



Report No.: GZEM190701429205

Page: 1 of 60

FCC ID: SP9-00011D

TEST REPORT

Application No.: GZEM1907014292CR
Applicant: Kysho Multimedia Ltd
Address of Applicant: Flat F,5/F Valiant Industrial. Centre, 2-12 Au Pui Wan St, Fo Tan, Shatin
Manufacturer: Kysho Multimedia Ltd
Address of Manufacturer: Flat F,5/F Valiant Industrial. Centre, 2-12 Au Pui Wan St, Fo Tan, Shatin
Factory: 1.Huizhou ShenKe XinFei Technology Co. Ltd; 2. Dongguan Longyi Electronics Co., Ltd
Address of Factory: 1. Building C Tangxia Area, Changjing Village Xinxu Town, Huiyang District, Huizhou Guangdong Province, China; 2. Jieling Industrial Zone No.8, GuangJingTou Village, Fenggang, Dongguan, 523690
Equipment Under Test (EUT):
FCC ID: SP9-00011D
EUT Name: Bluetooth Speaker
Model No.: IMW580L, IMW581L, IMW790L, IMW578L □
□ Please refer to section 2 of this report which indicates which model was actually tested and which were electrically identical.
Standard(s) : 47 CFR Part 15, Subpart E 15.407
Date of Receipt: 2019-07-15
Date of Test: 2020-02-10 to 2020-02-15
Date of Issue: 2020-02-18

Test Result:	Pass*
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* In the configuration tested, the EUT complied with the standards specified above.

Kobe Jian
EMC Laboratory Manager



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Guangzhou Branch EMC Laboratory

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Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2020-02-18		Original

Authorized for issue by:			
Tested By	 Curry_Wu /Project Engineer	2020-02-10 to 2020-02-15	Date
Checked By	 Ricky_Liu /Reviewer	2020-02-18	Date



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2 Test Summary

Radio Spectrum Technical Requirement				
Item	Standard	Method	Requirement	Result
Antenna Requirement	47 CFR Part 15, Subpart E 15.407	N/A	47 CFR Part 15, Subpart E 15.405	Pass
Transmission in the Absence of Data	47 CFR Part 15, Subpart E 15.407	N/A	47 CFR Part 15, Subpart E 15.407 (c)	Pass

Radio Spectrum Matter Part				
Item	Standard	Method	Requirement	Result
Conducted Emissions at AC Power Line (150kHz-30MHz)	47 CFR Part 15, Subpart E 15.407	ANSI C63.10 (2013) Section 6.2	47 CFR Part 15, Subpart E15.407 b(6)	Pass
99% Bandwidth	47 CFR Part 15, Subpart E 15.407	KDB 789033 II D	N/A	Pass
26dB Emission bandwidth	47 CFR Part 15, Subpart E 15.407	KDB 789033 D02 II C 1	47 CFR Part 15, Subpart E 15.407 (a)	Pass
Minimum 6 dB bandwidth (5.725-5.85 GHz band)	47 CFR Part 15, Subpart E 15.407	KDB 789033 D02 II C 2	47 CFR Part 15, Subpart E 15.407 (e)	Pass
Maximum Conducted output power	47 CFR Part 15, Subpart E 15.407	KDB 789033 D02 II E	47 CFR Part 15, Subpart E 15.407 (a)	Pass
Peak Power spectrum density	47 CFR Part 15, Subpart E 15.407	KDB 789033 D02 II F	47 CFR Part 15, Subpart E 15.407 (a)	Pass
Radiated Emissions	47 CFR Part 15, Subpart E 15.407	KDB 789033 D02 II G	47 CFR Part 15, 15.407(b)(4) & 15.407(b)(6)	Pass
Radiated Emissions which fall in the restricted bands	47 CFR Part 15, Subpart E 15.407	KDB 789033 D02 II G	47 CFR Part 15, 15.407(b)(7)	Pass
Frequency Stability	47 CFR Part 15, Subpart E 15.407	ANSI C63.10 (2013) Section 6.8	47 CFR Part 15, Subpart E 15.407 (g)	Pass

N/A: Not applicable

■ Declaration of EUT Family Grouping:

Model No.: IMW580L, IMW581L, IMW790L, IMW578L

According to the declaration from the applicant, the electrical circuit design, layout, components used and internal wiring were identical for all models, with only difference on the model No..

Therefore only one model IMW580L was tested in this report.



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4 General Information

4.1 Details of E.U.T.

Power Supply:	DC 5V 1A for charging DC 3.7V for working
Test Voltage:	DC 3.7V & AC 120V 60Hz
Cable:	about 0.5m unscreened USB cable
Antenna Gain	0dBi
Antenna Type	Integral Antenna
Modulation Type	GFSK
Number of Channels	16
Operation Frequency	5727MHz-5800MHz
TPC Function:	Not support

4.2 Test frequencies

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	5727	9	5767
2	5731	10	5771
3	5734	11	5773
4	5738	12	5774
5	5749	13	5778
6	5753	14	5789
7	5756	15	5796
8	5760	16	5800

Remark: Test frequencies are lowest channel: 5727 MHz, middle channel: 5760 MHz and highest channel: 5800 MHz



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4.3 Description of Support Units

The EUT has been tested with corresponding accessories as below:

Supplied by SGS:

Description	Manufacturer	Model No.	SN/Certificate NO
Adapter 1(EMCA021)	SGS	MJ4105	N/A

4.4 Measurement Uncertainty

RF

No.	Item	Measurement Uncertainty
1	Radio Frequency	$\pm 5.5 \times 10^{-8}$
2	Duty cycle	$\pm 0.57\%$
3	Occupied Bandwidth	$\pm 3\%$
4	RF Conducted power	$\pm 0.68\text{dB}$
5	RF Power Density	$\pm 1.50\text{dB}$
6	Conducted Spurious Emissions	$\pm 1.04\text{dB}$
7	RF Radiated Power	$\pm 4.5\text{dB}$ (below 1GHz)
		$\pm 4.8\text{dB}$ (above 1GHz)
8	Radiated Spurious Emission Test	$\pm 4.5\text{dB}$ (30MHz-1GHz)
		$\pm 4.8\text{dB}$ (1GHz-18GHz)
9	Temperature	$\pm 0.4^{\circ}\text{C}$
10	Humidity	$\pm 1.3\%$
11	Supply Voltages	$\pm 1.5\%$
12	Time	$\pm 3\%$

4.5 Test Location

All tests were performed at:

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 198 Kezhu Road, Sciencetech Park, Guangzhou Economic & Technology Development District,
 Guangzhou, China 510663

Tel: +86 20 82155555

Fax: +86 20 82075059

No tests were sub-contracted.



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4.6 Test Facility

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

● **NVLAP (Lab Code: 200611-0)**

SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 200611-0.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

● **ACMA**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory can also perform testing for the Australian C-Tick mark as a result of our NVLAP accreditation.

● **SGS UK(Certificate No.: 32), SGS-TUV SAARLAND and SGS-FIMKO**

Have approved SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory as a supplier of EMC TESTING SERVICES and SAFETY TESTING SERVICES.

● **CNAS (Lab Code: L0167)**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been assessed and in compliance with CNAS-CL01:2018 accreditation criteria for testing laboratories (identical to

ISO/IEC 17025:2017 General Requirements) for the Competence of Testing Laboratories.

● **FCC Recognized 2.948 Listed Test Firm(Registration No.: 282399)**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 282399, May 31, 2002.

● **FCC Recognized Accredited Test Firm(Registration No.: 486818)**

SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been accredited and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Designation Number: CN5016, Test Firm Registration Number: 486818, Jul 13, 2017.

● **Industry Canada (Registration No.: 4620B, CAB identifier: CN0052)**

SGS-CSTC Standards Technical Services Co., Ltd., has been registered by Innovation Science and Economic Development Canada for Wireless Device Testing laboratories to test to Canadian radio equipment requirements. Registration No. 4620B, CAB identifier: CN0052.

● **VCCI (Registration No.: R-12460, C-12584, G-10449 and T-11179)**

The 10m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-12460, C-12584, G-10449 and T-11179 respectively.

● **CBTL (Lab Code: TL129)**

SGS-CSTC Standards Technical Services Co., Ltd., E&E Laboratory has been assessed and fully comply with the requirements of ISO/IEC 17025:2005, the Basic Rules, IECEE 01 and Rules of procedure IECEE 02, and the relevant IECEE CB-Scheme Operational documents.



4.7 Deviation from Standards

None

4.8 Abnormalities from Standard Conditions

None



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5 Equipment List

Conducted Emissions at AC Power Line (150kHz-30MHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Shielding Room	Zhong Yu	8m x 3m x 3.8m	EMC0306	2019-12-26	2022-12-26
Two-Line V-Network	R&S	ENV216	EMC0118	2020-01-10	2021-01-09
LISN	R&S	ENV216	EMC2135	2020-01-10	2021-01-09
EMI Test Receiver	Rohde & Schwarz	ESCS30	EMC0506	2019-11-18	2020-11-17
Coaxial Cable	HangTianXing	2m	EMC0107	2018-09-20	2020-09-19
Voltage Probe	SGS	N/A	EMC0106	2018-04-04	2020-04-03
Conical Metal Housing	SGS-EMC	N/A	EMC0167	2018-04-19	2020-04-18
Test Software E3c	Audix	Ver. 5.4.1221b	GZE100-62	N/A	N/A

6dB&99%&26dB Bandwidth					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EXA Signal Analyzer	AgilentTechnologies	N9010A	EMC2138	2019-11-18	2020-11-17
6dB Attenuator	HP	8491A	EMC2062	2018-04-04	2020-04-03
Test Software JS1120-3	HangTianXing	V2.6	GZE100-69	N/A	N/A
MI CABLE	SGS	0.8M	EMC2136	2019-11-02	2021-11-01
MI CABLE	SGS	0.8M	EMC2137	2019-11-02	2021-11-01

Conducted Peak Output Power					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EXA Signal Analyzer	AgilentTechnologies	N9010A	EMC2138	2019-11-18	2020-11-17
6dB Attenuator	HP	8491A	EMC2062	2018-04-04	2020-04-03
Test Software JS1120-3	HangTianXing	V2.6	GZE100-69	N/A	N/A
MI CABLE	SGS	0.8M	EMC2136	2019-11-02	2021-11-01
MI CABLE	SGS	0.8M	EMC2137	2019-11-02	2021-11-01

Power Spectrum Density					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EXA Signal Analyzer	AgilentTechnologies	N9010A	EMC2138	2019-11-18	2020-11-17
6dB Attenuator	HP	8491A	EMC2062	2018-04-04	2020-04-03
Test Software JS1120-3	HangTianXing	V2.6	GZE100-69	N/A	N/A
MI CABLE	SGS	0.8M	EMC2136	2019-11-02	2021-11-01
MI CABLE	SGS	0.8M	EMC2137	2019-11-02	2021-11-01



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Conducted Spurious Emissions					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EXA Signal Analyzer	AgilentTechnologies	N9010A	EMC2138	2019-11-18	2020-11-17
6dB Attenuator	HP	8491A	EMC2062	2018-04-04	2020-04-03
Test Software JS1120-3	HangTianXing	V2.6	GZE100-69	N/A	N/A
MI CABLE	SGS	0.8M	EMC2136	2019-11-02	2021-11-01
MI CABLE	SGS	0.8M	EMC2137	2019-11-02	2021-11-01

Frequency Stability					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EXA Signal Analyzer	AgilentTechnologies	N9010A	EMC2138	2019-11-18	2020-11-17
6dB Attenuator	HP	8491A	EMC2062	2018-04-04	2020-04-03
Test Software JS1120-3	HangTianXing	V2.6	GZE100-69	N/A	N/A
MI CABLE	SGS	0.8M	EMC2136	2019-11-02	2021-11-01
MI CABLE	SGS	0.8M	EMC2137	2019-11-02	2021-11-01

15-40GHz Radiated Emission & Spurious Emission					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Horn Antenna (15-40GHz)	Compliance Direction Systems Inc.	PAP-2640-50	SEM005-08	2019-04-02	2020-04-02
Horn Antenna (15-40GHz)	Schwarzbeck	BBHA 9170	EMC2041	2019-06-16	2020-06-16
966 Anechoic Chamber	Schwarzbeck	BBHA 9170	SEM003-15	2019-10-17	2020-10-17
EXA Signal Analyzer (10Hz-44GHz)	Shenzhen C.R.T Technology Co., LTD	9X6X6	EMC2142	2019-11-29	2021-11-29
Horn Antenna 1-18GHz	KEYSIGHT	N9010A	EMC2138	2019/11/19	2021/11/18
Pre-Amplifier (1-26.5GHz)	Schwarzbeck	BBHA 9120D	EMC2026	2019-09-09	2021-09-08
Highpass Filter	Agilent	8449B	EMC0521	2019-01-08	2021-01-07
2.4GHz filter	WAINWRIGHT	WHNX7.0/26.5 G-6SS	EMC2167	2019-12-12	2020-12-12
EXG Analog Signal Generator	Micro-Tronics	BRM 50702	EMC2069	2019-01-08	2021-01-07
Horn Antenna (15-40GHz)	KEYSIGHT	N5173B	SEM006-05	2019-09-27	2020-09-27



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Radiated Emission					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Compact Semi-Anechoic Chamber	ChangZhou ZhongYu	N/A	EMC0525	2019-10-20	2022-10-19
EMI Test Receiver	Rohde & Schwarz	ESIB26	EMC0522	2020-01-10	2021-01-09
EMI Test Receiver	Rohde & Schwarz	ESCI	EMC0056	2020-01-10	2021-01-09
Trilog Broadband Antenna 30-1000MHz	SCHWARZBECK MESS-ELEKTRONIK	VULB 9168	EMC2174	2018-09-06	2021-09-05
Trilog Broadband Antenna 25-2000MHz	SCHWARZBECK MESS-ELEKTRONIK	VULB 9168	SEM003-18	2019-02-22	2022-02-22
Bilog Type Antenna	Schaffner -Chase	CBL6143	EMC0519	2017-05-04	2020-05-03
Horn Antenna (1G~18G)	R& S	HF906	EMC0518	2018-09-02	2021-09-01
1-26.5 GHz Pre-Amplifier	Agilent	8449B	EMC0521	2020-01-10	2021-01-09
Amplifier	HP	8447F	EMC2065	2019-05-29	2020-05-28
PRE AMPLIFIER MH648A	ANRITSU CORP	MH648A	EMC2086	2019-11-18	2020-11-17
Active Loop Antenna	EMCO	6502	EMC0523	2018-03-05	2020-03-04
Broad-Band Horn Antenna 15-26.5GHz	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9170	EMC2041	2017-05-23	2020-05-22
High Pass Filter(915MHz)	FSY MICROWAVE	HM1465-9SS	EMC2079	2020-01-10	2021-01-09
966 Anechoic Chamber	C.R.T	9mX6mX6m	EMC2142	2017-12-19	2020-12-18
MXE EMI Receiver	Keysight	N9038A	EMC2139	2019-11-18	2020-11-17
EXA Signal Analyzer	Keysight	N9010A	EMC2138	2019-11-18	2020-11-17
2.4GHz Filter	Micro-Tronics	BRM 50702	EMC2069	2020-01-10	2021-01-09
10m Semi-Anechoic Chamber	ETS	N/A	EMC0530	2019-10-20	2022-10-19



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Radiated Emission which fall in restrict band					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Compact Semi-Anechoic Chamber	ChangZhou ZhongYu	N/A	EMC0525	2019-10-20	2022-10-19
EMI Test Receiver	Rohde & Schwarz	ESIB26	EMC0522	2020-01-10	2021-01-09
EMI Test Receiver	Rohde & Schwarz	ESCI	EMC0056	2020-01-10	2021-01-09
Trilog Broadband Antenna 30-1000MHz	SCHWARZBECK MESS-ELEKTRONIK	VULB 9168	EMC2174	2018-09-06	2021-09-05
Trilog Broadband Antenna 25-2000MHz	SCHWARZBECK MESS-ELEKTRONIK	VULB 9168	SEM003-18	2019-02-22	2022-02-22
Bilog Type Antenna	Schaffner -Chase	CBL6143	EMC0519	2017-05-04	2020-05-03
Horn Antenna (1G~18G)	R& S	HF906	EMC0518	2018-09-02	2021-09-01
1-26.5 GHz Pre-Amplifier	Agilent	8449B	EMC0521	2020-01-10	2021-01-09
Amplifier	HP	8447F	EMC2065	2019-05-29	2020-05-28
PRE AMPLIFIER MH648A	ANRITSU CORP	MH648A	EMC2086	2019-11-18	2020-11-17
Active Loop Antenna	EMCO	6502	EMC0523	2018-03-05	2020-03-04
Broad-Band Horn Antenna 15-26.5GHz	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9170	EMC2041	2017-05-23	2020-05-22
High Pass Filter(915MHz)	FSY MICROWAVE	HM1465-9SS	EMC2079	2020-01-10	2021-01-09
966 Anechoic Chamber	C.R.T	9mX6mX6m	EMC2142	2017-12-19	2020-12-18
MXE EMI Receiver	Keysight	N9038A	EMC2139	2019-11-18	2020-11-17
EXA Signal Analyzer	Keysight	N9010A	EMC2138	2019-11-18	2020-11-17
2.4GHz Filter	Micro-Tronics	BRM 50702	EMC2069	2020-01-10	2021-01-09
10m Semi-Anechoic Chamber	ETS	N/A	EMC0530	2019-10-20	2022-10-19

General used equipment					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
DMM	Fluke	73	EMC0006	2019-07-16	2020-07-15
DMM	Fluke	73	EMC0007	2019-07-16	2020-07-15



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6 Radio Spectrum Technical Requirement

6.1 Antenna Requirement

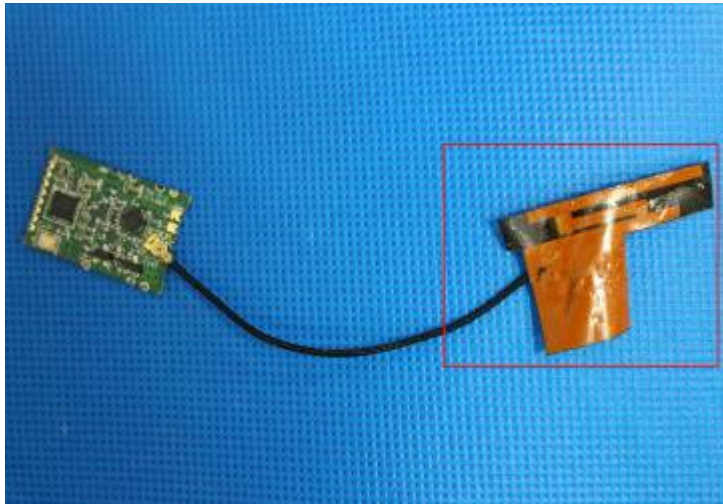
6.1.1 Test Requirement:

47 CFR Part 15, Subpart E 15.405

6.1.2 Conclusion

Standard Requirement:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, 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.



EUT Antenna:

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

6.2 Transmission in the Absence of Data

6.2.1 Test Requirement:

47 CFR Part 15, Subpart E 15.407 (c)

6.2.2 Conclusion

Standard Requirement:

The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signalling information, or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals.

Applicants shall include in their application for equipment authorization a description of how this requirement is met.

EUT Details:

Wireless chip support automatically discontinue transmission in case of either absence of information to transmit or operational failure, if the chip detect absence of information to transmit or operational failure, it will be automatically shut off.



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7 Radio Spectrum Matter Test Results

7.1 Conducted Emissions at AC Power Line (150kHz-30MHz)

Test Requirement 47 CFR Part 15, Subpart E 15.407 b(6)

Test Method: ANSI C63.10 (2013) Section 6.2

Limit:

Frequency of emission (MHz)	Conducted limit(dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.



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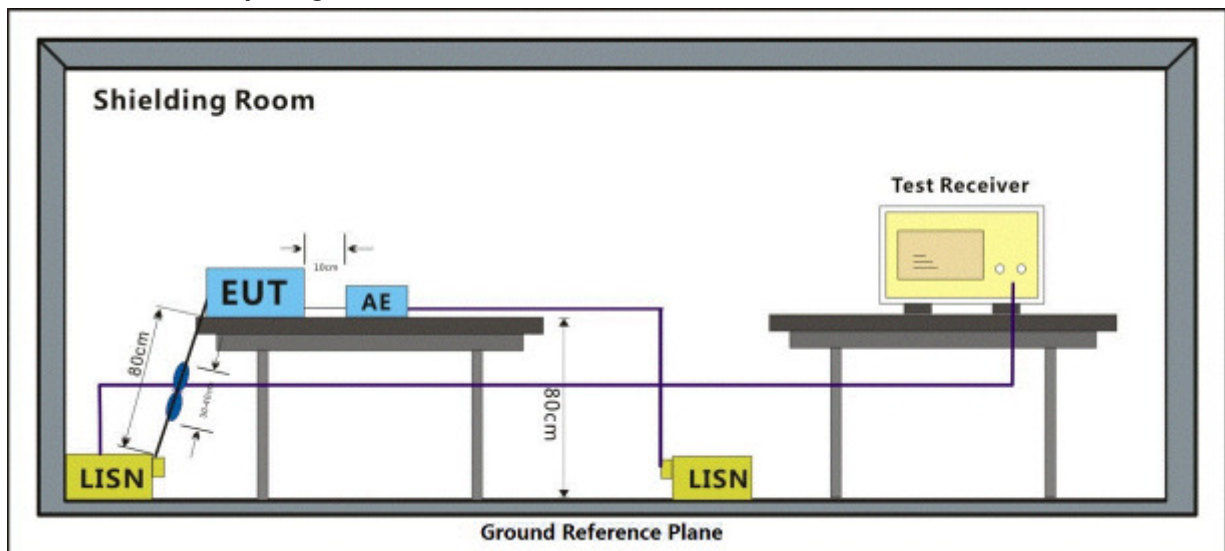
7.1.1 E.U.T. Operation

Operating Environment:

Temperature: 22.9 °C Humidity: 56.3 % RH Atmospheric Pressure: 1020 mbar

Test mode: e:Charge + TX mode_Keep the EUT in charging and continuously transmitting mode with GFSK modulation.

7.1.2 Test Setup Diagram



7.1.3 Measurement Procedure and Data

- 1) The mains terminal disturbance voltage test was conducted in a shielded room.
- 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50ohm/50μH + 5ohm linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.
- 3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane,
- 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.
- 5) 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 on conducted measurement.

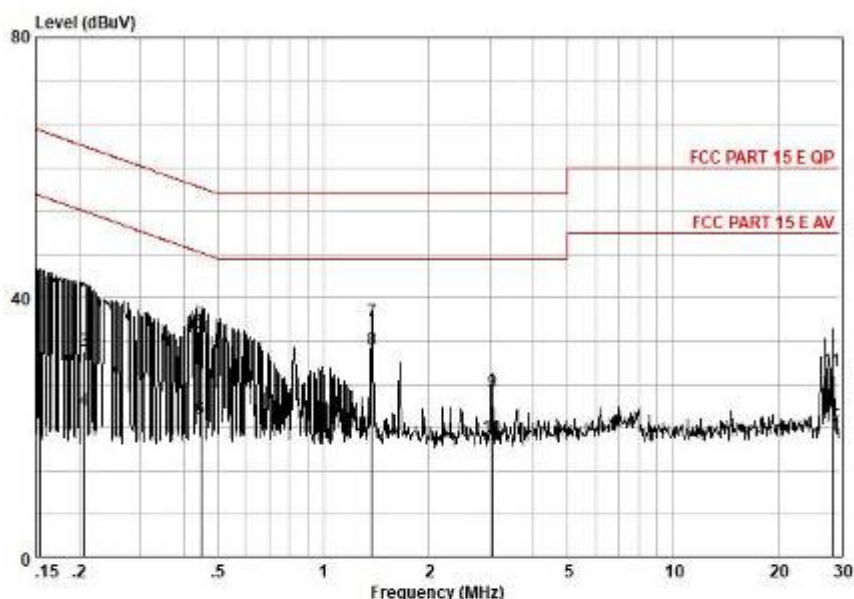
Remark: LISN=Read Level+ Cable Loss+ LISN Factor



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Line: Live Line



Pol :LIVE
No :
Model :

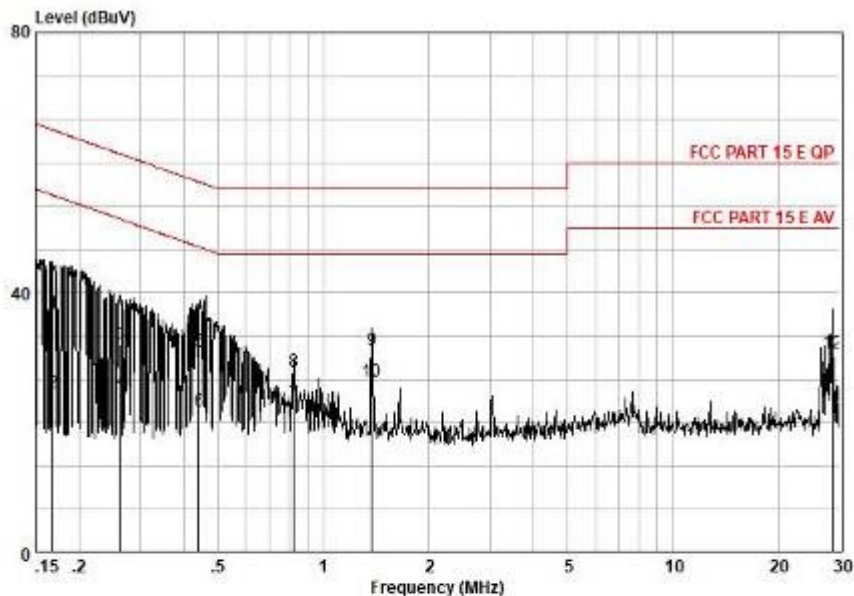
Frequency MHz	read level dBuV	Cable Loss dB	LISN Factor dB	Measured level dBuV	Limit Line dBuV	Over limit dB	Remark
0.15	29.16	0.10	9.47	38.73	65.78	-27.05	QP
0.15	13.72	0.10	9.47	23.29	65.78	-32.49	AVERAGE
0.21	23.04	0.10	9.63	31.76	63.36	-31.59	QP
0.31	13.04	0.10	9.63	22.76	63.36	-30.59	AVERAGE
0.45	24.08	0.19	9.65	34.71	66.93	-22.22	QP
0.45	11.56	0.19	9.65	21.39	66.93	-25.54	AVERAGE
1.37	26.82	0.30	9.62	36.44	66.00	-19.56	QP
1.37	22.08	0.30	9.62	32.00	66.00	-14.00	AVERAGE
3.04	16.34	0.64	9.62	26.60	66.00	-30.60	QP
3.04	8.37	0.64	9.62	18.63	66.00	-27.47	AVERAGE
28.60	18.61	0.57	9.61	28.79	60.00	-31.21	QP
28.60	10.02	0.57	9.61	20.20	60.00	-29.80	AVERAGE



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Line: Neutral Line



Pol : NEUTRAL
No :
Model :

Frequency MHz	read level dBuV	Cable Loss dB	LISN Factor dB	Measured level dBuV	Limit Line dBuV	Over limit dB	Remark
0.17	27.19	0.10	9.46	36.75	55.03	-28.28	QP
0.17	16.06	0.10	9.46	24.62	55.03	-30.41	AVERAGE
0.36	23.20	0.13	9.50	31.99	51.34	-29.35	QP
0.36	16.06	0.13	9.50	24.76	51.34	-26.58	AVERAGE
0.44	21.21	0.19	9.56	30.95	57.07	-26.12	QP
0.44	12.01	0.19	9.56	21.75	47.07	-25.32	AVERAGE
0.82	13.21	0.27	9.59	23.07	46.00	-22.93	AVERAGE
0.82	18.10	0.27	9.59	27.96	56.00	-28.04	QP
1.37	21.39	0.30	9.56	31.26	56.00	-24.76	QP
1.37	16.40	0.30	9.56	26.34	46.00	-19.66	AVERAGE
28.75	12.44	0.56	9.60	22.60	50.00	-27.32	AVERAGE
28.75	20.57	0.56	9.60	30.81	60.00	-29.19	QP



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7.2 99% Bandwidth

Test Requirement N/A

Test Method: KDB 789033 II D

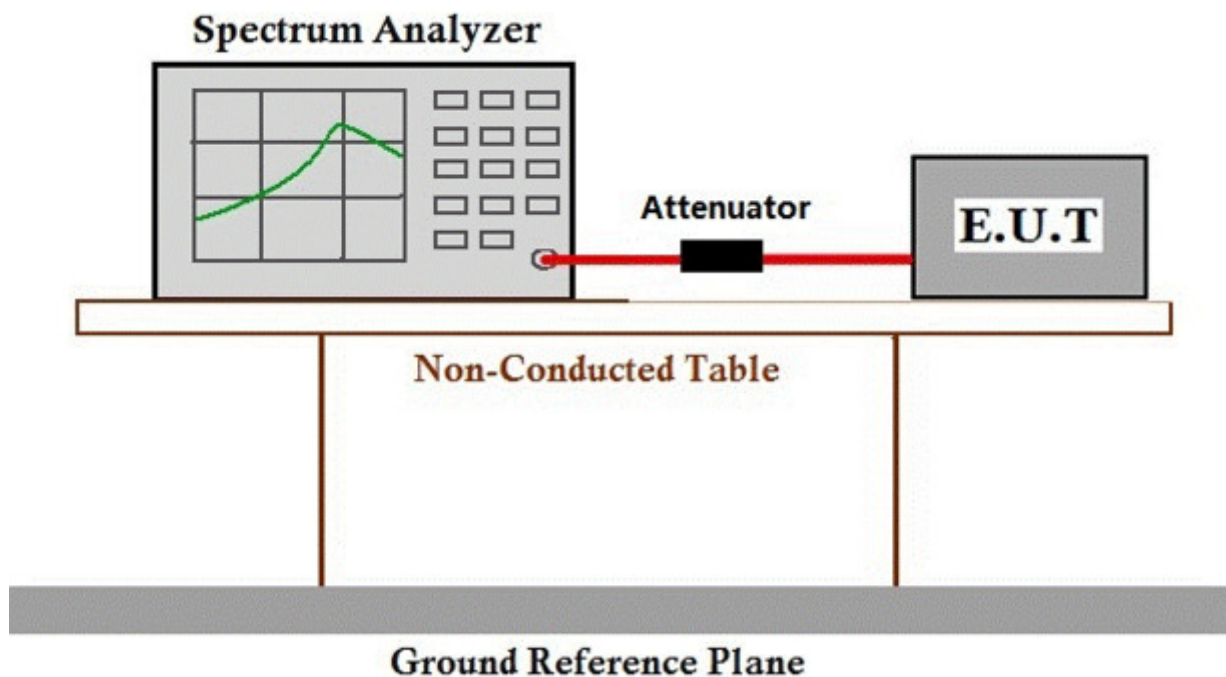
7.2.1 E.U.T. Operation

Operating Environment:

Temperature: 25.1 °C Humidity: 58.2 % RH Atmospheric Pressure: 1020 mbar

Test mode f: TX mode, Keep the EUT in continuously transmitting mode with GFSK modulation types.

7.2.2 Test Setup Diagram



7.2.3 Measurement Procedure and Data

The detailed test data see: Appendix 15.407



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7.3 26dB Emission bandwidth

Test Requirement 47 CFR Part 15, Subpart E 15.407 (a)

Test Method: KDB 789033 D02 II C 1

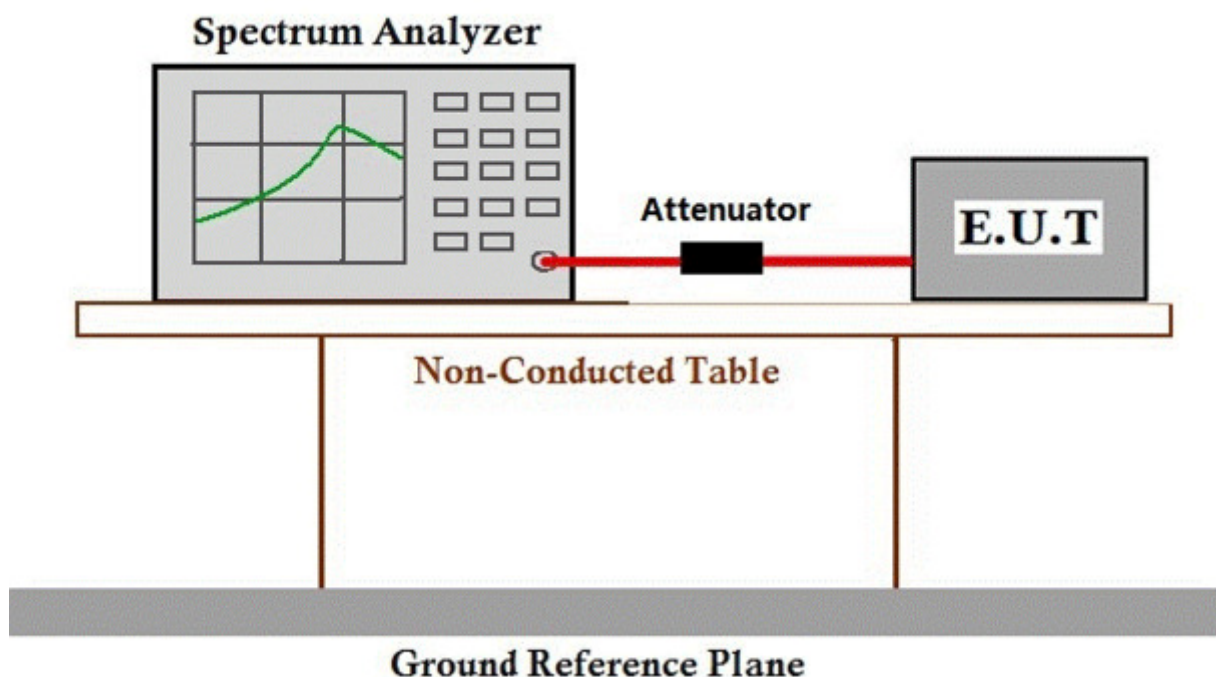
7.3.1 E.U.T. Operation

Operating Environment:

Temperature: 25.2 °C Humidity: 58.1 % RH Atmospheric Pressure: 1020 mbar

Test mode f: TX mode, Keep the EUT in continuously transmitting mode with GFSK modulation types.

7.3.2 Test Setup Diagram



7.3.3 Measurement Procedure and Data

The detailed test data see: Appendix 15.407



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7.4 Minimum 6 dB bandwidth (5.725-5.85 GHz band)

Test Requirement 47 CFR Part 15, Subpart E 15.407 (e)

Test Method: KDB 789033 D02 II C 2

Limit: ≥ 500 kHz

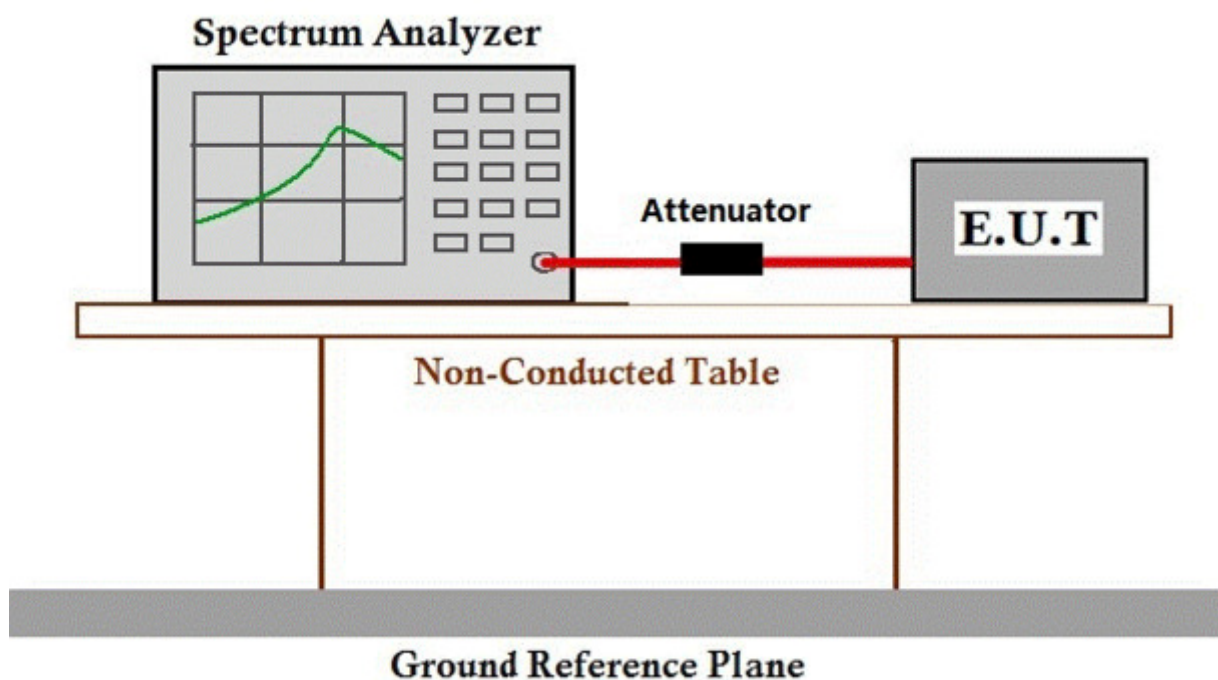
7.4.1 E.U.T. Operation

Operating Environment:

Temperature: 25.2 °C Humidity: 58.9 % RH Atmospheric Pressure: 1020 mbar

Test mode f: TX mode, Keep the EUT in continuously transmitting mode with GFSK modulation types.

7.4.2 Test Setup Diagram



7.4.3 Measurement Procedure and Data

The detailed test data see: Appendix 15.407

7.5 Maximum Conducted output power

Test Requirement 47 CFR Part 15, Subpart E 15.407 (a)

Test Method: KDB 789033 D02 II E

Limit:

Frequency band (MHz)	Limit
5150-5250	≤1W(30dBm) for master device
	≤250mW(24dBm) for client device
5250-5350	≤250mW(24dBm) for client device or 11dBm+10logB*
5470-5725	≤250mW(24dBm) for client device or 11dBm+10logB*
5725-5850	≤1W(30dBm)
Remark:	* Where B is the 26dB emission bandwidth in MHz The maximum conducted output power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage.



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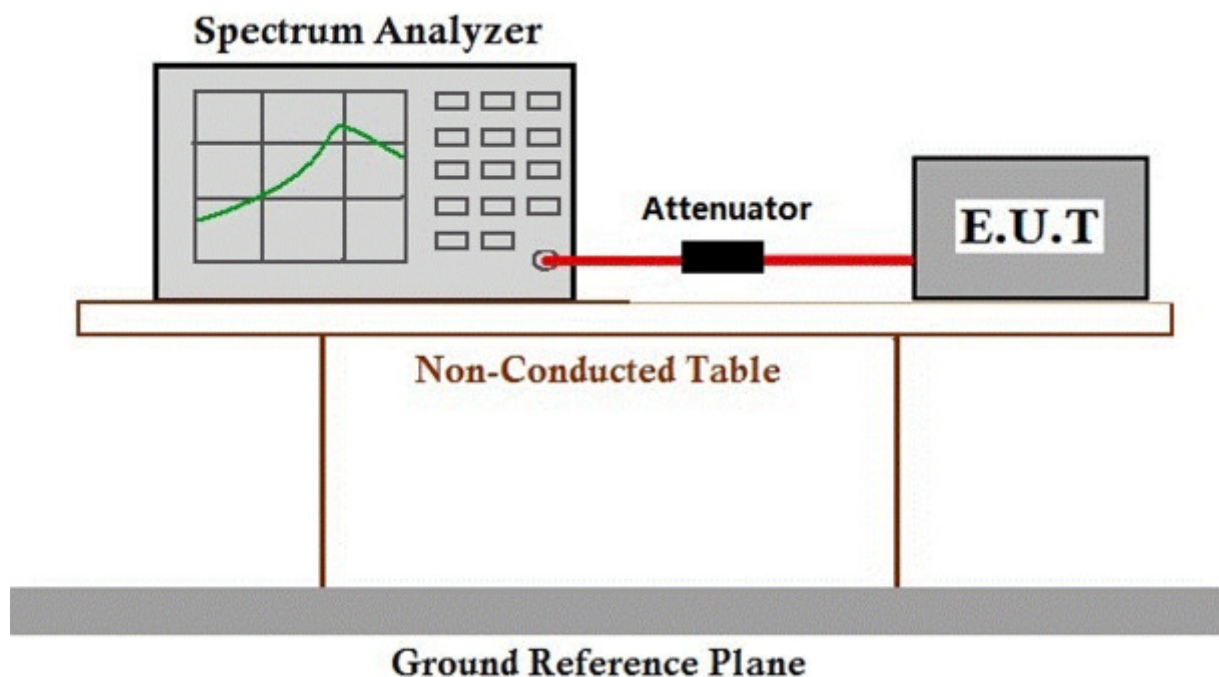
7.5.1 E.U.T. Operation

Operating Environment:

Temperature: 25.2 °C Humidity: 58.8 % RH Atmospheric Pressure: 1020 mbar

Test mode f: TX mode, Keep the EUT in continuously transmitting mode with GFSK modulation types.

7.5.2 Test Setup Diagram



7.5.3 Measurement Procedure and Data

The detailed test data see: Appendix 15.407



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7.6 Peak Power spectrum density

Test Requirement 47 CFR Part 15, Subpart E 15.407 (a)

Test Method: KDB 789033 D02 II F

Limit:

Frequency band (MHz)	Limit
5150-5250	≤17dBm in 1MHz for master device
	≤11dBm in 1MHz for client device
5250-5350	≤11dBm in 1MHz for client device
5470-5725	≤11dBm in 1MHz for client device
5725-5850	≤30dBm in 500 kHz
Remark:	The maximum power spectral density is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test.
	The limit will be calculated in different RBW.



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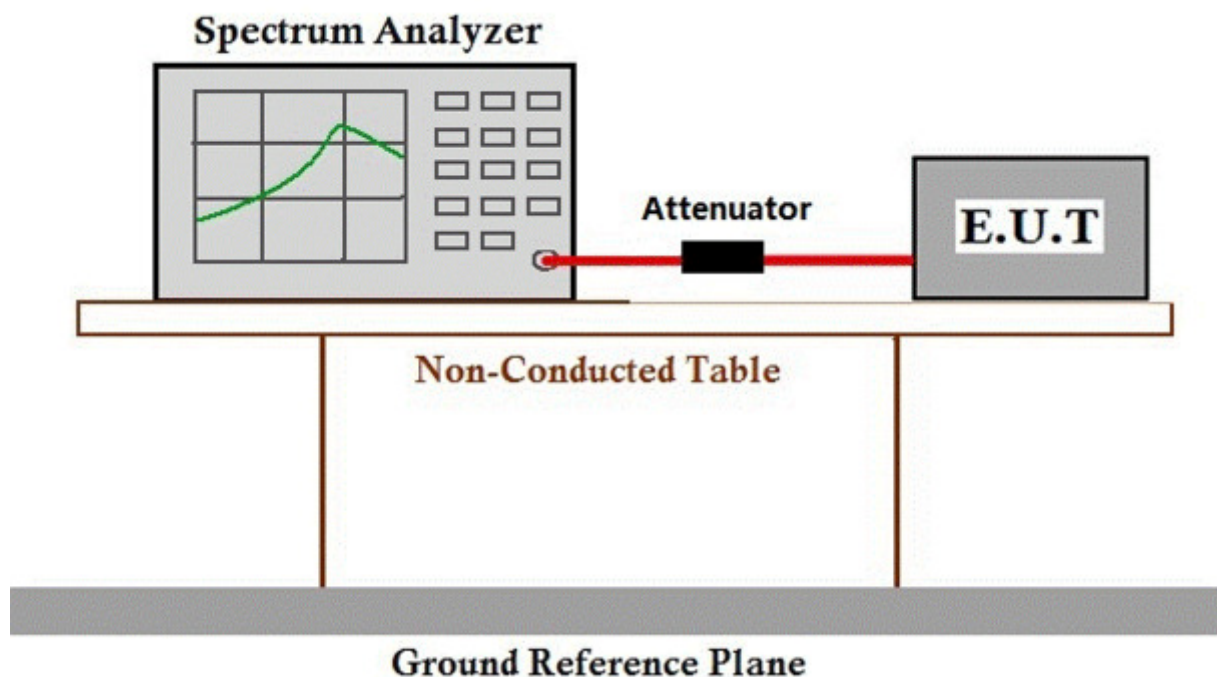
7.6.1 E.U.T. Operation

Operating Environment:

Temperature: 25.1 °C Humidity: 58.6 % RH Atmospheric Pressure: 1020 mbar

Test mode f: TX mode, Keep the EUT in continuously transmitting mode with GFSK modulation types.

7.6.2 Test Setup Diagram



7.6.3 Measurement Procedure and Data

The detailed test data see: Appendix 15.407



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7.7 Radiated Emissions

Test Requirement 47 CFR Part 15, Subpart E 15.407(b)(4) & 15.407(b)(6)
 Test Method: KDB 789033 D02 II G
 Measurement Distance: 3m
 Limit: (i) All emissions shall be limited to a level of -27dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25MHz above or below the band edge, and from 25MHz above or below the band edge increasing linearly to a level of 15.6dBm/MHz at 5MHz above or below the band edge, and from 5MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.
 (6) Unwanted emissions below 1GHz must comply with the general field strength limits set forth in 15.209.

Frequency (MHz)	Field strength (microvolts/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

7.7.1 E.U.T. Operation

Operating Environment:
 Temperature: 21 °C Humidity: 52 % RH Atmospheric Pressure: 1020 mbar
 Pretest these modes to find the worst case: f: TX mode, Keep the EUT in continuously transmitting mode with GFSK modulation types.
 g: Charge + TX mode, Keep the EUT in charging and continuously transmitting mode with GFSK modulation types.
 The worst case for final test: g: Charge + TX mode, Keep the EUT in charging and continuously transmitting mode with GFSK modulation types. Only the data of worst case is recorded in the report.

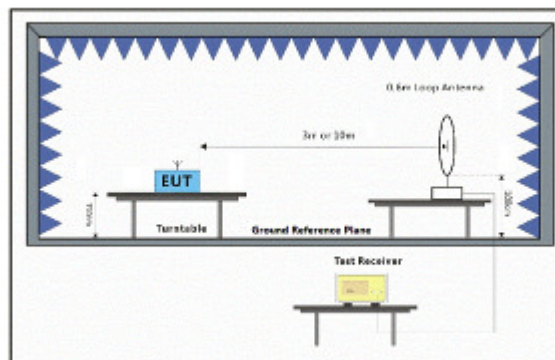
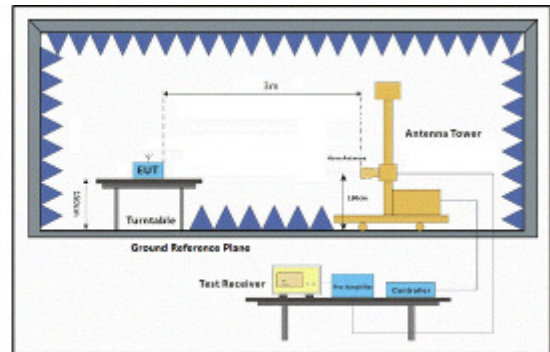
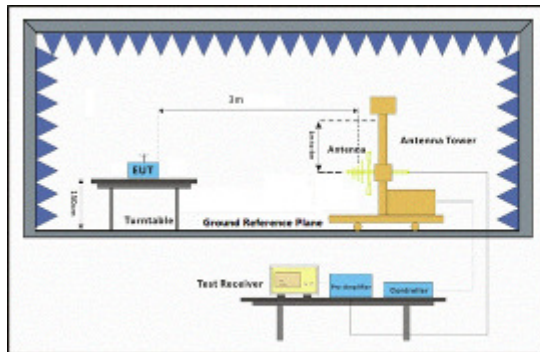


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7.7.2 Test Setup Diagram



7.7.3 Measurement Procedure and Data

- a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- d. 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.
- e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- g. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
- h. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- j. Repeat above procedures until all frequencies measured was complete.

Remark:

1. Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor
2. For emission below 1GHz, through the pre-scan found the worst case is the lowest channel. Only the worst case is recorded in the report.
3. Scan from 9kHz to 40GHz, the disturbance above 18GHz and below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.
4. As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.

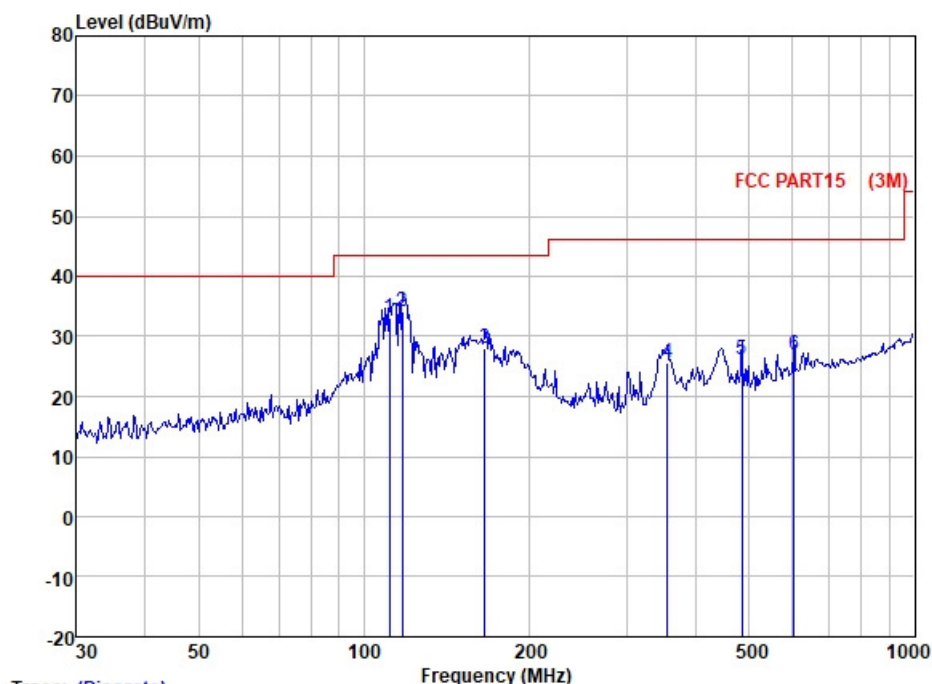
Level=Read Level + Antenna Factor + Cable Loss - Preamp Factor



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Polarization:Horizontal; Modulation:GFSK; Channel:Low



Trace: (Discrete)

	Freq	ReadAntenna	Cable	Preamp	Limit	Over			
	MHz	Level	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	110.957	47.88	10.34	1.16	26.40	32.98	43.50	-10.52	HORIZONTAL QP
2	117.360	48.50	10.87	1.19	26.41	34.15	43.50	-9.35	HORIZONTAL QP
3	165.487	39.52	13.47	1.36	26.44	27.91	43.50	-15.59	HORIZONTAL QP
4	355.427	35.35	15.49	1.95	27.24	25.55	46.00	-20.45	HORIZONTAL QP
5	485.609	33.14	17.97	2.38	27.46	26.03	46.00	-19.97	HORIZONTAL QP
6	603.539	31.48	20.33	2.62	27.42	27.01	46.00	-18.99	HORIZONTAL QP



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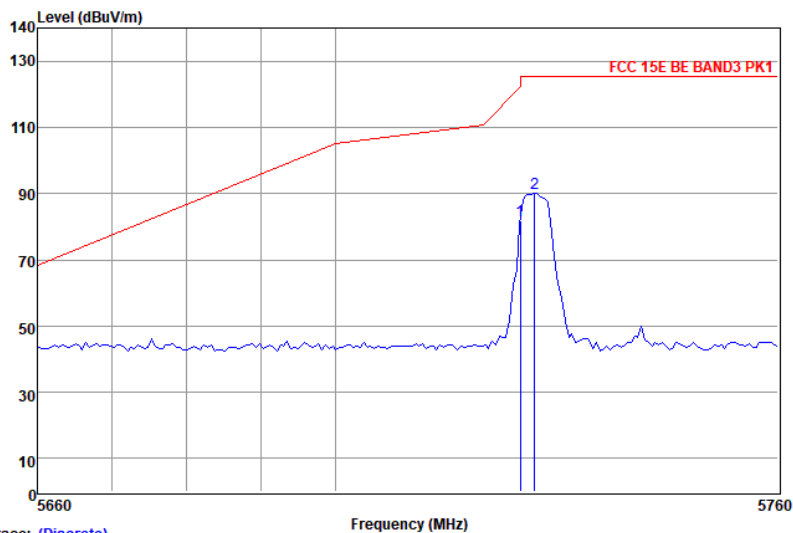
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Polarization:Horizontal; Modulation:GFSK; Channel:Low

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase
	MHz	dBm	dB/m	dB	dB	dBm	dBm	dB	
1	2047.90	47.03	25.28	10.36	37.85	44.82	68.20	-23.38	HORIZONTAL
2	3280.33	47.66	27.90	5.75	38.33	42.98	68.20	-25.22	HORIZONTAL
3	6659.76	48.00	34.53	7.15	37.28	52.40	68.20	-15.80	HORIZONTAL
4	8814.96	44.70	36.38	8.04	37.52	51.60	68.20	-16.60	HORIZONTAL
5	10039.39	45.57	38.04	8.82	37.32	55.11	68.20	-13.09	HORIZONTAL
6	14038.45	39.79	41.26	11.98	35.50	57.53	68.20	-10.67	HORIZONTAL

Data: 63 File: C:\Program Files (x86)\e3\Test DATA(total)\Client 2019\2089CR SE.EM6 (65)



Trace: (Discrete)

Site : SGS
Condition : FCC 15E BE BAND3 PK1 3m EMC2026 1G-18G 2016 HORIZONTAL
Job :
Application :
Test Mode : TX5727
Product :
Model :
Engineer :
Remark : Level=Read Level + Cable loss+Aux Factor
: + Antenna Factor - Preamp factor
AC Power :
Memo :

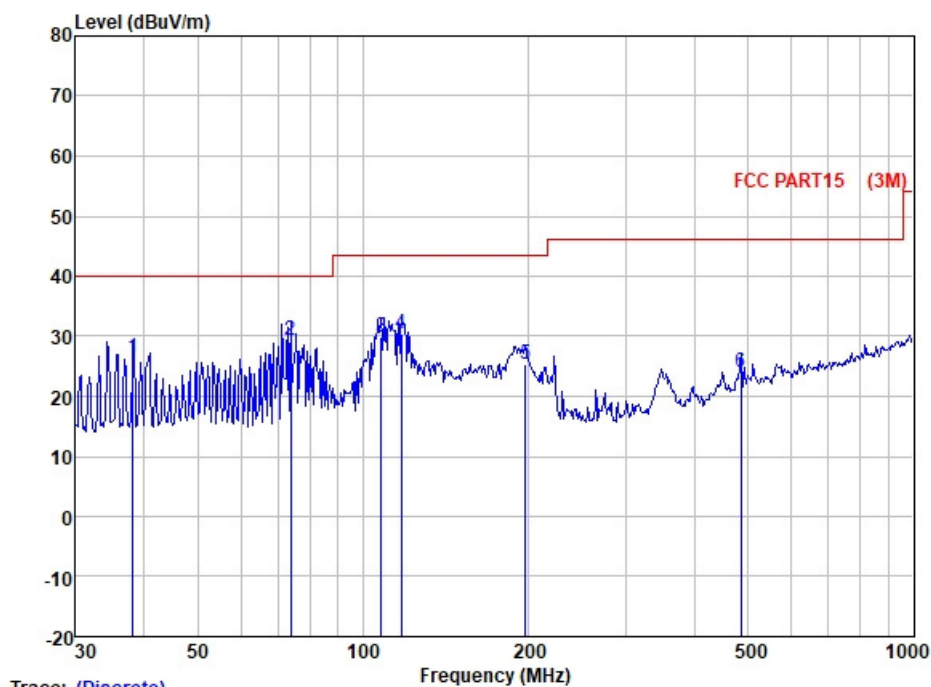
	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	5725.000	80.12	32.08	6.99	37.50	81.69	122.20	-40.51	Peak
2	5727.000	88.68	32.08	6.99	37.50	90.25	125.20	-34.95	Peak



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Polarization:Vertical; Modulation:GFSK; Channel:Low



Trace: (Discrete)

	Freq	ReadAntenna	Cable	Preamp	Limit	Over			
	MHz	Level	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	38.078	38.37	13.74	0.70	26.52	26.29	40.00	-13.71	VERTICAL QP
2	73.876	43.35	11.64	0.90	26.43	29.46	40.00	-10.54	VERTICAL QP
3	107.888	45.16	9.86	1.13	26.40	29.75	43.50	-13.75	VERTICAL QP
4	117.360	44.86	10.87	1.19	26.41	30.51	43.50	-12.99	VERTICAL QP
5	197.200	39.05	11.34	1.49	26.45	25.43	43.50	-18.07	VERTICAL QP
6	485.609	31.06	17.97	2.38	27.46	23.95	46.00	-22.05	VERTICAL QP



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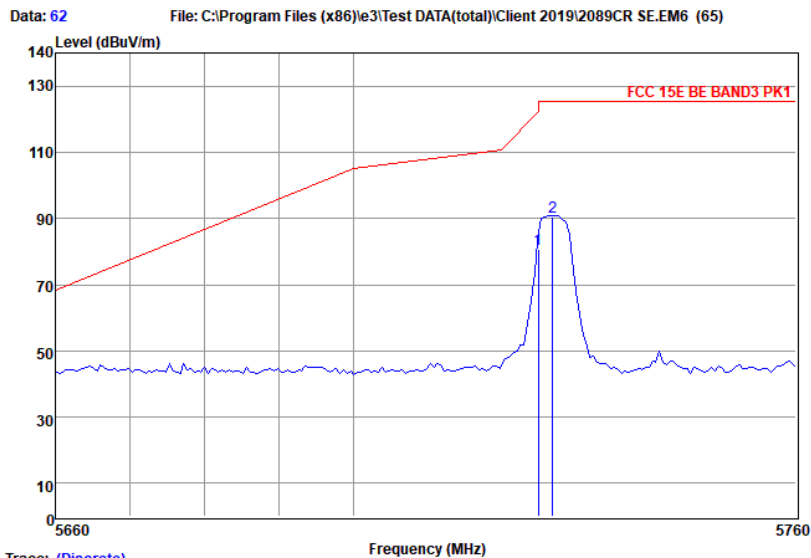
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Polarization:Vertical; Modulation:GFSK; Channel:Low

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase
	MHz	dBm	dB/m	dB	dB	dBm	dBm	dB	
1	2006.88	47.03	25.21	11.00	37.72	45.52	68.20	-22.68	VERTICAL
2	3177.67	47.91	27.90	5.86	38.47	43.20	68.20	-25.00	VERTICAL
3	3495.69	47.05	27.90	5.93	38.00	42.88	68.20	-25.32	VERTICAL
4	6894.81	48.25	34.98	7.24	37.33	53.14	68.20	-15.06	VERTICAL
5	9558.02	46.65	37.45	8.18	37.42	54.86	68.20	-13.34	VERTICAL
6	13997.93	40.66	41.20	11.95	35.50	58.31	68.20	-9.89	VERTICAL



	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	5725.000	79.31	32.08	6.99	37.50	80.88	122.20	-41.32	Peak
2	5727.000	89.04	32.08	6.99	37.50	90.61	125.20	-34.59	Peak



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Polarization:Horizontal; Modulation:GFSK; Channel:middle

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase
	MHz	dBm	dB/m	dB	dB	dBm	dBm	dB	
1	2041.98	47.17	25.27	10.46	37.83	45.07	68.20	-23.13	HORIZONTAL
2	3214.62	47.50	27.90	5.91	38.47	42.84	68.20	-25.36	HORIZONTAL
3	3485.60	47.32	27.90	5.87	38.01	43.08	68.20	-25.12	HORIZONTAL
4	6698.37	48.11	34.61	7.17	37.29	52.60	68.20	-15.60	HORIZONTAL
5	10010.42	44.43	38.00	8.78	37.33	53.88	68.20	-14.32	HORIZONTAL
6	13877.08	39.96	41.02	12.06	35.59	57.45	68.20	-10.75	HORIZONTAL

Polarization:Vertical; Modulation:GFSK; Channel:middle

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase
	MHz	dBm	dB/m	dB	dB	dBm	dBm	dB	
1	2012.69	47.50	25.22	10.92	37.73	45.91	68.20	-22.29	VERTICAL
2	3150.24	46.78	27.90	5.70	38.41	41.97	68.20	-26.23	VERTICAL
3	7035.73	45.12	35.15	7.29	37.38	50.18	68.20	-18.02	VERTICAL
4	8738.85	45.14	36.30	7.98	37.51	51.91	68.20	-16.29	VERTICAL
5	10215.02	43.42	38.36	9.05	37.32	53.51	68.20	-14.69	VERTICAL
6	13957.53	39.39	41.14	11.92	35.50	56.95	68.20	-11.25	VERTICAL



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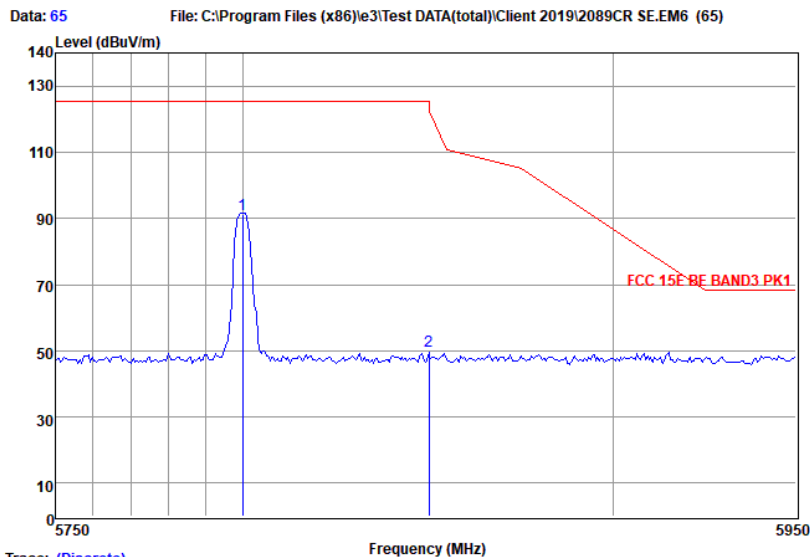
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Polarization:Horizontal; Modulation:GFSK; Channel:High

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase
	MHz	dBm	dB/m	dB	dB	dBm	dBm	dB	
1	2083.72	49.27	25.35	9.56	38.02	46.16	68.20	-22.04	HORIZONTAL
2	3078.23	46.85	27.90	5.12	38.19	41.68	68.20	-26.52	HORIZONTAL
3	3505.81	46.99	27.92	6.00	37.99	42.92	68.20	-25.28	HORIZONTAL
4	6954.85	47.69	35.06	7.26	37.36	52.65	68.20	-15.55	HORIZONTAL
5	10097.60	43.00	38.13	8.90	37.31	52.72	68.20	-15.48	HORIZONTAL
6	14079.08	39.23	41.33	12.02	35.50	57.08	68.20	-11.12	HORIZONTAL



Site : SGS
Condition : FCC 15E BE BAND3 PK1 3m EMC2026 1G-18G 2016 HORIZONTAL
Job :
Application:
Test Mode : TX5800
Product :
Model :
Engineer :
Remark : Level=Read Level + Cable loss+Aux Factor
 : + Antenna Factor - Preamp factor
AC Power :
Memo :

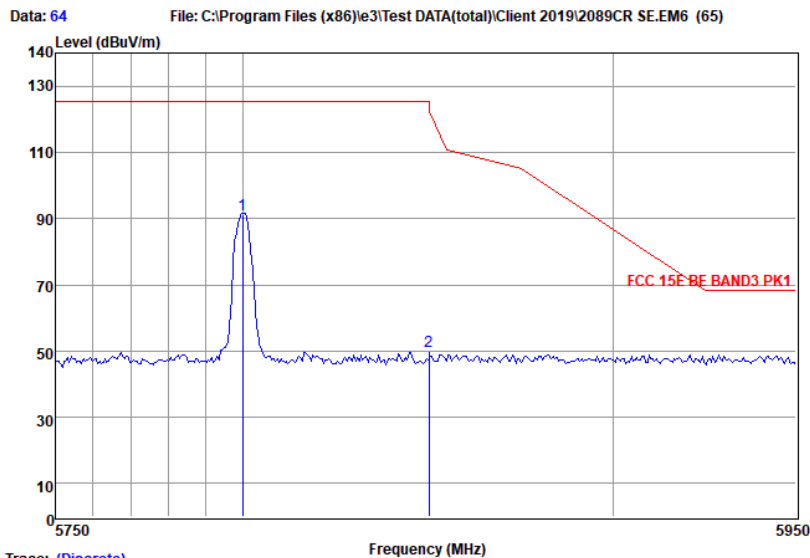
	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	5800.000	89.51	32.16	7.47	37.80	91.34	125.20	-33.86	Peak
2	5850.000	47.82	32.20	7.44	37.40	50.06	122.20	-72.14	Peak



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Polarization:Vertical; Modulation:GFSK; Channel:High

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Pol/Phase
	MHz	dBm	dB/m	dB	dB	dBm	dBm	dB	
1	2053.82	47.06	25.29	10.25	37.88	44.72	68.20	-23.48	VERTICAL
2	3214.62	46.91	27.90	5.91	38.47	42.25	68.20	-25.95	VERTICAL
3	5254.44	46.51	31.50	7.39	37.98	47.42	68.20	-20.78	VERTICAL
4	6954.85	47.79	35.06	7.26	37.36	52.75	68.20	-15.45	VERTICAL
5	10097.60	42.35	38.13	8.90	37.31	52.07	68.20	-16.13	VERTICAL
6	14038.45	39.74	41.26	11.98	35.50	57.48	68.20	-10.72	VERTICAL



Trace: (Discrete)

Site : SGS

Condition : FCC 15E BE BAND3 PK1 3m EMC2026 16-18G 2016 VERTICAL

Job :

Application:

Test Mode : TX5800

Product :

Model :

Engineer :

Remark : Level=Read Level + Cable loss+Aux Factor

AC Power :

Memo :

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	5800.000	89.38	32.16	7.47	37.80	91.21	125.20	-33.99	Peak
2	5850.000	47.53	32.20	7.44	37.40	49.77	122.20	-72.43	Peak



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7.8 Radiated Emissions which fall in the restricted bands

Test Requirement 47 CFR Part 15, Subpart E 15.407(b)(7)

Test Method: KDB 789033 D02 II G

Measurement Distance: 3m

Limit:

Frequency (MHz)	Field strength (microvolts/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

Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

7.8.1 E.U.T. Operation

Operating Environment:

Temperature: 21 °C Humidity: 52 % RH Atmospheric Pressure: 1020 mbar

Pretest these f: TX mode, Keep the EUT in continuously transmitting mode with GFSK modulation
 modes to find the g: Charge + TX mode, Keep the EUT in charging and continuously transmitting mode
 worst case: with GFSK modulation.

The worst case f: TX mode, Keep the EUT in continuously transmitting mode with GFSK modulation
 for final test:

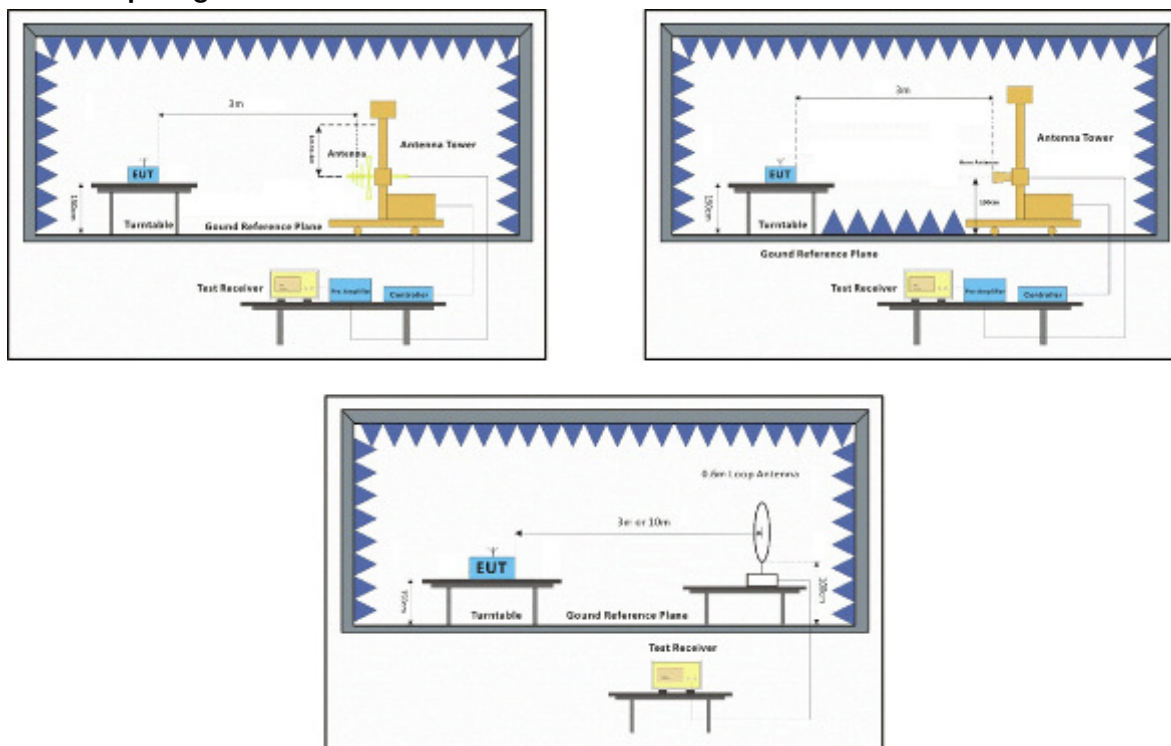


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7.8.2 Test Setup Diagram



7.8.3 Measurement Procedure and Data

- a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- d. 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.
- e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- g. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
- h. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- j. Repeat above procedures until all frequencies measured was complete.

All data meet the requirement of the restrict band and only closest point are show in the report.

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



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Polarization:Horizontal; Modulation:GFSK; Channel:low

	Freq	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	5460.000	37.41	31.85	7.73	37.86	39.13	54.00	-14.87	Average
2	5460.000	47.20	31.85	7.73	37.86	48.92	74.00	-25.08	Peak

Polarization:Vertical; Modulation:GFSK; Channel:low

	Freq	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	5460.000	37.55	31.85	7.73	37.86	39.27	54.00	-14.73	Average
2	5460.000	46.86	31.85	7.73	37.86	48.58	74.00	-25.42	Peak

Polarization:Horizontal; Modulation:GFSK; Channel:high

	Freq	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	7250.000	36.22	35.55	7.35	37.43	41.69	54.00	-12.31	Average
2	7250.000	45.73	35.55	7.35	37.43	51.20	74.00	-22.80	Peak

Polarization:Vertical; Modulation:GFSK; Channel:high

	Freq	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	7250.000	36.23	35.55	7.35	37.43	41.70	54.00	-12.30	Average
2	7250.000	46.49	35.55	7.35	37.43	51.96	74.00	-22.04	Peak



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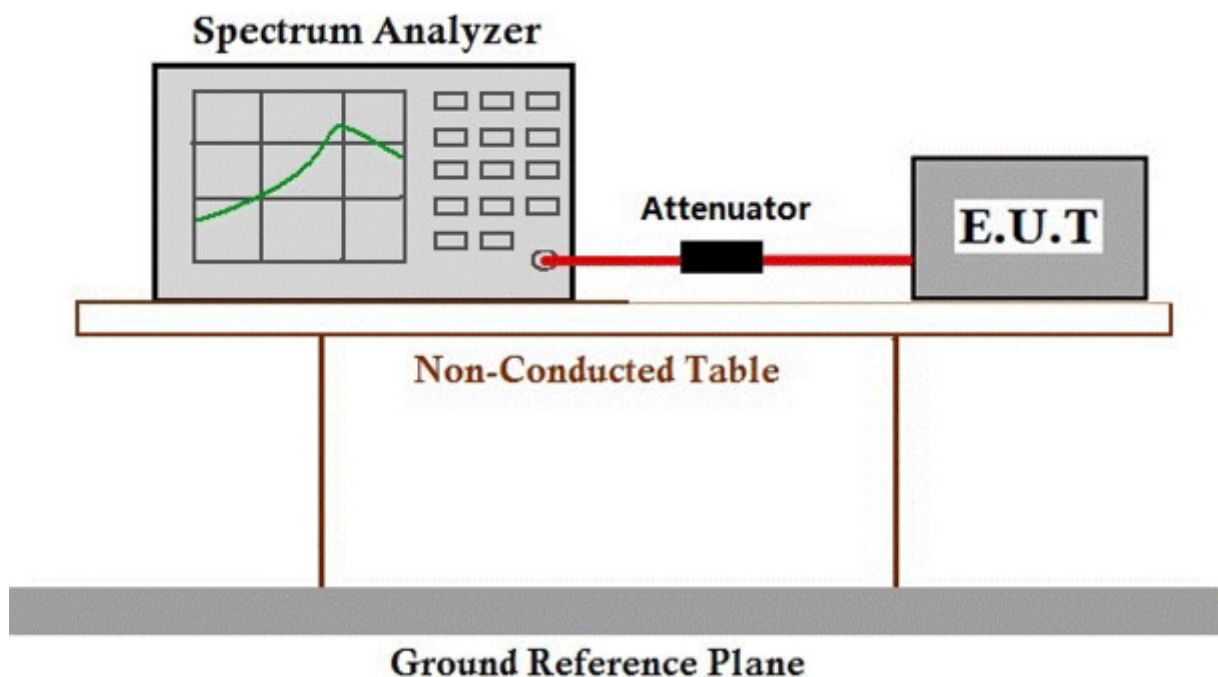
7.9 Frequency Stability

Test Requirement	47 CFR Part 15, Subpart E 15.407 (g)
Test Method:	ANSI C63.10 (2013) Section 6.8
Limit:	The frequency tolerance shall be maintained within the band of operation frequency over a temperature variation of 0 degrees to 35 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.

7.9.1 E.U.T. Operation

Operating Environment:				
Temperature:	25.3 °C	Humidity:	58.2 % RH	Atmospheric Pressure: 1020 mbar
Test mode	f: TX mode, Keep the EUT in continuously transmitting mode with GFSK modulation types.			

7.9.2 Test Setup Diagram



7.9.3 Measurement Procedure and Data

The detailed test data see: Appendix 15.407



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8 Appendix

1. Emission Bandwidth Measurement (26dB bandwidth/ 6dB bandwidth/99% bandwidth)

Test Channel	Ant	OBW[MHz]	-26dBW[MHz]	Limit[MHz]	Verdict
5727	Ant1	3.0067	4.145	NA	PASS
5760	Ant1	3.0819	4.129	NA	PASS
5800	Ant1	3.1034	4.088	NA	PASS
Test Channel	Ant	-6dBW[MHz]		Limit[MHz]	Verdict
5727	Ant1	1.843		0.5	PASS
5760	Ant1	1.917		0.5	PASS
5800	Ant1	1.787		0.5	PASS

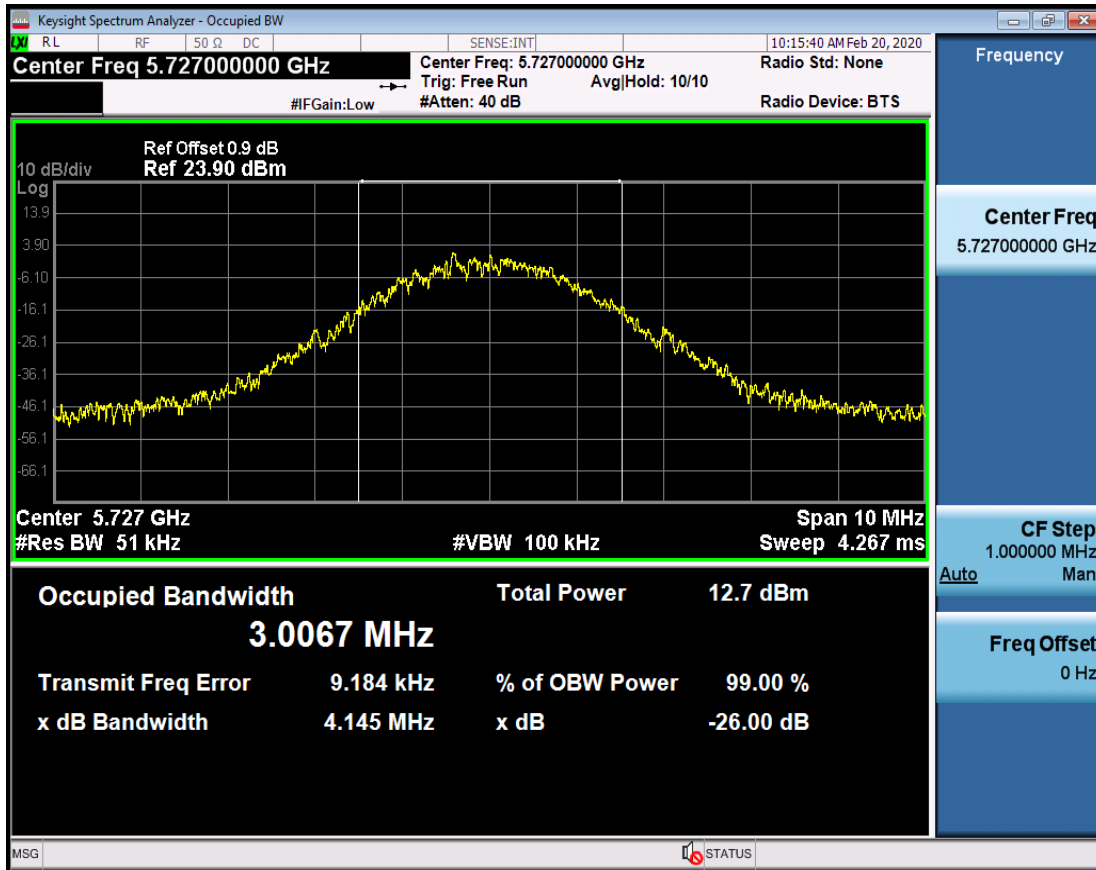


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TEST PLOT

26dB Emission Bandwidth Measurement_GFSK_5727_Ant1



26dB Emission Bandwidth Measurement_GFSK_5760_Ant1

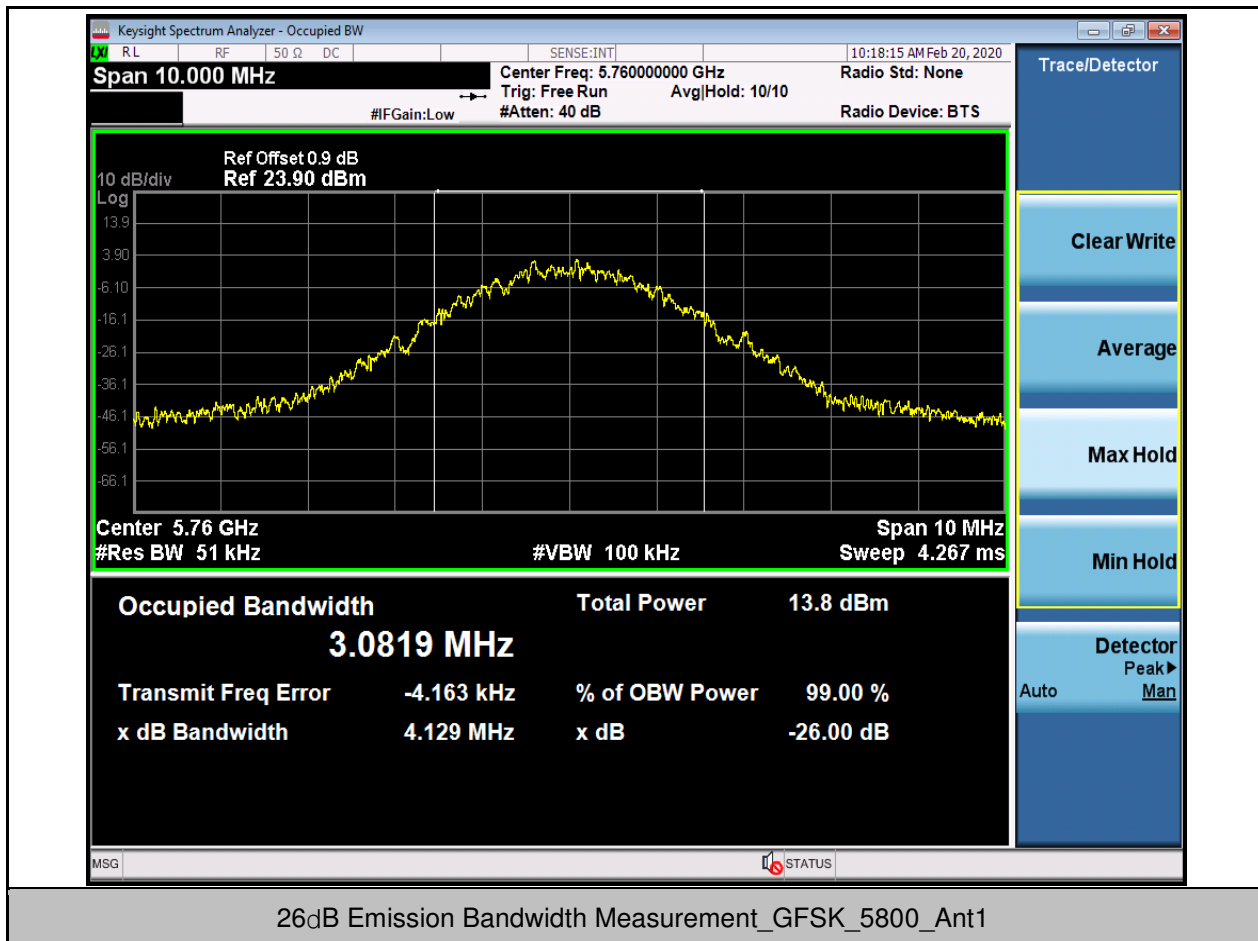


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26dB Emission Bandwidth Measurement_GFSK_5800_Ant1

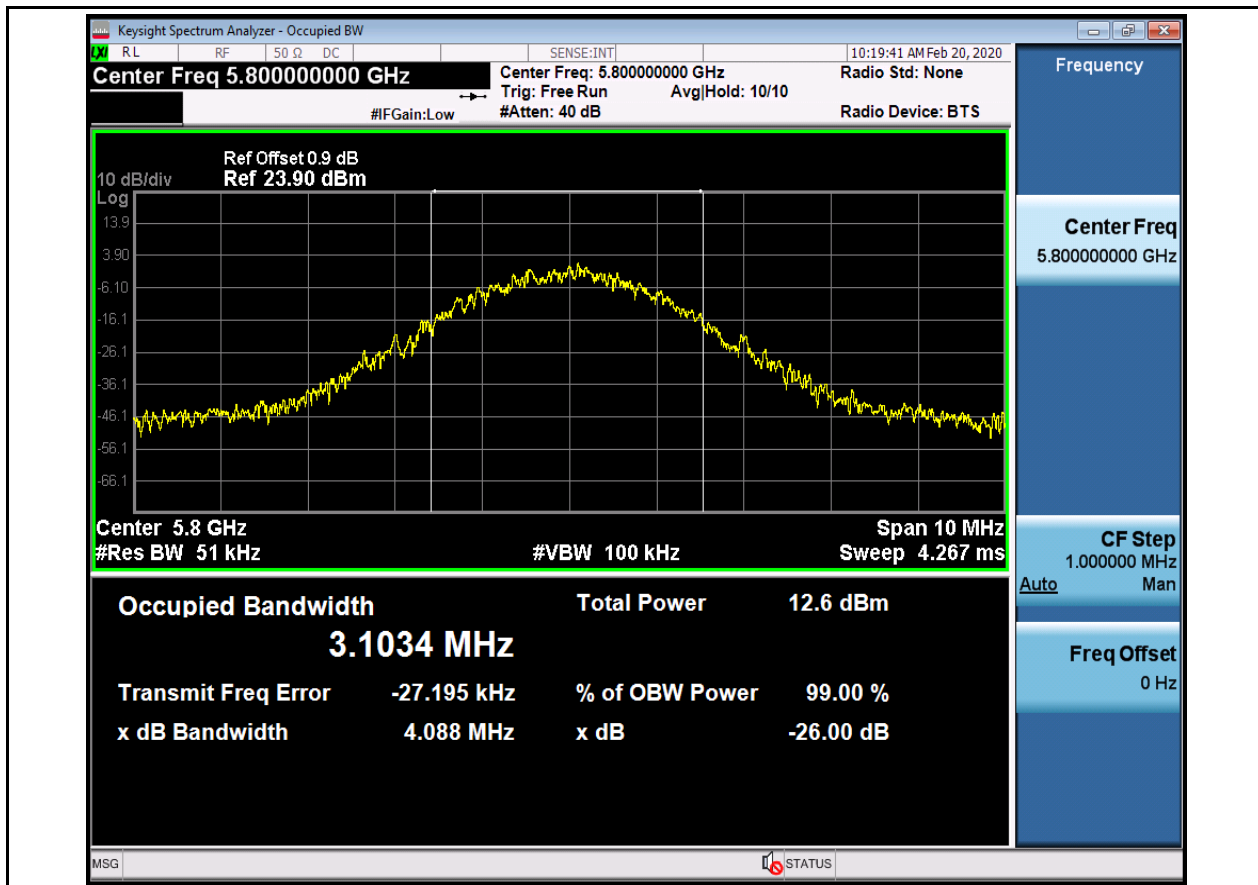


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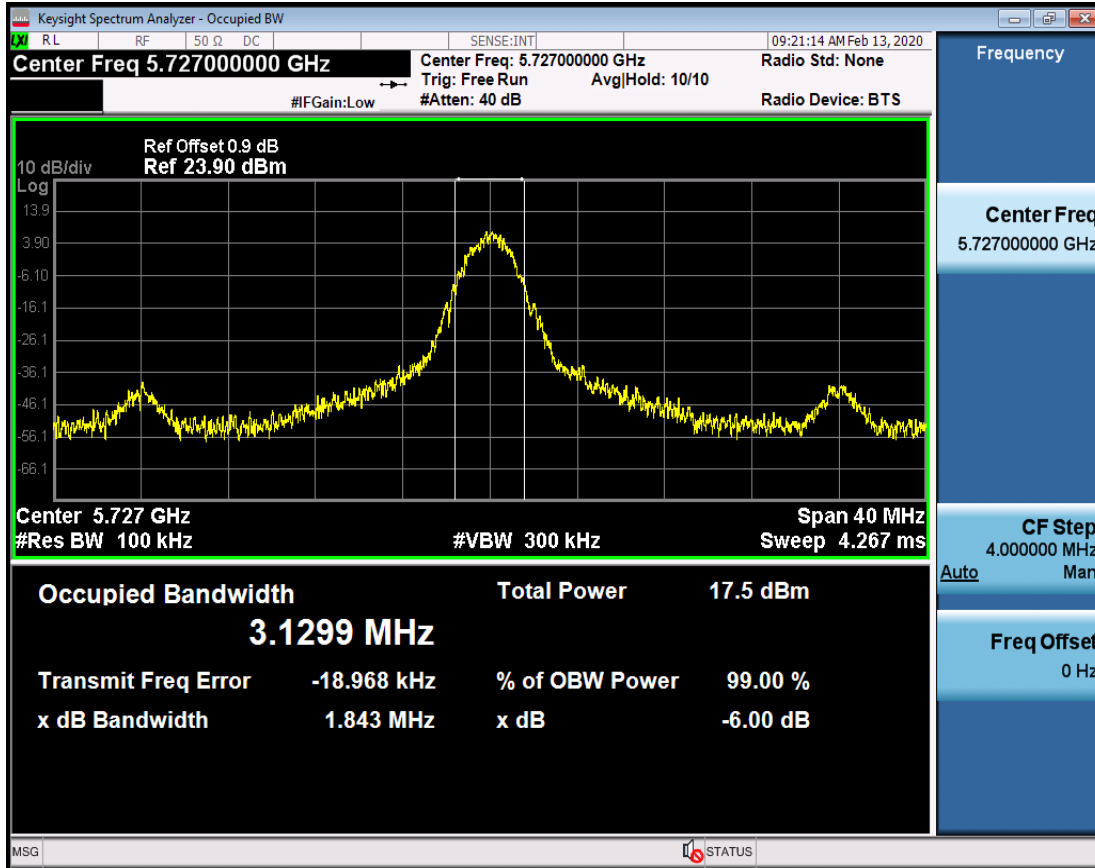
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TEST PLOT

6dB and 99% Emission Bandwidth Measurement_GFSK_5727_Ant1



6dB and 99% Emission Bandwidth Measurement_GFSK_5760_Ant1

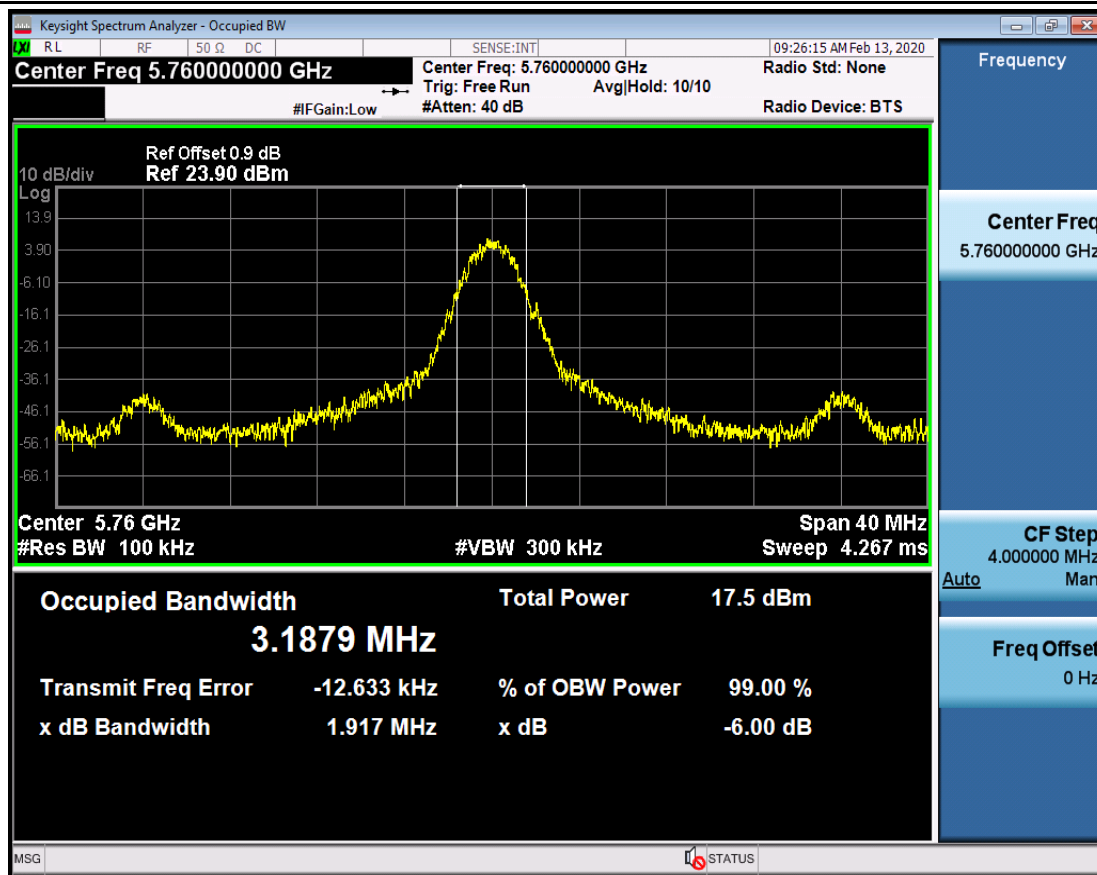


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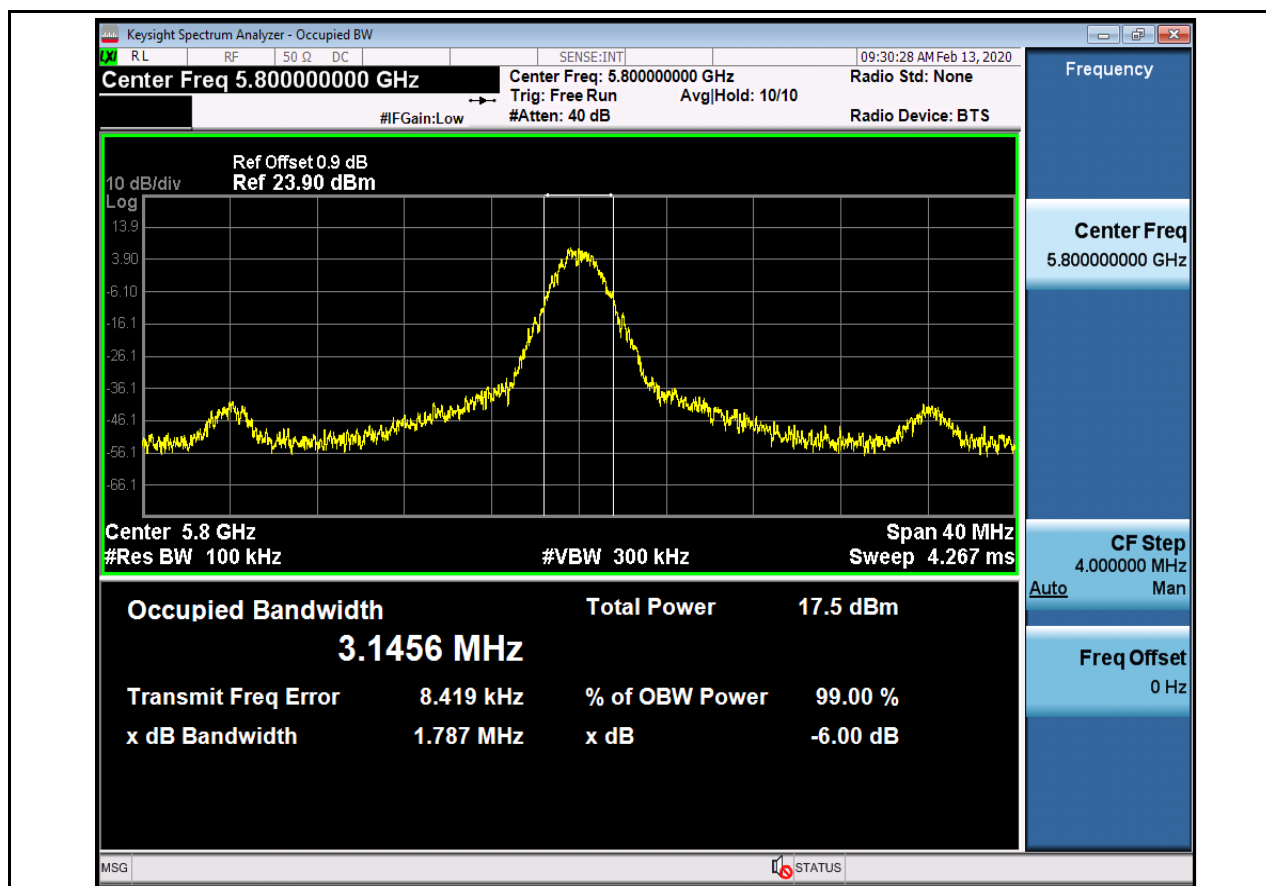
6dB and 99% Emission Bandwidth Measurement_GFSK_5800_Ant1



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2.Maximum Conduct Output Power

Test Mode	Test Channel	Ant	Level [dBm]	10log(1/x) Factor [dB]	Power [dBm]	Limit [dBm]	Verdict
GFSK	5760	Ant1	12.74	0.00	12.74	30.00	PASS
GFSK	5727	Ant1	11.17	0.00	11.17	30.00	PASS
GFSK	5800	Ant1	11.05	0.00	11.05	30.00	PASS

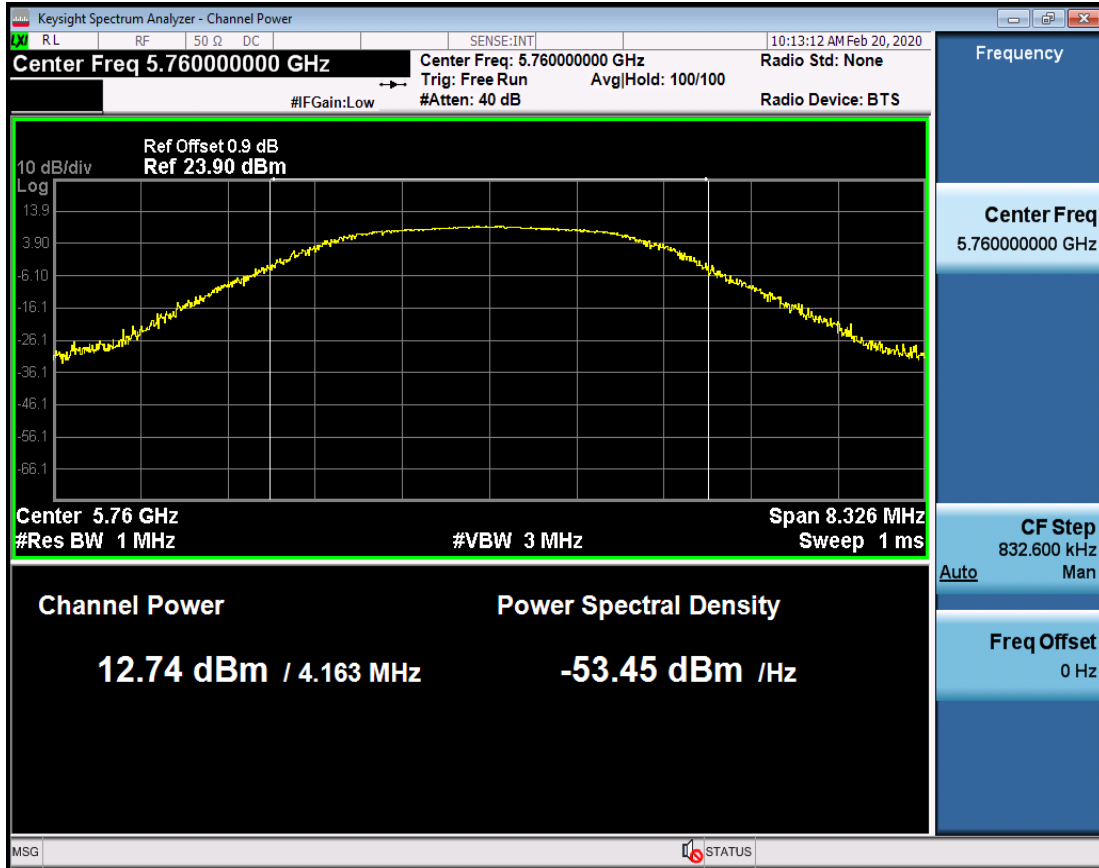


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TEST PLOT

Maximum Conduct Output Power_GFSK_5760_Ant1



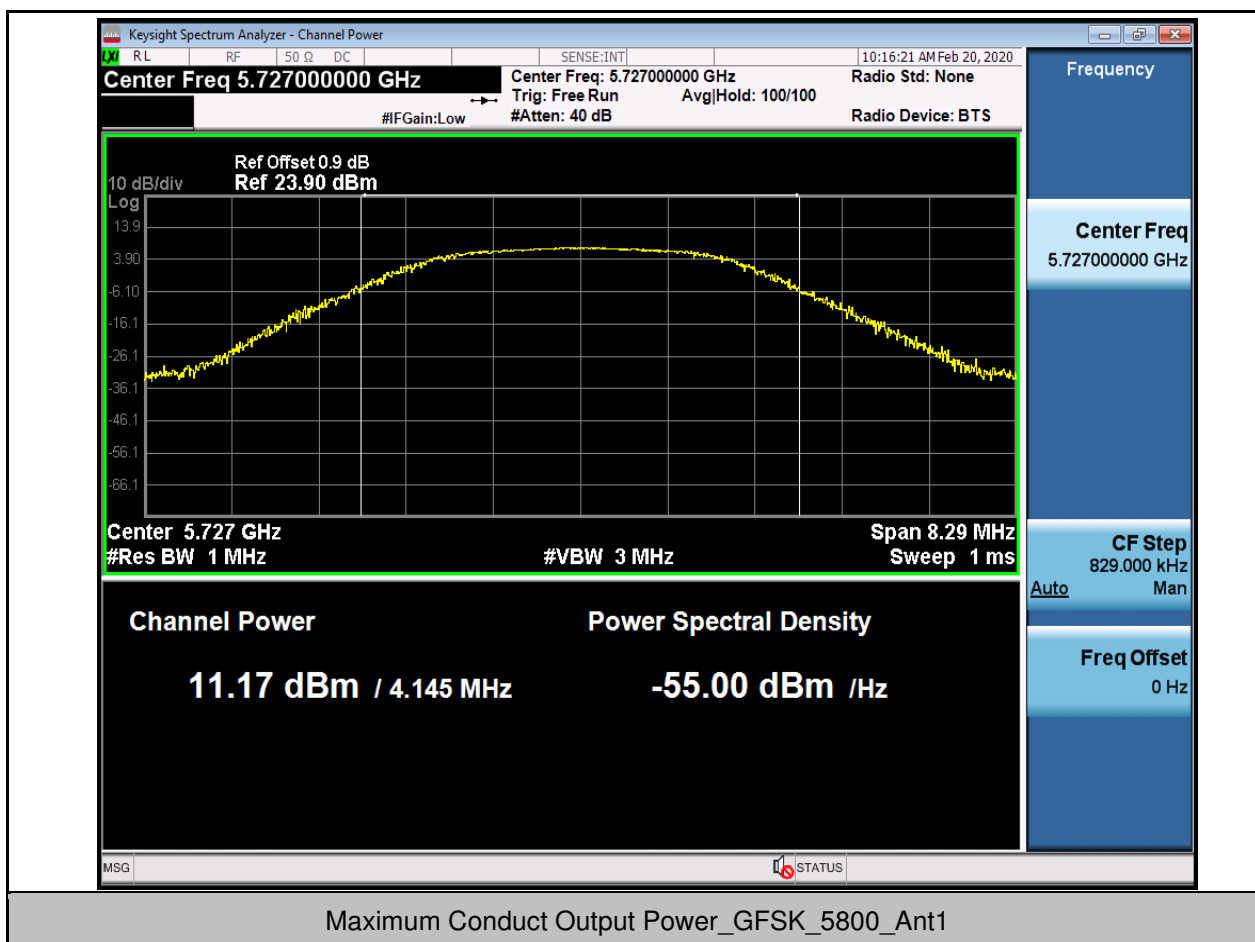
Maximum Conduct Output Power_GFSK_5727_Ant1



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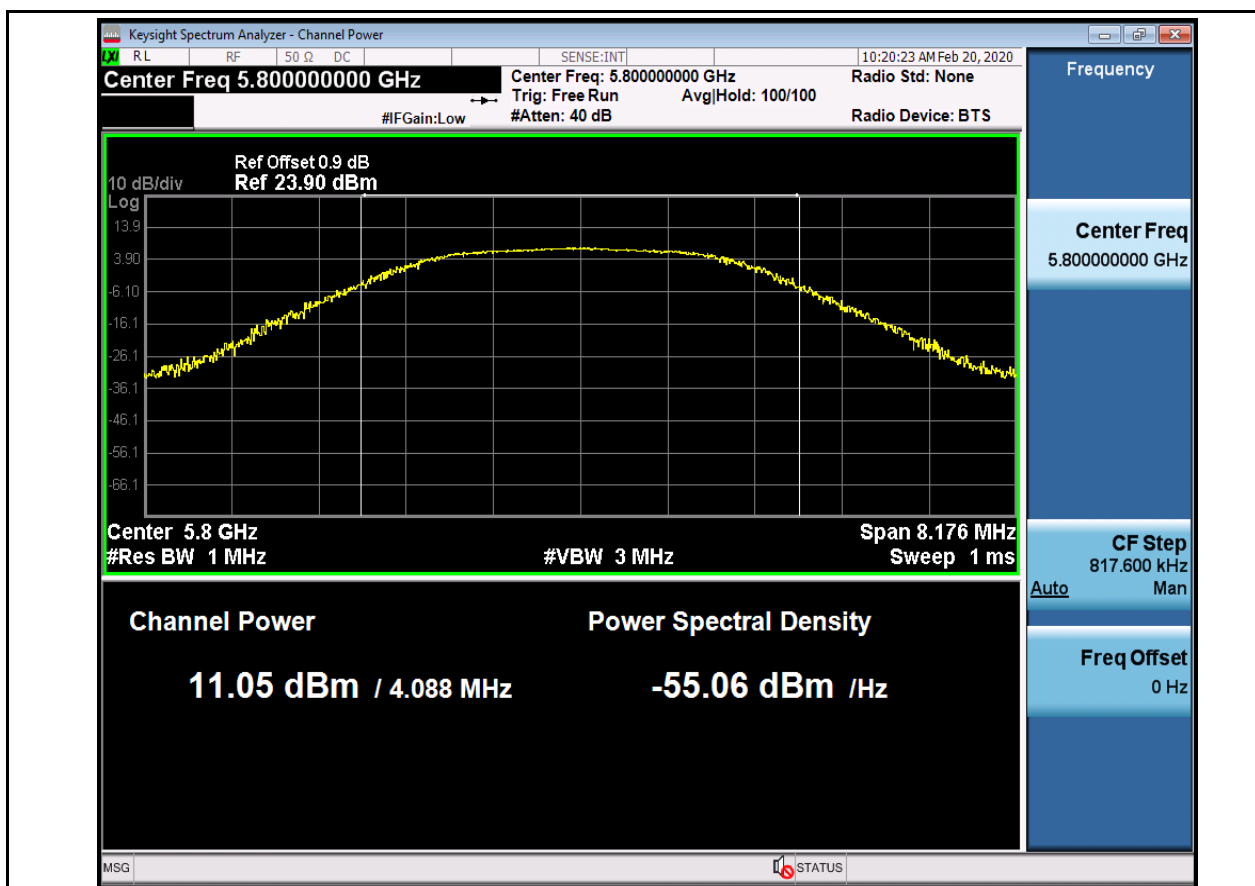


Maximum Conduct Output Power_GFSK_5800_Ant1



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3.Maximum Power Spectral Density

Test Mode	Test Channel	Ant	Level [dBm/300kHz]	10log(1/x) Factor[dB]	10log(500kHz/RBW) Factor [dB]	PSD [dBm/500kHz]	Limit [dBm/500kHz]	Verdict
GFSK	5760	Ant1	8.086	0	2.218	10.304	30	PASS
GFSK	5727	Ant1	7.165	0	2.218	9.383	30	PASS
GFSK	5800	Ant1	7.037	0	2.218	9.255	30	PASS

Remark:

The test set RBW=300Khz, the factor is $10\log(500\text{kHz}/\text{RBW}) = 10\log(500\text{Khz}/300\text{kHz}) = 2.218\text{dB}$



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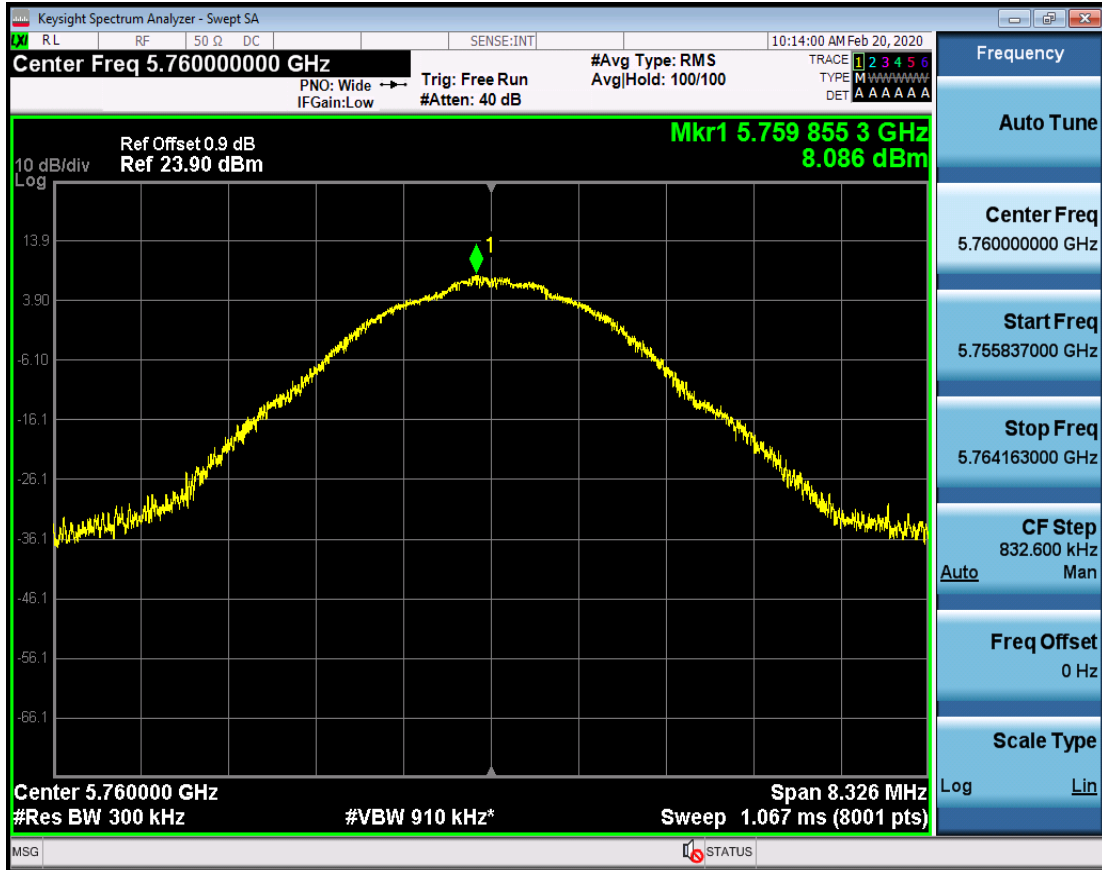
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TEST PLOT

Maximum Conduct Output Power_TNVN_GFSK_5760_Ant1



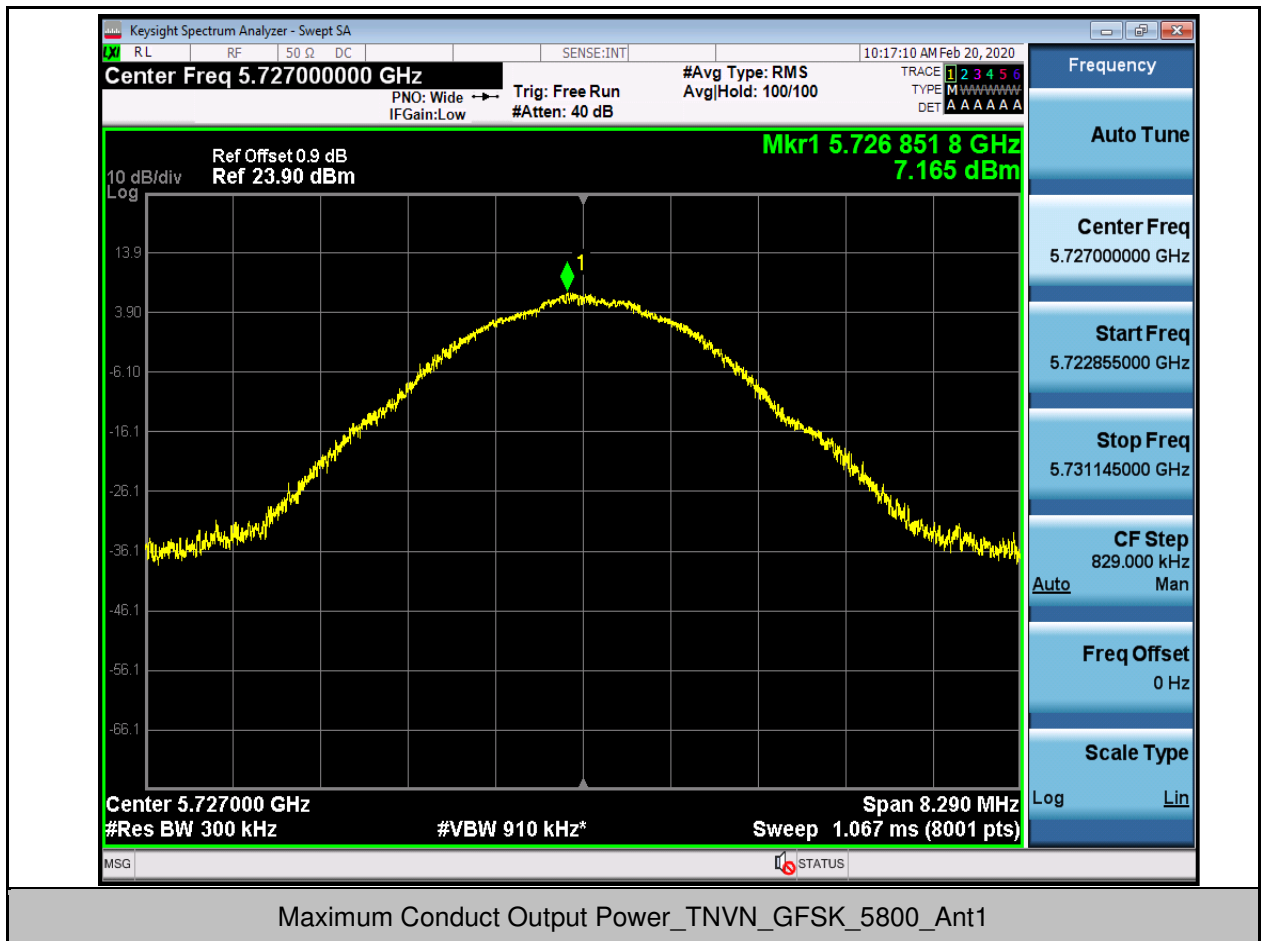
Maximum Conduct Output Power_TNVN_GFSK_5727_Ant1



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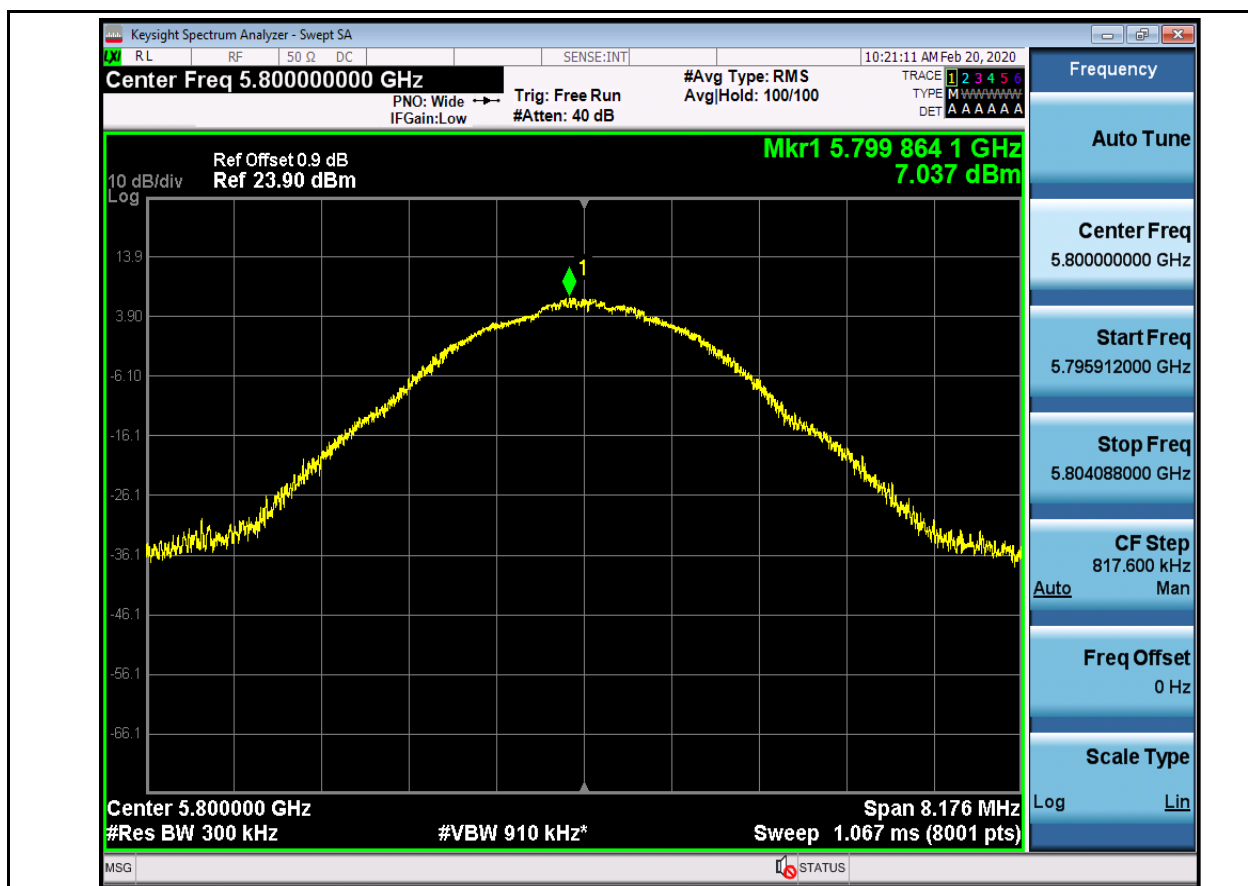
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5.Frequency Stability

Test Mode	Test Channel	Ant	Volt.	Temp.	Deviation [MHz]	Limit	Verdict
GFSK	5727	Ant1	120V	-30	5727.39	5725MHz-5850MHz	PASS
GFSK	5727	Ant1	120V	-20	5727.65		PASS
GFSK	5727	Ant1	120V	-10	5727.34		PASS
GFSK	5727	Ant1	120V	0	5727.89		PASS
GFSK	5727	Ant1	120V	10	5727.07		PASS
GFSK	5727	Ant1	138V	20	5727.14		PASS
GFSK	5727	Ant1	138V	30	5727.18		PASS
GFSK	5727	Ant1	102V	40	5727.15		PASS
GFSK	5727	Ant1	102V	50	5727.09		PASS
GFSK	5760	Ant1	120V	-30	5759.97		PASS
GFSK	5760	Ant1	120V	-20	5760.48		PASS
GFSK	5760	Ant1	120V	-10	5760.27		PASS
GFSK	5760	Ant1	120V	0	5760.64		PASS
GFSK	5760	Ant1	120V	10	5760.51		PASS
GFSK	5760	Ant1	138V	20	5760.29		PASS
GFSK	5760	Ant1	138V	30	5760.41		PASS
GFSK	5760	Ant1	102V	40	5760.02		PASS
GFSK	5760	Ant1	102V	50	5760.22		PASS
GFSK	5800	Ant1	120V	-30	5800.64		PASS
GFSK	5800	Ant1	120V	-20	5800.05		PASS
GFSK	5800	Ant1	120V	-10	5800.47		PASS
GFSK	5800	Ant1	120V	0	5800.14		PASS
GFSK	5800	Ant1	120V	10	5800.79		PASS
GFSK	5800	Ant1	138V	20	5800.05		PASS
GFSK	5800	Ant1	138V	30	5800.78		PASS
GFSK	5800	Ant1	102V	40	5800.79		PASS
GFSK	5800	Ant1	102V	50	5800.15		PASS



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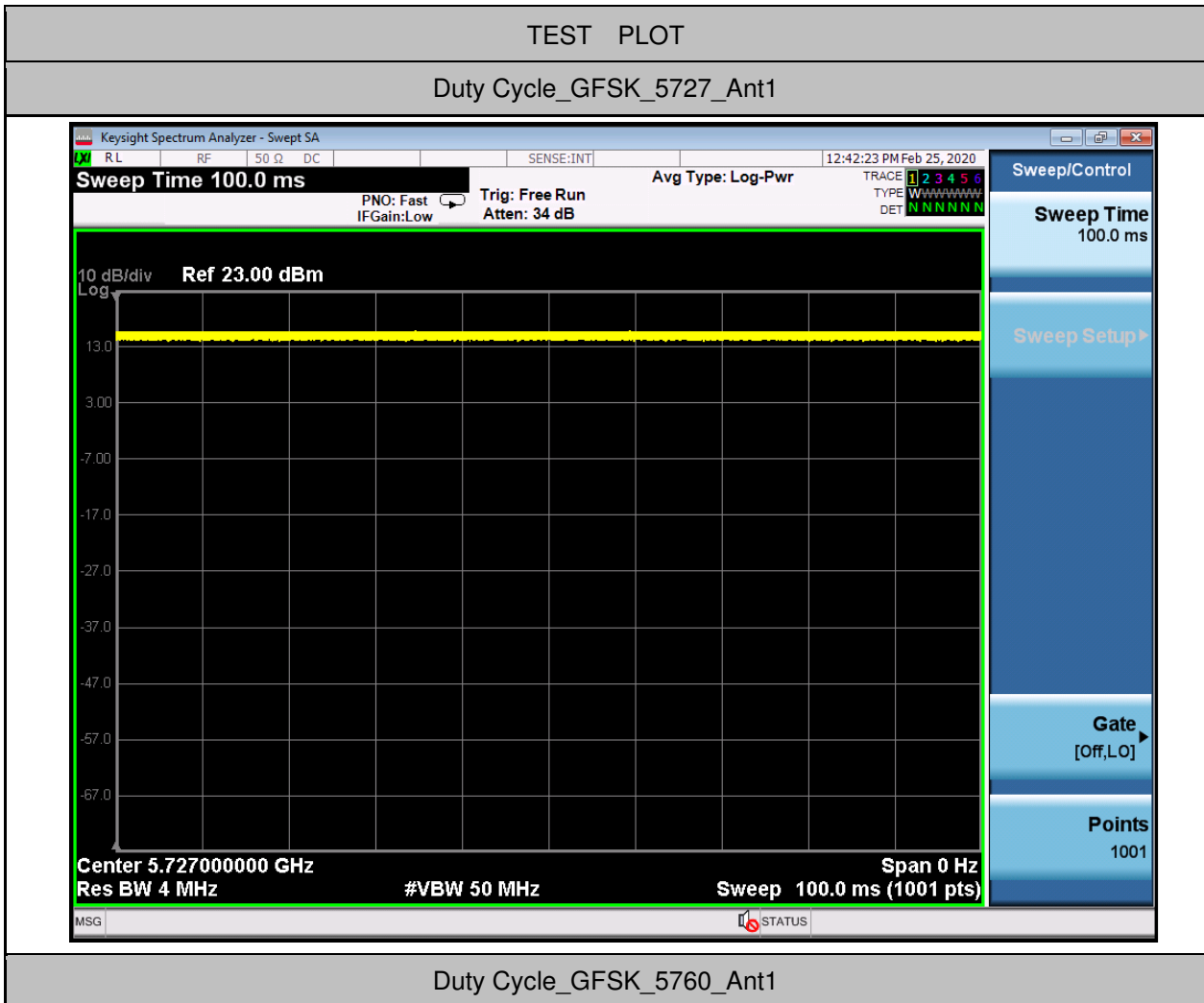
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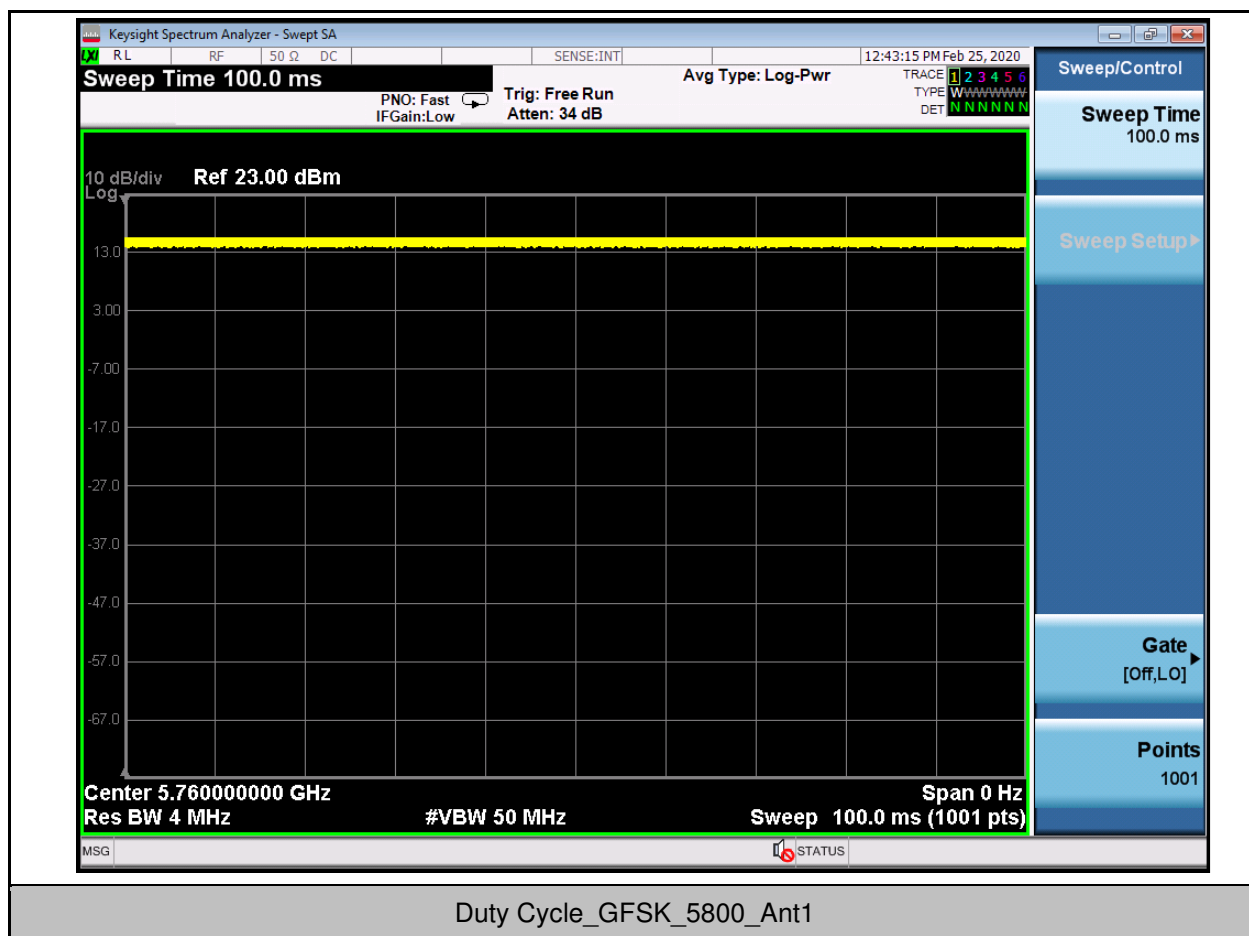
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Guangzhou Branch Inspection & Testing Services Laboratory

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6.Duty Cycle (x)

Test Mode	Test Channel	Ant	Duty Cycle[%]	10log(1/x) Factor[dB]
GFSK	5727	Ant1	100	0.00
GFSK	5760	Ant1	100	0.00
GFSK	5800	Ant1	100	0.00





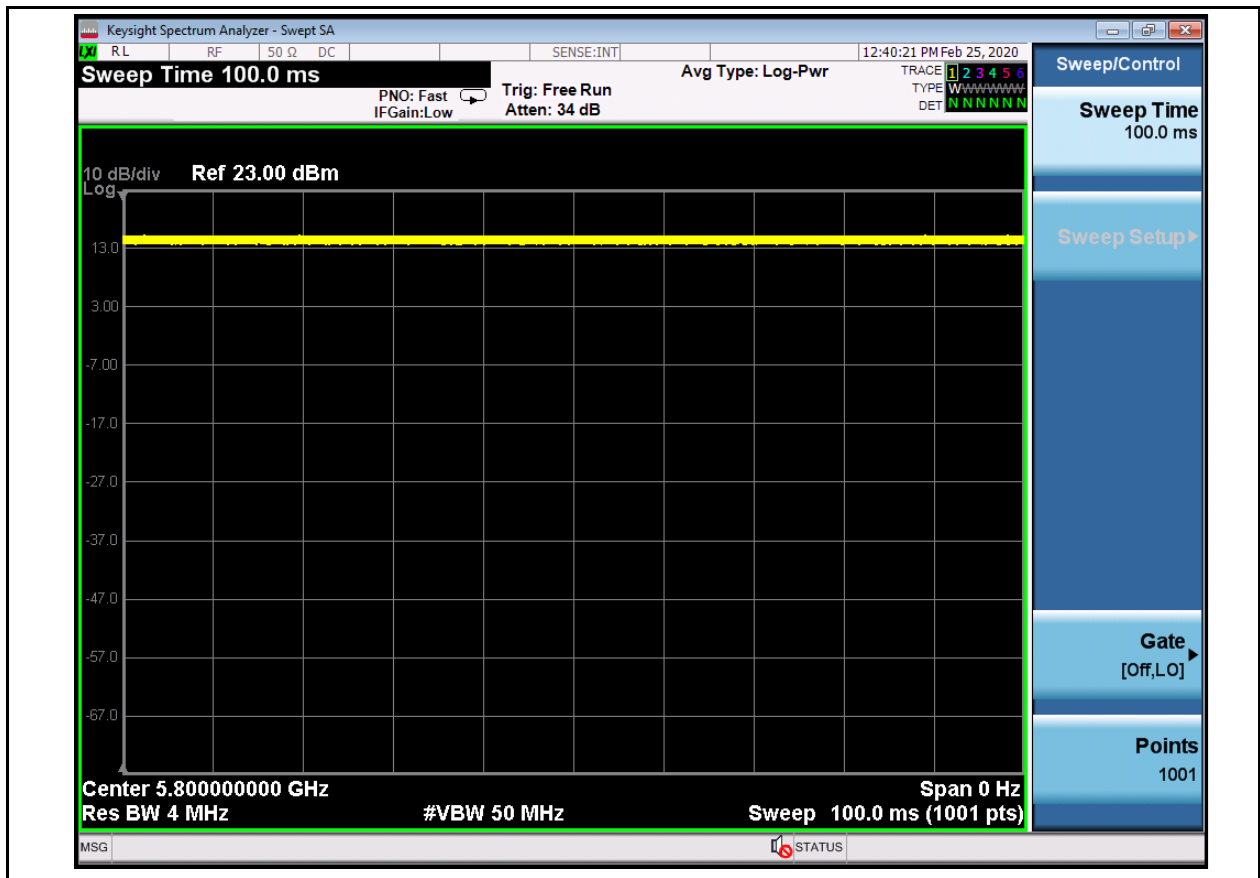
Duty Cycle_GFSK_5800_Ant1



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--End of Report--



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