

Project No: TM-2606000399P
Report No.: TMTN2606000581NR

FCC ID: 2ACIA-TTBT022

Page: 1 / 117
Rev.: 01

FCC 47 CFR PART 15 SUBPART E: 2013 AND ANSI C63.10:2020 TEST REPORT

For

40W Wall Plate Multi-Zone Bluetooth Audio Amplifier Kit

Model: A-1499WPR

Brand Name : N/A

Issued for

Ten Tronics Co., Ltd

No. 33, Lane 347, Chung-San S.Road Young-Kang District, Tainan, Taiwan

Issued by

Compliance Certification Services Inc.

Tainan Lab.

**No. 168, Ln. 523, Sec. 3, Zhongzheng Rd.,
Rende Dist., Tainan City, 717017, Taiwan**

Issued Date: August 28, 2026

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Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	August 20, 2026	Initial Issue	ALL	Gina Lin
01	August 28, 2026	See the following note rev.01	Page31, 100~103	Gina Lin

Note:

- ※ Rev.00 Issue Date: August 20, 2026
Original Report
- ※ Rev.01 Issue Date: August 28, 2026
Add Average Power Data on page31.
Add FREQUENCY STABILITY Data on page100~103.

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1. TEST REPORT CERTIFICATION

Applicant : **Ten Tronics Co., Ltd**
No. 33, Lane 347, Chung-San S.Road Young-Kang
District, Tainan, Taiwan

Manufacturer : **Ten Tronics Co., Ltd**
No. 33, Lane 347, Chung-San S.Road Young-Kang
District, Tainan, Taiwan

Equipment Under Test : 40W Wall Plate Multi-Zone Bluetooth Audio Amplifier Kit

Model : A-1499WPR

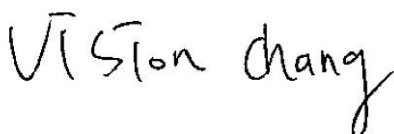
Brand : N/A

Date of Test : July 04, 2026 ~ July 15, 2026

APPLICABLE STANDARD	
Standard	Test Result
FCC 47 CFR PART 15 SUBPART E AND ANSI C63.10:2020	PASS

WE HEREBY CERTIFY THAT: The above equipment has been tested by Compliance Certification Services Inc., and found compliance with the requirements set forth in the technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Approved by:



Vision Chang
Team Leader

2. EUT DESCRIPTION

Product Name	40W Wall Plate Multi-Zone Bluetooth Audio Amplifier Kit
Model Number	A-1499WPR
Brand Name	N/A
Received Date	June 29, 2026
Reported Date	August 11, 2026
Frequency Range	Band 1: 5160~5240MHz, Band 4: 5730~5845MHz
Transmit Power	GFSK (5.2G) Mode: -6.76 dBm GFSK (5.8G) Mode: -2.45 dBm
Channel Spacing	2 MHz
Channel Number	GFSK (5.2G) Mode: 44 Channels GFSK (5.8G) Mode: 59 Channels
Transmit Data Rate	2 Mbps
Type of Modulation	GFSK
Antenna Type	5GHz Antenna (1TX1RX) Manufacture: Everestek Inc. Type: Wide-Band Antenna on Module Model: ETK52 Gain: 5.2G for 0.48 dBi, 5.8G for 0.26 dBi
Power Rating	24Vdc; 2.5A(Powered from Adapter)
Test Voltage	24Vdc
Firmware Version	V1.0
Software Version	V1.0

Remark :

1. Client consigns only one model sample to test (Model Number: A-1499WPR).
2. The sample selected for test was engineering sample that approximated to production product and was provided by manufacturer.
3. For more details, please refer to the User's manual of the EUT.
4. This submittal(s) (test report) is intended for FCC ID: **2ACIA-TTBT022** filing to comply with Section 15.407, of the FCC Part 15, Subpart E Rules.
5. According to customer declaration 40W Wall Plate Multi-Zone Bluetooth Audio Amplifier Kit (A-1499WPR / FCC ID: 2ACIA-TTBT022) and 40W Wall Plate Multi-Zone Bluetooth Audio Amplifier Kit (A-1499WPT / FCC ID: 2ACIA-TTBT021) for sale.

3. DESCRIPTION OF TEST MODES

Conducted Emission / Radiated Emission Test (Below 1 GHz)

1. The following test modes were scanned during the preliminary test:

No.	Pre-Test Mode
1	TX Mode

2. After the preliminary scan, the following test mode was found to produce the highest emission level.

Final Test Mode		
Emission	Radiated Emission	TX Mode
	Conducted Emission	5G LINK
		AUDIO IN

Remark : Then, the above highest emission mode of the configuration of the EUT and cable was chosen for all final test items.

Conducted / Radiated Emission Test (Above 1 GHz)

GFSK (5.2G) mode / 5160MHz ~ 5240MHz

The EUT had been tested under operating condition.

There are three channels have been tested as following :

Channel	Frequency (MHz)
Low	5160
Middle	5200
High	5240

GFSK (5.8G) mode / 5730MHz ~ 5845MHz

Channel	Frequency (MHz)
Low	5730
Middle	5785
High	5845

GFSK (5.2G) mode / GFSK (5.8G) mode:

2Mbps data rate (worst case) were chosen for full testing.

4. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10 and FCC CFR 47, 15.207, 15.209 and 15.407.

5. FACILITIES AND ACCREDITATION

5.1 FACILITIES

All measurement facilities used to collect the measurement data are located at

- ☐ No.8, Jiucengling, Xinhua Dist., Tainan City 712, Taiwan (R.O.C.)
- ☒ No. 168, Ln. 523, Sec. 3, Zhongzheng Rd., Rende Dist., Tainan City 717, Taiwan

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.10 and CISPR Publication 22.

5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, bi-conical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

5.3 LABORATORY ACCREDITATIONS LISTINGS

The test facilities used to perform radiated and conducted emissions tests are accredited by Taiwan Accreditation Foundation for the specific scope of accreditation under Lab Code: 1109 to perform Electromagnetic Interference tests according to FCC PART 15 AND CISPR 22 requirements. No part of this report may be used to claim or imply product endorsement by TAF or any agency of the Government. In addition, the test facilities are listed with Federal Communications Commission (registration no: TW0035).

5.4 TABLE OF ACCREDITATIONS AND LISTINGS

Our laboratories are accredited and approved by the following accreditation body according to ISO/IEC 17025.

Taiwan	TAF
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The measuring facility of laboratories has been authorized or registered by the following approval agencies.

Canada	Industry Canada (ISED#: 2324H)
Germany	TUV NORD
Taiwan	BSMI
USA	FCC

5.5 MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

5.6 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Measurement	Uncertainty
AC Powerline Conducted Emission	$\pm 2.21\text{dB}$
Channel Bandwidth	$\pm 2.87\%$
RF output power (Spectrum)	$\pm 2.88\text{dB}$
RF Output power (Power Meter & Power sensor)	$\pm 0.243\text{dB}$
Power Density	$\pm 2.87\text{dB}$
Conducted Badnedge	$\pm 2.87\text{dB}$
Conducted Spurious Emission	$\pm 2.88\text{dB}$
Channel Separation	$\pm 2.87\text{dB}$
In-Band Emission (Channel Mask)	$\pm 2.88\text{dB}$
Frequency Stability	$\pm 0.03\text{ ppm}$

Uncertainty figures are valid to a confidence level of 95%, K=2

6. SETUP OF EQUIPMENT UNDER TEST

SUPPORT EQUIPMENT

For RF test

No.	Product	Manufacturer	Model No.	Certify No.	Power cable
1	Note Book	ASUS	X515J	DOC	N/A
2	Adapter	N/A	GQ4Z-240250-AU	DOC	N/A
3	iPad nano	Apple	A1199	N/A	N/A
4	Speaker	logi	Z607	N/A	N/A

No.	Signal cable description	
A	Power	Unshielded, 1.5m 1 pcs.
B	Audio	Shielded, 1.5m 1 pcs.
C	Audio	Unshielded, 2.35m 1 pcs.
D	Command	Unshielded, 0.25m 1 pcs.
E	USB	Shielded, 1.5m 1 pcs.

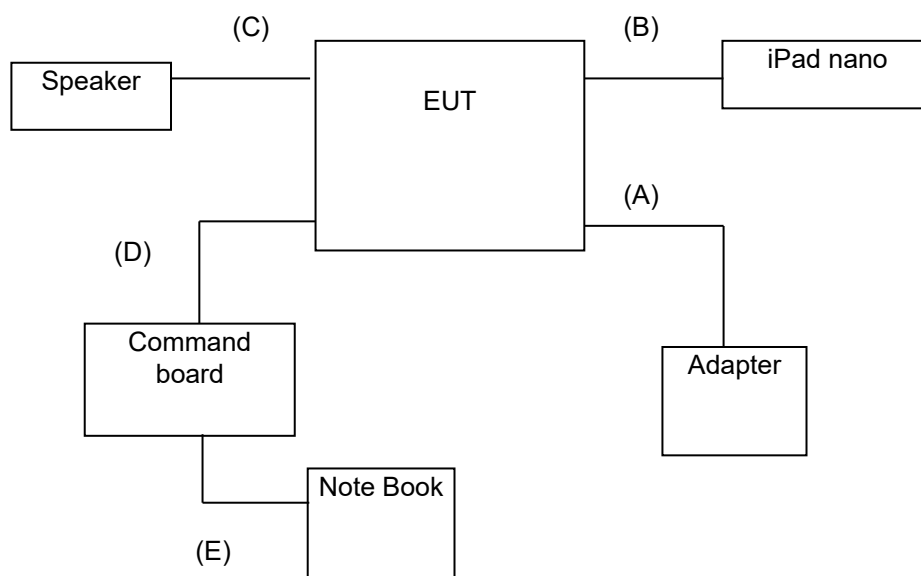
For EMI test

No.	Product	Manufacturer	Model No.	Certify No.	Signal cable
1	Adapter	Adapter	ATS060T-W240U	N/A	N/A
2	iPad nano	Apple	A1199	N/A	N/A
3	Speaker	logi	Z607	N/A	N/A
4	Multi-Zone BT Audio Amplifier Transmitter	TEN-TRONICS	A-1499WPT	N/A	N/A
5	Cell Phone	SONY	XQ-DE72	N/A	N/A

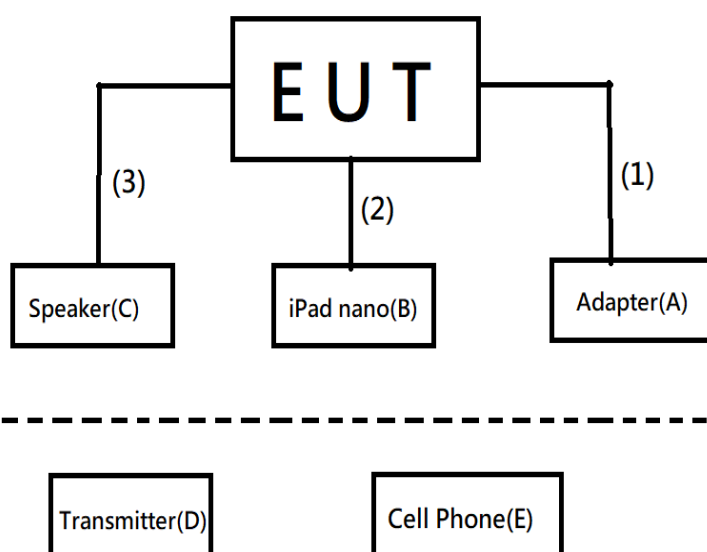
No.	Signal cable description	
1	Power	Unshielded, 1.5m 1 pcs, with 1 core.
2	Audio	Shielded, 1.5m 1 pcs.
3	Audio	Unshielded, 2.35m 1 pcs.

SETUP DIAGRAM FOR TESTS

RF



EMI



EUT OPERATING CONDITION

RF Setup

1. Set up all computers like the setup diagram.
2. The "EMI_Tool_V27_Everestekinc_2023_0203.exe" software was used for testing.
3. Choose Control Interface Selection : I2C.

TX Mode :

- Select Module Type : 5.8GHz or 5.2GHz
- EMI Standard : FCC
- EMI RF Channel : 5160 ~ 5240 , 5730~5845
- EMI Mode : Tx PN-9 mode
- EMI power : 5
- OK Write EMI setting into flash

RX Mode :

- Select Module Type : 5.8GHz or 5.2GHz
- EMI Standard : FCC
- EMI RF Channel : 5160 ~ 5240 , 5730~5845
- EMI Mode : Rx moed
- EMI power : 5
- OK Write EMI setting into flash

4. All of the function are under run and power off and on again.
5. Start test.

7. FCC PART 15.407 REQUIREMENTS

7.1 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

MEASUREMENT EQUIPMENT USED

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY54430216	07/24/2025	07/23/2026
SMA Cable+10dB Attenuator	CCS	SMA+10dB ATT	SMA/10dB	01/13/2026	01/12/2027
Software	Excel(ccs-o6-2020 v1.1)				

TEST RESULTS

TEST DATA

Model Name	A-1499WPR	Test By	Ted Huang
Temp & Humidity	25.8°C, 43%	Test Date	2026/07/15

Band 1

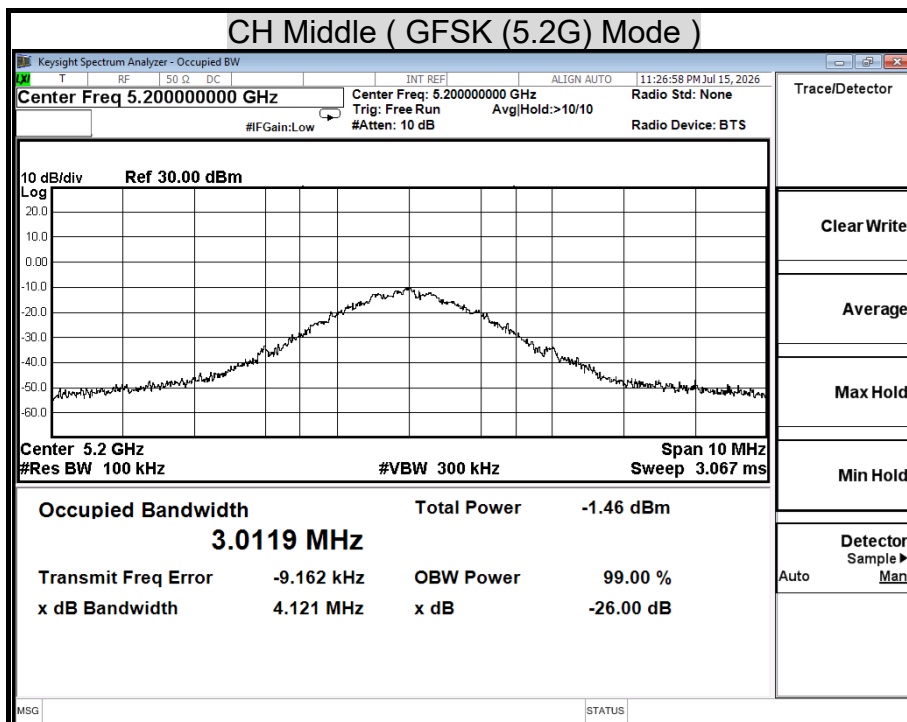
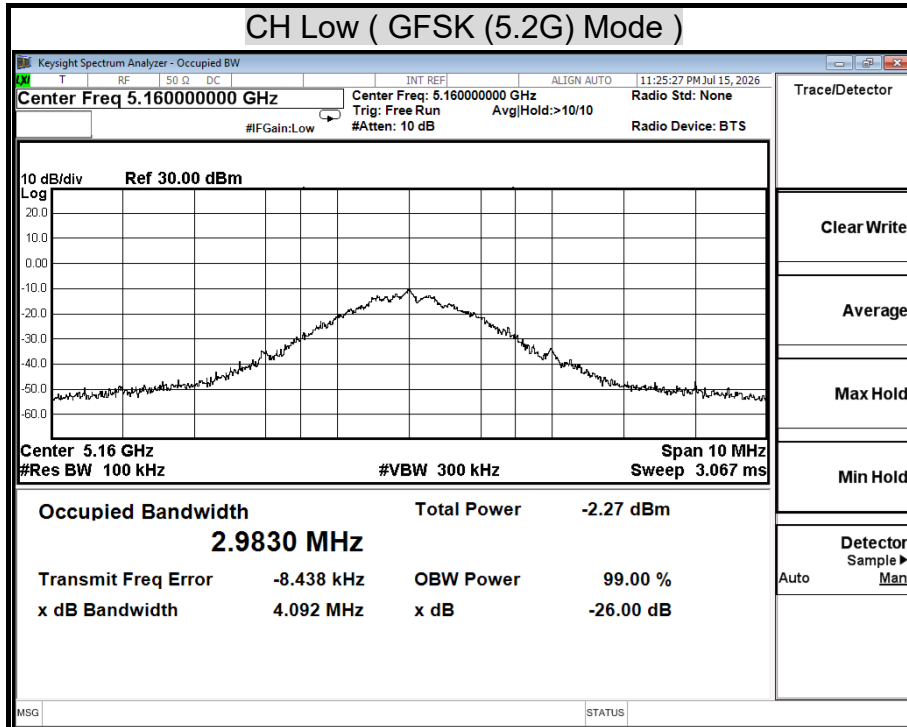
Channel	Channel Frequency (MHz)	99% Occupied Power Bandwidth (MHz)
Low	5160	2.98
Middle	5200	3.01
High	5240	3.07

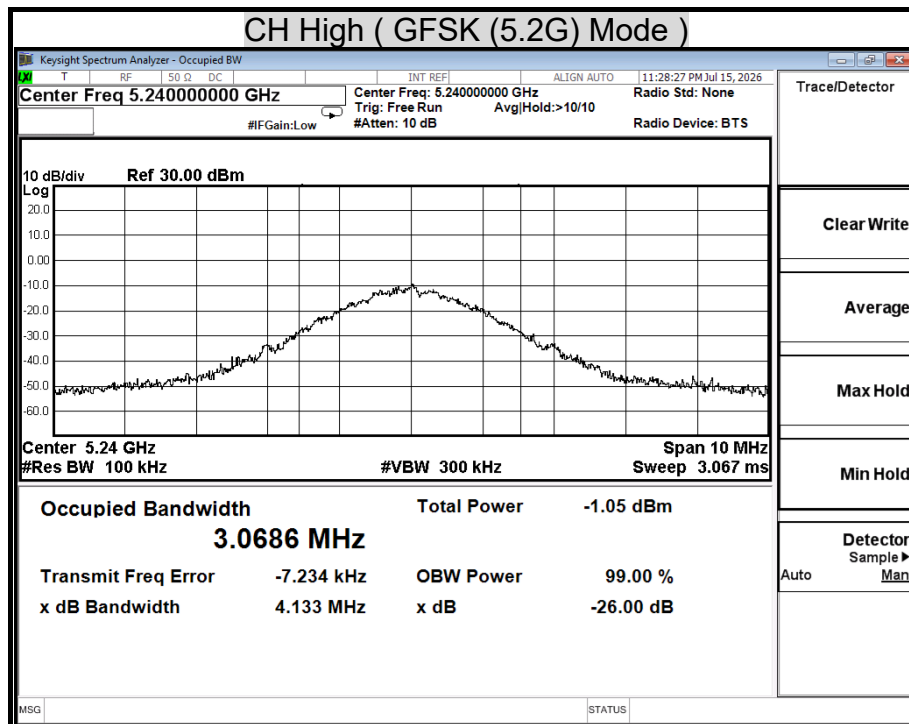
Band 4

Channel	Channel Frequency (MHz)	99% Occupied Power Bandwidth (MHz)
Low	5730	3.29
Middle	5785	3.31
High	5845	3.17

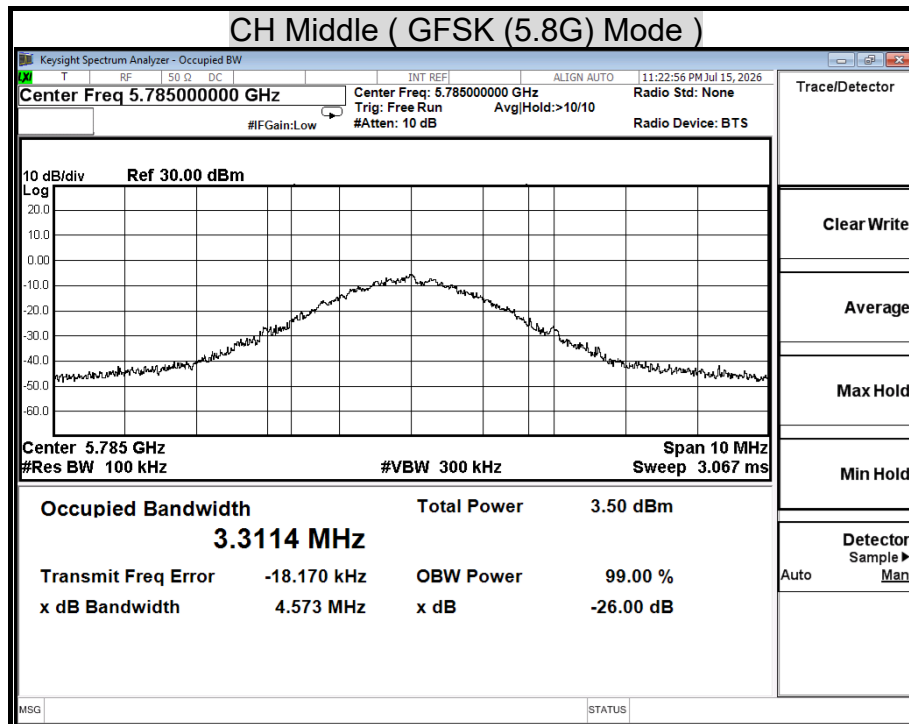
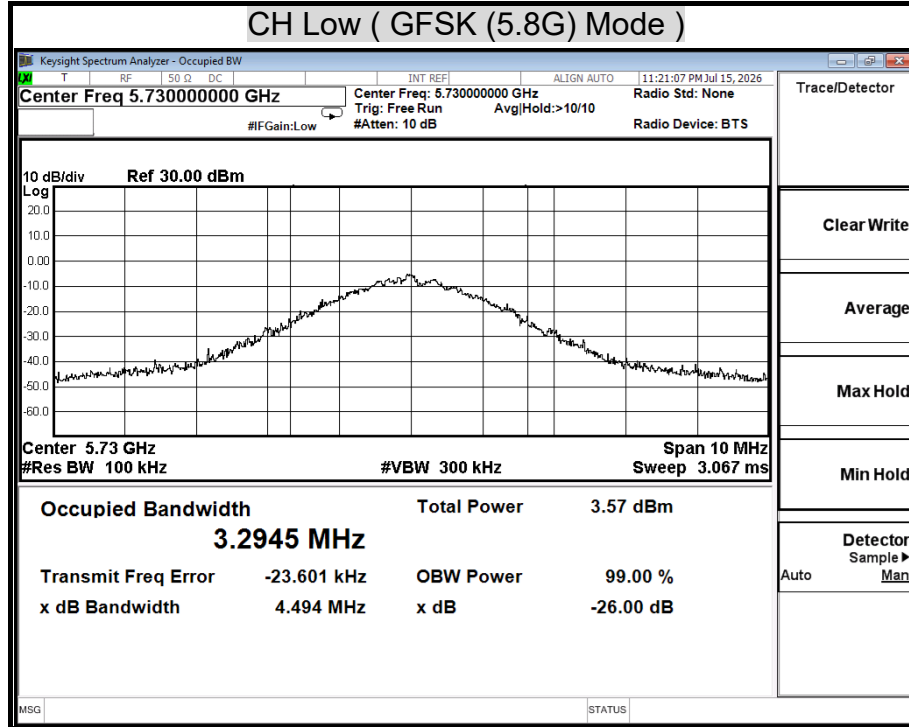
99% BANDWIDTH

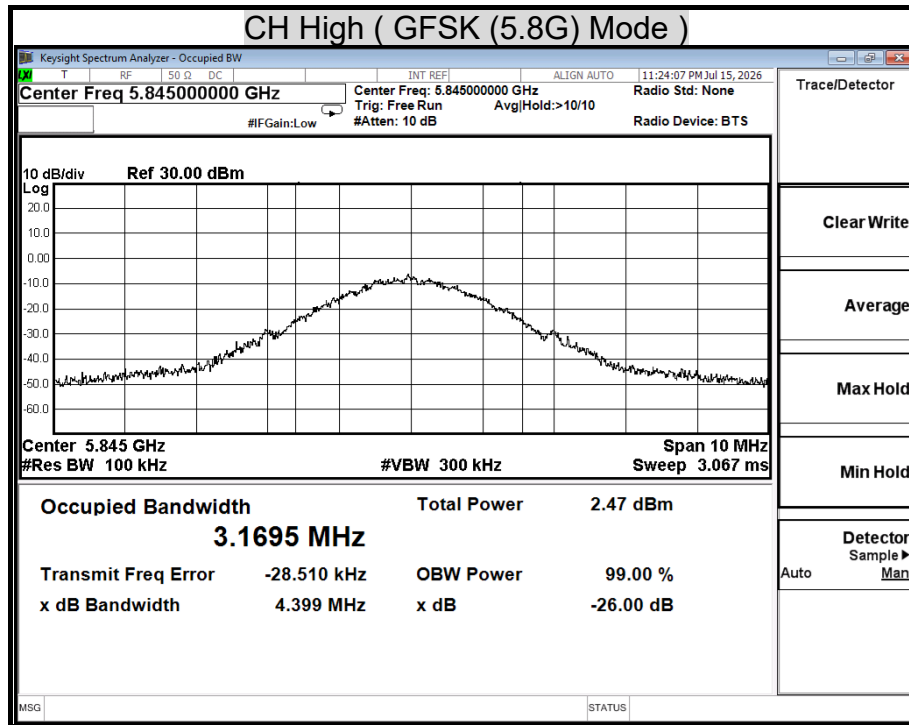
Test Mode: Band 1 / 5160 ~ 5240MHz





Test Mode: Band 4 / 5730 ~ 5845MHz





7.2 26dB BANDWIDTH

LIMITS

§ 15.303 (c) (2), For purposes of this subpart, the emission bandwidth shall be determined by measuring the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, that are 26 dB down relative to the maximum level of the modulated carrier. Determination of the emissions bandwidth is based on the use of measurement instrumentation employing a peak detector function with an instrument resolutions bandwidth approximately equal to 1.0 percent of the emission bandwidth of the device under measurement.

TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY54430216	07/24/2025	07/23/2026
SMA Cable+10dB Attenuator	CCS	SMA+10dB ATT	SMA/10dB	01/13/2026	01/12/2027
Software	Excel(ccs-o6-2020 v1.1)				

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

TEST SETUP



TEST PROCEDURE

1. Set RBW = approximately 1% of the emission bandwidth.
2. Set the VBW > RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Measure the maximum width of the emission that is 26 dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

TEST RESULTS

TEST DATA

Model Name	A-1499WPR	Test By	Ted Huang
Temp & Humidity	25.8°C, 43%	Test Date	2026/07/15

GFSK (5.2G) Mode / 5160 ~ 5240MHz

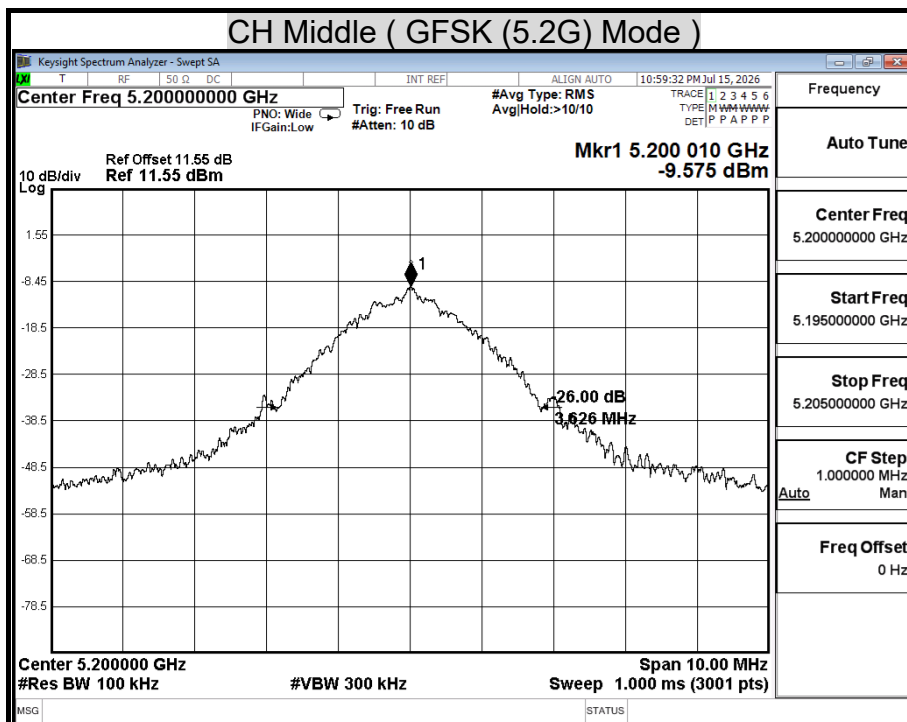
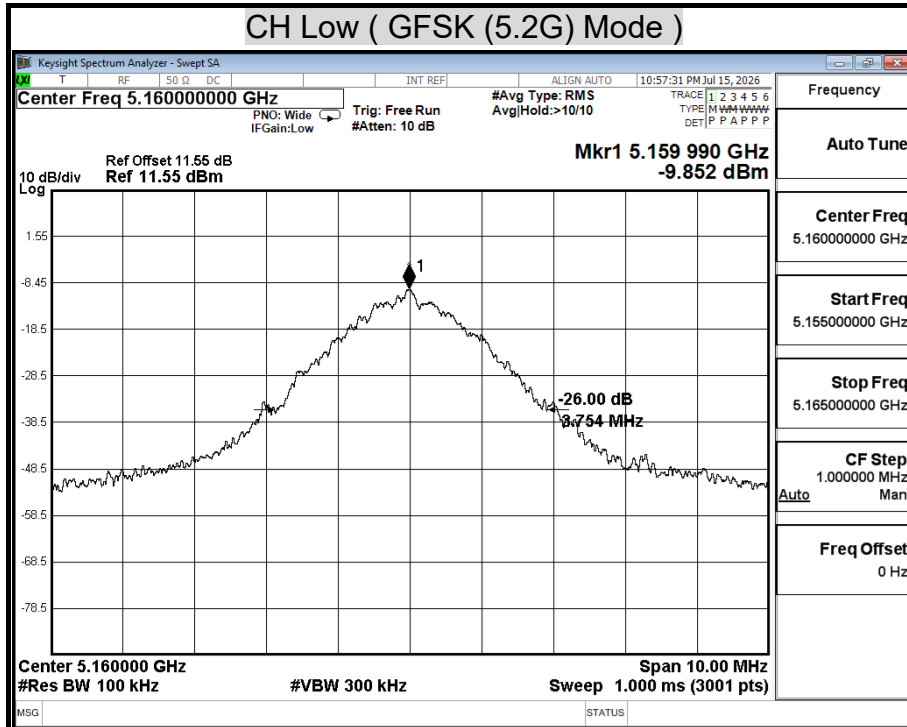
Channel	Channel Frequency (MHz)	26dB Bandwidth (MHz)	Pass / Fail
Low	5160	3.75	PASS
Middle	5200	3.63	PASS
High	5240	3.75	PASS

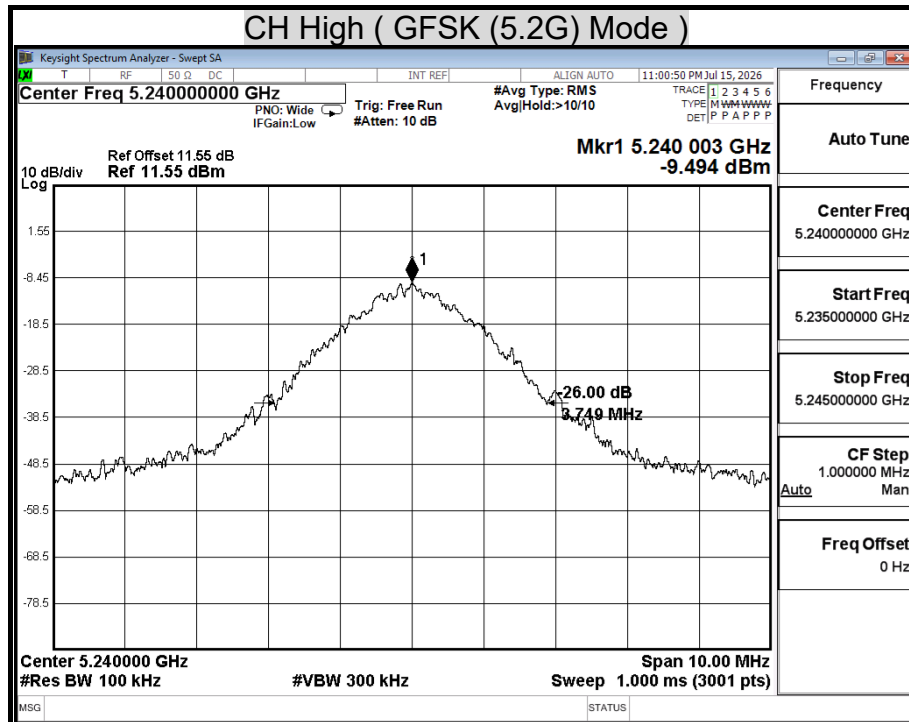
GFSK (5.8G) Mode / 5720 ~ 5845MHz

Channel	Channel Frequency (MHz)	26dB Bandwidth (MHz)	Pass / Fail
Low	5730	4.22	PASS
Middle	5785	4.35	PASS
High	5845	4.24	PASS

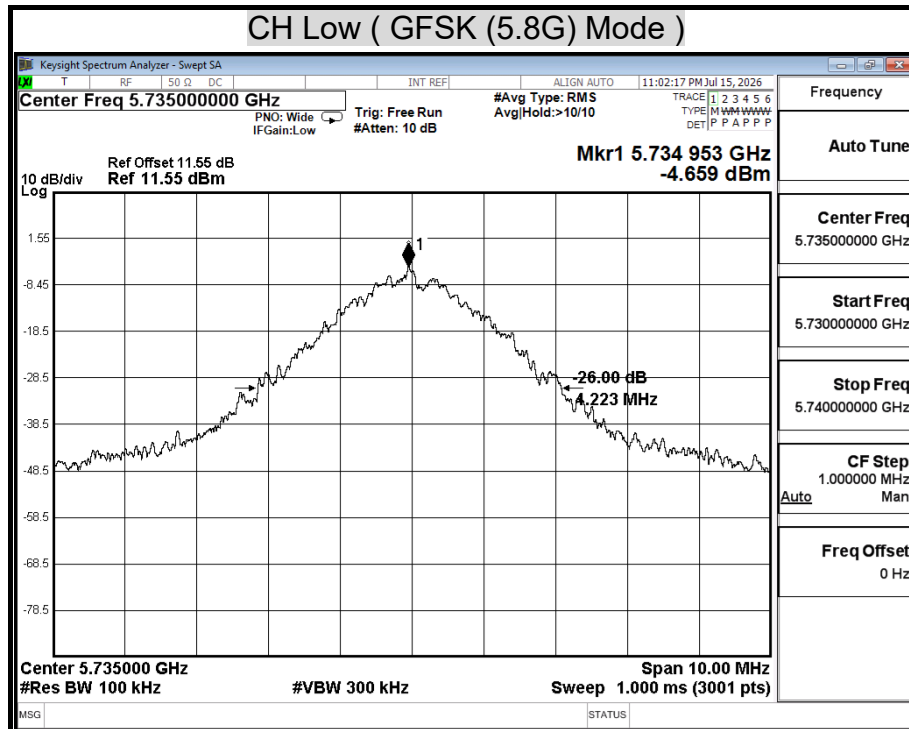
26dB BANDWIDTH

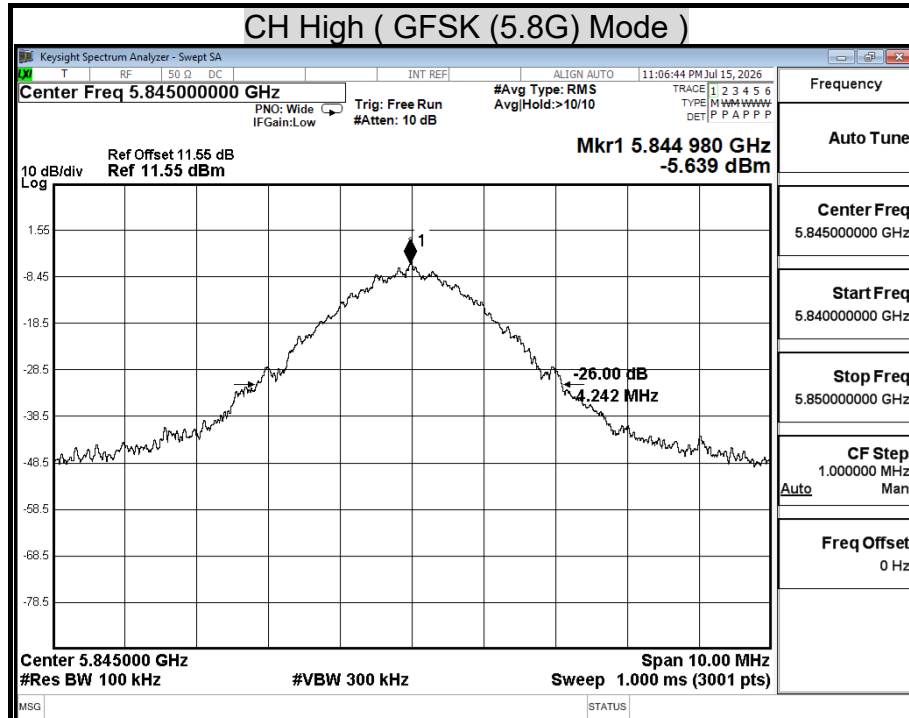
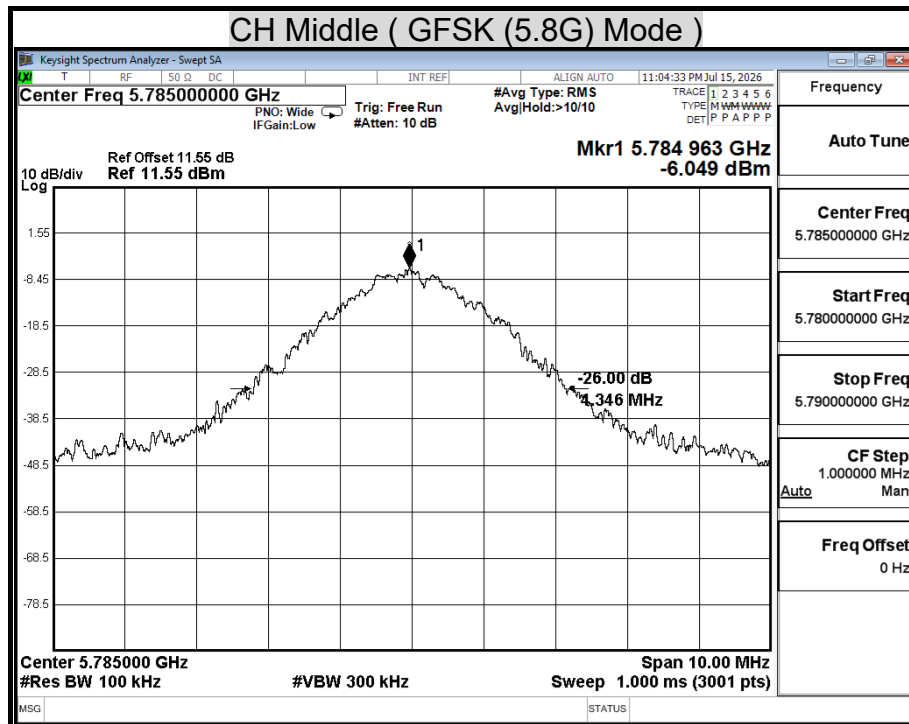
Test Mode: Band 1 / 5160 ~ 5240MHz





Test Mode: Band 4 / 5730 ~ 5845MHz





7.3 6dB BANDWIDTH

LIMIT

§ 15.407 (e) Within the 5.725-5.85 GHz band, the minimum 6dB bandwidth of U-NII devices shall be at least 500kHz.

TEST EQUIPMENTS

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY54430216	07/24/2025	07/23/2026
SMA Cable+10dB Attenuator	CCS	SMA+10dB ATT	SMA/10dB	01/13/2026	01/12/2027
Software	Excel(ccs-o6-2020 v1.1)				

TEST SETUP



TEST PROCEDURE

1. Set resolution bandwidth (RBW) = 1-5 % of the emission bandwidth (EBW).
2. Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission. Compare the resultant bandwidth with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is 1-5 %.

TEST RESULTS

TEST DATA

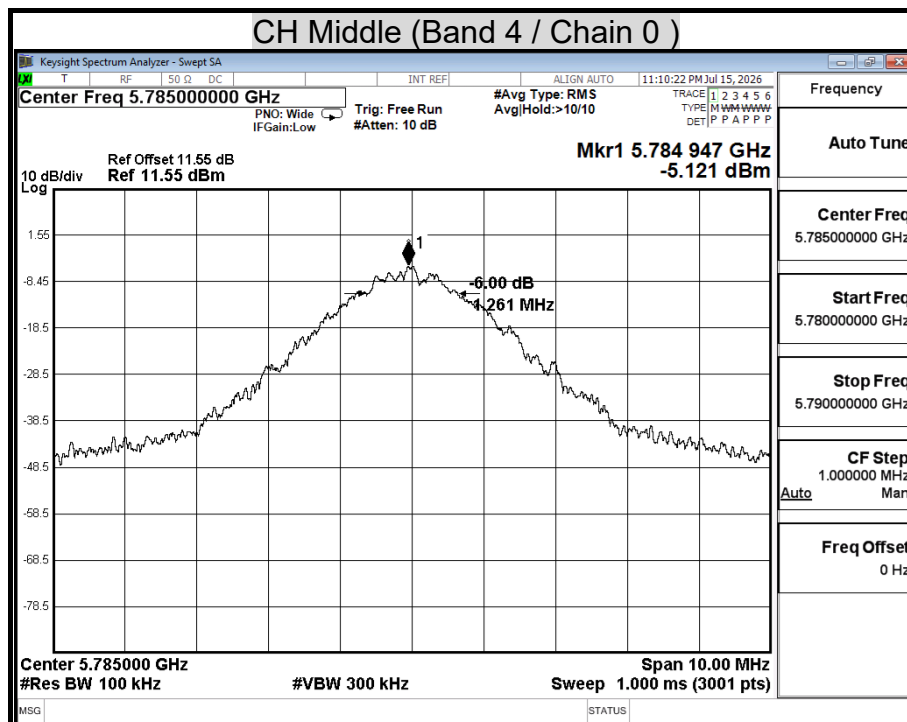
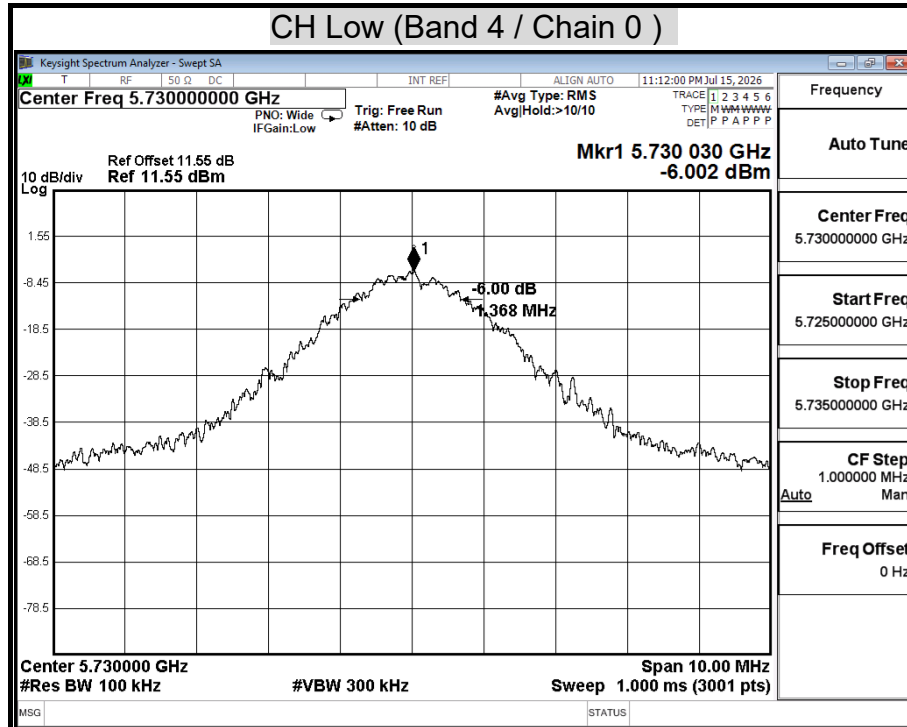
Model Name	A-1499WPR	Test By	Ted Huang
Temp & Humidity	25.8°C, 43%	Test Date	2026/07/15

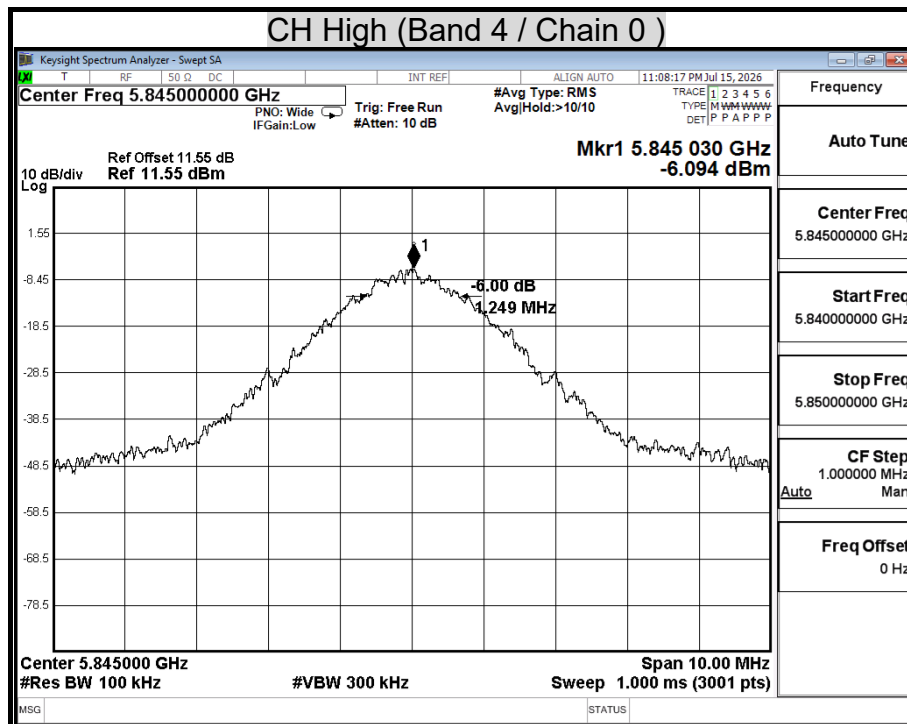
GFSK (5.8G) Mode / 5730 ~ 5845MHz

Channel	Channel Frequency (MHz)	6dB Bandwidth (kHz)	Minimum Limit (kHz)	Pass / Fail
Low	5745	1368	>500	PASS
Middle	5785	1261	>500	PASS
High	5825	1249	>500	PASS

6dB BANDWIDTH

Test Mode: Band 4 / 5730 ~ 58545Hz





Report No.: TMTN2606000581NR

7.4 MAXIMUM CONDUCTED OUTPUT POWER LIMITS

§ 15.407(a)

(1) For the band 5.15-5.25 GHz.

- (i) For an outdoor access point operating in the band 5.15 – 5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).
- (ii) For an indoor access point operating in the band 5.15 – 5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(2) For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm $10 \log B$, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(3) For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500 kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY54430216	07/24/2025	07/23/2026
SMA Cable+10dB Attenuator	CCS	SMA+10dB ATT	SMA/10dB	01/13/2026	01/12/2027
Software	Excel(ccs-o6-2020 v1.1)				

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

TEST SETUP



TEST PROCEDURE

1. Set span to encompass the entire 26-dB emission bandwidth (EBW) (or, alternatively, the entire 99% occupied bandwidth) of the signal.
2. Set RBW = 1 MHz.
3. Set VBW $\geq$ 3 MHz.
4. Number of points in sweep $\geq$ 2 Span / RBW. (This ensures that bin-to-bin spacing is $\leq$ RBW/2, so that narrowband signals are not lost between frequency bins.)
5. Sweep time = auto.
6. Detector = RMS (*i.e.*, power averaging), if available. Otherwise, use sample detector mode.
7. If transmit duty cycle < 98 percent, use a video trigger with the trigger level set to enable triggering only on full power pulses. Transmitter must operate at maximum power control level for the entire duration of every sweep. If the EUT transmits continuously (*i.e.*, with no off intervals) or at duty cycle $\geq$ 98 percent, and if each transmission is entirely at the maximum power control level, then the trigger shall be set to "free run".
8. Trace average at least 100 traces in power averaging (*i.e.*, RMS) mode.
9. Compute power by integrating the spectrum across the 26 dB EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal using the instrument's band power measurement function with band limits set equal to the EBW (or occupied bandwidth) band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at 1 MHz intervals extending across the 26 dB EBW (or, alternatively, the entire 99% occupied bandwidth) of the spectrum.

TEST RESULTS

TEST DATA

Model Name	A-1499WPR	Test By	Ted Huang
Temp & Humidity	25.8°C, 43%	Test Date	2026/07/15

GFSK (5.2G) Mode / 5160 ~ 5240MHz

Channel	Channel Frequency (MHz)	Peak Power (dBm)	Peak Power Limit	Pass / Fail
			(dBm)	
Low	5160	-7.96	30.00	PASS
Middle	5200	-7.33	30.00	PASS
High	5240	-6.76	30.00	PASS

GFSK (5.8G) Mode / 5730 ~ 5845MHz

Channel	Channel Frequency (MHz)	Peak Power (dBm)	Peak Power Limit	Pass / Fail
			(dBm)	
Low	5745	-2.45	30.00	PASS
Middle	5785	-2.59	30.00	PASS
High	5825	-2.97	30.00	PASS

Remark:

1. At final test to get the worst-case emission at 6Mbps.
2. The cable assembly insertion loss of 11.7dB (including 10 dB pad and 1.7 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.

Average Power Data

GFSK (5.2G) Mode / 5160 ~ 5240MHz

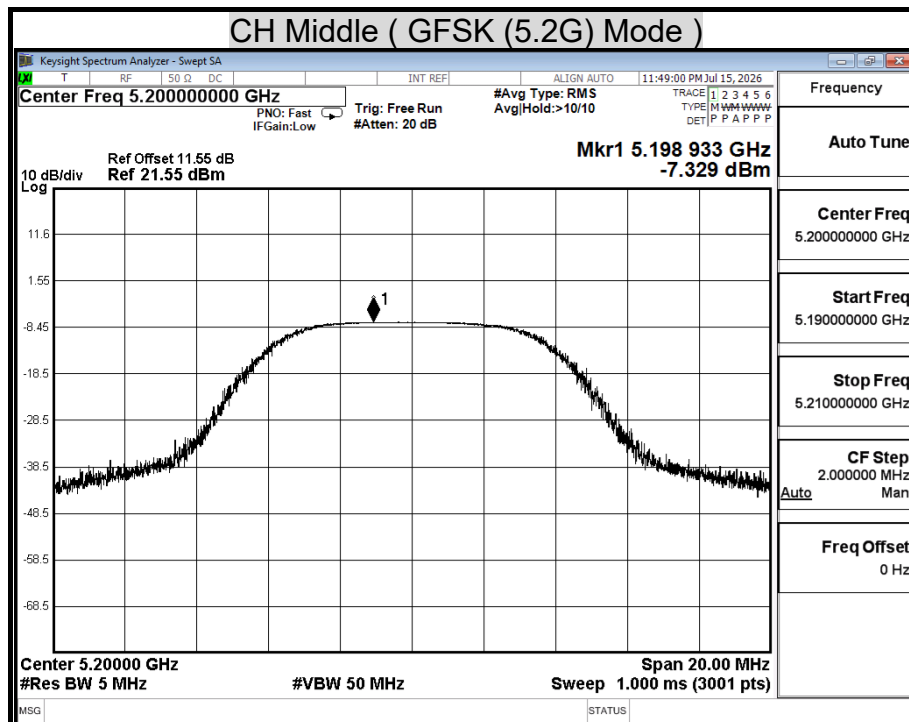
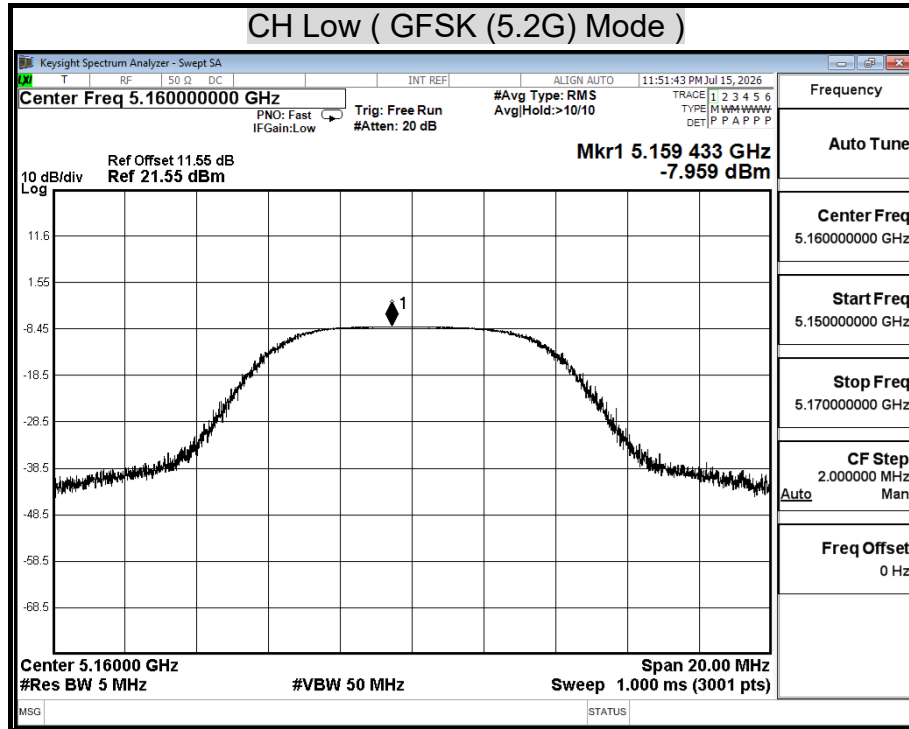
Channel	Channel Frequency (MHz)	Output Power (dBm)	Output Power (W)
Low	5160	-8.19	0.0002
Middle	5200	-7.77	0.0002
High	5240	-7.07	0.0002

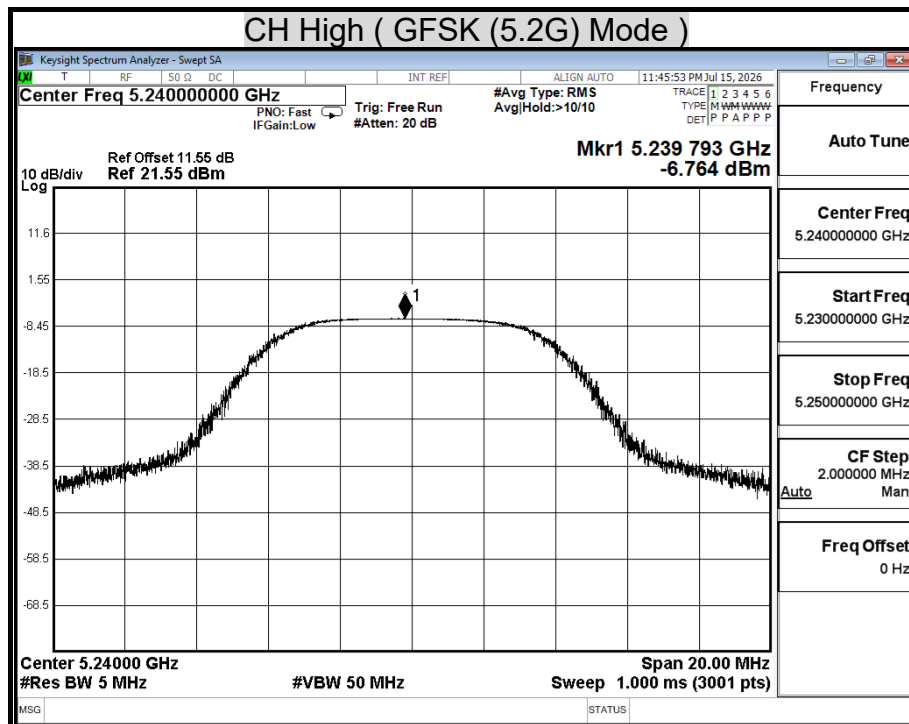
GFSK (5.8G) Mode / 5730 ~ 5845MHz

Channel	Channel Frequency (MHz)	Output Power (dBm)	Output Power (W)
Low	5745	-2.80	0.0005
Middle	5785	-2.88	0.0005
High	5825	-3.23	0.0005

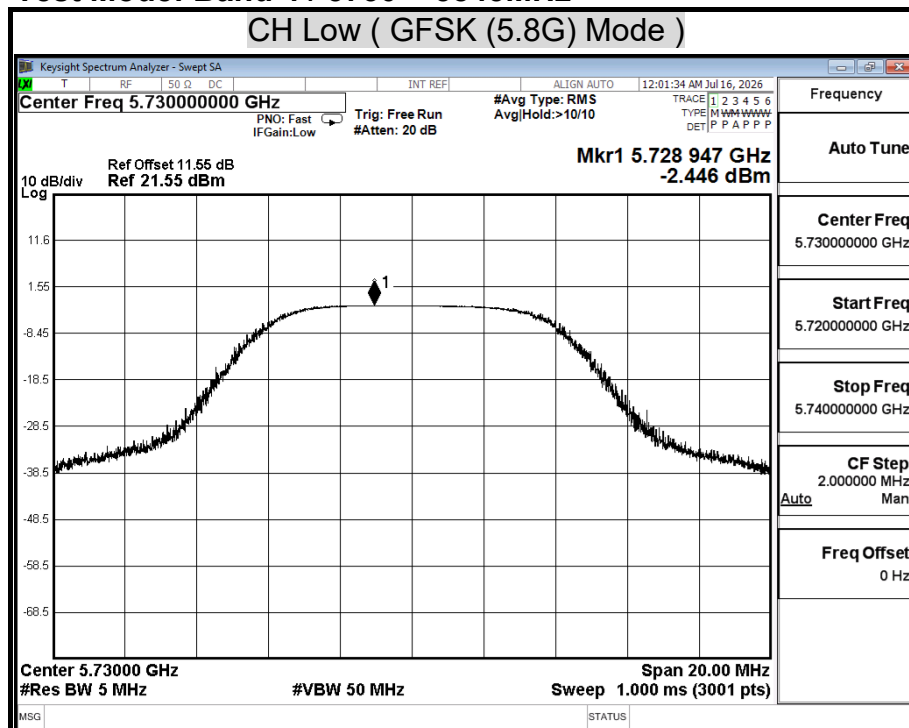
MAXIMUM CONDUCTED OUTPUT POWER

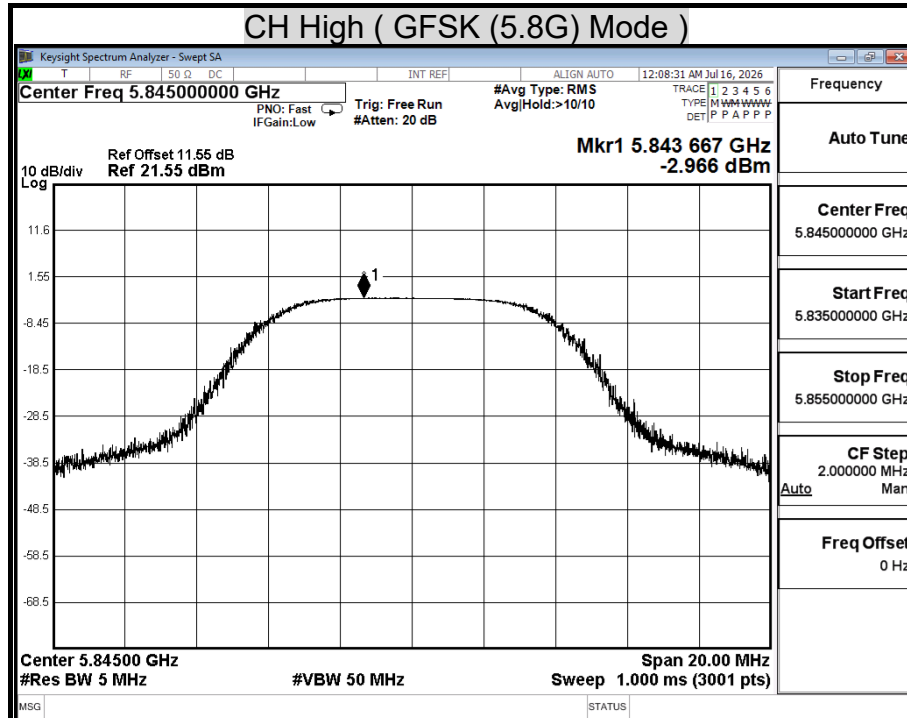
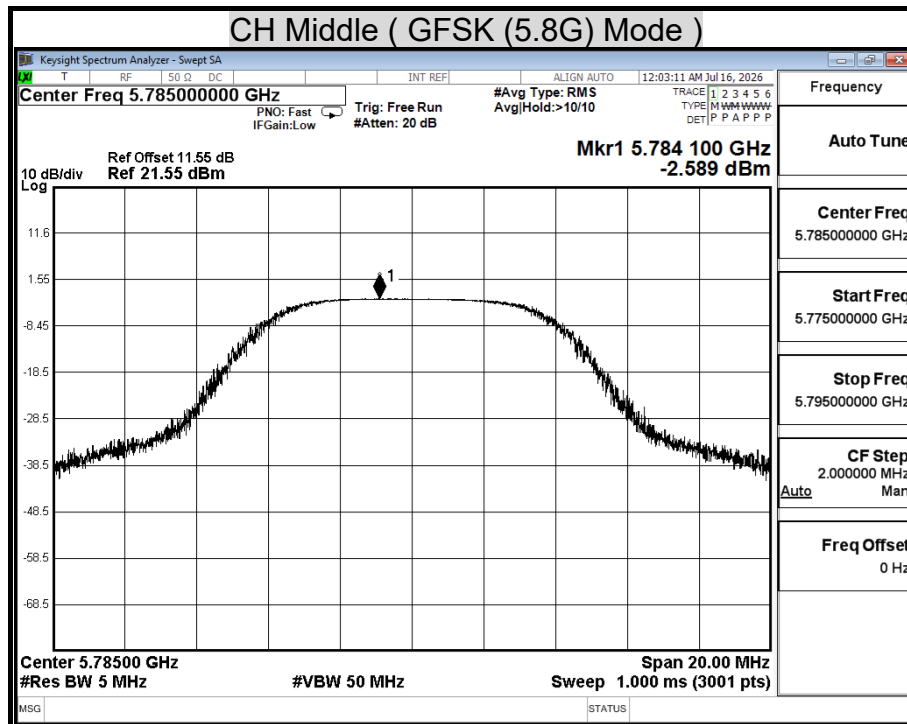
Test Mode: Band 1 / 5160 ~ 5240MHz





Test Mode: Band 4 / 5730 ~ 5845MHz







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7.5 PEAK POWER SPECTRAL DENSITY LIMITS

§ 15.407 (a)

(1) For the band 5.15-5.25 GHz.

- (i) For an outdoor access point operating in the band 5.15 – 5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).
- (ii) For an indoor access point operating in the band 5.15 – 5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(2) For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm $10 \log B$, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(3) For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500 kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY54430216	07/24/2025	07/23/2026
SMA Cable+10dB Attenuator	CCS	SMA+10dB ATT	SMA/10dB	01/13/2026	01/12/2027
Software	Excel(ccs-o6-2020 v1.1)				

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

TEST SETUP



TEST PROCEDURE

1. Set span to encompass the entire 26-dB emission bandwidth (EBW) (or, alternatively, the entire 99% occupied bandwidth) of the signal.
2. Set RBW = 1 MHz.
3. Set VBW ≥ 3 MHz.
4. Number of points in sweep ≥ 2 Span / RBW. (This ensures that bin-to-bin spacing is ≤ RBW/2, so that narrowband signals are not lost between frequency bins.)
5. Sweep time = auto.
6. Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.
7. If transmit duty cycle < 98 percent, use a video trigger with the trigger level set to enable triggering only on full power pulses. Transmitter must operate at maximum power control level for the entire duration of every sweep. If the EUT transmits continuously (i.e., with no off intervals) or at duty cycle ≥ 98 percent, and if each transmission is entirely at the maximum power control level, then the trigger shall be set to “free run”.
8. Trace average at least 100 traces in power averaging (i.e., RMS) mode.
9. Use the peak search function on the instrument to find the peak of the spectrum.

TEST RESULTS

TEST DATA

Model Name	A-1499WPR	Test By	Ted Huang
Temp & Humidity	25.8°C, 43%	Test Date	2026/07/15

GFSK (5.2G) Mode / 5160 ~ 5240 MHz

Channel	Channel Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)	Pass / Fail
Low	5160	-8.18	17.00	-25.18	PASS
Middle	5200	-7.53		-24.53	PASS
High	5240	-6.92		-23.92	PASS

GFSK (5.8G) Mode / 5730 ~ 5845 MHz

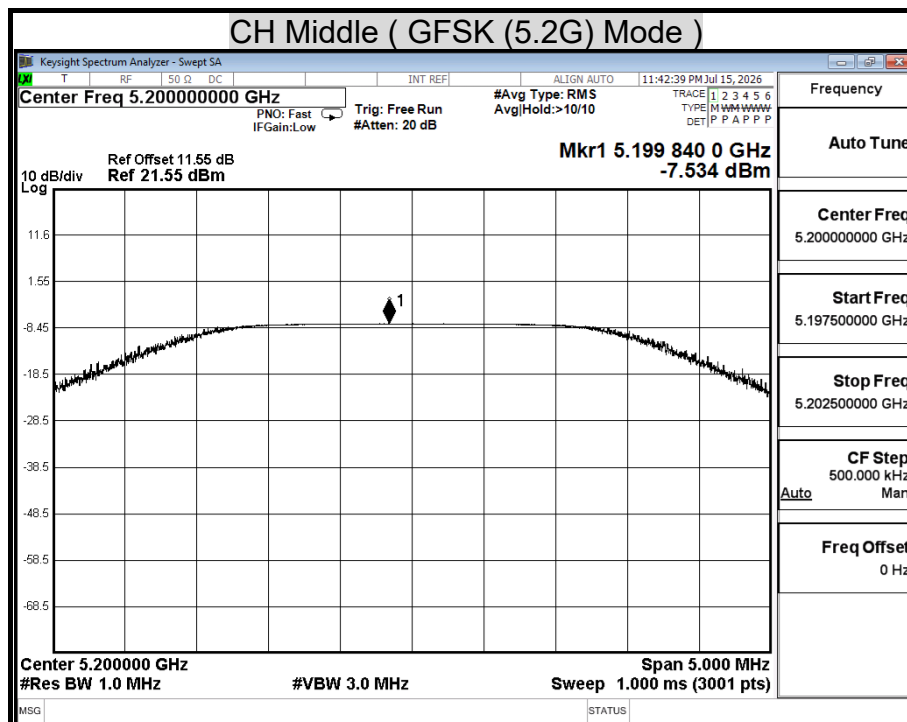
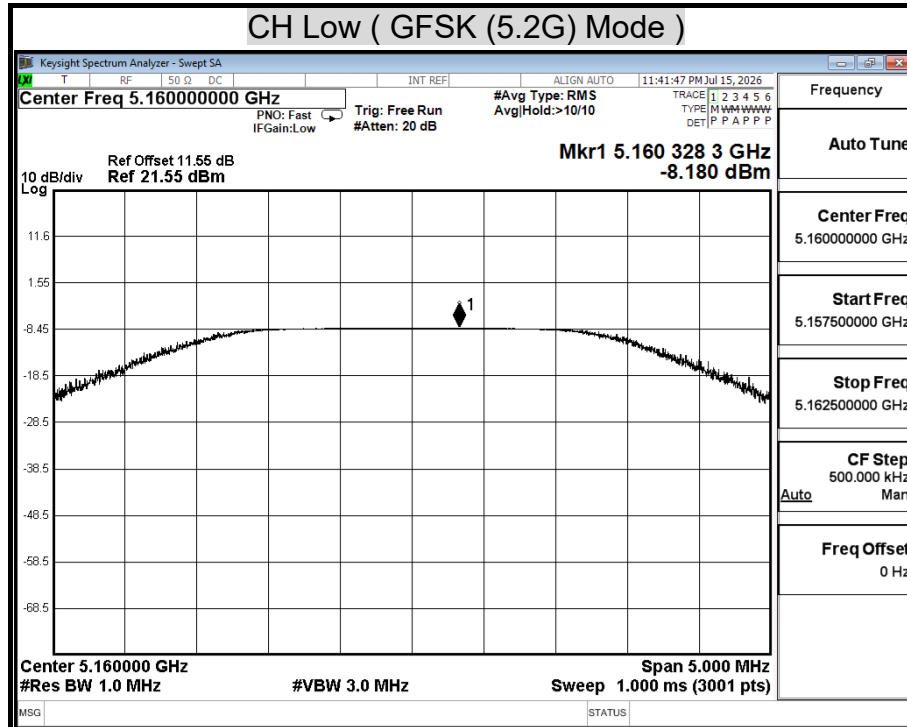
Channel	Channel Frequency (MHz)	PPSD (dBm)	Limit (dBm)	Margin (dB)	Pass / Fail
Low	5730	-2.78	30.00	-32.78	PASS
Middle	5785	-2.85		-32.85	PASS
High	5845	-3.36		-33.36	PASS

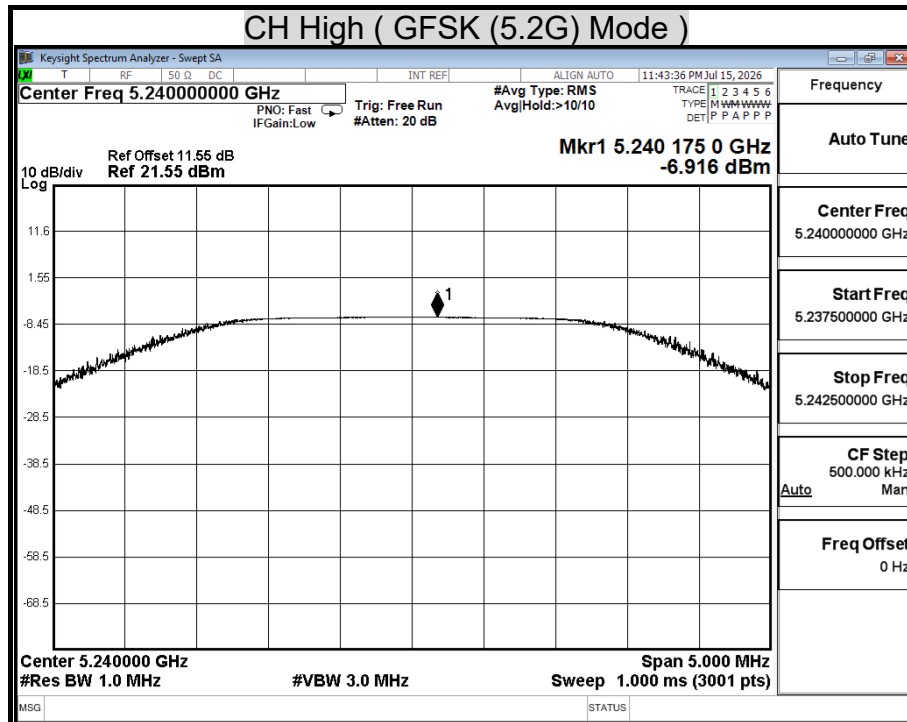
Remark:

1. At final test to get the worst-case emission at 117Mbps
2. The cable assembly insertion loss of 11.7dB (including 10 dB pad and 1.7 dB cable) was Entered as an offset in the spectrum analyzer to allow for direct reading of power.

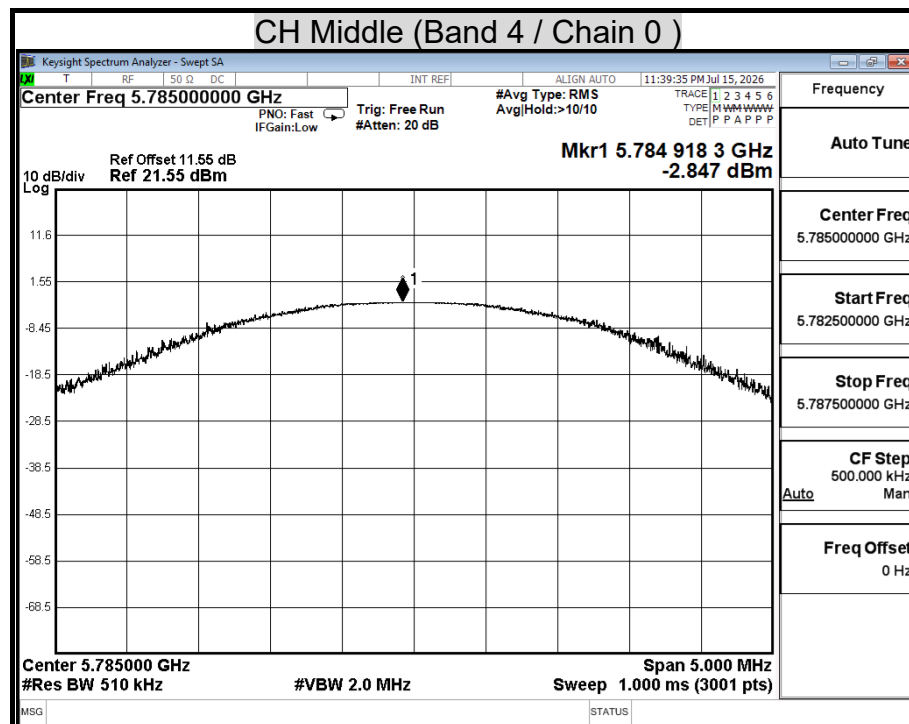
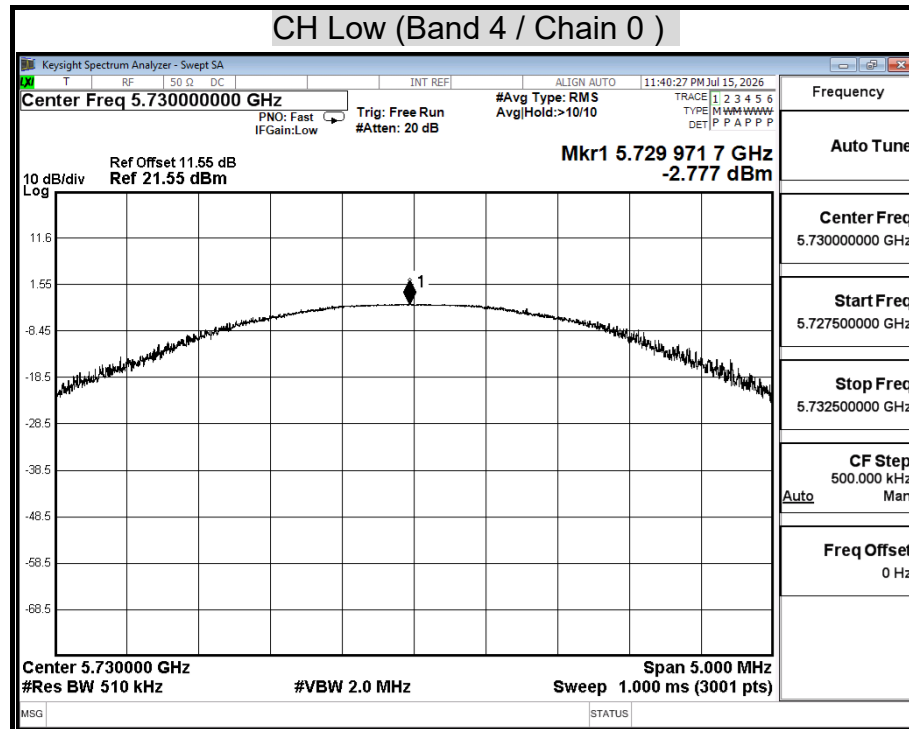
PEAK POWER SPECTRAL DENSITY

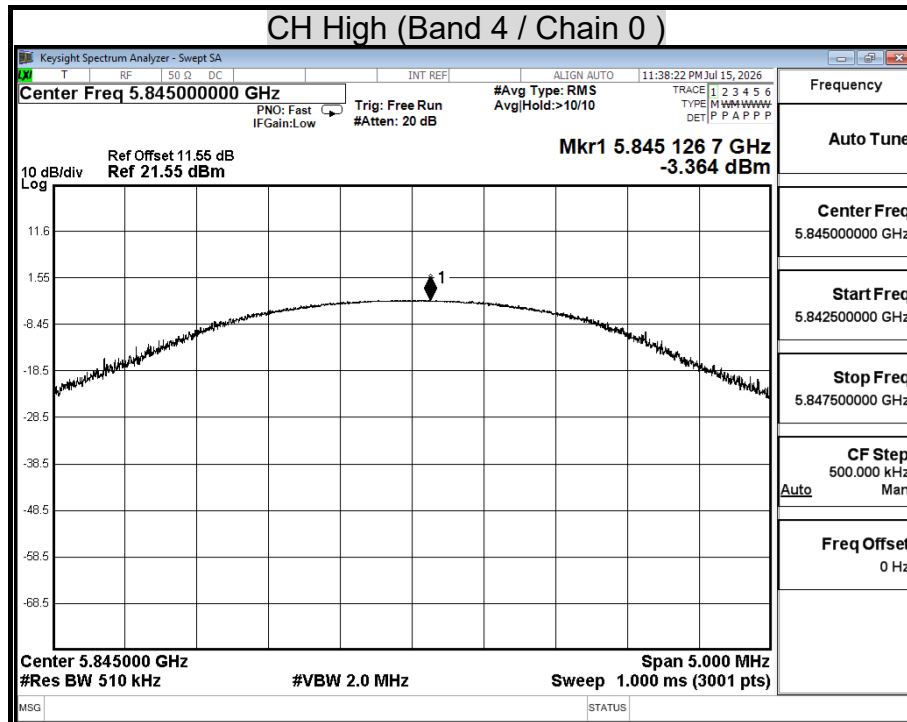
Test Mode: Band 1 / 5160 ~ 5240MHz





Test Mode: Band 4 / 5730 ~ 5845MHz





7.6 DUTY CYCLE

LIMIT

Nil (No dedicated limit specified in the Rules)

TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY54430216	07/24/2025	07/23/2026
SMA Cable+10dB Attenuator	CCS	SMA+10dB ATT	SMA/10dB	01/13/2026	01/12/2027
Software	Excel(ccs-o6-2020 v1.1)				

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

TEST SETUP



TEST PROCEDURE

- 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.
- The zero-span mode on a spectrum analyzer or EMI receiver if the response time and spacing between bins on the sweep are sufficient to permit accurate measurements of the on and off times of the transmitted signal. Set the center frequency of the instrument to the center frequency of the transmission. Set RBW $\geq$ OBW if possible; otherwise, set RBW to the largest available value. Set VBW $\geq$ RBW. Set detector = peak or average. The zero-span measurement method shall not be used unless both RBW and VBW are $> 50/T$ and the number of sweep points across duration T exceeds 100. (For example, if VBW and/or RBW are limited to 3 MHz, then the zero-span method of measuring duty cycle shall not be used if $T \leq 16.7$ microseconds.)

TEST RESULTS

No non-compliance noted.



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TEST DATA

Model Name	A-1499WPR	Test By	Ted Huang
Temp & Humidity	25.8°C, 43%	Test Date	2026/07/15

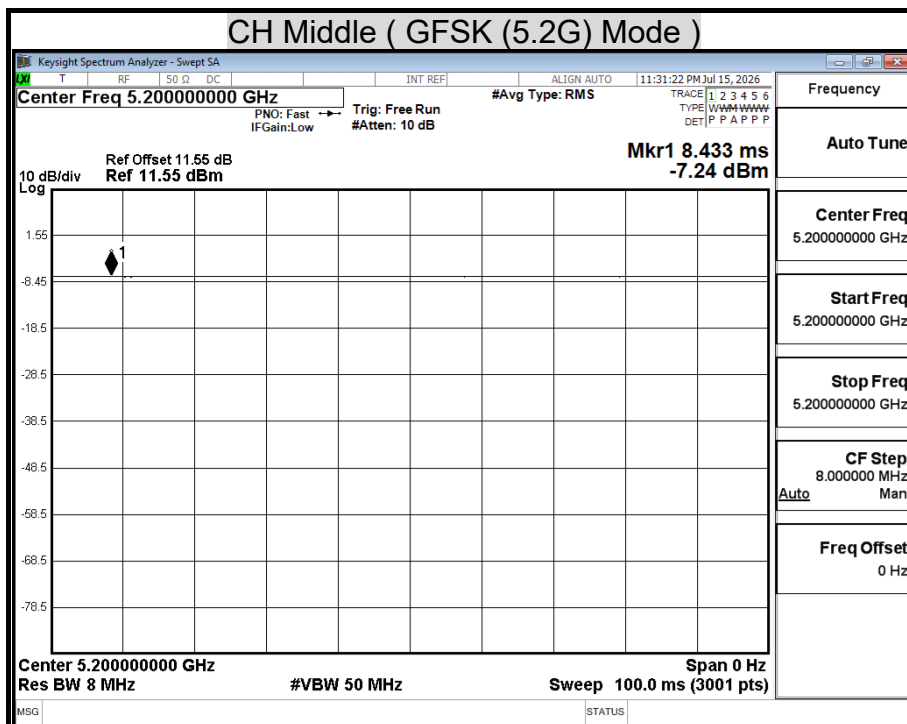
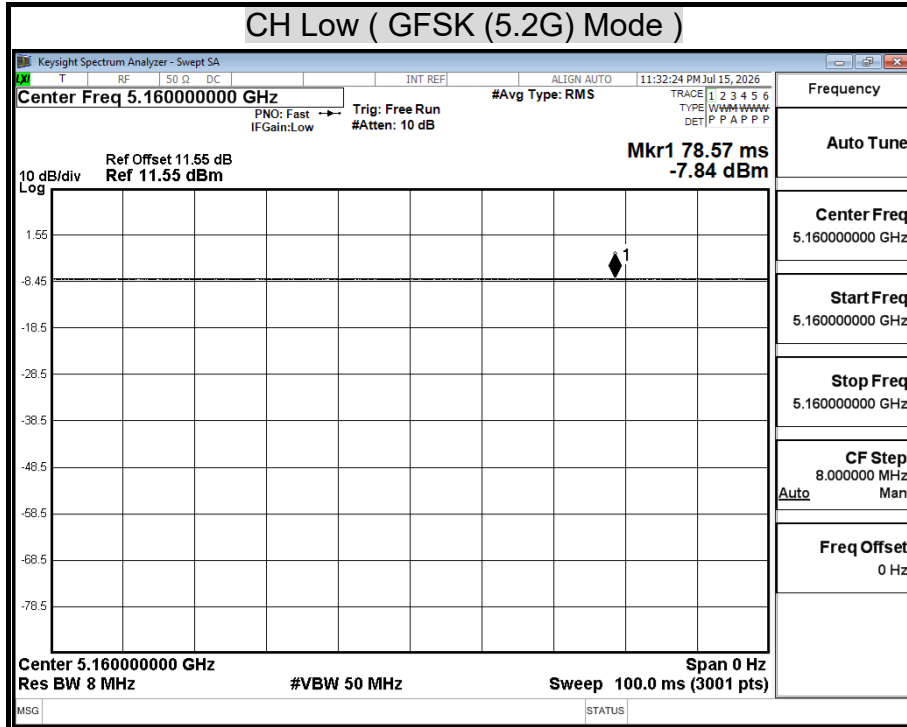
	us	Times	Ton	Total Ton time(ms)
Ton1	100000.000	1	100000	
Ton2		0	0	
Ton3			0	100
Tp				100

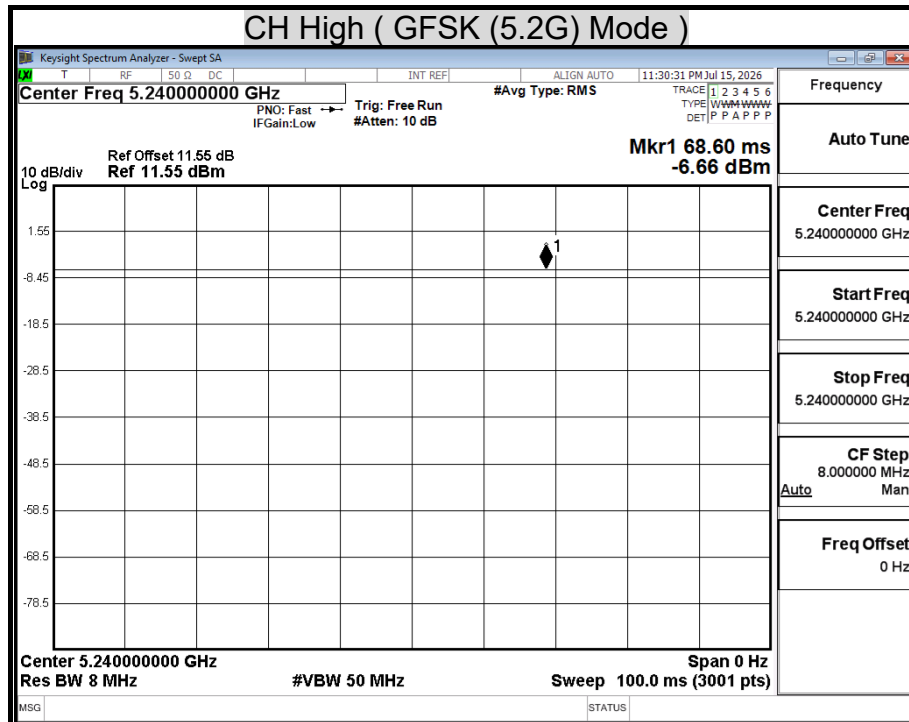
Ton	100
Tp(Ton+Toff)	100
Duty Cycle	1
Duty Factor	0

TEST PLOT

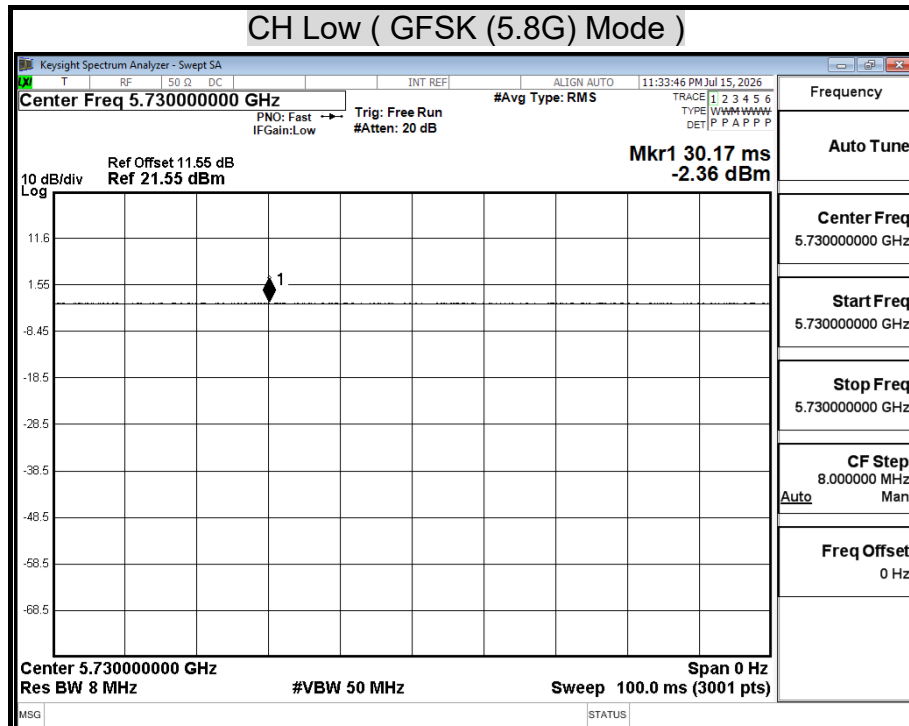
Duty Cycle

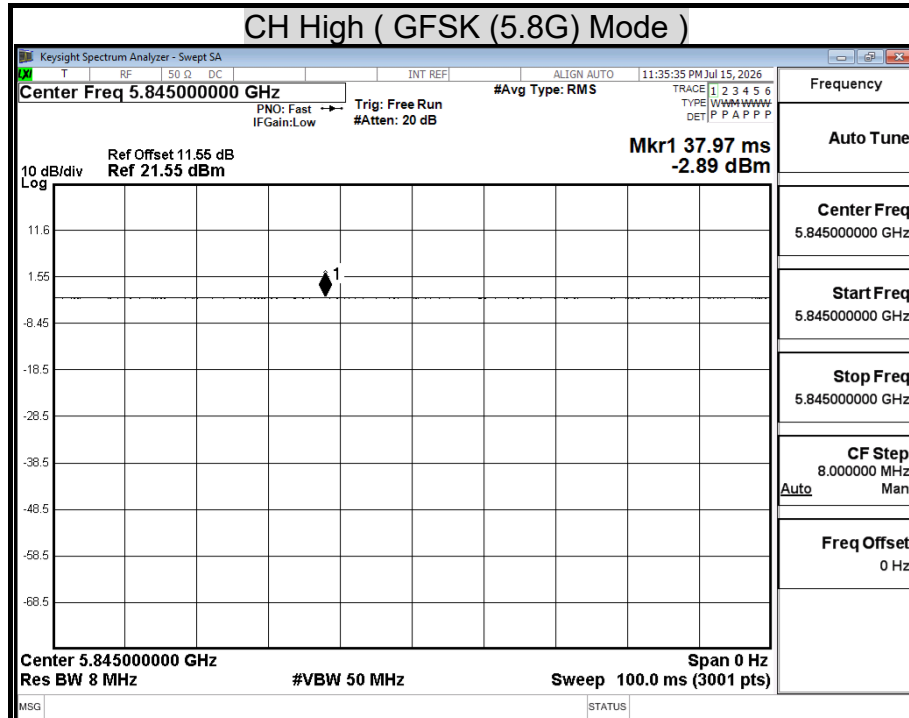
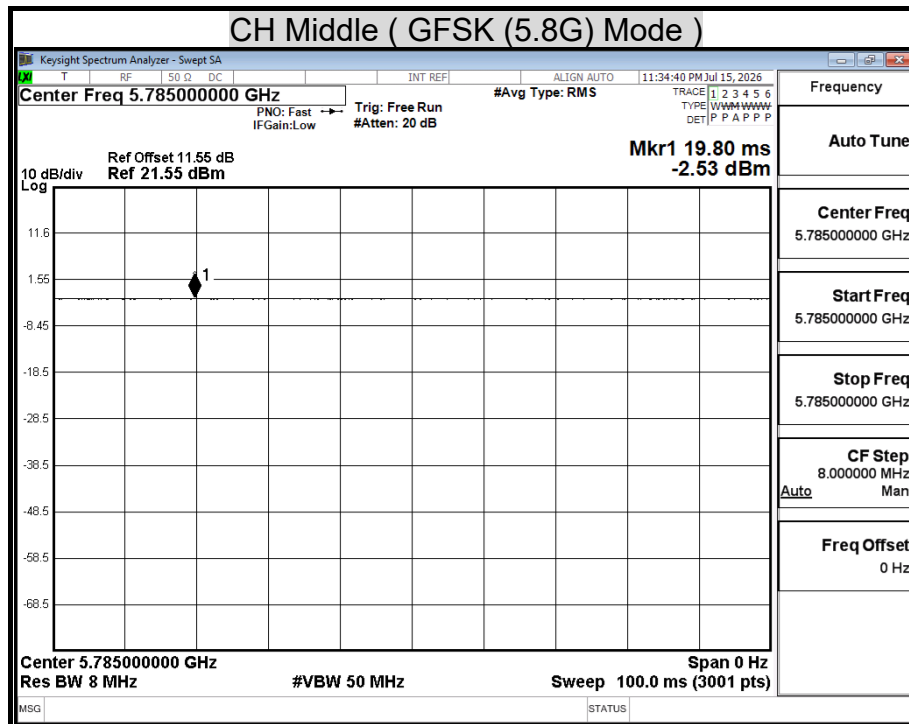
Test Mode: Band 1 / 5160 ~ 5240MHz





Test Mode: Band 4 / 5730 ~ 5845MHz





7.7 CONDUCTED SPURIOUS EMISSION

LIMITS

§ 15.407 (b): Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

- (1) For transmitters operating in the 5.15-5.25 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (2) For transmitters operating in the 5.25-5.35 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (3) For transmitters operating in the 5.47-5.725 GHz band: all emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (4) For transmitters operating in the 5.725-5.85 GHz band: all emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of -17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an e.i.r.p. of -27 dBm/MHz.

The provisions of § 15.205 apply to intentional radiators operating under this section.

TEST EQUIPMENT

Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY54430216	07/24/2025	07/23/2026
SMA Cable+10dB Attenuator	CCS	SMA+10dB ATT	SMA/10dB	01/13/2026	01/12/2027
Software	Excel(ccs-o6-2020 v1.1)				

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

TEST SETUP



TEST PROCEDURE

Conducted RF measurements of the transmitter output were made to confirm that the EUT antenna port conducted emissions meet the specified limit and to identify any spurious signals that require further investigation of measurements on the radiated emissions site.

The transmitter output is connected to the spectrum analyzer. The resolution bandwidth is set to 1MHz. The video bandwidth is set to 1MHz. Peak detection measurements are compared to the average EIRP limit, adjusted for the maximum antenna gain. If necessary, additional average detection measurements are made.

Measurements are made over the 30 MHz to 40 GHz range with the transmitter set to the lowest, middle, and highest channels.

TEST RESULTS

OUT-OF-BAND SPURIOUS EMISSIONS-CONDUCTED MEASUREMENT

Test Mode: Band 1 / 5160 ~ 5240MHz

