

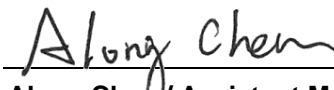
FCC Test Report

FCC ID : 2AGLL-2EGEN2
Equipment : DHSK-AF20
Model No. : DHSK-AF20
Brand Name : Afero
Applicant : Afero Inc.
Address : 4410 El Camino Real, Suite 200, Los Altos, CA,
94022
Standard : 47 CFR FCC Part 15.247
Received Date : Apr. 19, 2023
Tested Date : May 23 ~ Jul. 10, 2023

We, International Certification Corporation, would like to declare that the tested sample has been evaluated and in compliance with the requirement of the above standards. The test results contained in this report refer exclusively to the product. It shall not be reproduced except in full without the written approval of our laboratory.

Reviewed by:

Approved by:



Along Chen / Assistant Manager



Gary Chang / Manager

Table of Contents

1	GENERAL DESCRIPTION	5
1.1	Information.....	5
1.2	Local Support Equipment List	7
1.3	Test Setup Chart	7
1.4	Test Equipment List and Calibration Data.....	8
1.5	Test Standards	10
1.6	Reference Guidance	10
1.7	Deviation from Test Standard and Measurement Procedure.....	10
1.8	Measurement Uncertainty	10
2	TEST CONFIGURATION.....	11
2.1	Testing Facility	11
2.2	The Worst Test Modes and Channel Details	11
3	TRANSMITTER TEST RESULTS	12
3.1	6dB and Occupied Bandwidth	12
3.2	Conducted Output Power	13
3.3	Power Spectral Density	14
3.4	Unwanted Emissions in Restricted Frequency Bands	15
3.5	Emissions in non-restricted Frequency Bands.....	17
3.6	AC Power Line Conducted Emissions	18
4	TEST LABORATORY INFORMATION	19

Appendix A. 6dB and Occupied Bandwidth

Appendix B. Conducted Output Power

Appendix C. Power Spectral Density

Appendix D. Unwanted Emissions into Restricted Frequency Bands

Appendix E. Emissions in Non-Restricted Frequency Bands

Appendix F. AC Power Line Conducted Emissions

Release Record

Report No.	Version	Description	Issued Date
FR341901AE	Rev. 01	Initial issue	Aug. 25, 2023

Summary of Test Results

FCC Rules	Test Items	Measured	Result
15.207	AC Power Line Conducted Emissions	[dBuV]: 0.518MHz 32.47 (Margin -13.53dB) - AV	Pass
15.247(d) 15.209	Unwanted Emissions	[dBuV/m at 3m]: 73.65MHz 29.76 (Margin -10.24dB) - PK	Pass
15.247(b)(3)	Conducted Output Power	Power [dBm]: 9.10	Pass
15.247(a)(2)	6dB Bandwidth	Meet the requirement of limit	Pass
15.247(e)	Power Spectral Density	Meet the requirement of limit	Pass
15.203	Antenna Requirement	Meet the requirement of limit	Pass

Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

Comments and Explanations:

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

1 General Description

1.1 Information

1.1.1 Specification of the Equipment under Test (EUT)

RF General Information				
Frequency Range (MHz)	Bluetooth Mode	Ch. Freq. (MHz)	Channel Number	Data Rate
2400-2483.5	LE	2402-2480	0-39 [40]	1 Mbps
Note: Bluetooth LE (Low energy) uses GFSK modulation.				

1.1.2 Antenna Details

Ant. No.	Brand	Model	Type	Connector	Gain (dBi)
1	WNC	DHSK-AF20_ANT	PIFA	No	1.37

1.1.3 Power Supply Type of Equipment under Test (EUT)

Power Supply Type	5Vdc from host
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1.1.4 Accessories

N/A

1.1.5 Channel List

Frequency band (MHz)				2400~2483.5			
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
37	2402	9	2422	18	2442	28	2462
0	2404	10	2424	19	2444	29	2464
1	2406	38	2426	20	2446	30	2466
2	2408	11	2428	21	2448	31	2468
3	2410	12	2430	22	2450	32	2470
4	2412	13	2432	23	2452	33	2472
5	2414	14	2434	24	2454	34	2474
6	2416	15	2436	25	2456	35	2476
7	2418	16	2438	26	2458	36	2478
8	2420	17	2440	27	2460	39	2480

1.1.6 Test Tool and Duty Cycle

Test Tool	Realtek Bluetooth MP Kit, Version: 5.3.1.29	
Modulation Mode	Duty Cycle Of Test Signal (%)	Duty Factor (dB)
BT-LE(1Mbps)	65.90%	1.81

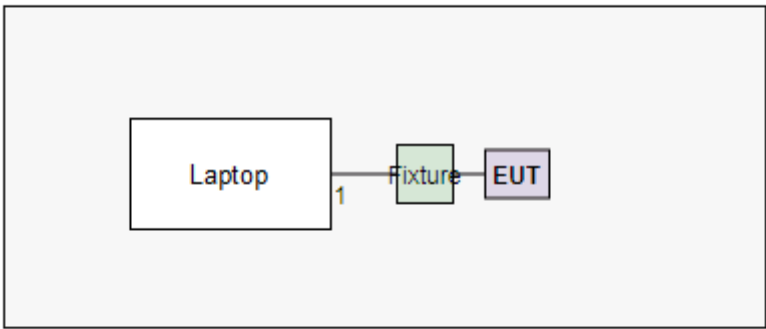
1.1.7 Power Index of Test Tool

Modulation Mode	Test Frequency (MHz)		
	2402	2440	2480
BT-LE(1Mbps)	Default	Default	Default

1.2 Local Support Equipment List

Support Equipment List					
No.	Equipment	Brand	Model	FCC ID	Remarks
1	Laptop	DELL	Latitude E5470	DoC	---
2	USB Cable	ICC	extension	---	
3	Fixture	---	---	---	Provided by applicant.

1.3 Test Setup Chart

Test Setup Diagram	
 <pre> graph LR Laptop[Laptop] --- 1[1] --- Fixture[Fixture] --- EUT[EUT] </pre>	
No.	Signal cable / Length (m)
1	USB Cable (extension), 1m shielded.

1.4 Test Equipment List and Calibration Data

Test Item	Conducted Emission				
Test Site	Conduction room 1 / (CO01-WS)				
Tested Date	May 23, 2023				
Instrument	Brand	Model No.	Serial No.	Calibration Date	Calibration Until
Receiver	R&S	ESR3	101658	Feb. 17, 2023	Feb. 16, 2024
LISN	R&S	ENV216	101295	Jan. 31, 2023	Jan. 30, 2024
LISN (Support Unit)	SCHWARZBECK	Schwarzbeck 8127	8127667	Jan. 03, 2023	Jan. 02, 2024
RF Cable-CON	Woken	CFD200-NL	CFD200-NL-001	Oct. 17, 2022	Oct. 16, 2023
50 ohm terminal (Support Unit)	NA	50	03	Jun. 08, 2022	Jun. 07, 2023
Measurement Software	AUDIX	e3	6.120210k	NA	NA
Measurement Software	Sporton	SENSE-EMI	V5.10.8.7	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

Test Item	RF Conducted				
Test Site	(TH01-WS)				
Tested Date	Jul. 10, 2023				
Instrument	Brand	Model No.	Serial No.	Calibration Date	Calibration Until
Spectrum Analyzer	R&S	FSV40	101910	Apr. 14, 2023	Apr. 13, 2024
Power Meter	Anritsu	ML2495A	1241002	Nov. 23, 2022	Nov. 22, 2023
Power Sensor	Anritsu	MA2411B	1207366	Nov. 23, 2022	Nov. 22, 2023
Measurement Software	Sporton	SENSE-15247_DTS	V5.11	NA	NA
Attenuator	Pasternack	PE7005-10	10-2	Oct. 06, 2022	Oct. 05, 2023
Note: Calibration Interval of instruments listed above is one year.					

Test Item	Radiated Emission				
Test Site	966 chamber1 / (03CH01-WS)				
Tested Date	Jul. 04, 2023				
Instrument	Brand	Model No.	Serial No.	Calibration Date	Calibration Until
Receiver	R&S	ESR3	101657	Mar. 03, 2023	Mar. 02, 2024
Spectrum Analyzer	R&S	FSV40	101498	Nov. 21, 2022	Nov. 20, 2023
Loop Antenna	R&S	HFH2-Z2	100330	Nov. 01, 2022	Oct. 31, 2023
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-522	Aug. 03, 2022	Aug. 02, 2023
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1096	Nov. 25, 2022	Nov. 24, 2023
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170517	Oct. 27, 2022	Oct. 26, 2023
Preamplifier	EMC	EMC02325	980225	Jun. 28, 2023	Jun. 27, 2024
Preamplifier	EMC	EMC118A45SE	980898	Jul. 16, 2022	Jul. 15, 2023
Preamplifier	EMC	EMC184045SE	980903	Jul. 16, 2022	Jul. 15, 2023
Loop Antenna Cable	KOAX KABEL	101354-BW	101354-BW	Oct. 04, 2022	Oct. 03, 2023
LF cable 3M	Woken	CFD400NL-LW	CFD400NL-001	Oct. 04, 2022	Oct. 03, 2023
LF cable 11M	EMC	EMCCFD400-NW-N W-11000	200801	Oct. 04, 2022	Oct. 03, 2023
LF cable 1M	EMC	EMCCFD400-NM-N M-1000	160502	Oct. 04, 2022	Oct. 03, 2023
RF Cable	EMC	EMC104-35M-35M- 8000	210920	Oct. 04, 2022	Oct. 03, 2023
RF Cable	EMC	EMC104-35M-35M- 3000	210922	Oct. 04, 2022	Oct. 03, 2023
HIGHPASS FILTER 3.1-18G	WHK	WHK3.1/18G-10SS	39	Oct. 06, 2022	Oct. 05, 2023
Attenuator	Pasternack	PE7005-10	10-1	Oct. 06, 2022	Oct. 05, 2023
Measurement Software	AUDIX	e3	6.120210g	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

1.5 Test Standards

47 CFR FCC Part 15.247

ANSI C63.10-2013

1.6 Reference Guidance

FCC KDB 558074 D01 15.247 Meas Guidance v05r02

1.7 Deviation from Test Standard and Measurement Procedure

None

1.8 Measurement Uncertainty

The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor ($k=2$)).

Measurement Uncertainty	
Parameters	Uncertainty
Bandwidth	± 34.130 Hz
Conducted power	± 0.808 dB
Power density	± 0.583 dB
Conducted emission	± 2.715 dB
AC conducted emission	± 2.92 dB
Unwanted Emission ≤ 1 GHz	± 3.41 dB
Unwanted Emission > 1 GHz	± 4.59 dB

2 Test Configuration

2.1 Testing Facility

Test Laboratory	International Certification Corporation
Test Site	CO01-WS, 03CH01-WS, TH01-WS
Address of Test Site	No.3-1, Lane 6, Wen San 3rd St., Kwei Shan Dist., Tao Yuan City 33381, Taiwan (R.O.C.)

- FCC Designation No.: TW2732
- FCC site registration No.: 181692
- ISED#: 10807A
- CAB identifier: TW2732

2.2 The Worst Test Modes and Channel Details

Test item	Modulation Mode	Test Frequency (MHz)	Test Configuration
AC Power Line Conducted Emissions	BT-LE(1Mbps)	2402	---
Unwanted Emissions ≤ 1GHz	BT-LE(1Mbps)	2402	---
Unwanted Emissions > 1GHz	BT-LE(1Mbps)	2402, 2440, 2480	---
Conducted Output Power 6dB bandwidth Power spectral density	BT-LE(1Mbps)	2402, 2440, 2480	---

NOTE:

1. The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement – X, Y, and Z-plane. The **X-plane** results were found as the worst case and were shown in this report.

3 Transmitter Test Results

3.1 6dB and Occupied Bandwidth

3.1.1 Limit of 6dB Bandwidth

The minimum 6dB bandwidth shall be at least 500 kHz.

3.1.2 Test Procedures

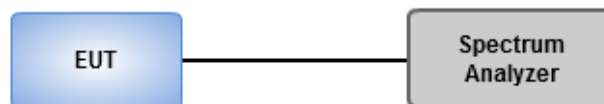
6dB Bandwidth

1. Set resolution bandwidth (RBW) = 100 kHz, Video bandwidth = 300 kHz.
2. Detector = Peak, Trace mode = max hold.
3. Sweep = auto couple, Allow the trace to stabilize.
4. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 6dB relative to the maximum level measured in the fundamental emission.

Occupied Bandwidth

1. Set resolution bandwidth (RBW) = 1% ~ 5 % of OBW, Video bandwidth = 3 x RBW
2. Detector = Sample, Trace mode = max hold.
3. Sweep = auto couple, Allow the trace to stabilize.
4. Use the OBW measurement function of spectrum analyzer to measure the occupied bandwidth.

3.1.3 Test Setup



3.1.4 Test Results

Ambient Condition	23°C / 66%	Tested By	Akun Chung
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Refer to Appendix A.

3.2 Conducted Output Power

3.2.1 Limit of Conducted Output Power

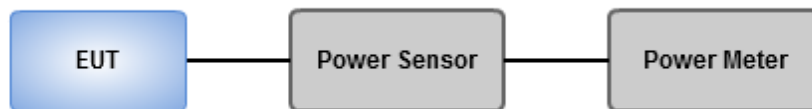
Conducted power shall not exceed 1Watt.

Antenna gain $\leq 6\text{dBi}$, no any corresponding reduction is in output power limit.

3.2.2 Test Procedures

A broadband RF power meter is used for output power measurement. The video bandwidth of power meter is greater than DTS bandwidth of EUT. If duty cycle of test signal is not 100 %, trigger and gating function of power meter will be enabled to capture transmission burst for measuring output power.

3.2.3 Test Setup



3.2.4 Test Results

Ambient Condition	23°C / 66%	Tested By	Akun Chung
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Refer to Appendix B.

3.3 Power Spectral Density

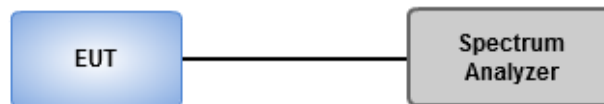
3.3.1 Limit of Power Spectral Density

Power spectral density shall not be greater than 8 dBm in any 3 kHz band.

3.3.2 Test Procedures

1. Set the RBW = 3 kHz, VBW = 10 kHz.
2. Detector = Peak, Sweep time = auto couple.
3. Trace mode = max hold, allow trace to fully stabilize.
4. Use the peak marker function to determine the maximum amplitude level.

3.3.3 Test Setup



3.3.4 Test Results

Ambient Condition	23°C / 66%	Tested By	Akun Chung
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Refer to Appendix C.

3.4 Unwanted Emissions in Restricted Frequency Bands

3.4.1 Limit of Unwanted Emissions in Restricted Frequency Bands

Restricted Band Emissions Limit			
Frequency Range (MHz)	Field Strength (uV/m)	Field Strength (dBuV/m)	Measure Distance (m)
0.009~0.490	2400/F(kHz)	48.5 - 13.8	300
0.490~1.705	24000/F(kHz)	33.8 - 23	30
1.705~30.0	30	29	30
30~88	100	40	3
88~216	150	43.5	3
216~960	200	46	3
Above 960	500	54	3

Note 1:
Quasi-Peak value is measured for frequency below 1GHz except for 9–90 kHz, 110–490 kHz frequency band. Peak and average value are measured for frequency above 1GHz. The limit on average radio frequency emission is as above table. The limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit

Note 2:
Measurements may be performed at a distance other than what is specified provided. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor as below, Frequency at or above 30 MHz: 20 dB/decade Frequency below 30 MHz: 40 dB/decade.

3.4.2 Test Procedures

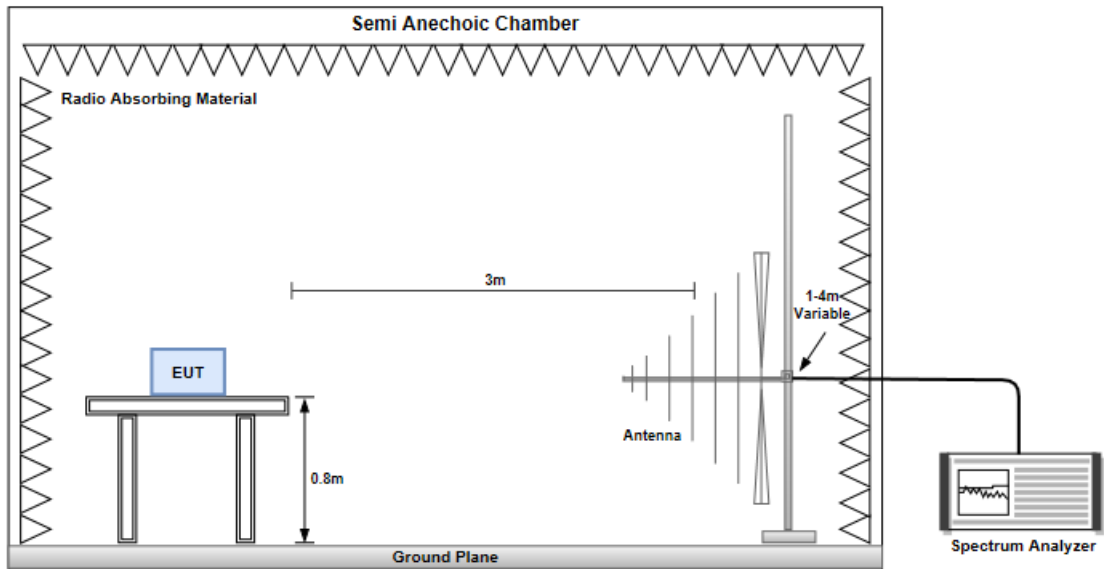
1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission frequency. The EUT is placed at test table. For emissions testing at or below 1 GHz, the table height is 80 cm above the reference ground plane. For emission measurements above 1 GHz, the table height is 1.5 m
2. Measurement is made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna is varied in height (1m ~ 4m) above the reference ground plane to obtain the maximum signal strength. Distance between EUT and antenna is 3 m.
3. This investigation is performed with the EUT rotated 360°, the antenna height scanned between 1 m and 4 m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations.

Note:

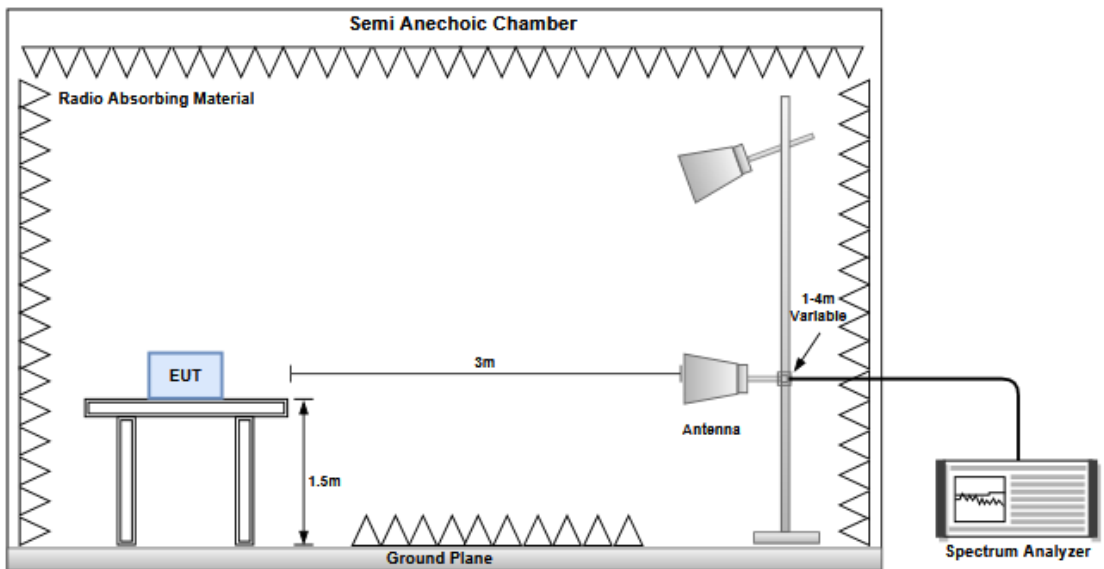
1. 120kHz measurement bandwidth of test receiver and Quasi-peak detector is for radiated emission below 1GHz.
2. RBW=1MHz, VBW=3MHz and Peak detector is for peak measured value of radiated emission above 1GHz.
3. RBW=1MHz, VBW=1/T and Peak detector is for average measured value of radiated emission above 1GHz.

3.4.3 Test Setup

Radiated Emissions below 1 GHz



Radiated Emissions above 1 GHz



3.4.4 Test Results

Refer to Appendix D.

3.5 Emissions in non-restricted Frequency Bands

3.5.1 Emissions in non-restricted frequency bands limit

Peak power in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz.

3.5.2 Test Procedures

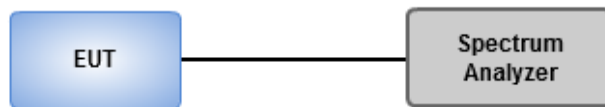
Reference level measurement

1. Set RBW=100kHz, VBW = 300kHz , Detector = Peak, Sweep time = Auto
2. Trace = max hold , Allow Trace to fully stabilize
3. Use the peak marker function to determine the maximum PSD level

Emission level measurement

1. Set RBW=100kHz, VBW = 300kHz , Detector = Peak, Sweep time = Auto
2. Trace = max hold , Allow Trace to fully stabilize
3. Scan Frequency range is up to 25GHz
4. Use the peak marker function to determine the maximum amplitude level

3.5.3 Test Setup



3.5.4 Test Results

Ambient Condition	23°C / 66%	Tested By	Akun Chung
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Refer to Appendix E.

3.6 AC Power Line Conducted Emissions

3.6.1 Limit of AC Power Line Conducted Emissions

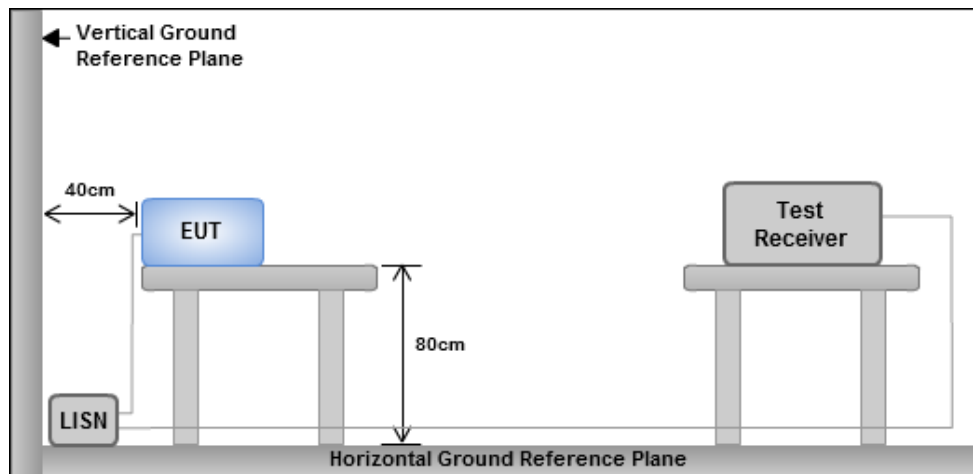
Conducted Emissions Limit		
Frequency Emission (MHz)	Quasi-Peak	Average
0.15-0.5	66 - 56 *	56 - 46 *
0.5-5	56	46
5-30	60	50

Note 1: * Decreases with the logarithm of the frequency.

3.6.2 Test Procedures

1. The device is placed on a test table, raised 80 cm above the reference ground plane. The vertical conducting plane is located 40 cm to the rear of the device.
2. The device is connected to line impedance stabilization network (LISN) and other accessories are connected to other LISN. Measured levels of AC power line conducted emission are across the 50 Ω LISN port.
3. AC conducted emission measurements is made over frequency range from 150 kHz to 30 MHz.
4. This measurement was performed with AC 120V/60Hz

3.6.3 Test Setup



- Note: 1. Support units were connected to second LISN.
 2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

3.6.4 Test Results

Refer to Appendix F.

4 Test laboratory information

Established in 2012, ICC provides foremost EMC & RF Testing and advisory consultation services by our skilled engineers and technicians. Our services employ a wide variety of advanced edge test equipment and one of the widest certification extents in the business.

International Certification Corporation (EMC and Wireless Communication Laboratory), it is our definitive objective is to institute long term, trust-based associations with our clients. The expectation we set up with our clients is based on outstanding service, practical expertise and devotion to a certified value structure. Our passion is to grant our clients with best EMC / RF services by oriented knowledgeable and accommodating staff.

Our Test sites are located at Linkou District and Kwei Shan District. Location map can be found on our website <http://www.icertifi.com.tw>.

Linkou

Tel: 886-2-2601-1640

No.30-2, Ding Fwu Tsuen, Lin Kou
District, New Taipei City, Taiwan
(R.O.C.)

Kwei Shan

Tel: 886-3-271-8666

No.3-1, Lane 6, Wen San 3rd
St., Kwei Shan Dist., Tao Yuan
City 33381, Taiwan (R.O.C.)
No.2-1, Lane 6, Wen San 3rd
St., Kwei Shan Dist., Tao Yuan
City 33381, Taiwan (R.O.C.)

Kwei Shan Site II

Tel: 886-3-271-8640

No.14-1, Lane 19, Wen San 3rd
St., Kwei Shan Dist., Tao Yuan
City 33381, Taiwan (R.O.C.)

If you have any suggestion, please feel free to contact us as below information.

Tel: 886-3-271-8666

Fax: 886-3-318-0155

Email: ICC_Service@icertifi.com.tw

==END==



Summary

Mode	Max-N dB (Hz)	Max-OBW (Hz)	ITU-Code	Min-N dB (Hz)	Min-OBW (Hz)
2.4-2.4835GHz	-	-	-	-	-
BT-LE(1Mbps)	661.25k	1.026M	1M03F1D	658.75k	1.021M

Max-N dB = Maximum 6dB down bandwidth; Max-OBW = Maximum 99% occupied bandwidth;
Min-N dB = Minimum 6dB down bandwidth; Min-OBW = Minimum 99% occupied bandwidth

Result

Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	500k	661.25k	1.026M
2440MHz	Pass	500k	658.75k	1.021M
2480MHz	Pass	500k	658.75k	1.024M

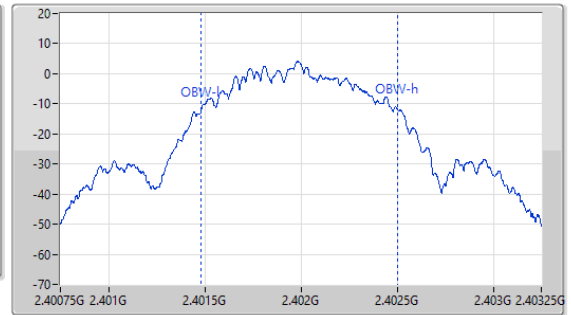
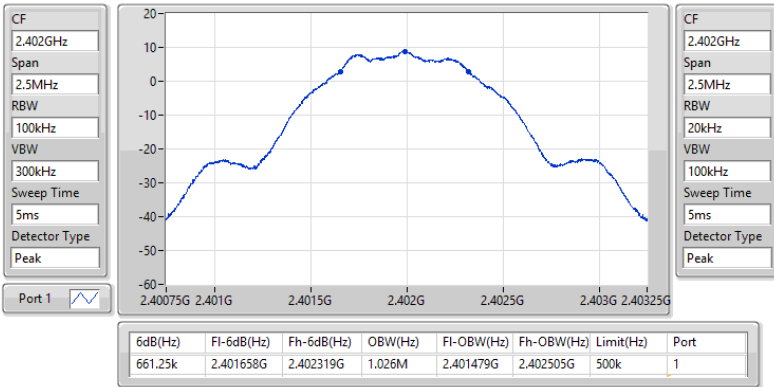
Port X-N dB = Port X 6dB down bandwidth;
Port X-OBW = Port X 99% occupied bandwidth



2.4-2.4835GHz_BT-LE(1Mbps)

EBW-DTS

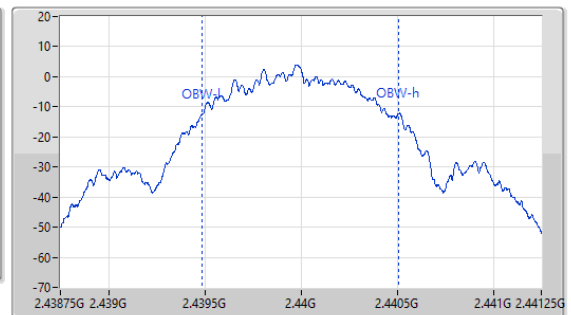
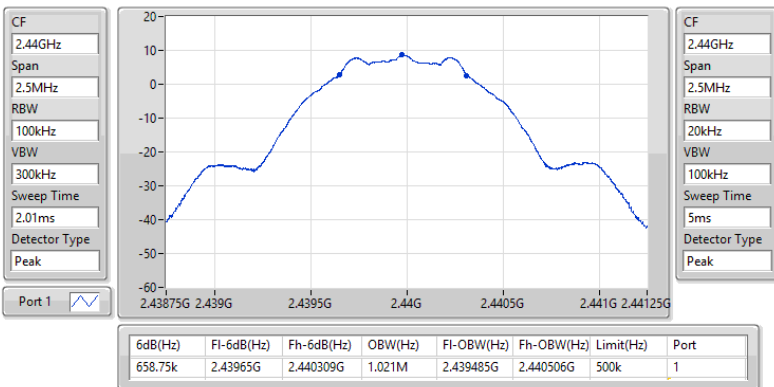
2402MHz



2.4-2.4835GHz_BT-LE(1Mbps)

EBW-DTS

2440MHz



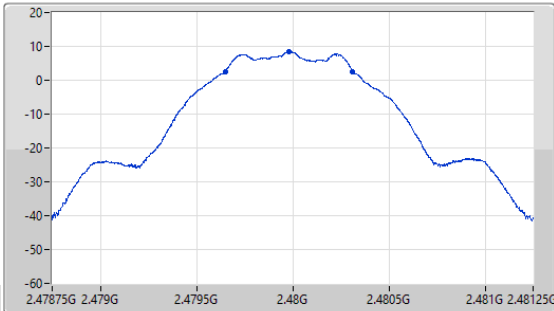


2.4-2.4835GHz_BT-LE(1Mbps)

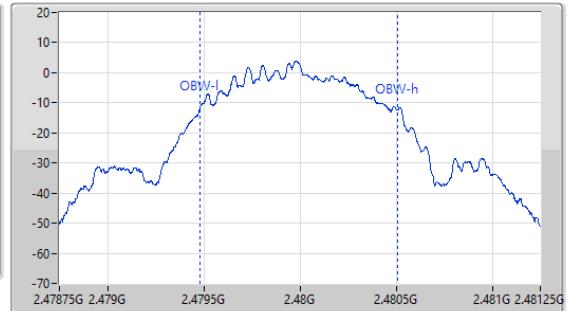
EBW-DTS

2480MHz

CF: 2.48GHz
Span: 2.5MHz
RBW: 100kHz
VBW: 300kHz
Sweep Time: 2.01ms
Detector Type: Peak



CF: 2.48GHz
Span: 2.5MHz
RBW: 20kHz
VBW: 100kHz
Sweep Time: 5ms
Detector Type: Peak



6dB(Hz)	F1-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	F1-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
658.75k	2.47965G	2.480309G	1.024M	2.479483G	2.480507G	500k	1



Summary

Mode	Total Power (dBm)	Power (W)
2.4-2.4835GHz	-	-
BT-LE(1Mbps)	9.10	0.00813

Result

Mode	Result	Antenna Gain (dBi)	Total Power (dBm)	Power Limit (dBm)	EIRP (dBm)	EIRP Limit (dBm)
BT-LE(1Mbps)	-	-	-	-	-	-
2402MHz	Pass	1.37	9.10	30.00	10.47	36.00
2440MHz	Pass	1.37	9.02	30.00	10.39	36.00
2480MHz	Pass	1.37	8.97	30.00	10.34	36.00



Summary

Mode	Total Power (dBm)	Power (W)
2.4-2.4835GHz	-	-
BT-LE(1Mbps)	8.85	0.00767

Result

Mode	Result	Antenna Gain (dBi)	Total Power (dBm)	Power Limit (dBm)	EIRP (dBm)	EIRP Limit (dBm)
BT-LE(1Mbps)	-	-	-	-	-	-
2402MHz	Pass	1.37	8.85	-	10.22	-
2440MHz	Pass	1.37	8.77	-	10.14	-
2480MHz	Pass	1.37	8.73	-	10.10	-

Note: Average power is for reference only.

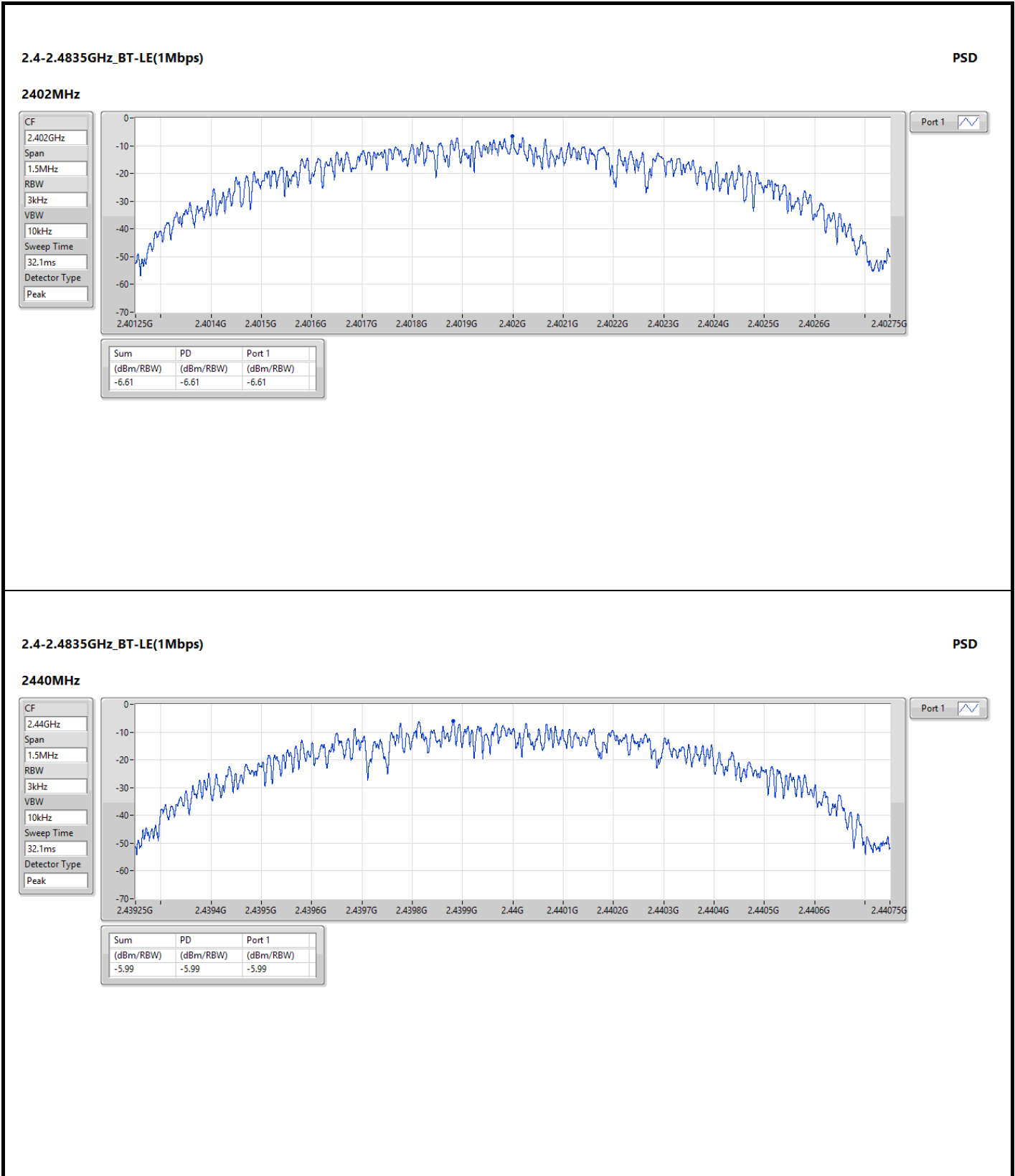


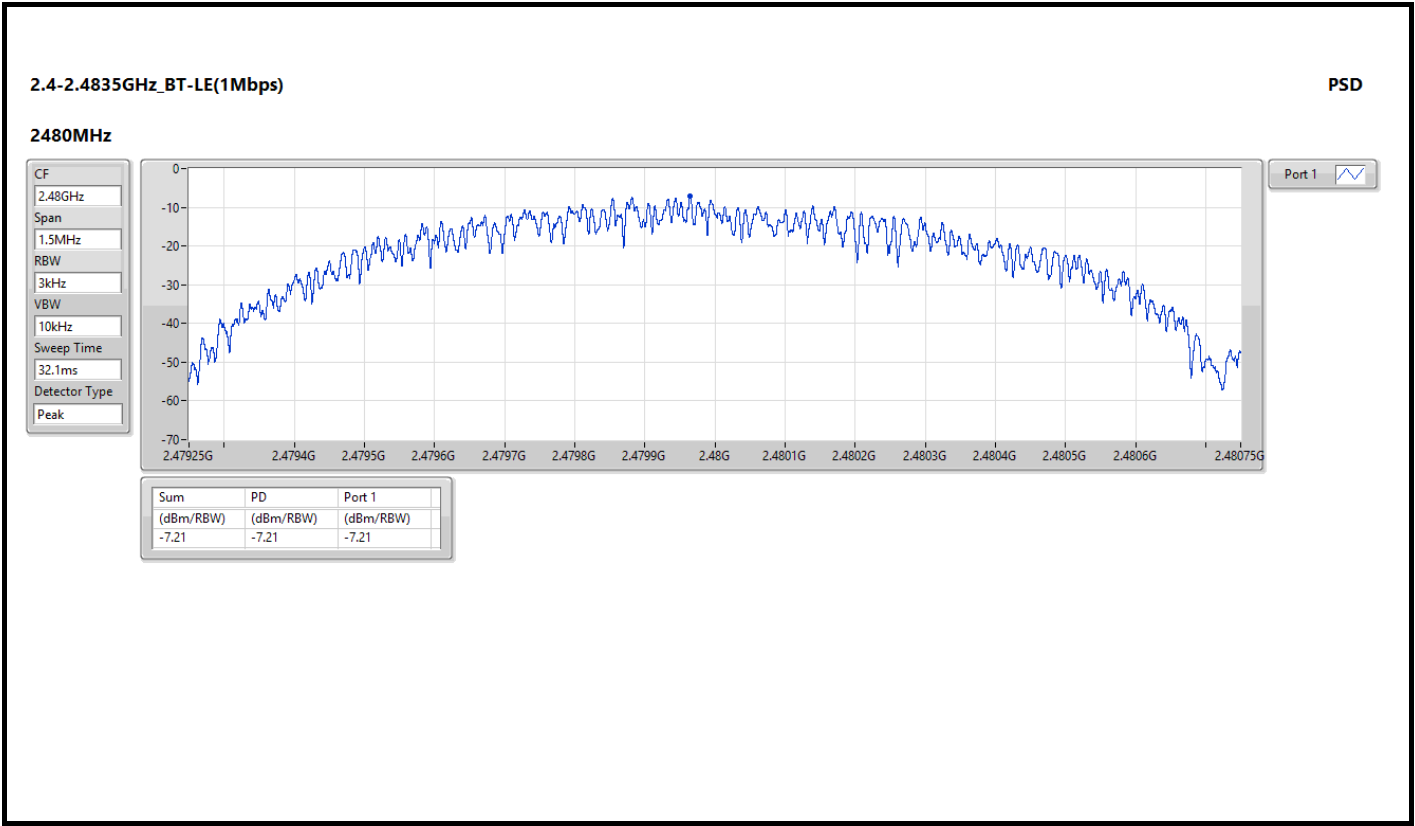
Summary

Mode	PD (dBm/3kHz)
2.4-2.4835GHz	-
BT-LE(1Mbps)	-5.99

Result

Mode	Result	Antenna Gain (dBi)	Power Density (dBm/3kHz)	Power Density Limit (dBm/3kHz)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	1.37	-6.61	8.00
2440MHz	Pass	1.37	-5.99	8.00
2480MHz	Pass	1.37	-7.21	8.00







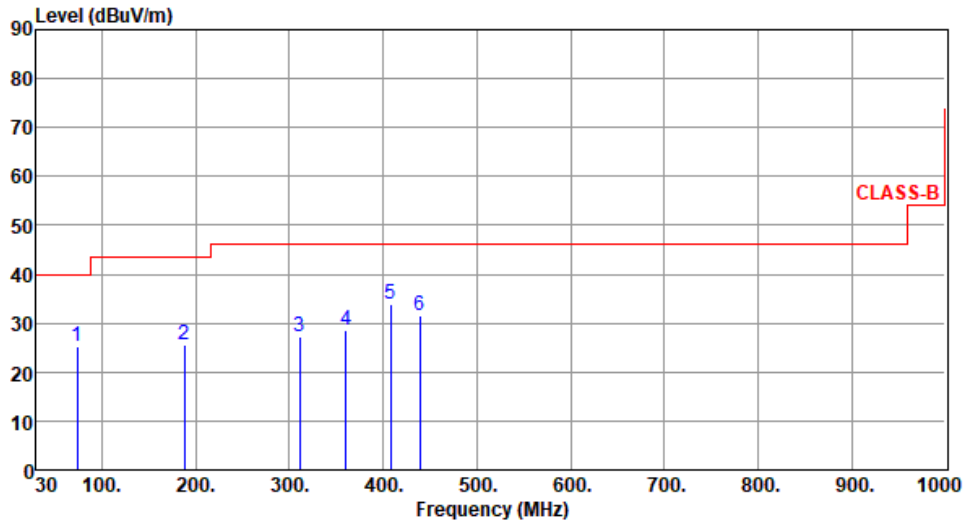
Unwanted Emissions (Below 1GHz)

Modulation	BT-LE (1Mbps)	Test Freq. (MHz)	2402						
Polarization	Horizontal								
Test By :Paul Lin Temperature(°C):23 Humidity(%):62									
<p>The graph plots Level (dBuV/m) on the y-axis (0 to 90) against Frequency (MHz) on the x-axis (30 to 1000). A red step function represents the CLASS-B limit, starting at 40 dBuV/m from 30 MHz to 100 MHz, rising to 45 dBuV/m at 100 MHz, and rising to 55 dBuV/m at 950 MHz. Six blue vertical lines indicate emission peaks labeled 1 through 6, with their respective levels and frequencies listed in the table below.</p>									
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
	1	73.65	29.76	40.00	-10.24	41.85	-12.09	Peak	---
	2	186.17	25.68	43.50	-17.82	36.86	-11.18	Peak	---
	3	201.69	32.98	43.50	-10.52	44.82	-11.84	Peak	---
	4	263.77	31.17	46.00	-14.83	40.33	-9.16	Peak	---
	5	311.30	32.87	46.00	-13.13	40.62	-7.75	Peak	---
	6	408.30	32.37	46.00	-13.63	37.74	-5.37	Peak	---
<p>Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m) *Factor includes antenna factor , cable loss and amplifier gain Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m). Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.</p>									



Modulation	BT-LE (1Mbps)	Test Freq. (MHz)	2402
Polarization	Vertical		

Test By : Paul Lin Temperature(°C): 23 Humidity(%): 62



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	73.65	25.37	40.00	-14.63	37.46	-12.09	Peak	---	---
2	188.11	25.41	43.50	-18.09	36.70	-11.29	Peak	---	---
3	311.30	27.19	46.00	-18.81	34.94	-7.75	Peak	---	---
4	360.77	28.41	46.00	-17.59	35.24	-6.83	Peak	---	---
5	408.30	33.87	46.00	-12.13	39.24	-5.37	Peak	---	---
6	439.34	31.48	46.00	-14.52	35.91	-4.43	Peak	---	---

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

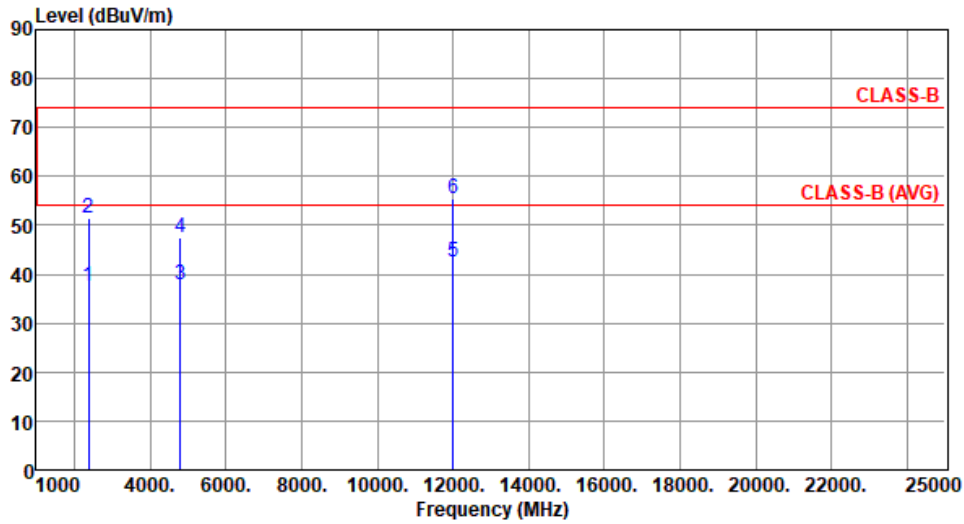
Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.



Unwanted Emissions (Above 1GHz)

Modulation	BT-LE (1Mbps)	Test Freq. (MHz)	2402
Polarization	Horizontal		

Test By :Paul Lin Temperature(°C):25 Humidity(%):64



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	2390.00	37.53	54.00	-16.47	42.18	-4.65	Average	134	136
2	2390.00	51.37	74.00	-22.63	56.02	-4.65	Peak	134	136
3	4804.00	37.76	54.00	-16.24	38.28	-0.52	Average	100	211
4	4804.00	47.63	74.00	-26.37	48.15	-0.52	Peak	100	211
5	12010.00	42.41	54.00	-11.59	36.28	6.13	Average	100	25
6	12010.00	55.35	74.00	-18.65	49.22	6.13	Peak	100	25

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).



Modulation	BT-LE (1Mbps)	Test Freq. (MHz)	2402						
Polarization	Vertical								
Test By : Paul Lin		Temperature(°C): 25		Humidity(%): 64					
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	2390.00	37.45	54.00	-16.55	42.10	-4.65	Average	100	165
2	2390.00	50.46	74.00	-23.54	55.11	-4.65	Peak	100	165
3	4804.00	34.48	54.00	-19.52	35.00	-0.52	Average	100	189
4	4804.00	46.35	74.00	-27.65	46.87	-0.52	Peak	100	189
5	12010.00	42.51	54.00	-11.49	36.38	6.13	Average	100	14
6	12010.00	55.94	74.00	-18.06	49.81	6.13	Peak	100	14
<p>Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)</p> <p>*Factor includes antenna factor , cable loss and amplifier gain</p> <p>Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).</p>									



Modulation	BT-LE (1Mbps)	Test Freq. (MHz)	2440						
Polarization	Horizontal								
Test By : Paul Lin Temperature(°C):25 Humidity(%):64									
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	2390.00	37.52	54.00	-16.48	42.17	-4.65	Average	133	136
2	2390.00	50.34	74.00	-23.66	54.99	-4.65	Peak	133	136
3	2483.50	37.23	54.00	-16.77	42.12	-4.89	Average	133	136
4	2483.50	50.87	74.00	-23.13	55.76	-4.89	Peak	133	136
5	4880.00	35.17	54.00	-18.83	35.71	-0.54	Average	100	209
6	4880.00	46.28	74.00	-27.72	46.82	-0.54	Peak	100	209
7	7320.00	38.14	54.00	-15.86	32.95	5.19	Average	100	44
8	7320.00	51.11	74.00	-22.89	45.92	5.19	Peak	100	44

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)
 *Factor includes antenna factor , cable loss and amplifier gain
 Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

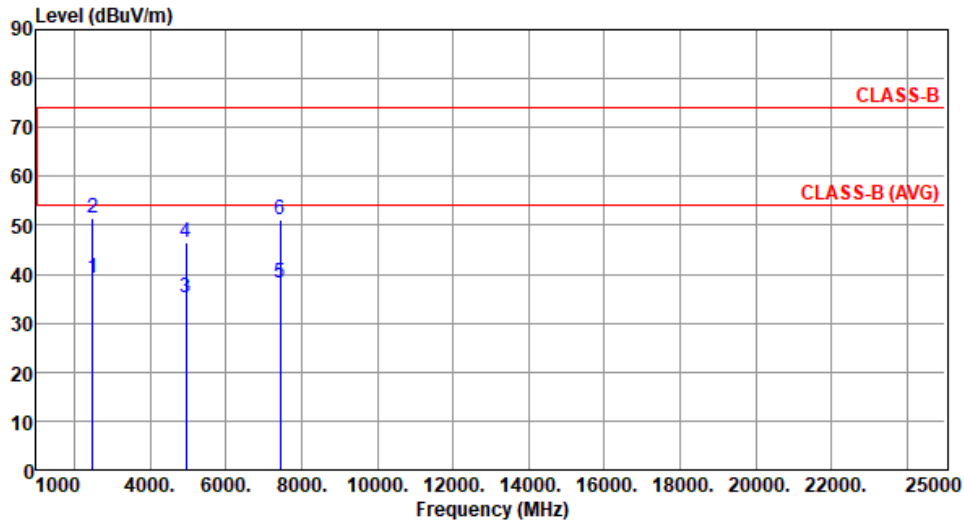


Modulation	BT-LE (1Mbps)	Test Freq. (MHz)	2440						
Polarization	Vertical								
Test By : Paul Lin		Temperature(°C): 25		Humidity(%): 64					
	Freq.	Emission level	Limit	Margin	SA	Factor	Remark	ANT	Turn
	MHz	dBuV/m	dBuV/m	dB	reading	dB/m		High	Table
					dBuV			cm	deg
1	2390.00	37.31	54.00	-16.69	41.96	-4.65	Average	100	169
2	2390.00	50.34	74.00	-23.66	54.99	-4.65	Peak	100	169
3	2483.50	36.91	54.00	-17.09	41.80	-4.89	Average	100	169
4	2483.50	50.02	74.00	-23.98	54.91	-4.89	Peak	100	169
5	4880.00	33.39	54.00	-20.61	33.93	-0.54	Average	100	188
6	4880.00	45.21	74.00	-28.79	45.75	-0.54	Peak	100	188
7	7320.00	37.84	54.00	-16.16	32.65	5.19	Average	100	26
8	7320.00	50.73	74.00	-23.27	45.54	5.19	Peak	100	26
<p>Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m) *Factor includes antenna factor , cable loss and amplifier gain Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).</p>									



Modulation	BT-LE (1Mbps)	Test Freq. (MHz)	2480
Polarization	Horizontal		

Test By : Paul Lin Temperature(°C): 25 Humidity(%): 64



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	2483.50	39.13	54.00	-14.87	44.02	-4.89	Average	132	135
2	2483.50	51.54	74.00	-22.46	56.43	-4.89	Peak	132	135
3	4960.00	35.24	54.00	-18.76	35.68	-0.44	Average	100	110
4	4960.00	46.38	74.00	-27.62	46.82	-0.44	Peak	100	110
5	7440.00	38.19	54.00	-15.81	33.08	5.11	Average	100	39
6	7440.00	51.22	74.00	-22.78	46.11	5.11	Peak	100	39

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

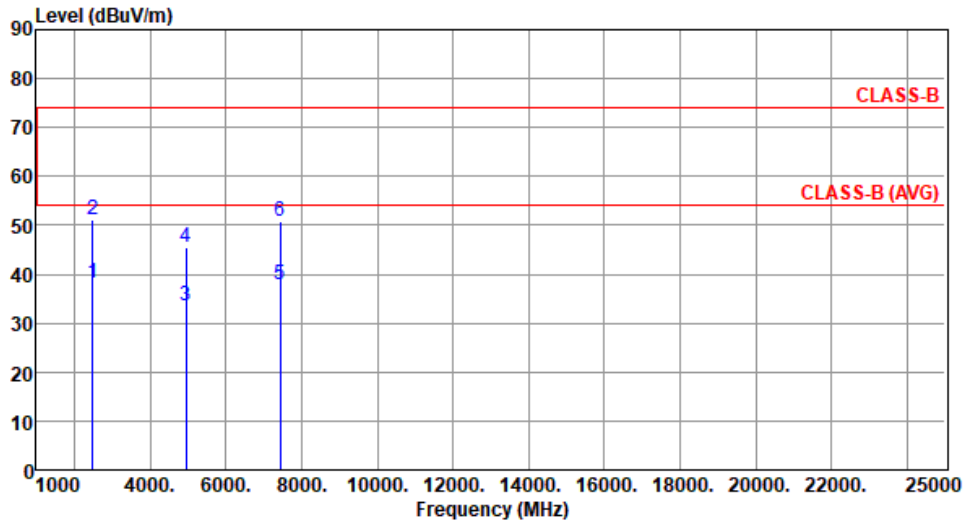
*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).



Modulation	BT-LE (1Mbps)	Test Freq. (MHz)	2480
Polarization	Vertical		

Test By : Paul Lin Temperature(°C): 25 Humidity(%): 64

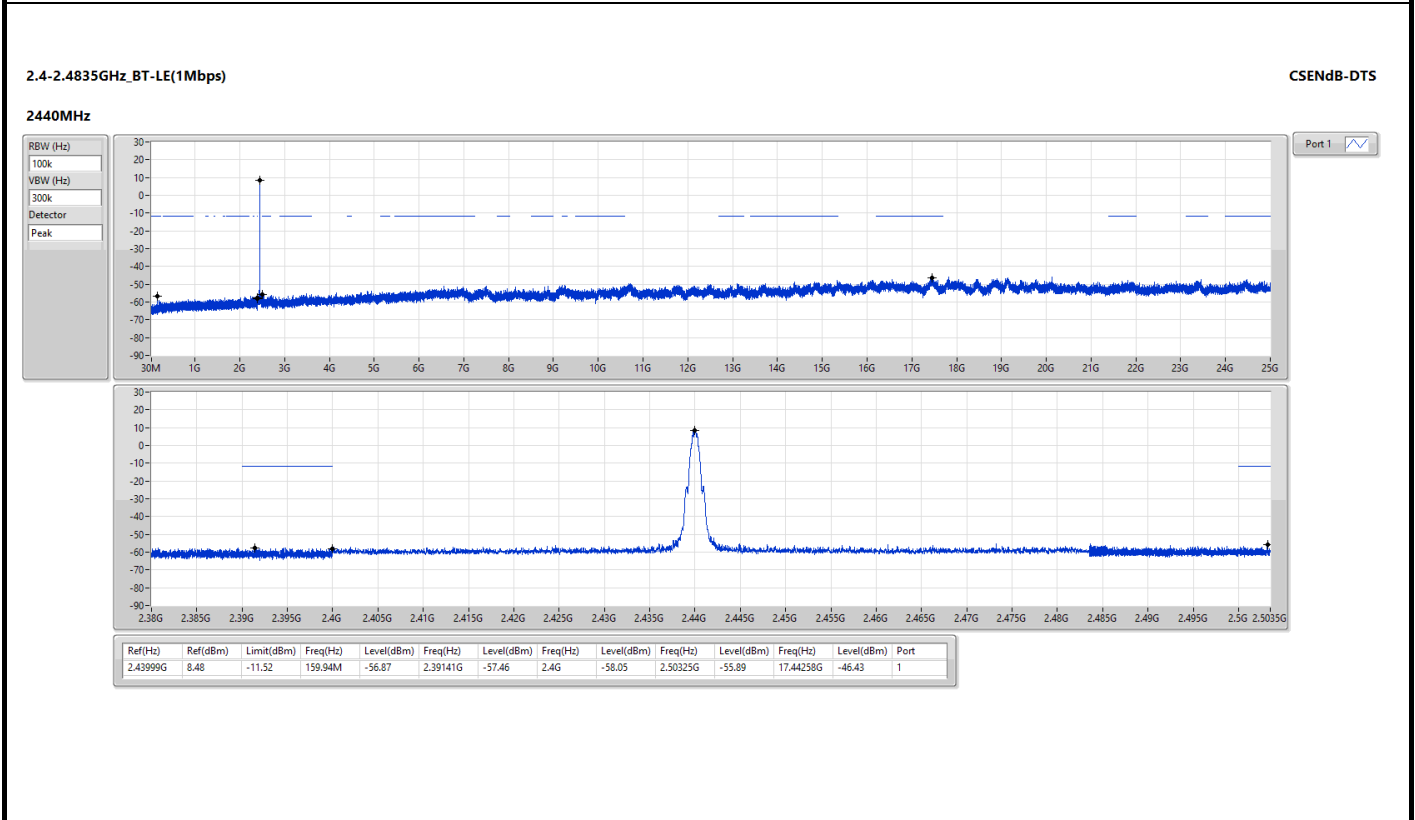
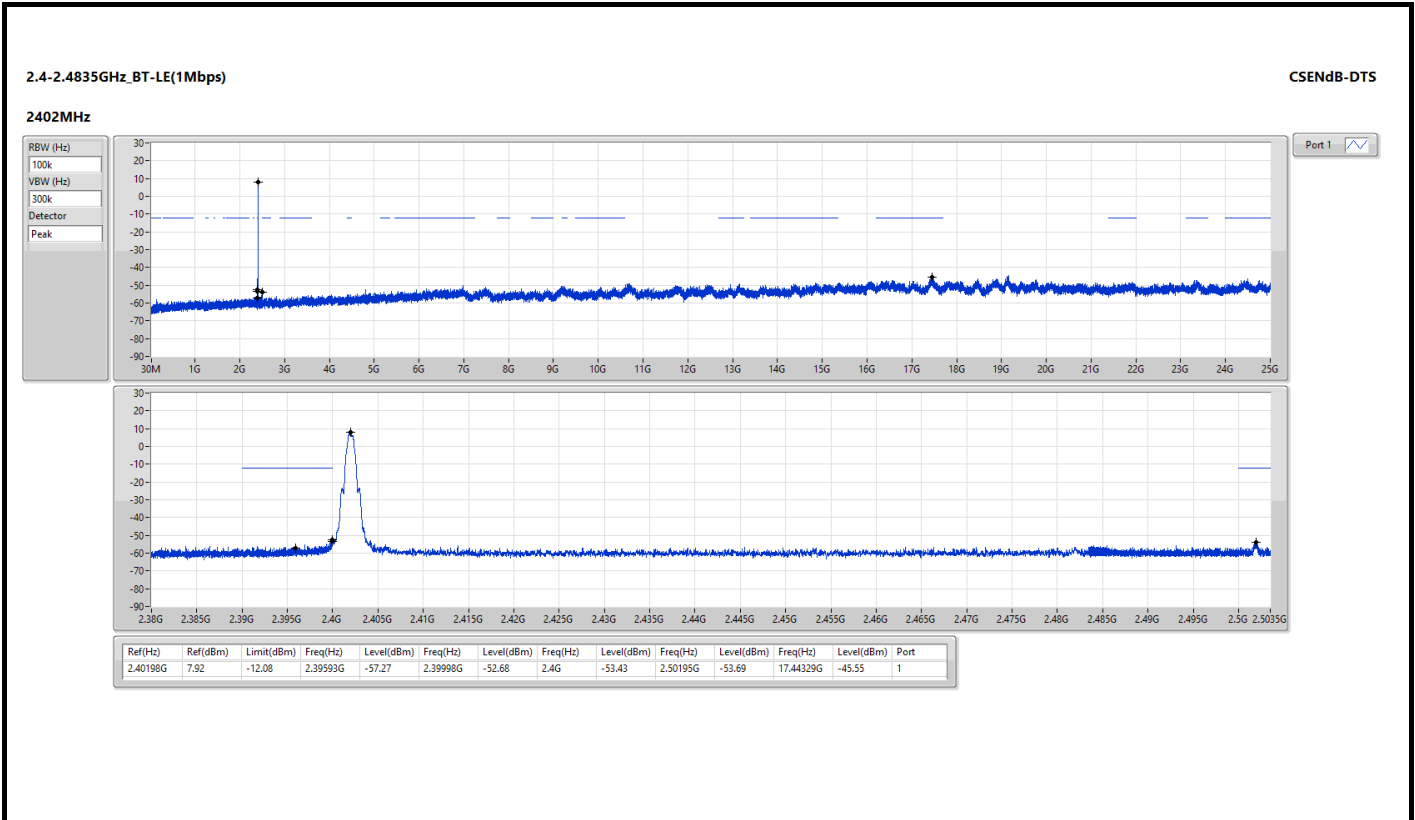


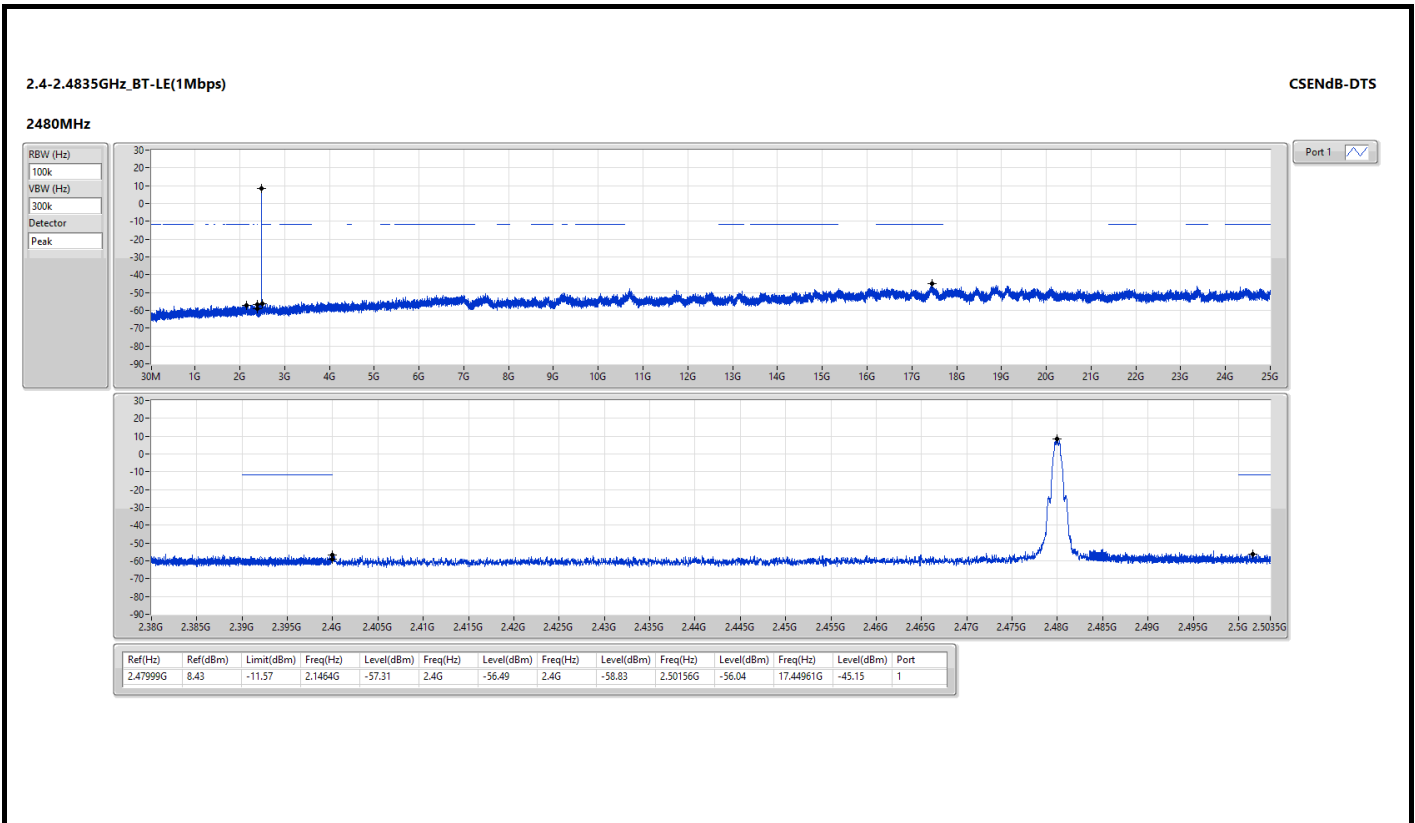
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	2483.50	38.32	54.00	-15.68	43.21	-4.89	Average	100	163
2	2483.50	51.13	74.00	-22.87	56.02	-4.89	Peak	100	163
3	4960.00	33.46	54.00	-20.54	33.90	-0.44	Average	100	182
4	4960.00	45.35	74.00	-28.65	45.79	-0.44	Peak	100	182
5	7440.00	37.91	54.00	-16.09	32.80	5.11	Average	100	21
6	7440.00	50.82	74.00	-23.18	45.71	5.11	Peak	100	21

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)

*Factor includes antenna factor , cable loss and amplifier gain

Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

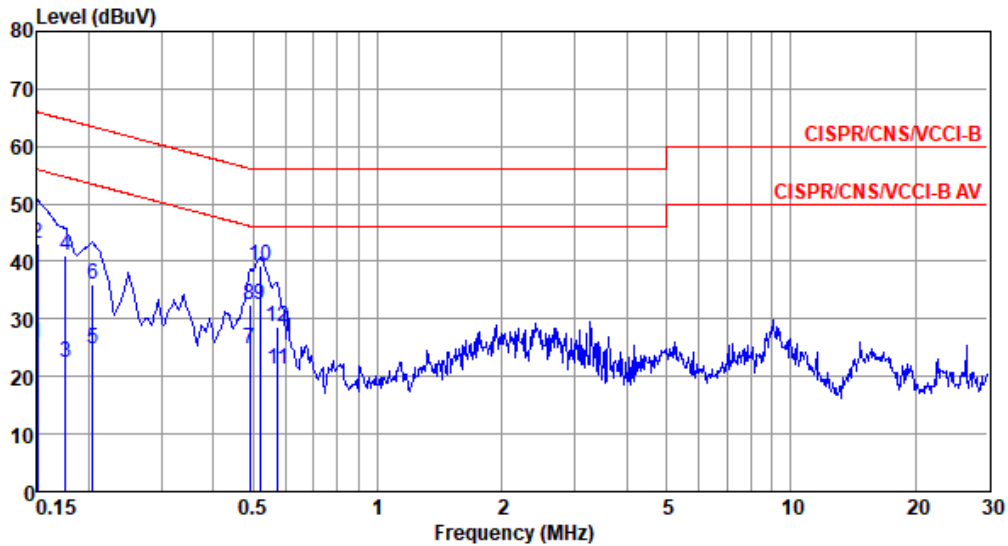






Modulation	BT-LE(1Mbps)	Test Freq. (MHz)	2402
Power Phase	Line		

Test by : Joe Liao Temperature: 22°C Humidity: 68%



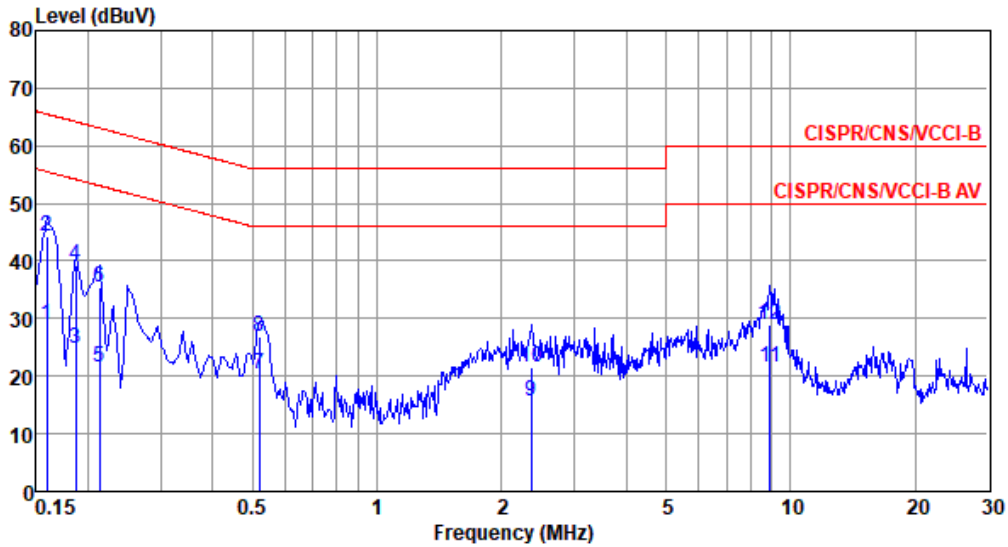
	Freq MHz	Level dBUV	Limit Line dBUV	Over Limit dB	Read Level dBUV	Factor dB	Cable loss dB	Aux dB	Remark
1	0.150	25.77	56.00	-30.23	16.08	9.63	0.06	0.00	Average
2	0.150	43.16	66.00	-22.84	33.47	9.63	0.06	0.00	QP
3	0.176	22.33	54.68	-32.35	12.65	9.62	0.06	0.00	Average
4	0.176	41.12	64.68	-23.56	31.44	9.62	0.06	0.00	QP
5	0.204	24.90	53.45	-28.55	15.22	9.62	0.06	0.00	Average
6	0.204	35.95	63.45	-27.50	26.27	9.62	0.06	0.00	QP
7	0.491	24.94	46.14	-21.20	15.25	9.62	0.07	0.00	Average
8	0.491	32.42	56.14	-23.72	22.73	9.62	0.07	0.00	QP
9*	0.518	32.47	46.00	-13.53	22.78	9.62	0.07	0.00	Average
10	0.518	39.28	56.00	-16.72	29.59	9.62	0.07	0.00	QP
11	0.573	21.25	46.00	-24.75	11.55	9.62	0.08	0.00	Average
12	0.573	28.66	56.00	-27.34	18.96	9.62	0.08	0.00	QP

Note 1: Level (dBUV) = Read Level (dBUV) + LISN Factor (dB) + Cable Loss (dB) + Aux (dB).
 Note 2: Over Limit (dB) = Level (dBUV) – Limit Line (dBUV).



Modulation	BT-LE(1Mbps)	Test Freq. (MHz)	2402
Power Phase	Neutral		

Test by : Joe Liao Temperature: 22°C Humidity: 68%



	Freq MHz	Level dBuV	Limit Line dBuV	Over Limit dB	Read Level dBuV	Factor dB	Cable loss dB	Aux dB	Remark
1	0.159	29.05	55.52	-26.47	19.36	9.63	0.06	0.00	Average
2*	0.159	44.14	65.52	-21.38	34.45	9.63	0.06	0.00	QP
3	0.186	24.93	54.20	-29.27	15.24	9.63	0.06	0.00	Average
4	0.186	39.38	64.20	-24.82	29.69	9.63	0.06	0.00	QP
5	0.213	21.44	53.10	-31.66	11.75	9.63	0.06	0.00	Average
6	0.213	35.29	63.10	-27.81	25.60	9.63	0.06	0.00	QP
7	0.518	20.45	46.00	-25.55	10.76	9.62	0.07	0.00	Average
8	0.518	26.85	56.00	-29.15	17.16	9.62	0.07	0.00	QP
9	2.358	15.60	46.00	-30.40	5.82	9.64	0.14	0.00	Average
10	2.358	21.47	56.00	-34.53	11.69	9.64	0.14	0.00	QP
11	8.916	21.41	50.00	-28.59	11.37	9.70	0.34	0.00	Average
12	8.916	29.03	60.00	-30.97	18.99	9.70	0.34	0.00	QP

Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB) + Aux (dB).
 Note 2: Over Limit (dB) = Level (dBuV) - Limit Line (dBuV).