Appendix B

WCDMA Band 2&5

CONTENT

1   Effective (Isotropic) Radiated Power Output Data

Part I - Test Results

Test Band	Test Mode	Test Channel	Conducted Power [dBm]	EIRP[dB]	Limit[dBm]	Verdict
WCDMA1900	UMTS/TM1	LCH	13.48	12.34	33	PASS
		MCH	12.53	11.44	33	PASS
		HCH	13.59	12.37	33	PASS

Note:

a: For getting the ERP (Efficient Isotropic Radiated Power) in substitution method, the following formula should be taken to calculate it,

EIRP [dBm] = SGP [dBm] – Cable Loss [dB] + Gain [dBi]

b: SGP=Signal Generator Level

c: RBW > emission bandwidth, VBW > 3 x RBW.

Detector: RMS

Test Band	Test Mode	Test Channel	Conducted Power [dBm]	ERP[dB]	Limit[dBm]	Verdict
WCDMA850	UMTS/TM1	LCH	19.20	16.28	38.45	PASS
		MCH	18.68	15.77	38.45	PASS
		HCH	18.19	15.31	38.45	PASS

Note:

a: For getting the ERP (Efficient Radiated Power) in substitution method, the following formula should be taken to calculate it,

ERP [dBm] = SGP [dBm] – Cable Loss [dB] + Gain [dBd]

b: SGP=Signal Generator Level

c: RBW > emission bandwidth, VBW > 3 x RBW.

Detector: RMS

2　Peak-to-Average Ratio

Part I - Test Results

Test Band	Test Mode	Test Channel	Measured[dB]	Limit [dB]	Verdict
WCDMA850	UMTS/TM1	LCH	3.31	13	PASS
		MCH	3.35	13	PASS
		HCH	3.33	13	PASS
Test Band	**Test Mode**	**Test Channel**	**Measured[dB]**	**Limit [dB]**	**Verdict**
WCDMA1900	UMTS/TM1	LCH	2.88	13	PASS
		MCH	3.07	13	PASS
		HCH	2.72	13	PASS

Part I I- Test Plots

2.1 For WCDMA

2.1.1 Test Band = WCDMA 850

2.1.1.1   Test Mode = UMTS/TM1

2.1.1.1.1 Test Channel = LCH

2.1.1.1.2 Test Channel = MCH

Agilent Spectrum Analyzer - Power Stat CCDF

RF 50 Ω AC   SENSE:EXT   ALIGN OFF   10:54:26 PM Apr 25, 2016

Center Freq 836.400000 MHz
Center Freq: 836.400000 MHz   Radio Std: None
Trig: Free Run   Counts:10.0 M/10.0 Mpt
#IFGain:Low   #Atten: 30 dB

Average Power

22.98 dBm

52.17 % at 0dB

10.0 %	1.78 dB
1.0 %	2.79 dB
0.1 %	3.35 dB
0.01 %	3.61 dB
0.001 %	3.76 dB
0.0001 %	3.85 dB
Peak	4.00 dB
	26.98 dBm

Gaussian

Info BW 5.0000 MHz

Frequency

Center Freq
836.400000 MHz

CF Step
5.000000 MHz
Auto   Man

Freq Offset
0 Hz

2.1.1.1.3 Test Channel = HCH

Agilent Spectrum Analyzer - Power Stat CCDF

| | RF | 50 Ω | AC | | SENSE:EXT | | ⚠ ALIGN OFF | 10:54:49 PM Apr 25, 2016 |

Center Freq 846.600000 MHz

#IFGain:Low

Center Freq: 846.600000 MHz   Radio Std: None
Trig: Free Run   Counts:10.0 M/10.0 Mpt
#Atten: 30 dB

Frequency

Average Power

22.79 dBm

52.31 % at 0dB

10.0 %	1.76 dB
1.0 %	2.77 dB
0.1 %	3.33 dB
0.01 %	3.58 dB
0.001 %	3.74 dB
0.0001 %	3.98 dB
Peak	4.04 dB
	26.83 dBm

Gaussian

100 %
10 %
1 %
0.1 %
0.01 %
0.001 %
0.0001 %
0 dB   20 dB

Info BW 5.0000 MHz

Center Freq
846.600000 MHz

CF Step
5.000000 MHz
Auto   Man

Freq Offset
0 Hz

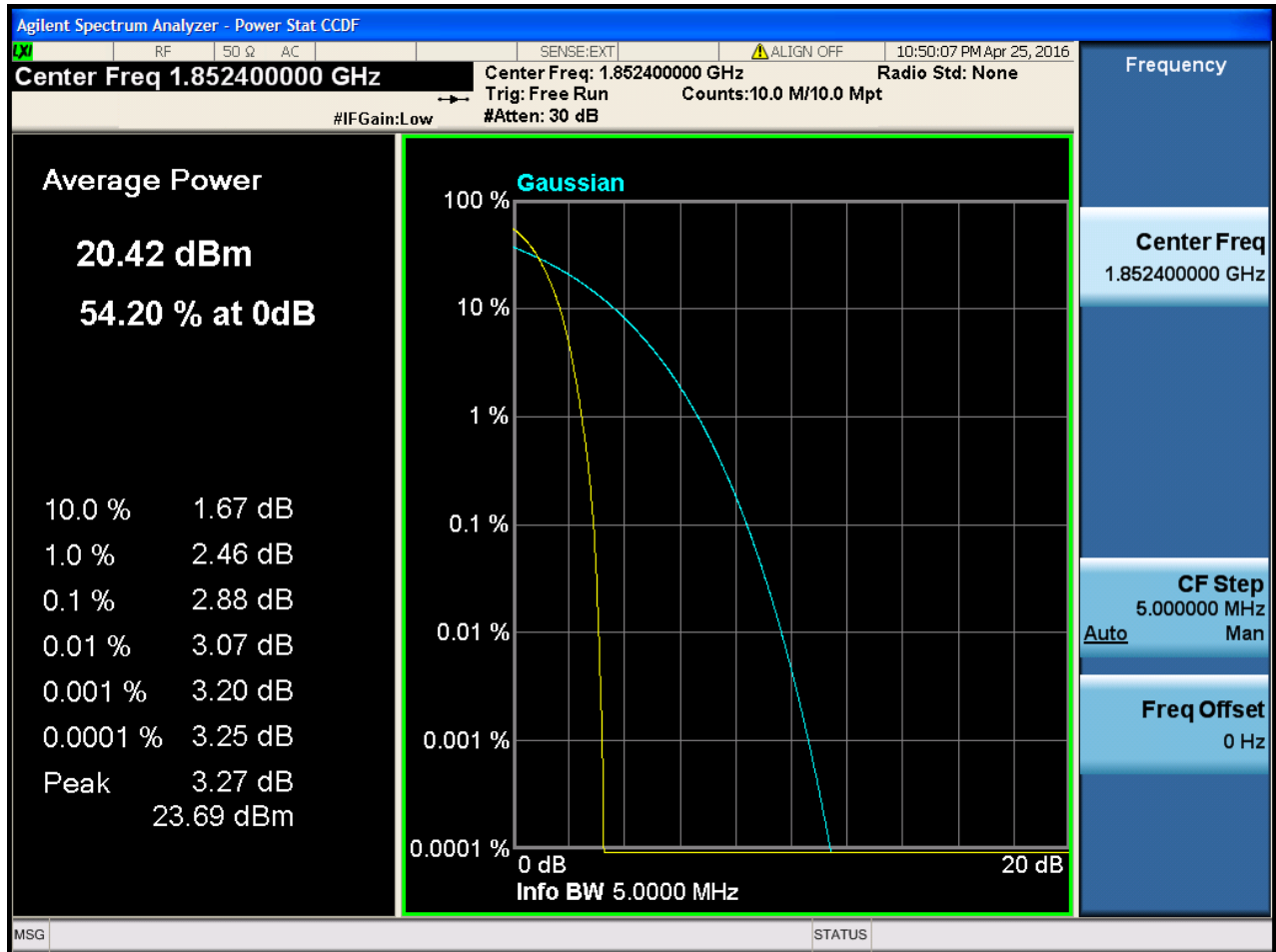MSG   STATUS

2.1.2 Test Band = WCDMA 1900

2.1.2.1   Test Mode = UMTS/TM1

2.1.2.1.1 Test Channel = LCH

2.1.2.1.2 Test Channel = MCH

Agilent Spectrum Analyzer - Power Stat CCDF

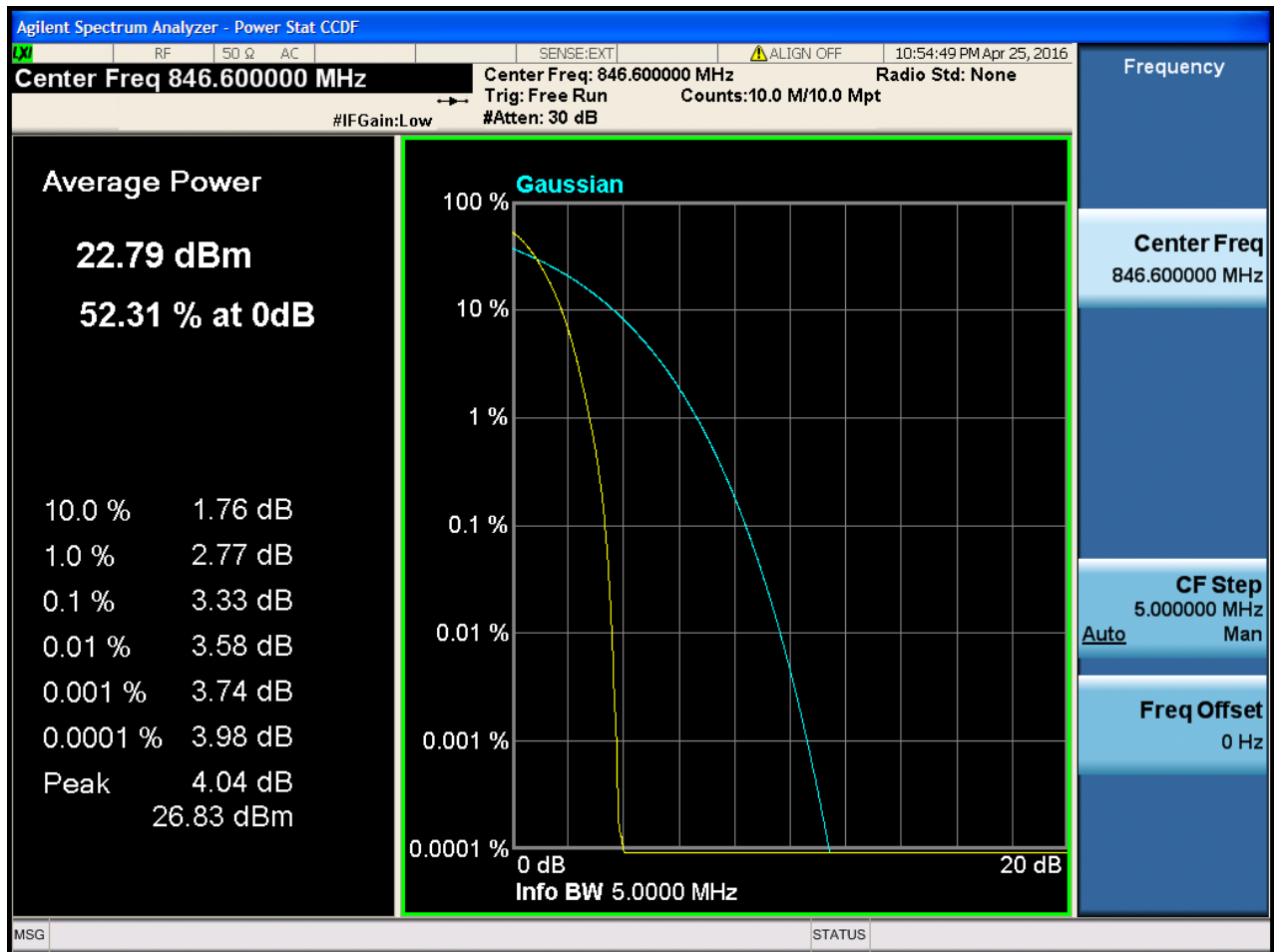| | | | | SENSE:EXT | | ⚠ ALIGN OFF | 10:54:26 PM Apr 25, 2016 |

Center Freq 836.400000 MHz

#IFGain:Low

Center Freq: 836.400000 MHz   Radio Std: None
Trig: Free Run   Counts:10.0 M/10.0 Mpt
#Atten: 30 dB

Average Power

22.98 dBm

52.17 % at 0dB

10.0 %	1.78 dB
1.0 %	2.79 dB
0.1 %	3.35 dB
0.01 %	3.61 dB
0.001 %	3.76 dB
0.0001 %	3.85 dB
Peak	4.00 dB
	26.98 dBm

Gaussian

100 %
10 %
1 %
0.1 %
0.01 %
0.001 %
0.0001 %

0 dB   20 dB

Info BW 5.0000 MHz

MSG   STATUS

Frequency

Center Freq
836.400000 MHz

CF Step
5.000000 MHz
Auto   Man

Freq Offset
0 Hz

2.1.2.1.3 Test Channel = HCH

Agilent Spectrum Analyzer - Power Stat CCDF

RF 50 Ω AC SENSE:EXT ⚠ ALIGN OFF 10:54:49 PM Apr 25, 2016

Center Freq 846.600000 MHz

Center Freq: 846.600000 MHz Radio Std: None
Trig: Free Run Counts:10.0 M/10.0 Mpt
#IFGain:Low #Atten: 30 dB

Average Power

22.79 dBm

52.31 % at 0dB

10.0 %	1.76 dB
1.0 %	2.77 dB
0.1 %	3.33 dB
0.01 %	3.58 dB
0.001 %	3.74 dB
0.0001 %	3.98 dB
Peak	4.04 dB
	26.83 dBm

Gaussian

Info BW 5.0000 MHz

Frequency

Center Freq 846.600000 MHz

CF Step 5.000000 MHz
Auto Man
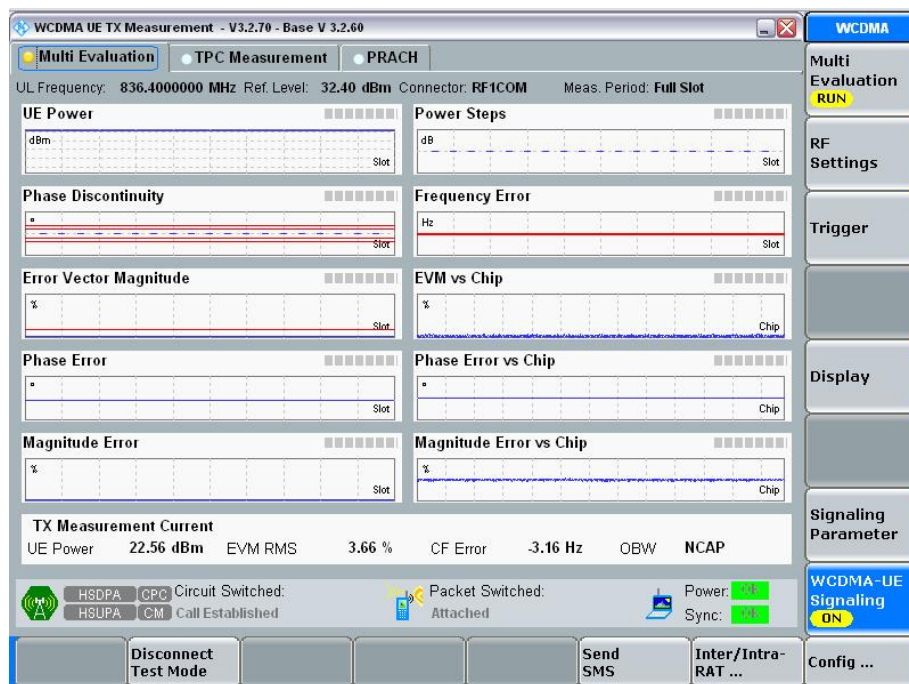
Freq Offset 0 Hz

3   Modulation Characteristics

Part I - Test Plots

3.1 For WCDMA

3.1.1 Test Band = WCDMA 850

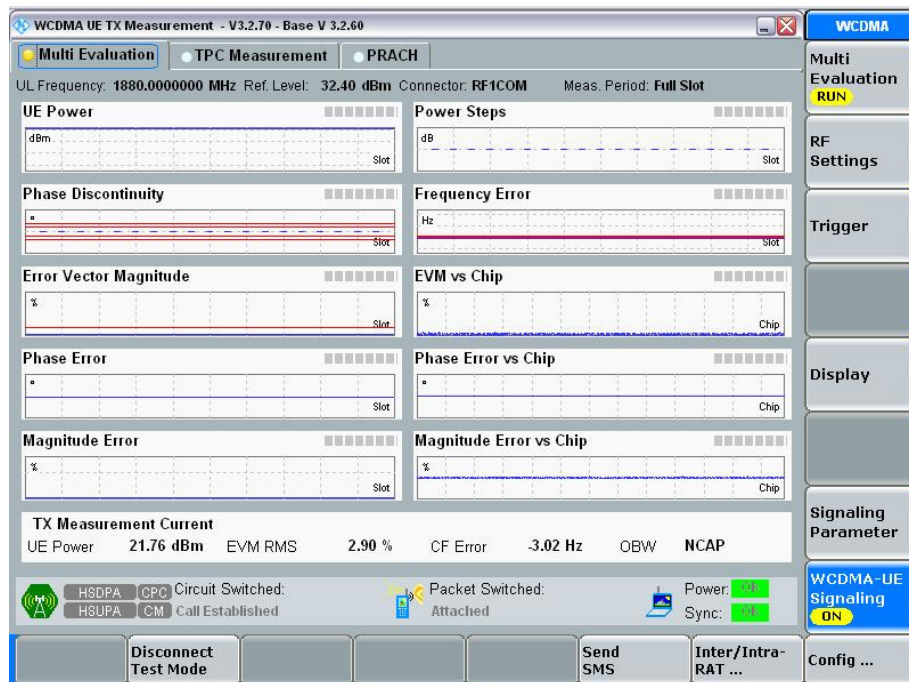#### 3.1.1.1   Test Mode = UMTS/TM1

3.1.1.1.1 Test Channel = MCH

3.1.2 Test Band = WCDMA 1900

3.1.2.1   Test Mode = UMTS/TM1

3.1.2.1.1 Test Channel = MCH

4   Bandwidth

Part I - Test Results

| Test Band	Test Mode	Test Channel	Occupied Bandwidth [MHz]	Emission Bandwidth [MHz]	Verdict
WCDMA850	UMTS/TM1	LCH	4.07	4.59	PASS
		MCH	4.06	4.60	PASS
		HCH	4.06	4.60	PASS
Test Band	**Test Mode**	**Test Channel**	**Occupied Bandwidth [MHz]**	**Emission Bandwidth [MHz]**	**Verdict**
WCDMA1900	UMTS/TM1	LCH	4.06	4.61	PASS
		MCH	4.06	4.61	PASS
		HCH	4.06	4.63	PASS

4.1.1 Test Band = WCDMA850

4.1.1.1   Test Mode = UMTS/TM1
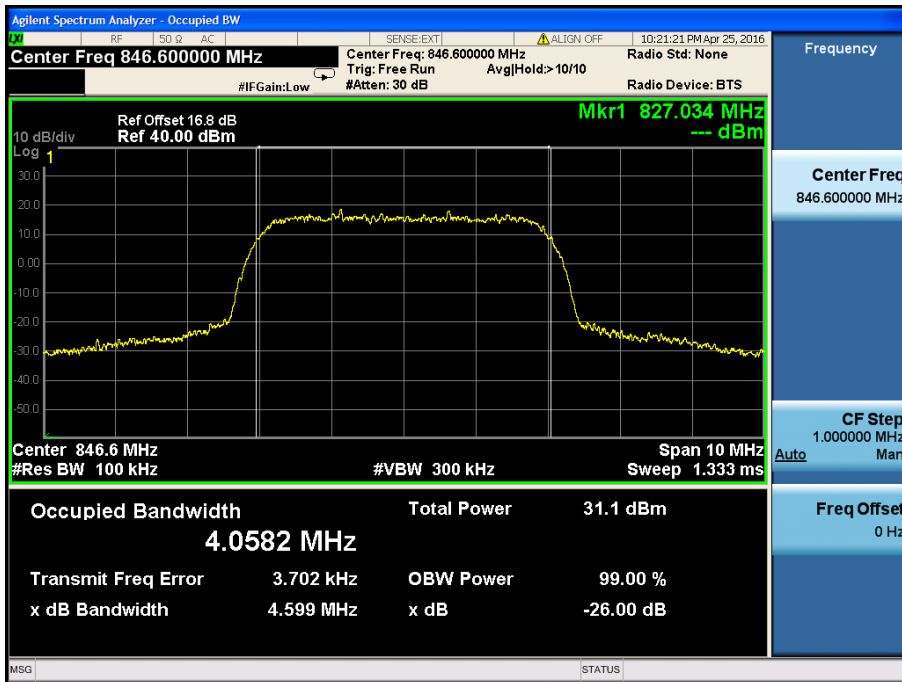
4.1.1.1.1 Test Channel = LCH
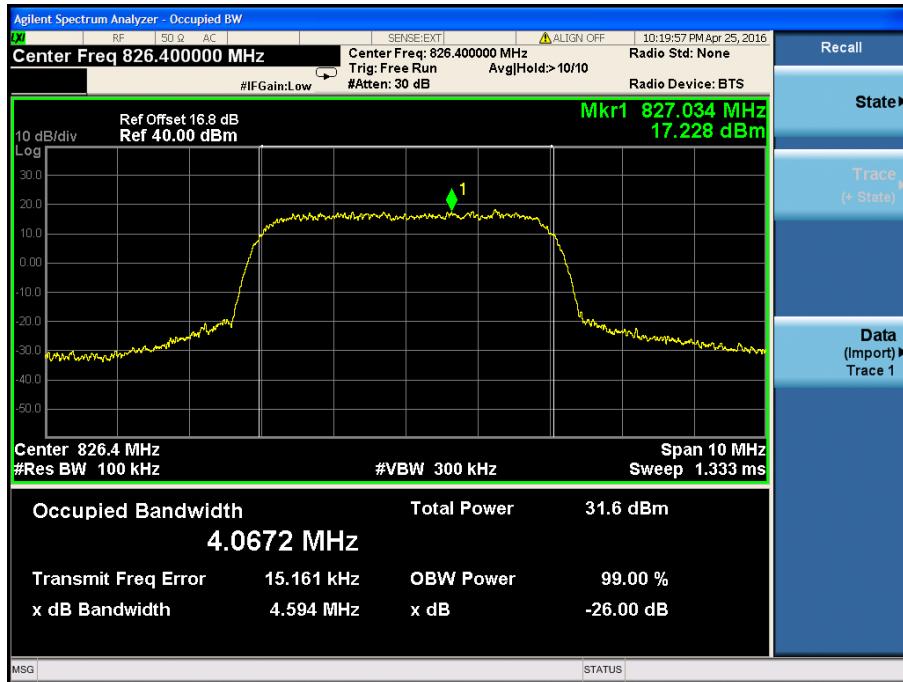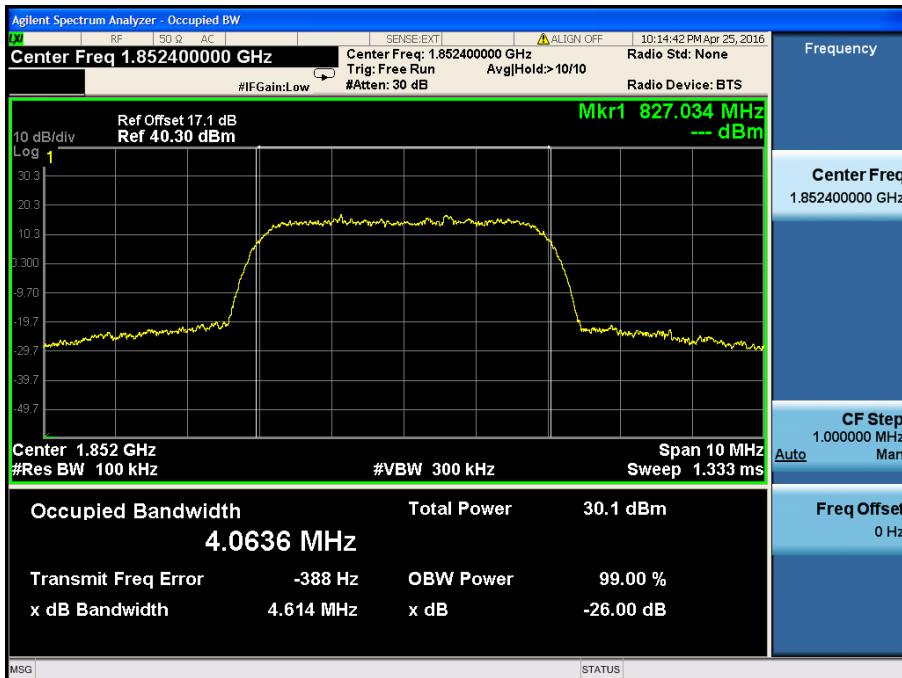

4.1.1.1.2 Test Channel = MCH
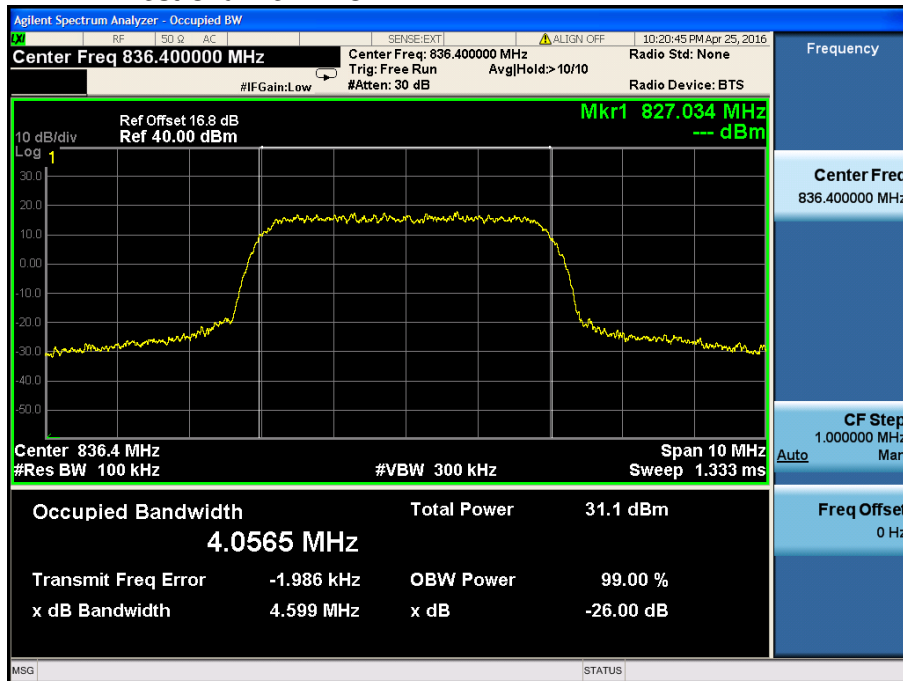
4.1.1.1.3 Test Channel = HCH

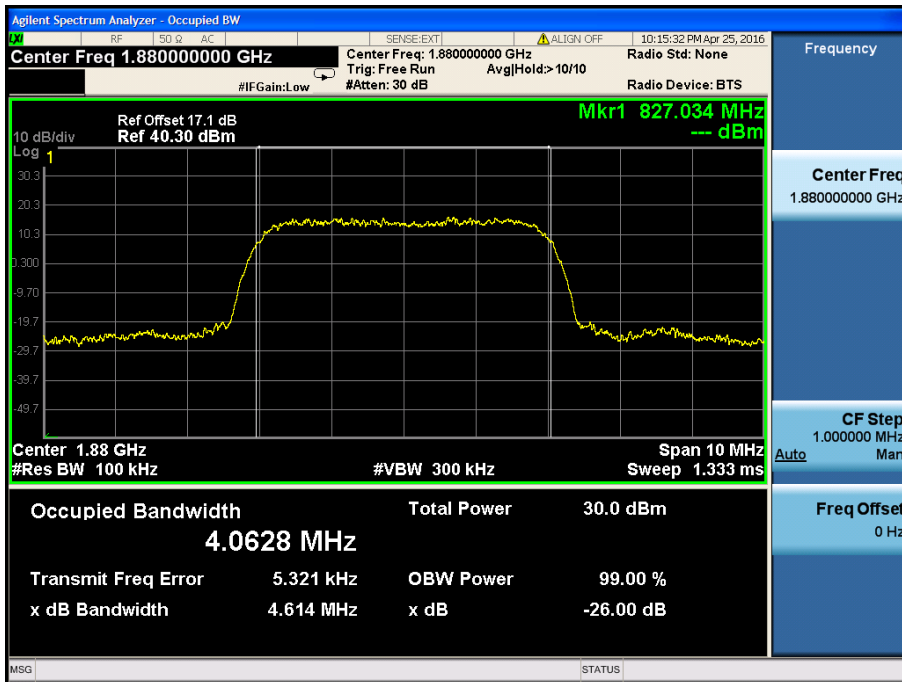### 4.1.2 Test Band = WCDMA1900

4.1.2.1　　Test Mode = UMTS/TM1

4.1.2.1.1 Test Channel = LCH
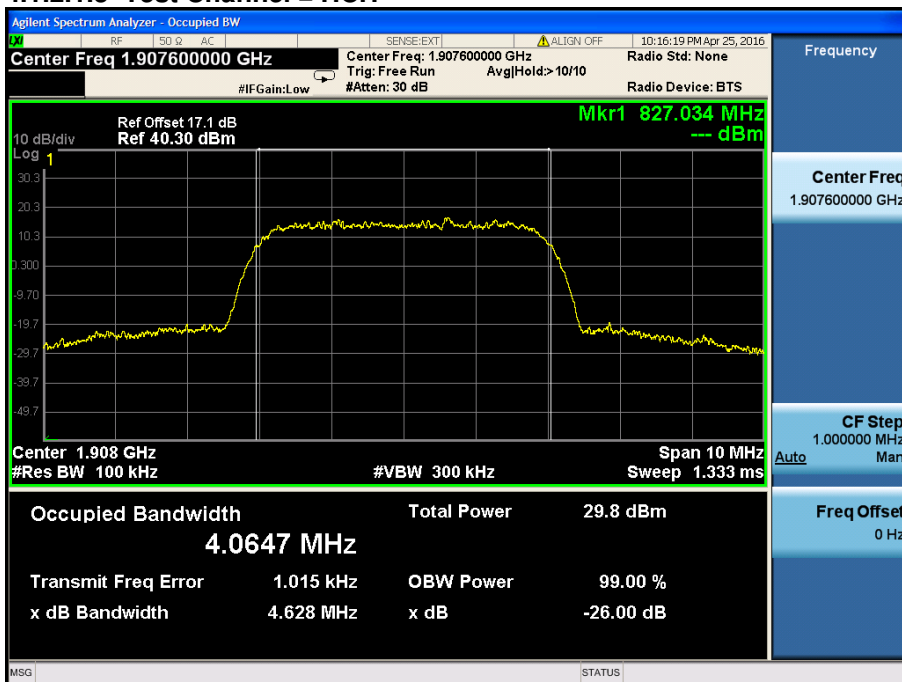
4.1.2.1.2 Test Channel = MCH

Occupied Bandwidth	Total Power	30.0 dBm
4.0628 MHz		
Transmit Freq Error	5.321 kHz	OBW Power	99.00 %
x dB Bandwidth	4.614 MHz	x dB	-26.00 dB

4.1.2.1.3 Test Channel = HCH

Occupied Bandwidth	Total Power	29.8 dBm
4.0647 MHz		
Transmit Freq Error	1.015 kHz	OBW Power	99.00 %
x dB Bandwidth	4.628 MHz	x dB	-26.00 dB

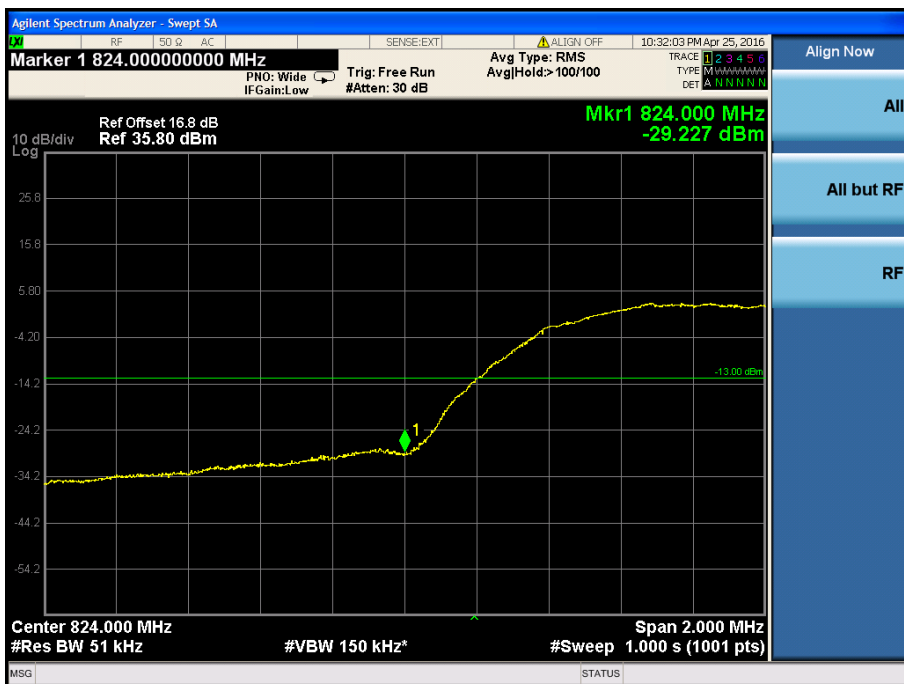**SGS-CSTC Standards Technical Services Co., Ltd.
Shenzhen Branch**

5   Band Edges Compliance

Part I - Test Plots

5.1 For WCDMA850

5.1.1.1   Test Mode = UMTS/TM1

5.1.1.1.1 Test Channel = LCH
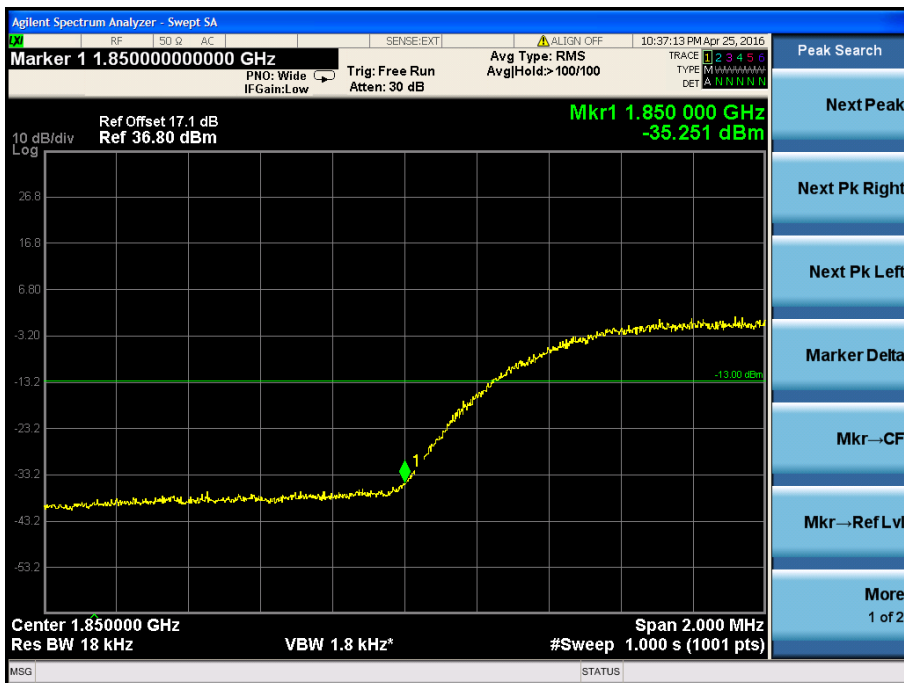

5.1.1.1.2 Test Channel = HCH

5.2 For WCDMA1900

5.2.1.1   Test Mode = UMTS/TM1

5.2.1.1.1 Test Channel = LCH

5.2.1.1.2 Test Channel = HCH
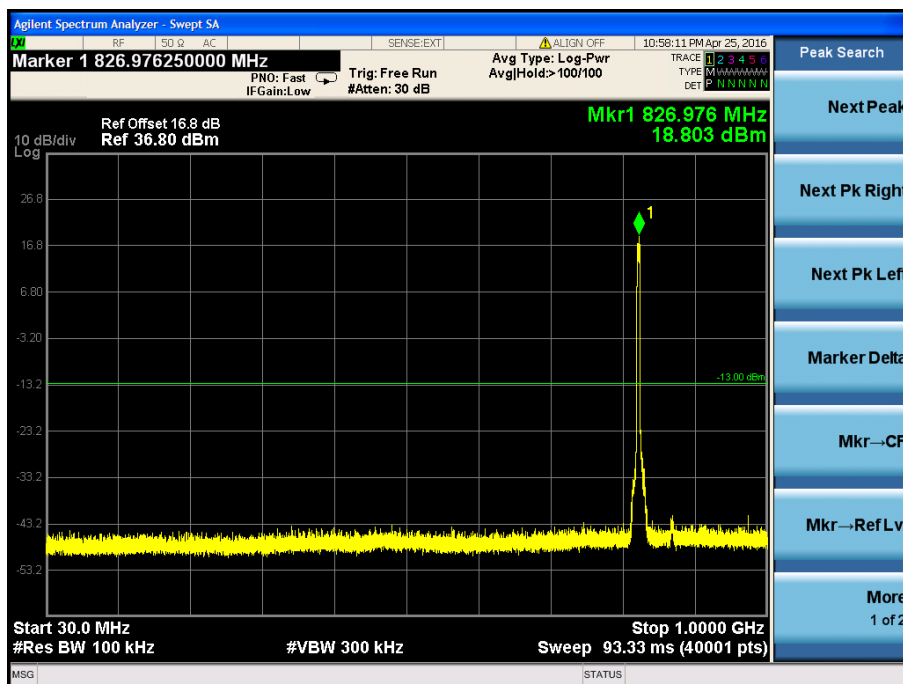
6   Spurious Emission at Antenna Terminal

NOTE: For the averaged unwanted emissions measurements, the measurement points in each sweep is greater than twice the Span/RBW in order to ensure bin-to-bin spacing of < RBW/2 so that narrowband signals are not lost between frequency bins. As to the present test item, the "Measurement Points = k * (Span / RBW)" with k between 4 and 5, which results in an acceptable level error of less than 0.5 dB.

Part I - Test Plots

6.1 For WCDMA850

8.1.1.2   Test Mode = UMTS/TM1

6.1.1.1.1 Test Channel = LCH

6.1.1.1.2 Test Channel = MCH

Agilent Spectrum Analyzer - Swept SA

Marker 1 5.598550000000 GHz

Mkr1 5.598 550 GHz
-29.468 dBm

Start 1.000 GHz   Stop 10.000 GHz
#Res BW 1.0 MHz   #VBW 3.0 MHz   Sweep 16.00 ms (40001 pts)

6.1.1.1.3 Test Channel = HCH

Agilent Spectrum Analyzer - Swept SA

Marker 1 845.479000000 MHz

Mkr1 845.479 MHz
17.109 dBm

Start 30.0 MHz   Stop 1.0000 GHz
#Res BW 100 kHz   #VBW 300 kHz   Sweep 93.33 ms (40001 pts)
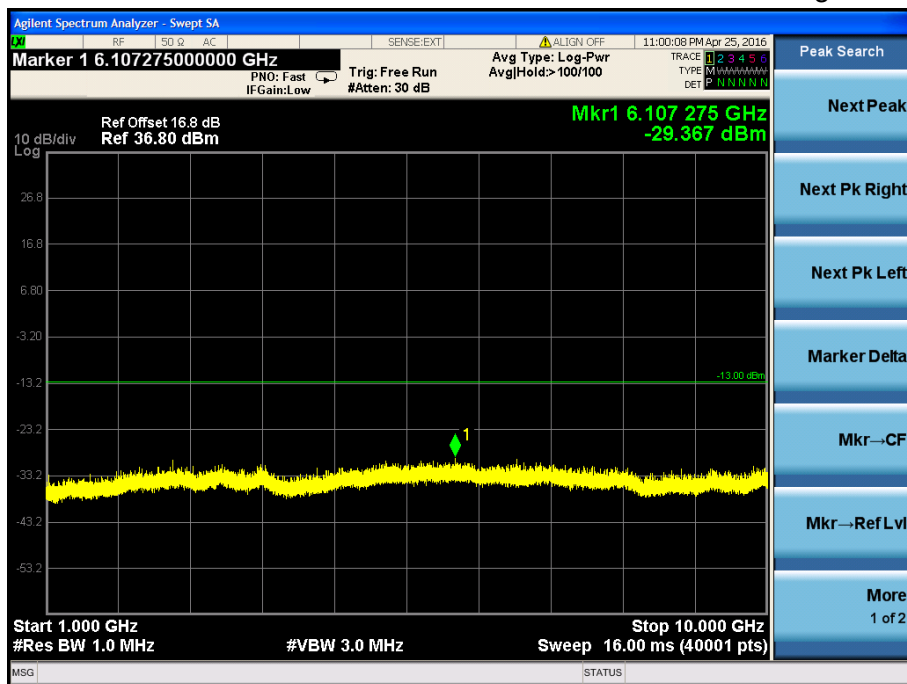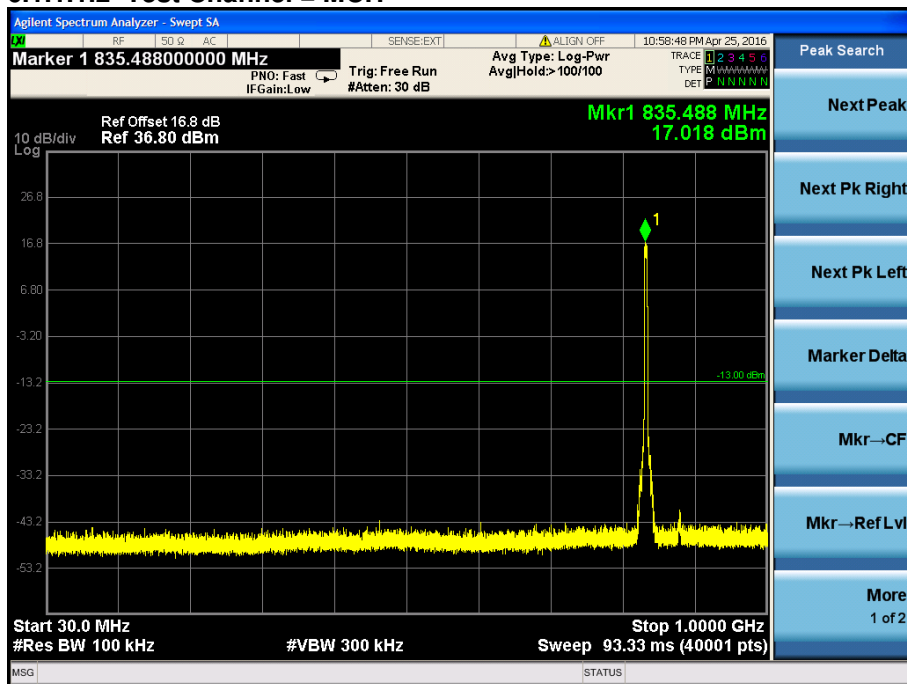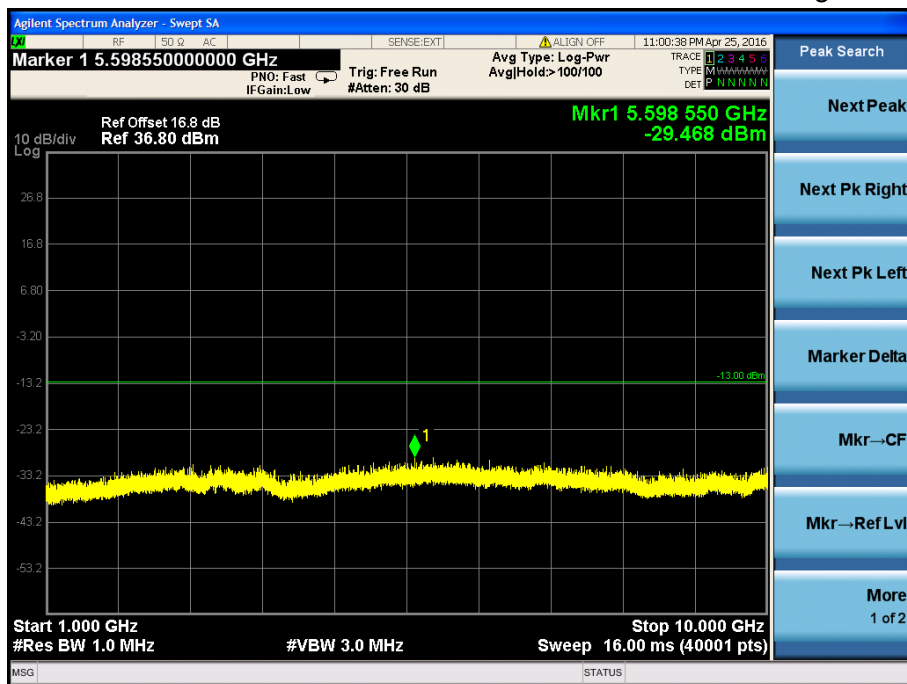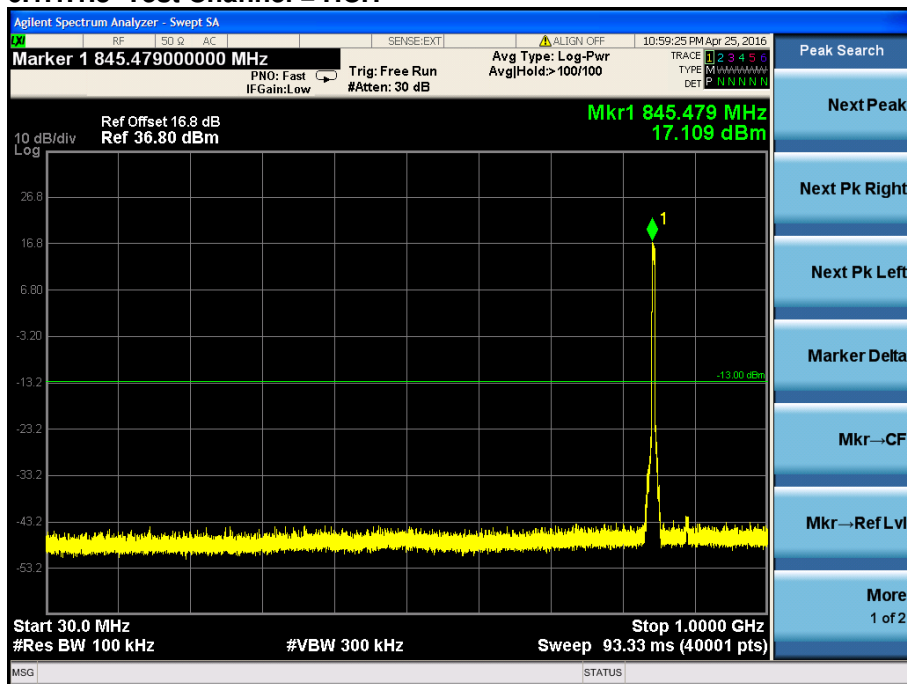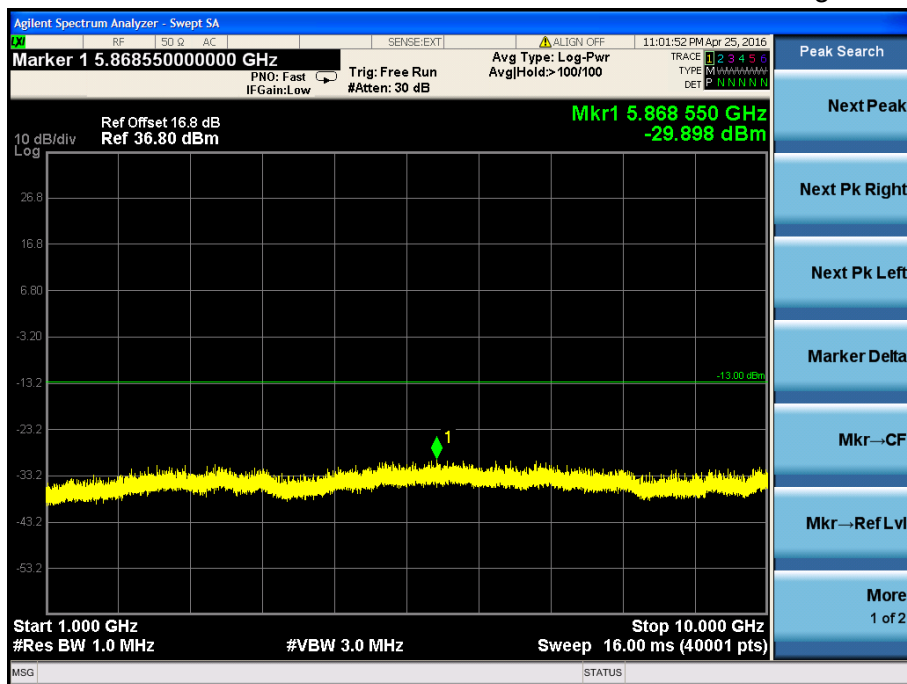
6.2 For WCDMA1900

8.1.1.2   Test Mode = UMTS/TM1

6.2.1.1.1 Test Channel = LCH
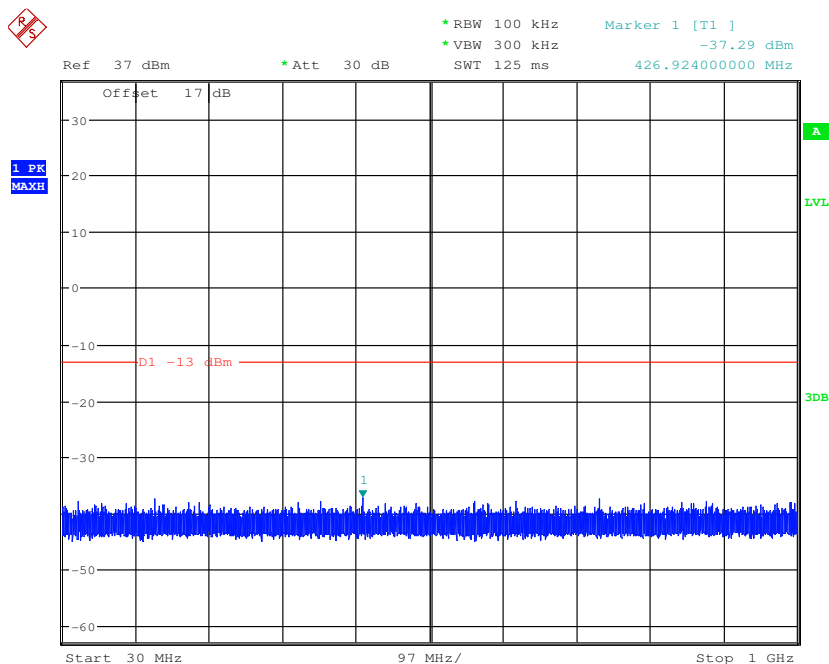
6.2.1.1.2 Test Channel = MCH


```
                                        * RBW  100 kHz       Marker 1 [T1 ]
                                        * VBW  300 kHz                    -37.58 dBm
        Ref   37 dBm        * Att  30 dB   SWT  125 ms        118.334666667 MHz
          Offset   17 dB
```



```
                                        * RBW  1 MHz        Marker 1 [T1 ]
                                        * VBW  3 MHz                      24.68 dBm
        Ref   37 dBm        * Att  30 dB   SWT  125 ms        1.877500000 GHz
          Offset   17 dB
```

```
* RBW  1 MHz        Marker 1 [T1 ]
* VBW  3 MHz                -30.57 dBm
Ref  37 dBm    * Att  30 dB    SWT 125 ms    18.572666667 GHz
Offset  17 dB
```

Start 10 GHz   1 GHz/   Stop 20 GHz

6.2.1.1.3 Test Channel = HCH


```
* RBW  100 kHz      Marker 1 [T1 ]
* VBW  300 kHz              -38.33 dBm
Ref  37 dBm    * Att  30 dB    SWT 125 ms    947.167333333 MHz
Offset  17 dB
```

Start 30 MHz   97 MHz/   Stop 1 GHz

Graph 1:
```
* RBW  1 MHz        Marker 1 [T1 ]
* VBW  3 MHz                25.99 dBm
Ref  37 dBm      * Att  30 dB    SWT 125 ms        1.905100000 GHz
Offset  17 dB
```
A
LVL
3DB
D1 −13 dBm
1 PK MAXH
Start 1 GHz   900 MHz/   Stop 10 GHz

Graph 2:
```
* RBW  1 MHz        Marker 1 [T1 ]
* VBW  3 MHz               −33.04 dBm
Ref  37 dBm      * Att  30 dB    SWT 125 ms       18.648000000 GHz
Offset  17 dB
```
A
LVL
3DB
D1 −13 dBm
1 PK MAXH
Start 10 GHz   1 GHz/   Stop 20 GHz
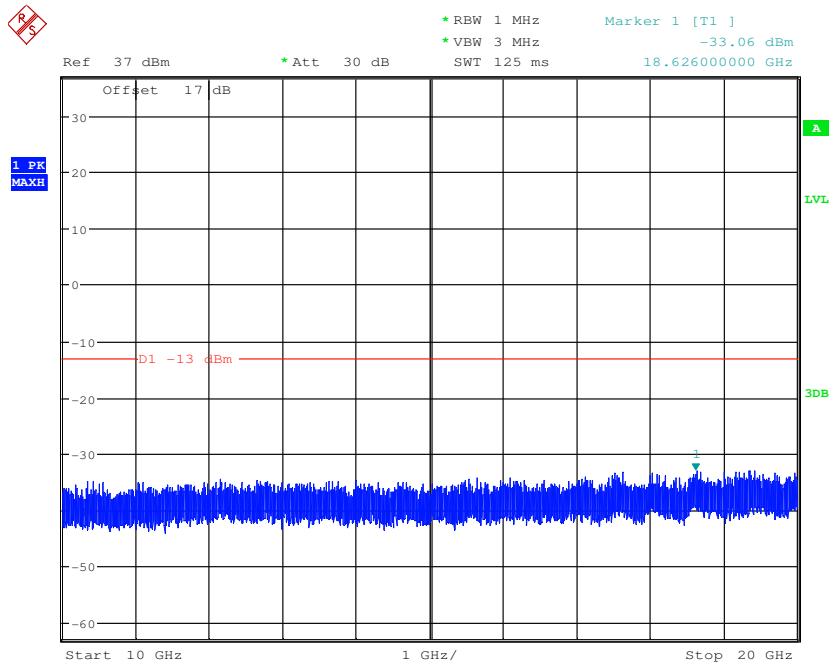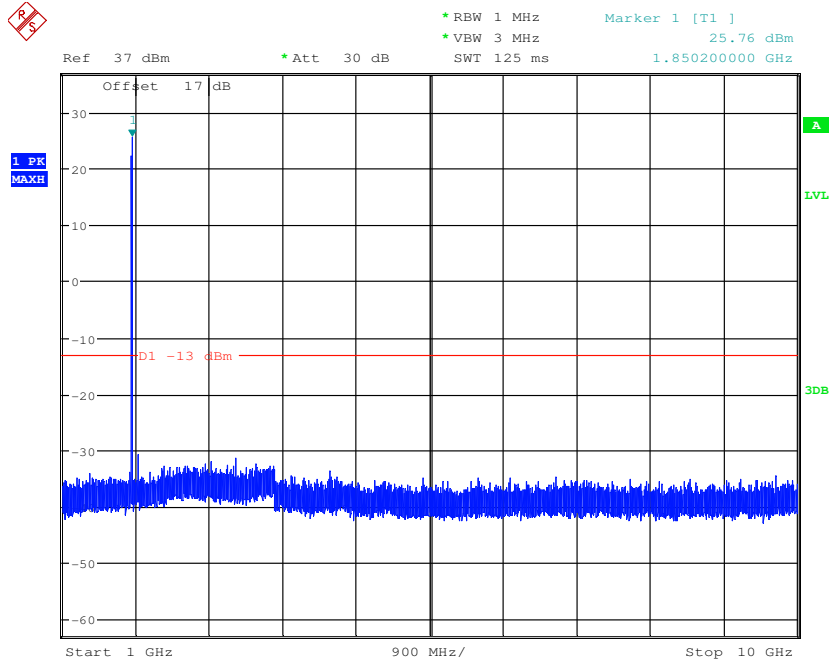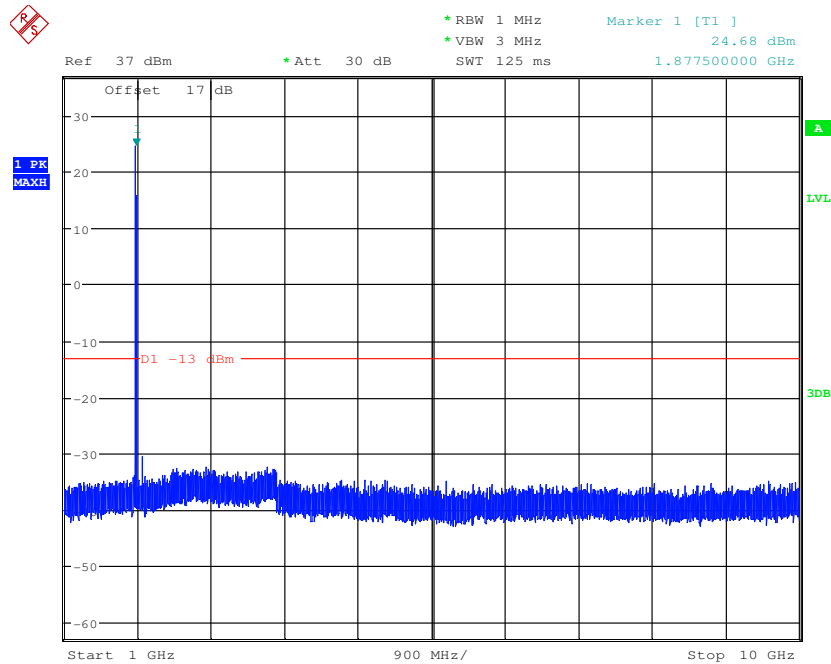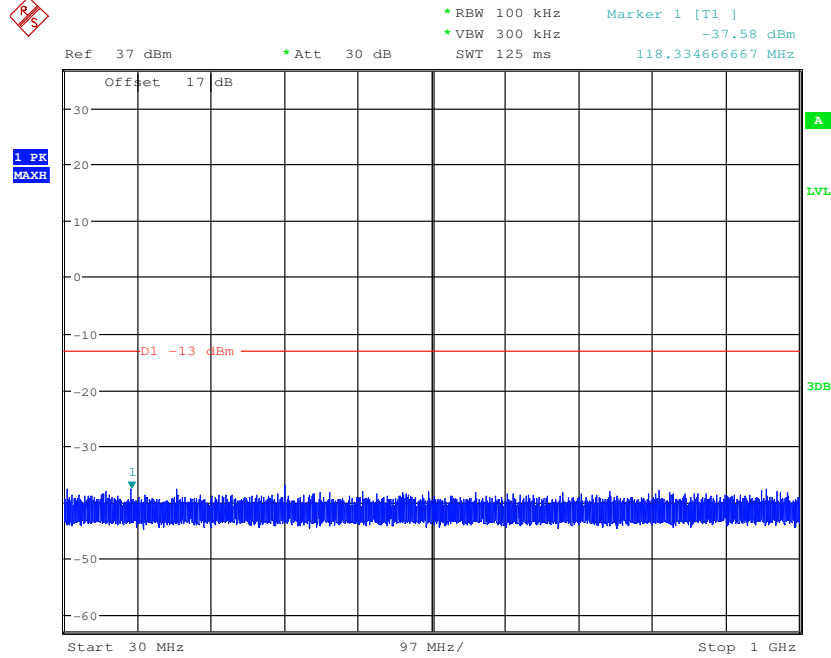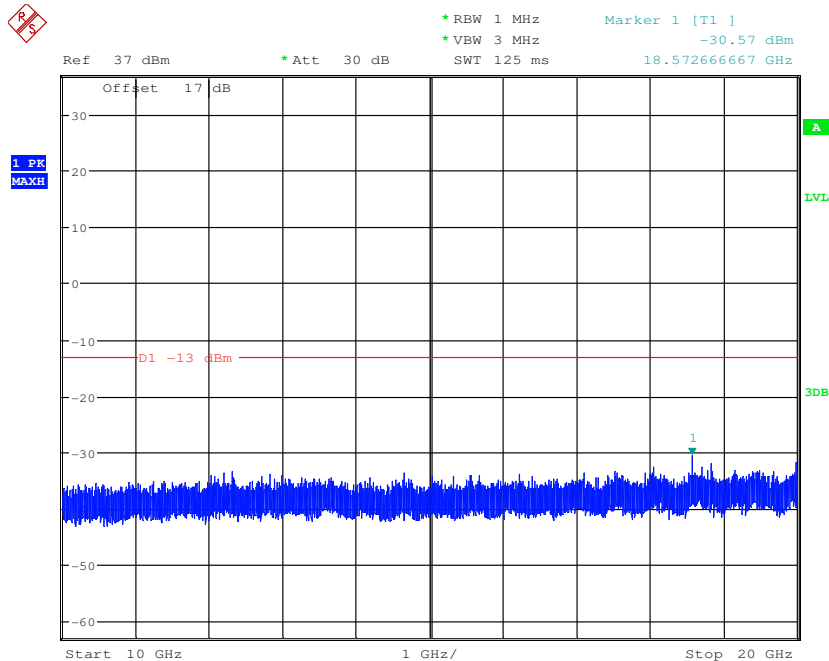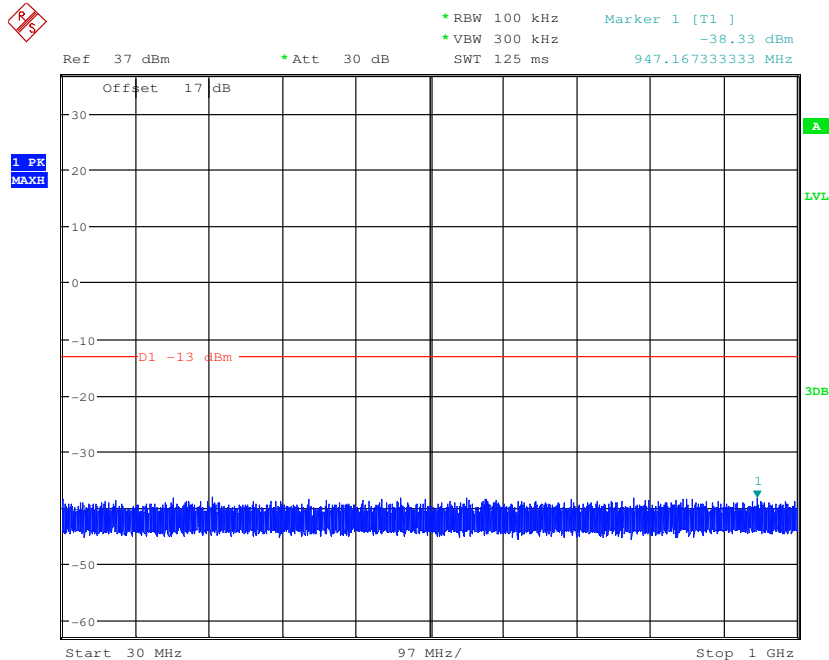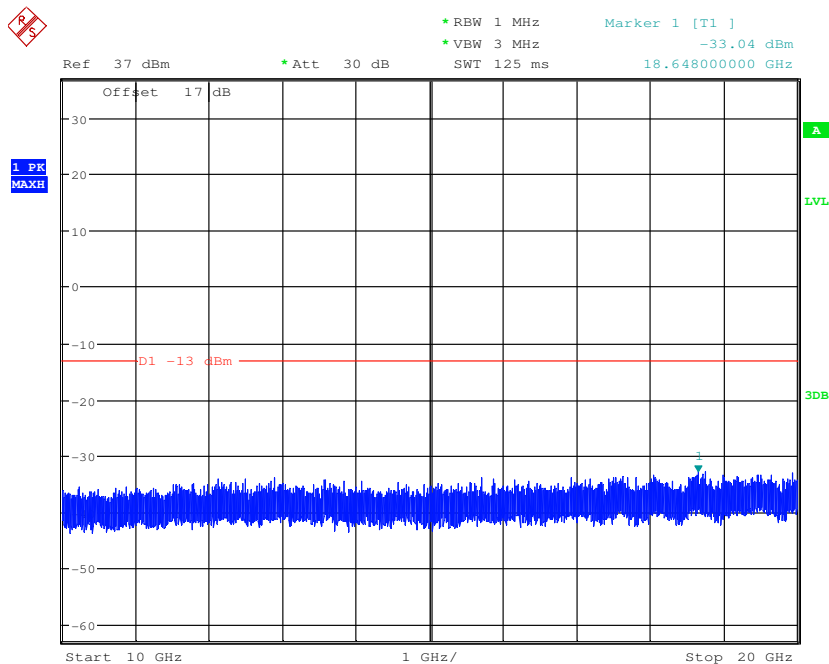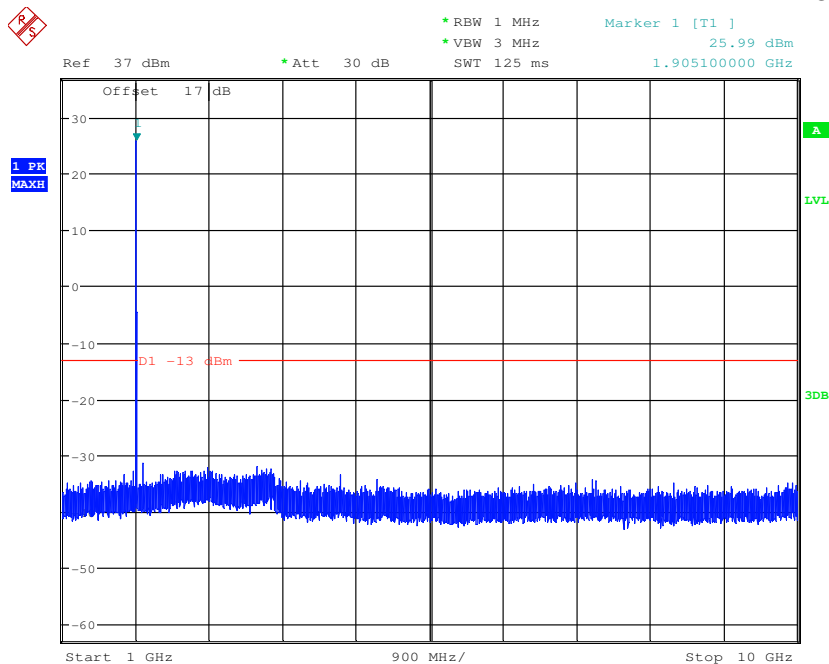
7   Field Strength of Spurious Radiation

Part I - Test Plots

7.1 For WCDMA

7.1.1 Test Band = WCDMA850

7.1.1.1   Test Mode = UMTS/TM1

7.1.1.1.1 Test Channel = LCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Over Limit (dB)	Polarization
1651.500	-31.14	-13.00	-18.14	Vertical
2477.000	-53.67	-13.00	-40.67	Vertical
4628.738	-67.89	-13.00	-54.89	Vertical
1651.500	-49.83	-13.00	-36.83	Horizontal
2482.000	-48.81	-13.00	-35.81	Horizontal
4298.213	-67.00	-13.00	-54.00	Horizontal

7.1.1.1.2 Test Channel = MCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Over Limit (dB)	Polarization
1674.500	-33.95	-13.00	-20.95	Vertical
2511.500	-56.48	-13.00	-43.48	Vertical
5020.688	-63.49	-13.00	-50.49	Vertical
1674.500	-63.23	-13.00	-50.23	Horizontal
2506.500	-55.64	-13.00	-42.64	Horizontal
5023.613	-65.49	-13.00	-52.49	Horizontal

7.1.1.1.3 Test Channel = HCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Over Limit (dB)	Polarization
1695.000	-39.01	-13.00	-26.01	Vertical
2486.000	-58.38	-13.00	-45.38	Vertical
5467.725	-67.02	-13.00	-54.02	Vertical
1544.500	-65.85	-13.00	-52.85	Horizontal
2422.000	-58.90	-13.00	-45.90	Horizontal
4234.838	-65.00	-13.00	-52.00	Horizontal

7.1.2 Test Band = WCDMA1900

7.1.2.1   Test Mode = UMTS/TM1

7.1.2.1.1 Test Channel = LCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Over Limit (dB)	Polarization
3702.975	-61.52	-13.00	-48.52	Vertical
6019.088	-65.57	-13.00	-52.57	Vertical
9279.000	-63.79	-13.00	-50.79	Vertical
3702.975	-62.12	-13.00	-49.12	Horizontal
5950.350	-65.86	-13.00	-52.86	Horizontal
8506.800	-64.56	-13.00	-51.56	Horizontal

7.1.2.1.2 Test Channel = MCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Over Limit (dB)	Polarization
3758.063	-64.54	-13.00	-51.54	Vertical
5977.650	-65.60	-13.00	-52.60	Vertical
9267.788	-63.80	-13.00	-50.80	Vertical
3761.475	-66.96	-13.00	-53.96	Horizontal
6228.713	-65.57	-13.00	-52.57	Horizontal
10500.675	-63.78	-13.00	-50.78	Horizontal

7.1.2.1.3 Test Channel = HCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Over Limit (dB)	Polarization
3811.200	-55.19	-13.00	-42.19	Vertical
6600.675	-65.21	-13.00	-52.21	Vertical
9265.350	-64.01	-13.00	-51.01	Vertical
3811.200	-62.66	-13.00	-49.66	Horizontal
5910.863	-66.14	-13.00	-53.14	Horizontal
10265.700	-64.28	-13.00	-51.28	Horizontal

NOTE:

1) The disturbance above 13GHz and below 30MHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.

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8 Frequency Stability

8.1 For WCDMA

8.1.1 Frequency Error VS. Voltage

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
WCDMA 850	UMTS/TM1	LCH	TN	VL	0.03	0.00004	PASS
				VN	-0.43	-0.00052	PASS
				VH	-0.23	-0.00028	PASS
		MCH	TN	VL	0.59	0.00071	PASS
				VN	0.50	0.00060	PASS
				VH	-1.60	-0.00191	PASS
		HCH	TN	VL	1.49	0.00176	PASS
				VN	-2.89	-0.00341	PASS
				VH	2.59	0.00306	PASS

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
WCDMA 1900	UMTS/TM1	LCH	TN	VL	-7.36	-0.00397	PASS
				VN	-4.28	-0.00231	PASS
				VH	-7.98	-0.00431	PASS
		MCH	TN	VL	-6.61	-0.00352	PASS
				VN	-9.57	-0.00509	PASS
				VH	-5.86	-0.00312	PASS
		HCH	TN	VL	-5.80	-0.00304	PASS
				VN	-10.50	-0.00550	PASS
				VH	-2.37	-0.00124	PASS

8.1.2 Frequency Error VS. Temperature

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
WCDMA 850	UMTS/TM1	LCH	VN	-30	2.66	0.00322	PASS
				-20	1.43	0.00173	PASS
				-10	0.57	0.00069	PASS
				0	-2.74	-0.00332	PASS
				10	0.51	0.00062	PASS
				20	-1.90	-0.00230	PASS
				30	1.58	0.00191	PASS
				40	-0.11	-0.00013	PASS
				50	-1.12	-0.00136	PASS
		MCH	VN	-30	-1.87	-0.00224	PASS
				-20	-1.14	-0.00136	PASS
				-10	-0.40	-0.00048	PASS
				0	-1.41	-0.00169	PASS
				10	2.27	0.00271	PASS
				20	1.69	0.00202	PASS
				30	1.58	0.00189	PASS
				40	0.04	0.00005	PASS
				50	-0.42	-0.00050	PASS
		HCH	VN	-30	-0.22	-0.00026	PASS
				-20	0.60	0.00071	PASS
				-10	0.51	0.00060	PASS
				0	-1.59	-0.00188	PASS
				10	1.50	0.00177	PASS
				20	-2.88	-0.00340	PASS
				30	2.60	0.00307	PASS
				40	-0.63	-0.00074	PASS
				50	-2.66	-0.00314	PASS

SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
WCDMA 1900	UMTS/TM1	LCH	VN	-30	-5.49	-0.00296	PASS
				-20	-8.94	-0.00483	PASS
				-10	-5.95	-0.00321	PASS
				0	-7.48	-0.00404	PASS
				10	-5.63	-0.00304	PASS
				20	-4.09	-0.00221	PASS
				30	-9.94	-0.00537	PASS
				40	-5.69	-0.00307	PASS
				50	-4.72	-0.00255	PASS
		MCH	VN	-30	-6.92	-0.00368	PASS
				-20	-8.27	-0.00440	PASS
				-10	-4.49	-0.00239	PASS
				0	-7.91	-0.00421	PASS
				10	-5.25	-0.00279	PASS
				20	-6.58	-0.00350	PASS
				30	-9.28	-0.00494	PASS
				40	-8.15	-0.00434	PASS
				50	-6.15	-0.00327	PASS
		HCH	VN	-30	-6.40	-0.00336	PASS
				-20	-6.69	-0.00351	PASS
				-10	-7.92	-0.00415	PASS
				0	-7.45	-0.00391	PASS
				10	-7.22	-0.00378	PASS
				20	-4.18	-0.00219	PASS
				30	-7.37	-0.00386	PASS
				40	-2.99	-0.00157	PASS
				50	-5.22	-0.00274	PASS

The End