

Test Report

FCC Part15 Subpart C

Product Name : EZ-BLE PSoC XT/XR module
Model No. : CYBLE-224110-00;CYBLE-224116-01
FCC ID : WAP4110
IC : 7922A-4110

Applicant : Cypress Semiconductor
Address : 198 Champion Ct, San Jose, California
95134 United States

Date of Receipt : Mar. 10, 2016
Test Date : Mar. 10, 2016~ Apr. 21, 2016
Issued Date : May. 24, 2016
Report No. : 1632048R-RF-US-P06V01
Report Version : V1.2

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 TAF or any agency of the government.

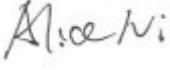
The test report shall not be reproduced without the written approval of QuieTek Corporation.

Test Report Certification

Issued Date : May. 24, 2016
Report No. : 1632048R-RF-US-P06V01



Product Name : EZ-BLE PSoC XT/XR module
Applicant : Cypress Semiconductor
Address : 198 Champion Ct, San Jose, California 95134 United States
Manufacturer : Wujiang Sigmatron Electronics Co., Ltd
Address : 386 Huahong Rd, Wujiang, Suzhou, Jiangsu, China
Model No. : CYBLE-224110-00;CYBLE-224116-01
FCC ID : WAP4110
IC : 7922A-4110
Brand Name : Cypress Semiconductor
EUT Voltage : DC 2.3V
Applicable Standard : FCC CFR Title 47 Part 15 Subpart C: 2015
ANSI C63.4:2014; ANSI C63.10:2013;
KDB 558074 D01v03r04
Industry Canada RSS-Gen Issue 4 / RSS-247 Issue 1
Test Result : Complied
Performed Location : Quietek Corporation - Suzhou EMC Laboratory
No.99 Hongye Rd., Suzhou Industrial Park, Suzhou, 215006,
Jiangsu, China
TEL: +86-512-6251-5088 / FAX: +86-512-6251-5098
FCC Registration Number: 800392; IC Lab Code: 4075B

Documented By : 
(Senior Adm. Specialist: Alice Ni)

Reviewed By : 
(Senior Engineer: Jack Zhang)

Approved By : 
(Engineering Manager : Harry Zhao)

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 <http://www.vt-lab.com/zh/tzj/>.

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.asp

If you have any comments, Please don't hesitate to contact us. Our contact information is as below:
http://www.quiteer.com/index_en.aspx

If you have any comments, Please don't hesitate to contact us. Our contact information is as below:

HsinChu Testing Laboratory :
No. 55, Sec. 2, HsinChu, Taiwan, R.O.C.

No.75-2, 3rd Lin, Wangye Keng, Yongxing Tsuen, Qionglin Shiang, Hsinchu County 307, Taiwan, R.O.C.
TEL: 886-3-562-2955/FAX: 886-3-562-2955 E-Mail: hsin@mail.hinet.net

TEL:+886-3-592-8858 / FAX:+886-3-592-8859 E-Mail : service@quietek.com

LinKou Testing Laboratory :

No.5-22, Ruishukeng, Linkou Dist., New Taipei City 24451, Taiwan, R.O.C.

TEL : 886-2-8601-3788 / FAX : 886-2-8601-3789
E-Mail : service@quietek.com

Suzhou Testing Laboratory :

No.99 Hongye Rd., Suzhou Industrial Park, Suzhou, 215006, Jiangsu, China

TEL : +86-512-6251-5088 / FAX : 86-512-6251-5098 E-Mail : service@quietek.com

TABLE OF CONTENTS

Description	Page
1. General Information.....	7
1.1. EUT Description	7
1.2. Working Frequency of Each Channel:	8
1.3. Antenna information	8
1.4. Mode of Operation.....	8
1.5. Tested System Details	9
1.6. Configuration of Tested System.....	10
1.7. EUT Exercise Software.....	12
2. Technical Test	13
2.1. Summary of Test Result.....	13
2.2. Test Frequency configuration:.....	15
2.3. Test Environment.....	16
2.4. Measurement Uncertainty.....	16
3. AC Power Line Conducted Emission.....	17
3.1. Test Equipment.....	17
3.2. Test Setup.....	17
3.3. Limit	18
3.4. Test Procedure	18
3.5. Test Result.....	19
4. Emissions in restricted frequency bands	21
4.1. Test Equipment.....	21
4.2. Test Setup.....	22
4.3. Limit	23
4.4. Test Procedure	25
4.5. EUT test Axis definition.....	26
4.6. Test Result.....	27
5. Emissions in non-restricted frequency bands	30
5.1. Test Equipment.....	30
5.2. Test Setup.....	31
5.3. Limit	32
5.4. Test Procedure	33
5.5. EUT test Axis definition.....	34
5.6. Test Result.....	35
6. Radiated Emission Band Edge	36
6.1. Test Equipment.....	36
6.2. Test Setup.....	37
6.3. Limit	37

6.4.	Test Procedure	38
6.5.	EUT test definition	39
6.6.	Duty Cycle	40
6.7	Test Result	41
7.	Occupied Bandwidth.....	49
7.1.	Test Equipment.....	49
7.2.	Test Setup.....	49
7.3.	Limit.....	50
7.4.	Test Procedure	50
7.5.	EUT test definition	51
7.6.	Test Result.....	52
8.	Fundamental emission output power	53
8.1.	Test Equipment.....	53
8.2.	Test Setup.....	53
8.3.	Limit.....	54
8.4.	Test Procedure	55
8.5.	EUT test definition	56
8.6.	Test Result.....	57
9.	Power Spectral Density	58
9.1.	Test Equipment.....	58
9.2.	Test Setup.....	58
9.3.	Limit.....	58
9.4.	Test Procedure	59
9.5.	EUT test definition	60
9.6.	Test Result.....	61

History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
1632048R-RF-US-P06V01	V1.0	Initial Issued Report	Apr. 22, 2016
1632048R-RF-US-P06V01	V1.1	Change Section 2.1 and the power supply	May. 19, 2016
1632048R-RF-US-P06V01	V1.2	Change the Antenna Type in Section 1.3	May. 24, 2016

1. General Information

1.1. EUT Description

Product Name	EZ-BLE PSoC XT/XR module
Model No.	CYBLE-224110-00
Working Voltage	DC 2.3V
Bluetooth Specification	V4.1
Frequency Range	2402- 2480 MHz
Channel Number	V4.1: 40
Channel Separation	V4.1: 2MHz
Type of Modulation	V4.1: GFSK
Data Rate	V4.1: 1Mbps(GFSK)
Model No.	CYBLE-224116-01
Working Voltage	DC 2.3V
Bluetooth Specification	V4.2
Frequency Range	2402- 2480 MHz
Channel Number	V4.2: 40
Channel Separation	V4.2: 2MHz
Type of Modulation	V4.2: GFSK
Data Rate	V4.2: 1Mbps(GFSK)
Antenna Type	Reference to Antenna List
Peak Antenna Gain	Reference to Antenna List

Note: 1.The Bluetooth version is 4.1&4.2 but only supports low energy mode.

2.Compared with CYBLE-224110-00, the main chip of CYBLE-224116-01 has upgraded the Bluetooth version from BLE 4.1 to BLE 4.2.

3.Both of the models were tested, and only the worst data are showed in the report.

1.2. Working Frequency of Each Channel:

Bluetooth Working Frequency of Each Channel: (For V4.0)							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
00	2402 MHz	01	2404 MHz	02	2406 MHz	03	2408 MHz
04	2410 MHz	05	2412 MHz	06	2414 MHz	07	2416 MHz
08	2418 MHz	09	2420 MHz	10	2422 MHz	11	2424 MHz
12	2426 MHz	13	2428 MHz	14	2430 MHz	15	2432 MHz
16	2434 MHz	17	2436 MHz	18	2438 MHz	19	2440 MHz
20	2442 MHz	21	2444 MHz	22	2446 MHz	23	2448 MHz
24	2450 MHz	25	2452 MHz	26	2454 MHz	27	2456 MHz
28	2458 MHz	29	2460 MHz	30	2462 MHz	31	2464 MHz
32	2466 MHz	33	2468 MHz	34	2470 MHz	35	2472 MHz
36	2474 MHz	37	2476 MHz	38	2478 MHz	39	2480 MHz

1.3. Antenna information

Model No.	N/A			
Antenna manufacturer	N//A			
Antenna Delivery	<input checked="" type="checkbox"/>	1*TX+1*RX		
Antenna technology	<input checked="" type="checkbox"/>	SISO		
	<input type="checkbox"/>	<input type="checkbox"/>	Basic	
	<input type="checkbox"/>	<input type="checkbox"/>	CDD	
	<input type="checkbox"/>	<input type="checkbox"/>	Beam-forming	
Antenna Type	<input type="checkbox"/>	External	<input type="checkbox"/>	Dipole
	<input checked="" type="checkbox"/>	Internal	<input type="checkbox"/>	PIFA
			<input type="checkbox"/>	PCB
			<input checked="" type="checkbox"/>	Ceramic Chip Antenna
			<input type="checkbox"/>	Metal plate type F antenna
Antenna Gain	0.5dBi			

1.4. Mode of Operation

Test Mode
Mode 1: Transmit-1Mbps(GFSK_BLE)

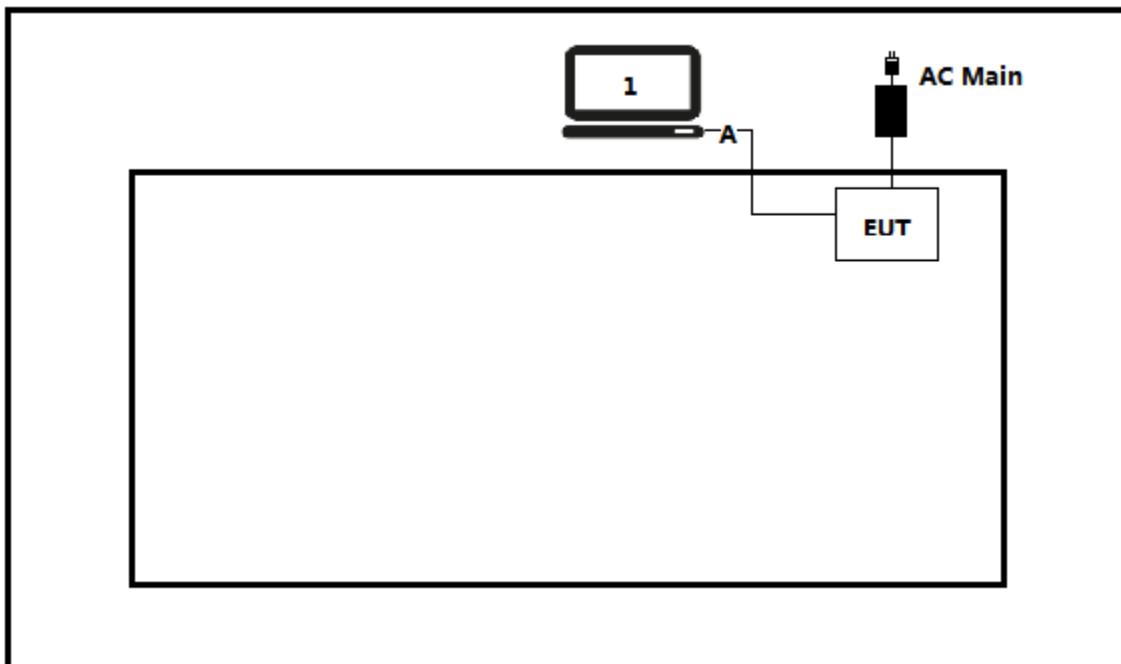
1.5. Tested System Details

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

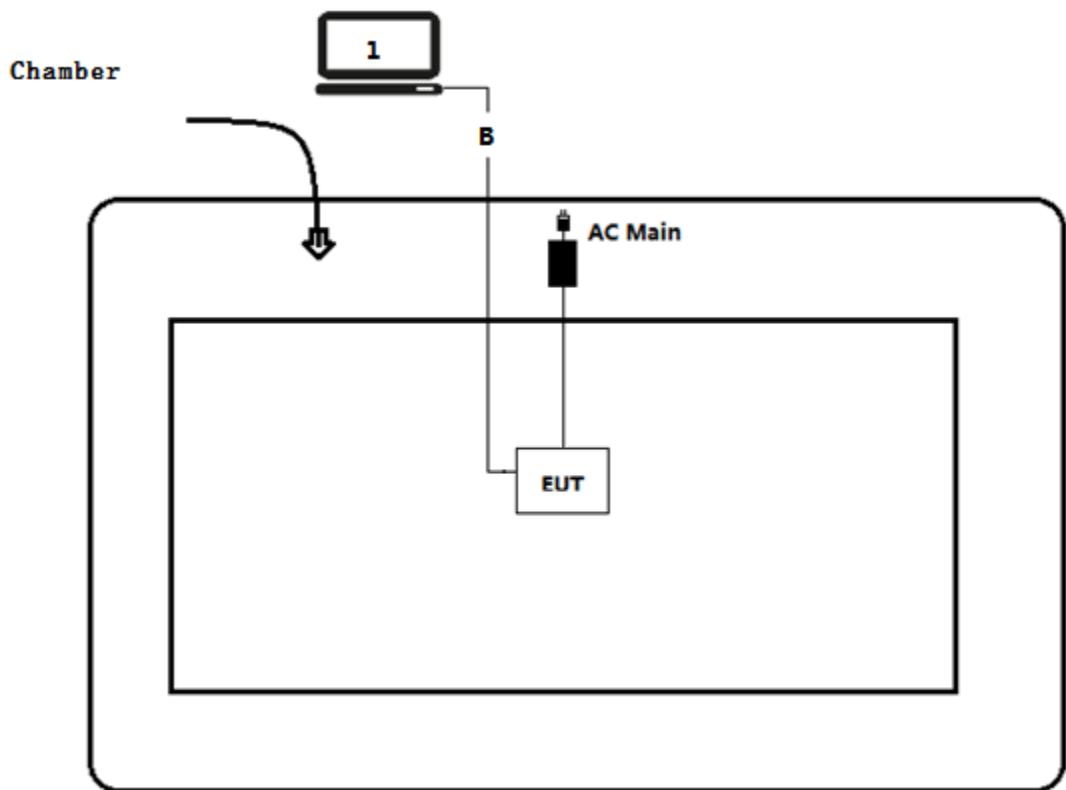
No.	Product	Manufacturer	Model No.	Serial No.	Power Cord
1	Notebook	Think Pad	2526	LV-A3285	Power by adapter

1.6. Configuration of Tested System

Test setup Diagram- AC Line Conducted Emission Test



Test setup Diagram- Radiated Emission



1.7. EUT Exercise Software

1	Setup the EUT and simulators as shown on above.
2	Turn on the power of all equipment.
3	Run the RF test software, and set the test mode and channel, then press OK to start continue receive.

2. Technical Test

2.1. Summary of Test Result

Performed Test Item	Normative References	Worst case mode	Limit	Result
AC Power Line Conducted Emission	FCC CFR Title 47 Part 15 Subpart C: 2015 Section 15.207	Mode 1	FCC 15.207	PASS
Emissions in restricted frequency bands	FCC CFR Title 47 Part 15 Subpart C: 2015 Section 15.209	Mode 1	FCC 15.209	PASS
Emissions in non-restricted frequency bands	FCC CFR Title 47 Part 15 Subpart C: 2015 Section 15.247(d)	Mode 1	$\geq 20\text{dBc}$	PASS
Radiated Emission Band Edge	FCC CFR Title 47 Part 15 Subpart C: 2015 15.247(d)	Mode 1	FCC 15.209	PASS
Occupied Bandwidth	FCC CFR Title 47 Part 15 Subpart C: 2015 Section 15.247(a)(2)	Mode 1	$\geq 500\text{kHz}$	PASS
Fundamental emission output power	FCC CFR Title 47 Part 15 Subpart C: 2015 Section 15.247(b)(3)	Mode 1	$\leq 30\text{dBm}$	PASS
Power Spectral Density	FCC CFR Title 47 Part 15 Subpart C: 2015 Section 15.247(e)	Mode 1	$\leq 8\text{dBm}/3\text{kHz}$	PASS

Performed Test Item	Normative References	Worse case mode	Limit	Result
AC Power Line Conducted Emission	RSS-Gen Issue 4 November 2014 Section 8.8	802.11b	RSS-Gen	PASS
Emissions in restricted frequency bands	RSS-247 Issue 1 May 2015 Section 5.5	802.11b	RSS-247	PASS
Emissions in non-restricted frequency bands	RSS-247 Issue 1 May 2015 Section 5.5	802.11b	$\geq 30\text{dBc}$	PASS
Radiated Emission Band Edge	RSS-Gen Issue 4 November 2014 Section 8.10	802.11g	RSS-Gen	PASS
Occupied Bandwidth	RSS-Gen Issue 4 November 2014 Section 6.6 RSS-247 Issue 1 May 2015 Section 5.2	802.11b	$\geq 500\text{kHz}$	PASS
Fundamental emission output power	RSS-247 Issue 1 May 2015 Section 5.4	802.11n(20MHz)	$\leq 30\text{dBm}$	PASS
Power Spectral Density	RSS-247 Issue 1 May 2015 Section 5.2	802.11b	$\leq 8\text{dBm}/3\text{kHz}$	PASS

2.2. Test Frequency configuration:

Bluetooth Working Frequency of Each Channel: (For BLE)							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
00	2402 MHz	01	2404 MHz	02	2406 MHz	03	2408 MHz
04	2410 MHz	05	2412 MHz	06	2414 MHz	07	2416 MHz
08	2418 MHz	09	2420 MHz	10	2422 MHz	11	2424 MHz
12	2426 MHz	13	2428 MHz	14	2430 MHz	15	2432 MHz
16	2434 MHz	17	2436 MHz	18	2438 MHz	19	2440 MHz
20	2442 MHz	21	2444 MHz	22	2446 MHz	23	2448 MHz
24	2450 MHz	25	2452 MHz	26	2454 MHz	27	2456 MHz
28	2458 MHz	29	2460 MHz	30	2462 MHz	31	2464 MHz
32	2466 MHz	33	2468 MHz	34	2470 MHz	35	2472 MHz
36	2474 MHz	37	2476 MHz	38	2478 MHz	39	2480 MHz

2.3. 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

2.4. Measurement Uncertainty

Test Items	Uncertainty
AC Power Line Conducted Emission	±2.02dB
Radiated Emission	Below 1GHz ±3.8 dB
	Above 1GHz ±3.9 dB
RF Antenna Port Conducted Emission	±1.27dB
Radiated Emission Band Edge	±3.9dB
Occupied Bandwidth	±1kHz
Power Spectral Density	±1.27dB

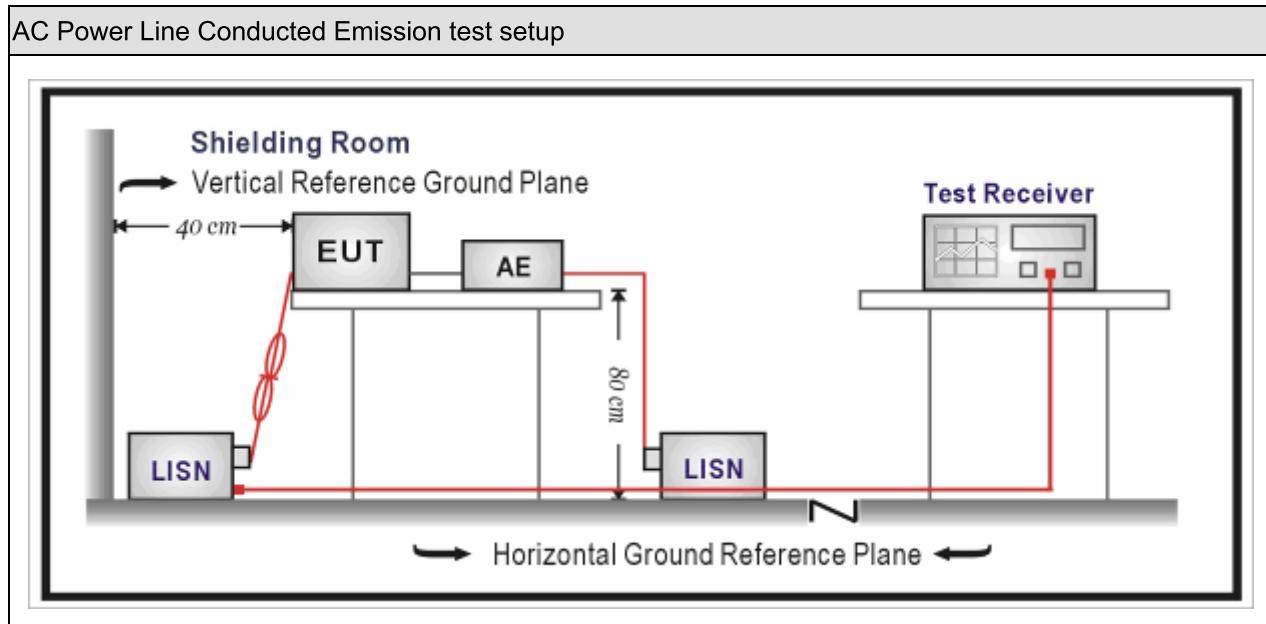
3. AC Power Line Conducted Emission

3.1. Test Equipment

AC Power Line Conducted Emission / TR-1					
Instrument	Manufacturer	Type No.	Serial No.	Cal. Date	Cal. Due Date
EMI Test Receiver	R&S	ESCI	100726	2016.03.05	2017.03.04
Two-Line V-Network	R&S	ENV216	100043	2015.03.29	2017.03.28
Two-Line V-Network	R&S	ENV216	100044	2015.09.17	2016.09.16
50ohm Coaxial Switch	Anritsu	MP59B	6200464462	2016.03.02	2017.03.01
50ohm Termination	SHX	TF2	07081401	2015.09.17	2016.09.16
Temperature/Humidity Meter	zhichen	ZC1-2	TR1-TH	2016.01.04	2017.01.03

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 μV)	Average(dB μV)
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

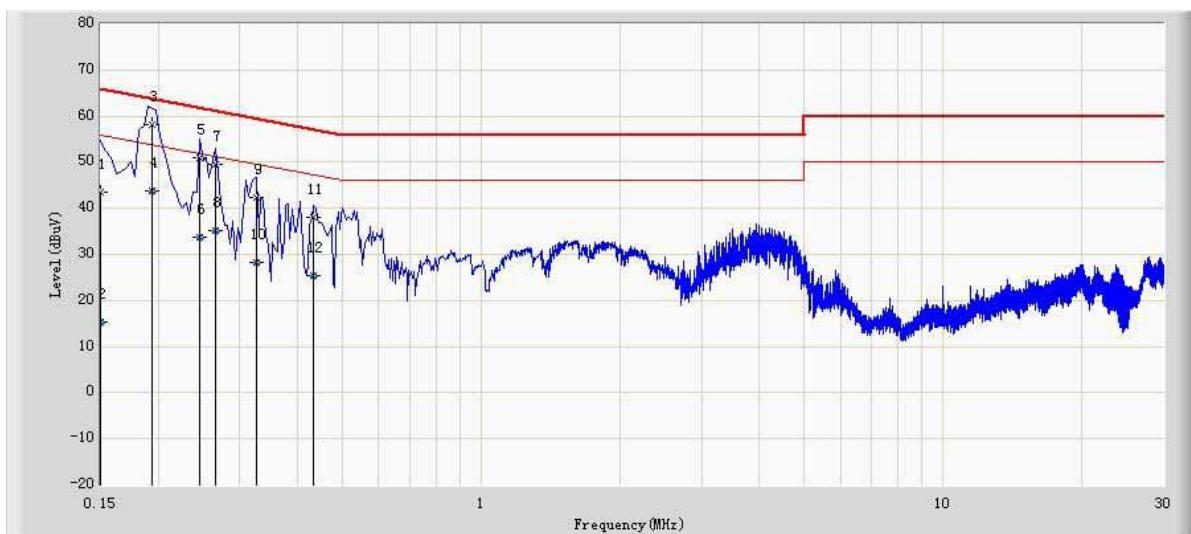
Test Method			
	References Rule	Chapter	Item
<input checked="" type="checkbox"/>	ANSI C63.10-2013	6.2	Standard test method for ac power-line conducted emissions from unlicensed wireless devices
<input checked="" type="checkbox"/>	ANSI C63.4-2014	7	AC power-line conducted emission measurements

3.5. Test Result

Product Name	:	EZ-BLE PSoC XT/XR module		Polarity	:	Line		
Test Item	:	AC Power Line Conducted Emission		Power	:	AC 120V/60Hz		
Test Site	:	TR1		Test Mode	:	Mode 1		

No	Frequency (MHz)	Measure Level (dB μ V)	Reading Level (dB μ V)	Over Limit (dB)	Limit (dB μ V)	Probe (dB)	Cable (dB)	Type
1	0.194	56.982	47.262	-6.882	63.864	9.660	0.060	QP
2	0.194	43.668	33.948	-10.196	53.864	9.660	0.060	AV
3	0.242	45.491	35.771	-16.536	62.027	9.660	0.060	QP
4	0.242	26.254	16.534	-25.773	52.027	9.660	0.060	AV
5	0.262	49.583	39.867	-11.785	61.368	9.656	0.060	QP
6	0.262	36.329	26.613	-15.039	51.368	9.656	0.060	AV
7	0.322	43.097	33.387	-16.558	59.655	9.650	0.060	QP
8	0.322	28.570	18.860	-21.085	49.655	9.650	0.060	AV
9	0.430	39.602	29.892	-17.651	57.253	9.640	0.070	QP
10	0.430	24.368	14.658	-22.885	47.253	9.640	0.070	AV
11	0.510	39.069	29.369	-16.931	56.000	9.630	0.070	QP
12	0.510	25.289	15.589	-20.711	46.000	9.630	0.070	AV

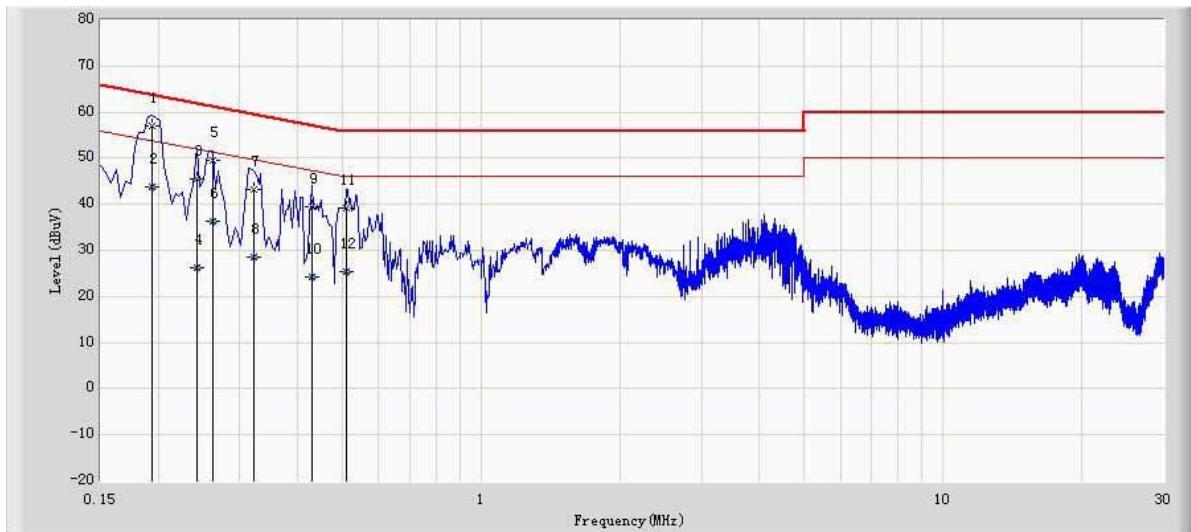
Polarity: Line



Product Name	:	EZ-BLE PSoC XT/XR module	Polarity	:	Neutral
Test Item	:	AC Power Line Conducted Emission	Power	:	AC 120V/60Hz
Test Site	:	TR1	Test Mode	:	Mode 1

No	Frequency (MHz)	Measure Level (dB μ V)	Reading Level (dB μ V)	Over Limit (dB)	Limit (dB μ V)	Probe (dB)	Cable (dB)	Type
1	0.194	56.982	47.262	-6.882	63.864	9.660	0.060	QP
2	0.194	43.668	33.948	-10.196	53.864	9.660	0.060	AV
3	0.242	45.491	35.771	-16.536	62.027	9.660	0.060	QP
4	0.242	26.254	16.534	-25.773	52.027	9.660	0.060	AV
5	0.262	49.583	39.867	-11.785	61.368	9.656	0.060	QP
6	0.262	36.329	26.613	-15.039	51.368	9.656	0.060	AV
7	0.322	43.097	33.387	-16.558	59.655	9.650	0.060	QP
8	0.322	28.570	18.860	-21.085	49.655	9.650	0.060	AV
9	0.430	39.602	29.892	-17.651	57.253	9.640	0.070	QP
10	0.430	24.368	14.658	-22.885	47.253	9.640	0.070	AV
11	0.510	39.069	29.369	-16.931	56.000	9.630	0.070	QP
12	0.510	25.289	15.589	-20.711	46.000	9.630	0.070	AV

Polarity: Neutral



4. Emissions in restricted frequency bands

4.1. Test Equipment

Radiated Emission(Below 1GHz) / AC-2					
Instrument	Manufacturer	Type No.	Serial No.	Cal. Date	Cal. Due Date
EMI Test Receiver	R&S	ESCI	100573	2016.03.05	2017.03.04
Loop Antenna	R&S	HFH2-Z2	833799/003	2015.11.16	2016.11.17
Bilog Chainenna	Teseq GmbH	CBL6112D	27611	2015.10.16	2016.10.15
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC2-C	2016.03.02	2017.03.01
Temperature/Humidity Meter	Zhichen	ZC1-2	AC2-TH	2016.01.04	2017.01.03

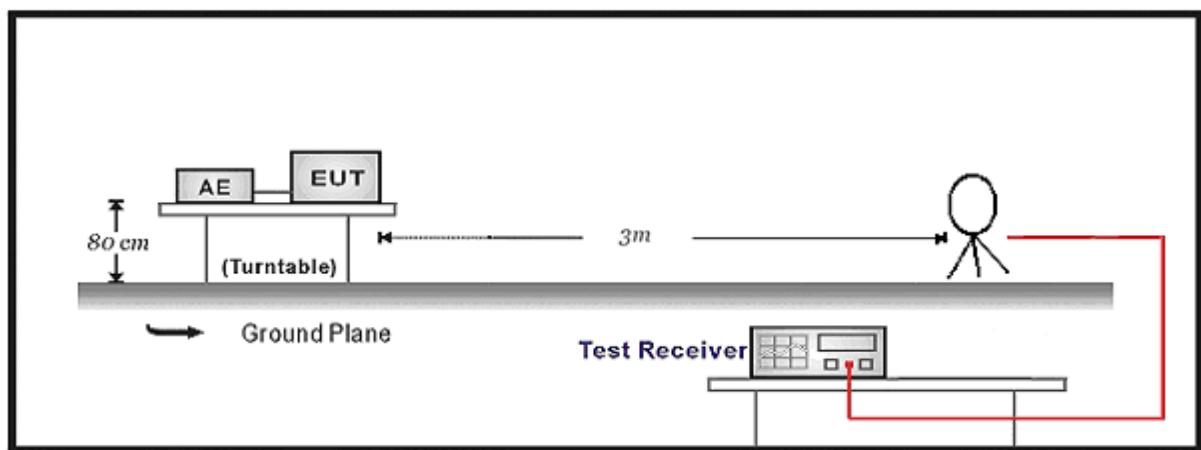
Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

Radiated Emission(Above 1GHz) / AC-5					
Instrument	Manufacturer	Type No.	Serial No.	Cal. Date	Cal. Due Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2016.01.04	2017.01.03
Preamplifier	Miteq	NSP1800-25	1364185	2015.05.06	2016.05.05
Preamplifier	QuieTek	AP-040G	CHM-0906001	2015.05.06	2016.05.05
DRG Horn	ETS-Lindgren	3117	00123988	2016.01.22	2017.01.21
Broad-Band Horn Antenna	Schwarzbeck	BBHA9170	294	2015.11.25	2016.11.24
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C1	2016.03.02	2017.03.01
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C2	2016.03.02	2017.03.01
Coaxial Cable	Huber+Suhner	SUCOFLEX 102	AC5-C3	2016.03.02	2017.03.01
EMI Receiver	Agilent	N9038A	MY51210196	2015.06.10	2016.06.09
Temperature/Humidity Meter	Zhichen	ZC1-2	AC5-TH	2016.01.04	2017.01.03

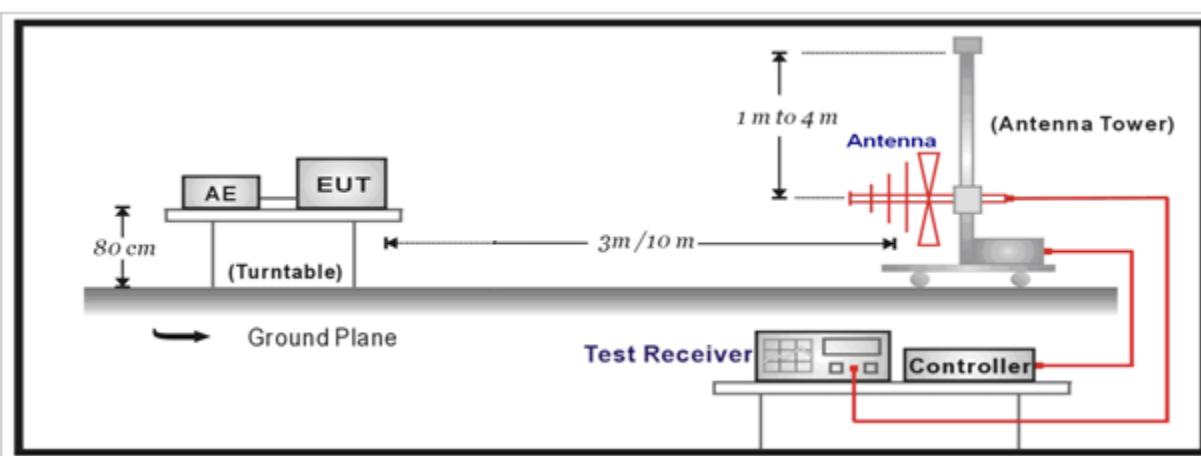
Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

4.2. Test Setup

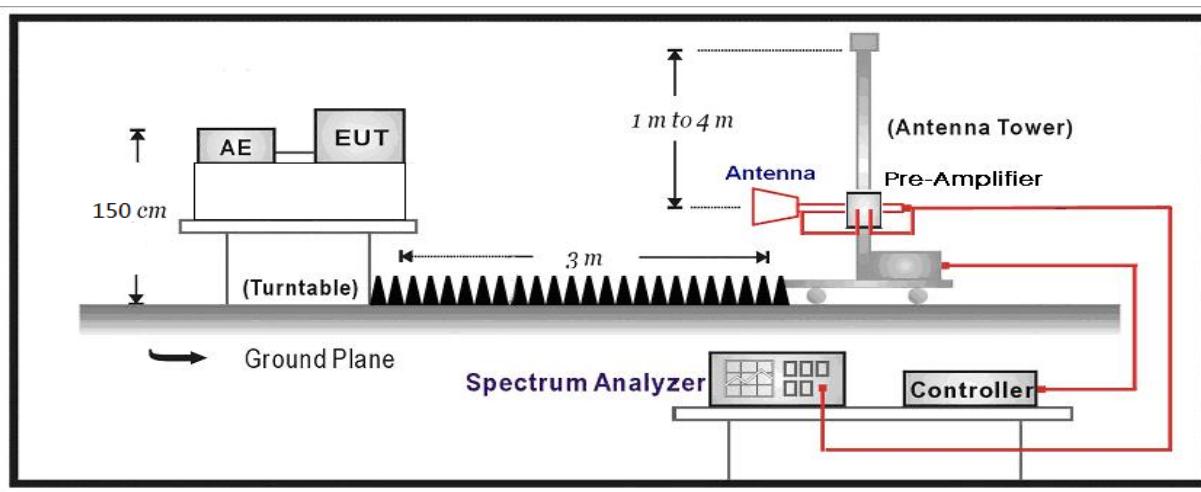
Below 30MHz Test Setup:



30MHz-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			

Restricted Band Emissions Limit			
Frequency (MHz)	Field strength (μ V/m)	Field strength (dB μ V/m)	Measurement distance (m)
0.009 - 0.49	2400/F(kHz)	48.5 – 13.8	300 _(Note 1)
0.49 - 1.705	24000/F(kHz)	33.8 - 23	30 _(Note 1)
1.705 - 30	30	29.5	30 _(Note 1)
30 - 88	100	40	3 _(Note 2)
88 - 216	150	43.5	3 _(Note 2)
216 - 960	200	46	3 _(Note 2)
Above 960	500	54	3 _(Note 2)

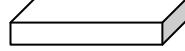
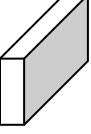
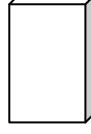
Note 1: At frequencies below 30 MHz, measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field. Pending the development of an appropriate measurement procedure for measurements performed below 30 MHz, when performing measurements at a closer distance than specified, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade).

Note 2: At frequencies at or above 30 MHz, measurements may be performed at a distance other than what is specified provided: measurements are not made in the near field except where it can be shown that near field measurements are appropriate due to the characteristics of the device; and it can be demonstrated that the signal levels needed to be measured at the distance employed can be detected by the measurement equipment. Measurements shall not be performed at a distance greater than 30 meters unless it can be further demonstrated that measurements at a distance of 30 meters or less are impractical. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse linear-distance for field strength measurements; inverse-linear-distance-squared for power density measurements).

4.4. Test Procedure

Test Method			
	References Rule	Chapter	Description
<input type="checkbox"/>	ANSI C63.10	11.11	Emissions in non-restricted frequency bands
<input type="checkbox"/>	<input type="checkbox"/> ANSI C63.10	11.11.2	Reference level measurement
	<input type="checkbox"/> ANSI C63.10	11.11.3	Emission level measurement
<input checked="" type="checkbox"/>	ANSI C63.10	11.12	Emissions in restricted frequency bands
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> ANSI C63.10	11.12.1	Radiated emission measurements
	<input checked="" type="checkbox"/> ANSI C63.10	11.12.2.7	Radiated spurious emission test
	<input checked="" type="checkbox"/> ANSI C63.10	6.4	Radiated emissions from unlicensed wireless devices below 30 MHz
	<input checked="" type="checkbox"/> ANSI C63.10	6.5	Radiated emissions from unlicensed wireless devices in the frequency range of 30 MHz to 1000 MHz
	<input checked="" type="checkbox"/> ANSI C63.10	6.6	Radiated emissions from unlicensed wireless devices above 1 GHz
	<input checked="" type="checkbox"/> ANSI C63.10	11.12.2	Antenna-port conducted measurements
	<input checked="" type="checkbox"/> ANSI C63.10	11.12.2.3	Quasi-peak measurement procedure
	<input checked="" type="checkbox"/> ANSI C63.10	11.12.2.4	Peak power measurement procedure
	<input checked="" type="checkbox"/> ANSI C63.10	11.12.2.5	Average power measurement procedures
	<input type="checkbox"/> ANSI C63.10	11.12.2.5.1	Trace averaging with continuous EUT transmission at full power
	<input type="checkbox"/> ANSI C63.10	11.12.2.5.2	Trace averaging across ON and OFF times of the EUT transmissions followed by duty cycle correction
	<input checked="" type="checkbox"/> ANSI C63.10	11.12.2.5.3	Reduced VBW averaging across ON and OFF times of the EUT transmissions with max hold

4.5. EUT test Axis definition

Item	Emissions in non-restricted frequency bands			
Device Category	<input checked="" type="checkbox"/>	Fixed position use		
	<input type="checkbox"/>	Mobile position use		
Test mode	Mode 1			
Test method	<input checked="" type="checkbox"/>	Radiated		
		X Axis	Y Axis	Z Axis
				
		Worst Axis <input type="checkbox"/>	Worst Axis <input type="checkbox"/>	Worst Axis <input checked="" type="checkbox"/>
	<input type="checkbox"/>	Conducted		
	<input checked="" type="checkbox"/>	Chain 1		
				
	<input type="checkbox"/>	Chain 1	Chain 2	
				
		Worst Chain <input type="checkbox"/>	Worst Chain <input type="checkbox"/>	
	<input type="checkbox"/>	Chain 1	Chain 2	Chain 3
				
		Worst Chain <input type="checkbox"/>	Worst Chain <input type="checkbox"/>	Worst Chain <input type="checkbox"/>

4.6. Test Result

Product Name	:	EZ-BLE PSoC XT/XR module		Power	:	AC 120V/60Hz	
Test Mode	:	Mode 1		Test Site	:	AC-5	

Chain	CH	Antenna	Frequency (MHz)	Reading Level (dB μ V/m)	Factor (dB)	Measure Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Detector
Ant 0	0	H	4804.0	36.4	8.0	44.3	54(note3)	-9.7	PK
		V	4804.0	37.5	8.0	45.5	54(note3)	-8.5	PK
		H	7206.0	33.1	12.8	45.9	54(note3)	-8.1	PK
		V	7206.0	32.9	12.8	45.7	54(note3)	-8.3	PK
		H	9608.0	30.7	16.1	46.8	54(note3)	-7.2	PK
		V	9608.0	30.5	16.1	46.5	54(note3)	-7.5	PK
	19	H	4880.0	36.2	8.2	44.4	54(note3)	-9.6	PK
		V	4880.0	37.0	8.2	45.1	54(note3)	-8.9	PK
		H	7320.0	32.6	12.9	45.5	54(note3)	-8.5	PK
		V	7320.0	32.2	12.9	45.0	54(note3)	-9.0	PK
		H	9760.0	30.6	16.1	46.7	54(note3)	-7.3	PK
		V	9760.0	29.8	16.1	45.8	54(note3)	-8.2	PK
	39	H	4960.0	35.3	8.5	43.8	54(note3)	-10.2	PK
		V	4960.0	36.2	8.5	44.8	54(note3)	-9.2	PK
		H	7440.0	33.2	13.2	46.5	54(note3)	-7.5	PK
		V	7440.0	32.5	13.2	45.7	54(note3)	-8.3	PK
		H	9920.0	30.5	16.1	46.6	54(note3)	-7.4	PK
		V	9920.0	30.4	16.1	46.5	54(note3)	-7.5	PK

Note: 1. Measure Level = Reading Level + Factor.

Note: 2. 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.

Note: 3. 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.

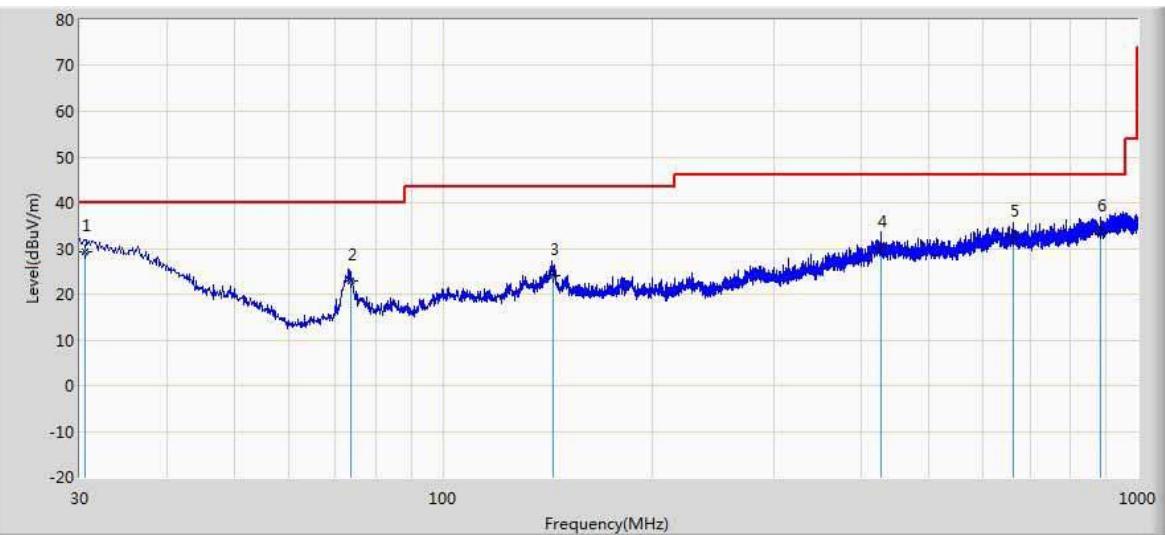
Note: 4. The RBW set up, see Clause 6.6.

The worst case of Radiated Emission below 1GHz:

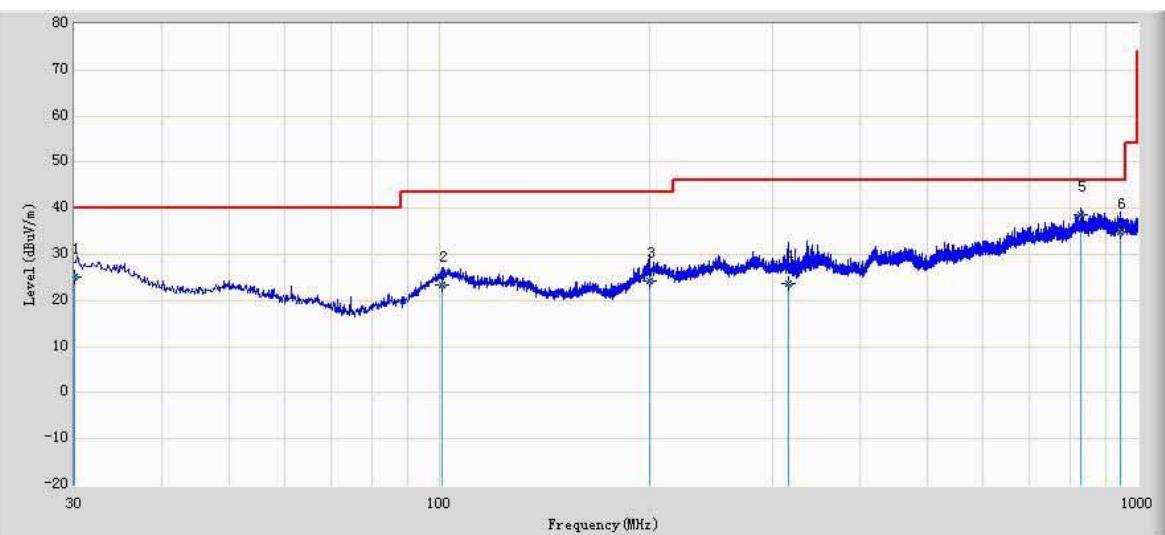
Chain	CH	Antenna	Frequency (MHz)	Reading Level (dB µV/m)	Factor (dB)	Measure Level (dB µV/m)	Limit (dB µV/m)	Margin (dB)	Detector
Ant 0	1	H	30.1	31.7	-3.7	28.0	40.0	-12	QP
		H	34.0	34.6	-6	28.6	40.0	-11.4	QP
		H	336.1	29.7	-6.7	23.0	46.0	-23	QP
		H	490.3	32.5	-2.7	29.8	46.0	-16.2	QP
		H	620.4	32.1	-0.9	31.2	46.0	-14.8	QP
		H	864.7	32.2	1.1	33.3	46.0	-12.7	QP
		V	30.0	28.9	-3.7	25.2	40.0	-14.8	QP
		V	100.8	34.4	-10.9	23.5	43.5	-20	QP
		V	199.8	36.3	-12.2	24.1	43.5	-19.4	QP
		V	315.7	31.0	-7.2	23.8	46.0	-22.2	QP
		V	830.4	37.6	1	38.6	46.0	-7.4	QP
		V	943.4	33.0	1.8	34.8	46.0	-11.2	QP

Note 1: The worst case of Radiated Emission below 1GHz:

Polarity: Horizontal



Polarity: Vertical



5. Emissions in non-restricted frequency bands

5.1. Test Equipment

Radiated Emission(Below 1GHz) / AC-2					
Instrument	Manufacturer	Type No.	Serial No.	Cal. Date	Cal. Due Date
EMI Test Receiver	R&S	ESCI	100573	2016.03.05	2017.03.04
Loop Antenna	R&S	HFH2-Z2	833799/003	2015.11.16	2016.11.17
Bilog Chainenna	Teseq GmbH	CBL6112D	27611	2015.10.16	2016.10.15
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC2-C	2016.03.02	2017.03.01
Temperature/Humidity Meter	Zhichen	ZC1-2	AC2-TH	2016.01.04	2017.01.03

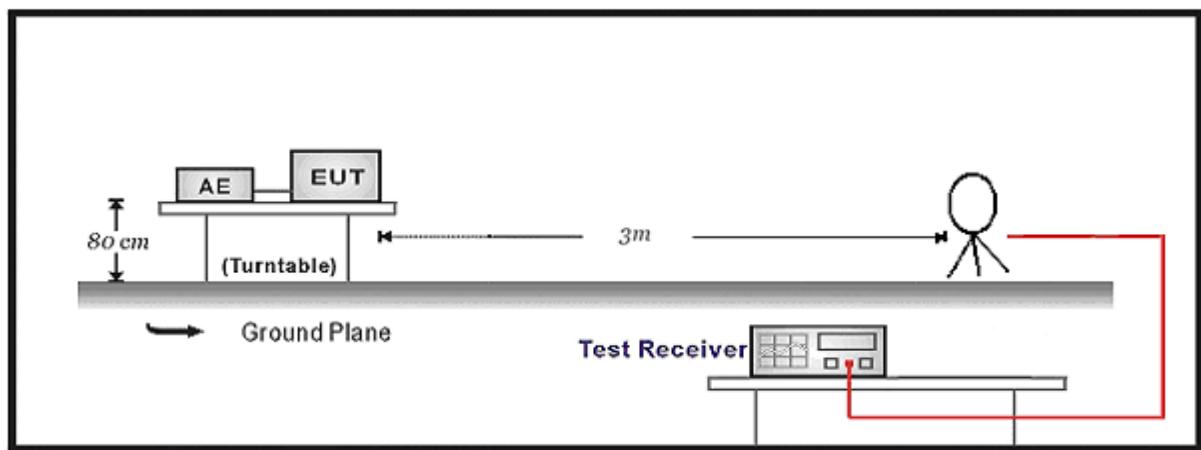
Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

Radiated Emission(Above 1GHz) / AC-5					
Instrument	Manufacturer	Type No.	Serial No.	Cal. Date	Cal. Due Date
Spectrum Analyzer	Agilent	N9020A	MY49100159	2016.03.05	2017.03.04
Spectrum Analyzer	Agilent	E4446A	MY45300103	2016.01.04	2017.01.03
Preamplifier	Miteq	NSP1800-25	1364185	2015.05.06	2016.05.05
Preamplifier	QuieTek	AP-040G	CHM-0906001	2015.05.06	2016.05.05
DRG Horn	ETS-Lindgren	3117	00123988	2016.01.22	2017.01.21
Broad-Band Horn Antenna	Schwarzbeck	BBHA9170	294	2015.11.25	2016.11.24
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C1	2016.03.02	2017.03.01
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C2	2016.03.02	2017.03.01
Coaxial Cable	Huber+Suhner	SUCOFLEX 102	AC5-C3	2016.03.02	2017.03.01
EMI Receiver	Agilent	N9038A	MY51210196	2015.06.10	2016.06.09
Temperature/Humidity Meter	Zhichen	ZC1-2	AC5-TH	2016.01.04	2017.01.03

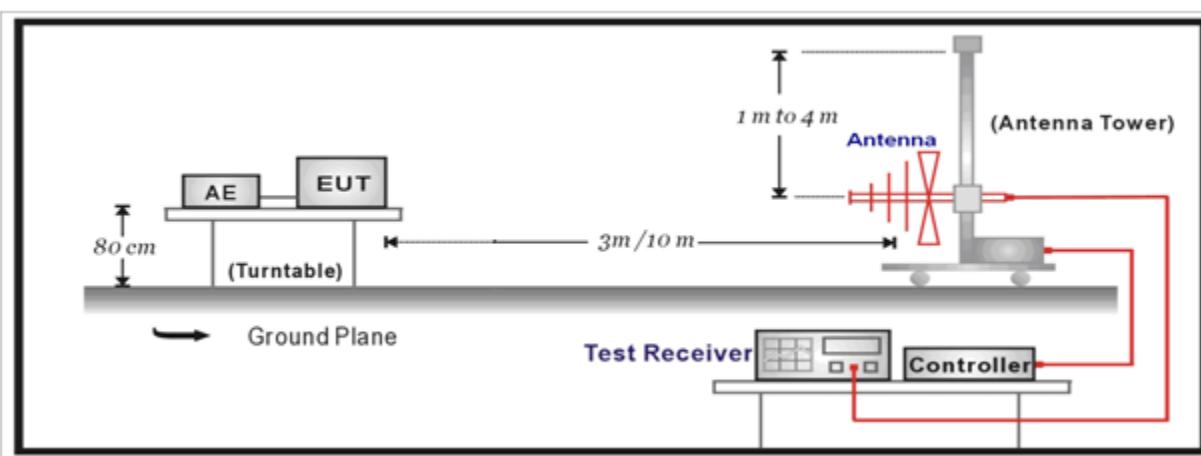
Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

5.2. Test Setup

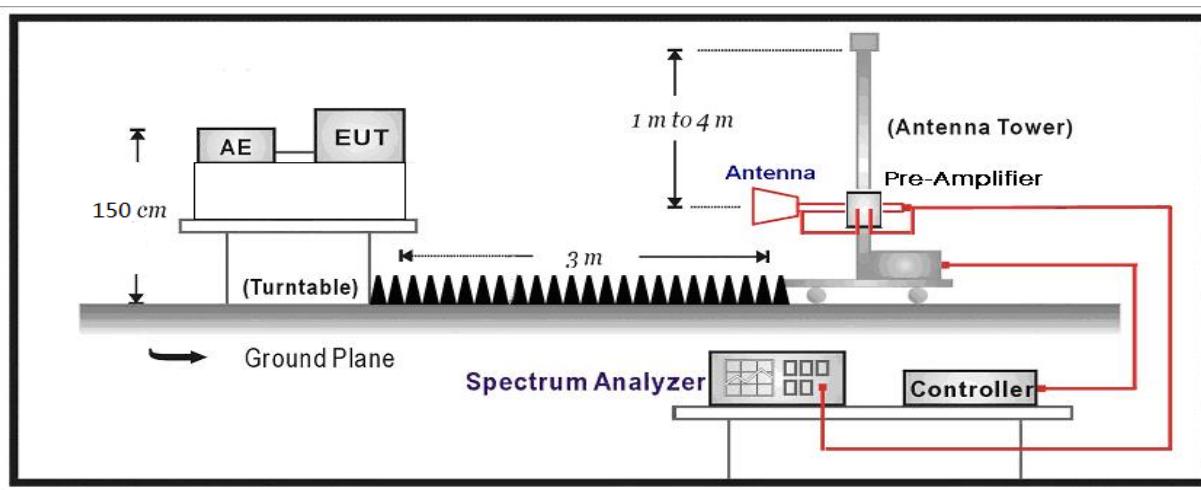
Below 30MHz Test Setup:



30MHz-1GHz Test Setup:



Above 1GHz Test Setup:



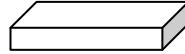
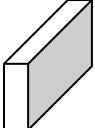
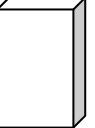
5.3. Limit

Un-Restricted Band Emissions Limit	
RF Output power (Detection methods)	Limit(dB)
RF Output power(Average detector)	30c(Note1)
RF Output power(PK detector)	20c(Note2)
<p>Note 1: If maximum conducted (average) output power was used to demonstrate compliance as described in 9.2, then the peak power in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum in-band peak PSD level in 100 kHz (i.e., 30 dBc).</p> <p>Note 2: If the maximum peak conducted output power procedure was used, then the peak output power measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz (i.e., 20 dBc).</p>	

5.4. Test Procedure

Test Method			
	References Rule	Chapter	Description
<input checked="" type="checkbox"/>	ANSI C63.10	11.11	Emissions in non-restricted frequency bands
	<input checked="" type="checkbox"/> ANSI C63.10	11.11.2	Reference level measurement
	<input checked="" type="checkbox"/> ANSI C63.10	11.11.3	Emission level measurement
<input type="checkbox"/>	ANSI C63.10	11.12	Emissions in restricted frequency bands
	<input checked="" type="checkbox"/> ANSI C63.10	11.12.1	Radiated emission measurements
	<input checked="" type="checkbox"/> ANSI C63.10	11.12.2.7	Radiated spurious emission test
<input checked="" type="checkbox"/>	ANSI C63.10	6.4	Radiated emissions from unlicensed wireless devices below 30 MHz
<input checked="" type="checkbox"/>	ANSI C63.10	6.5	Radiated emissions from unlicensed wireless devices in the frequency range of 30 MHz to 1000 MHz
<input checked="" type="checkbox"/>	ANSI C63.10	6.6	Radiated emissions from unlicensed wireless devices above 1 GHz
	<input checked="" type="checkbox"/> ANSI C63.10	11.12.2	Antenna-port conducted measurements
	<input type="checkbox"/> ANSI C63.10	11.12.2.3	Quasi-peak measurement procedure
	<input checked="" type="checkbox"/> ANSI C63.10	11.12.2.4	Peak power measurement procedure
	<input type="checkbox"/> ANSI C63.10	11.12.2.5	Average power measurement procedures
	<input type="checkbox"/> ANSI C63.10	11.12.2.5.1	Trace averaging with continuous EUT transmission at full power
	<input type="checkbox"/> ANSI C63.10	11.12.2.5.2	Trace averaging across ON and OFF times of the EUT transmissions followed by duty cycle correction
	<input type="checkbox"/> ANSI C63.10	11.12.2.5.3	Reduced VBW averaging across ON and OFF times of the EUT transmissions with max hold

5.5. EUT test Axis definition

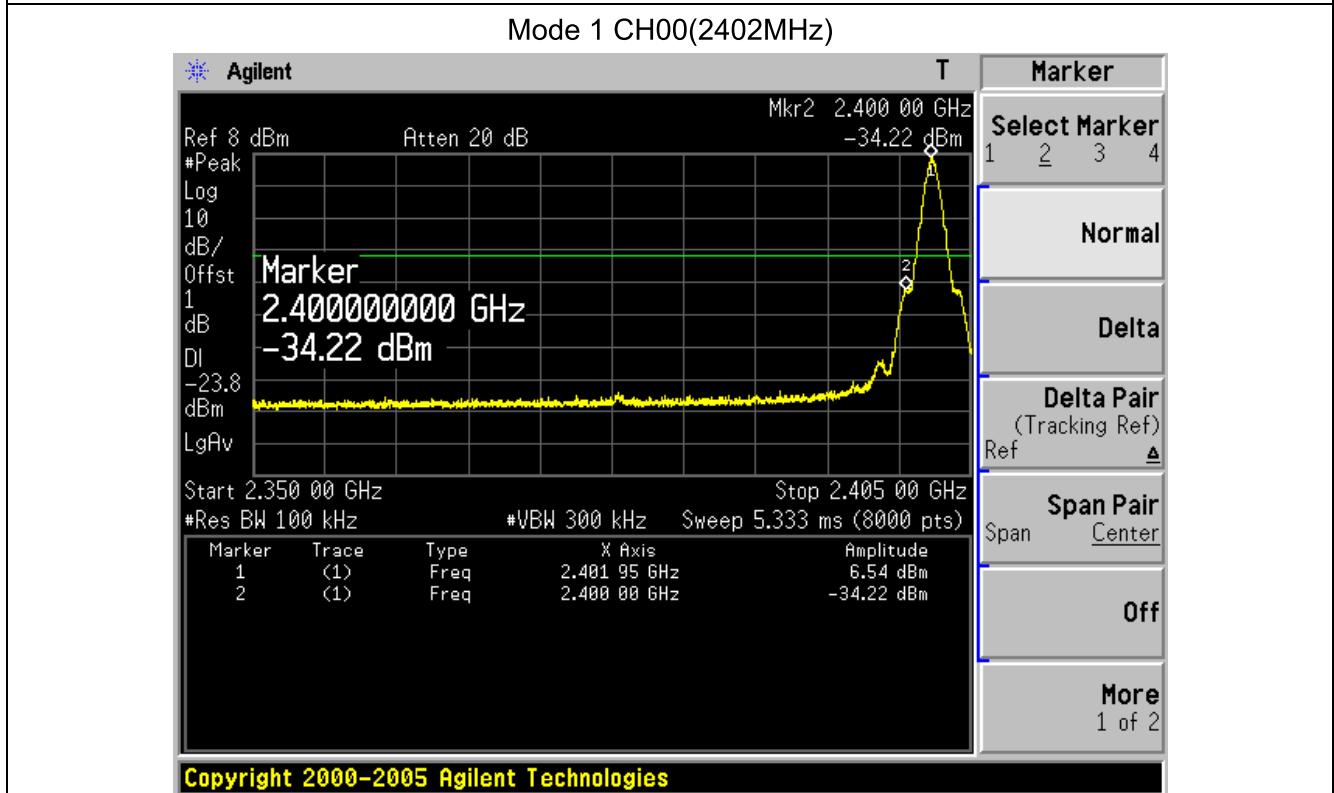
Item	Emissions in non-restricted frequency bands				
Device Category	<input checked="" type="checkbox"/>	Fixed position use			
	<input type="checkbox"/>	Mobile position use			
Test mode	Mode 1				
	<input type="checkbox"/>	Radiated			
		X Axis	Y Axis	Z Axis	
					
		Worst Axis <input type="checkbox"/>	Worst Axis <input type="checkbox"/>	Worst Axis <input type="checkbox"/>	
	<input checked="" type="checkbox"/>	Conducted			
	<input checked="" type="checkbox"/>	Chain 1			
Test method					
	<input type="checkbox"/>	Chain 1	Chain 2		
					
		Worst Chain <input type="checkbox"/>	Worst Chain <input type="checkbox"/>		
	<input type="checkbox"/>	Chain 1	Chain 2	Chain 3	
					
		Worst Chain <input type="checkbox"/>	Worst Chain <input type="checkbox"/>	Worst Chain <input type="checkbox"/>	

5.6. Test Result

Product Name	:	EZ-BLE PSoC XT/XR module	Test Power	:	AC 120V/60Hz
Test Site	:	TR8			

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	6.54	2400.00	-34.22	40.76	>30	Pass
1	39	2480	6.92	2483.50	-67.25	74.17	>30	Pass

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



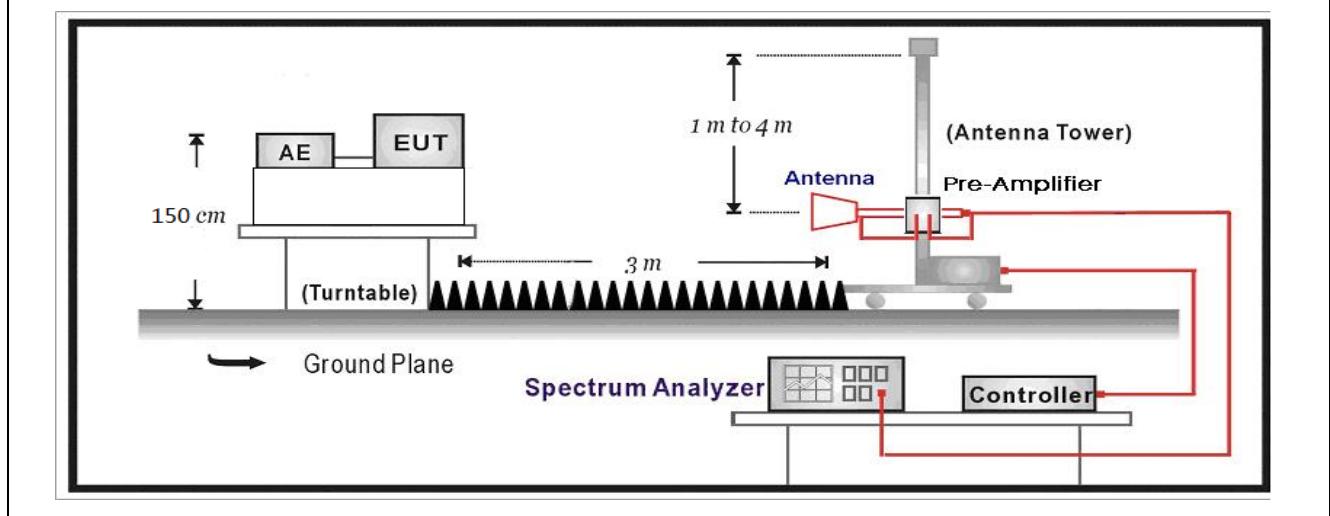
6. Radiated Emission Band Edge

6.1. Test Equipment

Radiated Emission(Above 1GHz) / AC-5					
Instrument	Manufacturer	Type No.	Serial No.	Cal. Date	Cal. Due Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2016.01.04	2017.01.03
Preamplifier	Miteq	NSP1800-25	1364185	2015.05.06	2016.05.05
Preamplifier	QuieTek	AP-040G	CHM-0906001	2015.05.06	2016.05.05
DRG Horn	ETS-Lindgren	3117	00123988	2016.01.22	2017.01.21
Broad-Band Horn Antenna	Schwarzbeck	BBHA9170	294	2015.11.25	2016.11.24
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C1	2016.03.02	2017.03.01
Coaxial Cable	Huber+Suhner	SUCOFLEX 106	AC5-C2	2016.03.02	2017.03.01
Coaxial Cable	Huber+Suhner	SUCOFLEX 102	AC5-C3	2016.03.02	2017.03.01
EMI Receiver	Agilent	N9038A	MY51210196	2015.06.10	2016.06.09
Temperature/Humidity Meter	Zhichen	ZC1-2	AC5-TH	2016.01.04	2017.01.03
Note: All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.					

6.2. Test Setup

Above 1GHz Test Setup:



6.3. Limit

Band edge Limit

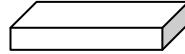
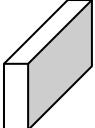
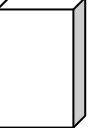
Frequency bands (MHz)	Detector	Limit (dB μ V/m)	RBW (MHz)	Distance (m)
2310-2390	PK	74	1	3
	AV	54	1	3

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

6.4. Test Procedure

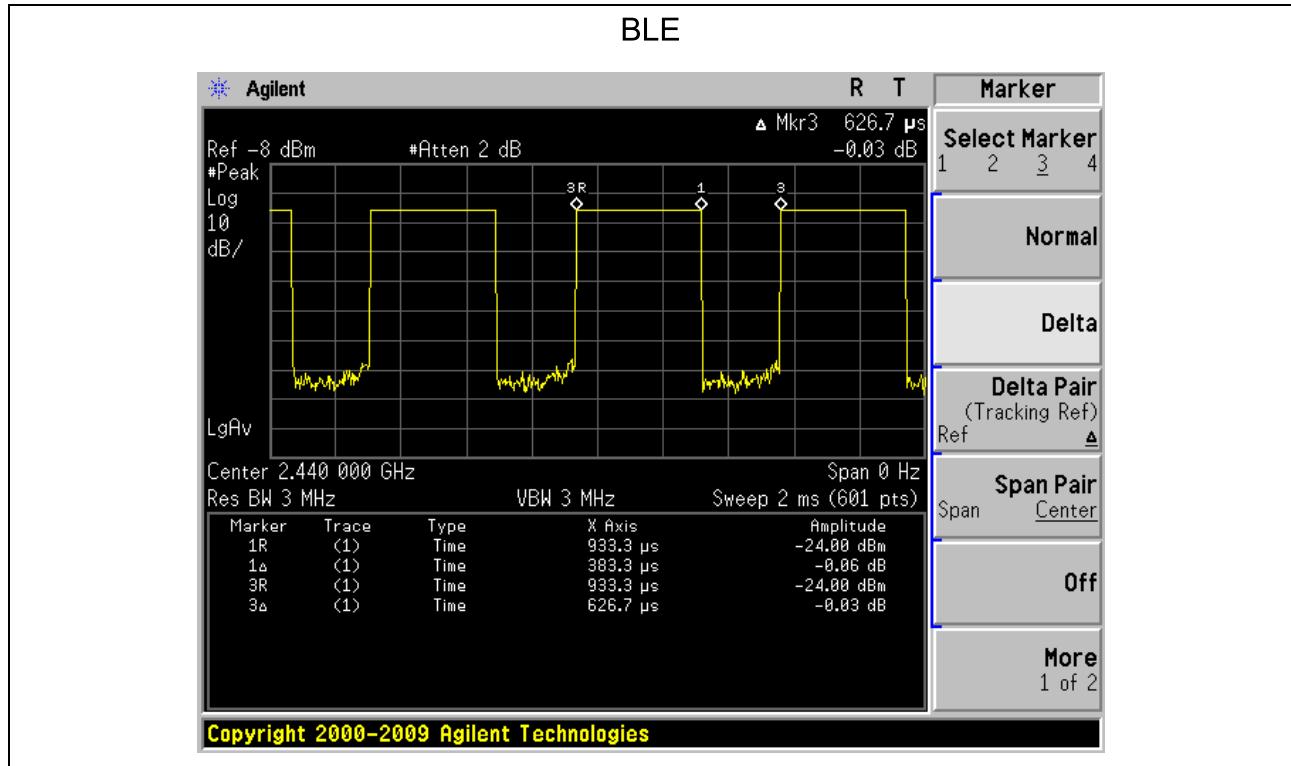
Test Method			
	References Rule	Chapter	Description
<input checked="" type="checkbox"/>	ANSI C63.10	6.10	Band-edge testing
	<input type="checkbox"/> ANSI C63.10	6.10.5	Restricted-band band-edge measurements
	<input checked="" type="checkbox"/> ANSI C63.10	6.10.6	Marker-delta method
<input checked="" type="checkbox"/>	ANSI C63.10	11.12	Emissions in restricted frequency bands
	<input checked="" type="checkbox"/> ANSI C63.10	11.12.1	Radiated emission measurements
	<input checked="" type="checkbox"/> ANSI C63.10	11.12.2.7	Radiated spurious emission test
<input type="checkbox"/>	ANSI C63.10	6.4	Radiated emissions from unlicensed wireless devices below 30 MHz
<input type="checkbox"/>	ANSI C63.10	6.5	Radiated emissions from unlicensed wireless devices in the frequency range of 30 MHz to 1000 MHz
<input checked="" type="checkbox"/>	ANSI C63.10	6.6	Radiated emissions from unlicensed wireless devices above 1 GHz
	<input type="checkbox"/> ANSI C63.10	11.12.2	Antenna-port conducted measurements
	<input type="checkbox"/> ANSI C63.10	11.12.2.3	Quasi-peak measurement procedure
	<input checked="" type="checkbox"/> ANSI C63.10	11.12.2.4	Peak power measurement procedure
	<input checked="" type="checkbox"/> ANSI C63.10	11.12.2.5	Average power measurement procedures
	<input type="checkbox"/> ANSI C63.10	11.12.2.5.1	Trace averaging with continuous EUT transmission at full power
	<input type="checkbox"/> ANSI C63.10	11.12.2.5.2	Trace averaging across ON and OFF times of the EUT transmissions followed by duty cycle correction
	<input checked="" type="checkbox"/> ANSI C63.10	11.12.2.5.3	Reduced VBW averaging across ON and OFF times of the EUT transmissions with max hold

6.5. EUT test definition

Item	Emissions in non-restricted frequency bands			
Device Category	<input checked="" type="checkbox"/>	Fixed position use		
	<input type="checkbox"/>	Mobile position use		
Test mode	Mode 1			
	<input checked="" type="checkbox"/>	Radiated		
		X Axis	Y Axis	Z Axis
				
		Worst Axis <input type="checkbox"/>	Worst Axis <input type="checkbox"/>	Worst Axis <input checked="" type="checkbox"/>
	<input type="checkbox"/>	Conducted		
	<input type="checkbox"/>	Chain 1		
Test method				
	<input type="checkbox"/>	Chain 1	Chain 2	
				
		Worst Chain <input type="checkbox"/>	Worst Chain <input type="checkbox"/>	
	<input type="checkbox"/>	Chain 1	Chain 2	Chain 3
				
		Worst Chain <input type="checkbox"/>	Worst Chain <input type="checkbox"/>	Worst Chain <input type="checkbox"/>

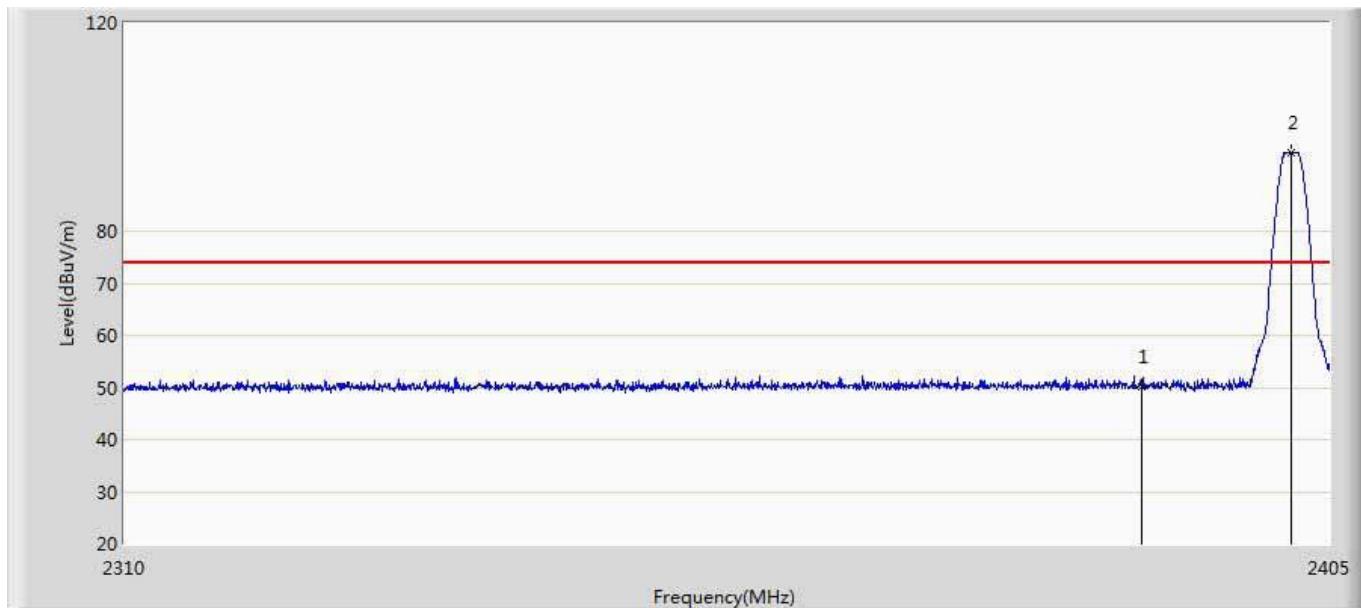
6.6. Duty Cycle

Test Mode	Tx On (ms)	Tx Off (ms)	Reduced VBW (kHz)	Tx On + Tx Off (ms)	Duty Cycle
BLE	0.3833	0.2434	2.7	0.6267	BLE



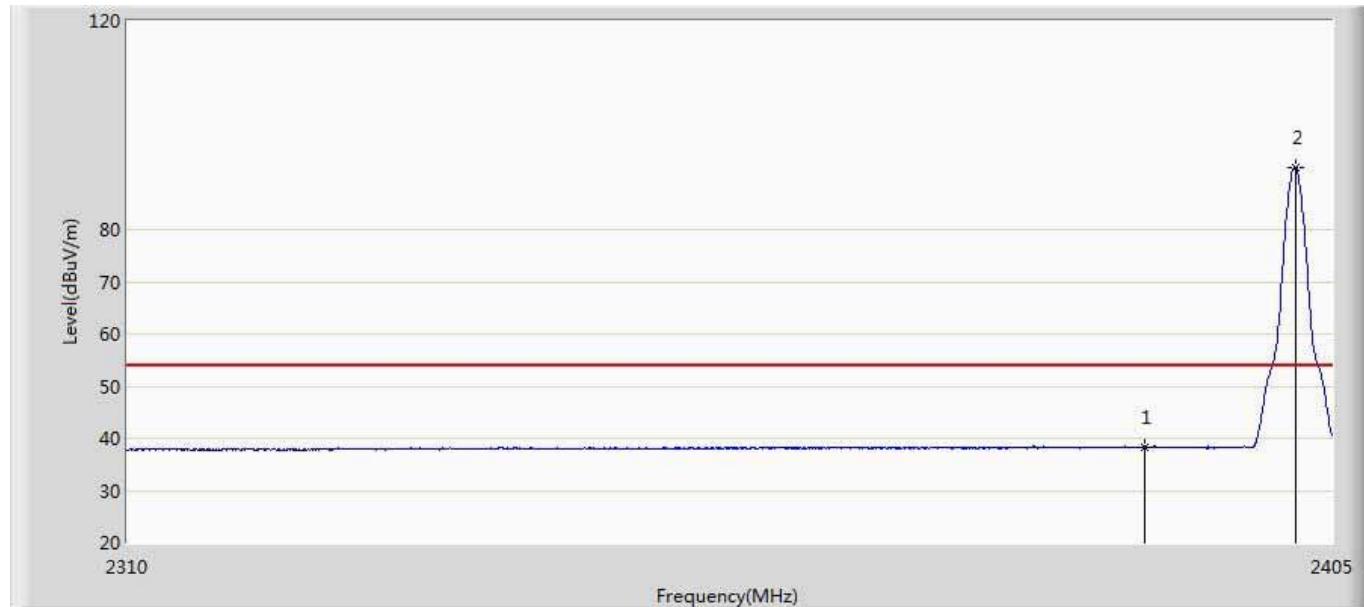
6.7 Test Result

Engineer: Scott	
Site: AC5	Time: 2016/03/31 - 09:17
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: EZ-BLE PSoC XT/XR module	Power: AC 120V/60Hz
Note: Mode 1:Transmit at CH2402Mhz by BLE	



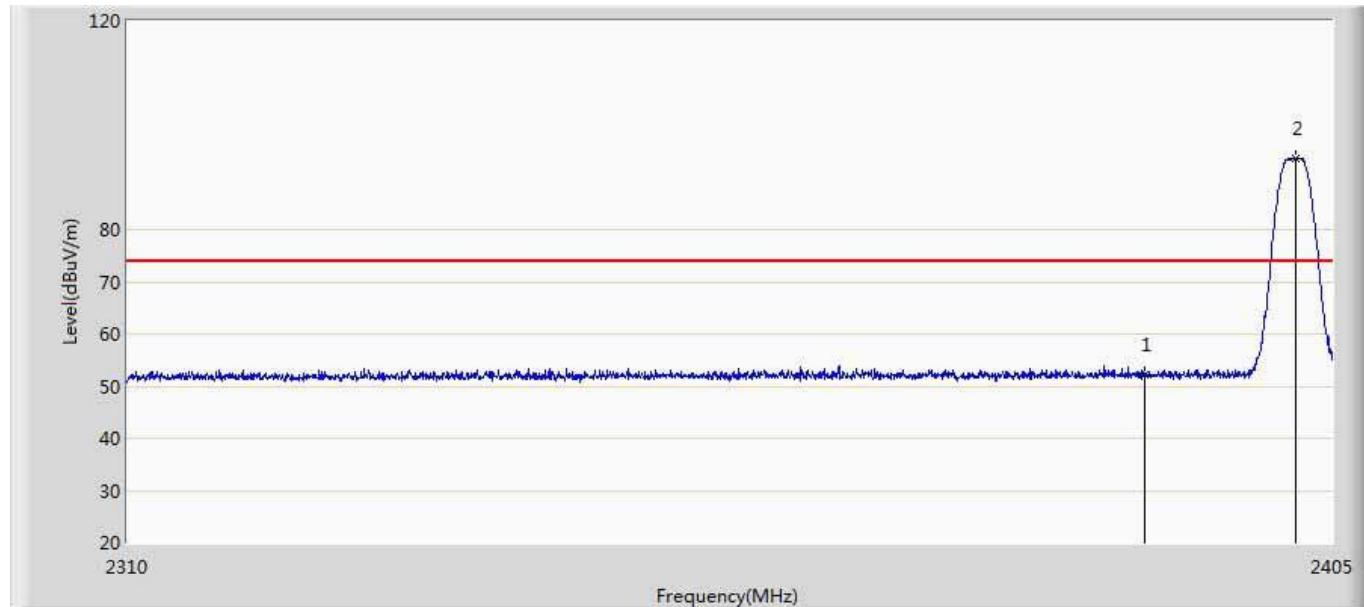
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	50.284	12.929	-23.716	74.000	37.355	PK
2	*	2401.913	95.087	57.745	N/A	N/A	37.342	PK

Engineer: Scott	
Site: AC5	Time: 2016/03/31 - 09:17
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: EZ-BLE PSoC XT/XR module	Power: AC 120V/60Hz
Note: Mode 1:Transmit at CH2402Mhz by BLE	



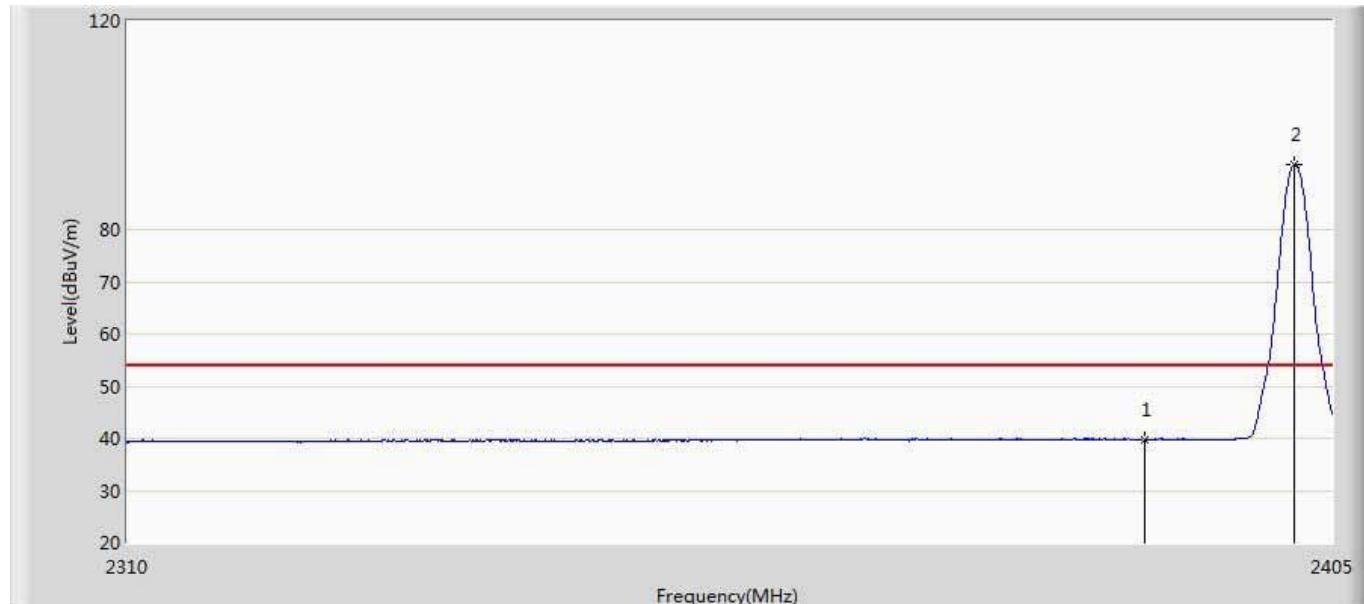
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	38.159	0.804	-15.841	54.000	37.355	AV
2	*	2402.055	91.987	54.645	N/A	N/A	37.341	AV

Engineer: Scott	
Site: AC5	Time: 2016/03/31 - 09:21
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: EZ-BLE PSoC XT/XR module	Power: AC 120V/60Hz
Note: Mode 1:Transmit at CH2402Mhz by BLE	



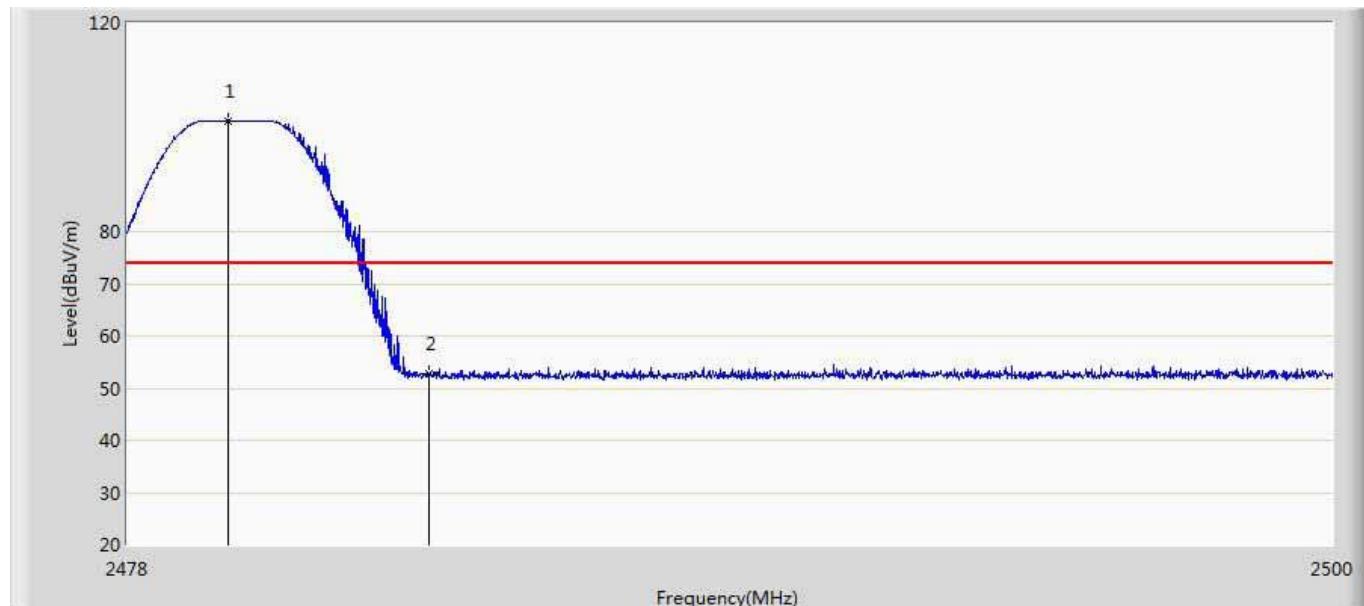
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	52.264	14.909	-21.736	74.000	37.355	PK
2	*	2402.055	93.530	56.188	N/A	N/A	37.341	PK

Engineer: Scott	
Site: AC5	Time: 2016/03/31 - 09:21
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: EZ-BLE PSoC XT/XR module	Power: AC 120V/60Hz
Note: Mode 1:Transmit at CH2402Mhz by BLE	



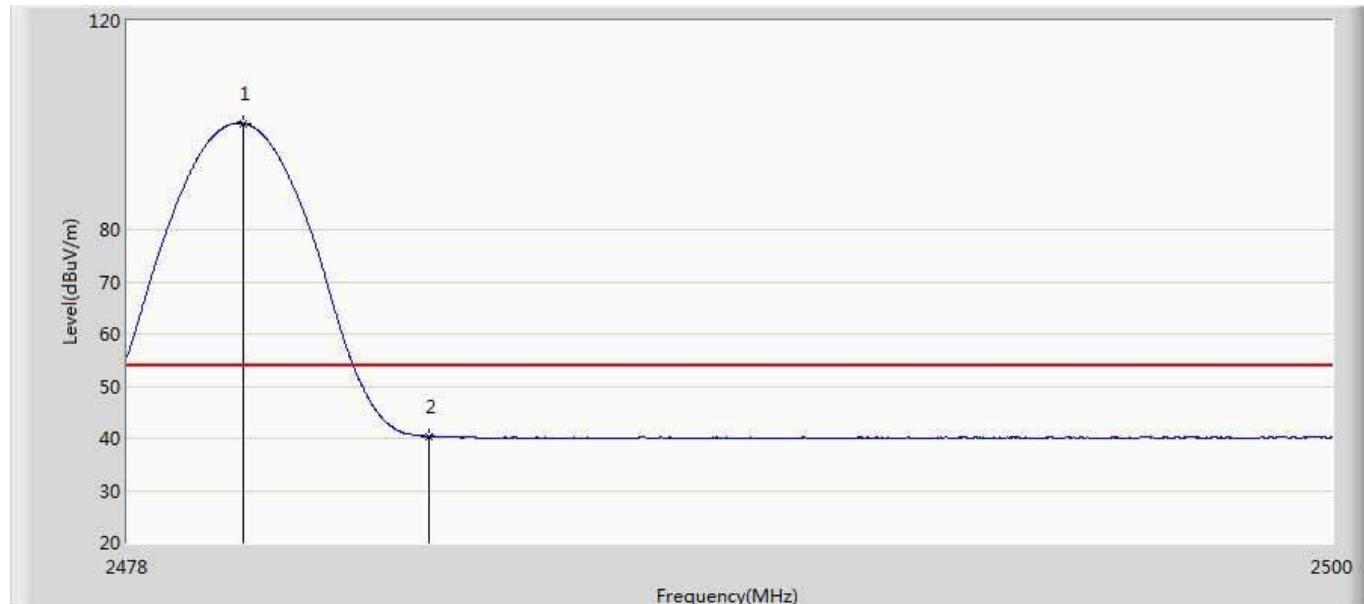
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1		2390.000	39.810	2.455	-14.190	54.000	37.355	AV
2	*	2402.008	92.531	55.189	N/A	N/A	37.341	AV

Engineer: Scott	
Site: AC5	Time: 2016/03/31 - 09:24
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: EZ-BLE PSoC XT/XR module	Power: AC 120V/60Hz
Note: Mode 1:Transmit at CH2480Mhz by BLE	



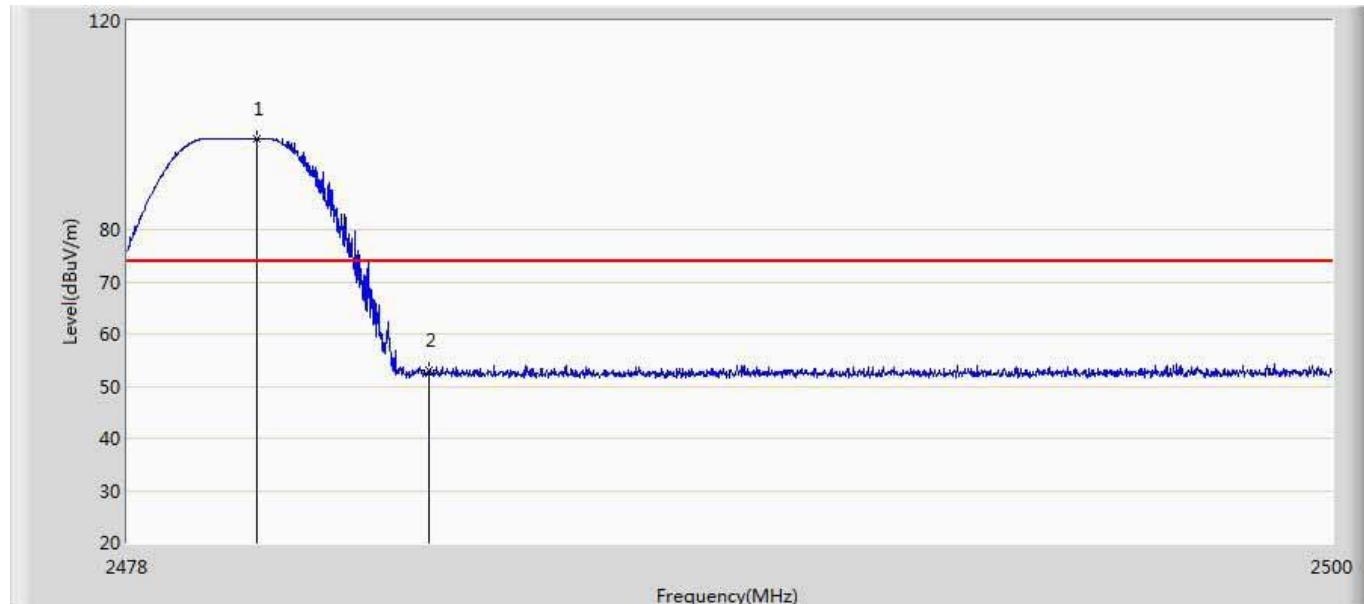
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2479.837	101.289	63.804	N/A	N/A	37.485	PK
2		2483.500	52.723	15.212	-21.277	74.000	37.511	PK

Engineer: Scott	
Site: AC5	Time: 2016/03/31 - 09:25
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Horizontal
EUT: EZ-BLE PSoC XT/XR module	Power: AC 120V/60Hz
Note: Mode 1:Transmit at CH2480Mhz by BLE	



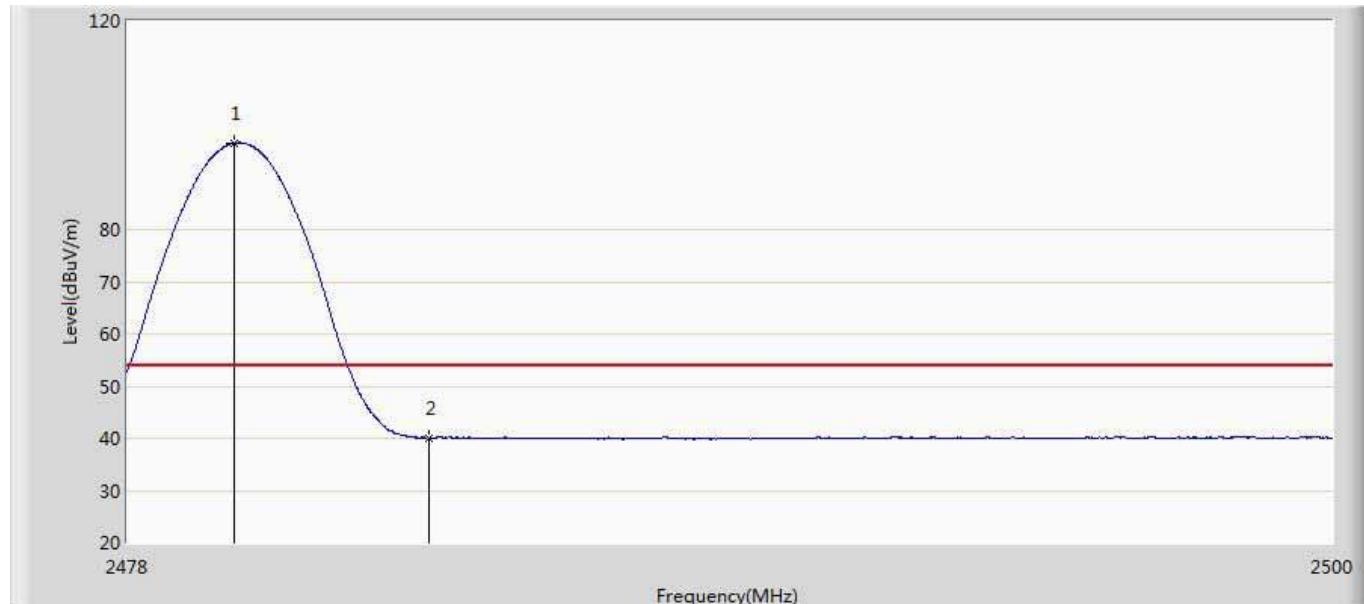
No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2480.112	100.357	62.870	N/A	N/A	37.487	AV
2		2483.500	40.377	2.866	-13.623	54.000	37.511	AV

Engineer: Scott	
Site: AC5	Time: 2016/03/31 - 09:27
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: EZ-BLE PSoC XT/XR module	Power: AC 120V/60Hz
Note: Mode 1:Transmit at CH2480Mhz by BLE	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2480.354	97.434	59.945	N/A	N/A	37.489	PK
2		2483.500	53.078	15.567	-20.922	74.000	37.511	PK

Engineer: Scott	
Site: AC5	Time: 2016/03/31 - 09:28
Limit: FCC_Part15.209_RE(3m)	Margin: 0
Probe: Horn_3117_00167055(1-18GHz)	Polarity: Vertical
EUT: EZ-BLE PSoC XT/XR module	Power: AC 120V/60Hz
Note: Mode 1:Transmit at CH2480Mhz by BLE	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Factor (dB)	Type
1	*	2479.936	96.562	59.076	N/A	N/A	37.486	AV
2		2483.500	40.065	2.554	-13.935	54.000	37.511	AV

7. Occupied Bandwidth

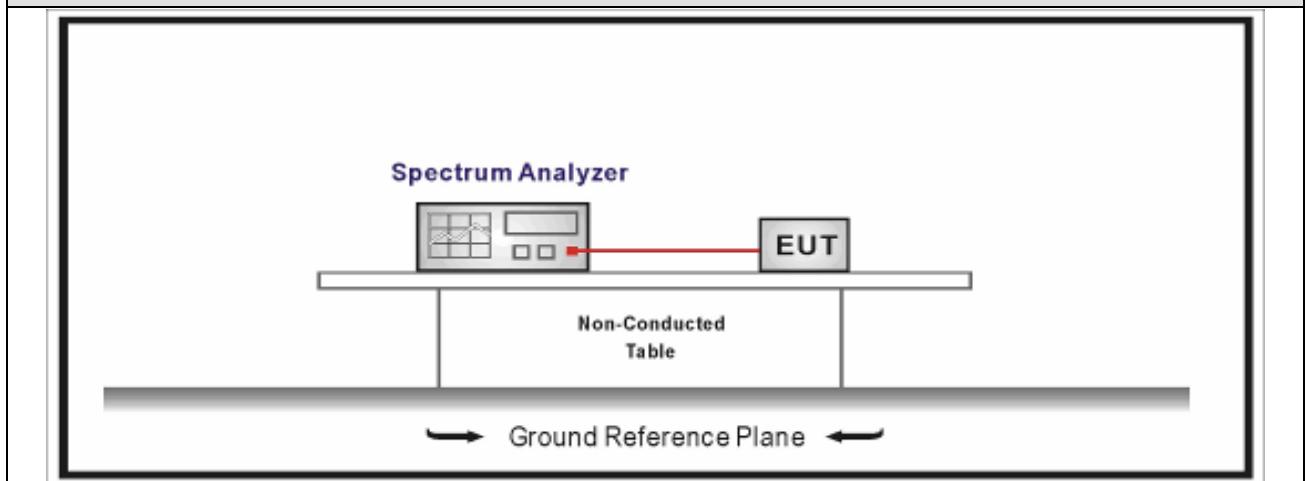
7.1. Test Equipment

Occupied Bandwidth / TR-8					
Instrument	Manufacturer	Type No.	Serial No.	Cal. Date	Cal. Due Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2016.01.04	2017.01.03
Spectrum Analyzer	Agilent	N9010A	MY48030494	2016.03.11	2017.03.10
Temperature/Humidity Meter	zhichen	ZC1-2	TR8-TH	2015.04.10	2017.04.10

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

7.2. Test Setup

Occupied Bandwidth test setup:



7.3. Limit

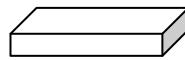
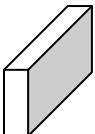
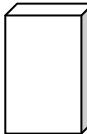
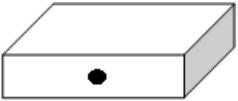
Occupied Bandwidth

Systems using digital modulation techniques operate in the 2400-2483.5 MHz. The minimum 6 dB bandwidth shall be at least 500 kHz

7.4. Test Procedure

Test Method			
	Reference Rule	Chapter	Description
<input checked="" type="checkbox"/>	ANSI C63.10	11.8	DTS bandwidth
<input type="checkbox"/>	<input type="checkbox"/> ANSI C63.10	11.8.1	Option 1
	<input checked="" type="checkbox"/> ANSI C63.10	11.8.2	Option 2

7.5. EUT test definition

Item	Occupied Bandwidth				
Device Category	<input type="checkbox"/>	Fixed position use			
	<input checked="" type="checkbox"/>	Mobile position use			
Test mode	Mode 1, Mode 2, Mode 3, Mode 4				
	<input type="checkbox"/>	Radiated			
		X Axis	Y Axis	Z Axis	
					
		Worst Axis <input type="checkbox"/>	Worst Axis <input type="checkbox"/>	Worst Axis <input type="checkbox"/>	
	<input checked="" type="checkbox"/>	Conducted			
	<input checked="" type="checkbox"/>	Chain 1			
Test method					
	<input type="checkbox"/>	Chain 1	Chain 2		
					
		Worst Chain <input type="checkbox"/>	Worst Chain <input type="checkbox"/>		
	<input type="checkbox"/>	Chain 1	Chain 2	Chain 3	
					
		Worst Chain <input type="checkbox"/>	Worst Chain <input type="checkbox"/>	Worst Chain <input type="checkbox"/>	

7.6. Test Result

Product Name	:	EZ-BLE PSoC XT/XR module	Test Power	:	DC 2.3V
Test Site	:	TR-8			

Mode	CH.	Test Freq. (MHz)	99% Occupied Bandwidth (kHz)	6dB Occupied Bandwidth (kHz)	Limit (kHz)	Result
1	00	2402	1603.3	744.0	>500	Pass
1	19	2440	1656.9	775.8	>500	Pass
1	39	2480	1693.2	775.6	>500	Pass

Note : The worst case of Occupied Bandwidth as below:

Mode 1 CH39 (2480MHz)



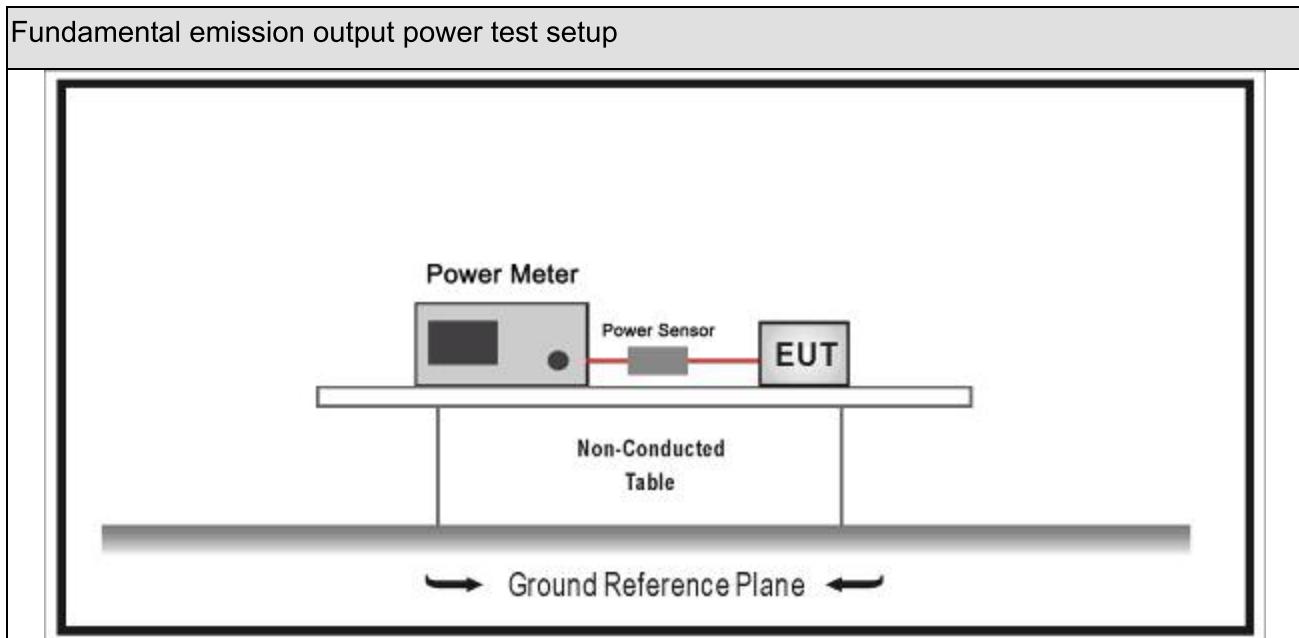
8. Fundamental emission output power

8.1. Test Equipment

Fundamental emission output power/ TR-8					
Instrument	Manufacturer	Type No.	Serial No.	Cal. Date	Cal. Due Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2016.01.04	2017.01.03
Spectrum Analyzer	Agilent	N9010A	MY48030494	2016.03.11	2017.03.10
Wideband Peak Power Meter	Anritsu	ML2495A	0905006	2015.11.11	2016.11.10
Power Sensor	Anritsu	MA2411B	0846014	2015.11.11	2016.11.10
Temperature/Humidity Meter	zhicheng	ZC1-2	TR8-TH	2016.04.10	2017.04.09

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

8.2. Test Setup



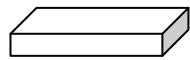
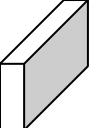
8.3. Limit

Fundamental emission output power Limit		
<input checked="" type="checkbox"/>	$G_{TX} < 6\text{dBi}$	$P_{out} \leq 30\text{dBm}$
<input type="checkbox"/>	$G_{TX} > 6\text{dBi}$	
	<input type="checkbox"/> Non-Fix point-point	$P_{out} \leq 30 - (G_{TX} - 6)$
	<input type="checkbox"/> Fix point-point	$P_{out} \leq 30 - [(G_{TX} - 6)]/3$
	<input type="checkbox"/> Point-to-multipoint	$P_{out} \leq 30 - (G_{TX} - 6)$
	<input type="checkbox"/> Overlap Beams	$P_{out} \leq 30 - [(G_{TX} - 6)]/3$
	<input type="checkbox"/> Aggregate power transmitted simultaneously on all beams	$P_{out} \leq 30 - [(G_{TX} - 6)]/3$
	<input type="checkbox"/> single directional beam	$P_{out} \leq 30 - [(G_{TX} - 6)]/3 + 8\text{dB}$
Note 1 : G_{TX} directional gain of transmitting antennas.		
Note 2 : P_{out} is maximum peak conducted output power .		

8.4. Test Procedure

Fundamental emission output power Test Method			
	References Rule	Chapter	Description
<input checked="" type="checkbox"/>	ANSI C63.10	11.9	Fundamental emission output power
	<input checked="" type="checkbox"/> ANSI C63.10	11.9.1	Maximum peak conducted output power
	<input type="checkbox"/> ANSI C63.10	11.9.1.1	RBW \geq DTS bandwidth
	<input type="checkbox"/> ANSI C63.10	11.9.1.2	Integrated band power method
	<input checked="" type="checkbox"/> ANSI C63.10	11.9.1.3	PKPM1 Peak power meter method
	<input type="checkbox"/> ANSI C63.10	11.9.2	Maximum conducted (average) output power
	<input type="checkbox"/> ANSI C63.10	11.9.2.2	Measurement using a spectrum analyzer (SA)
	<input type="checkbox"/> ANSI C63.10	11.9.2.2.2	Method AVGSA-1(Duty cycle $\geq 98\%$)
	<input type="checkbox"/> ANSI C63.10	11.9.2.2.3	Method AVGSA-1A(Duty cycle $\geq 98\%$)
	<input type="checkbox"/> ANSI C63.10	11.9.2.2.4	Method AVGSA-2(Duty cycle $\leq 98\%$)
	<input type="checkbox"/> ANSI C63.10	11.9.2.2.5	Method AVGSA-2A(Duty cycle $\leq 98\%$)
	<input type="checkbox"/> ANSI C63.10	11.9.2.2.4	Method AVGSA-3
	<input type="checkbox"/> ANSI C63.10	11.9.2.2.5	Method AVGSA-3A
	<input type="checkbox"/> ANSI C63.10	11.9.2.3	Measurement using a power meter (PM)
	<input type="checkbox"/> ANSI C63.10	11.9.2.3.1	Method AVGPM
	<input type="checkbox"/> ANSI C63.10	11.9.2.3.2	Method AVGPM-G

8.5. EUT test definition

Item	Fundamental emission output power		
Device Category	<input type="checkbox"/>	Fixed position use	
	<input checked="" type="checkbox"/>	Mobile position use	
Test mode	Mode 1		
Test method	<input type="checkbox"/>	Radiated	
		X Axis	Y Axis
			
		Worst Axis <input type="checkbox"/>	Worst Axis <input type="checkbox"/>
	<input checked="" type="checkbox"/>	Conducted	
	<input checked="" type="checkbox"/>	Chain 1	
			
	<input type="checkbox"/>	Chain 1	Chain 2
			
		Worst Chain <input type="checkbox"/>	Worst Chain <input type="checkbox"/>
	<input type="checkbox"/>	Chain 1	Chain 2
			
		Worst Chain <input type="checkbox"/>	Worst Chain <input type="checkbox"/>

8.6. Test Result

Product Name	:	EZ-BLE PSoC XT/XR module	Test Power	:	DC 2.3V
Test Site	:	TR8			

Mode	Channel	Test Frequency (MHz)	Measurement Power Output (dBm)	Limit (dBm)	Result
1	00	2402	5.71	30	Pass
1	19	2440	6.06	30	Pass
1	39	2480	6.39	30	Pass

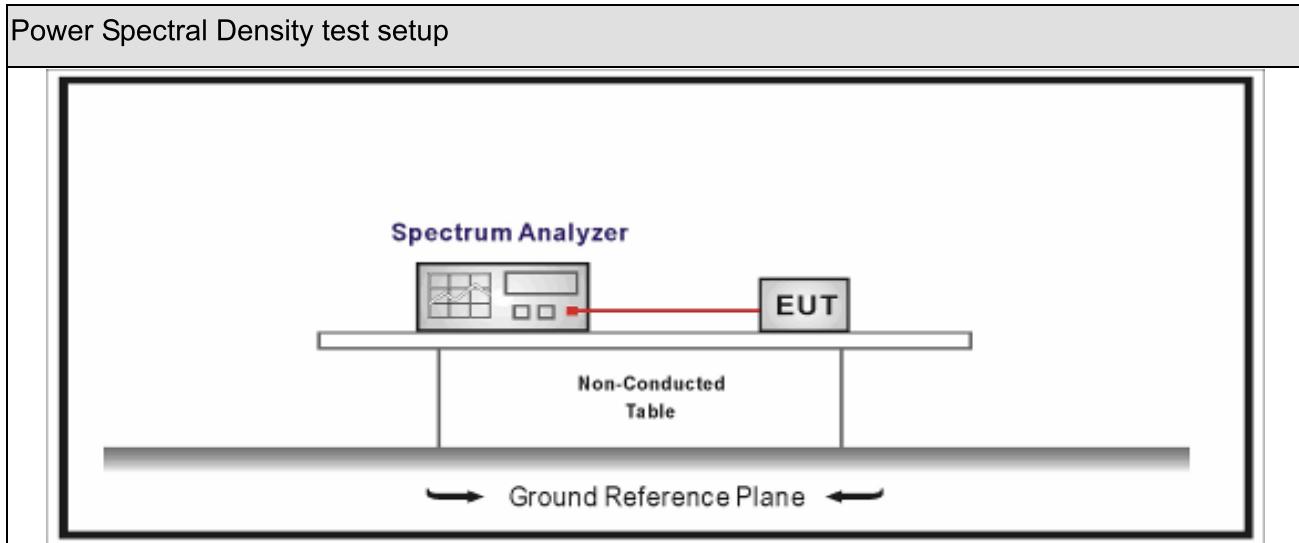
9. Power Spectral Density

9.1. Test Equipment

Power Spectral Density / TR-8					
Instrument	Manufacturer	Type No.	Serial No.	Cal. Date	Cal. Due Date
Spectrum Analyzer	Agilent	E4446A	MY45300103	2016.01.04	2017.01.03
Spectrum Analyzer	Agilent	N9010A	MY48030494	2016.03.11	2017.03.10
Temperature/Humidity Meter	zhichen	ZC1-2	TR8-TH	2015.04.10	2017.04.10

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

9.2. Test Setup



9.3. Limit

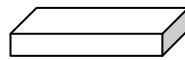
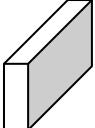
Power Spectral Density Limit

Power Spectral Density $\leq 8\text{dBm}/3\text{kHz}$

9.4. Test Procedure

Power Spectral Density Test Method			
	References Rule	Chapter	Description
<input checked="" type="checkbox"/>	ANSI C63.10	11.10	Maximum power spectral density level in the fundamental emission
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> ANSI C63.10	11.10.2	Method PKPSD (peak PSD)
	<input type="checkbox"/> ANSI C63.10	11.10.3	Method AVGPSD-1(Duty cycle $\geq 98\%$)
	<input type="checkbox"/> ANSI C63.10	11.10.4	Method AVGPSD-1A(Duty cycle $\geq 98\%$)
	<input type="checkbox"/> ANSI C63.10	11.10.5	Method AVGPSD-2(Duty cycle $< 98\%$)
	<input type="checkbox"/> ANSI C63.10	11.10.6	Method AVGPSD-2A(Duty cycle $< 98\%$)
	<input type="checkbox"/> ANSI C63.10	11.10.7	Method AVGPSD-3
	<input type="checkbox"/> ANSI C63.10	11.10.8	Method AVGPSD-3A

9.5. EUT test definition

Item	Power Spectral Density Test Method				
Device Category	<input type="checkbox"/>	Fixed position use			
	<input checked="" type="checkbox"/>	Mobile position use			
Test mode	Mode 1				
	<input type="checkbox"/>	Radiated			
		X Axis	Y Axis	Z Axis	
					
		Worst Axis <input type="checkbox"/>	Worst Axis <input type="checkbox"/>	Worst Axis <input type="checkbox"/>	
	<input checked="" type="checkbox"/>	Conducted			
	<input checked="" type="checkbox"/>	Chain 1			
Test method					
	<input type="checkbox"/>	Chain 1	Chain 2		
					
		Worst Chain <input type="checkbox"/>	Worst Chain <input type="checkbox"/>		
	<input type="checkbox"/>	Chain 1	Chain 2	Chain 3	
					
		Worst Chain <input type="checkbox"/>	Worst Chain <input type="checkbox"/>	Worst Chain <input type="checkbox"/>	

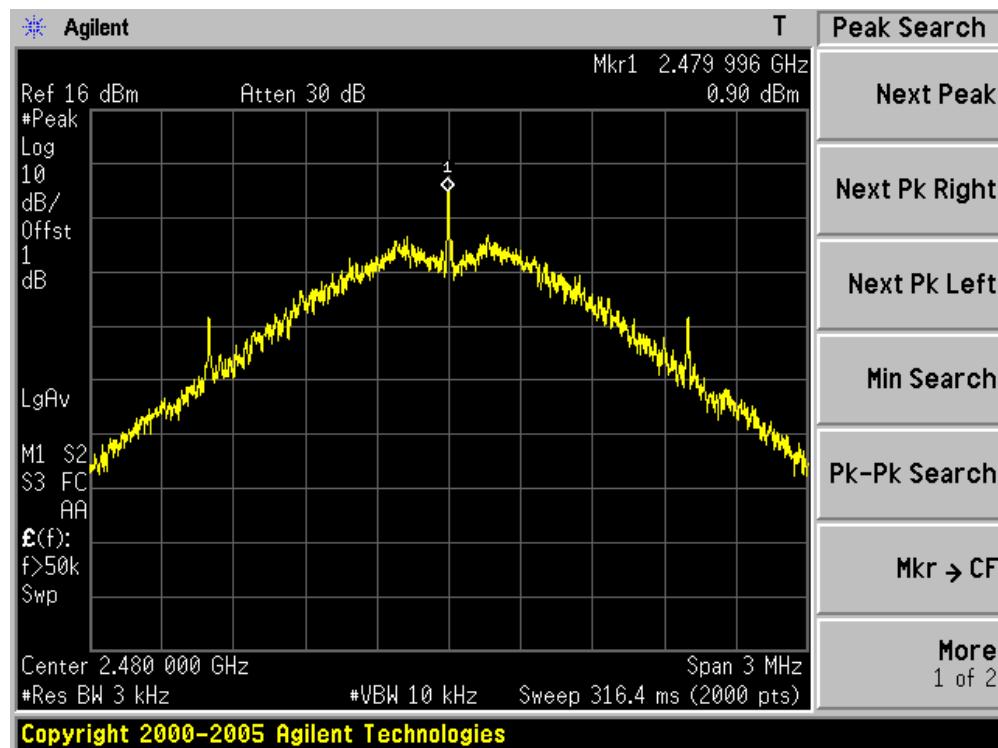
9.6. Test Result

Product Name	:	EZ-BLE PSoC XT/XR module	Test Power	:	DC 2.3V
Test Site	:	TR8			

Mode	Channel	Test Frequency (MHz)	Measurement PSD (dBm/3kHz)	Total PSD (dBm/3kHz)	Directional Gain (dBi)	Limit (dBm/3kHz)	Result
			Ant 0				
1	00	2402	0.37	0.37	0.5	8	Pass
1	19	2440	0.45	0.45	0.5	8	Pass
1	39	2480	0.90	0.90	0.5	8	Pass

Note : The worst case of Power Spectral Density as below:

Mode 1 CH39(2480MHz)



The End