

FCC TEST REPORT

Report No.: DHQA-19NO2333VTSHPB-3

Product: 4MP Pan/Tilt wireless IP Camera

Test Model: IP4M-1041W

Serial Model: IP4M-1041B

Received: Nov.21, 2019

ISSUED: Dec.23, 2019

Applicant: Amcrest Technologies LLC

Address: 16727 Park Row Dr. Houston, TX 77084

Issued By: BUREAU VERITAS ADT (Shanghai) Corporation

Lab Location: No. 829, Xinzhuan Road, Shanghai, P.R.China (201612)

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1. TEST PROGRAM

PRODUCT: 4MP Pan/Tilt wireless IP Camera

TEST MODEL: IP4M-1041W

SERIES MODEL: IP4M-1041B

APPLICANT: Amcrest Technologies LLC

TESTED: Nov.25 to Dec.10, 2019

STANDARDS: 47 CFR FCC Part15, Subpart B, Class B
ANSI C63.4:2014

We, BUREAU VERITAS ADT (Shanghai) Corporation, declare that the equipment above has been tested and found compliance with the requirement limits of applicable standards. The test record, data evaluation and Equipment Under Test (EUT) configurations represented herein are true and accurate under the standards herein specified.

Prepared by : Will YAN, Date: Dec.23, 2019

Project Engineer

Approved by : Daniel SUN, Date: Dec.23, 2019

Daniel SUN
RF Supervisor

2. Summary of Test Procedure and Test Results

EMISSION (47 CFR FCC Part15, Subpart B)		
Test Item	Normative References	Test Result
Conducted Emission	47 CFR FCC Part15, Subpart B 15.107	Meets the Class B requirements
Radiated Emission	47 CFR FCC Part15, Subpart B 15.109	Meets the Class B requirements

Special Comment: All tests were performed on 120Vac 60Hz.



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3. Test Configuration of Equipment under Test

3.1 Manufacturer information

Manufacturer : Amcrest Technologies LLC

Address : 16727 Park Row Dr. Houston, TX 77084

3.2 Feature of Equipment under Test

Product Name:	4MP Pan/Tilt wireless IP Camera
Test Model:	IP4M-1041W
Serial Model:	IP4M-1041B
Model Discrepancy:	Only product color is different
EUT Power Rating:	5VDC/1A with adaptor 100-240V~,50/60Hz

Note: Please refer to user manual.

3.3 Description of support units

NO.	PRODUCT	BRAND	MODEL NO.
1	Mobile Phone	Apple	--
2	Cable	--	--

3.4 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT:

This listed uncertainties are the worst case uncertainty for the entire range of measurement. Please note that the uncertainty values are provided for informational purposes only and are not used in determining the PASS/FAIL results.

Measurement		Value
Conducted emissions		2.55 dB
Radiated emissions	30 MHz ~ 1GHz	3.22 dB
	Above 1GHz	2.89 dB

4 Test of Conducted Emission

4.1 Test Limit

TEST STANDARD:

CFR 47 FCC Part 15, Subpart B (Section: 15.107)

FREQUENCY (MHz)	Class A (dBμV)		Class B (dBμV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	60	50

- NOTES:**
1. The lower limit shall apply at the transition frequencies.
 2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.
 3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.



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4.4 Measurement Equipment

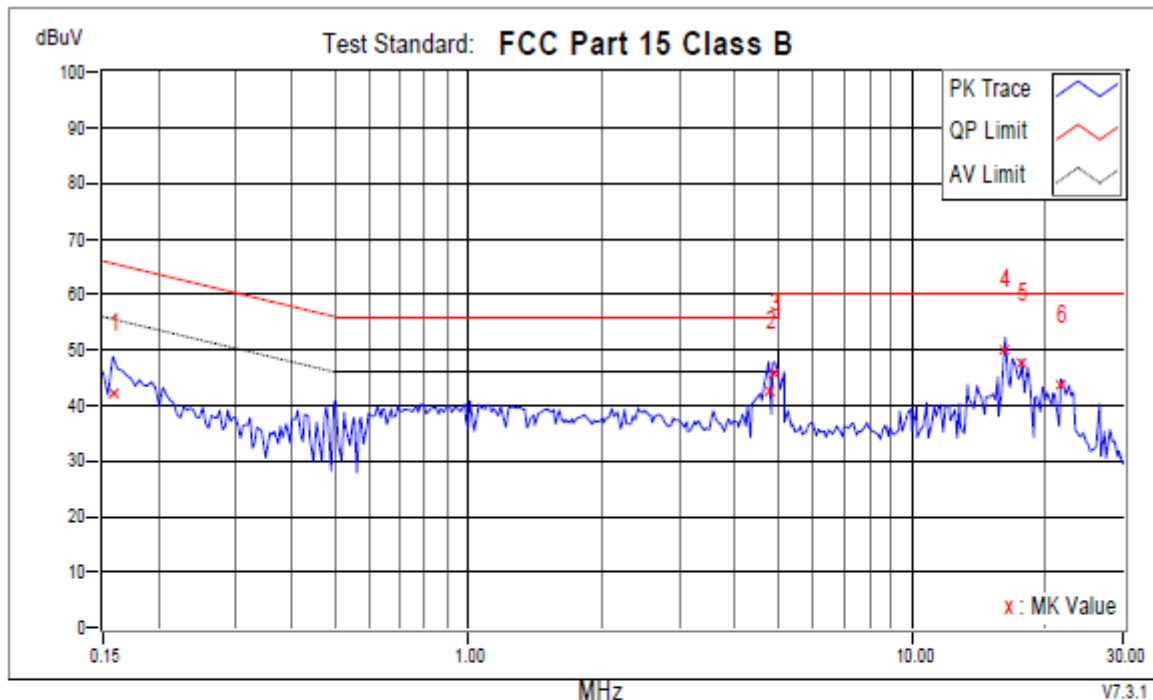
DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESCS30	E1R1001	Mar.04, 2020
LISN ROHDE & SCHWARZ	ENV216	E1L1011	Jul.17, 2020
Software ADT	ADT_Cond_V7.3.0	N/A	N/A



4.5 Test Result and Data

a. Conducted Emission Test Data

Phase: LINE



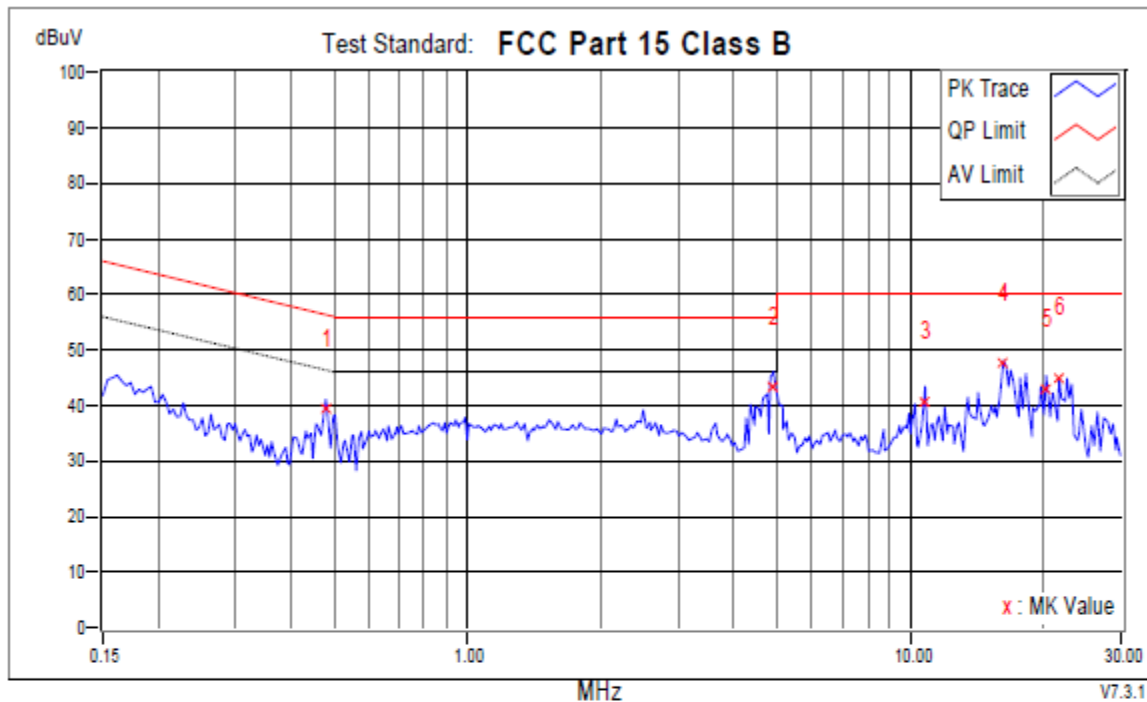
No.	Frequency MHz	Corr. Factor dB	Reading dBuV		Emission dBuV		Limit dBuV		Margins dB		Notes
			QP	AV	QP	AV	QP	AV	QP	AV	
1	0.15782	9.84	32.25	15.20	42.09	25.04	65.58	55.58	-23.48	-30.53	
2	4.75751	10.03	32.56	23.28	42.59	33.31	56.00	46.00	-13.41	-12.69	
3	4.91000	10.04	35.60	27.95	45.64	37.99	56.00	46.00	-10.36	-8.01	
+4	16.22863	10.31	39.73	36.05	50.04	46.36	60.00	50.00	-9.96	-3.64	
5	17.69488	10.29	37.25	34.28	47.54	44.57	60.00	50.00	-12.46	-5.43	
6	21.65962	10.18	33.47	31.35	43.65	41.53	60.00	50.00	-16.35	-8.47	

REMARKS:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value.



Phase : NEUTRAL



No.	Frequency MHz	Corr. Factor dB	Reading dBuV		Emission dBuV		Limit dBuV		Margins dB		Notes
			QP	AV	QP	AV	QP	AV	QP	AV	
1	0.47844	9.85	29.63	27.44	39.48	37.29	56.37	46.37	-16.89	-9.08	
2	4.91000	9.72	33.65	26.07	43.37	35.79	56.00	46.00	-12.63	-10.21	
3	10.79373	10.47	30.26	26.63	40.73	37.10	60.00	50.00	-19.27	-12.90	
+4	16.22863	10.34	37.48	34.62	47.82	44.96	60.00	50.00	-12.18	-5.04	
5	20.25593	10.39	32.77	29.58	43.16	39.97	60.00	50.00	-16.84	-10.03	
6	21.66353	10.35	34.69	32.09	45.04	42.44	60.00	50.00	-14.96	-7.56	

REMARKS:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value.



4.6 Test Photographs



5 Test of Radiated Emission

5.1 Test Limit

TEST STANDARD:

CFR 47 FCC Part 15, Subpart B (Section: 15.109)

FOR FREQUENCY BELOW 1000 MHz

FREQUENCY (MHz)	Class A (at 10m)		Class B (at 3m)	
	$\mu\text{V/m}$	$\text{dB}\mu\text{V/m}$	$\mu\text{V/m}$	$\text{dB}\mu\text{V/m}$
30 – 88	90	39.1	100	40.0
88 – 216	150	43.5	150	43.5
216 – 960	210	46.4	200	46.0
960 – 1000	300	49.5	500	54.0

LIMIT OF RADIATED EMISSION OF FCC PART 15, SUBPART B FOR FREQUENCY ABOVE 1000 MHz

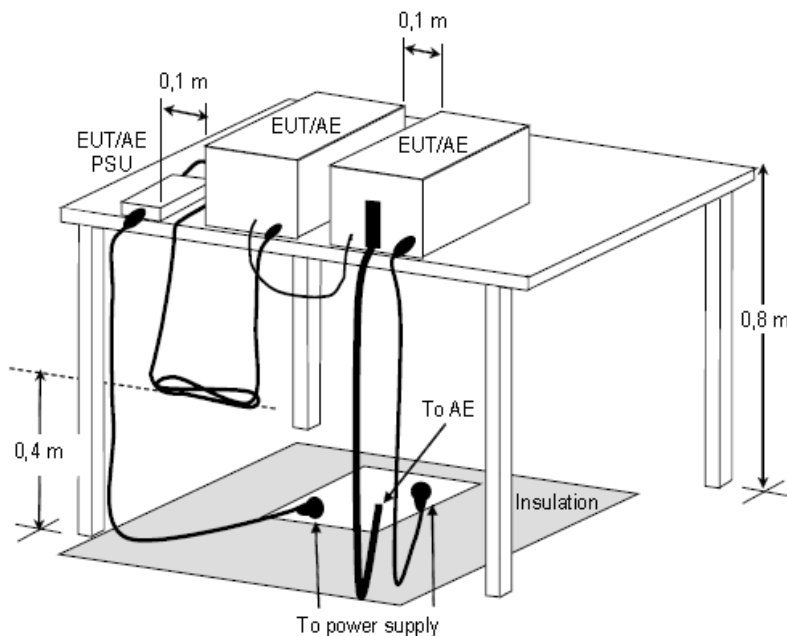
FREQUENCY (MHz)	Class A ($\text{dB}\mu\text{V/m}$) (at 3m)		Class B ($\text{dB}\mu\text{V/m}$) (at 3m)	
	PEAK	AVERAGE	PEAK	AVERAGE
Above 1000	80.0	60.0	74.0	54.0

- Note:** (1) The lower limit shall apply at the transition frequencies.
 (2) Emission level ($\text{dB}\mu\text{V/m}$) = $20 \log$ Emission level ($\mu\text{V/m}$).
 (3) All emanation from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

5.2 Test Procedures

- The EUT was placed on a rotatable table top 0.8 meter above ground.
- The EUT was set 3/10 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
- The table was rotated 360 degrees to determine the position of the highest radiation.
- The antenna is a half wave dipole and its height is varied between one meter and four meters above ground to find the maximum value of the field strength both horizontal polarization and vertical polarization of the antenna are set to make the measurement.
- For each suspected emission the EUT was arranged to its worst case and then tune the antenna tower (from 1 M to 4 M) and turn table (from 0 degree to 360 degrees) to find the maximum reading.
- Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.
- If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method and reported.

5.3 Typical Test Setup



**Figure D.8 – Example measurement arrangement for table-top EUT
(Radiated emission measurement)**

5.4 Measurement Equipment

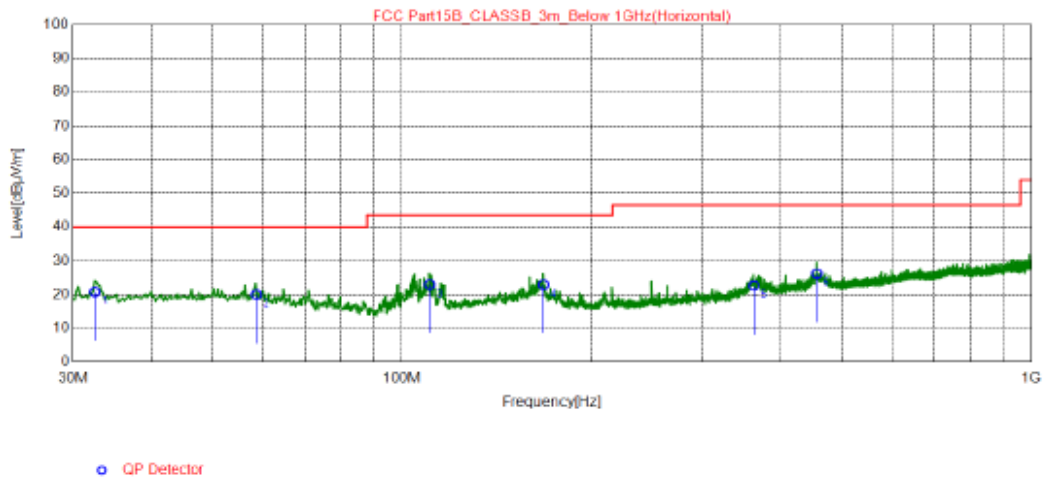
DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
EMI Test Spectrum ROHDE & SCHWARZ	ESR7	E1R1005	Dec.01, 2020
Spectrum Analyzer Keysight	N9030B	E1S1003	Jul.22, 2020
Broad-Band Antenna Schwarzbeck	VULB9168	E1A1012	Aug.25, 2020
Double Riaged Vroadband Horn Antenna Schwarzbeck	BBHA9120D	E1A1017	Jan.26, 2020
Preamplifier Agilent	8447D	E1A2001	Oct.13, 2020
Preamplifier Agilent	EMC051845SE	E1A2009	Jul.18, 2020



5.5 Test Result and Data (30MHz ~ 1GHz)

Position: Horizontal

Test Graph



NO.	Freq. [MHz]	QP Reading [dB μV/m]	Factor [dB]	QP Value [dB μV/m]	QP Limit [dB μV/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity
1	32.52	31.17	-10.39	20.78	40.00	19.22	200	108	Horizontal
2	58.71	30.41	-10.44	19.97	40.00	20.03	200	138	Horizontal
3	110.7	35.03	-12.06	22.97	43.50	20.53	200	68	Horizontal
4	167.9	32.17	-9.27	22.90	43.50	20.60	200	120	Horizontal
5	362.1	31.02	-8.42	22.60	46.50	23.90	200	92	Horizontal
6	456.0	32.83	-6.61	26.22	46.50	20.28	200	234	Horizontal

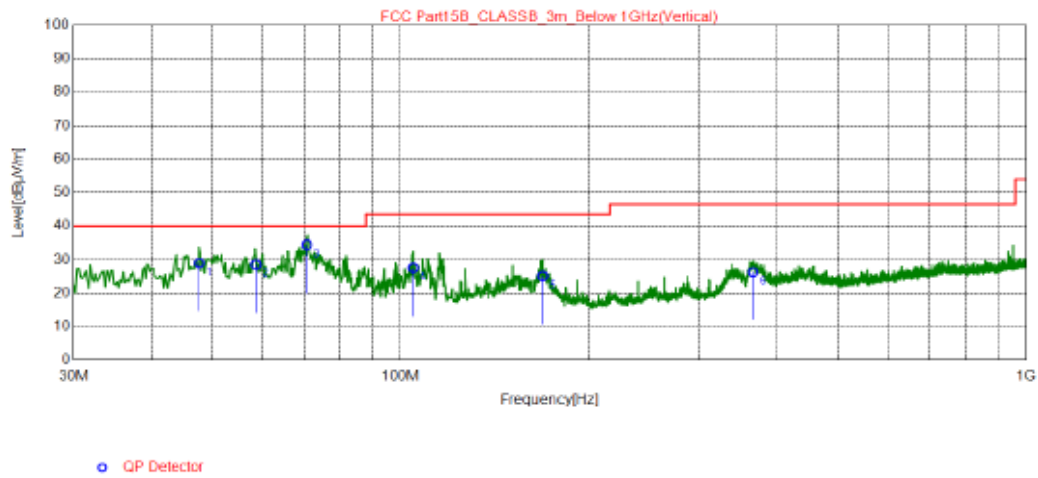
REMARKS:

1. Q.P. is abbreviation of quasi-peak individually.
2. The emission levels of other frequencies were very low against the limit.
3. QP Margin value = QP Limit value – QP value.
4. Factor = Antenna Factor + Amplifier Factor + Cable loss.
5. QP value = Factor + Reading Value.



Position: Vertical

Test Graph



NO.	Freq. [MHz]	QP Reading [dB μV/m]	Factor [dB]	QP Value [dB μV/m]	QP Limit [dB μV/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity
1	47.65	38.62	-9.64	28.98	40.00	11.02	100	242	Vertical
2	58.71	38.96	-10.44	28.52	40.00	11.48	100	360	Vertical
3	70.82	46.64	-12.24	34.40	40.00	5.60	101.6	191.4	Vertical
4	104.6	40.35	-12.82	27.53	43.50	15.97	100	74	Vertical
5	168.7	34.37	-9.31	25.06	43.50	18.44	100	53	Vertical
6	365.8	34.6	-8.30	26.30	46.50	20.20	100	83	Vertical

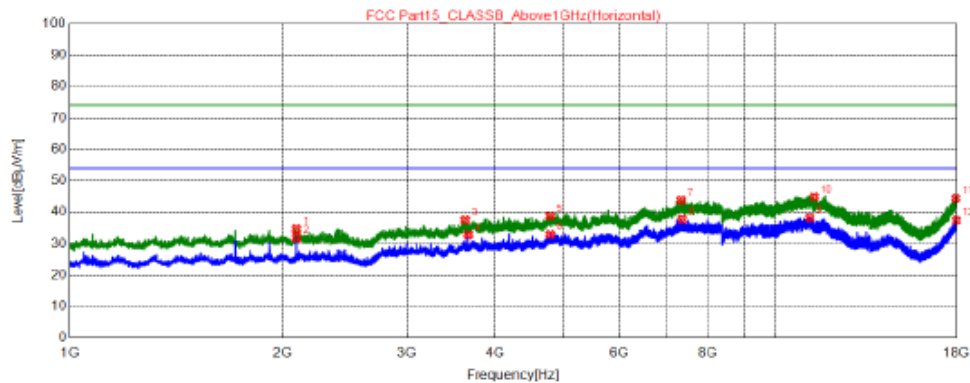
REMARKS:

1. Q.P. is abbreviation of quasi-peak individually.
2. The emission levels of other frequencies were very low against the limit.
3. QP Margin value = QP Limit value – QP value
4. Factor = Antenna Factor + Amplifier Factor + Cable loss
5. QP value = Factor + Reading Value.



5.6 Test Result and Data (1GHz ~ 18GHz)

Position: Horizontal



★ AV Detector

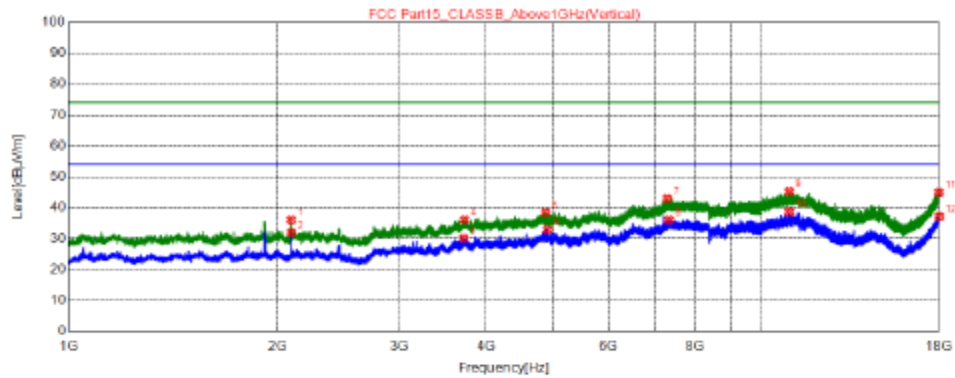
NO.	Freq. [MHz]	Reading [dBuV/m]	Level [dBuV/m]	Limit [dBuV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	Detector
1	2093.9500	51.21	34.62	74.00	39.38	100	185	Horizontal	PK
2	2094.8000	48.46	31.87	54.00	22.13	100	122	Horizontal	AV
3	3629.9000	49.84	37.43	74.00	36.57	100	311	Horizontal	PK
4	3665.6000	45.19	32.86	54.00	21.14	100	153	Horizontal	AV
5	4790.1500	48.26	38.80	74.00	35.20	100	58	Horizontal	PK
6	4791.0000	42.39	32.93	54.00	21.07	100	216	Horizontal	AV
7	7331.6500	48.17	43.82	74.00	30.18	100	58	Horizontal	PK
8	7358.8500	41.96	37.70	54.00	16.30	100	216	Horizontal	AV
9	11158.3500	36.63	38.24	54.00	15.76	100	58	Horizontal	AV
10	11320.7000	43.21	44.88	74.00	29.12	100	58	Horizontal	PK
11	17961.7500	32.83	44.45	74.00	29.55	100	280	Horizontal	PK
12	17992.3500	25.47	37.35	54.00	16.65	100	216	Horizontal	AV

REMARKS:

1. The emission levels of other frequencies were very low against the limit.
2. Margin = Limit –Level



Position: Vertical



★ AV Detector

NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	Detector
1	2093.9500	52.67	36.08	74.00	37.92	100	176	Vertical	PK
2	2094.8000	48.57	31.98	54.00	22.02	100	176	Vertical	AV
3	3713.2000	42.37	30.15	54.00	23.85	100	176	Vertical	AV
4	3722.5500	48.35	36.16	74.00	37.84	100	272	Vertical	PK
5	4870.9000	47.79	38.46	74.00	35.54	100	176	Vertical	PK
6	4900.6500	42.21	32.92	54.00	21.08	100	176	Vertical	AV
7	7295.9500	47.41	42.96	74.00	31.04	100	80	Vertical	PK
8	7335.9000	40.40	36.07	54.00	17.93	100	144	Vertical	AV
9	10940.7500	44.05	45.29	74.00	28.71	100	272	Vertical	PK
10	10941.6000	37.42	38.66	54.00	15.34	100	272	Vertical	AV
11	17973.6500	33.26	44.98	74.00	29.02	100	80	Vertical	PK
12	17999.1500	25.27	37.21	54.00	16.79	100	80	Vertical	AV

REMARKS:

1. The emission levels of other frequencies were very low against the limit.
2. Margin = Limit – Level

5.7 Test Photographs (30MHz ~ 1000MHz)





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5.8 Test Photographs (1000MHz ~ 18000MHz)



6 Photographs of EUT





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--- END ---