

### 7.3.3 Test Result for UHF-B2

-. Test Date : November 05, 2009  
 -. Temperature : 23 °C  
 -. Relative humidity : 45 % R.H.  
 -. Frequency range : 30 MHz ~ 20 GHz  
 -. Result : Pass  
 -. Modulation : FM with 2.5 kHz sine wave signal

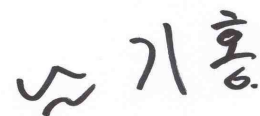
Channel Spacing (kHz)	Modulation (kHz)	Harmonic Frequency (MHz)		Measured Value (dBm)	Cable Loss (dB)	Total (dBm)	Limit (dBm)	Margin (dB)
25	2.5	Low	503.70	- 41.67	0.17	- 41.50	- 13.00	- 28.50
			4 105.00	- 36.67	1.00	- 35.67		- 22.67
		Middle	506.90	- 41.33	0.17	- 41.16		- 28.16
			4 360.00	- 34.00	1.00	- 33.00		- 20.00
		High	403.50	- 31.00	0.17	- 30.83		- 17.83
			4 090.00	- 33.83	1.00	- 32.83		- 19.83
12.5	2.5	Low	502.10	- 42.17	0.17	- 42.00	- 20.00	- 22.00
			4 285.00	- 34.67	1.00	- 33.67		- 13.67
		Middle	506.90	- 41.50	0.17	- 41.33		- 21.33
			4 510.00	- 35.50	1.00	- 34.50		- 14.50
		High	403.50	- 31.00	0.17	- 30.83		- 10.83
			4 135.00	- 35.00	1.00	- 34.00		- 14.00
6.25	0.8	Low	481.10	- 42.00	0.17	- 41.83	- 25.00	- 16.83
			3 580.00	- 35.00	0.83	- 34.17		- 9.17
		Middle	506.90	- 42.00	0.17	- 41.83		- 16.83
			3 010.00	- 34.17	0.67	- 33.50		- 8.50
		High	403.50	- 30.83	0.17	- 30.66		- 5.66
			3 850.00	- 35.50	0.83	- 34.67		- 9.67

According to Part 90I, out of band emission shall be attenuated by  $43 + 10 \log (P)$  dBc, equates to -13.0 dBm.

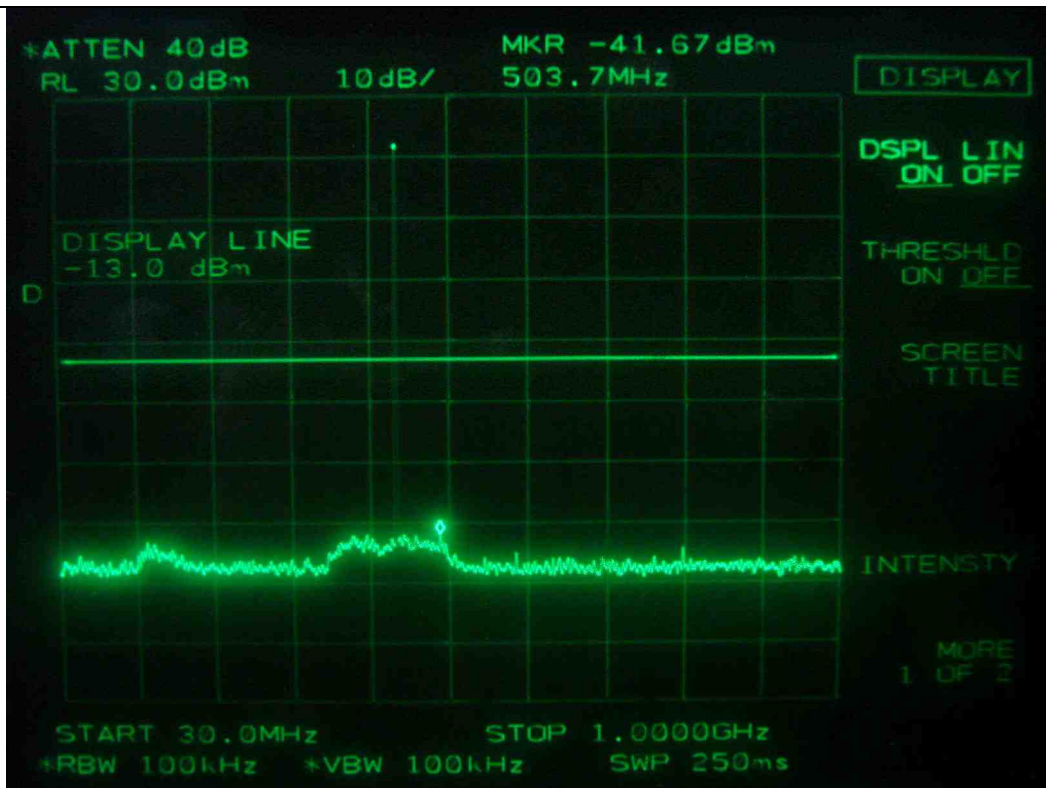
-. Modulation : FM with an external 9 600 b/s random data source

Channel Spacing (kHz)	Modulation (b/s)	Harmonic Frequency (MHz)		Measured Value (dBm)	Cable Loss (dB)	Total (dBm)	Limit (dBm)	Margin (dB)
25	9 600	Low	958.00	- 42.50	0.33	- 42.17	- 13.00	- 29.17
			3 640.00	- 34.67	0.83	- 33.84		- 20.84
		Middle	961.20	- 43.17	0.33	- 42.84		- 29.84
			2 995.00	- 34.17	0.67	- 33.50		- 20.50
		High	403.50	- 30.83	0.17	- 30.66		- 17.66
			3 265.00	- 34.83	0.83	- 34.00		- 21.00
12.5	9 600	Low	400.20	- 42.33	0.17	- 42.16	- 20.00	- 22.16
			2 950.00	- 35.17	0.67	- 34.50		- 14.50
		Middle	959.60	- 43.50	0.33	- 43.17		- 23.17
			2 890.00	- 35.00	0.67	- 34.33		- 14.33
		High	403.50	- 30.67	0.17	- 30.50		- 10.50
			3 175.00	- 34.83	0.83	- 34.00		- 14.00
6.25	4 800	Low	405.10	- 42.17	0.17	- 42.00	- 25.00	- 17.00
			2 905.00	- 34.67	0.67	- 34.00		- 9.00
		Middle	961.20	- 42.67	0.33	- 42.34		- 17.34
			3 340.00	- 34.67	0.83	- 33.84		- 8.84
		High	403.50	- 30.83	0.17	- 30.66		- 5.66
			3 550.00	- 33.83	0.83	- 33.00		- 8.00

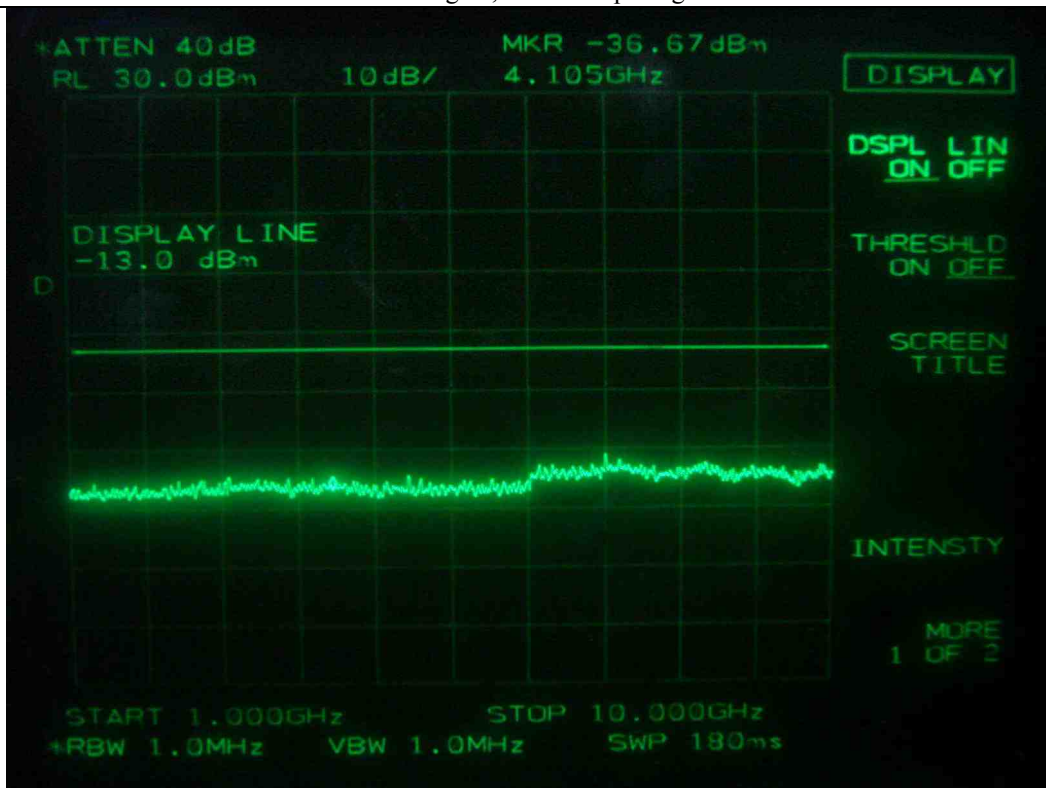
According to Part 90I, out of band emission shall be attenuated by  $43 + 10 \log (P)$  dBc, equates to -13.0 dBm.



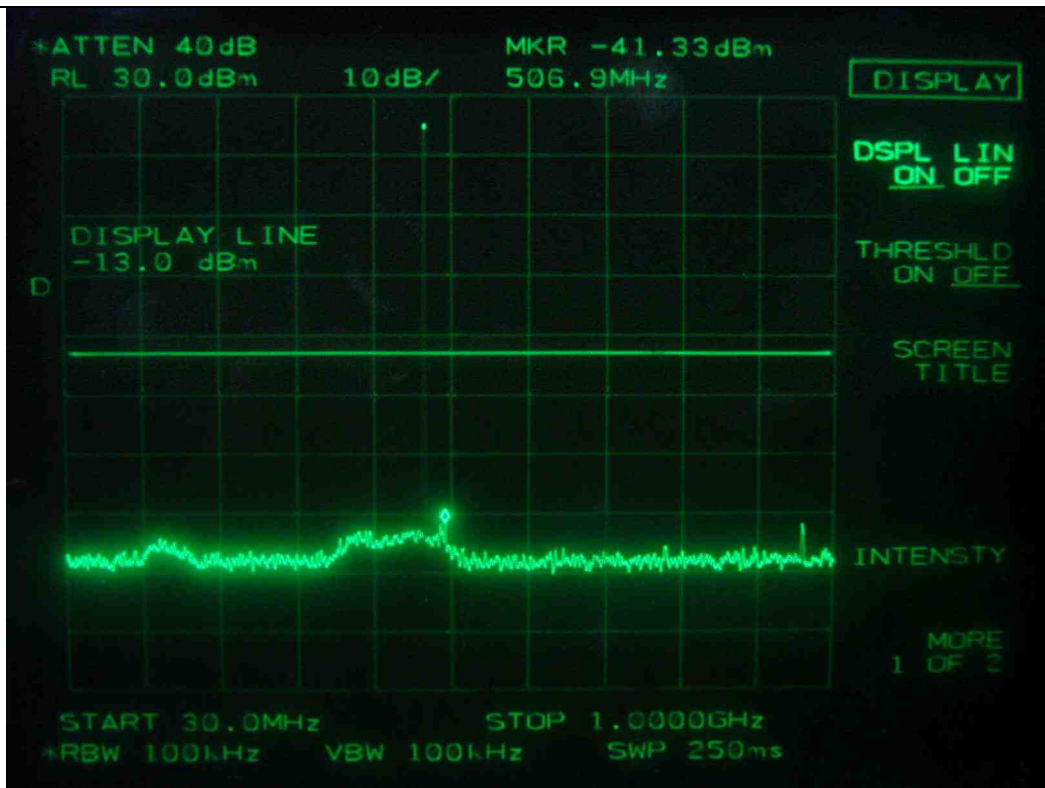
Tested by: Ki-Hong, Nam / Project Engineer



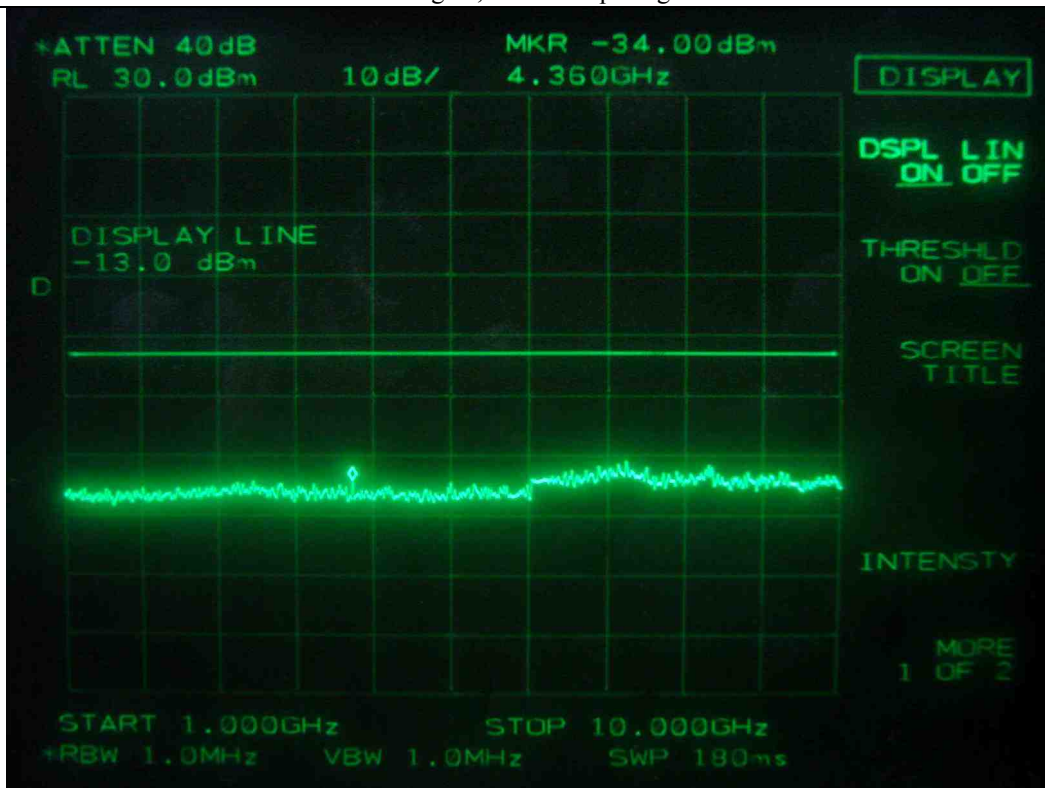
FM with 2.5 kHz sine wave signal, Channel Spacing 25 kHz - Low Channel



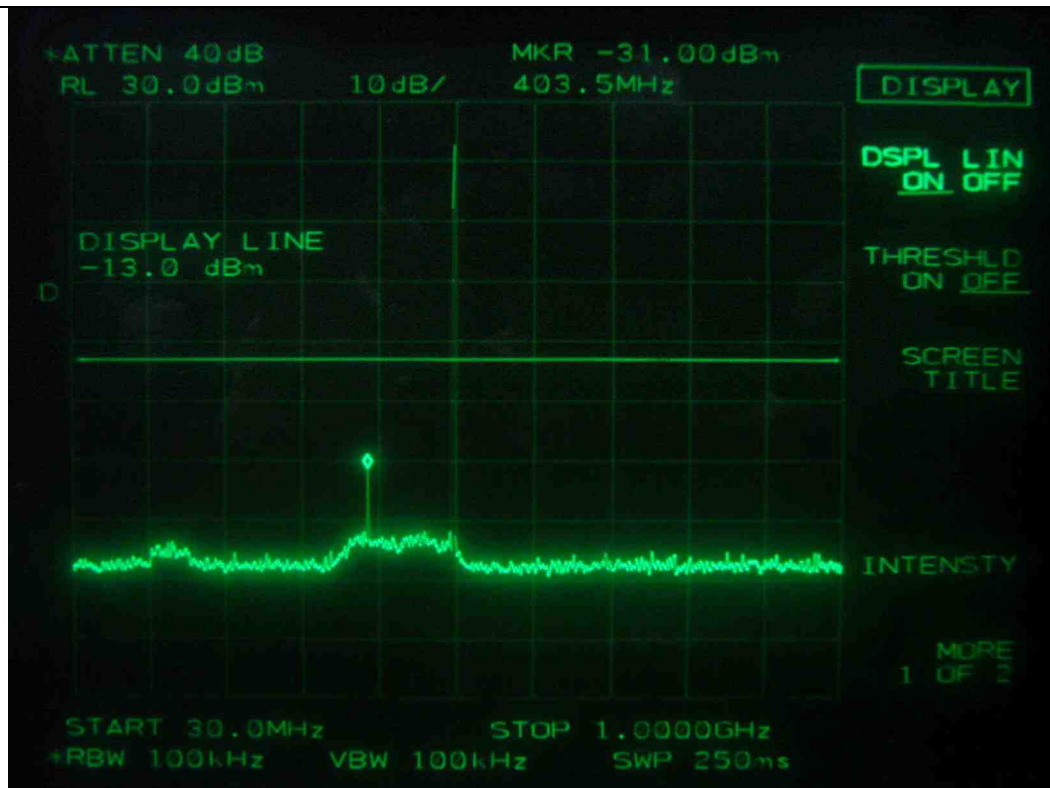
FM with 2.5 kHz sine wave signal, Channel Spacing 25 kHz- Low Channel



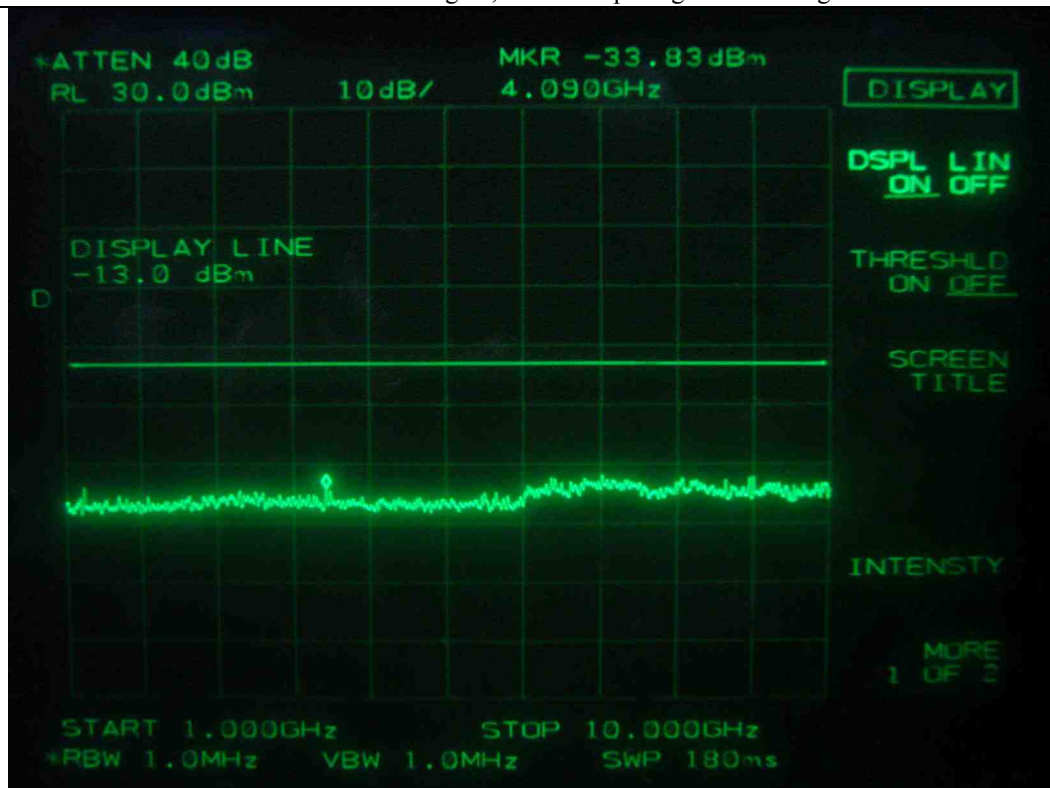
FM with 2.5 kHz sine wave signal, Channel Spacing 25 kHz - Middle Channel



FM with 2.5 kHz sine wave signal, Channel Spacing 25 kHz - Middle Channel

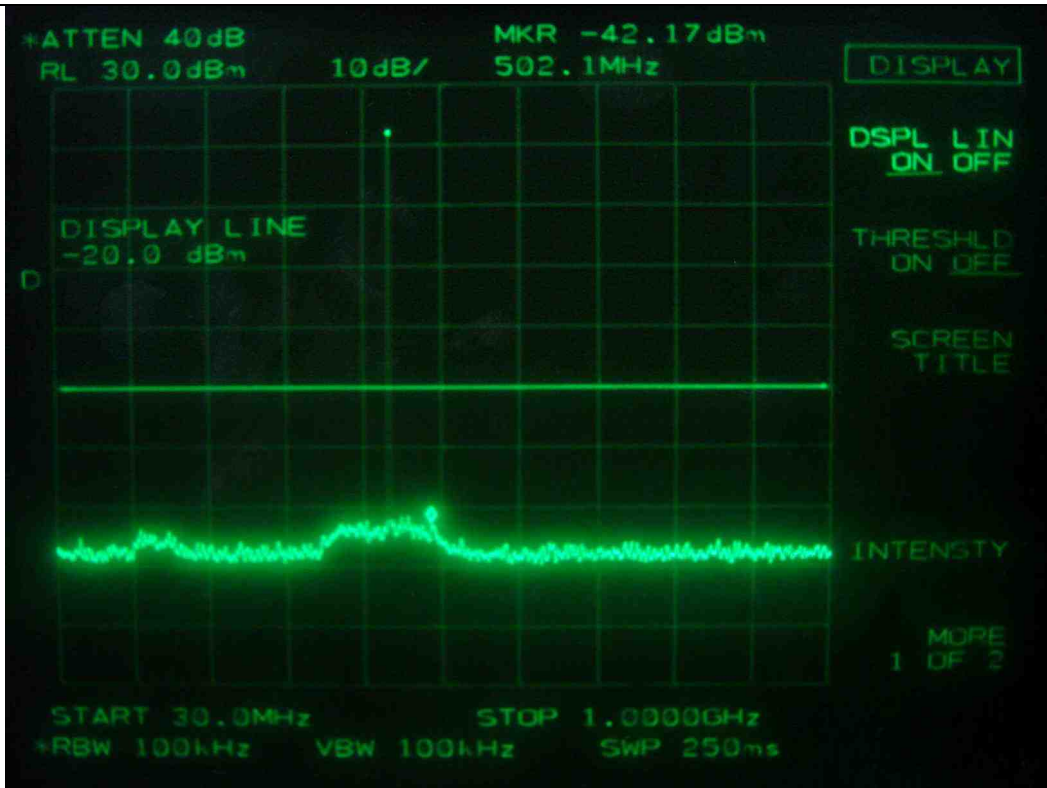


FM with 2.5 kHz sine wave signal, Channel Spacing 25 kHz - High Channel

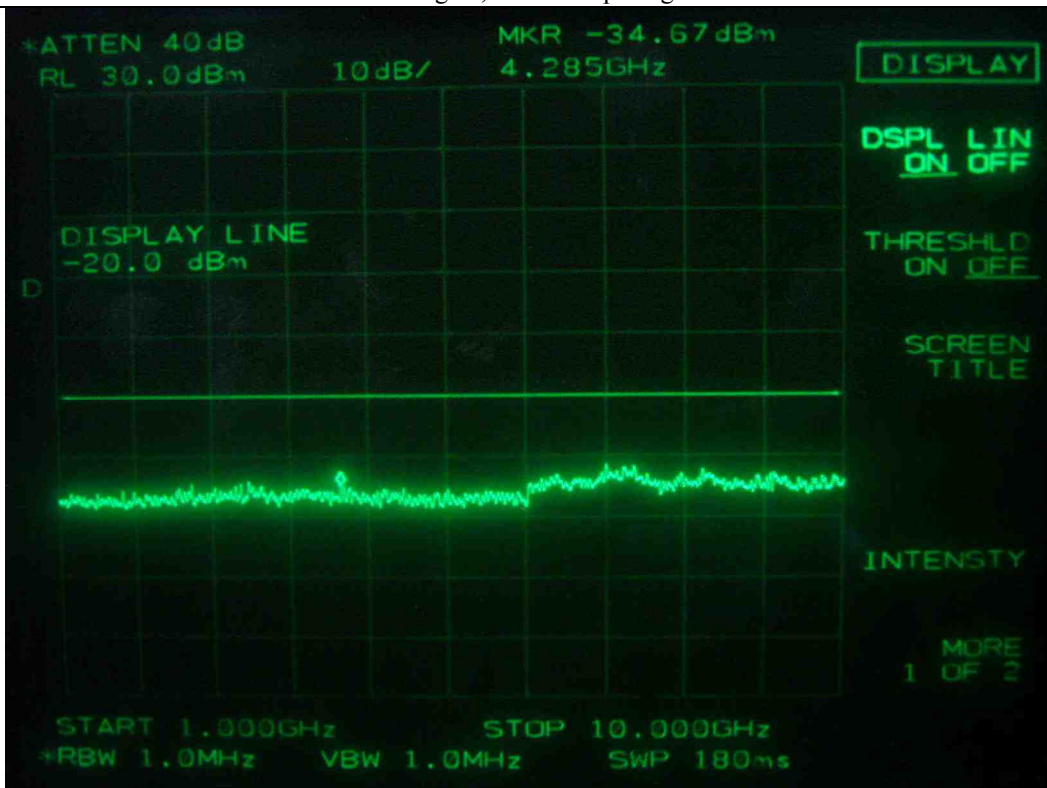


FM with 2.5 kHz sine wave signal, Channel Spacing 25 kHz - High Channel

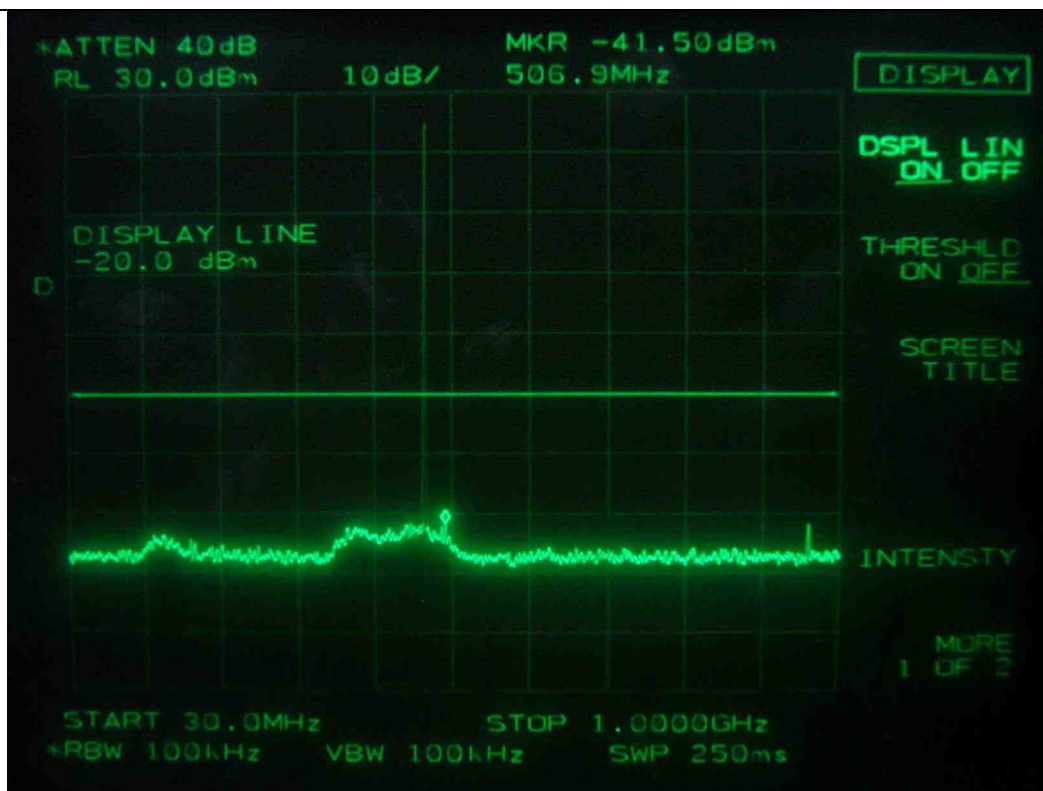




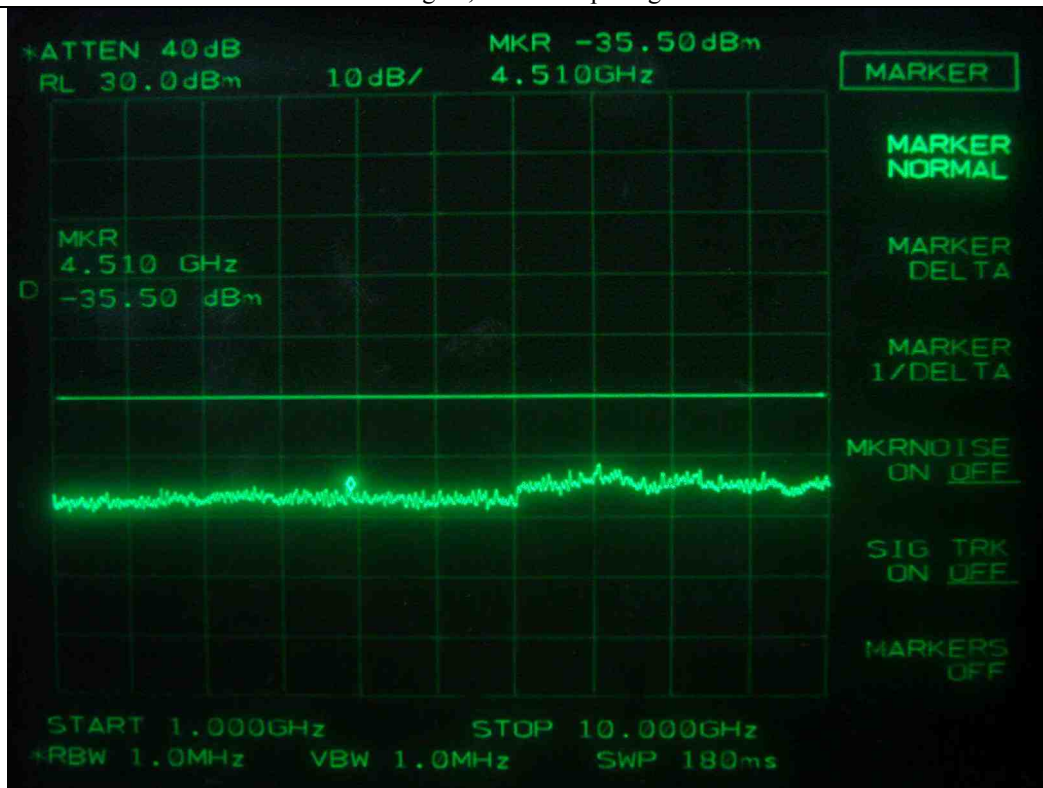
FM with 2.5 kHz sine wave signal, Channel Spacing 12.5 kHz - Low Channel



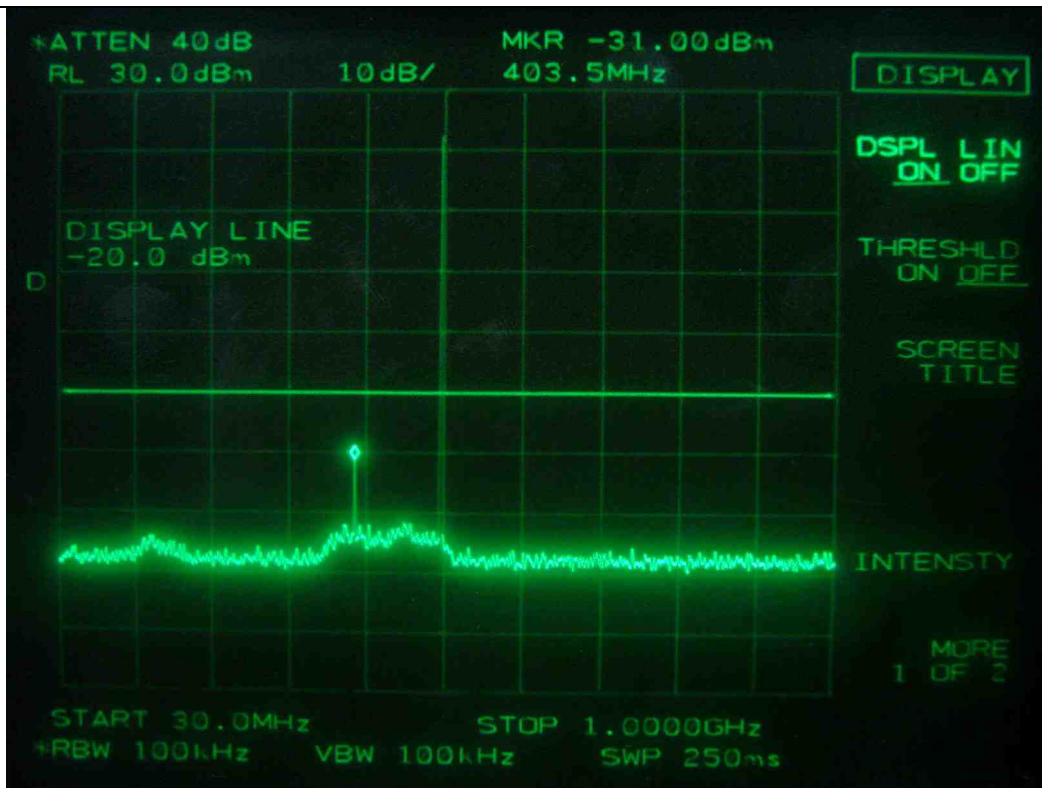
FM with 2.5 kHz sine wave signal, Channel Spacing 12.5 kHz - Low Channel



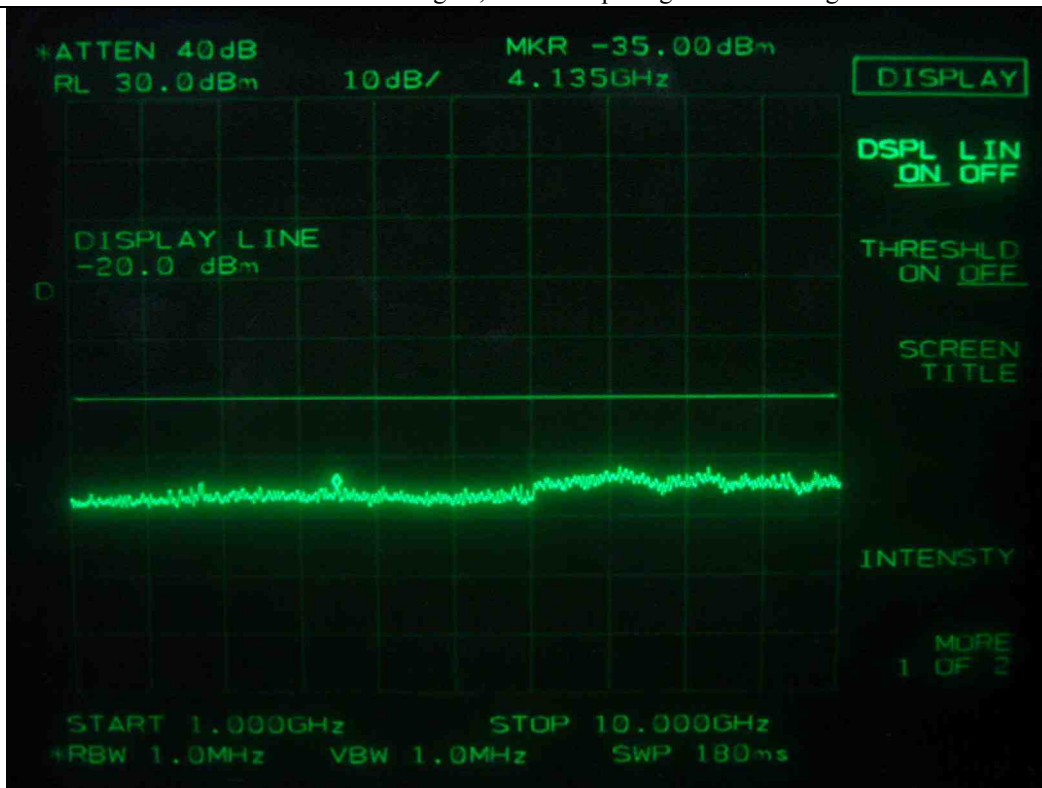
FM with 2.5 kHz sine wave signal, Channel Spacing 12.5 kHz - Middle Channel



FM with 2.5 kHz sine wave signal, Channel Spacing 12.5 kHz - Middle Channel

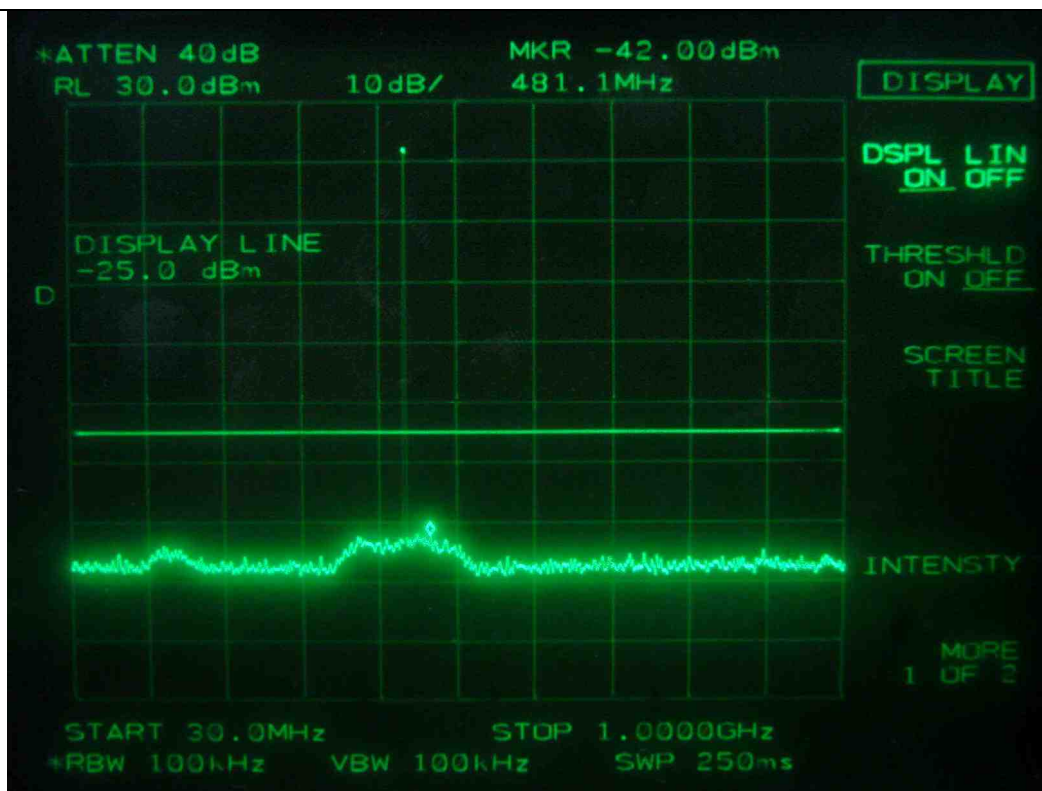


FM with 2.5 kHz sine wave signal, Channel Spacing 12.5 kHz - High Channel

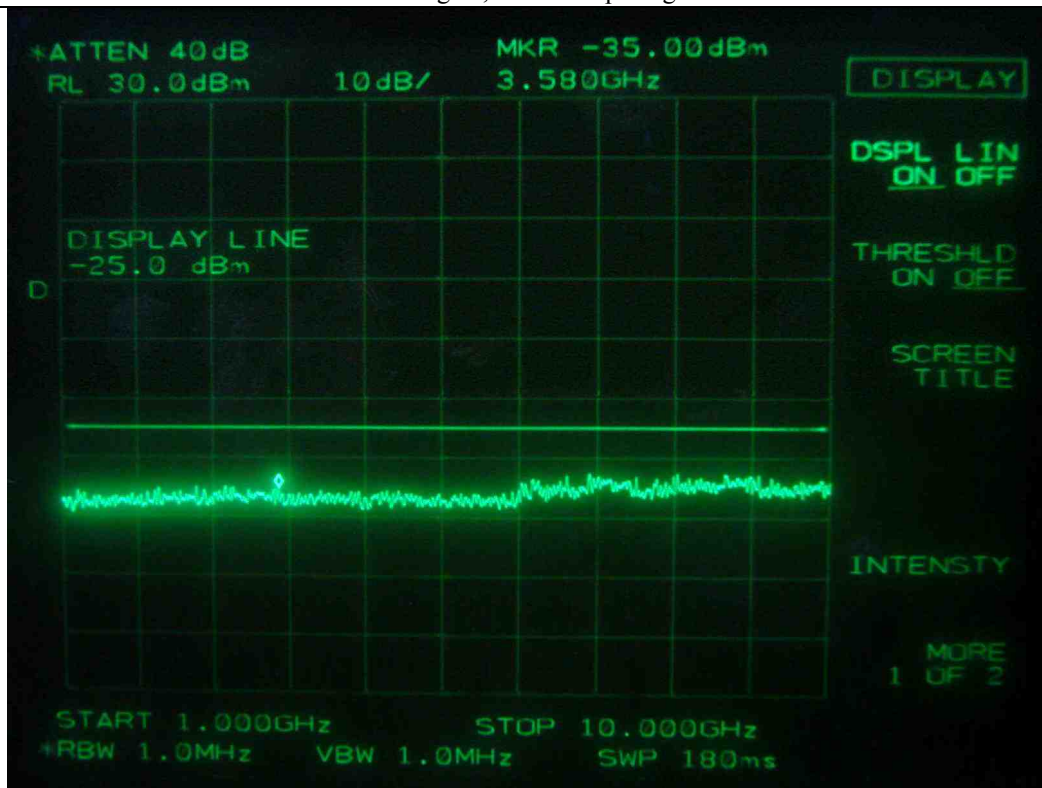


FM with 2.5 kHz sine wave signal, Channel Spacing 12.5 kHz - High Channel

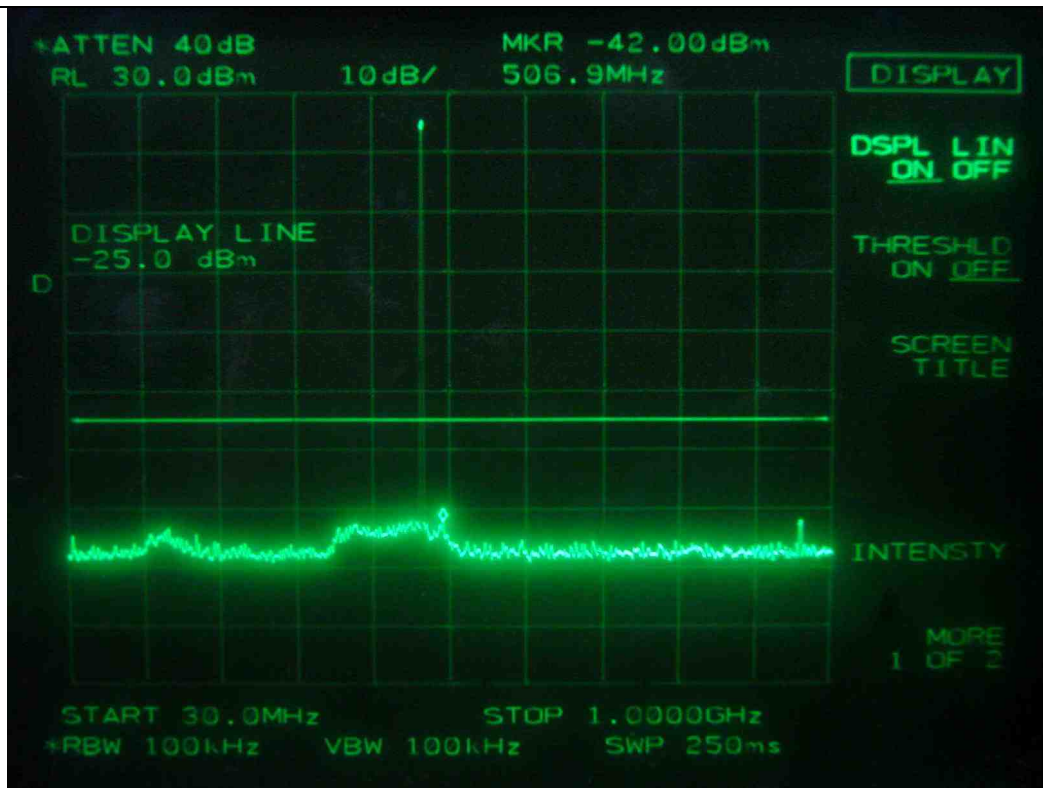




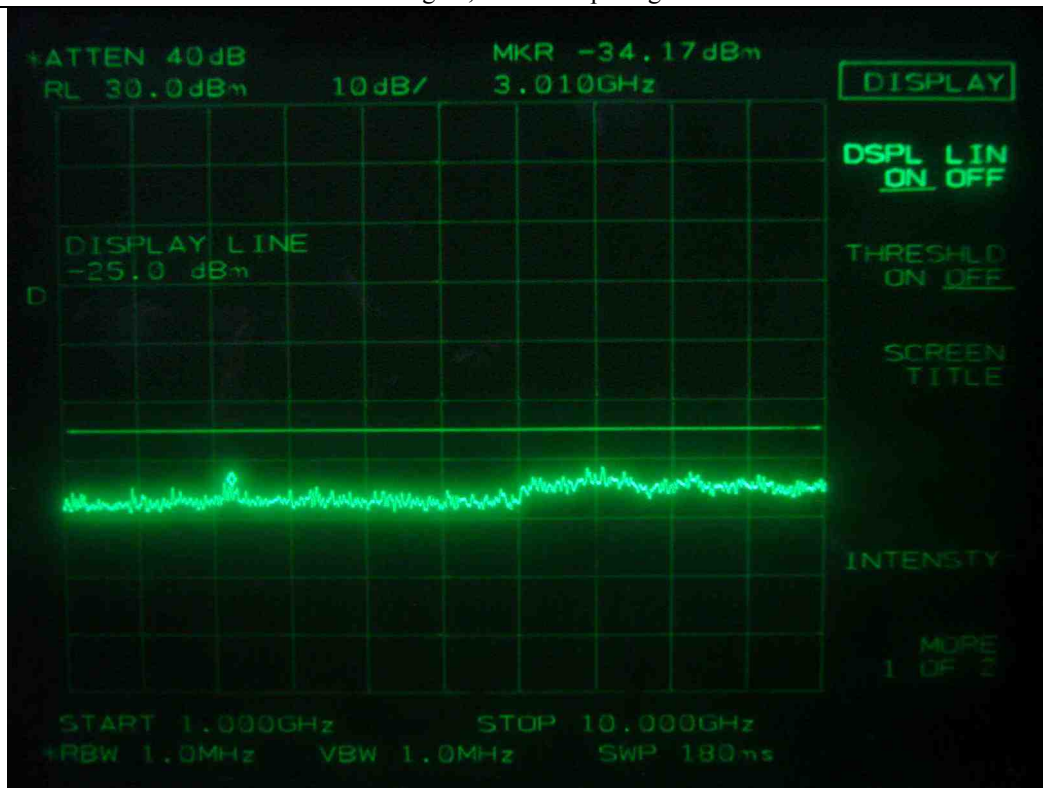
FM with 2.5 kHz sine wave signal, Channel Spacing 6.25 kHz - Low Channel



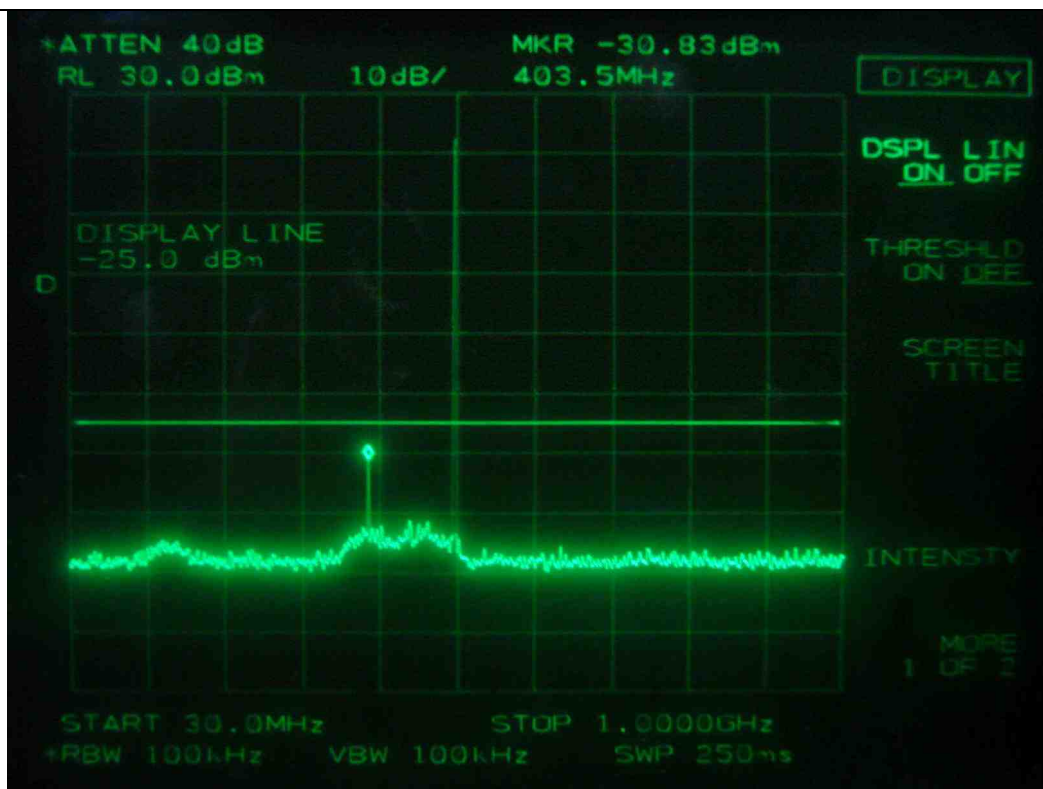
FM with 2.5 kHz sine wave signal, Channel Spacing 6.25 kHz - Low Channel



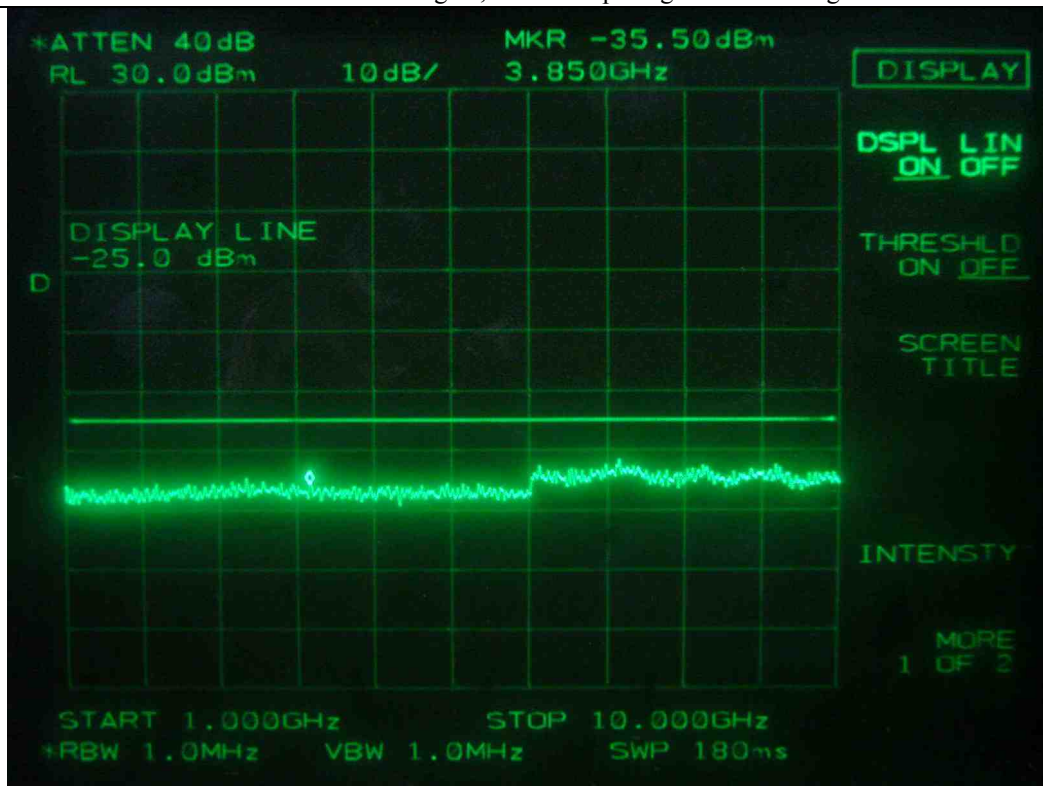
FM with 2.5 kHz sine wave signal, Channel Spacing 6.25 kHz - Middle Channel



FM with 2.5 kHz sine wave signal, Channel Spacing 6.25 kHz - Middle Channel

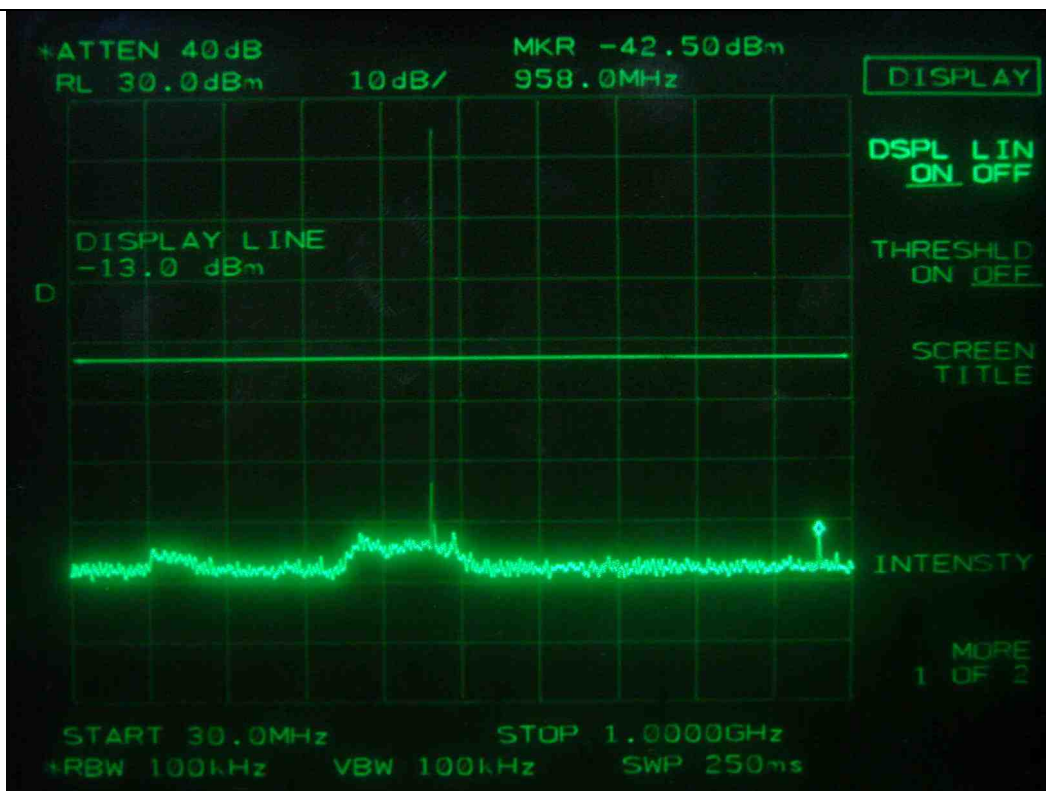


FM with 2.5 kHz sine wave signal, Channel Spacing 6.25 kHz - High Channel

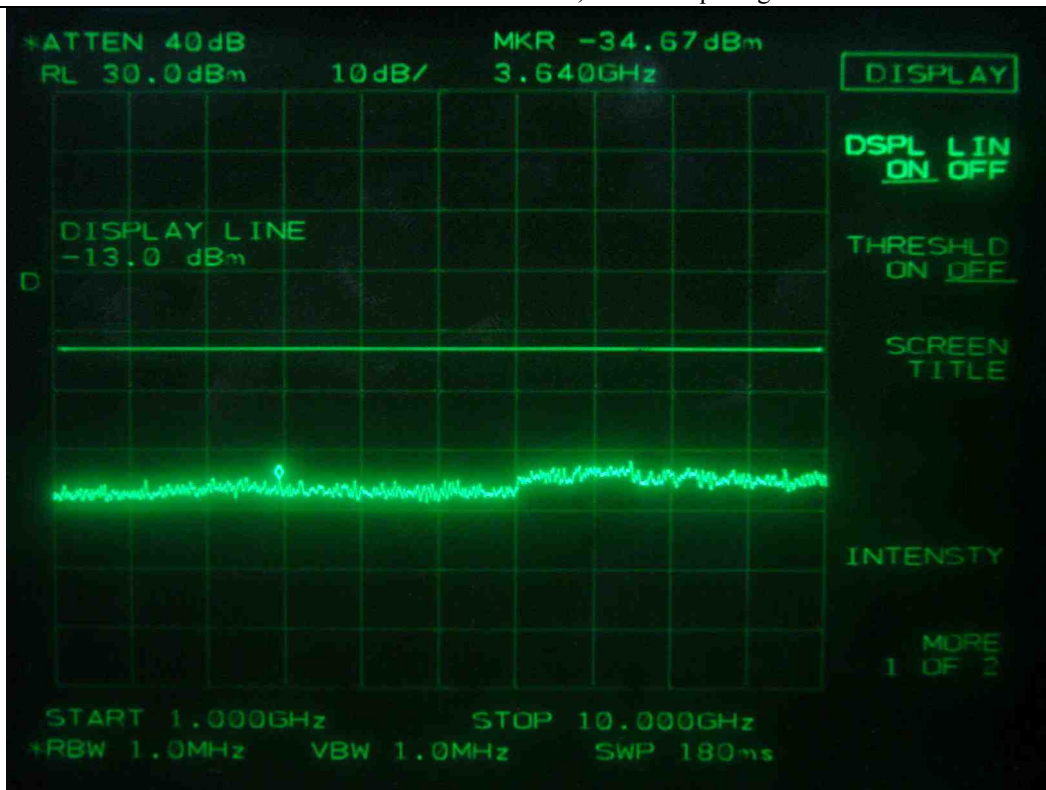


FM with 2.5 kHz sine wave signal, Channel Spacing 6.25 kHz - High Channel



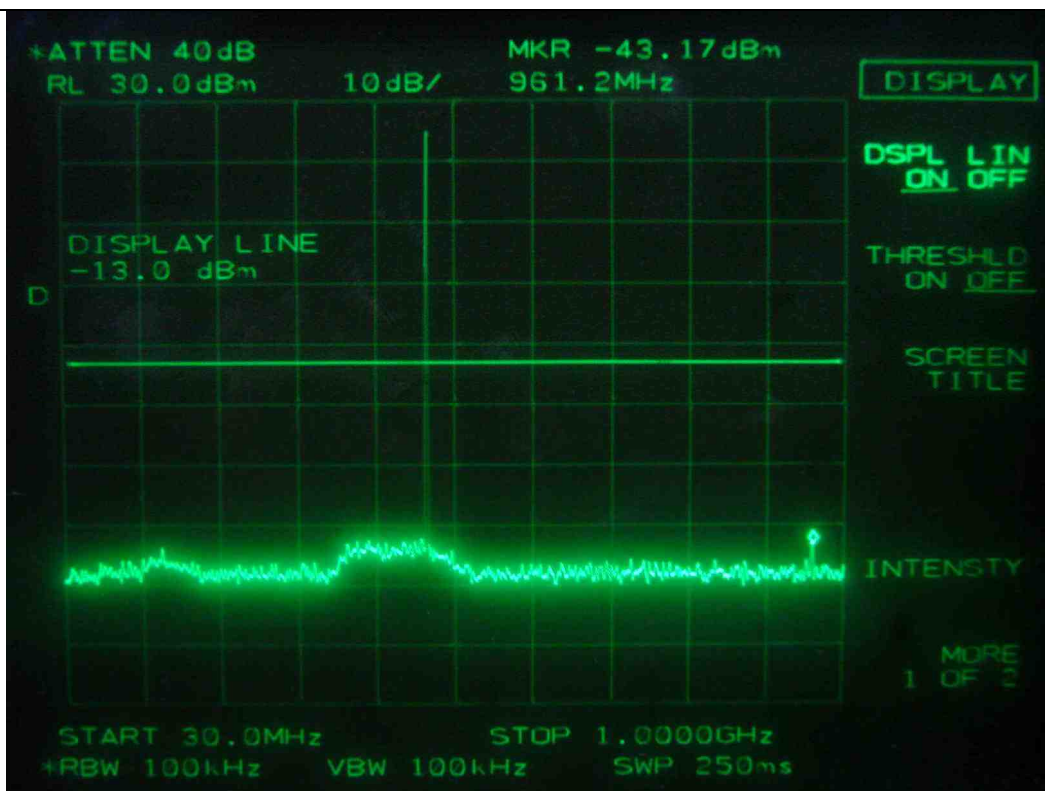


FM with an external 9 600 b/s random data source, Channel Spacing 25 kHz - Low Channel

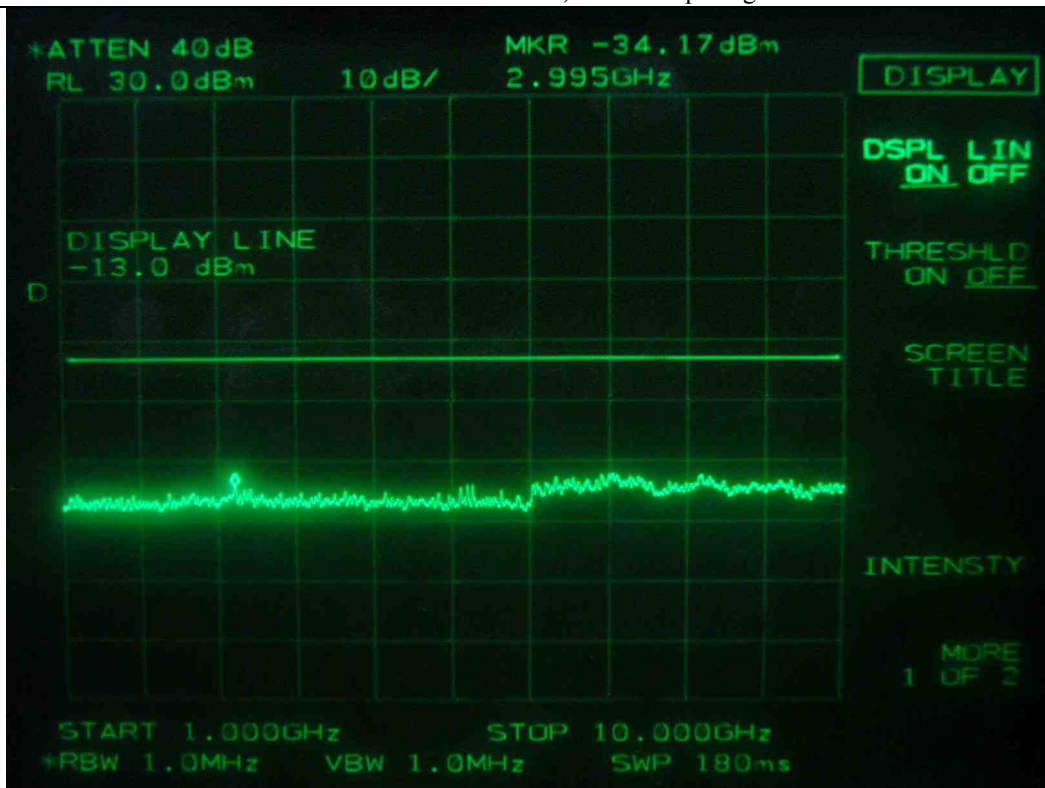


FM with an external 9 600 b/s random data source, Channel Spacing 25 kHz - Low Channel

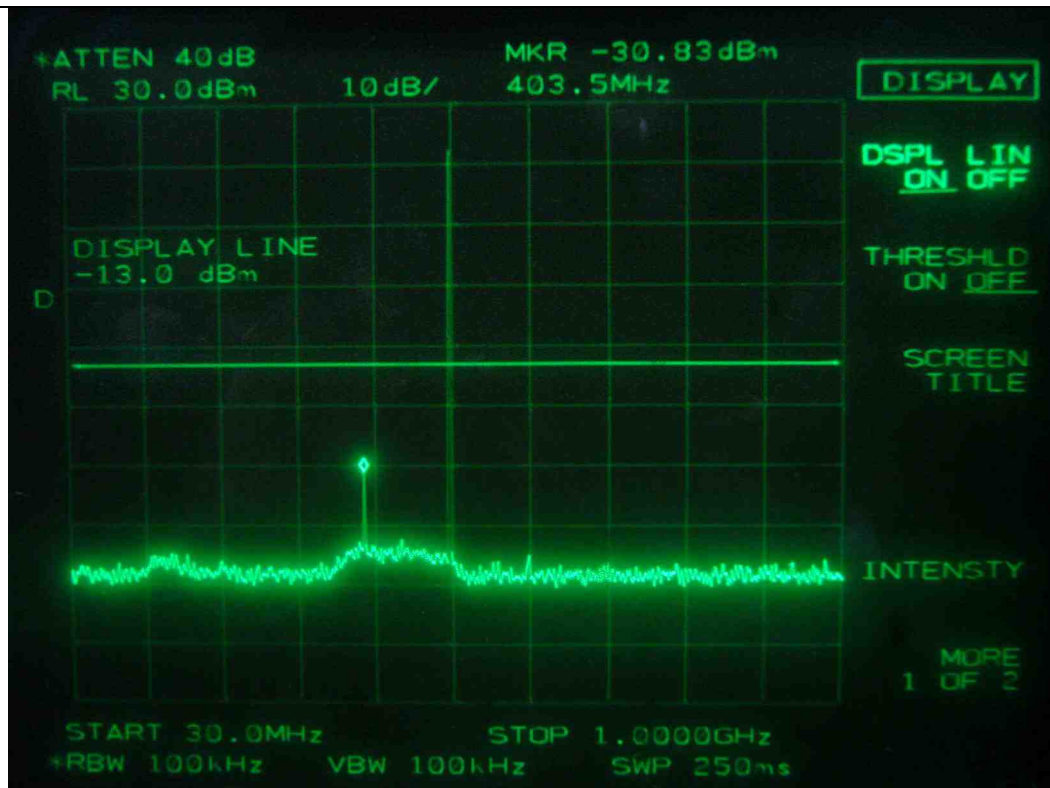




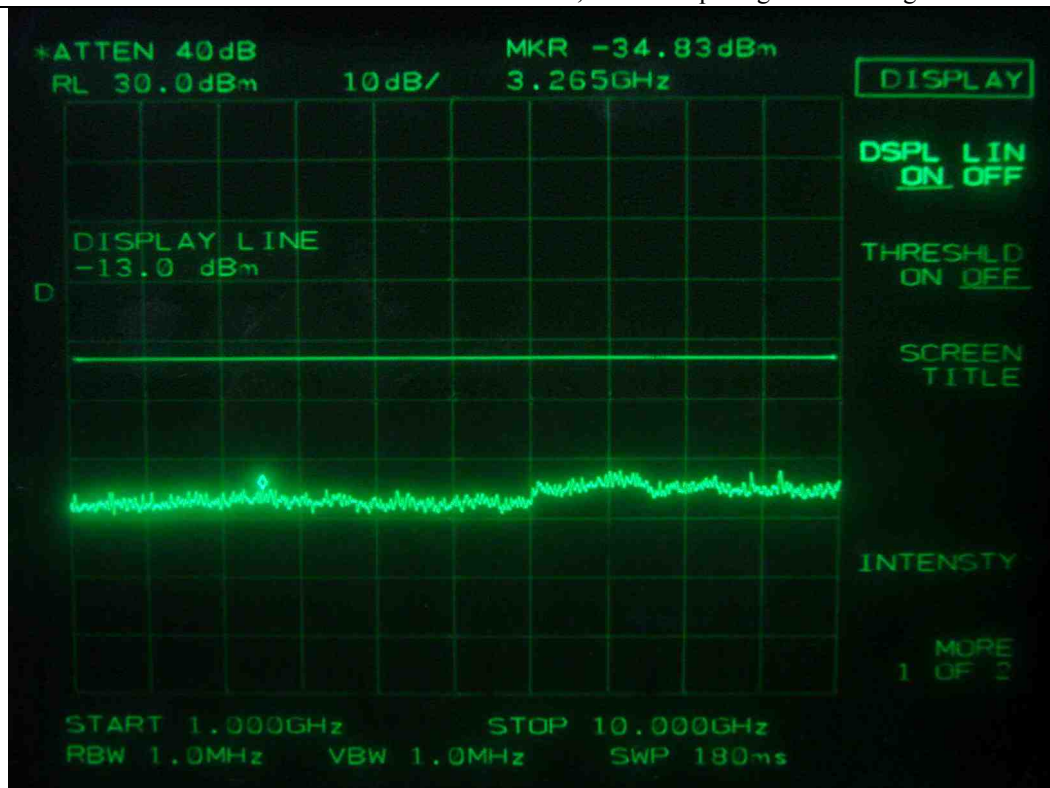
FM with an external 9 600 b/s random data source, Channel Spacing 25 kHz - Middle Channel



FM with an external 9 600 b/s random data source, Channel Spacing 25 kHz - Middle Channel



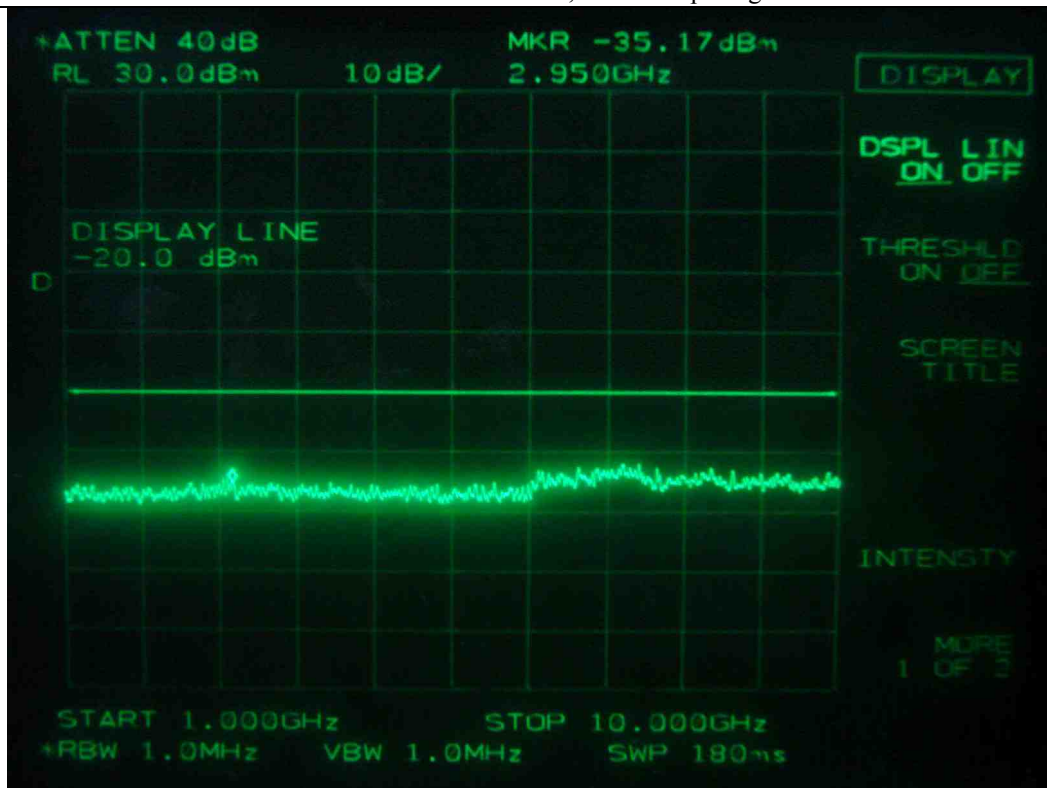
FM with an external 9 600 b/s random data source, Channel Spacing 25 kHz - High Channel



FM with an external 9 600 b/s random data source, Channel Spacing 25 kHz - High Channel

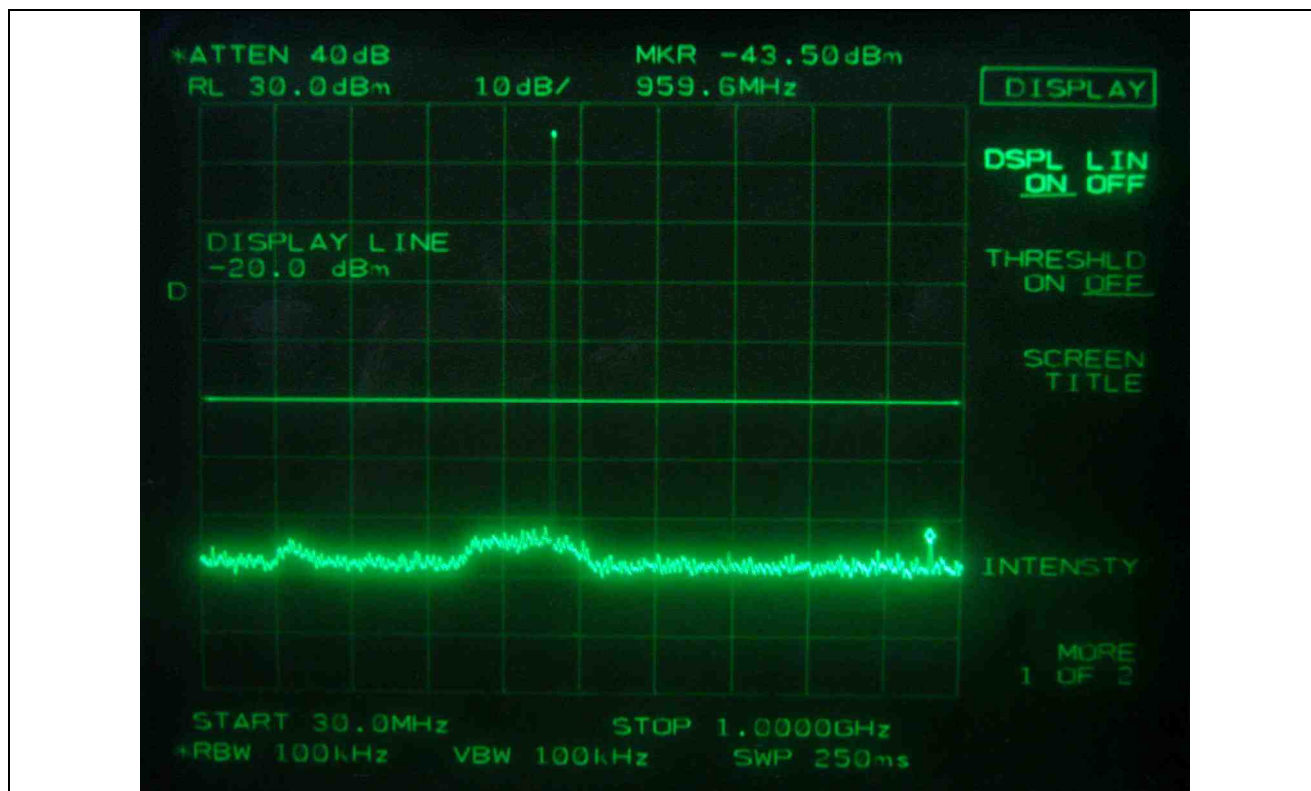


FM with an external 9 600 b/s random data source, Channel Spacing 12.5 kHz - Low Channel

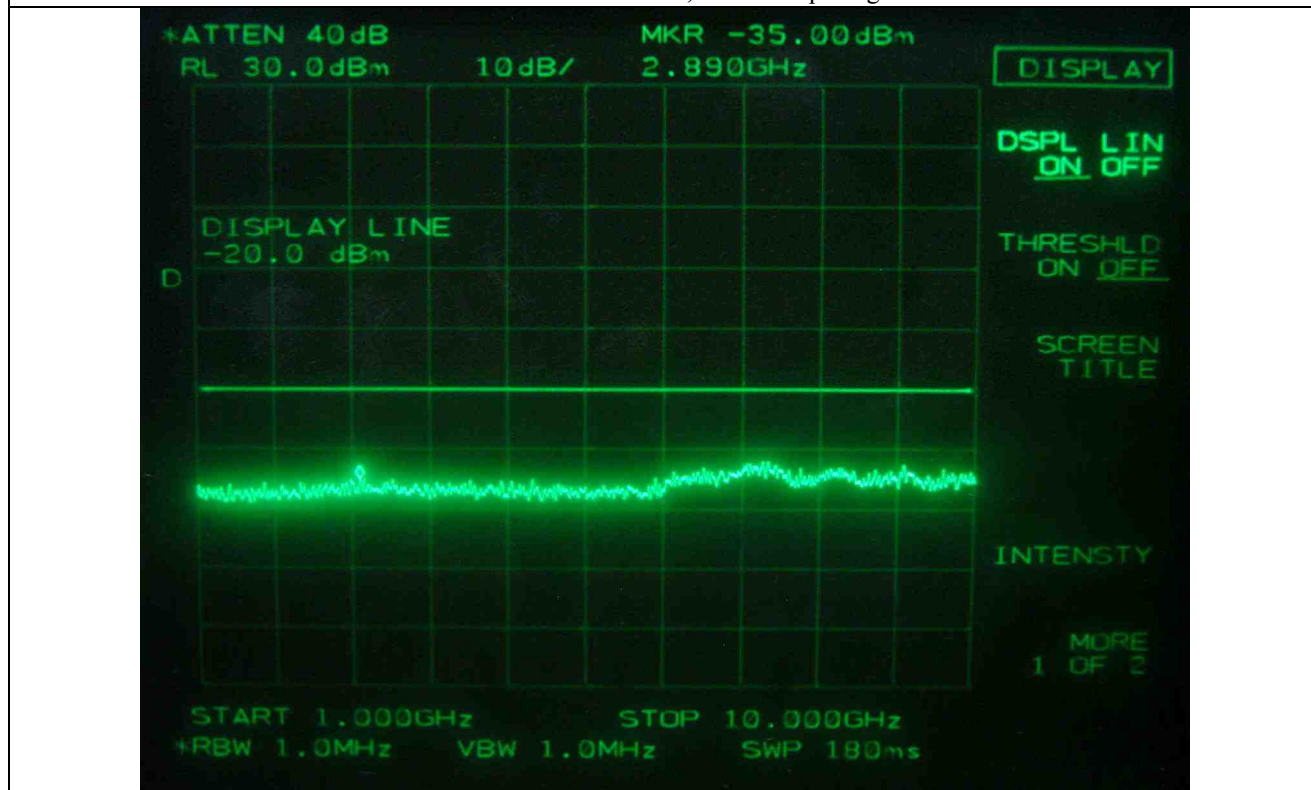


FM with an external 9 600 b/s random data source, Channel Spacing 12.5 kHz - Low Channel



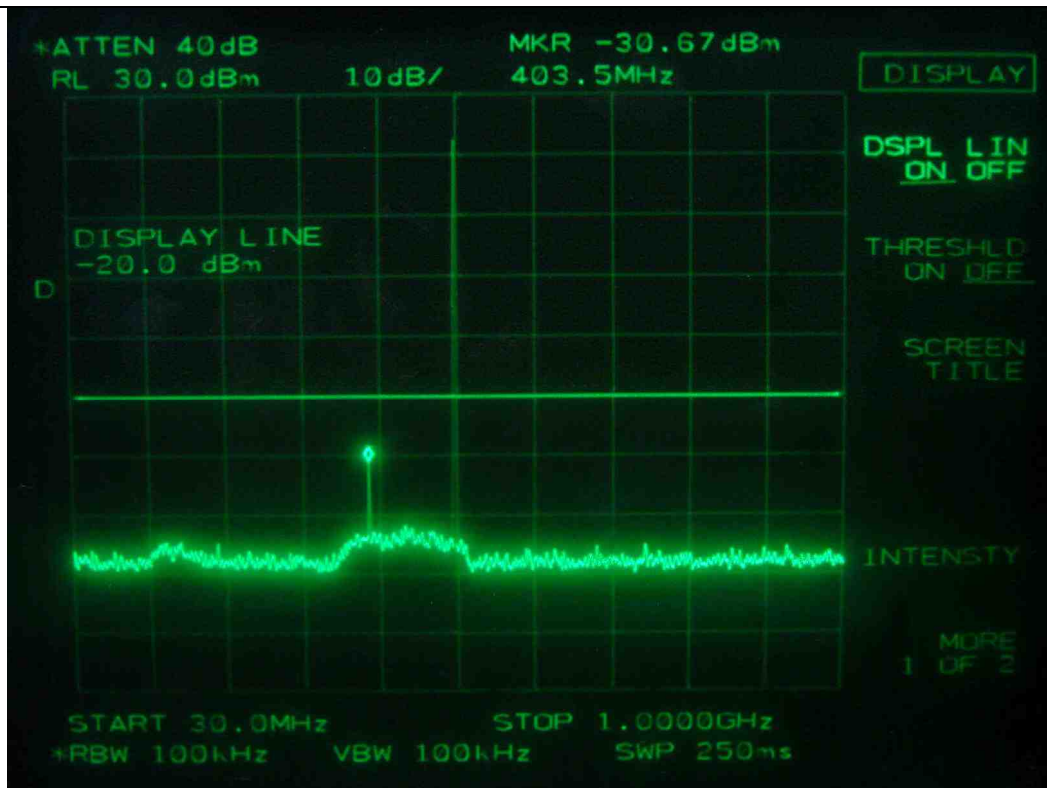


FM with an external 9 600 b/s random data source, Channel Spacing 12.5 kHz - Middle Channel

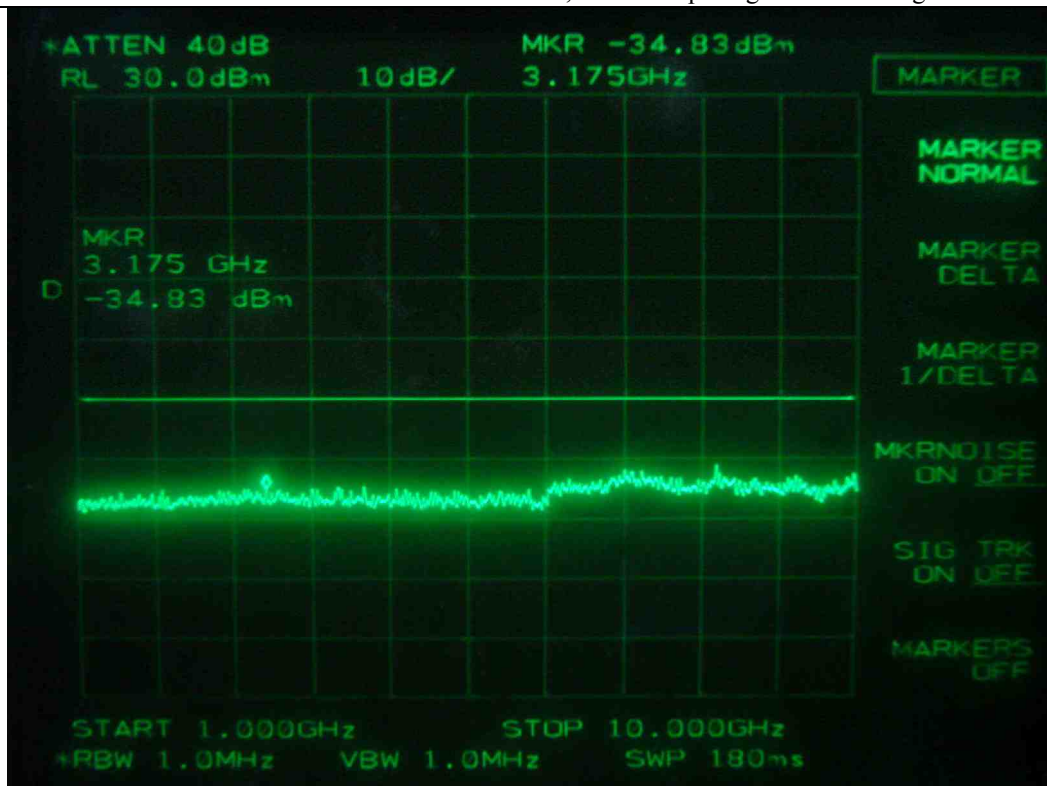


FM with an external 9 600 b/s random data source, Channel Spacing 12.5 kHz - Middle Channel

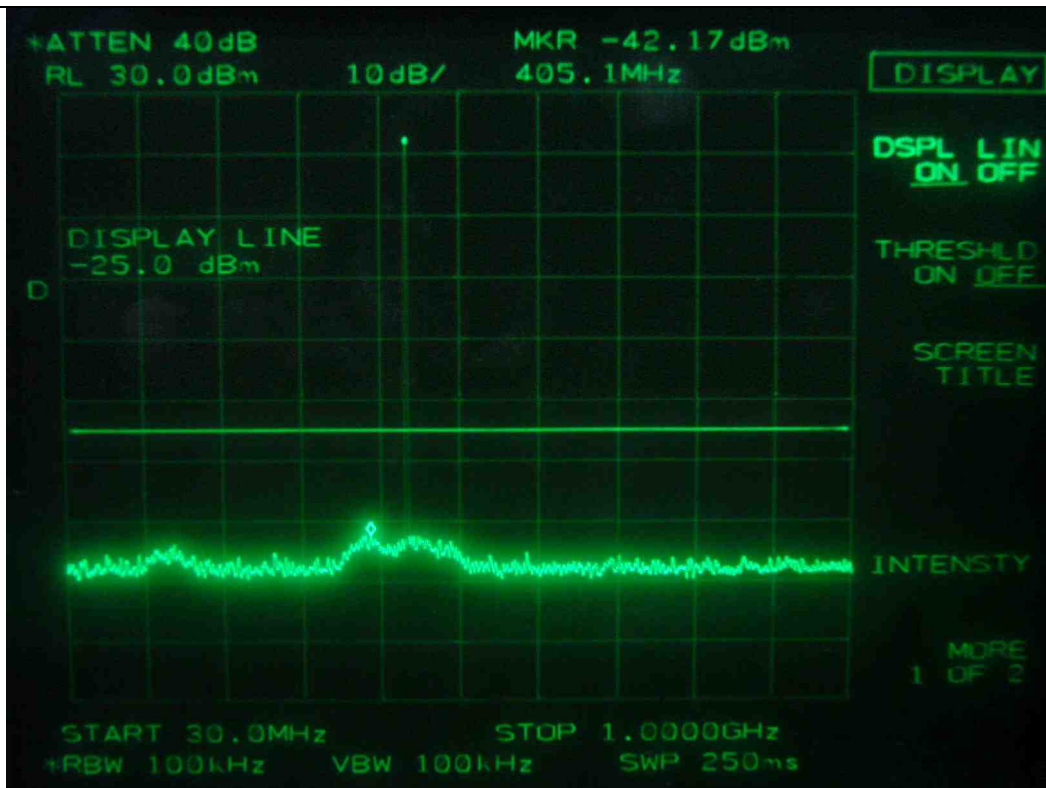




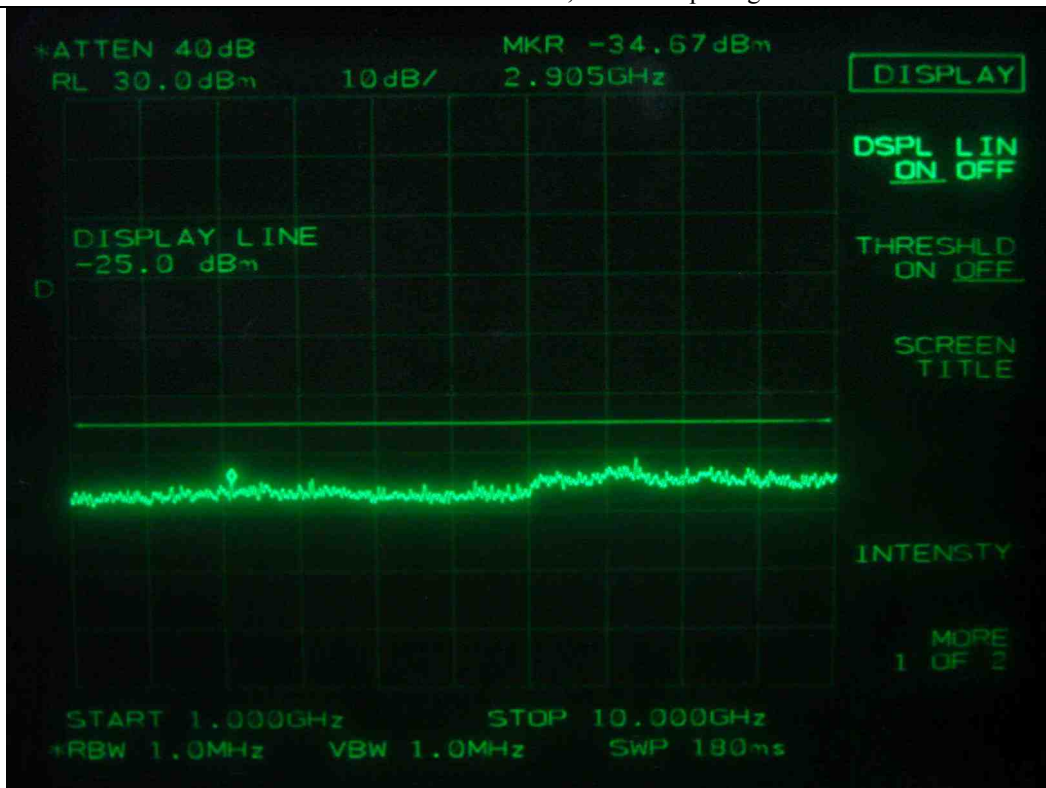
FM with an external 9 600 b/s random data source, Channel Spacing 12.5 kHz - High Channel



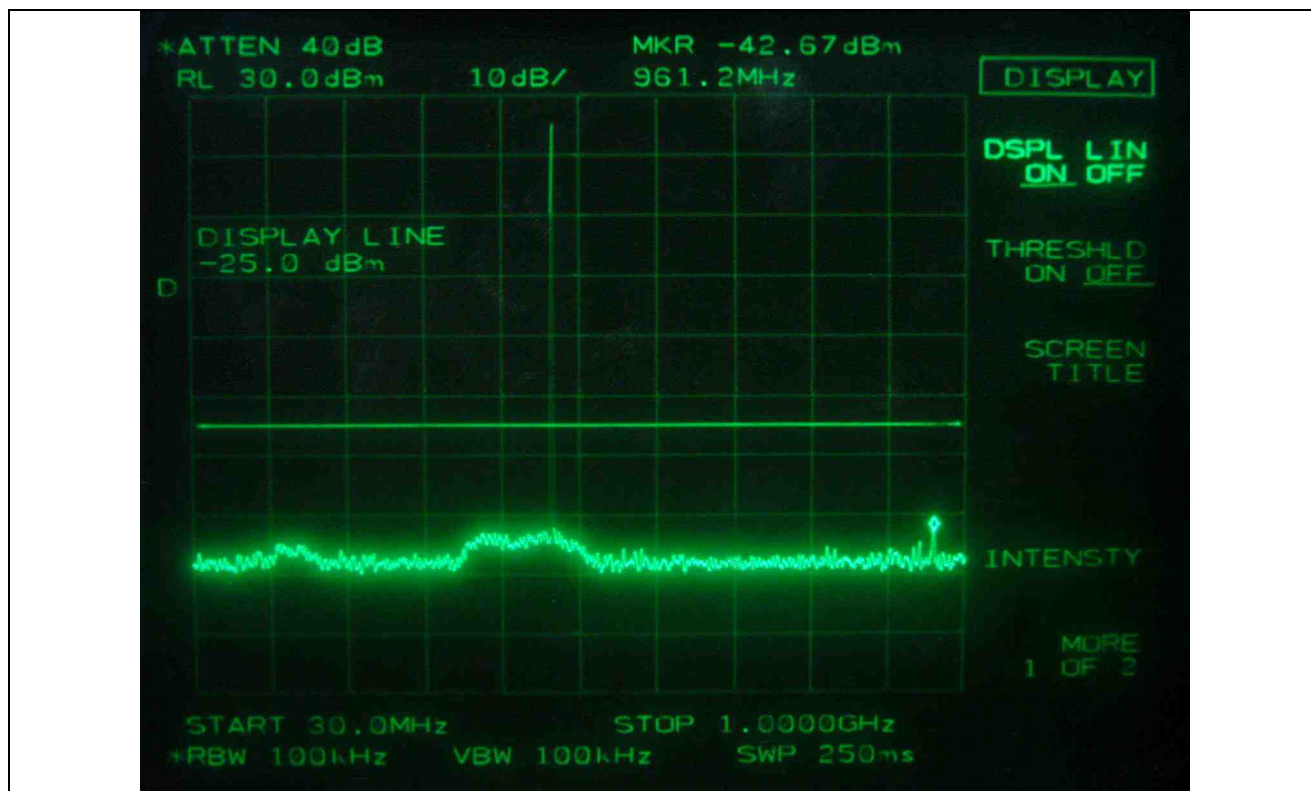
FM with an external 9 600 b/s random data source, Channel Spacing 12.5 kHz - High Channel



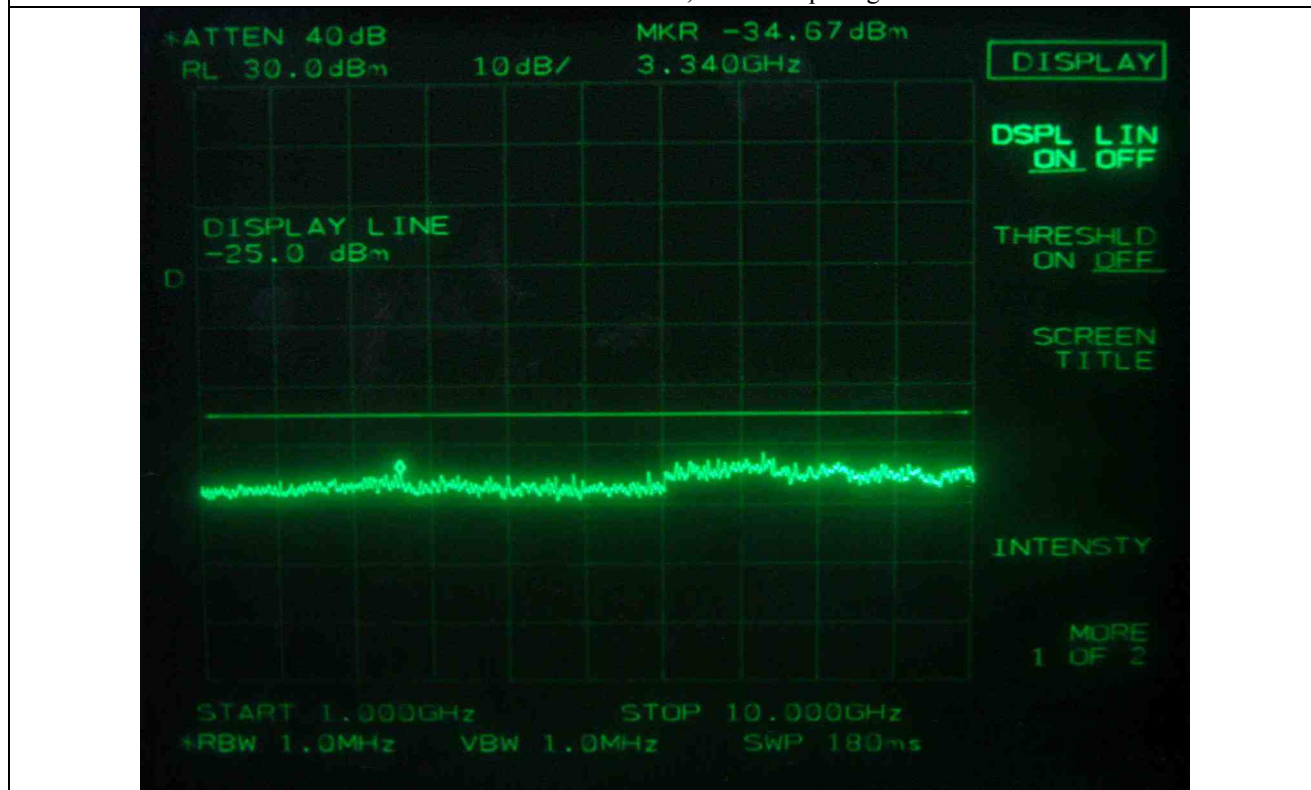
FM with an external 9 600 b/s random data source, Channel Spacing 6.25 kHz - Low Channel



FM with an external 9 600 b/s random data source, Channel Spacing 6.25 kHz - Low Channel

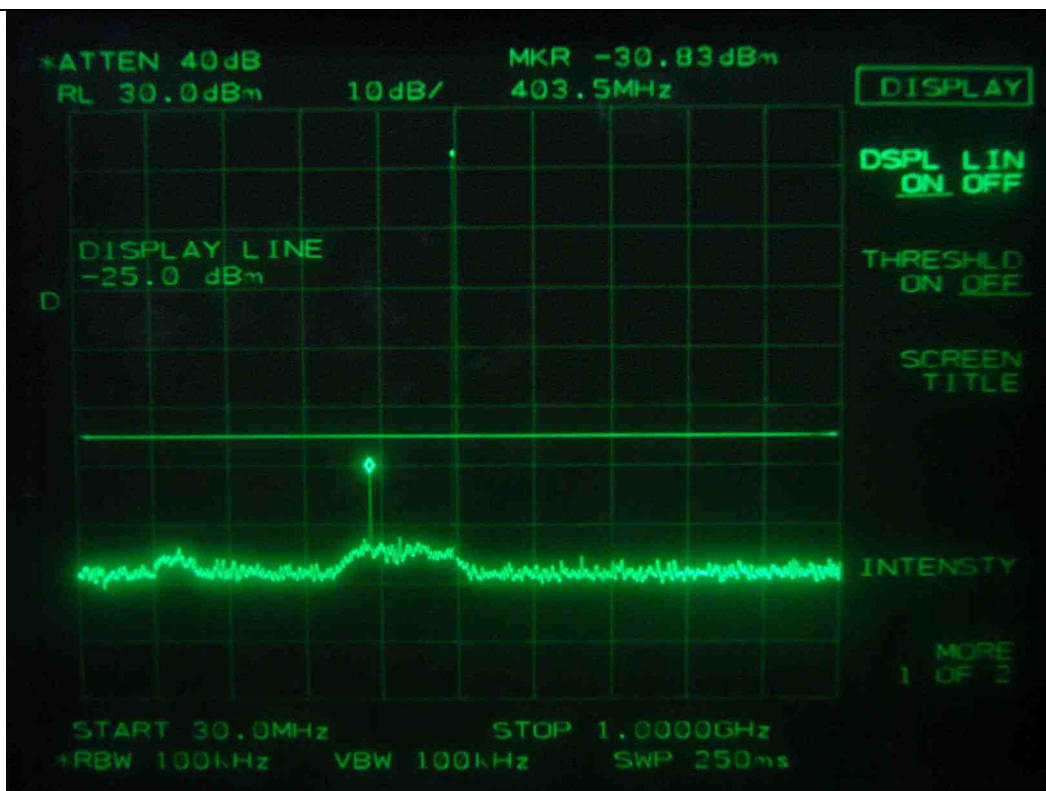


FM with an external 9 600 b/s random data source, Channel Spacing 6.25 kHz - Middle Channel

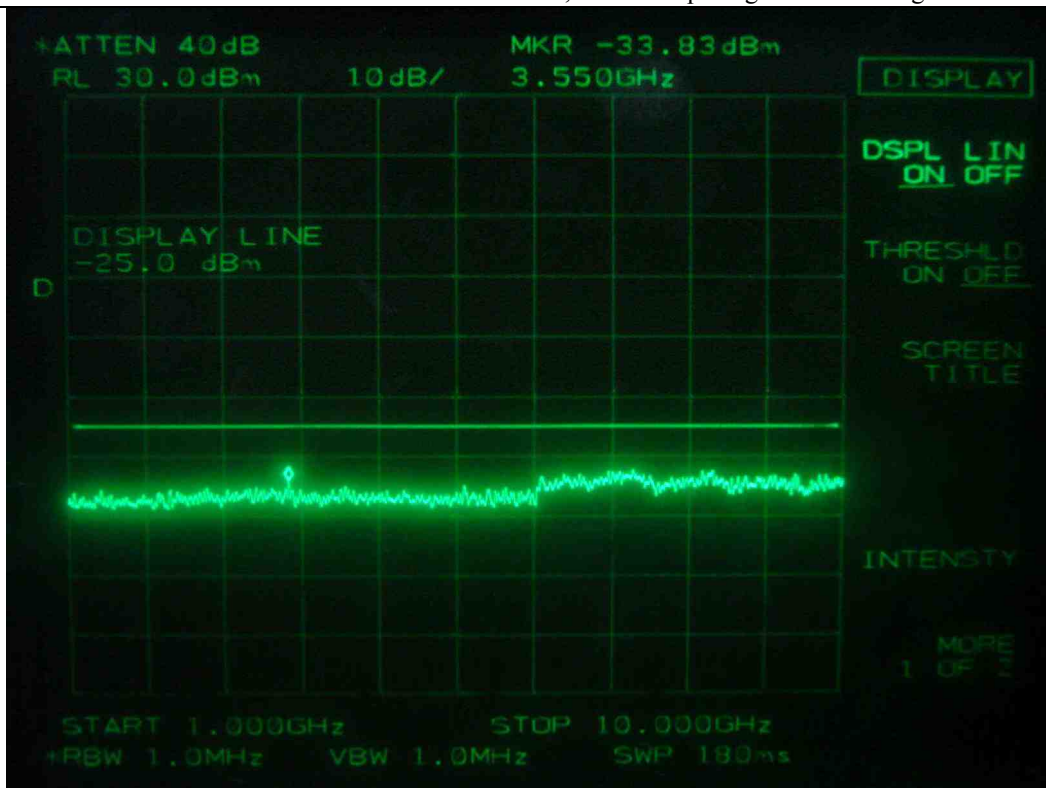


FM with an external 9 600 b/s random data source, Channel Spacing 6.25 kHz - Middle Channel





FM with an external 9 600 b/s random data source, Channel Spacing 6.25 kHz - High Channel



FM with an external 9 600 b/s random data source, Channel Spacing 6.25 kHz - High Channel

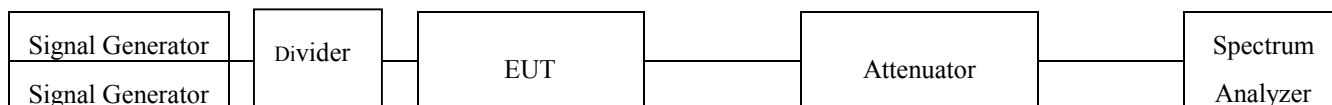


## 8. INTERMODULATION TEST

### 8.1 Test set-up

The RF signal from the signal generator(s) was injected to the EUT and the amplified RF signal at the output of the EUT was connected to the power meter or spectrum analyzer. The test was performed at three frequencies (low, middle, and high channels) at each band using all applicable modulation.

Two input signals are equal in level and were sent to the input of the EUT.



### 8.2 Test equipment used

	Model Number	Manufacturer	Description	Serial Number	Last Cal.
■ -	E4432B	HP	Signal Generator	US38440950	June 15, 2009
■ -	SMJ100A	R/S	Signal Generator	101038	Feb. 04, 2009
■ -	8564E	HP	Spectrum Analyzer	3650A00756	June 15, 2009
■ -	D-05180-2	PLC Electronics	Power Divider	0813	Apr. 15, 2009
□ -	FSP	R/S	Spectrum Analyzer	100017	Mar. 11, 2009

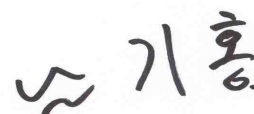
All test equipment used is calibrated on a regular basis.

### 8.3 Test data W/No-Modulation

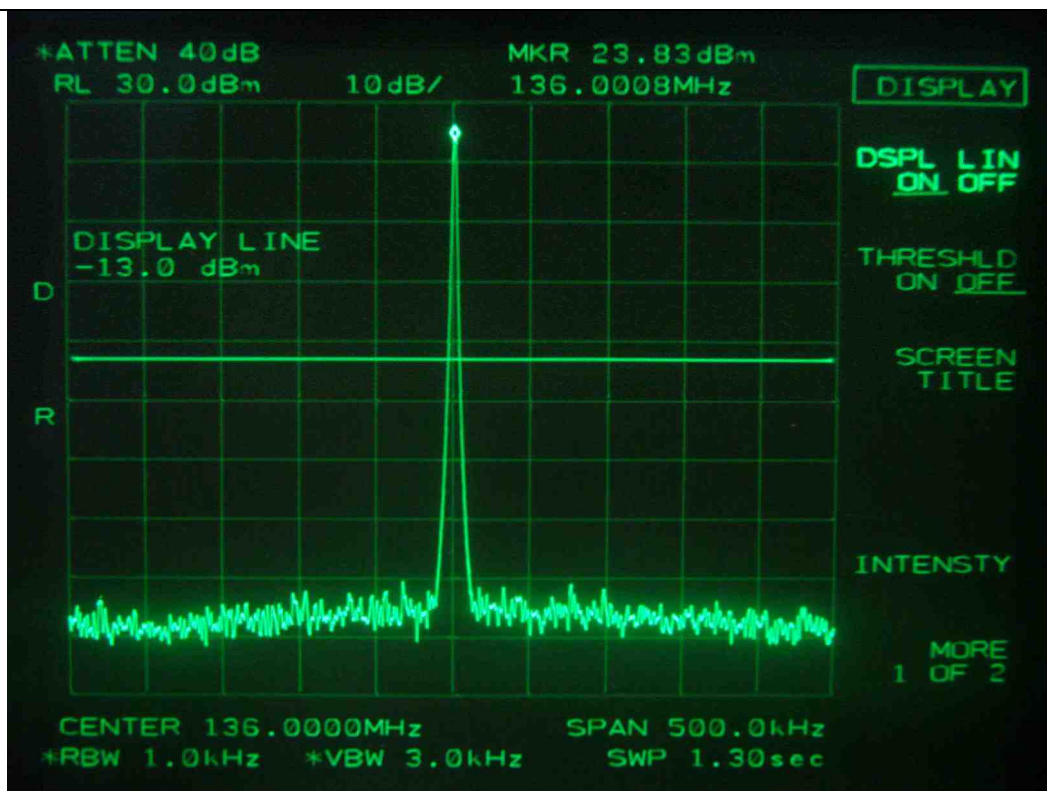
#### 8.3.1 Test Result for peak power at VHF band

-. Test Date : November 09, 2009  
-. Temperature : 24 °C  
-. Relative humidity : 47 % R.H.  
-. Test Result : Pass  
-. Modulation : No-Modulation

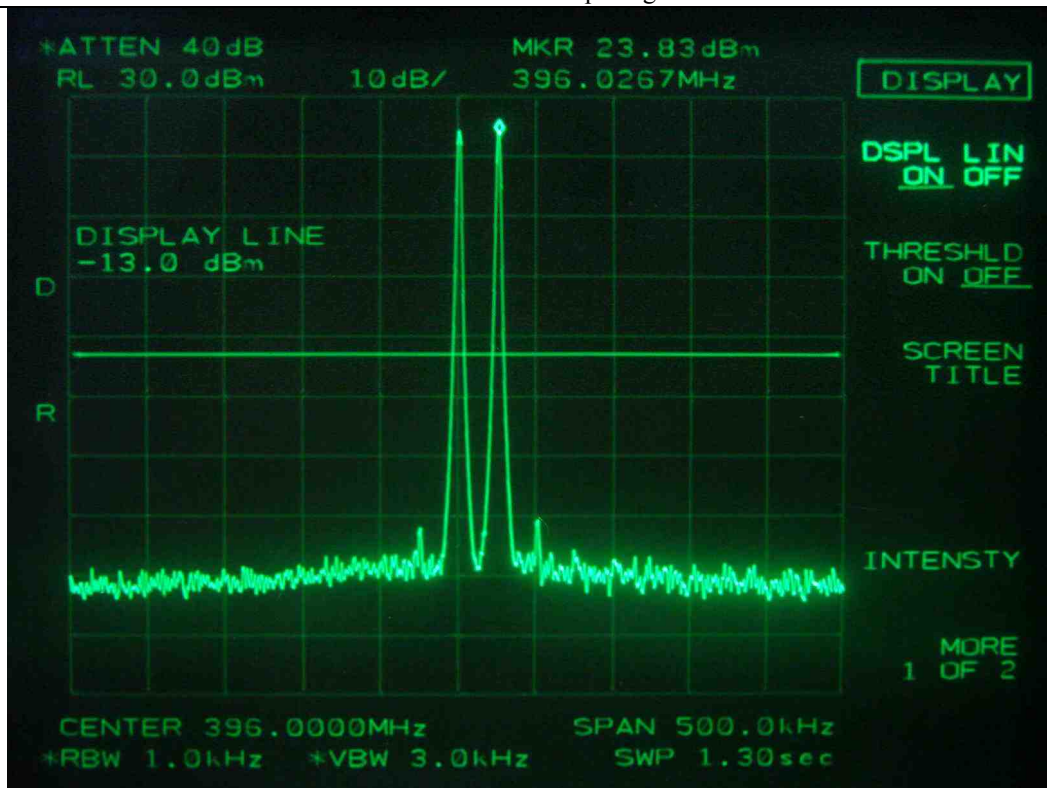
Frequency (MHz)	Number of Input Channel	Input Power (dBm)	Output Power (dBm)
136.0	1	-17.67	23.83
136.0 136.25	2	-17.83	24.0
136, 136.025 & 136.050	3	-17.72	23.83
174.0	1	-17.83	23.67
174.0 & 173.975	2	-17.67	24.0
174.0, 173.975 & 173.950	3	-17.80	23.67



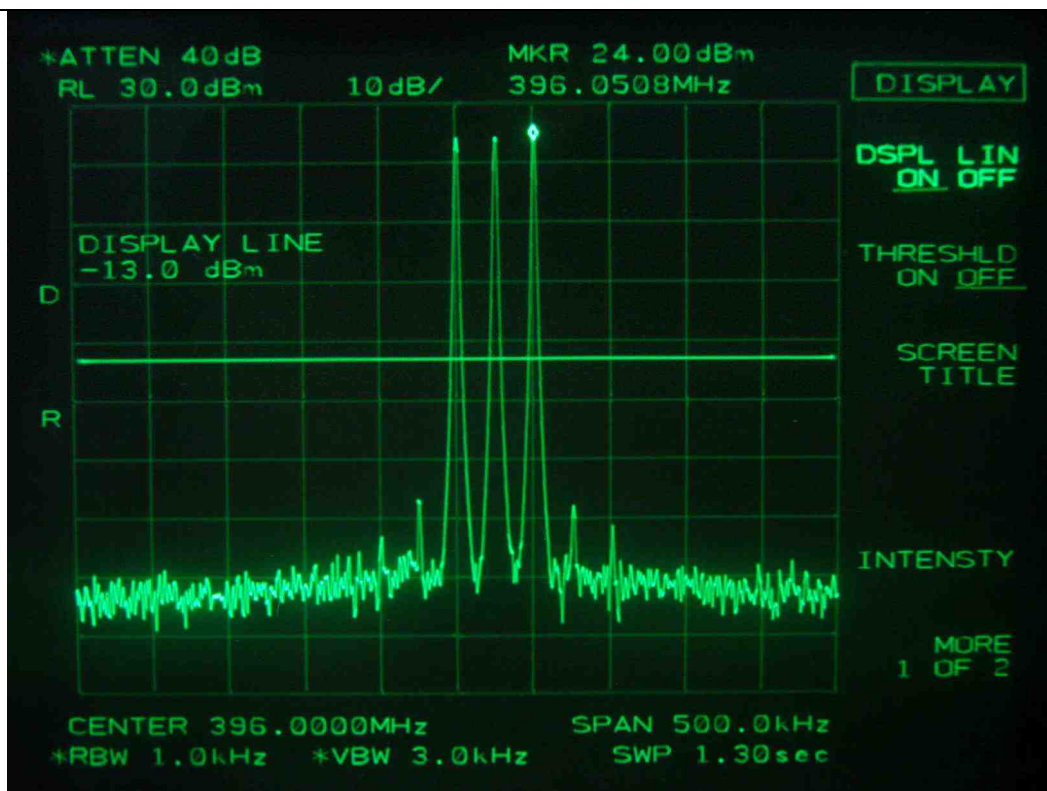
Tested by: Ki-Hong, Nam / Project Engineer



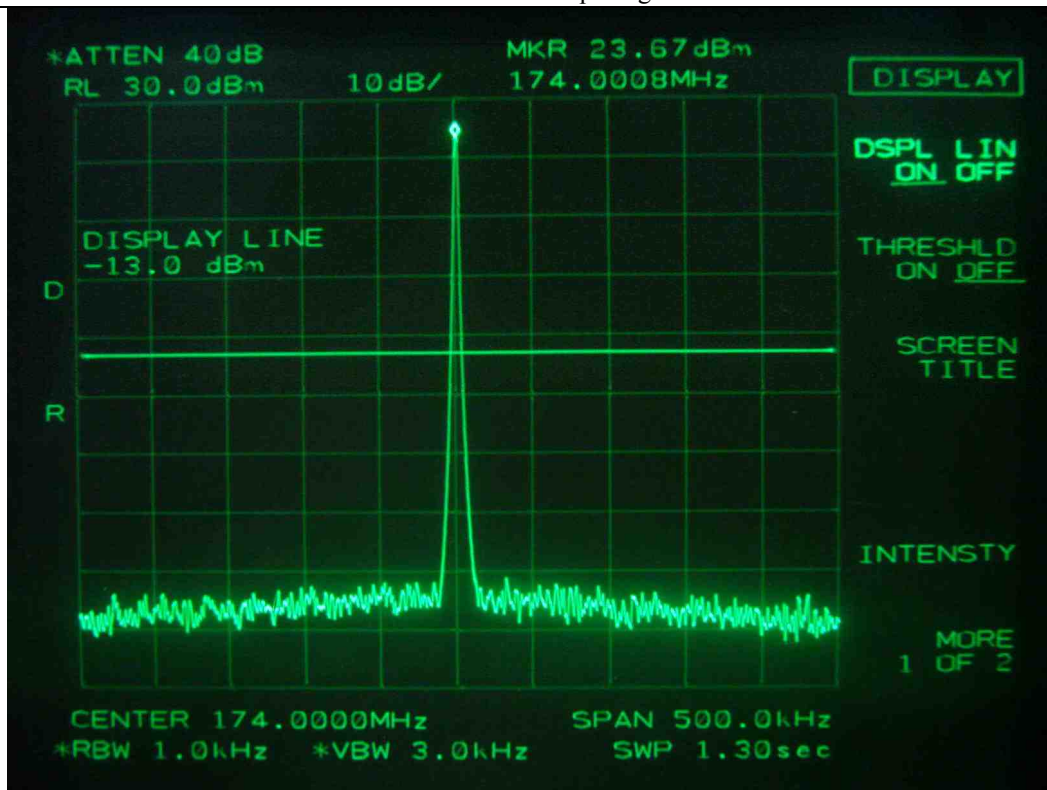
Low Channel – 1 input signal



Low Channel – 2 input signals

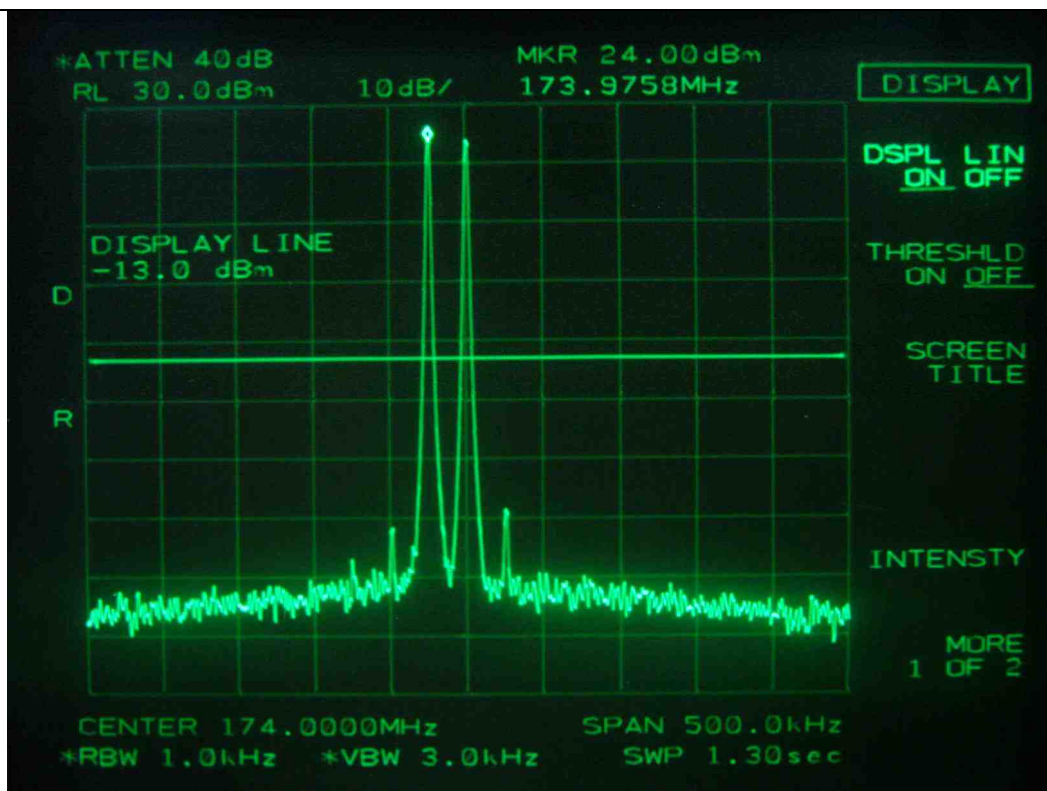


Low Channel – 3 input signals

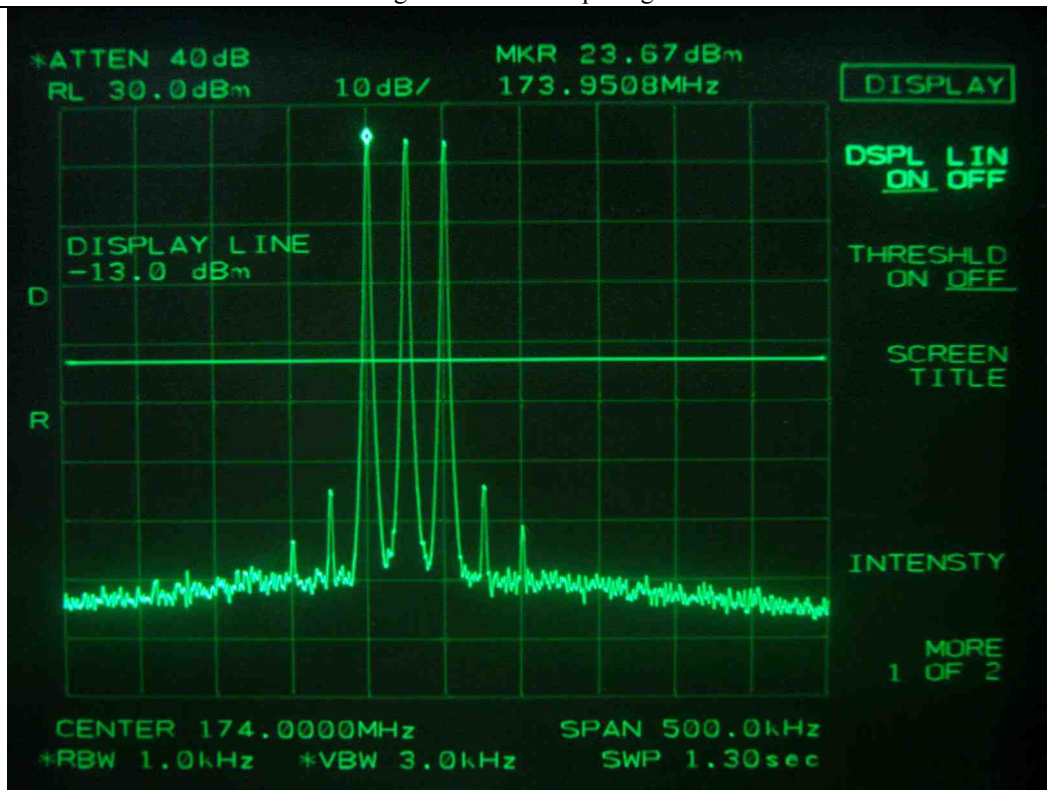


High Channel – 1 input signal





High Channel – 2 input signals



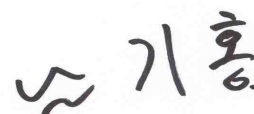
High Channel – 3 input signals

### 8.3.2 Test Result for Spurious emission at VHF band

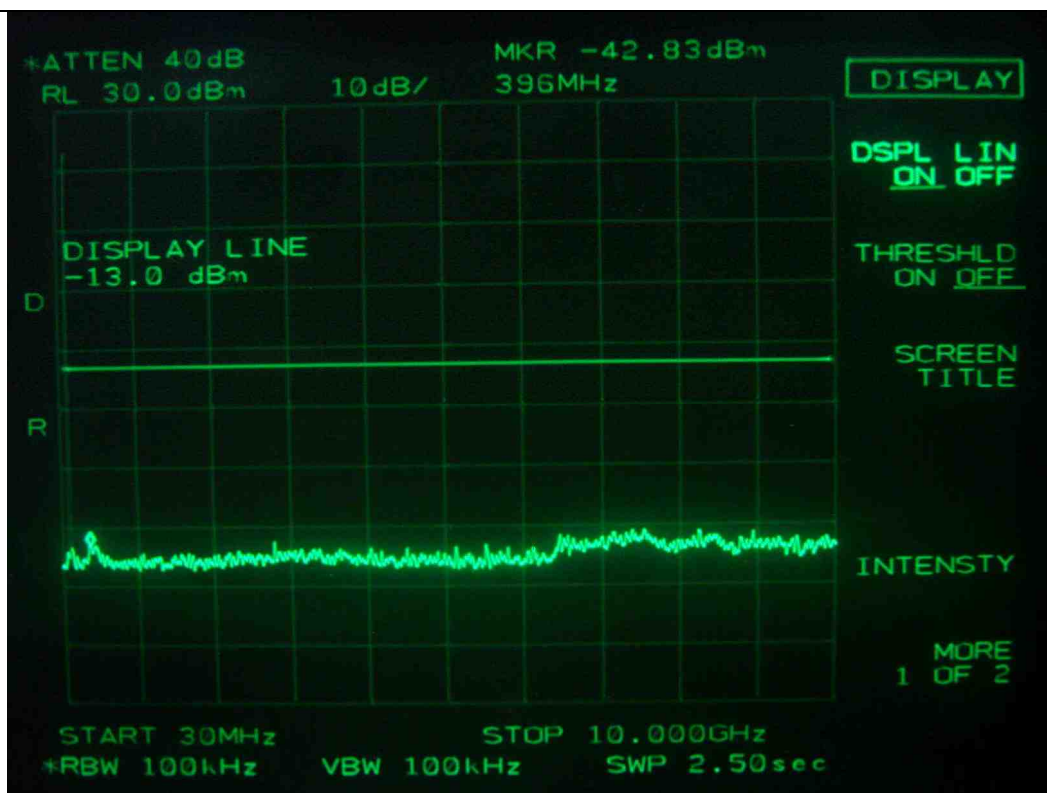
-. Test Date : November 09, 2009  
-. Temperature : 24 °C  
-. Relative humidity : 47 % R.H.  
-. Test Result : Pass  
-. Modulation : No-Modulation

Frequency (MHz)	Number of Input Channel	Measured Value	Result
136.0	1	< -13 dBm	Pass
136.0 136.25	2		
136, 136.025 & 136.050	3		
174.0	1	< -13 dBm	Pass
174.0 & 173.975	2		
174.0, 173.975 & 173.950	3		

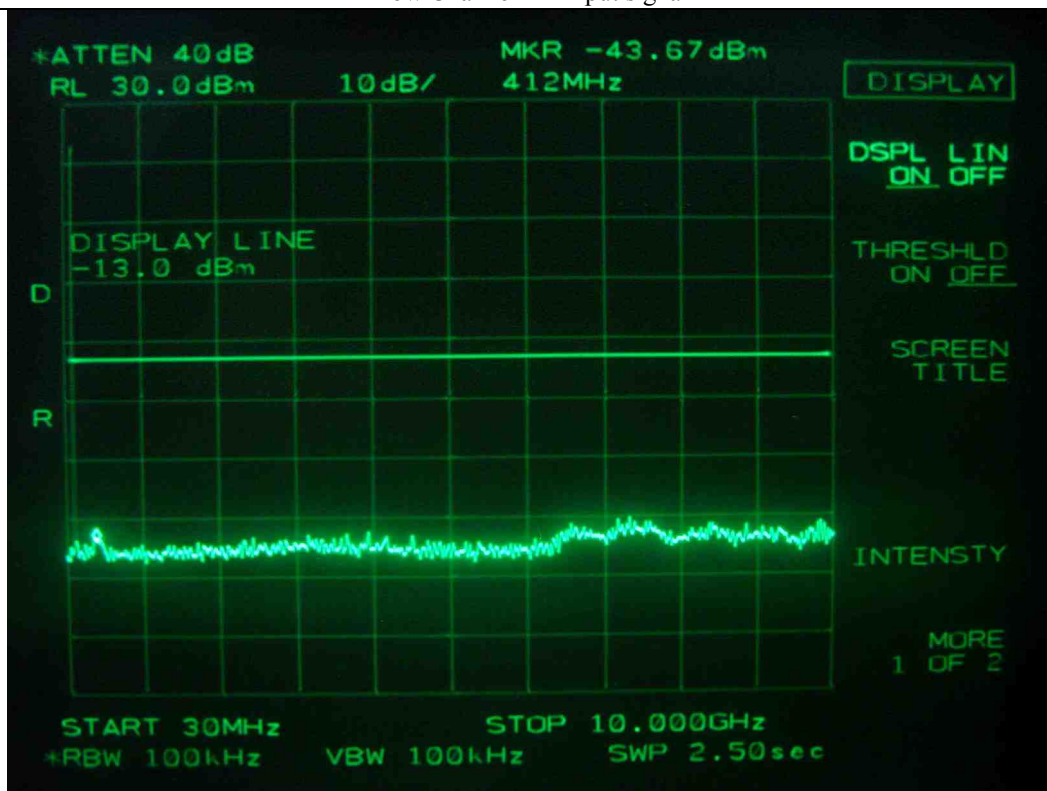
Remark: Intermodulation products must be attenuated below the rated power of the EUT at least  $43 + 10\log(P_w)$ , equivalent to -13 dBm. Please refer to test data hereinafter.



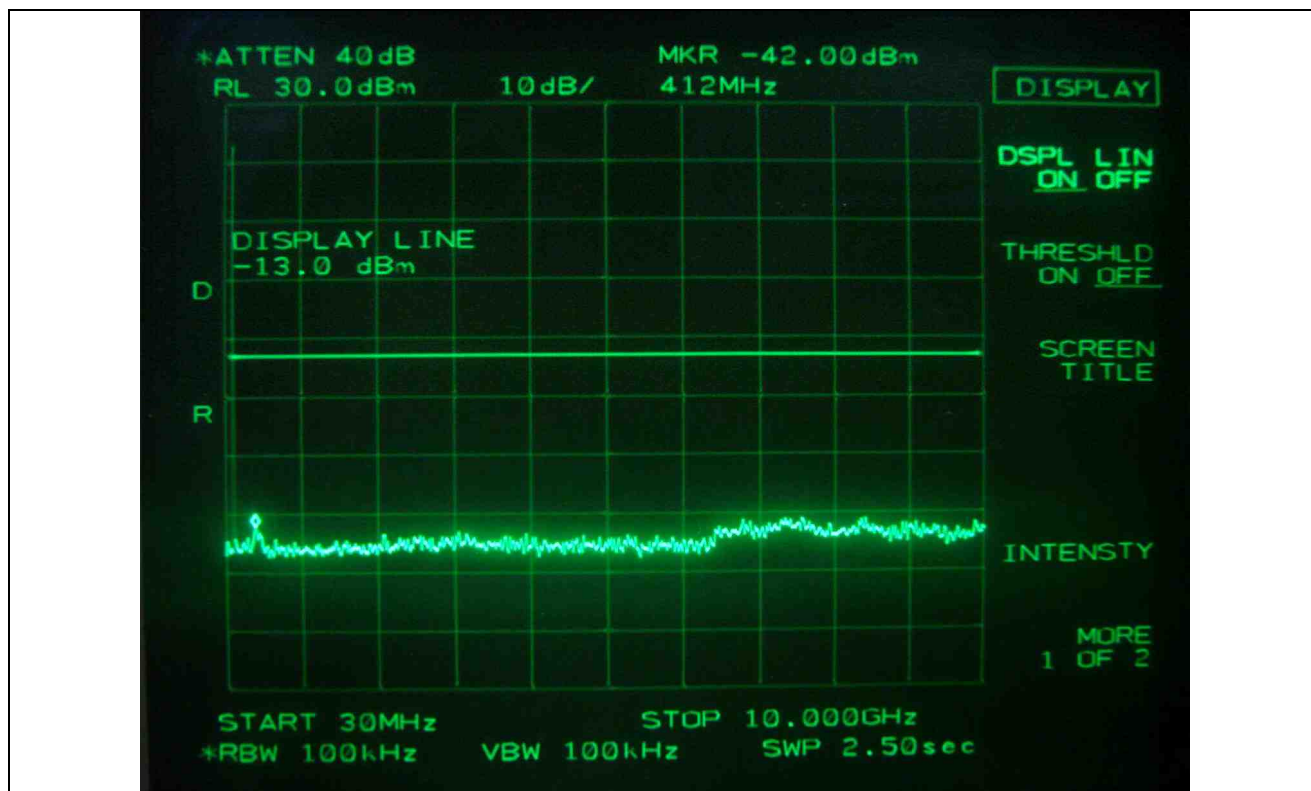
Tested by: Ki-Hong, Nam / Project Engineer



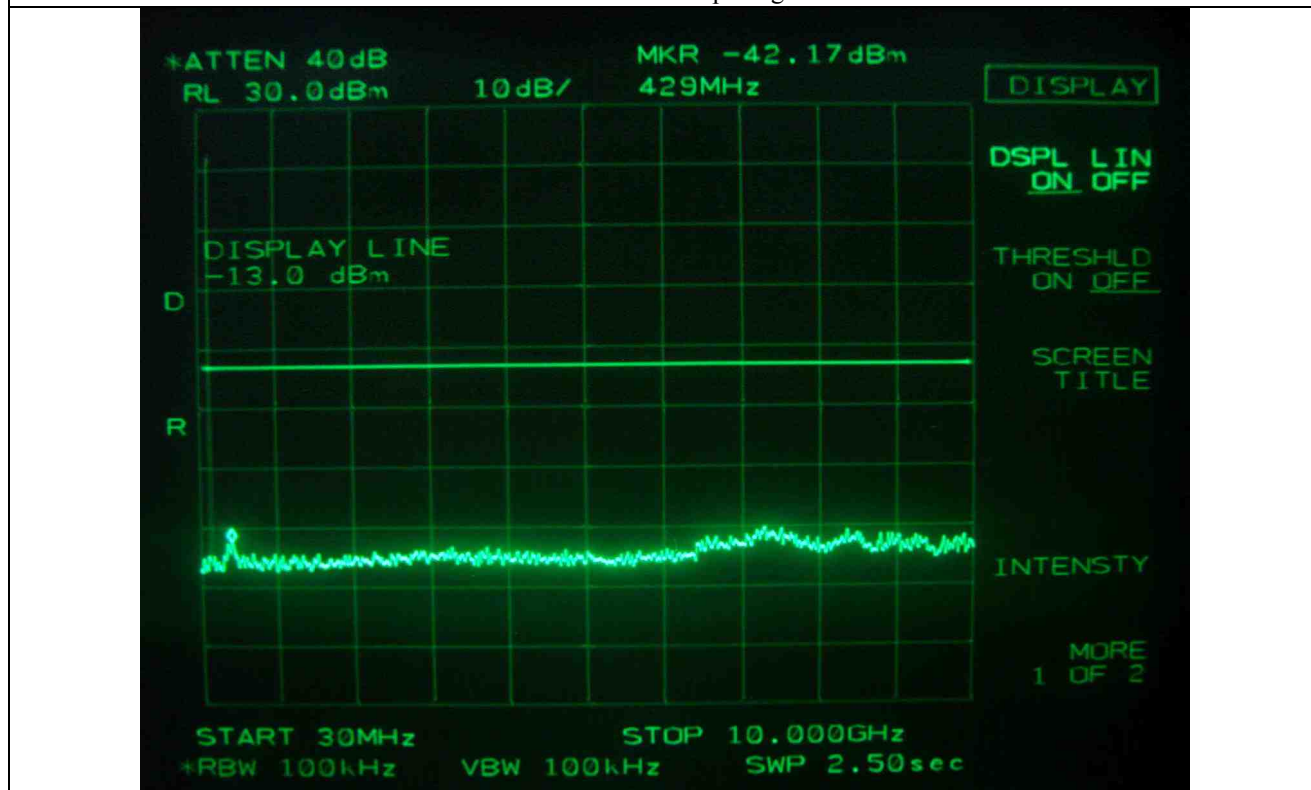
Low Channel – 1 input signal



Low Channel – 2 input signals

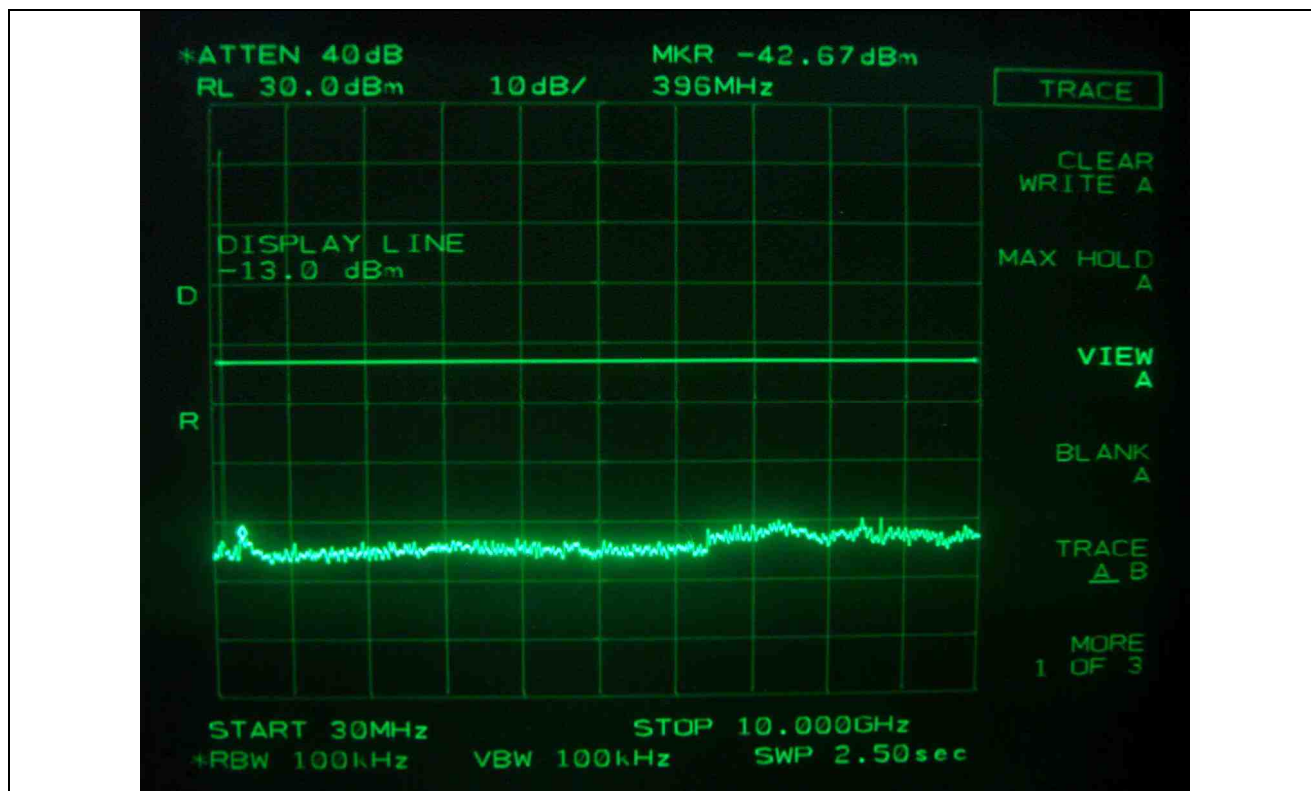


Low Channel – 3 input signals

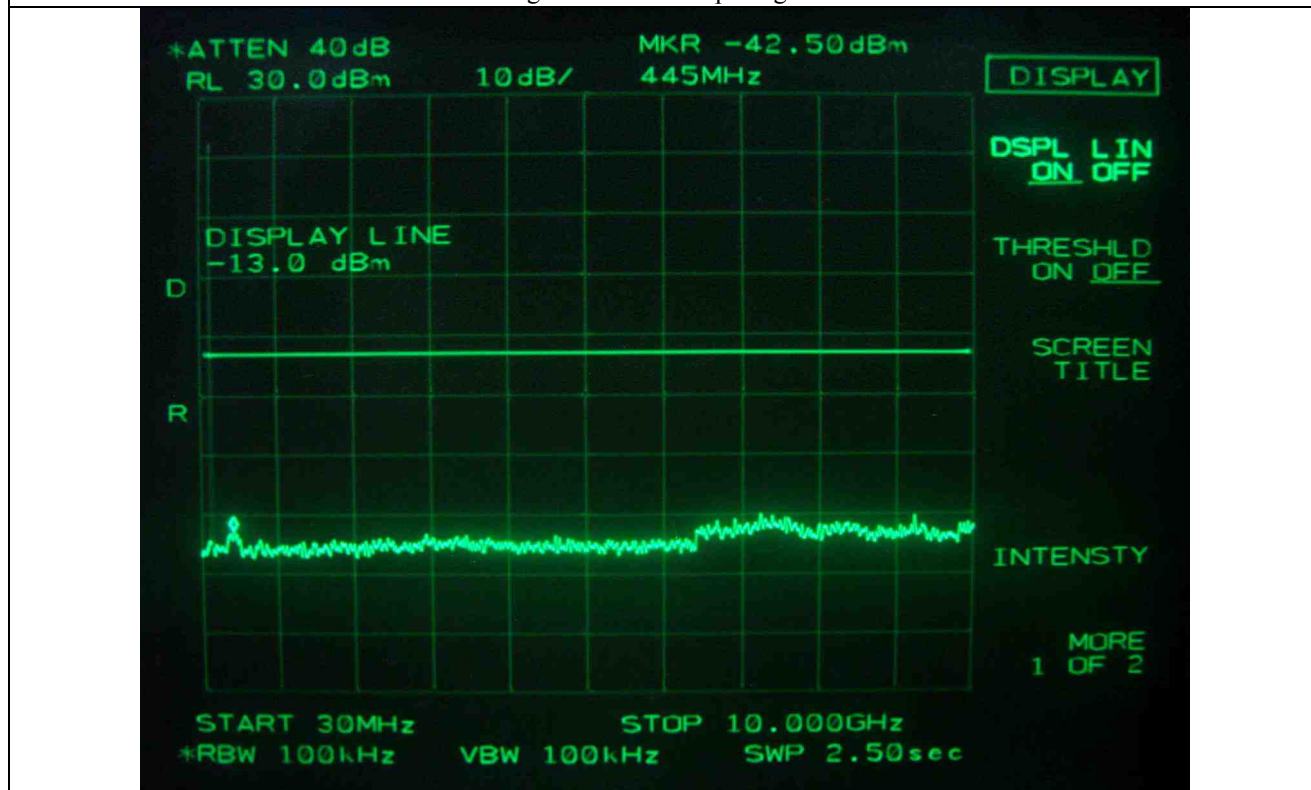


High Channel – 1 input signal





High Channel – 2 input signals

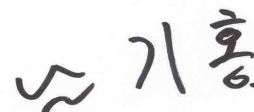


High Channel – 3 input signals

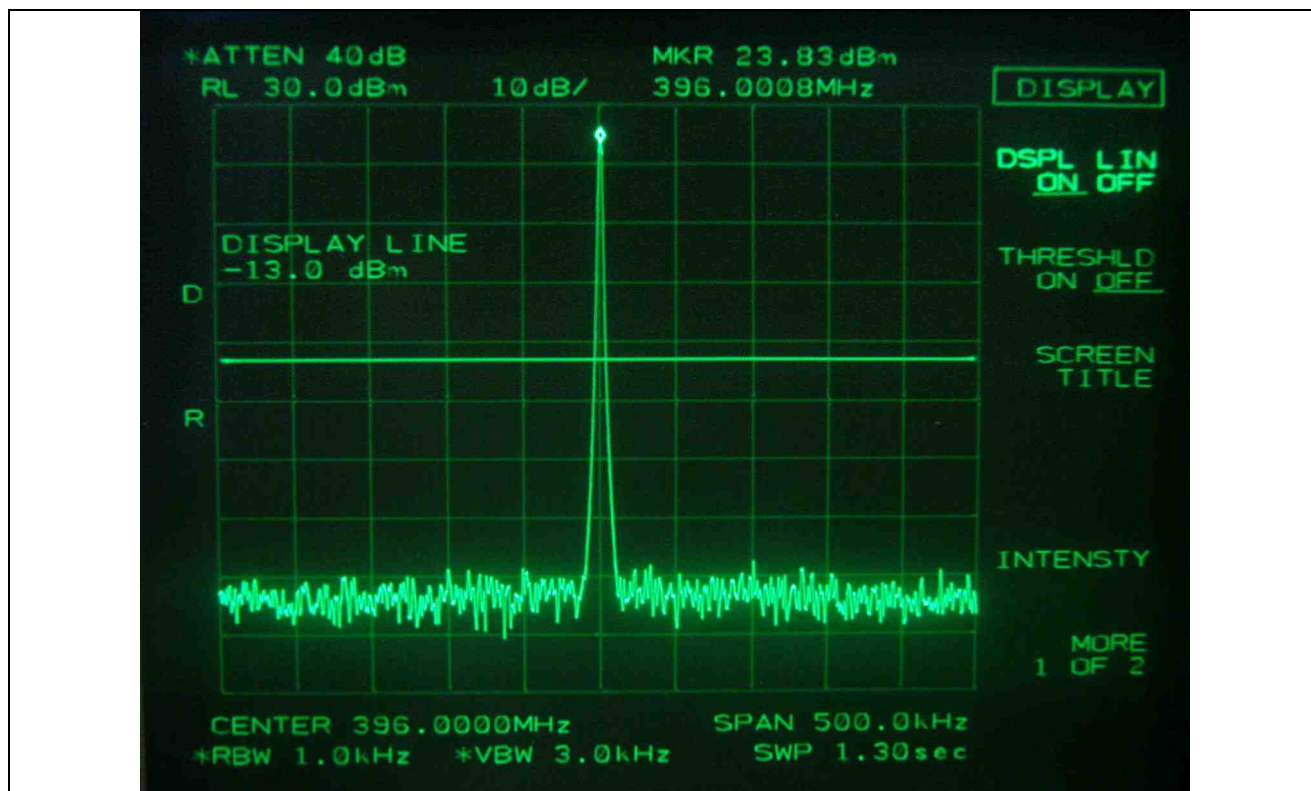
**8.3.3 Test Result for peak power at UHF band BI**

-. Test Date : November 09, 2009  
-. Temperature : 24 °C  
-. Relative humidity : 47 % R.H.  
-. Test Result : Pass  
-. Modulation : No-Modulation

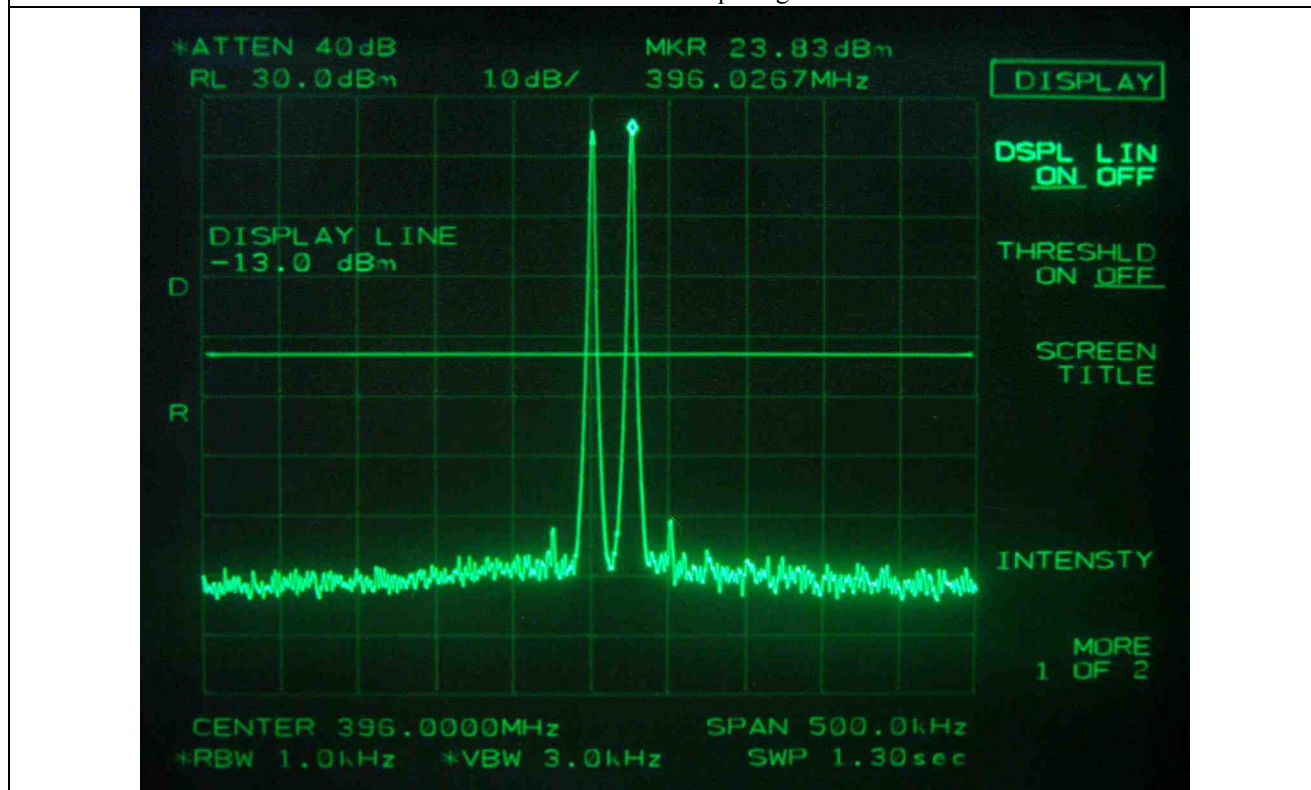
Frequency (MHz)	Number of Input Channel	Input Power (dBm)	Output Power (dBm)
396.0	1	-17.67	23.83
396.0 & 396.25	2	-17.83	24.0
396, 396.025 & 396.050	3	-17.72	23.83
450.0	1	-17.83	23.67
450.0 & 449.975	2	-17.67	24.0
450.0, 449.975 & 449.950	3	-17.80	23.67



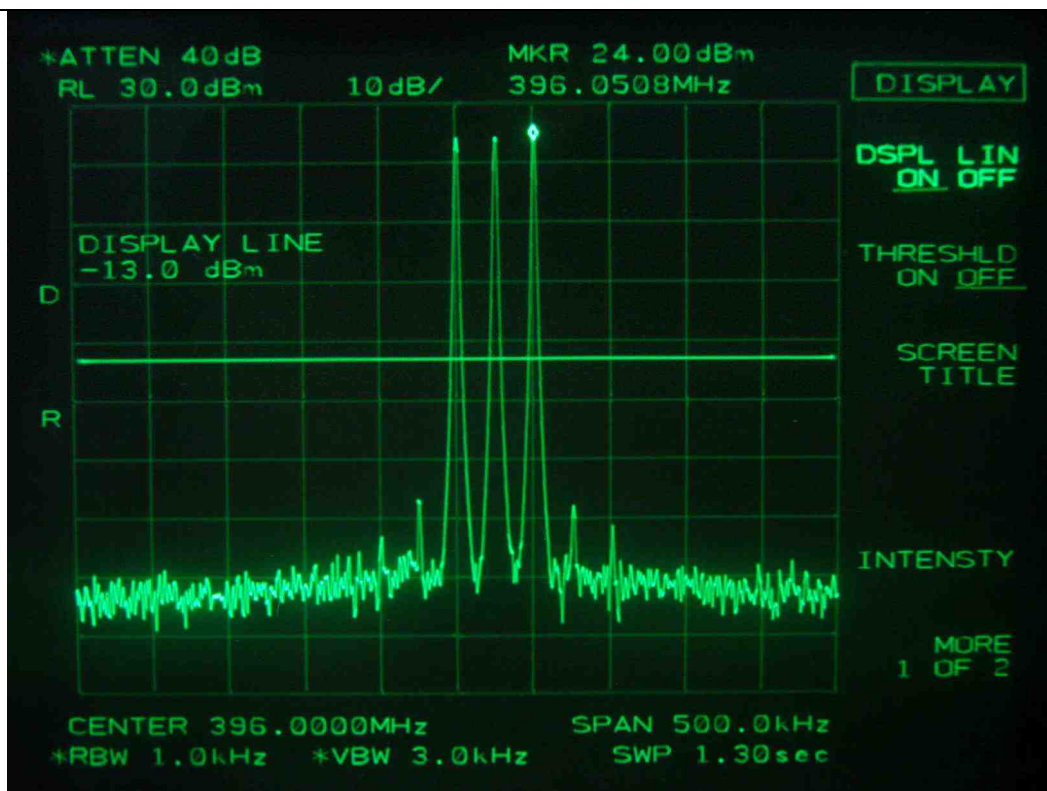
Tested by: Ki-Hong, Nam / Project Engineer



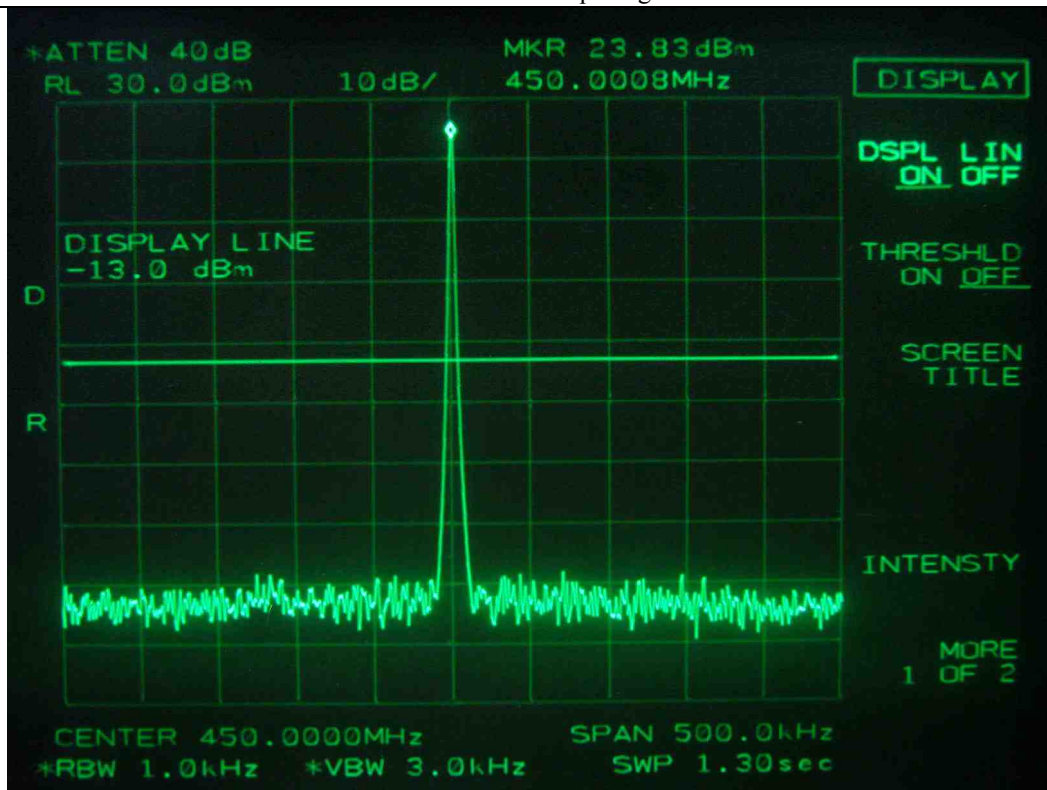
Low Channel – 1 input signal



Low Channel – 2 input signals

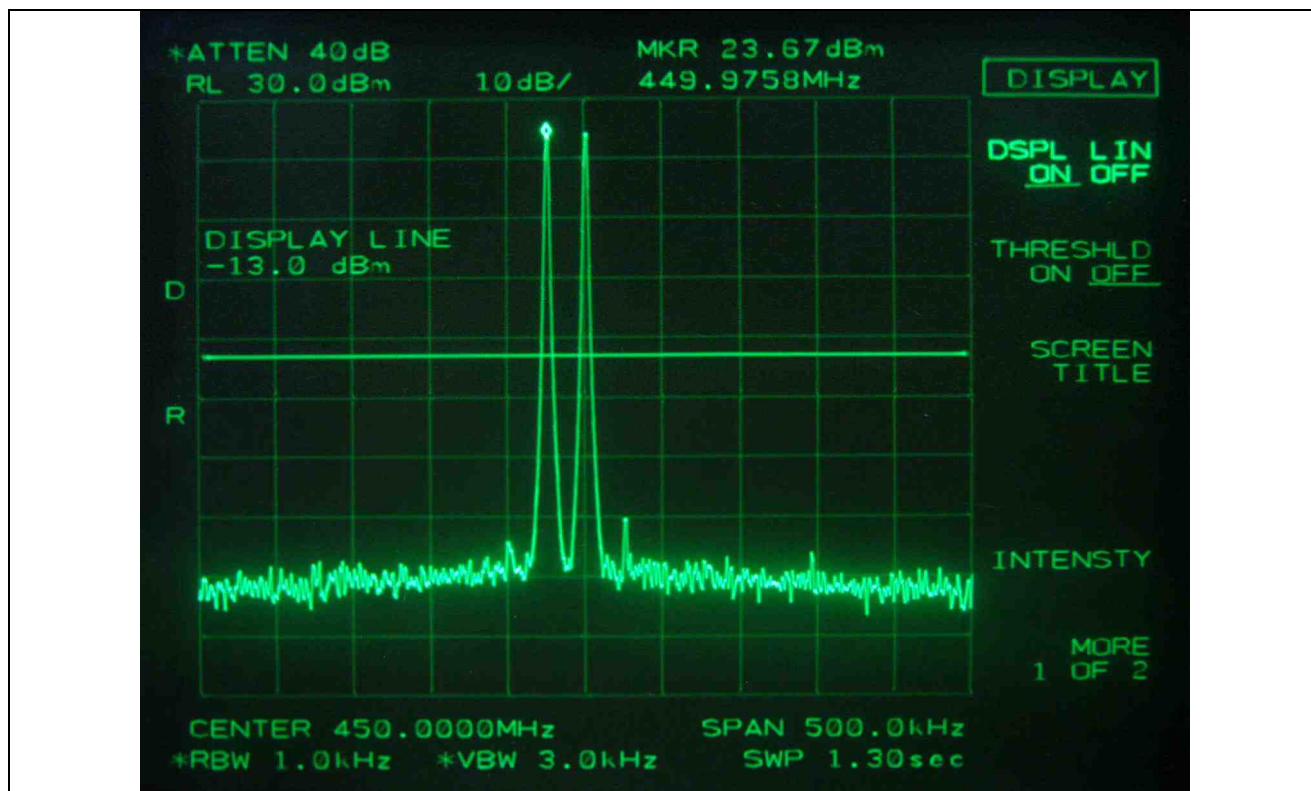


Low Channel – 3 input signals

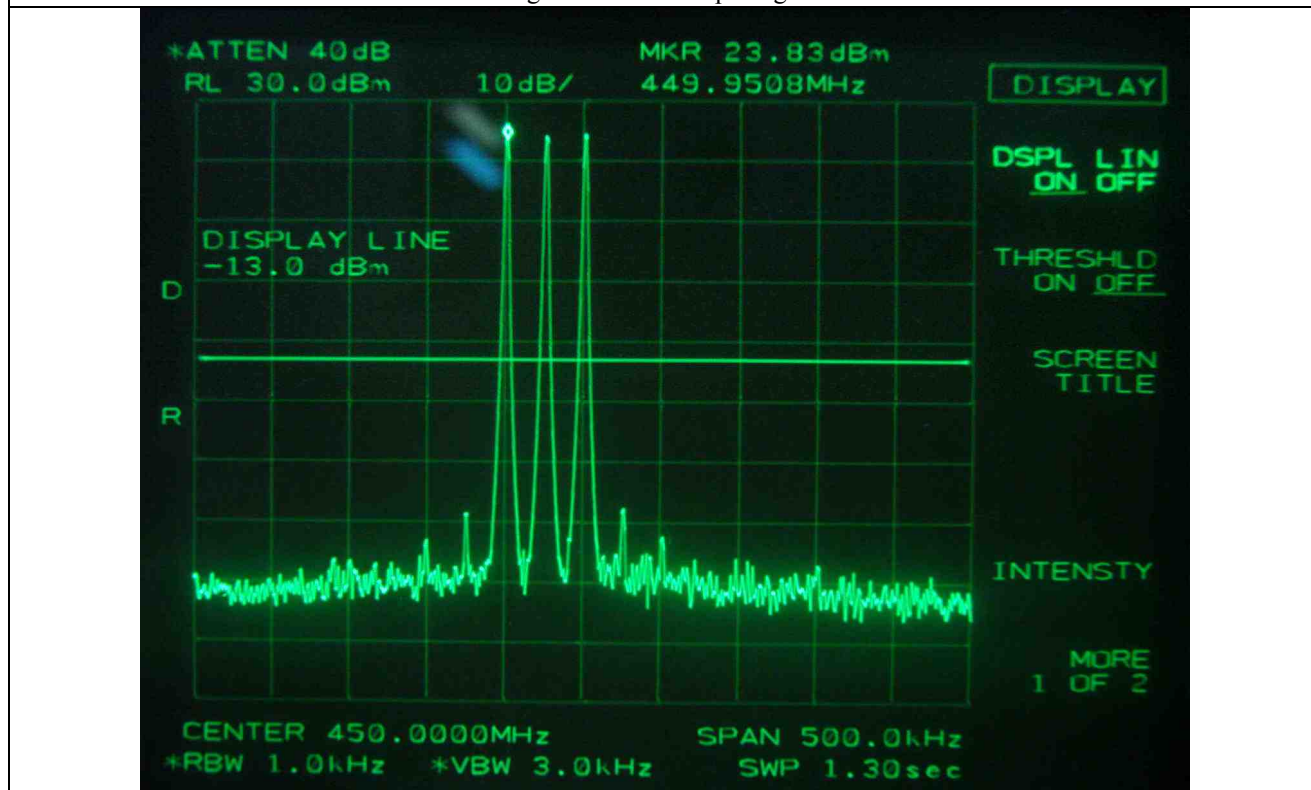


High Channel – 1 input signal





High Channel – 2 input signals



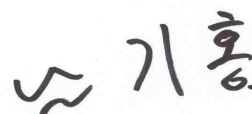
High Channel – 3 input signals

### 8.3.2 Test Result for Spurious emission at VHF band

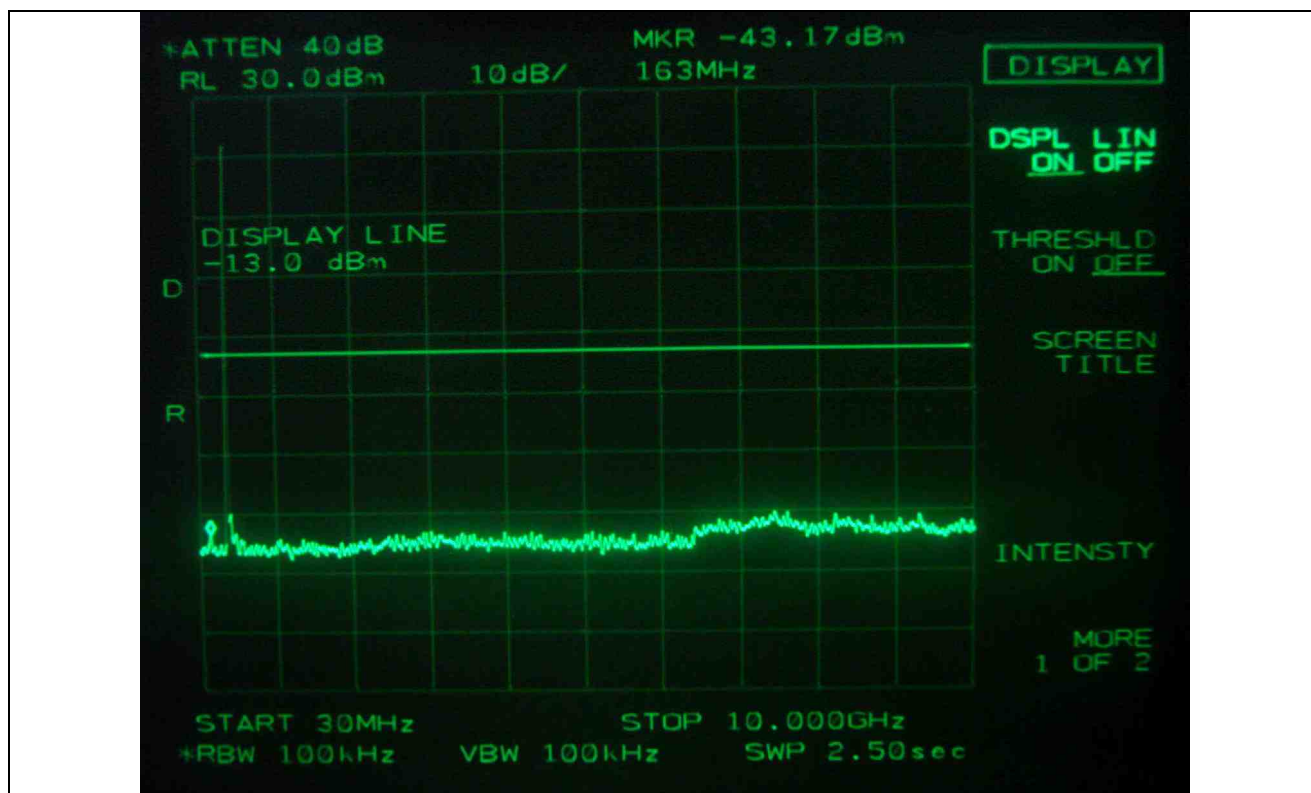
-. Test Date : November 09, 2009  
-. Temperature : 24 °C  
-. Relative humidity : 47 % R.H.  
-. Test Result : Pass  
-. Modulation : No-Modulation

Frequency (MHz)	Number of Input Channel	Measured Value	Result
396.0	1	< -13 dBm	Pass
396.0 & 396.25	2		
396, 396.025 & 396.050	3		
450.0	1	< -13 dBm	Pass
450.0 & 449.975	2		
450.0, 449.975 & 449.950	3		

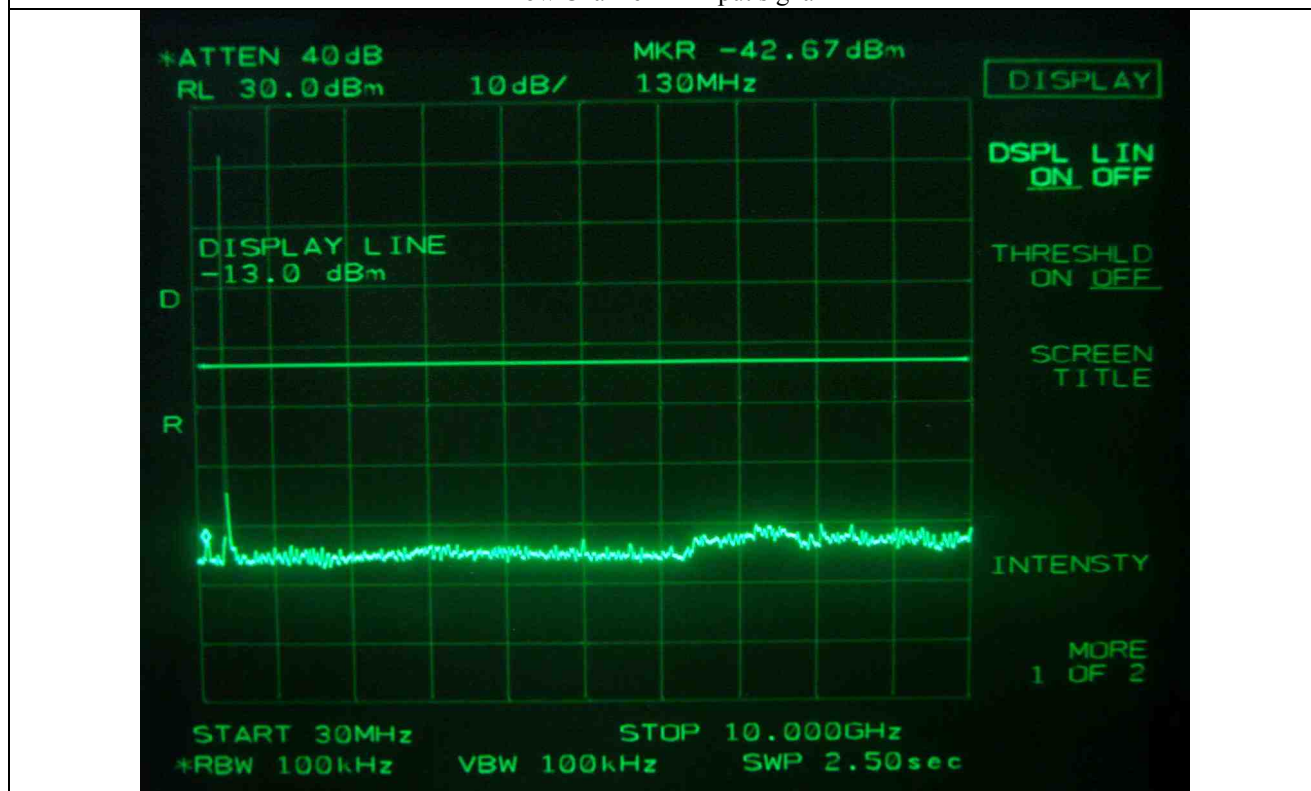
Remark: Intermodulation products must be attenuated below the rated power of the EUT at least  $43 + 10\log(P_w)$ , equivalent to -13 dBm. Please refer to test data hereinafter.



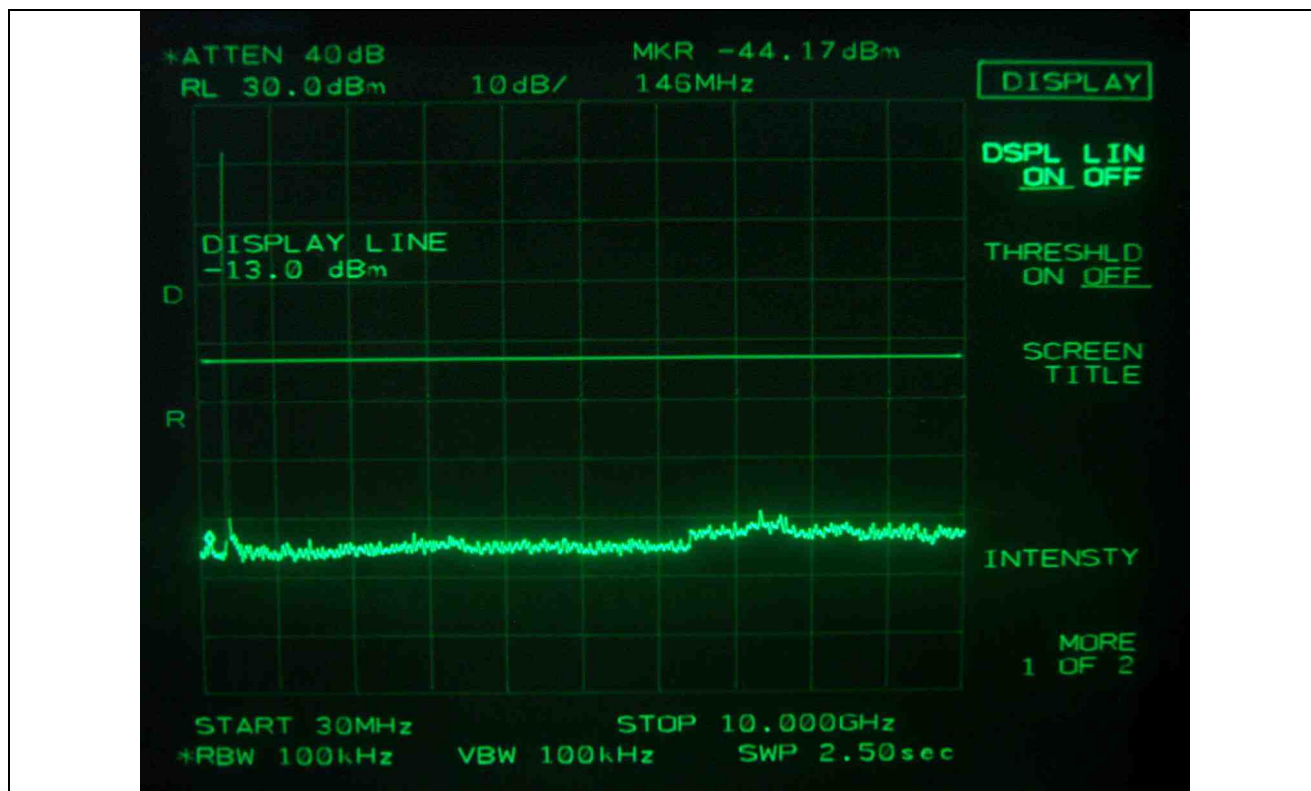
Tested by: Ki-Hong, Nam / Project Engineer



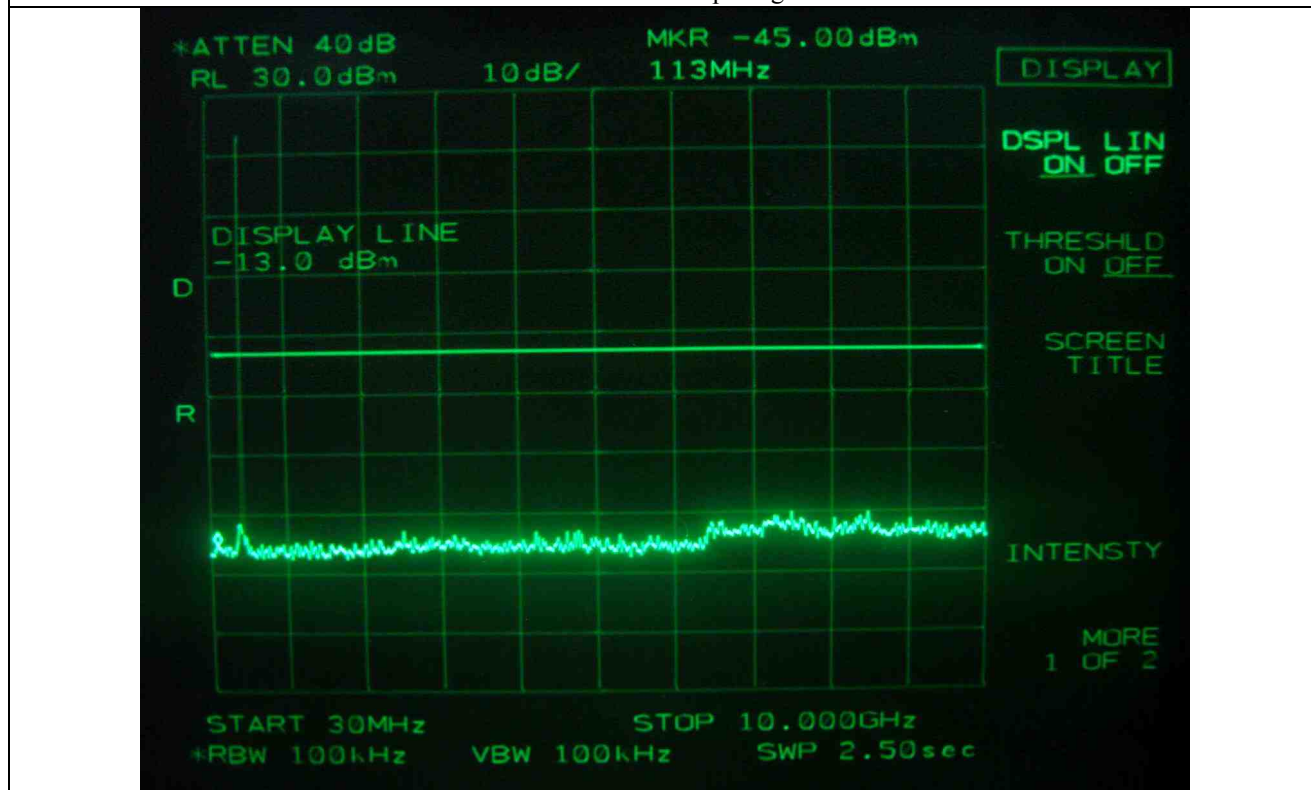
Low Channel – 1 input signal



Low Channel – 2 input signals

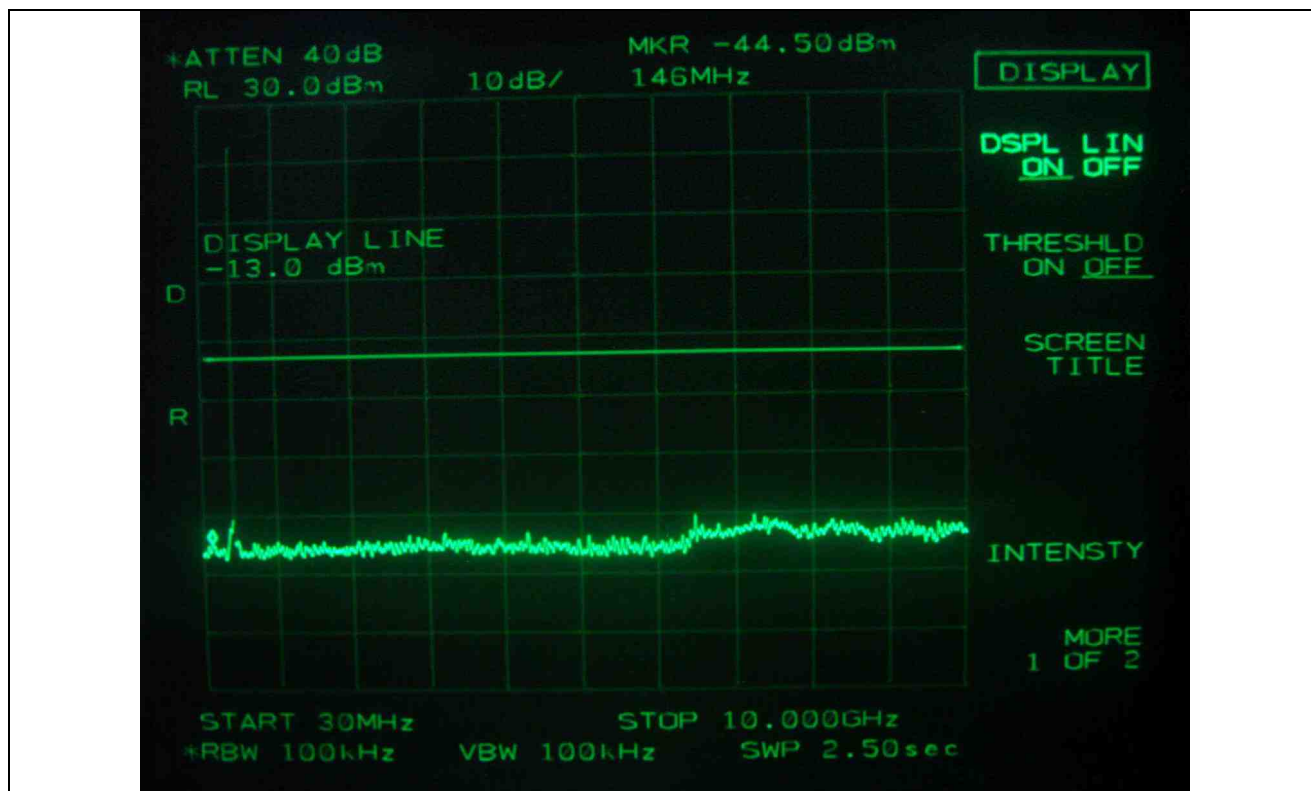


Low Channel – 3 input signals

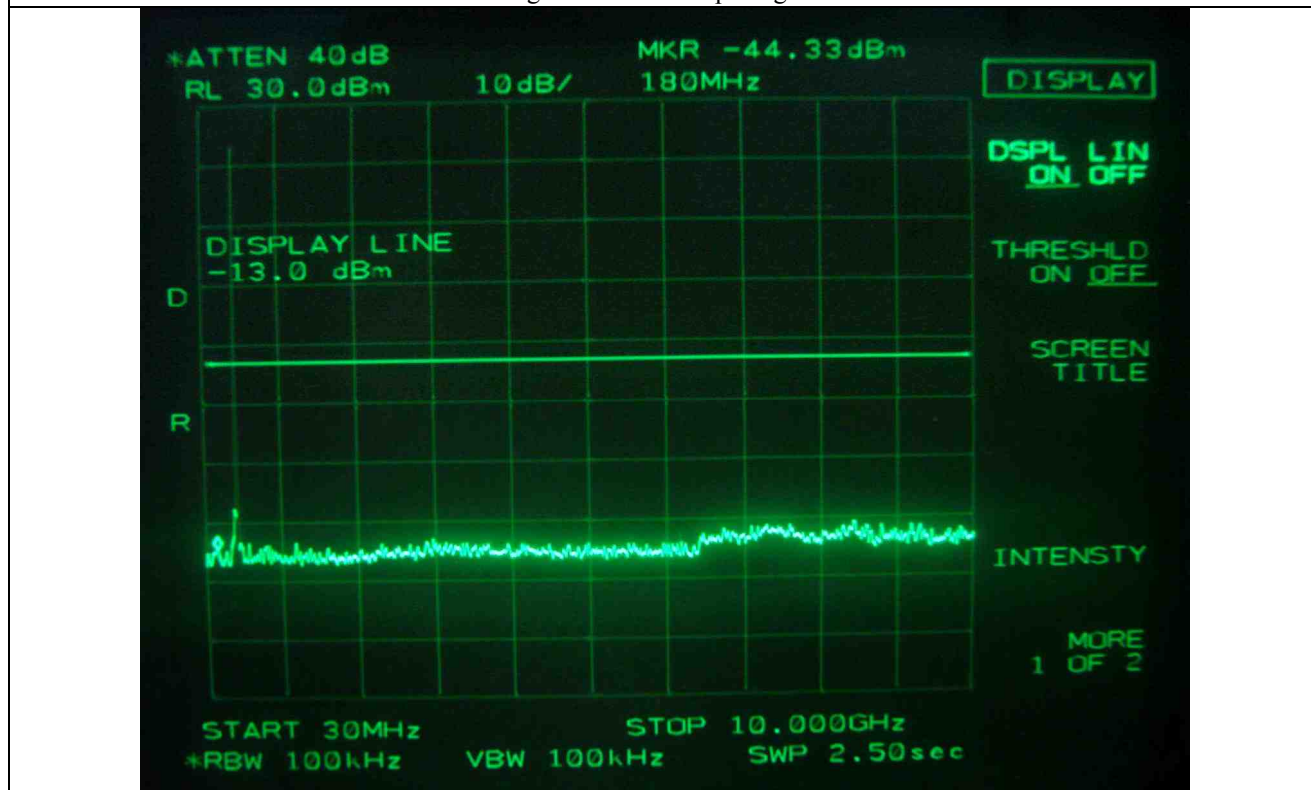


High Channel – 1 input signal





High Channel – 2 input signals



High Channel – 3 input signals