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).*

6.6.3. Test data

Configuration Band I (5165 - 5200 MHz)				
Mode	Test channel	Power Spectral Density	Limit (dBm/MHz)	Result
GFSK	0	2.263	17	PASS
GFSK	3	1.503	17	PASS
GFSK	7	1.037	17	PASS

Configuration Band II (5740 - 5840 MHz)				
Mode	Test channel	Power Spectral Density	Limit (dBm/500kHz)	Result
GFSK	0	7.415	30	PASS
GFSK	10	7.012	30	PASS
GFSK	20	6.766	30	PASS

Test plots as follows:

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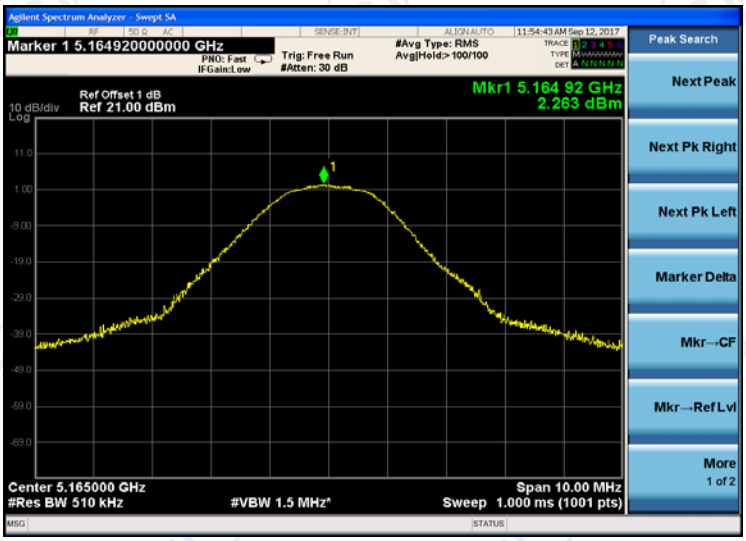
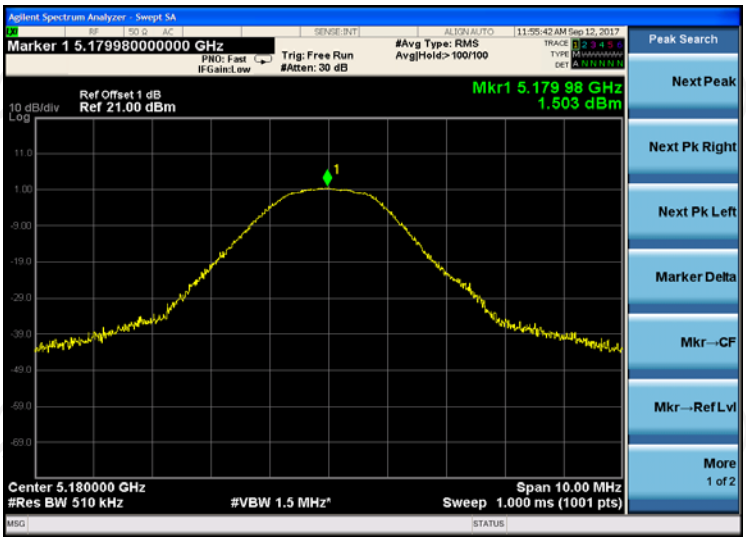
Band I (5165 - 5200 MHz)

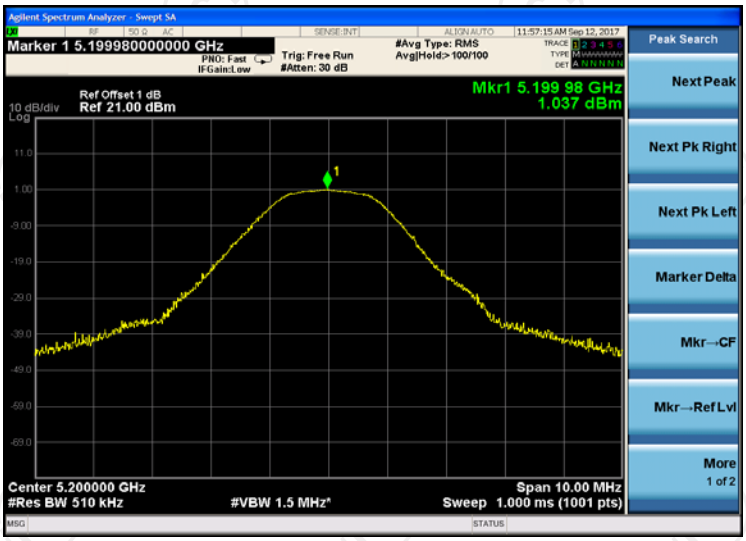
CH0



CH3

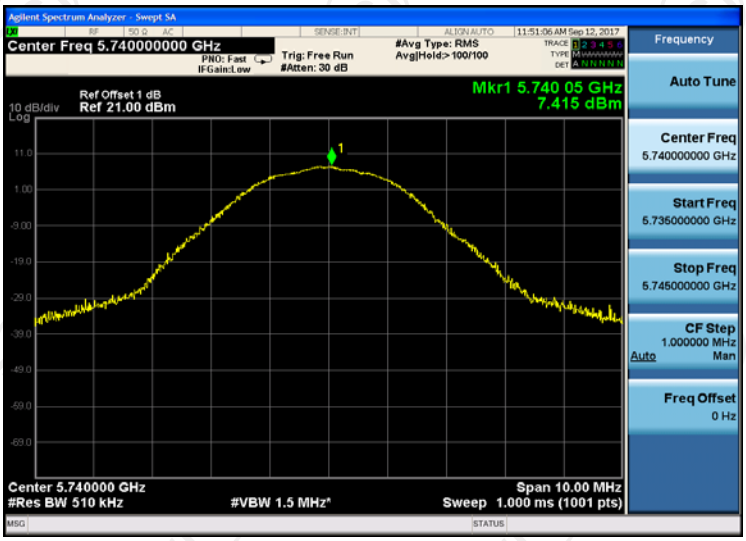


CH7

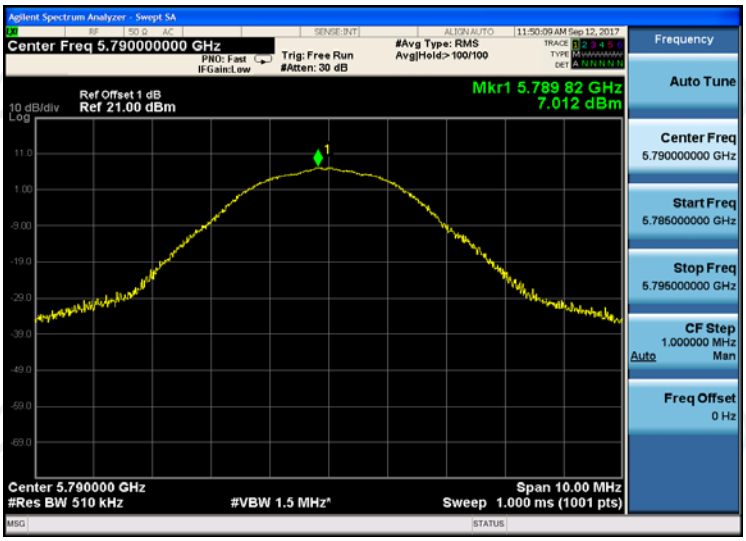


Band II (5740 - 5840 MHz)

CH0



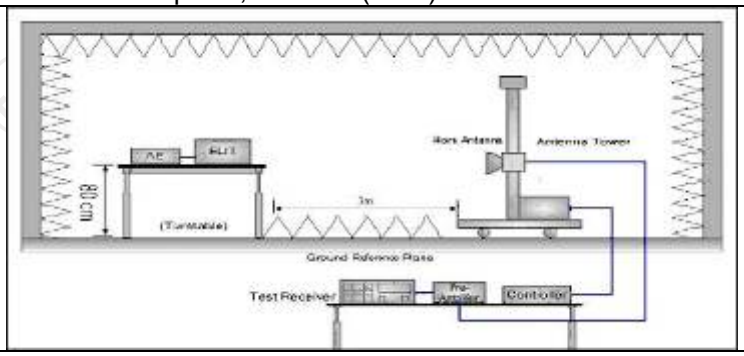
CH10



CH20

6.7. Band edge

6.7.1. Test Specification

Test Requirement:	FCC CFR47 Part 15E Section 15.407
Test Method:	ANSI C63.10 2013
Limit:	For band I: E[dBμV/m] = EIRP[dBm] + 95.2=68.2 dBμV/m, for EIRP(dBm)= **-27dBm** For band II (5715-5725MHz&5850-5860MHz): E[dBμV/m] = EIRP[dBm] + 95.2=78.2 dBμV/m, for EIRP(dBm)= **-17dBm;** For band IV(other un-restricted band):E[dBμV/m] = EIRP[dBm] + 95.2=68.2 dBμV/m, for EIRP(dBm)= **-27dBm**
Test Setup:	
Test Mode:	Transmitting mode with modulation
Test Procedure:	1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation. 2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. 3. 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. 4. 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 and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading. 5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. 6. 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, quasipeak or average method as specified and then reported in a data sheet.
Test Result:	PASS

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6.7.2. Test Instruments

Radiated Emission Test Site (966)				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
Test Receiver	ROHDE&SCHWARZ	ESVD	100008	Oct. 13, 2017
Spectrum Analyzer	ROHDE&SCHWARZ	FSQ	200061	Oct. 13, 2017
Spectrum Analyzer	ROHDE&SCHWARZ	FSP40	100056	Oct. 13, 2017
Spectrum Analyzer	Agilent	N9020A	MY49100060	Oct. 13, 2017
Pre-amplifier	EM Electronics Corporation CO.,LTD	EM30265	07032613	Oct. 13, 2017
Pre-amplifier	HP	8447D	2727A05017	Oct. 13, 2017
Loop antenna	ZHINAN	ZN30900A	12024	Oct. 13, 2017
Broadband Antenna	Schwarzbeck	VULB9163	340	Oct. 13, 2017
Horn Antenna	Schwarzbeck	BBHA 9120D	631	Oct. 13, 2017
Horn Antenna	Schwarzbeck	BBH 9170	582	Jun. 07, 2018
Coax cable (9KHz-1GHz)	TCT	RE-low-01	N/A	Oct. 13, 2017
Coax cable (9KHz-40GHz)	TCT	RE-high-02	N/A	Oct. 13, 2017
Coax cable (9KHz-1GHz)	TCT	RE-low-03	N/A	Oct. 13, 2017
Coax cable (9KHz-40GHz)	TCT	RE-high-04	N/A	Oct. 13, 2017
Antenna Mast	Keleto	CC-A-4M	N/A	N/A
EMI Test Software	Shurple Technology	EZ-EMC	N/A	N/A

Note: *The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).*

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6.7.3. Test Data

GFSK	CH	Freq. (MHz)	Read_level (dBuV/m)	Factor (dB)	Peak (dBuV/m)	Limit (dBuV/m) (Peak)	Limit (dBuV/m) (Avg)	Over	Ant. Pol. H/V
Band I	Lowest	5165	43.36	5.82	49.18	68.2	54	-4.82	H
		5165	38.36	5.82	44.18	68.2	54	-9.82	V
	Highest	5200	42.16	6.17	48.33	68.2	54	-5.67	H
		5200	39.51	6.17	45.68	68.2	54	-8.32	V
Band II	Lowest	5740	43.57	8.21	51.78	78.2	54	-2.22	H
		5740	43.57	8.21	51.78	78.2	54	-2.22	V
	Highest	5840	42.59	8.87	51.46	78.2	54	-2.54	H
		5840	40.61	8.87	49.48	78.2	54	-4.52	V
Remark: Factor(dB)=Ant. Factor+Cable Loss-Amp. Factor									

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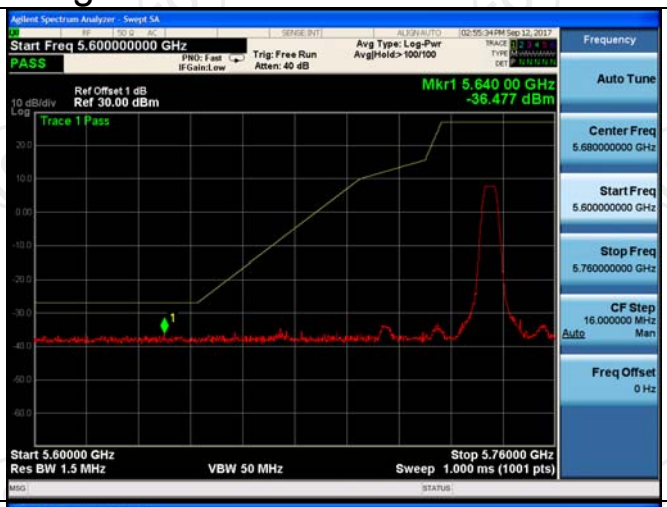
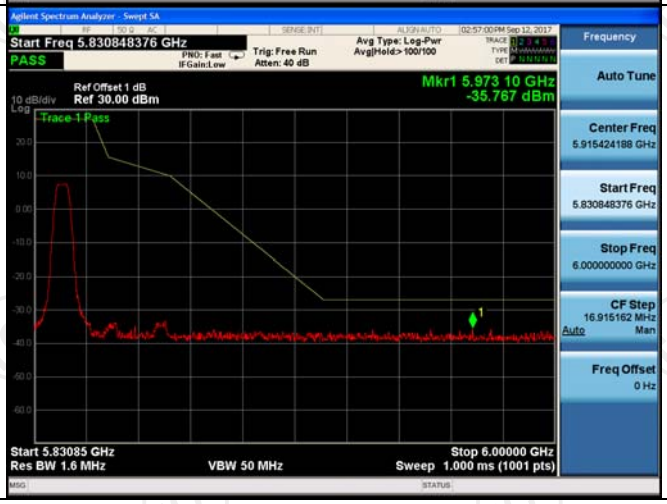
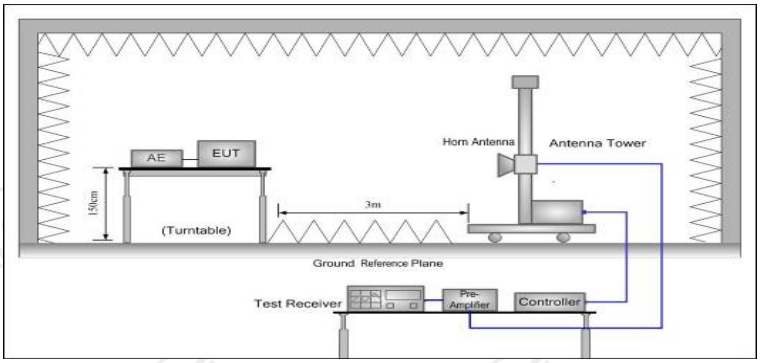
Band II Band-edge for RF Conducted Emissions		
5740MHz		
5840MHz		

6.8. Spurious Emission

6.8.1. Restrict Bands Measurement

6.8.1.1. Test Specification

<table>
<tr><td>Test Requirement:</td><td>FCC CFR47 Part 15 Section 15.407 & 15.209 & 15.205</td></tr>
<tr><td>Test Method:</td><td>KDB 789033 D02 v01r04</td></tr>
<tr><td>Frequency Range:</td><td>Band I: 4.5 GHz to 5.15 GHz and 5.35GHz to 5.46GHz
Band II: 5.35 GHz to 5.46 GHz</td></tr>
<tr><td>Measurement Distance:</td><td>3 m</td></tr>
<tr><td>Antenna Polarization:</td><td>Horizontal & Vertical</td></tr>
<tr><td>Operation mode:</td><td>Transmitting mode with modulation</td></tr>
<tr><td>Receiver Setup:</td><td>
<table>
<tr><td>Frequency</td><td>Detector</td><td>RBW</td><td>VBW</td><td>Remark</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>Peak</td><td>1MHz</td><td>3MHz</td><td>Peak Value</td></tr>
<tr><td>RMS</td><td>1MHz</td><td>3MHz</td><td>Average Value</td></tr>
</table>
</td></tr>
<tr><td>Limit:</td><td>
<table>
<tr><td>Frequency</td><td>Limit (dBuV/m @3m)</td><td>Remark</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>74</td><td>Peak Value</td></tr>
<tr><td>54</td><td>Average Value</td></tr>
</table>
</td></tr>
<tr><td>Test setup:</td><td>Above 1GHz
 
</td></tr>
<tr><td>Test Procedure:</td><td>1. The testing follows FCC KDB Publication No. 789033 D02 General UNII Test Procedures New Rules v01r04. Section G) Unwanted emissions measurement.
2. For the radiated emission test below 1GHz:
The EUT was placed on a turntable with 0.8 meter above ground. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable</td></tr>
</table>

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	(from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high PASS filter are used for the test in order to get better signal level. For the radiated emission test above 1GHz: Place the measurement antenna on a turntable with 1.5 meter above ground, which is 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. 3. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level 4. For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported. 5. Use the following spectrum analyzer settings: (1) Span shall wide enough to fully capture the emission being measured; (2) Set RBW=100 kHz for f < 1 GHz; VBW ≥RBW; Sweep = auto; Detector function = peak; Trace = max hold; (3) Set RBW = 1 MHz, VBW= 3MHz for f＞1 GHz for peak measurement. For average measurement: VBW = 10 Hz, when duty cycle is no less than 98 percent. VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation. (4) A 5.8GHz high –PASS filter is used druing radiated emissions above 1GHz measurement.
Test results:	PASS

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6.8.1.1 Test Instruments

Radiated Emission Test Site (966)				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
Test Receiver	ROHDE&SCHWARZ	ESVD	100008	Oct. 13, 2017
Spectrum Analyzer	ROHDE&SCHWARZ	FSQ	200061	Oct. 13, 2017
Spectrum Analyzer	ROHDE&SCHWARZ	FSP40	100056	Oct. 13, 2017
Spectrum Analyzer	Agilent	N9020A	MY49100060	Oct. 13, 2017
Pre-amplifier	EM Electronics Corporation CO.,LTD	EM30265	07032613	Oct. 13, 2017
Pre-amplifier	HP	8447D	2727A05017	Oct. 13, 2017
Loop antenna	ZHINAN	ZN30900A	12024	Oct. 13, 2017
Broadband Antenna	Schwarzbeck	VULB9163	340	Oct. 13, 2017
Horn Antenna	Schwarzbeck	BBHA 9120D	631	Oct. 13, 2017
Horn Antenna	Schwarzbeck	BBH 9170	582	Jun. 07, 2018
Coax cable (9KHz-1GHz)	TCT	RE-low-01	N/A	Oct. 13, 2017
Coax cable (9KHz-40GHz)	TCT	RE-high-02	N/A	Oct. 13, 2017
Coax cable (9KHz-1GHz)	TCT	RE-low-03	N/A	Oct. 13, 2017
Coax cable (9KHz-40GHz)	TCT	RE-high-04	N/A	Oct. 13, 2017
Antenna Mast	Keleto	CC-A-4M	N/A	N/A
EMI Test Software	Shurple Technology	EZ-EMC	N/A	N/A

Note: *The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).*

6.8.1.2 Test Data

Restrict band around fundamental

Band I

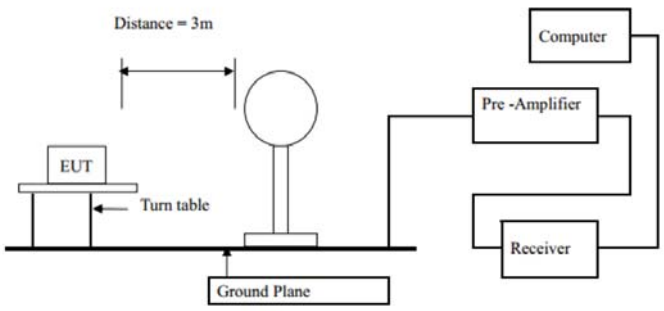
GFSK CH0: 5165MHz									
Frequency (MHz)	Ant. Pol. H/V	Peak reading (DbμV)	AV reading (dBuV)	Correction Factor (Db/m)	Emission Level Peak (DbμV/m)	Emission Level AV (DbμV/m)	Peak limit (DbμV/m)	AV limit (DbμV/m)	Margin (Db)
5142.00	H	42.51	---	5.79	48.30	---	74	54	-5.70
5150.00	H	43.68	---	5.82	49.50	---	74	54	-4.50
5142.00	V	40.85	---	5.79	46.64	---	74	54	-7.36
5150.00	V	41.66	---	5.82	47.48	---	74	54	-6.52
GFSK CH3: 5180MHz									
Frequency (MHz)	Ant. Pol. H/V	Peak reading (DbμV)	AV reading (DbμV)	Correction Factor (Db/m)	Emission Level Peak (DbμV/m)	Emission Level AV (DbμV/m)	Peak limit (DbμV/m)	AV limit (DbμV/m)	Margin (Db)
5135.50	H	42.67	---	5.78	48.45	---	74	54	-5.55
5150.00	H	44.03	---	5.82	49.85	---	74	54	-4.15
5135.50	V	41.34	---	5.78	47.12	---	74	54	-6.88
5150.00	V	42.21	---	5.82	48.03	---	74	54	-5.97
GFSK CH7: 5200MHz									
Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBμV)	AV reading (dBuV)	Correction Factor (dB/m)	Emission Level Peak (dBμV/m)	Emission Level AV (dBμV/m)	Peak limit (dBμV/m)	AV limit (dBμV/m)	Margin (dB)
5128.00	H	42.57	---	5.75	48.32	---	74	54	-5.68
5150.00	H	44.17	---	5.82	49.99	---	74	54	-4.01
5128.00	V	41.35	---	5.75	47.10	---	74	54	-6.90
5150.00	V	42.34	---	5.82	48.16	---	74	54	-5.84

Band II

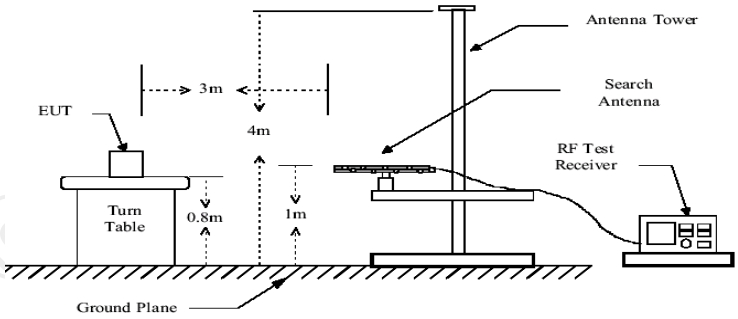
GFSK CH0: 5740MHz									
Frequency (MHz)	Ant. Pol. H/V	Peak reading (DbμV)	AV reading (dBuV)	Correction Factor (Db/m)	Emission Level Peak (DbμV/m)	Emission Level AV (DbμV/m)	Peak limit (DbμV/m)	AV limit (DbμV/m)	Margin (Db)
5425.00	H	41.65	---	6.87	48.52	---	74	54	-5.48
5460.00	H	42.75	---	6.90	49.65	---	74	54	-4.35
5425.00	V	40.37	---	6.87	47.24	---	74	54	-6.76
5460.00	V	41.68	---	6.90	48.58	---	74	54	-5.42
GFSK CH10: 5790MHz									
Frequency (MHz)	Ant. Pol. H/V	Peak reading (DbμV)	AV reading (DbμV)	Correction Factor (Db/m)	Emission Level Peak (DbμV/m)	Emission Level AV (DbμV/m)	Peak limit (DbμV/m)	AV limit (DbμV/m)	Margin (Db)
5439.31	H	41.81	---	6.83	48.64	---	74	54	-5.36
5460.00	H	43.06	---	6.90	49.96	---	74	54	-4.04
5439.31	V	41.25	---	6.83	48.08	---	74	54	-5.92
5460.00	V	42.32	---	6.90	49.22	---	74	54	-4.78
GFSK CH20: 5840MHz									
Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBμV)	AV reading (dBuV)	Correction Factor (dB/m)	Emission Level Peak (dBμV/m)	Emission Level AV (dBμV/m)	Peak limit (dBμV/m)	AV limit (dBμV/m)	Margin (dB)
5446.24	H	41.77	---	6.85	48.62	---	74	54	-5.38
5460.00	H	42.82	---	6.90	49.72	---	74	54	-4.28
5446.24	V	40.36	---	6.85	47.21	---	74	54	-6.79
5460.00	V	41.81	---	6.90	48.71	---	74	54	-5.29

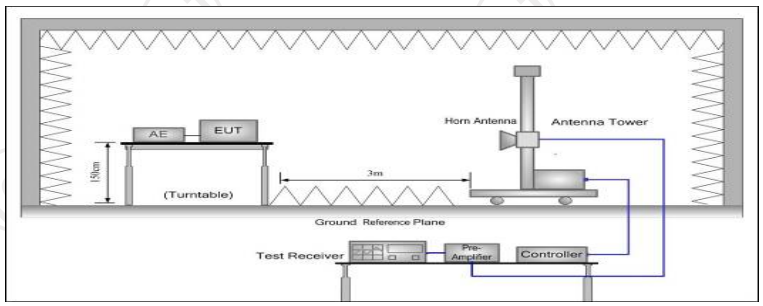
6.8.2. Unwanted Emissions out of the Restricted Bands

6.8.2.1. Test Specification

<table>
<tr><td>Test Requirement:</td><td>FCC CFR47 Part 15 Section 15.407 & 15.209 & 15.205</td></tr>
<tr><td>Test Method:</td><td>KDB 789033 D02 v01r04</td></tr>
<tr><td>Frequency Range:</td><td>9kHz to 40GHz</td></tr>
<tr><td>Measurement Distance:</td><td>3 m</td></tr>
<tr><td>Antenna Polarization:</td><td>Horizontal & Vertical</td></tr>
<tr><td>Operation mode:</td><td>Transmitting mode with modulation</td></tr>
<tr><td>Receiver Setup:</td><td>
<table>
<tr><td>Frequency</td><td>Detector</td><td>RBW</td><td>VBW</td><td>Remark</td></tr>
<tr><td>9kHz- 150kHz</td><td>Quasi-peak</td><td>200Hz</td><td>1kHz</td><td>Quasi-peak Value</td></tr>
<tr><td>150kHz-30MHz</td><td>Quasi-peak</td><td>9kHz</td><td>30kHz</td><td>Quasi-peak Value</td></tr>
<tr><td>30MHz-1GHz</td><td>Quasi-peak</td><td>100KHz</td><td>300KHz</td><td>Quasi-peak Value</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>Peak</td><td>1MHz</td><td>3MHz</td><td>Peak Value</td></tr>
<tr><td>Peak</td><td>1MHz</td><td>10Hz</td><td>Average Value</td></tr>
</table>
</td></tr>
<tr><td>Limit:</td><td>Unwanted spurious emissions fallen in restricted bands per FCC Part15.205 shall comply with the general field strength limits set forth in § 15.209 as below table,
<table>
<tr><td>Frequency</td><td>Field Strength (microvolts/meter)</td><td>Measurement Distance (meters)</td></tr>
<tr><td>0.009-0.490</td><td>2400/F(KHz)</td><td>300</td></tr>
<tr><td>0.490-1.705</td><td>24000/F(KHz)</td><td>30</td></tr>
<tr><td>1.705-30</td><td>30</td><td>30</td></tr>
<tr><td>30-88</td><td>100</td><td>3</td></tr>
<tr><td>88-216</td><td>150</td><td>3</td></tr>
<tr><td>216-960</td><td>200</td><td>3</td></tr>
<tr><td>Above 960</td><td>500</td><td>3</td></tr>
</table>
<table>
<tr><td>Frequency</td><td>Limit (dBuV/m @3m)</td><td>Detector</td></tr>
<tr><td rowspan="2">Above 1G</td><td>74.0</td><td>Peak</td></tr>
<tr><td>54.0</td><td>Average</td></tr>
</table>
</td></tr>
<tr><td>Test setup:</td><td>For radiated emissions below 30MHz


30MHz to 1GHz</td></tr>
</table>

<table>
<tr><td></td><td> 

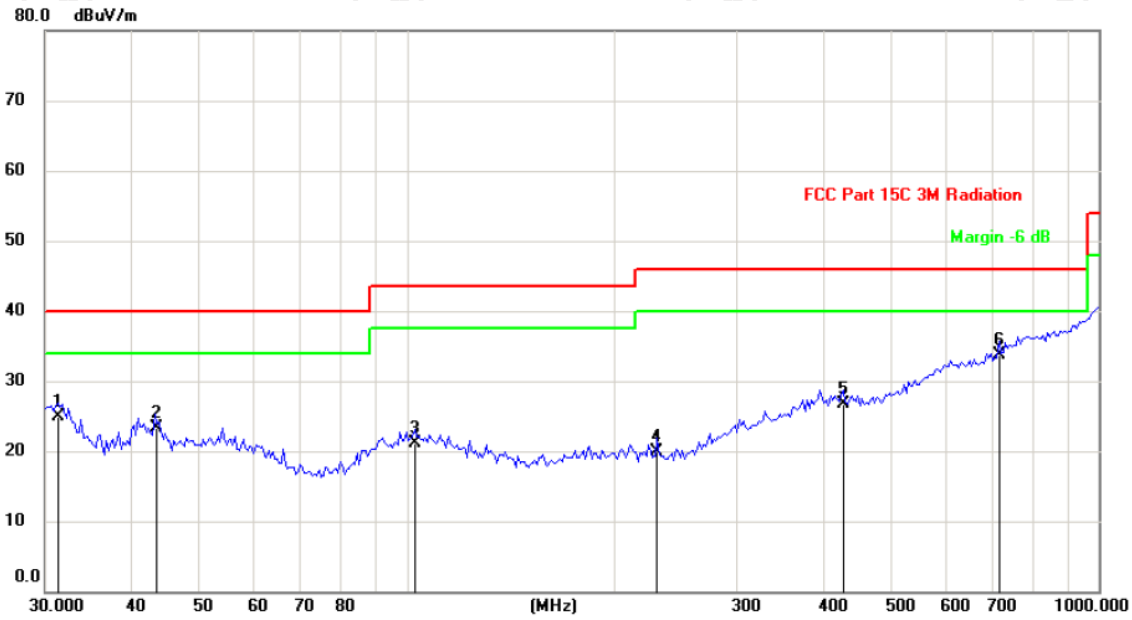
Above 1GHz

</td></tr>
<tr><td>Test Procedure:</td><td>1. The EUT was placed on the top of a rotating table 0.8 meters above the groundat a 3 meter camber. The table was rotated 360 degrees todetermine the position of the highest radiation.
2. The EUT was set 3 meters away from the interference-receiving antenna, whichwas mounted on the top of a variable-height antenna tower.
3. 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.
4. For each suspected emission, the EUT was arranged to its worst case and thenthe antenna was tuned to heights from 1 meter to 4 meters and the rotatablewas turned from 0 degrees to 360 degrees to find the maximum reading.
5. The test-receiver system was set to Peak Detect Function and SpecifiedBandwidth with Maximum Hold Mode.
6. If the emission level of the EUT in peak mode was 10dB lower than the limitspecified, then testing could be stopped and the peak values of the EUT wouldbe reported. Otherwise the emissions that did not have 10dB margin would bere-tested one by one using peak, quasi-peak or average method as specified andthen reported in a data sheet.</td></tr>
<tr><td>Test results:</td><td>PASS</td></tr>
</table>

6.8.3. Test Data

Please refer to following diagram for individual

Below 1GHz

Horizontal:



Site

Limit: FCC Part 15C 3M Radiation

Polarization: *Horizontal*

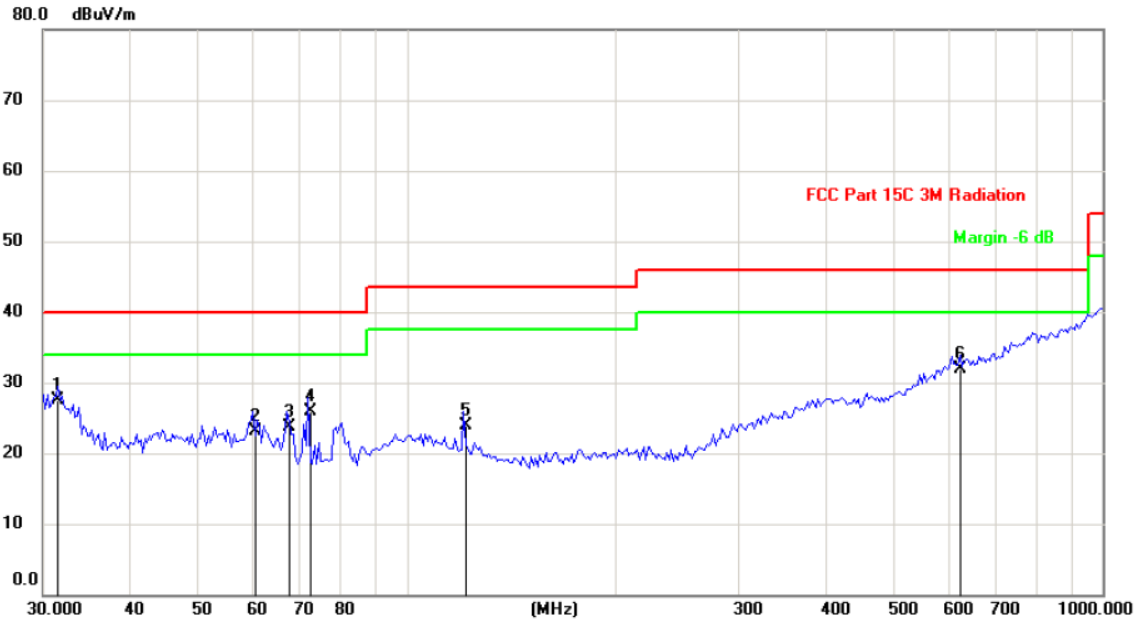
Power: DC 3.3V

Temperature: 25

Humidity: 55 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		31.2919	32.79	-7.89	24.90	40.00	-15.10	QP			
2		43.2333	30.25	-6.95	23.30	40.00	-16.70	QP			
3		102.6117	27.67	-6.57	21.10	43.50	-22.40	QP			
4		230.2295	28.96	-9.06	19.90	46.00	-26.10	QP			
5		427.2920	28.34	-1.64	26.70	46.00	-19.30	QP			
6	*	718.7246	29.49	4.21	33.70	46.00	-12.30	QP			

Vertical:



Site

Limit: FCC Part 15C 3M Radiation

Polarization: *Vertical*

Power: DC 3.3V

Temperature: 25

Humidity: 55 %

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	31.5126	35.37	-7.87	27.50	40.00	-12.50	QP			
2		60.1528	30.59	-7.49	23.10	40.00	-16.90	QP			
3		67.3109	33.92	-10.12	23.80	40.00	-16.20	QP			
4		72.2111	37.00	-11.10	25.90	40.00	-14.10	QP			
5		120.6118	32.72	-8.82	23.90	43.50	-19.60	QP			
6		624.4897	29.22	2.68	31.90	46.00	-14.10	QP			

Note: *1.The low frequency, which started from 9KHz~30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported*

Modulation Type: Band I									
GFSK CH0: 5165MHz									
Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBμV)	AV reading (dBuV)	Correction Factor (dB/m)	Emission Level		Peak limit (dBμV/m)	AV limit (dBμV/m)	Margin (dB)
					Peak (dBμV/m)	AV (dBμV/m)			
10330	H	42.68	---	8.02	50.70	---	74	54	-3.30
15495	H	41.37	---	9.87	51.24	---	74	54	-2.76
---	H	---	---	---	---	---	---	---	---
10330	V	41.41	---	8.02	49.43	---	74	54	-4.57
15495	V	39.27	---	9.87	49.14	---	74	54	-4.86
---	V	---	---	---	---	---	---	---	---
GFSK CH3: 5180MHz									
Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBμV)	AV reading (dBμV)	Correction Factor (dB/m)	Emission Level		Peak limit (dBμV/m)	AV limit (dBμV/m)	Margin (dB)
					Peak (dBμV/m)	AV (dBμV/m)			
10360	H	42.42	---	7.97	50.65	---	74	54	-3.35
15540	H	40.34	---	9.83	51.20	---	74	54	-2.80
---	H	---	---	---	---	---	---	---	---
10360	V	41.27	---	7.97	49.24	---	74	54	-4.76
15540	V	39.14	---	9.83	48.97	---	74	54	-5.03
---	V	---	---	---	---	---	---	---	---
GFSK CH7: 5200MHz									
Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBμV)	AV reading (dBμV)	Correction Factor (dB/m)	Emission Level		Peak limit (dBμV/m)	AV limit (dBμV/m)	Margin (dB)
					Peak (dBμV/m)	AV (dBμV/m)			
10400	H	41.67	---	9.18	50.85	---	74	54	-3.15
15600	H	39.25	---	10.07	49.32	---	74	54	-4.68
---	H	---	---	---	---	---	---	---	---
10400	V	40.34	---	9.18	49.52	---	74	54	-4.48
15600	V	38.51	---	10.07	48.58	---	74	54	-5.42
---	V	---	---	---	---	---	---	---	---

Note:

1. *Emission Level=Peak Reading + Correction Factor; Correction Factor= Antenna Factor + Cable loss – Pre-amplifier*
2. *Margin (dB) = Emission Level (Peak) (dBμV/m)-Average limit (dBμV/m)*
3. *The emission levels of other frequencies are very lower than the limit and not show in test report.*
4. *Measurements were conducted from 1 GHz to the 10th harmonic of highest fundamental frequency. The highest test frequency is 40GHz.*
5. *Data of measurement shown "---"in the above table mean that the reading of emissions is attenuated more than 20 dB below the limits or the field strength is too small to be measured.*

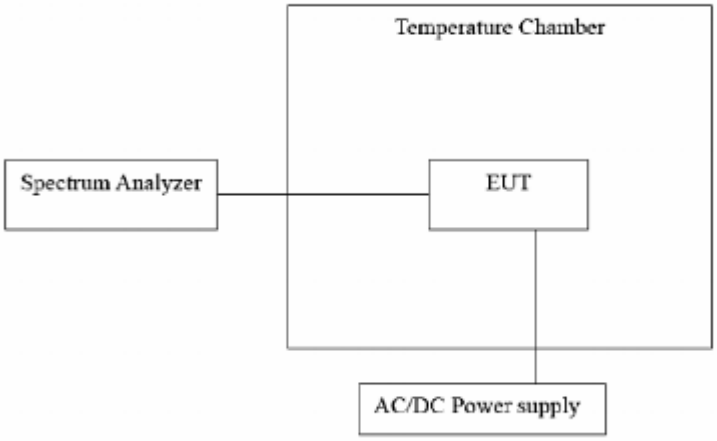
Modulation Type: Band IV									
GFSK CH0: 5740MHz									
Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBμV)	AV reading (dBuV)	Correction Factor (dB/m)	Emission Level		Peak limit (dBμV/m)	AV limit (dBμV/m)	Margin (dB)
					Peak (dBμV/m)	AV (dBμV/m)			
11480	H	41.67	---	7.66	49.33	---	74	54	-4.67
17220	H	38.38	---	9.5	47.88	---	74	54	-6.12
---	H	---	---	---	---	---	---	---	---
11480	V	40.56	---	7.66	48.22	---	74	54	-5.78
17220	V	36.27	---	9.5	45.77	---	74	54	-8.23
---	V	---	---	---	---	---	---	---	---
GFSK CH10: 5790MHz									
Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBμV)	AV reading (dBμV)	Correction Factor (dB/m)	Emission Level		Peak limit (dBμV/m)	AV limit (dBμV/m)	Margin (dB)
					Peak (dBμV/m)	AV (dBμV/m)			
11580	H	41.37	---	7.99	49.36	---	74	54	-4.64
17370	H	36.75	---	9.85	46.60	---	74	54	-7.40
---	H	---	---	---	---	---	---	---	---
11580	V	40.29	---	7.99	48.28	---	74	54	-5.72
17370	V	35.18	---	9.85	45.03	---	74	54	-8.97
---	V	---	---	---	---	---	---	---	---
GFSK CH20: 5840MHz									
Frequency (MHz)	Ant. Pol. H/V	Peak reading (dBμV)	AV reading (dBμV)	Correction Factor (dB/m)	Emission Level		Peak limit (dBμV/m)	AV limit (dBμV/m)	Margin (dB)
					Peak (dBμV/m)	AV (dBμV/m)			
11680	H	41.83	---	8.12	49.95	---	74	54	-4.05
17520	H	36.57	---	9.5	46.07	---	74	54	-7.93
---	H	---	---	---	---	---	---	---	---
11680	V	40.89	---	8.12	49.01	---	74	54	-4.99
17520	V	34.69	---	9.5	44.19	---	74	54	-9.81
---	V	---	---	---	---	---	---	---	---

Note:

1. *Emission Level=Peak Reading + Correction Factor; Correction Factor= Antenna Factor + Cable loss – Pre-amplifier*
2. *Margin (dB) = Emission Level (Peak) (dBμV/m)-Average limit (dBμV/m)*
3. *The emission levels of other frequencies are very lower than the limit and not show in test report.*
4. *Measurements were conducted from 1 GHz to the 10th harmonic of highest fundamental frequency. The highest test frequency is 40GHz.*
5. *Data of measurement shown "---"in the above table mean that the reading of emissions is attenuated more than 20 dB below the limits or the field strength is too small to be measured.*

6.9. Frequency Stability Measurement

6.9.1. Test Specification

Test Requirement:	FCC Part15 Section 15.407(g) &Part2 J Section 2.1055
Test Method:	ANSI C63.10: 2013
Limit:	The frequency tolerance shall be maintained within the band of operation frequency over a temperature variation of -20 degrees to 50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C.
Test Setup:	
Test Procedure:	The EUT was placed inside the environmental test chamber and powered by nominal AC/DC voltage. B. Turn the EUT on and couple its output to a spectrum analyzer. C. Turn the EUT off and set the chamber to the highest temperature specified. D. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize. E. Repeat step 2 and 3 with the temperature chamber set to the lowest temperature. F. The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.
Test Result:	PASS
Remark:	Pre-scan was performed at Antenna 0 and Antenna 1, the worst case was found. Only the test data of Antenna 0 was shown in this report.

Test plots as follows:

Test mode:	GFSK	Frequency(MHz):	5165	
Temperature (°C)	Voltage(VAC)	Measurement Frequency(MHz)	Delta Frequency(Hz)	Result
50	3.3	5165.0054	5400	PASS
40		5165.0016	1600	PASS
30		5164.9967	-3300	PASS
20		5164.9965	-3500	PASS
10		5165.0035	3500	PASS
0		5165.0052	5200	PASS
-10		5165.0031	3100	PASS
-20		5165.0025	2500	PASS
20	3.6	5165.0033	3300	PASS
	3.3	5164.9957	-4300	PASS
	3.0	5164.9969	-3100	PASS

Test mode:	GFSK	Frequency(MHz):	5180	
Temperature (°C)	Voltage(VAC)	Measurement Frequency(MHz)	Delta Frequency(Hz)	Result
50	3.3	5180.0048	4800	PASS
40		5180.0048	4800	PASS
30		5180.0053	5300	PASS
20		5180.0030	3000	PASS
10		5179.9957	-4300	PASS
0		5179.9921	-7900	PASS
-10		5180.0048	4800	PASS
-20		5180.0037	3700	PASS
20	3.6	5179.9970	-3000	PASS
	3.3	5180.0017	1700	PASS
	3.0	5180.0060	6000	PASS

Test mode:	GFSK	Frequency(MHz):	5200	
Temperature (°C)	Voltage(VAC)	Measurement Frequency(MHz)	Delta Frequency(Hz)	Result
50	3.3	5200.0074	7400	PASS
40		5200.0052	5200	PASS
30		5200.0047	4700	PASS
20		5199.9983	-1700	PASS
10		5199.9988	-1200	PASS
0		5199.9982	-1800	PASS
-10		5200.0049	4900	PASS
-20		5200.0036	3600	PASS
20	3.6	5200.0054	5400	PASS
	3.3	5200.0021	2100	PASS
	3.0	5200.0021	2100	PASS

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Test mode:	GFSK	Frequency(MHz):	5740
Temperature (°C)	Voltage(VAC)	Measurement Frequency(MHz)	Delta Frequency(Hz)	Result
50	3.3	5740.0067	6700	PASS
40		5740.0028	2800	PASS
30		5740.0031	3100	PASS
20		5740.0019	1900	PASS
10		5740.0013	1300	PASS
0		5740.0074	7400	PASS
-10		5740.0016	1600	PASS
-20		5740.0033	3300	PASS
20	3.6	5740.0042	4200	PASS
	3.3	5739.9940	-6000	PASS
	3.0	5740.0028	2800	PASS

Test mode:	GFSK	Frequency(MHz):	5790
Temperature (°C)	Voltage(VAC)	Measurement Frequency(MHz)	Delta Frequency(Hz)	Result
50	3.3	5790.0101	10100	PASS
40		5790.0045	4500	PASS
30		5790.0029	2900	PASS
20		5789.9987	-1300	PASS
10		5789.9932	-6800	PASS
0		5790.0021	2100	PASS
-10		5790.0046	4600	PASS
-20		5790.0053	5300	PASS
20	3.6	5790.0038	3800	PASS
	3.3	5790.0033	3300	PASS
	3.0	5790.0050	5000	PASS

Test mode:	GFSK	Frequency(MHz):	5840
Temperature (°C)	Voltage(VAC)	Measurement Frequency(MHz)	Delta Frequency(Hz)	Result
50	3.3	5839.9815	-18500	PASS
40		5839.9935	-6500	PASS
30		5839.9959	-4100	PASS
20		5839.9973	-2700	PASS
10		5840.0016	1600	PASS
0		5840.0046	4600	PASS
-10		5840.0020	2000	PASS
-20		5840.0031	3100	PASS
20	3.6	5840.0042	4200	PASS
	3.3	5839.9987	-1300	PASS
	3.0	5840.0028	2800	PASS

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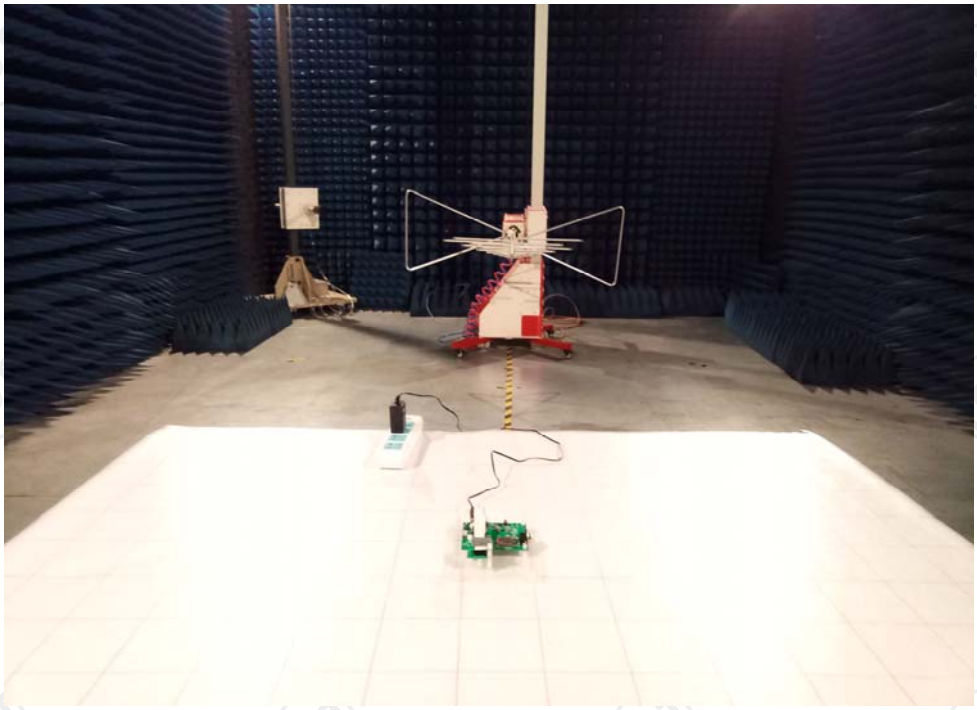
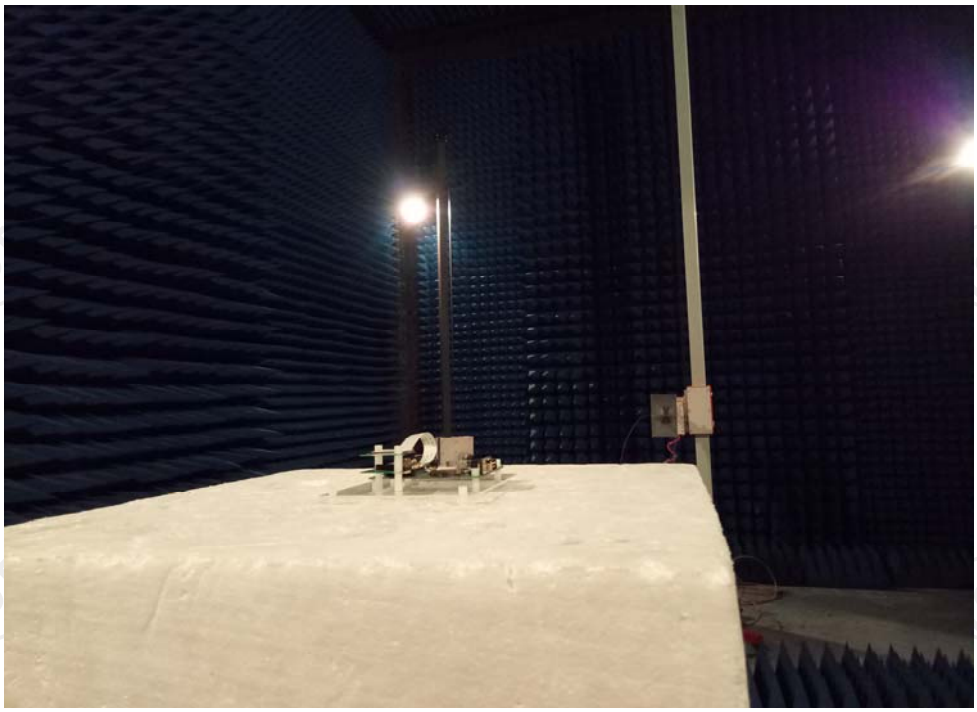
Appendix A: Photographs of Test Setup

Product: RF 5G Wireless Module
Model: IA9Q5 S83F
Radiated Emission





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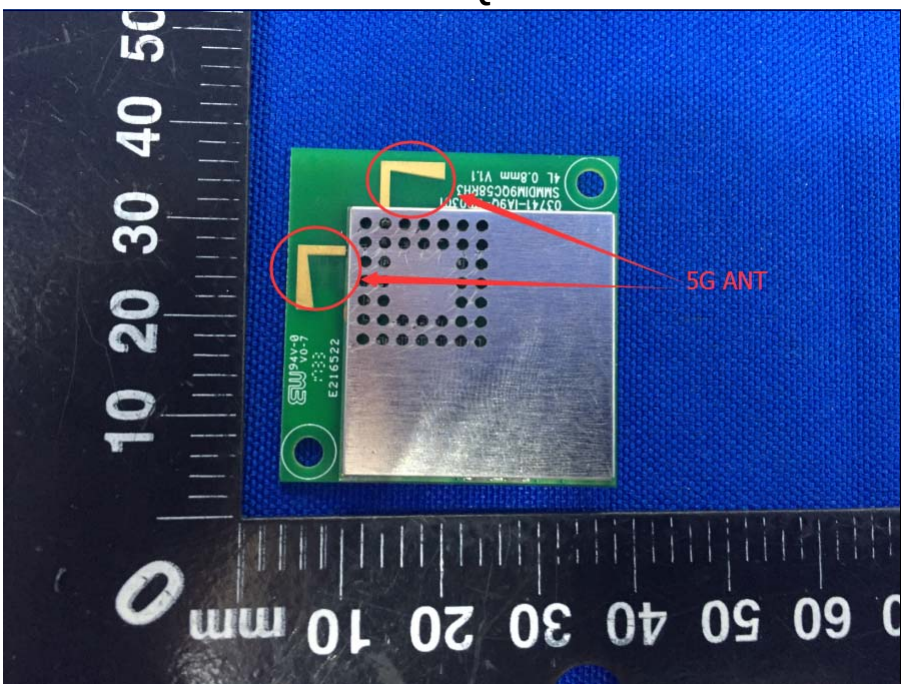
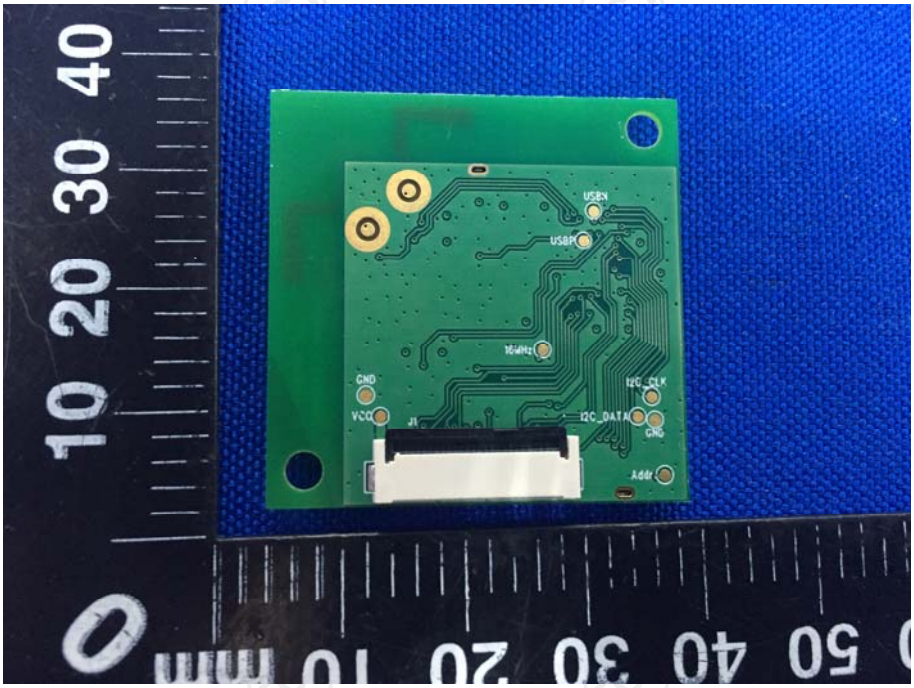
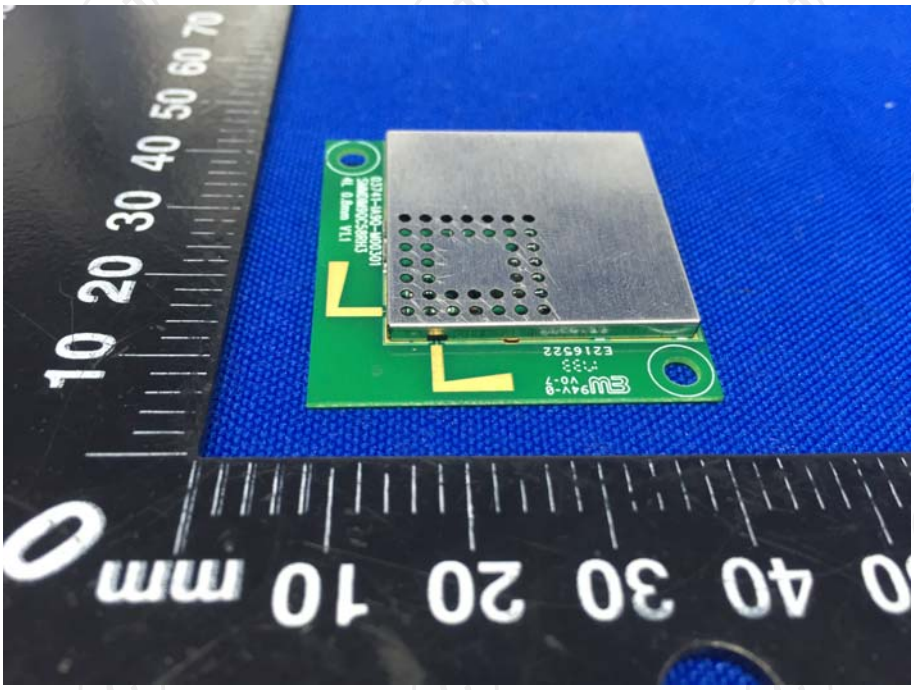
Appendix B: Photographs of EUT

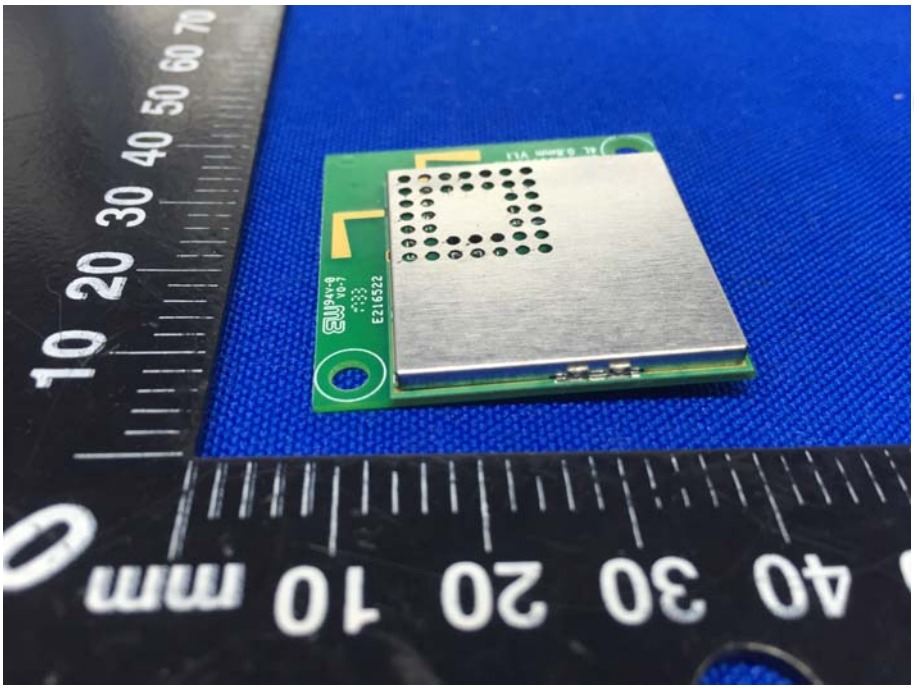
Product: RF 5G Wireless Module

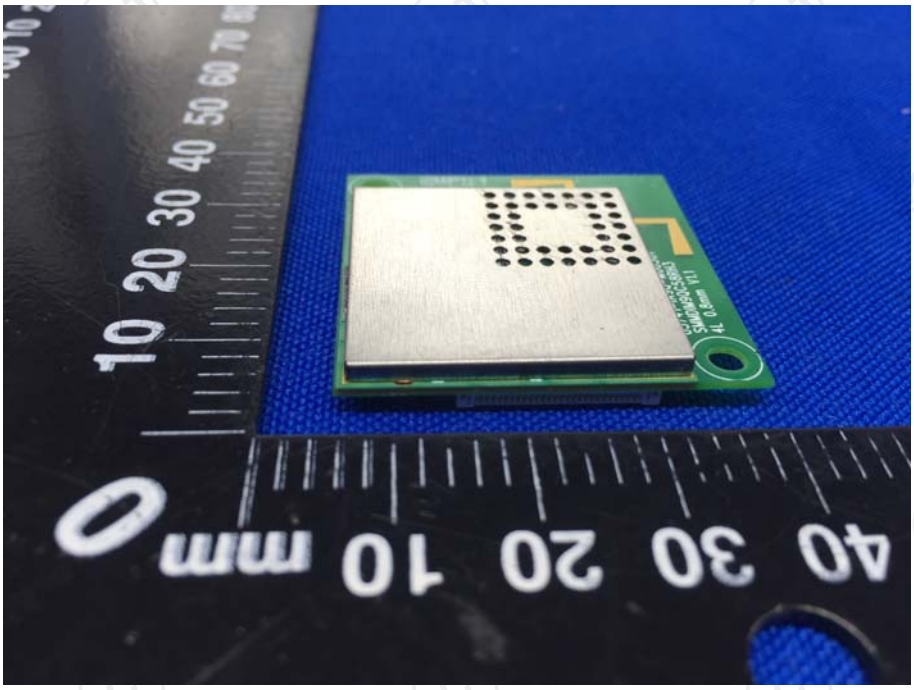
Model: IA9Q5 S83F

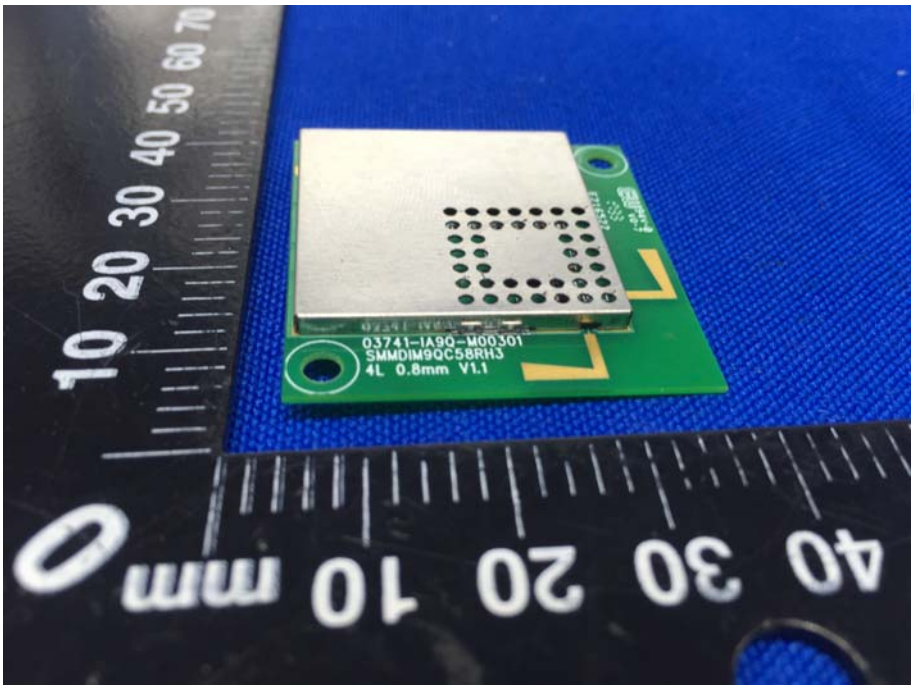








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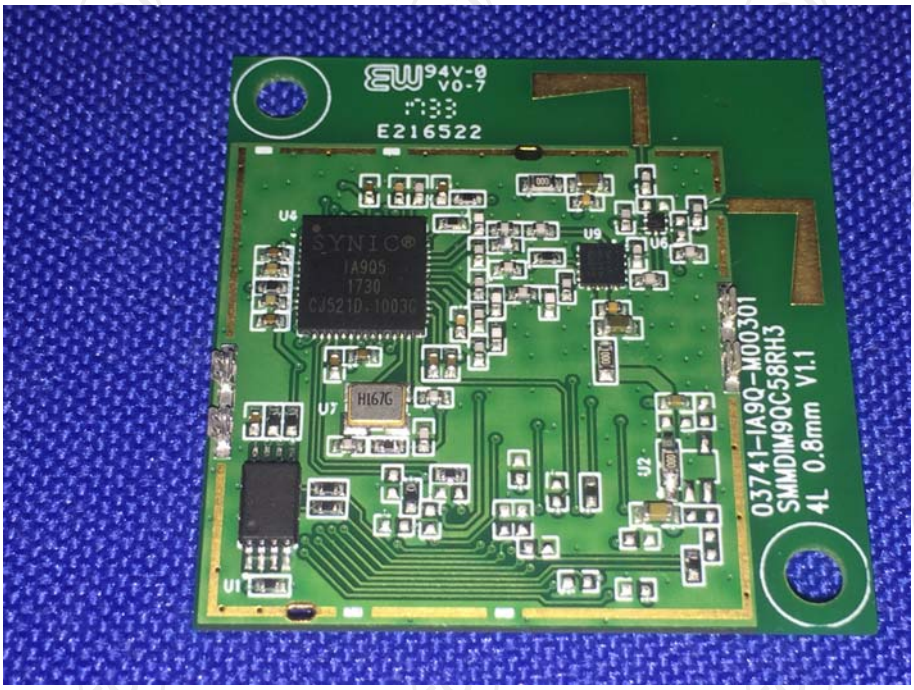
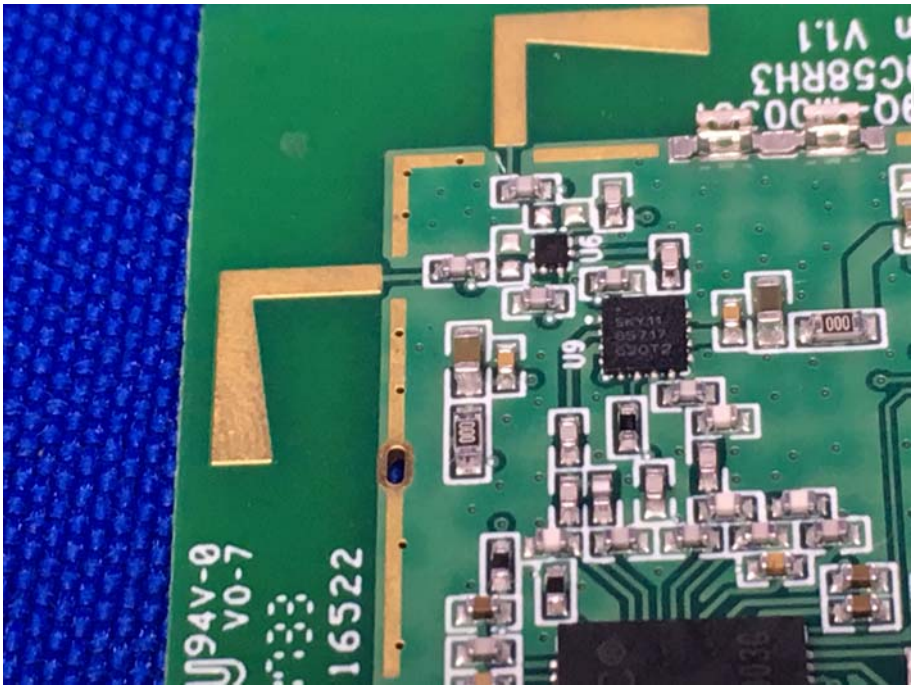
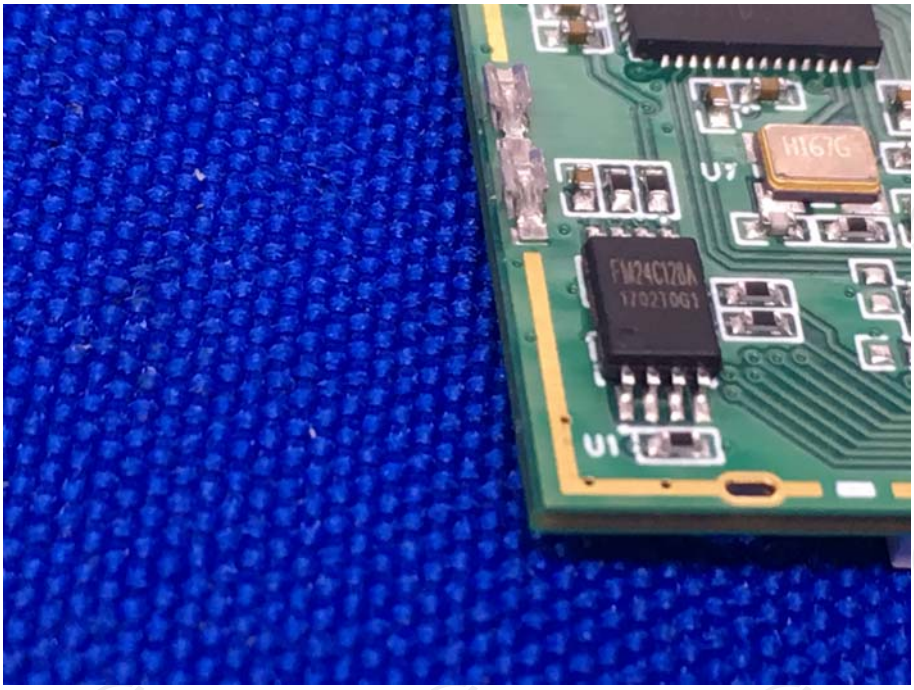
SMMDIM9QC58RH3
4L 0.8mm V1.1


94V-0
V0-7
E216522
SYNIC
03741-1A9Q-M00301
SMMDIM9QC58RH3
4L 0.8mm V1.1





*****END OF REPORT*****

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