



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.: N50
Trade Mark: 
FCC ID: 2A3MU-N50
Applicable standards: FCC CFR Title 47 Part 90, FCC CFR Title 47 Part 2
Test Procedure:: ANSI C63.26-2015
Date of Test: Jan. 20, 2026 – Apr. 10, 2026
Date of report issued: Apr. 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



Authorized Signature



Report Revision History		
Report No.	Description	Issue Date
ET-26041474E	Original	Apr. 10, 2026



Contents

	Page
Contents -----	3
1. Test Summary -----	4
2. General Information -----	5
2.1. General Description of EUT -----	5
2.2. Test frequency channel-----	6
2.3. Test mode-----	6
2.4. EUT configuration-----	6
2.5. Test Environment-----	6
2.6. Test Facility-----	6
2.7. Environmental conditions -----	7
2.8. Measurement Uncertainty -----	7
3. Test Instruments list -----	8
4. Test Results and Measurement Data -----	10
4.1. Transmitter Power (Conducted) -----	10
4.2. Occupied Bandwidth and Emission Mask-----	14
4.3. Spurious Emissions(conducted)-----	20
4.4. Radiated Spurious Emission-----	22
4.5. Transient Frequency Behavior -----	26
4.6. Behavior Frequency Stability -----	28
4.7. Modulation Characteristic -----	30
4.8. Adjacent Channel Power -----	31
5. Test Setup Photo -----	32
5.1. Photos of Radiated Emission-----	32

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 - Audio Frequency Response	FCC PART 2	N/A
Modulation Characteristics - Modulation Limiting	FCC PART 90	N/A
Adjacent channel power	FCC PART 2	N/A

Remark:

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

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/manufacturer. 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.:	N50
Difference in series models	N/A
Test model:	N50
Hardware version:	V1.1.0
Software version:	V1.0
Power supply:	DC 7.2V from battery and DC 5V from adapter
UHF information	
Operation frequency	410MHz-470MHz
Conducted Power	0.5W(26.99±1dBm), 1W(30.00±1dBm)
Channel spacing	12.5KHz
Modulation type	GMSK
Antenna Type:	Whip antenna
Antenna gain:	-3.95dBi
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 1W(30.00±1dBm) results in this report.</i>	

2.2. Test frequency channel

GMSK		
Test Channel	Channel spacing (KHz)	Frequency(MHz)
Low	12.5	410.050
Mid	12.5	440.000
High	12.5	469.950

2.3. Test mode

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

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	6.48V
	VN	7.2V
	VH	7.92V

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	ESC13	100605	2025.3.06	2026.3.05
2	Artificial power network	schwarbeck	NSLK8127	8127483	2025.3.06	2026.3.05
3	Artificial power network	ETS	3186/2NM	1132	2025.3.06	2026.3.05
4	10dB attenuator	HUBER+SUHNER	10dB	/	2025.3.06	2026.3.05
5	Cable 4	HUBER SUNNER	3M	/	2025.3.06	2026.3.05
7	EMI Test Receiver	Rohde&schwarz	ESC17	101032	2025.3.06	2026.3.05
8	Broadband antenna	schwarbeck	VULB9168	1064	2024.3.26	2026.3.25
9	Horn antenna	schwarbeck	BBHA9120D	9120D-1145	2024.3.22	2026.3.21
10	Amplifier	EMtrace	RP01A	50117	2025.3.06	2026.3.05
11	Amplifier	Space-Dtronics	EVLAN0118G-P4	19113001	2025.3.06	2026.3.05
12	Spectrum analyzer	KEYSIGHT	N9020A	MY55370280	2025.3.06	2026.3.05
13	Power detector meter	MWRFtest	MW100-PSB	MW201020JYT	2025.3.06	2026.3.05
14	Signal generator	Agilent	N5182A	MY49060455	2025.3.06	2026.3.05
15	Spectrum analyzer	Rohde&schwarz	FSV40	102137	2025.3.06	2026.3.05
16	Amplifier	SKET	LNPA_1840-50	SK2019040302	2024.3.22	2026.3.21
17	Horn antenna	schwarbeck	BBHA 9170	946	2024.3.26	2026.3.25
18	Loop antenna	schwarbeck	FMZB 1519 B	1519	2024.3.26	2026.3.25
19	Cable 6	HUBER SUNNER	0.5M	/	2025.3.06	2026.3.05
20	Cable7	HUBER SUNNER	2.0M	/	2025.3.06	2026.3.05
21	Cable8	HUBER SUNNER	6.0M	/	2025.3.06	2026.3.05
22	Filter	Xin bo	XBLBQ-GTA29	210410-3-2	2025.3.06	2026.3.05
23	Automated filter bank	onscend	JS0806-F	JS0806-F	2025.3.06	2026.3.05

Item	Equipment name	Manufacturer	Model	Serial No.	Calibration date	Due date
1	EMI Test Receiver	Rohde&schwarz	ESC13	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+SUHNER	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	ESC17	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	EVLAN0118G-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



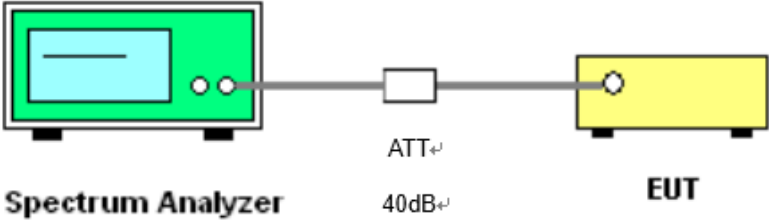
Note: the calibration interval of the above test instruments is 12 or 24 months and the calibrations are traceable to international system unit (SI).

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

4. Test Results and Measurement Data

4.1. Transmitter Power (Conducted)

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:	 The diagram illustrates the test setup. On the left is a green box labeled 'Spectrum Analyzer'. A cable connects its output to a small white box labeled 'ATT' with '40dB' below it. Another cable connects the output of the ATT to a yellow box labeled 'EUT'.
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

GMSK mode (0.5W):						
Channel spacing (KHz)	Frequency (MHz)	Maximum Conducted Output Power(Peak) (dBm)	Maximum ERP (dBm)	Stated ERP Power (dBm)	Conducted Output Power Limit (dBm)	Result
12.5	410.050	26.796	20.696	21.5	26.99±1	PASS
12.5	440.000	27.338	21.238	21.5	26.99±1	PASS
12.5	469.950	27.389	21.289	21.5	26.99±1	PASS

Note: 1. Maximum ERP= Maximum Conducted Output Power(Peak) + Antenna Gain – 2.15dB

GMSK mode (1W):						
Channel spacing (KHz)	Frequency (MHz)	Maximum Conducted Output Power(Peak) (dBm)	Maximum ERP (dBm)	Stated ERP Power (dBm)	Conducted Output Power Limit (dBm)	Result
12.5	410.050	29.856	23.756	24.5	30±1	PASS
12.5	440.000	30.418	24.318	24.5	30±1	PASS
12.5	469.950	30.347	24.247	24.5	30±1	PASS

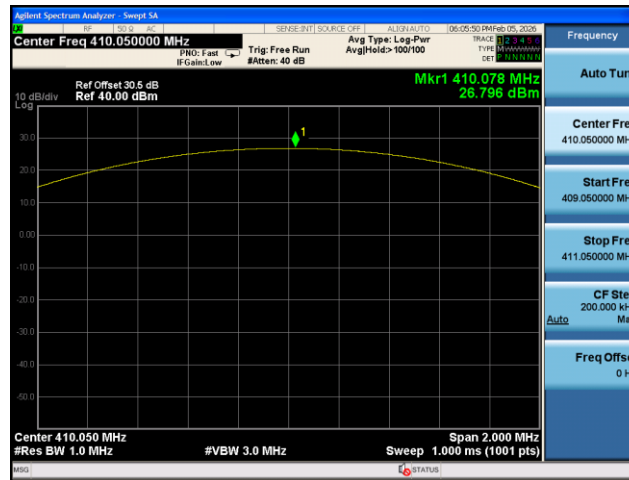
Note: 1. Maximum ERP= Maximum Conducted Output Power(Peak) + Antenna Gain – 2.15dB



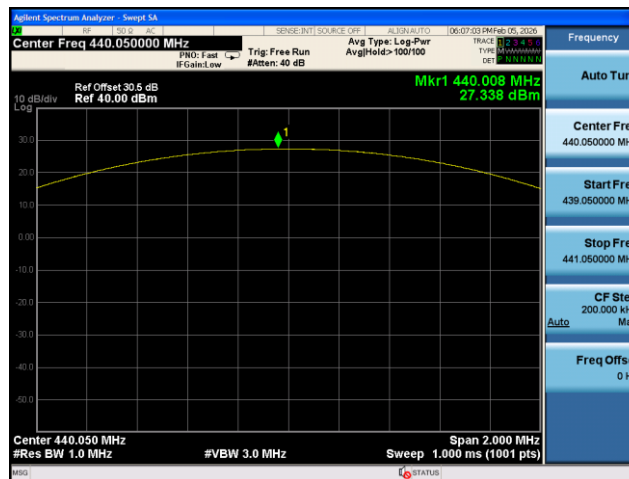
Test plots as follows:

GMSK 0.5W 12.5KHz Channel Spacing: Transmitter Power

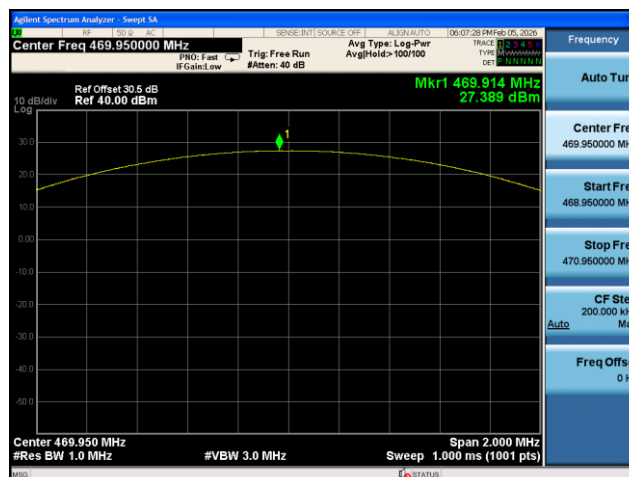
Low: 410.050MHz



Mid: 440.000MHz



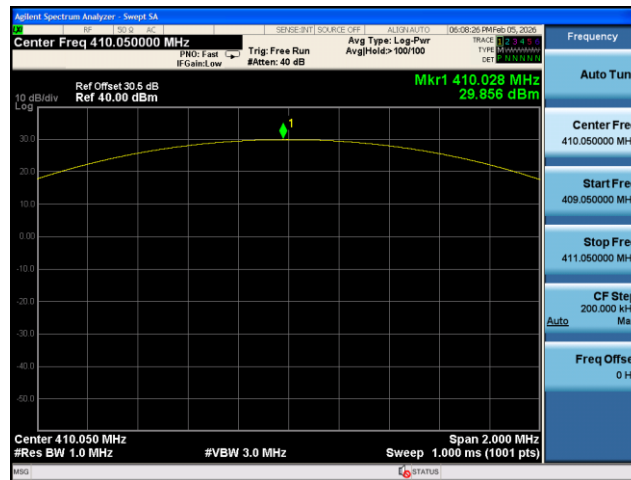
High: 470.00MHz



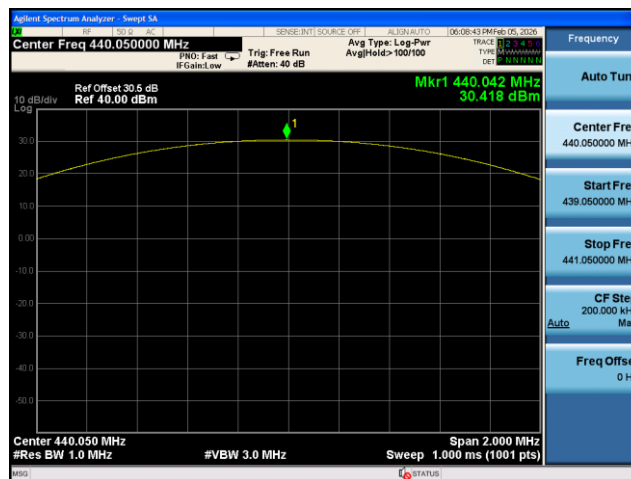


GMSK 1W 12.5KHz Channel Spacing: Transmitter Power

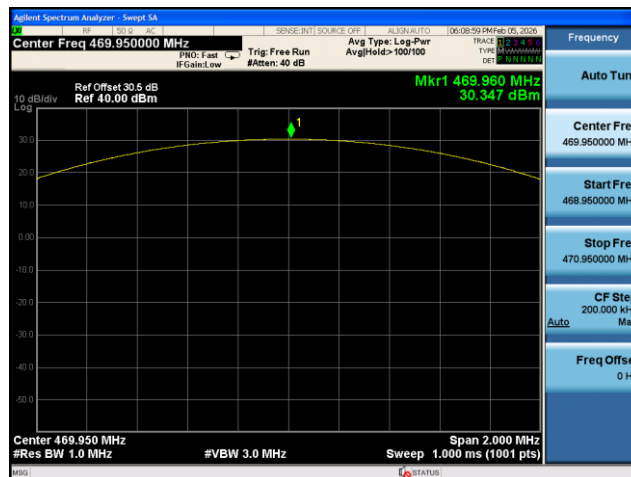
Low: 410.050MHz



Mid: 440.000MHz

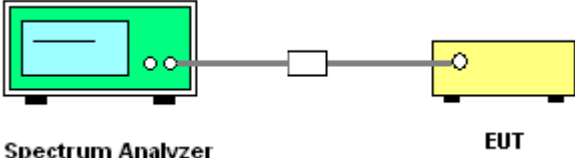


High: 470.00MHz



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 small white box, which in turn connects to a yellow box on the right labeled 'EUT' with a single red dot representing a port.
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:

GMSK mode (0.5W) 12.5KHz Channel Spacing:

Channel	Frequency (MHz)	26dB Bandwidth (KHz)	99% Occupied Bandwidth (KHz)	99% Occupied Bandwidth Limit (KHz)	Result
Low	410.050	6.560	5.928	11.25	PASS
Mid	440.000	6.421	5.942	11.25	PASS
High	469.950	6.880	5.933	11.25	PASS

GMSK mode (1W) 12.5KHz Channel Spacing:

Channel	Frequency (MHz)	26dB Bandwidth (KHz)	99% Occupied Bandwidth (KHz)	99% Occupied Bandwidth Limit (KHz)	Result
Low	410.050	6.583	5.927	11.25	PASS
Mid	440.000	6.835	5.932	11.25	PASS
High	469.950	6.587	5.941	11.25	PASS



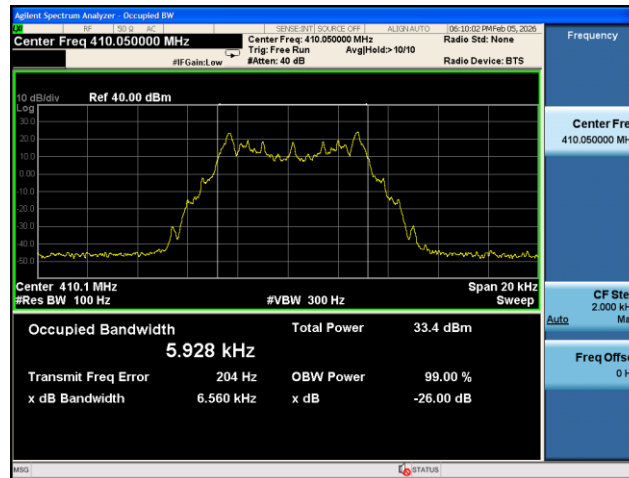
Emission Mask:

GMSK mode (1W) 12.5KHz Channel Spacing:				
Channel	Frequency (MHz)	Applicable Mask	RBW	Result
Low	410.050	D	100Hz	PASS
Mid	440.000	D	100Hz	PASS
High	469.950	D	100Hz	PASS

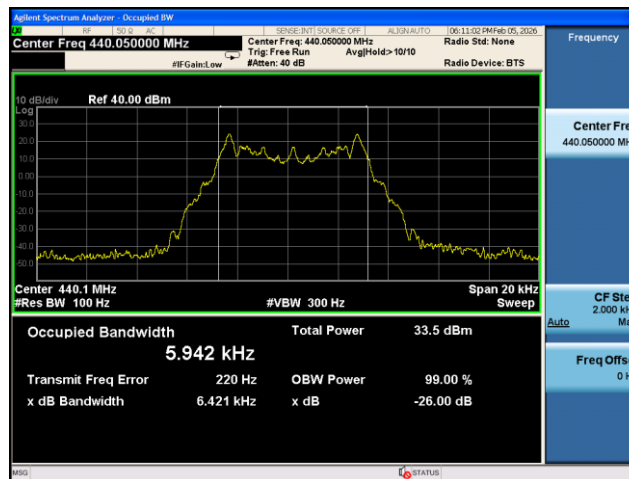
Test plots as follows:

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

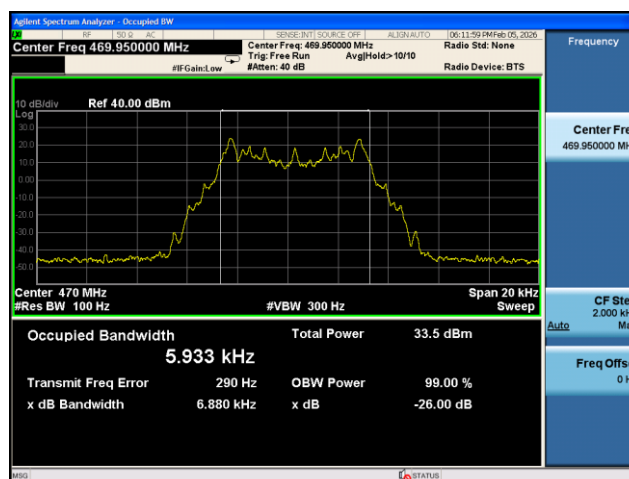
Low: 410.050MHz



Mid: 440.000MHz

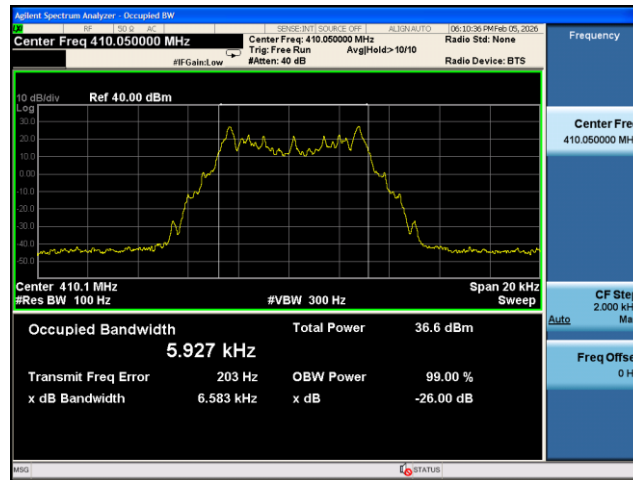


High: 470.00MHz

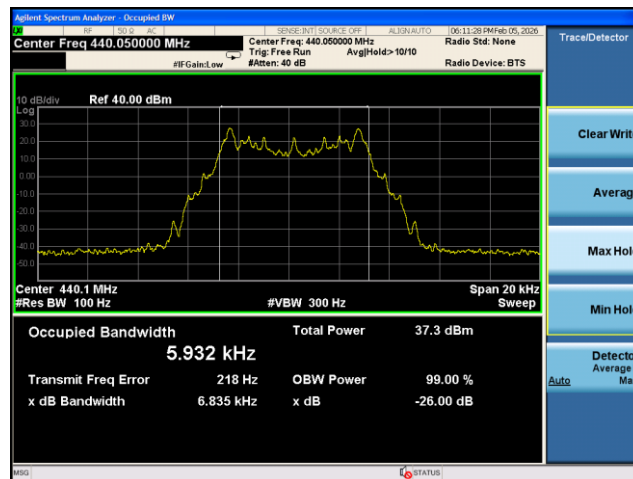


GMSK mode (1W) 12.5KHz Channel Spacing: Occupied Bandwidth

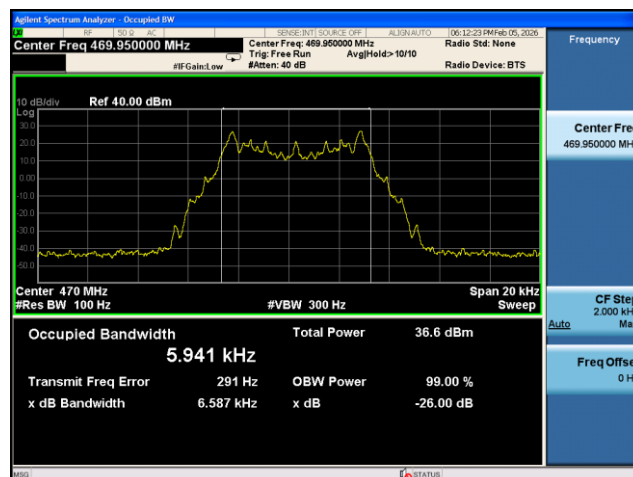
Low: 410.050MHz



Mid: 440.000MHz

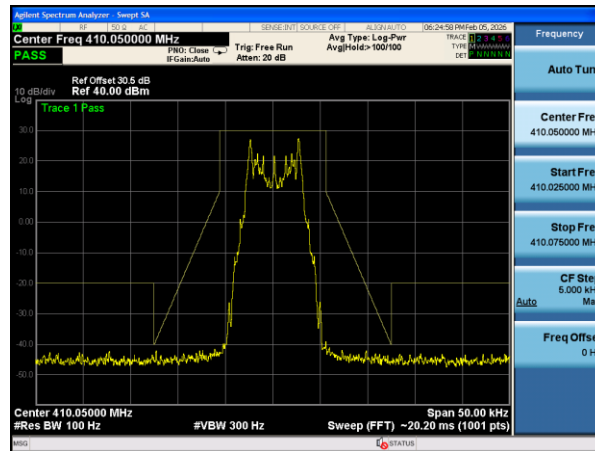


High: 470.00MHz

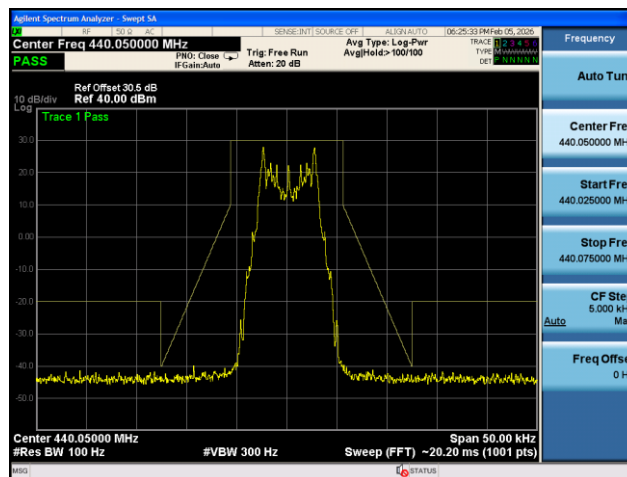


GMSK mode (1W) 12.5KHz Channel Spacing: Emission Mask

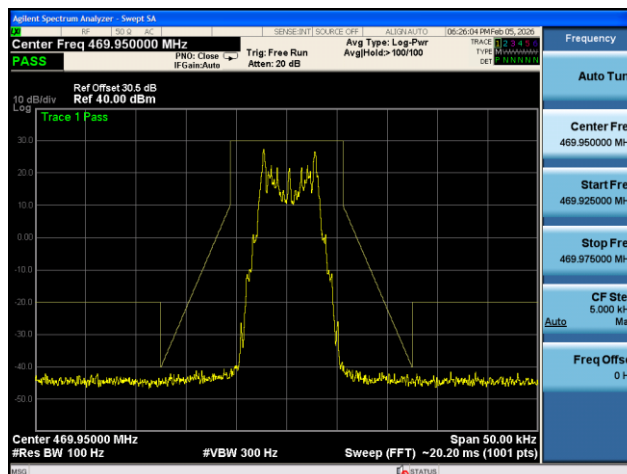
Low: 410.050MHz



Mid: 440.000MHz



High: 469.950MHz



4.3. Spurious Emissions(conducted)

4.3.1.Test Specification

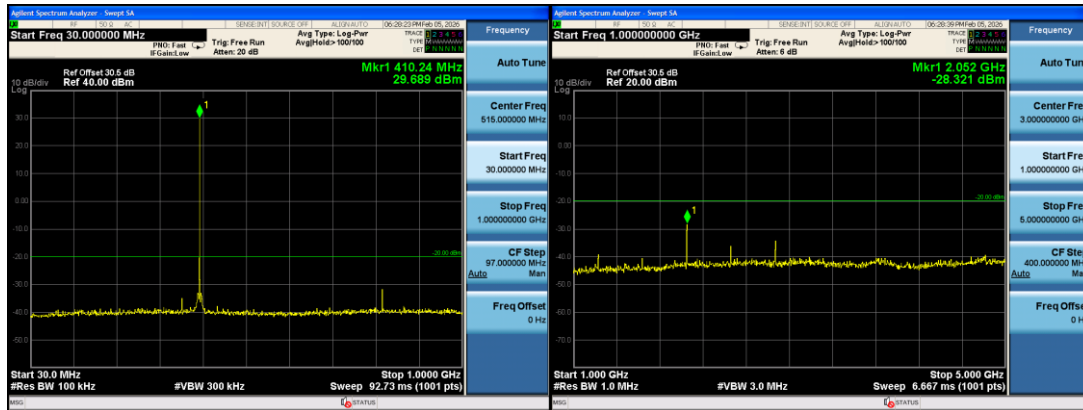
Test Requirement:	FCC Part 90.210
Test Method:	FCC part 2.1051, ANSI C63.26-2015 Section 5.7
Test Setup:	 Spectrum Analyzer EUT
Test Limit:	Modulation Type: GMSK FCC Part 22.359, 74.462, 80.211 and 90.210: For 6.25 bandwidth: On any frequency removed from the center of the authorized bandwidth by a displacement 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-55-10log10 (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-50-10log10 (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-43-10log10 (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

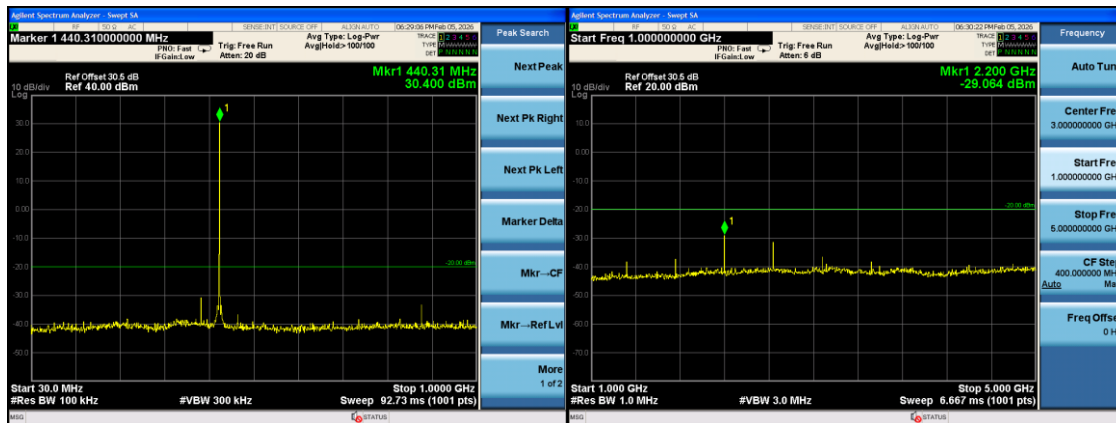
Test plots as follows:

GMSK 12.5KHz Channel Spacing:

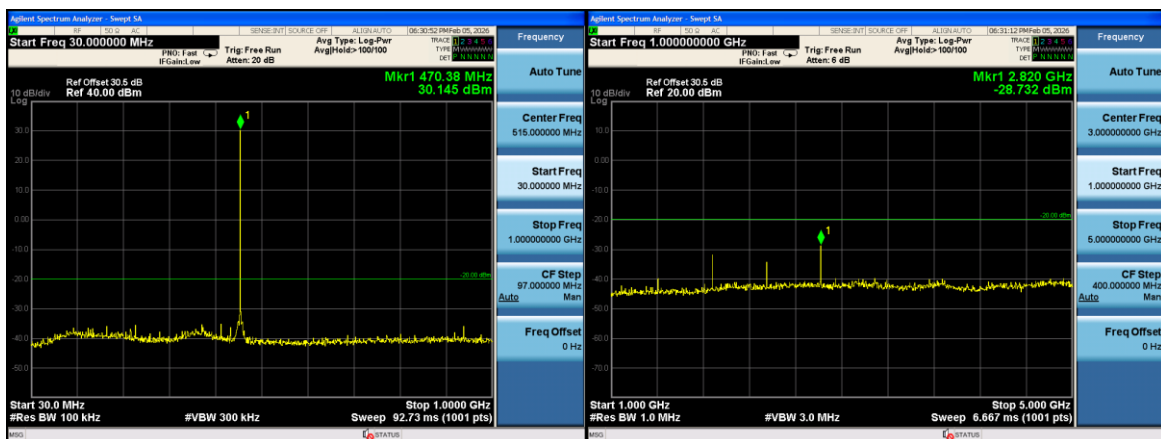
Low: 410.050MHz



Mid: 440.000MHz

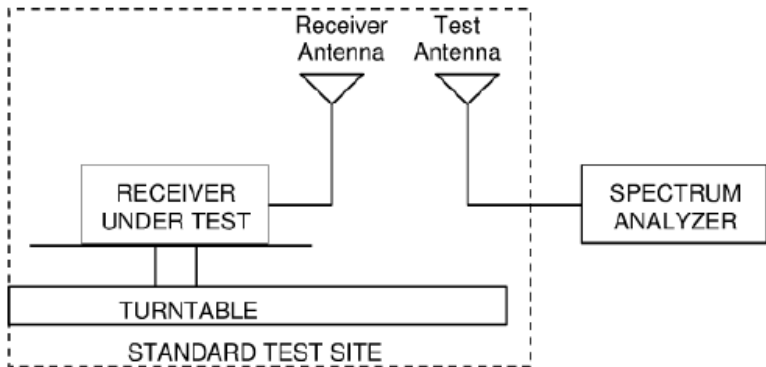


High: 469.950MHz



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:																
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

GMSK:

Test Mode: Low: 410.050MHz, Channel Spacing 12.5KHz

Frequency (MHz)	Reading level (dBm)	Antenna Polarization	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)
152.503	-91.290	V	0.24	31.35	-60.180	-20	-40.180
362.423	-95.598	V	0.26	31.34	-64.518	-20	-44.518
674.114	-96.868	V	0.42	31.24	-66.048	-20	-46.048
820.510	-98.857	V	0.58	30.71	-68.727	-20	-48.727
1231.152	-80.671	V	1.23	26.38	-55.521	-20	-35.521
3863.847	-78.811	V	1.68	25.47	-55.021	-20	-35.021
287.108	-96.976	H	0.43	31.24	-66.166	-20	-46.166
399.940	-94.031	H	0.45	30.68	-63.801	-20	-43.801
677.557	-96.114	H	0.64	30.85	-65.904	-20	-45.904
818.375	-100.713	H	0.79	31.12	-70.383	-20	-50.383
1228.153	-84.372	H	1.29	26.12	-59.542	-20	-39.542
3258.166	-77.865	H	1.62	25.41	-54.075	-20	-34.075

Test Mode: Mid: 440.000MHz, Channel Spacing 12.5KHz

Frequency (MHz)	Reading level (dBm)	Antenna Polarization	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)
156.608	-94.536	V	0.24	31.35	-63.426	-20	-43.426
365.967	-90.736	V	0.26	31.34	-59.656	-20	-39.656
670.305	-94.610	V	0.42	31.24	-63.790	-20	-43.790
878.553	-96.118	V	0.58	30.71	-65.988	-20	-45.988
1320.672	-90.534	V	1.23	26.38	-65.384	-20	-45.384
3859.827	-79.151	V	1.68	25.47	-55.361	-20	-35.361
288.296	-100.199	H	0.43	31.24	-69.389	-20	-49.389
399.027	-99.483	H	0.45	30.68	-69.253	-20	-49.253
682.483	-99.462	H	0.64	30.85	-69.252	-20	-49.252
879.364	-102.988	H	0.79	31.12	-72.658	-20	-52.658
1320.483	-85.980	H	1.29	26.12	-61.150	-20	-41.150
3262.627	-79.713	H	1.62	25.41	-55.923	-20	-35.923



Test Mode: High: 469.950MHz, Channel Spacing 12.5KHz

Frequency (MHz)	Reading level (dBm)	Antenna Polarization	Cable loss (dB)	Ant.Gain (dBi)	Emission level (dBm)	Limit (dBm)	Margin (dB)
149.629	-94.548	V	0.24	31.35	-63.438	-20	-43.438
362.648	-93.052	V	0.26	31.34	-61.972	-20	-41.972
670.705	-95.860	V	0.42	31.24	-65.040	-20	-45.040
942.609	-97.669	V	0.58	30.71	-67.539	-20	-47.539
1408.728	-86.349	V	1.23	26.38	-61.199	-20	-41.199
3857.577	-81.773	V	1.68	25.47	-57.983	-20	-37.983
293.114	-96.678	H	0.43	31.24	-65.868	-20	-45.868
404.099	-95.131	H	0.45	30.68	-64.901	-20	-44.901
678.151	-96.673	H	0.64	30.85	-66.463	-20	-46.463
939.683	-97.222	H	0.79	31.12	-66.892	-20	-46.892
1408.882	-83.627	H	1.29	26.12	-58.797	-20	-38.797
3262.626	-81.095	H	1.62	25.41	-57.305	-20	-37.305

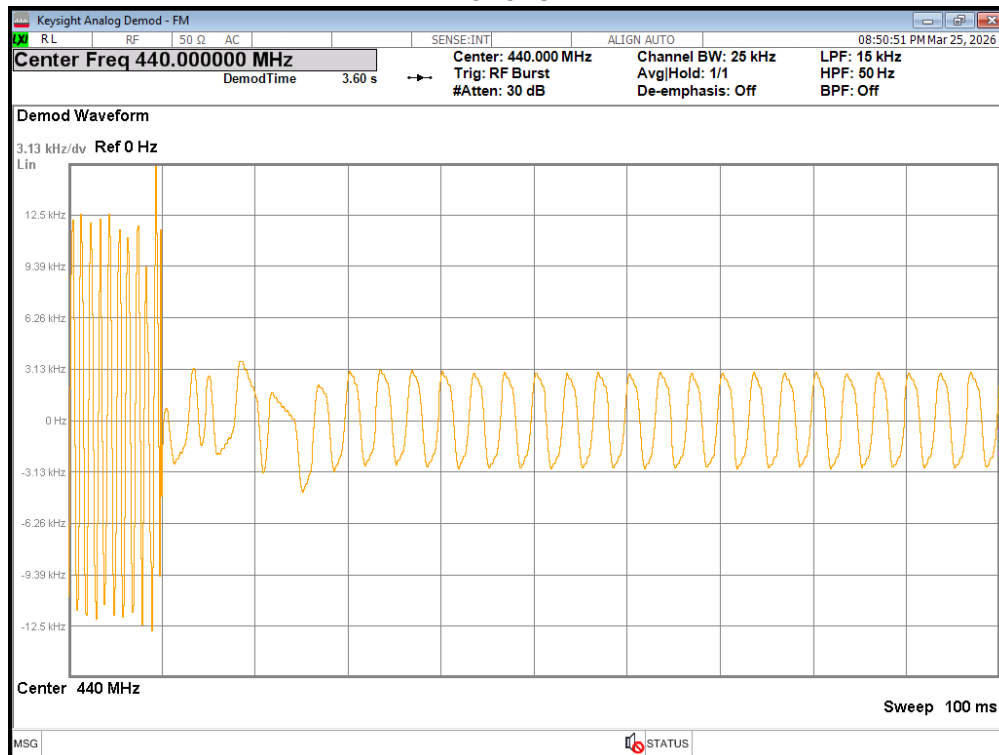
4.5. Transient Frequency Behavior

4.5.1. Test Specification

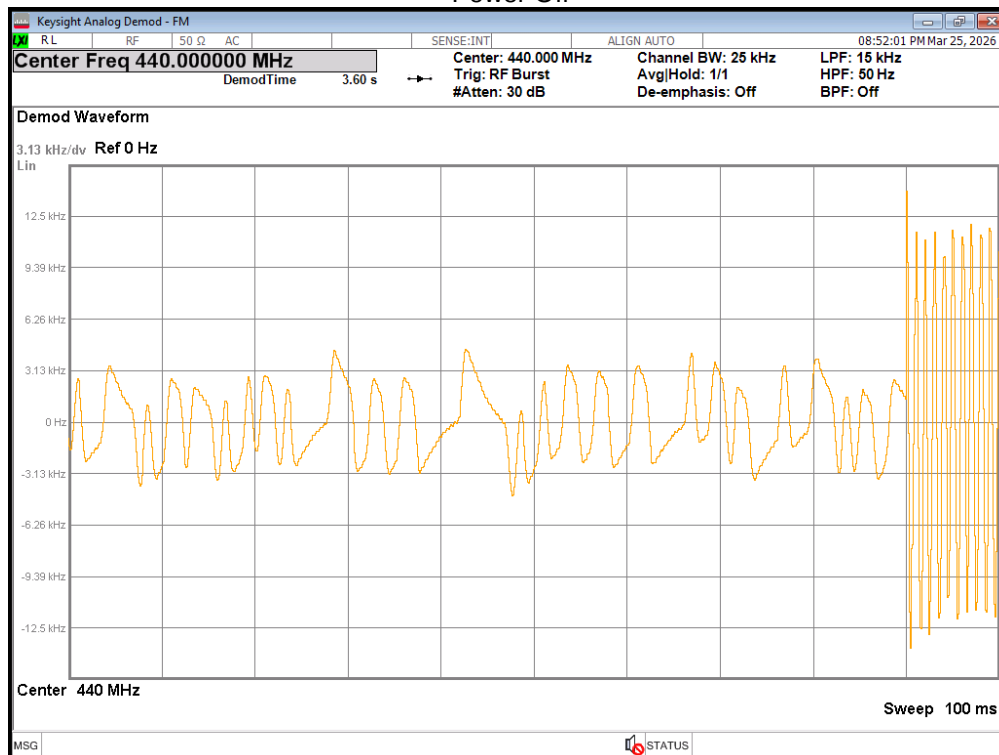
Test Requirement:	FCC Part 90.214																																																		
Test Setup:	 OscilloscopeEUT																																																		
Test Limit	<table><tr><th rowspan="2">Channel Bandwidth (kHz)</th><th rowspan="2">Time Intervals (Notes 1, 2)</th><th rowspan="2">Maximum 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

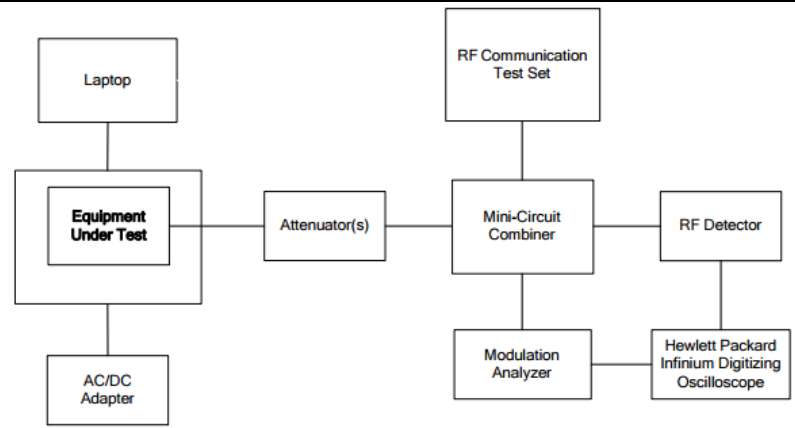


Power Off



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] EUT --- ACDC[AC/DC Adapter] EUT --- Att[Attenuator(s)] Att --- MC[Mini-Circuit Combiner] MC --- RFTS[RF Communication Test Set] MC --- MA[Modulation Analyzer] MC --- RFDR[RF Detector] RFDR --- 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

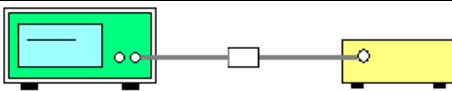
Conclusion: PASS			
Mode	Voltage (V)	Frequency error (Hz)	frequency error (ppm)
Middle Channel 12.5KHz Channel Spacing	5	16.20	0.037
	6	8.26	0.019
	7	2.31	0.005
	8	-9.71	-0.022
	9	1.30	0.003
	10	29.86	0.068
Limit	2.5ppm		

Mode	Temperature (°C)	Frequency error (Hz)	frequency error (ppm)
Middle Channel 12.5KHz Channel Spacing	-30	-0.98	-0.002
	-20	-4.65	-0.011
	-10	12.83	0.029
	0	28.81	0.065
	10	-8.16	-0.019
	20	-5.90	-0.013
	30	1.18	0.003
	40	27.65	0.063
	50	13.20	0.030
Limit	2.5ppm		

4.7. Modulation Characteristic

Test Requirement:	FCC Part 90.207
Test Result:	According to FCC § 2.1047(d), Part 22, 74, 90 there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

4.8. Adjacent Channel Power

Test Requirement:	FCC Part 90.221												
Test Setup:	 Spectrum AnalyzerEUT												
Test Limit:	Maximum adjacent power levels for frequencies in the 450–470 MHz band, no need compliance with below -36dBm: <table><thead><tr><th>Frequency offset</th><th>Maximum ACP (dBc) for devices 1 watt and less</th><th>Maximum ACP (dBc) for devices above 1 watt</th></tr></thead><tbody><tr><td>25 kHz</td><td>– 55 dBc</td><td>– 60 dBc</td></tr><tr><td>50 kHz</td><td>– 70 dBc</td><td>– 70 dBc</td></tr><tr><td>75 kHz</td><td>– 70 dBc</td><td>– 70 dBc</td></tr></tbody></table>	Frequency offset	Maximum ACP (dBc) for devices 1 watt and less	Maximum ACP (dBc) for devices above 1 watt	25 kHz	– 55 dBc	– 60 dBc	50 kHz	– 70 dBc	– 70 dBc	75 kHz	– 70 dBc	– 70 dBc
Frequency offset	Maximum ACP (dBc) for devices 1 watt and less	Maximum ACP (dBc) for devices above 1 watt											
25 kHz	– 55 dBc	– 60 dBc											
50 kHz	– 70 dBc	– 70 dBc											
75 kHz	– 70 dBc	– 70 dBc											
Test method:	The resolution bandwidth of the spectrum analyzer was set at 100 Hz and the spectrum was recorded in the Frequency band 0Kz from the wanted frequency												
Test result:	N/A, according to FCC Part 90.221 (a), there are no specific requirements for devices with a 12.5KHz channel bandwidth												

5. Test Setup Photo

5.1. Photos of Radiated Emission



----- END OF REPORT-----