

CE Test Report

Product Name : Network Camera

Model No. : MD9561-H, MD9581-H, MD9581-HTPM

Applicant : VIVOTEK INC.

Address : 6F, No.192, Lien-Cheng Rd., Chung-Ho, New Taipei City,
Taiwan, R.O.C.

Date of Receipt : 2019/04/02

Issued Date : 2019/11/14

Report No. : 1940043R-ITCEP27V00

Report Version : V2.0

The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration of the equipment and evaluated measurement uncertainty herein.

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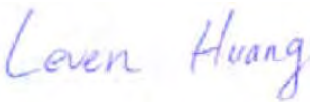
Test Report

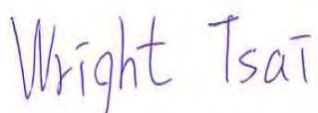
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Taiwan, R.O.C.
Manufacturer : VIVOTEK INC.
Model No. : MD9561-H, MD9581-H, MD9581-HTPM
EUT Rated Voltage : By PoE
EUT Test Voltage : By PoE
Trade Name : VIVOTEK
Applicable Standard : EN 50121-1: 2017
EN 50121-4: 2016
EN 61000-6-4: 2007+A1: 2011
Test Result : Complied
Performed Location : DEKRA Testing and Certification Co., Ltd.
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TABLE OF CONTENTS

Description	Page
1. General Information	5
1.1. EUT Description.....	5
1.2. Mode of Operation	6
1.3. Tested System Details	7
1.4. Configuration of Tested System	8
1.5. EUT Exercise Software.....	9
2. Technical Test	10
2.1. Summary of Test Result.....	10
2.2. List of Test Equipment	11
2.3. Measurement Uncertainty.....	13
2.4. Test Environment.....	15
3. Conducted Emissions (Telecommunication Ports).....	16
3.1. Test Specification	16
3.2. Test Setup.....	16
3.3. Limit.....	16
3.4. Test Procedure	17
3.5. Deviation from Test Standard.....	17
3.6. Test Result.....	18
3.7. Test Photograph	30
4. Radiated Emission.....	32
4.1. Test Specification	32
4.2. Test Setup.....	32
4.3. Limit	33
4.4. Test Procedure	34
4.5. Deviation from Test Standard.....	34
4.6. Test Result.....	35
4.7. Test Photograph	43
5. Electrostatic Discharge	46
5.1. Test Specification	46
5.2. Test Setup.....	46
5.3. Limit	46
5.4. Test Procedure	47
5.5. Deviation from Test Standard.....	47
5.6. Test Result.....	48
5.7. Test Photograph	50
5.8. EUT to dot photo for ESD test	51
6. Radiated Susceptibility	58
6.1. Test Specification	58
6.2. Test Setup.....	58

6.3.	Limit	58
6.4.	Test Procedure	59
6.5.	Deviation from Test Standard.....	59
6.6.	Test Result.....	60
6.7.	Test Photograph	64
7.	Electrical Fast Transient/Burst	70
7.1.	Test Specification	70
7.2.	Test Setup.....	70
7.3.	Limit	70
7.4.	Test Procedure	71
7.5.	Deviation from Test Standard.....	71
7.6.	Test Result	72
7.7.	Test Photograph	74
8.	Surge	75
8.1.	Test Specification	75
8.2.	Test Setup.....	75
8.3.	Limit	75
8.4.	Test Procedure	76
8.5.	Deviation from Test Standard.....	76
8.6.	Test Result	77
8.7.	Test Photograph	79
9.	Conducted Susceptibility	80
9.1.	Test Specification	80
9.2.	Test Setup.....	80
9.3.	Limit	81
9.4.	Test Procedure	81
9.5.	Deviation from Test Standard.....	81
9.6.	Test Result	82
9.7.	Test Photograph	84
10.	Power Frequency Magnetic Field	85
10.1.	Test Specification	85
10.2.	Test Setup.....	85
10.3.	Limit	85
10.4.	Test Procedure	86
10.5.	Deviation from Test Standard.....	86
10.6.	Test Result	87
10.7.	Test Photograph	89
11.	Attachment	90
	EUT Photograph	90

1. General Information

1.1. EUT Description

Product Name	Network Camera
Trade Name	VIVOTEK
Model No.	MD9561-H, MD9581-H, MD9581-HTPM

Note: The different of the each model is shown as below:

Model Number	Description
MD9561-H	2M sensor.
MD9581-H	5M sensor.
MD9581-HTPM	5M sensor. Waterproof membrane design on PCB.

1.2. Mode of Operation

DEKRA has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

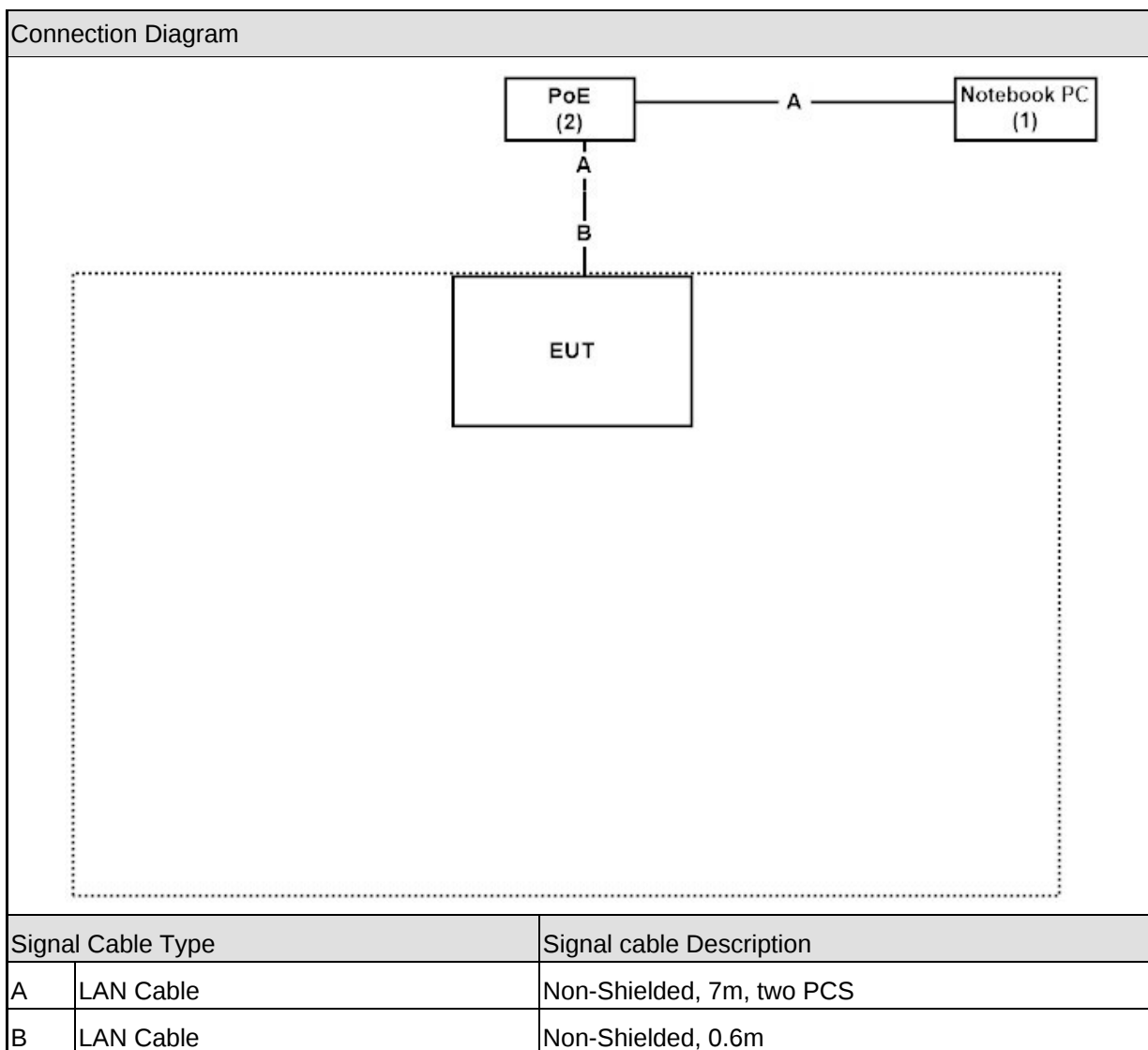
Pre-Test Mode	
Mode 1: MD9561-H , PoE	
Mode 2: MD9581-H , PoE	
Final Test Mode	
Emission	Mode 1: MD9561-H , PoE Mode 2: MD9581-H , PoE
Immunity	Mode 1: MD9561-H , PoE Mode 2: MD9581-H , PoE
Note: According to pre-test data, we choose the worst case mode 1, 2 as the final and full testing.	

1.3. Tested System Details

The types for all equipments, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product		Manufacturer	Model No.	Serial No.	Power Cord
1	Notebook PC	DELL	Latitude 5491	BJ746S2	Non-Shielded, 0.8m
2	PoE	N/A	N/A	N/A	Non-Shielded, 1.8m

1.4. Configuration of Tested System



1.5. EUT Exercise Software

1	Setup the EUT and simulators as shown on 1.4.
2	Turn on the power of all equipment.
3	All the features of the EUT operation normally.

2. Technical Test

2.1. Summary of Test Result

- ☒ No deviations from the test standards
- ☐ Deviations from the test standards as below description:

Emission			
Performed Item	Normative References	Test Performed	Deviation
Power Line Conducted Emission	EN 61000-6-4:2007+A1:2011 CISPR 16-2-1:2003+A1:2005 CISPR 16-1-2:2003/A2:2006	No	No
Impedance Stabilization Network (ISN)	EN 61000-6-4:2007+A1:2011 CISPR 22	Yes	No
Radiated Emission	EN 61000-6-4:2007+A1:2011 CISPR 16-2-3:2006	Yes	No

Immunity			
Performed Item	Normative References	Test Performed	Deviation
Electrostatic Discharge	IEC 61000-4-2 Ed. 2.0: 2008	Yes	No
Radio-frequency electromagnetic field. (Radiated susceptibility)	IEC 61000-4-3 Ed. 3.2: 2010	Yes	No
Electrical fast transient/burst	IEC 61000-4-4 Ed. 3.0: 2012	Yes	No
Surge	IEC 61000-4-5 Ed. 3.1: 2014 +A1: 2017	Yes	No
Radio-frequency common mode (Conducted susceptibility)	IEC 61000-4-6 Ed. 4.0: 2013	Yes	No
Power frequency magnetic field	IEC 61000-4-8 Ed. 2.0: 2009	Yes	No

2.2. List of Test Equipment

Impedance Stabilization Network / SR8

Instrument	Manufacturer	Type No.	Serial No	Cal. Date
EMI Test Receiver	R&S	ESCS 30	100369	2018/11/19
LISN	R&S	ENV216	100097	2019/02/18
LISN	R&S	ESH3-Z5	836679/017	2019/02/18
Coaxial Cable	DEKRA	RG 400	LC018-RG	2018/06/21
Capacitive Voltage Probe	Schaffner	CVP2200A	18331	2018/12/03
RF Current Probe	FCC	F-65	198	2018/12/13
BALANCED TELECOM ISN	FCC	FCC-TLISN-T2-02	20316	2018/09/14
Impedance Stabilization Network	Teseq	ISN T800	42815	2018/07/12

Radiated Emission / Site7

Instrument	Manufacturer	Type No.	Serial No	Cal. Date
Broadband Antenna	Schwarzbeck	VULB 9168	0852	2019/02/02
EMI Test Receiver	R&S	ESCI	100649	2018/07/20
Coaxial Cable	DEKRA	RG 214	LC007-RG	2018/06/18
Pre-Amplifier	DEKRA	AP/0100A	CHM/1009094	2018/06/18
Site7 NSA	DEKRA	N/A	N/A	2018/06/18

Radiated Emission / CB7

Instrument	Manufacturer	Type No.	Serial No	Cal. Date
EMI Test Receiver	R&S	ESU26	100433	2018/11/13
Horn Antenna	ETS-Lindgren	3117	00202723	2018/08/08
Horn Antenna	SCHWARZBECK	9120D	576	2018/12/18
Pre-Amplifier	EMCI	EMC051845SE	980359	2018/10/24
CB7 VSWR	DEKRA	N/A	N/A	2018/06/25

Electrostatic Discharge / SR6

Instrument	Manufacturer	Type No.	Serial No	Cal. Date
ESD Simulator System	Noiseken	ESS-B3011	ESS1233479	2018/05/16
ESD GUN	Noiseken	GT-30R	ESS1233499	2018/05/16
Horizontal Coupling Plane(HCP)	QuieTek	HCP AL50	N/A	N/A
Vertical Coupling Plane(VCP)	QuieTek	VCP AL50	N/A	N/A

Radiated susceptibility / CB9

Instrument	Manufacturer	Type No.	Serial No	Cal. Date
Signal Generator	Keysight	N5171B	MY53051650	2019/03/03
Power Sensor	Keysight	N1912A	MY55480006	2019/03/05
Stacked double Log.-Per.-Broadband Antenna	SCHWARZBECK	STLP 9129	9129 011	N/A
Power Amplifier	MILMEGA	80RF1000-300	1071481	N/A
Power Amplifier	MILMEGA	AS0860B-50/50	1071482	N/A
uniform field calibration	Dekra	N/A	N/A	2018/06/15

Electrical fast transient/burst / SR6

Instrument	Manufacturer	Type No.	Serial No	Cal. Date
EMS TEST System	TESEQ	NSG 3060	1685	2018/09/02

Surge / SR6

Instrument	Manufacturer	Type No.	Serial No	Cal. Date
EMS TEST System	TESEQ	NSG 3060	1685	2018/09/02

Conducted susceptibility / SR6

Instrument	Manufacturer	Type No.	Serial No	Cal. Date
TESEQ RF-Generator	TESEQ	NSG 4070B-30	37490	2018/05/29

Power frequency magnetic field / SR3

Instrument	Manufacturer	Type No.	Serial No	Cal. Date
45kVA Power Source	TESEQ	NSG 1007-45	1847A00294	2018/12/19
Magnetic Loop Coil	TESEQ	INA 703	2007	2018/08/02

2.3. Measurement Uncertainty

Impedance Stabilization Network

The measurement uncertainty is evaluated as ± 3.88 dB.

Radiated Emission

The measurement uncertainty is evaluated as ± 4.22 dB.

Radiated Emission Above 1GHz

The measurement uncertainty is evaluated as ± 5.08 dB.

Electrostatic Discharge

As what is concluded in the document from Note2 of clause 5.4.6.2 of ISO/IEC 17025, the requirements for measurement uncertainty in ESD testing are deemed to have been satisfied, and the testing is reported in accordance with the relevant ESD standards. The immunity test signal from the ESD system meet the required specifications in IEC 61000-4-2 through the calibration report with the calibrated uncertainty for the waveform of current and timing as being 4.6 % and 6.7 %

Radiated susceptibility

As what is concluded in the document from Note2 of clause 5.4.6.2 of ISO/IEC 17025, the requirements for measurement uncertainty in RS testing are deemed to have been satisfied, and the testing is reported in accordance with the relevant RS standards. The immunity test signal from the RS system meet the required specifications in IEC 61000-4-3 through the calibration for the uniform field strength and monitoring for the test level with the uncertainty evaluation report for the electrical field strength as being 3.57 dB

Electrical fast transient/burst

As what is concluded in the document from Note2 of clause 5.4.6.2 of ISO/IEC 17025, the requirements for measurement uncertainty in EFT/Burst testing are deemed to have been satisfied, and the testing is reported in accordance with the relevant EFT/Burst standards. The immunity test signal from the EFT/Burst system meet the required specifications in IEC 61000-4-4 through the calibration report with the calibrated uncertainty for the waveform of voltage and timing as being 8.4 % and 4.7%.

Surge

As what is concluded in the document from Note2 of clause 5.4.6.2 of ISO/IEC 17025, the requirements for measurement uncertainty in Surge testing are deemed to have been satisfied, and the testing is reported in accordance with the relevant Surge standards. The immunity test signal from the Surge system meet the required specifications in IEC 61000-4-5 through the calibration report with the calibrated uncertainty for the waveform of voltage and timing as being 4.1 % and 3.9%

Conducted susceptibility

As what is concluded in the document from Note2 of clause 5.4.6.2 of ISO/IEC 17025, the requirements for measurement uncertainty in CS testing are deemed to have been satisfied, and the testing is reported in accordance with the relevant CS standards. The immunity test signal from the CS system meet the required specifications in IEC 61000-4-6 through the calibration for unmodulated signal and monitoring for the test level with the uncertainty evaluation report for the injected modulated signal level through CDN and EM Clamp/Direct Injection as being 2.15 dB and 3.3 dB

Power frequency magnetic field

As what is concluded in the document from Note2 of clause 5.4.6.2 of ISO/IEC 17025, the requirements for measurement uncertainty in PFM testing are deemed to have been satisfied, and the testing is reported in accordance with the relevant PFM standards. The immunity test signal from the PFM system meet the required specifications in IEC 61000-4-8 through the calibration report with the calibrated uncertainty for the Gauss Meter to verify the output level of magnetic field strength as being 1.0 %

2.4. Test Environment

Performed Item	Items	Required	Actual
Impedance Stabilization Network	Temperature (°C)	15-35	20
	Humidity (%RH)	25-75	51
	Barometric pressure (mbar)	860-1060	950-1000
Radiated Emission	Temperature (°C)	15-35	25.2
	Humidity (%RH)	25-75	50
	Barometric pressure (mbar)	860-1060	950-1000
Electrostatic Discharge	Temperature (°C)	15-35	20
	Humidity (%RH)	30-60	50
	Barometric pressure (mbar)	860-1060	900-1000
Radiated susceptibility	Temperature (°C)	15-35	21
	Humidity (%RH)	25-75	53
	Barometric pressure (mbar)	860-1060	950-1000
Electrical fast transient/burst	Temperature (°C)	15-35	20
	Humidity (%RH)	25-75	50
	Barometric pressure (mbar)	860-1060	950-1000
Surge	Temperature (°C)	15-35	20
	Humidity (%RH)	10-75	50
	Barometric pressure (mbar)	860-1060	950-1000
Conducted susceptibility	Temperature (°C)	15-35	20
	Humidity (%RH)	25-75	50
	Barometric pressure (mbar)	860-1060	950-1000
Power frequency magnetic field	Temperature (°C)	15-35	20
	Humidity (%RH)	25-75	51
	Barometric pressure (mbar)	860-1060	950-1000

3.4. Test Procedure

Telecommunication Port:

The mains voltage shall be supplied to the EUT via the LISN when the measurement of telecommunication port is performed. The common mode disturbances at the telecommunication port shall be connected to the ISN, which is 150 ohm impedance.

Both alternative cables are tested related to the LCL requested. The measurement range is from 150kHz to 30MHz. The bandwidth of measurement is set to 9kHz.

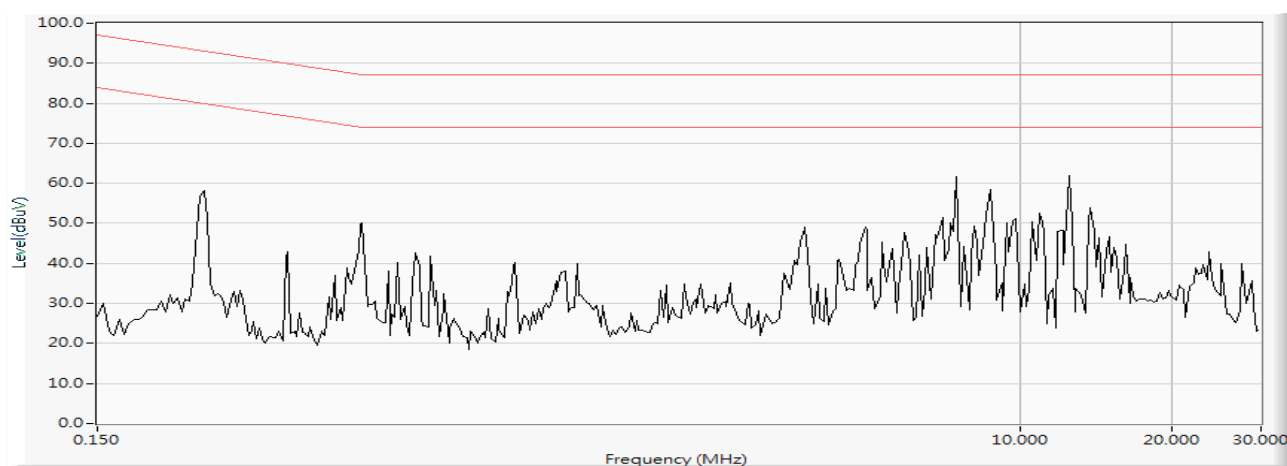
The 75dB LCL ISN is used for cat. 6 cable, the 65dB LCL ISN is used for cat. 5 cable, 55dB LCL ISN is used for cat. 3.

3.5. Deviation from Test Standard

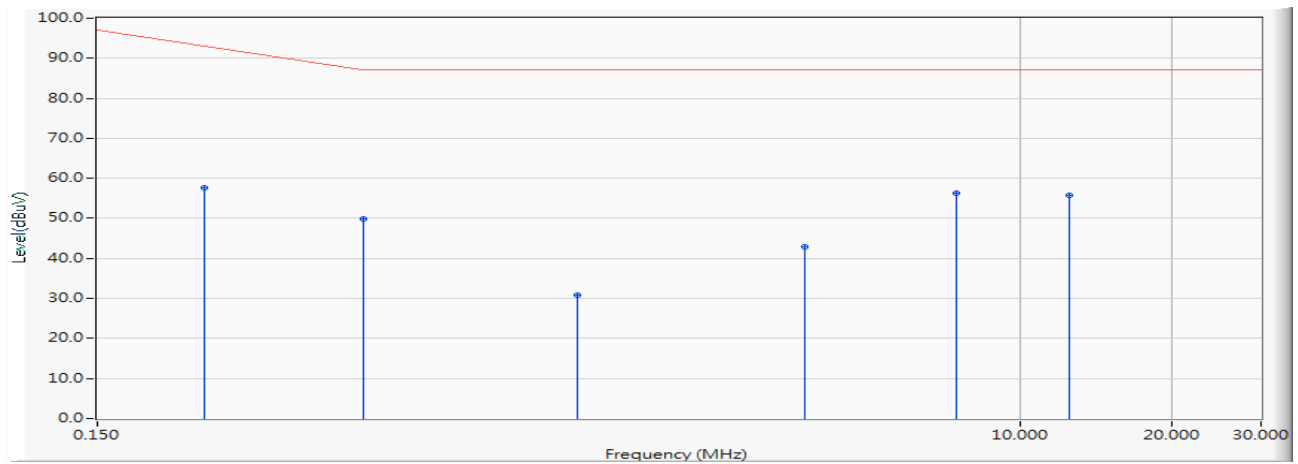
No deviation.

3.6. Test Result

Site : SR8	Time : 2019/04/09 - 11:52
Limit : ISN_Voltage_A_00M_QP	Margin : 13
EUT : Network Camera	Probe : TESEQ_T8_42815 - Line1
Power : POE	Note : Mode 1, ISN 10M



Site : SR8	Time : 2019/04/09 - 11:52
Limit : ISN_Voltage_A_00M_QP	Margin : 0
EUT : Network Camera	Probe : TESEQ_T8_42815 - Line1
Power : POE	Note : Mode 1, ISN 10M

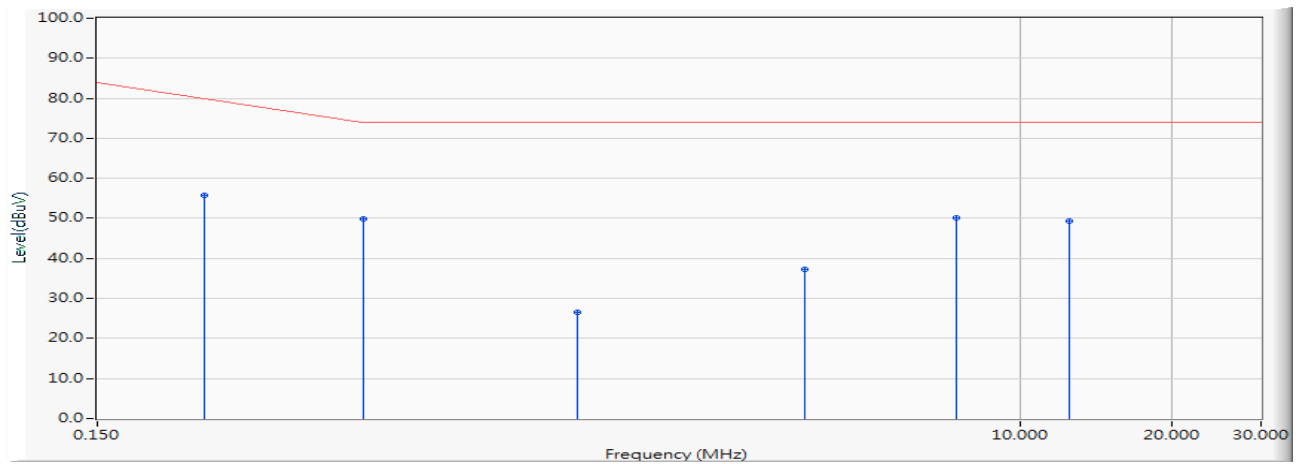


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1		0.244	10.204	47.460	57.664	-36.650	94.314	QUASIPeAK
2		0.502	10.012	39.960	49.972	-37.028	87.000	QUASIPeAK
3		1.334	9.924	20.920	30.844	-56.156	87.000	QUASIPeAK
4		3.750	9.899	33.100	42.999	-44.001	87.000	QUASIPeAK
5	*	7.500	9.970	46.380	56.350	-30.650	87.000	QUASIPeAK
6		12.500	10.090	45.780	55.870	-31.130	87.000	QUASIPeAK

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor(Probe+Cable-Amp).

Site : SR8	Time : 2019/04/09 - 11:53
Limit : ISN_Voltage_A_00M_AV	Margin : 0
EUT : Network Camera	Probe : TESEQ_T8_42815 - Line1
Power : POE	Note : Mode 1, ISN 10M

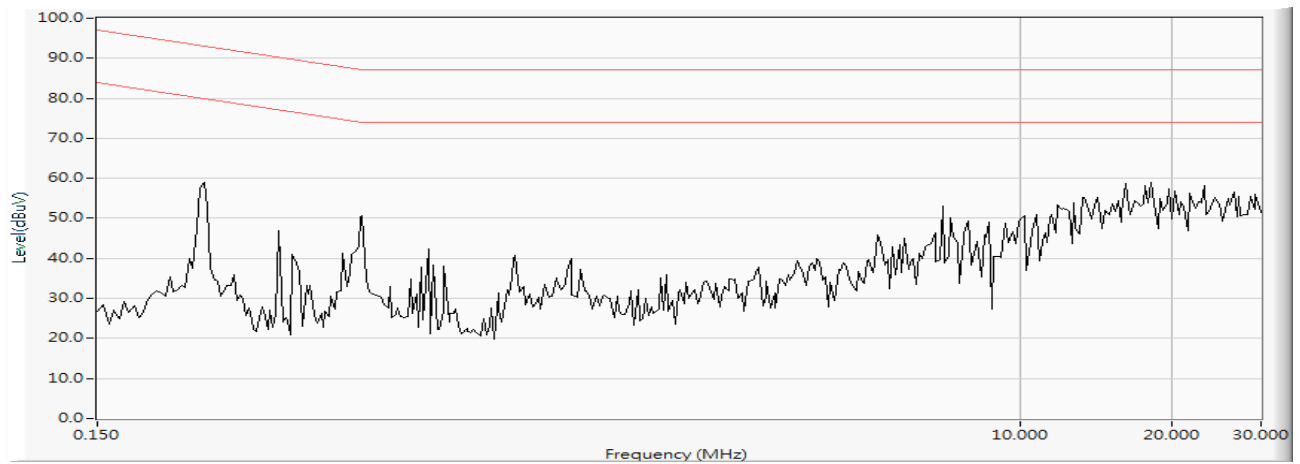


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1		0.244	10.204	45.440	55.644	-25.670	81.314	AVERAGE
2		0.502	10.012	39.820	49.832	-24.168	74.000	AVERAGE
3		1.334	9.924	16.720	26.644	-47.356	74.000	AVERAGE
4		3.750	9.899	27.280	37.179	-36.821	74.000	AVERAGE
5	*	7.500	9.970	40.200	50.170	-23.830	74.000	AVERAGE
6		12.500	10.090	39.200	49.290	-24.710	74.000	AVERAGE

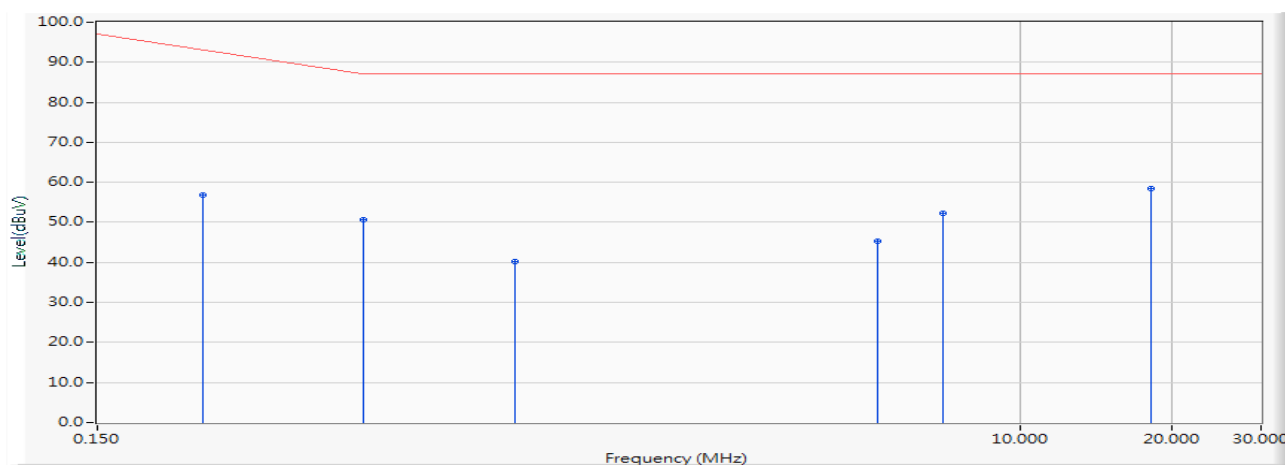
Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor(Probe+Cable-Amp).

Site : SR8	Time : 2019/04/09 - 11:52
Limit : ISN_Voltage_A_00M_QP	Margin : 13
EUT : Network Camera	Probe : TESEQ_T8_42815 - Line1
Power : POE	Note : Mode 1, ISN 100M



Site : SR8	Time : 2019/04/09 - 11:52
Limit : ISN_Voltage_A_00M_QP	Margin : 0
EUT : Network Camera	Probe : TESEQ_T8_42815 - Line1
Power : POE	Note : Mode 1, ISN 100M

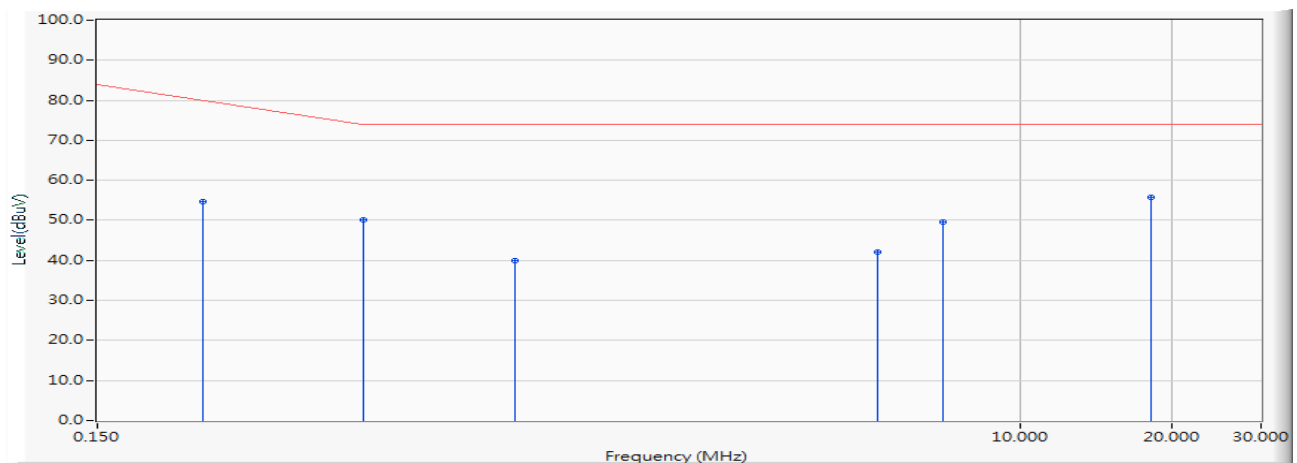


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1		0.242	10.207	46.500	56.706	-37.665	94.371	QUASIPeAK
2		0.502	10.012	40.700	50.712	-36.288	87.000	QUASIPeAK
3		1.002	9.931	30.400	40.331	-46.669	87.000	QUASIPeAK
4		5.236	9.919	35.520	45.439	-41.561	87.000	QUASIPeAK
5		7.041	9.960	42.380	52.340	-34.660	87.000	QUASIPeAK
6	*	18.244	10.239	48.260	58.499	-28.501	87.000	QUASIPeAK

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor(Probe+Cable-Amp).

Site : SR8	Time : 2019/04/09 - 11:52
Limit : ISN_Voltage_A_00M_AV	Margin : 0
EUT : Network Camera	Probe : TESEQ_T8_42815 - Line1
Power : POE	Note : Mode 1, ISN 100M

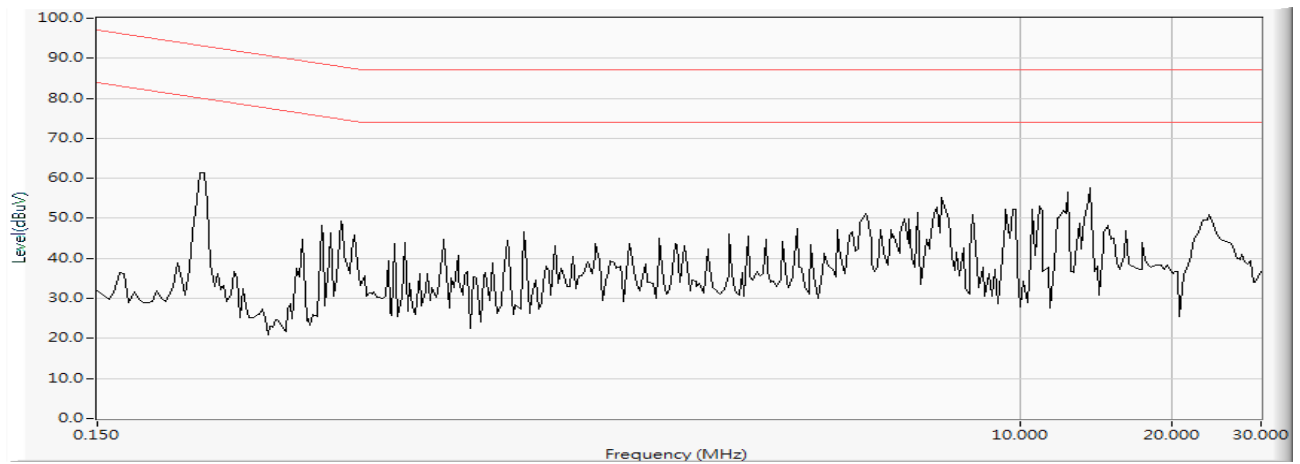


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1		0.242	10.207	44.480	54.686	-26.685	81.371	AVERAGE
2		0.502	10.012	40.240	50.252	-23.748	74.000	AVERAGE
3		1.002	9.931	29.920	39.851	-34.149	74.000	AVERAGE
4		5.236	9.919	32.280	42.199	-31.801	74.000	AVERAGE
5		7.041	9.960	39.660	49.620	-24.380	74.000	AVERAGE
6	*	18.244	10.239	45.640	55.879	-18.121	74.000	AVERAGE

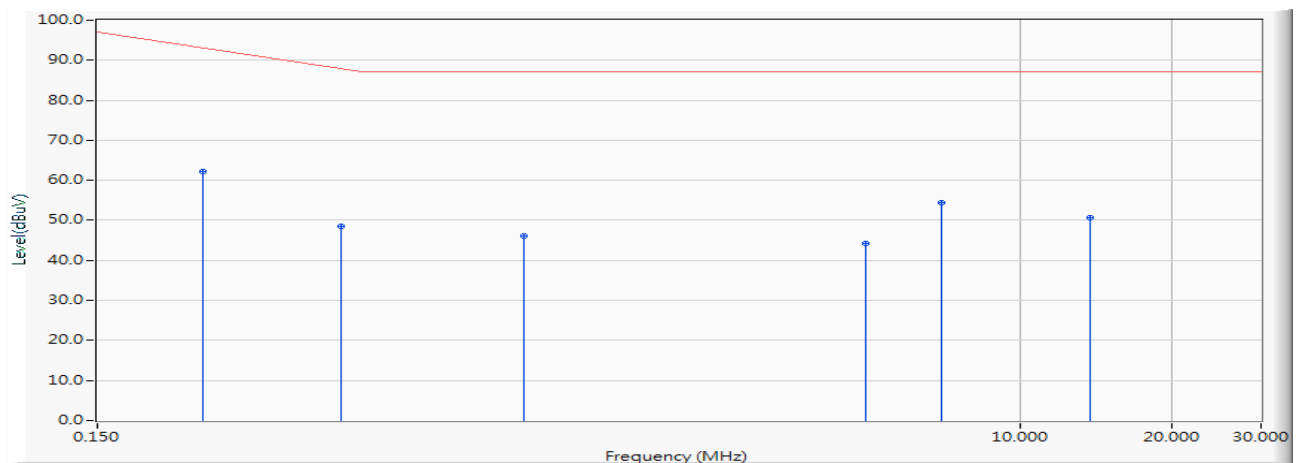
Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor(Probe+Cable-Amp).

Site : SR8	Time : 2019/04/09 - 11:52
Limit : ISN_Voltage_A_00M_QP	Margin : 13
EUT : Network Camera	Probe : TESEQ_T8_42815 - Line1
Power : POE	Note : Mode 2, ISN 10M



Site : SR8	Time : 2019/04/09 - 11:52
Limit : ISN_Voltage_A_00M_QP	Margin : 0
EUT : Network Camera	Probe : TESEQ_T8_42815 - Line1
Power : POE	Note : Mode 2, ISN 10M

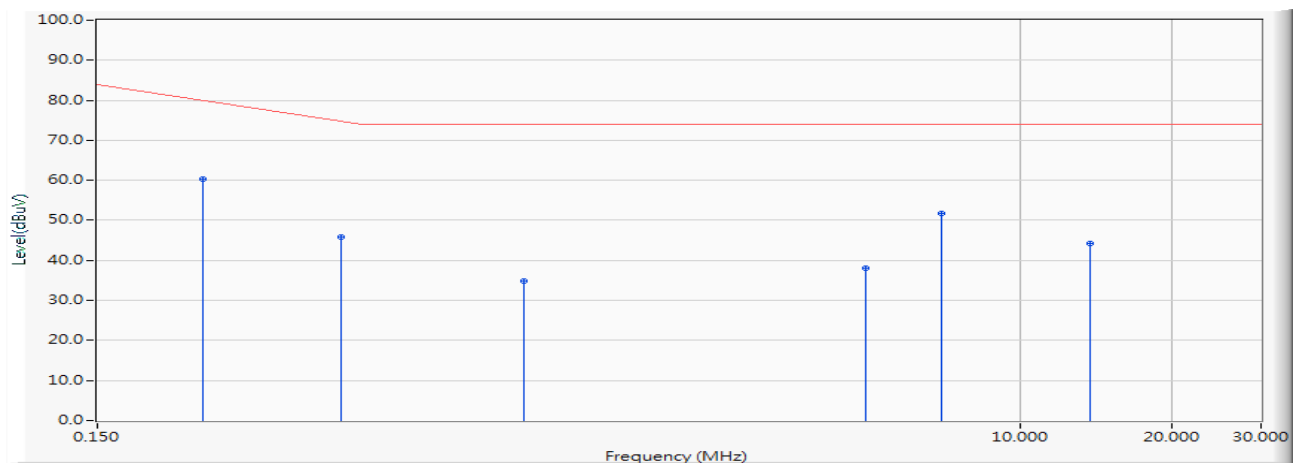


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1	*	0.242	10.206	51.860	62.066	-32.305	94.371	QUASIPeAK
2		0.455	10.026	38.620	48.646	-39.640	88.286	QUASIPeAK
3		1.048	9.932	36.180	46.112	-40.888	87.000	QUASIPeAK
4		4.947	9.912	34.360	44.272	-42.728	87.000	QUASIPeAK
5		7.017	9.959	44.400	54.359	-32.641	87.000	QUASIPeAK
6		13.752	10.120	40.620	50.740	-36.260	87.000	QUASIPeAK

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor(Probe+Cable-Amp).

Site : SR8	Time : 2019/04/09 - 11:52
Limit : ISN_Voltage_A_00M_AV	Margin : 0
EUT : Network Camera	Probe : TESEQ_T8_42815 - Line1
Power : POE	Note : Mode 2, ISN 10M

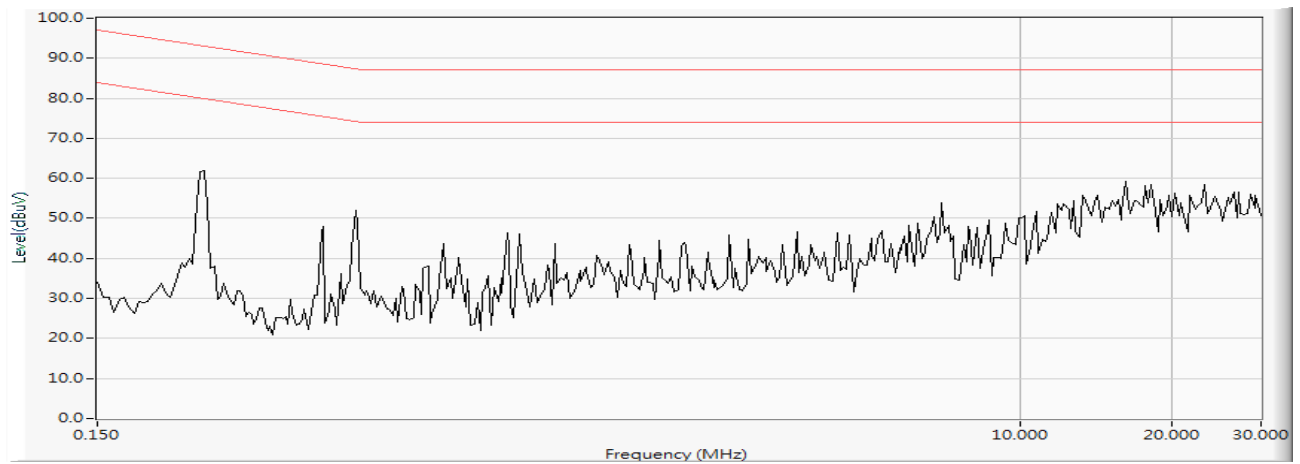


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1	*	0.242	10.206	50.040	60.246	-21.125	81.371	AVERAGE
2		0.455	10.026	35.840	45.866	-29.420	75.286	AVERAGE
3		1.048	9.932	24.800	34.732	-39.268	74.000	AVERAGE
4		4.947	9.912	28.260	38.172	-35.828	74.000	AVERAGE
5		7.017	9.959	41.800	51.759	-22.241	74.000	AVERAGE
6		13.752	10.120	34.200	44.320	-29.680	74.000	AVERAGE

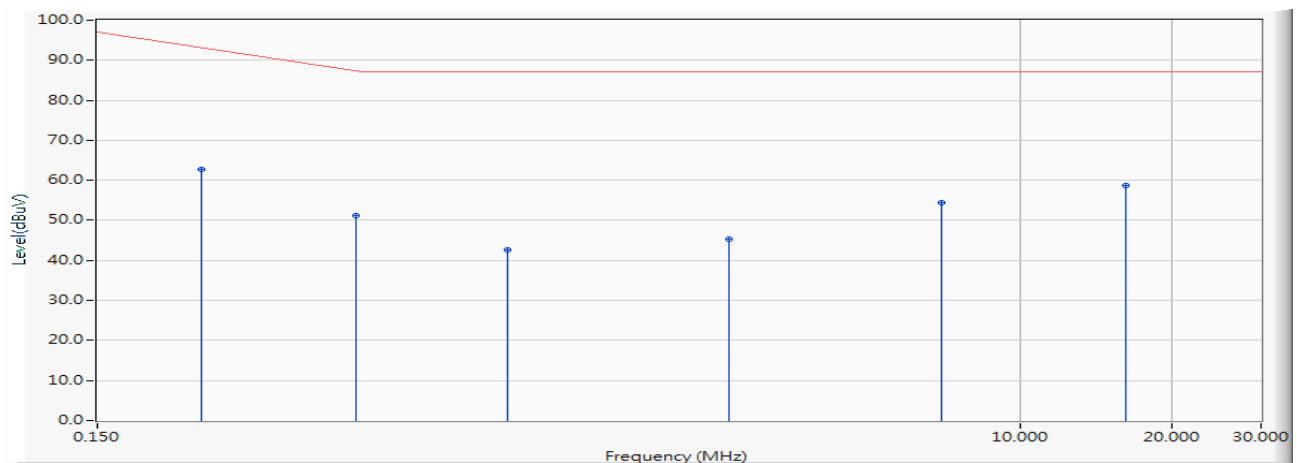
Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor(Probe+Cable-Amp).

Site : SR8	Time : 2019/04/09 - 11:51
Limit : ISN_Voltage_A_00M_QP	Margin : 13
EUT : Network Camera	Probe : TESEQ_T8_42815 - Line1
Power : POE	Note : Mode 2, ISN 100M



Site : SR8	Time : 2019/04/09 - 11:52
Limit : ISN_Voltage_A_00M_QP	Margin : 0
EUT : Network Camera	Probe : TESEQ_T8_42815 - Line1
Power : POE	Note : Mode 2, ISN 100M

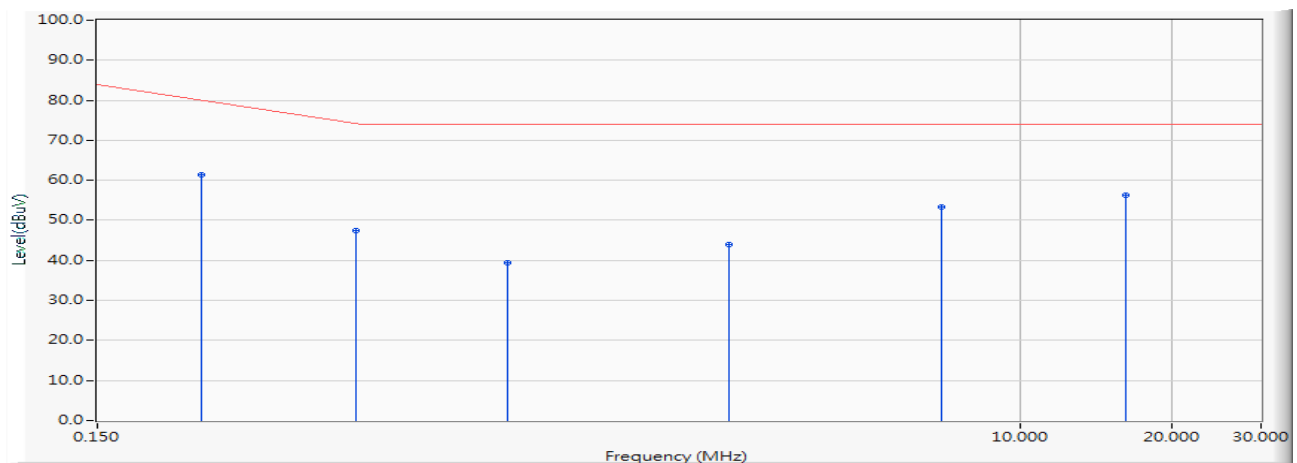


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1		0.241	10.208	52.520	62.727	-31.673	94.400	QUASIPeAK
2		0.487	10.017	41.260	51.277	-36.094	87.371	QUASIPeAK
3		0.972	9.929	32.760	42.689	-44.311	87.000	QUASIPeAK
4		2.662	9.900	35.360	45.260	-41.740	87.000	QUASIPeAK
5		7.017	9.959	44.420	54.379	-32.621	87.000	QUASIPeAK
6	*	16.229	10.191	48.420	58.611	-28.389	87.000	QUASIPeAK

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor(Probe+Cable-Amp).

Site : SR8	Time : 2019/04/09 - 11:52
Limit : ISN_Voltage_A_00M_AV	Margin : 0
EUT : Network Camera	Probe : TESEQ_T8_42815 - Line1
Power : POE	Note : Mode 2, ISN 100M



		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV)	Margin (dB)	Limit (dBuV)	Detector Type
1		0.241	10.208	51.300	61.507	-19.893	81.400	AVERAGE
2		0.487	10.017	37.560	47.577	-26.794	74.371	AVERAGE
3		0.972	9.929	29.540	39.469	-34.531	74.000	AVERAGE
4		2.662	9.900	34.200	44.100	-29.900	74.000	AVERAGE
5		7.017	9.959	43.420	53.379	-20.621	74.000	AVERAGE
6	*	16.229	10.191	46.060	56.251	-17.749	74.000	AVERAGE

Note:

1. All Reading Levels are Quasi-Peak and average value.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor(Probe+Cable-Amp).

3.7. Test Photograph

Test Mode : Mode 1: MD9561-H , PoE

Description : Front View of ISN Test



Test Mode : Mode 1: MD9561-H , PoE

Description : Back View of ISN Test



Test Mode : Mode 2: MD9581-H , PoE

Description : Front View of ISN Test



Test Mode : Mode 2: MD9581-H , PoE

Description : Back View of ISN Test



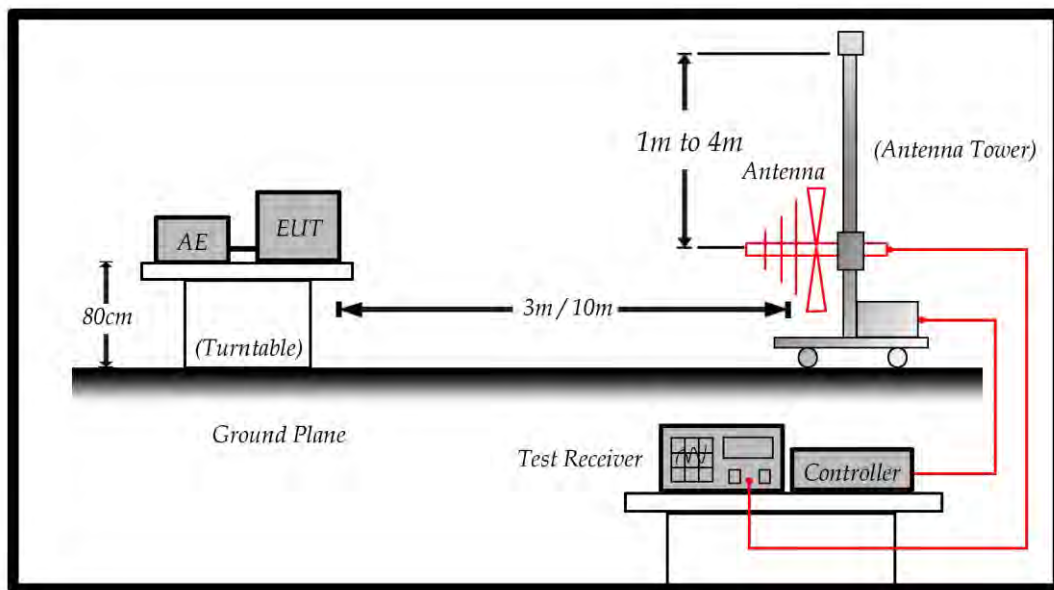
4. Radiated Emission

4.1. Test Specification

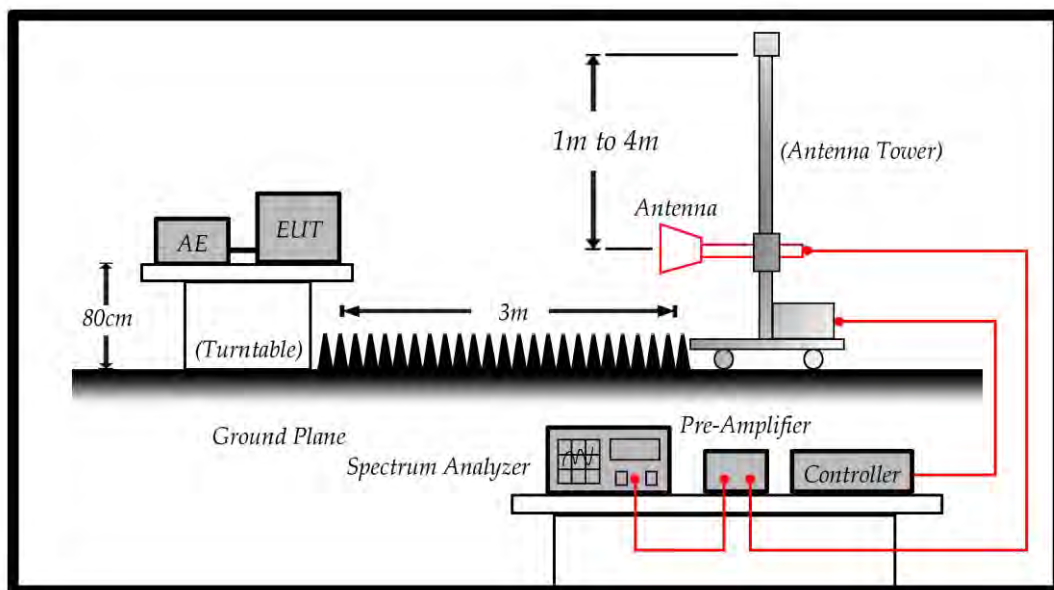
According to EN 50121-4 clause 5 and EN 61000-6-4 Table 1

4.2. Test Setup

Under 1GHz Test Setup:



Above 1GHz Test Setup:



4.3. Limit

Limits		
Frequency MHz	Distance (m)	dBuV/m
30 – 230	10	40
230 – 1000	10	47

Limits			
Frequency (GHz)	Distance (m)	Peak (dBuV/m)	Average (dBuV/m)
1 – 3	3	76	56
3 – 6	3	80	60

Remark:

1. The tighter limit shall apply at the edge between two frequency bands.
2. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement range (MHz)
Below 108	1000
108 – 500	2000
500 – 1000	5000
Above 1000	5 th harmonic of the highest frequency or 6 GHz, whichever is lower

4.4. Test Procedure

According to CISPR 16-2-3.

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 10 meters. The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated on radiated measurement.

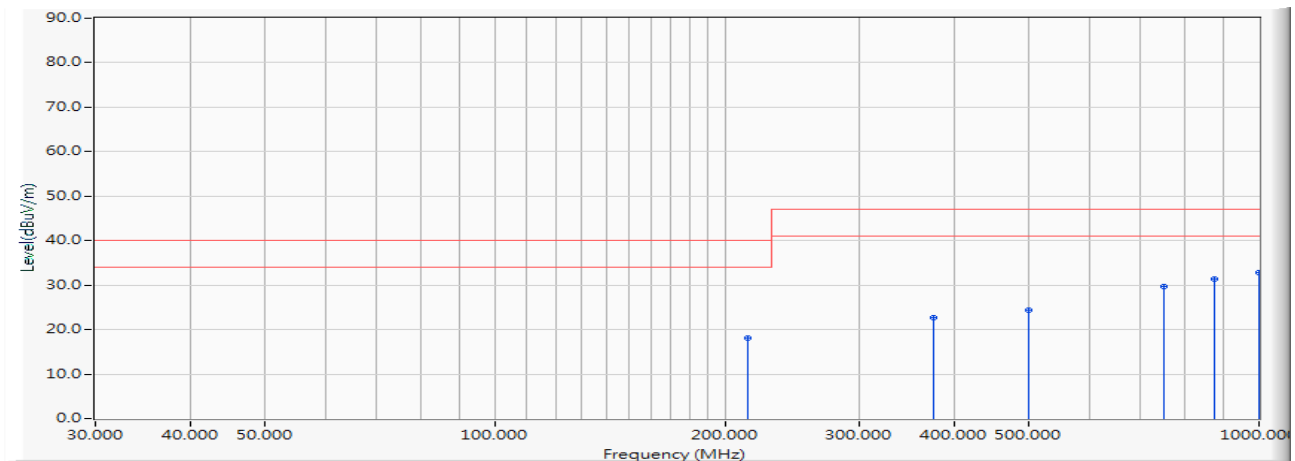
Radiated emissions were investigated over the frequency range from 30MHz to 1GHz using a receiver bandwidth of 120kHz. Radiated was performed at an antenna to EUT distance of 10 meters.

4.5. Deviation from Test Standard

No deviation.

4.6. Test Result

Site : SITE7	Time : 2019/04/03 - 14:57
Limit : CISPR_A_10M_QP	Margin : 6
EUT : Network Camera	Probe : Site7_VULB9168_10m_1804 - HORIZONTAL
Power : POE	Note : Mode 1

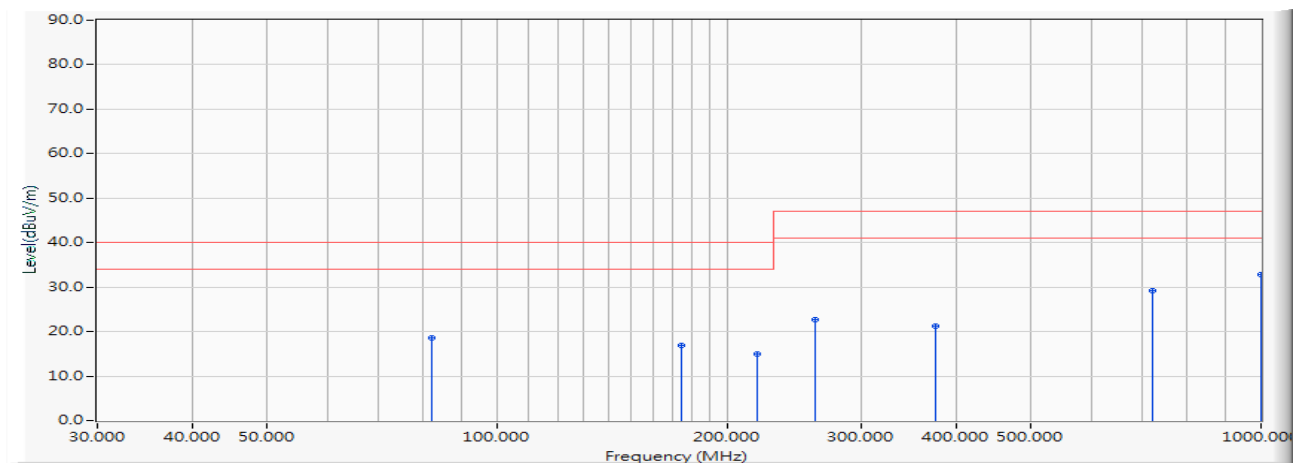


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1		214.600	-12.601	30.600	17.999	-22.001	40.000	QUASIPeAK	380.000	66.000
2		375.000	-5.843	28.600	22.757	-24.243	47.000	QUASIPeAK	300.000	-85.000
3		500.000	-1.909	26.200	24.291	-22.709	47.000	QUASIPeAK	200.000	-48.000
4		750.000	4.566	25.200	29.765	-17.235	47.000	QUASIPeAK	115.000	31.000
5		875.000	6.091	25.300	31.391	-15.609	47.000	QUASIPeAK	100.000	-49.000
6	*	1000.000	7.730	25.200	32.930	-14.070	47.000	QUASIPeAK	165.000	31.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor(Probe+Cable-Amp).

Site : SITE7	Time : 2019/04/03 - 14:57
Limit : CISPR_A_10M_QP	Margin : 6
EUT : Network Camera	Probe : Site7_VULB9168_10m_1804 - VERTICAL
Power : POE	Note : Mode 1

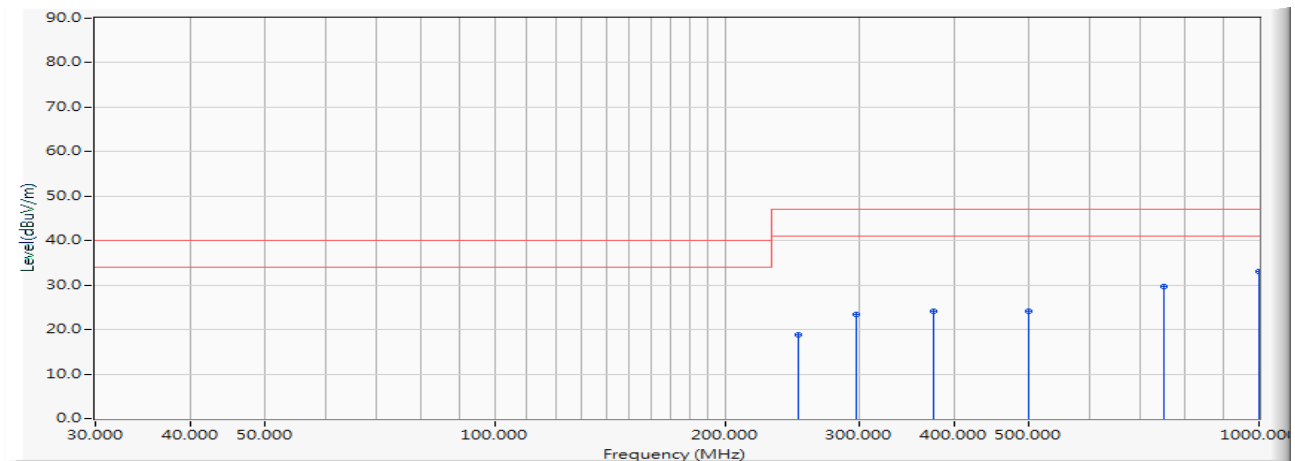


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1	82.100	-15.961	34.600	18.639	-21.361	40.000	QUASIPeAK	100.000	-139.000
2	174.190	-10.765	27.600	16.835	-23.165	40.000	QUASIPeAK	100.000	-94.000
3	219.200	-12.458	27.500	15.042	-24.958	40.000	QUASIPeAK	100.000	62.000
4	261.400	-9.886	32.500	22.613	-24.387	47.000	QUASIPeAK	100.000	-99.000
5	375.000	-5.843	27.000	21.157	-25.843	47.000	QUASIPeAK	100.000	-94.000
6	720.000	3.653	25.600	29.254	-17.746	47.000	QUASIPeAK	260.000	-39.000
7	* 1000.000	7.730	25.200	32.930	-14.070	47.000	QUASIPeAK	165.000	31.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor(Probe+Cable-Amp).

Site : SITE7	Time : 2019/04/03 - 15:04
Limit : CISPR_A_10M_QP	Margin : 6
EUT : Network Camera	Probe : Site7_VULB9168_10m_1804 - HORIZONTAL
Power : POE	Note : Mode 2

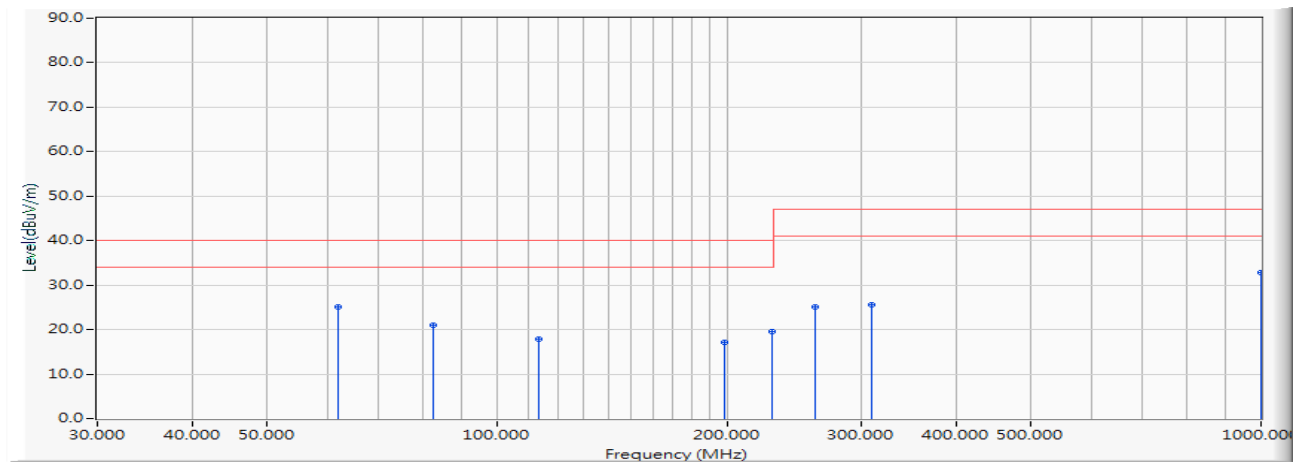


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1		250.000	-10.388	29.300	18.912	-28.088	47.000	QUASIPeAK	365.000	32.000
2		297.000	-8.171	31.500	23.328	-23.672	47.000	QUASIPeAK	385.000	-88.000
3		375.000	-5.843	30.000	24.157	-22.843	47.000	QUASIPeAK	280.000	-41.000
4		500.000	-1.909	26.000	24.091	-22.909	47.000	QUASIPeAK	200.000	36.000
5		750.000	4.566	25.000	29.565	-17.435	47.000	QUASIPeAK	100.000	39.000
6	*	1000.000	7.730	25.300	33.030	-13.970	47.000	QUASIPeAK	100.000	-49.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor(Probe+Cable-Amp).

Site : SITE7	Time : 2019/04/03 - 15:04
Limit : CISPR_A_10M_QP	Margin : 6
EUT : Network Camera	Probe : Site7_VULB9168_10m_1804 - VERTICAL
Power : POE	Note : Mode 2

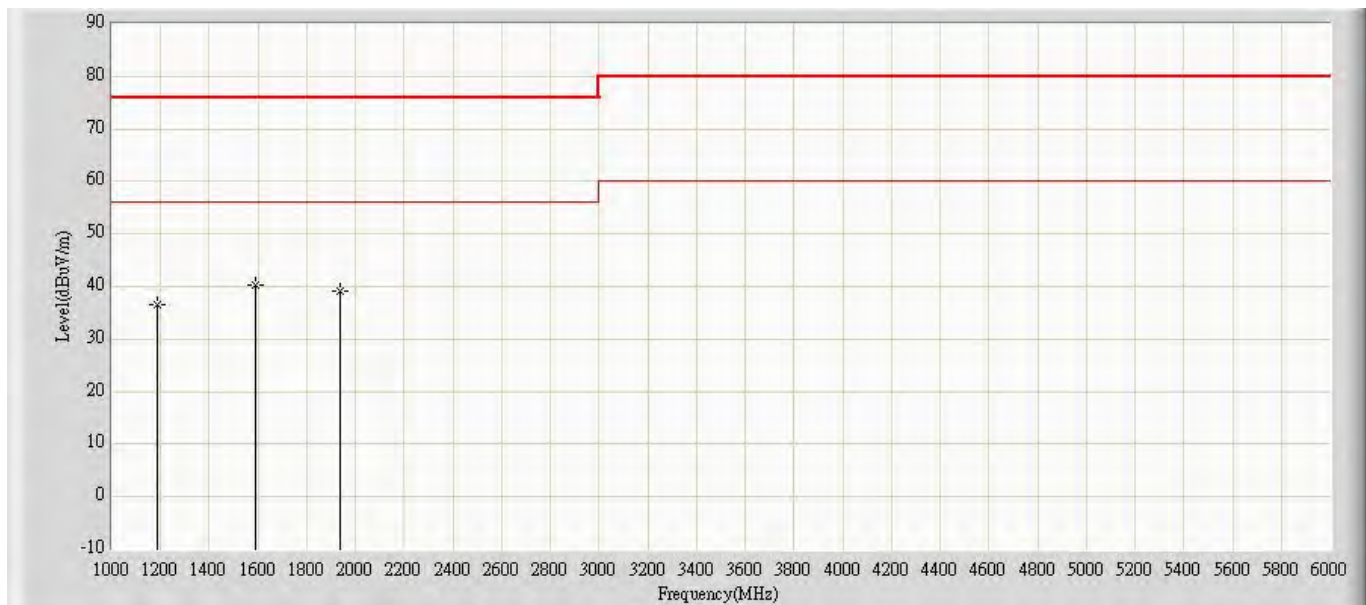


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1	62.000	-11.978	37.000	25.022	-14.978	40.000	QUASIPeAK	100.000	45.000
2	82.645	-16.020	37.000	20.980	-19.020	40.000	QUASIPeAK	100.000	84.000
3	113.250	-13.628	31.600	17.972	-22.028	40.000	QUASIPeAK	100.000	94.000
4	198.500	-12.809	30.000	17.192	-22.808	40.000	QUASIPeAK	100.000	-53.000
5	228.700	-12.155	31.600	19.445	-20.555	40.000	QUASIPeAK	100.000	96.000
6	261.000	-9.912	35.000	25.089	-21.911	47.000	QUASIPeAK	100.000	97.000
7	309.600	-7.823	33.500	25.677	-21.323	47.000	QUASIPeAK	100.000	12.000
8	* 1000.000	7.730	25.100	32.830	-14.170	47.000	QUASIPeAK	1650.000	21.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Correct Factor(Probe+Cable-Amp).

Site: CB7	Time: 2019/04/08 - 14:50
Limit: CISPR_A_(Above_1G)	Margin: 0
Probe: CB7_Horn_3117_1808	Polarity: Horizontal
EUT : Network Camera	Power: POE
Note: Mode 1	

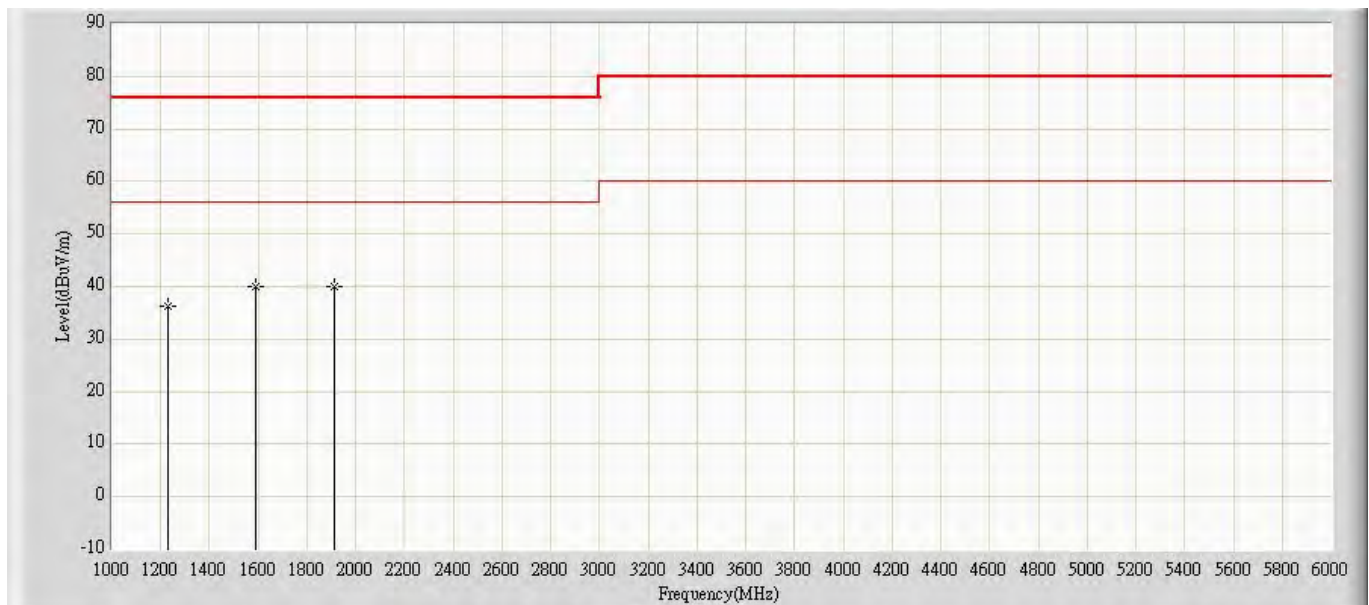


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Ant Pos (cm)	Table Pos (deg)	Type
1			1189.000	36.574	50.760	-39.426	76.000	-14.186	100	200	PK
2		*	1590.000	40.181	53.610	-35.819	76.000	-13.429	100	170	PK
3			1934.000	39.102	49.300	-36.898	76.000	-10.198	100	130	PK

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Factor(Probe+Cable-Amp).

Site: CB7	Time: 2019/04/08 - 14:51
Limit: CISPR_A_(Above_1G)	Margin: 0
Probe: CB7_Horn_3117_1808	Polarity: Vertical
EUT : Network Camera	Power: POE
Note: Mode 1	

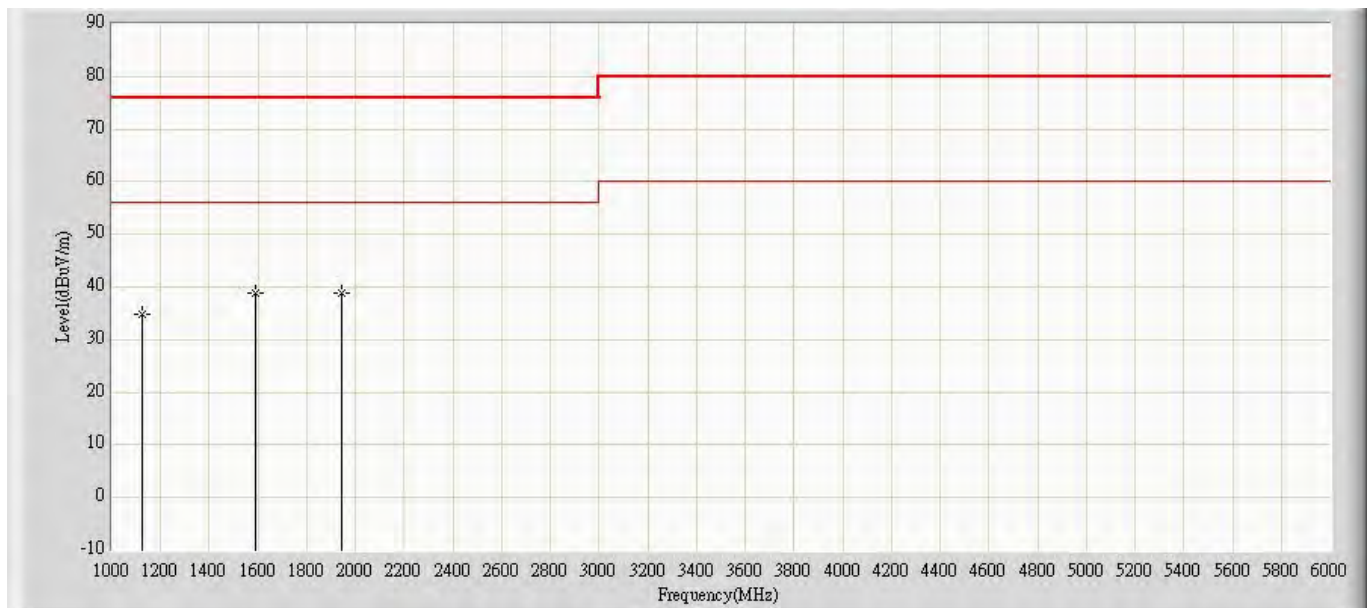


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Ant Pos (cm)	Table Pos (deg)	Type
1			1229.000	36.338	50.510	-39.662	76.000	-14.172	100	190	PK
2		*	1590.000	40.021	53.450	-35.979	76.000	-13.429	100	32	PK
3			1910.000	39.901	50.290	-36.099	76.000	-10.390	100	200	PK

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Factor(Probe+Cable-Amp).

Site: CB7	Time: 2019/04/08 - 14:40
Limit: CISPR_A_(Above_1G)	Margin: 0
Probe: CB7_Horn_3117_1808	Polarity: Horizontal
EUT : Network Camera	Power: POE
Note: Mode 2	

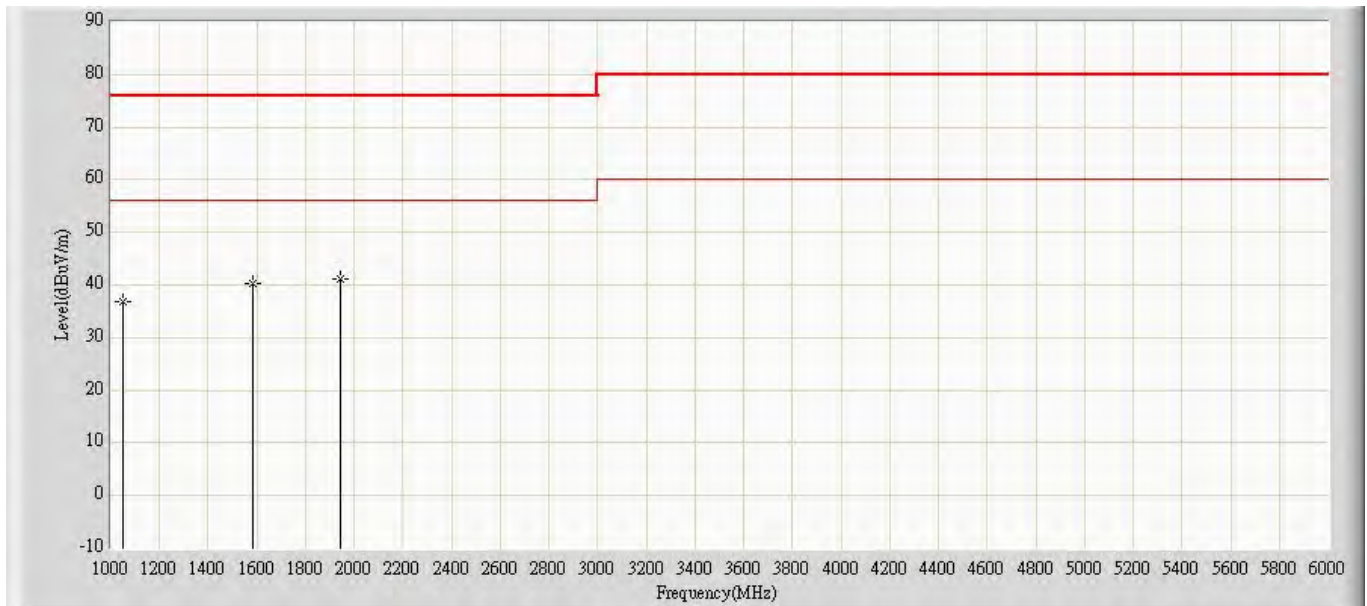


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Ant Pos (cm)	Table Pos (deg)	Type
1			1125.000	34.963	49.560	-41.037	76.000	-14.596	100	120	PK
2		*	1590.000	38.981	52.410	-37.019	76.000	-13.429	100	160	PK
3			1942.000	38.795	48.940	-37.205	76.000	-10.145	100	170	PK

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Factor(Probe+Cable-Amp).

Site: CB7	Time: 2019/04/08 - 14:41
Limit: CISPR_A_(Above_1G)	Margin: 0
Probe: CB7_Horn_3117_1808	Polarity: Vertical
EUT : Network Camera	Power: POE
Note: Mode 2	



No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Ant Pos (cm)	Table Pos (deg)	Type
1			1050.000	36.963	52.300	-39.037	76.000	-15.337	100	130	PK
2			1586.000	40.219	53.700	-35.781	76.000	-13.481	100	190	PK
3		*	1940.000	41.042	51.200	-34.958	76.000	-10.158	100	188	PK

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. " * ", means this data is the worst emission level.
3. Measurement Level = Reading Level + Factor(Probe+Cable-Amp).

4.7. Test Photograph

Test Mode : Mode 1: MD9561-H , PoE

Description : Front View of Radiated Test



Test Mode : Mode 1: MD9561-H , PoE

Description : Back View of Radiated Test



Test Mode : Mode 1: MD9561-H , PoE

Description : Front View of High Frequency Radiated Test



Test Mode : Mode 2: MD9581-H , PoE

Description : Front View of Radiated Test



Test Mode : Mode 2: MD9581-H , PoE

Description : Back View of Radiated Test



Test Mode : Mode 2: MD9581-H , PoE

Description : Front View of High Frequency Radiated Test



5.4. Test Procedure

According to EN 61000-4-2.

Direct application of discharges to the EUT:

Contact discharge was applied only to conductive surfaces of the EUT.

Air discharges were applied only to non-conductive surfaces of the EUT.

During the test, it was performed with single discharges. For the single discharge time between successive single discharges will be keep longer 1 second. It was at least ten single discharges with positive and negative at the same selected point.

The selected point, which was performed with electrostatic discharge, was marked on the red label of the EUT.

Indirect application of discharges to the EUT:

Vertical Coupling Plane (VCP):

The coupling plane, of dimensions 0.5m x 0.5m, is placed parallel to, and positioned at a distance 0.1m from, the EUT, with the Discharge Electrode touching the coupling plane.

The four faces of the EUT will be performed with electrostatic discharge. It was at least ten single discharges with positive and negative at the same selected point.

Horizontal Coupling Plane (HCP):

The coupling plane is placed under to the EUT. The generator shall be positioned vertically at a distance of 0.1m from the EUT, with the Discharge Electrode touching the coupling plane.

The four faces of the EUT will be performed with electrostatic discharge. It was at least ten single discharges with positive and negative at the same selected point.

5.5. Deviation from Test Standard

No deviation..

5.6. Test Result

Product	Network Camera		
Test Item	Electrostatic Discharge		
Test Mode	Mode 1: MD9561-H , PoE		
Date of Test	2019/04/17	Test Site	No.6 Shielded Room

Item	Amount of Discharge	Voltage	Required Criteria	Complied To Criteria (A,B,C)	Results
Air Discharge	10	+8kV	B	A	Pass
	10	-8kV	B	A	Pass
Contact Discharge	25	+6kV	B	A	Pass
	25	-6kV	B	A	Pass
Indirect Discharge (HCP)	25	+6kV	B	A	Pass
	25	-6kV	B	A	Pass
Indirect Discharge (VCP)	25	+6kV	B	A	Pass
	25	-6kV	B	A	Pass

Note:

The testing performed is from lowest level up to the highest level as required by standard, but only highest level is shown on the report.

NR: No Requirement

- ☒ Meet criteria A: Operate as intended during and after the test
- ☐ Meet criteria B: Operate as intended after the test
- ☐ Meet criteria C: Loss/Error of function
- ☐ Additional Information
 - ☐ EUT stopped operation and could / could not be reset by operator at ____ kV.
 - ☒ No false alarms or other malfunctions were observed during or after the test.

Remark:

The Contact discharges were applied at least total 200 discharges at a minimum of four test points.

Product	Network Camera		
Test Item	Electrostatic Discharge		
Test Mode	Mode 2: MD9581-H , PoE		
Date of Test	2019/04/17	Test Site	No.6 Shielded Room

Item	Amount of Discharge	Voltage	Required Criteria	Complied To Criteria (A,B,C)	Results
Air Discharge	10	+8kV	B	A	Pass
	10	-8kV	B	A	Pass
Contact Discharge	25	+6kV	B	A	Pass
	25	-6kV	B	A	Pass
Indirect Discharge (HCP)	25	+6kV	B	A	Pass
	25	-6kV	B	A	Pass
Indirect Discharge (VCP)	25	+6kV	B	A	Pass
	25	-6kV	B	A	Pass

Note:

The testing performed is from lowest level up to the highest level as required by standard, but only highest level is shown on the report.

NR: No Requirement

- ☒ Meet criteria A: Operate as intended during and after the test
- ☐ Meet criteria B: Operate as intended after the test
- ☐ Meet criteria C: Loss/Error of function
- ☐ Additional Information
 - ☐ EUT stopped operation and could / could not be reset by operator at ____ kV.
 - ☒ No false alarms or other malfunctions were observed during or after the test.

Remark:

The Contact discharges were applied at least total 200 discharges at a minimum of four test points.

5.7. Test Photograph

Test Mode : Mode 1: MD9561-H , PoE

Description : ESD Test Setup



Test Mode : Mode 2: MD9581-H , PoE

Description : ESD Test Setup



5.8. EUT to dot photo for ESD test

Test dot: (Contact Discharge) (M/N: MD9561-H)



Test dot: (Contact Discharge) (M/N: MD9561-H)



Test dot: (Contact Discharge) (M/N: MD9561-H)



Test dot: (Contact Discharge) (M/N: MD9561-H)



Test dot: (Contact Discharge) (M/N: MD9561-H)



Test dot: (Contact Discharge) (M/N: MD9561-H)



Test dot: (Contact Discharge) (M/N: MD9561-H)



Test dot: (Contact Discharge) (M/N: MD9581-H)



Test dot: (Contact Discharge) (M/N: MD9581-H)



Test dot: (Contact Discharge) (M/N: MD9581-H)



Test dot: (Contact Discharge) (M/N: MD9581-H)



Test dot: (Contact Discharge) (M/N: MD9581-H)



Test dot: (Contact Discharge) (M/N: MD9581-H)



Test dot: (Contact Discharge) (M/N: MD9581-H)

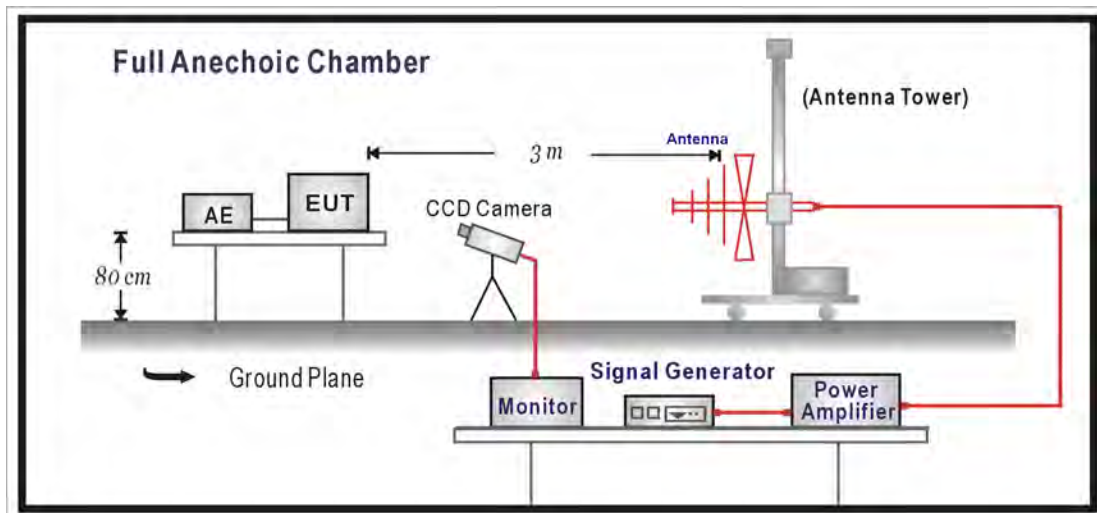


6. Radiated Susceptibility

6.1. Test Specification

According to EN 50121-4 clause 6.

6.2. Test Setup



6.3. Limit

Item	Environmental Phenomena	Units	Test Specification	Performance Criteria
Enclosure Port				
Radio-Frequency Electromagnetic Field Amplitude Modulated		MHz	80-800	A
		V/m(Un-modulated, rms)	10	
		% AM (1kHz)	80	
Radio-Frequency Electromagnetic Field Amplitude Modulated		MHz	800-1000	A
		V/m(Un-modulated, rms)	20	
		% AM (1kHz)	80	
Radio-Frequency Electromagnetic Field Amplitude Modulated		MHz	1400-2000	A
		V/m(Un-modulated, rms)	10	
		% AM (1kHz)	80	
Radio-Frequency Electromagnetic Field Amplitude Modulated		MHz	2000-2700	A
		V/m(Un-modulated, rms)	5	
		% AM (1kHz)	80	
Radio-Frequency Electromagnetic Field Amplitude Modulated		MHz	5100-6000	A
		V/m(Un-modulated, rms)	3	
		% AM (1kHz)	80	

6.4. Test Procedure

According to EN 61000-4-3

The EUT and load, which are placed on a table that is 0.8 meter above ground, are placed with one coincident with the calibration plane such that the distance from antenna to the EUT was 3 meters.

Both horizontal and vertical polarization of the antenna and four sides of the EUT are set on measurement.

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

All the scanning conditions are as follows:

Condition of Test	Remarks
1. Field Strength	5, 10, 20V/m
2. Radiated Signal	AM 80% Modulated with 1kHz
3. Scanning Frequency	80MHz-800MHz for 10V/m 800MHz-1000MHz for 20V/m 1400MHz-2000MHz for 10V/m 2000MHz-2700MHz for 5V/m 5100MHz-6000MHz for 3V/m
4 Dwell Time	3 Seconds
5. Frequency step size Δf :	1%
6. The rate of Swept of Frequency	1.5×10^{-3} decades/s

6.5. Deviation from Test Standard

No deviation.

6.6. Test Result

Product	Network Camera		
Test Item	Radiated susceptibility		
Test Mode	Mode 1: MD9561-H , PoE		
Date of Test	2019/04/21	Test Site	Chamber9

Frequency (MHz)	Position (Angle)	Polarity (H or V)	Field Strength (V/m)	Required Criteria	Complied To Criteria (A,B,C)	Results
80-800	0°	H	10	A	A	PASS
80-800	0°	V	10	A	A	PASS
80-800	90°	H	10	A	A	PASS
80-800	90°	V	10	A	A	PASS
80-800	180°	H	10	A	A	PASS
80-800	180°	V	10	A	A	PASS
80-800	270°	H	10	A	A	PASS
80-800	270°	V	10	A	A	PASS
800-1000	0°	H	20	A	A	PASS
800-1000	0°	V	20	A	A	PASS
800-1000	90°	H	20	A	A	PASS
800-1000	90°	V	20	A	A	PASS
800-1000	180°	H	20	A	A	PASS
800-1000	180°	V	20	A	A	PASS
800-1000	270°	H	20	A	A	PASS
800-1000	270°	V	20	A	A	PASS
1400-2000	0°	H	10	A	A	PASS
1400-2000	0°	V	10	A	A	PASS
1400-2000	90°	H	10	A	A	PASS
1400-2000	90°	V	10	A	A	PASS
1400-2000	180°	H	10	A	A	PASS
1400-2000	180°	V	10	A	A	PASS
1400-2000	270°	H	10	A	A	PASS
1400-2000	270°	V	10	A	A	PASS
2000-2700	0°	H	5	A	A	PASS
2000-2700	0°	V	5	A	A	PASS
2000-2700	90°	H	5	A	A	PASS
2000-2700	90°	V	5	A	A	PASS
2000-2700	180°	H	5	A	A	PASS
2000-2700	180°	V	5	A	A	PASS
2000-2700	270°	H	5	A	A	PASS
2000-2700	270°	V	5	A	A	PASS
5100-6000	0°	H	3	A	A	PASS
5100-6000	0°	V	3	A	A	PASS
5100-6000	90°	H	3	A	A	PASS
5100-6000	90°	V	3	A	A	PASS
5100-6000	180°	H	3	A	A	PASS
5100-6000	180°	V	3	A	A	PASS
5100-6000	270°	H	3	A	A	PASS
5100-6000	270°	V	3	A	A	PASS

Note:

The testing performed is from lowest level up to the highest level as required by standard, but only highest level is shown on the report.

- ☒ Meet criteria A: Operate as intended during and after the test
- ☐ Meet criteria B: Operate as intended after the test
- ☐ Meet criteria C: Loss/Error of function
- ☐ Additional Information
 - ☐ There was no observable degradation in performance.
 - ☐ EUT stopped operation and could / could not be reset by operator at _____ V/m at frequency _____ MHz.
- ☒ No false alarms or other malfunctions were observed during or after the test.

Product	Network Camera		
Test Item	Radiated susceptibility		
Test Mode	Mode 2: MD9581-H , PoE		
Date of Test	2019/04/21	Test Site	Chamber9

Frequency (MHz)	Position (Angle)	Polarity (H or V)	Field Strength (V/m)	Required Criteria	Complied To Criteria (A,B,C)	Results
80-800	0°	H	10	A	A	PASS
80-800	0°	V	10	A	A	PASS
80-800	90°	H	10	A	A	PASS
80-800	90°	V	10	A	A	PASS
80-800	180°	H	10	A	A	PASS
80-800	180°	V	10	A	A	PASS
80-800	270°	H	10	A	A	PASS
80-800	270°	V	10	A	A	PASS
800-1000	0°	H	20	A	A	PASS
800-1000	0°	V	20	A	A	PASS
800-1000	90°	H	20	A	A	PASS
800-1000	90°	V	20	A	A	PASS
800-1000	180°	H	20	A	A	PASS
800-1000	180°	V	20	A	A	PASS
800-1000	270°	H	20	A	A	PASS
800-1000	270°	V	20	A	A	PASS
1400-2000	0°	H	10	A	A	PASS
1400-2000	0°	V	10	A	A	PASS
1400-2000	90°	H	10	A	A	PASS
1400-2000	90°	V	10	A	A	PASS
1400-2000	180°	H	10	A	A	PASS
1400-2000	180°	V	10	A	A	PASS
1400-2000	270°	H	10	A	A	PASS
1400-2000	270°	V	10	A	A	PASS
2000-2700	0°	H	5	A	A	PASS
2000-2700	0°	V	5	A	A	PASS
2000-2700	90°	H	5	A	A	PASS
2000-2700	90°	V	5	A	A	PASS
2000-2700	180°	H	5	A	A	PASS
2000-2700	180°	V	5	A	A	PASS
2000-2700	270°	H	5	A	A	PASS
2000-2700	270°	V	5	A	A	PASS
5100-6000	0°	H	3	A	A	PASS
5100-6000	0°	V	3	A	A	PASS
5100-6000	90°	H	3	A	A	PASS
5100-6000	90°	V	3	A	A	PASS
5100-6000	180°	H	3	A	A	PASS
5100-6000	180°	V	3	A	A	PASS
5100-6000	270°	H	3	A	A	PASS
5100-6000	270°	V	3	A	A	PASS

Note:

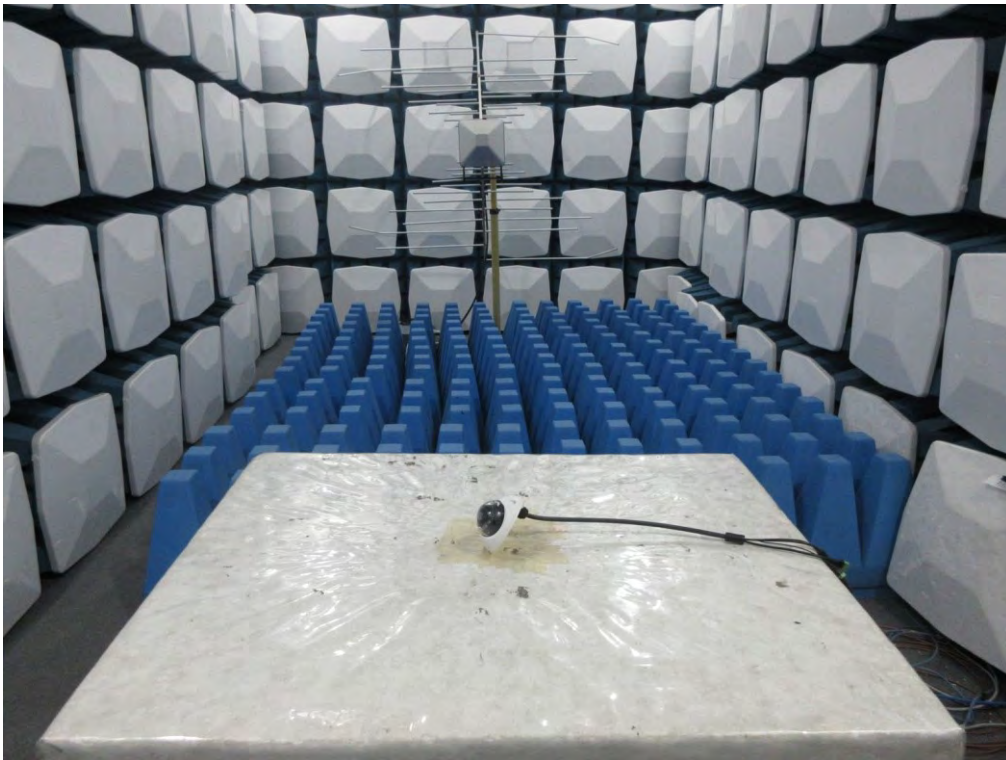
The testing performed is from lowest level up to the highest level as required by standard, but only highest level is shown on the report.

- ☒ Meet criteria A: Operate as intended during and after the test
- ☐ Meet criteria B: Operate as intended after the test
- ☐ Meet criteria C: Loss/Error of function
- ☐ Additional Information
 - ☐ There was no observable degradation in performance.
 - ☐ EUT stopped operation and could / could not be reset by operator at _____ V/m at frequency _____ MHz.
- ☒ No false alarms or other malfunctions were observed during or after the test.

6.7. Test Photograph

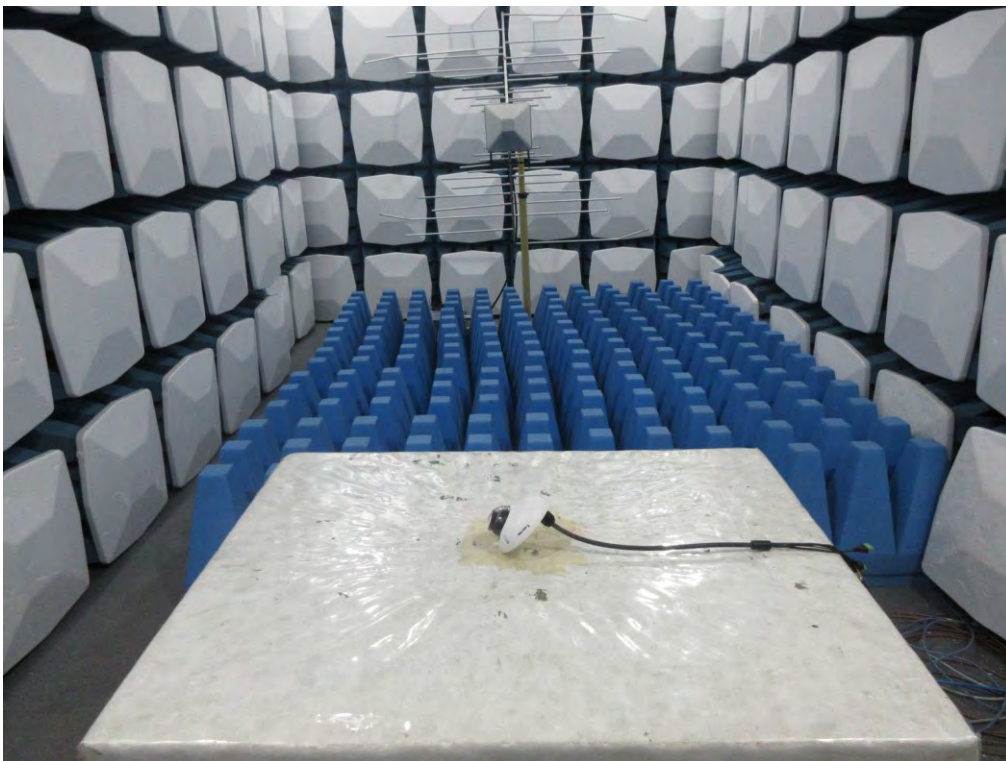
Test Mode : Mode 1: MD9561-H , PoE

Description : Radiated Susceptibility Test Setup



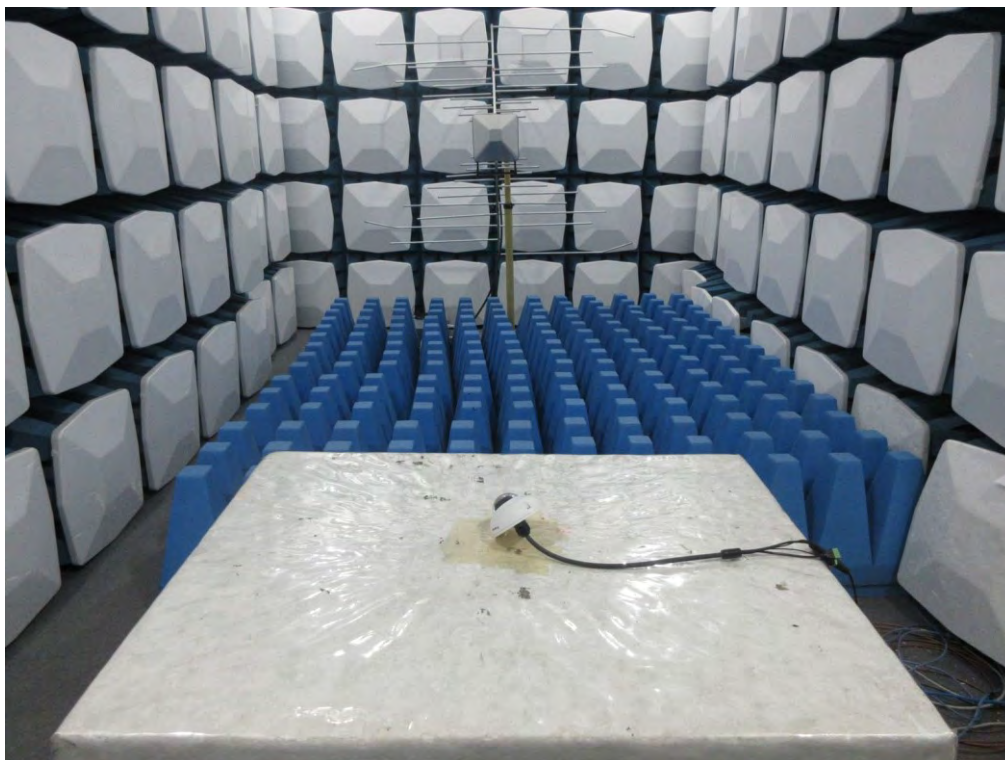
Test Mode : Mode 1: MD9561-H , PoE

Description : Radiated Susceptibility Test Setup



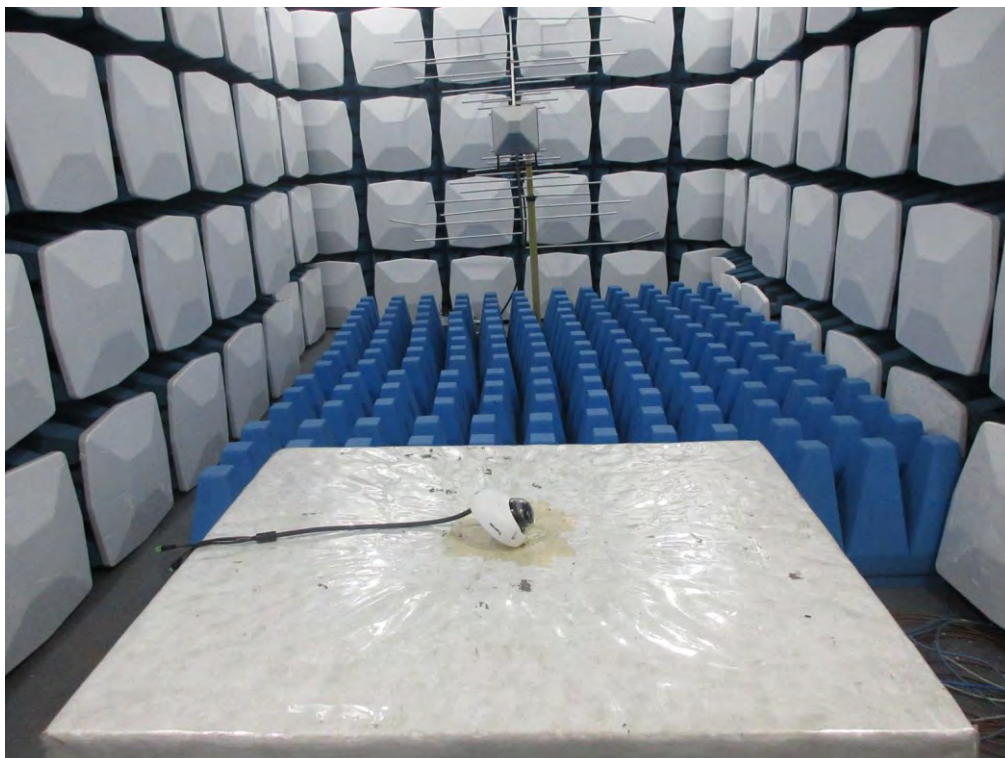
Test Mode : Mode 1: MD9561-H , PoE

Description : Radiated Susceptibility Test Setup



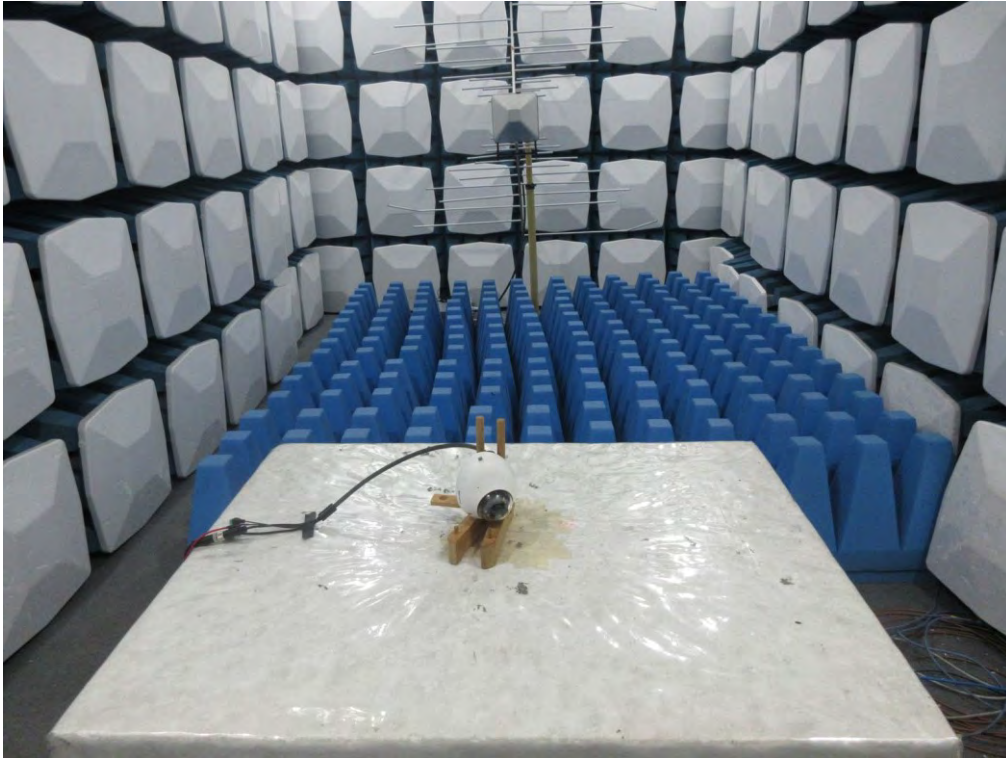
Test Mode : Mode 1: MD9561-H , PoE

Description : Radiated Susceptibility Test Setup



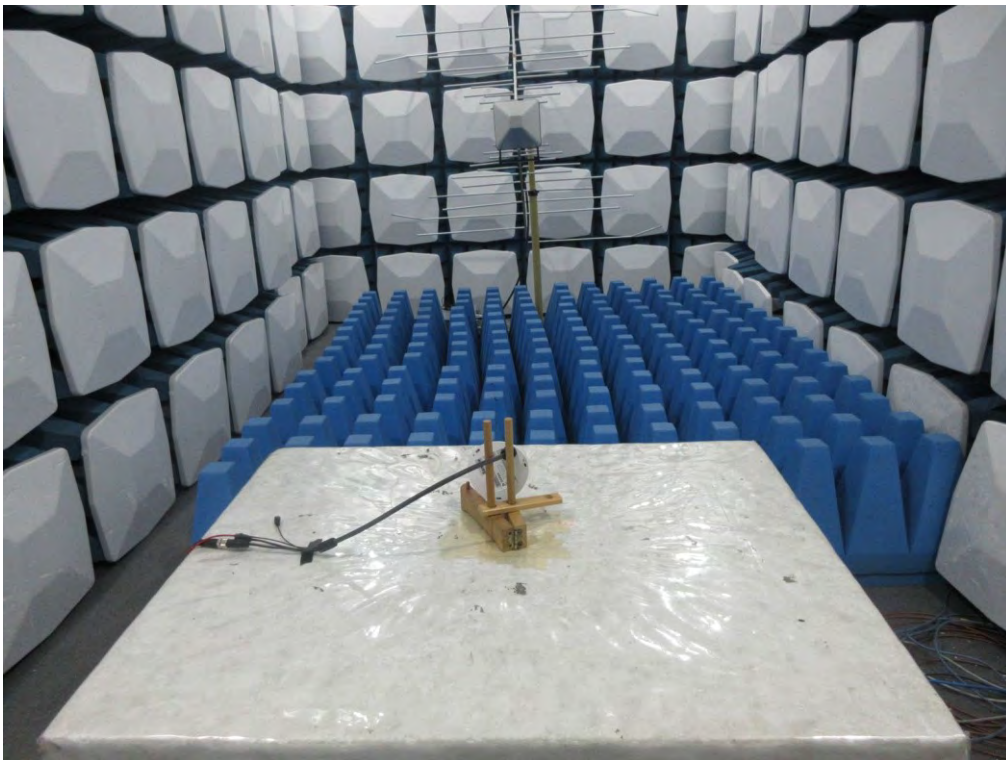
Test Mode : Mode 1: MD9561-H , PoE

Description : Radiated Susceptibility Test Setup



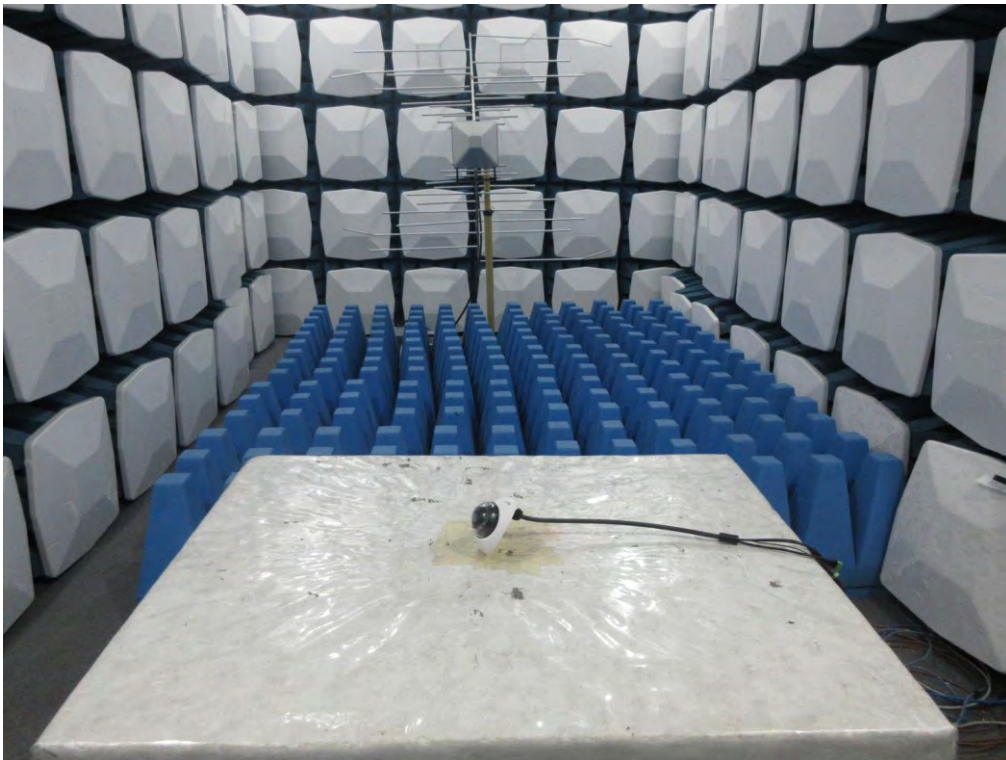
Test Mode : Mode 1: MD9561-H , PoE

Description : Radiated Susceptibility Test Setup



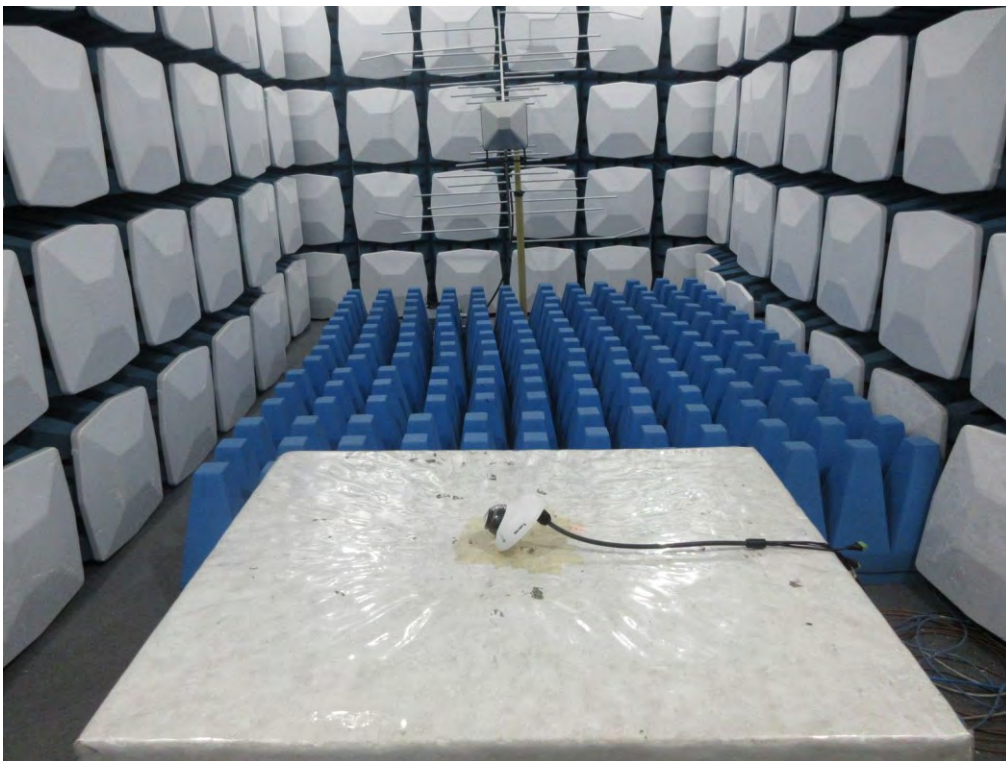
Test Mode : Mode 2: MD9581-H , PoE

Description : Radiated Susceptibility Test Setup



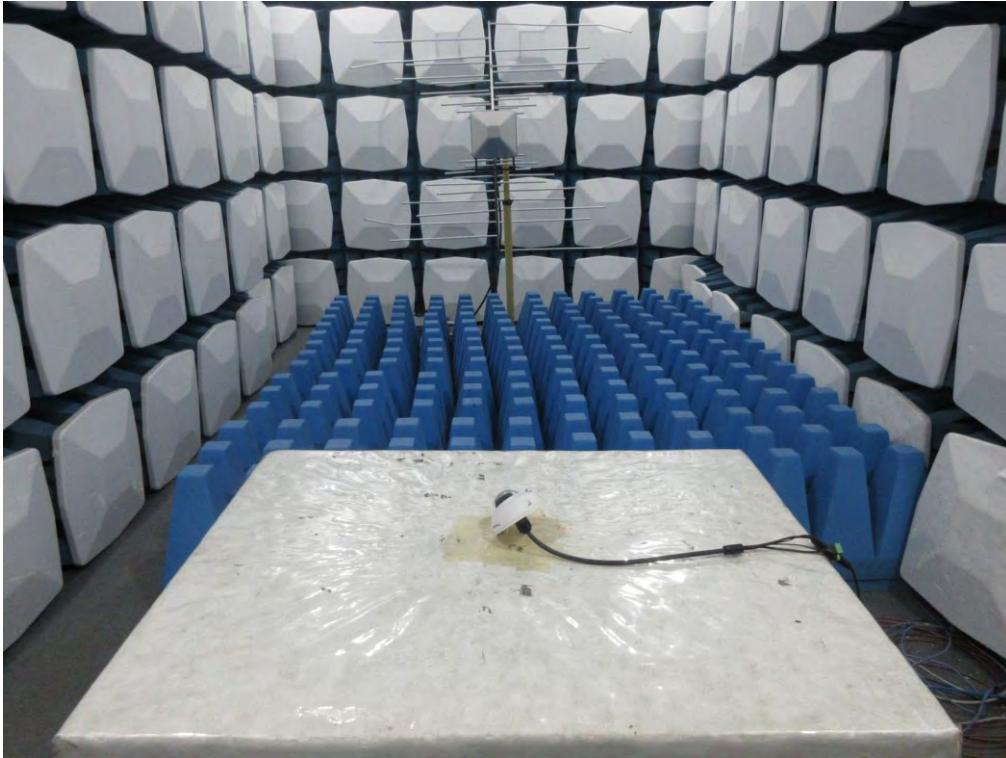
Test Mode : Mode 2: MD9581-H , PoE

Description : Radiated Susceptibility Test Setup



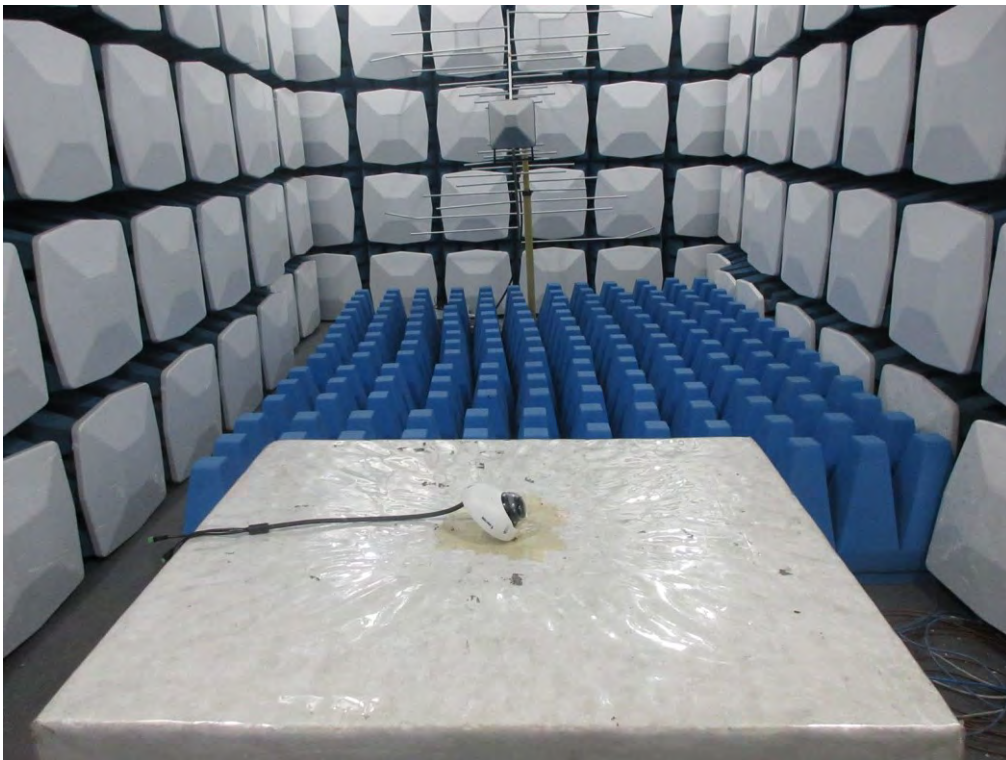
Test Mode : Mode 2: MD9581-H , PoE

Description : Radiated Susceptibility Test Setup



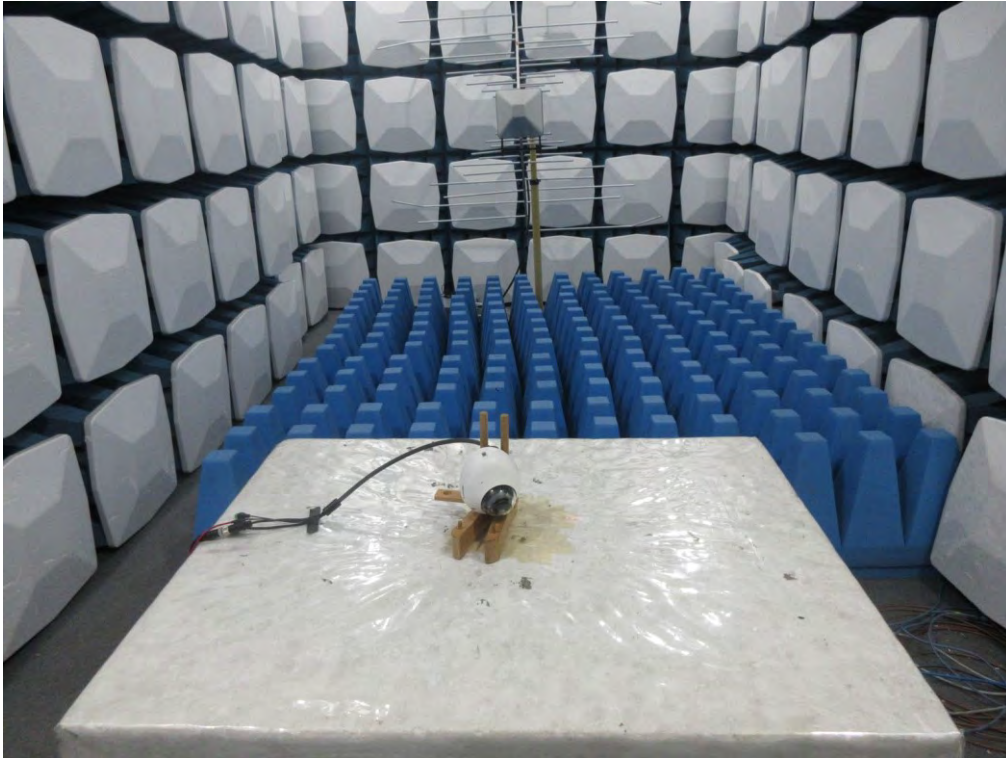
Test Mode : Mode 2: MD9581-H , PoE

Description : Radiated Susceptibility Test Setup



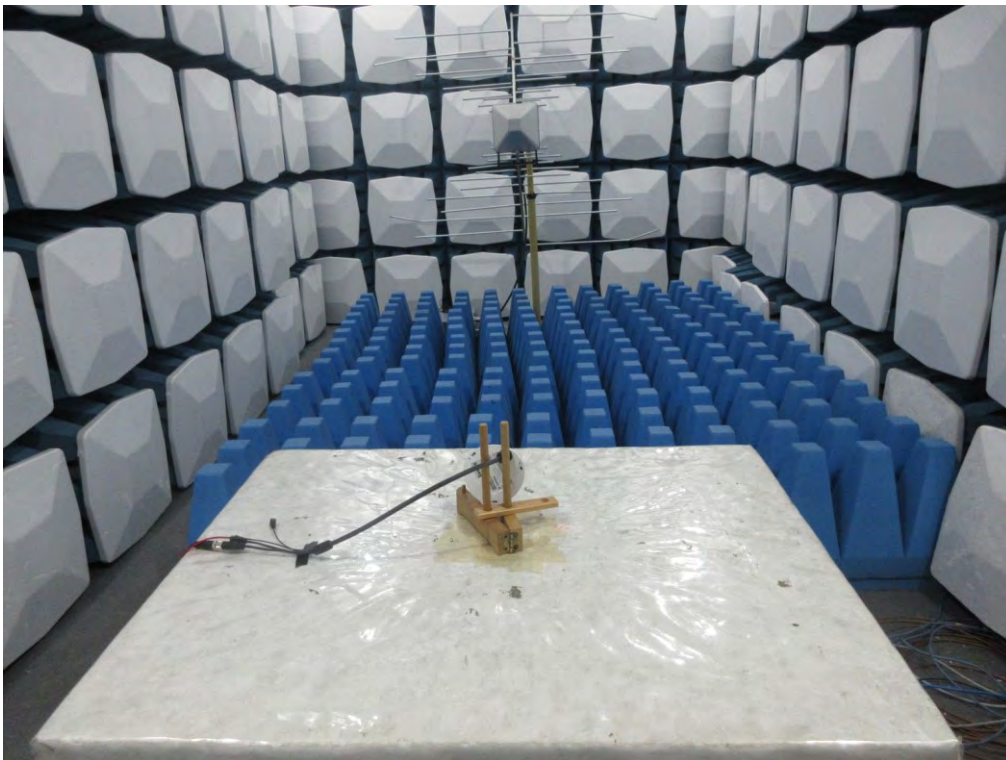
Test Mode : Mode 2: MD9581-H , PoE

Description : Radiated Susceptibility Test Setup



Test Mode : Mode 2: MD9581-H , PoE

Description : Radiated Susceptibility Test Setup

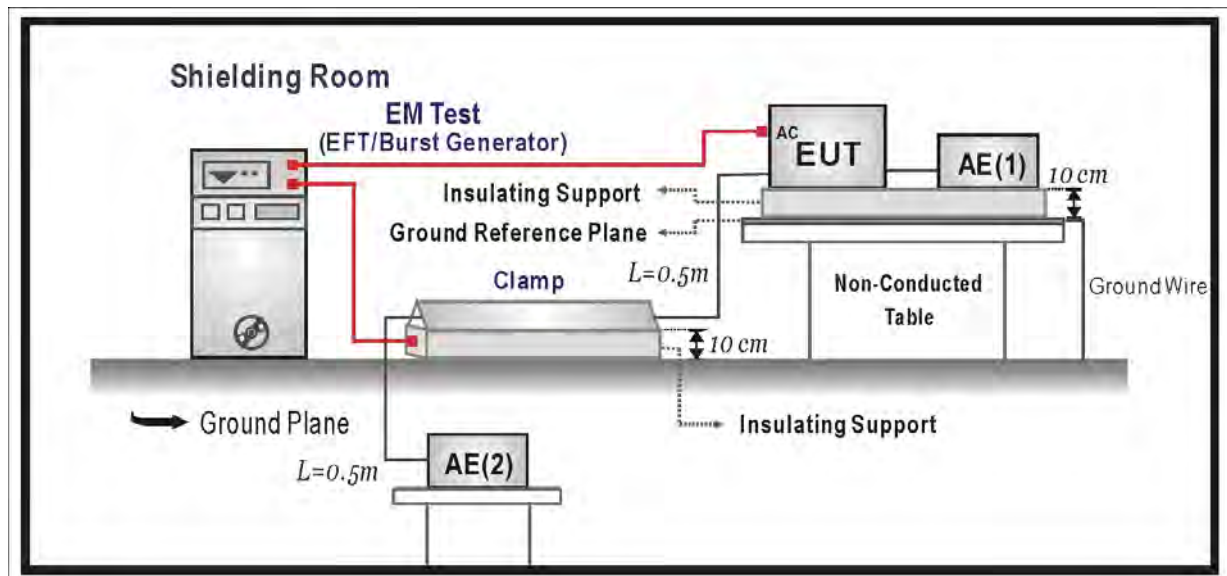


7. Electrical Fast Transient/Burst

7.1. Test Specification

According to EN 50121-4 clause 6.

7.2. Test Setup



7.3. Limit

Item	Environmental Phenomena	Units	Test Specificatio	Performance Criteria
Signal and Telecommunication Ports				
	Fast Transients Common Mode	kV (Peak)	+2	A
		Tr/Th ns	5/50	
		Rep. Frequency kHz	5	
Input DC Power Ports				
	Fast Transients Common Mode	kV (Peak)	+2	A
		Tr/Th ns	5/50	
		Rep. Frequency kHz	5	
Input AC Power Ports				
	Fast Transients Common Mode	kV (Peak)	+2	A
		Tr/Th ns	5/50	
		Rep. Frequency kHz	5	

7.4. Test Procedure

According to EN 61000-4-4.

The EUT is placed on a table that is 0.8 meter height. A ground reference plane is placed on the table, and uses a 0.1m insulation between the EUT and ground reference plane.

The minimum area of the ground reference plane is 1m*1m, and 0.65mm thick min, and projected beyond the EUT by at least 0.1m on all sides.

Test on I/O and communication ports:

The EFT interference signal is through a coupling clamp device couples to the signal and control lines of the EUT with burst noise for 1minute.

Test on power supply ports:

The EUT is connected to the power mains through a coupling device that directly couples the EFT/B interference signal.

Each of the Line and Neutral conductors is impressed with burst noise for 1 minute.

The length of the signal and power lines between the coupling device and the EUT is 0.5m.

7.5. Deviation from Test Standard

No deviation

7.6. Test Result

Product	Network Camera		
Test Item	Electrical fast transient/burst		
Test Mode	Mode 1: MD9561-H , PoE		
Date of Test	2019/04/17	Test Site	No.6 Shielded Room

Inject Line	Polarity	Voltage kV	Inject Time (Second)	Inject Method	Required Criteria	Complied to Criteria	Result
LAN	±	2kV	60	Clamp	A	A	PASS

Note:

The testing performed is from lowest level up to the highest level as required by standard, but only highest level is shown on the report.

- ☒ Meet criteria A : Operate as intended during and after the test
- ☐ Meet criteria B : Operate as intended after the test
- ☐ Meet criteria C : Loss/Error of function
- ☐ Additional Information
 - ☐ EUT stopped operation and could / could not be reset by operator at _____ kV of Line _____.
- ☒ No false alarms or other malfunctions were observed during or after the test.

Product	Network Camera		
Test Item	Electrical fast transient/burst		
Test Mode	Mode 2: MD9581-H , PoE		
Date of Test	2019/04/17	Test Site	No.6 Shielded Room

Inject Line	Polarity	Voltage kV	Inject Time (Second)	Inject Method	Required Criteria	Complied to Criteria	Result
LAN	±	2kV	60	Clamp	A	A	PASS

Note:

The testing performed is from lowest level up to the highest level as required by standard, but only highest level is shown on the report.

- ☒ Meet criteria A : Operate as intended during and after the test
- ☐ Meet criteria B : Operate as intended after the test
- ☐ Meet criteria C : Loss/Error of function
- ☐ Additional Information
 - ☐ EUT stopped operation and could / could not be reset by operator at _____ kV of Line _____.
- ☒ No false alarms or other malfunctions were observed during or after the test.

7.7. Test Photograph

Test Mode : Mode 1: MD9561-H , PoE

Description : EFT/B Test Setup-Clamp



Test Mode : Mode 2: MD9581-H , PoE

Description : EFT/B Test Setup-Clamp

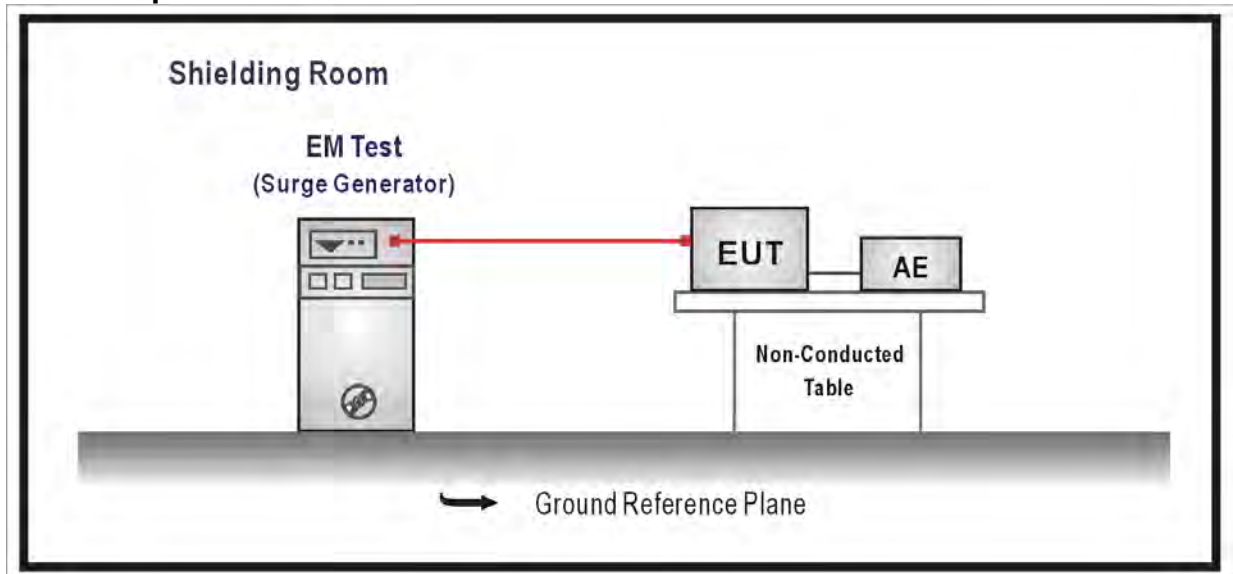


8. Surge

8.1. Test Specification

According to EN 50121-4 clause 6.

8.2. Test Setup



8.3. Limit

Item	Environmental Phenomena	Units	Test Specification	Performance Criteria
Signal Ports and Telecommunication Ports(See 1) and 2))				
	Surges Line to Line Line to Ground	Tr/Th us KV kV Output Impedance Ω Coupling Capacitance μF	1.2/50 (8/20) ± 1 ± 2 42 0.5	B
Input DC Power Ports				
	Surges Line to Line Line to Ground	Tr/Th us kV KV Output Impedance Ω Coupling Capacitance μF	1.2/50 (8/20) ± 1 ± 2 42 0.5	B
Input AC Power Ports				
	Surges Line to Line Line to Ground	Tr/Th us kV kV	1.2/50 (8/20) ± 1 ± 2	B

Notes:

- 1) For telecommunication ports and other ports intended for connection to highly balanced pairs, a line to line test is not required.
- 2) Ports directly connected to power ports or to the (public) low voltage network are classified as power ports also.

8.4. Test Procedure

According to EN 61000-4-5.

The EUT and its load are placed on a table that is 0.8 meter above a metal ground plane measured 1m*1m min. and 0.65mm thick min. And projected beyond the EUT by at least 0.1m on all sides. The length of power cord between the coupling device and the EUT shall be 2m or less.

For Input and Output AC Power or DC Input and DC Output Power Ports:

The EUT is connected to the power mains through a coupling device that directly couples the Surge interference signal.

The surge noise shall be applied synchronized to the voltage phase at 0°, 90°, 180°, 270° and the peak value of the a.c. voltage wave. (Positive and negative)

Each of Line-Earth and Line-Line is impressed with a sequence of five surge voltages with interval of 1 min.

8.5. Deviation from Test Standard

No deviation.

8.6. Test Result

Product	Network Camera		
Test Item	Surge		
Test Mode	Mode 1: MD9561-H , PoE		
Date of Test	2019/04/21	Test Site	No.6 Shielded Room

Inject Line	Polarity	Voltage kV	Angle	Time Interval (Second)	Inject Method	Required Criteria	Complied to Criteria	Result
LAN (Line to Ground)	±	2kV	--	60	Direct	B	B	PASS

Note:

The testing performed is from lowest level up to the highest level as required by standard, but only highest level is shown on the report.

- ☐ Meet criteria A : Operate as intended during and after the test
- ☒ Meet criteria B : Operate as intended after the test
- ☐ Meet criteria C : Loss/Error of function
- ☐ Additional Information
 - ☐ EUT stopped operation and could / could not be reset by operator at _____ kV of Line _____.
- ☒ No false alarms or other malfunctions were observed during or after the test.

Product	Network Camera		
Test Item	Surge		
Test Mode	Mode 2: MD9581-H , PoE		
Date of Test	2019/04/21	Test Site	No.6 Shielded Room

Inject Line	Polarity	Voltage kV	Angle	Time Interval (Second)	Inject Method	Required Criteria	Complied to Criteria	Result
LAN (Line to Ground)	±	2kV	--	60	Direct	B	B	PASS

Note:

The testing performed is from lowest level up to the highest level as required by standard, but only highest level is shown on the report.

- ☐ Meet criteria A : Operate as intended during and after the test
- ☒ Meet criteria B : Operate as intended after the test
- ☐ Meet criteria C : Loss/Error of function
- ☐ Additional Information
 - ☐ EUT stopped operation and could / could not be reset by operator at _____ kV of Line _____.
- ☒ No false alarms or other malfunctions were observed during or after the test.

8.7. Test Photograph

Test Mode : Mode 1: MD9561-H , PoE

Description : SURGE Test Setup



Test Mode : Mode 2: MD9581-H , PoE

Description : SURGE Test Setup



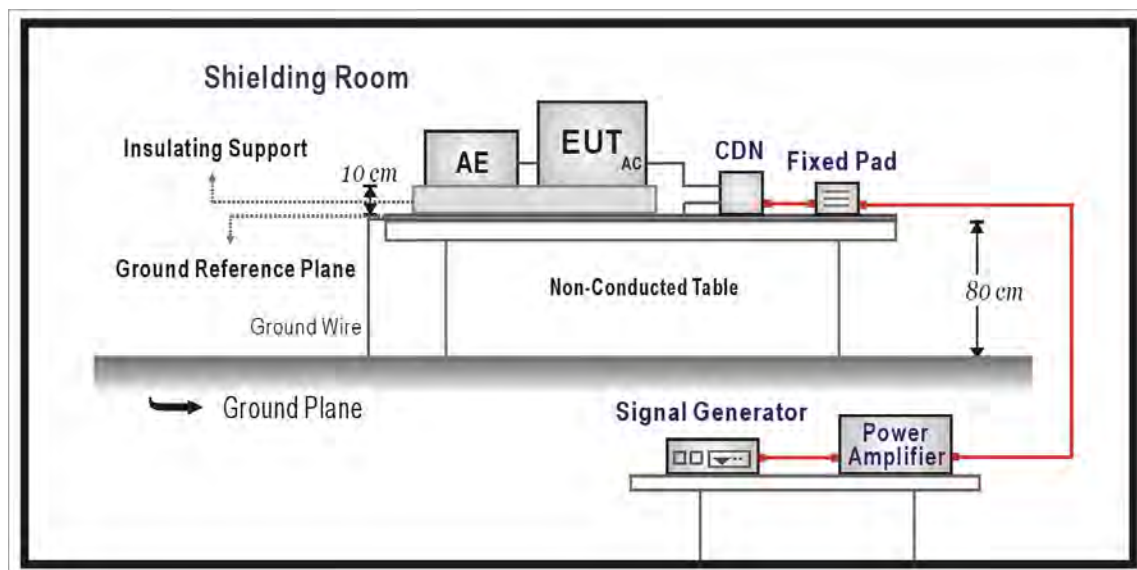
9. Conducted Susceptibility

9.1. Test Specification

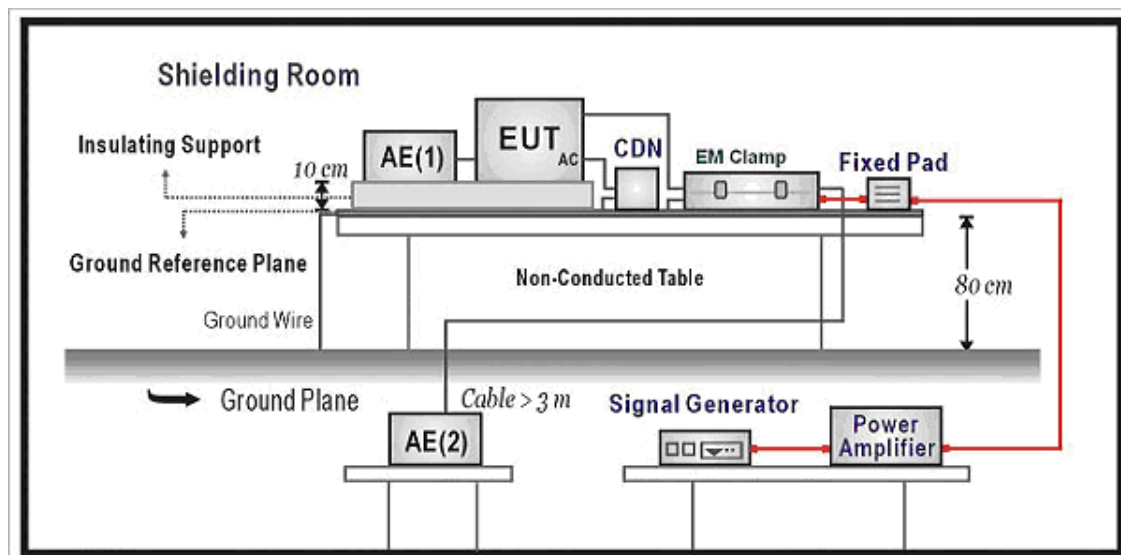
According to EN 50121-4 clause 6.

9.2. Test Setup

CDN Inject Method



EM Clamp Inject Method



9.3. Limit

Item	Environmental Phenomena	Units	Test Specification	Performance Criteria
Signal Ports and Telecommunication Ports				
	Radio-Frequency Continuous Conducted	MHz V (rms, Un-modulated) % AM (1kHz)	0.15-80 10 80	A
Input DC Power Ports				
	Radio-Frequency Continuous Conducted	MHz V (rms, Un-modulated) % AM (1kHz)	0.15-80 10 80	A
Input AC Power Ports				
	Radio-Frequency Continuous Conducted	MHz V (rms, Un-modulated) % AM (1kHz)	0.15-80 10 80	A

9.4. Test Procedure

According to EN 61000-4-6.

The EUT are placed on a table that is 0.8 meter height, and a Ground reference plane on the table, EUT are placed upon table and use a 10cm insulation between the EUT and Ground reference plane.

For Signal Ports and Telecommunication Ports

The disturbance signal is through a coupling and decoupling networks (CDN) or EM-clamp device couples to the signal and Telecommunication lines of the EUT.

For Input DC and AC Power Ports

The EUT is connected to the power mains through a coupling and decoupling networks for power supply lines. And directly couples the disturbances signal into EUT.

Used CDN-M2 for two wires or CDN-M3 for three wires.

All the scanning conditions are as follows:

Condition of Test	Remarks
1. Field Strength	140dB μ V(10V) Level 3
2. Radiated Signal	AM 80% Modulated with 1kHz
3. Scanning Frequency	0.15MHz – 80MHz
4. Dwell Time	3 Seconds
5. Frequency step size Δf :	1%

9.5. Deviation from Test Standard

No deviation.

9.6. Test Result

Product	Network Camera		
Test Item	Conducted susceptibility		
Test Mode	Mode 1: MD9561-H , PoE		
Date of Test	2019/04/17	Test Site	No.6 Shielded Room

Frequency Range (MHz)	Voltage Applied dBuV(V)	Inject Method	Tested Port of EUT	Required Criteria	Performance Criteria Complied To	Result
0.15~80	10V	CDN	LAN	A	A	PASS

Note:

The testing performed is from lowest level up to the highest level as required by standard, but only highest level is shown on the report.

- ☒ Meet criteria A : Operate as intended during and after the test
- ☐ Meet criteria B : Operate as intended after the test
- ☐ Meet criteria C : Loss/Error of function
- ☐ Additional Information
 - ☐ EUT stopped operation and could / could not be reset by operator at _____ dBuV(V) at frequency _____MHz.
 - ☒ No false alarms or other malfunctions were observed during or after the test. The acceptance criteria were met, and the EUT passed the test.

Product	Network Camera		
Test Item	Conducted susceptibility		
Test Mode	Mode 2: MD9581-H , PoE		
Date of Test	2019/04/17	Test Site	No.6 Shielded Room

Frequency Range (MHz)	Voltage Applied dBuV(V)	Inject Method	Tested Port of EUT	Required Criteria	Performance Criteria Complied To	Result
0.15~80	10V	CDN	LAN	A	A	PASS

Note:

The testing performed is from lowest level up to the highest level as required by standard, but only highest level is shown on the report.

- ☒ Meet criteria A : Operate as intended during and after the test
- ☐ Meet criteria B : Operate as intended after the test
- ☐ Meet criteria C : Loss/Error of function
- ☐ Additional Information
 - ☐ EUT stopped operation and could / could not be reset by operator at _____ dBuV(V) at frequency _____MHz.
 - ☒ No false alarms or other malfunctions were observed during or after the test. The acceptance criteria were met, and the EUT passed the test.

9.7. Test Photograph

Test Mode : Mode 1: MD9561-H , PoE

Description : Conducted Susceptibility Test Setup-CDN



Test Mode : Mode 2: MD9581-H , PoE

Description : Conducted Susceptibility Test Setup-CDN

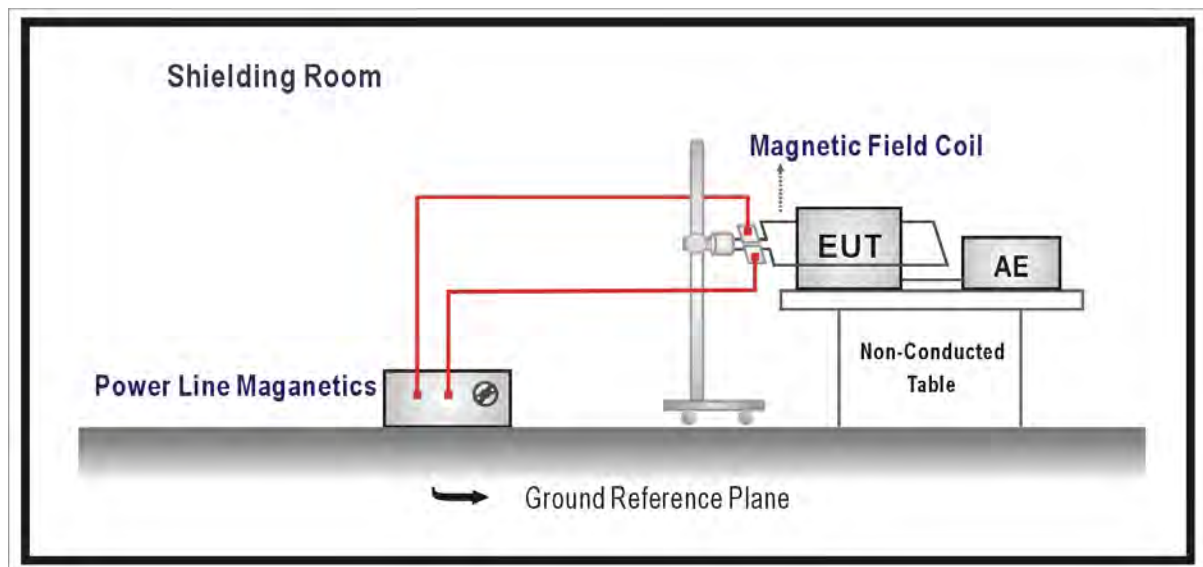


10. Power Frequency Magnetic Field

10.1. Test Specification

According to EN 50121-4 clause 6.

10.2. Test Setup



10.3. Limit

Item	Environmental Phenomena	Units	Test Specification	Performance Criteria
Enclosure Port				
	Power-Frequency Magnetic Field	Hz	16.7	A
		Hz	50	
		Hz	0 d.c	
		A/m (r.m.s.)	100 a.c. systems	
		A/m (r.m.s.)	300 d.c. systems	

Note: Test only applies to apparatus containing devices sensitive to magnetic fields, such as Hall elements, electro-dynamic microphones etc.

10.4. Test Procedure

According to EN 61000-4-8.

The EUT and its load are placed on a table which is 0.8 meter above a metal ground plane measured at least 1m*1m min. The test magnetic field shall be placed at central of the induction coil.

The plane of the inductive coil shall then be rotated by 90° in order to expose the EUT to the test field with different orientations(X, Y, Z Orientations) and the same procedure.

10.5. Deviation from Test Standard

No deviation.

10.6. Test Result

Product	Network Camera		
Test Item	Power frequency magnetic field		
Test Mode	Mode 1: MD9561-H , PoE		
Date of Test	2019/04/19	Test Site	No.3 Shielded Room

Polarization	Frequency (Hz)	Inject Time (s)	Magnetic Strength (A/m)	Required Performance Criteria	Performance Criteria Complied To	Test Result
X Orientation	50	60	100	A	A	PASS
Y Orientation	50	60	100	A	A	PASS
Z Orientation	50	60	100	A	A	PASS
X Orientation	16.7	60	100	A	A	PASS
Y Orientation	16.7	60	100	A	A	PASS
Z Orientation	16.7	60	100	A	A	PASS
X Orientation	0	60	300	A	A	PASS
Y Orientation	0	60	300	A	A	PASS
Z Orientation	0	60	300	A	A	PASS

- ☒ Meet criteria A: Operate as intended during and after the test
☐ Meet criteria B: Operate as intended after the test
☐ Meet criteria C: Loss/Error of function
☐ Additional Information
☐ EUT stopped operation and could / could not be reset by operator at _____ kV of Line _____.
- ☒ No false alarms or other malfunctions were observed during or after the test. The acceptance criteria were met, and the EUT passed the test.

Product	Network Camera		
Test Item	Power frequency magnetic field		
Test Mode	Mode 2: MD9581-H , PoE		
Date of Test	2019/04/19	Test Site	No.3 Shielded Room

Polarization	Frequency (Hz)	Inject Time (s)	Magnetic Strength (A/m)	Required Performance Criteria	Performance Criteria Complied To	Test Result
X Orientation	50	60	100	A	A	PASS
Y Orientation	50	60	100	A	A	PASS
Z Orientation	50	60	100	A	A	PASS
X Orientation	16.7	60	100	A	A	PASS
Y Orientation	16.7	60	100	A	A	PASS
Z Orientation	16.7	60	100	A	A	PASS
X Orientation	0	60	300	A	A	PASS
Y Orientation	0	60	300	A	A	PASS
Z Orientation	0	60	300	A	A	PASS

- ☒ Meet criteria A: Operate as intended during and after the test
☐ Meet criteria B: Operate as intended after the test
☐ Meet criteria C: Loss/Error of function
☐ Additional Information
☐ EUT stopped operation and could / could not be reset by operator at _____ kV of Line _____.
- ☒ No false alarms or other malfunctions were observed during or after the test. The acceptance criteria were met, and the EUT passed the test.

10.7. Test Photograph

Test Mode : Mode 1: MD9561-H , PoE

Description : Power Frequency Magnetic Field Test Setup



Test Mode : Mode 2: MD9581-H , PoE

Description : Power Frequency Magnetic Field Test Setup



11. Attachment

➤ EUT Photograph

(1) EUT Photo (M/N: MD9561-H)



(2) EUT Photo (M/N: MD9561-H)



(3) EUT Photo (M/N: MD9561-H)



(4) EUT Photo (M/N: MD9581-H)



(5) EUT Photo (M/N: MD9581-H)



(6) EUT Photo (M/N: MD9581-H)



(7) EUT Photo

