



# Appendix B

## E-UTRA Band 30



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# 1 Effective (Isotropic) Radiated Power Output Data

**Effective Isotropic Radiated Power of Transmitter (EIRP) for LTE BAND 30**

Test Band(LTE)	Test Mode	Test Bandwidth	Test channel	Test RB	Measured (dBm)	EIRP (dBm)	limit (dBm)	Verdict
BAND30	LTE/TM1	5M	LCH	RB1#0	23.92	21.31	24.00	PASS
				RB1#13	24.16	21.55	24.00	PASS
				RB1#24	24.15	21.54	24.00	PASS
				RB12#0	21.5	18.89	24.00	PASS
				RB12#6	21.43	18.82	24.00	PASS
				RB12#13	21.47	18.86	24.00	PASS
				RB25#0	21.46	18.85	24.00	PASS
			MCH	RB1#0	23.16	20.55	24.00	PASS
				RB1#13	24.14	21.53	24.00	PASS
				RB1#24	24.17	21.56	24.00	PASS
				RB12#0	21.44	18.83	24.00	PASS
				RB12#6	21.45	18.84	24.00	PASS
				RB12#13	21.48	18.87	24.00	PASS
				RB25#0	21.45	18.84	24.00	PASS
			HCH	RB1#0	23.12	20.51	24.00	PASS
				RB1#13	24.07	21.46	24.00	PASS
				RB1#24	23.96	21.35	24.00	PASS
				RB12#0	21.47	18.86	24.00	PASS
				RB12#6	21.41	18.8	24.00	PASS
				RB12#13	21.49	18.88	24.00	PASS
				RB25#0	21.36	18.75	24.00	PASS



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Test Band(LTE)	Test Mode	Test Bandwidth	Test channel	Test RB	Measured (dBm)	EIRP (dBm)	limit (dBm)	Verdict
BAND30	LTE/TM2	5M	LCH	RB1#0	21.34	18.73	24.00	PASS
				RB1#13	21.35	18.74	24.00	PASS
				RB1#24	21.29	18.68	24.00	PASS
				RB12#0	20.86	18.25	24.00	PASS
				RB12#6	20.87	18.26	24.00	PASS
				RB12#13	20.8	18.19	24.00	PASS
				RB25#0	20.85	18.24	24.00	PASS
			MCH	RB1#0	21.53	18.92	24.00	PASS
				RB1#13	21.64	19.03	24.00	PASS
				RB1#24	21.59	18.98	24.00	PASS
				RB12#0	20.79	18.18	24.00	PASS
				RB12#6	20.75	18.14	24.00	PASS
				RB12#13	20.85	18.24	24.00	PASS
				RB25#0	20.71	18.1	24.00	PASS
			HCH	RB1#0	21.54	18.93	24.00	PASS
				RB1#13	21.58	18.97	24.00	PASS
				RB1#24	21.43	18.82	24.00	PASS
				RB12#0	20.81	18.2	24.00	PASS
				RB12#6	20.81	18.2	24.00	PASS
				RB12#13	20.77	18.16	24.00	PASS
				RB25#0	20.76	18.15	24.00	PASS



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Test Band(LTE)	Test Mode	Test Bandwidth	Test channel	Test RB	Measured (dBm)	EIRP (dBm)	limit (dBm)	Verdict
BAND30	LTE/TM3	5M	LCH	RB1#0	21.13	18.52	24.00	PASS
				RB1#13	21.14	18.53	24.00	PASS
				RB1#24	21.01	18.4	24.00	PASS
				RB12#0	19.87	17.26	24.00	PASS
				RB12#6	19.83	17.22	24.00	PASS
				RB12#13	19.83	17.22	24.00	PASS
				RB25#0	19.82	17.21	24.00	PASS
			MCH	RB1#0	20.87	18.26	24.00	PASS
				RB1#13	20.91	18.3	24.00	PASS
				RB1#24	20.83	18.22	24.00	PASS
				RB12#0	19.98	17.37	24.00	PASS
				RB12#6	19.76	17.15	24.00	PASS
				RB12#13	19.85	17.24	24.00	PASS
				RB25#0	19.79	17.18	24.00	PASS
			HCH	RB1#0	20.97	18.36	24.00	PASS
				RB1#13	20.95	18.34	24.00	PASS
				RB1#24	20.82	18.21	24.00	PASS
				RB12#0	19.88	17.27	24.00	PASS
				RB12#6	19.81	17.2	24.00	PASS
				RB12#13	19.91	17.3	24.00	PASS
				RB25#0	19.74	17.13	24.00	PASS



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Test Band(LTE)	Test Mode	Test Bandwidth	Test channel	Test RB	Measured (dBm)	EIRP (dBm)	limit (dBm)	Verdict
BAND30	LTE/TM1	10M	MCH	RB1#0	23.02	20.41	24.00	PASS
				RB1#25	23.87	21.26	24.00	PASS
				RB1#49	23.14	20.53	24.00	PASS
				RB25#0	21.42	18.81	24.00	PASS
				RB25#13	21.37	18.76	24.00	PASS
				RB25#25	21.41	18.8	24.00	PASS
				RB50#0	21.44	18.83	24.00	PASS
	LTE/TM2	10M	MCH	RB1#0	21.42	18.81	24.00	PASS
				RB1#25	21.19	18.58	24.00	PASS
				RB1#49	21.39	18.78	24.00	PASS
				RB25#0	20.82	18.21	24.00	PASS
				RB25#13	20.83	18.22	24.00	PASS
				RB25#25	20.80	18.19	24.00	PASS
				RB50#0	20.78	18.17	24.00	PASS
	LTE/TM3	10M	MCH	RB1#0	20.87	18.26	24.00	PASS
				RB1#25	20.80	18.19	24.00	PASS
				RB1#49	20.75	18.14	24.00	PASS
				RB25#0	19.74	17.13	24.00	PASS
				RB25#13	19.80	17.19	24.00	PASS
				RB25#25	19.82	17.21	24.00	PASS
				RB50#0	19.81	17.20	24.00	PASS

**Note:**

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

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

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
Band 30	TM1/10M	MCH	4.87	13	PASS
	TM2/10M	MCH	5.25	13	PASS
	TM3/10M	MCH	5.48	13	PASS



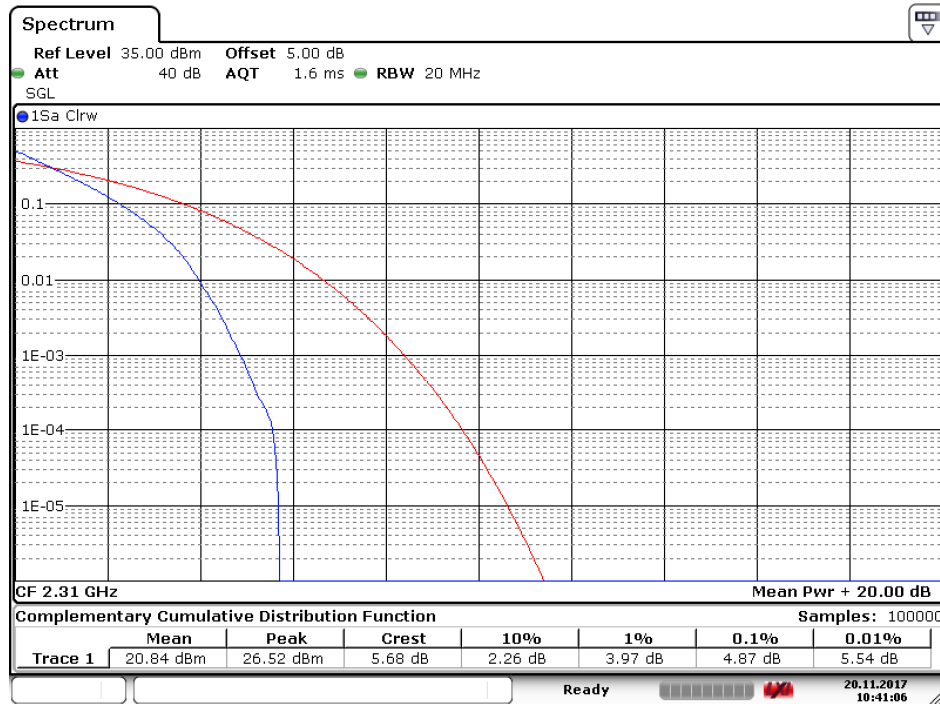
Part II - Test Plots

2.1 For LTE

2.1.1 Test Band = LTE band30

2.1.1.1 Test Mode = LTE/TM1.Bandwidth=10MHz

2.1.1.1.1 Test Channel = MCH

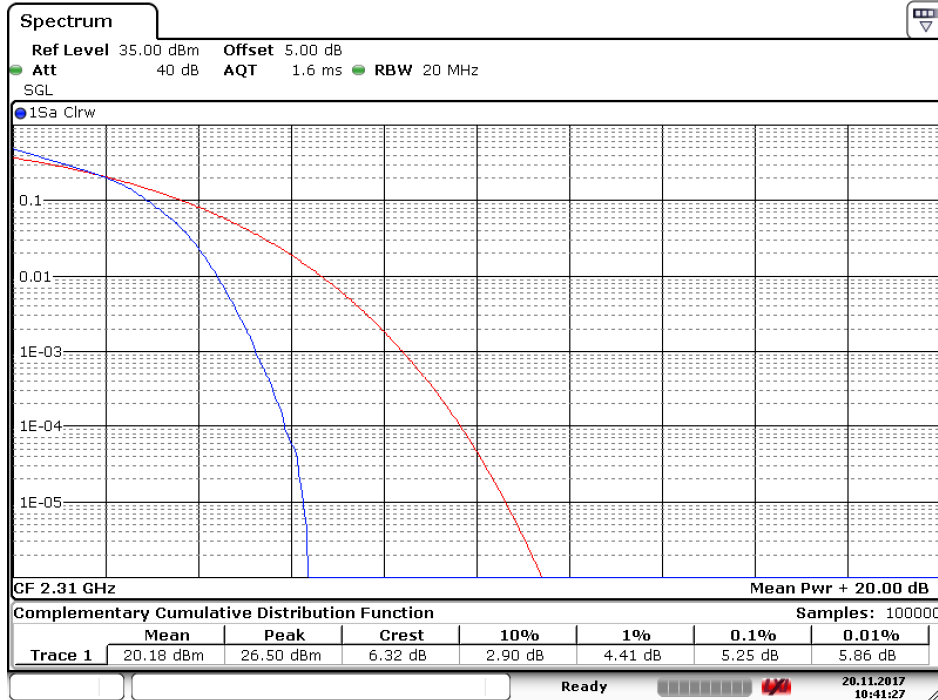


Date: 20.NOV.2017 10:41:06



**2.1.1.2 Test Mode = LTE/TM2.Bandwidth=10MHz**

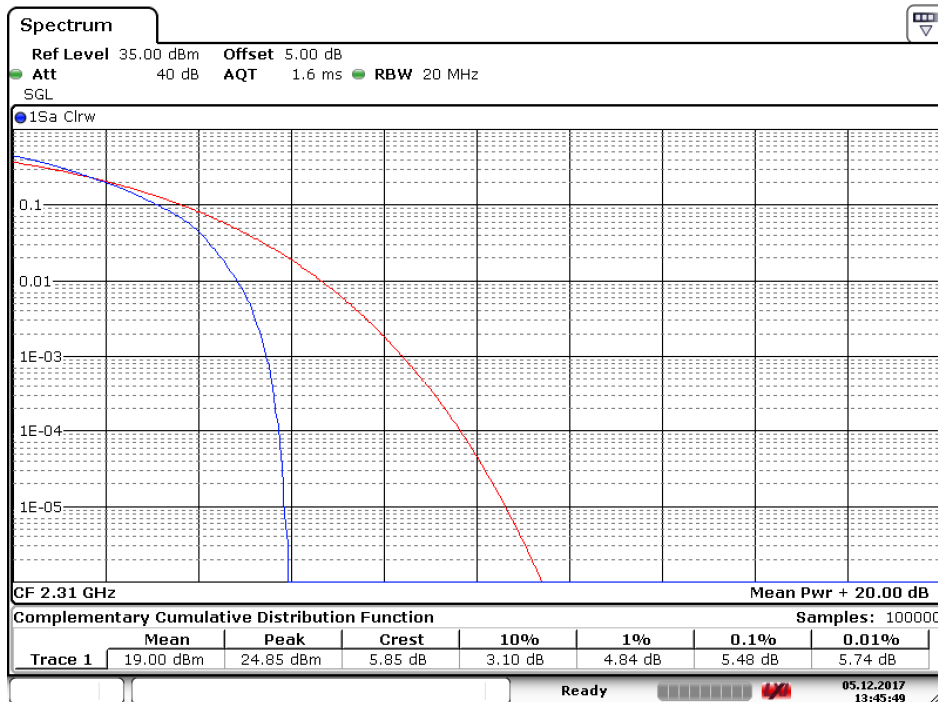
**2.1.1.2.1 Test Channel = MCH**



Date: 20.NOV.2017 10:41:28

**2.1.1.3 Test Mode = LTE/TM3.Bandwidth=10MHz**

**2.1.1.3.1 Test Channel = MCH**



Date: 5.DEC.2017 13:45:49

### 3 Modulation Characteristics

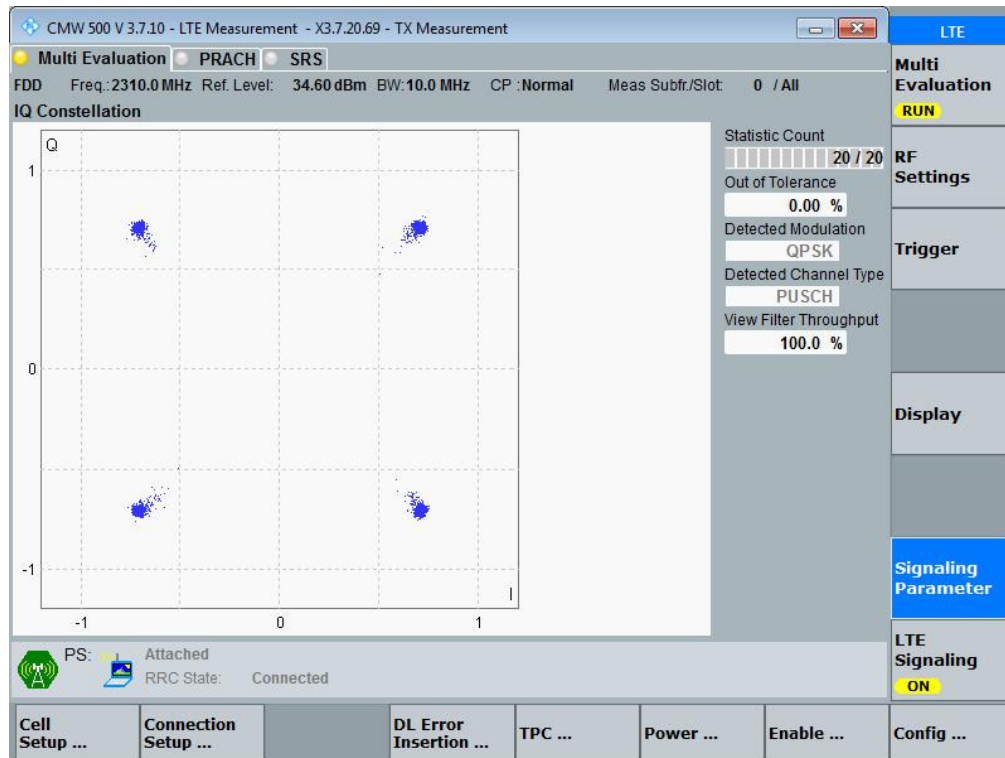
#### Part I - Test Plots

#### 3.1 For LTE

##### 3.1.1 Test Band = LTE band30

##### 3.1.1.1 Test Mode = LTE /TM1 10MHz

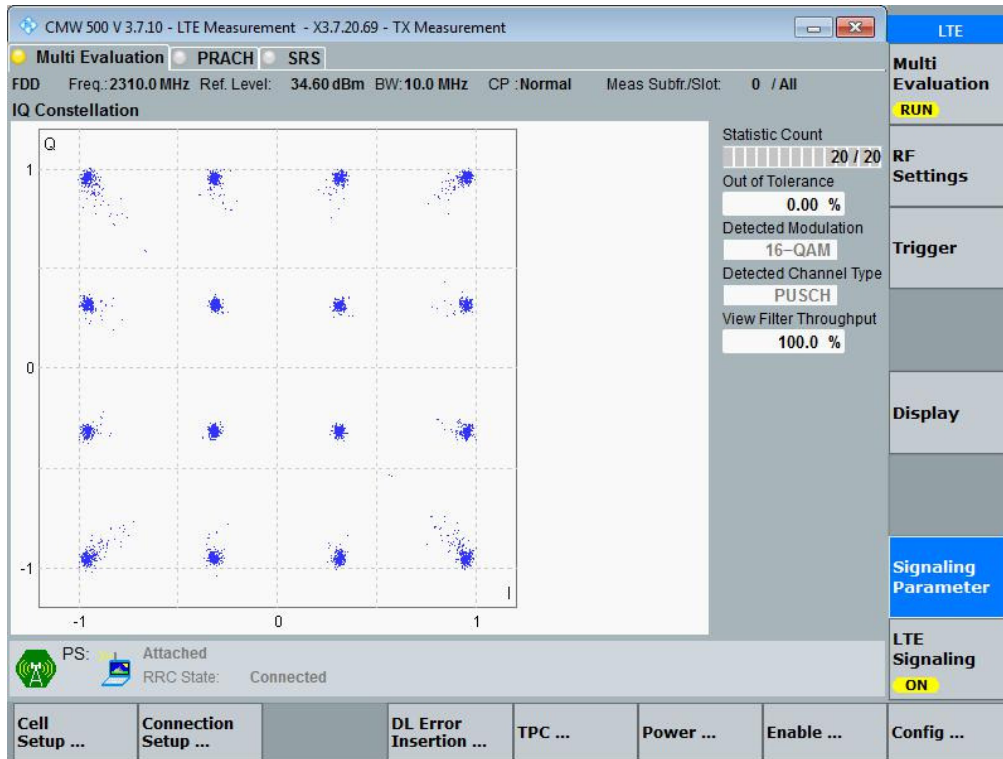
##### 3.1.1.1.1 Test Channel = MCH





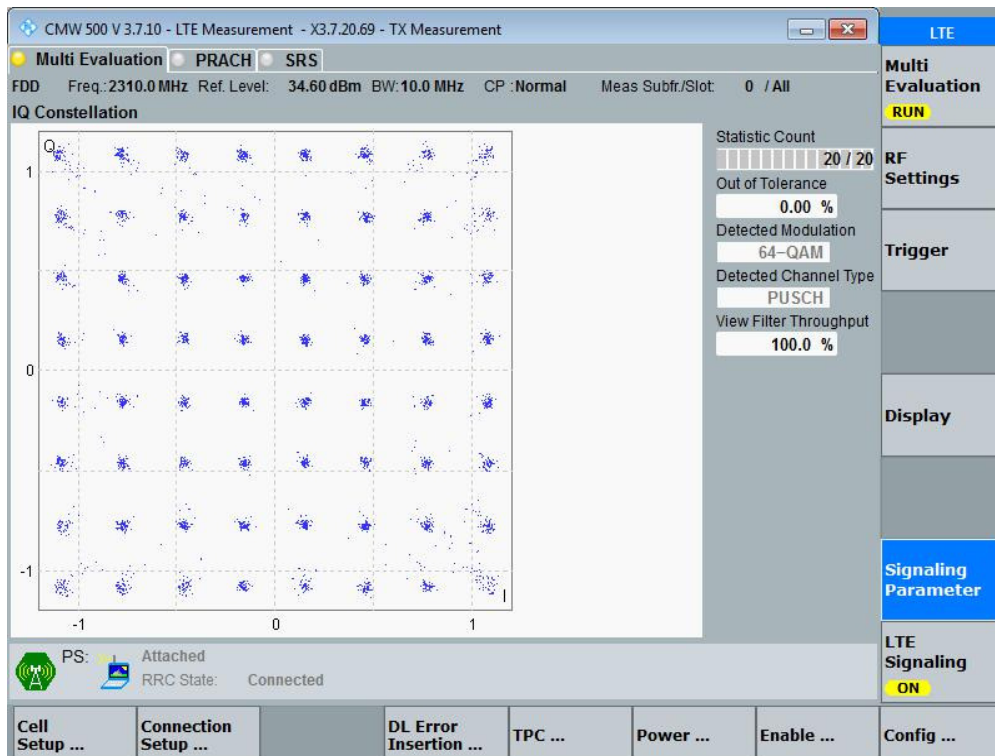
### 3.1.1.2 Test Mode = LTE /TM2 10MHz

#### 3.1.1.2.1 Test Channel = MCH



### 3.1.1.3 Test Mode = LTE /TM3 10MHz

#### 3.1.1.3.1 Test Channel = MCH





## 4 Bandwidth

### Part I - Test Results

Test Band	Test Mode	Test Channel	Occupied Bandwidth [MHz]	Emission Bandwidth [MHz]	Verdict
Band 30	TM1/ 5MHz	LCH	4.48	4.90	PASS
		MCH	4.48	4.93	PASS
		HCH	4.49	4.91	PASS
	TM2/ 5MHz	LCH	4.49	4.91	PASS
		MCH	4.50	4.89	PASS
		HCH	4.49	4.93	PASS
	TM3/ 5MHz	LCH	4.47	4.88	PASS
		MCH	4.48	4.83	PASS
		HCH	4.48	4.87	PASS
	TM1/10MHz	MCH	8.93	9.77	PASS
	TM2/ 10MHz	MCH	8.95	9.79	PASS
	TM3/ 10MHz	MCH	8.93	9.81	PASS

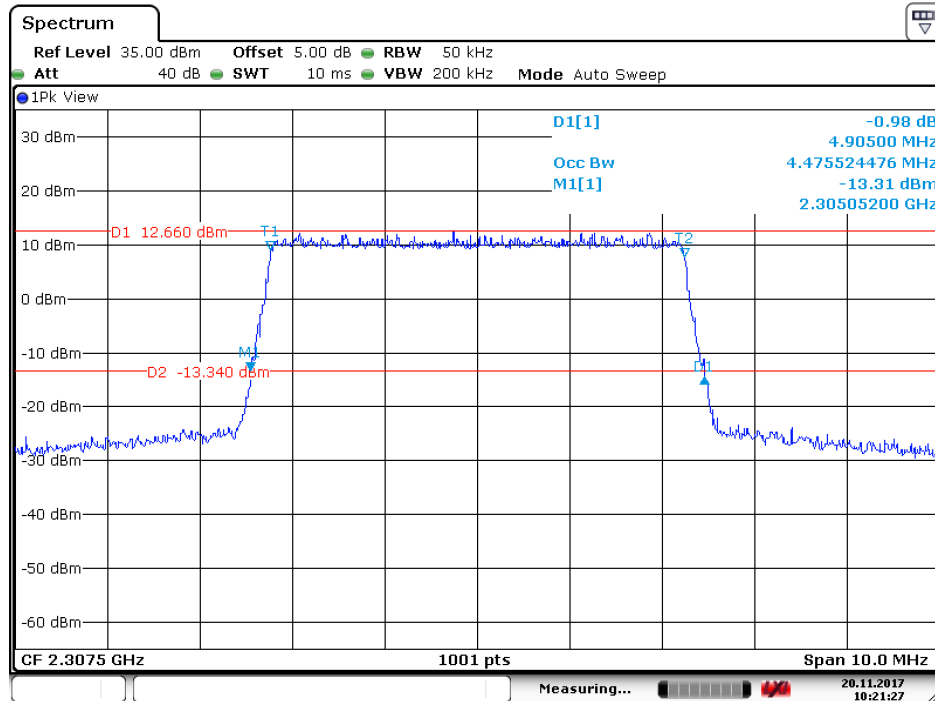


## 4.1 For LTE

### 4.1.1 Test Band = LTE band30

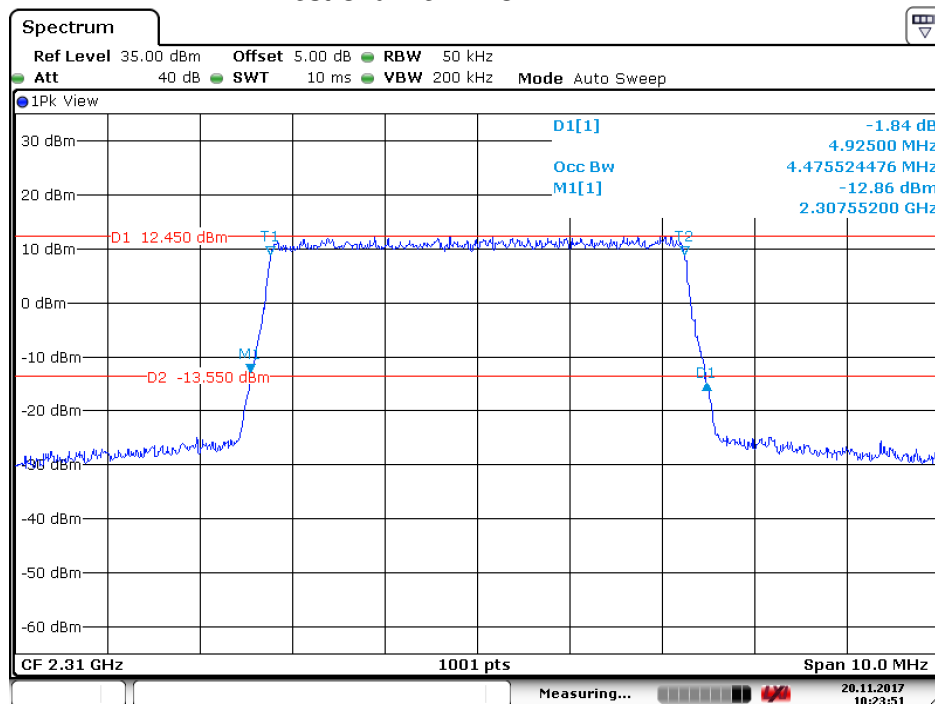
#### 4.1.1.1 Test Mode = LTE/TM1 5MHz

##### 4.1.1.1.1 Test Channel = LCH



Date: 20.NOV.2017 10:21:27

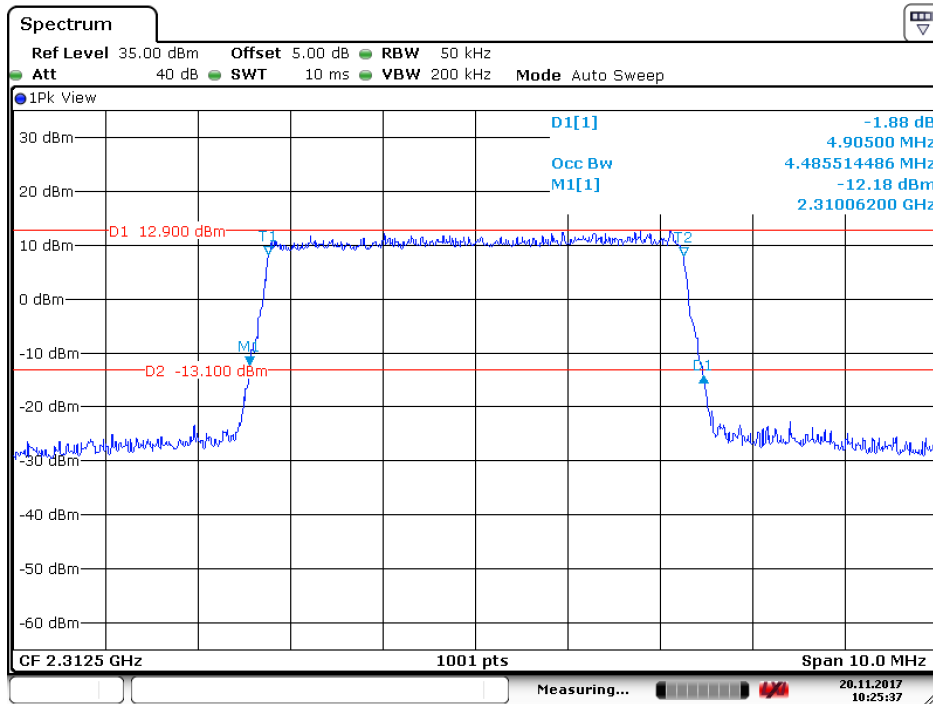
##### 4.1.1.1.2 Test Channel = MCH



Date: 20.NOV.2017 10:23:51



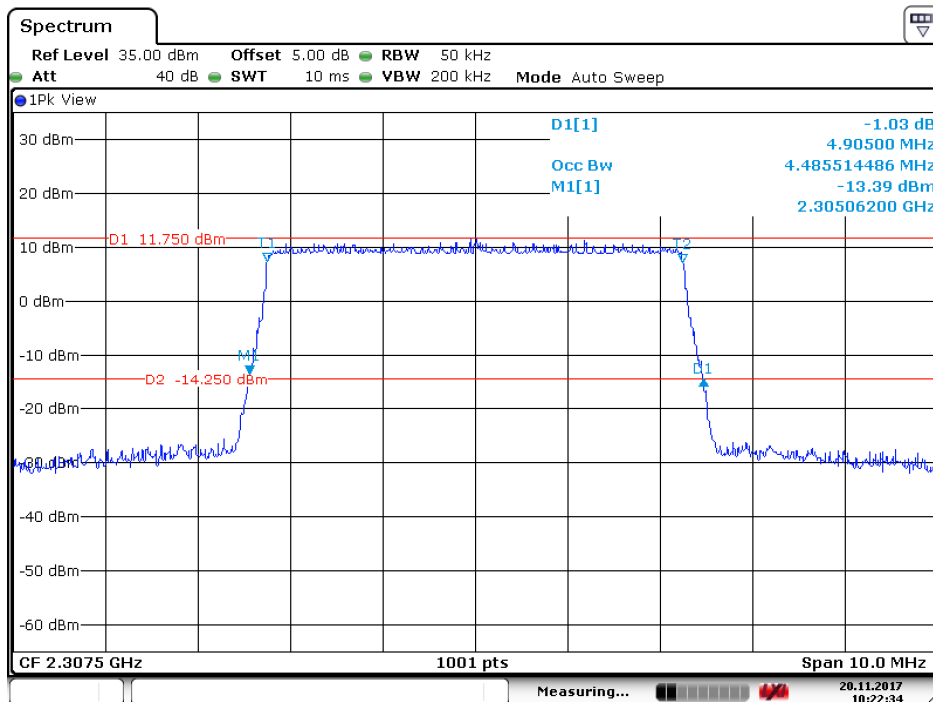
4.1.1.1.3 Test Channel = HCH



Date: 20.NOV.2017 10:25:37

4.1.1.2 Test Mode = LTE/TM2 5MHz

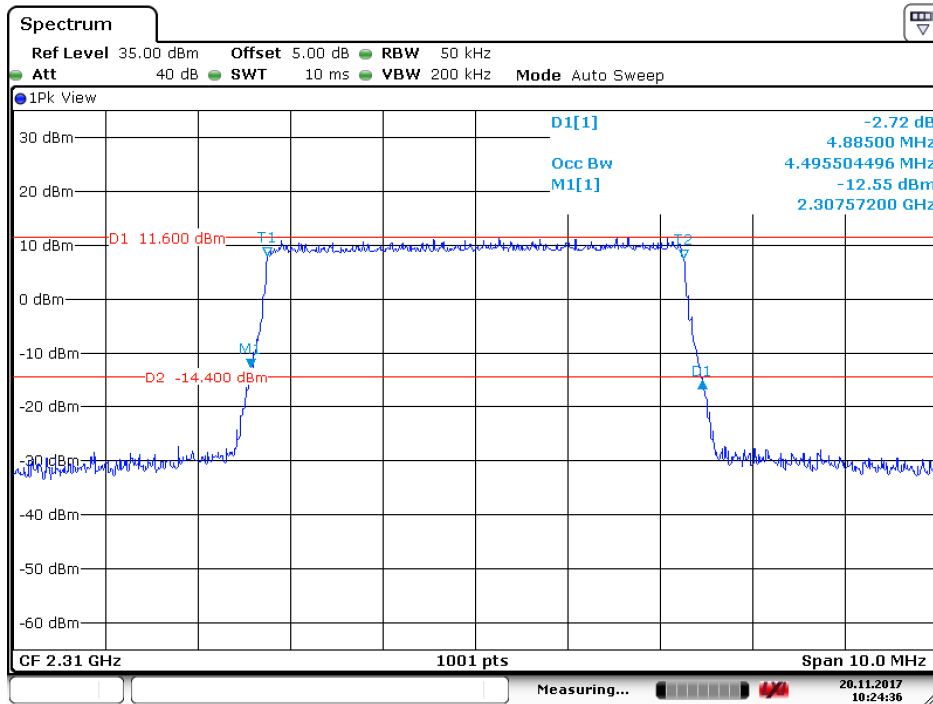
4.1.1.2.1 Test Channel = LCH



Date: 20.NOV.2017 10:22:34

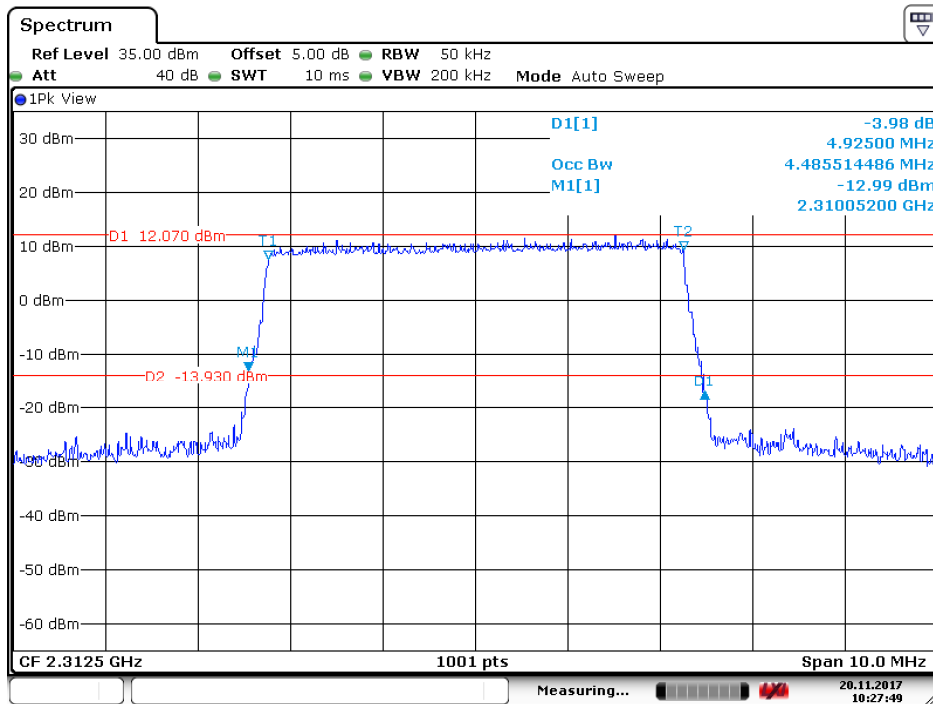


4.1.1.2.2 Test Channel = MCH



Date: 20.NOV.2017 10:24:37

4.1.1.2.3 Test Channel = HCH

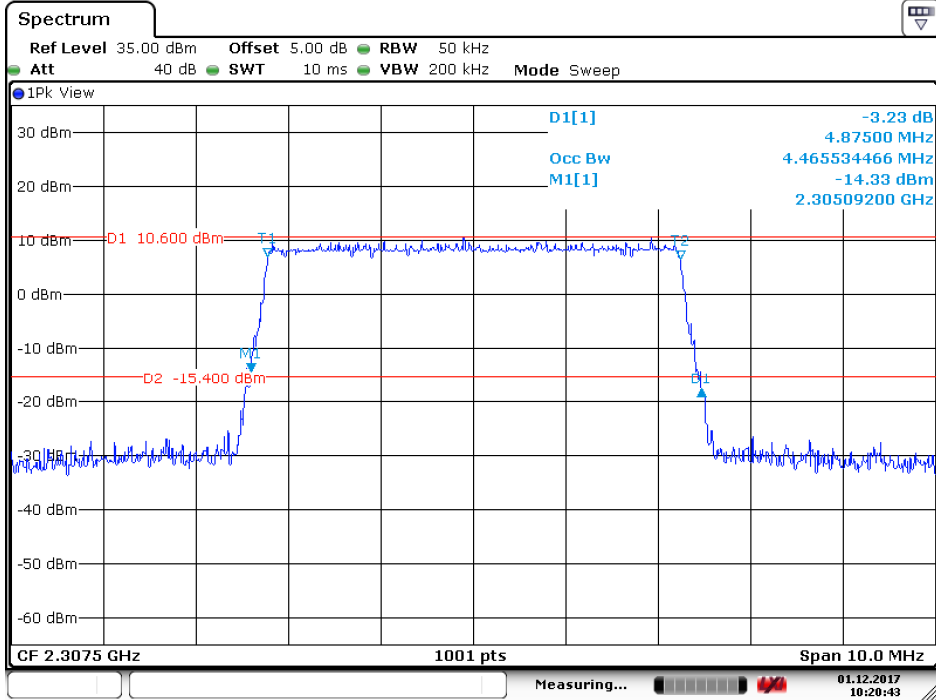


Date: 20.NOV.2017 10:27:50



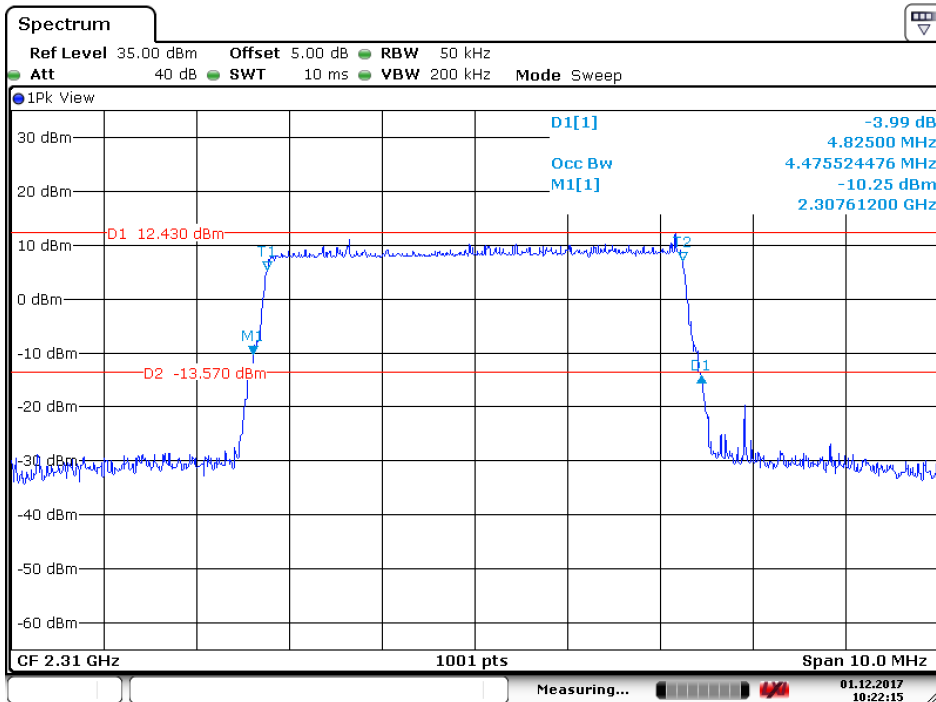
4.1.1.3 Test Mode = LTE/TM3 5MHz

4.1.1.3.1 Test Channel = LCH



Date: 1.DEC.2017 10:20:44

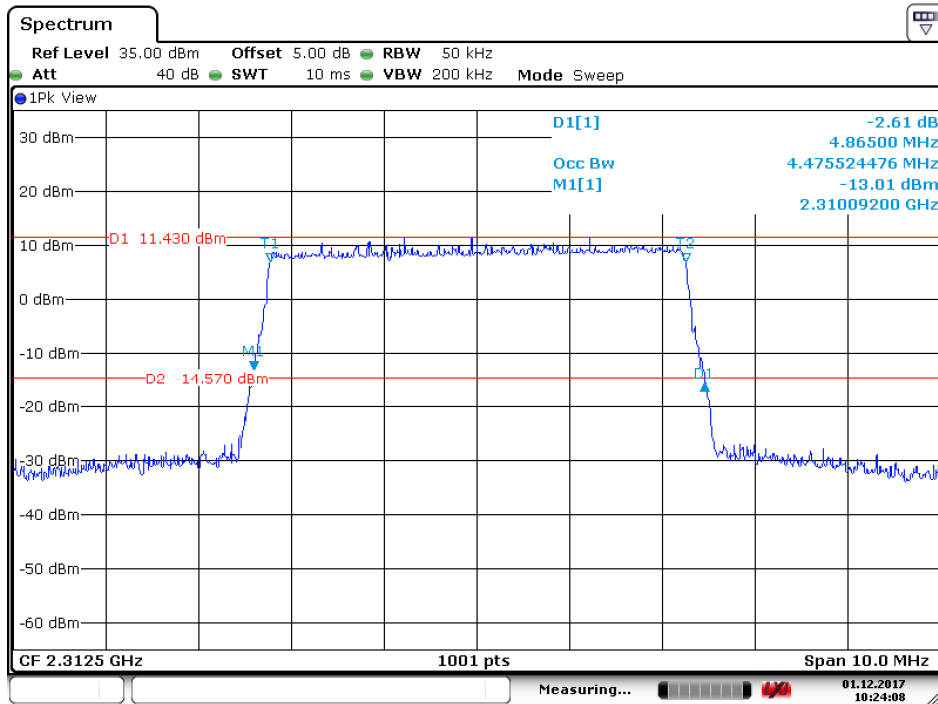
4.1.1.3.2 Test Channel = MCH



Date: 1.DEC.2017 10:22:16



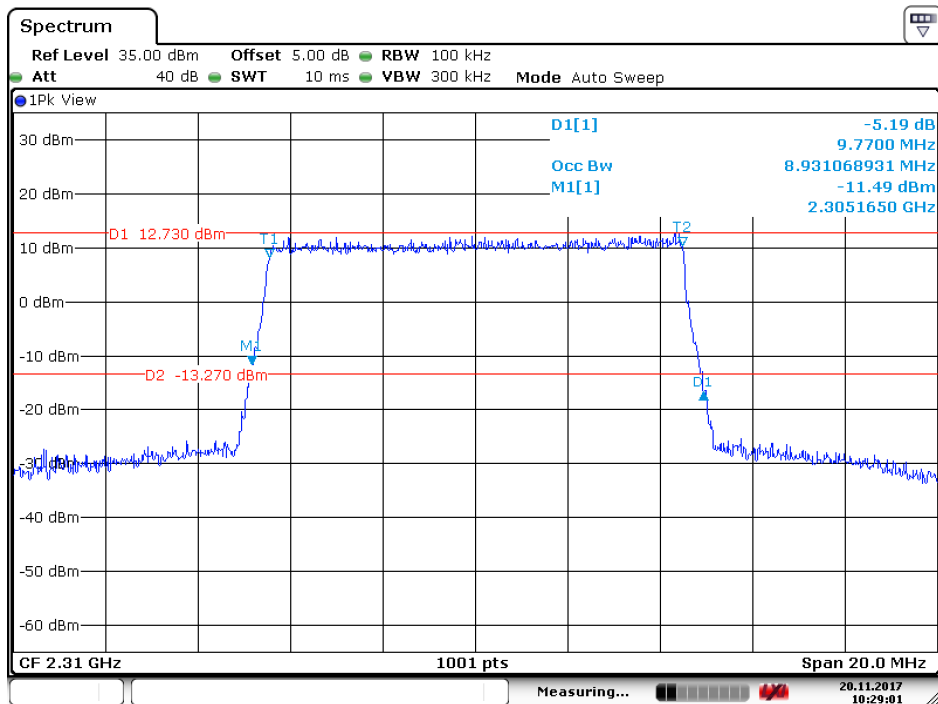
**4.1.1.3.3 Test Channel = HCH**



Date: 1.DEC.2017 10:24:08

**4.1.1.4 Test Mode = LTE/TM1 10MHz**

**4.1.1.4.1 Test Channel = MCH**

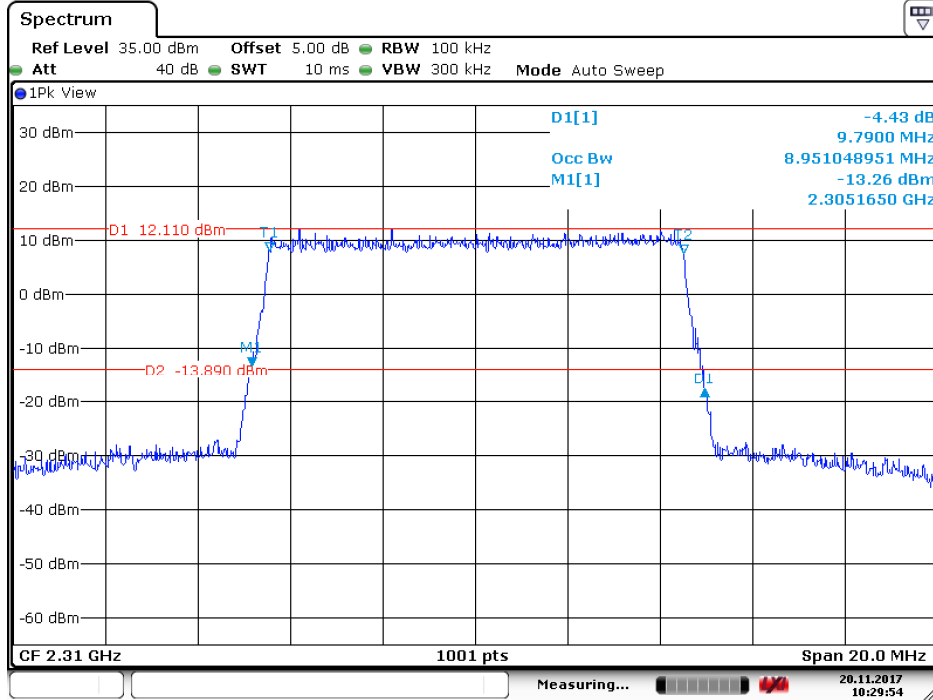


Date: 20.NOV.2017 10:29:01



4.1.1.5 Test Mode = LTE/TM2 10MHz

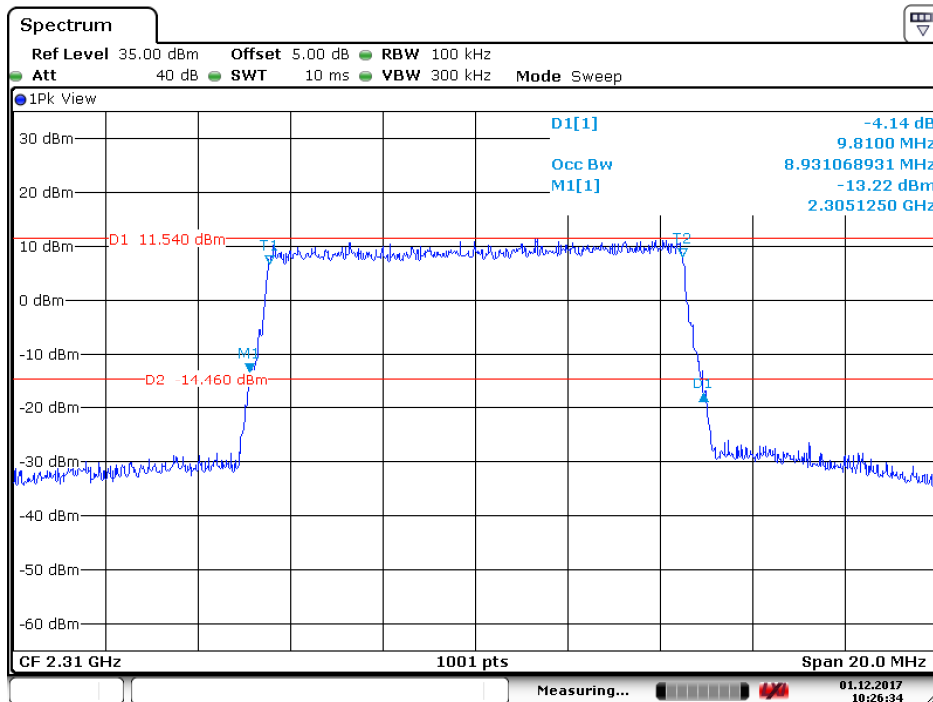
4.1.1.5.1 Test Channel = MCH



Date: 20.NOV.2017 10:29:54

4.1.1.6 Test Mode = LTE/TM3 10MHz

4.1.1.6.1 Test Channel = MCH



Date: 1.DEC.2017 10:26:34

## 5 Band Edges Compliance

Part I –

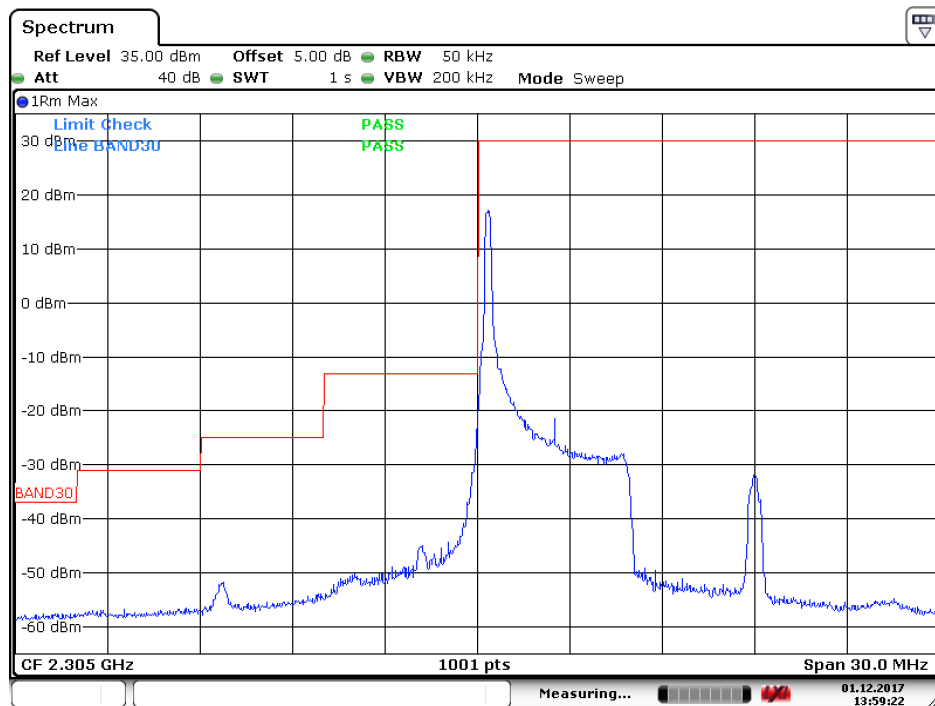
### 5.1 For LTE

#### 5.1.1 Test Band = LTE band30

##### 5.1.1.1 Test Mode = LTE/TM1 5MHz

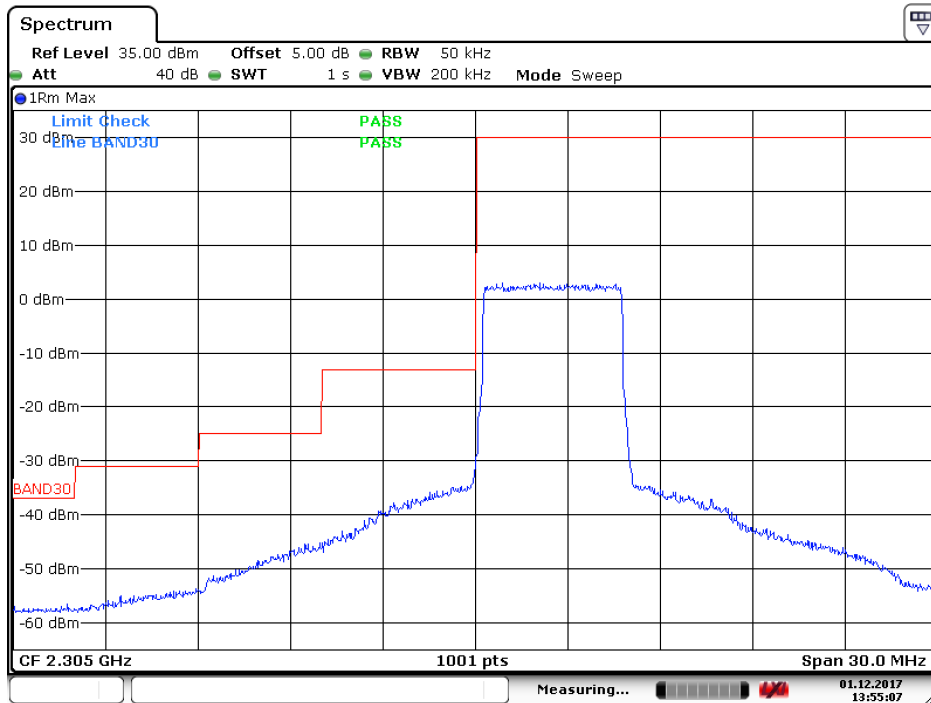
##### 5.1.1.1.1 Test Channel = LCH

##### 5.1.1.1.1.1 Test RB=1RB



Date: 1.DEC.2017 13:59:23

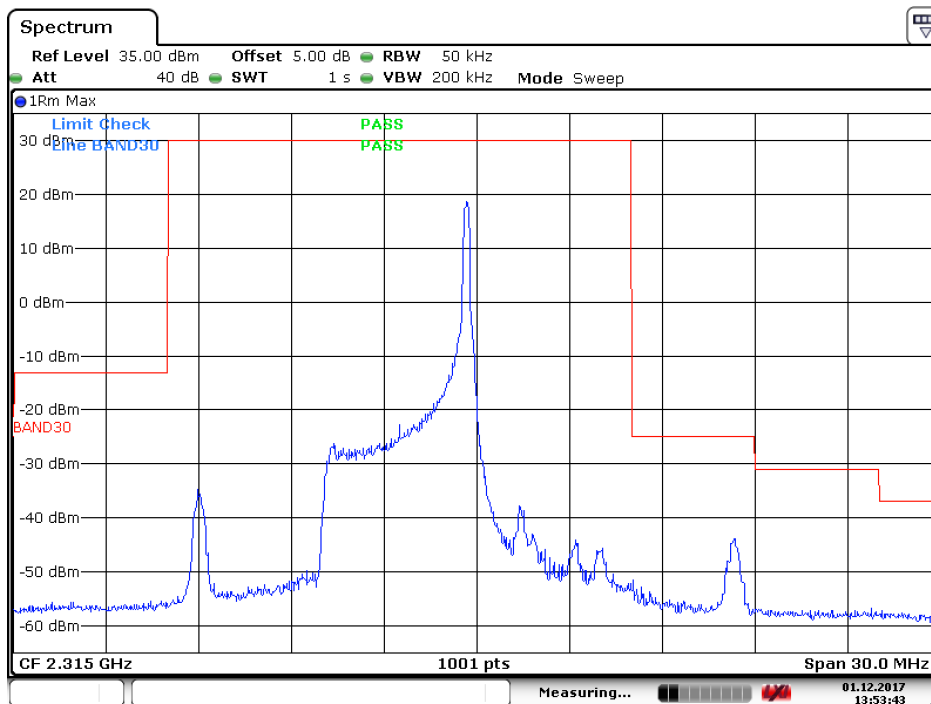
**5.1.1.1.2 Test RB=25RB**



Date: 1.DEC.2017 13:55:07

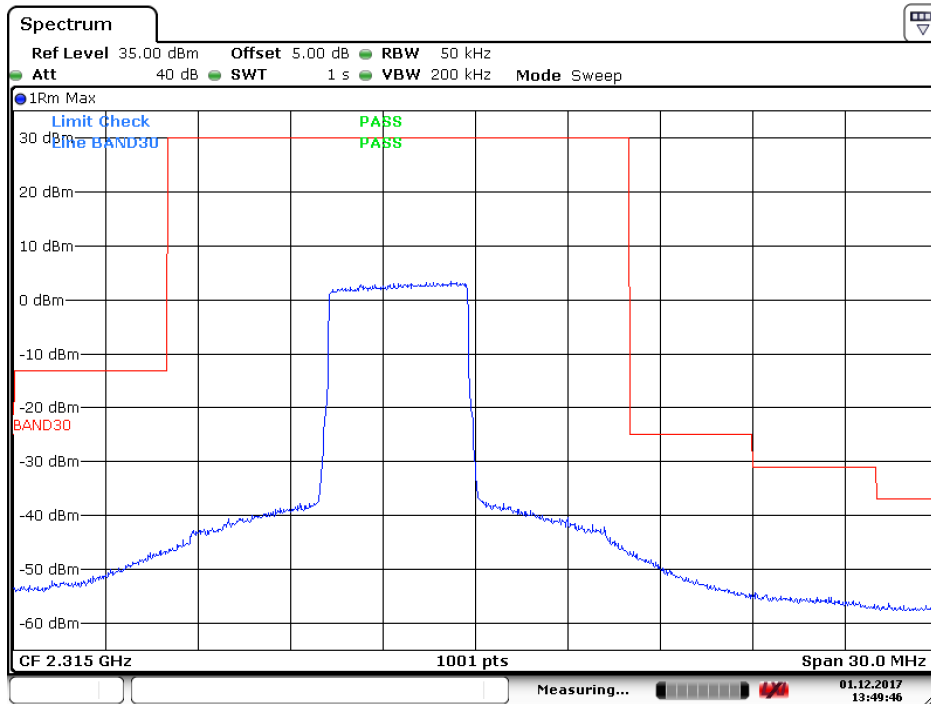
**5.1.1.1.2 Test Channel = HCH**

**5.1.1.1.2.1 Test RB=1RB**



Date: 1.DEC.2017 13:53:44

**5.1.1.1.2.2 Test RB=25RB**

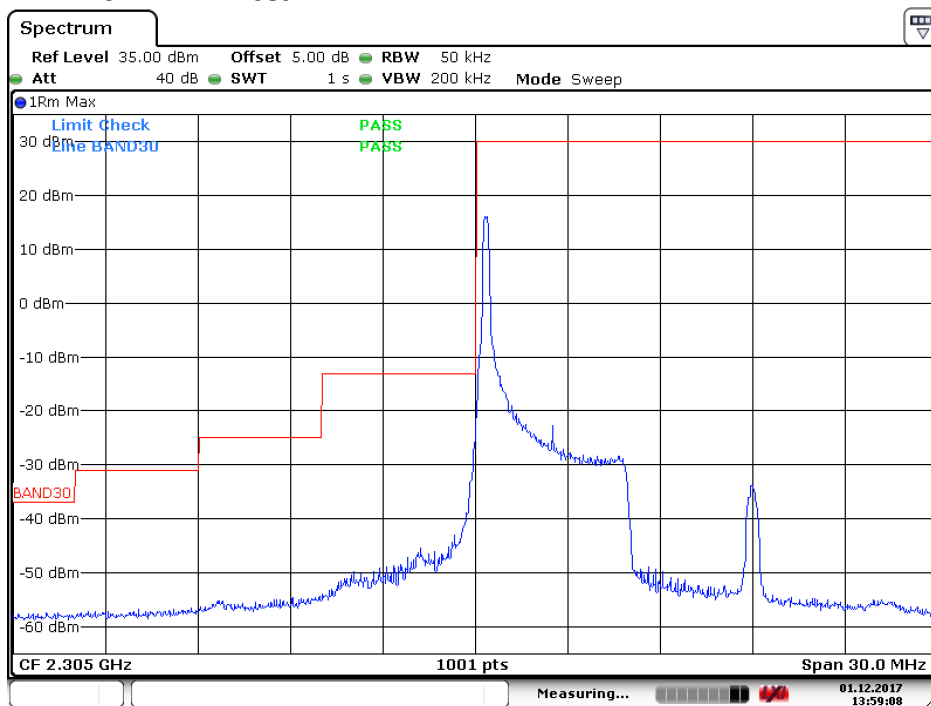


Date: 1.DEC.2017 13:49:47

**5.1.1.2 Test Mode = LTE/TM2 5MHz**

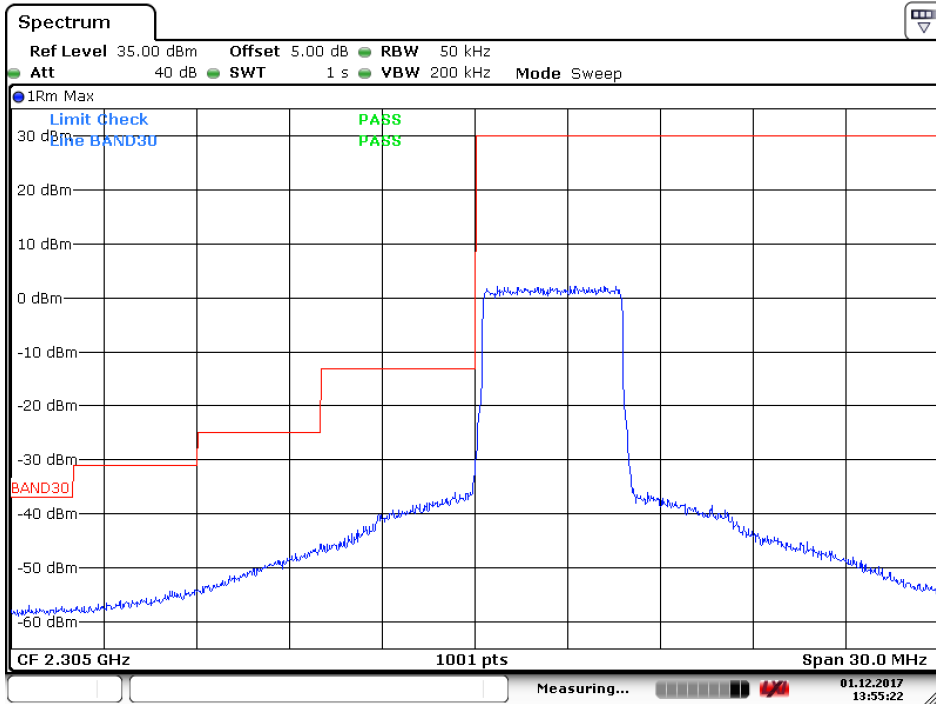
**5.1.1.2.1 Test Channel = LCH**

**5.1.1.2.1.1 Test RB=1RB**



Date: 1.DEC.2017 13:59:08

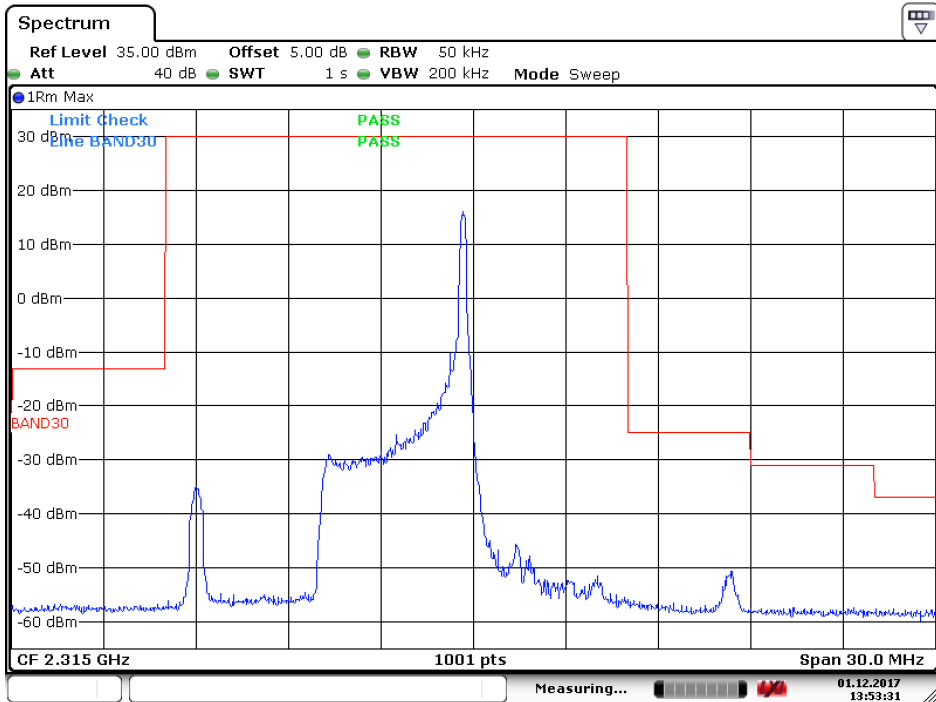
**5.1.1.2.1.2 Test RB=25RB**



Date: 1.DEC.2017 13:55:22

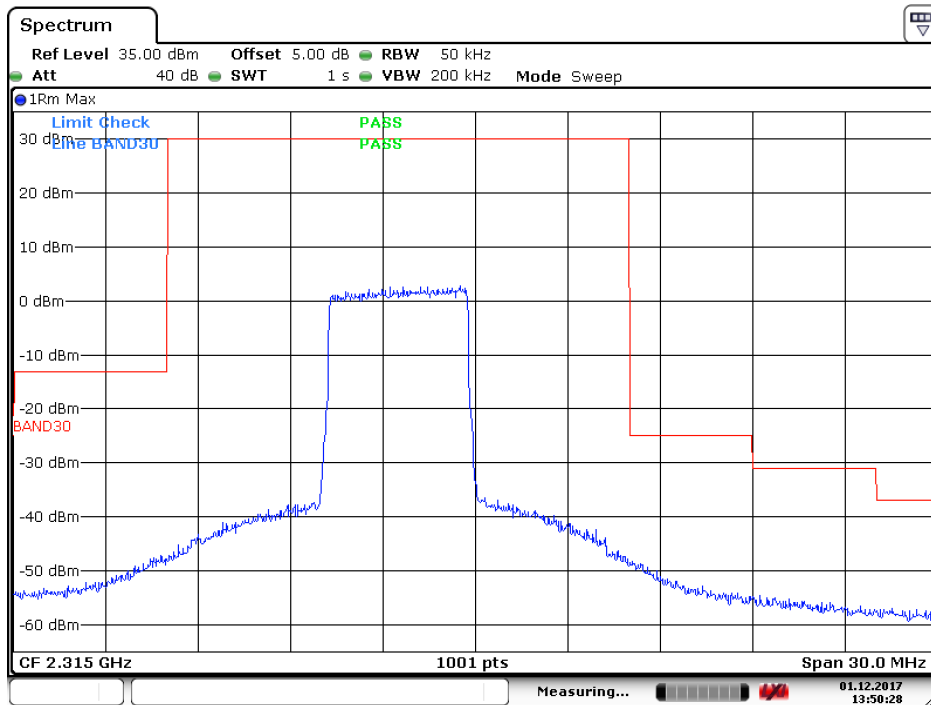
**5.1.1.2.2 Test Channel = HCH**

**5.1.1.2.2.1 Test RB=1RB**



Date: 1.DEC.2017 13:53:31

**5.1.1.2.2 Test RB=25RB**

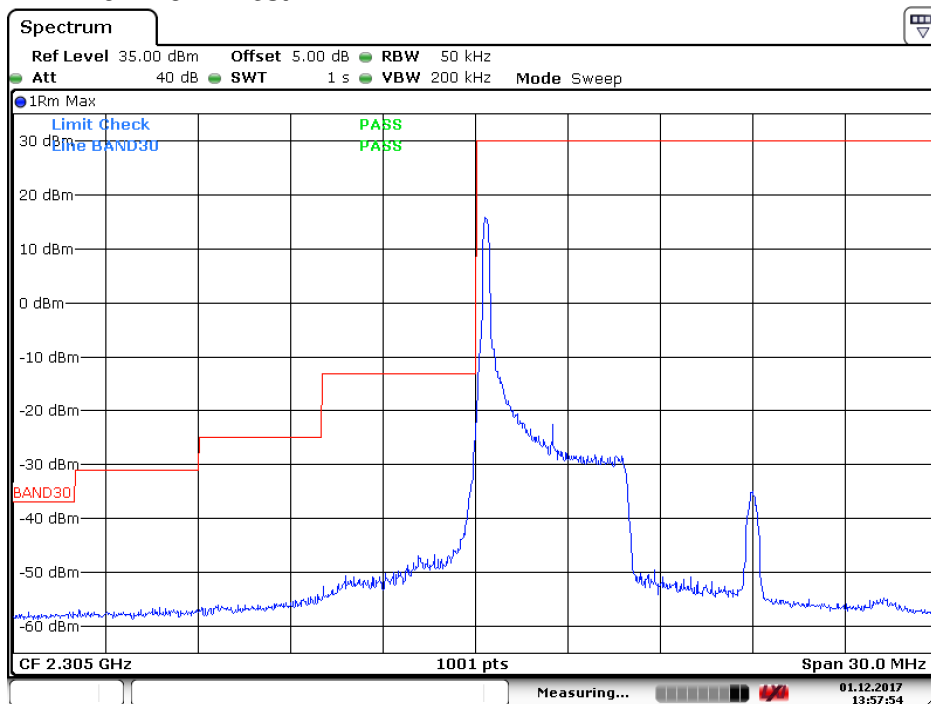


Date: 1.DEC.2017 13:50:28

**5.1.1.3 Test Mode = LTE/TM3 5MHz**

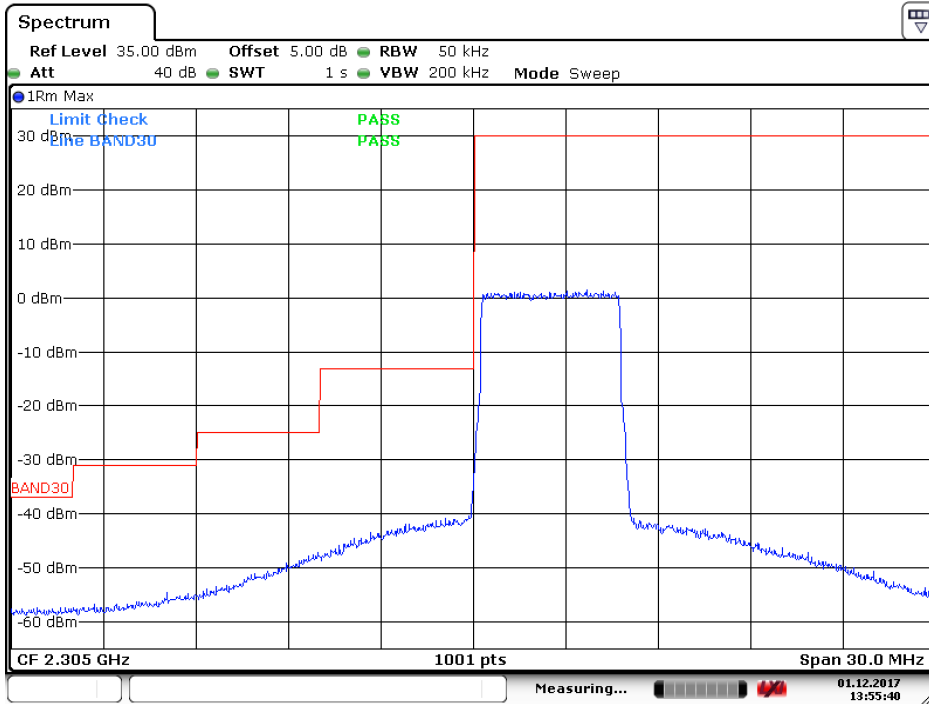
**5.1.1.3.1 Test Channel = LCH**

**5.1.1.3.1.1 Test RB=1RB**



Date: 1.DEC.2017 13:57:54

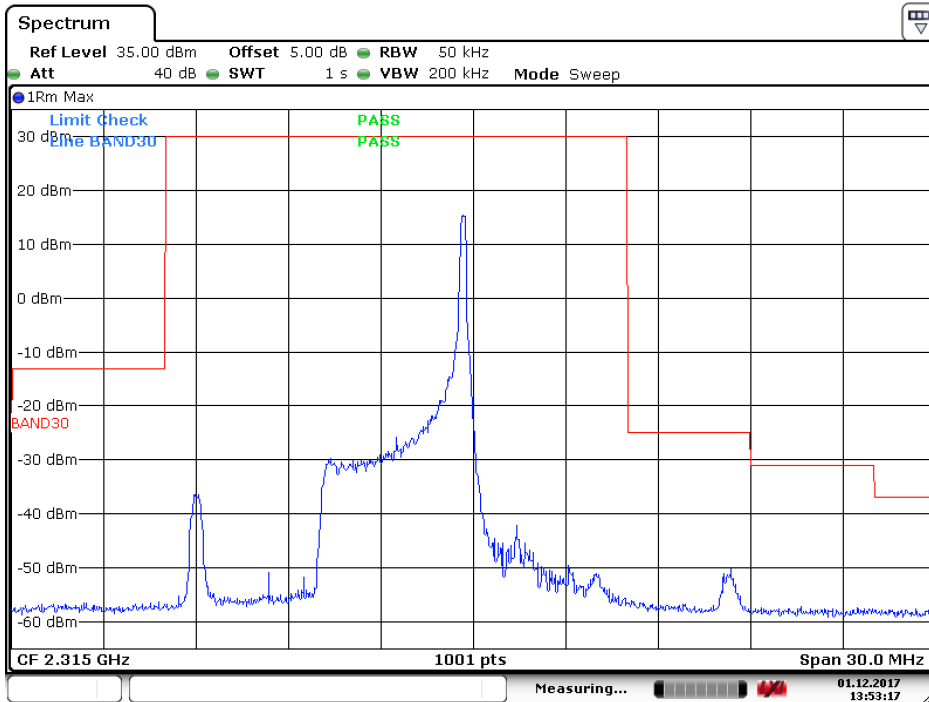
5.1.1.3.1.2 Test RB=25RB



Date: 1.DEC.2017 13:55:40

5.1.1.3.2 Test Channel = HCH

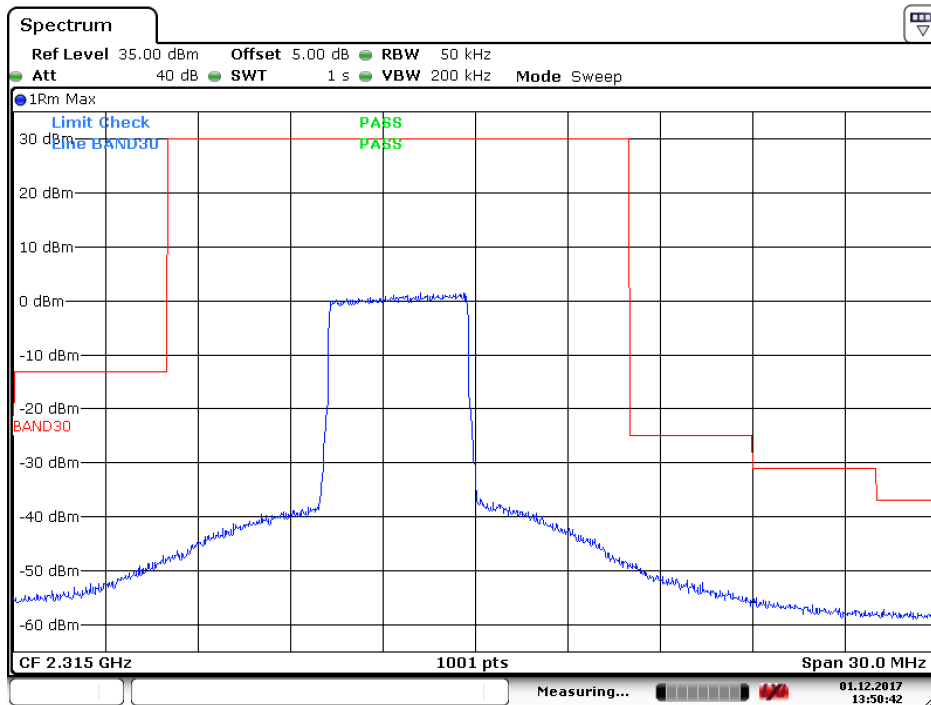
5.1.1.3.2.1 Test RB=1RB



Date: 1.DEC.2017 13:53:17



**5.1.1.3.2.2 Test RB=25RB**

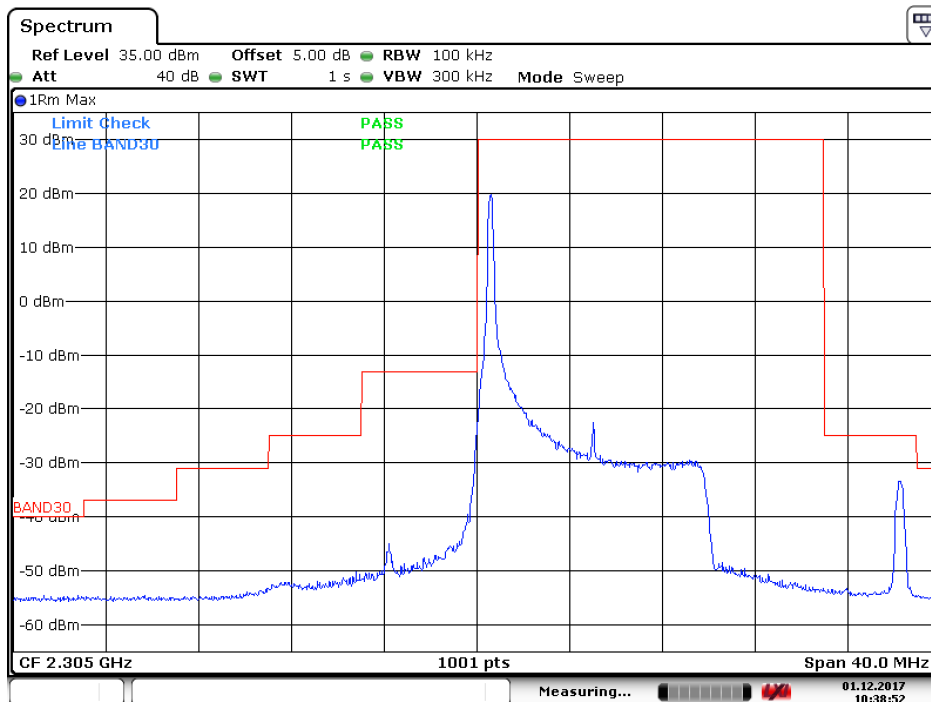


Date: 1.DEC.2017 13:50:42

**5.1.1.4 Test Mode = LTE/TM1 10MHz**

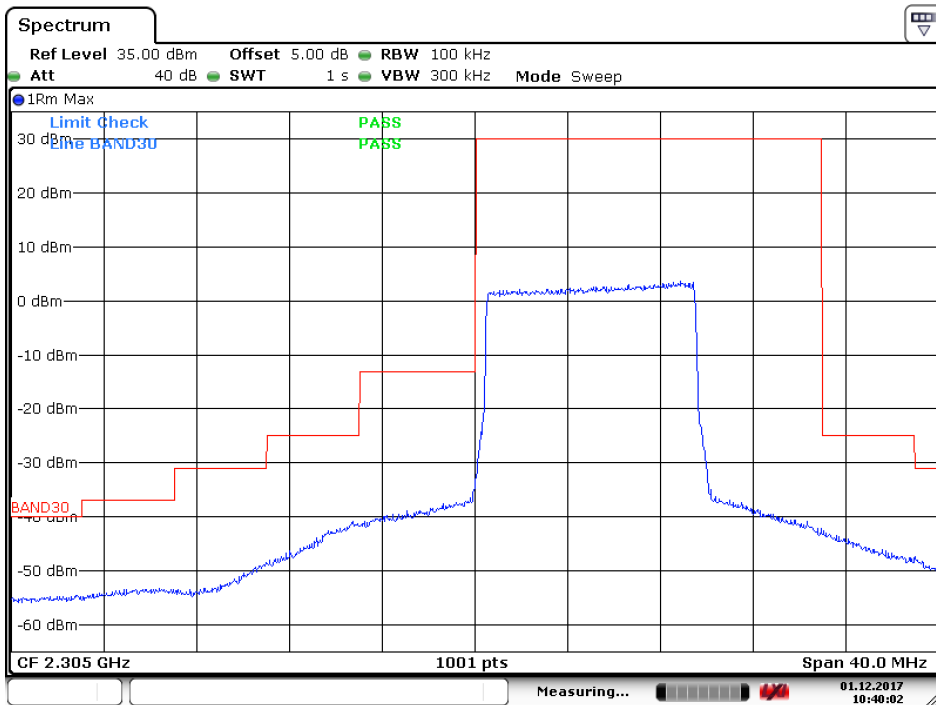
**5.1.1.4.1 Test Channel = LCH**

**5.1.1.4.1.1 Test RB=1RB**



Date: 1.DEC.2017 10:38:52

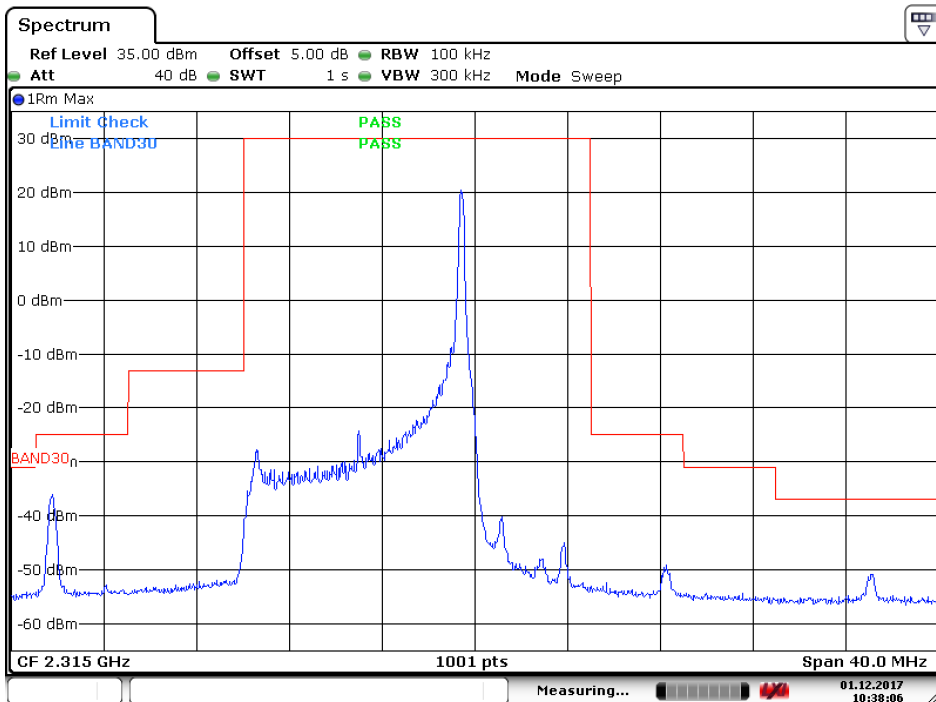
**5.1.1.4.1.2 Test RB=50RB**



Date: 1.DEC.2017 10:40:03

**5.1.1.4.2 Test Channel = HCH**

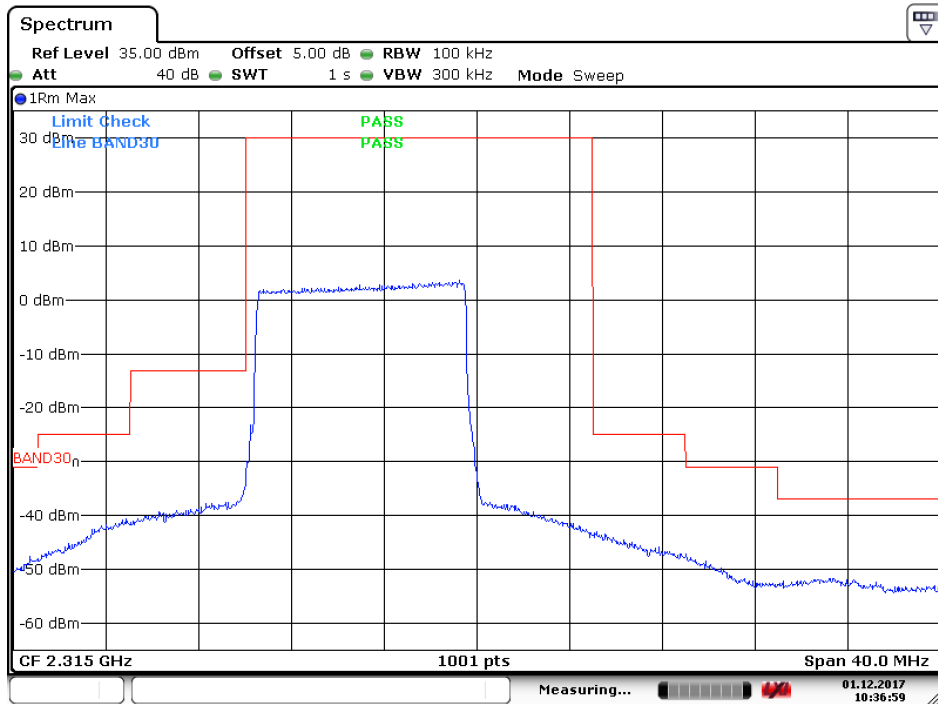
**5.1.1.4.2.1 Test RB=1RB**



Date: 1.DEC.2017 10:38:07



### 5.1.1.4.2.2 Test RB=50RB

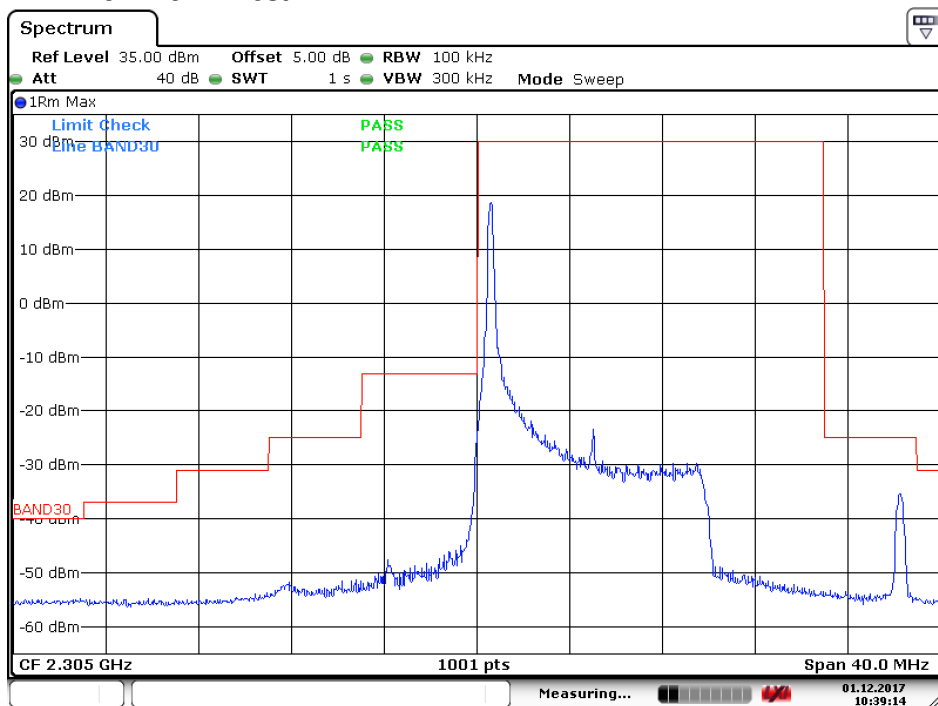


Date: 1.DEC.2017 10:37:00

### 5.1.1.5 Test Mode = LTE/TM2 10MHz

#### 5.1.1.5.1 Test Channel = LCH

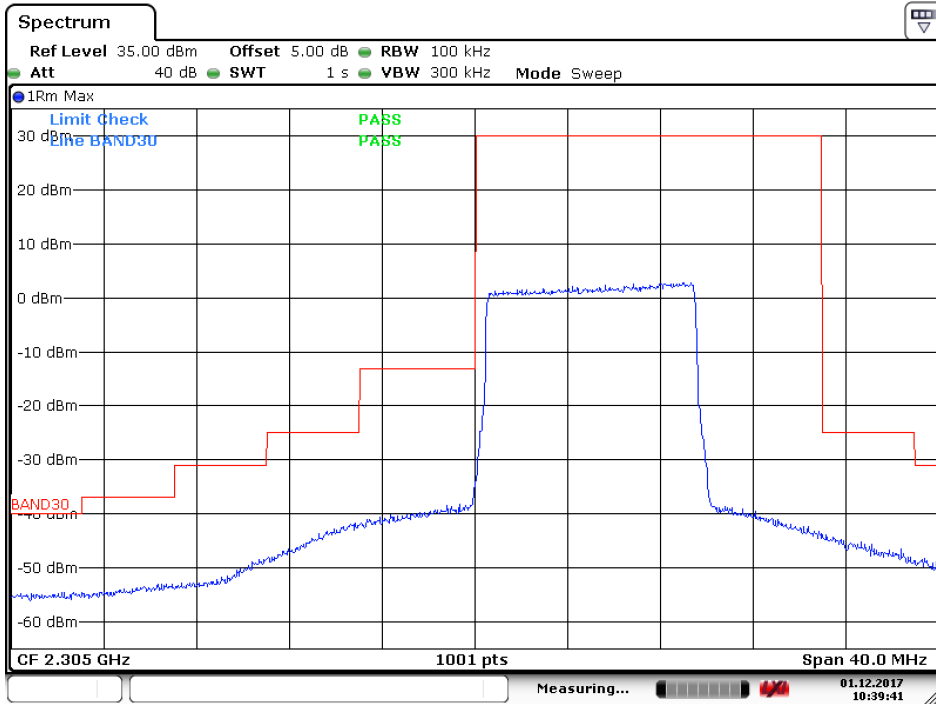
##### 5.1.1.5.1.1 Test RB=1RB



Date: 1.DEC.2017 10:39:15



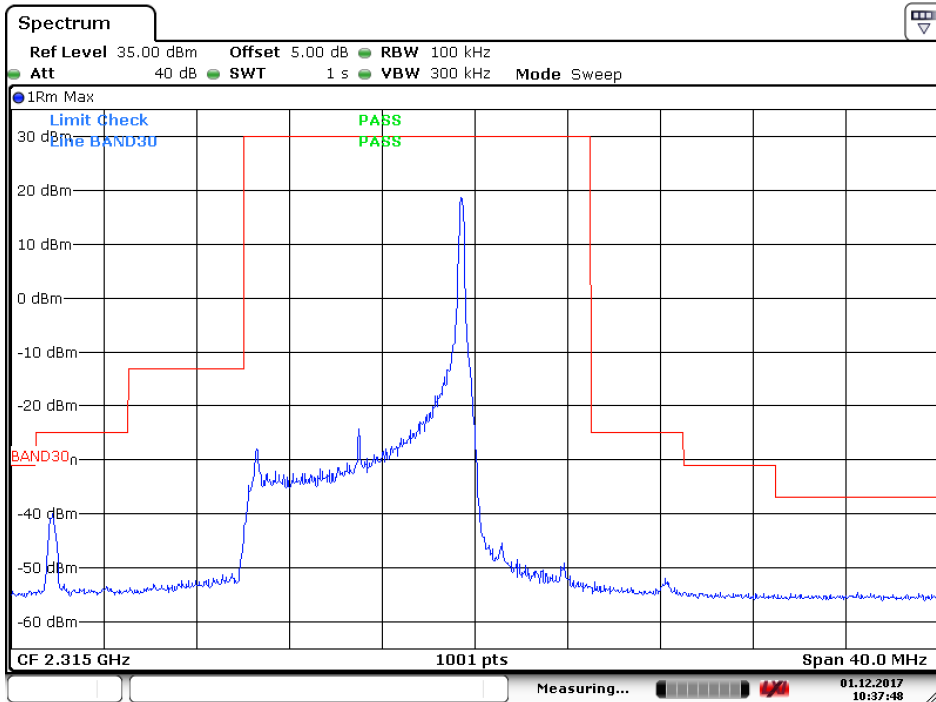
### 5.1.1.5.1.2 Test RB=50RB



Date: 1.DEC.2017 10:39:41

### 5.1.1.5.2 Test Channel = HCH

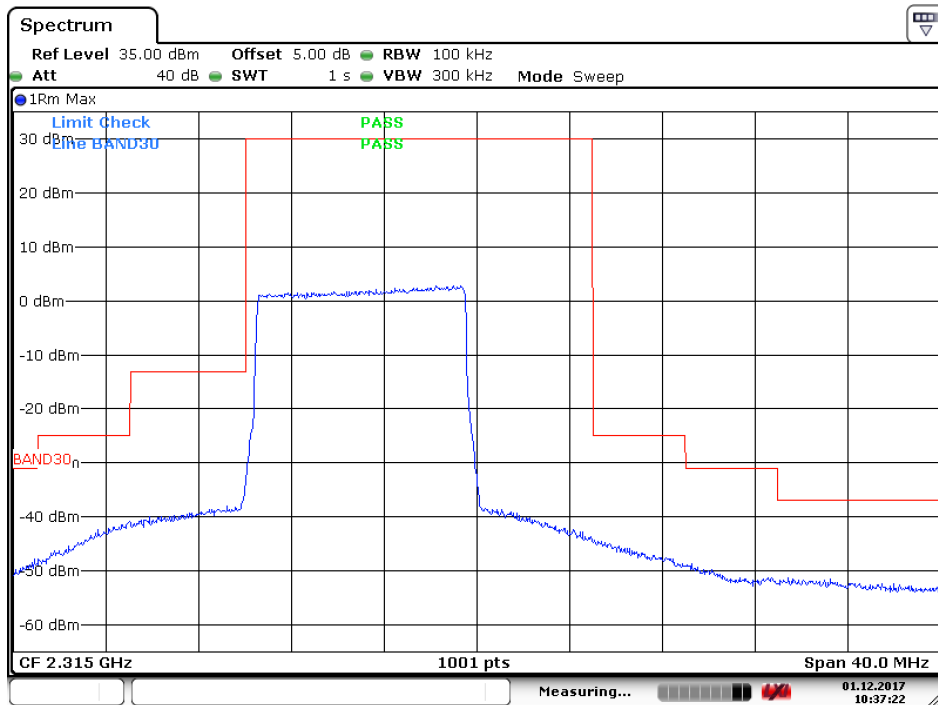
#### 5.1.1.5.2.1 Test RB=1RB



Date: 1.DEC.2017 10:37:48



5.1.1.5.2.2 Test RB=50RB

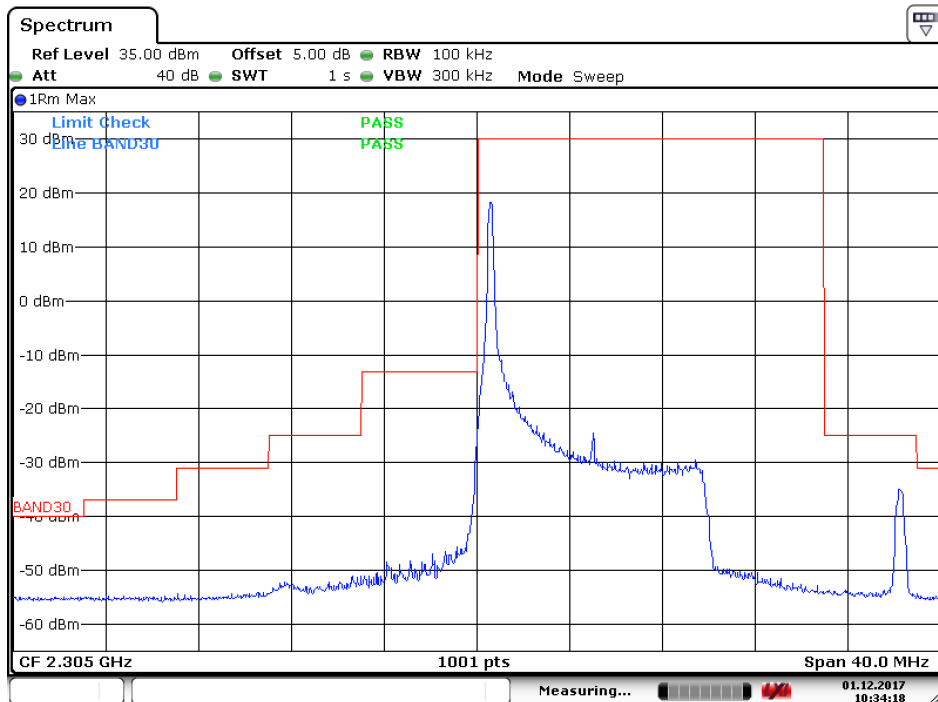


Date: 1.DEC.2017 10:37:22

5.1.1.6 Test Mode = LTE/TM3 10MHz

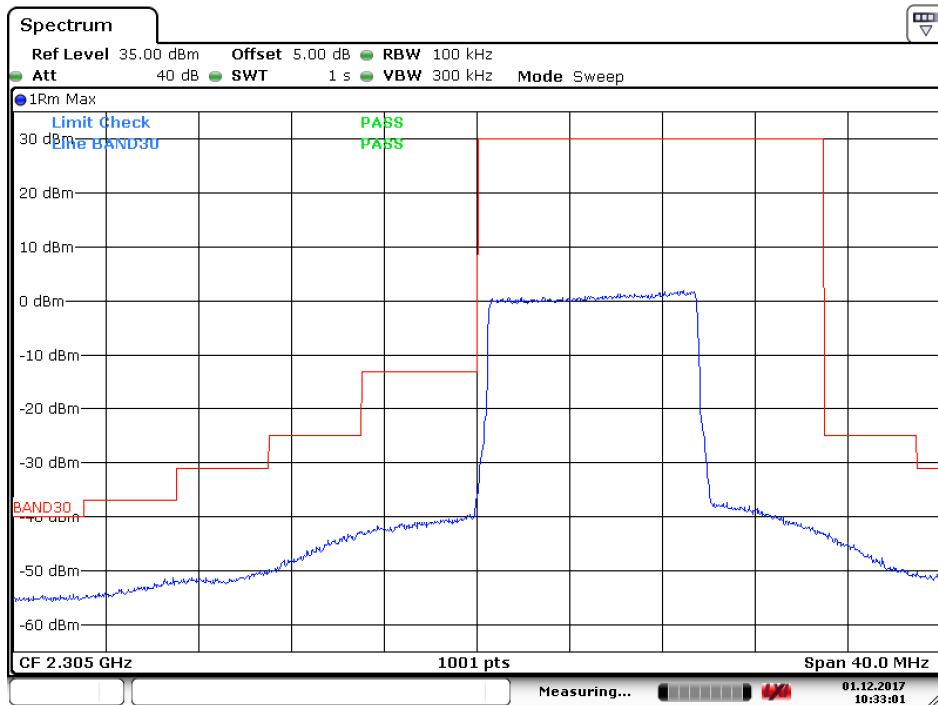
5.1.1.6.1 Test Channel = LCH

5.1.1.6.1.1 Test RB=1RB



Date: 1.DEC.2017 10:34:19

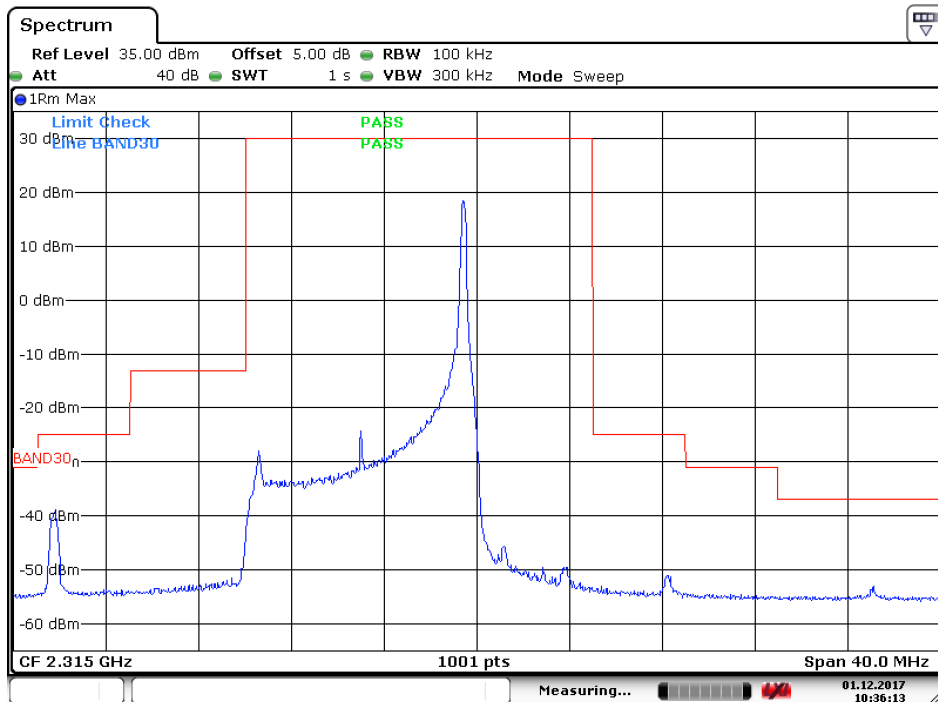
**5.1.1.6.1.2 Test RB=50RB**



Date: 1.DEC.2017 10:33:02

**5.1.1.6.2 Test Channel = HCH**

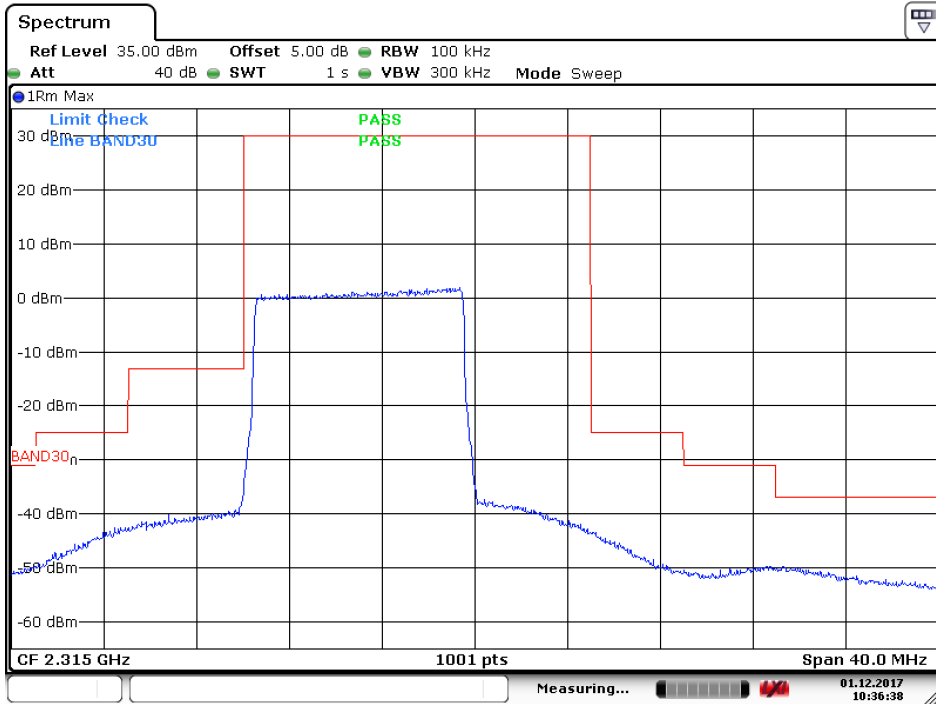
**5.1.1.6.2.1 Test RB=1RB**



Date: 1.DEC.2017 10:36:13



5.1.1.6.2.2 Test RB=50RB



Date: 1.DEC.2017 10:36:38

## 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.

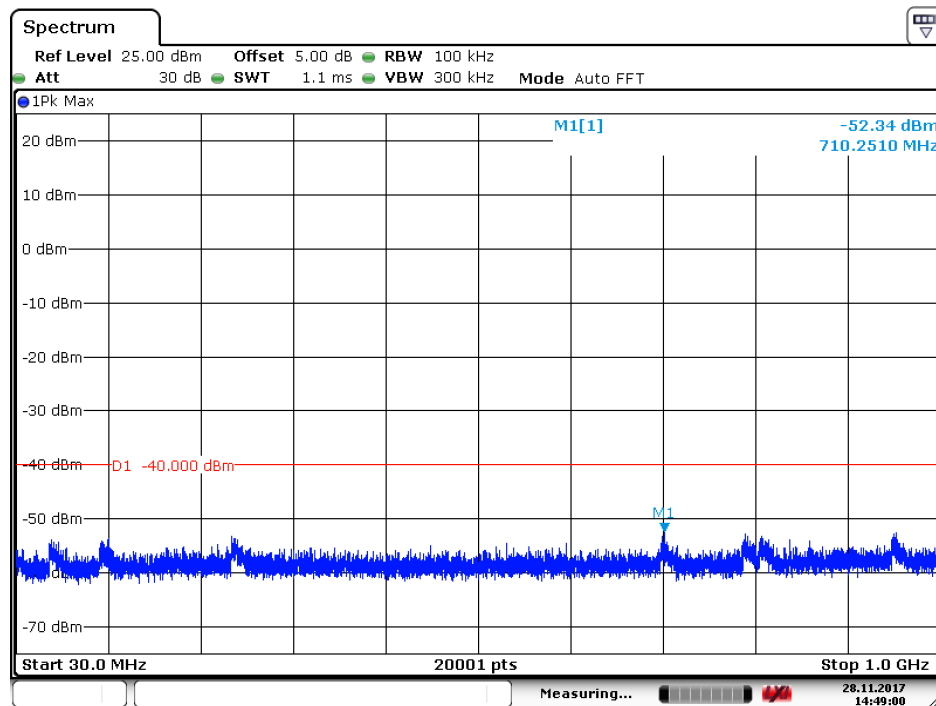
Part I - Test Plots

### 6.1 For LTE

#### 6.1.1 Test Band = LTE band30

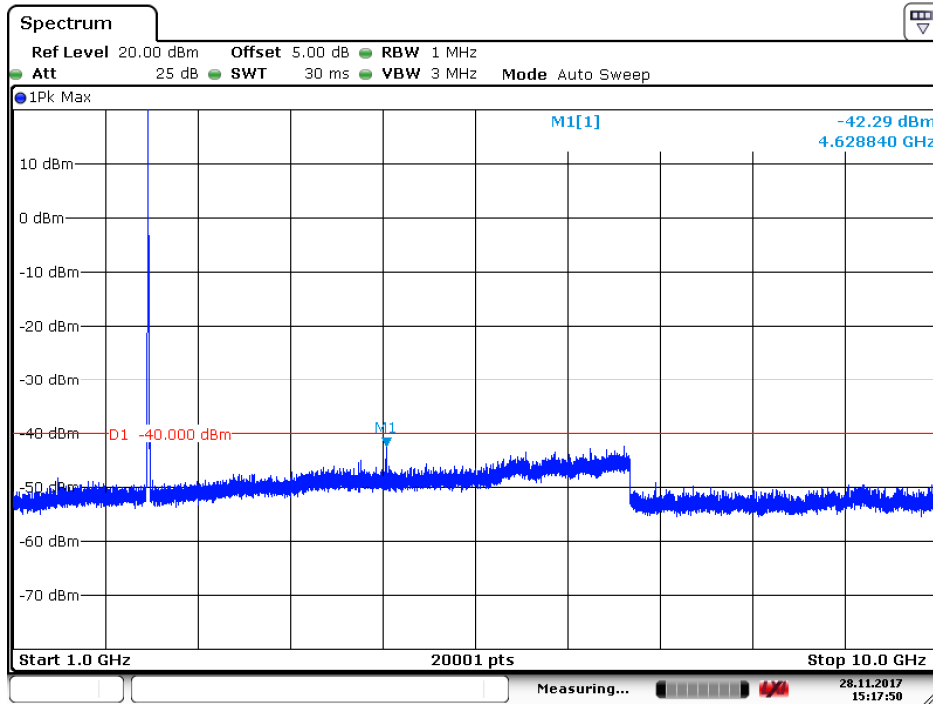
##### 6.1.1.1 Test Mode = LTE / TM1 10MHz RB1#0

##### 6.1.1.1.1 Test Channel = MCH

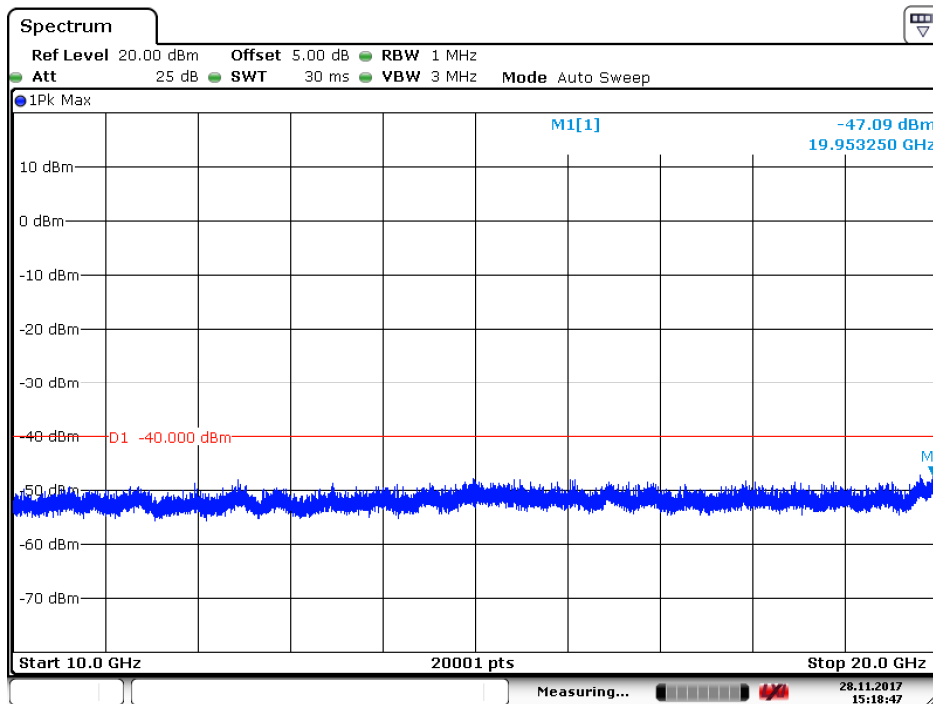


Date: 28.NOV.2017 14:49:01

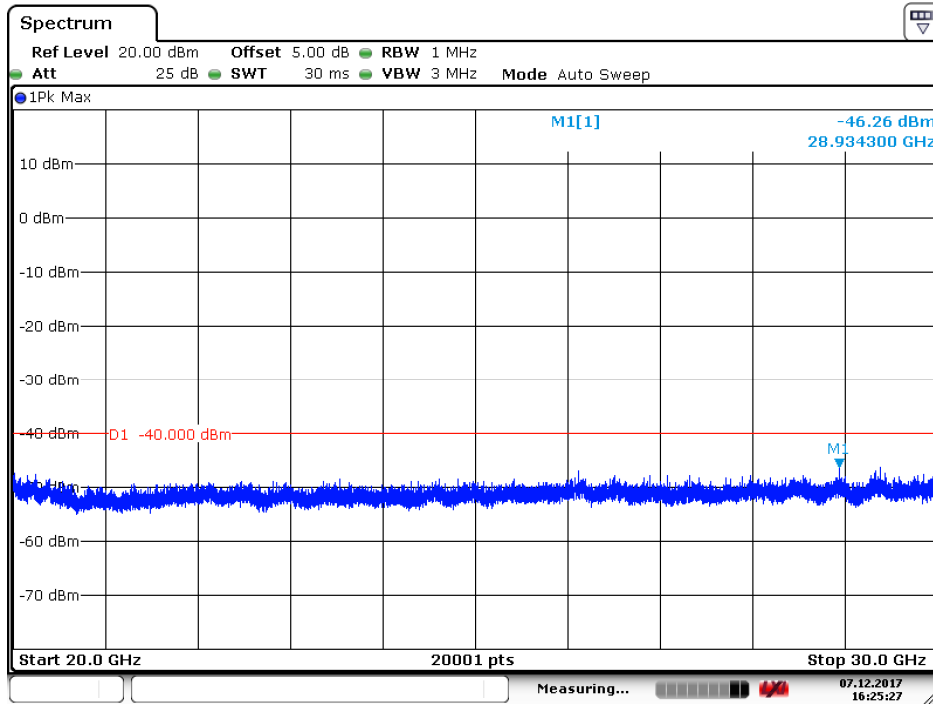




Date: 28.NOV.2017 15:17:50



Date: 28.NOV.2017 15:18:48



Date: 7.DEC.2017 16:25:27

## 7 Field Strength of Spurious Radiation

### 7.1 For LTE

#### 7.1.1 Test Band = LTE band30

##### 7.1.1.1 Test Mode =LTE/TM1 10MHz RB1#0

##### Diversity antenna

###### 7.1.1.1.1 Test Channel = MCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Over Limit (dB)	Polarization
1705.000	-64.43	-40.00	-14.43	Vertical
3975.000	-67.98	-40.00	-17.98	Vertical
4620.250	-64.40	-40.00	-14.40	Vertical
1210.000	-67.07	-40.00	-17.07	Horizontal
3975.000	-68.15	-40.00	-18.15	Horizontal
4620.250	-60.12	-40.00	-20.12	Horizontal

##### Main antenna

###### 7.1.1.1.1 Test Channel = MCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Over Limit (dB)	Polarization
1243.000	-66.56	-40.00	-16.56	Vertical
2720.000	-57.88	-40.00	-17.88	Vertical
4620.250	-55.68	-40.00	-15.68	Vertical
1474.000	-66.21	-40.00	-16.21	Horizontal
2832.000	-55.34	-40.00	-15.34	Horizontal
4620.250	-48.41	-40.00	-8.41	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.

## 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
LTEband30	LTE/TM1 10MHz	LCH	TN	VL	-4.03	-0.00175	PASS
				VN	2.46	0.00107	PASS
				VH	-7.79	-0.00338	PASS
		MCH	TN	VL	2.45	0.00106	PASS
				VN	-2.48	-0.00107	PASS
				VH	2.23	0.00097	PASS
		HCH	TN	VL	-0.46	-0.00020	PASS
				VN	-5.19	-0.00224	PASS
				VH	-0.44	-0.00019	PASS
	LTE/TM2 10MHz	LCH	TN	VL	-4.92	-0.00213	PASS
				VN	-2.48	-0.00107	PASS
				VH	-5.89	-0.00255	PASS
		MCH	TN	VL	1.36	0.00059	PASS
				VN	-0.86	-0.00037	PASS
				VH	2.86	0.00124	PASS
		HCH	TN	VL	-3.06	-0.00132	PASS
				VN	-8.22	-0.00355	PASS
				VH	5.52	0.00239	PASS
	LTE/TM3 10MHz	LCH	TN	VL	2.99	0.00130	PASS
				VN	-2.39	-0.00104	PASS
				VH	4.37	0.00189	PASS
		MCH	TN	VL	-2.43	-0.00105	PASS
				VN	2.46	0.00106	PASS
				VH	-3.59	-0.00155	PASS
		HCH	TN	VL	3.54	0.00153	PASS
				VN	1.40	0.00061	PASS
				VH	-2.90	-0.00125	PASS



## 8.2 Frequency Error VS. Temperature

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
LTEband30	LTE/TM1 10MHz	MCH	VN	-30	-0.49	-0.00021	PASS
				-20	-1.24	-0.00054	PASS
				-10	2.36	0.00102	PASS
				0	1.70	0.00074	PASS
				10	1.35	0.00059	PASS
				20	6.11	0.00265	PASS
				30	-3.31	-0.00143	PASS
				40	-2.14	-0.00093	PASS
				50	0.69	0.00030	PASS
	LTE/TM2 10MHz	MCH	VN	-30	-7.89	-0.00342	PASS
				-20	-5.25	-0.00227	PASS
				-10	-7.49	-0.00324	PASS
				0	-5.66	-0.00245	PASS
				10	-4.44	-0.00192	PASS
				20	-2.94	-0.00127	PASS
				30	-5.65	-0.00245	PASS
				40	-4.64	-0.00201	PASS
				50	-6.95	-0.00301	PASS
	LTE/TM3 10MHz	MCH	VN	-30	0.56	0.00024	PASS
				-20	-5.49	-0.00237	PASS
				-10	1.57	0.00068	PASS
				0	-2.43	-0.00105	PASS
				10	2.67	0.00115	PASS
				20	-2.57	-0.00111	PASS
				30	-2.67	-0.00115	PASS
				40	-5.44	-0.00235	PASS
				50	-8.95	-0.00387	PASS

The End