

TEST DATA

Model Number : BS HH16 VHF

Sample Number : No.1

Date : 1 December 2004

KANEMATSU CORPORATION

1. Carrier Output Power Rating

Test Voltage [Vdc]	Carrier Frequency [MHz]	Output Power / Hi	Output Power / Low	Unit
6.375	134.125	4.8	0.98	[W]
7.5	155.125	5.05	1.02	[W]
8.625	173.975	5.12	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	136.125	4.88	0.97	[W]
6.375	155.125	4.86	1.03	[W]
6.375	173.975	4.78	1.05	[W]
Test Voltage [Vdc]	Carrier Frequency [MHz]	Output Power / Hi	Output Power / Low	Unit
8.625	136.125	5.02	0.95	[W]
8.625	155.125	5.12	1.08	[W]
8.625	173.975	5.20	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] 136.125	Carrier Frequency[MHz] 155.125	Carrier Frequency[MHz] 173.975	Unit
-30	5.03	5.01	4.78	[W]
-20	5.02	5.03	4.77	[W]
-10	4.98	5.05	4.80	[W]
0	4.89	5.02	4.82	[W]
10	4.99	4.99	4.85	[W]
20	5.03	4.89	4.98	[W]
30	5.05	4.88	4.87	[W]
40	5.07	4.87	4.99	[W]
50	5.01	4.99	4.87	[W]
60	4.97	5.03	4.78	[W]
Test Voltage : 7.5 [Vdc] Low Power				
Test Temperature [Deg C]	Carrier Frequency[MHz] 136.125	Carrier Frequency[MHz] 155.125	Carrier Frequency[MHz] 173.975	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] 136.125	Carrier Frequency[MHz] 155.125	Carrier Frequency[MHz] 173.975	Unit
Start	5.03	5.03	5.07	[W]
10	5.03	5.03	5.07	[W]
20	5.04	5.03	5.07	[W]
30	5.04	5.03	5.08	[W]
40	5.04	5.03	5.09	[W]
50	5.04	5.03	5.09	[W]
60	5.04	5.03	5.09	[W]
90	5.05	5.04	5.09	[W]
120	5.05	5.04	5.09	[W]
150	5.05	5.04	5.08	[W]
180	5.06	5.04	5.08	[W]
210	5.05	5.04	5.08	[W]
240	5.05	5.04	5.08	[W]
270	5.06	5.04	5.08	[W]
300	5.06	5.04	5.08	[W]

5. Voltage and Current Drain of Final RF Stage

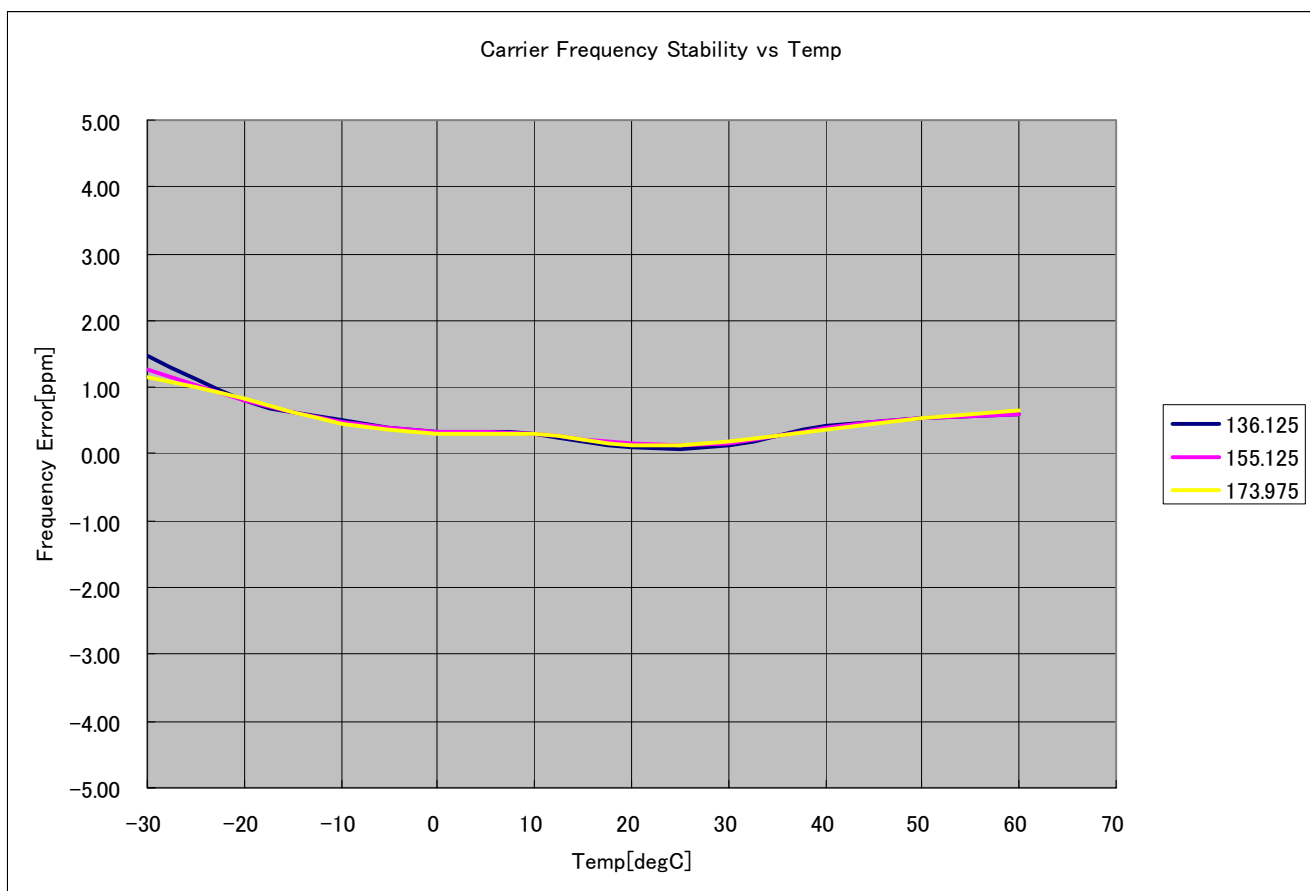
Test Items	Carrier Frequency[MHz] 134.125	Carrier Frequency[MHz] 155.125	Carrier Frequency[MHz] 173.975	Unit
Final Volatge	7.2	7.2	7.2	[Vdc]
Final Current Drain	1.76	1.74	1.74	[A]
RF Output Power (ANT port)	4.98	5.12	5.03	[W]
Efficiency	39.2	40.86	40.15	[%]

6. Carrier frequency Stability vs. Voltage

Test Voltage[Vdc]	Carrier Frequency[MHz] 136.125	Carrier Frequency[MHz] 155.125	Carrier Frequency[MHz] 173.975	Unit
6.375	0.10	0.10	0.10	[ppm]
7.5	0.10	0.10	0.10	[ppm]
8.625	0.10	0.10	0.10	[ppm]

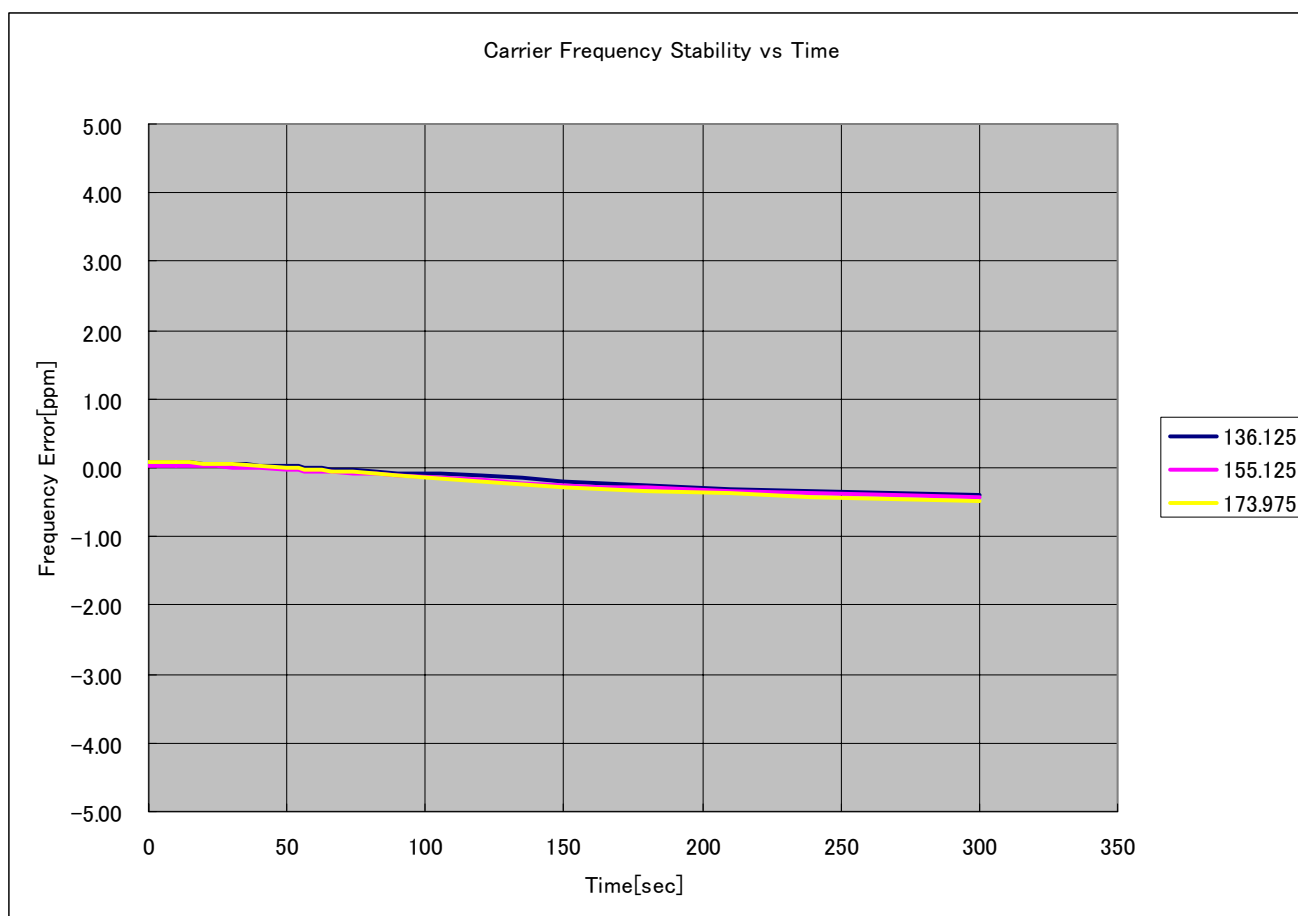
7. Carrier frequency Stability vs. Temperature

Test Temperature [Deg C]	Carrier Frequency[MHz] 136.125	Carrier Frequency[MHz] 155.125	Carrier Frequency[MHz] 173.975	Unit
-30	1.47	1.26	1.15	[ppm]
-20	0.81	0.81	0.84	[ppm]
-10	0.50	0.47	0.45	[ppm]
0	0.33	0.34	0.32	[ppm]
10	0.32	0.32	0.30	[ppm]
20	0.10	0.16	0.13	[ppm]
30	0.14	0.17	0.18	[ppm]
40	0.41	0.40	0.35	[ppm]
50	0.53	0.54	0.55	[ppm]
60	0.60	0.60	0.67	[ppm]



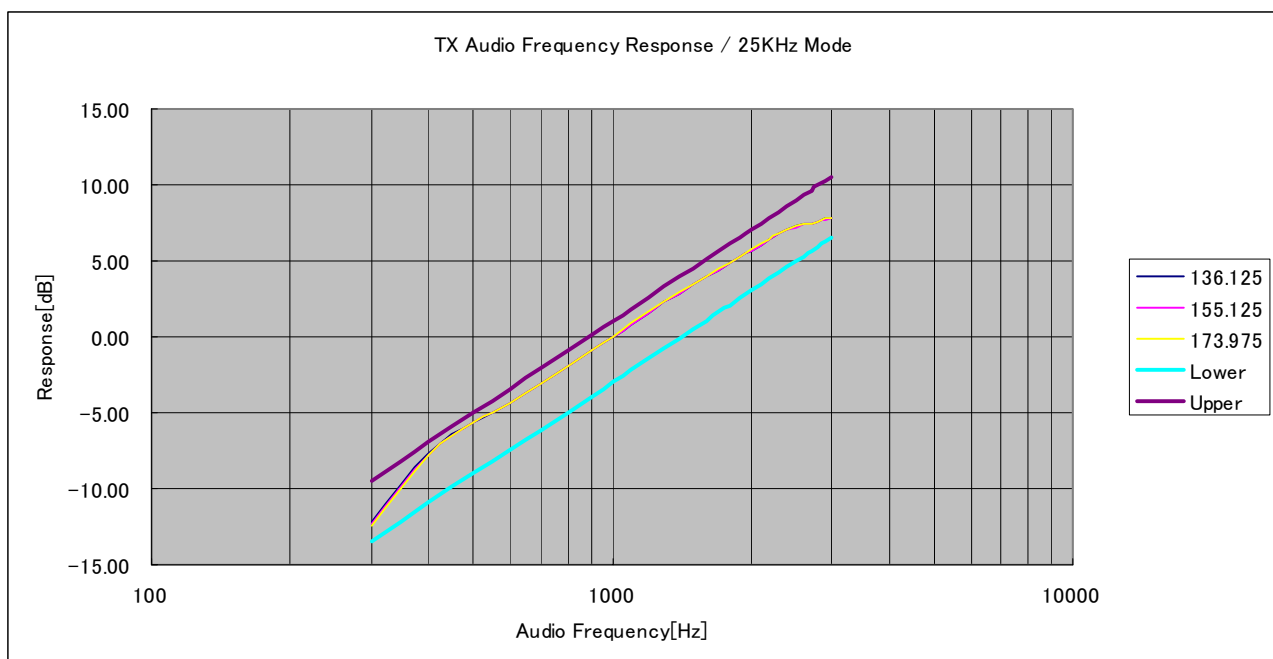
8. Carrier frequency Stability vs. Time

Test Temperature [Deg C]	Carrier Frequency[MHz] 136.125	Carrier Frequency[MHz] 155.125	Carrier Frequency[MHz] 173.975	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]



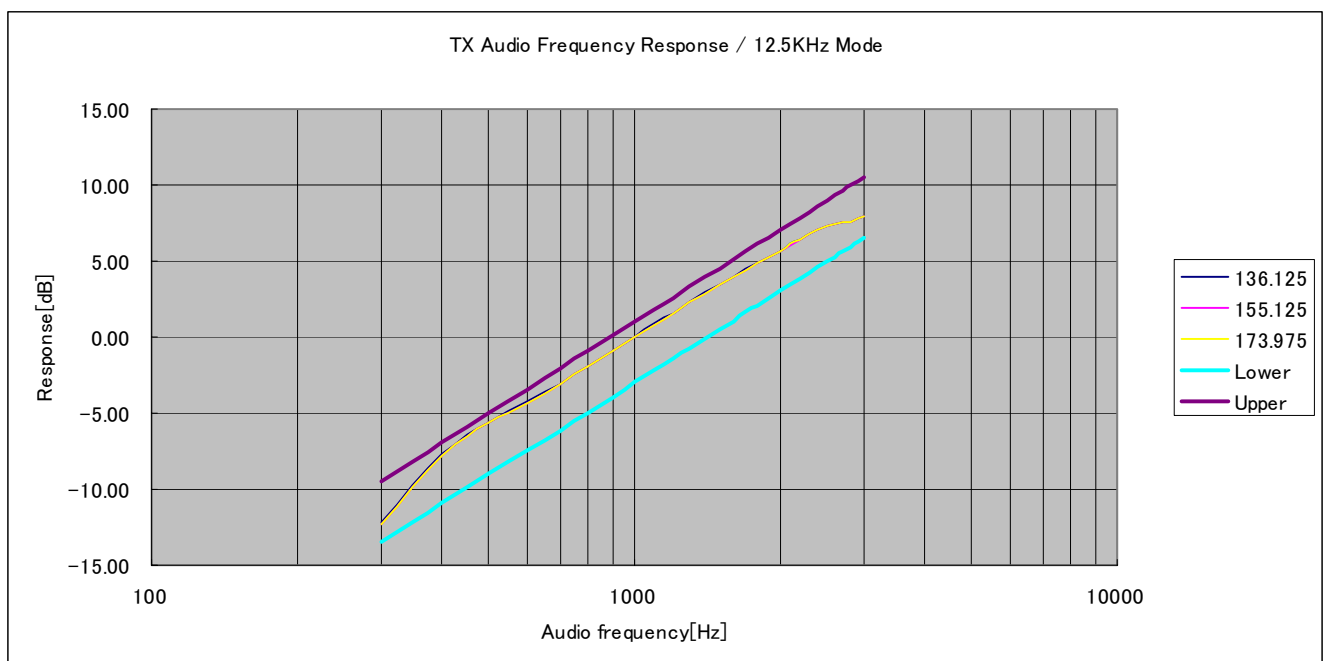
9. TX Audio Frequency Response / 25KHz Band

Audio Frequency[Hz]	Carrier Frequency[MHz] 136.125	Carrier Frequency[MHz] 155.125	Carrier Frequency[MHz] 173.975	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]



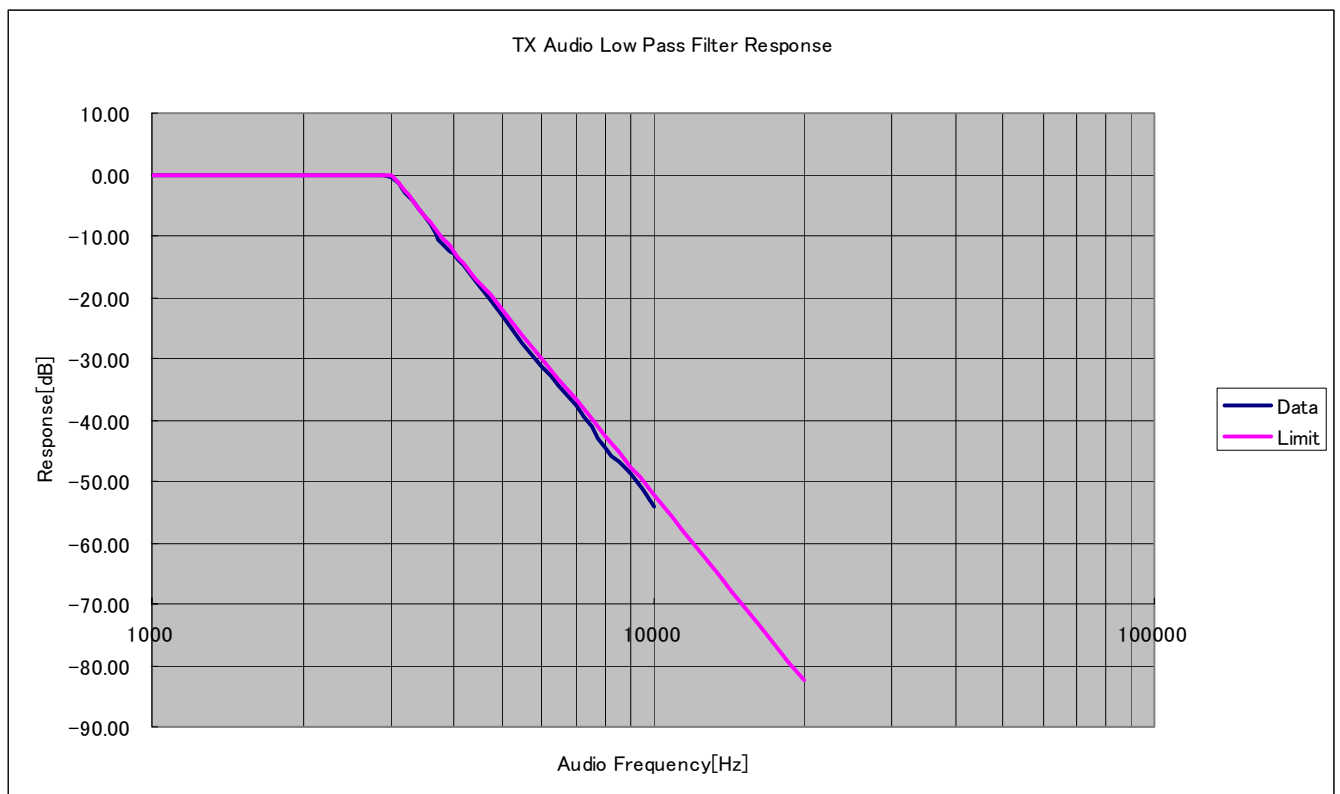
10. TX Audio Frequency Response / 12.5KHz Band

Audio Frequency[Hz]	Carrier Frequency[MHz] 136.125	Carrier Frequency[MHz] 155.125	Carrier Frequency[MHz] 173.975	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]

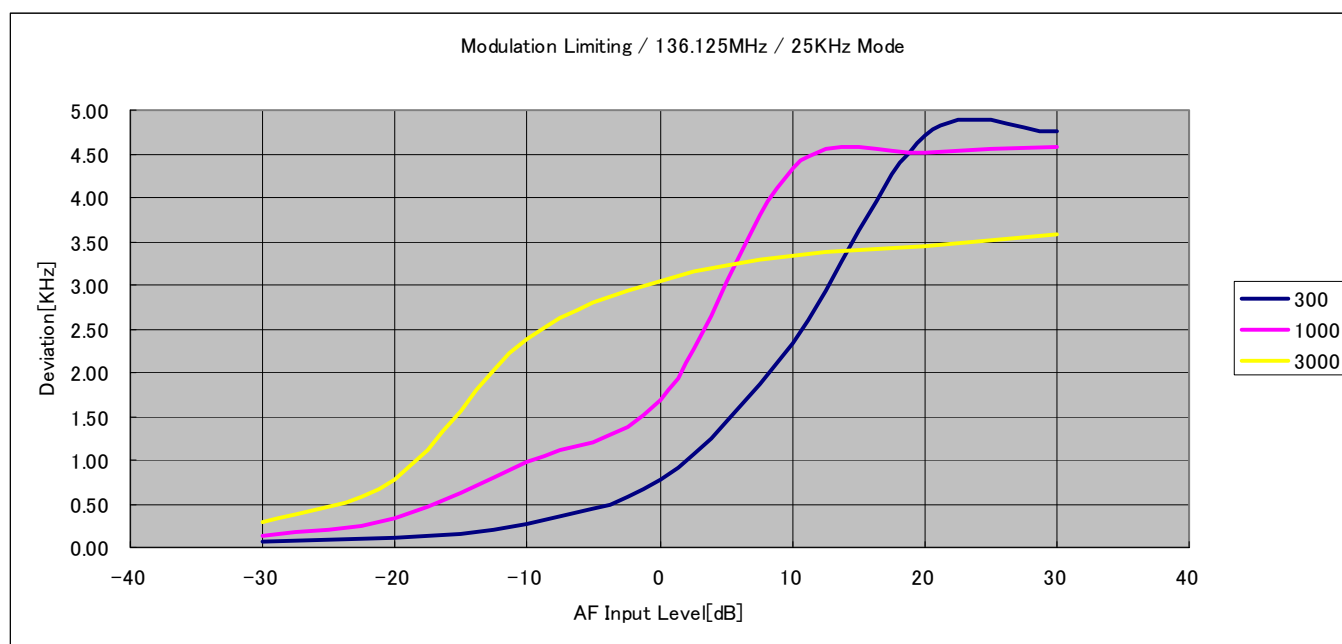


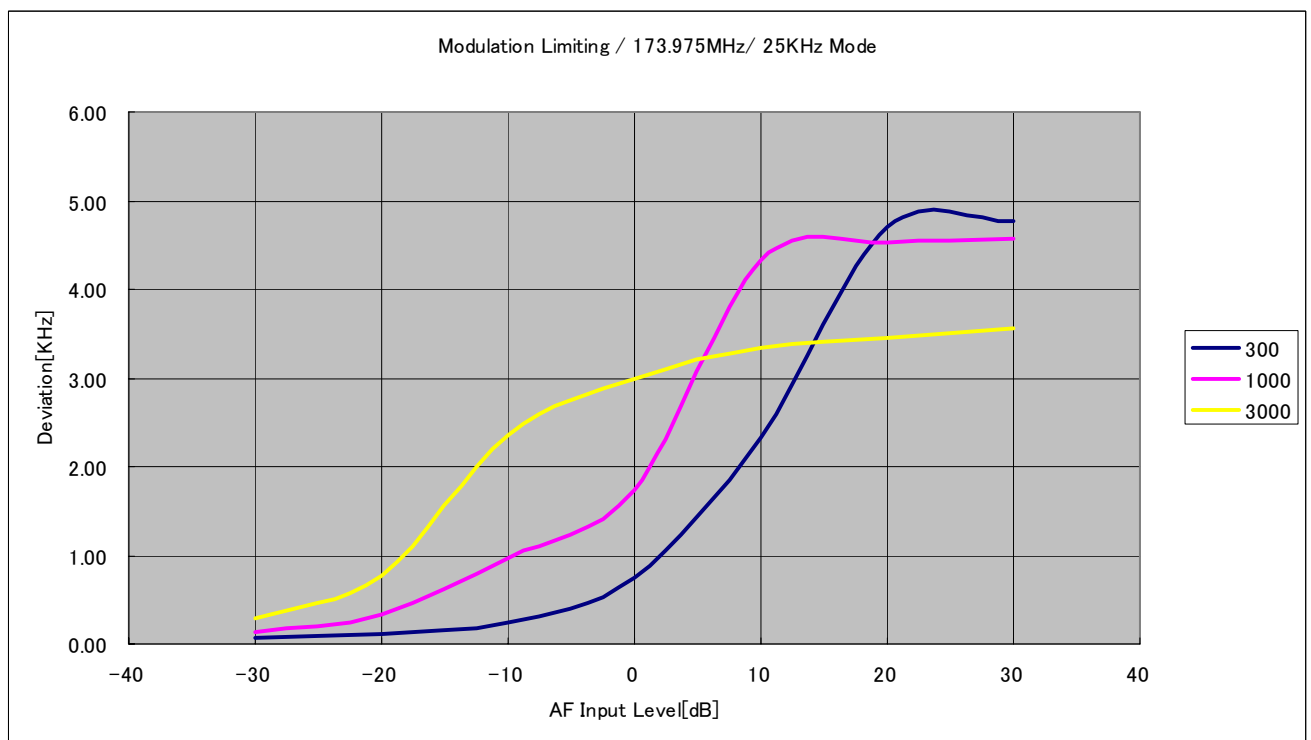
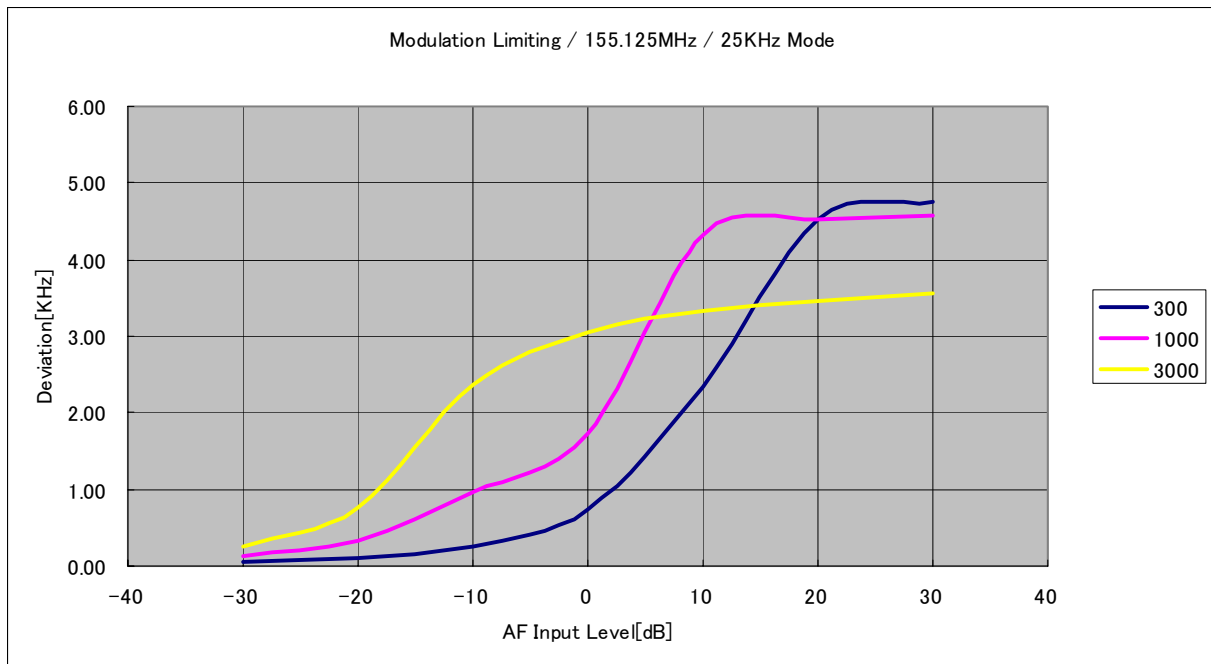
12. Modulation Limiting / 25KHz Band

Test Frequency		136.125[MHz]			0[dB]=-39.3dBm / 8.40mV	
TX Audio Input Level[dB]		Audio Frequency [Hz] 300	Audio Frequency [Hz] 1000	Audio Frequency [Hz] 3000	Unit	
-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		155.125[MHz]			0[dB]=-39.8dBm / 7.93mV	
TX Audio Input Level[dB]		Audio Frequency [Hz] 300	Audio Frequency [Hz] 1000	Audio Frequency [Hz] 3000	Unit	
-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		173.975[MHz]			0[dB]=-40.5dBm / 7.31mV	
TX Audio Input Level[dB]		Audio Frequency [Hz] 300	Audio Frequency [Hz] 1000	Audio Frequency [Hz] 3000	Unit	
-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]	



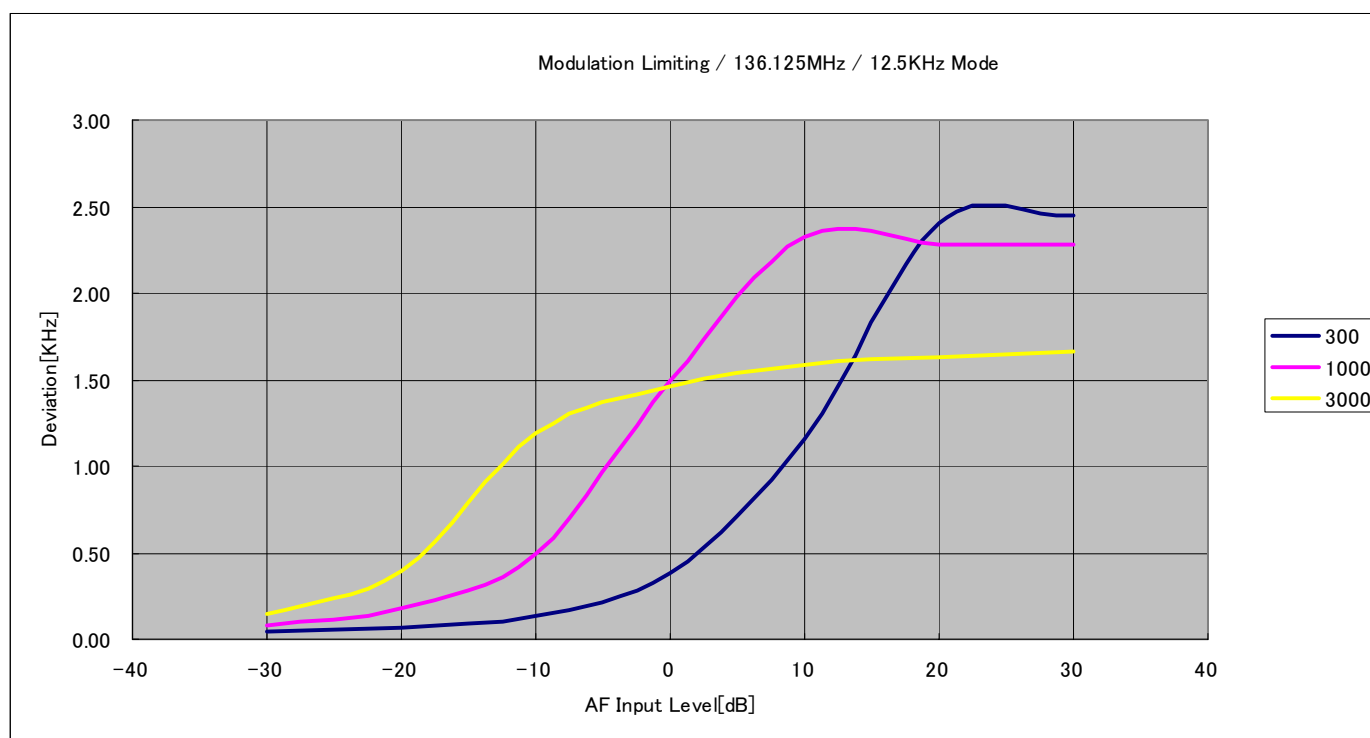


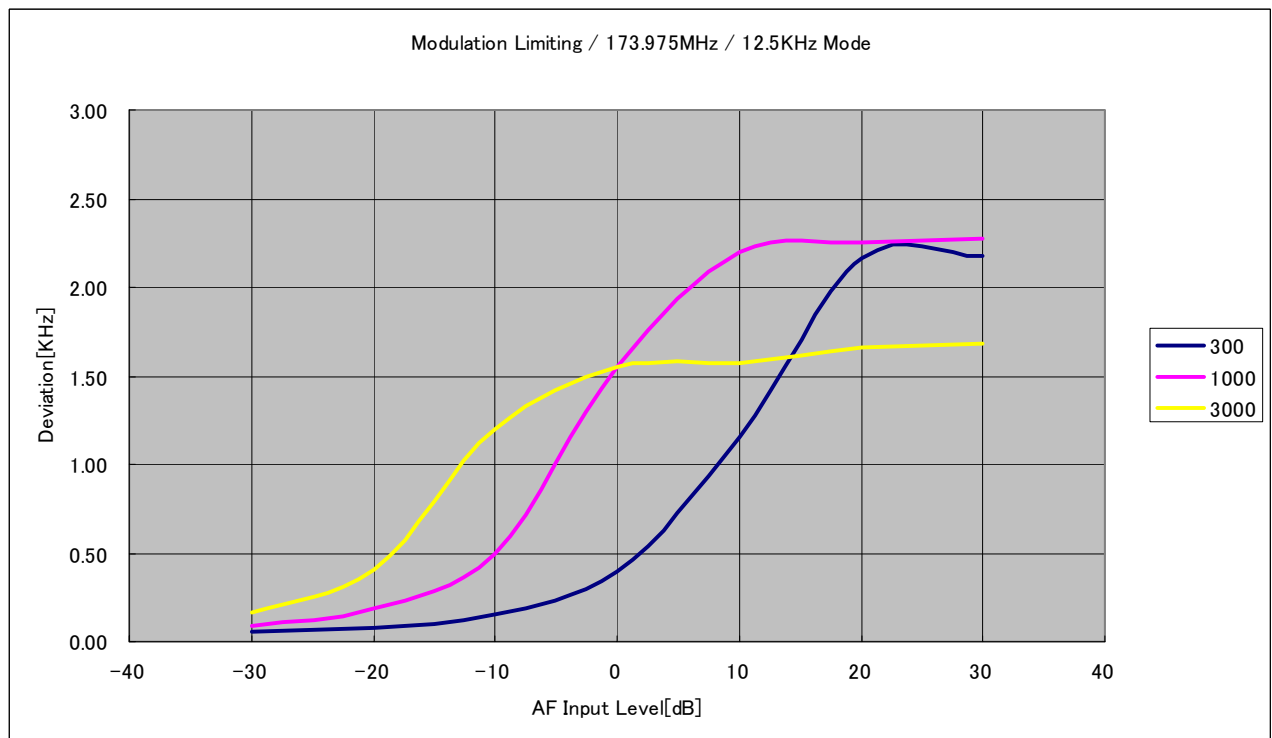
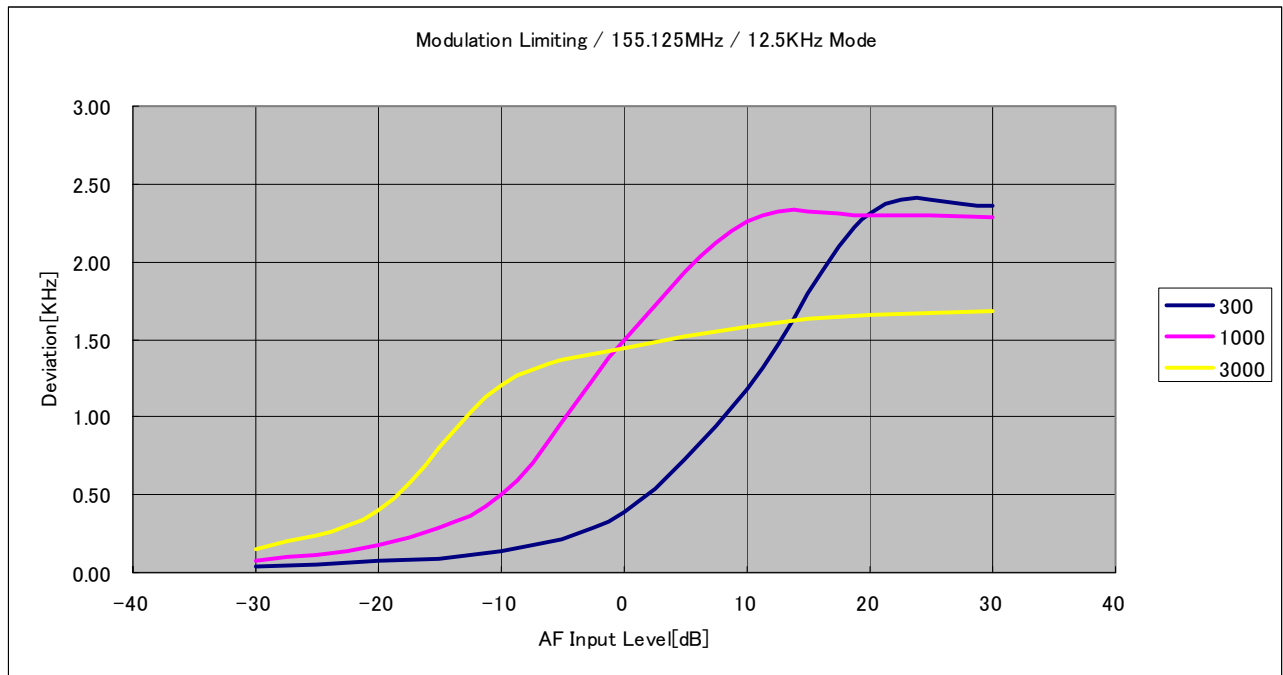
13. Modulation Limiting / 12.5KHz Band

Test Frequency		136.125[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		155.125[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		173.975[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

Test Frequency 136.125[MHz]			
Harmonic Frequency [MHz]	High Power	Low Power	Unit
136.125	N/A	N/A	[dBm]
272.250	-36	-36	[dBm]
408.375	-40	-53	[dBm]
544.500	-52	-58	[dBm]
680.625	-48	-55	[dBm]
816.750	-68	-70	[dBm]
952.875	-70	-70	[dBm]
1089.000	-62	-70	[dBm]
1225.125	-50	-59	[dBm]
1361.250	-61	-70	[dBm]
1487.375	-45	-57	[dBm]
1633.500	-64	-70	[dBm]
1769.625	-53	-56	[dBm]
1905.750	-70	-70	[dBm]
2041.875	-70	-70	[dBm]
Test Frequency 155.125[MHz]			
Harmonic Frequency [MHz]	High Power	Low Power	Unit
155.125	N/A	N/A	[dBm]
310.250	-56	-57	[dBm]
465.375	-46	-51	[dBm]
620.500	-59	-60	[dBm]
775.625	-51	-63	[dBm]
930.750	-70	-70	[dBm]
1085.875	-53	-59	[dBm]
1241.000	-63	-70	[dBm]
1396.125	-42	-53	[dBm]
1551.250	-58	-70	[dBm]
1706.375	-43	-55	[dBm]
1861.500	-61	-70	[dBm]
2016.625	-70	-70	[dBm]
Test Frequency 173.975[MHz]			
Harmonic Frequency [MHz]	High Power	Low Power	Unit
173.975	N/A	N/A	[dBm]
347.950	-51	-60	[dBm]
521.925	-43	-53	[dBm]
695.900	-62	-70	[dBm]
869.875	-54	-61	[dBm]
1043.850	-70	-70	[dBm]
1217.825	-44	-54	[dBm]
1391.800	-62	-70	[dBm]
1565.775	-43	-49	[dBm]
1739.750	-59	-70	[dBm]
1913.725	-56	-70	[dBm]
2087.700	-70	-70	[dBm]

15. RX Conducted Spurious Emission to the Antenna

Test Frequency 136.125[MHz]+45.1[MHz]		
Harmonic Frequency [MHz]		Unit
181.225	-76	[dBm]
362.450	<-100	[dBm]
543.675	<-100	[dBm]
749.900	<-100	[dBm]
906.125	<-100	[dBm]
1087.350	<-100	[dBm]
1268.575	<-100	[dBm]
1449.800	<-100	[dBm]
1631.025	<-100	[dBm]
1812.250	<-100	[dBm]
1993.475	<-100	[dBm]
2174.700	<-100	[dBm]

Test Frequency 155.125[MHz]+45.1[MHz]		
Harmonic Frequency [MHz]		Unit
200.225	-72	[dBm]
400.450	<-100	[dBm]
600.675	<-100	[dBm]
800.900	<-100	[dBm]
1001.125	<-100	[dBm]
1201.350	<-100	[dBm]
1401.575	<-100	[dBm]
1601.800	<-100	[dBm]
1802.025	<-100	[dBm]
2002.250	<-100	[dBm]

Test Frequency 173.975[MHz]+45.1[MHz]		
Harmonic Frequency [MHz]		Unit
219.075	-78	[dBm]
438.150	<-100	[dBm]
657.225	<-100	[dBm]
876.300	<-100	[dBm]
1095.375	<-100	[dBm]
1314.450	<-100	[dBm]
1533.525	<-100	[dBm]
1752.600	<-100	[dBm]
1971.675	<-100	[dBm]
2190.750	<-100	[dBm]