

TEST DATA

Model Number : BS HH16 UHF

Sample Number : No.1

Date: 1 December 2004

**1. Carrier Output Power Rating**

Test Voltage [Vdc]	Carrier Frequency[MHz]	Output Power / Hi	Output Power / Low	Unit
6.375	430.125	3.8	0.98	[W]
7.5	450.125	4.07	1.05	[W]
8.625	469.975	4.10	1.12	[W]

**2. Variation of Carrier Output Power vs. Voltage**

Nominal Voltage	7.5 [Vdc]			
Lower Voltage	6.375 [Vdc] , 85% of Nominal			
Higher voltage	8.625 [Vdc] , 115% of Nominal			
Test Voltage [Vdc]	Carrier Frequency[MHz]	Output Power / Hi	Output Power / Low	Unit
6.375	430.125	3.88	0.97	[W]
6.375	450.125	3.86	1.05	[W]
6.375	469.975	3.78	1.07	[W]

Test Voltage [Vdc]	Carrier Frequency[MHz]	Output Power / Hi	Output Power / Low	Unit
8.625	430.125	4.02	0.97	[W]
8.625	450.125	4.12	1.06	[W]
8.625	469.975	4.20	1.04	[W]

**3. Variation of Carrier Output Power vs. Temperature**

Test Voltage : 7.5 [Vdc] High Power				
Test Temperature [Deg C]	Carrier Frequency[MHz] 430.125	Carrier Frequency[MHz] 450.125	Carrier Frequency[MHz] 469.975	Unit
-30	4.03	4.01	3.78	[W]
-20	4.02	4.03	3.77	[W]
-10	3.98	4.05	3.80	[W]
0	3.89	4.02	3.82	[W]
10	3.99	3.99	3.85	[W]
20	4.03	3.89	3.98	[W]
30	4.05	3.88	3.87	[W]
40	4.07	3.87	3.99	[W]
50	4.01	3.99	3.87	[W]
60	3.97	4.03	3.78	[W]
Test Voltage : 7.5 [Vdc] Low Power				
Test Temperature [Deg C]	Carrier Frequency[MHz] 430.125	Carrier Frequency[MHz] 450.125	Carrier Frequency[MHz] 469.975	Unit
-30	0.90	0.96	0.98	[W]
-20	0.91	0.90	0.97	[W]
-10	0.93	0.92	0.99	[W]
0	0.94	0.93	0.99	[W]
10	0.94	0.94	0.99	[W]
20	0.92	0.93	0.98	[W]
30	0.99	0.91	0.97	[W]
40	0.95	0.89	0.95	[W]
50	0.90	0.85	0.92	[W]
60	0.98	0.84	0.92	[W]

**4. Variation of Carrier Output Power vs. Time**

Test Time [Sec]	Carrier Frequency[MHz] 430.125	Carrier Frequency[MHz] 450.125	Carrier Frequency[MHz] 469.975	Unit
Start	4.03	4.03	4.07	[W]
10	4.03	4.02	4.05	[W]
20	4.04	4.02	4.02	[W]
30	4.04	4.01	4.00	[W]
40	4.00	4.00	3.98	[W]
50	3.99	3.99	3.97	[W]
60	3.98	3.98	3.95	[W]
90	3.97	3.97	3.94	[W]
120	3.96	3.96	3.93	[W]
150	3.95	3.96	3.90	[W]
180	3.94	3.95	3.89	[W]
210	3.93	3.94	3.88	[W]
240	3.92	3.92	3.87	[W]
270	3.91	3.91	3.85	[W]
300	3.86	3.90	3.84	[W]

**5. Voltage and Current Drain of Final RF Stage**

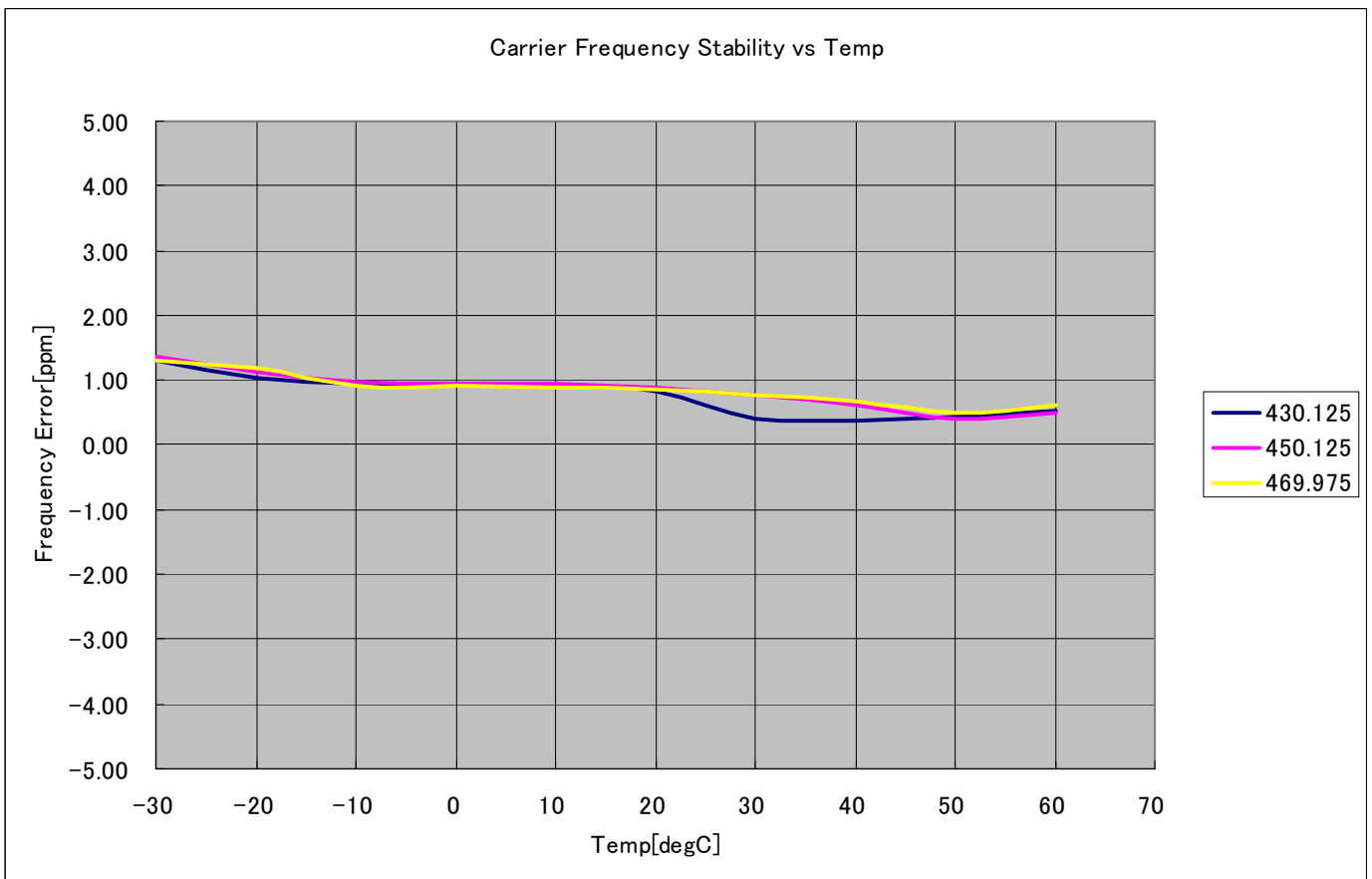
Test Items	Carrier Frequency[MHz] 430.125	Carrier Frequency[MHz] 450.125	Carrier Frequency[MHz] 469.975	Unit
Final Volatge	7.2	7.2	7.2	[Vdc]
Final Current Drain	1.72	1.70	1.74	[A]
RF Output Power (ANT port)	3.98	4.12	4.03	[W]
Efficiency	32.13	33.66	32.16	[%]

**6. Carrier frequency Stability vs. Voltage**

Test Voltage[Vdc]	Carrier Frequency[MHz] 430.125	Carrier Frequency[MHz] 450.125	Carrier Frequency[MHz] 469.975	Unit
6.375	0.22	0.21	0.22	[ppm]
7.5	0.21	0.20	0.20	[ppm]
8.625	0.20	0.20	0.21	[ppm]

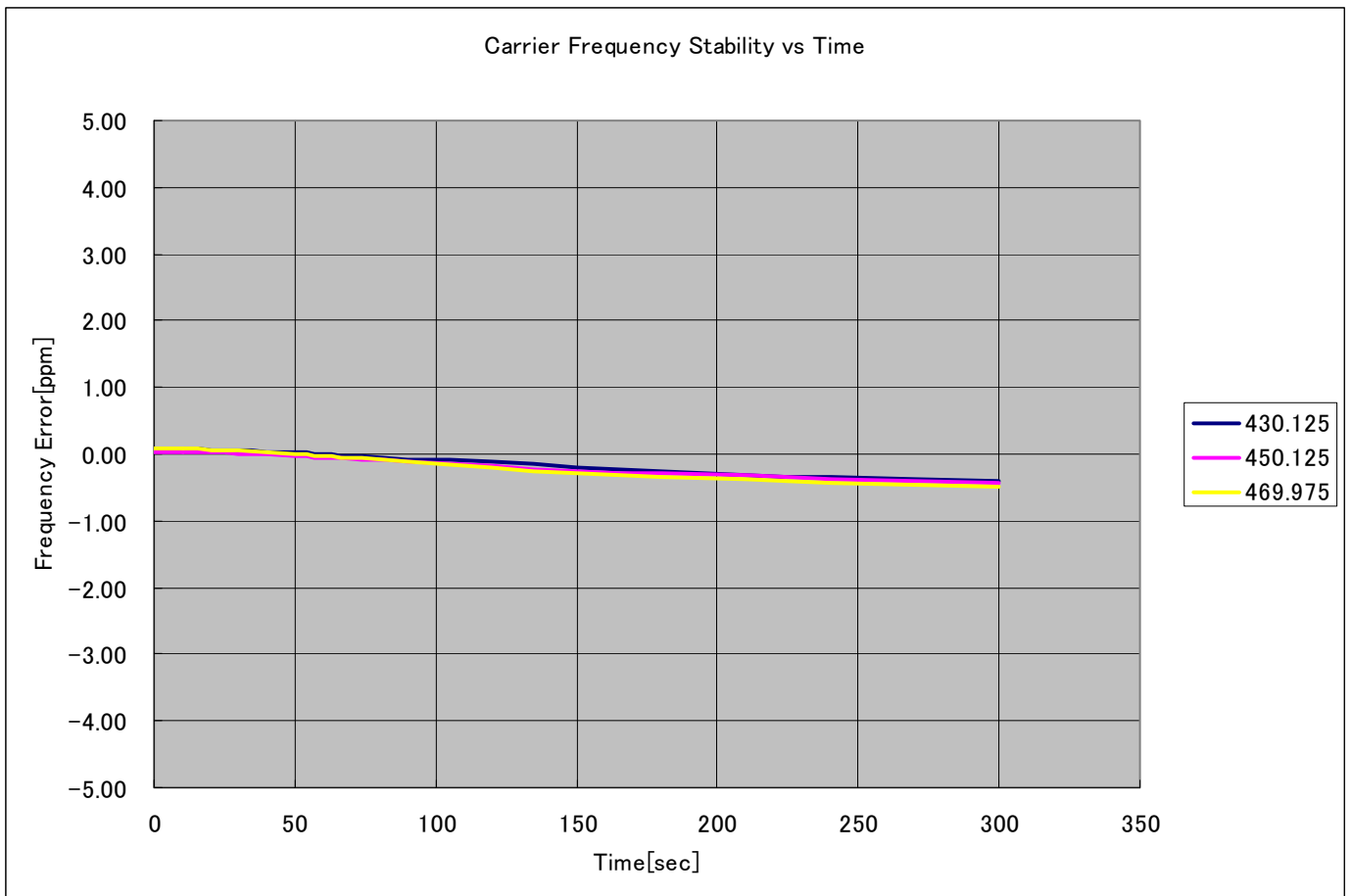
**7. Carrier frequency Stability vs. Temperature**

Test Temperature [Deg C]	Carrier Frequency[MHz] 430.125	Carrier Frequency[MHz] 450.125	Carrier Frequency[MHz] 469.975	Unit
-30	1.32	1.36	1.30	[ppm]
-20	1.03	1.12	1.18	[ppm]
-10	0.95	0.98	0.92	[ppm]
0	0.95	0.96	0.90	[ppm]
10	0.91	0.95	0.88	[ppm]
20	0.82	0.88	0.86	[ppm]
30	0.42	0.78	0.78	[ppm]
40	0.37	0.61	0.67	[ppm]
50	0.43	0.42	0.51	[ppm]
60	0.52	0.50	0.62	[ppm]



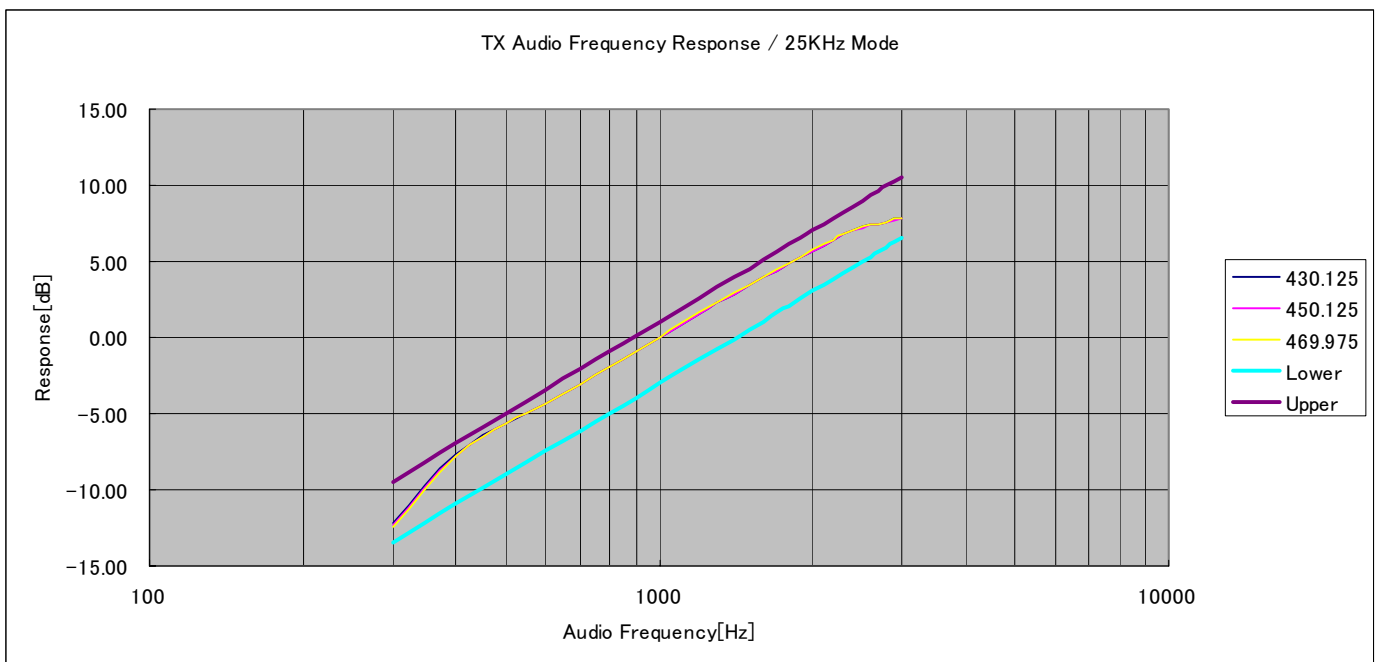
**8. Carrier frequency Stability vs. Time**

Test Temperature [Deg C]	Carrier Frequency[MHz] 430.125	Carrier Frequency[MHz] 450.125	Carrier Frequency[MHz] 469.975	Unit
0	0.08	0.02	0.08	[ppm]
10	0.08	0.02	0.08	[ppm]
20	0.07	0.02	0.07	[ppm]
30	0.05	0.01	0.06	[ppm]
40	0.04	-0.01	0.03	[ppm]
50	0.02	-0.03	0.00	[ppm]
60	0.00	-0.05	-0.04	[ppm]
90	-0.08	-0.11	-0.12	[ppm]
120	-0.12	-0.17	-0.21	[ppm]
150	-0.21	-0.25	-0.28	[ppm]
180	-0.26	-0.29	-0.34	[ppm]
210	-0.31	-0.33	-0.38	[ppm]
240	-0.34	-0.38	-0.42	[ppm]
270	-0.38	-0.40	-0.45	[ppm]
300	-0.41	-0.42	-0.48	[ppm]



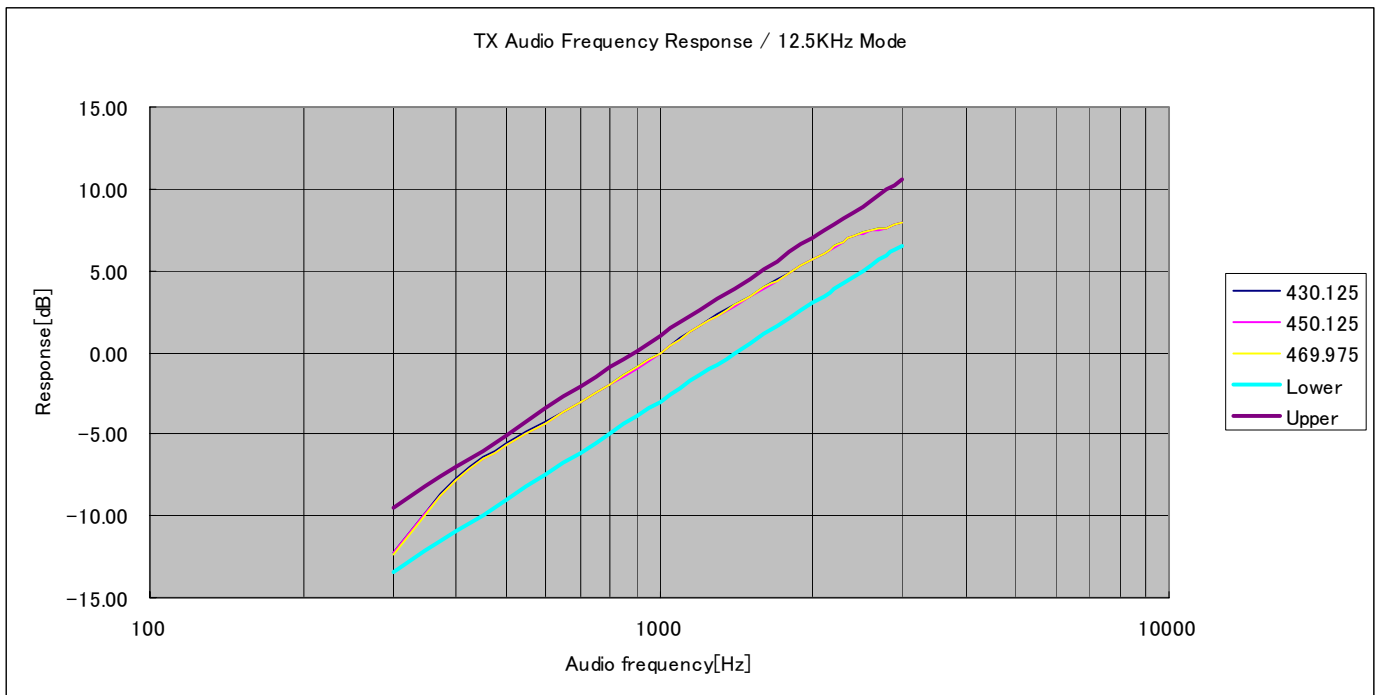
**9. TX Audio Frequency Response / 25KHz Band**

Audio Frequency[Hz]	Carrier Frequency[MHz] 430.125	Carrier Frequency[MHz] 450.125	Carrier Frequency[MHz] 469.975	Unit
300	-12.20	-12.37	-12.40	[dB]
400	-7.75	-7.78	-7.83	[dB]
500	-5.63	-5.65	-5.66	[dB]
600	-4.30	-4.32	-4.31	[dB]
700	-3.09	-3.12	-3.08	[dB]
800	-1.97	-1.98	-1.96	[dB]
900	-0.94	-0.94	-0.93	[dB]
1000	0.00	0.00	0.00	[dB]
1100	0.82	0.82	0.85	[dB]
1200	1.60	1.57	1.62	[dB]
1300	2.27	2.28	2.30	[dB]
1400	2.88	2.88	2.89	[dB]
1500	3.43	3.44	3.47	[dB]
1600	3.95	3.95	3.98	[dB]
1700	4.41	4.42	4.45	[dB]
1800	4.86	4.85	4.88	[dB]
1900	5.27	5.27	5.31	[dB]
2000	5.67	5.67	5.71	[dB]
2100	6.06	6.06	6.09	[dB]
2200	6.42	6.42	6.46	[dB]
2300	6.76	6.75	6.79	[dB]
2400	7.05	7.04	7.08	[dB]
2500	7.26	7.24	7.29	[dB]
2600	7.40	7.39	7.43	[dB]
2700	7.47	7.46	7.50	[dB]
2800	7.56	7.54	7.58	[dB]
2900	7.76	7.75	7.79	[dB]
3000	7.84	7.83	7.87	[dB]



**10. TX Audio Frequency Response / 12.5KHz Band**

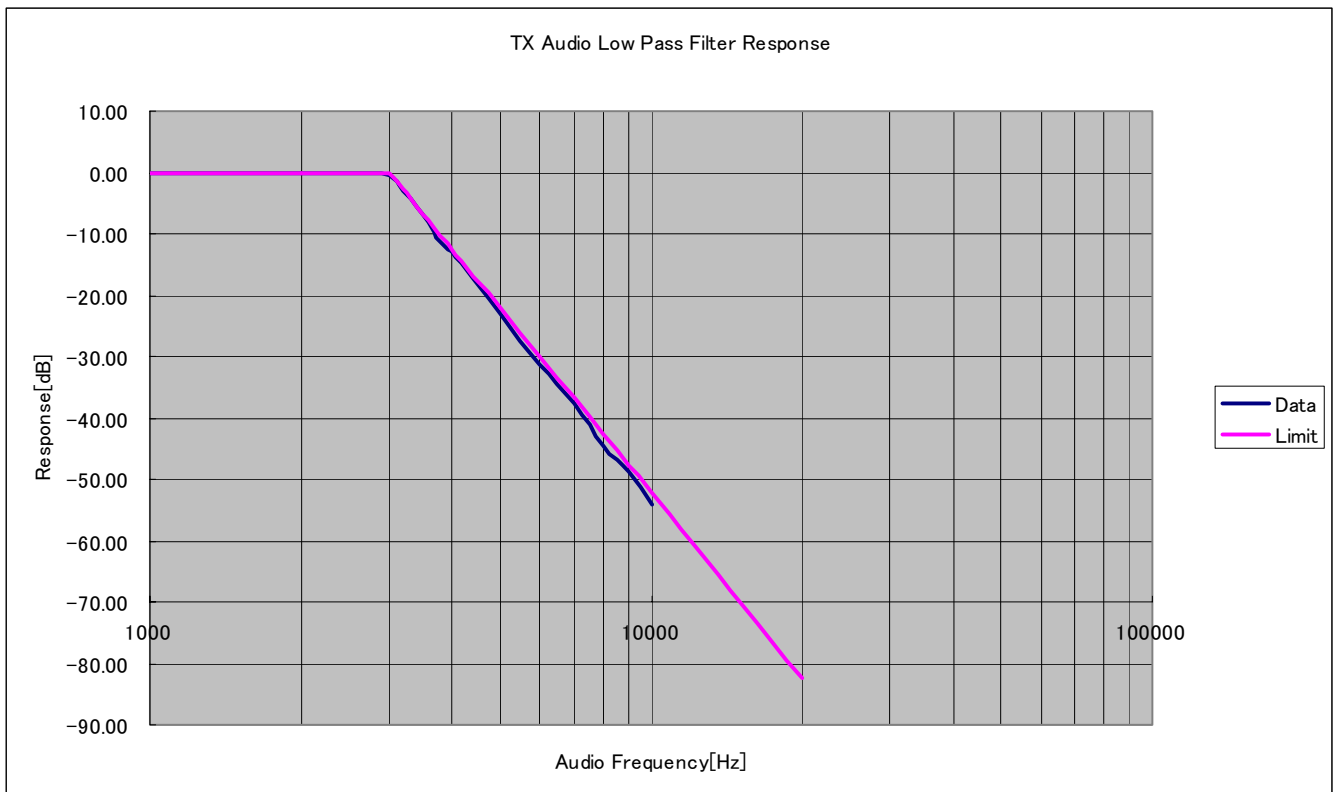
Audio Frequency[Hz]	Carrier Frequency[MHz] 430.125	Carrier Frequency[MHz] 450.125	Carrier Frequency[MHz] 469.975	Unit
300	-12.20	-12.30	-12.34	[dB]
400	-7.72	-7.80	-7.83	[dB]
500	-5.60	-5.66	-5.68	[dB]
600	-4.27	-4.32	-4.31	[dB]
700	-3.06	-3.09	-3.10	[dB]
800	-1.95	-1.98	-1.98	[dB]
900	-0.91	-0.96	-0.93	[dB]
1000	0.00	0.00	0.00	[dB]
1100	0.85	0.82	0.82	[dB]
1200	1.60	1.57	1.59	[dB]
1300	2.28	2.25	2.25	[dB]
1400	2.89	2.86	2.87	[dB]
1500	3.44	3.46	3.44	[dB]
1600	3.96	3.94	3.95	[dB]
1700	4.43	4.41	4.42	[dB]
1800	4.88	4.86	4.88	[dB]
1900	5.30	5.28	5.29	[dB]
2000	5.70	5.68	5.70	[dB]
2100	6.09	6.07	6.09	[dB]
2200	6.46	6.44	6.46	[dB]
2300	6.81	6.78	6.80	[dB]
2400	7.09	7.07	7.09	[dB]
2500	7.32	7.29	7.32	[dB]
2600	7.46	7.45	7.46	[dB]
2700	7.54	7.52	7.53	[dB]
2800	7.62	7.61	7.62	[dB]
2900	7.83	7.82	7.83	[dB]
3000	7.93	7.91	7.92	[dB]





**11. TX Audio Low Pass-Filter Response**

Audio Frequency[Hz]		Unit
1000	0.00	[dB]
2000	0.00	[dB]
2500	0.00	[dB]
2600	0.00	[dB]
2700	0.00	[dB]
2800	0.00	[dB]
2900	-0.23	[dB]
3000	-0.50	[dB]
3100	-1.50	[dB]
3200	-2.90	[dB]
3300	-4.15	[dB]
3400	-5.65	[dB]
3500	-6.78	[dB]
3600	-8.23	[dB]
3700	-9.67	[dB]
3800	-11.14	[dB]
3900	-12.32	[dB]
4000	-12.98	[dB]
5000	-23.05	[dB]
6000	-31.24	[dB]
7000	-37.74	[dB]
8000	-44.56	[dB]
9000	-48.67	[dB]
10000	-54.11	[dB]
15000	Below a measurement limit	[dB]
20000	Below a measurement limit	[dB]
25000	Below a measurement limit	[dB]
30000	Below a measurement limit	[dB]



12. Modulation Limiting / 25KHz Band

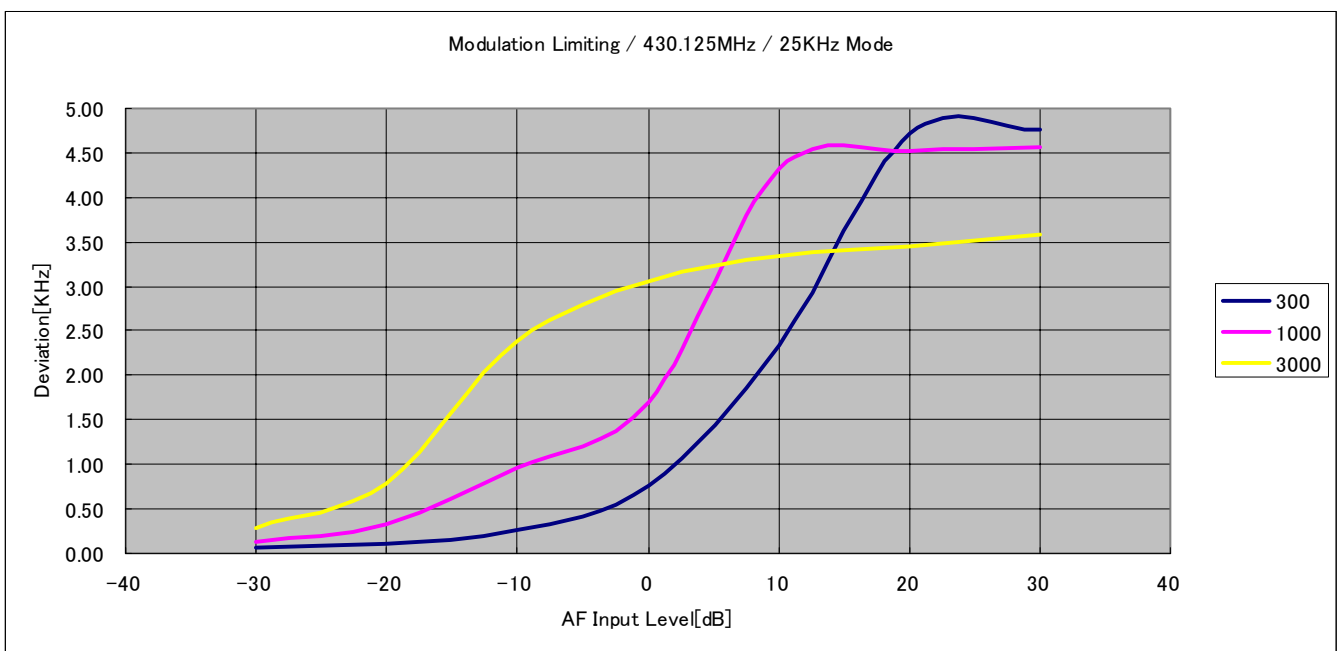
Test Frequency		430.125[MHz]			0[dB]=-39.3dBm / 8.40mV
TX Audio Input Level[dB]	Audio Frequency [Hz]	Audio Frequency [Hz]	Audio Frequency [Hz]	Unit	
	300	1000	3000		
-30	0.06	0.13	0.28	[KHz]	
-20	0.11	0.33	0.78	[KHz]	
-10	0.26	0.97	2.38	[KHz]	
0	0.77	1.70	3.05	[KHz]	
10	2.33	4.33	3.34	[KHz]	
20	4.71	4.52	3.45	[KHz]	
30	4.83	4.57	3.57	[KHz]	

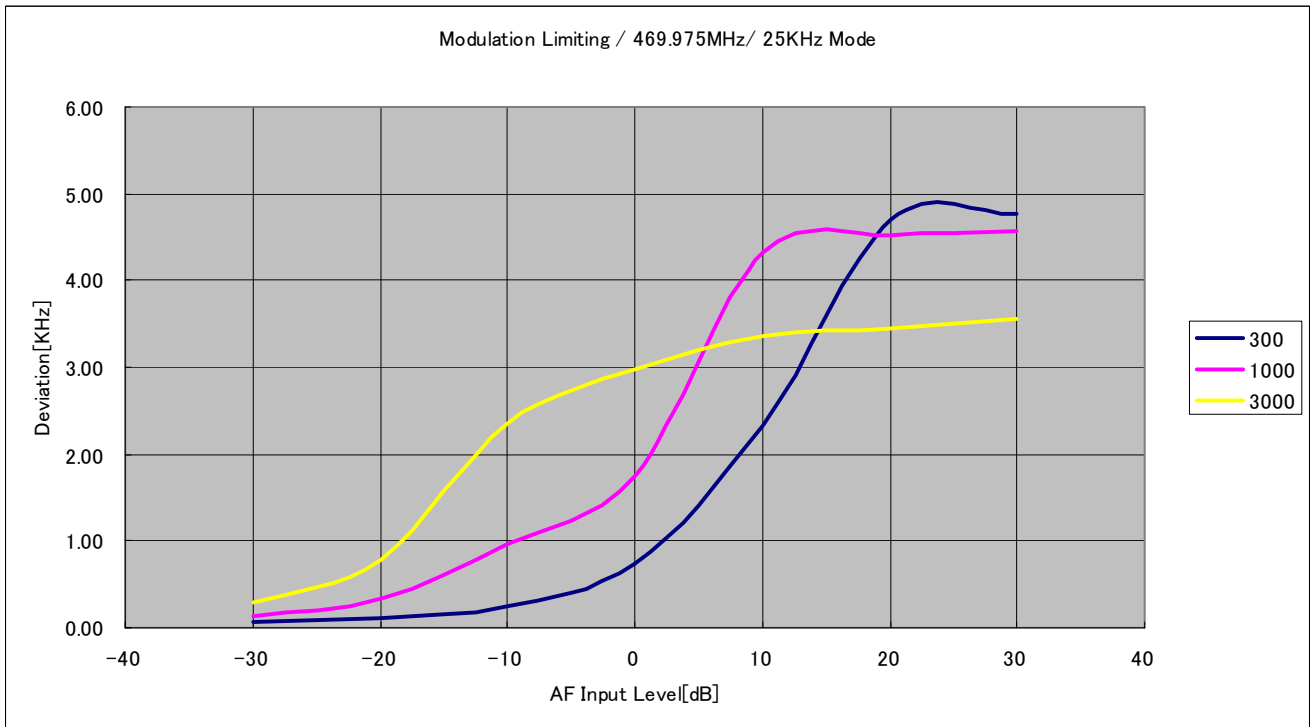
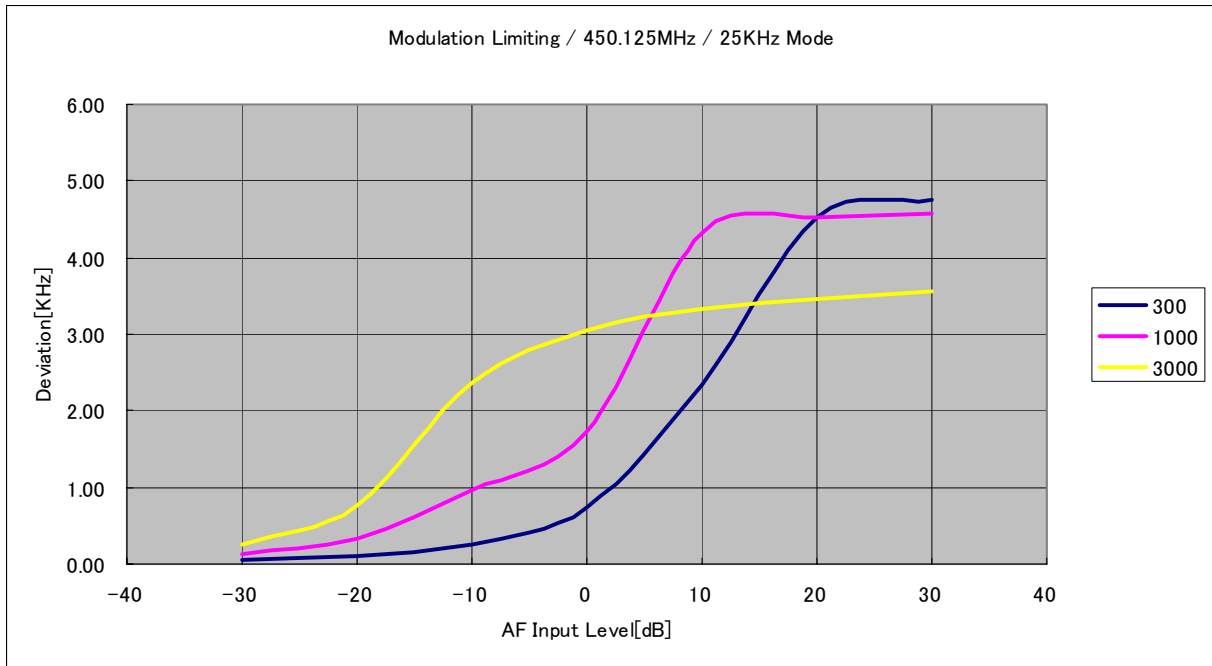
  

Test Frequency		450.125[MHz]			0[dB]=-39.8dBm / 7.93mV
TX Audio Input Level[dB]	Audio Frequency [Hz]	Audio Frequency [Hz]	Audio Frequency [Hz]	Unit	
	300	1000	3000		
-30	0.06	0.13	0.26	[KHz]	
-20	0.10	0.32	0.76	[KHz]	
-10	0.26	0.97	2.37	[KHz]	
0	0.74	1.72	3.01	[KHz]	
10	2.31	4.52	3.34	[KHz]	
20	4.57	4.53	3.45	[KHz]	
30	4.68	4.63	3.57	[KHz]	

Test Frequency		469.975[MHz]			0[dB]=-40.5dBm / 7.31mV
TX Audio Input Level[dB]	Audio Frequency [Hz]	Audio Frequency [Hz]	Audio Frequency [Hz]	Unit	
	300	1000	3000		
-30	0.06	0.13	0.28	[KHz]	
-20	0.11	0.34	0.78	[KHz]	
-10	0.25	0.96	2.35	[KHz]	
0	0.82	3.02	2.87	[KHz]	
10	1.72	4.35	3.04	[KHz]	
20	4.68	4.54	3.46	[KHz]	
30	4.71	4.58	3.62	[KHz]	





13. Modulation Limiting / 12.5KHz Band

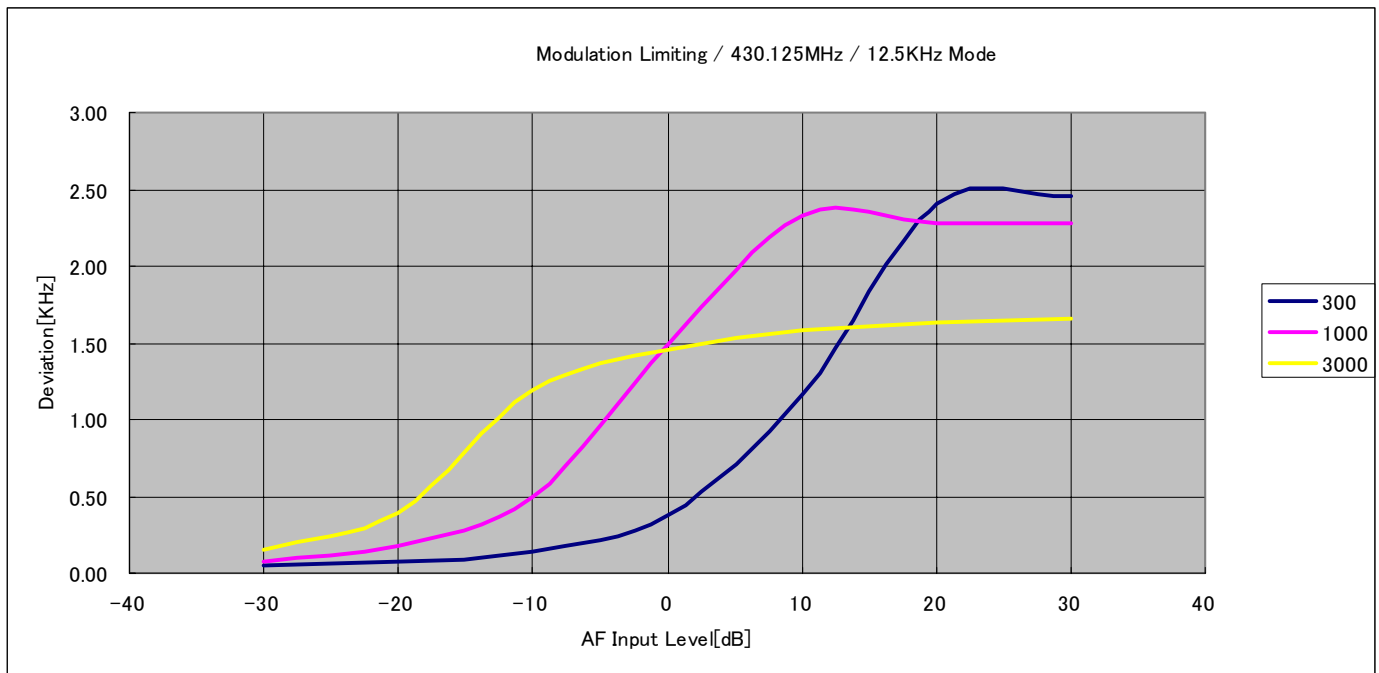
Test Frequency		430.125[MHz]			0[dB]=-39.6dBm / 8.11mV
TX Audio Input Level[dB]	Audio Frequency [Hz]	Audio Frequency [Hz]	Audio Frequency [Hz]	Unit	
	300	1000	3000		
-30	0.05	0.08	0.15	[KHz]	
-20	0.07	0.18	0.39	[KHz]	
-10	0.14	0.49	1.19	[KHz]	
0	0.38	1.49	1.39	[KHz]	
10	1.16	2.33	1.58	[KHz]	
20	2.40	2.28	1.66	[KHz]	
30	2.45	2.28	1.67	[KHz]	

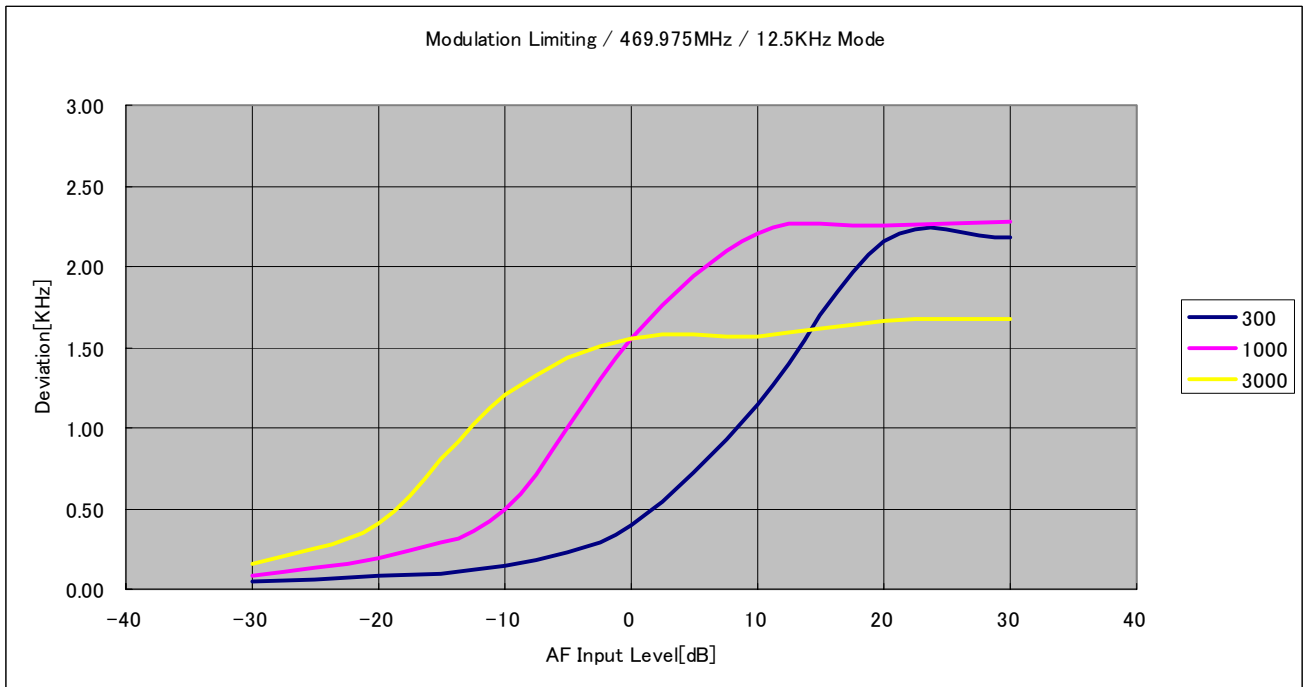
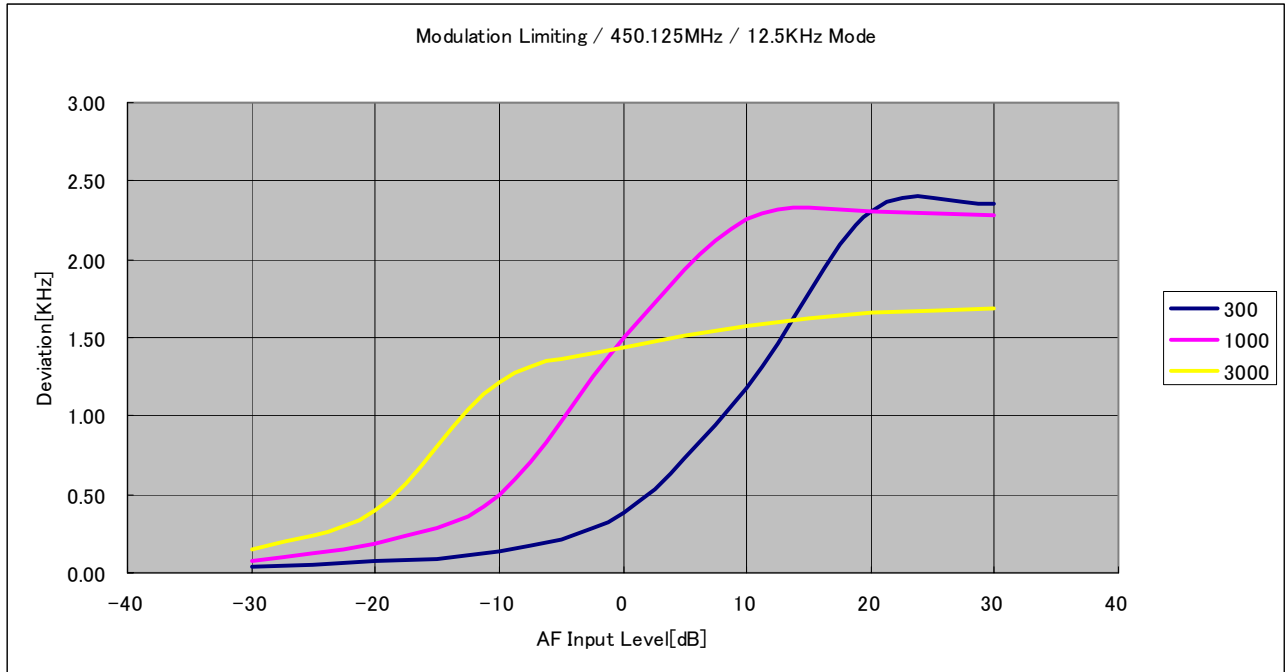
  

Test Frequency		450.125[MHz]			0[dB]=-39.8dBm / 7.93mV
TX Audio Input Level[dB]	Audio Frequency [Hz]	Audio Frequency [Hz]	Audio Frequency [Hz]	Unit	
	300	1000	3000		
-30	0.04	0.08	0.15	[KHz]	
-20	0.07	0.18	0.40	[KHz]	
-10	0.14	0.50	1.21	[KHz]	
0	0.39	1.50	1.46	[KHz]	
10	1.18	2.26	1.53	[KHz]	
20	2.31	2.30	1.65	[KHz]	
30	2.36	2.28	1.67	[KHz]	

Test Frequency		469.975[MHz]			0[dB]=-40.5dBm / 7.31mV
TX Audio Input Level[dB]	Audio Frequency [Hz]	Audio Frequency [Hz]	Audio Frequency [Hz]	Unit	
	300	1000	3000		
-30	0.05	0.09	0.16	[KHz]	
-20	0.08	0.19	0.41	[KHz]	
-10	0.15	0.50	1.20	[KHz]	
0	0.40	1.55	1.46	[KHz]	
10	1.15	2.20	1.54	[KHz]	
20	2.16	2.25	1.64	[KHz]	
30	2.18	2.28	1.68	[KHz]	





**14. TX Conducted Spurious Emission to the Antenna**

<b>Test Frequency 430.125[MHz]</b>			
Harmonic Frequency [MHz]	High Power	Low Power	Unit
430.125	N/A	N/A	[dBm]
860.250	-26	-26	[dBm]
1290.375	-30	-33	[dBm]
1720.500	-42	-48	[dBm]
<b>Test Frequency 450.125[MHz]</b>			
Harmonic Frequency [MHz]	High Power	Low Power	Unit
450.125	N/A	N/A	[dBm]
900.250	-36	-37	[dBm]
1350.375	-46	-41	[dBm]
1800.500	-59	-60	[dBm]
<b>Test Frequency 469.975[MHz]</b>			
Harmonic Frequency [MHz]	High Power	Low Power	Unit
469.975	N/A	N/A	[dBm]
939.950	-41	-40	[dBm]
1409.925	-43	-53	[dBm]
1879.900	-60	-60	[dBm]

**15. RX Conducted Spurious Emission to the Antenna**

<b>Test Frequency 430.125[MHz]+45.1[MHz]</b>		
Harmonic Frequency [MHz]		Unit
475.225	-72	[dBm]
950.450	<-100	[dBm]
1425.675	<-100	[dBm]
1900.900	<-100	[dBm]
<b>Test Frequency 450.125[MHz]+45.1[MHz]</b>		
Harmonic Frequency [MHz]		Unit
495.225	-70	[dBm]
990.450	<-100	[dBm]
1485.675	<-100	[dBm]
1980.900	<-100	[dBm]
<b>Test Frequency 469.975[MHz]+45.1[MHz]</b>		
Harmonic Frequency [MHz]		Unit
515.075	-73	[dBm]
1030.150	<-100	[dBm]
1545.225	<-100	[dBm]
2060.300	<-100	[dBm]