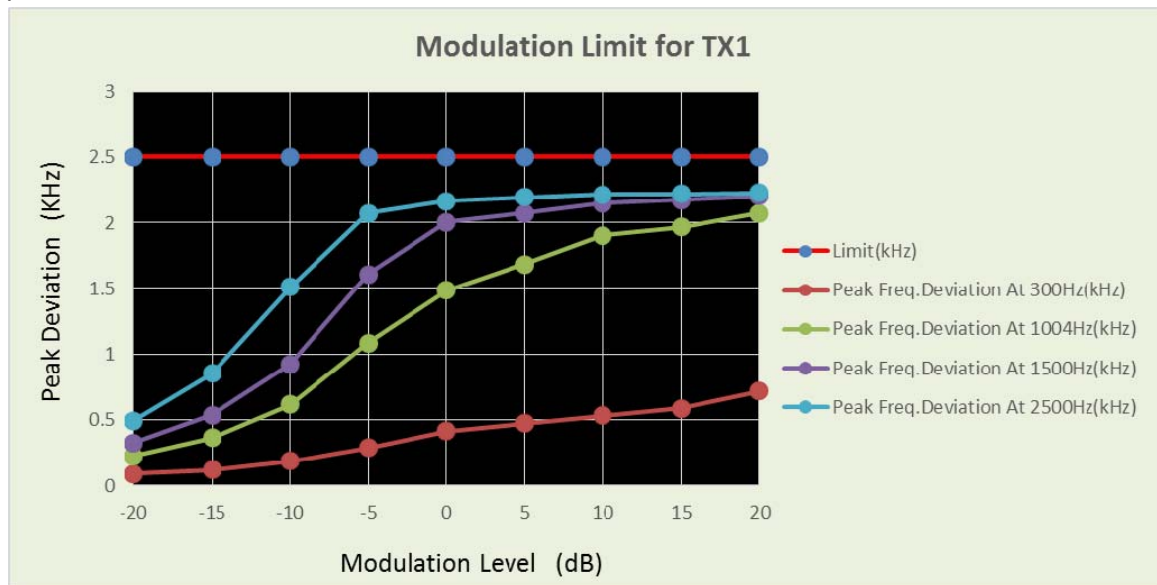


TX1: CH <sub>M1</sub>						
Modulation Level (dB)	Peak frequency deviation (kHz)				Limit (kHz)	Result
	300Hz	1004Hz	1500Hz	2500 Hz		
-20	0.092	0.227	0.326	0.496	2.5	Pass
-15	0.12	0.366	0.537	0.853		
-10	0.187	0.618	0.925	1.512		
-5	0.29	1.086	1.607	2.07		
0	0.416	1.486	2.004	2.164		
5	0.475	1.682	2.07	2.195		
10	0.533	1.904	2.147	2.214		
15	0.589	1.968	2.174	2.219		
20	0.72	2.071	2.204	2.229		

Test plot as follows:



TX2: CH <sub>M2</sub>						
Modulation Level (dB)	Peak frequency deviation (kHz)				Limit (kHz)	Result
	300Hz	1004Hz	1500Hz	2500 Hz		
-20	0.082	0.189	0.266	0.399	2.5	Pass
-15	0.103	0.305	0.443	0.685		
-10	0.155	0.489	0.737	1.194		
-5	0.242	0.862	1.283	1.945		
0	0.397	1.514	2.012	2.166		
5	0.443	1.633	2.053	2.174		
10	0.512	1.832	2.108	2.194		
15	0.589	1.962	2.171	2.214		
20	0.658	2.048	2.182	2.228		

Test plot as follows:



TX3: CH <sub>M3</sub>						
Modulation Level (dB)	Peak frequency deviation (kHz)				Limit (kHz)	Result
	300Hz	1004Hz	1500Hz	2500 Hz		
-20	0.510	1.819	2.106	2.202	5.0	Pass
-15	0.612	1.923	2.173	2.211		
-10	0.714	2.038	2.204	2.224		
-5	0.789	2.164	2.213	2.235		
0	1.189	2.205	2.26	2.245		
5	1.356	2.346	2.305	2.21		
10	1.687	2.389	2.368	2.348		
15	1.857	2.415	2.418	2.462		
20	2.152	2.453	2.443	2.531		

Test plot as follows:



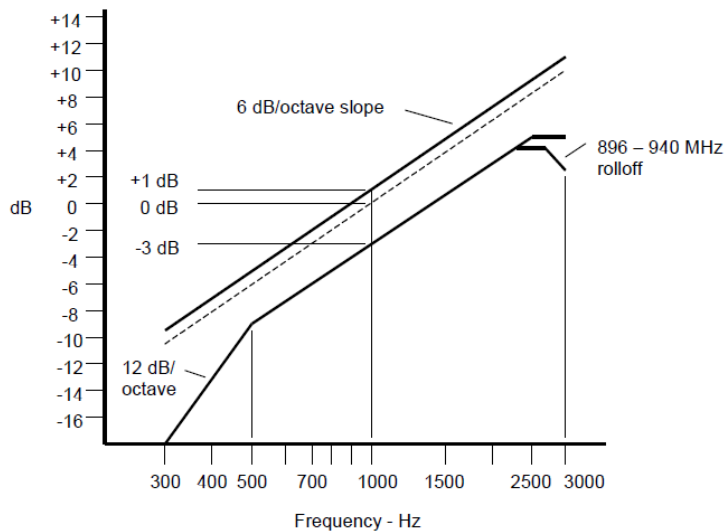
## 5.7. Audio Frequency Response

The audio frequency response is the degree of closeness to which the frequency deviation of the transmitter follows a prescribed characteristic.

### LIMIT

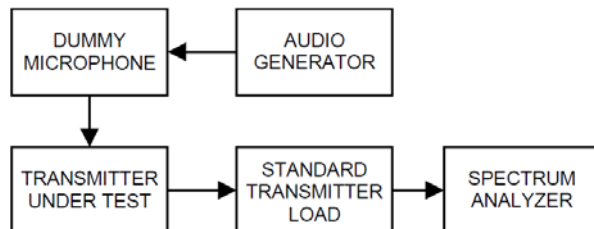
FCC Part 95.637(a), FCC Part 2.1047(a):

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. For equipment required to have an audio low-pass filter, a curve showing the frequency response of the filter or of all circuitry installed between the modulation limiter and the modulated stage 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) Configure the EUT as shown in figure.
- 2) Adjust the audio input for 20% of rated system deviation at 1kHz using this level as a reference.
- 3) Vary the Audio frequency from 300Hz to 3 kHz and record the frequency deviation.
- 4) Audio Frequency Response =  $20\log_{10} (V_{\text{FREQ}}/V_{\text{REF}})$ .

### TEST MODE:

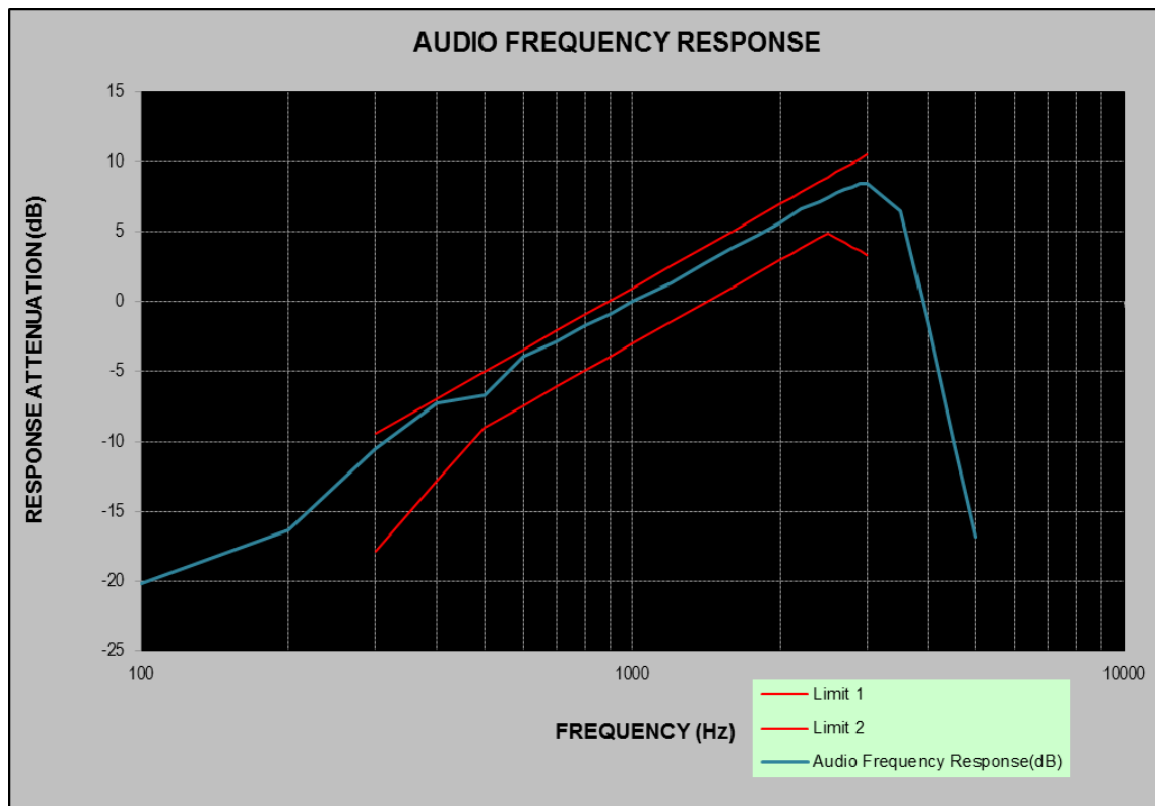
Please reference to the section 3.4

### TEST RESULTS

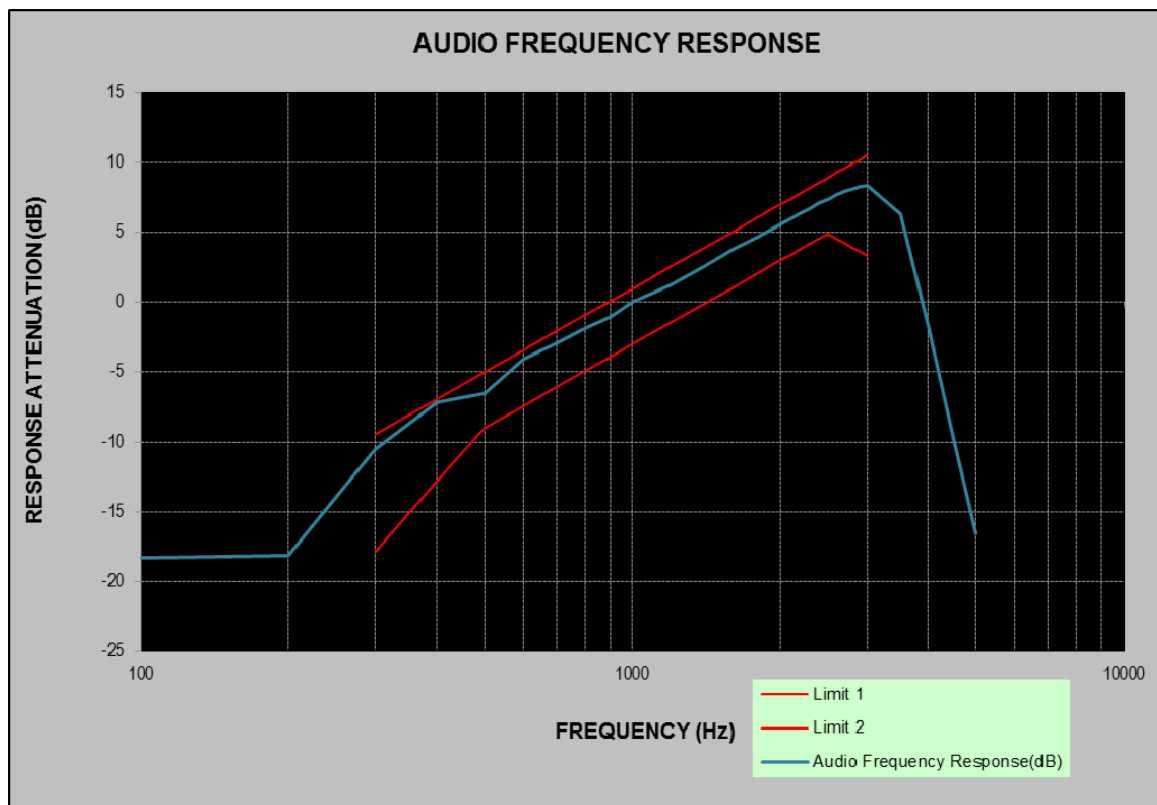
☒ Passed ☐ Not Applicable

Note: have pre-tested all test frequency, record the worst case mode CH<sub>M1</sub>, CH<sub>M2</sub> and CH<sub>M3</sub> on the report.

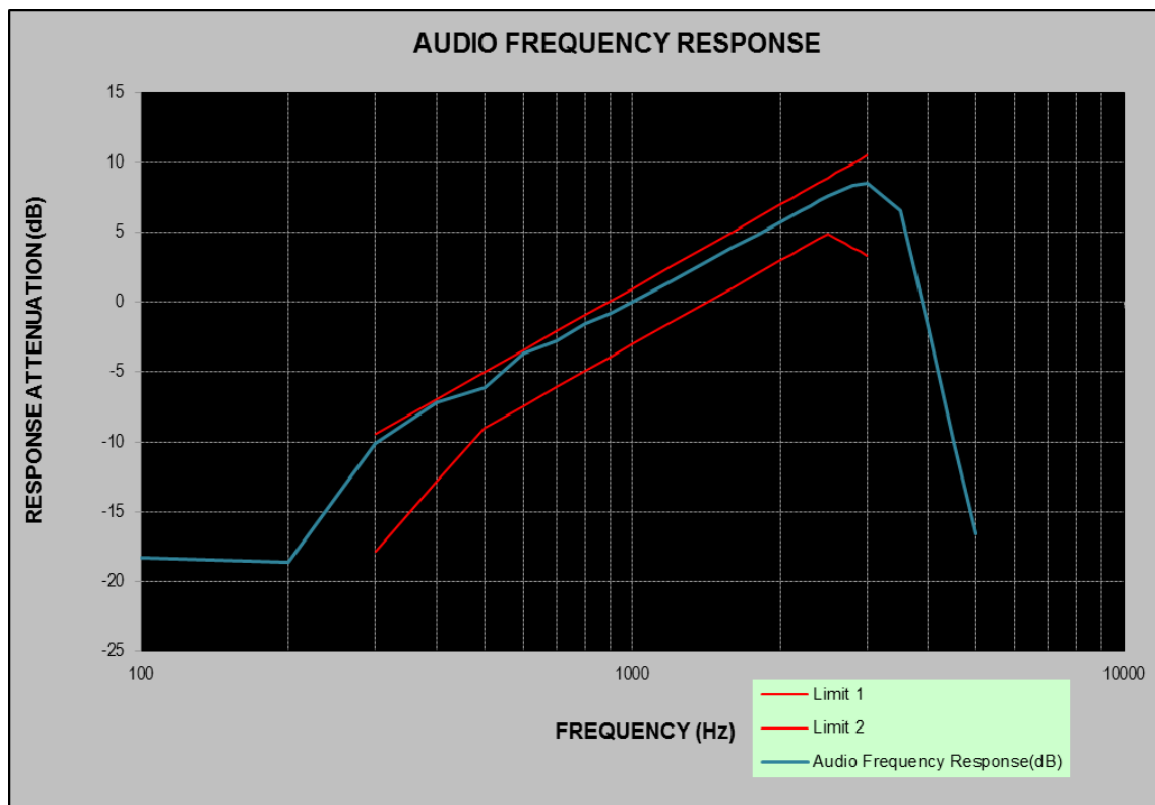
TX1: CH <sub>M1</sub>			
Audio Frequency (Hz)	Audio Frequency Response (dB)	Audio Frequency (Hz)	Audio Frequency Response (dB)
100	-20.17	2100	6.13
200	-16.31	2200	6.64
300	-10.51	2300	6.89
400	-7.26	2400	7.17
500	-6.69	2500	7.49
600	-3.94	2600	7.77
700	-2.83	2700	8.01
800	-1.73	2800	8.24
900	-0.86	2900	8.42
1000	0.00	3000	8.49
1200	1.32	3500	6.48
1400	2.71	4000	-1.60
1600	3.90	4500	-10.10
1800	4.80	5000	-16.84
2000	5.71	-	-



TX2: CH <sub>M2</sub>			
Audio Frequency (Hz)	Audio Frequency Response (dB)	Audio Frequency (Hz)	Audio Frequency Response (dB)
100	-18.30	2100	5.97
200	-18.16	2200	6.39
300	-10.51	2300	6.72
400	-7.19	2400	7.12
500	-6.48	2500	7.42
600	-4.08	2600	7.70
700	-2.93	2700	7.96
800	-1.85	2800	8.15
900	-1.03	2900	8.28
1000	0.00	3000	8.36
1200	1.27	3500	6.33
1400	2.60	4000	-1.60
1600	3.75	4500	-9.98
1800	4.67	5000	-16.61
2000	5.55	-	-



TX3: CH <sub>M3</sub>			
Audio Frequency (Hz)	Audio Frequency Response (dB)	Audio Frequency (Hz)	Audio Frequency Response (dB)
100	-18.30	2100	6.18
200	-18.59	2200	6.56
300	-10.12	2300	6.92
400	-7.15	2400	7.29
500	-6.12	2500	7.60
600	-3.65	2600	7.88
700	-2.72	2700	8.11
800	-1.54	2800	8.35
900	-0.77	2900	8.49
1000	0.00	3000	8.56
1200	1.51	3500	6.53
1400	2.81	4000	-1.72
1600	3.96	4500	-10.08
1800	4.86	5000	-16.60
2000	5.77	-	-



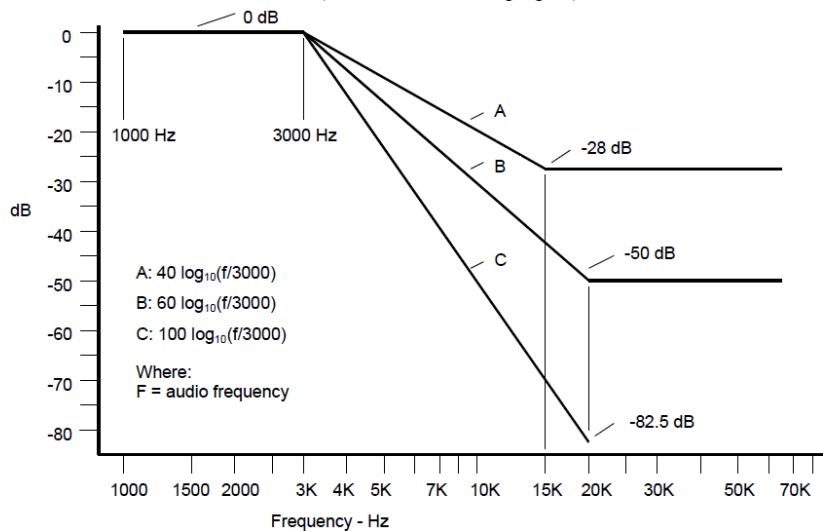
## 5.8. Audio Low Pass Filter Response

The audio low pass filter response is the frequency response of the post limiter low pass filter circuit above 3000 Hz.

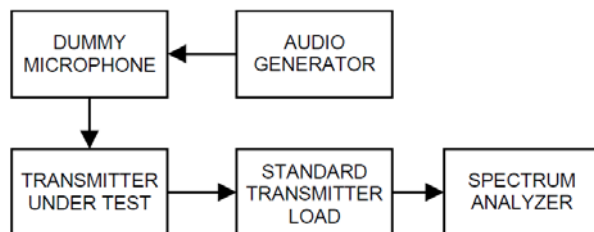
### LIMIT

FCC Part 95.637(b):

The filter must be between the modulation limiter and the modulated stage of the transmitter. At any frequency (f in kHz) between 3 and 20 kHz, the filter must have an attenuation of at least  $60 \log_{10} (f/3)$  dB greater than the attenuation at 1 kHz. Above 20 kHz, it must have an attenuation of at least 50 dB greater 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 3.4

### TEST RESULTS

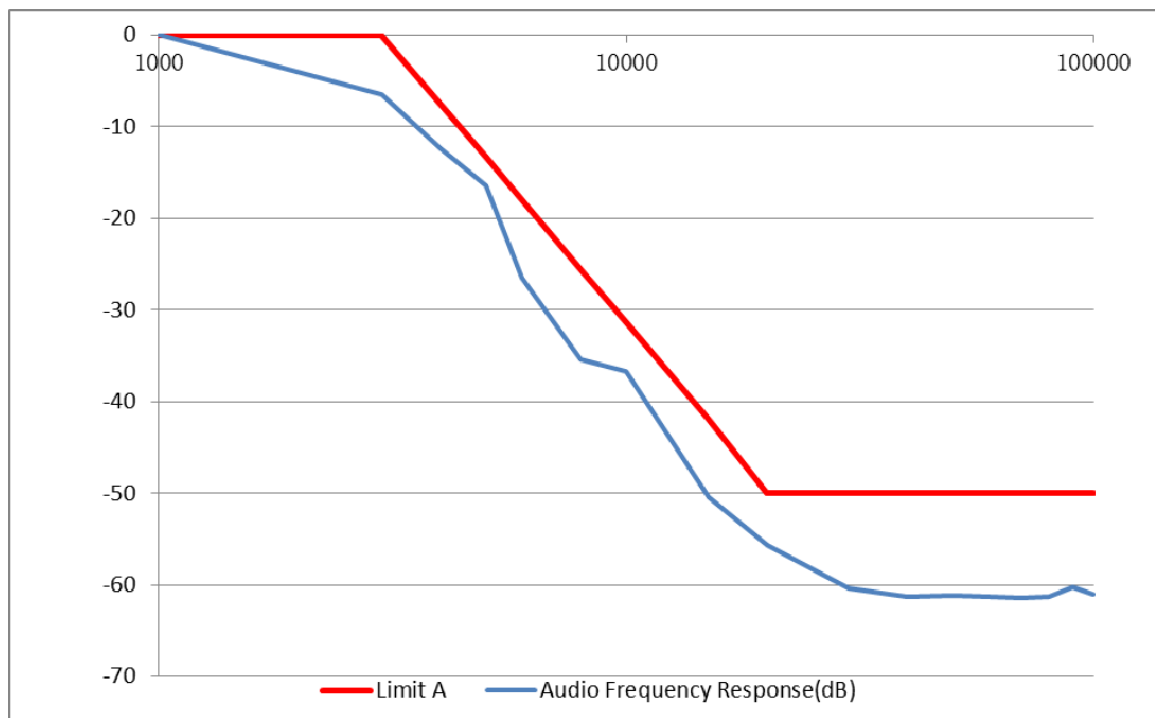
☒ Passed ☐ Not Applicable

Note: We have pre-tested all test frequency, recorded the worst case mode at  $CH_{M1}$  and  $CH_{M3}$  on the report.



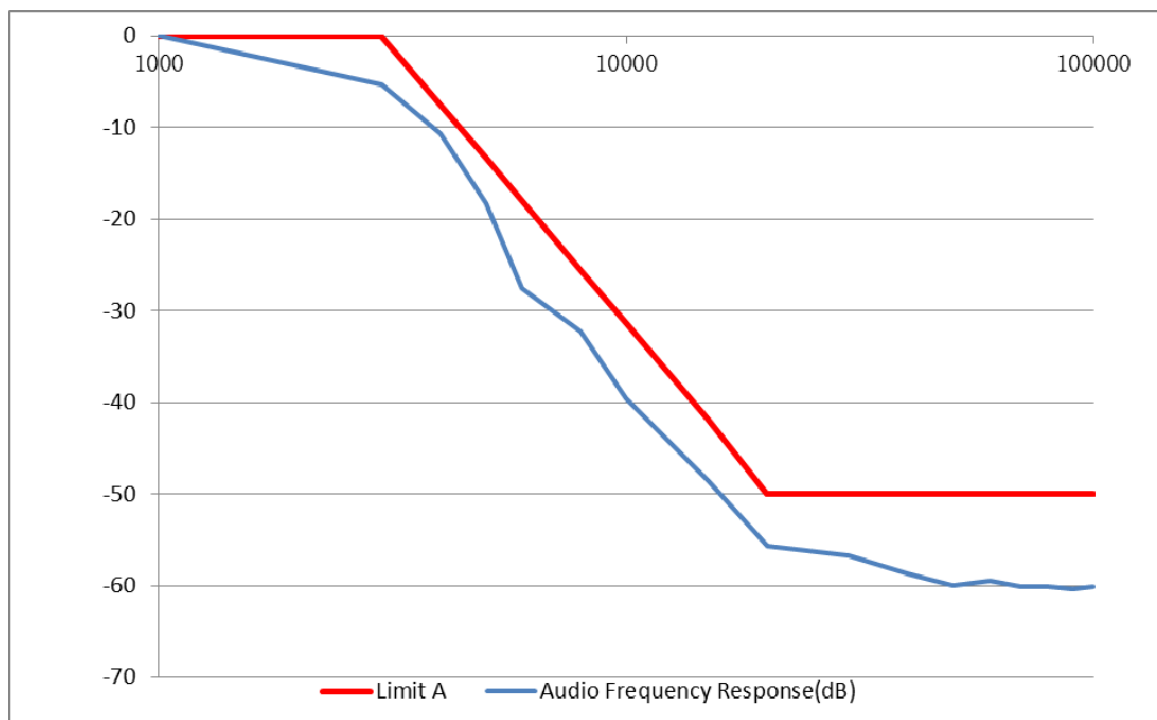
Operation Mode	Audio Frequency (Hz)	Response Attenuation (dB)	Limit	Result
TX1: CH <sub>M1</sub>	1000	0	0	Pass
	3000	-6.52	0	
	4000	-12.32	-7.5	
	5000	-16.42	-13.3	
	6000	-26.51	-18.1	
	8000	-35.41	-25.6	
	10000	-36.74	-31.4	
	15000	-50.42	-41.9	
	20000	-55.62	-50	
	30000	-60.32	-50	
	40000	-61.25	-50	
	50000	-61.21	-50	
	60000	-61.23	-50	
	70000	-61.42	-50	
	80000	-61.32	-50	
	90000	-60.25	-50	
	100000	-61.06	-50	

Test plot as follows:



Operation Mode	Audio Frequency (Hz)	Response Attenuation (dB)	Limit	Result
TX3: CH <sub>M3</sub>	1000	0	0	Pass
	3000	-5.32	0	
	4000	-10.62	-7.5	
	5000	-18.24	-13.3	
	6000	-27.52	-18.1	
	8000	-32.32	-25.6	
	10000	-39.52	-31.4	
	15000	-48.62	-41.9	
	20000	-55.62	-50	
	30000	-56.74	-50	
	40000	-58.62	-50	
	50000	-59.95	-50	
	60000	-59.42	-50	
	70000	-60.14	-50	
	80000	-60.12	-50	
	90000	-60.32	-50	
	100000	-60.15	-50	

Test plot as follows:



## 5.9. Frequency Stability

The carrier frequency stability is the ability of the transmitter to maintain an assigned carrier frequency.

### LIMIT

FCC Part 95.626(b):

FRS:

The carrier frequency tolerance shall be better than  $\pm 2.5$  ppm.

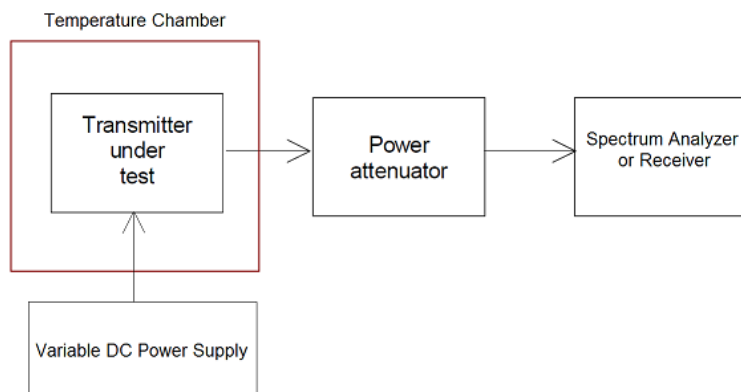
GMRS:

The carrier frequency tolerance shall be better than  $\pm 5$  ppm.

### TEST PROCEDURE

1. According to FCC Part 2 Section 2.1055 (a)(1), the frequency stability shall be measured with variation of ambient temperature from  $-30^{\circ}\text{C}$  to  $+50^{\circ}\text{C}$  centigrade.
2. According to FCC Part 2 Section 2.1055 (d) (2), for battery powered equipment, the frequency stability shall be measured with reducing primary supply voltage to the battery operating end point, which is specified by the manufacture.
3. Vary primary supply voltage from 3.06V to 4.14V.
4. The EUT was set in the climate chamber and connected to an external DC power supply. The RF output was directly connected to Spectrum Analyzer. The coupling loss of the additional cables was recorded and taken in account for all the measurements. After temperature stabilization (approx. 20 min for each stage), the frequency for the lower, the middle and the highest frequency range was recorded. For Frequency stability Vs. Voltage the EUT was connected to a DC power supply and the voltage was adjusted in the required ranges. The result was recorded.

### TEST CONFIGURATION



### TEST MODE:

Please reference to the section 3.4

### TEST RESULTS

☒ Passed ☐ Not Applicable

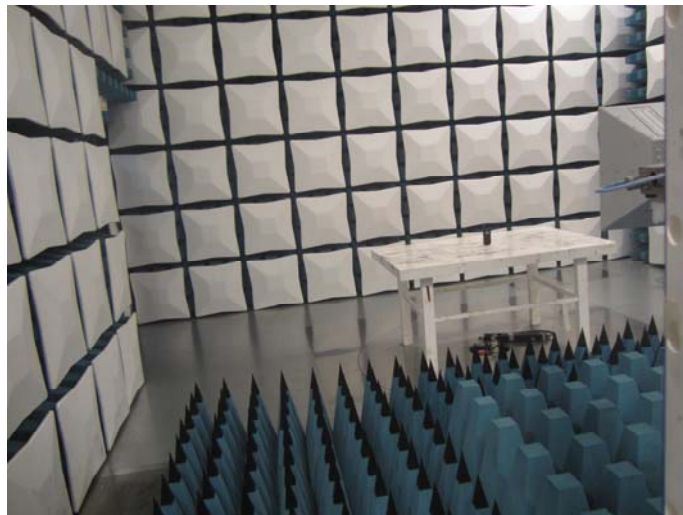
TX1						
Test conditions		Frequency error (ppm)			Limit (ppm)	Result
Voltage(V)	Temp(°C)	CH <sub>L1</sub>	CH <sub>M1</sub>	CH <sub>H1</sub>		
3.6	-30	0.19	0.19	0.19	±5	Pass
	-20	0.10	0.19	0.18		
	-10	0.08	0.09	0.11		
	0	0.16	0.13	0.13		
	10	0.13	0.10	0.12		
	20	0.20	0.18	0.19		
	30	0.12	0.14	0.18		
	40	0.14	0.09	0.14		
	50	0.15	0.13	0.09		
3.06	20	0.18	0.08	0.12		
4.14	20	0.19	0.10	0.15		

TX2						
Test conditions		Frequency error (ppm)			Limit (ppm)	Result
Voltage(V)	Temp(°C)	CH <sub>L2</sub>	CH <sub>M2</sub>	CH <sub>H2</sub>		
3.6	-30	0.23	0.28	0.42	±2.5	Pass
	-20	0.36	0.39	0.30		
	-10	0.32	0.46	0.23		
	0	0.29	0.31	0.28		
	10	0.52	0.63	0.38		
	20	0.15	0.16	0.25		
	30	0.13	0.19	0.23		
	40	0.12	0.16	0.18		
	50	0.23	0.45	0.38		
3.06	20	0.28	0.42	0.36		
4.14	20	0.42	0.63	0.55		

TX3						
Test conditions		Frequency error (ppm)			Limit (ppm)	Result
Voltage(V)	Temp(°C)	CH <sub>L3</sub>	CH <sub>M3</sub>	CH <sub>H3</sub>		
3.6	-30	0.23	0.18	0.26	±5	Pass
	-20	0.56	0.42	0.51		
	-10	0.41	0.35	0.39		
	0	0.32	0.46	0.42		
	10	0.42	0.36	0.52		
	20	0.28	0.35	0.45		
	30	0.31	0.36	0.26		
	40	0.52	0.43	0.51		
	50	0.26	0.33	0.39		
3.06	20	0.35	0.42	0.45	±5	Pass
4.14	20	0.42	0.28	0.33		

## 6. Test Setup Photos of the EUT

Transmitter Radiated Spurious Emission:

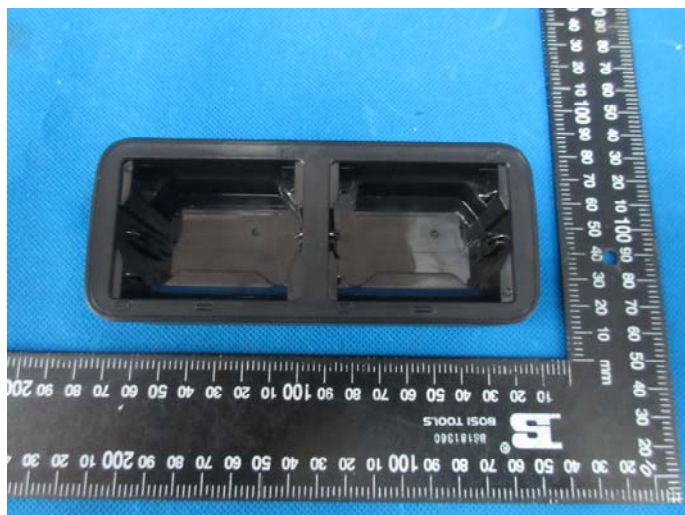


## 7. External and Internal Photos of the EUT

### External photos of the EUT







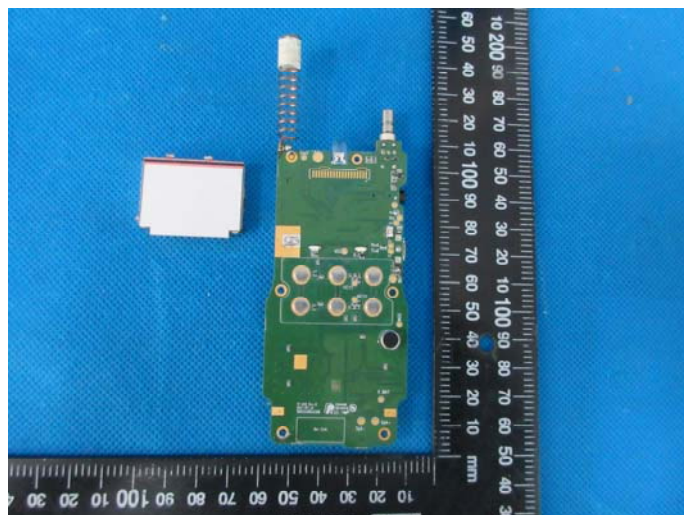


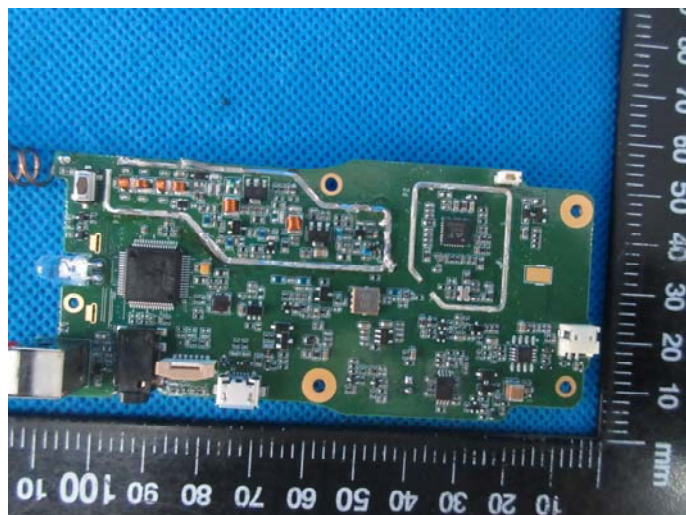
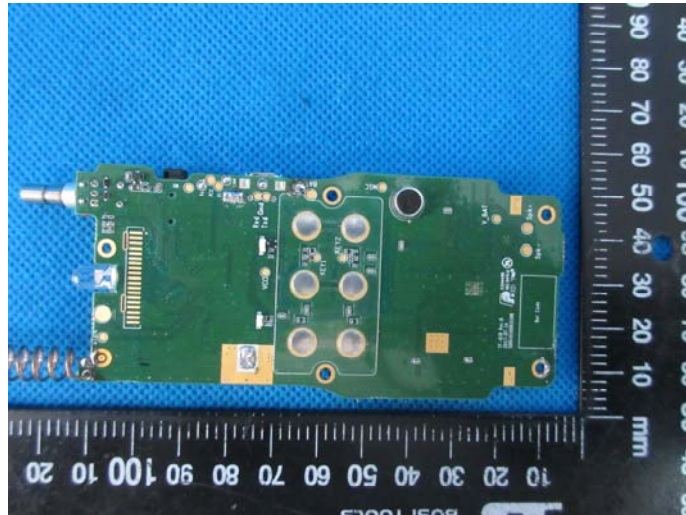


### Internal photos of the EUT









-----End of Report-----