



# TEST REPORT

Product Name: No fan embedded computer

Trademark: N/A  
WBOX-5760

Model Number: WBOX-5761, WBOX-5762, WBOX-5764, WBOX-5160, WBOX-5161, WBOX-5162, WBOX-5163, WBOX-5164, WBOX-5166, WBOX-5167, WBOX-5168, WBOX-5169

Prepared For: Shanghai fushengwei intelligent control technology co., LTD

Address: Floor 2, Building 16, no. 481, Guiping Road, Caohejing Development Zone, Shanghai City, China

Manufacturer: Shanghai fushengwei intelligent control technology co., LTD

Address: Floor 2, Building 16, no. 481, Guiping Road, Caohejing Development Zone, Shanghai City, China

Prepared By: Shenzhen BCTC Testing Co., Ltd.

Address: BCTC Building & 1-2F, East of B Building, Pengzhou Industrial, Fuyuan 1st Road, Qiaotou Community, Fuyong Street, Bao'an District, Shenzhen, China

Sample Received Date: Aug.19, 2019

Sample tested Date: Aug.19, 2019 to Oct. 18, 2019

Issue Date: Nov. 28, 2019

Report No.: BCTC1911001627E

Test Standards 47 CFR FCC Part 15 Subpart B

Test Results PASS

All test data come from the report of No. BCTC-FY190805141E.

Compiled by:

*Icey Chen*

Icey Chen

Reviewed by:

*Eric Yang*

Eric Yang

Approved by:



Zero Zhou/Manager

*The test report is effective only with both signature and specialized stamp. This result(s) shown in this report refer only to the sample(s) tested. Without written approval of Shenzhen BCTC Testing Co., Ltd, this report can't be reproduced except in full. The tested sample(s) and the sample information are provided by the client.*



## TABLE OF CONTENT

	Page
Test Report Declaration	
<b>1. VERSION.....</b>	<b>3</b>
<b>2. TEST SUMMARY.....</b>	<b>4</b>
<b>3. MEASUREMENT UNCERTAINTY.....</b>	<b>5</b>
<b>4. PRODUCT INFORMATION AND TEST SETUP.....</b>	<b>6</b>
<b>5. TEST FACILITY AND TEST INSTRUMENT USED.....</b>	<b>8</b>
<b>6. CONDUCTED EMISSION AT THE MAINS TERMINALS TEST.....</b>	<b>9</b>
6.1 Block Diagram Of Test Setup.....	9
6.2 Limit.....	9
6.3 Test procedure.....	9
6.4 Test Result.....	10
<b>7. RADIATION EMISSION TEST.....</b>	<b>12</b>
7.1 Block Diagram Of Test Setup.....	12
7.2 Limit.....	12
7.3 Test Procedure.....	13
7.4 Test Result.....	14
<b>8. EUT PHOTOGRAPHS.....</b>	<b>16</b>
<b>9. EUT TEST SETUP PHOTOGRAPHS.....</b>	<b>21</b>

(Note: N/A means not applicable)



## 1. VERSION

Report No.	Issue Date	Description	Approved
BCTC1911001627E	Nov. 28, 2019	Original	Valid



## 2. TEST SUMMARY

The Product has been tested according to the following specifications:

Standard	Test Item	Test result
FCC 15.107	Conducted Emission	Pass
FCC 15.109	Radiated Emission	Pass



### 3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the Product as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k=2$ .

Test item	Value (dB)
Conducted Emission (150kHz-30MHz)	3.20
Radiated Emission(30MHz~1GHz)	4.80
Radiated Emission(1GHz~6GHz)	4.90



## 4. PRODUCT INFORMATION AND TEST SETUP

### 4.1 Product Information

**Ratings:** DC 12V 5A

**Adapter Information:** Manufacture: Channel well technology  
Model No.:KPL-060F  
Input: AC100-240V 50/60Hz 1.7A  
Output: DC 12V 5A

**Model difference:** All models are identical except for the appearance color, the test model is eBOX-3230 and the test results are applicable to other tests.

### 4.2 Test Setup Configuration

See test photographs attached in EUT TEST SETUP PHOTOGRAPHS for the actual connections between Product and support equipment.

### 4.3 Support Equipment

No.	Device Type	Brand	Model	Series No.	Data Cable	Power Cord
	---	---	---	---	---	---

**Notes:**

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.



#### 4.4 Test Mode

Test item	Test Mode	Test Voltage
Conducted Emission (150KHz-30MHz) Class B	HDMI	AC 120V/60Hz*
	VGA	AC 120V/60Hz
Radiated mission(30MHz-1GHz) Class B	HDMI	AC 120V/60Hz*
	VGA	AC 120V/60Hz

All test mode were tested and passed, only Conducted Emissions, Radiated Emissions shows (\*) is the worst case mode which were recorded in this report.



## 5. TEST FACILITY AND TEST INSTRUMENT USED

### 5.1 Test Facility

All measurement facilities used to collect the measurement data are located at BCTC Building & 1-2F, East of B Building, Pengzhou Industrial, Fuyuan 1st Road, Qiaotou Community, Fuyong Street, Bao'an District, Shenzhen, China. The site and apparatus are constructed in conformance with the requirements of ANSI C63.4 and CISPR 16-1-1 other equivalent standards.

### 5.2 Test Instrument Used

Conducted emissions Test					
Equipment	Manufacturer	Model#	Serial#	Last Cal.	Next Cal.
Receiver	R&S	ESR3	102075	Jun. 13, 2019	Jun.12, 2020
LISN	R&S	ENV216	101375	Jun. 13, 2019	Jun.12, 2020
ISN	HPX	ISN T800	S1509001	Jun. 13, 2019	Jun.12, 2020
Software	Frad	EZ-EMC	EMC-CON 3A1	\	\

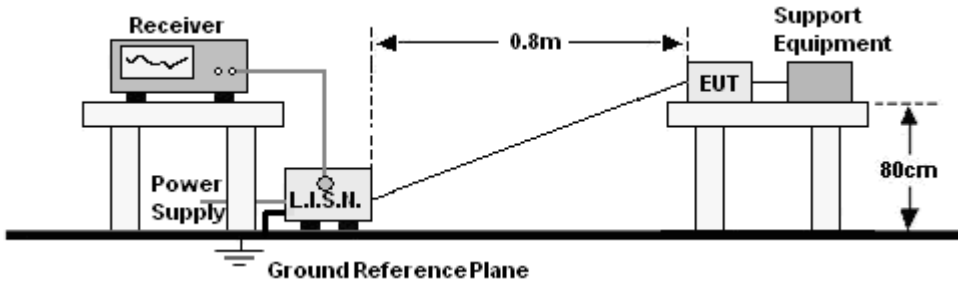
Radiated emissions Test (966 chamber)					
Equipment	Manufacturer	Model#	Serial#	Last Cal.	Next Cal.
966 chamber	ChengYu	966 Room	966	Jun. 19, 2018	Jun. 18, 2021
Receiver	R&S	ESR3	102075	Jun. 13, 2019	Jun.12, 2020
Receiver	R&S	ESRP	101154	Jun. 13, 2019	Jun.12, 2020
Amplifier	Schwarzbeck	BBV9718	9718-309	Jun. 25, 2019	Jun.24, 2020
Amplifier	Schwarzbeck	BBV9744	9744-0037	Jun. 25, 2019	Jun.24, 2020
TRILOG Broadband Antenna	schwarzbeck	VULB 9163	VULB9163-9 42	Jun. 22, 2019	Jun.21, 2020
Horn Antenna	SCHWARZBEC K	BBHA9120D	1541	Jun. 22, 2019	Jun.21, 2020
Software	Frad	EZ-EMC	FA-03A2 RE	\	\



## 6. CONDUCTED EMISSION AT THE MAINS TERMINALS TEST

### 6.1 Block Diagram Of Test Setup

For mains ports:



### 6.2 Limit

Limits for Class B devices

(MHz)	Limits dB( $\mu$ V)	
	Quasi-peak	Average
0,15 to 0,50	66 to 56*	56 to 46*
0,50 to 5	56	46
5 to 30	60	50

Notes: 1. \*Decreasing linearly with logarithm of frequency.  
2. The lower limit shall apply at the transition frequencies.

### 6.3 Test procedure

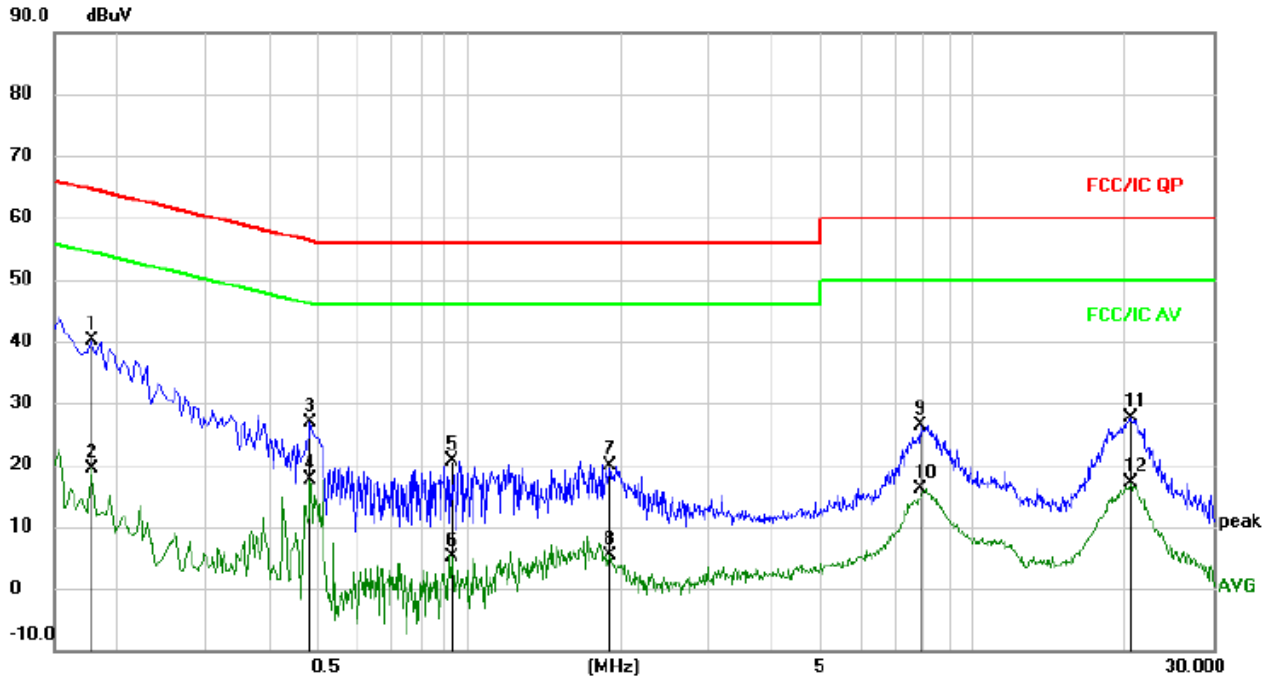
For mains ports:

- The Product was placed on a nonconductive table 0.8 m above the horizontal ground reference plane, and 0.4 m from the vertical ground reference plane, and connected to the main through Line Impedance Stability Network (L.I.S.N).
- The RBW of the receiver was set at 9 kHz in 150 kHz ~ 30MHz with Peak and AVG detector in Max Hold mode. Run the receiver's pre-scan to record the maximum disturbance generated from Product in all power lines in the full band.
- For each frequency whose maximum record was higher or close to limit, measure its QP and AVG values and record.



### 6.4 Test Result

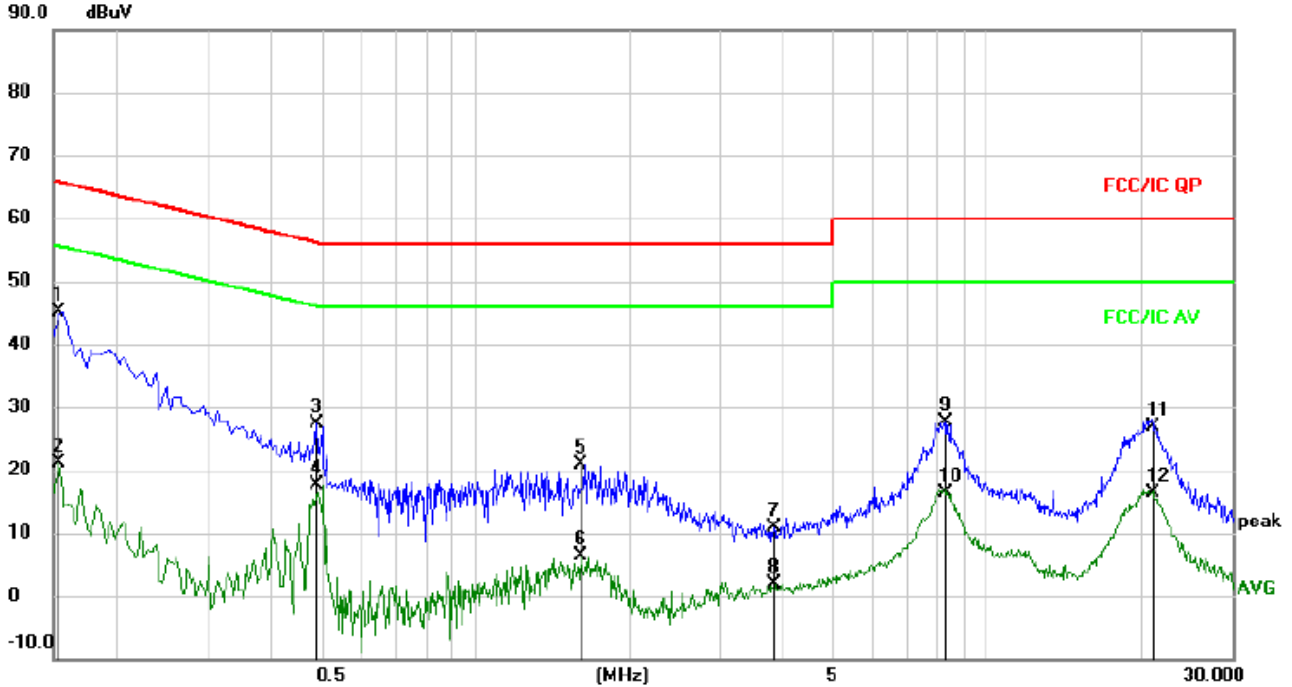
Temperature:	26 °C	Relative Humidity:	54 %
Pressure:	101kPa	Phase :	Line
Test Voltage :	AC 120V/60Hz	Test Mode:	The worst mode



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1	*	0.1780	30.64	9.49	40.13	64.58	-24.45	QP	
2		0.1780	9.86	9.49	19.35	54.58	-35.23	AVG	
3		0.4860	17.31	9.58	26.89	56.24	-29.35	QP	
4		0.4860	8.13	9.58	17.71	46.24	-28.53	AVG	
5		0.9260	11.13	9.59	20.72	56.00	-35.28	QP	
6		0.9260	-4.37	9.59	5.22	46.00	-40.78	AVG	
7		1.8980	10.25	9.59	19.84	56.00	-36.16	QP	
8		1.8980	-4.27	9.59	5.32	46.00	-40.68	AVG	
9		7.8740	16.68	9.71	26.39	60.00	-33.61	QP	
10		7.8740	6.39	9.71	16.10	50.00	-33.90	AVG	
11		20.4940	17.82	9.79	27.61	60.00	-32.39	QP	
12		20.4940	7.35	9.79	17.14	50.00	-32.86	AVG	



Temperature:	26 °C	Relative Humidity:	54%
Pressure:	101kPa	Phase :	Neutral
Test Voltage :	AC 120V/60Hz	Test Mode:	The worst mode



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1	*	0.1539	35.57	9.52	45.09	65.79	-20.70	QP	
2		0.1539	11.63	9.52	21.15	55.79	-34.64	AVG	
3		0.4900	17.68	9.58	27.26	56.17	-28.91	QP	
4		0.4900	7.96	9.58	17.54	46.17	-28.63	AVG	
5		1.6019	11.30	9.58	20.88	56.00	-35.12	QP	
6		1.6019	-3.20	9.58	6.38	46.00	-39.62	AVG	
7		3.8220	1.11	9.72	10.83	56.00	-45.17	QP	
8		3.8220	-7.86	9.72	1.86	46.00	-44.14	AVG	
9		8.2739	17.86	9.71	27.57	60.00	-32.43	QP	
10		8.2739	6.55	9.71	16.26	50.00	-33.74	AVG	
11		20.9460	16.99	9.78	26.77	60.00	-33.23	QP	
12		20.9460	6.72	9.78	16.50	50.00	-33.50	AVG	

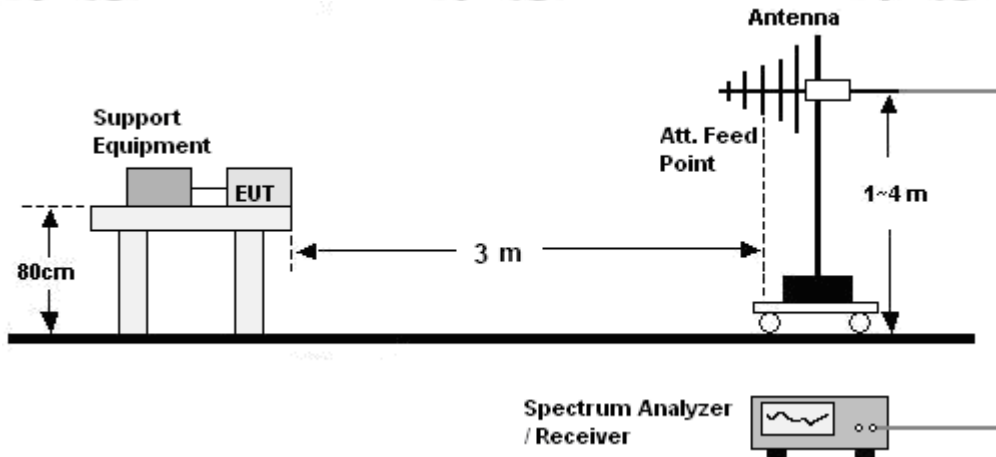
Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

## 7. RADIATION EMISSION TEST

### 7.1 Block Diagram Of Test Setup

30MHz ~ 1GHz:



### 7.2 Limit

Limits for Class B devices

Frequency (MHz)	limits at 3m dB( $\mu$ V/m)		
	QP Detector	PK Detector	AV Detector
30-88	40.0	--	--
88-216	43.5	--	--
216-960	46.0	--	--
960 to 1000	54.0	--	--
Above 1000	--	74.0	54.0

**Note:** The lower limit shall apply at the transition frequencies.



### 7.3 Test Procedure

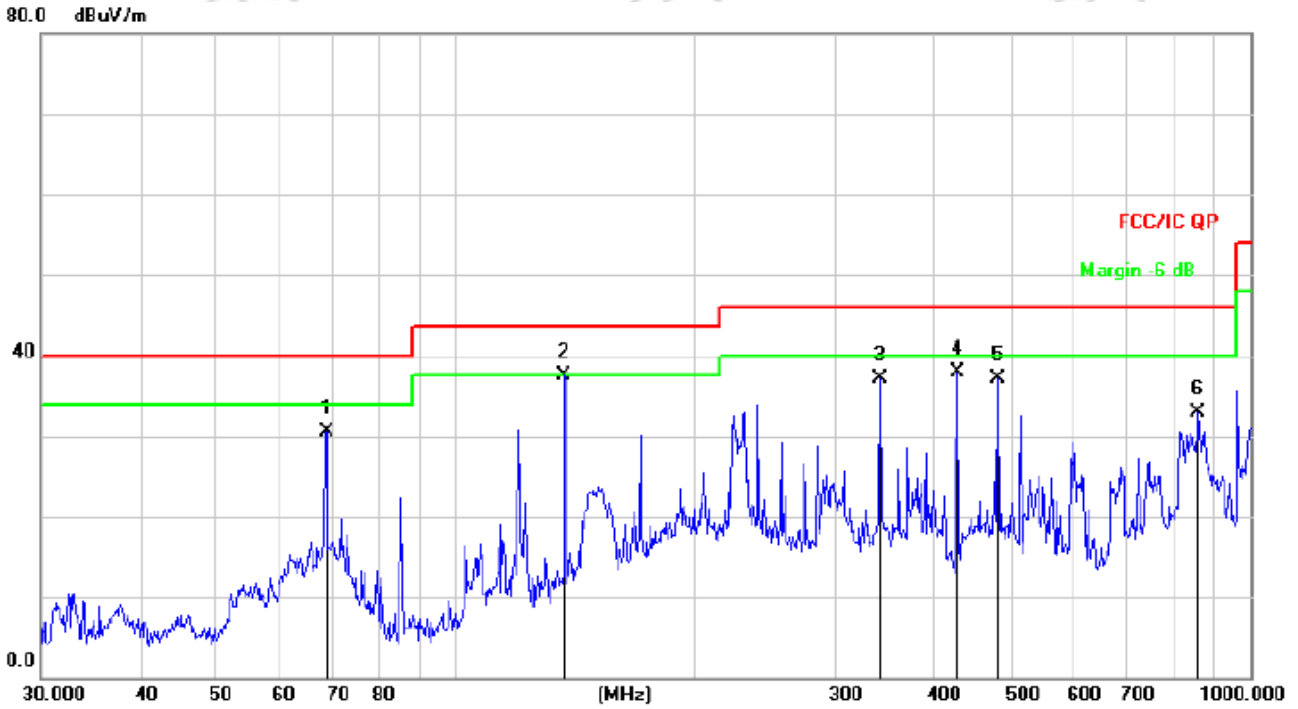
#### **30MHz ~ 1GHz:**

- a. The Product was placed on the nonconductive turntable 0.8 m above the ground at a chamber.
- b. Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 120 kHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied between 1~4 m in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.
- c. For each frequency whose maximum record was higher or close to limit, measure its QP value: vary the antenna's height and rotate the turntable from 0 to 360 degrees to find the height and degree where Product radiated the maximum emission, then set the test frequency analyzer/receiver to QP Detector and specified bandwidth with Maximum Hold Mode, and record the maximum value.



### 7.4 Test Result

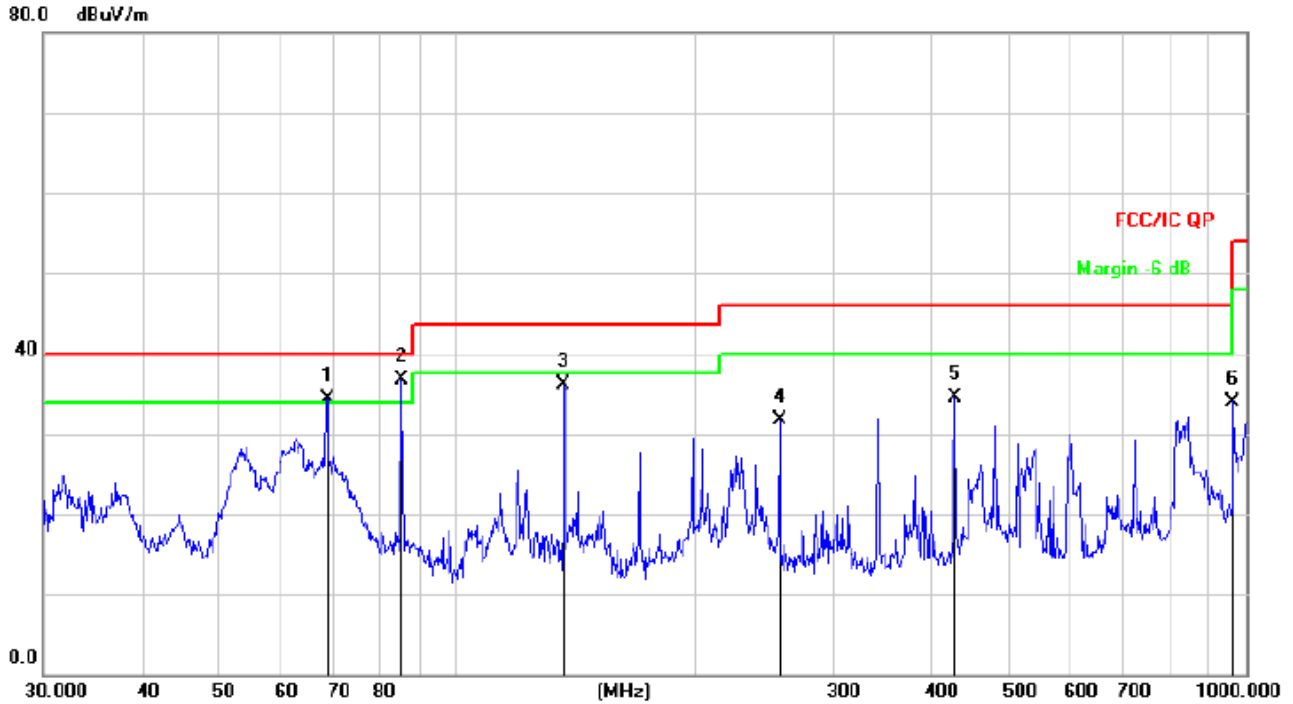
Temperature:	26 °C	Relative Humidity:	54%
Pressure:	101kPa	Phase :	Horizontal
Test Voltage :	AC 120V/60Hz	Test Mode:	The worst mode



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dB/m	Over dB	Detector	Antenna Height cm	Table Degree degree	Comment
1		68.6310	48.46	-17.88	30.58	40.00	-9.42	QP			
2	*	136.9391	56.24	-18.66	37.58	43.50	-5.92	QP			
3		341.9786	49.57	-12.45	37.12	46.00	-8.88	QP			
4		428.0193	48.45	-10.46	37.99	46.00	-8.01	QP			
5		480.5276	46.37	-9.34	37.03	46.00	-8.97	QP			
6		860.0352	35.14	-2.32	32.82	46.00	-13.18	QP			



Temperature:	26 °C	Relative Humidity:	54%
Pressure:	101kPa	Phase :	Vertical
Test Voltage :	AC 120V/60Hz	Test Mode:	The worst mode



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	cm	degree	Comment
1	!	68.6310	52.16	-17.88	34.28	40.00	-5.72			QP
2	*	85.2980	55.90	-19.19	36.71	40.00	-3.29			QP
3		136.9391	54.83	-18.66	36.17	43.50	-7.33			QP
4		256.5211	46.71	-14.95	31.76	46.00	-14.24			QP
5		428.0193	44.89	-10.46	34.43	46.00	-11.57			QP
6		962.1623	35.04	-1.04	34.00	54.00	-20.00			QP

Remark:  
Factor = Antenna Factor + Cable Loss – Pre-amplifier.

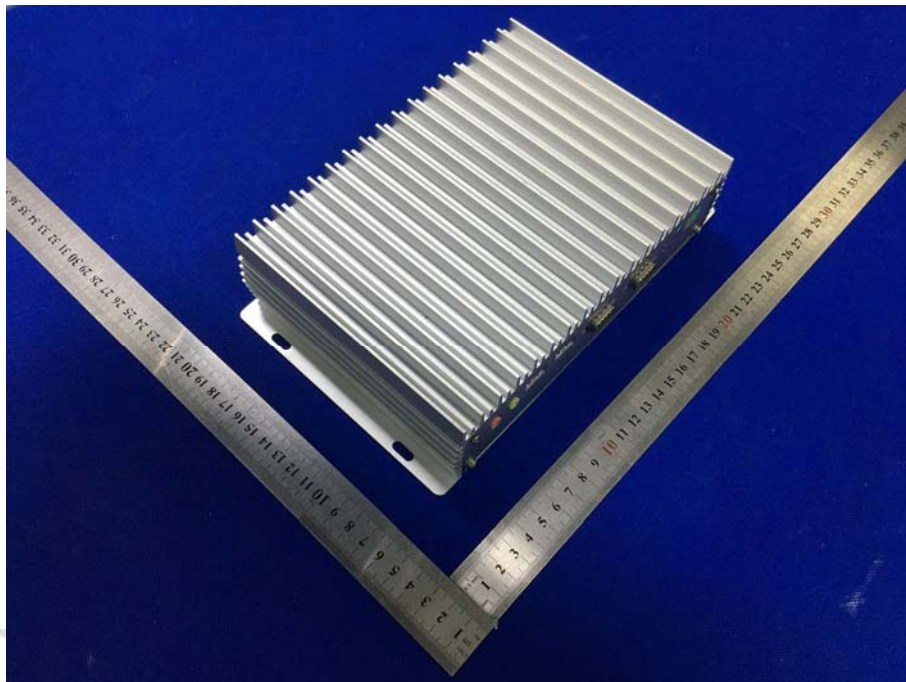


## 8. EUT PHOTOGRAPHS

EUT Photo 1

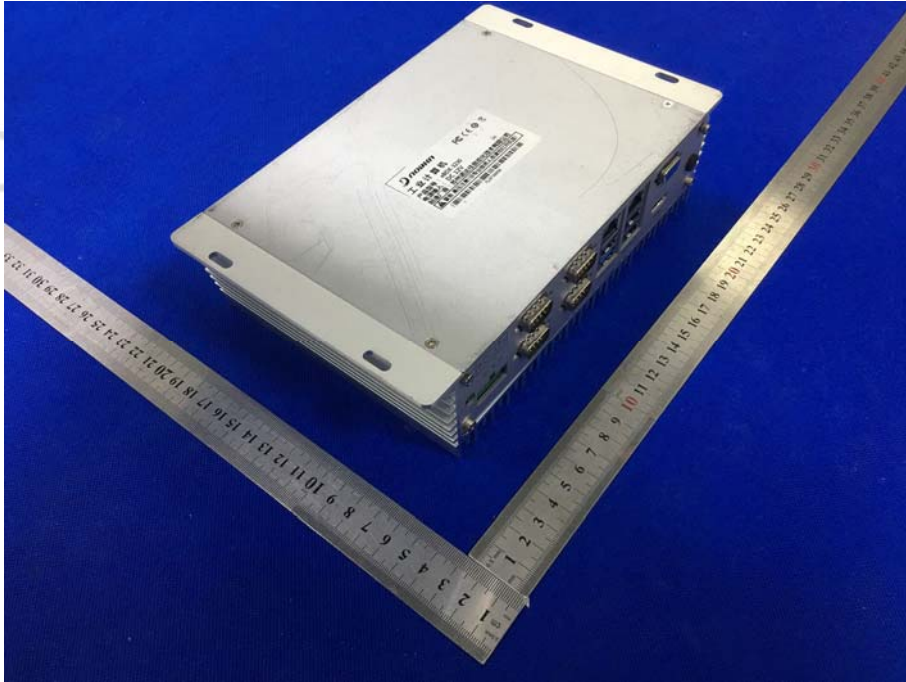


EUT Photo 2





EUT Photo 3



EUT Photo 4



EUT Photo 5



EUT Photo 6

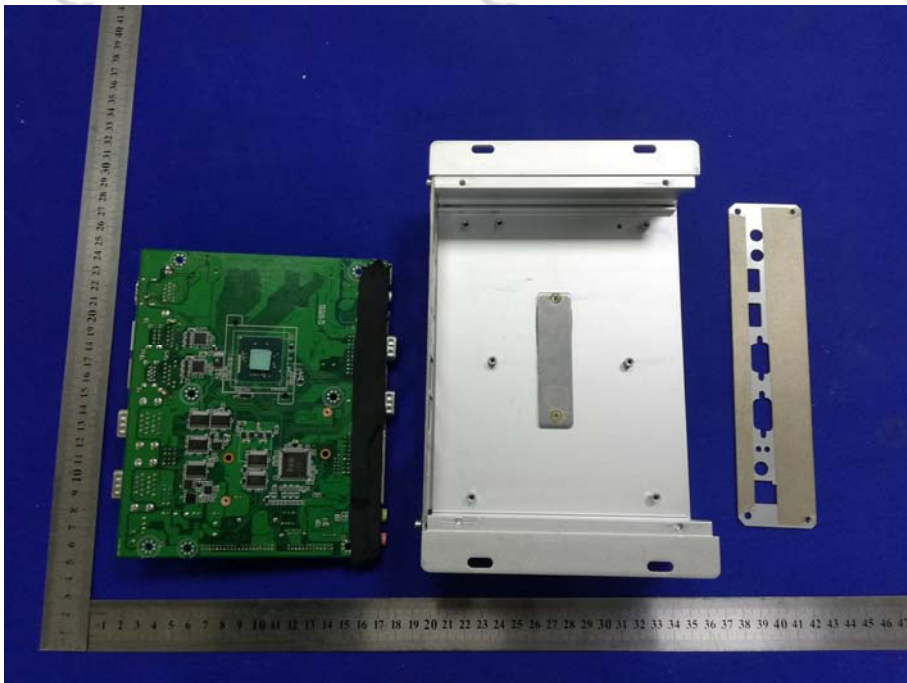




EUT Photo 7



EUT Photo 8



EUT Photo 9



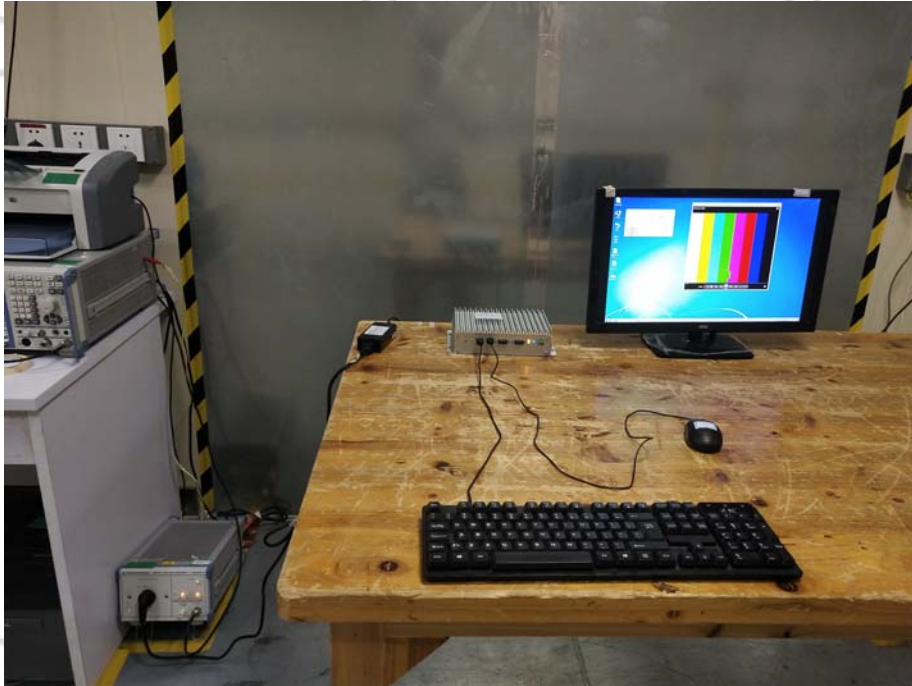
EUT Photo 10



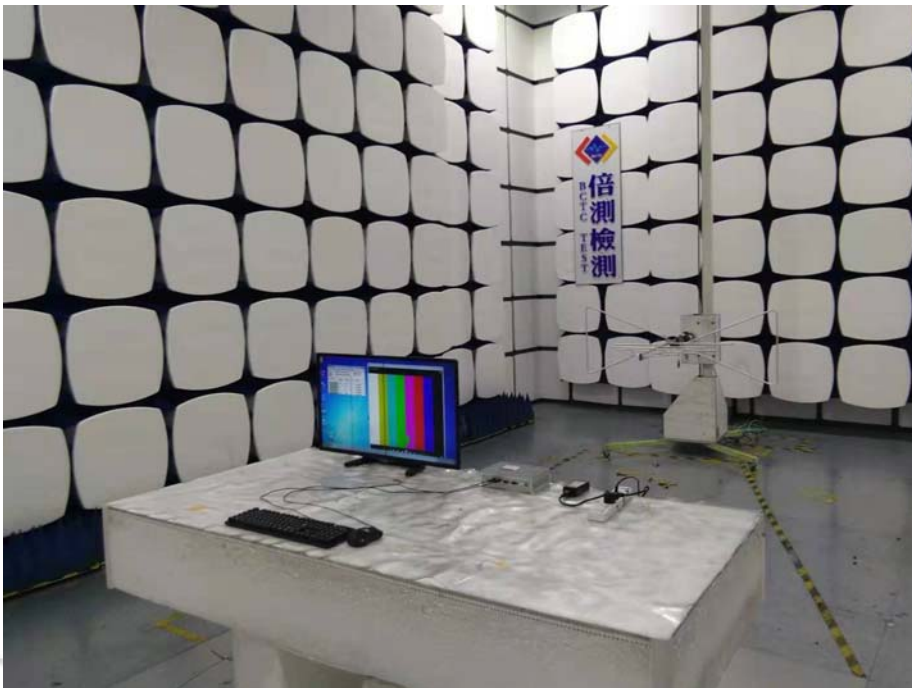


## 9. EUT TEST SETUP PHOTOGRAPHS

Conducted emission



Radiated emission



\*\*\*\*\* END OF REPORT \*\*\*\*\*