

# Appendix B

## WCDMA BAND II & V

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## 1 Effective (Isotropic) Radiated Power Output Data

### Part I - Test Results

Test Band	Test Mode	Test Channel	Measured [dBm]	EIRP[dBm]	Limit[dBm]	Verdict
WCDMA BAND II	UMTS/TM1	LCH	22.36	22.74	33.00	PASS
		MCH	22.35	22.73	33.00	PASS
		HCH	22.33	22.71	33.00	PASS

Test Band	Test Mode	Test Channel	Measured [dBm]	ERP[dBm]	Limit[dBm]	Verdict
WCDMA BAND V	UMTS/TM1	LCH	22.95	20.61	38.45	PASS
		MCH	22.96	20.62	38.45	PASS
		HCH	22.81	20.47	38.45	PASS

**Remark:**

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

$$\text{EIRP [dBm]} = \text{SGP [dBm]} - \text{Cable Loss [dB]} + \text{Gain [dBi]}$$

$$\text{ERP [dBm]} = \text{SGP [dBm]} - \text{Cable Loss [dB]} + \text{Gain [dBd]}$$

b: SGP=Signal Generator Level

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## 2 Peak-to-Average Ratio

### Part I - Test Results

Test Band	Test Mode	Test Channel	Measured[dB]	Limit [dB]	Verdict
WCDMA BAND II	UMTS/TM1	LCH	3.28	13	PASS
		MCH	3.30	13	PASS
		HCH	3.22	13	PASS
WCDMA BAND V	UMTS/TM1	LCH	3.25	13	PASS
		MCH	3.19	13	PASS
		HCH	3.16	13	PASS

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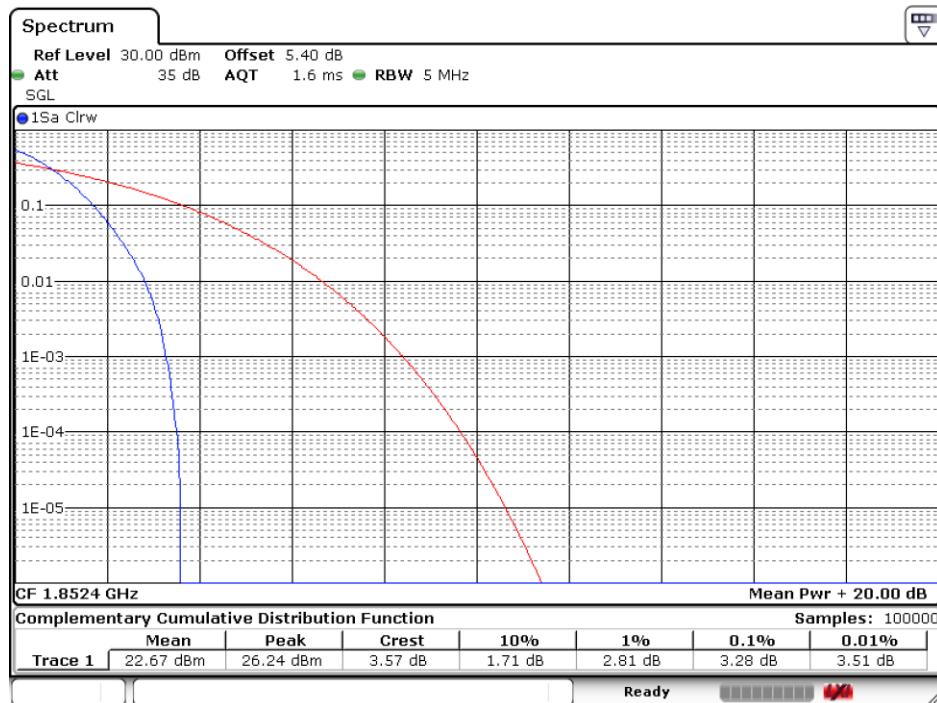
## Part II - Test Plots

## 2.1 For WCDMA

## 2.1.1 Test Band = WCDMA BAND II

## 2.1.1.1 Test Mode = UMTS/TM1

## 2.1.1.1.1 Test Channel = LCH



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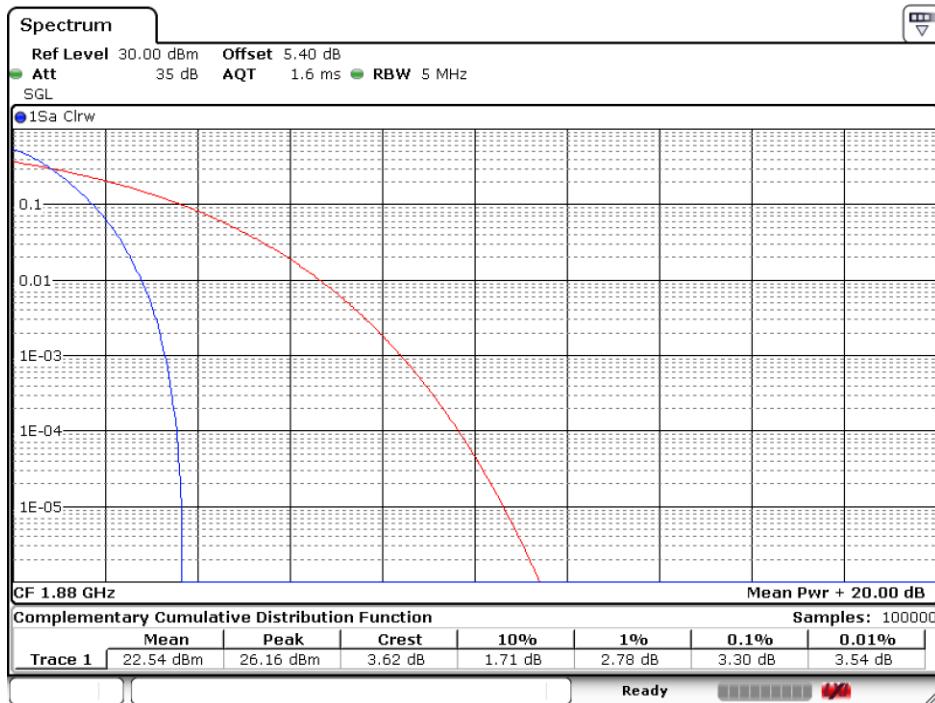
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## 2.1.1.1.2 Test Channel = MCH



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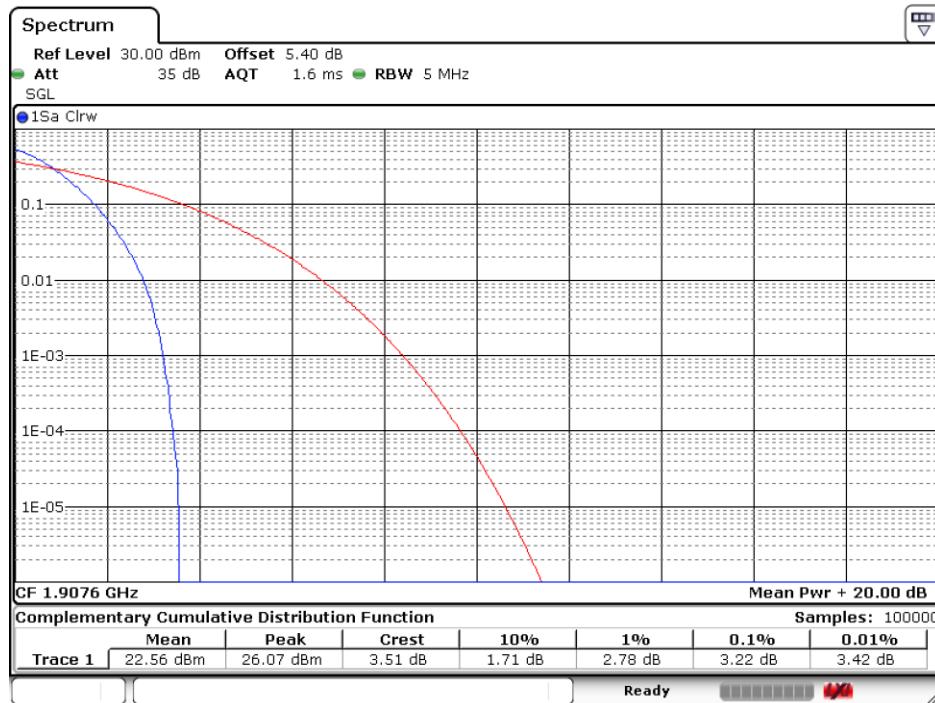
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## 2.1.1.1.3 Test Channel = HCH



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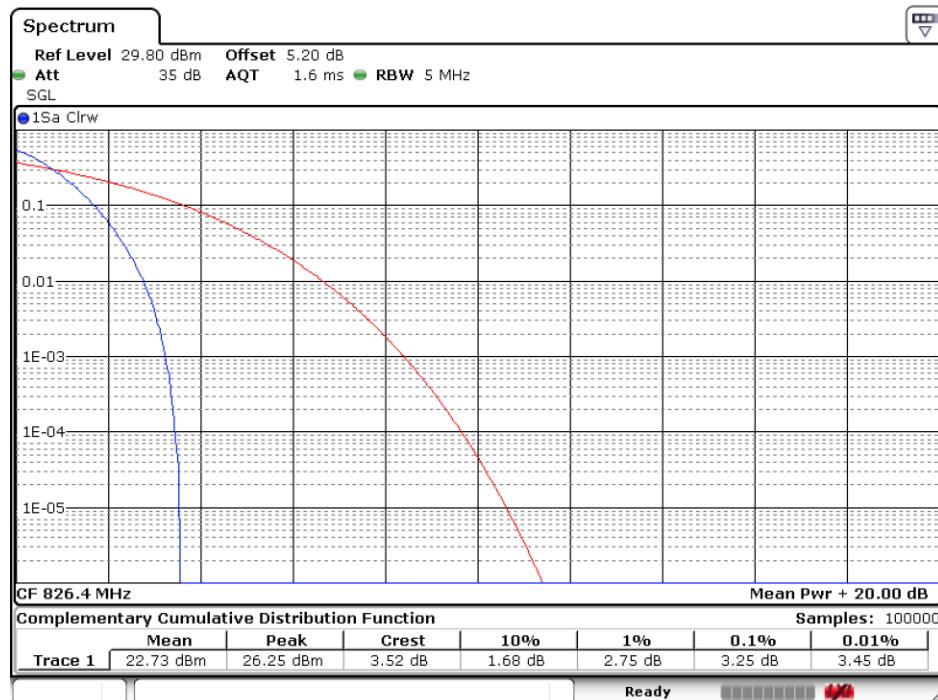


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## 2.1.2 Test Band = WCDMA BAND V

### 2.1.2.1 Test Mode = UMTS/TM1

#### 2.1.2.1.1 Test Channel = LCH



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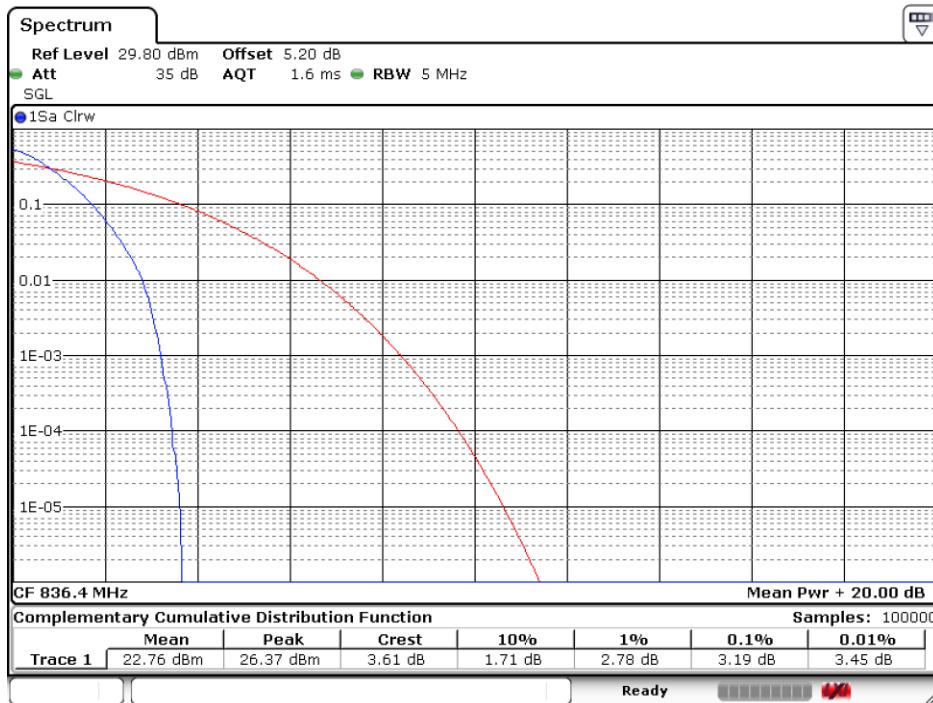
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## 2.1.2.1.2 Test Channel = MCH



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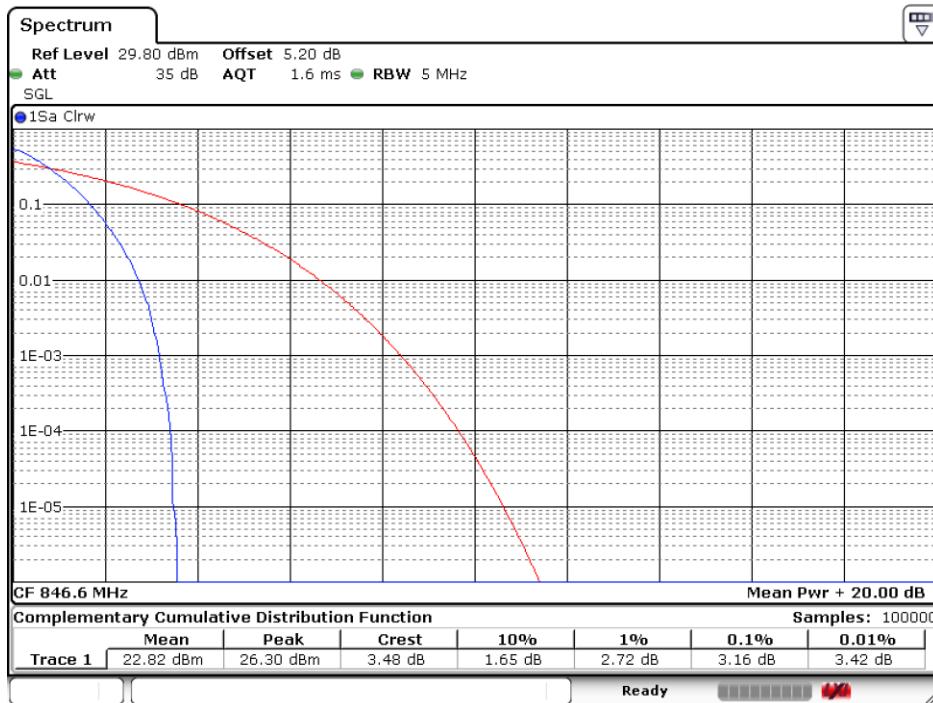
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## 2.1.2.1.3 Test Channel = HCH



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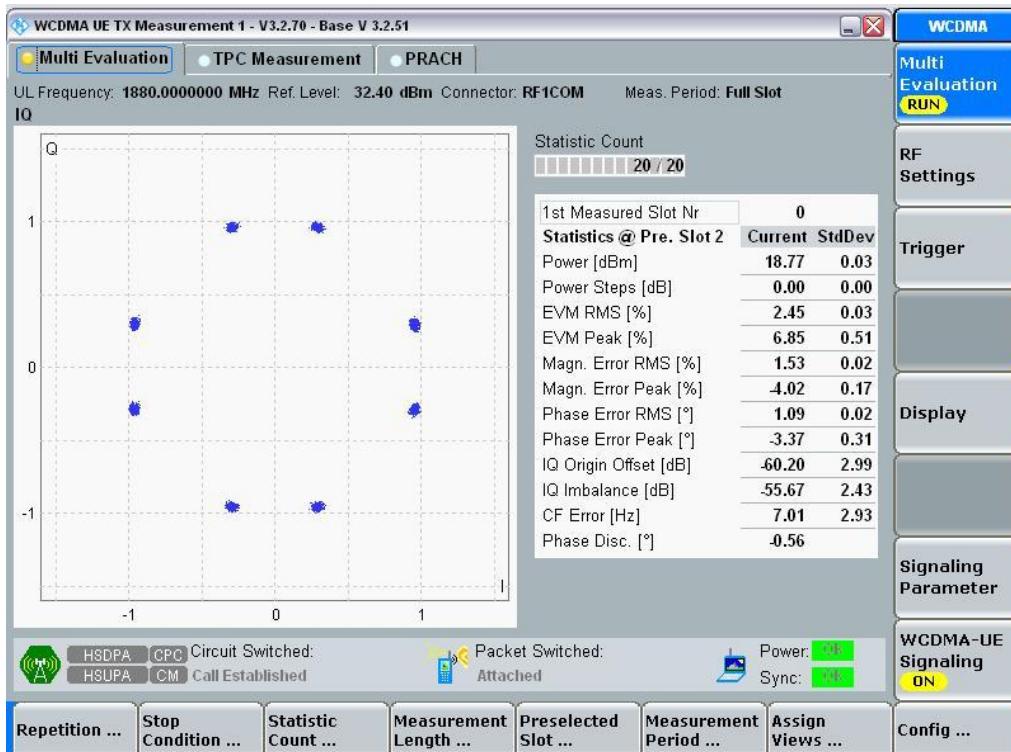
### 3 Modulation Characteristics

#### 3.1 For WCDMA

##### 3.1.1 Test Band = WCDMA BAND II

###### 3.1.1.1 Test Mode = UMTS/TM1

###### 3.1.1.1.1 Test Channel = MCH



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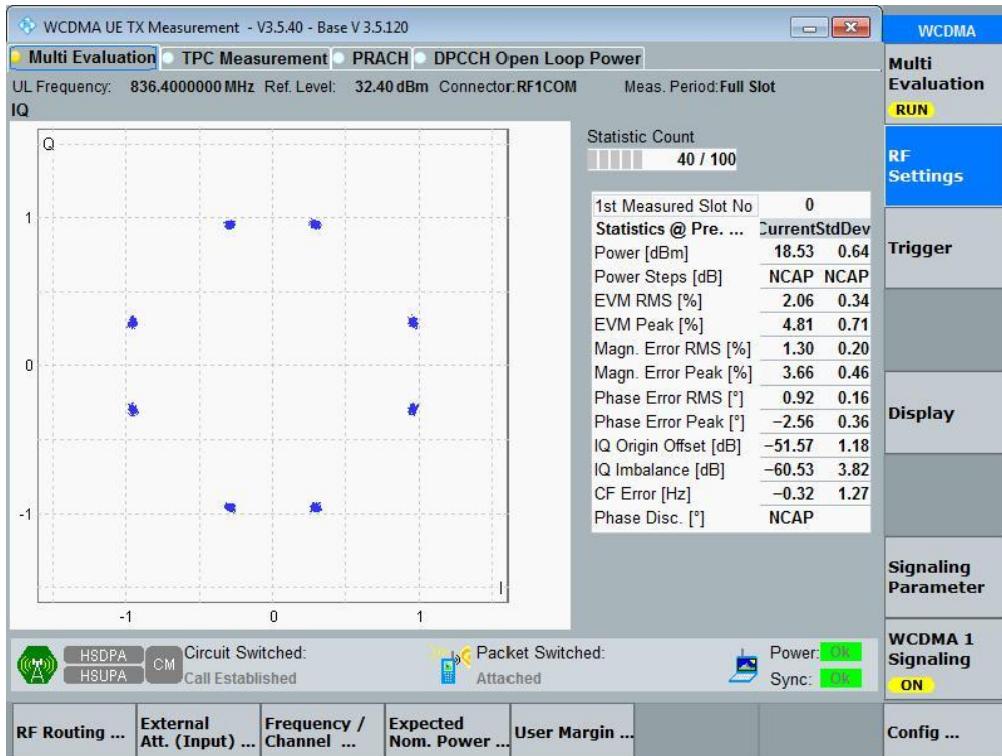


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### 3.1.2 Test Band = WCDMA BAND V

#### 3.1.2.1 Test Mode = UMTS /TM1

##### 3.1.2.1.1 Test Channel = MCH



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## 4 Bandwidth

### Part I - Test Results

Test Band	Test Mode	Test Channel	Occupied Bandwidth [MHz]	Emission Bandwidth [MHz]	Verdict
WCDMA BAND II	UMTS/TM1	LCH	4.13	4.70	PASS
		MCH	4.13	4.71	PASS
		HCH	4.13	4.72	PASS
WCDMA BAND V	UMTS/TM1	LCH	4.13	4.72	PASS
		MCH	4.14	4.72	PASS
		HCH	4.12	4.71	PASS

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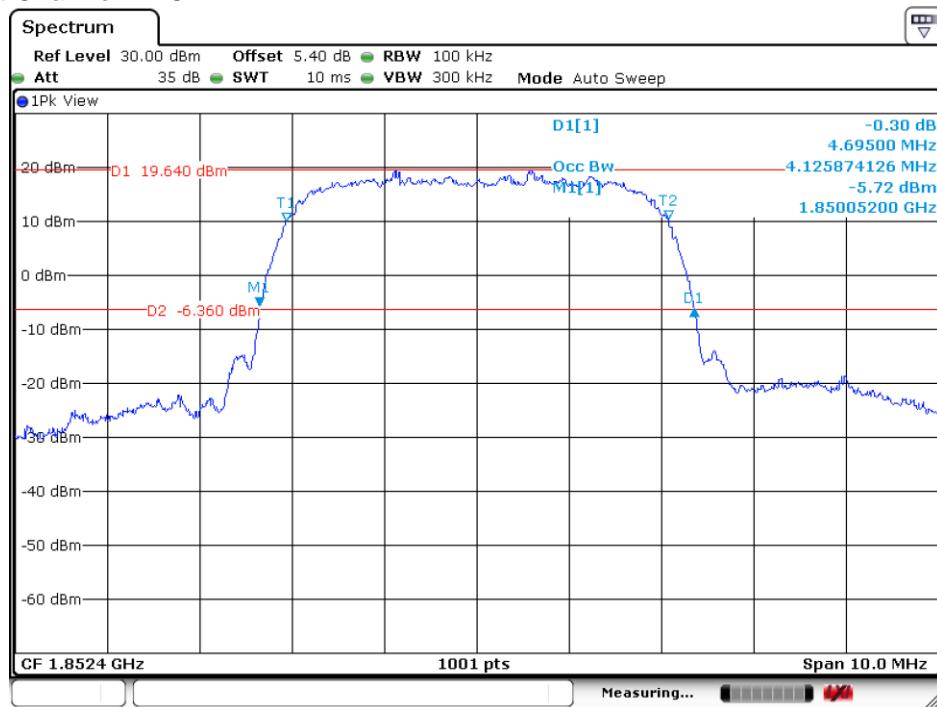
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## 4.1 For WCDMA

### 4.1.1 Test Band = WCDMA BAND II

#### 4.1.1.1 Test Mode = UMTS/TM1

##### 4.1.1.1.1 Test Channel = LCH



Date: 1.APR.2020 02:44:04

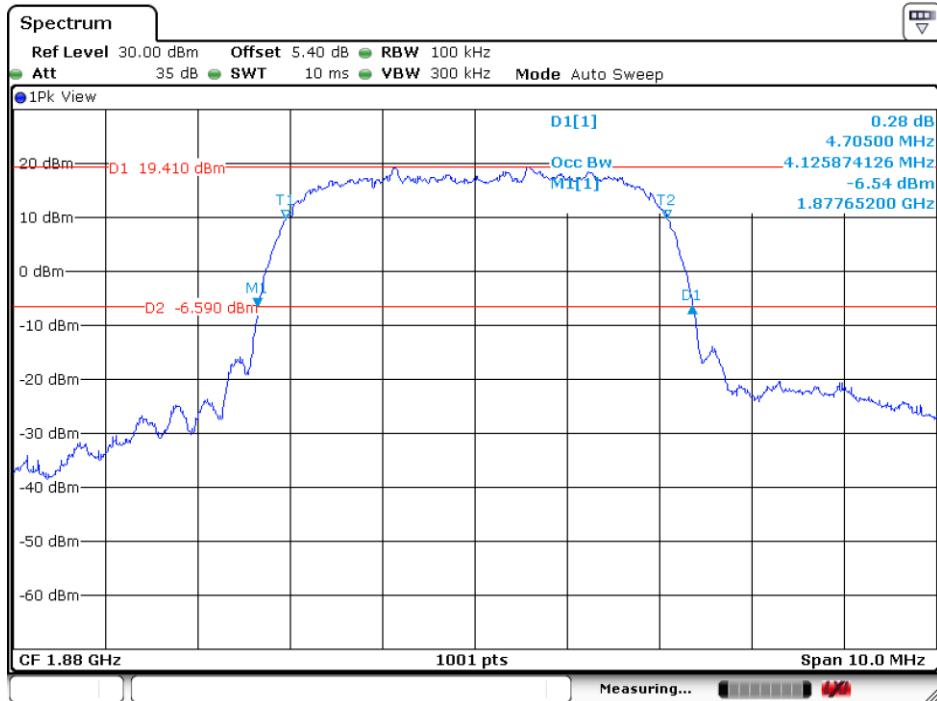
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## 4.1.1.1.2 Test Channel = MCH



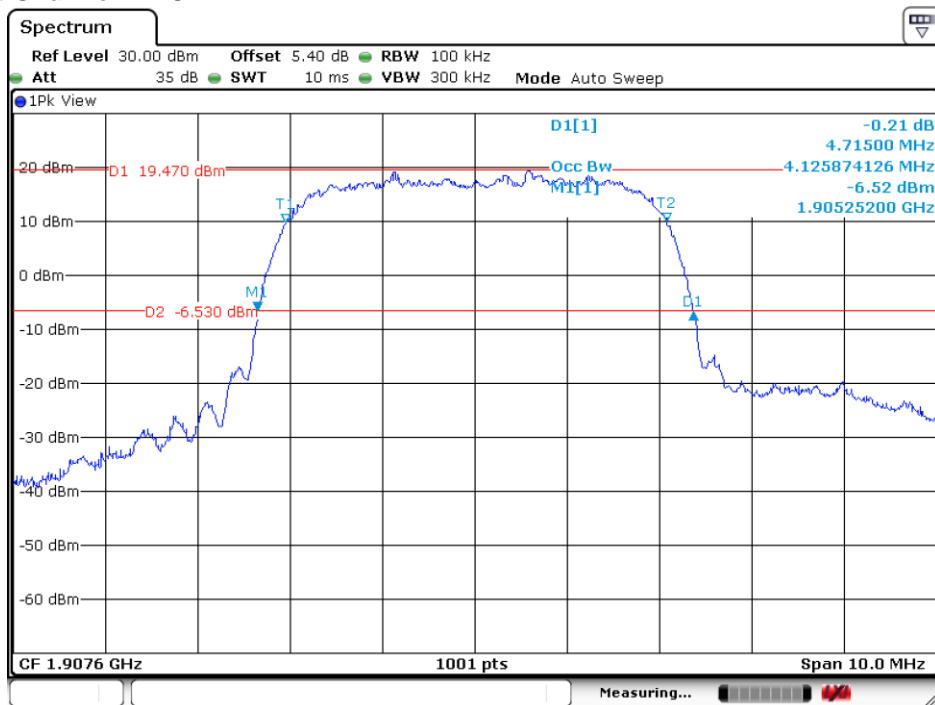
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## 4.1.1.1.3 Test Channel = HCH



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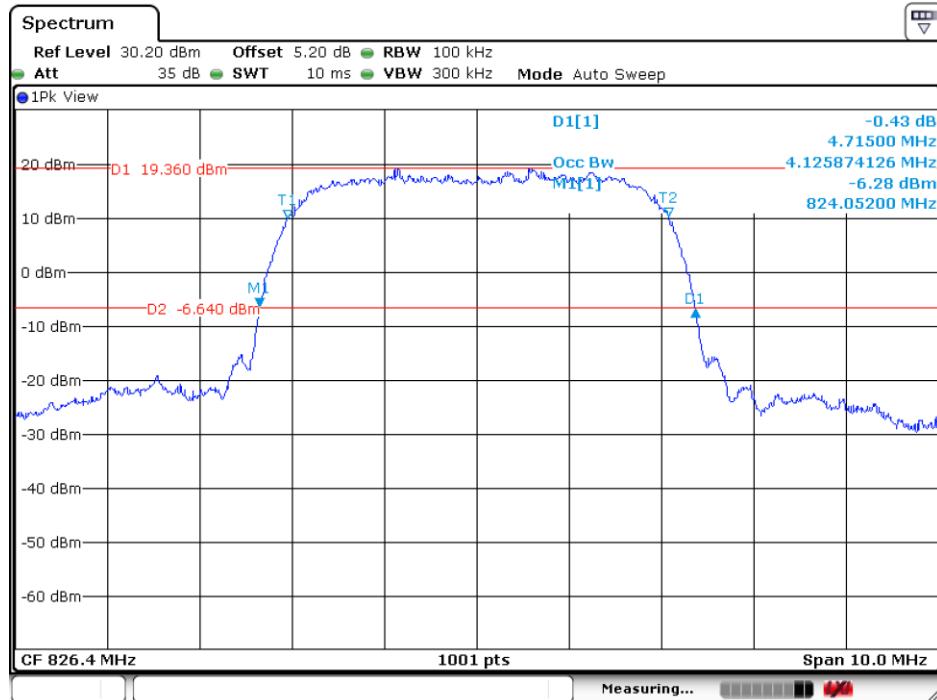


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## 4.1.2 Test Band = WCDMA BAND V

### 4.1.2.1 Test Mode = UMTS/TM1

#### 4.1.2.1.1 Test Channel = LCH



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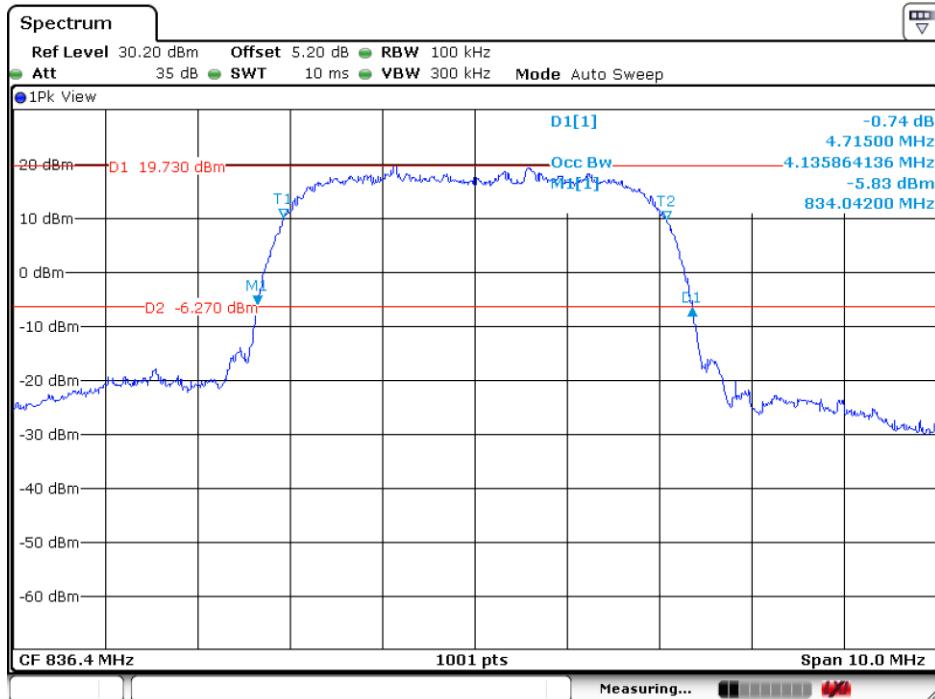
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## 4.1.2.1.2 Test Channel = MCH



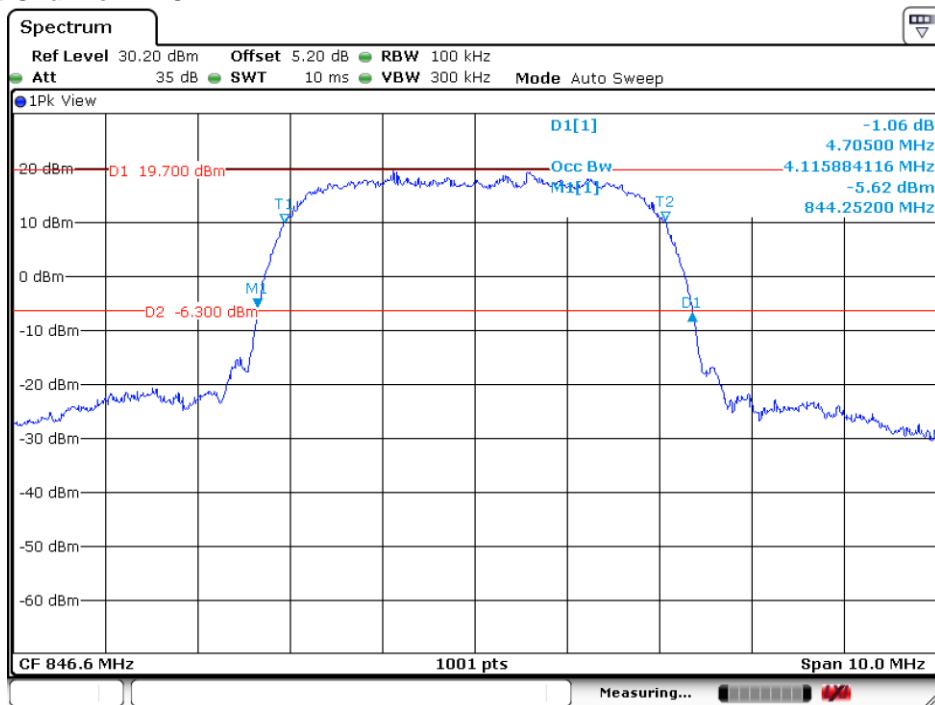
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## 4.1.2.1.3 Test Channel = HCH



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## 5 Band Edges Compliance

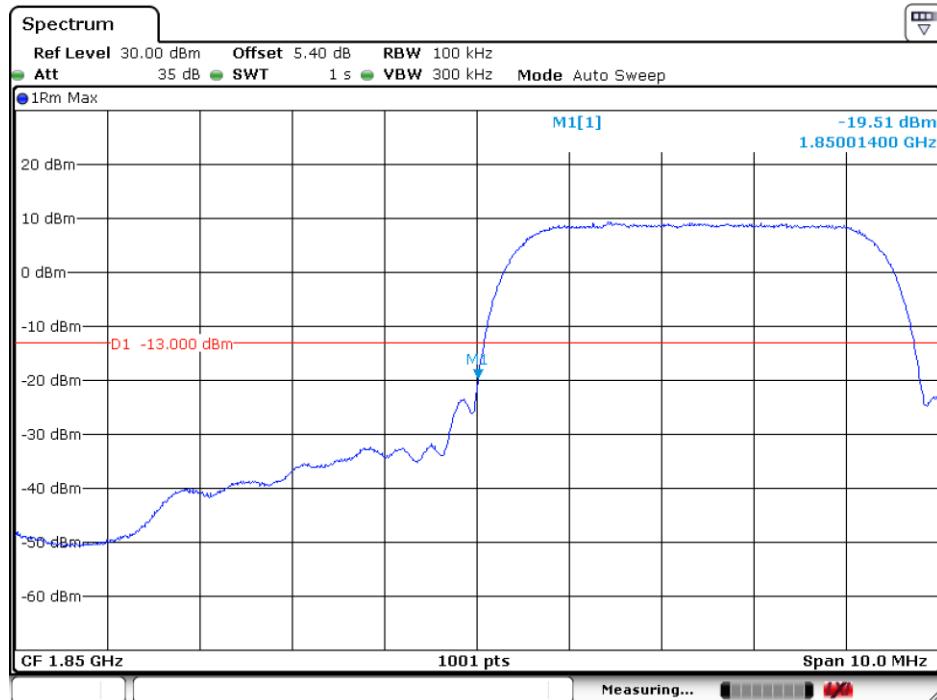
Part I - Test Plots

### 5.1 For WCDMA

#### 5.1.1 Test Band = WCDMA BAND II

##### 5.1.1.1 Test Mode = UMTS/TM1

###### 5.1.1.1.1 Test Channel = LCH



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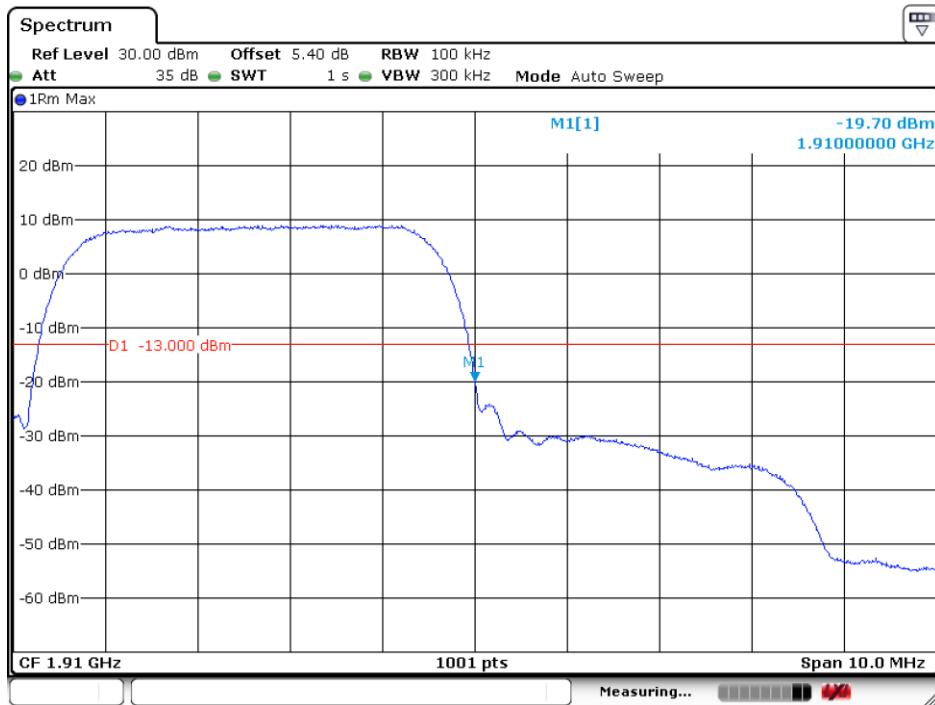
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## 5.1.1.1.2 Test Channel = HCH



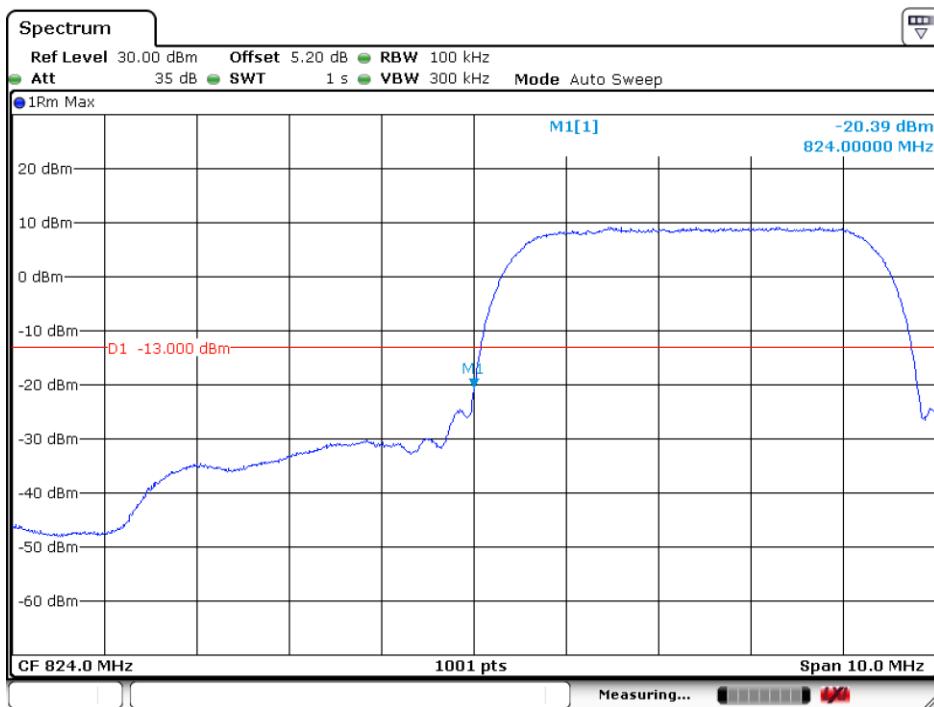
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**5.1.2 Test Band = WCDMA BAND V****5.1.2.1 Test Mode = UMTS/TM1****5.1.2.1.1 Test Channel = LCH**

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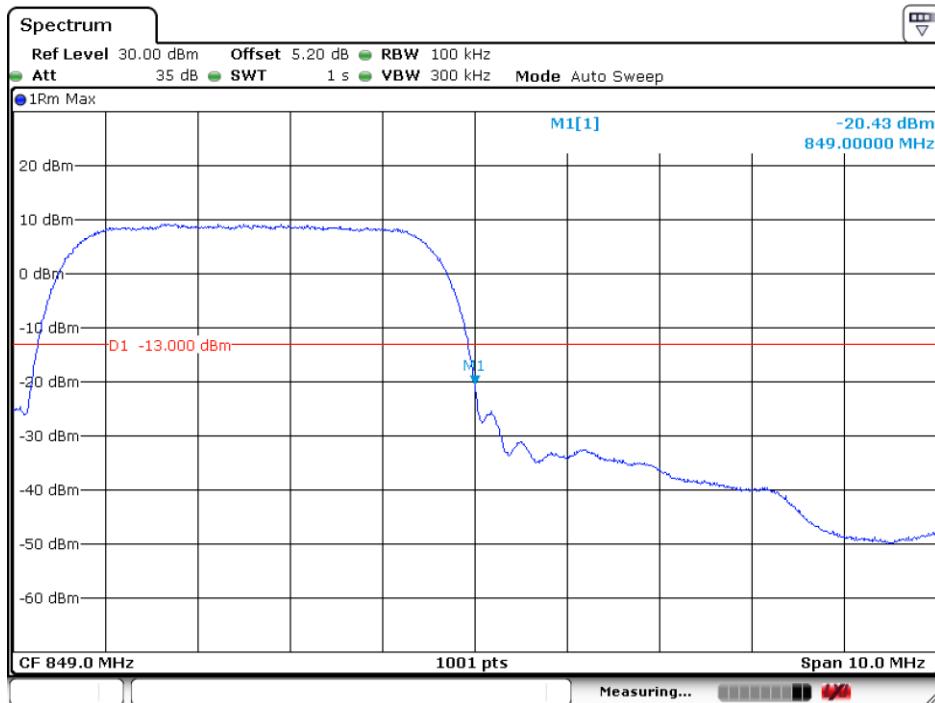
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## 5.1.2.1.2 Test Channel = HCH



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## 6 Spurious Emission at Antenna Terminal

REMARK: 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  $< \text{RBW}/2$  so that narrowband signals are not lost between frequency bins. As to the present test item, the "Measurement Points =  $k * (\text{Span} / \text{RBW})$ " with  $k$  between 4 and 5, which results in an acceptable level error of less than 0.5 dB.

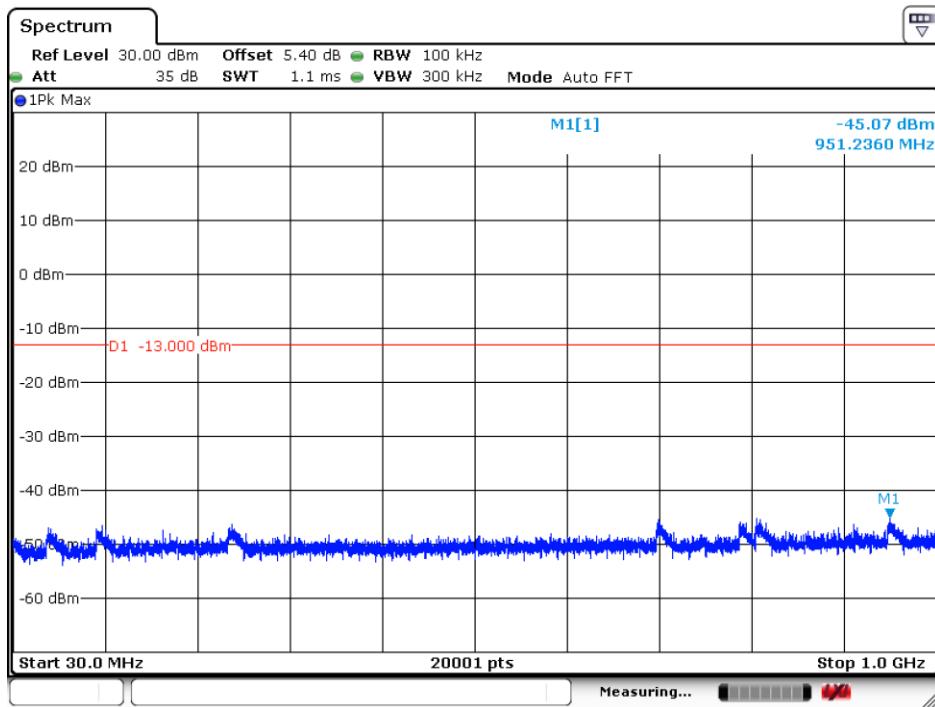
Part I - Test Plots

### 6.1 For WCDMA

#### 6.1.1 Test Band = WCDMA BAND II

##### 6.1.1.1 Test Mode = UMTS/TM1

###### 6.1.1.1.1 Test Channel = LCH



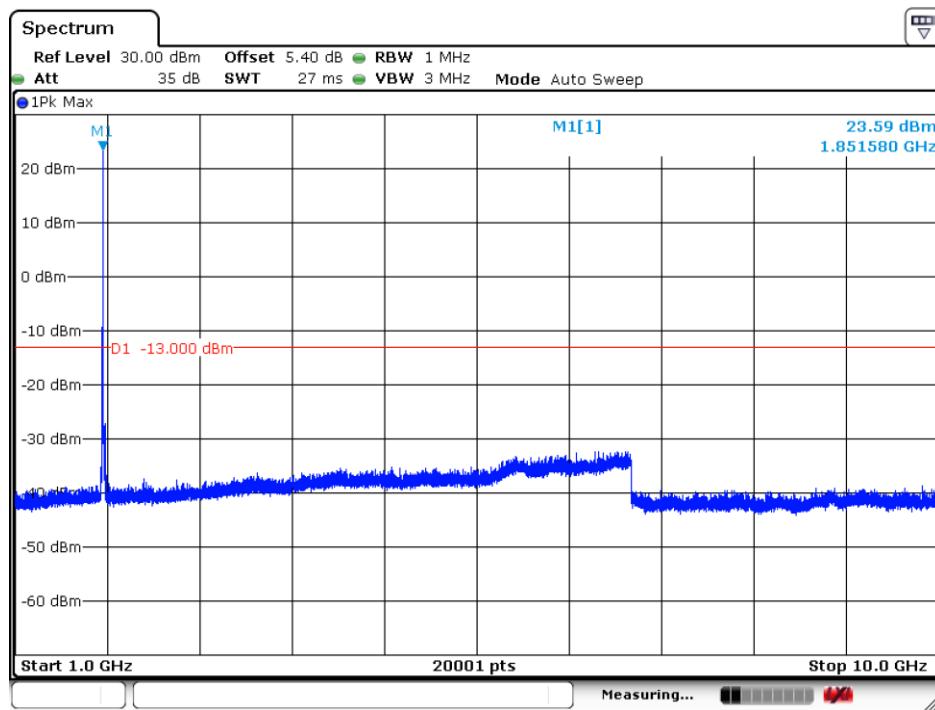
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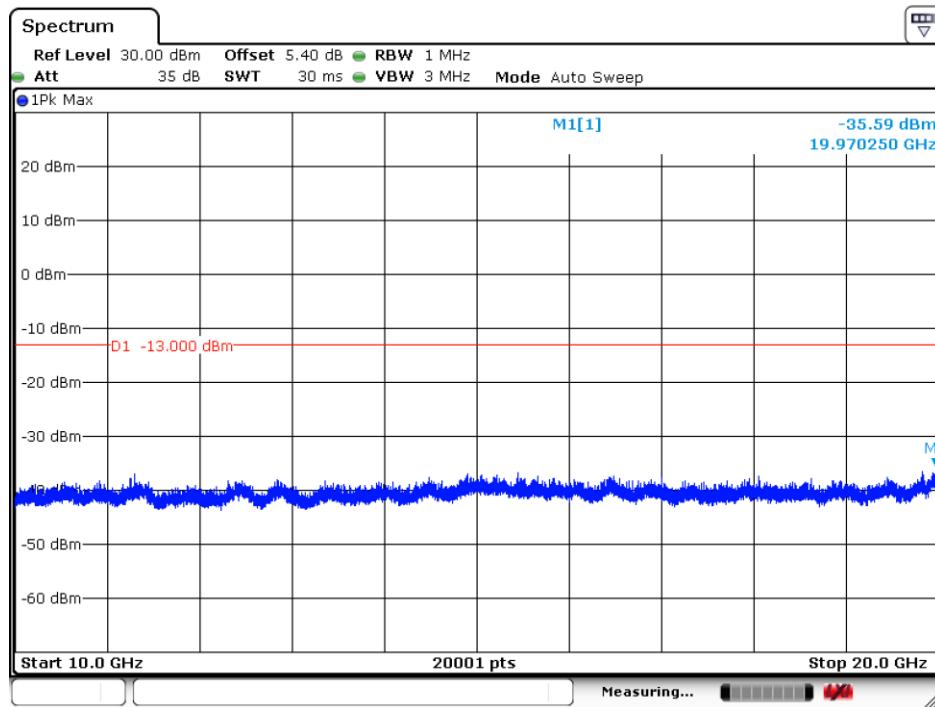
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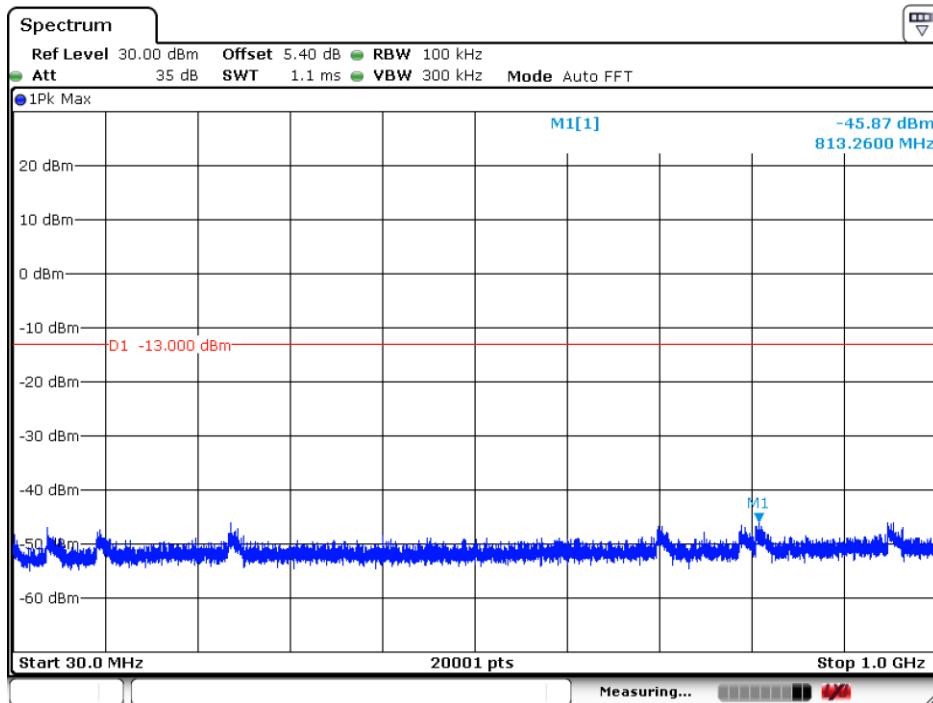
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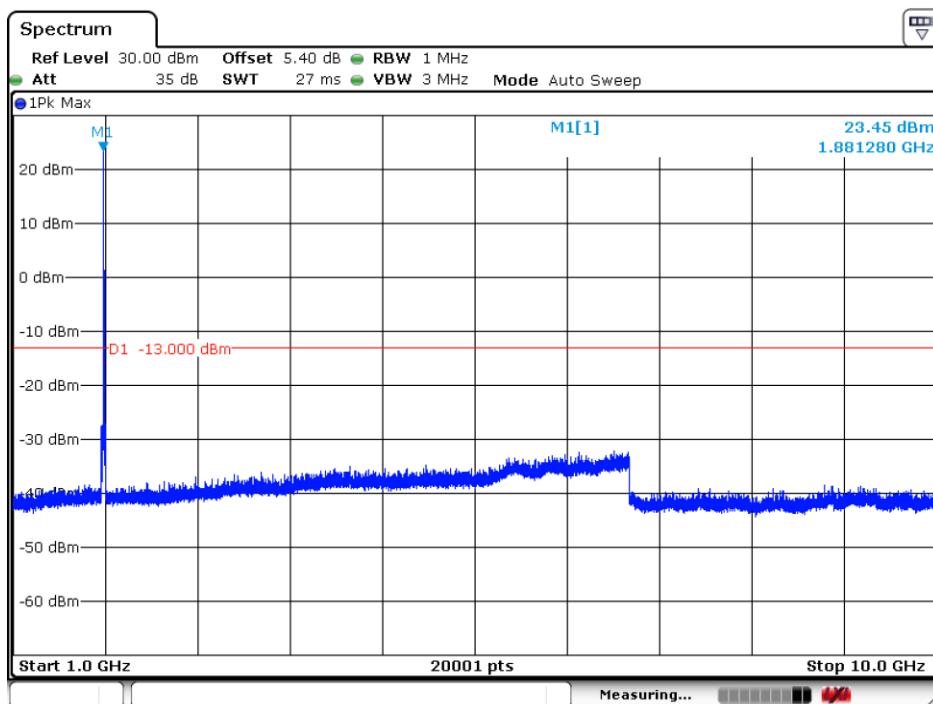


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## 6.1.1.1.2 Test Channel = MCH



Date: 1.APR.2020 03:13:06



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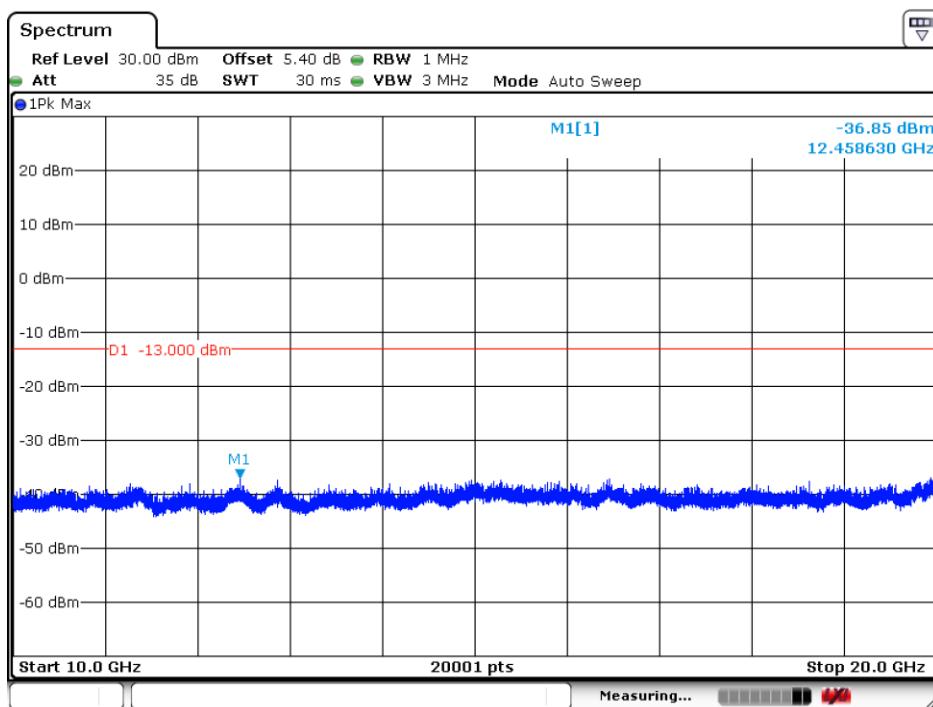
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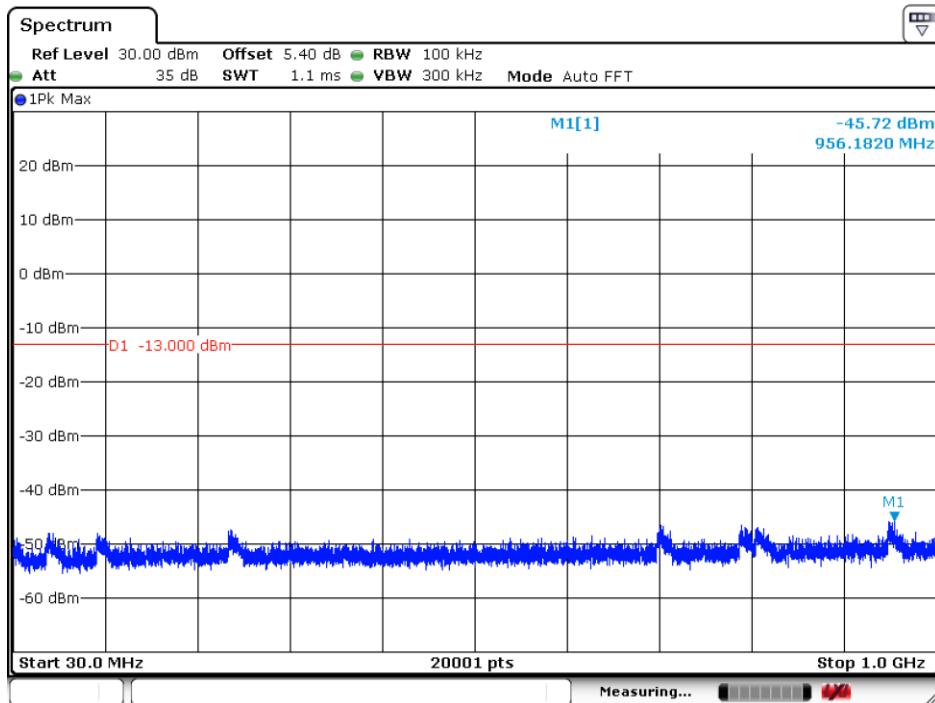
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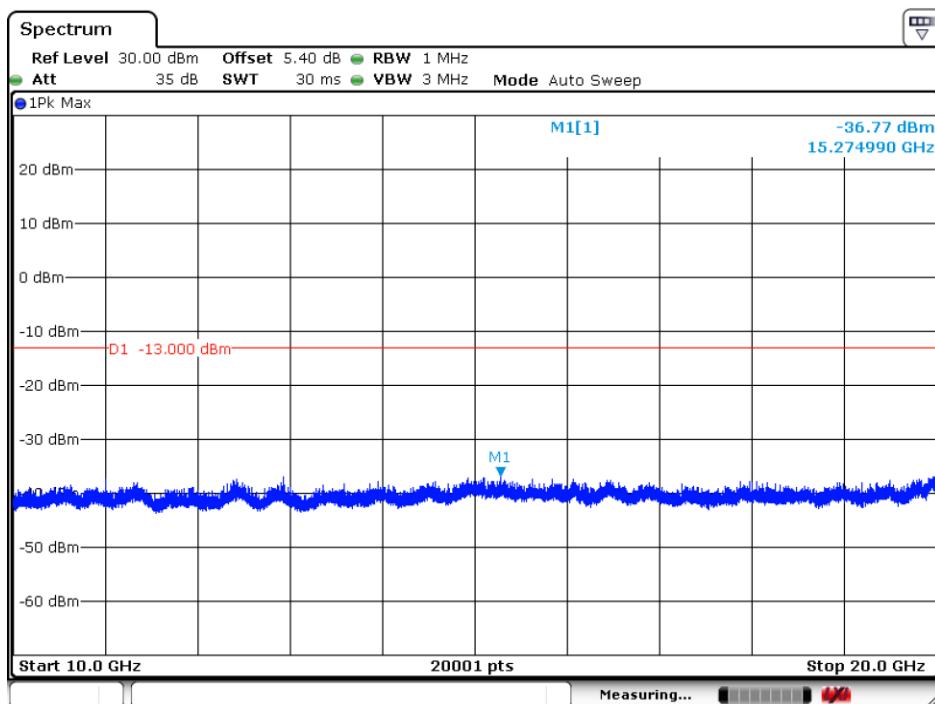


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## 6.1.1.1.3 Test Channel = HCH



Date: 1.APR.2020 03:20:27



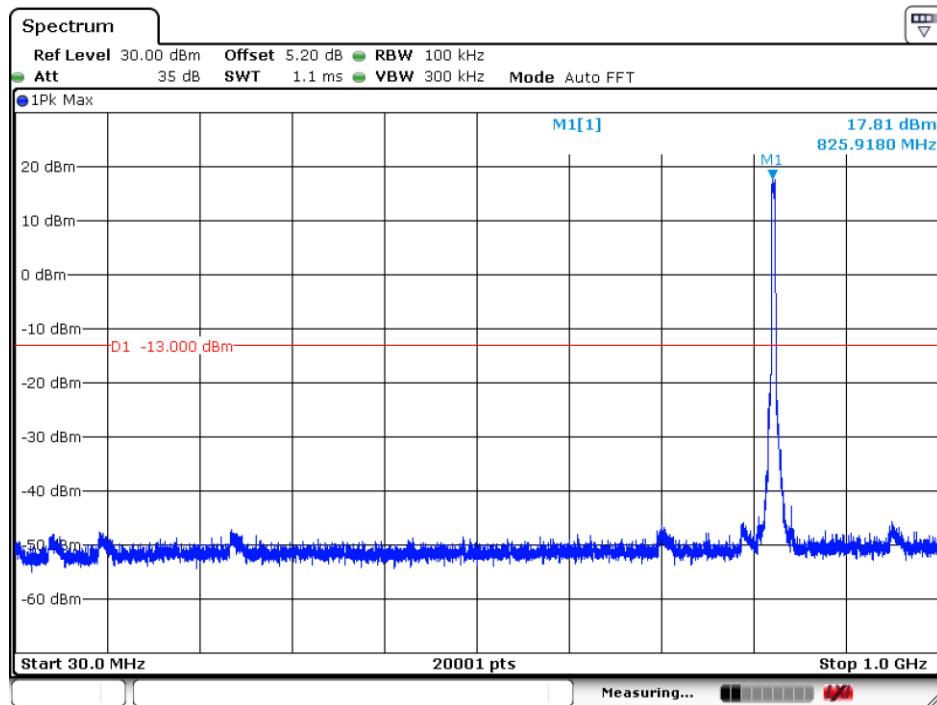
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**6.1.2 Test Band = WCDMA BAND V****6.1.2.1 Test Mode = UMTS/TM1****6.1.2.1.1 Test Channel = LCH**

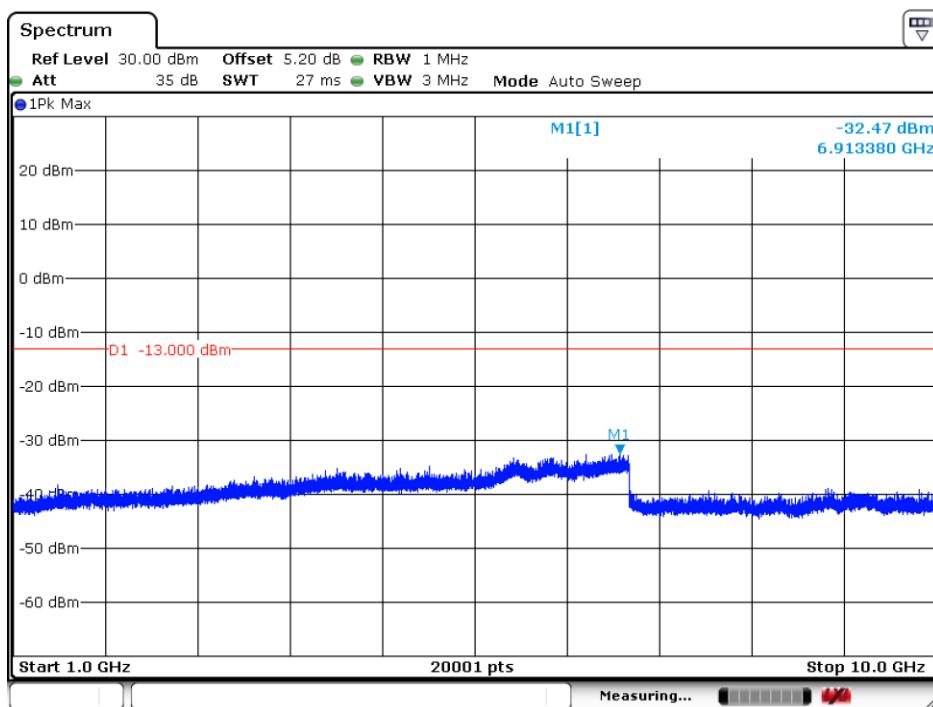
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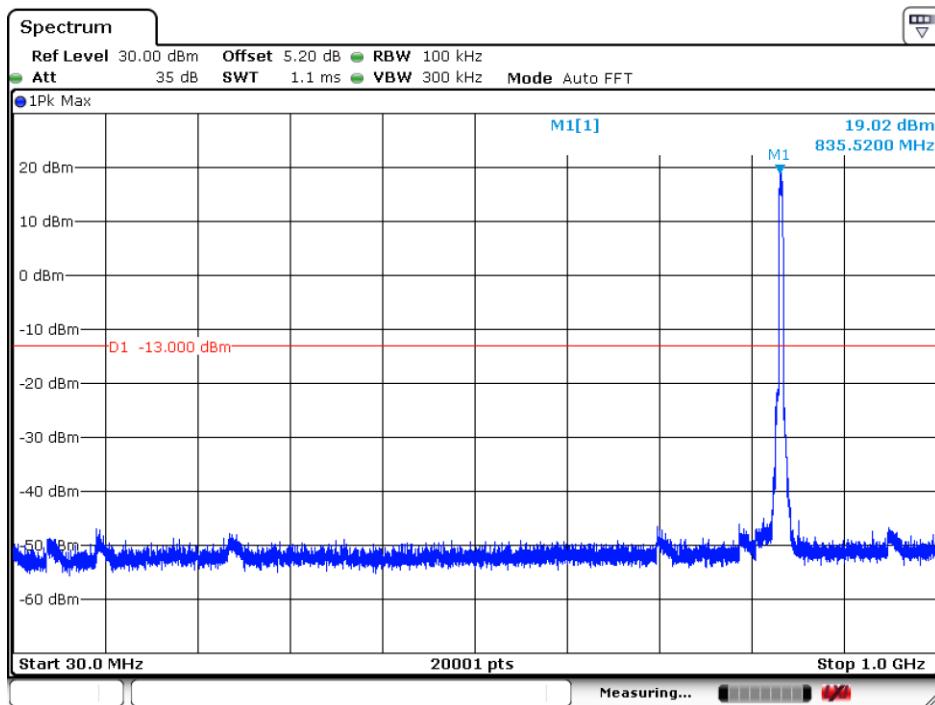
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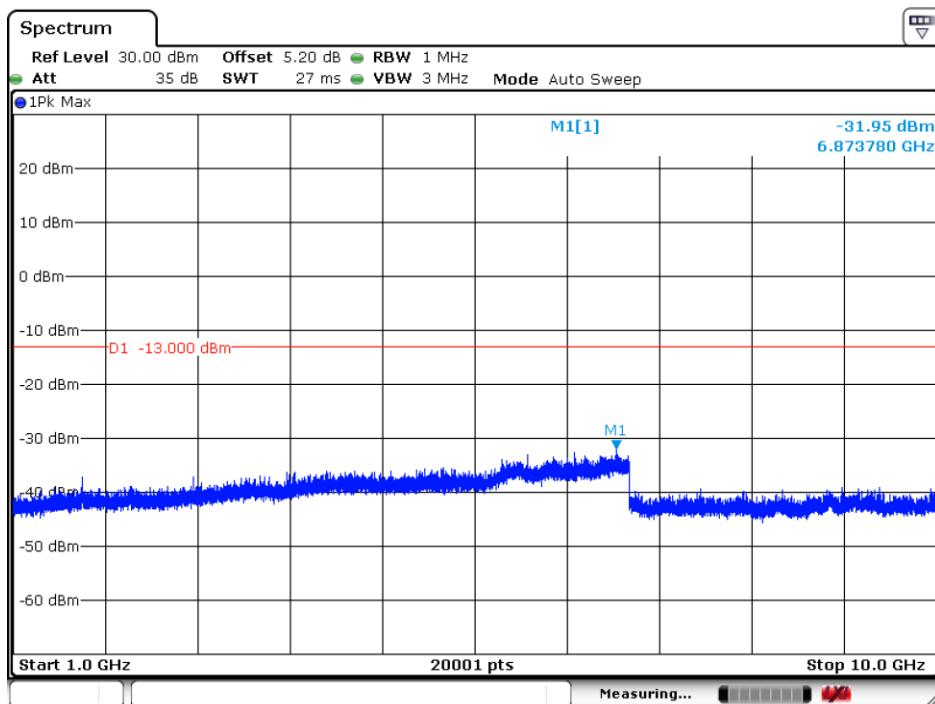


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## 6.1.2.1.2 Test Channel = MCH



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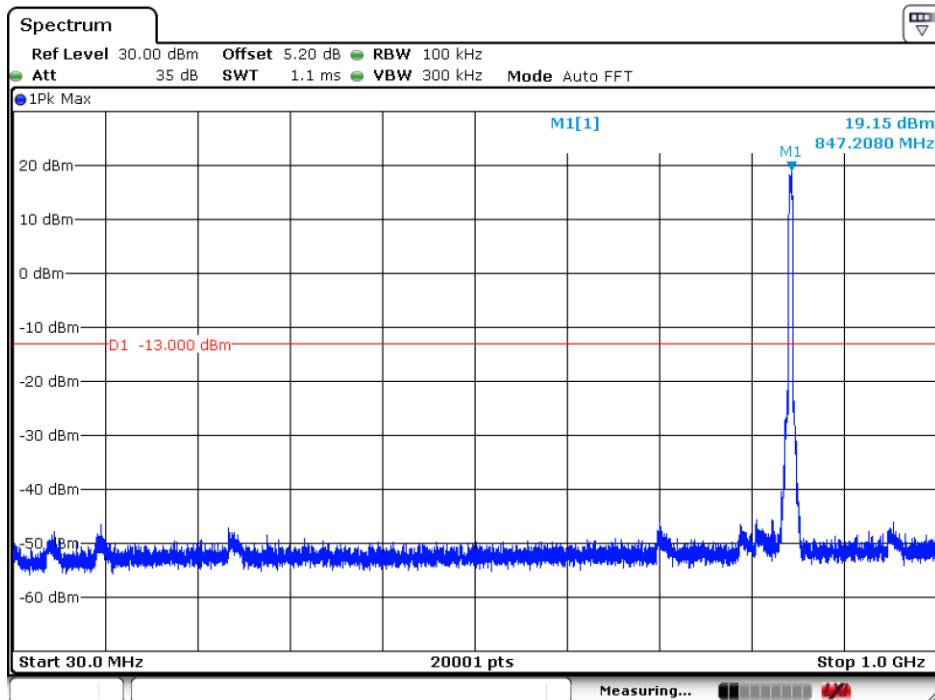
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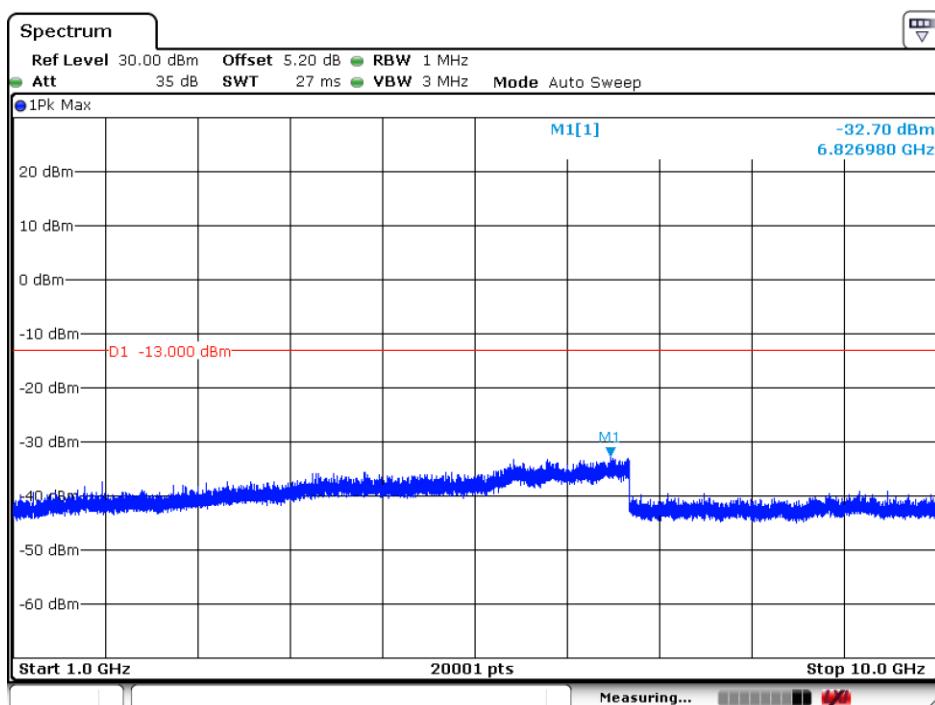
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## 6.1.2.1.3 Test Channel = HCH



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## 7 Field Strength of Spurious Radiation

### Part I - Test Plots

#### 7.1 For WCDMA

##### 7.1.1 Test Band = WCDMA BAND II

###### 7.1.1.1 Test Mode = UMTS/TM1

###### 7.1.1.1.1 Test Channel = LCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
65.450000	-79.07	-13.00	66.07	Vertical
169.000000	-78.70	-13.00	65.70	Vertical
3703.462500	-63.71	-13.00	50.71	Vertical
5559.862500	-61.55	-13.00	48.55	Vertical
7412.362500	-59.71	-13.00	46.71	Vertical
65.450000	-79.07	-13.00	66.07	Vertical
56.300000	-74.71	-13.00	61.71	Horizontal
188.150000	-75.03	-13.00	62.03	Horizontal
3702.487500	-63.69	-13.00	50.69	Horizontal
5554.500000	-60.44	-13.00	47.44	Horizontal
7406.512500	-60.08	-13.00	47.08	Horizontal
9266.325000	-54.30	-13.00	41.30	Horizontal

###### 7.1.1.1.2 Test Channel = MCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
58.800000	-78.71	-13.00	65.71	Vertical
186.050000	-79.12	-13.00	66.12	Vertical
3758.550000	-62.23	-13.00	49.23	Vertical
5636.887500	-62.02	-13.00	49.02	Vertical
7523.025000	-60.27	-13.00	47.27	Vertical
9404.775000	-59.59	-13.00	46.59	Vertical
57.200000	-74.88	-13.00	61.88	Horizontal
186.400000	-74.96	-13.00	61.96	Horizontal
3758.550000	-62.98	-13.00	49.98	Horizontal
5637.375000	-60.69	-13.00	47.69	Horizontal
7521.075000	-60.01	-13.00	47.01	Horizontal
9404.287500	-55.63	-13.00	42.63	Horizontal

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**7.1.1.1.3 Test Channel = HCH**

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
65.000000	-79.25	-13.00	66.25	Vertical
199.450000	-70.51	-13.00	57.51	Vertical
3813.150000	-60.24	-13.00	47.24	Vertical
5720.250000	-56.88	-13.00	43.88	Vertical
7625.887500	-59.10	-13.00	46.10	Vertical
9542.737500	-60.23	-13.00	47.23	Vertical
62.750000	-75.38	-13.00	62.38	Horizontal
187.200000	-74.27	-13.00	61.27	Horizontal
3816.562500	-61.54	-13.00	48.54	Horizontal
5719.275000	-53.54	-13.00	40.54	Horizontal
7627.350000	-58.49	-13.00	45.49	Horizontal
9536.887500	-54.12	-13.00	41.12	Horizontal

**7.1.2 Test Band = WCDMA BAND V****7.1.2.1 Test Mode = UMTS/TM1**

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
64.400000	-79.94	-13.00	66.94	Vertical
168.350000	-72.43	-13.00	59.43	Vertical
1651.000000	-61.50	-13.00	48.50	Vertical
2475.500000	-58.18	-13.00	45.18	Vertical
4581.937500	-65.51	-13.00	52.51	Vertical
7870.612500	-62.35	-13.00	49.35	Vertical
62.450000	-72.73	-13.00	59.73	Horizontal
167.450000	-76.61	-13.00	63.61	Horizontal
1654.000000	-60.46	-13.00	47.46	Horizontal
2506.000000	-58.81	-13.00	45.81	Horizontal
4354.762500	-64.71	-13.00	51.71	Horizontal
7901.812500	-61.95	-13.00	48.95	Horizontal

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**7.1.2.1.1 Test Channel = MCH**

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
56.100000	-77.84	-13.00	64.84	Vertical
162.550000	-70.66	-13.00	57.66	Vertical
1671.000000	-60.56	-13.00	47.56	Vertical
2512.000000	-57.19	-13.00	44.19	Vertical
4638.975000	-58.98	-13.00	45.98	Vertical
7843.312500	-62.35	-13.00	49.35	Vertical
56.250000	-74.82	-13.00	61.82	Horizontal
163.900000	-76.65	-13.00	63.65	Horizontal
1671.000000	-59.95	-13.00	46.95	Horizontal
2512.000000	-58.35	-13.00	45.35	Horizontal
4336.725000	-65.08	-13.00	52.08	Horizontal
7218.337500	-63.18	-13.00	50.18	Horizontal

**7.1.2.1.2 Test Channel = HCH**

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
57.150000	-79.39	-13.00	66.39	Vertical
164.250000	-71.89	-13.00	58.89	Vertical
1695.000000	-58.27	-13.00	45.27	Vertical
2543.000000	-57.50	-13.00	44.50	Vertical
4308.450000	-65.11	-13.00	52.11	Vertical
7937.887500	-62.38	-13.00	49.38	Vertical
56.100000	-75.09	-13.00	62.09	Horizontal
164.500000	-77.52	-13.00	64.52	Horizontal
1695.000000	-57.48	-13.00	44.48	Horizontal
2543.000000	-58.34	-13.00	45.34	Horizontal
4348.912500	-65.14	-13.00	52.14	Horizontal
7959.337500	-62.00	-13.00	49.00	Horizontal

**REMARK:**

- 1) The disturbance above 12.75GHz and below 30MHz was very low, and the above harmonics were the highest point could be found when testing, so only the worst case data had been displayed.
- 2) We have tested all modulation and all Bandwidth , but only the worst case data presented in this report.

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## 8 Frequency Stability

### 8.1 Frequency Error VS. Voltage

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
WCDMA BAND II	UMTS/TM1	LCH	TN	VL	2.48	0.00134	PASS
				VN	-0.78	-0.00042	PASS
				VH	0.52	0.00028	PASS
		MCH	TN	VL	2.81	0.00149	PASS
				VN	0.95	0.00051	PASS
				VH	-1.87	-0.00099	PASS
		HCH	TN	VL	1.64	0.00086	PASS
				VN	-2.34	-0.00123	PASS
				VH	-3.25	-0.00170	PASS

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
WCDMA BAND V	UMTS/TM1	LCH	TN	VL	-2.38	-0.00288	PASS
				VN	-0.48	-0.00058	PASS
				VH	2.32	0.00281	PASS
		MCH	TN	VL	-3.80	-0.00454	PASS
				VN	1.54	0.00184	PASS
				VH	-2.45	-0.00293	PASS
		HCH	TN	VL	1.66	0.00196	PASS
				VN	-3.61	-0.00426	PASS
				VH	2.80	0.00331	PASS

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## 8.2 Frequency Error VS. Temperature

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	-4.23	-0.00228	PASS
				-20	1.60	0.00086	PASS
				-10	0.67	0.00036	PASS
				0	-2.61	-0.00141	PASS
				10	0.56	0.00030	PASS
				20	-4.80	-0.00259	PASS
				30	1.60	0.00086	PASS
				40	-0.84	-0.00045	PASS
				50	-6.01	-0.00324	PASS
		MCH	VN	-30	-3.80	-0.00202	PASS
				-20	-5.08	-0.00270	PASS
				-10	-0.37	-0.00020	PASS
				0	-3.32	-0.00177	PASS
				10	1.31	0.00070	PASS
				20	2.72	0.00145	PASS
				30	1.61	0.00086	PASS
				40	0.13	0.00007	PASS
				50	-4.35	-0.00231	PASS
		HCH	VN	-30	-0.47	-0.00025	PASS
				-20	3.68	0.00193	PASS
				-10	2.55	0.00134	PASS
				0	-5.52	-0.00289	PASS
				10	1.53	0.00080	PASS
				20	-2.72	-0.00143	PASS
				30	3.64	0.00191	PASS
				40	-0.63	-0.00033	PASS
				50	-4.48	-0.00235	PASS

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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	0.45	0.00054	PASS
				-20	4.25	0.00514	PASS
				-10	2.75	0.00333	PASS
				0	-2.87	-0.00347	PASS
				10	5.32	0.00644	PASS
				20	1.74	0.00211	PASS
				30	-5.39	-0.00652	PASS
				40	2.45	0.00296	PASS
				50	3.69	0.00447	PASS
		MCH	VN	-30	1.94	0.00232	PASS
				-20	5.23	0.00625	PASS
				-10	-2.44	-0.00292	PASS
				0	4.38	0.00524	PASS
				10	1.32	0.00158	PASS
				20	2.37	0.00283	PASS
		HCH	VN	30	-4.42	-0.00528	PASS
				40	-2.43	-0.00291	PASS
				50	1.99	0.00238	PASS
				-30	4.04	0.00477	PASS
				-20	3.42	0.00404	PASS
				-10	4.32	0.00510	PASS
				0	-3.50	-0.00413	PASS
				10	2.54	0.00300	PASS
				20	3.07	0.00363	PASS

The End

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