

TEST REPORT

CERTIFICATE OF CONFORMITY

Standards: 47 CFR FCC Part 15, Subpart B, Class B
ANSI C63.4-2014

Report No.: FDBHCP-WTW-P22040326-1

FCC ID: ACJ932AT2202

Model No: AT2202

Received Date: May 03, 2022

Test Date: May 05 ~ May 07, 2022

Issued Date: Jun. 15, 2022

Applicant: Panasonic Corporation of North America

Address: Two Riverfront Plaza, 9th Floor Newark New Jersey United States 07102-5490

Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Lin Kou Laboratories

Lab Address: No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan

Test Location: No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, TAIWAN

FCC Registration /
Designation Number: 328930 / TW1050

Approved by :



Date: Jun. 15, 2022

Ace Wu / Project Engineer

This test report consists of 30 pages in total. It may be duplicated completely for legal use with the approval of the applicant. It should not be reproduced except in full, without the written approval of our laboratory. The test results in the report only apply to the tested sample. The test results in this report are traceable to the national or international standards.



Prepared by : Gina Liu / Specialist

This report is for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence, provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents. Unless specific mention, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification.

Table of Contents

Release Control Record	3
1 Certification	4
2 Summary of Test Results	5
2.1 Measurement Uncertainty	5
2.2 Modification Record.....	5
3 General Information.....	6
3.1 Description of EUT	6
3.2 Primary Clock Frequencies of Internal Source	6
3.3 Features of EUT	6
3.4 Operating Modes of EUT and Determination of Worst Case Operating Mode	6
3.5 Test Program Used and Operation Descriptions.....	7
3.6 Connection Diagram of EUT and Peripheral Devices	8
3.7 Configuration of Peripheral Devices and Cable Connections	9
4 Test Instruments	10
4.1 Radiated Emissions up to 1 GHz	10
4.2 Radiated Emissions above 1 GHz	11
4.3 Antenna-conducted Power Measurement.....	12
5 Limits of Emission	13
5.1 Radiated Emissions up to 1 GHz	13
5.2 Radiated Emissions above 1 GHz	14
5.3 Antenna-conducted Power Measurement.....	14
6 Test Arrangement.....	15
6.1 Radiated Emissions up to 1 GHz	15
6.2 Radiated Emissions above 1 GHz	16
6.3 Antenna-conducted Power Measurement.....	17
7 Test Results of Emission	18
7.1 Radiated Emissions up to 1 GHz	18
7.2 Radiated Emissions above 1 GHz	22
7.3 Antenna-conducted Power Measurement.....	26
8 Pictures of Test Arrangements	29
9 Information of the Testing Laboratories	30

Release Control Record

Issue No.	Description	Date Issued
FDBHCP-WTW-P22040326-1	Original release.	Jun. 15, 2022

1 Certification

Product: Display Audio

Brand: Panasonic or Panasonic Automotive Systems Asia Pacific.,Ltd.

Test Model: AT2202

Sample Status: Engineering Sample

Applicant: Panasonic Corporation of North America

Test Date: May 05 ~ May 07, 2022

Standards: 47 CFR FCC Part 15, Subpart B, Class B
ANSI C63.4-2014

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

2 Summary of Test Results

The test items that the EUT needs to perform according to its interfaces and functions evaluation are as follows:

FCC Part 15 Clause	Test Item	Result/Remarks	Verdict
15.109	Radiated Emissions up to 1 GHz	Minimum passing Class B margin is -4.25 dB at 44.65 MHz	Pass
	Radiated Emissions above 1 GHz	Minimum passing Class B margin is -8.49 dB at 3514.01 MHz	Pass
15.111	Antenna-Conducted Power Test (30MHz ~ 960MHz)	Minimum passing Class B margin is -13.63 dB at 944.500 MHz	Pass

Note: Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Expanded Uncertainty (k=2) ($\pm$)
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	4.14 dB
Radiated Emissions above 1 GHz	Above 1GHz	5.04 dB
Antenna-conducted Power Measurement	30MHz ~ 960MHz	5.57 dB

The other instruments specified are routine verified to remain within the calibrated levels, no measurement uncertainty is required to be calculated.

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 Description of EUT

Product	Display Audio
Brand	Panasonic or Panasonic Automotive Systems Asia Pacific.,Ltd.
Test Model	AT2202
Sample Status	Engineering Sample
Operating Software	N/A
Equipment Radio Type	Receiver
FM Frequency Band	87.5-108.0 MHz (50/100 kHz step) or 87.5-108.0 MHz (100 kHz step) or 76.0-108.0 MHz (100 kHz step)
Power Supply Rating	12 Vdc (Battery)
Accessory Device	N/A
Data Cable Supplied	N/A

3.2 Primary Clock Frequencies of Internal Source

The highest frequency generated or used within the EUT or on which the EUT operates or tunes is 5875 MHz provided by Panasonic Corporation of North America, for detailed internal source, please refer to the manufacturer's specifications.

3.3 Features of EUT

The tests reported herein were performed according to the method specified by Panasonic Corporation of North America, for detailed feature description, please refer to the manufacturer's specifications or user's manual.

3.4 Operating Modes of EUT and Determination of Worst Case Operating Mode

The EUT is designed with DC power.

For radiated emission test, the EUT has been pre-tested under following test modes, and test mode 1, 6 were the worst cases for final test.

Mode	Test Condition
1	Play Video from USB Flash + WLAN 2.4G Link + EUT with Speaker + Antenna + GPS Antenna + USB with Flash + Type C with Flash + AV out with Monitor + 12 Vdc
2	Play Video from Type C Flash + WLAN 5G B4 Link + EUT with Speaker + Antenna + GPS Antenna + USB with Flash + Type C with Flash + AV out with Monitor + 12 Vdc
3	Play Music from BT + WLAN 2.4G Link + BT Link + NFC Link + EUT with Speaker + Antenna + GPS Antenna + USB with Flash + Type C with Flash + AV out with Monitor(Load) + 12 Vdc
4	Camera preview + WLAN 2.4G Link + EUT with Speaker + Antenna + GPS Antenna + USB with Flash + Type C with Flash + AV out with Monitor(Load) + 12 Vdc
5	FM 88MHz + EUT with Speaker + Antenna + GPS Antenna + USB with Flash + Type C with Flash + AV out with Monitor(Load) + 12 Vdc
6	FM 98MHz + EUT with Speaker + Antenna + GPS Antenna + USB with Flash + Type C with Flash + AV out with Monitor(Load) + 12 Vdc
7	FM 108MHz + EUT with Speaker + Antenna + GPS Antenna + USB with Flash + Type C with Flash

	+ AV out with Monitor(Load) + 12 Vdc
--	--------------------------------------

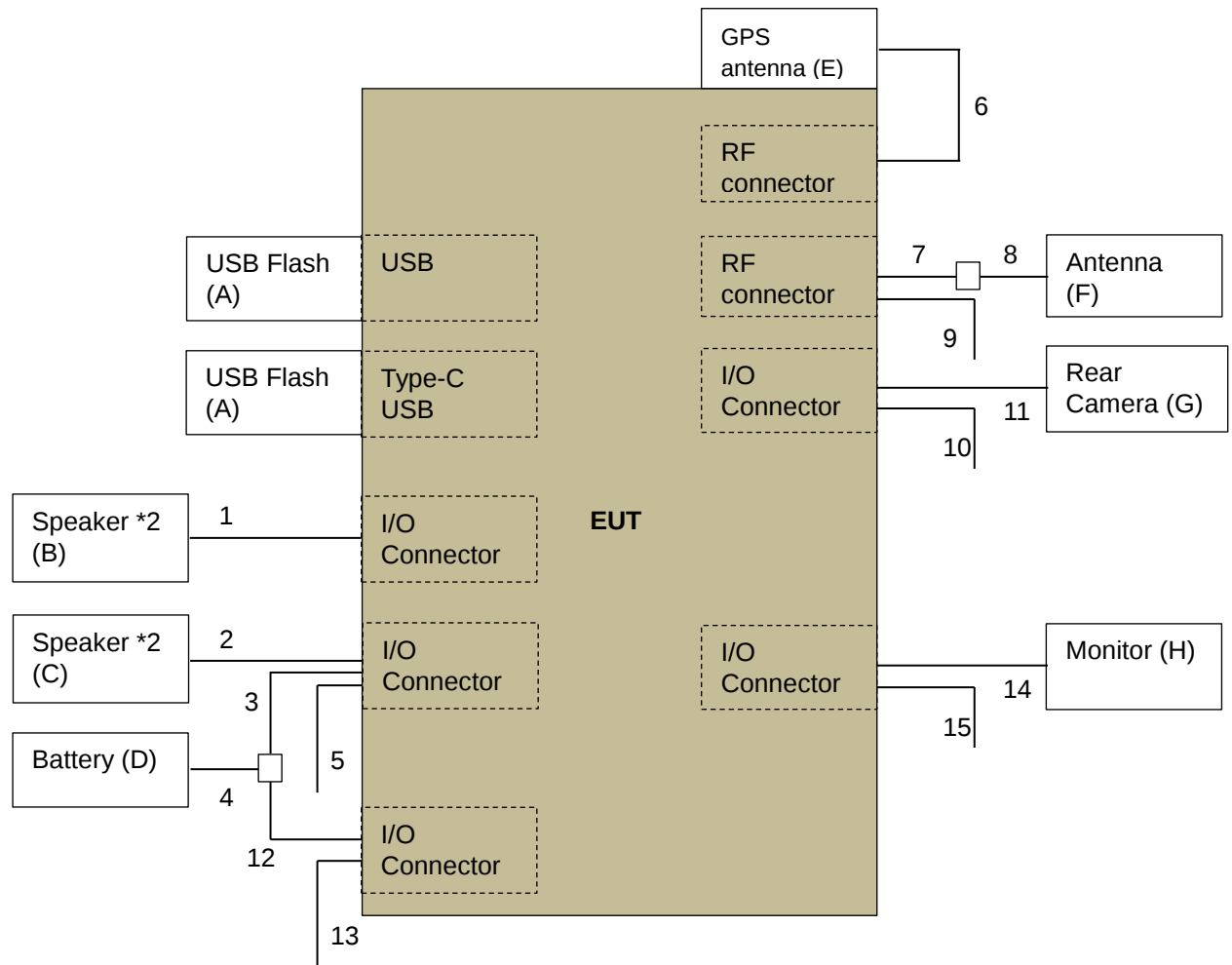
Test modes are presented in the report as below.

Mode	Test Condition
Radiated emission up to 1GHz test	
A	Play Video from USB Flash + WLAN 2.4G Link + EUT with Speaker + Antenna + GPS Antenna + USB with Flash + Type C with Flash + AV out with Monitor + 12 Vdc
B	FM 98MHz + EUT with Speaker + Antenna + GPS Antenna + USB with Flash + Type C with Flash + AV out with Monitor(Load) + 12 Vdc
Radiated emission above 1GHz test	
-	Play Video from USB Flash + WLAN 2.4G Link + EUT with Speaker + Antenna + GPS Antenna + USB with Flash + Type C with Flash + AV out with Monitor + 12 Vdc
Antenna-conducted power measurement test	
A	FM 88MHz + EUT with Speaker + Antenna + GPS Antenna + 12 Vdc
B	FM 98MHz + EUT with Speaker + Antenna + GPS Antenna + 12 Vdc
C	FM 108MHz + EUT with Speaker + Antenna + GPS Antenna + 12 Vdc

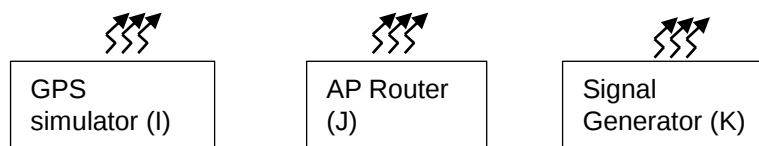
3.5 Test Program Used and Operation Descriptions

- Turned on the power of all equipment.
- The volume control was adjusted to be 1/8 of the rated audio output power.
- Pattern Generator sent FM signal to EUT and EUT played audio signal to speaker for FM radio mode
- EUT read mpeg files from USB Flash and EUT played video/audio signal on internal display and monitor
- EUT sent and received messages to/from AP Router (kept in a remote area) via wireless transmission.
- EUT received messages from GPS simulator (kept in a remote area) via wireless transmission.

3.6 Connection Diagram of EUT and Peripheral Devices



Remote Site



3.7 Configuration of Peripheral Devices and Cable Connections

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	USB Flash*2	HP	X5000m	NA	NA	--
B.	Speaker		JC125-025	NA	NA	--
C.	Speaker	Logitech	THX	NA	NA	--
D.	Battery	SMF	NX120-7L	NA	NA	--
E.	GPS antenna	NA	NA	NA	NA	Supplied by applicant
F.	Antenna	NA	NA	NA	NA	
G.	Rear Camera	NA	NA	NA	NA	Supplied by applicant
H.	MONITOR	DELL	U2410	CN-0J257M-72872-0A6-02YL	DoC	
I.	GPS simulator	PENDULUM	GSG-54	191121	NA	
J.	AP Router	D-LINK	DIR826L	QBQ91C9000007	NA	
K.	Signal Generator	R&S	SMJ100A	101943	NA	

Note:

1. All power cords of the above support units are non-shielded (1.8m).
2. Items I-K acted as communication partners to transfer data.

ID	Cable Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	I/O Cable	2	1.5	No	0	Supplied by applicant
2.	I/O Cable	4	1	No	0	Supplied by applicant
3.	DC Cable	1	1	No	0	Supplied by applicant
4.	DC Cable	1	0.8	No	0	-
5.	I/O Cable	1	2	No	0	Supplied by applicant
6.	RF cable	1	0.05	Yes	0	Supplied by applicant
7.	RF cable	1	0.3	Yes	0	Supplied by applicant
8.	RF cable	1	2	Yes	0	-
9.	I/O Cable	1	2	No	0	Supplied by applicant
10.	I/O Cable	1	2	No	0	Supplied by applicant
11.	I/O Cable	1	1.5	No	0	Supplied by applicant
12.	I/O Cable	1	1.5	No	0	Supplied by applicant
13.	I/O Cable	1	1.5	No	0	Supplied by applicant
14.	AV Cable	1	2	No	0	Supplied by applicant
15.	I/O Cable	1	2	No	0	Supplied by applicant

4 Test Instruments

The calibration interval of the all test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.1 Radiated Emissions up to 1 GHz

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ (Below 1GHz)	ESCI	100424	Dec. 30, 2021	Dec. 29, 2022
Spectrum Analyzer Agilent	E4446A	MY51100039	Dec. 07, 2021	Dec. 06, 2022
BILOG Antenna SCHWARZBECK	VULB9168	9168-149	Oct. 29, 2021	Oct. 28, 2022
RF signal cable (with 5dB PAD) Times	LMR-400 (18M)	CABLE-CH2-01	Jan. 15, 2022	Jan. 14, 2023
Preamplifier Agilent (Below 1GHz)	8447D	2944A10629	Mar. 19, 2022	Mar. 18, 2023
Software BV ADT	BV ADT_Radiated_ V8.7.08	NA	NA	NA
Antenna Tower BV ADT	AT100	AT93021702	NA	NA
Turn Table BV ADT	TT100	TT93021702	NA	NA
Controller BV ADT	SC100	SC93021702	NA	NA

Note: 1. The test was performed in HwaYa Chamber 2 (966 Chamber 1).
 2. The VCCI Site Registration No. is R-20018.
 3. Tested Date: 2022/05/05

4.2 Radiated Emissions above 1 GHz

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Spectrum Analyzer Agilent	E4446A	MY51100039	Dec. 07, 2021	Dec. 06, 2022
PXA S Analyzer KEYSIGHT	N9030B	MY57141885	Jun. 07, 2021	Jun. 06, 2022
BILOG Antenna SCHWARZBECK	VULB9168	9168-149	Oct. 29, 2021	Oct. 28, 2022
RF signal cable (with 5dB PAD) Times	LMR-400 (18M)	CABLE-CH2-01	Jan. 15, 2022	Jan. 14, 2023
HORN Antenna (with 4dB PAD) SCHWARZBECK	BBHA 9120 D	9120D-405	Nov. 14, 2021	Nov. 13, 2022
Pre-Amplifier Agilent (Above 1GHz)	8449B	3008A01961	Sep. 04, 2021	Sep. 03, 2022
Software BV ADT	BV ADT_Radiated_ V8.7.08	NA	NA	NA
Antenna Tower BV ADT	AT100	AT93021702	NA	NA
Turn Table BV ADT	TT100	TT93021702	NA	NA
Controller BV ADT	SC100	SC93021702	NA	NA
BandPass Filter (2.4G) MICRO-TRONICS	BRM17690-01	003	Sep. 04, 2021	Sep. 03, 2022
BandPass Filter (5G) MICRO-TRONICS	BRM50716-01	G011	Sep. 04, 2021	Sep. 03, 2022
RF Coaxial Cable EMCI	EMC102-KM-KM-1000	170820	Jan. 15, 2022	Jan. 14, 2023
RF Coaxial Cable Rosnol	K1K50-UP0279- K1K50-3000	181129-2	Jan. 15, 2022	Jan. 14, 2023
RF Coaxial Cable JUNFLON+EMC	JUNFLON+EMC104- SM-SM-6000	Cable-CH2- 02(MWX3221308 G003+130710)	Jan. 15, 2022	Jan. 14, 2023
Fix tool for Boresight antenna	BAF-01	2	NA	NA
Pre-amplifier (18GHz-40GHz) EMC	EMC184045B	980175	Sep. 04, 2021	Sep. 03, 2022
HORN Antenna (with 3dB PAD) SCHWARZBECK	BBHA 9170	148	Nov. 14, 2021	Nov. 13, 2022

Note: 1. The test was performed in HwaYa Chamber 2 (966 Chamber 1).
2. The VCCI Site Registration No. is G-10018.
3. Tested Date: 2022/05/05

4.3 Antenna-conducted Power Measurement

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver R&S	ESR3	102412	Jan. 22, 2022	Jan. 21, 2023
Matching Pad EMCI	EMCI-3PDSM75BF	N/A	Dec. 20, 2021	Dec. 19, 2022
Pre_Amplifier HP	8447D	2944A08118	Feb. 16, 2022	Feb. 15, 2023
RF Coaxial Cable Wonpro	5D-FB	FCC-APC-01	Dec. 07, 2021	Dec. 06, 2022
Software BVADT	Radiated_V8.7.08	NA	NA	NA

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Linkou 966 Chamber 2 (CH 7).
3. Tested Date: 2022/05/07.

5 Limits of Emission

5.1 Radiated Emissions up to 1 GHz

Radiated Emissions Limits at 10 meters (dBμV/m)				
Frequencies (MHz)	FCC Part 15B, Class A	FCC Part 15B, Class B	CISPR 22, Class A	CISPR 22, Class B
30-88	39	29.5	40	30
88-216	43.5	33.1		
216-230	46.4	35.6		
230-960			47	37
960-1000	49.5	43.5		

Radiated Emissions Limits at 3 meters (dBμV/m)				
Frequencies (MHz)	FCC Part 15B, Class A	FCC Part 15B, Class B	CISPR 22, Class A	CISPR 22, Class B
30-88	49.5	40	50.5	40.5
88-216	54	43.5		
216-230	56.9	46		
230-960			57.5	47.5
960-1000	60	54		

Notes:

1. The lower limit shall apply at the transition frequencies.

5.2 Radiated Emissions above 1 GHz

Frequency Range (For unintentional radiators)

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	5th harmonic of the highest frequency or 40GHz, whichever is lower

Radiated Emissions Limits at 3 meters (dB μ V/m)		
Frequency range	Class A	Class B
Above 1GHz	Avg: 60 Peak: 80	Avg: 54 Peak: 74

Notes:

1. These limit levels apply for a measurement distance of 3 m. If using a different measurement distance, the measured levels shall be extrapolated to the 3 m limit distance using a factor of 20 dB per decade of distance. The measurement distance shall place the measurement antenna in the far field of the ITE or digital apparatus under test.

Radiated Emissions Limits at 1.5 meters (dB μ V/m)		
Frequencies (MHz)	FCC 15B / ICES-003, Class A	FCC 15B / ICES-003, Class B
Above 18000	Avg: 66 Peak: 86	Avg: 60 Peak: 80

Note: Limit@1.5m = Limit@3m + 20log(3/1.5)

5.3 Antenna-conducted Power Measurement

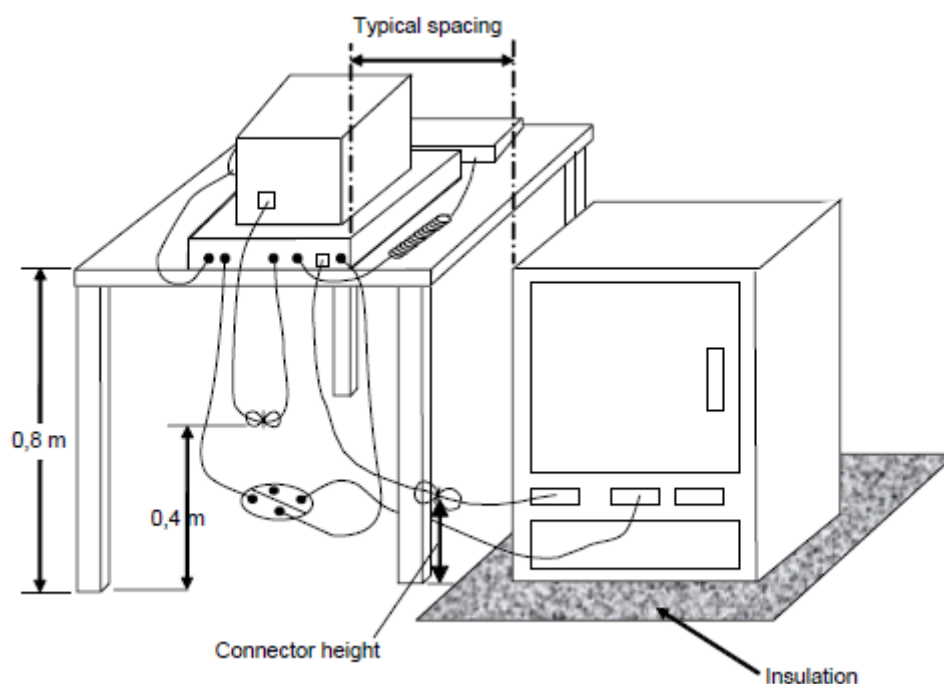
Frequency (MHz)	Limits	
	(nW $\rightarrow$ dBuV)	
30 – 960	2 nW	51.81 dBuV

6 Test Arrangement

6.1 Radiated Emissions up to 1 GHz

- For the table-top EUT is placed on a 0.8 meter to the top of rotating table; for the the floor standing EUT shall be insulated (by insulation of 12 mm) from the horizontal reference ground plane. The rotating table is rotated 360 degrees to determine the position of the highest radiation. If the equipment requires a dedicated ground connection, this shall be provided and bonded to the RGP.
- The EUT was set 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is up to 1 GHz.

Note: The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for quasi-peak detection (QP) at frequency up to 1GHz.

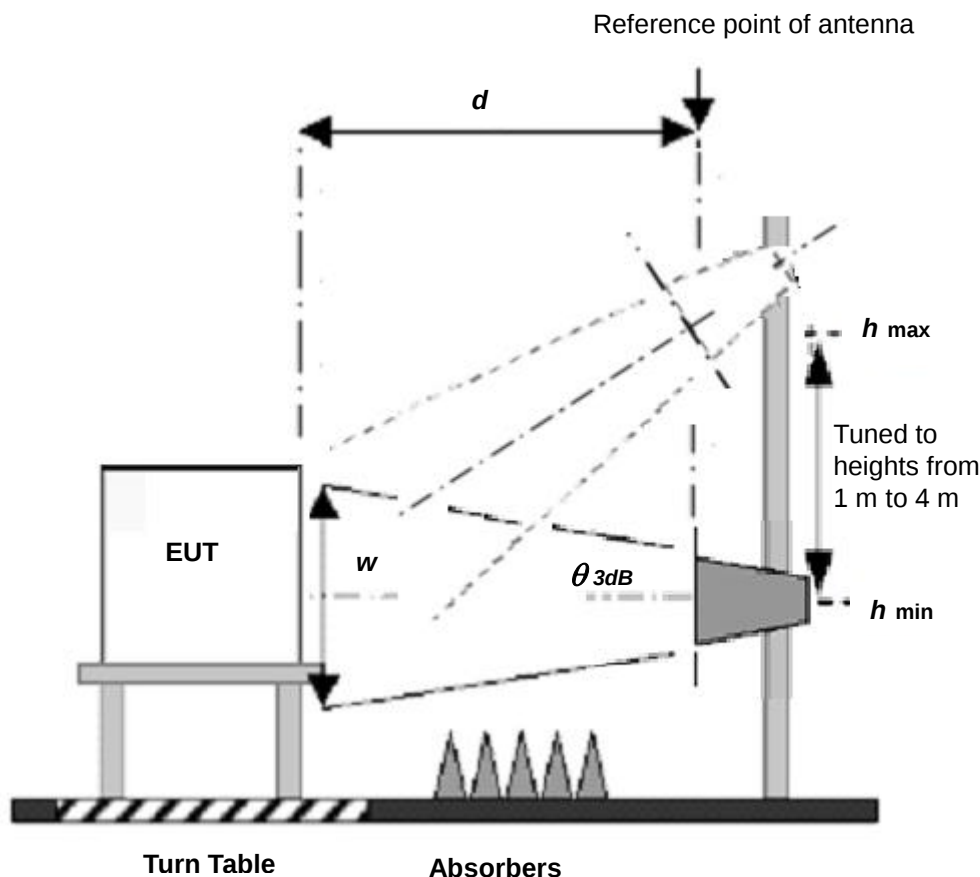


For the actual test configuration, please refer to the related Item – Photographs of the Test Configuration.

6.2 Radiated Emissions above 1 GHz

- For the table-top EUT is placed on a 0.8 meter to the top of rotating table. The rotating table is rotated 360 degrees to determine the position of the highest radiation. If the equipment requires a dedicated ground connection, this shall be provided and bonded to the RGP.
- The EUT was set $d = 3$ meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The height of antenna can be varied from one meter to four meters, the height of adjustment depends on the EUT height and the antenna 3dB beamwidth both, to detect the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The spectrum analyzer system was set to peak and average detects function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz.

Note: The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection (PK) at frequency above 1GHz. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz for Average detection (AV) at frequency above 1GHz.



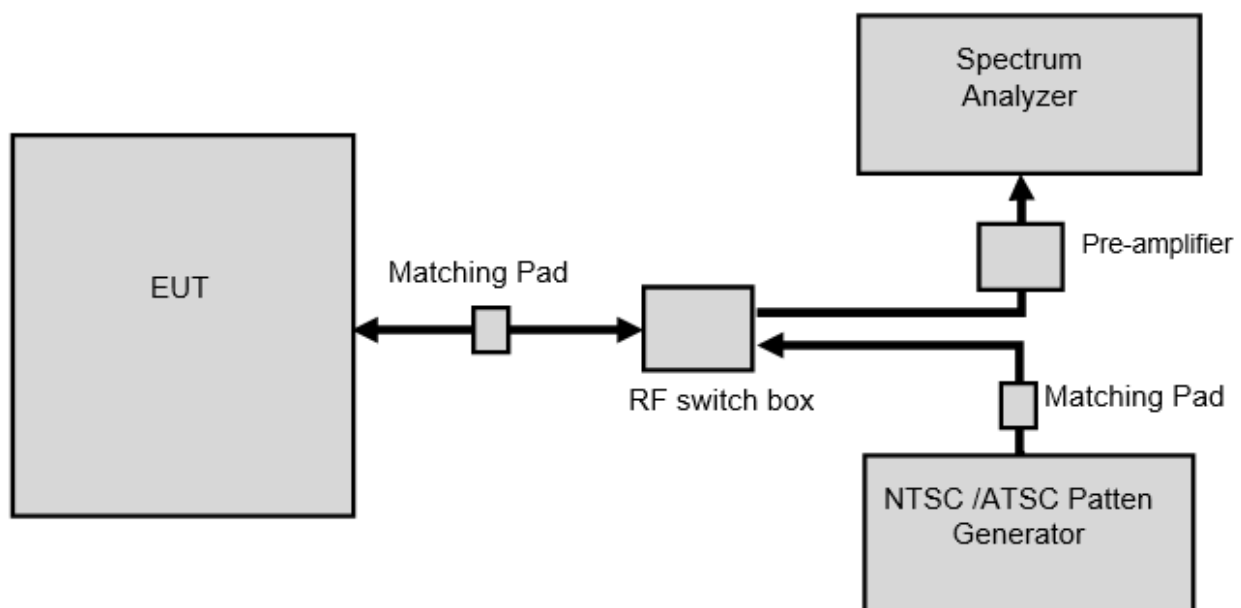
For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

6.3 Antenna-conducted Power Measurement

- The antenna terminals of the EUT and the auxiliary signal generator(NTSC/ATSC) are connected to the measuring receiver by means of coaxial cables.
- RF switch box shall be switched to auxiliary signal generator side.
- The output level of the auxiliary signal generator would be set to give 70dB (μV) at the antenna input of the EUT on 75Ω impedance. (For Analog signal in)
- The output level of the auxiliary signal generator would be set to give VHF 50 dB (μV) and UHF 54 dB (μV) at the antenna input of the EUT on 75Ω impedance. (For Digital signal in)
- RF switch box shall be switched to spectrum analyzer side.
- The measuring receiver is tuned to the test frequency and the disturbance level is measured, taking into account the attenuation between the receiver antenna terminal and the measuring receiver input.
- The test shall then be repeated with EUT switched off, to check that the measured disturbance voltage is not due to the auxiliary generator.
- In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed on antenna input terminal emission measurement.
- Conducted emissions were investigated over the frequency range from 30MHz to 960MHz using a receiver bandwidth of 120kHz.

Note:

- Emission level = Reading + Correction Factor
- Correction factor = Insertion loss + Cable loss – amplifier gain.
- Margin value = Emission level – Limit value.



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

7 Test Results of Emission

7.1 Radiated Emissions up to 1 GHz

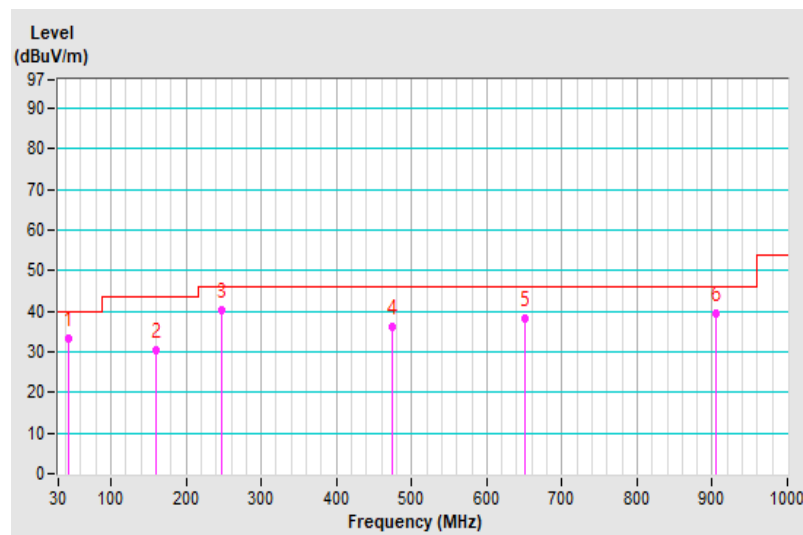
Mode A

Frequency Range	30 MHz ~ 1 GHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP), 120 kHz
Tested By	Mick Chou	Environmental Conditions	23°C, 69% RH

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	44.36	33.35 QP	40.00	-6.65	1.00 H	360	42.28	-8.93
2	159.89	30.51 QP	43.50	-12.99	2.00 H	56	38.93	-8.42
3	246.61	40.22 QP	46.00	-5.78	1.50 H	112	49.28	-9.06
4	474.14	36.19 QP	46.00	-9.81	2.00 H	186	39.65	-3.46
5	651.12	38.33 QP	46.00	-7.67	1.50 H	97	37.88	0.45
6	904.01	39.58 QP	46.00	-6.42	4.00 H	3	34.85	4.73

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
– Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value

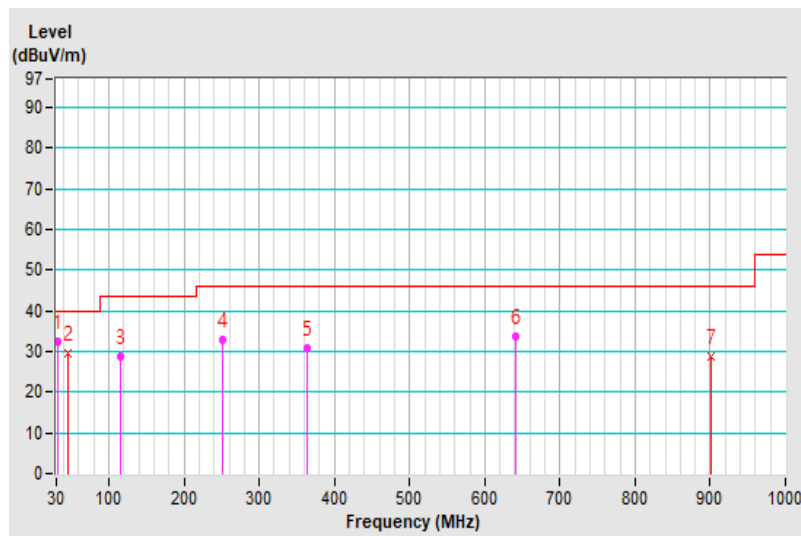


Frequency Range	30 MHz ~ 1 GHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP), 120 kHz
Tested By	Mick Chou	Environmental Conditions	23°C, 69% RH

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	32.28	32.48 QP	40.00	-7.52	2.00 V	360	42.85	-10.37
2	44.84	29.63 QP	40.00	-10.37	1.00 V	51	38.48	-8.85
3	114.98	28.67 QP	43.50	-14.83	2.00 V	320	39.88	-11.21
4	251.46	32.70 QP	46.00	-13.30	2.00 V	180	41.57	-8.87
5	362.82	30.84 QP	46.00	-15.16	1.50 V	177	36.75	-5.91
6	641.28	33.68 QP	46.00	-12.32	1.50 V	137	33.20	0.48
7	901.93	28.80 QP	46.00	-17.20	1.00 V	360	24.17	4.63

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
– Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value



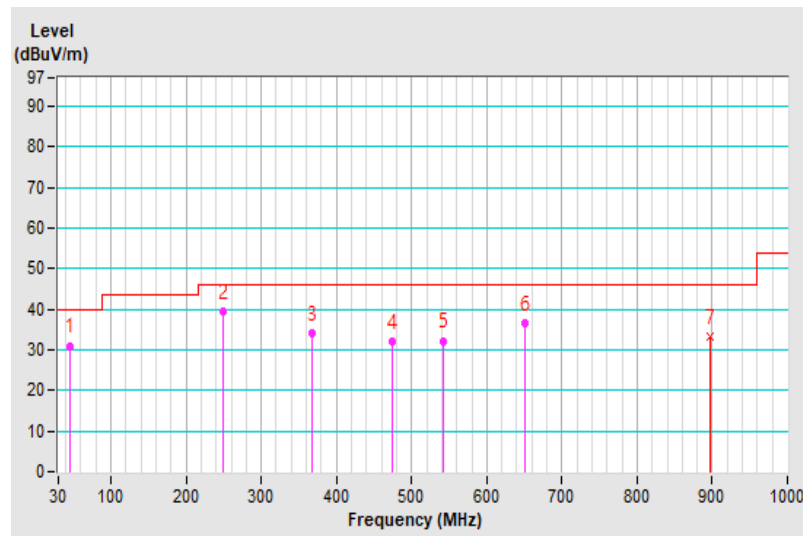
Mode B

Frequency Range	30 MHz ~ 1 GHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP), 120 kHz
Tested By	Mick Chou	Environmental Conditions	23°C, 69% RH

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	44.55	31.01 QP	40.00	-8.99	1.50 H	49	39.91	-8.90
2	249.72	39.26 QP	46.00	-6.74	1.00 H	109	48.20	-8.94
3	367.04	34.19 QP	46.00	-11.81	1.00 H	245	39.92	-5.73
4	474.14	32.05 QP	46.00	-13.95	2.50 H	2	35.51	-3.46
5	541.90	32.22 QP	46.00	-13.78	2.00 H	360	34.53	-2.31
6	650.01	36.44 QP	46.00	-9.56	1.00 H	315	35.99	0.45
7	896.79	33.12 QP	46.00	-12.88	2.48 H	107	28.77	4.35

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
– Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value

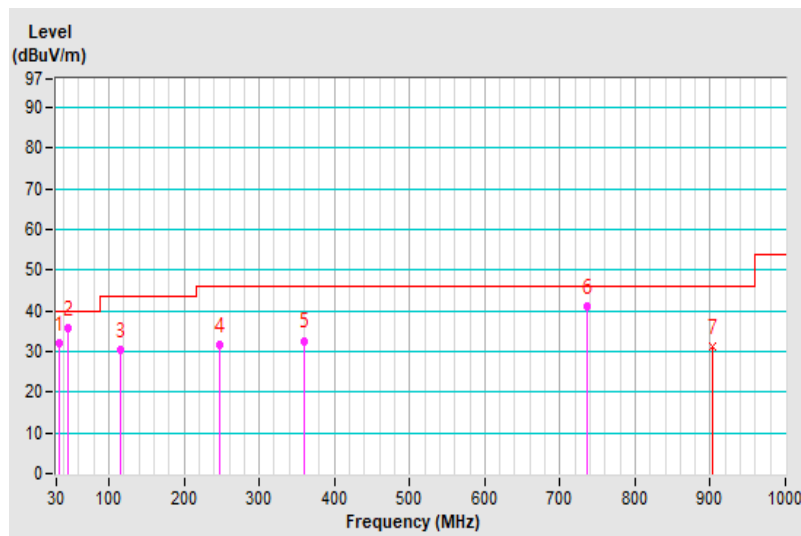


Frequency Range	30 MHz ~ 1 GHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP), 120 kHz
Tested By	Mick Chou	Environmental Conditions	23°C, 69% RH

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	34.12	31.95 QP	40.00	-8.05	1.50 V	2	42.14	-10.19
2	44.65	35.75 QP	40.00	-4.25	2.00 V	360	44.63	-8.88
3	116.14	30.36 QP	43.50	-13.14	1.50 V	2	41.55	-11.19
4	246.37	31.62 QP	46.00	-14.38	2.00 V	179	40.69	-9.07
5	359.04	32.65 QP	46.00	-13.35	1.50 V	180	38.70	-6.05
6	736.92	40.94 QP	46.00	-5.06	4.00 V	330	38.65	2.29
7	903.92	31.24 QP	46.00	-14.76	1.00 V	330	26.51	4.73

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
– Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value



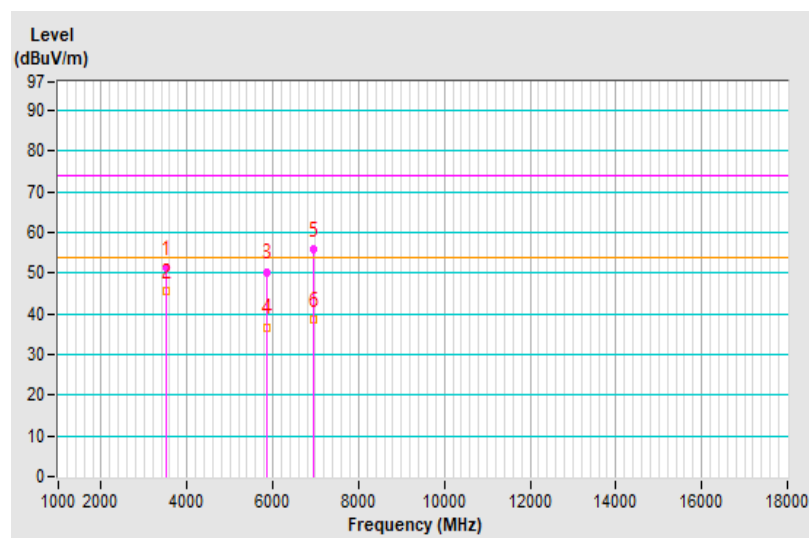
7.2 Radiated Emissions above 1 GHz

Frequency Range	1GHz ~ 18GHz	Detector Function & Resolution Bandwidth	Peak (PK) / Average (AV), 1MHz
Tested By	Jim Lee	Environmental Conditions	23°C, 69% RH

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3514.01	51.34 PK	74.00	-22.66	1.00 H	203	45.60	5.74
2	3514.01	45.51 AV	54.00	-8.49	1.00 H	203	39.77	5.74
3	5852.41	50.29 PK	74.00	-23.71	1.00 H	248	37.91	12.38
4	5852.41	36.75 AV	54.00	-17.25	1.00 H	248	24.37	12.38
5	6956.54	56.02 PK	74.00	-17.98	1.52 H	14	39.04	16.98
6	6956.54	38.64 AV	54.00	-15.36	1.52 H	14	21.66	16.98

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
– Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value

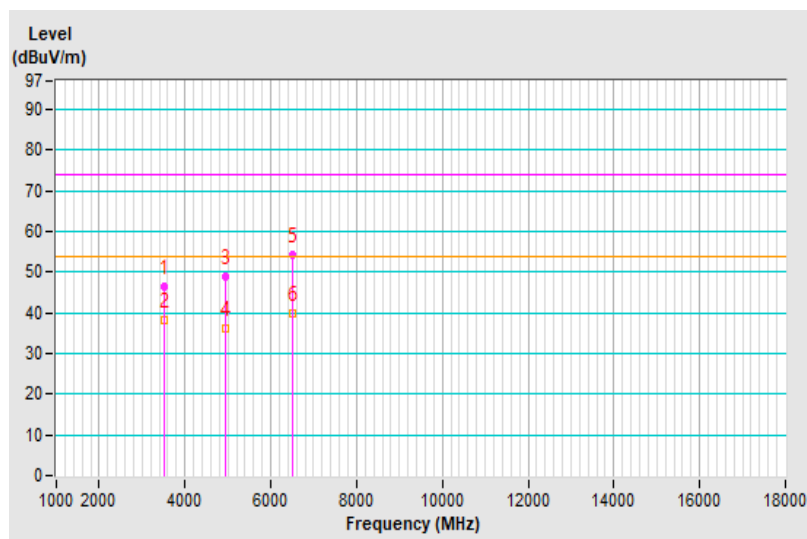


Frequency Range	1GHz ~ 18GHz	Detector Function & Resolution Bandwidth	Peak (PK) / Average (AV), 1MHz
Tested By	Jim Lee	Environmental Conditions	23°C, 69% RH

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	3514.00	46.37 PK	74.00	-27.63	1.52 V	345	40.63	5.74
2	3514.00	38.24 AV	54.00	-15.76	1.52 V	345	32.50	5.74
3	4932.98	48.81 PK	74.00	-25.19	1.00 V	223	39.18	9.63
4	4932.98	36.02 AV	54.00	-17.98	1.00 V	223	26.39	9.63
5	6497.86	54.22 PK	74.00	-19.78	1.75 V	319	39.16	15.06
6	6497.86	39.78 AV	54.00	-14.22	1.75 V	319	24.72	15.06

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
– Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value

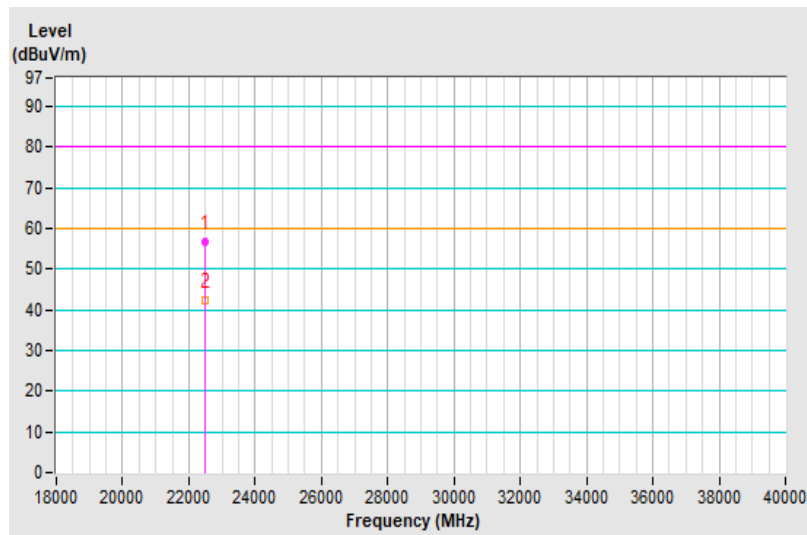


Frequency Range	18GHz ~ 30GHz	Detector Function & Resolution Bandwidth	Peak (PK) / Average (AV), 1MHz
Tested By	Jim Lee	Environmental Conditions	23°C, 69% RH

Antenna Polarity & Test Distance : Horizontal at 1.5 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	22501.53	56.73 PK	80.00	-23.27	1.00 H	360	53.13	3.60
2	22501.53	42.25 AV	60.00	-17.75	1.00 H	360	38.65	3.60

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) – Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value

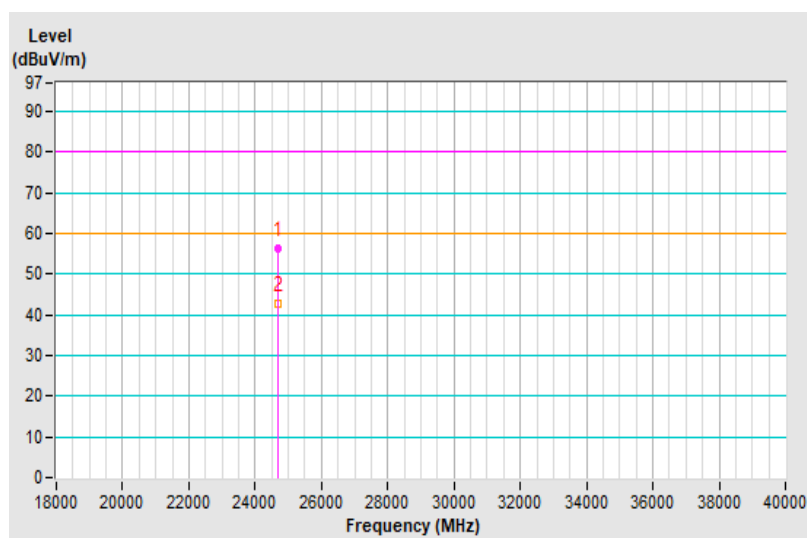


Frequency Range	18GHz ~ 30GHz	Detector Function & Resolution Bandwidth	Peak (PK) / Average (AV), 1MHz
Tested By	Jim Lee	Environmental Conditions	23°C, 69% RH

Antenna Polarity & Test Distance : Vertical at 1.5 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	24706.63	56.20 PK	80.00	-23.80	1.00 V	213	52.58	3.62
2	24706.63	42.68 AV	60.00	-17.32	1.00 V	213	39.06	3.62

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) – Pre-Amplifier Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value



7.3 Antenna-conducted Power Measurement

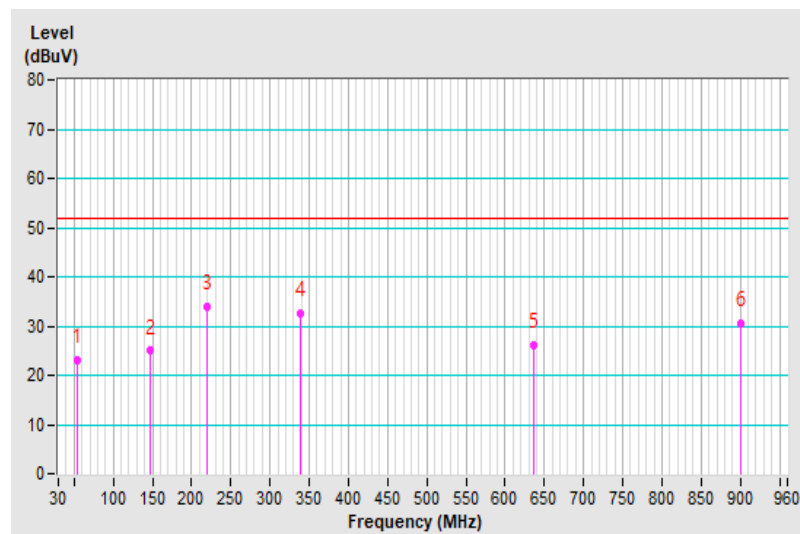
Mode A (FM 88MHz)

Frequency Range	30MHz ~ 960MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP), 120kHz
Tested by	Vincent Lin	Environmental Conditions	25°C, 75%RH

No	Frequency (MHz)	Emission Level (dBuV)	Limit (dBuV)	Margin (dB)	Reading (dBuV)	Correction Factor (dB)
1	53.250	23.20	51.81	-28.61	42.67	-19.47
2	146.250	24.99	51.81	-26.82	43.53	-18.54
3	219.100	33.94	51.81	-17.87	51.51	-17.57
4	338.450	32.55	51.81	-19.26	48.96	-16.41
5	636.050	26.16	51.81	-25.65	41.83	-15.67
6	901.100	30.58	51.81	-21.23	43.29	-12.71

Remarks:

1. Emission Level = Reading + Correction Factor
2. Correction Factor = Insertion loss + Cable loss – amplifier gain.
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value



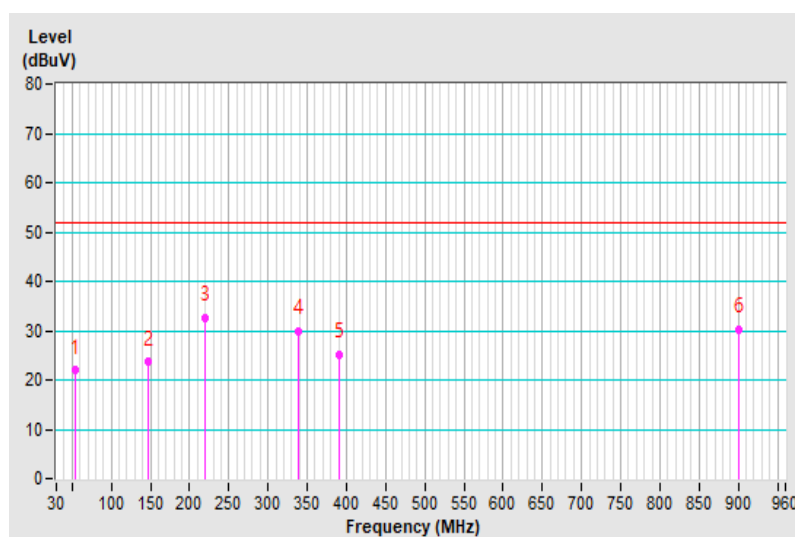
Mode B (FM 98MHz)

Frequency Range	30MHz ~ 960MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP), 120kHz
Tested by	Vincent Lin	Environmental Conditions	25°C, 75%RH

No	Frequency (MHz)	Emission Level (dBuV)	Limit (dBuV)	Margin (dB)	Reading (dBuV)	Correction Factor (dB)
1	53.250	21.93	51.81	-29.88	41.40	-19.47
2	146.250	23.62	51.81	-28.19	42.16	-18.54
3	219.100	32.56	51.81	-19.25	50.13	-17.57
4	338.450	29.91	51.81	-21.90	46.32	-16.41
5	391.150	25.12	51.81	-26.69	41.56	-16.44
6	901.100	30.09	51.81	-21.72	42.80	-12.71

Remarks:

1. Emission Level = Reading + Correction Factor
2. Correction Factor = Insertion loss + Cable loss – amplifier gain.
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value



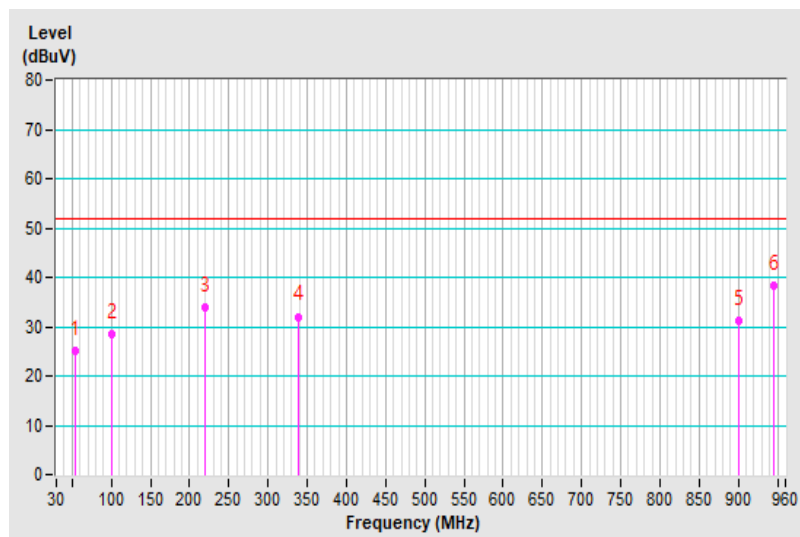
Mode C (FM 108MHz)

Frequency Range	30MHz ~ 960MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP), 120kHz
Tested By	Vincent Lin	Environmental Conditions	25°C, 75%RH

No	Frequency (MHz)	Emission Level (dBuV)	Limit (dBuV)	Margin (dB)	Reading (dBuV)	Correction Factor (dB)
1	53.250	24.96	51.81	-26.85	44.43	-19.47
2	101.300	28.37	51.81	-23.44	47.41	-19.04
3	219.100	33.77	51.81	-18.04	51.34	-17.57
4	338.450	31.85	51.81	-19.96	48.26	-16.41
5	901.100	31.09	51.81	-20.72	43.80	-12.71
6	944.500	38.18	51.81	-13.63	50.24	-12.06

Remarks:

1. Emission Level = Reading + Correction Factor
2. Correction Factor = Insertion loss + Cable loss – amplifier gain.
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value



8 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo).

9 Information of the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

Lin Kou EMC/RF Lab

Tel: 886-2-26052180

Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab

Tel: 886-3-6668565

Fax: 886-3-6668323

Hwa Ya EMC/RF/Safety Lab

Tel: 886-3-3183232

Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com

Web Site: www.bureauveritas-adt.com

The address and road map of all our labs can be found in our web site also.

--- END ---