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FCC/ISED Test Report

Prepared for: Garmin International, Inc.

Address:

1200 E. 151st Street Olathe, Kansas, 66062, USA

Product:

AA4724

Test Report No:

R20240506-00-E7 Rev: B

Approved by:

I d ane

Fox Lane, EMC Test Engineer

DATE:

April 25, 2025

Total Pages:

82

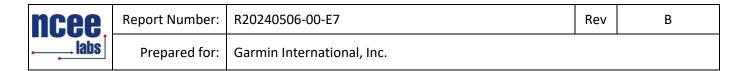
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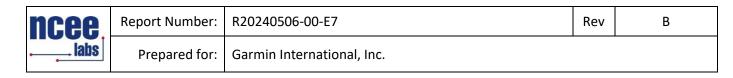
REVISION PAGE

Rev. No.	Date	Description
0	14 April 2025	Issued by FLane
0	14 April 2025	Prepared by Flane, ESchmidt
A	23 April 2025	Added FVIN – FL
Р	DE April 202E	Corrected Plot labeling
В	25 April 2025	Updated equipment list – FL



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1.0 SUMMARY OF TEST RESULTS

The worst-case measurements were reported in this report. Summary of test results presented in this report correspond to the following section(s):

- (1) US Code of Federal Regulations, Title 47, Part 15
- (2) ISED RSS-Gen, Issue 5
- (3) ISED RSS-247, Issue 3

APPLIED STANDARDS AND REGULATIONS					
Standard Section	Test Type	Result			
FCC Part 15.35 RSS Gen, Issue 5, Section 6.10	Duty Cycle	Pass			
FCC Part 15.247(b)(3) RSS-247 Issue 3 Section 5.4(d)	Peak output power	Pass			
FCC Part 15.247(a)(2) RSS-247 Issue 3 Section 5.2 (a)	Bandwidth	Pass			
FCC Part 15.209 RSS-Gen Issue 5, Section 7.3	Receiver Radiated Emissions	Pass			
FCC Part 15.209 (restricted bands), 15.247 (unrestricted) RSS-247 Issue 3 Section 5.5, RSS-Gen Issue 5, Section 8.9	Transmitter Radiated Emissions	Pass			
FCC Part 15.247(e) RSS-247 Issue 3 Section 5.2 (b)	Power Spectral Density	Pass			
FCC Part 15.209, 15.247(d) RSS-247 Issue 3 Section 5.5	Band Edge Measurement	Pass			
FCC Part 15.207 RSS-Gen Issue 5, Section 8.8	Conducted Emissions	Pass			

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2.0 EUT DESCRIPTION

2.1 EQUIPMENT UNDER TEST

Summary and Operating Condition:

EUT	AA4724
FCC ID	IPH-A4724
IC ID	1792A-A4724
FVIN	13.17
EUT Received	30 August 2024
EUT Tested	6 March 2025- 26 March 2025
Serial No.	3495066773 (Radiated Measurements) 3495066743 (Conducted Measurements)
Operating Band	2400 – 2483.5 MHz
Device Type	□ GMSK □ GFSK □ BT BR □ BT EDR 2MB □ BT EDR 3MB ⊠ 802.11x
Power Supply / Voltage	Internal Battery / 5VDC Charger: Garmin (Phi Hong) Model: PSAI05R-050Q GPN: 362-00072-00 (Representative Power Supply)

NOTE: For more detailed features description, please refer to the manufacturer's specifications or user's manual.

2.2 DESCRIPTION OF TEST MODES

The operating range of the EUT is dependent on the device type found in section 2.1: Region was set to 00:

Data Rates:			
Modulation Low/High Data rate			
802.11b	1MB/11MB		
802.11g	6MB/54MB		
802.11n	MCS0/MCS7		

For 802.11x Transmissions:			
Channel Frequency			
Low	2412 MHz		
Mid	2437 MHz		
High	2472 MHz		

These are the only representative channels tested in the frequency range according to FCC Part 15.31 and RSS-Gen Table A1. See the operational description for a list of all channel frequencies and designations.

2.3 DESCRIPTION OF SUPPORT UNITS

None



3.0 LABORATORY AND GENERAL TEST DESCRIPTION

3.1 LABORATORY DESCRIPTION

All testing was performed at the following Facility:

The Nebraska Center for Excellence in Electronics (NCEE Labs)				
4740 Discovery Drive				
Lincoln, NE 68521				
A2LA Certificate Number:	1953.01			
FCC Accredited Test Site Designation No:	US1060			
Industry Canada Test Site Registration No:	4294A			
NCC CAB Identification No:	US0177			

Environmental conditions varied slightly throughout the tests:

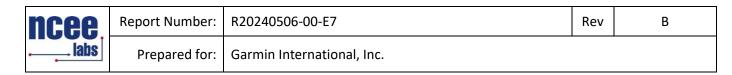
Relative humidity of $35 \pm 4\%$ Temperature of $22 \pm 3^{\circ}$ Celsius



3.2 TEST PERSONNEL

No.	PERSONNEL	TITLE	ROLE
1	Fox Lane	Test Engineer	Testing and Report
-	T OX Lanc		
2	Blake Winter	Test Engineer	Testing
3	Ethan Schmidt	Test Engineer	Testing and Report

Notes: All personnel are permanent staff members of NCEE Labs. No testing or review was sub-contracted or performed by sub-contracted personnel.



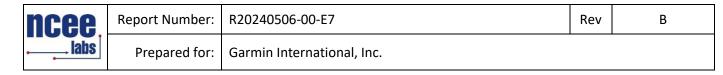
3.3 TEST EQUIPMENT

DESCRIPTION AND MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CALIBRATION DATE	CALIBRATION DUE DATE
Keysight MXE Signal Analyzer (44GHz)	N9038A	MY59050109	July 17, 2024	July 18, 2026
Keysight MXE Signal Analyzer (26.5GHz)	N9038A	MY56400083	July 17, 2024	July 18, 2026
Keysight EXA Signal Analyzer	N9010A	MY56070862	July 18, 2023	July 17, 2025
SunAR RF Motion	JB1	A082918-1	July 17, 2024	July 17, 2025
EMCO Horn Antenna	3117	29616	June 12, 2024	June 12, 2025
EMCO Horn Antenna	3116	2576	July 31, 2023	July 30, 2025
Com-Power LISN, Single Phase	LI-220C	20070017	July 17, 2023	July 17, 2025
Agilent Preamp*	87405A	3207A01475	May 2, 2024	May 2, 2026
ETS Red Preamplifier (Orange)*	3115-PA	00218576	January 22, 2024	January 22, 2026
Trilithic High Pass Filter*	6HC330	23042	June 5, 2023	June 5, 2025
Tektronix Average Power Meter	PSM3110	118674	July 17, 2024	July 18, 2026
ETS – Lindgren- VSWR on 10m Chamber	10m Semi- anechoic chamber-VSWR	4740 Discovery Drive	May 15, 2024	May 15, 2027
NCEE Labs-NSA on 10m Chamber*	10m Semi- anechoic chamber-NSA	NCEE-001	May 22, 2024	May 22, 2026
RF Cables (3m Ant. to Control room Bulkhead)	MFR-57500	1E3874	June 5, 2023	June 5, 2025
RF Cable (antenna to 10m chamber bulkhead)*	FSCM 64639	01E3872	June 5, 2023	June 5, 2025
RF Cable (10m chamber bulkhead to control room bulkhead)*	FSCM 64639	01E3874	June 5, 2023	June 5, 2025
RF Cable (control room bulkhead to test receiver)*	FSCM 64639	01F1206	June 5, 2023	June 5, 2025
N connector bulkhead (10m chamber)*	PE9128	NCEEBH1	June 5, 2023	June 5, 2025
N connector bulkhead (control room)*	PE9128	NCEEBH2	June 5, 2023	June 5, 2025
TDK Emissions Lab Software	V11.25	700307	NA	NA

*Internal Characterization

Notes:

All equipment is owned by NCEE Labs and stored permanently at NCEE Labs facilities.



3.4 GENERAL TEST PROCEDURE AND SETUP FOR RADIO MEASUREMNTS

Measurement type presented in this report (Please see the checked box below):

Conducted \Box

The conducted measurements were performed by connecting the output of the transmitter directly into a spectrum analyzer using an impedance matched cable and connector soldered to the EUT in place of the antenna. The information regarding resolution bandwidth, video bandwidth, span and the detector used can be found in the graphs provided in Appendix C. All the radio measurements were performed using the sections from ANSI C63.10, details about the section used can be found in the spectrum analyzer titles on the graph.



Figure 1 - Bandwidth Measurements Test Setup

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Radiated \boxtimes

All the radiated measurements were taken at a distance of 3m from the EUT. The information regarding resolution bandwidth, video bandwidth, span and the detector used can be found in the graphs provided in Appendix C. All the radio measurements were performed using the sections from ANSI C63.10, details about the section used can be found in the spectrum analyzer titles on the graph.

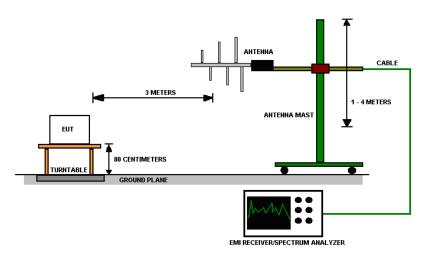


Figure 2 - Radiated Emissions Test Setup

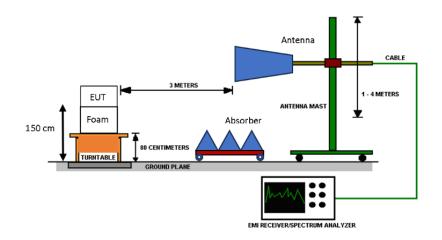


Figure 3 - Radiated Emissions Test Setup, >1GHz

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4.0 RESULTS

		DTS R	DTS Radio Measurements, Low Data Rate								
CHANNEL	Mode	Occupied BW (kHz)	6 dB BW (kHz)		PSD (dBm)	P	OUTPUT OWER dBm)	AVG OUTPUT POWER (mW)	RESULT		
Low	Wifi B 1MB	13922.00	11590.00		-17.637	1	4.393	27.498	PASS		
Mid	Wifi B 1MB	14320.00	11570.00		-17.671	1	8.629	72.929	PASS		
High	Wifi B 1MB	13905.00	12550.00		-18.433	1	3.001	19.957	PASS		
Low	Wifi G 6MB	16493.00	16520.00		-15.963	1	1.096	12.871	PASS		
Mid	Wifi G 6MB	16547.00	16530.00		-14.349	1	7.009	50.223	PASS		
High	Wifi G 6MB	16491.00	16530.00		-17.047	1	0.103	10.240	PASS		
Low	Wifi N MCS0	17670.00	17770.00		-16.842	1	0.823	12.086	PASS		
Mid	Wifi N MCS0	17718.00	17770.00		-10.087	1	6.744	47.250	PASS		
High	Wifi N MCS0	17680.00	17770.00		-17.564	1	0.431	11.043	PASS		
Occupied B	andwidth = N/A;	6dB Bandwidth Li	mit = N/A	Р	eak Output Po	ower Li	mit = 30d8	3m; PSD Limit = 3	8dBm		
		Unre	estricted Band	l-Edg	e, Low Data Ra	ate					
CHANNEL	Mode	Band edge /Measurement Frequency (MHz	of han	out d	Relative Fundamer (dBm)		Delta (dB) Min Delta (dB)	Result		
Low	Wifi B 1MB	2400.00	-35.72	2	0.82		36.53	30.00	PASS		
Low	Wifi G 6MB	2400.00	-42.07	7	-5.63		36.45	30.00	PASS		
Low	Wifi N MCS0	2400.00	-41.75	5	-5.28		36.47	30.00	PASS		
High	Wifi B 1MB	2483.50	-53.35	5	-2.01		51.35	30.00	PASS		
High	Wifi G 6MB	2483.50	-44.38	3	-7.00		37.38	30.00	PASS		
High	Wifi N MCS0	2483.50	-46.90)	-5.49		41.41	30.00	PASS		

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Peak Restricted Band-Edge, Low Data Rate									
CHANNEL	Mode	Band edge /Measurement Frequency (MHz)	Highest out of band level (dBuV/m @ 3m)Limit (dBuV/m @ 3m)		Margin	Result			
Low	Wifi B 1MB	2390.00	55.15	Peak	73.98	18.83	PASS		
Low	Wifi G 6MB	2390.00	55.66	Peak	73.98	18.32	PASS		
Low	Wifi N MCS0	2390.00	55.22	Peak	73.98	18.76	PASS		
High	Wifi B 1MB	2483.50	57.41	Peak	73.98	16.57	PASS		
High	Wifi G 6MB	2483.50	60.29	Peak	73.98	13.69	PASS		
High	Wifi N MCS0	2483.50	62.80	Peak	73.98	11.18	PASS		

*Limit shown is the peak limit taken from FCC Part 15.209

		Average R	lestricted Band-I	Edge, Low Data F	Rate		
CHANNEL	Mode	Band edge /Measurement Frequency (MHz)	ement (dBuV/m @ Detector (dBuV/m @		Margin	Result	
Low	Wifi B 1MB	2390.00	43.31	Average	53.98	10.67	PASS
Low	Wifi G 6MB	2390.00	43.61	Average	53.98	10.37	PASS
Low	Wifi N MCS0	2390.00	43.82	Average	53.98	10.16	PASS
High	Wifi B 1MB	2483.50	48.15	Average	53.98	5.83	PASS
High	Wifi G 6MB	2483.50	44.12	Average	53.98	9.86	PASS
High	Wifi N MCS0	2483.50	44.30	Average	53.98	9.68	PASS
*Limit shov	vn is the average	e limit taken from FC	C Part 15.209				

		DTS Ra	dio Measureme	nts, High Data Ra	ate		
CHANNEL	Mode	Occupied BW (kHz)	6 dB BW (kHz)	PSD (dBm)	AVG OUTPUT POWER (dBm)	AVG OUTPUT POWER (mW)	RESULT
Low	Wifi B 11MB	13754.00	11820.00	-18.181	13.888	24.479	PASS
Mid	Wifi B 11MB	13889.00	11630.00	-8.095	18.670	73.621	PASS
High	Wifi B 11MB	13748.00	11770.00	-14.528	13.068	20.267	PASS
Low	Wifi G 54MB	16483.00	16530.00	-16.057	11.249	13.332	PASS
Mid	Wifi G 54MB	16554.00	16530.00	-9.187	17.041	50.594	PASS
High	Wifi G 54MB	16489.00	16530.00	-17.18	9.965	9.920	PASS
Low	Wifi N MCS7	17665.00	17770.00	-17.659	11.283	13.437	PASS
Mid	Wifi N MCS7	17716.00	17780.00	-10.384	16.737	47.174	PASS
High	Wifi N MCS7	17679.00	17770.00	-17.772	9.981	9.956	PASS
Occupied Ba	andwidth = N/A; 6c	lB Bandwidth Limi	t = N/A	Peak Output Po	wer Limit = 30dl	Bm; PSD Limit = 8	3dBm



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Unrestricted Band-Edge, High Data Rate									
CHANNEL	Mode	Band edge /Measurement Frequency (MHz)	RelativeRelativeHighest outFundamentalof band level(dBm)		Delta (dB)	Min Delta (dB)	Result		
Low	Wifi B 11MB	2400.00	-45.23	-4.43	40.81	30.00	PASS		
Low	Wifi G 54MB	2400.00	-42.69	-4.12	38.57	30.00	PASS		
Low	Wifi N MCS7	2400.00	-41.63	-4.89	36.74	30.00	PASS		
High	Wifi B 11MB	2483.50	-50.61	-1.37	49.24	30.00	PASS		
High	Wifi G 54MB	2483.50	-48.34	-4.51	43.83	30.00	PASS		
High	Wifi N MCS7	2483.50	-47.81	-6.15	41.66	30.00	PASS		

	Peak Restricted Band-Edge, High Data Rate									
CHANNEL	Mode	Band edge /Measurement Frequency (MHz)	Highest out of band level (dBuV/m @ 3m)	Detector	Limit (dBuV/m @ 3m)	Margin	Result			
Low	Wifi B 11MB	2390.00	54.43	Peak	73.98	19.55	PASS			
Low	Wifi G 54MB	2390.00	55.14	Peak	73.98	18.84	PASS			
Low	Wifi N MCS7	2390.00	55.19	Peak	73.98	18.79	PASS			
High	Wifi B 11MB	2483.50	57.91	Peak	73.98	16.07	PASS			
High	Wifi G 54MB	2483.50	60.29	Peak	73.98	13.69	PASS			
High	Wifi N MCS7	2483.50	63.39	Peak	73.98	10.59	PASS			
*Limit show	vn is the peak limit	taken from FCC Part	15.209							
		Average Be	stricted Band E	lao High Data Pa	ato.					

	Average Restricted Band-Edge, High Data Rate									
CHANNEL	Mode	Band edge /Measurement Frequency (MHz)	Highest out of band level (dBuV/m @ 3m)	Detector	Limit (dBuV/m @ 3m)	Margin	Result			
Low	Wifi B 11MB	2390.00	43.28	Average	53.98	10.70	PASS			
Low	Wifi G 54MB	2390.00	43.68	Average	53.98	10.30	PASS			
Low	Wifi N MCS7	2390.00	43.70	Average	53.98	10.28	PASS			
High	Wifi B 11MB	2483.50	47.46	Average	53.98	6.52	PASS			
High	Wifi G 54MB	2483.50	44.23	Average	53.98	9.75	PASS			
High	Wifi N MCS7	2483.50	44.29	Average	53.98	9.69	PASS			
*Limit show	vn is the average li	mit taken from FCC P	art 15.209							



4.1 OUTPUT POWER

Test Method:

Power measurements were performed using ANSI C63.10, Section 11.9.2.3.1.

Limits of power measurements: For FCC Part 15.247 Device:

The maximum allowed output power is 30 dBm.

Test procedures:

Details can be found in section 3.4 of this report.

Deviations from test standard:

No deviation.

Test setup:

Details can be found in section 3.4 of this report.

EUT operating conditions:

Details can be found in section 2.1 of this report.

Test results:

Pass

Comments:

- 1. All the measurements were found to be compliant.
- 2. Tabulated data is listed in section 4.0.



4.2 **BANDWIDTH**

Test Method:

All the radio measurements were performed using ANSI C63.10 Sec. 11.8.1 for 6dB BW.

Limits of bandwidth measurements:

For FCC Part 15.247 Device:

The 99% occupied bandwidth is for informational/documentation purposes only. The 6dB bandwidth of the signal must be greater than 500 kHz.

Test procedures:

Details can be found in section 3.4 of this report.

Deviations from test standard:

No deviation.

Test setup:

Test setup details can be found in section 3.4 of this report.

EUT operating conditions:

Details can be found in section 2.1 of this report.

Test results:

Pass

Comments:

- 1. All the bandwidth plots can be found in Appendix C.
- 2. All the measurements were found to be compliant.
- 3. Tabulated data is listed in section 4.0.

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4.3 DUTY CYCLE

Modulations in this report have a duty cycle of >98%. No DCCF used.



4.4 RADIATED EMISSIONS

Test Method:

ANSI C63.10-2020, Section 6.5, 6.6

Limits for radiated emissions measurements:

Emissions radiated outside of the specified bands shall be applied to the limits in 15.209 as followed:

FREQUENCIES (MHz)	FIELD STRENGTH (μV/m)	MEASUREMENT DISTANCE (m)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	3
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

NOTE:

1. The lower limit shall apply at the transition frequencies.

2. Emission level (dBuV/m) = 20 * log * Emission level (μ V/m).

3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits by more than 20dB under any condition of modulation.



Test procedures:

a. The EUT was placed on the top of a rotating table above the ground plane in a 10 meter semianechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation. The table was 0.8m high for measurements from 30MHz-1Ghz and 1.5m for measurements from 1GHz and higher.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The antenna was a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are used to make the measurement.

d. For each suspected emission, the EUT was arranged to maximize its emissions and then the antenna height was varied from 1 meter to 4 meters and the rotating table was turned from 0 degrees to 360 degrees to find the maximum emission reading.

e. The test-receiver system was set to use a peak detector with a specified resolution bandwidth. For spectrum analyzer measurements, the composite maximum of several analyzer sweeps was used for final measurements.

f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

g. The EUT was maximized in all 3 orthogonal positions. The results are presented for the axis that had the highest emissions.

Test setup:



NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Peak detection (PK) and Quasi-peak detection (QP) at frequencies below 1GHz.

2. The resolution bandwidth 1 MHz for all measurements and at frequencies above 1GHz, A peak detector was used for all measurements above 1GHz. Measurements were made with an EMI Receiver.

Deviations from test standard:

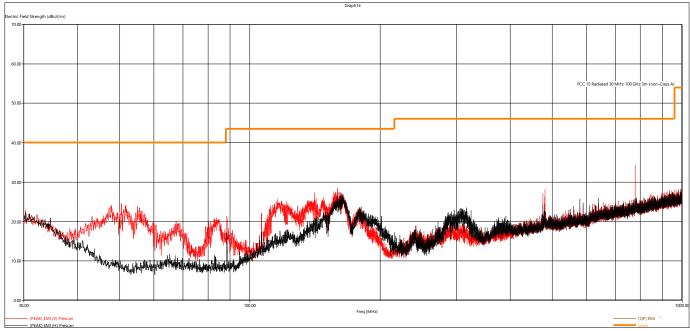
No deviation.

EUT operating conditions

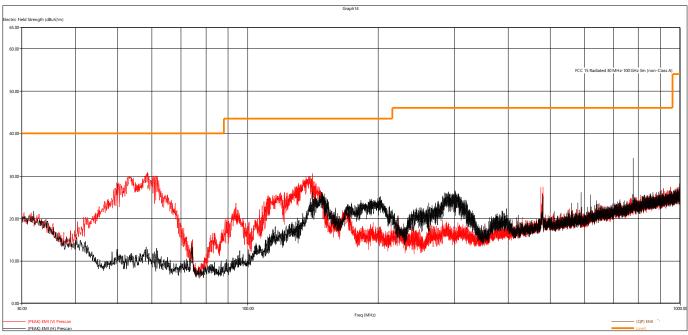
Details can be found in section 2.1 of this report.

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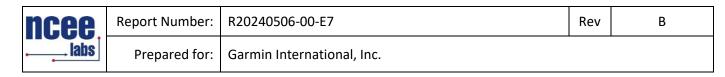
Test results:

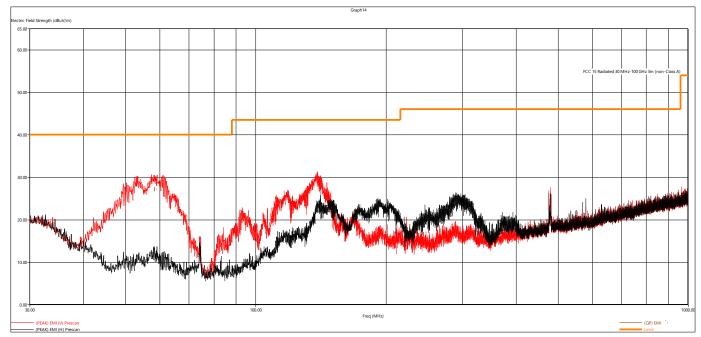














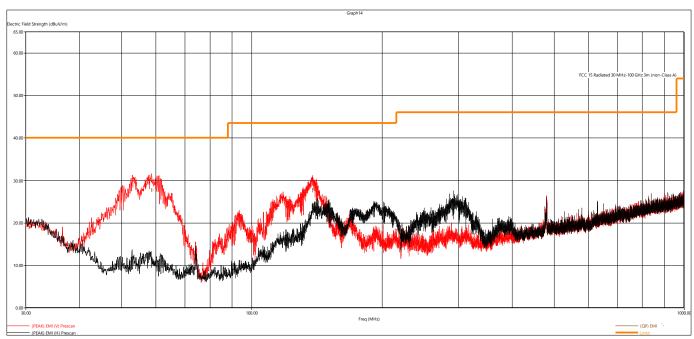
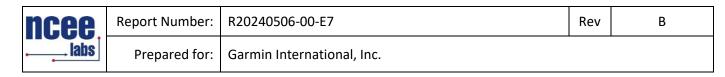
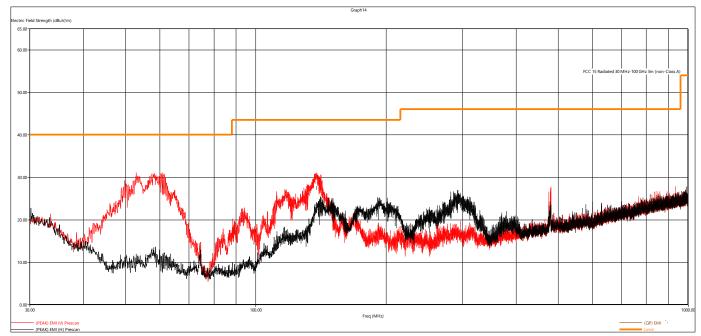


Figure 7 - Radiated Emissions Plot, 802.11g 6MB







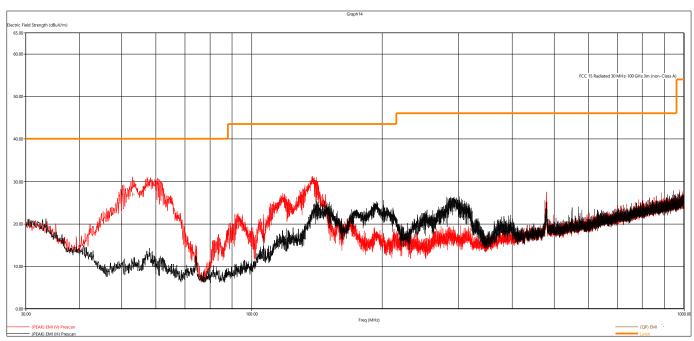
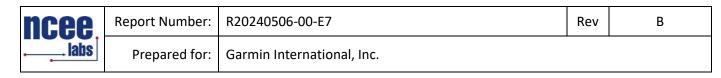
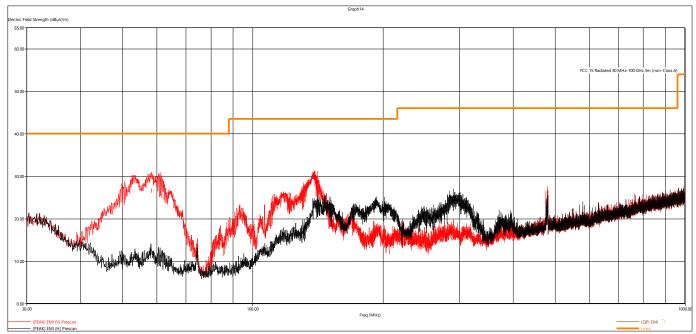


Figure 9 - Radiated Emissions Plot, 802.11n MCS0







REMARKS:

- 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB)
- 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
- 3. The other emission levels were very low against the limit.
- 4. Margin value = Limit value Emission level

Frequency	Level	Limit	Margin	Height	Angle	Pol	Modulation
MHz	dBµV/m	dBµV/m	dB	cm.	deg.		
58.562160	27.38	40.00	12.62	106.32	59.25	V	802.11b 1MB
141.127440	26.44	43.52	17.08	103.58	228.00	V	802.11b 1MB
58.172400	27.09	40.00	12.91	106.44	167.50	V	802.11b 11MB
58.612560	27.65	40.00	12.35	104.00	148.00	V	802.11g 6MB
138.064560	27.59	43.52	15.93	104.59	286.00	V	802.11g 6MB
60.938160	27.64	40.00	12.36	118.74	209.75	V	802.11g 54MB
138.105840	27.40	43.52	16.12	112.89	299.25	V	802.11g 54MB
52.810560	26.86	40.00	13.14	108.11	306.00	V	802.11n MCS0
58.147200	26.52	40.00	13.48	103.64	197.00	V	802.11n MCS7
50.433600	19.71	40.00	20.29	109.01	207.50	V	RX
159.132480	22.73	43.52	20.79	121.85	277.50	V	RX

The EUT was maximized in all 3 orthogonal axes. The worst-case is shown in the plot and table above.

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labs	Prepared for:	Garmin International, Inc.		

Peak Radiated Emissions								
Freq (Max)	(PEAK) EMI	Limit	(PEAK) Margin	Twr Ht	Ttbl Ang	Pol	Channel	Modulation
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg)			
7306.410000	49.39	73.98	24.59	199.94	193.75	V	6	Wifi B 1MB
7303.864000	49.67	73.98	24.31	186.32	173.75	V	6	Wifi G 6MB
7308.076000	48.48	73.98	25.50	129.91	193.25	V	6	Wifi G 54MB

All other measurements up to 25GHz were investigated and found to be at least 10dB below the applicable limit line

Average Radiated Emissions								
Freq (Max)	(CISPR AVG) EMI	Limit	(CISPR AVG) Margin	Twr Ht	Ttbl Ang	Pol	Channel	Modulation
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	(cm)	(deg)			
7306.410000	38.92	53.98	15.06	199.94	193.75	V	6	Wifi B 1MB
7303.864000	35.07	53.98	18.91	186.32	173.75	V	6	Wifi G 6MB
7308.076000	34.42	53.98	19.56	129.91	193.25	V	6	Wifi G 54MB

All other measurements up to 25GHz were investigated and found to be at least 10dB below the applicable limit line



Test Method: ANSI C63.10-2020, Section 6.7

Limits of spurious 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. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in § 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.205(c)).

Test procedures:

The highest emissions level was measured and recorded. All spurious measurements were evaluated to 30dB below the fundamental. More details can be found in section 3.4 of this report.

Deviations from test standard:

None.

Test setup:

Test setup details can be found in section 3.4 of this report.

EUT operating conditions:

Details can be found in section 2.1 of this report.

Test results:

Note that the limit shown on the plots does not apply. It is a line for reference.

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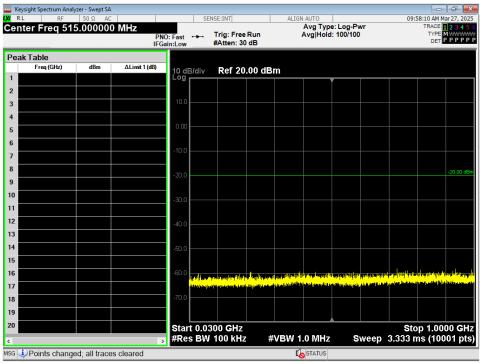


Figure 11 - Conducted Emissions Plot, WIFI 802.11b, 30M – 1G, Mid

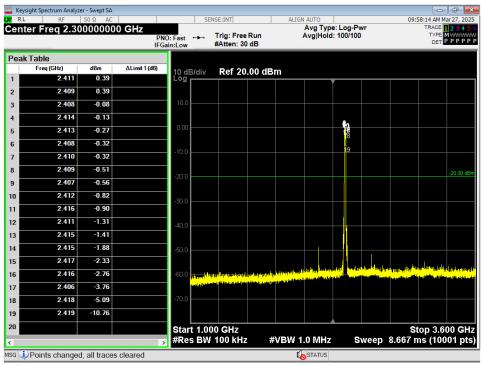
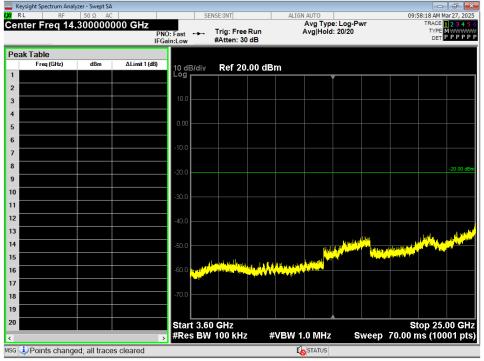


Figure 12 - Conducted Emissions Plot, WIFI 802.11b, 1G – 3.6G, Mid







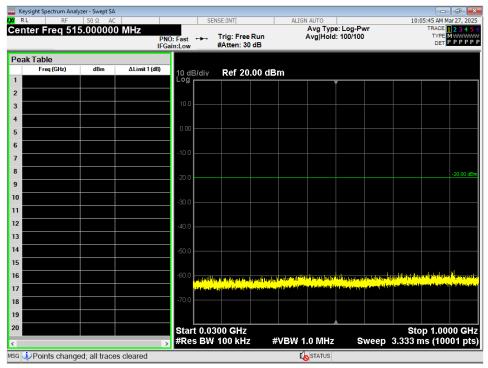


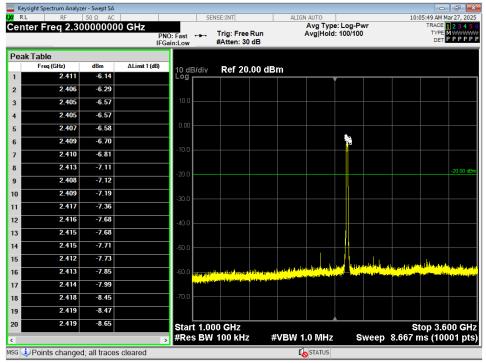
Figure 14 - Conducted Emissions Plot, WIFI 802.11g, 30M - 1G, Mid



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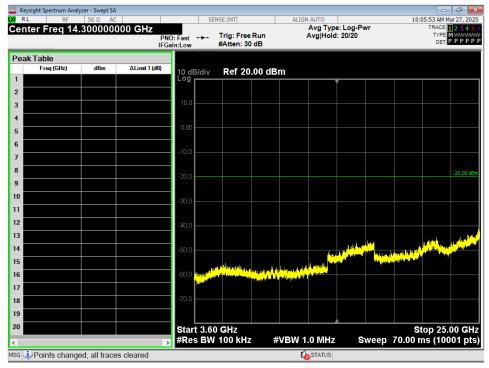


Figure 16 - Conducted Emissions Plot, WIFI 802.11g, 3.6G - 25G, Mid



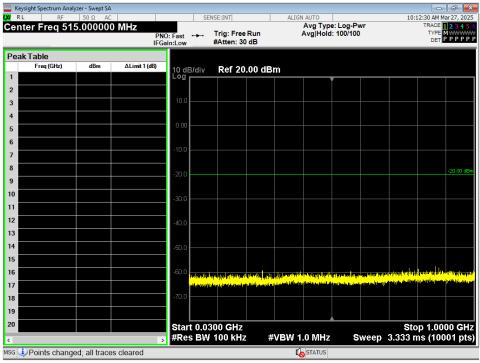


Figure 17 - Conducted Emissions Plot, WIFI 802.11n, 30M – 1G, Mid

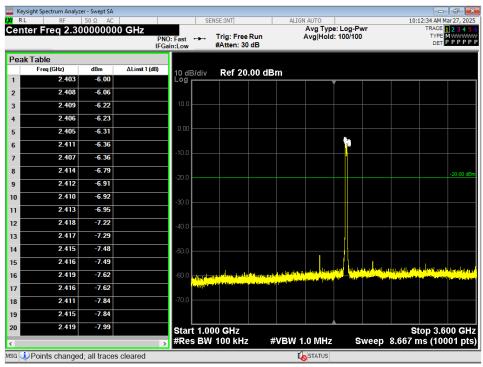


Figure 18 - Conducted Emissions Plot, WIFI 802.11n, 1G – 3.6G, Mid



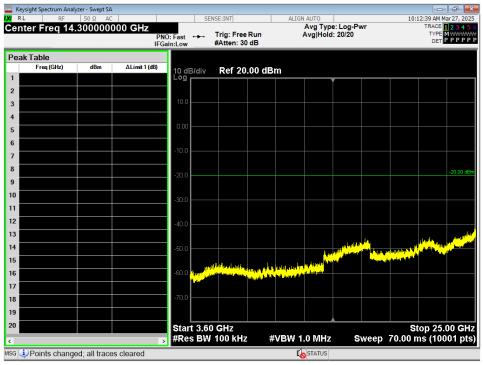


Figure 19 - Conducted Emissions Plot, WIFI 802.11n, 3.6G – 25G, Mid



4.6 BAND EDGES

Test Method: All the radio measurements were performed using the sections from ANSI C63.10, details about the section used can be found in the spectrum analyzer titles on the graph.

Limits of band-edge measurements: For FCC Part 15.247 Device:

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. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.205(c))

Test procedures:

The highest emissions level beyond the band-edge was measured and recorded. All band edge measurements were evaluated to the general limits in Part 15.209. More details can be found in section 3.4 of this report.

Deviations from test standard:

No deviation.

Test setup:

Test setup details can be found in section 3.4 of this report.

EUT operating conditions:

Details can be found in section 2.1 of this report.

Test results:

Pass

Comments:

- 1. All the band edge plots can be found in Appendix C.
- 2. If the device falls under FCC Part 15.247 (Details can be found in summary of test results), compliance is shown in the unrestricted band edges by showing minimum delta of 20 dB between peak and the band edge.
- 3. The restricted band edge compliance is shown by comparing it to the general limit defined in Part 15.209.
- 4. Tabulated data is listed in section 4.0.



4.7 **POWER SPECTRAL DENSITY**

Test Method: All the radio measurements were performed using the sections from ANSI C63.10, details about the section used can be found in the spectrum analyzer titles on the graph.

Limits of power measurements:

For FCC Part 15.247 Device: The maximum PSD allowed is 8 dBm.

Test procedures:

Details can be found in section 3.4 of this report.

Deviations from test standard:

No deviation.

Test setup:

Details can be found in section 3.4 of this report.

EUT operating conditions:

Details can be found in section 2.1 of this report.

Test results:

Pass

Comments:

- 1. All the Power Spectral Density (PSD) plots can be found in Appendix C.
- 2. All the measurements were found to be compliant.
- 3. Tabulated data is listed in section 4.0.



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4.8 CONDUCTED AC MAINS EMISSIONS

Test Method: ANSI C63.10-2020, Section(s) 6.2

Limits for conducted emissions measurements:

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dBµV)		
	Quasi-peak	Average	
0.15-0.5	66 to 56	56 to 46	
0.5-5	56	46	
5-30	60	50	

Notes:

1. The lower limit shall apply at the transition frequencies.

2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz

3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

Test Procedures:

- a. The EUT was placed 0.8m above a ground reference plane and 0.4 meters from the conducting wall of a shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). The LISN provides 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference as well as the ground.
- c. The frequency range from 150 kHz to 30 MHz was searched. Emission levels over 10dB under the prescribed limits are not reported.
- d. Results were compared to the 15.207 limits.

Deviation from the test standard:

No deviation

EUT operating conditions:

Details can be found in section 2.1 of this report.

Test Results:





Figure 20 - Conducted Emissions Plot, Line, TX

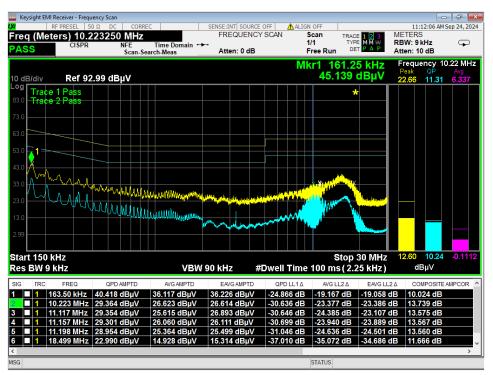


Figure 21 - Conducted Emissions Plot, Neutral, TX





Figure 22 - Conducted Emissions Plot, Line, IDLE

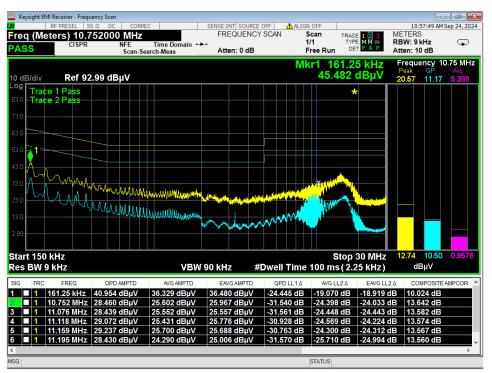


Figure 23 - Conducted Emissions Plot, Neutral, IDLE

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	Prepared for:	Garmin International, Inc.		

APPENDIX A: SAMPLE CALCULATION

Field Strength Calculation

The field strength is calculated by adding the Antenna Factor, Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF - (-CF + AG) + AV

where FS = Field Strength

RA = Receiver Amplitude

AF = Antenna Factor

CF = Cable Attenuation Factor

AG = Amplifier Gain

AV = Averaging Factor (if applicable)

Assume a receiver reading of 55 dB μ V is obtained. The Antenna Factor of 12 and a Cable Factor of 1.1 is added. The Amplifier Gain of 20 dB is subtracted, giving a field strength of 48.1 dB μ V/m.

 $FS = 55 + 12 - (-1.1 + 20) + 0 = 48.1 \text{ dB}\mu\text{V/m}$

The 48.1 dB μ V/m value can be mathematically converted to its corresponding level in μ V/m.

Level in μ V/m = Common Antilogarithm [(48.1 dB μ V/m)/20]= 254.1 μ V/m

AV is calculated by taking the $20*\log(T_{on}/100)$ where T_{on} is the maximum transmission time in any 100ms window.

EIRP Calculations

In cases where direct antenna port measurement is not possible or would be inaccurate, output power is measured in EIRP. The maximum field strength is measured at a specified distance and the EIRP is calculated using the following equation;

EIRP (Watts) = [Field Strength (V/m) x antenna distance (m)]² / 30 Power (watts) = $10^{Power} (dBm)/10$] / 1000 Voltage (dB μ V) = Power (dBm) + 107 (for 50 Ω measurement systems) Field Strength (V/m) = 10^{Field} Strength (dB μ V/m) / 20] / 10^{6} Gain = 1 (numeric gain for isotropic radiator) Conversion from 3m field strength to EIRP (d=3): EIRP = [FS(V/m) x d^2]/30 = FS [0.3] for d = 3 EIRP(dBm) = FS(dB μ V/m) - $10(\log 10^{9})$ + $10\log[0.3]$ = FS(dB μ V/m) - 95.23 10log(10^{9}) is the conversion from micro to milli



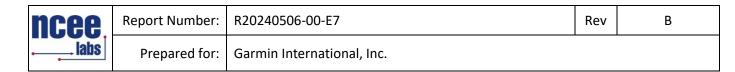
APPENDIX B – MEASUREMENT UNCERTAINTY

NCEE Labs does not add uncertainty levels to measurement levels

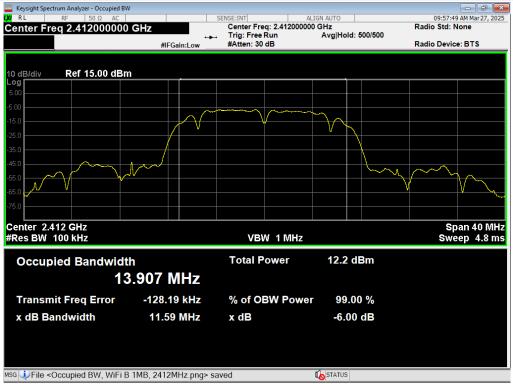
Where relevant, the following measurement uncertainty levels have been for tests performed in this test report:

Test	Frequency Range	Uncertainty Value (dB)
Radiated Emissions, 3m	30MHz – 1GHz	±4.31
Radiated Emissions, 3m	1GHz – 18GHz	±5.08
Emissions limits, conducted	30MHz – 18GHz	±3.03

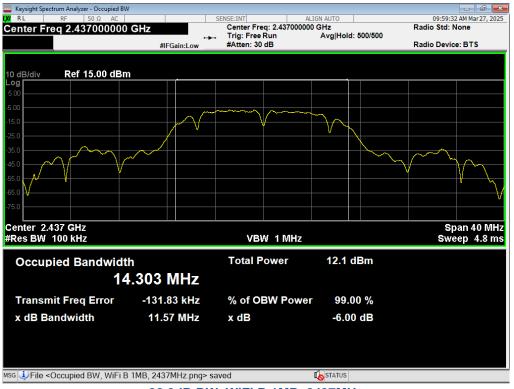
Expanded uncertainty values are calculated to a confidence level of 95%.



APPENDIX C – GRAPHS AND TABLES



01 6dB BW, WiFi B 1MB, 2412MHz

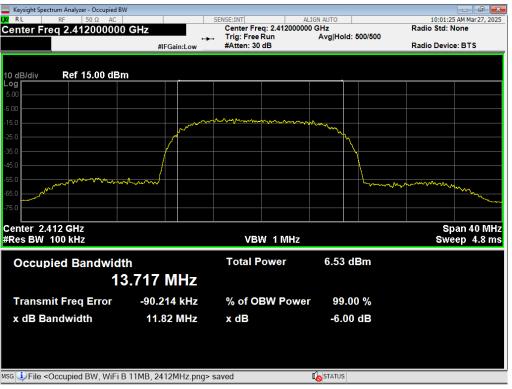


02 6dB BW, WiFi B 1MB, 2437MHz



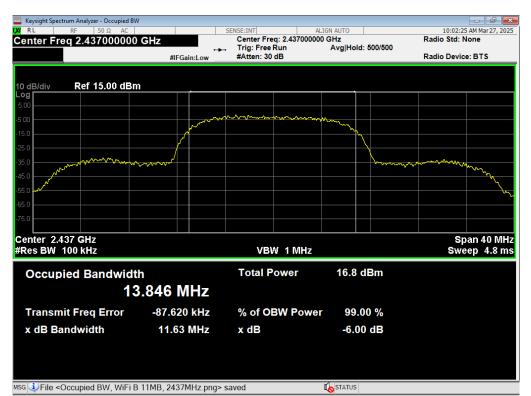


03 6dB BW, WiFi B 1MB, 2472MHz

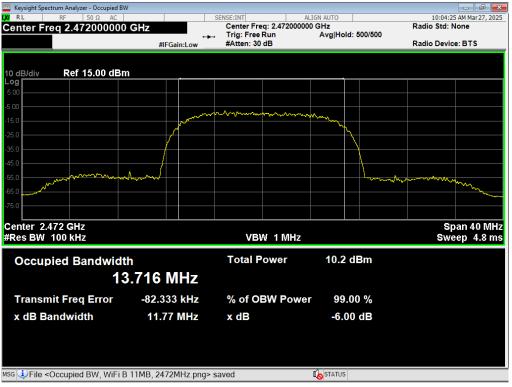


04 6dB BW, WiFi B 11MB, 2412MHz



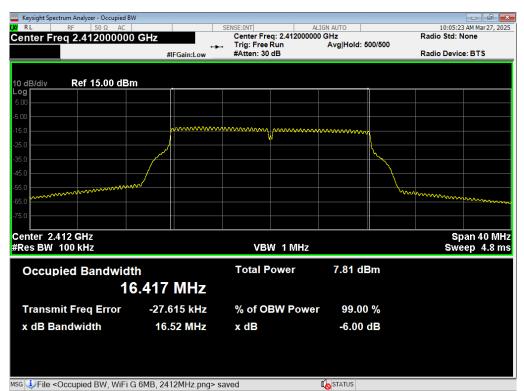


05 6dB BW, WiFi B 11MB, 2437MHz



06 6dB BW, WiFi B 11MB, 2472MHz





07 6dB BW, WiFi G 6MB, 2412MHz



08 6dB BW, WiFi G 6MB, 2437MHz



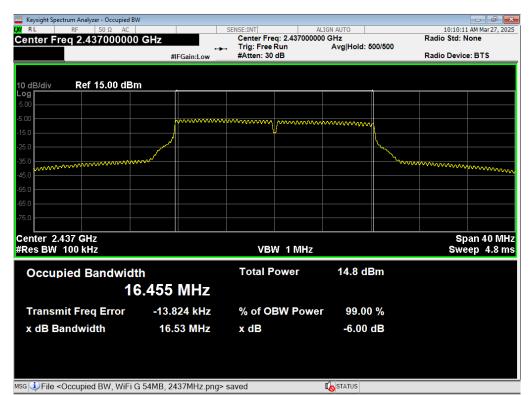


09 6dB BW, WiFi G 6MB, 2472MHz

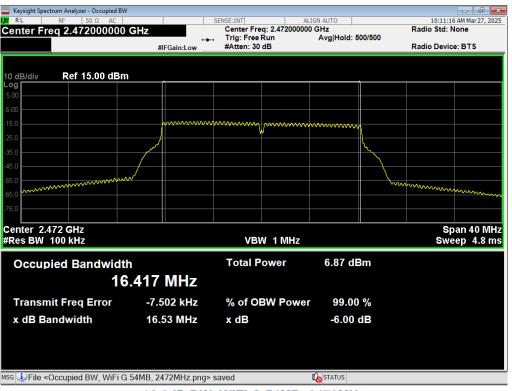


10 6dB BW, WiFi G 54MB, 2412MHz





11 6dB BW, WiFi G 54MB, 2437MHz

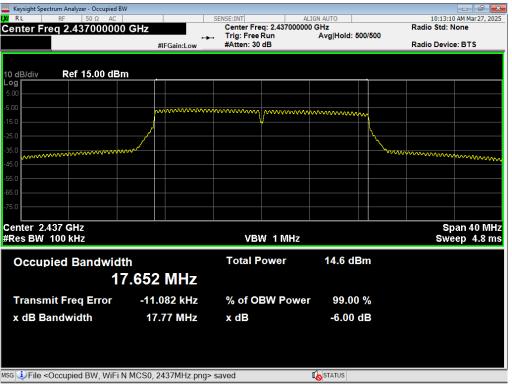


12 6dB BW, WiFi G 54MB, 2472MHz





13 6dB BW, WiFi N MCS0, 2412MHz

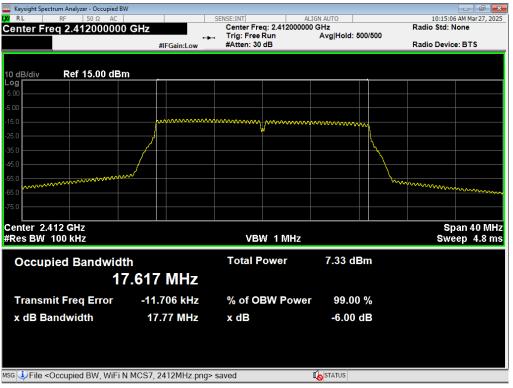


14 6dB BW, WiFi N MCS0, 2437MHz





15 6dB BW, WiFi N MCS0, 2472MHz

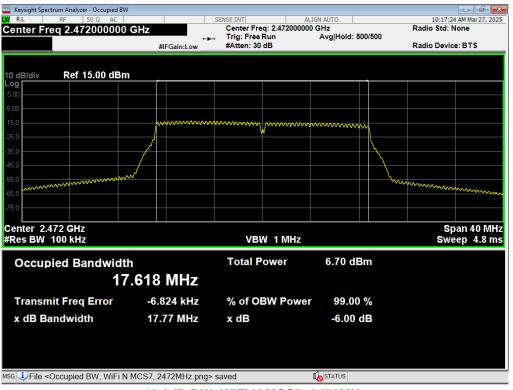


16 6dB BW, WiFi N MCS7, 2412MHz



Keysight Spect	rum Analyzer - Occupied BW				
LX/RL	RF 50 Ω AC		SENSE:INT	ALIGN AUTO	10:16:12 AM Mar 27, 2025
Center Fre	eq 2.437000000	GHz	Center Freq: 2.437000		Radio Std: None
		↔ #IFGain:Low	Trig: Free Run #Atten: 30 dB	Avg Hold: 500/500	Radio Device: BTS
10 dB/div	Ref 15.00 dBm				
Log					
5.00					
-5.00		AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA		~~~~~	
-15.0					
		ا الر			
-25.0					
-35.0	······	~~ [/]			······································
-45.0	000000000000000000000000000000000000000				
-55.0					
-65.0					
-75.0					
-75.0					
Center 2.4	37 647				Span 40 MHz
#Res BW			VBW 1 MHz		Sweep 4.8 ms
WINCS DW	TOO KI12				Sweep 4.8 ms
Occup	ied Bandwidth		Total Power	14.5 dBm	
occup					
	17	.653 MHz			
Transm	it Freq Error	-8.359 kHz	% of OBW Pow	er 99.00 %	
x dB Ba	ndwidth	17.78 MHz	x dB	-6.00 dB	
			Ada	0100 48	
		MCS7, 2437MHz.png>			

17 6dB BW, WiFi N MCS7, 2437MHz

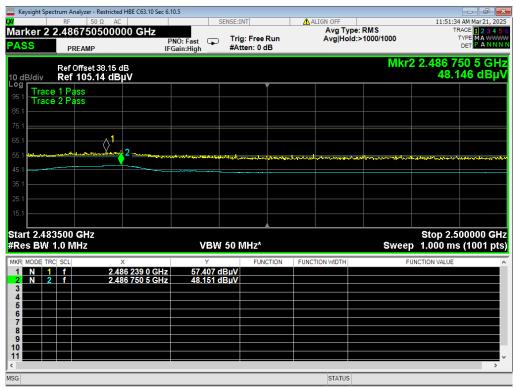


18 6dB BW, WiFi N MCS7, 2472MHz



🛄 Keysight Spe	ctrum Analyzer - F	Restricted HBE C63.10 Sec 6	i.10.5					
l <mark>XI</mark>		Ω AC	SENS	E:INT	ALIGN OFF			AM Mar 27, 2025
Marker 2	2.483962	000000 GHz			Avg Typ			RACE 1 2 3 4 5 6
PASS	005440			Trig: Free Run Atten: 0 dB	Avg Hold	d:>1000/1000		
	PREAMP	I	FGain:High #	Atten. V dB				
	Ref Offset 3	38 15 dB				Mkr	2 2.483 9	62 0 GHz
10 dB/div	Ref 105.1						44.8	07 dBµV
Trac	e 1 Pass			Ť				
	e 2 Pass							
85.1								
75.1								
65.1								
K) '								
55.1 2			and the second		************	مرمواطور معامل وروب ال <mark>لروا</mark> الدان ا	lan dan gerlaga yakara dan dari	مرچین ^ر امون ارونو و
45.1								
35.1								
25.1								
15.1								
Start 2.48							Stop 2.5	00000 GHz
#Res BW	1.0 MHz		VBW 50) MHz*		Swee	o 1.000 ms	; (1001 pts)
MKR MODE TR	C SCL	Х	Y	FUNCTION	FUNCTION WIDTH	F	UNCTION VALUE	^
1 N 1	f	2.483 665 0 GHz						
2 N 2 3	f	2.483 962 0 GHz	44.807 dBµ	v				
4								
5								
6								
8								
9								
10								
11								~
MSG					STATUS			
					514105			



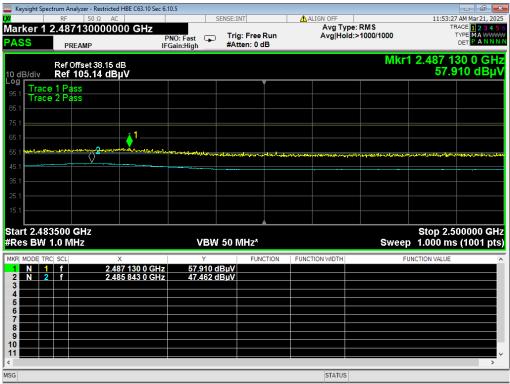


20 HBE Restricted, Wifi B 1MB, ch13, new power settings



Keysight Spectrum Analyzer - Restricted HBE C63.10 Sec	6.10.5					
IXI RF 50 Ω AC	SENSE:I	INT	ALIGN OFF	DMC		AM Mar 27, 2025
Marker 2 2.483516500000 GHz PASS PREAMP		g: Free Run tten: 0 dB	Avg Type Avg Hold:	>1000/1000	T	ACE 1 2 3 4 5 6 YPE MA DET PANNNN
				Mkr	2 2.483 5	16 5 GH7
Ref Offset 38.15 dB 10 dB/div Ref 105.14 dBµV						71 dBμV
Log 95.1 Trace 1 Pass						
95.1 Trace 2 Pass 85.1						
75.1						
65.11						
55.1 2 Lalerthan Armanuel Article Million	hours and and a second production	the Provide standards	en verskele des nameterster	لمعدمي أستحيار والمعاصر	And Aller Andread and	and th e Alexandre and
45.1						
35.1						
25.1						
15.1						
Start 2.483500 GHz					Stop 2.5	00000 GHz
#Res BW 1.0 MHz	VBW 50 I	MHz*		Swee	0 1.000 ms	(1001 pts)
MKR MODE TRC SCL X	Y	FUNCTION	FUNCTION WIDTH	F	UNCTION VALUE	^
1 N 1 f 2.484 473 5 GH 2 N 2 f 2.483 516 5 GH						
3						
5						
8 9 						
10						
<						>
MSG			STATUS			



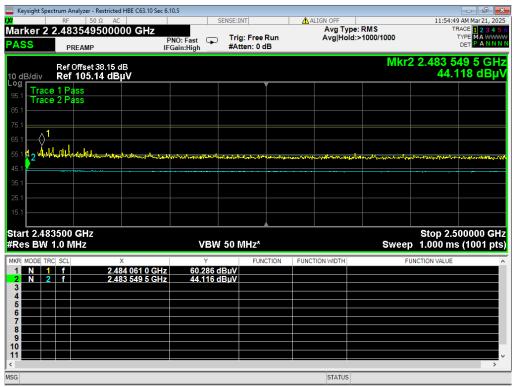


22 HBE Restricted, Wifi B 11MB, ch13, new power settings



🔤 Keysight Sp	ectrum Analyzer - F	Restricted HBE C63.10 Sec 6	5.10.5					
L <mark>XI</mark>	RF 50	Ω ΑC	SENS	E:INT	ALIGN OFF			AM Mar 27, 2025
Marker 2	2.484127	000000 GHz			Avg Typ			ACE 1 2 3 4 5 (
PASS				rig: Free Run	Avg Hold	l:>1000/1000		
PASS	PREAMP	II	FGain:High #	Atten: 0 dB				DEI
						Mkr	2 2.484 9	35 5 GHz
	Ref Offset 3							40 dBµV
10 dB/div	Ref 105.1	ι4 αΒμν					40.0	40 UBHV
	e 1 Pass			Ť				
95.1 Trac	e 2 Pass							
85.1								
75.1								
65.1								
	$\langle 0 \rangle$							
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45.1	•ī							
35.1								
25.1								
25.1								
25.1								
15.1	33500 GHz						Stop 2.5	00000 GHz
15.1	33500 GHz 1.0 MHz		VBW 50) MHz*		Sweet	Stop 2.5	00000 GHz
15.1 Start 2.48 #Res BW	1.0 MHz		VBW 50) MHz*		Sweep	Stop 2.5 0 1.000 ms	00000 GHz (1001 pts)
15.1	1.0 MHz	x	Y	FUNCTION	FUNCTION WIDTH		Stop 2.5 5 1.000 ms	00000 GHz (1001 pts)
15.1 Start 2.48 #Res BW	1.0 MHz	2.484 952 0 GHz	Y 56.178 dBu		FUNCTION WIDTH		o 1.000 ms	00000 GHz (1001 pts)
15.1 Start 2.48 #Res BW	1.0 MHz		Y 56.178 dBu		FUNCTION WIDTH		o 1.000 ms	00000 GHz (1001 pts)
15:1 Start 2.48 #Res BW	1.0 MHz	2.484 952 0 GHz	Y 56.178 dBu		FUNCTION WIDTH		o 1.000 ms	00000 GHz (1001 pts)
15.1 Start 2.48 #Res BW MKR MODE T 1 N 2 N 3 4	1.0 MHz	2.484 952 0 GHz	Y 56.178 dBu		FUNCTION WIDTH		o 1.000 ms	00000 GHz (1001 pts)
15.1 Start 2.48 #Res BW MKR MODE TI 1 N 2 N 3 4 5	1.0 MHz	2.484 952 0 GHz	Y 56.178 dBu		FUNCTION WIDTH		o 1.000 ms	00000 GHz (1001 pts)
15.1 Start 2.48 #Res BW MKR MODE T 1 N 2 N 3 4	1.0 MHz	2.484 952 0 GHz	Y 56.178 dBu		FUNCTION WIDTH		o 1.000 ms	00000 GHz (1001 pts)
15.1 Start 2.48 #Res BW MKR MODE TI 1 N 2 2 N 2 3 4 5 6	1.0 MHz	2.484 952 0 GHz	Y 56.178 dBu		FUNCTION WIDTH		o 1.000 ms	00000 GHz (1001 pts)
15.1 Start 2.48 #Res BW MKR MODE T 1 N 2 2 N 2 3 4 5 6 6 7 8 9	1.0 MHz	2.484 952 0 GHz	Y 56.178 dBu		FUNCTION WIDTH		o 1.000 ms	00000 GHz (1001 pts)
15.1 Start 2.48 #Res BW MKR MODE TI 1 N 2 N 3 4 5 6 7 8 9 10	1.0 MHz	2.484 952 0 GHz	Y 56.178 dBu		FUNCTION WIDTH		o 1.000 ms	00000 GHz (1001 pts)
15.1 Start 2.48 #Res BW MKR MODE TO 1 1 2 N 3 4 5 6 7 8 9 10 11	1.0 MHz	2.484 952 0 GHz	Y 56.178 dBu		FUNCTION WIDTH		o 1.000 ms	00000 GHz (1001 pts)
15.1 Start 2.48 #Res BW MKR MODE TI 1 N 2 3 3 4 5 6 7 7 8 9 9 10	1.0 MHz	2.484 952 0 GHz	Y 56.178 dBu		FUNCTION WIDTH		o 1.000 ms	00000 GHz (1001 pts)
15.1 Start 2.48 #Res BW MKR MODE TI 1 1 2 N 3 4 5 6 7 8 9 10 11	1.0 MHz	2.484 952 0 GHz	Y 56.178 dBu		FUNCTION WIDTH		o 1.000 ms	(1001 pts)

23 HBE Restricted, Wifi G 6MB, ch12, new power settings

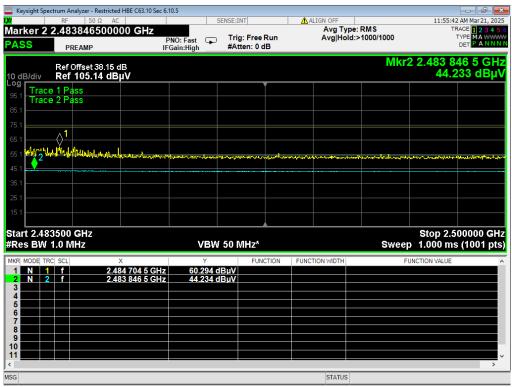


24 HBE Restricted, Wifi G 6MB, ch13, new power settings



Keysight Spectrum Analyzer - Restricted HBE C63.10 Sec						- P ×
Marker 2 2.484869500000 GHz		g: Free Run	ALIGN OFF Avg Type Avg Hold:	RMS >1000/1000	TR	AM Mar 27, 2025 ACE 1 2 3 4 5 6 YPE MA
PASS PREAMP	IFGain:High #At	tten: 0 dB				
Ref Offset 38.15 dB 10 dB/div Ref 105.14 dBµV				Mkr	2 2.484 8 43.6	69 5 GHz 14 dBµV
Log Trace 1 Pass		Ĭ				
^{95.1} Trace 2 Pass						
85.1						
75.1						
65.1						
55.1 martine 2 and the martine and the second	and the second	wal-hangersahara	All Martin and a stranger	Assessment and the second	and and the second stands	land and the second
45.1						
35.1						
25.1						
15.1						
Start 2.483500 GHz		A			Stop 2.5	00000 GHz
#Res BW 1.0 MHz	VBW 50 I	MHz*		Swee	0 1.000 ms	(1001 pts)
MKR MODE TRC SCL X	Y	FUNCTION	FUNCTION WIDTH	FI	UNCTION VALUE	^
1 N 1 f 2.483 945 5 GH 2 N 2 f 2.484 869 5 GH						
3						
5						
7						
8						
10						
<						>
MSG			STATUS			

25 HBE Restricted, Wifi G 54MB, ch12, new power settings

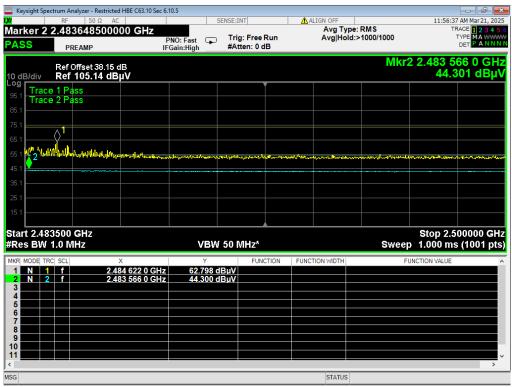


26 HBE Restricted, Wifi G 54MB, ch13, new power settings



Keysight Spe		lestricted HBE C63.10 Sec 6.		- TAIT	A 11701 055	1	00.40.2	
				rig: Free Run Atten: 0 dB	ALIGN OFF Avg Typ Avg Hold	e: RMS :>1000/1000	TF	AM Mar 27, 2025 RACE 1 2 3 4 5 6 TYPE MA WWW DET P A N N N N
10 dB/div	Ref Offset 3 Ref 105.1					Mkr	2 2.483 5 43.7	00 0 GHz ′12 dBµV
Log 95.1 Trac 85.1	e 1 Pass e 2 Pass							
75.1 65.1	1							
45.1	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	hier and an and a second a second a second a s	**************************************			9 oct 10 and 20 and	19	
25.1 15.1								
Start 2.48 #Res BW	3500 GHz 1.0 MHz		VBW 50	MHz*		Swee	Stop 2.5 p 1.000 ms	00000 GHz (1001 pts)
MKR MODE TF 1 N 1 2 N 2 3 4 5 5 6	f	X 2.485 282 0 GHz 2.483 500 0 GHz	Υ 56.011 dBμ\ 43.710 dBμ\		FUNCTION WIDTH	F	UNCTION VALUE	
7 8 9 10 11 <								×
MSG					STATUS			

27 HBE Restricted, Wifi N MCS0, ch12, new power settings

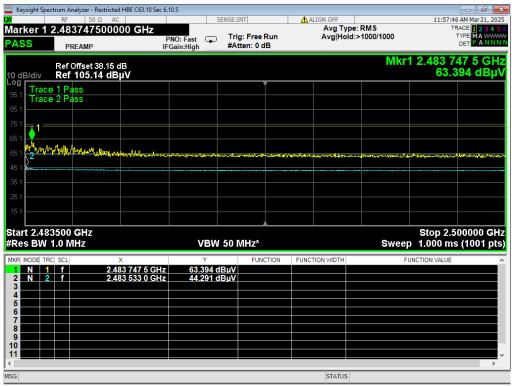


28 HBE Restricted, Wifi N MCS0, ch13, new power settings

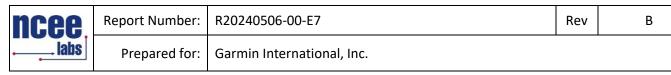


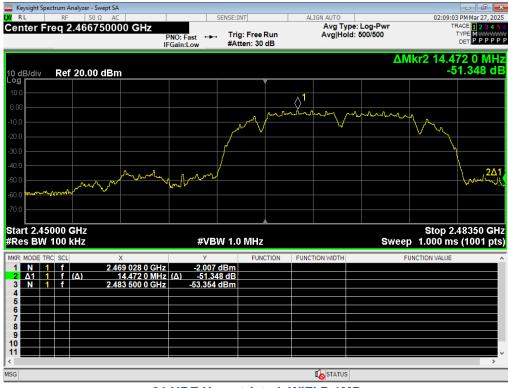
	· · · · · ·	estricted HBE C63.10 Sec 6.			•			
Marker 2				rig: Free Run Atten: 0 dB	ALIGN OFF Avg Type Avg Hold:	: RMS >1000/1000	TF	AM Mar 27, 2025 ACE 1 2 3 4 5 6 TYPE MA DET PANNNN
10 dB/div	Ref Offset 3 Ref 105.1					Mkr	2 2.483 6 43.6	81 5 GHz 80 dBµV
95.1 Trac 85.1 Trac	e 1 Pass e 2 Pass							
75.1								
55.1 2	اله ماد المراجع المارين المراجع	and and the and the and	oogenationany of the first of the second	ฟรูโอรสรรุกษณ์เมืองรูกกรุกษณ	ะสมนาสาระ 		o law at a mand	1WeD9%944 ² 9%7*%5%
35.1 25.1								
	3500 GHz						Stop 2.5	00000 GHz
#Res BW			VBW 50					; (1001 pts)
MKR MODE TF 1 N 1 2 N 2 3 4 5 6 7	f	× 2.483 549 5 GHz 2.483 681 5 GHz	Υ 55.738 dBμ\ 43.680 dBμ\		FUNCTION WIDTH	F	UNCTION VALUE	
7 8 9 10 11 <								×
MSG					STATUS			



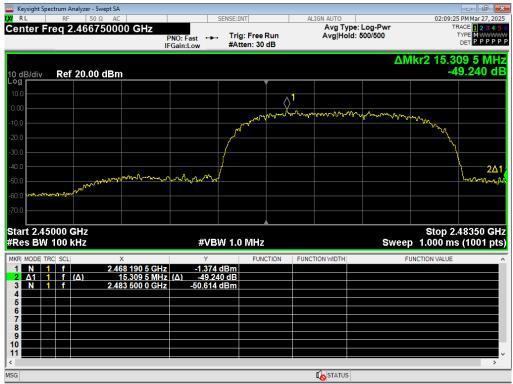


30 HBE Restricted, Wifi N MCS7, ch13, new power settings









32 HBE Unrestricted, WiFi B 11MB



🔤 Keysight Spectrum Analyzer - Swept SA 02:09:46 PM Mar 27, 2025 ALIGN Center Freq 2.466750000 GHz Avg Type: Log-Pwi Avg|Hold: 500/500 TRACE 1 2 3 4 5 Trig: Free Run #Atten: 30 dB PNO: Fast IFGain:Low PPPPPP DE ΔMkr2 17.487 0 MHz -37.381 dB 10 dB/div Log **r** Ref 20.00 dBm ฬ mmm male mm Stop 2.48350 GHz Sweep 1.000 ms (1001 pts) Start 2.45000 GHz #Res BW 100 kHz #VBW 1.0 MHz FUNCTION WIDTH FUNCTION FUNCTION VALUE 2.466 013 0 GHz 17.487 0 MHz (Δ) 2.483 500 0 GHz -7.001 dBm -37.381 dB -44.382 dBm
 N
 1
 f

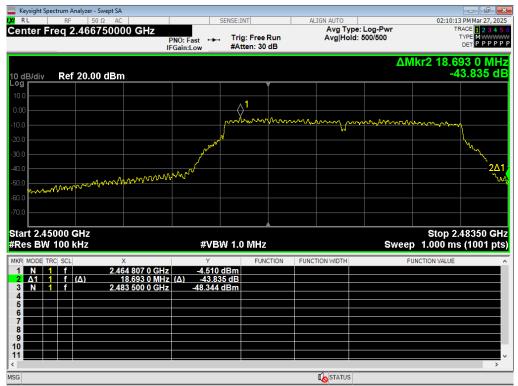
 Δ1
 1
 f
 (Δ)

 N
 1
 f
 1 3 4 67 9 10 11 MSG **I**STATUS

Rev

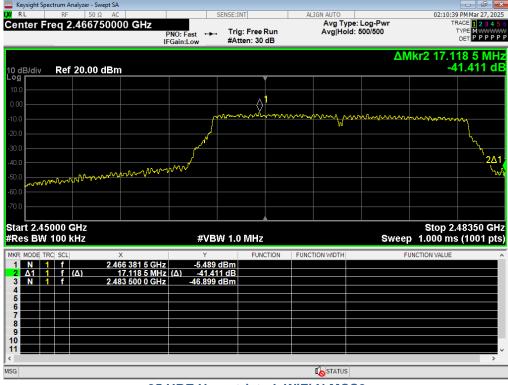
В



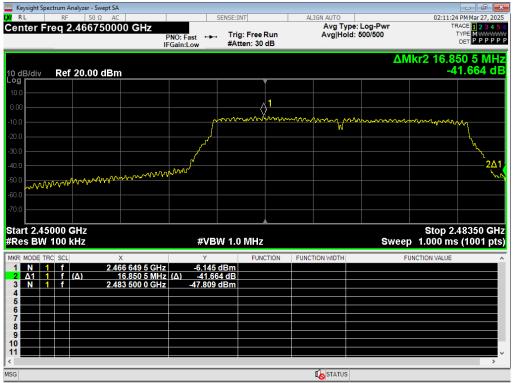


34 HBE Unrestricted, WiFi G 54MB





35 HBE Unrestricted, WiFi N MCS0

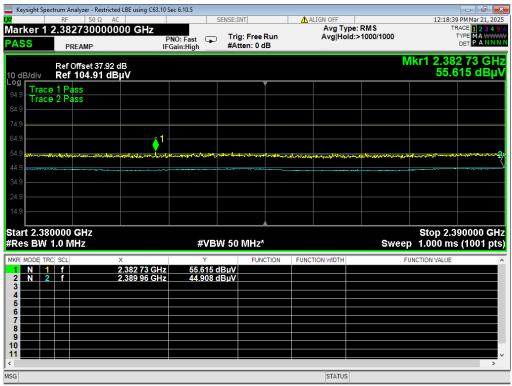


36 HBE Unrestricted, WiFi N MCS7



Keysight Spectrum Analyzer - Restricted			A		- 7 ×
M RF 50 Ω AC Marker 1 2.38503000000 PREAMP PREAMP		SENSE:INT Trig: Free Run #Atten: 0 dB	ALIGN OFF Avg Type: F Avg Hold:>1		11:36:45 AM Mar 21, 2025 TRACE 1 2 3 4 5 6 TYPE MA WWW DET P A N N N N
Ref Offset 37.92 d 10 dB/div Ref 104.91 dB				Mkr	1 2.385 03 GHz 55.154 dBμV
94.9 Trace 1 Pass Trace 2 Pass					
74.9 64.9					
54.9 as the second seco	an generation of the second			ntuskipanon frances, segre	2 ²
34.9					
14.9 Start 2.380000 GHz					Stop 2.390000 GHz
#Res BW 1.0 MHz	#VB	W 50 MHz*		Sweep 1	.000 ms (1001 pts)
2 N 2 f 2	X X 385 03 GHz X 389 38 GHz X 380 38 GHZ		FUNCTION WIDTH	FUNCT	ION VALUE
3 4 5 6					
7 8 9					
10 11 <					×
MSG			STATUS		



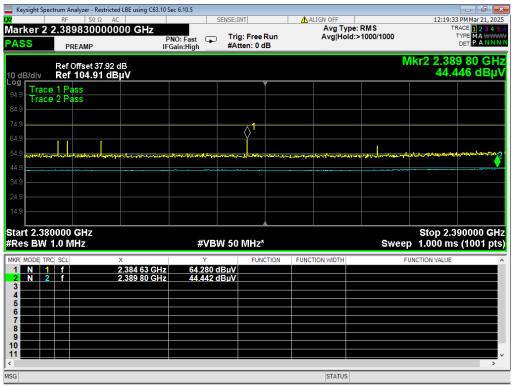


38 LBE Restricted, Wifi B 1MB, ch2, new power settings



Marker 2 2.389640000000 GHz			ricted LBE using C63.10 !							
PASS PREAMP If Gain:High #Atten: 0 dB Det PANNEN Ref Offset 37.92 dB Mkr2 2.389 64 GHz 43.271 dBµV 43.271 dBµV 949 Trace 1 P ass 1 <	<mark>.x.</mark> Marker 2					_	Avg Type		TF	RACE 1 2 3 4 5 6
Net Outsel/01/2 Conservation 100 B/div 43.271 dBµV 43.271 dBµV 43.271 dBµV 43.271 dBµV 43.271 dBµV 44.9 1 44.9 1 44.9 1 44.9 1 44.9 1 44.9 1 44.9 1 44.9 1 44.9 1 44.9 1 44.9 1 44.9 1 5 1 5 1 14.9 1 5 2.380000 GHz Start 2.380000 GHz \$ 7 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	PASS	PREAMP					Avg Hold	:>1000/1000		
Log Trace 1 Pass Image: Construction of the construle of the construction of the construction of the cons								Μ		
94.9 Trace 1 Pass	Loa		dBµV		1	_			43.2	παθμν
84.9 74.9	Trac	e 1 Pass								
64.9 1										
64.9 2.0 34.9 2.4.9 34.9 2.4.9 14.9 2.0 14.9 2.0 14.9 2.0 14.9 2.0 14.9 2.0 14.9 2.0 14.9 2.0 14.9 2.0 14.9 2.0 14.9 2.0 14.9 2.0 14.9 2.00000 GHz #Res BW 1.0 MHz #VBW 50 MHz* Sweep 1.000 ms (1001 pts) MKR MODE TRC ScL 2.0 2 N 1 N 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	74.9									
44.9 44.9	64.9								1	
44 9 44 9	54.9								<u>\</u>	
24.9 24.9 14.9 14.9 Start 2.380000 GHz #Res BW 1.0 MHz #VBW 50 MHz* Stop 2.390000 GHz Sweep 1.000 ms (1001 pts) MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE 1 N 1 f 2.389 64 GHz 54.434 dBuV - - 2 N 2 f 2.389 64 GHz 43.281 dBuV - - 3 - - - - - - - 4 - - - - - - 5 - - - - - - 8 - - - - - - 9 - - - - - - 10 - - - - - -	44.9	***********	₩,₩₩,₩,₩,₩,₩,₩,₩,₩,₩,₩,₩,₩,₩,₩,₩,₩,₩,₩	A Propher Andrew Andrew	hand a long and a long a	<u> (</u> үүүнд Цурун (бордо		and a for the formation of the for		2
14.9 Start 2.380000 GHz Stop 2.390000 GHz #Res BW 1.0 MHz #VBW 50 MHz* Sweep 1.000 ms (1001 pts) MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH 1 N 1 f 2.389 64 GHz 54.434 dBuV 2 N 2 f 2.389 64 GHz 43.281 dBuV 3 4 5 5 5 5 6 6 6 6 6 6 9 9 9 9 9 9 10 1 1 1 1 1	34.9									
14.9 Start 2.380000 GHz Stop 2.390000 GHz #Res BW 1.0 MHz #VBW 50 MHz* Sweep 1.000 ms (1001 pts) MKR MODE TRC SCL X Y FUNCTION FUNCTION WIDTH 1 N 1 f 2.389 64 GHz 54.434 dBuV 2 N 2 f 2.389 64 GHz 43.281 dBuV 3 4 5 5 5 5 6 6 6 6 6 6 9 9 9 9 9 9 10 1 1 1 1 1	24.9									
Start 2.380000 GHz #Res BW 1.0 MHz X Y FUNCTION Stop 2.390000 GHz Sweep 1.00 ms (1001 pts) MKR MODE TC SCL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE 1 N 1 f 2.389 64 GHz 54.434 dBuV FUNCTION FUNCTION WIDTH FUNCTION VALUE 3 4 -										
#Res BW 1.0 MHz #VBW 50 MHz* Sweep 1.000 ms (1001 pts) MKR MODE Trc Sci X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE										
MKR MODE TRC ScL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE 1 N 1 f 2.388 22 GHz 54.434 dBpV				41) (B	W 50 M			Success	Stop 2.3	90000 GHz
1 N 1 f 2.388 22 GHz 54.434 dBµV 2 N 2 f 2.389 64 GHz 43.281 dBµV 3										s (1001 pts)
2 N 2 f 2.389 64 GHz 43.281 dBuV 3 4 4 4 4 4 4 4 4 4 4 4 5 4 4 4 4 4 6 4 4 4 4 4 7 4 4 4 4 4 8 4 4 4 4 4 4 9 4 4 4 4 4 4 4 10 4 4 4 4 4 4 4 4 11 4 4 4 4 4 4 4 4 4						FUNCTION	FUNCTION WIDTH	FU	INCTION VALUE	^
4	2 N 2			43.281	dBµV					
6 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7										
7	-									
9 9 10 10 10 10 10 10 10 10 10 10 10 10 10	7									
							<u> </u>			
										>
MSG STATUS	MSG						STATUS			

39 LBE Restricted, Wifi B 11MB, ch1, new power settings

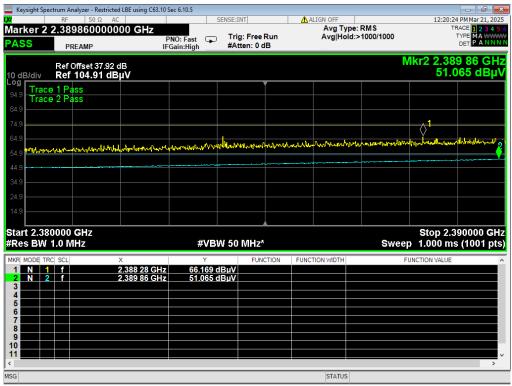


40 LBE Restricted, Wifi B 11MB, ch2, new power settings



LXI	ectrum Analyzer - Restr RF 50 Ω 2.38305000			ENSE:INT		ALIGN OFF			B AM Mar 21, 2025
PASS	PREAMP	P	NO: Fast 😱 Gain:High	Trig: Free R #Atten: 0 dB		Avg Hold:	>1000/1000		
10 dB/div	Ref Offset 37.9 Ref 104.91						ľ	/lkr1 2.38 55.6	3 05 GHz 64 dBµV
Log 94.9 Trac 84.9	e 1 Pass e 2 Pass								
74.9									
	and the second	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	1 http://www.tone.augurer.com	والألية بماسيكم ويكرون	QLALINE THE THE	almanter have have a first and a first	an falmaly set and	allana varana angalarita	witherstatewithing
44.9 34.9				· · · ·		·····			Y
24.9 14.9									
Start 2.38 #Res BW	0000 GHz 1.0 MHz		#VBW	v 50 MHz*			Swee	Stop 2.3 p 1.000 ms	90000 GHz s (1001 pts)
		× 2.383 05 GHz	۲ 55.664 dl	FUNC	TION	FUNCTION WIDTH	F	UNCTION VALUE	^
2 N 2 3		2.383 05 GHZ 2.389 93 GHz	43.606 dl	вµv ВµV					
4 5 6									
7									
9 10 11									
<									> `
MSG						STATUS			

41 LBE Restricted, Wifi G 6MB, ch1, new power settings

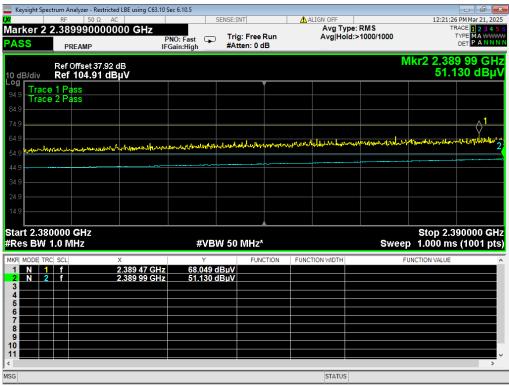


42 LBE Restricted, Wifi G 6MB, ch2, new power settings



Keysight Spectrum Analyzer - Restricted LBE using C6						
RF 50 Ω AC Marker 2 2.389670000000 GHz PASS PREAMP		nt g: Free Run ten: 0 dB	ALIGN OFF Avg Type: Avg Hold:>		TF	3 AM Mar 21, 2025 RACE 1 2 3 4 5 6 TYPE MA WWW DET PANNN
Ref Offset 37.92 dB 10 dB/div Ref 104.91 dBµV				М		9 67 GHz 82 dBµV
94.9 Trace 2 Pass 84.9						
74.9 64.9					1	
54.9	an and a second and	**************************************	and the second			2
34.9						
14.9 Start 2.380000 GHz					Stop 2.3	90000 GHz
#Res BW 1.0 MHz	#VBW 50	MHz*		Sweep	1.000 ms	6 (1001 pts)
MKR MODE[TRC] SCL X 1 N 1 f 2.388 59 C 2 N 2 f 2.389 67 C 3 4 5 6 6		FUNCTION	FUNCTION WIDTH	FU	NCTION VALUE	
7 8 9 10 11						
MSG			STATUS			

43 LBE Restricted, Wifi G 54MB, ch1, new power settings

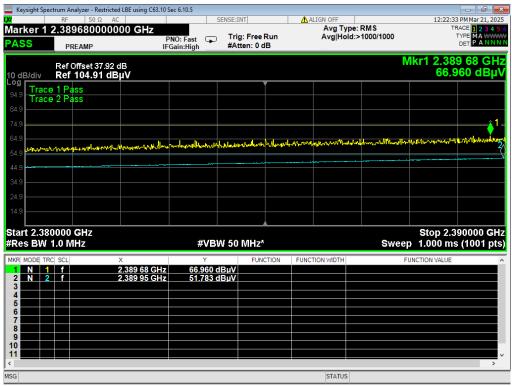


44 LBE Restricted, Wifi G 54MB, ch2, new power settings



LXI	ectrum Analyzer - Restricted RF 50 Ω AC	_	i.10.5	NT	ALIGN OFF			AM Mar 21, 2025
Marker 2 PASS	2.3899000000 PREAMP	PNO		g: Free Run ten: 0 dB	Avg Type Avg Hold:	: RMS >1000/1000	TR	ACE 1 2 3 4 5 6 TYPE MA DET P A N N N N
10 dB/div	Ref Offset 37.92 c Ref 104.91 dB					Μ	kr2 2.38 43.8	90 GHz 19 dBµV
Log 94.9 Trac 84.9	e 1 Pass e 2 Pass							
74.9 64.9								1
54.9 44.9	-The for the second	an a	theory of the second	manantonamentes	27-09-2711 ⁰ 1-0 ⁻¹ 19-09-19-10		Wowers and a second	······
24.9 14.9								
Start 2.38 #Res BW	0000 GHz 1.0 MHz		#VBW 50	MHz*		Sweep	Stop 2.3 1.000 ms	90000 GHz (1001 pts)
MKR MODE TF 1 N 1 2 N 2 3 4	f	× 2.389 21 GHz 2.389 90 GHz	ү 55.217 dBµV 43.818 dBµV	FUNCTION	FUNCTION WIDTH	FU	INCTION VALUE	^
5 6 7 8								
9 10 11 <								×
MSG					STATUS			

45 LBE Restricted, Wifi N MCS0, ch1, new power settings

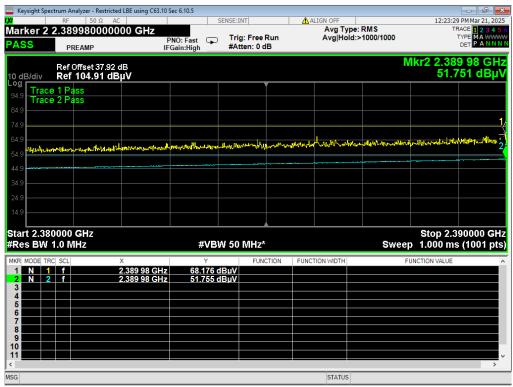


46 LBE Restricted, Wifi N MCS0, ch2, new power settings

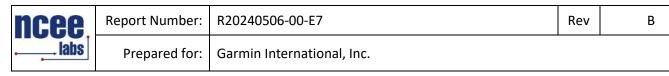


	um Analyzer - Restricte								
Marker 1 2 PASS	RF 50 Ω A .3893000000 PREAMP	000 GHz	NO: Fast 🖵 Gain:High	Trig: Free F #Atten: 0 d		ALIGN OFF Avg Type Avg Hold:	: RMS >1000/1000	TF	5 AM Mar 21, 2025 RACE 1 2 3 4 5 6 TYPE MA WWWW DET P A N N N N
	Ref Offset 37.92 Ref 104.91 dE							/kr1 2.38 55.1	9 30 GHz 87 dBµV
Trace	1 Pass 2 Pass				/				
74.9 64.9									1
54.9 44.9	1/10/2/~~~~~~	and a series of the series of	مەرىلىرى ^م ەرىكى يىلىرى مەرىلىرى مەرىكى يىلىرى	Internet State of the second	م ملوم کر اور اور اور اور اور اور اور اور اور او	antra Miller or an antra and and	-Annes and a second	ىسىدىنى كەرىمىلى مەرا ^{سى} ت	······ 8
34.9 24.9 14.9									
Start 2.380 #Res BW 1			#VB	N 50 MHz*			Swee	Stop 2.3 p 1.000 ms	90000 GHz (1001 pts)
MKR MODE TRC		× 2.389 30 GHz	ү 55.187 d	FUNC	TION	FUNCTION WIDTH		UNCTION VALUE	^
2 N 2 3 4 5 6 7	f	2.389 90 GHz	43.701 d						
8 9 10 11 <									```
MSG						STATUS			

47 LBE Restricted, Wifi N MCS7, ch1, new power settings

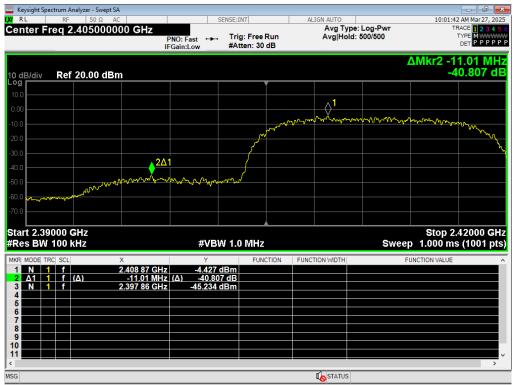


48 LBE Restricted, Wifi N MCS7, ch2, new power settings



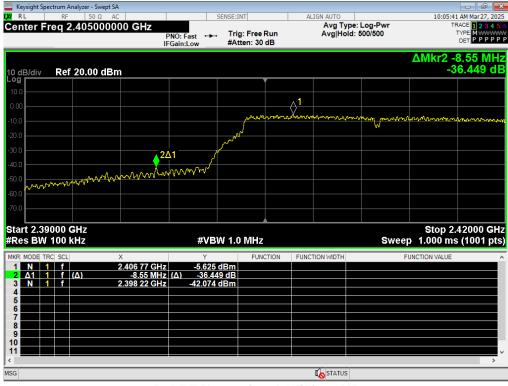




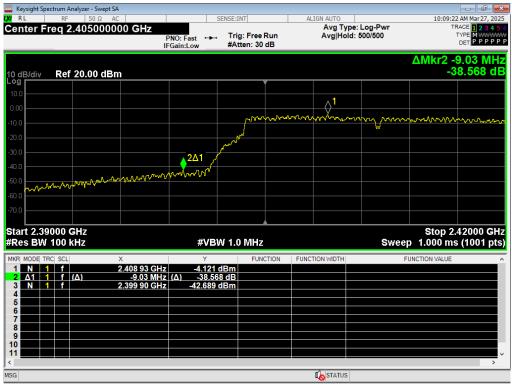


50 LBE Unrestricted, WiFi B 11MB



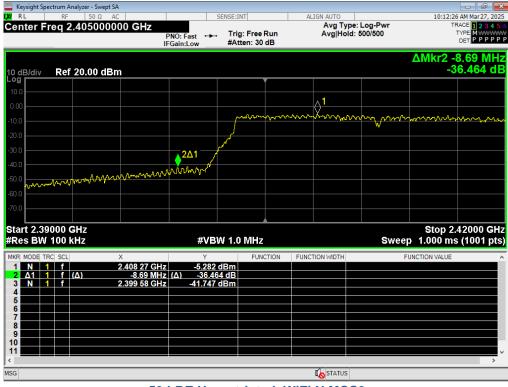




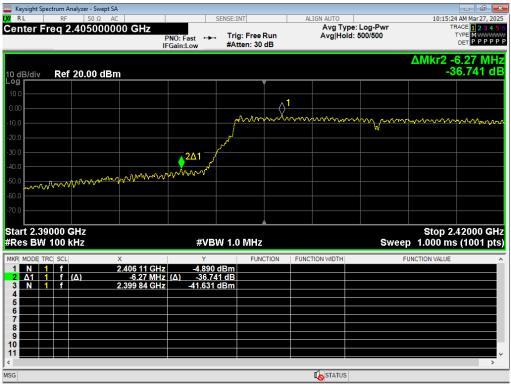


52 LBE Unrestricted, WiFi G 54MB







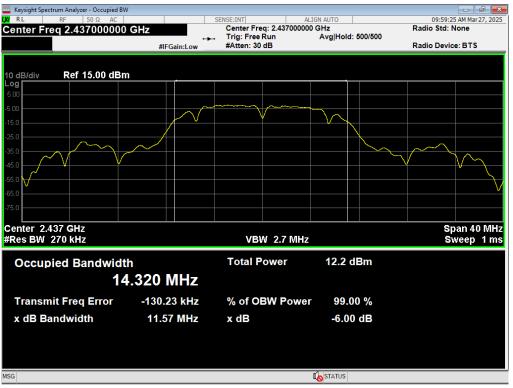


54 LBE Unrestricted, WiFi N MCS7







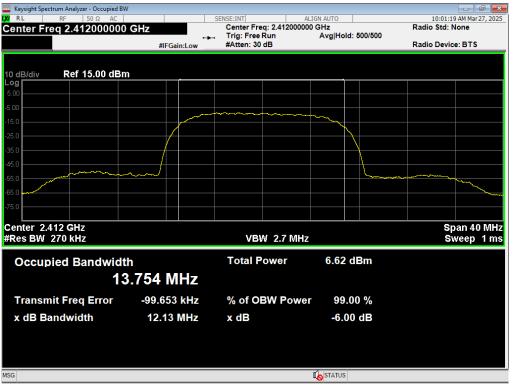










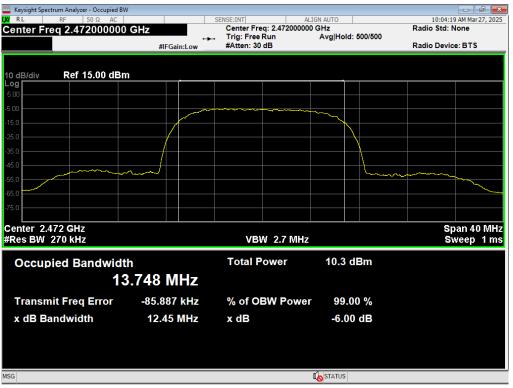






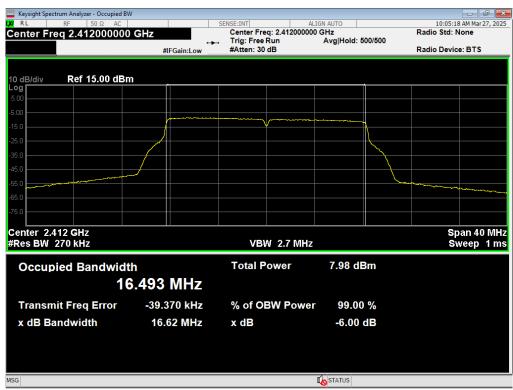




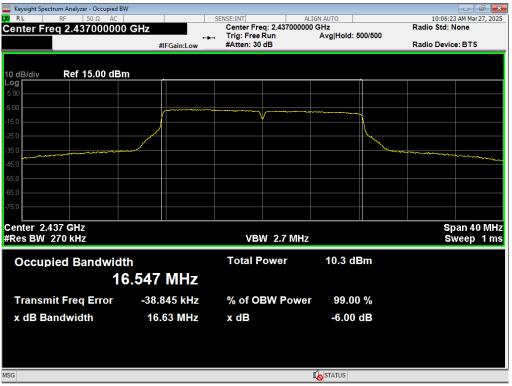






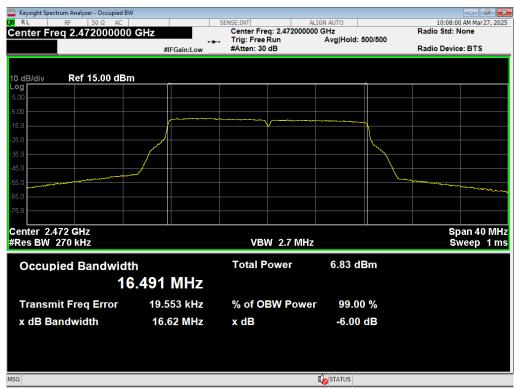




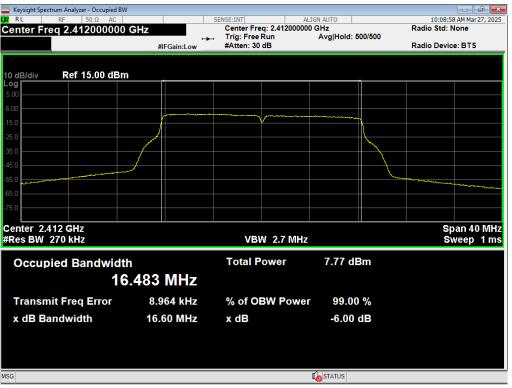










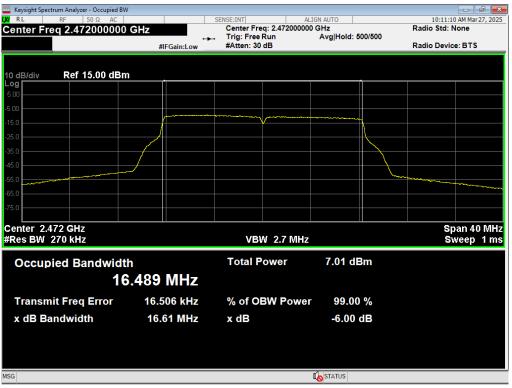






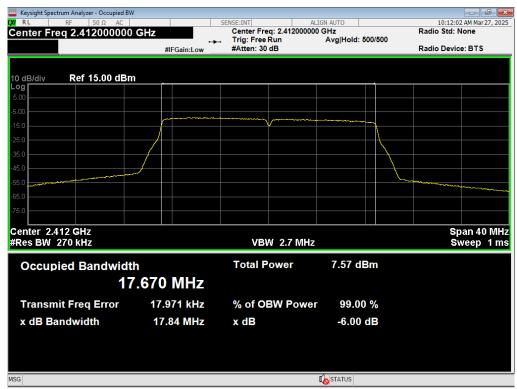
www.www.www.www.www.www.www.www.www.ww	1							
LX RL RF 50Ω AC		SENSE:INT	ALIGN AUTO	10:10:05 AM Mar 27, 2025				
Center Freq 2.437000000	GHz	Center Freq: 2.43700	Radio Std: None					
	#IFGain:Low	#Atten: 30 dB	Avg Hold: 500/500	Radio Device: BTS				
10 dB/div Ref 15.00 dBm								
	·							
5.00								
-5.00								
-15.0		¥						
-25.0								
	~		· · · · · · · · · · · · · · · · · · ·					
-35.0								
-45.0								
-55.0								
-65.0								
-75.0								
Center 2.437 GHz				Span 40 MHz				
#Res BW 270 kHz		VBW 2.7 M	Sweep 1 ms					
	-	Total Power	14.9 dBm					
Occupied Bandwidt		Total Fower	14.9 UDIII					
16	6.554 MHz							
Transmit Freq Error	17.037 kHz	% of OBW Pow	ver 99.00 %					
x dB Bandwidth	16.63 MHz	x dB	-6.00 dB					
MSG			ISG ISG ISG ISG					



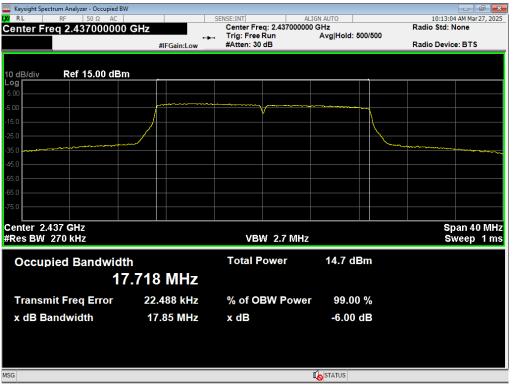






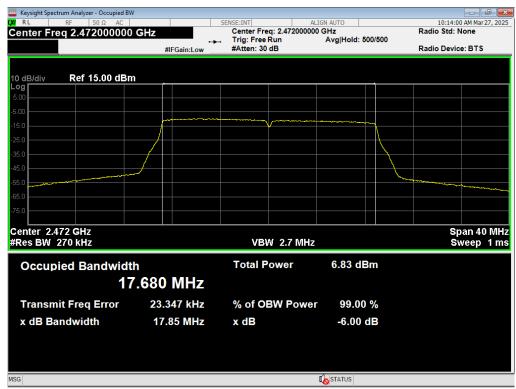




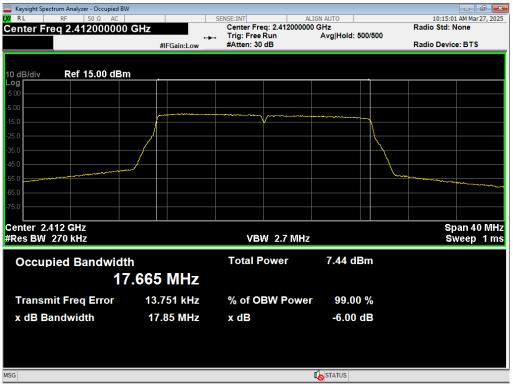










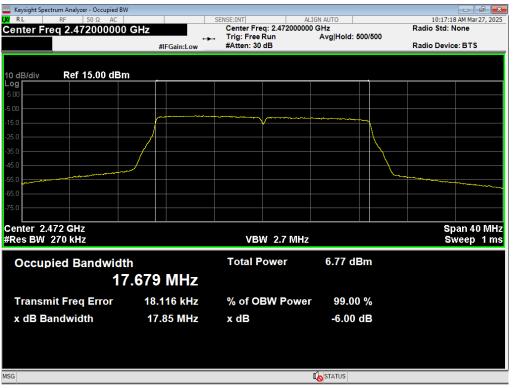






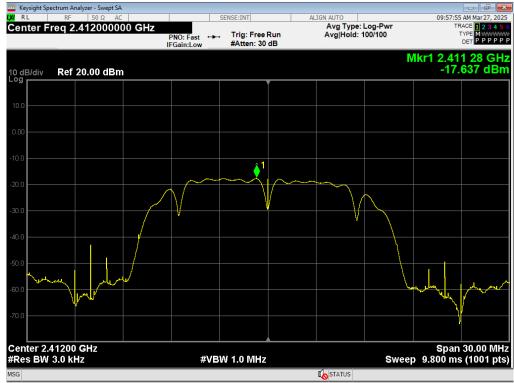
Keysight Spectrum Analyzer - Occupied BW	V				
X RL RF 50 Ω AC		SENSE:INT A Center Freg: 2.4370000	10:16:06 AM Mar 27, 202 Radio Std: None		
Center Freq 2.437000000	GHZ →	. Trig: Free Run	10		
	#IFGain:Low	#Atten: 30 dB		Radio Device: BTS	
10 dB/div Ref 15.00 dBn	n				
5.00					
-5.00		V			
-15.0					
-25.0					
-35.0					
-45.0					
-55.0					
-65.0					
-75.0					
Center 2.437 GHz				Onen 40 Mill	
#Res BW 270 kHz		VBW 2.7 MHz	Span 40 MH Sweep 1 m		
Occupied Bandwidt	h	Total Power	14.6 dBm		
17	7.716 MHz				
Transmit Freq Error	20.473 kHz	% of OBW Powe	r 99.00 %		
x dB Bandwidth	17.83 MHz	x dB	-6.00 dB		
ISG			STATUS		



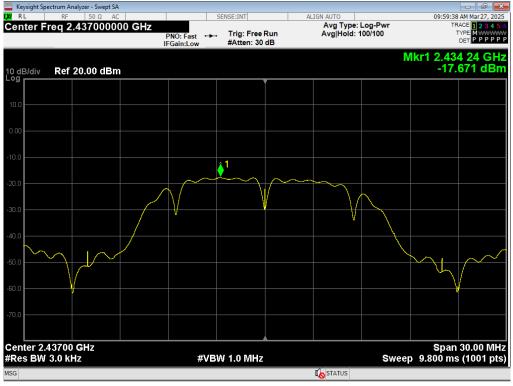






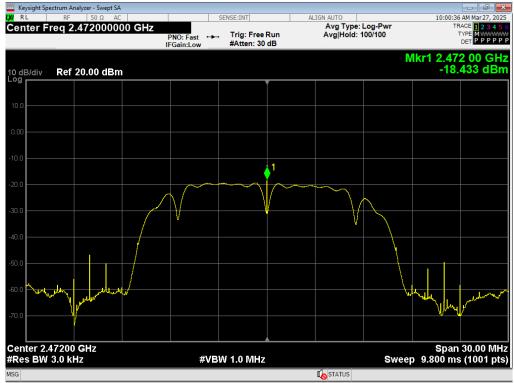


73 PSD, WiFi B 1MB, 2412MHz

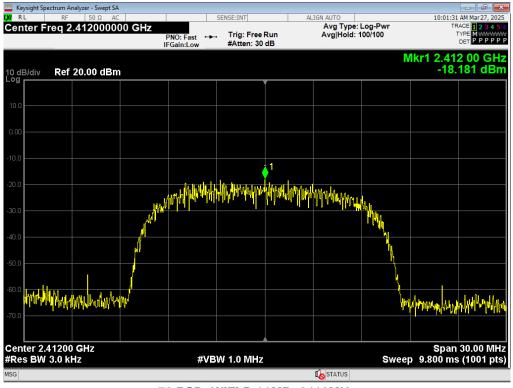


74 PSD, WiFi B 1MB, 2437MHz





75 PSD, WiFi B 1MB, 2472MHz

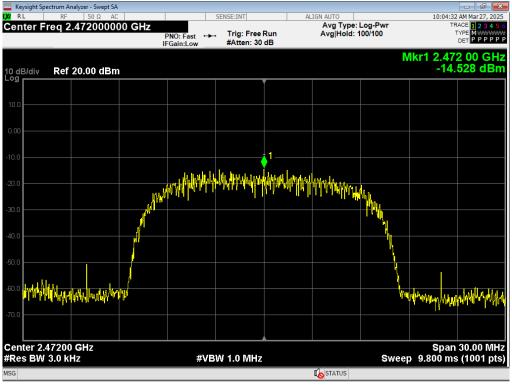


76 PSD, WiFi B 11MB, 2412MHz



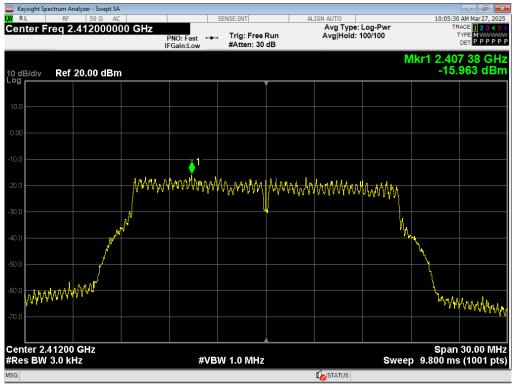


77 PSD, WiFi B 11MB, 2437MHz

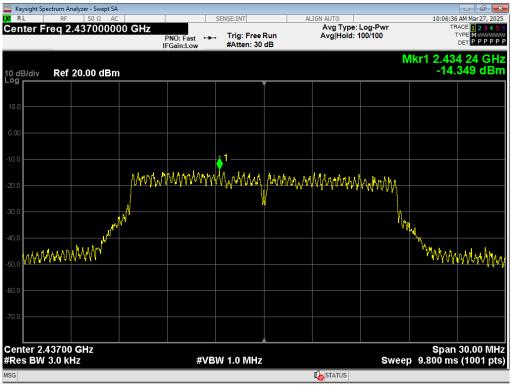


78 PSD, WiFi B 11MB, 2472MHz



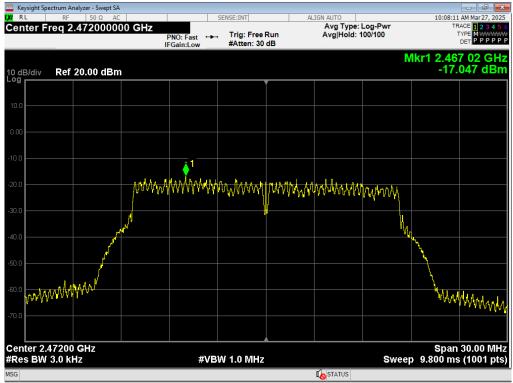


79 PSD, WiFi G 6MB, 2412MHz

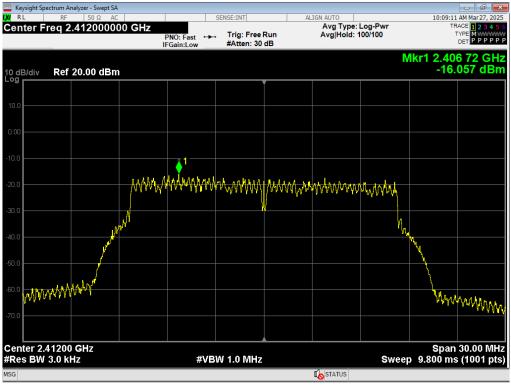


80 PSD, WiFi G 6MB, 2437MHz



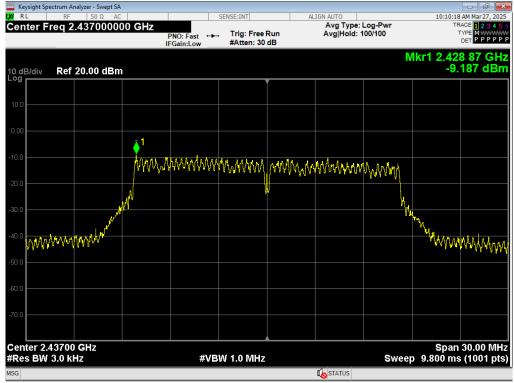


81 PSD, WiFi G 6MB, 2472MHz

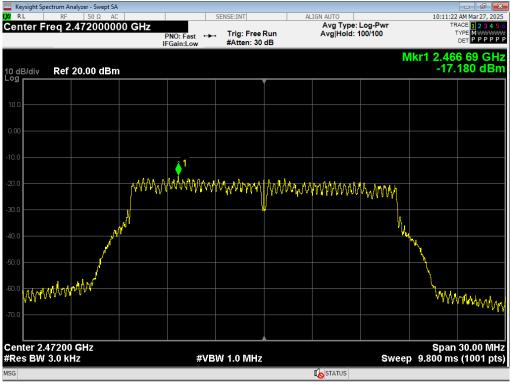


82 PSD, WiFi G 54MB, 2412MHz



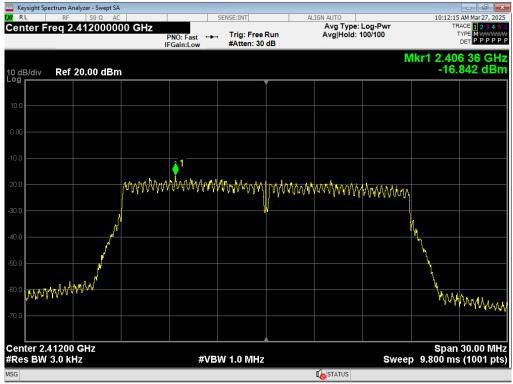


83 PSD, WiFi G 54MB, 2437MHz

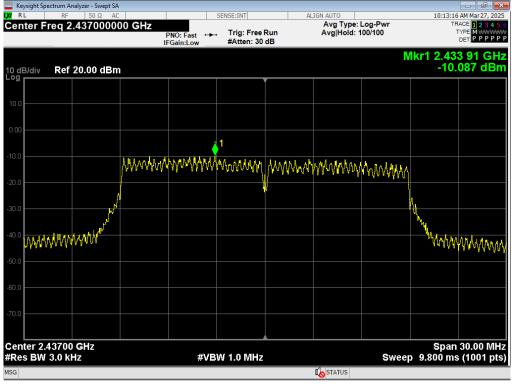


84 PSD, WiFi G 54MB, 2472MHz



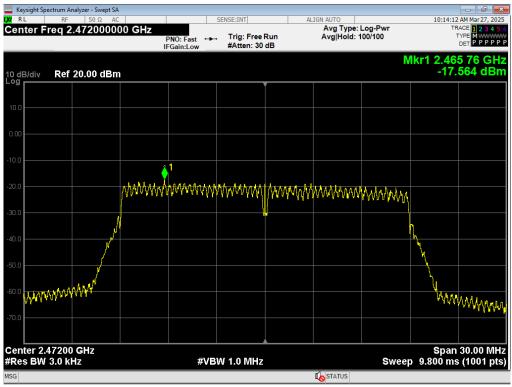


⁸⁵ PSD, WiFi N MCS0, 2412MHz

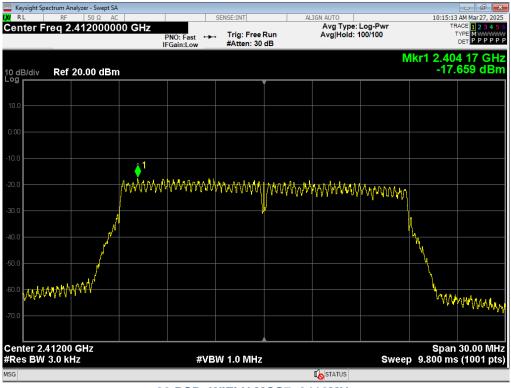






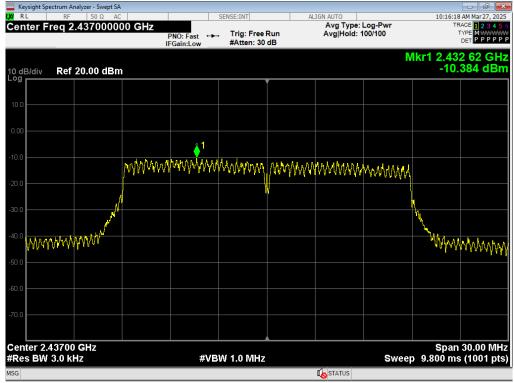


⁸⁷ PSD, WiFi N MCS0, 2472MHz

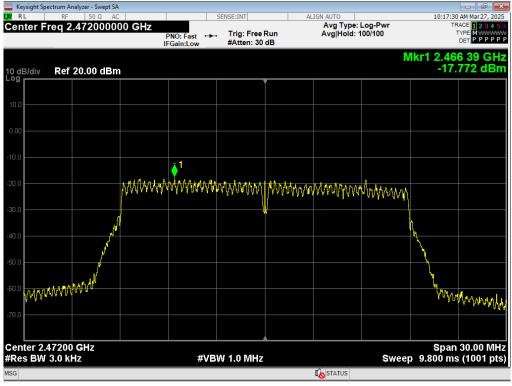


88 PSD, WiFi N MCS7, 2412MHz





⁸⁹ PSD, WiFi N MCS7, 2437MHz



90 PSD, WiFi N MCS7, 2472MHz

Incee labs	Report Number:	R20240506-00-E7		В
		Garmin International, Inc.		

REPORT END