



TEST REPORT

Applicant: Shanghai EFIX Geomatics Co., Ltd.
Address of Applicant: Room 1137, Area D, 11th Floor, Building 1, No. 158, Shuanglian Road, Qingpu District, Shanghai
Manufacturer: Shanghai EFIX Geomatics Co., Ltd.
Address of Manufacturer: Room 1137, Area D, 11th Floor, Building 1, No. 158, Shuanglian Road, Qingpu District, Shanghai
Product Name: Geodetic GNSS Receiver
Model No.: NBase
Trade Mark: **Farnav**
FCC ID: 2A3MU-NBASE
Applicable standards: FCC CFR Title 47 Part 90, FCC CFR Title 47 Part 2
Test Procedure:: ANSI C63.26-2015
Date of Test: April 29, 2026 – July 10, 2026
Date of report issued: July 10, 2026

Remark:

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full without prior written permission of the company.

The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

Prepared By

Shenzhen ETR Standard Technology Co., Ltd.

Address: No.103, No.10, Phase I, Zone 3, Xinxing Industrial Park, Xinhe, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

Compiled by:

Reviewed by:

Approved by:

Project Engineer

Project Manager

Autorized Signature



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1. Test Summary

Test Item	Section in Standard	Result
Transmitter Power(Conducted)	FCC PART 90	PASS
Occupied Bandwidth & Emission Mask	FCC PART 90	PASS
Spurious Emissions(conducted)	FCC PART 90	PASS
Spurious Emissions(Radiated)	FCC PART 90	PASS
Transient Frequency Behavior	FCC PART 90	PASS
Frequency Stability	FCC PART 90	PASS
Modulation Characteristics	FCC PART 2 FCC PART 90	N/A ^{Note1}
Adjacent channel power	FCC PART 2	N/A ^{Note2}

Remark:

Pass: The EUT complies with the essential requirements in the standard.

N/A^{Note1}: The EUT is used in digital modulation.

N/A^{Note2}: Authorized bandwidth (kHz) < 20 kHz.

Compliance determination rules

- 1).The Compliance determination of test results does not take into account measurement uncertainty. Measurement results are determined based on regulatory limitations or requirements specified by the applicant/manufacture. If measurement uncertainty is taken into account, the applicant/manufacture will bear all possible risks of non-compliance.*
- 2).The measurement uncertainty please refer to each test result in the "Measurement Uncertainty"*

2. General Information

2.1. General Description of EUT

Product Name:	Geodetic GNSS Receiver
Model No.:	NBase
Difference in series models	N/A
Test model:	NBase
Hardware version:	V1.0
Software version:	V1.0
Power supply:	DC 7.4V from battery
UHF information	
Operation frequency	450MHz-470MHz
Conducted Power	5W(37 ± 1 dBm), 3W(35 ± 1 dBm), 0.5W(27 ± 1 dBm)
Channel spacing	GFSK: 12.5KHz, 25KHz
Modulation type	GFSK,
Antenna Type:	External antenna
Antenna gain:	4.11dBi
Note: <i>1. Other information please Reference user manual.</i> <i>2. Antenna information is provided by applicant, Testing lab is not responsible for the accuracy of the information.</i> <i>3. All Conducted Power have been tested, and recorded the worst case 5W(37 ± 1dBm) results in this report.</i>	

2.2. Test frequency channel

GFSK		
Test Channel	Channel spacing (KHz)	Frequency(MHz)
Low	12.5	456.050
	25	456.050
Mid	12.5	459.050
	25	459.050
High	12.5	462.550
	25	462.550

2.3. Test mode

Test Mode		
Item	Description of operation mode	Note
1	GFSK+CS12.5KHz+TX	at maximum rated power for transmitter
2	GFSK+CS25KHz+TX	at maximum rated power for transmitter

Note: The worst case modes for all test are the item 1.

2.4. EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

- - supplied by the manufacturer
- - supplied by the lab

Description of Support Units

No.	Description	Manufacturer	Model	Serial Number
1	/	/	/	/

2.5. Test Environment

Environment Parameter	Selected Values During Tests	
Relative Humidity	Ambient	
Voltage	TN	Ambient
	VL	6.66V
	VN	7.40V
	VH	8.14V

NOTE: VL=lower extreme test voltage VN=nominal voltage

VH=upper extreme test voltage TN=normal temperature

2.6. Test Facility

Test laboratory:	Shenzhen ETR Standard Technology Co., Ltd.
Laboratory location:	No.103, No.10, Phase I, Zone 3, Xinxing Industrial Park, Xinhe, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
CNAS Registration No.:	CNAS 11864
A2LA Certificate Number:	6640.01
FCC Designation Number:	CN1326
FCC Test Firm Registration:	183064

2.7. Environmental conditions

Temperature:	15-35 ° C
Humidity:	30-60 %
Atmospheric pressure:	950-1050mbar

2.8. Measurement Uncertainty

Test Item	Uncertainty Criterion	Measurement Uncertainty	Notes
Occupied Channel Bandwidth	±5%	2.38%	(1)
RF output power, conducted	±1.5dB	±0.63dB	(1)
Power Spectral Density, conducted	±3dB	±0.69dB	(1)
Unwanted Emissions, conducted	±3dB	±2.39dB	(1)
AC Power Line Conducted Emission	±6dB	± 2.64 dB	(1)
Radiated emissions Below 1GHz	±6dB	±4.32 dB	(1)
Radiated emissions Above 1GHz	±6dB	±4.56 dB	(1)
Note (1): The measurement uncertainty is for coverage factor of k=2 and a level of confidence of 95%.			

3. Test Instruments list

Item	Equipment name	Manufacturer	Model	Serial No.	Calibration date	Due date
1	EMI Test Receiver	Rohde&schwarz	ESCI3	100605	2026.3.05	2027.3.04
2	Artificial power network	schwarbeck	NSLK8127	8127483	2026.3.05	2027.3.04
3	Artificial power network	ETS	3186/2NM	1132	2026.3.05	2027.3.04
4	10dB attenuator	HUBER+SUNNER	10dB	/	2026.3.05	2027.3.04
5	Cable 4	HUBER SUNNER	3M	/	2026.3.05	2027.3.04
7	EMI Test Receiver	Rohde&schwarz	ESCI7	101032	2026.3.05	2027.3.04
8	Broadband antenna	schwarbeck	VULB9168	1064	2026.3.11	2028.3.10
9	Horn antenna	schwarbeck	BBHA9120D	9120D-1145	2026.3.11	2028.3.10
10	Amplifier	EMtrace	RP01A	50117	2026.3.05	2027.3.04
11	Amplifier	Space-Dtronics	EVLN0118G-P4	19113001	2026.3.05	2027.3.04
12	Spectrum analyzer	KEYSIGHT	N9020A	MY55370280	2026.3.05	2027.3.04
13	Power detector meter	MWRFtest	MW100-PSB	MW201020JYT	2026.3.05	2027.3.04
14	Signal generator	Agilent	N5182A	MY49060455	2026.3.05	2027.3.04
15	Spectrum analyzer	Rohde&schwarz	FSV40	102137	2026.3.05	2027.3.04
16	Amplifier	SKET	LNPA_1840-50	SK2019040302	2026.3.05	2027.3.04
17	Horn antenna	schwarbeck	BBHA 9170	946	2026.3.11	2028.3.10
18	Loop antenna	schwarbeck	FMZB 1519 B	1519	2026.3.11	2028.3.10
19	Cable 6	HUBER SUNNER	0.5M	/	2026.3.05	2027.3.04
20	Cable7	HUBER SUNNER	2.0M	/	2026.3.05	2027.3.04
21	Cable8	HUBER SUNNER	6.0M	/	2026.3.05	2027.3.04
22	Filter	Xin bo	XBLBQ-GTA29	210410-3-2	2026.3.05	2027.3.04
23	Automated filter bank	onscend	JS0806-F	JS0806-F	2026.3.05	2027.3.04

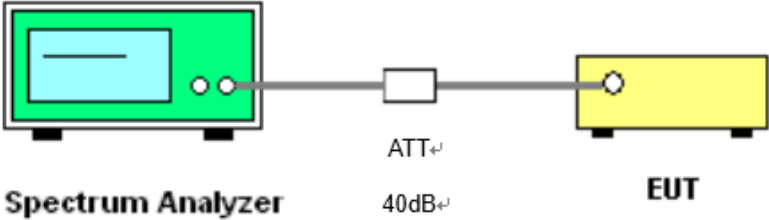
Note: the calibration interval of the above test instruments is 12 or 24 months and the calibrations are traceable to international system unit (SI).

Software Name	Manufacturer	Model	Version
LTE test software	CESHENG	WCS-LTE	Ver:25.09.1601
Conducted test software	Farad	EZ-EMC	Ver.EMC-CON 3A1.1
Radiated test software	Farad	EZ-EMC	Ver.FA-03A2 RE

4. Test Results and Measurement Data

4.1. Transmitter Power (conduct)

4.1.1. Test Specification

Test Requirement:	Part 90.205
Test Method:	FCC part 2.1046, ANSI C63.26-2015 Section 5.2
Limits:	Please refer section FCC Part 90.205
Test Setup:	 Spectrum Analyzer ATT EUT 40dB
Test Procedure:	a) Connect the equipment as illustrated. b) Turn on the Spectrum Analyzer c) Record value
Test Result:	PASS

4.1.2. Test Results

Modulation Mode	Channel Separation (KHz)	Test Channel	Conducted Power (dBm)			Gain (dBi)	Maximum ERP (dBm)			Verdict
			High Power Level	Mid Power Level	Low Power Level		High Power Level	Mid Power Level	Low Power Level	
GFSK	12.5	L	36.336	34.400	27.220	4.11	38.296	36.36	29.180	Pass
	12.5	M	36.272	34.533	27.619	4.11	38.232	36.493	29.579	Pass
	12.5	H	36.013	34.287	26.915	4.11	37.973	36.247	28.875	Pass
	25	L	36.627	34.002	26.836	4.11	38.587	35.962	28.796	Pass
	25	M	36.772	35.114	26.775	4.11	38.732	37.074	28.735	Pass
	25	H	36.865	35.217	26.974	4.11	38.825	37.177	28.934	Pass

Note: 1. Maximum ERP = Conducted Power + Antenna Gain - 2.15dB

According to part 90.205 (s), the limit is as below:

Rated High power: 5W (37 ± 1 dBm)

Rated Mid power: 3W (35 ± 1 dBm)

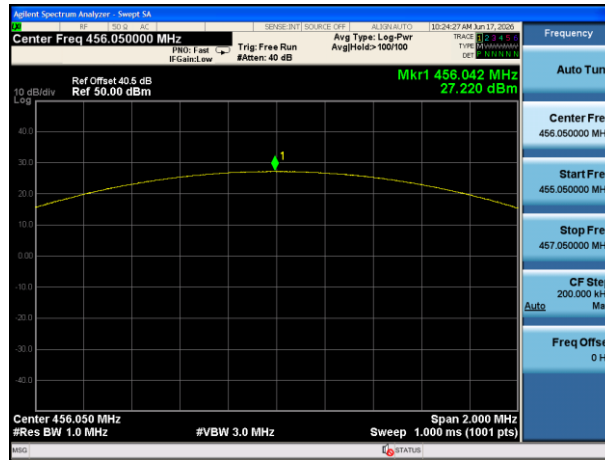
Rated Low power: 0.5W (27 ± 1 dBm)



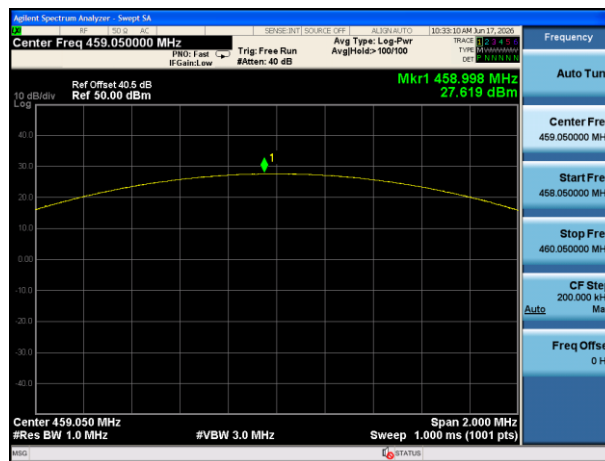
Test plots as follows:

GFSK 0.5W 12.5KHz Channel Spacing: Transmitter Power

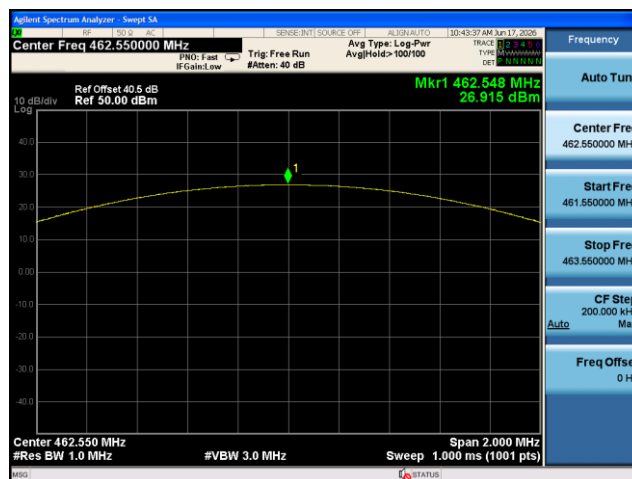
Low: 456.050MHz



Mid: 459.050MHz



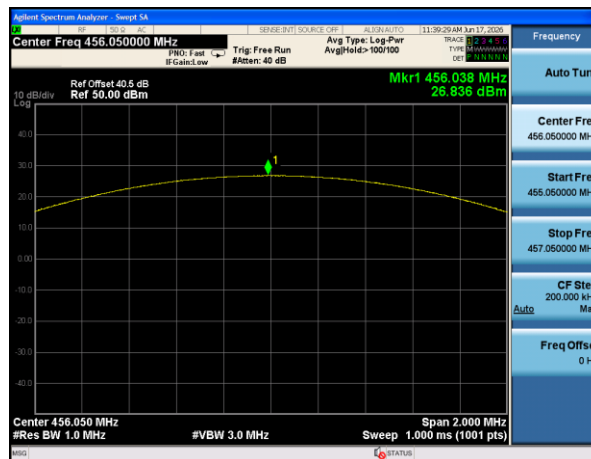
High: 462.550MHz



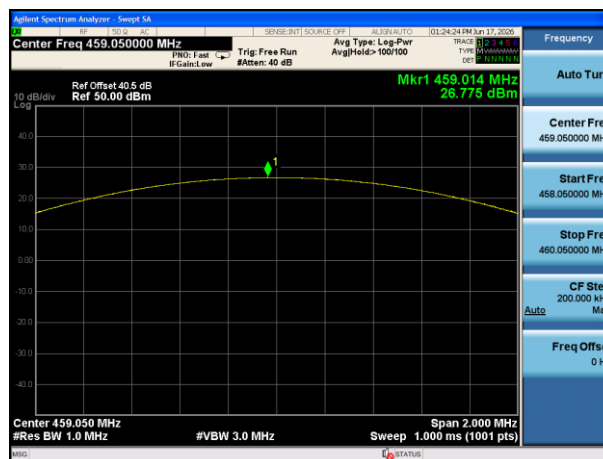


GFSK 0.5W 25KHz Channel Spacing: Transmitter Power

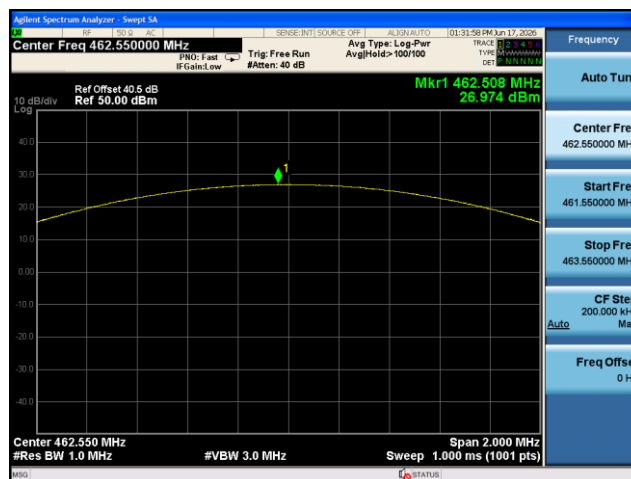
Low: 456.050MHz



Mid: 459.050MHz



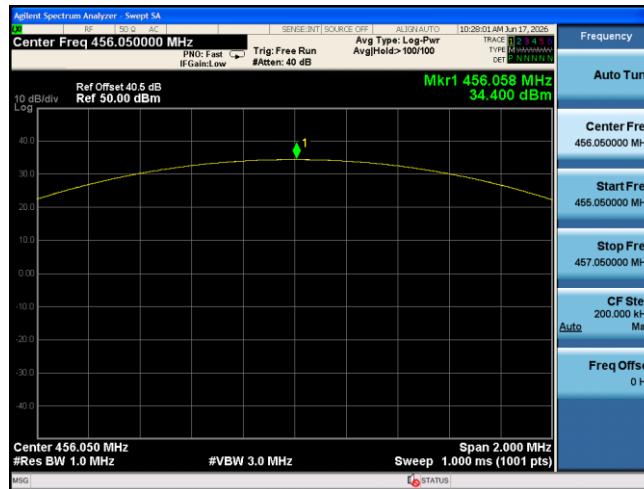
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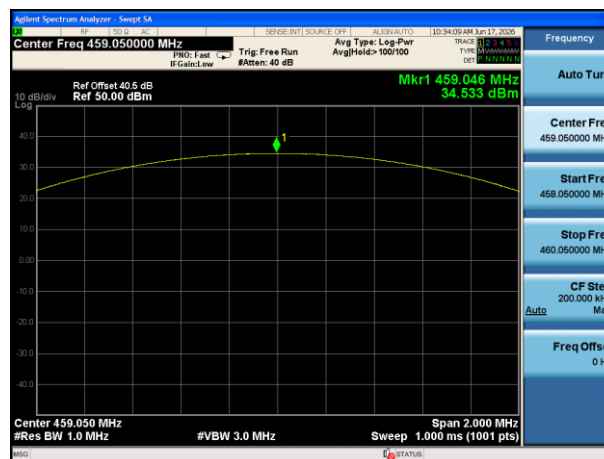


GFSK 3W 12.5KHz Channel Spacing: Transmitter Power

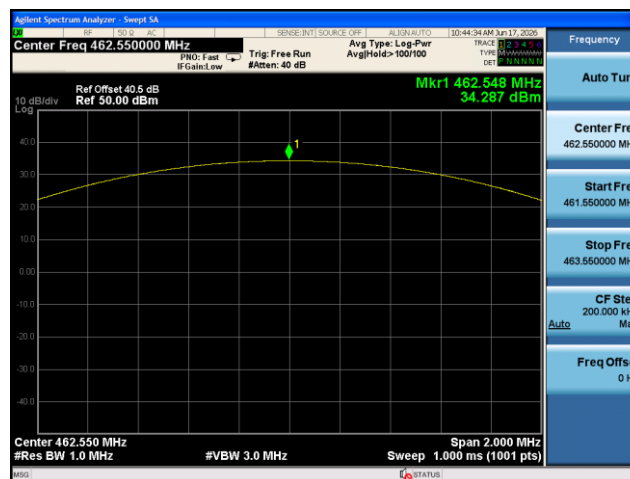
Low: 456.050MHz



Mid: 459.050MHz



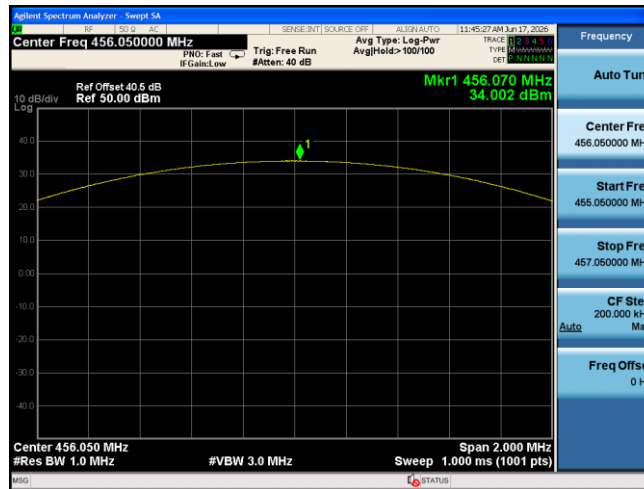
High: 462.550MHz



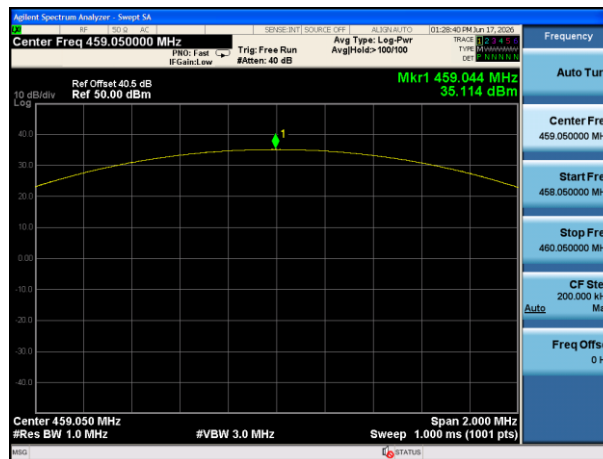


GFSK 3W 25KHz Channel Spacing: Transmitter Power

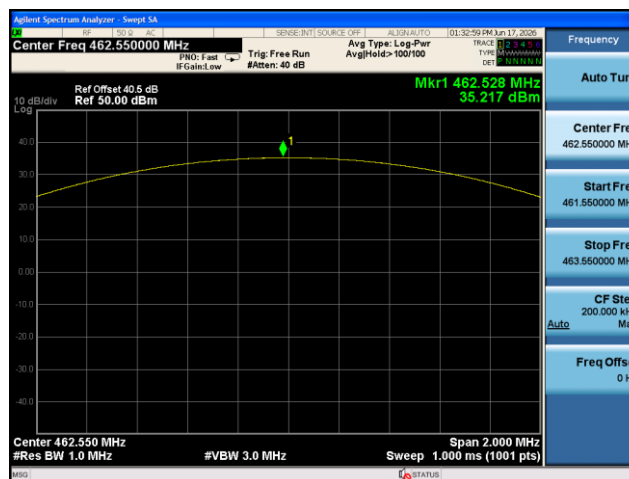
Low: 456.050MHz



Mid: 459.050MHz



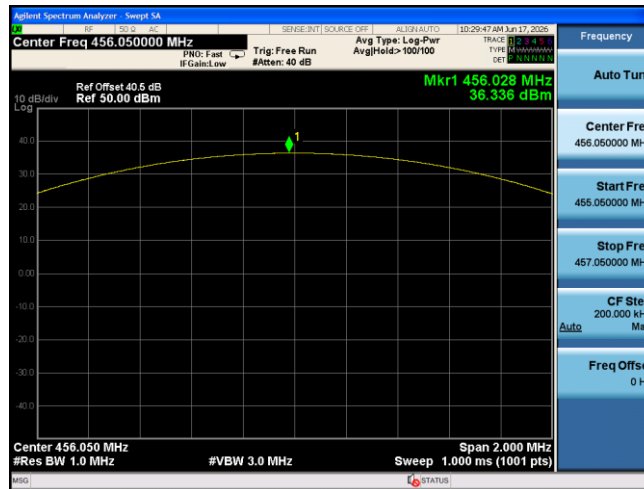
High: 462.550MHz



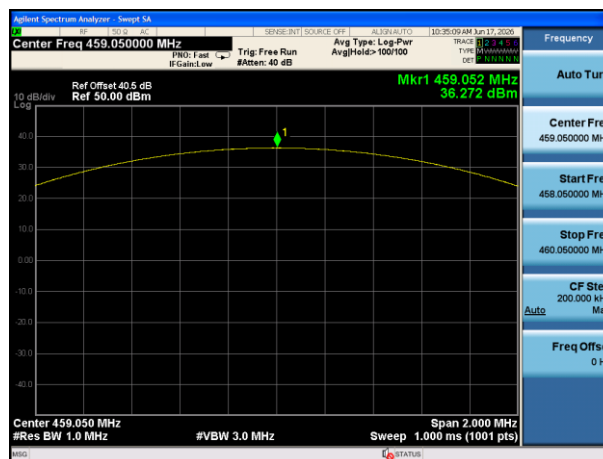


GFSK 5W 12.5KHz Channel Spacing: Transmitter Power

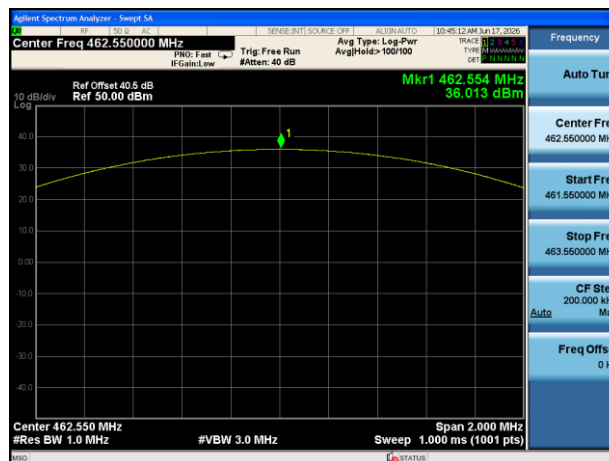
Low: 456.050MHz



Mid: 459.050MHz



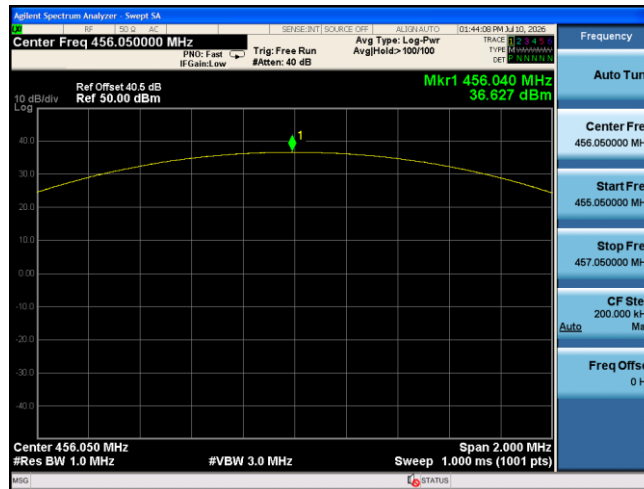
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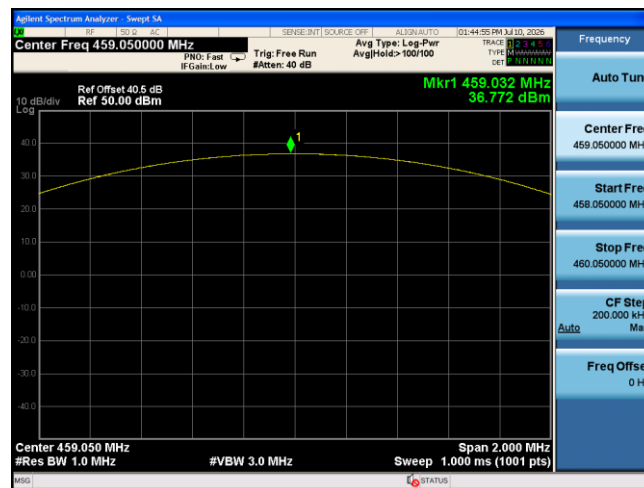


GFSK 5W 25KHz Channel Spacing: Transmitter Power

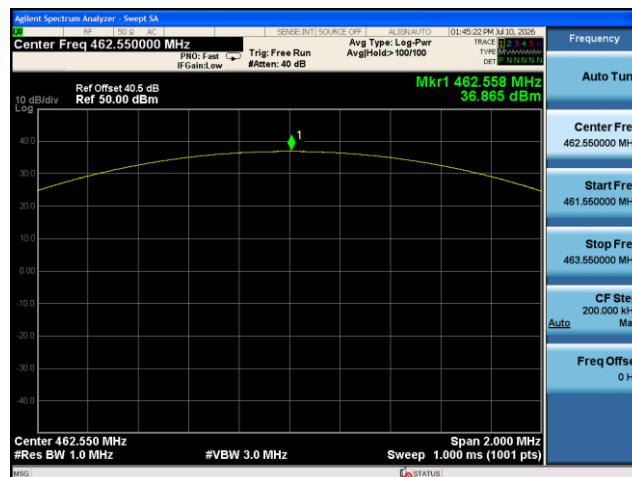
Low: 456.050MHz



Mid: 459.050MHz

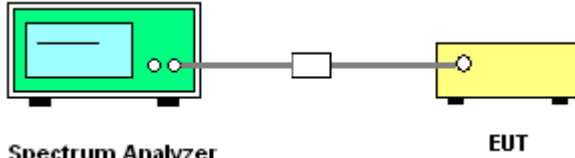


High: 462.550MHz



4.2. Occupied Bandwidth and Emission Mask

4.2.1. Test Specification

Test Requirement:	FCC Part 90.209, FCC Part 90.210
Test Method:	FCC part 2.1049, ANSI C63.26-2015 Section 5.4
Test Setup:	 The diagram illustrates the test setup. On the left is a green box labeled 'Spectrum Analyzer' with a blue screen and two red dots representing ports. A grey cable connects this to a yellow box on the right labeled 'EUT', which also has a red dot representing a port. A small white box is located in the middle of the cable connection.
Test Procedure:	The resolution bandwidth of the spectrum analyzer was set at 300 Hz and the spectrum was recorded in the Frequency band $\pm 50\text{KHz}$ from the carrier frequency for Occupied Bandwidth, the resolution bandwidth of the spectrum analyzer was set at 100 Hz and the spectrum was recorded in the Frequency band $\pm 100\text{KHz}$ from the carrier frequency for Emission Mask.
Test Result:	PASS

4.2.2. Test Data

Occupied Bandwidth:

GFSK mode (0.5W) 12.5KHz Channel Spacing:

Channel	Frequency (MHz)	26dB Bandwidth (KHz)	99% Occupied Bandwidth (KHz)	99% Occupied Bandwidth Limit (KHz)	Result
Low	456.050	5.955	5.022	11.25	PASS
Mid	459.050	5.927	5.059	11.25	PASS
High	462.550	5.891	5.018	11.25	PASS

GFSK mode (0.5W) 25KHz Channel Spacing:

Channel	Frequency (MHz)	26dB Bandwidth (KHz)	99% Occupied Bandwidth (KHz)	99% Occupied Bandwidth Limit (KHz)	Result
Low	456.050	10.930	9.842	20	PASS
Mid	459.050	10.940	9.788	20	PASS
High	462.550	10.940	9.771	20	PASS

GFSK mode (3W) 12.5KHz Channel Spacing:

Channel	Frequency (MHz)	26dB Bandwidth (KHz)	99% Occupied Bandwidth (KHz)	99% Occupied Bandwidth Limit (KHz)	Result
Low	456.050	5.838	5.015	11.25	PASS
Mid	459.050	5.839	5.015	11.25	PASS
High	462.550	6.101	5.040	11.25	PASS

GFSK mode (3W) 25KHz Channel Spacing:

Channel	Frequency (MHz)	26dB Bandwidth (KHz)	99% Occupied Bandwidth (KHz)	99% Occupied Bandwidth Limit (KHz)	Result
Low	456.050	10.940	9.799	20	PASS
Mid	459.050	10.940	9.808	20	PASS
High	462.550	10.950	9.776	20	PASS



GFSK mode (5W) 12.5KHz Channel Spacing:

Channel	Frequency (MHz)	26dB Bandwidth (KHz)	99% Occupied Bandwidth (KHz)	99% Occupied Bandwidth Limit (KHz)	Result
Low	456.050	6.105	5.018	11.25	PASS
Mid	459.050	6.177	5.018	11.25	PASS
High	462.550	6.465	5.030	11.25	PASS

GFSK mode (5W) 25KHz Channel Spacing:

Channel	Frequency (MHz)	26dB Bandwidth (KHz)	99% Occupied Bandwidth (KHz)	99% Occupied Bandwidth Limit (KHz)	Result
Low	456.050	10.950	9.770	20	PASS
Mid	459.050	10.930	9.806	20	PASS
High	462.550	10.940	9.778	20	PASS

Emission Mask:

GFSK mode (5W) 12.5KHz Channel Spacing:

Channel	Frequency (MHz)	Applicable Mask	RBW	Result
Low	456.050	D	100Hz	PASS
Mid	459.050	D	100Hz	PASS
High	462.550	D	100Hz	PASS

GFSK mode (5W) 25KHz Channel Spacing:

Channel	Frequency (MHz)	Applicable Mask	RBW	Result
Low	456.050	C	300Hz	PASS
Mid	459.050	C	300Hz	PASS
High	462.550	C	300Hz	PASS

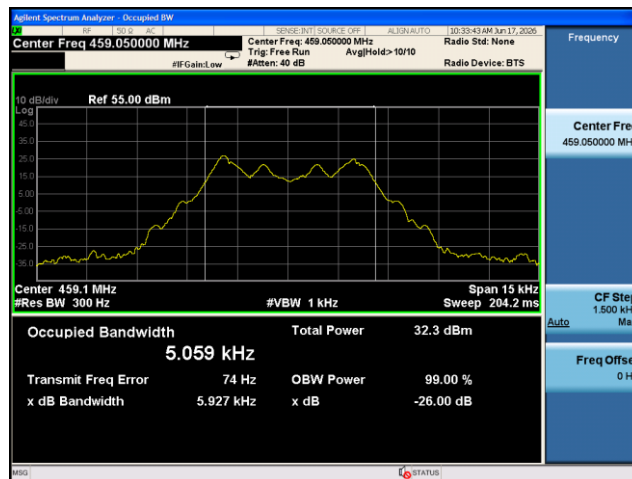
Test plots as follows:

GFSK mode (0.5W) 12.5KHz Channel Spacing: Occupied Bandwidth

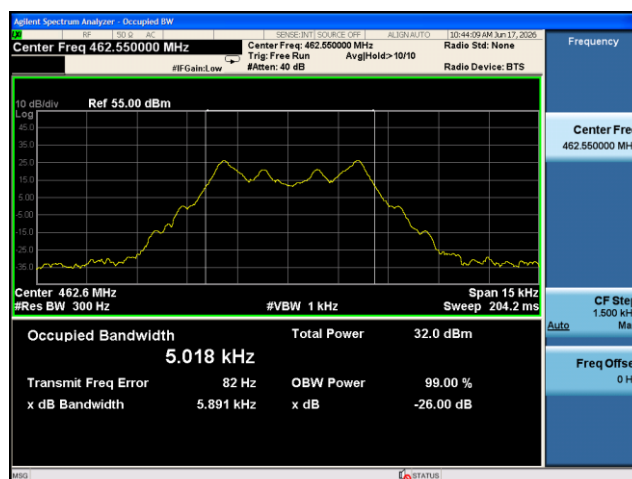
Low: 456.050MHz



Mid: 459.050MHz

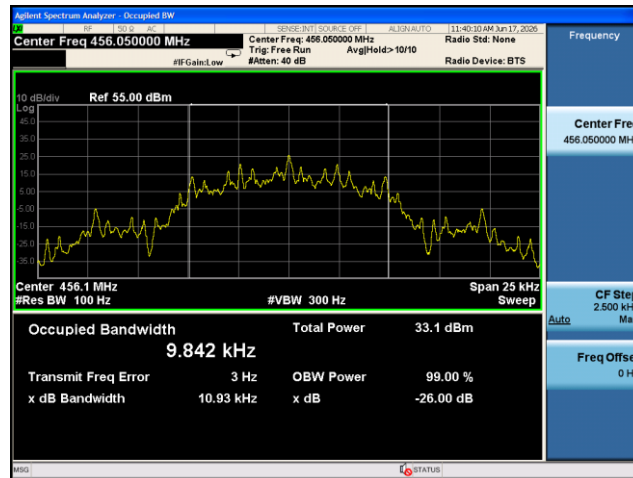


High: 462.550MHz

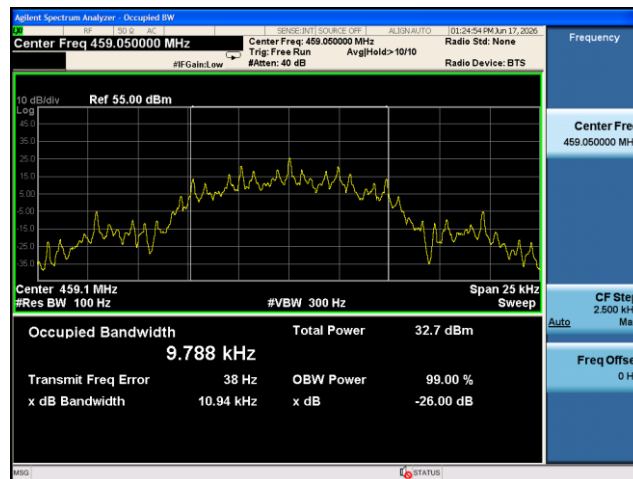


GFSK mode (0.5W) 25KHz Channel Spacing: Occupied Bandwidth

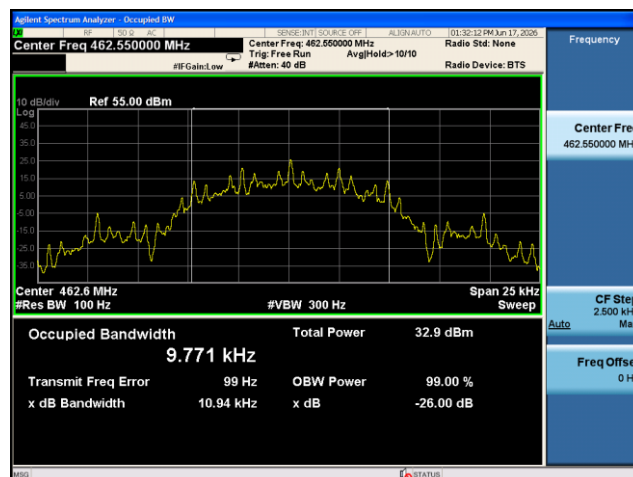
Low: 456.050MHz



Mid: 459.050MHz



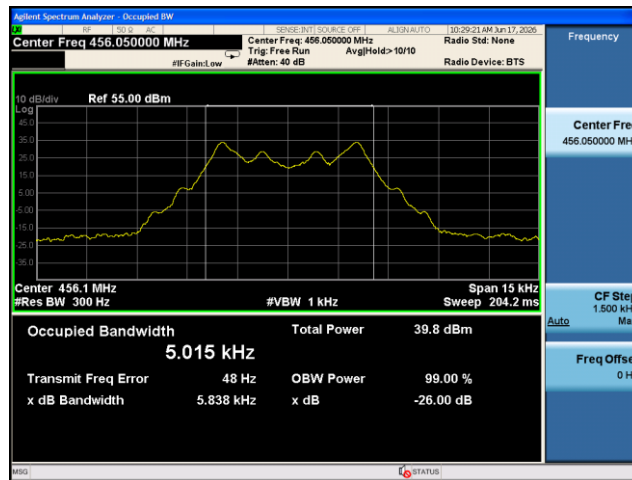
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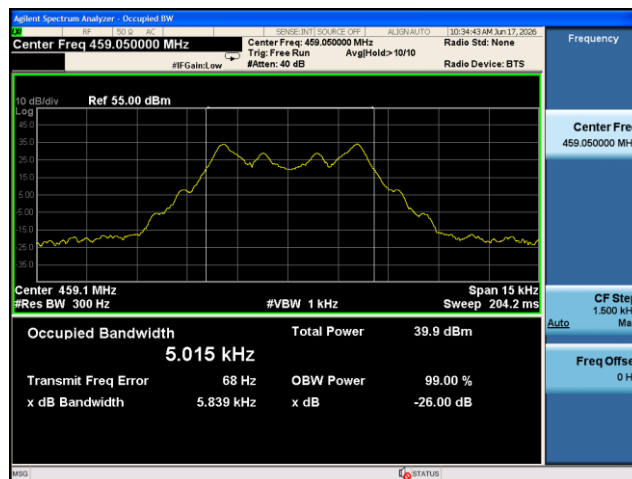


GFSK mode (3W) 12.5KHz Channel Spacing: Occupied Bandwidth

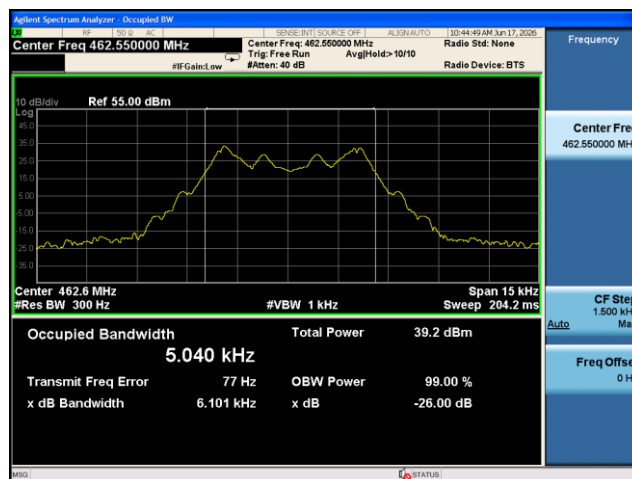
Low: 456.050MHz



Mid: 459.050MHz

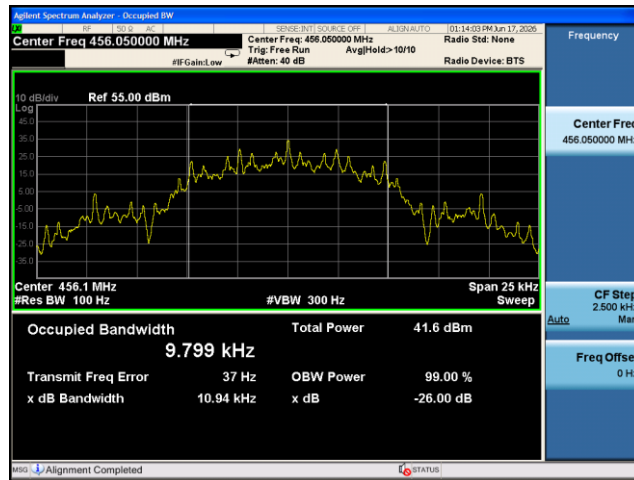


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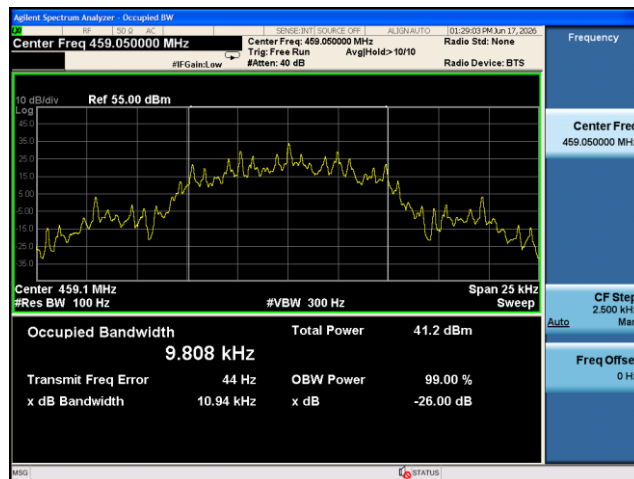


GFSK mode (3W) 25KHz Channel Spacing: Occupied Bandwidth

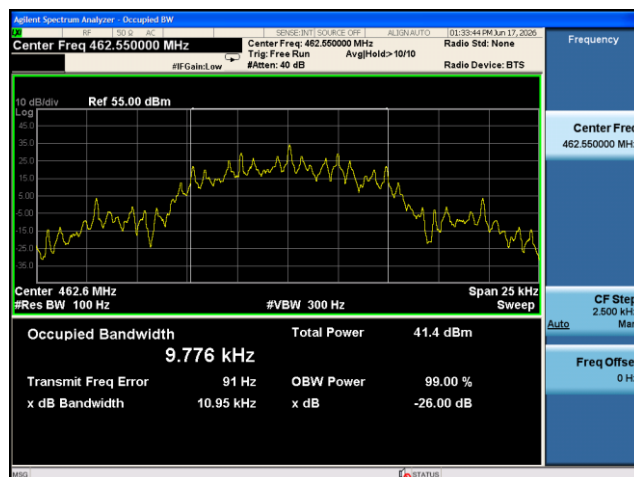
Low: 456.050MHz



Mid: 459.050MHz



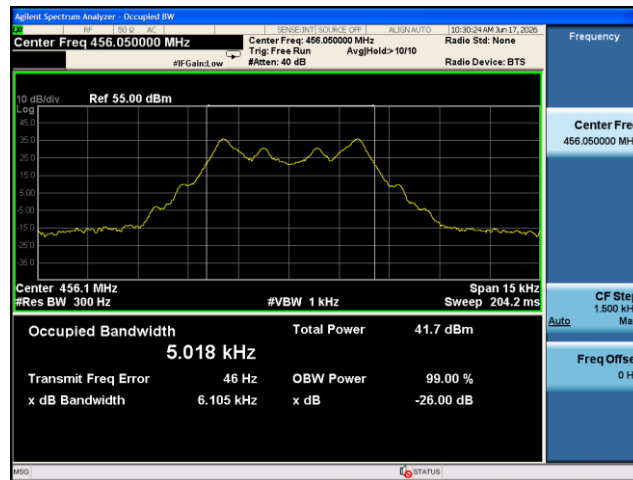
High: 462.550MHz



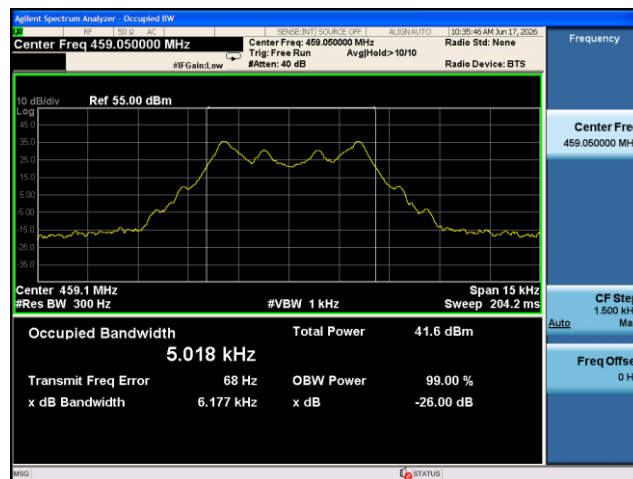


GFSK mode (5W) 12.5KHz Channel Spacing: Occupied Bandwidth

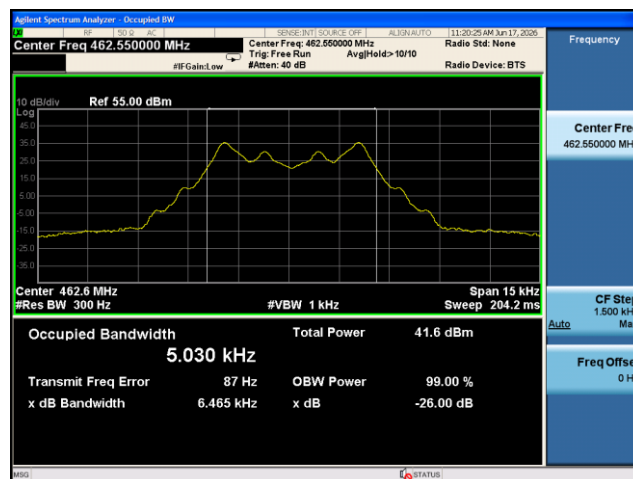
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Mid: 459.050MHz

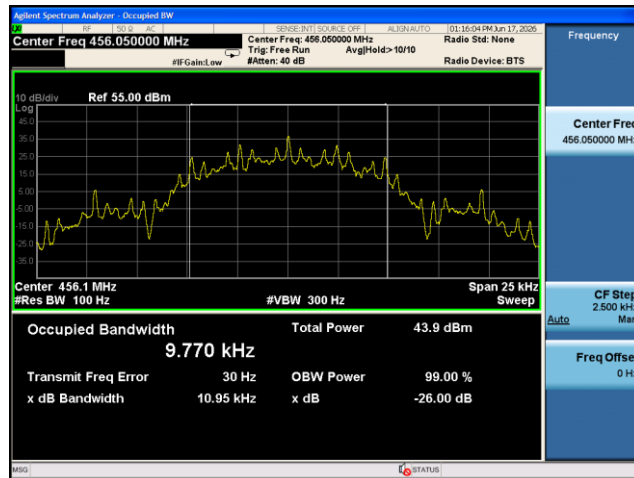


High: 462.550MHz

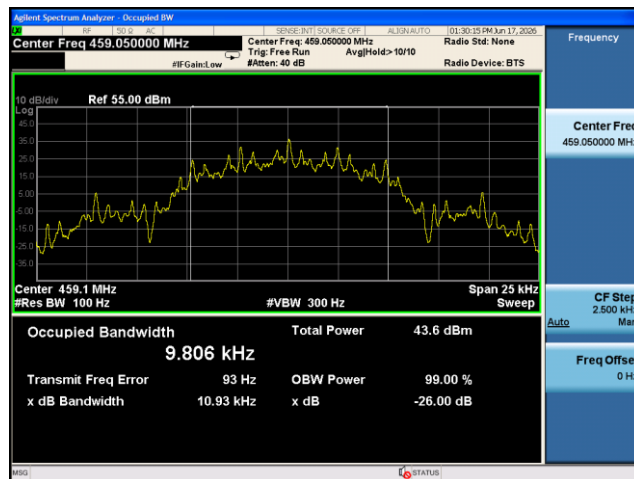


GFSK mode (5W) 25KHz Channel Spacing: Occupied Bandwidth

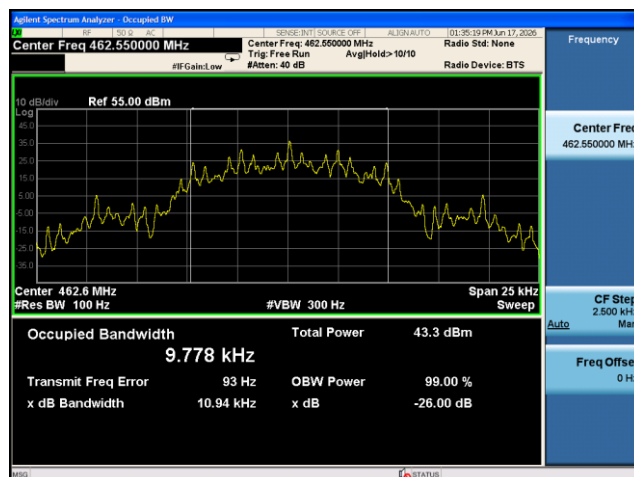
Low: 456.050MHz



Mid: 459.050MHz

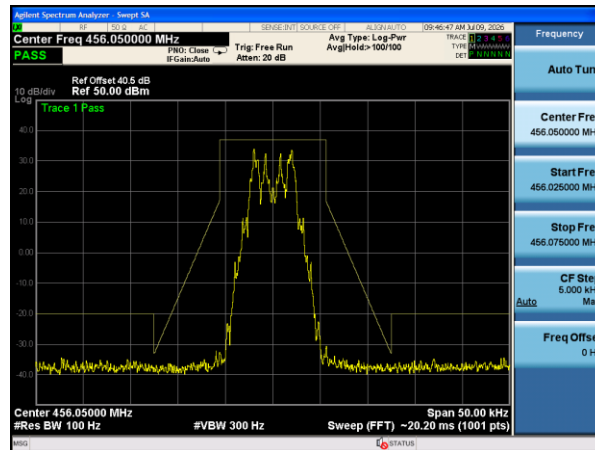


High: 462.550MHz

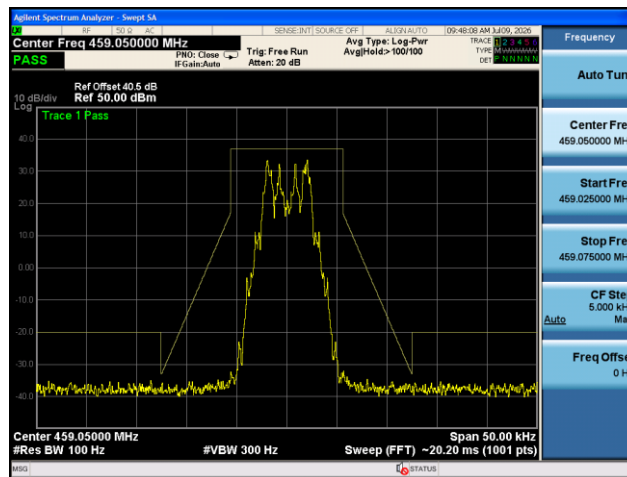


GFSK mode (5W) 12.5KHz Channel Spacing: Emission Mask

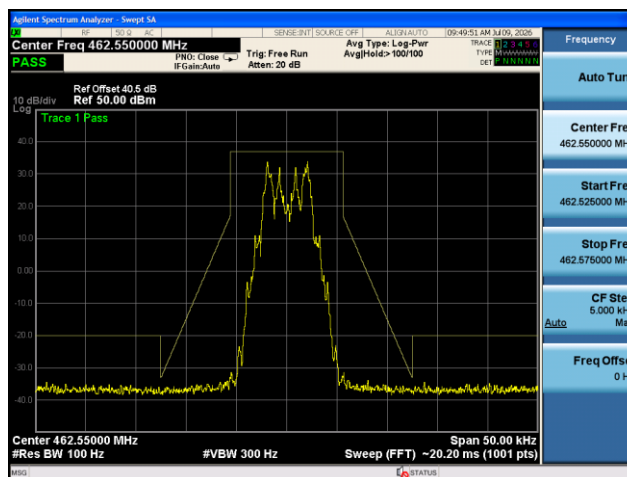
Low: 456.050MHz



Mid: 459.050MHz

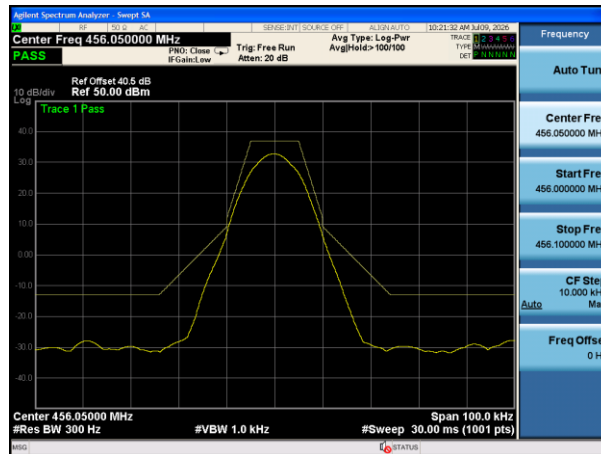


High: 462.550MHz

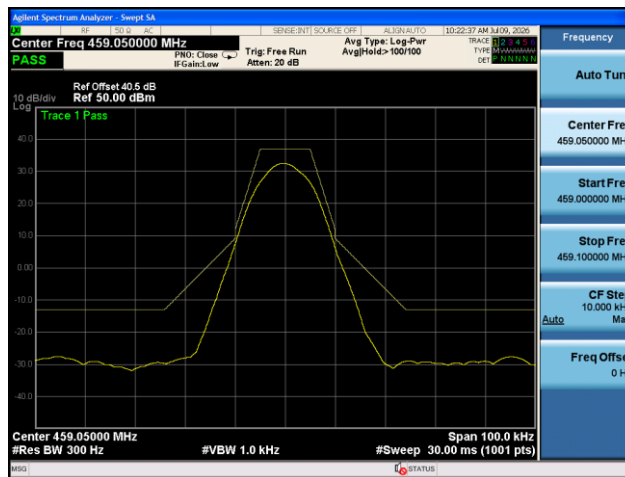


GFSK mode (5W) 25KHz Channel Spacing: Emission Mask

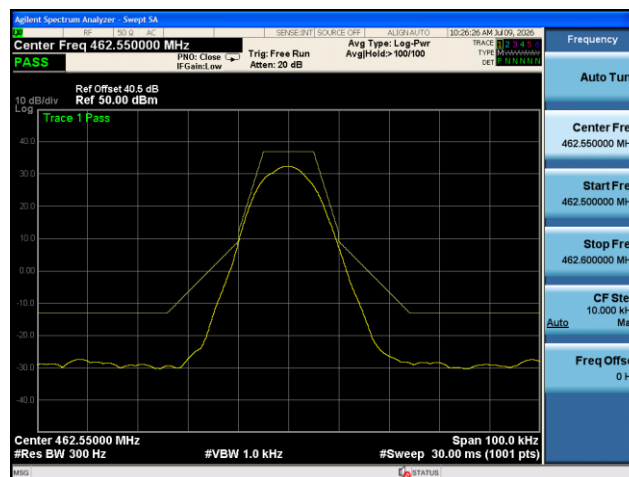
Low: 456.050MHz



Mid: 459.050MHz



High: 462.550MHz



Note: The worst case modes for all test are the item 1.

4.3. Spurious Emissions(conducted)

4.3.1. Test Specification

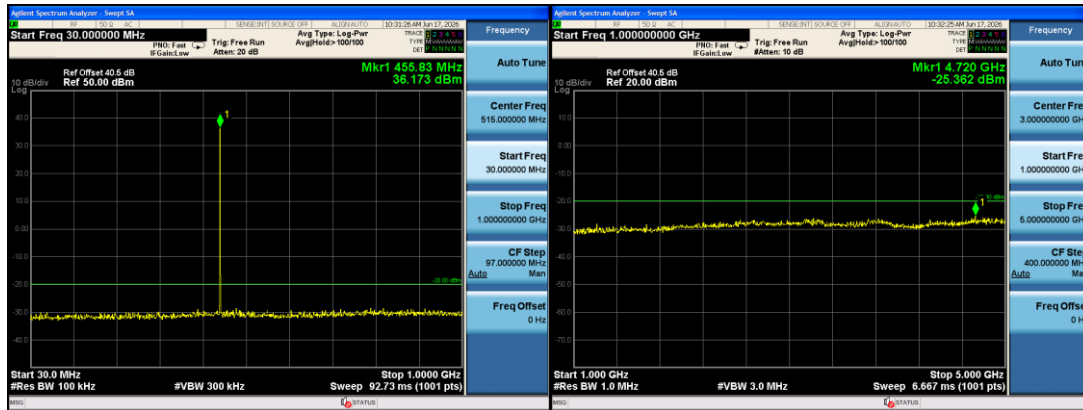
Test Requirement:	FCC Part 90.210
Test Method:	FCC part 2.1051, ANSI C63.26-2015 Section 5.7
Test Setup:	 Spectrum Analyzer EUT
Test Limit:	Modulation Type: GFSK FCC Part 22.359, 74.462, 80.211 and 90.210: For 6.25 bandwidth: On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 4.6 kHz at least: $55 + 10 \log(P)$ or 65 dB, whichever is the lesser attenuation. Calculation: Limit (dBm) = $EL - 55 - 10 \log_{10}(TP)$ Notes: EL is the emission level of the Output Power expressed in dBm, For 12.5 bandwidth: On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 12.5 kHz at least: $50 + 10 \log(P)$ dB or 70 dB, whichever is the lesser attenuation. Calculation: Limit (dBm) = $EL - 50 - 10 \log_{10}(TP)$ Notes: EL is the emission level of the Output Power expressed in dBm, For 25 kHz bandwidth: On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 62.5 kHz at least: Calculation: Limit (dBm) = $EL - 43 - 10 \log_{10}(TP)$ Note: 1. In general, the worst case attenuation requirement shown above was applied. For emission inside from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of channel spacing, emission mask limit should be compliant. 2. The measurement frequency range from 9 KHz to 5 GHz. 3. *** means that the emission level is too low to be measured or at least 20 dB down than the limit. 4. ERP for below 1GHz and EIRP above 1GHz.
Test Result:	PASS

4.3.2. Test Data

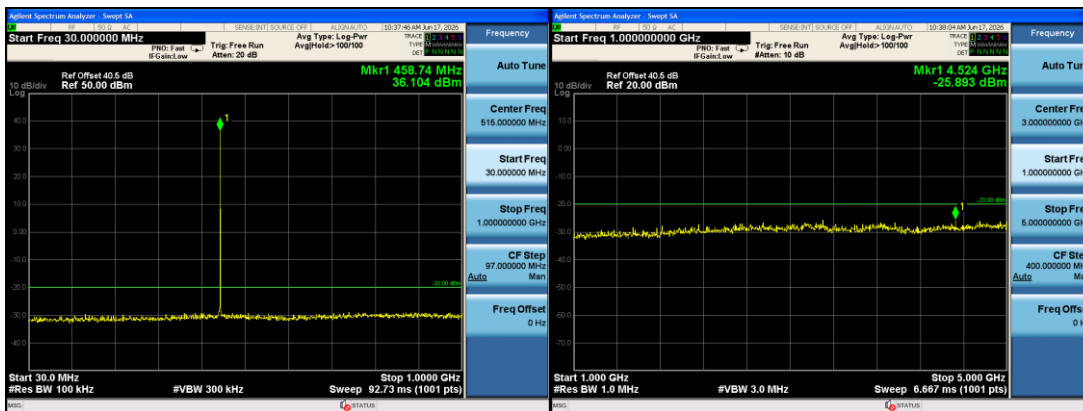
Test plots as follows:

GFSK 12.5KHz Channel Spacing:

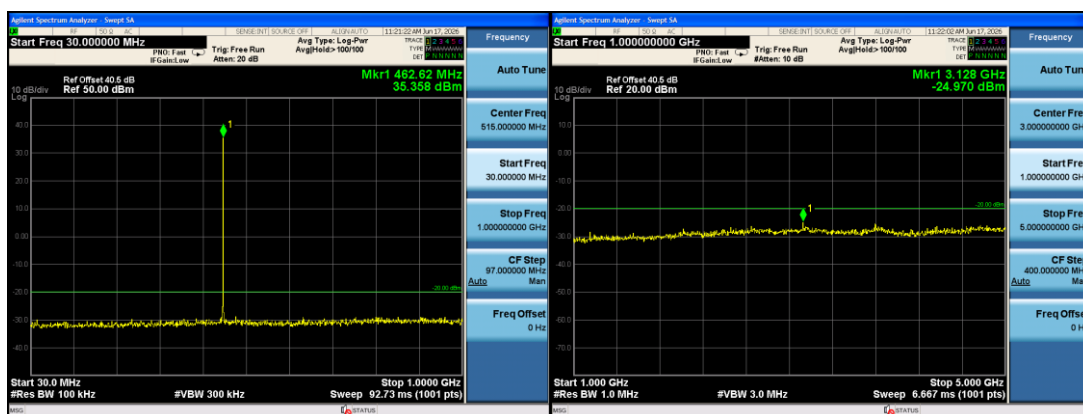
Low: 456.050MHz



Mid: 459.050MHz

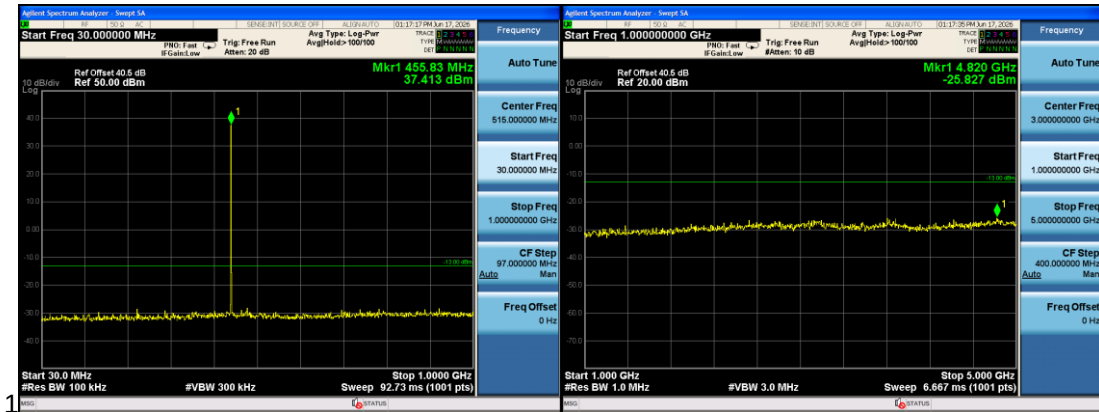


High: 462.550MHz

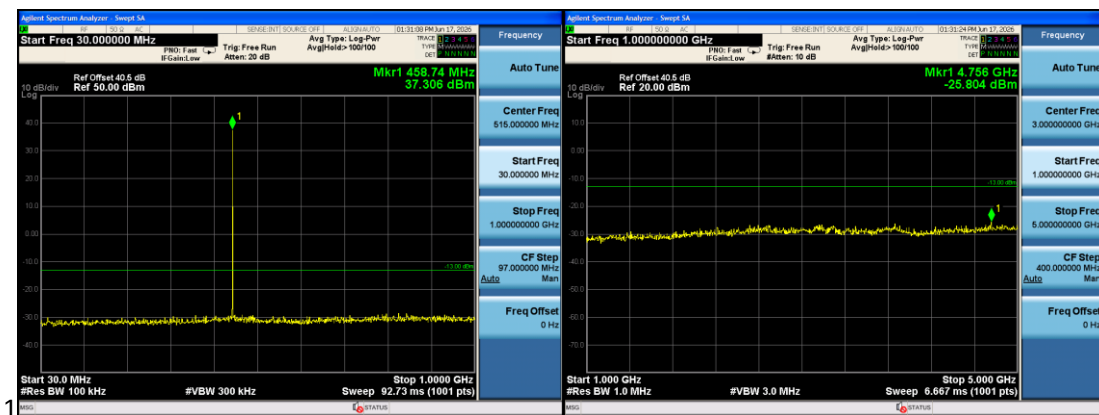


GFSK 25KHz Channel Spacing:

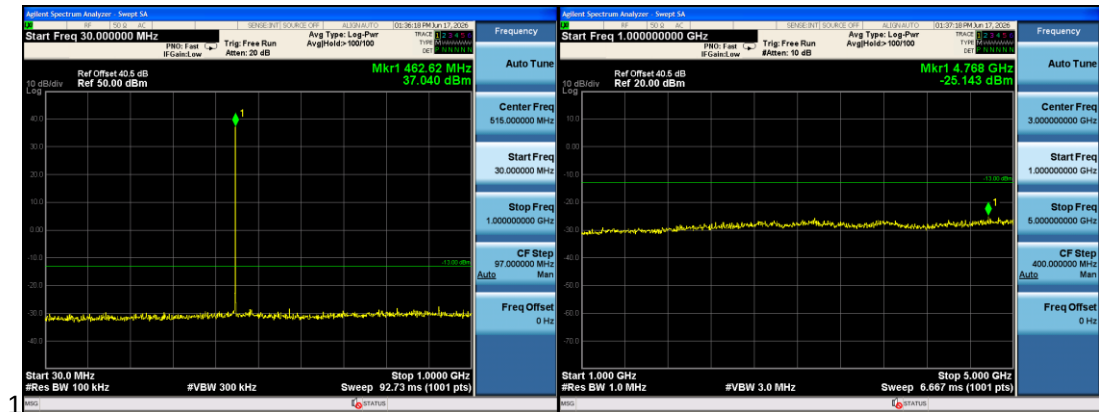
Low: 456.050MHz



Mid: 459.050MHz



High: 462.550MHz

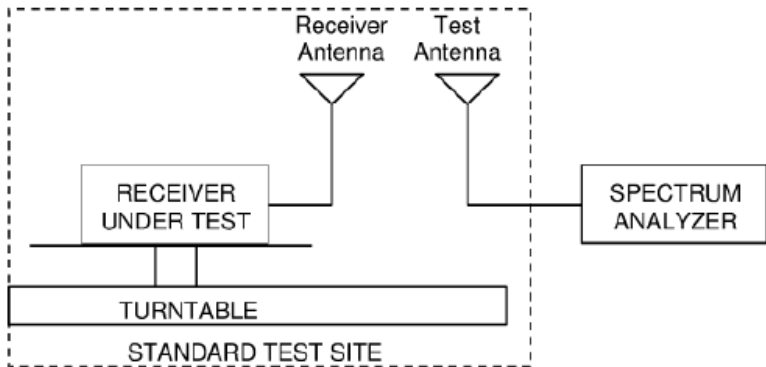


Note:

Pre-scan all mode, and found the 5W power level which it is worse case, so only show the test data for worse case

4.4. Radiated Spurious Emission

4.4.1. Test Specification

Test Requirement:	FCC Part 90.210															
Test Method:	FCC part 2.1051, ANSI C63.26-2015 Section 5.5															
Measurement Distance:	3 m															
Antenna Polarization:	Horizontal & Vertical															
Operation mode:	Refer to item 4.1															
Receiver Setup:	<table><tr><td>Frequency</td><td>RBW</td><td>VBW</td></tr><tr><td>9kHz- 150kHz</td><td>200Hz</td><td>1kHz</td></tr><tr><td>150kHz- 30MHz</td><td>9kHz</td><td>30kHz</td></tr><tr><td>30MHz-1GHz</td><td>100KHz</td><td>300KHz</td></tr><tr><td>Above 1GHz</td><td>1MHz</td><td>3MHz</td></tr></table>	Frequency	RBW	VBW	9kHz- 150kHz	200Hz	1kHz	150kHz- 30MHz	9kHz	30kHz	30MHz-1GHz	100KHz	300KHz	Above 1GHz	1MHz	3MHz
Frequency	RBW	VBW														
9kHz- 150kHz	200Hz	1kHz														
150kHz- 30MHz	9kHz	30kHz														
30MHz-1GHz	100KHz	300KHz														
Above 1GHz	1MHz	3MHz														
Limit:	For equipment using 25 kHz channel spacing, on any frequency removed from the center of the authorized bandwidth by more than 250 percent of the authorized bandwidth: At least $43 + 10\log (P)$ dB. For equipment using 12.5 kHz channel spacing, on any frequency removed from the center of The authorized bandwidth by a displacement frequency (f_d in kHz) of more than 12.5 kHz: At least $50 + 10 \log(P)$ dB or 70 dB, whichever is the lesser attenuation. For equipment using 6.25 kHz channel spacing, On any frequency removed from the center of the authorized bandwidth by more than 4.6 kHz: At least $55 + 10 \log (P)$ or 65 dB, whichever is the lesser attenuation.															
Test setup:	 The diagram illustrates the test setup within a 'STANDARD TEST SITE' (indicated by a dashed box). A 'RECEIVER UNDER TEST' is placed on a 'TURNTABLE'. A 'Receiver Antenna' is connected to the receiver, and a 'Test Antenna' is connected to a 'SPECTRUM ANALYZER'. Both antennas are positioned above the turntable. The entire setup is enclosed within the dashed box representing the standard test site.															
Test Procedure:	The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load, which was also placed on the turntable. The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT . The test was performed by placing the EUT on 3-orthogonal axis. The frequency range up to teeth harmonic of the fundamental frequency was investigated. Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a															



	non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution. Spurious emissions in dB =10, 1g (TXpwr in Watts/0.001)-the absolute level
Test results:	PASS

4.4.2. Test Data

Note:

Pre-scan all mode, and found the 5W power level which it is worse case, so only show the test data for worse case

GFSK:

Test Mode: Low: 456.050MHz, Channel Spacing 12.5KHz

Frequency (MHz)	Reading level (dBm)	Antenna Polarization	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)
153.599	-93.337	V	0.24	31.35	-62.227	-20	-42.227
359.212	-91.725	V	0.26	31.34	-60.645	-20	-40.645
671.928	-96.501	V	0.42	31.24	-65.681	-20	-45.681
818.623	-97.371	V	0.58	30.71	-67.241	-20	-47.241
1230.482	-81.027	V	1.23	26.38	-55.877	-20	-35.877
3864.905	-78.609	V	1.68	25.47	-54.819	-20	-34.819
285.850	-98.322	H	0.43	31.24	-67.512	-20	-47.512
400.852	-93.530	H	0.45	30.68	-63.300	-20	-43.300
674.514	-98.215	H	0.64	30.85	-68.005	-20	-48.005
821.905	-96.709	H	0.79	31.12	-66.379	-20	-46.379
1230.733	-82.281	H	1.29	26.12	-57.451	-20	-37.451
3260.488	-81.988	H	1.62	25.41	-58.198	-20	-38.198

Test Mode: Mid: 459.050MHz, Channel Spacing 12.5KHz

Frequency (MHz)	Reading level (dBm)	Antenna Polarization	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)
156.949	-91.799	V	0.24	31.35	-60.689	-20	-40.689
367.061	-92.898	V	0.26	31.34	-61.818	-20	-41.818
671.503	-98.911	V	0.42	31.24	-68.091	-20	-48.091
882.896	-98.130	V	0.58	30.71	-68.000	-20	-48.000
1322.303	-88.179	V	1.23	26.38	-63.029	-20	-43.029
3860.745	-81.421	V	1.68	25.47	-57.631	-20	-37.631
292.624	-93.286	H	0.43	31.24	-62.476	-20	-42.476
399.526	-93.973	H	0.45	30.68	-63.743	-20	-43.743
683.437	-95.401	H	0.64	30.85	-65.191	-20	-45.191
878.438	-95.359	H	0.79	31.12	-65.029	-20	-45.029
1321.052	-82.613	H	1.29	26.12	-57.783	-20	-37.783
3262.627	-76.741	H	1.62	25.41	-52.951	-20	-32.951



Test Mode: High: 462.550MHz, Channel Spacing 12.5KHz

Frequency (MHz)	Reading level (dBm)	Antenna Polarization	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)
150.510	-92.380	V	0.24	31.35	-61.270	-20	-41.270
365.490	-96.140	V	0.26	31.34	-65.060	-20	-45.060
674.517	-98.389	V	0.42	31.24	-67.569	-20	-47.569
941.167	-94.932	V	0.58	30.71	-64.802	-20	-44.802
1412.637	-84.733	V	1.23	26.38	-59.583	-20	-39.583
3859.259	-80.408	V	1.68	25.47	-56.618	-20	-36.618
289.963	-96.321	H	0.43	31.24	-65.511	-20	-45.511
407.760	-92.561	H	0.45	30.68	-62.331	-20	-42.331
678.028	-96.569	H	0.64	30.85	-66.359	-20	-46.359
938.249	-98.388	H	0.79	31.12	-68.058	-20	-48.058
1410.518	-85.163	H	1.29	26.12	-60.333	-20	-40.333
3262.653	-81.515	H	1.62	25.41	-57.725	-20	-37.725



Test Mode: Low: 456.050MHz, Channel Spacing 25KHz

Frequency (MHz)	Reading level (dBm)	Antenna Polarization	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)
152.429	-96.578	V	0.24	31.35	-65.468	-13	-52.468
361.575	-94.010	V	0.26	31.34	-62.930	-13	-49.930
675.283	-93.534	V	0.42	31.24	-62.714	-13	-49.714
818.565	-94.127	V	0.58	30.71	-63.997	-13	-50.997
1232.895	-84.944	V	1.23	26.38	-59.794	-13	-46.794
3859.343	-82.742	V	1.68	25.47	-58.952	-13	-45.952
290.494	-92.017	H	0.43	31.24	-61.207	-13	-48.207
401.957	-96.681	H	0.45	30.68	-66.451	-13	-53.451
677.502	-95.938	H	0.64	30.85	-65.728	-13	-52.728
818.138	-94.755	H	0.79	31.12	-64.425	-13	-51.425
1228.333	-83.606	H	1.29	26.12	-58.776	-13	-45.776
3256.707	-78.285	H	1.62	25.41	-54.495	-13	-41.495

Test Mode: Mid: 459.050MHz, Channel Spacing 25KHz

Frequency (MHz)	Reading level (dBm)	Antenna Polarization	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)
160.097	-97.721	V	0.24	31.35	-66.611	-13	-53.611
359.968	-93.740	V	0.26	31.34	-62.660	-13	-49.660
668.701	-95.428	V	0.42	31.24	-64.608	-13	-51.608
878.383	-94.143	V	0.58	30.71	-64.013	-13	-51.013
1322.661	-83.553	V	1.23	26.38	-58.403	-13	-45.403
3859.743	-80.433	V	1.68	25.47	-56.643	-13	-43.643
287.426	-95.558	H	0.43	31.24	-64.748	-13	-51.748
407.148	-99.306	H	0.45	30.68	-69.076	-13	-56.076
685.253	-97.806	H	0.64	30.85	-67.596	-13	-54.596
878.344	-96.760	H	0.79	31.12	-66.430	-13	-53.430
1319.655	-82.902	H	1.29	26.12	-58.072	-13	-45.072
3261.204	-80.490	H	1.62	25.41	-56.700	-13	-42.260



Test Mode: High: 462.550MHz, Channel Spacing 25KHz

Frequency (MHz)	Reading level (dBm)	Antenna Polarization	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)
154.419	-92.357	V	0.24	31.35	-61.247	-13	-48.247
362.359	-95.755	V	0.26	31.34	-64.675	-13	-51.675
667.898	-93.009	V	0.42	31.24	-62.189	-13	-49.189
937.198	-94.870	V	0.58	30.71	-64.740	-13	-51.740
1410.648	-80.945	V	1.23	26.38	-55.795	-13	-42.795
3858.315	-76.403	V	1.68	25.47	-52.613	-13	-39.613
291.462	-94.134	H	0.43	31.24	-63.324	-13	-50.324
400.184	-100.017	H	0.45	30.68	-69.787	-13	-56.787
680.518	-99.256	H	0.64	30.85	-69.046	-13	-56.046
937.735	-98.219	H	0.79	31.12	-67.889	-13	-54.889
1405.595	-80.219	H	1.29	26.12	-55.389	-13	-42.389
3263.655	-77.245	H	1.62	25.41	-53.455	-13	-40.455

Note:

1. Emission level = Reading level + Cable loss + Ant.Gain
2. Margin = Emission level – Limit

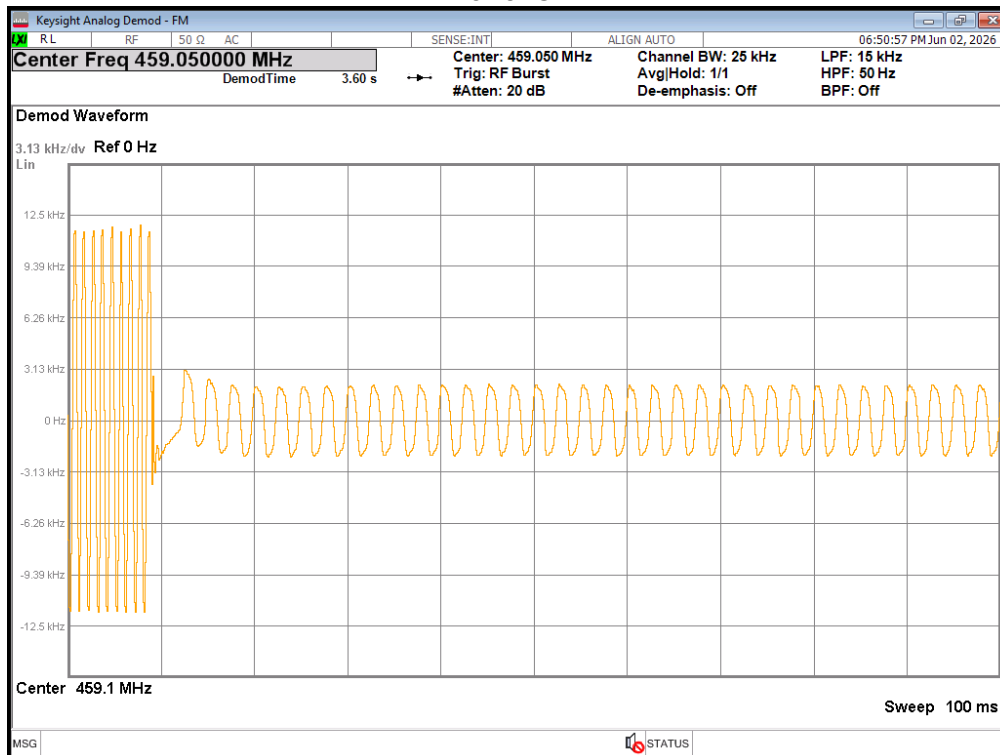
4.5. Transient Frequency Behavior

4.5.1. Test Specification

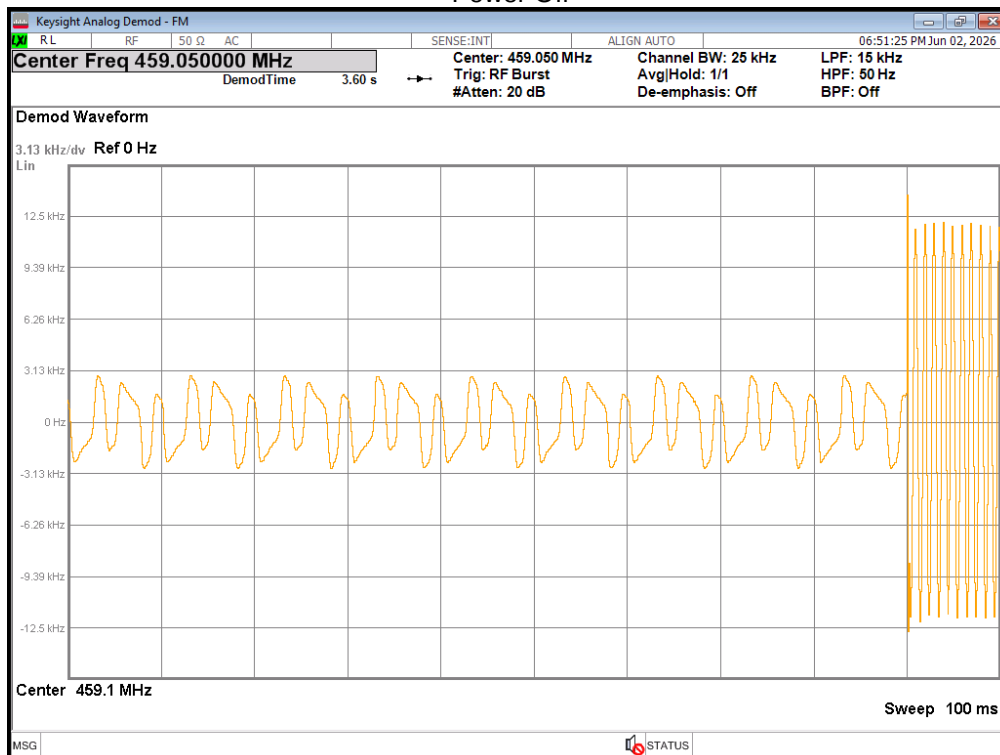
Test Requirement:	FCC Part 90.214																																																		
Test Setup:	 OscilloscopeEUT																																																		
Test Limit	<table><tr><th rowspan="2">Channel Bandwidth (kHz)</th><th rowspan="2">Time Intervals (Notes 1, 2)</th><th rowspan="2">Maximum Frequency Difference (kHz)</th><th colspan="2">Transient Duration Limit (ms)</th></tr><tr><th>138-174 MHz</th><th>406.1-512 MHz</th></tr><tr><td rowspan="3">25</td><td>t₁</td><td>±25</td><td>5</td><td>10</td></tr><tr><td>t₂</td><td>±12.5</td><td>20</td><td>25</td></tr><tr><td>t₃</td><td>±25</td><td>5</td><td>10</td></tr><tr><td rowspan="3">12.5</td><td>t₁</td><td>±12.5</td><td>5</td><td>10</td></tr><tr><td>t₂</td><td>±6.25</td><td>20</td><td>25</td></tr><tr><td>t₃</td><td>±12.5</td><td>5</td><td>10</td></tr><tr><td rowspan="3">6.25</td><td>t₁</td><td>±6.25</td><td>5</td><td>10</td></tr><tr><td>t₂</td><td>±3.125</td><td>20</td><td>25</td></tr><tr><td>t₃</td><td>±6.25</td><td>5</td><td>10</td></tr></table>					Channel Bandwidth (kHz)	Time Intervals (Notes 1, 2)	Maximum Frequency Difference (kHz)	Transient Duration Limit (ms)		138-174 MHz	406.1-512 MHz	25	t ₁	±25	5	10	t ₂	±12.5	20	25	t ₃	±25	5	10	12.5	t ₁	±12.5	5	10	t ₂	±6.25	20	25	t ₃	±12.5	5	10	6.25	t ₁	±6.25	5	10	t ₂	±3.125	20	25	t ₃	±6.25	5	10
Channel Bandwidth (kHz)	Time Intervals (Notes 1, 2)	Maximum Frequency Difference (kHz)	Transient Duration Limit (ms)																																																
			138-174 MHz	406.1-512 MHz																																															
25	t ₁	±25	5	10																																															
	t ₂	±12.5	20	25																																															
	t ₃	±25	5	10																																															
12.5	t ₁	±12.5	5	10																																															
	t ₂	±6.25	20	25																																															
	t ₃	±12.5	5	10																																															
6.25	t ₁	±6.25	5	10																																															
	t ₂	±3.125	20	25																																															
	t ₃	±6.25	5	10																																															
Test Procedure:	The EUT was set in the climate chamber and connected to an external DC power supply and AC power supply. The RF output was directly connected to Oscilloscope. The coupling loss of the additional cables was recorded and taken in account for all the measurements. The result was recorded.																																																		
Test Result:	PASS																																																		

4.5.2. Test Data

Test Plots for channel spacing 12.5KHz, EUT power setting: Maximum.
Power On

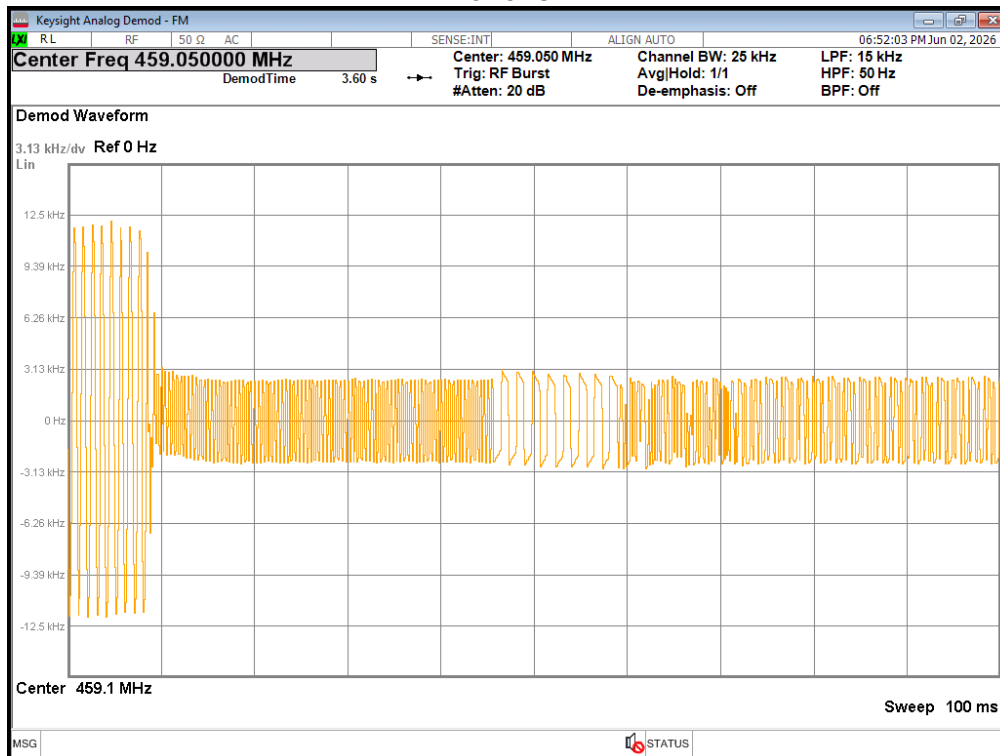


Power Off

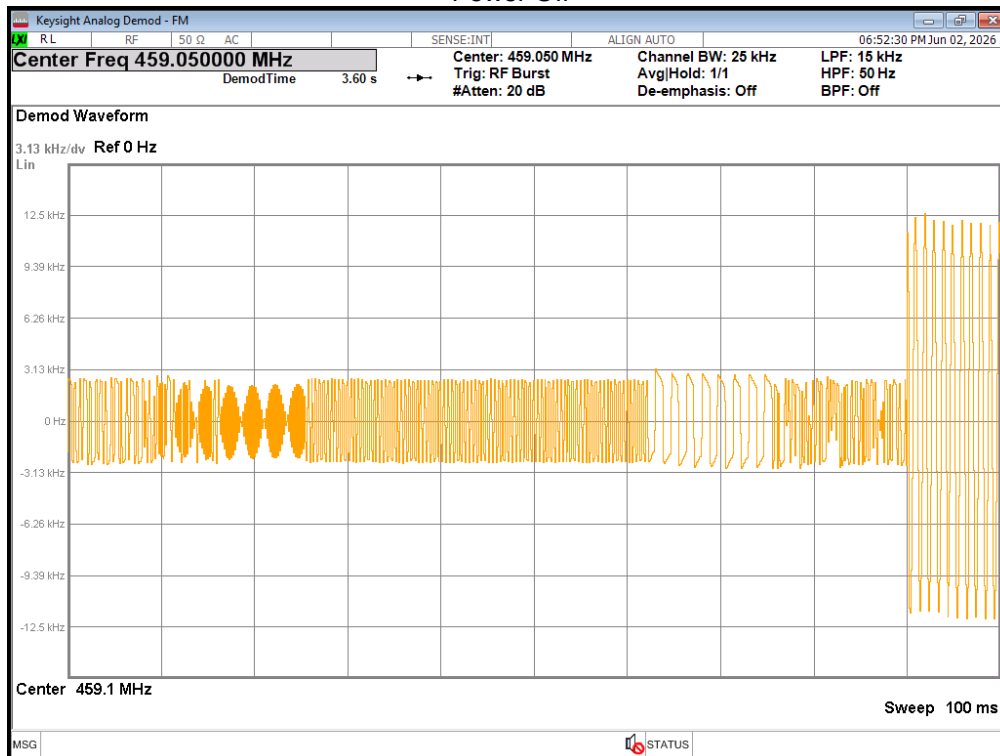




Test Plots for channel spacing 25KHz, EUT power setting: Maximum.
Power On

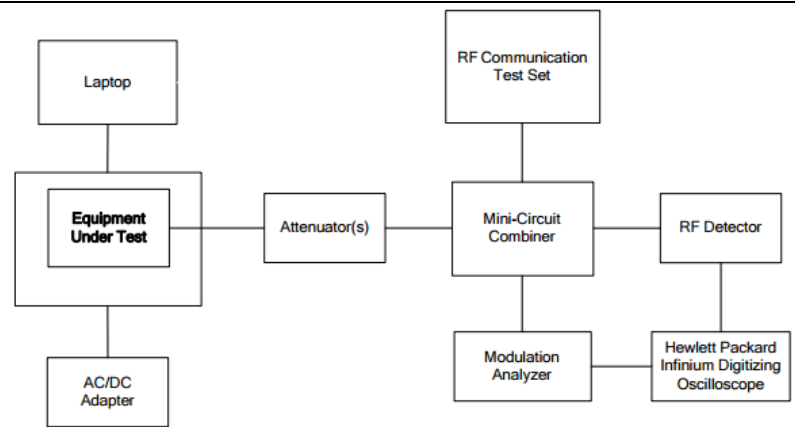


Power Off



4.6. Behavior Frequency Stability

4.6.1. Test Specification

Test Requirement:	FCC Part 90.213
Test Method:	FCC part 2.1055, ANSI C63.26-2015 Section 5.6
Test Setup:	 <pre> graph LR Laptop[Laptop] --- EUT[Equipment Under Test] ACDC[AC/DC Adapter] --- EUT EUT --- Att[Attenuator(s)] Att --- MC[Mini-Circuit Combiner] RFCS[RF Communication Test Set] --- MC MC --- RF[RF Detector] MC --- MA[Modulation Analyzer] RF --- HPO[Hewlett Packard Infinium Digitizing Oscilloscope] </pre>
Test Procedure:	Method of Measurement: After temperature stabilization (approx. 20 min for each stage), the frequency for the lower, the middle and the highest frequency range was recorded. For Frequency stability Vs. Voltage the EUT was connected to a DC power supply or AC power supply and the voltage was adjusted in the required ranges.
Test Result:	PASS



4.6.2. Test Data

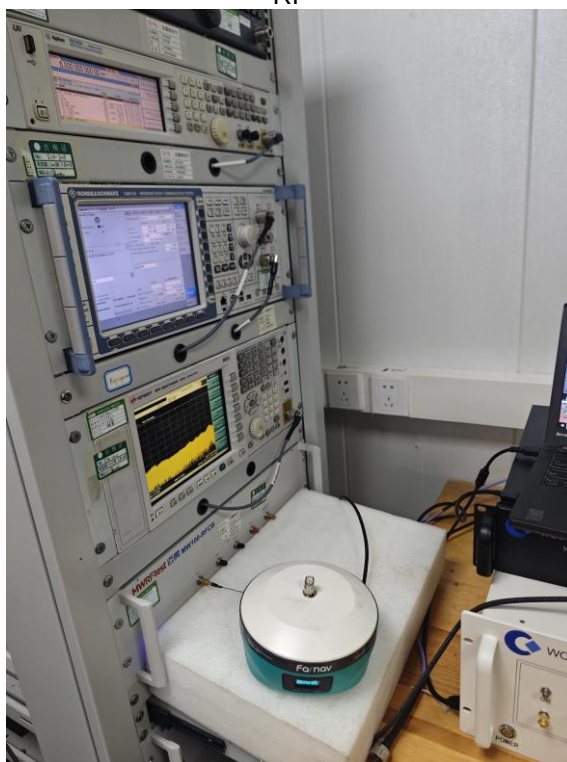
Middle Channel, High Power						
Channel Separation (KHz)	Temp. (°C)	Voltage	Freq. Error (Hz)	Freq. vs. Rated (ppm)		Verdict
				Result	Limit	
12.5	20	LV	23.58	0.054	2.5	Pass
		NV	16.56	0.038	2.5	Pass
		HV	7.37	0.017	2.5	Pass
	-30	NV	12.43	0.028	2.5	Pass
	-20	NV	12.84	0.029	2.5	Pass
	-10	NV	2.48	0.006	2.5	Pass
	0	NV	-2.80	-0.006	2.5	Pass
	10	NV	22.89	0.052	2.5	Pass
	30	NV	29.46	0.067	2.5	Pass
	40	NV	25.15	0.057	2.5	Pass
	50	NV	1.23	0.003	2.5	Pass
25	20	LV	21.10	0.048	5	Pass
		NV	-5.92	-0.013	5	Pass
		HV	-4.31	-0.010	5	Pass
	-30	NV	11.80	0.027	5	Pass
	-20	NV	0.47	0.001	5	Pass
	-10	NV	3.22	0.007	5	Pass
	0	NV	-5.19	-0.012	5	Pass
	10	NV	21.22	0.048	5	Pass
	30	NV	13.62	0.031	5	Pass
	40	NV	-3.43	-0.008	5	Pass
	50	NV	9.85	0.022	5	Pass

5. Test Setup Photo

Radiated Emission



RF



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