
EMC Test Report

Report No.: AGC03507201004EE01

PRODUCT DESIGNATION : High borosilicate bottle
BRAND NAME : N/A
MODEL NAME : M06169
APPLICANT : MID OCEAN BRANDS B.V
DATE OF ISSUE : Nov. 02, 2020
STANDARD(S) : EN 55014-1:2017
: EN 55014-2:2015
REPORT VERSION : V1.0

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Tel: +86-755 2523 4088 E-mail: agc@agc-cert.com Web: <http://cn.agc-cert.com/>



REPORT REVISE RECORD

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Nov. 02, 2020	Valid	Initial release

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1 VERIFICATION OF CONFORMITY

Applicant	MID OCEAN BRANDS B.V
Address	7/F, Kings Tower, 111 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong
Manufacturer	MID OCEAN BRANDS B.V
Address	7/F, Kings Tower, 111 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong
Factory	MID OCEAN BRANDS B.V
Address	7/F, Kings Tower, 111 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong
Product Designation	High borosilicate bottle
Brand Name	N/A
Test Model	MO6169
Date of test	Oct. 27, 2020 to Nov. 02, 2020
Deviation	The sample has no any deviation to the method of standard mentioned on page 1
Condition of Test Sample	Normal
Test Result	Pass

The above equipment was tested by Attestation of Global Compliance (Shenzhen) Co., Ltd. for compliance with the requirements set forth in the Technical Standards mentioned above. This said equipment in the configuration described in this report shows the maximum emission levels emanating from equipment and the level of the immunity endurance of the equipment are within the compliance requirements. The test results of this report relate only to the tested sample identified in this report.

Prepared By *Faler Yang*

 Faler Yang
 (Project Engineer) Nov. 02, 2020

Reviewed By *Calvin Liu*

 Calvin Liu
 (Reviewer) Nov. 02, 2020

Approved By *Forrest Lei*

 Forrest Lei
 (Authorized Officer) Nov. 02, 2020

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2 SYSTEM DESCRIPTION

TEST MODE DESCRIPTION		
NO.	TEST MODE DESCRIPTION	WORST
1	Normal	V
Note: 1. V means EMI worst mode.		

3 MEASUREMENT UNCERTAINTY

The uncertainty is calculated using the methods suggested in the “Guide to the Expression of Uncertainty in measurement” (GUM) published by ISO.

- Uncertainty of Radiated Emission, $U_c = \pm 4.5\text{dB}$

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4 PRODUCT INFORMATION

Housing Type	Plastic and metal
EUT Input Rating	DC 3V by battery
Classification of apparatus	Category III

I/O Port Information (Applicable Not Applicable)

I/O Port of EUT			
I/O Port Type	Number	Cable Description	Tested With
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5 SUPPORT EQUIPMENT

Device Type	Manufacturer	Model Name	Serial No.	Data Cable	Power Cable
--	--	--	--	--	--

Note:

1. "--" means no any support device during testing.

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6 TEST FACILITY

Location	Hechang Five Road East No.8,Zhongkai Ave., New District of Port, Huizhou City, Guangdong Province, China 516006
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7 TEST EQUIPMENT LIST

TEST EQUIPMENT OF RADIATED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
EMI Test Receiver	Rohde&Schwarz	ESU 8	100471	Sep.19,2020	Sep.18,2021
Log Periodic Antenna	Schwarzbeck	VULB 9163	9163-603	Sep.19,2020	Sep.18,2021
3m Semi-anechoic Chamber	TDK	966	201244UH0077	Sep.29,2020	Sep.28,2021
Test software	Tonscend	JS32-RE (Ver. 2.5)	N/A	N/A	N/A

TEST EQUIPMENT OF ESD TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
ESD Generator	TESEQ	NSG438	1240	Sep. 24, 2020	Sep. 23, 2021

TEST EQUIPMENT OF RS IMMUNITY TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
Transmitting Antenna	Schwarzbeck	VULP9118 E-921	D69250	Sep.25,2020	Sep.24,2021
Amplifier (80-1000MHz)	MILMEGA	80RF1000-175	1055332	Sep.25,2020	Sep.24,2021
Signal Generator	Agilent	N5181B	MY53050432	Sep.19,2020	Sep.18,2021
Directional Coupler	Werlatone	C5597-10	99814	Sep.25,2020	Sep.24,2021
Anechoic chamber	TDK	844	201244UH0078	Sep.19,2020	Sep.18,2021
Power Meter	Agilent	N1914A	MY53060011	Sep.25,2020	Sep.24,2021
Power Sensor	Agilent	E9304A	MY53100010	Sep.25,2020	Sep.24,2021

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8 TEST SUMMARY LIST

Test item	Test Requirement	Test Method	Class/Severity	Result
CONDUCTED EMISSION	EN 55014-1	EN 55014-1	EN 55014-1	N/A
RADIATED EMISSION	EN 55014-1	EN 55014-1	EN 55014-1	Pass
DISTURBANCE POWER EMISSION	EN 55014-1	EN 55014-1	EN 55014-1	N/A
CLICK EMISSION	EN 55014-1	EN 55014-1	EN 55014-1	N/A
Harmonic current emission	EN 61000-3-2	EN 61000-3-2	Class A	N/A
Voltage fluctuations & flicker	EN 61000-3-3	EN 61000-3-3	§5 of EN 61000-3-3	N/A
Electrostatic Discharge Immunity	EN 55014-2	EN 61000-4-2	± 8.0 kV (Air Discharge) ± 4.0 kV (Contact Discharge) ± 4.0 kV (Indirect Discharge)	Pass
Radiated RF Electromagnetic	EN 55014-2	EN 61000-4-3	3V/m with 80% AM. 1kHz Modulation.	Pass
Electrical fast transient/burst Immunity	EN 55014-2	EN 61000-4-4	+/- 1kV for Power Supply Lines	N/A
SURGE IMMUNITY	EN 55014-2	EN 61000-4-5	+/- 1kV (Line to Line) +/- 2kV (Line to Ground)	N/A
Immunity to Conducted Disturbances Induced by RF fields	EN 55014-2	EN 61000-4-6	3V with 80% AM. 1 kHz Modulation for Power Supply Lines	N/A
Voltage dips and short interruptions immunity	EN 55014-2	EN 61000-4-11	PHASE ANGLE 0, 45, 90, 135, 180, 225, 270, 315 degrees	N/A

Note : N/A means not applicable.

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9 EN 55014-1 RADIATED EMISSION TEST

9.1 LIMITS OF RADIATED DISTURBANCES

AT 10M DISTANCES

Frequency (MHz)	Distance (m)	Maximum Field Strength Limit (dBuV/m Q.P.)
30-230	10	30.00
230-1000	10	37.00

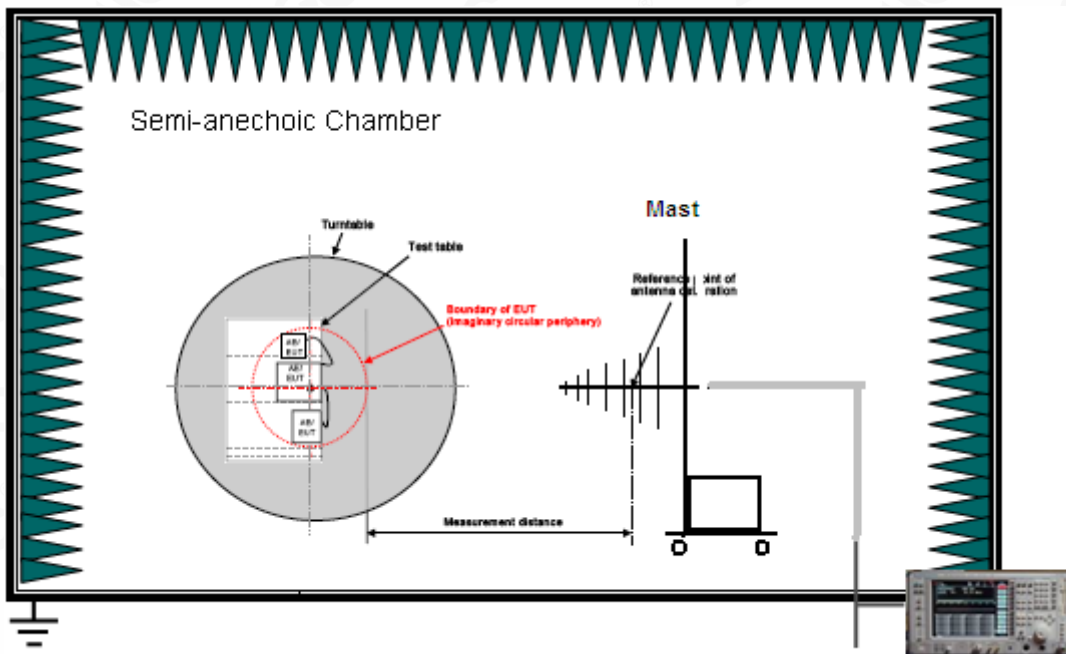
AT 3M DISTANCES

Frequency (MHz)	Distance (m)	Maximum Field Strength Limit (dBuV/m Q.P.)
30-230	3	40.00
230-1000	3	47.00

Note: The lower limit shall apply at the transition frequency.

9.2 BLOCK DIAGRAM OF TEST SETUP

System Diagram of Connections between EUT and Simulators



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9.3 PROCEDURE OF RADIATED EMISSION TEST

- (1) The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden turntable with a height of 0.8 meters is used which is placed on the ground plane as per EN 55014-1 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 10cm non-conductive covering to insulate the EUT from the ground plane.
- (2) Support equipment, if needed, was placed as per EN 55014-1.
- (3) All I/O cables were positioned to simulate typical actual usage as per EN 55014-1.
- (4) The EUT was turned on.
- (5) The antenna was placed at 3 meter away from the EUT as stated in EN 55014-1. The antenna connected to the Analyzer via a cable and at times a pre-amplifier would be used.
- (6) The Analyzer / Receiver quickly scanned from 30MHz to 1000MHz. The EUT test program was started. Emissions were scanned and measured rotating the EUT to 360 degrees and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.
- (7) The test mode(s) were scanned during the test.
- (8) Recorded at least the six highest emissions. Emission frequency, amplitude, antenna position, polarization and turntable position were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit and Q.P./Peak reading is presented.

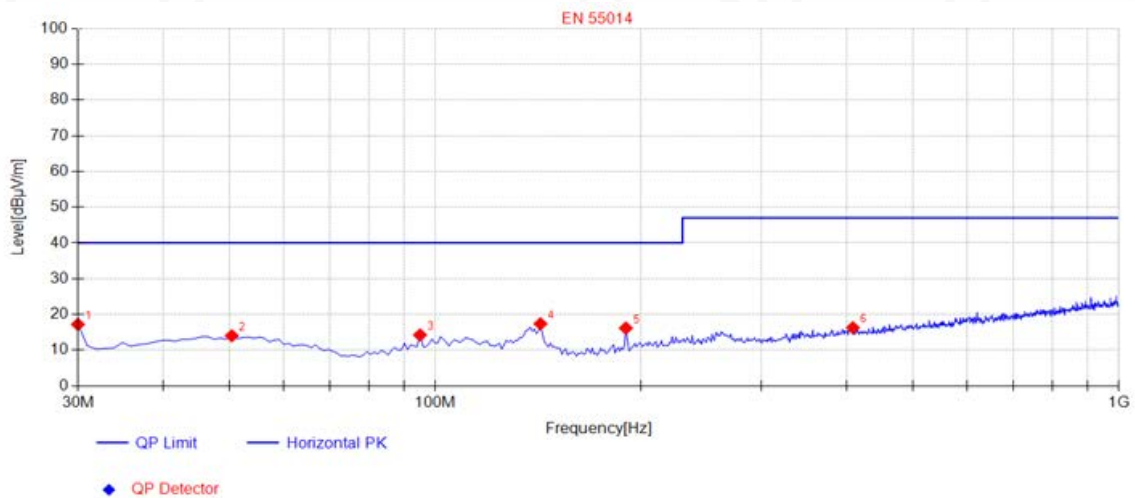
The test data of the worst case condition was reported on the Summary Data page.

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9.4 TEST RESULT OF RADIATED EMISSION TEST

Radiated Emission Test at 3m Distance-Horizontal



NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	30.0000	17.21	-15.34	40.00	22.79	200	242	Horizontal
2	50.3700	14.02	-12.64	40.00	25.98	100	236	Horizontal
3	94.9900	14.24	-15.43	40.00	25.76	200	162	Horizontal
4	142.5200	17.38	-18.39	40.00	22.62	100	330	Horizontal
5	190.0500	16.18	-15.97	40.00	23.82	100	76	Horizontal
6	408.3000	16.28	-10.74	47.00	30.72	100	108	Horizontal

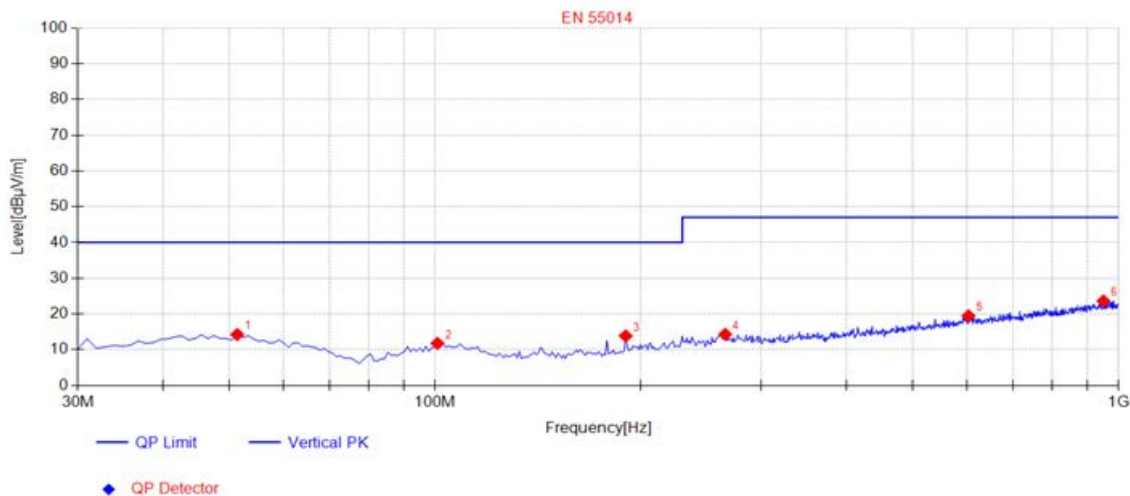
RESULT: PASS

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Radiated Emission Test at 3m Distance-Vertical



NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	51.3400	14.24	-12.64	40.00	25.76	100	2	Vertical
2	100.8100	11.79	-14.65	40.00	28.21	100	153	Vertical
3	190.0500	13.87	-15.97	40.00	26.13	100	289	Vertical
4	265.7100	14.30	-13.77	47.00	32.70	100	94	Vertical
5	603.2700	19.48	-7.10	47.00	27.52	100	348	Vertical
6	950.5300	23.63	-3.04	47.00	23.37	100	112	Vertical

RESULT: PASS

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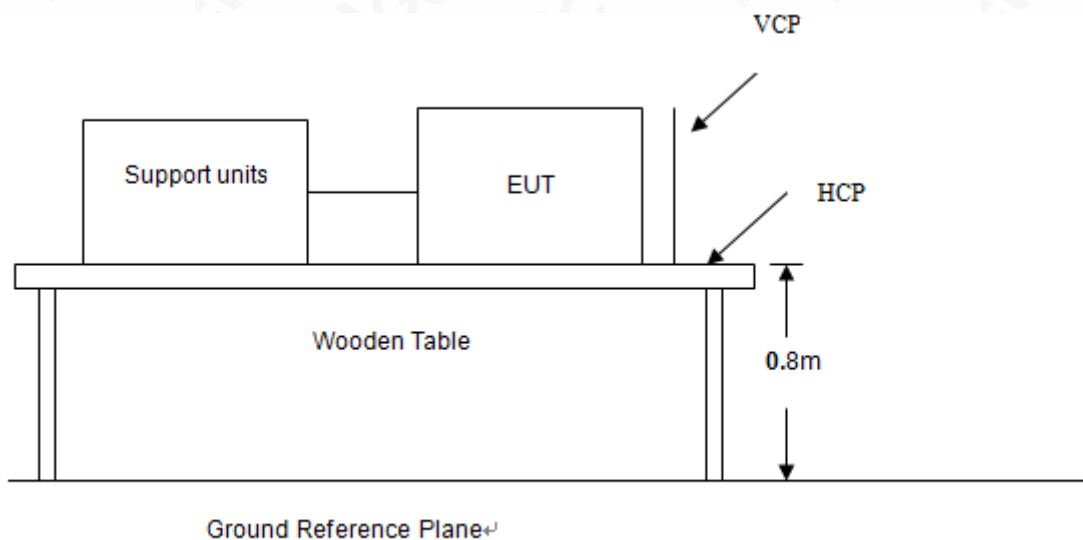
10 EN 61000-4-2 ESD IMMUNITY TEST

ELECTROSTATIC DISCHARGE (ESD) IMMUNITY TEST

Port	Enclosure
Basic Standard	EN 61000-4-2
Test Level	± 8.0 kV (Air Discharge) ± 4.0 kV (Contact Discharge) ± 4.0 kV (Indirect Discharge)
Standard require	B
Temperature	24.8°C
Humidity	56.6%

10.1 BLOCK DIAGRAM OF TEST SETUP

(The 470 k ohm resistors are installed per standard requirement)



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10.2 TEST PROCEDURE

The EUT was located 0.1 m minimum from all side of the HCP.
 The support units were located 1 m minimum away from the EUT.
 EUT worked with resistance load, and make sure EUT worked normally.
 Activates the communication function if the EUT with such port(s).
 As per the requirement of EN 55014-2: Contact discharge is the preferred test method. 20 discharges (10 with positive and 10 negative polarity) shall be applied on each accessible metal part of the enclosure. In case of a non-conductive enclosure, discharges shall be applied on the horizontal or vertical coupling planes as specified in EN 61000-4-2.
 Air discharges shall be used where contact discharges cannot be applied.
 The following test condition was followed during the tests.
Note: As per the A2 to EN 61000-4-2, a bleed resistor cable is connected between the EUT and HCP during the test.

The electrostatic discharges were applied as follows:

Amount of Discharges	Voltage	Coupling	Result
Mini 20 /Point	±4kV	Contact Discharge	A
Mini 20 /Point	±4kV	Indirect Discharge HCP (Front)	A
Mini 20 /Point	±4kV	Indirect Discharge HCP (Back)	A
Mini 20 /Point	±4kV	Indirect Discharge HCP (Left)	A
Mini 20 /Point	±4kV	Indirect Discharge HCP (Right)	A
Mini 20 /Point	±4kV	Indirect Discharge VCP (Front)	A
Mini 20 /Point	±4kV	Indirect Discharge VCP (Back)	A
Mini 20 /Point	±4kV	Indirect Discharge VCP (Left)	A
Mini 20 /Point	±4kV	Indirect Discharge VCP (Right)	A
Mini 20 /Point	±8kV	Air Discharge	A

10.3 PERFORMANCE & RESULT

Criteria A:	The apparatus continues to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance.
Criteria B:	The apparatus continues to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.
Criteria C:	Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

PASS **FAIL**

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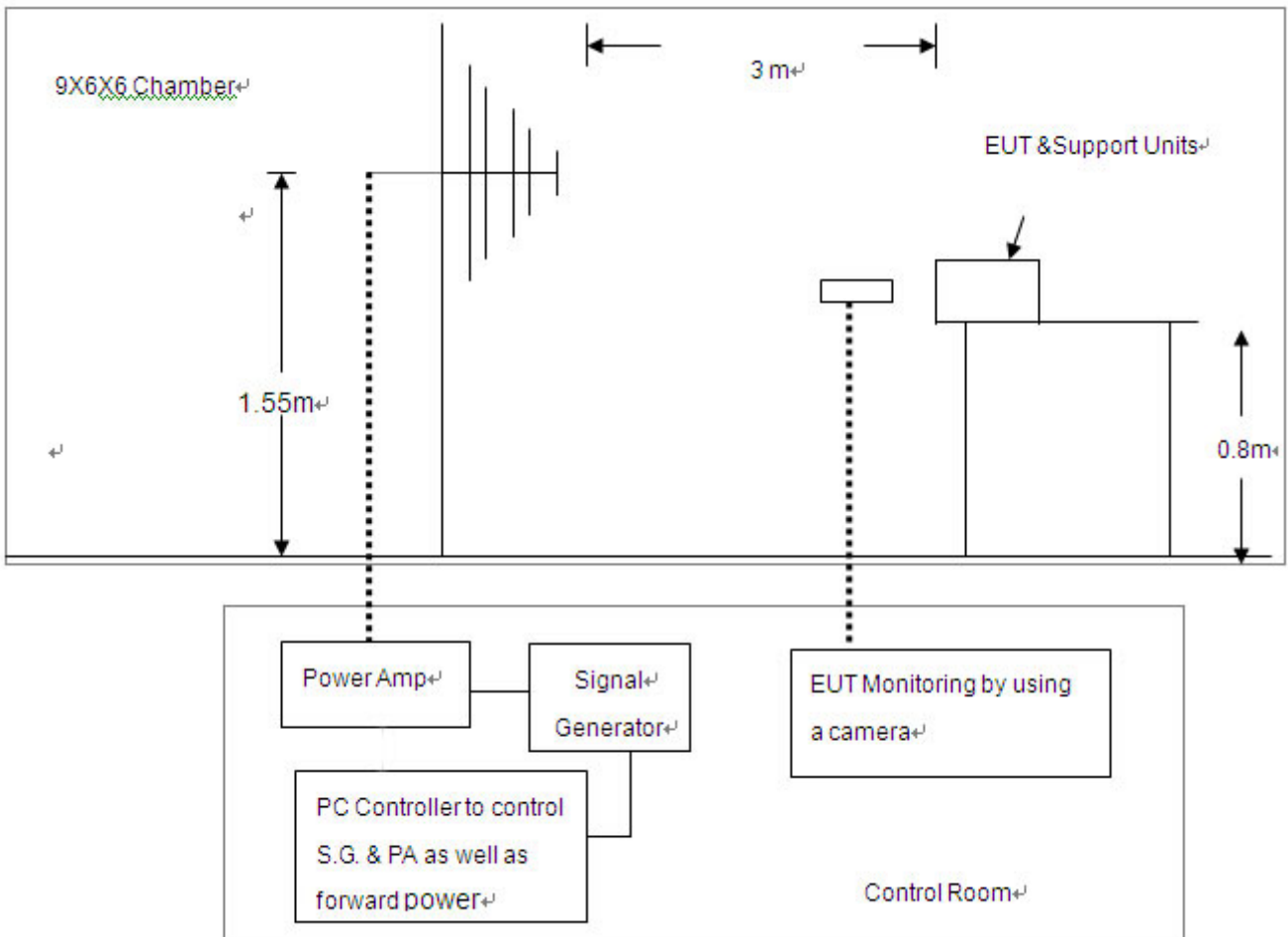


11 EN 61000-4-3 RS IMMUNITY TEST

RADIATED ELECTROMAGNETIC FIELD IMMUNITY TEST

Port	Enclosure
Basic Standard	EN 61000-4-3
Test Level:	3V/m with 80% AM. 1kHz Modulation.
Standard require	A
Temperature	23.4°C
Humidity	58.0%

11.1 BLOCK DIAGRAM OF TEST SETUP



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11.2 TEST PROCEDURE

The EUT was located at the edge of supporting table keep 3 meter away from transmitting antenna, it just the calibrated square area of field uniformity. The support units were located outside of the uniformity area, but the cable(s) connected with EUT were exposed to the calibrated field as per EN 61000-4-3.

EUT worked with resistance load, and make sure EUT worked normally.

Setting the testing parameters of RS test software per EN 61000-4-3.

Performing the test at each side of with specified level (3V/m) at 1% steps and test frequency from 80MHz to 1000MHz

Recording the test result in following table.

EN 61000-4-3 Final test conditions:

Test level: 3V/m

Steps: 1 % of fundamental

Dwell Time: 3 sec

Range (MHz)	Field	Modulation	Polarity	Position	Test Performance	Result (Criteria meet)
80-1000	3V/m	AM	H	Front	No function loss	A
80-1000	3V/m	AM	H	Left	No function loss	A
80-1000	3V/m	AM	H	Back	No function loss	A
80-1000	3V/m	AM	H	Right	No function loss	A
80-1000	3V/m	AM	V	Front	No function loss	A
80-1000	3V/m	AM	V	Left	No function loss	A
80-1000	3V/m	AM	V	Back	No function loss	A
80-1000	3V/m	AM	V	Right	No function loss	A

11.3 PERFORMANCE & RESULT

Criteria A:	The apparatus continues to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance.
Criteria B:	The apparatus continues to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed.
Criteria C:	Temporary loss of function is allowed, provided the functions self recoverable or can be restored by the operation of controls.

PASS

FAIL

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APPENDIX A: PHOTOGRAPHS OF TEST SETUP

EN 55014-1 RADIATED EMISSION TEST SETUP



EN 61000-4-2 ESD IMMUNITY TEST SETUP



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EN 61000-4-3 RS IMMUNITY TEST SETUP



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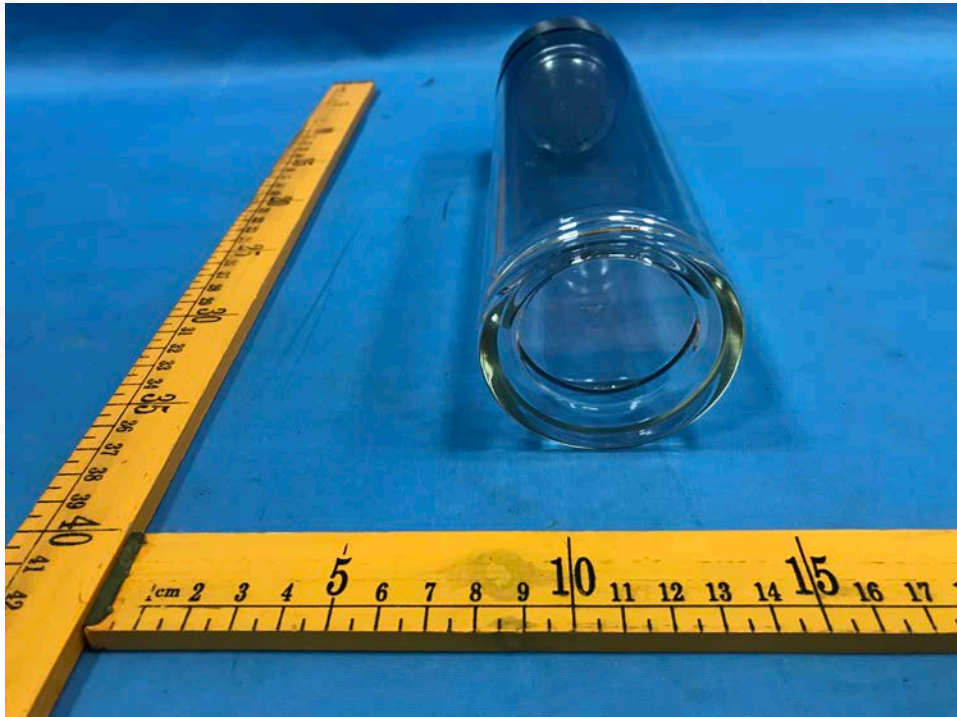


APPENDIX B: PHOTOGRAPHS OF EUT

TOP VIEW OF EUT



BOTTOM VIEW OF EUT



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FRONT VIEW OF EUT



BACK VIEW OF EUT



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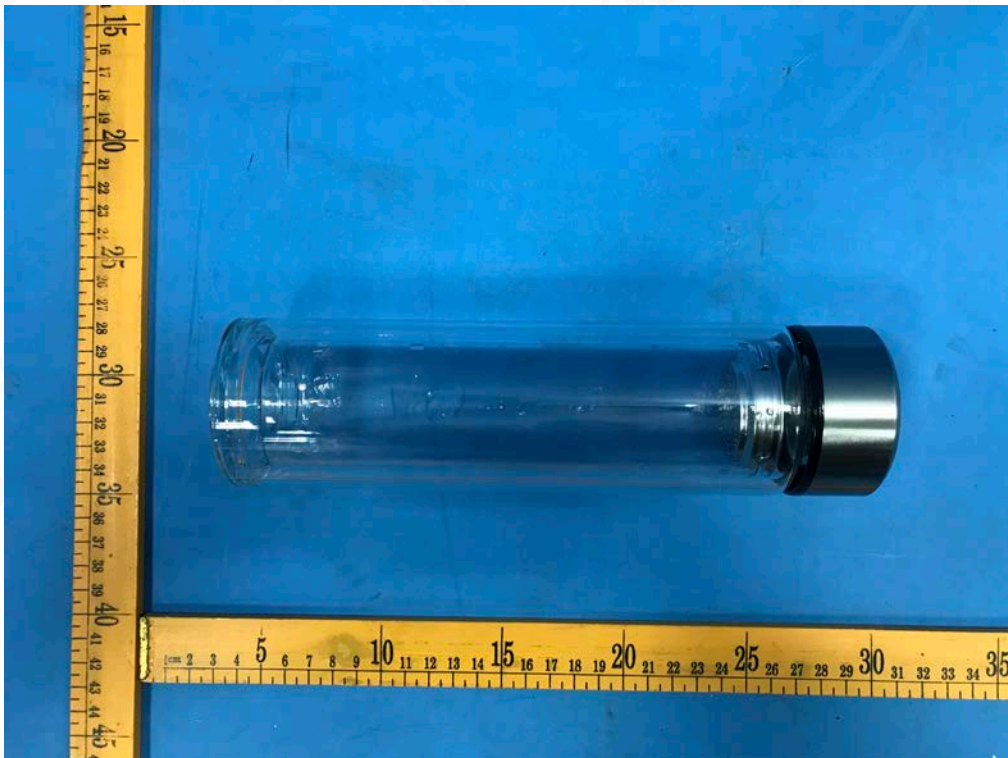
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LEFT VIEW OF EUT



RIGHT VIEW OF EUT



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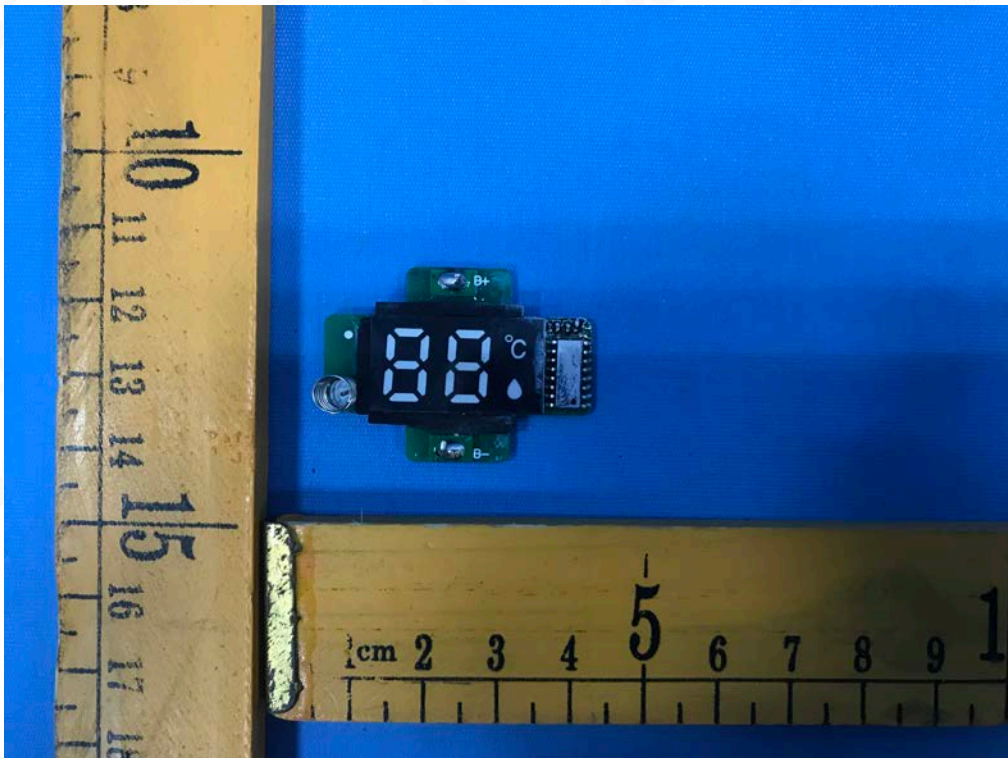
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OPEN VIEW OF EUT



INTERNAL VIEW OF EUT-1

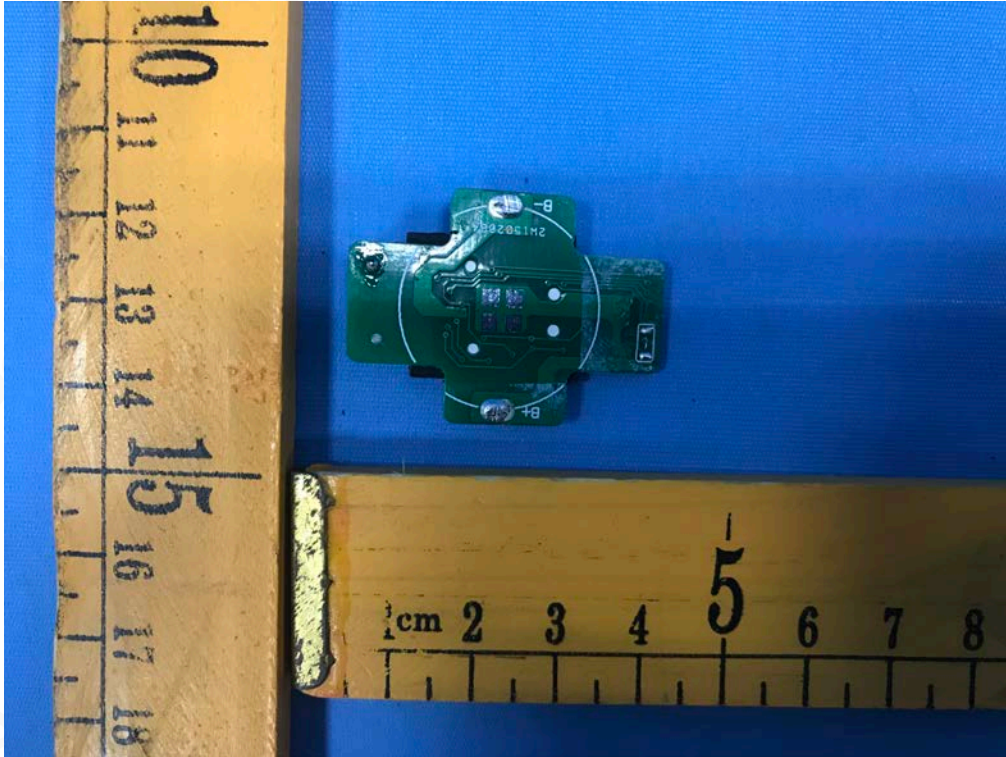


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INTERNAL VIEW OF EUT-2



----END OF REPORT----

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Conditions of Issuance of Test Reports

1. All samples and goods are accepted by the Attestation of Global Compliance (Shenzhen) Co., Ltd (the “Company”) solely for testing and reporting in accordance with the following terms and conditions. The company provides its services on the basis that such terms and conditions constitute express agreement between the company and any person, firm or company requesting its services (the “Clients”).
2. Any report issued by Company as a result of this application for testing services (the “Report”) shall be issued in confidence to the Clients and the Report will be strictly treated as such by the Company. It may not be reproduced either in its entirety or in part and it may not be used for advertising or other unauthorized purposes without the written consent of the Company. The Clients to whom the Report is issued may, however, show or send it, or a certified copy thereof prepared by the Company to its customer, supplier or other persons directly concerned. The Company will not, without the consent of the Clients, enter into any discussion or correspondence with any third party concerning the contents of the Report, unless required by the relevant governmental authorities, laws or court orders.
3. The Company shall not be called or be liable to be called to give evidence or testimony on the Report in a court of law without its prior written consent, unless required by the relevant governmental authorities, laws or court orders.
4. The non-CMA report issued by AGC is only permitted to be used by the client as internal reference use and shall not be used for public demonstration purpose.
5. In the event of the improper use of the report as determined by the Company, the Company reserves the right to withdraw it, and to adopt any other additional remedies which may be appropriate.
6. Samples submitted for testing are accepted on the understanding that the Report issued cannot form the basis of, or be the instrument for, any legal action against the Company.
7. The Company will not be liable for or accept responsibility for any loss or damage however arising from the use of information contained in any of its Reports or in any communication whatsoever about its said tests or investigations.
8. Clients wishing to use the Report in court proceedings or arbitration shall inform the Company to that effect prior to submitting the sample for testing.
9. The Company is not responsible for recalling the electronic version of the original report when any revision is made to them. The Client assumes the responsibility to providing the revised version to any interested party who uses them.
10. Subject to the variable length of retention time for test data and report stored hereinto as otherwise specifically required by individual accreditation authorities, the Company will only keep the supporting test data and information of the test report for a period of six years. The data and information will be disposed of after the aforementioned retention period has elapsed. Under no circumstances shall we provide any data and information which has been disposed of after retention period. Under no circumstances shall we be liable for damage of any kind, including (but not limited to) compensatory damages, lost profits, lost data, or any form of special, incidental, indirect, consequential or punitive damages of any kind, whether based on breach of contract of warranty, tort (including negligence), product liability or otherwise, even if we are informed in advance of the possibility of such damages.

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