

TEST REPORT

Application No.: GZCR2201000078HS
Applicant: Breville Pty Ltd
Address of Applicant: Ground Floor, Suite 2, 170-180 Bourke Road, Alexandria, NSW 2015, Australia
Manufacturer: Breville Pty Ltd
Address of Manufacturer: Ground Floor, Suite 2, 170-180 Bourke Road, Alexandria, NSW 2015, Australia
Factory: Kolvin Industries Ltd
Address of Factory: Unit 6 M/F, Century Centre, 44 Hung To Road, Kwun Tong, Kowloon, Hong Kong SAR

Equipment Under Test (EUT):
EUT Name: Immersion Circulator
Model No.: CSV750
Trade Mark: Hydro Pro Plus
Standard(s) : 47 CFR Part 15, Subpart C 15.247
Date of Receipt: 2022-01-19
Date of Test: 2022-01-20 to 2022-04-08
Date of Issue: 2022-05-11

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

Kobe Jian
EMC Laboratory Manager



Revision Record			
Version	Report No.	Date	Remark
01	GZEM191001654102	2019-11-07	Original
02	GZEM191001654105	2022-05-11	Copy report: Changed factory information; Updated EUT name, added trade mark; Alternative new motor driver IC (DRV10975)

Authorized for issue by:			
		<i>Kevin Zhang</i>	
		Kevin Zhang /Project Engineer	
		<i>Ricky Liu</i>	
		Ricky Liu/Reviewer	



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2 Test Summary

Radio Spectrum Matter Part				
Item	Standard	Method	Requirement	Result
Radiated Spurious Emissions Below 1GHz	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 6.4,6.5	47 CFR Part 15, Subpart C 15.205 & 15.209	Pass

Emission Part				
Item	Standard	Method	Requirement	Result
Conducted Emissions at AC Power Line (150kHz-30MHz)	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 6.2	47 CFR Part 15, Subpart C 15.207	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.

Remark for report GZEM191001654105:

This report GZEM191001654105 is based on original report GZEM191001654102. With the follow changes:

1. Changed factory information;
2. Updated EUT name and added trade mark
3. Alternative new motor driver IC (DRV10975)

Considering to the alternative motor driver also, Radiated Spurious Emissions Below 1GHz and Conducted Emissions at AC Power Line (150kHz-30MHz) tests were performed to model CSV750 and recorded the new test results in this report GZEM191001654105.

Other tests please refer to original report GZEM191001654102 for details.



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4 General Information

4.1 Details of E.U.T.

Power Supply:	AC 120V, 60Hz
Rated Power:	1450W
Test Voltage:	AC 120V, 60Hz
Cable:	AC mains (unshielded, 1.3m) AUX in ports Micro USB ports
Antenna Gain	0 dBi
Antenna Type	PCB Antenna
Channel Spacing	2MHz
Modulation Type	GFSK
Number of Channels	40
Operation Frequency	2402MHz to 2480MHz
Software	Smart RF studio 7
Power Setting	5

4.2 Description of Support Units

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

4.3 Measurement Uncertainty

Test Item	Measurement Uncertainty
Conducted Emissions at AC Power Line (150kHz-30MHz)	±2.76dB
Radiated Spurious Emissions Below 1GHz	±5.00dB (3m); ±4.38dB (10m)

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.



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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 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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5 Equipment List

Conducted Emissions at AC Power Line (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 Spurious Emissions Below 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
Active Loop Antenna-RED	ETS-Lindgren	6502	EMC2190	2022-04-06	2024-04-05
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



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6 Radio Spectrum Matter Test Results

6.1 Radiated Spurious Emissions Below 1GHz

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.209

Test Method: ANSI C63.10 (2013) Section 6.4,6.5

Limit:

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance(meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
960-1000	500	3

6.1.1 E.U.T. Operation

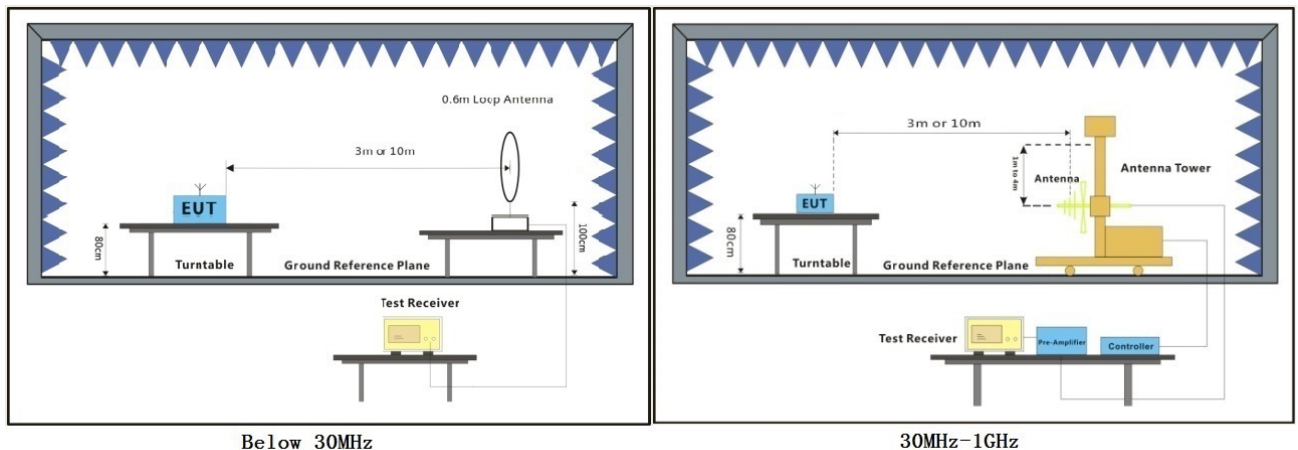
Operating Environment:

Temperature: 23.8 °C Humidity: 55.2 % RH Atmospheric Pressure: 1020 mbar

6.1.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode(1Mbps)_Keep the EUT in continuously transmitting mode with GFSK modulation.

6.1.3 Test Setup Diagram



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6.1.4 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. 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.
- c. 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.
- d. 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.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. 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 quasi-peak method as specified and then reported in a data sheet.
- g. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- h. 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.
- i. Repeat above procedures until all frequencies measured was complete.

Remark:

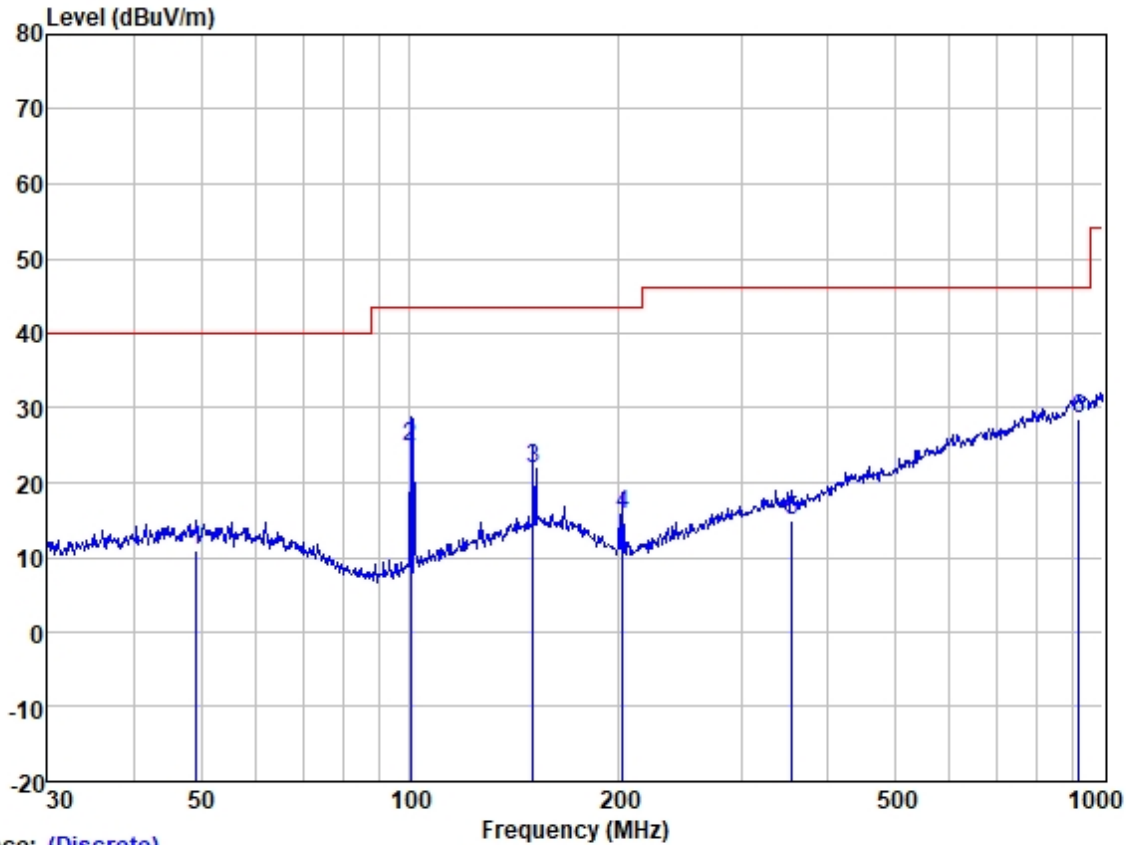
1. Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor
2. Scan from 9kHz to 30MHz, the disturbance below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.
3. The disturbance below 1GHz was very low and the harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.



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Test Mode: 00; Polarity: Horizontal



Trace: (Discrete)

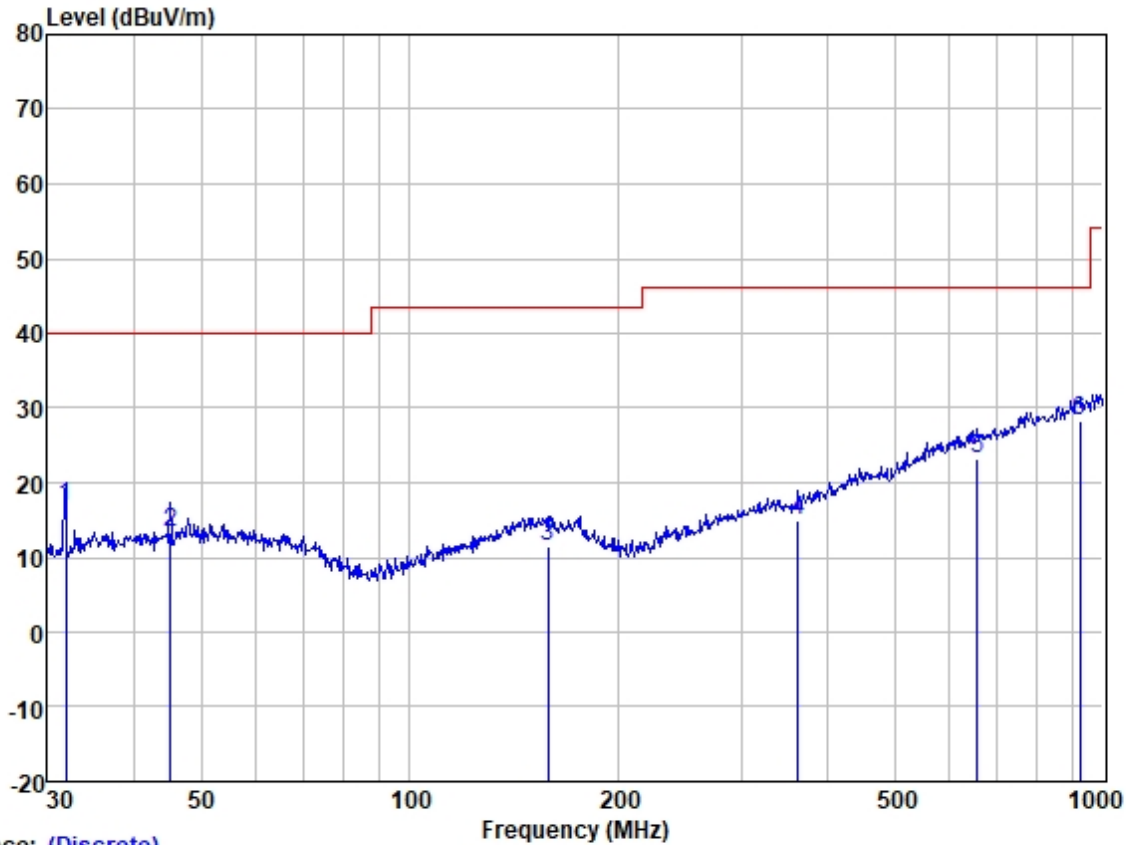
Site : SGS
Job :
Model : M4
Power :
Test Mode : RT

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Measured Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	49.187	23.40	13.60	1.14	27.17	10.97	40.00	-29.03	HORIZONTAL	QP
2	100.229	41.41	8.70	1.73	27.08	24.76	43.50	-18.74	HORIZONTAL	QP
3	150.538	33.19	13.34	2.24	26.83	21.94	43.50	-21.56	HORIZONTAL	QP
4	202.810	30.25	9.54	2.54	26.73	15.60	43.50	-27.90	HORIZONTAL	QP
5	355.427	24.11	14.29	3.67	27.07	15.00	46.00	-31.00	HORIZONTAL	QP
6	922.516	25.53	23.78	7.01	27.82	28.50	46.00	-17.50	HORIZONTAL	QP



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Test Mode: 00; Polarity: Vertical



Trace: (Discrete)

Site : SGS
Job :
Model : M4
Power :
Test Mode : RT

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Measured Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB		
1	31.843	30.94	11.93	1.04	27.19	16.72	40.00	-23.28	VERTICAL	QP
2	45.058	26.07	13.43	1.12	27.17	13.45	40.00	-26.55	VERTICAL	QP
3	158.112	22.61	13.37	2.31	26.80	11.49	43.50	-32.01	VERTICAL	QP
4	362.985	23.82	14.51	3.73	27.14	14.92	46.00	-31.08	VERTICAL	QP
5	658.836	25.54	20.29	5.56	28.18	23.21	46.00	-22.79	VERTICAL	QP
6	925.756	25.34	23.65	7.01	27.81	28.19	46.00	-17.81	VERTICAL	QP



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7 Emission Test Results

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

Test Requirement: 47 CFR Part 15, Subpart C 15.247

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

Limit:

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

*Decreases with the logarithm of the frequency.

Detector: Peak for pre-scan (9kHz resolution bandwidth) 0.15M to 30MHz

7.1.1 E.U.T. Operation

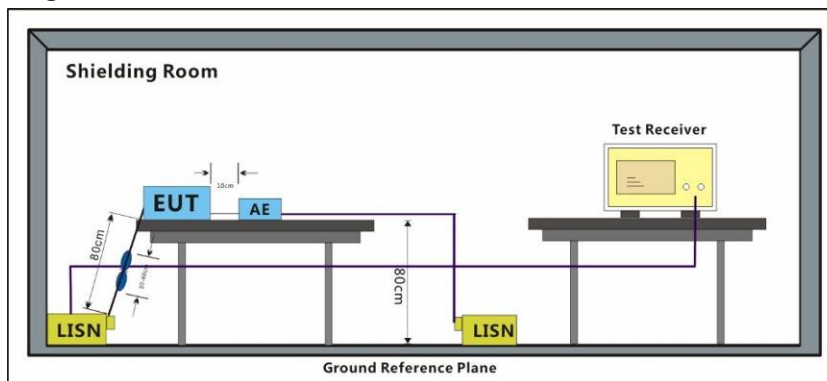
Operating Environment:

Temperature: 21.8 °C Humidity: 65.6 % RH Atmospheric Pressure: 1014 mbar

7.1.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode(1Mbps)_Keep the EUT in continuously transmitting mode with GFSK modulation.

7.1.3 Test Setup Diagram



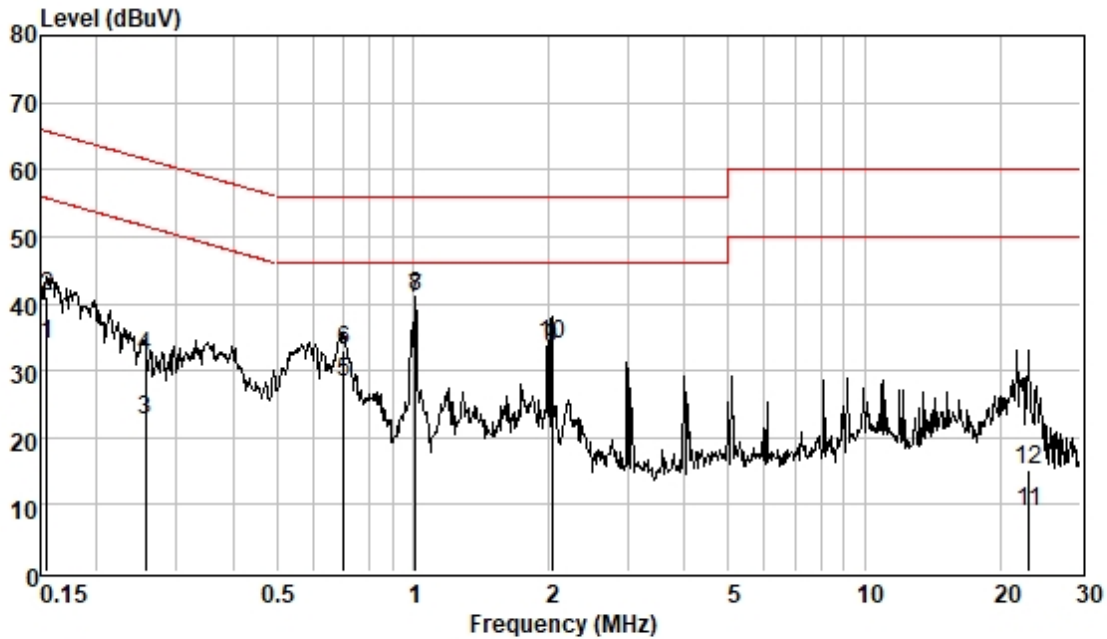
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7.1.4 Measurement Procedure and Data

- 1) The mains terminal disturbance voltage test was conducted in a shielded room.
 - 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50ohm/50μH + 5ohm linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.
 - 3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane.
 - 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.
 - 5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10 on conducted measurement.
- Remark: Level=Read Level+ Cable Loss+ LISN Factor



Test Mode: 00; Line: Live line



Pol :LINE
Mode :
Model :

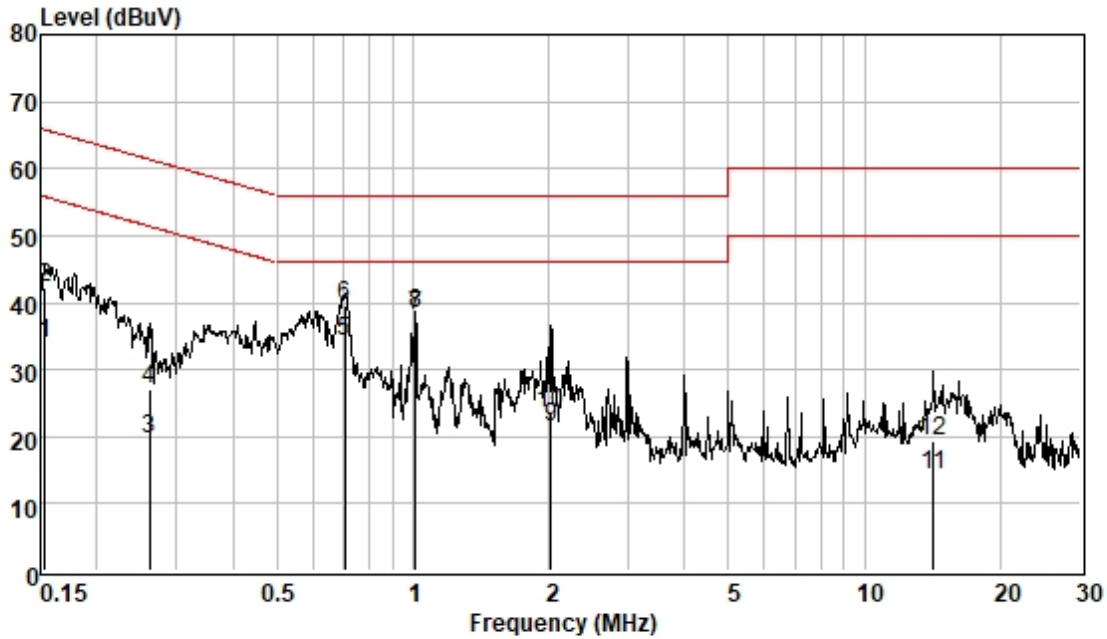
Frequenc MHz	Read Level dBuV	Cable Loss dB	LISN Factor dB	Measured Level dBuV	Limit Line dBuV	Over Limit dB	Remark
0.155	24.34	0.06	9.54	33.94	55.74	-21.80	Average
0.155	31.47	0.06	9.54	41.07	65.74	-24.67	QP
0.256	13.10	0.06	9.57	22.73	51.56	-28.83	Average
0.256	22.52	0.06	9.57	32.15	61.56	-29.41	QP
0.705	18.58	0.07	9.59	28.24	46.00	-17.76	Average
0.705	23.27	0.07	9.59	32.93	56.00	-23.07	QP
1.016	31.09	0.07	9.60	40.76	46.00	-5.24	Average
1.016	31.26	0.07	9.60	40.93	56.00	-15.07	QP
2.033	23.54	0.12	9.60	33.26	46.00	-12.74	Average
2.033	24.05	0.12	9.60	33.77	56.00	-22.23	QP
23.140	-1.13	0.39	9.80	9.06	50.00	-40.94	Average
23.140	5.02	0.39	9.80	15.21	60.00	-44.79	QP



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Test Mode: 00; Line: Neutral Line



Pol : NEUTRAL
Mode :
Model :

Freque _{nc} MHz	Read Level dBuV	Cable Loss dB	LISN Factor dB	Measured Level dBuV	Limit Line dBuV	Over Limit dB	Remark
0.153	24.22	0.06	9.53	33.81	55.82	-22.01	Average
0.153	32.54	0.06	9.53	42.13	65.82	-23.69	QP
0.262	9.87	0.06	9.56	19.49	51.38	-31.89	Average
0.262	17.58	0.06	9.56	27.20	61.38	-34.18	QP
0.708	24.47	0.07	9.59	34.13	46.00	-11.87	Average
0.708	30.00	0.07	9.59	39.66	56.00	-16.34	QP
1.016	28.31	0.07	9.59	37.97	46.00	-8.03	Average
1.016	28.65	0.07	9.59	38.31	56.00	-17.69	QP
2.023	11.64	0.12	9.59	21.35	46.00	-24.65	Average
2.023	13.88	0.12	9.59	23.59	56.00	-32.41	QP
14.213	4.20	0.30	9.85	14.35	50.00	-35.65	Average
14.213	9.22	0.30	9.85	19.37	60.00	-40.63	QP



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8 Test Setup Photo

Refer to Setup Photo for GZCR220100007802



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9 EUT Constructional Details (EUT Photos)

Refer to External and Internal Photos for GZCR2201000078HS

- End of the Report -



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