

# TEST REPORT

## CERTIFICATE OF CONFORMITY

**Standard:** VCCI-CISPR 32: 2016, Class A  
**Report No.:** VBDBO-WTW-P25030603  
**Product:** QEC  
**Brand:** ICOP Technology Inc.  
**Model No.:** QEC-PPC-M-090T  
**Series Model:** QEC-PPC-M-090TXXX (X=0~9, A~Z, (,), /, - or Blank)  
**Received Date:** 2025/3/20  
**Test Date:** 2025/3/21 ~ 2025/3/25  
**Issued Date:** 2025/5/26  
**Applicant:** ICOP Technology Inc.  
**Address:** No. 15, Wugong 5th., Xinzhuang Dist., New Taipei City 248020, Taiwan  
**Issued By:** Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch  
Lin Kou Laboratories  
**Lab. VCCI Member No:** 395  
**Lab Address:** No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan  
**Test Location:** No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan

**Approved by:**  , **Date:** 2025/5/26  
Jim Hsiang / Associate Technical Manager

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Prepared by : Annie Chang / Senior Specialist



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## Table of Contents

<b>Release Control Record .....</b>	<b>3</b>
<b>1 Certificate.....</b>	<b>4</b>
<b>2 Summary of Test Results .....</b>	<b>5</b>
2.1 Measurement Uncertainty .....	5
2.2 Supplementary Information .....	5
<b>3 General Information .....</b>	<b>6</b>
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 .....	6
3.6 Connection Diagram of EUT and Peripheral Devices .....	7
3.7 Configuration of Peripheral Devices and Cable Connections .....	8
<b>4 Test Instruments .....</b>	<b>9</b>
4.1 Conducted Emissions from Power Ports .....	9
4.2 Conducted Emissions from Wired Network Ports .....	10
4.3 Radiated Emissions up to 1 GHz .....	11
4.4 Radiated Emissions above 1 GHz.....	12
<b>5 Limits of Test Items.....</b>	<b>13</b>
5.1 Conducted Emissions from Power Ports .....	13
5.2 Conducted Emissions from Wired Network Ports .....	13
5.3 Radiated Emissions up to 1 GHz .....	13
5.4 Radiated Emissions above 1 GHz.....	14
<b>6 Test Arrangements.....</b>	<b>15</b>
6.1 Conducted Emissions from Power Ports .....	15
6.2 Conducted Emissions from Wired Network Ports .....	16
6.3 Radiated Emissions up to 1 GHz .....	19
6.4 Radiated Emissions above 1 GHz.....	20
<b>7 Test Results of Test Item .....</b>	<b>21</b>
7.1 Conducted Emissions from Power Ports .....	21
7.2 Conducted Emissions from Wired Network Ports .....	23
7.3 Radiated Emissions up to 1 GHz .....	24
7.4 Radiated Emissions above 1 GHz.....	26
<b>8 Pictures of Test Arrangements .....</b>	<b>28</b>
8.1 Conducted Emissions from Power Ports .....	28
8.2 Conducted Emissions from Wired Network Ports .....	29
8.3 Radiated Emissions up to 1 GHz .....	30
8.4 Radiated Emissions above 1 GHz.....	31
<b>9 Information of the Testing Laboratories .....</b>	<b>32</b>

## Release Control Record

Issue No.	Description	Date Issued
VBDBO-WTW-P25030603	Original release.	2025/5/26

## 1 Certificate

**Product:** QEC

**Brand:** ICOP Technology Inc.

**Test Model:** QEC-PPC-M-090T

**Series Model:** QEC-PPC-M-090TXXX (X=0~9, A~Z, (,), /, - or Blank)

**Sample Status:** Engineering sample

**Applicant:** ICOP Technology Inc.

**Test Date:** 2025/3/21 ~ 2025/3/25

**Standard:** VCCI-CISPR 32: 2016, Class A

**Measurement procedure:** CISPR 32: 2015 (Edition 2.0)

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 need to perform in accordance with its interfaces, evaluated functions, are as follows:

Standard	Test Item	Result	Remark
VCCI-CISPR 32	Conducted Emissions from Power Ports	Pass	Minimum passing Class A margin is -26.64 dB at 2.95956 MHz
VCCI-CISPR 32	Conducted Emissions from Wired Network Ports	Pass	Minimum passing Class A margin is -32.07 dB at 19.70927 MHz
VCCI-CISPR 32	Radiated Emissions up to 1 GHz	Pass	Minimum passing Class A margin is -2.48 dB at 219.02 MHz
VCCI-CISPR 32	Radiated Emissions above 1 GHz	Pass	Minimum passing Class A margin is -15.65 dB at 1440.09 MHz

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	Specification	Expanded Uncertainty (k=2) (±)	Maximum allowable uncertainty (±)
Conducted Emissions from Power Ports	9 kHz ~ 30 MHz	2.9 dB	3.4 dB ( $U_{\text{CISPR}}$ )
Conducted Emissions from Wired Network Ports	150 kHz ~ 30 MHz	ISN Cat3 : 3.0 dB ISN Cat5 : 3.0 dB ISN Cat6 : 3.0 dB Current Probe : 1.56 dB Voltage Probe : 2.90 dB Coaxial : 2.34 dB	5.0 dB ( $U_{\text{CISPR}}$ ) using AAN 2.9 dB ( $U_{\text{CISPR}}$ ) using CP 3.9 dB ( $U_{\text{CISPR}}$ ) using CVP
Radiated Emissions up to 1 GHz	30 MHz ~ 1 GHz	3m : 5.54 dB 10m : 4.16 dB	6.3 dB ( $U_{\text{CISPR}}$ )
Radiated Emissions above 1 GHz	1 GHz ~ 6 GHz	4.64 dB	5.2 dB ( $U_{\text{CISPR}}$ )

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

### 2.2 Supplementary Information

There is not any deviation from the test standards for the test method, and no modifications required for compliance.

### 3 General Information

#### 3.1 Description of EUT

Product	QEC
Brand	ICOP Technology Inc.
Test Model	QEC-PPC-M-090T
Series Model	QEC-PPC-M-090TXXX (X=0~9, A~Z, (,), /, - or Blank)
Model Difference	Marketing Differentiation
Sample Status	Engineering sample
Power Supply Rating	DC 24V, 0.65A

#### 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 533 MHz, provided by ICOP Technology Inc., 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 ICOP Technology Inc., for detailed feature description, please refer to the manufacturer's specifications or user's manual.

Please refer to appendix of the report if the applicant has provided additional descriptions of the EUT.

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

The EUT has been pre-tested under following test modes.

Test Condition	
Mode	Radiated Emissions up to 1 GHz
1	Full system + Input Power(24 Vdc)
Note: There are both standby mode and normal mode to be pre-tested then normal mode has the highest emission value.	

Test modes are presented in the report as below.

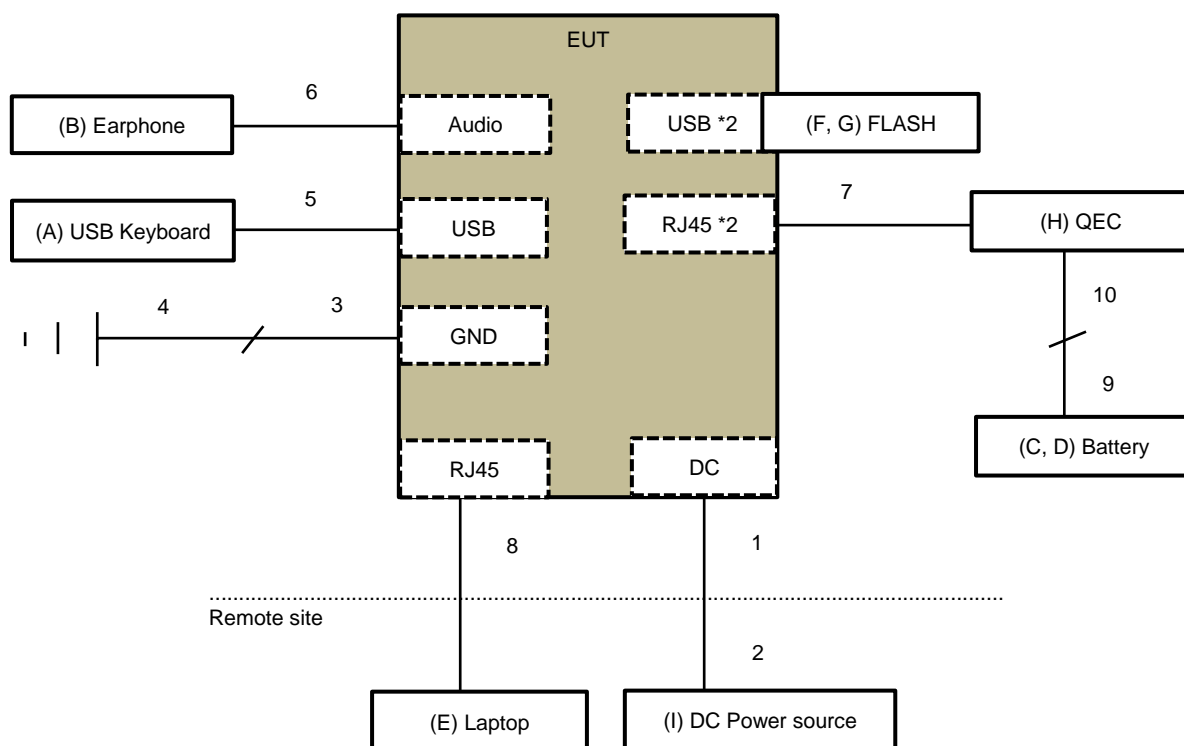
Test Condition	
Mode	Conducted Emissions from Power Ports
A	Full system + Input Power(24 Vdc)
Mode	Conducted Emissions from Wired Network Ports
A	Full system + For Lan 1Gbps link test + Input Power(24 Vdc)
Note: The idle mode of conducted emission test at wired network ports test was pre-tested based on the worst case of link mode. Due to emissions of idle mode being very low compared to link mode, only the link mode data were presented in the test report.	
Mode	Radiated Emissions up to 1 GHz
A	Full system + Input Power(24 Vdc)
Mode	Radiated Emissions above 1 GHz
A	Full system + Input Power(24 Vdc)

#### 3.5 Test Program Used and Operation Descriptions

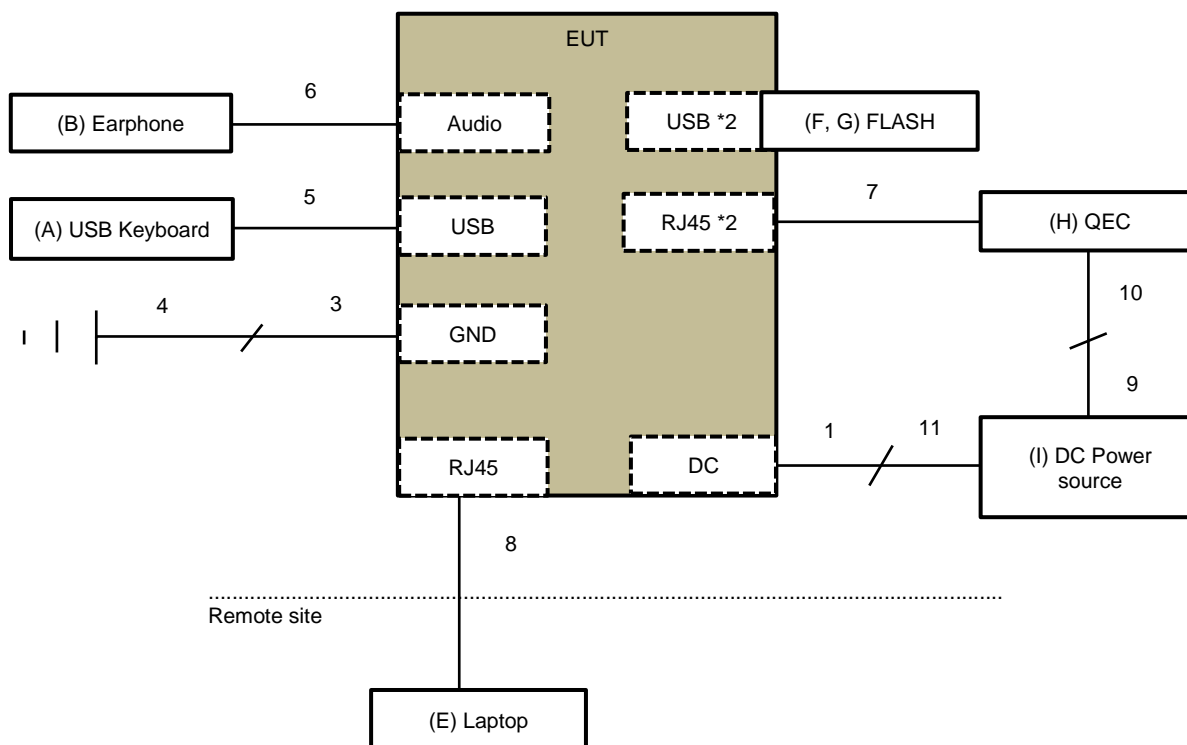
- Turned on the power of all equipment.
- EUT ran test program to enable all functions.
- EUT read and wrote messages to/ from internal and external storage devices.
- Laptop and QEC system sent and received messages to/ from EUT via LAN cable.
- EUT sent ( H ) messages to panel, then the displayed messages on its screen.

### 3.6 Connection Diagram of EUT and Peripheral Devices

#### For Conduction



#### For Radiated



### 3.7 Configuration of Peripheral Devices and Cable Connections

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A	USB Keyboard	Dell	KB216t	CN-0W33XP- LO300-7CL-191E	N/A	Provided by Lab
B	EARPHONE	PHILIPS	SBC HL150	H2010153	N/A	Provided by Lab
C	Battery	GS	60044-MFZ	N/A	N/A	Provided by Lab
D	Battery	GS	60044 MF-PLUS	N/A	N/A	Provided by Lab
E	Laptop	LENOVO	T480	PF1EK03U	N/A	Provided by Lab
F	FLASH	ICOP	JETFLASH890- 32G	N/A	N/A	Supplied by applicant
G	FLASH	ICOP	JETFLASH890- 32G	N/A	N/A	Supplied by applicant
H	QEC	ICOP	QEC-R11D88D-C	N/A	N/A	Supplied by applicant
I	DC Power source	Chroma	62024P-80-60	62024PA03093	N/A	Provided by Lab

ID	Cable Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1	Power	1	0.3	N	0	Supplied by applicant
2	Power	1	10	N	0	Provided by Lab
3	GND	1	0.3	N	0	Supplied by applicant
4	GND	1	1.5	N	0	Provided by Lab
5	USB	1	1.8	Y	0	Provided by Lab
6	Audio	1	1.2	N	0	Provided by Lab
7	Cat. 5e	2	1	N	0	Supplied by applicant
8	Cat. 5e	1	10	N	0	Provided by Lab
9	Power	1	1.5	N	0	Provided by Lab
10	Power	1	0.3	N	0	Supplied by applicant
11	Power	1	1.5	N	0	Provided by Lab



## 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.	Calibrated Date	Calibrated Until
50 ohm terminal resistance LYNICS	0900510	E1-011284	2024/9/16	2025/9/15
		E1-011285	2024/9/25	2025/9/24
Coupling / Decoupling Network Schwarzbeck	CDNE-M2	00097	2024/5/28	2025/5/27
	CDNE-M3	00091	2025/3/20	2026/3/19
EMI Test Receiver R&S	ESR3	102413	2025/1/22	2026/1/21
Fixed Attenuator EMEC	EM-ATT30002602NN	N/A	2025/3/21	2026/3/20
Fixed Attenuator STI	STI02-2200-10	NO.3	2024/10/19	2025/10/18
High Voltage Probe Schwarzbeck	TK9420	00982	2024/12/6	2025/12/5
Isolation Transformer Erika Fiedler	D-65396	017	2024/9/18	2025/9/17
LISN R&S	ENV216	101196	2024/5/22	2025/5/21
	ESH3-Z5	100220	2024/11/21	2025/11/20
LISN Schwarzbeck	NNLK 8121	8121-731	2024/6/12	2025/6/11
		8121-808	2024/4/26	2025/4/25
	NNLK 8129	8129229	2024/10/14	2025/10/13
RF Coaxial Cable PEWC	5D-FB	Cable-CO3-01	2024/9/12	2025/9/11
Software BVADT	Cond_V7.4.1.0	N/A	N/A	N/A

Notes:

1. The test was performed in Linkou Conduction 3.
2. The VCCI Site Registration No. C-10274.
3. Tested Date: 2025/3/21

## 4.2 Conducted Emissions from Wired Network Ports

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
50 ohm terminal resistance LYNICS	0900510	E1-011284	2024/9/16	2025/9/15
		E1-011285	2024/9/25	2025/9/24
Capacitive Voltage Probe FCC	F-CVP-1	94	2024/3/22	2025/3/21
Coupling / Decoupling Network TESEQ	CDN A201A	44601	2024/12/30	2025/12/29
DC LISN R&S	ESH3-Z6	100219	2024/7/19	2025/7/18
		844950/018	2024/7/19	2025/7/18
EMI Test Receiver R&S	ESR3	102413	2025/1/22	2026/1/21
Impedance Stabilization Network FCC	F-071115-1057-1	20651	2025/3/12	2026/3/11
		20652	2025/1/2	2026/1/1
Impedance Stabilization Network TESEQ	ISN S751	40599	2024/8/15	2025/8/14
	ISN ST08	41212	2024/9/9	2025/9/8
	ISN T8-Cat.6	53159	2024/6/18	2025/6/17
Isolation Transformer Erika Fiedler	D-65396	017	2024/9/18	2025/9/17
LISN R&S	ENV216	101196	2024/5/22	2025/5/21
	ESH3-Z5	100220	2024/11/21	2025/11/20
LISN Schwarzbeck	NNLK 8121	8121-731	2024/6/12	2025/6/11
	NNLK 8129	8129229	2024/10/14	2025/10/13
Matching Pad EMCI	EMCI-3PDSM75BF	N/A	2024/12/17	2025/12/16
RF Coaxial Cable PEWC	5D-FB	Cable-CO3-01	2024/9/12	2025/9/11
RF Current Probe FCC	F-33-4	56	2024/8/5	2025/8/4
Software BVADT	ISN_V7.4.1.0	N/A	N/A	N/A

### Notes:

1. The test was performed in Linkou Conduction 3 (ISN 3).
2. The VCCI Site Registration No. T-11651.
3. Tested Date: 2025/3/21

### 4.3 Radiated Emissions up to 1 GHz

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
ADT. Tower	AT100	0205	N/A	N/A
ADT. Turn Table	TT100	0205	N/A	N/A
Bi_Log Antenna Schwarzbeck	VULB 9168	9168-303	2024/10/14	2025/10/13
Coupling / Decoupling Network Schwarzbeck	CDNE-M2	00097	2024/5/28	2025/5/27
	CDNE-M3	00091	2025/3/20	2026/3/19
EMI Test Receiver R&S	ESCS 30	100276	2024/4/24	2025/4/23
Fixed Attenuator Mini-Circuits	UNAT-5+	PAD-ST2-01	2024/10/19	2025/10/18
Preamplifier HP	8447D	2727A05786	2025/2/14	2026/2/13
RF Coaxial Cable Pacific	8D-FB	Cable-ST2-01	2024/11/6	2025/11/5
Software BVADT	Radiated_V8.8.09	N/A	N/A	N/A

Notes:

1. The test was performed in Linkou Open Site2 , The test site validated date: 2024/7/13 (NSA)
2. The VCCI Site Registration No. R-10237.
3. Tested Date: 2025/3/24

#### 4.4 Radiated Emissions above 1 GHz

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Fix tool for Boresight antenna tower BV	BAF-01	9	N/A	N/A
Fixed Attenuator Mini-Circuits	BW-K3-2W44+	PAD-CH7-03	2024/7/5	2025/7/4
	BW-N4W5+	PAD-CH10-02	2024/7/5	2025/7/4
Horn Antenna EMCO	3115	6714	2024/11/10	2025/11/9
Horn Antenna ETS-Lindgren	3117-PA	00215857	2024/11/10	2025/11/9
Horn Antenna Schwarzbeck	BBHA 9170	BBHA9170190	2024/11/10	2025/11/9
MXA Signal Analyzer Keysight	N9020B	MY60110438	2024/12/5	2025/12/4
		MY60112260	2024/5/29	2025/5/28
Notch Filter Micro-Tronics	BRC50703-01	010	2024/5/24	2025/5/23
	BRM17690	005	2024/5/24	2025/5/23
Preamplifier EMCI	EMC0126545	980076	2025/2/14	2026/2/13
	EMC184045B	980235	2025/2/14	2026/2/13
Preamplifier HP	8449B	3008A01292	2025/2/14	2026/2/13
RF Coaxial Cable EMEC	EM102-KMKM-100	02	2024/7/5	2025/7/4
	EM102-KMKM-350	01	2024/7/5	2025/7/4
Software BVADT	Radiated_V8.8.09	N/A	N/A	N/A
Turn Table & Tower Max Full	MF7802	MF780208216	N/A	N/A

Notes:

1. The test was performed in Linkou 966 Chamber 3 (CH 10).
2. The VCCI Site Registration No. G-10427.
3. Tested Date: 2025/3/25

## 5 Limits of Test Items

### 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
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	60	50

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

2. The limit decreases linearly with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.

### 5.2 Conducted Emissions from Wired Network Ports

Frequency (MHz)	Coupling Device	Class A				Class B			
		Voltage Limit (dBuV)		Current limits (dBA)		Voltage Limit (dBuV)		Current limits (dBA)	
		Quasi-peak	Average	Quasi-peak	Average	Quasi-peak	Average	Quasi-peak	Average
0.15-0.5	Using AAN	97-87	84-74	-	-	84-74	74-64	-	-
0.5-30		87	74	-	-	74	64	-	-
0.15-0.5	Using CVP and Current probe	97-87	84-74	53-43	40-30	84-74	74-64	40-30	30-20
0.5-30		87	74	43	30	74	64	30	20
0.15-0.5	Current probe	-	-	53-43	40-30	-	-	40-30	30-20
0.5-30		-	-	43	30	-	-	30	20

Note: The limits decrease linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

### 5.3 Radiated Emissions up to 1 GHz

Frequency (MHz)	Class A Quasi-peak (dBuV/m)		Class B Quasi-peak (dBuV/m)	
	at 3m	at 10m	at 3m	at 10m
30 - 230	50	40	40	30
230 - 1000	57	47	47	37

#### For radiated emissions from FM receivers only (Measurement Facility: OATS/SAC)

Frequency (MHz)	Fundamental (dBuV/m)		Harmonics (dBuV/m)	
	at 3m	at 10m	at 3m	at 10m
30 - 230	60	50	52	42
230 - 300	60	50	52	42
300 - 1000	60	50	56	46

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

2. Emission level (dBuV/m) = 20 log Emission level (uV/m).

3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

#### 5.4 Radiated Emissions above 1 GHz

Frequency (GHz)	Class A (dBuV/m) (at 3m)		Class B (dBuV/m) (at 3m)	
	Average	Peak	Average	Peak
1 to 3	56	76	50	70
3 to 6	60	80	54	74

- Notes: 1. The lower limit shall apply at the transition frequencies.  
 2. Emission level (dBuV/m) = 20 log Emission level (uV/m).  
 3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

#### Frequency Range of Radiated Measurement (For unintentional radiators)

Highest internal frequency ( $F_x$ )	Highest measurement frequency ( $F_m$ ) (GHz)
$F_x \leq 108 \text{ MHz}$	1
$108 \text{ MHz} < F_x \leq 500 \text{ MHz}$	2
$500 \text{ MHz} < F_x \leq 1 \text{ GHz}$	5
$F_x > 1 \text{ GHz}$	5 x $F_x$ up to a maximum of 6 GHz

$F_x$  is the highest fundamental frequency generated and/or used in the ITE or digital apparatus under test.

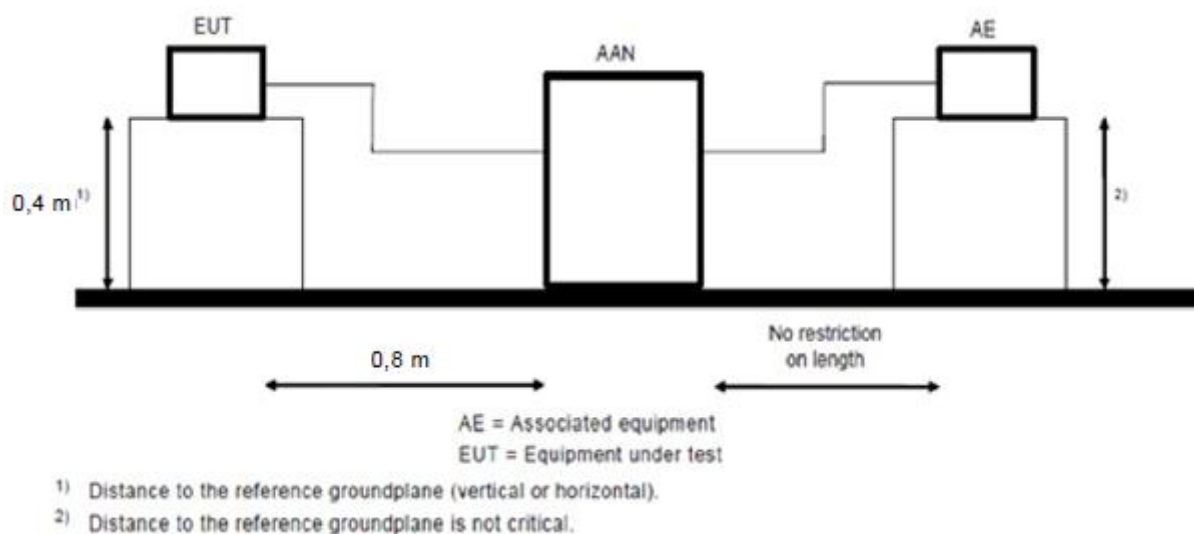


## 6.2 Conducted Emissions from Wired Network Ports

### Method of Using AANs:

- The EUT is placed 0.4 meters from the conducting wall of the shielded room and connected to AAN directly to reference ground plane.
- If voltage measurement is used, measure voltage at the measurement port of the AAN, correct the reading by adding the AAN voltage division factor, and compare to the voltage limit.
- It is not necessary to apply the current limit if a AAN is used.
- The test results of disturbance at telecommunication ports are recorded of six worst margins for quasi-peak (mandatory) [and average (if necessary)] values against the limits at frequencies of interest unless the margin is 20 dB or greater.

Note: The resolution bandwidth and video bandwidth of test receiver is 9 kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15 MHz-30 MHz.



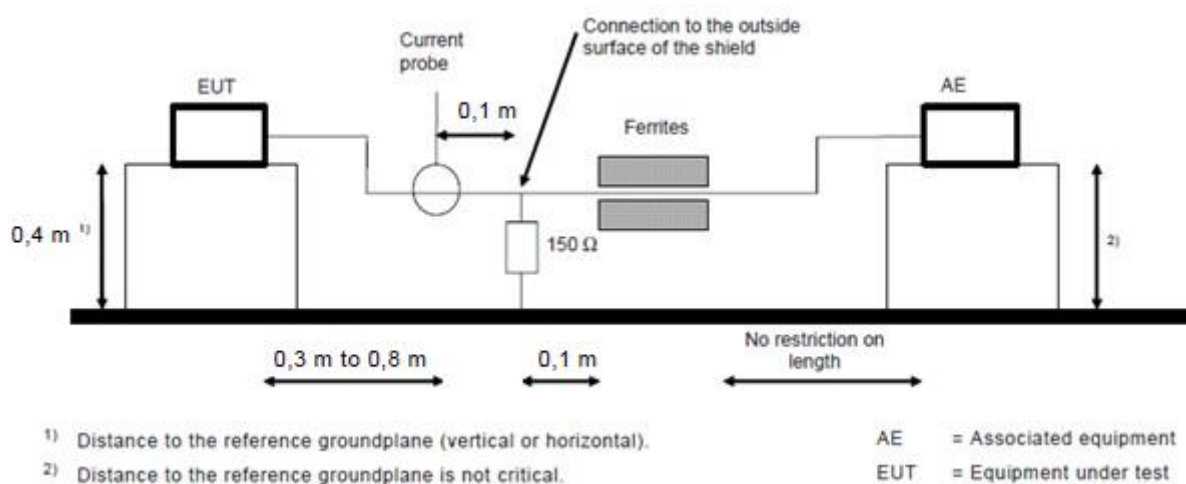
For the actual test configuration, please refer to the related Item – Photographs of the Test Configuration.



### Method of Using a combination of Current Probe and 150 $\Omega$ load to the outside surface of the shielding cable:

- Breaks the external protective insulation (exposing the shield) and connect a 150 $\Omega$  resistor from the outside surface of the shield to ground.
- A current probe shall be placed at 0.1 m from the 150 $\Omega$  resistor. The current probe to EUT horizontal distance is between 0.3 m to 0.8 m.
- If current measurement is used, measure current at the measurement port of the current probe, correct the reading by adding the current probe division factor, and compare to the current limit.
- It is not necessary to apply the voltage limit if a current probe is used.
- The test results of disturbance at telecommunication ports are recorded of six worst margins for quasi-peak (mandatory) [and average (if necessary)] values against the limits at frequencies of interest unless the margin is 20 dB or greater.

Note: The resolution bandwidth and video bandwidth of test receiver is 9 kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15 MHz-30 MHz.

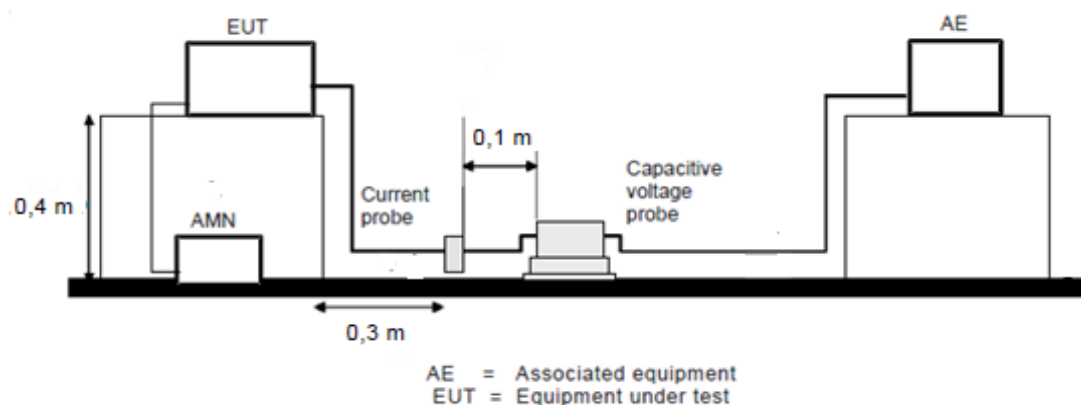


For the actual test configuration, please refer to the related Item – Photographs of the Test Configuration.

### Method of Using a combination of current probe and capacitive voltage probe:

- a. Measure current with a current probe.
- b. Compare the measured current with the applicable current limit.
- c. Measure voltage with a capacitive voltage probe as specified in 5.2.2 of CISPR 16-1-2.
- d. Adjust the measured voltage as follows:
  - current margin  $\leq 6$  dB – subtract the actual current margin from measured voltage;
  - current margin  $> 6$  dB – subtract 6 dB from measured voltage.
- e. Compare adjusted voltage with the applicable voltage limit
- f. Both the measured current and the adjusted voltage shall be below the applicable
- g. The test results of disturbance at telecommunication ports are recorded of six worst margins for quasi-peak (mandatory) [and average (if necessary)] values against the limits at frequencies of interest unless the margin is 20 dB or greater.

Note: The resolution bandwidth and video bandwidth of test receiver is 9 kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15 MHz-30 MHz.

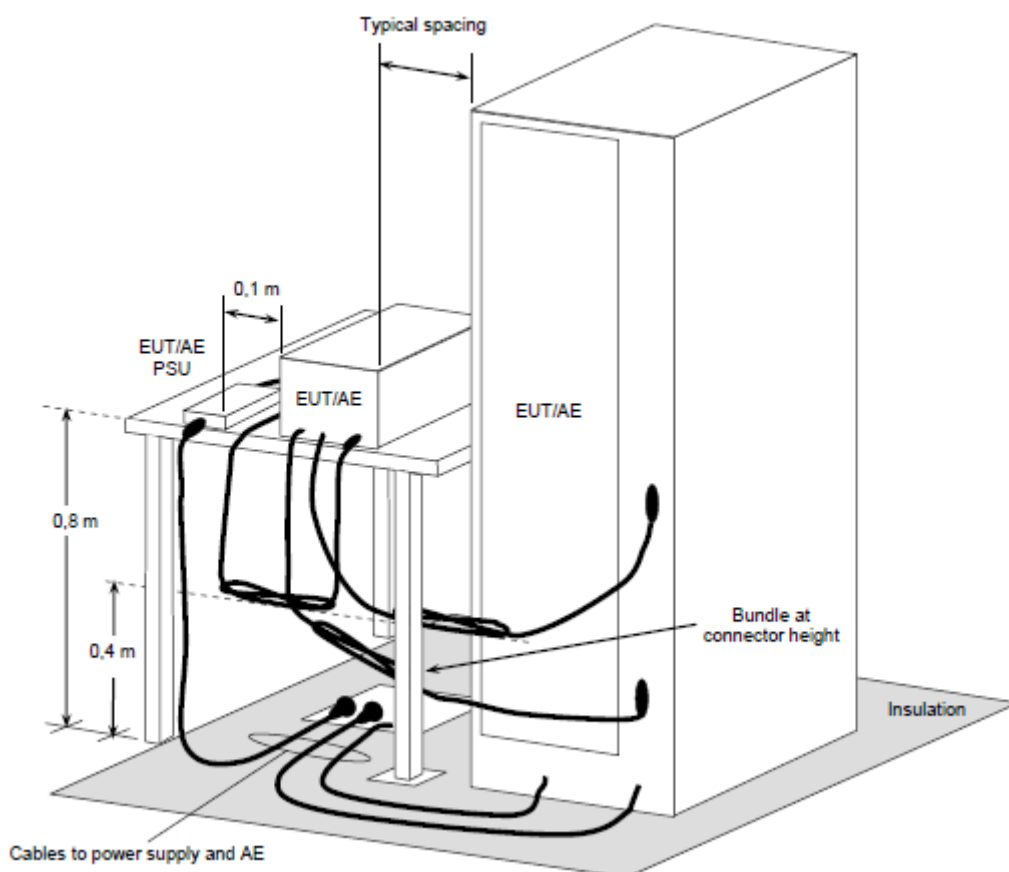


For the actual test configuration, please refer to the related Item – Photographs of the Test Configuration.

### 6.3 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 floor standing EUT shall be insulated (by insulation of maximum thickness of 150 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 is set 10 meters away from the interference-receiving antenna, which is 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 is arranged to its worst case and then the antenna is tuned to heights from 1 m to 4 m and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system is 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 120 kHz for quasi-peak detection (QP) at frequency up to 1 GHz.

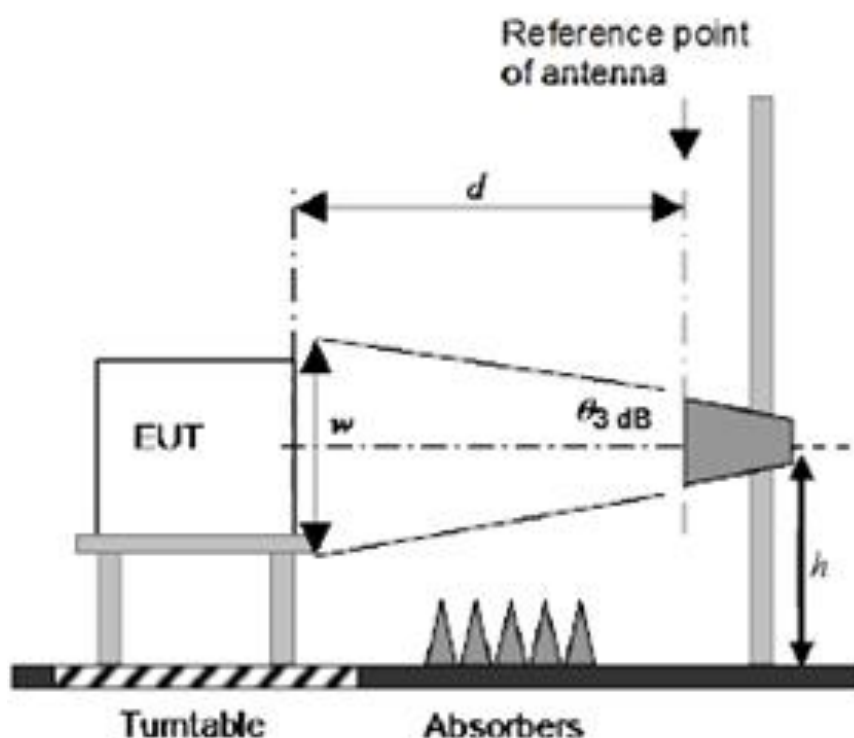


For the actual test configuration, please refer to the related Item – Photographs of the Test Configuration.

#### 6.4 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 floor standing EUT shall be insulated (by insulation of maximum thickness of 150 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 3 dB 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 1 MHz and video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1 GHz. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz for Average detection (AV) at frequency above 1 GHz.



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

## 7 Test Results of Test Item

### 7.1 Conducted Emissions from Power Ports

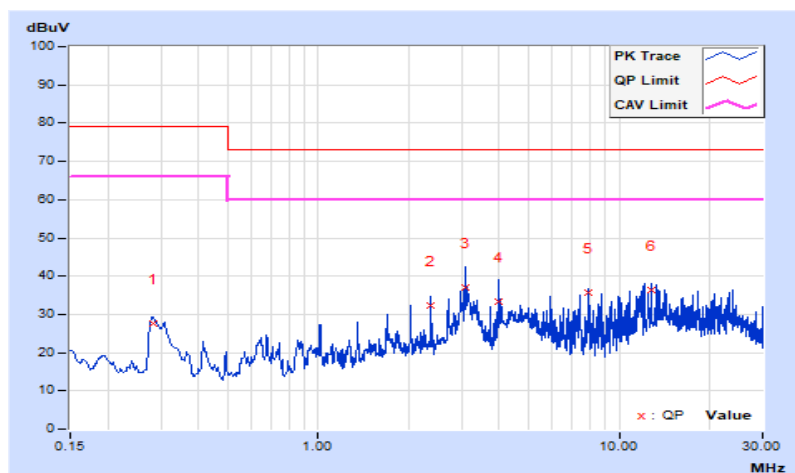
#### Mode A

Frequency Range	150 kHz ~ 30 MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
Input Power	24 Vdc	Environmental Conditions	20 °C, 51 % RH, 1011.7 mbar
Tested by	Abraham Sun		

Phase Of Power : Positive (+)										
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	0.28140	9.98	17.53	13.38	27.51	23.36	79.00	66.00	-51.49	-42.64
2	2.36555	10.07	22.09	21.08	32.16	31.15	73.00	60.00	-40.84	-28.85
3	3.09299	10.09	26.80	9.13	36.89	19.22	73.00	60.00	-36.11	-40.78
4	3.99643	10.12	23.32	6.58	33.44	16.70	73.00	60.00	-39.56	-43.30
5	7.92152	10.21	25.40	21.32	35.61	31.53	73.00	60.00	-37.39	-28.47
6	12.74769	10.32	25.93	21.49	36.25	31.81	73.00	60.00	-36.75	-28.19

#### 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

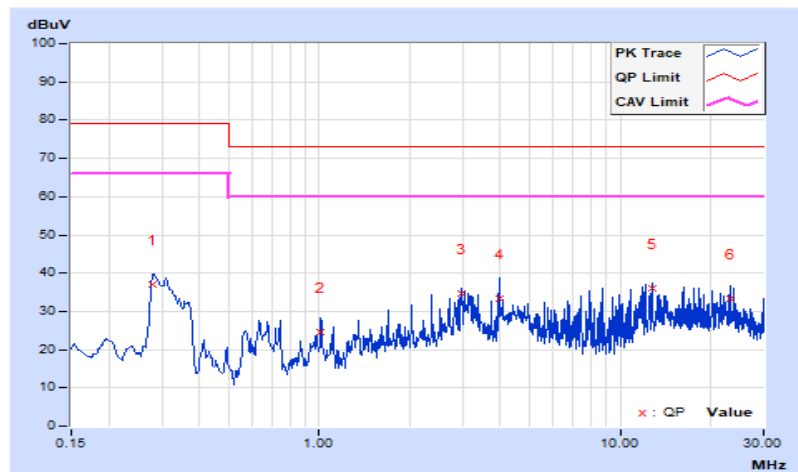


Frequency Range	150 kHz ~ 30 MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
Input Power	24 Vdc	Environmental Conditions	20 °C, 51 % RH, 1011.8 mbar
Tested by	Abraham Sun		

Phase Of Power : Negative (-)										
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	0.27906	9.97	27.05	18.09	37.02	28.06	79.00	66.00	-41.98	-37.94
2	1.01234	10.02	14.50	13.96	24.52	23.98	73.00	60.00	-48.48	-36.02
3	2.95956	10.09	24.74	23.27	34.83	33.36	73.00	60.00	-38.17	-26.64
4	3.96906	10.12	23.29	10.95	33.41	21.07	73.00	60.00	-39.59	-38.93
5	12.74769	10.31	25.64	21.29	35.95	31.60	73.00	60.00	-37.05	-28.40
6	23.13140	10.47	23.01	18.81	33.48	29.28	73.00	60.00	-39.52	-30.72

#### 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 Conducted Emissions from Wired Network Ports

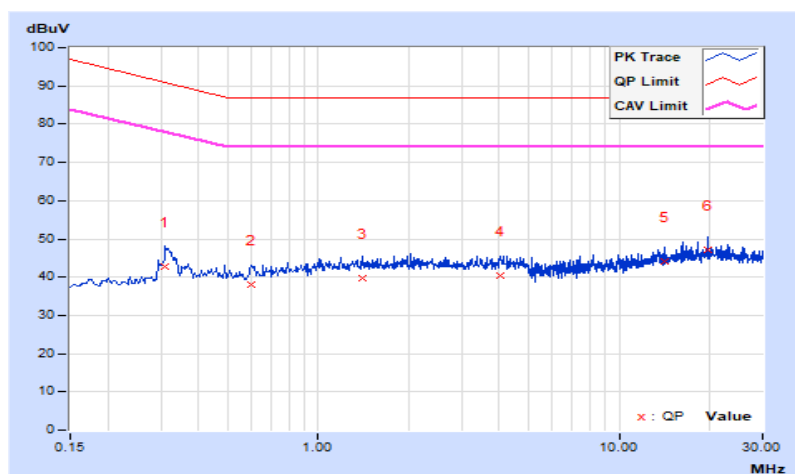
### Mode A

Frequency Range	150 kHz ~ 30 MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
Input Power	24 Vdc	Environmental Conditions	20 °C, 51 % RH, 1011.6 mbar
Tested by	Abraham Sun		

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	0.31022	9.58	33.10	25.38	42.68	34.96	90.96	77.96	-48.28	-43.00
2	0.59777	9.41	28.73	23.16	38.14	32.57	87.00	74.00	-48.86	-41.43
3	1.39562	9.27	30.39	24.82	39.66	34.09	87.00	74.00	-47.34	-39.91
4	4.04728	9.19	31.22	25.61	40.41	34.80	87.00	74.00	-46.59	-39.20
5	14.21040	9.55	34.42	28.91	43.97	38.46	87.00	74.00	-43.03	-35.54
6	19.70927	9.83	37.40	32.10	47.23	41.93	87.00	74.00	-39.77	-32.07

#### 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



### 7.3 Radiated Emissions up to 1 GHz

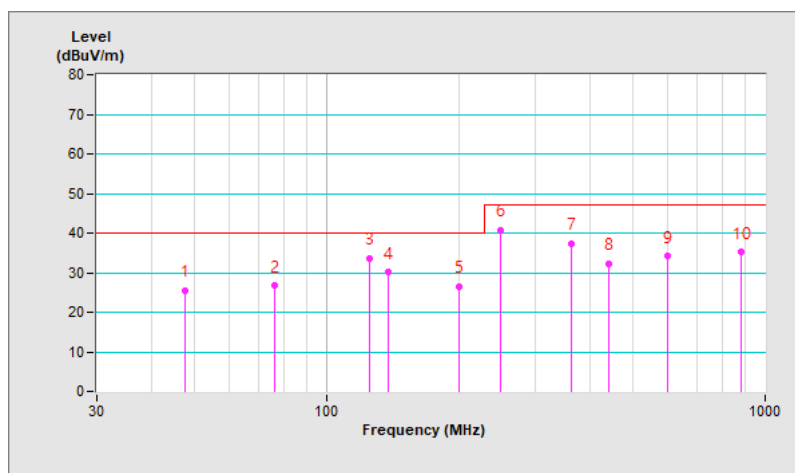
#### Mode A

Frequency Range	30 MHz ~ 1 GHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP), 120 kHz
Input Power	24 Vdc	Environmental Conditions	24 °C, 75 % RH, 1000 mbar
Tested By	Kobe Lu		

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	47.69	25.46 QP	40.00	-14.54	4.00 H	360	33.55	-8.09
2	76.40	26.62 QP	40.00	-13.38	4.00 H	344	38.91	-12.29
3	125.05	33.53 QP	40.00	-6.47	4.00 H	149	42.48	-8.95
4	138.50	30.01 QP	40.00	-9.99	4.00 H	265	37.94	-7.93
5	200.11	26.57 QP	40.00	-13.43	4.00 H	153	37.18	-10.61
6	250.14	40.77 QP	47.00	-6.23	4.00 H	310	48.62	-7.85
7	360.54	37.22 QP	47.00	-9.78	3.79 H	121	42.02	-4.80
8	440.00	32.22 QP	47.00	-14.78	2.20 H	287	35.16	-2.94
9	600.23	34.12 QP	47.00	-12.88	1.15 H	322	33.71	0.41
10	878.33	35.10 QP	47.00	-11.90	1.00 H	148	29.64	5.46

#### 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.



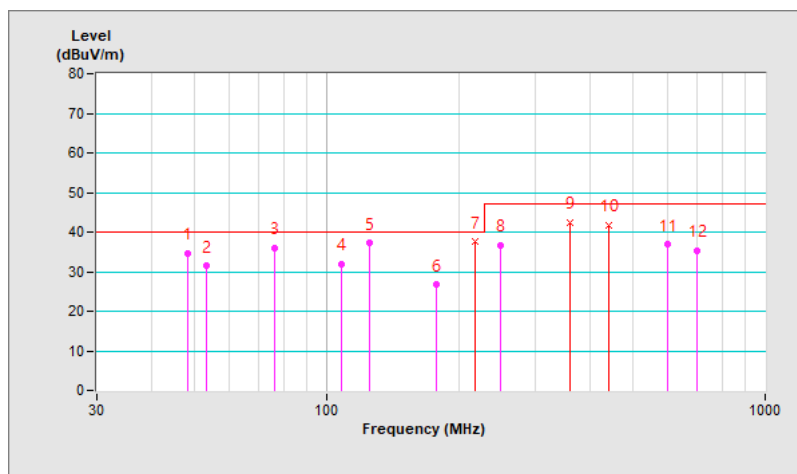


Frequency Range	30 MHz ~ 1 GHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP), 120 kHz
Input Power	24 Vdc	Environmental Conditions	24 °C, 75 % RH, 1000 mbar
Tested By	Kobe Lu		

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	48.41	34.55 QP	40.00	-5.45	1.00 V	91	42.63	-8.08
2	53.20	31.37 QP	40.00	-8.63	1.00 V	132	39.61	-8.24
3	76.40	35.96 QP	40.00	-4.04	1.00 V	181	48.25	-12.29
4	108.31	31.90 QP	40.00	-8.10	1.00 V	344	42.73	-10.83
5	125.11	37.12 QP	40.00	-2.88	1.00 V	220	46.07	-8.95
6	178.46	26.63 QP	40.00	-13.37	1.00 V	270	35.11	-8.48
7	219.02	37.52 QP	40.00	-2.48	1.00 V	265	47.93	-10.41
8	250.03	36.75 QP	47.00	-10.25	1.00 V	101	44.60	-7.85
9	360.12	42.52 QP	47.00	-4.48	1.26 V	304	47.34	-4.82
10	440.86	41.71 QP	47.00	-5.29	3.70 V	351	44.62	-2.91
11	600.55	36.85 QP	47.00	-10.15	2.53 V	77	36.43	0.42
12	700.01	35.25 QP	47.00	-11.75	2.51 V	123	33.12	2.13

#### 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.



## 7.4 Radiated Emissions above 1 GHz

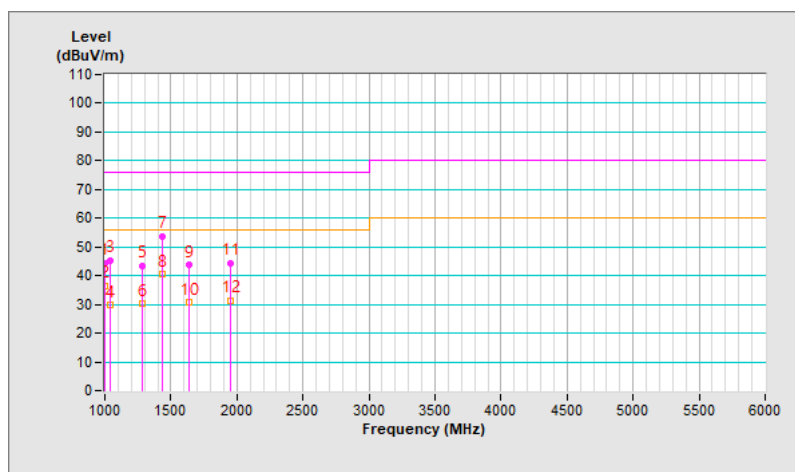
### Mode A

Frequency Range	1 GHz ~ 5 GHz	Detector Function & Resolution Bandwidth	Peak (PK) / Average (AV), 1 MHz
Input Power	24 Vdc	Environmental Conditions	22 °C, 66 % RH, 999.4 mbar
Tested By	Abraham Sun		

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	1000.07	44.20 PK	76.00	-31.80	1.02 H	218	49.97	-5.77
2	1000.07	36.49 AV	56.00	-19.51	1.02 H	218	42.26	-5.77
3	1039.33	45.12 PK	76.00	-30.88	1.57 H	360	50.87	-5.75
4	1039.33	29.60 AV	56.00	-26.40	1.57 H	360	35.35	-5.75
5	1282.00	43.28 PK	76.00	-32.72	1.38 H	83	47.11	-3.83
6	1282.00	30.08 AV	56.00	-25.92	1.38 H	83	33.91	-3.83
7	1440.09	53.56 PK	76.00	-22.44	1.54 H	202	57.31	-3.75
8	<b>1440.09</b>	<b>40.35 AV</b>	<b>56.00</b>	<b>-15.65</b>	<b>1.54 H</b>	<b>202</b>	<b>44.10</b>	<b>-3.75</b>
9	1638.00	43.68 PK	76.00	-32.32	1.66 H	131	46.42	-2.74
10	1638.00	30.64 AV	56.00	-25.36	1.66 H	131	33.38	-2.74
11	1956.17	44.19 PK	76.00	-31.81	1.05 H	188	45.84	-1.65
12	1956.17	31.41 AV	56.00	-24.59	1.05 H	188	33.06	-1.65

### 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.

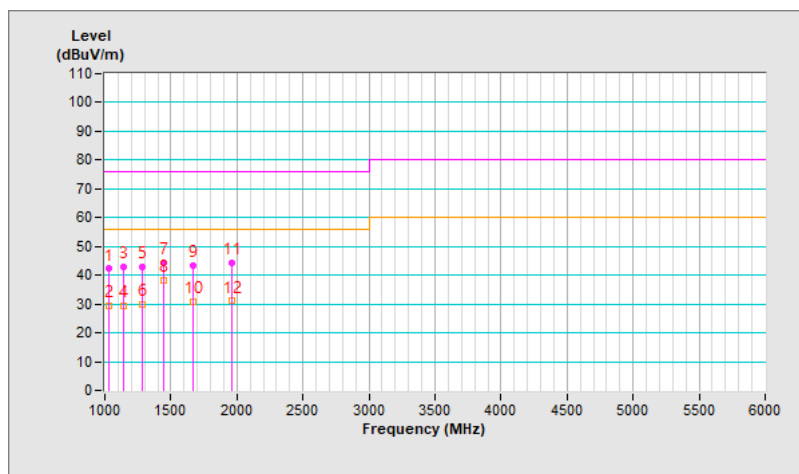


Frequency Range	1 GHz ~ 5 GHz	Detector Function & Resolution Bandwidth	Peak (PK) / Average (AV), 1 MHz
Input Power	24 Vdc	Environmental Conditions	22 °C, 66 % RH, 999.6 mbar
Tested By	Abraham Sun		

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	1035.17	42.19 PK	76.00	-33.81	1.84 V	267	47.93	-5.74
2	1035.17	29.43 AV	56.00	-26.57	1.84 V	267	35.17	-5.74
3	1137.50	42.83 PK	76.00	-33.17	1.35 V	347	47.49	-4.66
4	1137.50	29.37 AV	56.00	-26.63	1.35 V	347	34.03	-4.66
5	1282.33	42.79 PK	76.00	-33.21	1.72 V	354	46.62	-3.83
6	1282.33	29.98 AV	56.00	-26.02	1.72 V	354	33.81	-3.83
7	1441.50	44.43 PK	76.00	-31.57	1.23 V	179	48.18	-3.75
8	1441.50	38.24 AV	56.00	-17.76	1.23 V	179	41.99	-3.75
9	1671.83	43.26 PK	76.00	-32.74	2.00 V	72	45.94	-2.68
10	1671.83	30.67 AV	56.00	-25.33	2.00 V	72	33.35	-2.68
11	1965.17	44.29 PK	76.00	-31.71	1.47 V	4	45.86	-1.57
12	1965.17	31.09 AV	56.00	-24.91	1.47 V	4	32.66	-1.57

#### Remarks:

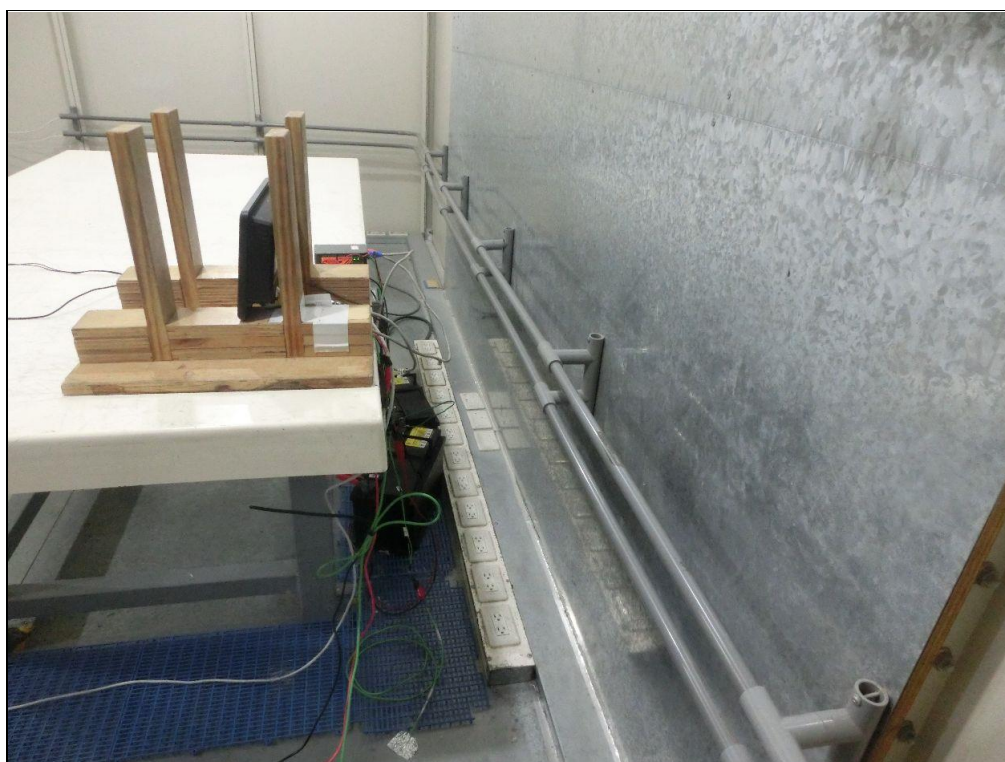
- Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
- Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)  
– Pre-Amplifier Factor (dB)
- Margin value = Emission level – Limit value
- The other emission levels were very low against the limit.



## 8 Pictures of Test Arrangements

### 8.1 Conducted Emissions from Power Ports

#### Mode A





## 8.2 Conducted Emissions from Wired Network Ports

### Mode A



### 8.3 Radiated Emissions up to 1 GHz

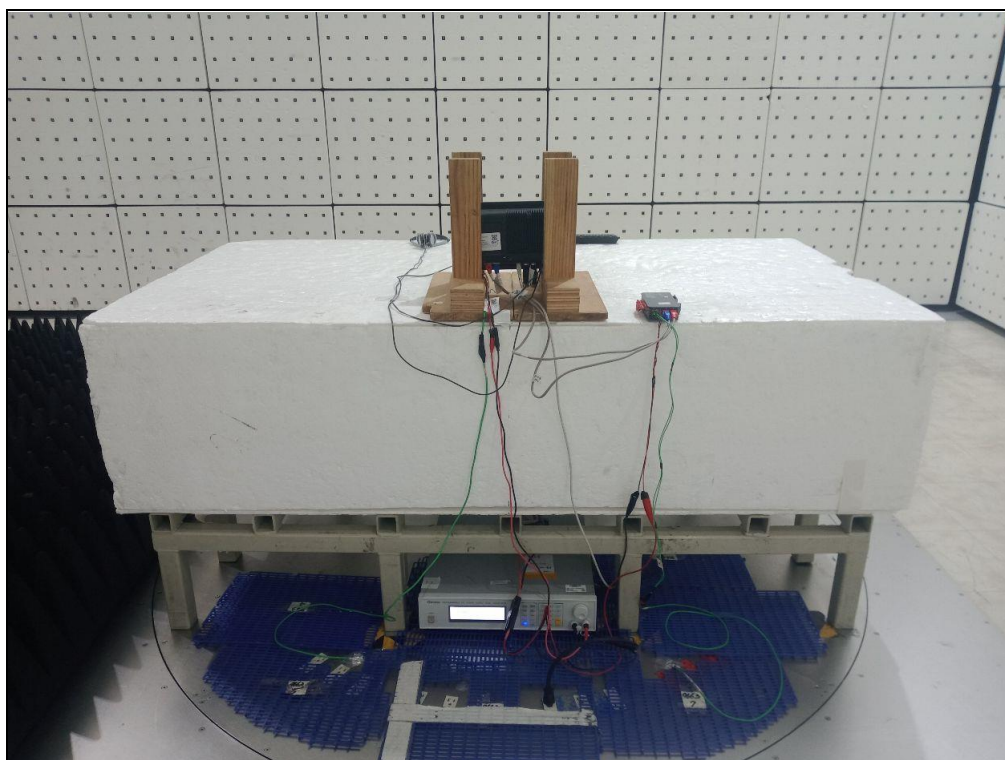
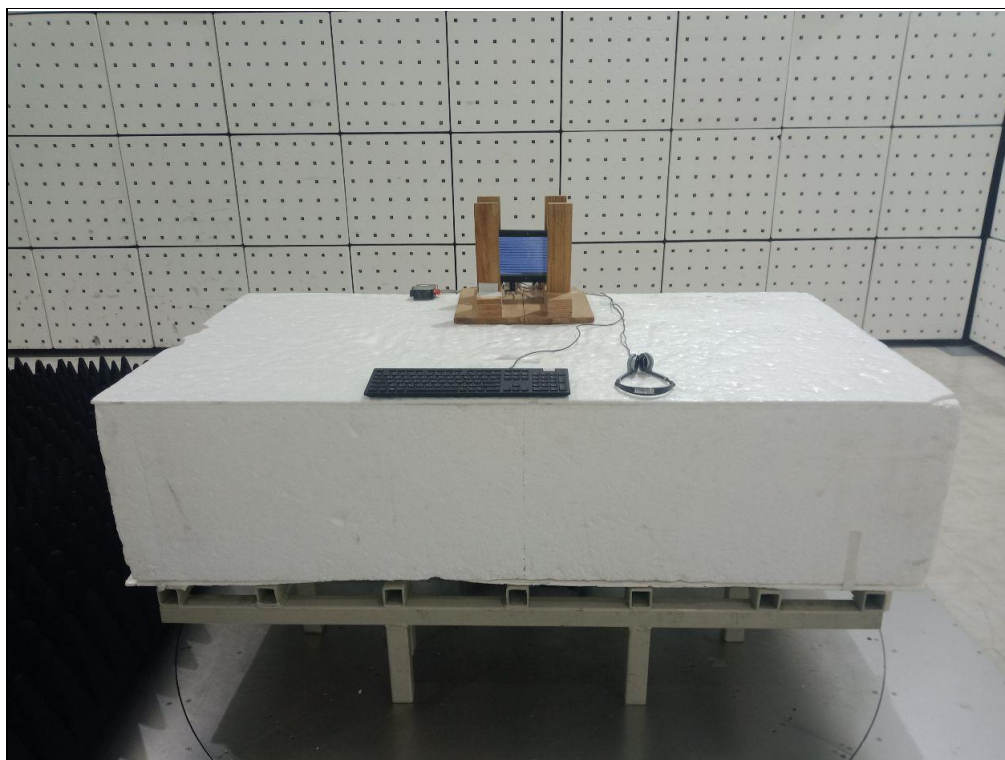
#### Mode A





## 8.4 Radiated Emissions above 1 GHz

### Mode A



## 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 FCC recognized accredited test firms and accredited according to ISO/IEC 17025.

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

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