



TEST REPORT

Application No.: GZEM2205002324LM
Applicant: ROYCHE Co., Ltd
Address of Applicant: F11 ParkLand B/D 601 Eunjuro Gangnam Gu, Seoul, Korea, 06109
Manufacturer: ShenZhen Wang-tech Co., Ltd
Address of Manufacturer: Room 806, Building 3A, Phase 1, Tiananyungu Industrial Park, Bantian Street, Longgang, ShenZhen, China
Factory: ShenZhen Wang-tech Co., Ltd
Address of Factory: Room 806, Building 3A, Phase 1, Tiananyungu Industrial Park, Bantian Street, Longgang, ShenZhen, China
Equipment Under Test (EUT):
EUT Name: BT21 minini dual blades Handy Fan
Model No.: BT21-RHF-4E-TT, BT21-RHF-4E-CK, BT21-RHF-4E-CM, BT21-RHF-4E-SK, BT21-RHF-4E-RJ, BT21-RHF-4E-MG, BT21-RHF-4E-KY ♣
♣ Please refer to section 2 of this report which indicates which item was actually tested and which were electrically identical.
Standard(s) : 47 CFR Part 15, Subpart B
Date of Receipt: 2022-05-09
Date of Test: 2022-05-10
Date of Issue: 2022-05-17

Test Result:	Pass*
---------------------	--------------

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

Kobe Jian

Kobe Jian
EMC Laboratory Manager

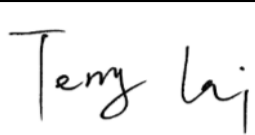


Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.
Attention: To check the authenticity of testing / inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

SGS-CSTC Standards Technical Services Co., Ltd.
Guangzhou Branch EMC Laboratory

No.198 Kezhu Road, Sciencetech Park, Guangzhou Economic & Technology Development District, Guangzhou, China 510663 t (86-20) 82155555 f (86-20) 82075058 www.sgsgroup.com.cn
中国·广州·经济技术开发区科学城科珠路198号 邮编: 510663 t (86-20) 82155555 f (86-20) 82075058 sgs.china@sgs.com

Revision Record			
Version	Report No.	Date	Remark
01	GZEM220500232401	2022-05-17	Original

Authorized for issue by:			
			
		Michael Huang/Project Engineer	
			
		Terry Lai/Reviewer	

2 Test Summary

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

Model No.: BT21-RHF-4E-TT, BT21-RHF-4E-CK, BT21-RHF-4E-CM, BT21-RHF-4E-SK, BT21-RHF-4E-RJ, BT21-RHF-4E-MG, BT21-RHF-4E-KY

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 being the color.

Only the model BT21-RHF-4E-KY was tested.

3 Contents

	Page
1 Cover Page	1
2 Test Summary	3
3 Contents.....	4
4 General Information	5
4.1 Details of E.U.T.	5
4.2 Description of Support Units.....	5
4.3 Measurement Uncertainty	5
4.4 Test Location	5
4.5 Test Facility	6
4.6 Deviation from Standards.....	6
4.7 Abnormalities from Standard Conditions	6
5 Equipment List	7
6 Emission Test Results.....	8
6.1 Conducted Emissions at Mains Terminals (150kHz-30MHz)	8
6.1.1 E.U.T. Operation	8
6.1.2 Test Mode Description	8
6.1.3 Test Setup Diagram	8
6.1.4 Measurement Procedure and Data	8
6.2 Radiated Emissions (30MHz-1GHz).....	11
6.2.1 E.U.T. Operation	11
6.2.2 Test Mode Description	11
6.2.3 Test Setup Diagram	12
6.2.4 Measurement Procedure and Data	12
7 Test Setup Photo.....	15
8 EUT Constructional Details (EUT Photos)	16



4 General Information

4.1 Details of E.U.T.

Power supply: Input: DC 5V 1A
Battery operation: DC 3.7V 7.4Wh 18650 battery
Highest operating frequency: Below 108MHz
Test Voltage: AC 120 V, 60 Hz powered by AC\DC adapter refer to section 4.2

4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
The EUT has been tested with the AC\DC adapter, supply by test lab.	/	Model: CX-4405(US), INPUT: AC 120V 60Hz, OUTPUT: DC 5V 1A	/

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

Remark:
The U_{lab} (lab Uncertainty) is less than U_{cisprr} (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, Sciencetech Park, Guangzhou Economic & Technology Development District,
Guangzhou, China 510663

Tel: +86 20 82155555 Fax: +86 20 82075059

No tests were sub-contracted.



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.
Attention: To check the authenticity of testing / inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

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.

4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None



5 Equipment List

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	2021-06-01	2022-05-31
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	2021-05-19	2022-05-18
EMI Test Receiver (1Hz-8GHz)	Rohde & Schwarz	ESW8	EMC2220	2021-05-26	2022-05-25
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

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

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(μV)-56dB(μV) quasi-peak, 56dB(μV)-46dB(μV) 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

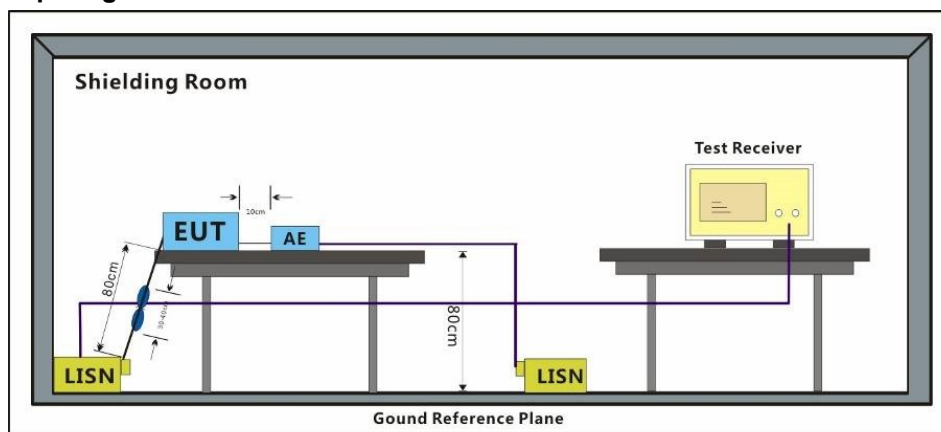
6.1.1 E.U.T. Operation

Operating Environment:					
Temperature:	22.6 °C	Humidity:	53.6 % RH	Atmospheric Pressure:	1005 mbar

6.1.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Pre-scan	00	Test the EUT in charging mode, supply power by the AC\DC adapter.
Final test	01	Test the EUT in charging mode with motor running, adjusting speed at max output power, supply power by the AC\DC adapter.
Pre-scan	02	Test the EUT in charging mode with motor running, adjusting speed at middle output power, supply power by the AC\DC adapter.
Pre-scan	03	Test the EUT in charging mode with motor running, adjusting speed at lowest output power, supply power by the AC\DC adapter.

6.1.3 Test Setup Diagram

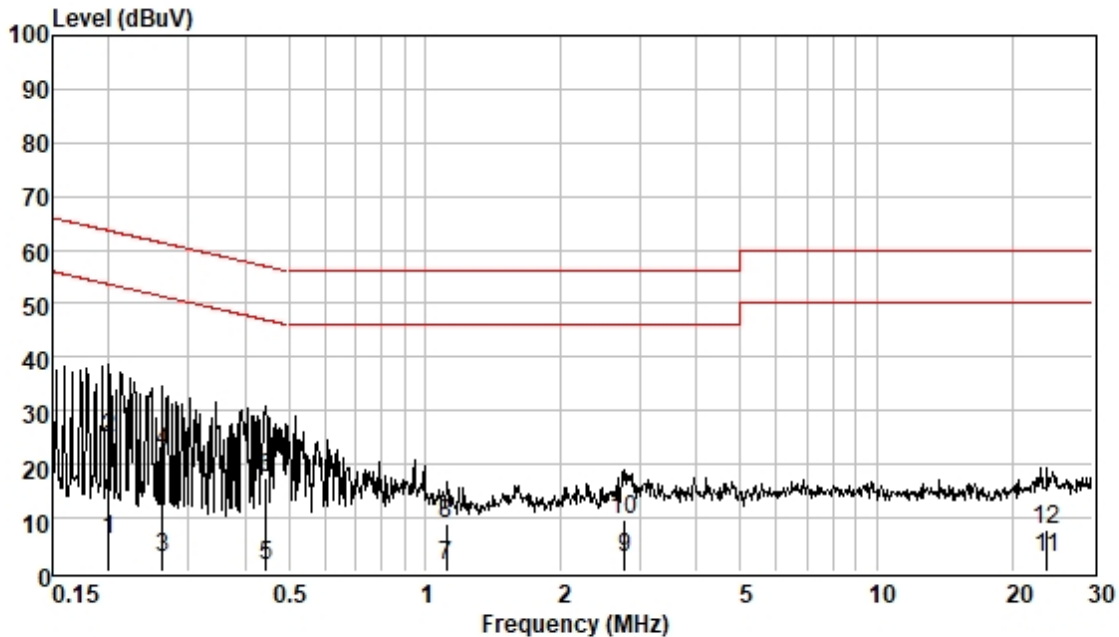


6.1.4 Measurement Procedure and Data

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.

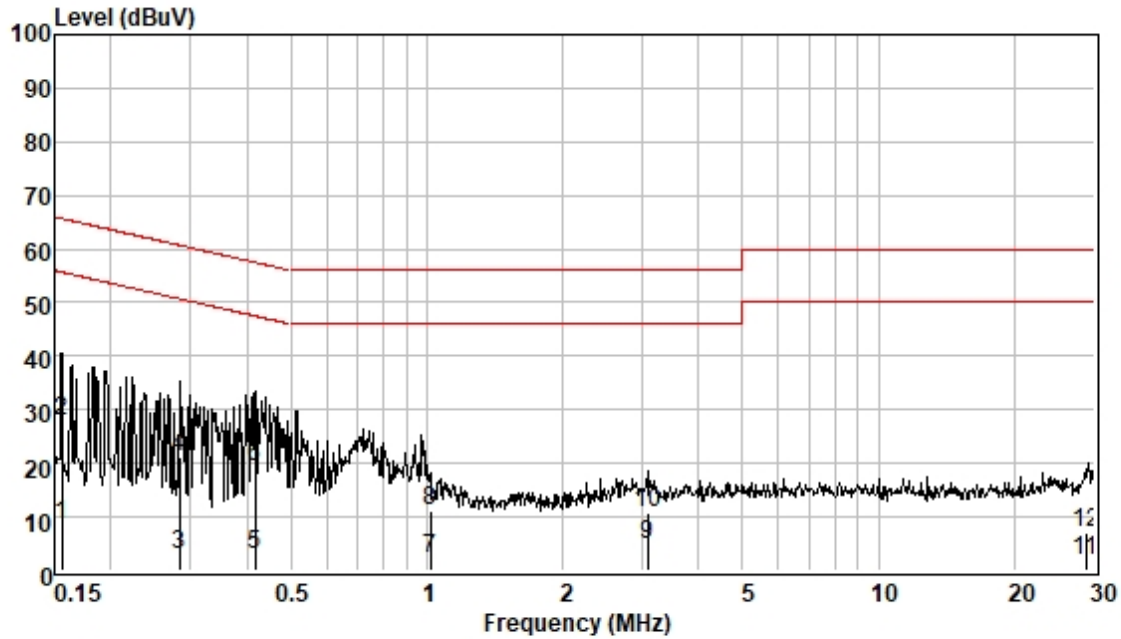
Remark: Level= Read Level+ Cable Loss+ LISN Factor

Test Mode: 01; Line: Live line

Pol : LINE
Mode :
Model :

	Freque MHz	Read Level dBUV	Cable Loss dB	LISN Factor dB	Measured Level dBUV	Limit Line dBUV	Over Limit dB	Remark
1	0.200	-3.62	0.06	9.56	6.00	53.62	-47.62	Average
2	0.200	15.25	0.06	9.56	24.87	63.62	-38.75	QP
3	0.263	-7.05	0.06	9.57	2.58	51.34	-48.76	Average
4	0.263	12.82	0.06	9.57	22.45	61.34	-38.89	QP
5	0.444	-8.51	0.06	9.58	1.13	46.98	-45.85	Average
6	0.444	7.65	0.06	9.58	17.29	56.98	-39.69	QP
7	1.117	-8.43	0.08	9.60	1.25	46.00	-44.75	Average
8	1.117	-0.82	0.08	9.60	8.86	56.00	-47.14	QP
9	2.765	-7.14	0.14	9.61	2.61	46.00	-43.39	Average
10	2.765	-0.21	0.14	9.61	9.54	56.00	-46.46	QP
11	23.762	-7.77	0.40	9.80	2.43	50.00	-47.57	Average
12	23.762	-2.40	0.40	9.80	7.80	60.00	-52.20	QP

Test Mode: 01; Line: Neutral Line

Pol : NEUTRAL
Mode :
Model :

	Freque	Read	Cable	LISN	Measured	Limit	Over	Remark
	nc	Level	Loss	Factor	Level	Line	Limit	
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.156	-1.00	0.06	9.53	8.59	55.69	-47.10	Average
2	0.156	18.44	0.06	9.53	28.03	65.69	-37.66	QP
3	0.283	-6.77	0.06	9.57	2.86	50.72	-47.86	Average
4	0.283	11.55	0.06	9.57	21.18	60.72	-39.54	QP
5	0.417	-6.56	0.06	9.58	3.08	47.51	-44.43	Average
6	0.417	9.55	0.06	9.58	19.19	57.51	-38.32	QP
7	1.021	-7.56	0.07	9.59	2.10	46.00	-43.90	Average
8	1.021	1.52	0.07	9.59	11.18	56.00	-44.82	QP
9	3.074	-5.00	0.15	9.61	4.76	46.00	-41.24	Average
10	3.074	1.06	0.15	9.61	10.82	56.00	-45.18	QP
11	28.755	-8.47	0.43	9.91	1.87	50.00	-48.13	Average
12	28.755	-3.30	0.43	9.91	7.04	60.00	-52.96	QP

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: 22.0 °C Humidity: 59.9 % RH Atmospheric Pressure: 1005 mbar

6.2.2 Test Mode Description

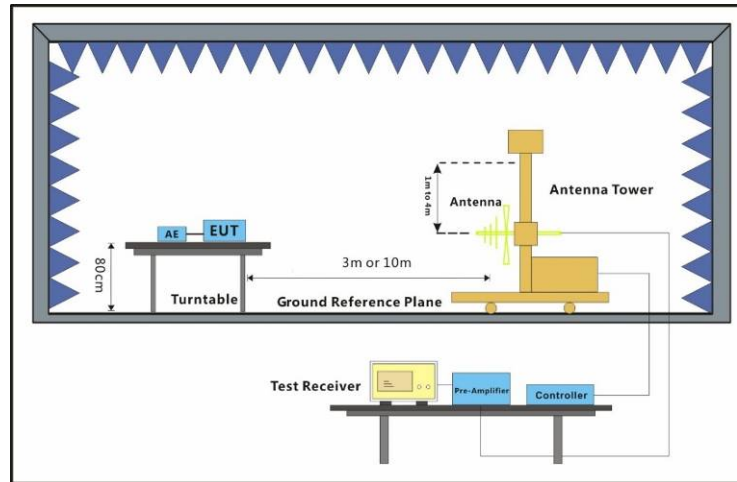
Pre-scan / Final test	Mode Code	Description
Pre-scan	00	Test the EUT in charging mode, supply power by the AC\DC adapter.
Final test	01	Test the EUT in charging mode with motor running, adjusting speed at max output power, supply power by the AC\DC adapter.
Pre-scan	02	Test the EUT in charging mode with motor running, adjusting speed at middle output power, supply power by the AC\DC adapter.
Pre-scan	03	Test the EUT in charging mode with motor running, adjusting speed at lowest output power, supply power by the AC\DC adapter.
Pre-scan	04	Test the EUT in motor running mode with max output power, supply power by the DC battery.
Pre-scan	05	Test the EUT in motor running mode with middle output power, supply power by the DC battery.
Pre-scan	06	Test the EUT in motor running mode with lowest output power, supply power by the DC battery.



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Document.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing / inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

6.2.3 Test Setup Diagram

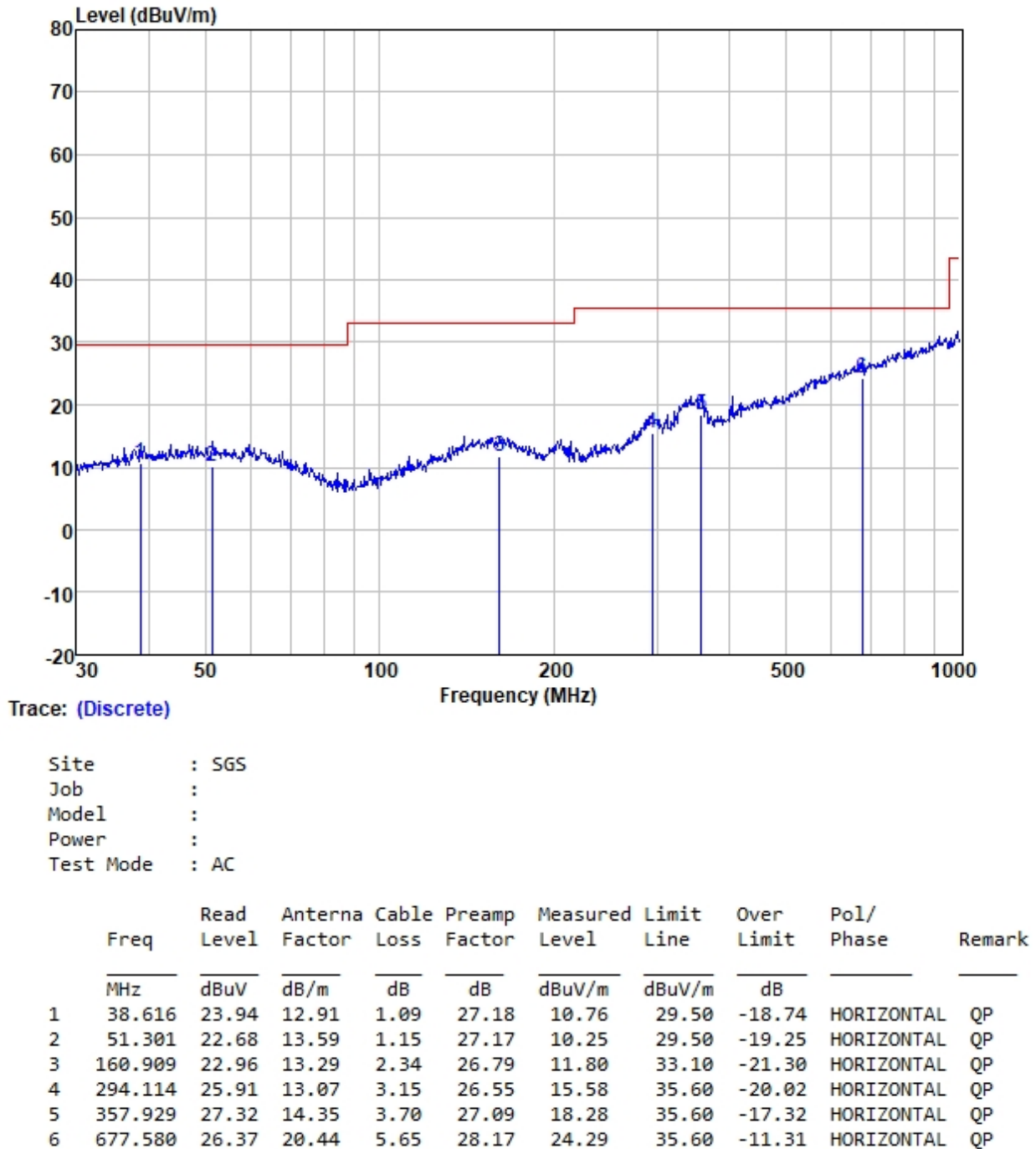


6.2.4 Measurement Procedure and Data

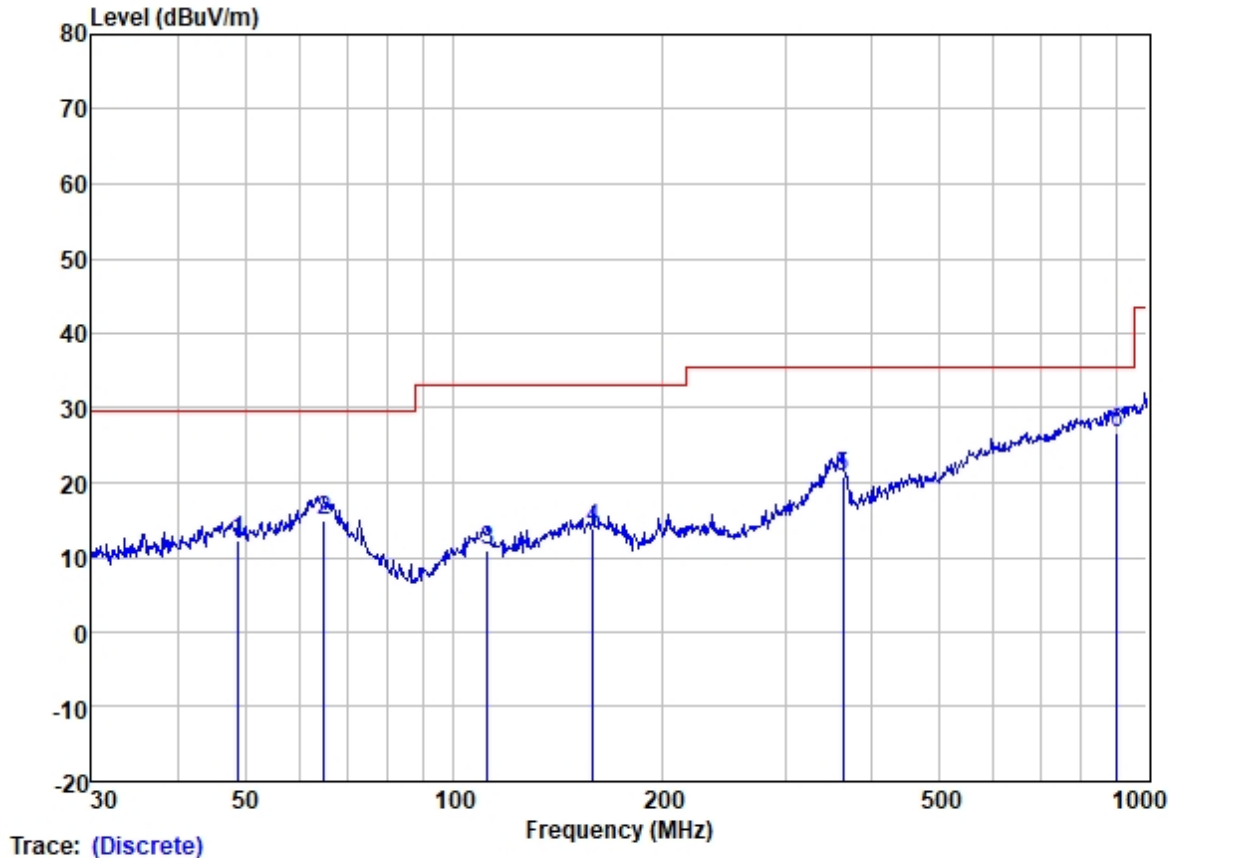
An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by BiConiLog antenna with 2 orthogonal polarities.

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

Test Mode: 01; Polarity: Horizontal



Test Mode: 01; Polarity: Vertical



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

	Freq	Read Level	Antenna Factor	Cable Loss	Preamplifier Factor	Measured Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	48.843	24.71	13.59	1.14	27.17	12.27	29.50	-17.23	VERTICAL	QP
2	64.887	28.70	12.14	1.35	27.15	15.04	29.50	-14.46	VERTICAL	QP
3	111.738	25.87	10.22	1.80	27.05	10.84	33.10	-22.26	VERTICAL	QP
4	158.668	24.89	13.36	2.33	26.80	13.78	33.10	-19.32	VERTICAL	QP
5	364.260	29.63	14.54	3.73	27.15	20.75	35.60	-14.85	VERTICAL	QP
6	903.309	24.44	23.23	6.92	27.84	26.75	35.60	-8.85	VERTICAL	QP

7 Test Setup Photo

Refer to Setup Photo for GZEM2205002324LM.



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Document.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Attention: To check the authenticity of testing / inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com

8 EUT Constructional Details (EUT Photos)

Refer to External Photo & Internal Photo for GZEM2205002324LM.

- End of the Report -



Unless otherwise agreed in writing, this document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Documents.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.
Attention: To check the authenticity of testing / inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com