

RADIO TEST REPORT

FCC 47 CFR PART 15 SUBPART C

INDUSTRY CANADA RSS-247

Test Standard	FCC Part 15.247 RSS-247 issue 2 and RSS-GEN issue 5
Product name	Bluetooth headset
Brand Name	plantronics
Model No.	V4320, V4310
Test Result	Pass
Statements of Conformity	Determination of compliance is based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

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 Compliance Certification Services Inc. (Wugu Laboratory)

Approved by:



Kevin Tsai
Deputy Manager

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

除非另有說明，此報告結果僅對測試之樣品負責，同時此樣品僅保留90天。本報告未經本公司書面許可，不可部份複製。

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Rev.: 01

Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	June 18, 2021	Initial Issue	ALL	Doris Chu
01	June 28, 2021	See the following Note Rev. (01)	P. A-1	Doris Chu

Rev. (01)

1. Revised above 1GHz setup photo.

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APPENDIX 1 - PHOTOGRAPHS OF EUT		

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1. GENERAL INFORMATION

1.1 EUT INFORMATION

Applicant	FCC: Plantronics Inc 345 Encinal Street Santa Cruz, CA 95060 USA IC: PLANTRONICS INC 345 Encinal Street, Santa Cruz CA 95060 United States Of America(Excluding The States Of Alaska
Manufacturer	FCC: Plantronics Inc 345 Encinal Street Santa Cruz, CA 95060 USA IC: PLANTRONICS INC 345 Encinal Street, Santa Cruz CA 95060 United States Of America(Excluding The States Of Alaska
Equipment	Bluetooth headset
Model No.	V4320, V4310
Model Discrepancy	Basic model V4320: Stereo Headset Multi model V4310: Mono Headset (One speaker connected only) Battery size different but rating and capacity is the same
Trade Name	plantronics
Received Date	April 15, 2021
Date of Test	May 3 ~ 6, 2021
Power Supply	1. Power via USB cable. 2. Power from Battery. Rating: 3.7Vdc, 360mAh
HW Version	VB2.2
SW Version	V200_600
EUT Serial #	FJ01E4

Remark:

1. For more details, refer to the User's manual of the EUT.
2. Disclaimer: Antenna information is provided by the applicant, test results of this report are applicable to the sample EUT received.
3. Disclaimer: Variant information between/among model numbers / trademarks is provided by the applicant, test results of this report are applicable to the sample EUT received of main test model name.

1.2 EUT CHANNEL INFORMATION

Frequency Range	2402MHz-2480MHz
Modulation Type	GFSK for BLE 1 Mbps & 2 Mbps
Number of channels	40 Channels

Remark:

Refer as ANSI C63.10: 2013 clause 5.6.1 Table 4 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	Printed Antenna
Antenna Gain	Model: V4320 (Worst) Gain: 2.26 dBi Model: V4310 Gain: 2.15 dBi
Antenna Connector	N/A

1.4 MEASUREMENT UNCERTAINTY

PARAMETER	UNCERTAINTY
AC Powerline Conducted Emission	+/- 1.2575
Emission bandwidth, 20dB bandwidth	+/- 0.0014
RF output power, conducted	+/- 1.14
Power density, conducted	+/- 1.40
3M Semi Anechoic Chamber / 30M~200M	+/- 4.12
3M Semi Anechoic Chamber / 200M~1000M	+/- 4.68
3M Semi Anechoic Chamber / 1G~8G	+/- 5.18
3M Semi Anechoic Chamber / 8G~18G	+/- 5.47
3M Semi Anechoic Chamber / 18G~26G	+/- 3.81
3M Semi Anechoic Chamber / 26G~40G	+/- 3.87

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.

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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, Taiwan. (R.O.C.)

CAB identifier: TW1309

Test site	Test Engineer	Remark
AC Conduction Room	Jack Chen	-
Radiation	Ray Li	-
RF Conducted	Lance Chen	-

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
Coaxial Cable	Woken	WC12	CC003	06/29/2020	06/28/2021
Coaxial Cable	Woken	WC12	CC001	06/29/2020	06/28/2021
Signal Analyzer	R&S	FSV 40	101073	09/17/2020	09/16/2021
Power Meter	Anritsu	ML2495A	1149001	N.C.R	N.C.R
Power Seneor	Anritsu	MA2491A	030982	N.C.R	N.C.R
Software	N/A				

Conducted Emission Room					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
CABLE	EMCI	CFD300-NL	CERF	06/29/2020	06/28/2021
EMI Test Receiver	R&S	ESCI	100064	07/17/2020	07/16/2021
LISN	SCHAFFNER	NNB 41	03/10013	02/02/2021	02/01/2022
Software	EZ-EMC(CCS-3A1-CE)				

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

2. N.C.R. = No Calibration Required.

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3M 966 Chamber Test Site					
Equipment	Manufacturer	Model	S/N	Cal Date	Cal Due
Band Reject Filters	MICRO TRONICS	BRM 50702	120	02/08/2021	02/07/2022
Bilog Antenna	Sunol Sciences	JB3	A030105	07/24/2020	07/23/2021
Horn Antenna	ETS LINDGREN	3116	00026370	12/11/2020	12/10/2021
Coaxial Cable	HUBER SUHNER	SUCOFLEX 104PEA	20995	02/24/2021	02/23/2022
Coaxial Cable	EMCI	EMC105	190914+327109/4	09/19/2020	09/18/2021
K Type Cable	Huber+Suhner	SUCOFLEX 102	29406/2	12/09/2020	12/08/2021
K Type Cable	Huber+Suhner	SUCOFLEX 102	22470/2	12/09/2020	12/08/2021
Digital Thermo-Hygro Meter	WISEWIND	1206	D07	01/06/2021	01/05/2022
double Ridged Guide Horn Antenna	ETC	MCTD 1209	DRH13M02003	09/30/2020	09/29/2021
Loop Ant	COM-POWER	AL-130	121051	04/07/2021	04/06/2022
Pre-Amplifier	EMEC	EM330	060609	02/24/2021	02/23/2022
Pre-Amplifier	HP	8449B	3008A00965	12/25/2020	12/24/2021
Pre-Amplifier	MITEQ	AMF-6F-18004000-37-8P	985646	09/02/2020	09/01/2021
PSA Series Spectrum Analyzer	Agilent	E4446A	MY46180323	07/24/2020	07/23/2021
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	e3 6.11-20180413				

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



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1.7 SUPPORT AND EUT ACCESSORIES EQUIPMENT

EUT Accessories Equipment					
No.	Equipment	Brand	Model	Series No.	FCC ID
1	USB-A to C cable	Poly/Plantronics	207488-07	N/A	N/A
2	USB-C to C cable	Poly/plantronics	207488-08	N/A	N/A
3	Charging Stand	Poly/plantronics	214183-01	N/A	N/A
4	Charging Stand	Poly/plantronics	214183-02	N/A	N/A
5	Bluetooth USB adapter	poly	BT700	N/A	N/A
6	Bluetooth USB adapter	poly	BT700C	N/A	N/A

Support Equipment					
No.	Equipment	Brand	Model	Series No.	FCC ID
1	PC	HP	HP Compag d530 CMT	N/A	DoC

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, RSS-247 Issue 2 and RSS-GEN Issue 5

2. TEST SUMMARY

FCC Standard Section	IC Standard Section	Report Section	Test Item	Result
15.203	-	1.3	Antenna Requirement	Pass
15.207(a)	RSS-GEN 8.8	4.1	AC Conducted Emission	Pass
15.247(a)(2)	RSS-247(5.2)(a)	4.2	6 dB Bandwidth	Pass
-	RSS-GEN 6.7	4.2	Occupied Bandwidth (99%)	Pass
15.247(b)(3)	RSS-247(5.4)(d)	4.3	Output Power Measurement	Pass
15.247(e)	RSS-247(5.2)(b)	4.4	Power Spectral Density	Pass
15.247(d)	RSS-247(5.5)	4.5	Conducted Band Edge	Pass
15.247(d)	RSS-247(5.5)	4.5	Conducted Spurious Emission	Pass
15.247(d)	RSS-GEN 8.9, 8.10	4.6	Radiation Band Edge	Pass
15.247(d)	RSS-GEN 8.9, 8.10	4.6	Radiation Spurious Emission	Pass



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3. DESCRIPTION OF TEST MODES

3.1 THE WORST MODE OF OPERATING CONDITION

Operation mode	BLE Mode (1Mbps) BLE Mode (2Mbps)
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.

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3.2 THE WORST MODE OF MEASUREMENT

AC Power Line Conducted Emission	
Test Condition	AC Power line conducted emission for line and neutral
Power supply Mode	Mode 1: EUT power by Host System (Type C to Type A) (Model: V4320) Mode 2: EUT power by Host System (Type C to Type A) (Model: V4310) Mode 3: EUT power by Host System (Type C to Type C) Mode 4: EUT power by Host System (Charging stand to Type A) Mode 5: EUT power by Host System (Charging stand to Type C)
Worst Mode	☒ Mode 1 ☐ Mode 2 ☐ Mode 3 ☐ Mode 4 ☐ Mode 5

Radiated Emission Measurement Above 1G	
Test Condition	Radiated Emission Above 1G
Power supply Mode	Mode 1: EUT power by Host System (Type C to Type A) (Model: V4320) Mode 2: EUT power by Host System (Type C to Type A) (Model: V4310) Mode 3: EUT power by Host System (Type C to Type C) Mode 4: EUT power by Host System (Charging stand to Type A) Mode 5: EUT power by Host System (Charging stand to Type C)
Worst Mode	☒ Mode 1 ☐ Mode 2 ☐ Mode 3 ☐ Mode 4 ☐ Mode 5
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)

Radiated Emission Measurement Below 1G	
Test Condition	Radiated Emission Below 1G
Power supply Mode	Mode 1: EUT power by Host System (Type C to Type A) (Model: V4320) Mode 2: EUT power by Host System (Type C to Type A) (Model: V4310) Mode 3: EUT power by Host System (Type C to Type C) Mode 4: EUT power by Host System (Charging stand to Type A) Mode 5: EUT power by Host System (Charging stand to Type C)
Worst Mode	☒ Mode 1 ☒ Mode 2 ☐ Mode 3 ☐ Mode 4 ☐ Mode 5

Remark:

1. The worst mode was record in this test report.
2. EUT pre-scanned in three axis ,X,Y, Z and two polarity, for radiated measurement. The worst case(Z-Plane) were recorded in this report
3. AC power line conducted emission and for below 1G radiation emission were performed the EUT transmit at the highest output power channel as worse case.

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3.3 EUT DUTY CYCLE

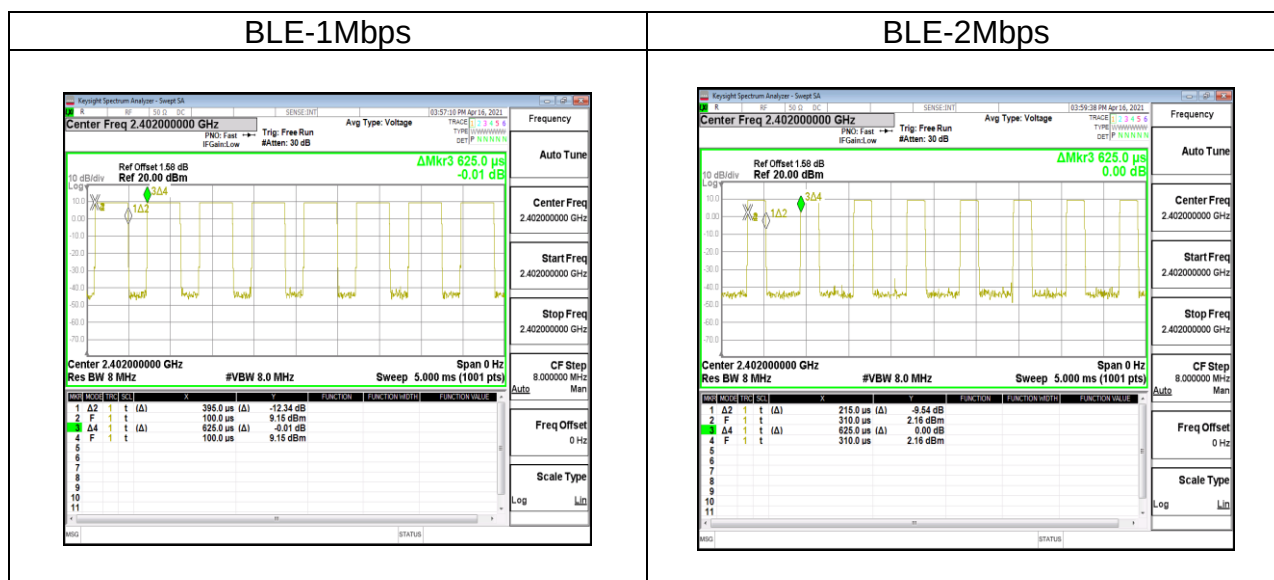
Temperature: 23.9 ~ 25.8°C

Humidity: 48.7 ~ 50.2% RH

Tested by: Lance Chen

Test date: May 5 ~ 6, 2021

Duty Cycle				
Configuration	Duty Cycle (%)	Duty Factor (dB)	1/T (kHz)	VBW Setting (kHz)
BLE-1Mbps	63.00	2.01	2.53	3.00
BLE-2Mbps	34.00	4.69	4.65	5.00



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4. TEST RESULT

4.1 AC POWER LINE CONDUCTED EMISSION

4.1.1 Test Limit

According to §15.207(a) and RSS-GEN section 8.8,

Frequency Range (MHz)	Limits(dB μ V)	
	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

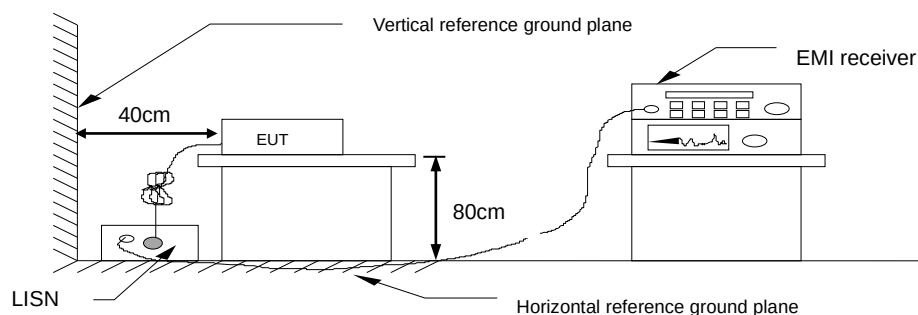
* Decreases with the logarithm of the frequency.

4.1.2 Test Procedure

Test method Refer as ANSI C63.10: 2013 clause 6.2,

1. The EUT was placed 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

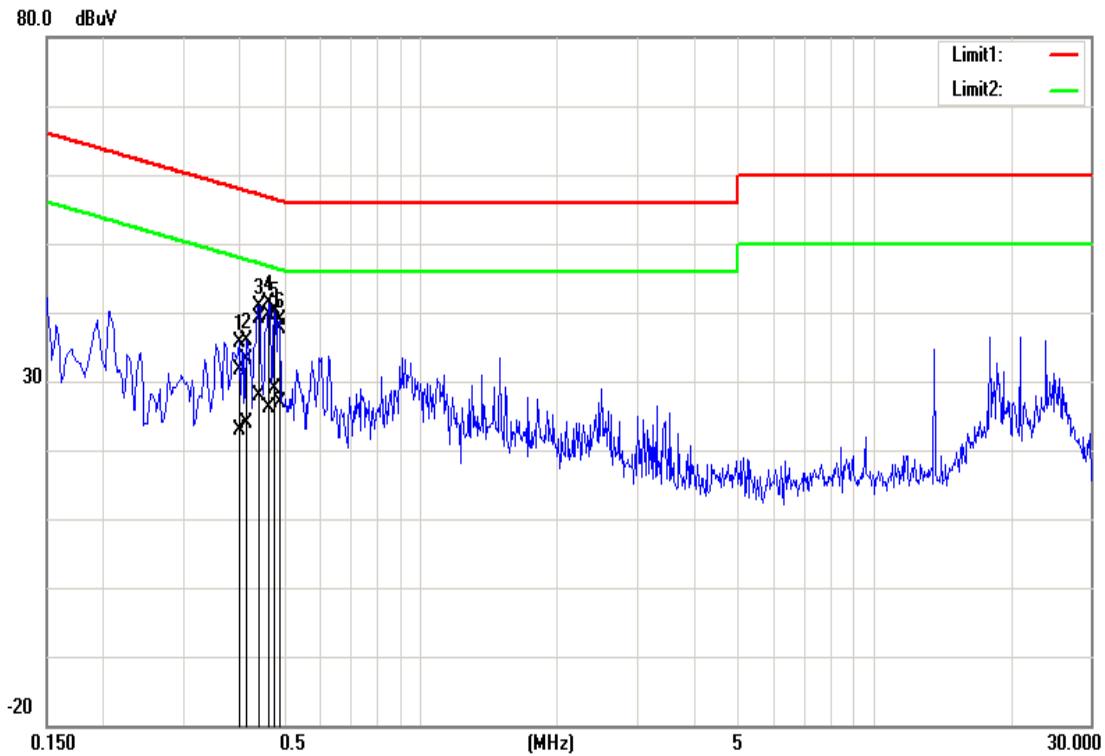


4.1.4 Test Result

PASS

Test Data

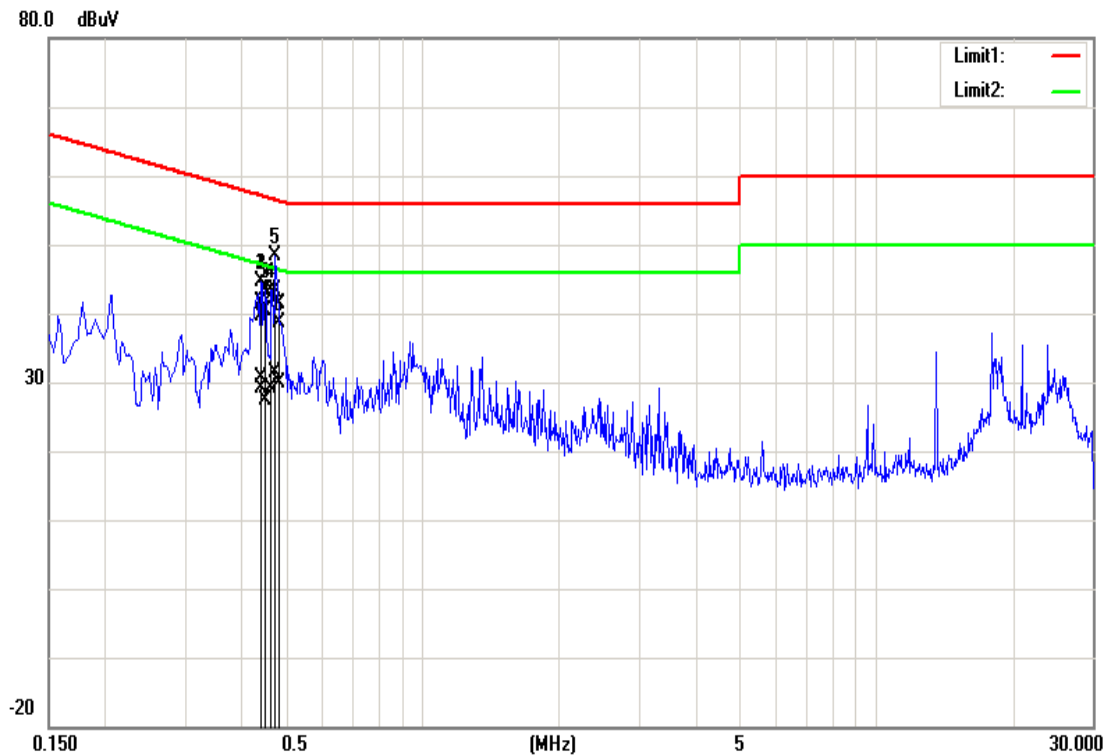
Test Mode:	Mode 1 BLE 1M	Temp/Hum	23.9(°C)/ 51%RH
Phase:	Line	Test Date	May 6, 2021
		Test Engineer	Jack Chen



Frequency (MHz)	Quasi Peak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	Quasi Peak result (dBuV)	Average result (dBuV)	Quasi Peak limit (dBuV)	Average limit (dBuV)	Quasi Peak margin (dB)	Average margin (dB)	Remark
0.3980	21.30	12.63	10.29	31.59	22.92	57.90	47.90	-26.31	-24.98	Pass
0.4140	22.80	13.64	10.29	33.09	23.93	57.57	47.57	-24.48	-23.64	Pass
0.4420	28.94	17.55	10.29	39.23	27.84	57.02	47.02	-17.79	-19.18	Pass
0.4660	29.40	15.91	10.29	39.69	26.20	56.58	46.58	-16.89	-20.38	Pass
0.4780	29.71	18.66	10.29	40.00	28.95	56.37	46.37	-16.37	-17.42	Pass
0.4900	27.33	16.65	10.29	37.62	26.94	56.17	46.17	-18.55	-19.23	Pass

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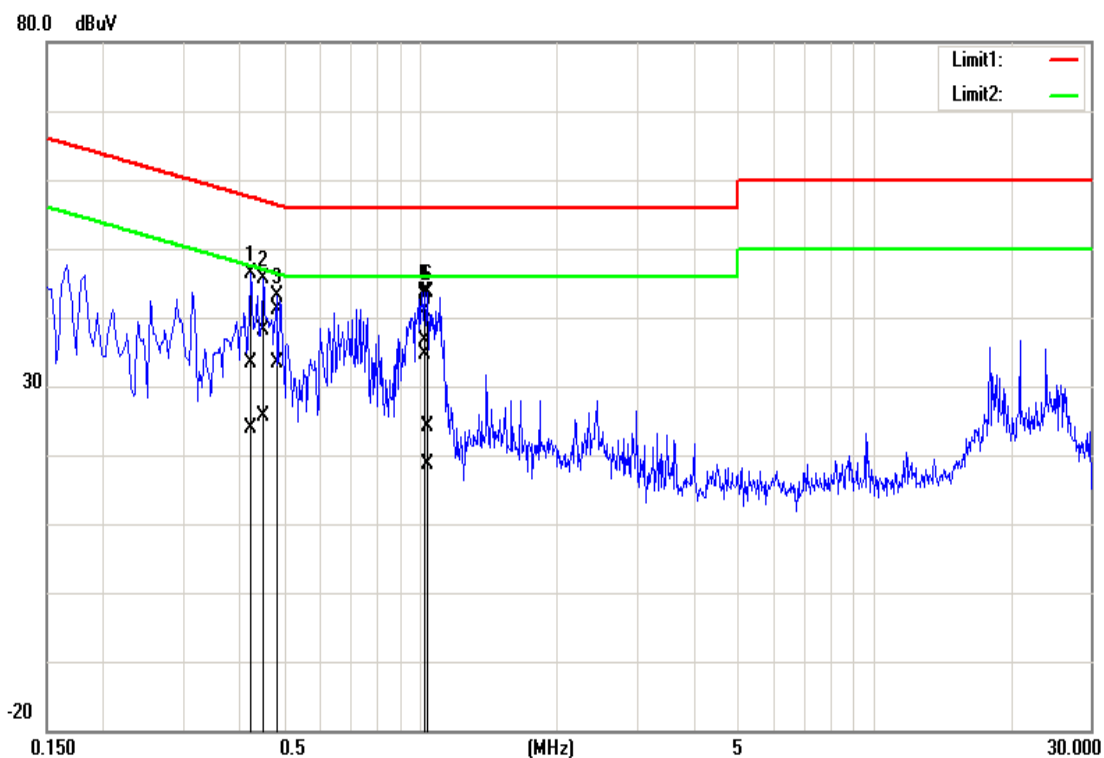
Test Mode:	Mode 1 BLE 1M	Temp/Hum	23.9(°C)/ 51%RH
Phase:	Neutral	Test Date	May 6, 2021
		Test Engineer	Jack Chen



Frequency (MHz)	Quasi Peak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	Quasi Peak result (dBuV)	Average result (dBuV)	Quasi Peak limit (dBuV)	Average limit (dBuV)	Quasi Peak margin (dB)	Average margin (dB)	Remark
0.4340	29.40	18.92	10.26	39.66	29.18	57.18	47.18	-17.52	-18.00	Pass
0.4420	31.43	20.34	10.26	41.69	30.60	57.02	47.02	-15.33	-16.42	Pass
0.4500	30.05	17.21	10.26	40.31	27.47	56.88	46.88	-16.57	-19.41	Pass
0.4660	32.13	18.89	10.26	42.39	29.15	56.58	46.58	-14.19	-17.43	Pass
0.4740	33.09	21.23	10.26	43.35	31.49	56.44	46.44	-13.09	-14.95	Pass
0.4860	31.10	19.64	10.26	41.36	29.90	56.24	46.24	-14.88	-16.34	Pass

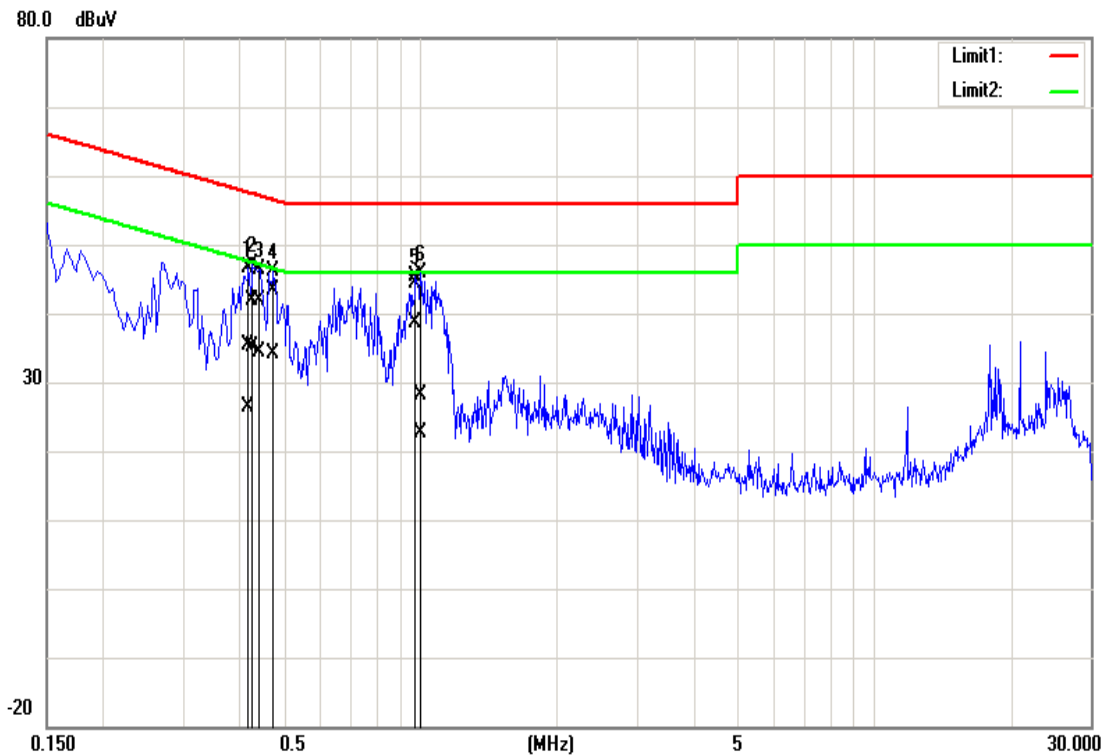
Report No.: T210415W01-RP2

Test Mode:	Mode 1 BLE 2M	Temp/Hum	23.9(°C)/ 51%RH
Phase:	Line	Test Date	May 6, 2021
		Test Engineer	Jack Chen



Frequency (MHz)	Quasi Peak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	Quasi Peak result (dBuV)	Average result (dBuV)	Quasi Peak limit (dBuV)	Average limit (dBuV)	Quasi Peak margin (dB)	Average margin (dB)	Remark
0.4220	23.14	13.47	10.29	33.43	23.76	57.41	47.41	-23.98	-23.65	Pass
0.4500	27.77	15.22	10.29	38.06	25.51	56.88	46.88	-18.82	-21.37	Pass
0.4820	30.90	23.09	10.29	41.19	33.38	56.30	46.30	-15.11	-12.92	Pass
1.0060	32.74	26.36	10.31	43.05	36.67	56.00	46.00	-12.95	-9.33	Pass
1.0220	30.51	24.41	10.31	40.82	34.72	56.00	46.00	-15.18	-11.28	Pass
1.0380	13.83	8.26	10.31	24.14	18.57	56.00	46.00	-31.86	-27.43	Pass

Test Mode:	Mode 1 BLE 2M	Temp/Hum	23.9(°C)/ 51%RH
Phase:	Neutral	Test Date	May 6, 2021
		Test Engineer	Jack Chen



Frequency (MHz)	Quasi Peak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	Quasi Peak result (dBuV)	Average result (dBuV)	Quasi Peak limit (dBuV)	Average limit (dBuV)	Quasi Peak margin (dB)	Average margin (dB)	Remark
0.4180	25.06	16.22	10.26	35.32	26.48	57.49	47.49	-22.17	-21.01	Pass
0.4260	31.72	24.80	10.26	41.98	35.06	57.33	47.33	-15.35	-12.27	Pass
0.4420	31.57	24.11	10.26	41.83	34.37	57.02	47.02	-15.19	-12.65	Pass
0.4740	33.07	23.85	10.26	43.33	34.11	56.44	46.44	-13.11	-12.33	Pass
0.9780	34.05	28.47	10.28	44.33	38.75	56.00	46.00	-11.67	-7.25	Pass
1.0020	17.76	12.34	10.28	28.04	22.62	56.00	46.00	-27.96	-23.38	Pass

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4.2 6dB BANDWIDTH AND OCCUPIED BANDWIDTH (99%)

4.2.1 Test Limit

According to §15.247(a)(2) and RSS-247 section 5.2(a)

6 dB Bandwidth :

Limit	Shall be at least 500kHz
-------	--------------------------

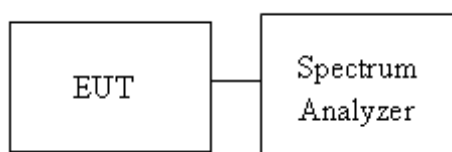
Occupied Bandwidth(99%) : For reporting purposes only.

4.2.2 Test Procedure

Test method Refer as ANSI C63.10: 2013,

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 6dB Bandwidth.
4. SA set RBW = 1% ~ 5% OBW, VBW = three times the RBW and Detector = Peak, to measurement 99% Bandwidth.
5. 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

Temperature: 23.9 ~ 25.8°C

Humidity: 48.7 ~ 50.2% RH

Tested by: Lance Chen

Test date: May 5 ~ 6, 2021

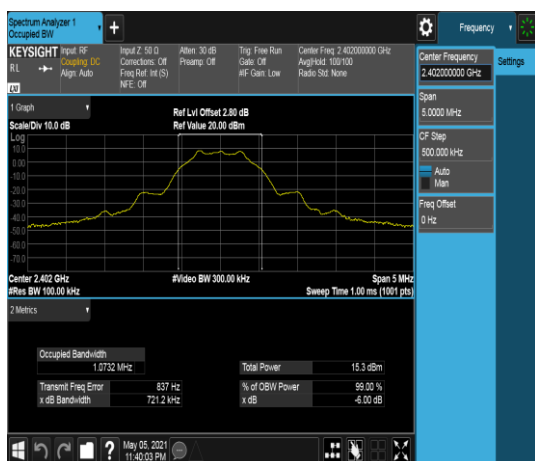
Test mode: BLE-1Mbps mode / 2402-2480 MHz				
Channel	Frequency (MHz)	OBW (99%) (MHz)	6dB BW (MHz)	6dB limit (kHz)
Low	2402	1.0398	0.7212	>500
Mid	2440	1.0371	0.7173	
High	2480	1.0352	0.7156	
Test mode: BLE-2Mbps mode / 2402-2480 MHz				
Low	2402	2.0464	1.2690	>500
Mid	2440	2.0448	1.2610	
High	2480	2.0421	1.2540	

Test Data

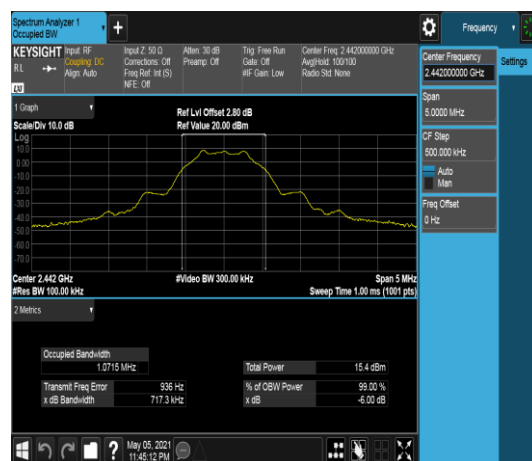
6dB BANDWIDTH

BLE-1Mbps mode

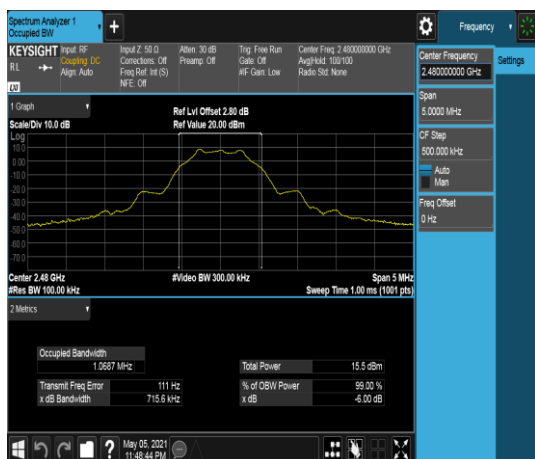
Low CH



Mid CH



High CH



BLE-2Mbps mode

Low CH



Mid CH

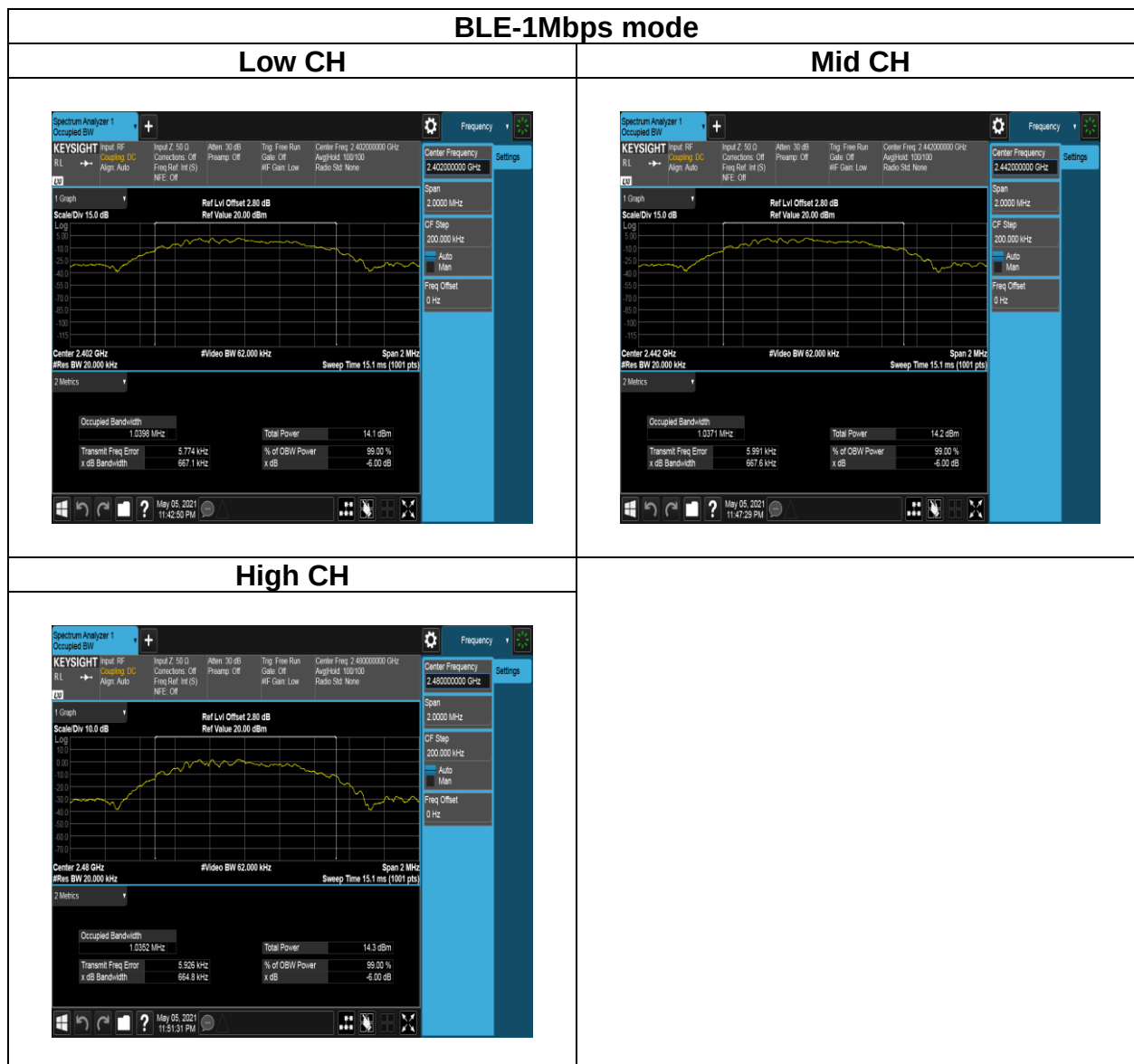


High CH



Test Data

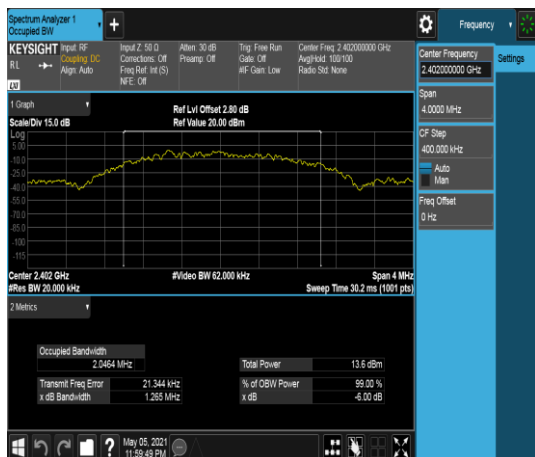
BANDWIDTH (99%)



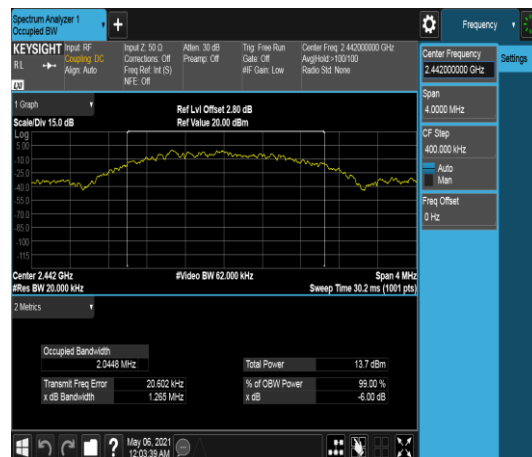
Report No.: T210415W01-RP2

BLE-2Mbps mode

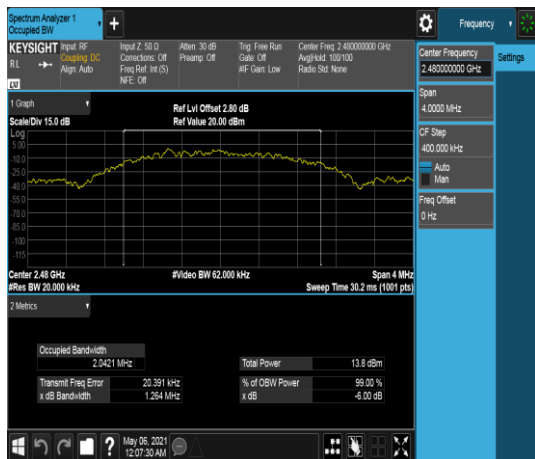
Low CH



Mid CH



High CH



4.3 OUTPUT POWER MEASUREMENT

4.3.1 Test Limit

According to §15.247(b)(3) and RSS-247 section 5.4(d)

Peak output power :

FCC

Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

IC

For DTSSs employing digital modulation techniques operating in the bands 902-928 MHz and 2400-2483.5 MHz, the maximum peak conducted output power shall not exceed 1 W. The e.i.r.p. shall not exceed 4 W, except as provided in section 5.4(e), 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
-------	---

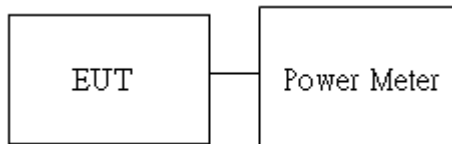
Average output power : For reporting purposes only.

4.3.2 Test Procedure

Test method Refer as ANSI C63.10:2013.

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



Report No.: T210415W01-RP2

4.3.4 Test Result

Temperature: 23.9 ~ 25.8°C

Humidity: 48.7 ~ 50.2% RH

Tested by: Lance Chen

Test date: May 5 ~ 6, 2021

Peak output power :

BLE Mode									
Config.	CH	Freq. (MHz)	Power Setting	PK Power (dBm)	EIRP PK Power (dBm)	PK Power (W)	EIRP PK Power (W)	FCC/IC Limit (dBm)	IC EIRP Limit (dBm)
BLE Data rate: 1Mbps	0	2402	default	7.1800	9.4400	0.0052	0.0088	30	36
	19	2440	default	8.5100	10.7700	0.0071	0.0119		
	39	2480	default	8.3000	10.5600	0.0068	0.0114		
BLE Data rate: 2Mbps	0	2402	default	8.6300	10.8900	0.0073	0.0123	30	36
	19	2440	default	8.6100	10.8700	0.0073	0.0122		
	39	2480	default	8.2900	10.5500	0.0067	0.0114		

Average output power :

BLE Mode				
Config.	CH	Freq. (MHz)	Power set	AV Power (dBm)
BLE Data rate: 1Mbps	0	2402	default	6.8766
	19	2440	default	8.4466
	39	2480	default	8.0766
BLE Data rate: 2Mbps	0	2402	default	8.4252
	19	2440	default	8.2452
	39	2480	default	7.8252

4.4 POWER SPECTRAL DENSITY

4.4.1 Test Limit

According to §15.247(e) and RSS-247 section 5.2(b)

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.

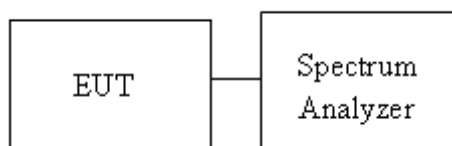
Limit	☒ Antenna not exceed 6 dBi : 8dBm ☐ Antenna with DG greater than 6 dBi [Limit = 8 – (DG – 6)] ☐ Point-to-point operation :
-------	---

4.4.2 Test Procedure

Test method Refer as ANSI C63.10:2013.

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 = 10kHz, 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

Temperature: 23.9 ~ 25.8°C

Humidity: 48.7 ~ 50.2% RH

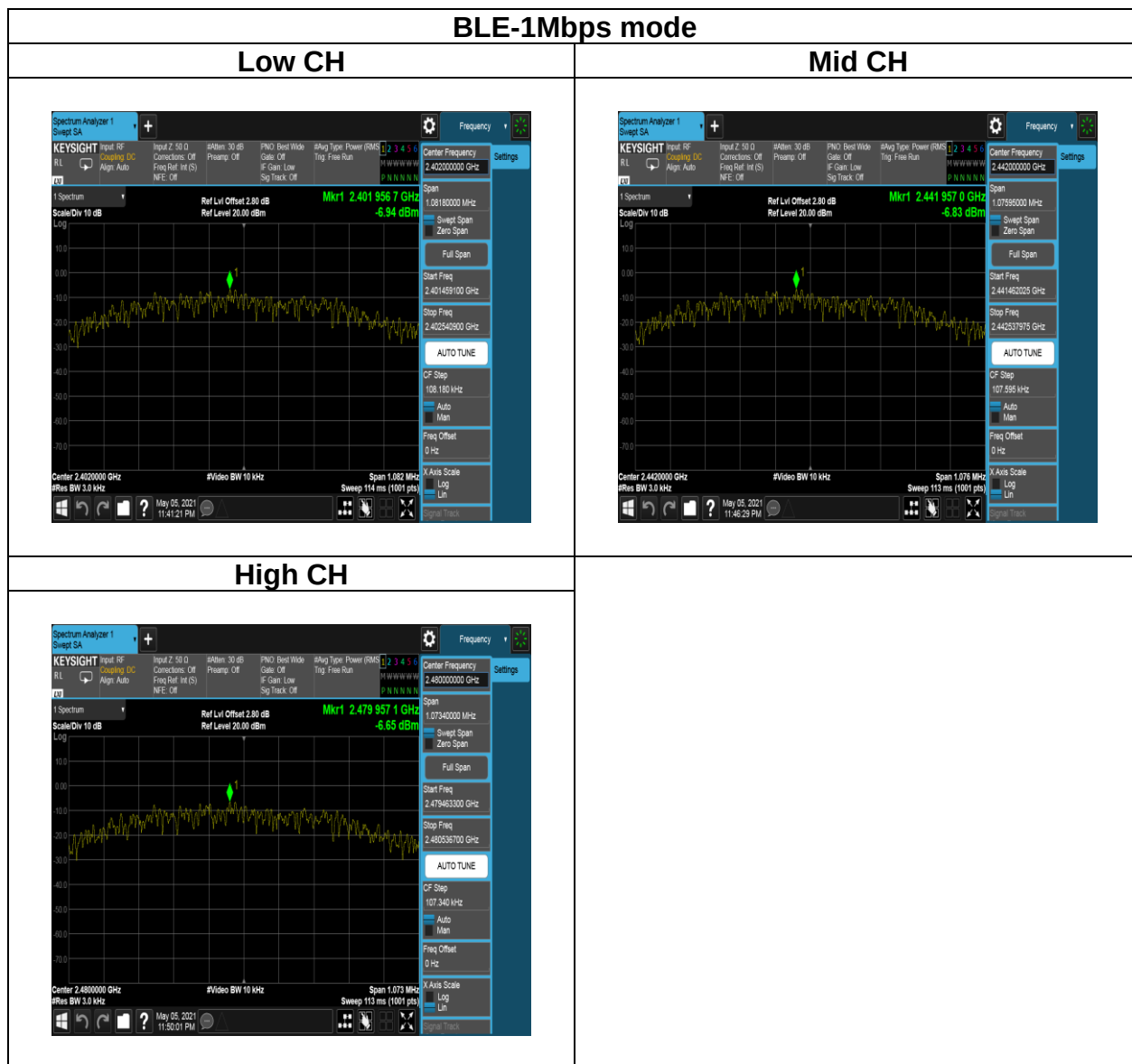
Tested by: Lance Chen

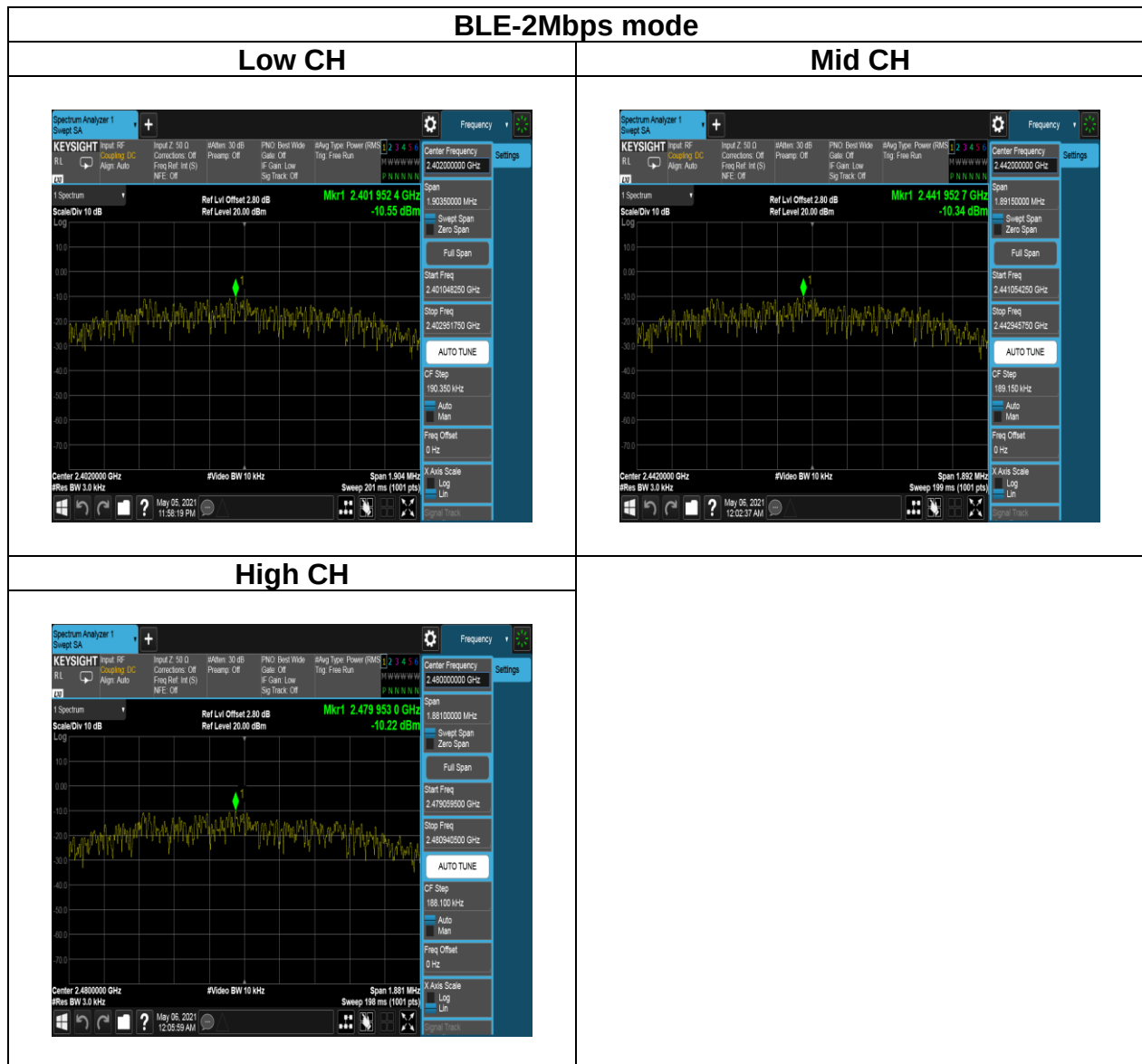
Test date: May 5 ~ 6, 2021

Test mode: BLE-1Mbps mode / 2402-2480 MHz			
Channel	Frequency (MHz)	PSD (dBm)	FCC limit (dBm)
Low	2402	-6.94	8
Mid	2440	-6.83	
High	2480	-6.65	

Test mode: BLE-2Mbps mode / 2402-2480 MHz			
Channel	Frequency (MHz)	PSD (dBm)	FCC limit (dBm)
Low	2402	-10.55	8
Mid	2440	-10.34	
High	2480	-10.22	

Test Data





4.5 CONDUCTED BAND EDGE AND SPURIOUS EMISSION

4.5.1 Test Limit

According to §15.247(d) and RSS-247 section 5.5

FCC: 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).

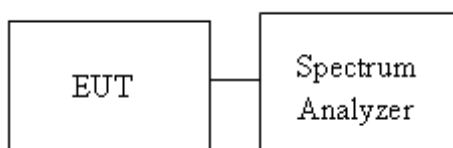
IC: In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under section 5.4(d), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

4.5.2 Test Procedure

Test method Refer as ANSI C63.10:2013.

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



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4.5.4 Test Result

Test Data

Temperature: 23.9 ~ 25.8°C

Humidity: 48.7 ~ 50.2% RH

Tested by: Lance Chen

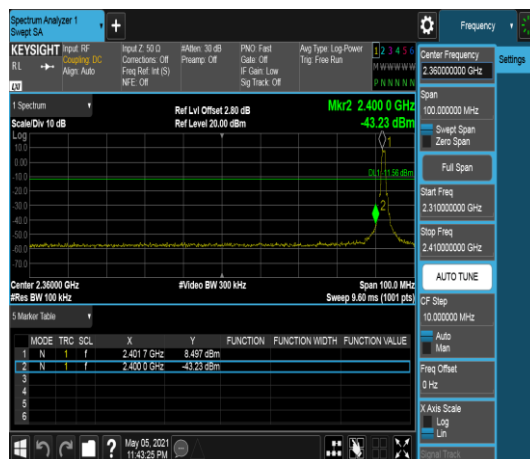
Test date: May 5 ~ 6, 2021

BLE-1Mbps mode Low CH

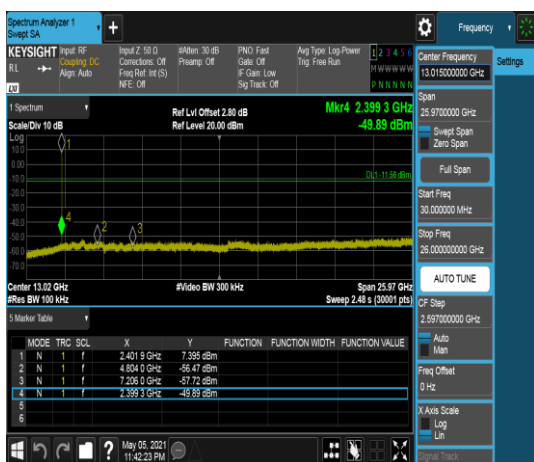
Reference Level of PSD in 100kHz

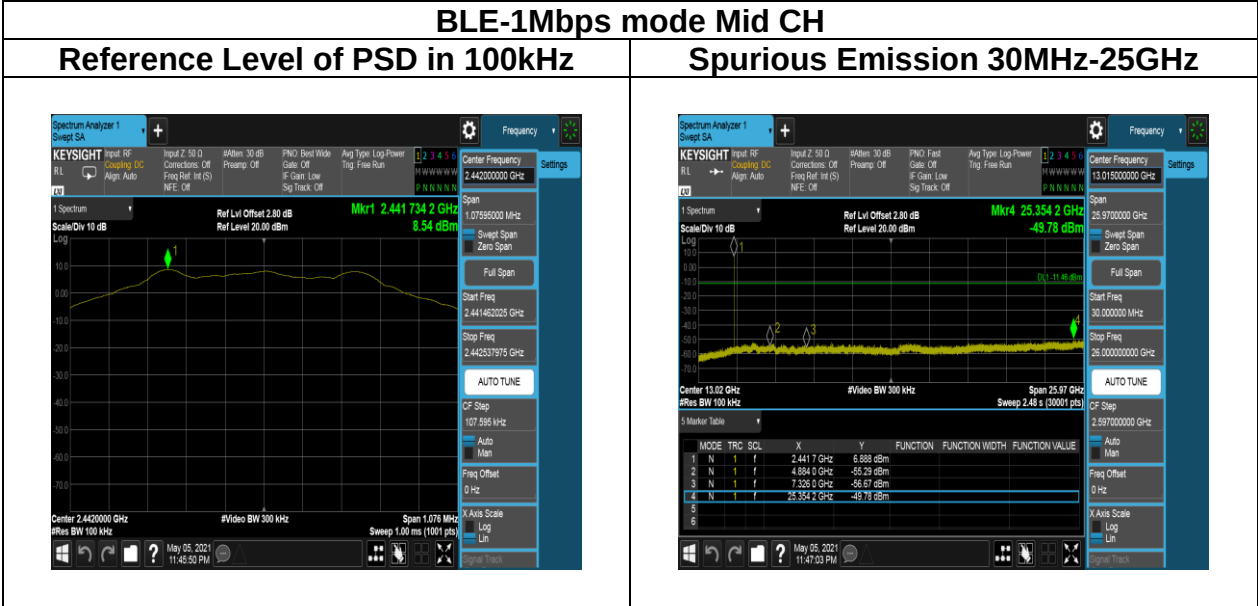


Band Edge



Spurious Emission 30MHz-25GHz



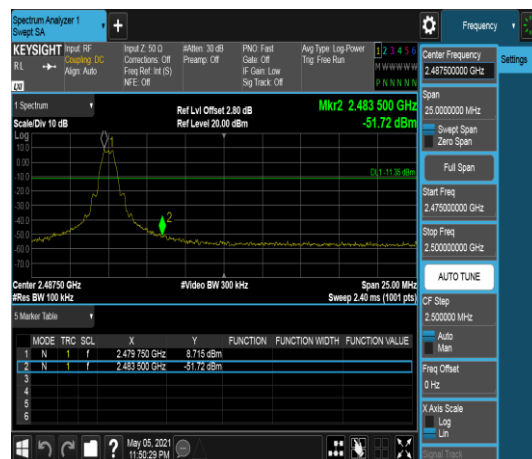


BLE-1Mbps mode High CH

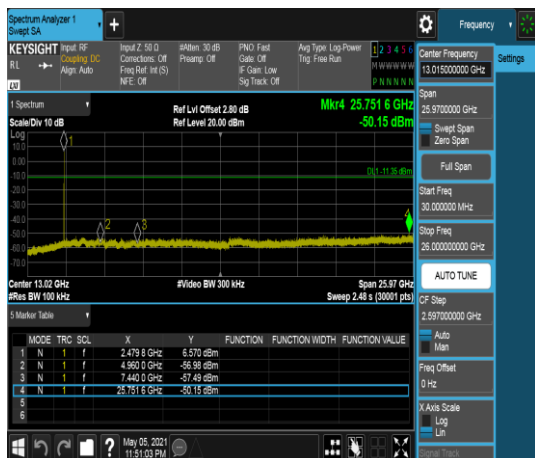
Reference Level of PSD in 100kHz



Band Edge



Spurious Emission 30MHz-25GHz



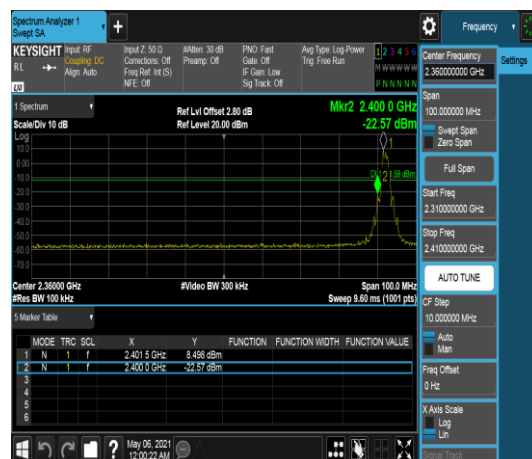
Report No.: T210415W01-RP2

BLE-2Mbps mode Low CH

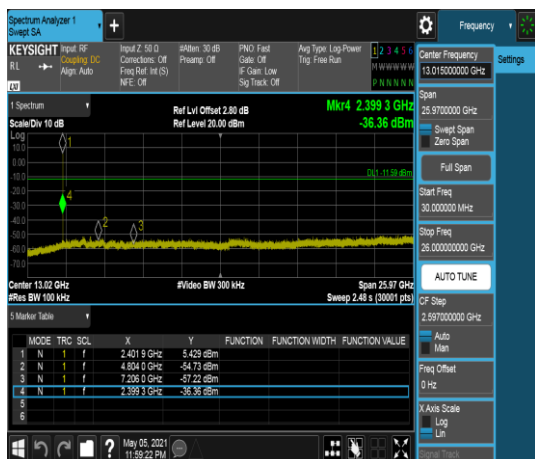
Reference Level of PSD in 100kHz

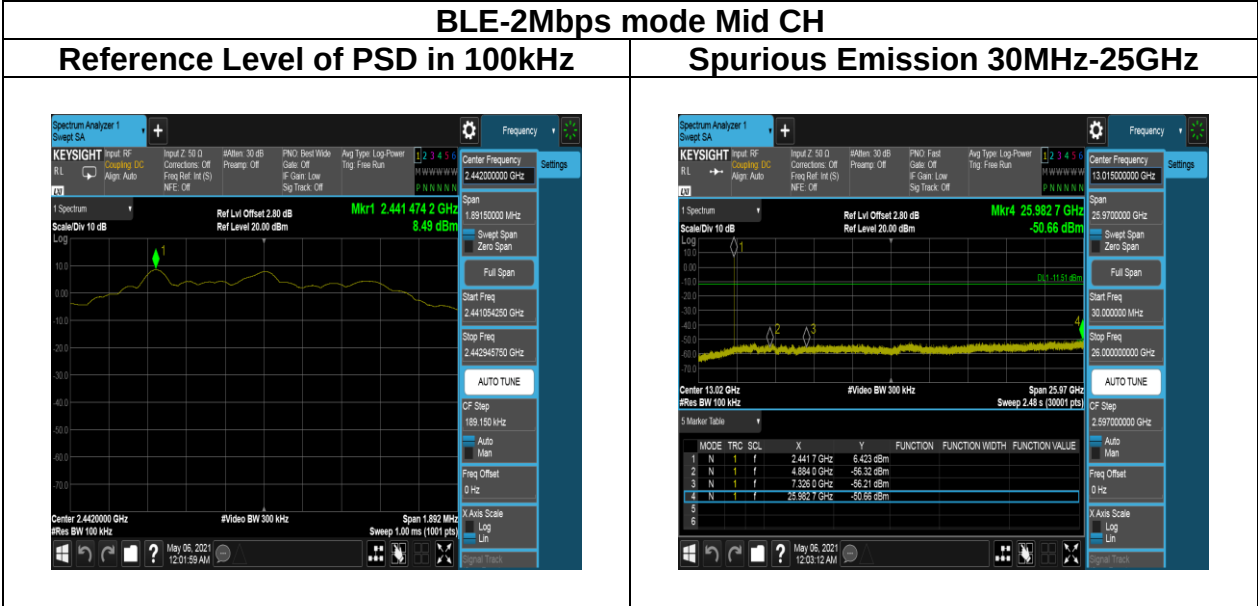


Band Edge



Spurious Emission 30MHz-25GHz





BLE-2Mbps mode High CH

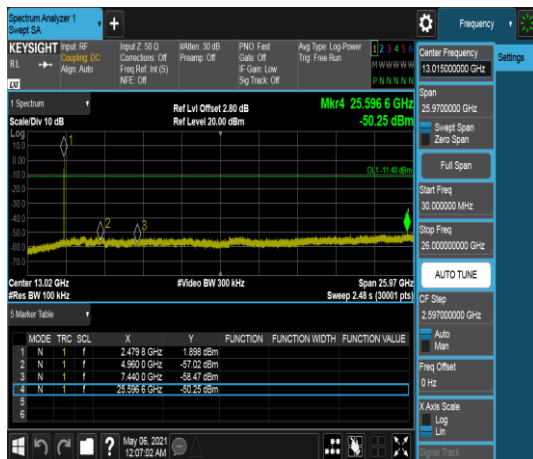
Reference Level of PSD in 100kHz



Band Edge



Spurious Emission 30MHz-25GHz



4.6 RADIATION BANDEDGE AND SPURIOUS EMISSION

4.6.1 Test Limit

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

IC according to RSS-247 section 5.5, RSS-Gen, Section 8.9 and 8.10

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 area 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 414788.

IC according to RSS-247 section 5.5, RSS-Gen, Section 8.9 and 8.10

RSS-Gen Table 3 and Table 5 – General Field Strength Limits for Transmitters and Receivers at Frequencies Above 30 MHz ^(Note)

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)

Note: Measurements for compliance with the limits in table 3 may be performed at distances other than 3 metres, in accordance with Section 6.6.

RSS-Gen Table 6: General Field Strength Limits for Transmitters at Frequencies Below 30 MHz (Transmit)

Frequency	Magnetic field strength (H-Field) (μA/m)	Measurement Distance (m)
9-490 kHz ^{Note}	6.37/F (F in kHz)	300
490-1,705 kHz	63.7/F (F in kHz)	30
1.705-30 MHz	0.08	30

Note: The emission limits for the ranges 9-90 kHz and 110-490 kHz are based on measurements employing a linear average detector.

4.6.2 Test Procedure

Test method Refer as ANSI C63.10:2013.

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: 2013, 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 9KHz to 26.5GHz set to the low, Mid and High channels with the EUT transmit.

Remark:

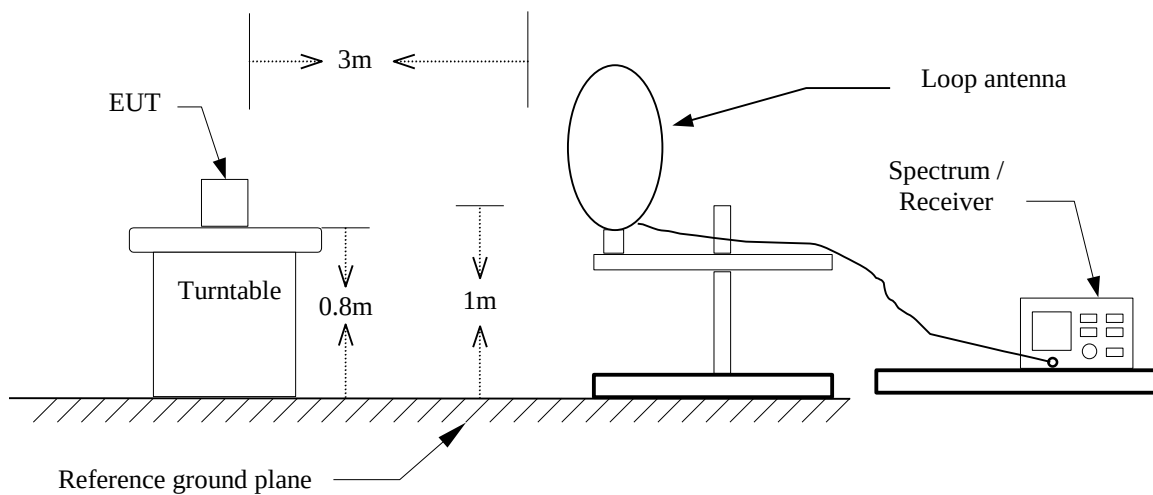
1. Although these tests were performed other than open area test site, adequate comparison measurements were confirmed against 30 m open are test site. Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 414788.
2. No emission found between lowest internal used/generated frequency to 30MHz (9kHz~30MHz).

4. The SA setting following :

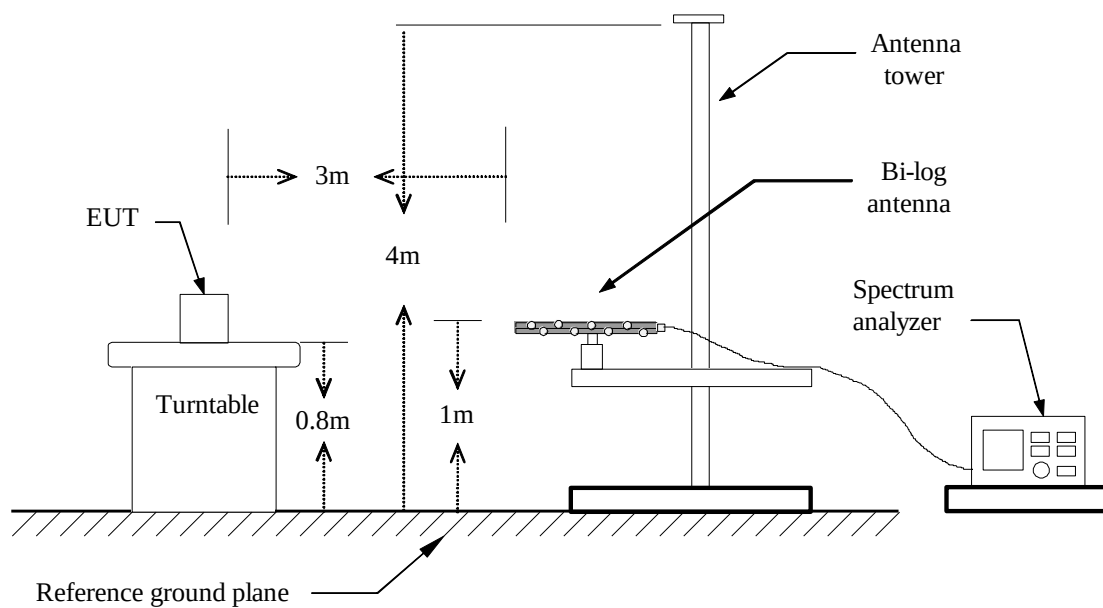
- (1) Below 1G : RBW = 100kHz, VBW $\geq$ 3 RBW, Sweep = Auto, Detector = Peak, Trace = Max hold.
- (2) Above 1G :
 - (2.1) For Peak measurement : RBW = 1MHz, VBW $\geq$ 3 RBW, Sweep = Auto, Detector = Peak, Trace = Max hold.
 - (2.2) For Average measurement : RBW = 1MHz, VBW
 - *If Duty Cycle $\geq$ 98%, VBW=10Hz.
 - *If Duty Cycle < 98%, VBW=1/T.

4.6.3 Test Setup

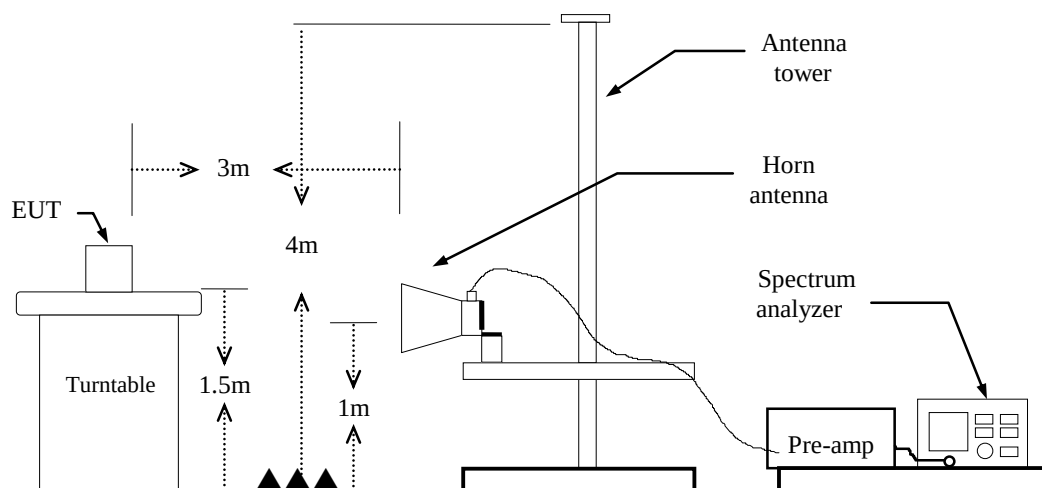
9kHz ~ 30MHz



30MHz ~ 1GHz



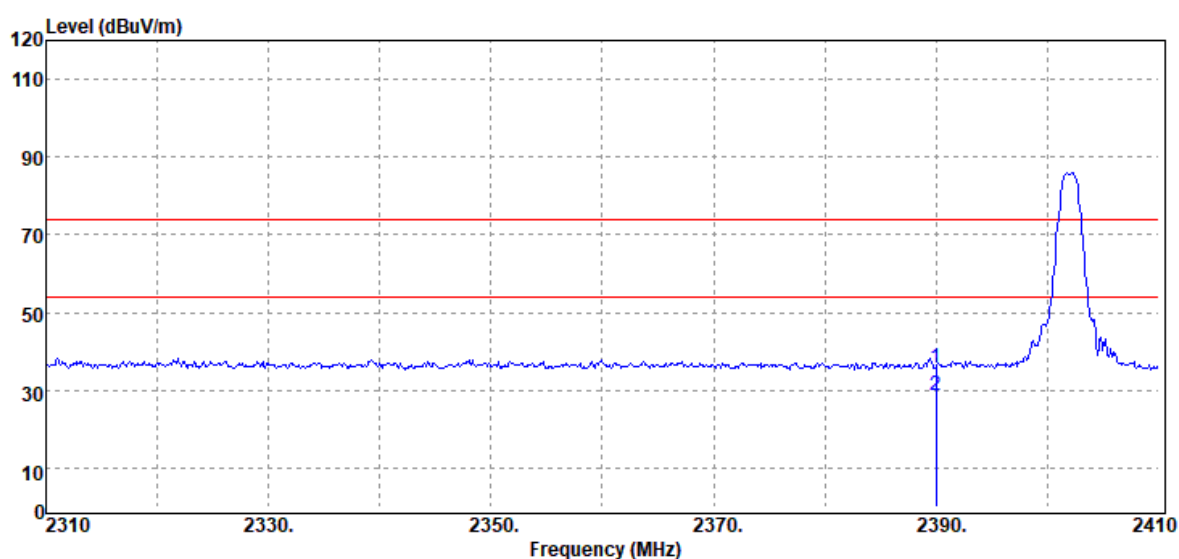
Above 1 GHz



4.6.4 Test Result

Band Edge Test Data

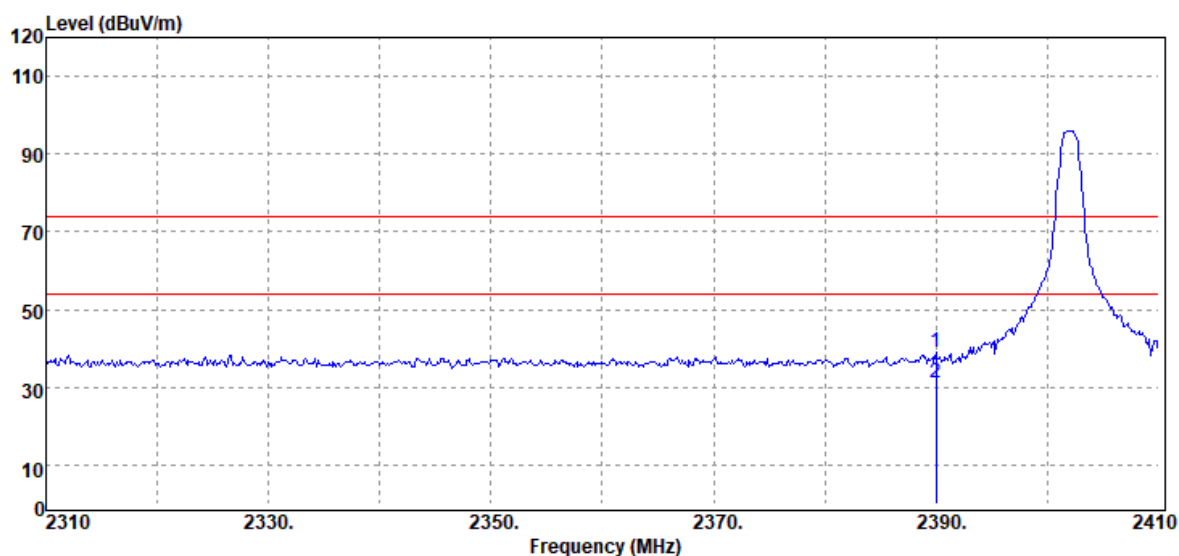
Test Mode:	BLE-1Mbps Low CH	Temp/Hum	22.1(°C)/ 44%RH
Test Item	Band Edge	Test Date	May 3, 2021
Polarize	Vertical	Test Engineer	Ray Li
Detector	Peak / Average		



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
2390.00	Peak	45.45	-9.60	35.85	74.00	-38.15
2390.00	Average	38.43	-9.60	28.83	54.00	-25.17

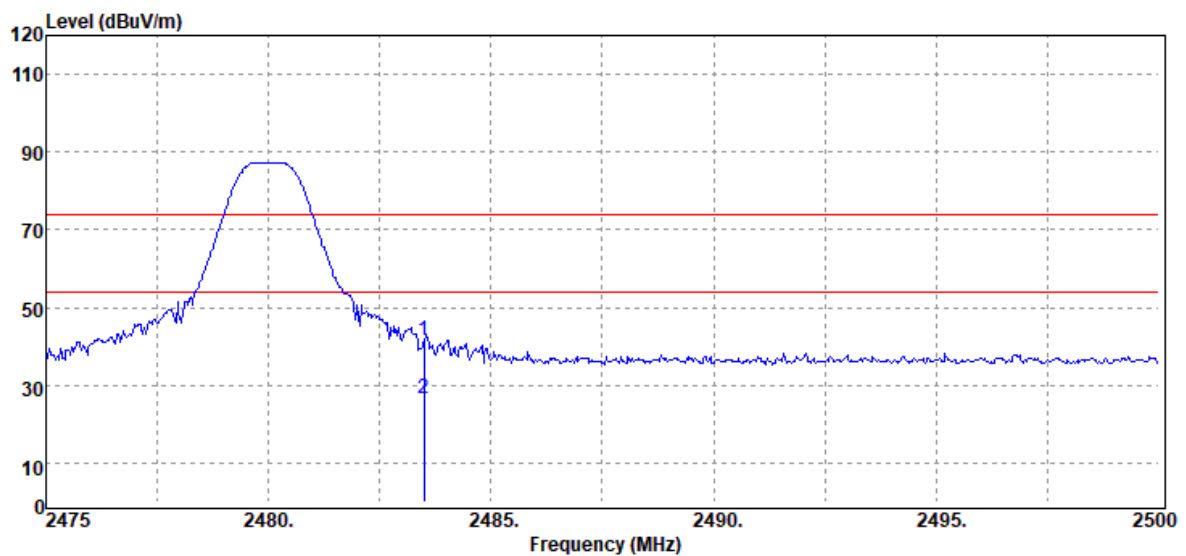
Report No.: T210415W01-RP2

Test Mode:	BLE-1Mbps Low CH	Temp/Hum	22.1(°C)/ 44%RH
Test Item	Band Edge	Test Date	May 3, 2021
Polarize	Horizontal	Test Engineer	Ray Li
Detector	Peak / Average		



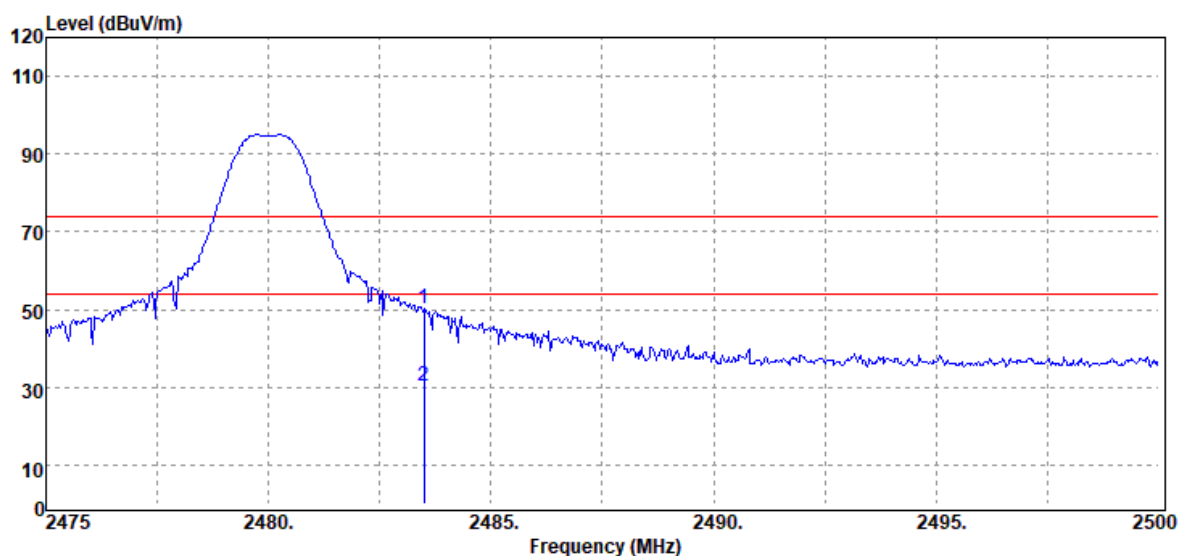
Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
2390.00	Peak	48.62	-9.60	39.02	74.00	-34.98
2390.00	Average	40.86	-9.60	31.26	54.00	-22.74

Test Mode:	BLE-1Mbps High CH	Temp/Hum	22.1(°C)/ 44%RH
Test Item	Band Edge	Test Date	May 3, 2021
Polarize	Vertical	Test Engineer	Ray Li
Detector	Peak / Average		



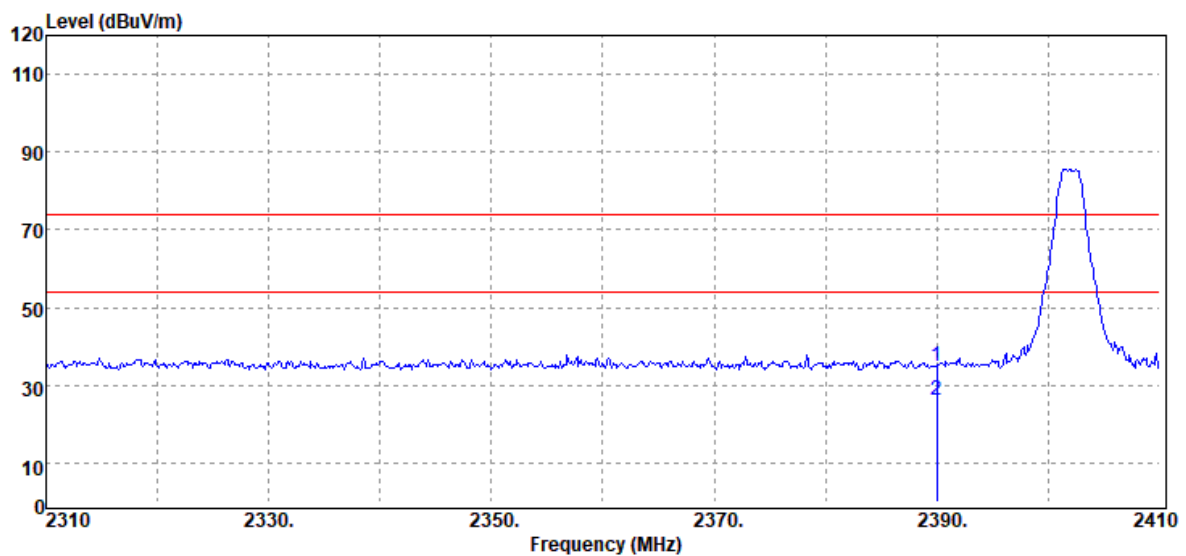
Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
2483.50	Peak	50.58	-9.18	41.40	74.00	-32.60
2483.50	Average	35.60	-9.18	26.42	54.00	-27.58

Test Mode:	BLE-1Mbps High CH	Temp/Hum	22.1(°C)/ 44%RH
Test Item	Band Edge	Test Date	May 3, 2021
Polarize	Horizontal	Test Engineer	Ray Li
Detector	Peak / Average		



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
2483.50	Peak	59.49	-9.18	50.31	74.00	-23.69
2483.50	Average	39.59	-9.18	30.41	54.00	-23.59

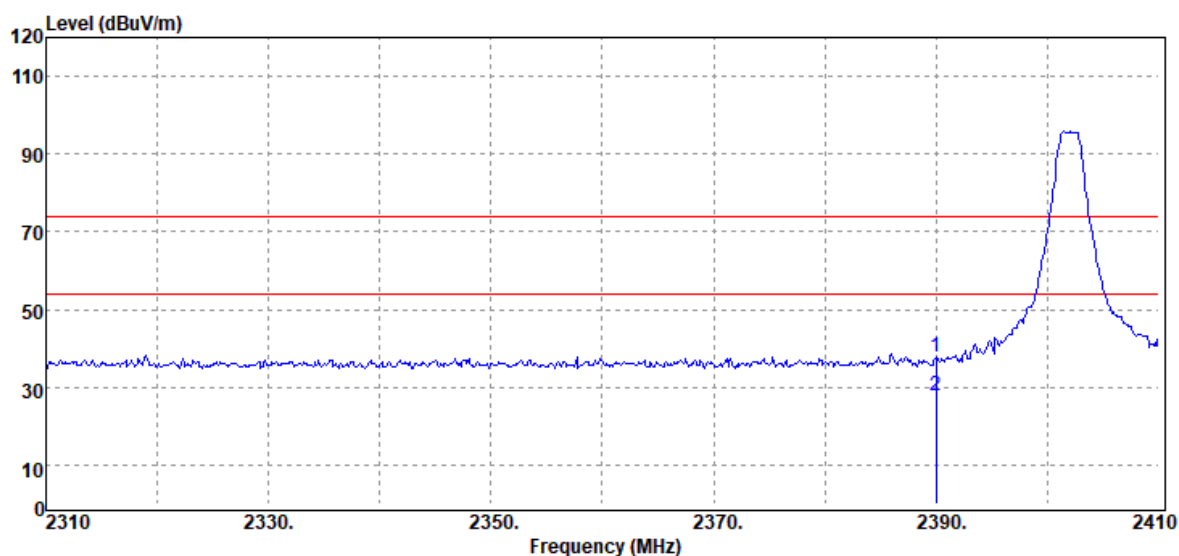
Test Mode:	BLE-2Mbps Low CH	Temp/Hum	22.1(°C)/ 44%RH
Test Item	Band Edge	Test Date	May 3, 2021
Polarize	Vertical	Test Engineer	Ray Li
Detector	Peak / Average		



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
2390.00	Peak	44.56	-9.60	34.96	74.00	-39.04
2390.00	Average	35.66	-9.60	26.06	54.00	-27.94

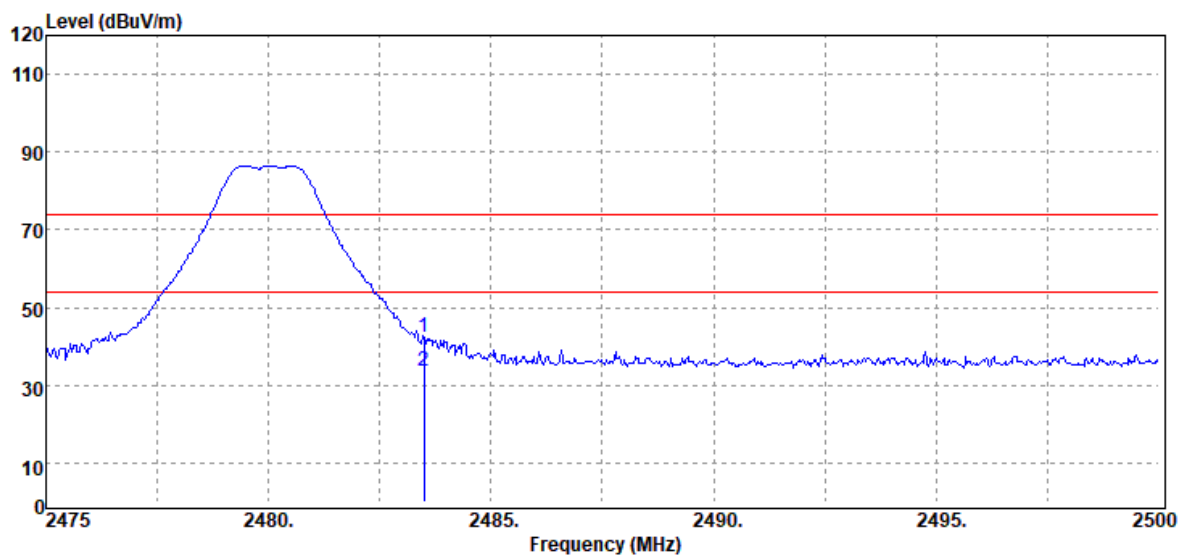
Report No.: T210415W01-RP2

Test Mode:	BLE-2Mbps Low CH	Temp/Hum	22.1(°C)/ 44%RH
Test Item	Band Edge	Test Date	May 3, 2021
Polarize	Horizontal	Test Engineer	Ray Li
Detector	Peak / Average		



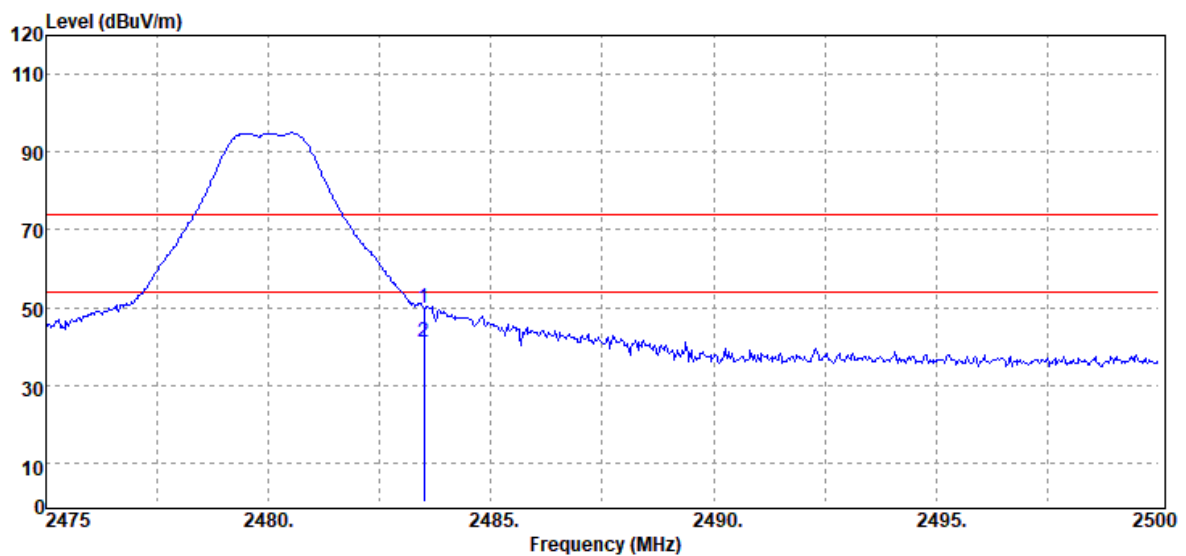
Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
2390.00	Peak	47.38	-9.60	37.78	74.00	-36.22
2390.00	Average	37.44	-9.60	27.84	54.00	-26.16

Test Mode:	BLE-2Mbps High CH	Temp/Hum	22.1(°C)/ 44%RH
Test Item	Band Edge	Test Date	May 3, 2021
Polarize	Vertical	Test Engineer	Ray Li
Detector	Peak / Average		



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
2483.50	Peak	51.42	-9.18	42.24	74.00	-31.76
2483.50	Average	42.97	-9.18	33.79	54.00	-20.21

Test Mode:	BLE-2Mbps High CH	Temp/Hum	22.1(°C)/ 44%RH
Test Item	Band Edge	Test Date	May 3, 2021
Polarize	Horizontal	Test Engineer	Ray Li
Detector	Peak / Average		

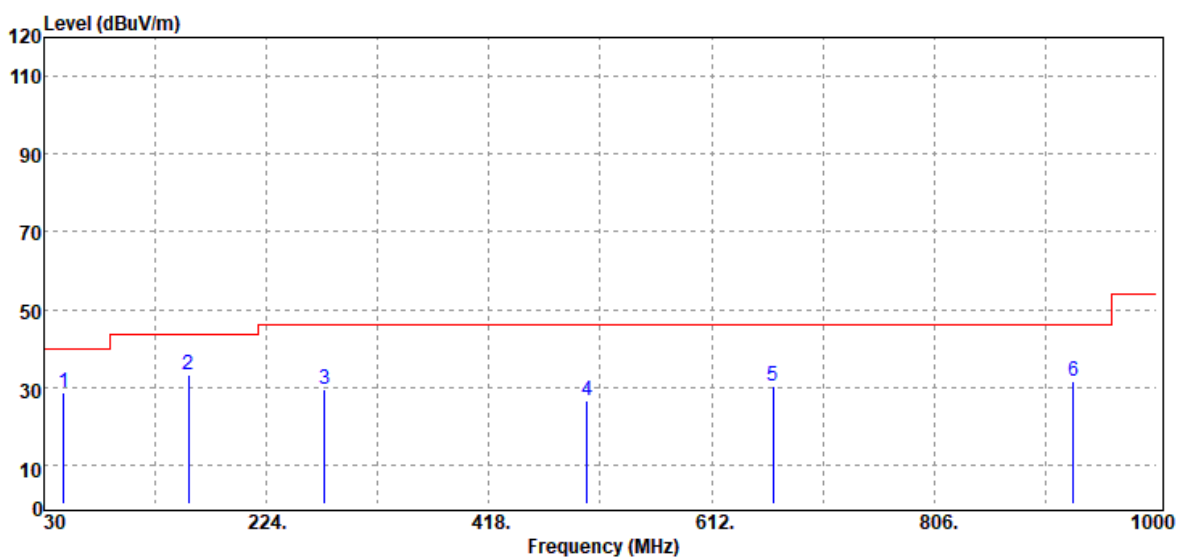


Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
2483.50	Peak	58.99	-9.18	49.81	74.00	-24.19
2483.50	Average	50.24	-9.18	41.06	54.00	-12.94

Report No.: T210415W01-RP2

Below 1G Test Data

Test Mode:	Mode 1 BLE-1Mbps	Temp/Hum	22.1(°C)/ 44%RH
Test Item	30MHz-1GHz	Test Date	May 3, 2021
Polarize	Vertical	Test Engineer	Ray Li
Detector	Peak		

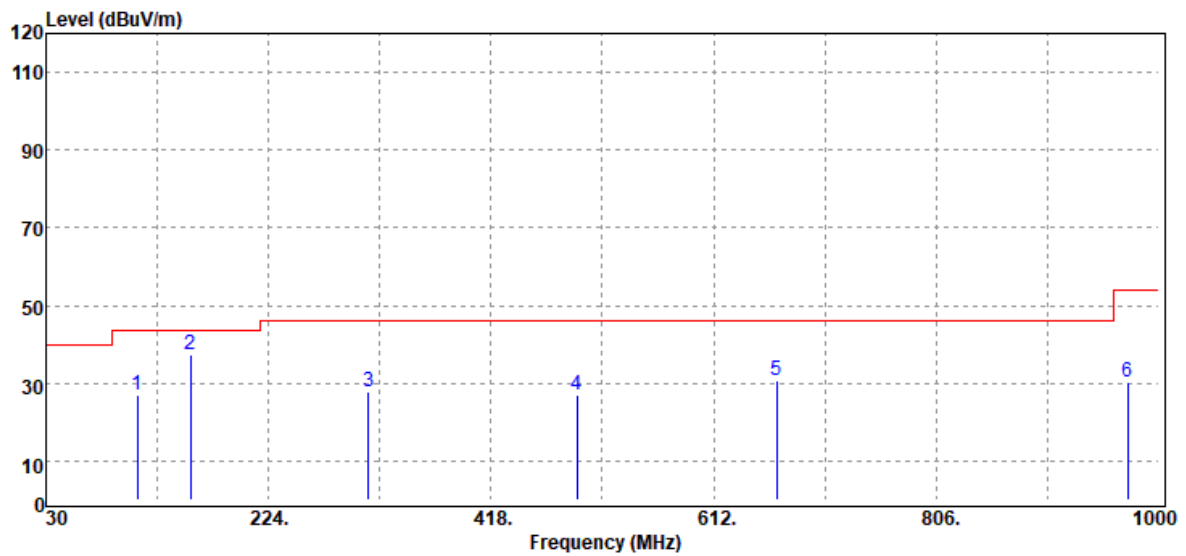


Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
47.46	Peak	42.58	-14.11	28.47	40.00	-11.53
156.10	Peak	42.99	-9.82	33.17	43.50	-10.33
274.44	Peak	38.12	-8.44	29.68	46.00	-16.32
503.36	Peak	29.60	-3.00	26.60	46.00	-19.40
665.35	Peak	30.13	0.01	30.14	46.00	-15.86
927.25	Peak	27.90	3.84	31.74	46.00	-14.26

Note: No emission found between lowest internal used/generated frequency to 30MHz (9kHz~30MHz).

Report No.: T210415W01-RP2

Test Mode:	Mode 1 BLE-1Mbps	Temp/Hum	22.1(°C)/ 44%RH
Test Item	30MHz-1GHz	Test Date	May 3, 2021
Polarize	Horizontal	Test Engineer	Ray Li
Detector	Peak		

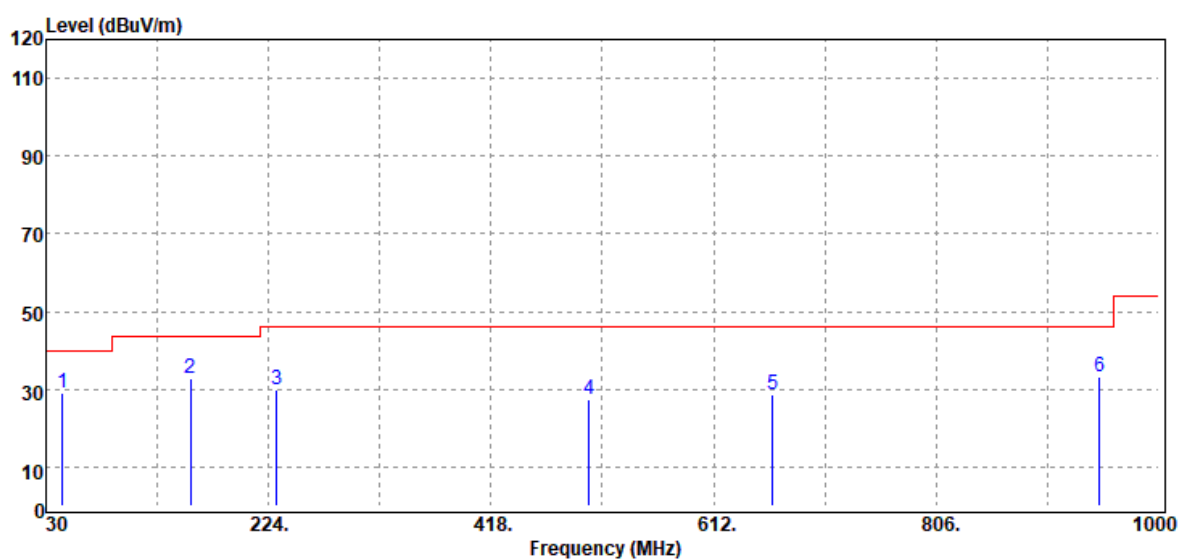


Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
109.54	Peak	36.94	-10.06	26.88	43.50	-16.62
156.10	Peak	47.01	-9.82	37.19	43.50	-6.31
311.30	Peak	35.47	-7.84	27.63	46.00	-18.37
492.69	Peak	30.05	-2.92	27.13	46.00	-18.87
667.29	Peak	30.61	0.00	30.61	46.00	-15.39
972.84	Peak	24.98	5.54	30.52	54.00	-23.48

Note: No emission found between lowest internal used/generated frequency to 30MHz (9kHz~30MHz).

Report No.: T210415W01-RP2

Test Mode:	Mode 1 BLE-2Mbps	Temp/Hum	22.1(°C)/ 44%RH
Test Item	30MHz-1GHz	Test Date	May 3, 2021
Polarize	Vertical	Test Engineer	Ray Li
Detector	Peak		

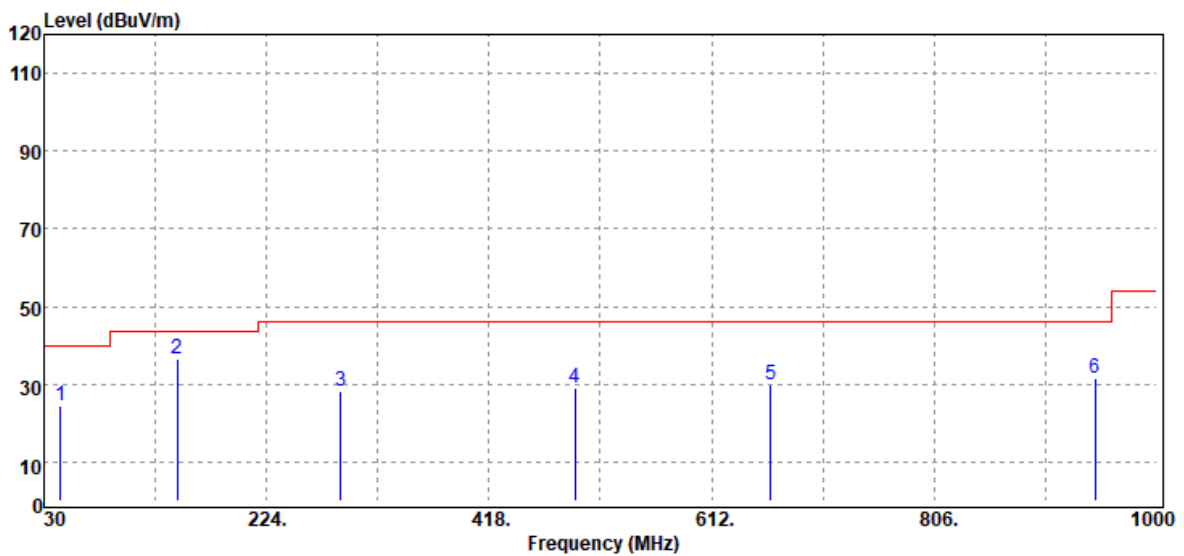


Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
44.55	Peak	41.84	-12.62	29.22	40.00	-10.78
156.10	Peak	42.46	-9.82	32.64	43.50	-10.86
230.79	Peak	40.73	-10.78	29.95	46.00	-16.05
503.36	Peak	30.30	-3.00	27.30	46.00	-18.70
663.41	Peak	28.60	0.12	28.72	46.00	-17.28
948.59	Peak	29.05	3.97	33.02	46.00	-12.98

Note: No emission found between lowest internal used/generated frequency to 30MHz (9kHz~30MHz).

Report No.: T210415W01-RP2

Test Mode:	Mode 1 BLE-2Mbps	Temp/Hum	22.1(°C)/ 44%RH
Test Item	30MHz-1GHz	Test Date	May 3, 2021
Polarize	Horizontal	Test Engineer	Ray Li
Detector	Peak		

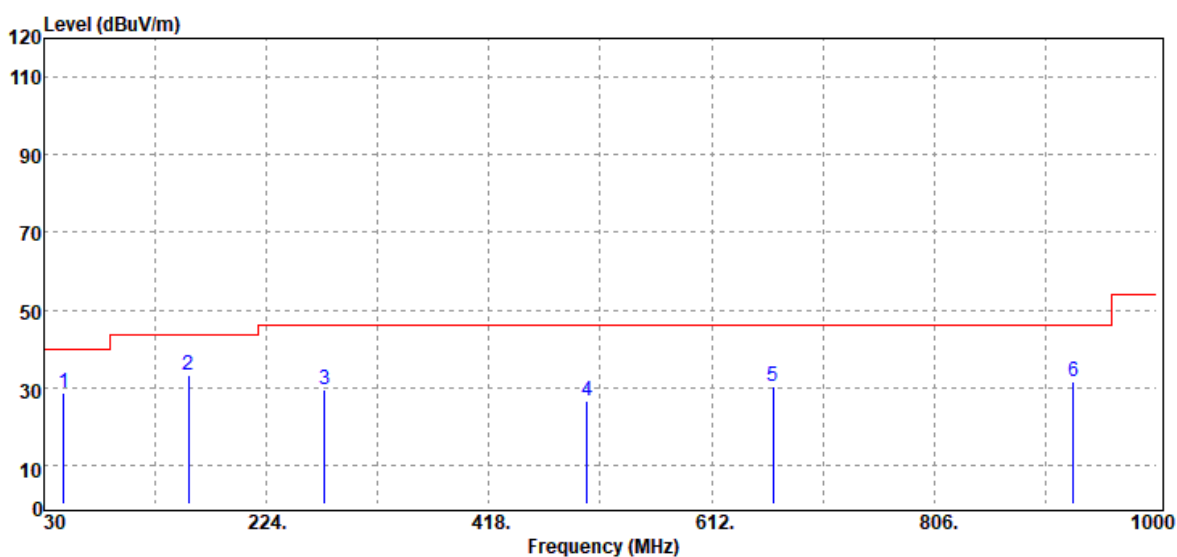


Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
44.55	Peak	37.03	-12.62	24.41	40.00	-15.59
146.40	Peak	46.49	-9.89	36.60	43.50	-6.90
288.99	Peak	36.58	-8.34	28.24	46.00	-17.76
492.69	Peak	31.96	-2.92	29.04	46.00	-16.96
663.41	Peak	29.64	0.12	29.76	46.00	-16.24
946.65	Peak	27.75	4.01	31.76	46.00	-14.24

Note: No emission found between lowest internal used/generated frequency to 30MHz (9kHz~30MHz).

Report No.: T210415W01-RP2

Test Mode:	Mode 2 BLE-1Mbps	Temp/Hum	22.1(°C)/ 44%RH
Test Item	30MHz-1GHz	Test Date	May 3, 2021
Polarize	Vertical	Test Engineer	Ray Li
Detector	Peak		

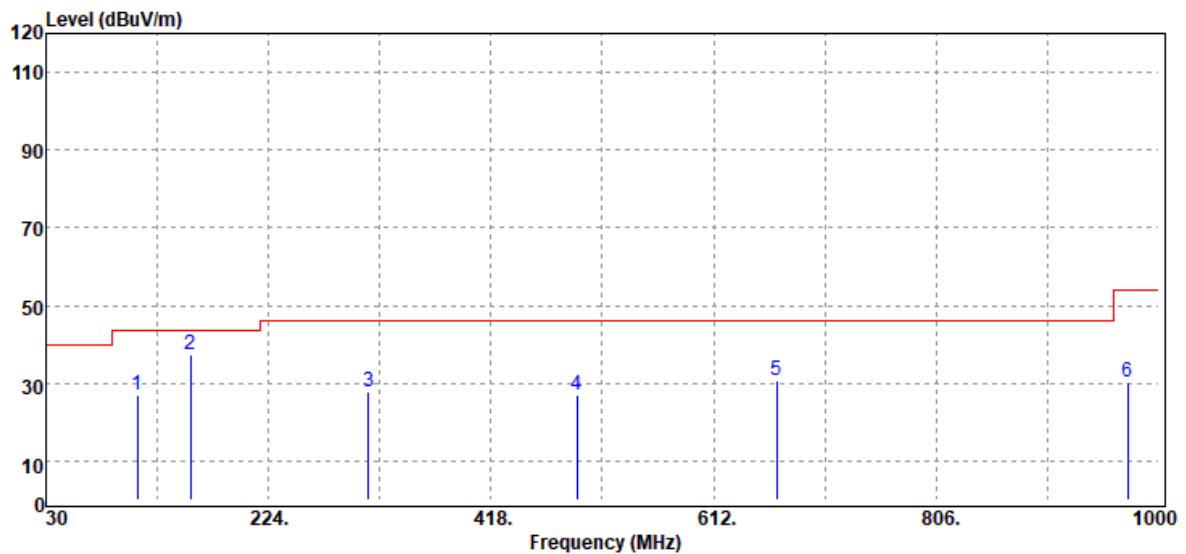


Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
47.46	Peak	42.58	-14.11	28.47	40.00	-11.53
156.10	Peak	42.99	-9.82	33.17	43.50	-10.33
274.44	Peak	38.12	-8.44	29.68	46.00	-16.32
503.36	Peak	29.60	-3.00	26.60	46.00	-19.40
665.35	Peak	30.13	0.01	30.14	46.00	-15.86
927.25	Peak	27.90	3.84	31.74	46.00	-14.26

Note: No emission found between lowest internal used/generated frequency to 30MHz (9kHz~30MHz).

Report No.: T210415W01-RP2

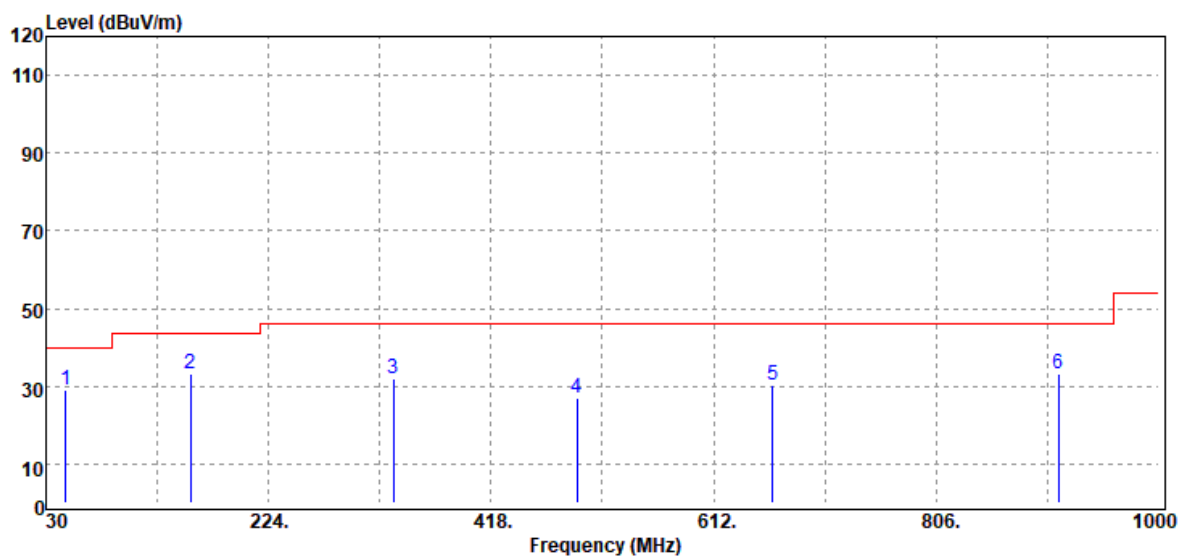
Test Mode:	Mode 2 BLE-1Mbps	Temp/Hum	22.1(°C)/ 44%RH
Test Item	30MHz-1GHz	Test Date	May 3, 2021
Polarize	Horizontal	Test Engineer	Ray Li
Detector	Peak		



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
109.54	Peak	36.94	-10.06	26.88	43.50	-16.62
156.10	Peak	47.01	-9.82	37.19	43.50	-6.31
311.30	Peak	35.47	-7.84	27.63	46.00	-18.37
492.69	Peak	30.05	-2.92	27.13	46.00	-18.87
667.29	Peak	30.61	0.00	30.61	46.00	-15.39
972.84	Peak	24.98	5.54	30.52	54.00	-23.48

Note: No emission found between lowest internal used/generated frequency to 30MHz (9kHz~30MHz).

Test Mode:	Mode 2 BLE-2Mbps	Temp/Hum	22.1(°C)/ 44%RH
Test Item	30MHz-1GHz	Test Date	May 3, 2021
Polarize	Vertical	Test Engineer	Ray Li
Detector	Peak		

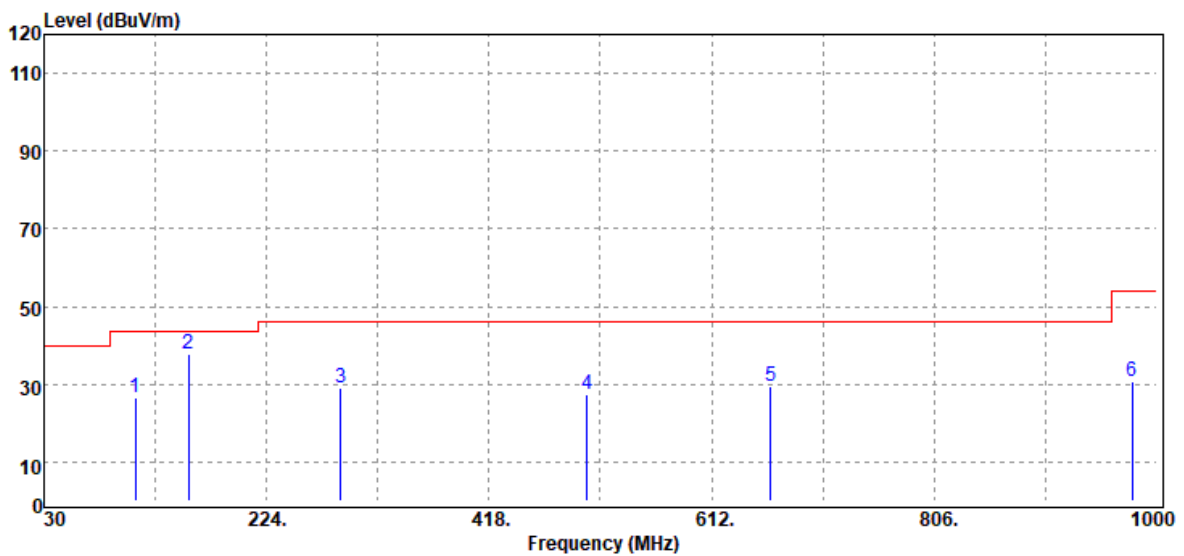


Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
47.46	Peak	43.17	-14.11	29.06	40.00	-10.94
156.10	Peak	42.86	-9.82	33.04	43.50	-10.46
332.64	Peak	39.19	-7.17	32.02	46.00	-13.98
492.69	Peak	29.93	-2.92	27.01	46.00	-18.99
663.41	Peak	30.16	0.12	30.28	46.00	-15.72
912.70	Peak	29.24	3.94	33.18	46.00	-12.82

Note: No emission found between lowest internal used/generated frequency to 30MHz (9kHz~30MHz).

Report No.: T210415W01-RP2

Test Mode:	Mode 2 BLE-2Mbps	Temp/Hum	22.1(°C)/ 44%RH
Test Item	30MHz-1GHz	Test Date	May 3, 2021
Polarize	Horizontal	Test Engineer	Ray Li
Detector	Peak		



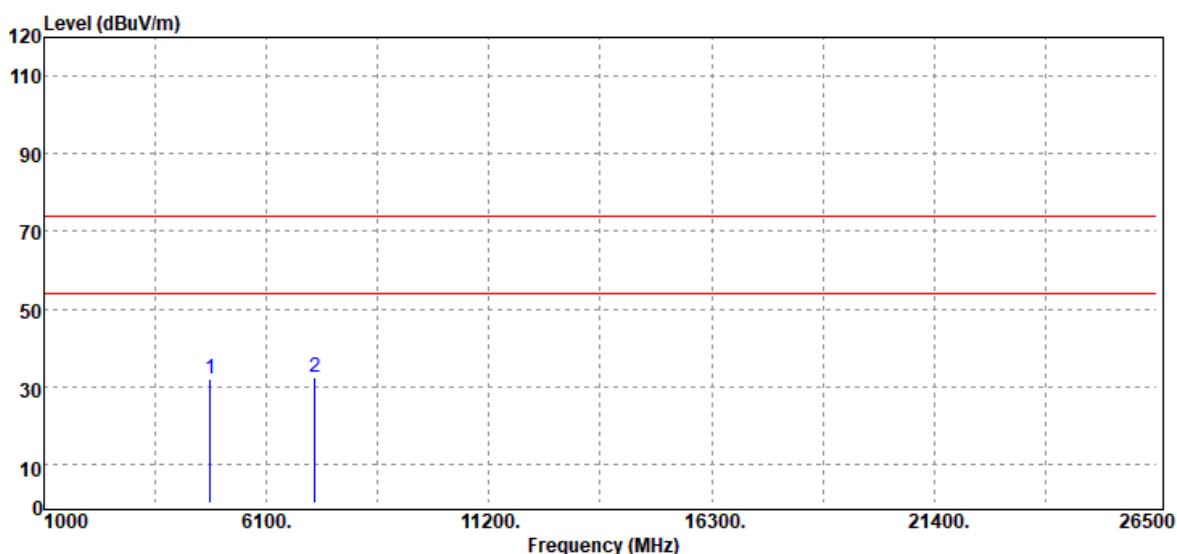
Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBuV	Factor dB	Actual FS dBuV/m	Limit @3m dBuV/m	Margin dB
109.54	Peak	36.65	-10.06	26.59	43.50	-16.91
156.10	Peak	47.49	-9.82	37.67	43.50	-5.83
288.99	Peak	37.21	-8.34	28.87	46.00	-17.13
503.36	Peak	30.34	-3.00	27.34	46.00	-18.66
663.41	Peak	29.50	0.12	29.62	46.00	-16.38
978.66	Peak	25.01	5.58	30.59	54.00	-23.41

Note: No emission found between lowest internal used/generated frequency to 30MHz (9kHz~30MHz).

Report No.: T210415W01-RP2

Above 1G Test Data

Test Mode:	BLE-1Mbps Low CH	Temp/Hum	22.1(°C)/ 44%RH
Test Item	Harmonic	Test Date	May 3, 2021
Polarize	Vertical	Test Engineer	Ray Li
Detector	Peak		



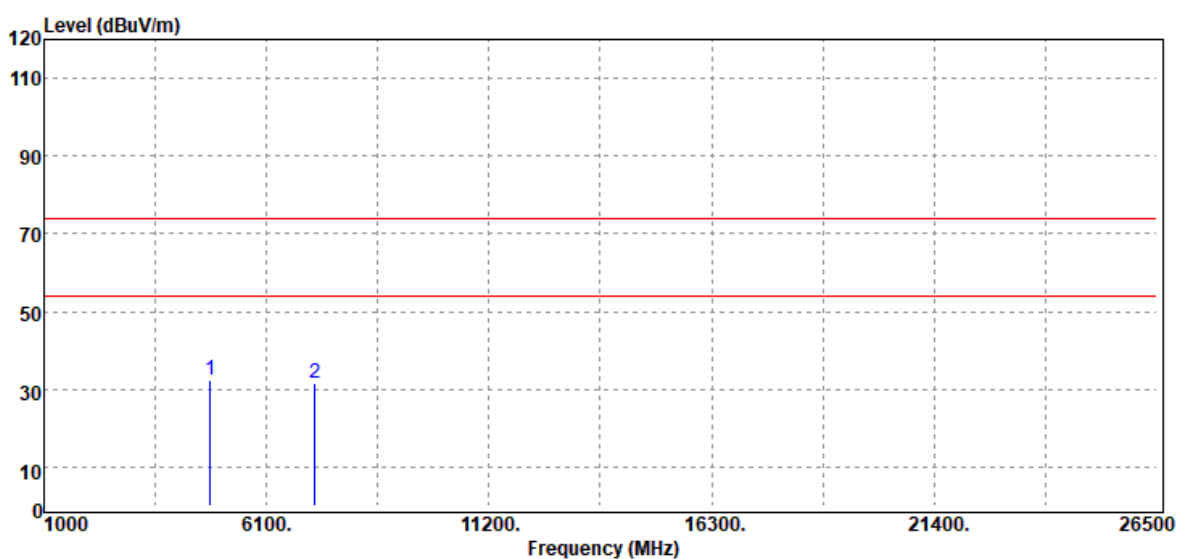
Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
4804.00	Peak	38.29	-6.13	32.16	74.00	-41.84
7206.00	Peak	33.29	-0.91	32.38	74.00	-41.62
N/A						

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

Report No.: T210415W01-RP2

Test Mode:	BLE-1Mbps Low CH	Temp/Hum	22.1(°C)/ 44%RH
Test Item	Harmonic	Test Date	May 3, 2021
Polarize	Horizontal	Test Engineer	Ray Li
Detector	Peak		



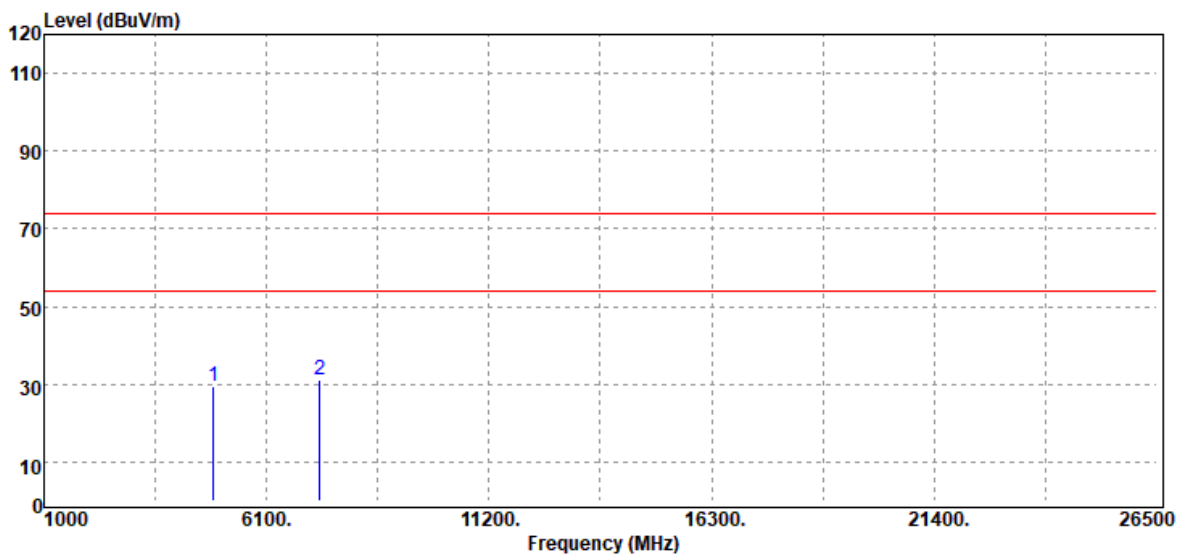
Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
4804.00	Peak	38.39	-6.13	32.26	74.00	-41.74
7206.00	Peak	32.43	-0.91	31.52	74.00	-42.48
N/A						

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

Report No.: T210415W01-RP2

Test Mode:	BLE-1Mbps Mid CH	Temp/Hum	22.1(°C)/ 44%RH
Test Item	Harmonic	Test Date	May 3, 2021
Polarize	Vertical	Test Engineer	Ray Li
Detector	Peak		



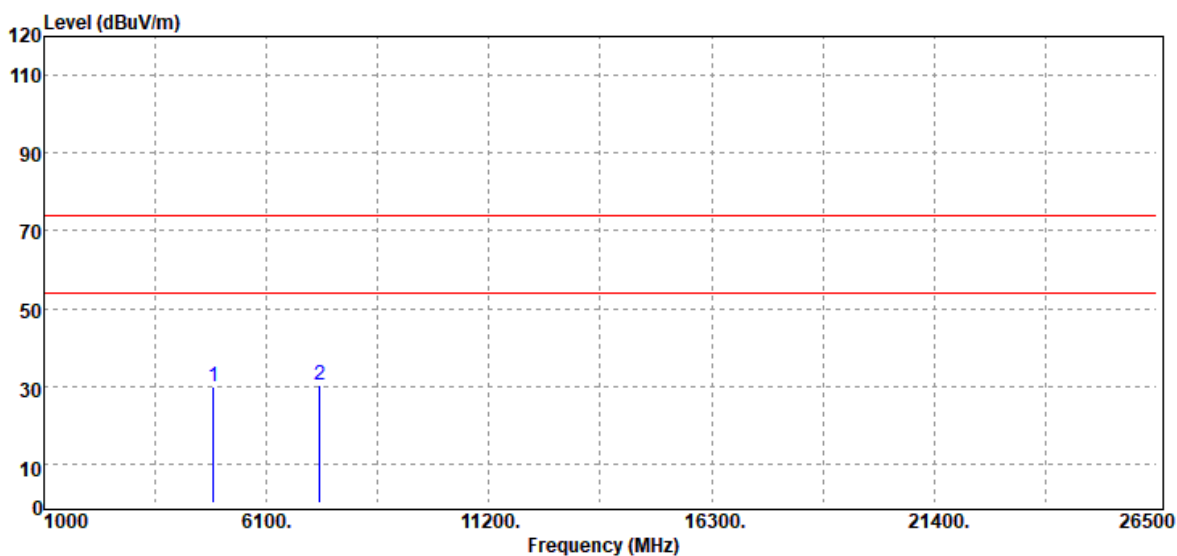
Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
4880.00	Peak	35.30	-5.98	29.32	74.00	-44.68
7320.00	Peak	32.14	-0.88	31.26	74.00	-42.74
N/A						

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

Report No.: T210415W01-RP2

Test Mode:	BLE-1Mbps Mid CH	Temp/Hum	22.1(°C)/ 44%RH
Test Item	Harmonic	Test Date	May 3, 2021
Polarize	Horizontal	Test Engineer	Ray Li
Detector	Peak		



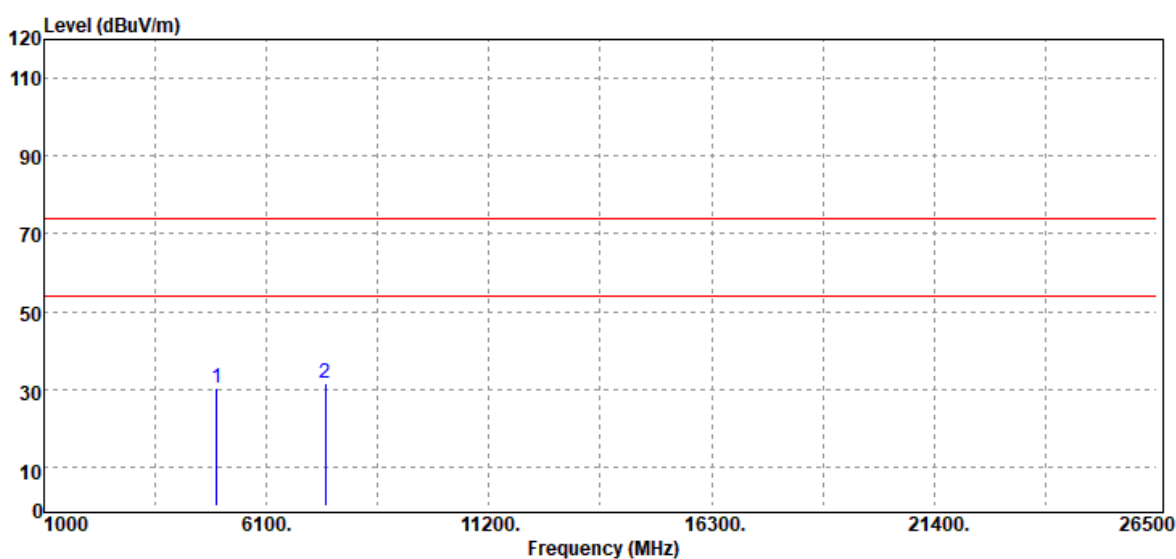
Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
4880.00	Peak	35.69	-5.98	29.71	74.00	-44.29
7320.00	Peak	31.29	-0.88	30.41	74.00	-43.59
N/A						

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

Report No.: T210415W01-RP2

Test Mode:	BLE-1Mbps High CH	Temp/Hum	22.1(°C)/ 44%RH
Test Item	Harmonic	Test Date	May 3, 2021
Polarize	Vertical	Test Engineer	Ray Li
Detector	Peak		



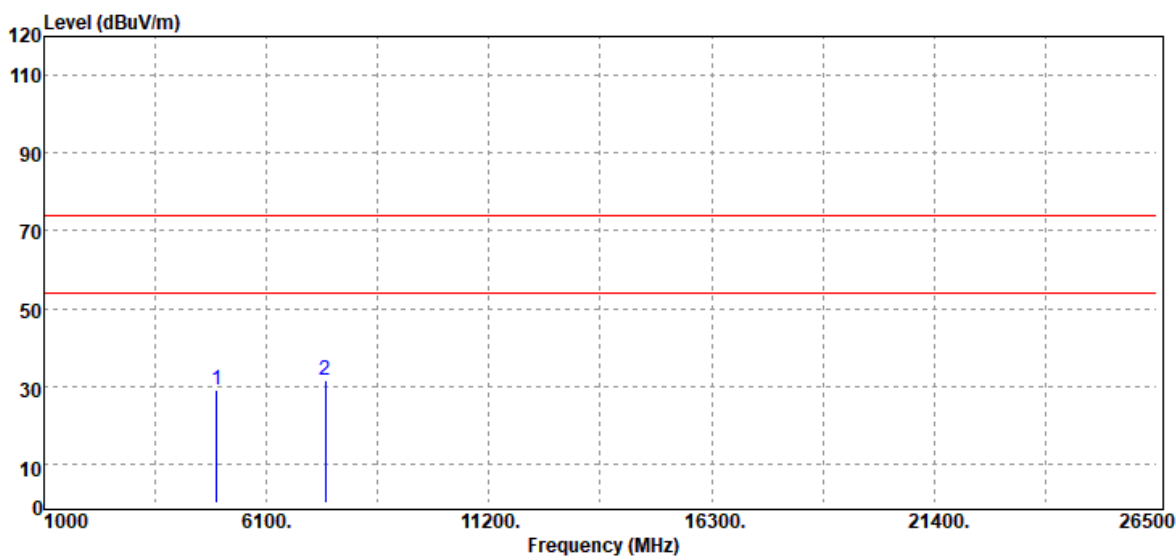
Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
4960.00	Peak	35.54	-5.27	30.27	74.00	-43.73
7440.00	Peak	32.18	-0.71	31.47	74.00	-42.53
N/A						

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

Report No.: T210415W01-RP2

Test Mode:	BLE-1Mbps High CH	Temp/Hum	22.1(°C)/ 44%RH
Test Item	Harmonic	Test Date	May 3, 2021
Polarize	Horizontal	Test Engineer	Ray Li
Detector	Peak		



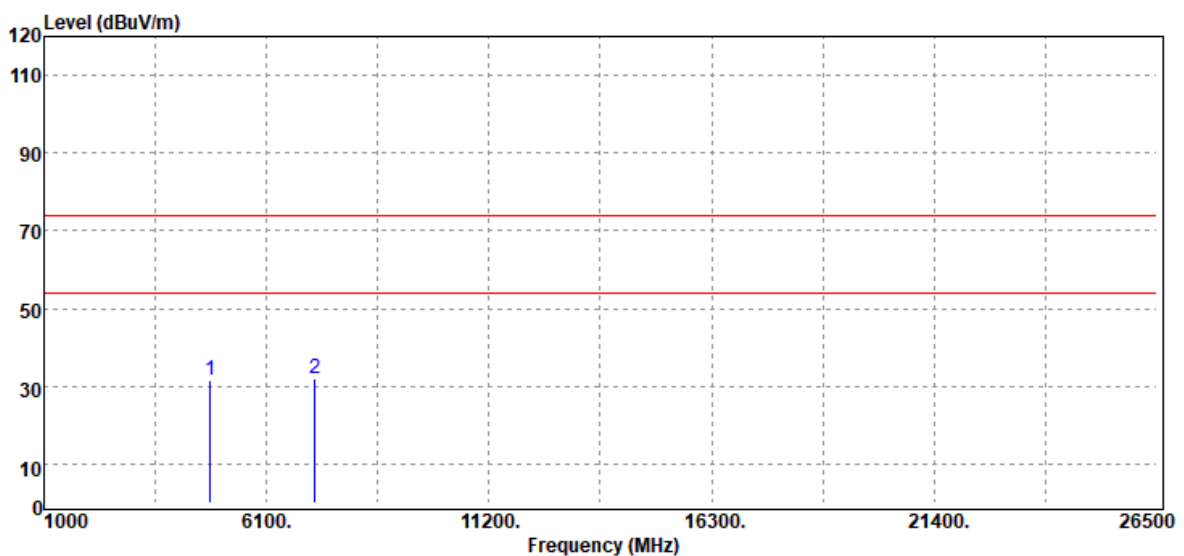
Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
4960.00	Peak	34.39	-5.27	29.12	74.00	-44.88
7440.00	Peak	32.43	-0.71	31.72	74.00	-42.28
N/A						

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

Report No.: T210415W01-RP2

Test Mode:	BLE-2Mbps Low CH	Temp/Hum	22.1(°C)/ 44%RH
Test Item	Harmonic	Test Date	May 3, 2021
Polarize	Vertical	Test Engineer	Ray Li
Detector	Peak		

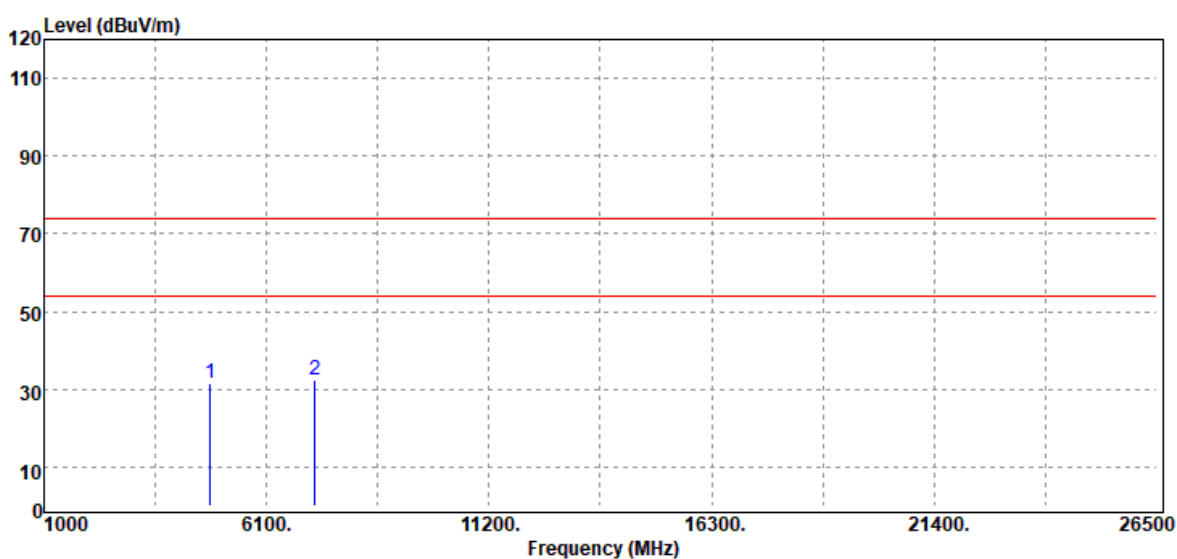


Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
4804.00	Peak	37.61	-6.13	31.48	74.00	-42.52
7206.00	Peak	32.79	-0.91	31.88	74.00	-42.12
N/A						

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

Test Mode:	BLE-2Mbps Low CH	Temp/Hum	22.1(°C)/ 44%RH
Test Item	Harmonic	Test Date	May 3, 2021
Polarize	Horizontal	Test Engineer	Ray Li
Detector	Peak		



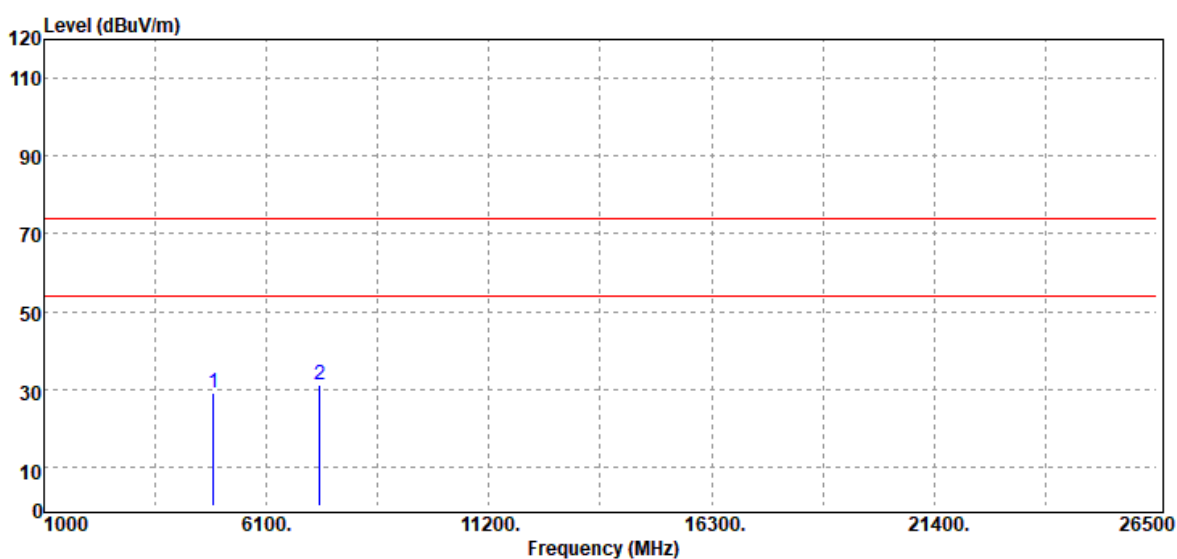
Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
4804.00	Peak	37.55	-6.13	31.42	74.00	-42.58
7206.00	Peak	33.23	-0.91	32.32	74.00	-41.68
N/A						

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

Report No.: T210415W01-RP2

Test Mode:	BLE-2Mbps Mid CH	Temp/Hum	22.1(°C)/ 44%RH
Test Item	Harmonic	Test Date	May 3, 2021
Polarize	Vertical	Test Engineer	Ray Li
Detector	Peak		



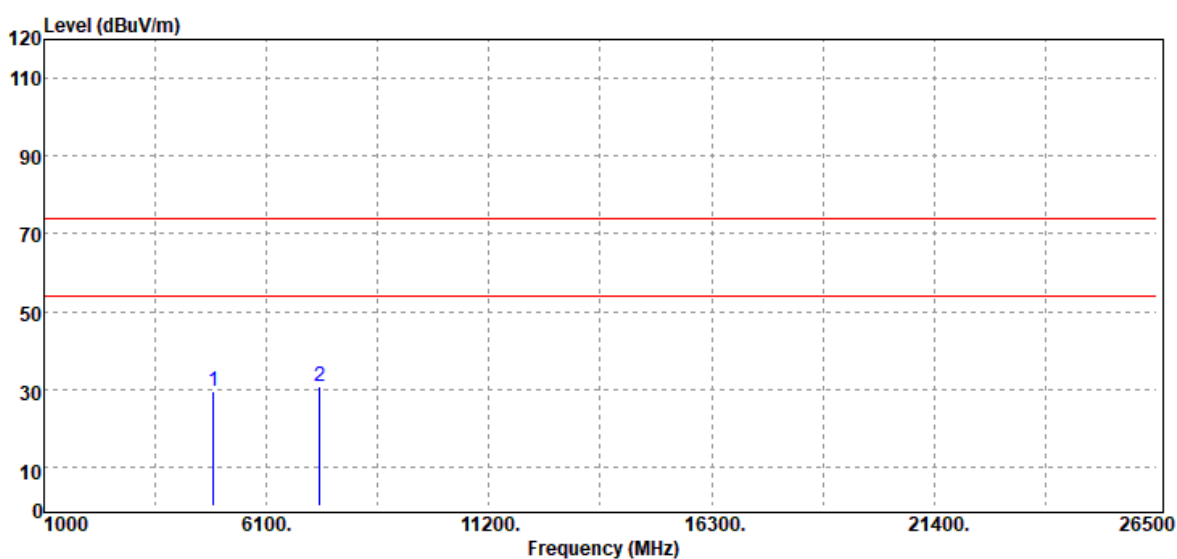
Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
4880.00	Peak	34.92	-5.98	28.94	74.00	-45.06
7320.00	Peak	32.00	-0.88	31.12	74.00	-42.88
N/A						

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

Report No.: T210415W01-RP2

Test Mode:	BLE-2Mbps Mid CH	Temp/Hum	22.1(°C)/ 44%RH
Test Item	Harmonic	Test Date	May 3, 2021
Polarize	Horizontal	Test Engineer	Ray Li
Detector	Peak		



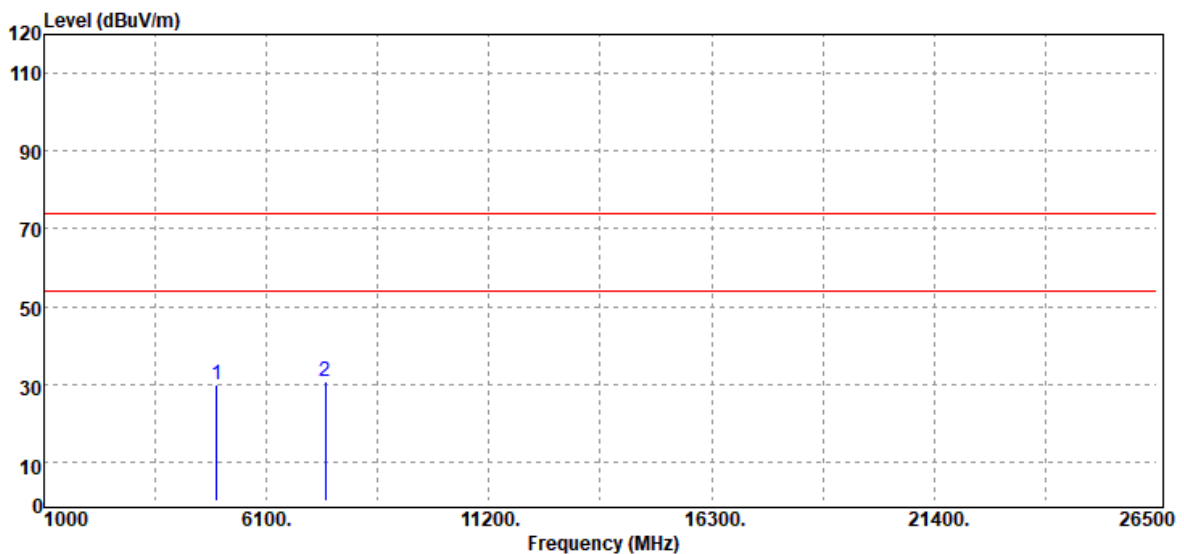
Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
4880.00	Peak	35.46	-5.98	29.48	74.00	-44.52
7320.00	Peak	31.69	-0.88	30.81	74.00	-43.19
N/A						

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

Report No.: T210415W01-RP2

Test Mode:	BLE-2Mbps High CH	Temp/Hum	22.1(°C)/ 44%RH
Test Item	Harmonic	Test Date	May 3, 2021
Polarize	Vertical	Test Engineer	Ray Li
Detector	Peak		



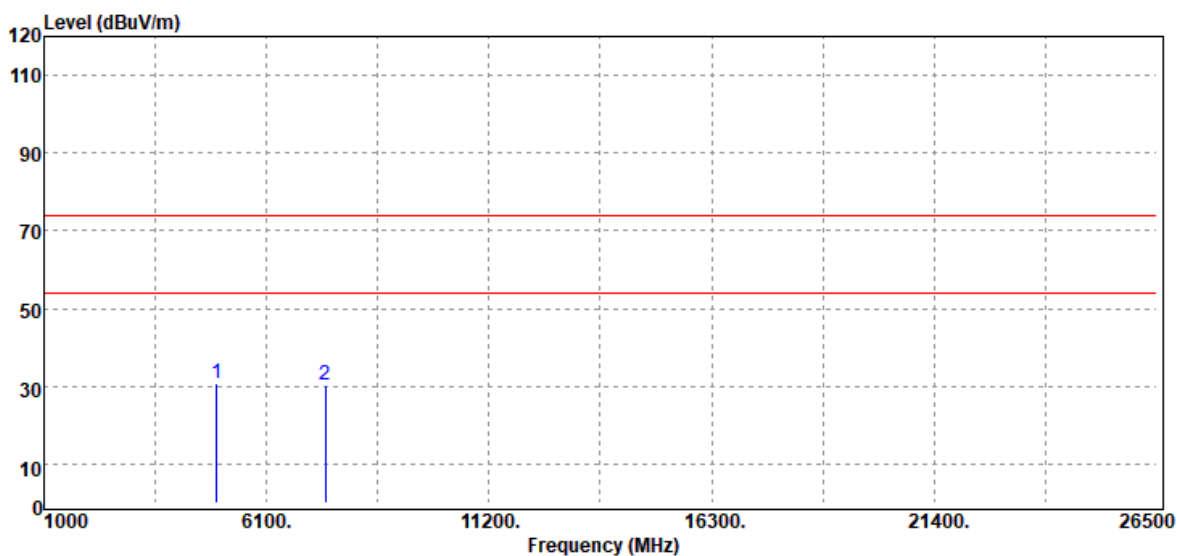
Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
4960.00	Peak	35.05	-5.27	29.78	74.00	-44.22
7440.00	Peak	31.42	-0.71	30.71	74.00	-43.29
N/A						

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

Report No.: T210415W01-RP2

Test Mode:	BLE-2Mbps High CH	Temp/Hum	22.1(°C)/ 44%RH
Test Item	Harmonic	Test Date	May 3, 2021
Polarize	Horizontal	Test Engineer	Ray Li
Detector	Peak		



Freq. MHz	Detector Mode PK/QP/AV	Spectrum Reading Level dBμV	Factor dB	Actual FS dBμV/m	Limit @3m dBμV/m	Margin dB
4960.00	Peak	36.18	-5.27	30.91	74.00	-43.09
7440.00	Peak	31.21	-0.71	30.50	74.00	-43.50
N/A						

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

--End of Test Report--