



YOUR EYES IN THE SUPPLY CHAIN

Test Report # 20A-006037(A5) Date of Report Issue: October 16, 2020
Date of Sample Received: September 11, 2020 Pages: Page 1 of 26

PRODUCT DESIGNATION: Electric salt or pepper mill

BRAND NAME: N/A

MODEL NAME: MO8816

CLIENT: Mid Ocean Brands B.V.


DATE OF ISSUE: Oct. 12, 2020

STANDARD(S): EN 55014-1:2017
EN 55014-2:2015

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1. VERIFICATION OF CONFORMITY

Applicant	
Address	
Manufacturer	
Address	
Factory	
Address	
Product Designation	Electric salt or pepper mill
Brand Name	N/A
Test Model	MO8816
Date of test	Sep. 14, 2020 to Oct. 12, 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
<p>The above equipment was subcontracted to external laboratory 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.</p> <p>This report applies to above tested sample only. This report shall not be reproduced except in full, without written approval of QIMA (Hangzhou) Testing Technology Co.,Ltd, this document may be altered or revised by QIMA (Hangzhou) Testing Technology Co.,Ltd, personal only, and shall be noted in the revision of the document..</p>	
Approved by	<p><i>Ada Guo</i></p> 
	Assist Physical Laboratory Manager

2. SYSTEM DESCRIPTION

TEST MODE DESCRIPTION		
NO.	TEST MODE DESCRIPTION	WORST
1	Motor On	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, $U_c = \pm 4.5\text{dB}$

4. PRODUCT INFORMATION

Housing Type	Metal
EUT Input Rating	DC 6V 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
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Note:

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

6. TEST FACILITY

Location	4-5/F A2 BLDG NO. 1213 HUOJU SOUTH ROAD PUYAN STREET BINJIANG DISTRICT HANGZHOU CHINA
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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

Description	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

Description	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

8. TEST SUNMMER 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	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.

9. EN 55015 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
230-300	10	37.00

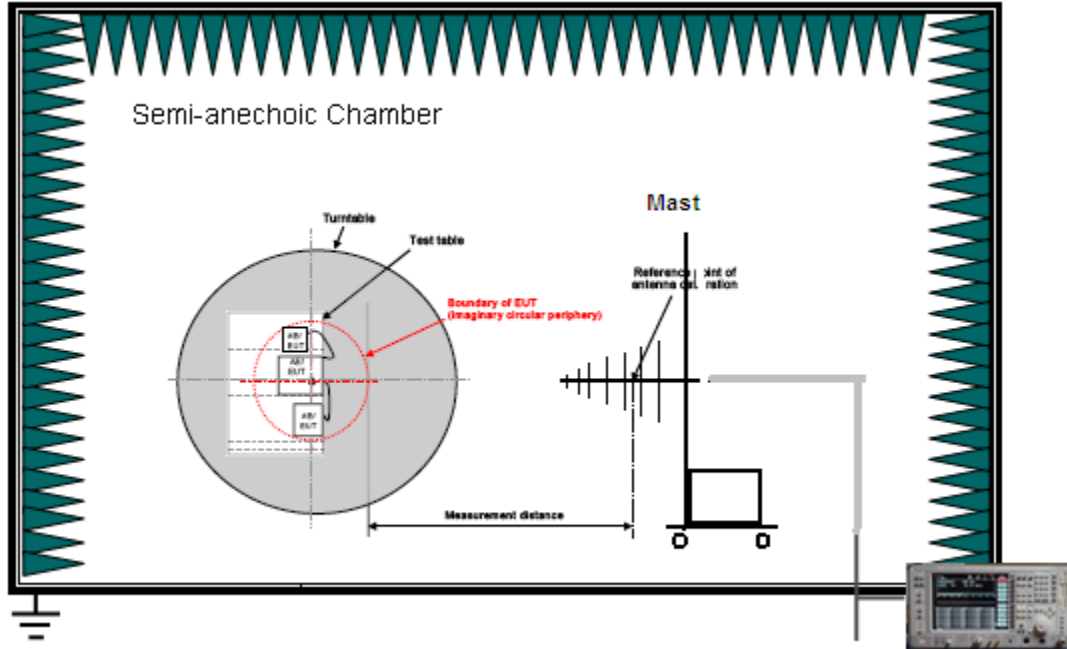
AT 3M DISTANCES

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



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.

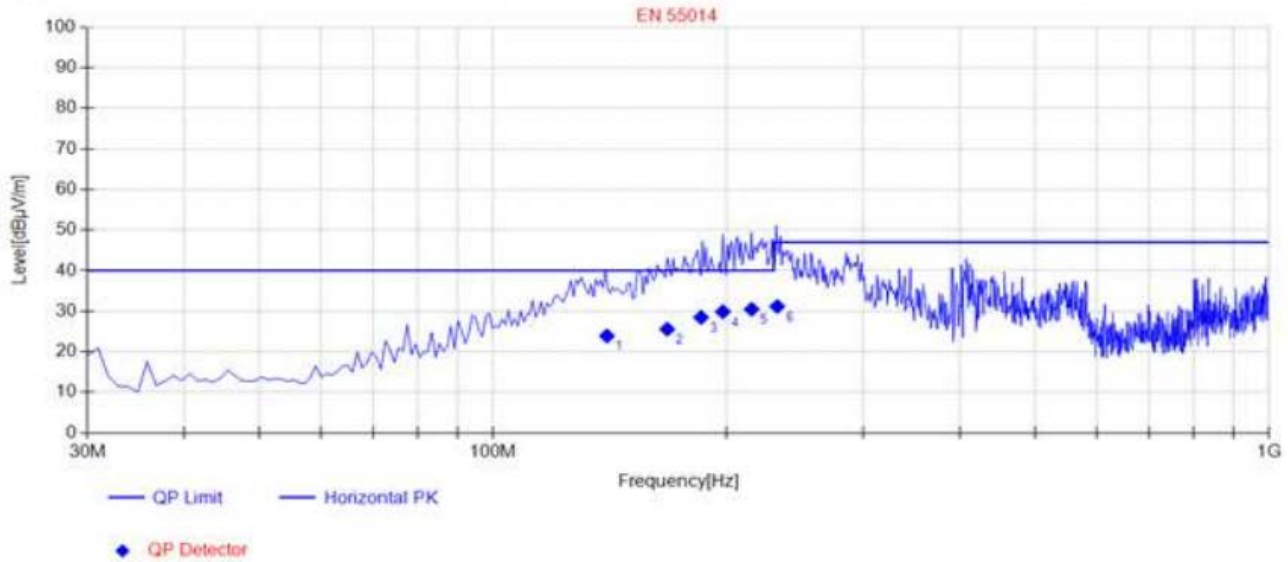
(8) Recorded at least the six highest emissions. Emission frequency, amplitude, antenna position, polarization and turntable position were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit and Q.P./Peak reading is presented.

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

9.4. TEST RESULT OF RADIATED EMISSION TEST

Radiated Emission Test at 3m Distance-Horizontal

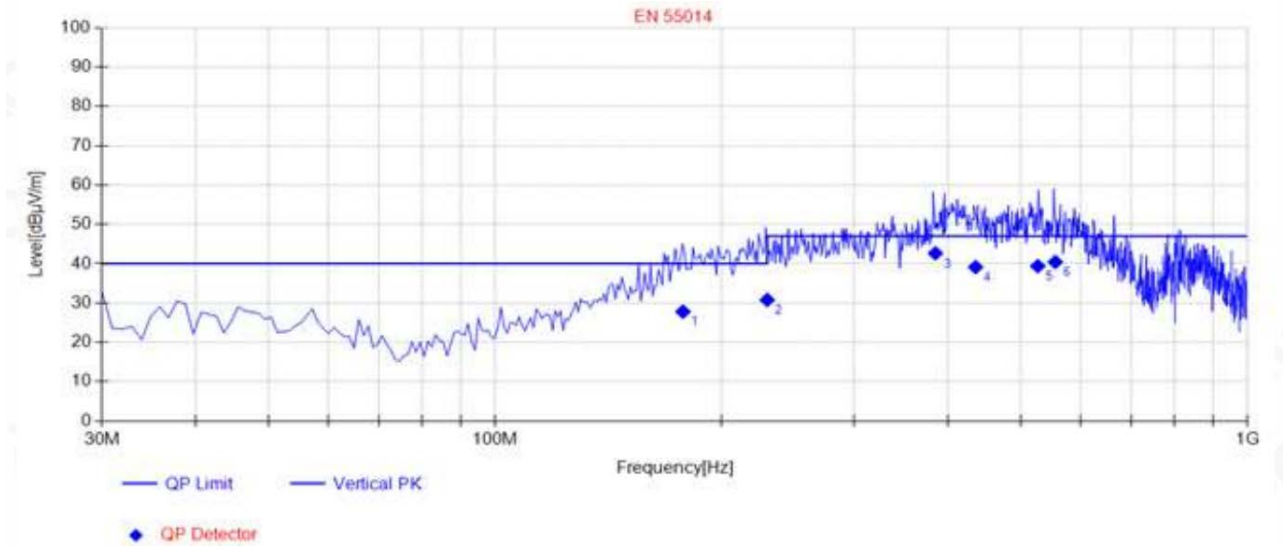
Radiated Emission Test at 3m Distance-Horizontal



NO.	Freq. [MHz]	Factor [dB]	QP Value [dBµV/m]	QP Limit [dBµV/m]	QP Margin [dB]	Height (cm)	Angle [°]	Polarity
1	140.1984	-18.32	23.90	40.00	16.10	190	215.6	Horizontal
2	167.7104	-17.56	25.54	40.00	14.46	213	137.2	Horizontal
3	185.4241	-16.37	28.47	40.00	11.53	220	74.3	Horizontal
4	197.8227	-15.28	29.87	40.00	10.13	209	221.2	Horizontal
5	215.4425	-15.34	30.44	40.00	9.56	215	110.5	Horizontal
6	232.4620	-14.51	31.17	40.00	15.83	220	220.3	Horizontal

RESULT: PASS

Radiated Emission Test at 3m Distance-Vertical



NO.	Freq. [MHz]	Factor [dB]	QP Value [dBµV/m]	QP Limit [dBµV/m]	QP Margin [dB]	Height (cm)	Angle [°]	Polarity
1	177.7101	-17.07	27.81	40.00	12.19	110	77.1	Vertical
2	229.9686	-14.63	30.79	40.00	9.21	115	294.4	Vertical
3	384.8542	-11.36	42.64	40.00	4.36	112	2.2	Vertical
4	435.1804	-10.38	39.13	40.00	7.87	106	23.2	Vertical
5	526.4792	-8.79	39.37	40.00	7.63	120	124.8	Vertical
6	555.5661	-8.45	40.42	40.00	6.58	120	83.9	Vertical

RESULT: PASS

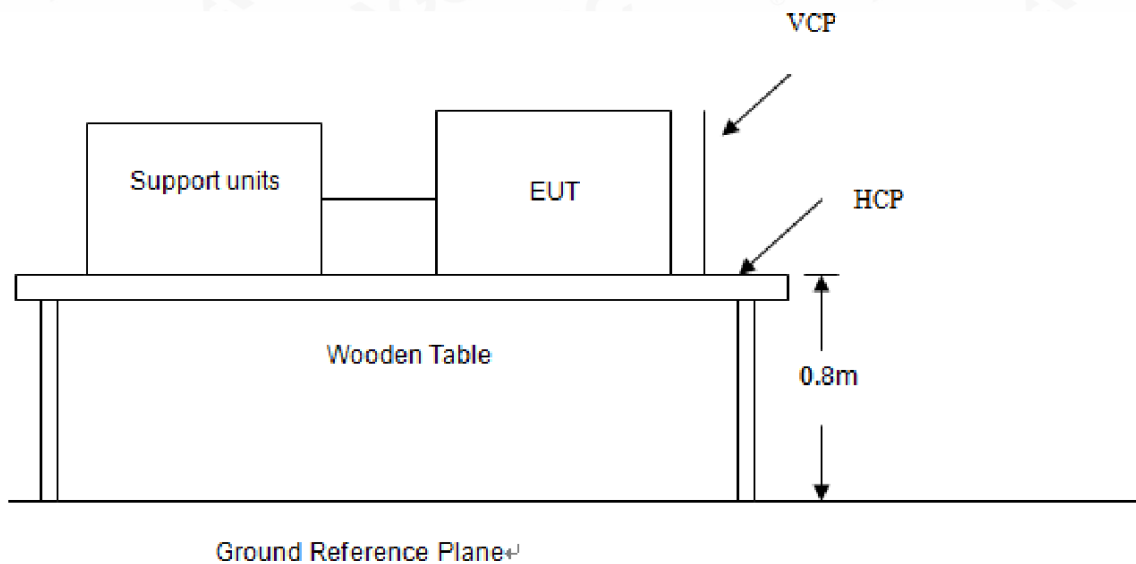
10 EN 61000-4-2 ESD IMMUNITY TEST

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)



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

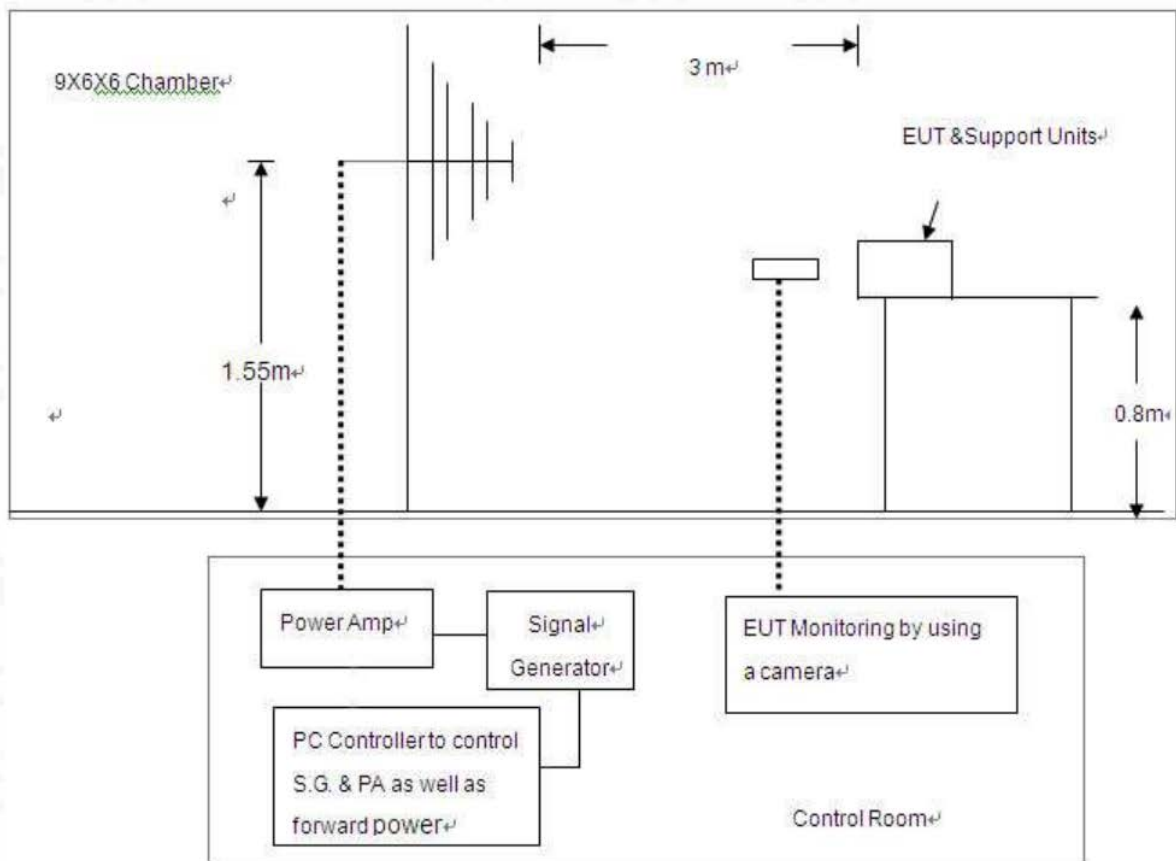
Criteria A:	The apparatus continues to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance.
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.

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



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

APPENDIX A: PHOTOGRAPHS OF TEST SETUP

EN 55014-1 RADIATED EMISSION TEST SETUP



EN 61000-4-2 ESD IMMUNITY TEST SETUP

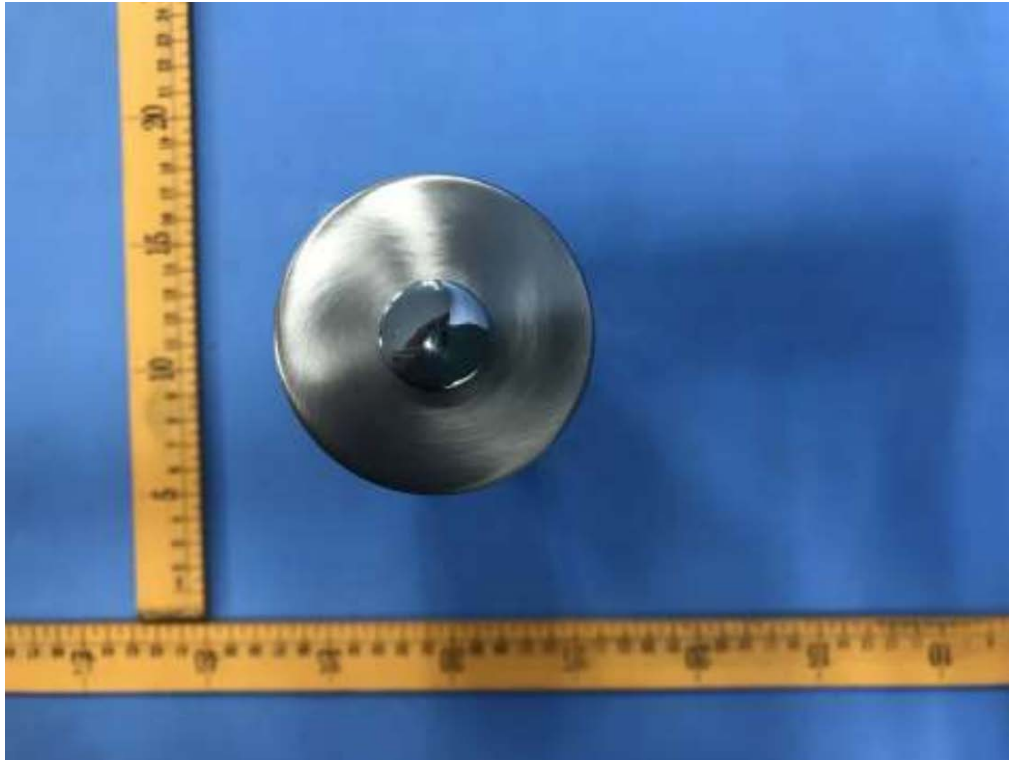


EN 61000-4-3 RS IMMUNITY TEST SETUP

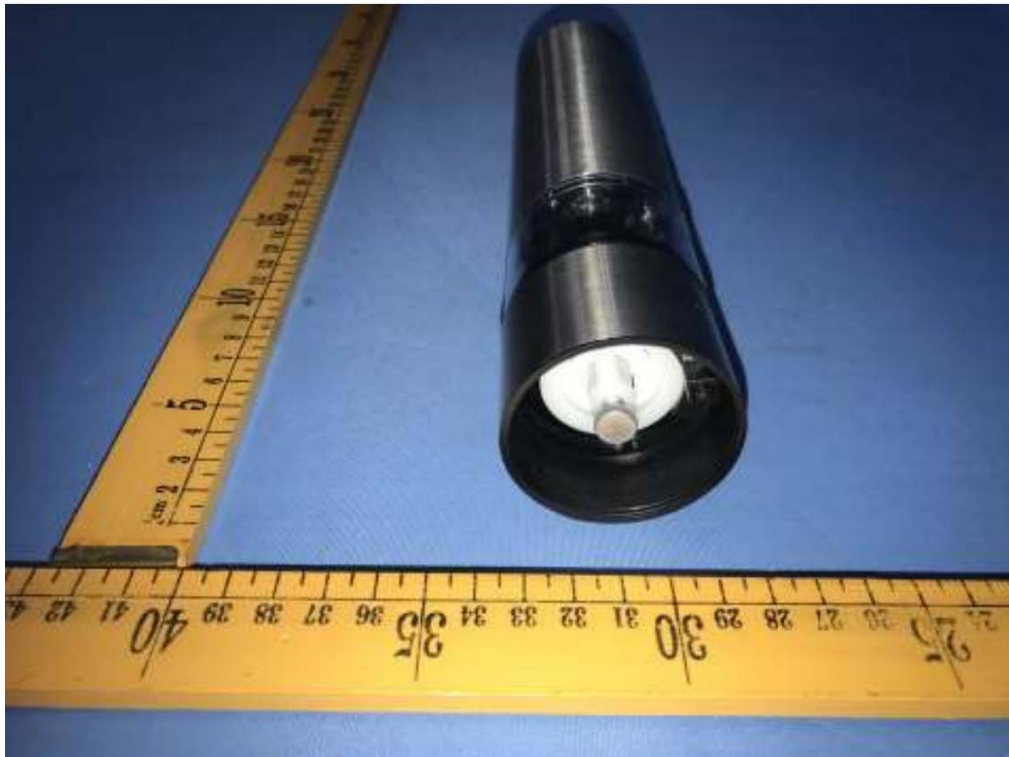


APPENDIX B: PHOTOGRAPHS OF EUT

TOP VIEW OF EUT



BOTTOM VIEW OF EUT



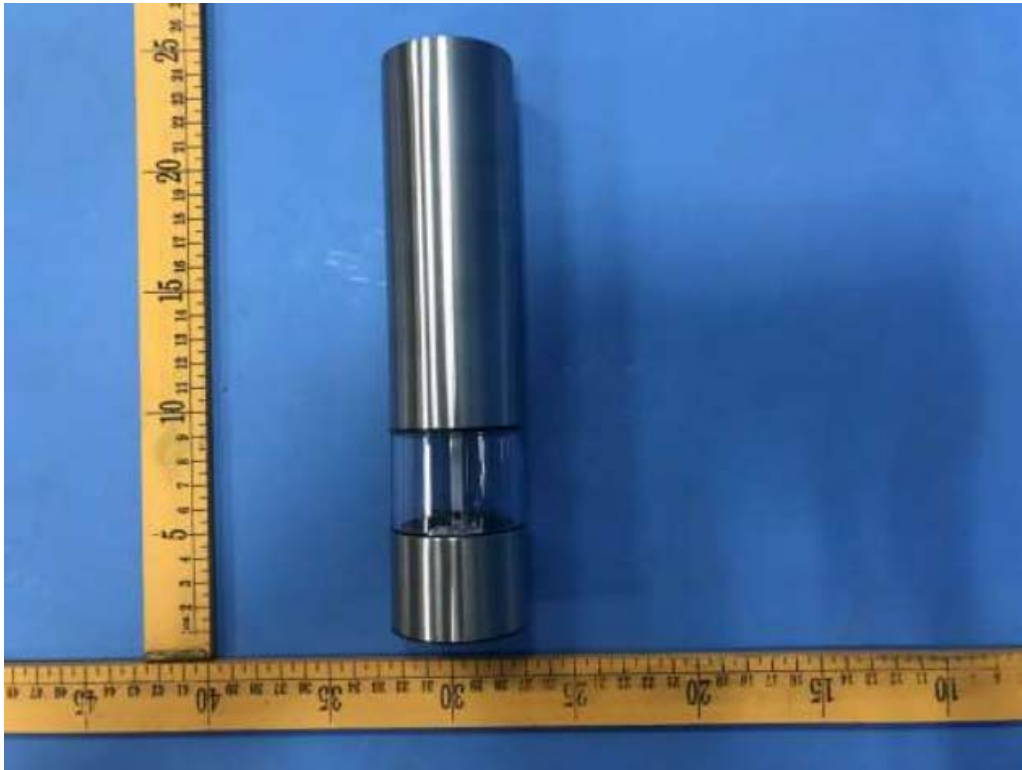
FRONT VIEW OF EUT



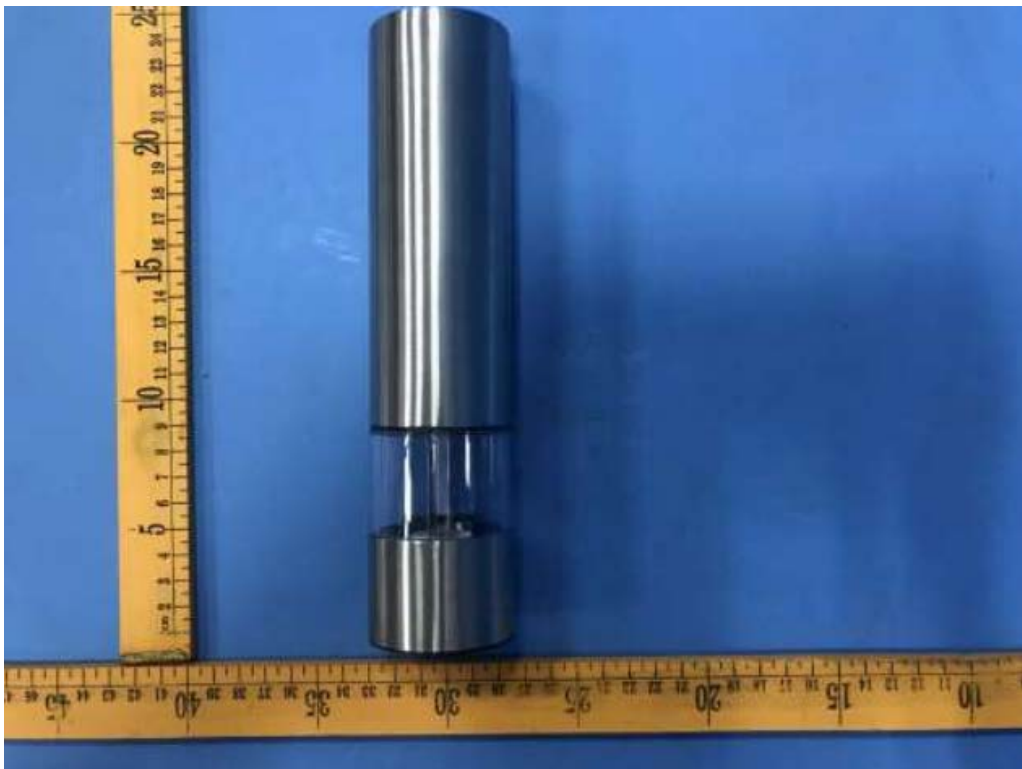
BACK VIEW OF EUT



LEFT VIEW OF EUT



RIGHT VIEW OF EUT



OPEN VIEW OF EUT



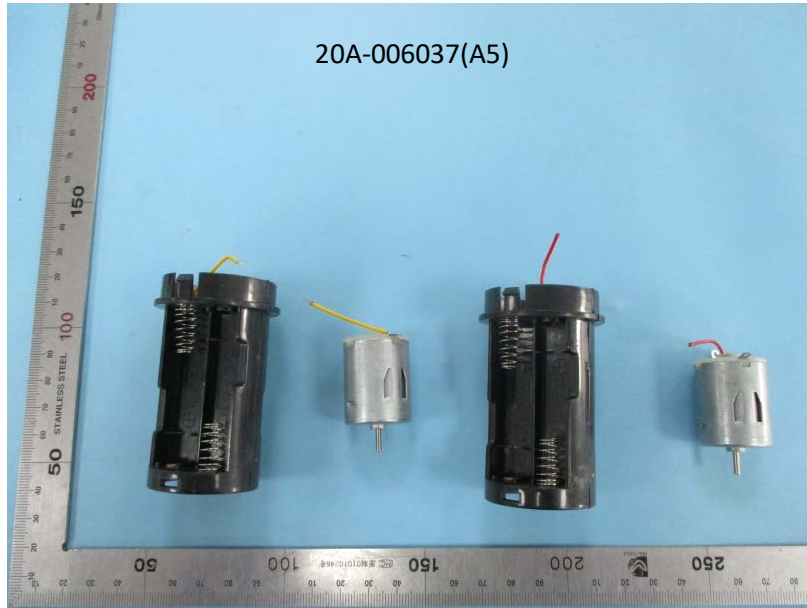
SAMPLE PHOTO:



SAMPLE PHOTO:



PRODUCT PHOTO:



PRODUCT PHOTO:



-End Report-