TEST REPORT

Applicant Name :	Shenzhen Ysair Technology Co., LTD
Address :	6/F, building 6, Yunli intelligent park, No. 3, Changfa, Middle Road, Yangmei community, Bantian street, Longgang District, Shenzhen, Guangdong China
Report Number :	RA221031-50472E-RF-00B
FCC ID:	2A3OORA86

Test Standard (s)

FCC PART 95

Sample Description

Product Type:	Mobile Radio
Model No.:	RA86
Multiple Model(s) No.:	N/A
Trade Mark:	RETEVIS
Date Received:	2022/10/31
Report Date:	2022/12/02

Test Result:	Pass*

* In the configuration tested, the EUT complied with the standards above.

Prepared and Checked By:

Andy Yu
EMC Engineer

Approved By:

Candy Li
EMC Engineer

Note: This report may contain data that are not covered by the A2LA accreditation and are marked with an asterisk "★ ".
Shenzhen Accurate Technology Co., Ltd. is not responsible for the authenticity of any test data provided by the applicant. Data included from the applicant that may affect test results are marked with an asterisk '*'. Customer model name, addresses, names, trademarks etc. are not considered data.
This report cannot be reproduced except in full, without prior written approval of the Company. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested. This report is valid only with a valid digital signature. The digital signature may be available only under the Adobe software above version 7.0.

TABLE OF CONTENTS

GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

Frequency Range	462MHz Main channels: 462.5500-462.7250MHz 462MHz Interstitial channels: 462.5625-462.7125MHz 467MHz Main channels: 467.5500-467.7250MHz
Rated Output Power	462MHz Main channels: 20Watts(High), 5Watts(Low) 462MHz Interstitial channels: 5Watts 467MHz Main channels: 20Watts(High), 5Watts(Low)
Modulation Technique	FM
Antenna Specification*	2dBi(It is provided by the applicant)
Voltage Range	DC 13.8V
Sample serial number	1O93-2 for Radiated Emissions 1O95-4 for RF Conducted Test (Assigned by ATC)
Sample/EUT Status	Good condition

Objective

This report is in accordance with Part 2 and Part 95, Subpart A & Subpart E of the Federal Communication Commissions rules.

Test Methodology

All tests and measurements indicated in this document were performed in accordance with Part 95 Subpart A, Subpart E of the Federal Communication Commissions rules with TIA-603-E 2016, Land Mobile FM or PM-Communications Equipment-Measurement and Performance Standards, and ANSI C63.26-2015: American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services.

All emissions measurement was performed at Shenzhen Accurate Technology Co., Ltd. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Measurement Uncertainty

Parameter		Uncertainty
Occupied Channel Bandwidth		5%
RF Frequency		$0.082*10^{-7}$
RF output power, conducted		0.73dB
Unwanted Emission, conducted		1.6dB
AC Power Lines Conducted Emissions		2.72dB
Emissions, Radiated	9kHz - 30MHz	2.66dB
	30MHz - 1GHz	4.28dB
	1GHz - 18GHz	4.98dB
	18GHz - 26.5GHz	5.06dB
	26.5GHz - 40GHz	4.72dB
Temperature		1℃
Humidity		6%
Supply voltages		0.4%

Note: The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

Test Facility

The test site used by Shenzhen Accurate Technology Co., Ltd. to collect test data is located on the 1/F., Building A, Changyuan New Material Port, Science & Industry Park, Nanshan District, Shenzhen, Guangdong, P.R. China.

The test site has been approved by the FCC under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No.: 708358, the FCC Designation No.: CN1189. Accredited by American Association for Laboratory Accreditation (A2LA) The Certificate Number is 429 7.01.

Listed by Innovation, Science and Economic Development Canada (ISEDC), the Registration Number is 5077A.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in a typical fashion (as normally used by a typical user).

Description of Channel List

462MHz main channels

Channel No.	Channel Frequency (MHz)	Channel No.	Channel Frequency (MHz)
1	462.5500	2	462.5750
3	462.6000	4	**462.6250**
5	462.6500	6	462.6750
7	462.7000	8	462.7250

462MHz interstitial channels

Channel No.	Channel Frequency (MHz)	Channel No.	Channel Frequency (MHz)
1	462.5625	2	462.5875
3	462.6125	4	**462.6375**
5	462.6625	6	462.6875
7	462.7125	/	/

467MHz main channels

Channel No.	Channel Frequency (MHz)	Channel No.	Channel Frequency (MHz)
1	467.5500	2	467.5750
3	467.6000	4	**467.6250**
5	467.6500	6	467.6750
7	467.7000	8	467.7250

Note: The EUT transmit on these 467MHz main channels only when communicating through a repeater station or making brief test transmissions in accordance with § 95.319(c), and which testing is compliant to this report and will do not cause interference to the communications of other stations.

Equipment Modifications

No modification was made to the EUT tested.

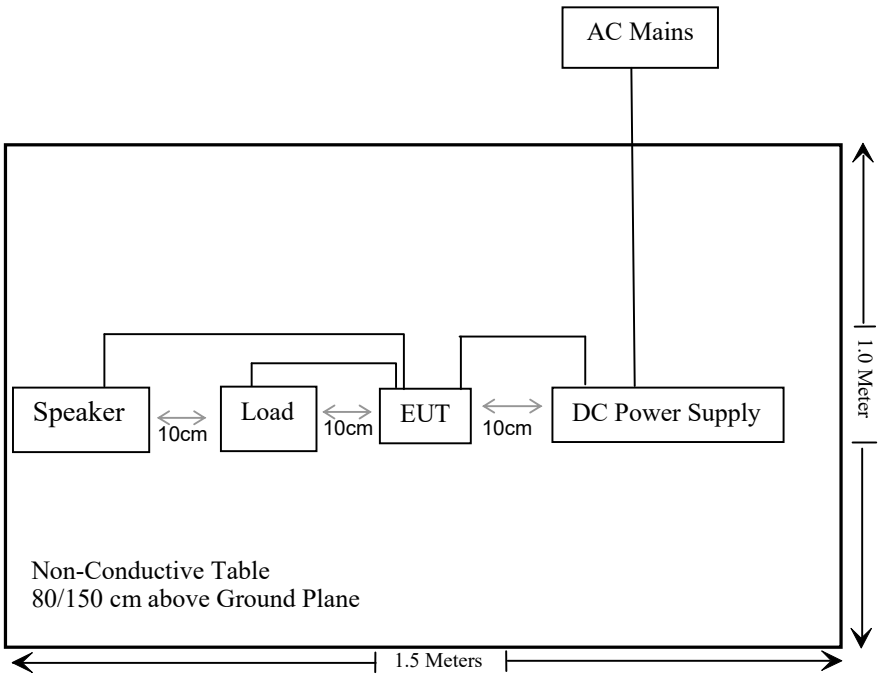
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
UNI-T	DC Power Supply	UTP8305M	Unknown
Unknown	Speaker	Unknown	Unknown
Unknown	Load	Unknown	Unknown

External I/O Cable

Cable Description	Length (m)	From Port	To
Unshielded detachable AC cable	1.5	DC Power Supply	AC Mains
Unshielded Un-detachable DC cable	2.5	DC Power Supply	EUT
Un-shielded detachable Audio cable	1.0	EUT	Speaker
RF cable	1.5	EUT	Load

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Results
§2.1091	MAXIMUM PERMISSIBLE EXPOSURE (MPE)	Compliant
§95.1787	GMRS additional requirements	Not Applicable
§2.1046, §95.1767	RF Output Power	Compliant
§2.1047, §95.1775	Modulation Characteristic	Compliant
§2.1049, §95.1773, §95.1779	Authorized Bandwidth & Emission Mask	Compliant
§2.1051, §95.1779	Spurious Emission at Antenna Terminal	Compliant
§2.1053, §95.1779	Spurious Radiated Emissions	Compliant
§2.1055(d), §95.1765	Frequency Stability	Compliant

Not Applicable: The product has not digital data transmissions function.

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Radiated Emission Test					
Rohde& Schwarz	Test Receiver	ESR	102725	2021/12/13	2022/12/12
Rohde&Schwarz	Spectrum Analyzer	FSV40	101949	2021/12/13	2022/12/12
SONOMA INSTRUMENT	Amplifier	310 N	186131	2022/11/08	2023/11/07
A.H. Systems, inc.	Preamplifier	PAM-0118P	135	2022/11/08	2023/11/07
Schwarzbeck	Bilog Antenna	VULB9163	9163-323	2021/07/06	2024/07/05
Schwarzbeck	Bilog Antenna	VULB9163	9163-194	2020/01/05	2023/01/04
Schwarzbeck	Horn Antenna	BBHA9120D	9120D-1067	2020/01/05	2023/01/04
Schwarzbeck	Horn Antenna	BBHA9120D	9120D-655	2020/01/05	2023/01/04
Radiated Emission Test Software: e3 19821b (V9)					
Unknown	RF Coaxial Cable	No.10	N050	2021/12/14	2022/12/13
Unknown	RF Coaxial Cable	No.11	N1000	2021/12/14	2022/12/13
Unknown	RF Coaxial Cable	No.12	N040	2021/12/14	2022/12/13
Unknown	RF Coaxial Cable	No.13	N300	2021/12/14	2022/12/13
Unknown	RF Coaxial Cable	No.14	N800	2021/12/14	2022/12/13
CD	High Pass Filter	HPM-1.2/18G-60	110	2021/12/14	2022/12/13

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
RF Conducted Test					
Rohde&Schwarz	Spectrum Analyzer	FSV-40	101948	2021/12/13	2022/12/12
SPECTRUM ANALYZER	Rohde & Schwarz	FSU26	200982	2022/07/04	2023/07/03
HP Agilent	RF Communication test set	8920B	3325U00859	2021/12/14	2022/12/13
Aeroflex/Weinschel	30dB Attenuator (Input 250W/Output 50W)	58-30-33	PS467	2021/12/14	2022/12/13
Mini-Circuits	Power Splitter	DC-18000MHz	SF10944151S	2021/12/14	2022/12/13
REALE	Temp. & Humid. Chamber	RHP-800BT	R20170318310	2021/12/14	2022/12/13
UNI-T	DC Power Supply	UTP8305M	Unknown	NCR	NCR
Fluke	Multi Meter	45	7664009	2021/12/14	2022/12/13
Unknown	RF Cable	Unknown	Unknown	Each time	

*** Statement of Traceability:** Shenzhen Accurate Technology Co., Ltd. attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

FCC§2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Applicable Standard

According to subpart 2.1091 systems operating under the provisions of this section shall be operated in a manner that ensures the public is not exposed to RF energy level in excess of the communication guidelines.

Limits for General Population/Uncontrolled Exposure

Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	**Electric Field Strength (V/m)**	**Magnetic Field Strength (A/m)**	**Power Density (mW/cm^2)**	**Averaging Time (Minutes)**
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*($180/f^2$)	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	f/1500	30
1500-100,000	/	/	1.0	30

f = frequency in MHz
* = Plane-wave equivalent power density

Result

Calculated Formulary:

Predication of MPE limit at a given distance

$$S = \frac{PG}{4\pi R^2}$$

S = power density (in appropriate units, e.g. mW/cm^2)
P = power input to the antenna (in appropriate units, e.g., mW).
G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain.
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

For worst case:

Frequency (MHz)	**Tune up conducted power**		**Maximum Antenna Gain**		**Cable loss**	**Duty cycle**	**MPE Limit**	**Minimum safty Distance**
	(dBm)	**(W)**	**(dBi)**	**(numeric)**	**(dB)**	**(%)**	**(mW/cm^2)**	**(cm)**
462.5500-467.7250	43	20	2	1.58	3	50	0.308	45.2

Note: For PTT function, 50% duty cycle was used.
The tune up power, antenna gain and cable loss was provided by applicant.

To maintain compliance with the FCC's RF exposure guidelines, place the equipment at least 45.2cm from nearby persons.

Result: Compliance

FCC §2.1046 & §95.1767 - RF OUTPUT POWER

Applicable Standard

Per FCC §2.1046, and §95.1767, This section contains transmitting power limits for GMRS stations. The maximum transmitting power depends on which channels are being used and the type of station.

(a) 462/467 MHz main channels. The limits in this paragraph apply to stations transmitting on any of the 462 MHz main channels or any of the 467 MHz main channels. Each GMRS transmitter type must be capable of operating within the allowable power range. GMRS licensees are responsible for ensuring that their GMRS stations operate in compliance with these limits.

(1) The transmitter output power of mobile, repeater and base stations must not exceed 50 Watts.

(2) The transmitter output power of fixed stations must not exceed 15 Watts.

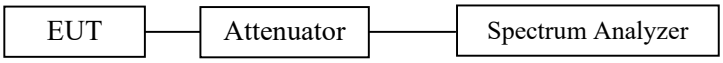
(b) 462 MHz interstitial channels. The effective radiated power (ERP) of mobile, hand-held portable and base stations transmitting on the 462 MHz interstitial channels must not exceed 5 Watts.

(c) 467 MHz interstitial channels. The effective radiated power (ERP) of hand-held portable units transmitting on the 467 MHz interstitial channels must not exceed 0.5 Watt. Each GMRS transmitter type capable of transmitting on these channels must be designed such that the ERP does not exceed 0.5 Watt.

Test Procedure

Test Method: TIA/EIA-603-E 2016.

1) Connect the equipment as below setup block.



2) Correct for all losses in the RF path.
3) Set the RBW of 100kHz and VBW of 300kHz for Spectrum Analyzer.
4) Detector of Peak.
5) Trace mode is Maxhold.
6) Allow trace to fully stabilize.
7) The peak value recorded is the conducted output power.
8) Repeat to test all frequencies.

Test Data

Environmental Conditions

Temperature:	26~28.7 °C
Relative Humidity:	53~55 %
ATM Pressure:	101.0 kPa

The testing was performed by Gleen Jiang on 2022-12-01 and 2022-12-02.

Test Mode: Transmitting

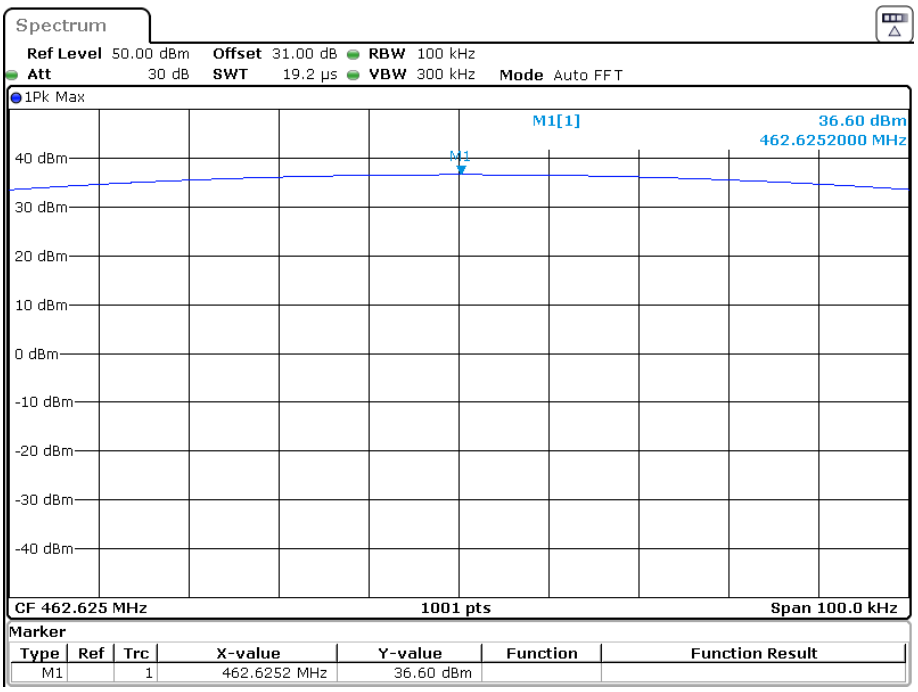
Test Result: Compliance.

Please refer to the following tables and plots.

Channel Spacing (kHz)	Test Frequency (MHz)	Power level	Conducted Output Power (dBm)	Conducted Output Power Limit (dBm)	ERP (dBm)	ERP Limit (dBm)
25	462.6375	/	36.55	/	36.40	37
	462.6250	High	42.50	47	42.35	/
		Low	36.60	47	36.87	/
	467.6250	High	42.30	47	42.15	/
		Low	36.65	47	36.50	/
12.5	462.6375	/	35.39	/	35.24	37
	462.6250	High	42.02	47	41.87	/
		Low	35.40	47	35.25	/
	467.6250	High	41.85	47	41.70	/
		Low	35.42	47	35.27	/

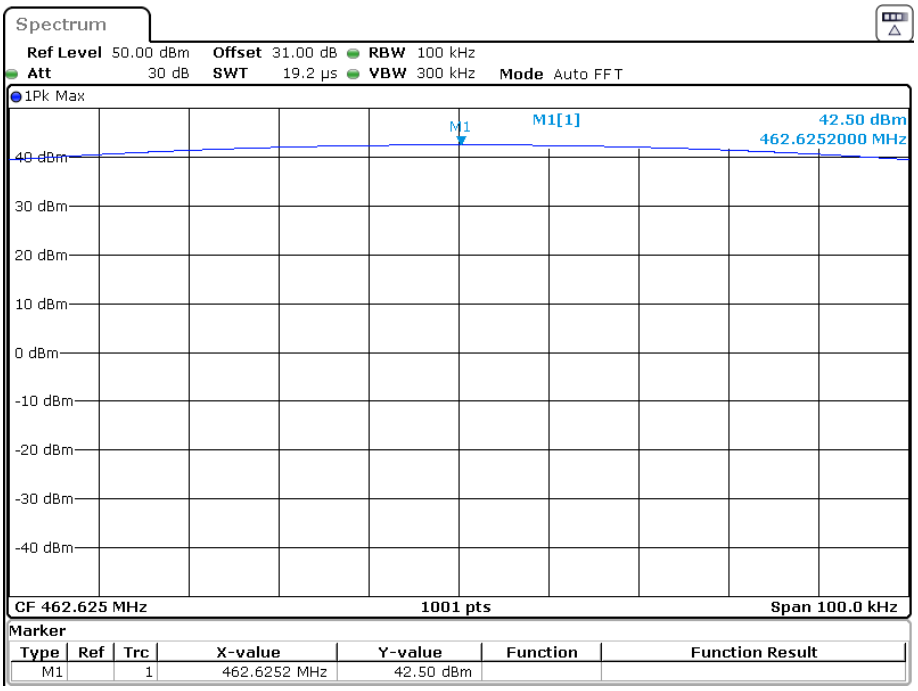
Note:
Antenna Gain:2dBi(-0.15dBd)
0dBd=2.15dBi
ERP=Conducted Output Power+ Antenna Gain(dBd)

462.625MHz_25k – Low Power level



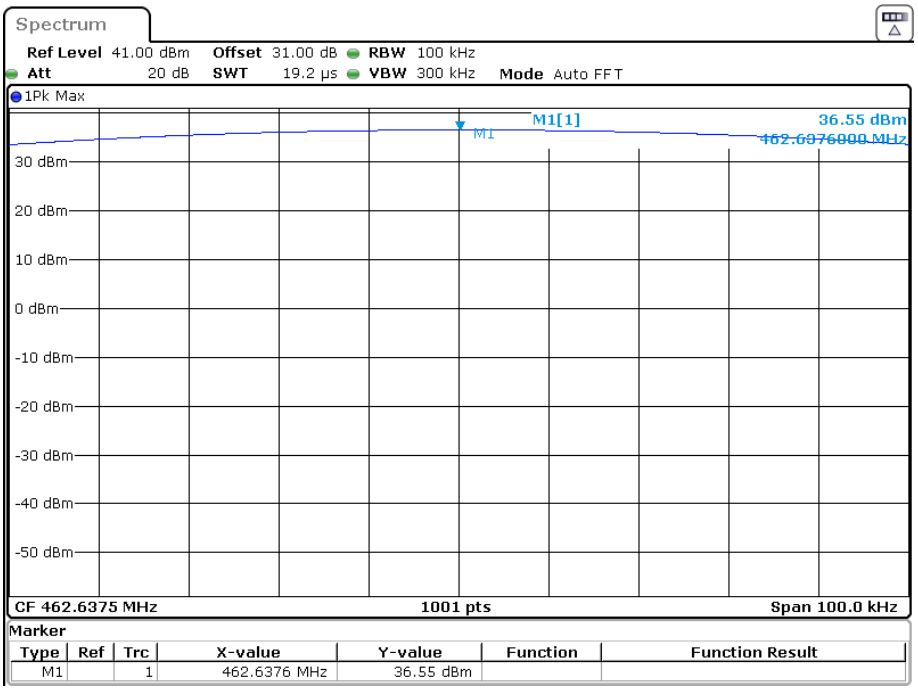
Date: 1.DEC.2022 00:04:02

462.625MHz_25k– High Power level

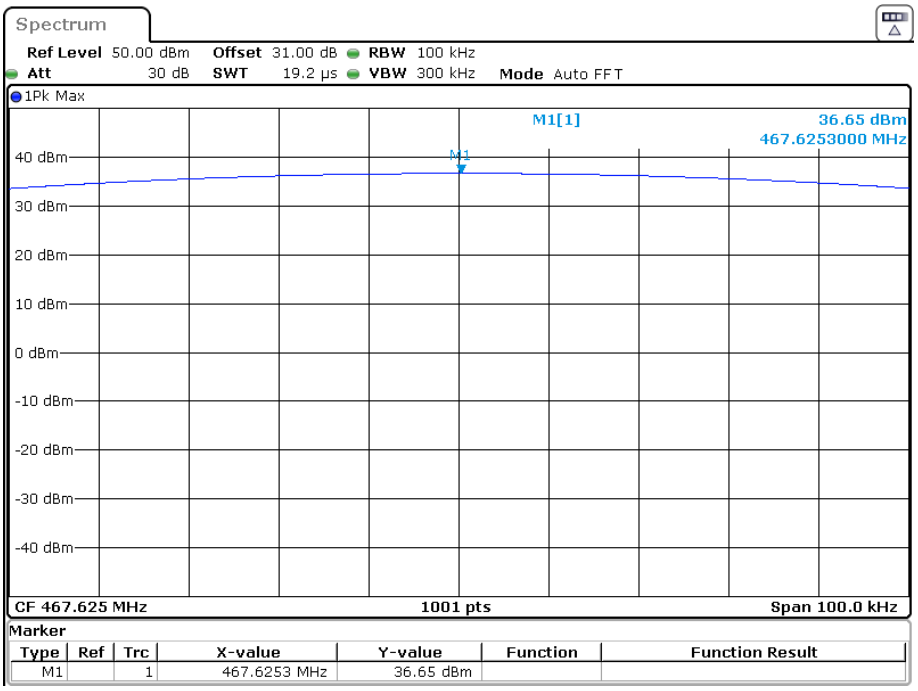


Date: 1.DEC.2022 00:11:06

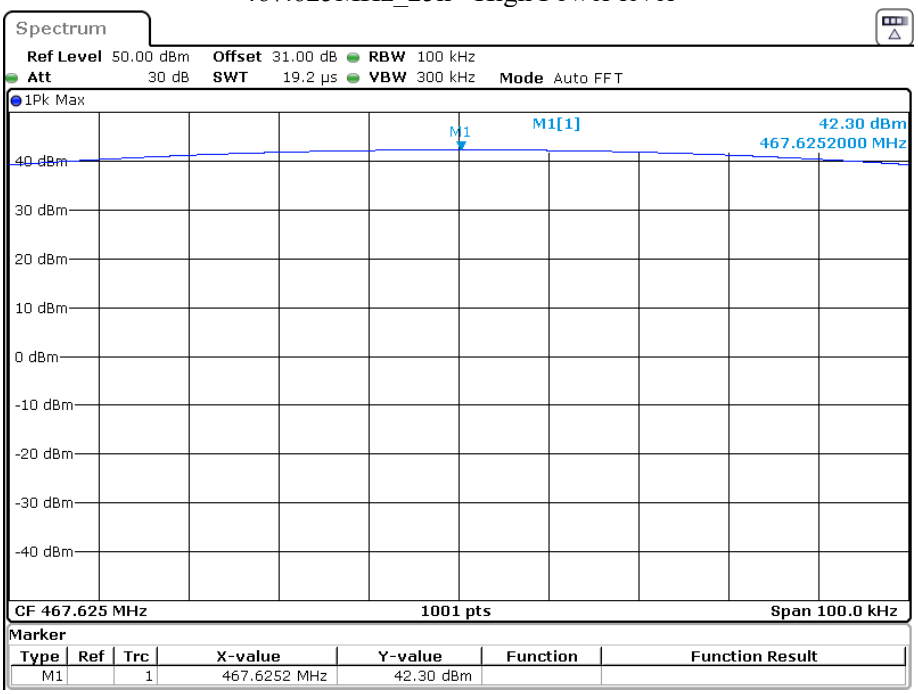
462.6375MHz_25k



467.625MHz_25k - Low Power level

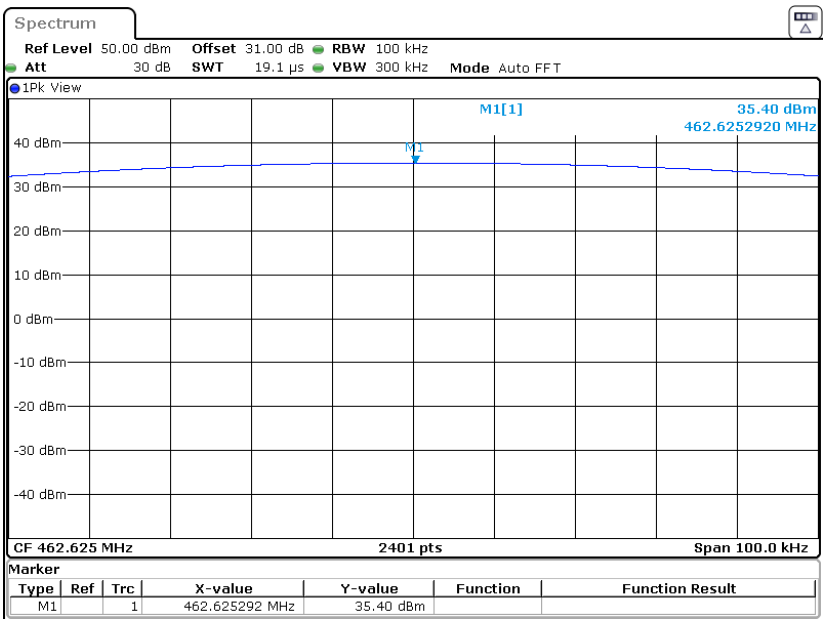


467.625MHz_25k - High Power level



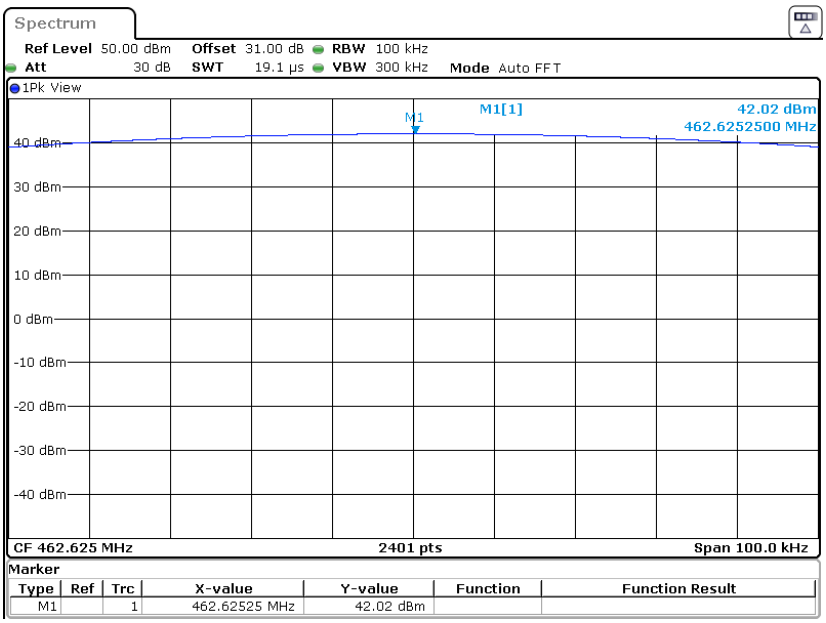
Date: 1.DEC.2022 00:06:43

462.625MHz_12.5k – Low Power level



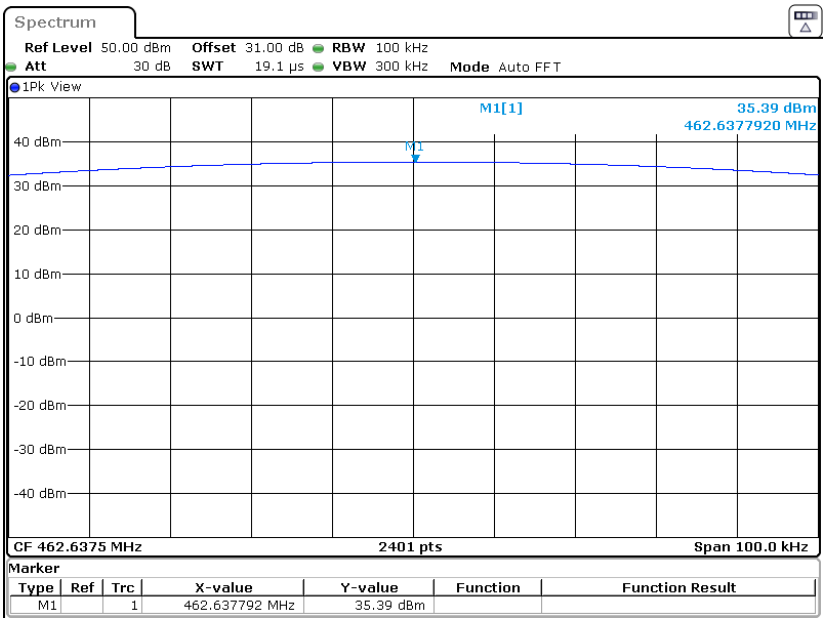
Date: 2.DEC.2022 16:15:45

462.625MHz_12.5k – High Power level



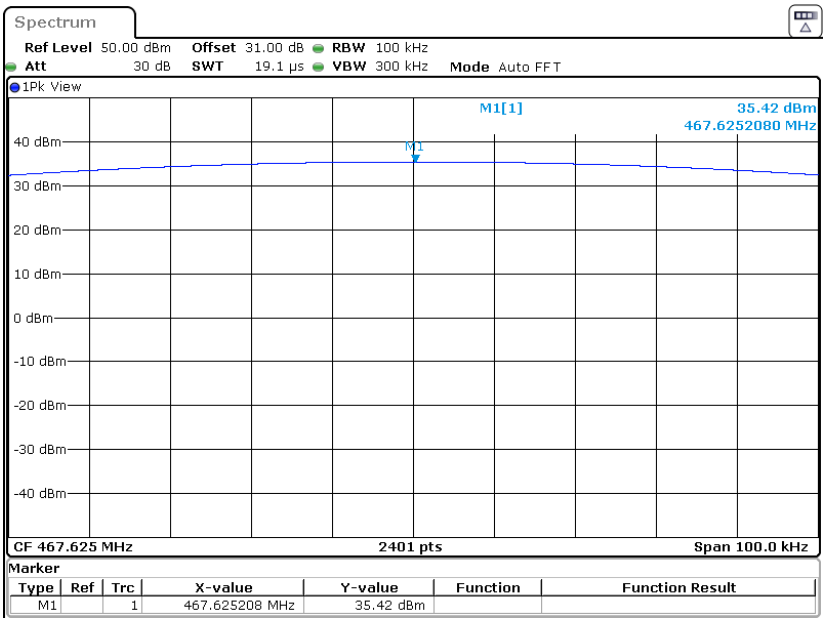
Date: 2.DEC.2022 16:08:38

462.6375MHz_12.5k



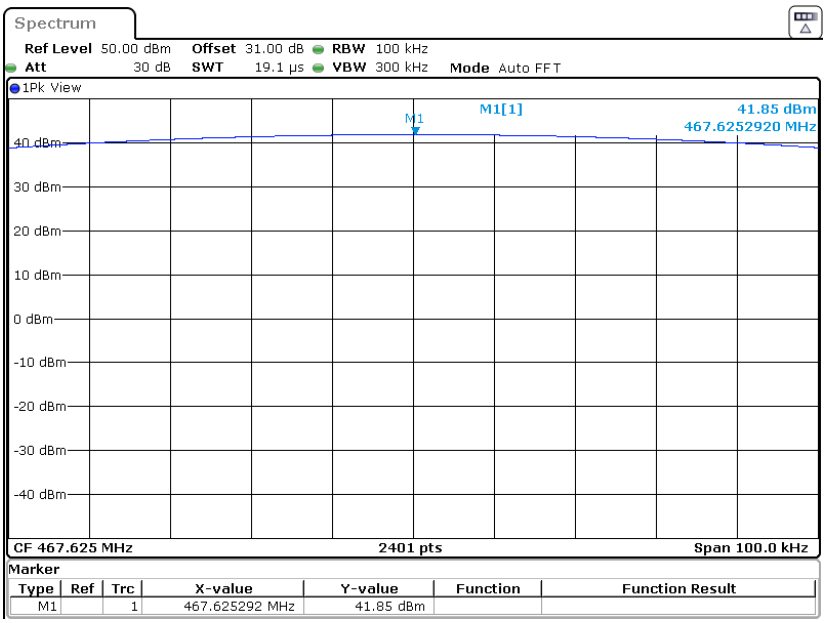
Date: 2.DEC.2022 16:16:37

467.625MHz_12.5k - Low Power level



Date: 2.DEC.2022 16:16:11

467.625MHz_12.5k - High Power level



Date: 2.DEC.2022 16:09:35

FCC §2.1047 & §95.1775 - MODULATION CHARACTERISTIC

Applicable Standard

Per FCC §2.1047 and §95.1775: Each GMRS transmitter type must be designed to satisfy the modulation requirements in this section. Operation of GMRS stations must also be in compliance with these requirements.

(a) Main channels. The peak frequency deviation for emissions to be transmitted on the main channels must not exceed ± 5 kHz.

(b) 462 MHz interstitial channels. The peak frequency deviation for emissions to be transmitted on the 462 MHz interstitial channels must not exceed ± 5 kHz.

(c) 467 MHz interstitial channels. The peak frequency deviation for emissions to be transmitted on the 467 MHz interstitial channels must not exceed ± 2.5 kHz, and the highest audio frequency contributing substantially to modulation must not exceed 3.125 kHz.

(d) Overmodulation. Each GMRS transmitter type, except for a mobile station transmitter type with a transmitter power output of 2.5 W or less, must automatically prevent a higher than normal audio level from causing overmodulation.

(e) Audio filter. Each GMRS transmitter type must include audio frequency low pass filtering, unless it complies with the applicable paragraphs of §95.1779 (without filtering).

(1) The filter must be between the modulation limiter and the modulated stage of the transmitter.

(2) At any frequency (f in kHz) between 3 and 20 kHz, the filter must have an attenuation of at least 60 log (f/3) dB more than the attenuation at 1 kHz. Above 20 kHz, it must have an attenuation of at least 50 dB more than the attenuation at 1 kHz.

Test Procedure

Test Method: TIA/EIA-603-E 2016

Test Data

Environmental Conditions

Temperature:	27.4 °C
Relative Humidity:	53 %
ATM Pressure:	101.0 kPa

The testing was performed by Glenn Jiang on 2022-11-22.

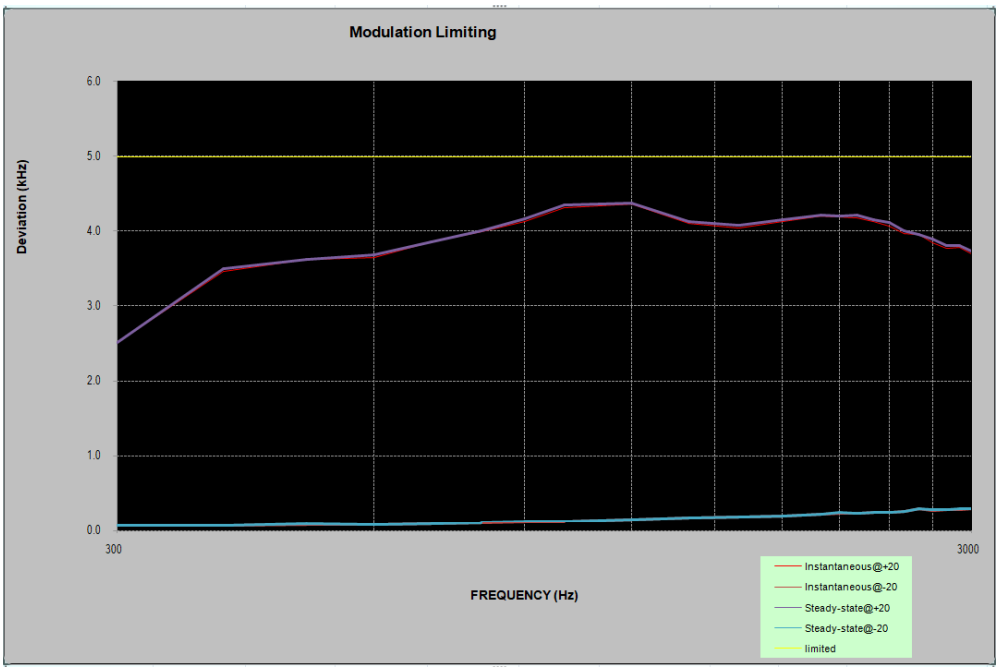
Please refer to the following tables and plots.

Test Mode: Transmitting

MODULATION LIMITING

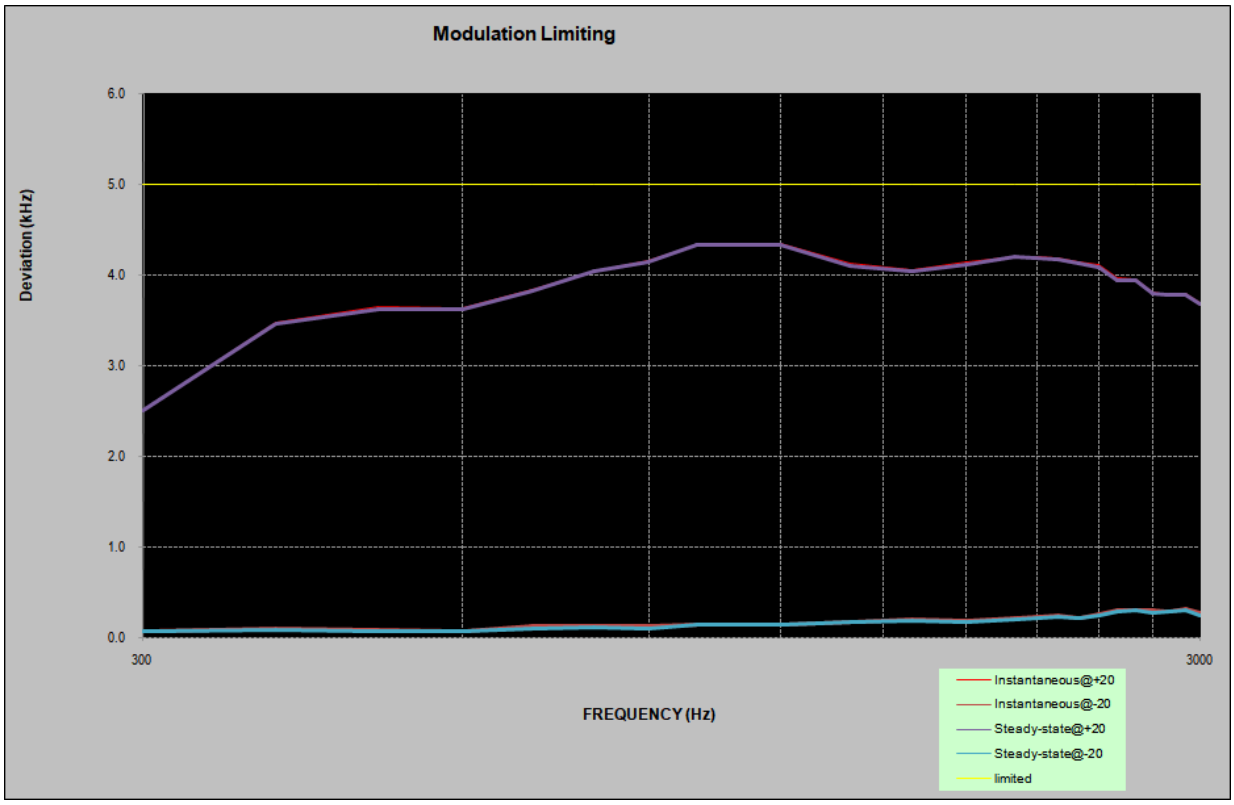
Carrier Frequency: 462.6250 MHz_25k

Audio Frequency (Hz)	Instantaneous		Steady-state		FCC Limit [kHz]
	DEVIATION (@+20dB) [kHz]	DEVIATION (@-20dB) [kHz]	DEVIATION (@+20dB) [kHz]	DEVIATION (@-20dB) [kHz]	
300	2.521	0.074	2.522	0.076	5.000
400	3.469	0.077	3.508	0.080	5.000
500	3.622	0.096	3.623	0.101	5.000
600	3.655	0.091	3.694	0.094	5.000
700	3.859	0.102	3.867	0.108	5.000
800	3.996	0.115	4.009	0.117	5.000
900	4.136	0.124	4.164	0.128	5.000
1000	4.321	0.124	4.351	0.129	5.000
1200	4.365	0.146	4.376	0.151	5.000
1400	4.112	0.171	4.132	0.175	5.000
1600	4.043	0.184	4.077	0.190	5.000
1800	4.133	0.206	4.161	0.207	5.000
2000	4.207	0.227	4.222	0.230	5.000
2100	4.200	0.243	4.209	0.245	5.000
2200	4.181	0.234	4.213	0.238	5.000
2300	4.136	0.246	4.156	0.249	5.000
2400	4.070	0.251	4.119	0.255	5.000
2500	3.970	0.261	4.013	0.263	5.000
2600	3.957	0.295	3.959	0.298	5.000
2700	3.843	0.281	3.893	0.286	5.000
2800	3.771	0.283	3.810	0.284	5.000
2900	3.786	0.292	3.809	0.296	5.000
3000	3.700	0.294	3.739	0.300	5.000


Modulation Limiting
Deviation (kHz)
6.0
5.0
4.0
3.0
2.0
1.0
0.0
300
3000
FREQUENCY (Hz)
Instantaneous@+20
Instantaneous@-20
Steady-state@+20
Steady-state@-20
limited

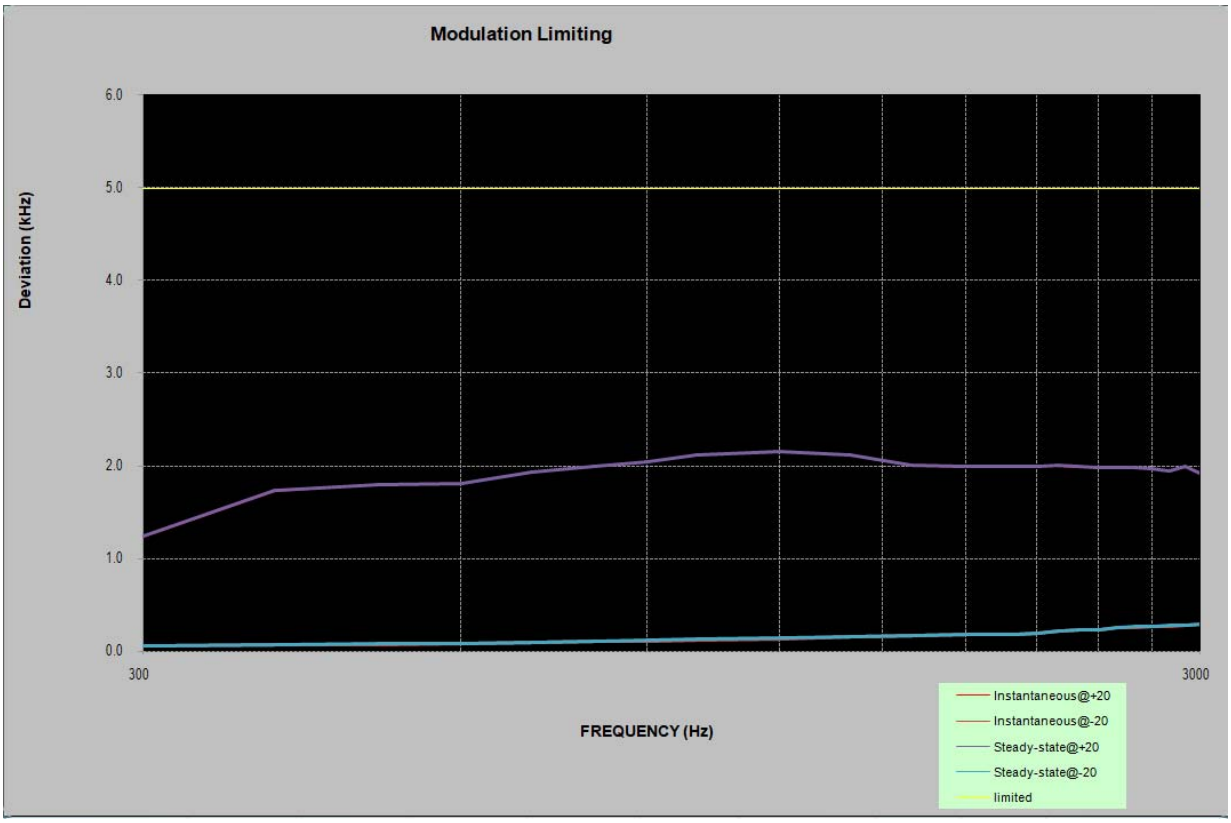
Carrier Frequency: 467.6250 MHz_25k

Audio Frequency (Hz)	Instantaneous		Steady-state		FCC Limit [kHz]
	DEVIATION (@+20dB) [kHz]	DEVIATION (@-20dB) [kHz]	DEVIATION (@+20dB) [kHz]	DEVIATION (@-20dB) [kHz]	
300	2.505	0.066	2.494	0.065	5.000
400	3.472	0.091	3.450	0.085	5.000
500	3.638	0.085	3.611	0.065	5.000
600	3.629	0.071	3.610	0.069	5.000
700	3.838	0.130	3.822	0.101	5.000
800	4.042	0.126	4.040	0.106	5.000
900	4.145	0.120	4.137	0.100	5.000
1000	4.329	0.137	4.321	0.134	5.000
1200	4.342	0.142	4.326	0.135	5.000
1400	4.117	0.172	4.099	0.162	5.000
1600	4.051	0.192	4.029	0.182	5.000
1800	4.133	0.182	4.113	0.166	5.000
2000	4.197	0.208	4.191	0.196	5.000
2100	4.193	0.230	4.176	0.203	5.000
2200	4.187	0.242	4.173	0.224	5.000
2300	4.131	0.205	4.130	0.203	5.000
2400	4.108	0.255	4.084	0.246	5.000
2500	3.965	0.295	3.940	0.285	5.000
2600	3.951	0.299	3.941	0.293	5.000
2700	3.806	0.293	3.795	0.271	5.000
2800	3.777	0.281	3.770	0.280	5.000
2900	3.786	0.306	3.771	0.293	5.000
3000	3.693	0.266	3.667	0.237	5.000


Modulation Limiting
Deviation (kHz)
6.0
5.0
4.0
3.0
2.0
1.0
0.0
300
3000
FREQUENCY (Hz)
Instantaneous@+20
Instantaneous@-20
Steady-state@+20
Steady-state@-20
limited

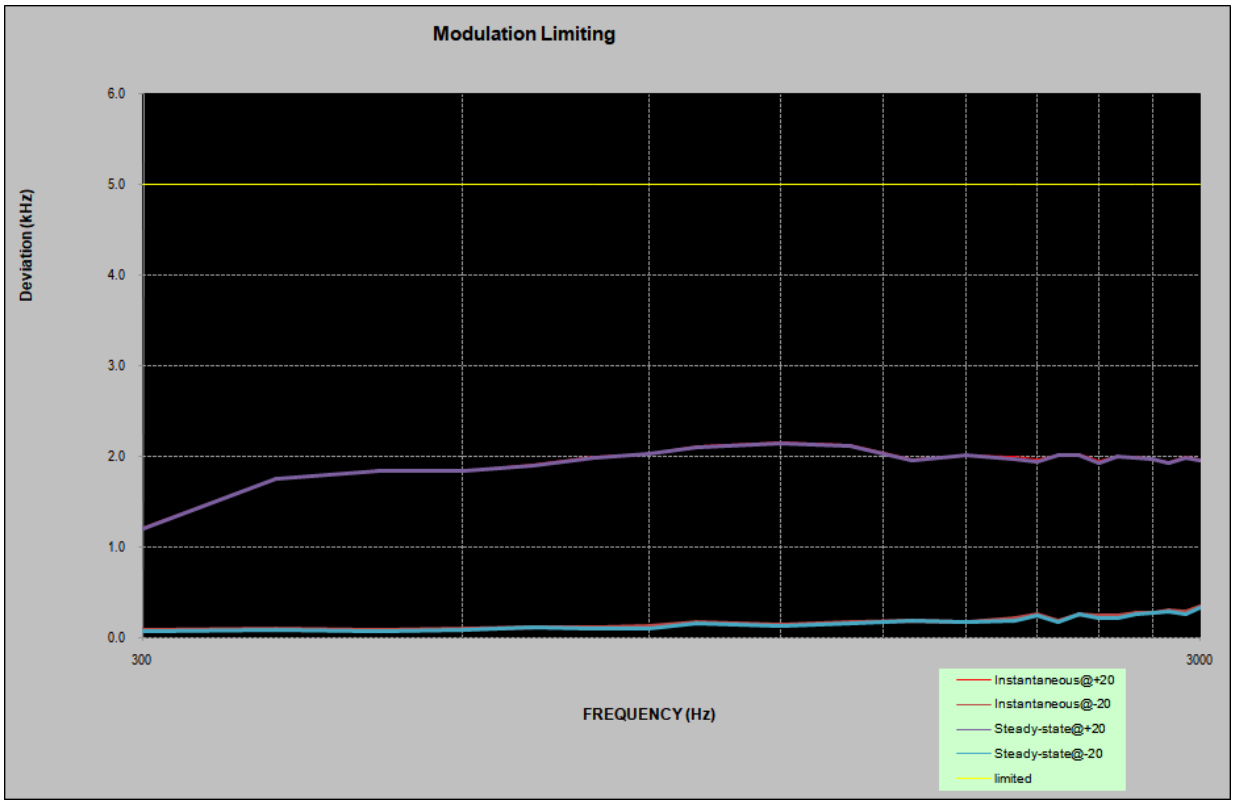
Carrier Frequency: 462.6250 MHz_12.5k

Audio Frequency (Hz)	Instantaneous		Steady-state		FCC Limit [kHz]
	DEVIATION (@+20dB) [kHz]	DEVIATION (@-20dB) [kHz]	DEVIATION (@+20dB) [kHz]	DEVIATION (@-20dB) [kHz]	
300	1.242	0.065	1.243	0.069	5.000
400	1.733	0.074	1.736	0.076	5.000
500	1.805	0.082	1.808	0.087	5.000
600	1.820	0.092	1.822	0.096	5.000
700	1.936	0.099	1.937	0.103	5.000
800	1.996	0.110	1.999	0.113	5.000
900	2.054	0.121	2.056	0.124	5.000
1000	2.118	0.131	2.120	0.135	5.000
1200	2.159	0.145	2.163	0.148	5.000
1400	2.121	0.162	2.125	0.166	5.000
1600	2.007	0.176	2.012	0.180	5.000
1800	1.994	0.184	1.996	0.186	5.000
2000	2.001	0.193	2.002	0.194	5.000
2100	1.999	0.201	2.003	0.201	5.000
2200	2.006	0.221	2.009	0.222	5.000
2300	1.992	0.236	1.996	0.238	5.000
2400	1.983	0.241	1.985	0.242	5.000
2500	1.982	0.258	1.986	0.259	5.000
2600	1.987	0.269	1.991	0.269	5.000
2700	1.975	0.274	1.978	0.274	5.000
2800	1.956	0.281	1.956	0.282	5.000
2900	1.999	0.286	1.999	0.287	5.000
3000	1.921	0.294	1.921	0.294	5.000


Modulation Limiting
Deviation (kHz)
6.0
5.0
4.0
3.0
2.0
1.0
0.0
300
3000
FREQUENCY (Hz)
Instantaneous@+20
Instantaneous@-20
Steady-state@+20
Steady-state@-20
limited

Carrier Frequency: 467.6250 MHz_12.5k

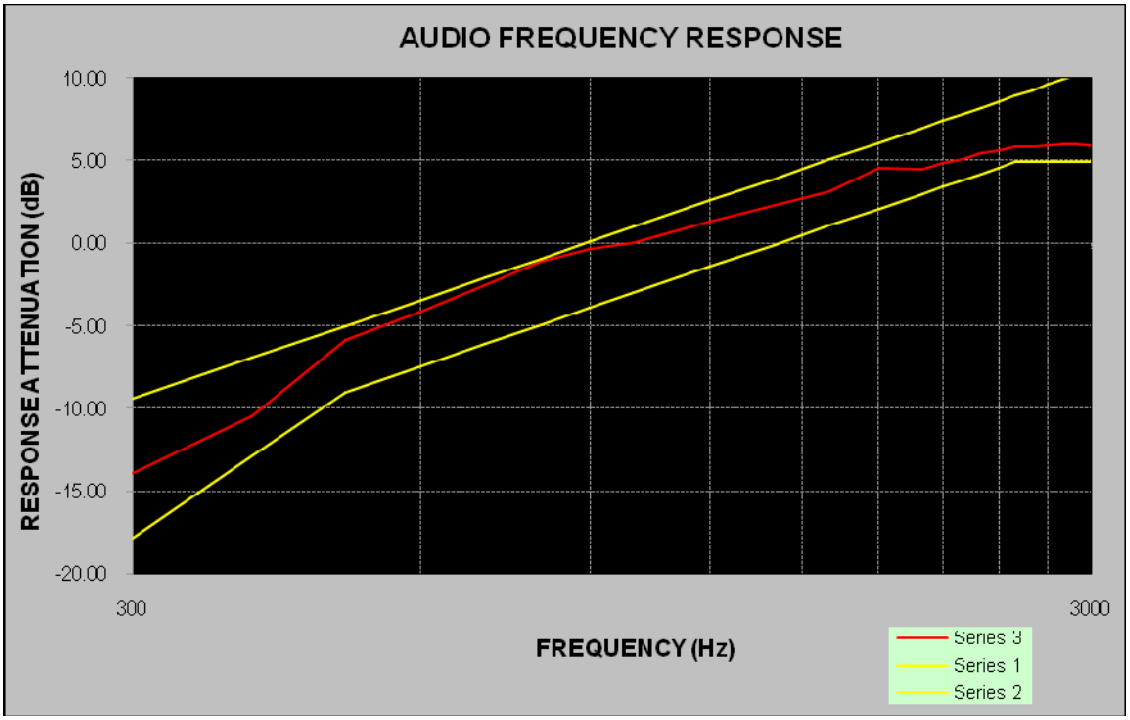
Audio Frequency (Hz)	Instantaneous		Steady-state		FCC Limit [kHz]
	DEVIATION (@+20dB) [kHz]	DEVIATION (@-20dB) [kHz]	DEVIATION (@+20dB) [kHz]	DEVIATION (@-20dB) [kHz]	
300	1.214	0.080	1.189	0.072	5.000
400	1.752	0.097	1.746	0.078	5.000
500	1.831	0.081	1.831	0.070	5.000
600	1.838	0.093	1.832	0.080	5.000
700	1.911	0.109	1.891	0.107	5.000
800	2.000	0.114	1.980	0.100	5.000
900	2.028	0.125	2.022	0.095	5.000
1000	2.106	0.161	2.090	0.152	5.000
1200	2.159	0.134	2.134	0.124	5.000
1400	2.127	0.160	2.107	0.145	5.000
1600	1.966	0.186	1.954	0.183	5.000
1800	2.008	0.161	2.002	0.160	5.000
2000	1.991	0.205	1.963	0.180	5.000
2100	1.957	0.250	1.929	0.245	5.000
2200	2.002	0.174	2.001	0.167	5.000
2300	2.022	0.253	2.004	0.248	5.000
2400	1.947	0.237	1.921	0.214	5.000
2500	1.989	0.235	1.988	0.211	5.000
2600	1.987	0.271	1.975	0.260	5.000
2700	1.966	0.274	1.964	0.262	5.000
2800	1.931	0.294	1.924	0.289	5.000
2900	1.994	0.278	1.976	0.254	5.000
3000	1.964	0.335	1.955	0.320	5.000


Modulation Limiting
Deviation (kHz)
6.0
5.0
4.0
3.0
2.0
1.0
0.0
300
3000
FREQUENCY (Hz)
Instantaneous@+20
Instantaneous@-20
Steady-state@+20
Steady-state@-20
limited

Audio Frequency Response

Carrier Frequency: 462.6250MHz_25k

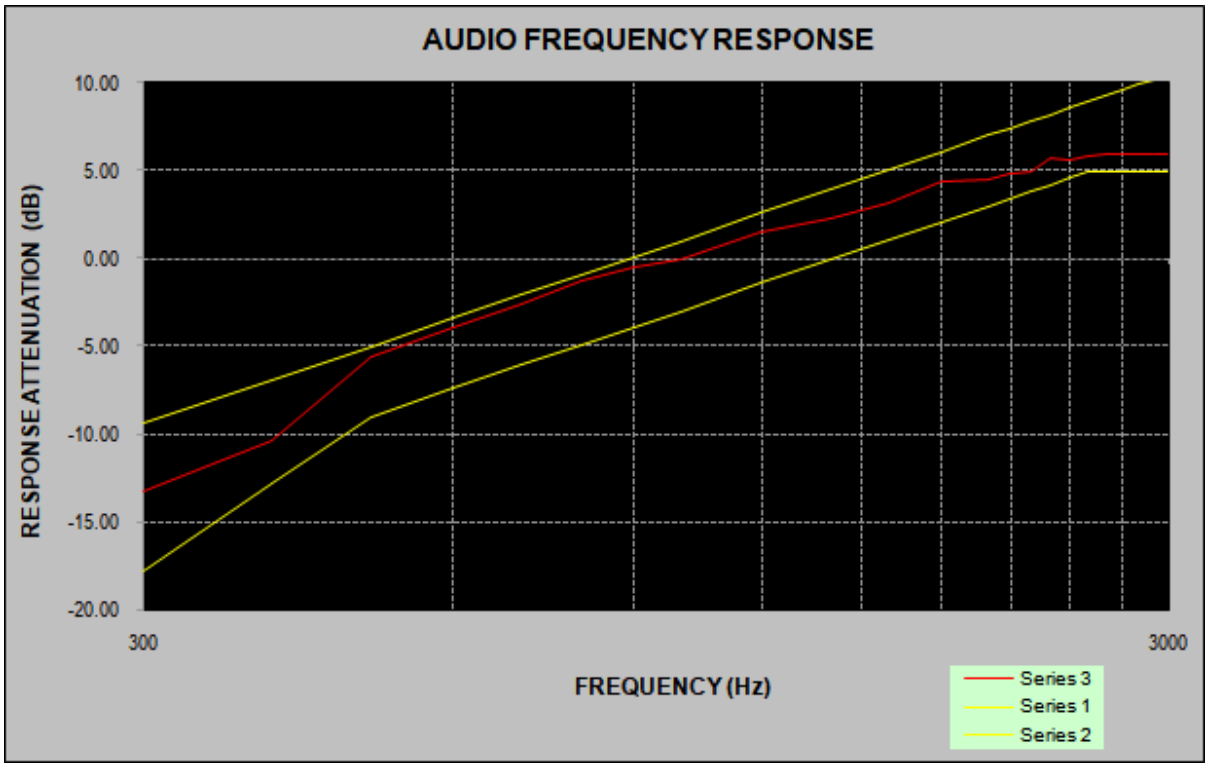
Audio Frequency (Hz)	Response (dB)
300	-13.94
400	-10.43
500	-5.85
600	-4.15
700	-2.50
800	-1.10
900	-0.35
1000	0.00
1200	1.30
1400	2.27
1600	3.14
1800	4.53
2000	4.51
2100	4.89
2200	5.10
2300	5.47
2400	5.58
2500	5.82
2600	5.87
2700	5.94
2800	6.00
2900	6.00
3000	5.94


AUDIO FREQUENCY RESPONSE
10.00
5.00
0.00
-5.00
-10.00
-15.00
-20.00
RESPONSE ATTENUATION (dB)
300
3000
FREQUENCY (Hz)
Series 3
Series 1
Series 2

Audio Frequency Response

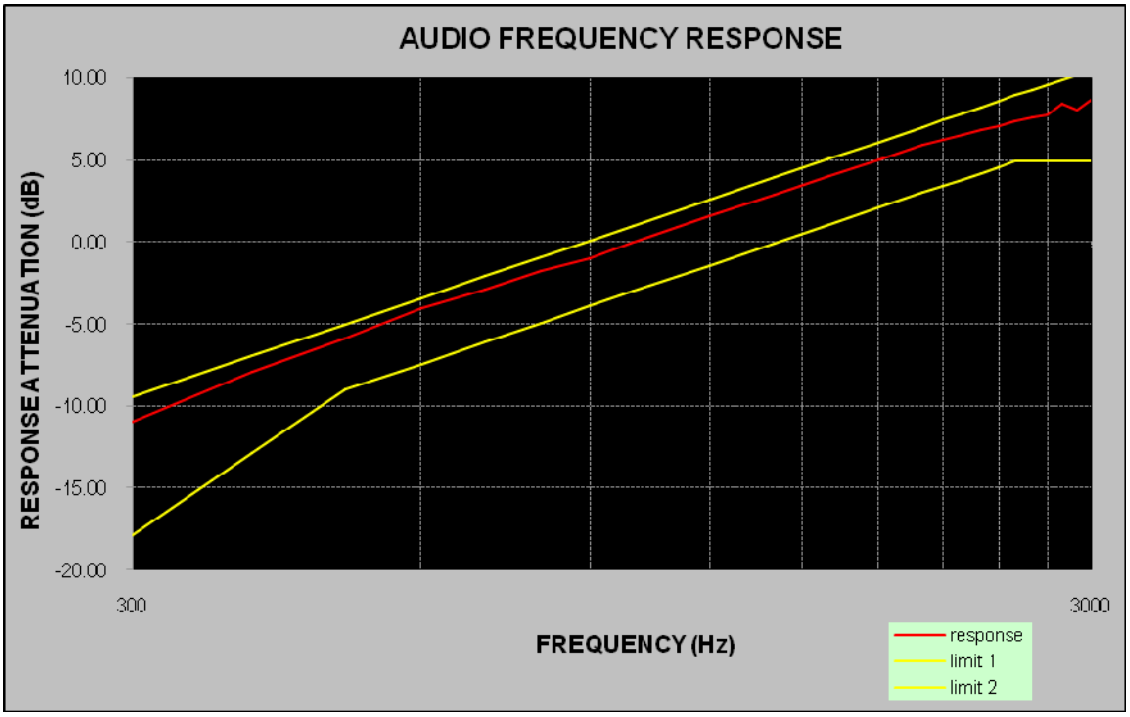
Carrier Frequency: 467.6250MHz_25k

Audio Frequency (Hz)	Response (dB)
300	-13.31
400	-10.37
500	-5.58
600	-3.94
700	-2.58
800	-1.24
900	-0.49
1000	0.00
1200	1.46
1400	2.31
1600	3.12
1800	4.42
2000	4.55
2100	4.81
2200	4.95
2300	5.72
2400	5.63
2500	5.87
2600	5.96
2700	5.98
2800	6.00
2900	5.99
3000	5.92


AUDIO FREQUENCY RESPONSE
RESPONSE ATTENUATION (dB)
10.00
5.00
0.00
-5.00
-10.00
-15.00
-20.00
300
3000
FREQUENCY (Hz)
Series 3
Series 1
Series 2

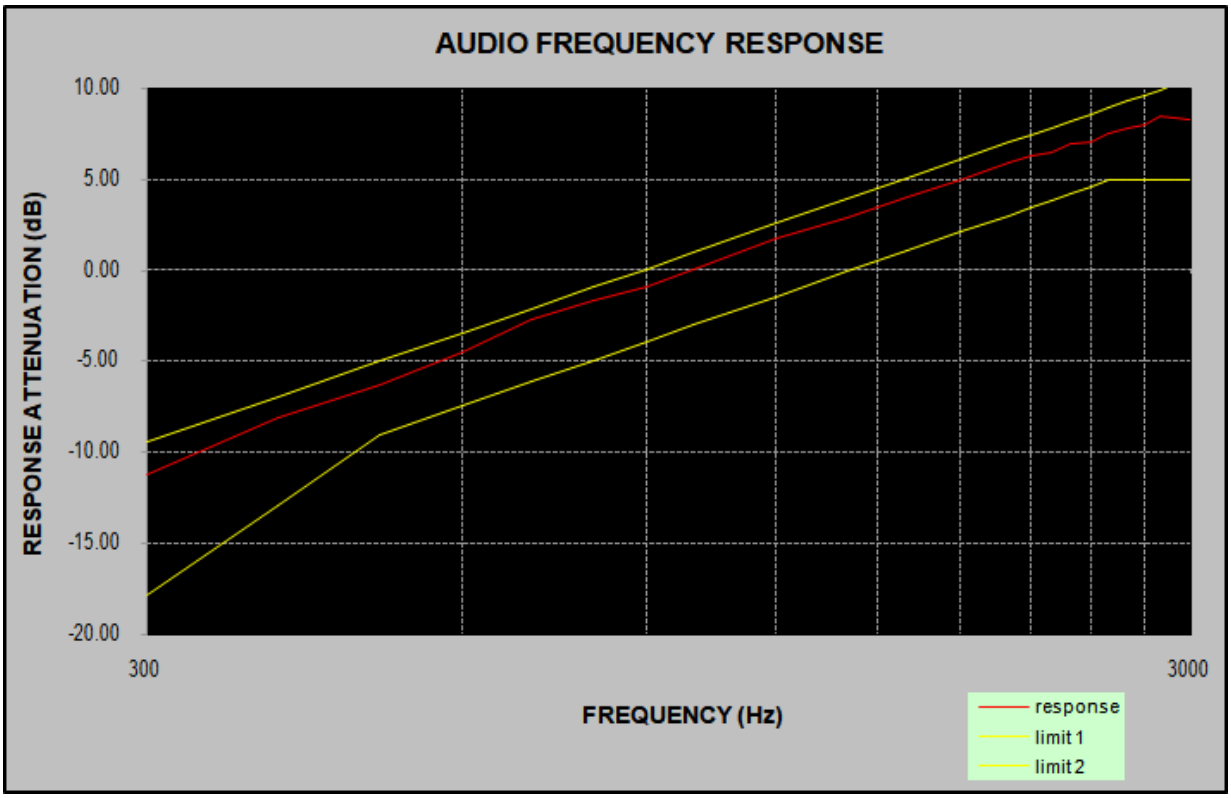
Carrier Frequency: 462.6250MHz_12.5k

Audio Frequency (Hz)	Response (dB)
300	-10.96
400	-7.89
500	-5.87
600	-4.04
700	-2.90
800	-1.73
900	-0.99
1000	0.00
1200	1.58
1400	2.88
1600	4.01
1800	5.05
2000	5.94
2100	6.24
2200	6.51
2300	6.88
2400	7.09
2500	7.36
2600	7.62
2700	7.78
2800	8.42
2900	8.05
3000	8.69


AUDIO FREQUENCY RESPONSE
10.00
5.00
0.00
-5.00
-10.00
-15.00
-20.00
RESPONSE ATTENUATION (dB)
300
3000
FREQUENCY (Hz)
response
limit 1
limit 2

Carrier Frequency: 467.6250MHz_12.5k

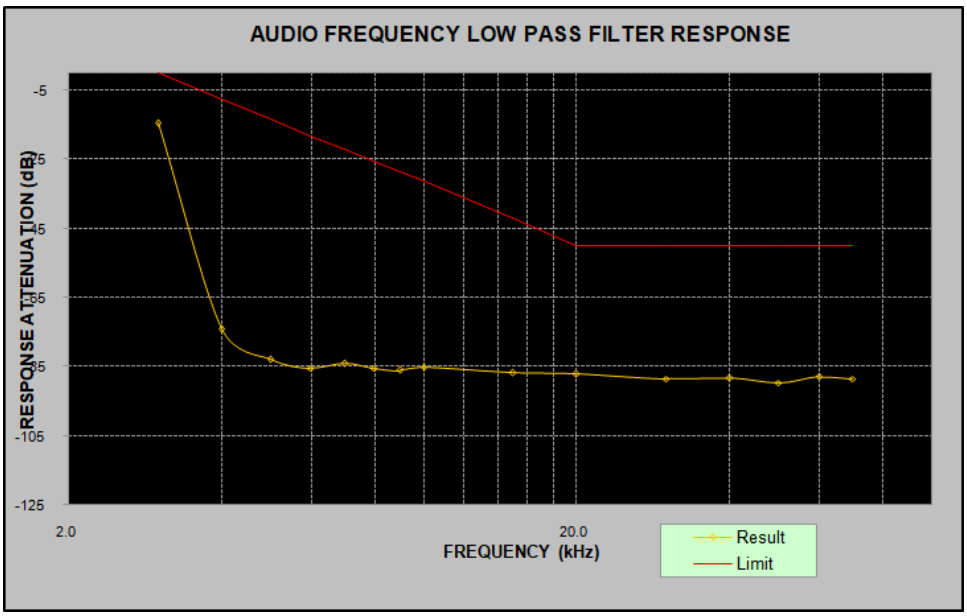
Audio Frequency (Hz)	Response (dB)
300	-11.18
400	-8.05
500	-6.27
600	-4.47
700	-2.73
800	-1.66
900	-0.88
1000	0.00
1200	1.77
1400	2.86
1600	4.00
1800	5.00
2000	5.92
2100	6.33
2200	6.43
2300	6.93
2400	7.07
2500	7.52
2600	7.83
2700	7.97
2800	8.48
2900	8.41
3000	8.29


AUDIO FREQUENCY RESPONSE
RESPONSE ATTENUATION (dB)
10.00
5.00
0.00
-5.00
-10.00
-15.00
-20.00
300
3000
FREQUENCY (Hz)
response
limit 1
limit 2

Audio frequency lows pass filter response

Carrier Frequency: 462.6250 MHz_25k

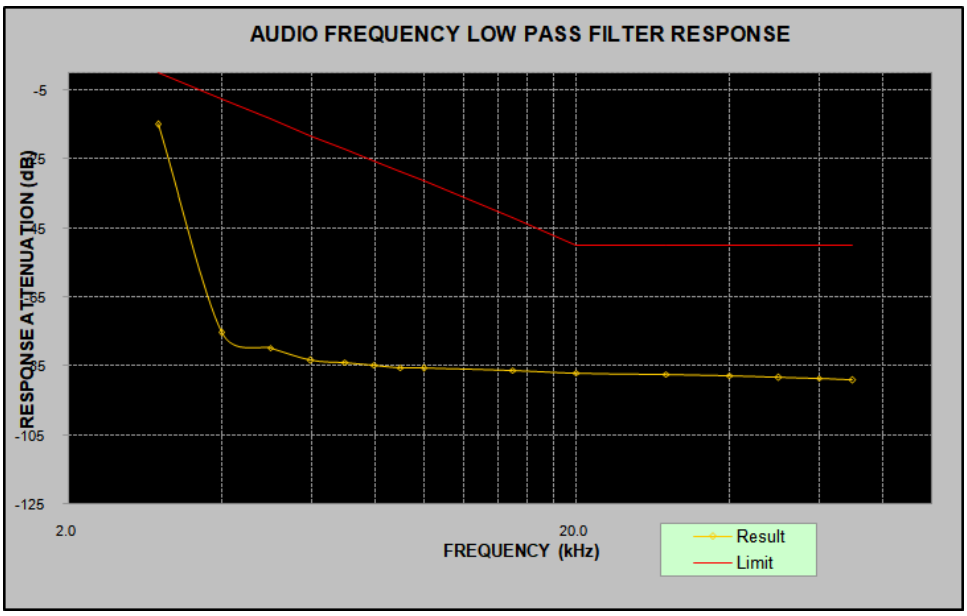
Audio Frequency (kHz)	Response Attenuation (dB)	FCC Limit (dB)
1.0	0.0	/
3.0	-14.6	0.0
4.0	-74.2	-7.5
5.0	-82.9	-13.3
6.0	-85.4	-18.1
7.0	-84.1	-22.1
8.0	-85.3	-25.6
9.0	-86.0	-28.6
10.0	-85.2	-31.4
15.0	-86.7	-41.9
20.0	-87.0	-50.0
30.0	-88.4	-50.0
40.0	-88.3	-50.0
50.0	-89.6	-50.0
60.0	-87.9	-50.0
70.0	-88.3	-50.0



Audio frequency lows pass filter response

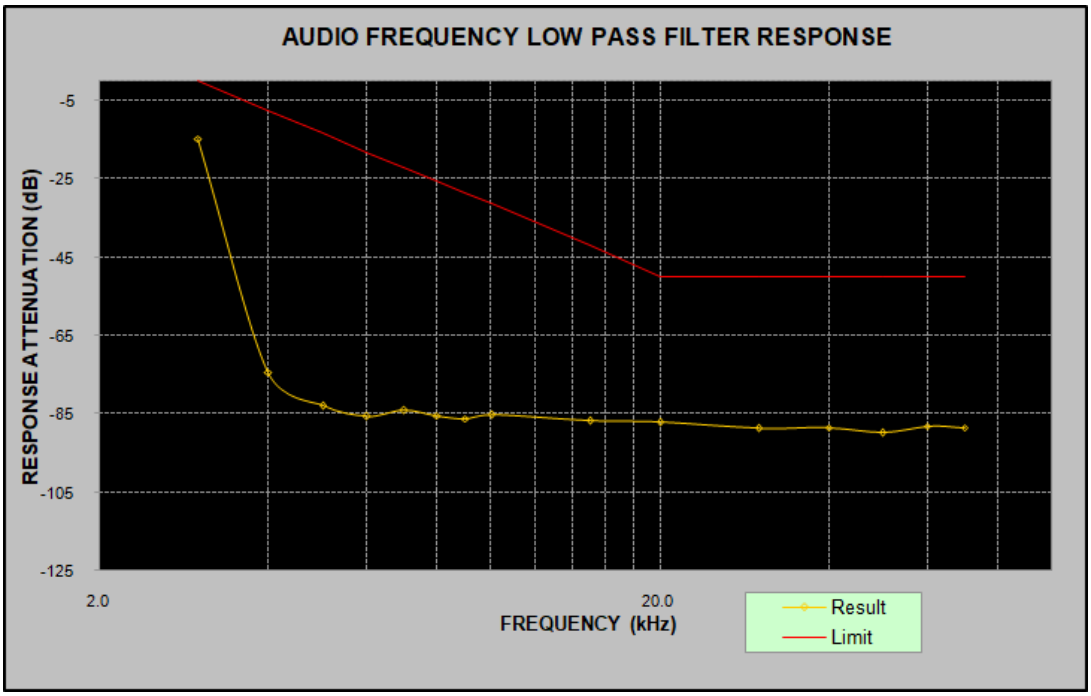
Carrier Frequency: 467.6250 MHz_25k

Audio Frequency (kHz)	Response Attenuation (dB)	FCC Limit (dB)
1.0	0.0	/
3.0	-14.9	0.0
4.0	-75.3	-7.5
5.0	-79.6	-13.3
6.0	-83.2	-18.1
7.0	-83.9	-22.1
8.0	-84.6	-25.6
9.0	-85.4	-28.6
10.0	-85.6	-31.4
15.0	-86.1	-41.9
20.0	-86.9	-50.0
30.0	-87.3	-50.0
40.0	-87.6	-50.0
50.0	-88.2	-50.0
60.0	-88.4	-50.0
70.0	-88.9	-50.0



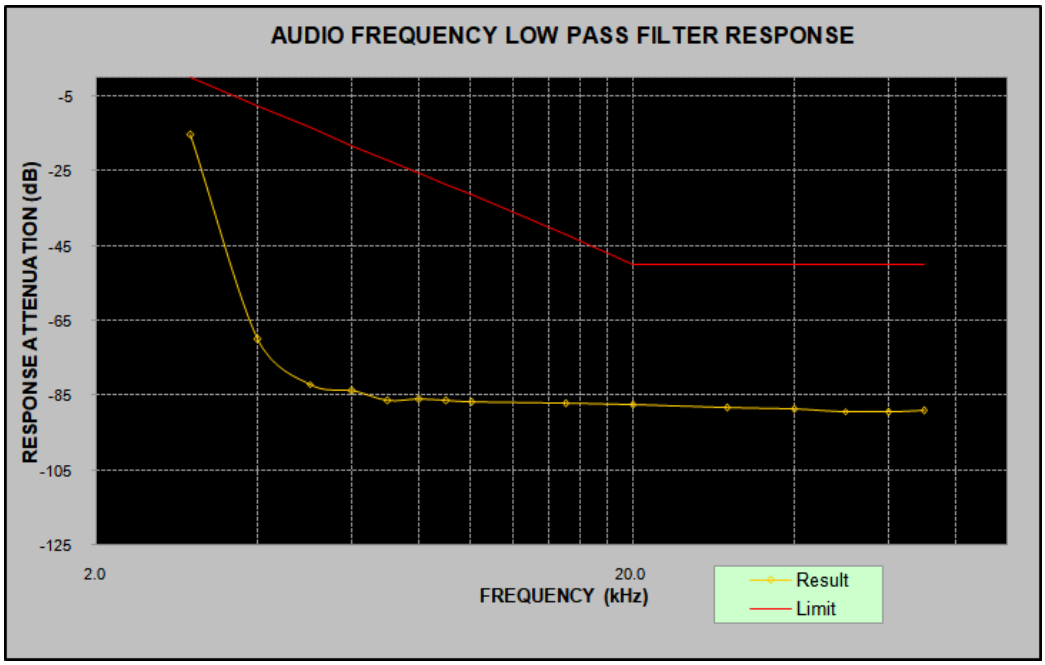
Carrier Frequency: 462.6250 MHz_12.5k

Audio Frequency (kHz)	Response Attenuation (dB)	FCC Limit (dB)
1.0	0.0	/
3.0	-14.7	0.0
4.0	-74.3	-7.5
5.0	-82.9	-13.3
6.0	-85.5	-18.1
7.0	-84.1	-22.1
8.0	-85.4	-25.6
9.0	-86.1	-28.6
10.0	-85.2	-31.4
15.0	-86.8	-41.9
20.0	-87.1	-50.0
30.0	-88.6	-50.0
40.0	-88.4	-50.0
50.0	-89.7	-50.0
60.0	-88.1	-50.0
70.0	-88.4	-50.0



Carrier Frequency: 467.6250 MHz_12.5k

Audio Frequency (kHz)	Response Attenuation (dB)	FCC Limit (dB)
1.0	0.0	/
3.0	-15.3	0.0
4.0	-69.8	-7.5
5.0	-81.9	-13.3
6.0	-83.6	-18.1
7.0	-86.3	-22.1
8.0	-85.9	-25.6
9.0	-86.4	-28.6
10.0	-86.8	-31.4
15.0	-87.1	-41.9
20.0	-87.5	-50.0
30.0	-88.3	-50.0
40.0	-88.7	-50.0
50.0	-89.2	-50.0
60.0	-89.3	-50.0
70.0	-89.1	-50.0



FCC §2.1049 & §95.1773&§95.1779(a)(c) - AUTHOURIZED BANDWIDTH AND EMISSION MASK

Applicable Standard

According to §95.1773. Each GMRS transmitter type must be designed such that the occupied bandwidth does not exceed the authorized bandwidth for the channels used. Operation of GMRS stations must also be in compliance with these requirements.

(a) Main channels. The authorized bandwidth is 20 kHz for GMRS transmitters operating on any of the 462 MHz main channels (see §95.1763(a)) or any of the 467 MHz main channels (see §95.1763(c)).

(b) Interstitial channels. The authorized bandwidth is 20 kHz for GMRS transmitters operating on any of the 462 MHz interstitial channels (see §95.1763(b)) and is 12.5 kHz for GMRS transmitters operating on any of the 467 MHz interstitial channels (see §95.1763(d)).

(c) Digital data transmissions. Digital data transmissions are limited to the 462 MHz main channels and interstitial channels in the 462 MHz and 467 MHz bands.

According to §95.1779. Each GMRS transmitter type must be designed to comply with the applicable unwanted emissions limits in this section.

(a) Emission masks. Emission masks applicable to transmitting equipment in the GMRS are defined by the requirements in the following table. The numbers in the attenuation requirements column refer to rule paragraph numbers under paragraph (b) of this section.

Emission types filter	Attenuation requirements
A1D, A3E, F1D, G1D, F2D, F3E, G3E with audio filter	(1), (2), (7)
A1D, A3E, F1D, G1D, F3E, G3E without audio filter	(3), (4), (7)
H1D, J1D, R1D, H3E, J3E, R2E	(5), (6), (7)

(1) Filtering noted for GMRS transmitters refers to the requirement in §95.1775(e).

(2) Unwanted emission power may be measured as either mean power or peak envelope power, provided that the transmitter output power is measured the same way.

(b) Attenuation requirements. The power of unwanted emissions must be attenuated below the transmitter output power in Watts (P) by at least:

(1) 25 dB (decibels) on any frequency removed from the center of the authorized bandwidth by more than 50% up to and including 100% of the authorized bandwidth.

(2) 35 dB on any frequency removed from the center of the authorized bandwidth by more than 100% up to and including 250% of the authorized bandwidth.

(7) 43 + 10 log (P) dB on any frequency removed from the center of the authorized bandwidth by more than 250%.

(c) Measurement bandwidths. The power of unwanted emissions in the frequency bands specified in paragraphs (b)(1) through (4) of this section is measured with a reference bandwidth of 300 Hz. The power of unwanted emissions in the frequency range specified in paragraph (b)(5) of this section is measured with a reference bandwidth of at least 30 kHz.

Test Procedure

TIA-603-E 2016, section 2.2.11

Test Data

Environmental Conditions

Temperature:	26~27.4 °C
Relative Humidity:	53~56 %
ATM Pressure:	101.0 kPa

The testing was performed by Glenn Jiang from 2022-11-22 to 2022-12-02.

Test Mode: Transmitting

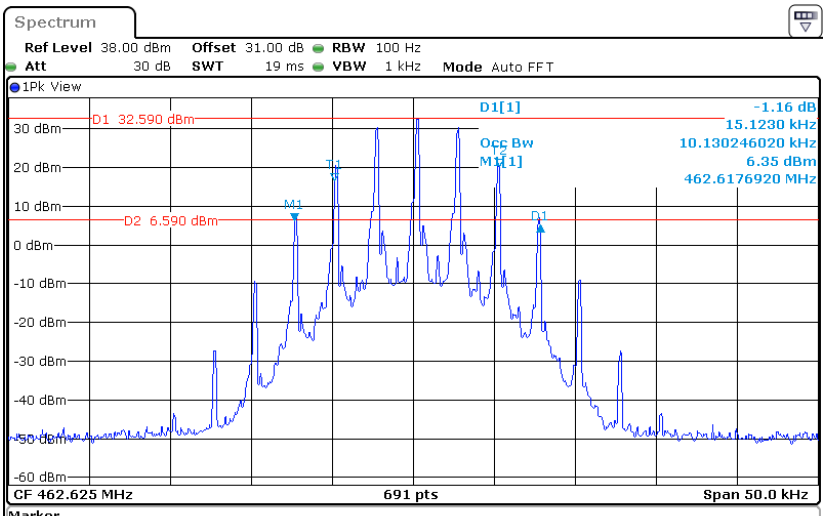
Frequency	Channel Separation (kHz)	Frequency (MHz)	Power level	99% Occupied Bandwidth (kHz)	Limit (kHz)
Analog	25	462.6375	/	10.130	20
		462.6250	High	10.203	20
			LOW	10.130	20
		467.6250	High	10.130	20
			LOW	10.130	20
Analog	12.5	462.6375	/	5.210	20
		462.6250	High	5.282	20
			LOW	5.210	20
		467.6250	High	5.282	20
			LOW	5.210	20

Emission Designator Per CFR 47 §2.201& §2.202&, Bn = 2M + 2D:

Emission Designator 11K0F3E In this case, the maximum modulating frequency is 3.0 kHz with a 3.0 kHz deviation. BW = 2(M+D) = 2*(3.0 kHz + 3.0 kHz) = 11 kHz → 11K0
F3E portion of the designator represents an FM voice transmission Therefore, the entire designator for 12.5 kHz channel spacing FM mode is 11K0F3E.

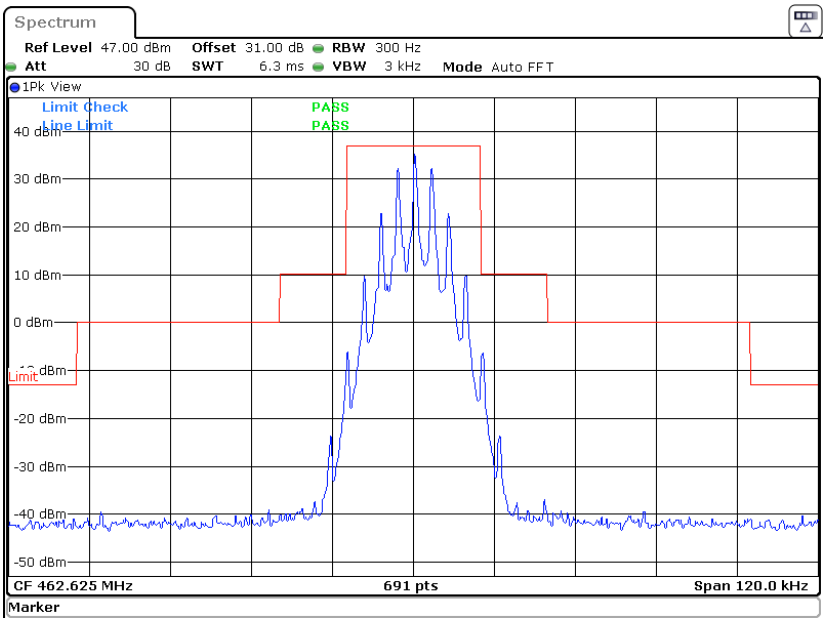
Emission Designator 16K0F3E In this case, the maximum modulating frequency is 3.0 kHz with a 5.0 kHz deviation. BW = 2(M+D) = 2*(3.0 kHz + 5.0 kHz) = 16 kHz → 16K0
F3E portion of the designator represents an FM voice transmission Therefore, the entire designator for 25 kHz channel spacing FM mode is 16K0F3E.

OBW, 462.625 MHz_25k – Low Power Level



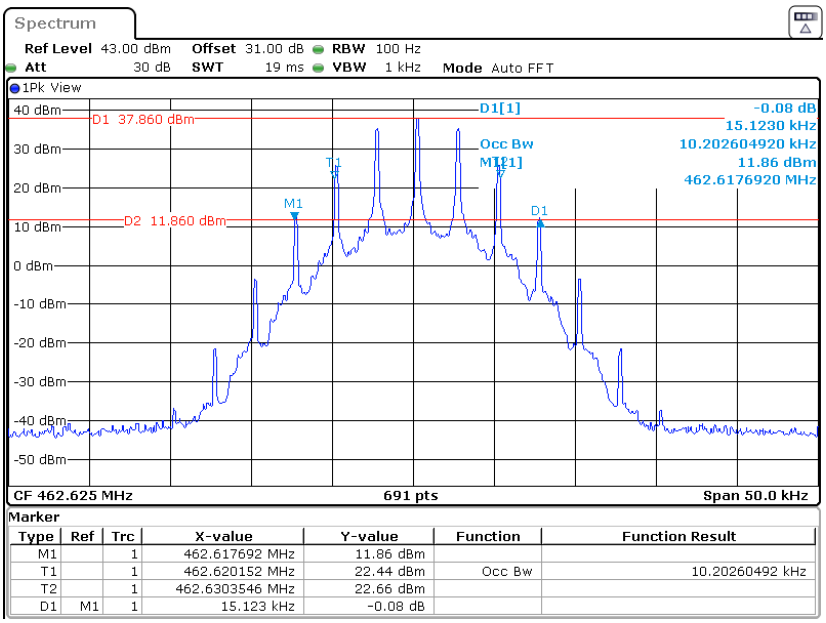
Date: 22.NOV.2022 19:01:45

Emission Mask, 462.625 MHz_25k – Low Power Level



Date: 30.NOV.2022 18:36:25

OBW, 462.625 MHz_25k – High Power Level

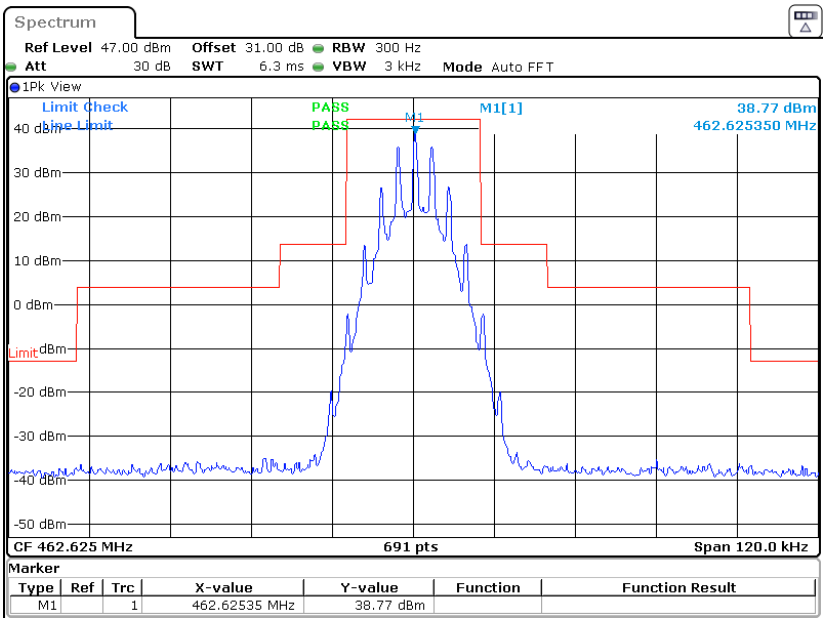


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	462.617692 MHz	11.86 dBm		
T1		1	462.620152 MHz	22.44 dBm	Occ Bw	10.20260492 kHz
T2		1	462.6303546 MHz	22.66 dBm		
D1	M1	1	15.123 kHz	-0.08 dB		

Date: 30.NOV.2022 03:11:41

Emission Mask, 462.625 MHz_25k - High Power Level

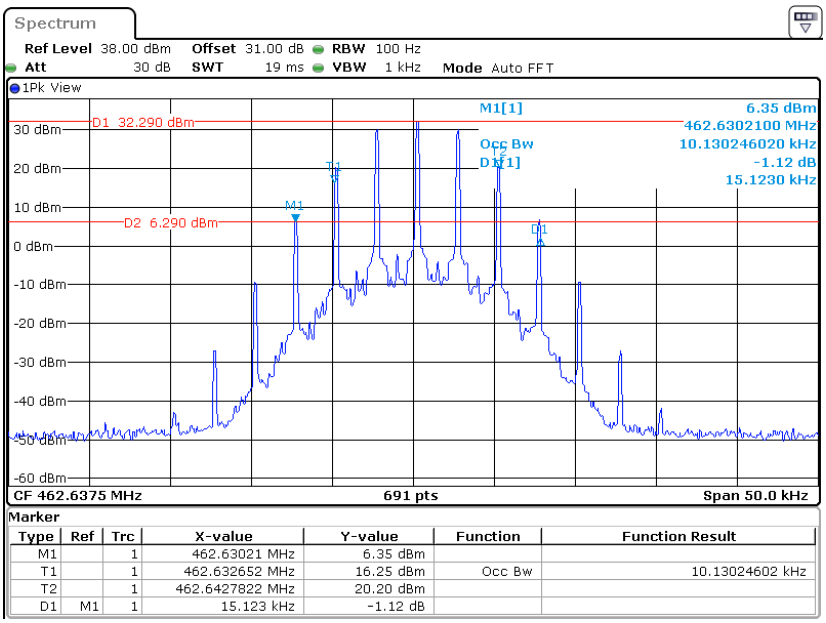


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	462.62535 MHz	38.77 dBm		

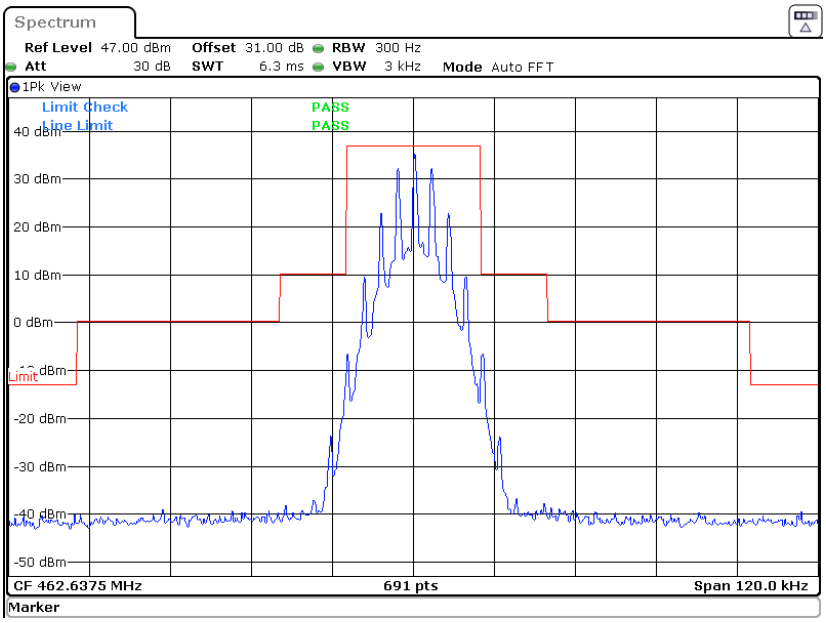
Date: 30.NOV.2022 18:29:54

OBW, 462.6375 MHz_25k



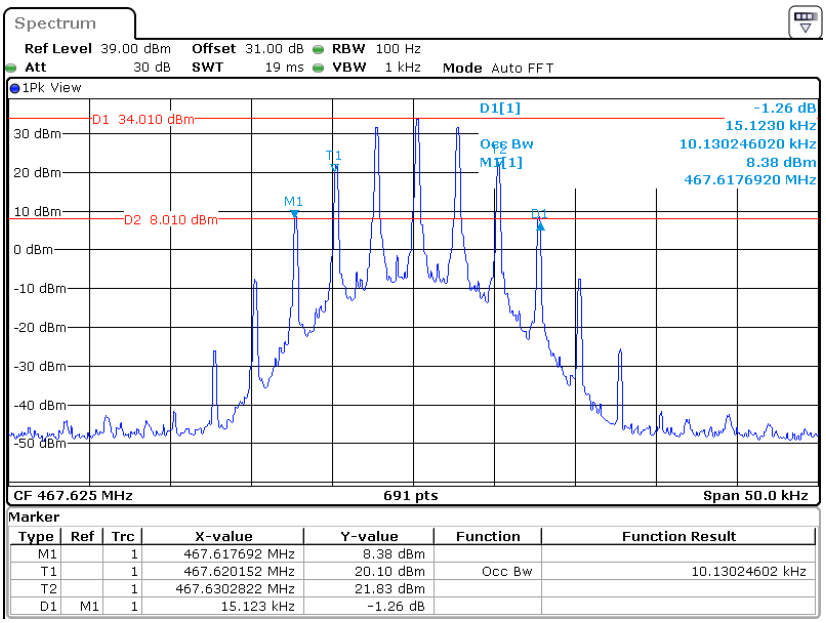
Date: 22.NOV.2022 18:58:26

Emission Mask, 462.6375 MHz_25k



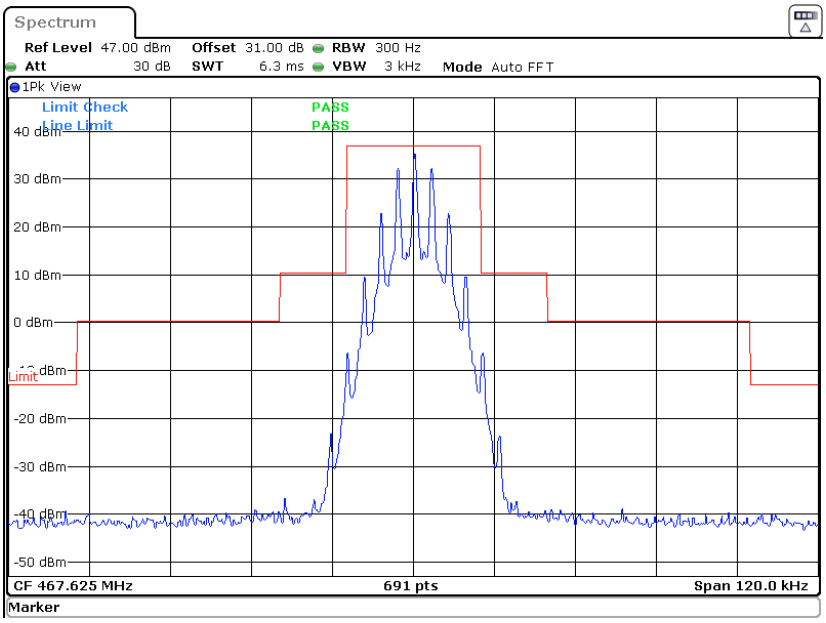
Date: 30.NOV.2022 18:37:26

OBW, 467.625 MHz_25k – Low Power Level



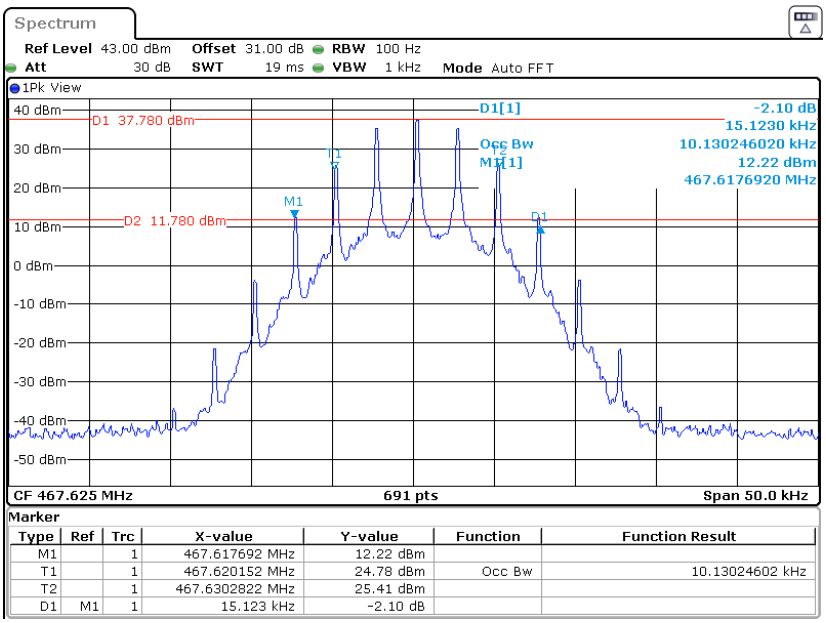
Date: 22.NOV.2022 19:57:51

Emission Mask, 467.625 MHz_25k – Low Power Level



Date: 30.NOV.2022 18:35:30

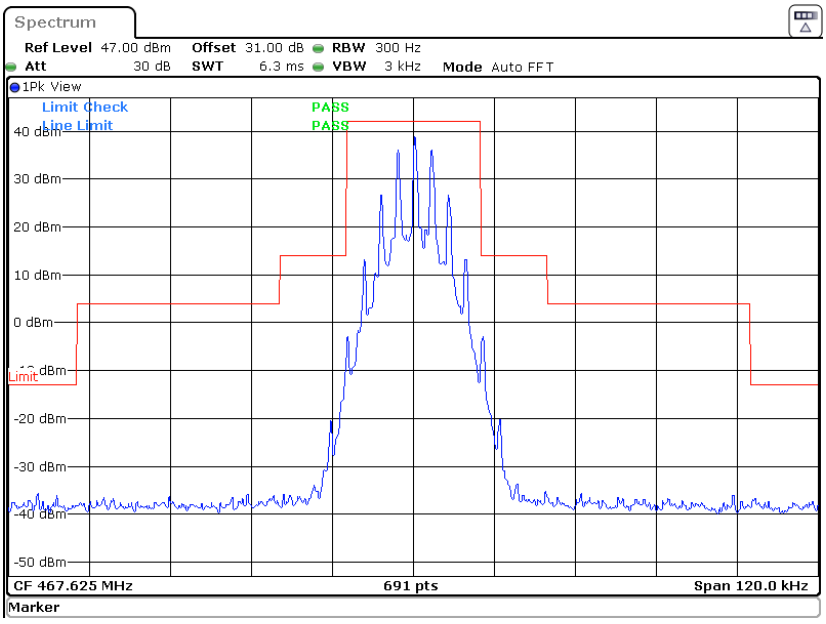
OBW, 467.625 MHz_25k – High Power Level



Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	467.617692 MHz	12.22 dBm		
T1		1	467.620152 MHz	24.78 dBm	Occ Bw	10.13024602 kHz
T2		1	467.6302822 MHz	25.41 dBm		
D1	M1	1	15.123 kHz	-2.10 dB		

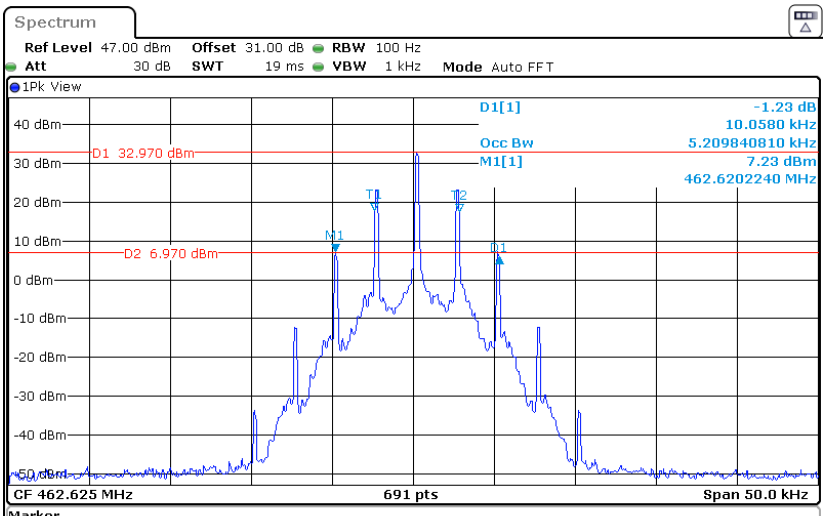
Date: 30.NOV.2022 03:09:38

Emission Mask, 467.625 MHz_25k – High Power Level



Date: 30.NOV.2022 18:32:49

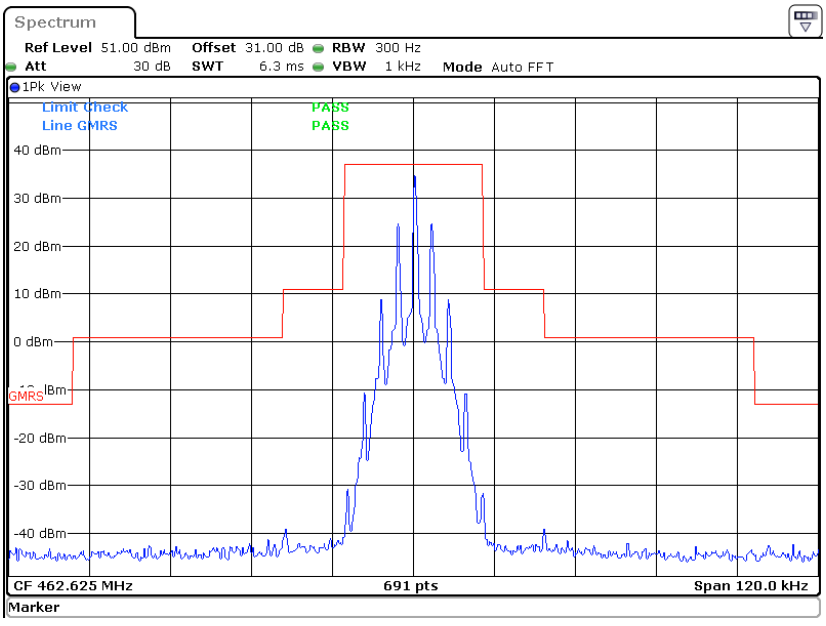
OBW, 462.625 MHz_12.5k – Low Power Level



Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	462.620224 MHz	7.23 dBm		
T1		1	462.6226122 MHz	17.89 dBm	Occ Bw	5.20984081 kHz
T2		1	462.627822 MHz	17.52 dBm		
D1	M1	1	10.058 kHz	-1.23 dB		

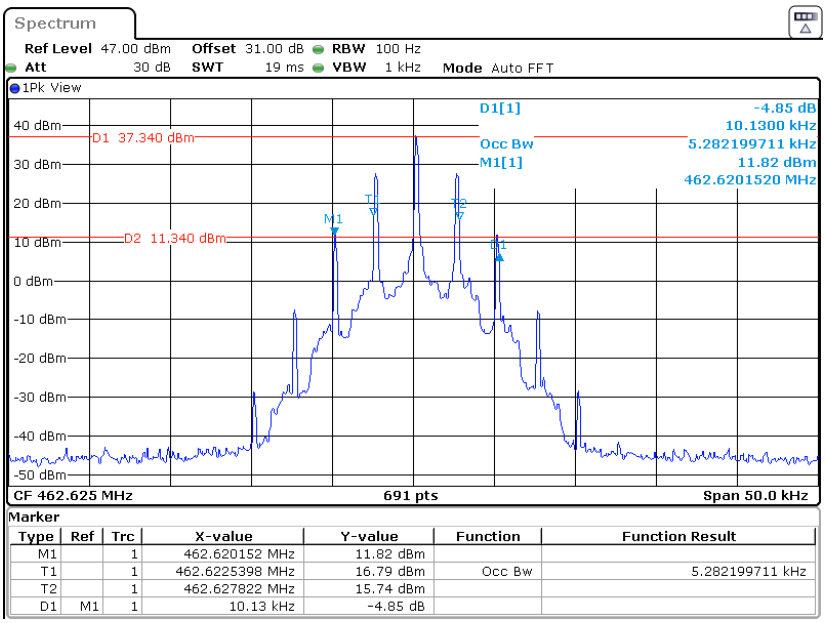
Date: 2.DEC.2022 15:15:59

Emission Mask, 462.625 MHz_12.5k – Low Power Level



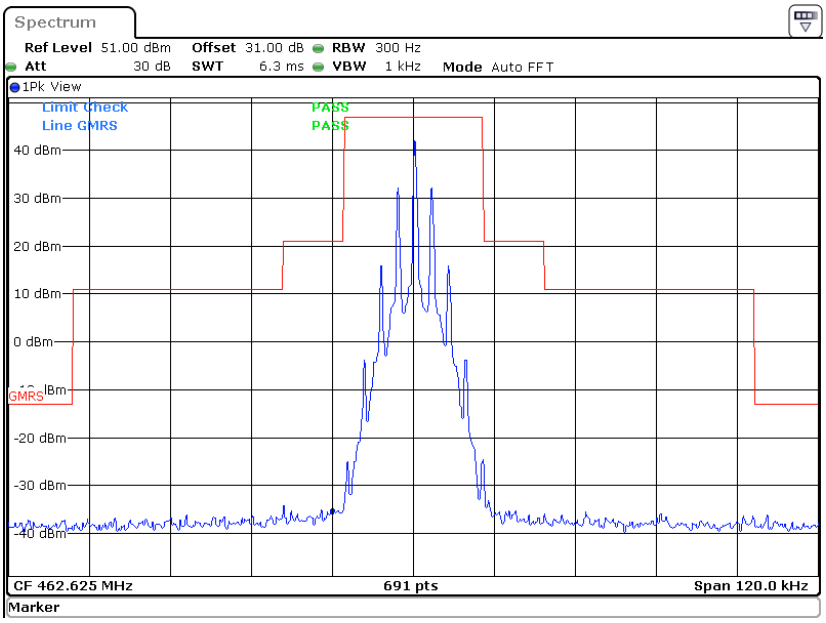
Date: 2.DEC.2022 21:31:26

OBW, 462.625 MHz_12.5k – High Power Level



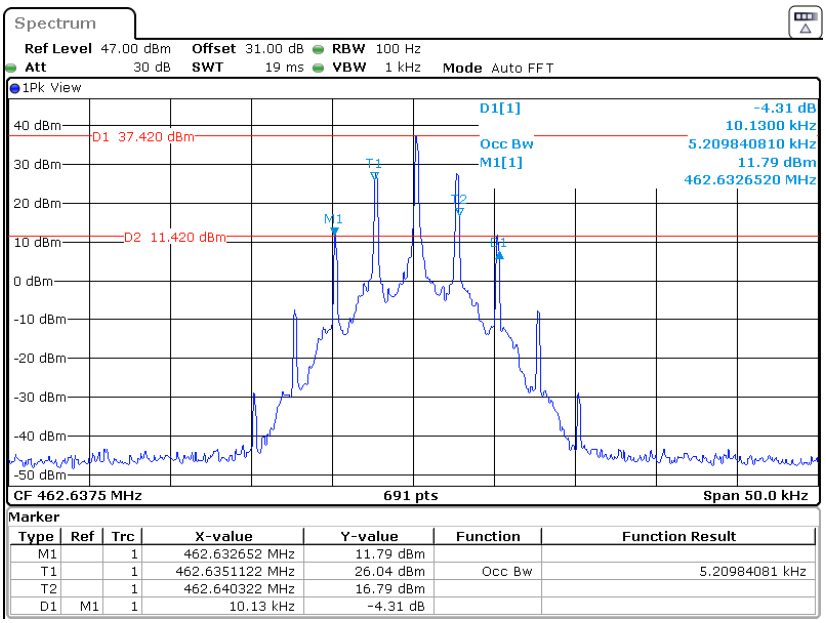
Date: 2.DEC.2022 15:22:11

Emission Mask, 462.625 MHz_12.5k - High Power Level



Date: 2.DEC.2022 21:36:09

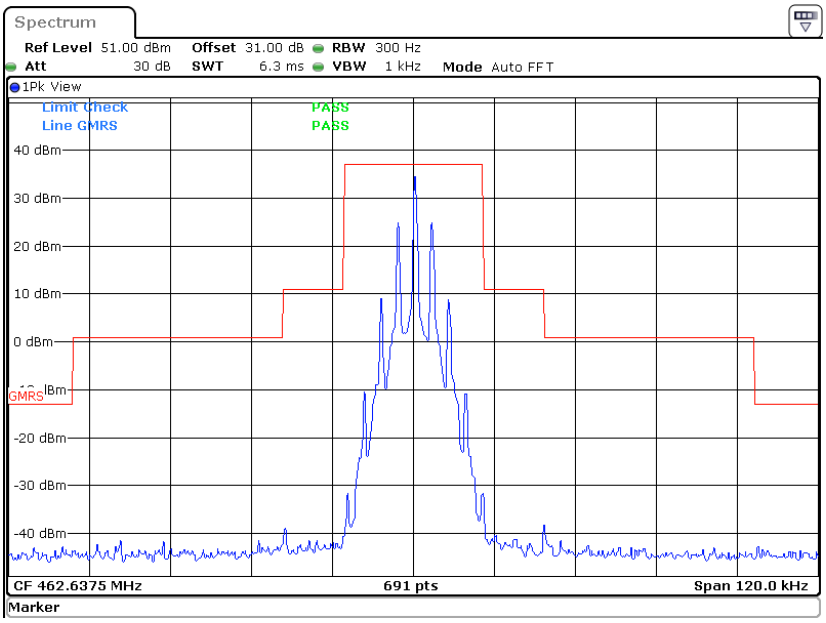
OBW, 462.6375 MHz_12.5k



Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	462.632652 MHz	11.79 dBm		
T1		1	462.6351122 MHz	26.04 dBm	Occ Bw	5.20984081 kHz
T2		1	462.640322 MHz	16.79 dBm		
D1	M1	1	10.13 kHz	-4.31 dB		

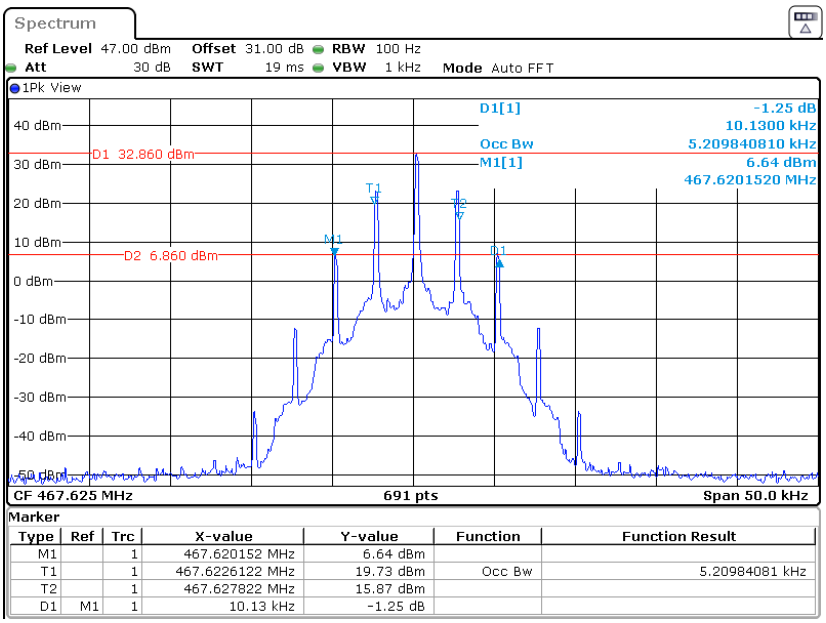
Date: 2.DEC.2022 15:26:06

Emission Mask, 462.6375 MHz_12.5k



Date: 2.DEC.2022 21:33:44

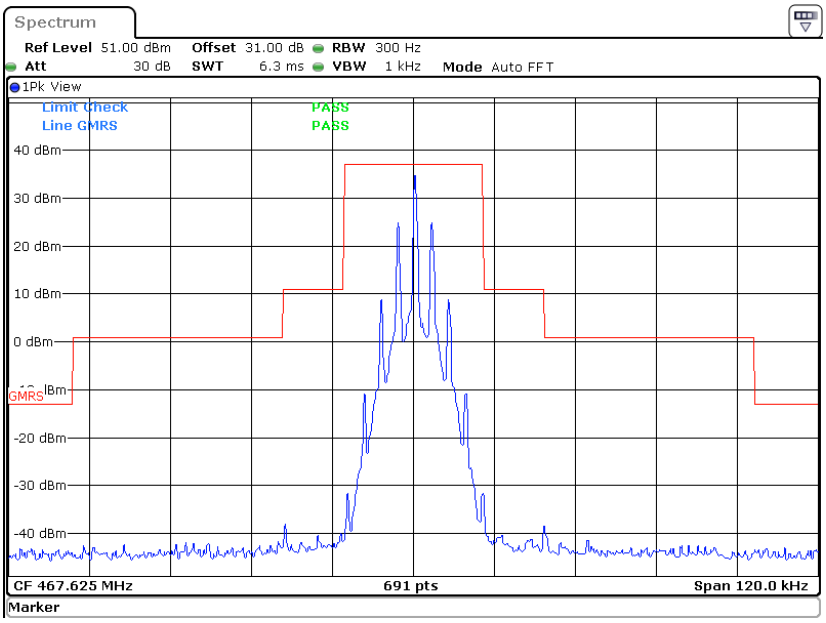
OBW, 467.625 MHz_12.5k – Low Power Level



Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	467.620152 MHz	6.64 dBm		
T1		1	467.6226122 MHz	19.73 dBm	Occ Bw	5.20984081 kHz
T2		1	467.627822 MHz	15.87 dBm		
D1	M1	1	10.13 kHz	-1.25 dB		

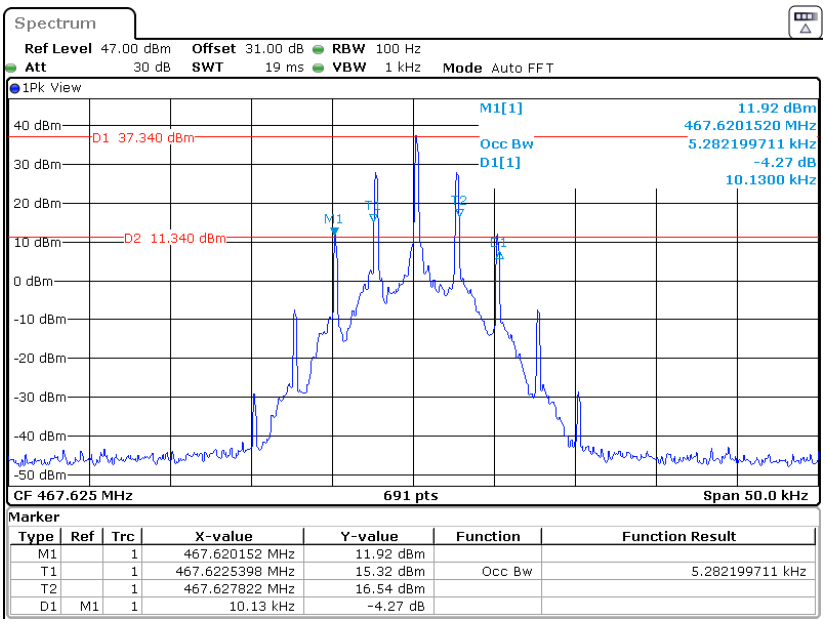
Date: 2.DEC.2022 15:29:29

Emission Mask, 467.625 MHz_12.5k – Low Power Level



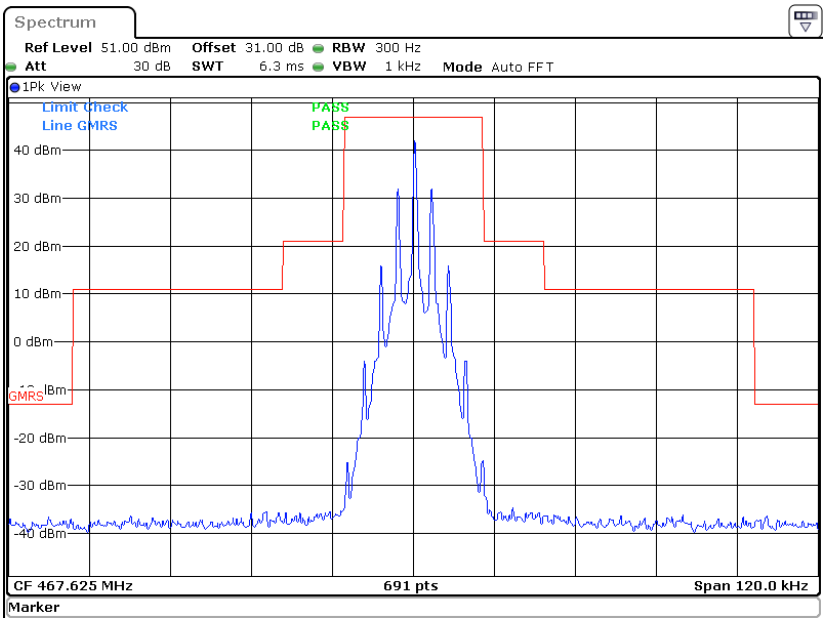
Date: 2.DEC.2022 21:32:13

OBW, 467.625 MHz_12.5k – High Power Level



Date: 2.DEC.2022 15:24:27

Emission Mask, 467.625 MHz_12.5k – High Power Level



Date: 2.DEC.2022 21:36:55

FCC §2.1051 & §95.1779 - SPURIOUS EMISSIONS AT ANTENNA TERMINALS

Applicable Standard

According to §95.1779. Each GMRS transmitter type must be designed to comply with the applicable unwanted emissions limits in this section.

(b) Attenuation requirements. The power of unwanted emissions must be attenuated below the transmitter output power in Watts (P) by at least:

(1) 25 dB (decibels) on any frequency removed from the center of the authorized bandwidth by more than 50% up to and including 100% of the authorized bandwidth.

(2) 35 dB on any frequency removed from the center of the authorized bandwidth by more than 100% up to and including 250% of the authorized bandwidth.

(7) 43 + 10 log (P) dB on any frequency removed from the center of the authorized bandwidth by more than 250%.

(c) Measurement bandwidths. The power of unwanted emissions in the frequency bands specified in paragraphs (b)(1) through (4) of this section is measured with a reference bandwidth of 300 Hz. The power of unwanted emissions in the frequency range specified in paragraph (b)(5) of this section is measured with a reference bandwidth of at least 30 kHz.

(d) Measurement conditions. The requirements in this section apply to each GMRS transmitter type both with and without the connection of permitted attachments, such as an external speaker, microphone, power cord and/or antenna.

Test Procedure

The RF output of the EUT was connected to a spectrum analyzer through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 100 kHz for below 1GHz, and 1MHz for above 1GHz. sufficient scans were taken to show any out of band emissions up to 10th harmonic.

Test Data

Environmental Conditions

Temperature:	26~27.4 ℃
Relative Humidity:	53~55 %
ATM Pressure:	101.0 kPa

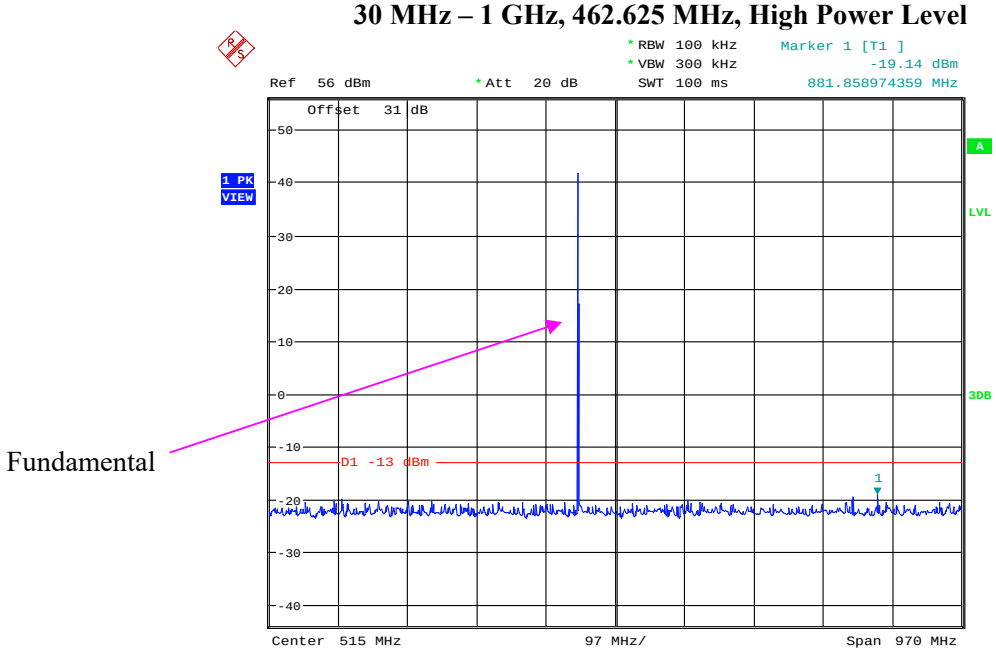
The testing was performed by Gleen Jiang on 2022-11-29 and 2022-12-02.

Test Mode: Transmitting(worst case)

Please refer to the following plots.

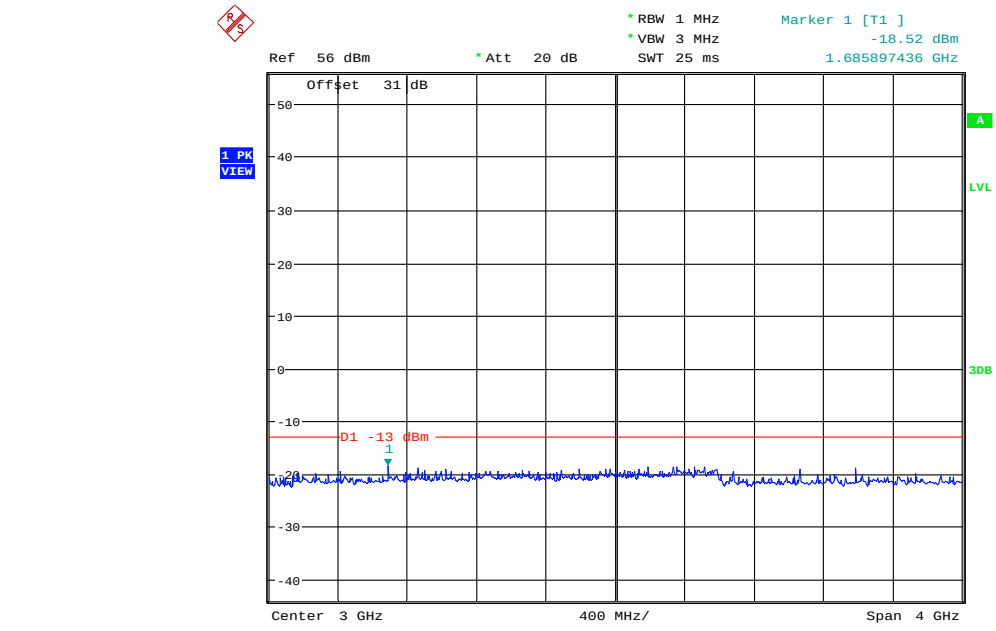
Channel spacing: 25kHz

30 MHz – 1 GHz, 462.625 MHz, High Power Level



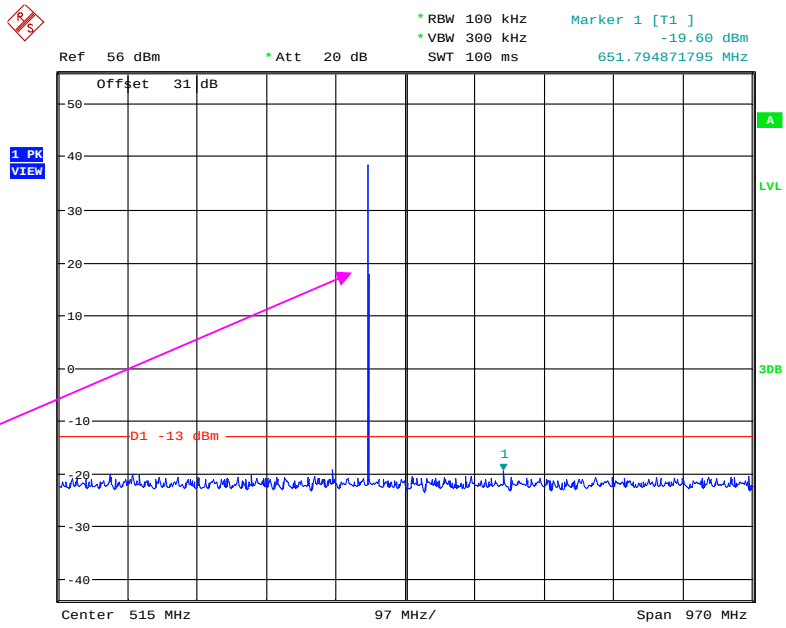
Date: 29.NOV.2022 19:06:00

1 GHz – 5.0 GHz, 462.625 MHz, High Power Level



Date: 29.NOV.2022 19:09:16

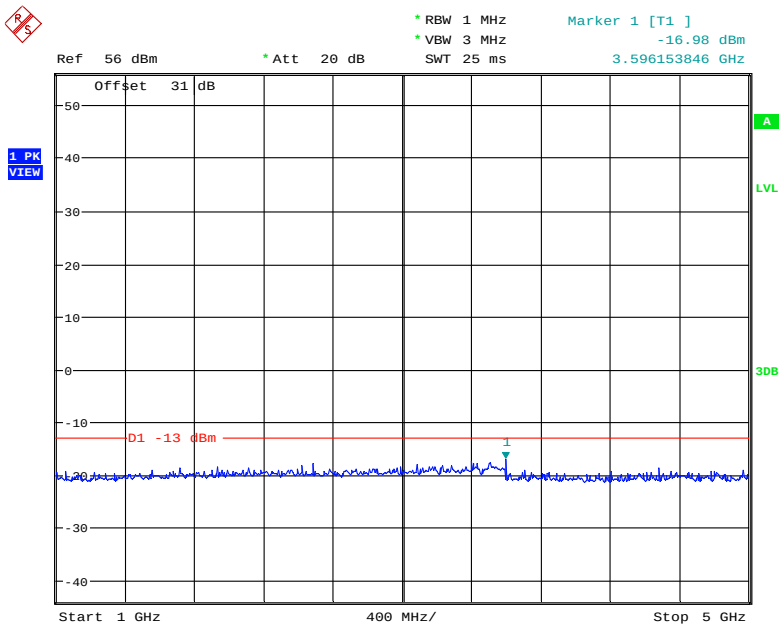
30 MHz – 1 GHz, 462.6375 MHz



Fundamental

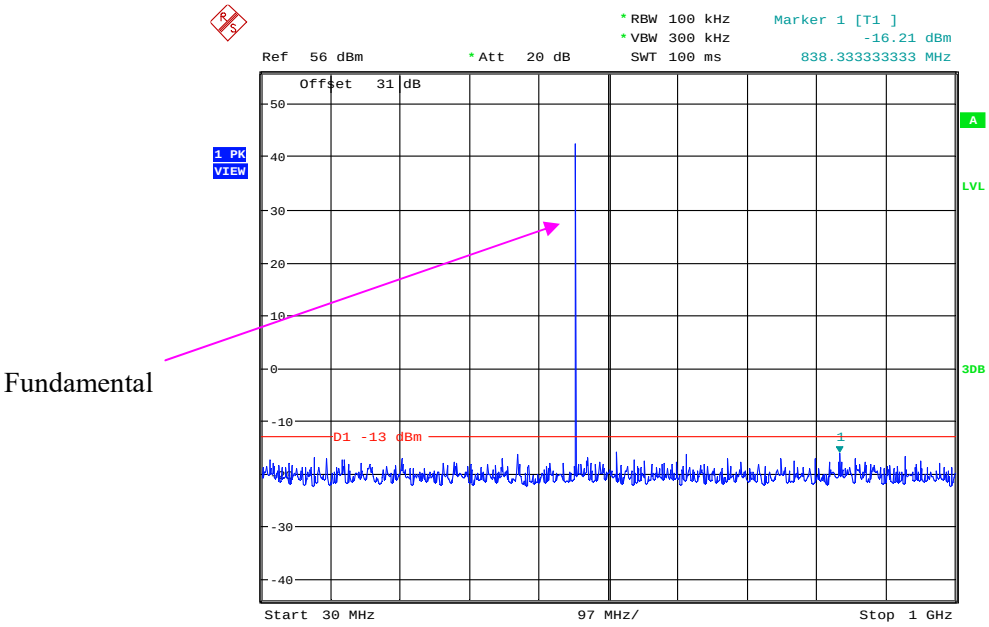
Date: 29.NOV.2022 19:07:04

1 GHz – 5.0 GHz, 462.6375 MHz



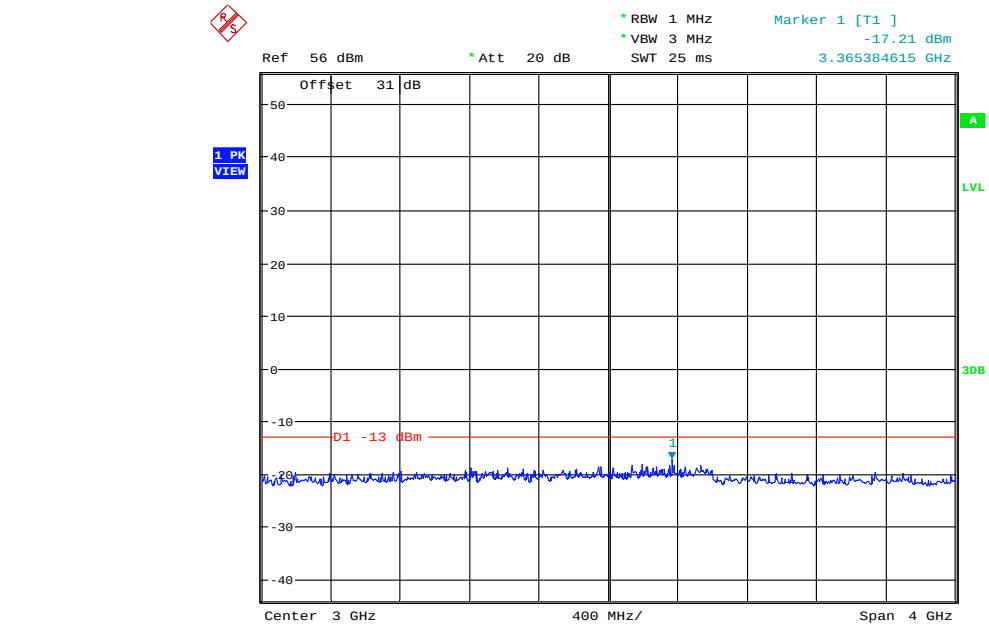
Date: 29.NOV.2022 19:08:42

30 MHz – 1 GHz, 467.625 MHz, High Power Level



Date: 29.NOV.2022 19:05:07

1 GHz – 5.0 GHz, 467.625 MHz, High Power Level

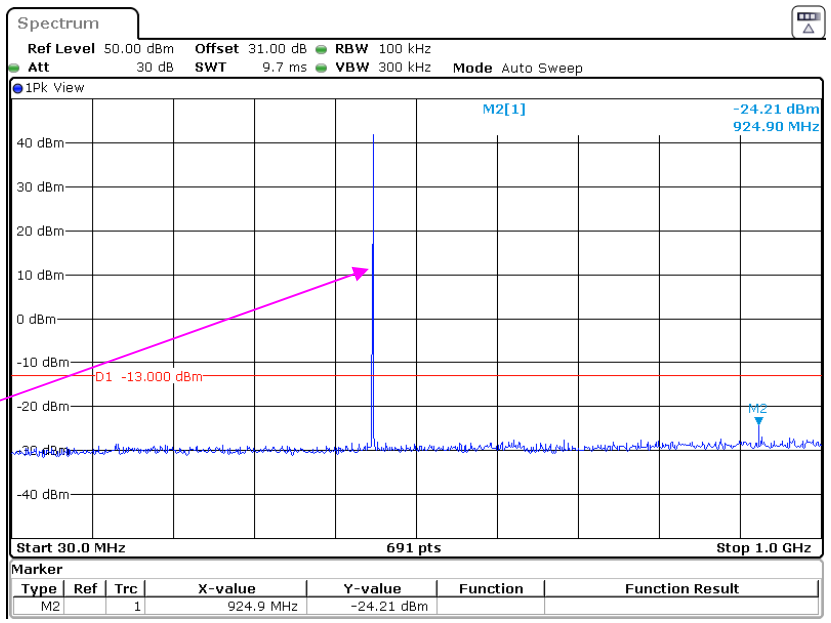


Date: 29.NOV.2022 19:09:48

Channel spacing 12.5kHz

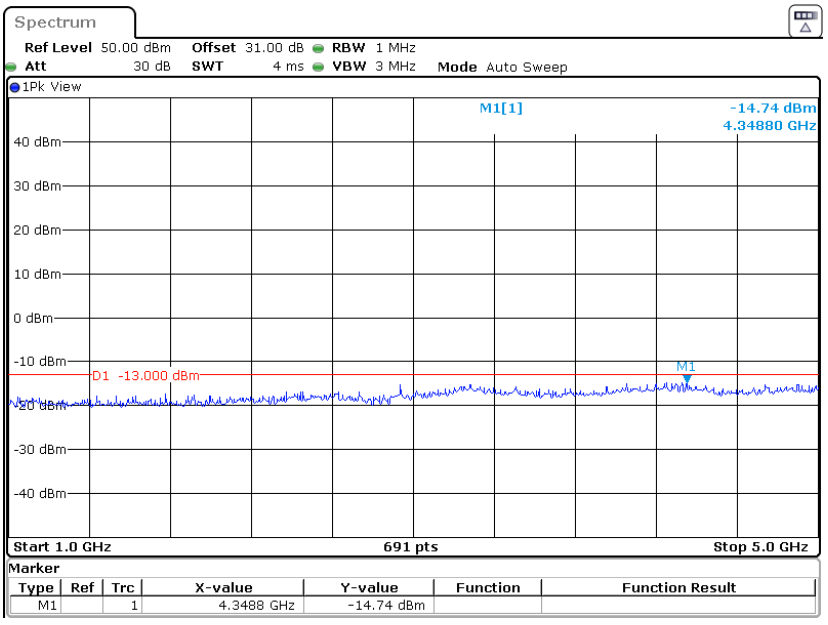
30 MHz – 1 GHz, 462.625 MHz, High Power Level

Fundamental



Date: 2.DEC.2022 16:27:21

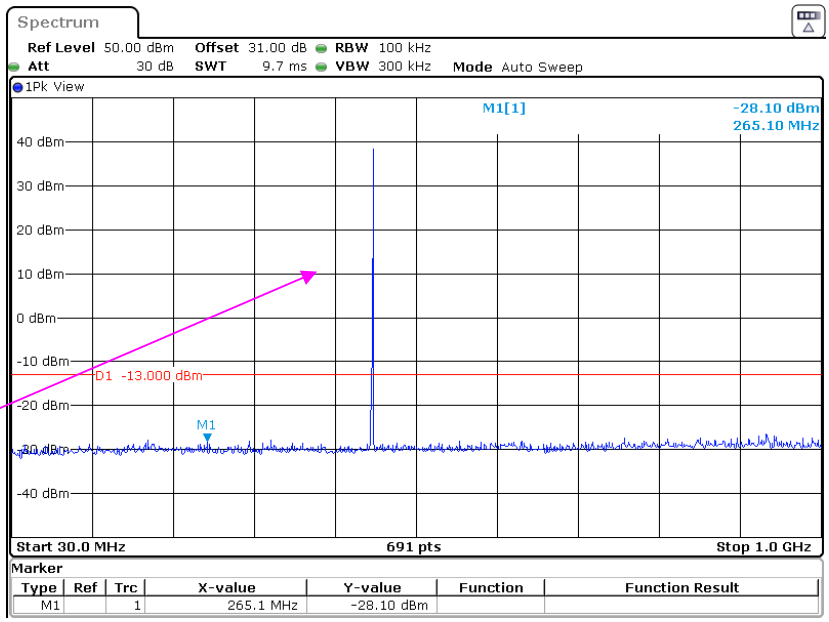
1 GHz – 5.0 GHz, 462.625 MHz, High Power Level



Date: 2.DEC.2022 16:27:37

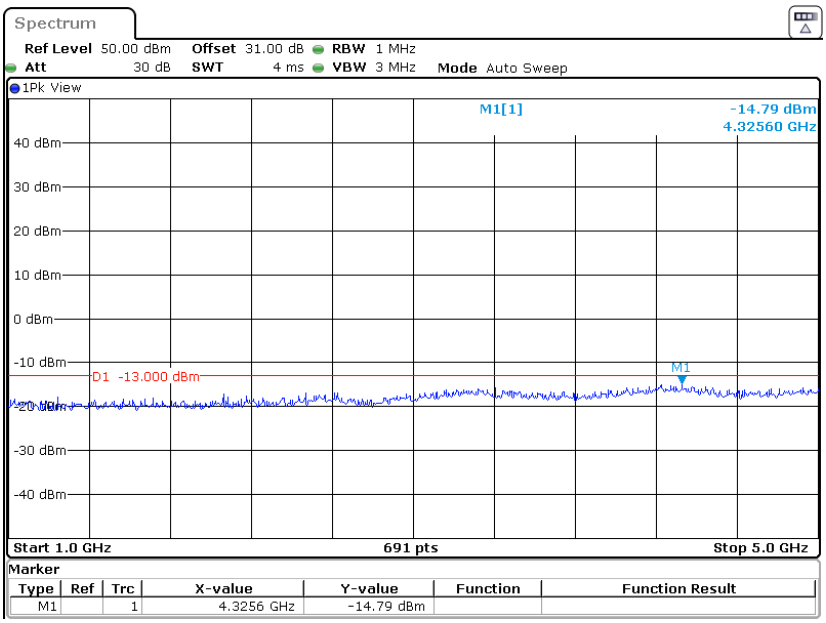
30 MHz – 1 GHz, 462.6375 MHz

Fundamental



Date: 2.DEC.2022 16:30:44

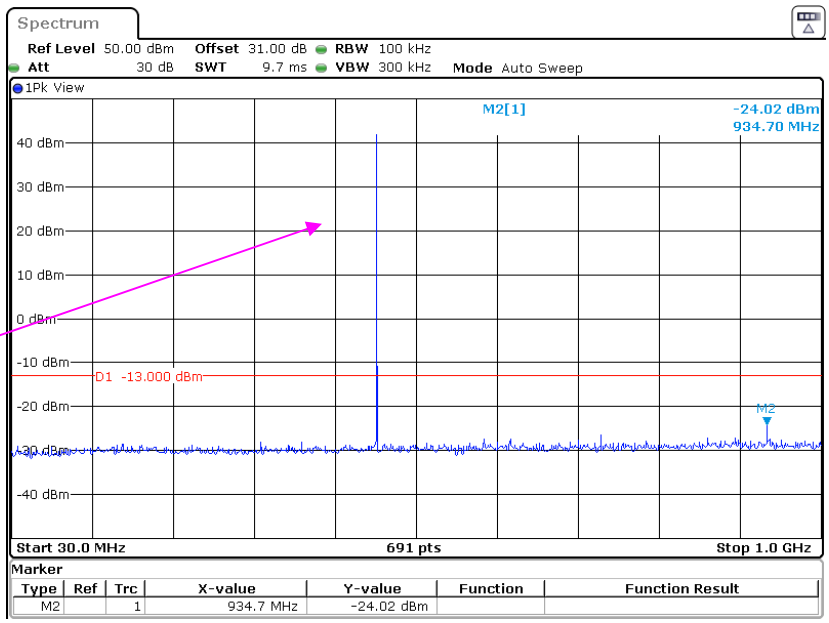
1 GHz – 5.0 GHz, 462.6375 MHz



Date: 2.DEC.2022 16:28:52

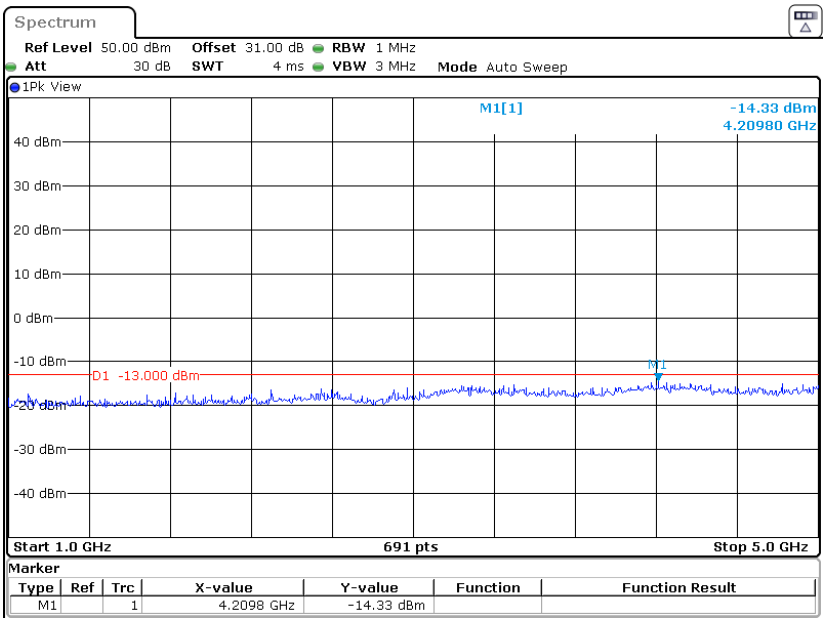
30 MHz – 1 GHz, 467.625 MHz, High Power Level

Fundamental



Date: 2.DEC.2022 16:28:01

1 GHz – 5.0 GHz, 467.625 MHz, High Power Level



Date: 2.DEC.2022 16:28:19

FCC §2.1053 & §95.1779- RADIATED SPURIOUS EMISSION

Applicable Standard

FCC §2.1053 and §95.1779. Each GMRS transmitter type must be designed to comply with the applicable unwanted emissions limits in this section.

(b) Attenuation requirements. The power of unwanted emissions must be attenuated below the transmitter output power in Watts (P) by at least:

(1) 25 dB (decibels) on any frequency removed from the center of the authorized bandwidth by more than 50% up to and including 100% of the authorized bandwidth.

(2) 35 dB on any frequency removed from the center of the authorized bandwidth by more than 100% up to and including 250% of the authorized bandwidth.

(7) 43 + 10 log (P) dB on any frequency removed from the center of the authorized bandwidth by more than 250%.

(c) Measurement bandwidths. The power of unwanted emissions in the frequency bands specified in paragraphs (b)(1) through (4) of this section is measured with a reference bandwidth of 300 Hz. The power of unwanted emissions in the frequency range specified in paragraph (b)(5) of this section is measured with a reference bandwidth of at least 30 kHz.

(d) Measurement conditions. The requirements in this section apply to each GMRS transmitter type both with and without the connection of permitted attachments, such as an external speaker, microphone, power cord and/or antenna.

Test Procedure

The transmitter was placed on a nonconducting 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 tenth 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
Spurious attenuation limit in dB = 43+10 Log_{10} (power out in Watts)

Test Data

Environmental Conditions

Temperature:	25~26.7 °C
Relative Humidity:	55~62 %
ATM Pressure:	101.0 kPa

The testing was performed by Jimi Zheng from 2022-11-10 to 2022-11-24.

Test Mode: Transmitting (worst case)

Frequency (MHz)	Receiver Reading (dBm)	Turntable Degree	Rx Antenna		Substituted Factor (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)				
25kHz								
462.6375MHz								
925.28	-28.9	75	1.7	H	9.27	-19.63	-13	-6.63
925.28	-34.28	130	2	V	11.55	-22.73	-13	-9.73
1387.91	-33.10	358	1.8	H	6.0	-27.10	-13	-14.10
1387.91	-33.60	345	1.2	V	5.8	-27.80	-13	-14.80
1850.55	-26.30	54	1.6	H	4.4	-21.90	-13	-8.90
1850.55	-25.50	286	1.3	V	3.6	-21.90	-13	-8.90
2313.19	-29.40	358	2.0	H	7.2	-22.20	-13	-9.20
2313.19	-29.20	56	2.3	V	6.7	-22.50	-13	-9.50
462.6250MHz, High Power Level								
925.25	-28.1	50	1.6	H	9.27	-18.83	-13	-5.83
925.25	-33.28	44	1.9	V	11.55	-21.73	-13	-8.73
1387.88	-23.50	263	1.3	H	6.0	-17.50	-13	-4.50
1387.88	-25.30	79	2.0	V	5.8	-19.50	-13	-6.50
1850.5	-26.40	232	1.7	H	4.4	-22.00	-13	-9.00
1850.5	-25.70	85	2.5	V	3.6	-22.10	-13	-9.10
2313.13	-29.40	69	1.8	H	7.2	-22.20	-13	-9.20
2313.13	-29.20	288	1.3	V	6.7	-22.50	-13	-9.50
467.6250MHz, High Power Level								
935.25	-27.95	301	1.4	H	9.22	-18.73	-13	-5.73
935.25	-32.98	340	1.7	V	11.65	-21.33	-13	-8.33
1402.88	-34.70	19	1.2	H	5.9	-28.80	-13	-15.80
1402.88	-34.20	262	1.8	V	5.8	-28.40	-13	-15.40
1870.5	-26.70	306	1.5	H	4.2	-22.50	-13	-9.50
1870.5	-25.70	273	1.6	V	3.4	-22.30	-13	-9.30
2338.13	-30.80	194	2.3	H	7.3	-23.50	-13	-10.50
2338.13	-29.80	58	1.6	V	6.5	-23.30	-13	-10.30

Frequency (MHz)	Receiver Reading (dBm)	Turntable Degree	Rx Antenna		Substituted Factor (dB)	Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (m)	Polar (H/V)				
12.5kHz								
462.6375MHz								
925.28	-29.19	57	1.7	H	9.27	-19.92	-13	-6.92
925.28	-34.37	169	2.4	V	11.55	-22.82	-13	-9.82
1387.91	-33.37	345	1.6	H	6	-27.37	-13	-14.37
1387.91	-33.69	178	1.3	V	5.8	-27.89	-13	-14.89
1850.55	-26.33	34	2.3	H	4.4	-21.93	-13	-8.93
1850.55	-25.72	279	1.4	V	3.6	-22.12	-13	-9.12
2313.19	-29.43	72	1.3	H	7.2	-22.23	-13	-9.23
2313.19	-29.29	342	2.3	V	6.7	-22.59	-13	-9.59
462.6250MHz								
925.25	-28.18	196	1.9	H	9.27	-18.91	-13	-5.91
925.25	-33.55	299	1.7	V	11.55	-22	-13	-9
1387.88	-23.68	129	2.1	H	6	-17.68	-13	-4.68
1387.88	-25.47	94	1.2	V	5.8	-19.67	-13	-6.67
1850.5	-26.63	229	2.3	H	4.4	-22.23	-13	-9.23
1850.5	-25.77	347	1.7	V	3.6	-22.17	-13	-9.17
2313.13	-29.42	213	1.8	H	7.2	-22.22	-13	-9.22
2313.13	-29.43	28	1.8	V	6.7	-22.73	-13	-9.73
467.6250MHz								
935.25	-28.1	333	2.2	H	9.22	-18.88	-13	-5.88
935.25	-33.2	270	1.8	V	11.65	-21.55	-13	-8.55
1402.88	-34.87	263	1.4	H	5.9	-28.97	-13	-15.97
1402.88	-34.43	168	1.1	V	5.8	-28.63	-13	-15.63
1870.5	-26.71	12	1.3	H	4.2	-22.51	-13	-9.51
1870.5	-25.74	249	1.5	V	3.4	-22.34	-13	-9.34
2338.13	-30.97	74	2.2	H	7.3	-23.67	-13	-10.67
2338.13	-30	109	1.3	V	6.5	-23.50	-13	-10.50

Note:
Absolute Level = Reading Level + Substituted Factor
Substituted Factor contains: SG Level - Cable loss+ Antenna Gain
Margin = Absolute Level - Limit

FCC§2.1055 (d) & §95.1765 - FREQUENCY STABILITY

Applicable Standard

According to FCC §2.1055(a) (1), the frequency stability shall be measured with variation of ambient temperature from -30 ºC to +50 ºC, and according to FCC 2.1055(d) (2), the frequency stability shall be measured with reducing primary supply voltage to the battery operating end point which is specified by the manufacturer.

According to FCC §95.1765,Each GMRS transmitter type must be designed to comply with the frequency accuracy requirements in this section under normal operating conditions. Operators of GMRS stations must also ensure compliance with these requirements.

(a) The carrier frequency of each GMRS transmitter transmitting an emission with an occupied bandwidth greater than 12.5 kHz must remain within 5 parts-per-million (ppm) of the channel center frequencies listed in §95.1763 under normal operating conditions.

(b) The carrier frequency of each GMRS transmitter transmitting an emission with an occupied bandwidth of 12.5 kHz or less must remain within 2.5 ppm of the channel center frequencies listed in §95.1763 under normal operating conditions.

Test Procedure

Frequency Stability vs. Temperature: The equipment under test was connected to an external DC power supply and the RF output was connected to a Frequency Counter via feed-through attenuators. The EUT was placed inside the temperature chamber. The DC leads and RF output cable exited the chamber through an opening made for the purpose.

After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from the Frequency Counter.

Frequency Stability vs. Voltage (item 1or item 2 will be chosen according to different condition) :

☒1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.

☐2) For hand carried, battery powered equipment, reduce primary supply voltage to the battery operating end point which shall be specified by the manufacturer.

The output frequency was recorded for each voltage.

Test Data

Environmental Conditions

Temperature:	26~27.4 °C
Relative Humidity:	53~56 %
ATM Pressure:	101.0 kPa

The testing was performed by Glenn Jiang on 2022-11-22 and 2022-12-02.

Test Mode: Transmitting

Reference Frequency:462.6375MHz, Limit: 2.5ppm，25kHz			
Environment Temperature	Power Supplied	Frequency Measure with Time Elapsed	
(°C)	(Vdc)	MCF (MHz)	PPM Error
50	13.8	462.637399	-0.22
40	13.8	462.637358	-0.31
30	13.8	462.637332	-0.36
20	13.8	462.637291	-0.45
10	13.8	462.637442	-0.13
0	13.8	462.637481	-0.04
-10	13.8	462.637574	0.16
-20	13.8	462.637668	0.36
-30	13.8	462.637510	0.02
Frequency Stability Versus Input Voltage			
20	12.6	462.637692	0.42
20	14.4	462.637378	-0.26

Reference Frequency:462.6250MHz, Limit: 2.5ppm，25kHz			
Environment Temperature	Power Supplied	Frequency Measure with Time Elapsed	
(°C)	(Vdc)	MCF (MHz)	PPM Error
50	13.8	462.625035	0.08
40	13.8	462.624963	-0.08
30	13.8	462.625121	0.26
20	13.8	462.624905	-0.21
10	13.8	462.624992	-0.02
0	13.8	462.624823	-0.38
-10	13.8	462.624896	-0.22
-20	13.8	462.625158	0.34
-30	13.8	462.624875	-0.27
Frequency Stability Versus Input Voltage			
20	12.6	462.625174	0.38
20	14.4	462.624808	-0.42

Reference Frequency:467.6250MHz, Limit: 2.5ppm，25kHz			
Environment Temperature	Power Supplied	Frequency Measure with Time Elapsed	
(°C)	(Vdc)	MCF (MHz)	PPM Error
50	13.8	467.624805	-0.42
40	13.8	467.625126	0.27
30	13.8	467.625058	0.12
20	13.8	467.624875	-0.27
10	13.8	467.625102	0.22
0	13.8	467.625065	0.14
-10	13.8	467.625107	0.23
-20	13.8	467.624912	-0.19
-30	13.8	467.624848	-0.33
Frequency Stability Versus Input Voltage			
20	12.6	467.625119	0.25
20	14.4	467.624988	-0.03

Reference Frequency:462.6375MHz, Limit:2.5 ppm，12.5kHz			
Environment Temperature (°C)	Power Supplied (Vdc)	Frequency Measure with Time Elapsed	
		MCF (MHz)	PPM Error
50	13.8	462.637585	0.18
40	13.8	462.637105	-0.85
30	13.8	462.637449	-0.11
20	13.8	462.637188	-0.67
10	13.8	462.637324	-0.38
0	13.8	462.637588	0.19
-10	13.8	462.637428	-0.16
-20	13.8	462.637296	-0.44
-30	13.8	462.637326	-0.38
Frequency Stability Versus Input Voltage			
20	12.6	462.637357	-0.31
20	14.4	462.637432	-0.15

Reference Frequency:462.6250MHz, Limit:2.5 ppm，12.5kHz			
Environment Temperature (°C)	Power Supplied (Vdc)	Frequency Measure with Time Elapsed	
		MCF (MHz)	PPM Error
50	13.8	462.624671	-0.71
40	13.8	462.625077	0.17
30	13.8	462.625153	0.33
20	13.8	462.625119	0.26
10	13.8	462.625062	0.13
0	13.8	462.624847	-0.33
-10	13.8	462.624799	-0.43
-20	13.8	462.624651	-0.75
-30	13.8	462.624877	-0.27
Frequency Stability Versus Input Voltage			
20	12.6	462.624955	-0.10
20	14.4	462.625197	0.43

Reference Frequency:467.6250MHz, Limit:2.5 ppm，12.5kHz			
Environment Temperature (°C)	Power Supplied (Vdc)	Frequency Measure with Time Elapsed	
		MCF (MHz)	PPM Error
50	13.8	467.624992	-0.02
40	13.8	467.624608	-0.84
30	13.8	467.624657	-0.73
20	13.8	467.625098	0.21
10	13.8	467.624748	-0.54
0	13.8	467.624631	-0.79
-10	13.8	467.624934	-0.14
-20	13.8	467.625131	0.28
-30	13.8	467.624693	-0.66
Frequency Stability Versus Input Voltage			
20	12.6	467.625058	0.12
20	14.4	467.625141	0.30

Note: the extreme voltage was provided by applicant.

******* END OF REPORT *******