



EN 55032:2015+A11+A1:2020
EN 55035:2017+A11:2020
EN IEC 61000-3-2:2019+A1:2021
EN 61000-3-3:2013+A1:2019+A2:2021
MEASUREMENT AND TEST REPORT

FOR
Global Camera Manufacturer Corp.

Room 3D12, No. 5, Sec. 5, Hsin Yi Road, Taipei 110, Taiwan

Model: UM012CH, GM012CH, 44308-B

September 23, 2022

This Report Concerns: ☒ Derive Report	Equipment Type: Digital Microscope
Test Engineer: Life Liao / <i>Life Liao</i>	
Report Number: QCT22IR-1944E-01	
Test Date: April 15 - April 29, 2022	
Reviewed By: Gordon Tan / <i>Gordon Tan</i>	
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1 - GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant: Global Camera Manufacturer Corp.
Address of applicant: Room 3D12, No. 5, Sec. 5, Hsin Yi Road, Taipei 110, Taiwan
Manufacturer: Global Camera Manufacturer Corp.
Address of manufacturer: Room 3D12, No. 5, Sec. 5, Hsin Yi Road, Taipei 110, Taiwan

General Description of E.U.T

Product Description: Digital Microscope
Trade Mark: Global, Celestron
Model No.: UM012CH, GM012CH, 44308-B
(Note: All models have the same circuitry, mechanical and physical construction, except for the appearance and model name.)
Test Model No.: UM012CH
Sample No.: Y22D1329E01OY
Rated Supply: DC 5V (Powered by computer)
Highest internal frequency: 240MHz
Adapter Information: N/A

Description of version

Edition No.	Report Date	Summary
QCT22DR-1329E-01	April 30, 2022	Original Report
QCT22IR-1944E-01	September 23, 2022	Change Applicant, manufacturer, trade Mark and product model.

Edition No: QCT22IR-1944E-01

1. This report is an additional version with original report number QCT22DR-1329E-01, Please refer to the above table for the differences between this report and the original report.
2. Compared with the original report QCT22DR-1329E-01, The test sample is same, so it is not necessary to repeat the test. All test data and test picture would refer to QCT22DR-1329E-01.
3. This report is based on report of QCT22DR-1329E-01.

Remark: * The test data gathered are from the production sample provided by the manufacturer.



General Description of Test Auxiliary

AUX Description:	Manufacturer	Model No.	Certificate	CABLE
Notebook	SAMSUNG	500R5H	/	/

1.2 Test Standards

The following Declaration of Conformity report of EUT is prepared in accordance with

EN 55032:2015+A11+A1:2020

EN 55035:2017+A11:2020

EN IEC 61000-3-2:2019+A1:2021

EN 61000-3-3:2013+A1:2019+A2:2021

The objective of the manufacturer is to demonstrate compliance with the described standards above.

1.3 Test Summary

For the EUT described above. The Standards used were EN 55032 for Emissions & EN 55035 for Immunity.

Table 1: Tests Carried Out Under EN 55032:2015+A11+A1:2020

Standard	Test Items	Status
EN 55032:2015+A11+A1:2020	Disturbance Voltage at The Mains Terminals (150KHz To 30MHz)	✓
	Radiated Disturbances (30MHz To 1GHz)	✓
	Radiated Disturbances (Above 1GHz)	✓

✓ Indicates that the test is applicable

× Indicates that the test is not applicable.

Table 2: Tests Carried Out Under EN IEC 61000-3-2:2019+A1:2021 / EN 61000-3-3:2013+A1:2019+A1:2021

Standard	Test Items	Status
EN IEC 61000-3-2:2019+A1:2021	Harmonic Current Test	✓
EN 61000-3-3:2013+A1:2019+A1:2021	Voltage Fluctuations and Flicker Test	✓

✓ Indicates that the test is applicable

× Indicates that the test is not applicable

Table 3: Tests Carried Out Under EN 55035:2017+A11:2020

Standard	Test Items	Status
IEC 61000-4-2:2008	Electrostatic discharge Immunity	✓
IEC 61000-4-3:2006+A1:2007+A2:2010	Radiated Susceptibility (80MHz to 6GHz)	✓
IEC 61000-4-4:2012	Electrical Fast Transient/Burst Immunity	✓
IEC 61000-4-5:2014+A1:2017	Surge Immunity	✓
IEC 61000-4-6:2013	Conducted Susceptibility (150kHz to 80MHz)	✓
IEC 61000-4-6:2013	Broadband impulsive conducted disturbances	×
IEC 61000-4-8:2009	Power Frequency Magnetic Field Immunity (50/60Hz)	×
IEC 61000-4-11:2004+A1:2017	Voltage Dips, Short Interruptions Immunity	✓

✓ Indicates that the test is applicable

×

1.4 Test Methodology

All measurements contained in this report were conducted with CISPR 16-1-1, radio disturbance and immunity measuring apparatus, and CISPR16-2-3, Method of measurement of disturbances and immunity.

All measurement required was performed at **Shenzhen QC Testing Laboratory Co., Ltd.** at East of 1/F., Building E, Xinghong Science Park, No.111, Shuike Road, Fenghuanggang, Xixiang Street, Bao'an District, Shenzhen, Guangdong, China.

1.5 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

CNAS – Registration No.: L8464

Shenzhen QC Testing Laboratory Co., Ltd. To ISO/IEC 17025:25 General Requirements for the Competence of Testing and Calibration Laboratories(CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing. The acceptance letter from the CNAS is maintained in our files: Registration: CNAS L8464, April 20, 2022.

2 - SYSTEM TEST CONFIGURATION

2.1 Justification

The system was configured for testing in a typical fashion (as normally used by a typical user).

2.2 EUT Exercise Software

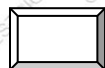
The EUT exercising program used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use. The software offered by manufacturer, can let the EUT being **ON Mode**.

2.3 Special Accessories

As shown in section 2.5, interface cable used for compliance testing is shielded as normally supplied by **Mustech Electronics Co.,Ltd.** and its respective support equipment manufacturers.

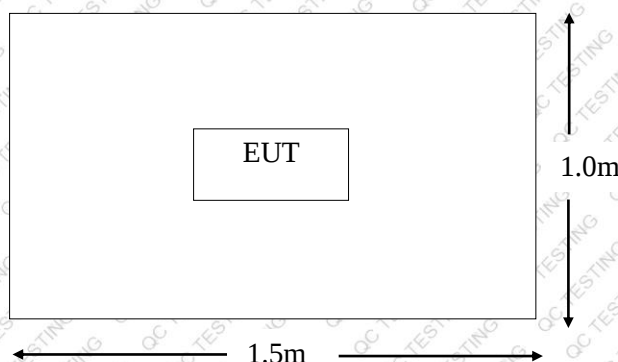
2.4 Equipment Modifications

The EUT tested was not modified by QCT.



EUT

2.5 Test Setup Diagram





3 - DISTURBANCE VOLTAGE AT THE MAINS TERMINALS

3.1 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, and LISN.

The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement is 2.46dB for Peak; 2.42dB for Average.

3.2 Limit of Disturbance Voltage At The Mains Terminals

(Class A)

Frequency Range (MHz)	Quasi-Peak(dB μ V)	Average(dB μ V)
0.150~0.500	79	66
0.500~30.00	73	60

(Class B)

Frequency Range (MHz)	Quasi-Peak(dB μ V)	Average(dB μ V)
0.150~0.500	66~56*	56~46*
0.500~5.000	56	46
5.000~30.00	60	50

Note:

1. The tighter limit applies at the band edges.
2. The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

3.3 EUT Setup

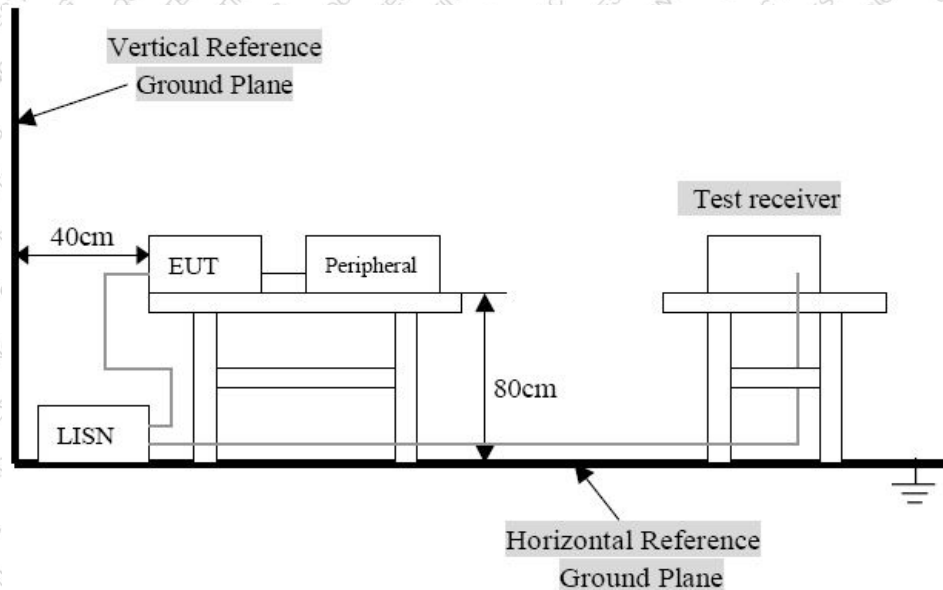
The setup of EUT is according with CISPR 16-1-1 and CISPR16-2-3 measurement procedure. The specification used was the EN 55032 limits.

The EUT was placed center and the back edge of the test table.

The AV cables were draped along the test table and bundled to 30-40cm in the middle.

The spacing between the peripherals was 10cm.

Maximum emission emitted from EUT was determined by manipulating the EUT, support equipment, interconnecting cables and varying the mode of operation and the levels in the final result of the test were recorded with the EUT running in the operating mode that maximum emission was emitted.



3.4 Instrument Setup

The test receiver was set with the following configurations:

Test Receiver Setting:

Frequency Range.....150 KHz to 30 MHz
 Detector.....Peak &Quasi-Peak& Average
 Sweep Speed.....Auto
 IF Band Width.....9 KHz

3.5 Test Procedure

During the conducted emission test, the EUT power cord was connected to the auxiliary outlet of the first Artificial Mains.

Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance using all installation combination.

All data was recorded in the peak detection mode. Quasi-peak and Average readings were only performed when an emission was found to be marginal (within -10 dB μ V of specification limits). Quasi-peak readings are distinguished with a "QP". Average readings are distinguished with a "AV".



3.6 Summary of Test Results

According to the data in section 3.6, the EUT complied with the EN 55032 Conducted margin, with the worst margin reading of:

3.7 Disturbance Voltage Test Data

Temperature (°C)	26
Humidity (%RH)	57
Barometric Pressure (kpa)	101
EUT	Digital Microscope
M/N	UM012CH
Operating Mode	ON

Test data see following pages

3.8 Test Equipment List and Details

No.	Equipment	Manufacturer	Model	Serial No.	Last Cal.	Cal.Due
1	EMI Test Receiver	R&S	ESIB 7	2277573376	2022.03.02	2023.03.01
2	Artificial Mains Network	SCHWARZBECK	NSLK8126	8126200	2022.03.02	2023.03.01
3	PULSE LIMITER	R&S	ESH3-Z2	100058	2022.03.02	2023.03.01

3.9 Test Result

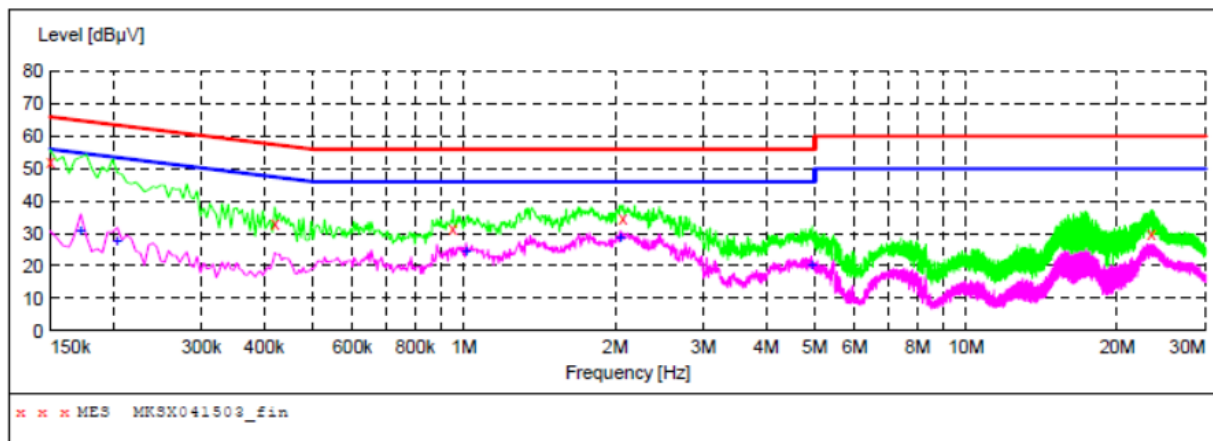
PASS



Conducted Emission Test Data

EUT:	Digital Microscope
M/N:	UM012CH
Operating Condition:	ON
Test Site:	Shielded Room
Operator:	Liao
Input Voltage:	AC 230V/50Hz
Comment:	Live Line
Condition of Test:	Temperature:26℃Humidity:57%

SCAN TABLE: "Voltage (9K-30M)FIN"
Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "MKSX041503_fin"

2022-4-15 14:40

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.150000	52.00	10.1	66	14.0	QP	L1	GND
0.420000	33.30	10.3	57	24.1	QP	L1	GND
0.951000	31.50	10.4	56	24.5	QP	L1	GND
2.076500	34.70	10.3	56	21.3	QP	L1	GND
23.384000	30.00	10.9	60	30.0	QP	L1	GND

MEASUREMENT RESULT: "MKSX041503_fin2"

2022-4-15 14:40

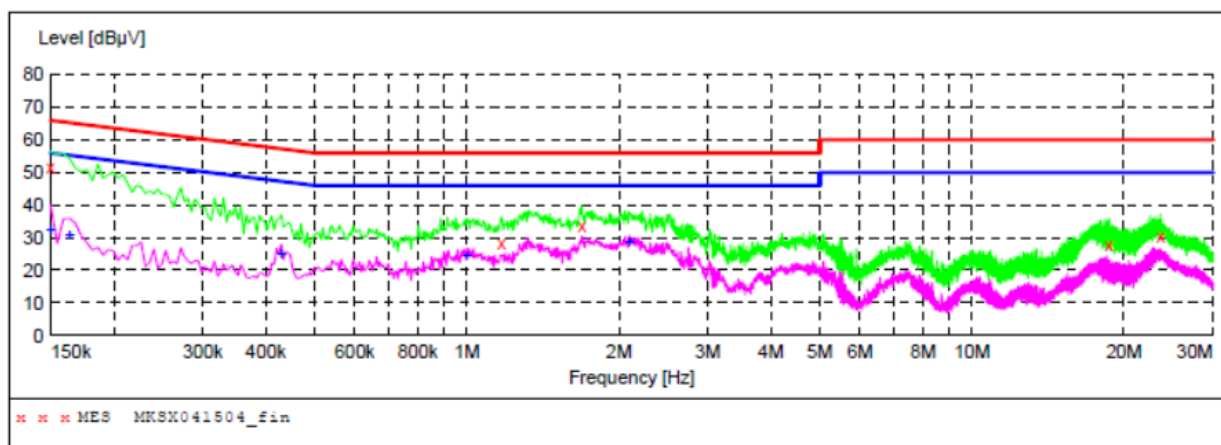
Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.172500	31.10	10.1	55	23.7	AV	L1	GND
0.204000	27.60	10.1	53	25.8	AV	L1	GND
1.009500	24.60	10.4	46	21.4	AV	L1	GND
2.049500	28.70	10.3	46	17.3	AV	L1	GND
4.925000	20.50	10.5	46	25.5	AV	L1	GND



Conducted Emission Test Data

EUT:	Digital Microscope
M/N:	UM012CH
Operating Condition:	ON
Test Site:	Shielded Room
Operator:	Liao
Input Voltage:	AC 230V/50Hz
Comment:	Neutral Line
Condition of Test:	Temperature:26°C Humidity:57%

SCAN TABLE: "Voltage (9K-30M)FIN"
Short Description: 150K-30M Voltage



MEASUREMENT RESULT: "MKSX041504_fin"

2022-4-15 14:43

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.150000	51.80	10.1	66	14.2	QP	N	GND
1.171500	28.60	10.4	56	27.4	QP	N	GND
1.689000	33.60	10.3	56	22.4	QP	N	GND
18.681500	28.00	10.7	60	32.0	QP	N	GND
23.609000	30.50	10.9	60	29.5	QP	N	GND

MEASUREMENT RESULT: "MKSX041504_fin2"

2022-4-15 14:43

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.150000	32.30	10.1	56	23.7	AV	N	GND
0.163500	30.90	10.1	55	24.4	AV	N	GND
0.429000	25.00	10.3	47	22.3	AV	N	GND
1.000500	24.50	10.4	46	21.5	AV	N	GND
2.099000	28.80	10.3	46	17.2	AV	N	GND

4- RADIATED DISTURBANCES

4.1 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement is 3.1dB.

4.2 Limit of Radiated Disturbances

(Class A)

Frequency(MHz)	Distance(Meters)	Field Strengths Limits(dBμV/m)
30 ~ 230	3	50
230 ~ 1000	3	57

Frequency(MHz)	Distance(Meters)	Field Strengths Limits(dBμV/m)	
		Average	Peak
1000~3000	3	56	76
3000 ~ 6000	3	60	80

(Class B)

Frequency(MHz)	Distance(Meters)	Field Strengths Limits(dBμV/m)
30 ~ 230	3	40
230 ~ 1000	3	47

Frequency (MHz)	Distance (Meters)	Field Strengths Limits (dBμV/m)	
		Average	Peak
1000 ~ 3000	3	50	70
3000 ~ 6000	3	54	74

Note: (1) The tighter limit shall apply at the edge between two frequency bands.

(2) Distance refers to the distance in meters between the test instrument antenna and the closest point of any part of the E.U.T.

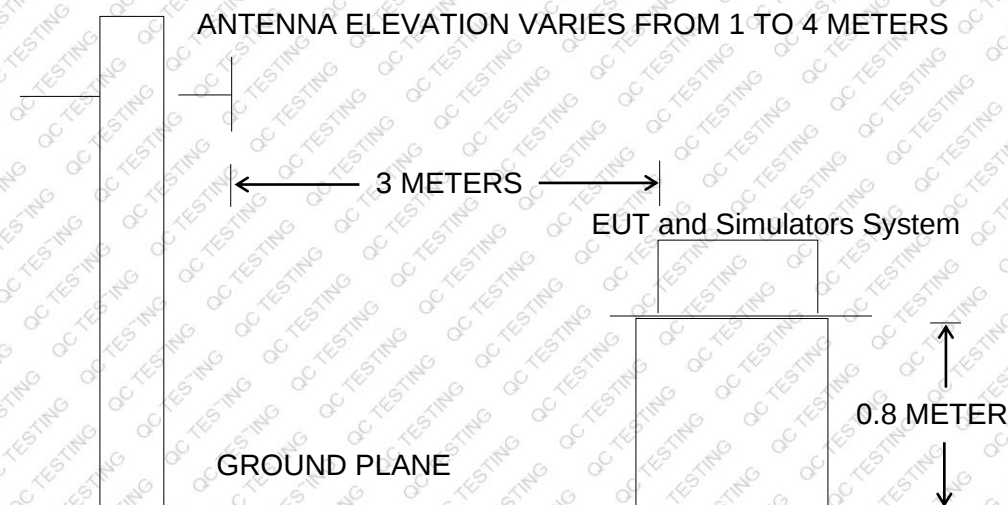
4.3 EUT Setup

The radiated emission tests were performed in the open area 3-meter test site, using the setup accordance with the CISPR 16-1-1 and CISPR16-2-3. The specification used was EN 55032 limits.

The EUT was placed on the center of the test table.

Maximum emission emitted from EUT was determined by manipulating the EUT, support equipment, interconnecting cables and varying the mode of operation and the levels in the final result of the test were recorded with the EUT running in the operating mode that maximum emission was emitted.

Block diagram of test setup (In chamber)



4.4 Test Receiver Setup

According to EN 55032 rules, the frequency was investigated from 30 to 6000MHz. During the radiated emission test, the test receiver was set with the following configurations:

Test Receiver Setting:

Detector.....	Peak & Quasi-Peak & Average
IF Band Width.....	120KHz/1MHz
Frequency Range.....	30MHz to 1000MHz/Above 1GHz
Turntable Rotated.....	0 to 360 degrees

Antenna Position:

Height.....	1m to 4m
Polarity.....	Horizontal and Vertical

4.5 Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

All data was recorded in the peak detection mode. Quasi-peak readings performed only when an emission was found to be marginal (within -10 dB μ V of specification limits), and are distinguished with a "QP" in the data table.



4.6 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Amplifier Gain}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB μ V means the emission is 7dB μ V below the maximum limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Corr. Ampl.}$$

4.7 Radiated Emissions Test Result

Temperature (°C)	26
Humidity (%RH)	54
Barometric Pressure (kpa)	101
EUT	Digital Microscope
M/N	UM012CH
Operating Mode	ON

4.8 Test Equipment List and Details

No.	Equipment	Manufacturer	Model	Serial No.	Last Cal.	Cal.Due
1	EMI Test Receiver	R&S	ESIB 7	2277573376	2022.03.02	2023.03.01
2	Spectrum analyzer	Agilent	N9020A	MY52134421	2022.03.02	2023.03.01
3	TRILOG Broadband Test-Antenna	SCHWARZBECK	VULB9168	VULB9168-588	2022.03.02	2023.03.01
4	horn antenna	SCHWARZBECK	BBHA9120D	2069	2022.03.02	2023.03.01
5	High-frequency amplifier	SCHWARZBECK	BBV9743	9743-137	2022.03.02	2023.03.01
6	Broadband Preamplifier	HPX	BP-01G-18G	210902	2022.03.02	2023.03.01

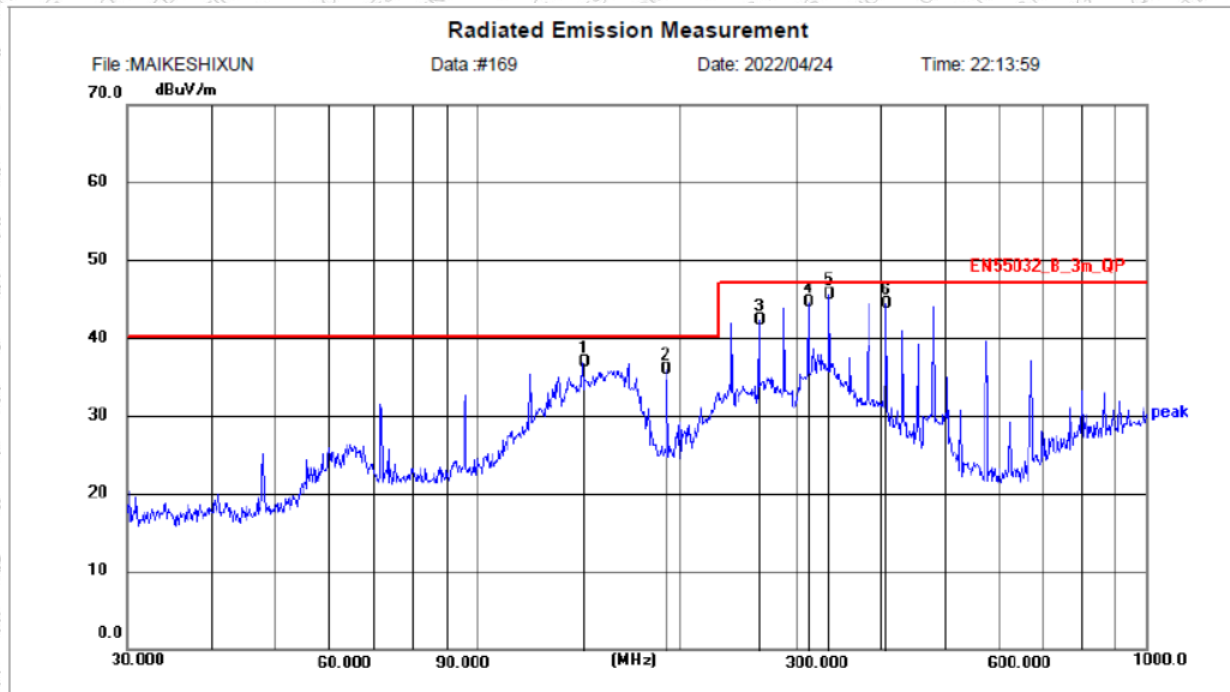
4.9 Test Result

PASS



Radiated Emission Test Data of Below 1GHz

EUT:	Digital Microscope
M/N:	UM012CH
Operating Condition:	ON
Test Site:	3m CHAMBER
Operator:	Liao
Input Voltage:	DC 5V
Comment:	Polarization: Horizontal
Condition of Test:	Temperature:26°C Humidity:54%



Site: 966 Chamber
Limit: EN55032_B_3m_QP

Polarization: **Horizontal**
Power: DC5V
Distance: 3m

Temperature: 26(C)
Humidity: 54 %

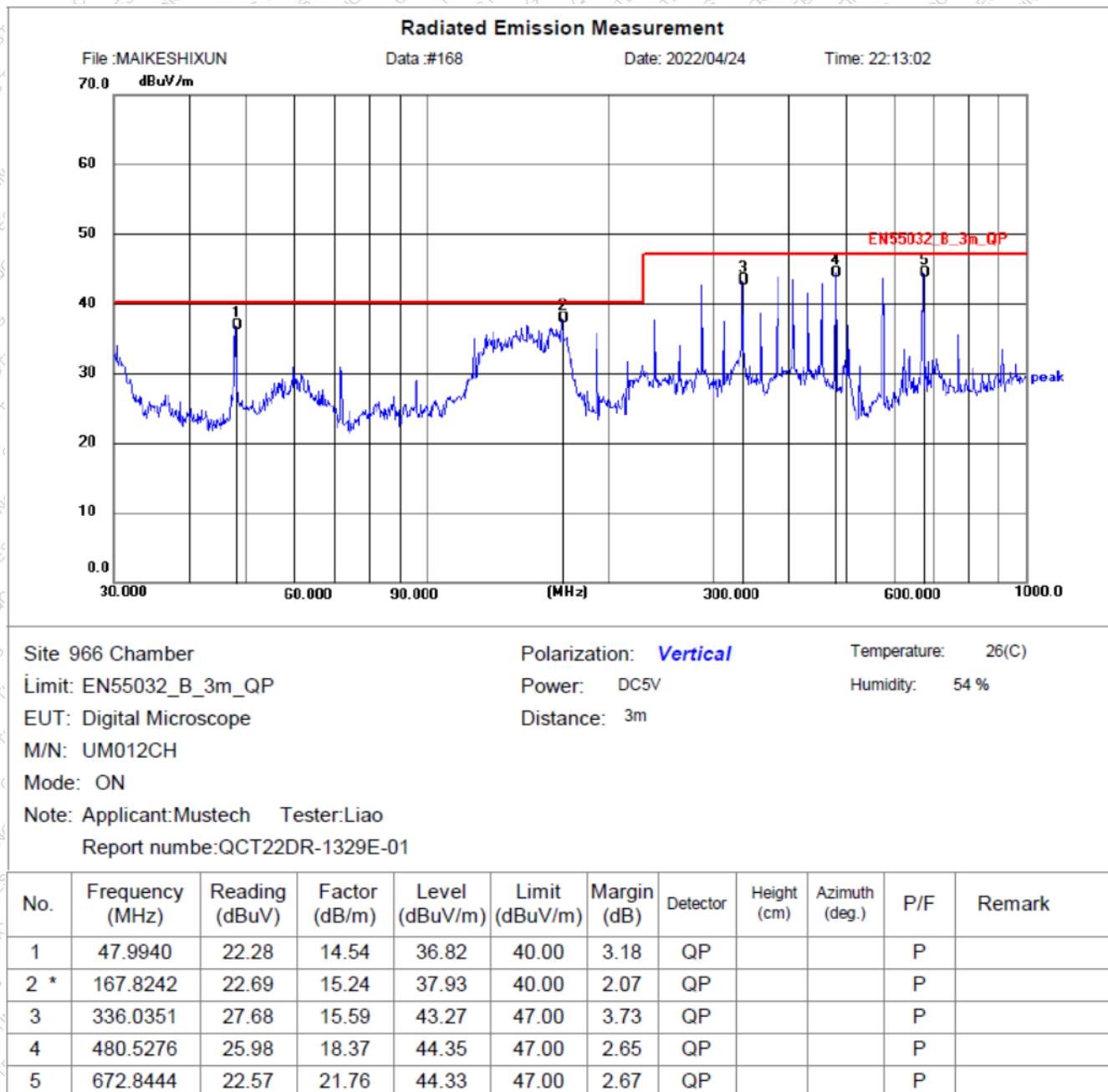
EUT: Digital Microscope
M/N: UM012CH
Mode: ON
Note: Applicant: Mustech Tester: Liao
Report numbe: QCT22DR-1329E-01

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	143.8293	22.17	14.66	36.83	40.00	3.17	QP			P	
2	191.7450	23.72	12.24	35.96	40.00	4.04	QP			P	
3	263.8190	28.37	13.81	42.18	47.00	4.82	QP			P	
4	312.1792	29.49	15.08	44.57	47.00	2.43	QP			P	
5 *	336.0350	30.01	15.59	45.60	47.00	1.40	QP			P	
6	408.9458	27.42	17.01	44.43	47.00	2.57	QP			P	



Radiated Emission Test Data of Below 1GHz

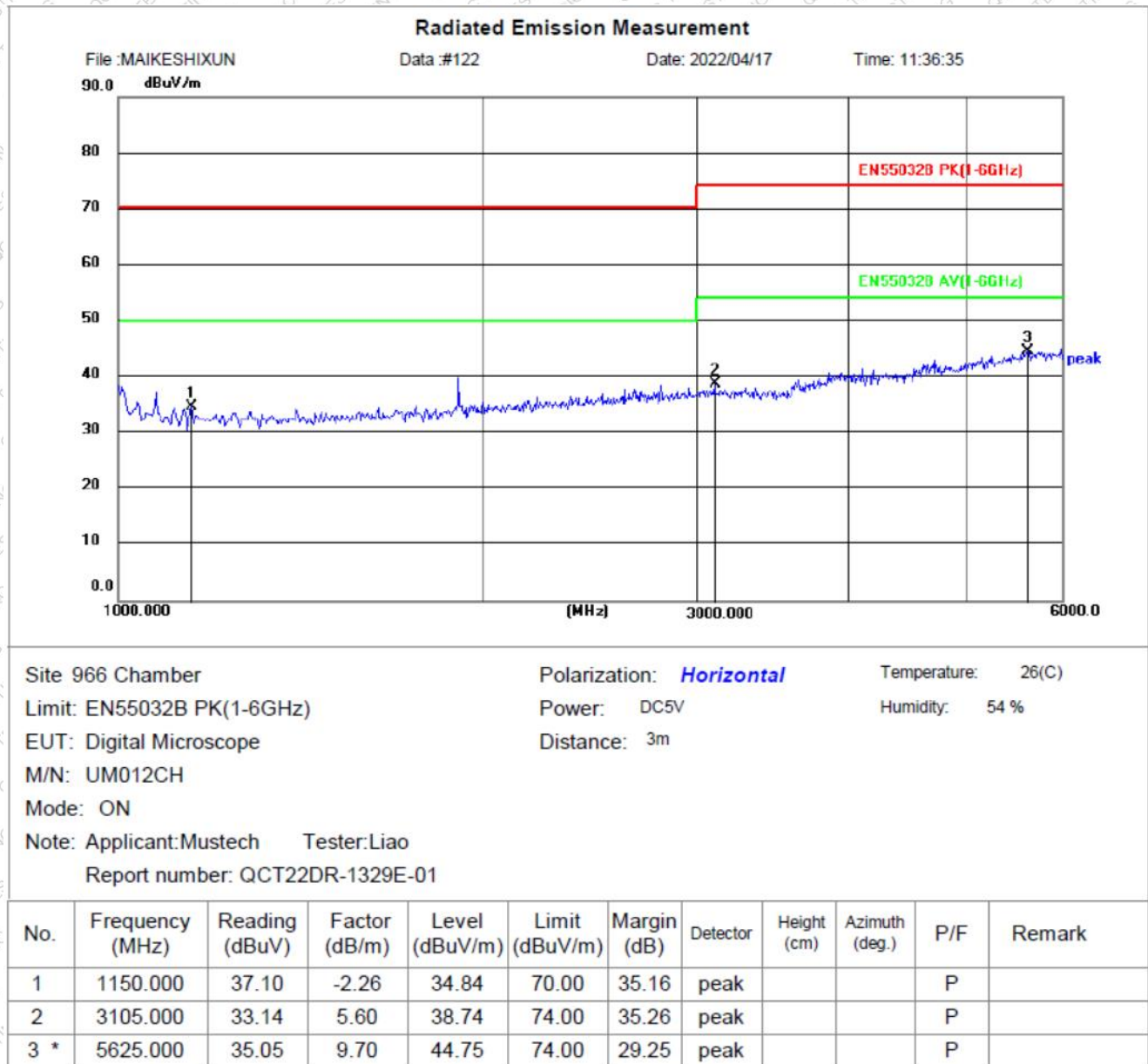
EUT:	Digital Microscope
M/N:	UM012CH
Operating Condition:	ON
Test Site:	3m CHAMBER
Operator:	Liao
Input Voltage:	DC 5V
Comment:	Polarization: Vertical
Condition of Test:	Temperature:26°C Humidity:54%





Radiated Emission Test Data of Above 1GHz

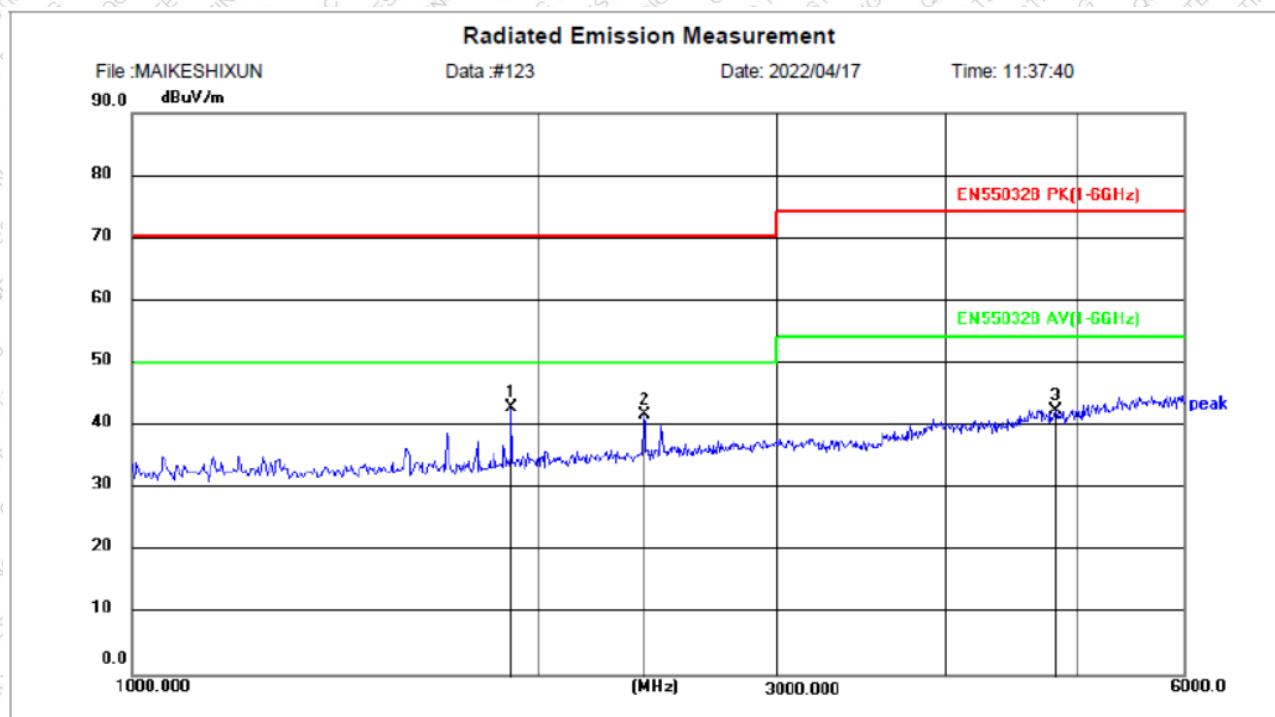
EUT:	Digital Microscope
M/N:	UM012CH
Operating Condition:	ON
Test Site:	3m CHAMBER
Operator:	Liao
Input Voltage:	DC 5V
Comment:	Polarization: Horizontal
Condition of Test:	Temperature:26°C Humidity:54%





Radiated Emission Test Data of Above 1GHz

EUT:	Digital Microscope
M/N:	UM012CH
Operating Condition:	ON
Test Site:	3m CHAMBER
Operator:	Liao
Input Voltage:	DC 5V
Comment:	Polarization: Vertical
Condition of Test:	Temperature:26°C Humidity:54%



Site: 966 Chamber

Limit: EN55032B PK(1-6GHz)

EUT: Digital Microscope

M/N: UM012CH

Mode: ON

Note: Applicant: Mustech Tester: Liao

Report number: QCT22DR-1329E-01

Polarization: **Vertical**

Power: DC5V

Distance: 3m

Temperature: 26(C)

Humidity: 54 %

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1 *	1910.000	42.31	0.49	42.80	70.00	27.20	peak			P	
2	2395.000	39.01	2.77	41.78	70.00	28.22	peak			P	
3	4825.000	34.73	7.76	42.49	74.00	31.51	peak			P	



5 - HARMONIC CURRENT TEST (EN 61000-3-2)

5.1 Application of Harmonic Current Emission

Compliance to these standards ensures that tested equipment will not generate harmonic currents at levels that cause unacceptable degradation of the main environment. This directly contributes to meeting compatibility levels established in other EMC standards, which defines compatibility levels for low-frequency conducted disturbances in low-voltage supply systems.

5.2 Measurement Data

Note: For detailed test data, refer to the following pages:

Standard used:	EN IEC 61000-3-2:2019+A1:2021 Quasi-stationary - Equipment class A
Observation time:	150s
E. U. T.:	Digital Microscope
M/N	UM012CH
Operation Mode	ON

5.3 Test Results

Pass

5.4 Test Equipment List and Details

No.	Equipment	Manufacturer	Model	Serial No.	Last Cal.	Cal.Due
1	SIGNAL CONDITIONING UNIT	SCHAFFNER	CCN 1000-1	72336	2022.03.02	2023.03.01
2	NSG 1007 5KVA AC POWER SOURCE	TESEQ	5001IX- 400-413- SCH	59534	2022.03.02	2023.03.01



Harmonics – Class-A per IEC 61000-3-2:2018/AMD1:2020(Run time)

EUT: Digital Microscope M/N:UM012CH
Test category: Class-A (European limits)

Test date: 2022/4/29

Start time: 16:08:36

Test duration (min): 2.5

Data file name: H-000247.cts_data

Comment: ON

Customer: Mustech

Tested by: Liao

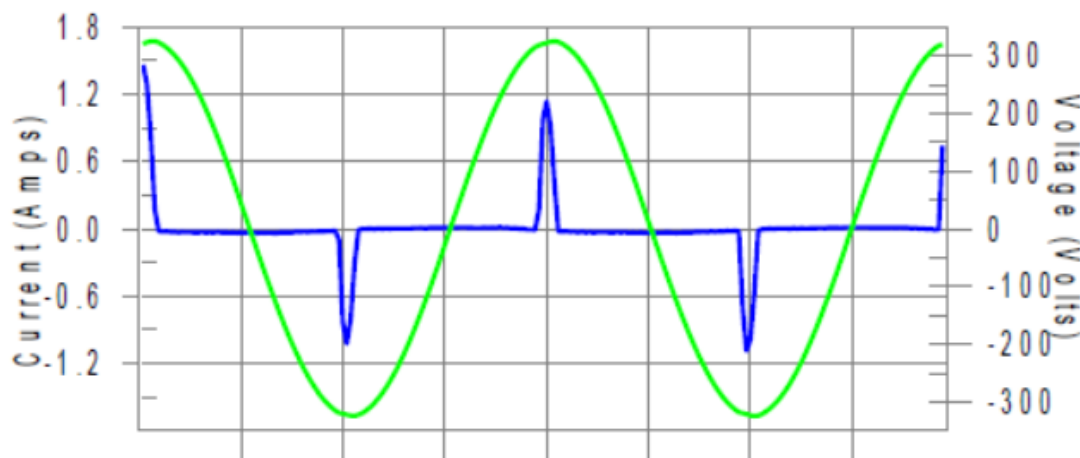
Test Margin: 100

End time: 16:11:17

Test Result: Pass

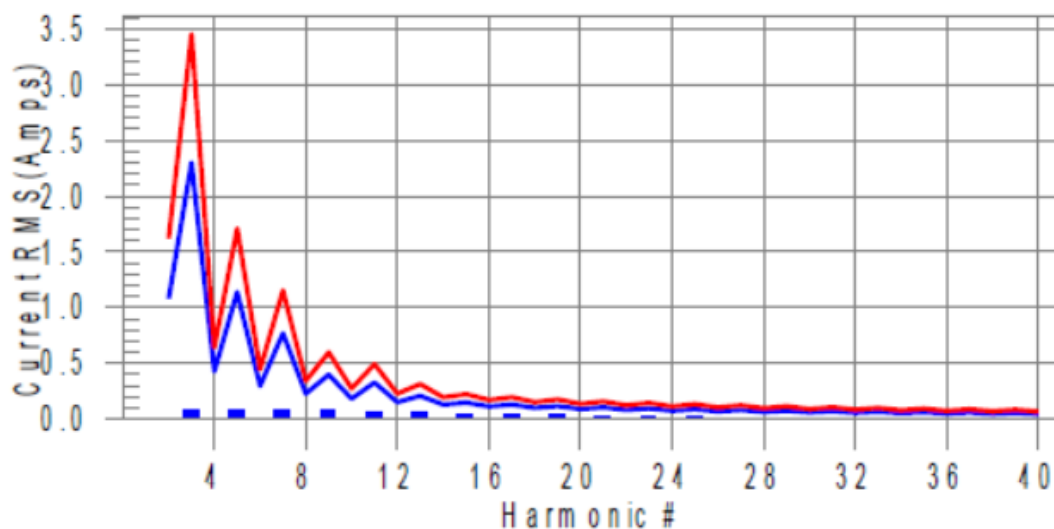
Source qualification: Normal

Current & voltage waveforms



Harmonics and Class A limit line

European Limits



Test result: Pass Worst harmonics H15-24.5% of 150% limit, H15-35.3% of 100% limit



Current Test Result Summary (Run time)

EUT: Digital Microscope M/N:UM012CH

Tested by: Liao

Test category: Class-A (European limits)

Test Margin: 100

Test date: 2022/4/29

Start time: 16:08:36

End time: 16:11:17

Test duration (min): 2.5

Data file name: H-000247.cts_data

Comment: ON

Customer: Mustech

Test Result: Pass

Source qualification: Normal

THC(A): 0.208

I-THD(%): 219.0

POHC(A): 0.046

POHC Limit(A): 0.251

Highest parameter values during test:

V_RMS (Volts): 229.62

Frequency(Hz): 50.00

I_Peak (Amps): 1.461

I_RMS (Amps): 0.270

I_Fund (Amps): 0.095

Crest Factor: 6.130

Power (Watts): 21.0

Power Factor: 0.389

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.014	1.080	1.3	0.016	1.620	1.0	Pass
3	0.085	2.300	3.7	0.090	3.450	2.6	Pass
4	0.014	0.430	3.2	0.015	0.645	2.4	Pass
5	0.082	1.140	7.2	0.087	1.710	5.1	Pass
6	0.013	0.300	4.4	0.014	0.450	3.2	Pass
7	0.078	0.770	10.1	0.083	1.155	7.2	Pass
8	0.013	0.230	5.4	0.013	0.345	3.9	Pass
9	0.073	0.400	18.2	0.077	0.600	12.8	Pass
10	0.012	0.184	6.3	0.012	0.276	4.5	Pass
11	0.067	0.330	20.3	0.070	0.495	14.2	Pass
12	0.011	0.153	6.9	0.011	0.230	4.9	Pass
13	0.060	0.210	28.6	0.063	0.315	20.0	Pass
14	0.010	0.131	7.3	0.010	0.197	5.2	Pass
15	0.053	0.150	35.3	0.055	0.225	24.5	Pass
16	0.009	0.115	7.4	0.009	0.173	5.3	Pass
17	0.045	0.132	34.4	0.047	0.198	23.7	Pass
18	0.007	0.102	7.3	0.008	0.153	5.2	Pass
19	0.038	0.118	32.0	0.039	0.178	21.9	Pass
20	0.007	0.092	7.1	0.007	0.138	5.1	Pass
21	0.030	0.107	28.5	0.031	0.161	19.3	Pass
22	0.006	0.084	6.8	0.006	0.125	4.8	Pass
23	0.024	0.098	24.1	0.024	0.147	16.2	Pass
24	0.005	0.077	6.5	0.005	0.115	4.7	Pass
25	0.017	0.090	19.1	0.018	0.135	13.0	Pass
26	0.004	0.071	N/A	0.005	0.107	N/A	Pass
27	0.012	0.083	13.9	0.012	0.125	9.7	Pass
28	0.004	0.066	N/A	0.004	0.099	N/A	Pass
29	0.007	0.078	9.0	0.007	0.116	6.4	Pass
30	0.004	0.061	N/A	0.004	0.092	N/A	Pass
31	0.004	0.073	N/A	0.004	0.109	N/A	Pass
32	0.004	0.058	N/A	0.004	0.086	N/A	Pass
33	0.003	0.068	N/A	0.004	0.102	N/A	Pass
34	0.003	0.054	N/A	0.004	0.081	N/A	Pass
35	0.004	0.064	N/A	0.005	0.096	N/A	Pass
36	0.003	0.051	N/A	0.004	0.077	N/A	Pass
37	0.005	0.061	9.0	0.006	0.091	6.9	Pass
38	0.003	0.048	N/A	0.003	0.073	N/A	Pass
39	0.006	0.058	10.7	0.007	0.087	7.9	Pass
40	0.003	0.046	N/A	0.003	0.069	N/A	Pass



Voltage Source Verification Data (Run time)

EUT: Digital Microscope M/N:UM012CH

Tested by: Liao

Test category: Class-A (European limits)

Test Margin: 100

Test date: 2022/4/29

Start time: 16:08:36

End time: 16:11:17

Test duration (min): 2.5

Data file name: H-000247.cts_data

Comment: ON

Customer: Mustech

Test Result: Pass

Source qualification: Normal

Highest parameter values during test:

Voltage (Vrms): 229.62

Frequency(Hz): 50.00

I_Peak (Amps): 1.461

I_RMS (Amps): 0.270

I_Fund (Amps): 0.095

Crest Factor: 6.130

Power (Watts): 21.0

Power Factor: 0.389

Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.088	0.459	19.14	OK
3	0.679	2.066	32.84	OK
4	0.082	0.459	17.87	OK
5	0.121	0.918	13.15	OK
6	0.032	0.459	6.89	OK
7	0.166	0.689	24.05	OK
8	0.034	0.459	7.32	OK
9	0.107	0.459	23.26	OK
10	0.038	0.459	8.17	OK
11	0.182	0.230	79.45	OK
12	0.035	0.230	15.37	OK
13	0.143	0.230	62.45	OK
14	0.028	0.230	12.08	OK
15	0.142	0.230	61.79	OK
16	0.022	0.230	9.79	OK
17	0.116	0.230	50.43	OK
18	0.025	0.230	10.80	OK
19	0.093	0.230	40.32	OK
20	0.025	0.230	11.03	OK
21	0.078	0.230	34.13	OK
22	0.013	0.230	5.78	OK
23	0.055	0.230	24.03	OK
24	0.013	0.230	5.82	OK
25	0.042	0.230	18.33	OK
26	0.012	0.230	5.17	OK
27	0.027	0.230	11.72	OK
28	0.012	0.230	5.10	OK
29	0.018	0.230	7.83	OK
30	0.010	0.230	4.26	OK
31	0.010	0.230	4.40	OK
32	0.009	0.230	3.94	OK
33	0.011	0.230	4.60	OK
34	0.009	0.230	3.87	OK
35	0.011	0.230	4.98	OK
36	0.008	0.230	3.41	OK
37	0.014	0.230	5.98	OK
38	0.008	0.230	3.41	OK
39	0.013	0.230	5.86	OK
40	0.009	0.230	3.75	OK



6 - VOLTAGE FLUCTUATIONS AND FLICKER TEST (EN 61000-3-3)

6.1 Application of Voltage Fluctuations and Flicker Test

Compliance to these standards ensures that tested equipment will not generate flickers and voltage change at levels that cause unacceptable degradation of the main environment. This directly contributes to meeting compatibility levels established in other EMC standards, which defines compatibility levels for low-frequency conducted disturbances in low-voltage supply systems.

6.2 Measurement Data

Note: For detailed test data, refer to the following pages:

Standard used:	EN/IEC 61000-3-3 Flicker
Short time (Pst):	10 min
Observation time:	10 min (1 Flicker measurement)
E. U. T.:	Digital Microscope
M/N	UM012CH
Operation Mode	ON

6.3 Test Results

Pass

6.4 Test Equipment List and Details

No.	Equipment	Manufacturer	Model	Serial No.	Last Cal.	Cal.Due
1	SIGNAL CONDITIONING UNIT	SCHAFFNER	CCN 1000-1	72336	2022.03.02	2023.03.01
2	NSG 1007 5KVA AC POWER SOURCE	TESEQ	5001IX- 400-413- SCH	59534	2022.03.02	2023.03.01



Flicker Test Summary per IEC61000-3-3:2013/AMD1:2017 (Run time)

EUT: Digital Microscope M/N:UM012CH

Tested by: Liao

Test category: All parameters (European limits)

Test Margin: 100

Test date: 2022/4/29

Start time: 16:12:51

End time: 16:23:18

Test duration (min): 10

Data file name: F-000248.cts_data

Comment: ON

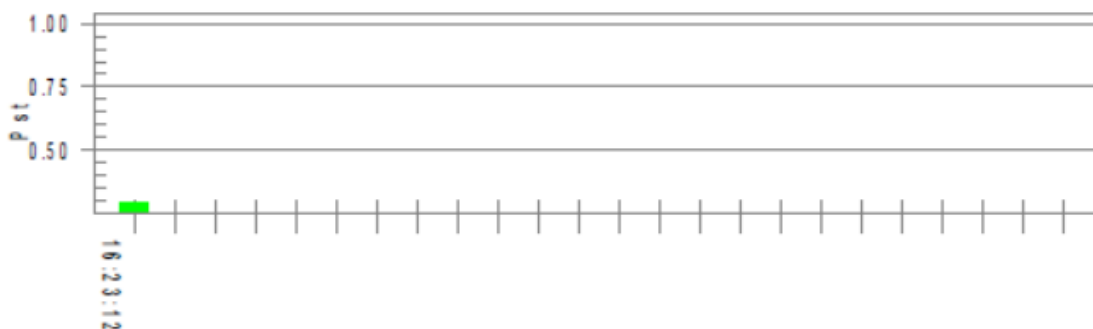
Customer: Mustech

Test Result: Pass

Status: Test Completed

Pst_i and limit line

European Limits



Plt and limit line



Parameter values recorded during the test:

Vrms at the end of test (Volt): 229.50

Highest dt (%):

0

T-max (mS):

Highest dc (%):

0.00

Highest dmax (%):

0.00

Highest Pst (10 min. period):

0.288

Highest Plt (2 hr. period):

0.126

Test limit (%):

Test limit (mS):

500.0

Pass

Test limit (%):

3.30

Pass

Test limit (%):

7.00

Pass

Test limit:

1.000

Pass

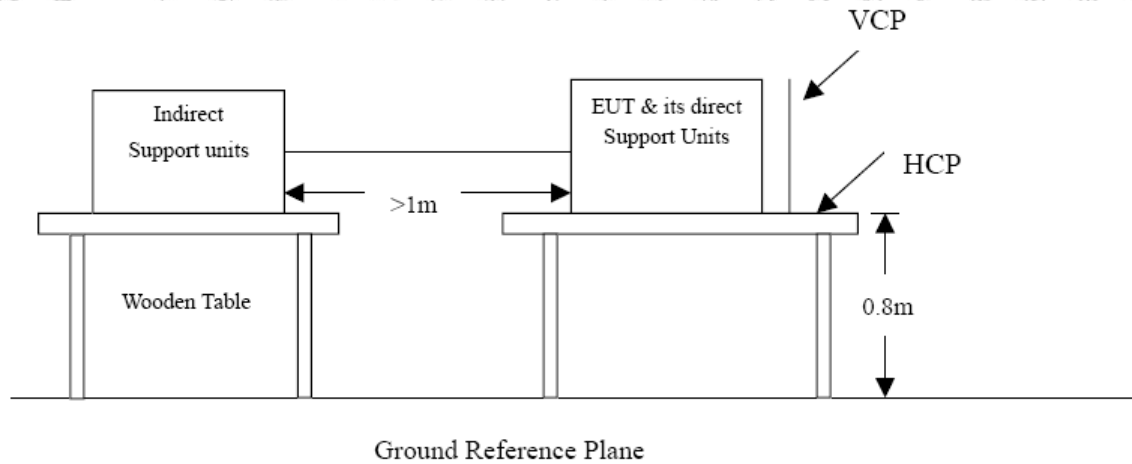
Test limit:

0.650

Pass

7 - Electrostatic Discharge immunity Test (IEC 61000-4-2)

7.1 Block Diagram of Test Setup



7.2 Test Standard

EN 55035:2017+A11:2020 (IEC 61000-4-2:2008, Severity Level 3 / Air Discharge: $\pm 8\text{KV}$; Level 2 / Contact Discharge: $\pm 4\text{KV}$)

7.3 Severity Levels and Performance Criterion

7.3.1 Severity level

Level	Test Voltage Contact Discharge (KV)	Test Voltage Air Discharge (KV)
1.	± 2	± 2
2.	± 4	± 4
3.	± 6	± 8
4.	± 8	± 15
X	Special	Special

7.3.2 Performance criterion: B

7.4 Operating Condition of EUT

7.4.1 Setup the EUT as shown on Section 7.1.

7.4.2 Turn on the power of all equipments.

7.4.3 Let the EUT work in measuring mode (**ON**) and measure it.



7.5 Test Procedure

7.5.1 Air Discharge:

This test is done on a non-conductive surface. The round discharge tip of the discharge electrode shall be approached as fast as possible to touch the EUT. After each discharge, the discharge electrode shall be removed from the EUT. The generator is then re-triggered for a new single discharge and repeated 10 times for each pre-selected test point. This procedure shall be repeated until all the air discharge completed.

7.5.2 Contact Discharge:

All the procedure shall be same as Section 7.5.1. Except that the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

7.5.3 Indirect discharge for horizontal coupling plane

At least 10 single discharges (in the most sensitive polarity) shall be applied at the front edge of each HCP opposite the center point of each unit (if applicable) of the EUT and 0.1m from the front of the EUT. The long axis of the discharge electrode shall be in the plane of the HCP and perpendicular to its front edge during the discharge.

7.5.4 Indirect discharge for vertical coupling plane

At least 10 single discharge (in the most sensitive polarity) shall be applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m X 0.5m, is placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges shall be applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.

7.6 Test Equipment List and Details

No.	Equipment	Manufacturer	Model	Serial No.	Last Cal.	Cal.Due
1	Electrostatic Discharge Generator	SCHAFFNER	NSG438	785	2022.03.04	2023.03.03

7.7 Test Results

PASS

Please refer to the following pages

Temperature (°C)	26
Humidity (%RH)	54
Barometric Pressure (kpa)	101
EUT	Digital Microscope
M/N	UM012CH
Operating Mode	ON



Table 1: Electrostatic Discharge Immunity (Air Discharge)

IEC 61000-4-2 Test Points	Test Levels and Results									
	-2 kV	+2 kV	-4 kV	+4 kV	-6 kV	+6 kV	-8 kV	+8 kV	-15 kV	+15 kV
Shell	Pass	Pass	Pass	Pass	/	/	Pass	Pass	/	/
Gap	Pass	Pass	Pass	Pass	/	/	Pass	Pass	/	/
Camera	Pass	Pass	Pass	Pass	/	/	Pass	Pass	/	/
Others	Pass	Pass	Pass	Pass	/	/	Pass	Pass	/	/

Table 2: Electrostatic Discharge Immunity (Direct Contact)

IEC 61000-4-2 Test Points	Test Levels and Results									
	-2 kV	+2 kV	-4 kV	+4 kV	-6 kV	+6 kV	-8 kV	+8 kV	-15 kV	+15 kV
USB Port	Pass	Pass	Pass	Pass	/	/	/	/	/	/
Others	Pass	Pass	Pass	Pass	/	/	/	/	/	/

Table 3: Electrostatic Discharge Immunity (Indirect Contact HCP)

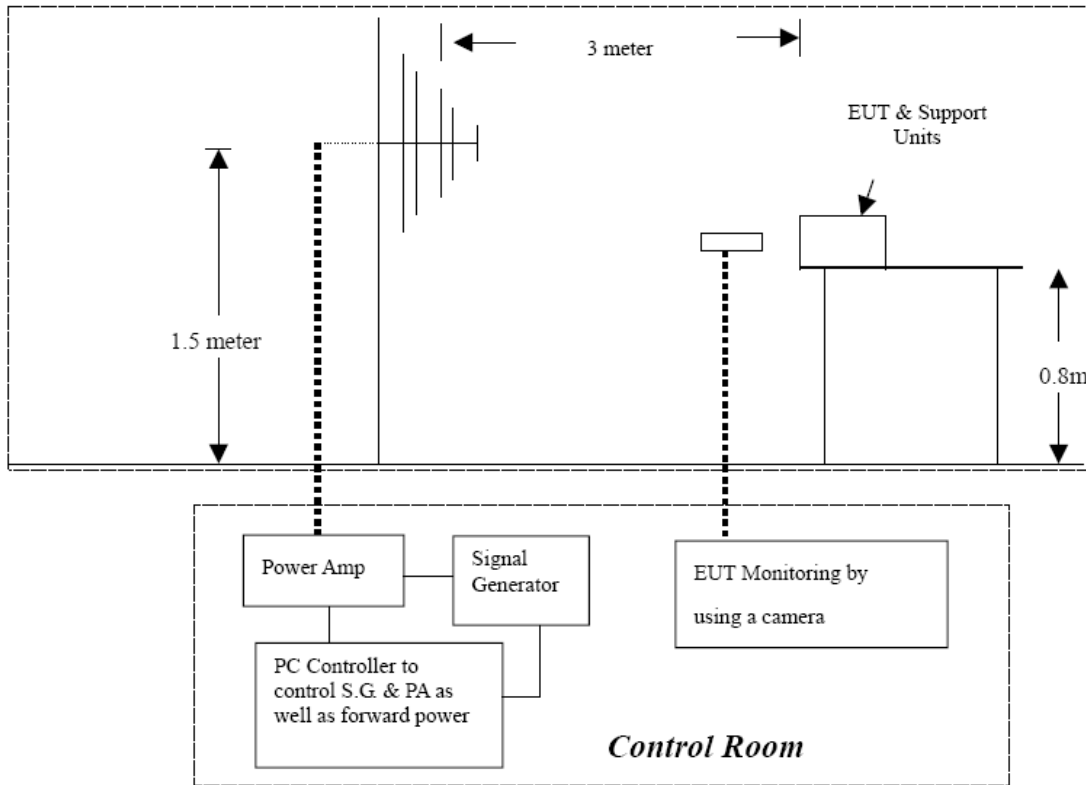
IEC 61000-4-2 Test Points	Test Levels and Results									
	-2 kV	+2 kV	-4 kV	+4 kV	-6 kV	+6 kV	-8 kV	+8 kV	-15 kV	+15 kV
Front Side	Pass	Pass	Pass	Pass	/	/	/	/	/	/
Back Side	Pass	Pass	Pass	Pass	/	/	/	/	/	/
Left Side	Pass	Pass	Pass	Pass	/	/	/	/	/	/
Right Side	Pass	Pass	Pass	Pass	/	/	/	/	/	/

Table 4: Electrostatic Discharge Immunity (Indirect Contact VCP)

IEC 61000-4-2 Test Points	Test Levels and Results									
	-2 kV	+2 kV	-4 kV	+4 kV	-6 kV	+6 kV	-8 kV	+8 kV	-15 kV	+15 kV
Front Side	Pass	Pass	Pass	Pass	/	/	/	/	/	/
Back Side	Pass	Pass	Pass	Pass	/	/	/	/	/	/
Left Side	Pass	Pass	Pass	Pass	/	/	/	/	/	/
Right Side	Pass	Pass	Pass	Pass	/	/	/	/	/	/

8 - RF Field Strength susceptibility TEST (IEC 61000-4-3)

8.1 Block Diagram of Test



8.2 Test Standard

EN 55035:2017+A11:2020(IEC 61000-4-3:2006+A1:2007+A2:2010, Severity Level 2:3V/m)

8.3 Severity Levels and Performance Criterion

8.3.1 Severity Levels

Level	Field Strength V/m
1.	1
2.	3
3.	10
X	Special

8.3.2 Performance Criterion: B

8.4 Operating Condition of EUT

8.4.1 Setup the EUT as shown on Section 8.1.

8.4.2 Turn on the power of all equipments.

8.4.3 Let the EUT work in measuring mode (ON) and measure it.



8.5 Test Procedure

The EUT are placed on a table which is 0.8 meter high above the ground. The EUT is set 3 meters away from the transmitting antenna which is mounted on an antenna tower. Both horizontal and vertical polarization of the antenna are set on test. Each of the four sides of the EUT must be faced this transmitting antenna and measured individually.

In order to judge the EUT performance, a CCD camera is used to monitor its screen.

All the scanning conditions are as following:

Condition of Test	Remark
1. Fielded Strength	3V/m (Severity Level 2)
2. Radiated Signal	Modulated
3. Scanning Frequency	80MHz-1000MHz, 1800MHz, 2600MHz, 3500MHz, 5000MHz
4. Sweep time of radiated	0.0015 Decade/s
5. Dwell Time	1 Sec.

8.6 Test Equipment List and Details

No.	Equipment	Manufacturer	Model	Serial No.	Last Cal.	Cal.Due
1	Power Meter	Agilent	E4419B	MY45102 879	2022.03.02	2023.03.01
2	Signal Generator	Agilent	E4428C	MY49070 124	2022.03.02	2023.03.01
3	Radio Frequency Power Amplifier	Ophir	5245F	1594320	2022.03.02	2023.03.01
4	Radio Frequency Power Amplifier	Ophir	5227-002F	1594321	2022.03.02	2023.03.01
5	Power Antenna	SCHWARZBEC K	BBHA912 0 J	BBHA912 0 J 143	2022.03.02	2023.03.01
6	Power Antenna	SCHWARZBEC K	E9128ES	9128ES- 3066	2022.03.02	2023.03.01
7	Directional Coupler	Ophir	CI0117-12	112349	2022.03.02	2023.03.01



8.7 Test Results

PASS

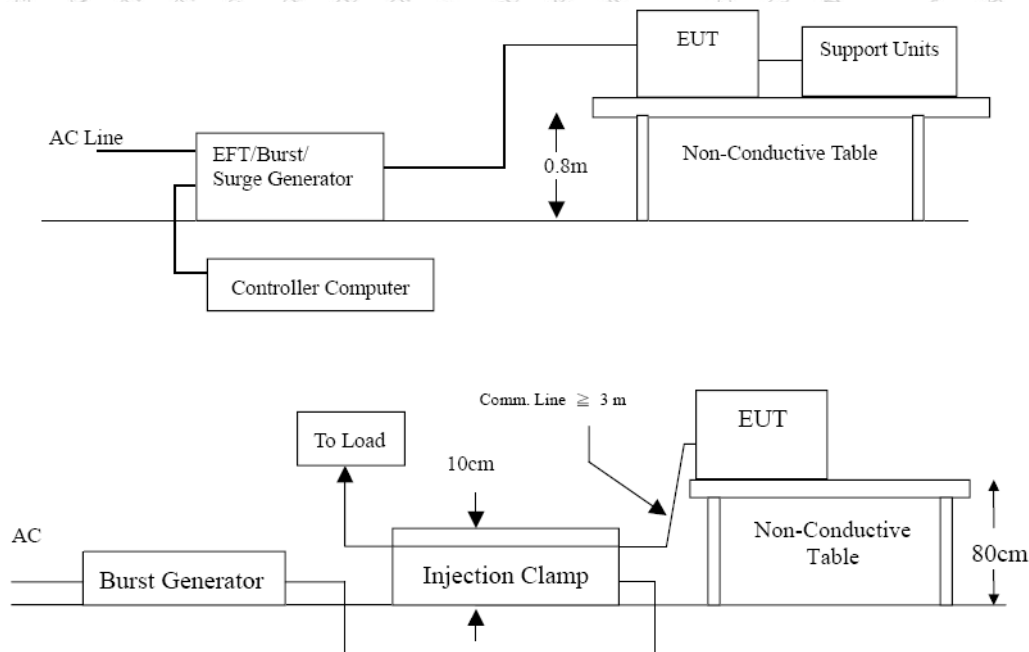
Please refer to the following page.

Temperature (°C)	26
Humidity (%RH)	53
Barometric Pressure (kpa)	101
EUT	Digital Microscope
M/N	UM012CH
Operating Mode	ON

Frequency Range (MHz)	Test Levels and Result							
	Front (3 V/m)		Rear (3 V/m)		Left Side (3 V/m)		Right Side (3 V/m)	
	VERT	HORI	VERT	HORI	VERT	HORI	VERT	HORI
80-1000	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
1800	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
2600	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
3500	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
5000	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass

9 – Electrical Fast Transient/Burst Immunity Test (IEC 61000-4-4)

9.1 Block Diagram of Test Setup



9.2 Test Standard

EN 55035:2017+A11:2020 (IEC 61000-4-4:2012, Severity Level 2: $\pm 1\text{KV}$)

9.3 Severity Levels and Performance Criterion

9.3.1 Severity level

Level	Open Circuit Output Test Voltage $\pm 10\%$	
	On Power Supply Lines	On I/O (Input/Output) Signal data and control lines
1.	$\pm 0.5\text{ KV}$	$\pm 0.25\text{ KV}$
2.	$\pm 1\text{ KV}$	$\pm 0.5\text{ KV}$
3.	$\pm 2\text{ KV}$	$\pm 1\text{ KV}$
4.	$\pm 4\text{ KV}$	$\pm 2\text{ KV}$
X	Special	Special

9.3.2 Performance criterion: B

9.4 Operating Condition of EUT

9.4.1 Setup the EUT as shown in Section 9.1.

9.4.2 Turn on the power of all equipments.

9.4.3 Let the EUT work in test mode (**ON**) and measure it.



9.5 Test Procedure

The EUT is put on the table which is 0.8 meter high above the ground. This reference ground plane shall project beyond the EUT by at least 0.1m on all sides and the minimum distance between EUT and all other conductive structure, except the ground plane beneath the EUT, shall be more than 0.5m.

9.5.1 For input and output AC power ports:
It's unnecessary to test

9.5.2 For signal lines and control lines ports:
It's unnecessary to test.

9.5.3 For AC Input line ports:

The EUT is connected to the AC power mains by using a coupling device which couples the EFT interference signal to AC power lines. Both polarities of the test voltage should be applied during compliance test and the duration of the test is 2 mins.

9.6 Test Equipment List and Details

No.	Equipment	Manufacturer	Model	Serial No.	Last Cal.	Cal.Due
1	EMC Comprehensive Tester	SCHAFFNER	BEST EMC V2.7	200234-010SC	2022.03.02	2023.03.01

9.7 Test Result

PASS

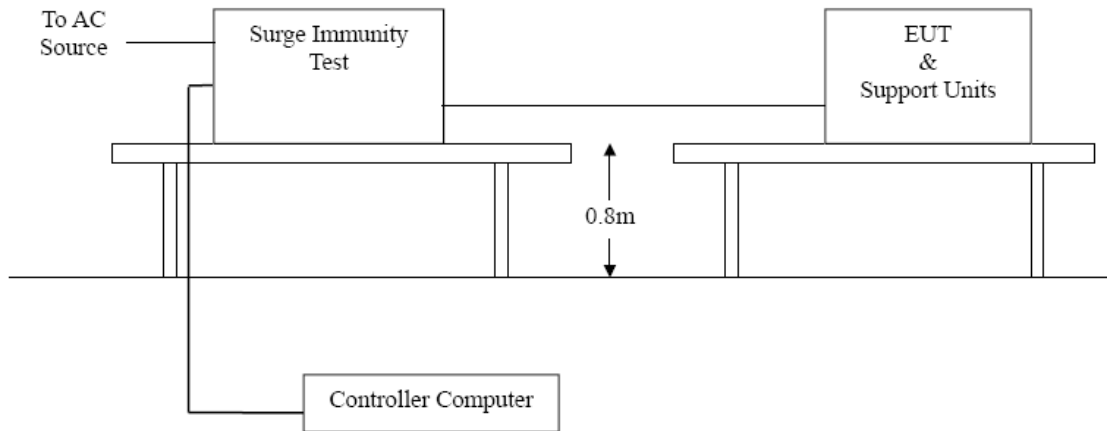
Please refer to the following page.

Temperature (°C)	26
Humidity (%RH)	53
Barometric Pressure (kpa)	101
EUT	Digital Microscope
M/N	UM012CH
Operating Mode	ON

IEC 61000-4-4		Test Levels (kV) and Results							
Test Points		+0.5	-0.5	+1.0	-1.0	+2.0	-2.0	+4.0	-4.0
Power Supply Power Line of EUT	L	/	/	PASS	PASS	/	/	/	/
	N	/	/	PASS	PASS	/	/	/	/
	L+N	/	/	PASS	PASS	/	/	/	/
	PE	/	/	PASS	PASS	/	/	/	/
	L+PE	/	/	PASS	PASS	/	/	/	/
	N+PE	/	/	PASS	PASS	/	/	/	/
	L+N+PE	/	/	PASS	PASS	/	/	/	/
Signal Port		/	/	/	/	/	/	/	/

10 - Surge Immunity Test (IEC 61000-4-5)

10.1 Block Diagram of Test Setup



10.2 Test Standard

EN 55035:2017+A11:2020 (IEC 61000-4-5:2014+A1:2017, Severity Level: Line to Line/Level 2: $\pm 1\text{KV}$, Severity Level: Line to PE/Level 3: $\pm 2\text{KV}$)

10.3 Severity Levels and Performance Criterion

10.3.1 Severity level

Severity Level	Open-Circuit Test Voltage KV
1	± 0.5
2	± 1.0
3	± 2.0
4	± 4.0
*	Special

10.3.2 Performance criterion: B

10.4 Operating Condition of EUT

10.4.1 Setup the EUT as shown in Section 10.1.

10.4.2 Turn on the power of all equipments.

10.4.3 Let the EUT work in test mode (ON) and measure it.

10.5 Test Procedure

- 1) Set up the EUT and test generator as shown on Section 10.1.
- 2) For DC port coupling mode, provide a 1 KV 1.2/50us voltage surge (at open-circuit condition) and 8/20us current surge to EUT selected points.
- 3) At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate are conducted during test.
- 4) Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.



10.6 Test Equipment List and Details

No.	Equipment	Manufacturer	Model	Serial No.	Last Cal.	Cal.Due
1	EMC Comprehensive Tester	SCHAFFNER	BEST EMC V2.7	200234-010SC	2022.03.02	2023.03.01

10.7 Test Result

PASS

Please refer to the following page.

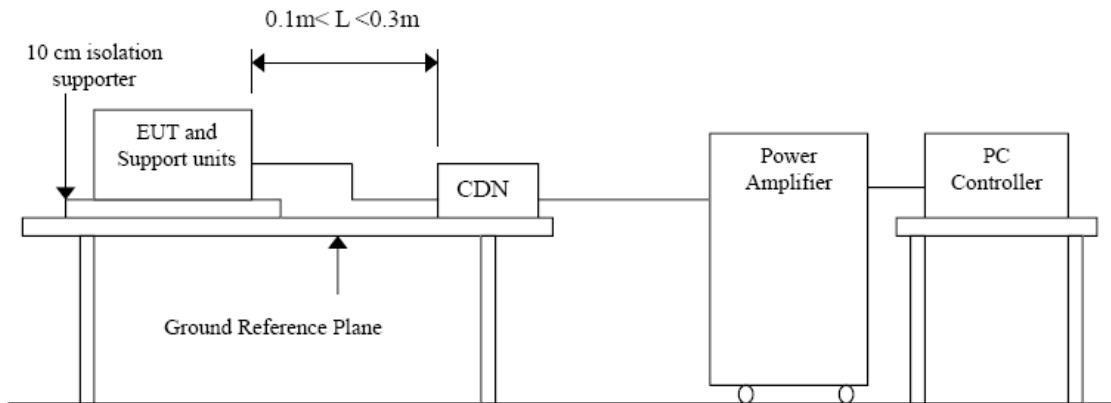
Temperature (°C)	26
Humidity (%RH)	53
Barometric Pressure (kpa)	101
EUT	Digital Microscope
M/N	UM012CH
Operating Mode	ON

Path	Phase	Test Levels (kV) and Results							
		+0.5	-0.5	+1.0	-1.0	+2.0	-2.0	+4.0	-4.0
L-N	0°	/	/	/	/	/	/	/	/
	90°	/	/	PASS	/	/	/	/	/
	180°	/	/	/	/	/	/	/	/
	270°	/	/	/	PASS	/	/	/	/
L-PE	0°	/	/	/	/	/	/	/	/
	90°	/	/	/	/	PASS	/	/	/
	180°	/	/	/	/	/	/	/	/
	270°	/	/	/	/	/	PASS	/	/
N-PE	0°	/	/	/	/	/	/	/	/
	90°	/	/	/	/	PASS	/	/	/
	180°	/	/	/	/	/	/	/	/
	270°	/	/	/	/	/	PASS	/	/
DC Supply	P-N	/	/	/	/	/	/	/	/
	P-PE	/	/	/	/	/	/	/	/
	N-PE	/	/	/	/	/	/	/	/
Signal Port	Line-PE	/	/	/	/	/	/	/	/

Note: P-N (Positive-Negative)

11- Conducted Susceptibility Test (IEC 61000-4-6)

11.1 Block Diagram of Test Setup



11.2 Test Standard

EN 55035:2017+A11:2020 (IEC 61000-4-6:2013, Severity Level 2: 3V (rms)).(0.15MHz ~ 80MHz)

11.3 Severity Levels and Performance Criterion

11.3.1 Severity level

Level	Field Strength V(rms)
1.	1
2.	3
3.	10
X	Special

11.3.2 Performance criterion: A

11.4 Operating Condition of EUT

11.4.1 Setup the EUT as shown in Section 11.1.

11.4.2 Turn on the power of all equipments.

11.4.3 Let the EUT work in test mode (**ON**) and measure it.

11.5 Test Procedure

11.5.1 For DC Mains
It's unnecessary to test.

11.5.2 For signal lines and control lines ports:
It's unnecessary to test.



11.5.3 For AC Input line ports:

- 1) Set up the EUT, CDN and test generators as shown on Section 11.1.
- 2) Let the EUT work in test mode and measure it.
- 3) The EUT are placed on an insulating support 0.1m high above a ground reference plane. CDN (coupling and decoupling network) is placed on the ground plane about 0.3m from EUT. Cables between CDN and EUT are as short as possible, and their height above the ground reference plane shall be between 30 and 50 mm (where possible).
- 4) The disturbance signal described below is injected to EUT through CDN.
- 5) The EUT operates within its operational mode(s) under intended climatic conditions after power on.
- 6) The frequency range is swept from 150KHz to 80MHz using 3V signal level, and with the disturbance signal 80% amplitude modulated with a 1KHz sine wave.
- 7) The rate of sweep shall not exceed 1.5×10^{-3} decades/s. Where the frequency is swept incrementally, the step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value.

Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

11.6 Test Equipment List and Details

No.	Equipment	Manufacturer	Model	Serial No.	Last Cal.	Cal.Due
1	Signal Generator	IFR	2024	112261/113	2022.03.02	2023.03.01
2	Power Amplifier	AR	75A250	302944	2022.03.02	2023.03.01
3	CDN	LIONCEL	CDN-M2	CDNM2160160201	2022.03.02	2023.03.01
4	CDN	LIONCEL	CDN-M3	CDNM3160170401	2022.03.02	2023.03.01
5	6dB Attenuator	Bird	75-A-MFN-06	0051504	2022.03.02	2023.03.01



11.7 Test Results

PASS

Please refer to the following page.

Frequency Range (MHz):0.15~80MHz

Modulation: Amplitude 80%, 1kHz sinewave

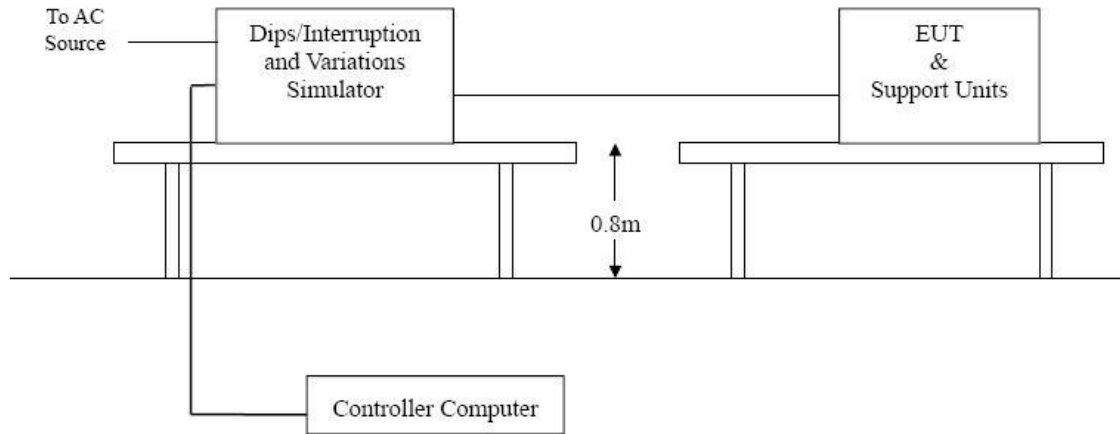
Severity Level: 1~3Vr.m.s.

Temperature (°C)	26
Humidity (%RH)	54
Barometric Pressure (kpa)	101
EUT	Digital Microscope
M/N	UM012CH
Operating Mode	ON

Frequency Range (MHz)	Test Point	Test levels and Test Results		
		Voltage Level(e.m.f.)	Criterion	Results
0.15~10	AC Mains	3 V	A	Pass
10~30	AC Mains	3 V to 1 V	A	Pass
30~80	AC Mains	1 V	A	Pass
0.15-80	Signal Line	/	/	/

12 - Voltage Dips, Short Interruptions Immunity Tests (IEC 61000-4-11)

12.1 Block Diagram of Test Setup



12.2 Test Standard

EN 55035:2017+A11:2020 (IEC 61000-4-11:2004+A1:2017)

12.3 Severity Levels and Performance Criterion

12.3.1 Severity level

Test Level %UT	Voltage dip and short interruptions %UT	Duration (in period)
0	100	0.5
40	60	1
70	30	5
		10
		25
		50
		*

12.3.2 Performance criterion: B&C

12.4 EUT Configuration

The configuration of EUT is listed in Section 12.1.

12.5 Operating Condition of EUT

12.5.1 Turn on the power of all equipments.

12.5.2 Let the EUT work in test mode (ON) and measure it.

12.6 Test Procedure

- 1) Set up the EUT and test generator as shown on Section 12.1.
- 2) The interruption is introduced at selected phase angles with specified duration.
- 3) Record any degradation of performance.

12.7 Test Equipment List and Details

No.	Equipment	Manufacturer	Model	Serial No.	Last Cal.	Cal.Due
1	EMC Comprehensive Tester	SCHAFFNER	BEST EMC V2.7	200234-010SC	2022.03.02	2023.03.01

12.8 Test Result

PASS

Please refer to the following page.

Temperature (°C)	26
Humidity (%RH)	53
Barometric Pressure (kpa)	101
EUT	Digital Microscope
M/N	UM012CH
Operating Mode	ON

Item	Voltage dips in % UT	Test level in % UT	Durations for voltage dips	Phase Angle	No.	Criterion	Result
1	100	0	0.5 cycle	0°/90°/180°/270°	3	B	Pass
2	30	70	25 cycle	0°/90°/180°/270°	3	C	Pass
3	100	0	250 cycle	0°/90°/180°/270°	3	C	Pass

Note:

- A. The apparatus shall continue to operate as intended during and after the test. The manufacturer specifies some minimum performance level. The performance level may be specified by the manufacturer as a permissible loss of performance.
- B. The apparatus shall continue to operate as intended after the test. This indicates that the EUT does not need to function at normal performance levels during the test, but must recover. Again some minimal performance is defined by the manufacture. No change in operating state or loss or data is permitted.
- C. Temporary loss of function is allowed. Operation of the EUT may stop as long as it is either automatically reset or can be manually restored by operation of the controls.

13 - TEST RESULTS

The following tests were performed on the **Mustech Electronics Co.,Ltd.** product; model: **UM012CH** ; the actual test results are contained within the Test Data section of this report.

13.1 IEC 61000-4-2 Electrostatic Discharge Immunity Test Configuration

The EUT was subjected to the electrostatic discharge tests required by EN 55035 and all lower levels specified in IEC 61000-4-2.

The EUT continued to perform as intended during and after the application of the ESD. Test setup photographs presented in Appendix B.

13.2 IEC 61000-4-3 Radiated Susceptibility Test Configuration

The EUT was subjected to a 3-volt/meter, 80% Amplitude, 1 kHz Sine wave field as required by EN 55035 and all lower levels specified in IEC 61000-4-3.

The EUT continued to perform as intended during and after the application of the electromagnetic field. Test setup photographs presented in Appendix B.

13.3 IEC 61000-4-4 Electrical Fast Transient/Burst Immunity Test Configuration

The EUT was subjected to the electrical fast transient tests required by EN 55035 and all lower levels specified in IEC 61000-4-4.

The EUT continued to perform as intended during and after the application of the EFT/B. Test setup photographs presented in Appendix B.

13.4 IEC 61000-4-5 Surge Immunity Test Configuration

The EUT was subjected to the Surge Immunity tests required by EN 55035 and all lower levels specified in IEC 61000-4-5.

The EUT continued to perform as intended during and after the application of the Surge Immunity Test. Test setup photographs presented in Appendix B.

13.5 IEC 61000-4-6 Conducted Susceptibility Test Configuration

The EUT was subjected to the Conducted Susceptibility tests required by EN 55035 and all lower levels specified in IEC 61000-4-6.

The EUT continued to perform as intended during and after the application of the Conducted Susceptibility Test. Test setup photographs presented in Appendix B.

13.6 IEC 61000-4-11 Voltage Dips, Short Interruptions Immunity Tests Configuration

The EUT was subjected to the Voltage Dips/Interruptions tests required by EN 55035 and all lower levels specified in IEC 61000-4-11.

The EUT continued to perform as intended during and after the application of the Voltage Dips/Interruptions Test. Test setup photographs presented in Appendix B.

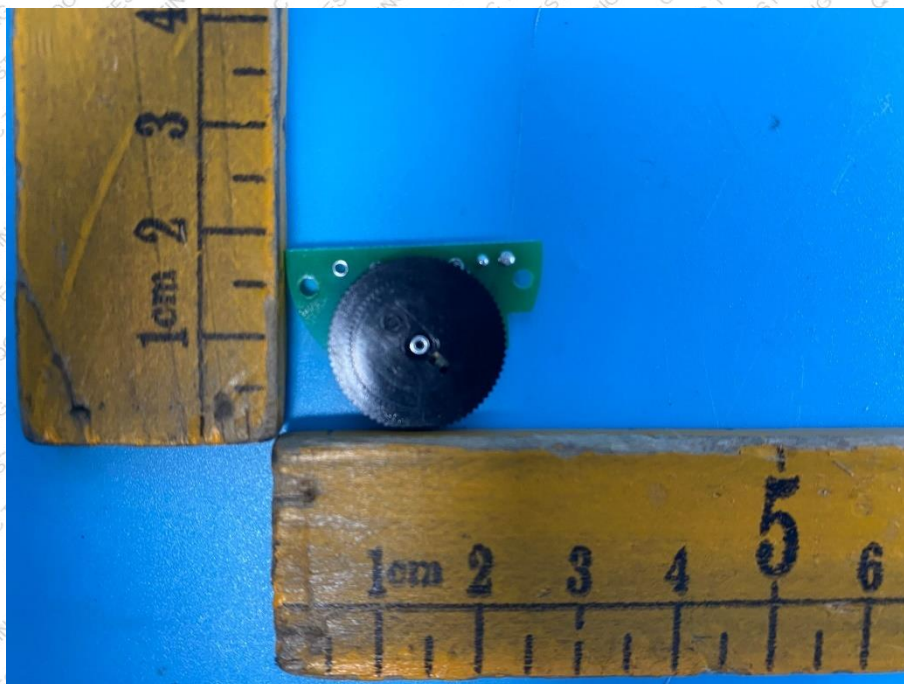


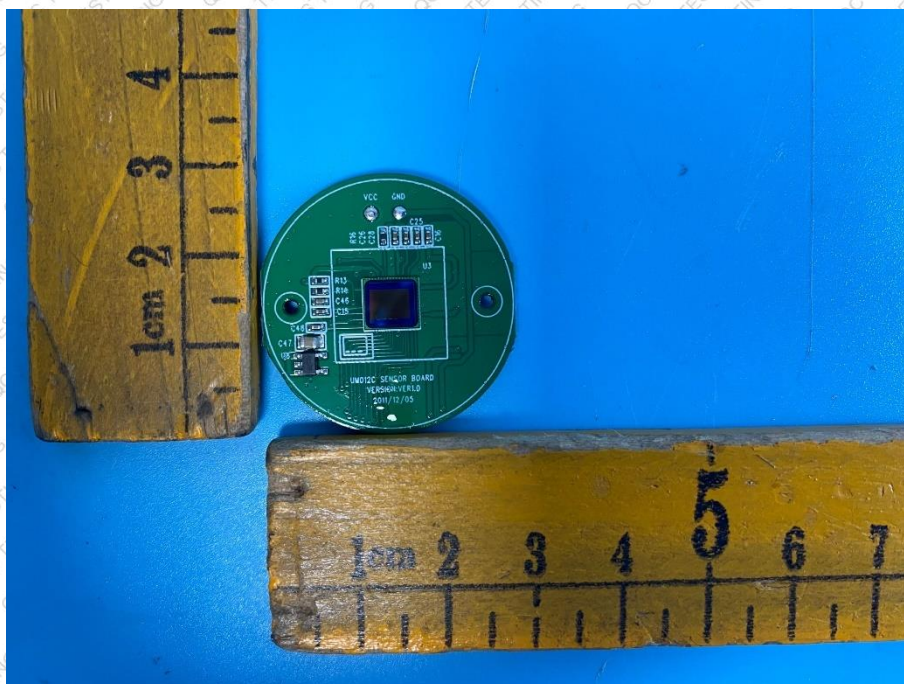
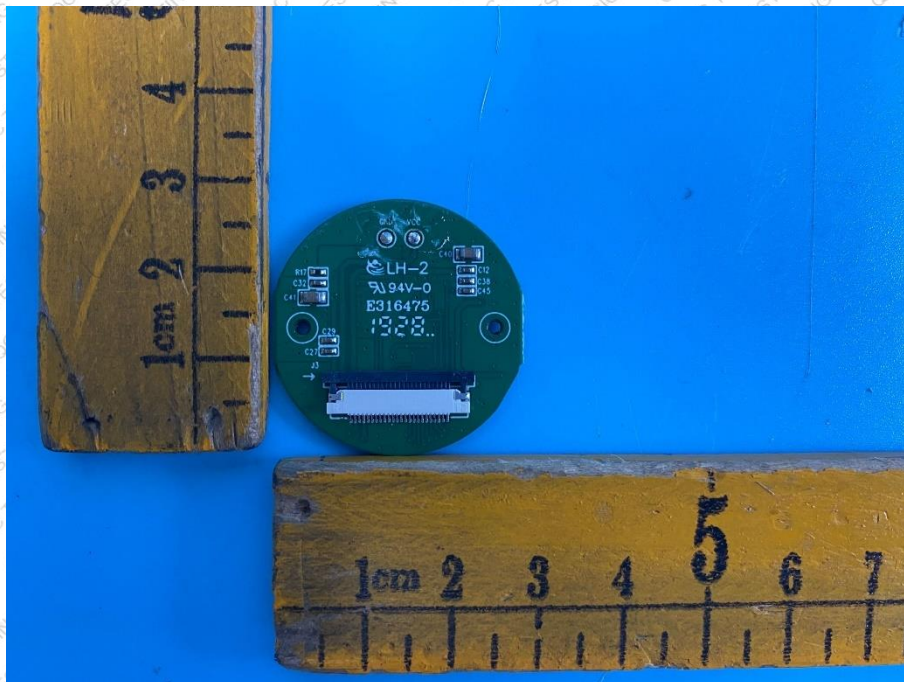
APPENDIX A - EUT PHOTOGRAPHS

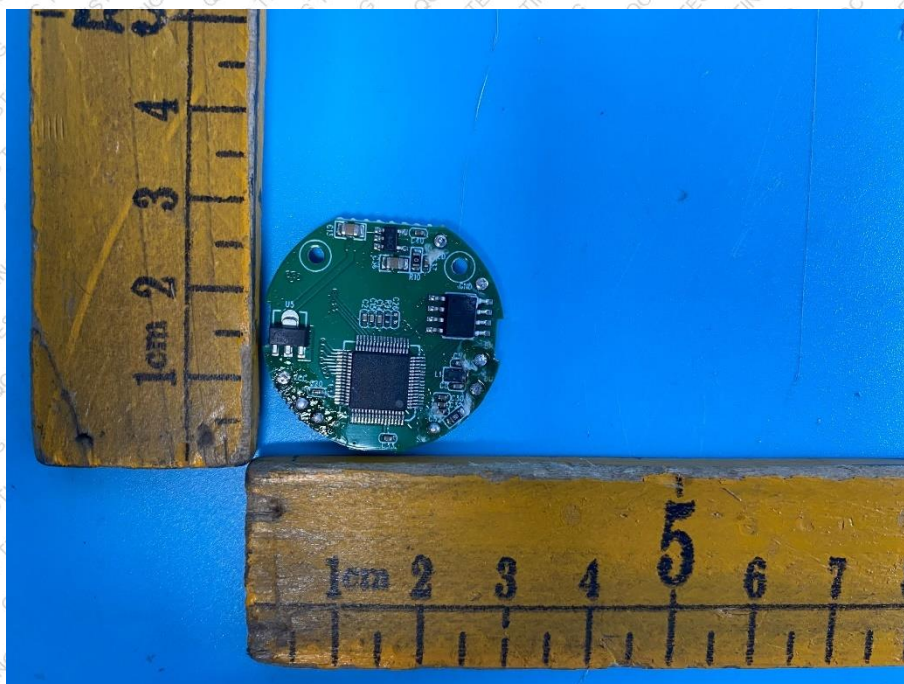
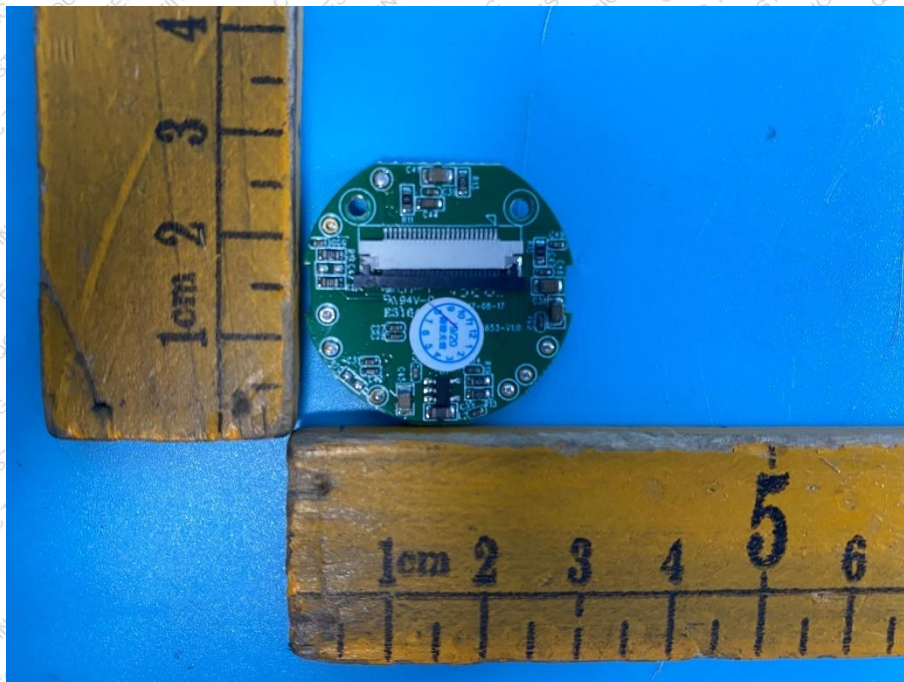






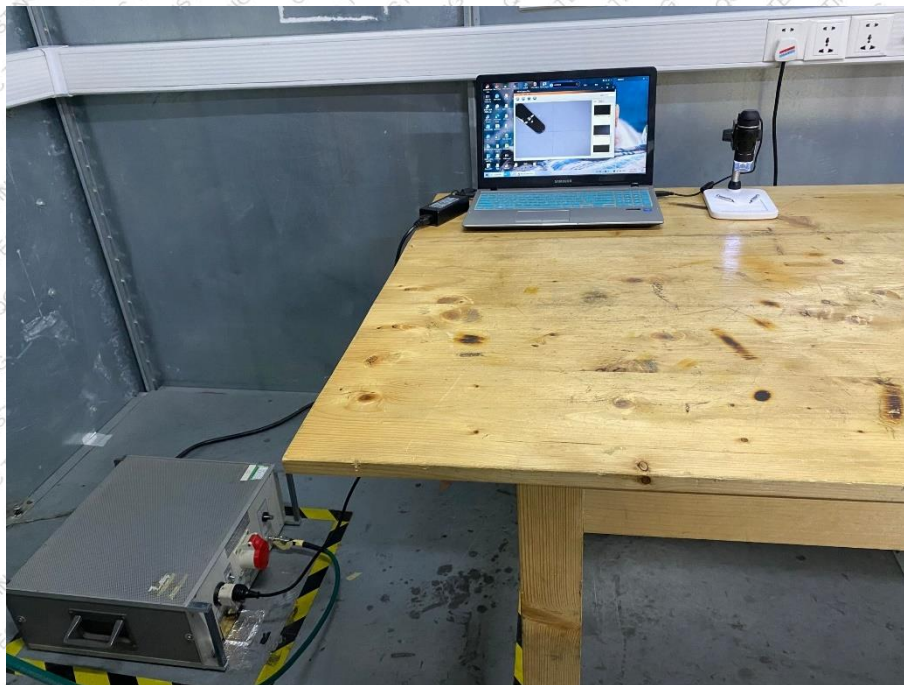




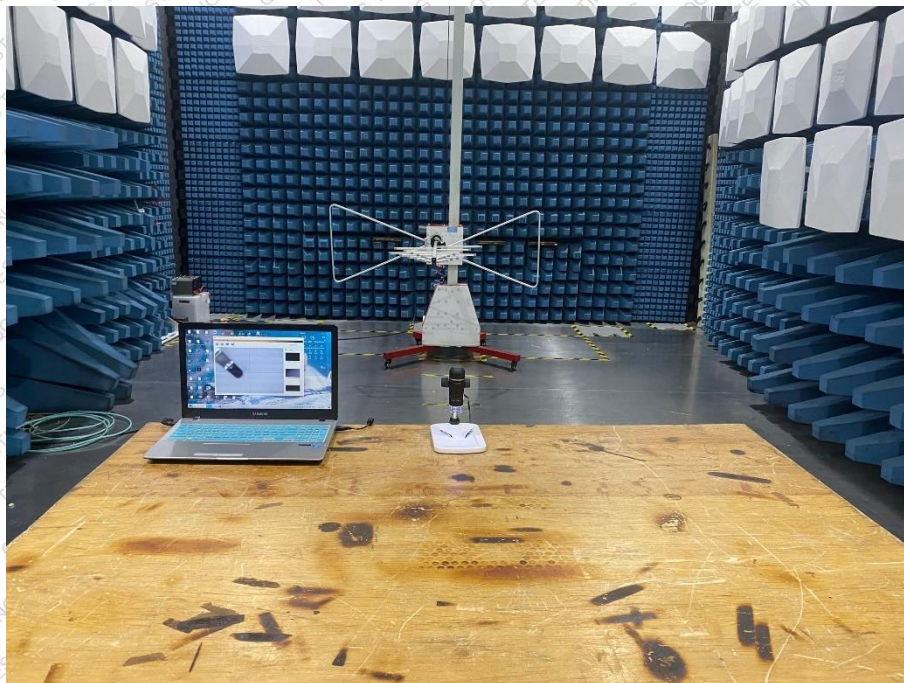


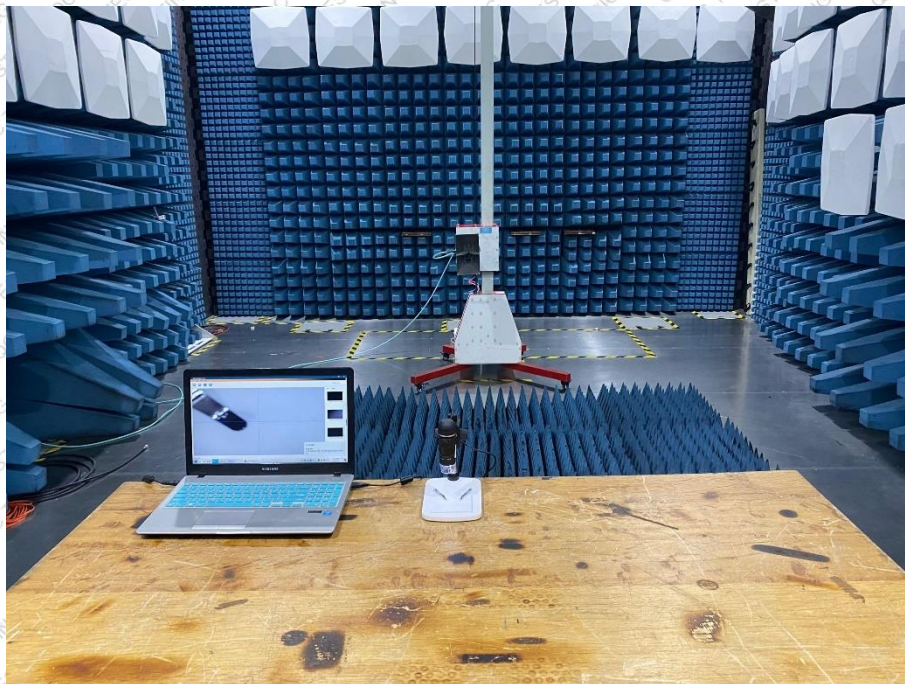
APPENDIX B- TEST SETUP PHOTOGRAPHS

Conducted Emission



Radiated Emission





Harmonic Current Test/ Voltage Fluctuations and Flicker Test (EN 61000-3-2/3)



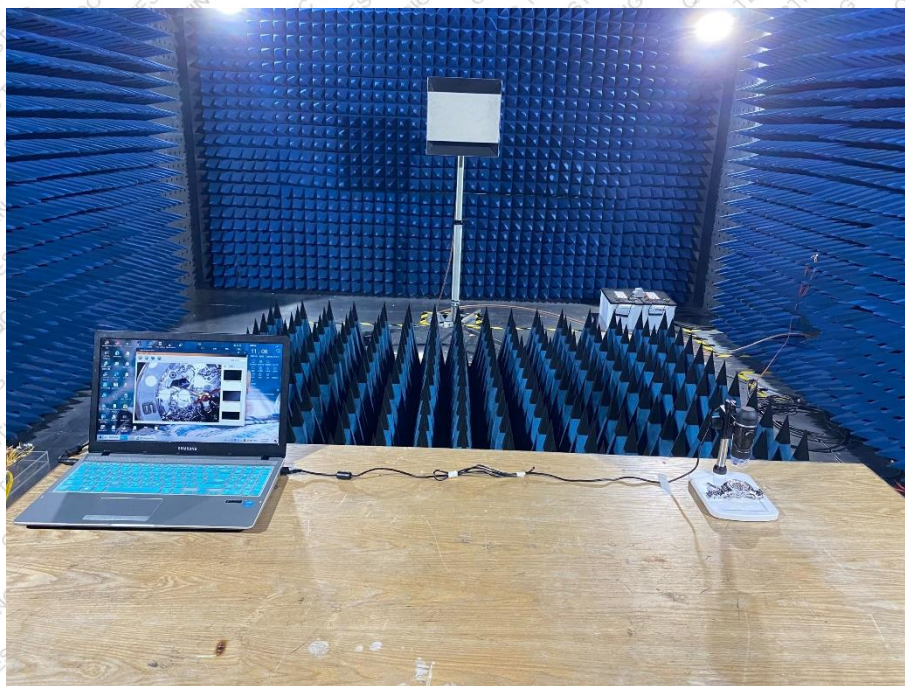
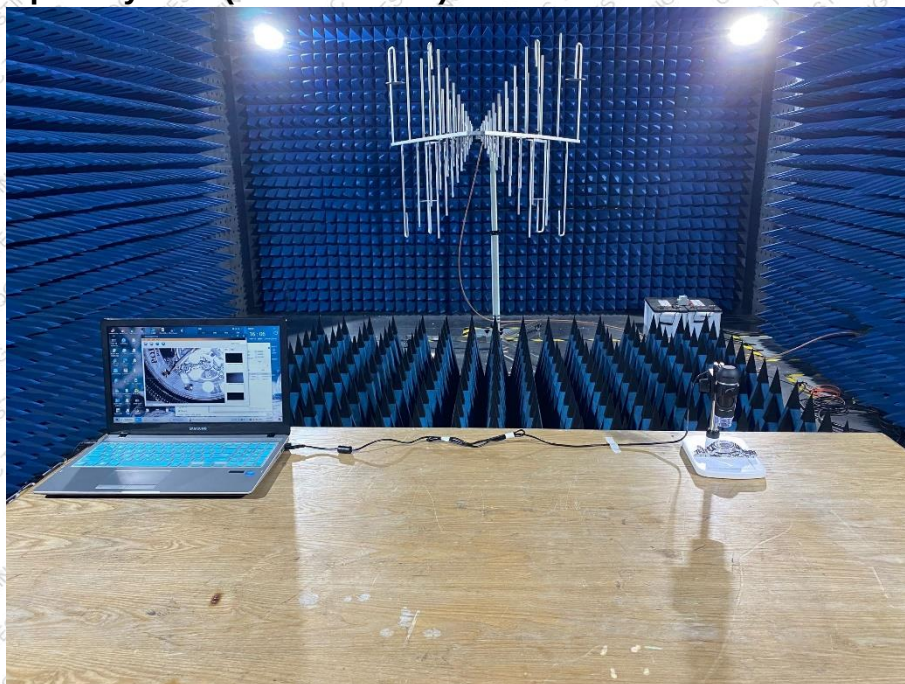


Electrostatic Discharge Immunity Test (IEC 61000-4-2)



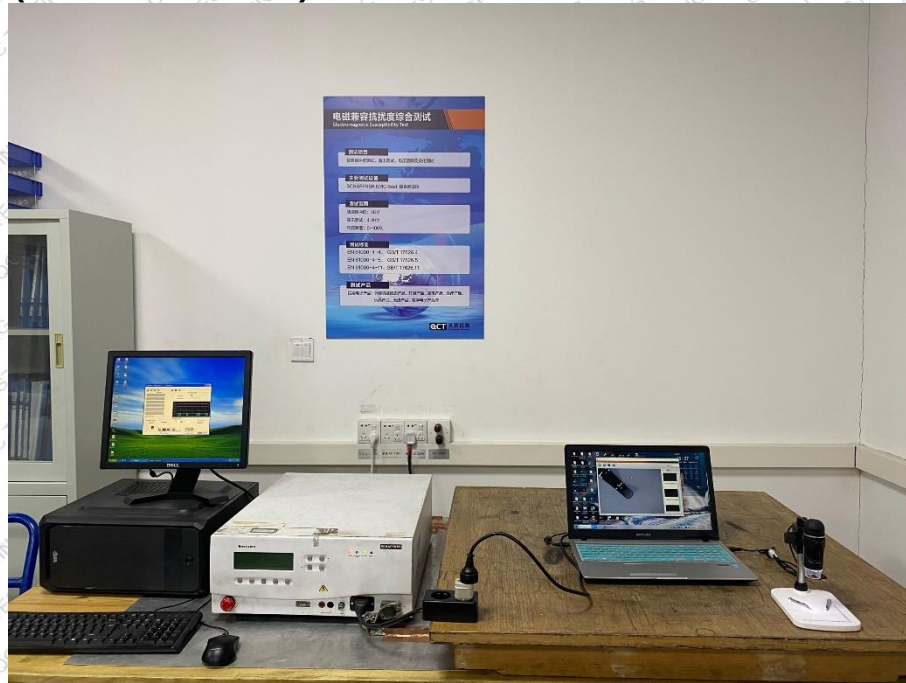


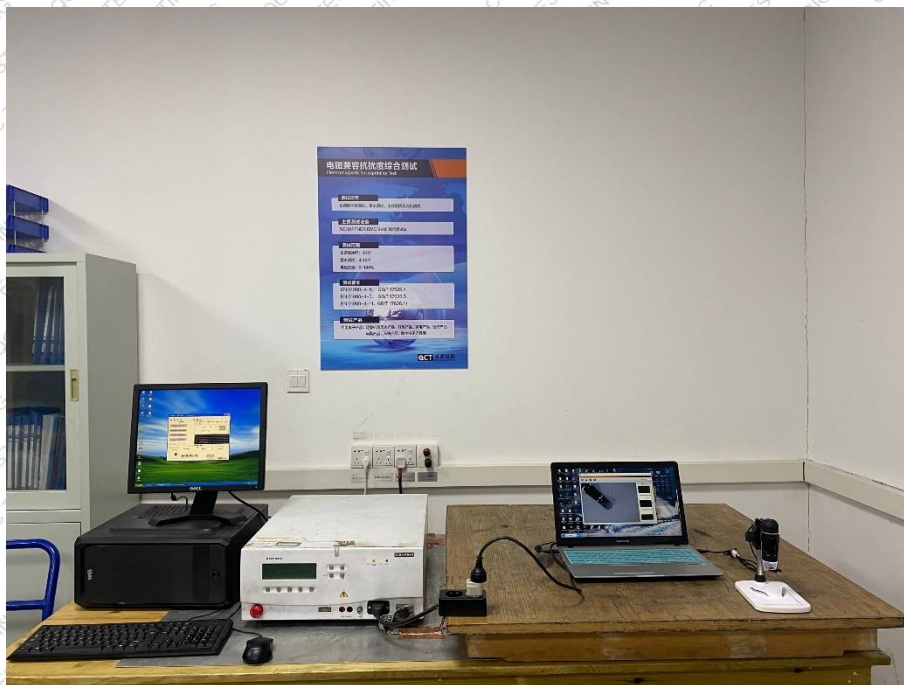
Radiated Susceptibility Test (IEC 61000-4-3)





Electrical Fast Transient Test/Surge Immunity Test/Voltage Dips, Short Interruptions Immunity Test (IEC 61000-4-4/5/11)





Conducted Susceptibility Test (IEC 61000-4-6)

