

ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT



EUT Description: COREXOM
Applicant: Coretronic Reality Inc.
15F., No 225, Sec.3, Beixin Rd., Xindian Dist. New Taipei
City, Taiwan 231
Manufacturer: Coretronic Reality Inc.
No. 5, Wenhua Rd., Fengshan Vil., Hukou Township, Hsinchu
County 303035, Taiwan (R.O.C.)
Brand Name: Coretronic Reality Inc.
Model No. R6490WGQ
Family Model No. R6490Q, R5430WGQ, R5430Q
Model Difference: Refer to section 1.2
Report Number: TERF2506002019E2
FCC ID 2BPQQ-R6490WGQ
Date of EUT Received: June 17, 2025
Date of Test: June 20, 2025 ~ September 03, 2025
Issue Date: December 4, 2025

Arno Hsieh

Approved By

Arno Hsieh

We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. Central RF Lab The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10 and the energy emitted by the sample EUT comply with FCC rule part §15.247.

The results of this report relate only to the sample identified in this report.

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Revision History

Report Number	Revision	Description	Issue Date	Revised By	Remark
TERF2506002019E2	00	Original	October 29, 2025	Yuri Tsai	
TERF2506002019E2	01	Update applicant information	November 25, 2025	Yuri Tsai	*
TERF2506002019E2	02	Update section7.3	December 4, 2025	Yuri Tsai	*

Note:

- 1、The remark "*" indicates modification of the report upon requests from certification body.
- 2、Variant information of model numbers is provided by the applicant, test results of this report are applicable to the sample EUT(s) received.
And are assessed as electrically identical in RF characteristics, therefore, no further assessment required for the variant(s).

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1 GENERAL INFORMATION

1.1 Product Description

EUT Description	COREXOM
Brand Name	Coretronic Reality Inc.
Model No.	R6490WGQ
Family Model No.	R6490Q, R5430WGQ, R5430Q
Hardware Version	N/A
Firmware Version	Android13
EUT Series No.	a607e351
Power Supply	3.8 Vdc
Test Software (Name/Version)	Qualcomm Radio Control Toolkit v4.0

1.2 Model Difference

Model	Difference
R6490WGQ	With BT+Wi-Fi/GPS, Memory : uMCP 8GB LPDDR4X+128GB UFS
R6490Q	Without BT+Wi-Fi/GPS, Memory : uMCP 8GB LPDDR4X+128GB UFS
R5430WGQ	With BT+Wi-Fi/GPS, Memory : uMCP 4GB LPDDR4X+64GB UFS
R5430Q	Without BT+Wi-Fi/GPS, , Memory : uMCP 4GB LPDDR4X+64GB UFS

1.3 RF Specification

Radio Technology	BLE
Frequency Range	2402 – 2480MHz
Channel number	40 channels
Modulation type	GFSK
Transmit Power	BLE 1M: 6 dBm BLE 2M: 5.88 dBm BLE 125k: 6.01 dBm BLE 500k: 5.98 dBm

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1.4 Antenna Designation

Antenna Type	Freq. (MHz)	Peak Gain(dBi)
Dipole	2400 – 2483.5	4

Note:

1. The antenna information is provided by the applicant. The laboratory does not verify the accuracy of this information, and all test results related to antenna characteristics are based solely on the data supplied. Responsibility for the authenticity and accuracy of these specifications rests entirely with the party who provided the information.
2. The antenna complies with part 15.203 requirement and no consideration of replacement. Please see EUT photo for details.

1.5 Operating Frequencies

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

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1.6 EUT Availability and The Worst Test Modes

1. Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.
2. The field strength of radiation emission was measured as the EUT positioned in different orthogonal planes (E1/E2/H) based on actual usage of the EUT to pre-scan the emissions for determining the worst case scenario.
3. Investigation has been done on all the possible configurations for searching the worst case. The given UE is pre-scanned among below modes.

CONDUCTED TEST				
MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)
Bluetooth LE	0 to 39	0,20,39	GFSK	1
Bluetooth LE	0 to 39	0,20,39	GFSK	2
Bluetooth LE	0 to 39	0,20,39	GFSK	0.125
Bluetooth LE	0 to 39	0,20,39	GFSK	0.5

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION	DATA RATE (Mbps)
TRANSMIT RADIATED EMISSION TEST (BELOW 1 GHz)				
Bluetooth LE_125k	0 to 39	20	GFSK	0.125
TRANSMIT RADIATED EMISSION TEST (ABOVE 1 GHz)				
Bluetooth LE_1M	0 to 39	0,20,39	GFSK	1
Bluetooth LE_125k	0 to 39	0,20,39	GFSK	0.125
Note: The field strength of radiation emission was measured as EUT stand-up position (H mode) and lie down position (E1, E2 mode) for channel Low, Mid and High, the worst case position was reported.				

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2 SUMMARY OF TEST RESULTS

FCC Rules	Description Of Test	Result
§15.207(a)	AC Power Line Conducted Emission	Compliant
§15.247(b) (3)	Peak Output Power	Compliant
§15.247(a)(2)	Emission Bandwidth	Compliant
§15.205 §15.209 §15.247(d)	Out of Band Emission	Compliant
§15.205 §15.209 §15.247(d)	Unwanted Emission	Compliant
§15.247(e)	Power Spectral Density	Compliant
§15.203	Antenna Requirement	Compliant

2.1 Test Methodology of Applied Standards

1. FCC Part 15, Subpart C §15.247
2. FCC KDB 558074 D01 15.247 Meas Guidance v05r02
3. ANSI C63.10:2020

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2.2 Measurement Uncertainty

Test Items	Uncertainty
AC Power Line Conducted Emission	+/- 1.54 dB
Output Power measurement	+/- 0.97 dB
Emission Bandwidth	+/- 1.38 Hz
Conducted emission measurement	+/- 0.77 dB
Peak Power Density	+/- 0.61 dB
Temperature	+/- 0.60 °C
Humidity	+/- 3.00 %
DC / AC Power Source	+/- 1.00 %

Radiated Spurious Emission Measurement Uncertainty		
Polarization: Vertical	+/- 1.89 dB	9kHz - 30MHz
	+/- 4.10 dB	30MHz - 1000MHz
	+/- 3.37 dB	1GHz - 18GHz
	+/- 3.83 dB	18GHz - 40GHz
Polarization: Horizontal	+/- 1.89 dB	9kHz - 30MHz
	+/- 4.10 dB	30MHz - 1000MHz
	+/- 3.37 dB	1GHz - 18GHz
	+/- 3.83 dB	18GHz - 40GHz
Radiated Spurious Emission	+/- 2.00 dB	33GHz - 50GHz
	+/- 1.59 dB	50GHz - 60GHz
	+/- 1.71 dB	60GHz - 90GHz
	+/- 1.64 dB	90GHz - 140GHz
	+/- 3.84 dB	140GHz - 220GHz

Note

1. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.
2. The conformity assessment statement in this report is based solely on the test results, measurement uncertainty is excluded.

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2.3 Test Facility

Laboratory	Test Site Address	Test Site Name	FCC Designation number / Registration Number	IC CAB identifier
SGS Taiwan Ltd. Central RF Lab. (TAF code 3702)	No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan 24803	SAC 1 / SAC 2 / SAC 3 Conduction 1 / Conducted 1 Conducted 2 / Conducted 3 Conducted 4 / Conducted 5 Conducted 6	TW0027 / 891563	TW3702
SGS Taiwan Ltd. Central RF Lab. (TAF code 3702)	No.2, Keji 1st Rd, Guishan District, Taoyuan City, Taiwan 333	SAC C / SAC D / SAC G Conduction C / Conducted A Conducted B / Conducted C Conducted D / Conducted E Conducted F / Conducted G	TW0028 / 200037	TW3702

Test Condition	Test Site name	Test Engineer	Test Environment (T&H)	Test Date
Conducted	Conducted D	Charlie	20~25°C / 60~66%	2025/07/30 ~ 2025/09/03

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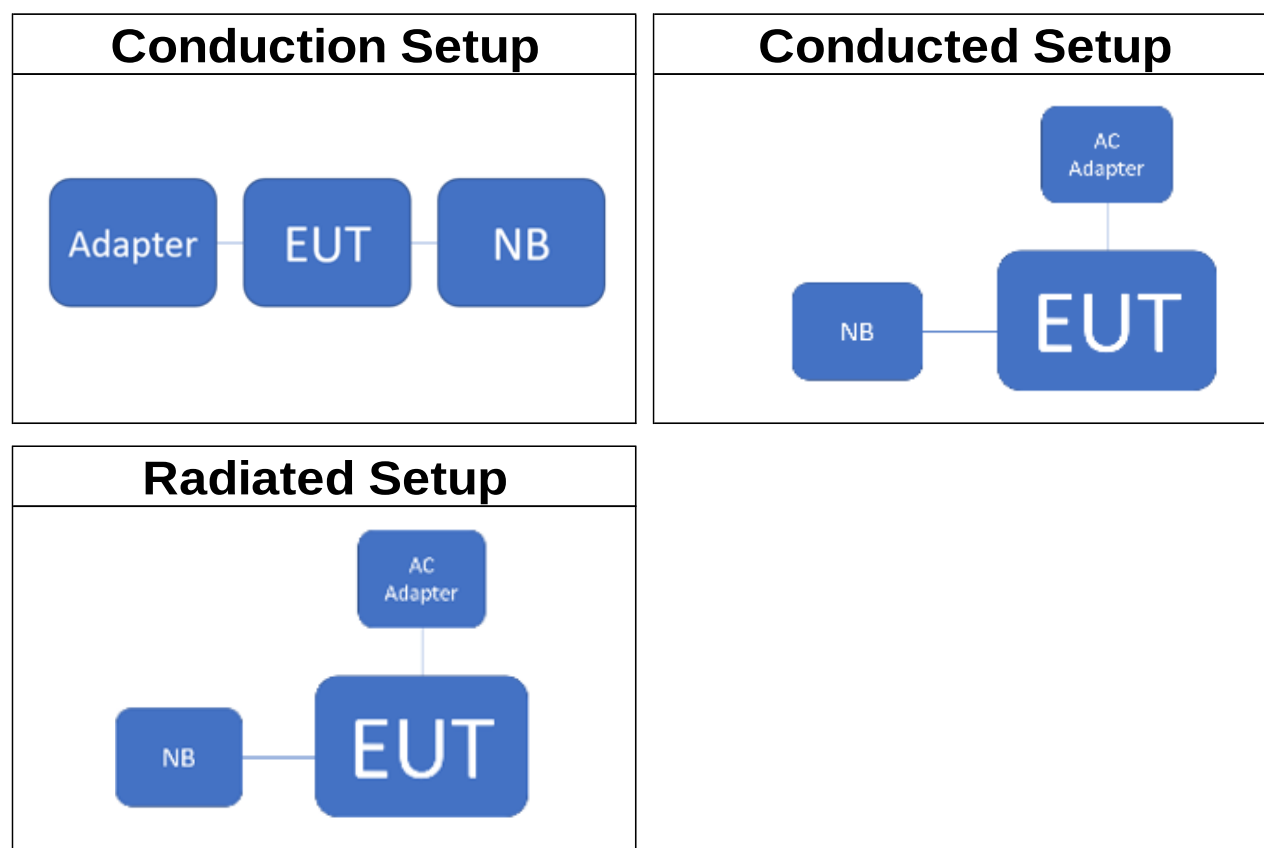
3 CONTROL UNIT(S) AND PERIPHERAL(S)

3.1 EUT Exercise

An engineering test mode (software/firmware) that applicant provided was utilized to manipulate the EUT into transmit, selection of the test channel, and modulation scheme.

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuation factor between EUT conducted port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly EUT RF output level.

3.2 Diagrams



3.3 List

3.3.1 Conduction Setup

AC Power-Line Conducted Emission Test Site: Conduction C					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL. (mm/dd/yyyy)	CAL DUE. (mm/dd/yyyy)
Adapter	LYD	LYD1202500B	N/A	N/A	N/A
USB Cable	Yunkang	80.00095.001	N/A	N/A	N/A
Notebook	HP	HSN-Q35C-4	P0004691	N/A	N/A

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3.3.2 Conducted Setup

Conducted Emission Test Site: Conducted D					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL. (mm/dd/yyyy)	CAL DUE. (mm/dd/yyyy)
Notebook	Lenovo	T14	P0003332	N/A	N/A
AC Adapter	LYD	LYD1202500B	N/A	N/A	N/A
Type C	YUNGKANG	80.00095.001	N/A	N/A	N/A

3.3.3 Radiated Setup

Radiated Emission Test Site: SAC C					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL. (mm/dd/yyyy)	CAL DUE. (mm/dd/yyyy)
Adapter	LYD	LYD1202500B	N/A	N/A	N/A
USB Cable	Yungkang	80.00095.001	N/A	N/A	N/A
Notebook	HP	HSN-Q35C-4	P0004691	N/A	N/A

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4 TEST INSTRUMENT

4.1 Conducted Measurement

Conducted Emission Test Site: Conducted D					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL. (mm/dd/yyyy)	CAL DUE. (mm/dd/yyyy)
Attenuator	Marvelous	MVE2213-10	RF08	11/14/2024	11/13/2025
Attenuator	Woken	WATT-218FS-10	RF17	11/14/2024	11/13/2025
DC Block	Marvelous	MVE6114	RF39	11/14/2024	11/13/2025
Power Meter	Anritsu	ML2496A	2138005	09/25/2024	09/24/2025
Power Sensor	Anritsu	MA2411B	1911395	09/25/2024	09/24/2025
Power Sensor	Anritsu	MA2411B	1911396	09/25/2024	09/24/2025
Spectrum Analyzer	KEYSIGHT	N9010A	MY51440113	09/18/2024	09/17/2025
Test Software	SGS Taiwan	Radio Test Software	Ver.21	N.C.R	N.C.R

4.2 Radiated Measurement

Radiated Emission Test Site: SAC C					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL. (mm/dd/yyyy)	CAL DUE. (mm/dd/yyyy)
3m Site NSA	SGS	966 chamber C	N/A	03/02/2025	03/01/2026
Active Loop Antenna	COM-POWER	AL-130R	10160105	12/11/2024	12/10/2025
Attenuator	Woken	WATT-218FS-10	RF17	11/14/2024	11/13/2025
Broadband Antenna	SCHWARZBECK	VULB 9168	9168-300	11/06/2024	11/05/2025
Coaxial Cable	EMCI+Huber Suhner	RG 214/U+EMC104-SM-SM-6000+EMC105-SM-SM-12000+15	W13.01+150813+2310002+15	11/14/2024	11/13/2025
EMI Test Receiver	R&S	ESU 40	100363	05/06/2025	05/05/2026
Highpass Filter	R&S	F13 HPF 3GHz	RF167	11/14/2024	11/13/2025
Horn Antenna	Schwarzbeck	BBHA9120D	1187	02/05/2025	02/04/2026
Horn Antenna	Schwarzbeck	BBHA9170	184	12/20/2024	12/19/2025
Lowpass Filter	Woken	EWI-56-0019	RF163	11/14/2024	11/13/2025
Notch Filter	Micro-Tronics	BRM50701-02	RF208	11/14/2024	11/13/2025
Pre-Amplifier	EMC Instruments	EMC118A45SE	980789	11/14/2024	11/13/2025
Pre-Amplifier	EMC Instruments	EMC184045SEE	980881	11/14/2024	11/13/2025
Pre-Amplifier	EMC Instruments	EMC330	980091	11/14/2024	11/13/2025
Spectrum Analyzer	KEYSIGHT	N9010B	MY63440390	02/13/2025	02/12/2026
Test Software	audix	e3	E3 20923 SGS Ver.9 (C)	N.C.R	N.C.R

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4.3 Emission from AC power line

AC Power-Line Conducted Emission Test Site: Conduction C					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL. (mm/dd/yyyy)	CAL DUE. (mm/dd/yyyy)
Coaxial Cable	EC Lab	RF-HY-CAB-250	RF-HY-CAB-250-01	03/27/2025	03/26/2026
EMI Test Receiver	R&S	ESCI	101342	04/23/2025	04/22/2026
LISN	SCHWARZBECK Mess-Elektronik	NSLK8127	974	06/30/2025	06/29/2026
Pulse Limiter	EC Lab	VTSD 9561F-N	485	03/27/2025	03/26/2026
Test Software	audix	e3	E3 20923 SGS Ver.9 (C)	N.C.R	N.C.R

NOTE: N.C.R refers to Not Calibrated Required.

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5 REGULATORY REQUIREMENTS

5.1 Emission Bandwidth

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

5.2 Duty Cycle

Pre-analysis Check: While conducting average power measurement, duty cycle of each mode shall be checked to ensure its duty cycle in order to compensate for the loss due to insufficient ratio of duty cycle.

All duty cycle is pre-scanned, and result as obtained below shows only the most representative ones where duty cycle is conducted as the given transmission with given virtual operation that expresses the percentage.

5.3 Maximum Output Power

FCC

For systems using digital modulation in the 2400-2483.5 MHz bands, the limit for peak output power is 1Watt.

If the transmitting antenna of directional gain greater than 6dBi are used the peak output power from the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the Antenna exceeds 6dBi.

In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of Antenna exceeds 6dBi.

Note:

When the antenna gain is greater than 6 dBi, the power limit attenuated accordingly.

5.4 Maximum Power Spectral Density

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

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5.5 Out of Band Emission

For emissions in non-restricted frequency bands, in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator 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 the transmitter demonstrates compliance with the peak conducted power limits.

5.6 Unwanted Emissions

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator 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 the transmitter demonstrates compliance with the peak conducted power limits.

In addition, radiated emissions which fall in the restricted bands must also comply with the applicable radiated emission limits as defined in the general emission limit tables.

Moreover, for an intentional radiator operating below 10 GHz, the frequency range of measurements shall extend up to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

Frequency (MHz)	Field strength (microvolts/meter)	Distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Note: The lower limit shall apply at the transition frequencies.

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5.7 AC Power Line Conducted Emission

Frequency range within 150kHz to 30MHz shall not exceed the Limit table as below.

Frequency range MHz	Limits (dBuV)	
	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
Note 1.The lower limit shall apply at the transition frequencies 2.The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz		

5.8 Antenna Requirement

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §§ 15.211, 15.213, 15.217, 15.219, 15.221, or § 15.236. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with § 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

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6 TEST CONFIGURATION

6.1 Emission Bandwidth



Place the EUT on the table and set it in transmitting mode.

Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.

6dB BW measurements

The testing is performed in accordance with the applicable regulatory measurement procedure.

Set the spectrum analyzer as

RBW= 1% to 5% of the OBW but not less than 100 kHz,

VBW $\geq 3 \times$ RBW,

Span= 2 to 5 times of the OBW,

Sweep=Auto, Detector = Peak, and Trace mode = Max Hold.

Use the X dB bandwidth mode function of the spectrum analyzer and set to 6dB.

Repeat above procedures until all test default channel is completed.

99% BW measurements

The testing is performed in accordance with the applicable regulatory measurement procedure.

Set the spectrum analyzer as

RBW= 1 % to 5% of 99% without going below 10kHz,

VBW $\geq 3 \times$ RBW,

Span= 1.5 to 5 times of the OBW,

Sweep=Auto, Detector = Peak, and Trace mode = Max Hold,

Use the 99% power bandwidth function of the spectrum analyzer.

Repeat above procedures until all test default channel is completed.

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6.2 Maximum Output Power

6.2.1 Duty Cycle



Set the spectrum analyzer as

Center Frequency = fundamental frequency

Span = Zero,

RBW = 8 MHz,

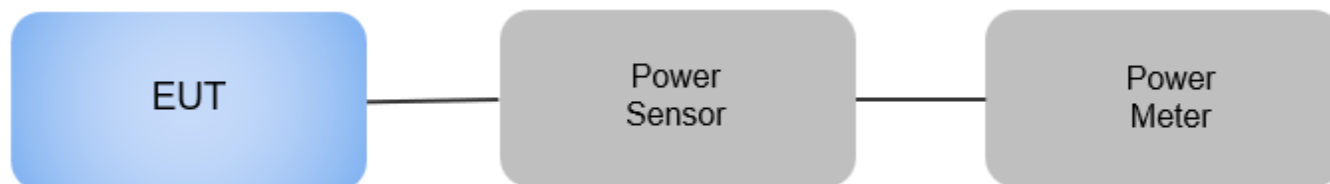
VBW = 8 MHz,

Detector = Peak,

Allow trace to fully stabilize.

Use the delta marker function to determine the ON and OFF times.

6.2.2 Output Power



Place the EUT on the table and set it to transmit mode.

The testing was performed in accordance with the applicable measurement procedure.

Remove the antenna from the EUT and connect a low-loss RF cable from the antenna port to the power meter.

Record the maximum reading as observed from the power meter.

Repeat the above procedures until all default test channels have been measured.

Note: The duty cycle factor is applied to obtain the average measurement corrected to its maximum equivalent.

Note: when the antenna gain is greater than 6 dBi, the power limit attenuated accordingly.

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6.3 Maximum Power Spectral Density



The test is conducted in accordance with the applicable regulatory measurement procedure.

Set spectrum analyzer center frequency to DTS channel center frequency.

Set the span > 1.5 times the DTS channel bandwidth.

Set the RBW = 3 kHz and VBW = 10 kHz.

Detector = Peak.

Sweep time = Auto Couple.

Trace mode = Max Hold.

Allow trace to fully stabilize.

Use the peak marker function to determine the maximum amplitude level.

*Note: When the antenna gain is greater than 6 dBi, the power spectral density limit attenuated accordingly.

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6.4 Out of Band Emission



6.4.1 Reference Level of Emission Limit

The testing is performed in accordance with the applicable measurement procedure.

Set the analyzer center frequency to the DTS channel center frequency.

Set the span to 1.5 times the DTS channel bandwidth.

Set RBW = 100 kHz and VBW = 300 kHz.

Detector = Peak.

Sweep time = Auto Couple.

Trace mode = Max Hold.

Allow the trace to fully stabilize.

Use the peak marker function to determine the maximum amplitude level.

6.4.2 Conducted Band Edge

The testing is performed in accordance with the applicable measurement procedure.

Connect the antenna port of the EUT to the spectrum analyzer.

Remove the antenna from the EUT and connect a low-loss RF cable from the antenna port to the spectrum analyzer.

Set the start frequency and stop frequency of the spectrum analyzer to encompass the spectrum to be examined.

Configure the spectrum analyzer as follows:

RBW = 100 kHz

VBW = 300 kHz

Detector = Peak

Sweep = Auto

Mark the highest reading of the emission as the reference level.

Set DL as the limit = reading on marker of reference level measurement - 20dBm

Mark the highest emissions observed outside of the 2400 MHz to 2483.5 MHz band.

Repeat the above procedure for each default test channel (low, middle, and high).

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6.4.3 Conducted Spurious Emission

The testing is performed in accordance with the applicable measurement procedure.

Connect the antenna port of the EUT to the spectrum analyzer.

Configure the spectrum analyzer as follows:

RBW = 100 kHz

VBW = 300 kHz

Detector = Peak

Sweep = Auto.

Allow the trace to fully stabilize.

Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental emission bandwidth (EBW).

Repeat the above procedures until all default test channels (low, middle, and high) have been measured.

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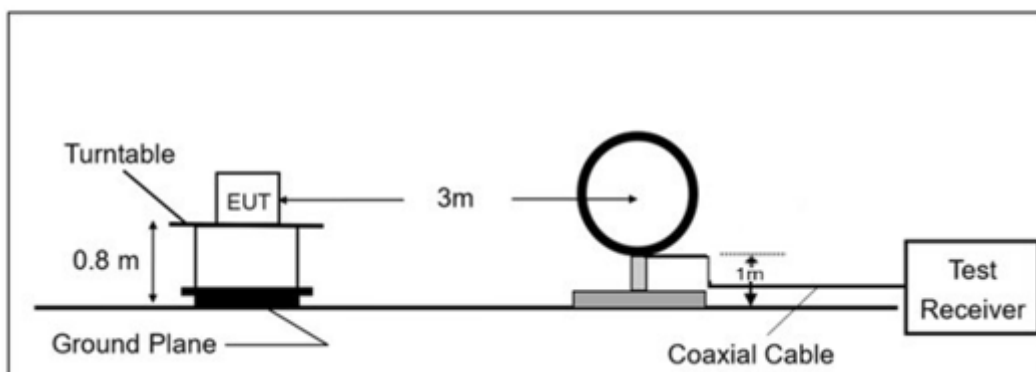
6.5 Unwanted Emissions

For Measurements From 9 kHz To 30 MHz

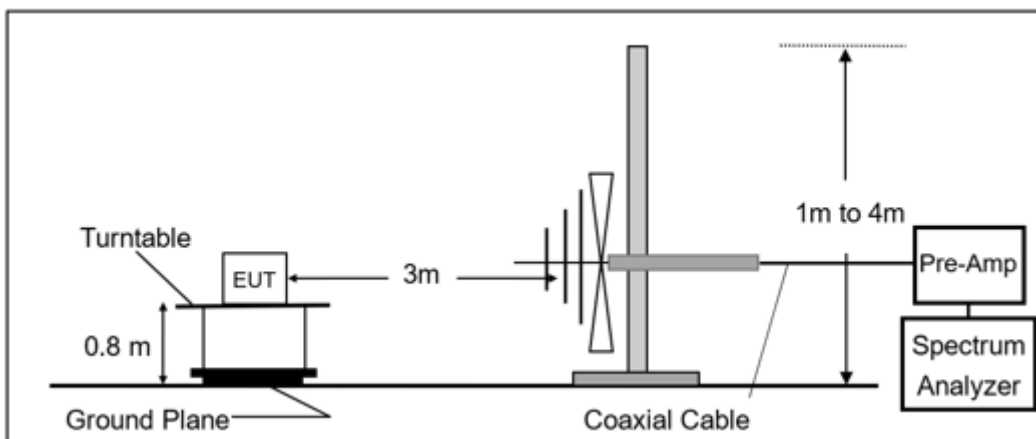
Radiated emission below 30MHz is measured in a 9m*6m*6m semi-anechoic chamber, the measurements correspond to those obtained at an open-field test site.

There is a comparison data of both open-field test site and semi-Anechoic chamber, and the result came out very similar.

Radiated Emission Test Set-Up, Frequency Below 30MHz.



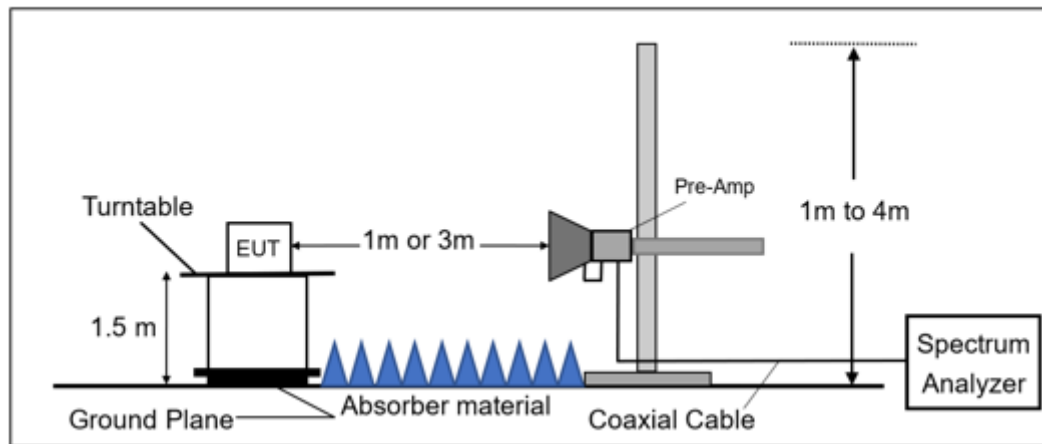
Radiated Emission Test Set-Up, Frequency From 30MHz to 1000MHz.



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Radiated Emission Test Set-Up, Frequency Above 1GHz.



Radiated emissions below 30 MHz were measured in a 9 m × 6 m × 6 m semi-anechoic chamber. The measurement results are equivalent to those obtained at an open-area test site (OATS).

A comparison between data measured at the open-area test site and the semi-anechoic chamber shows very similar results.

1. The testing was performed in accordance with the applicable radiated emission measurement procedure.
2. The EUT was placed on a turntable at a height of 0.8 m for frequencies below 1 GHz and 1.5 m for frequencies above 1 GHz.
3. The turntable was rotated 360 degrees to determine the position of the maximum emission level.
4. The EUT was positioned 3 meters away from the receiving antenna, which was varied in height from 1 m to 4 m to locate the highest emissions.
5. The spectrum analyzer was set with RBW = 100 kHz and VBW = 300 kHz, using a Peak detector for frequencies between 30 MHz and 1 GHz.
6. A receiver mode with RBW = 120 kHz was used for Quasi-Peak (QP) measurements between 30 MHz and 1 GHz.
7. For frequencies above 1 GHz, the spectrum analyzer was set with RBW = 1 MHz, VBW = 3 MHz, and Detector = Peak for maximum emission measurements.
8. Set the spectrum analyzer as RBW=1 MHz, VBW=3 MHz, Detector= RMS correction factor is $[10 \log (1 / D)]$ for Average Emission measurements at frequency above 1 GHz when $D \geq 98\%$. If a specific emission is demonstrated to be continuous ($D \geq 98\%$) rather than turning ON and OFF with the transmit cycle, then no duty cycle correction is required for that emission, where D is the duty cycle.
9. Set the spectrum analyzer as RBW=1 MHz, $VBW \geq 1/T$, Detector= Peak when $D < 98\%$ for Average Emission Measurements at frequency above 1 GHz.

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10. When measuring radiated emissions above 1 GHz, the receiving antenna was maintained within the "cone of radiation" and pointed at the emission source in both azimuth and elevation, with polarization oriented for maximum response, ensuring it remained within the 3 dB illumination beamwidth of the measurement antenna.
11. The six highest emissions were fully maximized using the above procedures to ensure EUT compliance.
12. Each emission was further maximized by changing the receiving antenna polarization between horizontal and vertical.
13. Repeat the above procedures until all default test channels (low, middle, and high) are measured.

Note: Emissions from 9 kHz to 30 MHz were pre-scanned and found to be at least 20 dB below the applicable limits, and are therefore not reported.

6.5.1 Field Strength Calculation

The field strength is calculated by adding the antenna factor and cable loss, then subtracting the amplifier gain and any applicable duty cycle correction factor from the measured reading. The basic equation and an example calculation are as follows:

$$FS = RA + AF + CL - AG$$

Where:

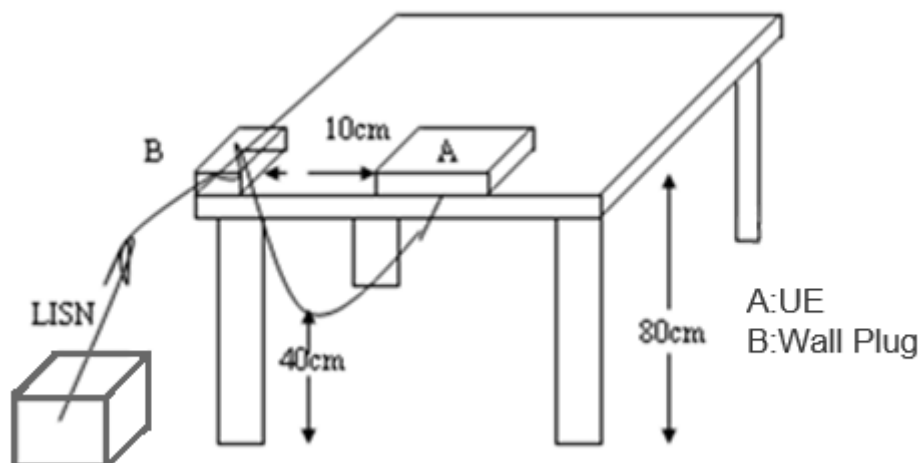
FS = Field Strength (dB μ V/m)
RA = Reading Amplitude (dB μ V)
AF = Antenna Factor (dB/m)
CL = Cable Loss (dB)
AG = Amplifier Gain (dB)

The emission limit is expressed in dB μ V/m, which corresponds to the logarithmic conversion of $20 \times \log_{10} (\mu\text{V/m})$.

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6.6 AC Power Line Conducted Emission



The conducted emission tests were performed at the designated test site using a setup in accordance with the applicable version of ANSI C63.10:2020.

1. The EUT was placed on a non-conductive table that is 0.8 meters above the ground plane. Conducted emissions were measured in the frequency range from 0.15 MHz to 30 MHz using CISPR Quasi-Peak and Average detector modes. Two LISNs were used to provide 50 μ H / 50 ohm coupling impedance to the measuring instrument. Both lines of the AC power mains connected to the EUT were evaluated to identify the maximum conducted interference.
2. The AC/DC power adapter of the EUT was connected to the LISN. The EUT was positioned flush with the rear edge of the table, maintaining at least 0.4 meters of separation from the shielding wall.
3. The LISNs were connected to the power source and configured in accordance with the test requirements.
4. The maximum emission levels were investigated for each operating mode. The six highest emissions were further maximized to ensure compliance.
5. The above procedures were repeated for all applicable power supply configurations of the EUT.

Calculation Formula:

Level = Read Level + Factor

Factor = LISN/ISN/Current Probe Factor + Cable Loss + Attenuator

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7 TEST RESULTS

7.1 Emission Bandwidth

7.1.1 6dB BW measurements

BLE 1M mode

Frequency (MHz)	6dB BW (MHz)	Required BW (MHz)	Result
2402	0.6679	≥ 0.5	PASS
2442	0.6698	≥ 0.5	PASS
2480	0.6715	≥ 0.5	PASS

BLE 2M mode

Frequency (MHz)	6dB BW (MHz)	Required BW (MHz)	Result
2402	1.16	≥ 0.5	PASS
2442	1.159	≥ 0.5	PASS
2480	1.163	≥ 0.5	PASS

BLE 125k mode(Payload S=8)

Frequency (MHz)	6dB BW (MHz)	Required BW (MHz)	Result
2402	0.6289	≥ 0.5	PASS
2442	0.6281	≥ 0.5	PASS
2480	0.6284	≥ 0.5	PASS

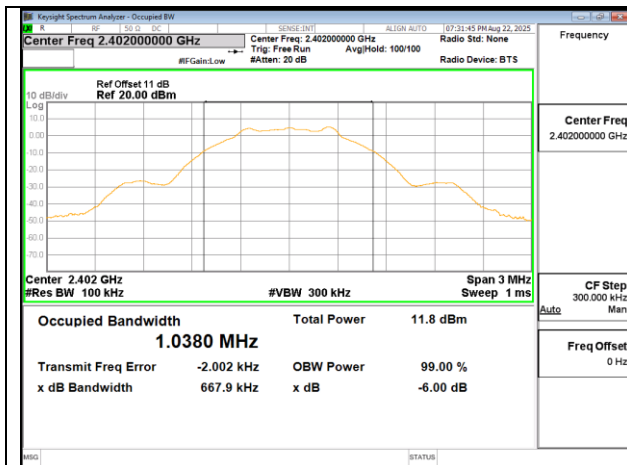
BLE 500k mode(Payload S=2)

Frequency (MHz)	6dB BW (MHz)	Required BW (MHz)	Result
2402	0.6678	≥ 0.5	PASS
2442	0.6672	≥ 0.5	PASS
2480	0.6651	≥ 0.5	PASS

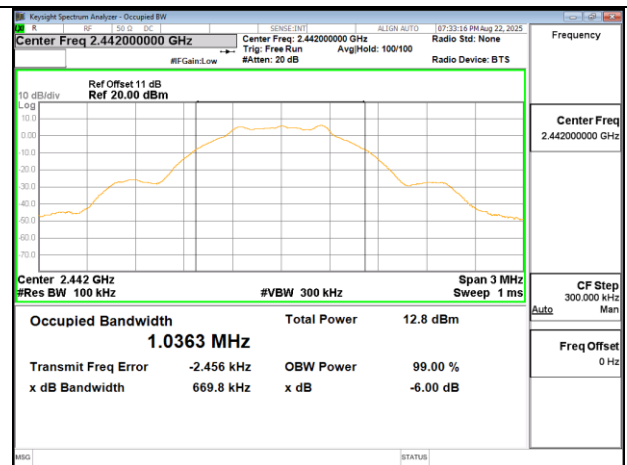
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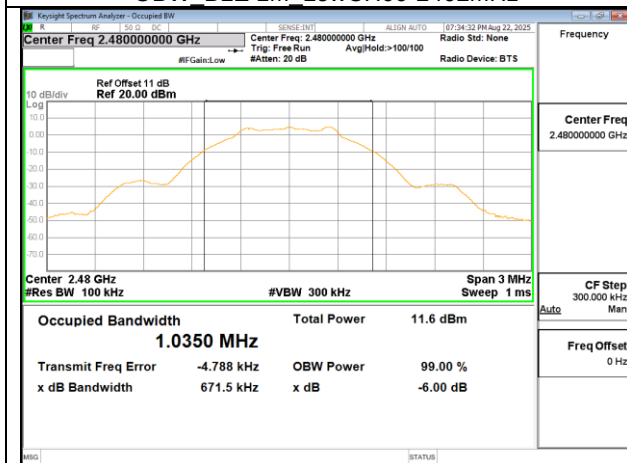
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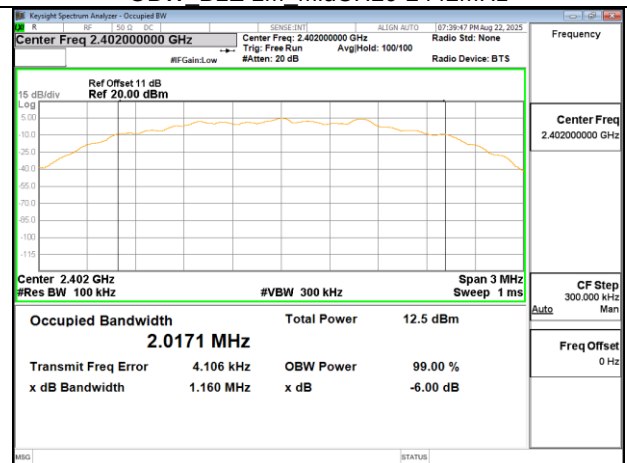
OBW_BLE 1M_LowCH00-2402MHz



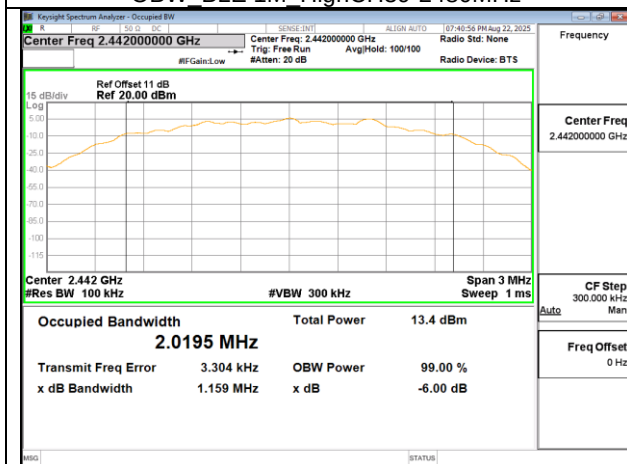
OBW_BLE 1M_MidCH20-2442MHz



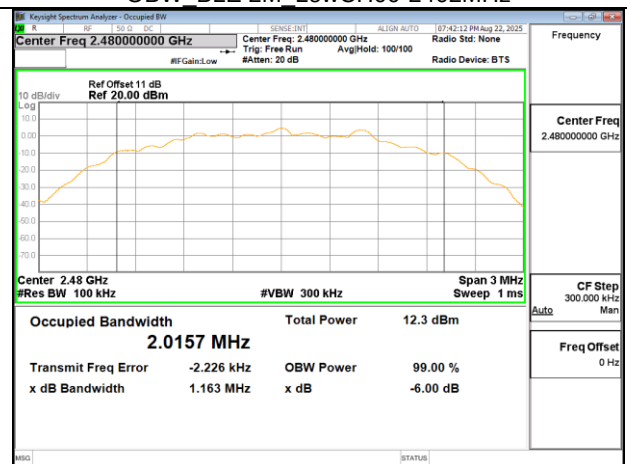
OBW_BLE 1M_HighCH39-2480MHz



OBW_BLE 2M_LowCH00-2402MHz



OBW_BLE 2M_MidCH20-2442MHz



OBW_BLE 2M_HighCH39-2480MHz

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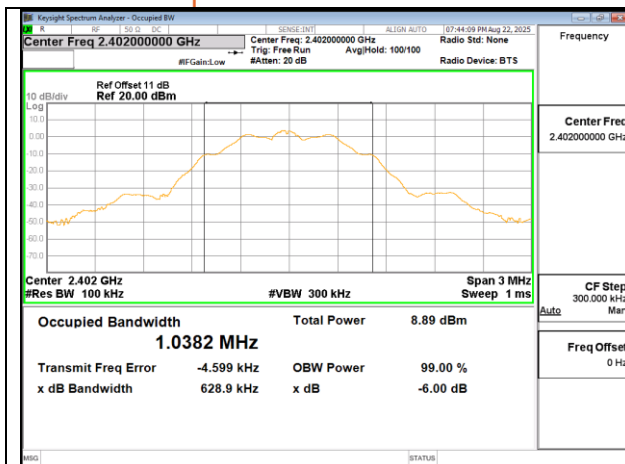
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t (886-2) 2299-3279

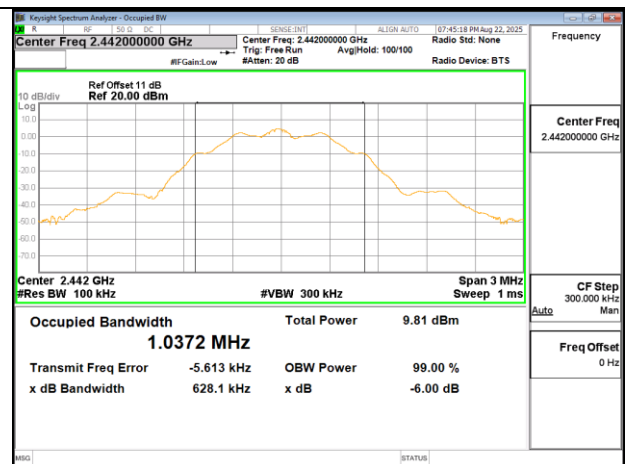
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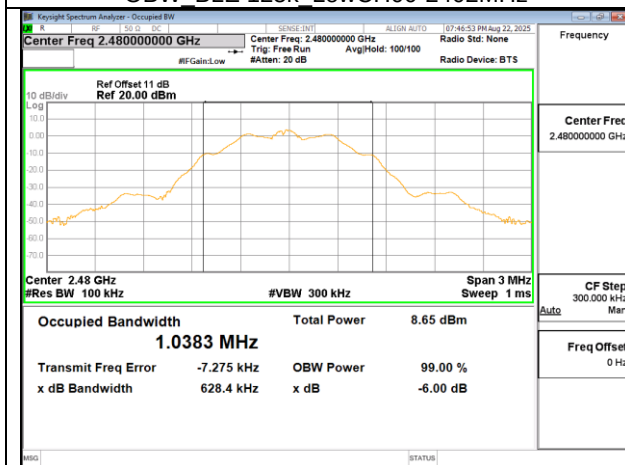
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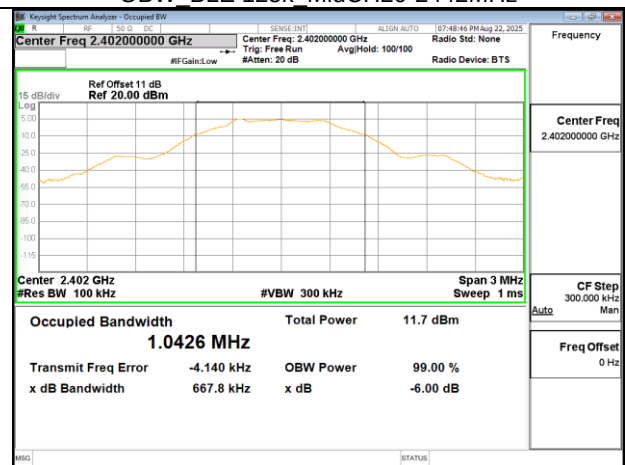
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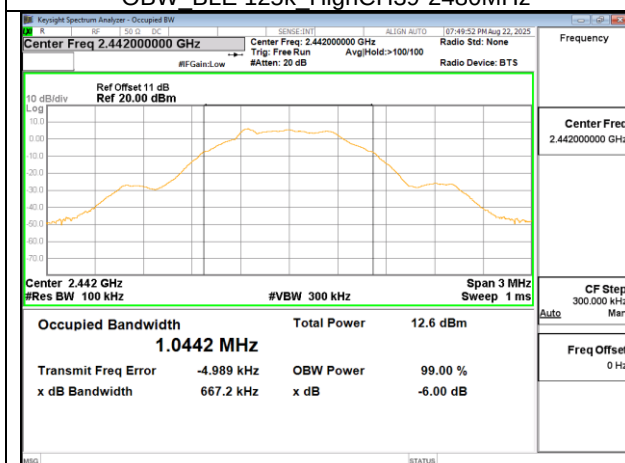
OBW_BLE 125k MidCH20-2442MHz



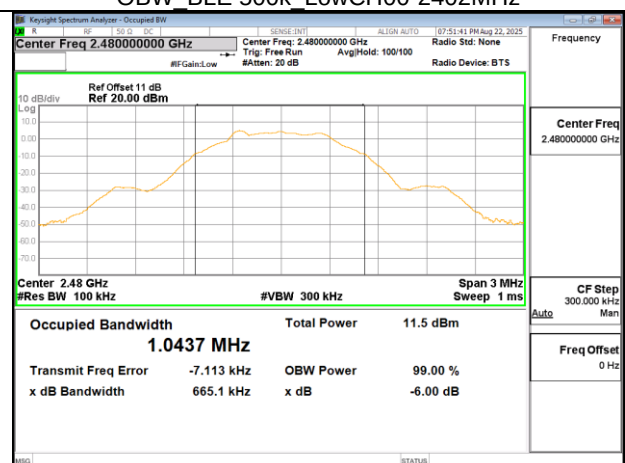
OBW_BLE 125k HighCH39-2480MHz



OBW_BLE 500k LowCH00-2402MHz



OBW_BLE 500k MidCH20-2442MHz



OBW_BLE 500k HighCH39-2480MHz

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7.1.2 99% Bandwidth

BLE 1M mode

Frequency (MHz)	99%Bandwidth (MHz)
2402	1.0201
2442	1.0176
2480	1.0156

BLE 2M mode

Frequency (MHz)	99%Bandwidth (MHz)
2402	2.0104
2442	2.0137
2480	2.0018

BLE 125k mode(Payload S=8)

Frequency (MHz)	99%Bandwidth (MHz)
2402	1.0443
2442	1.0447
2480	1.0444

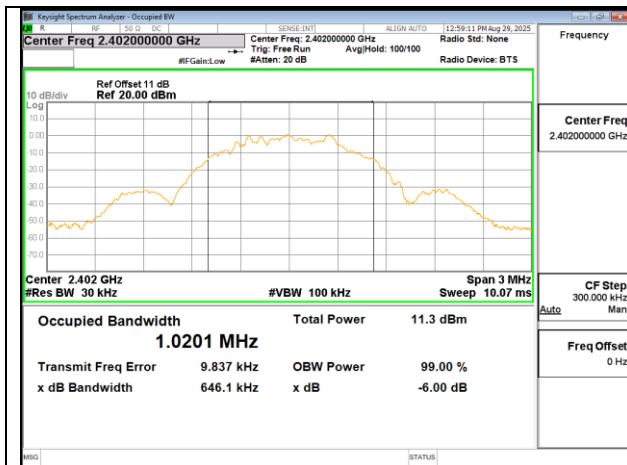
BLE 500k mode(Payload S=2)

Frequency (MHz)	99%Bandwidth (MHz)
2402	1.0186
2442	1.0196
2480	1.0186

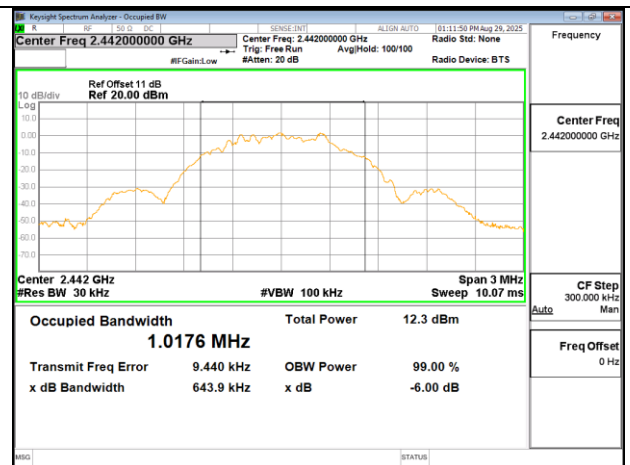
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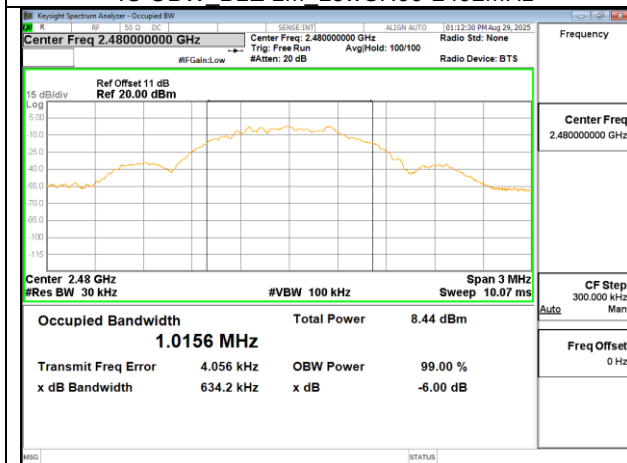
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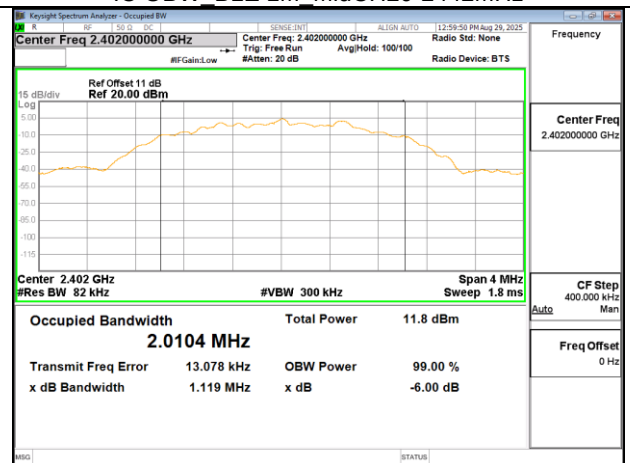
IC OBW BLE 1M LowCH00-2402MHz



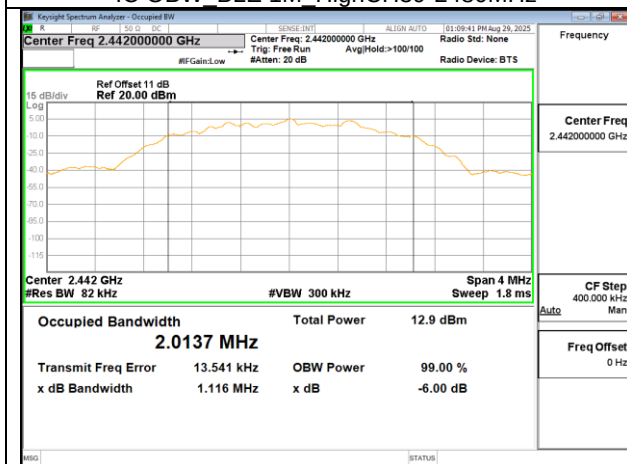
IC OBW BLE 1M MidCH20-2442MHz



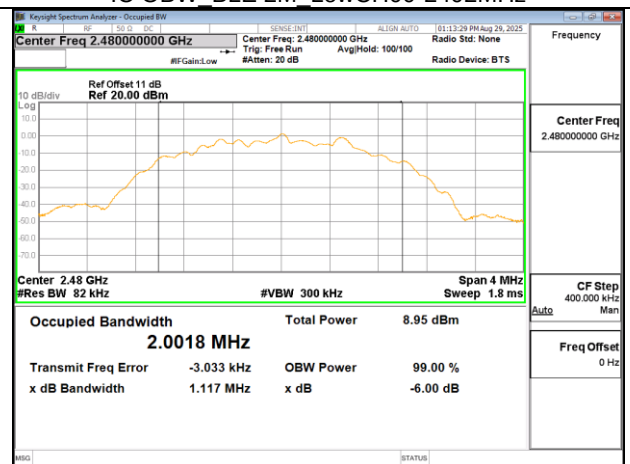
IC OBW BLE 1M HighCH39-2480MHz



IC OBW BLE 2M LowCH00-2402MHz



IC OBW BLE 2M MidCH20-2442MHz

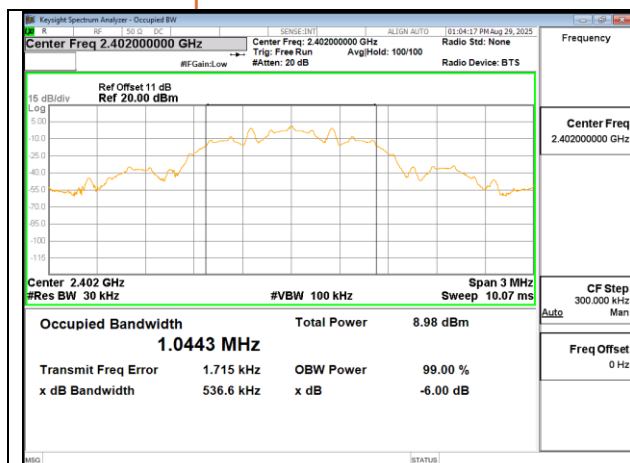


IC OBW BLE 2M HighCH39-2480MHz

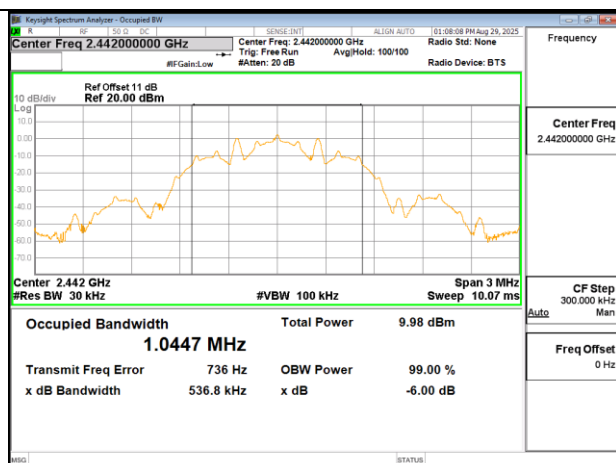
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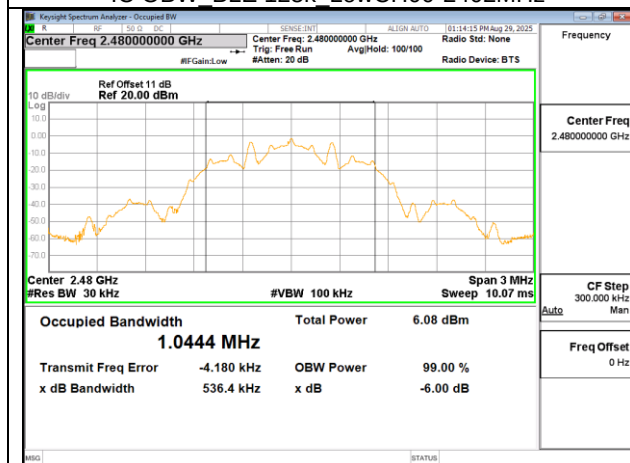
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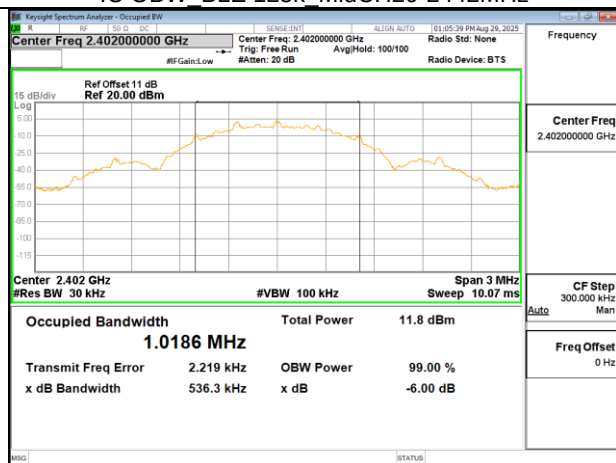
IC OBW_BLE 125k_LowCH00-2402MHz



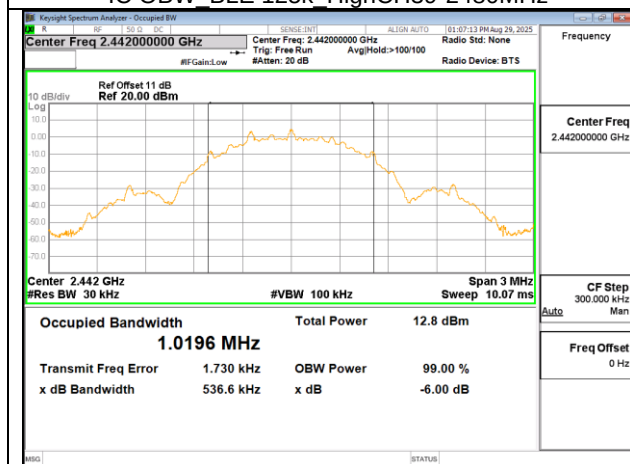
IC OBW_BLE 125k_MidCH20-2442MHz



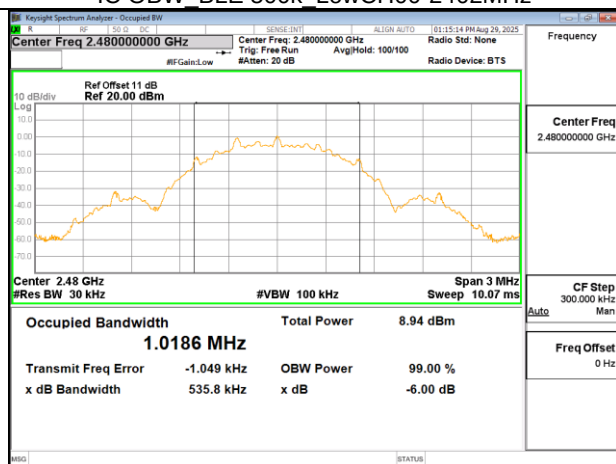
IC OBW_BLE 125k_HighCH39-2480MHz



IC OBW_BLE 500k_LowCH00-2402MHz



IC OBW_BLE 500k_MidCH20-2442MHz



IC OBW_BLE 500k_HighCH39-2480MHz

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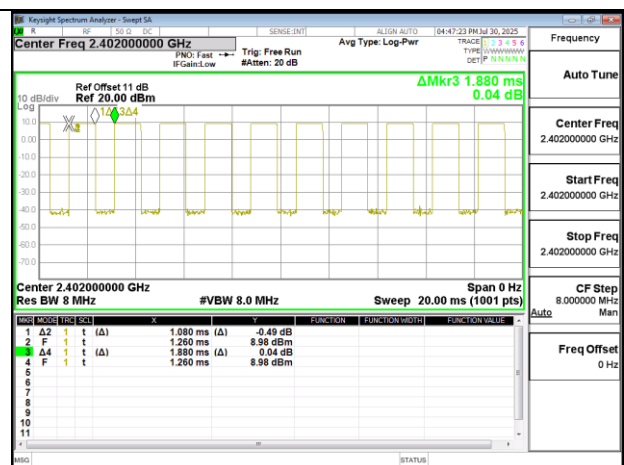
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7.2 Duty Factor

Mode	Duty Cycle (%) = Ton / (Ton+Toff)	Duty Factor (dB) =10*log (1/Duty Cycle)	1/T (kHz)	VBW setting (kHz)
BLE 1M	85.20	0.70	0.47	1.00
BLE 2M	57.45	2.41	0.93	1.00
BLE 125k	97.43	0.11	0.06	1.00
BLE 500k	91.20	0.40	0.22	1.00



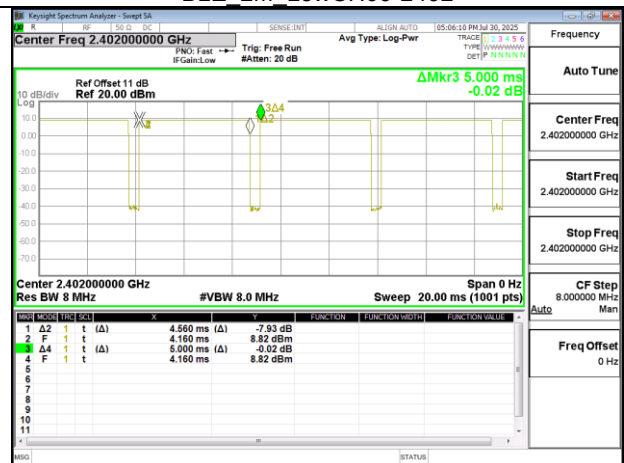
BLE 1M LowCH00-2402



BLE 2M LowCH00-2402



BLE 125k LowCH00-2402



BLE 500k LowCH00-2402

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7.3 Maximum Output Power

7.3.1 Peak & Avg

BLE 1M mode:

CH	Frequency (MHz)	Power Setting	Peak Output Power (dBm)	Required Limit (dBm)
0	2402	default	4.99	30
20	2442	default	6.00	30
39	2480	default	4.93	30
CH	Frequency (MHz)	Power Setting	Avg. Output Power (dBm)	Required Limit (dBm)
0	2402	default	4.84	30
20	2442	default	5.73	30
39	2480	default	4.78	30

***Note:**

1. Measured by power meter, cable loss 11 dB + Duty cycle factor has been offsetted to the power meter for Avg. power and cable loss has been offsetted for Peak power measurement.

BLE 2M mode:

CH	Frequency (MHz)	Power Setting	Peak Output Power (dBm)	Required Limit (dBm)
0	2402	default	5.25	30
20	2442	default	5.88	30
39	2480	default	5.22	30
CH	Frequency (MHz)	Power Setting	Avg. Output Power (dBm)	Required Limit (dBm)
0	2402	default	5.16	30
20	2442	default	5.56	30
39	2480	default	5.12	30

***Note:**

1. Measured by power meter, cable loss 11 dB + Duty cycle factor has been offsetted to the power meter for Avg. power and cable loss has been offsetted for Peak power measurement.

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BLE 125k mode(Payload S=8):

CH	Frequency (MHz)	Power Setting	Peak Output Power (dBm)	Required Limit (dBm)
0	2402	default	4.98	30
20	2442	default	6.01	30
39	2480	default	4.96	30
CH	Frequency (MHz)	Power Setting	Avg. Output Power (dBm)	Required Limit (dBm)
0	2402	default	4.69	30
20	2442	default	5.88	30
39	2480	default	4.64	30

***Note:**

1.Measured by power meter, cable loss 11 dB + Duty cycle factor has been offseted to the power meter for Avg. power and cable loss has been offseted for Peak power measurement.

BLE 500k mode(Payload S=2):

CH	Frequency (MHz)	Power Setting	Peak Output Power (dBm)	Required Limit (dBm)
0	2402	default	4.93	30
20	2442	default	5.98	30
39	2480	default	4.94	30
CH	Frequency (MHz)	Power Setting	Avg. Output Power (dBm)	Required Limit (dBm)
0	2402	default	4.66	30
20	2442	default	5.84	30
39	2480	default	4.62	30

***Note:**

1.Measured by power meter, cable loss 11 dB + Duty cycle factor has been offseted to the power meter for Avg. power and cable loss has been offseted for Peak power measurement.

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7.4 Maximum Power Spectral Density

BLE 1M mode

Frequency (MHz)	RF Power Density (dBm/3kHz)	Maximum Limit (dBm/3kHz)	Result
2402	-10.66	8	PASS
2442	-9.89	8	PASS
2480	-11.00	8	PASS

Note:*1.cable loss as 11dB that offsets in the spectrum**

BLE 2M mode

Frequency (MHz)	RF Power Density (dBm/3kHz)	Maximum Limit (dBm/3kHz)	Result
2402	-13.73	8	PASS
2442	-12.91	8	PASS
2480	-14.00	8	PASS

Note:*1.cable loss as 11dB that offsets in the spectrum**

BLE 125k mode(Payload S=8)

Frequency (MHz)	RF Power Density (dBm/3kHz)	Maximum Limit (dBm/3kHz)	Result
2402	-1.12	8	PASS
2442	-0.22	8	PASS
2480	-1.29	8	PASS

Note:*1.cable loss as 11dB that offsets in the spectrum**

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BLE 500k mode(Payload S=2)

Frequency (MHz)	RF Power Density (dBm/3kHz)	Maximum Limit (dBm/3kHz)	Result
2402	-1.22	8	PASS
2442	-0.28	8	PASS
2480	-1.34	8	PASS

Note:*1.cable loss as 11dB that offsets in the spectrum**

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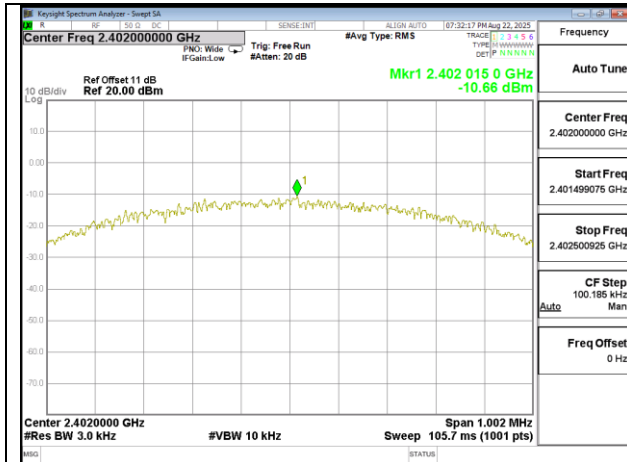
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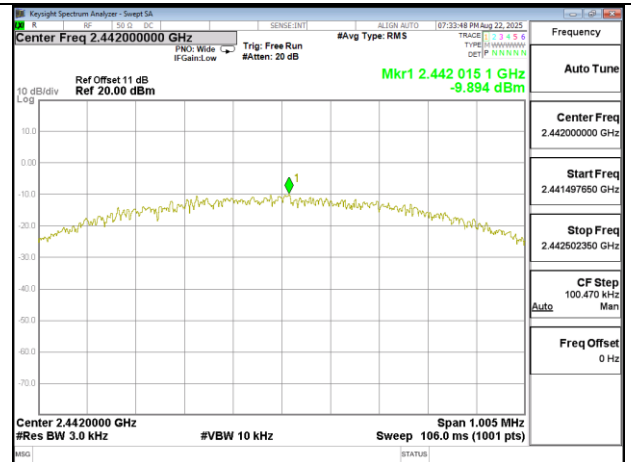
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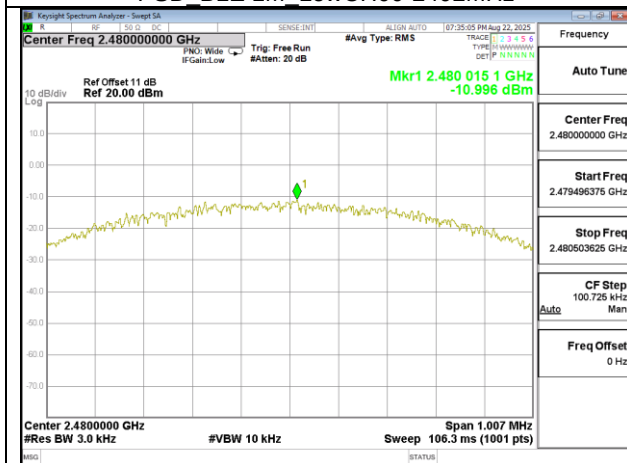
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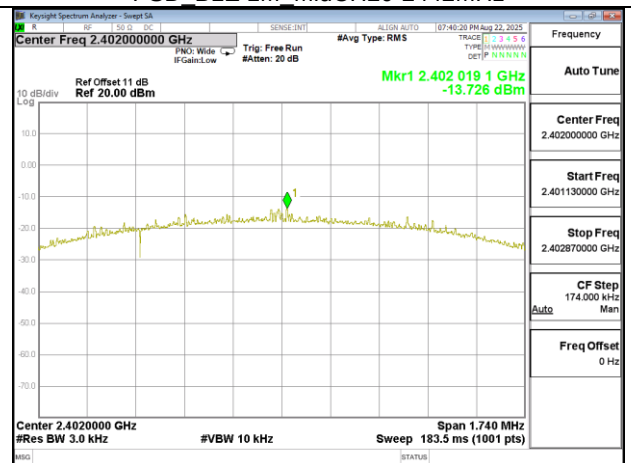
PSD BLE 1M LowCH00-2402MHz



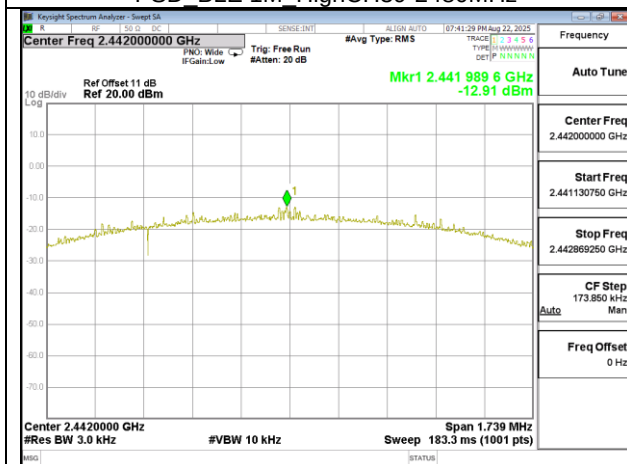
PSD BLE 1M MidCH20-2442MHz



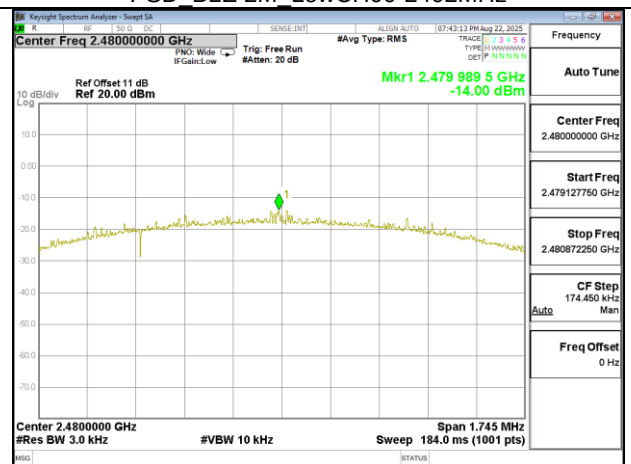
PSD BLE 1M HighCH39-2480MHz



PSD BLE 2M LowCH00-2402MHz



PSD BLE 2M MidCH20-2442MHz

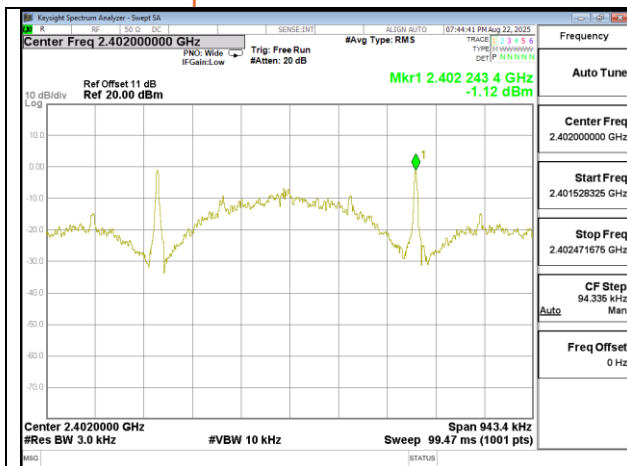


PSD BLE 2M HighCH39-2480MHz

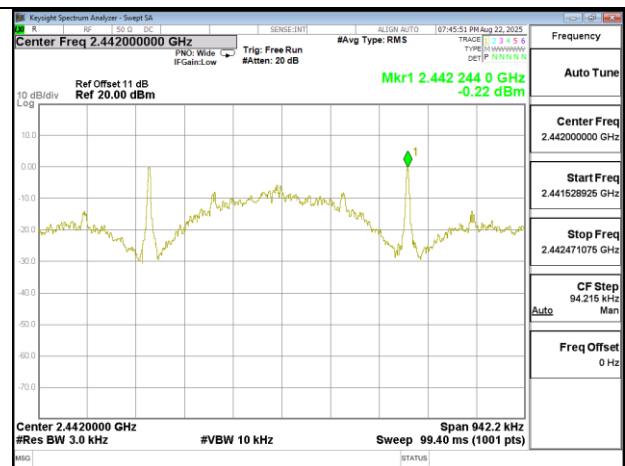
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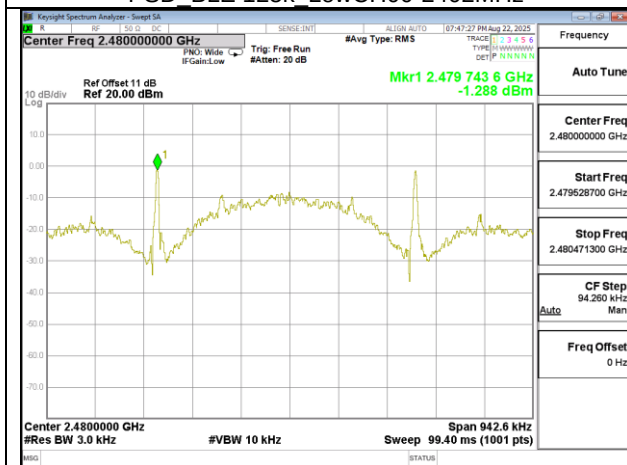
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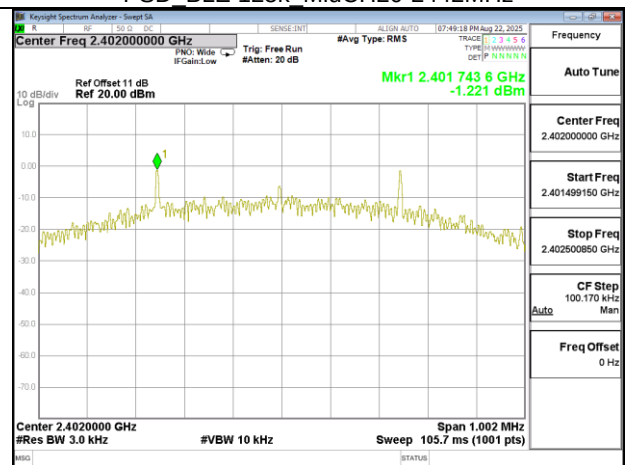
PSD_BLE 125k_LowCH00-2402MHz



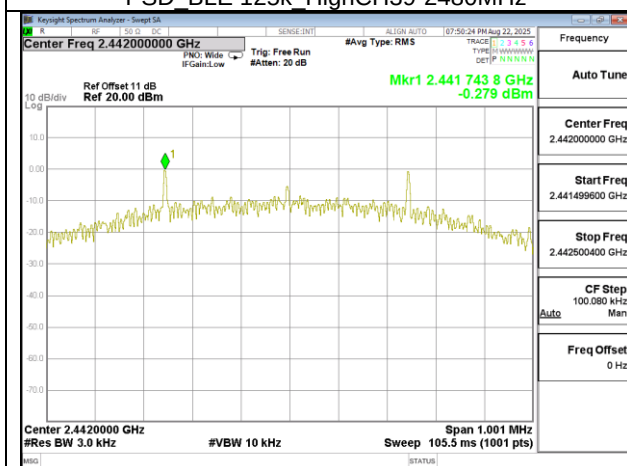
PSD_BLE 125k_MidCH20-2442MHz



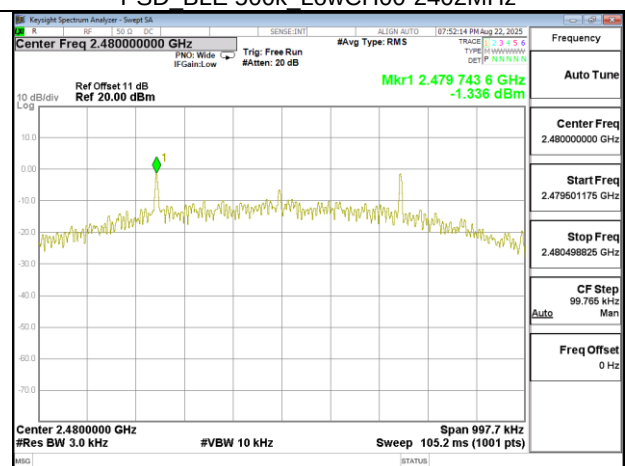
PSD_BLE 125k_HighCH39-2480MHz



PSD_BLE 500k_LowCH00-2402MHz



PSD_BLE 500k_MidCH20-2442MHz



PSD_BLE 500k_HighCH39-2480MHz

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7.5 Out of Band Emission

BLE 1M_Reference Level of Limit

Frequency (MHz)	RF Power Density (dBm)	Reference Level of Limit = PSD - 20dB (dBm)
2402	5.02	-14.98
2442	5.93	-14.07
2480	4.76	-15.24

***Note:**

- 1.cable loss as 11dB that offsets in the spectrum
- 2.Refer to next page for plots.

BLE 2M_Reference Level of Limit

Frequency (MHz)	RF Power Density (dBm)	Reference Level of Limit = PSD - 20dB (dBm)
2402	4.33	-15.67
2442	5.42	-14.58
2480	1.47	-18.53

***Note:**

- 1.cable loss as 11dB that offsets in the spectrum
- 2.Refer to next page for plots.

BLE 125k(Payload S=8)_Reference Level of Limit

Frequency (MHz)	RF Power Density (dBm)	Reference Level of Limit = PSD - 20dB (dBm)
2402	3.36	-16.64
2442	4.41	-15.59
2480	0.49	-19.51

***Note:**

- 1.cable loss as 11dB that offsets in the spectrum
- 2.Refer to next page for plots.

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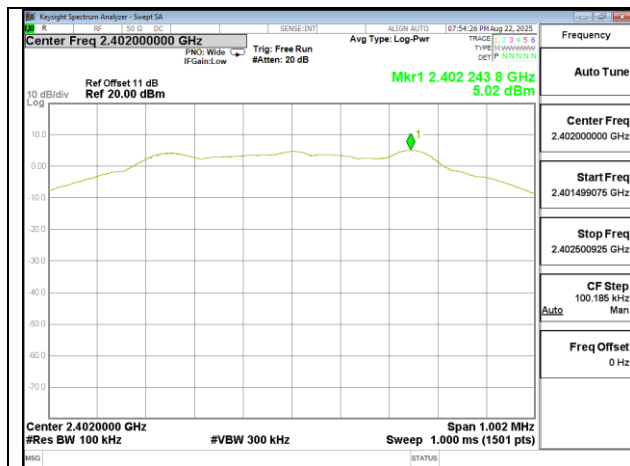
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BLE 500k(Payload S=2)_Reference Level of Limit

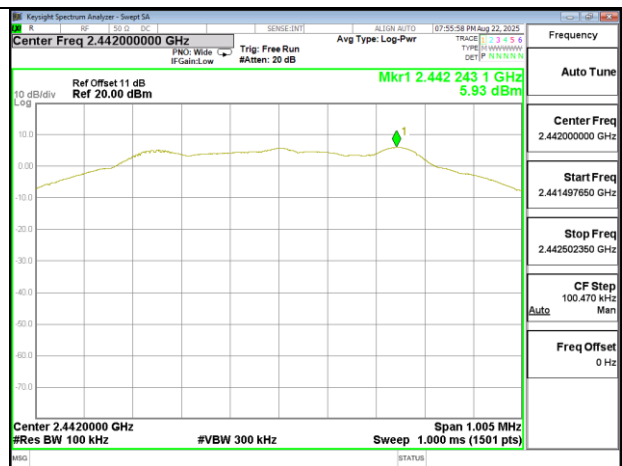
Frequency (MHz)	RF Power Density (dBm)	Reference Level of Limit = PSD - 20dB (dBm)
2402	4.57	-15.43
2442	5.58	-14.42
2480	1.84	-18.16

***Note:**

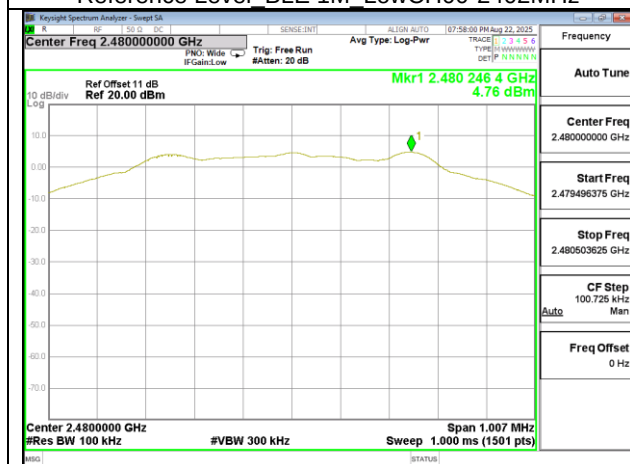
- 1.cable loss as 11dB that offsets in the spectrum
- 2.Refer to next page for plots.



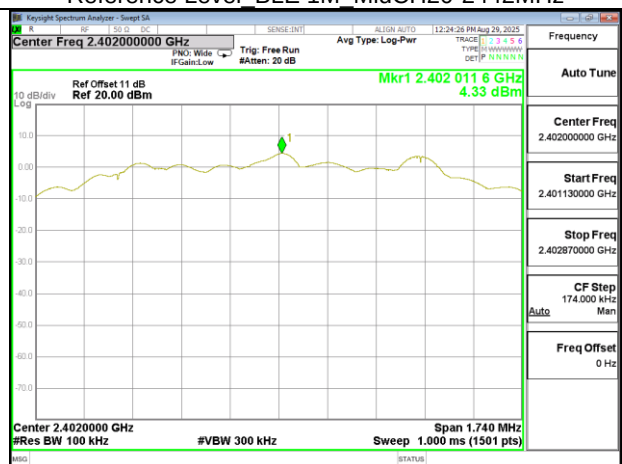
Reference Level BLE 1M LowCH00-2402MHz



Reference Level BLE 1M MidCH20-2442MHz



Reference Level BLE 1M HighCH39-2480MHz

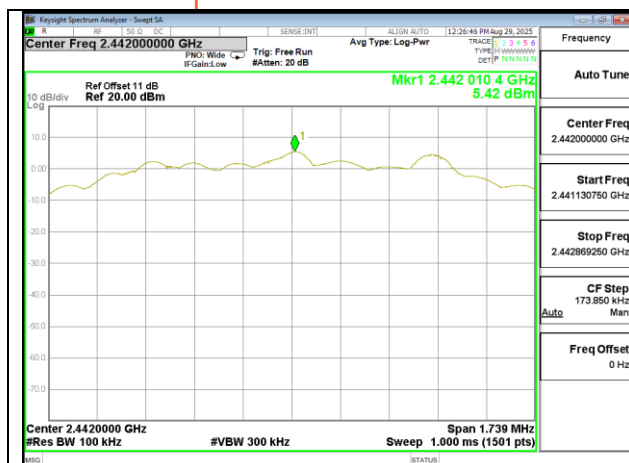


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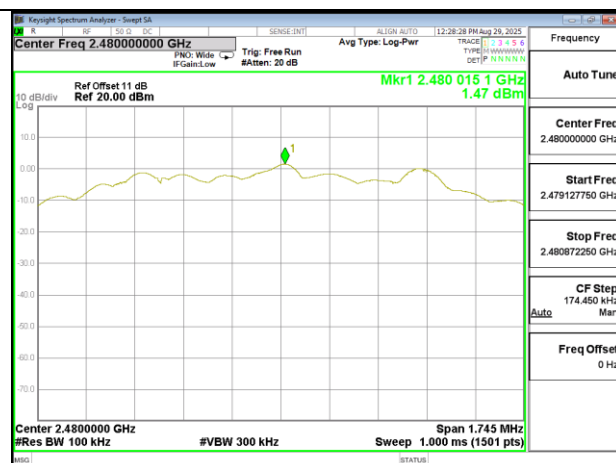
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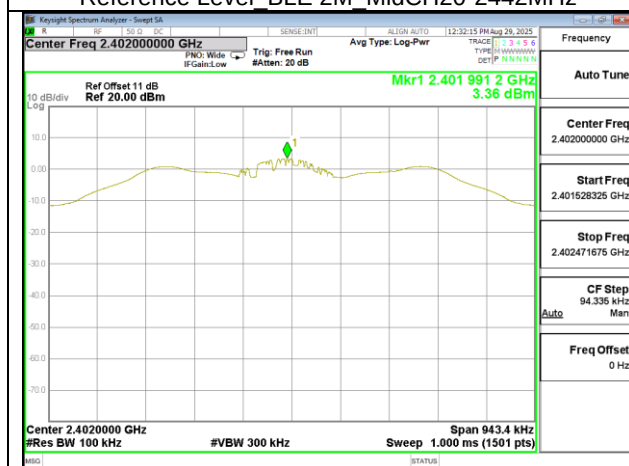
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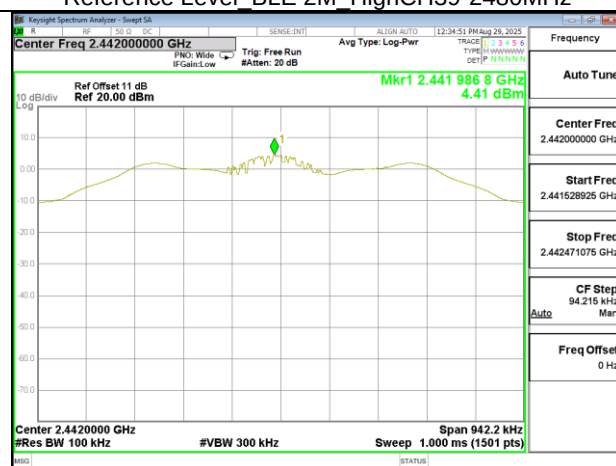
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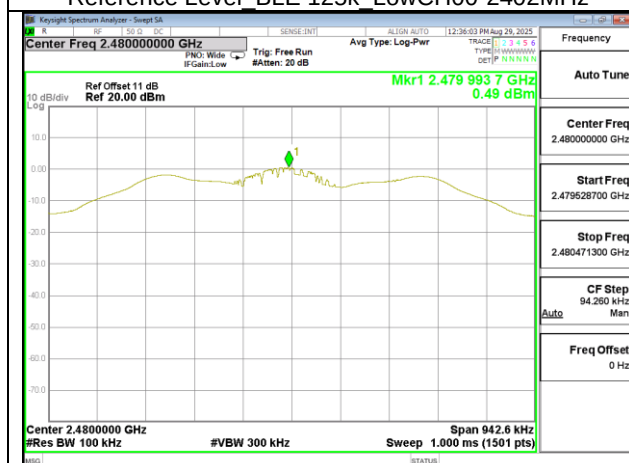
Reference Level BLE 2M_HighCH39-2480MHz



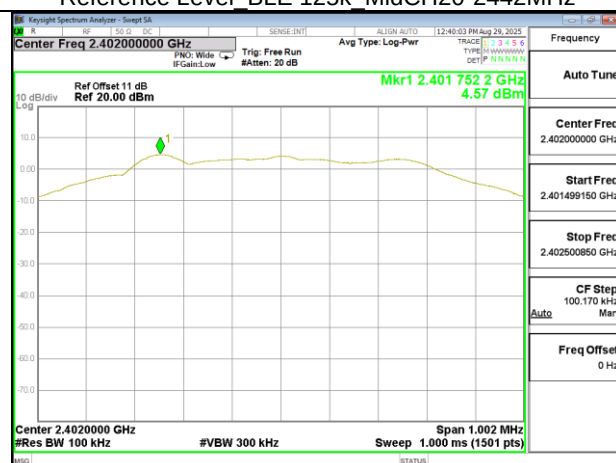
Reference Level BLE 125k_LowCH00-2402MHz



Reference Level BLE 125k_MidCH20-2442MHz



Reference Level BLE 125k_HighCH39-2480MHz

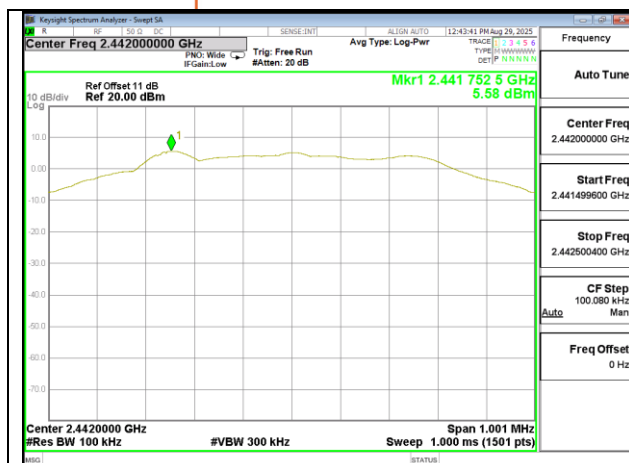


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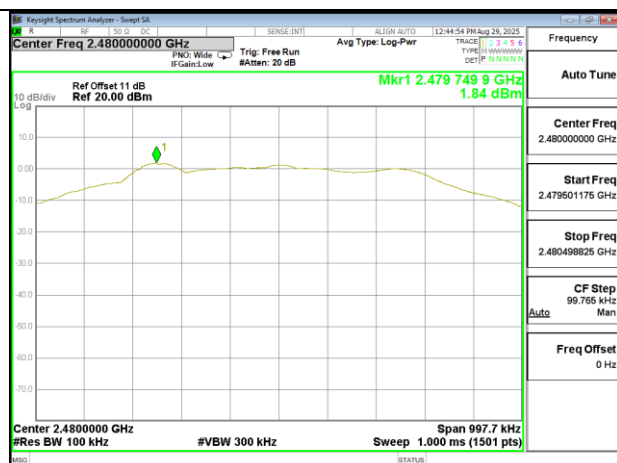
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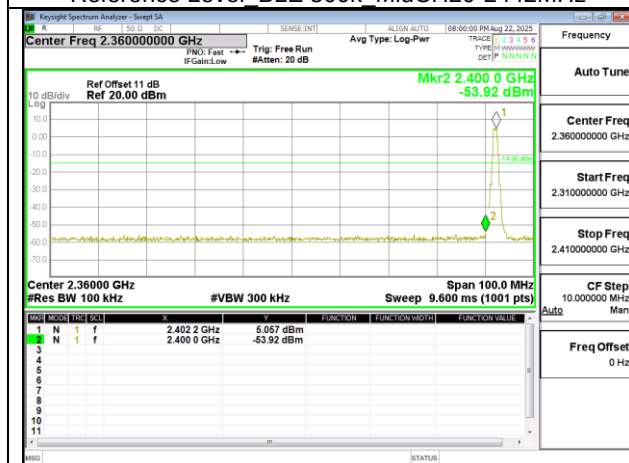
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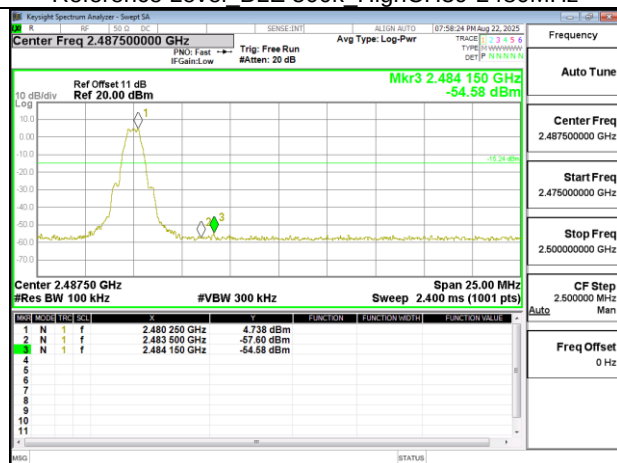
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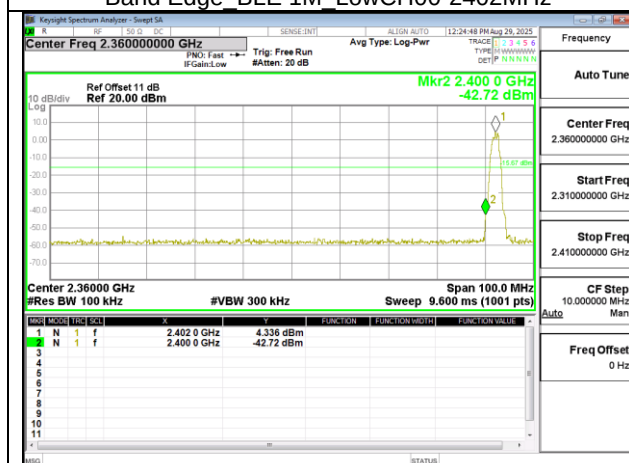
Reference Level BLE 500k HighCH39-2480MHz



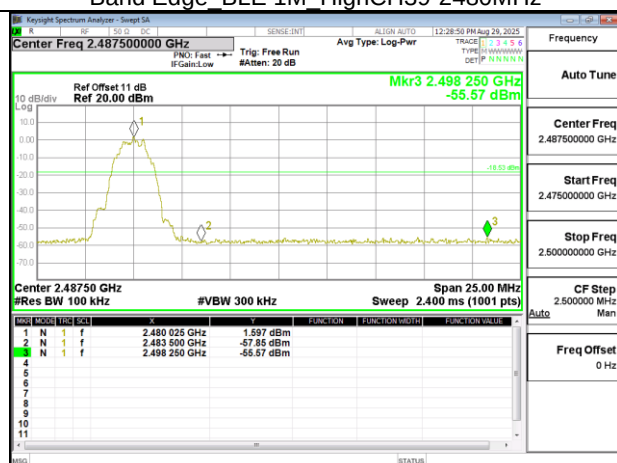
Band Edge BLE 1M LowCH00-2402MHz



Band Edge BLE 1M HighCH39-2480MHz



Band Edge BLE 2M LowCH00-2402MHz

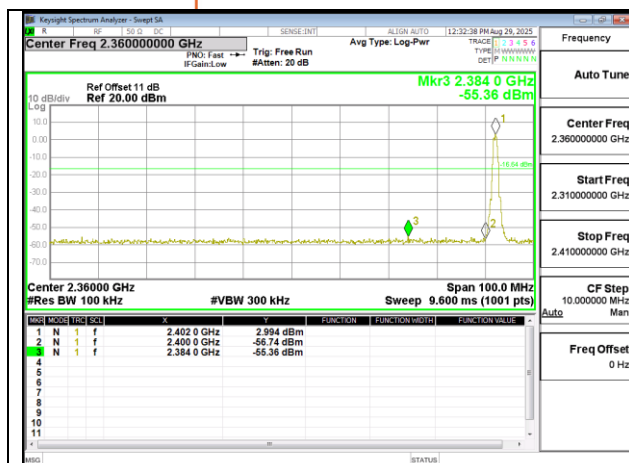


Band Edge BLE 2M HighCH39-2480MHz

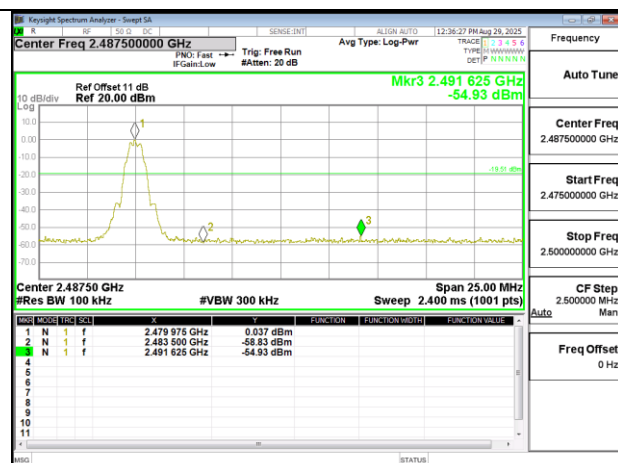
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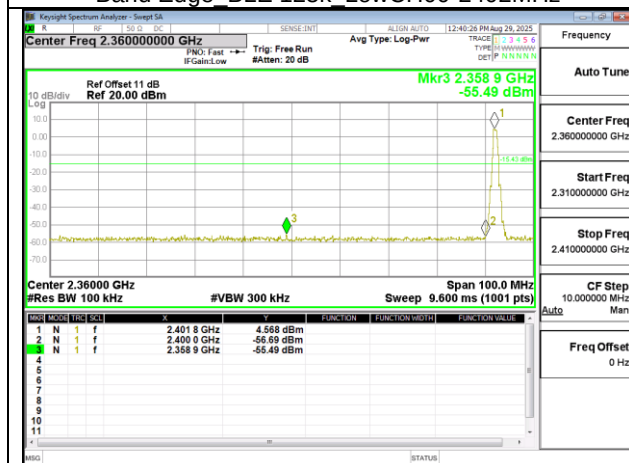
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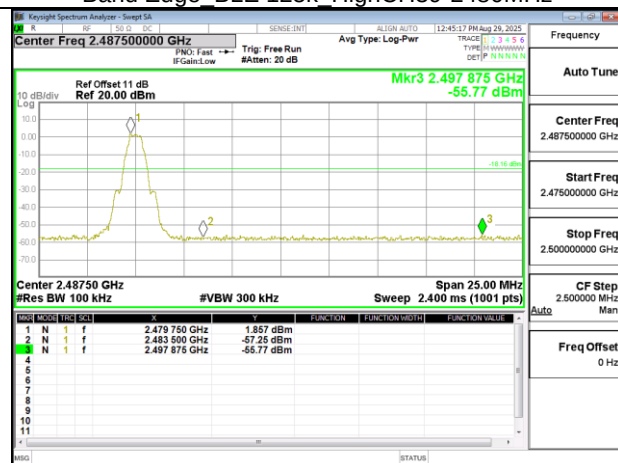
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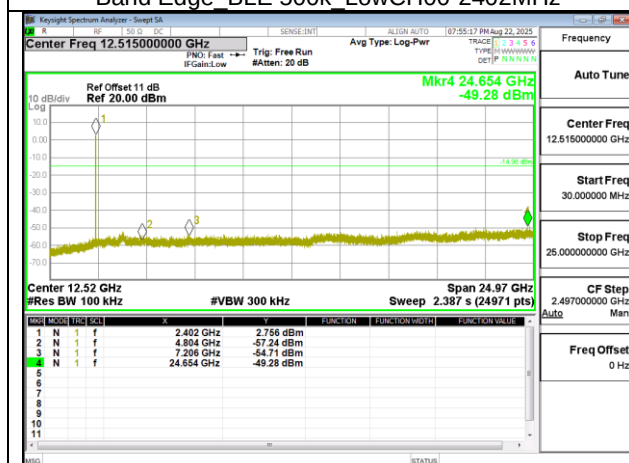
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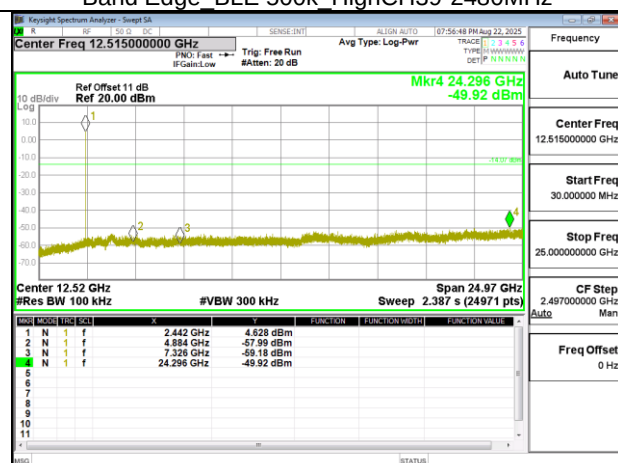
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Spurious Emission BLE 1M LowCH00-2402MHz

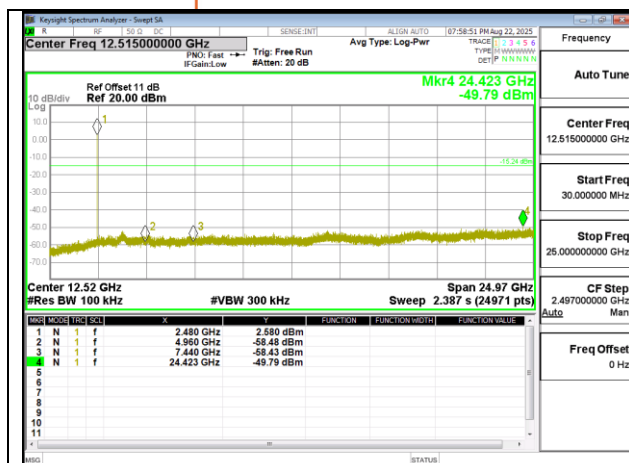


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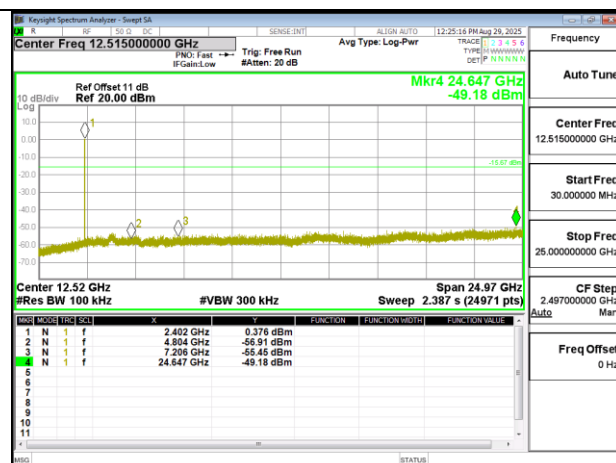
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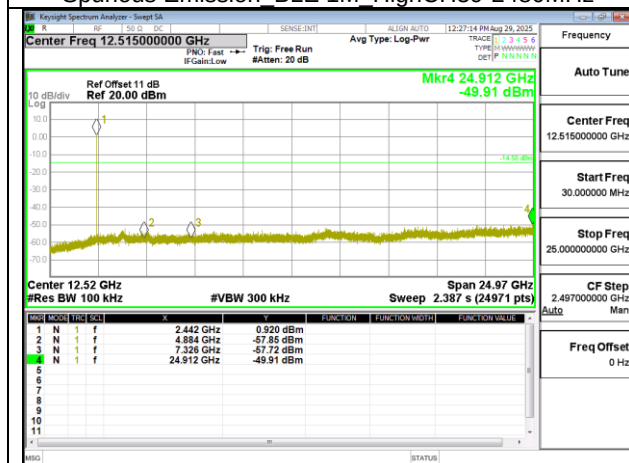
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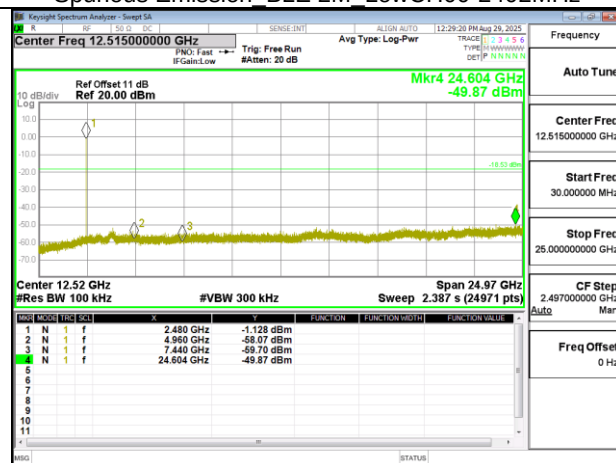
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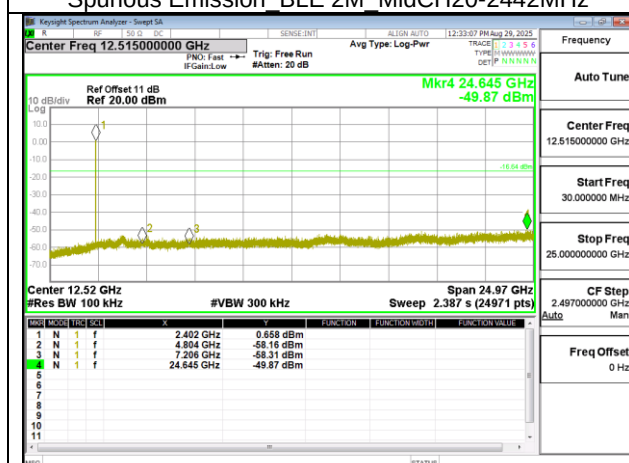
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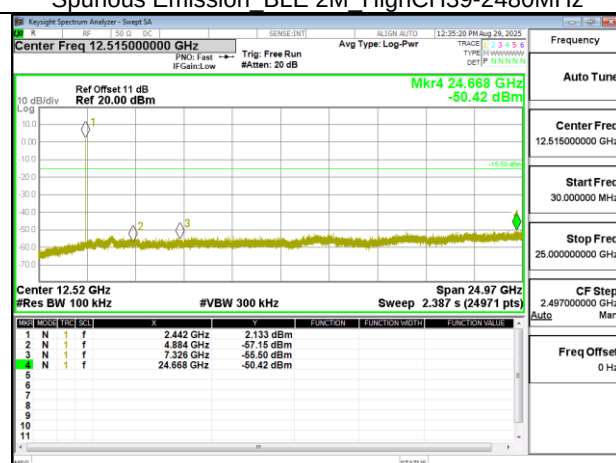
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Spurious Emission BLE 2M_HighCH39-2480MHz



Spurious Emission BLE 125k_LowCH00-2402MHz

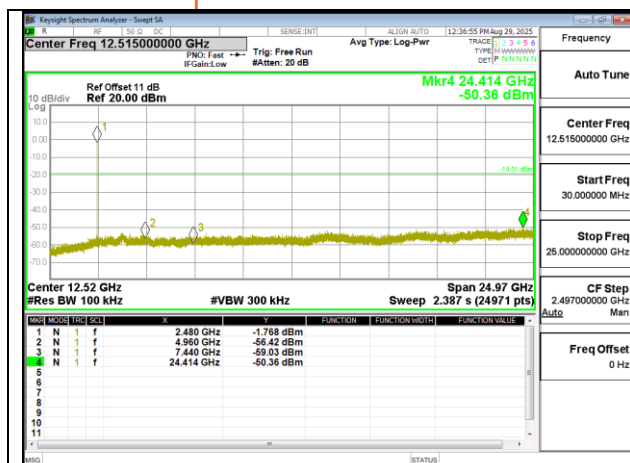


Spurious Emission BLE 125k_MidCH20-2442MHz

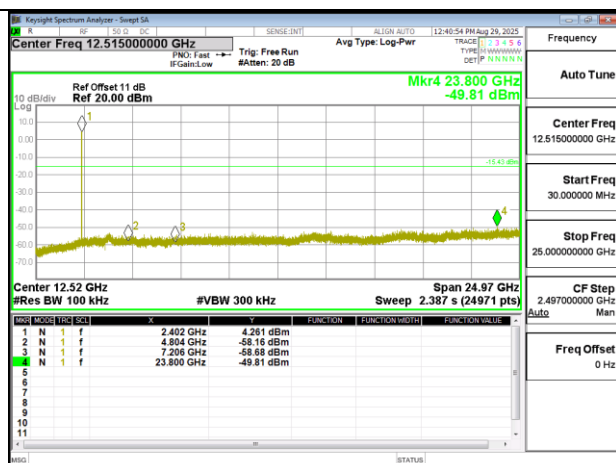
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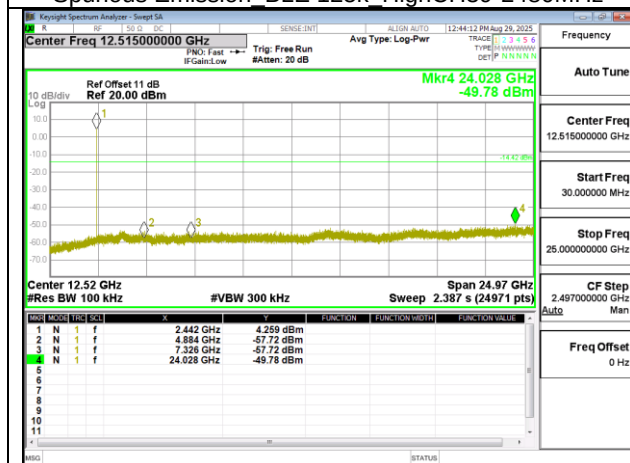
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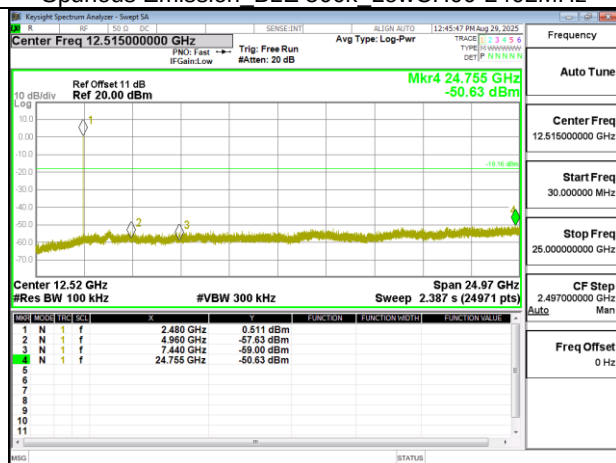
Spurious Emission BLE 125k HighCH39-2480MHz



Spurious Emission BLE 500k LowCH00-2402MHz



Spurious Emission BLE 500k MidCH20-2442MHz



Spurious Emission BLE 500k HighCH39-2480MHz

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