

## 7.5 EMISSION MASK PLOT

Standard Applicable [FCC Part 95.579] FRS: Unwanted emissions shall be attenuated below the unmodulated carrier power in accordance with the following:

- (1) At least 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) At least 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.
- (3) At least  $43 + 10 \log_{10}(T)$  dB on any frequency removed from the center of the authorized bandwidth by more than 250 %.

The detailed procedure employed for Emission Mask measurements are specified as following:

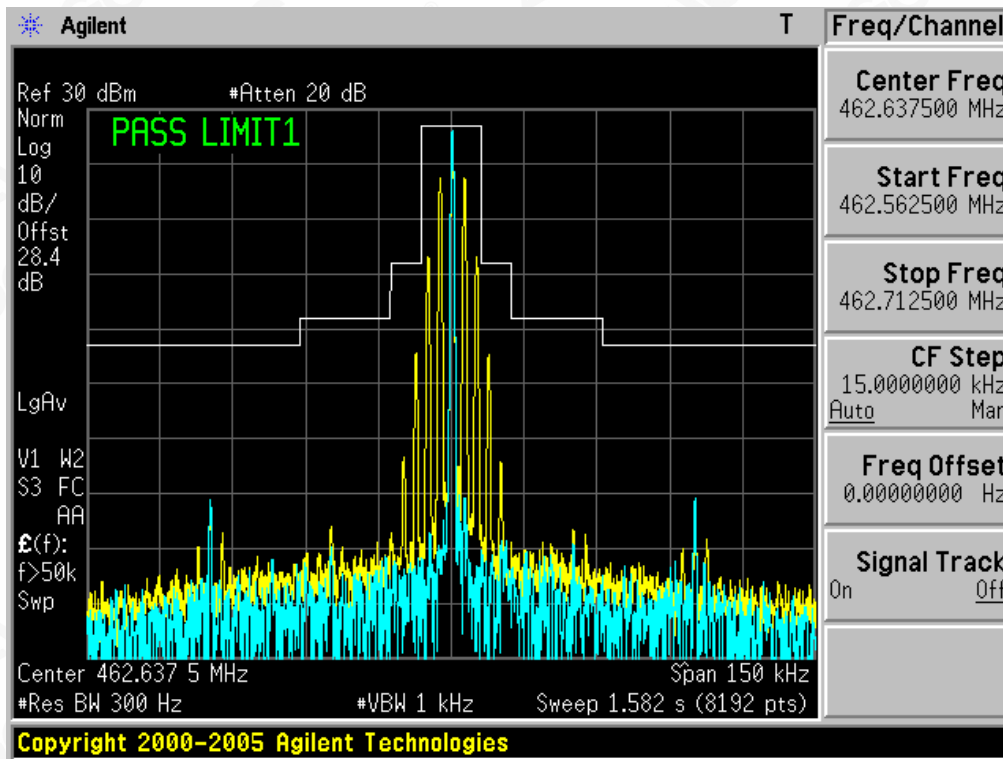
- The transmitter shall be modulated by a 2.5 kHz audio signal,
- The level of the audio signal employed is 16 dB greater than that necessary to produce 50% of rated system deviation. Rated system deviation is 2.5 kHz.

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Channel 4:

The Worst Emission Mask for channel 4 -0.5W



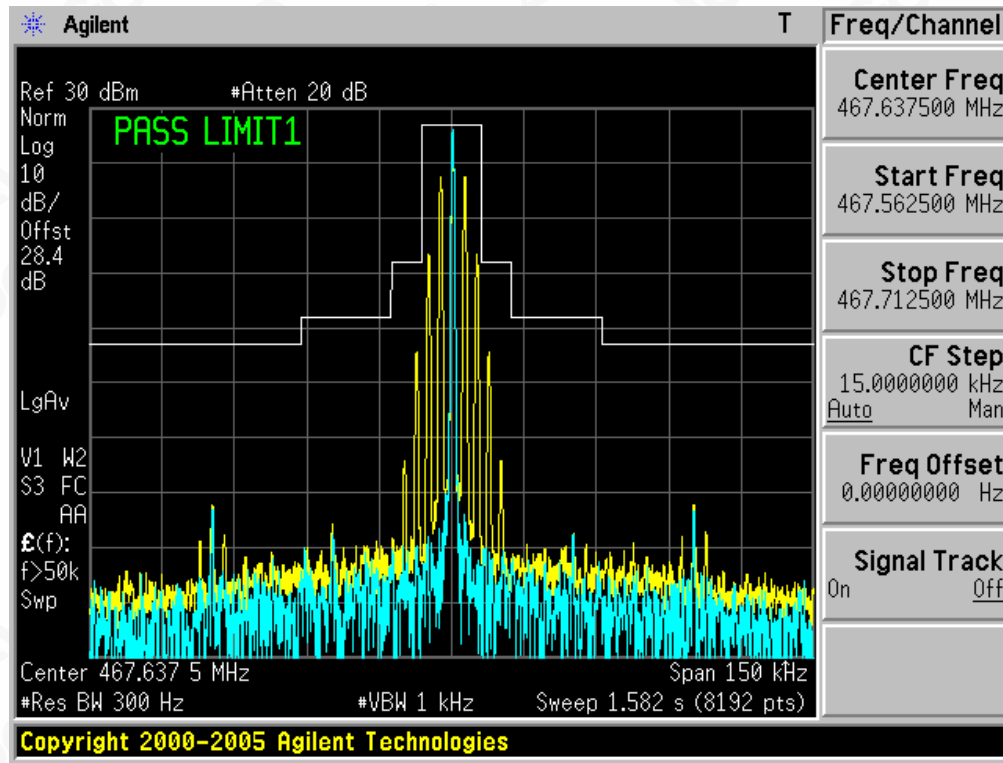
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Channel 11:

The Worst Emission Mask for channel 11 -0.5W



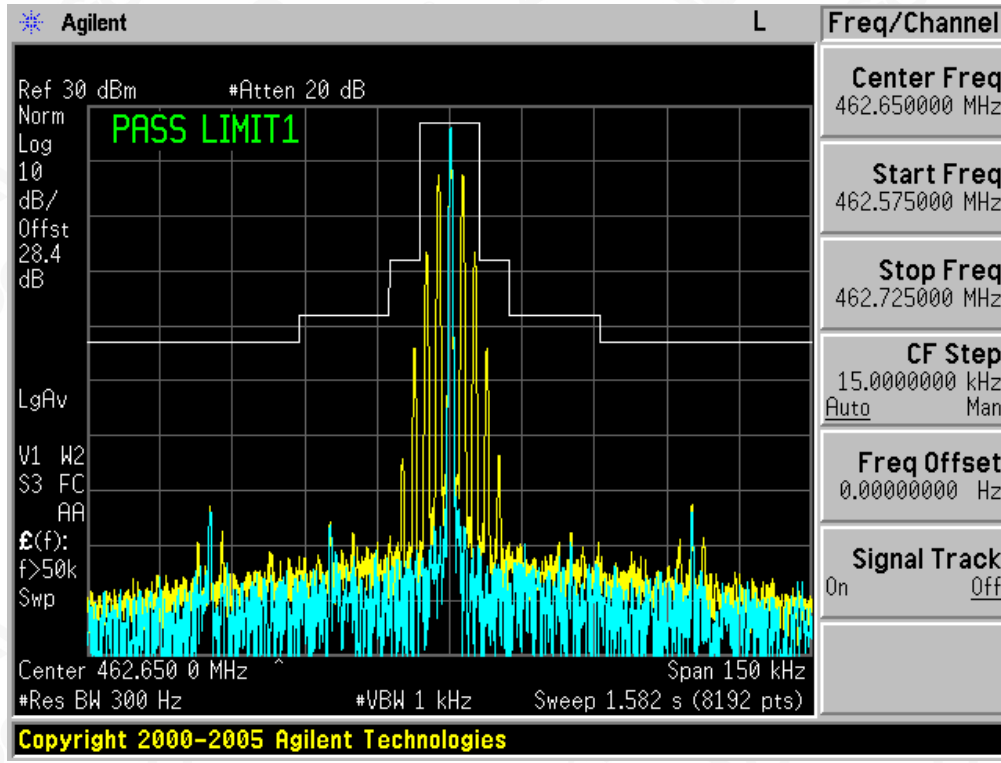
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Channel 19:

The Worst Emission Mask for channel 19-0.5W



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## 8. MAXIMUM TRANSMITTER POWER

### 8.1 PROVISIONS APPLICABLE

Per FCC §2.1046 and §95.567(h): Maximum ERP is dependent upon the station's antenna HAAT and required service area.

FCC Part 95.567 For FRS

Each FRS transmitter type must be designed such that the effective radiated power (ERP) on channels 8 through 14 does not exceed 0.5 Watts and the ERP on channels 1 through 7 and 15 through 22 does not exceed 2.0 Watts.

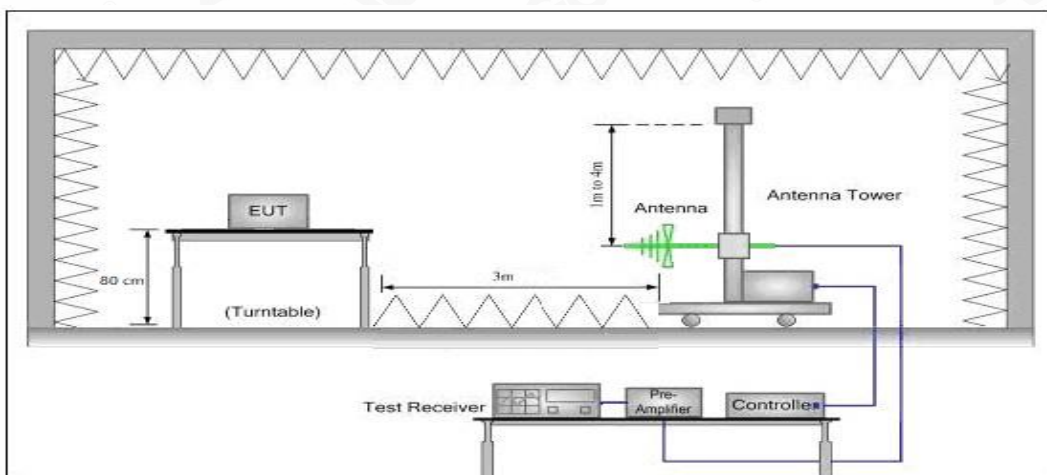
### 8.2 TEST PROCEDURE

- (1) The spectrum setting for Equivalent Isotropically Radiated Power (EIRP) is RBW = 100 kHz, VBW = 300 kHz. Detector Mode is RMS.
- (2) In the semi-anechoic chamber, setup as illustrated above the EUT placed on the 1.5m height of Turn Table, rotated the table 45 degree each interval to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power for each degree interval. The "Read Value" is the spectrum reading of maximum power value.
- (3) 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 rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum radiation power. Record the power level of maximum radiation power from spectrum. So, the Measured substitution value = Ref level of S.G + TX cables loss – Substituted Antenna Gain

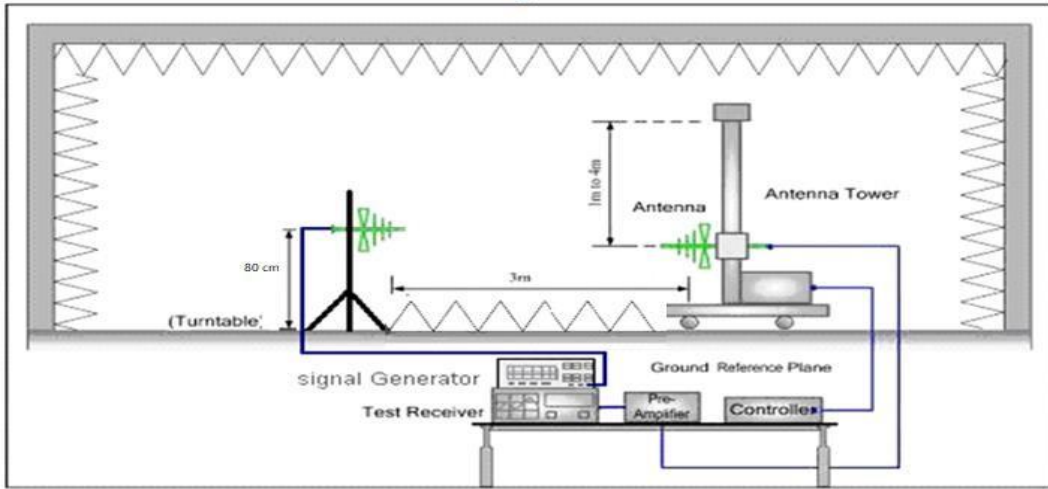
### 8.3 TEST CONFIGURATION

#### Effective Radiated Power

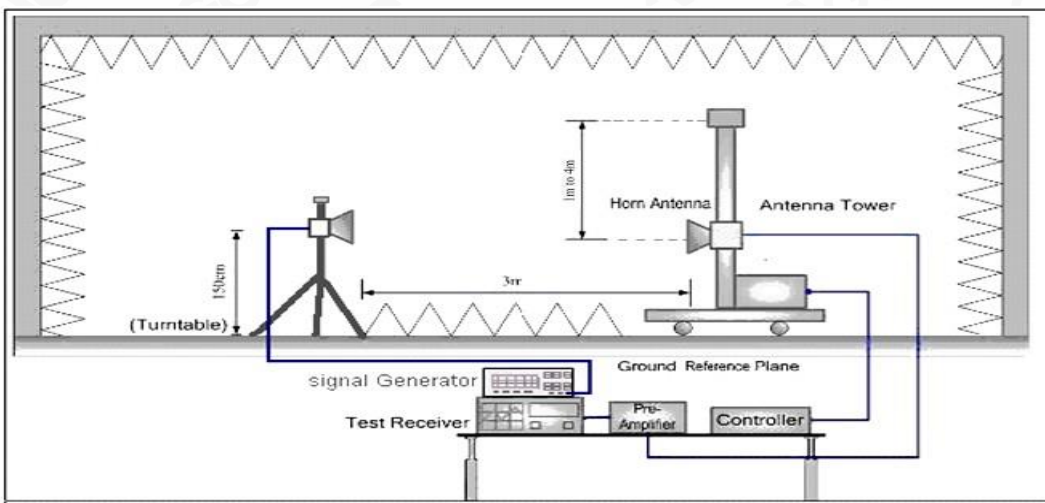
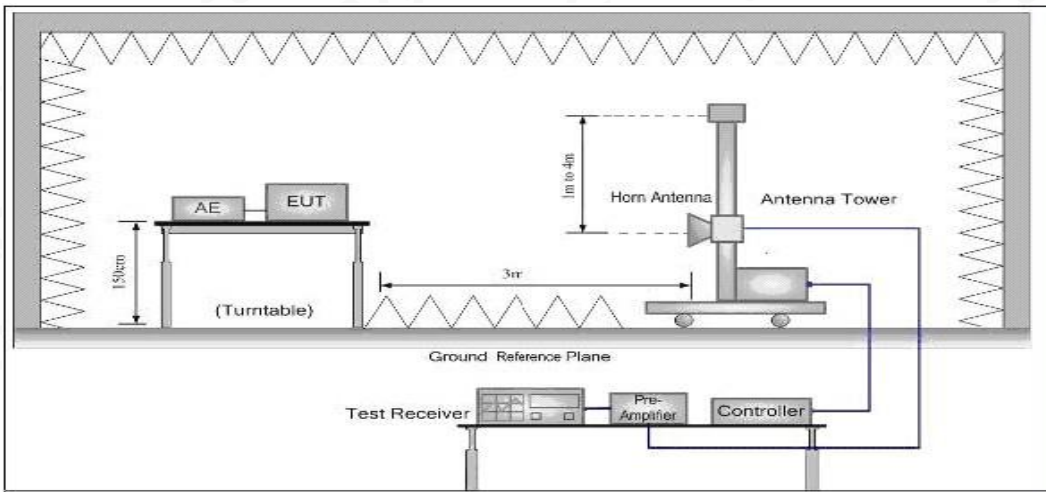
#### Radiated Below 1GHz



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Radiated Above 1 GHz



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### 8.4 TEST RESULT

The maximum Power (CP) for UHF is

Analog: 0.5W for 12.5 KHz Channel Separation

Calculation Formula:  $CP = R + A + L$

\* Note:

CP: The final Conducted Power

R : The reading value from spectrum analyzer

A : The attenuation value of the used attenuator

L : The loss of all connection cables

### ERP RESULT:

Frequency	Reading Level	Antenna	S.G.	Cable Loss	Ant.Gain	ERP Level	Limit	Margin
(MHz)	(dBuv/m)	Polarization	(dBm)	(dB)	(dBi)	(dBm)	(dBm)	(dB)
<b>Frequency: 462.6375MHz</b>								
462.6375	115.92	V	20.69	0.38	6.6	26.91	33.01	6.10
462.6375	115.78	H	20.55	0.38	6.6	26.77	33.01	6.24
<b>Frequency: 467.6375MHz</b>								
467.6375	115.90	V	20.67	0.38	6.6	26.89	26.99	0.10
467.6375	115.82	H	20.59	0.38	6.6	26.81	26.99	0.18
<b>Frequency: 462.6500MHz</b>								
462.6500	115.86	V	20.63	0.38	6.6	26.85	33.01	6.16
462.6500	115.74	H	20.51	0.38	6.6	26.73	33.01	6.28

Note: ERP level(dBm)=S.G.( dBm)-Cable Lloss(dB)+Ant. Gain(dBi), The Ant. Gain including the correct factor 2.15. and Margin(dB)=Limit(dBm)-Emission Level(dBm).

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## 9. MODULATION CHARACTERISTICS

### 9.1 PROVISIONS APPLICABLE

According to [FCC Part 95.575, Part 2.1047(a)], for Voice Modulation Communication Equipment, the frequency response of the audio modulation circuit over a range of 100 to 5000Hz shall be measured.

Part 95.575 A FRS unit that transmits emission type F3E must not exceed a peak frequency deviation of plus or minus 2.5 kHz, and the audio frequency response must not exceed 3.125 kHz.

Part 2.1047(a) 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.

### 9.2 MEASUREMENT METHOD

#### 9.2.1 Modulation Limit

- (1). Configure the EUT as shown in figure 1, adjust the audio input for 60% of rated system deviation at 1KHz using this level as a reference (0dB) and vary the input level from -20 to +20dB. Record the frequency deviation obtained as a function of the input level.
- (2). Repeat step 1 with input frequency changing to 300, 1000, 1500 and 3000Hz in sequence.

#### 9.2.2 Audio Frequency Response

Personal Radio Service stations that transmit voice emissions may also transmit audible or subaudible tones or other signals for the purpose of selective calling and/or receiver squelch activation. These tones and signals are ancillary to voice communications and are considered to be included within the voice emission types, e.g., A3E, F3E, and G3E.

- (a) Tones that are audible (having a frequency higher than 300 Hertz), must last no longer than 15 seconds at one time.
- (b) Tones that are subaudible (having a frequency of 300 Hertz or less), may be transmitted continuously during a communication session.
  - (1). Configure the EUT as shown in figure 1.
  - (2). Adjust the audio input for 20% of rated system deviation at 1 KHz using this level as a reference (0 dB).
  - (3). Vary the Audio frequency from 100 Hz to 10 KHz and record the frequency deviation.
  - (4). Audio Frequency Response =  $20\log_{10}(\text{Deviation of test frequency}/\text{Deviation of 1 KHz reference})$ .



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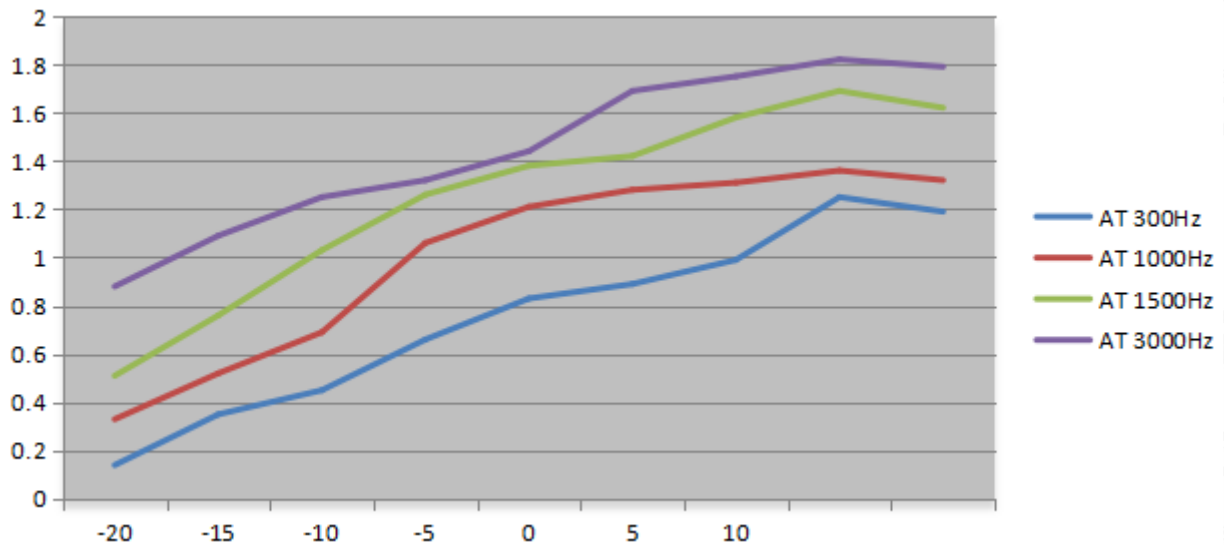
### 9.3 MEASUREMENT RESULT

TEST CHANNEL: 4

(A). MODULATION LIMIT:

**462.6375MHz @ 12.5 KHz Channel Separations-0.5W**

Modulation Level (dB)	Peak Freq. Deviation At 300 Hz	Peak Freq. Deviation At 1000 Hz	Peak Freq. Deviation At 1500 Hz	Peak Freq. Deviation At 3000 Hz
-20	0.14 KHz	0.33 KHz	0.51 KHz	0.88 KHz
-15	0.35 KHz	0.52 KHz	0.76 KHz	1.09 KHz
-10	0.45 KHz	0.69 KHz	1.03 KHz	1.25 KHz
-5	0.66 KHz	1.06 KHz	1.26 KHz	1.32 KHz
0	0.83 KHz	1.21 KHz	1.38 KHz	1.44 KHz
+5	0.89 KHz	1.28 KHz	1.42 KHz	1.69 KHz
+10	0.99 KHz	1.31 KHz	1.58 KHz	1.75 KHz
+15	1.25 KHz	1.36 KHz	1.69 KHz	1.82 KHz
+20	1.19 KHz	1.32 KHz	1.62 KHz	1.79 KHz



Note: All the modes had been tested, but only the worst data recorded in the report.

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**(B). AUDIO FREQUENCY RESPONSE:**

**462.6375MHz @ 12.5 KHz Channel Separations-0.5W**

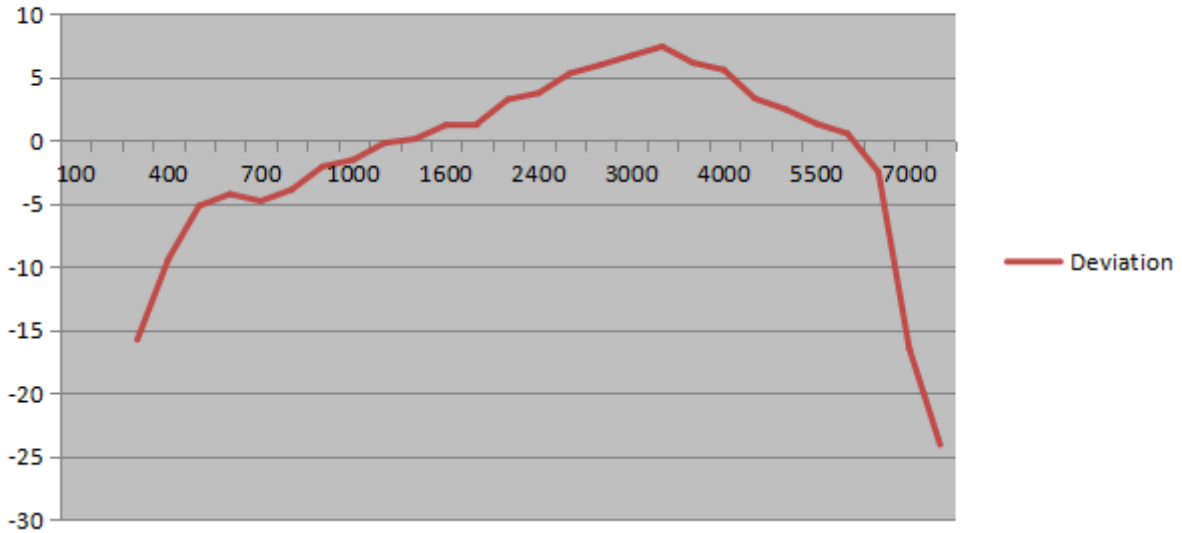
Frequency (Hz)	Deviation (KHz)	Audio Frequency Response(dB)
100	--	--
200	--	--
300	0.13	-15.78
400	0.27	-9.43
500	0.44	-5.19
600	0.49	-4.26
700	0.46	-4.81
800	0.51	-3.91
900	0.63	-2.07
1000	0.67	-1.54
1200	0.78	-0.22
1400	0.81	0.11
1600	0.92	1.21
1800	0.93	1.31
2000	1.16	3.23
2400	1.23	3.74
2500	1.47	5.28
2800	1.59	5.97
3000	1.73	6.70
3200	1.88	7.42
3600	1.62	6.13
4000	1.52	5.58
4500	1.17	3.30
5000	1.06	2.44
5500	0.93	1.31
6000	0.85	0.53
6500	0.60	-2.50
7000	0.12	-16.48
7500	0.05	-24.08
9000	--	--
10000	--	--
14000	--	--
18000	--	--
20000	--	--
30000	--	--

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Frequency Response Result

### 12.5 KHz Channel Separations



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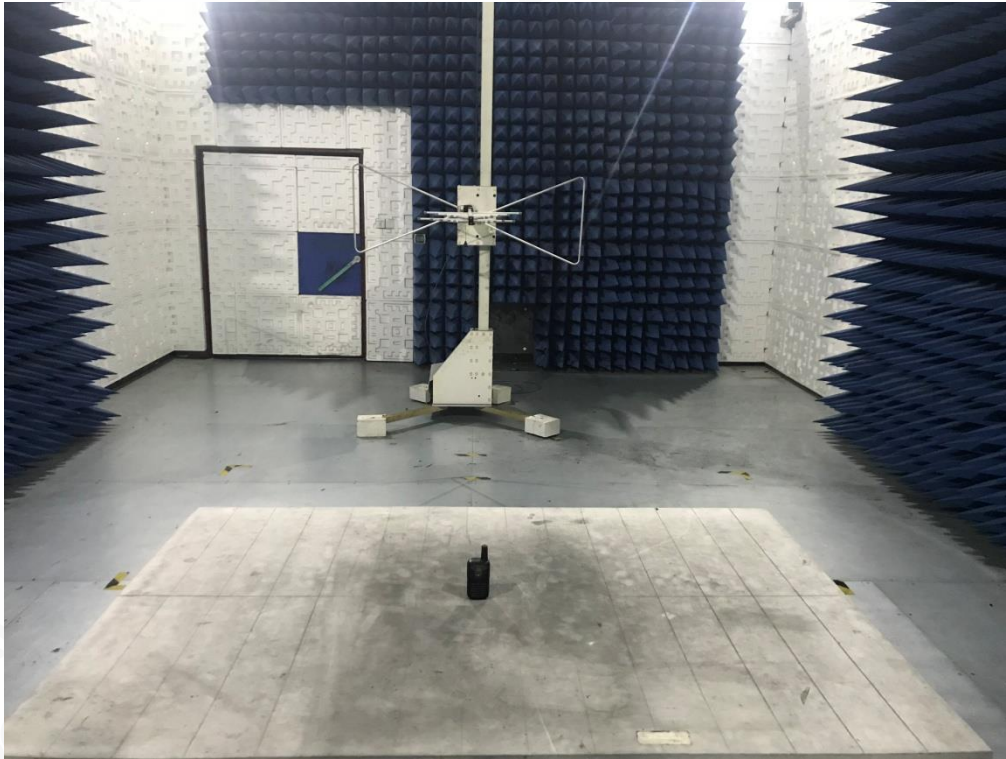
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### APPENDIX I: PHOTOGRAPHS OF SETUP RADIATED EMISSION TEST SETUP



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### APPENDIX II: EXTERNAL VIEW OF EUT WHOLE VIEW OF EUT



TOP VIEW OF EUT



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BOTTOM VIEW OF EUT



FRONT VIEW OF EUT



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BACK VIEW OF EUT



LEFT VIEW OF EUT



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RIGHT VIEW OF EUT



OPEN VIEW-1 OF EUT



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OPEN VIEW-2 OF EUT



OPEN VIEW-3 OF EUT



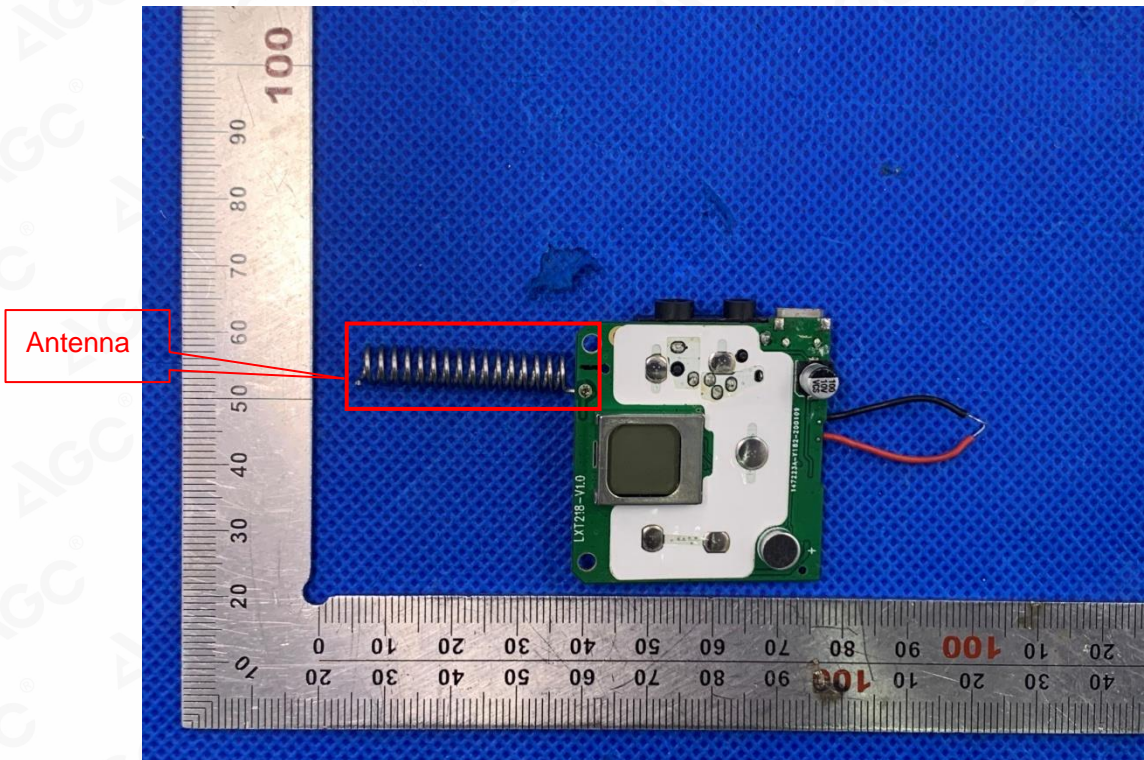
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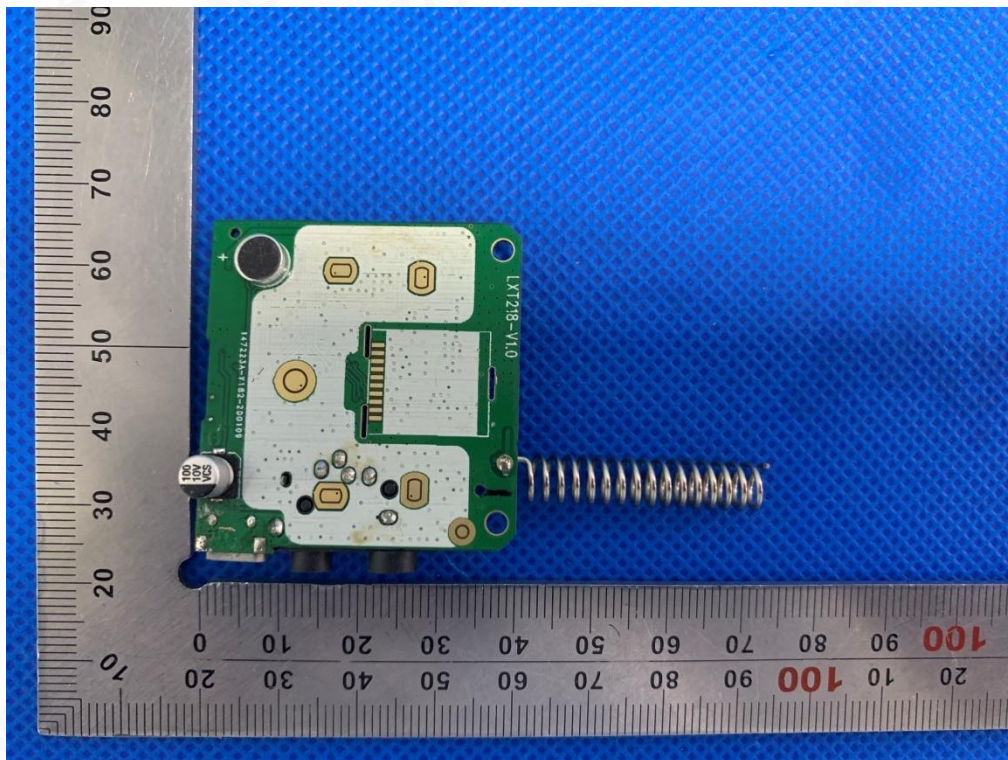




INTERNAL VIEW-1 OF EUT



INTERNAL VIEW-2 OF EUT



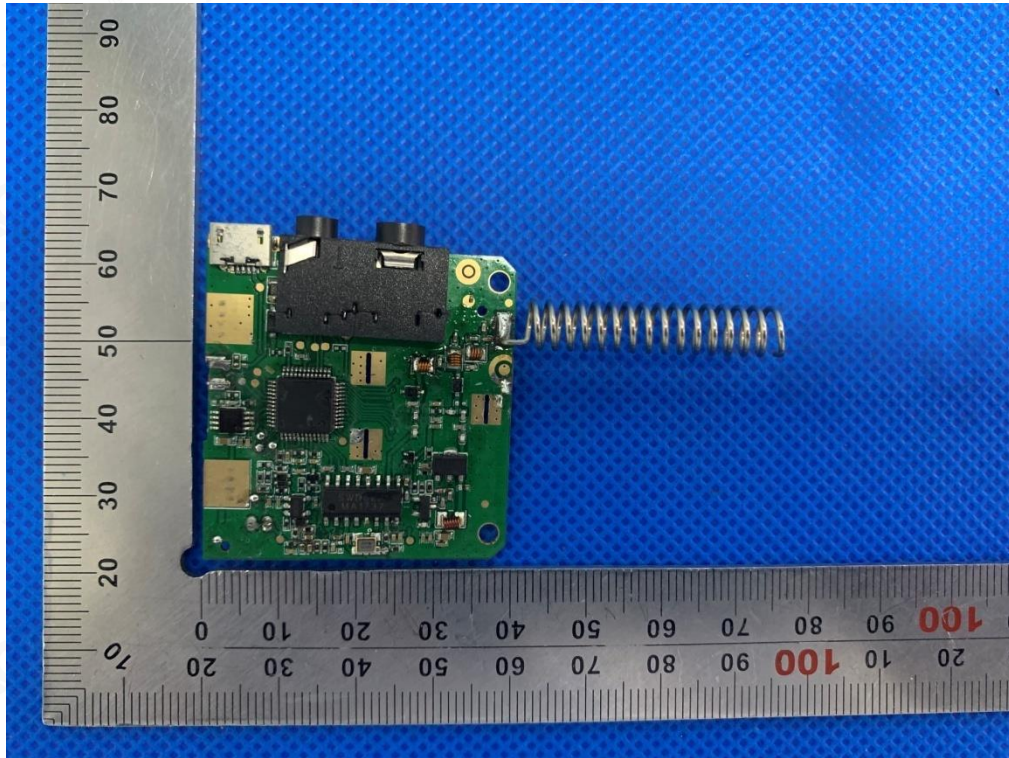
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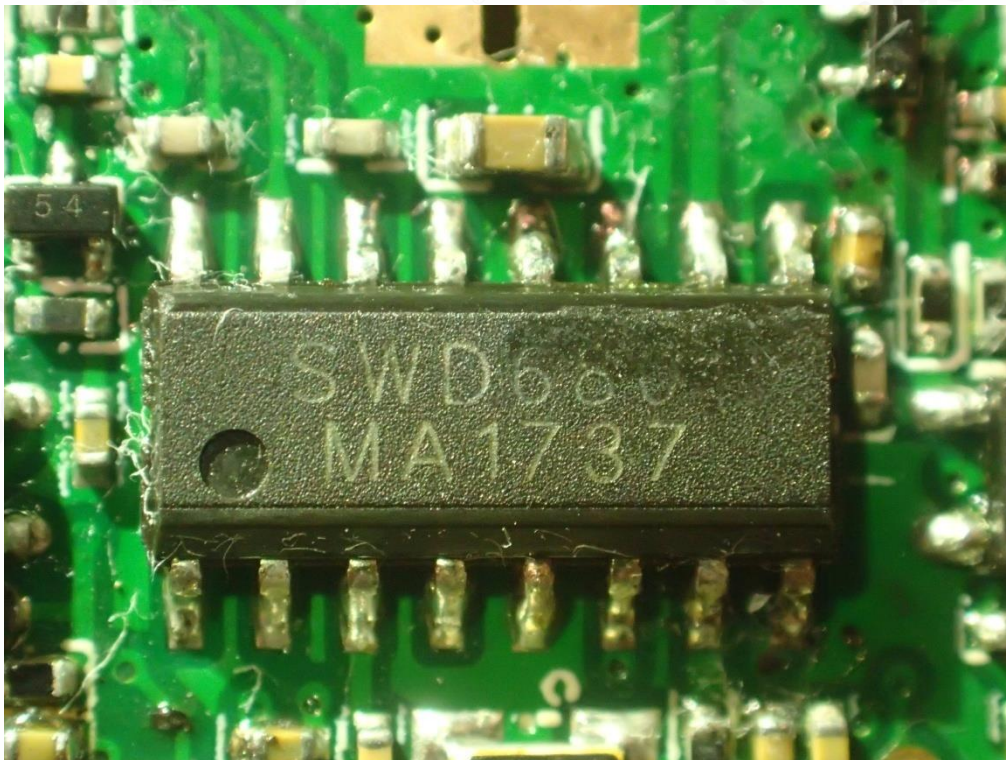




INTERNAL VIEW-3 OF EUT



INTERNAL VIEW-4 OF EUT



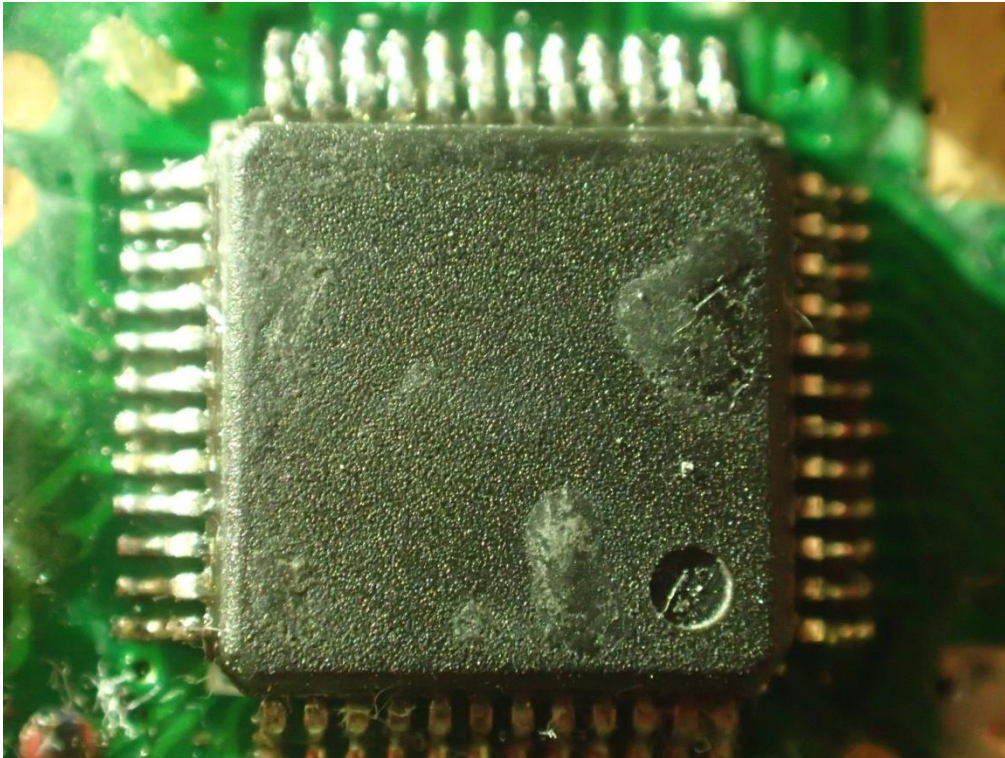
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INTERNAL VIEW-5 OF EUT



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