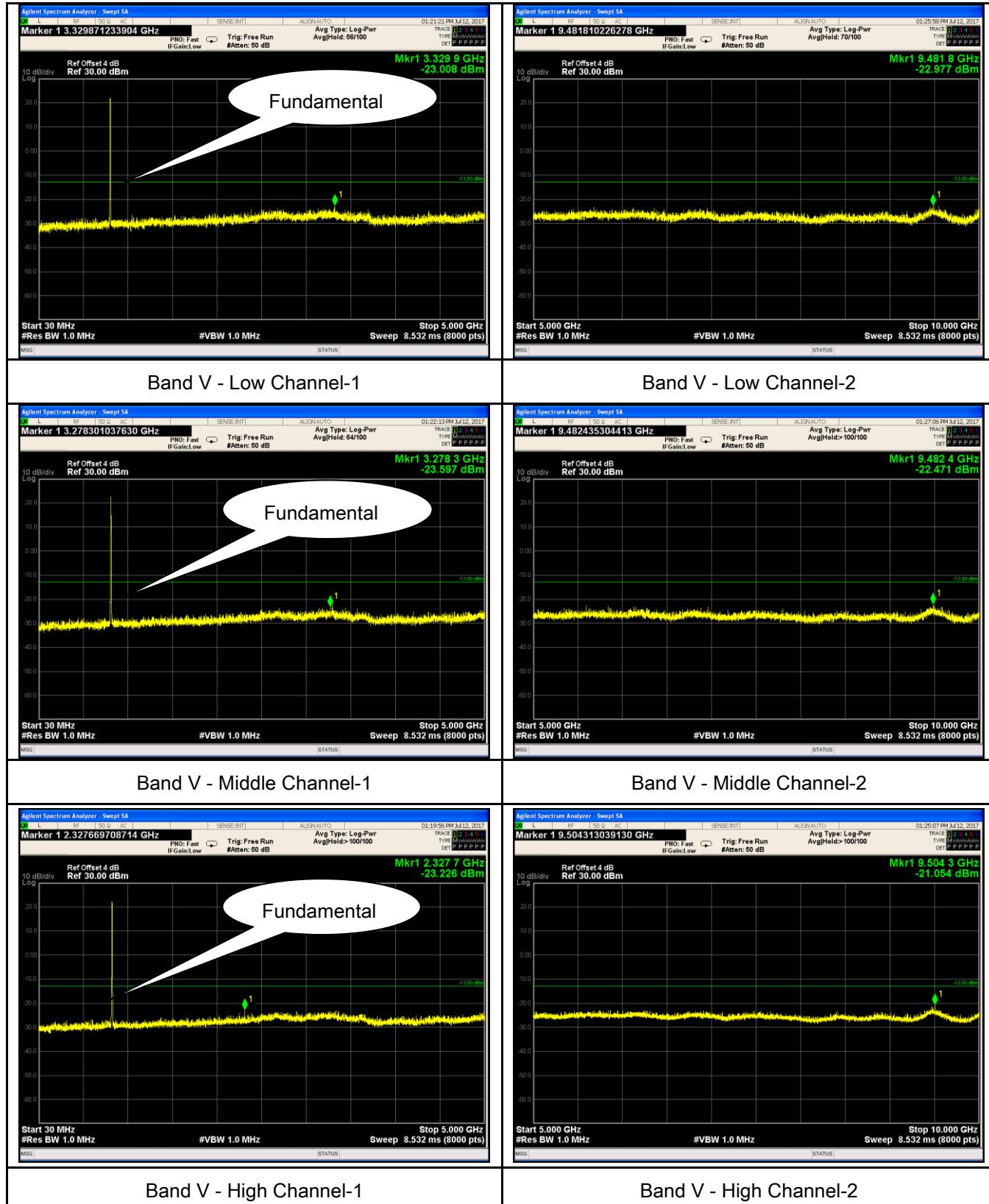
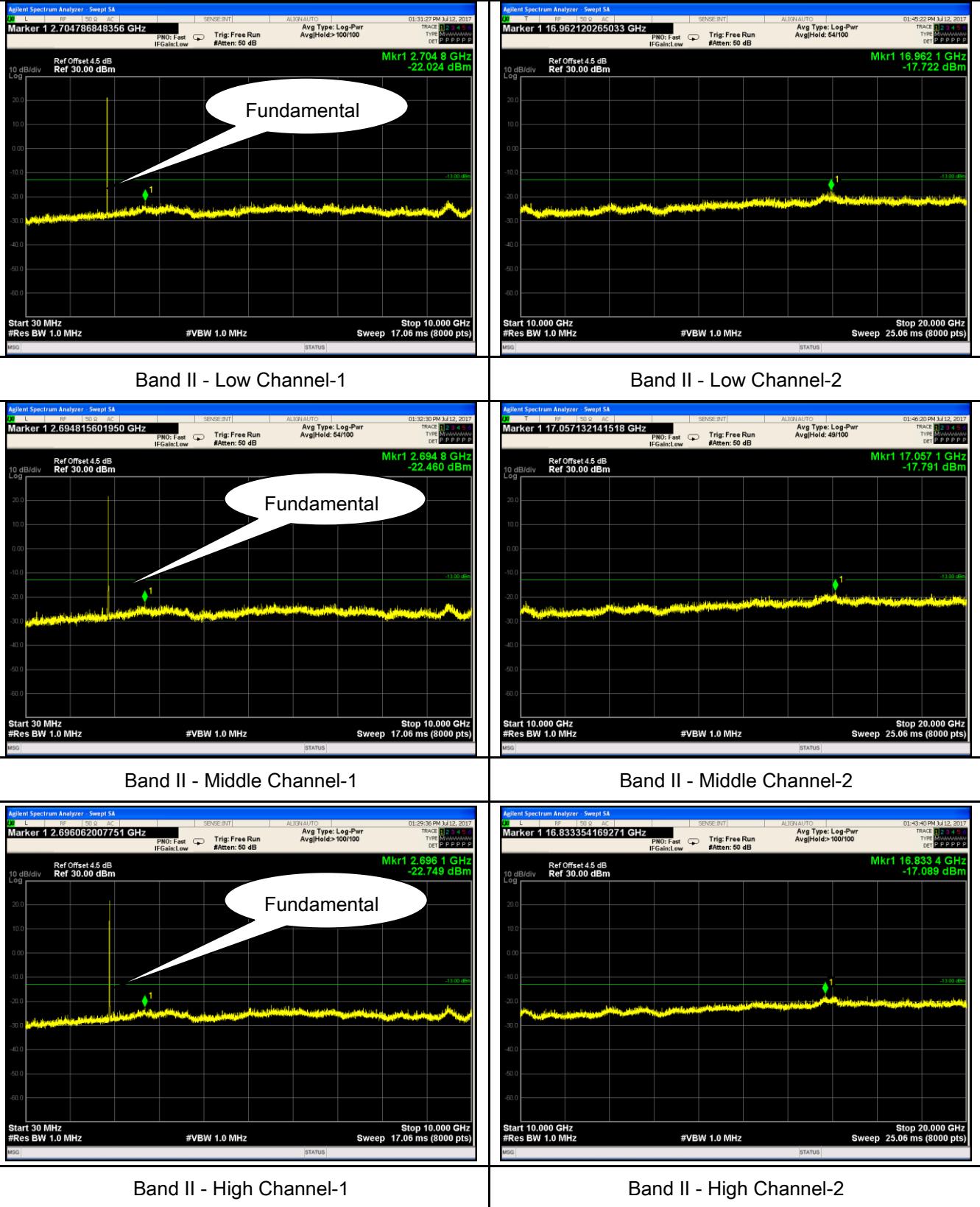


RMC

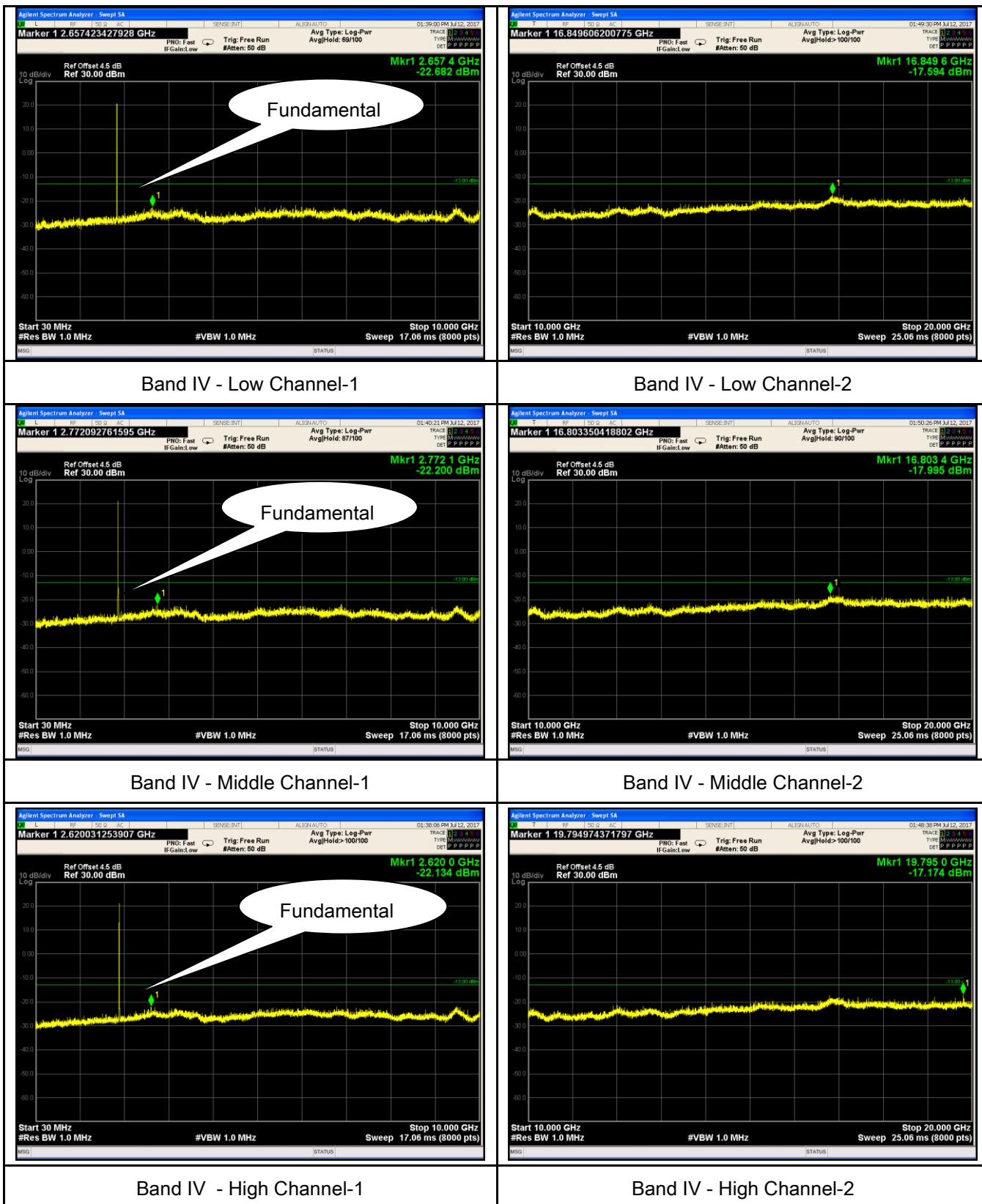
UMTS-FDD Band V (Part 22H)

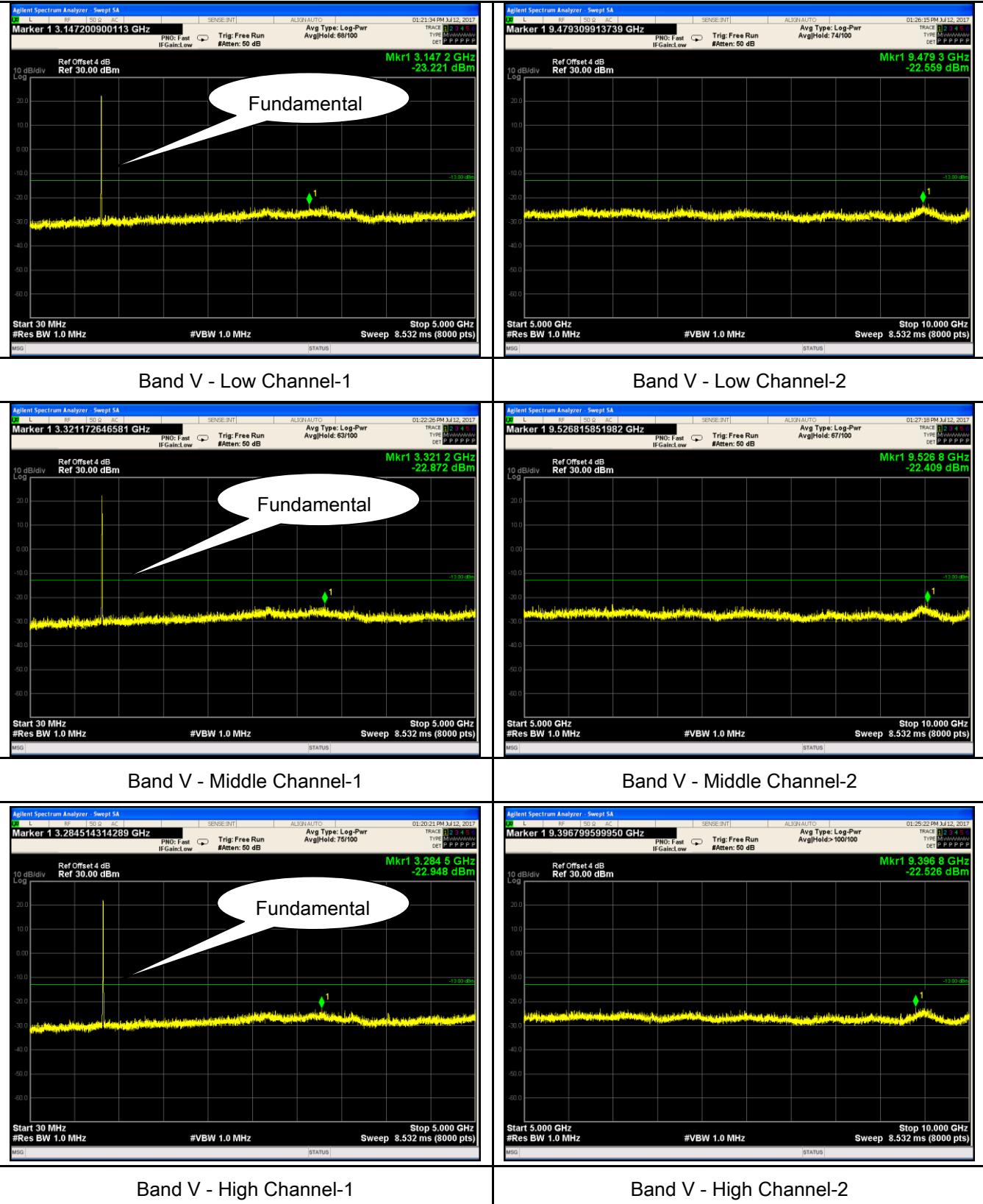


UMTS-FDD Band II (Part 24E)

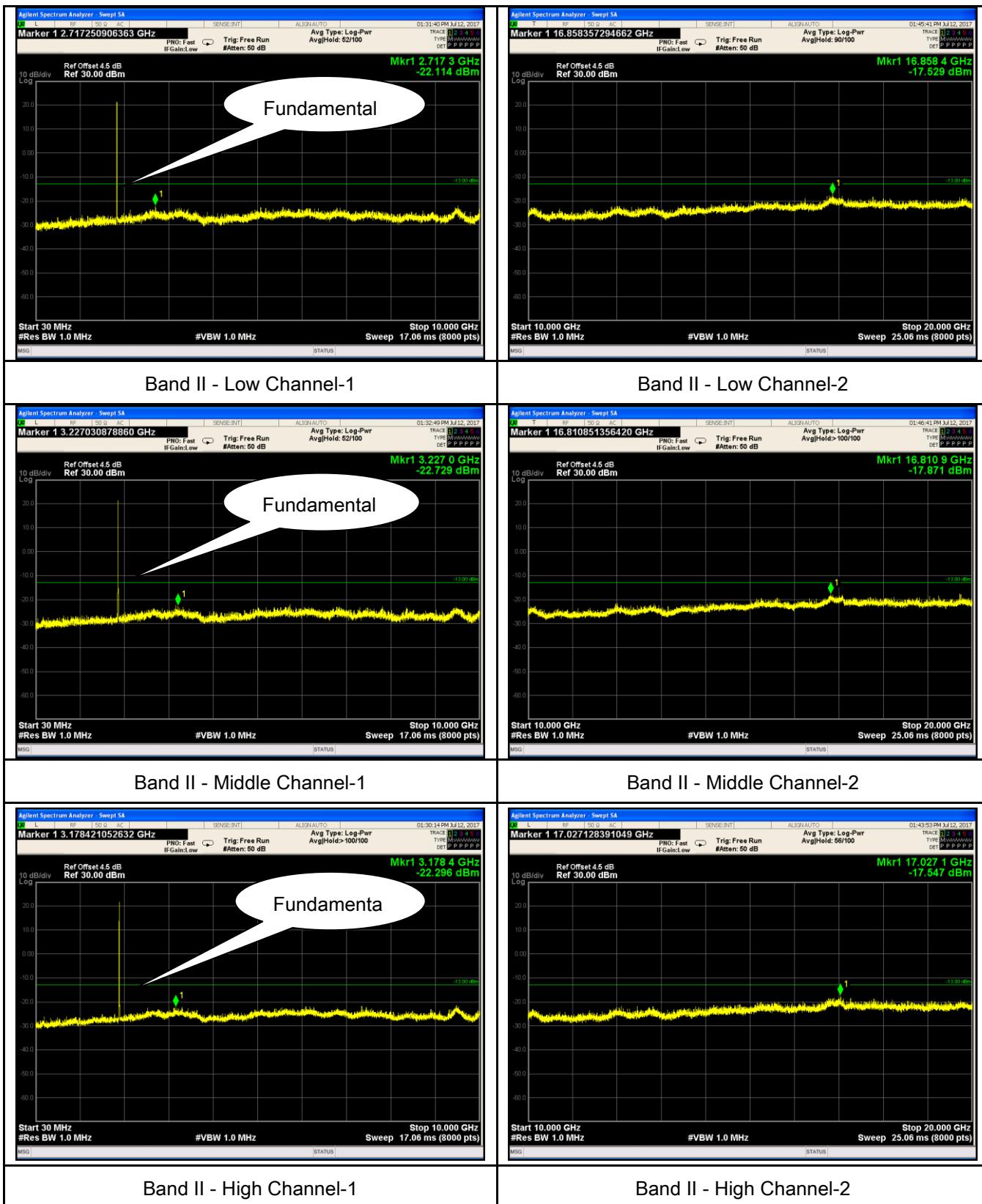


UMTS-FDD Band IV (Part 27)

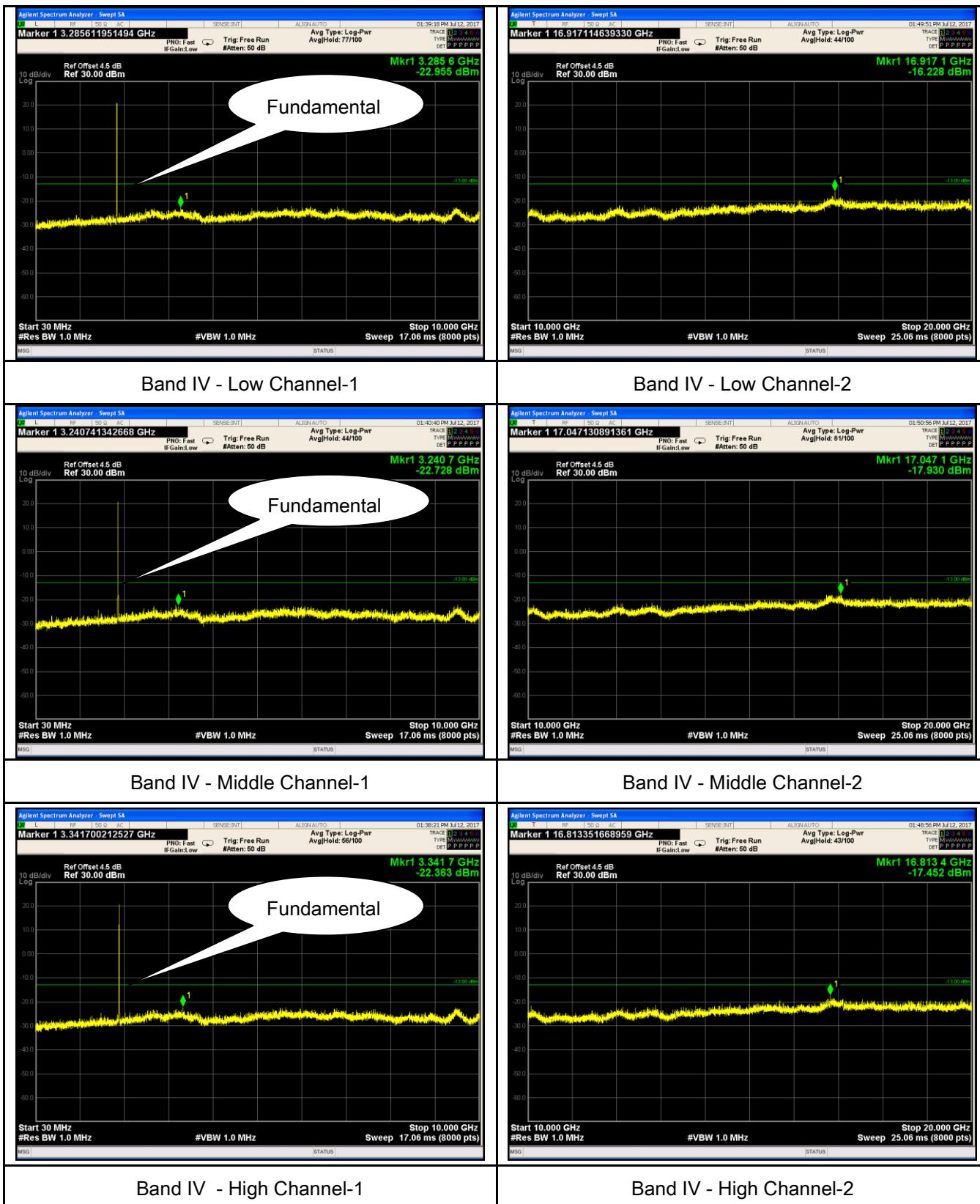


HSUPA:
UMTS-FDD Band V (Part 22H)


UMTS-FDD Band II (Part 24E)

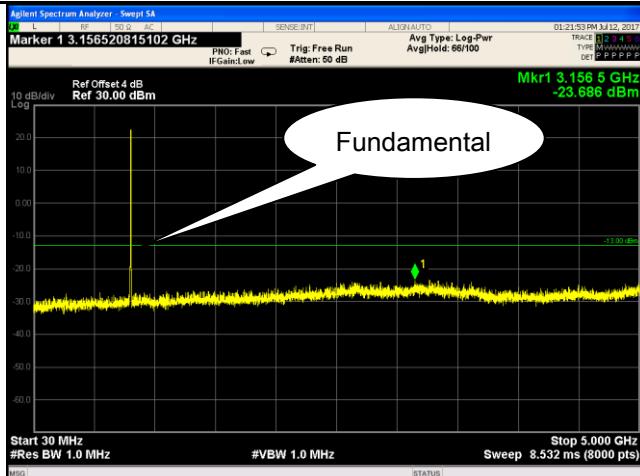


UMTS-FDD Band IV (Part 27)

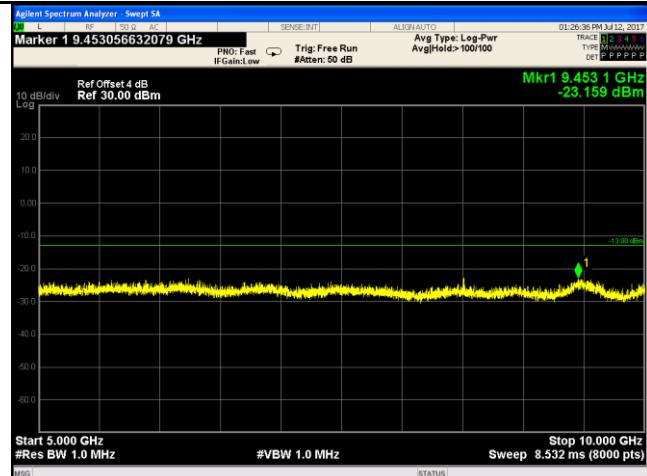


HSDPA:

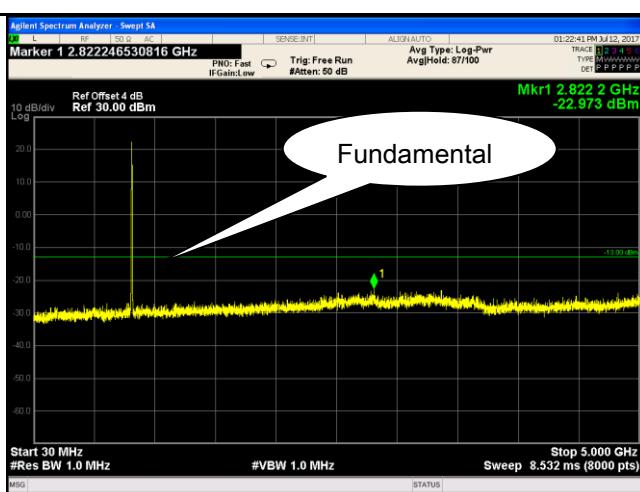
UMTS-FDD Band V (Part 22H)



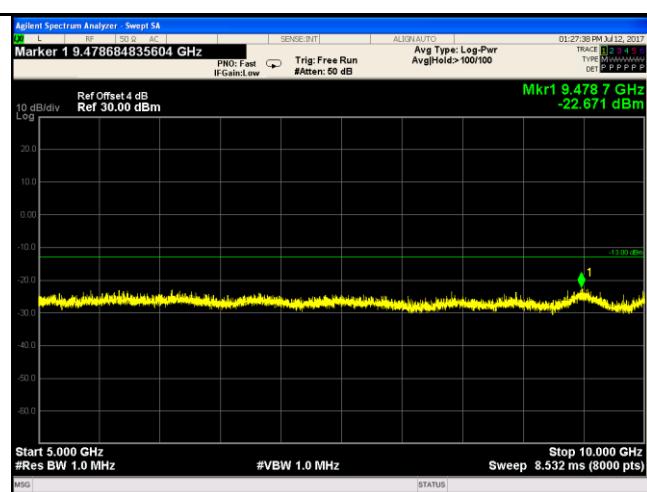
Band V - Low Channel-1



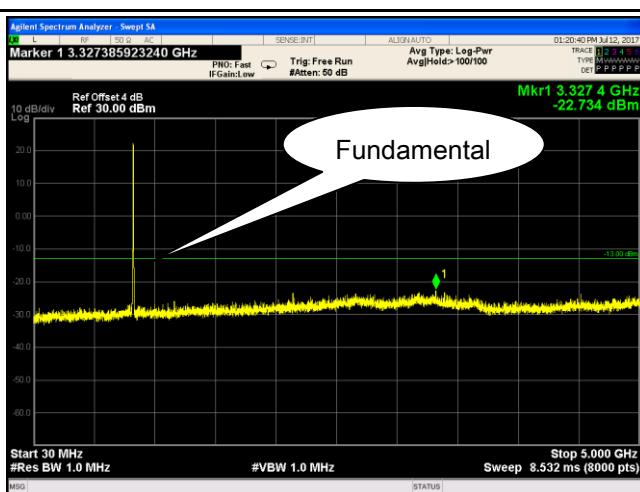
Band V - Low Channel-2



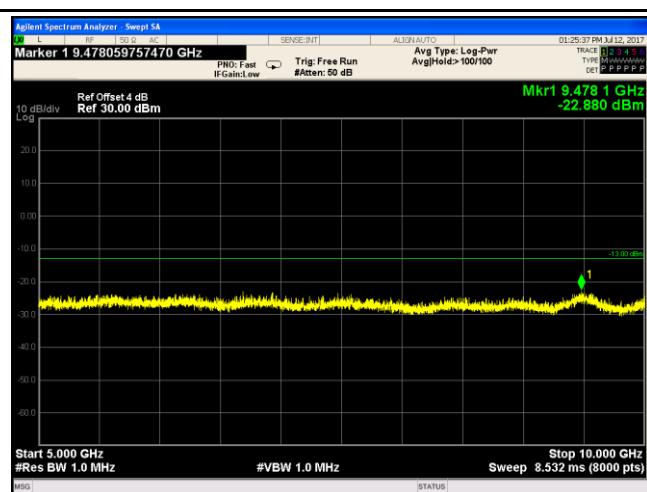
Band V - Middle Channel-1



Band V - Middle Channel-2

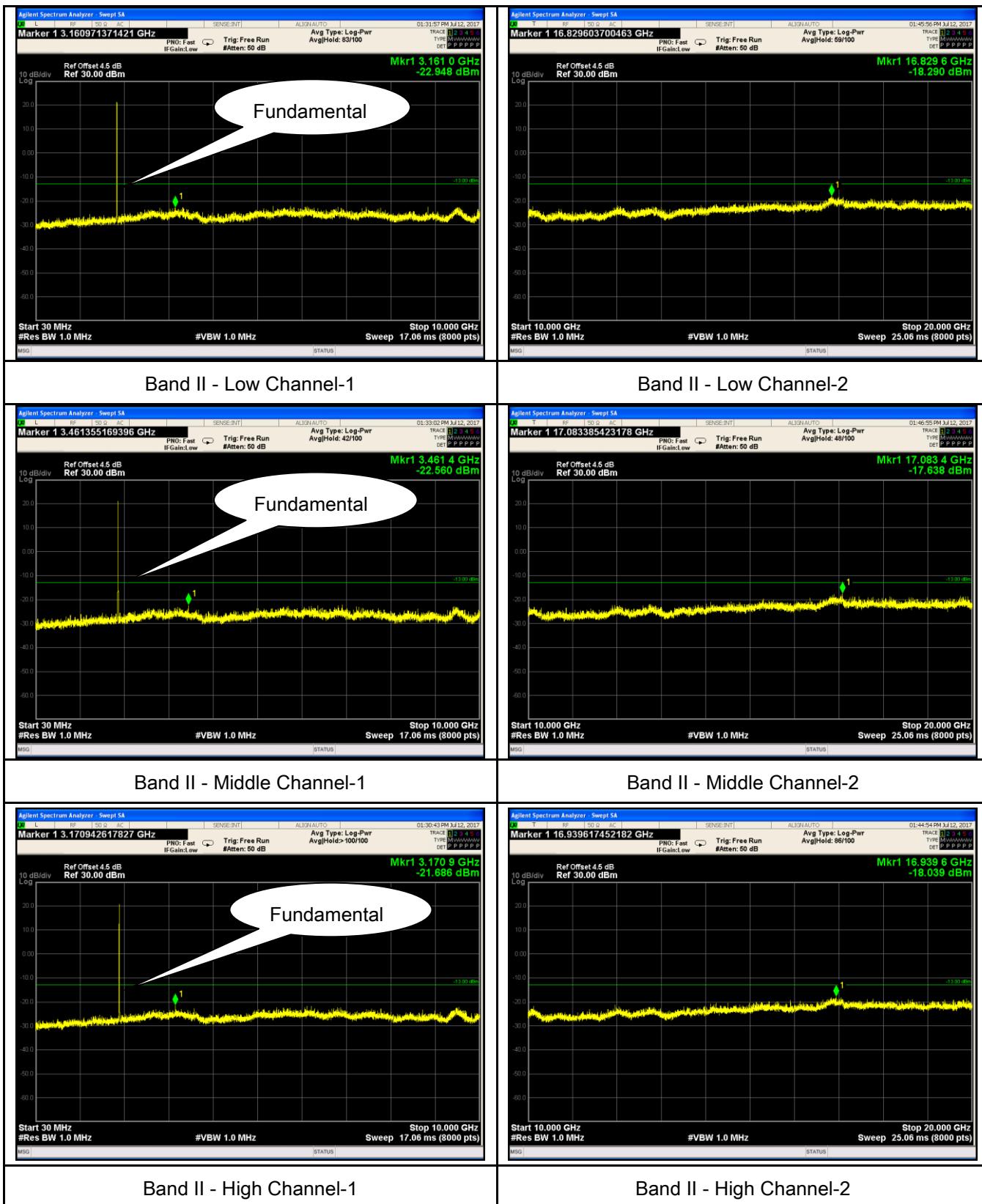


Band V - High Channel-1

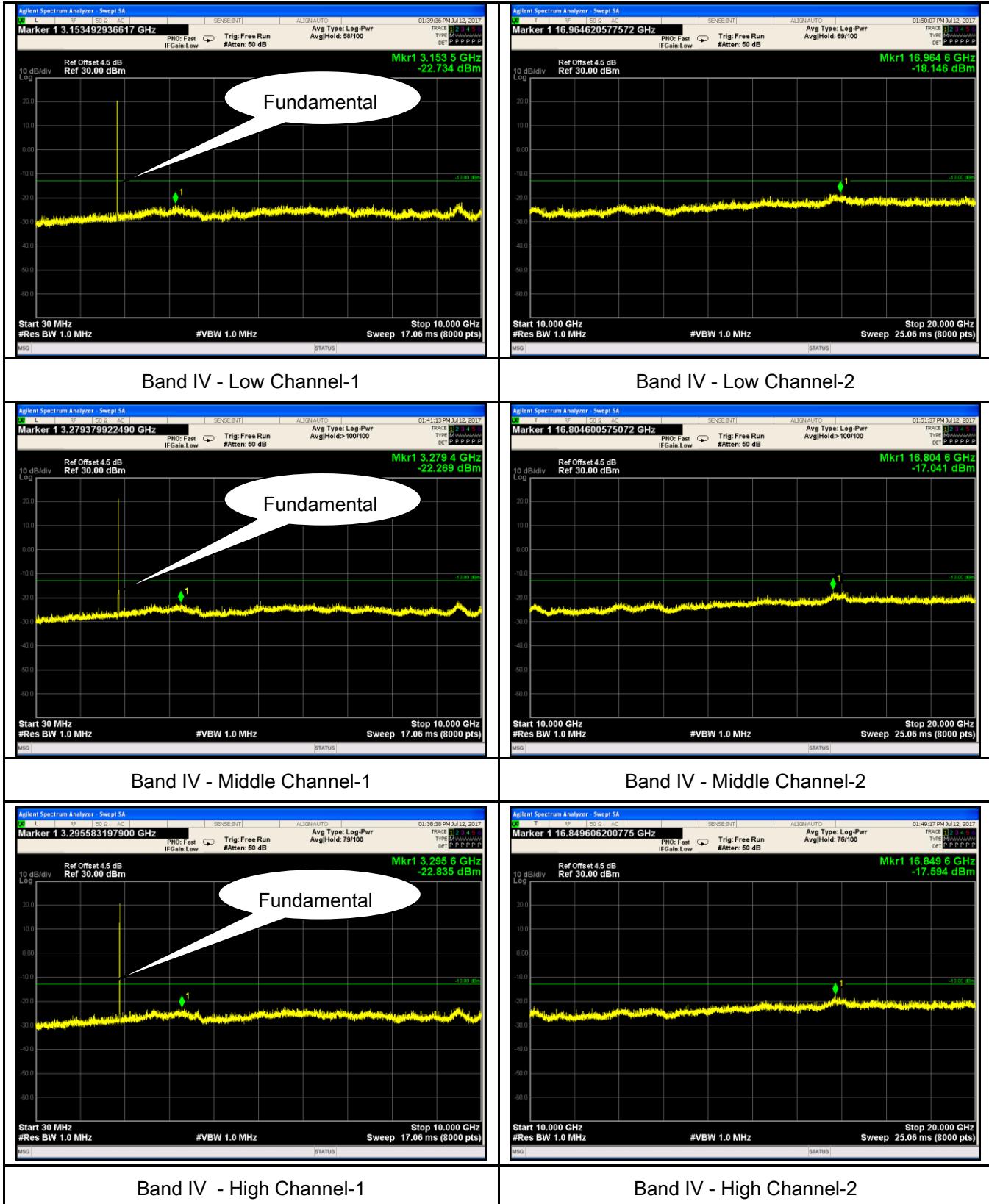


Band V - High Channel-2

UMTS-FDD Band II (Part 24E)



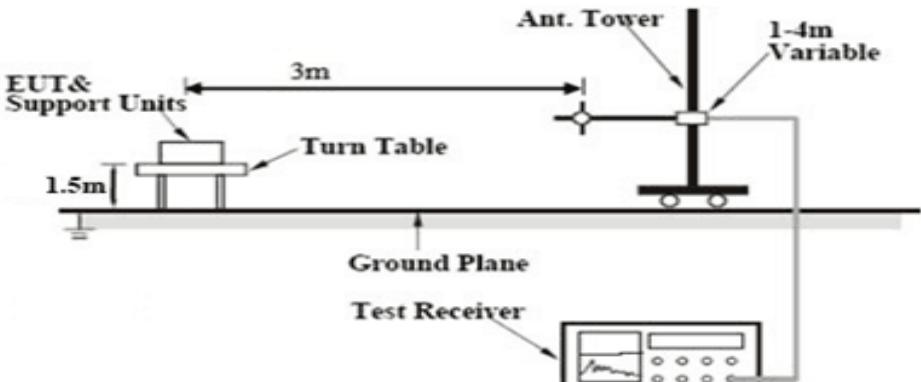
UMTS-FDD Band IV (Part 27)



6.6 Spurious Radiated Emissions

Temperature	25 °C
Relative Humidity	57%
Atmospheric Pressure	1015mbar
Test date :	July 07, 2017
Tested By :	Loren Luo

Requirement(s):

Spec	Item	Requirement	Applicable
§2.1053, §22.917 & §24.238 § 27.53(h)	a)	The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least $43 + 10 \log (P)$ dB. The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.	<input checked="" type="checkbox"/>
Test setup			
Test Procedure	<ol style="list-style-type: none"> 1. The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable. 2. The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis. 3. Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution. <p>Sample Calculation:</p> <p>EUT Field Strength = Raw Amplitude (dBμV/m) – Amplifier Gain (dB) + Antenna Factor (dB) + Cable Loss (dB) + Filter Attenuation (dB, if used)</p>		

Remark		
Result	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail

Test Data Yes N/A

Test Plot Yes (See below) N/A

Cellular Band (Part 22H) result

Low channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1648.4	-44.65	V	7.95	0.67	-37.37	-13	-24.37
1648.4	-44.32	H	7.95	0.67	-37.04	-13	-24.04
153.9	-53.61	V	1	0.19	-52.8	-13	-39.8
463.1	-51.98	H	6	0.29	-46.27	-13	-33.27

Middle channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1673.2	-44.62	V	7.95	0.67	-37.34	-13	-24.34
1673.2	-43.98	H	7.95	0.67	-36.7	-13	-23.7
248.7	-54.12	V	6	0.24	-48.36	-13	-35.36
546.8	-51.28	H	6.4	0.35	-45.23	-13	-32.23

High channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1697.6	-44.13	V	7.95	0.68	-36.86	-13	-23.86
1697.6	-45.87	H	7.95	0.68	-38.6	-13	-25.6
402.9	-53.26	V	6	0.3	-47.56	-13	-34.56
597.1	-50.98	H	6.1	0.37	-45.25	-13	-32.25

Note:

- 1, The testing has been conformed to $10 \times 848.8\text{MHz} = 8,488\text{MHz}$
- 2, All other emissions more than 30 dB below the limit
- 3, GSM voice , GPRS and EGPRS mode were investigated. The results above show only the worse cases
- 4, X-Axis, Y-Axis and Z-Axis were investigated. The results above show only the worst case.
- 5, The radiated spurious test above 18GHz is subcontracted to SIEMIC (Nanjing-China) Laboratories. and found 30dB below the limit at least.

PCS Band (Part24E) result

Low channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3700.4	-48.16	V	10.25	1	-38.91	-13	-25.91
3700.4	-47.69	H	10.25	1	-38.44	-13	-25.44
296.5	-53.62	V	5.6	0.25	-48.27	-13	-35.27
451.7	-51.94	H	6	0.29	-46.23	-13	-33.23

Middle channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3760	-49.13	V	10.25	1.01	-39.89	-13	-26.89
3760	-48.67	H	10.25	1.01	-39.43	-13	-26.43
354.8	-53.26	V	5.9	0.27	-47.63	-13	-34.63
605.8	-52.14	H	6.1	0.37	-46.41	-13	-33.41

High channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3819.6	-48.51	V	10.36	1.02	-39.17	-13	-26.17
3819.6	-49.37	H	10.36	1.02	-40.03	-13	-27.03
403.2	-53.34	V	6	0.3	-47.64	-13	-34.64
657.8	-51.73	H	6.1	0.39	-46.02	-13	-33.02

Note:

- 1, The testing has been conformed to $10 * 1909.8 \text{ MHz} = 19,098 \text{ MHz}$
- 2, All other emissions more than 30 dB below the limit
- 3, GSM voice , GPRS and EGPRS mode were investigated. The results above show only the worse cases
- 4, X-Axis, Y-Axis and Z-Axis were investigated. The results above show only the worst case.
- 5, The radiated spurious test above 18GHz is subcontracted to SIEMIC (Nanjing-China) Laboratories. and found 30dB below the limit at least.

UMTS-FDD Band V (Part 22H)

Low channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1652.8	-45.26	V	7.95	0.67	-37.98	-13	-24.98
1652.8	-47.12	H	7.95	0.67	-39.84	-13	-26.84
246.8	-53.62	V	6	0.24	-47.86	-13	-34.86
305.8	-52.14	H	5.6	0.25	-46.79	-13	-33.79

Middle channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1670	-46.15	V	7.95	0.67	-38.87	-13	-25.87
1670	-44.32	H	7.95	0.67	-37.04	-13	-24.04
106.5	-53.47	V	1	0.19	-52.66	-13	-39.66
391.2	-50.19	H	6	0.3	-44.49	-13	-31.49

High channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1693.2	-47.15	V	7.95	0.68	-39.88	-13	-26.88
1693.2	-46.95	H	7.95	0.68	-39.68	-13	-26.68
352.8	-54.13	V	5.9	0.27	-48.5	-13	-35.5
491.6	-50.28	H	6.1	0.34	-44.52	-13	-31.52

Note:

- 1, The testing has been conformed to 10*846.6MHz=8,466MHz
- 2, All other emissions more than 30 dB below the limit
- 3, RMC, HSUPA and HSDPA mode were investigated. The results above show only the worse cases
- 4, X-Axis, Y-Axis and Z-Axis were investigated. The results above show only the worst case.
- 5, The radiated spurious test above 18GHz is subcontracted to SIEMIC (Nanjing-China) Laboratories. and found 30dB below the limit at least.

UMTS-FDD Band II (Part 24E)

Low channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3704.8	-48.65	V	10.25	1	-39.4	-13	-26.4
3704.8	-47.25	H	10.25	1	-38	-13	-25
305.7	-53.16	V	6.4	0.26	-47.02	-13	-34.02
611.5	-50.31	H	6.8	0.37	-43.88	-13	-30.88

Middle channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3760	-50.21	V	10.25	1.01	-40.97	-13	-27.97
3760	-49.31	H	10.25	1.01	-40.07	-13	-27.07
195.6	-53.29	V	3.7	0.18	-49.77	-13	-36.77
453.1	-49.32	H	6	0.29	-43.61	-13	-30.61

High channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3815.2	-48.62	V	10.36	1.02	-39.28	-13	-26.28
3815.2	-47.13	H	10.36	1.02	-37.79	-13	-24.79
216.8	-55.25	V	3.7	0.18	-51.73	-13	-38.73
796.3	-51.38	H	6.1	0.44	-45.72	-13	-32.72

Note:

- 1, The testing has been conformed to $10 * 1907.6 \text{ MHz} = 19,076 \text{ MHz}$
- 2, All other emissions more than 30 dB below the limit
- 3, RMC, HSUPA and HSDPA mode were investigated. The results above show only the worse cases
- 4, X-Axis, Y-Axis and Z-Axis were investigated. The results above show only the worst case
- 5, The radiated spurious test above 18GHz is subcontracted to SIEMIC (Nanjing-China) Laboratories. and found 30dB below the limit at least.

UMTS-FDD Band IV (Part 27)

Low channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3424.8	-46.98	V	10.07	0.96	-37.87	-13	-24.87
3424.8	-47.61	H	10.07	0.96	-38.5	-13	-25.5
348.7	-57.61	V	5.9	0.27	-51.98	-13	-38.98
653.9	-54.38	H	6.1	0.39	-48.67	-13	-35.67

Middle channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3480	-46.89	V	10.09	0.96	-37.76	-13	-24.76
3480	-47.15	H	10.09	0.96	-38.02	-13	-25.02
245.7	-58.32	V	6	0.24	-52.56	-13	-39.56
598.2	-54.69	H	6.1	0.37	-48.96	-13	-35.96

High channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3505.2	-47.12	V	10.09	0.97	-38	-13	-25
3505.2	-48.23	H	10.09	0.97	-39.11	-13	-26.11
403.5	-58.13	V	6	0.3	-52.43	-13	-39.43
849.7	-53.94	H	6.2	0.44	-48.18	-13	-35.18

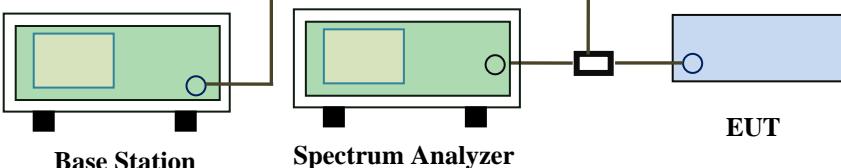
Note:

- 1, The testing has been conformed to $10 \times 1752.6\text{MHz} = 17,526\text{MHz}$
- 2, All other emissions more than 30 dB below the limit
- 3, RMC, HSUPA and HSDPA mode were investigated. The results above show only the worse cases.
- 4, X-Axis, Y-Axis and Z-Axis were investigated. The results above show only the worst case.
- 5, The radiated spurious test above 18GHz is subcontracted to SIEMIC (Nanjing-China) Laboratories. and found 30dB below the limit at least.

6.7 Band Edge

Temperature	25 °C
Relative Humidity	53%
Atmospheric Pressure	1010mbar
Test date :	July 12, 2017
Tested By :	Loren Luo

Requirement(s):

Spec	Item	Requirement	Applicable
§22.917(a) §24.238(a) § 27.53(h)	a)	The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least $43 + 10 \log (P)$ dB.	<input checked="" type="checkbox"/>
Test setup			
Procedure		<ul style="list-style-type: none"> - The EUT was connected to Spectrum Analyzer and Base Station via power divider. - The Band Edges of low and high channels for the highest RF powers were measured. Setting RBW as roughly BW/100. 	
Remark			
Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail		

Test Data Yes N/A

Test Plot Yes (See below) N/A

GSM Voice:

Cellular Band (Part 22H) result

Frequency (MHz)	Emission (dBm)	Limit (dBm)
823.977	-14.625	-13
849.003	-17.122	-13

PCS Band (Part24E) result

Frequency (MHz)	Emission (dBm)	Limit (dBm)
1849.995	-14.237	-13
1910.004	-15.893	-13

GPRS:

Cellular Band (Part 22H) result

Frequency (MHz)	Emission (dBm)	Limit (dBm)
823.997	-16.146	-13
849.020	-15.487	-13

PCS Band (Part24E) result

Frequency (MHz)	Emission (dBm)	Limit (dBm)
1849.994	-14.966	-13
1910.018	-16.457	-13

EGPRS (MCS5):

Cellular Band (Part 22H) result

Frequency (MHz)	Emission (dBm)	Limit (dBm)
823.996	-16.375	-13
849.020	-15.487	-13

PCS Band (Part24E) result

Frequency (MHz)	Emission (dBm)	Limit (dBm)
1849.996	-17.087	-13
1910.016	-15.093	-13

RCM:

UMTS-FDD Band V (Part 22H)

Frequency (MHz)	Emission (dBm)	Limit (dBm)
823.70	-23.509	-13
849.06	-21.140	-13

UMTS-FDD Band II (Part 24E)

Frequency (MHz)	Emission (dBm)	Limit (dBm)
1849.70	-24.738	-13
1910.26	-20.928	-13

UMTS-FDD Band IV (Part 27)

Frequency (MHz)	Emission (dBm)	Limit (dBm)
1709.69	-21.921	-13
1755.27	-20.471	-13

HSUPA:

UMTS-FDD Band V (Part 22H)

Frequency (MHz)	Emission (dBm)	Limit (dBm)
823.73	-25.365	-13
849.27	-21.231	-13

UMTS-FDD Band II (Part 24E)

Frequency (MHz)	Emission (dBm)	Limit (dBm)
1849.88	-24.596	-13
1910.27	-20.710	-13

UMTS-FDD Band IV (Part 27)

Frequency (MHz)	Emission (dBm)	Limit (dBm)
1708.71	-22.927	-13
1755.22	-21.548	-13

HSDPA:

UMTS-FDD Band V (Part 22H)

Frequency (MHz)	Emission (dBm)	Limit (dBm)
823.67	-23.411	-13
849.27	-21.338	-13

UMTS-FDD Band II (Part 24E)

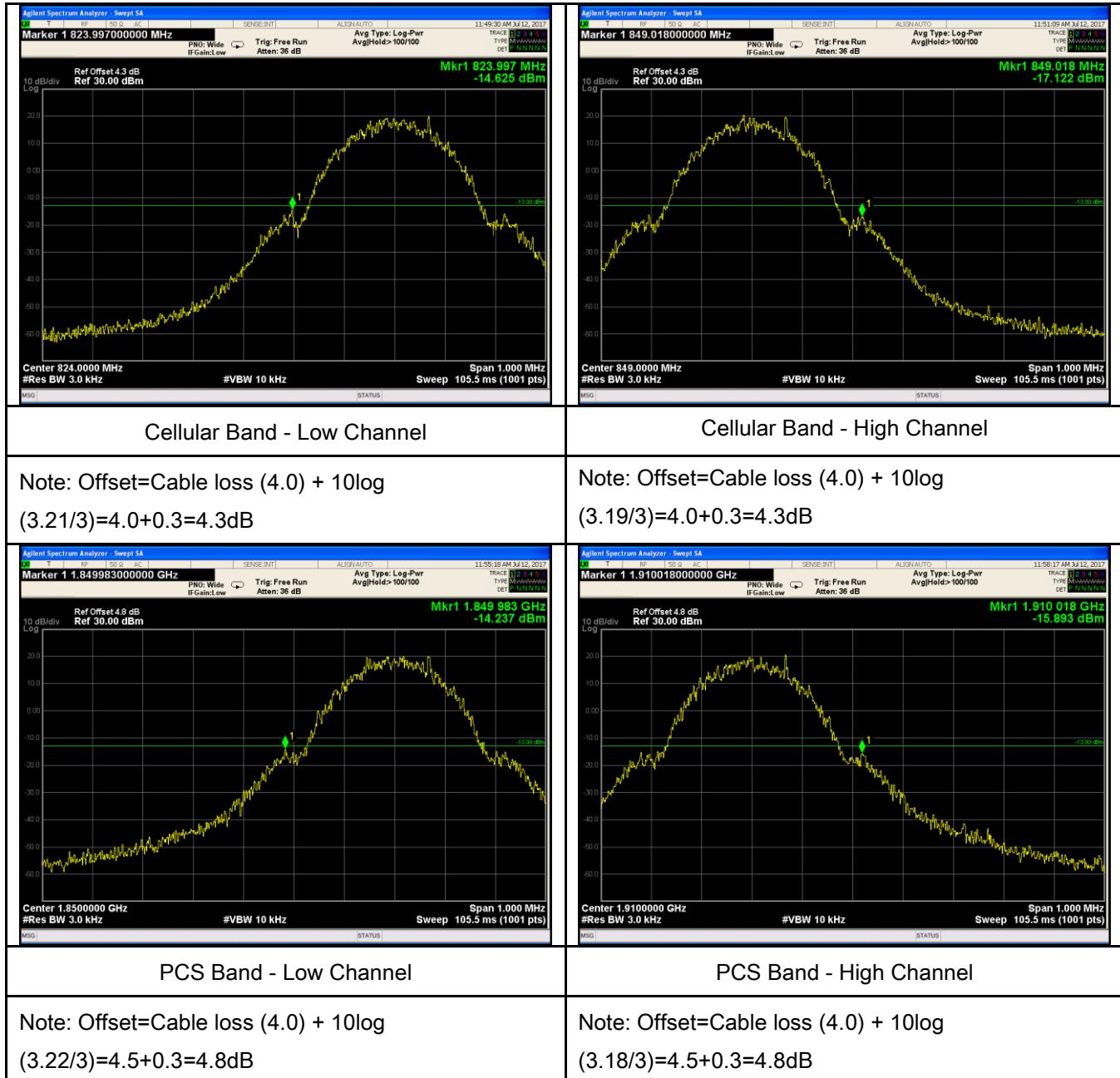
Frequency (MHz)	Emission (dBm)	Limit (dBm)
1849.69	-24.747	-13
1910.51	-21.779	-13

UMTS-FDD Band IV (Part 27)

Frequency (MHz)	Emission (dBm)	Limit (dBm)
1709.99	-22.186	-13
1756.19	-21.485	-13

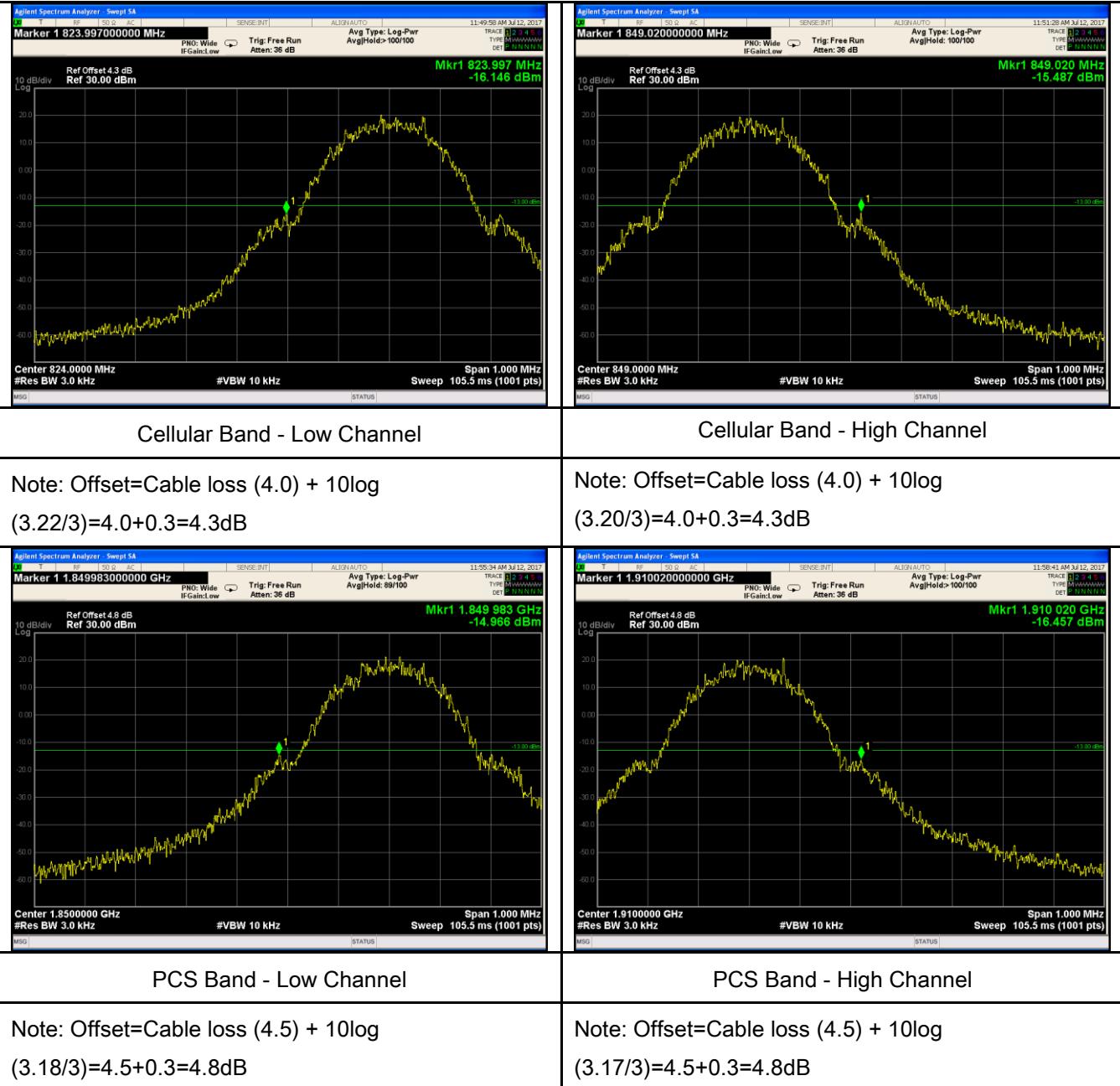
GSM Voice:

Test Plots



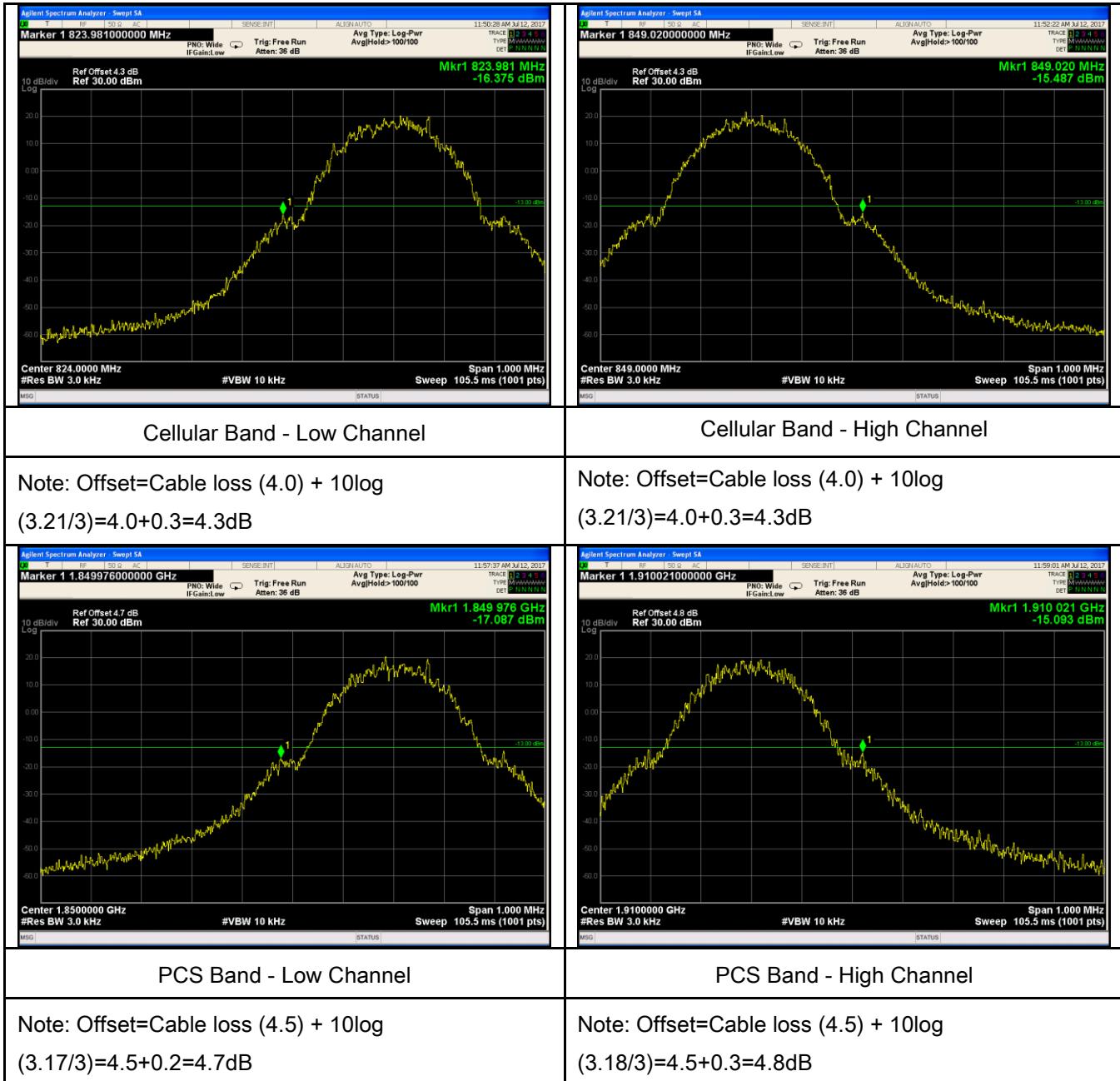
GPRS:

Test Plots



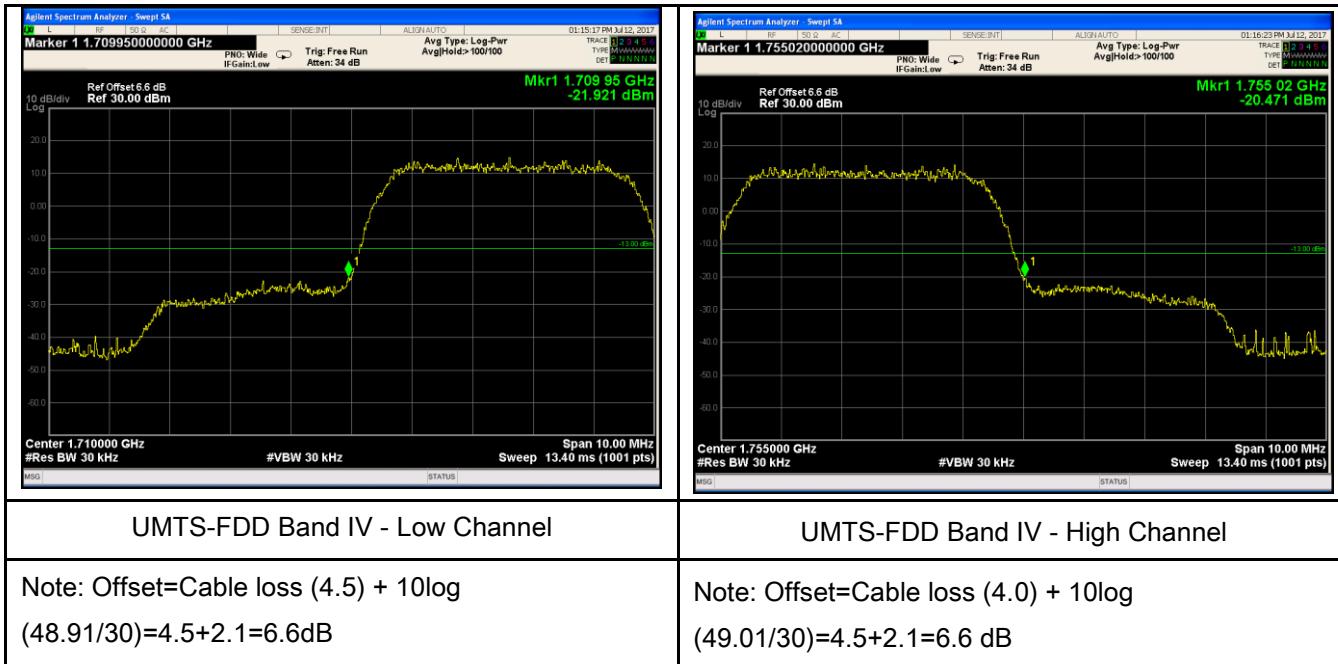
EGPRS (MCS5):

Test Plots

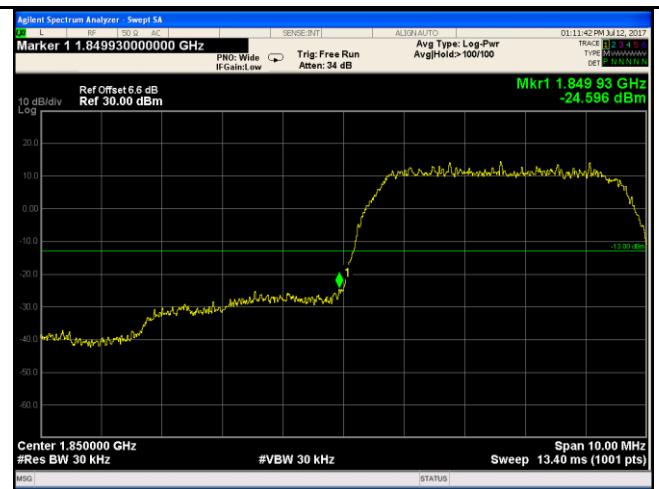


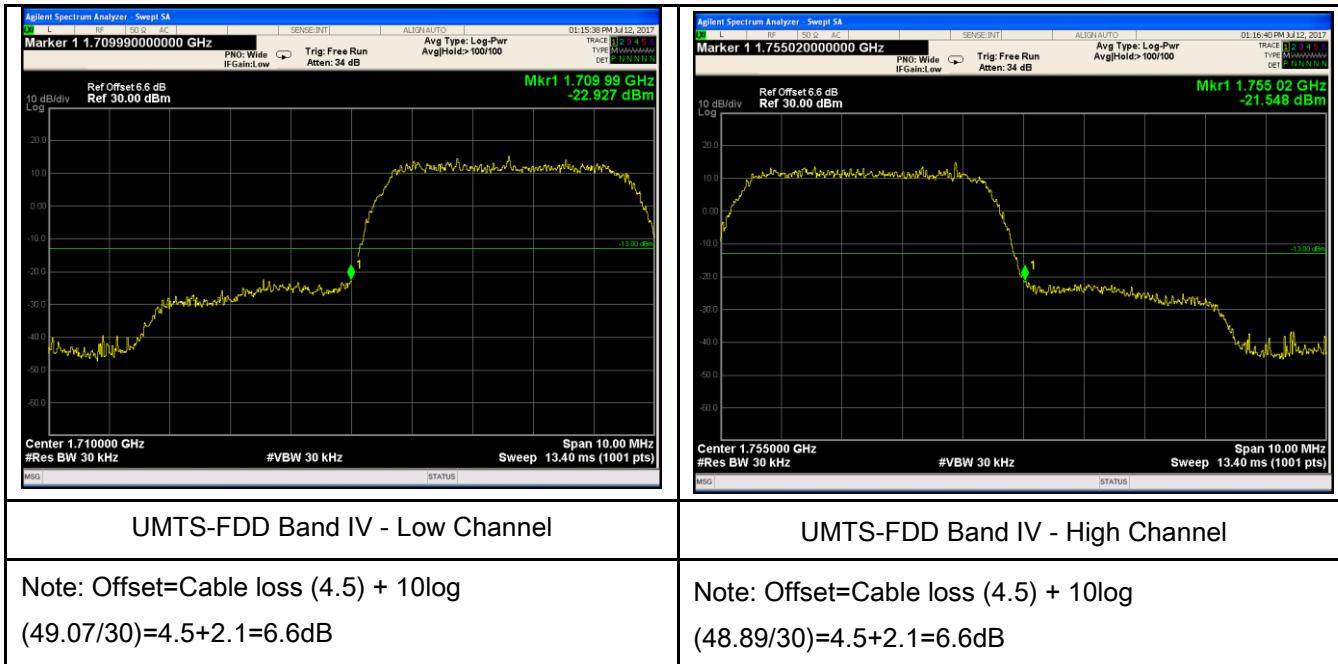
RMC:

 <p>Marker 1 823.960000000 MHz Mkr1 823.96 MHz -23.509 dBm</p> <p>Center 824.000 MHz #Res BW 30 kHz #VBW 30 kHz Sweep 13.40 ms (1001 pts)</p>	 <p>Marker 1 849.030000000 MHz Mkr1 849.03 MHz -21.140 dBm</p> <p>Center 849.000 MHz #Res BW 30 kHz #VBW 30 kHz Sweep 13.40 ms (1001 pts)</p>
<p>UMTS-FDD Band V - Low Channel</p> <p>Note: Offset=Cable loss (4.0) + 10log (48.88/30)=4.0+2.1=6.1 dB</p>	<p>UMTS-FDD Band V - High Channel</p> <p>Note: Offset=Cable loss (4.0) + 10log (49.29/30)=4.0+2.2=6.2dB</p>
 <p>Marker 1 1.849990000000 GHz Mkr1 1.849.99 GHz -24.738 dBm</p> <p>Center 1.850000 GHz #Res BW 30 kHz #VBW 30 kHz Sweep 13.40 ms (1001 pts)</p>	 <p>Marker 1 1.910020000000 GHz Mkr1 1.910.02 GHz -20.928 dBm</p> <p>Center 1.910000 GHz #Res BW 30 kHz #VBW 30 kHz Sweep 13.40 ms (1001 pts)</p>
<p>UMTS-FDD Band II - Low Channel</p> <p>Note: Offset=Cable loss (4.5) + 10log (48.96/30)=4.5+2.1=6.6 dB</p>	<p>UMTS-FDD Band II - High Channel</p> <p>Note: Offset=Cable loss (4.5) + 10log (48.94/30)=4.5+2.1=6.6 dB</p>

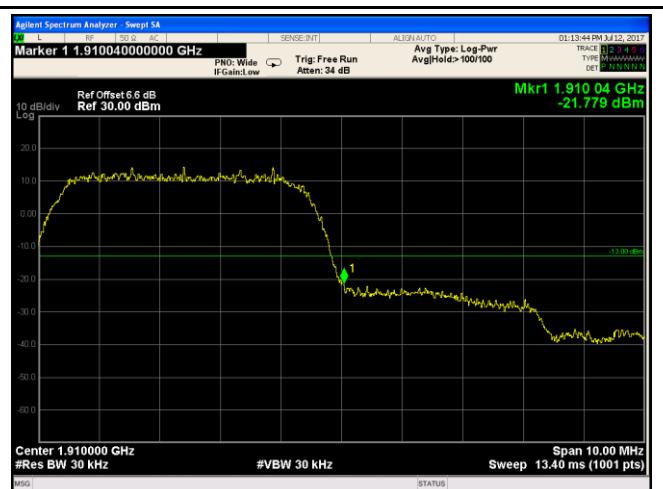


HSUPA:

 <p>Marker 1 823.970000000 MHz PNO: Wide IF-Gain:Low Trig: Free Run Atten: 34 dB</p> <p>Avg Type: Log-Pwr Avg Hold>100/100</p> <p>Ref Offset 6.1 dB Ref 30.00 dBm</p> <p>10 dB/div Log</p> <p>Center 824.000 MHz #Res BW 30 kHz #VBW 30 kHz Sweep 13.40 ms (1001 pts)</p>	 <p>Marker 1 849.030000000 MHz PNO: Wide IF-Gain:Low Trig: Free Run Atten: 34 dB</p> <p>Avg Type: Log-Pwr Avg Hold>100/100</p> <p>Ref Offset 6.1 dB Ref 30.00 dBm</p> <p>10 dB/div Log</p> <p>Center 849.000 MHz #Res BW 30 kHz #VBW 30 kHz Sweep 13.40 ms (1001 pts)</p>
<p>UMTS-FDD Band V - Low Channel</p>	<p>UMTS-FDD Band V - High Channel</p>
<p>Note: Offset=Cable loss (4.0) + 10log (48.87/30)=4.0+2.1=6.1 dB</p>	<p>Note: Offset=Cable loss (4.0) + 10log (49.12/30)=4.0+2.1=6.1 dB</p>
 <p>Marker 1 1.849930000000 GHz PNO: Wide IF-Gain:Low Trig: Free Run Atten: 34 dB</p> <p>Avg Type: Log-Pwr Avg Hold>100/100</p> <p>Ref Offset 6.6 dB Ref 30.00 dBm</p> <p>10 dB/div Log</p> <p>Center 1.850000 GHz #Res BW 30 kHz #VBW 30 kHz Sweep 13.40 ms (1001 pts)</p>	 <p>Marker 1 1.910020000000 GHz PNO: Wide IF-Gain:Low Trig: Free Run Atten: 34 dB</p> <p>Avg Type: Log-Pwr Avg Hold>100/100</p> <p>Ref Offset 6.6 dB Ref 30.00 dBm</p> <p>10 dB/div Log</p> <p>Center 1.910000 GHz #Res BW 30 kHz #VBW 30 kHz Sweep 13.40 ms (1001 pts)</p>
<p>UMTS-FDD Band II - Low Channel</p>	<p>UMTS-FDD Band II - High Channel</p>
<p>Note: Offset=Cable loss (4.5) + 10log (49.02/30)=4.5+2.1=6.6 dB</p>	<p>Note: Offset=Cable loss (4.5) + 10log (48.83/30)=4.5+2.1=6.6 dB</p>



HSDPA:

 <p>Marker 1 823.960000000 MHz PNO: Wide IF-Gain:Low Trig: Free Run Atten: 34 dB Avg Type: Log-Pwr Avg Hold> 100/100</p> <p>Ref Offset 6.1 dB Ref 30.00 dBm</p> <p>10 dB/div Log</p> <p>Center 824.000 MHz #Res BW 30 kHz #VBW 30 kHz Sweep 13.40 ms (1001 pts)</p>	 <p>Marker 1 849.030000000 MHz PNO: Wide IF-Gain:Low Trig: Free Run Atten: 34 dB Avg Type: Log-Pwr Avg Hold> 100/100</p> <p>Ref Offset 6.1 dB Ref 30.00 dBm</p> <p>10 dB/div Log</p> <p>Center 849.000 MHz #Res BW 30 kHz #VBW 30 kHz Sweep 13.40 ms (1001 pts)</p>
<p>UMTS-FDD Band V - Low Channel</p>	<p>UMTS-FDD Band V - High Channel</p>
<p>Note: Offset=Cable loss (4.0) + 10log (48.72/30)=4.0+2.1=6.1 dB</p>	<p>Note: Offset=Cable loss (4.0) + 10log (49.11/30)=4.0+2.1=6.1 dB</p>
 <p>Marker 1 1.849990000000 GHz PNO: Wide IF-Gain:Low Trig: Free Run Atten: 34 dB Avg Type: Log-Pwr Avg Hold> 100/100</p> <p>Ref Offset 6.6 dB Ref 30.00 dBm</p> <p>10 dB/div Log</p> <p>Center 1.850000 GHz #Res BW 30 kHz #VBW 30 kHz Sweep 13.40 ms (1001 pts)</p>	 <p>Marker 1 1.910040000000 GHz PNO: Wide IF-Gain:Low Trig: Free Run Atten: 34 dB Avg Type: Log-Pwr Avg Hold> 100/100</p> <p>Ref Offset 6.6 dB Ref 30.00 dBm</p> <p>10 dB/div Log</p> <p>Center 1.910000 GHz #Res BW 30 kHz #VBW 30 kHz Sweep 13.40 ms (1001 pts)</p>
<p>UMTS-FDD Band II - Low Channel</p>	<p>UMTS-FDD Band II - High Channel</p>
<p>Note: Offset=Cable loss (4.5) + 10log (48.81/30)=4.5+2.1=6.6dB</p>	<p>Note: Offset=Cable loss (4.5) + 10log (49.00/30)=4.5+2.1=66 dB</p>

