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## 10. MAXIMUM TRANSMITTER POWER

### 10.1 PROVISIONS APPLICABLE

FCC Part 95.967, FCC Part 2.1046(a)

Each CBRS transmitter type must be designed such that the transmitter power can not exceed the following limits:

- (a) When transmitting amplitude modulated (AM) voice signals or frequency modulated (FM) voice signals, the mean carrier power must not exceed 4 Watts
- (b) When transmitting single sideband (SSB) voice signals, the peak envelope power must not exceed 12 Watts.

### 10.2 MEASUREMENT METHOD

Conducted RF Output Power:

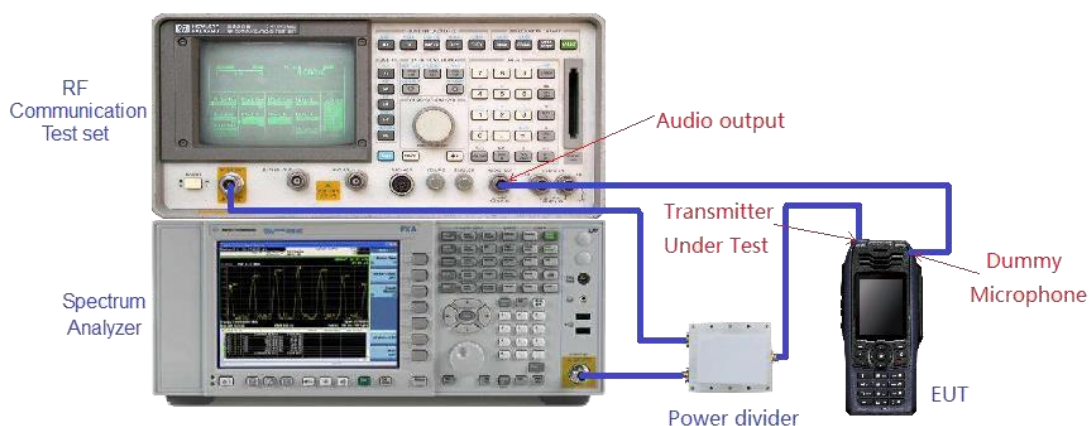
1. The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.
2. The DUT was connected to a Spectrum Analyzer (SA) via a 30dB attenuator connected to the DUT's antenna port. The SA was configured as above using the Automatic 6dB Cursor Bandwidth measurement. The output power of the DUT was set to the manufacturer's highest output power setting at the Low, Mid and High frequency channels as permitted by the device. The DUT was set to transmit at its maximum Duty Cycle.

3. Spectrum set as follow:

Centre frequency = fundamental frequency, Span=50kHz , RBW=300Hz, VBW=3KHz ;

Sweep = auto, Detector function = peak, Trace = max hold

### 10.3 MEASUREMENT SETUP



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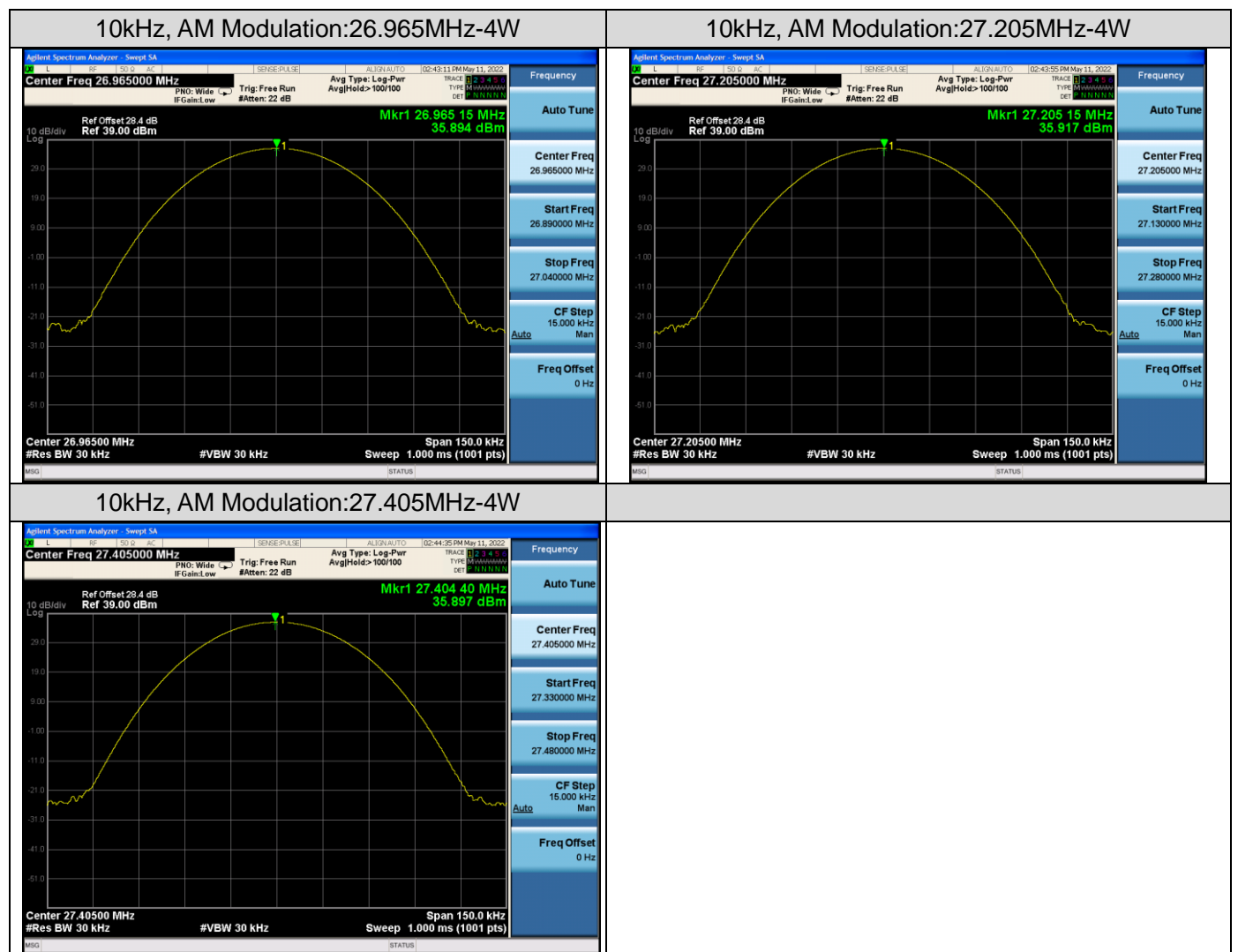
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## 10.4 MEASUREMENT RESULTS

Conducted Power Measurement Results			
Mode	Channel Separation	Test Channel	Measurement Result (dBm)
CBRS TX	10 kHz	26.965 MHz	35.89
		27.205 MHz	<b>35.92</b>
		27.405 MHz	35.90

Test plot as follows:



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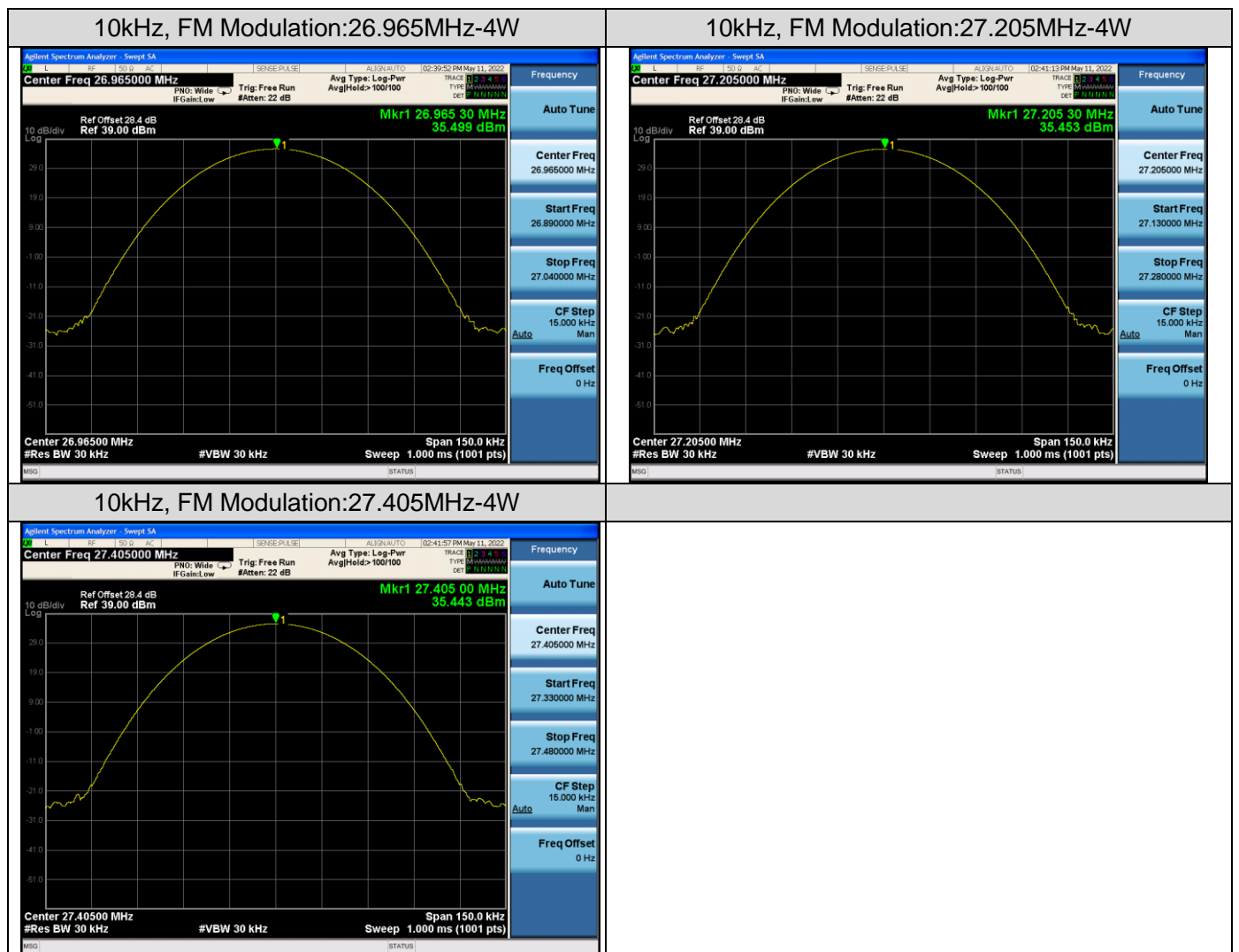
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### Conducted Power Measurement Results

Mode	Channel Separation	Test Channel	Measurement Result (dBm)
CBRS TX	10 kHz	26.965 MHz	35.50
		27.205 MHz	35.45
		27.405 MHz	35.44

Test plot as follows:



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## 11. MODULATION CHARACTERISTICS

### 11.1 PROVISIONS APPLICABLE

FCC Part 95.975, FCC Part 2.1047(b)

Each CBRS transmitter type must be designed such that the modulation characteristics are in compliance with the rules in this section.

- a) When emission type A3E is transmitted with voice modulation, the modulation percentage must be at least 85%, but not more than 100%.
- b) When emission type A3E is transmitted by a CBRS transmitter having a transmitter output power of more than 2.5 W, the transmitter must contain a circuit that automatically prevents the modulation percentage from exceeding 100%.
- c) When emission type F3E is transmitted the peak frequency deviation shall not exceed  $\pm 2$  kHz.

### 11.2 MEASUREMENT METHOD\_(AM)

#### (A) Audio frequency response

Connect the equipment as illustrated.

Adjust to deliver 50% modulation at the audio frequency that produces the maximum modulation level

Record the modulation input level (mV) and use this level as 0dB for plotting modulation limiting.

Vary the modulating frequency from 100Hz to 10000Hz and record the input levels necessary to maintain a constant 50% modulation.

Graph the audio level in dB relative to the 0dB reference level as a function of the modulating frequency.

Record audio frequency where it is impossible to perform the measurement.

#### (B) Modulation limiting

Connect the equipment as illustrated.

Adjust to deliver 50% modulation at the audio frequency that produces the maximum modulation level

Record the modulation input level (mV) and use this level as 0dB for plotting modulation limiting.

Increment the audio signal level to 40dB above the reference level. Record the modulation level (%).

Repeat the measurements using a 400Hz and a 2500Hz sinusoidal audio signal, record the modulation level (%), perform for both positive and negative modulation.

### 11.3 MEASUREMENT METHOD\_(FM)

#### (C) Modulation limiting

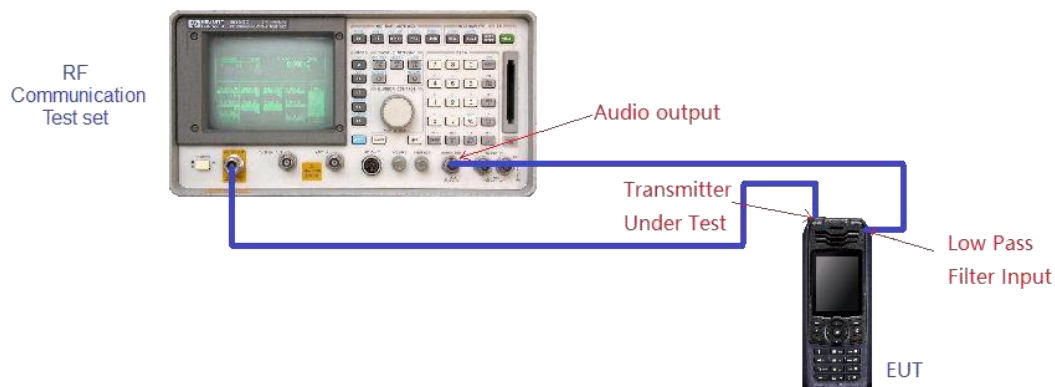
- (1). Configure the EUT as shown in figure 1, adjust the audio input for 60% of rated system deviation at 1kHz using this level as a reference (0dB) and vary the input level from -20 to +20dB. Record the frequency deviation obtained as a function of the input level.

- (2). Repeat step 1 with input frequency changing to 300, 1000, 1500 and 3000Hz in sequence.

#### (D) Audio frequency response

- (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 =  $20\log_{10} (\text{Deviation of test frequency}/\text{Deviation of 1 kHz reference})$ .

## 11.4 MEASUREMENT SETUP



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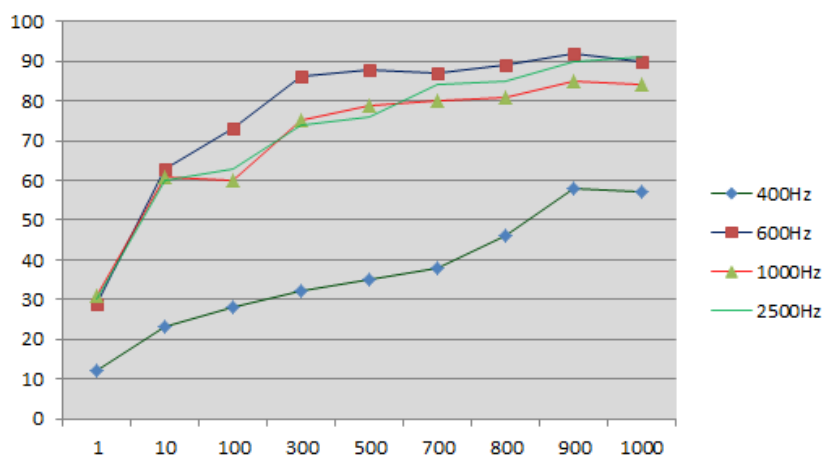
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## 11.5 MEASUREMENT RESULTS

### (A). MODULATION LIMIT:

10kHz, AM modulation, Assigned Frequency:27.405MHz-4W				
Modulation Level (mV)	Peak Freq. Deviation At 300 Hz (%)	Peak Freq. Deviation At 600 Hz (%)	Peak Freq. Deviation At 1000 Hz (%)	Peak Freq. Deviation At 2500 Hz (%)
1	12	29	31	30
10	23	63	61	60
100	28	73	60	63
300	32	86	75	74
500	35	88	79	76
700	38	87	80	84
800	46	89	81	85
900	58	92	85	90
1000	57	90	84	91



#### Note:

1. All the modes had been tested, but only the worst data recorded in the report
2. The equipment circuit comes with circuit control that automatically prevents the modulation limit from exceeding 100%.

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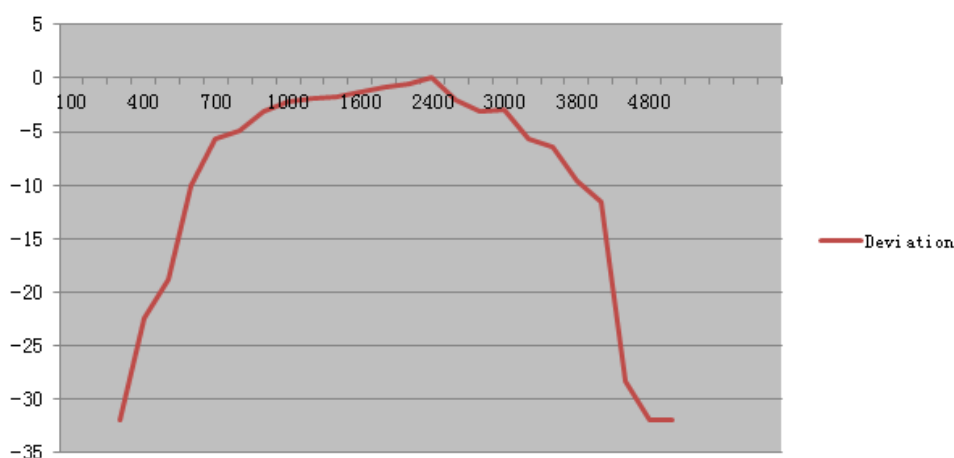
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# (B). AUDIO FREQUENCY RESPONSE:

10kHz, AM modulation, Assigned Frequency:27.405MHz-4W			
Frequency (Hz)	modulation level (mV)	Deviation (kHz)	Audio Frequency Response(dB)
100		--	--
200		--	--
300	20.50	0.02	-31.93
400	13.68	0.06	-22.39
500	11.50	0.09	-18.87
600	8.75	0.25	-9.99
700	7.25	0.41	-5.70
800	7.15	0.45	-4.89
900	6.85	0.55	-3.15
1000	6.45	0.61	-2.25
1200	6.15	0.63	-1.97
1400	6.05	0.65	-1.69
1600	5.95	0.68	-1.30
1800	5.65	0.72	-0.81
2000	5.55	0.74	-0.57
2400	5.35	0.79	0.00
2500	5.75	0.62	-2.10
2800	5.95	0.55	-3.15
3000	6.35	0.56	-2.99
3200	6.95	0.41	-5.70
3600	7.05	0.38	-6.36
3800	8.25	0.26	-9.65
4000	9.45	0.21	-11.51
4200	10.55	0.03	-28.41
4800	13.55	0.02	-31.93
5200	18.65	0.02	-31.93
6000	--	--	--

Audio Frequency Response@50%MI  
10 KHz Channel Separations



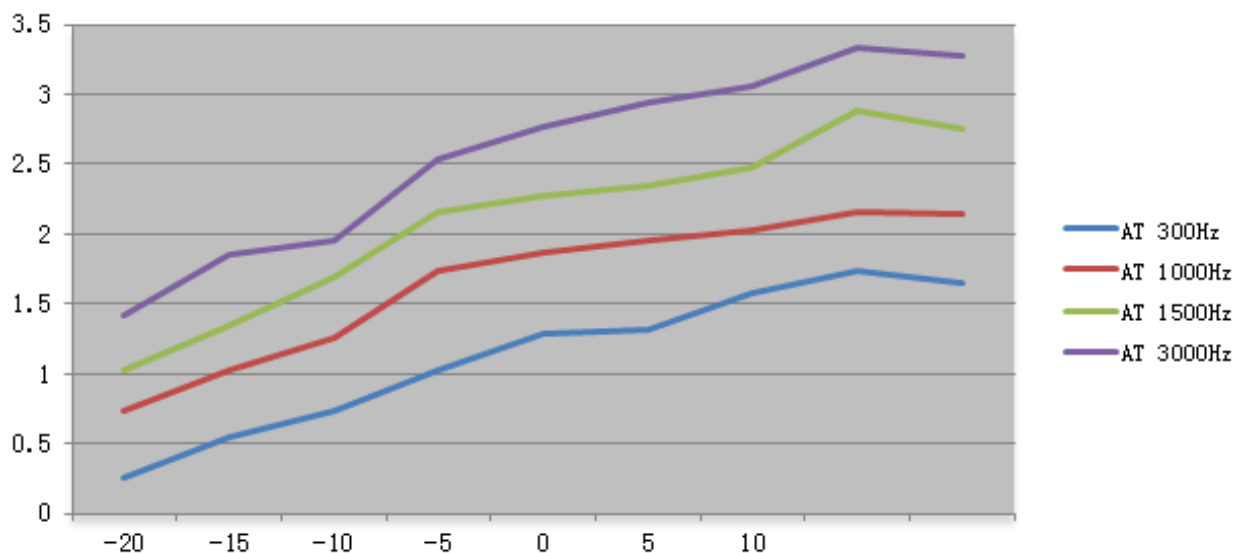
Note:1.All the modes had been tested, but only the worst data recorded in the report.  
2. 50% MI Could not be achieved above 5200 Hz.

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### (C). MODULATION LIMIT:

10kHz, FM modulation, Assigned Frequency:27.405MHz-4W				
Modulation Level (dB)	Peak Freq. Deviation At 300 Hz (kHz)	Peak Freq. Deviation At 1000 Hz (kHz)	Peak Freq. Deviation At 1500 Hz (kHz)	Peak Freq. Deviation At 3000 Hz (kHz)
-20	0.26	0.74	1.03	1.42
-15	0.55	1.03	1.35	1.85
-10	0.74	1.25	1.69	1.96
-5	1.03	1.74	2.15	2.54
0	1.28	1.86	2.28	2.77
+5	1.31	1.95	2.34	2.94
+10	1.58	2.03	2.47	3.06
+15	1.74	2.15	2.89	3.33
+20	1.65	2.14	2.75	3.28



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

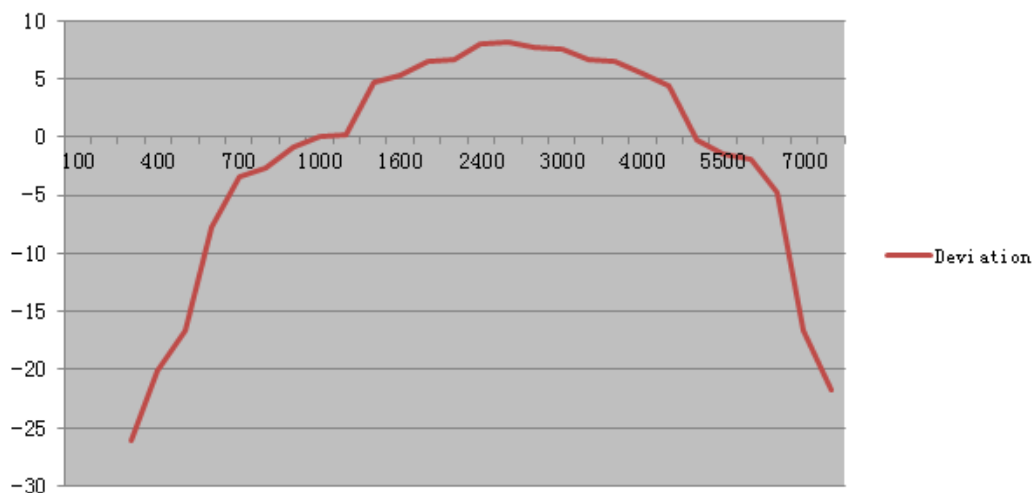
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#### (D). AUDIO FREQUENCY RESPONSE:

10kHz, Analog modulation, Assigned Frequency:27.405MHz-4W		
Frequency (Hz)	Deviation (kHz)	Audio Frequency Response(dB)
100	--	--
200	--	--
300	0.03	-26.16
400	0.06	-20.14
500	0.09	-16.62
600	0.25	-7.75
700	0.41	-3.45
800	0.45	-2.64
900	0.55	-0.90
1000	0.61	0.00
1200	0.62	0.14
1400	1.05	4.72
1600	1.12	5.28
1800	1.28	6.44
2000	1.31	6.64
2400	1.53	7.99
2500	1.56	8.16
2800	1.47	7.64
3000	1.45	7.52
3200	1.32	6.70
3600	1.28	6.44
4000	1.14	5.43
4500	1.02	4.47
5000	0.59	-0.29
5500	0.52	-1.39
6000	0.49	-1.90
6500	0.35	-4.83
7000	0.09	-16.62
7500	0.05	-21.73

#### 10KHz Channel Separations



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

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## **APPENDIX I: PHOTOGRAPHS OF TEST SETUP**

Refer to the Report No.: AGC01284220402AP01

## **APPENDIX II: PHOTOGRAPHS OF TEST EUT**

Refer to the Report No.: AGC01284220402AP02

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

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8. The Company is not responsible for recalling the electronic version of the original report when any revision is made to them. The Client assumes the responsibility to providing the revised version to any interested party who uses them.
9. Subject to the variable length of retention time for test data and report stored hereinto as otherwise specifically required by individual accreditation authorities, the Company will only keep the supporting test data and information of the test report for a period of six years. The data and information will be disposed of after the aforementioned retention period has elapsed. Under no circumstances shall we provide any data and information which has been disposed of after retention period. Under no circumstances shall we be liable for damage of any kind, including (but not limited to) compensatory damages, lost profits, lost data, or any form of special, incidental, indirect, consequential or punitive damages of any kind, whether based on breach of contract of warranty, tort (including negligence), product liability or otherwise, even if we are informed in advance of the possibility of such damages.

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