

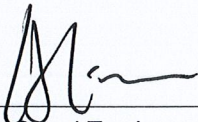
EMC TEST REPORT

The device described below is tested by Dongguan Nore Testing Center Co., Ltd. to determine the maximum emission levels emanating from the device, the severe levels which the device can endure and E.U.T.'s performance criterion. The test results are contained in this test report. Dongguan Nore Testing Center Co., Ltd. is assumed of full responsibility for the accuracy and completeness of these tests.

Applicant : Boardcon Technology Limited
Address : Room 702, HuaFeng XinAn Business Building, 45Zone, BaoAn District, Shenzhen, Guangdong Province, China
Manufacturer : Boardcon Technology Limited
Address : Room 702, HuaFeng XinAn Business Building, 45Zone, BaoAn District, Shenzhen, Guangdong Province, China
E.U.T. : PICO3399 Computer on Module
Brand name : N/A
Model No. : PICO3399
Measurement Standard : 47 CFR FCC Part 15, Subpart B, Class B 2016
Date of Receiver : June 19, 2017
Date of Test : June 20, 2017 to June 28, 2017
Date of Report : June 28, 2017

This Test Report is Issued Under the Authority of :

Prepared by


Alina Guo / Engineer

Approved & Authorized Signer


Iori Fan / Authorized Signatory

This report shows that the E.U.T. is technically compliant with the 47 CFR FCC Part 15, Subpart B, Class B. This report applies to above tested sample only and shall not be reproduced in part without written approval of Dongguan Nore Testing Center Co., Ltd.

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Revision History of This Test Report

Report Number	Description	Issued Date
NTC1706213FV00	Initial Issue	2017-06-28

1. SUMMARY OF TEST RESULTS

The E.U.T. has been tested according to the following specifications:

EMISSION			
Standard	Test Type	Result	Remarks
47 CFR FCC Part 15, Subpart B, Class B 2016	Mains Terminal Disturbance Voltage Test	PASS	Uncertainty: 2.7dB
	Radiated Emission Test	PASS	Uncertainty: 3.4dB

2. GENERAL INFORMATION

2.1 Details of E.U.T.

E.U.T. : PICO3399 Computer on Module

Model No. : PICO3399

Brand name : N/A

Rating : DC 5V

E.U.T. Type : Class B

Operation Frequency : 1GHz (Declaration by manufacturer)

Test Voltage : AC 120V 60Hz

Cable : None

Description of model difference : None

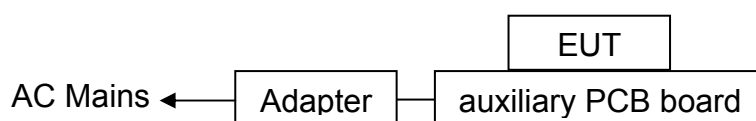
Remark : The EUT is installed on a auxiliary PCB board for tests.

2.2 Description of Support Device

Adapter : M/N: K-C71202000E
Input: AC 100-240V 50-60Hz, 0.75A Max
Output: DC 12V 2000mA

2.3 Block Diagram of Test Setup

Block diagram of connection between the E.U.T. and simulators



2.4 Test Facility

Site Description

- EMC Lab : Listed by CNAS, August 14, 2015
The certificate is valid until August 13, 2018
The Laboratory has been assessed and proved to
be in compliance with CNAS/CL01
The Certificate Registration Number is L5795.
- Listed by FCC, July 03, 2014
The Certificate Number is 665078.
- Listed by Industry Canada, June 18, 2014
The Certificate Registration Number. Is 46405-9743
- Name of Firm : Dongguan Nore Testing Center Co., Ltd.
(Dongguan NTC Co., Ltd.)
- Site Location : Building D, Gaosheng Science & Technology Park,
Zhouxi Longxi Road, Nancheng District, Dongguan,
Guangdong, China.

2.5 Abnormalities from Standard Conditions

None

3. MEASURING DEVICES AND TEST EQUIPMENT

3.1 For Mains terminals Disturbance voltage Test

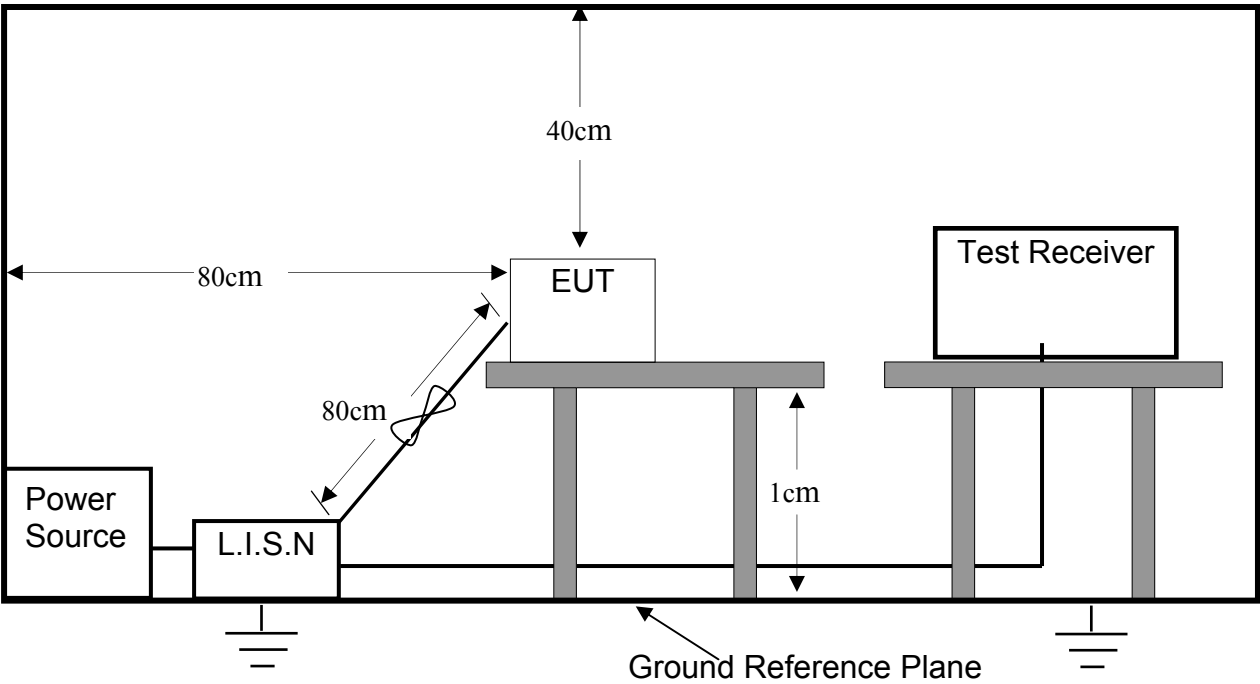
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde & Schwarz	ESCI	101152	Mar. 07, 2017	1 Year
2.	L.I.S.N	Rohde & Schwarz	ENV 216	101317	Mar. 07, 2017	1 Year
3.	L.I.S.N	Schwarzbeck	NNLK8129	8129-212	Mar. 07, 2017	1 Year
4.	RF Switching Unit	Compliance Direction Systems Inc.	RSU-M2	38311	Mar. 07, 2017	1 Year

3.2 For Radiated Emission Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde & Schwarz	ESCI7	100837	Mar. 07, 2017	1 Year
2.	Antenna	Schwarzbeck	VULB9162	9162-010	Apr. 25, 2017	1 Year
3.	Positioning Controller	UC	UC 3000	N/A	N/A	N/A
4.	Color Monitor	SUNSPO	SP-140A	N/A	N/A	N/A
5.	Single Phase Power Line Filter	SAEMC	PF201A-32	110210	N/A	N/A
6.	3 Phase Power Line Filter	SAEMC	PF401A-200	110318	N/A	N/A
7.	DC Power Filter	SAEMC	PF301A-200	110245	N/A	N/A
8.	Cable	Huber+Suhner	CBL3-NN-9M	21490001	Mar. 07, 2017	1 Year
9.	Cable	Huber+Suhner	RG223U	N/A	Mar. 07, 2017	1 Year
10.	Power Amplifier	HP	HP 8447D	1145A00203	Mar. 07, 2017	1 Year
11.	Horn Antenna	COM-Power	AH-118	071078	Mar. 07, 2017	1 Year
12.	Pre-Amplifier	COM-Power	PAM-118	443007	Mar. 07, 2017	1 Year

4. MAINS TERMINAL DISTURBANCE VOLTAGE MEASUREMENT

4.1 Block Diagram of Test Setup



4.2 Limit of Mains Terminal Disturbance voltage measurement

Test Standard: 47 CFR FCC Part 15, Class B

Frequency range	Limits (dB(uV))	
(MHz)	Quasi-peak	Average
0.15 to 0.5	66 to 56	56 to 46
0.5 to 5	56	46
5 to 30	60	50

- Note:
1. The lower limit shall apply at the transition frequencies.
 2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

4.3 Test Procedure

The E.U.T. is put on the 0.01 m high table and connected to the AC mains through a Artificial Mains Network (AMN). This provided a 50ohm coupling impedance for the tested equipments. Both sides of AC line are checked to find out the maximum conducted emission levels according to the FCC ANSI C63.4-2016 regulations during conducted emission test.

The bandwidth of the test receiver (R&S Test Receiver ESCI) is set at 9 KHz.

4.4 Operating Condition of E.U.T.

4.4.1 Setup the E.U.T. and simulators as shown in Section 2.3.

4.4.2 Turn on the power of all equipments.

4.4.3 Let the E.U.T. work in test mode (Empty Load) and test it.

4.5 Mains Terminal Disturbance Voltage Test Results

PASS.

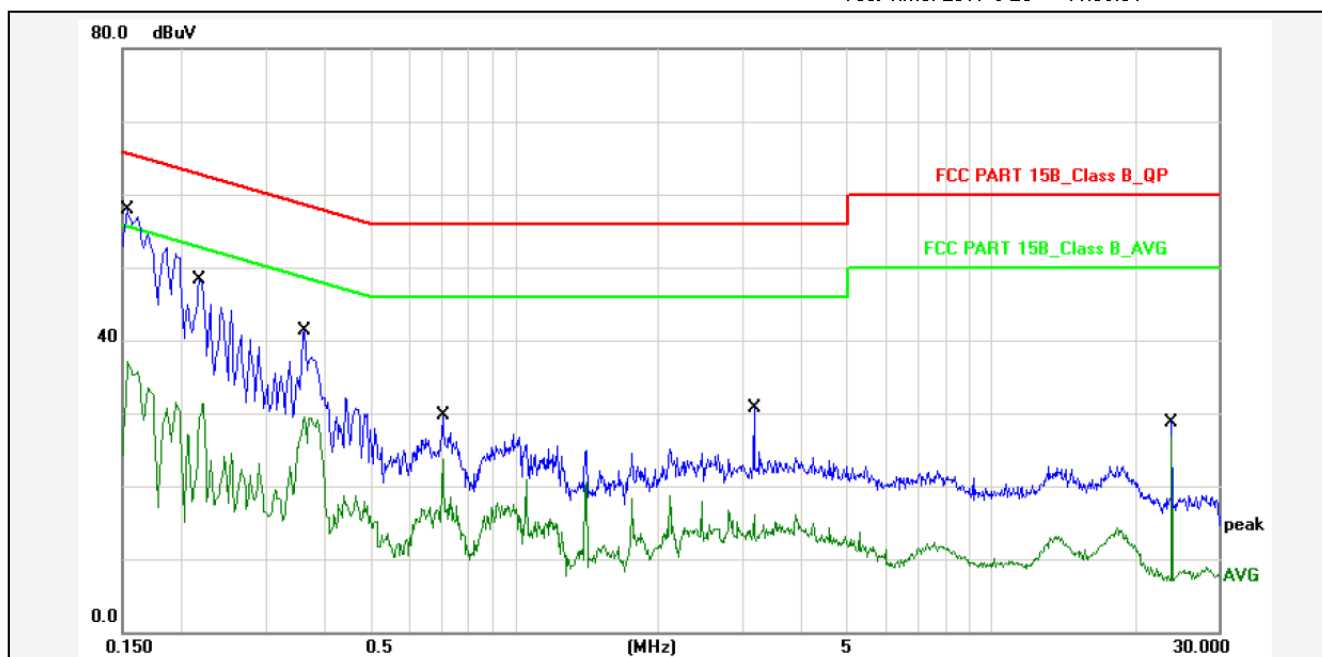
Please refer to the following pages.



Dongguan NTC Co., Ltd.
Tel: +86-769-22022444 Fax: +86-769-22022799
Web: [Http://www.ntc-c.com](http://www.ntc-c.com)

Site: Conduction

Test Time: 2017-6-20 11:09:54



Report No.: PICO3399

Test Standard: FCC PART 15B_Class B_QP

Test item: Conducted Emission

Applicant: Boardcon

Product: PICO3389 Computer on Module

Model No.: PICO3399

Phase: L1

Temp.()/Hum.(%): 24(C) / 50 %

Power Rating: AC 120V/60Hz

Test Engineer: Ivan

Test Mode: Empty Load

Remark:

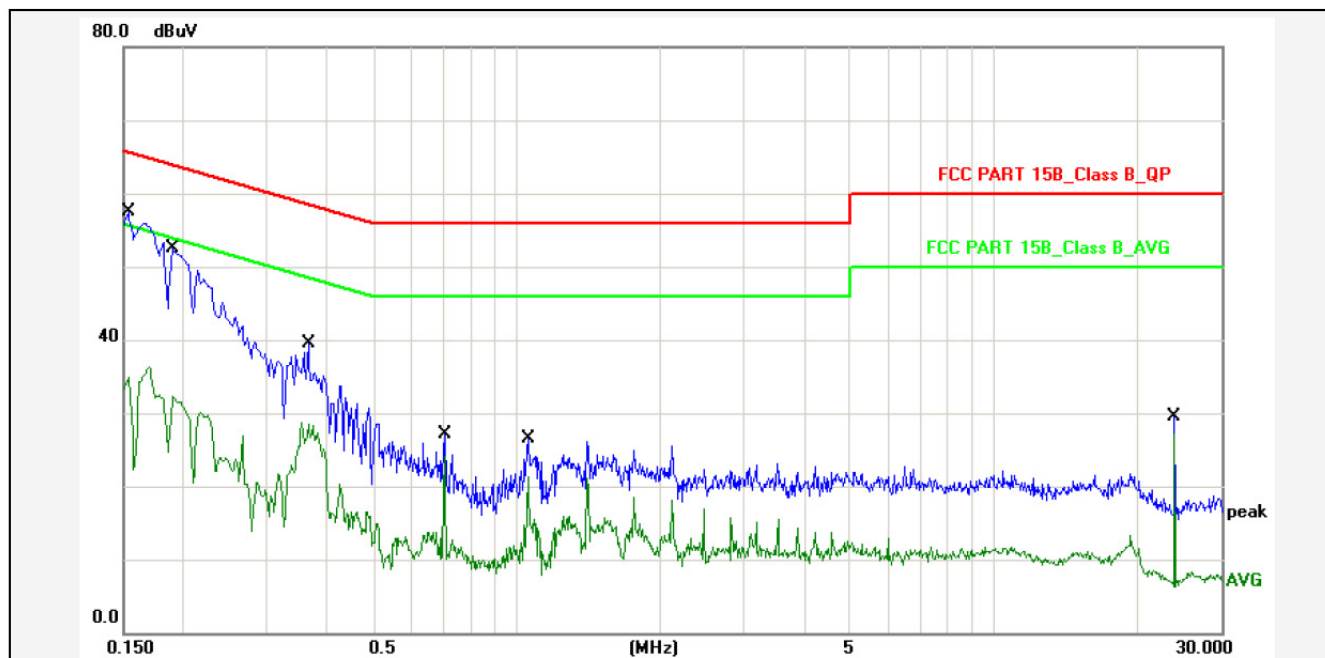
No.	Frequency (MHz)	Factor (dBuV)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1539	10.80	45.16	55.96	65.78	-9.82	QP	P	
2	0.1539	10.80	24.30	35.10	55.78	-20.68	AVG	P	
3	0.2180	10.80	35.40	46.20	62.89	-16.69	QP	P	
4	0.2180	10.80	18.50	29.30	52.89	-23.59	AVG	P	
5	0.3620	10.80	28.60	39.40	58.68	-19.28	QP	P	
6	0.3620	10.80	16.70	27.50	48.68	-21.18	AVG	P	
7	0.7060	10.80	16.80	27.60	56.00	-28.40	QP	P	
8	0.7060	10.80	11.00	21.80	46.00	-24.20	AVG	P	
9	3.1780	10.80	27.90	38.70	56.00	-17.30	QP	P	
10	3.1780	10.80	3.30	14.10	46.00	-31.90	AVG	P	
11	24.0020	10.80	15.90	26.70	60.00	-33.30	QP	P	
12	24.0020	10.80	14.10	24.90	50.00	-25.10	AVG	P	



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Tel: +86-769-22022444 Fax: +86-769-22022799
Web: [Http://www.ntc-c.com](http://www.ntc-c.com)

Site: Conduction

Test Time: 2017-6-20 11:02:35



Report No.: PICO3399

Test Standard: FCC PART 15B_Class B_QP

Test item: Conducted Emission

Applicant: Boardcon

Product: PICO3389 Computer on Module

Model No.: PICO3399

Phase: N

Temp.()/Hum.(%): 24(C) / 50 %

Power Rating: AC 120V/60Hz

Test Engineer: Ivan

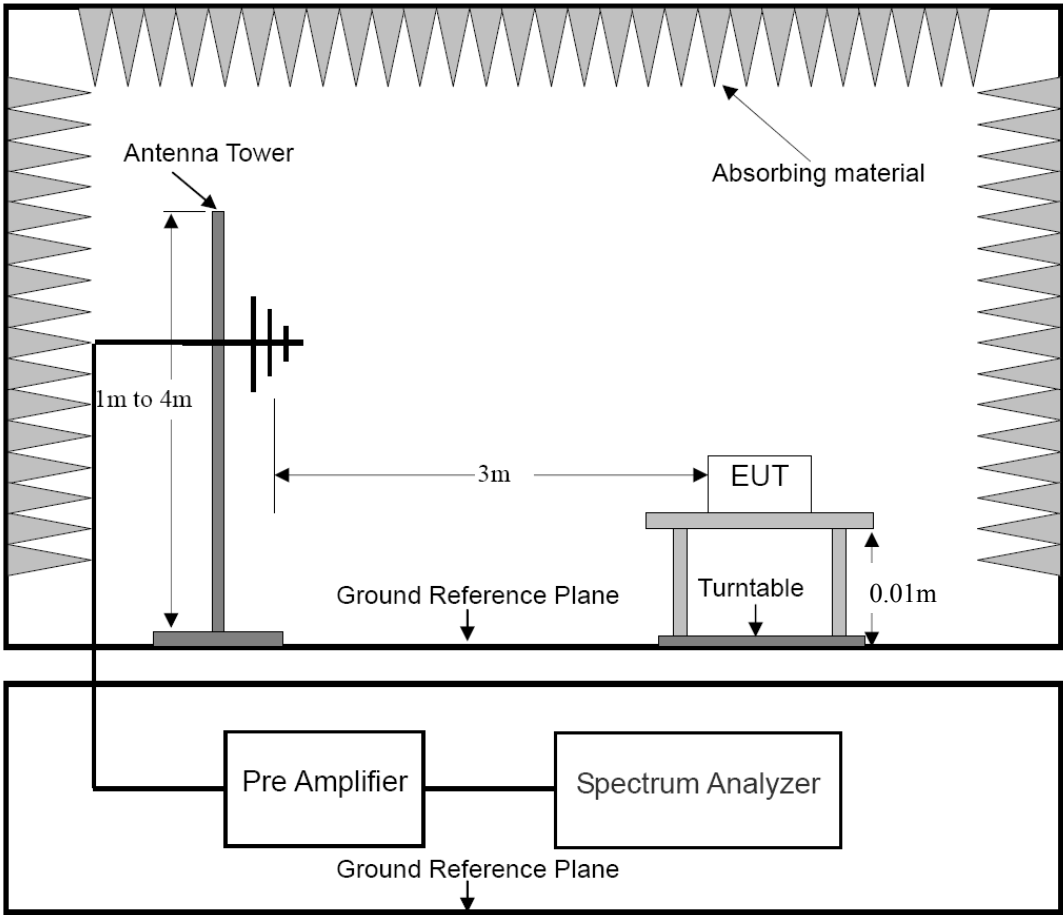
Test Mode: Empty Load

Remark:

No.	Frequency (MHz)	Factor (dBuV)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1539	10.80	44.60	55.40	65.78	-10.38	QP	P	
2	0.1539	10.80	22.10	32.90	55.78	-22.88	AVG	P	
3	0.1900	10.80	39.70	50.50	64.03	-13.53	QP	P	
4	0.1900	10.80	19.60	30.40	54.03	-23.63	AVG	P	
5	0.3660	10.80	26.60	37.40	58.59	-21.19	QP	P	
6	0.3660	10.80	15.90	26.70	48.59	-21.89	AVG	P	
7	0.7060	10.80	14.20	25.00	56.00	-31.00	QP	P	
8	0.7060	10.80	11.40	22.20	46.00	-23.80	AVG	P	
9	1.0580	10.80	13.60	24.40	56.00	-31.60	QP	P	
10	1.0580	10.80	8.50	19.30	46.00	-26.70	AVG	P	
11	24.0020	10.80	16.80	27.60	60.00	-32.40	QP	P	
12	24.0020	10.80	14.30	25.10	50.00	-24.90	AVG	P	

5. RADIATED EMISSION MEASUREMENT

5.1 Block Diagram of Test



5.2 Limit of Radiated Emission Measurement

Test Standard: 47 CFR FCC Part 15, Class B

Frequency range MHz	Distance Meters	Field Strengths Limit	
		$\mu\text{V/m}$	$\text{dB}(\mu\text{V})/\text{m}$
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0

Remark : (1) Emission level $(\text{dB})\mu\text{V} = 20 \log \text{Emission level } \mu\text{V/m}$

(2) The smaller limit shall apply at the cross point between two frequency bands.

(3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

Above 1GHz:

Frequency range GHz	Average limit $\text{dB}(\mu\text{V}/\text{m})$	Peak limit $\text{dB}(\mu\text{V}/\text{m})$
Above 1000	54	74

5.3 Test Procedure

E.U.T. and its simulators are placed on a turntable, which is 0.8 meter high above ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. E.U.T. is set 3.0 meters away from the receiving antenna, which is mounted on a antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated bilog antenna) is used as receiving antenna. Both horizontal and vertical polarization of the antenna is set on measurement. In order to find the maximum emission levels, all of the interface cables must be manipulated according to FCC ANSI C63.4-2014 on radiated emission measurement.

Class B on radiated emission measurement.

Below 1GHz, the bandwidth of the EMI test is set at 120 KHz.

Above 1GHz, the bandwidth of the EMI test is set at 1MHz.

The frequency range from 30 MHz to 6 GHz is checked

5.4 Operating Condition of E.U.T.

5.4.1 Setup the E.U.T. and simulators as shown in Section 2.3.

5.4.2 Turn on the power of all equipments.

5.4.3 Let the E.U.T. work in test mode (Empty Load) and test it.

5.5 Radiated Emission Measurement Result

PASS.

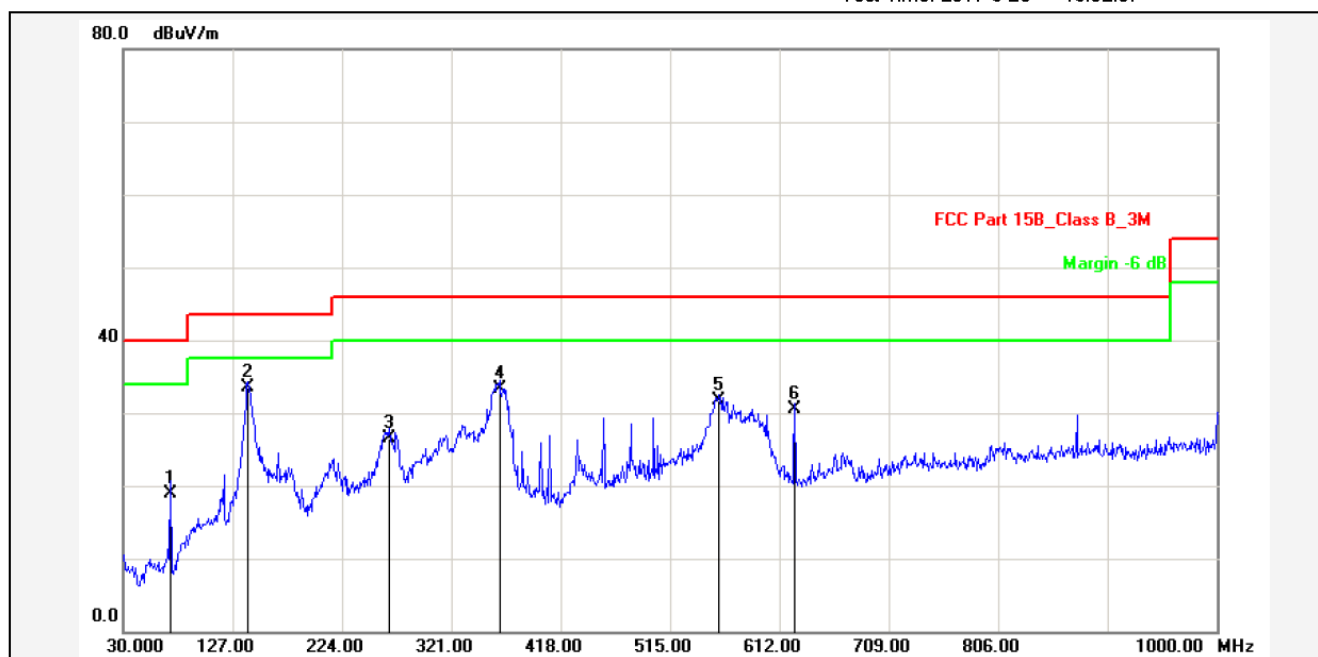
Please refer to the following pages.



Dongguan NTC Co., Ltd.
Tel: +86-769-22022444 Fax: +86-769-22022799
Web: <http://www.ntc-c.com>

Site: Radiation

Test Time: 2017-6-20 16:52:57



Report No.: PICO3399

Test Standard: FCC Part 15B_Class B_3M

Test item: Radiation Emission

Applicant: Boardcon

Product: PICO3399 Computer on Module

Model No.: PICO3399

Test Distance: 3m

Ant. Polarization: Horizontal

Temp.(C)/Hum.(%): 22(C) / 54 %

Power Rating: AC 120V/60Hz

Test Engineer: Chilam

Test Mode: Empty Load

Remark:

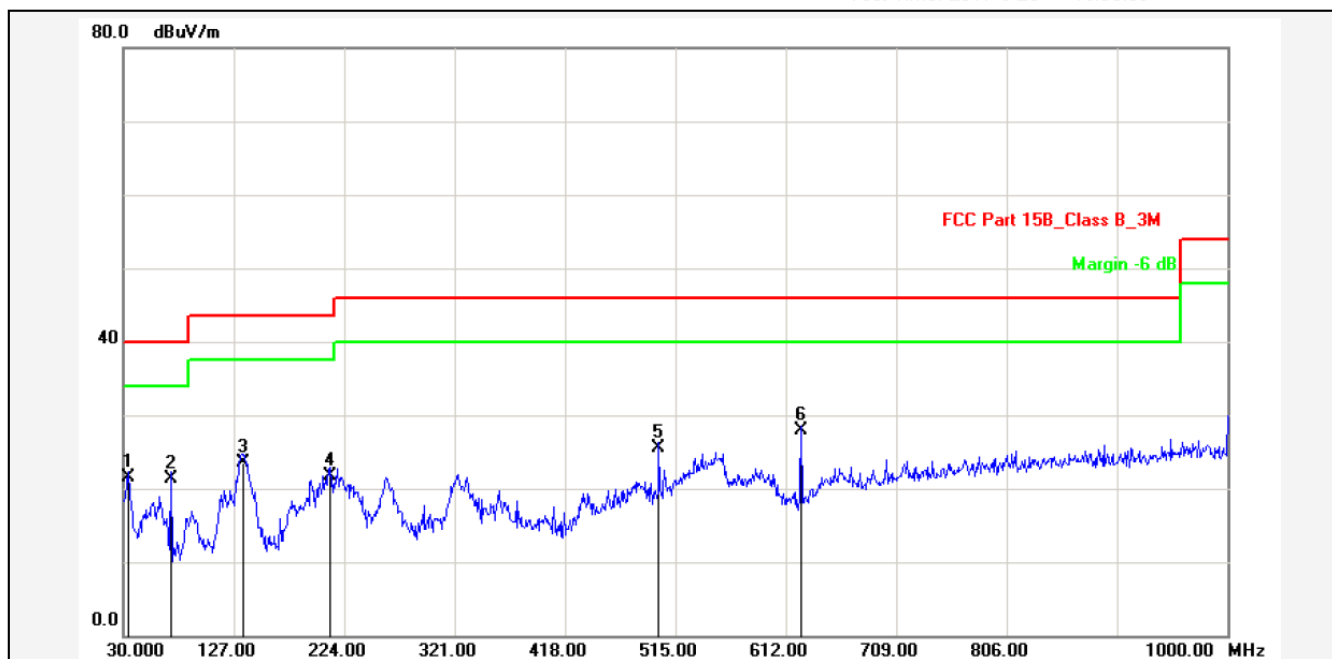
No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	71.7099	-20.61	39.51	18.90	40.00	-21.10	QP			P	
2	140.5800	-15.60	49.20	33.60	43.50	-9.90	QP			P	
3	265.7099	-11.29	37.79	26.50	46.00	-19.50	QP			P	
4	363.6800	-9.15	42.55	33.40	46.00	-12.60	QP			P	
5	558.6499	-6.27	37.97	31.70	46.00	-14.30	QP			P	
6	625.5800	-5.09	35.69	30.60	46.00	-15.40	QP			P	



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Tel: +86-769-22022444 Fax: +86-769-22022799
Web: <http://www.ntc-c.com>

Site: Radiation

Test Time: 2017-6-20 16:58:39



Report No.: PICO3399

Test Standard: FCC Part 15B_Class B_3M

Test item: Radiation Emission

Applicant: Boardcon

Product: PICO3399 Computer on Module

Model No.: PICO3399

Test Distance: 3m

Ant. Polarization: Vertical

Temp.(C)/Hum.(%): 22(C) / 54 %

Power Rating: AC 120V/60Hz

Test Engineer: Chilam

Test Mode: Empty Load

Remark:

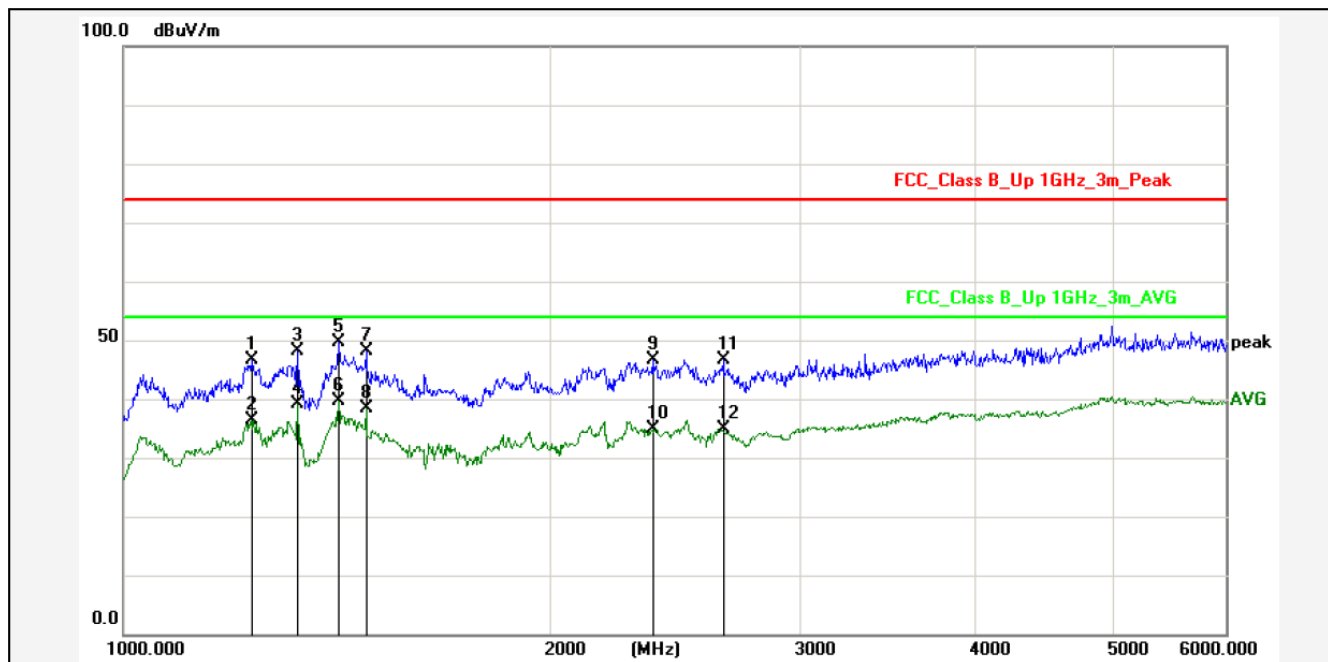
No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	34.8500	-16.17	37.67	21.50	40.00	-18.50	QP			P	
2	71.7099	-17.95	39.35	21.40	40.00	-18.60	QP			P	
3	135.7298	-18.40	42.00	23.60	43.50	-19.90	QP			P	
4	211.3899	-16.21	38.01	21.80	43.50	-21.70	QP			P	
5	500.4499	-8.76	34.36	25.60	46.00	-20.40	QP			P	
6	625.5800	-6.81	34.71	27.90	46.00	-18.10	QP			P	



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Tel: +86-769-22022444 Fax: +86-769-22022799
Web: <http://www.ntc-c.com>

Site: Radiation

Test Time: 2017-6-20 17:36:06



Report No.: PICO3399

Test Standard: FCC_Class B_Up 1GHz_3m_Peak

Test Distance: 3m

Test item: Radiation Emission

Ant. Polarization: Horizontal

Applicant: Boardcon

Temp.(C)/Hum.(%): 22(C) / 54 %

Product: PICO3399 Computer on Module

Power Rating: AC 120V/60Hz

Model No.: PICO3399

Test Engineer: Chilam

Test Mode: Empty Load

Remark:

No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	1231.021	2.25	44.34	46.59	74.00	-27.41	peak			P	
2	1231.021	2.25	34.03	36.28	54.00	-17.72	AVG			P	
3	1327.235	2.74	45.29	48.03	74.00	-25.97	peak			P	
4	1327.235	2.74	36.35	39.09	54.00	-14.91	AVG			P	
5	1418.207	3.23	46.43	49.66	74.00	-24.34	peak			P	
6	1418.207	3.23	36.46	39.69	54.00	-14.31	AVG			P	
7	1483.178	3.58	44.62	48.20	74.00	-25.80	peak			P	
8	1483.178	3.58	34.85	38.43	54.00	-15.57	AVG			P	
9	2363.266	7.95	38.74	46.69	74.00	-27.31	peak			P	
10	2363.266	7.95	26.86	34.81	54.00	-19.19	AVG			P	
11	2650.417	8.60	38.12	46.72	74.00	-27.28	peak			P	
12	2650.417	8.60	26.25	34.85	54.00	-19.15	AVG			P	



Dongguan NTC Co., Ltd.
Tel: +86-769-22022444 Fax: +86-769-22022799
Web: [Http://www.ntc-c.com](http://www.ntc-c.com)

Site: Radiation

Test Time: 2017-6-20 17:30:12



Report No.: PICO3399

Test Standard: FCC_Class B_Up 1GHz_3m_Peak

Test item: Radiation Emission

Applicant: Boardcon

Product: PICO3399 Computer on Module

Model No.: PICO3399

Test Distance: 3m

Ant. Polarization: Vertical

Temp.(C)/Hum.(%): 22(C) / 54 %

Power Rating: AC 120V/60Hz

Test Engineer: Chilam

Test Mode: Empty Load

Remark:

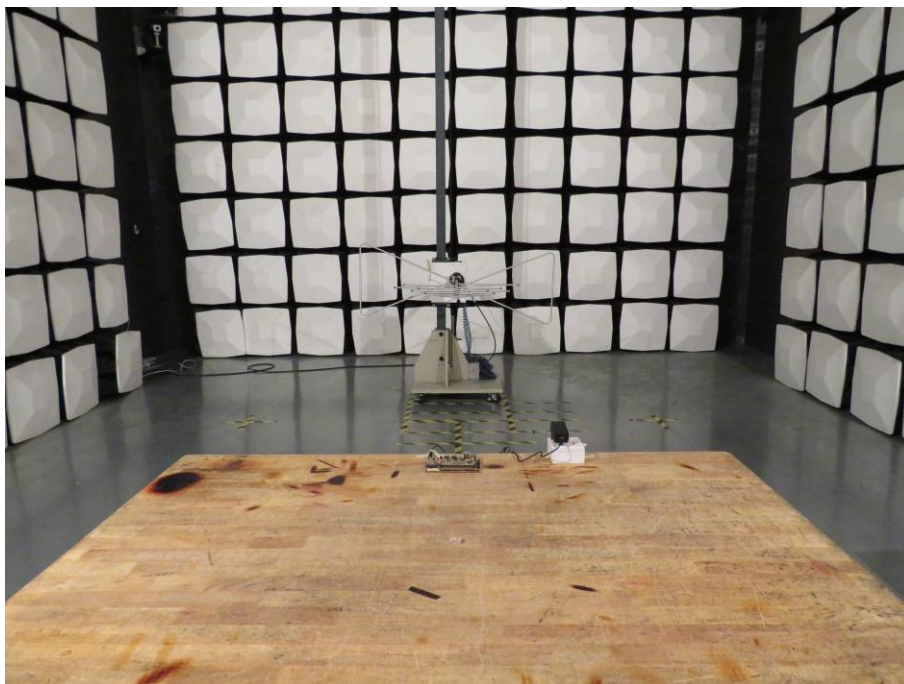
No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	1329.615	2.75	43.56	46.31	74.00	-27.69	peak			P	
2	1329.615	2.75	29.56	32.31	54.00	-21.69	AVG			P	
3	1467.318	3.49	44.66	48.15	74.00	-25.85	peak			P	
4	1467.318	3.49	34.42	37.91	54.00	-16.09	AVG			P	
5	1752.110	5.51	41.50	47.01	74.00	-26.99	peak			P	
6	1752.110	5.51	30.22	35.73	54.00	-18.27	AVG			P	
7	1982.685	6.87	38.64	45.51	74.00	-28.49	peak			P	
8	1982.685	6.87	28.86	35.73	54.00	-18.27	AVG			P	
9	2259.742	7.62	43.28	50.90	74.00	-23.10	peak			P	
10	2259.742	7.62	33.24	40.86	54.00	-13.14	AVG			P	
11	3031.626	9.31	39.48	48.79	74.00	-25.21	peak			P	
12	3031.626	9.31	29.00	38.31	54.00	-15.69	AVG			P	

6. PHOTOGRAPH

6.1 Photo of Conducted Emission Measurement



6.2 Photo of Radiation Emission Measurement



APPENDIX I

(Photos of E.U.T.)

Figure 1
General Appearance of the E.U.T.

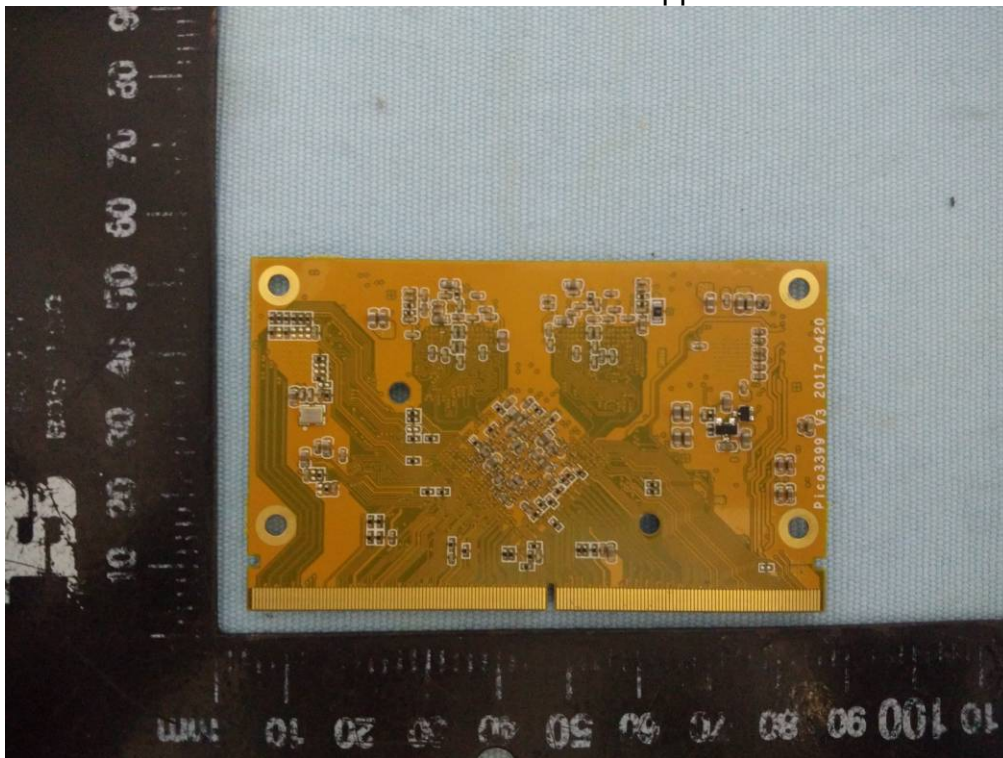


Figure 2
General Appearance of the E.U.T.



--- End ---