

TEST REPORT

Report No. : CHTEW21080032 Report Verification: 

Project No. : SHT2106071401EW

FCC ID. : 2ASNSRB17A

Applicant's name : Shenzhen Retevis Technology Co., Ltd.

Address : Room 700, 7/F, 13-C, Zhonghaixin Science&Technology Park,
No.12 Ganli 6th Road, Jihua Street, Longgang District, Shenzhen,
China

Test item description : Two Way Radio

Trade Mark : RETEVIS

Model/Type reference : RB17A

Listed Model(s) : -

Standard : FCC CFR Title 47 Part 95 Subpart E

Date of receipt of test sample : Jun.25, 2021

Date of testing : Jun.26, 2021- Aug.03,2021

Date of issue : Aug.04,2021

Result : PASS

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Testing Laboratory Name : Shenzhen Huatongwei International Inspection Co., Ltd.

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The test report merely correspond to the test sample.

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1. TEST STANDARDS AND REPORT VERSION

1.1. Test Standards

The tests were performed according to following standards:

- [FCC Rules Part 95](#): PERSONAL RADIO SERVICES
- [FCC Rules Part 2](#): Frequency allocations and radio treaty matters; General rules and regulations
- [ANSI C63.26-2013](#): American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services

1.2. Report version

Revision No.	Date of issue	Description
N/A	2021-08-04	Original

2. TEST DESCRIPTION

Report clause	Test Items	Standard Requirement	Result
5.1	Carrier Output Power (ERP)	Part 95.1767 Part 2.1046	PASS
5.2	99% Occupied Bandwidth & 26dB bandwidth	Part 95.1773 Part 2.1049	PASS
5.3	Emission Mask	Part 95.1779 Part 2.1049	PASS
5.4	Modulation Limit	Part 95.1775 Part 2.1047	PASS
5.5	Audio Frequency Response	Part 95.1775 Part 2.1047	PASS
5.6	Audio Low Pass Filter Response	Part 95.1775 Part 2.1047	PASS
5.7	Frequency Stability V.S. Temperature	Part 95.1765 Part 2.1055	PASS
5.8	Frequency Stability V.S. Voltage	Part 95.1765 Part 2.1055	PASS
5.9	Transmit Radiated Spurious Emission	Part 95.1779 Part 2.1051	PASS

Note:

- The measurement uncertainty is not included in the test result.

3. SUMMARY

3.1. Client Information

Applicant:	Shenzhen Retevis Technology Co., Ltd.
Address:	Room 700, 7/F, 13-C, Zhonghaixin Science&Technology Park, No.12 Ganli 6th Road, Jihua Street, Longgang District, Shenzhen, China
Manufacturer:	Shenzhen Retevis Technology Co., Ltd.
Address:	Room 700, 7/F, 13-C, Zhonghaixin Science&Technology Park, No.12 Ganli 6th Road, Jihua Street, Longgang District, Shenzhen, China

3.2. Product Description

Name of EUT:	Two Way Radio
Trade Mark:	RETEVIS
Model No.:	RB17A
Listed Model(s):	-
Power supply:	DC 7.4V from battery
Battery information:	Model: BL17A Voltage: 7.4V Capacity: 2200mAh Power: 16.28Wh
Charger information:	Model: DC17A Input: DC 5.0V, 1000mA Output: DC 8.4V, 400mA
Adapter information:	Model: DSA-5PF07-05 FUS 050100 Input: 100-240V, 50/60Hz, 0.2A Output: 5V, 1A
Hardware version:	V1.2
Software version:	V1.3

3.3. Radio Specification Description

Support Frequency Range:	462MHz Main channel:	462.5500, 462.5750, 462.6000, 462.6250, 462.6500, 462.6750, 462.7000, 462.7250MHz
	462MHz interstitial channel:	462.5625, 462.5875, 462.6125, 462.6375, 462.6625, 462.6875, 462.7125 MHz
	467MHz Main channel:	467.5500, 467.5750, 467.6000, 467.6250, 467.6500, 467.6750, 467.7000, 467.7250MHz
	467MHz interstitial channel:	467.5625, 467.5875, 467.6125, 467.6375, 467.6625, 467.6875, 467.7125MHz
Modulation Type:	FM	
Emission Designator: * ¹	11K0F3E	
Antenna Type:	Integral	
Antenna Gain:	2.15dBi	

Note:

(1) *1 According to FCC Part 2.202 requirements, the Necessary Bandwidth is calculated as follows:

- For FM Voice Modulation

Channel Spacing = 12.5 KHz, D = 2.5 KHz max, K = 1, M = 3 KHz

$B_n = 2M + 2DK = 2*3 + 2*2.5*1 = \mathbf{11\ KHz}$

Emission designation: 11K0F3E

(2) The device only supports voice communication.

3.4. Testing Laboratory Information

Laboratory Name	Shenzhen Huatongwei International Inspection Co., Ltd.	
Laboratory Location	1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, China	
Connect information:	Tel: 86-755-26715499 E-mail: cs@szhtw.com.cn http://www.szhtw.com.cn	
Qualifications	Type	Accreditation Number
	FCC	762235

4. TEST CONFIGURATION

4.1. Test frequency list

According to ANSI C63.26 section 5.1.2.1:

Measurements of transmitters shall be performed and, if required, reported for each frequency band in which the EUT can be operated with the device transmitting at the number of frequencies in each band specified in Table 2.

Frequency range over which EUT operates	Number of frequencies	Location in frequency range of operation
1 MHz or less	1	Middle
1 MHz to 10 MHz	2	1 near top and 1 near bottom
More than 10 MHz	3	1 near top, 1 near middle, and 1 near bottom

Test Channel	Frequency range	Type	Frequency (MHz)
CH _{M1}	462MHz	Main	462.6500
CH _{M2}	467MHz	Main	467.6500
CH _{M3}	462MHz	Interstitial	462.6375
CH _{M4}	467MHz	Interstitial	467.6375

The Product channel frequency table:

Frequency Band	Type	Frequency (MHz)	Frequency Band	Type	Frequency (MHz)
462MHz	Main	462.5500	467MHz	Main	467.5500
		462.5750			467.5750
		462.6000			467.6000
		462.6250			467.6250
		462.6500			467.6500
		462.6750			467.6750
		462.7000			467.7000
		462.7250			467.7250
462MHz	Interstitial	462.5625	467MHz	Interstitial	467.5625
		462.5875			467.5875
		462.6125			467.6125
		462.6375			467.6375
		462.6625			467.6625
		462.6875			467.6875
		462.7125			467.7125

4.2. Test mode

Test mode	Transmitting	Receiving
TX-GMRS	√	
RX-GMRS		√

Note:

√: is operation mode.

Modulation Type	Description
UM	Un-modulation
AM2	Apply a 1000 Hz tone and adjust the audio frequency generator to produce 20% of the rated system deviation.
AM6	Apply a 1000 Hz modulating signal to the transmitter from the audio frequency generator, and adjust the level to obtain 60% of full rated system deviation, then increase the level from the audio generator by 20 dB
AM5	Modulate the transmitter with a 2500 Hz sine wave at an input level 16 dB greater than that necessary to produce 50% of rated system deviation.

Test item	Modulation Type	Test mode
Output Power(ERP)	UM	TX-GMRS
99% Occupied Bandwidth & 26dB bandwidth	AM6	TX-GMRS
Emission Mask	AM5	TX-GMRS
Modulation Limit	AM6	TX-GMRS
Audio Frequency Response	AM2	TX-GMRS
Audio Low Pass Filter Response	AM2	TX-GMRS
Frequency Stability VS Temperature	UM	TX-GMRS
Frequency Stability VS Voltage	UM	TX-GMRS
Transmit Radiated Spurious Emission	AM5	TX-GMRS

4.3. Support unit used in test configuration and system

The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application.

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

Whether support unit is used?					
No					
Item	Equipment	Trade Name	Model No.	FCC ID	Power cord
1					
2					

4.4. Testing environmental condition

Type	Requirement	Actual
Temperature:	15~35°C	25°C
Relative Humidity:	25~75%	50%
Air Pressure:	860~1060mbar	1000mbar
Test voltage:	Normal voltage (V_N):	
	Extreme lower voltage (V_L):	
	Extreme higher voltage (V_H):	

4.5. Measurement uncertainty

Test Item	Measurement Uncertainty
Frequency stability	25 Hz
Carrier output power (ERP)	2.20 dB
Occupied Bandwidth	35 Hz
Modulation Limiting	0.42 %
FM deviation	25 Hz
Audio level	0.62 dB
Radiated Spurious Emission 30~1000MHz	4.65 dB
Radiated Spurious Emission 1~18GHz	5.16 dB
AC power line Conducted Emission 9KHz-30MHz	3.39 dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=1.96$.

4.6. Equipment Used during the Test

● Radiated Emission-6th test site						
Used	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
●	Semi-Anechoic Chamber	Albatross projects	SAC-3m-02	N/A	2018/09/30	2021/09/29
●	EMI Test Receiver	R&S	ESCI	100900	2020/10/19	2021/10/18
●	Loop Antenna	R&S	HFH2-Z2	100020	2021/04/06	2022/04/05
●	Ultra-Broadband Antenna	SCHWARZBECK	VULB9163	546	2021/04/06	2022/04/05
●	Pre-Amplifier	SCHWARZBECK	BBV 9742	N/A	2020/11/13	2021/11/12
●	RF Connection Cable	HUBER+SUHNER	N/A	N/A	2021/02/26	2022/02/25
●	RF Connection Cable	HUBER+SUHNER	SUCOFLEX104	501184/4	2021/02/26	2022/02/25
●	Test Software	R&S	ES-K1	N/A	N/A	N/A
●	Turntable	Maturo Germany	TT2.0-1T	N/A	N/A	N/A
●	Antenna Mast	Maturo Germany	CAM-4.0-P-12	N/A	N/A	N/A

● Radiated emission-7th test site							
Used	Test Equipment	Manufacturer	Equipment No.	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
●	Semi-Anechoic Chamber	Albatross projects	HTWE0122	SAC-3m-01	N/A	2018/09/27	2021/09/26
●	Spectrum Analyzer	R&S	HTWE0098	FSP40	100597	2020/10/20	2021/10/19
●	Horn Antenna	SCHWARZBECK	HTWE0126	9120D	1011	2020/04/01	2023/03/31
●	Broadband Horn Antenna	SCHWARZBECK	HTWE0103	BBHA9170	BBHA9170472	2018/10/11	2021/10/11
●	Pre-amplifier	CD	HTWE0071	PAP-0102	12004	2020/11/13	2021/11/12
●	Broadband Pre-amplifier	SCHWARZBECK	HTWE0201	BBV 9718	9718-248	2021/03/05	2022/03/04
●	RF Connection Cable	HUBER+SUHNER	HTWE0120-01	6m 18GHz S Serisa	N/A	2021/02/26	2022/02/25
●	RF Connection Cable	HUBER+SUHNER	HTWE0120-02	6m 3GHz RG Serisa	N/A	2021/02/26	2022/02/25
●	RF Connection Cable	HUBER+SUHNER	HTWE0119-05	6m 3GHz RG Serisa	N/A	2021/02/26	2022/02/25
●	RF Connection Cable	HUBER+SUHNER	HTWE0120-04	6m 3GHz RG Serisa	N/A	2021/02/26	2022/02/25
●	RF Connection Cable	HUBER+SUHNER	HTWE0121-01	6m 18GHz S Serisa	N/A	2021/02/26	2022/02/25
●	Test Software	Audix	N/A	E3	N/A	N/A	N/A

● RF Conducted Method						
Used	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)
●	Signal and spectrum Analyzer	R&S	FSV40	100048	2020/10/19	2021/10/18
●	Spectrum Analyzer	Agilent	N9020A	MY50510187	2020/10/19	2021/10/18
○	Radio communication tester	R&S	CMW500	137688-Lv	2020/10/19	2021/10/18

5. TEST CONDITIONS AND RESULTS

5.1. Carrier Output Power (ERP)

LIMIT

FCC Part FCC Part 95.1767, FCC Part 2.1046

(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**.

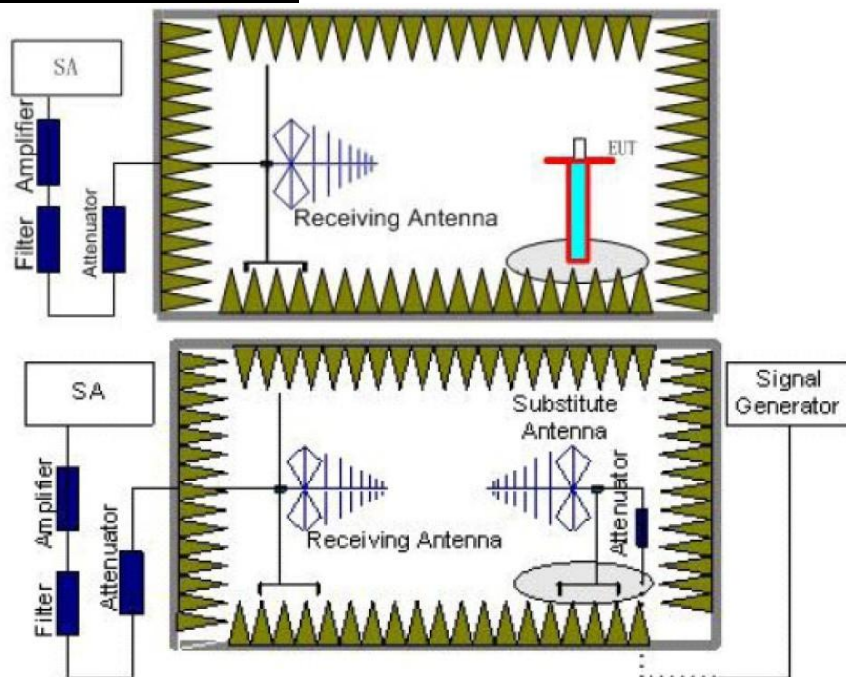
(b) 462 MHz interstitial channels.

The effective radiated power (ERP) of mobile, hand-held portable and base stations transmitting on the 462MHz 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 CONFIGURATION



TEST PROCEDURE

- 1) The measuring distance of at 3m shall be used for measurements
- 2) The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation
- 3) The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- 4) The spectrum setting for Equivalent Isotropically Radiated Power (EIRP) is RBW = 100kHz, VBW = 300kHz. Detector Mode is Positive Peak
- 5) Record the field strength level of the EUT from the spectrum
- 6) The substitution antenna is substituted for EUT at the same position and signals generator (S.G) export the CW signal to the substitution antenna via a TX cable. The receiver antenna shall be moved height from 1m to 4m to find the highest radiation. Adjust the S.G. output level and repeat this step to get the same field strength level as the EUT
- 7) The EIRP level = S.G. output level(dBm)- TX cable(dB) + Substituted Antenna Gain(dBi)
- 8) The ERP level = EIRP-2.15

TEST MODE

Please reference to the section 4.2

TEST RESULTS

☒ **Passed** ☐ **Not Applicable**

TEST Data

Please refer to appendix A on the appendix report

5.2. 99% Occupied Bandwidth & 26dB Bandwidth

LIMIT

FCC Part 95.1773, FCC Part 2.1049

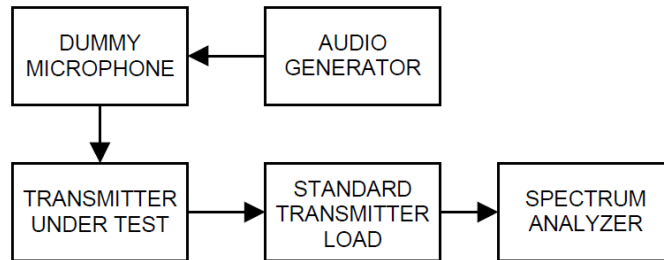
(a) Main channels.

The authorized bandwidth is **20 kHz** for GMRS transmitters operating on any of the 462 MHz main channels or any of the 467 MHz main channels.

(b) Interstitial channels.

The authorized bandwidth is **20 kHz** for GMRS transmitters operating on any of the 462 MHz interstitial channels and is **12.5 kHz** for GMRS transmitters operating on any of the 467 MHz interstitial channels

TEST CONFIGURATION



TEST PROCEDURE

- 1) Connect the equipment as illustrated
- 2) Spectrum set as follow:
Centre frequency = the nominal EUT channel center frequency,
The frequency span for the spectrum analyzer shall be set wide enough to capture all modulation products including the emission skirts (typically a span of $1.5 \times \text{OBW}$ is sufficient)
RBW = 1% to 5% of the anticipated OBW, VBW $\geq 3 \times \text{RBW}$, Sweep = auto,
Detector function = peak, Trace = max hold
- 3) Set 99% Occupied Bandwidth and 26dB Bandwidth
- 4) Measure and record the results in the test report.

TEST MODE

Please reference to the section 4.2

TEST RESULTS

☒ Passed ☐ Not Applicable

TEST Data

Please refer to appendix B on the appendix report

5.3. Emission Mask

LIMIT

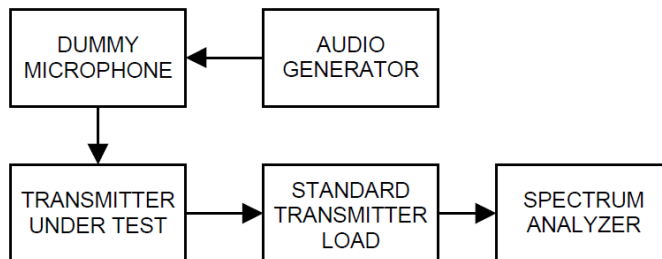
FCC Part 95.1779(b)(1)(2)(7), FCC Part 2.1049

(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%.

TEST CONFIGURATION



TEST PROCEDURE

- 1) Connect the equipment as illustrated.
- 2) Spectrum set as follow:
Centre frequency = fundamental frequency, RBW=300Hz, VBW=1000Hz, Sweep = auto, Detector function = peak, Trace = max hold
- 3) Key the transmitter, and set the level of the unmodulated carrier to a full scale reference line.
This is the 0dB reference for the measurement.
- 4) Apply Input Modulation Signal to EUT according to Section 4.2
- 5) Measure and record the results in the test report.

TEST MODE

Please reference to the section 4.2

TEST RESULTS

☒ Passed ☐ Not Applicable

TEST Data

Please refer to appendix C on the appendix report

5.4. Modulation Limit

LIMIT

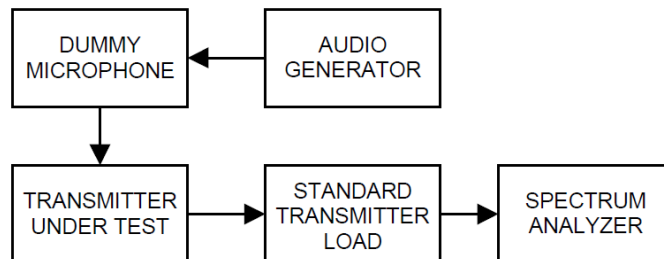
FCC Part 95.1775, FCC Part 2.1047(b)

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**.

TEST CONFIGURATION



TEST PROCEDURE

- 1) Connect the equipment as illustrated.
- 2) Adjust the transmitter per the manufacturer's procedure for full rated system deviation.
- 3) Set the test receiver to measure peak positive deviation. Set the audio bandwidth for ≤ 0.25 Hz to $\geq 15,000$ Hz. Turn the de-emphasis function off.
- 4) Apply a 1000 Hz modulating signal to the transmitter from the audio frequency generator, and adjust the level to obtain 60% of full rated system deviation.
- 5) Increase the level from the audio frequency generator by 20 dB in one step (rise time between the 10% and 90% points shall be 0.1 second maximum).
- 6) Measure both the instantaneous and steady-state deviation at and after the time of increasing the audio input level
- 7) With the level from the audio frequency generator held constant at the level obtained in step 4), slowly vary the audio frequency from 300 Hz to 3000 Hz and observe the steady-state deviation. Record the maximum deviation.

TEST MODE

Please reference to the section 4.2

TEST RESULTS

☒ Passed ☐ Not Applicable

TEST Data

Please refer to appendix D on the appendix report

5.5. Audio Frequency Response

LIMIT

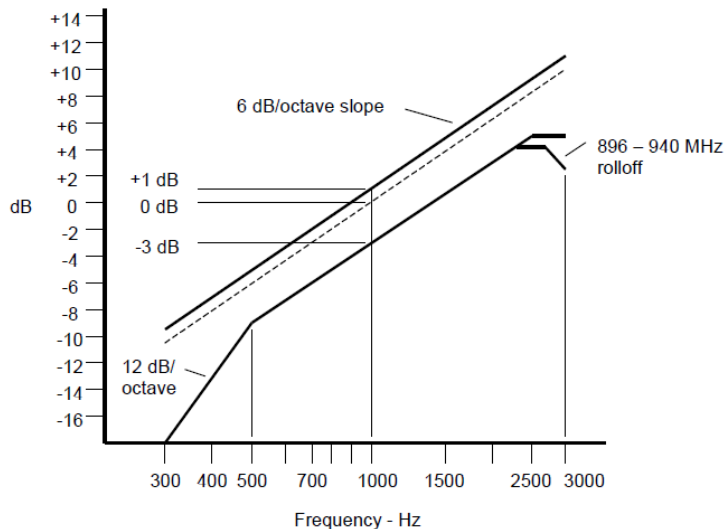
FCC Part 95.1775, FCC Part 2.1047(a)

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.

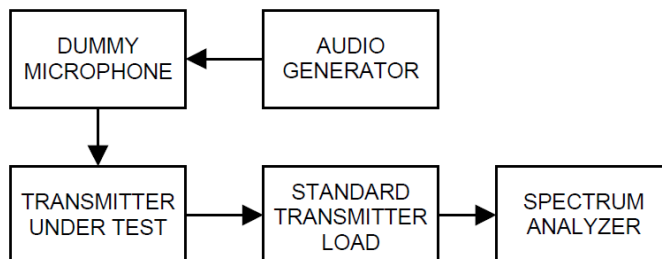
- (d) **Main channels** The peak frequency deviation for emissions to be transmitted on the main channels must **not exceed ± 5 kHz**.
- (e) **462 MHz interstitial channels.** The peak frequency deviation for emissions to be transmitted on the 462 MHz interstitial channels must **not exceed ± 5 kHz**.
- (f) **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**.

Voice modulated communication equipment. A curve or equivalent data showing the frequency response of the audio modulating circuit over a range of 100 to 5000 Hz shall be submitted.



An additional 6 dB per octave attenuation is allowed from 2500 Hz to 3000 Hz in equipment operating in the 25 MHz to 869 MHz range.

TEST CONFIGURATION



TEST PROCEDURE

- 1) Connect the equipment as illustrated.
- 2) Set the test receiver to measure peak positive deviation. Set the audio bandwidth for 50 Hz to 15,000 Hz. Turn the de-emphasis function off.
- 3) Set the DMM to measure rms voltage.
- 4) Adjust the transmitter per the manufacturer's procedure for full rated system deviation.
- 5) Apply a 1000 Hz tone and adjust the audio frequency generator to produce 20% of the rated system deviation.
- 6) Set the test receiver to measure rms deviation and record the deviation reading.
- 7) Record the DMM reading as V_{REF} .
- 8) Set the audio frequency generator to the desired test frequency between 300 Hz and 3000 Hz.
- 9) Vary the audio frequency generator output level until the deviation reading that was recorded in step 6) is obtained.
- 10) Record the DMM reading as V_{FREQ} .

- 11) Calculate the audio frequency response at the present frequency as:
audio frequency response= $20\log_{10}(V_{\text{FREQ}}/V_{\text{REF}})$.
- 12) Repeat steps 8) through 11) for all the desired test frequencies

TEST MODE

Please reference to the section 4.2

TEST RESULTS

☒ **Passed** ☐ **Not Applicable**

TEST Data

Please refer to appendix E on the appendix report

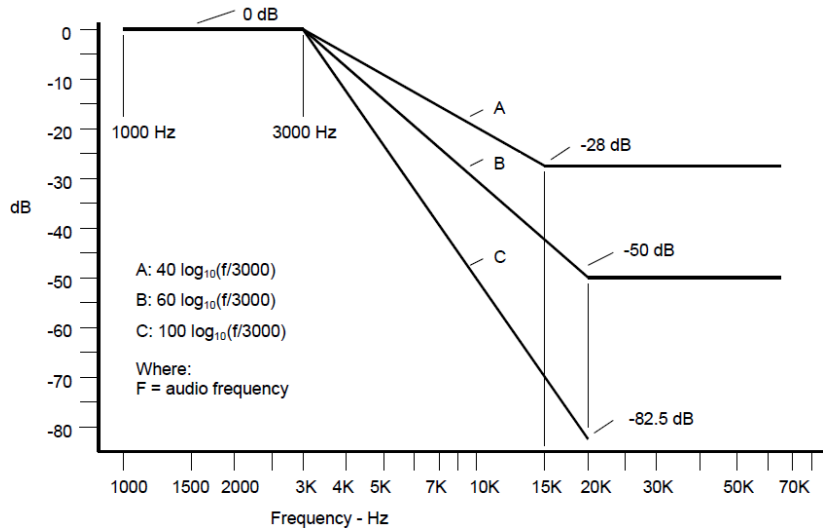
5.6. Audio Low Pass Filter Response

LIMIT

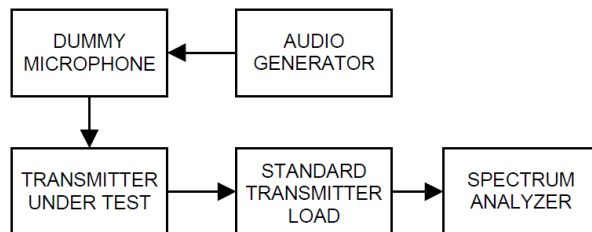
FCC Part 95.1775(e)(1)(2):

(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 CONFIGURATION



TEST PROCEDURE

- 1) Configure the EUT as shown in figure .
- 2) Apply a 1000 Hz tone from the audio signal generator and adjust the level per manufacturer's specifications. Record the dB level of the 1000 Hz tone as LEV_{REF} .
- 3) Set the audio signal generator to the desired test frequency between 3000 Hz and the upper low pass filter limit. Record the dB level at the test frequency as LEV_{FREQ} .
- 4) Calculate the audio frequency response at the test frequency as:
 low pass filter response = $LEV_{FREQ} - LEV_{REF}$

TEST MODE

Please reference to the section 4.2

TEST RESULTS

☒ Passed ☐ Not Applicable

TEST Data

Please refer to appendix F on the appendix report

5.7. Frequency stability VS Temperature

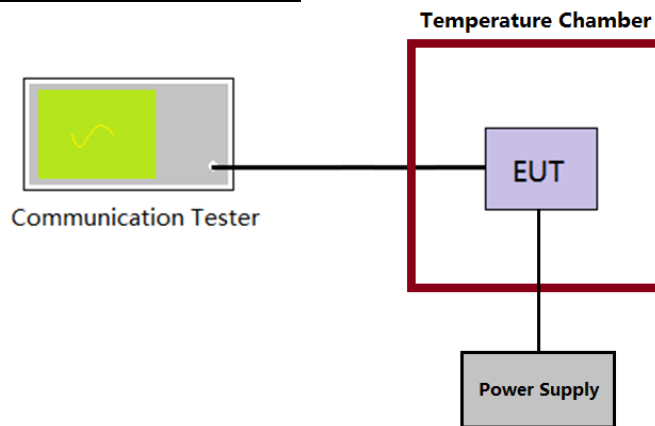
LIMIT

FCC Part 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 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 CONFIGURATION



TEST PROCEDURE

- 1) The EUT output port was connected to communication tester.
- 2) The EUT was placed inside the temperature chamber.
- 3) Turn EUT off and set the chamber temperature to -30°C . After the temperature stabilized for approximately 30 minutes recorded the frequency as MCF_{MHz} .
- 4) Calculate the ppm frequency error by the following:
$$\text{ppm error} = (MCF_{\text{MHz}} / ACF_{\text{MHz}} - 1) * 10^6$$

where
 MCF_{MHz} is the Measured Carrier Frequency in MHz
 ACF_{MHz} is the Assigned Carrier Frequency in MHz
- 5) Repeat step 3 measure with 10°C increased per stage until the highest temperature of $+50^{\circ}\text{C}$ reached.

TEST MODE

Please reference to the section 4.2

TEST RESULTS

☒ Passed ☐ Not Applicable

TEST Data

Please refer to appendix G on the appendix report

5.8. Frequency stability VS Voltage

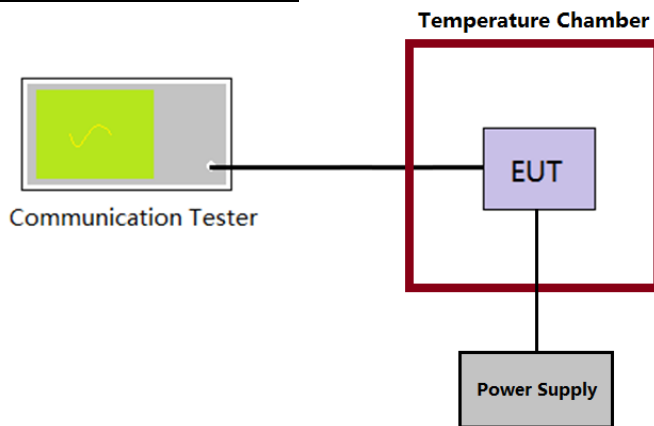
LIMIT

FCC Part 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 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 CONFIGURATION



TEST PROCEDURE

- 1) The EUT output port was connected to communication tester.
- 2) The EUT was placed inside the temperature chamber at 25°C
- 3) Record the carrier frequency of the transmitter as MCF_{MHz}
- 4) Calculate the ppm frequency error by the following:
$$ppm\ error = (MCF_{MHz} / ACF_{MHz} - 1) * 10^6$$

where
 MCF_{MHz} is the Measured Carrier Frequency in MHz
 ACF_{MHz} is the Assigned Carrier Frequency in MHz
- 5) Repeat step 3 measure with varied $\pm 15\%$ of the nominal value measured at the input to the EUT

TEST MODE

Please reference to the section 4.2

TEST RESULTS

☒ Passed ☐ Not Applicable

TEST Data

Please refer to appendix H on the appendix report

5.9. Transmit Radiated Spurious Emission

LIMIT

FCC Part 95.1779(b)(1)(2)(7), FCC Part 2.1049

(c) 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%.

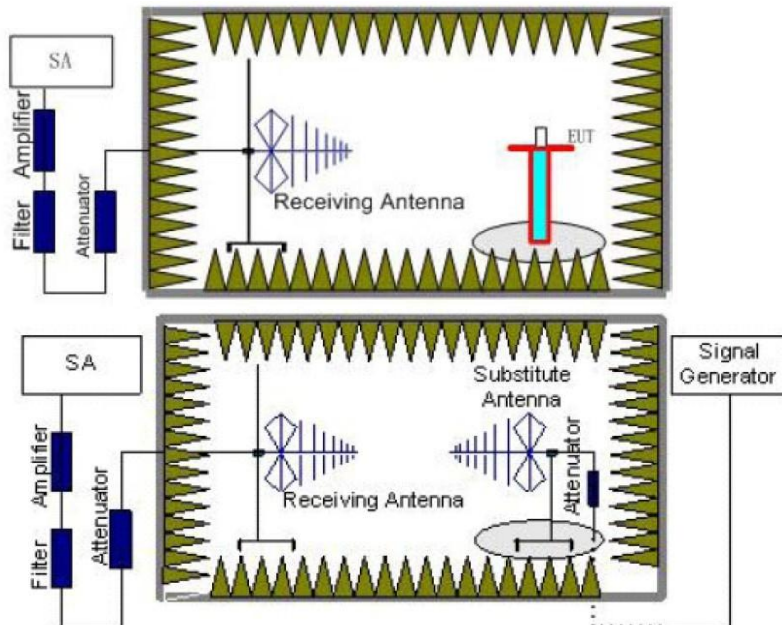
Note:

Limit (dBm) = $EL - [43 + 10 \log(P)] = 10 \log(P \times 1000) - [43 + 10 \log(P)] = 10 \log(P) + 30 - 43 - 10 \log(P) = -13 \text{ dBm}$

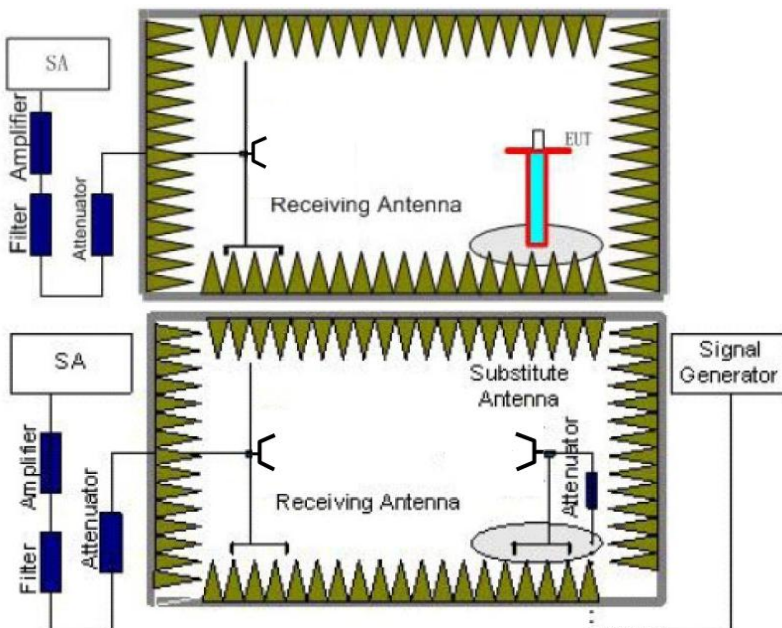
EL is the emission level of the Output Power expressed in dBm,

TEST CONFIGURATION

Below 1GHz:



Above 1GHz:



TEST PROCEDURE

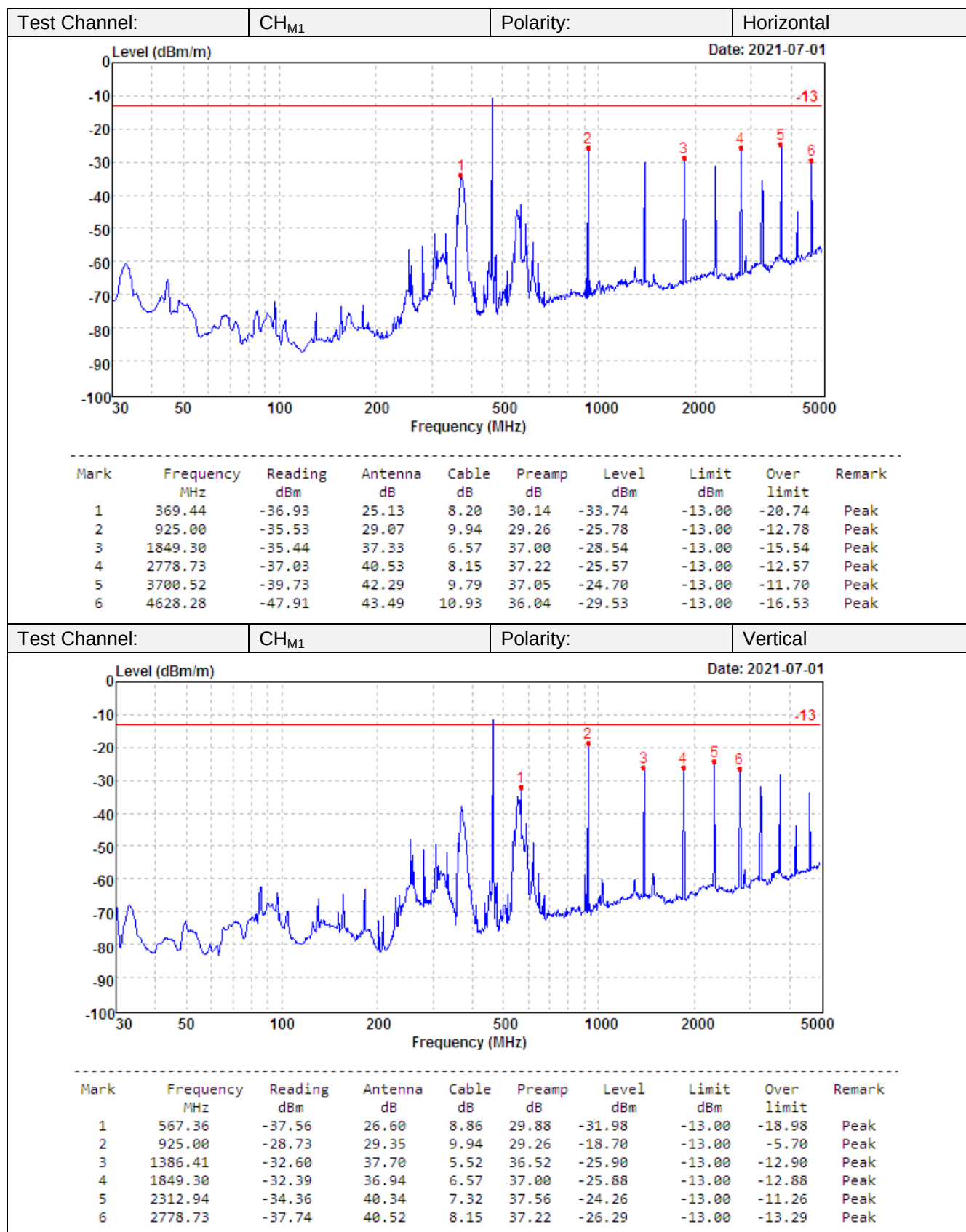
- 1) The measuring distance of at 3m shall be used for measurements
- 2) The EUT is placed on a turn table which is 0.8 meter above ground for below 1 GHz, and 1.5 m for above 1 GHz. The table was rotated 360 degrees to determine the position of the highest radiation
- 3) The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- 4) The spectrum setting as follow
Below 1 GHz: RBW=120kHz, VBW=300kHz, Sweep time=auto, Detector =peak, Trace=max hold;
Above 1GHz: RBW=1MHz, VBW=3MHz Sweep time=auto, Detector=peak, Trace=max hold
- 5) Record the field strength level of the EUT from the spectrum
- 6) The substitution antenna is substituted for EUT at the same position and signals generator (S.G) export the CW signal to the substitution antenna via a TX cable. The receiver antenna shall be moved height from 1m to 4m to find the highest radiation. Adjust the S.G. output level and repeat this step to get the same field strength level as the EUT
- 7) The EIRP level = S.G. output level(dBm)- TX cable(dB) + Substituted Antenna Gain(dBi)
- 8) Record the ERP value for below 1GHz, ERP value = EIRP-2.15; Record the EIRP for above 1GHz.

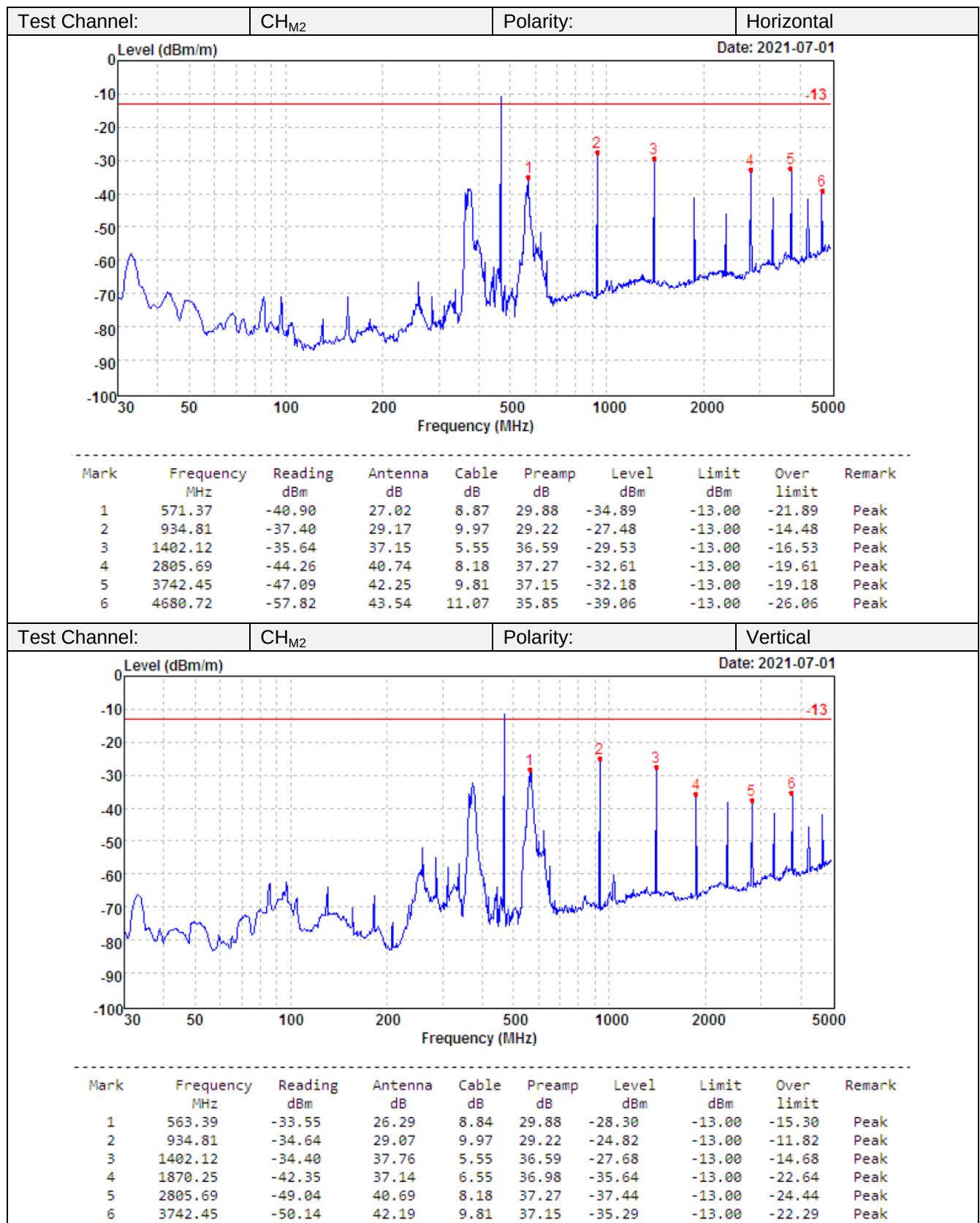
TEST MODE

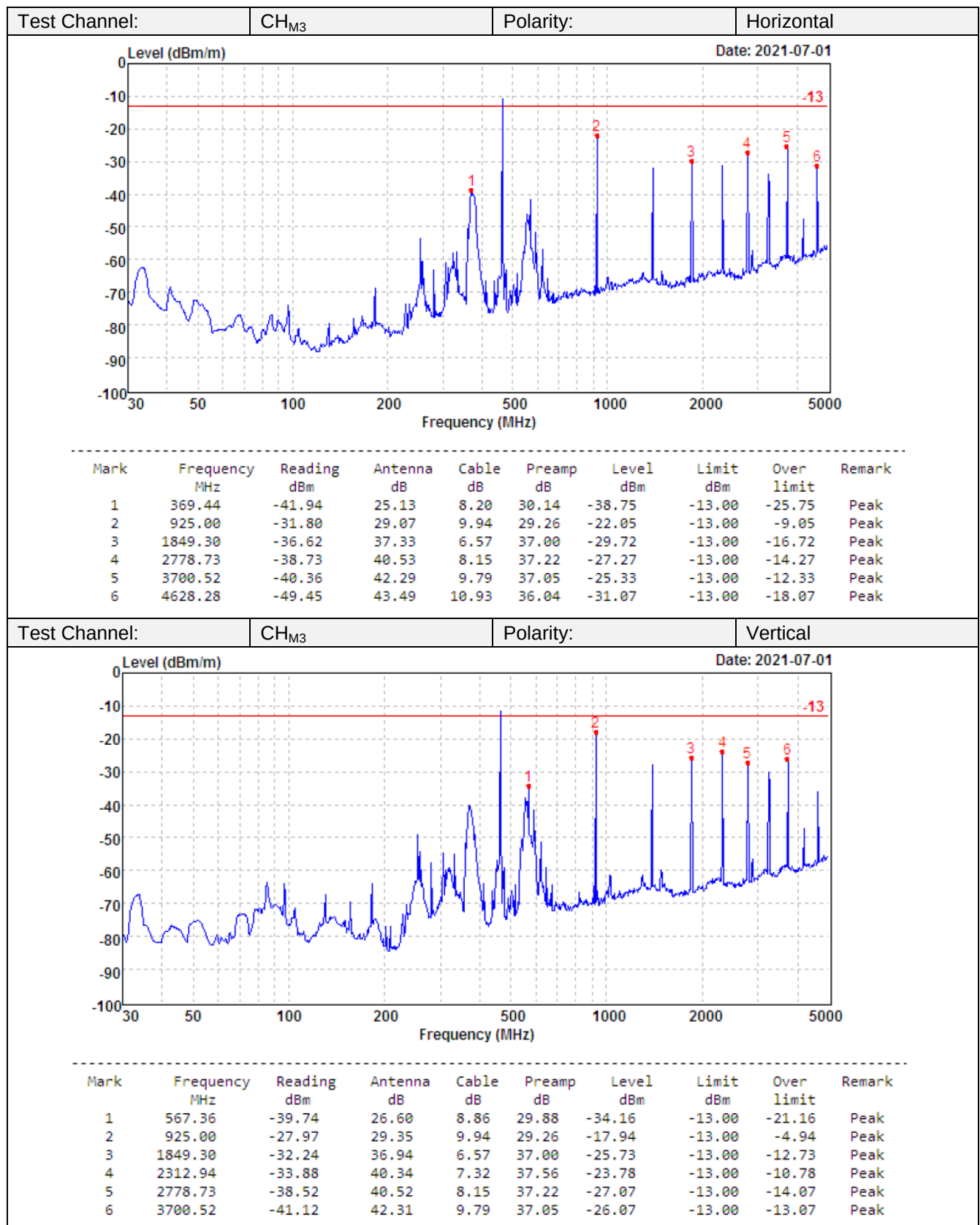
Please reference to the section 4.2

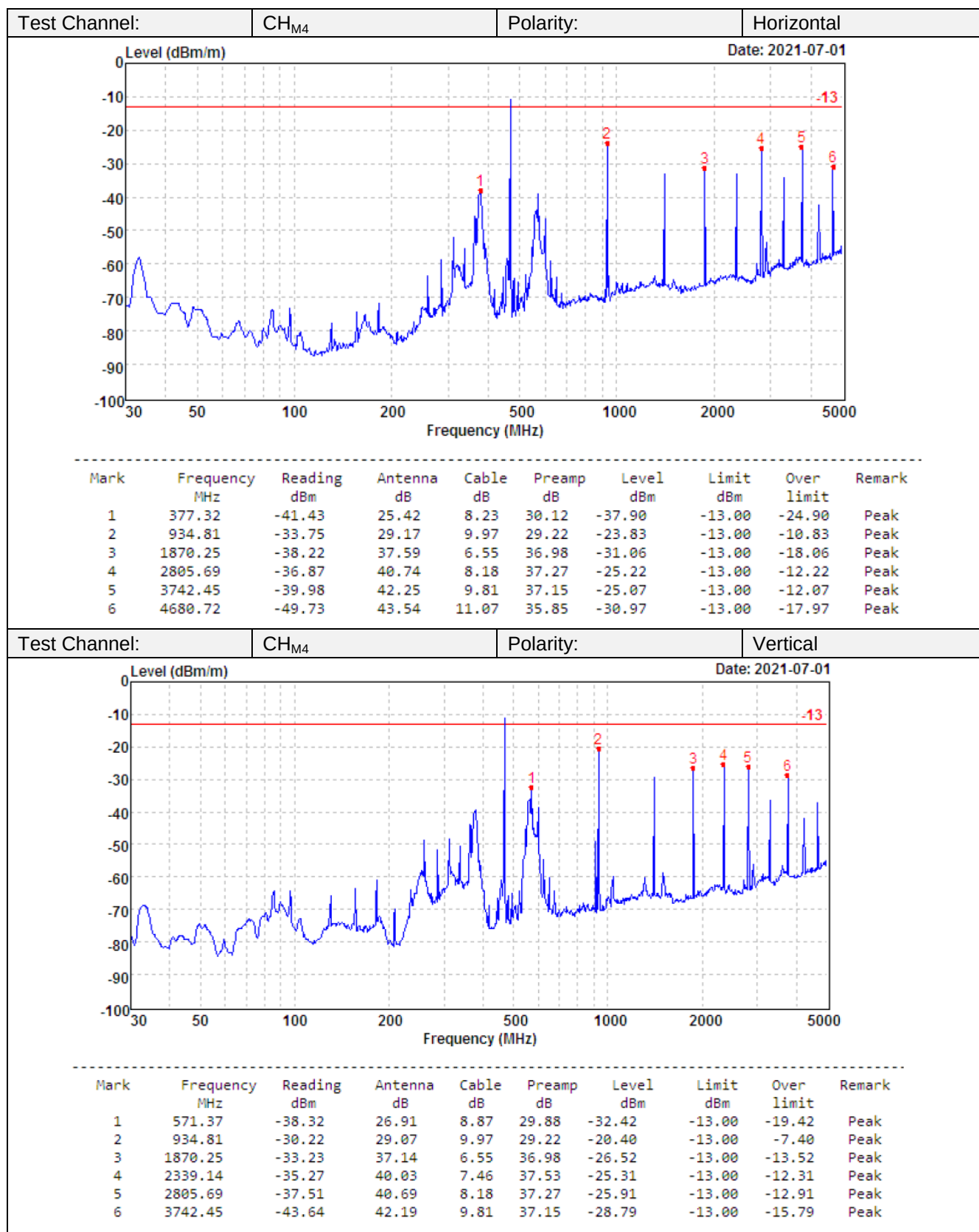
TEST RESULTS

☒ **Passed** ☐ **Not Applicable**

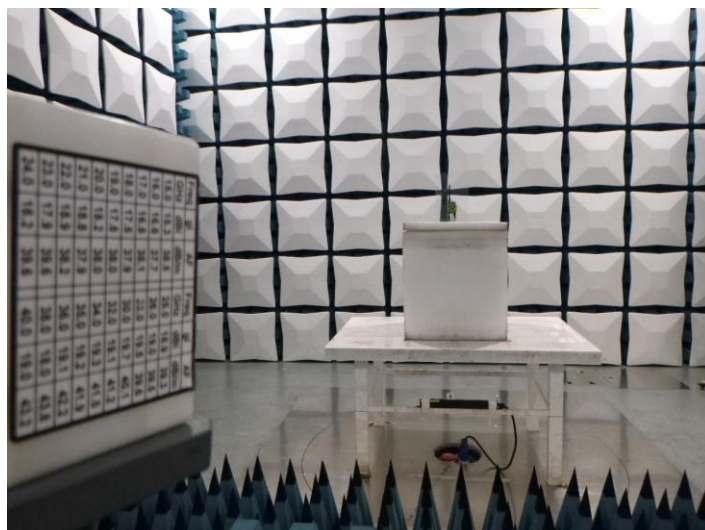
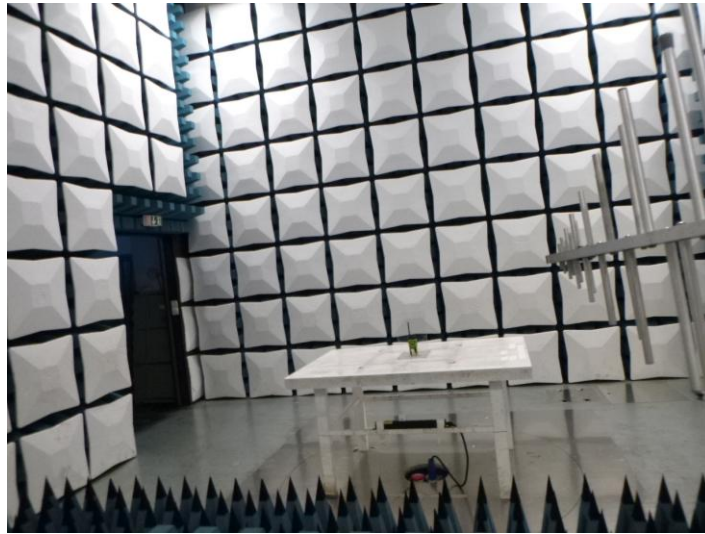








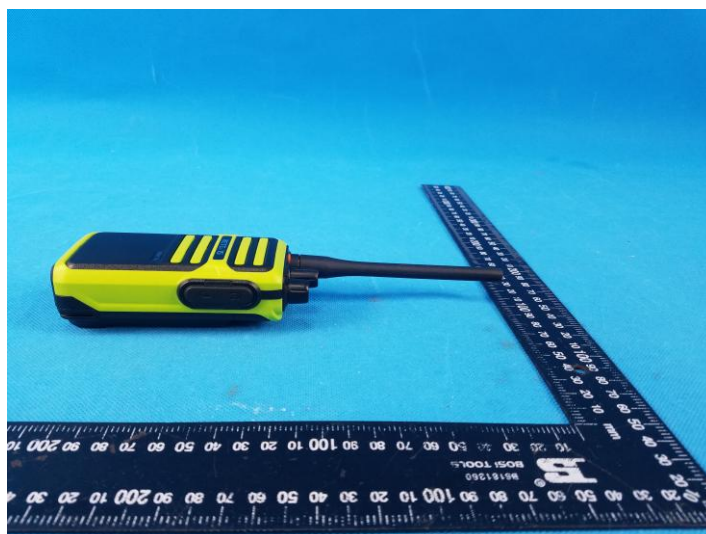
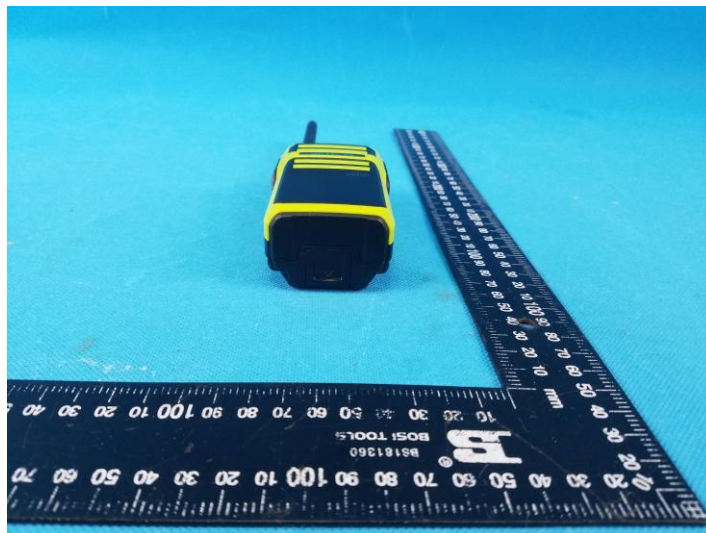
6. TEST SETUP PHOTOS

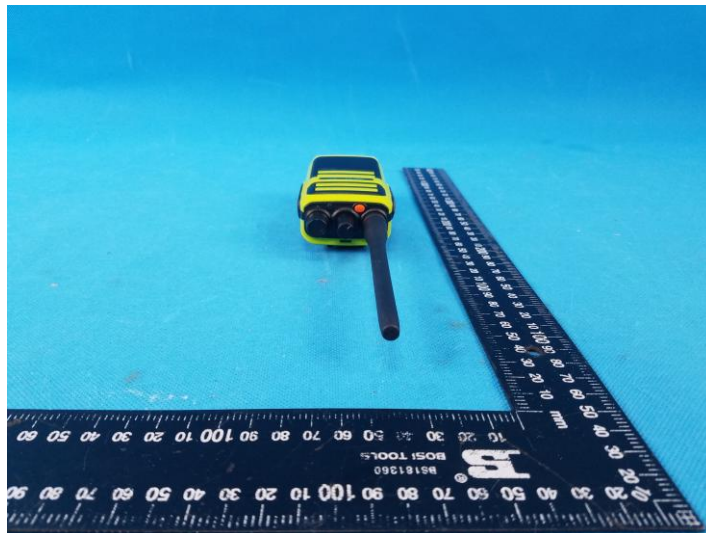


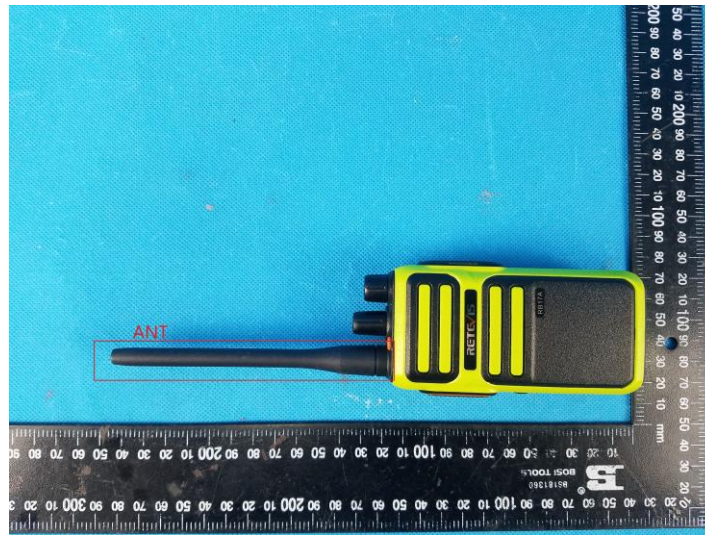
7. EXTERANAL AND INTERNAL PHOTOS

7.1. EXTERANAL PHOTOS



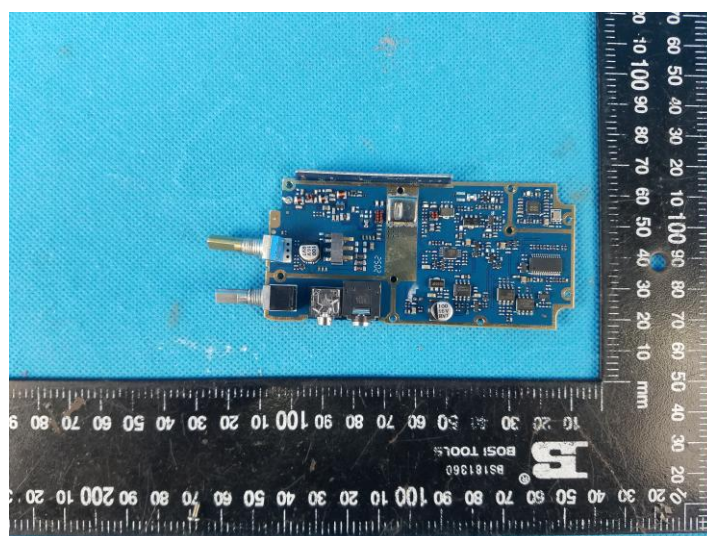
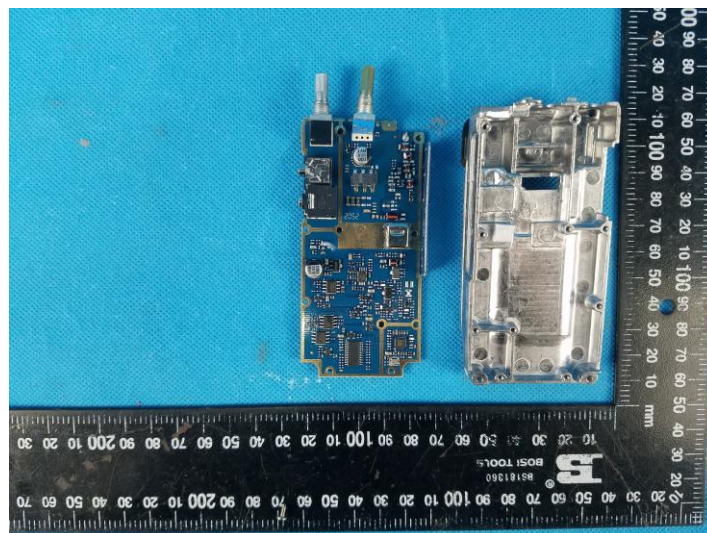


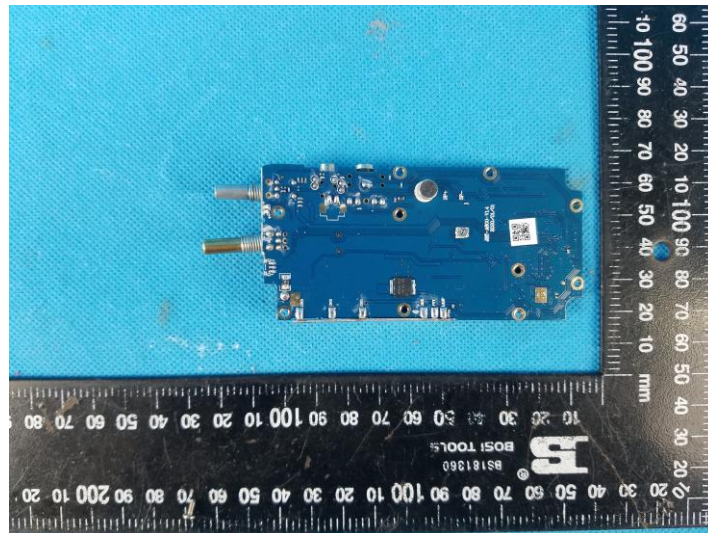




7.2. INTERNAL PHOTOS







8. APPENDIX REPORT

Project No.	SHT2106071401EW		
Test sample No.	YPHT21060714404	Model No.	RB17A
Start test date	2021/8/3	Finish date	2021/8/3
Temperature	22.9℃	Humidity	49%
Test Engineer	<i>Casper Chen</i>	Auditor	<i>Xiaodong Zhu</i>

Appendix clause	Test Item	Test date (M/D)	Test Result (PASS/FAIL)
A	Transmitting Power	8/3	PASS
B	99% Occupied Bandwidth & 26dB Bandwidth	8/3	PASS
C	Emission Mask	8/3	PASS
D	Modulation Limit	8/3	PASS
E	Audio Frequency Response	8/3	PASS
F	Audio Low Pass Filter Response	8/3	PASS
G	Frequency Stability Test & Temperature	8/3	PASS
H	Frequency Stability Test & Voltage	8/3	PASS

Appendix A: Transmitting Power

Test Mode	Modulation Type	Test Channel	Measured power (dBm)	Measured power (W)	Limit(W)	Result
TX-GMRS	FM	CH _{M1}	26.92	0.49	≤50	PASS
TX-GMRS	FM	CH _{M2}	26.92	0.49	≤5	PASS
TX-GMRS	FM	CH _{M3}	26.92	0.49	≤50	PASS
TX-GMRS	FM	CH _{M4}	26.92	0.49	≤0.5	PASS

Note: 1) 462/467 MHz main channels: mobile, repeater and base stations must not exceed 50 Watts, fixed stations must not exceed 15 Watts;
 2) 462 MHz interstitial channels(ERP): mobile, hand-held portable and base stations must not exceed 5 Watts;
 3) 467 MHz interstitial channels(ERP): hand-held portable must not exceed 0.5 Watt.

Appendix B: 99% Occupied Bandwidth & 26dB Bandwidth

Test Mode	Modulation Type	Test Channel	Occupied Bandwidth		99% Limit(kHz)	Result
			99%(kHz)	26dB(kHz)		
TX-GMRS	FM	CH _{M1}	10.029	10.186	≤20	PASS
TX-GMRS	FM	CH _{M2}	10.031	10.189	≤20	PASS
TX-GMRS	FM	CH _{M3}	10.029	10.186	≤20	PASS
TX-GMRS	FM	CH _{M4}	10.030	10.188	≤12.5	PASS

Appendix B:Occupied Bandwidth

Operation Mode	Modulation Type	Test Channel	TEST PLOT RESULT
TX-GMRS	FM	462.65MHz	Agilent Spectrum Analyzer - Occupied BW Center Freq 462.650000 MHz Center Freq: 462.650000 MHz Trig: Free Run Avg/Hold: > 10/10 Radio Std: None #IF Gain: Low #Atten: 22 dB Radio Device: BTS Ref 32.47 dBm Center 462.7 MHz #Res BW 100 Hz #VBW 300 Hz Span 50 kHz Sweep FFT Occupied Bandwidth 10.029 kHz Total Power 28.4 dBm Transmit Freq Error -55 Hz OBW Power 99.00 % x dB Bandwidth 10.19 kHz x dB -26.00 dB Frequency Center Freq 462.650000 MHz CF Step 5.000 kHz Man Freq Offset 0 Hz Auto STATUS DC Coupled
TX-GMRS	FM	462.6375 MHz	Agilent Spectrum Analyzer - Occupied BW Center Freq 462.637500 MHz Center Freq: 462.637500 MHz Trig: Free Run Avg/Hold: > 10/10 Radio Std: None #IF Gain: Low #Atten: 22 dB Radio Device: BTS Ref 32.64 dBm Center 462.6 MHz #Res BW 100 Hz #VBW 300 Hz Span 50 kHz Sweep FFT Occupied Bandwidth 10.031 kHz Total Power 28.7 dBm Transmit Freq Error -63 Hz OBW Power 99.00 % x dB Bandwidth 10.19 kHz x dB -26.00 dB Frequency Center Freq 462.637500 MHz CF Step 5.000 kHz Man Freq Offset 0 Hz Auto STATUS DC Coupled
TX-GMRS	FM	467.65MHz	Agilent Spectrum Analyzer - Occupied BW Center Freq 467.650000 MHz Center Freq: 467.650000 MHz Trig: Free Run Avg/Hold: > 10/10 Radio Std: None #IF Gain: Low #Atten: 22 dB Radio Device: BTS Ref 32.59 dBm Center 467.7 MHz #Res BW 100 Hz #VBW 300 Hz Span 50 kHz Sweep FFT Occupied Bandwidth 10.029 kHz Total Power 28.5 dBm Transmit Freq Error -53 Hz OBW Power 99.00 % x dB Bandwidth 10.19 kHz x dB -26.00 dB Frequency Center Freq 467.650000 MHz CF Step 5.000 kHz Man Freq Offset 0 Hz Auto STATUS DC Coupled

Appendix B:Occupied Bandwidth

Operation Mode	Modulation Type	Test Channel	TEST PLOT RESULT
TX-GMRS	FM	467.6375 MHz	Agilent Spectrum Analyzer - Occupied BW Center Freq 467.637500 MHz Center Freq: 467.637500 MHz Trig: Free Run Avg/Hold: 10/10 Radio Std: None Radio Device: BTS Ref 32.70 dBm Center 467.6 MHz #Res BW 100 Hz #VBW 300 Hz Span 50 kHz Sweep FFT Occupied Bandwidth 10.030 kHz Total Power 28.7 dBm Transmit Freq Error -48 Hz OBW Power 99.00 % x dB Bandwidth 10.19 kHz x dB -26.00 dB Frequency 467.637500 MHz CF Step 5.000 kHz Man Freq Offset 0 Hz Auto STATUS DC Coupled

Appendix C:Emission Mask

Test Mode	Modulation Type	Test Channel	TEST PLOT RESULT
TX-GMRS	FM	CH _{M1}	
TX-GMRS	FM	CH _{M2}	
TX-GMRS	FM	CH _{M3}	

Appendix C:Emission Mask

Test Mode	Modulation Type	Test Channel	TEST PLOT RESULT
TX-GMRS	FM	CH _{M4}	

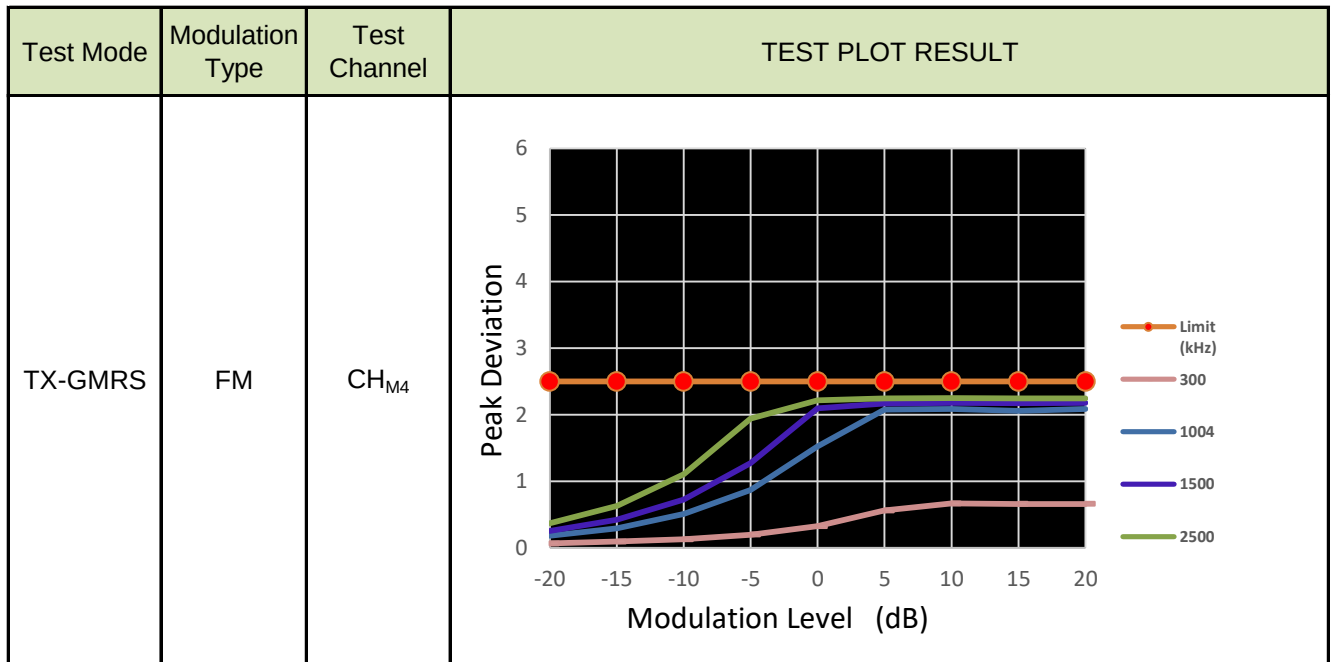
Appendix D:Modulation Limit

Test Mode	Modulation Type	Test Channel	Modulation Level (dB)	Peak Frequency Deviation (Hz)				Limit (kHz)	Result
				300	1004	1500	2500		
TX-GMRS	FM	CH _{M1}	-20	0.068	0.182	0.249	0.37	5	PASS
TX-GMRS	FM	CH _{M1}	-15	0.086	0.303	0.426	0.635	5	PASS
TX-GMRS	FM	CH _{M1}	-10	0.13	0.503	0.722	1.098	5	PASS
TX-GMRS	FM	CH _{M1}	-5	0.197	0.871	1.274	1.939	5	PASS
TX-GMRS	FM	CH _{M1}	0	0.316	1.505	2.087	2.206	5	PASS
TX-GMRS	FM	CH _{M1}	5	0.559	2.062	2.16	2.221	5	PASS
TX-GMRS	FM	CH _{M1}	10	0.676	2.071	2.161	2.229	5	PASS
TX-GMRS	FM	CH _{M1}	15	0.664	2.062	2.157	2.234	5	PASS
TX-GMRS	FM	CH _{M1}	20	0.658	2.075	2.156	2.229	5	PASS
TX-GMRS	FM	CH _{M2}	-20	0.067	0.182	0.257	0.368	5	PASS
TX-GMRS	FM	CH _{M2}	-15	0.093	0.3	0.422	0.63	5	PASS
TX-GMRS	FM	CH _{M2}	-10	0.129	0.501	0.725	1.102	5	PASS
TX-GMRS	FM	CH _{M2}	-5	0.198	0.871	1.269	1.938	5	PASS
TX-GMRS	FM	CH _{M2}	0	0.317	1.518	2.096	2.197	5	PASS
TX-GMRS	FM	CH _{M2}	5	0.547	2.101	2.158	2.226	5	PASS
TX-GMRS	FM	CH _{M2}	10	0.656	2.072	2.164	2.222	5	PASS
TX-GMRS	FM	CH _{M2}	15	0.654	2.058	2.17	2.225	5	PASS
TX-GMRS	FM	CH _{M2}	20	0.677	2.079	2.166	2.23	5	PASS
TX-GMRS	FM	CH _{M3}	-20	0.069	0.185	0.248	0.37	5	PASS
TX-GMRS	FM	CH _{M3}	-15	0.098	0.3	0.423	0.632	5	PASS
TX-GMRS	FM	CH _{M3}	-10	0.13	0.505	0.726	1.101	5	PASS
TX-GMRS	FM	CH _{M3}	-5	0.195	0.867	1.279	1.939	5	PASS
TX-GMRS	FM	CH _{M3}	0	0.328	1.521	2.084	2.194	5	PASS
TX-GMRS	FM	CH _{M3}	5	0.554	2.091	2.166	2.226	5	PASS
TX-GMRS	FM	CH _{M3}	10	0.671	2.079	2.167	2.234	5	PASS
TX-GMRS	FM	CH _{M3}	15	0.669	2.06	2.165	2.23	5	PASS
TX-GMRS	FM	CH _{M3}	20	0.65	2.085	2.172	2.23	5	PASS
TX-GMRS	FM	CH _{M4}	-20	0.067	0.185	0.255	0.371	2.5	PASS
TX-GMRS	FM	CH _{M4}	-15	0.095	0.294	0.421	0.629	2.5	PASS
TX-GMRS	FM	CH _{M4}	-10	0.128	0.509	0.728	1.106	2.5	PASS
TX-GMRS	FM	CH _{M4}	-5	0.198	0.871	1.273	1.942	2.5	PASS
TX-GMRS	FM	CH _{M4}	0	0.326	1.526	2.098	2.215	2.5	PASS
TX-GMRS	FM	CH _{M4}	5	0.561	2.076	2.17	2.245	2.5	PASS
TX-GMRS	FM	CH _{M4}	10	0.666	2.088	2.179	2.252	2.5	PASS
TX-GMRS	FM	CH _{M4}	15	0.66	2.057	2.175	2.244	2.5	PASS
TX-GMRS	FM	CH _{M4}	20	0.66	2.087	2.179	2.246	2.5	PASS

Appendix D:Modulation Limit

Test Mode	Modulation Type	Test Channel	TEST PLOT RESULT																																																		
TX-GMRS	FM	CH _{M1}	Peak Deviation (kHz) vs Modulation Level (dB) for CH_{M1}. The graph shows a red limit line at 5 kHz. Five data series are plotted for 300, 1004, 1500, and 2500 Hz. All series show an increase in peak deviation with modulation level, remaining below the 5 kHz limit. <table><thead><tr><th>Modulation Level (dB)</th><th>300</th><th>1004</th><th>1500</th><th>2500</th></tr></thead><tbody><tr><td>-20</td><td>0.1</td><td>0.2</td><td>0.3</td><td>0.4</td></tr><tr><td>-15</td><td>0.1</td><td>0.3</td><td>0.4</td><td>0.6</td></tr><tr><td>-10</td><td>0.1</td><td>0.4</td><td>0.6</td><td>1.0</td></tr><tr><td>-5</td><td>0.2</td><td>0.8</td><td>1.2</td><td>1.8</td></tr><tr><td>0</td><td>0.3</td><td>1.5</td><td>2.1</td><td>2.2</td></tr><tr><td>5</td><td>0.6</td><td>2.1</td><td>2.2</td><td>2.2</td></tr><tr><td>10</td><td>0.7</td><td>2.1</td><td>2.2</td><td>2.2</td></tr><tr><td>15</td><td>0.7</td><td>2.1</td><td>2.2</td><td>2.2</td></tr><tr><td>20</td><td>0.7</td><td>2.1</td><td>2.2</td><td>2.2</td></tr></tbody></table>	Modulation Level (dB)	300	1004	1500	2500	-20	0.1	0.2	0.3	0.4	-15	0.1	0.3	0.4	0.6	-10	0.1	0.4	0.6	1.0	-5	0.2	0.8	1.2	1.8	0	0.3	1.5	2.1	2.2	5	0.6	2.1	2.2	2.2	10	0.7	2.1	2.2	2.2	15	0.7	2.1	2.2	2.2	20	0.7	2.1	2.2	2.2
Modulation Level (dB)	300	1004	1500	2500																																																	
-20	0.1	0.2	0.3	0.4																																																	
-15	0.1	0.3	0.4	0.6																																																	
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-5	0.2	0.8	1.2	1.8																																																	
0	0.3	1.5	2.1	2.2																																																	
5	0.6	2.1	2.2	2.2																																																	
10	0.7	2.1	2.2	2.2																																																	
15	0.7	2.1	2.2	2.2																																																	
20	0.7	2.1	2.2	2.2																																																	
TX-GMRS	FM	CH _{M2}	Peak Deviation (kHz) vs Modulation Level (dB) for CH_{M2}. The graph shows a red limit line at 5 kHz. Five data series are plotted for 300, 1004, 1500, and 2500 Hz. All series show an increase in peak deviation with modulation level, remaining below the 5 kHz limit. <table><thead><tr><th>Modulation Level (dB)</th><th>300</th><th>1004</th><th>1500</th><th>2500</th></tr></thead><tbody><tr><td>-20</td><td>0.1</td><td>0.2</td><td>0.3</td><td>0.4</td></tr><tr><td>-15</td><td>0.1</td><td>0.3</td><td>0.4</td><td>0.6</td></tr><tr><td>-10</td><td>0.1</td><td>0.4</td><td>0.6</td><td>1.0</td></tr><tr><td>-5</td><td>0.2</td><td>0.8</td><td>1.2</td><td>1.8</td></tr><tr><td>0</td><td>0.3</td><td>1.5</td><td>2.1</td><td>2.2</td></tr><tr><td>5</td><td>0.6</td><td>2.1</td><td>2.2</td><td>2.2</td></tr><tr><td>10</td><td>0.7</td><td>2.1</td><td>2.2</td><td>2.2</td></tr><tr><td>15</td><td>0.7</td><td>2.1</td><td>2.2</td><td>2.2</td></tr><tr><td>20</td><td>0.7</td><td>2.1</td><td>2.2</td><td>2.2</td></tr></tbody></table>	Modulation Level (dB)	300	1004	1500	2500	-20	0.1	0.2	0.3	0.4	-15	0.1	0.3	0.4	0.6	-10	0.1	0.4	0.6	1.0	-5	0.2	0.8	1.2	1.8	0	0.3	1.5	2.1	2.2	5	0.6	2.1	2.2	2.2	10	0.7	2.1	2.2	2.2	15	0.7	2.1	2.2	2.2	20	0.7	2.1	2.2	2.2
Modulation Level (dB)	300	1004	1500	2500																																																	
-20	0.1	0.2	0.3	0.4																																																	
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0	0.3	1.5	2.1	2.2																																																	
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15	0.7	2.1	2.2	2.2																																																	
20	0.7	2.1	2.2	2.2																																																	
TX-GMRS	FM	CH _{M3}	Peak Deviation (kHz) vs Modulation Level (dB) for CH_{M3}. The graph shows a red limit line at 5 kHz. Five data series are plotted for 300, 1004, 1500, and 2500 Hz. All series show an increase in peak deviation with modulation level, remaining below the 5 kHz limit. <table><thead><tr><th>Modulation Level (dB)</th><th>300</th><th>1004</th><th>1500</th><th>2500</th></tr></thead><tbody><tr><td>-20</td><td>0.1</td><td>0.2</td><td>0.3</td><td>0.4</td></tr><tr><td>-15</td><td>0.1</td><td>0.3</td><td>0.4</td><td>0.6</td></tr><tr><td>-10</td><td>0.1</td><td>0.4</td><td>0.6</td><td>1.0</td></tr><tr><td>-5</td><td>0.2</td><td>0.8</td><td>1.2</td><td>1.8</td></tr><tr><td>0</td><td>0.3</td><td>1.5</td><td>2.1</td><td>2.2</td></tr><tr><td>5</td><td>0.6</td><td>2.1</td><td>2.2</td><td>2.2</td></tr><tr><td>10</td><td>0.7</td><td>2.1</td><td>2.2</td><td>2.2</td></tr><tr><td>15</td><td>0.7</td><td>2.1</td><td>2.2</td><td>2.2</td></tr><tr><td>20</td><td>0.7</td><td>2.1</td><td>2.2</td><td>2.2</td></tr></tbody></table>	Modulation Level (dB)	300	1004	1500	2500	-20	0.1	0.2	0.3	0.4	-15	0.1	0.3	0.4	0.6	-10	0.1	0.4	0.6	1.0	-5	0.2	0.8	1.2	1.8	0	0.3	1.5	2.1	2.2	5	0.6	2.1	2.2	2.2	10	0.7	2.1	2.2	2.2	15	0.7	2.1	2.2	2.2	20	0.7	2.1	2.2	2.2
Modulation Level (dB)	300	1004	1500	2500																																																	
-20	0.1	0.2	0.3	0.4																																																	
-15	0.1	0.3	0.4	0.6																																																	
-10	0.1	0.4	0.6	1.0																																																	
-5	0.2	0.8	1.2	1.8																																																	
0	0.3	1.5	2.1	2.2																																																	
5	0.6	2.1	2.2	2.2																																																	
10	0.7	2.1	2.2	2.2																																																	
15	0.7	2.1	2.2	2.2																																																	
20	0.7	2.1	2.2	2.2																																																	

Appendix D:Modulation Limit



Appendix E:Audio Frequency Response

Test Mode	Modulation Type	Test Channel	Frequency (Hz)	Audio Frequency Response (dB)	Lower Limit	Upper Limit	Result
TX-GMRS	FM	CH _{M1}	100	-33.03			PASS
TX-GMRS	FM	CH _{M1}	200	-33.19			PASS
TX-GMRS	FM	CH _{M1}	300	-13.92	-17.84	-9.42	PASS
TX-GMRS	FM	CH _{M1}	400	-10.49	-12.86	-6.93	PASS
TX-GMRS	FM	CH _{M1}	500	-7.88	-9.00	-5.00	PASS
TX-GMRS	FM	CH _{M1}	600	-5.27	-7.42	-3.42	PASS
TX-GMRS	FM	CH _{M1}	700	-3.97	-6.09	-2.09	PASS
TX-GMRS	FM	CH _{M1}	800	-2.52	-4.93	-0.93	PASS
TX-GMRS	FM	CH _{M1}	900	-1.21	-3.91	0.09	PASS
TX-GMRS	FM	CH _{M1}	1000	0.01	-3.00	1.00	PASS
TX-GMRS	FM	CH _{M1}	1200	1.16	-1.42	2.58	PASS
TX-GMRS	FM	CH _{M1}	1400	2.66	-0.09	3.91	PASS
TX-GMRS	FM	CH _{M1}	1600	3.81	1.07	5.07	PASS
TX-GMRS	FM	CH _{M1}	1800	4.35	2.09	6.09	PASS
TX-GMRS	FM	CH _{M1}	2000	5.53	3.00	7.00	PASS
TX-GMRS	FM	CH _{M1}	2100	5.74	3.42	7.42	PASS
TX-GMRS	FM	CH _{M1}	2200	5.82	3.83	7.83	PASS
TX-GMRS	FM	CH _{M1}	2300	6.09	4.21	8.21	PASS
TX-GMRS	FM	CH _{M1}	2400	6.60	4.58	8.58	PASS
TX-GMRS	FM	CH _{M1}	2500	7.07	4.93	8.93	PASS
TX-GMRS	FM	CH _{M1}	2600	7.18	4.59	9.27	PASS
TX-GMRS	FM	CH _{M1}	2700	7.19	4.27	9.60	PASS
TX-GMRS	FM	CH _{M1}	2800	7.48	3.95	9.91	PASS
TX-GMRS	FM	CH _{M1}	2900	7.98	3.65	10.22	PASS
TX-GMRS	FM	CH _{M1}	3000	7.67	3.35	10.51	PASS
TX-GMRS	FM	CH _{M1}	3500	-32.98			PASS
TX-GMRS	FM	CH _{M1}	4000	-33.26			PASS
TX-GMRS	FM	CH _{M1}	4500	-32.98			PASS
TX-GMRS	FM	CH _{M1}	5000	-32.84			PASS
TX-GMRS	FM	CH _{M2}	100	-33.36			PASS
TX-GMRS	FM	CH _{M2}	200	-33.27			PASS
TX-GMRS	FM	CH _{M2}	300	-14.19	-17.84	-9.42	PASS
TX-GMRS	FM	CH _{M2}	400	-10.27	-12.86	-6.93	PASS
TX-GMRS	FM	CH _{M2}	500	-7.96	-9.00	-5.00	PASS
TX-GMRS	FM	CH _{M2}	600	-5.34	-7.42	-3.42	PASS
TX-GMRS	FM	CH _{M2}	700	-3.96	-6.09	-2.09	PASS
TX-GMRS	FM	CH _{M2}	800	-2.51	-4.93	-0.93	PASS
TX-GMRS	FM	CH _{M2}	900	-1.18	-3.91	0.09	PASS
TX-GMRS	FM	CH _{M2}	1000	-0.04	-3.00	1.00	PASS
TX-GMRS	FM	CH _{M2}	1200	1.15	-1.42	2.58	PASS
TX-GMRS	FM	CH _{M2}	1400	2.65	-0.09	3.91	PASS
TX-GMRS	FM	CH _{M2}	1600	3.80	1.07	5.07	PASS

Appendix E:Audio Frequency Response

Test Mode	Modulation Type	Test Channel	Frequency (Hz)	Audio Frequency Response (dB)	Lower Limit	Upper Limit	Result
TX-GMRS	FM	CH _{M2}	1800	4.34	2.09	6.09	PASS
TX-GMRS	FM	CH _{M2}	2000	5.52	3.00	7.00	PASS
TX-GMRS	FM	CH _{M2}	2100	5.73	3.42	7.42	PASS
TX-GMRS	FM	CH _{M2}	2200	5.81	3.83	7.83	PASS
TX-GMRS	FM	CH _{M2}	2300	6.08	4.21	8.21	PASS
TX-GMRS	FM	CH _{M2}	2400	6.58	4.58	8.58	PASS
TX-GMRS	FM	CH _{M2}	2500	7.06	4.93	8.93	PASS
TX-GMRS	FM	CH _{M2}	2600	7.17	4.59	9.27	PASS
TX-GMRS	FM	CH _{M2}	2700	7.17	4.27	9.60	PASS
TX-GMRS	FM	CH _{M2}	2800	7.47	3.95	9.91	PASS
TX-GMRS	FM	CH _{M2}	2900	7.97	3.65	10.22	PASS
TX-GMRS	FM	CH _{M2}	3000	7.66	3.35	10.51	PASS
TX-GMRS	FM	CH _{M2}	3500	-33.04			PASS
TX-GMRS	FM	CH _{M2}	4000	-33.39			PASS
TX-GMRS	FM	CH _{M2}	4500	-33.22			PASS
TX-GMRS	FM	CH _{M2}	5000	-33.04			PASS
TX-GMRS	FM	CH _{M3}	100	-33.14			PASS
TX-GMRS	FM	CH _{M3}	200	-33.45			PASS
TX-GMRS	FM	CH _{M3}	300	-13.96	-17.84	-9.42	PASS
TX-GMRS	FM	CH _{M3}	400	-10.44	-12.86	-6.93	PASS
TX-GMRS	FM	CH _{M3}	500	-7.90	-9.00	-5.00	PASS
TX-GMRS	FM	CH _{M3}	600	-5.32	-7.42	-3.42	PASS
TX-GMRS	FM	CH _{M3}	700	-3.94	-6.09	-2.09	PASS
TX-GMRS	FM	CH _{M3}	800	-2.50	-4.93	-0.93	PASS
TX-GMRS	FM	CH _{M3}	900	-1.15	-3.91	0.09	PASS
TX-GMRS	FM	CH _{M3}	1000	-0.04	-3.00	1.00	PASS
TX-GMRS	FM	CH _{M3}	1200	1.15	-1.42	2.58	PASS
TX-GMRS	FM	CH _{M3}	1400	2.66	-0.09	3.91	PASS
TX-GMRS	FM	CH _{M3}	1600	3.80	1.07	5.07	PASS
TX-GMRS	FM	CH _{M3}	1800	4.34	2.09	6.09	PASS
TX-GMRS	FM	CH _{M3}	2000	5.52	3.00	7.00	PASS
TX-GMRS	FM	CH _{M3}	2100	5.73	3.42	7.42	PASS
TX-GMRS	FM	CH _{M3}	2200	5.81	3.83	7.83	PASS
TX-GMRS	FM	CH _{M3}	2300	6.08	4.21	8.21	PASS
TX-GMRS	FM	CH _{M3}	2400	6.59	4.58	8.58	PASS
TX-GMRS	FM	CH _{M3}	2500	7.07	4.93	8.93	PASS
TX-GMRS	FM	CH _{M3}	2600	7.17	4.59	9.27	PASS
TX-GMRS	FM	CH _{M3}	2700	7.18	4.27	9.60	PASS
TX-GMRS	FM	CH _{M3}	2800	7.48	3.95	9.91	PASS
TX-GMRS	FM	CH _{M3}	2900	7.98	3.65	10.22	PASS
TX-GMRS	FM	CH _{M3}	3000	7.66	3.35	10.51	PASS
TX-GMRS	FM	CH _{M3}	3500	-33.27			PASS

Appendix E:Audio Frequency Response

Test Mode	Modulation Type	Test Channel	Frequency (Hz)	Audio Frequency Response (dB)	Lower Limit	Upper Limit	Result
TX-GMRS	FM	CH _{M3}	4000	-33.05			PASS
TX-GMRS	FM	CH _{M3}	4500	-32.95			PASS
TX-GMRS	FM	CH _{M3}	5000	-33.00			PASS
TX-GMRS	FM	CH _{M4}	100	-33.16			PASS
TX-GMRS	FM	CH _{M4}	200	-33.10			PASS
TX-GMRS	FM	CH _{M4}	300	-13.99	-17.84	-9.42	PASS
TX-GMRS	FM	CH _{M4}	400	-10.30	-12.86	-6.93	PASS
TX-GMRS	FM	CH _{M4}	500	-7.94	-9.00	-5.00	PASS
TX-GMRS	FM	CH _{M4}	600	-5.27	-7.42	-3.42	PASS
TX-GMRS	FM	CH _{M4}	700	-3.93	-6.09	-2.09	PASS
TX-GMRS	FM	CH _{M4}	800	-2.49	-4.93	-0.93	PASS
TX-GMRS	FM	CH _{M4}	900	-1.15	-3.91	0.09	PASS
TX-GMRS	FM	CH _{M4}	1000	-0.03	-3.00	1.00	PASS
TX-GMRS	FM	CH _{M4}	1200	1.17	-1.42	2.58	PASS
TX-GMRS	FM	CH _{M4}	1400	2.67	-0.09	3.91	PASS
TX-GMRS	FM	CH _{M4}	1600	3.82	1.07	5.07	PASS
TX-GMRS	FM	CH _{M4}	1800	4.35	2.09	6.09	PASS
TX-GMRS	FM	CH _{M4}	2000	5.54	3.00	7.00	PASS
TX-GMRS	FM	CH _{M4}	2100	5.74	3.42	7.42	PASS
TX-GMRS	FM	CH _{M4}	2200	5.82	3.83	7.83	PASS
TX-GMRS	FM	CH _{M4}	2300	6.09	4.21	8.21	PASS
TX-GMRS	FM	CH _{M4}	2400	6.60	4.58	8.58	PASS
TX-GMRS	FM	CH _{M4}	2500	7.08	4.93	8.93	PASS
TX-GMRS	FM	CH _{M4}	2600	7.18	4.59	9.27	PASS
TX-GMRS	FM	CH _{M4}	2700	7.19	4.27	9.60	PASS
TX-GMRS	FM	CH _{M4}	2800	7.48	3.95	9.91	PASS
TX-GMRS	FM	CH _{M4}	2900	7.99	3.65	10.22	PASS
TX-GMRS	FM	CH _{M4}	3000	7.67	3.35	10.51	PASS
TX-GMRS	FM	CH _{M4}	3500	-32.92			PASS
TX-GMRS	FM	CH _{M4}	4000	-32.80			PASS
TX-GMRS	FM	CH _{M4}	4500	-33.08			PASS
TX-GMRS	FM	CH _{M4}	5000	-33.09			PASS

Appendix E:Audio Frequency Response

Test Mode	Modulation Type	Test Channel	TEST PLOT RESULT
TX-GMRS	FM	CH _{M1}	
TX-GMRS	FM	CH _{M2}	
TX-GMRS	FM	CH _{M3}	

Appendix E:Audio Frequency Response

Test Mode	Modulation Type	Test Channel	TEST PLOT RESULT
TX-GMRS	FM	CH _{M4}	RESPONSE ATTENUATION (dB) FREQUENCY (Hz) Legend: — Audio Frequency Response (dB) — Upper Limit

Appendix F:Audio Low Pass Filter Response

Test Mode	Modulation Type	Test Channel	Audio Frequency(Hz)	Audio Frequency Response(dB)	Limit	Result
TX-GMRS	FM	CH _{M1}	1000	-16.16	0	PASS
TX-GMRS	FM	CH _{M1}	3000	-17.23	0	PASS
TX-GMRS	FM	CH _{M1}	4000	-21.84	-7.5	PASS
TX-GMRS	FM	CH _{M1}	5000	-49.57	-13.3	PASS
TX-GMRS	FM	CH _{M1}	6000	-49.45	-18.1	PASS
TX-GMRS	FM	CH _{M1}	8000	-49.89	-25.6	PASS
TX-GMRS	FM	CH _{M1}	10000	-49.68	-31.4	PASS
TX-GMRS	FM	CH _{M1}	15000	-50.02	-41.9	PASS
TX-GMRS	FM	CH _{M1}	20000	-50.12	-50	PASS
TX-GMRS	FM	CH _{M1}	30000	-50.45	-50	PASS
TX-GMRS	FM	CH _{M1}	40000	-50.50	-50	PASS
TX-GMRS	FM	CH _{M1}	50000	-50.43	-50	PASS
TX-GMRS	FM	CH _{M1}	60000	-50.58	-50	PASS
TX-GMRS	FM	CH _{M1}	70000	-50.96	-50	PASS
TX-GMRS	FM	CH _{M1}	80000	-50.76	-50	PASS
TX-GMRS	FM	CH _{M1}	90000	-51.09	-50	PASS
TX-GMRS	FM	CH _{M1}	100000	-51.17	-50	PASS
TX-GMRS	FM	CH _{M2}	1000	-16.13	0	PASS
TX-GMRS	FM	CH _{M2}	3000	-17.08	0	PASS
TX-GMRS	FM	CH _{M2}	4000	-21.82	-7.5	PASS
TX-GMRS	FM	CH _{M2}	5000	-50.41	-13.3	PASS
TX-GMRS	FM	CH _{M2}	6000	-50.42	-18.1	PASS
TX-GMRS	FM	CH _{M2}	8000	-50.36	-25.6	PASS
TX-GMRS	FM	CH _{M2}	10000	-50.71	-31.4	PASS
TX-GMRS	FM	CH _{M2}	15000	-50.42	-41.9	PASS
TX-GMRS	FM	CH _{M2}	20000	-50.58	-50	PASS
TX-GMRS	FM	CH _{M2}	30000	-50.58	-50	PASS
TX-GMRS	FM	CH _{M2}	40000	-50.94	-50	PASS
TX-GMRS	FM	CH _{M2}	50000	-50.94	-50	PASS
TX-GMRS	FM	CH _{M2}	60000	-50.97	-50	PASS
TX-GMRS	FM	CH _{M2}	70000	-51.08	-50	PASS
TX-GMRS	FM	CH _{M2}	80000	-51.03	-50	PASS
TX-GMRS	FM	CH _{M2}	90000	-50.65	-50	PASS
TX-GMRS	FM	CH _{M2}	100000	-51.19	-50	PASS
TX-GMRS	FM	CH _{M3}	1000	-16.15	0	PASS
TX-GMRS	FM	CH _{M3}	3000	-17.15	0	PASS
TX-GMRS	FM	CH _{M3}	4000	-21.92	-7.5	PASS
TX-GMRS	FM	CH _{M3}	5000	-50.43	-13.3	PASS
TX-GMRS	FM	CH _{M3}	6000	-50.53	-18.1	PASS
TX-GMRS	FM	CH _{M3}	8000	-50.58	-25.6	PASS
TX-GMRS	FM	CH _{M3}	10000	-50.79	-31.4	PASS
TX-GMRS	FM	CH _{M3}	15000	-50.77	-41.9	PASS
TX-GMRS	FM	CH _{M3}	20000	-50.89	-50	PASS

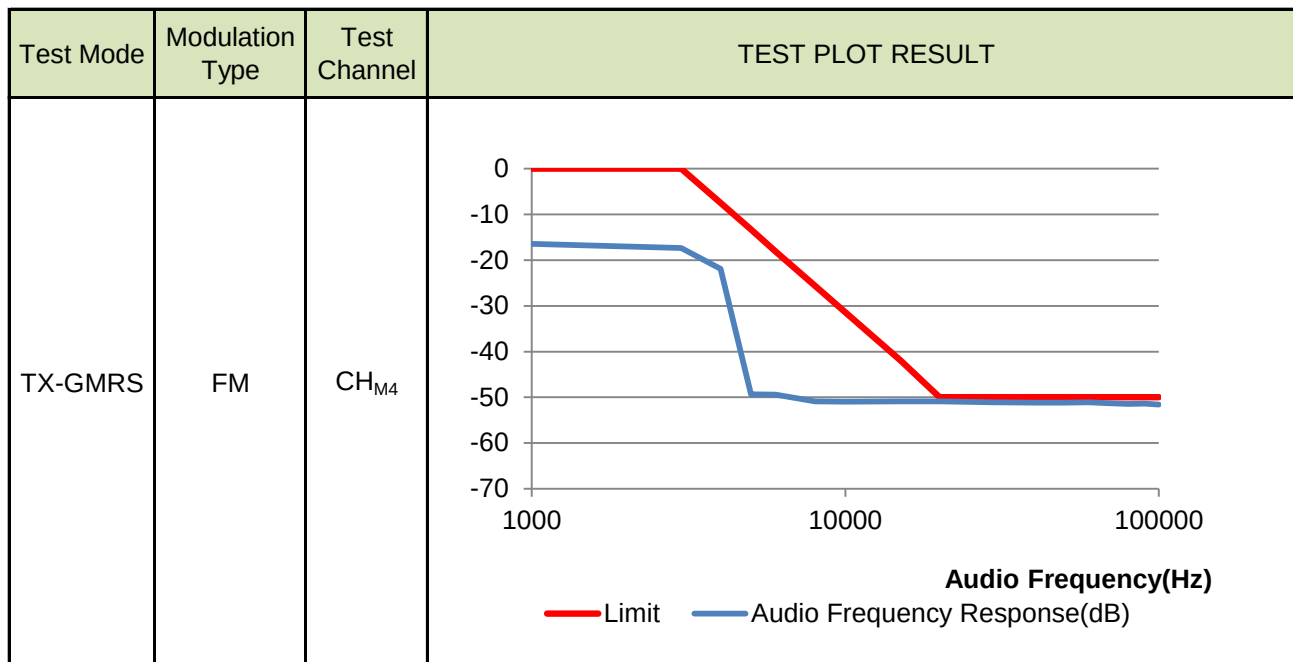
Appendix F:Audio Low Pass Filter Response

Test Mode	Modulation Type	Test Channel	Audio Frequency(Hz)	Audio Frequency Response(dB)	Limit	Result
TX-GMRS	FM	CH _{M3}	30000	-50.84	-50	PASS
TX-GMRS	FM	CH _{M3}	40000	-50.48	-50	PASS
TX-GMRS	FM	CH _{M3}	50000	-50.86	-50	PASS
TX-GMRS	FM	CH _{M3}	60000	-51.04	-50	PASS
TX-GMRS	FM	CH _{M3}	70000	-51.17	-50	PASS
TX-GMRS	FM	CH _{M3}	80000	-51.10	-50	PASS
TX-GMRS	FM	CH _{M3}	90000	-51.09	-50	PASS
TX-GMRS	FM	CH _{M3}	100000	-51.00	-50	PASS
TX-GMRS	FM	CH _{M4}	1000	-16.4	0	PASS
TX-GMRS	FM	CH _{M4}	3000	-17.32	0	PASS
TX-GMRS	FM	CH _{M4}	4000	-21.9	-7.5	PASS
TX-GMRS	FM	CH _{M4}	5000	-49.34	-13.3	PASS
TX-GMRS	FM	CH _{M4}	6000	-49.44	-18.1	PASS
TX-GMRS	FM	CH _{M4}	8000	-50.88	-25.6	PASS
TX-GMRS	FM	CH _{M4}	10000	-50.96	-31.4	PASS
TX-GMRS	FM	CH _{M4}	15000	-50.9	-41.9	PASS
TX-GMRS	FM	CH _{M4}	20000	-50.89	-50	PASS
TX-GMRS	FM	CH _{M4}	30000	-51.07	-50	PASS
TX-GMRS	FM	CH _{M4}	40000	-51.18	-50	PASS
TX-GMRS	FM	CH _{M4}	50000	-51.16	-50	PASS
TX-GMRS	FM	CH _{M4}	60000	-51.12	-50	PASS
TX-GMRS	FM	CH _{M4}	70000	-51.30	-50	PASS
TX-GMRS	FM	CH _{M4}	80000	-51.45	-50	PASS
TX-GMRS	FM	CH _{M4}	90000	-51.36	-50	PASS
TX-GMRS	FM	CH _{M4}	100000	-51.58	-50	PASS

Appendix F:Audio Low Pass Filter Response

Test Mode	Modulation Type	Test Channel	TEST PLOT RESULT
TX-GMRS	FM	CH _{M1}	Audio Frequency Response (dB) vs Audio Frequency (Hz) for CH_{M1}. The plot shows the response of the audio low pass filter for the first channel. The response is within the limit across the entire frequency range.
TX-GMRS	FM	CH _{M2}	Audio Frequency Response (dB) vs Audio Frequency (Hz) for CH_{M2}. The plot shows the response of the audio low pass filter for the second channel. The response is within the limit across the entire frequency range.
TX-GMRS	FM	CH _{M3}	Audio Frequency Response (dB) vs Audio Frequency (Hz) for CH_{M3}. The plot shows the response of the audio low pass filter for the third channel. The response is within the limit across the entire frequency range.

Appendix F:Audio Low Pass Filter Response



Appendix G:Frequency Stability Test & Temperature

Test Mode	Modulation Type	Test Conditions		Frequency error (ppm)				Limit (ppm)	Result
		Voltage	Temperature	CH _{M1}	CH _{M2}	CH _{M3}	CH _{M4}		
TX-GMRS	FM	V _N	-30	-0.21	-0.38	-0.39	-0.35	±2.5	PASS
TX-GMRS	FM	V _N	-20	-0.22	-0.38	-0.40	-0.34	±2.5	PASS
TX-GMRS	FM	V _N	-10	-0.22	-0.37	-0.39	-0.35	±2.5	PASS
TX-GMRS	FM	V _N	0	-0.22	-0.36	-0.39	-0.35	±2.5	PASS
TX-GMRS	FM	V _N	10	-0.21	-0.35	-0.38	-0.35	±2.5	PASS
TX-GMRS	FM	V _N	20	-0.21	-0.35	-0.37	-0.34	±2.5	PASS
TX-GMRS	FM	V _N	30	-0.21	-0.38	-0.37	-0.34	±2.5	PASS
TX-GMRS	FM	V _N	40	-0.21	-0.35	-0.38	-0.34	±2.5	PASS
TX-GMRS	FM	V _N	50	-0.21	-0.38	-0.38	-0.35	±2.5	PASS

Note: 1) Occupied bandwidth > 12.5kHz, Limit is ±5ppm;
2) Occupied bandwidth ≤ 12.5kHz, Limit is ±2.5ppm.

Appendix H:Frequency Stability Test & Voltage

Test Mode	Modulation Type	Test Conditions		Frequency error (ppm)				Limit (ppm)	Result
		Voltage	Temperature	CH _{M1}	CH _{M2}	CH _{M3}	CH _{M4}		
TX-GMRS	FM	V _N	T _N	-0.2	-0.3	-0.4	-0.3	±2.5	PASS
TX-GMRS	FM	V _L	T _N	-0.2	-0.4	-0.4	-0.3	±2.5	PASS
TX-GMRS	FM	V _H	T _N	-0.2	-0.4	-0.4	-0.3	±2.5	PASS

Note: 1) Occupied bandwidth > 12.5kHz, Limit is ±5ppm;
2) Occupied bandwidth ≤ 12.5kHz, Limit is ±2.5ppm.