

FCC Test Report

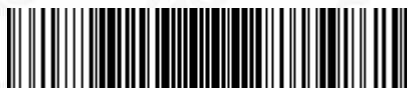
Report No.: AGC01559190905FE06

FCC ID : 2AANZAIR2
APPLICATION PURPOSE : Original Equipment
PRODUCT DESIGNATION : QUIRKY AIR
BRAND NAME : QUIRKY
MODEL NAME : QKY-AIR, QKY-AIR-5, QKY-AIR-5-BLK, EU-QKY-AIR,
EU-QKY-AIR-5, EU-QKY-AIR-7, QKY-AIR-7, QKY-AIR-7-BLK
APPLICANT : DGL Group LTD.
DATE OF ISSUE : Oct. 21, 2019
STANDARD(S) : FCC Part 15.407
TEST PROCEDURE(S) : KDB 789033 D02 v02r01
REPORT VERSION : V1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd

CAUTION:

This report shall not be reproduced except in full without the written permission of the test laboratory and shall not be quoted out of context.



Attestation of Global Compliance

Attestation of Global Compliance(Shenzhen)Co.,Ltd.

Add: 2/F., Building 2, Sanwei Chaxi Industrial Park, Sanwei Community,
Hangcheng Street, Bao'an District, Shenzhen, Guangdong, China

Tel: +86-755 2523 4088

E-mail: agc@agc-cert.com

Service Hotline: 400 089 2118

REPORT REVISE RECORD

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Oct. 21, 2019	Valid	Initial Release



Attestation of Global Compliance

Attestation of Global Compliance(Shenzhen)Co.,Ltd.

Add: 2/F., Building 2, Sanwei Chaxi Industrial Park, Sanwei Community,
Hangcheng Street, Bao'an District, Shenzhen, Guangdong, China

Tel: +86-755 2523 4088

E-mail: agc@agc-cert.com

Service Hotline: 400 089 2118

TABLE OF CONTENTS

1. VERIFICATION OF CONFORMITY	5
2. GENERAL INFORMATION.....	6
2.1. PRODUCT DESCRIPTION	6
2.2. TABLE OF CARRIER FREQUENCIES	6
2.3. RELATED SUBMITTAL(S) / GRANT (S)	7
2.4. TEST METHODOLOGY	7
2.5. SPECIAL ACCESSORIES	7
2.6. EQUIPMENT MODIFICATIONS	7
3. MEASUREMENT UNCERTAINTY	8
4. DESCRIPTION OF TEST MODES.....	9
5. SYSTEM TEST CONFIGURATION	10
5.1. CONFIGURATION OF EUT SYSTEM	10
5.2. EQUIPMENT USED IN EUT SYSTEM.....	10
5.3. SUMMARY OF TEST RESULTS.....	10
6. TEST FACILITY	11
7. MAXIMUM CONDUCTED OUTPUT POWER.....	12
7.1. MEASUREMENT PROCEDURE	12
7.2. TEST SET-UP.....	12
7.3. LIMITS AND MEASUREMENT RESULT	13
8. 6DB BANDWIDTH	14
8.1. MEASUREMENT PROCEDURE	14
8.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION).....	14
8.3. LIMITS AND MEASUREMENT RESULTS	15
9. MAXIMUM CONDUCTED OUTPUT PEAK POWER SPECTRAL DENSITY	18
9.1 MEASUREMENT PROCEDURE	18
9.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION).....	18
9.3 MEASUREMENT EQUIPMENT USED	18
9.4 LIMITS AND MEASUREMENT RESULT	18
10. CONDUCTED SPURIOUS EMISSION	21
10.1. MEASUREMENT PROCEDURE	21
10.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION).....	21
10.3. MEASUREMENT EQUIPMENT USED	21

10.4. LIMITS AND MEASUREMENT RESULT	21
11. RADIATED EMISSION.....	26
11.1. MEASUREMENT PROCEDURE	26
11.2. TEST SETUP	27
11.3. LIMITS AND MEASUREMENT RESULT	28
11.4. TEST RESULT	28
12. FREQUENCY STABILITY.....	33
12.1. MEASUREMENT PROCEDURE	33
12.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION).....	33
12.3. MEASUREMENT RESULTS.....	34
13. FCC LINE CONDUCTED EMISSION TEST	35
13.1. LIMITS OF LINE CONDUCTED EMISSION TEST.....	35
13.2. BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST	35
13.3. PRELIMINARY PROCEDURE OF LINE CONDUCTED EMISSION TEST	36
13.4. FINAL PROCEDURE OF LINE CONDUCTED EMISSION TEST	37
13.5. TEST RESULT OF LINE CONDUCTED EMISSION TEST	38
APPENDIX A: PHOTOGRAPHS OF TEST SETUP	40

1. VERIFICATION OF CONFORMITY

Applicant	DGL Group LTD.
Address	195 Raritan Center Parkway Edison, New Jersey United States 08837
Manufacturer	DGL Group LTD.
Address	195 Raritan Center Parkway Edison, New Jersey United States 08837
Product Designation	QUIRKY AIR
Brand Name	QUIRKY
Test Model	QKY-AIR
Series Model	QKY-AIR-5, QKY-AIR-5-BLK, EU-QKY-AIR, EU-QKY-AIR-5, EU-QKY-AIR-7, QKY-AIR-7, QKY-AIR-7-BLK
Model Difference	All the same except for the model name and different appearance color
Date of test	Sep. 12, 2019 to Sep. 20, 2019
Deviation	None
Condition of Test Sample	Normal
Test Result	Pass
Report Template	AGCRT-US-BGN/RF

We hereby certify that:

The above equipment was tested by Attestation of Global Compliance (Shenzhen) Co., Ltd. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10 (2013) and the energy emitted by the sample EUT tested as described in this report is in compliance with requirement of FCC Part 15 Rules requirement.

Prepared By

Draven Li

Draven Li
(Project Engineer)

Sep. 20, 2019

Reviewed By

Max Zhang

Max Zhang
(Reviewer)

Oct. 21, 2019

Approved By

Forrest Lei

Forrest Lei
(Authorized Officer)

Oct. 21, 2019

2. GENERAL INFORMATION

2.1. PRODUCT DESCRIPTION

The EUT is designed as “QUIRKY AIR”. It is designed by way of utilizing the GFSK technology to achieve the system operation.

A major technical description of EUT is described as following

Operation Frequency	5727 MHz~5800MHz
Output Power(Max)	9.21dBm
Modulation	GFSK
Number of channels	16
Hardware Version	V1.1
Software Version	V1.0
Antenna Designation	FPC Antenna
Number of transmit chain	1
Antenna Gain	0.5dBi
Power Supply	DC 3.7V by battery or DC 5V by adapter

2.2. TABLE OF CARRIER FREQUENCIES

Frequency Band	Channel Number	Frequency	Channel Number	Frequency
5727 MHz~5800MHz	1	5727	9	5767
	2	5731	10	5771
	3	5734	11	5774
	4	5738	12	5778
	5	5749	13	5789
	6	5753	14	5793
	7	5756	15	5796
	8	5760	16	5800

2.3. RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for FCC ID: 2AANZAIR2 filing to comply with the FCC Part 15 requirements.

2.4. TEST METHODOLOGY

Both conducted and radiated testing was performed according to the procedures in ANSI C63.10 (2013).

Radiated testing was performed at an antenna to EUT distance 3 meters.

Others testing (listed at item 5.3) was performed according to the procedures in FCC Part 15.407 rules KDB 789033 D02

2.5. SPECIAL ACCESSORIES

Refer to section 5.2.

2.6. EQUIPMENT MODIFICATIONS

Not available for this EUT intended for grant.



3. MEASUREMENT UNCERTAINTY

The uncertainty is calculated using the methods suggested in the “Guide to the Expression of Uncertainty in measurement” (GUM) published by CISPR and ANSI.

- Uncertainty of Conducted Emission, $U_c = \pm 3.2$ dB
- Uncertainty of Radiated Emission below 1GHz, $U_c = \pm 3.9$ dB
- Uncertainty of Radiated Emission above 1GHz, $U_c = \pm 4.8$ dB



4. DESCRIPTION OF TEST MODES

Mode	Available channel	Tested channel	Date rate(Mbps)
GFSK	1~16	1,8,16	1

Note:

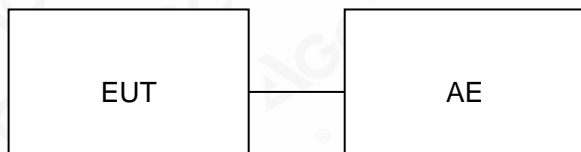
1. The EUT has been set to operate continuously on tested channel individually, and the EUT is operating at its maximum duty cycle>or equal 98%
2. All modes under which configure applicable have been tested and the worst mode test data recording in the test report, if no other mode data.
3. Use engineering instruction set the EUT into the individual test modes.



5. SYSTEM TEST CONFIGURATION

5.1. CONFIGURATION OF EUT SYSTEM

Configure 1:



5.2. EQUIPMENT USED IN EUT SYSTEM

Item	Equipment	Model No.	ID or Specification	Remark
1	QUIRKY AIR	QKY-AIR	2AANZAIR2	EUT
3	Adapter	KUANTEN	KT05W050100USU	AE

5.3. SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.407	6dB Bandwidth	Compliant
§15.407	Emission Bandwidth	Compliant
§15.407	Maximum conducted output power	Compliant
§15.407	Conducted Spurious Emission	Compliant
§15.407	Maximum Conducted Output Power Density	Compliant
§15.209	Radiated Emission	Compliant
§15.407	Band Edges	Compliant
§15.207	Line Conduction Emission	Compliant

6. TEST FACILITY

Test Site	Attestation of Global Compliance (Shenzhen) Co., Ltd
Location	1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
Designation Number	CN1259
FCC Test Firm Registration Number	975832
A2LA Cert. No.	5054.02
Description	Attestation of Global Compliance(Shenzhen) Co., Ltd is accredited by A2LA

TEST EQUIPMENT OF CONDUCTED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESPI	101206	Jun. 12, 2019	Jun. 11, 2020
LISN	R&S	ESH2-Z5	100086	Aug. 26, 2019	Aug. 25, 2020

TEST EQUIPMENT OF RADIATED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
TEST RECEIVER	R&S	ESCI	10096	Jun. 12, 2019	Jun. 11, 2020
EXA Signal Analyzer	Aglient	N9010A	MY53470504	Dec. 20, 2018	Dec. 19, 2019
2.4GHz Fliter	EM Electronics	2400-2500MHz	N/A	Feb. 27, 2019	Feb. 26, 2020
Attenuator	ZHINAN	E-002	N/A	Sep. 09, 2019	Sep. 08, 2020
Horn antenna	SCHWARZBECK	BBHA 9170	#768	Sep. 09, 2019	Sep. 08, 2021
Active loop antenna (9K-30MHz)	ZHINAN	ZN30900C	18051	Jun. 14, 2018	Jun. 13, 2020
Double-Ridged Waveguide Horn	ETS LINDGREN	3117	00034609	May. 26, 2018	May. 25, 2020
Broadband Preamplifier	ETS LINDGREN	3117PA	00225134	Oct. 25, 2018	Oct. 24, 2019
ANTENNA	SCHWARZBECK	VULB9168	D69250	Sep. 28, 2017	Sep. 27, 2019

7. MAXIMUM CONDUCTED OUTPUT POWER

7.1. MEASUREMENT PROCEDURE

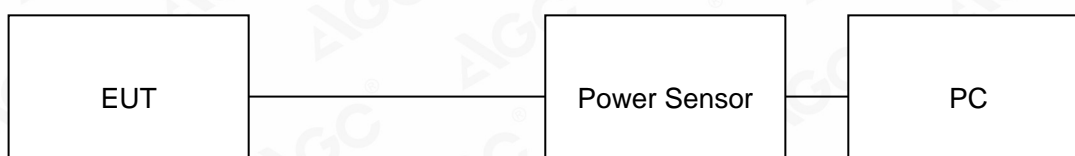
For average power test:

1. Connect EUT RF output port to power sensor through an RF attenuator.
2. Connect the power sensor to the PC.
3. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
4. Record the maximum power from the software.

Note : The EUT was tested according to KDB 789033 for compliance to FCC 47CFR 15.407 requirements.

7.2. TEST SET-UP

AVERAGE POWER SETUP



7.3. LIMITS AND MEASUREMENT RESULT

LIMITS AND MEASUREMENT RESULT FOR 802.11A20 MODULATION			
Frequency (MHz)	Average Power (dBm)	Applicable Limits (dBm)	Pass or Fail
5727	9.21	30	Pass
5760	9.13	30	Pass
5800	9.04	30	Pass



Attestation of Global Compliance

Attestation of Global Compliance(Shenzhen)Co.,Ltd.

Add: 2/F., Building 2, Sanwei Chaxi Industrial Park, Sanwei Community,
Hangcheng Street, Bao'an District, Shenzhen, Guangdong, China

Tel: +86-755 2523 4088

E-mail: agc@agc-cert.com

Service Hotline: 400 089 2118

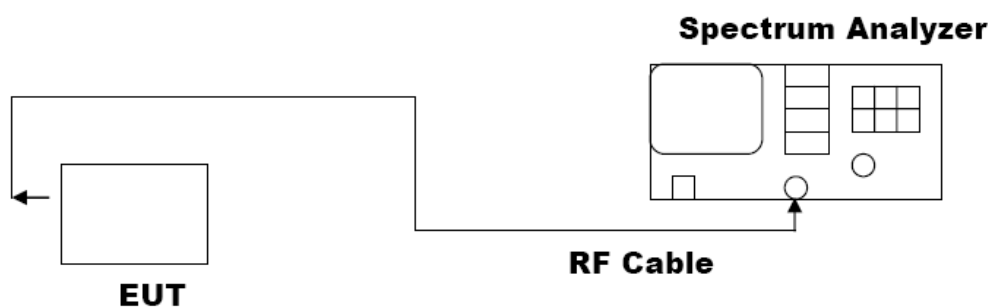
8. 6dB BANDWIDTH

8.1. MEASUREMENT PROCEDURE

1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
2. Set the EUT Work on operation frequency individually.
3. Set RBW = 100kHz.
4. Set the VBW $\geq 3 \times$ RBW. Detector = Peak. Trace mode = max hold.
5. Measure the maximum width of the emission that is 6 dB down from the peak of the emission.

Note: The EUT was tested according to KDB 789033 for compliance to FCC 47CFR 15.407 requirements.

8.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)



8.3. LIMITS AND MEASUREMENT RESULTS

LIMITS AND MEASUREMENT RESULT FOR GFSK MODULATION			
Applicable Limits	Applicable Limits		
	Test Data (MHz)		Criteria
>500KHZ	5727MHz	1.524	PASS
	5760MHz	1.649	PASS
	5800MHz	1.628	PASS



Attestation of Global Compliance

Attestation of Global Compliance(Shenzhen)Co.,Ltd.

Add: 2/F., Building 2, Sanwei Chaxi Industrial Park, Sanwei Community,
Hangcheng Street, Bao'an District, Shenzhen, Guangdong, China

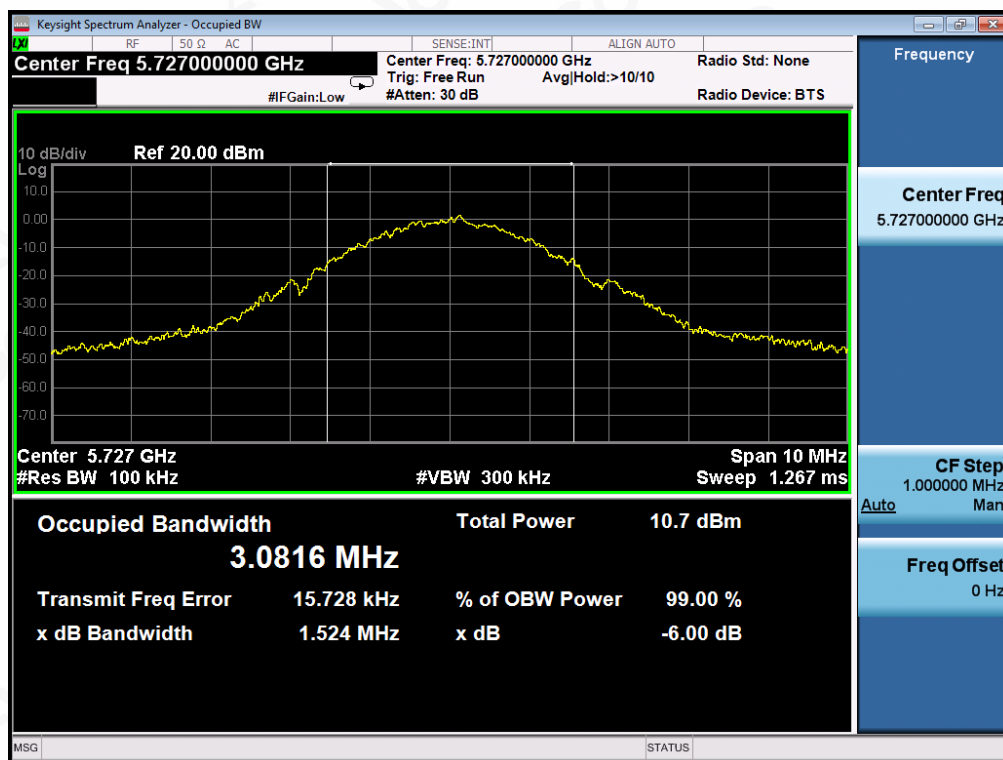
Tel: +86-755 2523 4088

E-mail: agc@agc-cert.com

Service Hotline: 400 089 2118

TEST RESULT

TEST PLOT OF BANDWIDTH FOR 5727MHz



TEST PLOT OF BANDWIDTH FOR 5760MHz



TEST PLOT OF BANDWIDTH FOR 5800MHZ



Attestation of Global Compliance

Attestation of Global Compliance(Shenzhen)Co.,Ltd.

Add: 2/F., Building 2, Sanwei Chaxi Industrial Park, Sanwei Community,
Hangcheng Street, Bao'an District, Shenzhen, Guangdong, China

Tel: +86-755 2523 4088

E-mail: agc@agc-cert.com

Service Hotline: 400 089 2118

9. MAXIMUM CONDUCTED OUTPUT PEAK POWER SPECTRAL DENSITY

9.1 MEASUREMENT PROCEDURE

Refer to KDB 789033 section F

9.2 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

Refer To Section 8.2.

9.3 MEASUREMENT EQUIPMENT USED

Refer To Section 6.

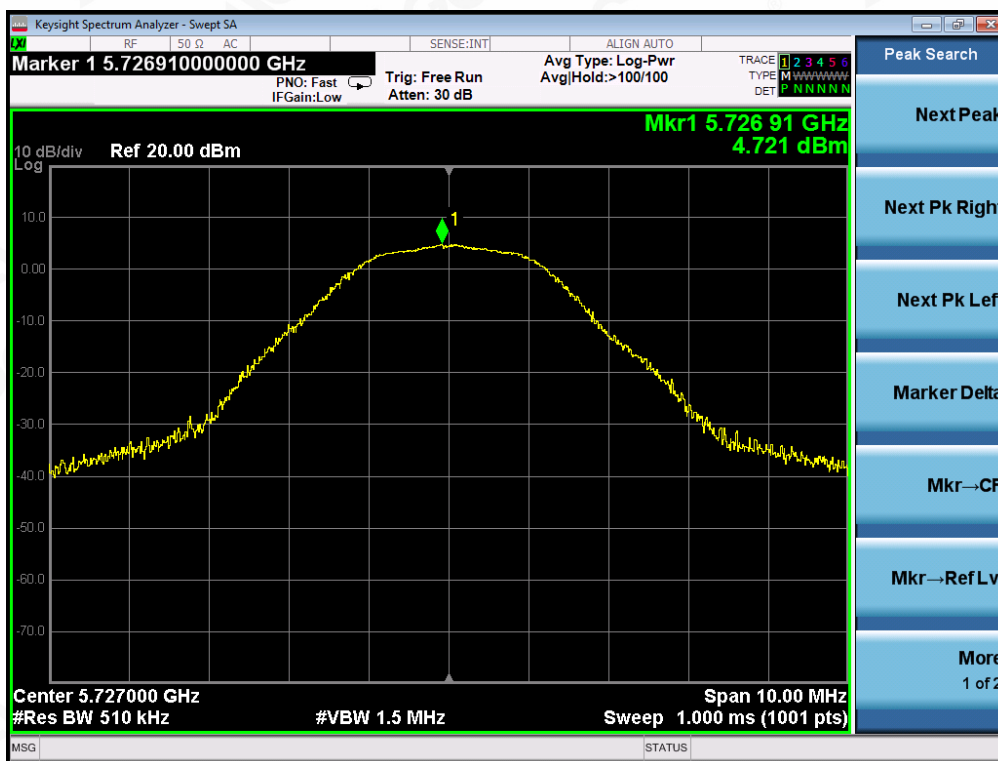
9.4 LIMITS AND MEASUREMENT RESULT

Frequency (MHz)	Power density (dBm/500kHz)	Applicable Limits (dBm/500kHz)	Pass or Fail
5727	4.721	30	Pass
5760	3.596	30	Pass
5800	3.592	30	Pass

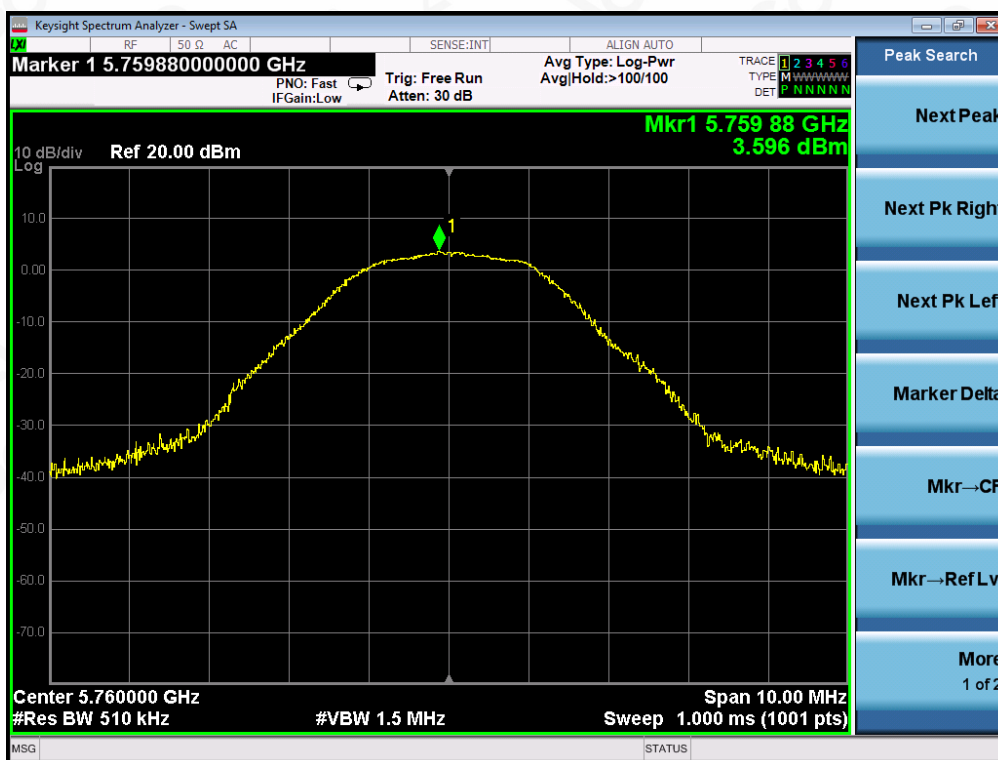


TEST RESULT

TEST PLOT OF SPECTRAL DENSITY FOR 5727MHz



TEST PLOT OF SPECTRAL DENSITY FOR 5760MHz



Attestation of Global Compliance

Attestation of Global Compliance(Shenzhen)Co.,Ltd.

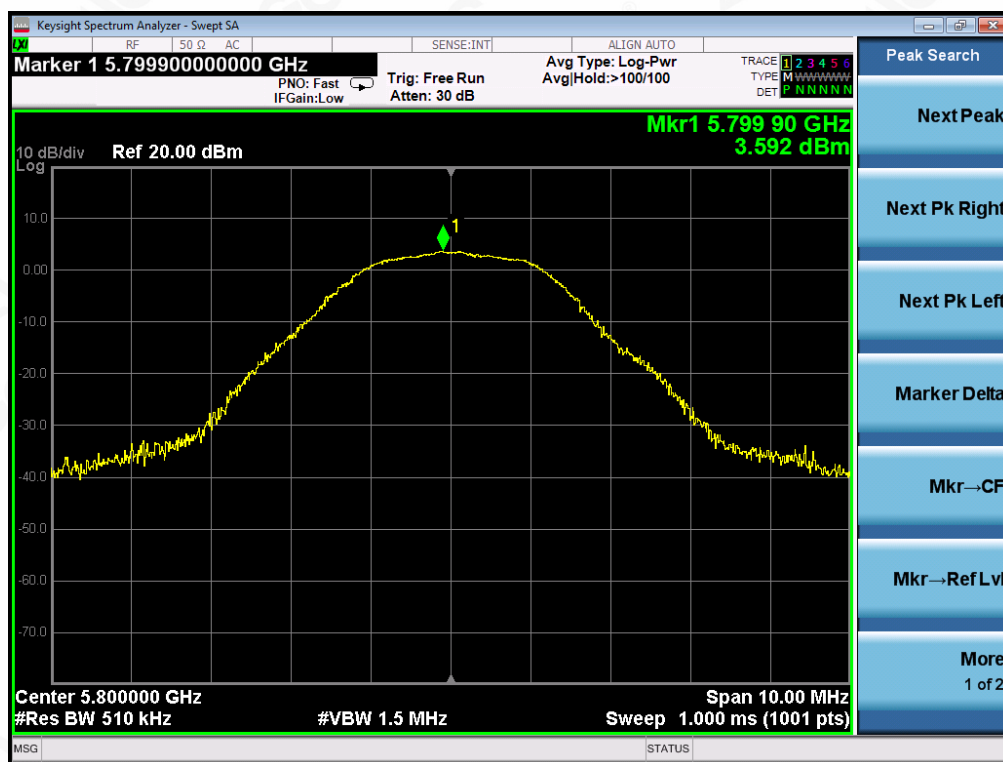
Add: 2/F., Building 2, Sanwei Chaxi Industrial Park, Sanwei Community,
Hangcheng Street, Bao'an District, Shenzhen, Guangdong, China

Tel: +86-755 2523 4088

E-mail: agc@agc-cert.com

Service Hotline: 400 089 2118

TEST PLOT OF SPECTRAL DENSITY FOR 5800MHz



Attestation of Global Compliance

Attestation of Global Compliance(Shenzhen)Co.,Ltd.

Add: 2/F., Building 2, Sanwei Chaxi Industrial Park, Sanwei Community,
Hangcheng Street, Bao'an District, Shenzhen, Guangdong, China

Tel: +86-755 2523 4088

E-mail: agc@agc-cert.com

Service Hotline: 400 089 2118

10. CONDUCTED SPURIOUS EMISSION

10.1. MEASUREMENT PROCEDURE

1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
2. Set the EUT Work on the top, the middle and the bottom operation frequency individually.
3. Set SPA Trace 1 Max hold, then View.

Note: The EUT was tested according to KDB 789033 for compliance to FCC 47CFR 15.407 requirements.

10.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)

The same as described in section 8.2.

10.3. MEASUREMENT EQUIPMENT USED

The same as described in section 6.

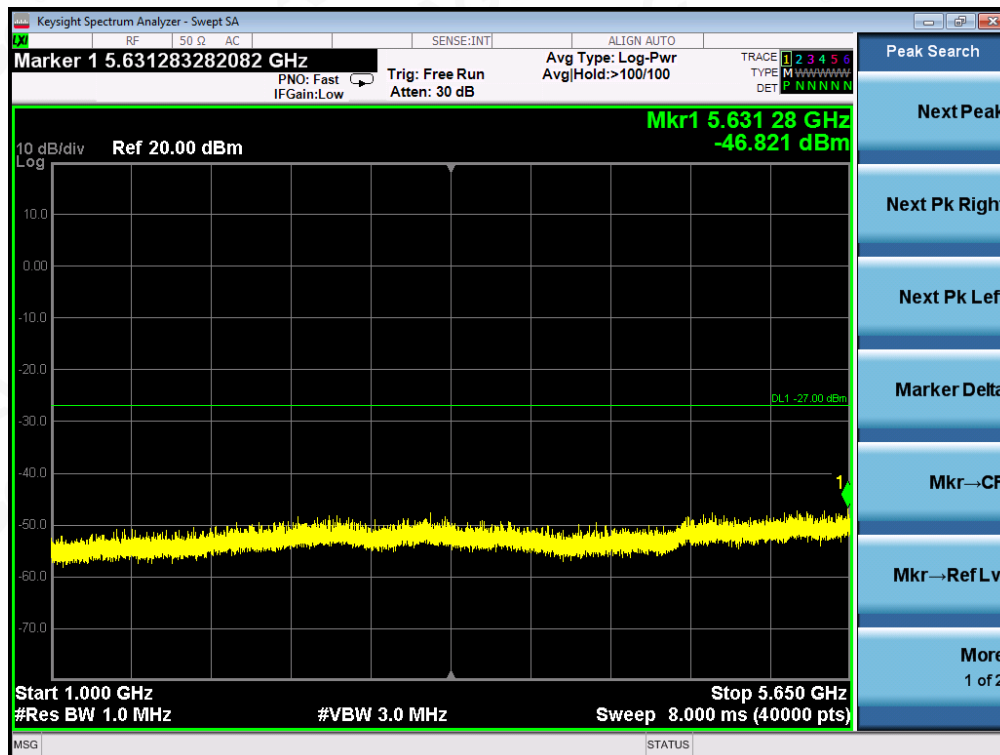
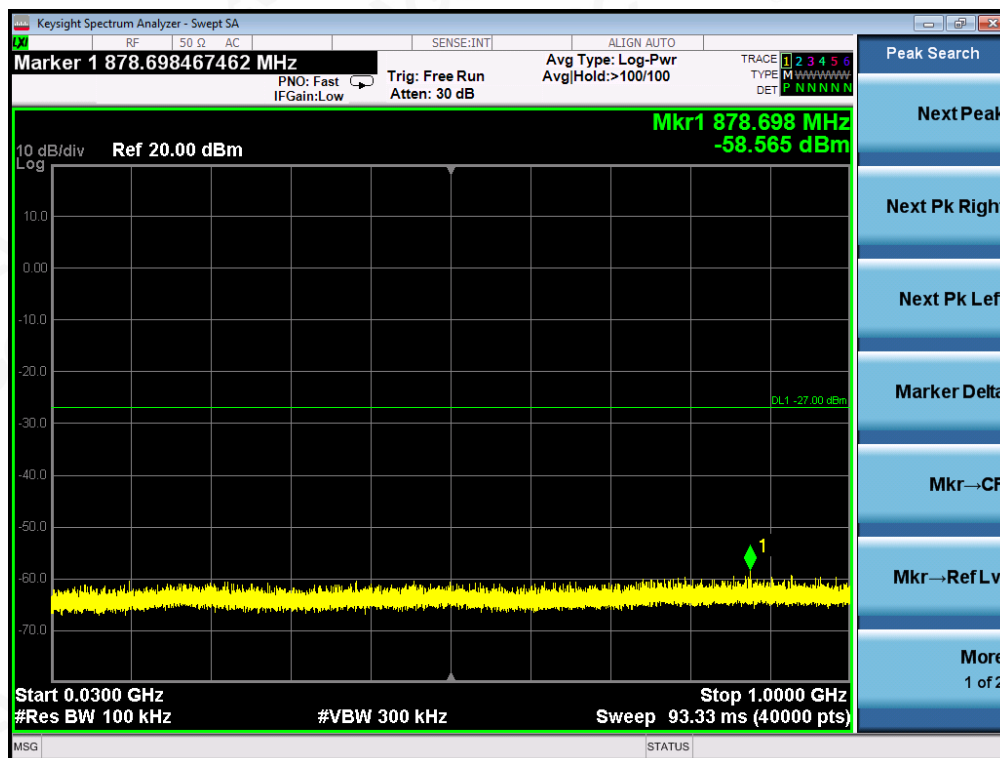
10.4. LIMITS AND MEASUREMENT RESULT

LIMITS AND MEASUREMENT RESULT		
Applicable Limits	Measurement Result	
	Test channel	Criteria
All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.	5725MHz-5850MHz	PASS



TEST RESULT

TEST PLOT OF OUT OF BAND EMISSIONS FOR MODULATION IN 5727MHz



Attestation of Global Compliance

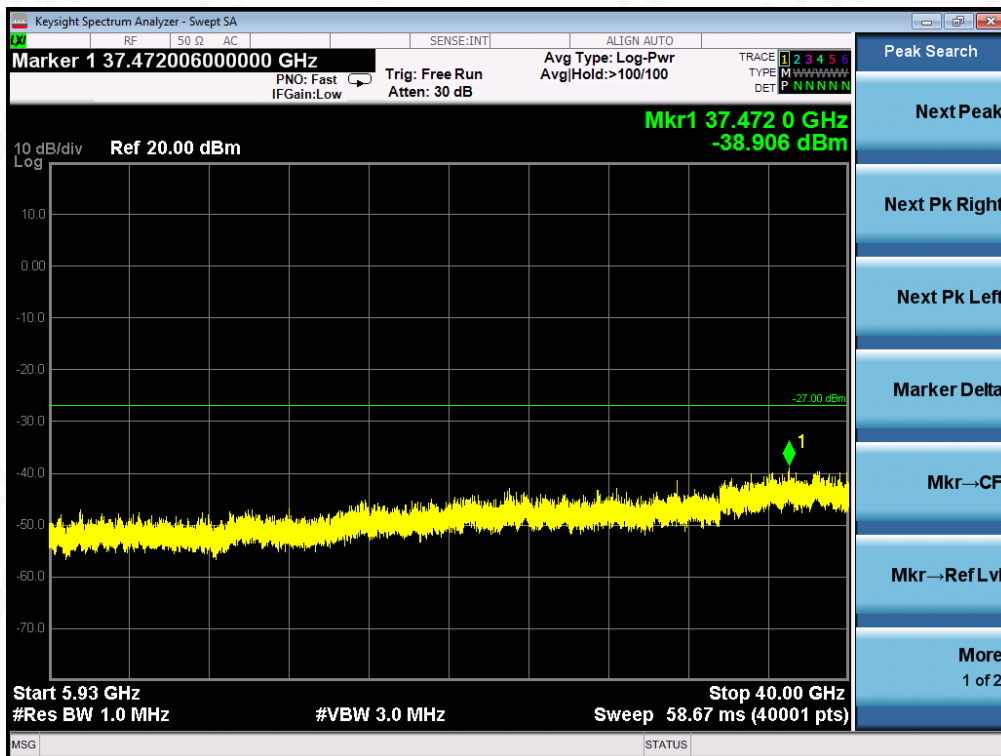
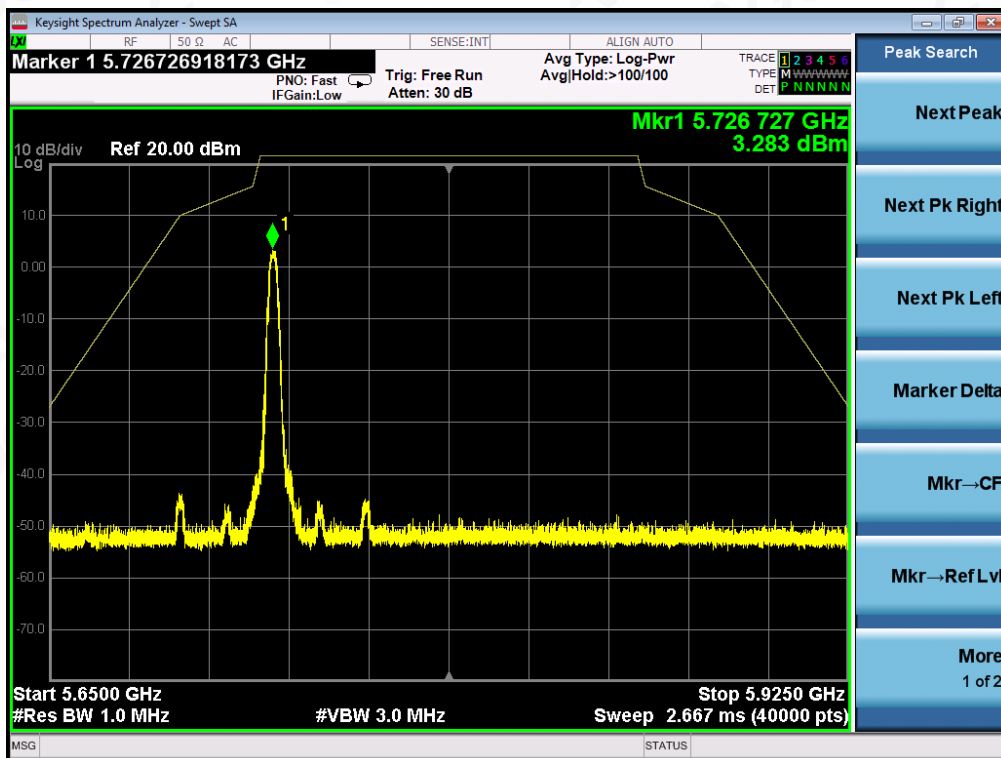
Attestation of Global Compliance(Shenzhen)Co.,Ltd.

Add: 2/F., Building 2, Sanwei Chaxi Industrial Park, Sanwei Community,
Hangcheng Street, Bao'an District, Shenzhen, Guangdong, China

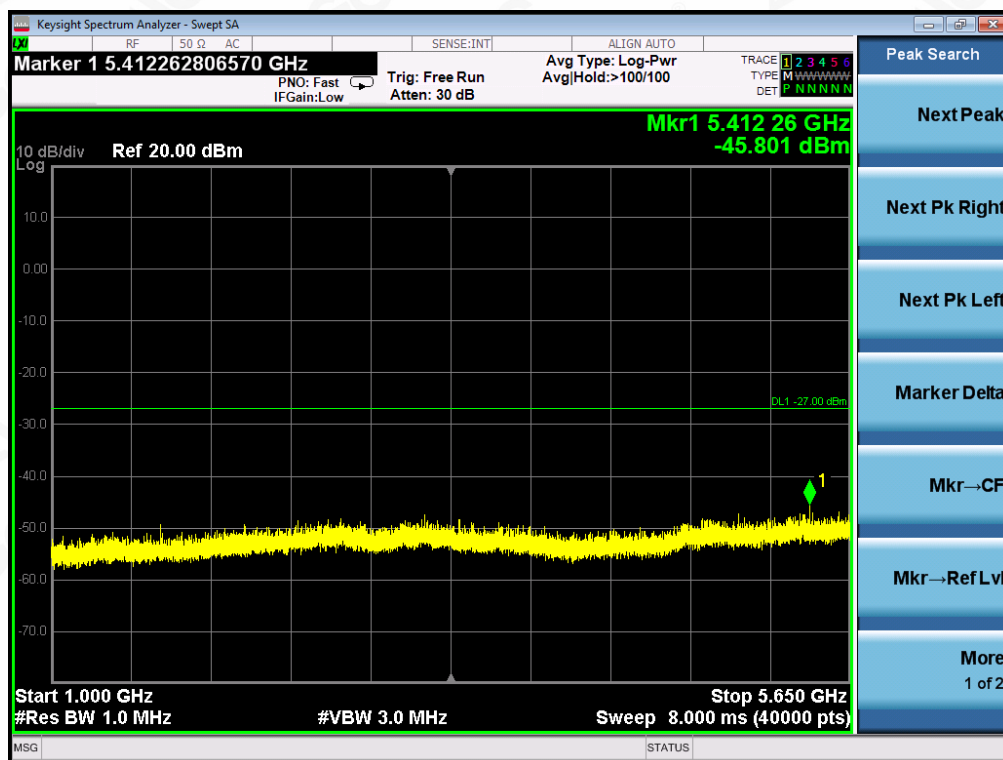
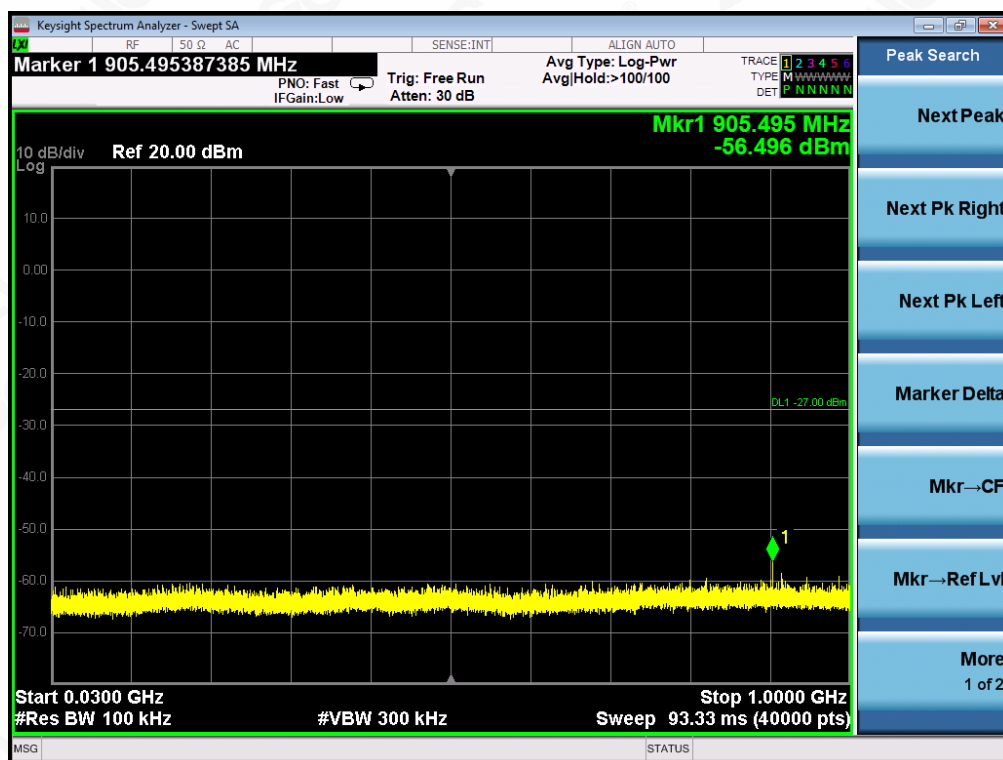
Tel: +86-755 2523 4088

E-mail: agc@agc-cert.com

Service Hotline: 400 089 2118



TEST PLOT OF OUT OF BAND EMISSIONS FOR MODULATION IN 5800MHZ



Attestation of Global Compliance

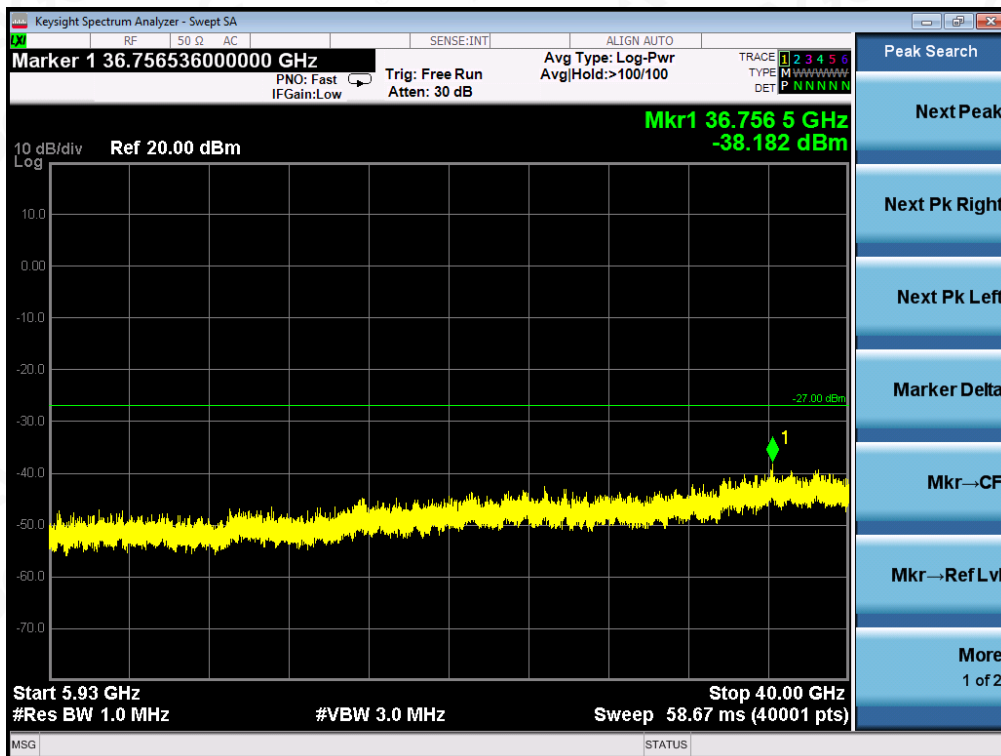
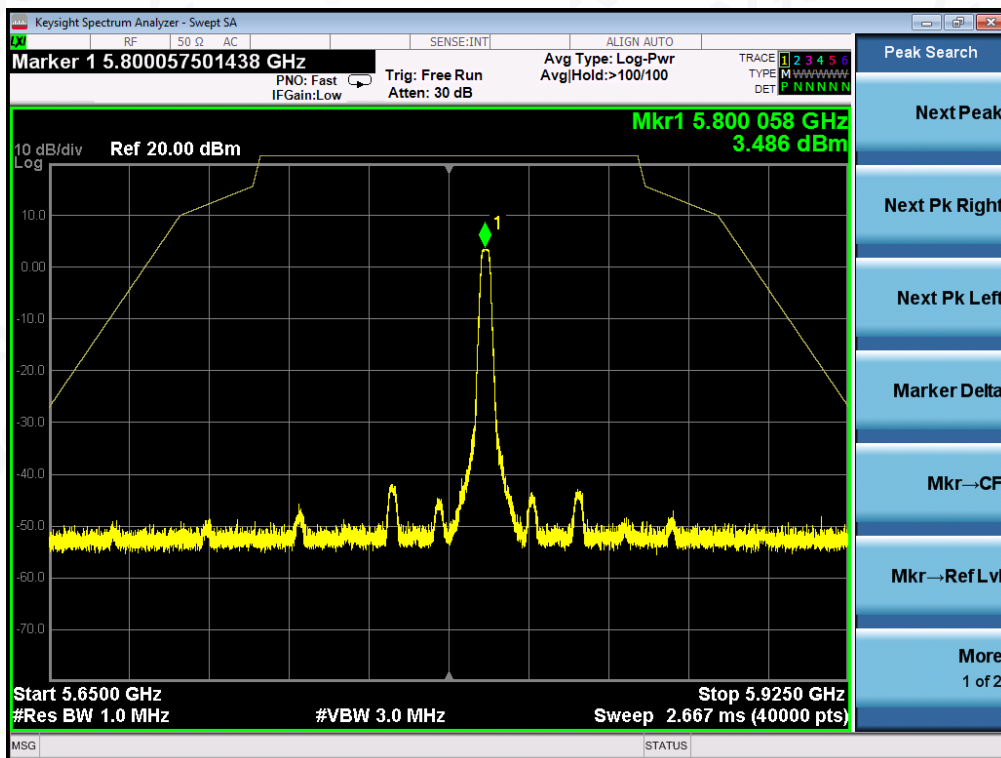
Attestation of Global Compliance(Shenzhen)Co.,Ltd.

Add: 2/F., Building 2, Sanwei Chaxi Industrial Park, Sanwei Community,
Hangcheng Street, Bao'an District, Shenzhen, Guangdong, China

Tel: +86-755 2523 4088

E-mail: agc@agc-cert.com

Service Hotline: 400 089 2118



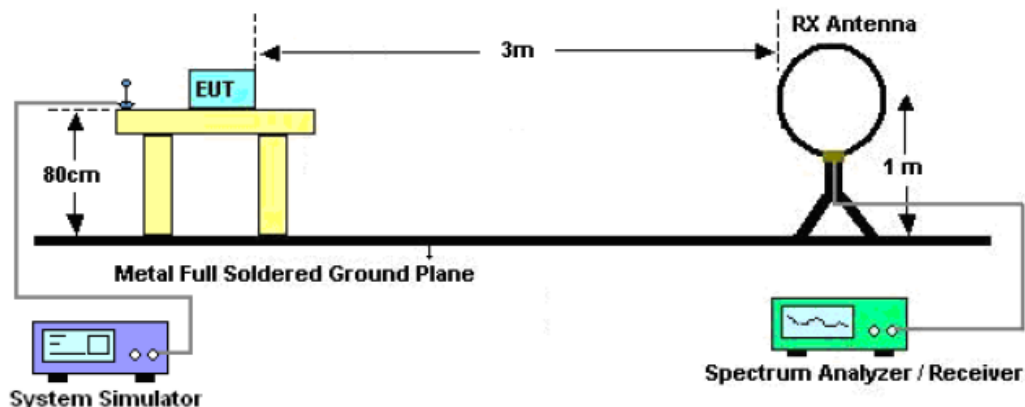
11. RADIATED EMISSION

11.1. MEASUREMENT PROCEDURE

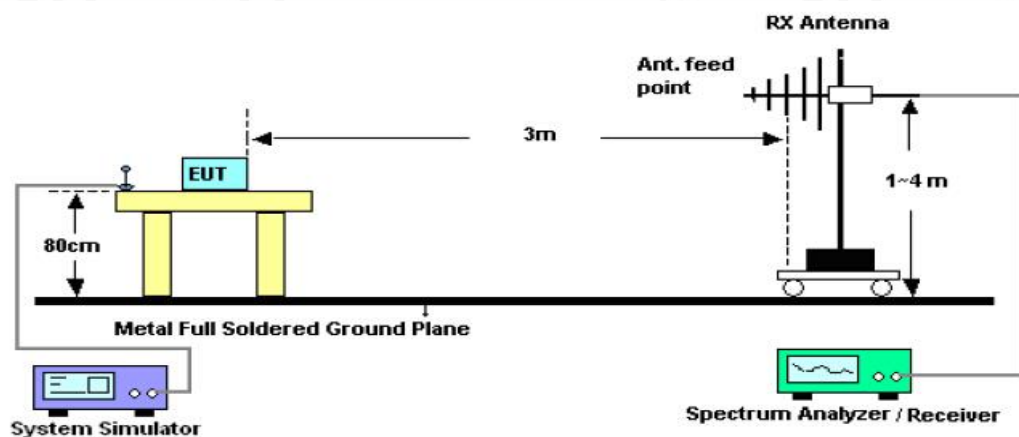
1. The EUT was placed on the top of the turntable 0.8 or 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use 1MHz RBW and 3M VBW for peak reading. Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.
7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum values.
8. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High - Low scan is not required in this case.

11.2. TEST SETUP

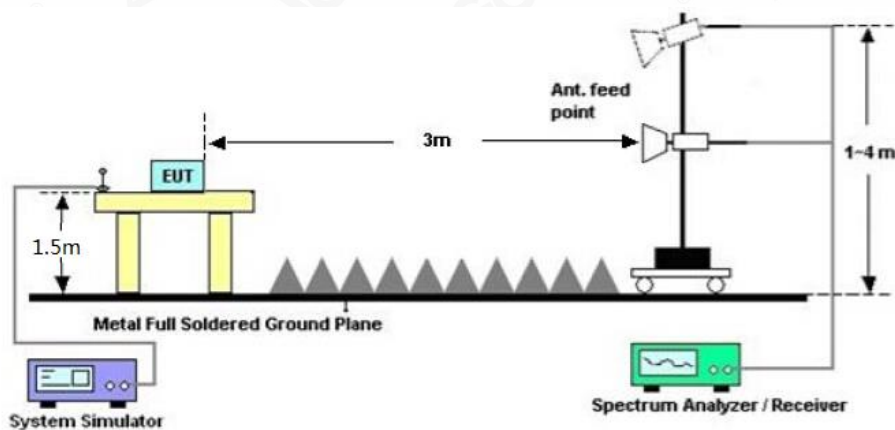
Radiated Emission Test-Setup Frequency Below 30MHz



RADIATED EMISSION TEST SETUP 30MHz-1000MHz



RADIATED EMISSION TEST SETUP ABOVE 1000MHz



11.3. LIMITS AND MEASUREMENT RESULT

15.209(a) Limit in the below table has to be followed

Frequencies (MHz)	Field Strength (micorvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

Note: All modes were tested For restricted band radiated emission, the test records reported below are the worst result compared to other modes.

11.4. TEST RESULT

RADIATED EMISSION BELOW 30MHZ

No emission found between lowest internal used/generated frequencies to 30MHz.

RADIATED EMISSION BELOW 1GHZ

EUT	QUIRKY AIR	Model Name	QKY-AIR
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	5727MHz	Antenna	Horizontal



No.	Mk	Freq. MHz	Reading dBuV	Factor dBuV/m	Measurement dBuV/m	Limit dBuV/m	Over dB	Detector	Antenna Height cm	Table Degree degree	Comment
1		78.5000	8.74	15.27	24.01	40.00	-15.99	peak			
2		403.4499	7.13	23.05	30.18	46.00	-15.82	peak			
3		599.0666	6.61	26.93	33.54	46.00	-12.46	peak			
4		637.8667	4.50	27.40	31.90	46.00	-14.10	peak			
5	*	770.4333	4.76	29.74	34.50	46.00	-11.50	peak			
6		998.3832	3.20	32.55	35.75	54.00	-18.25	peak			

RESULT: PASS

EUT	QUIRKY AIR	Model Name	QKY-AIR
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	5727MHz	Antenna	Vertical



No.	Mk	Freq.	Reading	Factor	Measurement	Limit	Over	Detector	Antenna Height	Table Degree	Comment
		MHz	dBuV	dBuV/m	dBuV/m	dBuV/m	dB		cm	degree	
1		60.7167	6.42	18.74	25.16	40.00	-14.84	peak			
2		135.0833	10.58	18.92	29.50	43.50	-14.00	peak			
3		314.5332	8.63	19.98	28.61	46.00	-17.39	peak			
4		403.4499	6.46	23.05	29.51	46.00	-16.49	peak			
5		597.4500	7.00	26.90	33.90	46.00	-12.10	peak			
6	*	953.1167	3.09	32.16	35.25	46.00	-10.75	peak			

RESULT: PASS

Note: All test channels had been tested. The 5727MHz is the worst case and recorded in the test report.

Factor = Antenna Factor + Cable loss - Amplifier gain, Margin= Limit-Level.

The "Factor" value can be calculated automatically by software of measurement system.

RADIATED EMISSION ABOVE 1GHZ

EUT	QUIRKY AIR	Model Name	QKY-AIR
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	5727MHz	Antenna	Horizontal/Vertical

RADIATED EMISSION ABOVE 1GHZ–Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
11454.062	43.32	9.42	52.74	74.00	-21.26	peak
11454.062	38.19	9.42	47.61	54.00	-6.39	AVG
17181.093	35.19	10.51	45.70	74.00	-28.30	peak
17181.093	33.33	10.51	43.84	54.00	-10.16	AVG

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

RADIATED EMISSION ABOVE 1GHZ–Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
11454.062	47.57	9.42	56.99	74.00	-17.01	peak
11454.062	38.65	9.42	48.07	54.00	-5.93	AVG
17181.093	35.43	10.51	45.94	74.00	-28.06	peak
17181.093	32.71	10.51	43.22	54.00	-10.78	AVG

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT	QUIRKY AIR	Model Name	QKY-AIR
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	Normal Voltage
Test Mode	5800MHz	Antenna	Horizontal/Vertical

RADIATED EMISSION ABOVE 1GHZ–Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
11600.062	42.15	9.62	51.77	74.00	-22.23	peak
11600.062	36.30	9.62	45.92	54.00	-8.08	AVG
17400.093	36.29	10.75	47.04	74.00	-26.96	peak
17400.093	34.15	10.75	44.90	54.00	-9.10	AVG

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

RADIATED EMISSION ABOVE 1GHZ–Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Value Type
11600.062	43.12	9.62	52.74	74.00	-21.26	peak
11600.062	39.26	9.62	48.88	54.00	-5.12	AVG
17400.093	36.89	10.75	47.64	74.00	-26.36	peak
17400.093	34.33	10.75	45.08	54.00	-8.92	AVG

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Note:Other frequencies radiation emission from 1GHz to 40GHz at least have 20dB margin and not recorded in the test report.

Factor = Antenna Factor + Cable loss - Amplifier gain, Margin= Limit-Level.

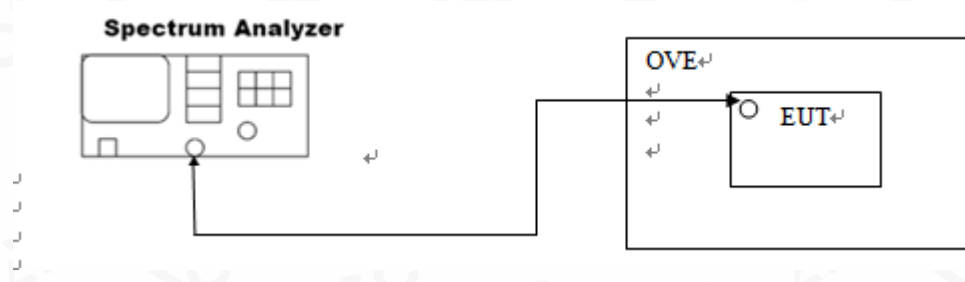
The “Factor” value can be calculated automatically by software of measurement system.

12. FREQUENCY STABILITY

12.1. MEASUREMENT PROCEDURE

1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
2. Set the EUT Work on the operation frequency.
3. Set SPA Centre Frequency = Operation Frequency. SPAN=enough to measure the emission is maintained within the band
4. Set SPA Trace 1 Max hold, then View.
5. Extreme temperature rule is -10°C~60°C.

12.2. TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)



12.3. MEASUREMENT RESULTS

Test Mode	Temperature	Measurement Frequency (MHz)	Result	Conclusion
GFSK	- 10℃	5727	within the band	PASS
	0℃	5727	within the band	PASS
	10℃	5727	within the band	PASS
	20℃	5727	within the band	PASS
	30℃	5727	within the band	PASS
	40℃	5727	within the band	PASS
	50℃	5727	within the band	PASS
	60℃	5727	within the band	PASS
	- 10℃	5800	within the band	PASS
	0℃	5800	within the band	PASS
	10℃	5800	within the band	PASS
	20℃	5800	within the band	PASS
	30℃	5800	within the band	PASS
	40℃	5800	within the band	PASS
	50℃	5800	within the band	PASS
	60℃	5800	within the band	PASS



13. FCC LINE CONDUCTED EMISSION TEST

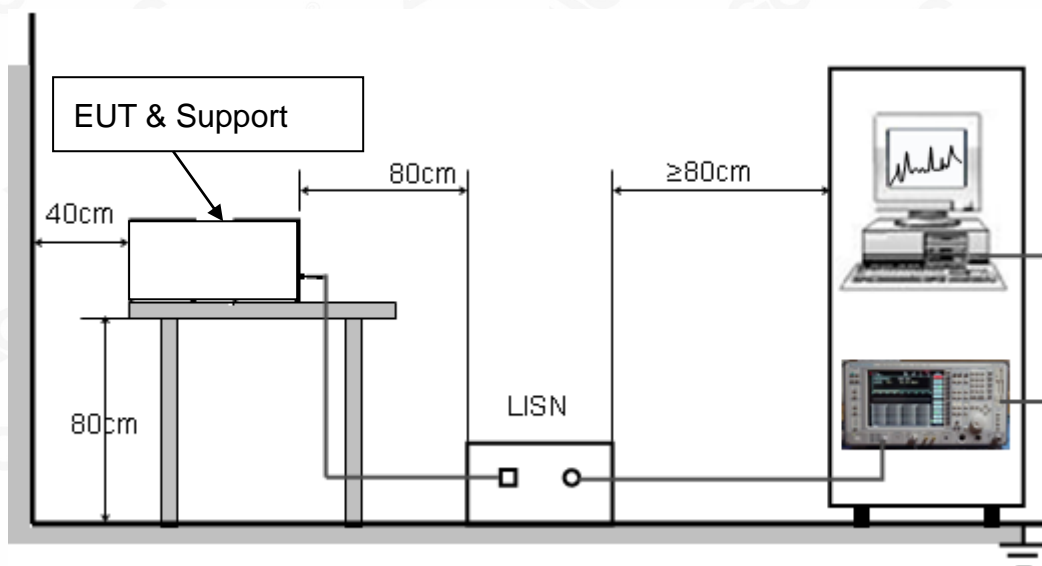
13.1. LIMITS OF LINE CONDUCTED EMISSION TEST

Frequency	Maximum RF Line Voltage	
	Q.P.(dBuV)	Average(dBuV)
150kHz~500kHz	66-56	56-46
500kHz~5MHz	56	46
5MHz~30MHz	60	50

Note:

1. The lower limit shall apply at the transition frequency.
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50MHz.

13.2. BLOCK DIAGRAM OF LINE CONDUCTED EMISSION TEST



13.3. PRELIMINARY PROCEDURE OF LINE CONDUCTED EMISSION TEST

1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
2. Support equipment, if needed, was placed as per ANSI C63.10.
3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.
4. All support equipments received AC120V/60Hz power from a LISN, if any.
5. The EUT received charging voltage by adapter which received 120V/60Hz power by a LISN.
6. The test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7. Analyzer / Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.
8. During the above scans, the emissions were maximized by cable manipulation.
9. The test mode(s) were scanned during the preliminary test.

Then, the EUT configuration and cable configuration of the above highest emission level were recorded for reference of final testing.



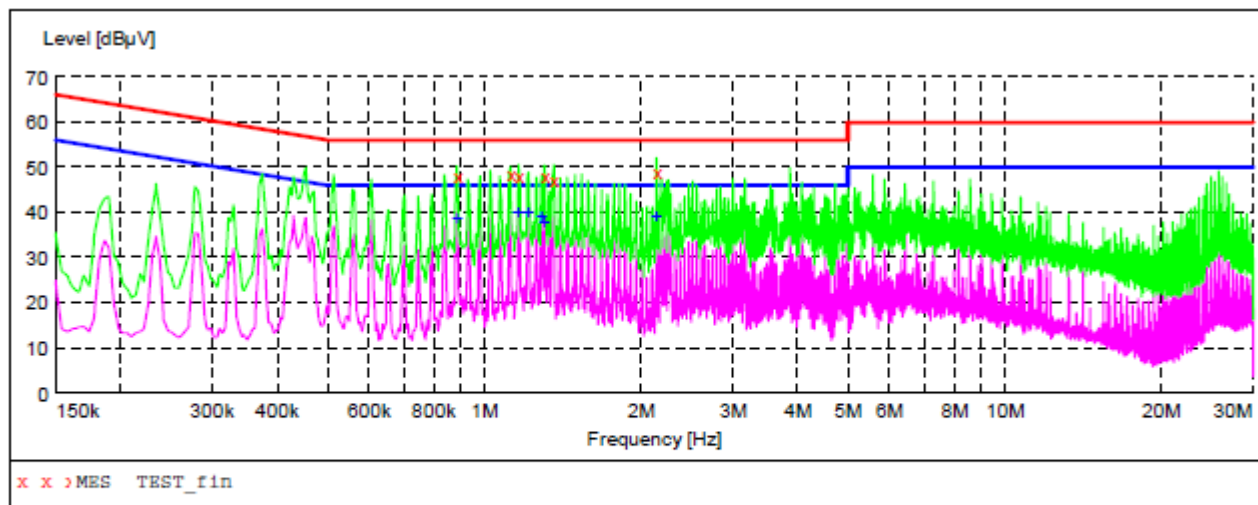
13.4. FINAL PROCEDURE OF LINE CONDUCTED EMISSION TEST

1. EUT and support equipment was set up on the test bench as per step 2 of the preliminary test.
2. A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. If EUT emission level was less -2dB to the A.V. limit in Peak mode, then the emission signal was re-checked using Q.P and Average detector.
3. The test data of the worst case condition(s) was reported on the Summary Data page.



13.5. TEST RESULT OF LINE CONDUCTED EMISSION TEST

LINE CONDUCTED EMISSION TEST-L



MEASUREMENT RESULT: "TEST_fin"

9/18/2019 9:23AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.886000	47.90	11.1	56	8.1	QP	L1	FLO
1.122000	48.70	11.5	56	7.3	QP	L1	FLO
1.166000	48.40	11.5	56	7.6	QP	L1	FLO
1.306000	48.00	11.5	56	8.0	QP	L1	FLO
1.358000	47.30	11.5	56	8.7	QP	L1	FLO
2.146000	49.10	11.5	56	6.9	QP	L1	FLO

MEASUREMENT RESULT: "TEST_fin2"

9/18/2019 9:23AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.886000	39.00	11.1	46	7.0	AV	L1	FLO
1.166000	40.10	11.5	46	5.9	AV	L1	FLO
1.214000	40.00	11.5	46	6.0	AV	L1	FLO
1.290000	39.40	11.5	46	6.6	AV	L1	FLO
1.306000	37.80	11.5	46	8.2	AV	L1	FLO
2.146000	39.10	11.5	46	6.9	AV	L1	FLO



Attestation of Global Compliance

Attestation of Global Compliance(Shenzhen)Co.,Ltd.

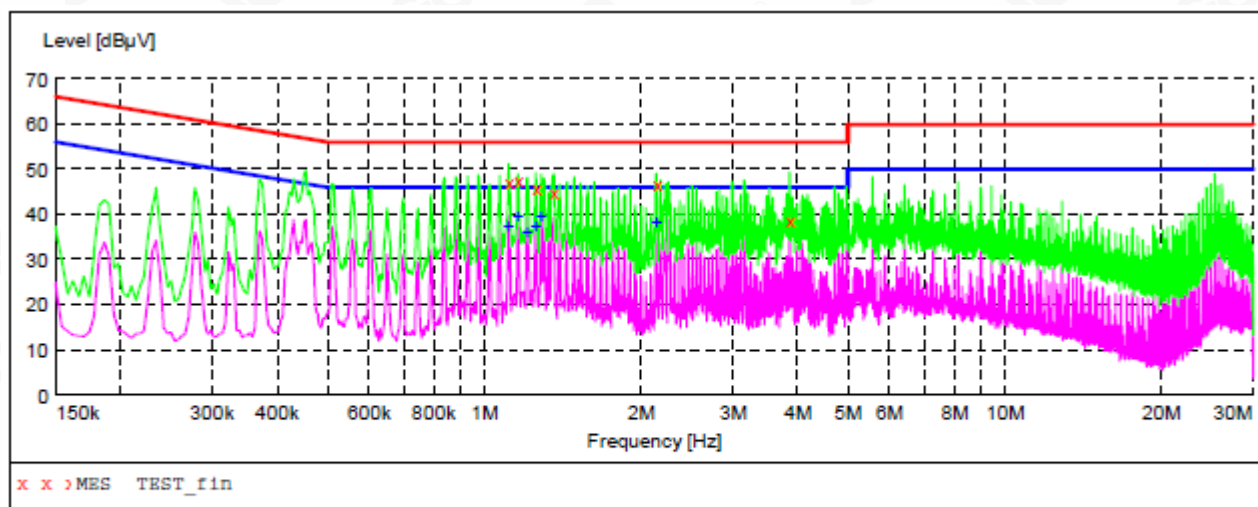
Add: 2/F., Building 2, Sanwei Chaxi Industrial Park, Sanwei Community,
Hangcheng Street, Bao'an District, Shenzhen, Guangdong, China

Tel: +86-755 2523 4088

E-mail: agc@agc-cert.com

Service Hotline: 400 089 2118

LINE CONDUCTED EMISSION TEST-N



MEASUREMENT RESULT: "TEST_fin"

9/18/2019 9:13AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
1.114000	47.20	11.5	56	8.8	QP	N	FLO
1.162000	47.70	11.5	56	8.3	QP	N	FLO
1.254000	45.60	11.5	56	10.4	QP	N	FLO
1.358000	44.80	11.5	56	11.2	QP	N	FLO
2.142000	46.70	11.5	56	9.3	QP	N	FLO
3.854000	38.70	11.6	56	17.3	QP	N	FLO

MEASUREMENT RESULT: "TEST_fin2"

9/18/2019 9:13AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
1.114000	37.40	11.5	46	8.6	AV	N	FLO
1.162000	39.50	11.5	46	6.5	AV	N	FLO
1.206000	36.20	11.5	46	9.8	AV	N	FLO
1.254000	37.30	11.5	46	8.7	AV	N	FLO
1.286000	39.70	11.5	46	6.3	AV	N	FLO
2.142000	38.20	11.5	46	7.8	AV	N	FLO

RESULT: PASS



Attestation of Global Compliance

Attestation of Global Compliance(Shenzhen)Co.,Ltd.

Add: 2/F., Building 2, Sanwei Chaxi Industrial Park, Sanwei Community,
Hangcheng Street, Bao'an District, Shenzhen, Guangdong, China

Tel: +86-755 2523 4088

E-mail: agc@agc-cert.com

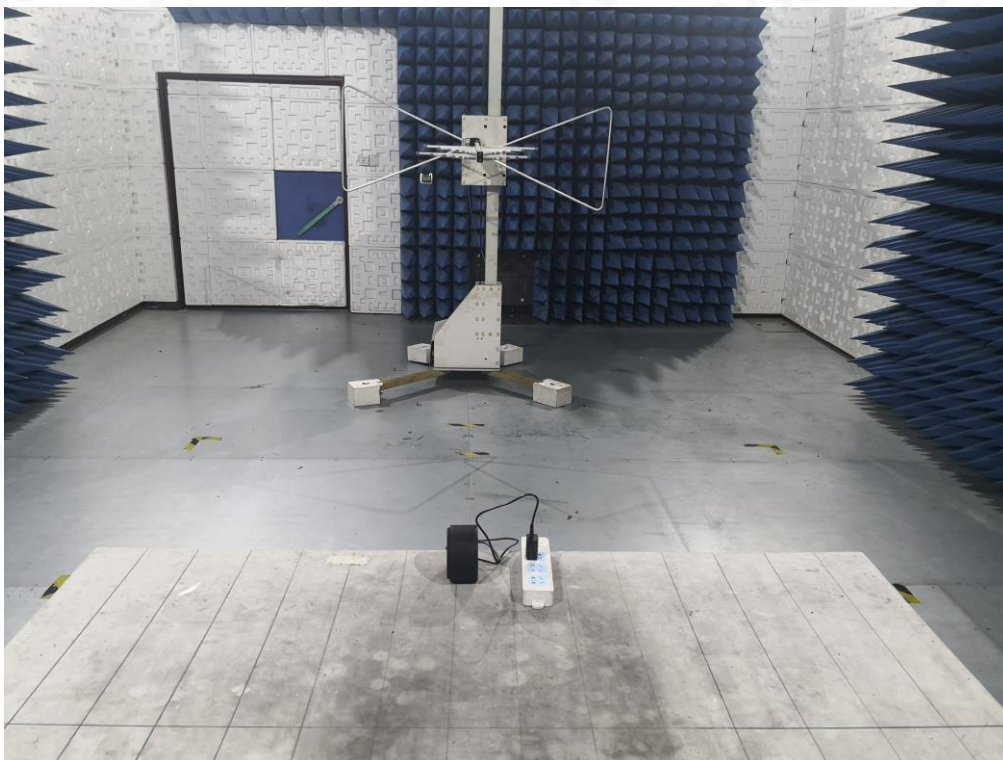
Service Hotline: 400 089 2118

APPENDIX A: PHOTOGRAPHS OF TEST SETUP

FCC LINE CONDUCTED EMISSION TEST SETUP



FCC RADIATED EMISSION TEST SETUP BELOW 1GHZ



FCC RADIATED EMISSION TEST SETUP ABOVE 1GHZ



----END OF REPORT----

