RADIO TEST REPORT
FCC 47 CFR PART 15 SUBPART C

Test Standard	**FCC Part 15.247**
FCC ID	**2AKOR10101**
Product name	**360livecam**
Brand Name	**Tamaggo**
Model	**10101**
Test Result	**Pass**

The test Result was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were given in ANSI C63.10: 2013 and compliance standards.

The test results of this report relate only to the tested sample (EUT) identified in this report.
The test Report of full or partial shall not copy. Without written approval of CCS. Inc.

The sample selected for test was production product and was provided by manufacturer.

Testing Laboratory
1309

Approved by:

Sam Chuang
Manager

Tested by:

Ed Chiang
Engineer

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

Revision History

Rev.	Issue Date	Revisions	Revised By
00	March 24, 2017	Initial Issue	Doris Chu
01	July 4, 2017	1. Added conduction data in P 14-15.	Angel Cheng

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

Table of contents

1. GENERAL INFORMATION 4
1.1 EUT INFORMATION 4
1.2 EUT CHANNEL INFORMATION 5
1.3 ANTENNA INFORMATION 5
1.4 MEASUREMENT UNCERTAINTY 6
1.5 FACILITIES AND TEST LOCATION 7
1.6 INSTRUMENT CALIBRATION 7
1.7 SUPPORT AND EUT ACCESSORIES EQUIPMENT 8
2. TEST SUMMERY 9
3. DESCRIPTION OF TEST MODES 10
3.1 THE WORST MODE OF OPERATING CONDITION 10
3.2 THE WORST MODE OF MEASUREMENT 11
3.3 EUT DUTY CYCLE 12
4. TEST RESULT 13
4.1 AC POWER LINE CONDUCTED EMISSION 13
4.2 6DB BANDWIDTH AND OCCUPIED BANDWIDTH(99%) 16
4.3 OUTPUT POWER MEASUREMENT 18
4.4 POWER SPECTRAL DENSITY 20
4.5 CONDUCTED BAND EDGE AND SPURIOUS EMISSION 22
4.6 RADIATION BANDEDGE AND SPURIOUS EMISSION 26
APPENDIX 1 - PHOTOGRAPHS OF EUT

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

1. GENERAL INFORMATION

1.1 EUT INFORMATION

Applicant	Tamaggo Enterprises S.A. Rue du Mont-Blanc 14, Geneva, CH, 1201, Switzerland
Manufacturer	Altek (Kunshan) Co., Ltd. No. 77, 3rd Main Street, Kunshan Free Trade Zone, Jiangsu Province, P.R. China
Equipment	360livecam
Model No.	10101
Model Discrepancy	N/A
Trade Name	Tamaggo
Received Date	February 15, 2017
Date of Test	March 16 ~ June 13, 2017
Output Power (W)	BLE : 0.0009 W
Power Operation	DC 3.7V

.

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

1.2 EUT CHANNEL INFORMATION

Frequency Range	2402MHz-2480MHz
Modulation Type	GFSK for BLE-1Mbps
Number of channel	40 Channels

Remark:
Refer as ANSI 63.10:2013 clause 5.6.1 Table 4 and RSS-GEN Table A1 for test channels

Number of frequencies to be tested		
Frequency range in which device operates	**Number of frequencies**	**Location in frequency range of operation**
☐ 1 MHz or less	1	Middle
☐ 1 MHz to 10 MHz	2	1 near top and 1 near bottom
☒ More than 10 MHz	3	1 near top, 1 near middle, and 1 near bottom

1.3 ANTENNA INFORMATION

Antenna Type	☐ PIFA ☐ PCB ☐ Dipole ☒ FPC
Antenna Gain	0.7 dBi

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

1.4 MEASUREMENT UNCERTAINTY

PARAMETER	UNCERTAINTY
AC Powerline Conducted Emission	+/- 1.2575
Emission bandwidth, 20dB bandwidth	+/- 1.4003
RF output power, conducted	+/- 1.1372
Power density, conducted	+/- 1.4003
3M Semi Anechoic Chamber / 30M~200M	+/- 4.0138
3M Semi Anechoic Chamber / 200M~1000M	+/- 3.9483
3M Semi Anechoic Chamber / 1G~8G	+/- 2.5975
3M Semi Anechoic Chamber / 8G~18G	+/- 2.6112
3M Semi Anechoic Chamber / 18G~26G	+/- 2.7389
3M Semi Anechoic Chamber / 26G~40G	+/- 2.9683
3M Semi Anechoic Chamber / 40G~60G	+/- 1.8509
3M Semi Anechoic Chamber / 60G~75G	+/- 1.9869
3M Semi Anechoic Chamber / 75G~110G	+/- 2.9651
3M Semi Anechoic Chamber / 110G~170G	+/- 2.7807
3M Semi Anechoic Chamber / 170G~220G	+/- 3.6437
3M Semi Anechoic Chamber / 220G~325G	+/- 4.2982

***Remark**:*
1.This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2
2. ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report.

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

1.5 FACILITIES AND TEST LOCATION

All measurement facilities used to collect the measurement data are located at *No.11, Wugong 6th Rd., Wugu Dist., New Taipei City 24891, Taiwan. (R.O.C.)*

Test site	Test Engineer	Remark
AC Conduction Room	Eric Lee	
Radiation	Ed Chiang	
RF Conducted	Eric Lee	

Remark: *The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.*

1.6 INSTRUMENT CALIBRATION

RF Conducted Test Site					
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Date**	**Calibration Due**
Power Meter	Anritsu	ML2495A	1012009	07/04/2016	07/03/2017
Power Sensor	Anritsu	MA2411B	917072	07/04/2016	07/03/2017
Spectrum Analyzer	R&S	FSV 40	101073	10/05/2016	10/04/2017

Wugu 966 Chamber A					
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Date**	**Calibration Due**
Bilog Antenna	Sunol Sciences	JB3	A030105	07/03/2016	07/02/2017
Horn Antenna	EMCO	3117	00055165	02/20/2017	02/19/2018
Horn Antenna	ETS LINDGREN	3116	00026370	01/12/2017	01/11/2018
Pre-Amplifier	EMCI	EMC 012635	980151	06/23/2016	06/22/2017
Pre-Amplifier	EMEC	EM330	060609	06/08/2016	06/07/2017
Spectrum Analyzer	Agilent	E4446A	US42510252	12/05/2016	12/04/2017
Antenna Tower	CCS	CC-A-1F	N/A	N.C.R	N.C.R
Controller	CCS	CC-C-1F	N/A	N.C.R	N.C.R
Turn Table	CCS	CC-T-1F	N/A	N.C.R	N.C.R
Software	EZ-EMC (CCS-3A1RE)				

Conducted Emission Room # B					
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Date**	**Calibration Due**
LISN	R&S	ENV216	101054	05/18/2017	05/17/2018
LISN	SCHWARZBECK	NSLK 8127	8127-541	02/14/2017	02/13/2018
Receiver	R&S	ESCI	101073	08/20/2016	08/19/2017

Remark: *Each piece of equipment is scheduled for calibration once a year.*

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

1.7 SUPPORT AND EUT ACCESSORIES EQUIPMENT

EUT Accessories Equipment					
No.	**Equipment**	**Brand**	**Model**	**Series No.**	**FCC ID**
	N/A				

Support Equipment					
No.	**Equipment**	**Brand**	**Model**	**Series No.**	**FCC ID**
1	Notebook	Lenovo	IBM 7663	N/A	N/A
2	DC Power Source	GWINSTEK	SPS-3610	N/A	N/A
3	NB	ASUS	M5200AE	N/A	N/A

1.8 TEST METHODOLOGY AND APPLIED STANDARDS

The test methodology, setups and results comply with all requirements in accordance with ANSI C63.10:2013, FCC Part 2, FCC Part 15.247, KDB 558074 D01 v03r05,

1.9 TABLE OF ACCREDITATIONS AND LISTINGS

Country	Agency	Scope of Accreditation	Logo
USA	FCC	3M Semi Anechoic Chamber (FCC MRA: TW1039) to perform FCC Part 15 measurements	FCC MRA: TW0240

.

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

2. TEST SUMMERY

FCC Standard Section	Report Section	Test Item	Result
15.203	1.3	Antenna Requirement	Pass
15.207(a)	4.1	AC Conducted Emission	-
15.247(a)(2)	4.2	6 dB Bandwidth	Pass
-	4.2	Occupied Bandwidth (99%)	-
15.247(b)	4.3	Output Power Measurement	Pass
15.247(e)	4.4	Power Spectral Density	Pass
15.247(d)	4.5	Conducted Band Edge	Pass
15.247(d)	4.5	Conducted Emission	Pass
15.247(d)	4.6	Radiation Band Edge	Pass
15.247(d)	4.6	Radiation Spurious Emission	Pass

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

3. DESCRIPTION OF TEST MODES

3.1 THE WORST MODE OF OPERATING CONDITION

Operation mode	BT4.0 Mode (1Mbps)
Test Channel Frequencies	1.Lowest Channel : 2402MHz 2.Middle Channel : 2440MHz 3.Highest Channel : 2480MHz

Remark:
1. EUT pre-scanned data rate of output power for each mode, the worst data rate were recorded in this report.
.

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

3.2 THE WORST MODE OF MEASUREMENT

Radiated Emission Measurement Above 1G	
Test Condition	Band edge, Emission for Unwanted and Fundamental
DC Voltage	3.7V
Test Mode	Mode 1: EUT power by DC source.
Worst Mode	☒ Mode 1 ☐ Mode 2 ☐ Mode 3 ☐ Mode 4
Worst Position	☐ Placed in fixed position. ☒ Placed in fixed position at X-Plane (E2-Plane) ☐ Placed in fixed position at Y-Plane (E1-Plane) ☐ Placed in fixed position at Z-Plane (H-Plane)
Worst Polarity	☐ Horizontal ☒ Vertical

Radiated Emission Measurement Below 1G	
Test Condition	Radiated Emission Below 1G
DC Voltage	3.7V
Test Mode	Mode 1: EUT power by DC source.
Worst Mode	☒ Mode 1 ☐ Mode 2 ☐ Mode 3 ☐ Mode 4

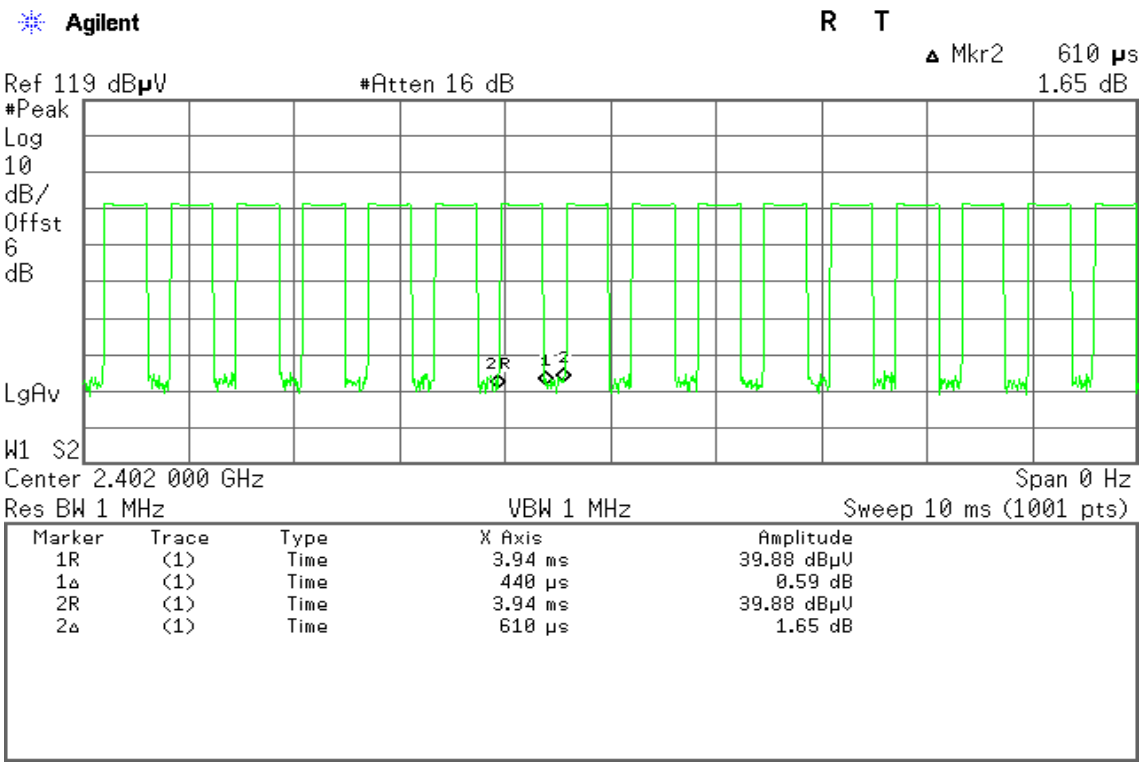
Remark:
1. The worst mode was record in this test report.
2. EUT pre-scanned in three axis ,X,Y, Z and two polarity, Horizontal and Vertical for radiated measurement. The worst case(X-Plane and Vertical) were recorded in this report

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

3.3 EUT DUTY CYCLE

Duty Cycle				
Configuration	TX ON (μs)	TX ALL (μs)	Duty Cycle (%)	Duty Factor(dB)
BLE	440	610	72.13 %	1.41

BLE



This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

4. TEST RESULT

4.1 AC POWER LINE CONDUCTED EMISSION

4.1.1 Test Limit

According to §15.207(a),

Frequency Range (MHz)	Limits(dBμV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56*	56 to 46*
0.50 to 5	56	46
5 to 30	60	50

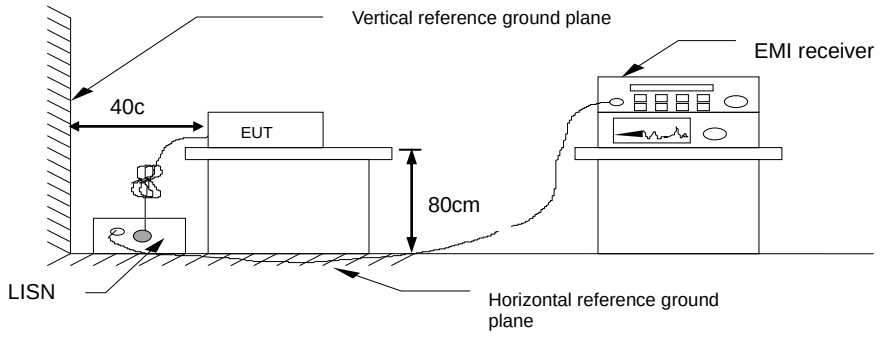
* Decreases with the logarithm of the frequency.

4.1.2 Test Procedure

Test method Refer as ANSI 63.10:2013 clause 6.2,

1. The EUT was placed on a non-conducted table, which is 0.8m above horizontal ground plane and 0.4m above vertical ground plane.
2. EUT connected to the line impedance stabilization network (LISN)
3. Receiver set RBW of 9kHz and Detector Peak, and note as quasi-peak and average.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. Recorded Line for Neutral and Line.

4.1.3 Test Setup

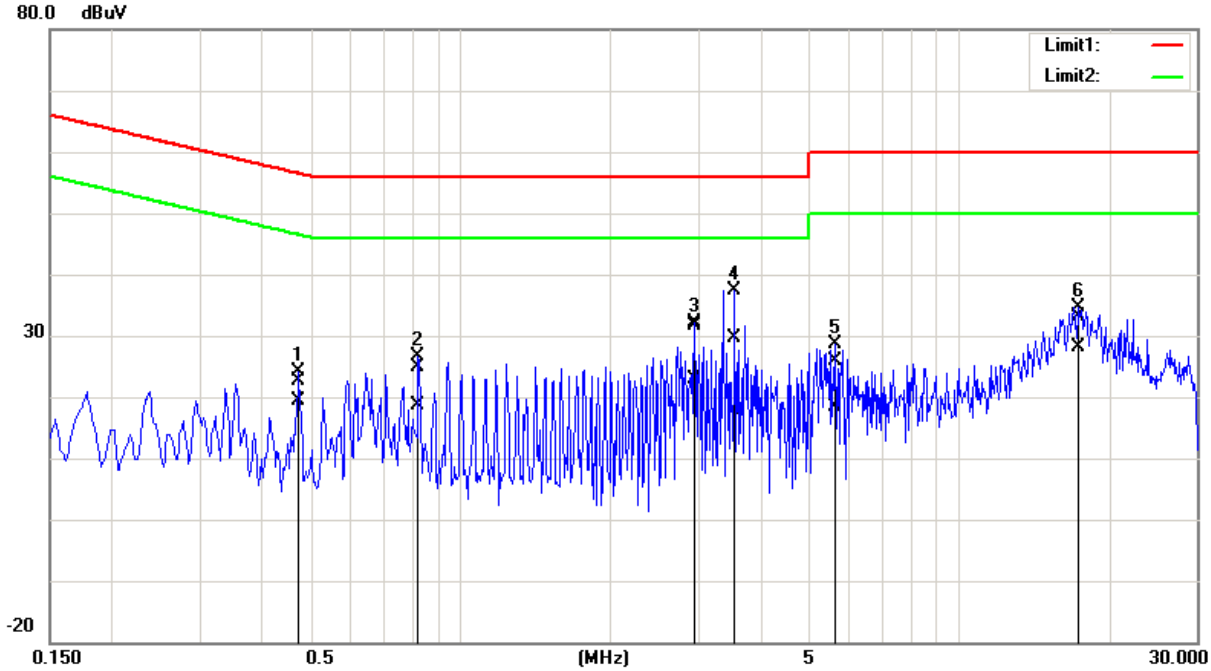


This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

4.1.4 Test Result

Test Data

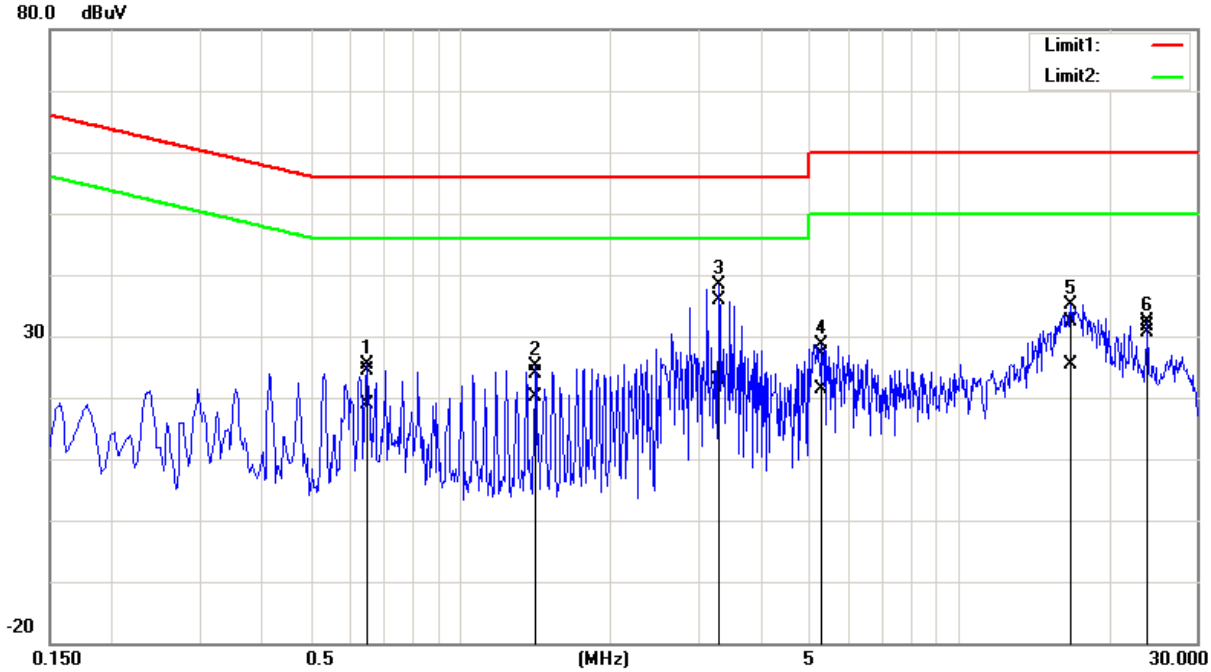
Test Mode:	Mode 1	Temp/Hum	24(℃)/ 50%RH
Test Voltage:	120Vac / 60Hz	Test Date	2017/6/13
Phase:	Line	Test Engineer	Eric Lee



No.	Frequency	QuasiPeak reading	Average reading	Correction factor	QuasiPeak result	Average result	QuasiPeak limit	Average limit	QuasiPeak margin	Average margin
	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)
1	0.4740	22.74	19.41	-0.05	22.69	19.36	56.44	46.44	-33.75	-27.08
2	0.8260	24.90	18.72	-0.05	24.85	18.67	56.00	46.00	-31.15	-27.33
3	2.9539	31.68	23.06	-0.06	31.62	23.00	56.00	46.00	-24.38	-23.00
4	3.5500	29.78	17.88	-0.05	29.73	17.83	56.00	46.00	-26.27	-28.17
5	5.6740	25.97	18.36	0.02	25.99	18.38	60.00	50.00	-34.01	-31.62
6*	17.4300	33.23	28.25	-0.20	33.03	28.05	60.00	50.00	-26.97	-21.95

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

Test Mode:	Mode 1	Temp/Hum	27(℃)/ 53%RH
Test Voltage:	120Vac / 60Hz	Test Date	2017/6/13
Phase:	Neutral	Test Engineer	Eric Lee



No.	Frequency	QuasiPeak reading	Average reading	Correction factor	QuasiPeak result	Average result	QuasiPeak limit	Average limit	QuasiPeak margin	Average margin
	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)
1	0.6500	24.40	18.93	-0.13	24.27	18.80	56.00	46.00	-31.73	-27.20
2	1.4180	23.98	20.21	-0.13	23.85	20.08	56.00	46.00	-32.15	-25.92
3	3.3060	35.92	23.03	-0.13	35.79	22.90	56.00	46.00	-20.21	-23.10
4	5.3140	27.24	21.41	-0.15	27.09	21.26	60.00	50.00	-32.91	-28.74
5	16.8340	32.60	25.73	-0.31	32.29	25.42	60.00	50.00	-27.71	-24.58
6*	23.9260	32.10	31.05	-0.39	31.71	30.66	60.00	50.00	-28.29	-19.34

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

4.2 6DB BANDWIDTH AND OCCUPIED BANDWIDTH(99%)

4.2.1 Test Limit

According to §15.247(a)(2)

6 dB Bandwidth ：

Limit	Shall be at least 500kHz

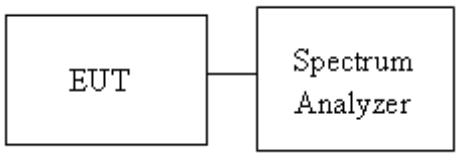
Occupied Bandwidth(99%) ： For reporting purposes only.

4.2.2 Test Procedure

Test method Refer as KDB 558074 D01 v03r05, section 8.1 and ANSI 63.10:2013 clause 6.9.3,

1. The EUT RF output connected to the spectrum analyzer by RF cable.
2. Setting maximum power transmit of EUT
3. SA set RBW = 100kHz, VBW = 300kHz and Detector = Peak, to measurement 6 dB Bandwidth and 99% Bandwidth.
4. Measure and record the result of 6 dB Bandwidth and 99% Bandwidth. in the test report.

4.2.3 Test Setup



4.2.4 Test Result

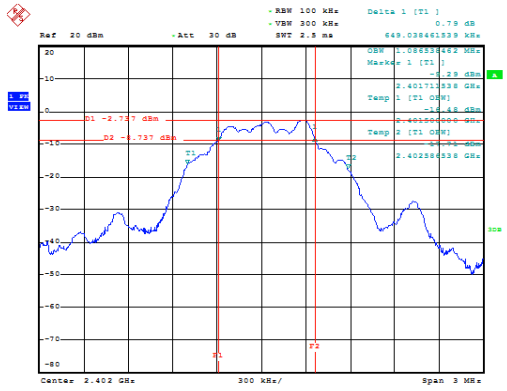
Test mode: BLE mode / 2402-2480 MHz				
Channel	**Frequency (MHz)**	**OBW (99%) (MHz)**	**6dB BW (MHz)**	**6dB limit (kHz)**
Low	2402	1.0865	0.6490	>500
Mid	2440	1.0913	0.6538	
High	2480	1.0817	0.6826	

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

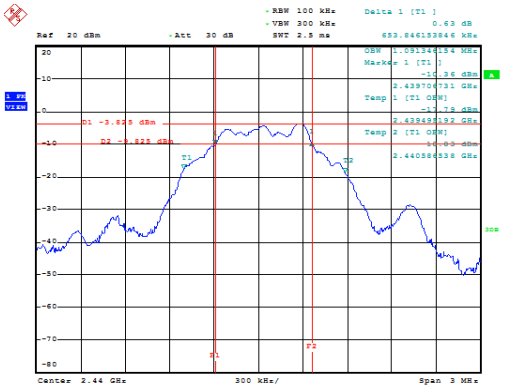
Test Data

BLE mode

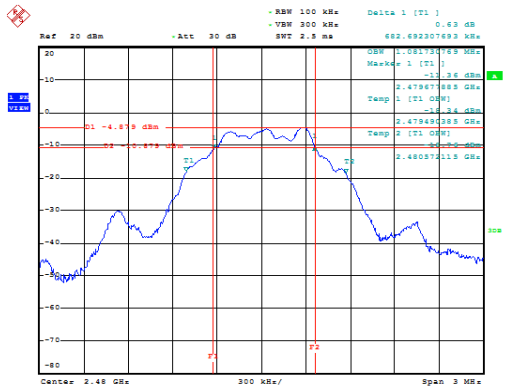
Low CH



Mid CH



High CH



This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

4.3 OUTPUT POWER MEASUREMENT

4.3.1 Test Limit

According to §15.247(b)

Peak output power：

For systems using digital modulation in the 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt(30 dBm), base on the use of antennas with directional gain not exceed 6 dBi If transmitting antennas of directional gain greater than 6dBi are used the peak output power the conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

Limit	☒ Antenna not exceed 6 dBi：30dBm ☐ Antenna with DG greater than 6 dBi [Limit = 30 – (DG – 6)] ☐ Point-to-point operation

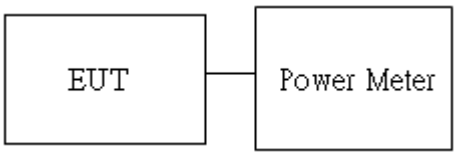
Average output power：For reporting purposes only.

4.3.2 Test Procedure

Test method Refer as KDB 558074 D01 v03r05, section 9.1.2.

1. The EUT RF output connected to the power meter by RF cable.
2. Setting maximum power transmit of EUT.
3. The path loss was compensated to the results for each measurement.
4. Measure and record the result of Peak output power and Average output power in the test report.

4.3.3 Test Setup



This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

4.3.4 Test Result

Peak output power：

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)	Limit (W)	Test Result
Low	2402	***-0.60**	0.0009	1	PASS
Mid	2440	-1.37	0.0007		PASS
High	2480	-2.01	0.0006		PASS

Average output power：

Channel	Frequency (MHz)	Output Power (dBm)	Output Power (W)
Low	2402	-3.85	0.0004
Mid	2440	-4.60	0.0003
High	2480	-5.99	0.0003

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

4.4 POWER SPECTRAL DENSITY

4.4.1 Test Limit

According to §15.247(e)

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

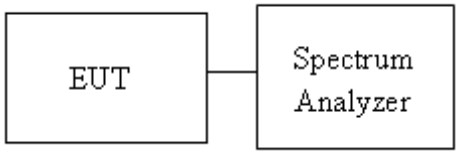
Limit	☒ Antenna not exceed 6 dBi：8dBm ☐ Antenna with DG greater than 6 dBi [Limit = 8 – (DG – 6)] ☐ Point-to-point operation：

4.4.2 Test Procedure

Test method Refer as KDB 558074 D01 v03r05, Section 10.2

1. The EUT RF output connected to the spectrum analyzer by RF cable.
2. Setting maximum power transmit of EUT
3. SA set RBW = 3kHz, VBW = 30kHz, Span = 1.5 times DTS Bandwidth (6 dB BW), Detector = Peak, Sweep Time = Auto and Trace = Max hold.
4. The path loss and Duty Factor were compensated to the results for each measurement by SA.
5. Mark the maximum level.
6. Measure and record the result of power spectral density. in the test report.

4.4.3 Test Setup



4.4.4 Test Result

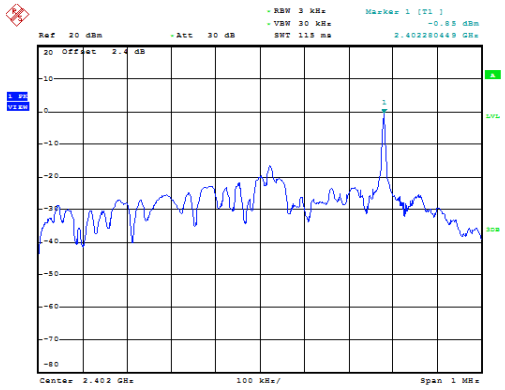
Test mode: BLE mode / 2402-2480 MHz			
Channel	**Frequency (MHz)**	**PSD (dBm)**	**limit (dBm)**
Low	2402	-0.85	8
Mid	2440	-1.94	
High	2480	-3.02	

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

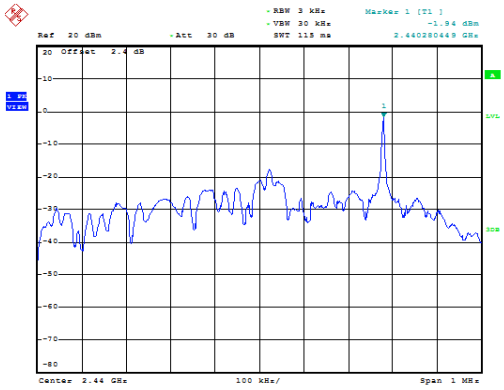
Test Data

BLE mode

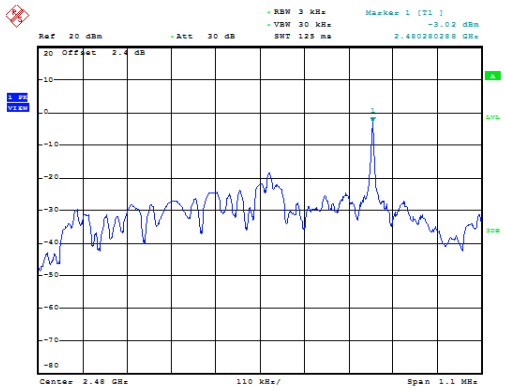
Low CH



Mid CH



High CH



This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

4.5 CONDUCTED BAND EDGE AND SPURIOUS EMISSION

4.5.1 Test Limit

According to §15.247(d)

In any 100 kHz bandwidth outside the authorized frequency band,

Non-restricted bands shall be attenuated at least 20 dB/30 dB relative to the maximum PSD level in 100 kHz by RF conducted or a radiated measurement which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a).

4.5.2 Test Procedure

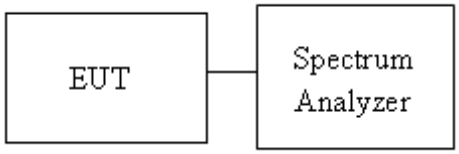
Test method Refer as KDB 558074 D01 v03r05, Section 11.

1. EUT RF output port connected to the SA by RF cable, and the path loss was compensated to result.

2. SA setting, RBW=100kHz, VBW=300kHz, Detector=Peak, Trace mode = max hold, SWT = Auto.

3. In any 100 kHz bandwidth outside the authorized frequency band, shall be attenuated at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz when conducted power procedure is used. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

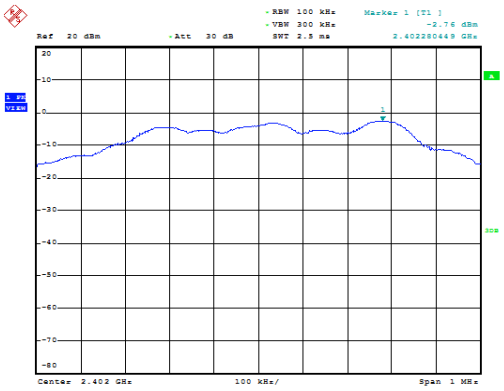
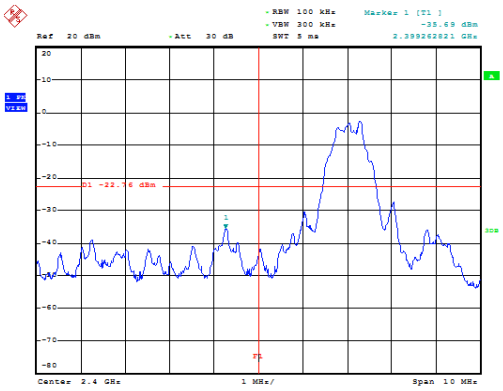
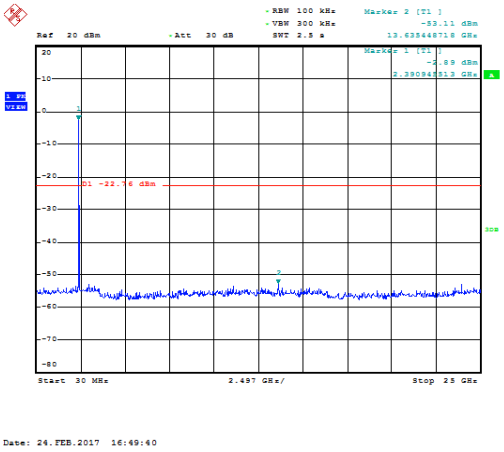
4.5.3 Test Setup



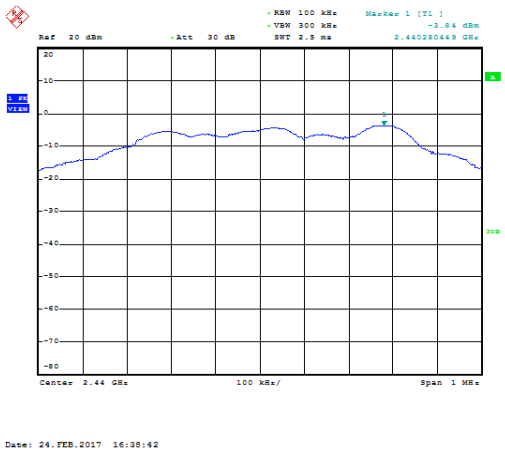
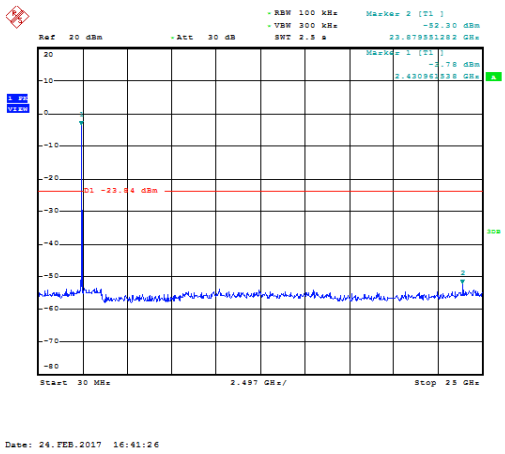
This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

4.5.4 Test Result

Test Data

BLE mode Low CH	
Reference Level of PSD in 100kHz	**Band Edge**
	
Spurious Emission 30MHz-25GHz	
	

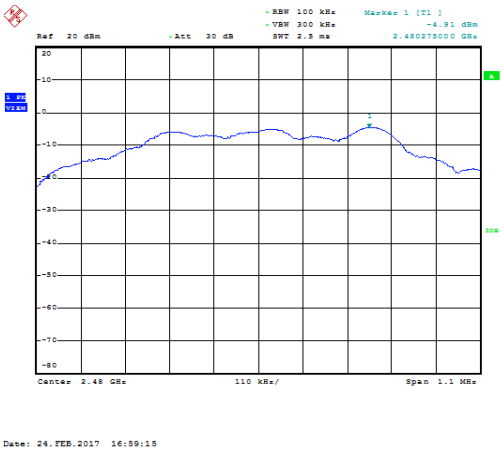
This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

BLE mode Mid CH	
Reference Level of PSD in 100kHz	**Spurious Emission 30MHz-25GHz**
	

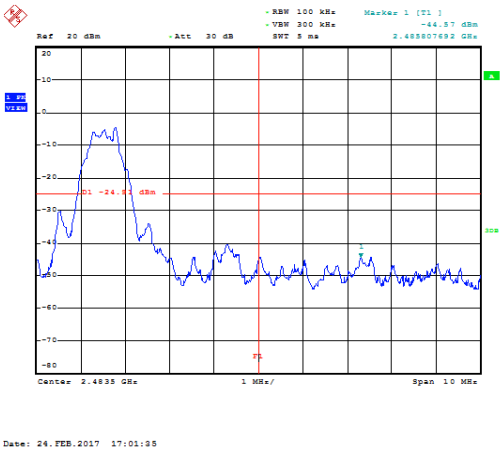
This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

BLE mode High CH

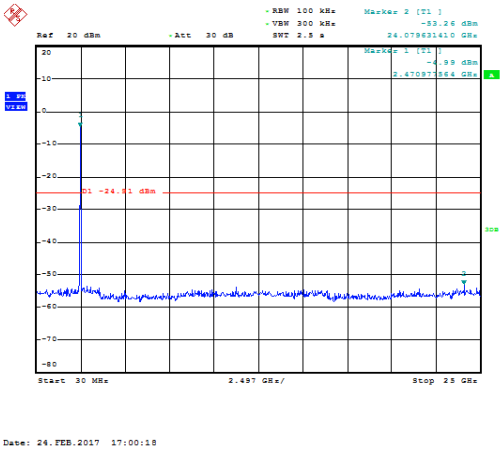
Reference Level of PSD in 100kHz



Band Edge



Spurious Emission 30MHz-25GHz



This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

4.6 RADIATION BANDEDGE AND SPURIOUS EMISSION

4.6.1 Test Limit

FCC according to §15.247(d), §15.209 and §15.205,

In any 100 kHz bandwidth outside the authorized frequency band, all harmonic and spurious must be least 20 dB below the highest emission level with the authorized frequency band. Radiation emission which fall in the restricted bands must also follow the FCC section 15.209 as below limit in table.

Below 30 MHz

Frequency	Field Strength (microvolts/m)	Magnetic H-Field (microamperes/m)	Measurement Distance (metres)
9-490 kHz	2,400/F (F in kHz)	2,400/F (F in kHz)	300
490-1,705 kHz	24,000/F (F in kHz)	24,000/F (F in kHz)	30
1.705-30 MHz	30	N/A	30

Above 30 MHz

Frequency (MHz)	Field Strength microvolts/m at 3 metres (watts, e.i.r.p.)	
	Transmitters	Receivers
30-88	100 (3 nW)	100 (3 nW)
88-216	150 (6.8 nW)	150 (6.8 nW)
216-960	200 (12 nW)	200 (12 nW)
Above 960	500 (75 nW)	500 (75 nW)

Remark:
Although these tests were performed other than open area test site, adequate comparison measurements were confirmed against 30 m open are test site. Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 937606.

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

4.6.2 Test Procedure

Test method Refer as KDB 558074 D01 v03r05, Section 12.1.

1. The EUT is placed on a turntable, Above 1 GHz is 1.5m and below 1 GHz is 0.8m above ground plane. The EUT Configured un accordance with ANSI C63.10, and the EUT set in a continuous mode.

2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level. And EUT is set 3m away from the receiving antenna, which is scanned from 1m to 4m above the ground plane to find out the highest emissions. Measurement are made polarized in both the vertical and the horizontal positions with antenna.

3. Span shall wide enough to full capture the emission measured. The SA from 30MHz to 26.5GHz set to the low, Mid and High channels with the EUT transmit.

4. The SA setting following：

(1) Below 1G：RBW = 100kHz, VBW ≥ 3 RBW, Sweep = Auto, Detector = Peak, Trace = Max hold.

(2) Above 1G：

(2.1) For Peak measurement：RBW = 1MHz, VBW ≥ 3 RBW, Sweep = Auto, Detector = Peak, Trace = Max hold.

(2.2) For Average measurement：RBW = 1MHz, VBW

˙If Duty Cycle ≥ 98%, VBW=10Hz.

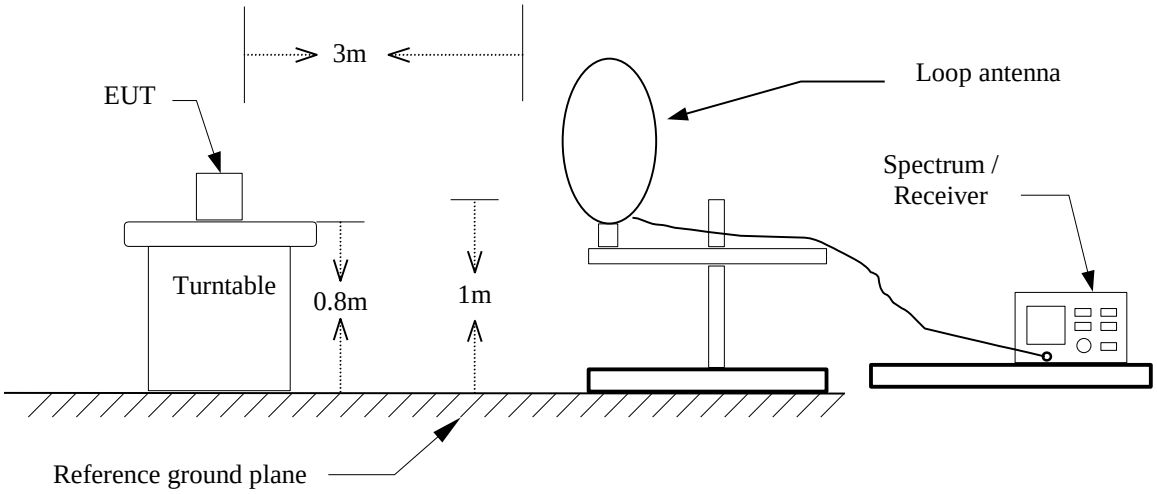
˙If Duty Cycle < 98%, VBW≥1/T.

Configuration	Duty Cycle (%)	T(μs)	1/T (kHz)	VBW
BLE	72.13 %	440	2.272	3kHz

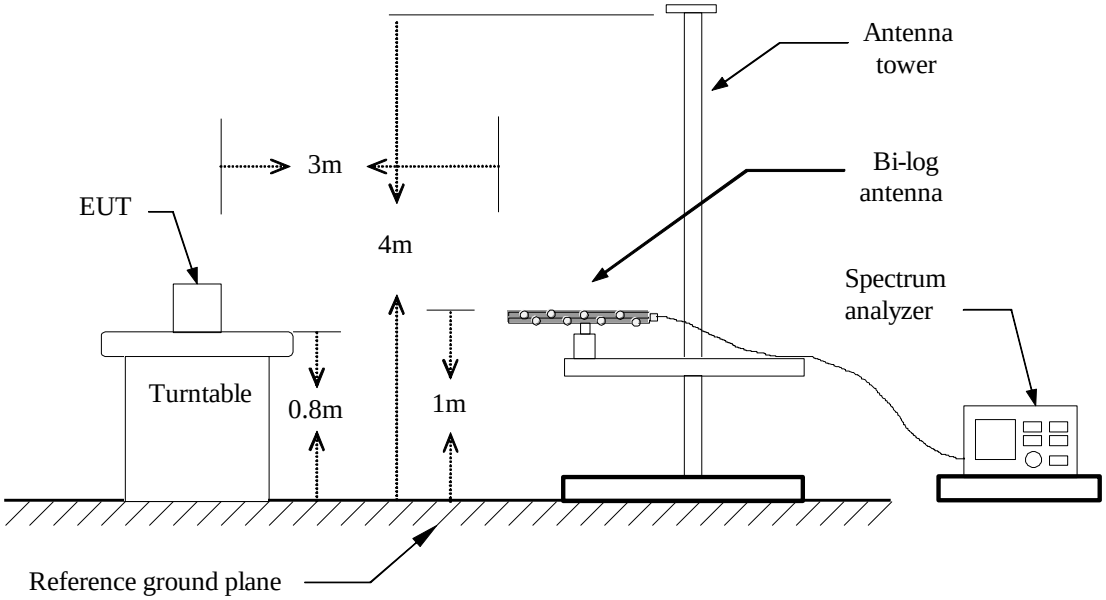
This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

4.6.3 Test Setup

9kHz ~ 30MHz

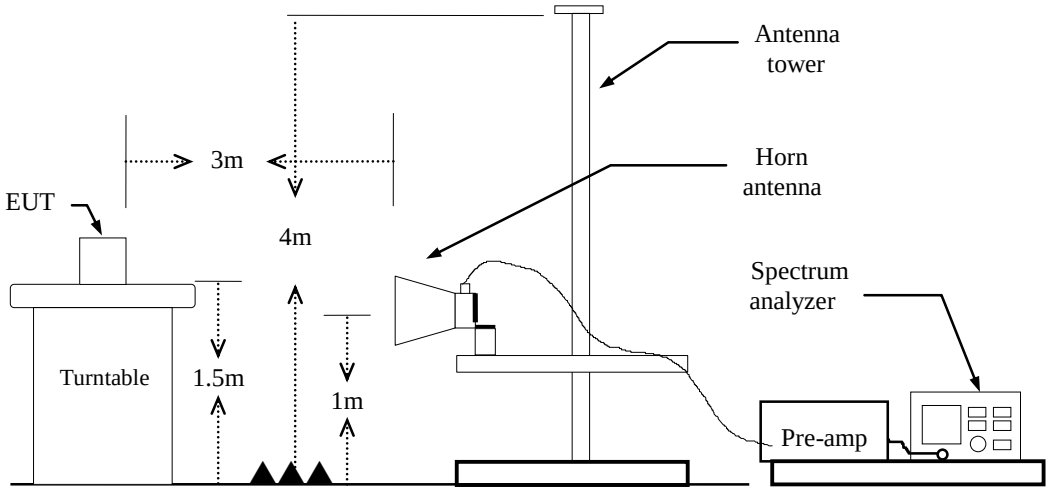


30MHz ~ 1GHz



This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

Above 1 GHz

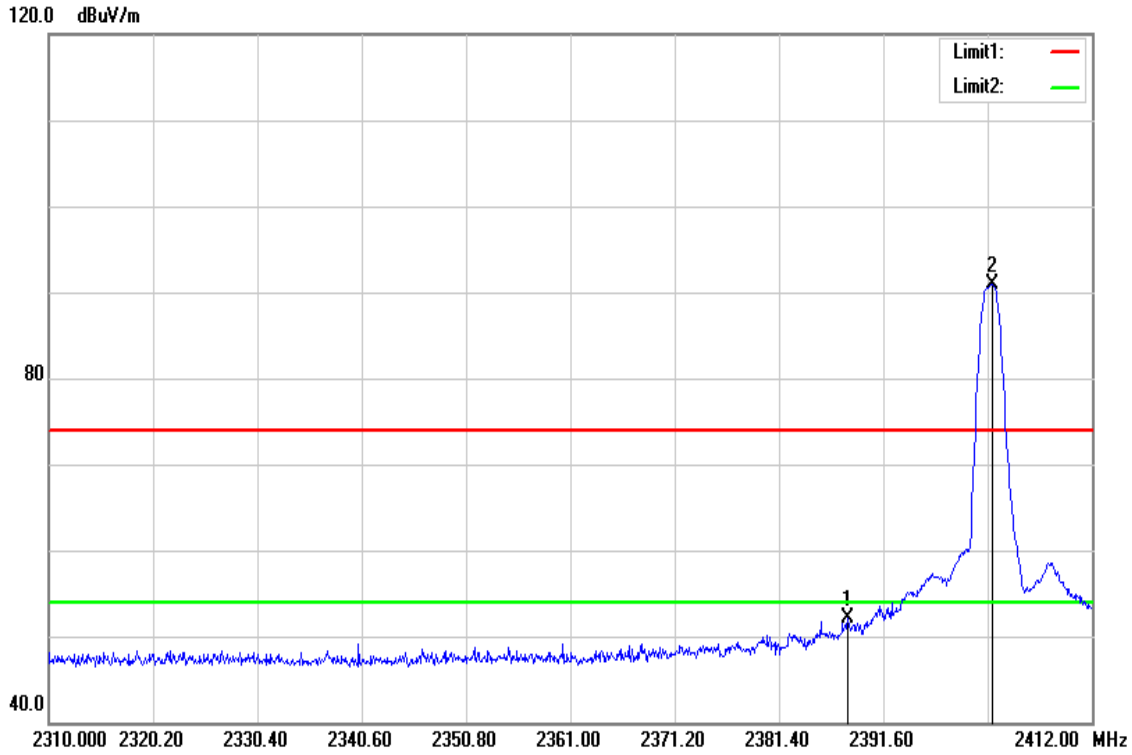


This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

4.6.4 Test Result

Band Edge Test Data

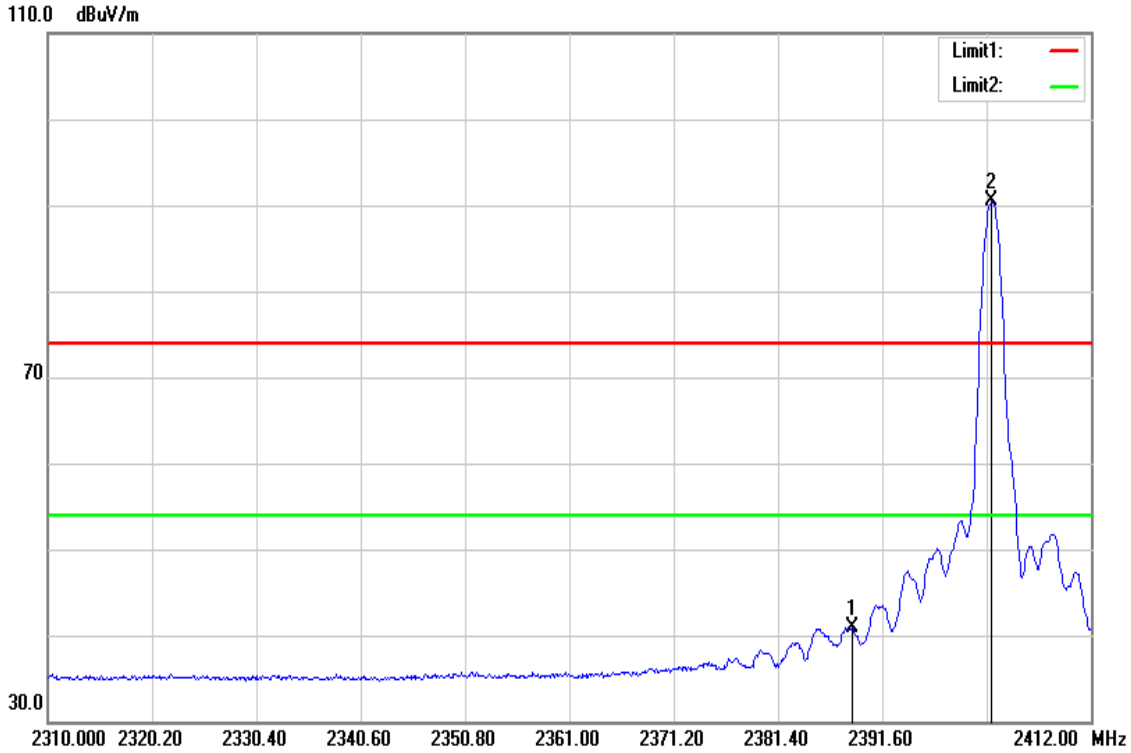
Test Mode:	BLE Low CH	Temp/Hum	27(℃)/ 53%RH
Test Item	Band Edge	Test Date	March 16, 2017
Polarize	Horizontal	Test Engineer	Ed Chiang
Detector	Peak		



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2388.132	54.52	-2.51	52.01	74.00	-21.99	peak
2402.310	93.37	-2.41	90.96	-	-	peak

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

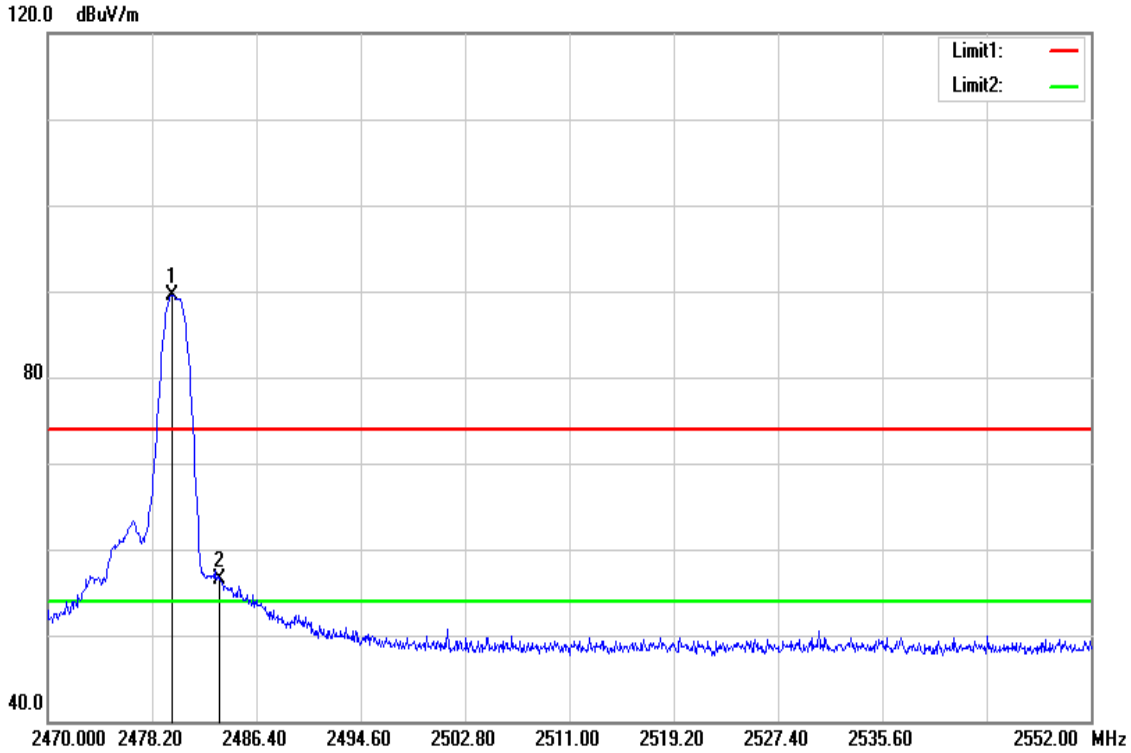
Test Mode:	BLE Low CH	Temp/Hum	27(℃)/ 53%RH
Test Item	Band Edge	Test Date	March 16, 2017
Polarize	Horizontal	Test Engineer	Ed Chiang
Detector	Average		



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2388.642	43.32	-2.50	40.82	54.00	-13.18	AVG
2402.310	92.83	-2.41	90.42	-	-	AVG

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

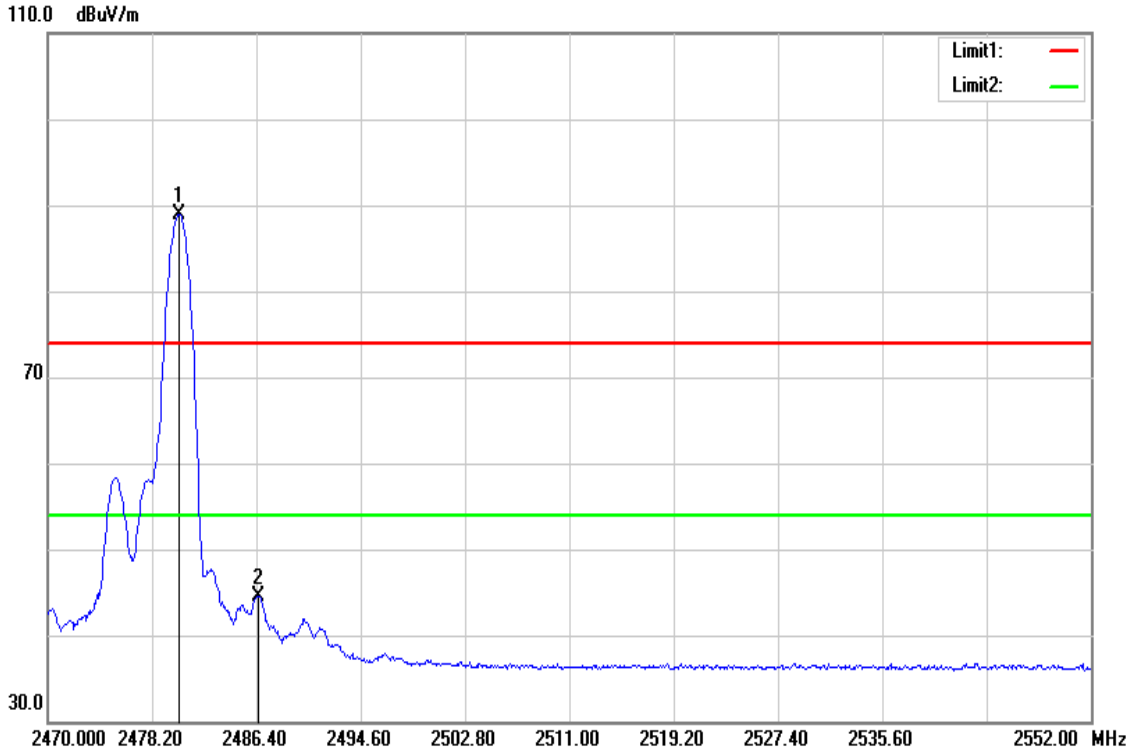
Test Mode:	BLE High CH	Temp/Hum	27(℃)/ 53%RH
Test Item	Band Edge	Test Date	March 16, 2017
Polarize	Horizontal	Test Engineer	Ed Chiang
Detector	Peak		



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2479.758	91.62	-2.03	89.59	-	-	peak
2483.500	58.59	-1.99	56.60	74.00	-17.40	peak

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

Test Mode:	BLE High CH	Temp/Hum	27(℃)/ 53%RH
Test Item	Band Edge	Test Date	March 16, 2017
Polarize	Horizontal	Test Engineer	Ed Chiang
Detector	Average		

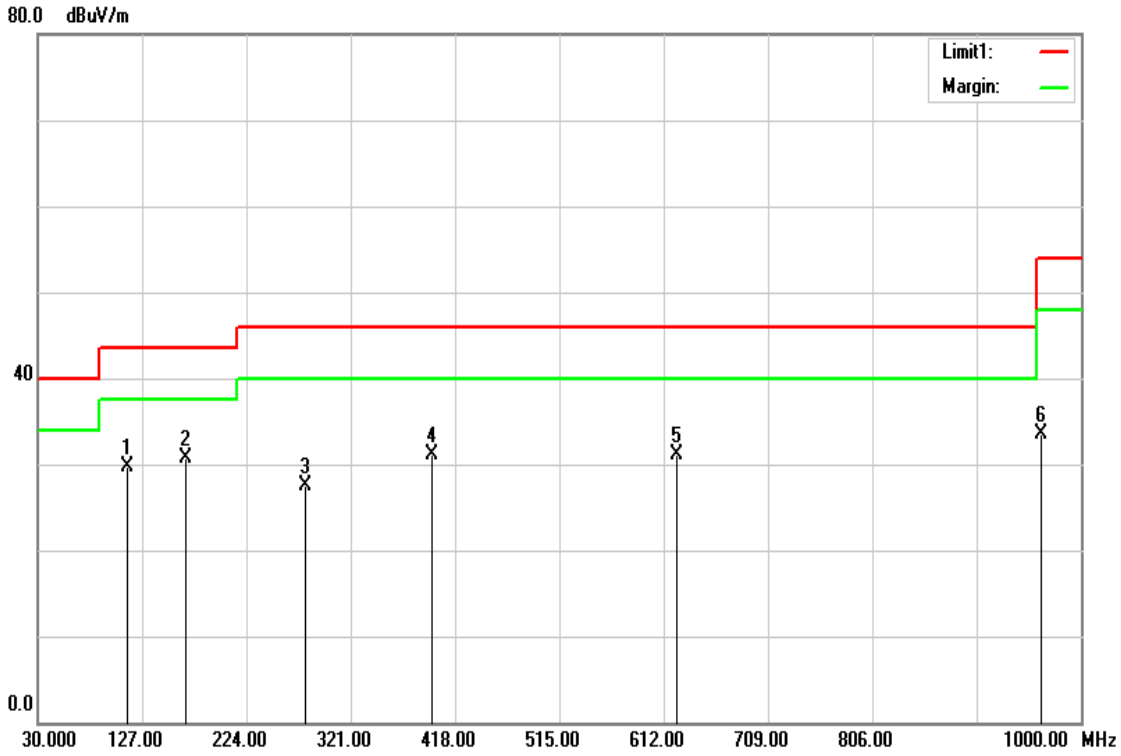


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2480.332	90.88	-2.03	88.85	-	-	AVG
2486.564	46.42	-1.96	44.46	54.00	-9.54	AVG

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

Below 1G Test Data

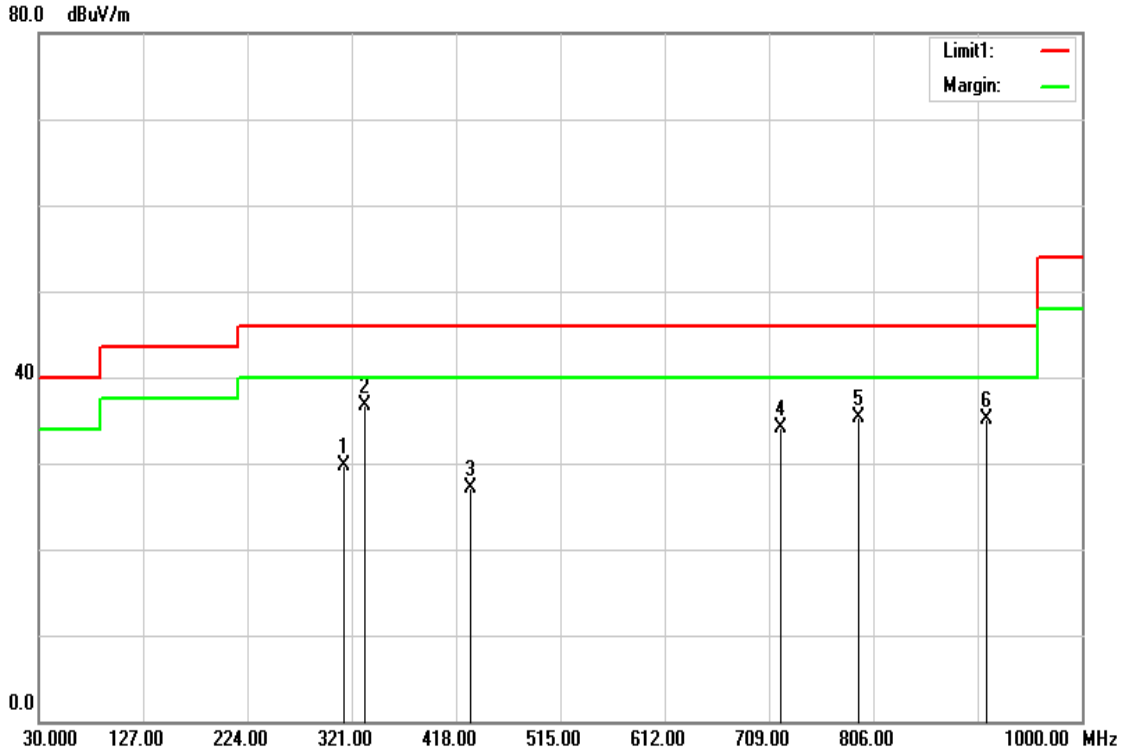
Test Mode:	BLE Mode	Temp/Hum	27(℃)/ 53%RH
Test Item	30MHz-1GHz	Test Date	March 16, 2017
Polarize	Vertical	Test Engineer	Ed Chiang
Detector	Peak and Qusi-peak		



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
113.4200	46.32	-16.66	29.66	43.50	-13.84	peak
167.7400	47.54	-16.74	30.80	43.50	-12.70	peak
279.2900	42.05	-14.63	27.42	46.00	-18.58	peak
396.6600	42.95	-11.78	31.17	46.00	-14.83	peak
623.6400	38.22	-7.20	31.02	46.00	-14.98	peak
963.1400	35.77	-2.18	33.59	54.00	-20.41	peak

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

Test Mode:	BLE Mode	Temp/Hum	27(℃)/ 53%RH
Test Item	30MHz-1GHz	Test Date	March 16, 2017
Polarize	Horizontal	Test Engineer	Ed Chiang
Detector	Peak and Qusi-peak		

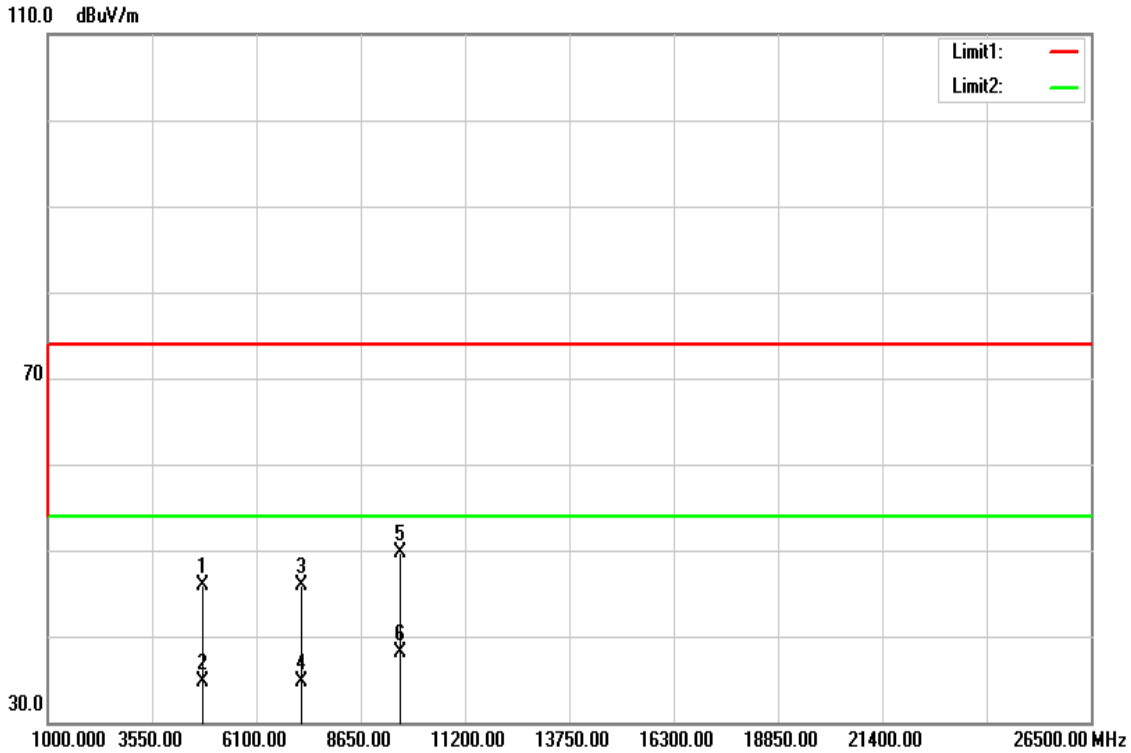


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
313.2400	43.58	-13.88	29.70	46.00	-16.30	peak
333.6100	49.97	-13.33	36.64	46.00	-9.36	peak
431.5800	37.84	-10.75	27.09	46.00	-18.91	peak
719.6700	39.77	-5.62	34.15	46.00	-11.85	peak
792.4200	39.90	-4.56	35.34	46.00	-10.66	peak
911.7300	38.10	-3.00	35.10	46.00	-10.90	peak

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

Above 1G Test Data

Test Mode:	BLE Low CH	Temp/Hum	27(℃)/ 53%RH
Test Item	Harmonic	Test Date	March 16, 2017
Polarize	Vertical	Test Engineer	Ed Chiang
Detector	Peak and Average		



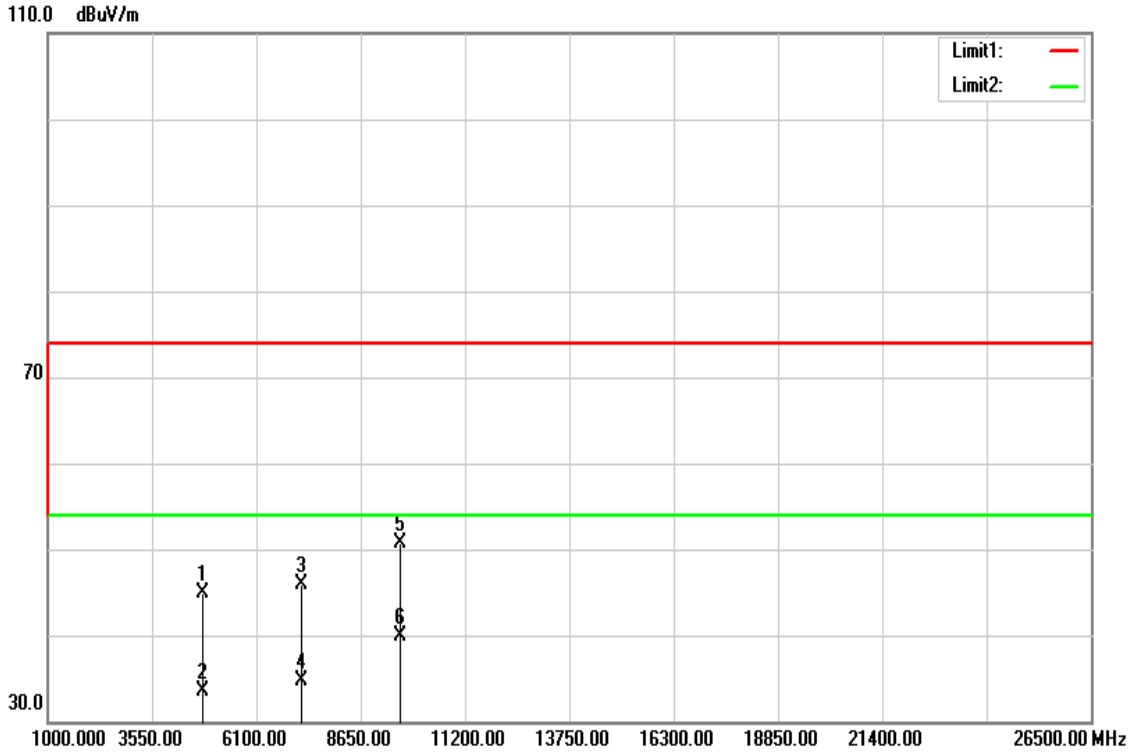
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4806.000	40.81	5.05	45.86	74.00	-28.14	peak
4806.000	29.60	5.05	34.65	54.00	-19.35	AVG
7206.000	33.31	12.62	45.93	74.00	-28.07	peak
7206.000	22.15	12.62	34.77	54.00	-19.23	AVG
9608.000	32.04	17.60	49.64	74.00	-24.36	peak
9608.000	20.55	17.60	38.15	54.00	-15.85	AVG

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit*

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

Test Mode:	BLE Low CH	Temp/Hum	27(℃)/ 53%RH
Test Item	Harmonic	Test Date	March 16, 2017
Polarize	Horizontal	Test Engineer	Ed Chiang
Detector	Peak and Average		



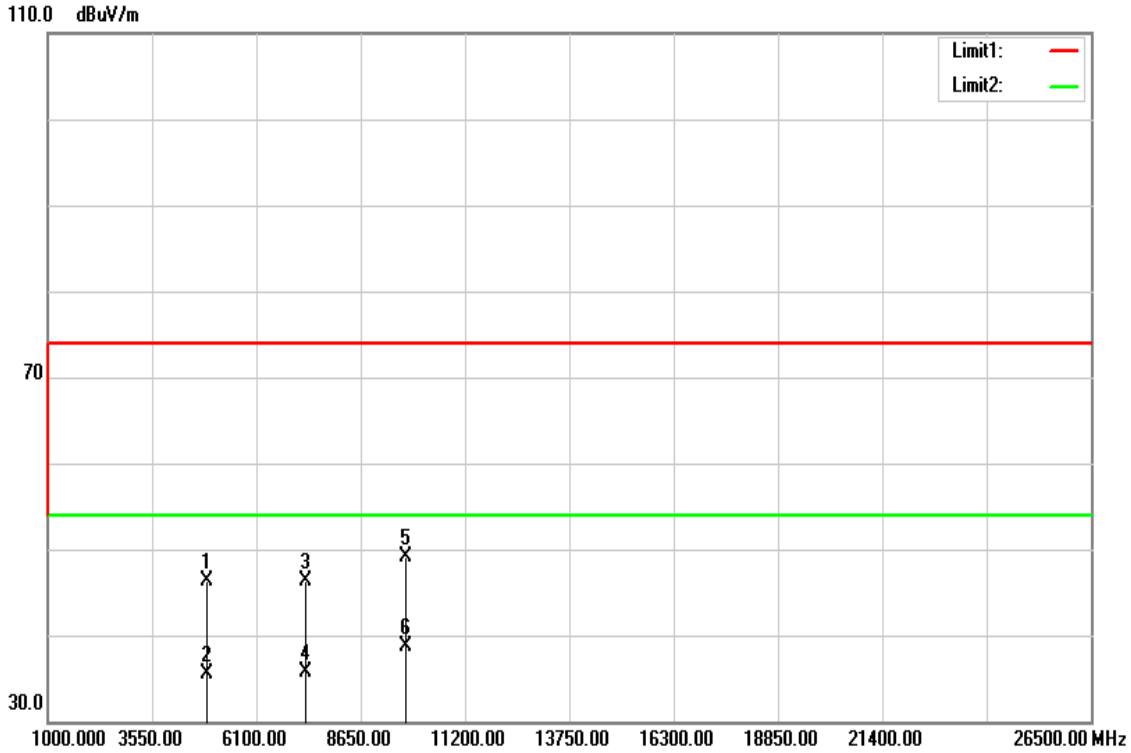
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4804.000	39.94	5.04	44.98	74.00	-29.02	peak
4804.000	28.44	5.04	33.48	54.00	-20.52	AVG
7206.000	33.33	12.62	45.95	74.00	-28.05	peak
7206.000	22.09	12.62	34.71	54.00	-19.29	AVG
9608.000	33.09	17.60	50.69	74.00	-23.31	peak
9608.000	22.24	17.60	39.84	54.00	-14.16	AVG

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit*

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

Test Mode:	BLE Mid CH	Temp/Hum	27(℃)/ 53%RH
Test Item	Harmonic	Test Date	March 16, 2017
Polarize	Vertical	Test Engineer	Ed Chiang
Detector	Peak and Average		



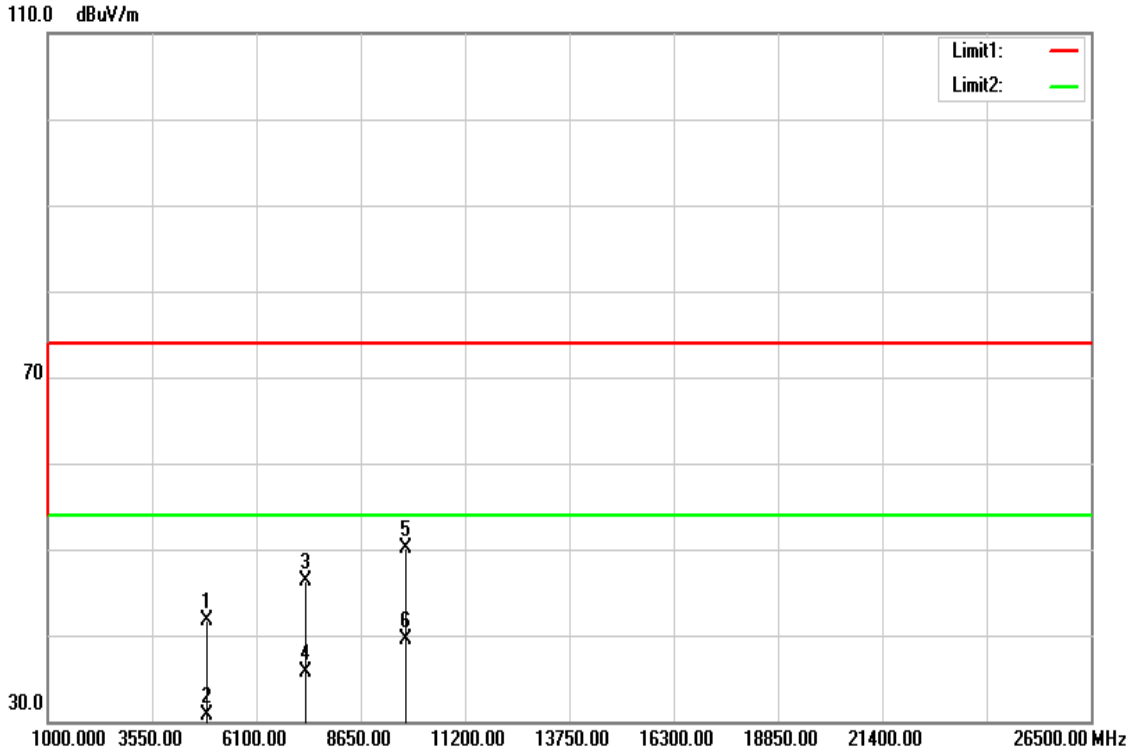
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4880.000	41.11	5.25	46.36	74.00	-27.64	peak
4880.000	30.16	5.25	35.41	54.00	-18.59	AVG
7320.000	33.33	12.97	46.30	74.00	-27.70	peak
7320.000	22.65	12.97	35.62	54.00	-18.38	AVG
9760.000	31.42	17.60	49.02	74.00	-24.98	peak
9760.000	21.14	17.60	38.74	54.00	-15.26	AVG

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit*

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

Test Mode:	BLE Mid CH	Temp/Hum	27(℃)/ 53%RH
Test Item	Harmonic	Test Date	March 16, 2017
Polarize	Horizontal	Test Engineer	Ed Chiang
Detector	Peak and Average		



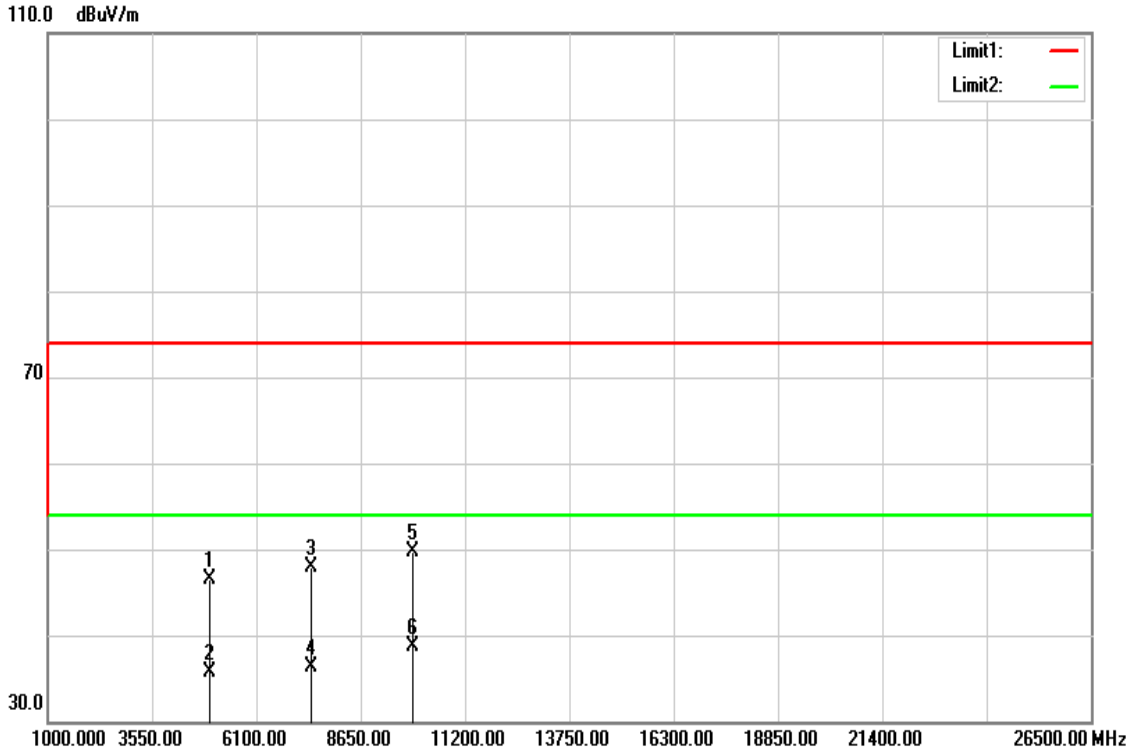
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4880.000	36.36	5.25	41.61	74.00	-32.39	peak
4880.000	25.49	5.25	30.74	54.00	-23.26	AVG
7320.000	33.33	12.97	46.30	74.00	-27.70	peak
7320.000	22.65	12.97	35.62	54.00	-18.38	AVG
9760.000	32.55	17.60	50.15	74.00	-23.85	peak
9760.000	21.98	17.60	39.58	54.00	-14.42	AVG

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit*

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

Test Mode:	BLE High CH	Temp/Hum	27(℃)/ 53%RH
Test Item	Harmonic	Test Date	March 16, 2017
Polarize	Vertical	Test Engineer	Ed Chiang
Detector	Peak and Average		



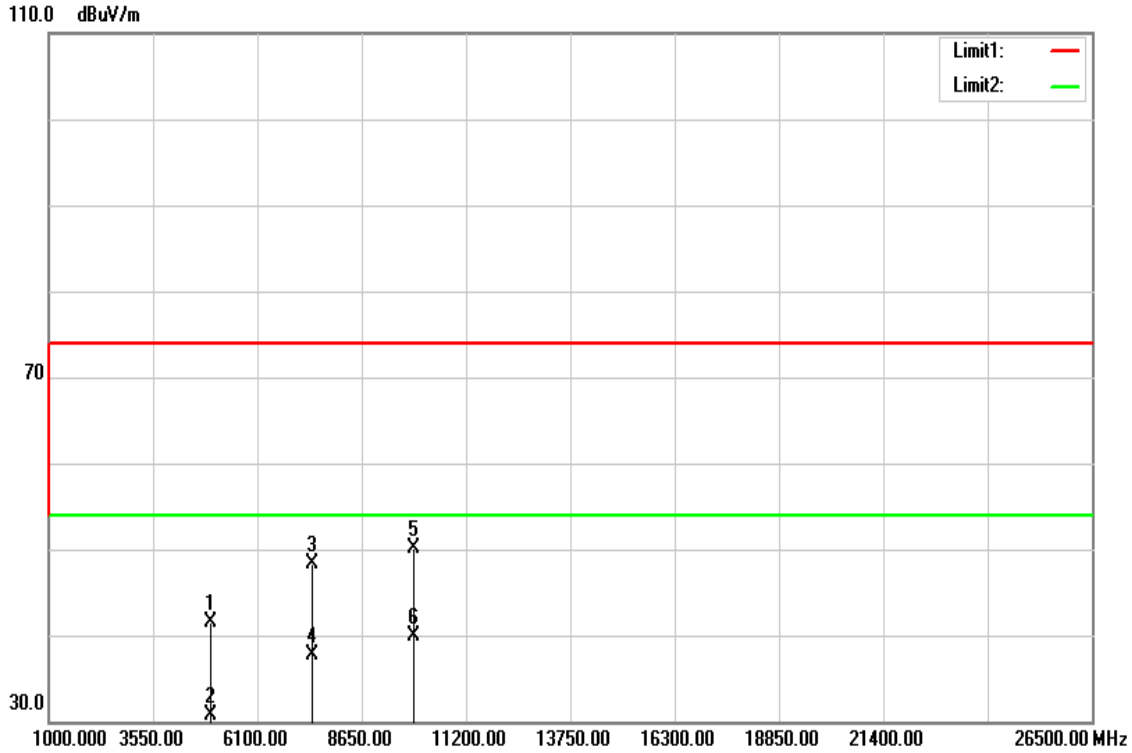
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4960.000	41.01	5.46	46.47	74.00	-27.53	peak
4960.000	30.30	5.46	35.76	54.00	-18.24	AVG
7440.000	34.54	13.33	47.87	74.00	-26.13	peak
7440.000	22.91	13.33	36.24	54.00	-17.76	AVG
9920.000	32.14	17.60	49.74	74.00	-24.26	peak
9920.000	21.01	17.60	38.61	54.00	-15.39	AVG

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit*

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.

Test Mode:	BLE High CH	Temp/Hum	27(℃)/ 53%RH
Test Item	Harmonic	Test Date	March 16, 2017
Polarize	Horizontal	Test Engineer	Ed Chiang
Detector	Peak and Average		



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4960.000	36.07	5.46	41.53	74.00	-32.47	peak
4960.000	25.28	5.46	30.74	54.00	-23.26	AVG
7440.000	34.98	13.33	48.31	74.00	-25.69	peak
7440.000	24.29	13.33	37.62	54.00	-16.38	AVG
9920.000	32.58	17.60	50.18	74.00	-23.82	peak
9920.000	22.28	17.60	39.88	54.00	-14.12	AVG

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit*

This report shall not be reproduced except in full, without the written approval of Compliance Certification Services.