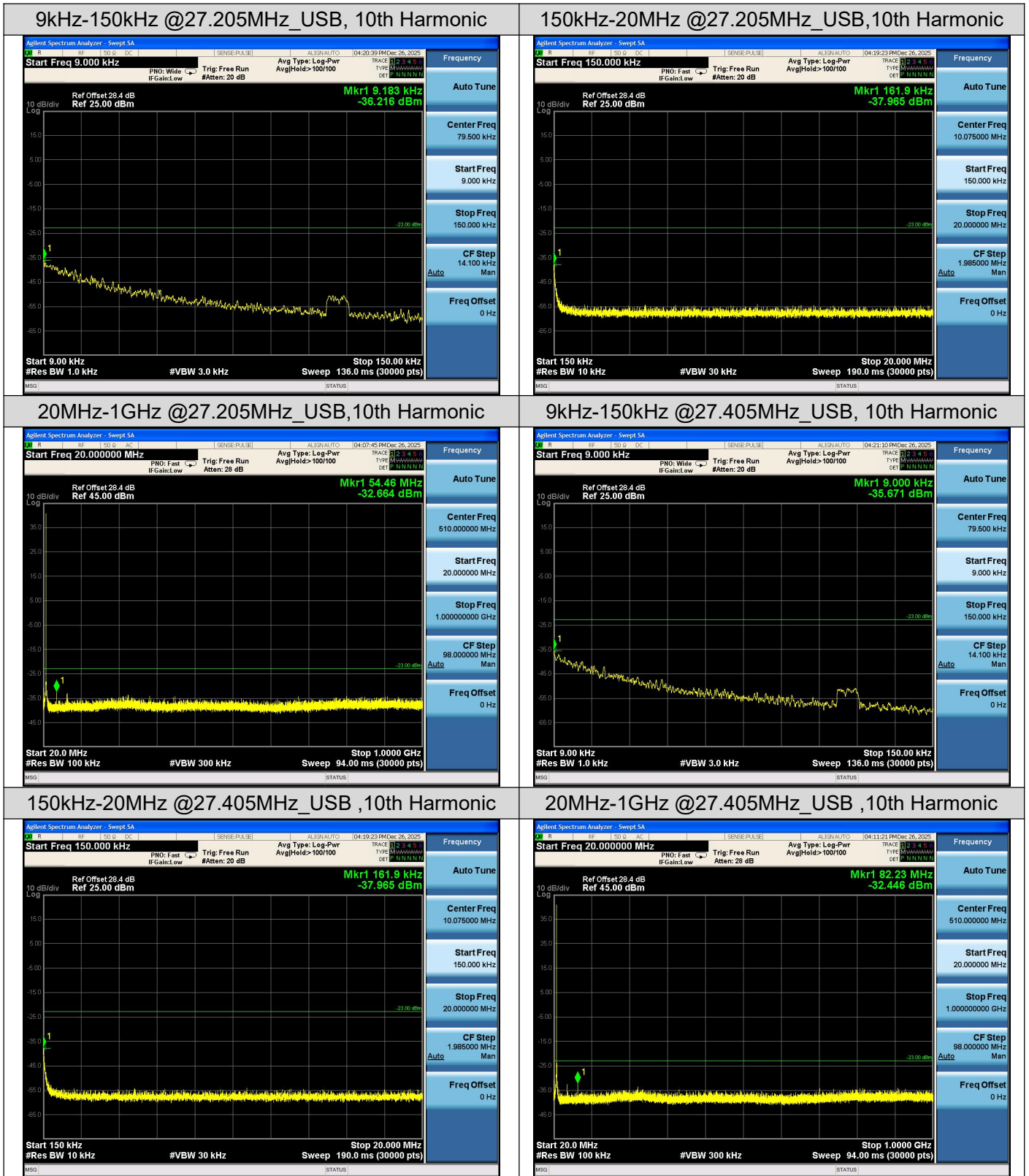




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11. Modulation Characteristics

11.1 Provisions Applicable

According to FCC§2.1047 and §95.975 the following requirements are required:

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 ± 2 kHz.

11.2 Measurement Procedure

A. Modulation Limiting for AM modulation

1. Connect the equipment as illustrated.
2. Adjust to deliver 50% modulation at the audio frequency that produces the maximum modulation level
3. Record the modulation input level (mV) and use this level as 0dB for plotting modulation limiting.
4. Increment the audio signal level to 40dB above the reference level. Record the modulation level (%).
5. Repeat the measurements using a 400Hz and a 2500Hz sinusoidal audio signal, record the modulation level (%), perform for both positive and negative modulation.

B. Audio Frequency Response for AM modulation

1. Connect the equipment as illustrated.
2. Adjust to deliver 50% modulation at the audio frequency that produces the maximum modulation level
3. Record the modulation input level (mV) and use this level as 0dB for plotting modulation limiting.
4. Vary the modulating frequency from 100Hz to 10000Hz and record the input levels necessary to maintain a constant 50% modulation.
5. 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.

C. Modulation Limiting for FM modulation

1. Test layout and build equipment as shown below.
2. adjust the audio input for 60% of rated system deviation at 1kHz using this level as a reference (0dB).
3. Vary the input level from -20 to +20dB.
4. Record the frequency deviation obtained as a function of the input level.
5. Repeat step 2 with input frequency changing to 300, 1000, 1500 and 3000Hz in sequence.

D. Audio Frequency Response for FM modulation

1. Test layout and build equipment as shown below.
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 = $20\log_{10} (\text{Deviation of test frequency}/\text{Deviation of 1 kHz reference})$.

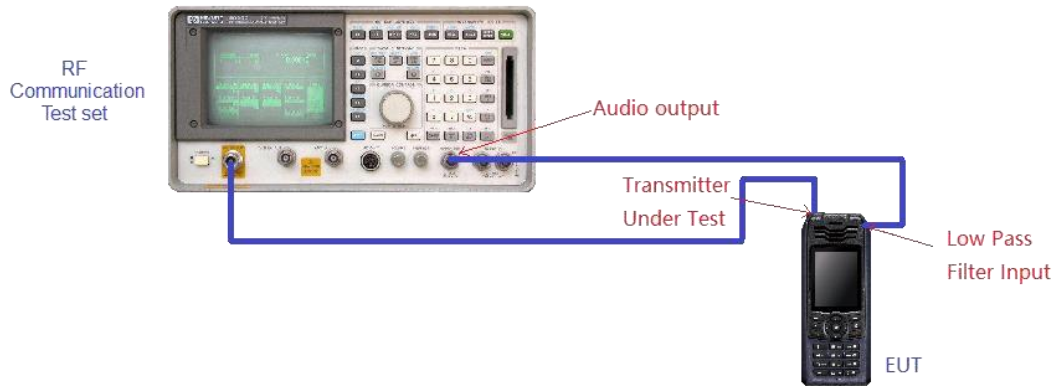
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11.3 Measurement Setup

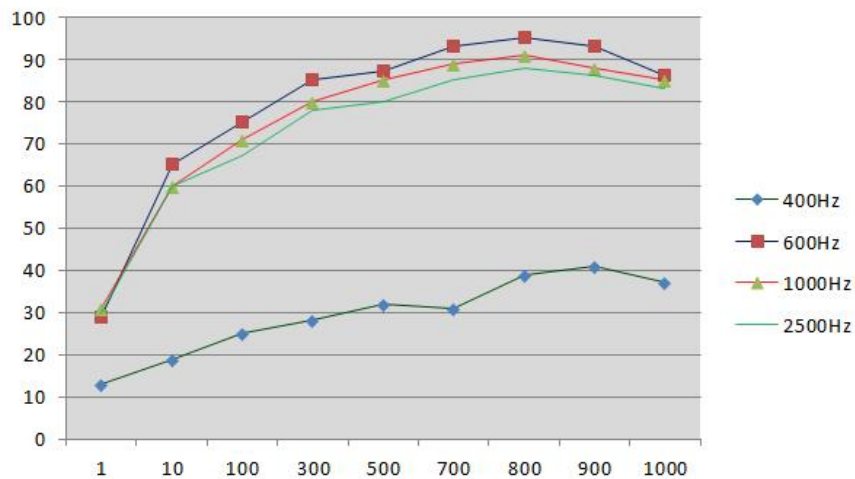


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11.4 Measurement Result

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	13	29	31	30
10	19	65	60	60
100	25	75	71	67
300	28	85	80	78
500	32	87	85	80
700	31	93	89	85
800	39	95	91	88
900	41	93	88	86
1000	37	86	85	83



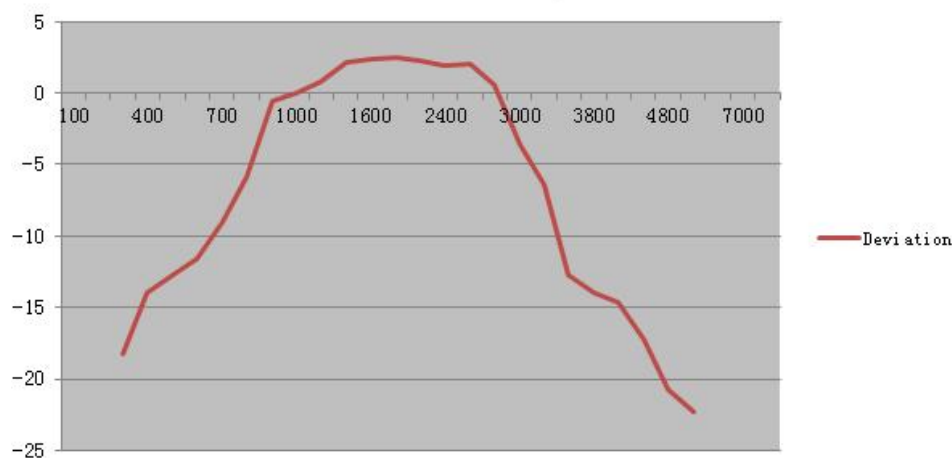
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B. Audio Frequency Response:

10kHz, AM modulation, Assigned Frequency:27.405MHz-4W			
Frequency (Hz)	modulation level (mV)	Deviation (kHz)	Audio Frequency Response(dB)
100		--	--
200		--	--
300	19.22	0.17	-13.67
400	14.16	0.28	-9.33
500	13.16	0.39	-6.45
600	9.79	0.45	-5.21
700	8.52	0.56	-3.31
800	8.51	0.57	-3.16
900	6.69	0.78	-0.43
1000	6.36	0.82	0.00
1200	6.77	0.89	0.71
1400	6.63	0.82	0.00
1600	6.05	0.81	-0.11
1800	5.11	0.82	0.00
2000	5.05	0.79	-0.32
2400	5.59	0.75	-0.78
2500	5.74	0.69	-1.50
2800	5.63	0.55	-3.47
3000	6.52	0.46	-5.02
3200	7.69	0.44	-5.41
3600	8.42	0.39	-6.45
3800	9.31	0.38	-6.68
4000	10.15	0.36	-7.15
4200	10.23	0.24	-10.67
4800	13.85	0.21	-11.83
5200	18.63	0.16	-14.19
6000	--	--	--

Audio Frequency Response@50%MI

10KHz Channel Separations

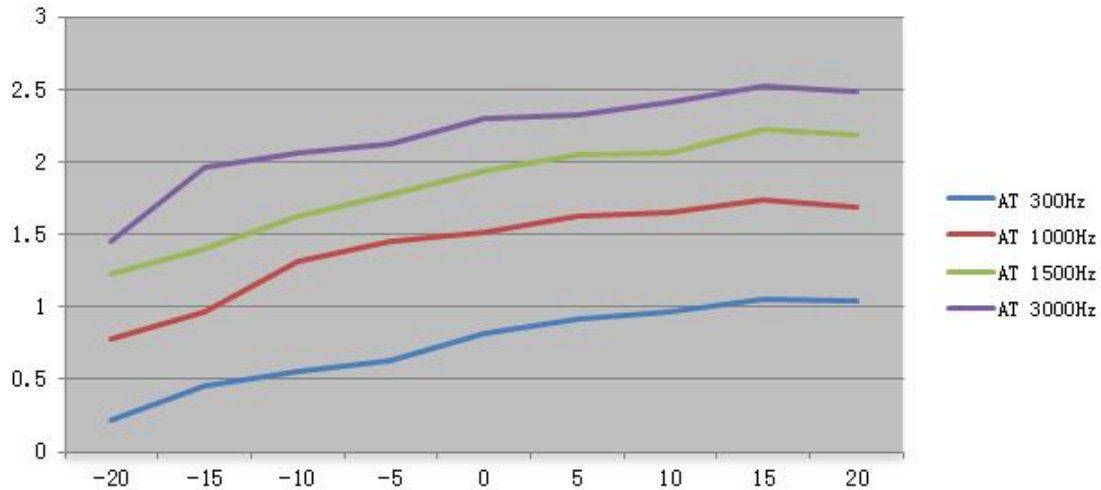


Note: All the modes had been tested, but only the worst data recorded in the report.

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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	0.22	0.78	1.22	1.45
-15	0.45	0.96	1.4	1.96
-10	0.56	1.31	1.63	2.06
-5	0.63	1.45	1.78	2.12
0	0.82	1.51	1.93	2.3
+5	0.91	1.63	2.05	2.32
+10	0.96	1.65	2.06	2.41
+15	1.05	1.74	2.22	2.52
+20	1.04	1.69	2.19	2.48

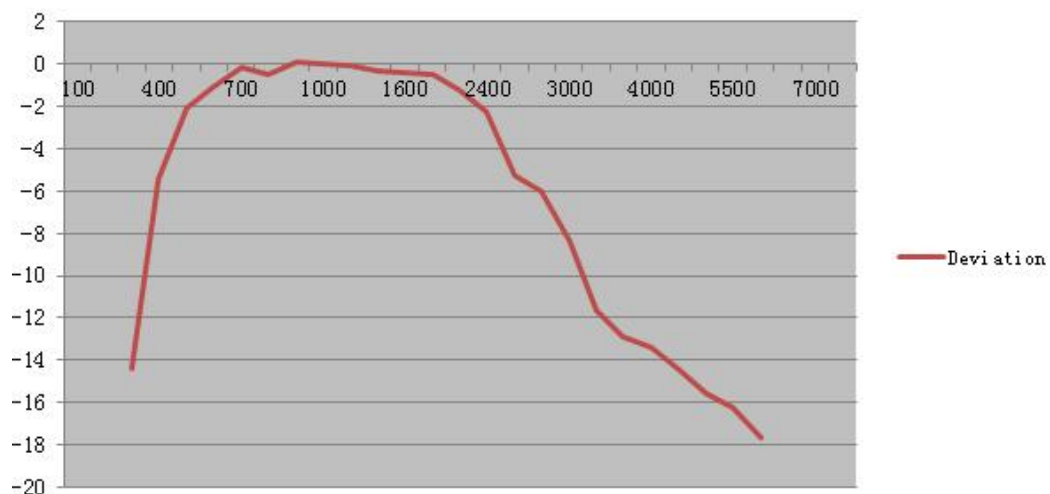


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D. Audio Frequency Response:

10kHz, LSB modulation, Assigned Frequency:27.405MHz-12W			
Frequency (Hz)	modulation level (mV)	Deviation (kHz)	Audio Frequency Response(dB)
100		--	--
200		--	--
300	20.10	0.16	-14.40
400	13.36	0.45	-5.42
500	12.42	0.66	-2.09
600	9.56	0.74	-1.10
700	8.00	0.82	-0.21
800	8.12	0.79	-0.53
900	6.46	0.85	0.10
1000	6.31	0.84	0.00
1200	6.59	0.83	-0.10
1400	6.21	0.81	-0.32
1600	5.25	0.8	-0.42
1800	5.39	0.79	-0.53
2000	5.10	0.73	-1.22
2400	5.19	0.65	-2.23
2500	5.37	0.46	-5.23
2800	5.20	0.42	-6.02
3000	6.41	0.32	-8.38
3200	7.25	0.22	-11.64
3600	8.96	0.19	-12.91
3800	9.41	0.18	-13.38
4000	10.00	0.16	-14.40
4200	10.01	0.14	-15.56
4800	13.96	0.13	-16.21
5200	18.22	0.11	-17.66
6000	--	--	--

Audio Frequency Response@50%MI
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.: AGC01284251102AP01

Appendix II: Photographs of Test EUT

Refer to the Report No.: AGC01284251102AP02

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

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