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

198 Kezhu Road, Scientech Park, Guangzhou Economic & Technological Development District, Guangzhou, China 510663

Telephone: +86 (0) 20 82155555
Fax: +86 (0) 20 82075059
Email: ee.guangzhou@sgs.com

TEST REPORT

Application No.:	GZEM1911017240GT
Applicant:	Hangzhou Hikvision Digital Technology Co., Ltd.
Address of Applicant:	No.555 Qianmo Road, Binjiang District, Hangzhou 310052, China
Manufacturer:	Hangzhou Hikvision Digital Technology Co., Ltd.
Address of Manufacturer:	No.555 Qianmo Road, Binjiang District, Hangzhou 310052, China
Equipment Under Test (EUT):	
EUT Name:	Network Camera
Trade Mark:	HIKVISION
Standard(s) :	EN 50155 :2017 clause 13.4.8
	EN 50121-3-2 :2016
Date of Receipt:	2019-11-22
Date of Test:	2019-11-27 to 2019-12-09
Date of Issue:	2019-12-26
Test Result:	**Pass***

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

The CE mark as shown below can be used, under the responsibility of the manufacturer, after completion of an EU Declaration of Conformity and compliance with all relevant EU Directives.

Kobe Jian
Lab Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.

Factory:	1, Hangzhou Hikvision Technology Co., Ltd. 2, Hangzhou Hikvision Electronics Co., Ltd. 3, Chongqing Hikvision technology Co., LTD.
Address of Factory:	1, No.700,Dongliu Road, Binjiang District, Hangzhou Ctiy,Zhejiang, 310052, China 2, No.299,Qiushi Road,Tonglu Economic Development Zone,Tonglu County, Hangzhou,Zhejiang,310052,China 3, No. 118, Haikang Road, Area C, Jianqiao Industrial Park, Dadukou District, Chongqing, 401325, China
Model No.:	DS-2XM6522G0-IDM, DS-2XM6512G0-ID, DS-2XM6512G0-IDUHK,DS-2XM6512G0-IDCKV,DS-2XM6512G0-IDUVS,DS-2XM6512G0-IDKVO,DS-2XM6512G0-IDHUN,DS-2XM6512G0-IDM,DS-2XM6512G0-IDMUHK,DS-2XM6512G0-IDMCKV,DS-2XM6512G0-IDMUVS,DS-2XM6512G0-IDMKVO,DS-2XM6512G0-IDMHUN,DS-2XM6522G0-ID,DS-2XM6522G0-IDUHK,DS-2XM6522G0-IDCKV,DS-2XM6522G0-IDUVS,DS-2XM6522G0-IDKVO,DS-2XM6522G0-IDHUN,DS-2XM6522G0-IDMUHK,DS-2XM6522G0-IDMCKV,DS-2XM6522G0-IDMUVS,DS-2XM6522G0-IDMKVO,DS-2XM6522G0-IDMHUN,DS-2XM6512WD-ID,DS-2XM6512WD-IDUHK,DS-2XM6512WD-IDCKV,DS-2XM6512WD-IDUVS, DS-2XM6512WD-IDKVO,DS-2XM6512WD-IDHUN,DS-2XM6512WD-IDM,DS-2XM6512WD-IDMUHK,DS-2XM6512WD-IDMCKV,DS-2XM6512WD-IDMUVS,DS-2XM6512WD-IDMKVO,DS-2XM6512WD-IDMHUN,DS-2XM6522WD-ID,DS-2XM6522WD-IDUHK,DS-2XM6522WD-IDCKV,DS-2XM6522WD-IDUVS,DS-2XM6522WD-IDKVO,DS-2XM6522WD-IDHUN,DS-2XM6522WD-IDM,DS-2XM6522WD-IDMUHK,DS-2XM6522WD-IDMCKV,DS-2XM6522WD-IDMUVS,DS-2XM6522WD-IDMKVO,DS-2XM6522WD-IDMHUN,DS-2XM6512WD-IM,DS-2XM6512WD-IMUHK,DS-2XM6512WD-IMCKV,DS-2XM6512WD-IMUVS,DS-2XM6512WD-IMKVO,DS-2XM6512WD-IMHUN,DS-2XM6522WD-IM,DS-2XM6522WD-IMUHK,DS-2XM6522WD-IMCKV,DS-2XM6522WD-IMUVS,DS-2XM6522WD-IMKVO,DS-2XM6522WD-IMHUN. ¤
¤	Please refer to section 2 of this report which indicates which model was actually tested and which were electrically identical.

Revision Record				
Version	**Chapter**	**Date**	**Modifier**	**Remark**
01		2019-12-26		Original

Authorized for issue by:				
Tested By		Cong_Chen /Project Engineer		2019-11-27 to 2019-12-09 **Date**
Checked By		Terry_Lai /Reviewer		2019-12-26 **Date**

2 Test Summary

Emission Part				
Item	**Standard**	**Method**	**Requirement**	**Result**
Conducted Emissions at Mains Terminals (150kHz-30MHz)	EN 50155:2017 clause 13.4.8 EN 50121-3-2:2016	EN 55016-2-1:2014	Table 1	Pass
Radiated Emissions (30MHz-1GHz)	EN 50155:2017 clause 13.4.8 EN 50121-3-2:2016	EN 61000-6-4:2007 +A1:2011	Table 1	Pass
Radiated Emissions (above 1GHz)	EN 50155:2017 clause 13.4.8 EN 50121-3-2:2016	EN 61000-6-4:2007 +A1:2011	Table 1	Pass

Internal Source	Upper Frequency
Below 108MHz	1GHz
108MHz to 500MHz	2GHz
500MHz to 1GHz	5GHz
Above 1GHz	5 times the highest frequency or 6 GHz, whichever is less

Immunity Part				
Item	**Standard**	**Method**	**Requirement**	**Result**
Electrostatic Discharge	EN 50155:2017 clause 13.4.8 EN 50121-3-2:2016	EN 61000-4-2:2009	±6kV Contact Discharge ±8kV Air Discharge	Pass
Electrical Fast Transients/Burst at Power Port	EN 50155:2017 clause 13.4.8 EN 50121-3-2:2016	EN 61000-4-4:2012	±2kV 5/50ns Tr/Td 5kHz Repetition Frequency	Pass
Electrical Fast Transients/Burst at Signal Port	EN 50155:2017 clause 13.4.8 EN 50121-3-2:2016	EN 61000-4-4:2012	±2kV 5/50ns Tr/Td 5kHz Repetition Frequency	Pass
Surge at Power Port	EN 50155:2017 clause 13.4.8 EN 50121-3-2:2016	EN 61000-4-5:2014	1.2/50μs Tr/Td ±1kV Line to Line ±2kV Line to Ground	Pass
Conducted Immunity at Power Port (150kHz-80MHz)	EN 50155:2017 clause 13.4.8 EN 50121-3-2:2016	EN 61000-4-6:2014	10Vrms (emf),80%,1kHz Amp. Mod.	Pass
Conducted Immunity at Signal Port (150kHz-80MHz)	EN 50155:2017 clause 13.4.8 EN 50121-3-2:2016	EN 61000-4-6:2014	10Vrms (emf),80%,1kHz Amp. Mod.	Pass
Radiated Immunity (80MHz-6000MHz)	EN 50155:2017 clause 13.4.8 EN 50121-3-2:2016	EN 61000-4-3:2006 +A1:2008+A2:2010	80MHz-800MHz 20V/m, 80% AM, 1kHz 800MHz-1000MHz 20V/m, 80% AM, 1kHz 1400MHz-2000MHz 10V/m, 80% AM, 1kHz 2000MHz-2700MHz 5V/m, 80% AM, 1kHz 5100MHz-6000MHz 3V/m, 80% AM, 1kHz	Pass

¤ Declaration of EUT Family Grouping:

Model No.: DS-2XM6522G0-IDM, DS-2XM6512G0-ID,DS-2XM6512G0-IDUHK,DS-2XM6512G0-IDCKV,DS-2XM6512G0-IDUVS,DS-2XM6512G0-IDKVO,DS-2XM6512G0-IDHUN,DS-2XM6512G0-IDM,DS-2XM6512G0-IDMUHK,DS-2XM6512G0-IDMCKV,DS-2XM6512G0-IDMUVS,DS-2XM6512G0-IDMKVO,DS-2XM6512G0-IDMHUN,DS-2XM6522G0-ID,DS-2XM6522G0-IDUHK,DS-2XM6522G0-IDCKV,DS-2XM6522G0-IDUVS,DS-2XM6522G0-IDKVO,DS-2XM6522G0-IDHUN,DS-2XM6522G0-IDMUHK,DS-2XM6522G0-IDMCKV,DS-2XM6522G0-IDMUVS,DS-2XM6522G0-IDMKVO,DS-2XM6522G0-IDMHUN,DS-2XM6512WD-ID,DS-2XM6512WD-IDUHK,DS-2XM6512WD-IDCKV,DS-2XM6512WD-IDUVS, DS-2XM6512WD-IDKVO,DS-2XM6512WD-IDHUN,DS-2XM6512WD-IDM,DS-2XM6512WD-IDMUHK,DS-2XM6512WD-IDMCKV,DS-2XM6512WD-IDMUVS,DS-2XM6512WD-IDMKVO,DS-2XM6512WD-IDMHUN,DS-2XM6522WD-ID,DS-2XM6522WD-IDUHK,DS-2XM6522WD-IDCKV,DS-2XM6522WD-IDUVS,DS-2XM6522WD-IDKVO,DS-2XM6522WD-IDHUN,DS-2XM6522WD-IDM,DS-2XM6522WD-IDMUHK,DS-2XM6522WD-IDMCKV,DS-2XM6522WD-IDMUVS,DS-2XM6522WD-IDMKVO,DS-2XM6522WD-IDMHUN,DS-2XM6512WD-IM,DS-2XM6512WD-IMUHK,DS-2XM6512WD-IMCKV,DS-2XM6512WD-IMUVS,DS-2XM6512WD-IMKVO,DS-2XM6512WD-IMHUN,DS-2XM6522WD-IM,DS-2XM6522WD-IMUHK,DS-2XM6522WD-IMCKV,DS-2XM6522WD-IMUVS,DS-2XM6522WD-IMKVO,DS-2XM6522WD-IMHUN

According to the declaration from the applicant, the electrical circuit design, layout, components used and internal wiring were identical for all models, with only difference on the model name and software.

Therefore only one model **DS-2XM6522G0-IDM** was tested in this report.

3 Contents

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

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4 General Information

4.1 Details of E.U.T.

Power Supply: DC 24V

Cable: 1, About 0.5m x 2 wires unscreened DC mains cable.
2, About 3m x 1 unscreened LAN cable supplied by lab.

4.2 Description of Support Units

Description	Manufacturer	Model No.	SN/Certificate NO
NoteBook	Lenovo	Xiaoxinchao 5000	PF0TLJX7
NoteBook	Lenovo	Xiaoxinchao 5000	PF0TNMGB
Mouse	DELL	M-WDEL1	OT0943
Mouse	DELL	MOC5UO	G1B02ZP5
DVR supplied by client	Hikvision	DS-MP7608H	C66859873
DC Power supply(EMC 0009)	Instek	PS-3030	L9905E037.34

4.3 Measurement Uncertainty

EMC

No.	Item	Measurement Uncertainty
1	Conducted Disturbance Voltage at Mains Terminals	±3.63dB (9kHz to 150kHz)
		±3.22dB (150kHz to 30MHz)
2	Disturbance Power	±3.78dB
3	Radiated Emissions	±5.0dB (30MHz-1GHz)
		±5.0dB (1GHz-6GHz)
4	Radiated Immunity	±2.18dB(80MHz-3GHz)
5	Conducted Immunity	±3.5dB(150kHz-230MHz)
6	Electrostatic Discharge	±6 %
7	EFT (Electrical Fast Transients)	±4 %
8	Surge Immunity	±6%
9	Voltage Dips and Interruptions	±4 %
10	CISPR 20 Immunity	±1.5dB
11	Temperature	±0.4℃
12	Humidity	±1.3%
13	DC power	±0.5 %

4.4 Test Location

All tests were performed at:

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

198 Kezhu Road, Scientech Park, Guangzhou Economic & Technology Development District, Guangzhou, China 510663

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

No tests were sub-contracted.

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 C-Tick mark as a result of our NVLAP accreditation.

- **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, Jul 13, 2017.

- **Industry Canada (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-10449 and T-11179)**

  The 10m Semi-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-10449 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.

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4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None

4.8 Monitoring of EUT for All Immunity Test

Visual: Test the EUT video recording mode

Audio: None.

5 Equipment List

Conducted Emission						
No.	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. date (YYYY-MM-DD)	Cal.Due date (YYYY-MM-DD)
EMC0306	Shielding Room	Zhong Yu	8 x 3 x 3.8 m³	N/A	2016-12-27	2019-12-26
EMC0118	Two-line v-netwok	R&S	ENV216	100359	2019-01-11	2020-01-10
EMC2135	Two-line v-netwok	R&S	ENV216	102259	2019-09-16	2020-09-15
EMC0203	LISN	AFJ	LS16-OPT001	116019831056	2019-01-11	2020-01-10
EMC0506	EMI Test Receiver	Rohde & Schwarz	ESCS30	100085	2019-11-18	2020-11-17
EMC0107	Coaxial Cable	SGS	2m	N/A	2018-09-20	2020-09-19
EMC0106	Voltage Probe	SGS	N/A	N/A	2018-04-04	2020-04-03
EMC2123	8 Line ISN Cat 6	SCHWARZBECK MESS-ELEKTRONIK	NTFM 8158	NTFM 8158 0151	2019-05-29	2020-05-28
EMC2124	8 Line ISN Cat 5	SCHWARZBECK MESS-ELEKTRONIK	CAT5 8158	CAT5 8158-188	2019-05-29	2020-05-28
EMC2126	8 Line ISN Cat 3	SCHWARZBECK MESS-ELEKTRONIK	CAT3 8158	CAT38158-0081	2019-05-29	2020-05-28
EMC2122	ISN S8	SCHWARZBECK MESS-ELEKTRONIK	ISN S8	57	2019-05-29	2020-05-28
EMC2121	ISN S1	SCHWARZBECK MESS-ELEKTRONIK	ISN S1	10	2019-05-29	2020-05-28
EMC2125	2 wires ISN	SCHWARZBECK MESS-ELEKTRONIK	NTFM 8131	8131-198	2019-05-29	2020-05-28
EMC2047	CDN	Elektronik-Feinmechanik	L-801:AF2	2793	2018-09-29	2020-09-27
EMC2048	CDN	Elektronik-Feinmechanik	L-801:M2/M3	2738	2018-08-13	2020-08-12
EMC2062	6dB Attenuator	HP	8491A	24487	2018-04-04	2020-04-03
EMC0167	Conical metal housing	SGS-EMC	N/A	N/A	2018-04-19	2020-04-18

RE in Chamber						
No.	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. date (YYYY-MM-DD)	Cal.Due date (YYYY-MM-DD)
EMC0525	Compact Semi-Anechoic Chamber	ChangZhou ZhongYu	N/A	N/A	2016-12-04	2022-10-19
EMC0522	EMI Test Receiver	Rohde & Schwarz	ESIB26	100283	2019-01-20	2020-01-19
EMC0056	EMI Test Receiver	Rohde & Schwarz	ESCI	100236	2019-01-20	2020-01-19
SEM003-18	Trilog Broadband Antenna 25-2000MHz	SCHWARZBECK MESS-ELEKTRONIK	VULB 9168	665	2019-02-22	2022-02-22
EMC0519	Bilog Type Antenna	Schaffner -Chase	CBL6143	5070	2017-05-04	2020-05-03
EMC2026	Horn Antenna 1-18GHz	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120D	9120D-841	2019-09-25	2022-09-24
EMC0521	1-26.5 GHz Pre-Amplifier	Agilent	8449B	3008A01649	2019-01-11	2020-01-10
EMC2065	Amplifier	HP	8447F	N/A	2019-05-29	2020-05-28
EMC2086	PRE AMPLIFIER MH648A	ANRITSU CORP	MH648A	N/A	2019-11-18	2020-11-17
EMC0523	Active Loop Antenna	EMCO	6502	42963	2018-03-05	2020-03-04
EMC2041	Broad-Band Horn Antenna (14)15-26.5(40)GHz	SCHWARZBECK MESS-ELEKTRONI	BBHA 9170	9170-375	2017-05-23	2020-05-22
EMC2079	High Pass Filter(915MHz)	FSY MICROWAVE	HM1465-9SS	009	2019-01-11	2020-01-10
EMC2142	966 Anechoic Chamber	C.R.T	9mX6mX6m	NA	2017-12-19	2019-12-18
EMC2139	MXE EMI Receiver	Keysight	N9038A	MY57290121	2019-11-18	2020-11-17
EMC2138	EXA Signal Analyzer	Keysight	N9010A	MY57120105	2019-11-18	2020-11-17
EMC2069	2.4GHz Filter	Micro-Tronics	BRM 50702	149	2019-01-11	2020-01-10
EMC0530	10m Semi-Anechoic Chamber	ETS	N/A	N/A	2019-10-20	2022-10-19

Electrostatic Discharge						
No.	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. date (YYYY-MM-DD)	Cal.Due date (YYYY-MM-DD)
EMC2071	ESD Simulator	TESEQ AG	NSG 435	6739	2019-07-04	2020-07-03
EMC0804	ESD Ground Plane	SGS	3m x 3m	N/A	N/A	N/A
EMC0078	Temperature, & Humidity	Shanghai Meteorological Instrument factory Co., Ltd.	ZJ1-2B	709131	2019-07-05	2020-07-04

EFT and Surge immunity						
No.	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. date (YYYY-MM-DD)	Cal.Due date (YYYY-MM-DD)
EMC2059	Modular Impulse Surge Generator	EMC PARTNER	MIG0603EN	259	2019-01-08	2020-01-07
EMC2060	High speed signal Surge CDN	EMC PARTNER	CDN-UTP	CDN-UTP0089	2019-01-08	2020-01-07
EMC2108 -AE1	signal line coupling network	TESEQ GmbH	CDN 117	43141	2017-06-19	2020-06-18
EMC2108 -AE2	Coulping capacitor(0.5uF)	TESEQ GmbH	INA 174A	75067	2017-06-19	2020-06-18
EMC2108 -AE3	Gas arrestor	TESEQ GmbH	INA 170	SL403-107	2017-06-19	2020-06-18
EMC2072	EMC Immunity Test System	TESEQ AG	NSG 3060 CDN3061 INA 6502 CIB CDN3425	1580 1466 222	2019-01-08	2020-01-07
EMC2055	Oscilloscope 500MHz	Tektronix	TDS3052C	C011815	2019-01-08	2020-01-07

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Conducted Immunity						
No.	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. date (YYYY-MM-DD)	Cal.Due date (YYYY-MM-DD)
EMC2115	TEST SYSTEM OF CI	TESEQ AG	NSG 4070B-80	46144	2019-07-04	2020-07-04
EMC2116	6dB Attenuator	TESEQ AG	ATN 6075	45823	2018-07-24	2020-07-23
EMC2113	CDN S502A	TESEQ	CDN S502A	46206	2017-06-19	2020-06-18
EMC2112	CDN ST08A	TESEQ	CDN ST08A	36631	2017-07-03	2020-07-02
EMC2114	CDN USB3.0	TESEQ	CDN USB3.0	45777	2017-06-19	2020-06-18
EMC1105	Dual Directional coupler	Werlatone Inc.	C1795	6635	2019-05-29	2020-05-28
EMC2055	Oscilloscope 500MHz	Tektronix	TDS3052C	C011815	2019-01-11	2020-01-10
EMC2048	CDN	Elektronik-Feinmechanik	L-801:M2/M3	2738	2018-08-13	2020-08-12
EMC2169	Coupling Decoupling Network	TESEQ	CDN M016	46989	2018--08-10	2021-08-20
EMC1107	CDN M2	Schaffner Chase	CDN-M2-16	9863	2017-10-26	2020-10-25
EMC1116	Current Probe	Schaffner Chase	CIP9136	1155	2017-10-26	2020-10-25
EMC1117	Current Probe	Schaffner Chase	CSP8445	18	2017-10-26	2020-10-25

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Radiated Immunity						
No.	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. date (YYYY-MM-DD)	Cal.Due date (YYYY-MM-DD)
EMC0525	Compact 3m Semi-Anechoic Chamber	Changzhou zhongyu	N/A	N/A	2019-10-20	2022-10-19
EMC2055	Oscilloscope	Tektronix	TDS3052C	C011815	2019-01-11	2020-01-10
EMC0909	Monitor System	Mitsubish Corp.	M-0552AB	91510185	N/A	N/A
EMC2089	Laser probe Interface	RF Microwave Instrumentation	FI7000	0344429	N/A	N/A
EMC2090	Open Switch and control unit	R&S	OSP130	100858	N/A	N/A
EMC2091	Broadband Amplifier (80M~1GHZ/250W)	R&S	BBA150	102036	2019-01-11	2020-01-10
EMC2092	Broadband Amplifier (800M~3GHZ/110W)	R&S	BBA150	102047	2019-01-11	2020-01-10
EMC2093	Signal Generator	R&S	SMB100A	113083	2019-01-11	2020-01-10
EMC2094	Laser probe	RF Microwave Instrumentation	FL7006	0345061	2019-02-25	2020-02-25
EMC2095	NRP-Z91 Power Sensor 6GHZ	R&S	NPR-Z91	103354	2019-01-11	2020-01-10
EMC2096	NRP-Z91 Power Sensor 6GHZ	R&S	NPR-Z91	103355	2019-01-11	2020-01-10
EMC2097	High-Gain Log-periodic Antenna	R&S	HL046E	100203	2019-02-15	2022-02-14
EMC2098	RI Cable	R&S	7m	N/A	2019-05-24	2020-05-23
SEM003-21	Stacked Logarithmic-Periodic Broadband Antenna (0.7~9GHz)/300W	SCHWARZBECK MESS - ELEKTRONIK	STLP 9149	356	2018-09-18	2021-09-17
GZE100-63	Test Software EMC32	Rohde & Schwarz	Ver. 9.26.00	N/A	N/A	N/A
EMC2105	Broadband Amplifier (2.5~6GHZ/30W)	R&S	BBA150	102305	2019-09-16	2020-09-15

General used equipment						
No.	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. date (YYYY-MM-DD)	Cal.Due date (YYYY-MM-DD)
EMC0006	DMM	Fluke	73	70681569	2019-07-16	2020-07-15
EMC0007	DMM	Fluke	73	70671122	2019-07-16	2020-07-15

6 Emission Test Results

6.1 Conducted Emissions at Mains Terminals (150kHz-30MHz)

Test Requirement: EN 50155:2017 clause 13.4.8 & EN 50121-3-2:2016

Test Method: EN 55016-2-1:2014

Frequency Range: 150kHz to 30MHz

Limit:

0.15M-0.5MHz	99dB(μV) quasi-peak
0.5M-30MHz	93dB(μV) quasi-peak

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

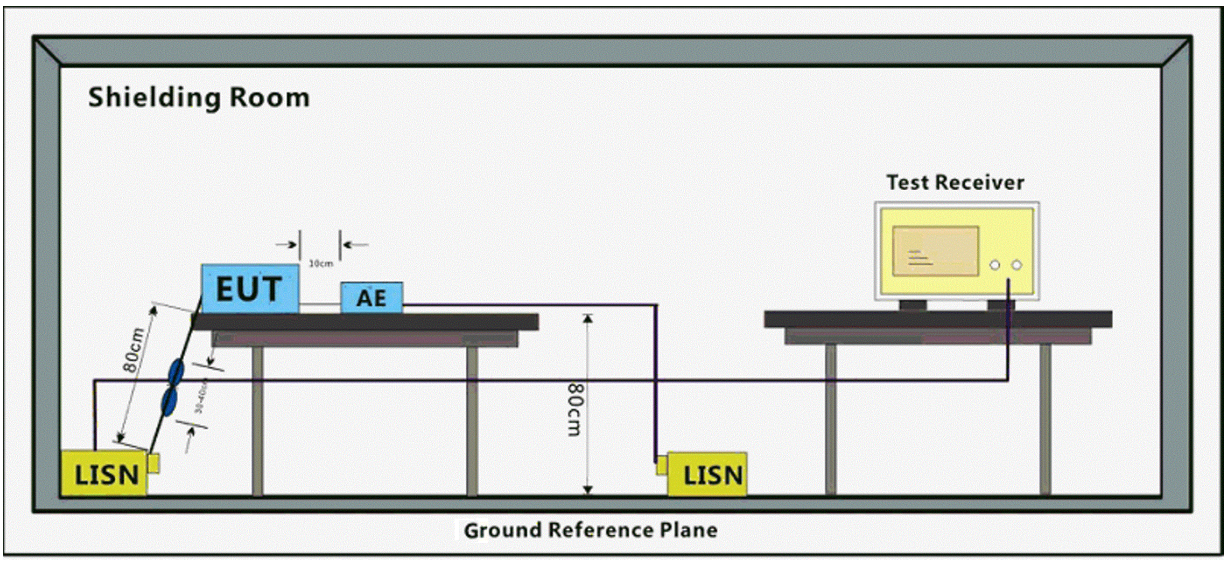
6.1.1 E.U.T. Operation

Operating Environment:

Temperature: 25.3 °C Humidity: 56 % RH Atmospheric Pressure: 1020 mbar

Test Mode: a: Test the EUT video recording mode.

6.1.2 Test Setup Diagram

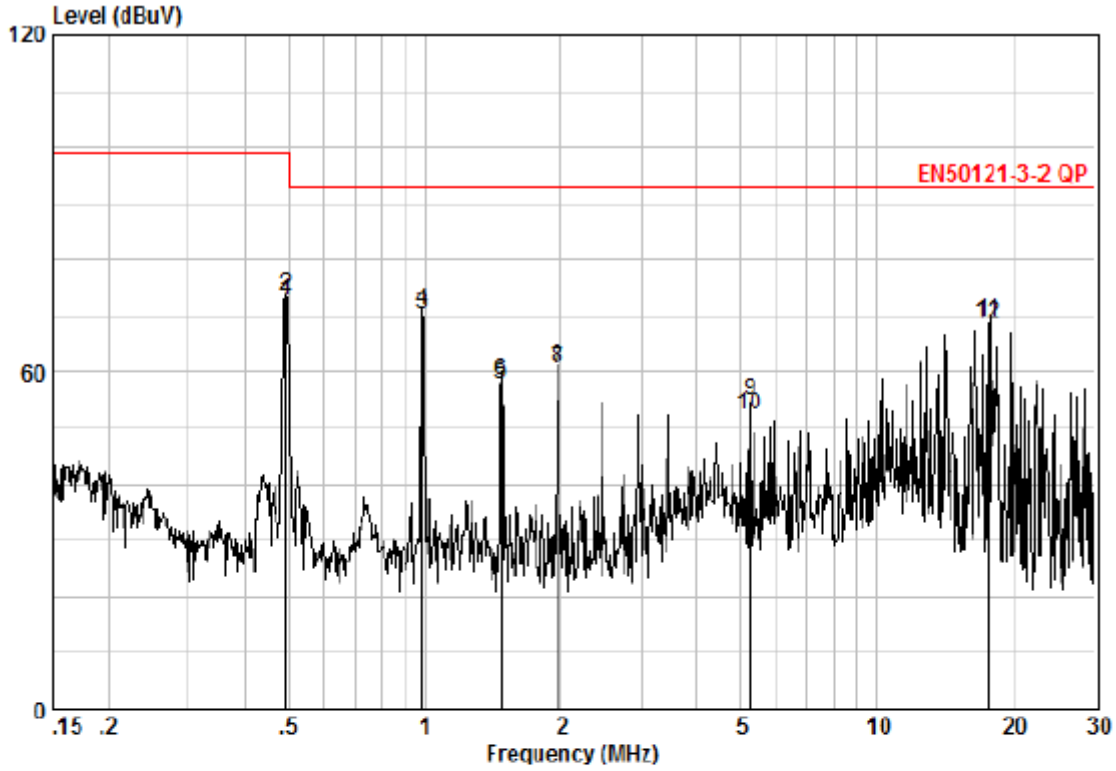


6.1.3 Measurement Data

An initial pre-scan was performed with peak detector. Quasi-Peak measurement were performed at the frequencies with maximized peak emission were detected.

Measured Level = Read level + Cable Loss + LISN Factor

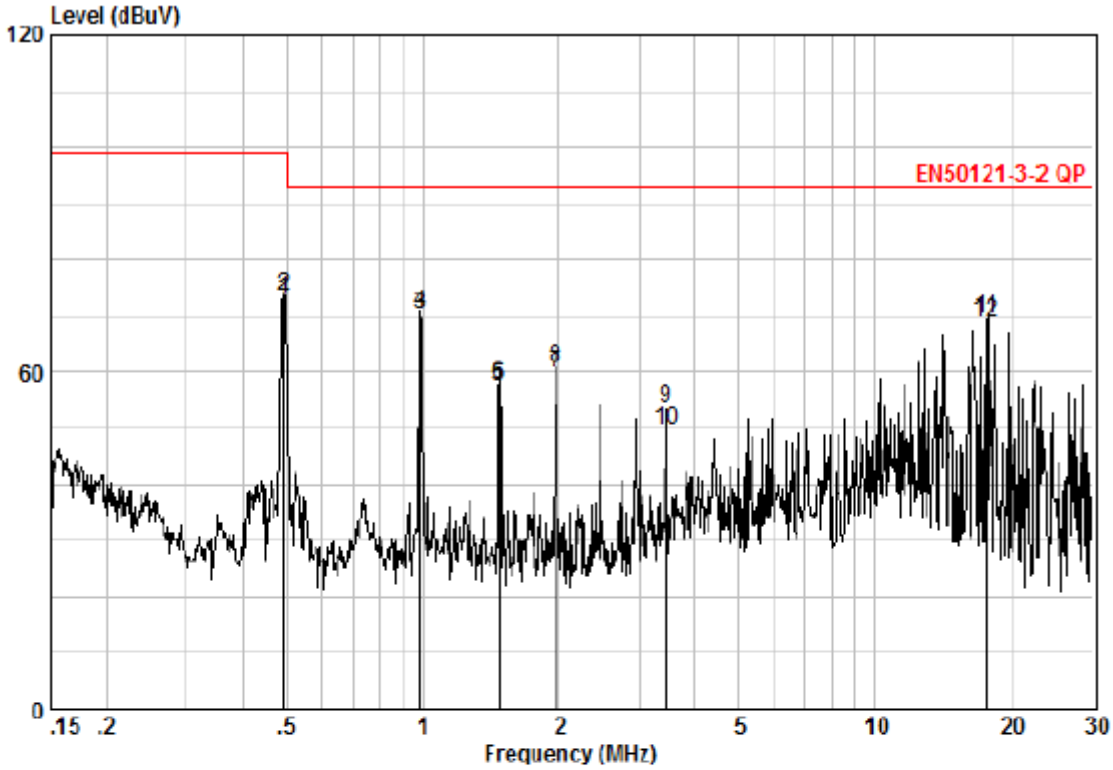
Mode:a; Line: Positive



Pol :+
No :
Model :

Frequency MHz	read level dBuV	Cable Loss dB	LISN Factor dB	Measured level dBuV	Limit Line dBuV	Over limit dB	Remark
0.49	62.94	0.10	9.67	72.71	99.00	-26.29	QP
0.49	63.69	0.10	9.67	73.46	99.00	-25.54	AVERAGE
0.96	60.67	0.10	9.67	70.44	93.00	-22.56	QP
0.96	61.23	0.10	9.67	71.00	93.00	-22.00	AVERAGE
1.48	48.06	0.10	9.68	57.83	93.00	-35.17	QP
1.48	48.59	0.10	9.68	58.37	93.00	-34.63	AVERAGE
1.97	50.61	0.10	9.69	60.40	93.00	-32.60	QP
1.97	51.07	0.10	9.69	60.86	93.00	-32.14	AVERAGE
5.25	45.00	0.20	9.72	54.92	93.00	-38.08	QP
5.25	42.51	0.20	9.72	52.43	93.00	-40.57	AVERAGE
17.69	58.89	0.40	9.82	69.11	93.00	-23.89	AVERAGE
17.69	58.51	0.40	9.82	68.73	93.00	-24.27	QP

Mode:a; Line: Negative



Pol :-
No :
Model :

Frequency MHz	read level dBuV	Cable Loss dB	LISN Factor dB	Measured level dBuV	Limit Line dBuV	Over limit dB	Remark
0.49	63.20	0.10	9.60	72.90	99.00	-26.10	QP
0.49	63.82	0.10	9.60	73.52	99.00	-25.48	AVERAGE
0.98	60.45	0.10	9.61	70.16	93.00	-22.84	QP
0.98	61.04	0.10	9.61	70.75	93.00	-22.25	AVERAGE
1.48	47.97	0.10	9.61	57.68	93.00	-35.32	QP
1.48	48.17	0.10	9.61	57.88	93.00	-35.12	AVERAGE
1.97	50.25	0.10	9.62	59.97	93.00	-33.03	QP
1.97	50.94	0.10	9.62	60.66	93.00	-32.34	AVERAGE
3.45	43.69	0.20	9.63	53.52	93.00	-39.49	QP
3.45	39.85	0.20	9.63	49.68	93.00	-43.33	AVERAGE
17.69	59.26	0.40	9.90	69.56	93.00	-23.44	AVERAGE
17.69	58.85	0.40	9.90	69.15	93.00	-23.85	QP

6.2 Radiated Emissions (30MHz-1GHz)

Test Requirement: EN 50155:2017 clause 13.4.8 & EN 50121-3-2:2016

Test Method: EN 61000-6-4:2007+A1:2011

Frequency Range: 30MHz to 1GHz

Measurement Distance: 10m

Limit:

30M-230MHz 40dB(μV) quasi-peak

230M-1000MHz 47dB(μV) quasi-peak

Detector: Peak for pre-scan (100kHz resolution bandwidth) 30M to 1000MHz

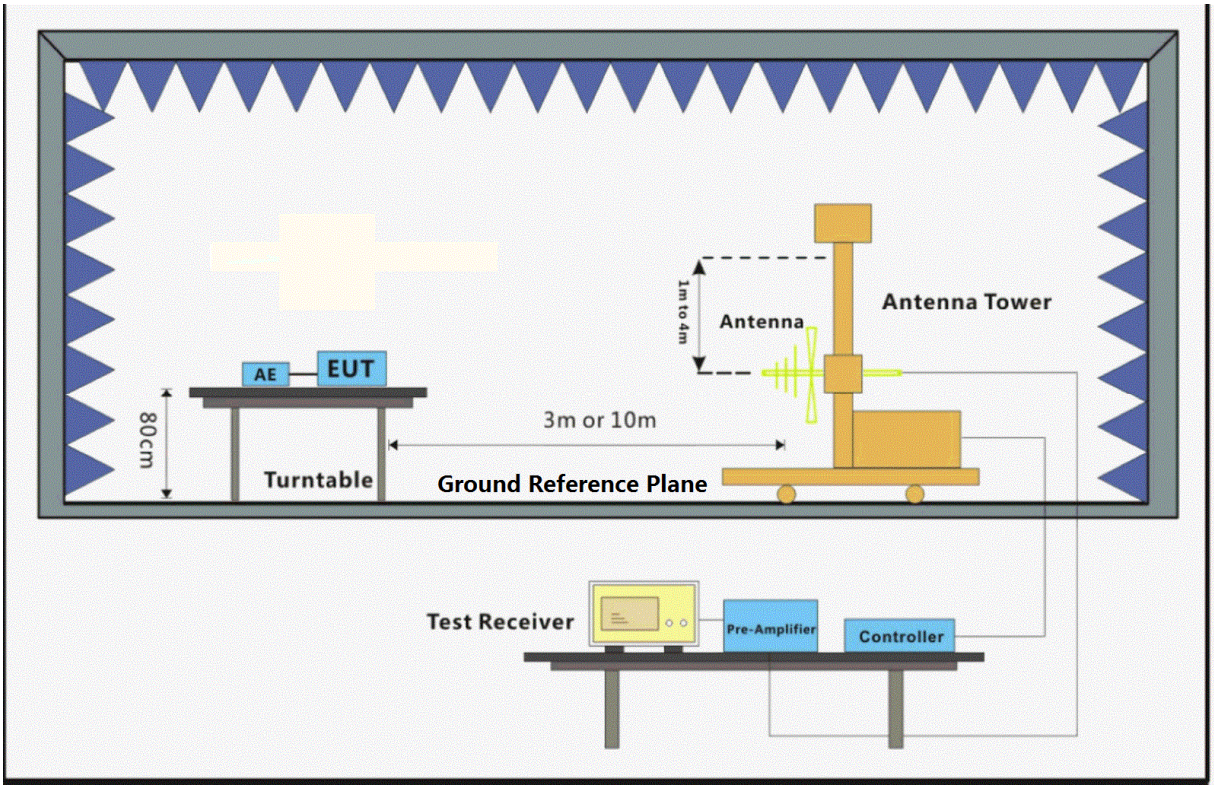
6.2.1 E.U.T. Operation

Operating Environment:

Temperature: 23.5 °C Humidity: 64.3 % RH Atmospheric Pressure: 1020 mbar

Test Mode: a: Test the EUT video recording mode.

6.2.2 Test Setup Diagram

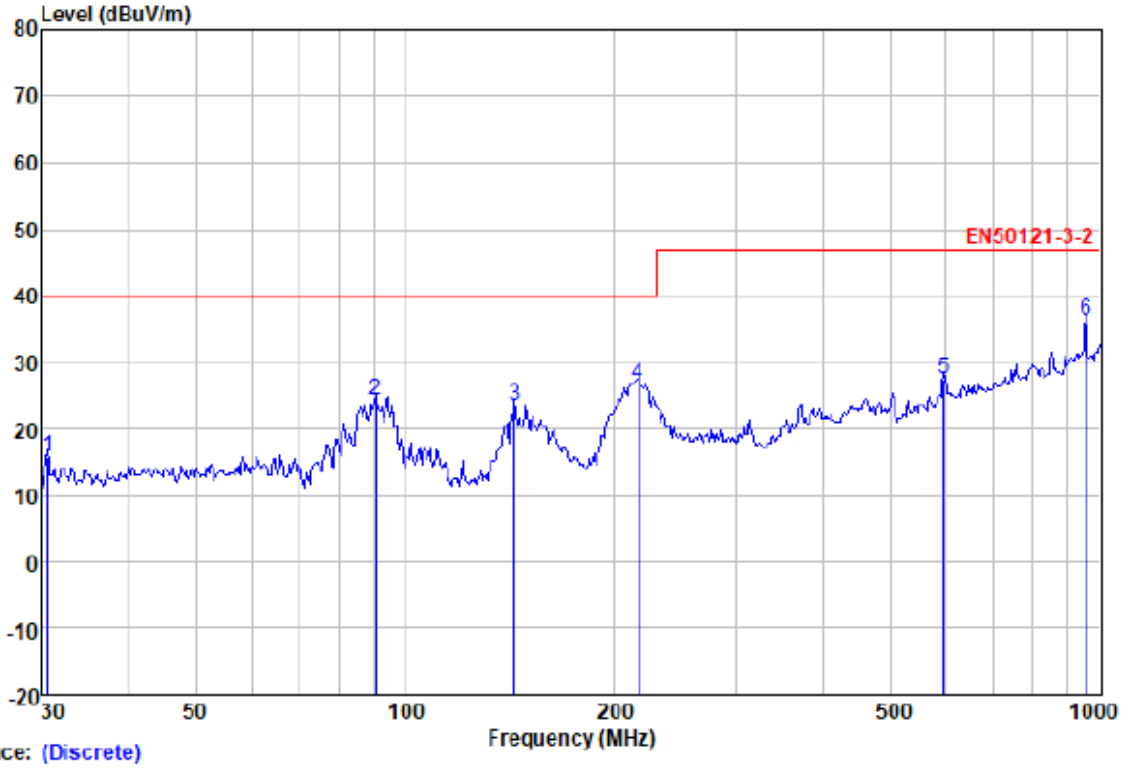


6.2.3 Measurement Data

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

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

Mode:a; Polarization:Horizontal

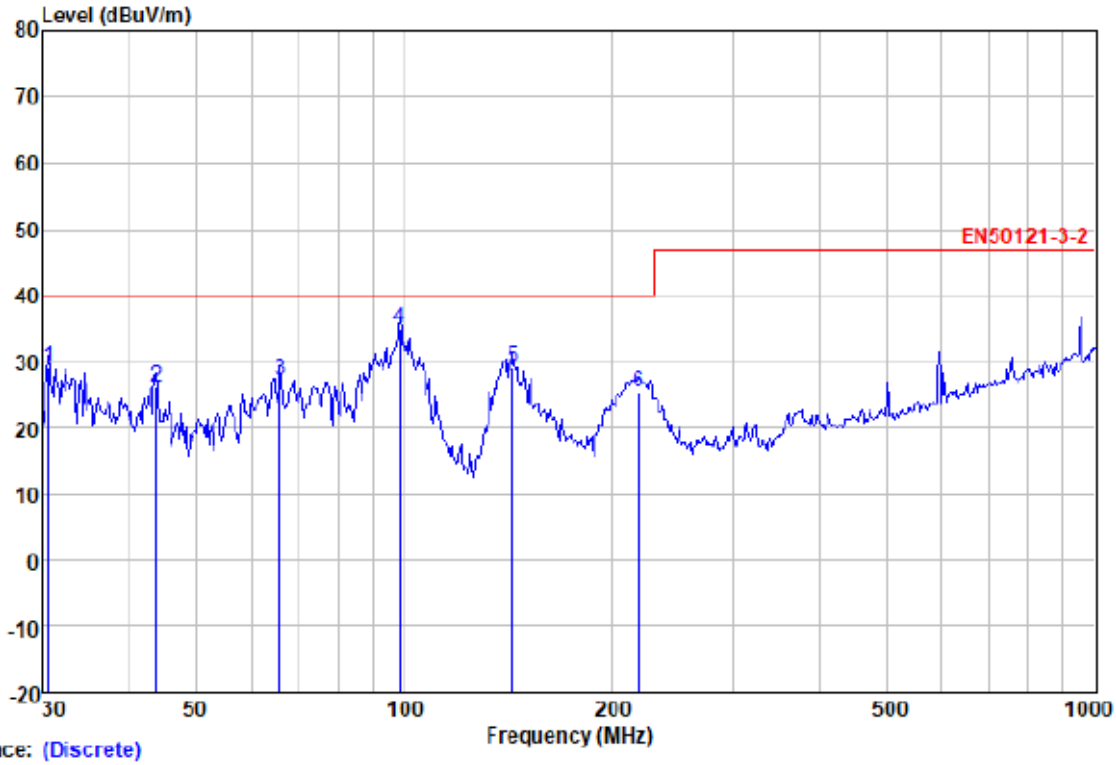


Trace: (Discrete)

Site : SGS
Condition : EN50121-3-2 10m VUBL9168(10M) 2019 HORIZONTAL
Job :
Application:
Test Mode :
Product :
Model :
Engineer :
Remark : Level=Read Level + Cable loss+Aux Factor
: + Antenna Factor - Preamp factor
AC Power :
Memo: :

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	30.638	29.48	12.49	1.01	27.20	15.78	40.00	-24.22	QP
2	90.537	41.85	7.90	1.61	27.10	24.26	40.00	-15.74	QP
3	143.830	34.80	13.60	2.01	26.92	23.49	40.00	-16.51	QP
4	216.024	41.01	9.80	2.58	26.83	26.56	40.00	-13.44	QP
5	595.133	31.18	19.70	4.78	28.07	27.59	47.00	-19.41	QP
6	952.094	33.75	23.90	6.52	27.85	36.32	47.00	-10.68	QP

Mode:a; Polarization:Vertical



Trace: (Discrete)

Site : SGS
Condition : EN50121-3-2 10m VUBL9168(10M) 2019 VERTICAL
Job :
Application:
Test Mode :
Product :
Model :
Engineer :
Remark : Level=Read Level + Cable loss+Aux Factor
: + Antenna Factor - Preamp factor
AC Power :
Memo: :

	Freq	ReadLevel	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	30.638	42.65	12.49	1.01	27.20	28.95	40.00	-11.05	QP
2	43.812	38.39	13.79	1.17	27.17	26.18	40.00	-13.82	QP
3	66.266	40.56	12.56	1.30	27.15	27.27	40.00	-12.73	QP
4	98.462	51.53	8.87	1.62	27.10	34.92	40.00	-5.08	QP
5	143.830	40.39	13.60	2.01	26.92	29.08	40.00	-10.92	QP
6	219.075	39.90	9.80	2.60	26.84	25.46	40.00	-14.54	QP

6.3 Radiated Emissions (above 1GHz)

Test Requirement:	EN 50155:2017 clause 13.4.8 & EN 50121-3-2:2016
Test Method:	EN 61000-6-4:2007 +A1:2011
Frequency Range:	Above 1GHz
Measurement Distance:	3m
Limit:	
1GHz-3GHz	76 dB(μV/m) peak, 56 dB(μV/m) average
3GHz-6GHz	80 dB(μV/m) peak, 60dB(μV/m) average
Detector:	Peak for pre-scan (1000kHz resolution bandwidth) 1000M to 6000MHz

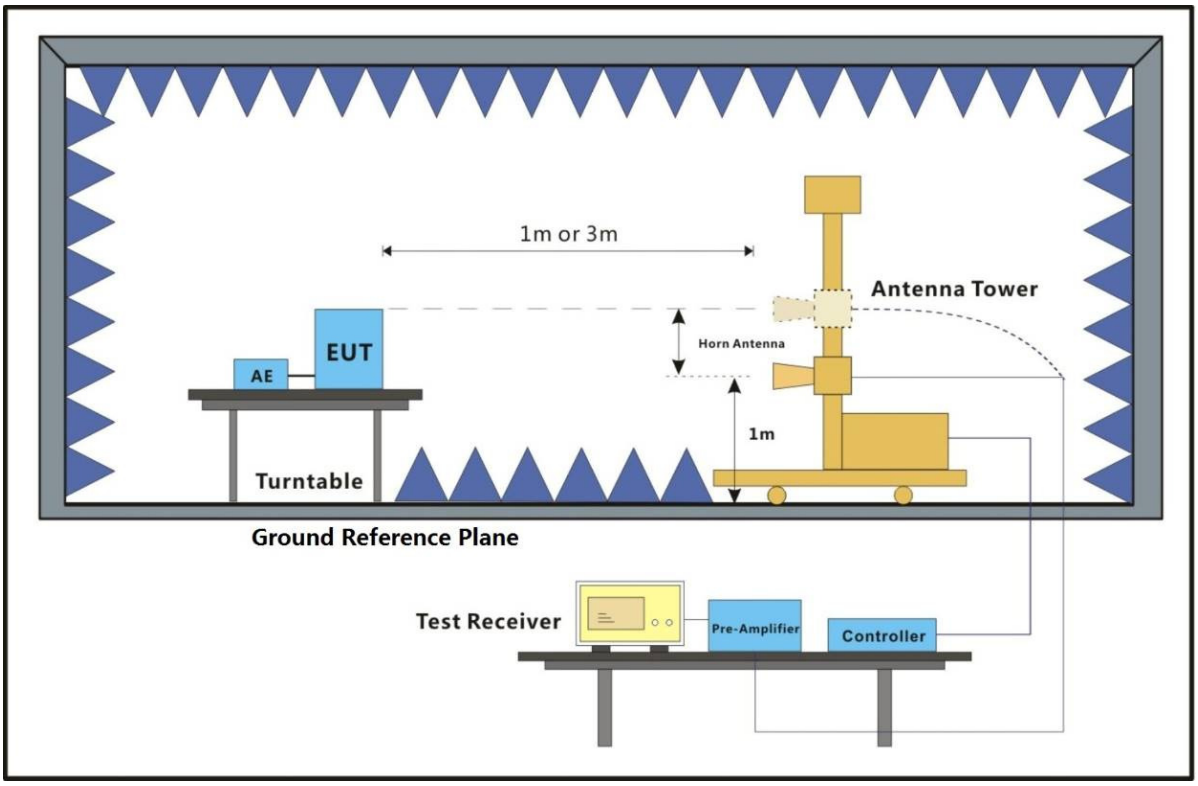
6.3.1 E.U.T. Operation

Operating Environment:

Temperature: 23.5 °C Humidity: 64.1 % RH Atmospheric Pressure: 1020 mbar

Test Mode: a: Test the EUT video recording mode.

6.3.2 Test Setup Diagram

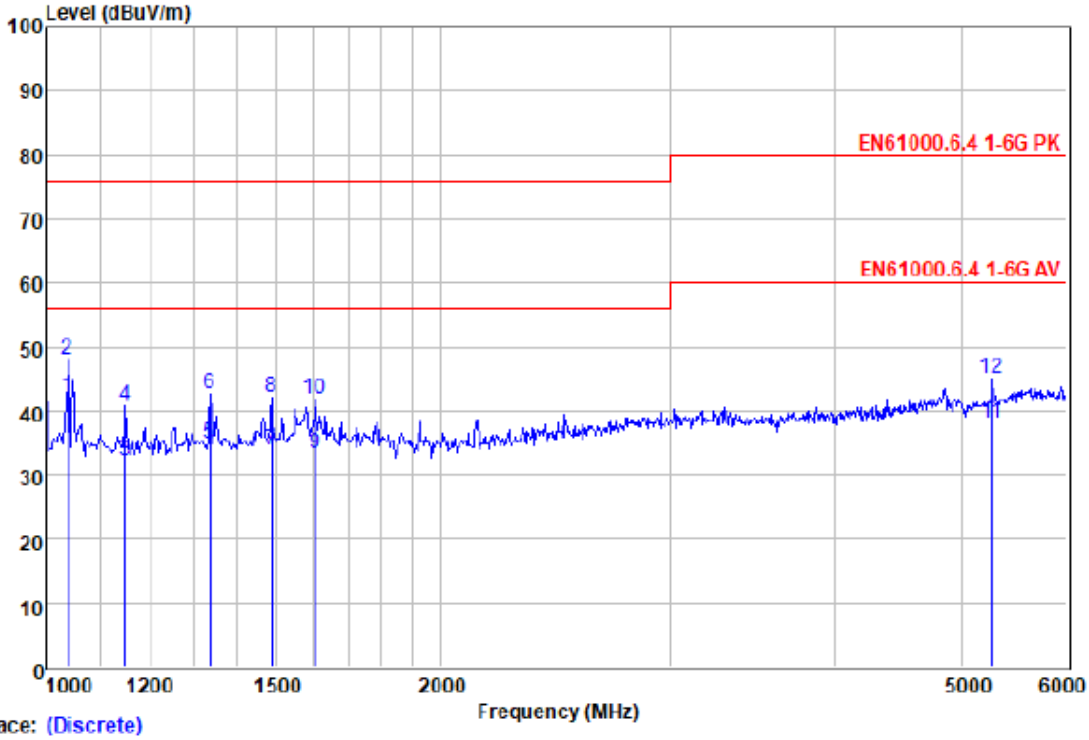


6.3.3 Measurement Data

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

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

Mode:a; Polarization:Horizontal

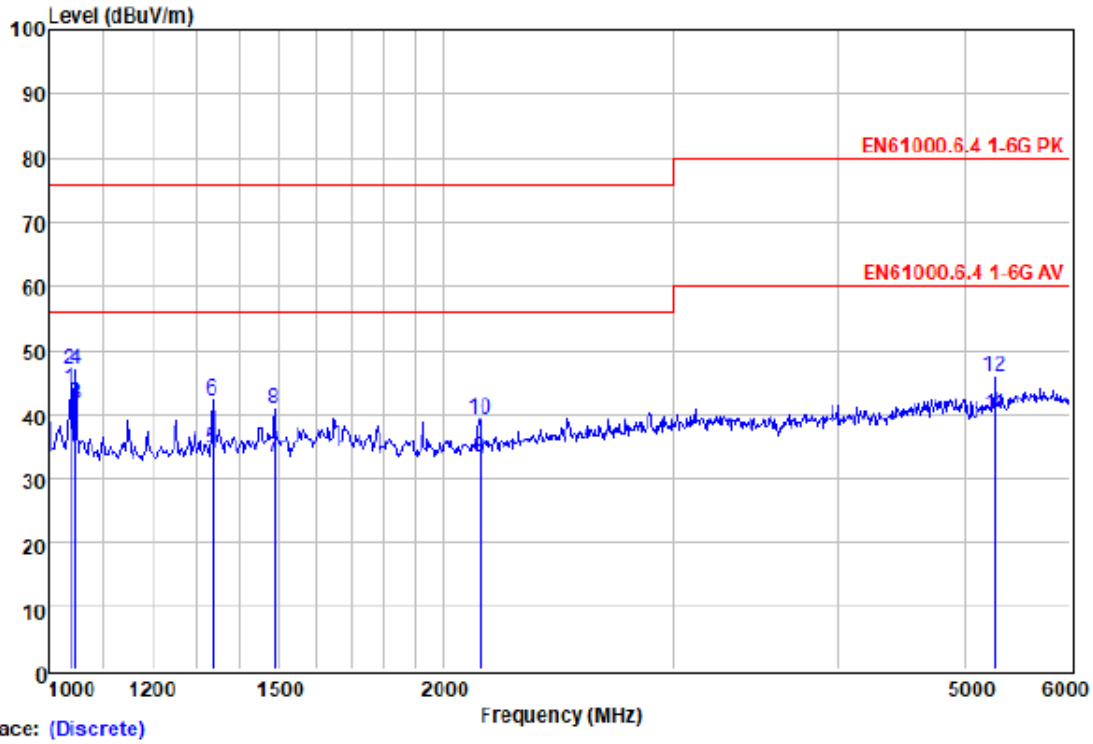


Trace: (Discrete)

```
Site        : SGS
Condition   : EN61000.6.4 1-6G PK 3m EMC2026 1G-18G 2016 HORIZONTAL
Job         :
Application:
Test Mode   :
Product     :
Model       :
Engineer    :
Remark      : Level=Read Level + Cable loss+Aux Factor
            : + Antenna Factor - Preamp factor
AC Power    :
Memo:       :
```

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	1039.300	53.76	24.14	2.36	38.28	41.98	56.00	-14.02	Average
2	1039.300	59.72	24.14	2.36	38.28	47.94	76.00	-28.06	Peak
3	1149.995	43.69	24.30	2.34	38.22	32.11	56.00	-23.89	Average
4	1149.995	52.40	24.30	2.34	38.22	40.82	76.00	-35.18	Peak
5	1334.389	45.58	24.85	2.60	38.06	34.97	56.00	-21.03	Average
6	1334.389	53.12	24.85	2.60	38.06	42.51	76.00	-33.49	Peak
7	1485.838	43.66	24.99	2.78	37.74	33.69	56.00	-22.31	Average
8	1485.838	52.11	24.99	2.78	37.74	42.14	76.00	-33.86	Peak
9	1604.841	43.08	25.03	2.80	37.64	33.27	56.00	-22.73	Average
10	1604.841	51.62	25.03	2.80	37.64	41.81	76.00	-34.19	Peak
11	5264.368	37.69	31.54	5.80	36.98	38.05	60.00	-21.95	Average
12	5264.368	44.81	31.54	5.80	36.98	45.17	80.00	-34.83	Peak

Mode:a; Polarization:Vertical



Trace: (Discrete)

Site : SGS
Condition : EN61000.6.4 1-6G PK 3m EMC2026 1G-18G 2016 VERTICAL
Job :
Application:
Test Mode :
Product :
Model :
Engineer :
Remark : Level=Read Level + Cable loss+Aux Factor
: + Antenna Factor - Preamp factor
AC Power :
Memo: :

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	1039.206	55.69	24.14	2.36	38.28	43.91	56.00	-12.09	Average
2	1039.206	58.62	24.14	2.36	38.28	46.84	76.00	-29.16	Peak
3	1050.567	53.29	24.15	2.40	38.28	41.56	56.00	-14.44	Average
4	1050.567	58.59	24.15	2.40	38.28	46.86	76.00	-29.14	Peak
5	1334.389	45.28	24.85	2.60	38.06	34.67	56.00	-21.33	Average
6	1334.389	52.73	24.85	2.60	38.06	42.12	76.00	-33.88	Peak
7	1485.838	43.29	24.99	2.78	37.74	33.32	56.00	-22.68	Average
8	1485.838	50.76	24.99	2.78	37.74	40.79	76.00	-35.21	Peak
9	2130.001	42.18	25.47	3.17	37.48	33.34	56.00	-22.66	Average
10	2130.001	48.04	25.47	3.17	37.48	39.20	76.00	-36.80	Peak
11	5264.368	39.66	31.54	5.80	36.98	40.02	60.00	-19.98	Average
12	5264.368	45.60	31.54	5.80	36.98	45.96	80.00	-34.04	Peak

7 Immunity Test Results

7.1 Performance Criteria Description in EN 50121-1:2017

Criterion A The apparatus shall continue to operate as intended during and 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. The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, either of these may be derived from the product description and documentation, and from what the user may reasonably expect from the apparatus if used as intended.

Criterion B The apparatus shall continue 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. The performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed. No change of actual operating state or stored data is allowed. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, either of these may be derived from the product description and documentation and what the user may reasonably expect from the apparatus if used as intended.

Criterion C Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of the controls.

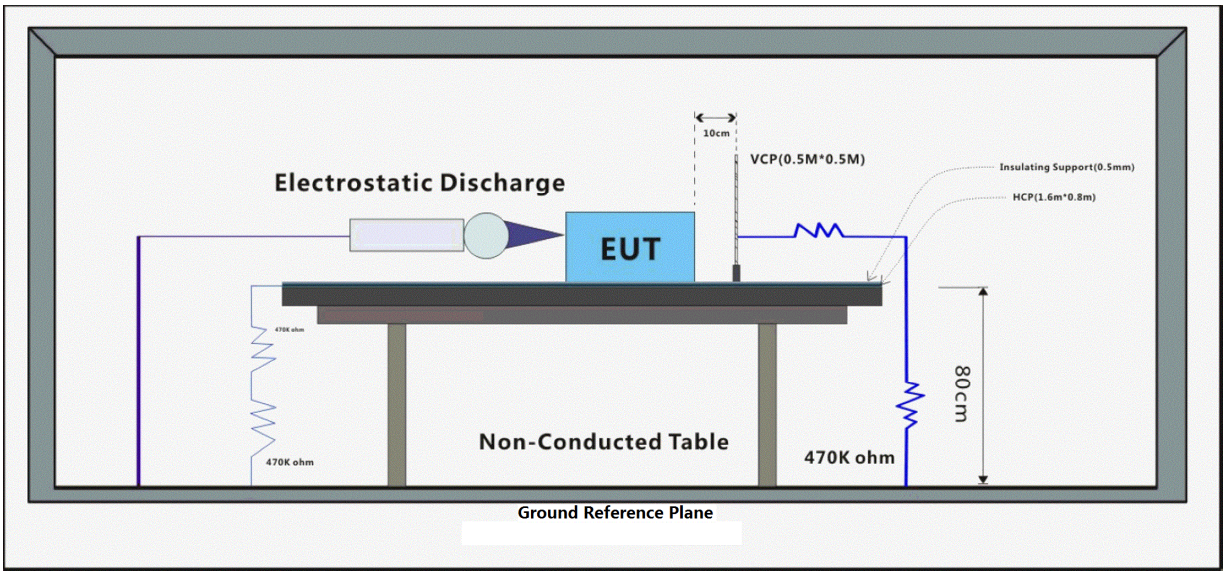
7.2 Electrostatic Discharge

Test Requirement: EN 50155:2017 clause 13.4.8 & EN 50121-3-2:2016
Test Method: EN 61000-4-2:2009
Performance Criterion: B
Discharge Impedance: 330Ω/150pF
Number of Discharge: Minimum 10 times at each test point
Discharge Mode: Single Discharge
Discharge Period: 1 second minimum

7.2.1 E.U.T. Operation

Operating Environment:
Temperature: 22.9 °C Humidity: 54.9 % RH Atmospheric Pressure: 1020 mbar
Test Mode: a: Test the EUT video recording mode.

7.2.2 Test Setup Diagram



7.2.3 Test Results

Observations:

Test Point:

1. All insulated enclosure and seams.
2. All accessible metal parts of the enclosure.
3. All side

Discharge type	Level (kV)	Polarity	Test Point	Result / Observations
Air Discharge	8	+	1	A
Air Discharge	8	-	1	A
Contact Discharge	6	+	2	A
Contact Discharge	6	-	2	A
Horizontal Coupling	6	+	3	A
Horizontal Coupling	6	-	3	A
Vertical Coupling	6	+	3	A
Vertical Coupling	6	-	3	A

Results:

A: No degradation in the performance of the EUT was observed.

N/A

7.3 Electrical Fast Transients/Burst at Power Port

Test Requirement: EN 50155:2017 clause 13.4.8 & EN 50121-3-2:2016

Test Method: EN 61000-4-4:2012

Performance Criterion: A

Repetition Frequency: 5kHz

Burst Period: 300ms

Test Duration: 2 minute per level & polarity

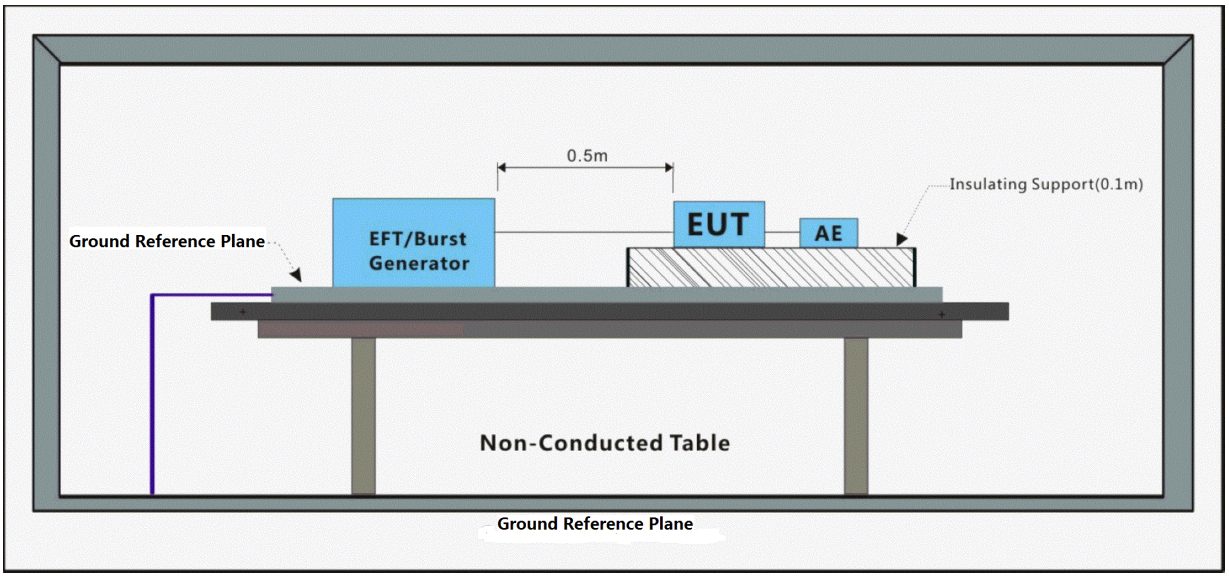
7.3.1 E.U.T. Operation

Operating Environment:

Temperature: 20 °C Humidity: 55 % RH Atmospheric Pressure: 1020 mbar

Test Mode: a: Test the EUT video recording mode.

7.3.2 Test Setup Diagram



7.3.3 Test Results

Test Line	Level (kV)	Polarity	CDN/Clamp	Result / Observations
DC power port	2	+	CDN	A
DC power port	2	-	CDN	A

Results:

A: No degradation in the performance of the EUT was observed.

7.4 Electrical Fast Transients/Burst at Signal Port

Test Requirement: EN 50155:2017 clause 13.4.8 & EN 50121-3-2:2016

Test Method: EN 61000-4-4:2012

Performance Criterion: A

Repetition Frequency: 5kHz

Burst Period: 300ms

Test Duration: 2 minute per level & polarity

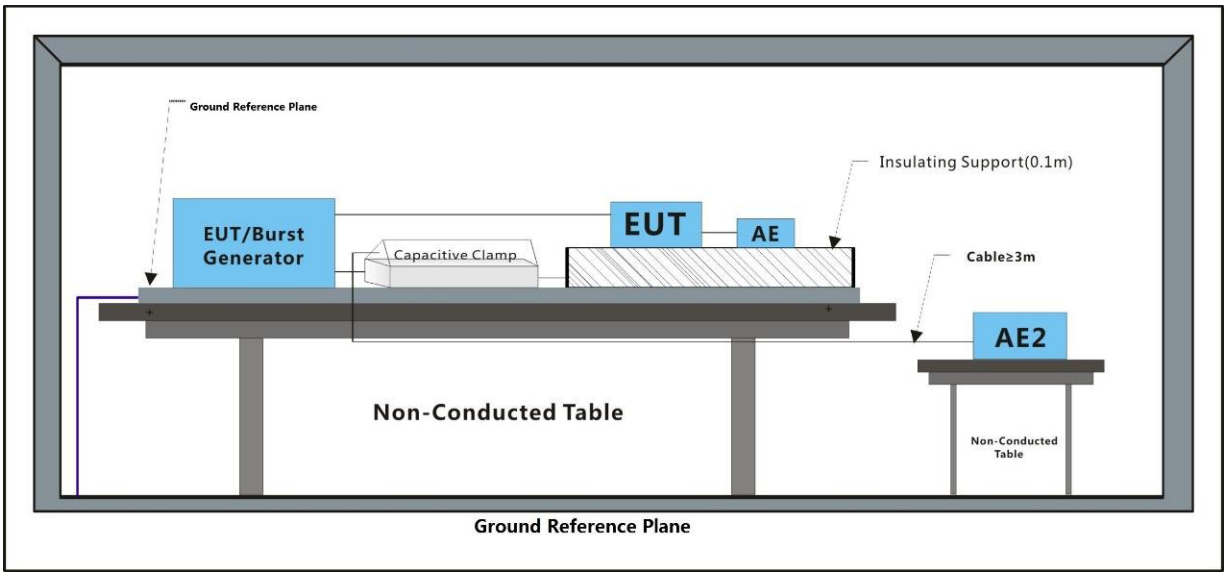
7.4.1 E.U.T. Operation

Operating Environment:

Temperature: 20 °C Humidity: 55 % RH Atmospheric Pressure: 1020 mbar

Test Mode: a: Test the EUT video recording mode.

7.4.2 Test Setup Diagram



7.4.3 Test Results

Port	Level (kV)	Polarity	CDN/Clamp	Result / Observations
Signal port	2	+	Clamp	A
Signal port	2	-	Clamp	A

Results:

A: No degradation in the performance of the EUT was observed.

7.5 Surge at Power Port

Test Requirement: EN 50155:2017 clause 13.4.8 & EN 50121-3-2:2016

Test Method: EN 61000-4-5:2014

Performance Criterion: B

Interval: 60s between each surge

No. of surges: 5 positive, 5 negative at DC power port

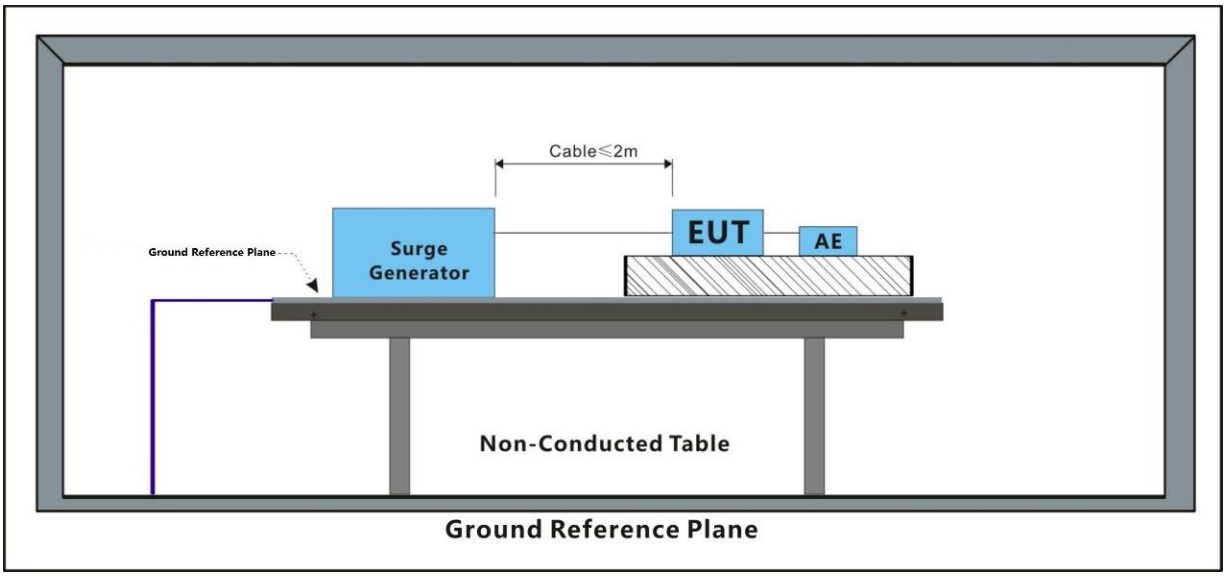
7.5.1 E.U.T. Operation

Operating Environment:

Temperature: 20 °C Humidity: 55 % RH Atmospheric Pressure: 1020 mbar

Test Mode: a: Test the EUT video recording mode.

7.5.2 Test Setup Diagram



7.5.3 Test Results

DC Power

Test Line	Level (kV)	Polarity	Phase (deg)	Coupling	Result / Observations
Line (P) - Line (N)	1	+	/	42Ω+0.5μF	A
Line (P) - Line (N)	1	-	/	42Ω+0.5μF	A

Results:

A: No degradation in the performance of the EUT was observed.

7.6 Conducted Immunity at Power Port (150kHz-80MHz)

Test Requirement: EN 50155:2017 clause 13.4.8 & EN 50121-3-2:2016

Test Method: EN 61000-4-6:2014

Performance Criterion: A

Frequency Range: 0.15MHz to 80MHz

Modulation: 80%, 1kHz Amplitude Modulation

Step Size 1%

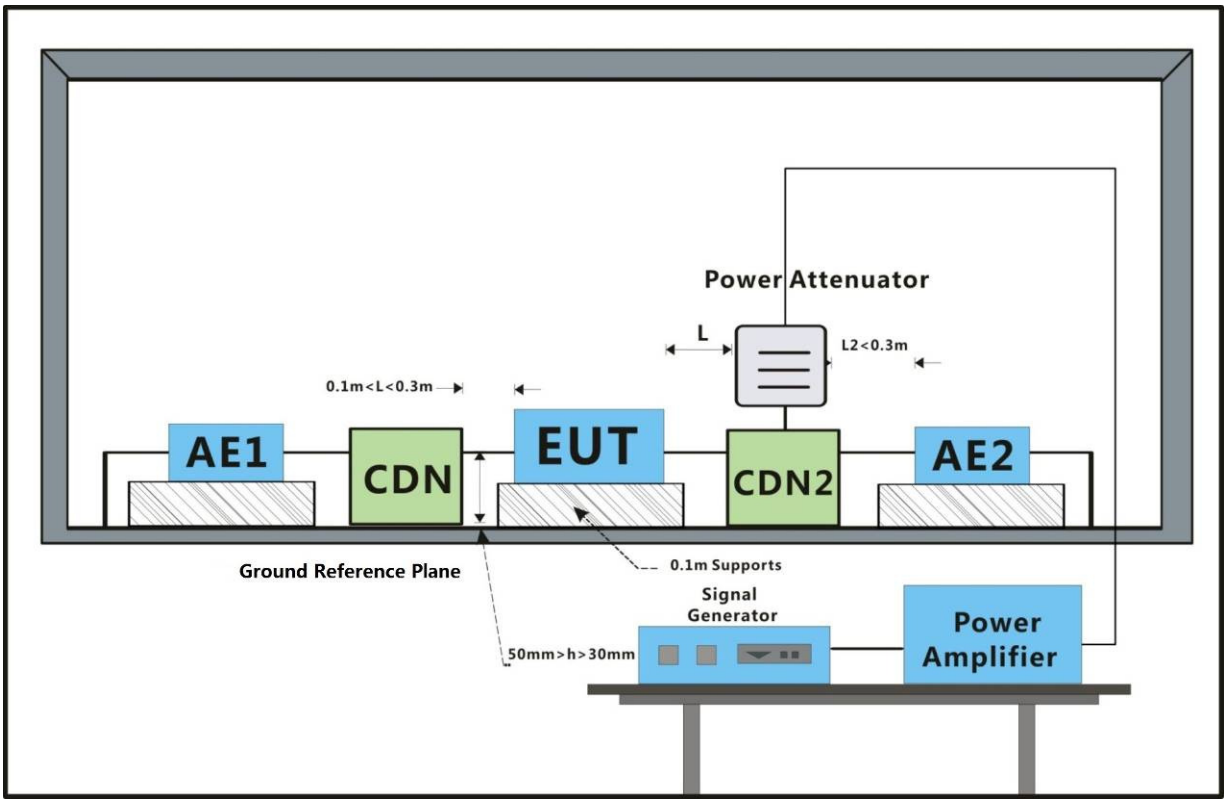
7.6.1 E.U.T. Operation

Operating Environment:

Temperature: 20 °C Humidity: 55 % RH Atmospheric Pressure: 1020 mbar

Test Mode: a: Test the EUT video recording mode.

7.6.2 Test Setup Diagram



7.6.3 Test Results

Cable port	Level (Vrms)	CDN/Clamp	Dwell time	Result / Observations
DC power port	10	CDN	2s	A

Results:

A: No degradation in the performance of the EUT was observed.

7.7 Conducted Immunity at Signal Port (150kHz-80MHz)

Test Requirement: EN 50155:2017 clause 13.4.8 & EN 50121-3-2:2016

Test Method: EN 61000-4-6:2014

Performance Criterion: A

Frequency Range: 0.15MHz to 80MHz

Modulation: 80%, 1kHz Amplitude Modulation

Step Size 1%

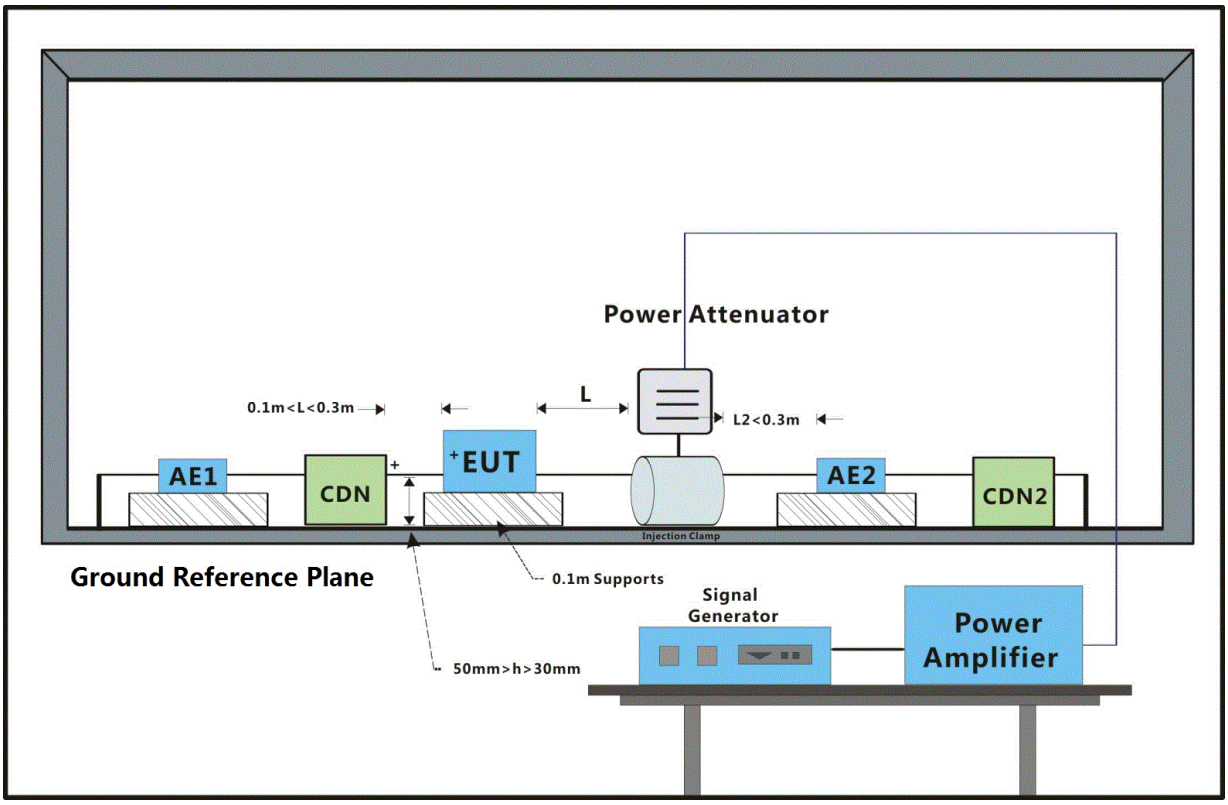
7.7.1 E.U.T. Operation

Operating Environment:

Temperature: 20 °C Humidity: 55 % RH Atmospheric Pressure: 1020 mbar

Test Mode: a: Test the EUT video recording mode.

7.7.2 Test Setup Diagram



7.7.3 Test Results

Port	Level (Vrms)	CDN/Clamp	Dwell time	Result / Observations
Signal port	10	Clamp	2s	A

Results:

A: No degradation in the performance of the EUT was observed.

7.8 Radiated Immunity (80MHz-6000MHz)

Test Requirement: EN 50155:2017 clause 13.4.8 & EN 50121-3-2:2016

Test Method: EN 61000-4-3:2006 +A1:2008+A2:2010

Performance Criterion: A

Frequency Range: 80MHz to 800MHz, 800MHz to 1000MHz, 1.4GHz to 2GHz, 2GHz to 2.7GHz, 5.1GHz to 6GHz

Antenna Polarisation: Vertical and Horizontal

Modulation: 1kHz,80% Amp. Mod,1% increment

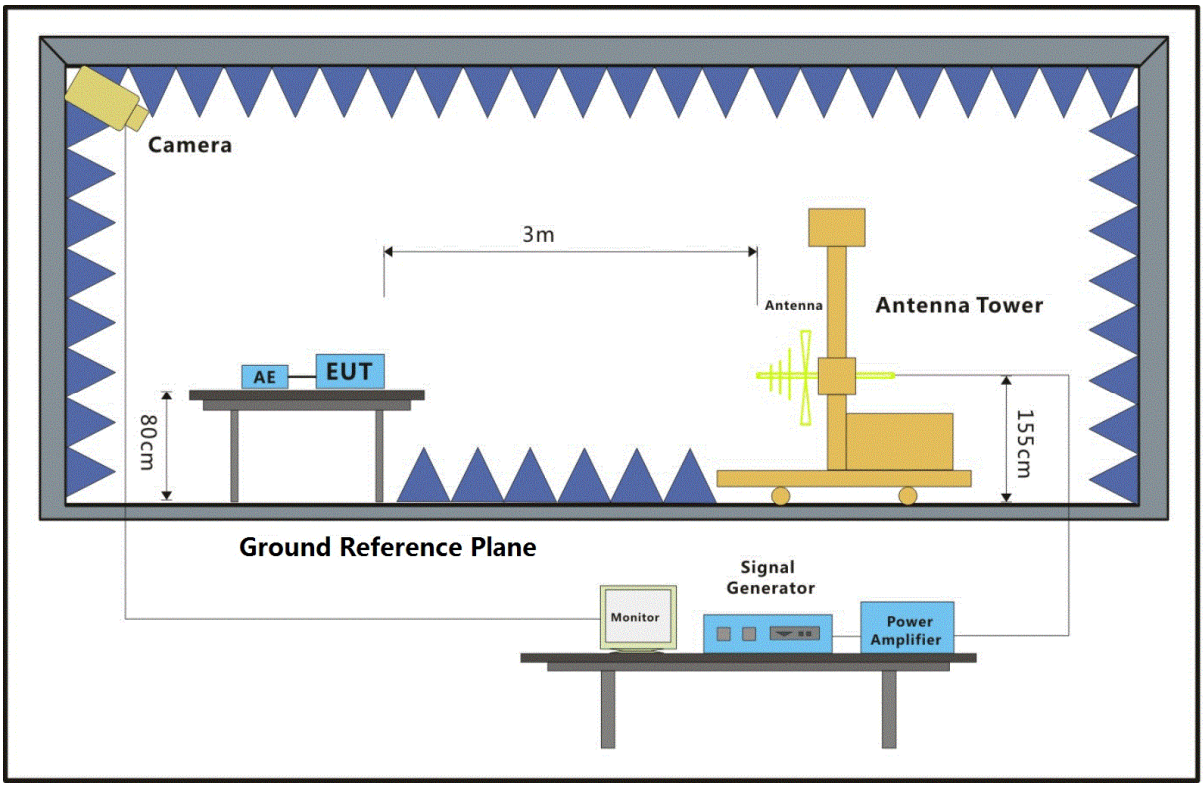
7.8.1 E.U.T. Operation

Operating Environment:

Temperature: 21 °C Humidity: 52 % RH Atmospheric Pressure: 1020 mbar

Test Mode: a: Test the EUT video recording mode.

7.8.2 Test Setup Diagram



7.8.3 Test Results

Frequency	Level (V/m)	EUT Face	Dwell time	Result / Observations
80MHz-800MHz	20	Front	2s	A
		Back	2s	A
		Left	2s	A
		Right	2s	A
		Top	2s	A
		Underside	2s	A
800MHz-1000MHz	20	Front	2s	A
		Back	2s	A
		Left	2s	A
		Right	2s	A
		Top	2s	A
		Underside	2s	A
1400MHz-2000MHz	10	Front	2s	A
		Back	2s	A
		Left	2s	A
		Right	2s	A
		Top	2s	A
		Underside	2s	A
2000MHz-2700MHz	5	Front	2s	A
		Back	2s	A
		Left	2s	A
		Right	2s	A
		Top	2s	A
		Underside	2s	A
5100MHz-6000MHz	3	Front	2s	A
		Back	2s	A
		Left	2s	A
		Right	2s	A
		Top	2s	A
		Underside	2s	A

Results:

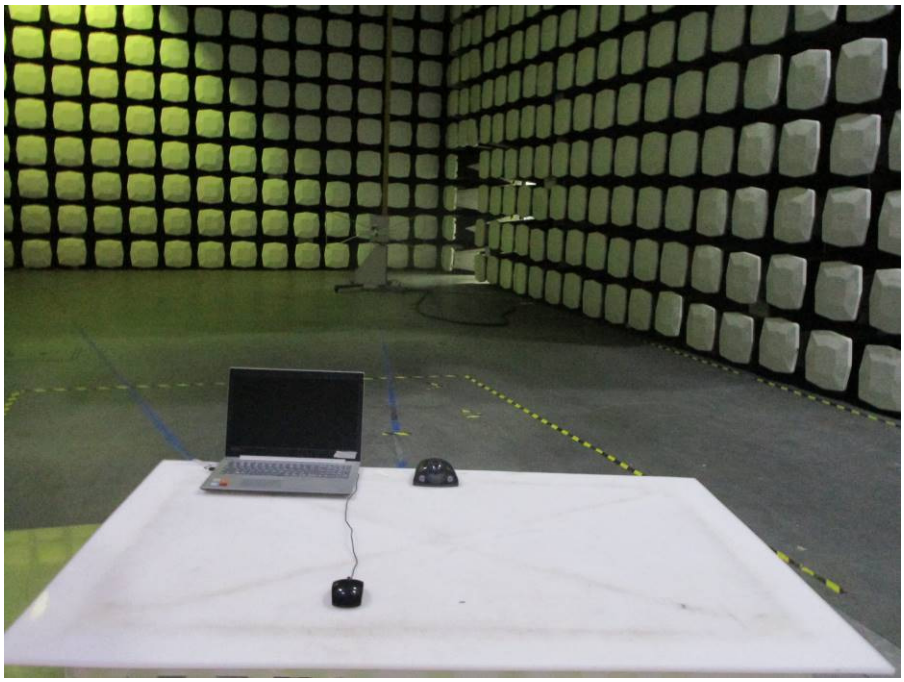
A: No degradation in the performance of the EUT was observed.

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

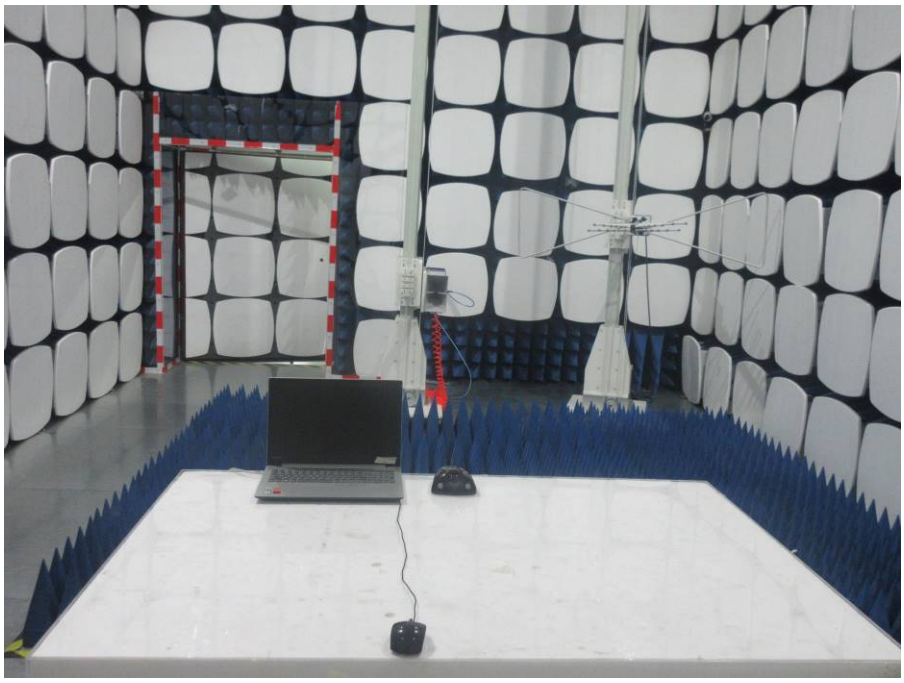
8 Photographs

8.1 Conducted Emissions at Mains Terminals (150kHz-30MHz) Test Setup

8.2 Radiated Emissions (30MHz-1GHz) Test Setup



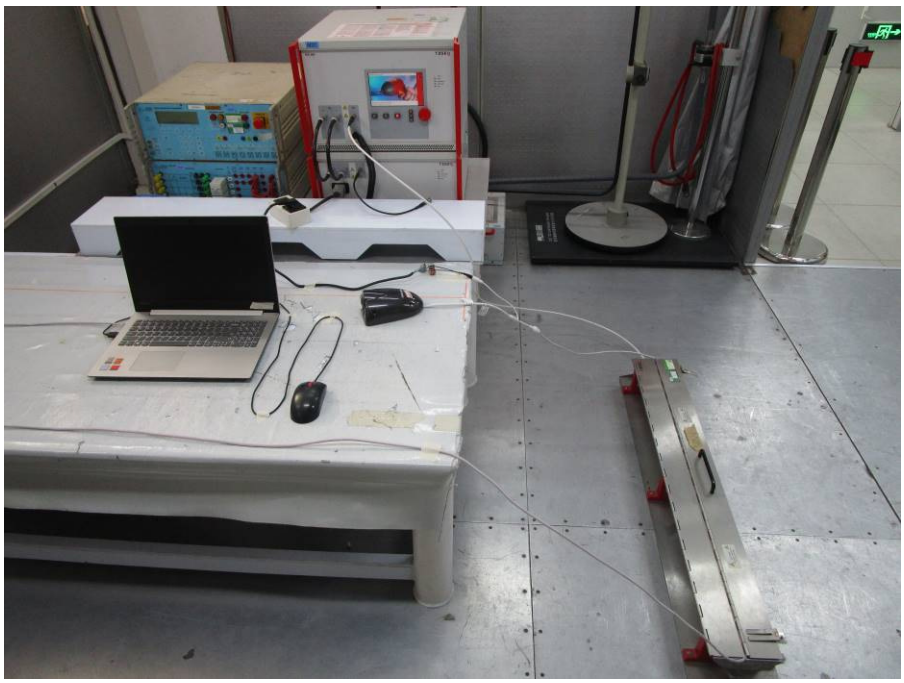
8.3 Radiated Emissions (above 1GHz) Test Setup



8.4 Electrostatic Discharge Test Setup

8.5 Electrical Fast Transients/Burst at Power Port Test Setup

8.6 Electrical Fast Transients/Burst at Signal Port Test Setup



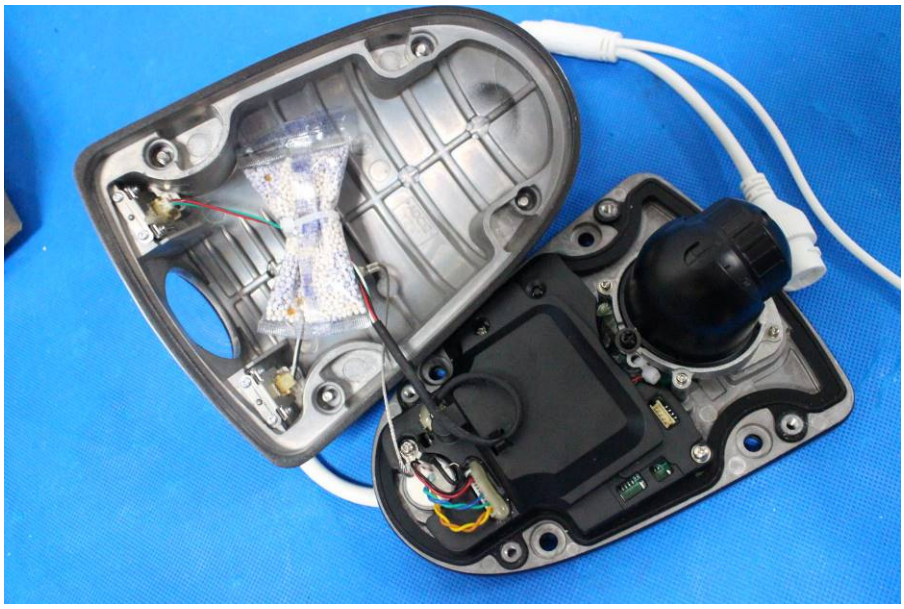
8.7 Surge at Power Port Test Setup

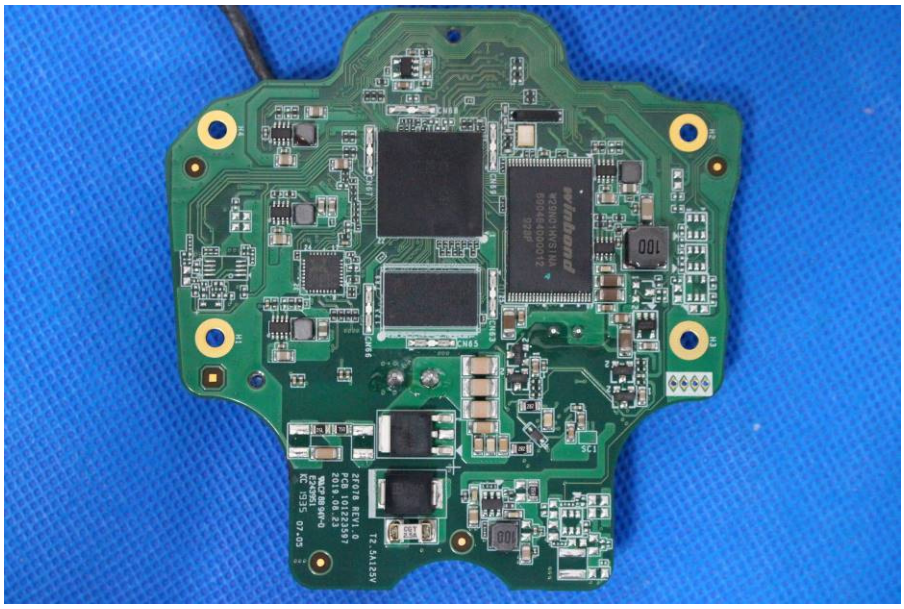
8.8 Conducted Immunity at Power Port (150kHz-80MHz) Test Setup

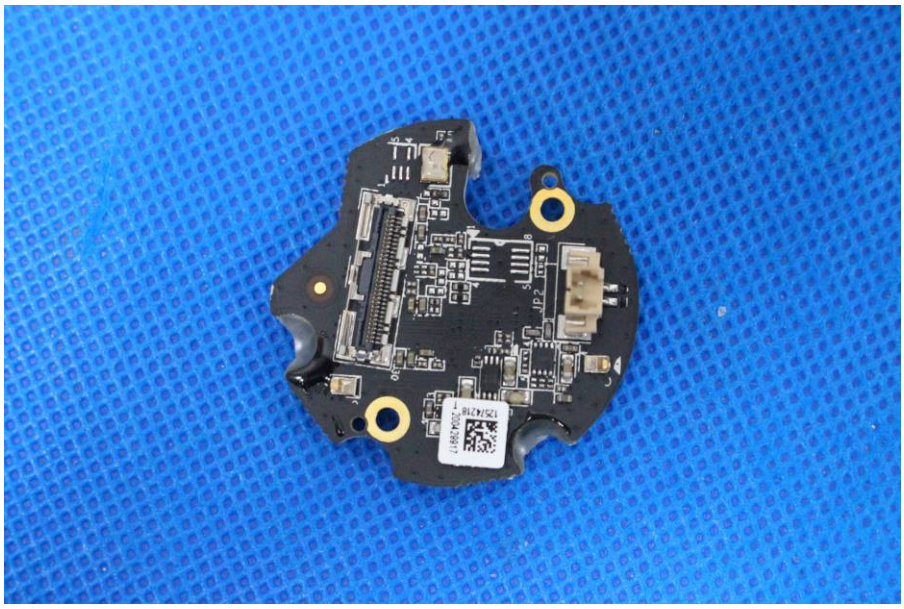
8.9 Conducted Immunity at Signal Port (150kHz-80MHz) Test Setup

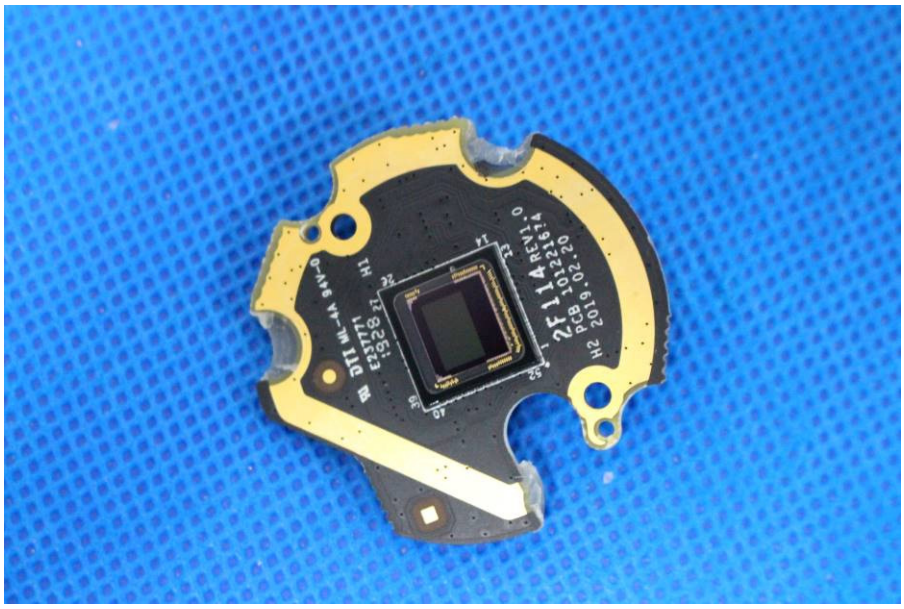
8.10 Radiated Immunity (80MHz-6000MHz) Test Setup

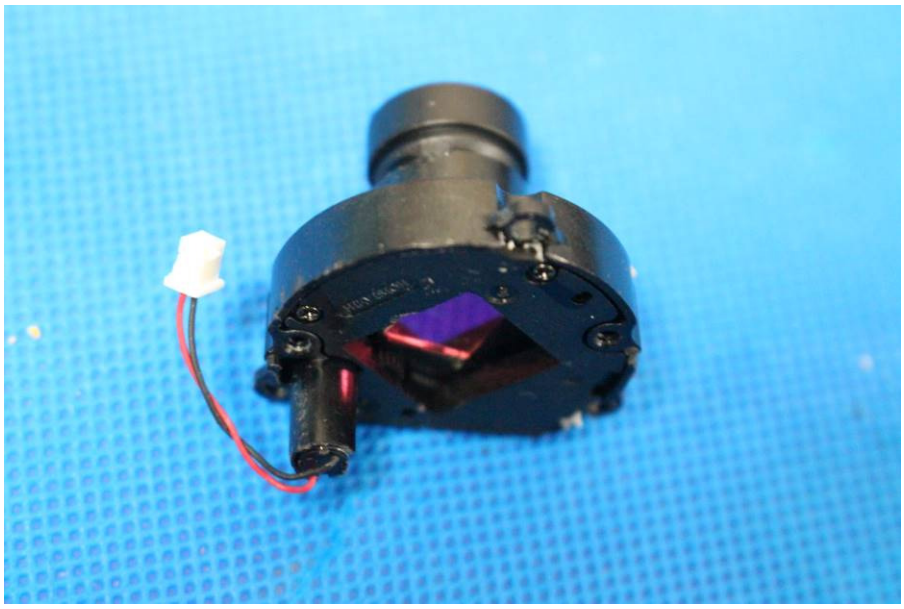
8.11 EUT Constructional Details

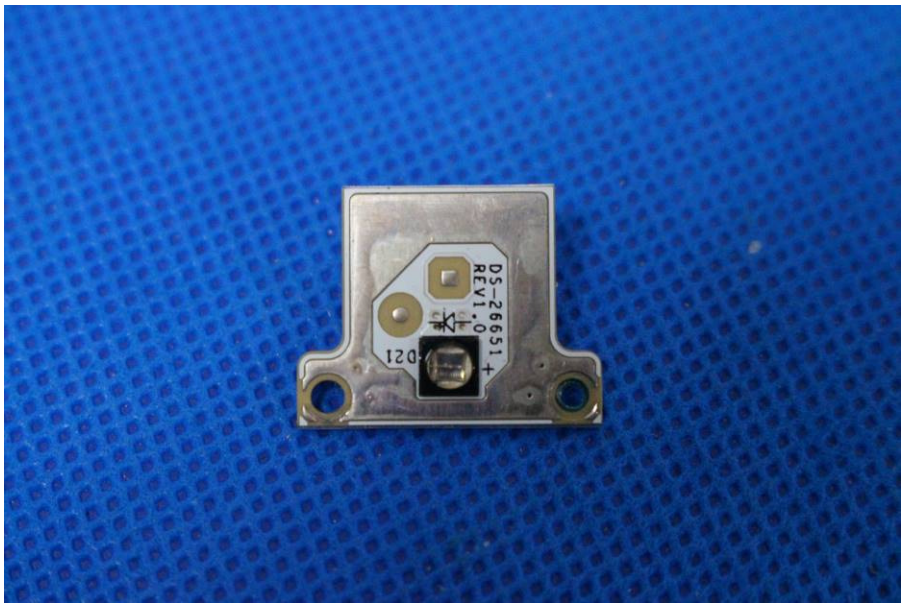


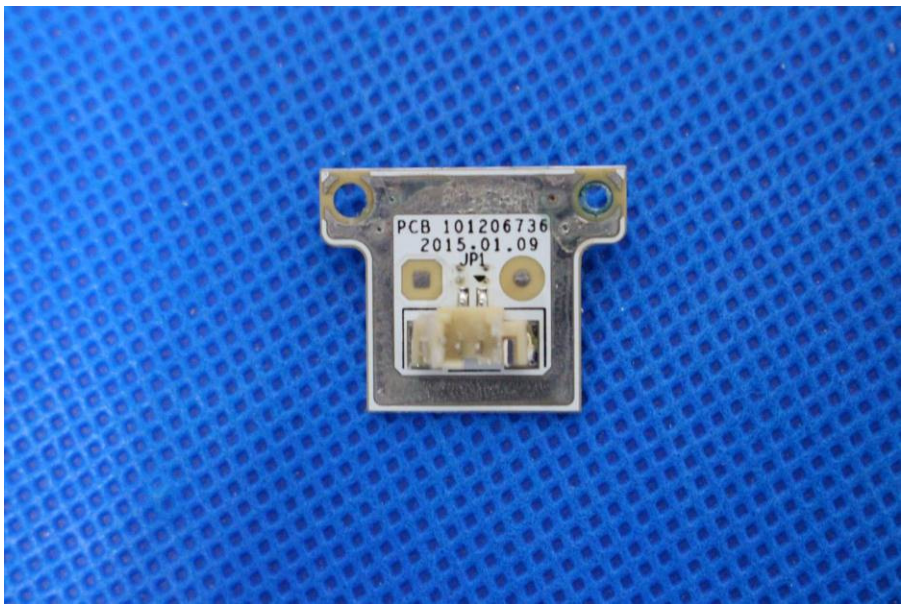












--End of Report—