

TEST REPORT

CERTIFICATE OF CONFORMITY

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

Report No.: FDBGTL-WTW-P22020477 R1

FCC ID: APYHRO00315

Received Date: Feb. 19, 2022

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Issued Date: Jun. 07, 2022

Applicant: SHARP Corporation Mobile Communication BU

Address: 2-13-1 Iida Hachihonmatsu Higashi-hiroshima City, Hiroshima 730-0192, Japan

Manufacturer: Sharp Corporation

Address: 1 Takumi-cho, Sakai-ku, Sakai City, Osaka 590-8522, Japan

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. 07, 2022

Ace Wu / Project Engineer

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Prepared by : Lena Wang / Specialist

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Release Control Record

Issue No.	Description	Date Issued
FDBGTL-WTW-P22020477	Original Release	May 30, 2022
FDBGTL-WTW-P22020477 R1	Revise section 4.3	Jun. 07, 2022

1 Certification

Product: Smart Phone

Brand: SHARP

FCC ID: APYHRO00315

Sample Status: Engineering Sample

Applicant: SHARP Corporation Mobile Communication BU

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

FCC Part 15 Clause	Test Item	Result/Remarks	Verdict
15.107	Conducted Emissions from input power ports	Minimum passing Class B margin is -10.49 dB at 3.71983 MHz	Pass
15.109	Radiated Emissions up to 1 GHz	Minimum passing Class B margin is -2.95 dB at 54.20 MHz	Pass
	Radiated Emissions above 1 GHz	Minimum passing Class B margin is -17.83 dB at 6715.40 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) ($\pm$)
Conducted Emissions from input power ports	150kHz ~ 30MHz	2.79 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	4.14 dB
Radiated Emissions above 1 GHz	Above 1GHz	5.04 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	Smart Phone
Brand	SHARP
FCC ID	APYHRO00315
Sample Status	Engineering Sample
Operating Software	N/A
Power Supply Rating	3.87 Vdc (Battery) 5 Vdc (Adapter)
Accessory Device	N/A
Data Cable Supplied	N/A

Note:

1. All sample are listed as below.

Sample	FCC ID	Memory		RAM		Remark
A	APYHRO00315	1st	I	1st	I	N/A
B				2nd	ii	
C				3rd	iii	

*The EUT is on the Sample A, B, C has been Radiated Emission pre-tested, and Sample B was the worst case for final test.

2. The EUT use following support unit.

Product	Brand	Model	Description
Adapter	Salom	XN-2QC25	I/P: 100-240 Vac, 50/60 Hz, 0.2 A O/P: 5 Vdc, 800 mA
Battery	N/A-	N/A	3.87V ,Rated 4870mAh (18.9Wh) , Typ. 5000mAh(19.4Wh)
Wireless Charge	au	0102PUA	--
USB Cable For Wireless Charge	Maxell Corporation	WP-PD21WH	0.9m with 1core, Shielding cable
Headset	Ambibio	AB-HI02JS	--
USB Cable	Luxshare-ICT	L6KU2007-CS-H	--

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 5850 MHz provided by SHARP Corporation Mobile Communication BU, 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 SHARP Corporation Mobile Communication BU, 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

For conducted emission, EUT has been pre-tested under following test modes, and test mode 25 was the worst case for final test.

Mode	Sample	Test Condition
1	B	GSM 850 Link + BT Link + WLAN 2.4G Link + GPS Rx + NFC Link + Headset + USB Cable + Adapter, 120Vac/60Hz
2	B	WCDMA B2 Link + BT Link + WLAN 5G Link + Front Camera REC + NFC Link + Headset + USB Cable + Adapter, 120Vac/60Hz
3	B	LTE B2 Link + BT Link + WLAN 5G Link + Back Camera REC + NFC Link + Headset + USB Cable + Adapter, 120Vac/60Hz
4	B	LTE B41 Link + BT Link + WLAN 5G Link + Play REC + NFC Link + Headset + USB Cable + Adapter, 120Vac/60Hz
5	B	LTE B5 Idle + BT Link + WLAN 5G Link + NFC Link + Headset + USB Cable + NB Link, 120Vac/60Hz
6	B	WCDMA B2 Link + BT Link + WLAN 5G Link + NFC Link + Headset + Qi Wireless Charger, 120Vac/60Hz
7	B	GSM 850 Rx (Low Channel) + Headset + USB Cable + Adapter, 120Vac/60Hz
8	B	GSM 850 Rx (Middle Channel) + Headset + USB Cable + Adapter, 120Vac/60Hz
9	B	GSM 850 Rx (High Channel) + Headset + USB Cable + Adapter, 120Vac/60Hz
10	B	WCDMA B5 Rx (Low Channel) + Headset + USB Cable + Adapter, 120Vac/60Hz
11	B	WCDMA B5 Rx (Middle Channel) + Headset + USB Cable + Adapter, 120Vac/60Hz
12	B	WCDMA B5 Rx (High Channel) + Headset + USB Cable + Adapter, 120Vac/60Hz
13	B	LTE B5 Rx (Low Channel) + Headset + USB Cable + Adapter, 120Vac/60Hz
14	B	LTE B5 Rx (Middle Channel) + Headset + USB Cable + Adapter, 120Vac/60Hz
15	B	LTE B5 Rx (High Channel) + Headset + USB Cable + Adapter, 120Vac/60Hz
16	B	LTE B12 Rx (Low Channel) + Headset + USB Cable + Adapter, 120Vac/60Hz
17	B	LTE B12 Rx (Middle Channel) + Headset + USB Cable + Adapter, 120Vac/60Hz
18	B	LTE B12 Rx (High Channel) + Headset + USB Cable + Adapter, 120Vac/60Hz
19	B	LTE B13 Rx (Low Channel) + Headset + USB Cable + Adapter, 120Vac/60Hz
20	B	LTE B13 Rx (Middle Channel) + Headset + USB Cable + Adapter, 120Vac/60Hz
21	B	LTE B13 Rx (High Channel) + Headset + USB Cable + Adapter, 120Vac/60Hz
22	B	LTE B17 Rx (Low Channel) + Headset + USB Cable + Adapter, 120Vac/60Hz
23	B	LTE B17 Rx (Middle Channel) + Headset + USB Cable + Adapter, 120Vac/60Hz
24	B	LTE B17 Rx (High Channel) + Headset + USB Cable + Adapter, 120Vac/60Hz
25	B	WCDMA B2 Link + BT Link + WLAN 5G Link + Front Camera REC + NFC Link + Headset + USB Cable + Adapter, 240Vac/60Hz

For radiated emission, EUT has been pre-tested under following test modes, and test mode 3 was the worst case for final test.

Mode	Sample	Test Condition
1	B	GSM 850 Link + BT Link + WLAN 2.4G Link + GPS Rx + NFC Link + Headset + USB Cable + Adapter, 120Vac/60Hz
2	B	WCDMA B2 Link + BT Link + WLAN 5G Link + Front Camera REC + NFC Link + Headset + USB Cable + Adapter, 120Vac/60Hz
3	B	LTE B2 Link + BT Link + WLAN 2.4G Link + Back Camera REC + NFC Link + Headset + USB Cable + Adapter, 120Vac/60Hz
4	B	LTE B41 Link + BT Link + WLAN 2.4G Link + Play REC + NFC Link + Headset + USB Cable + Adapter, 120Vac/60Hz
5	B	LTE B5 Idle + BT Link + WLAN 2.4G Link + NFC Link + Headset + USB Cable + NB Link, 120Vac/60Hz
6	B	LTE B2 Link + BT Link + WLAN 2.4G Link + NFC Link + Headset + Qi Wireless Charger, 120Vac/60Hz
7	B	GSM 850 Rx (Low Channel) + Headset + USB Cable + Adapter, 120Vac/60Hz
8	B	GSM 850 Rx (Middle Channel) + Headset + USB Cable + Adapter, 120Vac/60Hz
9	B	GSM 850 Rx (High Channel) + Headset + USB Cable + Adapter, 120Vac/60Hz
10	B	WCDMA B5 Rx (Low Channel) + Headset + USB Cable + Adapter, 120Vac/60Hz
11	B	WCDMA B5 Rx (Middle Channel) + Headset + USB Cable + Adapter, 120Vac/60Hz
12	B	WCDMA B5 Rx (High Channel) + Headset + USB Cable + Adapter, 120Vac/60Hz
13	B	LTE B5 Rx (Low Channel) + Headset + USB Cable + Adapter, 120Vac/60Hz
14	B	LTE B5 Rx (Middle Channel) + Headset + USB Cable + Adapter, 120Vac/60Hz
15	B	LTE B5 Rx (High Channel) + Headset + USB Cable + Adapter, 120Vac/60Hz
16	B	LTE B12 Rx (Low Channel) + Headset + USB Cable + Adapter, 120Vac/60Hz
17	B	LTE B12 Rx (Middle Channel) + Headset + USB Cable + Adapter, 120Vac/60Hz
18	B	LTE B12 Rx (High Channel) + Headset + USB Cable + Adapter, 120Vac/60Hz
19	B	LTE B13 Rx (Low Channel) + Headset + USB Cable + Adapter, 120Vac/60Hz
20	B	LTE B13 Rx (Middle Channel) + Headset + USB Cable + Adapter, 120Vac/60Hz
21	B	LTE B13 Rx (High Channel) + Headset + USB Cable + Adapter, 120Vac/60Hz
22	B	LTE B17 Rx (Low Channel) + Headset + USB Cable + Adapter, 120Vac/60Hz
23	B	LTE B17 Rx (Middle Channel) + Headset + USB Cable + Adapter, 120Vac/60Hz
24	B	LTE B17 Rx (High Channel) + Headset + USB Cable + Adapter, 120Vac/60Hz
25	B	LTE B2 Link + BT Link + WLAN 2.4G Link + Back Camera REC + NFC Link + Headset + USB Cable + Adapter (X-Axis) , 120Vac/60Hz
26	B	LTE B2 Link + BT Link + WLAN 2.4G Link + Back Camera REC + NFC Link + Headset + USB Cable + Adapter (Y-Axis) , 120Vac/60Hz

Test modes are presented in the report as below.

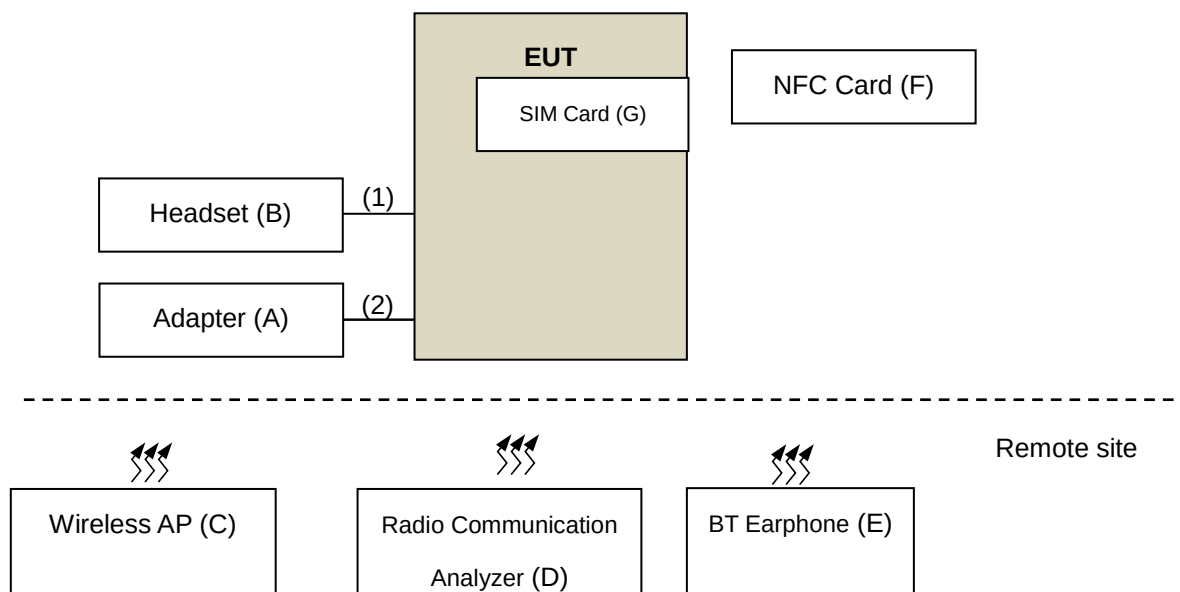
Mode	Sample	Test Condition
		Conducted Emission
Mode 25	B	WCDMA B2 Link + BT Link + WLAN 5G Link + Front Camera REC + NFC Link + Headset + USB Cable + Adapter, 240Vac/60Hz
		Radiated Emission
Mode 3	B	LTE B2 Link + BT Link + WLAN 2.4G Link + Back Camera REC + NFC Link + Headset +

		USB Cable + Adapter, 120Vac/60Hz
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3.5 Test Program Used and Operation Descriptions

- a. The EUT was powered by adapter.
- b. The EUT linked with Bluetooth earphone.
- c. The EUT sent audio signal to the Headset.
- d. The NFC function was activated.
- e. The EUT communicated data with the Radio Communication Analyzer and Wireless AP, which acted as communication partners.

3.6 Connection Diagram of EUT and Peripheral Devices



3.7 Configuration of Peripheral Devices and Cable Connections

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Adapter	Salom	XN-2QC25	N/A	N/A	Provided by client
B.	Headset	Ambibio	AB-HI02JS	N/A	N/A	Provided by client
C.	D-LINK DIR-826L 11a/n USB 1000M Router	D-LINK	DIR826L	QBQ91C9000416	N/A	--
D.	Radio Communication Analyzer	Anritsu	MT8820C	6201010284	N/A	--
E.	BT Earphone	Buffalo	BSHSBE22BK	A40303	N/A	--
F.	NFC Card	N/A	N/A	N/A	N/A	--
G.	SIM Card	R&S	N/A	N/A	N/A	--

Note:

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

ID	Cable Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	Audio Cable	1	1.1	N	0	Provided by client
2.	USB Cable	1	1	Y	0	Provided by client

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 Conducted Emissions from Power Ports

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESCI	100613	Dec. 03, 2021	Dec. 02, 2022
RF signal cable Woken	5D-FB	Cable-cond1-01	Jan. 15, 2022	Jan. 14, 2023
LISN ROHDE & SCHWARZ (EUT)	ENV216	101826	Mar. 14, 2022	Mar. 13, 2023
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Sep. 07, 2021	Sep. 06, 2022
Software ADT	BV ADT_Conc_ V7.3.7.4	NA	NA	NA

Note: 1. The test was performed in HwaYa Shielded Room 1 (Conduction 1).
 2. The VCCI Site Registration No. is C-12040.
 3. Test Date: 2022/5/7

4.2 Radiated Emissions up to 1 GHz

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ (V)	ESR	101240	Nov. 03, 2021	Nov. 02, 2022
Test Receiver ROHDE & SCHWARZ (H)	ESR	101264	Apr. 11, 2022	Apr. 10, 2023
BILOG Antenna SCHWARZBECK (V)	VULB9168	9168-148	Oct. 19, 2021	Oct. 18, 2022
BILOG Antenna SCHWARZBECK (H)	VULB9168	9168-156	Oct. 19, 2021	Oct. 18, 2022
Preamplifier Sonoma (V)	310N	352924	Jun. 05, 2021	Jun. 04, 2022
Preamplifier Sonoma (H)	310N	352923	Jun. 05, 2021	Jun. 04, 2022
RF signal cable (with 5dB PAD) Times (V)	LMR-600 (18M) +LMR-400 (7M)	CABLE-CH1 (VER) -01	Sep. 04, 2021	Sep. 03, 2022
RF signal cable (with 5dB PAD) Times (H)	LMR-600 (11.8M) +LMR-400 (7M)	CABLE-CH1 (HOR) -01	Sep. 04, 2021	Sep. 03, 2022
Software BV ADT	BV ADT_Radiated_ V8.7.08	NA	NA	NA
Antenna Tower (V)	MFA-440	9707	NA	NA
Antenna Tower (H)	MFA-440	970705	NA	NA
Turn Table	DS430	50303	NA	NA
Controller (V)	MF7802	074	NA	NA
Controller (H)	MF7802	08093	NA	NA

Note: 1. The test was performed in HwaYa Chamber 1.
 2. The VCCI Site Registration No. is R-11893.
 3. Test Date: 2022/5/5

4.3 Radiated Emissions above 1 GHz

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
MXA Signal Analyzer KEYSIGHT	N9020B	MY60110440	Dec. 09, 2021	Dec. 08, 2022
Broadband Horn Antenna Schwarzbeck	BBHA 9120 D	209	Nov. 14, 2021	Nov. 13, 2022
Pre_Amplifier Agilent	8449B	3008A02465	Mar. 19, 2022	Mar. 18, 2023
BandPass Filter MICRO-TRONICS	BRM17690-01	002	Sep. 04, 2021	Sep. 03, 2022
BandPass Filter MICRO-TRONICS	BRM50716-01	G010	Sep. 04, 2021	Sep. 03, 2022
RF Coaxial Cable HUBER+SUHNER&EMCI	SUCOFLEX 104&EMC104-SM-SM- 8000	Cable-CH3- 03(309224+17090 7)	Jul. 24, 2021	Jul. 23, 2022
Attenuator Mini-Circuits	BW-N4W5+	PAD-CH3-03	Jul. 24, 2021	Jul. 23, 2022
Fix tool for Boresight antenna	BAF-01	2	NA	NA
Software BVADT	ADT_Radiated_V8.7.0 8	NA	NA	NA
Antenna Tower BVADT	AT100	NA	NA	NA
Turn Table BVADT	TT100	NA	NA	NA
Controller BVADT	SC100	NA	NA	NA

Note: 1. The test was performed in HwaYa Chamber 3 (966 Chamber 2).
2. The VCCI Site Registration No. is G-20126.
3. Test Date: 2022/5/5

5 Limits of Emission

5.1 Conducted Emissions from Power Ports

Frequency (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.5 - 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 linearly with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.

5.2 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.

5.3 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

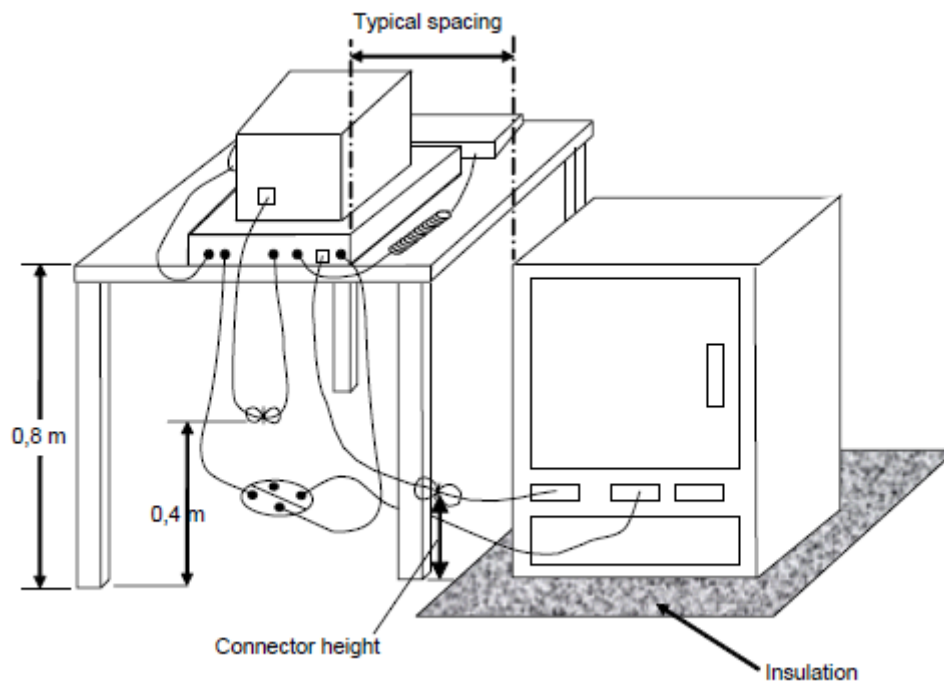
Notes:

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.

6.2 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.

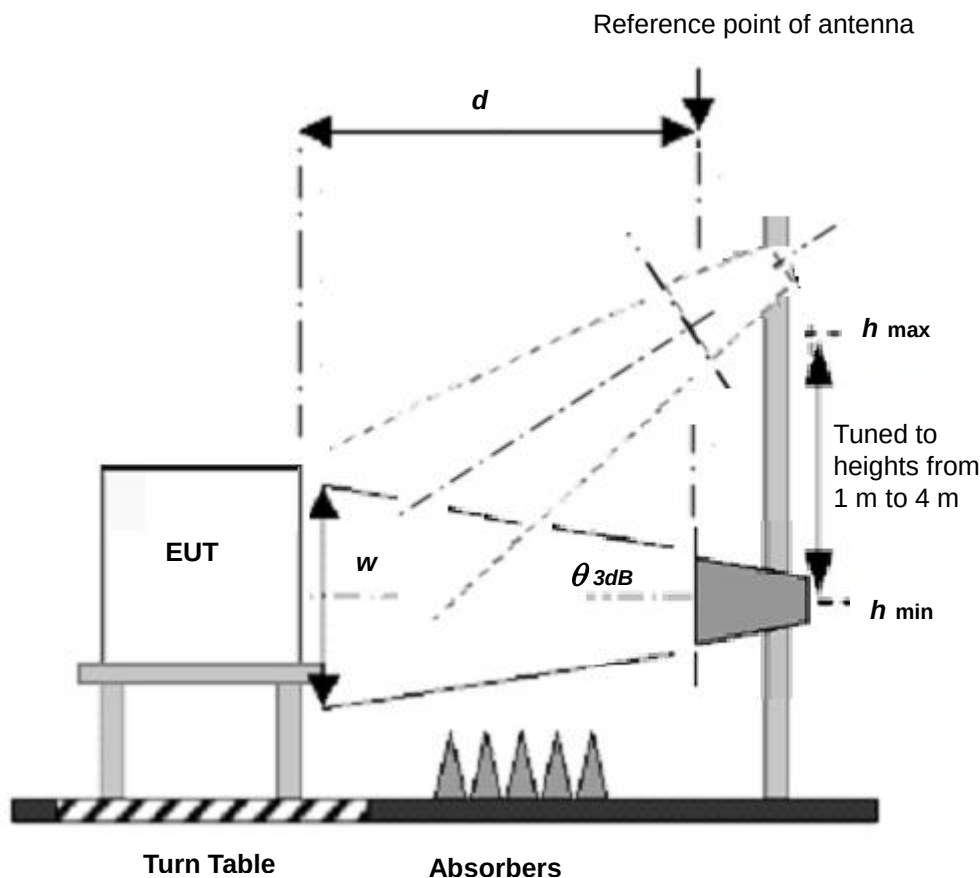


For the actual test configuration, please refer to the related Item – Photographs of the Test Configuration.

6.3 Radiated Emissions above 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 $d = 3$ 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.

7 Test Results of Emission

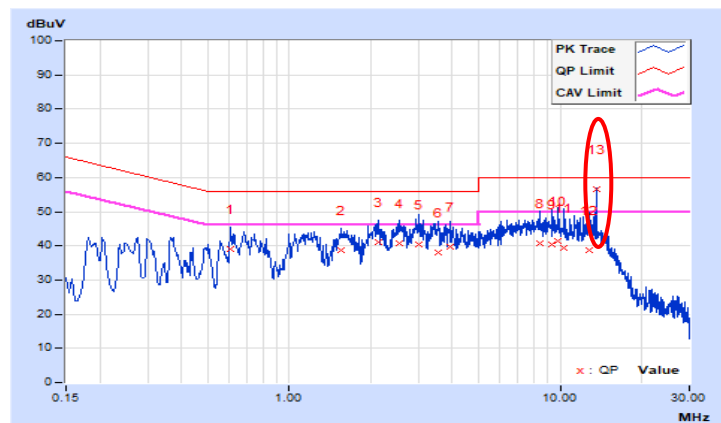
7.1 Conducted Emissions from Power Ports

Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	22 °C, 71% RH
Tested by	Kai Chu		

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.60747	9.81	29.21	19.62	39.02	29.43	56.00	46.00	-16.98	-16.57
2	1.55760	9.87	28.94	21.63	38.81	31.50	56.00	46.00	-17.19	-14.50
3	2.13628	9.90	31.29	23.16	41.19	33.06	56.00	46.00	-14.81	-12.94
4	2.54292	9.91	30.84	22.71	40.75	32.62	56.00	46.00	-15.25	-13.38
5	3.00039	9.93	30.51	20.57	40.44	30.50	56.00	46.00	-15.56	-15.50
6	3.55561	9.94	28.00	16.71	37.94	26.65	56.00	46.00	-18.06	-19.35
7	3.93879	9.95	29.73	20.47	39.68	30.42	56.00	46.00	-16.32	-15.58
8	8.36882	10.03	30.76	20.13	40.79	30.16	60.00	50.00	-19.21	-19.84
9	9.34241	10.05	30.42	19.04	40.47	29.09	60.00	50.00	-19.53	-20.91
10	9.79206	10.06	31.32	19.62	41.38	29.68	60.00	50.00	-18.62	-20.32
11	10.28472	10.06	29.28	18.76	39.34	28.82	60.00	50.00	-20.66	-21.18
12	12.74411	10.09	28.59	17.10	38.68	27.19	60.00	50.00	-21.32	-22.81
13	13.56000	10.10	46.50	41.14	56.60	51.24	--	--	--	--

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
6. No. 13 is NFC signal inductive with measurement system. Please see test result for EUT with a suitable dummy load.

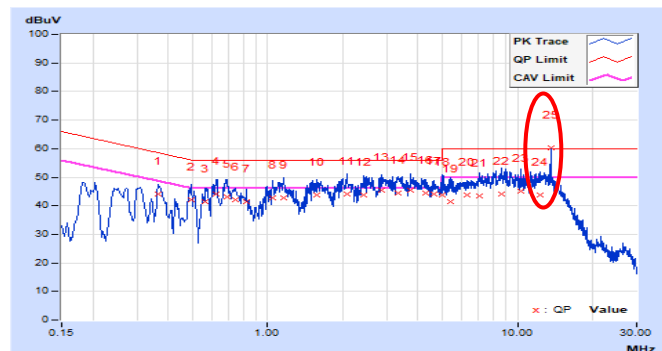


Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	22 °C, 71% RH
Tested by	Kai Chu		

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.36505	9.79	34.27	22.77	44.06	32.56	58.61	48.61	-14.55	-16.05
2	0.49408	9.82	32.32	19.61	42.14	29.43	56.10	46.10	-13.96	-16.67
3	0.56446	9.82	31.62	18.51	41.44	28.33	56.00	46.00	-14.56	-17.67
4	0.61920	9.83	34.44	23.52	44.27	33.35	56.00	46.00	-11.73	-12.65
5	0.68958	9.83	33.43	22.80	43.26	32.63	56.00	46.00	-12.74	-13.37
6	0.74432	9.84	32.25	21.57	42.09	31.41	56.00	46.00	-13.91	-14.59
7	0.82252	9.85	31.49	18.46	41.34	28.31	56.00	46.00	-14.66	-17.69
8	1.05321	9.86	32.95	21.08	42.81	30.94	56.00	46.00	-13.19	-15.06
9	1.16660	9.87	32.86	23.49	42.73	33.36	56.00	46.00	-13.27	-12.64
10	1.57324	9.89	33.92	24.11	43.81	34.00	56.00	46.00	-12.19	-12.00
11	2.07763	9.92	34.23	25.42	44.15	35.34	56.00	46.00	-11.85	-10.66
12	2.42953	9.93	33.87	23.90	43.80	33.83	56.00	46.00	-12.20	-12.17
13	2.86722	9.94	35.48	23.70	45.42	33.64	56.00	46.00	-10.58	-12.36
14	3.31710	9.95	34.40	23.78	44.35	33.73	56.00	46.00	-11.65	-12.27
15	3.71983	9.96	35.55	22.04	45.51	32.00	56.00	46.00	-10.49	-14.00
16	4.28678	9.97	34.42	22.84	44.39	32.81	56.00	46.00	-11.61	-13.19
17	4.61522	9.98	34.25	21.50	44.23	31.48	56.00	46.00	-11.77	-14.52
18	4.99058	9.98	33.65	20.16	43.63	30.14	56.00	46.00	-12.37	-15.86
19	5.36594	9.99	31.49	18.94	41.48	28.93	60.00	50.00	-18.52	-21.07
20	6.26915	10.00	33.63	22.69	43.63	32.69	60.00	50.00	-16.37	-17.31
21	7.01987	10.02	33.32	22.03	43.34	32.05	60.00	50.00	-16.66	-17.95
22	8.67380	10.04	34.09	23.42	44.13	33.46	60.00	50.00	-15.87	-16.54
23	10.35510	10.07	34.90	21.67	44.97	31.74	60.00	50.00	-15.03	-18.26
24	12.32183	10.09	33.78	20.75	43.87	30.84	60.00	50.00	-16.13	-19.16
25	13.56000	10.11	50.22	43.19	60.33	53.30	--	--	--	--

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
6. No. 25 is NFC signal inductive with measurement system. Please see test result for EUT with a suitable dummy load.



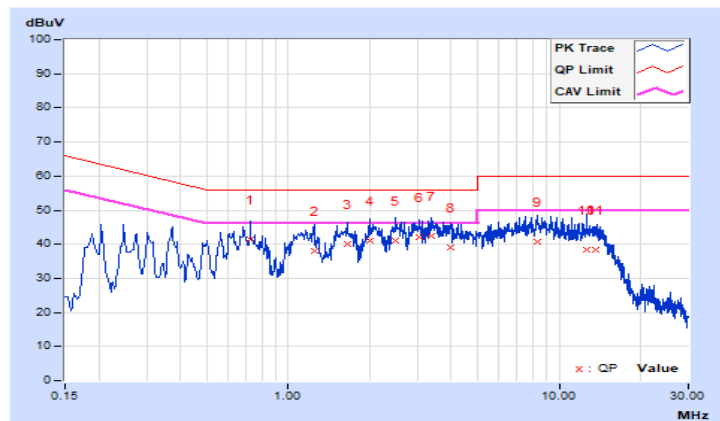
Test with Suitable Dummy Load

Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	22 °C, 71% RH
Tested by	Kai Chu		

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.72477	9.82	31.52	19.84	41.34	29.66	56.00	46.00	-14.66	-16.34
2	1.24480	9.85	28.10	19.62	37.95	29.47	56.00	46.00	-18.05	-16.53
3	1.65144	9.88	30.09	21.95	39.97	31.83	56.00	46.00	-16.03	-14.17
4	1.99161	9.90	31.17	22.94	41.07	32.84	56.00	46.00	-14.93	-13.16
5	2.48818	9.91	31.32	23.49	41.23	33.40	56.00	46.00	-14.77	-12.60
6	3.04731	9.93	32.14	22.58	42.07	32.51	56.00	46.00	-13.93	-13.49
7	3.35831	9.93	32.65	21.78	42.58	31.71	56.00	46.00	-13.42	-14.29
8	3.96616	9.95	29.20	18.80	39.15	28.75	56.00	46.00	-16.85	-17.25
9	8.33754	10.03	30.56	19.61	40.59	29.64	60.00	50.00	-19.41	-20.36
10	12.63072	10.09	28.32	16.79	38.41	26.88	60.00	50.00	-21.59	-23.12
11	13.56000	10.10	28.34	18.14	38.44	28.24	60.00	50.00	-21.56	-21.76

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



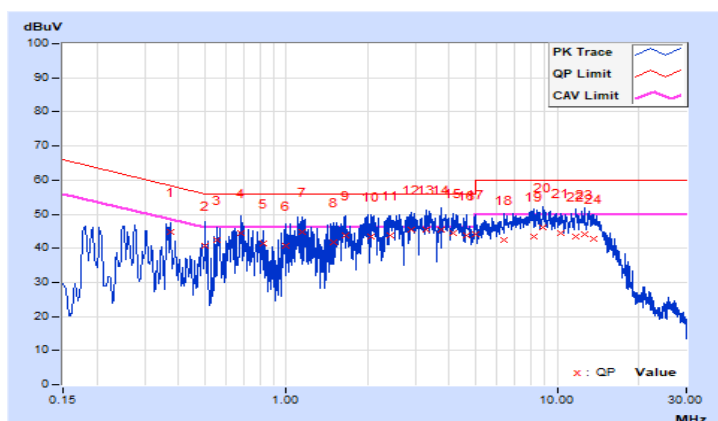
BUREAU
VERITAS

Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	22 °C, 71% RH
Tested by	Kai Chu		

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.37287	9.80	35.06	24.03	44.86	33.83	58.44	48.44	-13.58	-14.61
2	0.50190	9.82	30.97	16.87	40.79	26.69	56.00	46.00	-15.21	-19.31
3	0.55664	9.82	32.48	20.33	42.30	30.15	56.00	46.00	-13.70	-15.85
4	0.68176	9.83	34.64	24.40	44.47	34.23	56.00	46.00	-11.53	-11.77
5	0.82252	9.85	31.64	18.52	41.49	28.37	56.00	46.00	-14.51	-17.63
6	0.99065	9.86	30.89	17.72	40.75	27.58	56.00	46.00	-15.25	-18.42
7	1.14705	9.87	34.83	22.80	44.70	32.67	56.00	46.00	-11.30	-13.33
8	1.49895	9.89	31.88	21.92	41.77	31.81	56.00	46.00	-14.23	-14.19
9	1.65144	9.90	33.82	23.86	43.72	33.76	56.00	46.00	-12.28	-12.24
10	2.04635	9.92	33.63	24.17	43.55	34.09	56.00	46.00	-12.45	-11.91
11	2.42171	9.93	33.77	23.98	43.70	33.91	56.00	46.00	-12.30	-12.09
12	2.91046	9.94	35.52	25.18	45.46	35.12	56.00	46.00	-10.54	-10.88
13	3.28582	9.95	35.51	24.18	45.46	34.13	56.00	46.00	-10.54	-11.87
14	3.72374	9.96	35.35	23.29	45.31	33.25	56.00	46.00	-10.69	-12.75
15	4.15775	9.97	34.64	21.96	44.61	31.93	56.00	46.00	-11.39	-14.07
16	4.62695	9.98	33.77	20.78	43.75	30.76	56.00	46.00	-12.25	-15.24
17	4.98276	9.98	34.25	22.06	44.23	32.04	56.00	46.00	-11.77	-13.96
18	6.40209	10.01	32.44	22.03	42.45	32.04	60.00	50.00	-17.55	-17.96
19	8.16159	10.03	33.41	22.77	43.44	32.80	60.00	50.00	-16.56	-17.20
20	8.85366	10.04	35.93	22.77	45.97	32.81	60.00	50.00	-14.03	-17.19
21	10.27299	10.06	34.36	21.06	44.42	31.12	60.00	50.00	-15.58	-18.88
22	11.76270	10.09	33.30	20.66	43.39	30.75	60.00	50.00	-16.61	-19.25
23	12.63854	10.10	34.04	20.65	44.14	30.75	60.00	50.00	-15.86	-19.25
24	13.56000	10.11	32.53	20.91	42.64	31.02	60.00	50.00	-17.36	-18.98

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



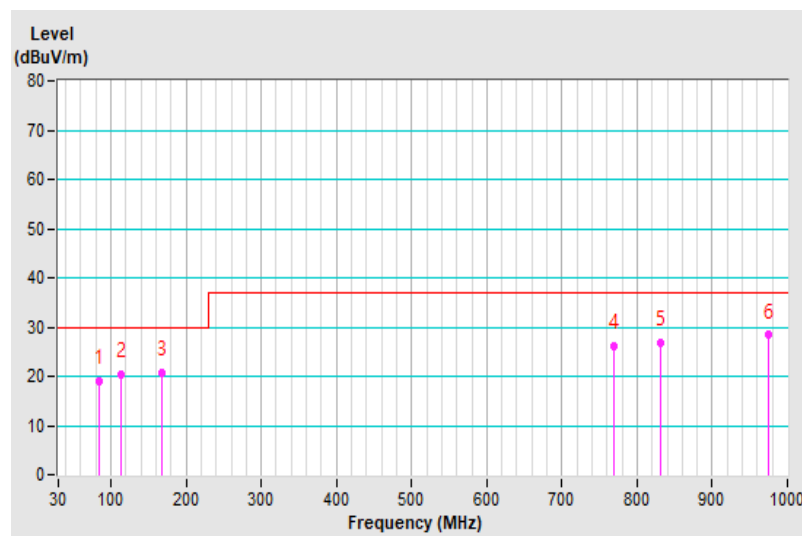
7.2 Radiated Emissions up to 1 GHz

Frequency Range	30MHz ~ 1GHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP), 120kHz
Tested By	Slash Huang	Environmental Conditions	21 °C, 68% RH

Antenna Polarity & Test Distance : Horizontal at 10 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	83.74	19.01 QP	30.00	-10.99	3.50 H	317	37.33	-18.32
2	114.35	20.49 QP	30.00	-9.51	4.00 H	272	36.53	-16.04
3	167.70	20.61 QP	30.00	-9.39	4.00 H	286	34.35	-13.74
4	768.30	26.07 QP	37.00	-10.93	4.00 H	16	28.24	-2.17
5	832.08	26.72 QP	37.00	-10.28	4.00 H	131	28.11	-1.39
6	974.78	28.32 QP	37.00	-8.68	2.00 H	268	26.82	1.50

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

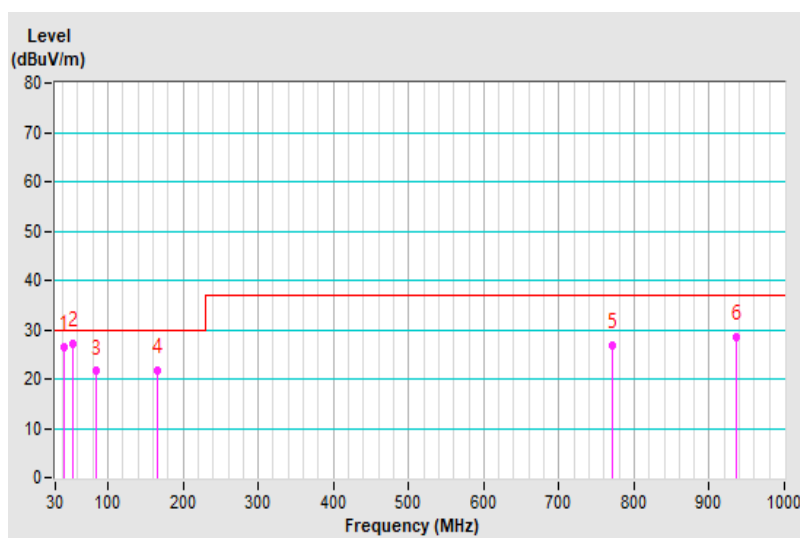


Frequency Range	30MHz ~ 1GHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP), 120kHz
Tested By	Slash Huang	Environmental Conditions	21 °C, 68% RH

Antenna Polarity & Test Distance : Vertical at 10 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	40.67	26.47 QP	30.00	-3.53	3.00 V	31	40.49	-14.02
2	54.20	27.05 QP	30.00	-2.95	1.00 V	166	40.20	-13.15
3	84.90	21.56 QP	30.00	-8.44	2.00 V	188	40.36	-18.80
4	165.32	21.74 QP	30.00	-8.26	1.00 V	81	35.28	-13.54
5	770.83	26.87 QP	37.00	-10.13	1.00 V	330	28.82	-1.95
6	936.36	28.53 QP	37.00	-8.47	4.00 V	99	27.94	0.59

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



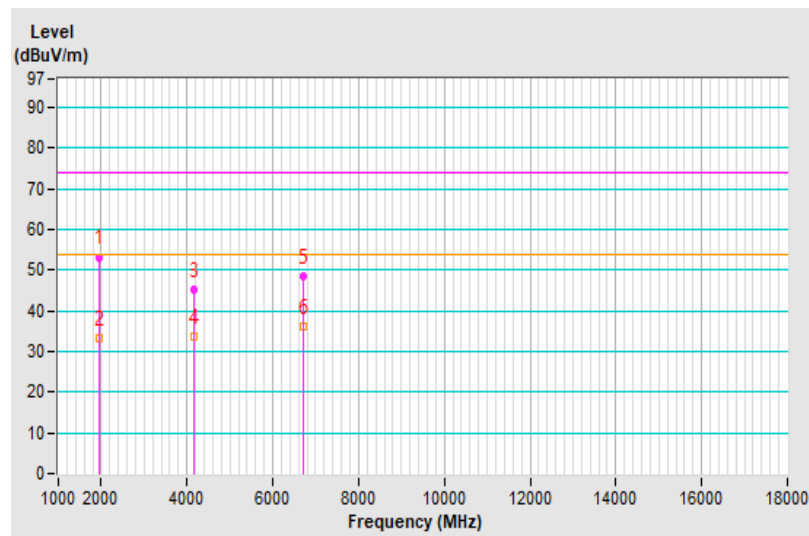
7.3 Radiated Emissions above 1 GHz

Frequency Range	1GHz ~ 18GHz	Detector Function & Resolution Bandwidth	Peak (PK) / Average (AV), 1MHz
Tested By	Jim Lee	Environmental Conditions	24 °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	1957.95	53.21 PK	74.00	-20.79	1.00 H	135	62.78	-9.57
2	1957.95	33.39 AV	54.00	-20.61	1.00 H	135	42.96	-9.57
3	4177.31	45.28 PK	74.00	-28.72	1.24 H	257	51.82	-6.54
4	4177.31	33.82 AV	54.00	-20.18	1.24 H	257	40.36	-6.54
5	6715.40	48.48 PK	74.00	-25.52	1.99 H	78	50.91	-2.43
6	6715.40	36.17 AV	54.00	-17.83	1.99 H	78	38.60	-2.43

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

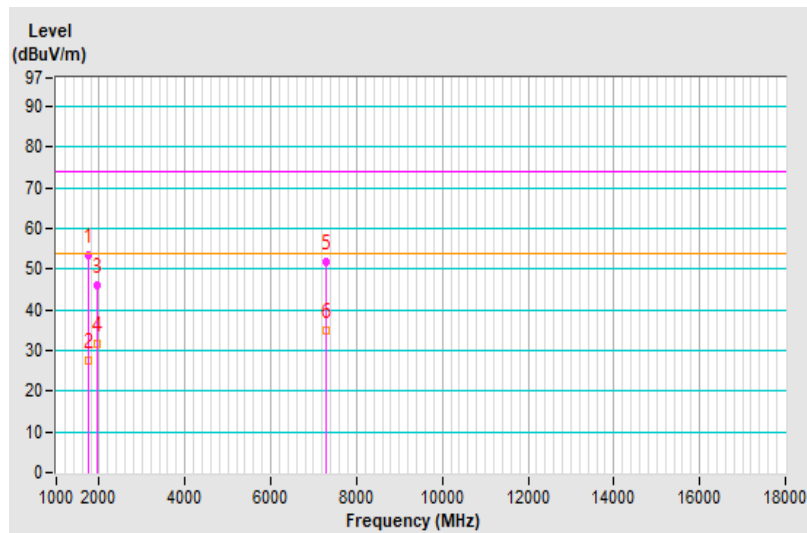


Frequency Range	1GHz ~ 18GHz	Detector Function & Resolution Bandwidth	Peak (PK) / Average (AV), 1MHz
Tested By	Jim Lee	Environmental Conditions	24 °C, 69% RH

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	1742.05	53.30 PK	74.00	-20.70	1.25 V	339	65.05	-11.75
2	1742.05	27.42 AV	54.00	-26.58	1.25 V	339	39.17	-11.75
3	1956.10	46.13 PK	74.00	-27.87	1.74 V	201	55.72	-9.59
4	1956.10	31.68 AV	54.00	-22.32	1.74 V	201	41.27	-9.59
5	7297.65	51.89 PK	74.00	-22.11	1.00 V	187	53.34	-1.45
6	7297.65	34.80 AV	54.00	-19.20	1.00 V	187	36.25	-1.45

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

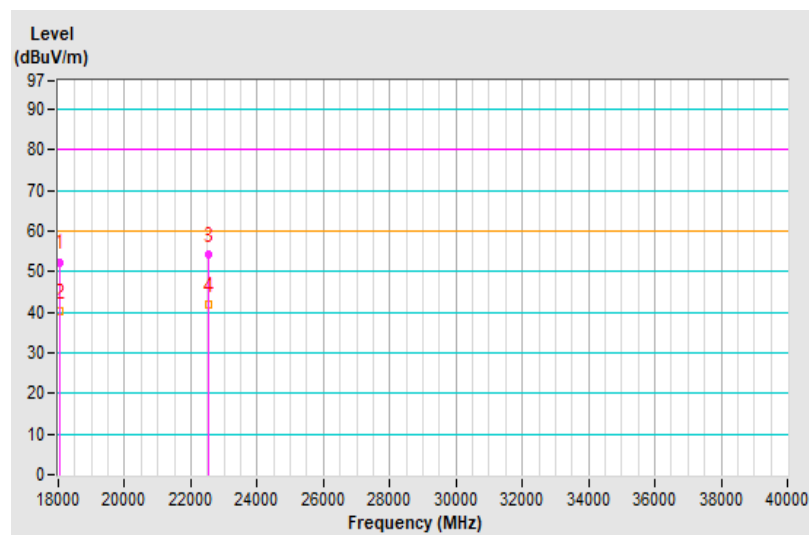


Frequency Range	18GHz ~ 30GHz	Detector Function & Resolution Bandwidth	Peak (PK) / Average (AV), 1MHz
Tested By	Jim Lee	Environmental Conditions	24 °C, 69% RH

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	18036.30	52.34 PK	80.00	-27.66	1.00 H	24	55.94	-3.60
2	18036.30	40.13 AV	60.00	-19.87	1.00 H	24	43.73	-3.60
3	22552.61	54.15 PK	80.00	-25.85	1.50 H	49	54.48	-0.33
4	22552.61	41.88 AV	60.00	-18.12	1.50 H	49	42.21	-0.33

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

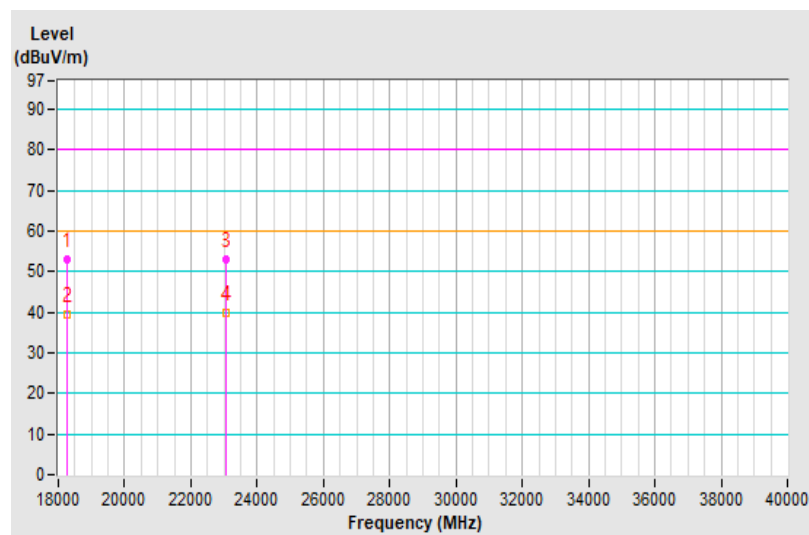


Frequency Range	18GHz ~ 30GHz	Detector Function & Resolution Bandwidth	Peak (PK) / Average (AV), 1MHz
Tested By	Jim Lee	Environmental Conditions	24 °C, 69% RH

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	18279.60	52.93 PK	80.00	-27.07	1.93 V	186	57.33	-4.40
2	18279.60	39.49 AV	60.00	-20.51	1.93 V	186	43.89	-4.40
3	23056.08	52.91 PK	80.00	-27.09	1.00 V	118	52.60	0.31
4	23056.08	39.80 AV	60.00	-20.20	1.00 V	118	39.49	0.31

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



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.

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