Japan Radio Law TEST REPORT

ZUIKI Inc.

Cuieboard3

Cubietruck

Prepared for : ZUIKI Inc.
Shin-Yokohama, Kohoku-ku, Yokohama-City, Kanagawa
222-0033, Japan

Prepared by : Audix Technology (Shenzhen) Co., Ltd.
No. 6, Ke Feng Rd., 52 Block,
Shenzhen Science & Industrial Park,
Nantou, Shenzhen, Guangdong, China

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Report Number	:	ACS-R15178
Date of Test	:	Apr.05~09, 2015
Date of Report	:	Apr.10, 2015

TABLE OF CONTENTS

TEST REPORT VERIFICATION

Applicant	:	ZUIKI Inc.
Manufacturer	:	CUBIEIECH LIMITED SHENZHEN
EUT Description	:	Cuieboard3
Model No.	:	Cubietruck
Test Voltage	:	DC 5V

Measurement Standards Used:

ARIB STD-T66 Version 2.1/2003-03
Technical Regulations Conformity Certification;
Radio Equipment Characteristics Testing Method

Second-Generation Low-Power Data Communication System/Wireless LAN System

The device described above is tested by AUDIX Technology Corporation. The measurement results were contained in this test report and AUDIX Technology Corporation was assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT to be technically compliance with. Article 49-20 and the relevant Articles in Ordinance Regulating Radio Equipment, which is equal to the ARIB STD-T66 requirements, and the device has been measured in accordance with the test method given in MIC notice No.88 Appendix No.43, or surpasses or is equal to the test method.

This report applies to above tested sample only and shall not be reproduced in part without written approval of AUDIX Technology Corporation.

Date of Test : Apr.05~09, 2015 Report of date: Apr.10, 2015

Prepared by : ______________________
Cindy Zhu / Assistant

Reviewed by : ______________________
Sunny Lu / Assistant Manager

Approved & Authorized Signer : ______________________
David Jin / Manager

1. SUMMARY OF MEASUREMENTS AND RESULTS

1.1. Compliance with ARIB STD-T66 Version 2.1/2003-03

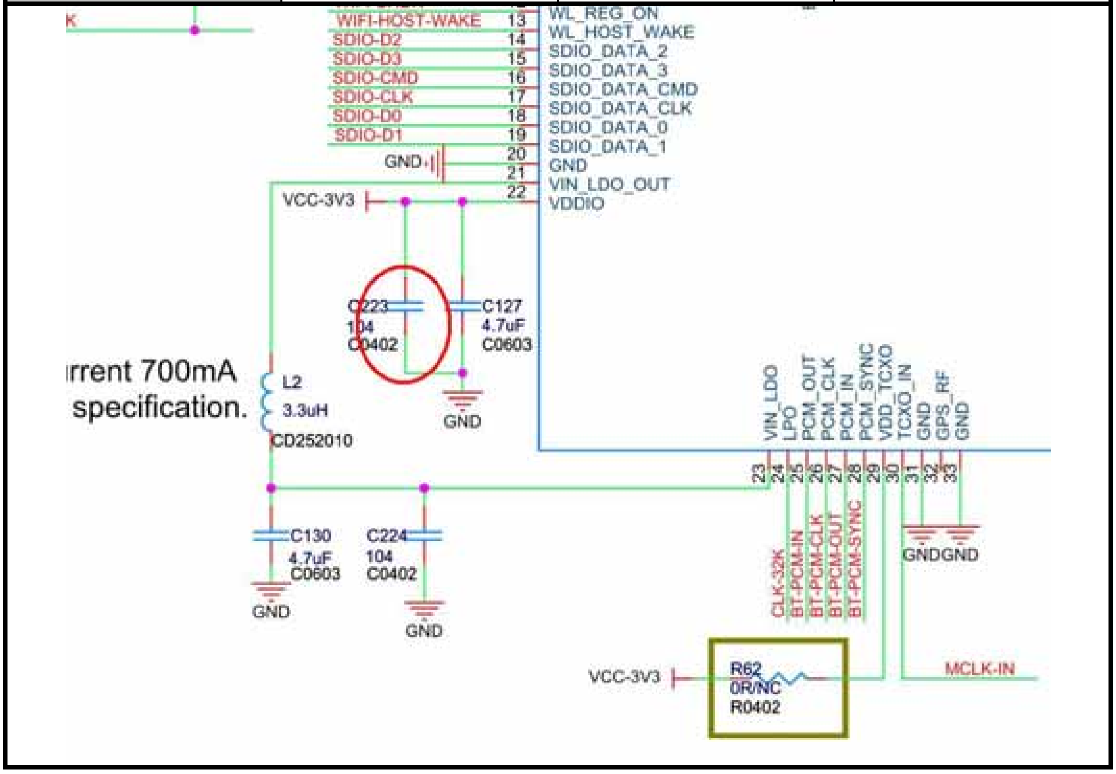
CLAUSE (ARIB STD-T66)	TEST PARAMETER	RESULTS
Transmitter Parameters		
3.2 (2)	Antenna Power	**PASS**
3.2 (3)	Tolerances for Antenna Power	**PASS**
3.2 (4)	Frequency Tolerance	**PASS**
3.2 (5)	Transmission Rate	**N/A**
3.2 (6)	Spurious Emissions	**PASS**
3.2 (7)	Spread-spectrum Bandwidth / Spread Factor	**PASS**
3.2 (8)	Spread Bandwidth	**PASS**
3.2 (9)	Number of Carriers	**N/A**
3.2 (10)	Dwell Time	**N/A**
Receiver Parameters		
3.3 (1)	Secondary Radiated Emissions	**PASS**
Other Parameters		
3.4.1	Interference Prevention Function	**PASS**
3.4.2	Construction Protection	**PASS**
N/A is an abbreviation for Not Applicable.		

2. GENERAL INFORMATION

2.1. Description of Device (EUT)

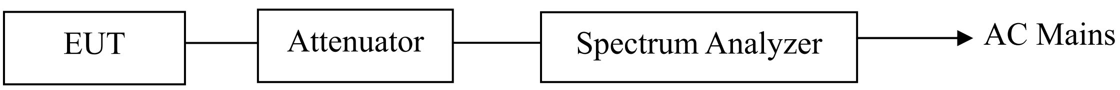
Product Name	:	Cuieboard3
Model Number	:	Cubietruck
Radio	:	Bluetooth V4.0; IEEE802.11 b/g/n
Operation Frequency	:	IEEE 802.11b: 2412MHz—2484MHz IEEE 802.11g: 2412MHz—2472MHz IEEE802.11nHT20: 2412MHz—2472MHz Bluetooth: 2402-2480MHz
Modulation Technology	:	IEEE 802.11b: DSSS(CCK,DQPSK,DBPSK) IEEE 802.11g: OFDM(64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n HT20: OFDM (64QAM, 16QAM, QPSK,BPSK) Bluetooth V4.0: GFSK
Antenna Assembly Gain	:	Integrated PCB antenna,Gain :4.1dBi
Applicant	:	ZUIKI Inc. Shin-Yokohama, Kohoku-ku, Yokohama-City, Kanagawa 222-0033, Japan
Manufacturer	:	CUBIEIECH LIMITED SHENZHEN 303, 1st Bldg, A Zone, Baoan Internet Industry Base, No.1009, Baoyuan Road, Baoan District, Shenzhen, China.
Date of Test	:	Apr.05~09, 2015
Date of Receipt	:	Apr.05, 2015
Sample Type	:	Prototype production

Operating Voltage	5 V	5.5 V	4.5 V
Measuring Voltage	3.3 V	3.32V	3.27V
Tolerance	-	0.60%	-0.90%



NOTE: When EUT be operated at ±10% from the normal supply voltage, the supply voltage of RF part was varied within ±1%. All test cases were done under the normal supply voltage.

2.2.Block Diagram of Test Setup



(EUT: Cuieboard3)

2.3.Test information

The Special test software was used to control EUT work in Continuous TX mode, and select test channel.

Tested mode, channel, and data rate information			
Mode	data rate (Mbps)	Channel	Frequency (MHz)
Tx Mode GFSK modulation	1	Low :CH 0	2402
	1	Middle: CH19	2440
	1	High: CH39	2480

2.4. Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Validity Date	Cal. Agency
1	Spectrum Analyzer	Agilent	N9030A	MY51380221	Oct.29,14	Oct.28,15	CEPREI
2	Attenuator (10dB)	Agilent	8491A	MY39264375	Apr.28,14	Apr.27,15	CEPREI
3	RF Cable	Hubersuhner	SUCOFLEX102	28610/2	Apr.28,14	Apr.27,15	CEPREI
4	Power meter	Anritsu	ML2487A	6K00002472	Aug.20,14	Aug.19,15	CEPREI
5	Signal Generator	HP	83732B	VS34490501	Apr.28,14	Apr.27,15	CEPREI

Note: Calibration by the calibration Agencies Listed in the table Correspond to paragraph 4(ii)(c) of Article 24-2 in the Radio Law.

2.5. Description of Test Facility

Site Description

Name of Firm : Audix Technology (Shenzhen) Co., Ltd.
No. 6, Ke Feng Rd., 52 Block, Shenzhen Science & Industrial Park, Nantou, Shenzhen, Guangdong, China

3m Anechoic Chamber : Certificated by FCC, USA
Registration Number: 90454
Valid Date: Dec.30, 2017

3m & 10m Anechoic Chamber : Certificated by FCC, USA
Registration Number: 794232
Valid Date: Oct.31, 2015

RF Anechoic Chamber : Dimensions are:
[L]10m Ｘ [W]5.5m Ｘ [H]5m

EMC Lab. : Certificated by DAkkS, Germany
Registration No: D-PL-12151-01-00
Valid Date: Dec.15, 2016

Accredited by NVLAP, USA
NVLAP Code: 200372-0
Valid Date: Mar.31, 2016

United States Department of Commerce
National Institute of Standards and Technology

NVLAP®

Certificate of Accreditation to ISO/IEC 17025:2005

NVLAP LAB CODE: 200372-0

AUDIX Technology (Shenzhen) Co., Ltd.
Shenzhen, Guangdong 518057
CHINA

is accredited by the National Voluntary Laboratory Accreditation Program for specific services, listed on the Scope of Accreditation, for:

ELECTROMAGNETIC COMPATIBILITY AND TELECOMMUNICATIONS

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).

DEPARTMENT OF COMMERCE · UNITED STATES OF AMERICA

2015-04-01 through 2016-03-31
Effective dates

For the National Institute of Standards and Technology

NVLAP-01C (REV. 2009-01-28)

2.6.Measurement Uncertainty (95% confidence levels, k=2)

Test Item	Uncertainty
Uncertainty for Radiated Spurious Emission test in RF chamber	3.6dB
Uncertainty for Conduction Spurious emission test	2.0dB
Uncertainty for Output power test	0.8dB
Uncertainty for Power density test	2.0dB
Uncertainty for Frequency range test	$7x10^{-8}$
Uncertainty for Bandwidth test	83kHz
Uncertainty for DC power test	0.1 %
Uncertainty for test site temperature and humidity	0.6℃
	3%

3. MEASUREMENTS OF TRANSMITTER PARAMETERS

3.1. Antenna Power

3.1.1. Limit

Item	Limits
Antenna Power	≦10mW(other modulation)
Antenna Power Error	+20%,-80% (Base on manufacturer declare antenna power density)

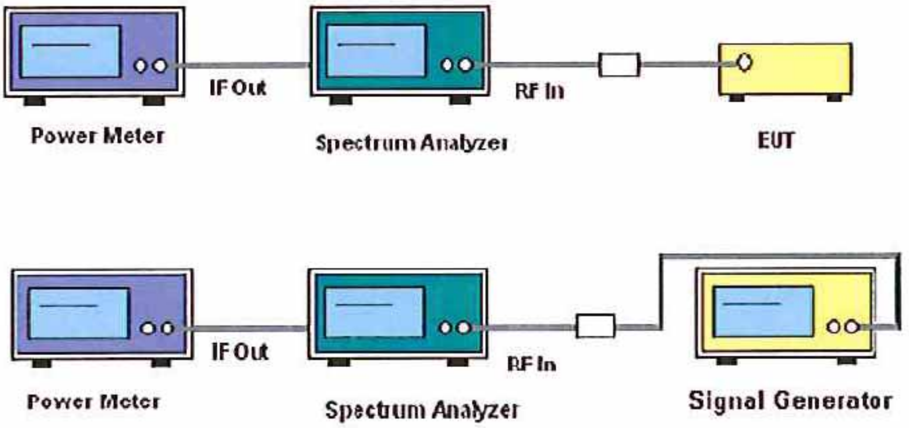
3.1.2. Measuring Instruments

See list of measuring instruments of the 2.3 section.

3.1.3. Test Procedures

1. A power meter is connected on the IF output port of the spectrum analyzer.
2. Adjust the spectrum analyzer to have the center frequency the same with the measured carrier.
   RBW=VBW=1MHz. detector mode is positive peak. Turn off the averaging function and use zero span.
3. The calibrating signal power shall be reduced to 0 dBm and is shall be verified that the power meter reading also reduces by 10 dB.
4. Connect the equipment to be measured. Using the following settings of the spectrum analyzer in combination with “max hold” function, fine the frequency of highest power output in the power envelope: center frequency equal to operating frequency; RBW & VBW: 1 MHz: detector mode: positive peak: averaging : off: span: 3 times the spectrum width: amplitude: adjust for middle of the instrument’s range. The frequency found shall be recorded.
5. Set the center frequency of the spectrum analyzer to the found frequency and switch to zero span. The power meter indicates the measured power density “E”.
6. Remove the EUT and put the replacing standard signal generator (SSG). Set the standard signal generator (SSG) at same frequency and transmit on, then set SSG output power at Pt to give the equivalent output level of “E”.
7. Calculate antenna power density by the formula PD=Pt + 10*log(1/X).
   x: The duty cycle of the EUT in continuously transmitting mode
   Pt: Output power of the SSG
8. Antenna power Error is definition that actual measure antenna power tolerance between +20% to -80% power range that base on manufacturer declare the conducted power density.

3.1.4. Test Setup



3.1.5. Test Results

EUT: Cuieboard3	
M/N: Cubietruck	Test Engineer: Donjon_Huang
Test Site: RF Site	Date:2015-04-07
Temperature:22.4±0.6 ℃ Humidity: 52.8±3.0 % Pressure: 101.4±1.0 kpa	

Mode	Test Voltage	Channel (MHz)	Result (mW)	Limit (mW)
GFSK	DC 5V	2402	1.96 2.62%	10mW or less Tolerance -80% +20%
		2440	1.91 0%	
		2480	1.72 -9.95%	
Rated Power: 1.91mW				
Conclusion: PASS				

3.2.Frequency Tolerance

3.2.1. Limit

Item	Limits
Frequency Tolerance	≦50ppm

3.2.2. Measuring Instruments

See list of measuring instruments of the 2.3 section.

3.2.3. Test Procedure

1. Frequency accuracy of instrument shall be less than 10% of limits tolerance (5ppm).
2. Setting of SA is following as: RBW:10kHz / VBW:10kHz.
3. The frequency tolerance test case is directly measured using spectrum analyzer. Then the frequency error formula is (f-fc)/fc╳106 ppm and the limit is less than ± 50ppm.

3.2.4. Test Setup

See clause 2.2 for block diagram of test setup.

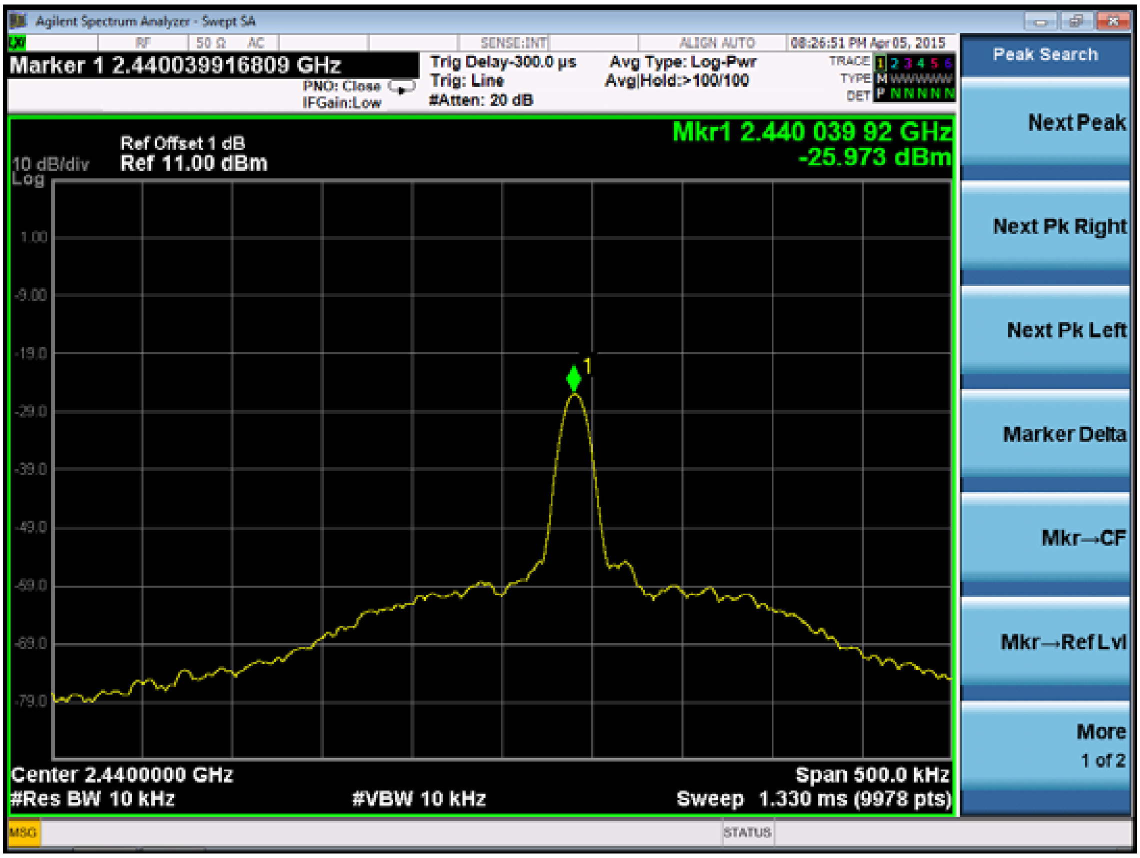
3.2.5. Test Results

EUT: Cuieboard3	
M/N: Cubietruck	Test Engineer: Donjon_Huang
Test Site: RF Site	Test date: 2015-04-07
Temperature：23.1±0.6 ℃ Humidity: 52.9±3.0 % Pressure: 101.1±1.0 kpa	

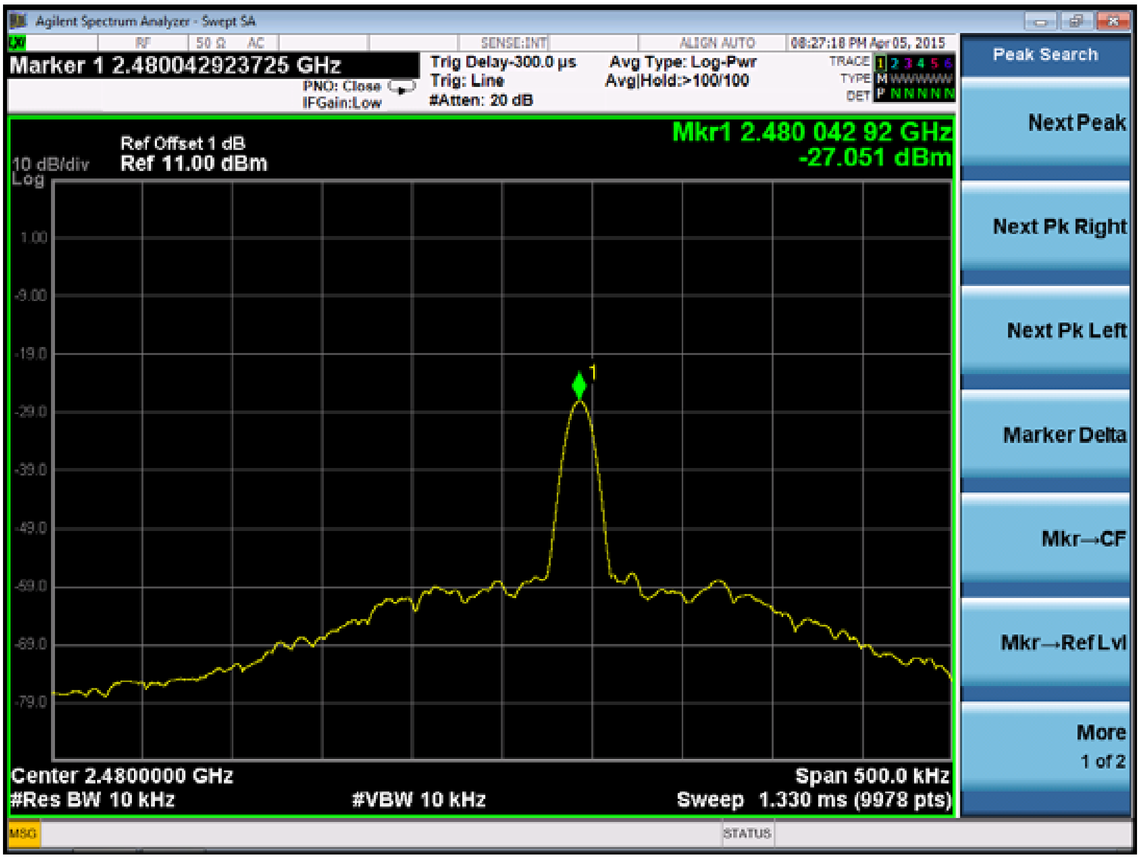
Test Voltage	Test Mode	CH	Reading (MHz)	Target Frequency (MHz)	Result (ppm)	Limit (ppm)
DC 5V	Tx	CH0	2402.03771	2402	15.70	±50
		CH39	2440.03992	2440	16.36	±50
		CH78	2480.04292	2480	17.31	±50
Conclusion: PASS						

CH0 2402MHz

CH19 2440MHz



CH39 2480MHz



3.3.Occupied Bandwidth and Spread-spectrum Bandwidth / Spread Factor Measurement

3.3.1. Limit

Item	Limits
Occupied Bandwidth	FH: 83.5MHz or less OFDM (For BW=20MHz)≦26MHz OFDM (For BW=40MHz)≦38MHz
Spreading Bandwidth	DS,OFDM,FH,FH+DS,FH+OFDM:500KHz or more
Spread Spectrum Factor	≧5

3.3.2. Measuring Instruments

See list of measuring instruments of the 2.3 section.

3.3.3. Test Procedure

1. Setting of SA is following as: RBW: 100KHz / VBW:300KHz
   Sweep Mode: Continuous sweep
   Detect mode: Positive peak
   Trace mode: Max hold.
2. EUT have transmitted each modulation signal and fixed channelize (For DSSS or OFDM Device).
   SA set to 99% of occupied bandwidth to measure occupied bandwidth. The limit is less than 26MHz(For DSSS or OFDM Device).
3. SA set to 90% of occupied bandwidth to measure Spread Spectrum Bandwidth and must greater than 500kHz.
4. Spread Spectrum Factor = Spread Spectrum Bandwidth / modulation rate of EUT.

3.3.4. Test Setup

See clause 2.2 for block diagram of test setup.

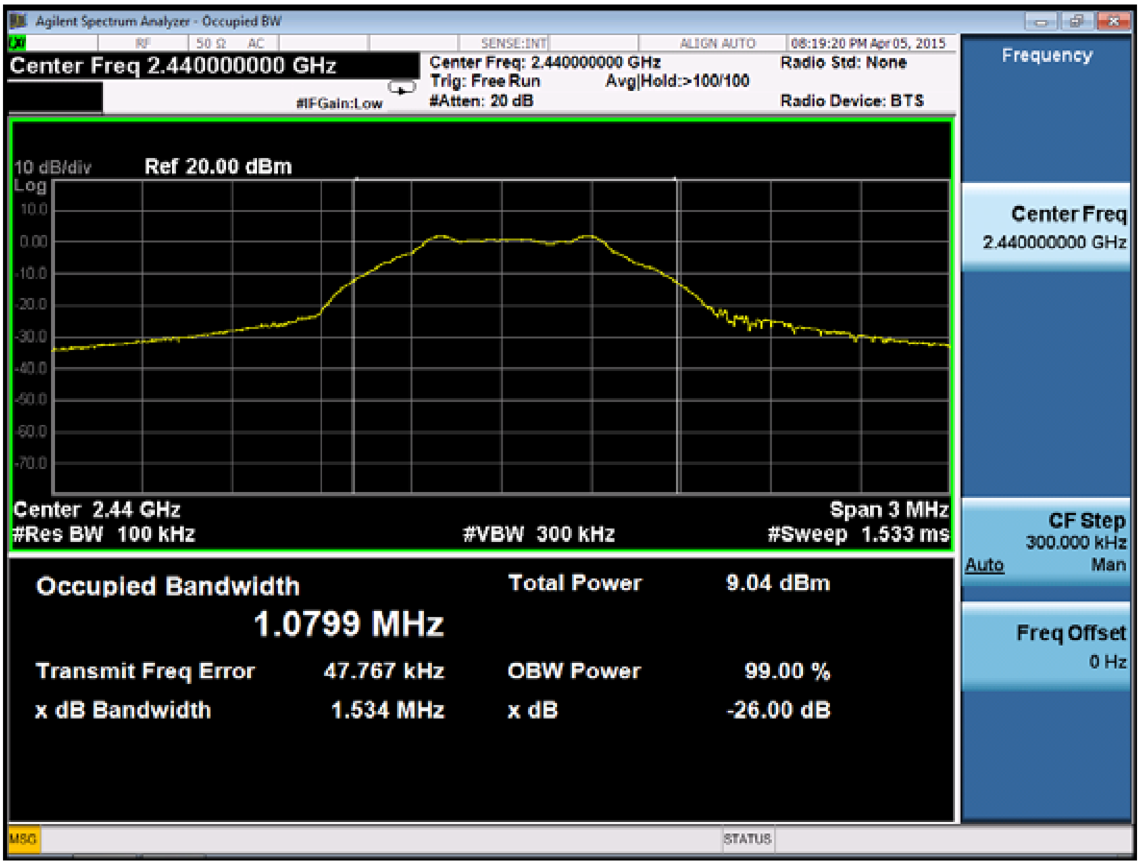
3.3.5. Test Results (99% BW)

EUT: Cuieboard3		
M/N: Cubietruck		
Test date: 2015-04-07	Pressure: 101.1±1.0kpa	Humidity: 53.1±3.0%
Tested by: Donjon-Huang	Test site: RF Site	Temperature:22.8±0.6℃

Test Mode	CH (MHz)	99% bandwidth (MHz)	Limit (MHz)
GFSK	CH0	1.0893	≦83.5
	CH19	1.0799	≦83.5
	CH39	1.0904	≦83.5
Conclusion：PASS			

CH0

CH19


Agilent Spectrum Analyzer - Occupied BW
Center Freq 2.440000000 GHz
Center Freq: 2.440000000 GHz
Trig: Free Run
Avg|Hold:>100/100
#Atten: 20 dB
Radio Std: None
Radio Device: BTS
08:19:20 PM Apr 05, 2015
10 dB/div
Ref 20.00 dBm
Center 2.44 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 3 MHz
#Sweep 1.533 ms
Occupied Bandwidth
1.0799 MHz
Total Power 9.04 dBm
Transmit Freq Error 47.767 kHz
OBW Power 99.00 %
x dB Bandwidth 1.534 MHz
x dB -26.00 dB
Frequency
Center Freq
2.440000000 GHz
CF Step
300.000 kHz
Auto Man
Freq Offset
0 Hz

CH39


Agilent Spectrum Analyzer - Occupied BW
Center Freq 2.480000000 GHz
Center Freq: 2.480000000 GHz
Trig: Free Run
Avg|Hold:>100/100
#Atten: 20 dB
Radio Std: None
Radio Device: BTS
08:19:52 PM Apr 05, 2015
10 dB/div
Ref 20.00 dBm
Center 2.48 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 3 MHz
#Sweep 1.533 ms
Occupied Bandwidth
1.0904 MHz
Total Power 9.05 dBm
Transmit Freq Error 44.439 kHz
OBW Power 99.00 %
x dB Bandwidth 1.557 MHz
x dB -26.00 dB
Frequency
Center Freq
2.480000000 GHz
CF Step
300.000 kHz
Auto Man
Freq Offset
0 Hz

(90% BW)

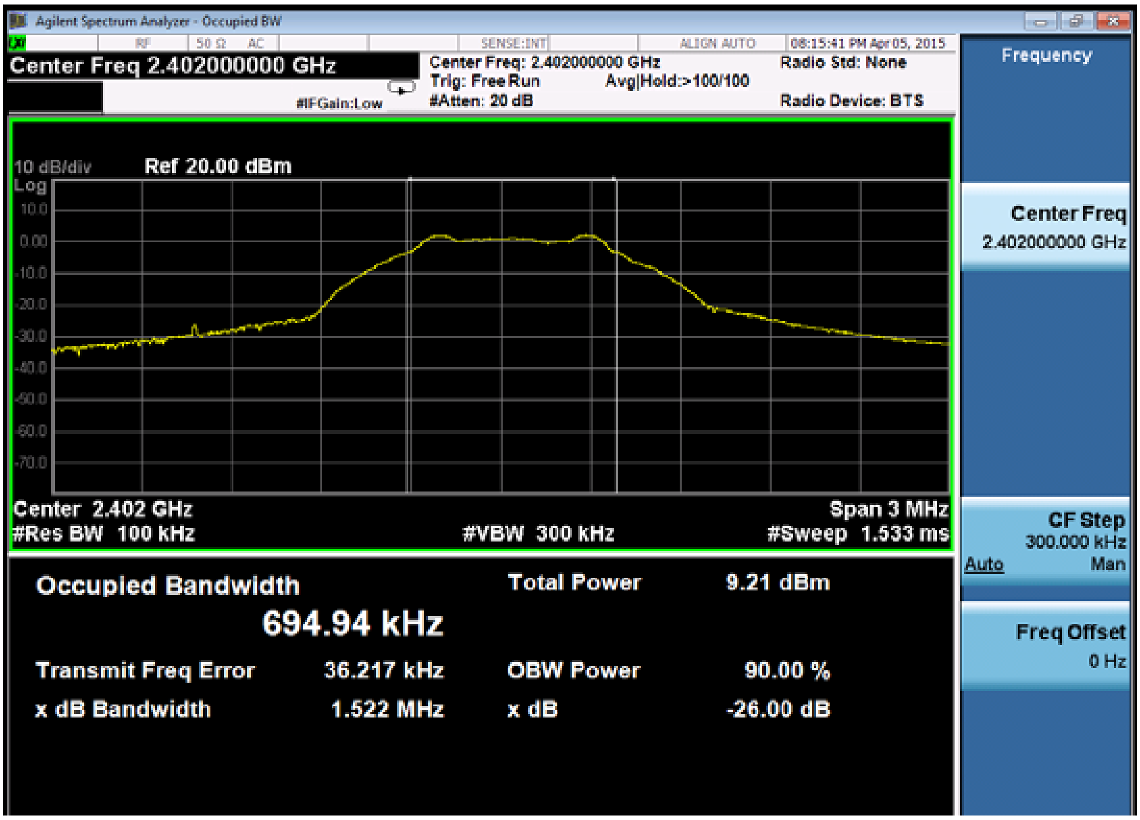
EUT: Cuieboard3		
M/N: Cubietruck		
Test date: 2015-04-07	Pressure: 101.2±1.0kpa	Humidity: 51.9±3.0%
Tested by: Donjon_Huang	Test site: RF Site	Temperature: 22.3±0.6℃

Test Mode	Frequency (MHz)	90% bandwidth (kHz)	Limit (KHz)
GFSK	CH0	694.94	≧500
	CH19	695.45	≧500
	CH39	697.10	≧500
Conclusion：PASS			

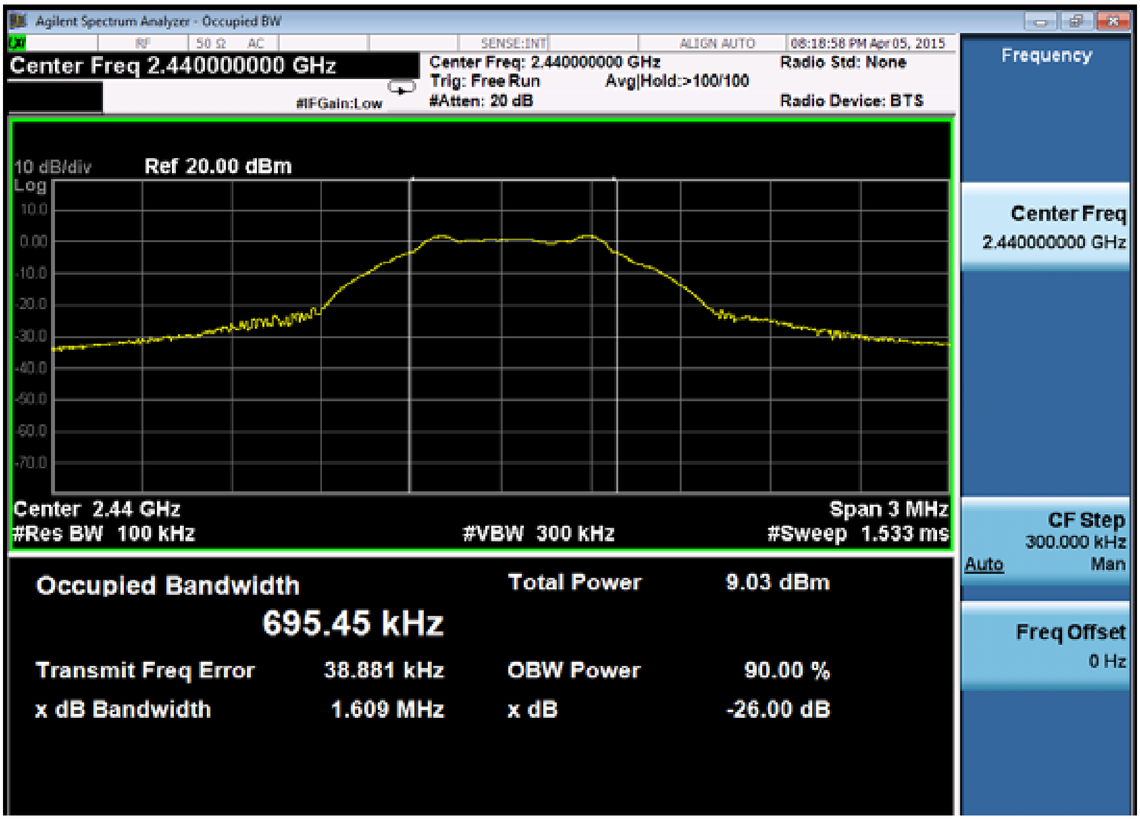
Spread Spectrum Factor

Test Mode	90% bandwidth (MHz)	Symbol Rate (MHz)	Spread Spectrum Factor	Limit
GFSK	694.94	1	694.94	≧5
	695.45	1	695.45	≧5
	697.10	1	697.10	≧5

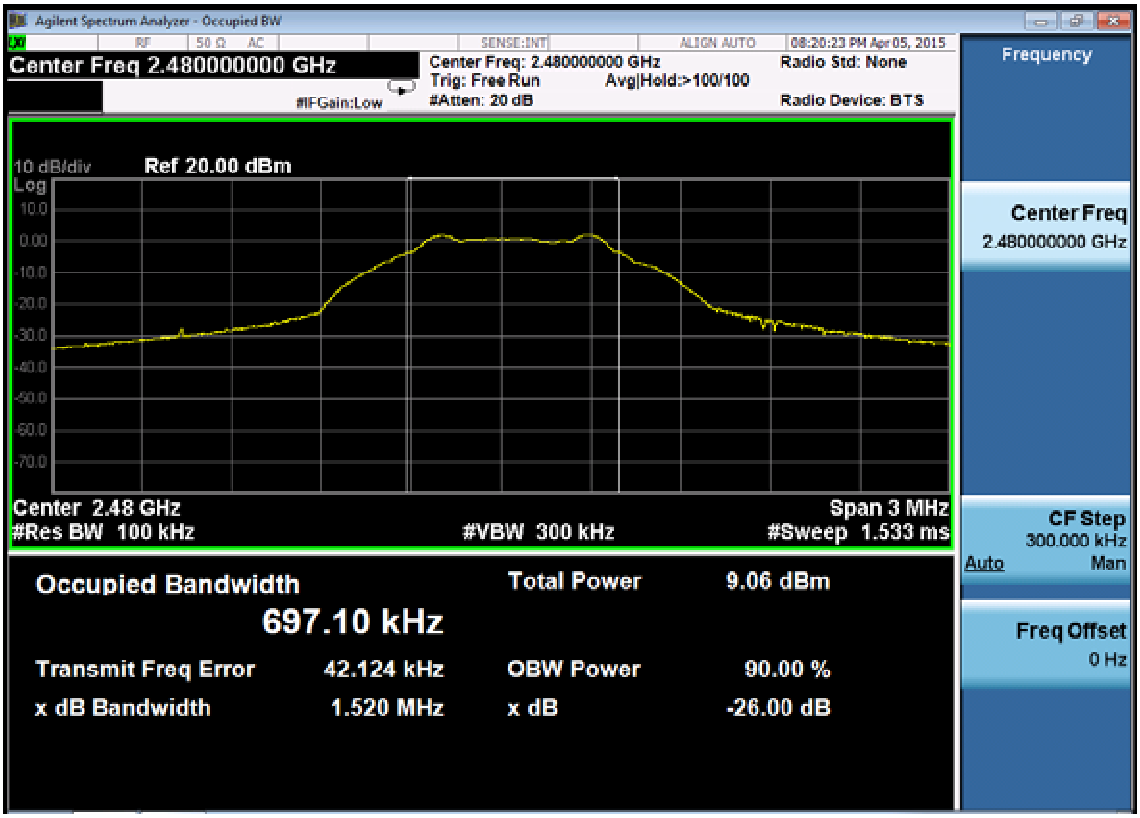
CH1



CH19


Agilent Spectrum Analyzer - Occupied BW
Center Freq 2.440000000 GHz
Center Freq: 2.440000000 GHz
Trig: Free Run
Avg|Hold:>100/100
#Atten: 20 dB
#IFGain:Low
Radio Std: None
Radio Device: BTS
08:18:58 PM Apr 05, 2015
10 dB/div
Log
Ref 20.00 dBm
Center 2.44 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 3 MHz
#Sweep 1.533 ms
Occupied Bandwidth
695.45 kHz
Total Power 9.03 dBm
Transmit Freq Error 38.881 kHz
OBW Power 90.00 %
x dB Bandwidth 1.609 MHz
x dB -26.00 dB
Frequency
Center Freq
2.440000000 GHz
CF Step
300.000 kHz
Auto
Man
Freq Offset
0 Hz

CH39


Agilent Spectrum Analyzer - Occupied BW
Center Freq 2.480000000 GHz
Center Freq: 2.480000000 GHz
Trig: Free Run
Avg|Hold:>100/100
#Atten: 20 dB
#IFGain:Low
Radio Std: None
Radio Device: BTS
08:20:23 PM Apr 05, 2015
10 dB/div
Log
Ref 20.00 dBm
Center 2.48 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 3 MHz
#Sweep 1.533 ms
Occupied Bandwidth
697.10 kHz
Total Power 9.06 dBm
Transmit Freq Error 42.124 kHz
OBW Power 90.00 %
x dB Bandwidth 1.520 MHz
x dB -26.00 dB
Frequency
Center Freq
2.480000000 GHz
CF Step
300.000 kHz
Auto
Man
Freq Offset
0 Hz

3.4. Transmitter Spurious Emissions (Conducted)

3.4.1. Limit

Item	Limits
Tx Spurious Emission	≦2.5 μ W (2387MHz＞f ; 2496.5MHz＜f)
	≦25 μ W (2387MHz≦f＜2400MHz) and (2483.5MHz＜f≦2496.5MHz)

3.4.2. Measuring Instruments

See list of measuring instruments of the 2.3 section.

3.4.3. Test Procedures

1. EUT has transmitted the maximum power and fixed channelize.
   Setting of SA is following as: RBW: 1MHz / VBW:1MHz above 1GHz, Sweep time : Auto / Sweep Mode: Continuous sweep / Detect mode: Positive peak / Trace mode: Max hold.
   Setting of SA is following as: RBW: 100kHz / VBW:100kHz under 1GHz, Sweep time : Auto / Sweep Mode: Continuous sweep / Detect mode: Positive peak / Trace mode: Max hold.
2. Setting of SA is following as: start frequency 30MHz and stop frequency 2387MHz Then to mark peak reading Value + cable loss shall be less than 2.5 μ W.
3. SA adjusted to start frequency 2387MHz and stop frequency 2400MHz. Then to mark peak reading Value + cable loss shall be less than 25 μ W.
4. SA adjusted to start frequency 2483.5MHz and stop frequency 2496.5MHz. Then to mark peak reading Value + cable loss shall be less than 25 μ W.
5. SA adjusted to start frequency 2496.5MHz and stop frequency 13000MHz. Then to mark peak reading Value + cable loss shall be less than 25 μ W.
6. If the Result Value is over the requirement, take total sum of 1MHz band centered at the spur frequency like ACLP measurement as result value.

3.4.4. Test Setup

See clause 2.2 for block diagram of test setup.

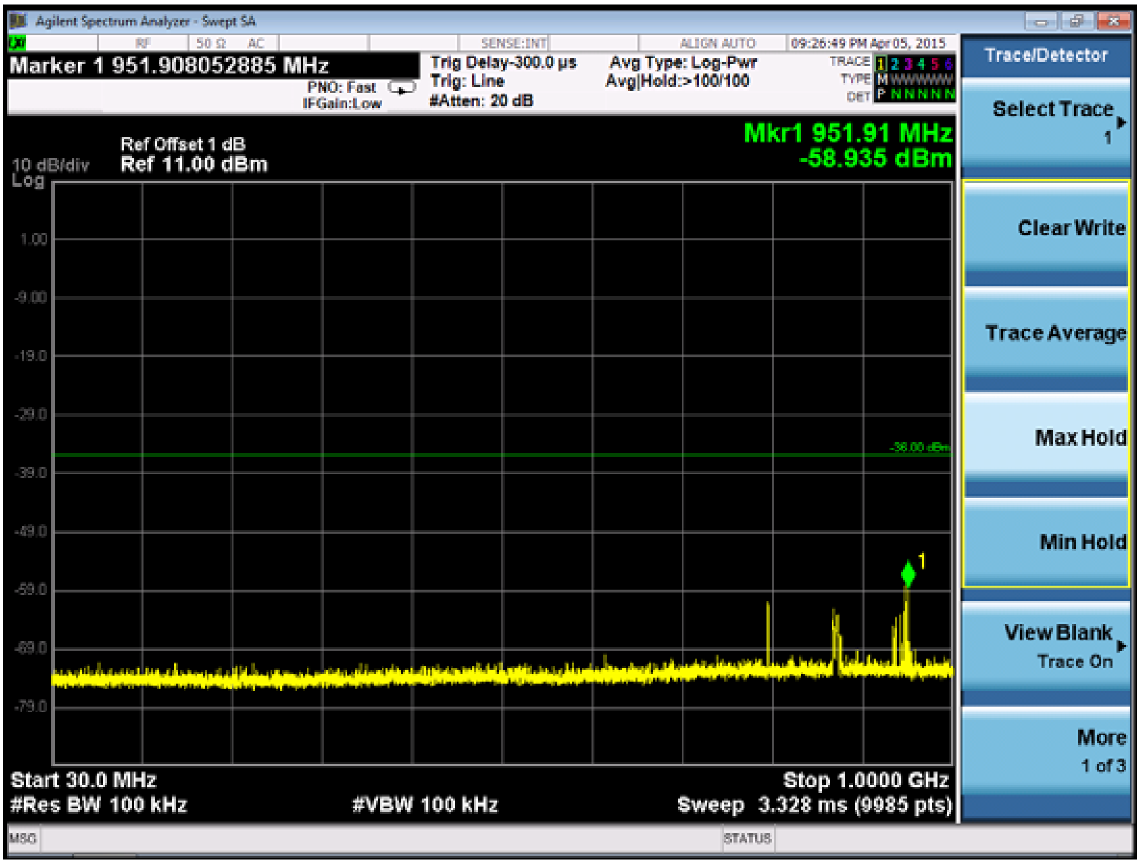
3.4.5. Test Results of Conducted Spurious Emissions – TX Operating

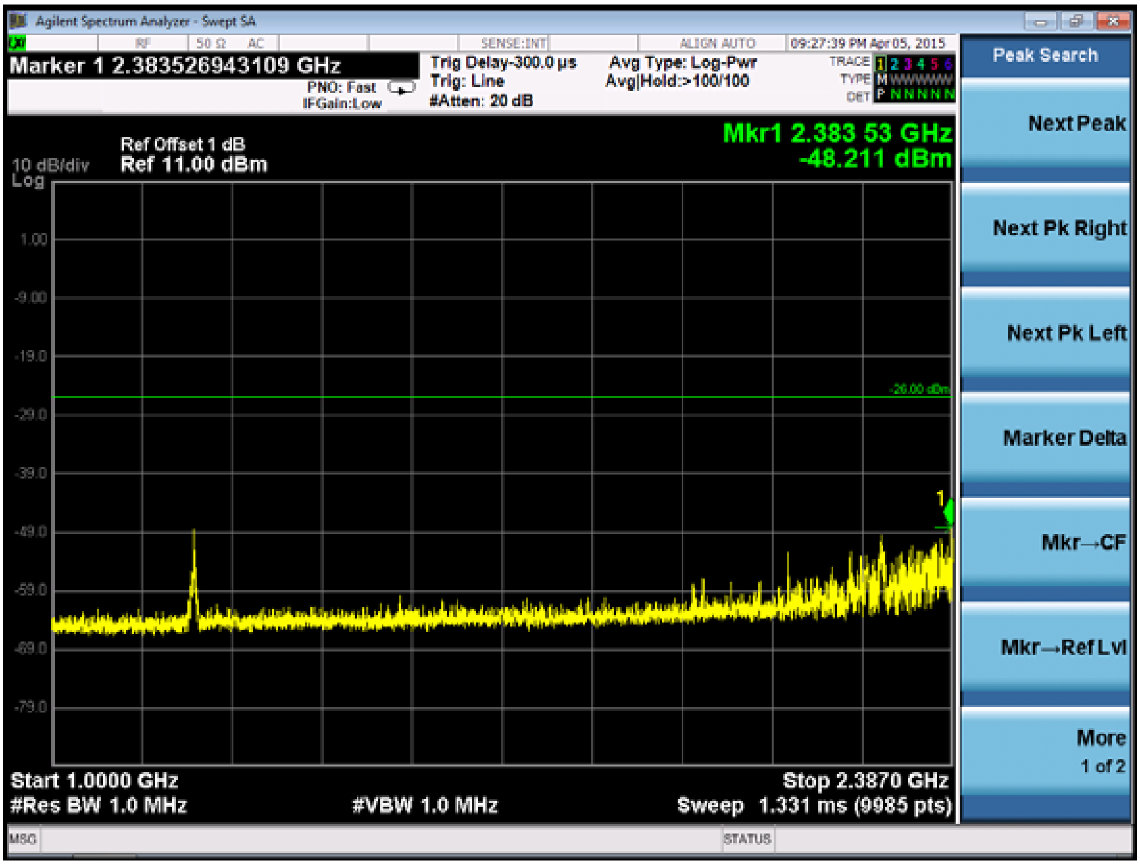
Note:
*1: Frequency Band (30MHz≤ f ≤1000MHz)
*2: Frequency Band (1000MHz≤ f ＜2387MHz)
*3: Frequency Band (2387MHz≤ f ＜2400MHz)
*4: Frequency Band (2483.5MHz＜ f ≤2496.5MHz)
*5: Frequency Band (2496.5MHz≤ f ≤13000MHz)

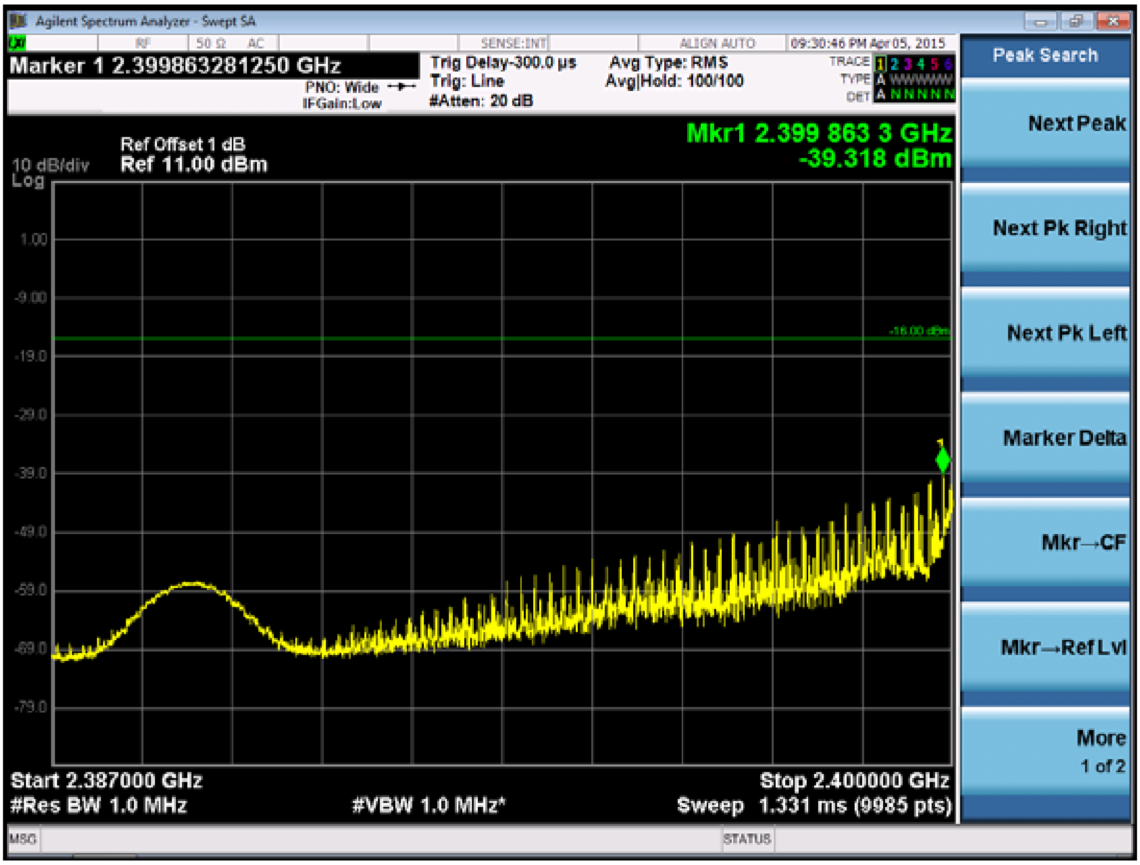
EUT: Cuieboard3		
M/N: Cubietruck		
Test date: 2015-04-05	Pressure: 101.3±1.0kpa	Humidity: 52.4±3.0%
Tested by: Kobe-Huang	Test site: RF Site	Temperature: 23.3±0.6℃

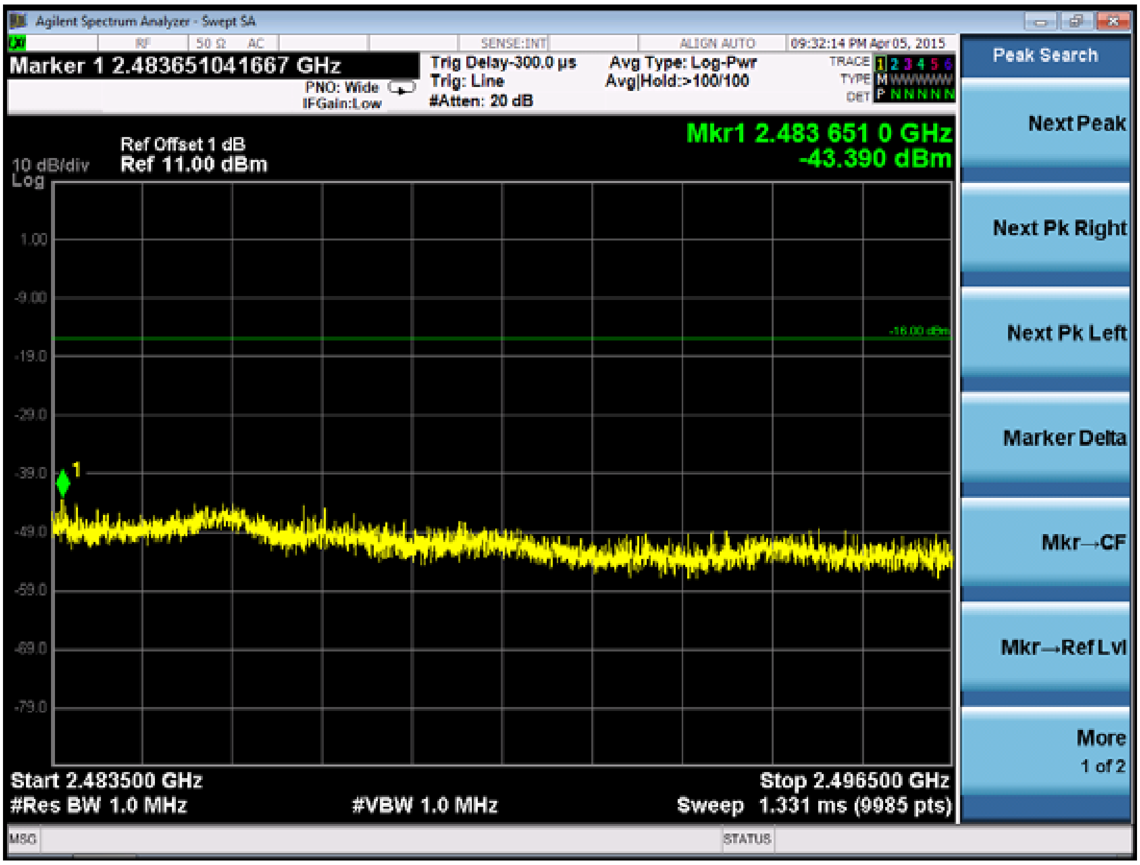
Test Mode	GFSK(CH0,CH19,CH39)				Remarks	Result
Test Frequency	MHz	2402	2440	2480	Low/Mid/High of test frequency range	(Pass/Fail)
*1	dBm/100kHz	-58.935	-60.521	-60.051	Limit≦2.5 μ W/MHz (-36dBm/100kHz)	Pass
*2	dBm/MHz	-48.211	-51.863	-52.186	Limit≦2.5 μ W/MHz (-26dBm/MHz)	Pass
*3	dBm/MHz	-39.318	-50.353	-48.740	Limit≦25 μ W/MHz (-16dBm/MHz)	Pass
*4	dBm/MHz	-43.390	-47.885	-43.011	Limit≦25 μ W/MHz (-16dBm/MHz)	Pass
*5	dBm/MHz	-45.789	-47.929	-50.309	Limit≦2.5 μ W/MHz (-26dBm/MHz)	Pass

Test Modulation: GFSK
CH 0: 2402MHz

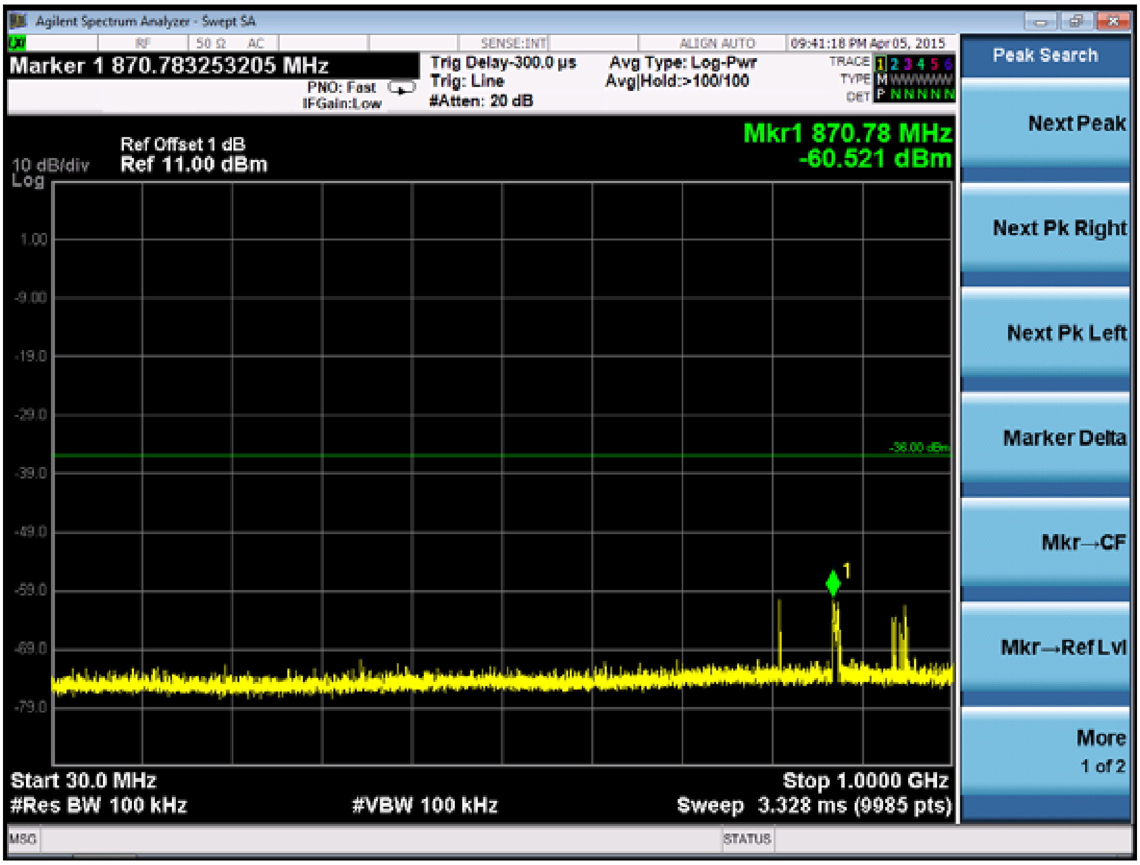


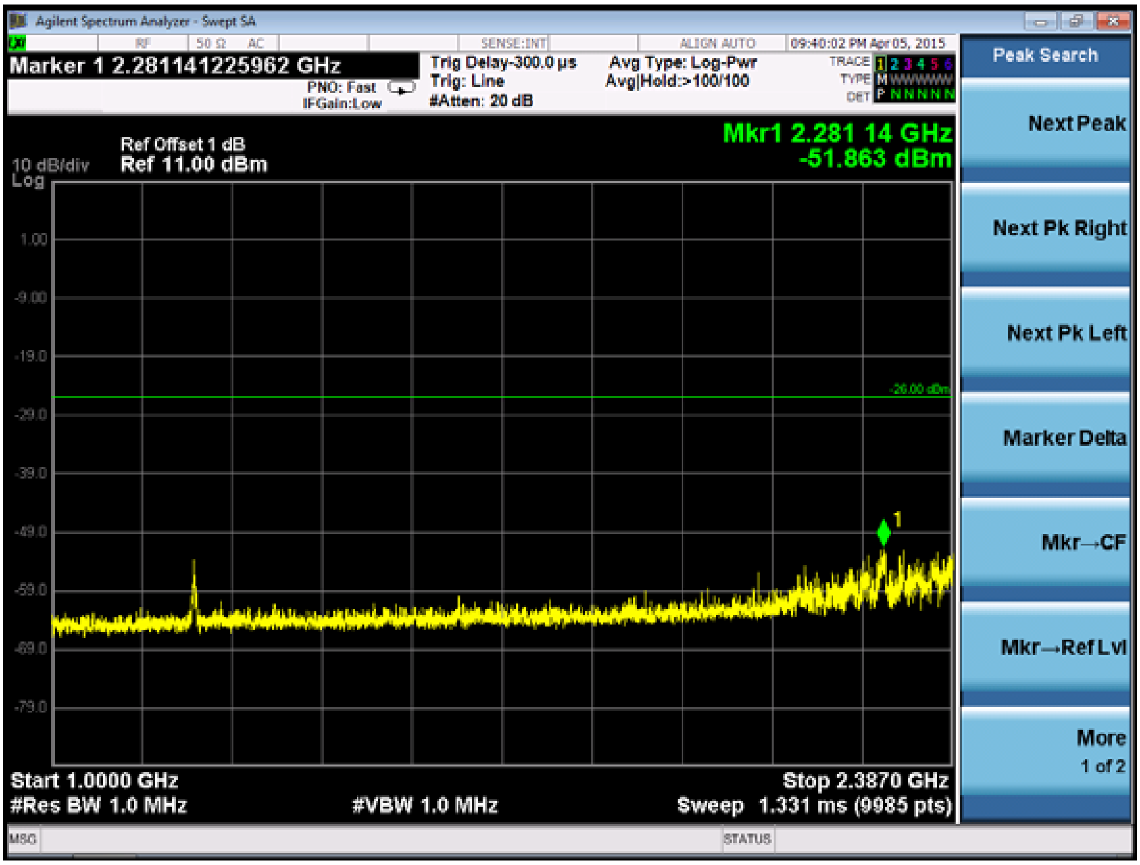


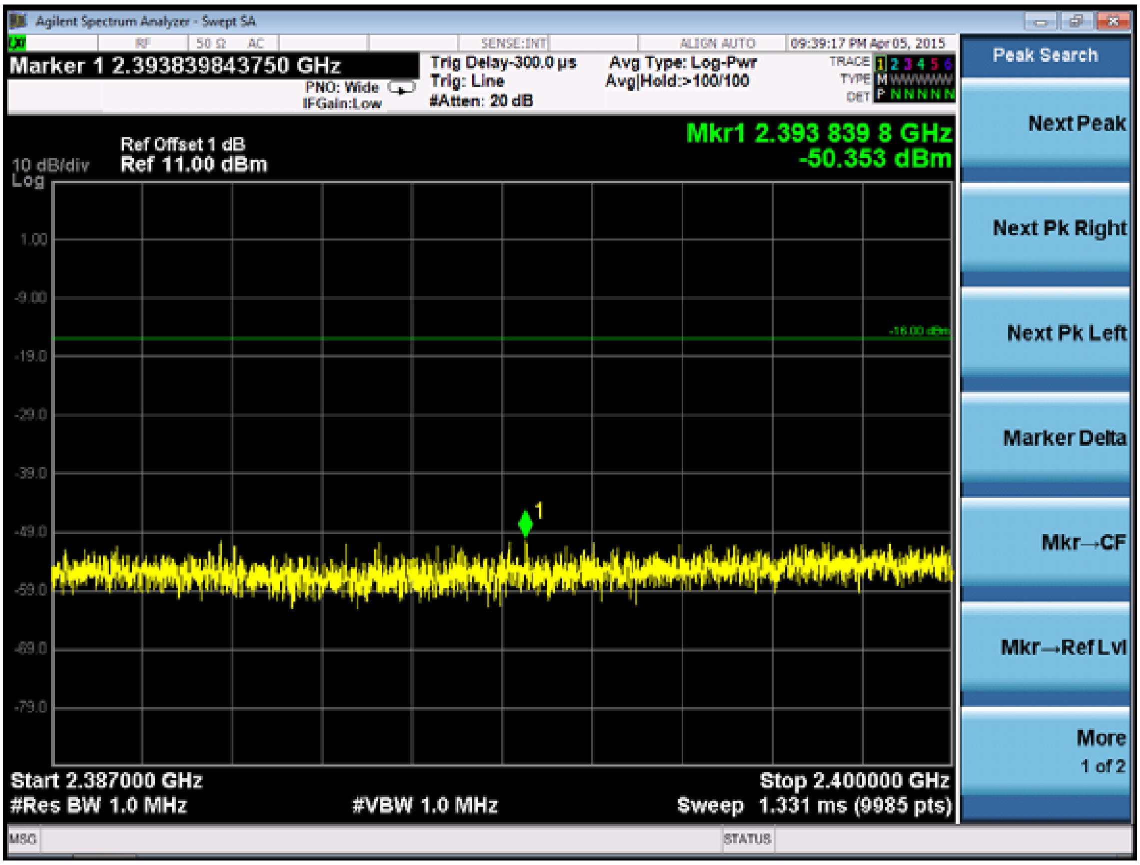

Agilent Spectrum Analyzer - Swept SA
Marker 1 2.399863281250 GHz
Trig Delay-300.0 µs
Trig: Line
#Atten: 20 dB
Avg Type: RMS
Avg|Hold: 100/100
09:30:46 PM Apr 05, 2015
Mkr1 2.399 863 3 GHz
-39.318 dBm
Ref Offset 1 dB
10 dB/div Ref 11.00 dBm
Log
Start 2.387000 GHz
#Res BW 1.0 MHz
#VBW 1.0 MHz*
Stop 2.400000 GHz
Sweep 1.331 ms (9985 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→RefLvl
More
1 of 2

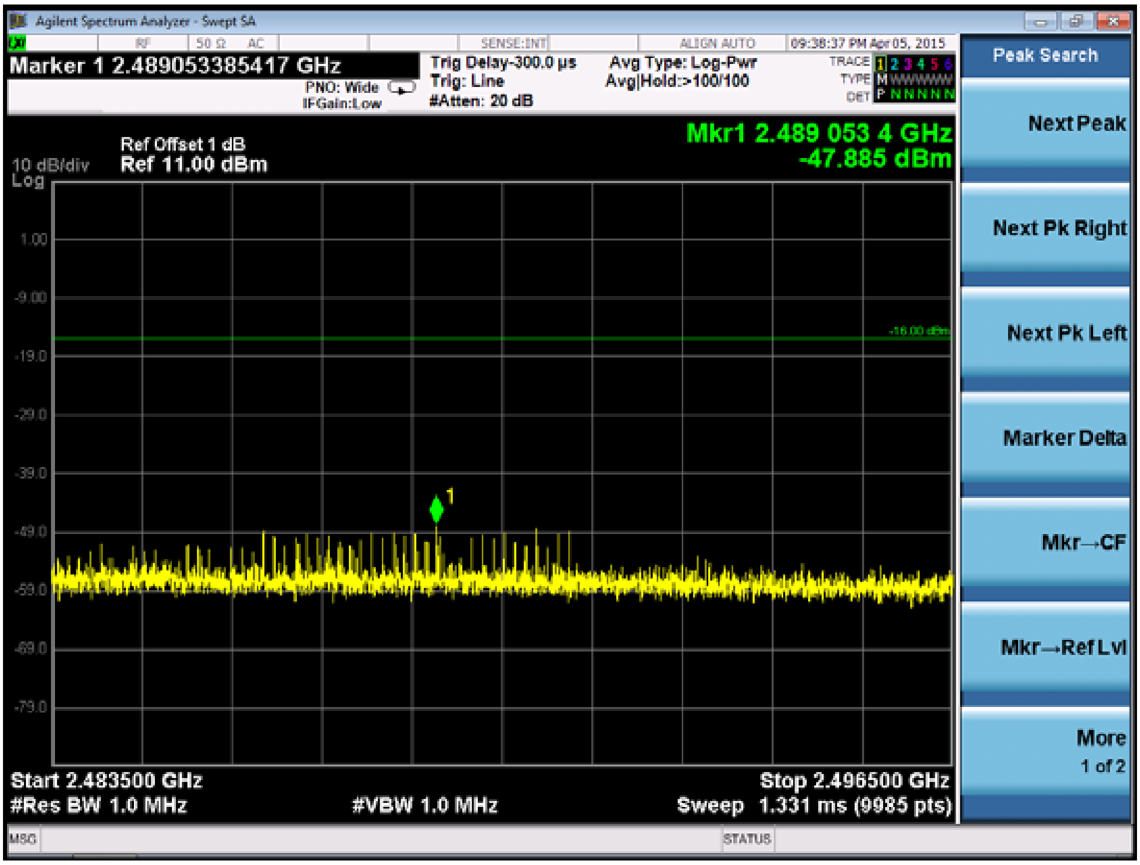

Agilent Spectrum Analyzer - Swept SA
Marker 1 2.483651041667 GHz
Trig Delay-300.0 µs
Trig: Line
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
09:32:14 PM Apr 05, 2015
Mkr1 2.483 651 0 GHz
-43.390 dBm
Ref Offset 1 dB
10 dB/div Ref 11.00 dBm
Log
Start 2.483500 GHz
#Res BW 1.0 MHz
#VBW 1.0 MHz
Stop 2.496500 GHz
Sweep 1.331 ms (9985 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→RefLvl
More
1 of 2

CH 19 2440MHz



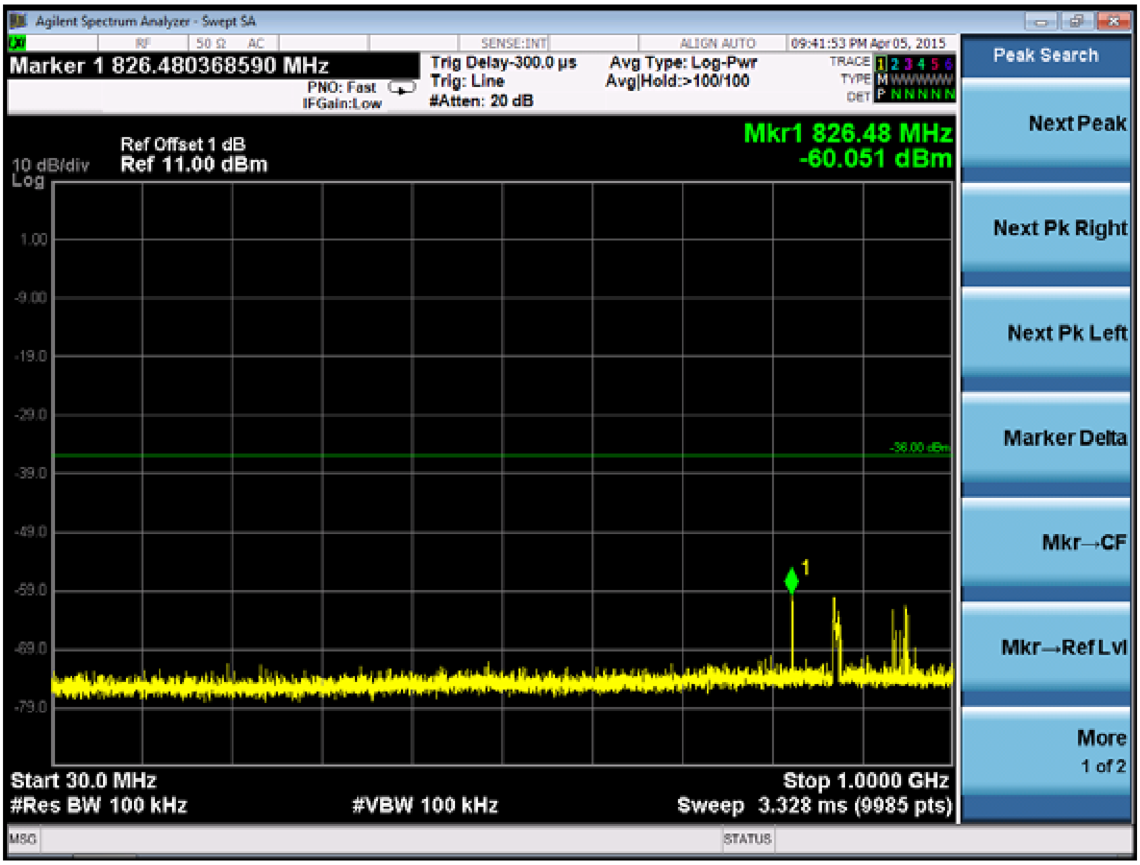

Agilent Spectrum Analyzer - Swept SA
Marker 1 2.281141225962 GHz
PNO: Fast
IFGain:Low
Trig Delay-300.0 µs
Trig: Line
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
09:40:02 PM Apr 05, 2015
Mkr1 2.281 14 GHz
-51.863 dBm
Ref Offset 1 dB
Ref 11.00 dBm
10 dB/div
Log
-26.00 dBm
Start 1.0000 GHz
#Res BW 1.0 MHz
#VBW 1.0 MHz
Stop 2.3870 GHz
Sweep 1.331 ms (9985 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→RefLvl
More
1 of 2

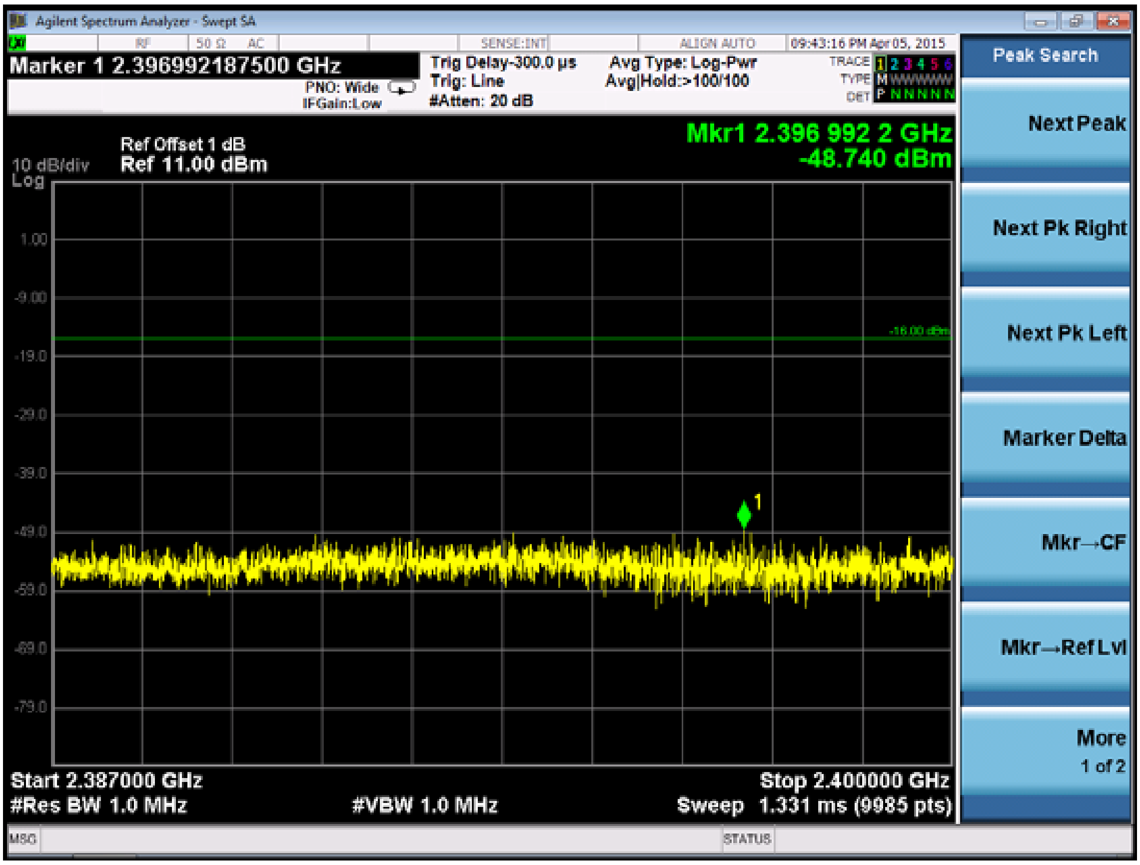

Agilent Spectrum Analyzer - Swept SA
Marker 1 2.393839843750 GHz
PNO: Wide
IFGain:Low
Trig Delay-300.0 µs
Trig: Line
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
09:39:17 PM Apr 05, 2015
Mkr1 2.393 839 8 GHz
-50.353 dBm
Ref Offset 1 dB
Ref 11.00 dBm
10 dB/div
Log
-16.00 dBm
Start 2.387000 GHz
#Res BW 1.0 MHz
#VBW 1.0 MHz
Stop 2.400000 GHz
Sweep 1.331 ms (9985 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→RefLvl
More
1 of 2

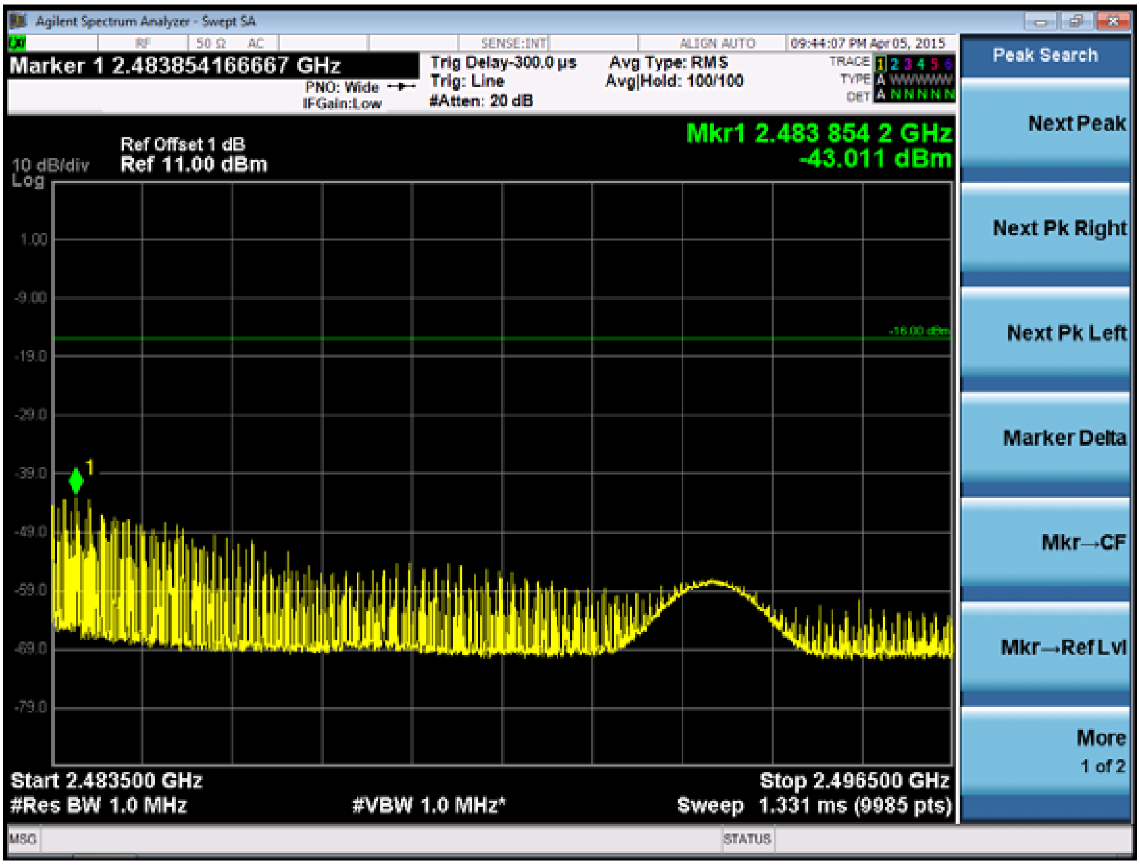

Agilent Spectrum Analyzer - Swept SA
SENSE:INT
ALIGN AUTO
09:38:37 PM Apr 05, 2015
Marker 1 2.489053385417 GHz
PNO: Wide
IFGain:Low
Trig Delay-300.0 µs
Trig: Line
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
Peak Search
Ref Offset 1 dB
10 dB/div
Log
Ref 11.00 dBm
Mkr1 2.489 053 4 GHz
-47.885 dBm
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→RefLvl
More
1 of 2
Start 2.483500 GHz
#Res BW 1.0 MHz
#VBW 1.0 MHz
Stop 2.496500 GHz
Sweep 1.331 ms (9985 pts)
MSG
STATUS

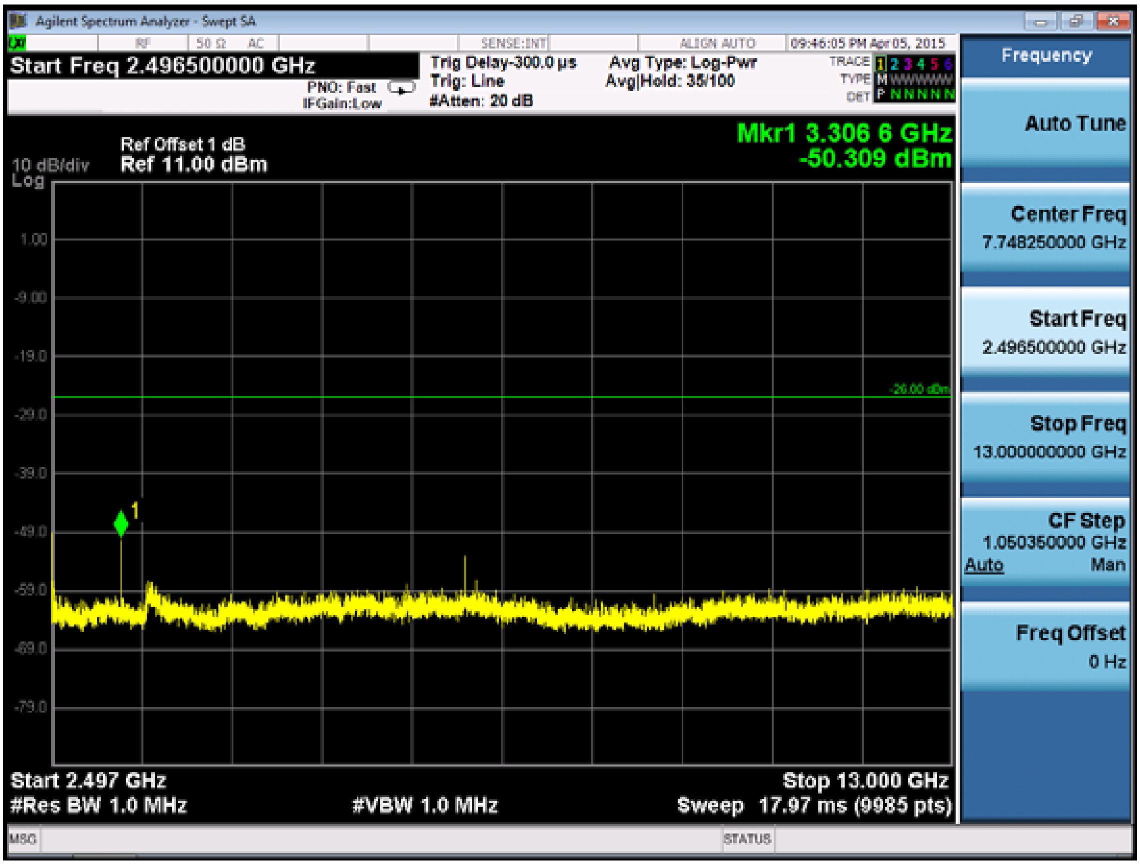

Agilent Spectrum Analyzer - Swept SA
SENSE:INT
ALIGN AUTO
09:47:04 PM Apr 05, 2015
Start Freq 2.496500000 GHz
PNO: Fast
IFGain:Low
Trig Delay-300.0 µs
Trig: Line
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
Frequency
Ref Offset 1 dB
10 dB/div
Log
Ref 11.00 dBm
Mkr1 3.656 9 GHz
-47.929 dBm
Auto Tune
Center Freq
7.748250000 GHz
Start Freq
2.496500000 GHz
Stop Freq
13.000000000 GHz
CF Step
1.050350000 GHz
Auto
Man
Freq Offset
0 Hz
Start 2.497 GHz
#Res BW 1.0 MHz
#VBW 1.0 MHz
Stop 13.000 GHz
Sweep 17.97 ms (9985 pts)
MSG
STATUS

CH 39: 2480MHz




Agilent Spectrum Analyzer - Swept SA
RF 50 Ω AC
SENSE:INT
ALIGN AUTO
09:43:16 PM Apr 05, 2015
Marker 1 2.396992187500 GHz
PNO: Wide
IFGain:Low
Trig Delay-300.0 µs
Trig: Line
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
TRACE 1 2 3 4 5 6
TYPE M WWWWW
DET P N N N N N
Peak Search
Ref Offset 1 dB
10 dB/div
Log
Ref 11.00 dBm
Mkr1 2.396 992 2 GHz
-48.740 dBm
1.00
-9.00
-19.0
-29.0
-39.0
-49.0
-59.0
-69.0
-79.0
-16.00 dBm
Start 2.387000 GHz
#Res BW 1.0 MHz
#VBW 1.0 MHz
Stop 2.400000 GHz
Sweep 1.331 ms (9985 pts)
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→RefLvl
More
1 of 2
MSG
STATUS


Agilent Spectrum Analyzer - Swept SA
RF 50 Ω AC
SENSE:INT
ALIGN AUTO
09:44:07 PM Apr 05, 2015
Marker 1 2.483854166667 GHz
PNO: Wide
IFGain:Low
Trig Delay-300.0 µs
Trig: Line
#Atten: 20 dB
Avg Type: RMS
Avg|Hold: 100/100
TRACE 1 2 3 4 5 6
TYPE A WWWWW
DET A N N N N N
Peak Search
Ref Offset 1 dB
10 dB/div
Log
Ref 11.00 dBm
Mkr1 2.483 854 2 GHz
-43.011 dBm
1.00
-9.00
-19.0
-29.0
-39.0
-49.0
-59.0
-69.0
-79.0
-16.00 dBm
Start 2.483500 GHz
#Res BW 1.0 MHz
#VBW 1.0 MHz*
Stop 2.496500 GHz
Sweep 1.331 ms (9985 pts)
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→RefLvl
More
1 of 2
MSG
STATUS


Agilent Spectrum Analyzer - Swept SA
Start Freq 2.496500000 GHz
PNO: Fast
IFGain:Low
Trig Delay-300.0 µs
Trig: Line
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold: 35/100
09:46:05 PM Apr 05, 2015
Ref Offset 1 dB
10 dB/div
Ref 11.00 dBm
Log
Mkr1 3.306 6 GHz
-50.309 dBm
-26.00 dBm
Start 2.497 GHz
#Res BW 1.0 MHz
#VBW 1.0 MHz
Stop 13.000 GHz
Sweep 17.97 ms (9985 pts)
Frequency
Auto Tune
Center Freq
7.748250000 GHz
Start Freq
2.496500000 GHz
Stop Freq
13.000000000 GHz
CF Step
1.050350000 GHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS

4. MEASUREMENTS OF RECEIVER PARAMETERS

4.1.Secondary Radiated Emissions (Conducted)

4.1.1. Limit

Item	Limits
Rx Spurious Emission	≦4nW(f＜1GHz)
	≦20nW(1GHz≦f)

4.1.2. Measuring Instruments

See list of measuring instruments of 2.3 section.

4.1.3. Test Procedures

1. EUT have the continuous reception mode and fixed only one channelize.
2. SA set RBW: 100KHz and VBW: 100KHz. Then adjust to start frequency 30MHz and stop frequency 1000MHz. Search to mark peak reading value + cable loss shall be less than 4nW.
3. SA set RBW: 1MHz and VBW:1MHz. Then adjust to start frequency 1000MHz and stop frequency13000MHz. Search to mark peak reading value + cable loss shall be less than 20nW.
4. If power level of lower emissions are more than 1/10 of limit(0.4nW for f＜1GHz,2nW for f≧1GHz), all those are to be indicated in the 2nd and 3rd lines. If others are 1/10 or less more of the limit ,no necessary to be indicated.

4.1.4. Test Setup

See clause 2.2 for block diagram of test setup.

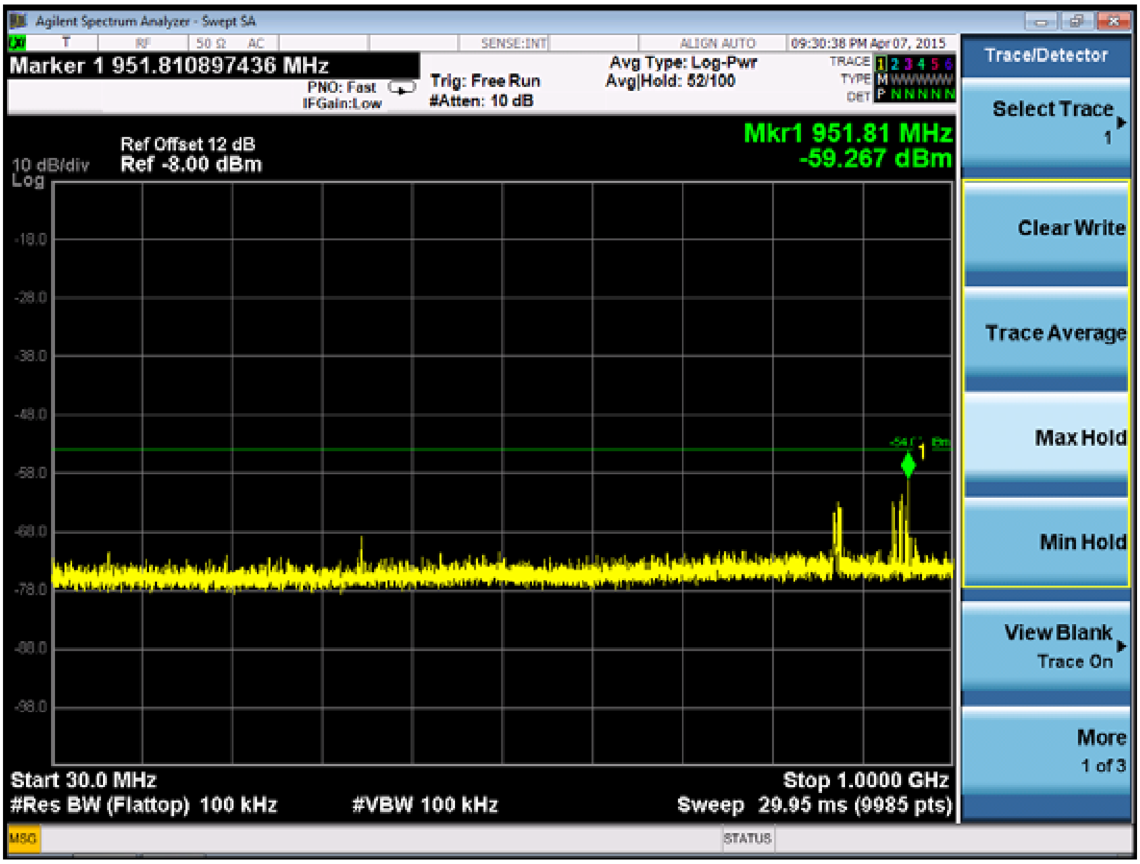
4.1.5. Test Results of Conducted Spurious Emissions – RX Operating

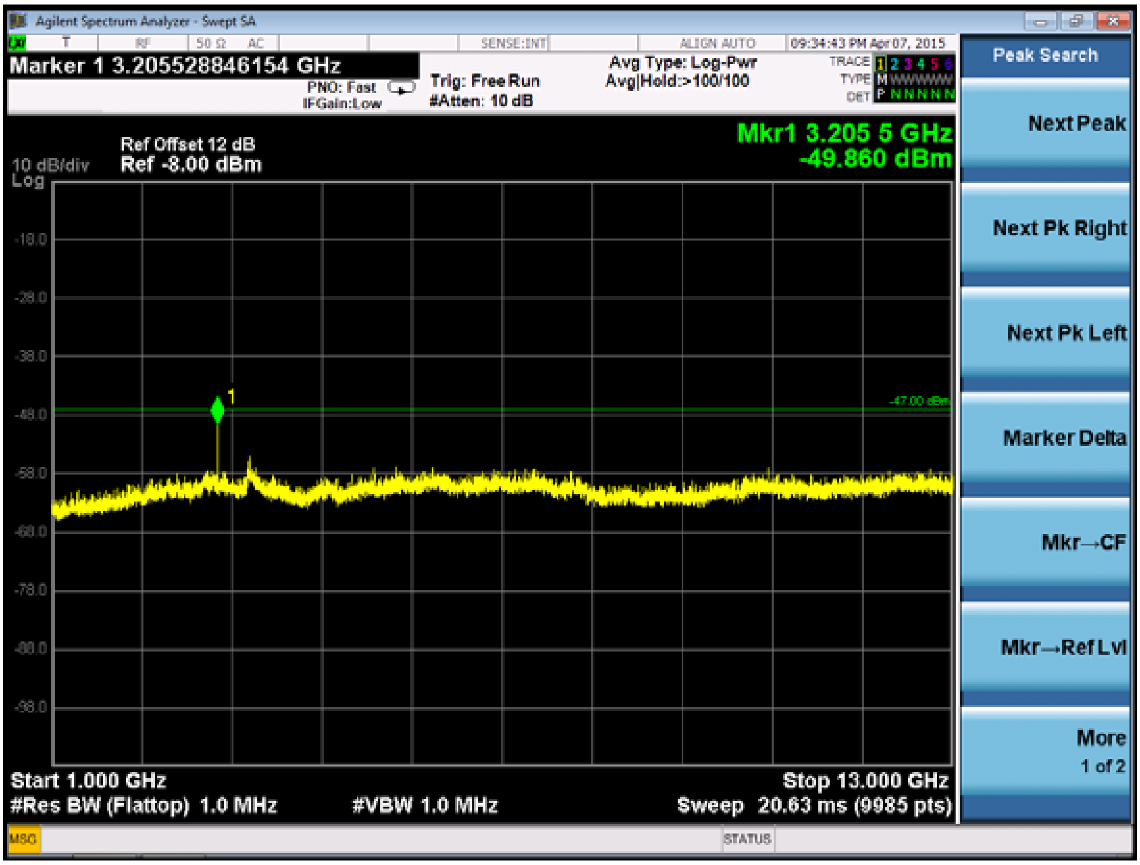
EUT: Cuieboard3		
M/N: Cubietruck		
Test date: 2015-04-07	Pressure: 101.5±1.0kpa	Humidity: 53.3±3.0%
Tested by: Kobe-Huang	Test site: RF Site	Temperature: 23.6±0.6℃

Test Voltage	DC 5V					
Test Mode	GFSK/CH0,CH39,CH78				Remarks	Result
Test Frequency	MHz	2402	2440	2480	Low/Mid/High of test frequency range	(Pass/Fail)
30MHz~1000MHz	dBm	-59.267	-59.011	-59.778	Limit≦4nW (-54dBm)	Pass
1000 MHz~13000MHz	dBm	-49.860	-49.044	-50.308	Limit≦20nW (-47dBm)	Pass

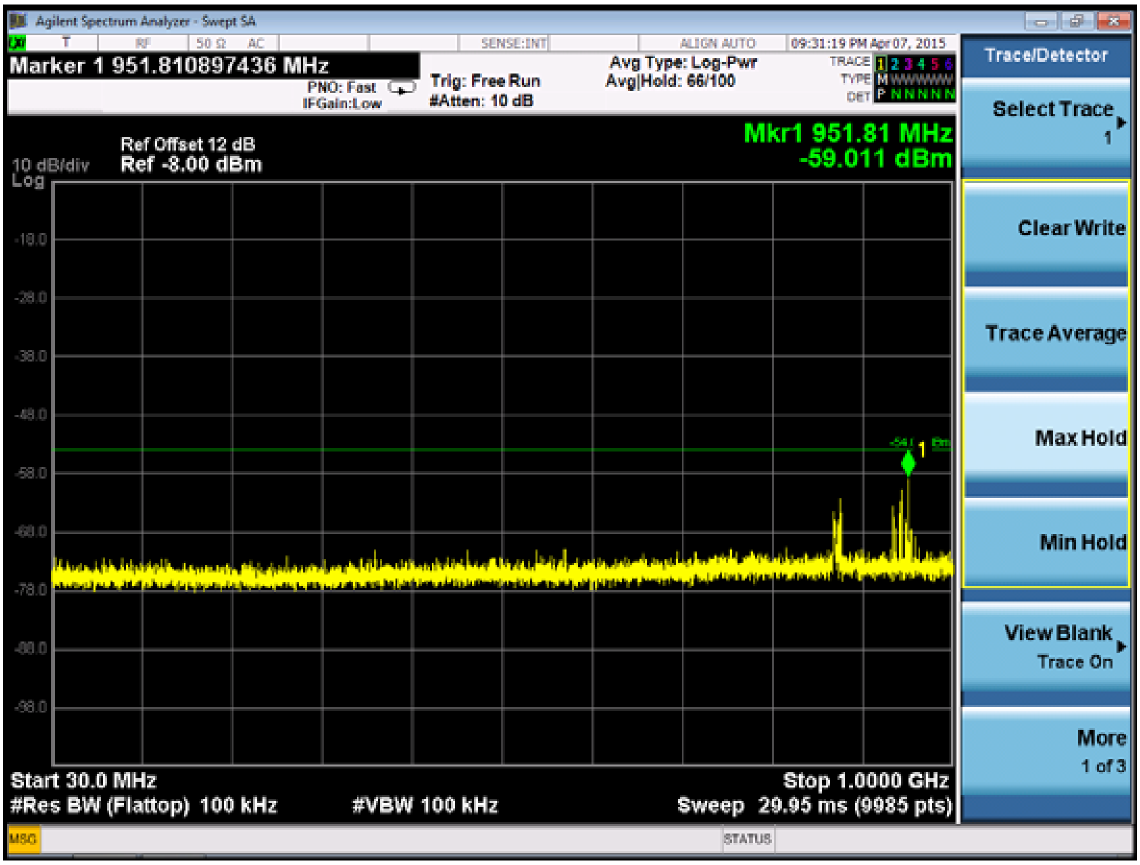
GFSK

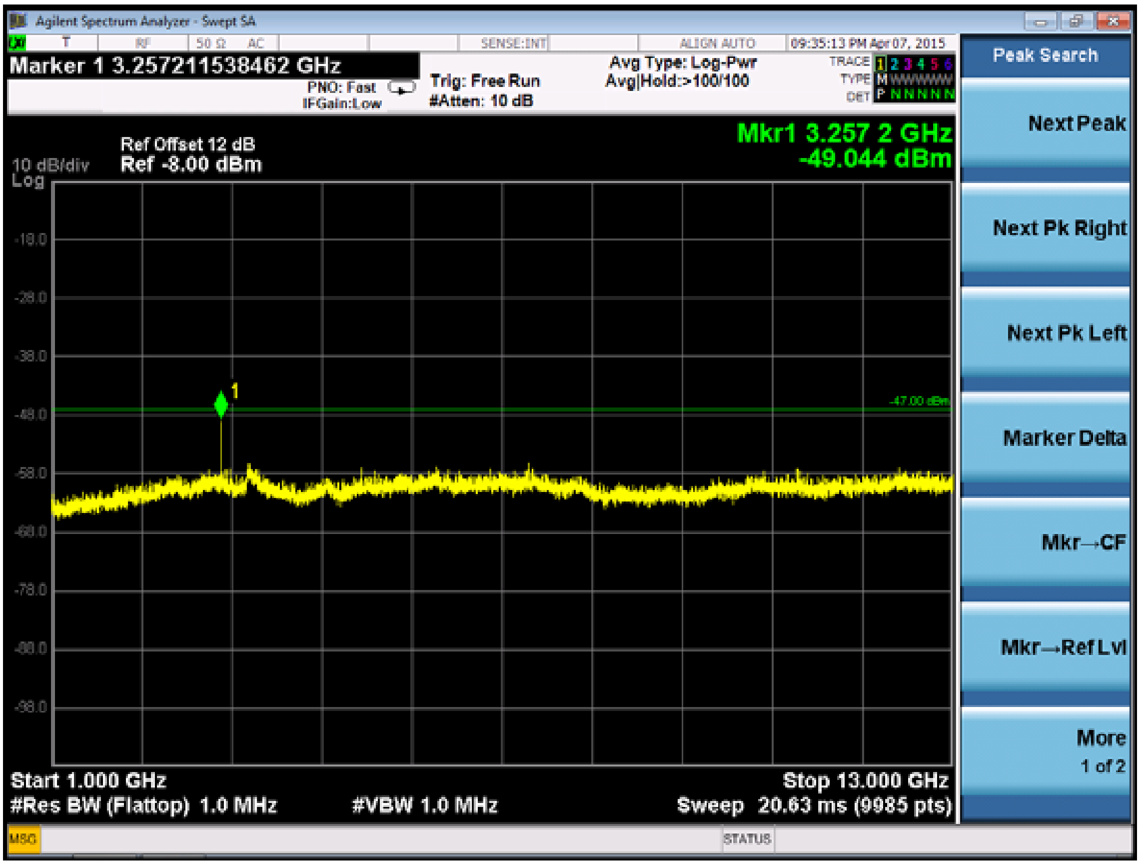
2402MHz



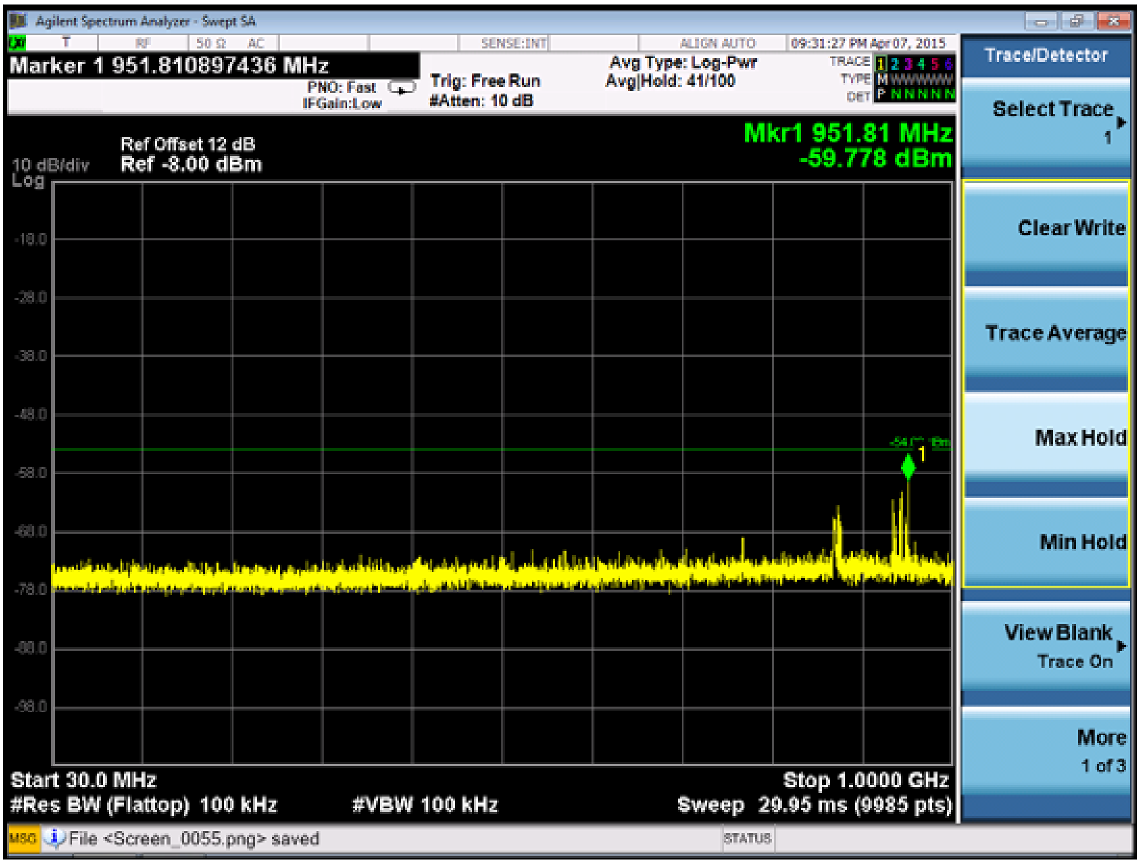


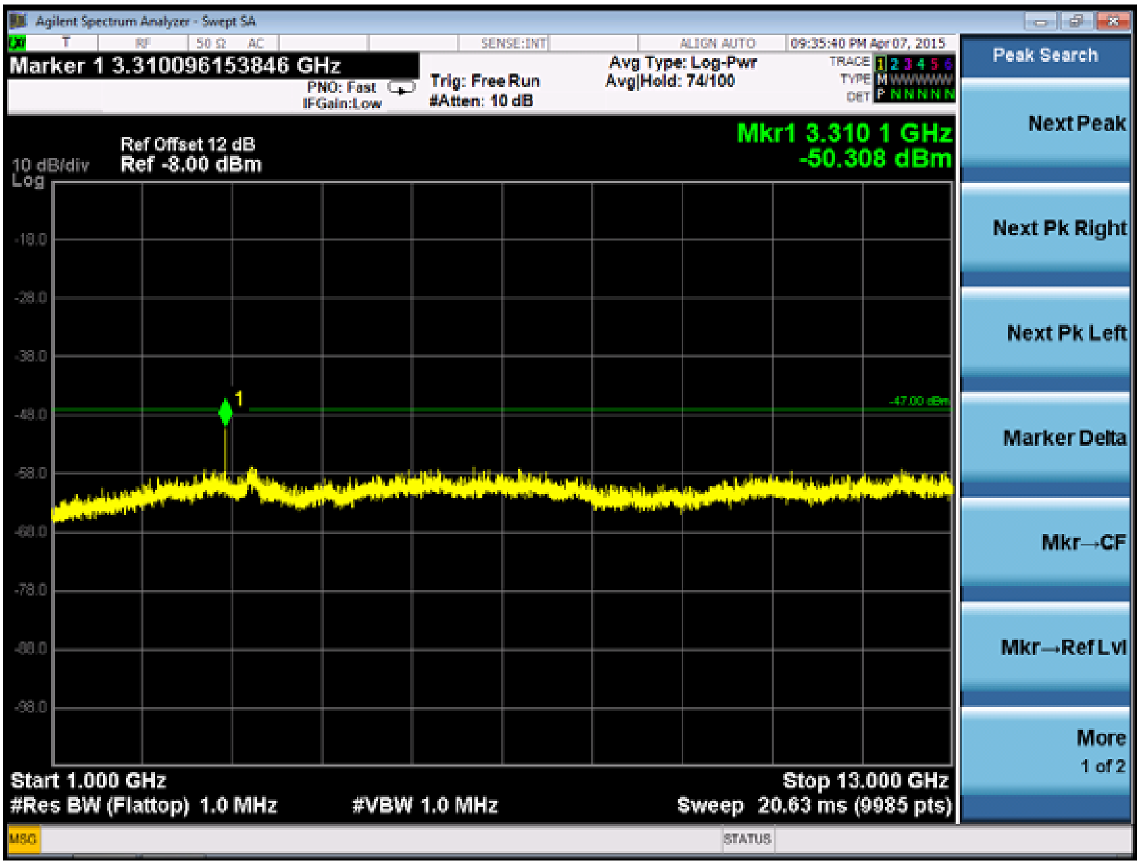
2440MHz


Agilent Spectrum Analyzer - Swept SA
Marker 1 951.810897436 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 10 dB
Avg Type: Log-Pwr
Avg|Hold: 66/100
09:31:19 PM Apr 07, 2015
Trace/Detector
Ref Offset 12 dB
10 dB/div Ref -8.00 dBm
Log
Mkr1 951.81 MHz
-59.011 dBm
Select Trace 1
Clear Write
Trace Average
Max Hold
Min Hold
View Blank Trace On
More 1 of 3
Start 30.0 MHz
Stop 1.0000 GHz
#Res BW (Flattop) 100 kHz
#VBW 100 kHz
Sweep 29.95 ms (9985 pts)
MSG
STATUS


Agilent Spectrum Analyzer - Swept SA
Marker 1 3.257211538462 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 10 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
09:35:13 PM Apr 07, 2015
Peak Search
Ref Offset 12 dB
10 dB/div Ref -8.00 dBm
Log
Mkr1 3.257 2 GHz
-49.044 dBm
-47.00 dBm
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→RefLvl
More 1 of 2
Start 1.000 GHz
Stop 13.000 GHz
#Res BW (Flattop) 1.0 MHz
#VBW 1.0 MHz
Sweep 20.63 ms (9985 pts)
MSG
STATUS

2480MHz


Agilent Spectrum Analyzer - Swept SA
SENSE:INT
ALIGN AUTO
09:31:27 PM Apr 07, 2015
Marker 1 951.810897436 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 10 dB
Avg Type: Log-Pwr
Avg|Hold: 41/100
Trace/Detector
Mkr1 951.81 MHz
-59.778 dBm
Ref Offset 12 dB
10 dB/div
Ref -8.00 dBm
Log
Select Trace
Clear Write
Trace Average
Max Hold
Min Hold
View Blank
Trace On
More
1 of 3
Start 30.0 MHz
#Res BW (Flattop) 100 kHz
#VBW 100 kHz
Stop 1.0000 GHz
Sweep 29.95 ms (9985 pts)
File <Screen_0055.png> saved
STATUS


Agilent Spectrum Analyzer - Swept SA
SENSE:INT
ALIGN AUTO
09:35:40 PM Apr 07, 2015
Marker 1 3.310096153846 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 10 dB
Avg Type: Log-Pwr
Avg|Hold: 74/100
Peak Search
Mkr1 3.310 1 GHz
-50.308 dBm
Ref Offset 12 dB
10 dB/div
Ref -8.00 dBm
Log
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
Start 1.000 GHz
#Res BW (Flattop) 1.0 MHz
#VBW 1.0 MHz
Stop 13.000 GHz
Sweep 20.63 ms (9985 pts)
STATUS

5. MEASUREMENT OF OTHER PARAMETERS

5.1.Interference Prevention Function

5.1.1. Limit

Item	Limits
Identification	≥48bits

5.1.2. Test Procedures

1. In the case that the EUT has the function of automatically transmitting the identification code: a. Transmit the predetermined identification cades form EUT. b. Check the transmitted identification codes with the demodulator.
2. In the case of receiving the identification code: a. Transmit the predetermined identification codes form the counterpart. b. Check if communication is normal. c. Transmit the signals other than predetermined ID codes form the counterpart. d. check if the EUT stops the transmission, or if it displays that identification codes are different from the predetermined ones.

5.1.3. Test Setup

See clause 2.2 for Block Diagram of test setup.

5.1.4. Test Results

TX: The transmitting mode of EUT is on normal operating, the interference prevention function is okay.

RX: The receiving mode of EUT is on normal operating, the interference prevention function is okay.

The ID code of this Bluetooth device is 43:29:B1:55:01:01 as below list:

5.2.Construction Protection

5.2.1. Limit

The high-frequency section and modulation section of the radio equipment except for the antenna system shall not be capable of being opened easily.

5.2.2. Confirmation Method

☐ Sealed with special screws.
☐ Plastic chassis is being welded using ultrasonic waves.
☐ Chassis is glued using a special adhesive.
☐ Metal covers are spot-fused.
☐ Cover is specially interlocked.
☐RF and Modulation components are covered with shielding case and this shielding case is soldered.
☐ RF modulation parts and ID-ROM be welded using the BGA Method.
☐ Shield case is welded at RF and modulation parts and ID-ROM is glued at its lead with a special adhesive.
☐ Shield case is welded at RF and modulation parts, and ID-ROM is glued with a non-transparent laminating agent.
■ Other: The RF module was Printed and fixed to the main board with amount contact pin, cannot be modified easily.

5.2.3. The Photos of Construction Protection

6. PHOTOGRAPHS OF TEST

7. PHOTOS OF THE EUT

Figure 1
General Appearance of the EUT

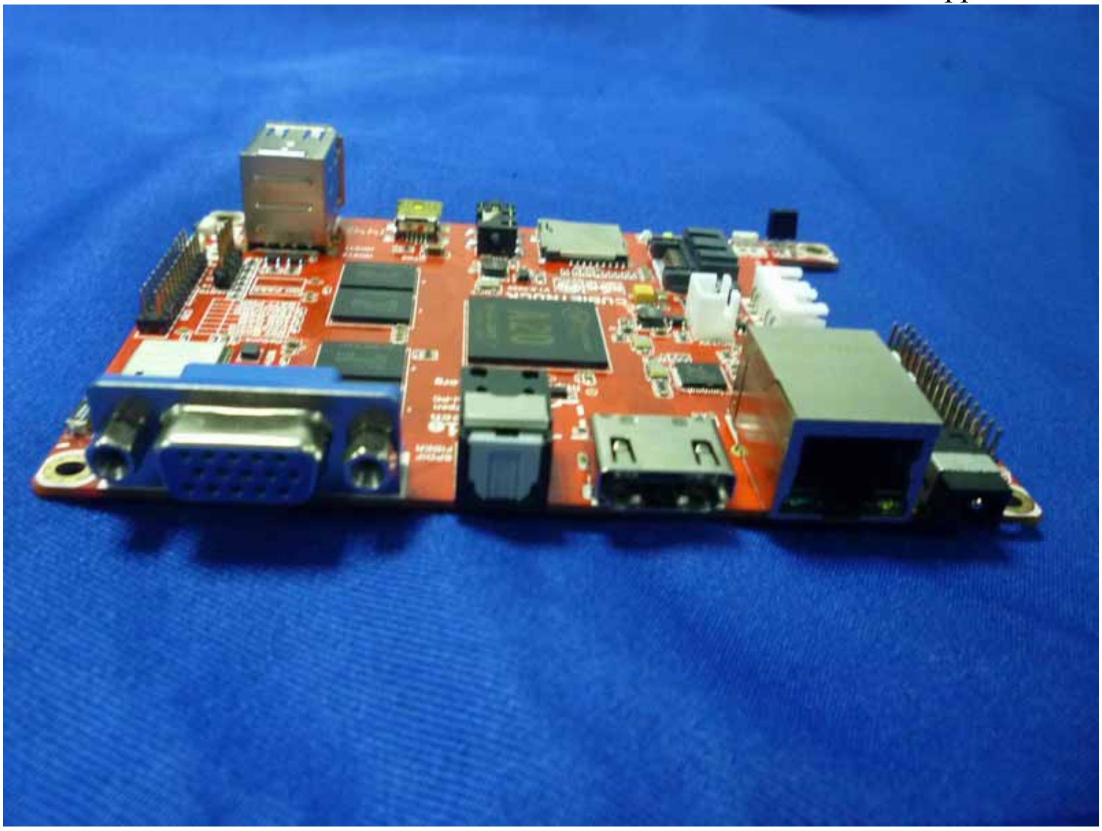


Figure 2
General Appearance of the EUT

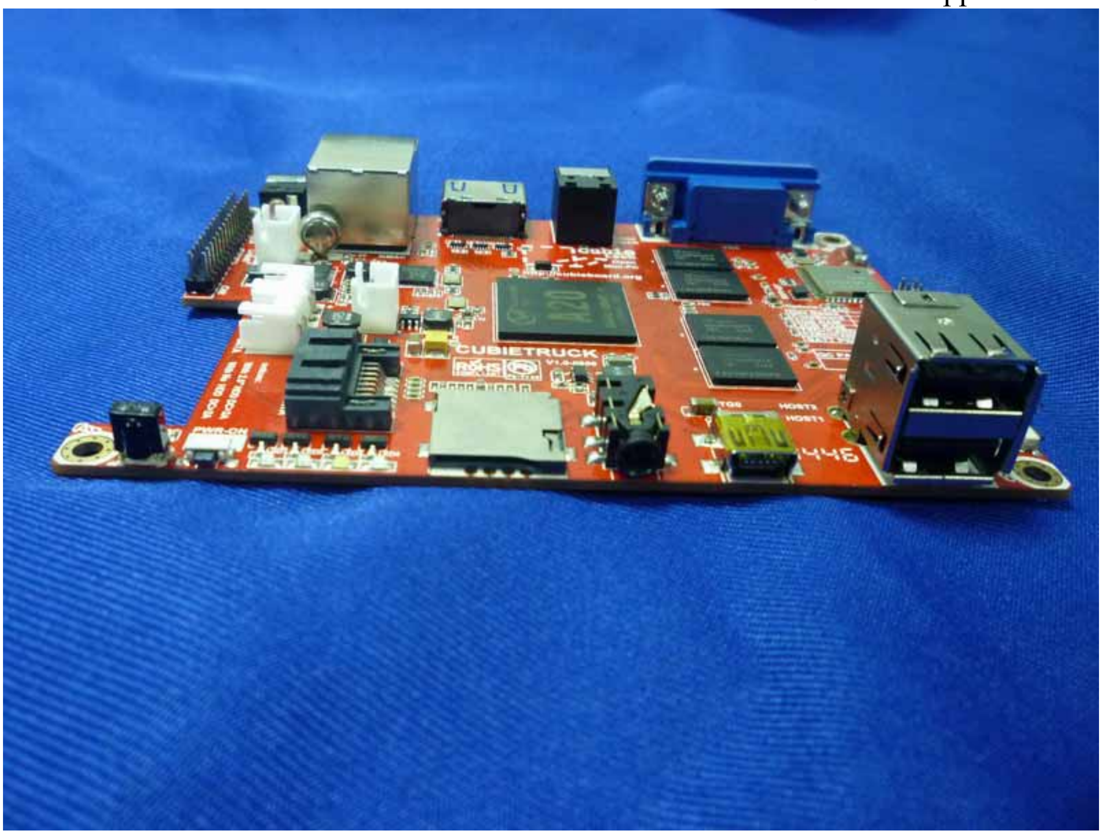


Figure 3
General Appearance of the EUT

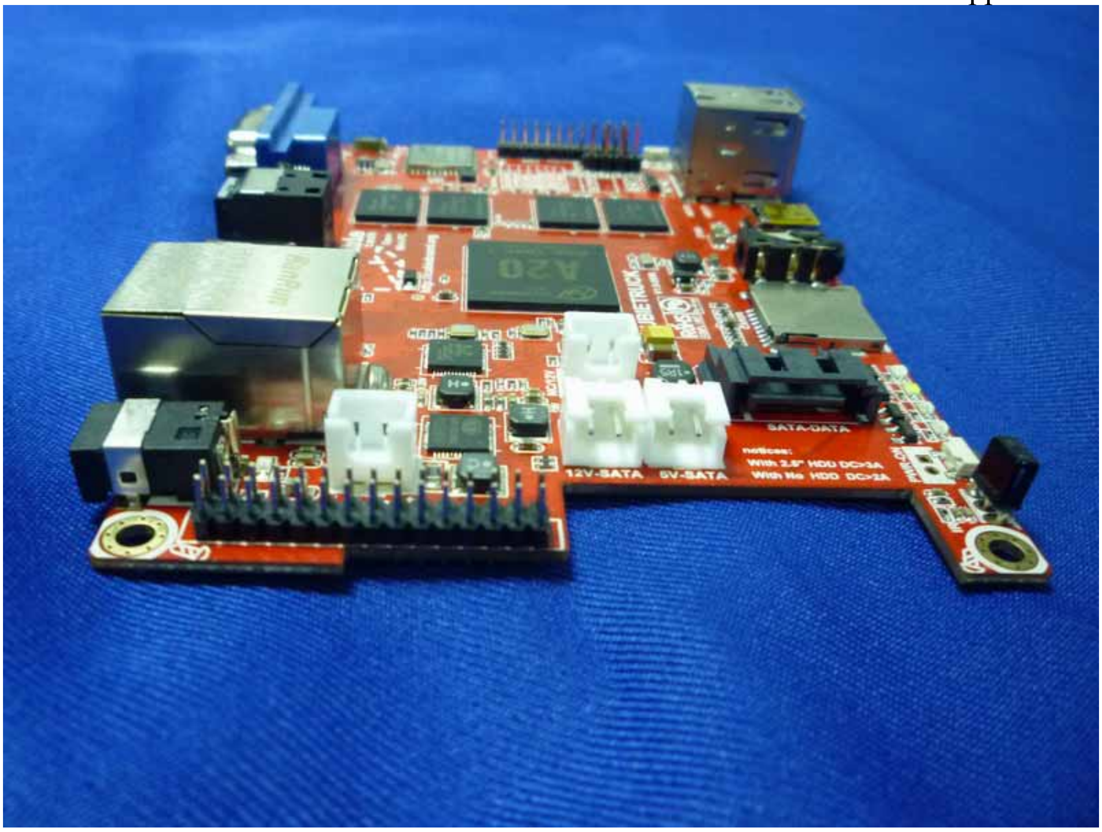


Figure 4
General Appearance of the EUT

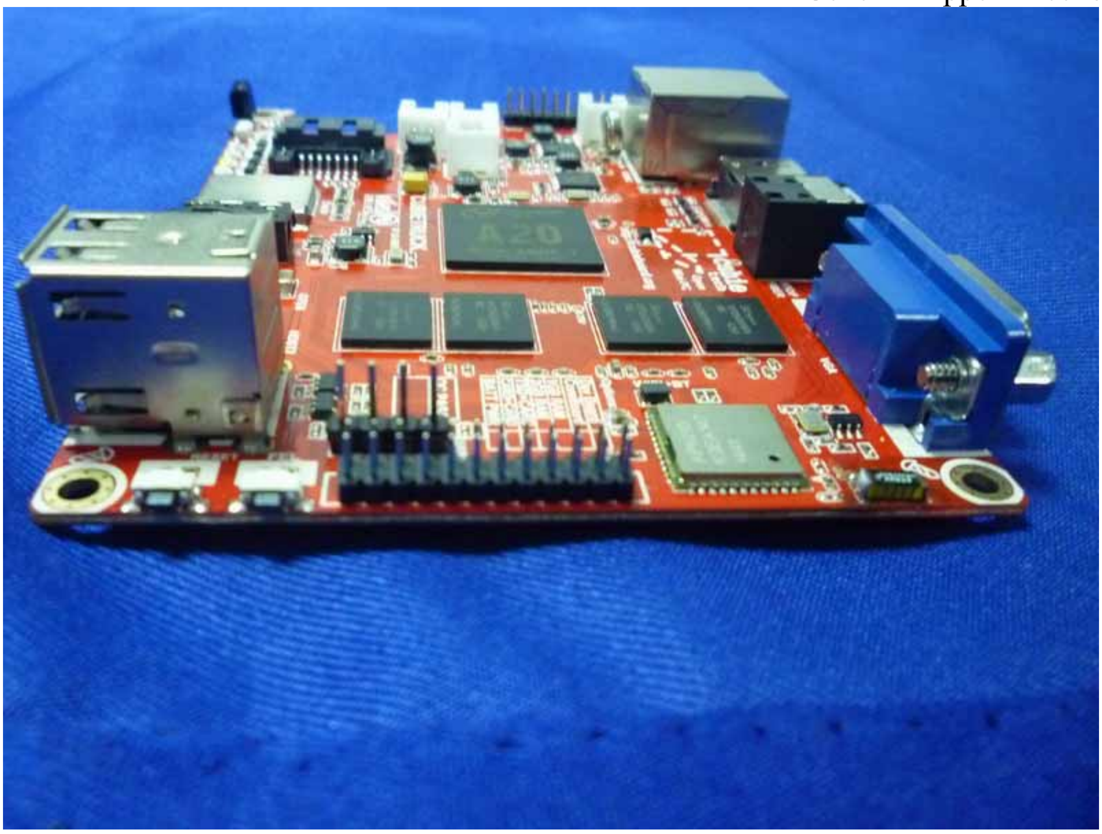


Figure 5
General Appearance of the EUT

Figure 6
General Appearance of the EUT

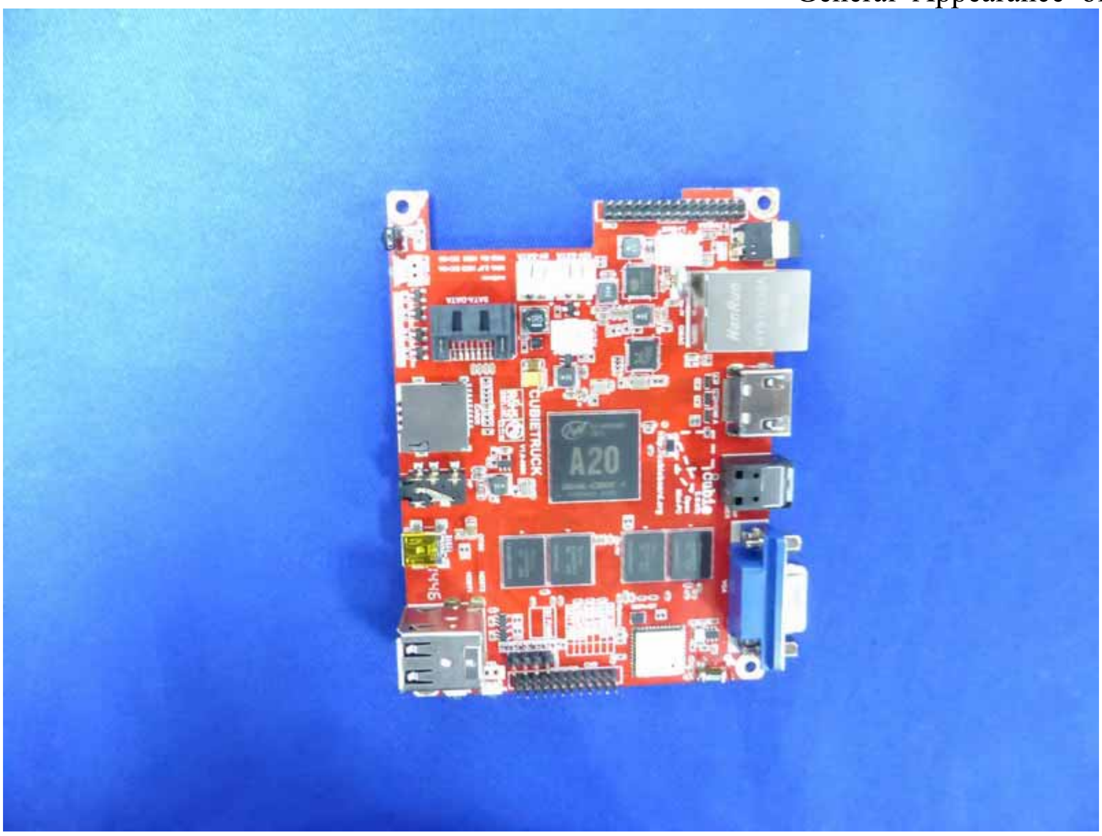


Figure 7
General Appearance of the EUT

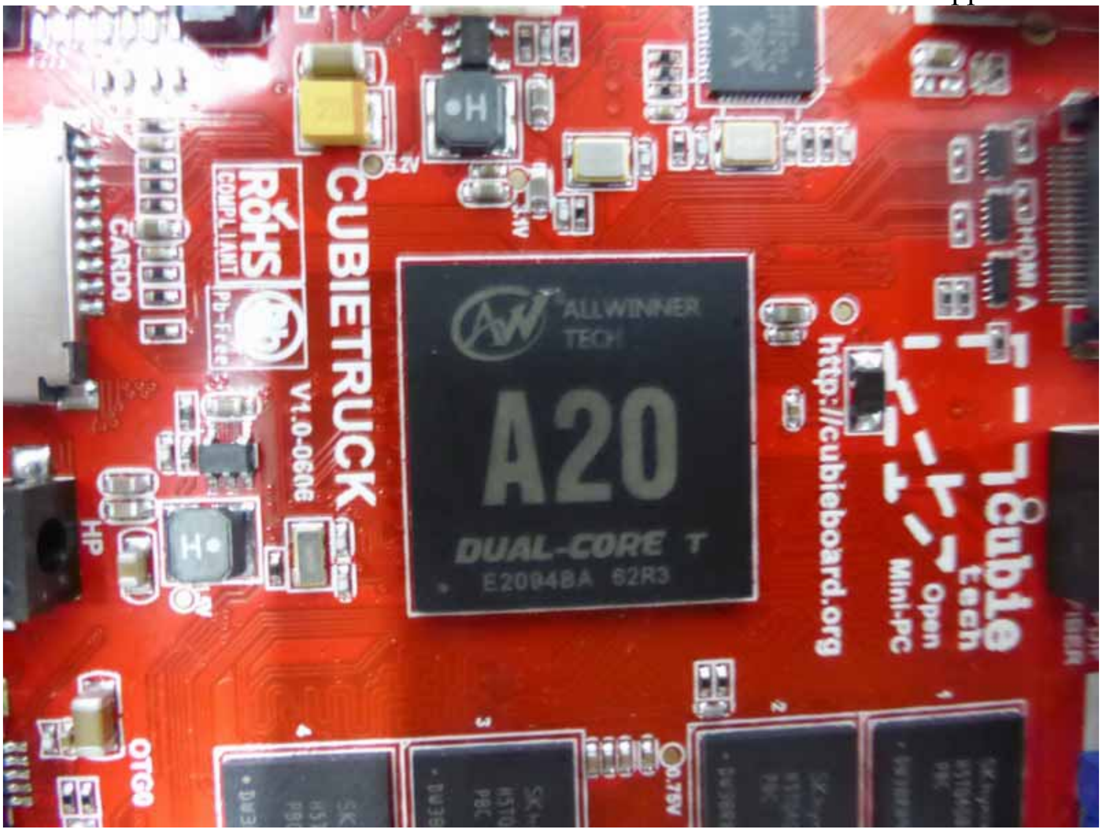


Figure 8
General Appearance of the EUT

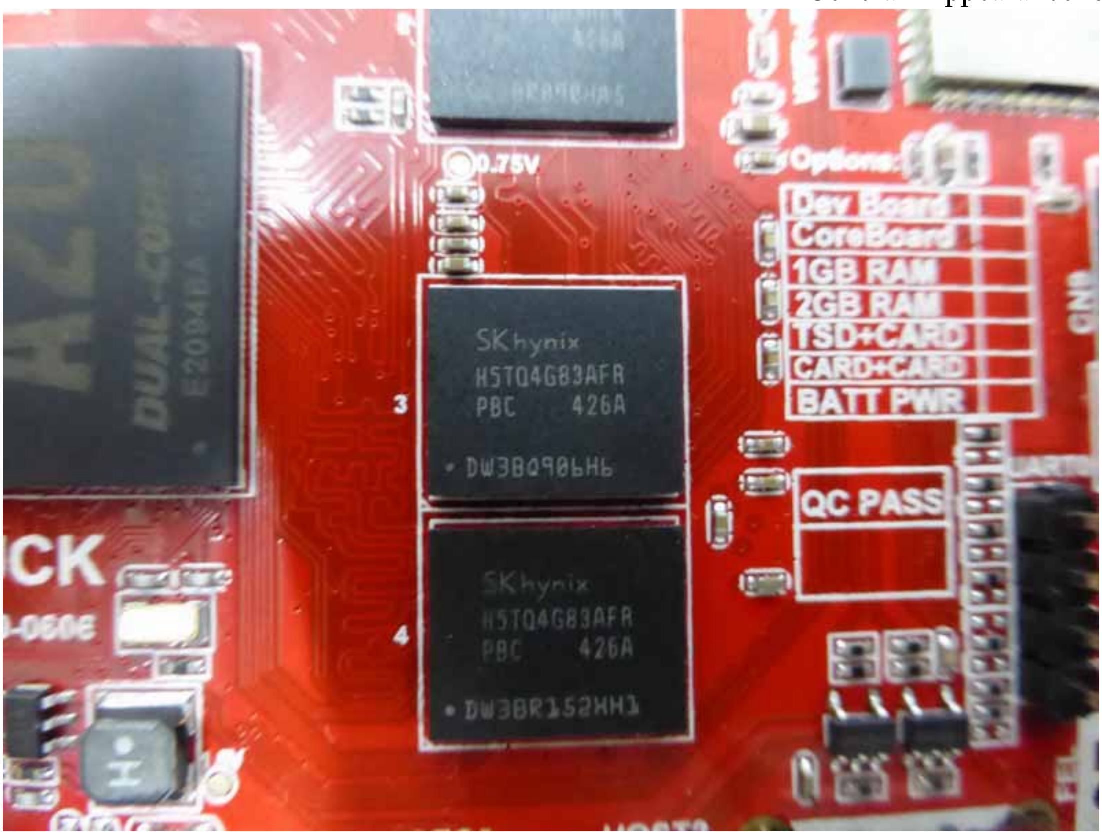


Figure 9
General Appearance of the EUT

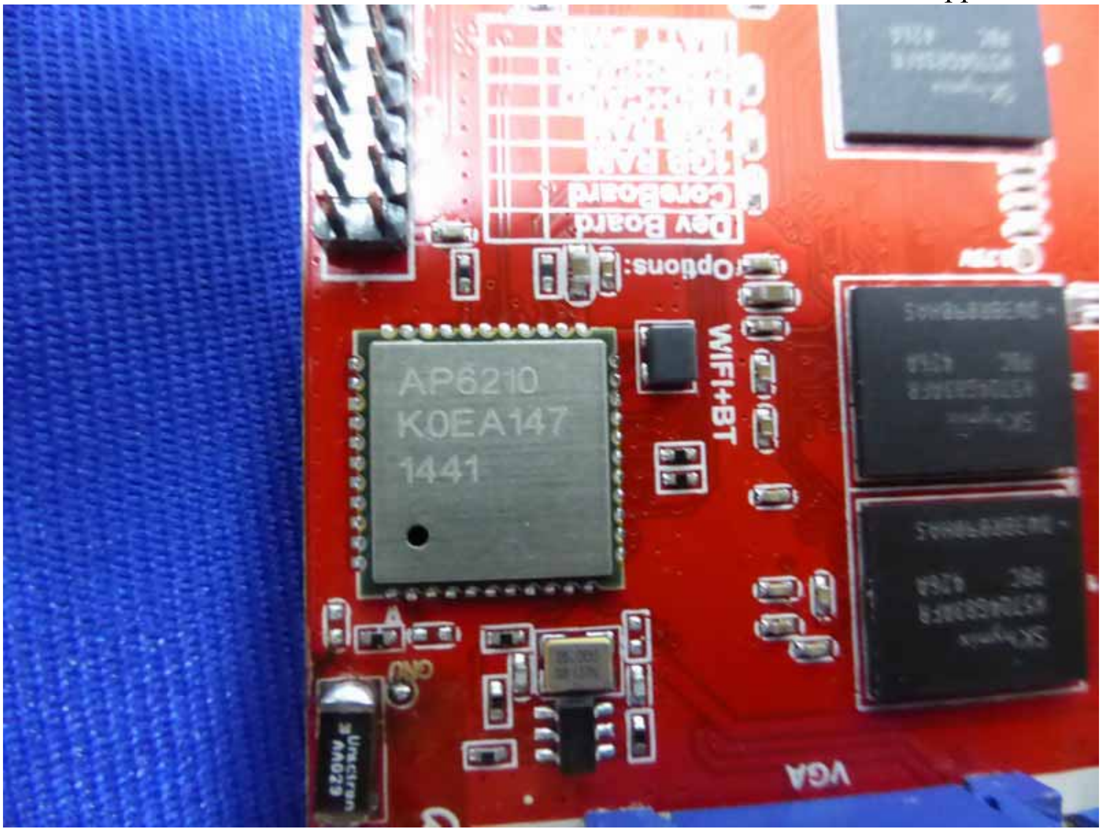


Figure 10
General Appearance of the EUT

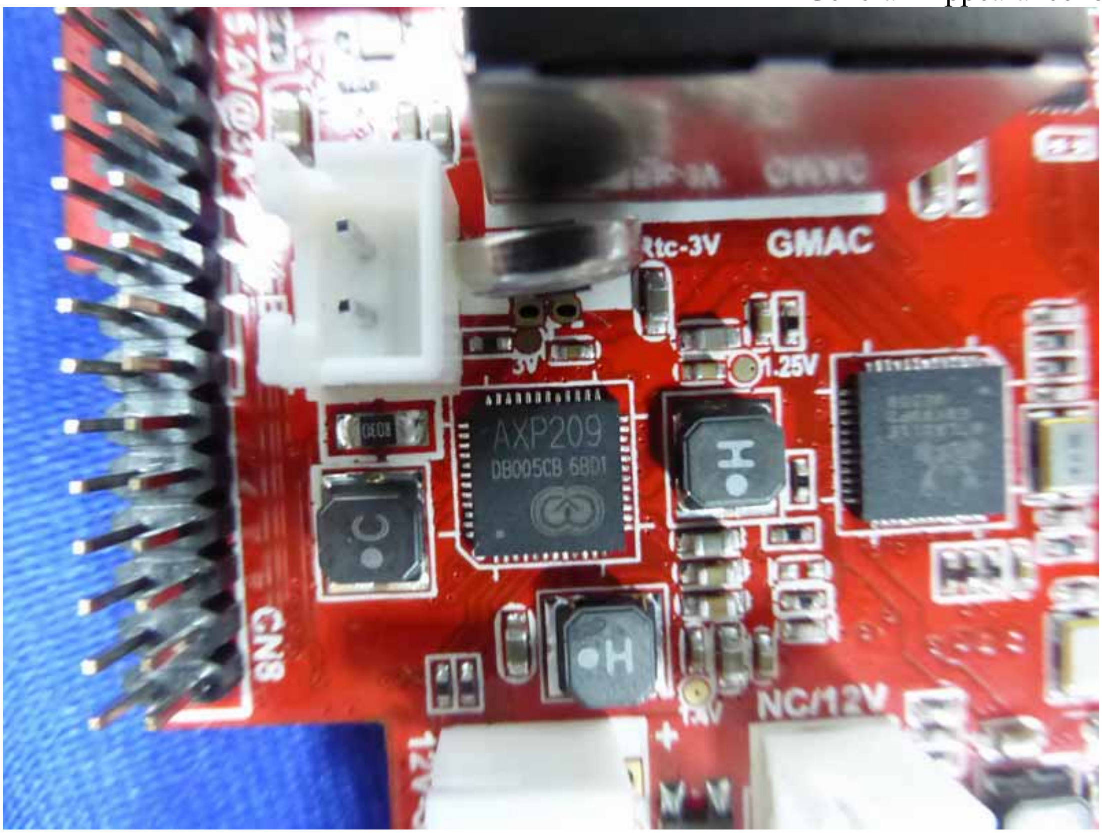


Figure 11
General Appearance of the EUT

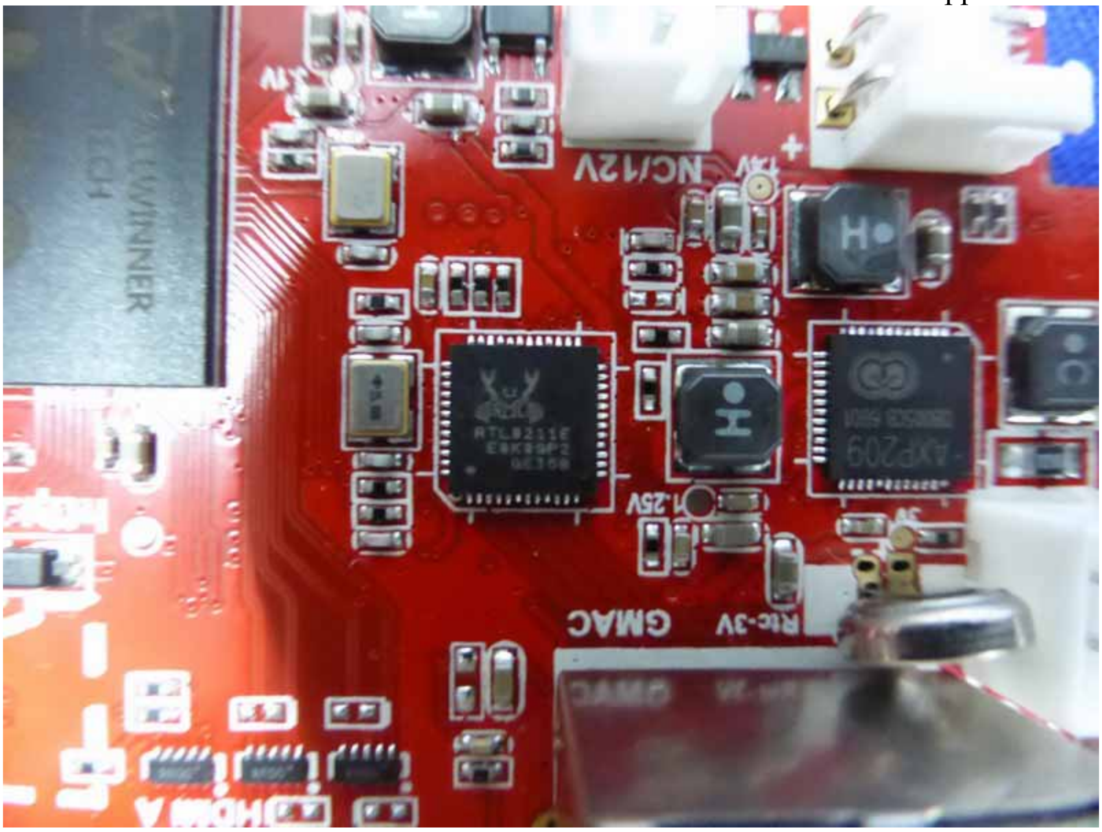


Figure 12
General Appearance of the EUT

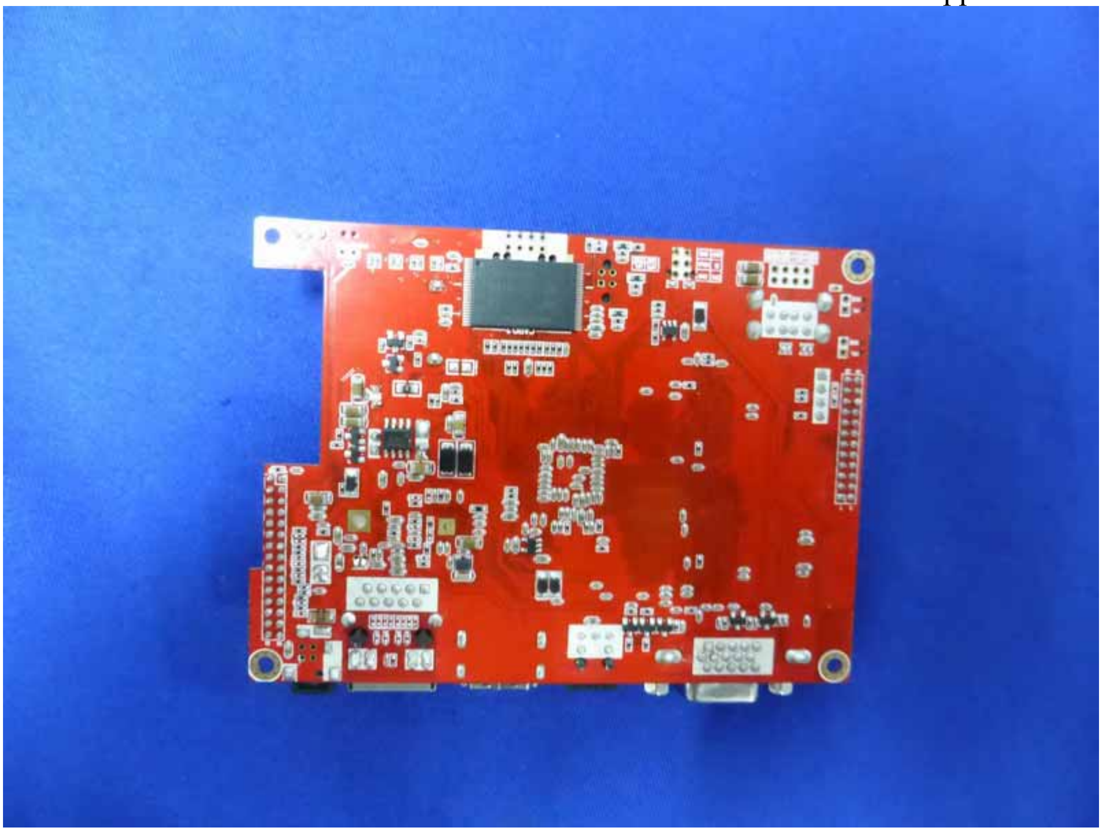


Figure 13
General Appearance of the EUT

Figure 14
USB Cable

Figure 15
USB Cable

Figure 16
USB Cable