

Report No.: GZCR220100010201 Page: 1 of 42 FCC ID: 2AGUM-5588014

TEST REPORT

Application No.:	GZCR2201000102AT				
Applicant:	MEKBAO PLASTIC ELECTRONIC INDUSTRIAL CO., LTD				
Address of Applicant:	Jiaoxi Industry Areas Lianxia Chenghai, Shantou City, GD, China				
Manufacturer:	MEKBAO PLASTIC ELECTRONIC INDUSTRIAL CO., LTD				
Address of Manufacturer:	Jiaoxi Industry Areas Lianxia Chenghai, Shantou City, GD, China				
Equipment Under Test (EUT):				
EUT Name:	Remote control car series				
Model No.:	5588-625 *				
÷.	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 C 15.249				
Date of Receipt:	2022-01-18				
Date of Test:	2022-01-20 to 2022-01-27				
Date of Issue:	2022-01-28				
Test Result:	Pass*				

* In the configuration tested, the EUT complied with the standards specified above.

oke. Jun

Kobe Jian EMC Laboratory Manager



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	Revision Record					
Version Chapter Date Modifier Remark						
01		2022-01-28		Original		

Authorized for issue by		
	CJ Vu	
	Curry Wu/Project Engineer	
	Ridey Lin	
	Ricky Liu/Reviewer	





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Test Summary 2

Radio Spectrum Technical Requirement					
Item	Standard	Method	Requirement	Result	
Antenna Requirement	47 CFR Part 15, Subpart C 15.249	N/A	47 CFR Part 15, Subpart C 15.203	Pass	

Radio Spectrum Matter Part					
Item	Standard	Method	Requirement	Result	
20dB Bandwidth		ANSI C63.10 (2013) Section 6.9	47 CFR Part 15, Subpart C 15.215	Pass	
Field Strength of the Fundamental Signal (15.249(a))	47 CFR Part 15,	ANSI C63.10 (2013) Section 6.5&6.6	47 CFR Part 15, Subpart C 15.249(a)	Pass	
Restricted Band Around Fundamental Frequency	Subpart C 15.249	ANSI C63.10 (2013) Section 6.10.5	47 CFR Part 15, Subpart C 15.205 & 15.249(d) & 15.209	Pass	
Radiated Emissions		ANSI C63.10 (2013) Section 6.4&6.5&6.6	47 CFR Part 15, Subpart C 15.209 & 15.249 (a),(d)	Pass	

Note:

E.U.T./EUT means Equipment Under Test.

Pass means the test result passed the test standard requirement, please find the detailed decision rule in the report relative section.

Declaration of EUT Family Grouping:

Model No.:5588-625, 10333

Only the model 5588-625 was tested, since according to the declaration from the applicant, the electrical circuit design, layout, components used, internal wiring and functions were identical for the above models, with only difference on color, appearance and packaging.



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General Information 4

Details of E.U.T. 4.1

Power supply:	3V DC(1.5V x 2 "AA" Size Batteries)
Operation Frequency:	2405MHz to 2475MHz
Modulation Type:	GFSK
Number of Channels:	71
Channel Spacing	1MHz
Sample Type:	Portable production
Antenna Type:	Integral
Antenna Gain:	0dBi

4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.			
The EUT has been tested as an independent unit.						



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4.3 Measurement Uncertainty

Test Item	Measurement Uncertainty
20dB Bandwidth	± 3%
Field Strength of the Fundamental Signal (15.249(a))	5.08dB (1GHz-6GHz); 5.14dB (above 6GHz)
Restricted Band Around Fundamental Frequency	5.06dB (30MHz-1GHz;3m)5.08dB (1GHz-6GHz); 5.14dB (above 6GHz)
Radiated Emissions (below 1GHz)	5.06dB (30MHz-1GHz;3m)
Radiated Emissions (above 1GHz)	5.08dB (1GHz-6GHz); 5.14dB (above 6GHz)
Dermenter	

Remark:

The Ulab (lab Uncertainty) is less than Ucispr (CISPR Uncertainty), so the test results

- compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;

- non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.



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4.4 Test Location

All tests were performed at: SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou Branch EMC Laboratory, 198 Kezhu Road, Scientech Park, Guangzhou Economic & Technology Development District, Guangzhou, China 510663 Tel: +86 20 8215555 Fax: +86 20 82075059 No tests were sub-contracted.

4.5 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/New Zealand Regulatory Compliance Mark (RCM).

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 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.

• ISED (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-20107 and T-11179)

The 10m Semi-anechoic chamber, 966 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-20107 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 17025:2017, the Basic Rules, IECEE 01 and Rules of procedure IECEE 02, and the relevant IECEE CB-Scheme Operational documents.



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- 4.6 Deviation from Standards None
- 4.7 Abnormalities from Standard Conditions None



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Equipment List 5

20dB Bandwidth					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EXA Signal Analzer(10Hz-44GHz)	Agilent Technologies	N9010A	EMC2138	2021-09-16	2022-09-15
6dB Attenuator	HP	8491A	EMC2062	2020-04-15	2022-04-14
MI CABLE	SGS-EMC	0.8M	EMC2136	2021-11-01	2023-11-01
MI CABLE	SGS-EMC	0.8M	EMC2137	2021-11-01	2023-11-01
Test Software	TST	V2.0	GZE100-78	N/A	N/A

Field Strength of the Fundamental Signal (15.249(a))					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EMI Test Receiver (20Hz-26.5GHz)	Rohde & Schwarz	ESIB26	EMC0522	2021-12-17	2022-12-16
Chamber cable (Above 1GHz)	Scoflex	KMKM-8.0m	EMC0545	2020-09-09	2022-09-08
Horn Antenna (1GHz-18GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120D	EMC2026	2019-09-25	2022-09-24
1GHz-26.5 GHz Pre-Amplifier	Agilent	8449B	EMC0521	2021-12-17	2022-12-16
966 Anechoic Chamber	C.R.T	9m x 6m x 6m	EMC2142	2020-12-20	2023-12-19
MXE EMI Receiver(10Hz-8.4GHz)	Keysight	N9038A	EMC2139	2021-11-01	2022-10-31
Test Software E3	Audix	Ver.6.120110a	GZE100-61	N/A	N/A

Restricted Band Around Fundamental Frequency						
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date	
EMI Test Receiver (20Hz-26.5GHz)	Rohde & Schwarz	ESIB26	EMC0522	2021-12-17	2022-12-16	
Chamber cable (Above 1GHz)	Scoflex	KMKM-8.0m	EMC0545	2020-09-09	2022-09-08	
Horn Antenna (1GHz-18GHz)	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120D	EMC2026	2019-09-25	2022-09-24	
1GHz-26.5 GHz Pre-Amplifier	Agilent	8449B	EMC0521	2021-12-17	2022-12-16	
2.4GHz Filter	Micro-Tronics	BRM 50702	EMC2069	2021-12-17	2022-12-16	
966 Anechoic Chamber	C.R.T	9m x 6m x 6m	EMC2142	2020-12-20	2023-12-19	
MXE EMI Receiver(10Hz-8.4GHz)	Keysight	N9038A	EMC2139	2021-11-01	2022-10-31	
EXA Signal Analyzer(10Hz-44GHz)	Keysight	N9010A	EMC2138	2021-09-16	2022-09-15	
Test Software E3	Audix	Ver.6.120110a	GZE100-61	N/A	N/A	



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Notch Filter (5150-5880)	Mico-Tronics	BRM50716	EMC2168	2021-07-29	2022-07-28
Horn Antenna (14-40GHz)	SCHWARZBECK	BBHA 9170	EMC2041	2020-06-28	2023-06-27
Microwave Broadband Preamplifier (18-40GHz)	SCHWARZBECK	BBV 9721	EMC2172	2021-08-30	2022-08-29

Radiated Emissions (below 1GHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Chamber cable	HangTianXing	N/A	EMC0542	2020-09-09	2022-09-08
Trilog Broadband Antenna(25MHz-1GHz)- Lab	SCHWARZBECK MESS-ELEKTRONIK	VULB 9168	SEM003-18	2019-02-22	2022-02-22
Amplifier(9kHz-1.3GHz)	HP	8447F	EMC2065	2021-05-19	2022-05-18
Active Loop Antenna	ETS-Lindgren	6502	EMC2190	2020-04-16	2022-04-15
10m Semi-Anechoic Chamber	ETS	N/A	EMC0530	2019-10-20	2022-10-19
Test Software E3	Audix	Ver.6.120110a	GZE100-61	N/A	N/A
EMI Test Receiver (1Hz-8GHz)	Rohde & Schwarz	ESW8	EMC2220	2021-05-26	2022-05-25

Radiated Emissions (above 1GHz)						
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date	
Chamber cable	Scoflex	KMKM-8.0m	EMC0545	2020-09-09	2022-09-08	
(Above 1GHz)						
Horn Antenna	SCHWARZBECK	BBHA 9120D	EMC2026	2019-09-25	2022-09-24	
(1GHz-18GHz)	MESS-ELEKTRONIK	BBITA 9120D	EIVIC2020	2019-09-25	2022-09-24	
1GHz-26.5 GHz	Agilent	8449B EMC0521	EMC0521	2021-12-17	2022-12-16	
Pre-Amplifier	Aglient	0449D	LIVIC0521			
2.4GHz Filter	Micro-Tronics	BRM 50702	EMC2069	2021-12-17	2022-12-16	
966 Anechoic Chamber	C.R.T	9m x 6m x 6m	EMC2142	2020-12-20	2023-12-19	
MXE EMI Receiver(10Hz-8.4GHz)	Keysight	N9038A	EMC2139	2021-11-01	2022-10-31	
EXA Signal Analyzer(10Hz-44GHz)	Keysight	N9010A	EMC2138	2021-09-16	2022-09-15	
Test Software E3	Audix	Ver.6.120110a	GZE100-61	N/A	N/A	

General used equipment					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
DMM	Fluke	73	EMC0006	2021-07-05	2022-07-05
DMM	Fluke	73	EMC0007	2021-07-05	2022-07-05



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6 Radio Spectrum Technical Requirement

6.1 Antenna Requirement

6.1.1 Test Requirement:

47 CFR Part 15, Subpart C 15.203

15.203 requirement:

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

6.1.2 Conclusion

EUT Antenna:

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

Antenna location: Refer to Internal photos



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7 Radio Spectrum Matter Test Results

7.1 20dB Bandwidth

Test Requirement	47 CFR Part 15, Subpart C 15.215
Test Method:	ANSI C63.10 (2013) Section 6.9
Limit:	N/A

7.1.1 E.U.T. Operation

Operating Environment:

Temperature: 24.5 °C

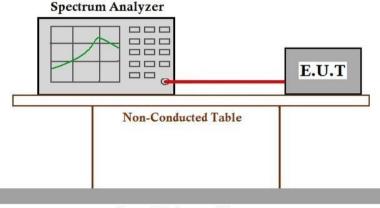
Humidity: 52.6 % RH

Atmospheric Pressure: 1010 mbar

7.1.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode_Keep the EUT in transmitting with modulation mode.

7.1.3 Test Setup Diagram



Ground Reference Plane

7.1.4 Measurement Procedure and Data

Test channel	20dB bandwidth (MHz)	Results
Lowest	3.189	Pass
Middle	2.525	Pass
Highest	1.313	Pass



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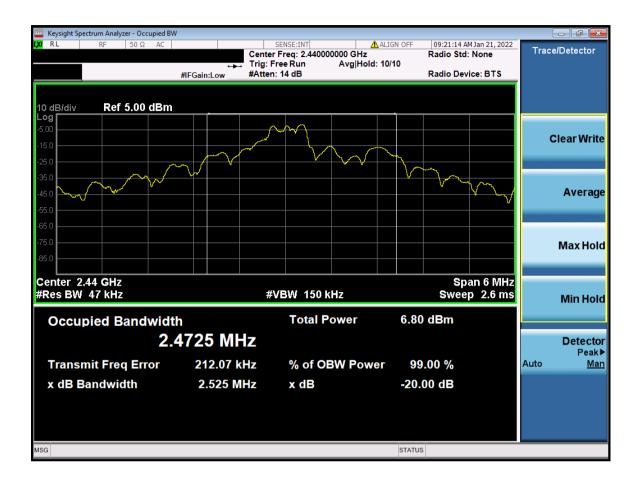


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Keysight Spectrum Analyzer - Occupied BW						
02 RL RF 50 Ω AC VBW 100.00 kHz	Trig: F	SENSE:INT A r Freq: 2.47500000 GHz Free Run Avg Hold: h: 14 dB	Radio Sto 10/10	AM Jan 21, 2022 d: None wice: BTS	Trace/D	etector
10 dB/div Ref 5.00 dBm						
-5.00					Cle	ar Write
-35.0 -45.0 -65.0				~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		Average
-65.0 -75.0 -85.0					N	lax Hold
Center 2.475 GHz #Res BW 30 kHz		VBW 100 kHz	Sweep	oan 5 MHz 5.333 ms	Ν	/lin Hold
Occupied Bandwidth	463 MHz	Total Power	8.06 dBm			Detector
Transmit Freq Error	154.81 kHz	% of OBW Powe	r 99.00 %		Auto	Peak▶ <u>Mar</u>
x dB Bandwidth	1.313 MHz	x dB	-20.00 dB			
MSG			STATUS			



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7.2 Field Strength of the Fundamental Signal (15.249(a))

Test Requirement47 CFR Part 15, Subpart C 15.249(a)Test Method:ANSI C63.10 (2013) Section 6.5&6.6Measurement Distance:3mLimit:Image: Constraint of the section of the sect

Fundamental Field strenath of Field strenath of fundamental(millivolts/meter) harmonics(microvolts/meter) frequency(MHz) 902-928 50 500 2400-2483.5 50 500 5725-5875 50 500 2500 24000-24250 250

Remark: The frequencies above 1000MHz 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 fundamental frequency in "902-928MHz", the field strength of fundamental is based on Quasi-Peak.

Average value:

Calculate Formula:	Average value=Peak value + PDCF
	PDCF=20 log(Duty cycle)
	Duty cycle= T on time / T period
	Ton time =0.7ms
Test data:	T period =20.1ms
Test data.	Duty cycle=3.483%
	PDCF value= -29.16dB



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Keysight Spectrum Analyzer - Swept SA	
Image: Rel and the second s	Trace/Detector
IFGain:Low Atten: 16 dB DET S S S S S S Mkr3 32.00 ms	Select Trace
10 dB/div Ref 6.00 dBm -2.31 dBm -2.31 dBm -2.31 dBm -2.31 dBm -2.31 dBm -2.31 dBm -2.31 dBm -2.31 dBm -2.31 dBm	Clear Write
-34.0 -44.0 -54.0	Trace Average
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Center 2.405000000 GHz Span 0 Hz Res BW 1.0 MHz #VBW 1.0 MHz Sweep 100.0 ms (1001 pts) MKR MODE TRC SCL X Y FUNCTION WIDTH FUNCTION WIDTH FUNCTION VALUE	Min Hold
1 Δ2 1 t (Δ) -31.78 dB 2 F 1 t 11.90 ms -2.08 dBm 3 N 1 t 32.00 ms -2.31 dBm 4 - - - - - 5 - - - - - 6 - - - - -	View Blank Trace On
7 8 <td>More 1 of 3</td>	More 1 of 3
ISG STATUS	

7.2.1 E.U.T. Operation

Operating Enviro	onment:					
Temperature:	25.3 °C	Humidity:	53.5 % RH	Atmospheric Pressure:	1010	mbar

7.2.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode_Keep the EUT in transmitting with modulation mode.



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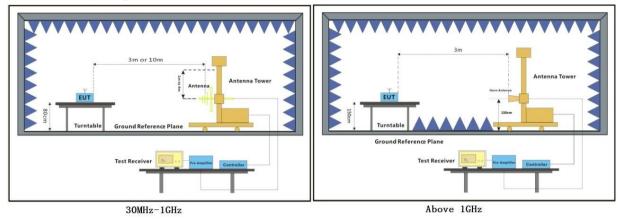
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7.2.3 Test Setup Diagram



7.2.4 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

Remark 2: Antenna: 3 denotes the type of antenna for above 1000MHz.



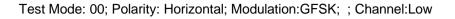
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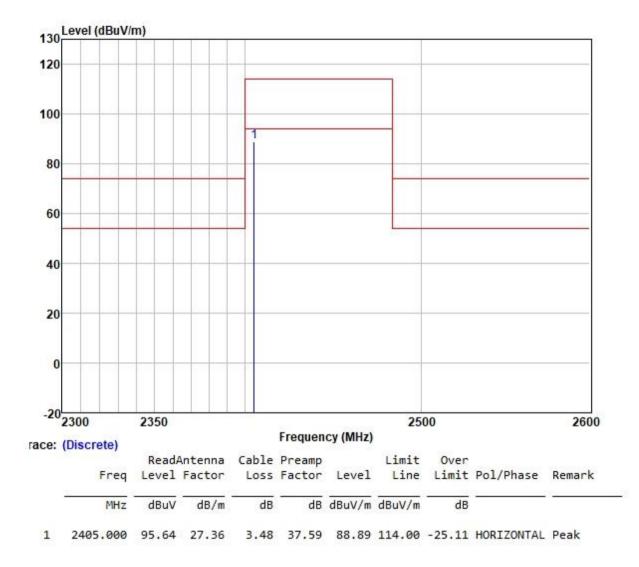
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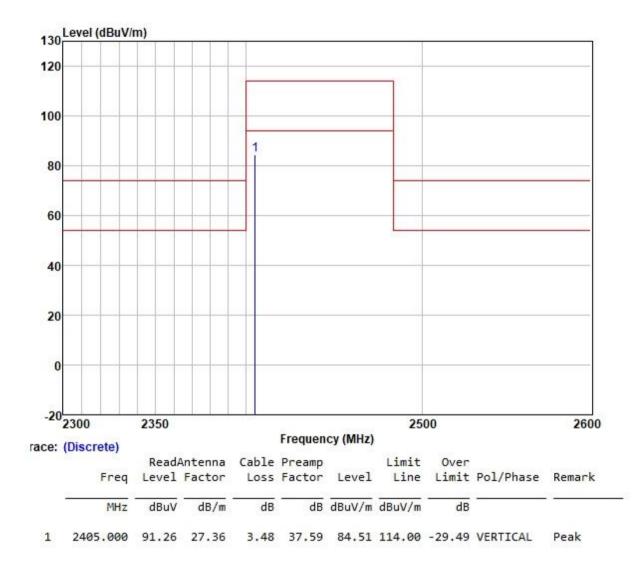
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Test Mode: 00; Polarity: Vertical; Modulation:GFSK; ; Channel:Low





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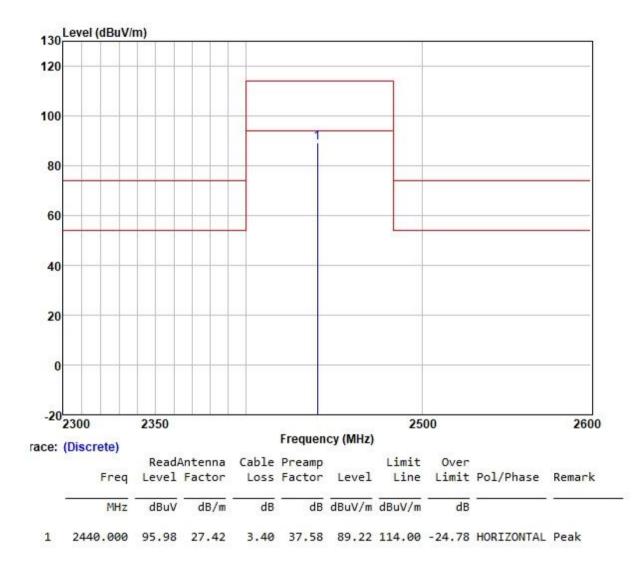
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Test Mode: 00; Polarity: Horizontal; Modulation:GFSK; ; Channel:middle





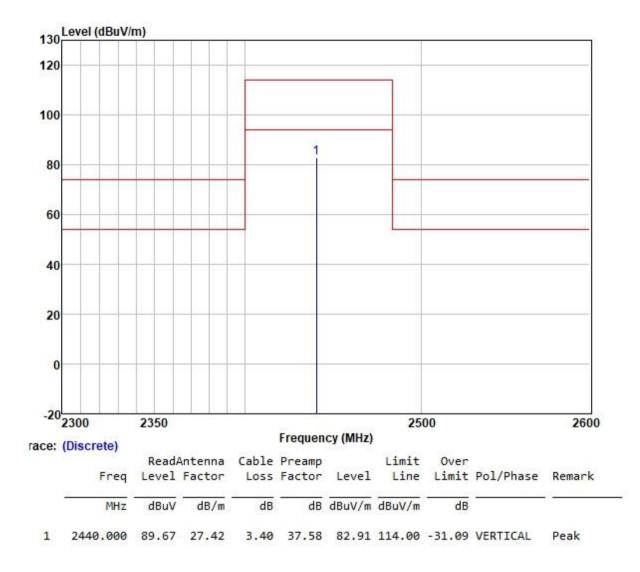
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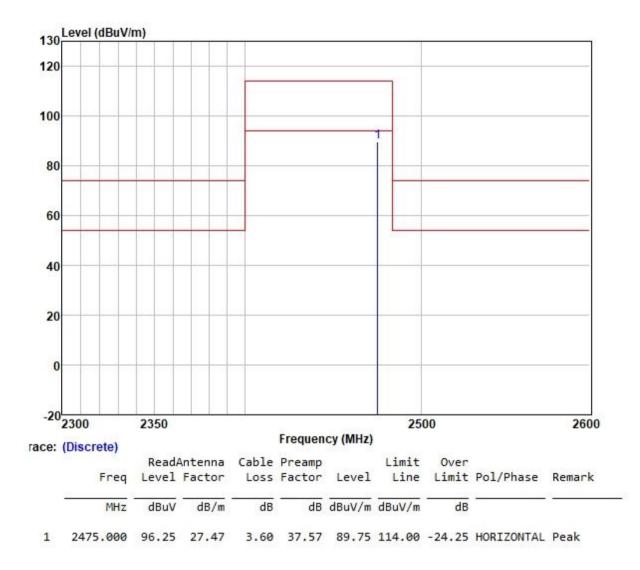
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Test Mode: 00; Polarity: Horizontal; Modulation:GFSK; ; Channel:High





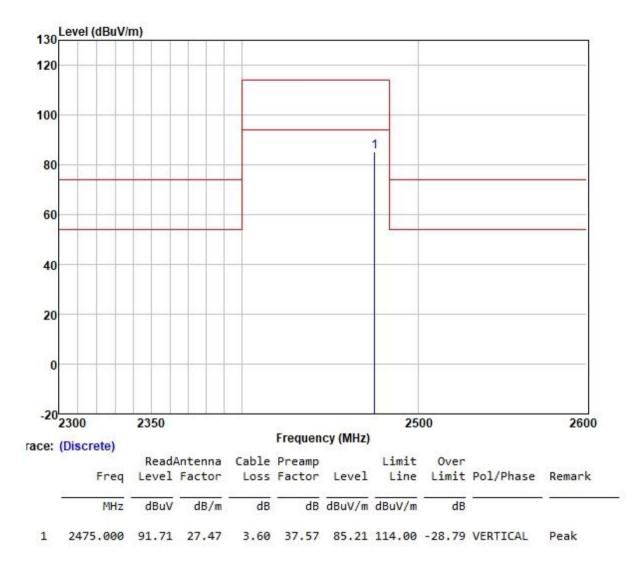
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Test Mode: 00; Polarity: Vertical; Modulation:GFSK; ; Channel:High



Remark:

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

Final Test Level = Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor

2) 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. So, only the above measurement data were shown in the report



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7.3 Restricted Band Around Fundamental Frequency

Test Requirement47 CFR Part 15, Subpart C 15.205 & 15.249(d) & 15.209Test Method:ANSI C63.10 (2013) Section 6.10.5Measurement Distance:3mLimit:Image: Control of the section of the secti

Frequency	Limit (dBuV/m @3m)	Remark		
30MHz-88MHz	40.0	Quasi-peak Value		
88MHz-216MHz	43.5	Quasi-peak Value		
216MHz-960MHz	46.0	Quasi-peak Value		
960MHz-1GHz	54.0	Quasi-peak Value		
Above 1GHz	54.0	Average Value		
Above 1GHz	74.0	Peak Value		

Emission radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

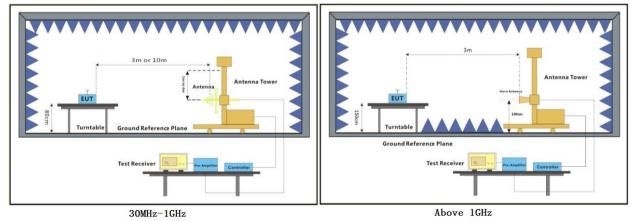
7.3.1 E.U.T. Operation

Operating Environment:									
Temperature:	25.3 °C	Humidity:	53.5 % RH	Atmospheric Pressure:	1010	mbar			

7.3.2 Test Mode Description

Pre-scan / Final test		Description
Final test	00	TX mode_Keep the EUT in transmitting with modulation mode.

7.3.3 Test Setup Diagram





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7.3.4 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 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

Remark 2: Antenna: 3 denotes the type of antenna for above 1000MHz.



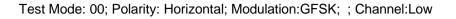
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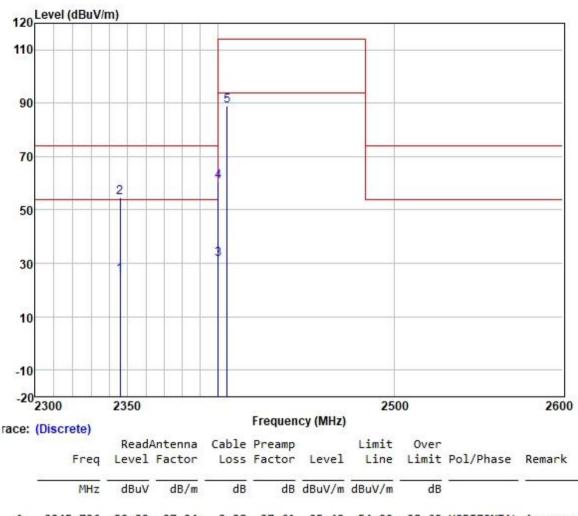
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1	2345.736	32.39	27.24	3.38	37.61	25.40	54.00	-28.60	HORIZONTAL	Average
2	2345.736	61.55	27.24	3.38	37.61	54.56	74.00	-19.44	HORIZONTAL	Peak
3	2400.000	38.35	27.35	3.50	37.59	31.61	54.00	-22.39	HORIZONTAL	Average
4	2400.000	67.51	27.35	3.50	37.59	60.77	74.00	-13.23	HORIZONTAL	Peak
5	2404.961	95.73	27.36	3.48	37.59	88.98	114.00	-25.02	HORIZONTAL	Peak



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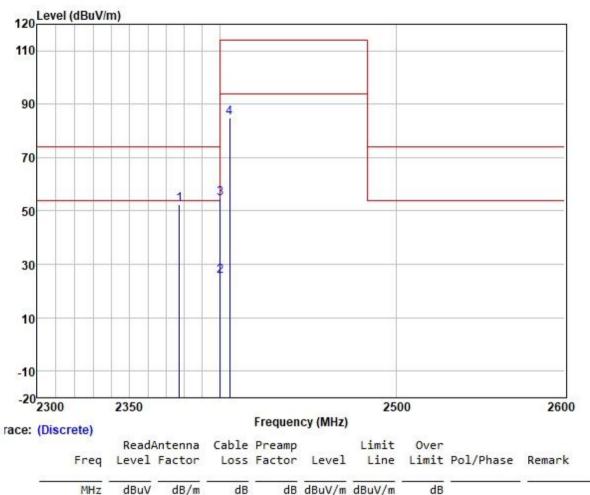
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Test Mode: 00; Polarity: Vertical; Modulation:GFSK; ; Channel:Low



	0.000	10000000		1077603	0.0025			1767		
1	2377.264	59.14	27.31	3.46	37.60	52.31	74.00	-21.69	VERTICAL	Peak
2	2400.000	32.33	27.35	3.50	37.59	25.59	54.00	-28.41	VERTICAL	Average
3	2400.000	61.49	27.35	3.50	37.59	54.75	74.00	-19.25	VERTICAL	Peak
4	2405.185	91.53	27.36	3.48	37.59	84.78	114.00	-29.22	VERTICAL	Peak



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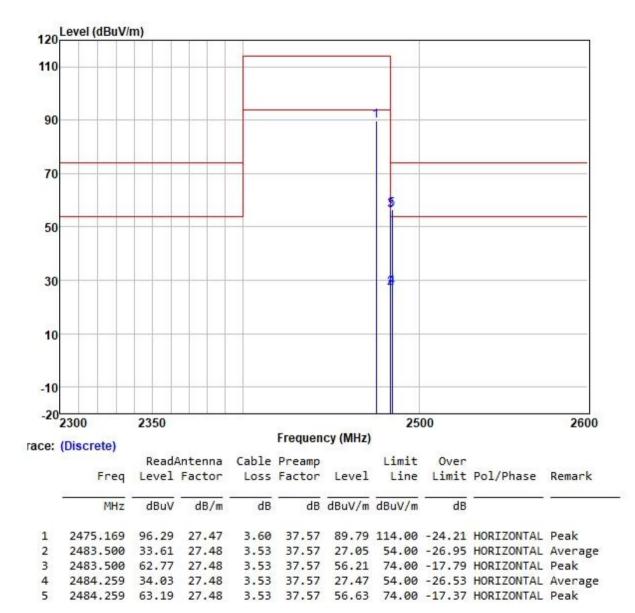
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Test Mode: 00; Polarity: Horizontal; Modulation:GFSK; ; Channel:High





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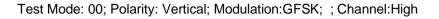
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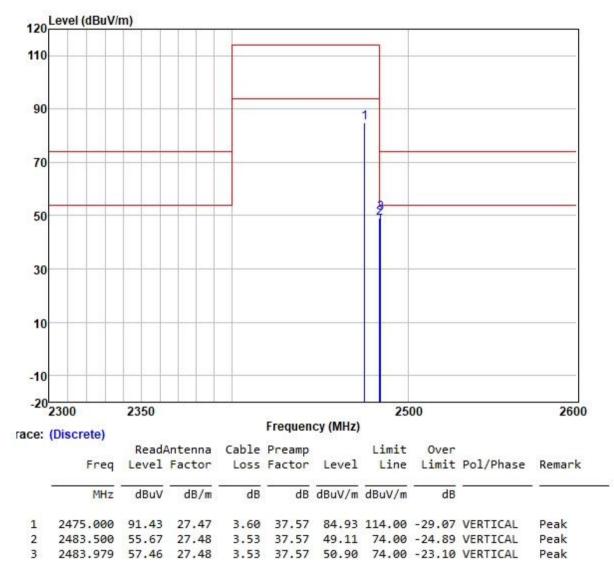
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Remark:

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

Final Test Level =Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor

2) 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. So, only the above measurement data were shown in the report



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7.4 Radiated Emissions

Test Requirement 47 CFR Part 15, Subpart C 15.209 & 15.249 (a),(d) Test Method: ANSI C63.10 (2013) Section 6.4&6.5&6.6 Measurement Distance: 3m Limit:

Frequency(MHz)	Field strength (microvolts/meter)	Limit (dBuV/m)	Detector	Measurement Distance (meters)
0.009-0.490	2400/F(kHz)	-	-	300
0.490-1.705	24000/F(kHz)	-	-	30
1.705-30	30	-	-	30
30-88	100	40.0	QP	3
88-216	150	43.5	QP	3
216-960	200	46.0	QP	3
960-1000	500	54.0	QP	3
Above 1000	500	54.0	AV	3

7.4.1 E.U.T. Operation

Operating Environment:								
Temperature:	25.3 °C	Humidity:	53.5 % RH		Atmospheric Pressure:	1010	mbar	

7.4.2 Test Mode Description

Pre-scan / Final test		Description
Final test	00	TX mode_Keep the EUT in transmitting with modulation mode.



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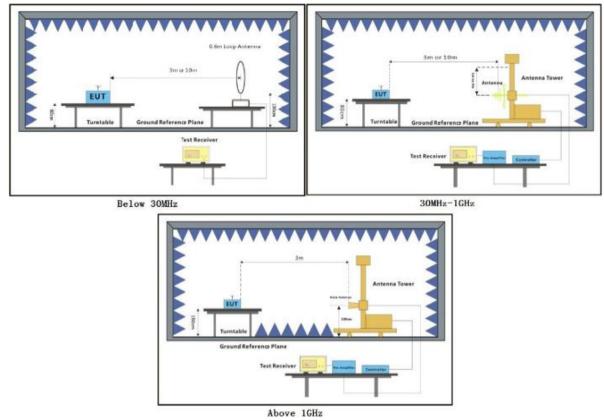
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7.4.4 Measurement Procedure and Data

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) For emission below 1GHz, through pre-scan found the worst case is the lowest channel. Only the worst case is recorded in the report.

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

Final Test Level = Receiver Reading + Antenna Factor + Cable Factor - Preamplifier Factor

3) Scan from 9kHz to 25GHz, 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) 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.



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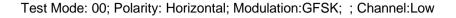
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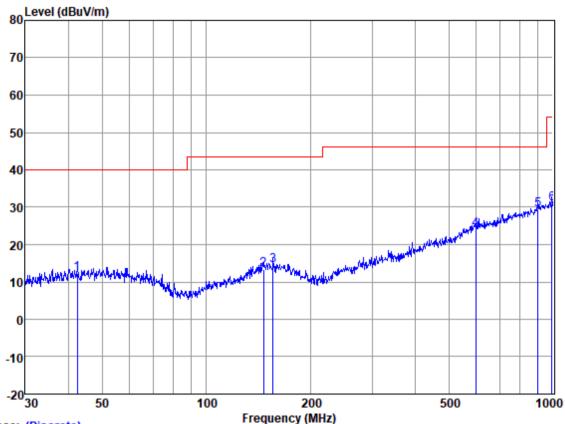


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EMC-TRF-01 Rev 1.0

Below 1GHz





Trace: (Discrete)

Site	:	SGS
Job	:	
Model	:	
Power	:	
Test Mode	:	

	Freq					Measured Level				Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	42.45	24.66	13.72	1.11	27.17	12.32	40.00	-27.68	HORIZONTAL	QP
2	145.86	24.25	13.70	2.18	26.86	13.27	43.50	-30.23	HORIZONTAL	QP
3	155.36	25.30	13.72	2.30	26.81	14.51	43.50	-28.99	HORIZONTAL	QP
4	597.22	27.16	19.80	5.14	28.21	23.89	46.00	-22.11	HORIZONTAL	QP
5	903.31	26.89	23.33	6.92	27.84	29.30	46.00	-16.70	HORIZONTAL	QP
6	993.01	26.91	24.23	7.37	27.67	30.84	54.00	-23.16	HORIZONTAL	QP



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80 Level (dBuV/m) 70 60 50 40 30 The last of the state of the st 20 harred the law an an the and the se 10 0 -10 -20 30 50 100 200 500 1000 Frequency (MHz)

Test Mode: 00; Polarity: Vertical; Modulation:GFSK; ; Channel:Low

Trace: (Discrete)

Site	:	SGS
Job	:	
Model	:	
Power	:	
Test Mode	:	

	Freq					Measured Level				Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	53.51	25.88	13.84	1.17	27.17	13.72	40.00	-26.28	VERTICAL	QP
2	145.35	24.83	13.68	2.18	26.86	13.83	43.50	-29.67	VERTICAL	QP
3	154.82	25.40	13.75	2.28	26.81	14.62	43.50	-28.88	VERTICAL	QP
4	584.79	27.44	19.30	5.06	28.19	23.61	46.00	-22.39	VERTICAL	QP
5	929.01	25.73	23.80	7.06	27.80	28.79	46.00	-17.21	VERTICAL	QP
6	993.01	25.38	24.23	7.37	27.67	29.31	54.00	-24.69	VERTICAL	QP



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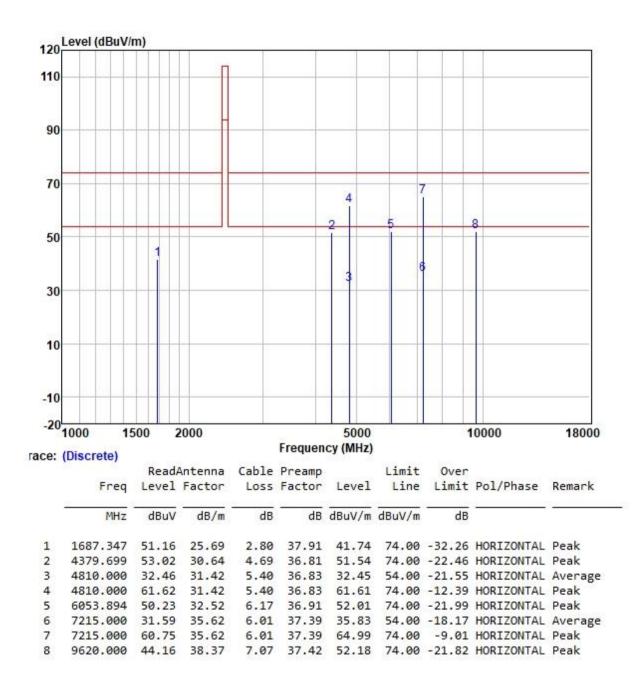
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Above 1GHz

Test Mode: 00; Polarity: Horizontal; Modulation:GFSK; ; Channel:Low





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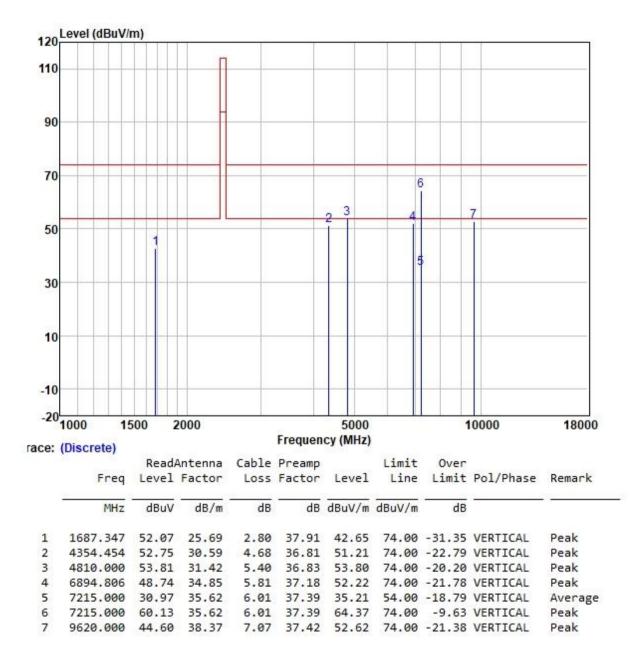
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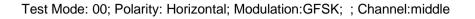
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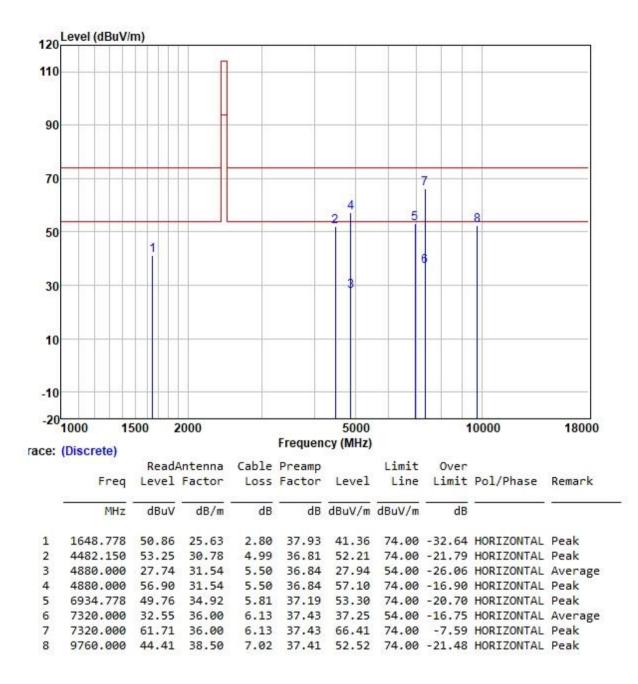
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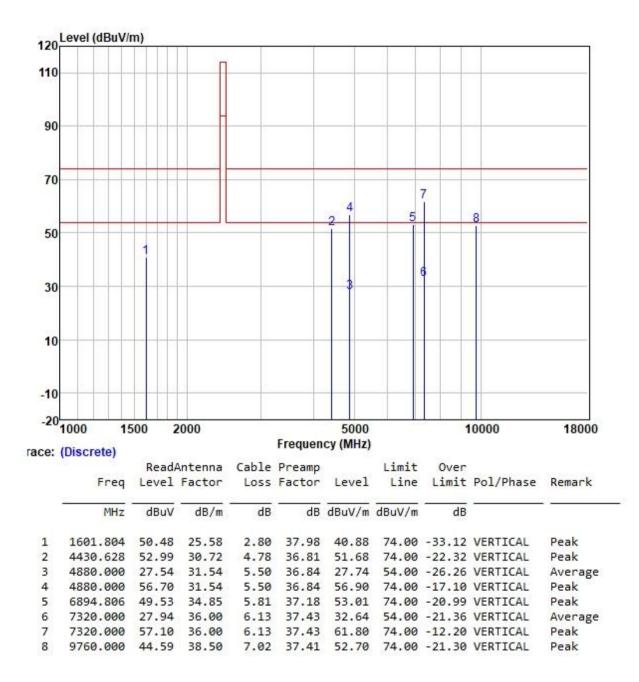
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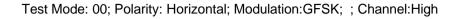
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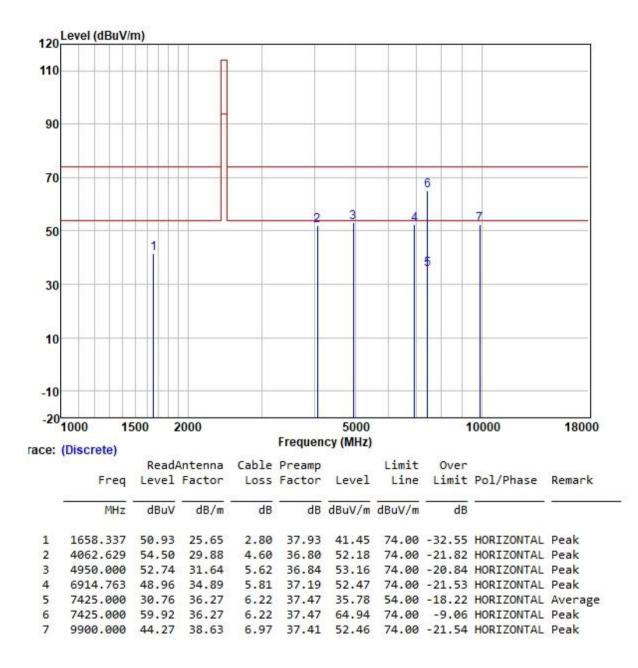
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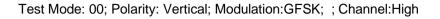
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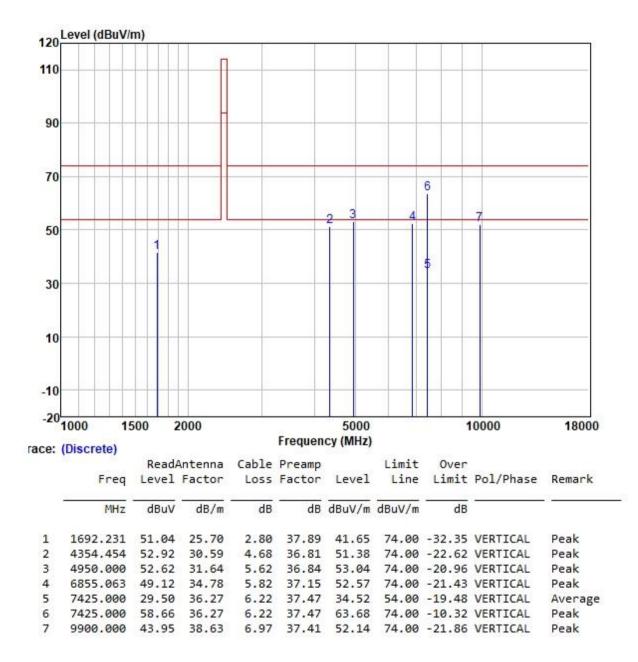
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Test Setup Photo 8

Refer to Appendix - Test Setup Photos for GZCR2201000102AT

EUT Constructional Details (EUT Photos) 9

Refer to Appendix - External and Internal Photos for GZCR2201000102AT

- End of the Report -



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