

TEST REPORT

Applicant: Quectel Wireless Solutions Co., Ltd.
EUT Description: Smart Module with Wi-Fi 5G & Bluetooth
Model: SG565D-WF
Brand: QUECTEL
FCC ID: XMR2025SG565DWF
Standards: FCC 47 CFR Part 15 Subpart C
Date of Receipt: 2025/11/17
Date of Test: 2025/11/17 to 2025/12/29
Date of Issue: 2025/12/29

TOWE. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

the results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. It is the manufacturer's responsibility to assure that additional production units of the model are manufactured with identical electrical and mechanical components. All samples tested were in good operating condition throughout the entire test program. Measurement Uncertainties are published for informational purposes only and were not taken into account unless noted otherwise. without written approval of TOWE, the test report shall not be reproduced except in full.



A handwritten signature in black ink, appearing to read "Jim Huang", is written over a horizontal line.

Jim Huang
Approved By:

A handwritten signature in black ink, appearing to read "Carey Chen", is written over a horizontal line.

Carey Chen
Reviewed By:

Revision History

Rev.	Issue Date	Description	Revised by
01	2025/12/29	Original	Carey Chen

Summary of Test Results

Clause	FCC Part	Test Items	Result
4.1	§15.203/15.247(b)	Antenna Requirement	Reference report TCWA25030013001
4.2	§15.207	AC Power Line Conducted Emission	
4.3	§15.247 (b)(1)	Output Power	
4.4	§15.247 (a)(1)	Occupied Bandwidth	
4.5	§15.247 (a)(1)	Hopping Frequency Separation	
4.6	§15.247 (a)(1)(iii)	Number Hopping Channels	
4.7	§15.247 (a)(1)(iii)	Dwell Time	
4.8	§15.247(d)	Band Edge for Conducted Emissions	
4.9	§15.247(d)	Spurious RF Conducted Emissions	
4.10	§15.205 §15.209	Radiated Spurious emissions and Band Edge	PASS
Test Method: ANSI C63.10-2020+Cor. 1-2023+C63.10a-2024 + Errata to C63.10a-2024, KDB 558074 D01 15.247 Mesa Guidance v05r02. Remark: Pass is EUT meets standard requirements.			

Remark:

In this report the worst data of Radiated Spurious emissions and Band Edge were spot checked, and all the other data please refer to the previous report with report number (TCWA25030013001).

Table of Contents

1	General Description	5
1.1	Lab Information	5
1.1.1	Testing Location	5
1.1.2	Test Facility / Accreditations	5
1.2	Client Information	5
1.2.1	Applicant	5
1.2.2	Manufacturer	5
1.3	Product Information	6
2	Test Configuration	7
2.1	Test Channel	7
2.2	Worst-case configuration and Mode	8
2.3	Support Unit used in test	8
2.4	Test Environment	8
2.5	Test RF Cable	8
2.6	Modifications	8
2.7	Test Setup Diagram	9
2.7.1	Radiated Configuration	9
3	Equipment and Measurement Uncertainty	10
3.1	Test Equipment List	10
3.2	Measurement Uncertainty	10
4	Test results	11
4.1	Radiated Spurious Emissions and Band Edge	11
5	Test Setup Photos	13
	Appendix	14

1 General Description

1.1 Lab Information

1.1.1 Testing Location

These measurements tests were conducted at the Sushi TOWE Wireless Testing(Shenzhen) Co., Ltd. facility located at F401 and F101, Building E, Hongwei Industrial Zone, Liuxian 3rd Road, Bao'an District, Shenzhen, China. The measurement facility is compliant with the test site requirements specified in ANSI C63.4-2014
Tel.: +86-755-27212361
Contact Email: info@towewireless.com

1.1.2 Test Facility / Accreditations

A2LA (Certificate Number: 7088.01)

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).

FCC Designation No.: CN1353

Sushi TOWE Wireless Testing(Shenzhen) Co., Ltd. has been recognized as an accredited testing laboratory. Designation Number: CN1353.

ISED CAB identifier: CN0152

Sushi TOWE Wireless Testing(Shenzhen) Co., Ltd. has been recognized by ISED as an accredited testing laboratory.
CAB identifier: CN0152
Company Number: 31000

1.2 Client Information

1.2.1 Applicant

Applicant:	Quectel Wireless Solutions Co., Ltd.
Address:	No. 8 Waipojing Road, Sijing Town, Songjiang District, Shanghai 201601, China

1.2.2 Manufacturer

Manufacturer:	Quectel Wireless Solutions Co., Ltd.
Address:	No. 8 Waipojing Road, Sijing Town, Songjiang District, Shanghai 201601, China

1.3 Product Information

EUT Description:	Smart Module with Wi-Fi 5G & Bluetooth
Model:	SG565D-WF
Brand:	QUECTEL
Hardware Version:	R1.0
Software Version:	SG5X5DWFPAR03A01
SN:	D1Y25IS2B000056
Bluetooth version:	Bluetooth V5.0
Modulation Technique:	Frequency Hopping Spread Spectrum(FHSS)
Modulation Type:	GFSK, $\pi/4$ DQPSK, 8DPSK
Frequency Range:	2400 ~ 2483.5MHz
Channel Frequency:	2402 ~ 2480MHz
Number of Channel:	79
Hopping Channel Type:	Adaptive Frequency Hopping systems
Antenna Type:	☒ External, ☐ Integrated
Antenna Gain:	Ant0 (dBi)
	0.47
Remark: The above EUT's information was declared by applicant, please refer to the specifications or user's manual for more detailed description.	

2 Test Configuration

2.1 Test Channel

Operation Frequency of each channel for GFSK, $\pi/4$ DQPSK, 8DPSK							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
0	2402MHz	20	2422MHz	40	2442MHz	60	2462MHz
1	2403MHz	21	2423MHz	41	2443MHz	61	2463MHz
2	2404MHz	22	2424MHz	42	2444MHz	62	2464MHz
3	2405MHz	23	2425MHz	43	2445MHz	63	2465MHz
4	2406MHz	24	2426MHz	44	2446MHz	64	2466MHz
5	2407MHz	25	2427MHz	45	2447MHz	65	2467MHz
6	2408MHz	26	2428MHz	46	2448MHz	66	2468MHz
7	2409MHz	27	2429MHz	47	2449MHz	67	2469MHz
8	2410MHz	28	2430MHz	48	2450MHz	68	2470MHz
9	2411MHz	29	2431MHz	49	2451MHz	69	2471MHz
10	2412MHz	30	2432MHz	50	2452MHz	70	2472MHz
11	2413MHz	31	2433MHz	51	2453MHz	71	2473MHz
12	2414MHz	32	2434MHz	52	2454MHz	72	2474MHz
13	2415MHz	33	2435MHz	53	2455MHz	73	2475MHz
14	2416MHz	34	2436MHz	54	2456MHz	74	2476MHz
15	2417MHz	35	2437MHz	55	2457MHz	75	2477MHz
16	2418MHz	36	2438MHz	56	2458MHz	76	2478MHz
17	2419MHz	37	2439MHz	57	2459MHz	77	2479MHz
18	2420MHz	38	2440MHz	58	2460MHz	78	2480MHz
19	2421MHz	39	2441MHz	59	2461MHz		

Remark:

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:

Test Channel	Test Frequency
The Lowest channel (CH0)	2402MHz
The Middle channel (CH39)	2441MHz
The Highest channel (CH78)	2480MHz

2.2 Worst-case configuration and Mode

Modulation Type	GFSK			$\pi/4$ DQPSK			8DPSK		
	DH1	DH3	DH5	2DH1	2DH3	2DH5	3DH1	3DH3	3DH5
Payload	27	183	339	54	367	679	83	552	1021
Hopping mode	Keep the EUT in hopping mode								
No hopping mode	Keep the EUT was programmed to be in continuously transmitting mode								
Normal Link	Keep the EUT operation to normal function.								

2.3 Support Unit used in test

Description	Manufacturer	Model	Serial Number
Development Board*	Quectel	SMART-5G-EVB	E1Q22HV3A000015
Development Board*	Quectel	SG555D-WF-TE-A	E1Y24KM4M000002
Remark: *the information are provided by applicant.			

2.4 Test Environment

Temperature:	Normal: 15°C ~ 35°C
Humidity:	45-56 % RH Ambient
Voltage:	DC 4.00V (Module Input)
Remark: The testing environment is within the scope of the EUT user manual and meets the requirements of the standard testing environment.	

2.5 Test RF Cable

For all conducted test items: The offset level is set spectrum analyzer to compensate the RF cable loss and attenuator factor between RF conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level will be exactly the RF output level.

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

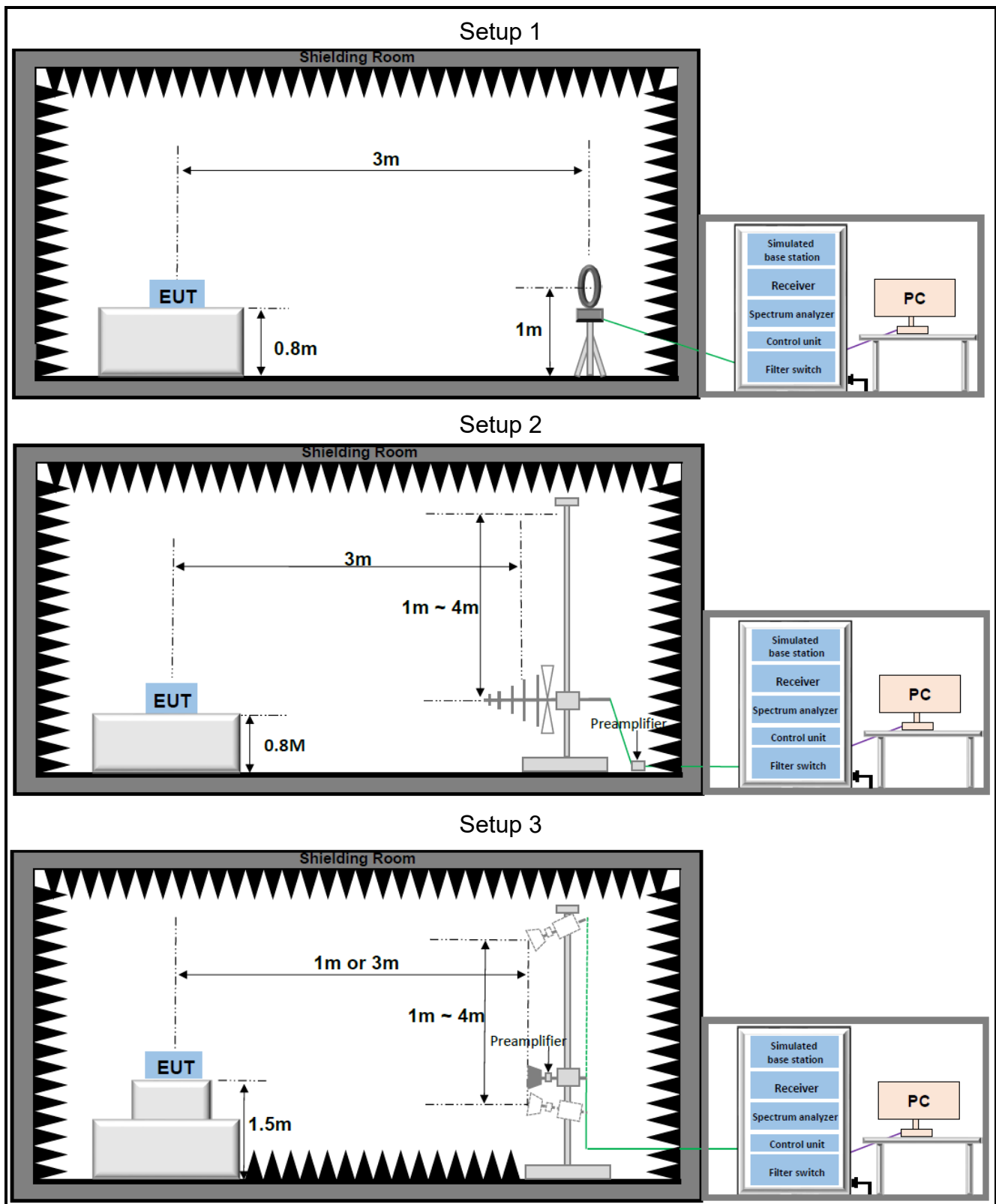
Offset = RF cable loss + attenuator factor.

2.6 Modifications

No modifications were made during testing.

2.7 Test Setup Diagram

2.7.1 Radiated Configuration



3 Equipment and Measurement Uncertainty

All test and measuring equipment utilized to perform the tests documented in this report are calibrated on a regular basis, whichever is less, and where applicable is traceable to recognized national standards.

3.1 Test Equipment List

Radiated Emission					
Description	Manufacturer	Model	S.N.	Last Due	Cal Due
Biconic Logarithmic Periodic Antennas	Schwarzbeck	VULB9163	1643	2023/06/25	2026/06/24
Double-Ridged Horn Antennas	Schwarzbeck	BBHA 9120D	2809	2023/06/25	2026/06/24
Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	1290	2023/06/25	2026/06/24
Loop Antenna	Schwarzbeck	FMZB 1519C	1519C-028	2023/06/29	2026/06/28
Signal Analyzer	Keysight	N9020A	MY49100252	2025/03/11	2026/03/10
EXA Signal Analyzer, Multi-touch	Keysight	N9010B	MY63440541	2025/05/29	2026/05/28
Wideband Radio Communication Tester	R&S	CMW500	150645	2025/03/11	2026/03/10
Low Noise Amplifier	Tonscend	TAP9K3G40	AP23A8060273	2025/03/11	2027/03/10
Low Noise Amplifier	Tonscend	TAP01018050	AP22G806258	2025/03/11	2027/03/10
Low Noise Amplifier	Tonscend	TAP18040048	AP22G806247	2025/03/11	2027/03/10
Hygrometer	BINGYU	HTC-1	N/A	2025/07/25	2026/07/24
Band Reject Filter Group	Townshend	JS0806-F	23A806F0652	N/A	N/A
Test Software	Tonscend	TS+	Version: 5.0.0	N/A	N/A

3.2 Measurement Uncertainty

Parameter	U _{lab}
Radiated Emissions(9kHz~30MHz)	2.40dB
Radiated Emissions(30MHz~1000MHz)	4.66dB
Radiated Emissions(1GHz~18GHz)	5.42dB
Radiated Emissions(18GHz~40GHz)	5.46dB

Uncertainty figures are valid to a confidence level of 95%

4 Test results

4.1 Radiated Spurious Emissions and Band Edge

Limits

Spurious emissions are permitted in an of the frequency bands:

MHz	MHz	MHz	MHz	GHz	GHz
0.090 - 0.110	12.29 - 12.293	149.9 - 150.05	1660 - 1710	4.5 - 5.15	14.47 - 14.5
0.495 - 0.505	12.51975 - 12.52025	156.52475 - 156.52525	1718.8 - 1722.2	5.35 - 5.46	15.35 - 16.2
2.1735 - 2.1905	12.5767 - 12.57725	156.7 - 156.9	2200 - 2300	7.25 - 7.75	17.7 - 21.4
4.125 - 128	13.36 - 13.41	162.0125 - 167.17	2310 - 2390	8.025 - 8.5	22.01 - 23.12
4.17725 - 4.17775	16.42 - 16.423	167.72 - 173.2	2483.5 - 2500	9.0 - 9.2	23.6 - 24.0
4.20725 - 4.20775	16.69475 - 16.69525	240 - 285	2655 - 2900	9.3 - 9.5	31.2 - 31.8
6.215 - 6.218	1680425 - 1680475	322 - 335.4	3260 - 3267	10.6 - 12.7	36.43 - 36.5
6.26775 - 6.26825	25.5 - 25.67	399.9 - 410	3332 - 3339	13.25 - 13.4	
6.31175 - 6.31225	37.5 - 38.25	608 - 614	3345.8 - 3358		
8.291 - 8.294	73 - 74.6	960 - 1240	3600 - 4400		
8.362 - 8.366	74.8 - 75.2	1300 - 1427			
8.37625 - 8.38675	108 - 121.94	1435 - 1626.5			
8.41425 - 8.41475	123 - 138	1645.5 - 1646.5			

Radiated disturbance of an intentional radiator:

Frequency	Field strength ($\mu\text{V/m}$)	Limit (dB $\mu\text{V/m}$)	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	74.0	Peak	3
		54.0	Average	

Test Procedure

ANSI C63.10-2020+Cor. 1-2023+C63.10a-2024 + Errata to C63.10a-2024 Section 6.4 & 6.5 & 6.6

Test Settings

- For radiated emissions measurements performed at frequencies less than or equal to 1GHz, the EUT shall be placed on a RF-transparent table or support at a nominal height of 80cm above the reference ground plane.
- For radiated emissions measurements performed at frequencies above 1GHz, the EUT shall be placed on a RF-transparent table or support at a nominal height of 80cm above the ground plane.
- Radiated measurements shall be made with the measurement antenna positioned in both horizontal and vertical polarization. The measurement antenna shall be varied from 1m to 4m in height above the reference ground in a search for the relative positioning that produces the maximum radiated signal level (i.e, field strength or received power), when orienting the measurement antenna in vertical polarization, the minimum height of the lowest element of the antenna shall clear the site reference ground plane by at least 25cm.
- For each suspected emission, the EUT was ranged its worst case and then tune the antenna tower(from 1~4m) and turntable(from 0~360°) find the maximum reading. Preamplifier and a high pass filter are used for the test in order get better signal level comply with the guidelines.
- Set to the maximum power setting and enable the EUT transmit continuously.
- The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.
- spectrum analyzer setting:

Measurements Below 1000MHz: RBW = 120 kHz; VBW $\geq$ 300 kHz; Detector = Peak

Measurements Above 1000MHz: RBW = 1 MHz; VBW $\geq$ 3 MHz; Detector = Peak

Average Measurements Above 1000MHz:

RBW = 1 MHz, VBW $\geq$ 1/T, with peak detector for average measurements.

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

Level = Reading(dB μ V) + Factor(dB):

Factor = Cable Factor(dB) + AF(dB/m) - Preamplifier gain(dB)

AF = Antenna Factor(dB/m)

Margin = Limit(dB μ V/m) – Level(dB μ V/m)

9. Repeat above procedures until all frequencies measured was complete.
10. Measure and record the results in the test report.

Test Notes

1. Emissions below 18GHz were measured at a 3-meter test distance while emissions above 18GHz were measured at a 1-meter test distance with the application of a distance correction factor.
2. Radiated spurious emissions were investigated from 9kHz to 30MHz, 30MHz-1GHz and above 1GHz. the disturbance between 9kHz to 30MHz and 18GHz to 40GHz was very low. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be recorded, so only the harmonics had been displayed.
3. These frequencies which near "-" should be ignored because they are Fundamental frequency.

Test Setup

Refer to section 2.7.1 for details.

Measuring Instruments

The measuring equipment is listed in the section 3.1 of this test report.

Test Result

The detailed test data see: **Appendix.**

5 Test Setup Photos

The detailed test data see: **Appendix-A BTWIFI Setup Photos**

Appendix

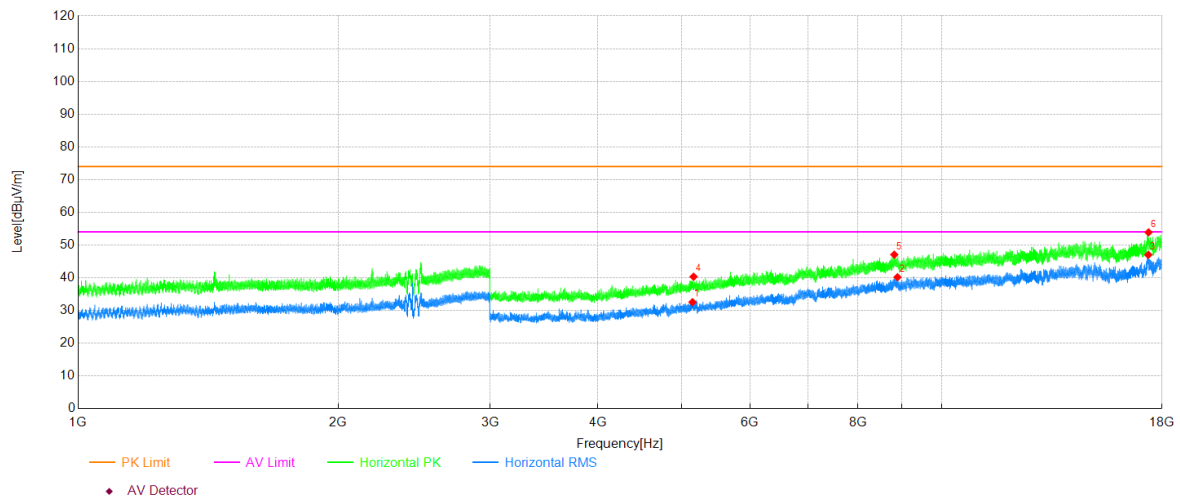
Radiated Spurious Emissions

Test for spot check:

Test Result

Project Information			
Mode:	BT(DH5)	Band:	-
Bandwidth	-	Channel	39
SN:	D1Y25IS2B000056	Engineer:	Tian Shuo
Remark:	Power 9		

Test Graph

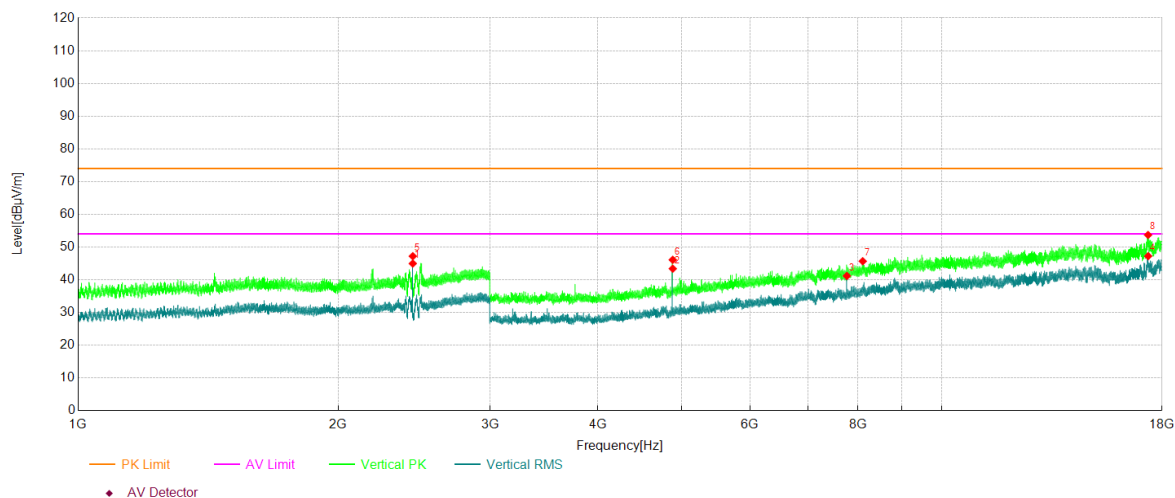


Data List								
NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity	Verdict
1	5146.00	39.31	-6.76	32.55	54.00	21.45	Horizontal	PASS
2	8889.50	38.16	2.01	40.17	54.00	13.83	Horizontal	PASS
3	17356.00	34.38	12.63	47.01	54.00	6.99	Horizontal	PASS
4	5161.00	47.07	-6.74	40.33	74.00	33.67	Horizontal	PASS
5	8814.00	44.71	2.35	47.06	74.00	26.94	Horizontal	PASS
6	17364.50	41.60	12.29	53.89	74.00	20.11	Horizontal	PASS

Project Information

Mode:	BT(DH5)	Band:	-
Bandwidth	-	Channel	39
SN:	D1Y25IS2B000056	Engineer:	Tian Shuo
Remark:	Power 9		

Test Graph



Data List

NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity	Verdict
1	2440.90	42.67	2.29	44.96	-	-	Vertical	NA
2	4882.50	51.43	-8.04	43.39	54.00	10.61	Vertical	PASS
3	7767.00	42.28	-1.10	41.18	54.00	12.82	Vertical	PASS
4	17346.50	34.53	12.70	47.23	54.00	6.77	Vertical	PASS
5	2440.90	44.92	2.29	47.21	-	-	Vertical	NA
6	4882.00	54.13	-8.04	46.09	74.00	27.91	Vertical	PASS
7	8103.50	45.32	0.35	45.67	74.00	28.33	Vertical	PASS
8	17342.00	41.20	12.49	53.69	74.00	20.31	Vertical	PASS

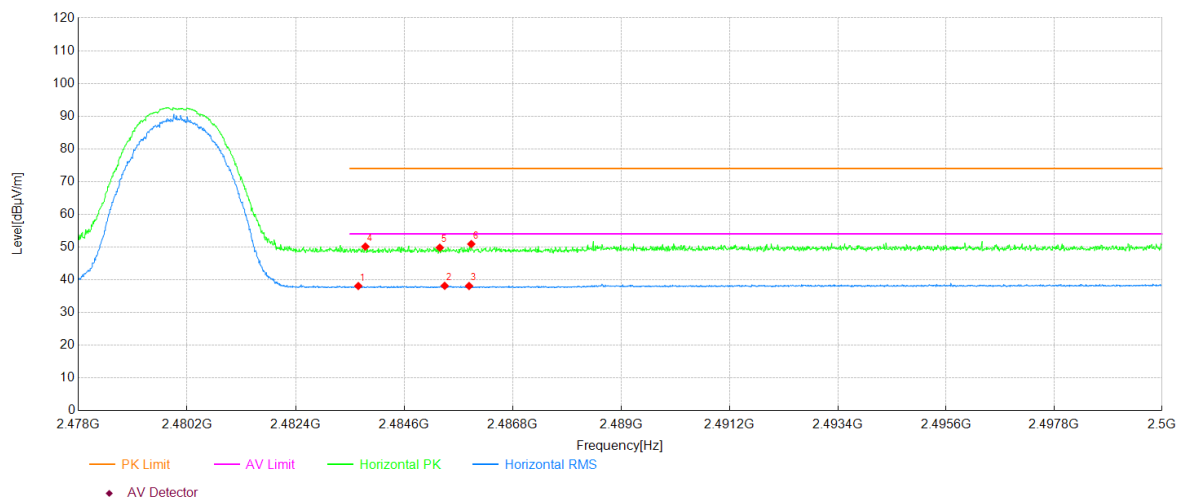
Radiated Band Edge

Test for spot check:

Test Result

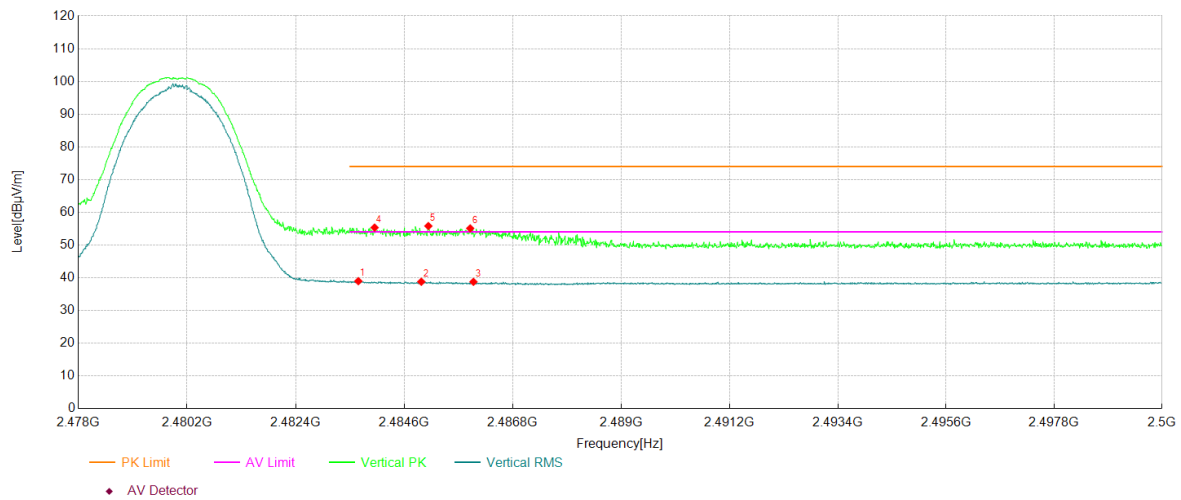
Project Information			
Mode:	BT(2DH5)	Band:	-
Bandwidth	-	Channel	78
SN:	D1Y25IS2B000056	Engineer:	Tian Shuo
Remark:	Power 9		

Test Graph



Data List								
NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity	Verdict
1	2483.67	36.23	1.86	38.09	54.00	15.91	Horizontal	PASS
2	2485.42	36.27	1.88	38.15	54.00	15.85	Horizontal	PASS
3	2485.91	36.22	1.88	38.10	54.00	15.90	Horizontal	PASS
4	2483.81	48.27	1.87	50.14	74.00	23.86	Horizontal	PASS
5	2485.32	47.93	1.88	49.81	74.00	24.19	Horizontal	PASS
6	2485.96	49.04	1.88	50.92	74.00	23.08	Horizontal	PASS

Project Information			
Mode:	BT(2DH5)	Band:	-
Bandwidth	-	Channel	78
SN:	D1Y25IS2B000056	Engineer:	Tian Shuo
Remark:	Power 9		

Test Graph

Data List								
NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity	Verdict
1	2483.67	37.11	1.86	38.97	54.00	15.03	Vertical	PASS
2	2484.94	36.92	1.87	38.79	54.00	15.21	Vertical	PASS
3	2486.00	36.88	1.88	38.76	54.00	15.24	Vertical	PASS
4	2484.00	53.47	1.87	55.34	74.00	18.66	Vertical	PASS
5	2485.09	53.94	1.87	55.81	74.00	18.19	Vertical	PASS
6	2485.93	53.23	1.88	55.11	74.00	18.89	Vertical	PASS

~The End~