

Report No.: GZCR220400045401 Page: 1 of 18 FCC ID: 2A8OW-MIRCU

TEST REPORT

Test Result:	Pass*
Date of Issue:	2022-06-22
Date of Test:	2022-04-24 to 2022-05-11
Date of Receipt:	2022-04-20
Standard(s) :	47 CFR Part 15, Subpart B
Trade Mark:	Comba
*	Please refer to section 2 of this report which indicates which model was actually tested and which were electrically identical.
Model No.:	MIRCU-S24, MIRCU-S22 🔹
EUT Name:	Multi Internal Remote Control Unit
Equipment Under Test (EUT):
Address of Factory:	No. 6 Jinbi Road, Economics and Technology Development District, Guangzhou, Guangdong, P.R. China
Factory:	Comba Telecom Technology (Guangzhou) Ltd.
Address of Manufacturer:	No. 6 Jinbi Road, Economics and Technology Development District, Guangzhou, Guangdong, P.R. China
Manufacturer:	Comba Telecom Technology (Guangzhou) Ltd.
Address of Applicant:	No.10 Shenzhou Road Guangzhou Science City, Guangzhou, Guangdong, China
Applicant:	Comba Telecom Ltd.
Application No.:	GZCR2204000454AT

* 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 Report No. Date Remark						
01	GZCR220400045401	2022-06-22	Original			

Authorized for issue by:		
	City knong	
	Lily Kuang/Project Engineer	
	vius cui	
	Vico Cui/Reviewer	



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2 **Test Summary**

Emission Part				
ltem	Standard	Method	Requirement	Result
Conducted Emissions at Mains Terminals (150kHz-30MHz)		ANSI C63.4:2014	15.107(a); Class B	Pass
Radiated Emissions (30MHz-1GHz)	47 CFR Part 15, Subpart B	ANSI C63.4:2014	15.109(a); Class B	Pass
Radiated Emissions (Above 1GHz)		ANSI C63.4:2014	15.109(g); Class B	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.: MIRCU-S24, MIRCU-S22

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 model designation, appearance and connector.

Therefore only one model MIRCU-S24 was tested in this report.



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4 **General Information**

Details of E.U.T. 4.1

Power supply:	DC 10-30V
Cable(s):	AC 120V, 60Hz powered by DC power supply refer to section 4.2 with output DC 24V (the worst case during the pretesting from DC 10-30V)
Max Internal Source:	120 MHz
Cable:	About 3m×8wires unshielded cable supplied by client for supporting test.

4.2 Description of Support Units

Description	Manufacturer	Model No.	SN/Certificate NO
Mouse	DELL	MOC5UO	G1B02ZP5
Mouse	DELL	M-WDEL1	OT0943
NoteBook	Apple	A1370	C02GR7BPDJYD
DC Power supply(EMC 0008)	Instek	PS-6010	L9905E037.11

4.3 Measurement Uncertainty

Test Item	Measurement Uncertainty
Conducted Emissions at Mains Terminals (150kHz- 30MHz)	2.76dB (150kHz to 30MHz)
Radiated Emissions (30MHz-1GHz)	5.00dB (30MHz-1GHz):3m; 4.38dB (30MHz-1GHz):10m
Radiated Emissions (Above 1GHz)	5.12dB (1GHz-6GHz)

Remark:

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.

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 82155555 Fax: +86 20 82075059

No tests were sub-contracted.



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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 Concred Requirements) for the Competence of Testing Laboratories

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.

4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None



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Equipment List 5

Conducted Emissions at Mains Terminals (150kHz-30MHz)						
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date	
Coaxial Cable	HangTianXing	2m	EMC0107	2020-09-09	2022-09-08	
Shielding Room	ChangZhou ZhongYu	8m x 3m x 3.8m	EMC0306	2019-10-20	2022-10-19	
Two-Line V-Network-GZ	Rohde & Schwarz	ENV216	EMC2135	2021-09-24	2022-09-23	
EMI Test Receiver (9kHz-3.6GHz)	Rohde & Schwarz	ESR3	EMC2221	2022-05-20	2023-05-19	
Test Software E3r	Audix	Ver.6.11812	GZE100-77	N/A	N/A	

Radiated Emissions (30MHz-1GHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
10m Semi-Anechoic Chamber	ETS	N/A	EMC0530	2019-10-20	2022-10-19
Chamber cable	HangTianXing	N/A	EMC0542	2020-09-09	2022-09-08
Amplifier (9kHz-1.3GHz)	HP	8447F	EMC2065	2022-05-16	2023-05-15
EMI Test Receiver (1Hz- 8GHz)	Rohde & Schwarz	ESW8	EMC2220	2022-05-20	2023-05-19
Test Software E3	Audix	Ver.6.120110a	GZE100-61	N/A	N/A
Trilog Broadband Antenna (25MHz-1GHz)	SCHWARZBECK MESS-ELEKTRONIK	VULB 9168	SEM003-18	2022-03-03	2025-03-02

Radiated Emissions (Above 1GHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
1GHz-26.5 GHz Pre- Amplifier	Agilent	8449B	EMC0521	2021-12-17	2022-12-16
EMI Test Receiver (10Hz-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
966 Anechoic Chamber	C.R.T	9m x 6m x 6m	EMC2142	2020-12-20	2023-12-19
Test Software E3	Audix	Ver.6.120110a	GZE100-61	N/A	N/A

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



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6 Emission Test Results

6.1 Conducted Emissions at Mains Terminals (150kHz-30MHz)

Test Requirement:	47 CFR Part 15, Subpart B
Test Method:	ANSI C63.4:2014
Limit:	
0.15MHz-0.5MHz:	66dB(μ V)-56dB(μ V) quasi-peak, 56dB(μ V)-46dB(μ V) average
0.5MHz-5MHz:	56dB(μV) quasi-peak, 46dB(μV) average
5MHz-30MHz:	60dB(μV) quasi-peak, 50dB(μV) average
Detector:	Peak for pre-scan (9kHz resolution bandwidth) 0.15M to 30MHz

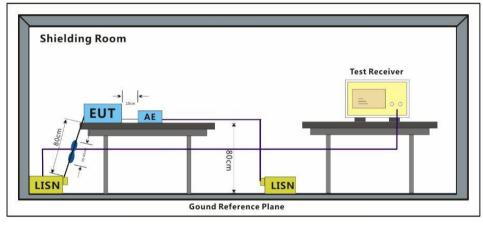
6.1.1 E.U.T. Operation

Operating Environment:							
Temperature:	23.6 °C	Humidity:	53.4 % RH	Atmospheric Pressure:	1020	mbar	

6.1.2 Test Mode Description

Pre-scan / Final test		Description
Final test	00	Normal working with AC

6.1.3 Test Setup Diagram



6.1.4 Measurement Procedure and Data

An initial pre-scan was performed with peak detector. Quasi-Peak or Average measurement were performed at the frequencies with maximized peak emission were detected.

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



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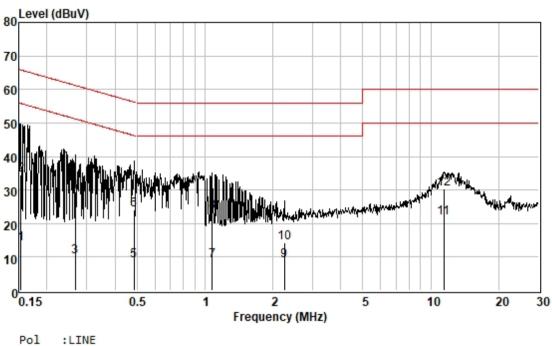
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Test Mode: 00; Line: Live line



Mode : Model :

	age
	age
1 0.153 4.36 0.06 9.54 13.96 55.82 -41.86 Aver	
2 0.153 24.92 0.06 9.54 34.52 65.82 -31.30 QP	
3 0.267 0.52 0.06 9.57 10.15 51.20 -41.05 Aver	age
4 0.267 19.69 0.06 9.57 29.32 61.20 -31.88 QP	
5 0.486 -0.69 0.07 9.59 8.97 46.23 -37.26 Aver	age
6 0.486 14.38 0.07 9.59 24.04 56.23 -32.19 QP	
7 1.077 -0.78 0.08 9.60 8.90 46.00 -37.10 Aver	age
8 1.077 13.95 0.08 9.60 23.63 56.00 -32.37 QP	
9 2.249 -0.91 0.13 9.60 8.82 46.00 -37.18 Aver	age
10 2.249 4.67 0.13 9.60 14.40 56.00 -41.60 QP	
11 11.438 11.59 0.26 9.79 21.64 50.00 -28.36 Aver	age
12 11.438 20.22 0.26 9.79 30.27 60.00 -29.73 QP	



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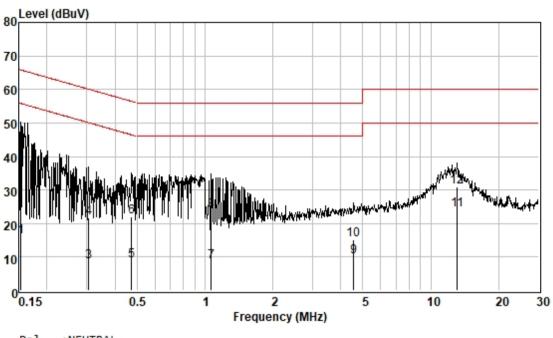
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Test Mode: 00; Line: Neutral Line



Pol :NEUTRAL Mode : Model :

	Frequenc MHz	Read Level dBuV	Cable Loss dB	LISN Factor dB	Measured Level dBuV	Limit Line dBuV	Over Limit dB	Remark
1	0.153	6.38	0.06	9.53	15.97	55.82	-39.85	Average
2	0.153	32.27	0.06	9.53	41.86	65.82	-23.96	QP
3	0.307	-1.02	0.06	9.57	8.61	50.06	-41.45	Average
4	0.307	12.20	0.06	9.57	21.83	60.06	-38.23	QP -
5	0.474	-0.74	0.07	9.58	8.91	46.45	-37.54	Average
6	0.474	12.45	0.07	9.58	22.10	56.45	-34.35	QP
7	1.065	-0.90	0.07	9.59	8.76	46.00	-37.24	Average
8	1.065	14.14	0.07	9.59	23.80	56.00	-32.20	QP
9	4.549	0.30	0.18	9.65	10.13	46.00	-35.87	Average
10	4.549	5.33	0.18	9.65	15.16	56.00	-40.84	QP
11	13.057	13.95	0.28	9.83	24.06	50.00	-25.94	Average
12	13.057	20.75	0.28	9.83	30.86	60.00	-29.14	QP



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6.2 Radiated Emissions (30MHz-1GHz)

Test Requirement:	47 CFR Part 15, Subpart B
Test Method:	ANSI C63.4:2014
Limit:	
	Class B
Test Distance:	10m
30MHz -88MHz	29.5(dBµV/m) quasi-peak
88MHz-216MHz	33.1(dBµV/m) quasi-peak
216MHz-960MHz	35.6(dBµV/m) quasi-peak
960MHz-1000MHz	43.5(dBµV/m) quasi-peak
Detector:	Peak for pre-scan (120kHz resolution bandwidth) 30MHz to1000MHz

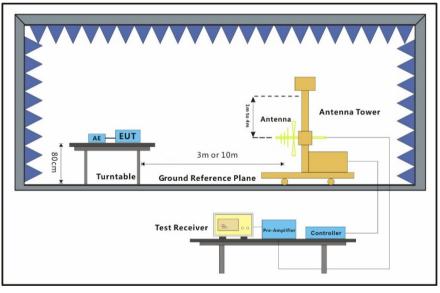
6.2.1 E.U.T. Operation

Operating Environment:							
Temperature:	24.5 °C	Humidity:	52	% RH	Atmospheric Pressure: 1020	mbar	

6.2.2 Test Mode Description

Pre-scan / Final test		Description
Final test	00	Normal working with AC

6.2.3 Test Setup Diagram



6.2.4 Measurement Procedure and Data

An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by BiConiLog antenna with 2 orthogonal polarities.

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



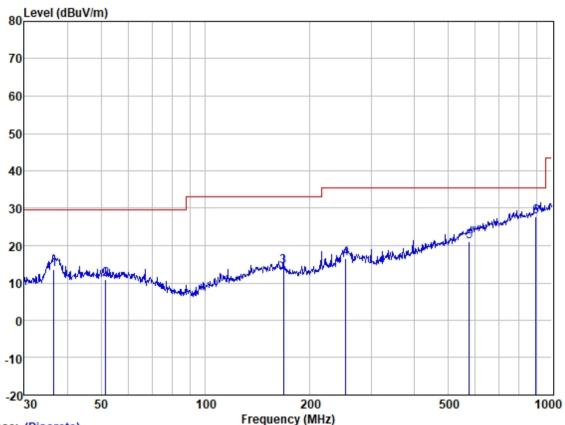
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Test Mode: 00; Polarity: Horizontal



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	36.509	26.94	12.68	1.08	27.18	13.52	29.50	-15.98	HORIZONTAL	QP
2	51.481	23.45	13.59	1.16	27.17	11.03	29.50	-18.47	HORIZONTAL	QP
3	167.824	25.88	12.87	2.38	26.78	14.35	33.10	-18.75	HORIZONTAL	QP
4	253.837	28.60	11.64	2.94	26.61	16.57	35.60	-19.03	HORIZONTAL	QP
5	576.644	25.28	19.08	5.02	28.18	21.20	35.60	-14.40	HORIZONTAL	QP
6	896.997	25.46	23.25	6.92	27.85	27.78	35.60	-7.82	HORIZONTAL	QP



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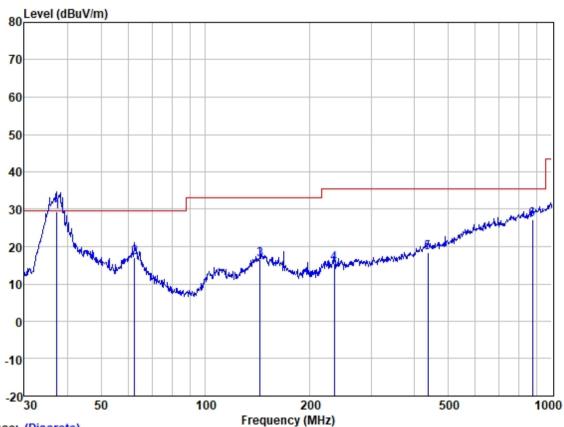
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Test Mode: 00; Polarity: Vertical



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	37.286	42.70	12.76	1.08	27.18	29.36	29.50	-0.14	VERTICAL	QP
2	62.431	30.24	12.56	1.30	27.15	16.95	29.50	-12.55	VERTICAL	QP
3	143.830	28.05	13.10	2.15	26.88	16.42	33.10	-16.68	VERTICAL	QP
4	234.991	28.43	10.94	2.76	26.67	15.46	35.60	-20.14	VERTICAL	QP
5	438.655	25.32	16.55	4.13	27.56	18.44	35.60	-17.16	VERTICAL	QP
6	878.322	25.41	22.80	6.79	27.88	27.12	35.60	-8.48	VERTICAL	QP



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6.3 Radiated Emissions (Above 1GHz)

Test Requirement:	47 CFR Part 15, Subpart B
Test Method:	ANSI C63.4:2014
Limit:	
	Class B
Above 1GHz	74(dBµV/m) peak, 54(dBµV/m) average
Detector:	Peak for pre-scan (1000kHz resolution bandwidth) 1000M to18000MHz

6.3.1 E.U.T. Operation

Operating Environment:

Temperature: 23.3 °C

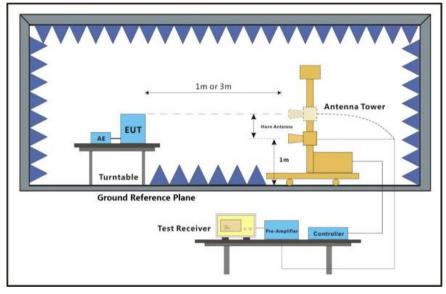
Humidity: 61.6 % RH

Atmospheric Pressure: 1005 mbar

6.3.2 Test Mode Description

Pre-scan /ModeFinal testCodeFinal test00Normal working with AC

6.3.3 Test Setup Diagram



6.3.4 Measurement Procedure and Data

An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Average measurements were conducted based on the peak sweep graph. The EUT was measured by Horn antenna with 2 orthogonal polarities.

The red line show in graphic is the limit in standard used in this section.

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



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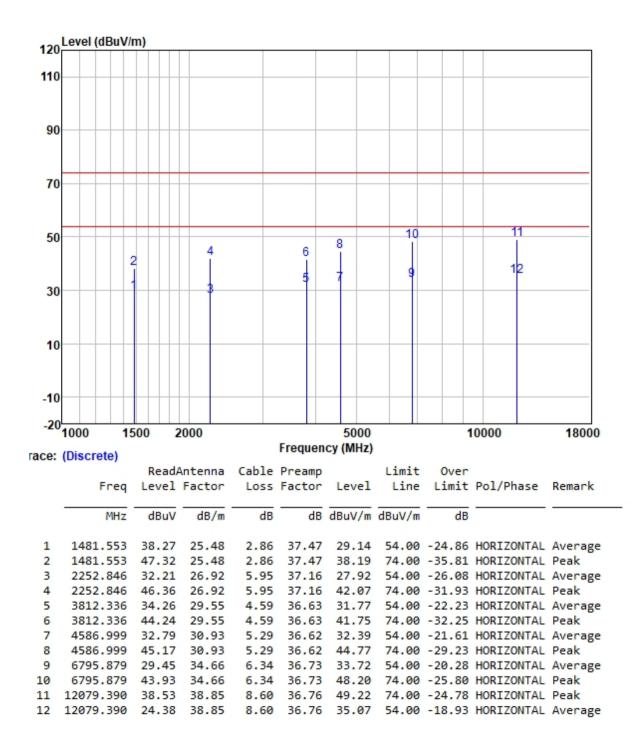
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Test Mode: 00; Polarity: Horizontal



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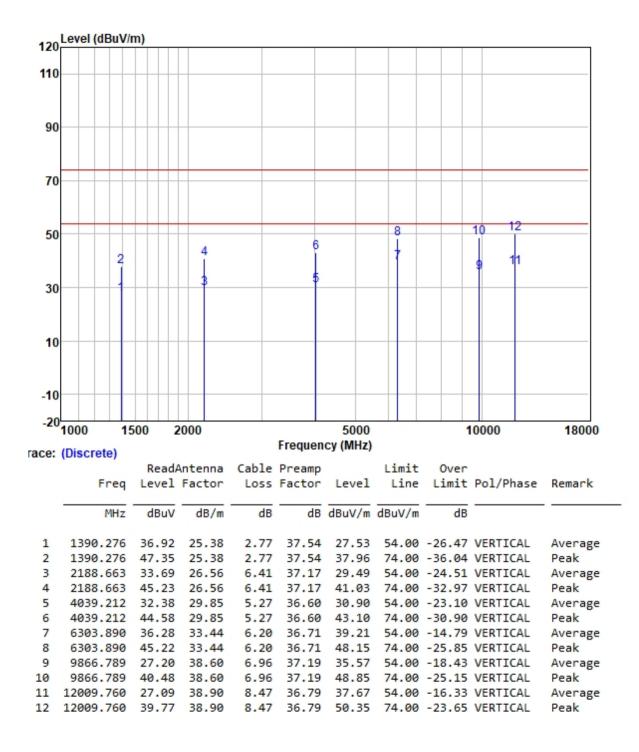
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Test Mode: 00; Polarity: Vertical



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Test Setup Photo 7

Refer to Appendix - Test Setup Photos for GZCR220400045401



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EUT Constructional Details (EUT Photos) 8

Refer to Appendix - External and Internal Photos for GZCR2204000454AT

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