FCC Test Report

Report No.:	RFBHBQ-WTW-P21030022-2
FCC ID:	2AH7L-UPSB
Test Model:	PAS600T, PAS600
Series Model:	PAS600L
Received Date:	Sep. 15, 2020
Test Date:	Oct. 05, 2020 ~ Mar. 17, 2021
Issued Date:	Mar. 19, 2021
Applicant:	Schneider Electric Industries SAS
Address:	Electropole Site - 38EQ1, 31 rue Pierre Mendes France, Eybens - 38050 Grenoble cedex 9
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:	788550 / TW0003

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.

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Release Control Record

Issue No.	Description	Date Issued
RFBHBQ-WTW-P21030022-2	Original Release	Mar. 19, 2021

1 Certificate of Conformity

Product:	EcoStruxure Panel Server
Brand:	Schneider Electric
Test Model:	PAS600T, PAS600
Series Model:	PAS600L
Sample Status:	Identical Prototype
Applicant:	Schneider Electric Industries SAS
Test Date:	Oct. 05, 2020 ~ Mar. 17, 2021
Standards:	47 CFR FCC Part 15, Subpart C (Section 15.247) ANSI C63.10:2013

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 RF characteristics under the conditions specified in this report.

Prepared by :  , **Date:** Mar. 19, 2021

Gina Liu / Specialist

Approved by :  , **Date:** Mar. 19, 2021

Dylan Chiou / Senior Project Engineer

2 Summary of Test Results

47 CFR FCC Part 15, Subpart C (Section 15.247)			
FCC Clause	**Test Item**	**Result**	**Remarks**
15.207	AC Power Conducted Emission	Pass	Meet the requirement of limit. Minimum passing margin is -10.89 dB at 0.6255 MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -4.2 dB at 210.42 MHz.
15.247(d)	Antenna Port Emission	N/A	Refer to Note
15.247(a)(2)	6 dB Bandwidth	N/A	Refer to Note
15.247(b)	Conducted power	N/A	Refer to Note
15.247(e)	Power Spectral Density	N/A	Refer to Note
15.203	Antenna Requirement	N/A	Refer to Note

Note:
1. This report is a partial report, only test item of Radiated Emissions below 1GHz and Conducted Emission were performed for this report. Other testing data please refer to report no.: RF200605C50-2.
2. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
3. N/A: Not applicable

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) (±)**
Conducted Emissions at mains ports	150 kHz ~ 30 MHz	2.79 dB
Radiated Emissions up to 1 GHz	9 kHz ~ 30 MHz	3.04 dB
	30 MHz ~ 200 MHz	2.93 dB
	200 MHz ~ 1000 MHz	2.95 dB
Radiated Emissions above 1 GHz	1 GHz ~ 18 GHz	2.26 dB
	18 GHz ~ 40 GHz	1.94 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	EcoStruxure Panel Server
Brand	Schneider Electric
Test Model	PAS600T, PAS600
Series Model	PAS600L
Status of EUT	Identical Prototype
Power Supply Rating	24Vdc for PAS600L 110-240Vac, 50-60Hz and 240Vdc for PAS600T 110-277Vac, 50-60Hz and 277Vdc for PAS600
Modulation Type	O-QPSK
Modulation Technology	DSSS
Transfer Rate	250 kbps
Operating Frequency	2405 ~ 2475 MHz
Number of Channel	15
Output Power	4.285 mW
Antenna Type	Antenna 1: PCB antenna with 4.4 dBi gain Antenna 2: PCB antenna with 5.1 dBi gain
Antenna Connector	N/A
Accessory Device	External antenna for 2.4G (Brand: Schneider Electric; Model: PASA-ANT1)
Data Cable Supplied	N/A

Note:

1. This report is prepared for FCC class II permissive change. This report is issued as a supplementary report to BV CPS report no.: RF200605C50-2. The differences compared with original report are adding model, changing the power supply and removing digital input port. Therefore, test items for conducted emission and radiated emission below 1GHz test had been re-tested in this report.
2. All models are listed as below. Model: PAS600T and PAS600 is the representative for final test. (New model is marked in boldface.)

Brand	Model	Difference
Schneider Electric	PAS600L	Power Supply Rating: 24Vdc
	PAS600T	**(1) Power Supply Rating: 110-240Vac/dc with +/-10% tolerance** **(2) Without digital input**
	PAS600	**(1) Power Supply Rating: 110 -277Vac/dc with +-/10% tolerance** **(2) Without digital input**

3. The EUT support 1TX diversity function in transmitter part.
4. The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.
5. The above EUT information is declared by manufacturer and for more detailed features description, please refers to the manufacturer's specifications or user's manual.

3.2 Description of Test Modes

15 channels are provided to this EUT:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
11	2405	19	2445
12	2410	20	2450
13	2415	21	2455
14	2420	22	2460
15	2425	23	2465
16	2430	24	2470
17	2435	25	2475
18	2440		

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable To		Description
	RE<1G	PLC	
A	√	√	Antenna 1

Where **RE≥1G:** Radiated Emission above 1 GHz **RE<1G:** Radiated Emission below 1 GHz
PLC: Power Line Conducted Emission **APCM:** Antenna Port Conducted Measurement

NOTE: The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **Z-plane**.
NOTE: "-"means no effect.

Radiated Emission Test (Below 1 GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type
A	11 to 26	26	OFDM	O-QPSK

Power Line Conducted Emission Test:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type
A	11 to 26	26	OFDM	O-QPSK

Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested by
RE<1G	25 deg. C, 65 % RH	110Vac, 60Hz; 240Vac, 60Hz; 277Vac, 60Hz; 240Vdc; 277Vdc	Han Wu; Tank Wu, Greg Lin
PLC	25 deg. C, 65 % RH	110Vac, 60Hz; 240Vac, 60Hz; 277Vac, 60Hz	Han Wu, Greg Lin

3.3 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

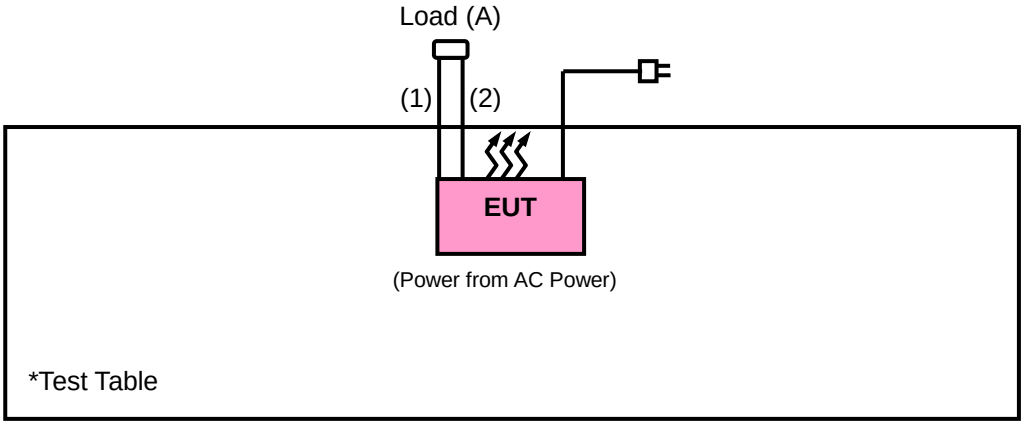
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Load	N/A	N/A	N/A	N/A	--

Note:

1. All power cords of the above support units are non-shielded (1.8m).

ID	Cable Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	LAN Cable	1	1.5	N	0	--
2.	LAN Cable	1	1.5	N	0	--

3.3.1 Configuration of System under Test



3.4 General Description of Applied Standards and References

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards and references:

Test Standard:

FCC Part 15, Subpart C (15.247)
ANSI C63.10-2013

All test items have been performed and recorded as per the above standards.

References Test Guidance:

KDB 558074 D01 15.247 Meas Guidance v05r02

All test items have been performed as a reference to the above KDB test guidance.

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 20 dB below the highest level of the desired power:

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 ~ 0.490	2400/F (kHz)	300
0.490 ~ 1.705	24000/F (kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000 MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20 dB under any condition of modulation.

4.1.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Date Of Calibration	Due Date Of Calibration
Test Receiver KEYSIGHT	N9038A	MY55420137	Apr. 16, 2020	Apr. 15, 2021
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100039	Jun. 12, 2020	Jun. 11, 2021
Spectrum Analyzer ROHDE & SCHWARZ	FSV40	100980	Apr. 20, 2020	Apr. 19, 2021
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	Nov. 07, 2019	Nov. 06, 2020
			Nov. 06, 2020	Nov. 05, 2021
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-1169	Nov. 24, 2019	Nov. 23, 2020
			Nov. 22, 2020	Nov. 21, 2021
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Nov. 24, 2019	Nov. 23, 2020
			Nov. 22, 2020	Nov. 21, 2021
Preamplifier Agilent (Below 1GHz)	8447D	2944A10638	Jun. 08, 2020	Jun. 07, 2021
Preamplifier Agilent (Above 1GHz)	8449B	3008A02367	Feb. 18, 2020	Feb. 17, 2021
			Feb. 17, 2021	Feb. 16, 2022
RF signal cable HUBER+SUHNER&EMCI	SUCOFLEX 104 & EMC104-SM-SM8000	CABLE-CH9-02 (248780+171006)	Feb. 18, 2020	Feb. 17, 2021
			Jan. 16, 2021	Jan. 15, 2022
RF signal cable HUBER+SUHNER	SUCOFLEX 104	CABLE-CH9-(250795/4)	Jan. 18, 2020	Jan. 17, 2021
			Jan. 16, 2021	Jan. 15, 2022
RF signal cable Woken	8D-FB	Cable-CH9-01	Jun. 08, 2020	Jun. 07, 2021
Software BV ADT	ADT_Radiated_V7.6.15.9.5	NA	NA	NA
Antenna Tower EMCO	2070/2080	512.835.4684	NA	NA
Turn Table EMCO	2087-2.03	NA	NA	NA
Antenna Tower &Turn BV ADT	AT100	AT93021705	NA	NA
Turn Table BV ADT	TT100	TT93021705	NA	NA
Turn Table Controller BV ADT	SC100	SC93021705	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
Power Meter Anritsu	ML2495A	1232003	Dec. 30, 2019	Dec. 29, 2020
			Jan. 05, 2021	Jan. 04, 2020

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 HwaYa Chamber 9.

4.1.3 Test Procedures

For Radiated Emission below 30 MHz

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c. Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.
d. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
e. The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

Note:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9 kHz at frequency below 30 MHz.

For Radiated Emission above 30 MHz

a. The EUT was placed on the top of a rotating table 0.8 meters (for 30 MHz ~ 1 GHz) / 1.5 meters (for above 1 GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c. The height of antenna 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.
d. 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.
e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
f. The test-receiver system was set to peak and average detected function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

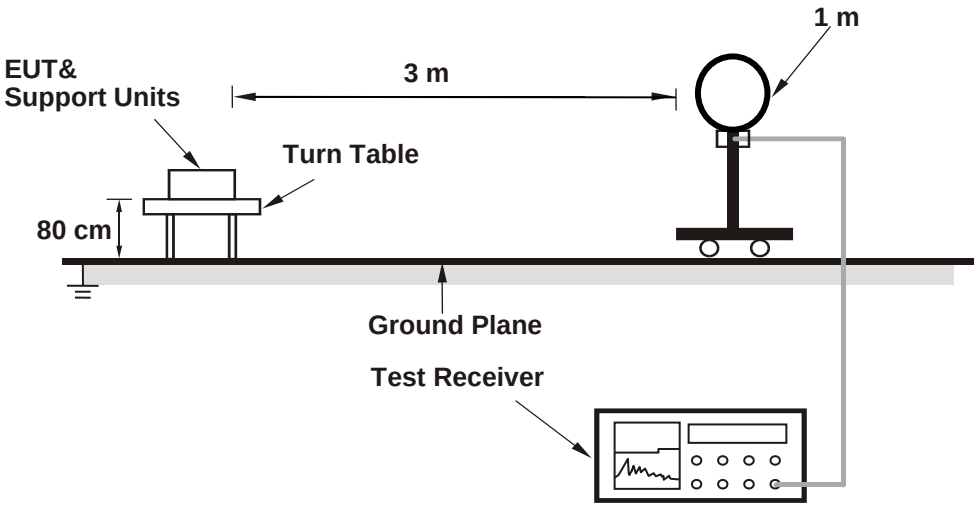
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection (QP) at frequency below 1 GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1 GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is ≥ 1/T (Duty cycle < 98 %) or 10 Hz (Duty cycle ≥ 98 %) for Average detection (AV) at frequency above 1 GHz. (RBW = 1 MHz, VBW = 1 kHz)
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

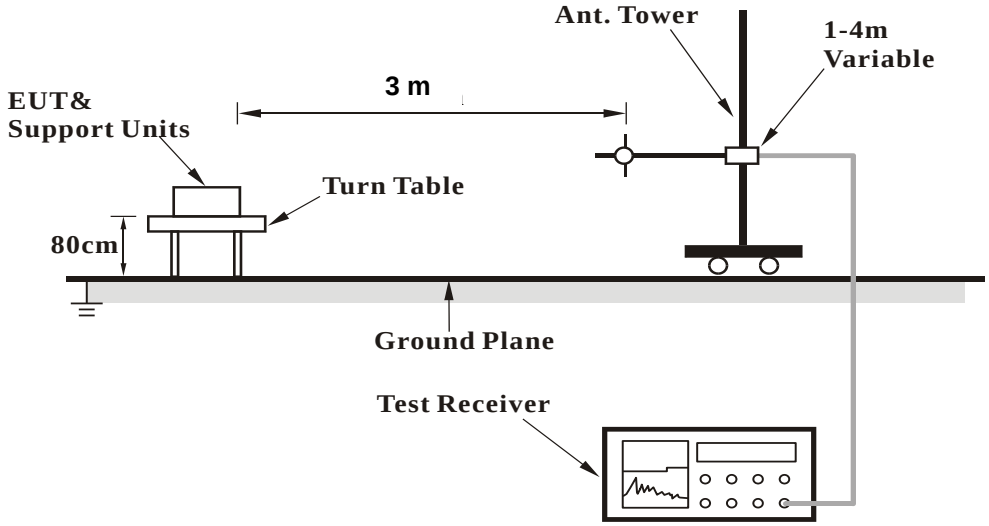
No deviation.

4.1.5 Test Set Up

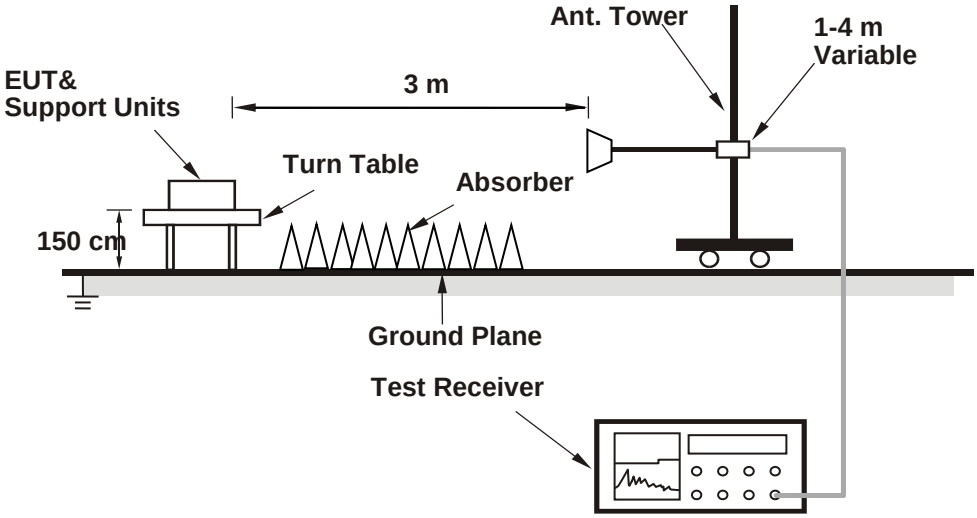
<Radiated Emission below 30 MHz>



<Radiated Emission 30 MHz to 1 GHz>



<Radiated Emission above 1 GHz>



For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.1.6 EUT Operating Conditions

a. Placed the EUT on a testing table.
b. Use the software to control the EUT under transmission condition continuously at specific channel frequency.

4.1.7 Test Results

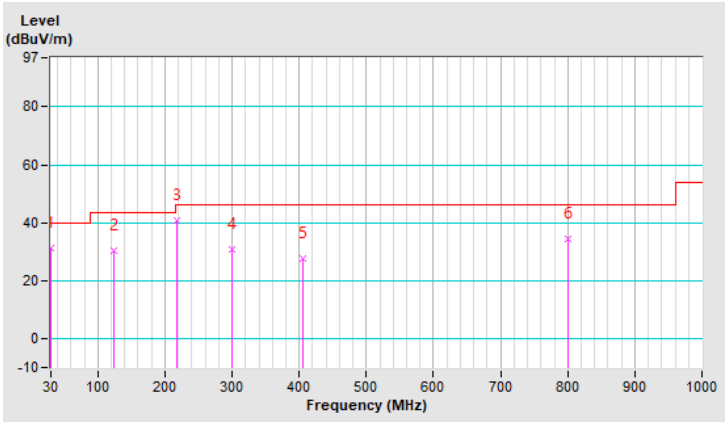
Below 1 GHz Worst-Case Data:

CHANNEL	TX Channel 26	**DETECTOR FUNCTION**	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz	**INPUT POWER**	110Vac, 60Hz

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	30.00	31.3 QP	40.0	-8.7	1.25 H	279	41.8	-10.5
2	123.12	30.5 QP	43.5	-13.0	1.00 H	4	41.2	-10.7
3	218.18	41.0 QP	46.0	-5.0	1.00 H	281	52.0	-11.0
4	300.63	30.7 QP	46.0	-15.3	1.00 H	50	37.8	-7.1
5	406.36	27.7 QP	46.0	-18.3	1.50 H	229	32.6	-4.9
6	800.18	34.6 QP	46.0	-11.4	1.00 H	10	31.8	2.8

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

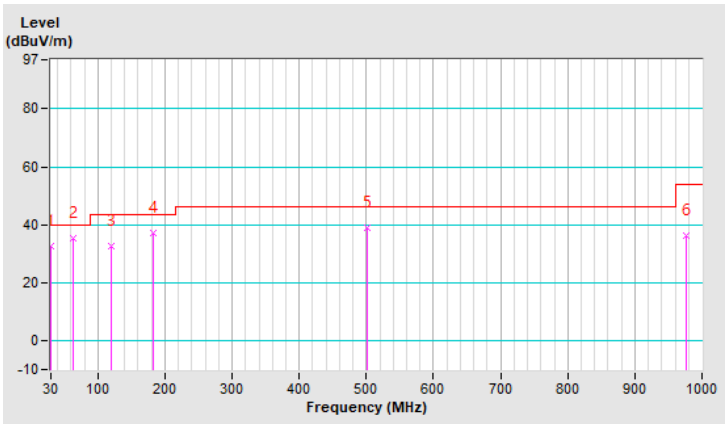


CHANNEL	TX Channel 26	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz	INPUT POWER	110Vac, 60Hz

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	30.97	32.6 QP	40.0	-7.4	1.25 V	358	43.6	-11.0
2	63.95	35.5 QP	40.0	-4.5	1.00 V	68	45.4	-9.9
3	120.21	32.6 QP	43.5	-10.9	1.00 V	316	43.7	-11.1
4	183.26	37.3 QP	43.5	-6.2	1.50 V	139	47.7	-10.4
5	500.45	38.9 QP	46.0	-7.1	1.00 V	324	41.9	-3.0
6	975.75	36.3 QP	54.0	-17.7	1.25 V	214	30.5	5.8

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

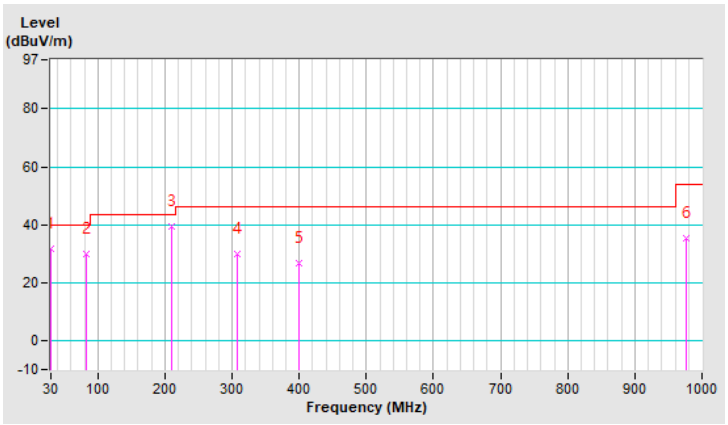


CHANNEL	TX Channel 26	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz	INPUT POWER	240Vac, 60Hz

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	30.00	31.7 QP	40.0	-8.3	1.00 H	286	42.2	-10.5
2	82.38	30.0 QP	40.0	-10.0	1.00 H	101	43.9	-13.9
3	**210.42**	**39.3 QP**	**43.5**	**-4.2**	**1.50 H**	**268**	**50.6**	**-11.3**
4	308.39	30.0 QP	46.0	-16.0	1.00 H	54	36.8	-6.8
5	400.54	26.8 QP	46.0	-19.2	1.00 H	205	31.9	-5.1
6	975.75	35.3 QP	54.0	-18.7	1.25 H	335	29.5	5.8

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

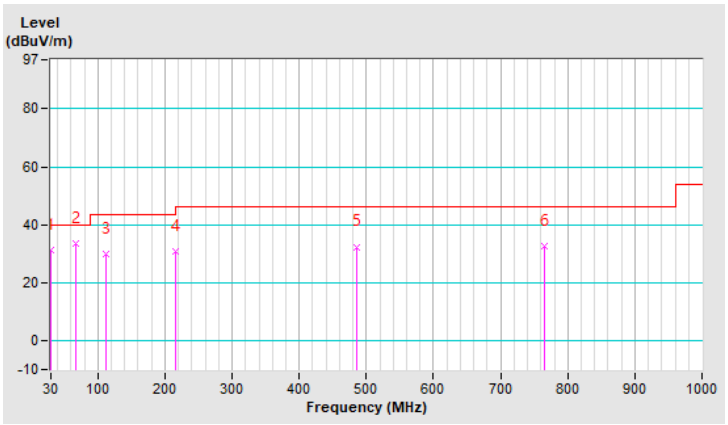


CHANNEL	TX Channel 26	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz	INPUT POWER	240Vac, 60Hz

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	30.00	31.4 QP	40.0	-8.6	1.25 V	125	41.9	-10.5
2	66.86	33.4 QP	40.0	-6.6	1.00 V	68	43.7	-10.3
3	112.45	30.1 QP	43.5	-13.4	1.50 V	310	41.8	-11.7
4	215.27	31.0 QP	43.5	-12.5	1.25 V	61	42.1	-11.1
5	484.93	32.4 QP	46.0	-13.6	1.00 V	72	35.7	-3.3
6	765.26	32.5 QP	46.0	-13.5	1.00 V	18	30.0	2.5

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

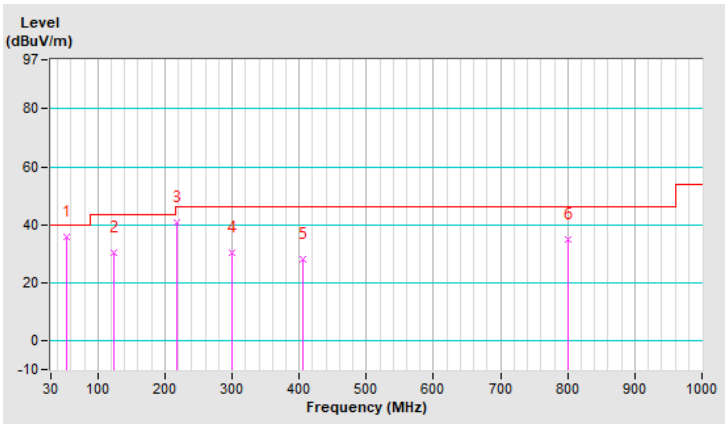


CHANNEL	TX Channel 26	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz	INPUT POWER	240Vdc

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	53.28	35.6 QP	40.0	-4.4	1.00 H	20	44.8	-9.2
2	123.12	30.5 QP	43.5	-13.0	1.00 H	4	41.2	-10.7
3	218.32	40.8 QP	46.0	-5.2	1.00 H	277	51.8	-11.0
4	300.42	30.5 QP	46.0	-15.5	1.00 H	55	37.6	-7.1
5	405.98	28.1 QP	46.0	-17.9	1.50 H	230	33.0	-4.9
6	800.45	34.7 QP	46.0	-11.3	1.25 H	10	31.9	2.8

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

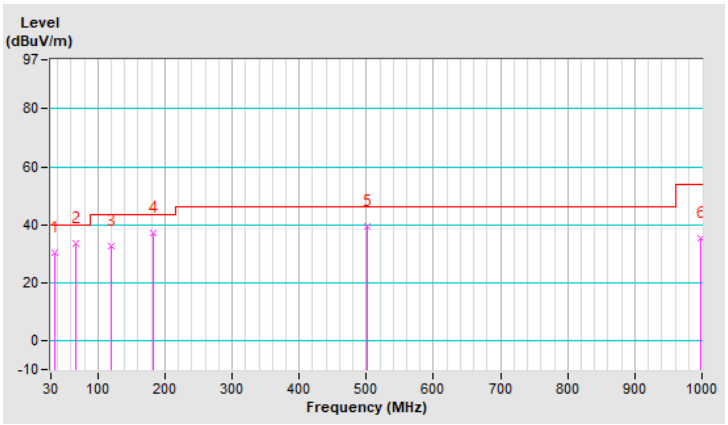


CHANNEL	TX Channel 26	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz	INPUT POWER	240Vdc

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	35.82	30.2 QP	40.0	-9.8	1.00 V	13	40.6	-10.4
2	66.86	33.4 QP	40.0	-6.6	1.00 V	68	43.7	-10.3
3	119.49	32.7 QP	43.5	-10.8	1.00 V	322	43.9	-11.2
4	183.26	37.3 QP	43.5	-6.2	1.50 V	139	47.7	-10.4
5	500.93	39.3 QP	46.0	-6.7	1.00 V	318	42.3	-3.0
6	998.06	35.2 QP	54.0	-18.8	1.00 V	35	29.4	5.8

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

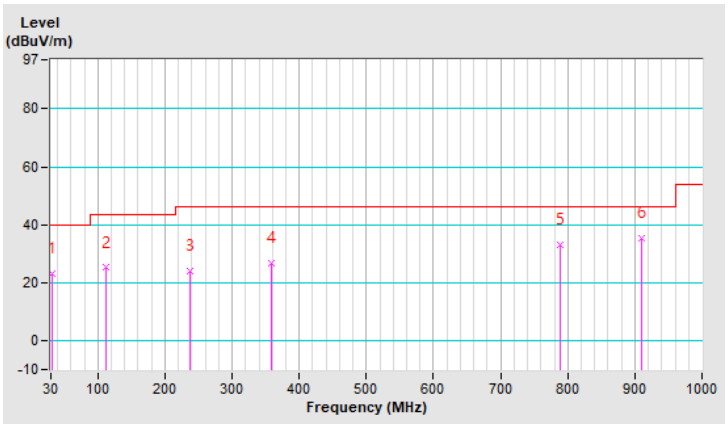


CHANNEL	TX Channel 26	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz	INPUT POWER	277Vac, 60Hz

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	31.94	22.9 QP	40.0	-17.1	1.25 H	75	33.2	-10.3
2	111.48	25.1 QP	43.5	-18.4	1.00 H	224	36.6	-11.5
3	237.58	24.2 QP	46.0	-21.8	1.25 H	117	33.5	-9.3
4	357.86	26.6 QP	46.0	-19.4	1.00 H	90	32.1	-5.5
5	788.54	33.2 QP	46.0	-12.8	1.00 H	13	29.8	3.4
6	910.76	35.3 QP	46.0	-10.7	1.50 H	141	29.8	5.5

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

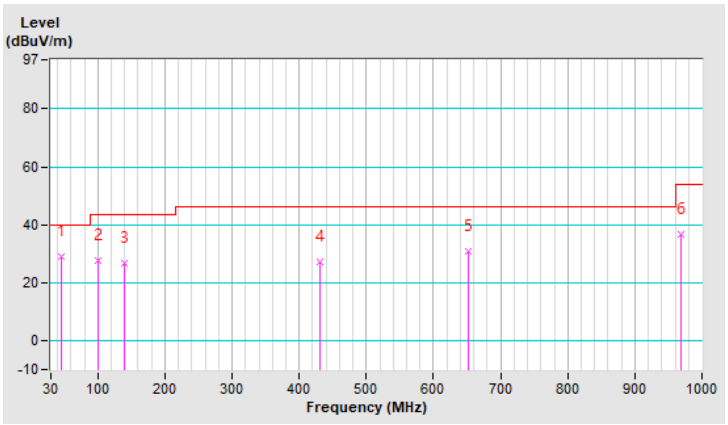


CHANNEL	TX Channel 26	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz	INPUT POWER	277Vac, 60Hz

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	45.52	29.0 QP	40.0	-11.0	1.00 V	193	38.1	-9.1
2	99.84	27.6 QP	43.5	-15.9	1.25 V	200	40.7	-13.1
3	138.64	26.5 QP	43.5	-17.0	1.50 V	131	35.4	-8.9
4	431.58	27.0 QP	46.0	-19.0	1.00 V	2	30.9	-3.9
5	652.74	30.8 QP	46.0	-15.2	1.25 V	8	30.5	0.3
6	968.96	36.7 QP	54.0	-17.3	1.00 V	4	30.6	6.1

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

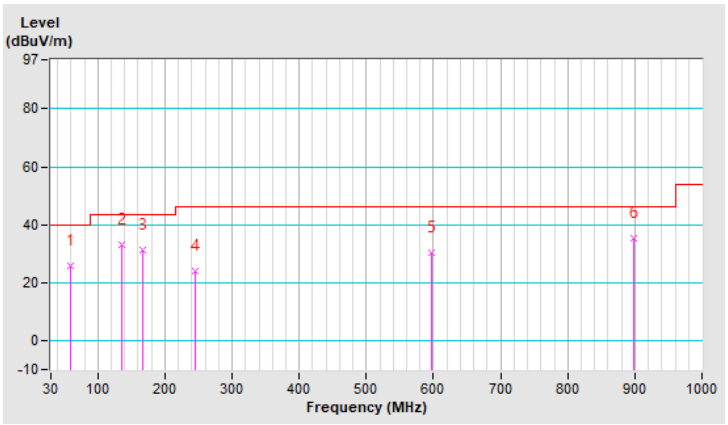


CHANNEL	TX Channel 26	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz	INPUT POWER	277Vdc

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	59.10	25.8 QP	40.0	-14.2	1.25 H	244	35.1	-9.3
2	134.76	33.0 QP	43.5	-10.5	1.00 H	290	42.3	-9.3
3	167.74	31.1 QP	43.5	-12.4	1.00 H	112	39.6	-8.5
4	245.34	24.0 QP	46.0	-22.0	1.25 H	102	32.9	-8.9
5	596.48	30.3 QP	46.0	-15.7	1.50 H	170	30.9	-0.6
6	899.12	35.4 QP	46.0	-10.6	2.00 H	80	30.6	4.8

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

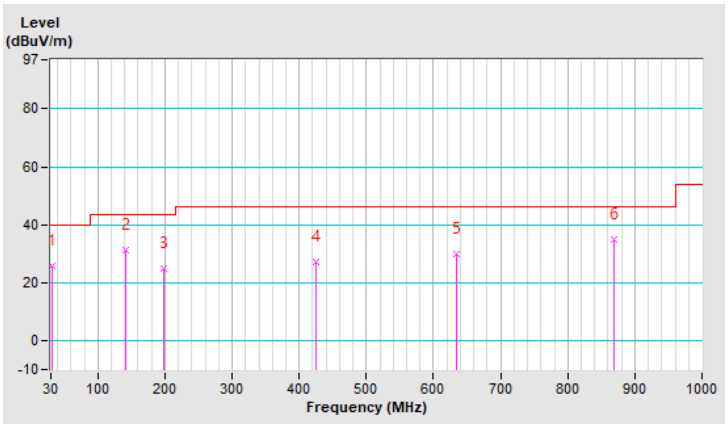


CHANNEL	TX Channel 26	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz	INPUT POWER	277Vdc

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	31.94	25.8 QP	40.0	-14.2	1.00 V	333	36.1	-10.3
2	140.58	31.4 QP	43.5	-12.1	1.25 V	243	40.2	-8.8
3	198.78	24.8 QP	43.5	-18.7	1.50 V	170	36.1	-11.3
4	425.76	27.1 QP	46.0	-18.9	2.00 V	186	31.2	-4.1
5	633.34	30.1 QP	46.0	-15.9	1.50 V	273	29.9	0.2
6	868.08	35.1 QP	46.0	-10.9	1.25 V	154	30.9	4.2

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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.



4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-Peak	Average
0.15 - 0.5	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30.0	60	50

Note: 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.

4.2.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver ROHDE & SCHWARZ	ESCI	100613	Dec. 11, 2019	Dec. 10, 2020
			Dec. 04, 2020	Dec. 03, 2021
RF signal cable Woken	5D-FB	Cable-cond1-01	Sep. 04, 2020	Sep. 03, 2021
LISN ROHDE & SCHWARZ (EUT)	ENV216	101826	Feb. 20, 2020	Feb. 19, 2021
			Feb. 25, 2021	Feb. 24, 2022
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Aug. 28, 2020	Aug. 27, 2021
Software ADT	BV ADT_Cond_ V7.3.7.4	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 HwaYa Shielded Room 1.
3. The VCCI Site Registration No. is C-12040.

4.2.3 Test Procedures

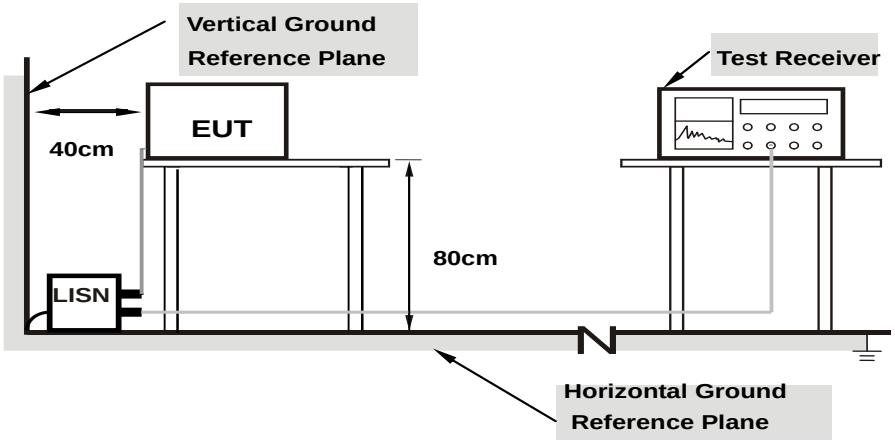
a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/50 uH of coupling impedance for the measuring instrument.
b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
c. The frequency range from 150 kHz to 30 MHz was searched. Emission levels under (Limit – 20 dB) was not recorded.

Note: All modes of operation were investigated and the worst-case emissions are reported.

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



Note: 1.Support units were connected to second LISN.

For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.2.6 EUT Operating Conditions

a. Placed the EUT on a testing table.
b. Use the software to control the EUT under transmission condition continuously at specific channel frequency.

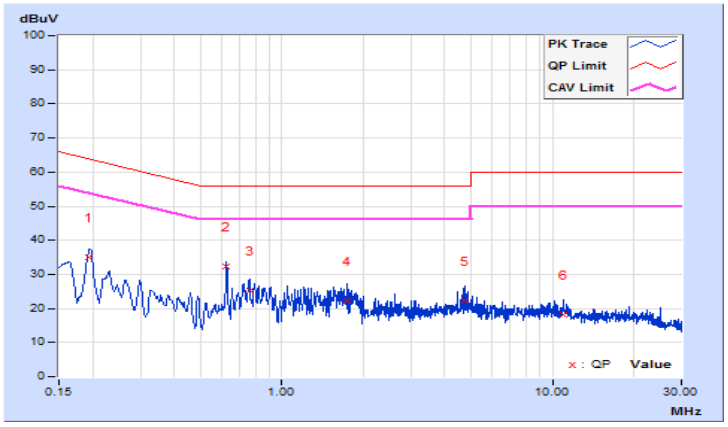
4.2.7 Test Results

Frequency Range	150kHz ~ 30MHz	**Detector Function & Resolution Bandwidth**	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	110Vac, 60Hz	**Environmental Conditions**	22℃, 66%RH
Tested by	Han Wu	**Test Date**	2020/10/5

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	0.19400	9.66	25.50	23.20	35.16	32.86	63.86	53.86	-28.70	-21.00
2	0.62600	9.66	22.74	18.94	32.40	28.60	56.00	46.00	-23.60	-17.40
3	0.75800	9.67	15.49	12.71	25.16	22.38	56.00	46.00	-30.84	-23.62
4	1.73800	9.69	12.51	8.98	22.20	18.67	56.00	46.00	-33.80	-27.33
5	4.77400	9.75	12.51	2.81	22.26	12.56	56.00	46.00	-33.74	-33.44
6	11.03000	9.80	8.31	1.52	18.11	11.32	60.00	50.00	-41.89	-38.68

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

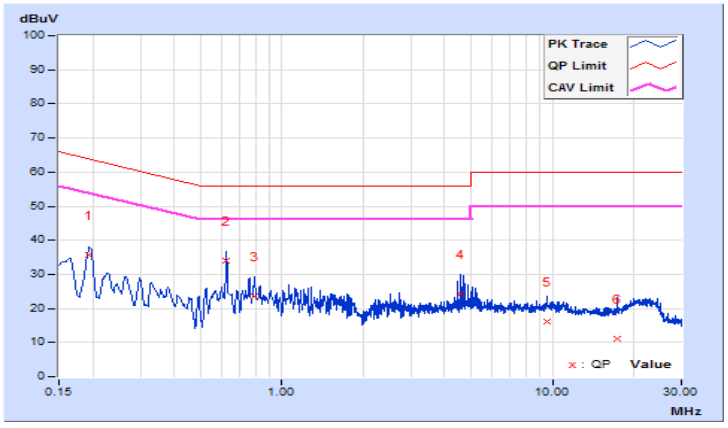


Frequency Range	150kHz ~ 30MHz	**Detector Function & Resolution Bandwidth**	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	110Vac, 60Hz	**Environmental Conditions**	22℃, 66%RH
Tested by	Han Wu	**Test Date**	2020/10/5

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	0.19400	9.68	26.05	23.58	35.73	33.26	63.86	53.86	-28.13	-20.60
2	0.62600	9.68	24.18	19.21	33.86	28.89	56.00	46.00	-22.14	-17.11
3	0.79000	9.69	13.86	11.58	23.55	21.27	56.00	46.00	-32.45	-24.73
4	4.56600	9.78	14.47	2.68	24.25	12.46	56.00	46.00	-31.75	-33.54
5	9.55800	9.83	6.48	0.62	16.31	10.45	60.00	50.00	-43.69	-39.55
6	17.36200	9.95	1.32	0.03	11.27	9.98	60.00	50.00	-48.73	-40.02

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

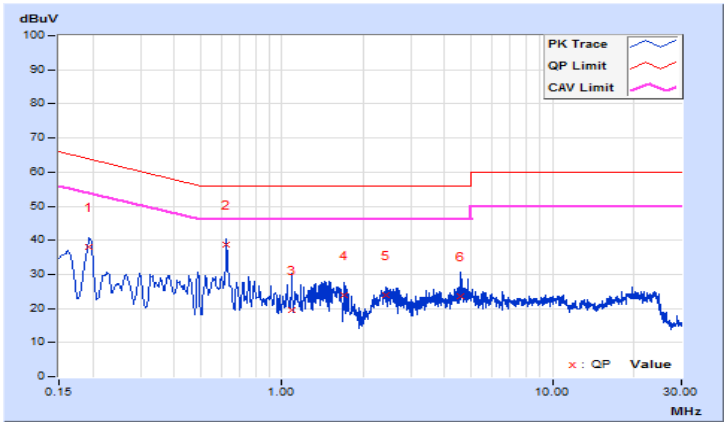


Frequency Range	150kHz ~ 30MHz	**Detector Function & Resolution Bandwidth**	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	240Vac, 60Hz	**Environmental Conditions**	22℃, 66%RH
Tested by	Han Wu	**Test Date**	2020/10/5

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	0.19400	9.66	28.45	25.58	38.11	35.24	63.86	53.86	-25.75	-18.62
2	0.62600	9.66	29.15	25.15	38.81	34.81	56.00	46.00	-17.19	-11.19
3	1.08600	9.67	10.02	7.78	19.69	17.45	56.00	46.00	-36.31	-28.55
4	1.69400	9.69	14.27	9.34	23.96	19.03	56.00	46.00	-32.04	-26.97
5	2.41654	9.71	14.15	9.99	23.86	19.70	56.00	46.00	-32.14	-26.30
6	4.56200	9.74	13.98	5.44	23.72	15.18	56.00	46.00	-32.28	-30.82

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

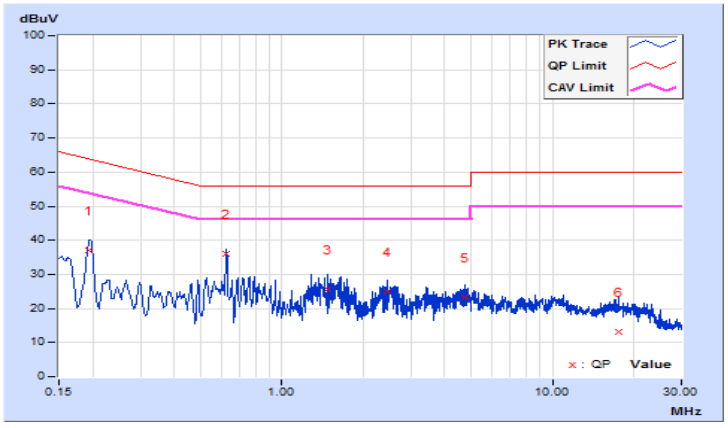


Frequency Range	150kHz ~ 30MHz	**Detector Function & Resolution Bandwidth**	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	240Vac, 60Hz	**Environmental Conditions**	22℃, 66%RH
Tested by	Han Wu	**Test Date**	2020/10/5

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	0.19400	9.68	27.36	25.26	37.04	34.94	63.86	53.86	-26.82	-18.92
2	**0.62550**	**9.68**	**26.47**	**25.43**	**36.15**	**35.11**	**56.00**	**46.00**	**-19.85**	**-10.89**
3	1.47000	9.71	15.89	11.35	25.60	21.06	56.00	46.00	-30.40	-24.94
4	2.45400	9.74	15.26	10.73	25.00	20.47	56.00	46.00	-31.00	-25.53
5	4.76200	9.78	13.42	4.11	23.20	13.89	56.00	46.00	-32.80	-32.11
6	17.49400	9.95	3.20	0.10	13.15	10.05	60.00	50.00	-46.85	-39.95

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

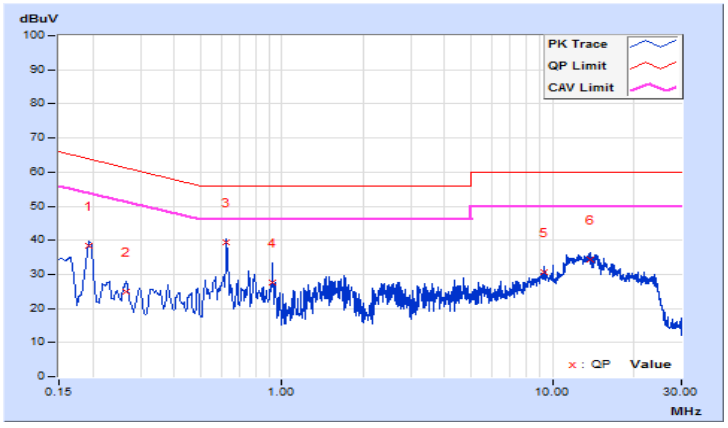


Frequency Range	150kHz ~ 30MHz	**Detector Function & Resolution Bandwidth**	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	277Vac, 60Hz	**Environmental Conditions**	25℃, 75%RH
Tested by	Greg Lin	**Test Date**	2021/3/12

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	0.19400	9.67	28.76	25.17	38.43	34.84	63.86	53.86	-25.43	-19.02
2	0.26600	9.68	15.17	12.89	24.85	22.57	61.24	51.24	-36.39	-28.67
3	0.62600	9.70	29.72	25.05	39.42	34.75	56.00	46.00	-16.58	-11.25
4	0.92600	9.72	17.73	13.85	27.45	23.57	56.00	46.00	-28.55	-22.43
5	9.37400	9.80	20.84	15.40	30.64	25.20	60.00	50.00	-29.36	-24.80
6	13.74600	9.78	24.57	16.79	34.35	26.57	60.00	50.00	-25.65	-23.43

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

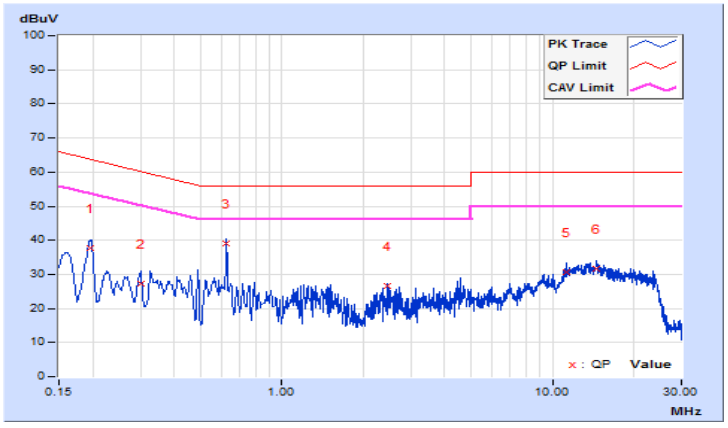


Frequency Range	150kHz ~ 30MHz	**Detector Function & Resolution Bandwidth**	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	277Vac, 60Hz	**Environmental Conditions**	25℃, 75%RH
Tested by	Greg Lin	**Test Date**	2021/3/12

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	0.19624	9.74	27.97	26.28	37.71	36.02	63.77	53.77	-26.06	-17.75
2	0.30200	9.75	17.46	12.71	27.21	22.46	60.19	50.19	-32.98	-27.73
3	0.62600	9.77	29.14	25.11	38.91	34.88	56.00	46.00	-17.09	-11.12
4	2.45000	9.80	16.94	5.34	26.74	15.14	56.00	46.00	-29.26	-30.86
5	11.25000	9.90	20.74	12.06	30.64	21.96	60.00	50.00	-29.36	-28.04
6	14.54200	9.90	21.79	11.73	31.69	21.63	60.00	50.00	-28.31	-28.37

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



5 Pictures of Test Arrangements

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

Appendix – 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 FCC recognized accredited test firms and accredited 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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