

FCC Test Report

Compliance with Canada Interference-Causing
Equipment Standard ICES-003

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-ITUSP01V00

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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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 : FCC CFR Title 47 Part 15 Subpart B: 2017, Class B
CISPR 22: 2008, ANSI C63.4: 2014
ICES-003 Issue 6: 2016 Class B

Test Result : Complied

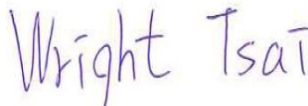
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Laboratory Information

We, **DEKRA Testing and Certification Co., Ltd.**, are an independent EMC and safety consultancy that was established the whole facility in our laboratories. The test facility has been accredited/accepted (audited or listed) by the following related bodies in compliance with ISO 17025, EN 45001 and specified testing scopes:

Taiwan	:	BSMI, NCC, TAF
Norway	:	DNVGL
USA	:	FCC
Japan	:	VCCI

The address and introduction of DEKRA Testing and Certification Co., Ltd. laboratories can be founded in our Web site : <http://www.dekra.com.tw>

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1. General Information

1.1. EUT Description

Product Name	Network Camera
Trade Name	VIVOTEK
Model No.	MD9561-H, MD9581-H, MD9581-HTPM
EUT Max Frequency	1866 MHz

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:

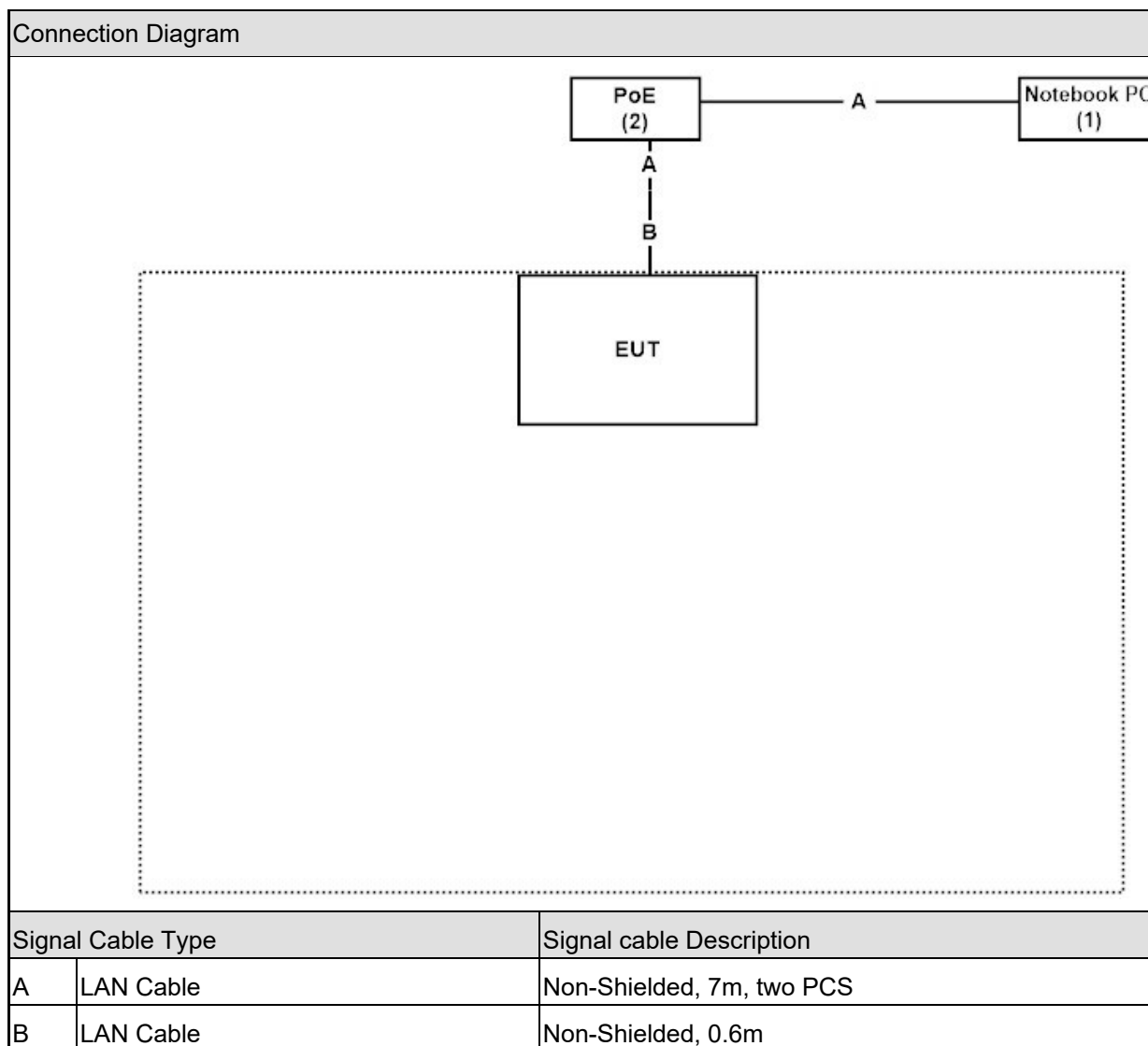
Pre-Test Mode	
Mode 1: MD9561-H , PoE Mode 2: MD9581-H , PoE	
Final Test Mode	
Emission	Mode 1: MD9561-H , PoE Mode 2: MD9581-H , PoE
Note: According to pre-test data, we choose the worst case mode 1, 2 as the final and full testing.	

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



Note:

- ☒ Use Full system setup configuration determines Worst-Case Mode.
- ☐ Use 2dB law program determines Max. Cable Configuration and Worst-Case Mode.
- ☒ Radiated emission item test: Performed using the Horn Antenna 3dB Beamwidth to 3m from the EUT size sufficient to cover the procedure.
- ☐ Radiated emission item test: Performed using the Horn Antenna 3dB Beamwidth non 3m distance sufficient to cover the size of the EUT program.

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
Conducted Emission	FCC CFR Title 47 Part 15 Subpart B: 2017 Class B, ANSI C63.4: 2014	No	No
Radiated Emission	FCC CFR Title 47 Part 15 Subpart B: 2017 Class B, ANSI C63.4: 2014	Yes	No

Note : Test Procedure ☒ ANSI C63.4:2014 ☐ MP-5:1986

2.2. List of Test Equipment

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

Note:Test Receiver Detector:Quasipeak Bandwidth:120KHz

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

2.3. Measurement Uncertainty

Radiated Emission(Under 1GHz)

The measurement uncertainty is evaluated as ± 4.22 dB.

Radiated Emission(Above 1GHz)

The measurement uncertainty is evaluated as ± 5.08 dB.

2.4. Test Environment

Performed Item	Items	Required	Actual
Radiated Emission	Temperature (°C)	15-35	25.2
	Humidity (%RH)	25-75	50
	Barometric pressure (mbar)	860-1060	950-1000

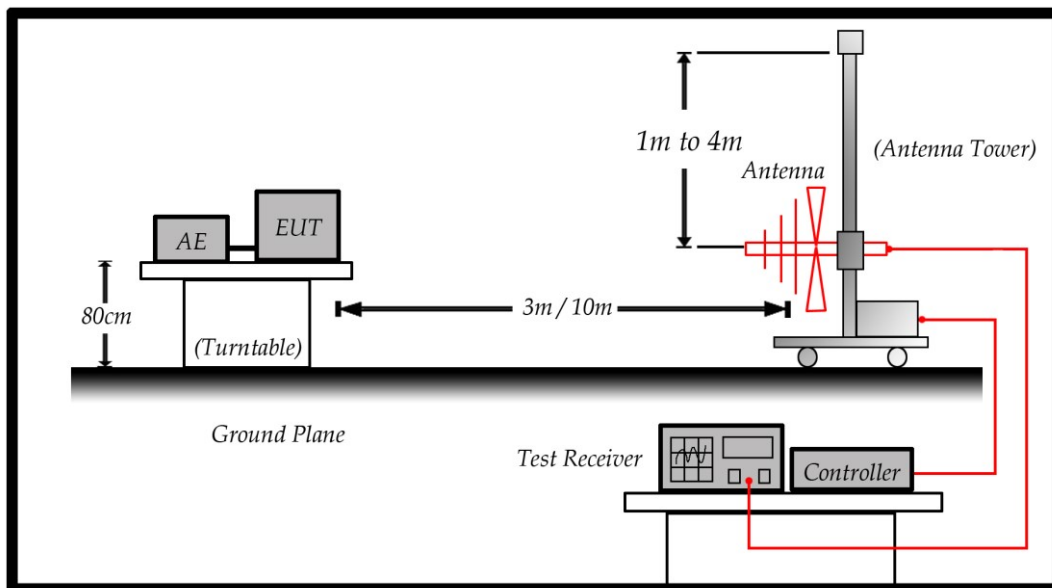
3. Radiated Emission

3.1. Test Specification

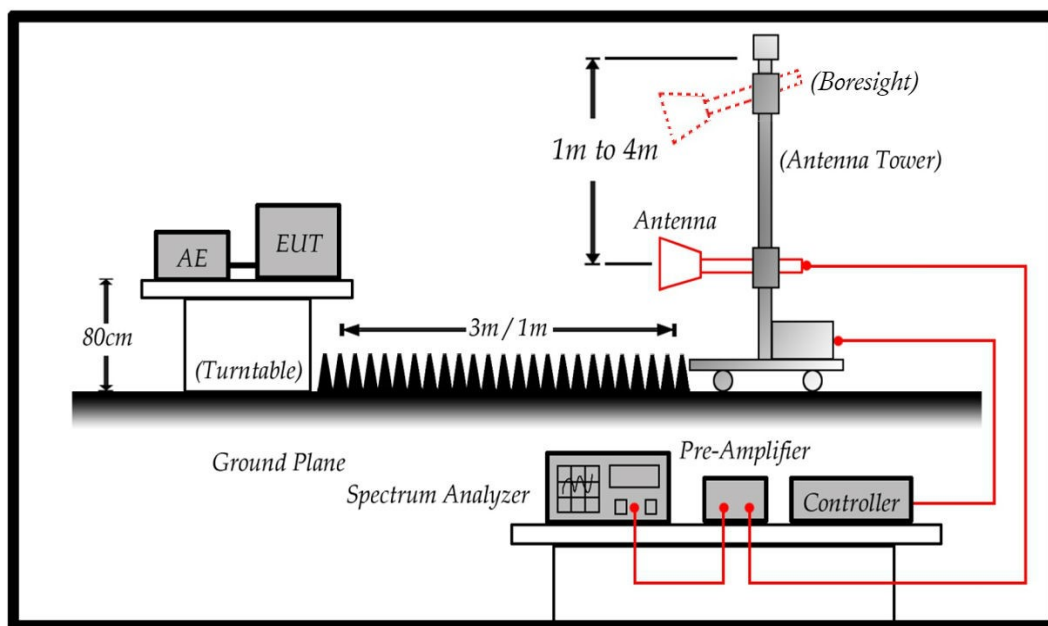
According to EMC Standard : FCC Part 15 Subpart B, ANSI C63.4

3.2. Test Setup

Under 1GHz Test Setup:



Above 1GHz Test Setup:



3.3. Limit

Under 1GHz test shall not exceed the following value:

Limits		
Frequency (MHz)	Distance (m)	dBuV/m
30 – 230	10	30
230 – 1000	10	37

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.

Above 1GHz test shall not exceed the following value:

FCC Part 15 Subpart B Paragraph 15.109 Limits (dBuV/m)		
Frequency (MHz)	Distance (m)	dBuV/m
30-88	3	40
88-216	3	43.5
216-960	3	46
960-18000	3	54
Above 18000	1	63.54

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.
3. RF Voltage (dBuV/m) = 20 log RF Voltage (uV/m)

3.4. Test Procedure

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 and the antenna (boresight antenna tower) 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.

For an unintentional radiator, including a digital device, the spectrum shall be investigated from the lowest radio frequency signal generated or used in the device, without going below the lowest frequency for which a radiated emission limit is specified, up to the frequency shown in the following table:

Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement range (MHz)
Below 1.705	30
1.705 – 108	1000
108 – 500	2000
500 – 1000	5000
Above 1000	5 th harmonic of the highest frequency or 40 GHz, whichever is lower

On any frequency or frequencies below or equal to 1000 MHz, the radiated limits shown are based on measuring equipment employing a quasi-peak detector function and above 1000 MHz, the radiated limits shown are based measuring equipment employing an average detector function.

When average radiated emission measurement are included emission measurement Above 1000 MHz, there also is a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit.

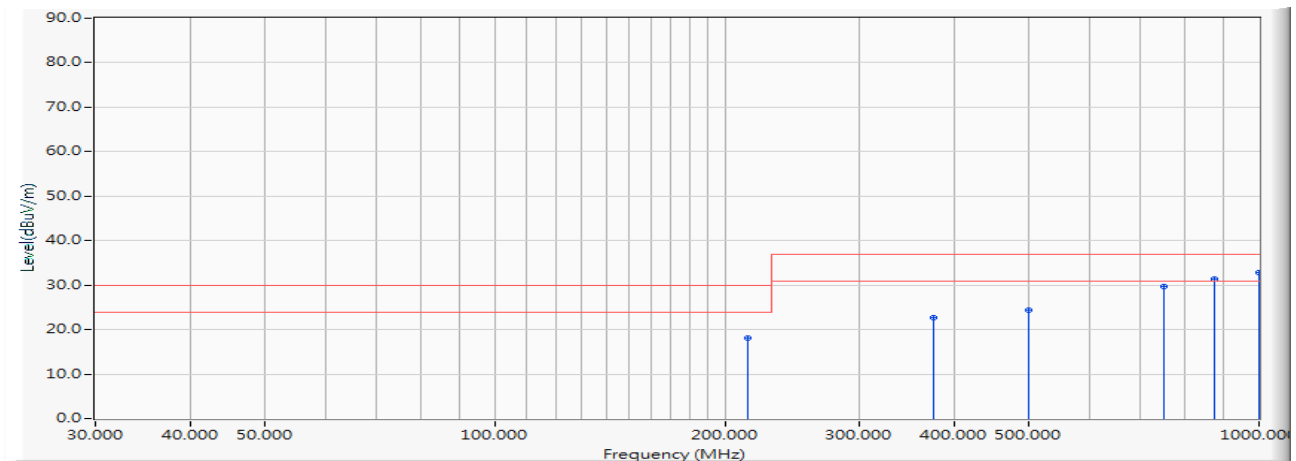
For class A, the measurement distance between the EUT and antenna is 10 meters for under 1GHz and above 1GHz.

For class B, the measurement distance between the EUT and antenna is 10 meters for under 1GHz and 3 meters for above 1GHz.

The bandwidth below 1GHz setting on the field strength meter (Test Receiver) is 120 kHz and above 1GHz is 1MHz.

3.5. Test Result

Site : SITE7	Time : 2019/03/19 - 14:31
Limit : CISPR_B_10M_QP	Margin : 6
EUT : Network Camera	Probe : Site7_VULB9168_10m_1804 - HORIZONTAL
Power : POE	Note : Mode 1

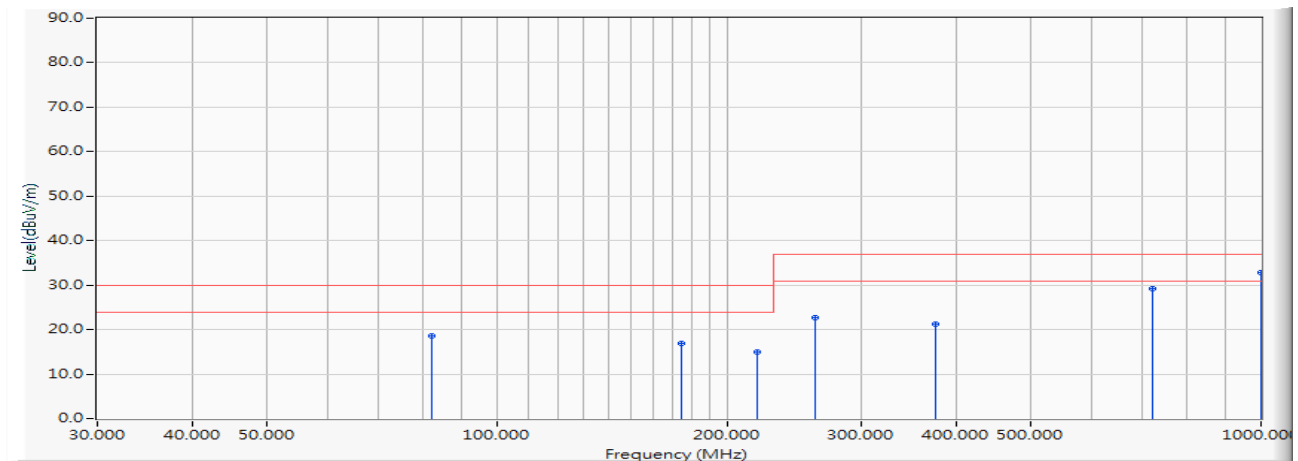


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1		214.600	-12.601	30.600	17.999	-12.001	30.000	QUASPEAK	380.000	66.000
2		375.000	-5.843	28.600	22.757	-14.243	37.000	QUASPEAK	300.000	-85.000
3		500.000	-1.909	26.200	24.291	-12.709	37.000	QUASPEAK	200.000	-48.000
4		750.000	4.566	25.200	29.765	-7.235	37.000	QUASPEAK	115.000	31.000
5		875.000	6.091	25.300	31.391	-5.609	37.000	QUASPEAK	100.000	-49.000
6	*	1000.000	7.730	25.200	32.930	-4.070	37.000	QUASPEAK	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 (ant factor + cable loss - amp).

Site : SITE7	Time : 2019/03/19 - 14:31
Limit : CISPR_B_10M_QP	Margin : 6
EUT : Network Camera	Probe : Site7_VULB9168_10m_1804 - VERTICAL
Power : POE	Note : Mode 1

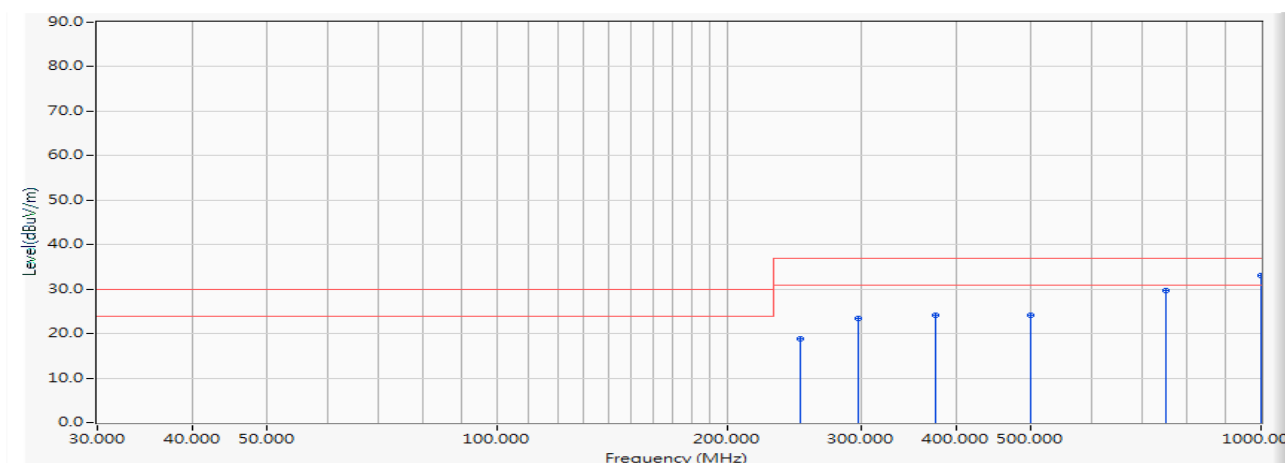


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1	82.100	-15.961	34.600	18.639	-11.361	30.000	QUASIPeAK	100.000	-139.000
2	174.190	-10.765	27.600	16.835	-13.165	30.000	QUASIPeAK	100.000	-94.000
3	219.200	-12.458	27.500	15.042	-14.958	30.000	QUASIPeAK	100.000	62.000
4	261.400	-9.886	32.500	22.613	-14.387	37.000	QUASIPeAK	100.000	-99.000
5	375.000	-5.843	27.000	21.157	-15.843	37.000	QUASIPeAK	100.000	-94.000
6	720.000	3.653	25.600	29.254	-7.746	37.000	QUASIPeAK	260.000	-39.000
7	* 1000.000	7.730	25.200	32.930	-4.070	37.000	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 (ant factor + cable loss - amp).

Site : SITE7	Time : 2019/03/19 - 15:17
Limit : CISPR_B_10M_QP	Margin : 6
EUT : Network Camera	Probe : Site7_VULB9168_10m_1804 - HORIZONTAL
Power : POE	Note : Mode 2

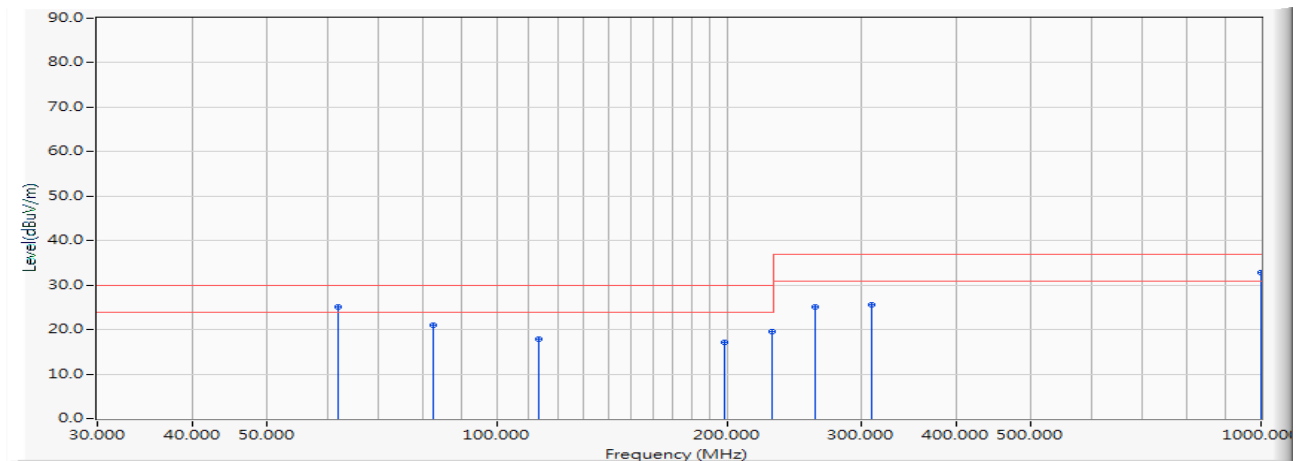


		Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1		250.000	-10.388	29.300	18.912	-18.088	37.000	QUASIPeAK	365.000	32.000
2		297.000	-8.171	31.500	23.328	-13.672	37.000	QUASIPeAK	385.000	-88.000
3		375.000	-5.843	30.000	24.157	-12.843	37.000	QUASIPeAK	280.000	-41.000
4		500.000	-1.909	26.000	24.091	-12.909	37.000	QUASIPeAK	200.000	36.000
5		750.000	4.566	25.000	29.565	-7.435	37.000	QUASIPeAK	100.000	39.000
6	*	1000.000	7.730	25.300	33.030	-3.970	37.000	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 (ant factor + cable loss - amp).

Site : SITE7	Time : 2019/03/19 - 15:17
Limit : CISPR_B_10M_QP	Margin : 6
EUT : Network Camera	Probe : Site7_VULB9168_10m_1804 - VERTICAL
Power : POE	Note : Mode 2

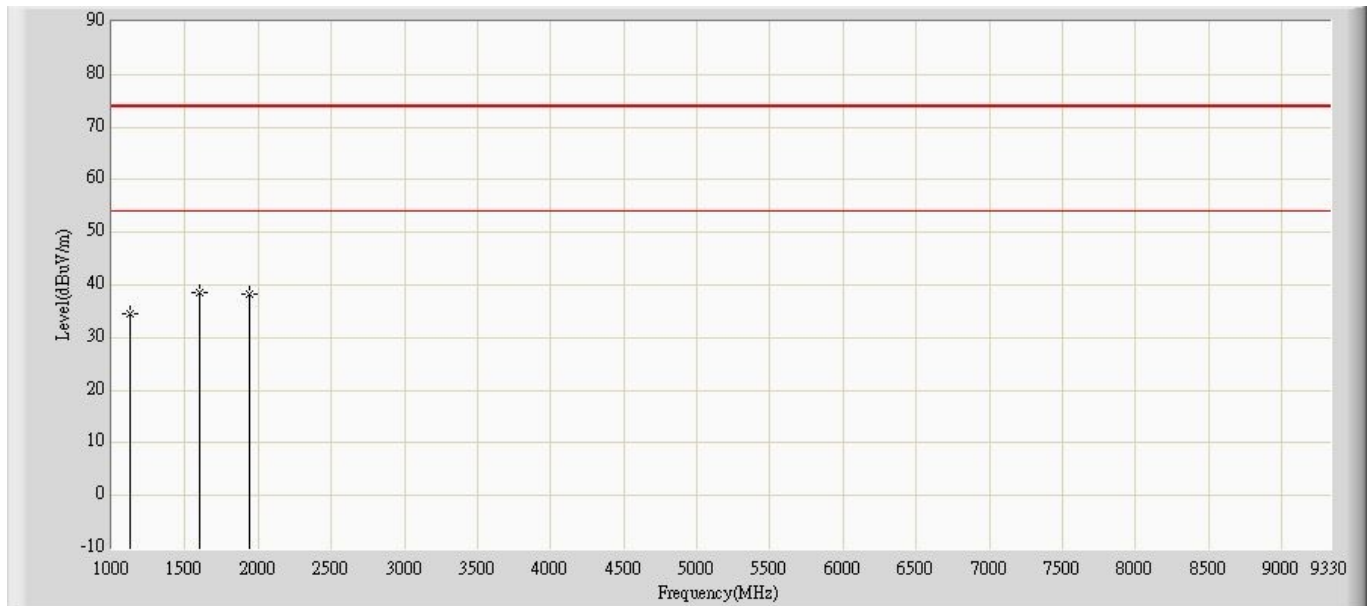


	Frequency (MHz)	Correct Factor (dB)	Reading Level (dBuV)	Measure Level (dBuV/m)	Margin (dB)	Limit (dBuV/m)	Detector Type	Ant Pos (cm)	Table Pos (deg)
1	62.000	-11.978	37.000	25.022	-4.978	30.000	QUASIPeAK	100.000	45.000
2	82.645	-16.020	37.000	20.980	-9.020	30.000	QUASIPeAK	100.000	84.000
3	113.250	-13.628	31.600	17.972	-12.028	30.000	QUASIPeAK	100.000	94.000
4	198.500	-12.809	30.000	17.192	-12.808	30.000	QUASIPeAK	100.000	-53.000
5	228.700	-12.155	31.600	19.445	-10.555	30.000	QUASIPeAK	100.000	96.000
6	261.000	-9.912	35.000	25.089	-11.911	37.000	QUASIPeAK	100.000	97.000
7	309.600	-7.823	33.500	25.677	-11.323	37.000	QUASIPeAK	100.000	12.000
8	* 1000.000	7.730	25.100	32.830	-4.170	37.000	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 (ant factor + cable loss - amp).

Site: CB7	Time: 2019/04/08 - 14:52
Limit: FCC_B_(Above_1G)	Margin: 0
Probe: CB7_Horn_3117_1808	Polarity: Horizontal
EUT: Network Camera	Power: POE
Note: Mode 1	

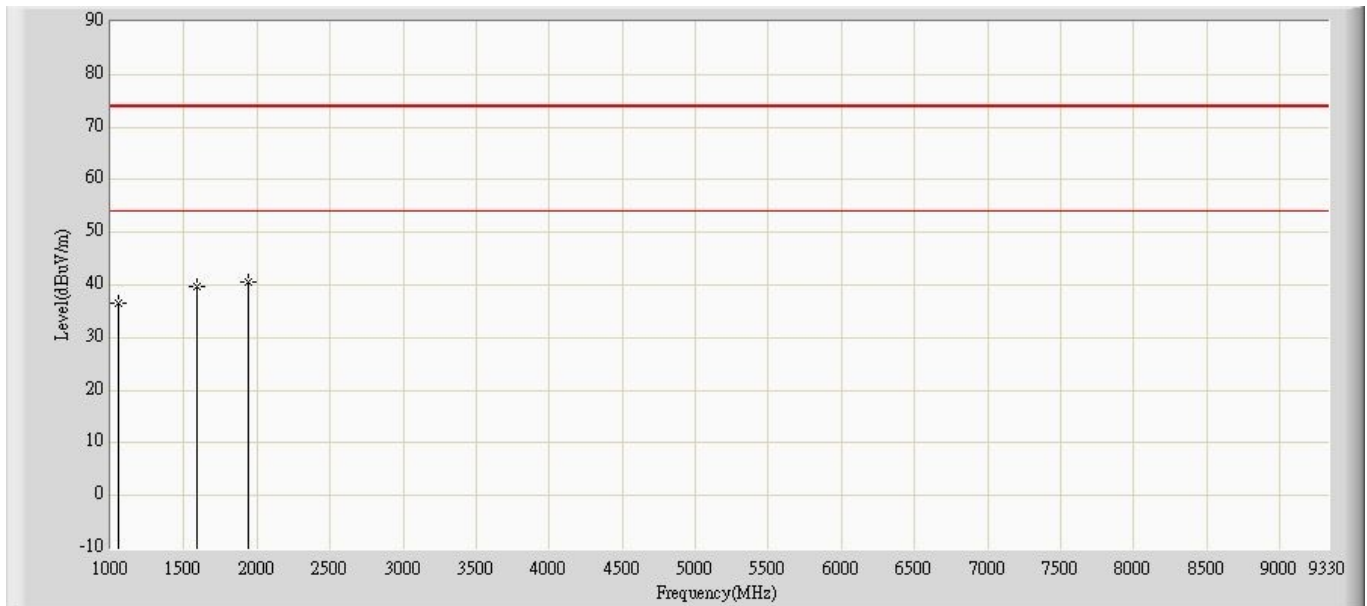


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Ant Pos (cm)	Table Pos (deg)	Type
1			1120.000	34.635	49.300	-39.365	74.000	-14.664	100	160	PK
2		*	1595.000	38.431	51.800	-35.569	74.000	-13.369	100	170	PK
3			1940.000	38.142	48.300	-35.858	74.000	-10.158	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(ant factor + cable loss - amp).

Site: CB7	Time: 2019/04/08 - 14:52
Limit: FCC_B_(Above_1G)	Margin: 0
Probe: CB7_Horn_3117_1808	Polarity: Vertical
EUT: Network Camera	Power: POE
Note: Mode 1	

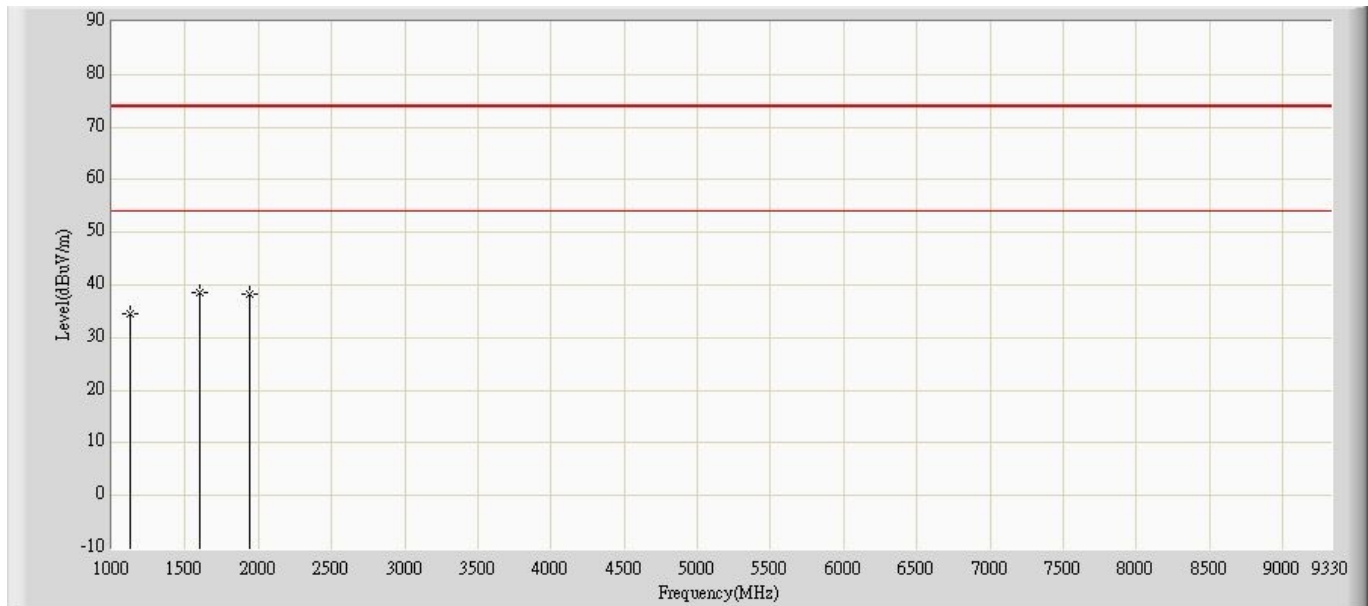


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Ant Pos (cm)	Table Pos (deg)	Type
1			1055.000	36.596	51.900	-37.404	74.000	-15.304	100	185	PK
2			1588.000	39.745	53.200	-34.255	74.000	-13.455	100	190	PK
3		*	1942.000	40.655	50.800	-33.345	74.000	-10.145	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(ant factor + cable loss - amp).

Site: CB7	Time: 2019/04/08 - 14:38
Limit: FCC_B_(Above_1G)	Margin: 0
Probe: CB7_Horn_3117_1808	Polarity: Horizontal
EUT: Network Camera	Power: POE
Note: Mode 2	

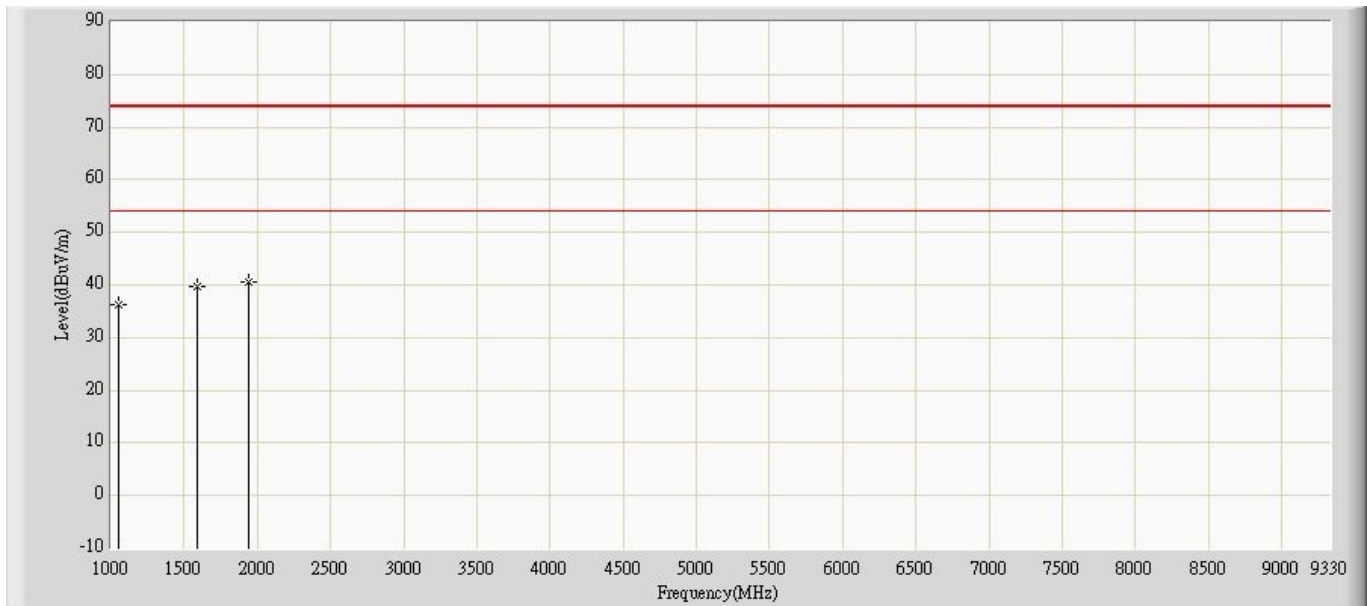


No	Flag	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor	Ant Pos (cm)	Table Pos (deg)	Type
1			1123.000	34.576	49.200	-39.424	74.000	-14.625	100	170	PK
2		*	1595.000	38.431	51.800	-35.569	74.000	-13.369	100	175	PK
3			1941.000	38.149	48.300	-35.851	74.000	-10.151	100	160	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(ant factor + cable loss - amp).

Site: CB7	Time: 2019/04/08 - 14:39
Limit: FCC_B_(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			1048.000	36.261	51.600	-37.739	74.000	-15.339	100	133	PK
2			1584.000	39.694	53.200	-34.306	74.000	-13.506	100	190	PK
3		*	1945.000	40.675	50.800	-33.325	74.000	-10.125	100	125	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(ant factor + cable loss - amp).

3.6. 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



4. Attachment

➤ EUT Photograph

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



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



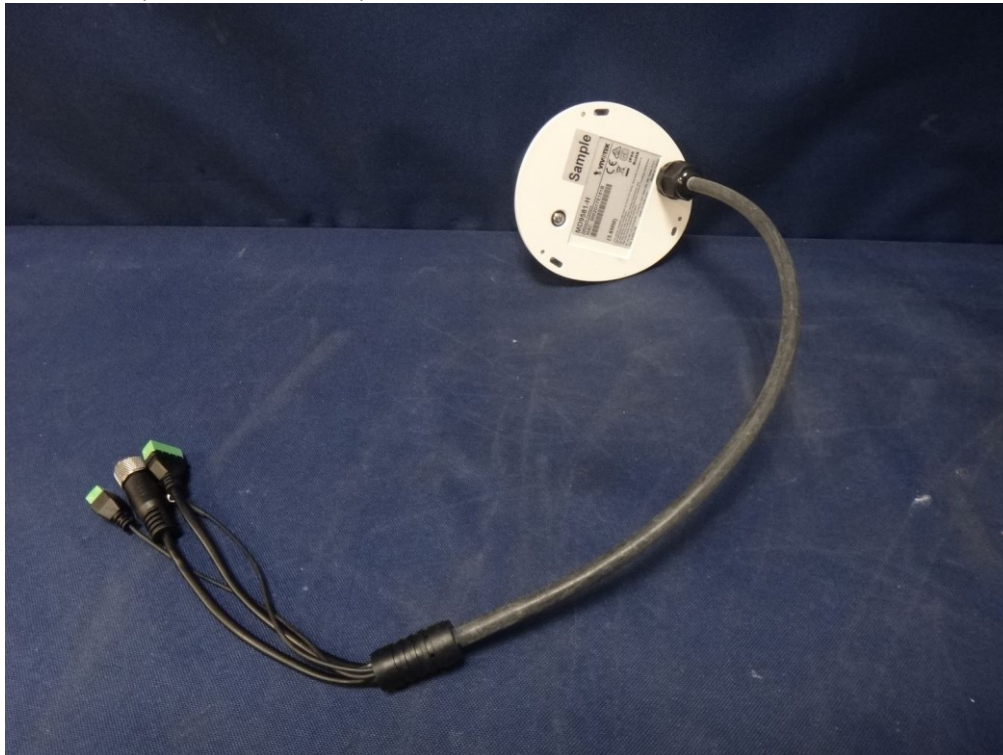
(3) EUT Photo (M/N: MD9561-H)



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



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



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



(7) EUT Photo

