

Report No.: GZCR210302001001 Page: 1 of 18 FCC ID: PX8MIRCU-S24

TEST REPORT

Application No.:	GZCR2103020010AT				
Applicant:	Comba Telecom Ltd.				
Address of Applicant:	611 East Wing, No.8 Science Park West Avenue, Hong Kong Science Park, Tai Po, Hong Kong				
Manufacturer:	Comba Telecom Systems(China) Ltd.				
Address of Manufacturer:	No.10 Shenzhou Road, Guangzhou Science City, Guangzhou 510663, Guangdong, P.R. China				
Factory:	Comba Telecom Technology(Guangzhou) Ltd.				
Address of Factory:	No. 6, Jinbi Road, Economics and Technology Development District, Guangzhou, Guangdong, P.R. China				
Equipment Under Test (EUT):				
EUT Name:	Multi internal Remote Control Unit				
Model No.:	MIRCU-S24/ MIRCU-S22 ¤				
¤	Please refer to section 2 of this report which indicates which model was actually tested and which were electrically identical.				
Trade mark:	Comba				
Standard(s) :	47 CFR Part 15, Subpart B				
Date of Receipt:	2021-03-15				
Date of Test:	2021-03-19 to 2021-03-25				
Date of Issue:	2021-04-28				
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	Version Chapter Date Modifier Remark							
01		2021-04-28		Original				

Authorized for issue by		
Tested By	City knong	
	Lily Kuang/Project Engineer	·
Reviewed By	Riday Lin	
	Ricky Liu /Reviewer	



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Test Summary 2

Emission Part				
Item	Standard	Method	Requirement	Result
Conducted Emissions at Mains Terminals (150kHz-30MHz)	47 CFR Part 15, Subpart B	ANSI C63.4:2014	Class B	Pass
Radiated Emissions (30MHz-1GHz)	47 CFR Part 15, Subpart B	ANSI C63.4:2014	Class B	Pass
Radiated Emissions (above 1GHz)	47 CFR Part 15, Subpart B	ANSI C63.4:2014	Class B	Pass

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

¤ 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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General Information 4

4.1 Details of E.U.T.

Power Supply:	DC 10-30V
Test Voltage:	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)	3.12dB
	5.06dB (3m)
Radiated Emissions (30MHz-1GHz)	4.46dB (10m)
Dedicted Emissions (shows 1047)	5.08dB (1GHz-6GHz)
Radiated Emissions (above 1GHz)	5.14dB (6GHz-18GHz)

Remark:

The U_{lab} (lab Uncertainty) is less than U_{cispr} (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.

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.

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

Conducted Emissions at Mains Terminals (150kHz-30MHz)						
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date	
EMI Test Receiver	Rohde & Schwarz	ESCS30	EMC0506	2020-11-13	2021-11-12	
Shielding Room	ChangZhou ZhongYu	8m x 3m x 3.8m	EMC0306	N/A	N/A	
LISN	Rohde & Schwarz	ENV216	EMC2135	2020-09-25	2021-09-24	
Coaxial Cable	HangTianXing	2m	EMC0107	2020-09-09	2022-09-08	
Test Software E3c	Audix	Ver. 5.4.1221b	GZE100-62	N/A	N/A	

Radiated Emissions (30MHz-1GHz)						
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date	
EMI Test Receiver	Rohde & Schwarz	ESIB26	EMC0522	2021-01-08	2022-01-07	
Chamber cable	HangTianXing	N/A	EMC0542	2019-06-28	2021-06-27	
Trilog Broadband Antenna 30MHz-1GHz	SCHWARZBECK MESS-ELEKTRONIK	VULB 9168	SEM003-18	2019-02-22	2022-02-22	
Amplifier	HP	8447F	EMC2065	2020-05-26	2021-05-25	
High Pass Filter (915MHz)	FSY MICROWAVE	HM1465-9SS	EMC2079	2021-01-08	2022-01-07	
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	

Radiated Emissions (above 1GHz)						
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date	
EMI Test Receiver	Rohde & Schwarz	ESIB26	EMC0522	2021-01-08	2022-01-07	
Chamber cable	HangTianXing	N/A	EMC0542	2019-06-28	2021-06-27	
Horn Antenna	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120D	EMC2016	2019-09-25	2022-09-24	
1GHz-26.5 GHz Pre-Amplifier	Agilent	8449B	EMC0521	2021-01-08	2022-01-07	
High Pass Filter (915MHz)	FSY MICROWAVE	HM1465-9SS	EMC2079	2021-01-08	2022-01-07	
2.4GHz Filter	Micro-Tronics	BRM 50702	EMC2069	2021-01-08	2022-01-07	
966 Anechoic Chamber	C.R.T	9m x 6m x 6m	EMC2142	2020-12-20	2023-12-19	
MXE EMI Receiver	Keysight	N9038A	EMC2139	2020-11-13	2021-11-12	
EXA Signal Analyzer	Keysight	N9010A	EMC2138	2020-09-17	2021-09-16	
Test Software E3	Audix	Ver.6.120110a	GZE100-61	N/A	N/A	



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General used equipment						
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date	
DMM	Fluke	73	EMC0006	2020-07-09	2021-07-08	
DMM	Fluke	73	EMC0007	2020-07-09	2021-07-08	



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Emission Test Results 6

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

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

6.1.1 E.U.T. Operation

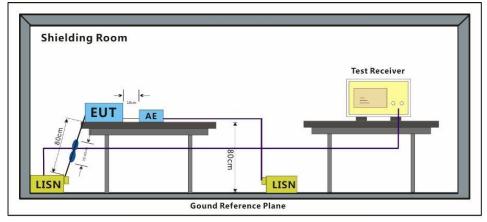
Operating Environment:

Temperature: 23 °C Humidity: 52 % RH Atmospheric Pressure: 1010 mbar

6.1.2 Test Mode Description

Pre-scan / Mode Description Final test Code Final test 01 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. Measured Level = Read level + Cable Loss + LISN Factor



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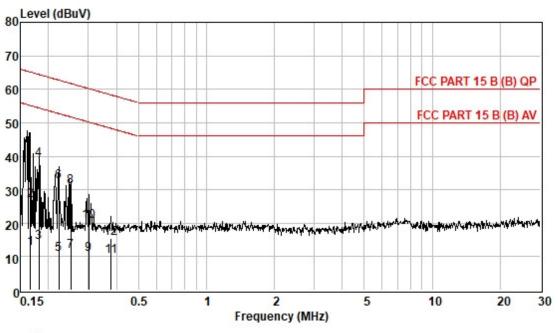
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Test Mode: 01; Line: Live line



Pol :LINE Mode :LEFT Model :

Frequenc MHz	Read Level dBuV	Cable Loss dB	LISN Factor dB	Measured Level dBuV	Limit Line dBuV	Over Limit dB	Remark
0.17	2.89	0.06	9.62	12.57	55.12	-42.55	Average
0.17	17.01	0.06	9.62	26.69	65.12	-38.43	QP
0.18	4.53	0.06	9.62	14.21	54.42	-40.21	Average
0.18	29.14	0.06	9.62	38.82	64.42	-25.60	QP -
0.22	0.99	0.06	9.63	10.68	52.74	-42.06	Average
0.22	22.75	0.06	9.63	32.44	62.74	-30.30	QP
0.25	1.96	0.06	9.62	11.64	51.73	-40.09	Average
0.25	21.23	0.06	9.62	30.91	61.73	-30.82	QP
0.30	0.92	0.06	9.62	10.60	50.19	-39.59	Average
0.30	10.90	0.06	9.62	20.58	60.19	-39.61	QP
0.38	0.52	0.06	9.63	10.21	48.30	-38.09	Average
0.38	5.70	0.06	9.63	15.39	58.30	-42.91	QP



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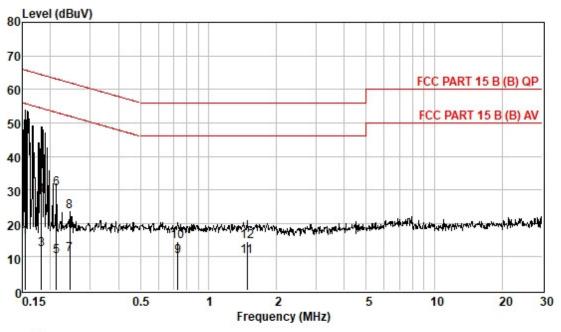
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Test Mode: 01; Line: Neutral Line



Pol :NEUTRAL Mode :LEFT Model :

Frequenc MHz	Read Level dBuV	Cable Loss dB	LISN Factor dB	Measured Level dBuV	Limit Line dBuV	Over Limit dB	Remark
0.15	6.17	0.06	9.55	15.78	55.78	-40.00	Average
0.15	17.68	0.06	9.55	27.29	65.78	-38.49	OP
0.18	2.67	0.06	9.55	12.28	54.37	-42.09	Average
0.18	18.52	0.06	9.55	28.13	64.37	-36.24	QP
0.21	0.38	0.06	9.54	9.98	53.10	-43.12	Average
0.21	20.79	0.06	9.54	30.39	63.10	-32.71	QP
0.24	1.06	0.06	9.55	10.67	52.00	-41.33	Average
0.24	13.86	0.06	9.55	23.47	62.00	-38.53	QP
0.73	0.43	0.07	9.55	10.05	46.00	-35.95	Average
0.73	5.09	0.07	9.55	14.71	56.00	-41.29	QP
1.48	0.41	0.10	9.55	10.06	46.00	-35.94	Average
1.48	5.07	0.10	9.55	14.72	56.00	-41.28	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: 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) 30M to1000MHz

6.2.1 E.U.T. Operation

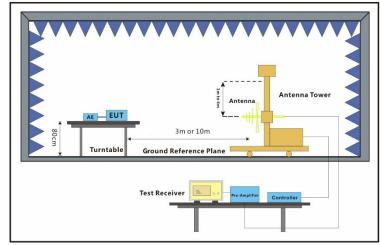
Operating Environment:

Temperature: 22 °C Humidity: 52 % RH Atmospheric Pressure: 1010 mbar

6.2.2 Test Mode Description

Pre-scan / Mode Description Final test Code Normal working with AC Final test 01

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.

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



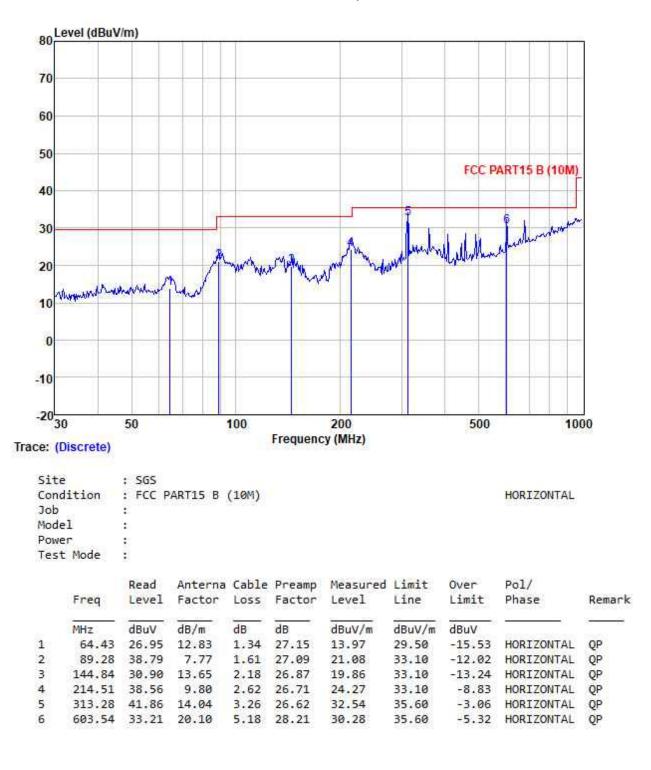
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Test Mode: 01; Polarity: Horizontal





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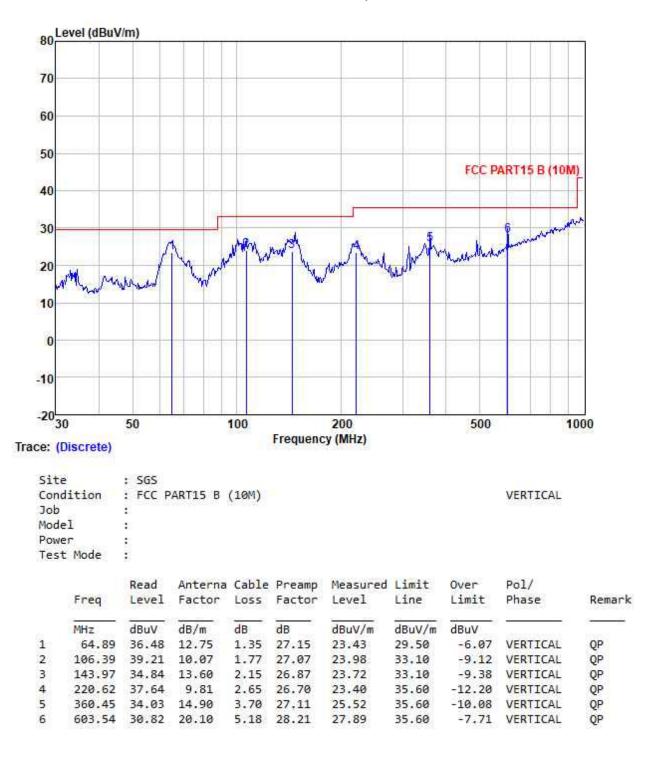
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Test Mode: 01; Polarity: Vertical





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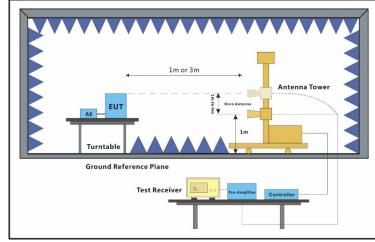


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6.3 Radiated Emissions (above 1GHz) **Test Requirement:** 47 CFR Part 15, Subpart B Test Method: ANSI C63.4:2014 Limit: Above 1GHz 74(dBµV/m) peak, 54(dBµV/m) average Peak for pre-scan (1000kHz resolution bandwidth) 1000M to18000MHz Detector: 6.3.1 E.U.T. Operation **Operating Environment:** Temperature: 23.1 °C Humidity: 60.7 % RH Atmospheric Pressure: 1010 mbar 6.3.2 Test Mode Description

Pre-scan / Mode Description Final test Code Final test 01 Normal 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. Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by BiConiLog antenna with 2 orthogonal polarities.

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



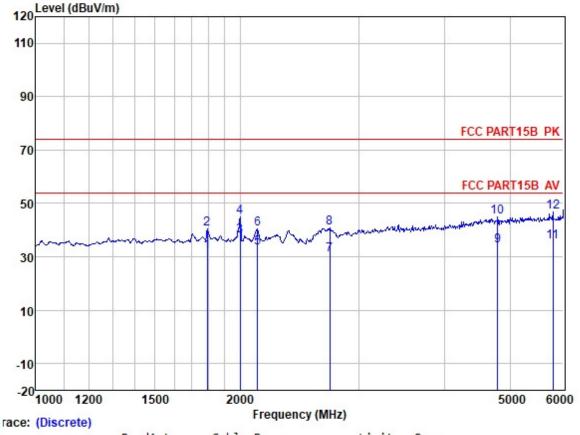
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Test Mode: 01; Polarity: Horizontal



		ReadAntenna		Cable	ble Preamp		Limit Over			
	Freq	Level	Factor	Loss	Factor	Level	Line	Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	1790.190	40.85	25.92	2.98	37.81	31.94	54.00	-22.06	HORIZONTAL	Average
2	1790.190	49.41	25.92	2.98	37.81	40.50	74.00	-33.50	HORIZONTAL	Peak
3	2000.528	46.46	26.10	3.10	37.70	37.96	54.00	-16.04	HORIZONTAL	Average
4	2000.528	53.50	26.10	3.10	37.70	45.00	74.00	-29.00	HORIZONTAL	Peak
5	2122.382	41.61	26.34	3.17	37.67	33.45	54.00	-20.55	HORIZONTAL	Average
6	2122.382	48.69	26.34	3.17	37.67	40.53	74.00	-33.47	HORIZONTAL	Peak
7	2712.878	36.60	27.87	3.61	37.46	30.62	54.00	-23.38	HORIZONTAL	Average
8	2712.878	46.73	27.87	3.61	37.46	40.75	74.00	-33.25	HORIZONTAL	Peak
9	4796.035	34.04	31.39	5.40	36.83	34.00	54.00	-20.00	HORIZONTAL	Average
10	4796.035	44.94	31.39	5.40	36.83	44.90	74.00	-29.10	HORIZONTAL	Peak
11	5788.796	34.32	32.19	6.10	36.89	35.72	54.00	-18.28	HORIZONTAL	Average
12	5788.796	45.36	32.19	6.10	36.89	46.76	74.00	-27.24	HORIZONTAL	Peak



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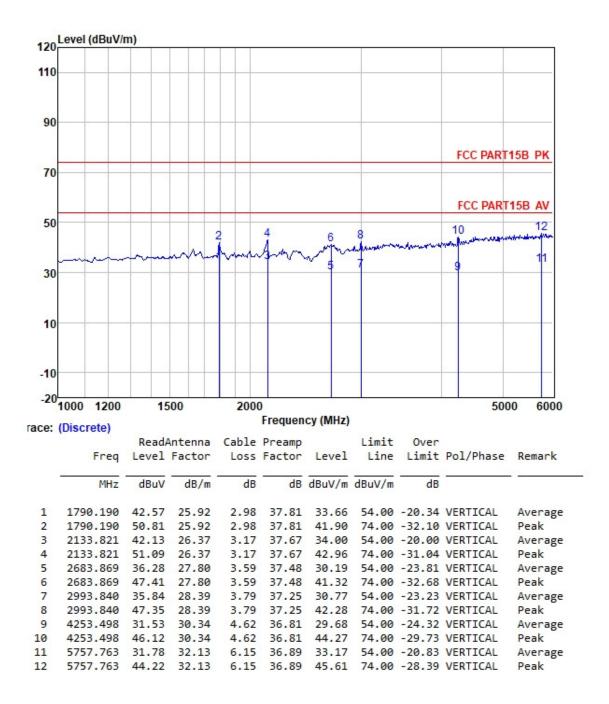
Laboratory.

Guangzho



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Test Mode: 01; Polarity: Vertical



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