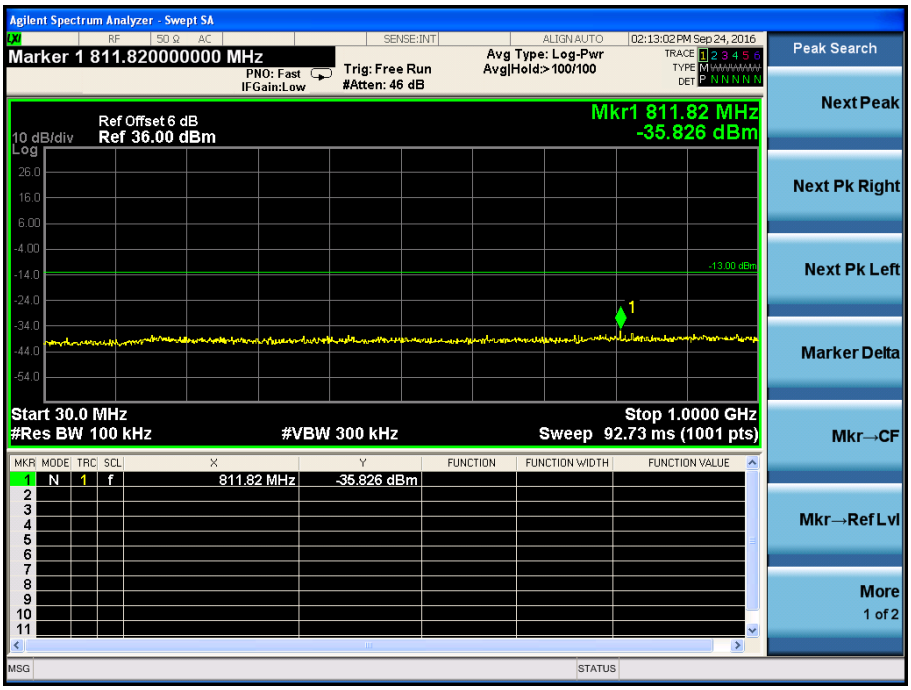
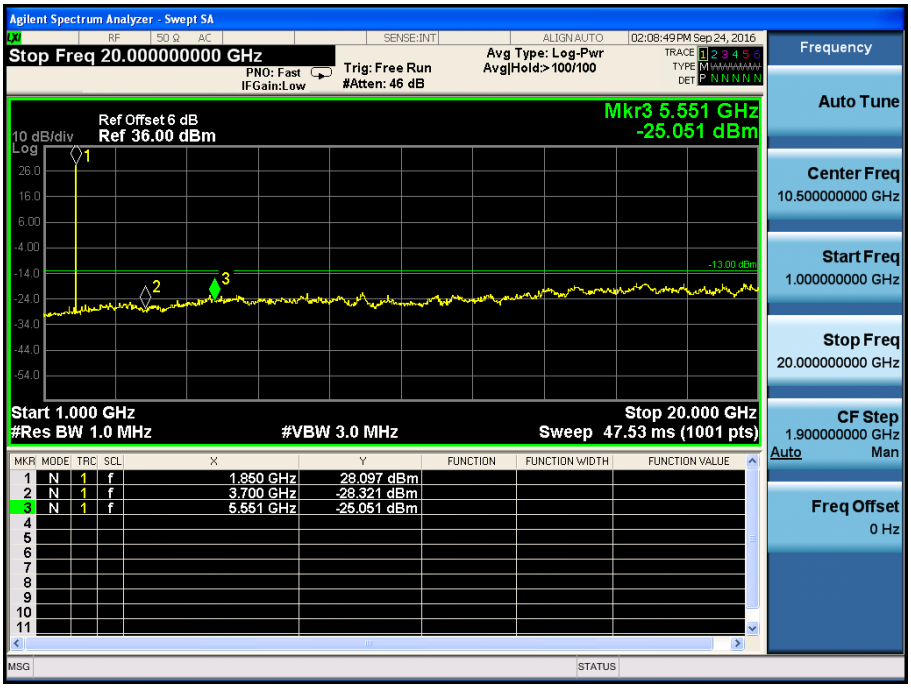
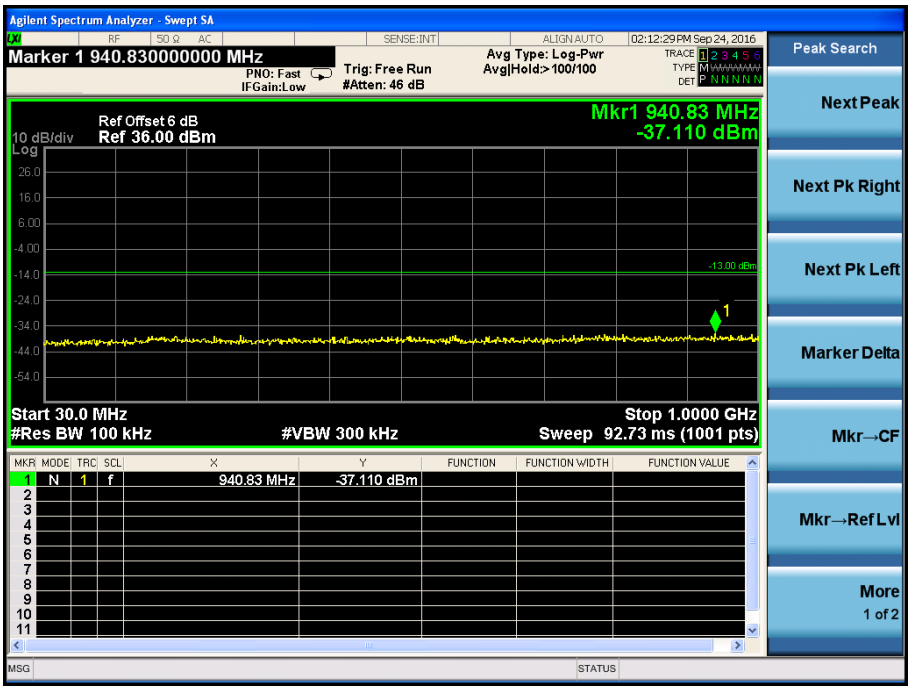
EDGE1900

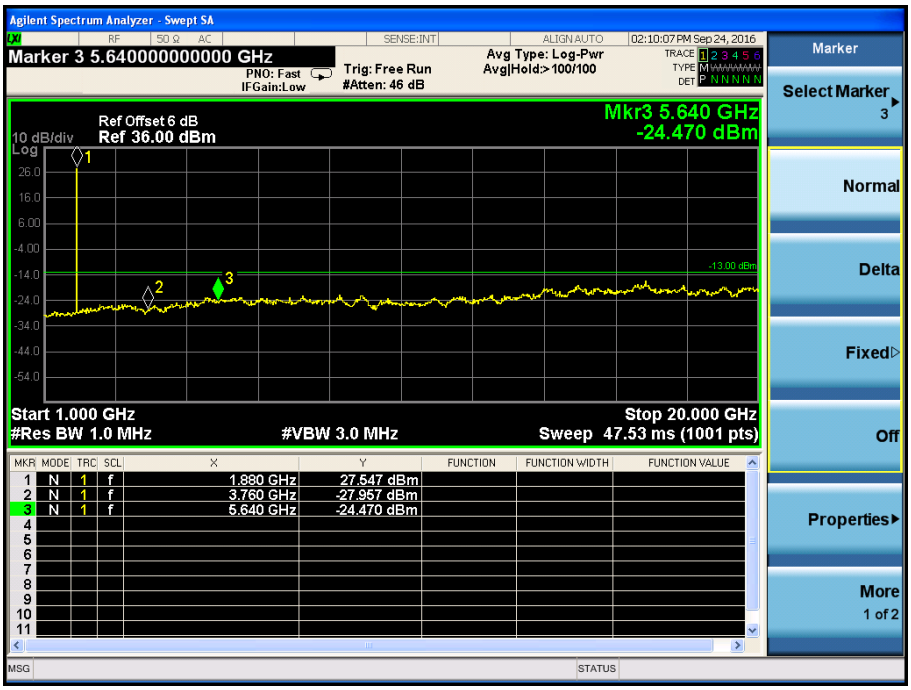
Low Channel



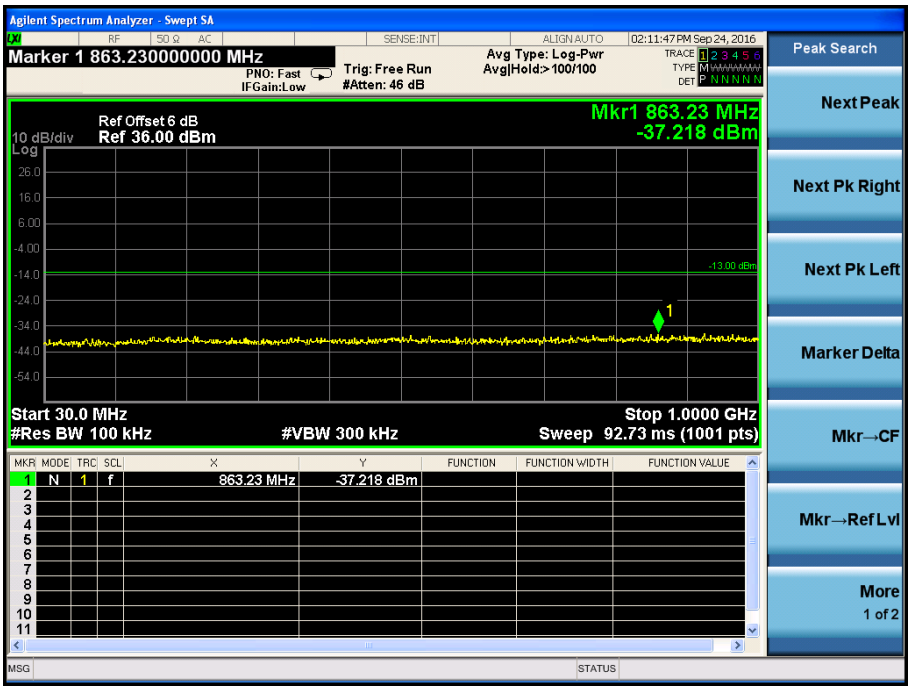


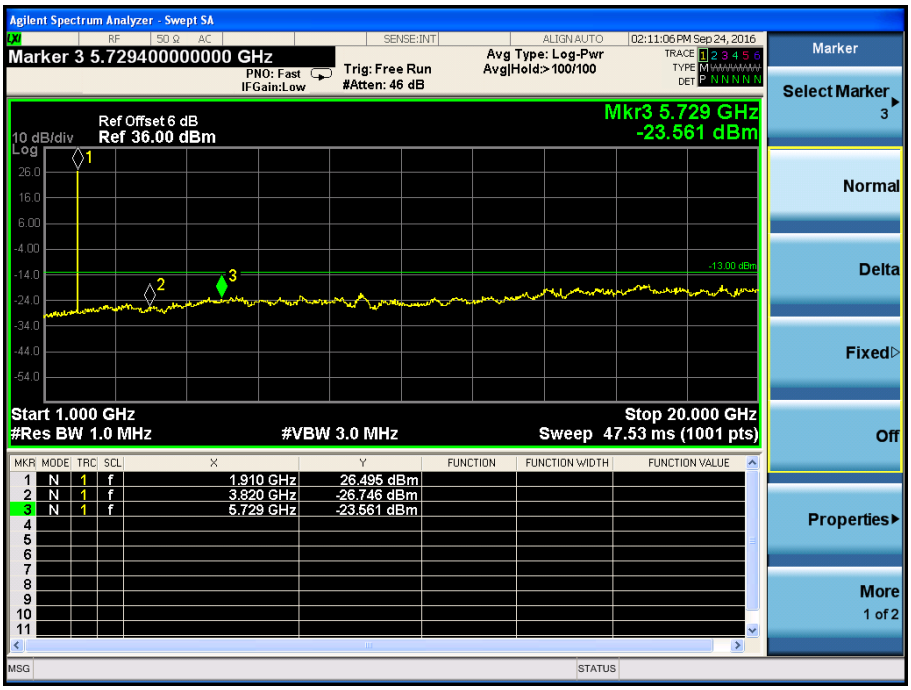
Middle Channel





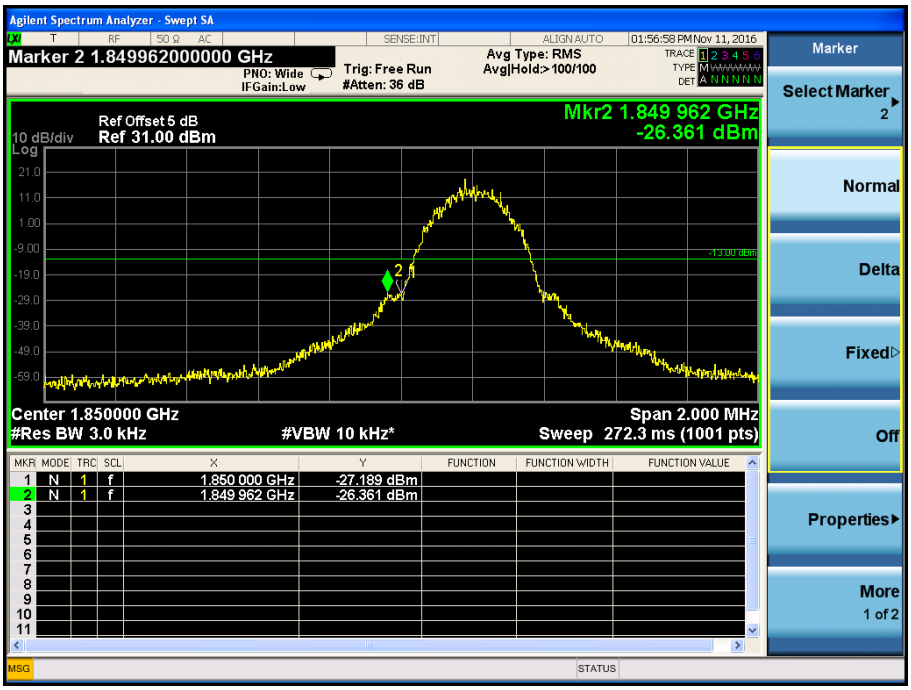
High Channel



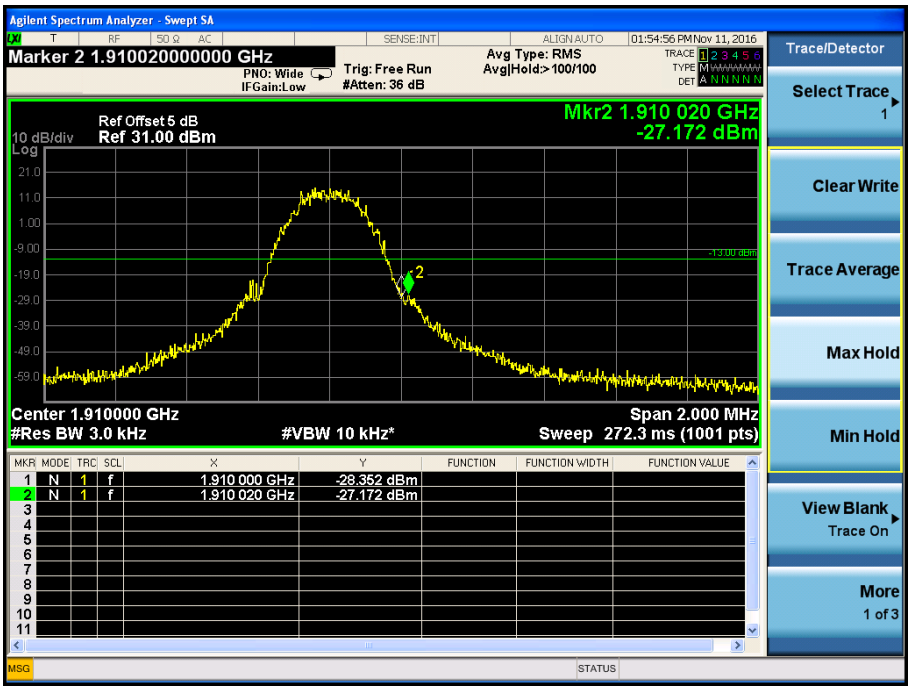


EDGE1900 Bandedge Spurious Emissions at Antenna Terminals

Low Band Emission

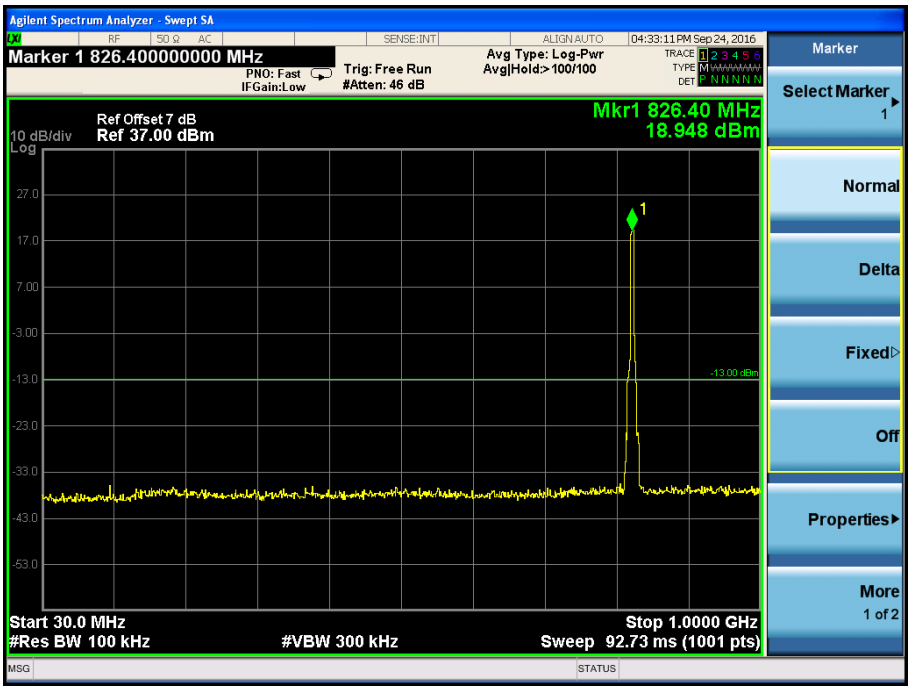


High Band Emission

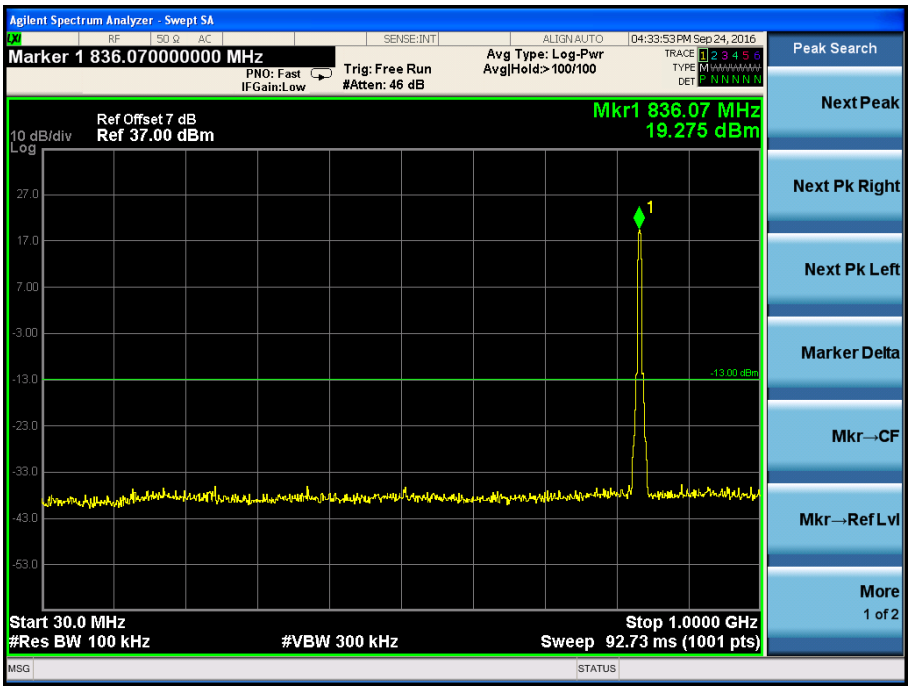


WCDMA Band 5

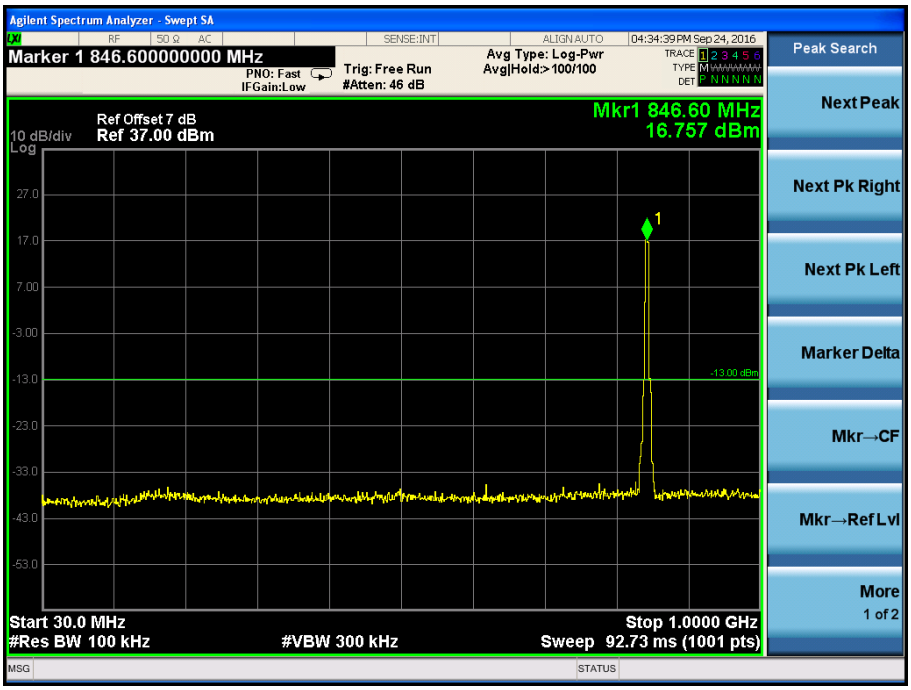
Low Channel



Middle Channel



High Channel

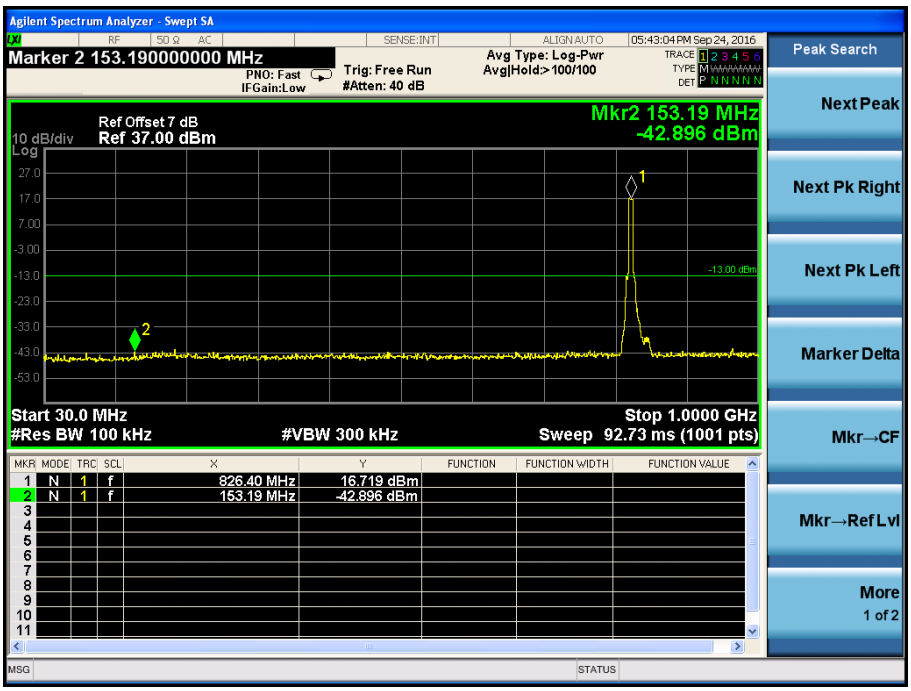


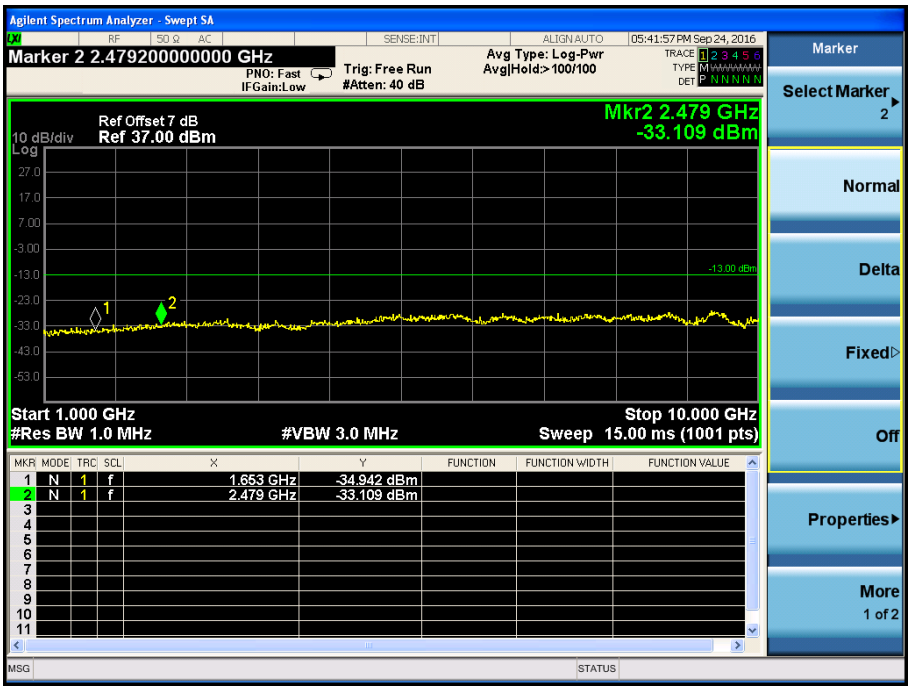
WCDMA Band 5 Bandedge Spurious Emissions at Antenna Terminals

Low Band Emission

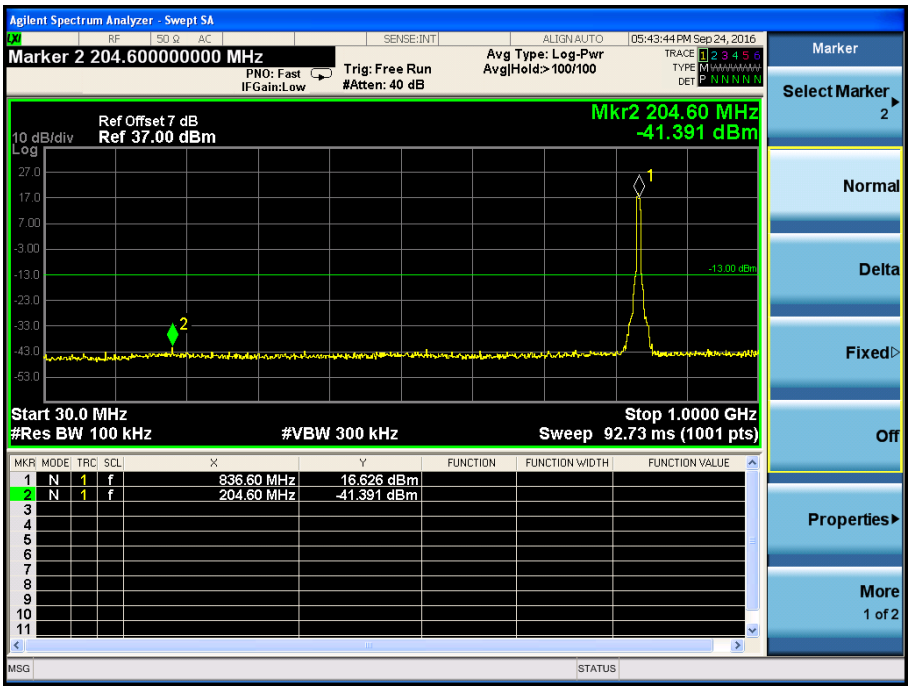
High Band Emission

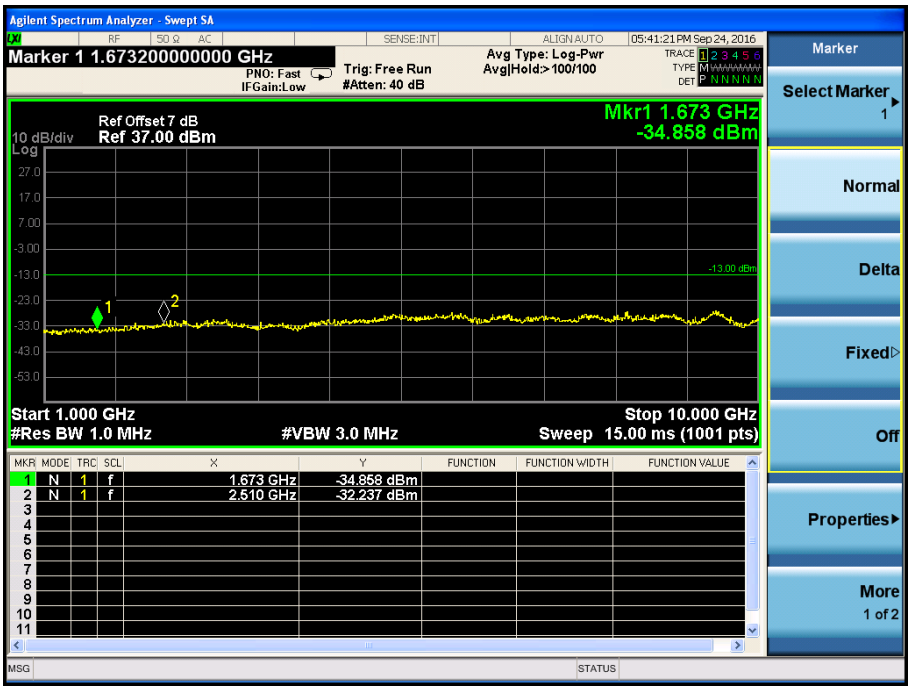
HSDPA Band 5
Low Channel



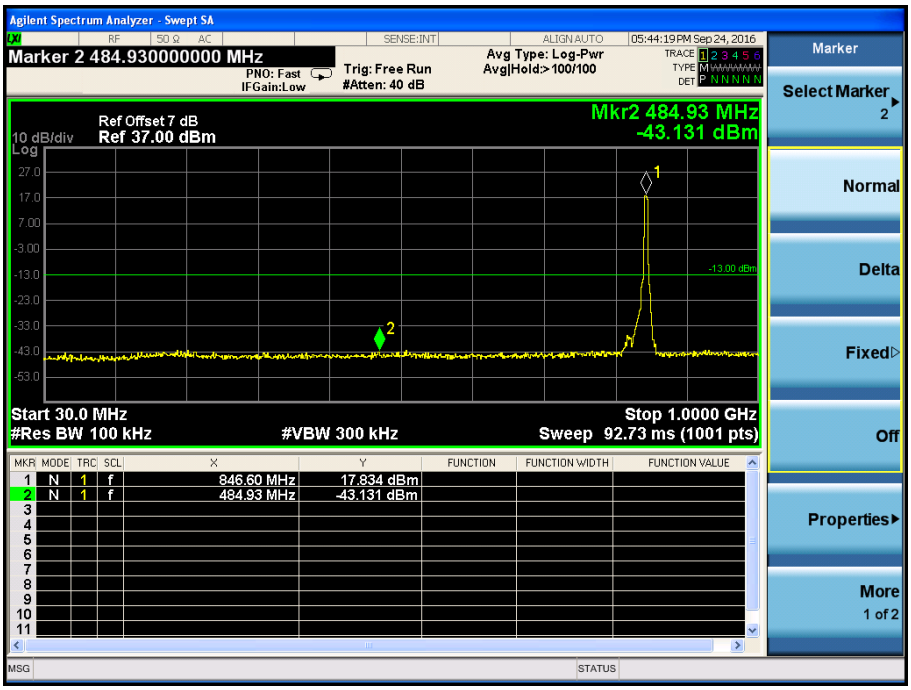


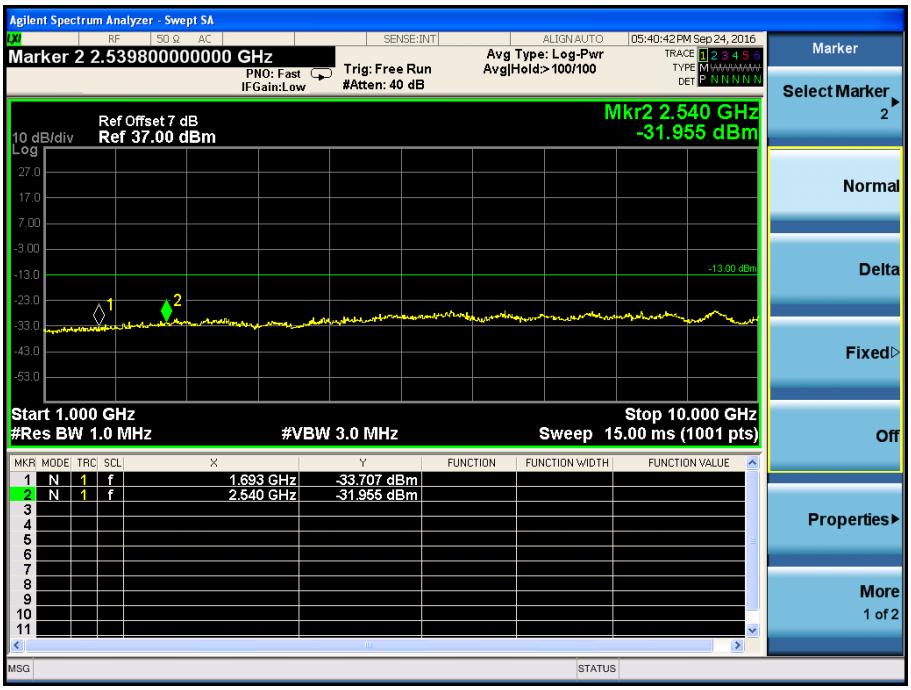
Middle Channel





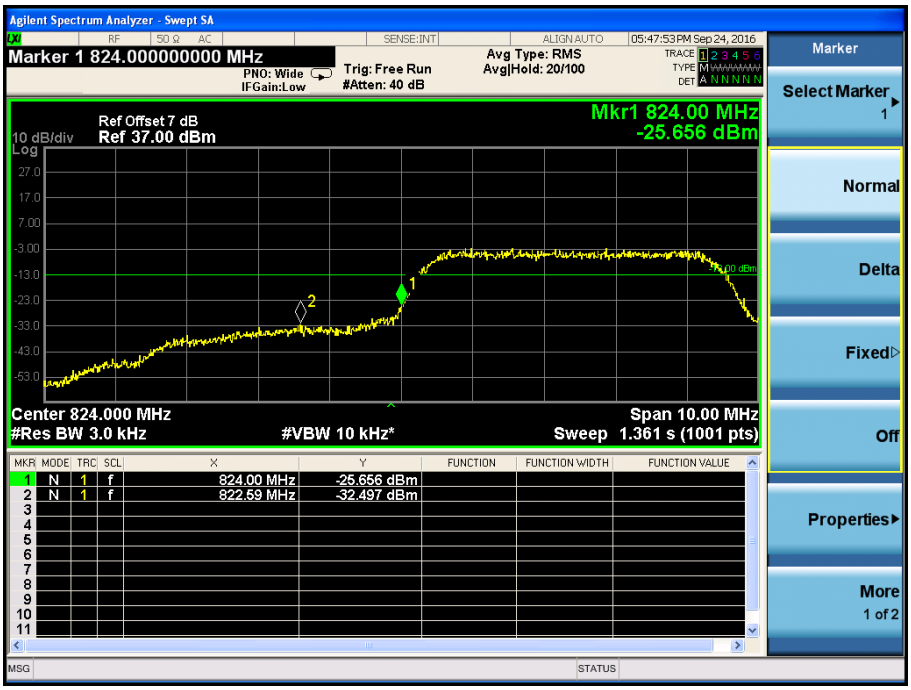
High Channel





HSDPA Band 5 Bandedge Spurious Emissions at Antenna Terminals

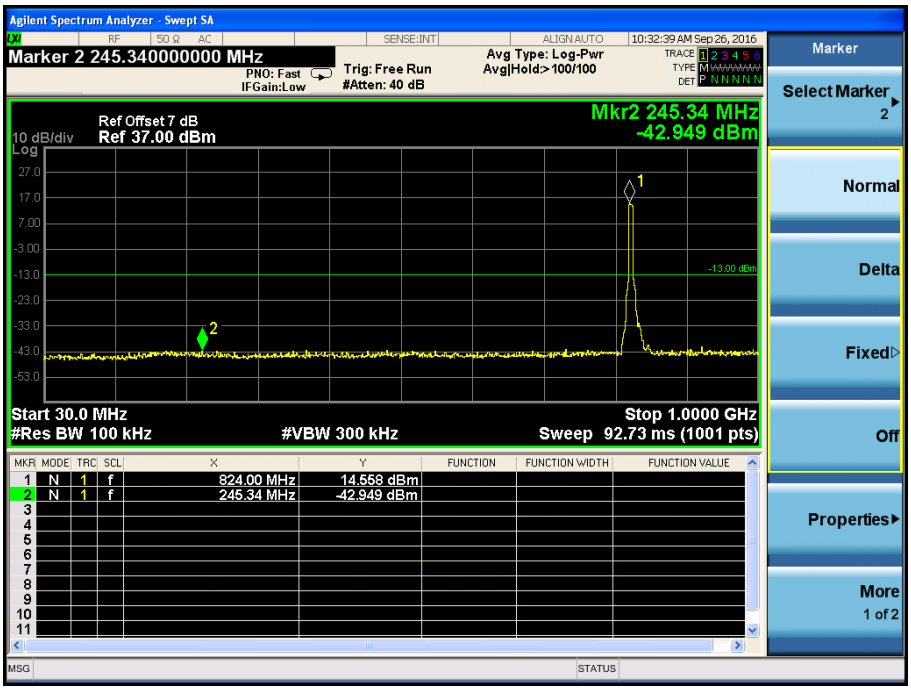
Low Band Emission

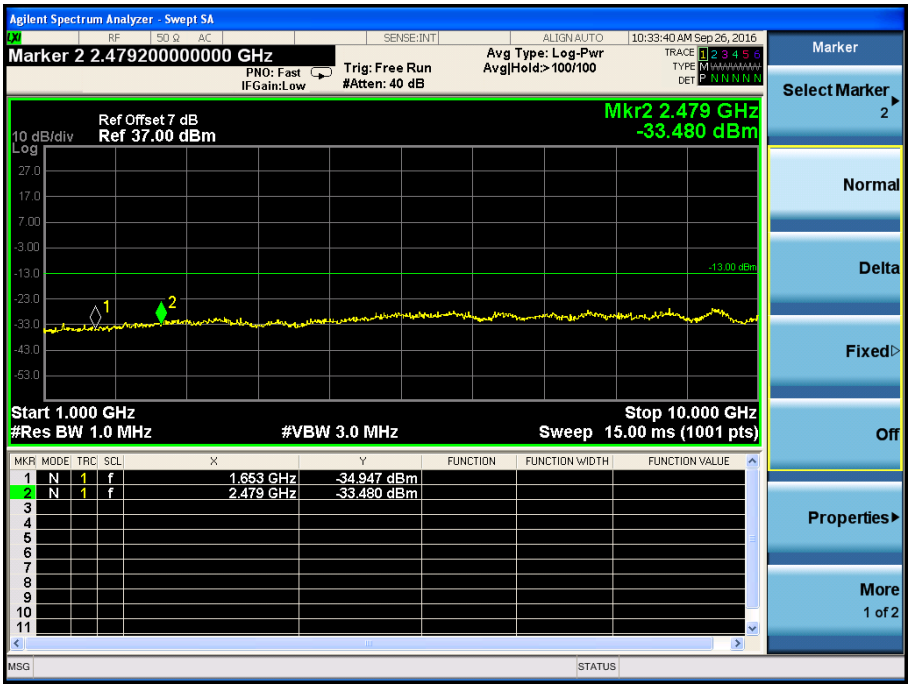


High Band Emission

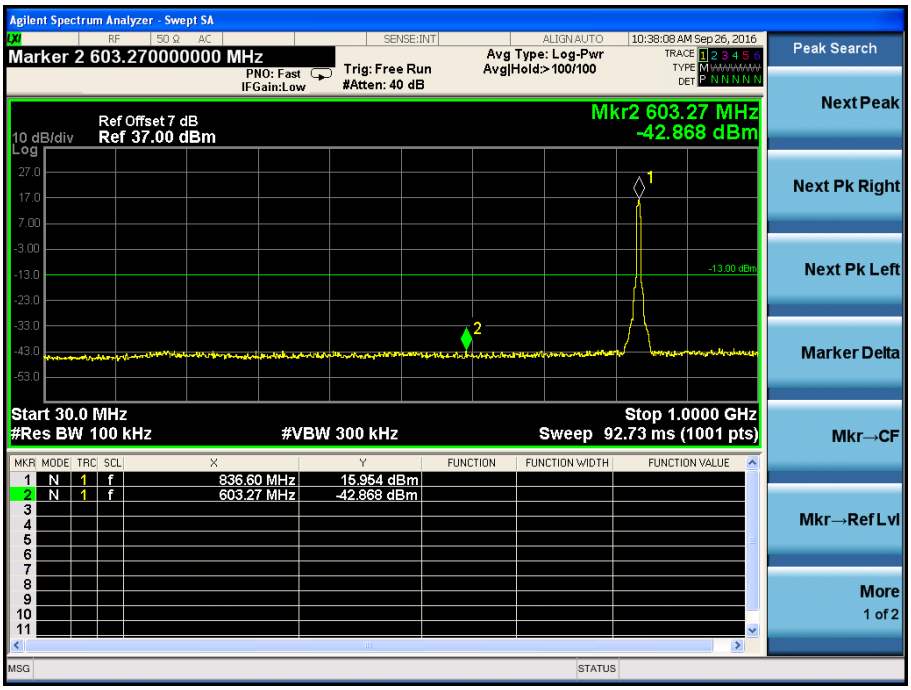
HSUPA Band 5

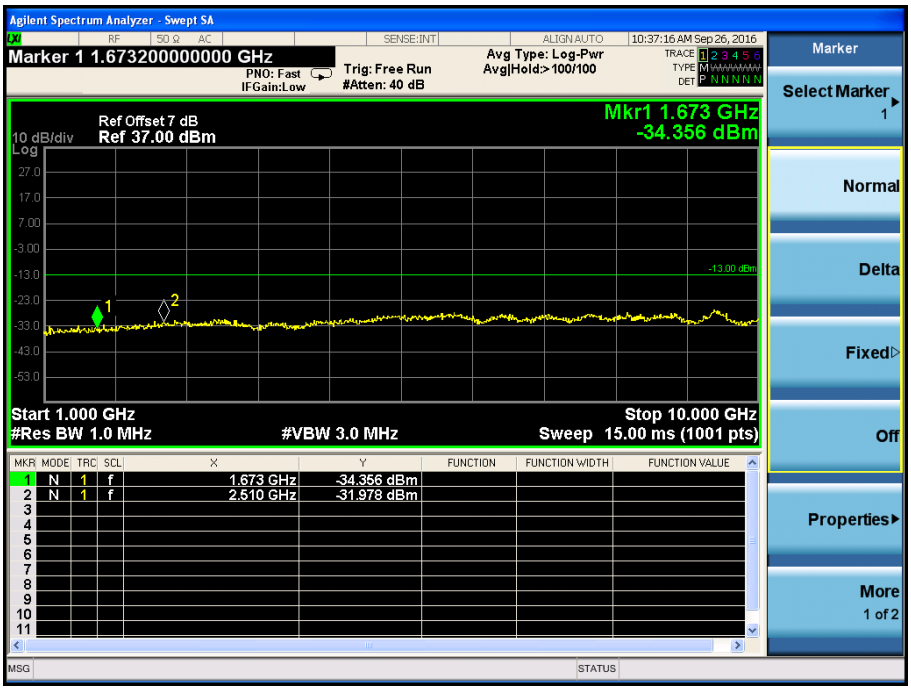
Low Channel



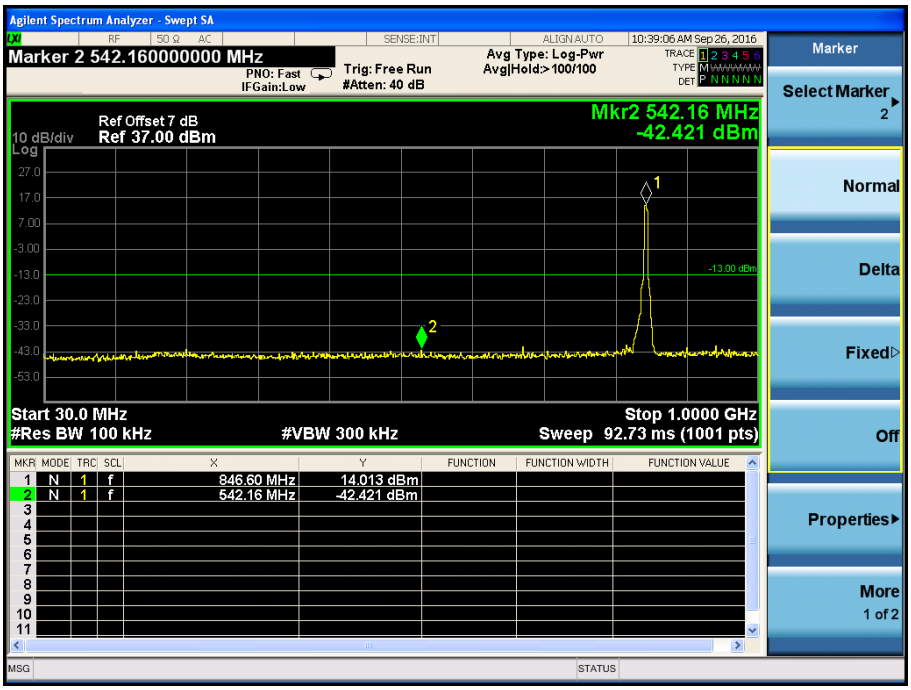


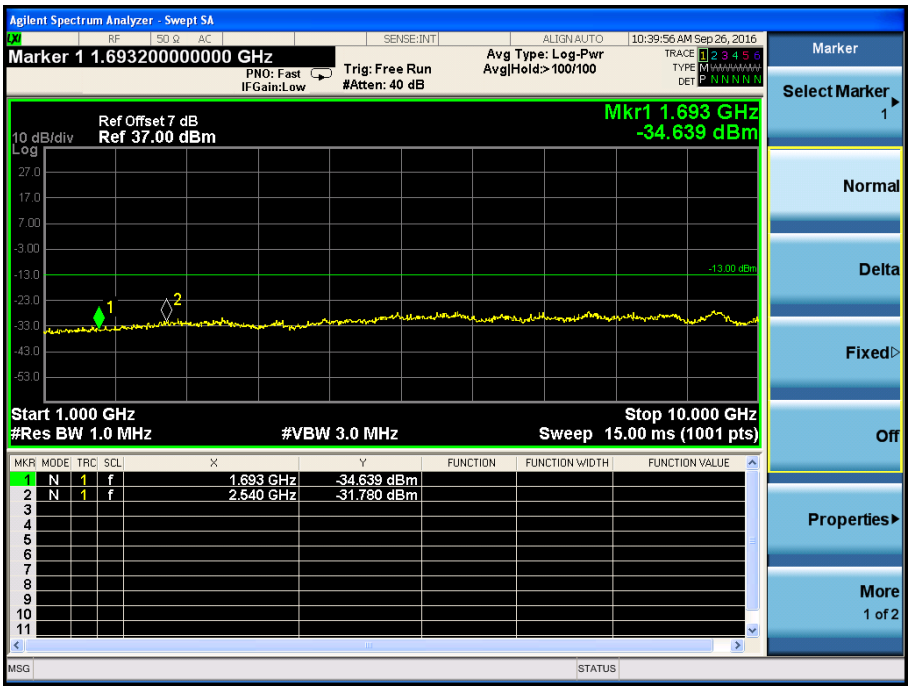
Middle Channel





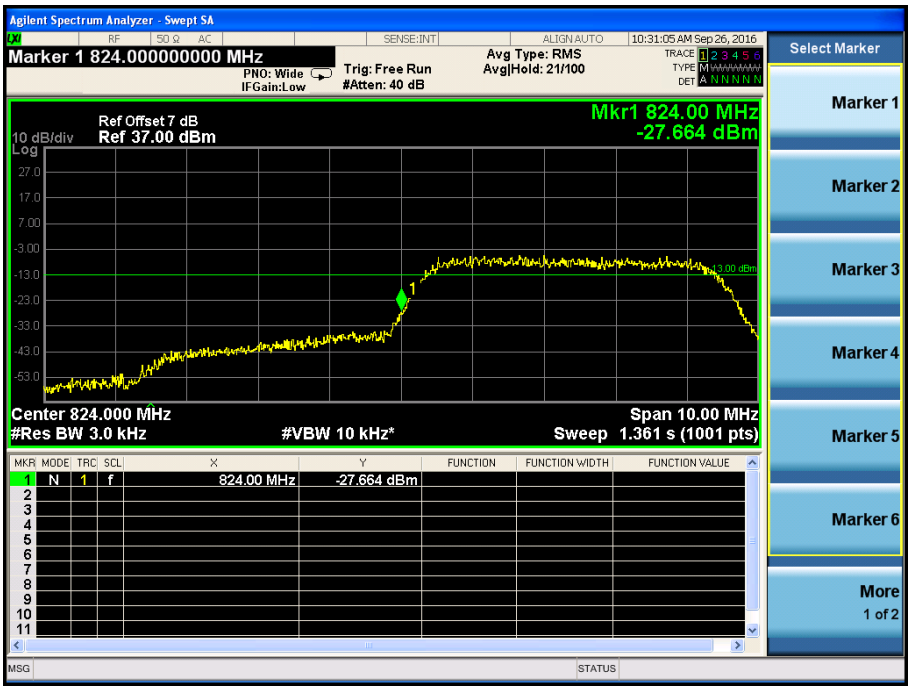
High Channel





HSUPA Band 5 Bandedge Spurious Emissions at Antenna Terminals

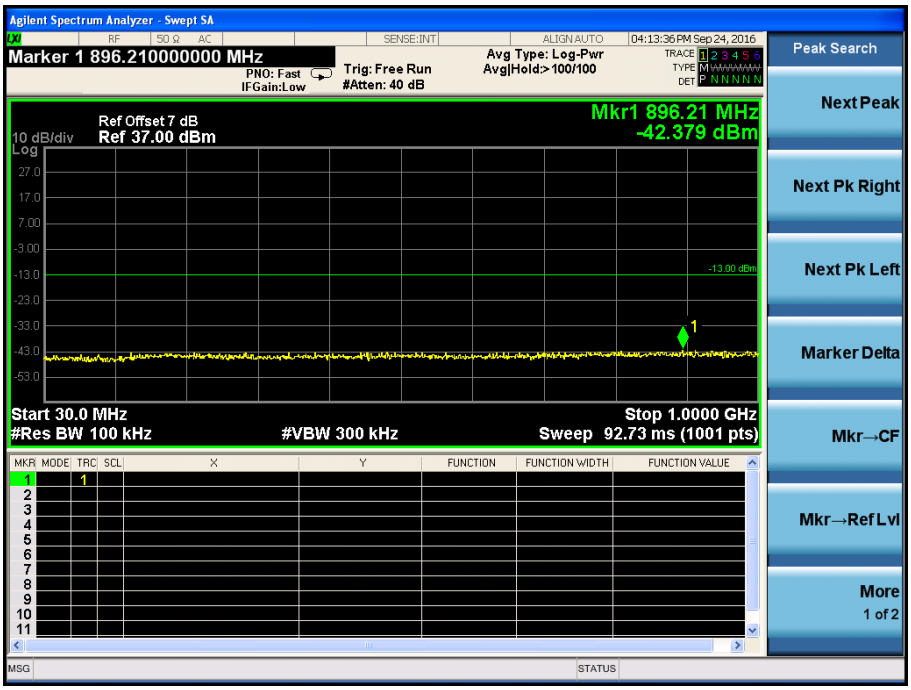
Low Band Emission



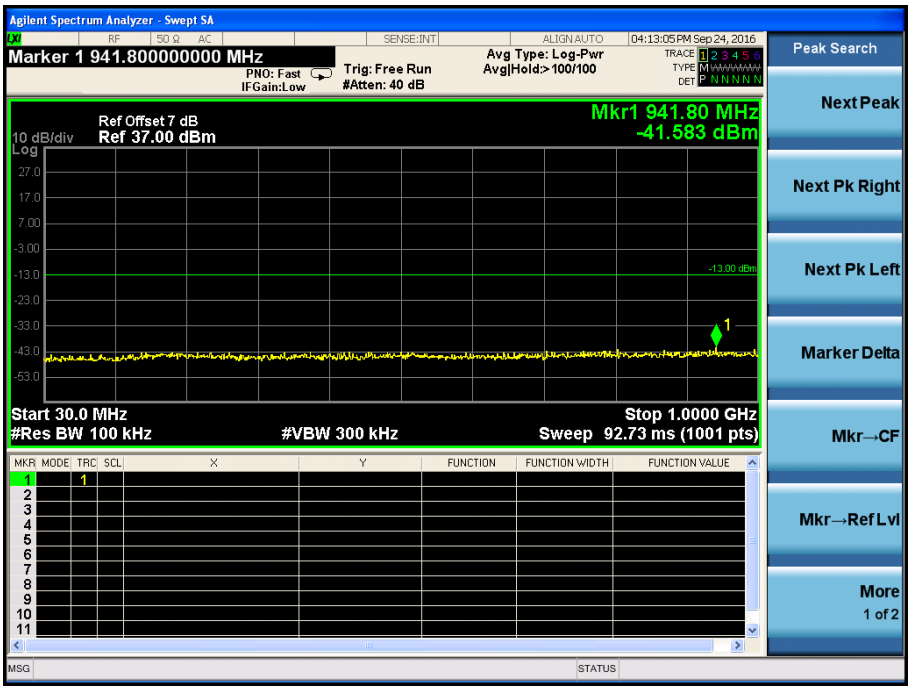
High Band Emission

WCDMA Band 2

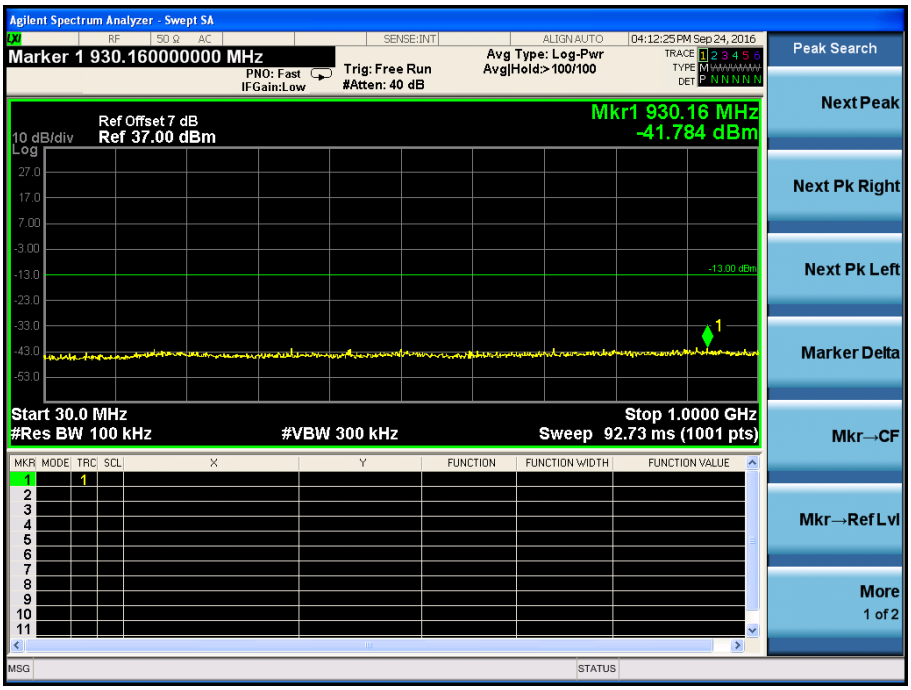
Low Channel



Middle Channel

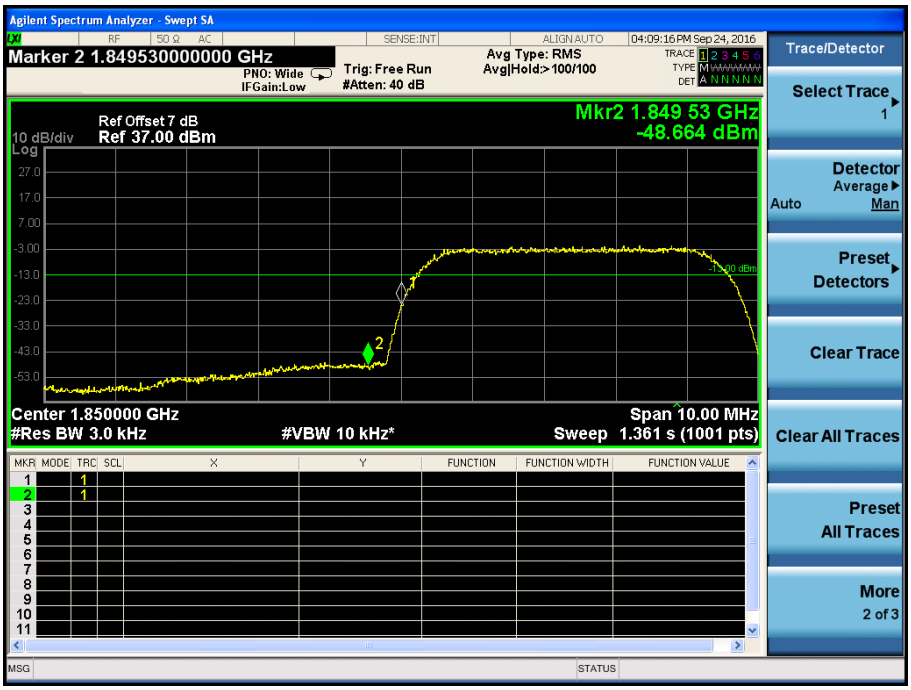


High Channel



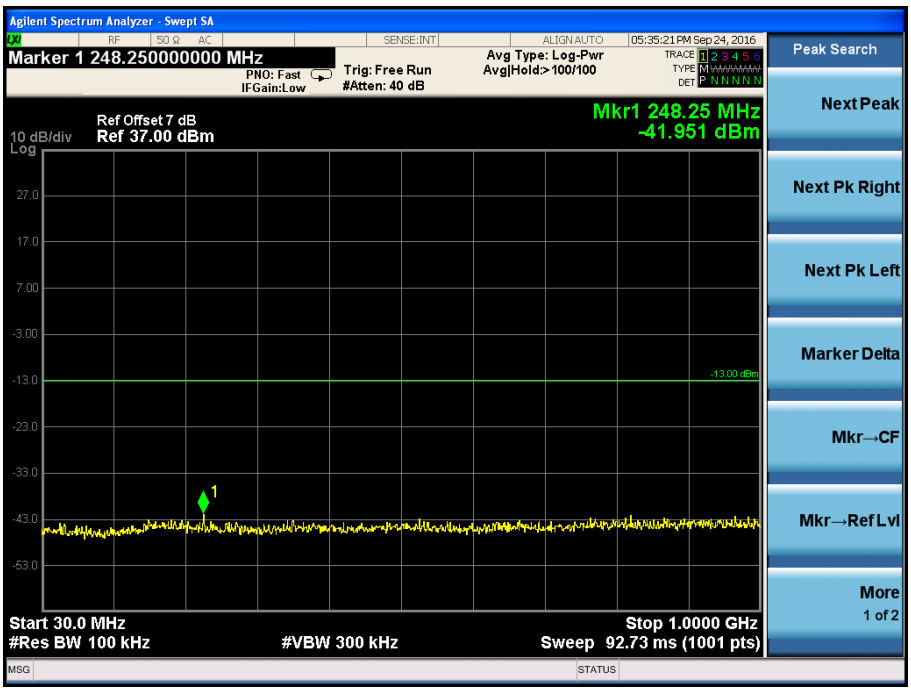
WCDMA Band 2 Bandedge Spurious Emissions at Antenna Terminals

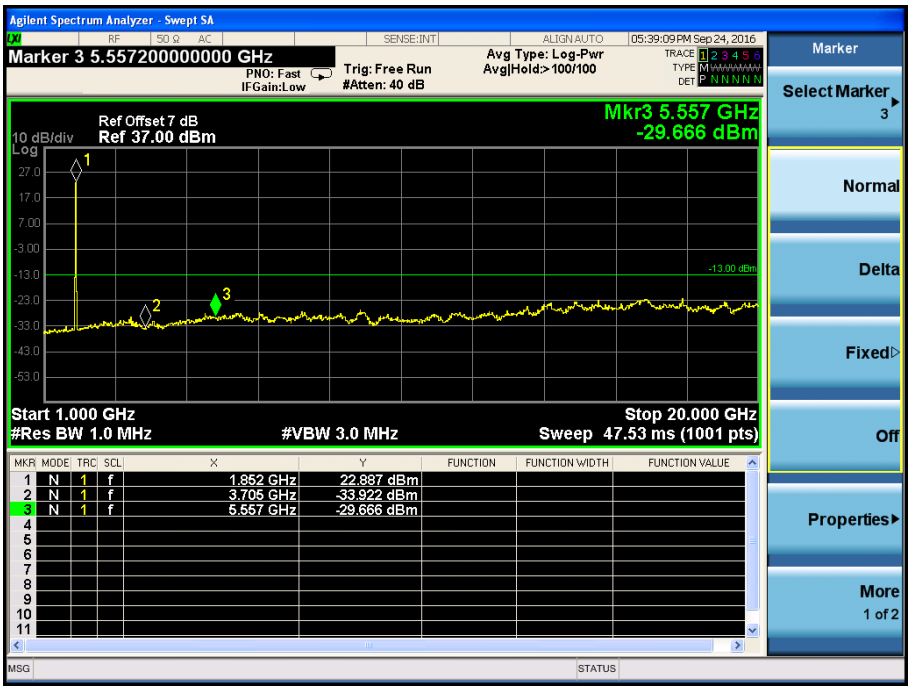
Low Band Emission



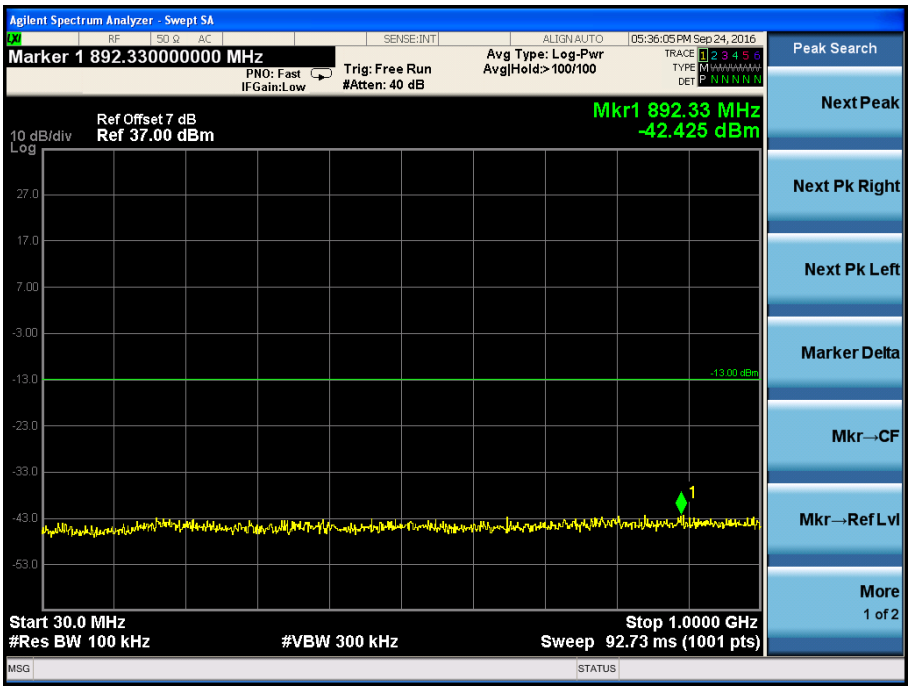
High Band Emission

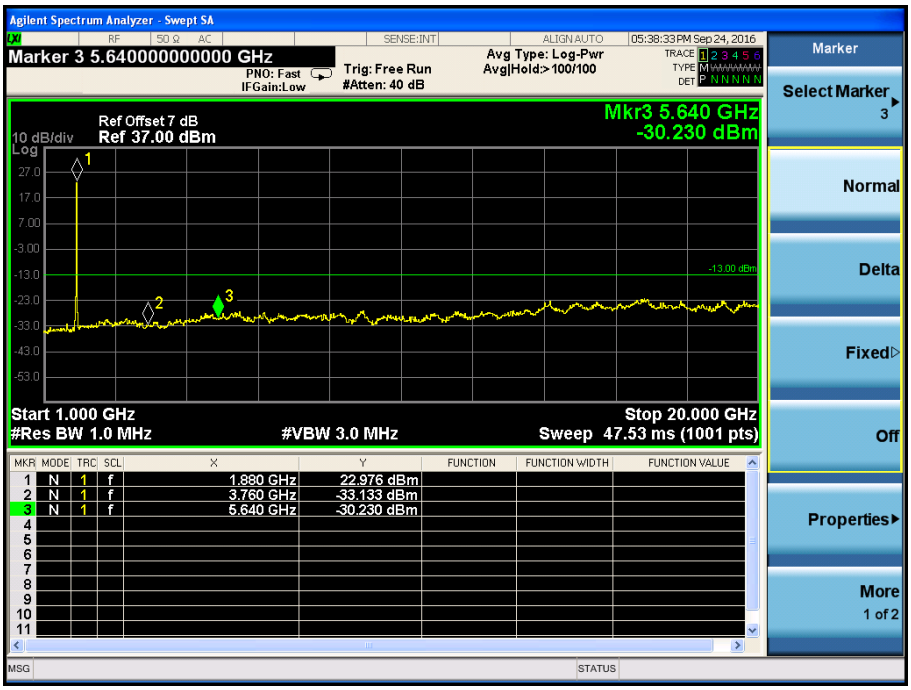
HSDPA Band 2
Low Channel



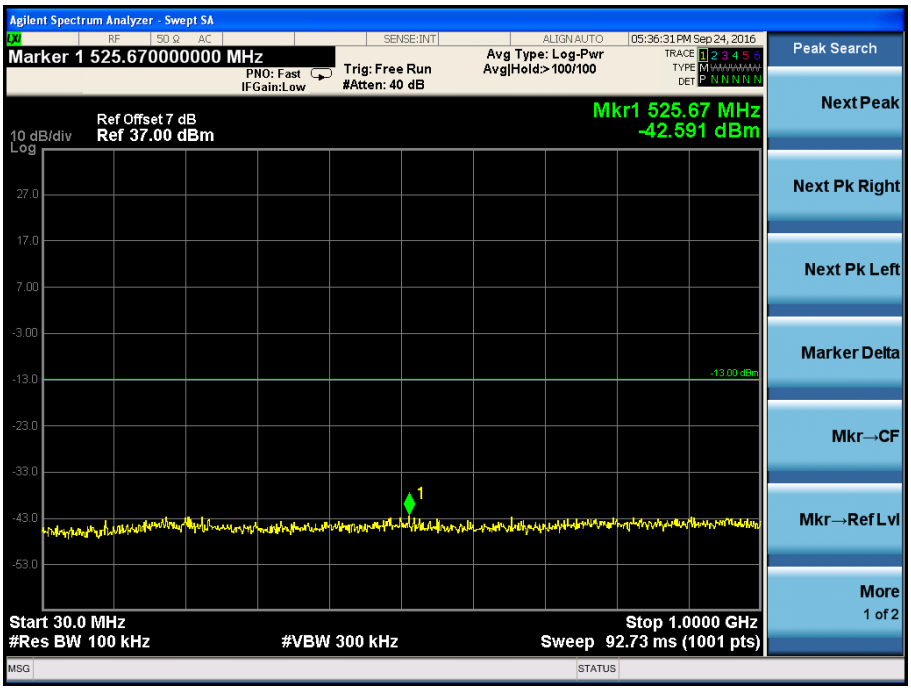


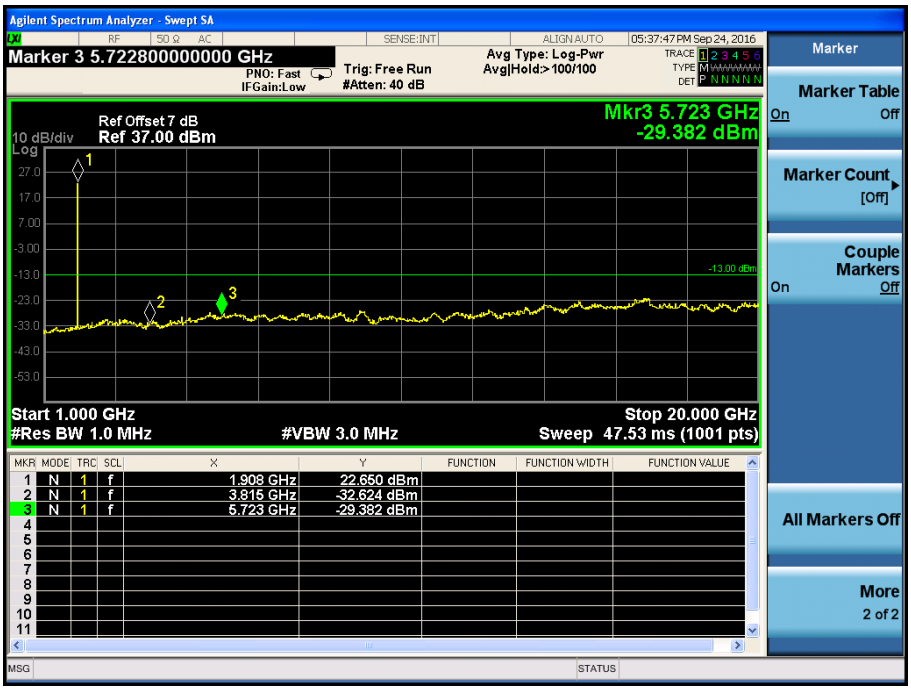
Middle Channel





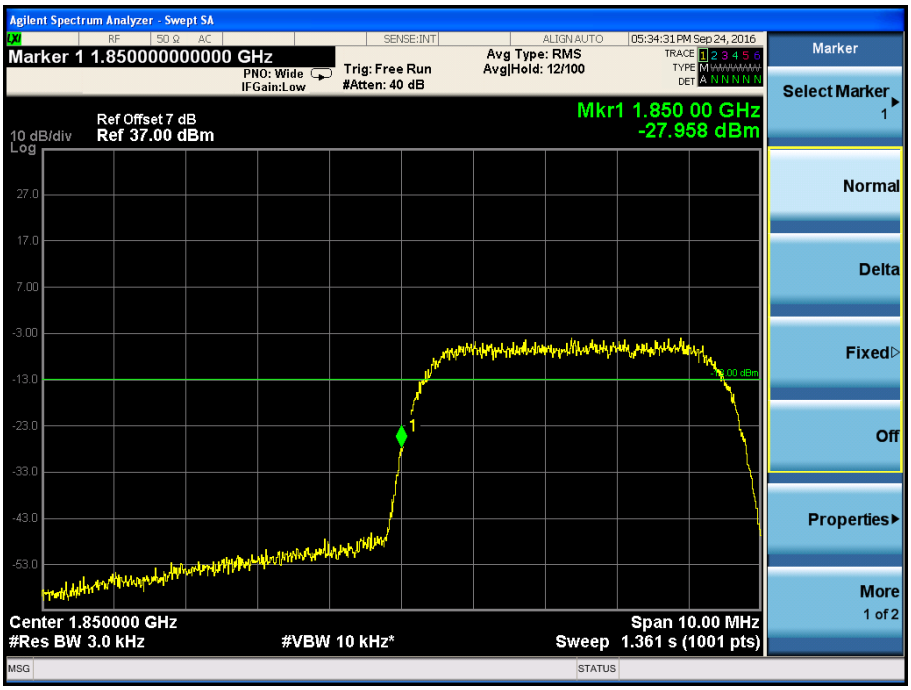
High Channel



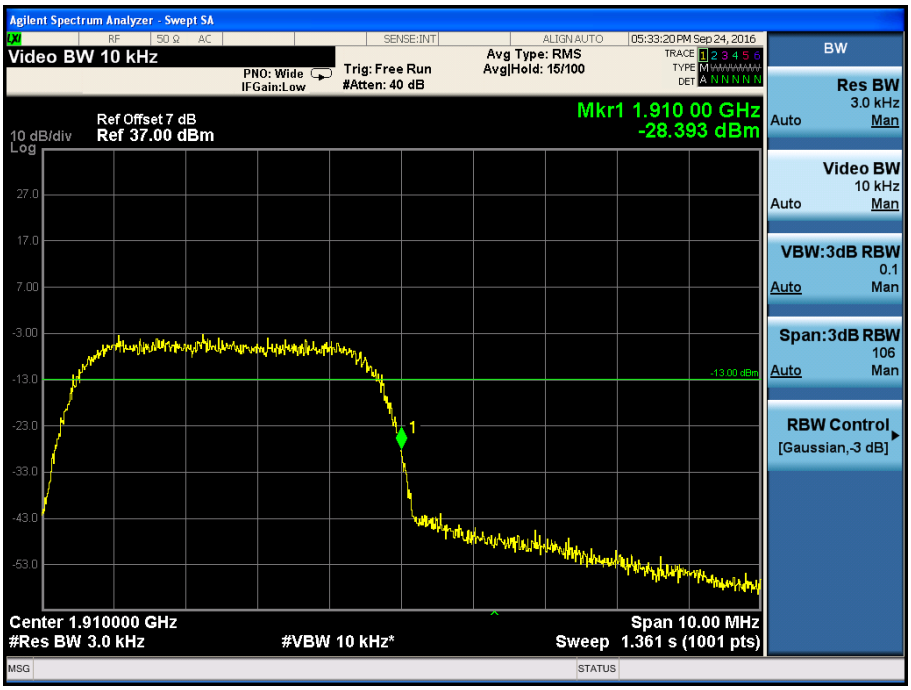


HSDPA Band 2 Bandedge Spurious Emissions at Antenna Terminals

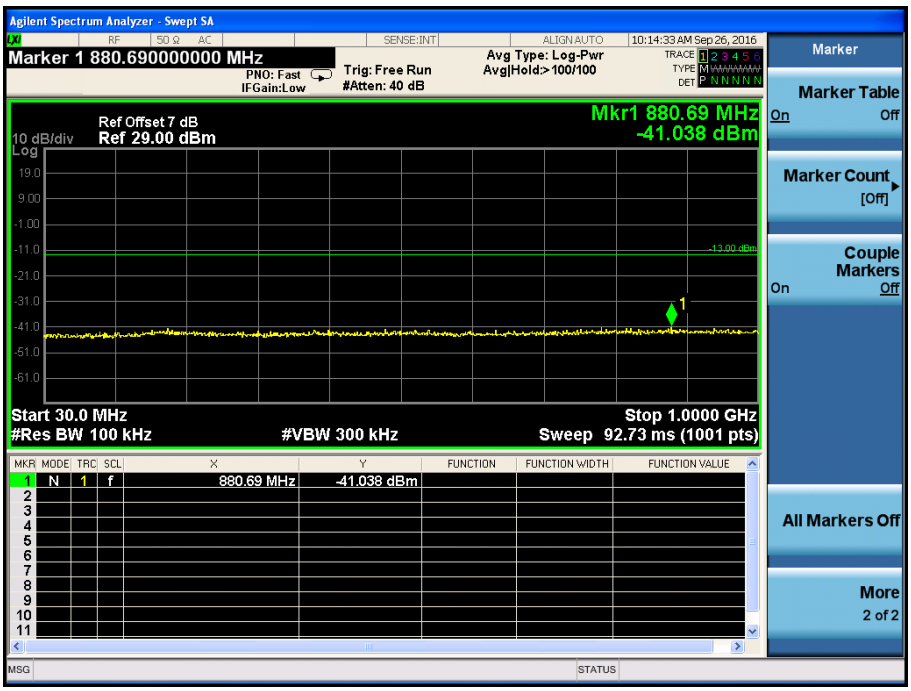
Low Band Emission

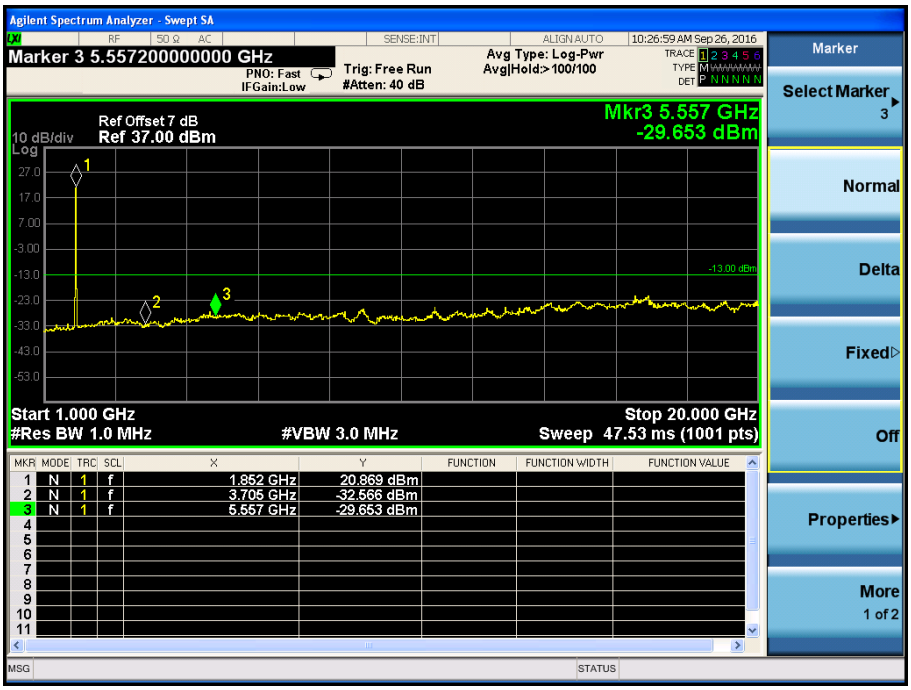


High Band Emission

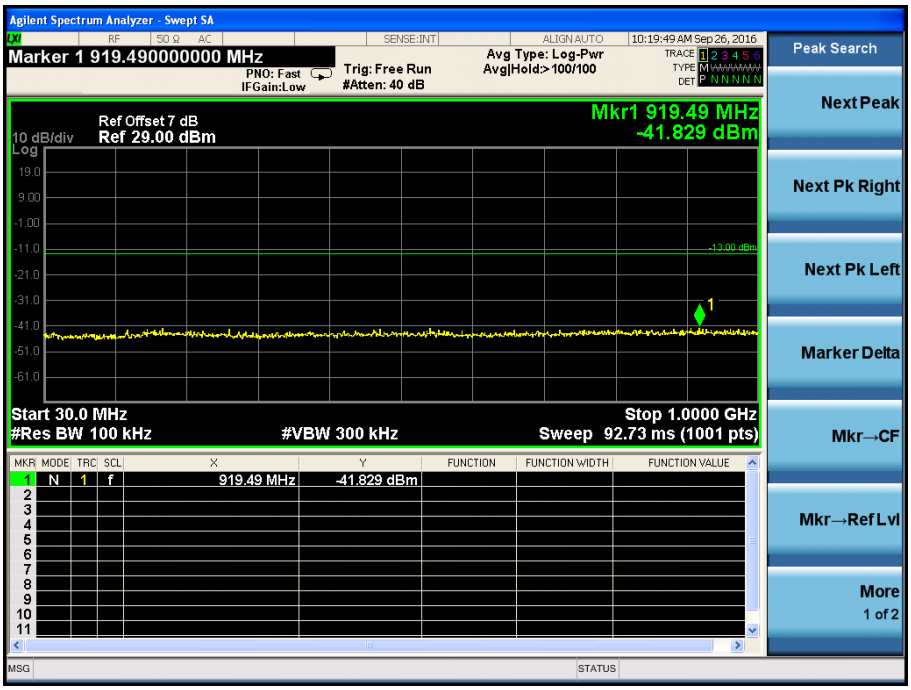


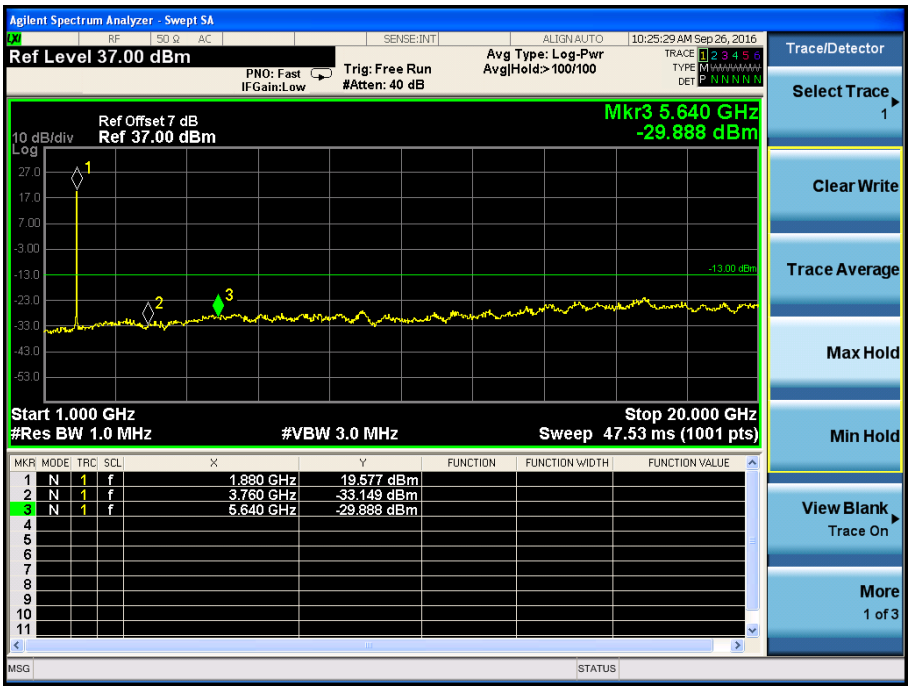
HSUPA Band 2
Low Channel



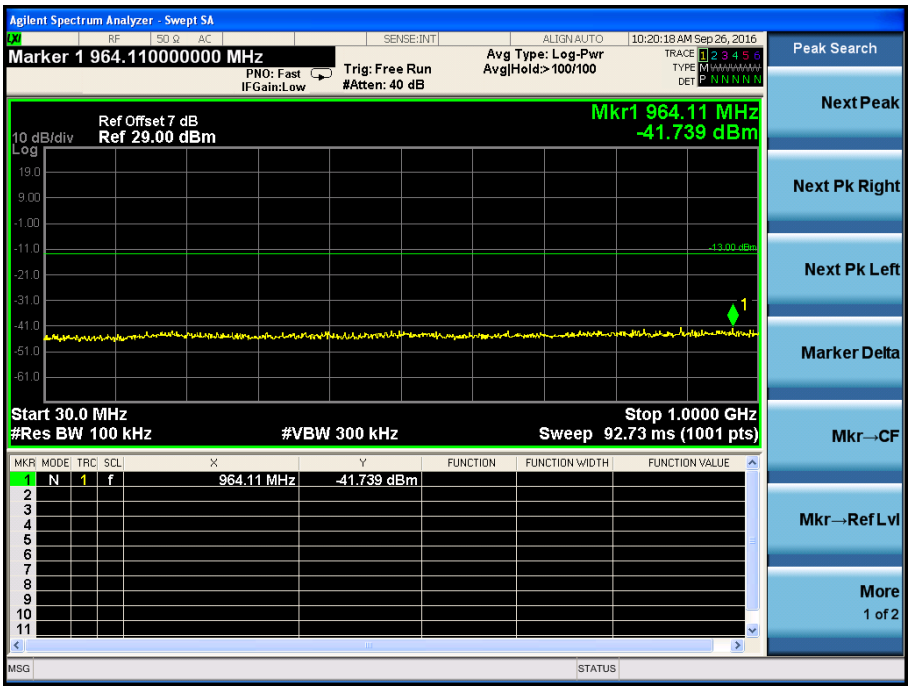


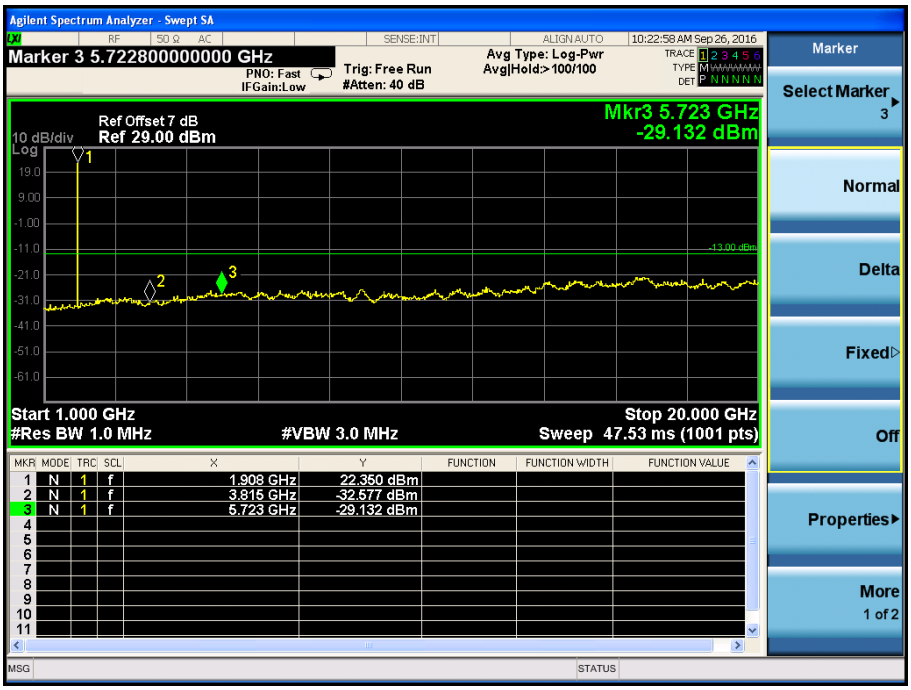
Middle Channel





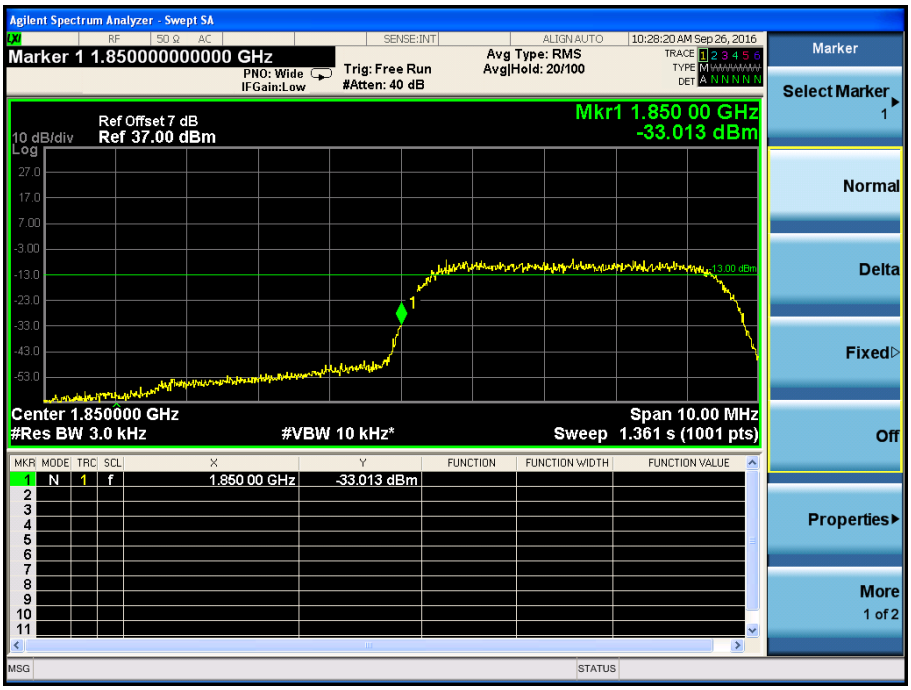
High Channel





HSUPA Band 2 Bandedge Spurious Emissions at Antenna Terminals

Low Band Emission

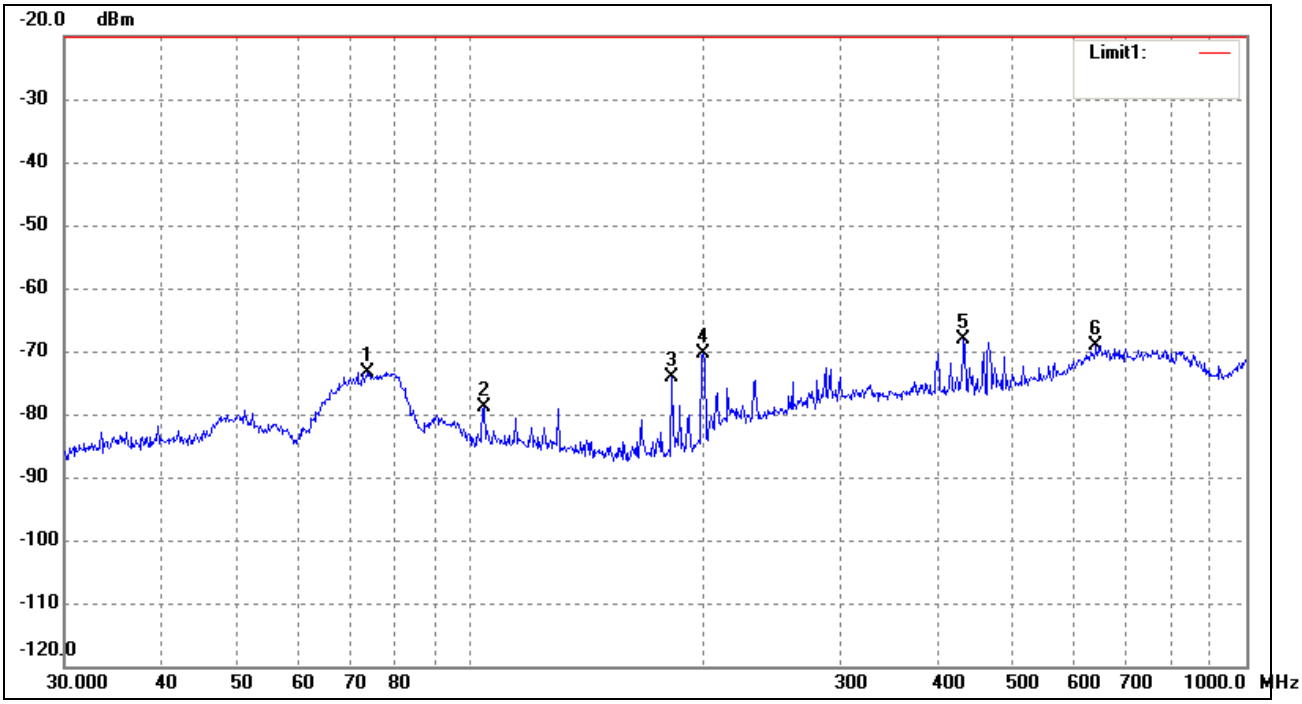


High Band Emission

4. Spurious Radiated Emissions

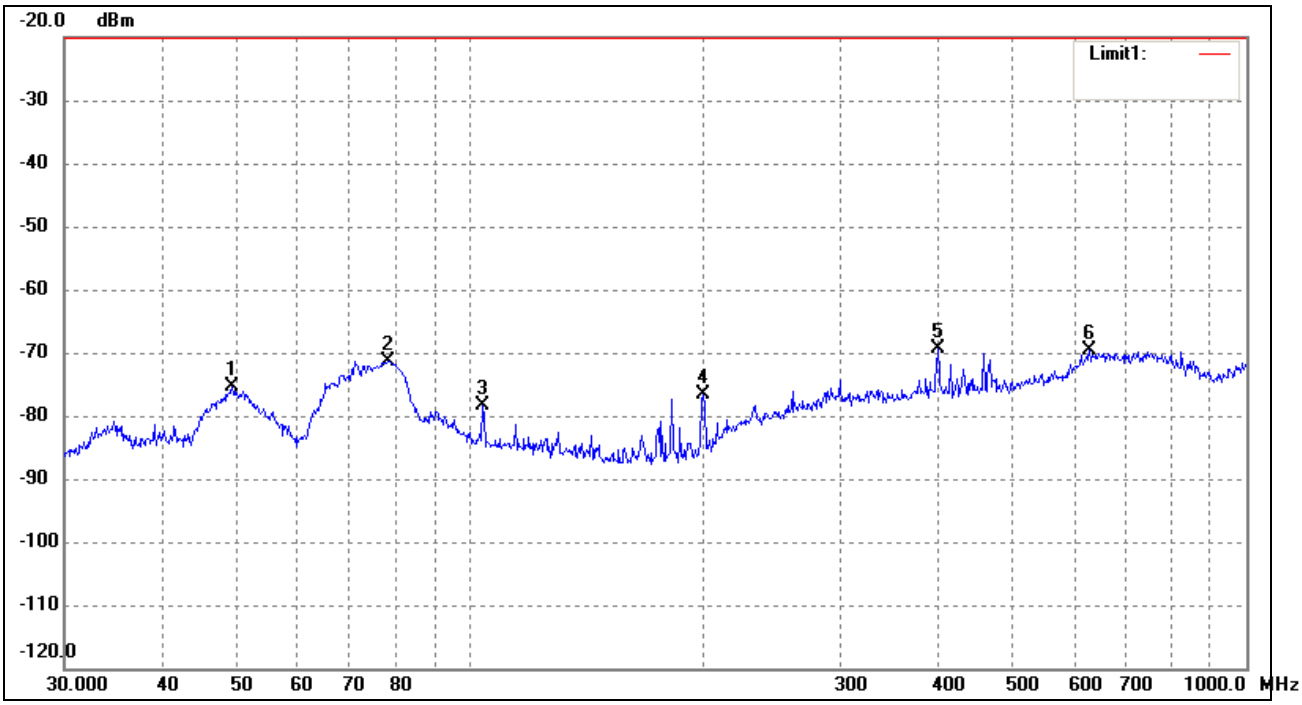
4.1 Test Datas

Spurious Emission 30MHz to 1GHz
GSM850 Mode
Horizontal:



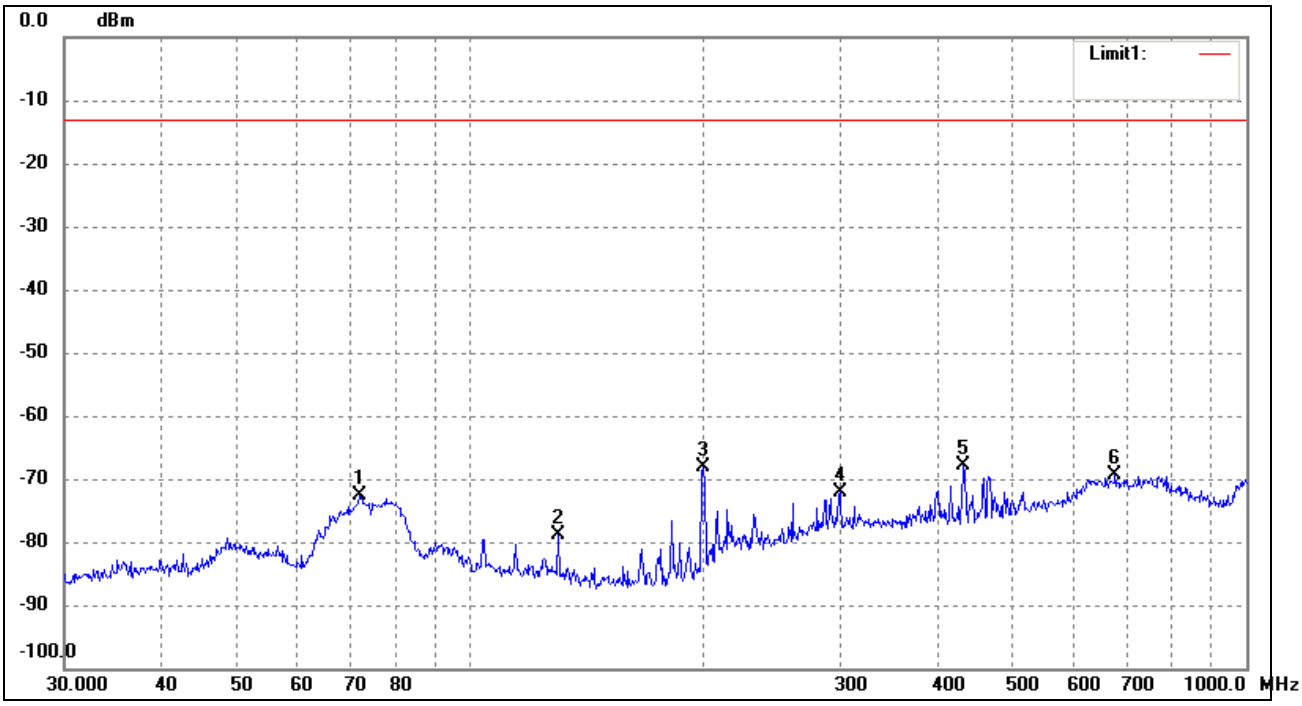
No.	Frequency (MHz)	Reading (dBm)	Correct Factor(dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	73.8756	-75.69	2.42	-73.27	-13.00	-60.27	ERP
2	104.1701	-83.79	4.89	-78.90	-13.00	-65.90	ERP
3	181.9202	-76.54	2.53	-74.01	-13.00	-61.01	ERP
4	199.2855	-73.72	3.32	-70.40	-13.00	-57.40	ERP
5	432.5457	-80.39	12.26	-68.13	-13.00	-55.13	ERP
6	640.6110	-87.16	18.05	-69.11	-13.00	-56.11	ERP

Vertical:



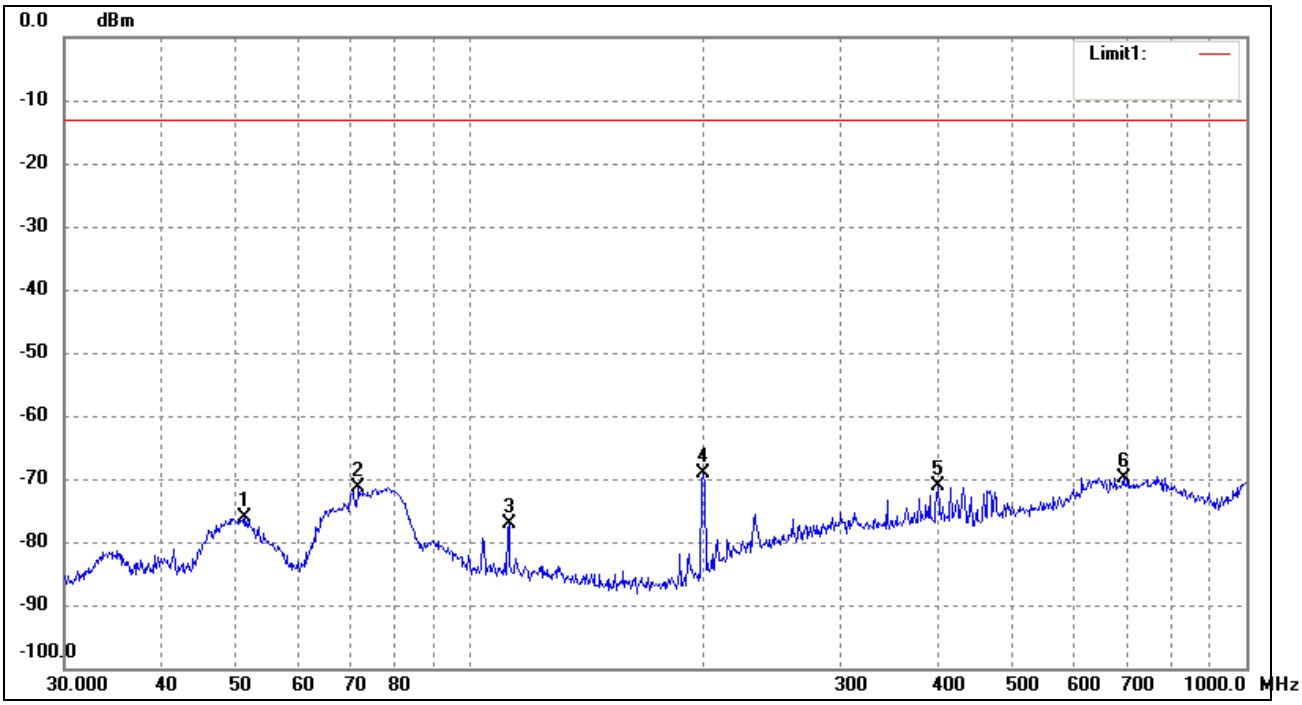
No.	Frequency (MHz)	Reading (dBm)	Correct Factor(dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	49.3594	-80.37	4.98	-75.39	-13.00	-62.39	ERP
2	78.4134	-73.33	1.90	-71.43	-13.00	-58.43	ERP
3	103.8055	-83.34	4.89	-78.45	-13.00	-65.45	ERP
4	199.2855	-79.85	3.32	-76.53	-13.00	-63.53	ERP
5	400.4319	-82.05	12.67	-69.38	-13.00	-56.38	ERP
6	627.2738	-87.24	17.61	-69.63	-13.00	-56.63	ERP

GSM1900 Mode
Horizontal:



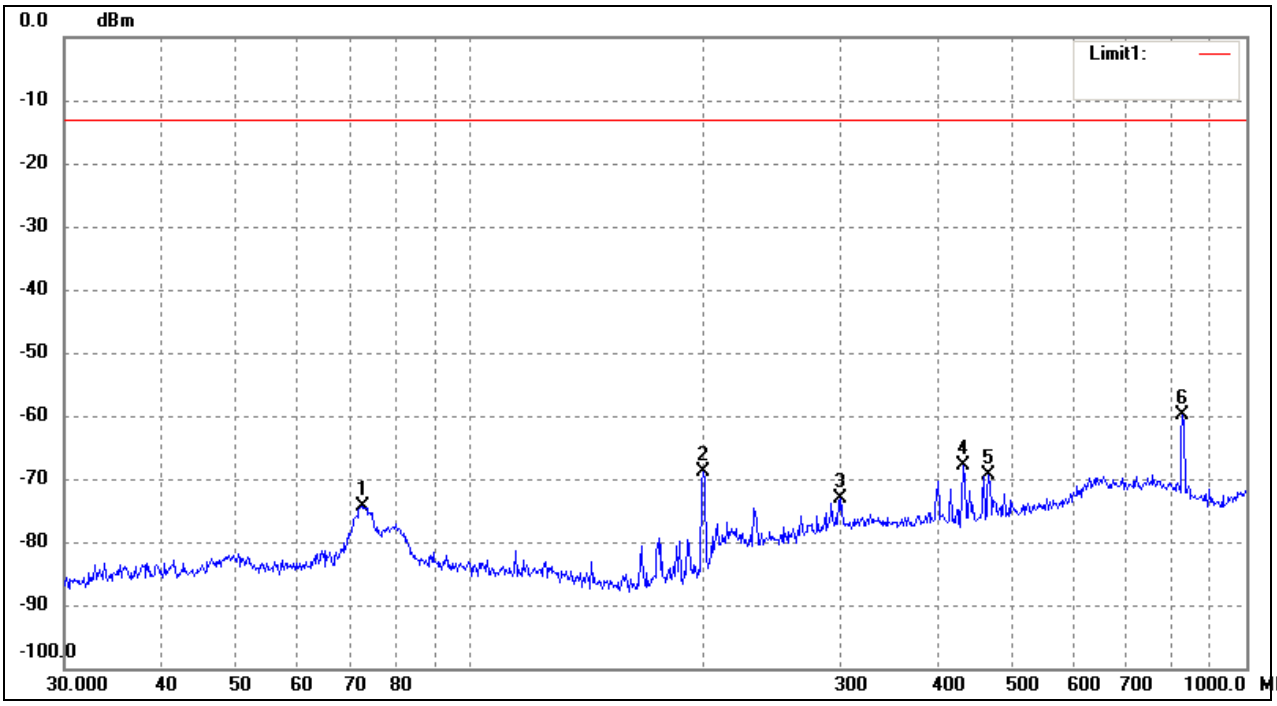
No.	Frequency (MHz)	Reading (dBm)	Correct Factor(dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	72.0843	-75.25	2.62	-72.63	-13.00	-59.63	ERP
2	129.9226	-82.83	3.99	-78.84	-13.00	-65.84	ERP
3	199.2855	-71.48	3.32	-68.16	-13.00	-55.16	ERP
4	299.3158	-84.09	11.92	-72.17	-13.00	-59.17	ERP
5	432.5457	-80.05	12.26	-67.79	-13.00	-54.79	ERP
6	677.5798	-87.85	18.55	-69.30	-13.00	-56.30	ERP

Vertical:



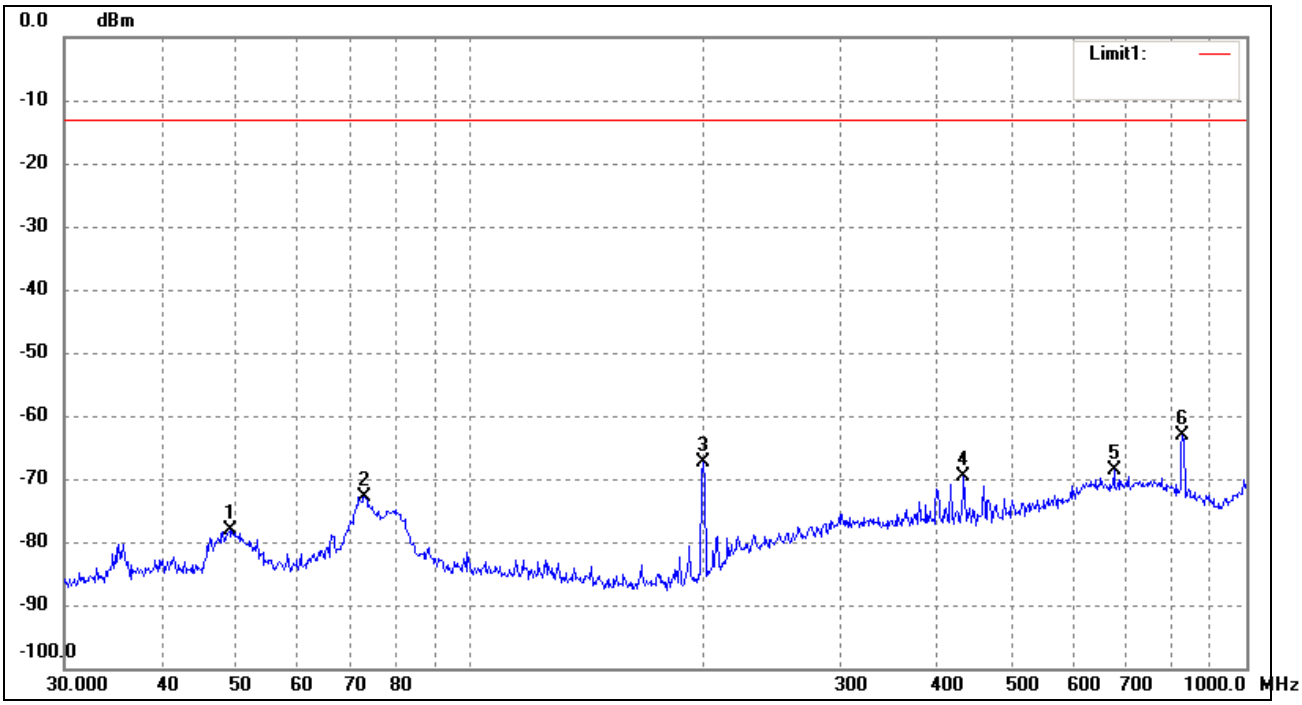
No.	Frequency (MHz)	Reading (dBm)	Correct Factor(dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	51.3005	-81.24	5.02	-76.22	-13.00	-63.22	ERP
2	71.8320	-74.00	2.65	-71.35	-13.00	-58.35	ERP
3	112.1305	-81.94	4.86	-77.08	-13.00	-64.08	ERP
4	199.9856	-72.50	3.35	-69.15	-13.00	-56.15	ERP
5	400.4319	-83.80	12.67	-71.13	-13.00	-58.13	ERP
6	694.4174	-87.38	17.61	-69.77	-13.00	-56.77	ERP

WCDMA Band 5 Mode
Horizontal:



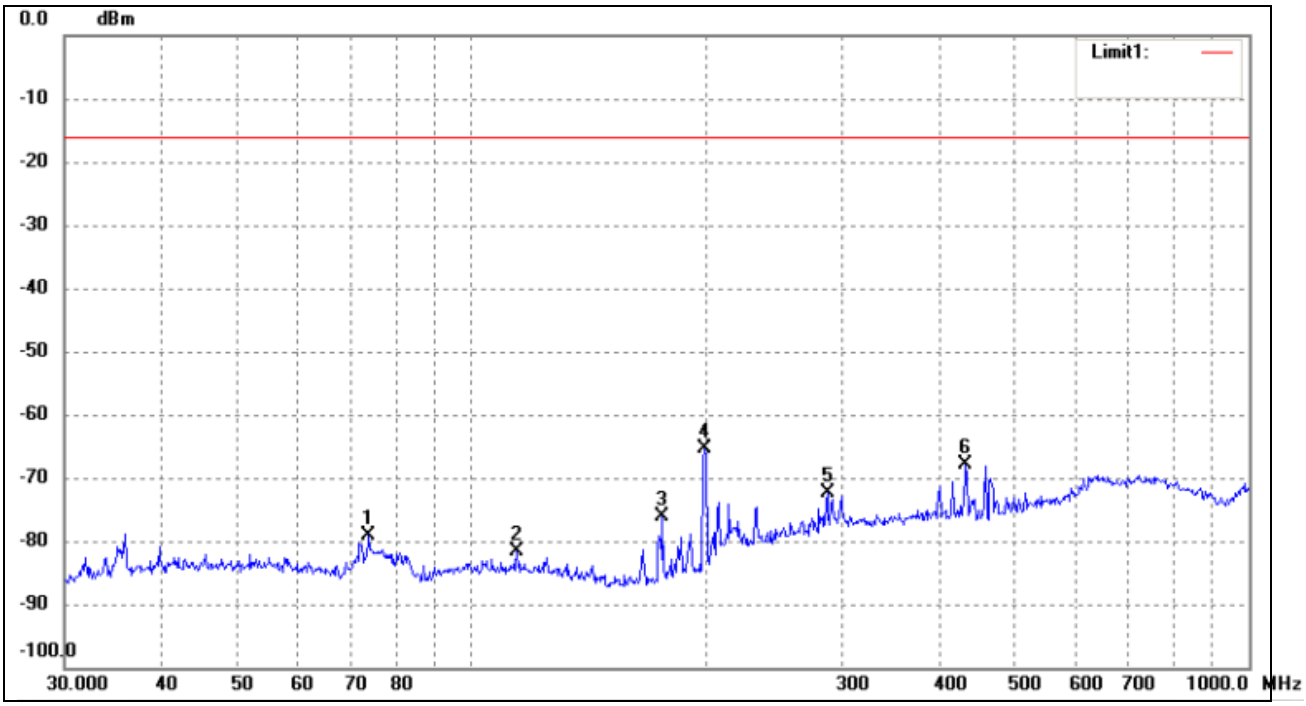
No.	Frequency (MHz)	Reading (dBm)	Correct Factor(dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	72.8466	-76.86	2.54	-74.32	-13.00	-61.32	ERP
2	199.9856	-72.26	3.36	-68.90	-13.00	-55.90	ERP
3	300.3672	-84.99	11.95	-73.04	-13.00	-60.04	ERP
4	432.5457	-80.12	12.26	-67.86	-13.00	-54.86	ERP
5	465.5994	-82.31	12.90	-69.41	-13.00	-56.41	ERP
6	827.4934	-75.74	15.80	-59.94	-13.00	-46.94	ERP

Vertical:



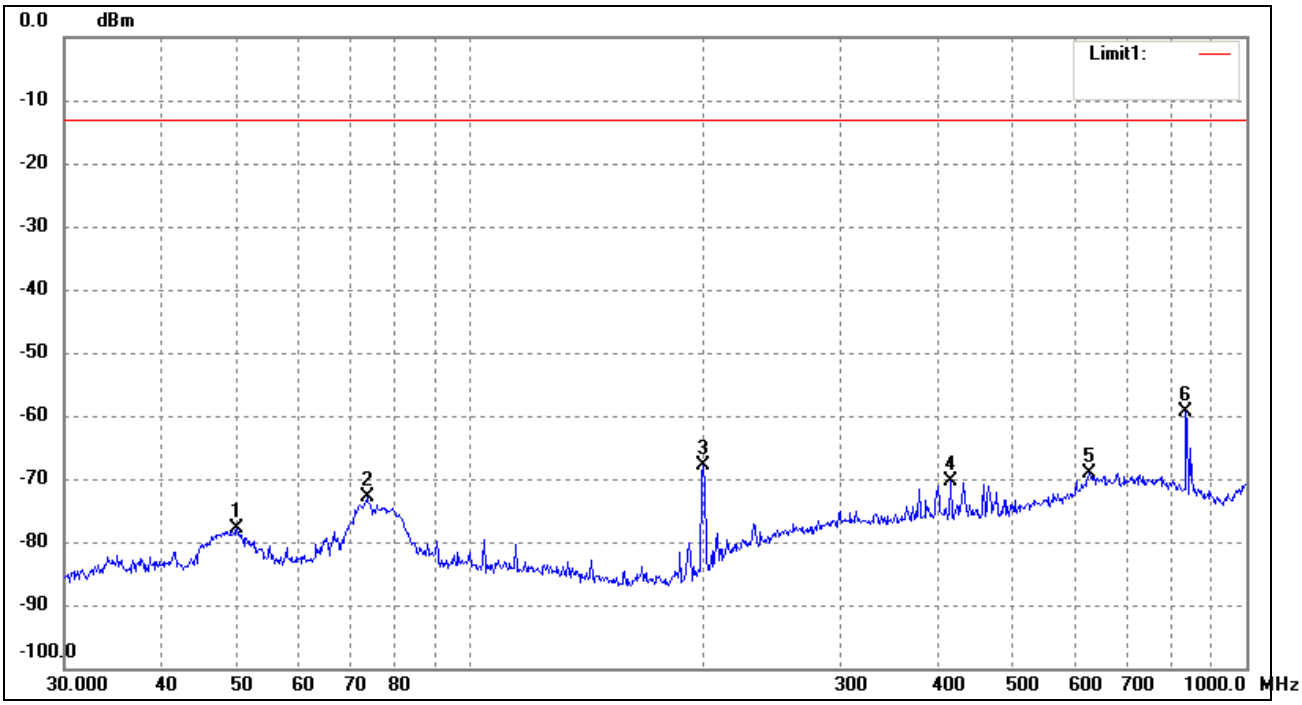
No.	Frequency (MHz)	Reading (dBm)	Correct Factor(dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	49.0145	-83.08	4.97	-78.11	-13.00	-65.11	ERP
2	73.1025	-75.39	2.51	-72.88	-13.00	-59.88	ERP
3	199.2855	-70.70	3.32	-67.38	-13.00	-54.38	ERP
4	432.5457	-81.94	12.26	-69.68	-13.00	-56.68	ERP
5	675.2080	-87.16	18.42	-68.74	-13.00	-55.74	ERP
6	827.4934	-78.88	15.80	-63.08	-13.00	-50.08	ERP

WCDMA band 2 Mode
Horizontal:



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBm)	dB	(dBm)	(dBm)	(dB)	
1	73.8756	-81.45	2.42	-79.03	-13.00	-66.03	ERP
2	114.5146	-86.44	4.85	-81.59	-13.00	-68.59	ERP
3	176.2686	-78.53	2.46	-76.07	-13.00	-63.07	ERP
4	199.2855	-68.60	3.32	-65.28	-13.00	-52.28	ERP
5	286.9823	-83.81	11.43	-72.38	-13.00	-59.38	ERP
6	432.5457	-80.13	12.26	-67.87	-13.00	-54.87	ERP

Vertical:



No.	Frequency (MHz)	Reading (dBm)	Correct Factor(dB)	Result (dBm)	Limit (dBm)	Margin (dB)	Remark
1	50.0566	-82.82	4.98	-77.84	-13.00	-64.84	ERP
2	73.6170	-75.44	2.45	-72.99	-13.00	-59.99	ERP
3	199.2855	-71.30	3.32	-67.98	-13.00	-54.98	ERP
4	416.1791	-82.42	12.04	-70.38	-13.00	-57.38	ERP
5	627.2738	-86.83	17.61	-69.22	-13.00	-56.22	ERP
6	836.2443	-75.28	15.96	-59.32	-13.00	-46.32	ERP

Spurious Radiated Emissions Above 1GHz

GSM850 Mode

Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Polar H/V
Low Channel (824.2MHz)						
1648.4	-42.73	4.94	-37.79	-13.00	-24.79	H
2472.6	-50.00	8.46	-41.54	-13.00	-28.54	H
1648.4	-44.55	4.94	-39.61	-13.00	-26.61	V
2472.6	-48.18	8.46	-39.72	-13.00	-26.72	V
Middle Channel (836.6MHz)						
1673.2	-55.45	5.11	-50.34	-13.00	-37.34	H
2509.8	-47.27	8.54	-38.73	-13.00	-25.73	H
1673.2	-50.91	5.11	-45.80	-13.00	-32.80	V
2509.8	-49.09	8.54	-40.55	-13.00	-27.55	V
High Channel (848.8MHz)						
1697.6	-53.64	5.29	-48.35	-13.00	-35.35	H
2546.4	-43.64	8.59	-35.05	-13.00	-22.05	H
1697.6	-53.64	5.29	-48.35	-13.00	-35.35	V
2546.4	-47.27	8.59	-38.68	-13.00	-25.68	V

GSM1900 Mode

Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Polar H/V
Low Channel (1850.2MHz)						
3700.4	-45.45	10.54	-34.91	-13	-21.91	H
5550.6	-46.36	13.37	-32.99	-13	-19.99	H
3700.4	-44.55	10.54	-34.01	-13	-21.01	V
5550.6	-50.91	13.37	-37.54	-13	-24.54	V
Middle Channel (1880MHz)						
3760.0	-53.64	10.64	-43.00	-13	-30.00	H
5640.0	-48.18	13.54	-34.64	-13	-21.64	H
3760.0	-52.73	10.64	-42.09	-13	-29.09	V
5640.0	-50.00	13.54	-36.46	-13	-23.46	V
High Channel (1909.8MHz)						
3819.6	-54.55	10.74	-43.81	-13	-30.81	H
5729.4	-50.91	13.71	-37.20	-13	-24.20	H
3819.6	-52.73	10.74	-41.99	-13	-28.99	V
5729.4	-50.00	13.71	-36.29	-13	-23.29	V

WCDMA Band 5 Mode

Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Polar H/V
Low Channel (826.4MHz)						
1652.8	-50.00	4.94	-45.06	-13.00	-32.06	H
2479.2	-47.27	8.46	-38.81	-13.00	-25.81	H
1652.8	-42.73	4.94	-37.79	-13.00	-24.79	V
2479.2	-46.36	8.46	-37.90	-13.00	-24.90	V
Middle Channel (836.6MHz)						
1672.8	-43.64	5.11	-38.53	-13.00	-25.53	H
2509.2	-48.18	8.54	-39.64	-13.00	-26.64	H
1672.8	-50.91	5.11	-45.80	-13.00	-32.80	V
2509.2	-55.45	8.54	-46.91	-13.00	-33.91	V
High Channel (846.6MHz)						
1693.2	-49.09	5.29	-43.80	-13.00	-30.80	H
2539.8	-42.73	8.59	-34.14	-13.00	-21.14	H
1693.2	-51.82	5.29	-46.53	-13.00	-33.53	V
2539.8	-55.45	8.59	-46.86	-13.00	-33.86	V

WCDMA Band 2 Mode

Frequency (MHz)	Reading (dBm)	Correct dB	Result (dBm)	Limit (dBm)	Margin (dB)	Polar H/V
Low Channel (1852.4MHz)						
3704.8	-34.18	10.17	-24.01	-13	-11.01	H
5557.2	-40.7	14.69	-26.01	-13	-13.01	H
3704.8	-37.46	10.17	-27.29	-13	-14.29	V
5557.2	-38.55	14.69	-23.86	-13	-10.86	V
Middle Channel (1880MHz)						
3760.8	-37.18	10.26	-26.92	-13	-13.92	H
5640.0	-38.57	14.78	-23.79	-13	-10.79	H
3760.8	-34.45	10.26	-24.19	-13	-11.19	V
5640.0	-38.9	14.78	-24.12	-13	-11.12	V
High Channel (1907.6MHz)						
3815.2	-35.45	10.59	-24.86	-13	-11.86	H
5722.8	-38.68	15.03	-23.65	-13	-10.65	H
3815.2	-36.28	10.59	-25.69	-13	-12.69	V
5722.8	-39.68	15.03	-24.65	-13	-11.65	H

Note:
1, Result=Reading+ Correct, Margin= Result- Limit
2, Testing is carried out with frequency rang 9kHz to 20GHz, which above 3th Harmonics are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured, so the data is not display.
3, Only the worst case were shown in this test report.

5. Frequency Stability

5.1 Environmental Conditions

Temperature:	Supply Voltage
20°C	DC 3.3-4.2V declared by manufacturer
-30°C to +50°C	Normal

5.2 Test Datas

GSM850

Reference Frequency(Middle Channel): 836.6 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	3.8	52	0.0625
40	3.8	45	0.0542
30	3.8	36	0.0432
20	3.8	28	0.0340
10	3.8	25	0.0294
0	3.8	20	0.0239
-10	3.8	25	0.0303
-20	3.8	29	0.0349
-30	3.8	35	0.0423

PCS1900

Reference Frequency(Middle Channel): 1880 MHz, Limit: Within assigned bands			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	3.8	67	0.0356
40	3.8	55	0.0291
30	3.8	43	0.0229
20	3.8	36	0.0192
10	3.8	32	0.0172
0	3.8	28	0.0151
-10	3.8	35	0.0188
-20	3.8	40	0.0213
-30	3.8	46	0.0245

GPRS850

Reference Frequency(Middle Channel): 836.6MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	3.8	77	0.0919
40	3.8	66	0.0791
30	3.8	57	0.0680
20	3.8	49	0.0588
10	3.8	45	0.0542
0	3.8	38	0.0460
-10	3.8	44	0.0524
-20	3.8	49	0.0588
-30	3.8	54	0.0644

GPRS1900

Reference Frequency(Middle Channel): 1880 MHz, Limit: Within assigned bands		
Environment	Power Supplied	Frequency Measure with Time Elapsed

Temperature (°C)	(VDC)	MCF (Hz)	Error (ppm)
50	3.8	58	0.0311
40	3.8	49	0.0262
30	3.8	44	0.0233
20	3.8	37	0.0196
10	3.8	32	0.0168
0	3.8	26	0.0139
-10	3.8	30	0.0160
-20	3.8	35	0.0188
-30	3.8	39	0.0209

EDGE850

Reference Frequency(Middle Channel): 836.6MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	3.8	56	0.0671
40	3.8	52	0.0616
30	3.8	42	0.0506
20	3.8	38	0.0460
10	3.8	33	0.0395
0	3.8	26	0.0313
-10	3.8	31	0.0368
-20	3.8	35	0.0414
-30	3.8	40	0.0478

EDGE1900

Reference Frequency(Middle Channel): 1880 MHz, Limit: Within assigned bands			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	3.8	51	0.0270
40	3.8	40	0.0213
30	3.8	34	0.0180
20	3.8	28	0.0147
10	3.8	21	0.0110
0	3.8	15	0.0082
-10	3.8	23	0.0123
-20	3.8	28	0.0147
-30	3.8	35	0.0184

WCDMA Band 5

Reference Frequency(Middle Channel): 836.6 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	3.8	60	0.0717
40	3.8	54	0.0644
30	3.8	47	0.0561
20	3.8	43	0.0515
10	3.8	36	0.0432
0	3.8	30	0.0359
-10	3.8	37	0.0441
-20	3.8	41	0.0487
-30	3.8	48	0.0579

WCDMA Band 2

Reference Frequency(Middle Channel): 1880 MHz, Limit: Within assigned bands		
Environment	Power Supplied	Frequency Measure with Time Elapsed

Temperature (°C)	(VDC)	MCF (Hz)	Error (ppm)
50	3.8	55	0.0295
40	3.8	45	0.0237
30	3.8	38	0.0200
20	3.8	31	0.0164
10	3.8	27	0.0143
0	3.8	19	0.0102
-10	3.8	27	0.0143
-20	3.8	33	0.0176
-30	3.8	40	0.0213

HSDPA Band 5

Reference Frequency(Middle Channel): 836.6 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	3.8	74	0.0883
40	3.8	66	0.0791
30	3.8	55	0.0653
20	3.8	48	0.0570
10	3.8	44	0.0524
0	3.8	36	0.0432
-10	3.8	42	0.0497
-20	3.8	46	0.0552
-30	3.8	53	0.0634

HSDPA Band 2

Reference Frequency(Middle Channel): 1880 MHz, Limit: Within assigned bands			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	3.8	54	0.0286
40	3.8	43	0.0229
30	3.8	37	0.0196
20	3.8	30	0.0160
10	3.8	23	0.0123
0	3.8	17	0.0090
-10	3.8	22	0.0115
-20	3.8	28	0.0147
-30	3.8	32	0.0168

HSUPA Band 5

Reference Frequency(Middle Channel): 836.6 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		MCF (Hz)	Error (ppm)
50	3.8	62	0.0736
40	3.8	53	0.0634
30	3.8	42	0.0497
20	3.8	34	0.0405
10	3.8	28	0.0340
0	3.8	25	0.0294
-10	3.8	31	0.0368
-20	3.8	35	0.0414
-30	3.8	42	0.0506

HSUPA Band 2

Reference Frequency(Middle Channel): 1880 MHz, Limit: Within assigned bands		
Environment	Power Supplied	Frequency Measure with Time Elapsed

Temperature (°C)	(VDC)	MCF (Hz)	Error (ppm)
50	3.8	65	0.0344
40	3.8	59	0.0315
30	3.8	53	0.0282
20	3.8	47	0.0250
10	3.8	42	0.0221
0	3.8	38	0.0200
-10	3.8	42	0.0225
-20	3.8	48	0.0254
-30	3.8	53	0.0282

Reference Frequency(Middle Channel): GSM 836.6MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	3.3	34	0.0405
	3.8	22	0.0267
	4.2	35	0.0423
Reference Frequency(Middle Channel): GSM 1880 MHz, Limit: Within assigned bands			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	3.3	44	0.0233
	3.8	28	0.0151
	4.2	41	0.0217
Reference Frequency(Middle Channel): GPRS 836.6MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	3.3	31	0.0368
	3.8	25	0.0303
	4.2	32	0.0377
Reference Frequency(Middle Channel): GPRS 1880 MHz, Limit: Within assigned bands			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	3.3	38	0.0200
	3.8	22	0.0119
	4.2	28	0.0147
Reference Frequency(Middle Channel): EDGE 836.6MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	3.3	52	0.0625
	3.8	38	0.0451
	4.2	51	0.0607
Reference Frequency(Middle Channel): EDGE 1880 MHz, Limit: Within assigned bands			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	3.3	28	0.0147
	3.8	18	0.0098
	4.2	32	0.0168
Reference Frequency(Middle Channel): WCDMA 836.6MHz, Limit: 2.5ppm			
Environment	Power Supplied	Frequency Measure with Time Elapsed	

Temperature (°C)	(VDC)	Frequency (Hz)	Error (ppm)
20	3.3	35	0.0423
	3.8	25	0.0294
	4.2	29	0.0349
Reference Frequency(Middle Channel): WCDMA 1880 MHz, Limit: Within assigned bands			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	3.3	28	0.0151
	3.8	17	0.0090
	4.2	30	0.0160
Reference Frequency(Middle Channel): HSDPA 836.6MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	3.3	33	0.0395
	3.8	25	0.0303
	4.2	38	0.0451
Reference Frequency(Middle Channel): HSDPA 1880 MHz, Limit: Within assigned bands			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	3.3	48	0.0258
	3.8	35	0.0184
	4.2	44	0.0233
Reference Frequency(Middle Channel): HSUPA 836.6MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	3.3	28	0.0331
	3.8	24	0.0285
	4.2	37	0.0441
Reference Frequency(Middle Channel): HSUPA 1880 MHz, Limit: Within assigned bands			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency (Hz)	Error (ppm)
20	3.3	33	0.0176
	3.8	22	0.0119
	4.2	32	0.0168

Note:
1, Only the worst case were shown in this test report.

6. Peak-to-average Ratio (PAR)

6.1 Test Datas

PCS1900

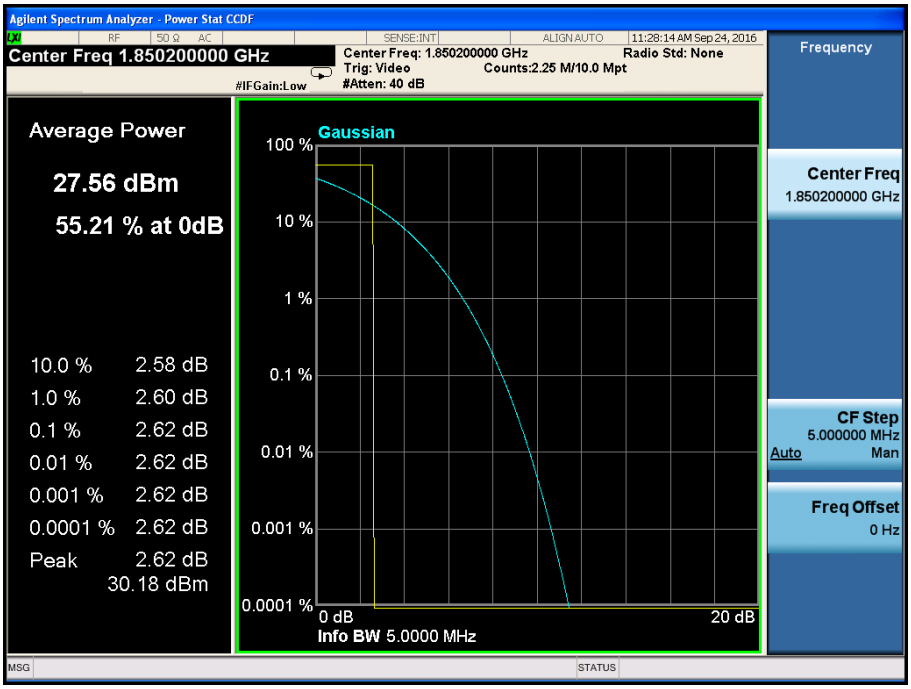
Test Mode	Channel	Frequency (MHz)	PAR (dB)	Limit (dB)
GSM	512	1850.2	2.62	13
GPRS(1 Slot)	512	1850.2	2.61	13
EDGE(1 Slot)	512	1850.2	5.25	13

WCDMA Band 2

Test Mode	Channel	Frequency (MHz)	PAR (dB)	Limit (dB)
WCDMA	9400	1880.0	2.75	13
HSDPA	9400	1880.0	3.94	13
HSUPA	9400	1880.0	3.54	13

6.2 Test Plots

GSM



WCDMA

Note:
1, Only the worst case were shown in this test report.