

Test Report

FCC Part15 Subpart C

Product Name : E-BOARDS Smart Controller

Model No. : EB24C

FCC ID : 2ACS5- EB24CP

IC : 11554B- EB24C

Applicant : Yuneec Technology Co., Limited

Address : 2/F Man Shung Industrial Building, 7 Lai Yip Street,
Kwun Tong, Hong Kong

Date of Receipt : May. 27, 2016

Test Date : Apr. 19, 2016~ May. 30, 2016

Issued Date : Jun. 08, 2016

Report No. : 1652102R-RF-US-P06V01

Report Version : V 1.0

The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration of the equipment and evaluated measurement uncertainty herein.

This report must not be used to claim product endorsement by CNAS,TAF or any agency of the government.

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Test Report Certification

Issued Date : Jun. 08, 2016

Report No. : 1652102R-RF-US-P06V01



Product Name : E-BOARDS Smart Controller
Applicant : Yuneec Technology Co., Limited
Address : 2/F Man Shung Industrial Building, 7 Lai Yip Street, Kwun Tong, Hong Kong
Manufacturer : Yuneec International (China) Co., Ltd.
Address : No.388 East Zhengwei Road, Jinxi Town, Kunshan, Jiangsu 215324, China
Model No. : EB24C
FCC ID : 2ACS5- EB24CP
IC : 11554B- EB24C
EUT Voltage : DC 5V
Brand Name : YUNEEC
Applicable Standard : FCC CFR Title 47 Part 15 Subpart C: 2015
ANSI C63.4: 2014; ANSI C63.10: 2013
Industry Canada RSS-210 Issue 8+A1; Industry Canada RSS-Gen Issue 4
Test Result : Complied
Performed Location : Quietek Corporation - Suzhou EMC Laboratory
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FCC Registration Number: 800392

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Laboratory Information

We, **Quietek Corporation**, are an independent EMC and safety consultancy that was established the whole facility in our laboratories. The test facility has been accredited/accepted(audited or listed) by the following related bodies in compliance with ISO 17025, EN 45001 and specified testing scope:

Taiwan R.O.C.	:	BSMI, NCC, TAF
USA	:	FCC
Japan	:	VCCI
China	:	CNAS

The related certificate for our laboratories about the test site and management system can be downloaded from Quietek Corporation's Web Site : <http://www.quietek.com/english/about/certificates.aspx?bval=5>
The address and introduction of Quietek Corporation's laboratories can be founded in our Web site : http://www.quietek.com/index_en.aspx

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History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
1652102R-RF-US-P06V01	V1.0	Initial Issued Report	Jun. 08, 2016

1. General Information

1.1. EUT Description

Product Name	E-BOARDS Smart Controller
Model No.	EB24C
Working Voltage	DC 5V
Frequency Range	2402- 2480 MHz
Channel Number	79
Channel Separation	1MHz
Type of Modulation	GFSK
Data Rate	256bps
Antenna Type	Reference to Antenna List
Peak Antenna Gain	Reference to Antenna List

2.4GHz Working Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
00	2402 MHz	01	2403 MHz	02	2404 MHz	03	2405 MHz
04	2406 MHz	05	2407 MHz	06	2408 MHz	07	2409 MHz
08	2410 MHz	09	2411 MHz	10	2412 MHz	11	2413 MHz
12	2414 MHz	13	2415 MHz	14	2416 MHz	15	2417 MHz
16	2418 MHz	17	2419 MHz	18	2420 MHz	19	2421 MHz
20	2422 MHz	21	2423 MHz	22	2424 MHz	23	2425 MHz
24	2426 MHz	25	2427 MHz	26	2428 MHz	27	2429 MHz
28	2430 MHz	29	2431 MHz	30	2432 MHz	31	2433 MHz
32	2434 MHz	33	2435 MHz	34	2436 MHz	35	2437 MHz
36	2438 MHz	37	2439 MHz	38	2440 MHz	39	2441 MHz
40	2442 MHz	41	2443 MHz	42	2444 MHz	43	2445 MHz
44	2446 MHz	45	2447 MHz	46	2448 MHz	47	2449 MHz
48	2450 MHz	49	2451 MHz	50	2452 MHz	51	2453 MHz
52	2454 MHz	53	2455 MHz	54	2456 MHz	55	2457 MHz
56	2458 MHz	57	2459 MHz	58	2460 MHz	59	2461 MHz
60	2462 MHz	61	2463 MHz	62	2464 MHz	63	2465 MHz
64	2466 MHz	65	2467 MHz	66	2468 MHz	67	2469 MHz
68	2470 MHz	69	2471 MHz	70	2472 MHz	71	2473 MHz
72	2474 MHz	73	2475 MHz	74	2476 MHz	75	2477 MHz
76	2478 MHz	77	2479 MHz	78	2480 MHz	N/A	N/A

Antenna List

Antenna	Manufacturer	Model No.	Peak Gain
Dipole Antenna	N/A	N/A	5.4dBi for 2.4GHz

1.2 Mode of Operation

QuieTek has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

Test Mode
Mode 1: Transmitter

Note:

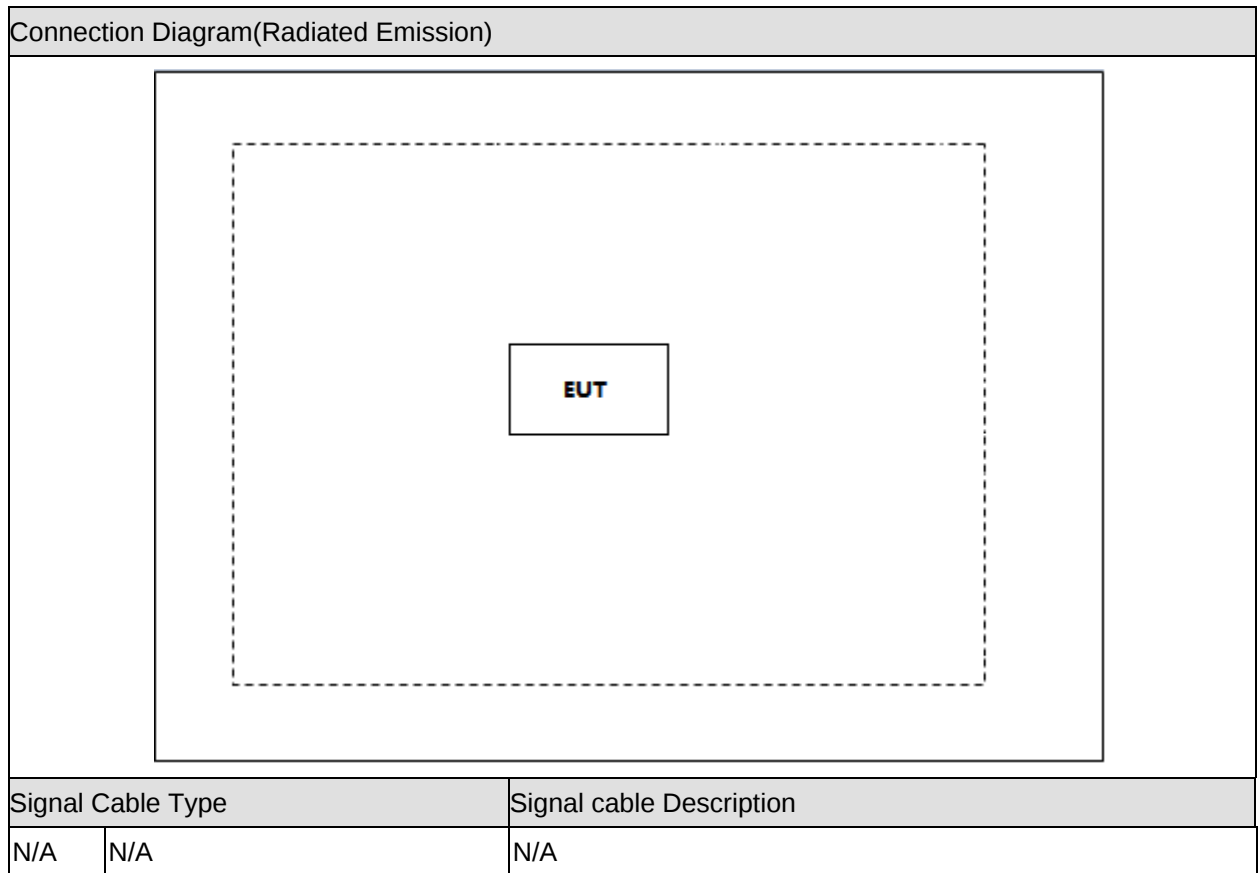
1. For portable device, radiated spurious emission was verified over X, Y, Z Axis, and shown the worst case on this report.
2. Regards to the frequency band operation for systems using FHSS modulation: normal operation (hopping) was selected to test for conducted, and the lowest, highest frequency channel for radiation spurious test.
3. The extreme test condition for voltage and temperature were declared by the manufacturer.
4. The reading values of all the test items contain cable loss.

1.3 Tested System Details

The types for all equipments, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product		Manufacturer	Model No.	Serial No.	Power Cord
1	N/A	N/A	N/A	N/A	N/A

1.4 Configuration of Tested System



1.5 EUT Exercise Software

1	Setup the EUT and simulators as shown on above.
2	Turn on the power of all equipment.
3	Select the EUT for different channels, then press OK to start continue Transmit.

2. Technical Test

2.1. Summary of Test Result

- ☒ No deviations from the test standards
- ☐ Deviations from the test standards as below description:

For FCC

Performed Test Item	Normative References	Test Performed	Deviation
Conducted Emission	FCC CFR Title 47 Part 15 Subpart C: 2015 Section 15.207	N/A	No
Emissions for Fundamental and Harmonics	FCC CFR Title 47 Part 15 Subpart C: 2015 Section 15.209 and 15.249	Yes	No
Emissions outside of the specified frequency	FCC CFR Title 47 Part 15 Subpart C: 2015 Section 15.215(c)	Yes	No

For IC

Performed Test Item	Normative References	Test Performed	Deviation
Conducted Emission	RSS-Gen Issue 4 Section 8.8	N/A	No
Emissions for Fundamental and Harmonics	RSS-210 Issue 8+A1 A2.9 (a)	Yes	No
Emissions outside of the specified frequency	RSS-210 Issue 8+A1 A2.9 (b)	Yes	No

2.2. Test Environment

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	21
Humidity (%RH)	25-75	50
Barometric pressure (mbar)	860-1060	950-1000

3. Conducted Emission

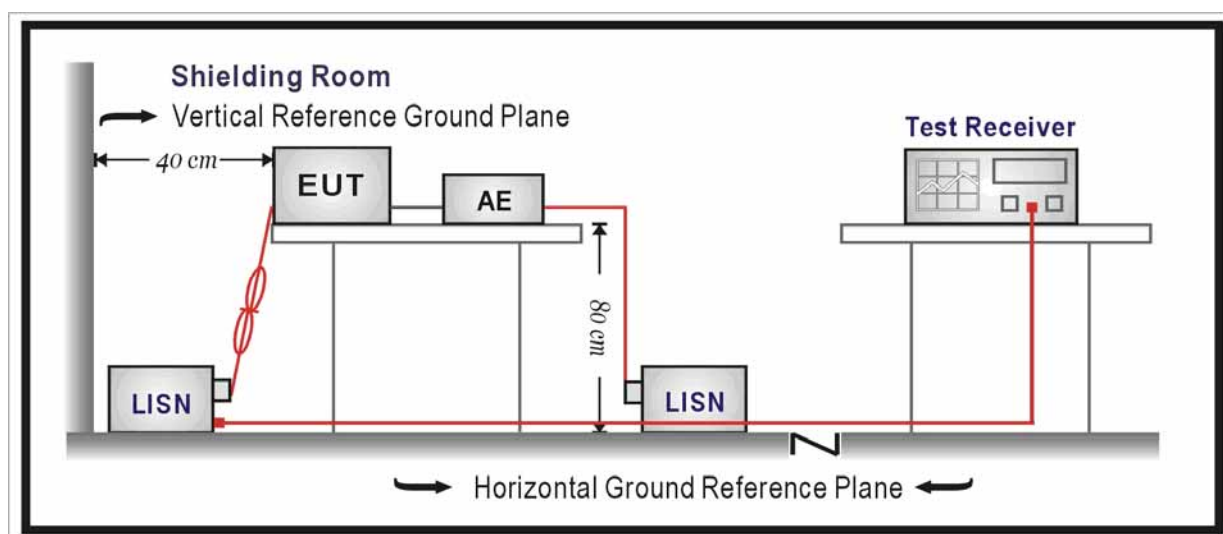
3.1. Test Equipment

Conducted Emission / TR-1

Instrument	Manufacturer	Type No.	Serial No.	Cal. Due Date
EMI Test Receiver	R&S	ESCI	100726	2017.03.05
Two-Line V-Network	R&S	ENV216	100043	2017.03.05
Two-Line V-Network	R&S	ENV216	100044	2016.09.16
50ohm Coaxial Switch	Anritsu	MP59B	6200464462	2017.03.01
50ohm Termination	SHX	TF2	07081401	2016.09.16
Temperature/Humidity Meter	zhicheng	ZC1-2	TR1-TH	2017.01.04

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

3.2. Test Setup



3.3. Limit

Frequency of Emission (MHz)	Conducted Limit	
	Quasi-peak (dB μ V)	Average (dB μ V)
0.15-0.5	66 to 56	56 to 46
0.5-5	56	46
5-30	60	50
Note 1: The lower limit shall apply at the transition frequencies.		
Note 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.		

3.4. Test Procedure

Test Method			
	References Rule	Chapter	Item
☒	ANSI C63.10-2013	6.2	Standard test method for ac power-line conducted emissions from unlicensed wireless devices
☒	ANSI C63.4-2014	7	AC power-line conducted emission measurements

3.5. Uncertainty

The measurement uncertainty is defined as ± 2.02 dB

3.6. Test Result

Note: The EUT is powered by battery, so the test is not applicable.

4. Emissions for Fundamental and Harmonics

4.1. Test Equipment

Emissions in restricted frequency bands / AC-2

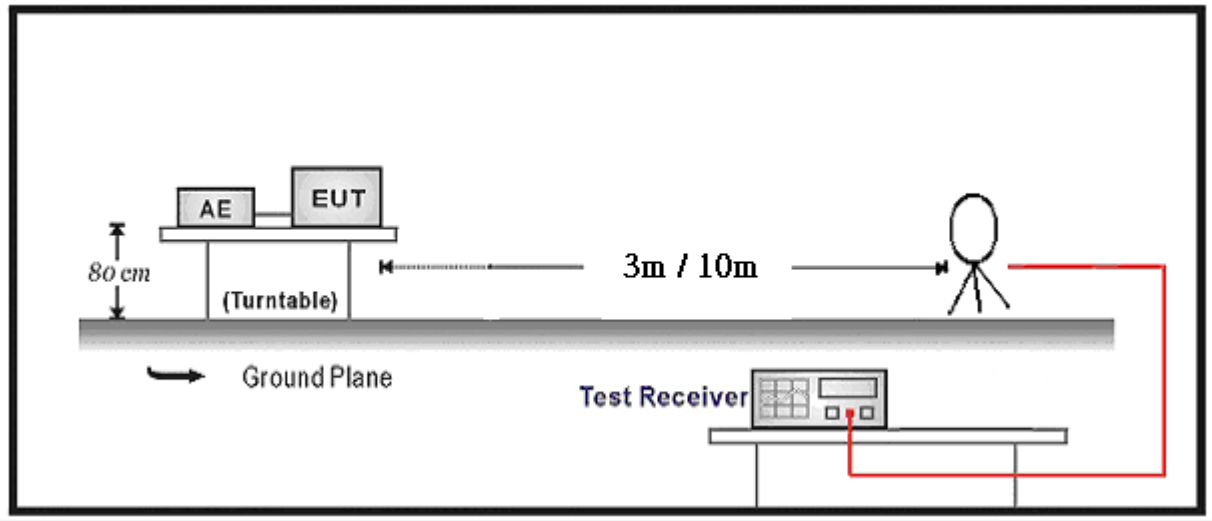
Instrument	Manufacturer	Type No.	Serial No.	Cal. Due Date
EMI Test Receiver	R&S	ESCI	100573	2017.03.05
Loop Antenna	R&S	HFH2-Z2	833799/003	2016.11.25
Bilog Antenna	Teseq GmbH	CBL6112D	27611	2016.10.10
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC2-C	2017.02.28
Temperature/Humidity Meter	Zhicheng	ZC1-2	AC2-TH	2017.01.04

Emissions in restricted frequency bands / AC-5

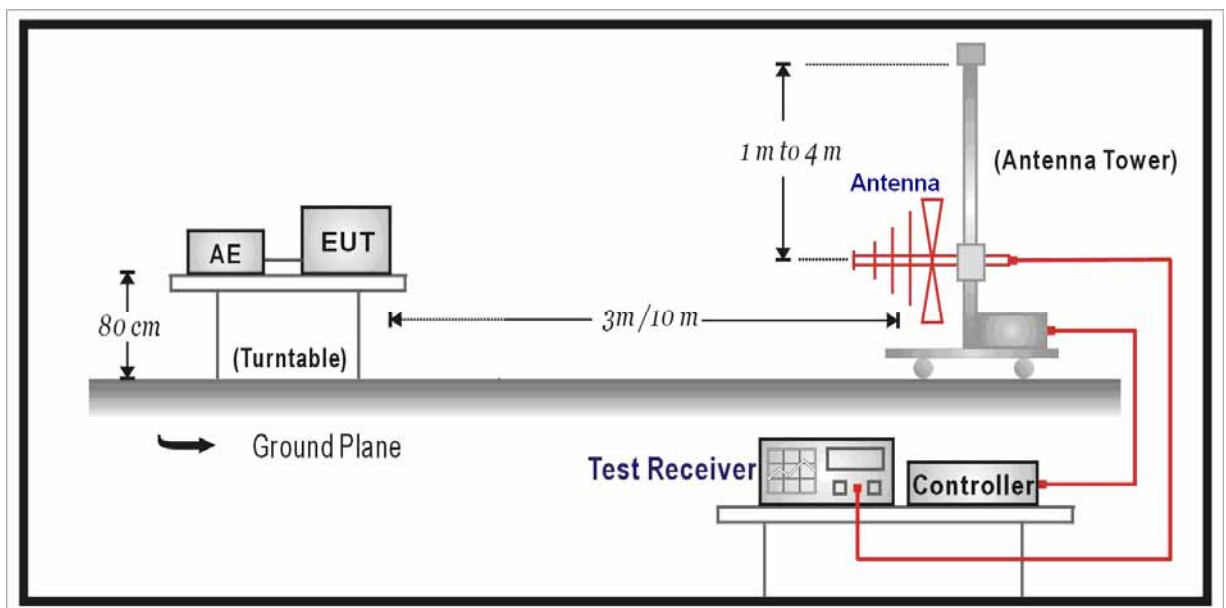
Instrument	Manufacturer	Type No.	Serial No.	Cal. Due Date
Spectrum Analyzer	Agilent	N9010A	MY48030494	2017.02.04
Preamplifier	Miteq	NSP1800-25	1364185	2017.05.03
Preamplifier	QuieTek	AP-040G	CHM-0906001	2017.05.03
Bilog Antenna	Teseq GmbH	CBL6112D	27612	2016.10.15
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	499	2016.06.08
Broad-Band Horn Antenna	Schwarzbeck	BBHA9170	294	2017.04.10
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C1	2017.02.28
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C2	2017.02.28
Coaxial Cable	Huber+Suhner	SUCOFLEX 102	AC5-C3	2017.02.28
Temperature/Humidity Meter	Zhicheng	ZC1-2	AC5-TH	2017.01.04

4.2. Test Setup

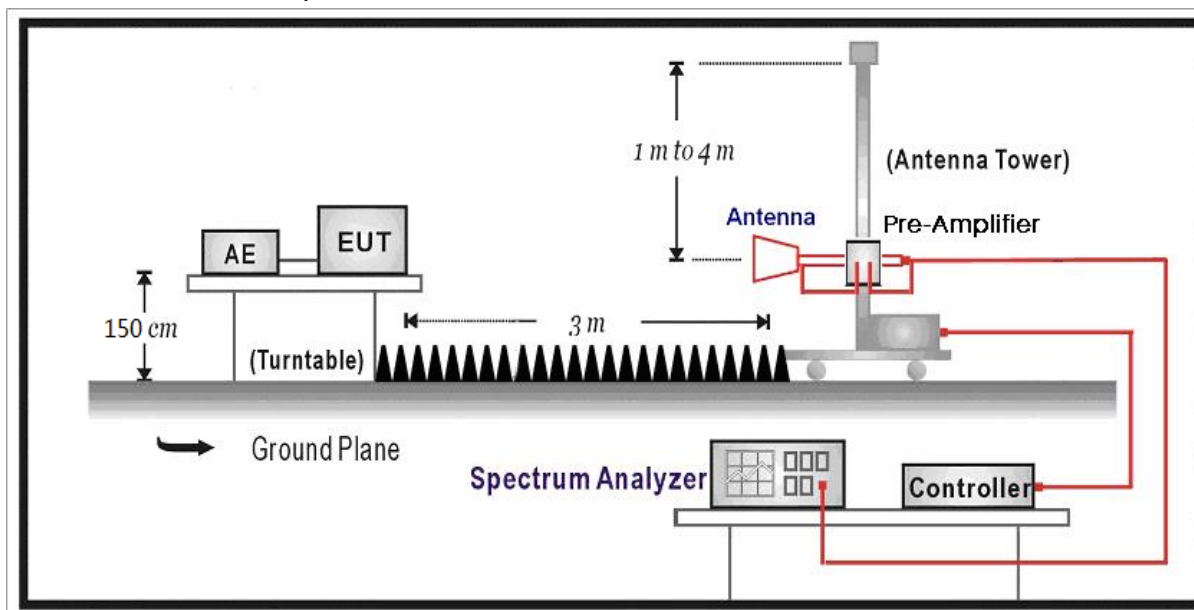
Below 30MHz Test Setup:



Below 1GHz Test Setup:



Above 1GHz Test Setup:



4.3. Limit

Restricted Bands of operation			
Frequency (MHz)	Frequency (MHz)	Frequency (MHz)	Frequency (GHz)
0.090 – 0.110	16.42 – 16.423	399.9 – 410	4.5 – 5.15
0.495 – 0.505	16.69475 – 16.69525	608 – 614	5.35 – 5.46
2.1735 – 2.1905	16.80425 – 16.80475	960 – 1240	7.25 – 7.75
4.125 – 4.128	25.5 – 25.67	1300 – 1427	8.025 – 8.5
4.17725 – 4.17775	37.5 – 38.25	1435 – 1626.5	9.0 – 9.2
4.20725 – 4.20775	73 – 74.6	1645.5 – 1646.5	9.3 – 9.5
6.215 – 6.218	74.8 – 75.2	1660 – 1710	10.6 – 12.7
6.26775 – 6.26825	108 – 121.94	1718.8 – 1722.2	13.25 – 13.4
6.31175 – 6.31225	123 – 138	2200 – 2300	14.47 – 14.5
8.291 – 8.294	149.9 – 150.05	2310 – 2390	15.35 – 16.2
8.362 – 8.366	156.52475 – 156.52525	2483.5 – 2500	17.7 – 21.4

8.37625 – 8.38675	156.7 – 156.9	2690 – 2900	22.01 – 23.12
8.81425 – 8.81475	162.0125 – 167.17	3260 – 3267	23.6 – 24.0
12.29 – 12.293	167.72 – 173.2	3332 – 3339	31.2 – 31.8
12.51975–12.52025	240 – 285	3345.8 – 3358	36.43 – 36.5
12.57675–12.57725	322 – 335.4	3600 – 4400	
13.36 – 13.41			

Fundamental frequency	Field strength of fundamental	Field strength of harmonics
902-928 MHz	50	500
2400-2483.5 MHz	50	500
5725-5875 MHz	50	500
24.0-24.25 GHz	250	2500

4.4. Test Procedure

Test Method				
	References Rule		Chapter	Description
	☒	ANSI C63.10	6.4	Radiated emissions from unlicensed wireless devices below 30 MHz
	☒	ANSI C63.10	6.5	Radiated emissions from unlicensed wireless devices in the frequency range of 30 MHz to 1000 MHz
	☒	ANSI C63.10	6.6	Radiated emissions from unlicensed wireless devices above 1 GHz

4.5. Uncertainty

The measurement uncertainty above 1G is defined as ± 3.9 dB
 below 1G is defined as ± 3.8 dB

4.6. Test Result

Fundamental Radiated Emission

Product	:	E-BOARDS SMART CONTROLLER
Test Item	:	Fundamental Radiated Emission
Test Site	:	AC-5
Test Mode	:	Mode 1: Transmit

Frequency (MHz)	Antenna	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
2402	H	50.8	37.3	88.1	114	25.9	PK
	V	43.7	37.4	81.1	114	32.9	PK
2440	H	48.0	37.4	85.4	114	28.6	PK
	V	41.9	37.4	79.3	114	34.7	PK
2480	H	46.1	37.5	83.6	114	30.4	PK
	V	35.9	37.5	73.4	114	40.6	PK

Note: Measure Level = Reading Level + Factor.

Frequency (MHz)	Antenna	Peak Measure (dBuV/m)	Duty Cycle Correct Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
2402	H	88.1	-38.4	49.7	94	44.3	AV
	V	81.1	-38.4	42.7	94	51.3	AV
2440	H	85.4	-38.4	47.0	94	47.0	AV
	V	79.3	-38.4	40.9	94	53.1	AV
2480	H	83.6	-38.4	45.2	94	48.8	AV
	V	73.4	-38.4	35.0	94	59.0	AV

Note: Measure Level = Peak Measure + Duty Cycle Correct Factor.

Harmonic Radiated Emission

Product	:	E-BOARDS SMART CONTROLLER
Test Item	:	Harmonic Radiated Emission
Test Site	:	AC-5
Test Mode	:	Mode 1: Transmit at Low Channel

Frequency (MHz)	Antenna	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
4808.0	H	44.5	8.0	52.4	74	21.6	PK
4808.0	V	43.3	8.0	51.2	74	22.8	PK
7205.0	H	38.5	12.8	51.3	74	22.7	PK
7205.0	V	44.4	12.8	57.2	74	16.8	PK
9608.0	H	29.5	16.1	45.6	74	28.4	PK
9608.0	V	33.2	16.1	49.3	74	24.7	PK

Frequency (MHz)	Antenna	Peak Level (dBuV/m)	Duty Factor (dB)	AV Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
4808.0	H	52.4	-38.4	14.0	54	40.0	AV
4808.0	V	51.2	-38.4	12.8	54	41.2	AV
7205.0	H	51.3	-38.4	12.9	54	41.1	AV
7205.0	V	57.2	-38.4	18.8	54	35.2	AV
9608.0	H	45.6	-38.4	7.2	54	46.8	AV
9608.0	V	49.3	-38.4	10.9	54	43.1	AV

Note 1: The test frequency range, 9kHz~30MHz, 18GHz~25GHz, both of the worst case are at least 6dB below the limits, therefore no data appear in the report.

2: This limit applies for using average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.

3: Measure Level = Reading Level + Factor.

Product	:	E-BOARDS SMART CONTROLLER
Test Item	:	Harmonic Radiated Emission
Test Site	:	AC-5
Test Mode	:	Mode 1: Transmit at Mid Channel

Frequency (MHz)	Antenna	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
4880.0	H	38.4	8.2	46.5	74	27.5	PK
4880.0	V	38.8	8.2	47.0	74	27.0	PK
7320.0	H	37.0	12.9	49.9	74	24.1	PK
7320.0	V	32.6	12.9	45.5	74	28.5	PK
9760.0	H	31.1	16.1	47.2	74	26.8	PK
9760.0	V	30.4	16.1	46.5	74	27.5	PK

Frequency (MHz)	Antenna	Peak Level (dBuV/m)	Duty Factor (dB)	AV Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
4880.0	H	46.5	-38.4	8.1	54	45.9	AV
4880.0	V	47.0	-38.4	8.6	54	45.4	AV
7320.0	H	49.9	-38.4	11.5	54	42.5	AV
7320.0	V	45.5	-38.4	7.1	54	46.9	AV
9760.0	H	47.2	-38.4	8.8	54	45.2	AV
9760.0	V	46.5	-38.4	8.1	54	45.9	AV

Note 1: The test frequency range, 9kHz~30MHz, 18GHz~25GHz, both of the worst case are at least 6dB below the limits, therefore no data appear in the report.

2: This limit applies for using average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.

3: Measure Level = Reading Level + Factor.

Product	:	E-BOARDS SMART CONTROLLER
Test Item	:	Harmonic Radiated Emission
Test Site	:	AC-5
Test Mode	:	Mode 1: Transmit at High Channel

Frequency (MHz)	Antenna	Reading Level (dBuV/m)	Factor (dB)	Measure Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
4961.0	H	47.1	8.5	55.6	74	18.4	PK
4961.0	V	42.6	8.5	51.1	74	22.9	PK
7443.0	H	41.8	13.2	55.0	74	19.0	PK
7443.0	V	40.7	13.2	53.9	74	20.1	PK
9920.0	H	37.5	16.1	53.5	74	20.5	PK
9920.0	V	36.5	16.1	52.5	74	21.5	PK

Frequency (MHz)	Antenna	Peak Level (dBuV/m)	Duty Factor (dB)	AV Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
4961.0	H	55.6	-38.4	17.2	54	36.8	AV
4961.0	V	51.1	-38.4	12.7	54	41.3	AV
7443.0	H	55.0	-38.4	16.6	54	37.4	AV
7443.0	V	53.9	-38.4	15.5	54	38.5	AV
9920.0	H	53.5	-38.4	15.1	54	38.9	AV
9920.0	V	52.5	-38.4	14.1	54	39.9	AV

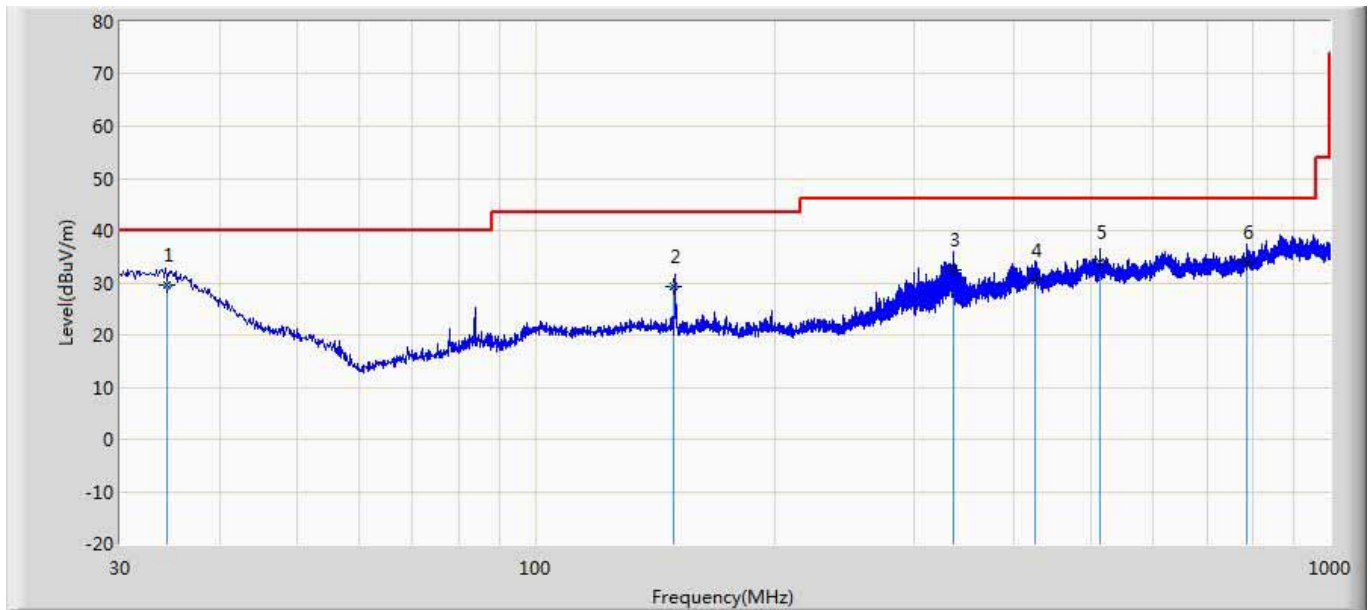
Note 1: The test frequency range, 9kHz~30MHz, 18GHz~25GHz, both of the worst case are at least 6dB below the limits, therefore no data appear in the report.

2: This limit applies for using average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.

3: Measure Level = Reading Level + Factor.

The worst case of Radiated Emission below 1GHz:

Engineer: Scott	
Site: AC2	Time: 2016/04/22
Limit: FCC_Part15.209_RE(3m)_ClassB	Margin: 0
Probe: AC2_10M(30-1000M)	Polarity: Horizontal
EUT: E-BOARDS Smart Controller	Power: By Battery
Note: Mode 1	

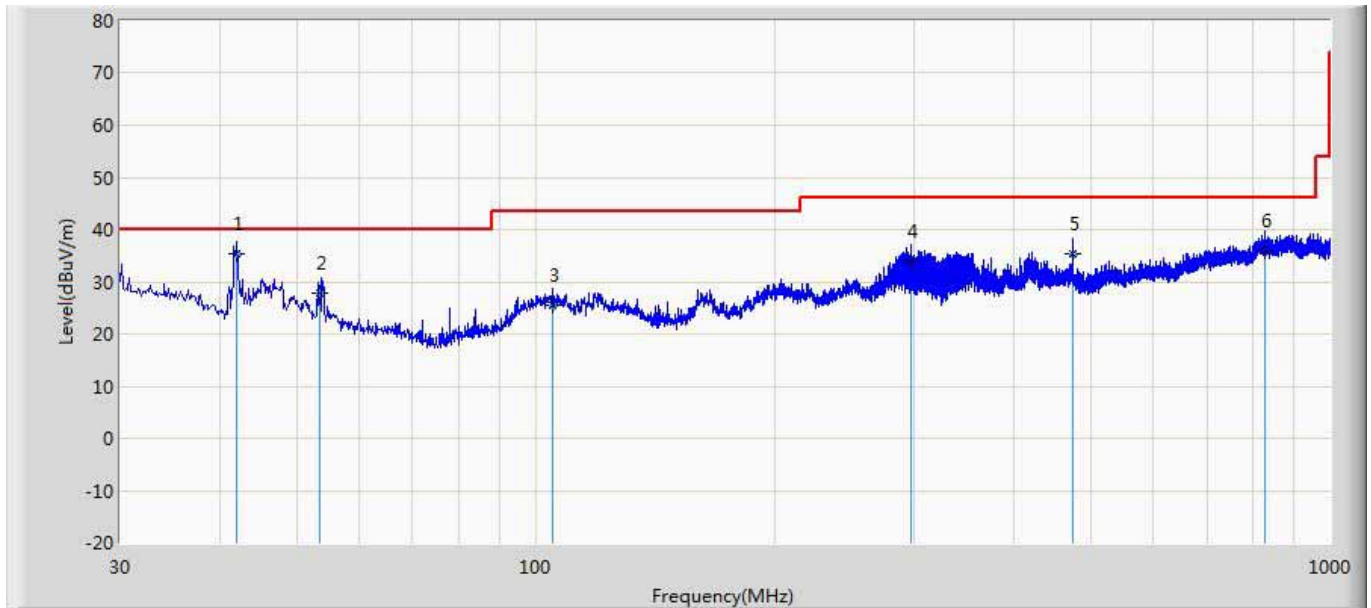


No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Probe (dB/m)	Cable (dB)	Amp (dB)	Ant Pos (cm)	Table Pos (deg)	Type
1	*	34.301	29.554	2.200	-10.446	40.000	20.689	6.664	0.000	100	64	QP
2		149.320	29.209	12.200	-14.291	43.500	9.831	7.178	0.000	106	360	QP
3		335.701	32.461	9.600	-13.539	46.000	15.124	7.738	0.000	200	60	QP
4		425.201	30.460	3.200	-15.540	46.000	19.288	7.972	0.000	200	110	QP
5		513.401	33.844	6.200	-12.156	46.000	19.543	8.101	0.000	200	116	QP
6		787.422	33.786	3.200	-12.214	46.000	21.609	8.977	0.000	100	212	QP

Note:

1. " * ", means this data is the worst emission level.
2. Measurement Level = Reading Level + Factor(Probe+Cable-Amp).

Engineer: Scott	
Site: AC2	Time: 2016/04/22
Limit: FCC_Part15.209_RE(3m)_ClassB	Margin: 0
Probe: AC2_10M(30-1000M)	Polarity: Vertical
EUT: E-BOARDS Smart Controller	Power: By Battery
Note: Mode 1	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Probe (dB/m)	Cable (dB)	Amp (dB)	Ant Pos (cm)	Table Pos (deg)	Type
1	*	42.105	35.481	16.900	-4.519	40.000	12.003	6.578	0.000	100	44	QP
2		53.601	27.742	9.600	-12.258	40.000	11.536	6.607	0.000	199	0	QP
3		105.201	25.521	3.200	-17.979	43.500	15.412	6.909	0.000	200	44	QP
4		297.200	33.952	10.100	-12.048	46.000	16.235	7.617	0.000	100	33	QP
5		474.201	35.435	9.200	-10.565	46.000	18.219	8.016	0.000	200	119	QP
6		827.600	35.916	3.200	-10.084	46.000	23.640	9.076	0.000	200	174	QP

Note:

1. " * ", means this data is the worst emission level.
2. Measurement Level = Reading Level + Factor(Probe+Cable-Amp).

5. Emissions outside of the specified frequency

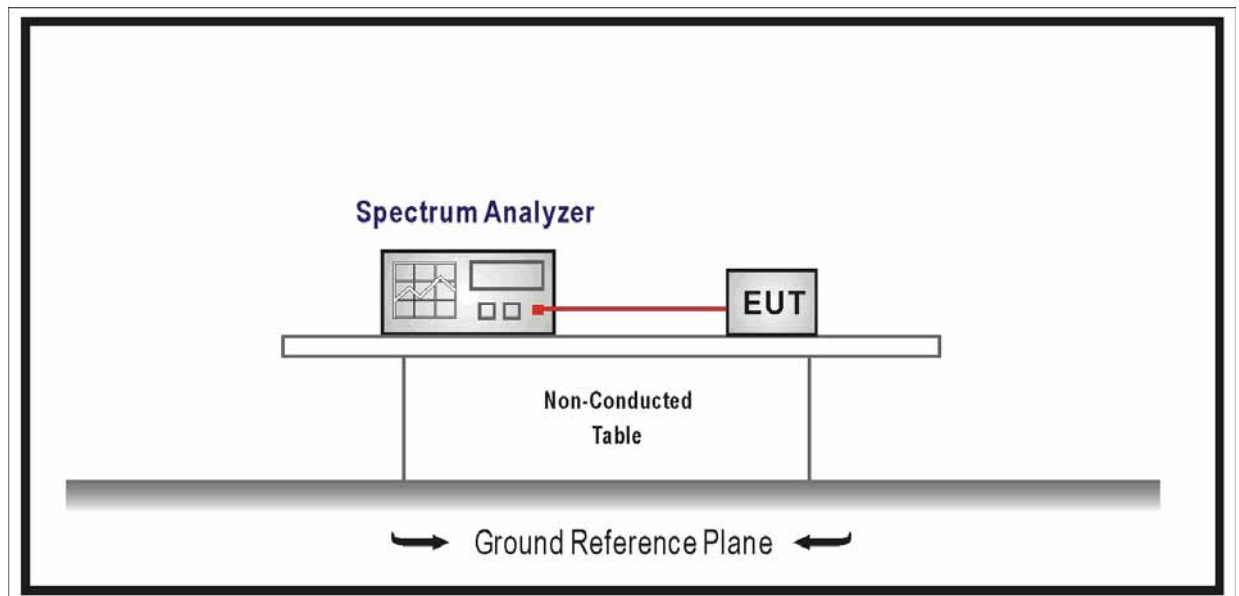
5.1. Test Equipment

Emissions in non-restricted frequency bands / TR-8

Instrument	Manufacturer	Type No.	Serial No.	Cal. Due Date
Spectrum Analyzer	Agilent	N9010A	MY48030494	2017.02.04
Temperature/Humidity Meter	Zhicheng	ZC1-2	TR8-TH	2017.04.03

Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

5.2. Test Setup



5.3. Limit

Un-Restricted Band Emissions Limit	
RF Output power (Detection methods)	Limit(dB)
RF Output power	50c
Note 1: FCC Part 15.249 (d), Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.	

5.4. Test Procedure

Test Method			
	References Rule	Chapter	Description
☒	ANSI C63.10	6.4	Radiated emissions from unlicensed wireless devices below 30 MHz
☒	ANSI C63.10	6.5	Radiated emissions from unlicensed wireless devices in the frequency range of 30 MHz to 1000 MHz
☒	ANSI C63.10	6.6	Radiated emissions from unlicensed wireless devices above 1 GHz

5.5. Uncertainty

The measurement uncertainty is defined as ± 1.0 dB

5.6. Test Result

Product	:	Bluetooth Headset
Test Item	:	Emissions in non-restricted frequency bands
Test Site	:	TR-8

Mode	Channel	Test Frequency (MHz)	In-Band PSD[a] (dBm/100kHz)	Frequency (MHz)	Out-Band PSD[b] (dBm/100kHz)	[a]-[b] (dB)	Limit (dB)	Result
1	00	2402	-0.553	2400.00	-49.921	50.474	>50	Pass
1	78	2480	-2.613	2483.50	-52.735	55.348	>50	Pass

Note: The worst case of Emissions in non-restricted frequency bands as below:

Mode 1 CH78(2480MHz)



Note: The above test pattern is synthesized by multiple of the frequency range.

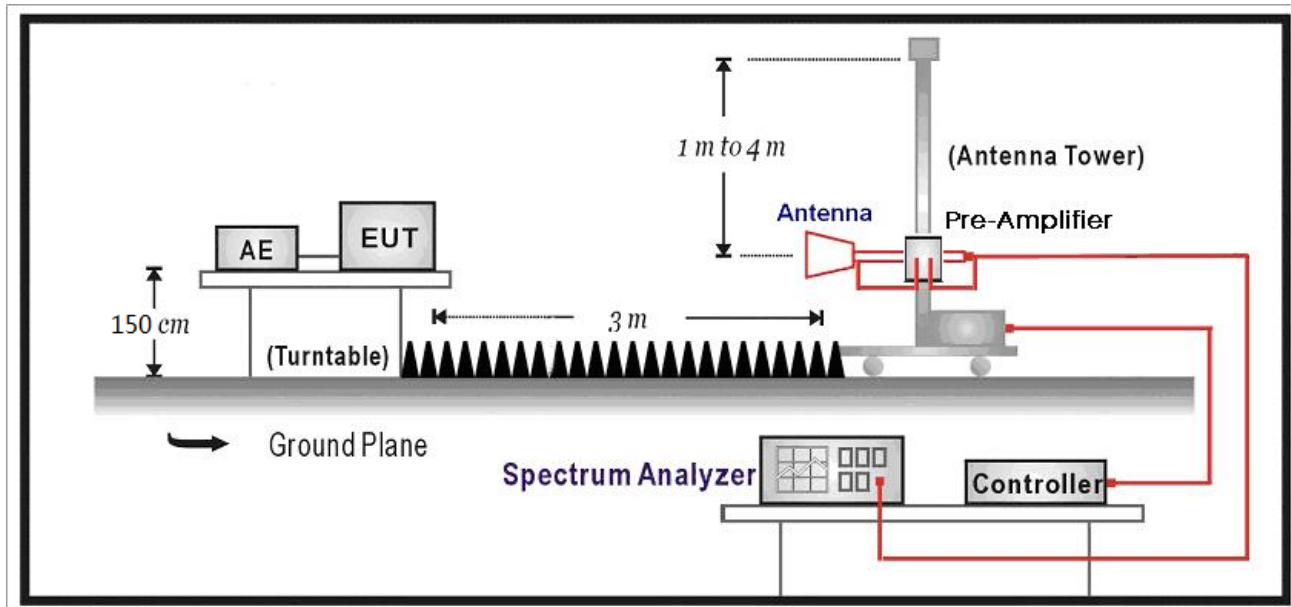
6. Radiated Emission Band Edge

6.1. Test Equipment

☒ Radiated Emission Band Edge / AC-5

Instrument	Manufacturer	Type No.	Serial No.	Cal. Due Date
Spectrum Analyzer	Agilent	N9010A	MY48030494	2017.02.04
Preamplifier	Miteq	NSP1800-25	1364185	2017.05.03
Preamplifier	QuieTek	AP-040G	CHM-0906001	2017.05.03
Bilog Antenna	Teseq GmbH	CBL6112D	27612	2016.10.15
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	733	2017.02.26
DRG Horn	ETS-Lindgren	3117	00167055	2016.07.16
Broad-Band Horn Antenna	Schwarzbeck	BBHA9170	294	2017.03.01
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C1	2017.03.01
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C2	2017.03.01
Coaxial Cable	Huber+Suhner	SUCOFLEX 102	AC5-C3	2016.08.07
Temperature/Humidity Meter	Zhicheng	ZC1-2	AC5-TH	2017.01.04

6.2. Test Setup



6.3. Limit

Band edge Limit				
Frequency bands (MHz)	Detector	Limit (dB μ V/m)	RBW (MHz)	Distance (m)
2310-2390	PK	74	1	3
2483.5-2500	AV	54	1	3

Note: The field strength of emissions appearing within these frequency bands shall not exceed the limits.

6.4. Test Procedure

Test Method			
	References Rule	Chapter	Description
☒	ANSI C63.10	6.10	Band-edge testing
	☒ ANSI C63.10	6.10.5	Restricted-band band-edge measurements
	☐ ANSI C63.10	6.10.6	Marker-delta method
☐	ANSI C63.10	6.4	Radiated emissions from unlicensed wireless devices below 30 MHz

☐	ANSI C63.10	6.5	Radiated emissions from unlicensed wireless devices in the frequency range of 30 MHz to 1000 MHz
☒	ANSI C63.10	6.6	Radiated emissions from unlicensed wireless devices above 1 GHz

6.5. Uncertainty

The measurement uncertainty above 1G is defined as ± 3.9 dB

below 1G is defined as ± 3.8 dB

6.6. Test Result

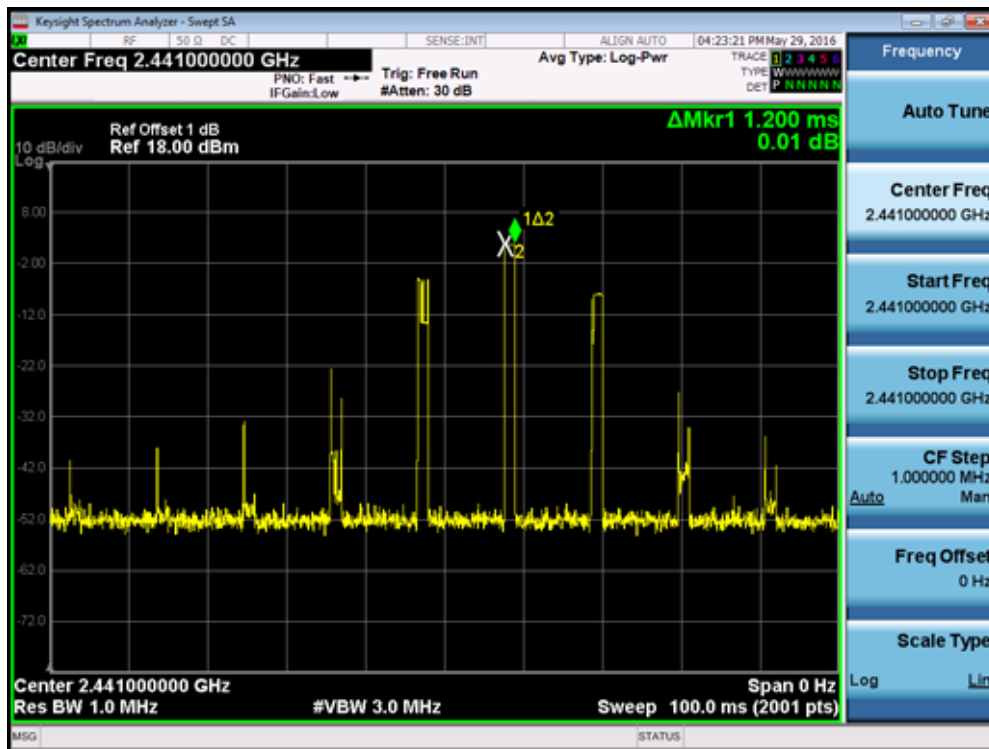
All of the test result shown indicates the worst case, and spectrum analyzer parameters setting as shown below:

Peak detector: RBW = 1MHz, VBW = 3MHz, sweep time = 200ms;

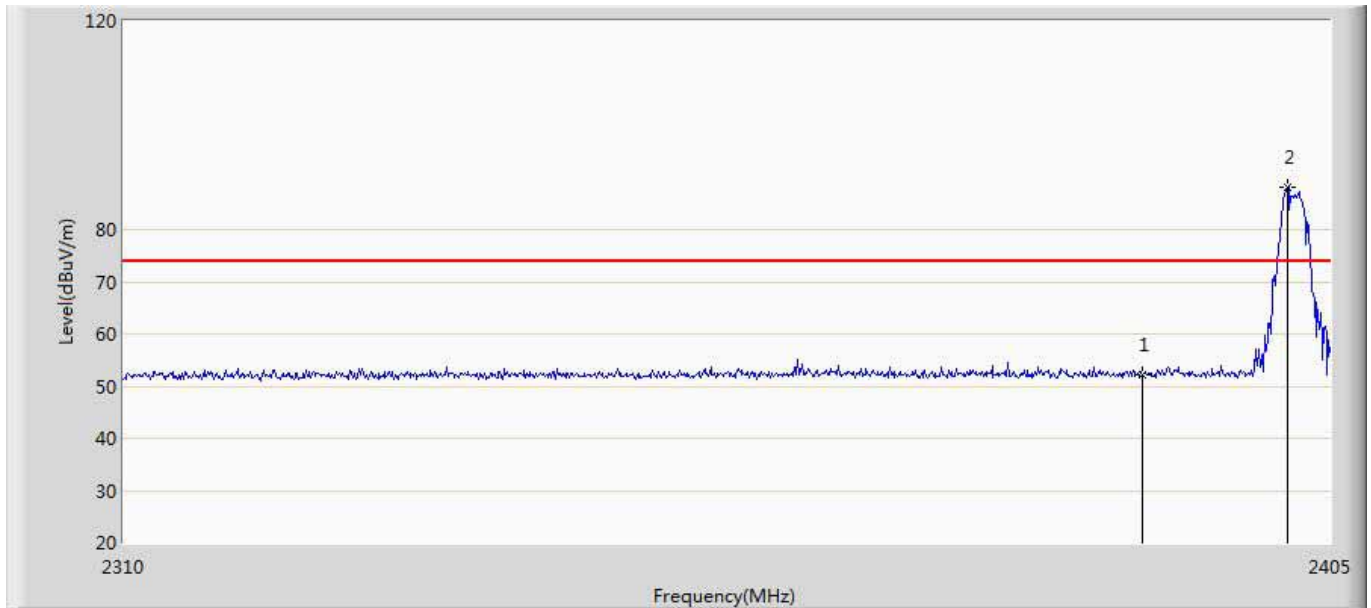
Average = Peak Measure Level+ Duty Factor

Duty Factor= $20 \cdot \text{LOG}(\text{Pulse Number} \cdot \text{On Time} / 100) = -38.42\text{dB}$ in worst condition in normal use.

Pulse Number



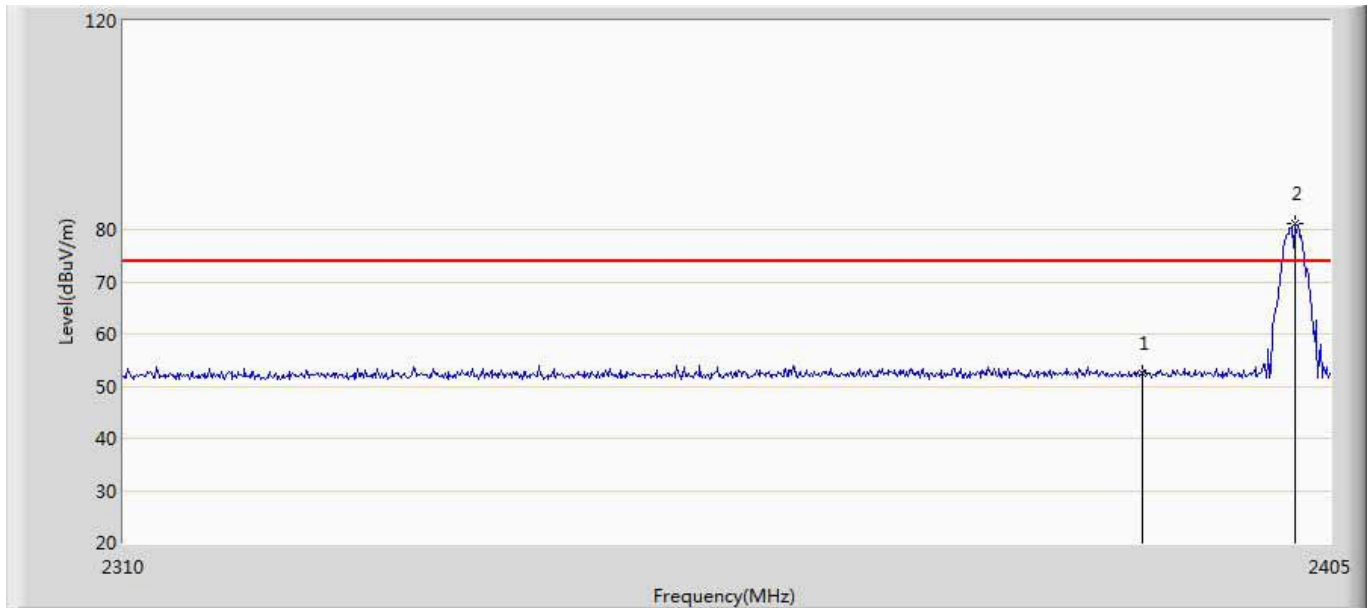
Engineer: Scott	
Site: AC5	Time: 2016/04/19 - 14:22
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: E-BOARDS Smart Controller	Power: By Battery
Note: Mode 1:Transmit at CH2402Mhz	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	52.220	14.865	-21.780	74.000	37.355	PK
2	*	2401.580	88.115	50.773	N/A	N/A	37.343	PK

No	Mark	Frequency (MHz)	Peak Level (dBuV/m)	AV Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Duty Factor (dB)	Type
1		2390.000	52.220	13.800	-40.200	54	38.42	AV
2	*	2401.580	88.115	49.695	N/A	N/A	38.42	AV

Engineer: Scott	
Site: AC5	Time: 2016/04/19 - 14:26
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: E-BOARDS Smart Controller	Power: By Battery
Note: Mode 1:Transmit at CH2402Mhz	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	52.583	15.228	-21.417	74.000	37.355	PK
2	*	2402.150	81.088	43.746	N/A	N/A	37.342	PK

No	Mark	Frequency (MHz)	Peak Level (dBuV/m)	AV Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Duty Factor (dB)	Type
1		2390.000	52.583	14.163	-39.837	54	38.42	AV
2	*	2402.150	81.088	42.668	N/A	N/A	38.42	AV

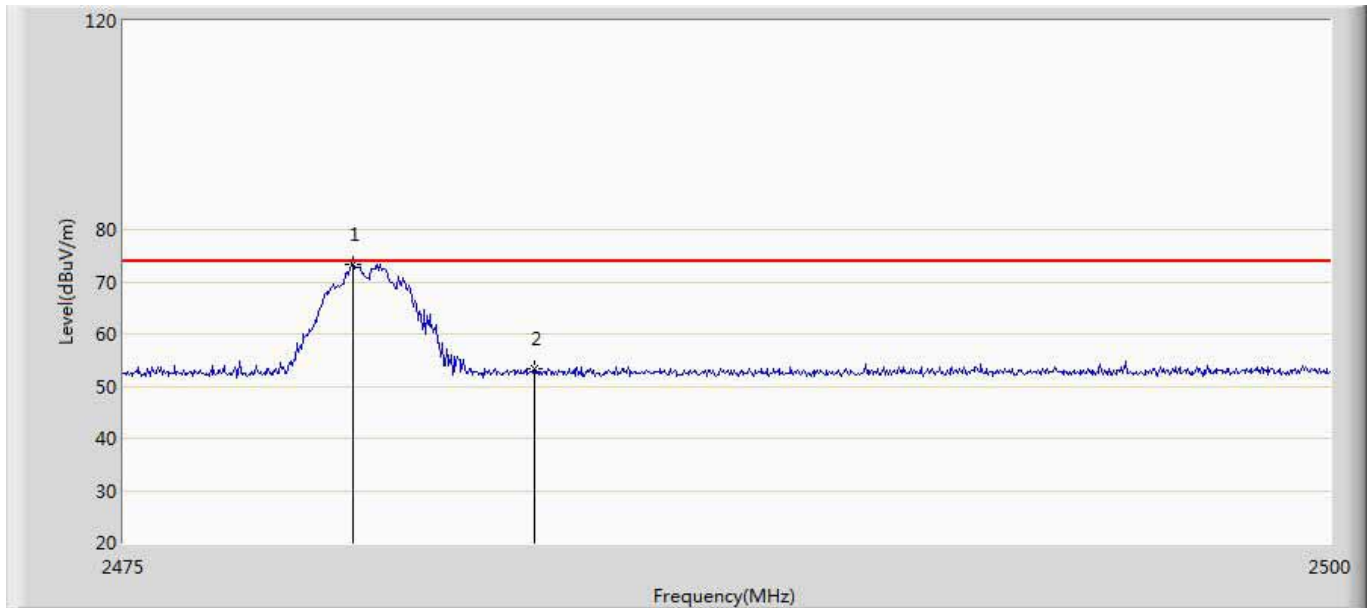
Engineer: Scott	
Site: AC5	Time: 2016/04/19 - 14:32
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: E-BOARDS Smart Controller	Power: By Battery
Note: Mode 1:Transmit at CH2480Mhz	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2480.125	83.569	46.082	N/A	N/A	37.487	PK
2		2483.500	52.044	14.533	-21.956	74.000	37.511	PK

No	Mark	Frequency (MHz)	Peak Level (dBuV/m)	AV Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Duty Factor (dB)	Type
1	*	2480.125	83.569	45.149	N/A	N/A	38.42	AV
2		2483.500	52.044	13.624	-40.376	54	38.42	AV

Engineer: Scott	
Site: AC5	Time: 2016/04/19 - 14:36
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: E-BOARDS Smart Controller	Power: By Battery
Note: Mode 1:Transmit at CH2480Mhz	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2479.750	73.339	35.855	N/A	N/A	37.484	PK
2		2483.500	53.190	15.679	-20.810	74.000	37.511	PK

No	Mark	Frequency (MHz)	Peak Level (dBuV/m)	AV Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Duty Factor (dB)	Type
1	*	2479.750	73.339	34.919	N/A	N/A	38.42	AV
2		2483.500	53.190	14.770	-39.230	54	38.42	AV

_____ The End _____