



# Appendix B

## E-UTRA BAND 4



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## 1. Effective (Isotropic) Radiated Power

### 1.1. Test Result

BAND	Bandwidth	Modulation	Channel	RB Configuration	Conducted Power (dBm)	EIRP (dBm)	Limit (dBm)	Verdict
Band4	1.4MHz	QPSK	19957	1RB#0	22.25	20.25	30.00	PASS
Band4	1.4MHz	QPSK	19957	1RB#2	22.24	20.24	30.00	PASS
Band4	1.4MHz	QPSK	19957	1RB#5	22.22	20.22	30.00	PASS
Band4	1.4MHz	QPSK	19957	3RB#0	22.21	20.21	30.00	PASS
Band4	1.4MHz	QPSK	19957	3RB#1	22.20	20.20	30.00	PASS
Band4	1.4MHz	QPSK	19957	3RB#3	22.21	20.21	30.00	PASS
Band4	1.4MHz	QPSK	19957	6RB#0	21.24	19.24	30.00	PASS
Band4	1.4MHz	QPSK	20175	1RB#0	22.08	20.08	30.00	PASS
Band4	1.4MHz	QPSK	20175	1RB#2	22.08	20.08	30.00	PASS
Band4	1.4MHz	QPSK	20175	1RB#5	22.04	20.04	30.00	PASS
Band4	1.4MHz	QPSK	20175	3RB#0	22.11	20.11	30.00	PASS
Band4	1.4MHz	QPSK	20175	3RB#1	22.12	20.12	30.00	PASS
Band4	1.4MHz	QPSK	20175	3RB#3	22.09	20.09	30.00	PASS
Band4	1.4MHz	QPSK	20175	6RB#0	21.21	19.21	30.00	PASS
Band4	1.4MHz	QPSK	20393	1RB#0	22.18	20.18	30.00	PASS
Band4	1.4MHz	QPSK	20393	1RB#2	22.13	20.13	30.00	PASS
Band4	1.4MHz	QPSK	20393	1RB#5	22.17	20.17	30.00	PASS
Band4	1.4MHz	QPSK	20393	3RB#0	22.20	20.20	30.00	PASS
Band4	1.4MHz	QPSK	20393	3RB#1	22.19	20.19	30.00	PASS
Band4	1.4MHz	QPSK	20393	3RB#3	22.16	20.16	30.00	PASS
Band4	1.4MHz	QPSK	20393	6RB#0	21.16	19.16	30.00	PASS
Band4	3MHz	QPSK	19965	1RB#0	22.27	20.27	30.00	PASS
Band4	3MHz	QPSK	19965	1RB#8	22.17	20.17	30.00	PASS
Band4	3MHz	QPSK	19965	1RB#14	22.15	20.15	30.00	PASS
Band4	3MHz	QPSK	19965	8RB#0	21.34	19.34	30.00	PASS
Band4	3MHz	QPSK	19965	8RB#4	21.30	19.30	30.00	PASS
Band4	3MHz	QPSK	19965	8RB#7	21.27	19.27	30.00	PASS
Band4	3MHz	QPSK	19965	15RB#0	21.29	19.29	30.00	PASS
Band4	3MHz	QPSK	20175	1RB#0	22.08	20.08	30.00	PASS
Band4	3MHz	QPSK	20175	1RB#8	22.05	20.05	30.00	PASS
Band4	3MHz	QPSK	20175	1RB#14	21.97	19.97	30.00	PASS



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Band4	3MHz	QPSK	20175	8RB#0	21.15	19.15	30.00	PASS
Band4	3MHz	QPSK	20175	8RB#4	21.17	19.17	30.00	PASS
Band4	3MHz	QPSK	20175	8RB#7	21.14	19.14	30.00	PASS
Band4	3MHz	QPSK	20175	15RB#0	21.14	19.14	30.00	PASS
Band4	3MHz	QPSK	20385	1RB#0	22.14	20.14	30.00	PASS
Band4	3MHz	QPSK	20385	1RB#8	22.12	20.12	30.00	PASS
Band4	3MHz	QPSK	20385	1RB#14	22.10	20.10	30.00	PASS
Band4	3MHz	QPSK	20385	8RB#0	21.20	19.20	30.00	PASS
Band4	3MHz	QPSK	20385	8RB#4	21.19	19.19	30.00	PASS
Band4	3MHz	QPSK	20385	8RB#7	21.22	19.22	30.00	PASS
Band4	3MHz	QPSK	20385	15RB#0	21.23	19.23	30.00	PASS
Band4	5MHz	QPSK	19975	1RB#0	22.28	20.28	30.00	PASS
Band4	5MHz	QPSK	19975	1RB#12	22.15	20.15	30.00	PASS
Band4	5MHz	QPSK	19975	1RB#24	22.12	20.12	30.00	PASS
Band4	5MHz	QPSK	19975	12RB#0	21.34	19.34	30.00	PASS
Band4	5MHz	QPSK	19975	12RB#6	21.27	19.27	30.00	PASS
Band4	5MHz	QPSK	19975	12RB#13	21.26	19.26	30.00	PASS
Band4	5MHz	QPSK	19975	25RB#0	21.27	19.27	30.00	PASS
Band4	5MHz	QPSK	20175	1RB#0	22.17	20.17	30.00	PASS
Band4	5MHz	QPSK	20175	1RB#12	22.05	20.05	30.00	PASS
Band4	5MHz	QPSK	20175	1RB#24	21.97	19.97	30.00	PASS
Band4	5MHz	QPSK	20175	12RB#0	21.22	19.22	30.00	PASS
Band4	5MHz	QPSK	20175	12RB#6	21.20	19.20	30.00	PASS
Band4	5MHz	QPSK	20175	12RB#13	21.16	19.16	30.00	PASS
Band4	5MHz	QPSK	20175	25RB#0	21.17	19.17	30.00	PASS
Band4	5MHz	QPSK	20375	1RB#0	22.17	20.17	30.00	PASS
Band4	5MHz	QPSK	20375	1RB#12	22.12	20.12	30.00	PASS
Band4	5MHz	QPSK	20375	1RB#24	22.08	20.08	30.00	PASS
Band4	5MHz	QPSK	20375	12RB#0	21.23	19.23	30.00	PASS
Band4	5MHz	QPSK	20375	12RB#6	21.18	19.18	30.00	PASS
Band4	5MHz	QPSK	20375	12RB#13	21.18	19.18	30.00	PASS
Band4	5MHz	QPSK	20375	25RB#0	21.18	19.18	30.00	PASS
Band4	10MHz	QPSK	20000	1RB#0	22.50	20.50	30.00	PASS
Band4	10MHz	QPSK	20000	1RB#24	22.19	20.19	30.00	PASS
Band4	10MHz	QPSK	20000	1RB#49	22.21	20.21	30.00	PASS
Band4	10MHz	QPSK	20000	25RB#0	21.41	19.41	30.00	PASS
Band4	10MHz	QPSK	20000	25RB#12	21.27	19.27	30.00	PASS
Band4	10MHz	QPSK	20000	25RB#25	21.26	19.26	30.00	PASS



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Band4	10MHz	QPSK	20000	50RB#0	21.33	19.33	30.00	PASS
Band4	10MHz	QPSK	20175	1RB#0	22.37	20.37	30.00	PASS
Band4	10MHz	QPSK	20175	1RB#24	22.02	20.02	30.00	PASS
Band4	10MHz	QPSK	20175	1RB#49	22.02	20.02	30.00	PASS
Band4	10MHz	QPSK	20175	25RB#0	21.29	19.29	30.00	PASS
Band4	10MHz	QPSK	20175	25RB#12	21.15	19.15	30.00	PASS
Band4	10MHz	QPSK	20175	25RB#25	21.14	19.14	30.00	PASS
Band4	10MHz	QPSK	20175	50RB#0	21.21	19.21	30.00	PASS
Band4	10MHz	QPSK	20350	1RB#0	22.33	20.33	30.00	PASS
Band4	10MHz	QPSK	20350	1RB#24	22.09	20.09	30.00	PASS
Band4	10MHz	QPSK	20350	1RB#49	22.08	20.08	30.00	PASS
Band4	10MHz	QPSK	20350	25RB#0	21.24	19.24	30.00	PASS
Band4	10MHz	QPSK	20350	25RB#12	21.16	19.16	30.00	PASS
Band4	10MHz	QPSK	20350	25RB#25	21.14	19.14	30.00	PASS
Band4	10MHz	QPSK	20350	50RB#0	21.21	19.21	30.00	PASS

**Remark:**

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

$$ERP [dBm] = \text{Conducted Power [dBm]} + \text{Gain [dBd]}$$

$$EIRP [dBm] = \text{Conducted Power [dBm]} + \text{Gain [dBi]}$$



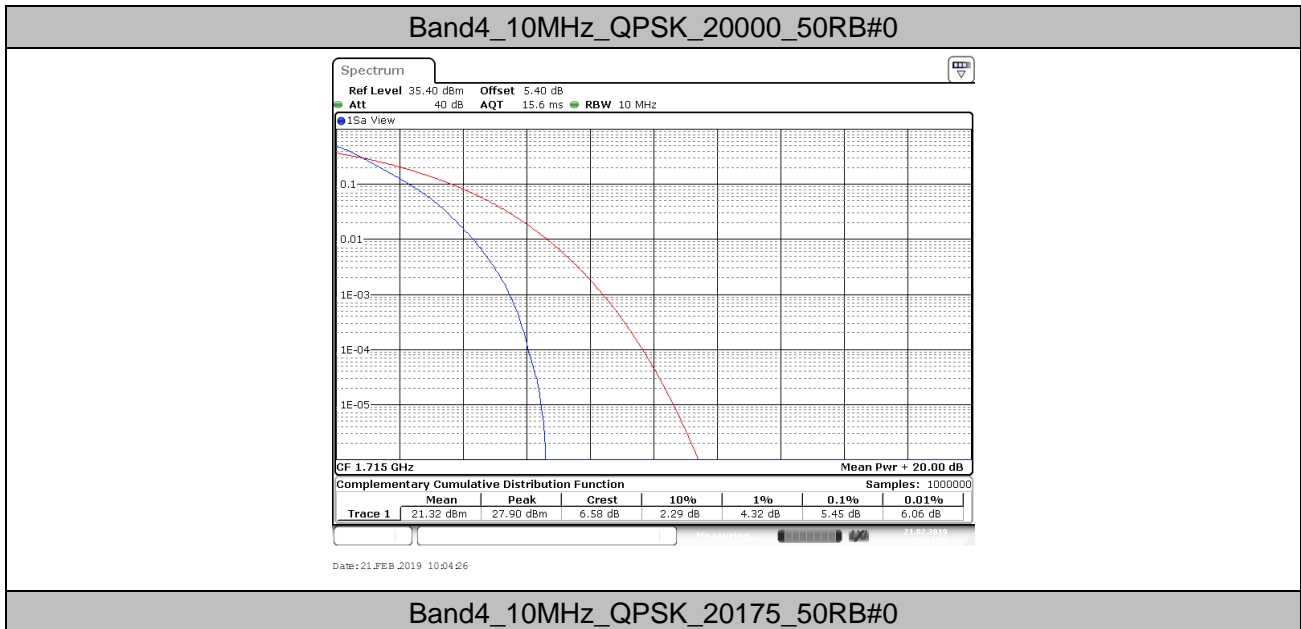
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## 2. Peak-to-Average Ratio(CCDF)

### 2.1. Test Result

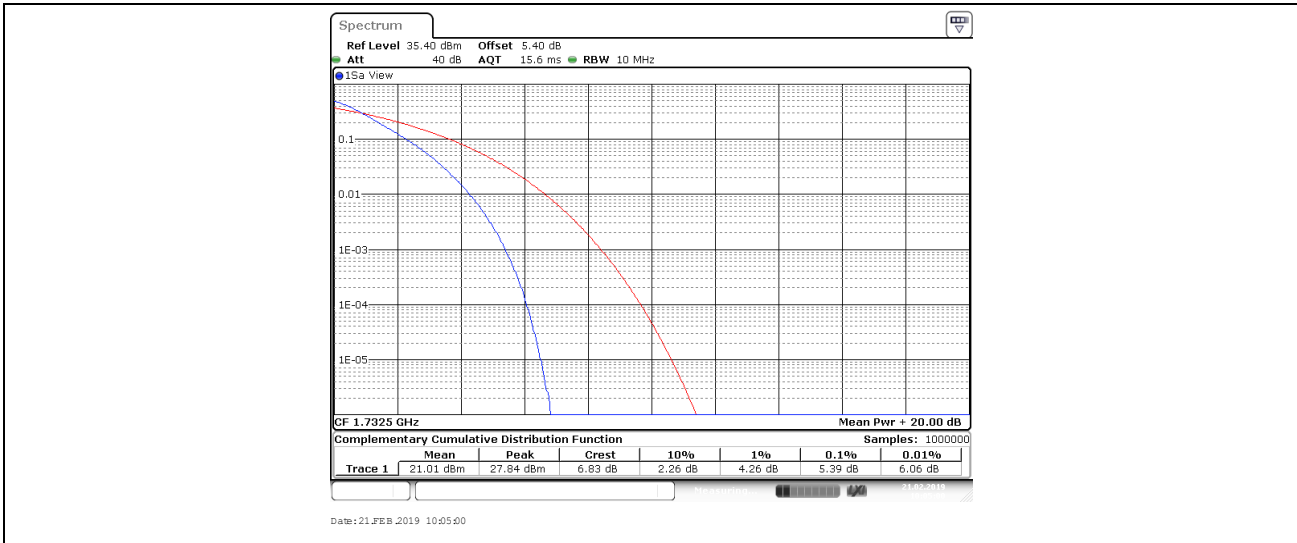
BAND	Bandwidth	Modulation	Channel	RB Configuration	Result(dB)	Limit(dB)	Verdict
Band4	10MHz	QPSK	20000	50RB#0	5.45	13	PASS
Band4	10MHz	QPSK	20175	50RB#0	5.39	13	PASS
Band4	10MHz	QPSK	20350	50RB#0	5.48	13	PASS

### 2.2. Test Plots

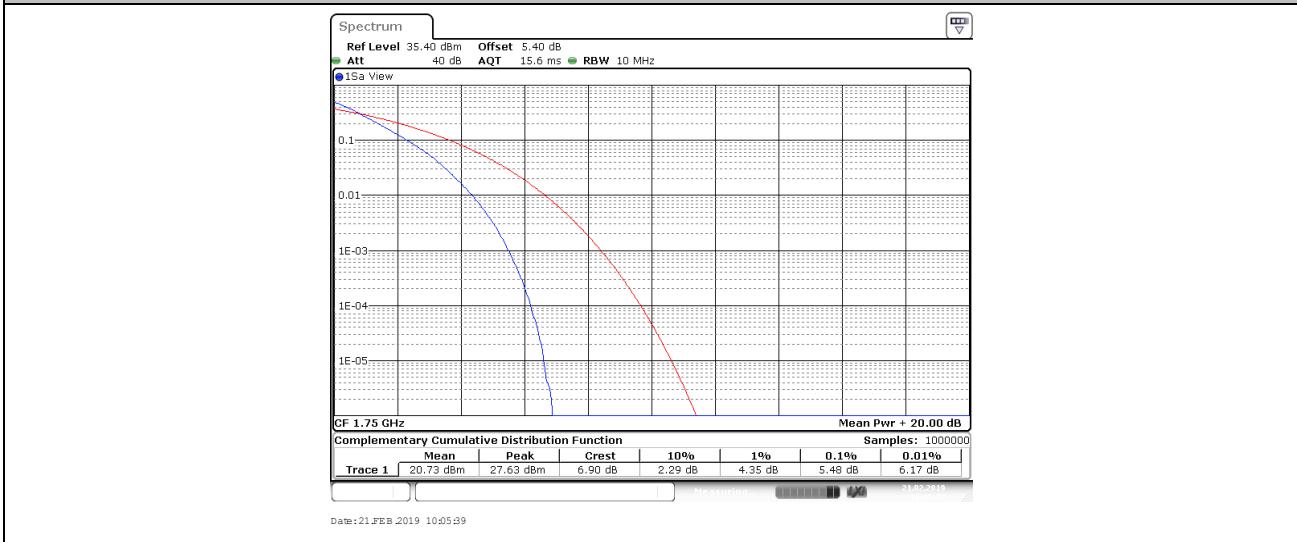


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**Band4\_10MHz\_QPSK\_20350\_50RB#0**



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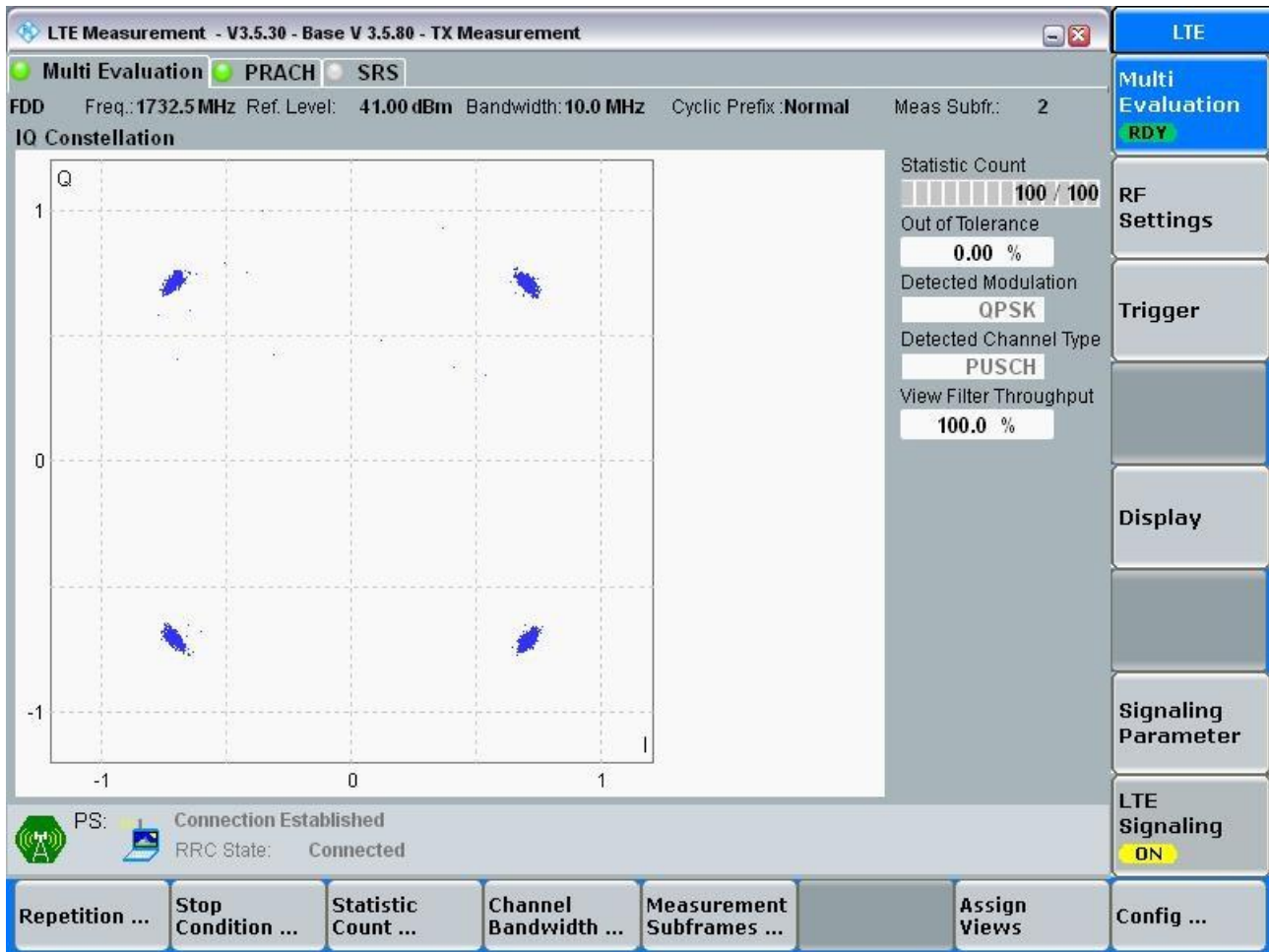
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### 3. Modulation Characteristics

#### 3.1. Test BAND = LTE BAND4

#### 3.1.1. Test Mode = LTE /TM1 10MHZ

#### 3.1.1.1. Test Channel = MCH



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## 4. 26dB Bandwidth and Occupied Bandwidth

### 4.1. Test Result

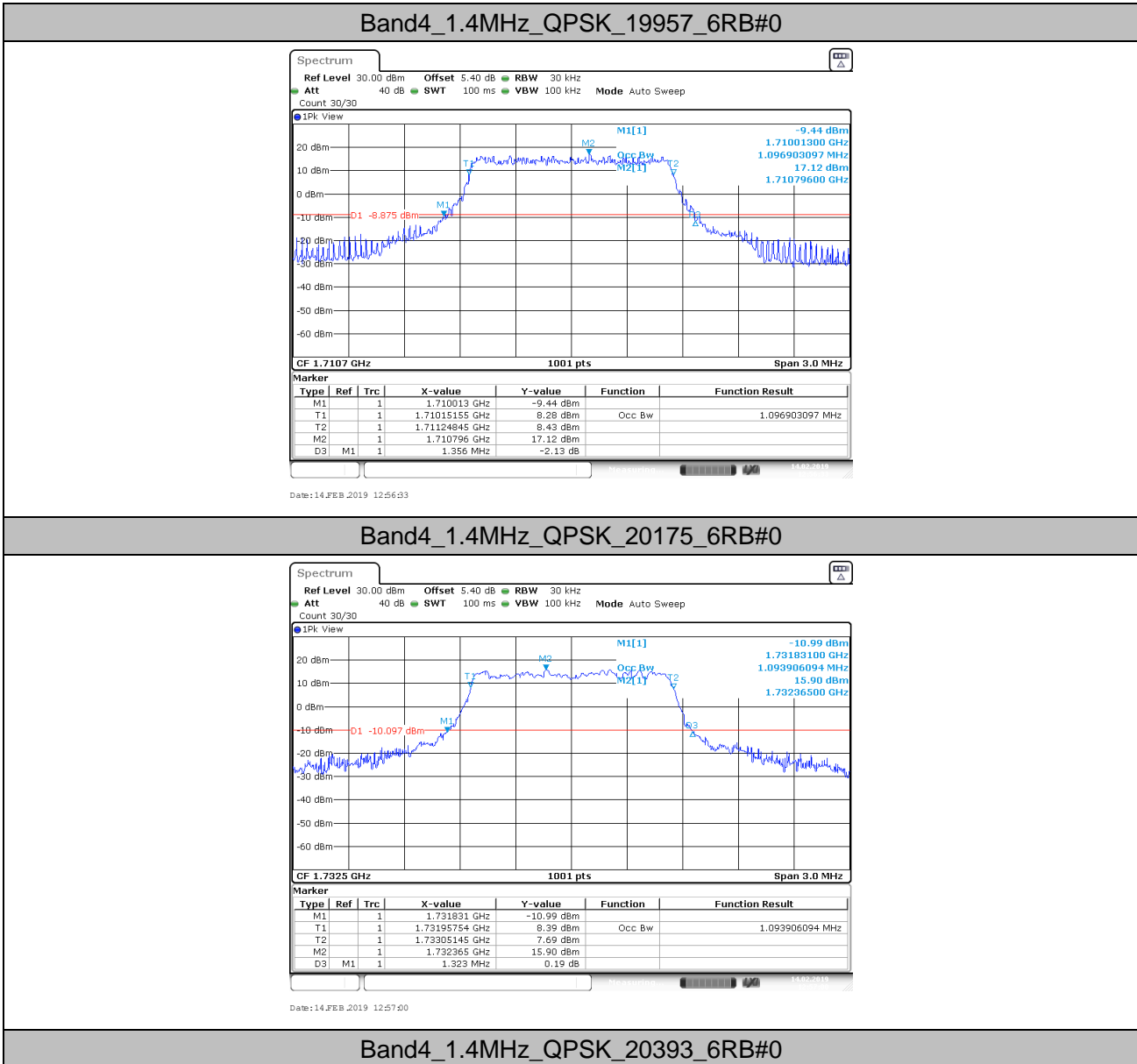
BAND	Bandwidth	Modulation	Channel	RB Configuration	Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)	Verdict
Band4	1.4MHz	QPSK	19957	6RB#0	1.097	1.356	PASS
Band4	1.4MHz	QPSK	20175	6RB#0	1.094	1.323	PASS
Band4	1.4MHz	QPSK	20393	6RB#0	1.097	1.350	PASS
Band4	3MHz	QPSK	19965	15RB#0	2.703	3.030	PASS
Band4	3MHz	QPSK	20175	15RB#0	2.697	3.030	PASS
Band4	3MHz	QPSK	20385	15RB#0	2.697	3.030	PASS
Band4	5MHz	QPSK	19975	25RB#0	4.476	4.990	PASS
Band4	5MHz	QPSK	20175	25RB#0	4.466	4.980	PASS
Band4	5MHz	QPSK	20375	25RB#0	4.476	5.020	PASS
Band4	10MHz	QPSK	20000	50RB#0	8.931	9.960	PASS
Band4	10MHz	QPSK	20175	50RB#0	8.931	10.000	PASS
Band4	10MHz	QPSK	20350	50RB#0	8.951	10.040	PASS



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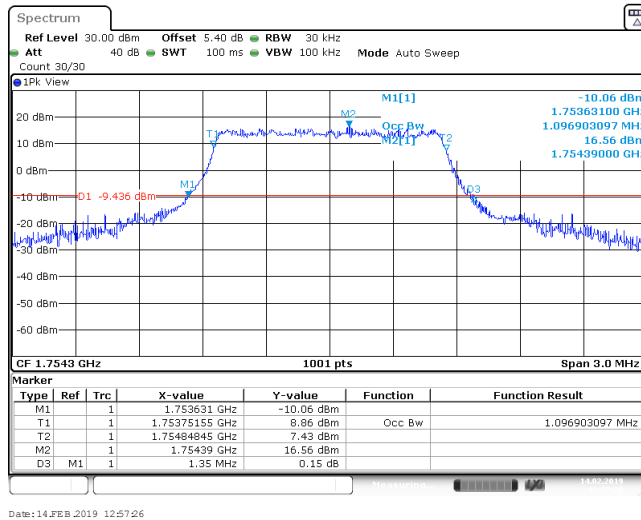
**4.2. Test Plots**



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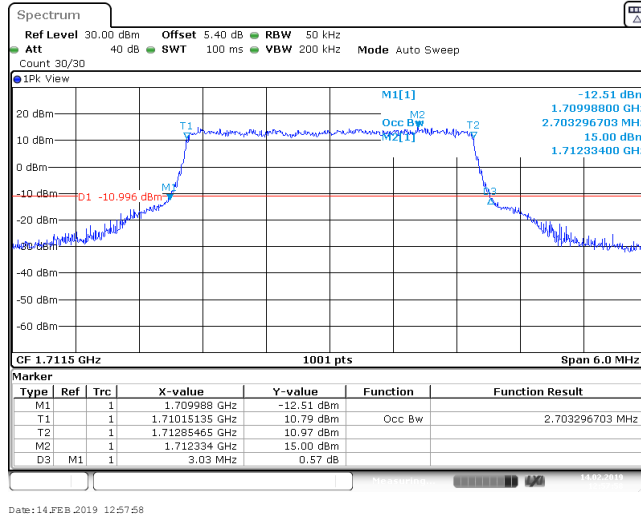
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Date: 14.FEB.2019 12:57:26

**Band4\_3MHz\_QPSK\_19965\_15RB#0**

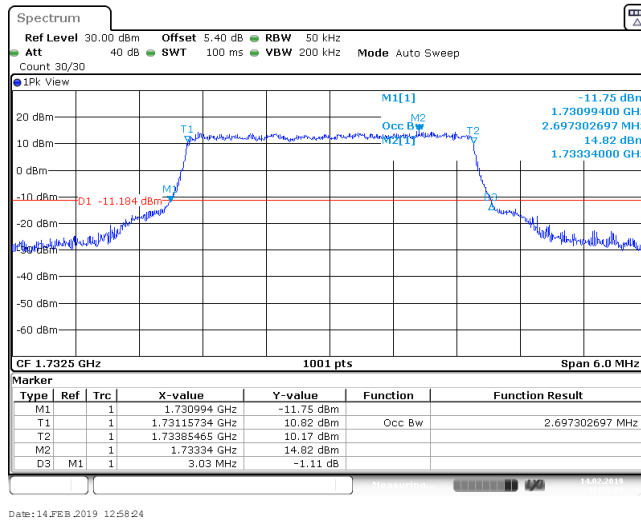


Date: 14.FEB.2019 12:57:58

**Band4\_3MHz\_QPSK\_20175\_15RB#0**

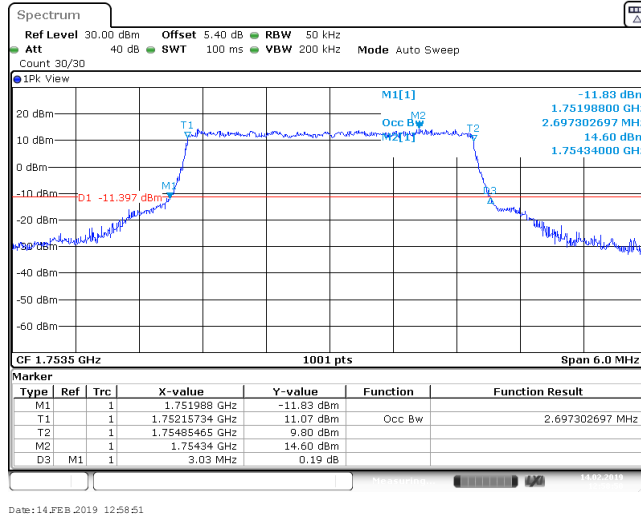


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Date: 14.FEB.2019 12:58:24

**Band4\_3MHz\_QPSK\_20385\_15RB#0**

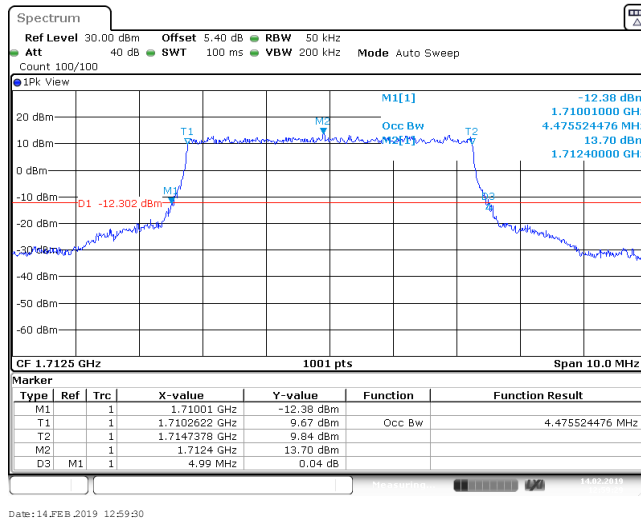


Date: 14.FEB.2019 12:58:51

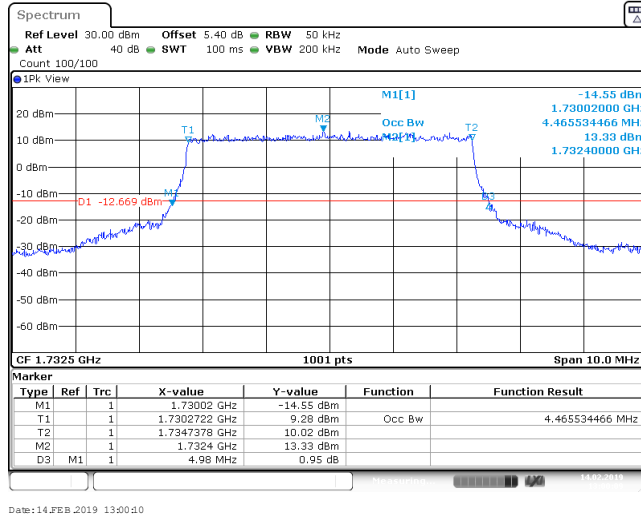
**Band4\_5MHz\_QPSK\_19975\_25RB#0**



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**Band4\_5MHz\_QPSK\_20175\_25RB#0**



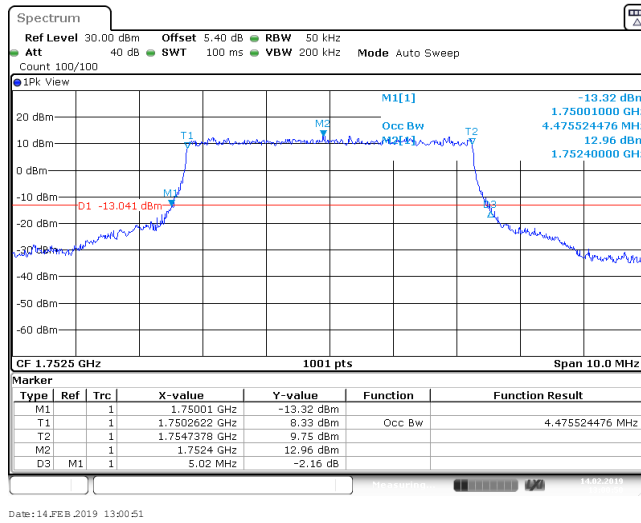
**Band4\_5MHz\_QPSK\_20375\_25RB#0**



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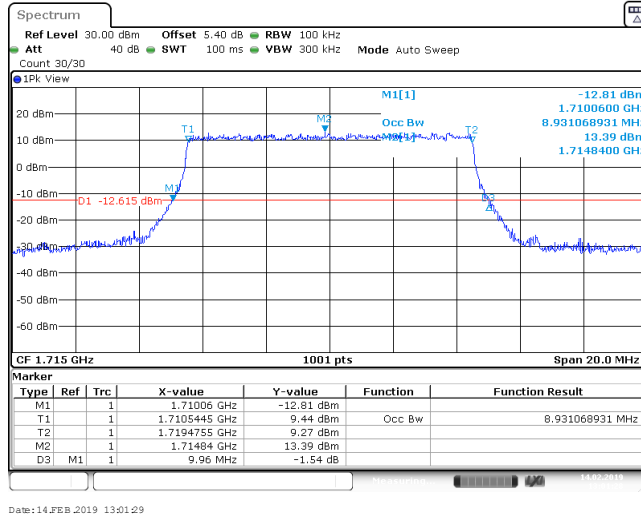
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Date: 14.FEB.2019 13:00:51

**Band4\_10MHz\_QPSK\_2000\_50RB#0**



Date: 14.FEB.2019 13:01:29

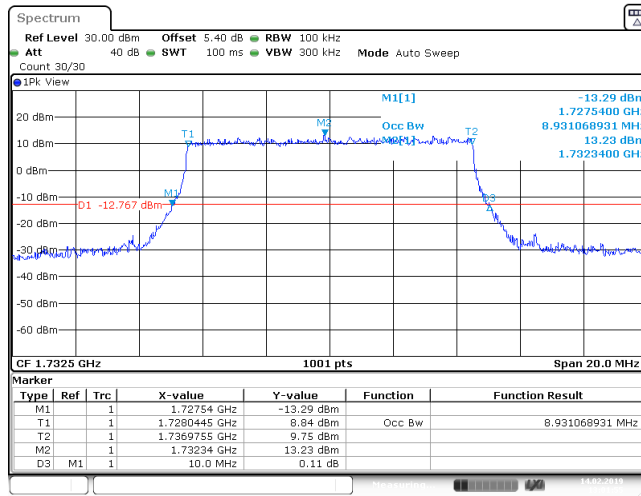
**Band4\_10MHz\_QPSK\_20175\_50RB#0**



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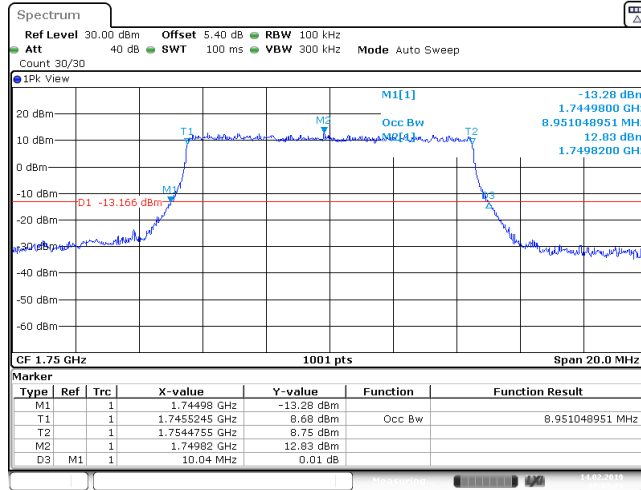
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Date: 14.FEB.2019 13:01:55

**Band\_10MHz\_QPSK\_20350\_50RB#0**



Date: 14.FEB.2019 13:02:22

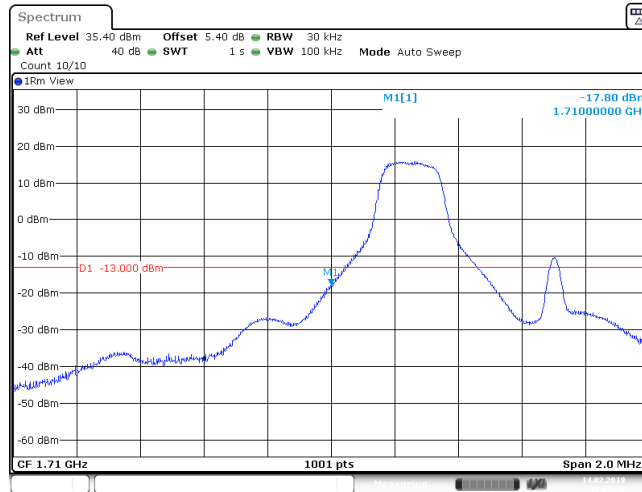


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## 5. Band Edge Compliance

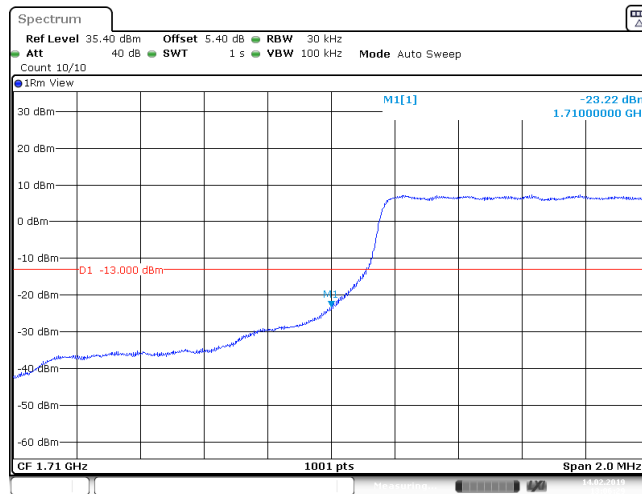
### 5.1. Test Plots

**Band4\_1.4MHz\_QPSK\_19957\_1RB#0**



Date: 14.FEB.2019 13:05:49

**Band4\_1.4MHz\_QPSK\_19957\_6RB#0**



Date: 14.FEB.2019 13:06:29

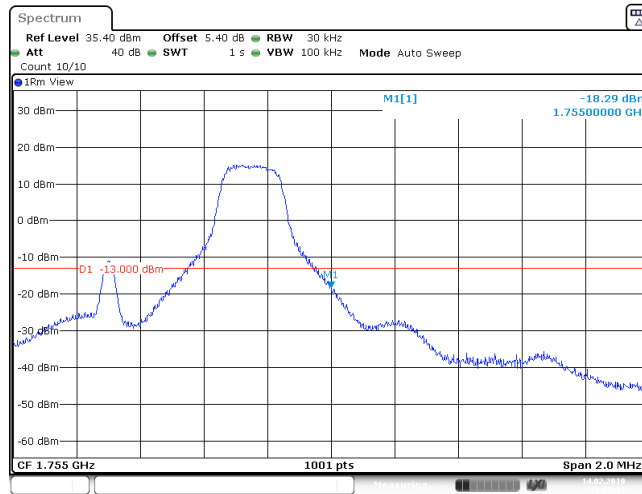
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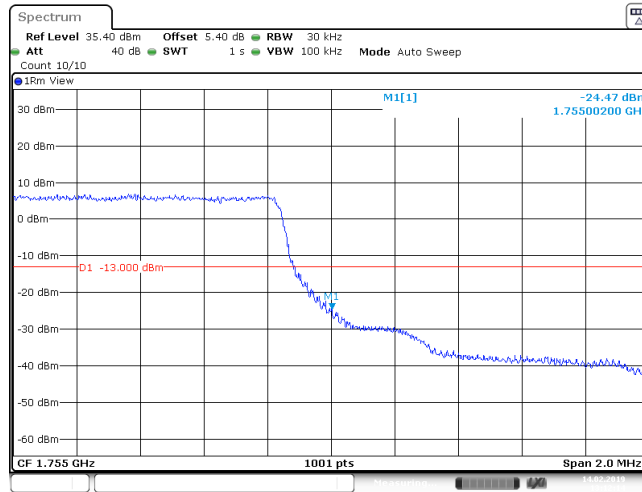
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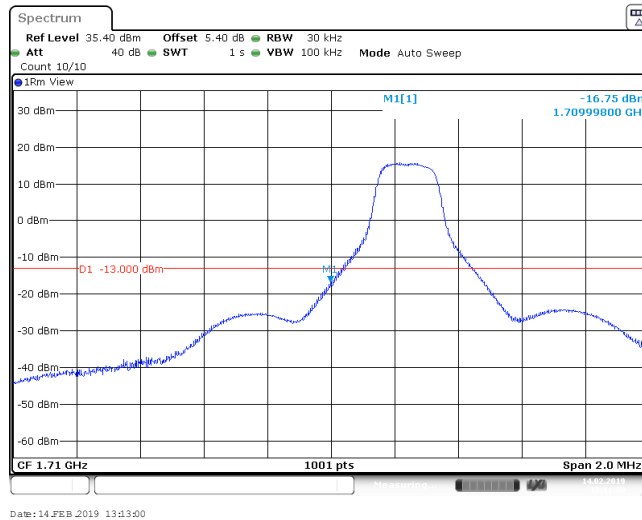
**Band4\_1.4MHz\_QPSK\_20393\_6RB#0**



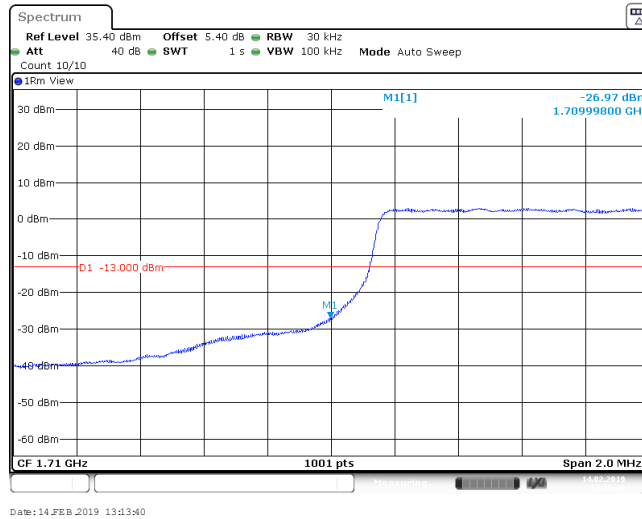
**Band4\_3MHz\_QPSK\_19965\_1RB#0**



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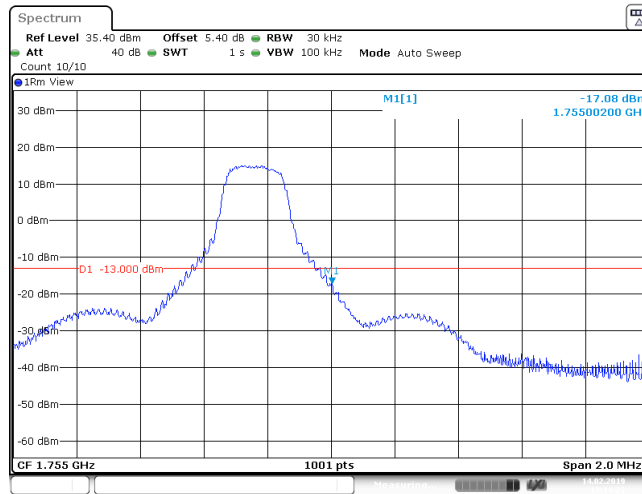
**Band4\_3MHz\_QPSK\_19965\_15RB#0**



**Band4\_3MHz\_QPSK\_20385\_1RB#14**

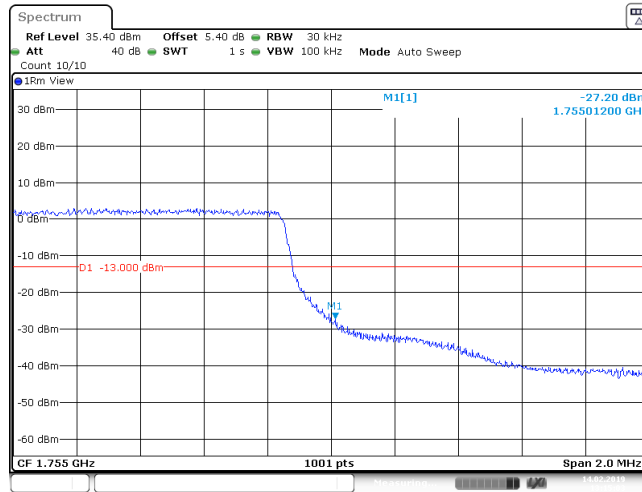


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Date: 14.FEB.2019 13:14:23

**Band4\_3MHz\_QPSK\_20385\_15RB#0**

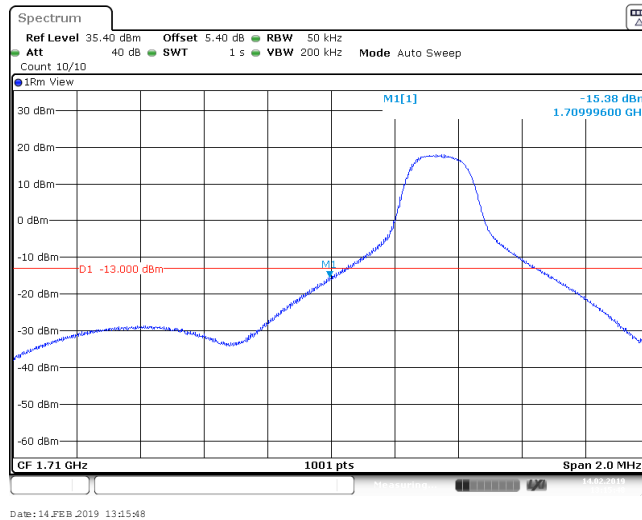


Date: 14.FEB.2019 13:15:04

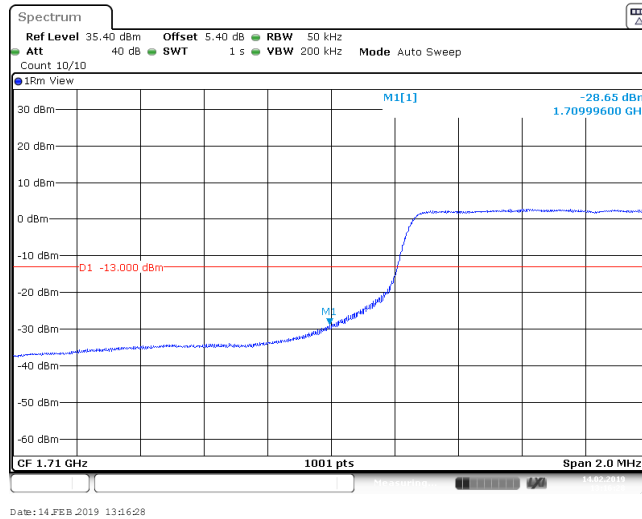
**Band4\_5MHz\_QPSK\_19975\_1RB#0**



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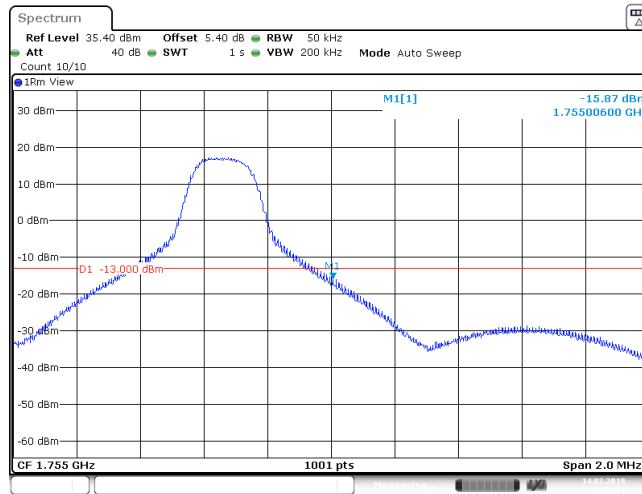
**Band4\_5MHz\_QPSK\_19975\_25RB#0**



**Band4\_5MHz\_QPSK\_20375\_1RB#24**

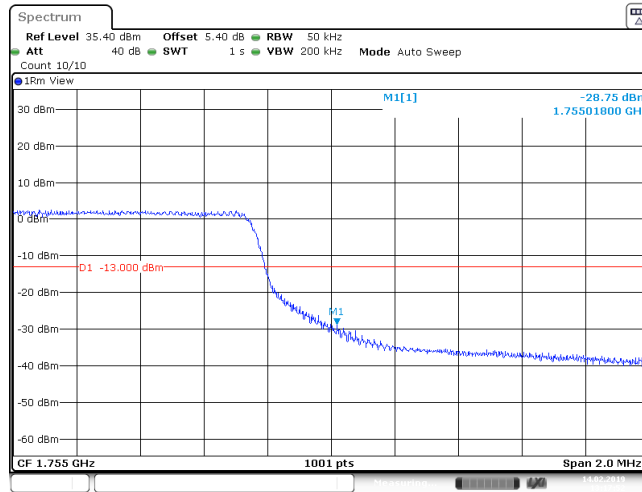


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Date: 14.FEB.2019 13:17:12

**Band4\_5MHz\_QPSK\_20375\_25RB#0**

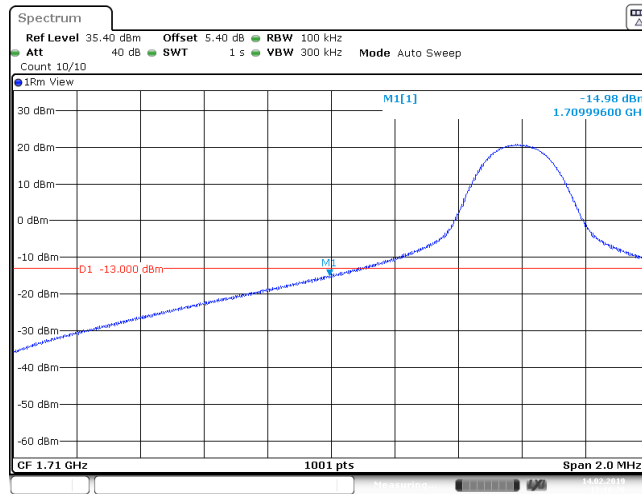


Date: 14.FEB.2019 13:17:52

**Band4\_10MHz\_QPSK\_20000\_1RB#0**

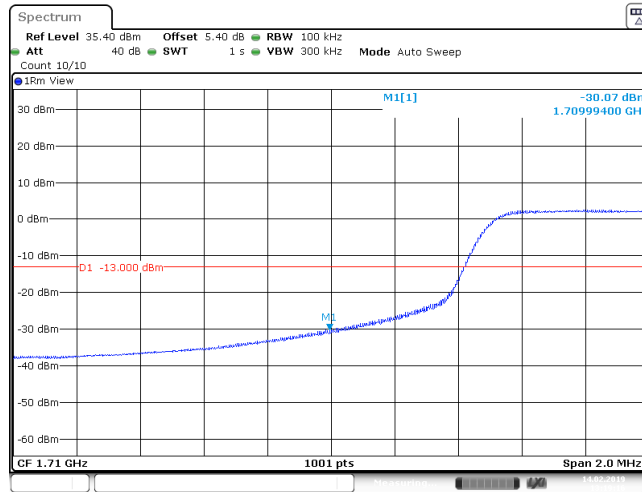


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Date: 14.FEB.2019 13:18:36

**Band4\_10MHz\_QPSK\_20000\_50RB#0**

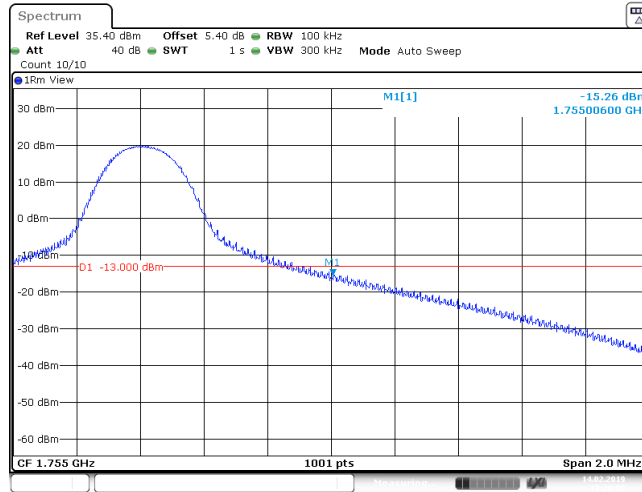


Date: 14.FEB.2019 13:19:16

**Band4\_10MHz\_QPSK\_20350\_1RB#49**

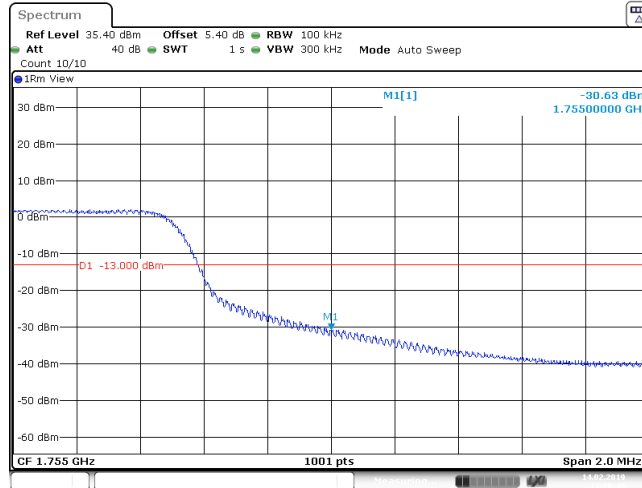


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Date: 14.FEB.2019 13:20:00

**Band4\_10MHz\_QPSK\_20350\_50RB#0**



Date: 14.FEB.2019 13:20:00



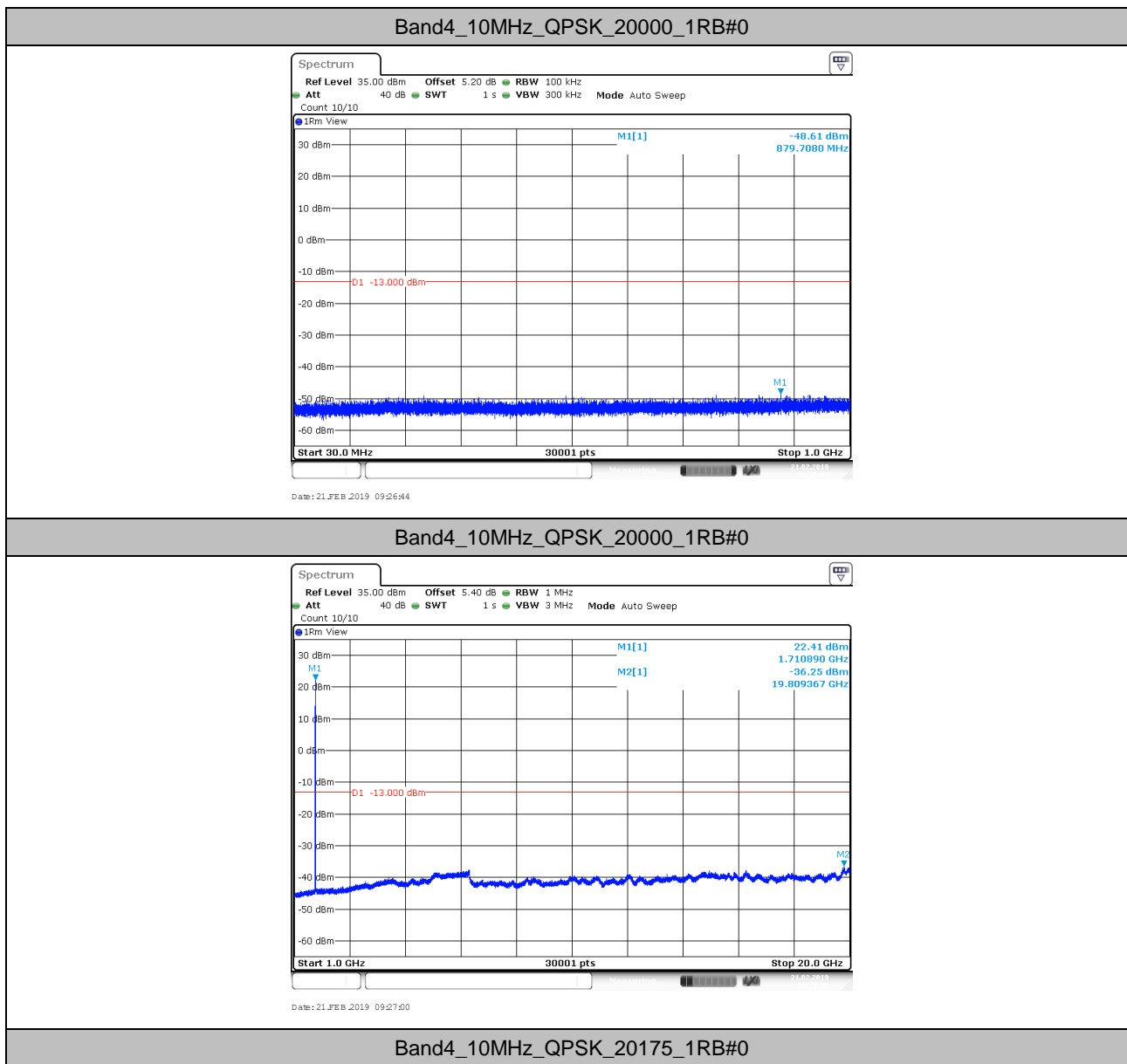
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## 6. Spurious Emission at Antenna Terminal

Remark1: 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.

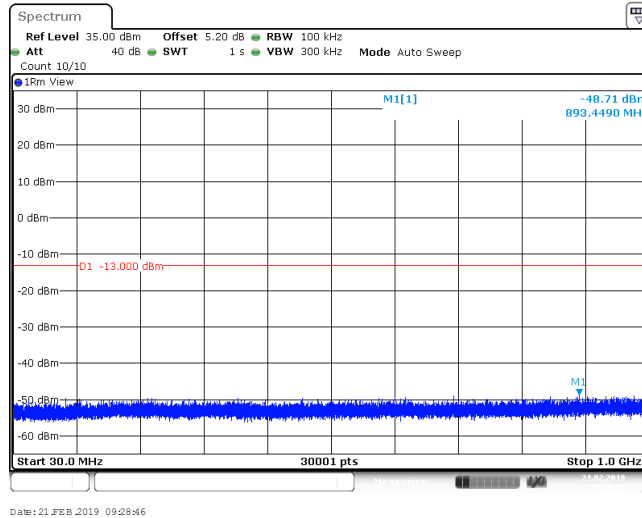
Remark2: only the worst case data displayed in this report.

### 6.1. Test Plots

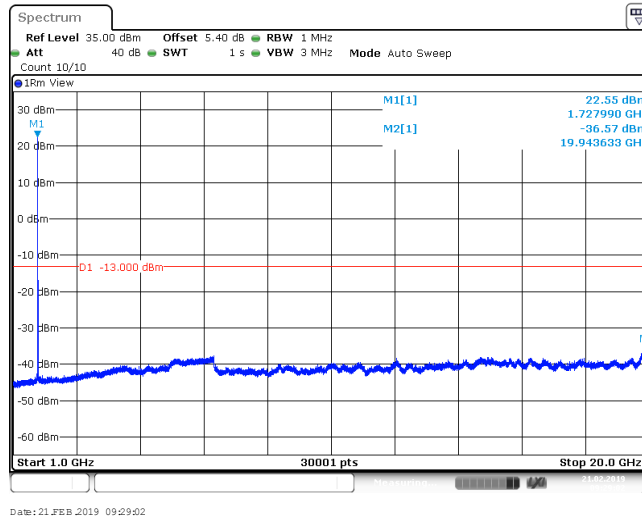


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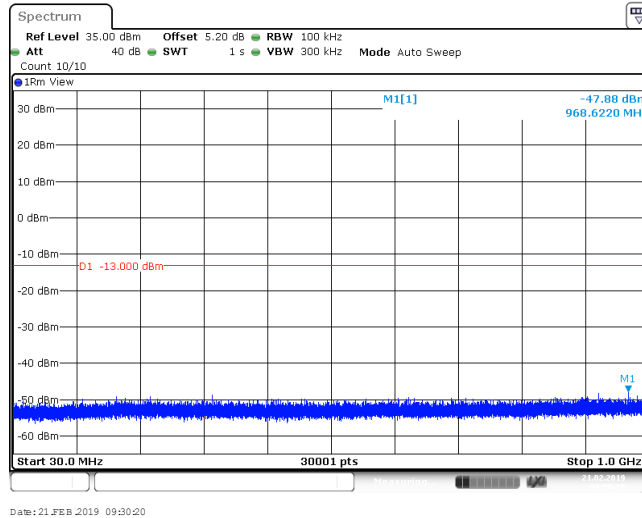
Band4\_10MHz\_QPSK\_20175\_1RB#0



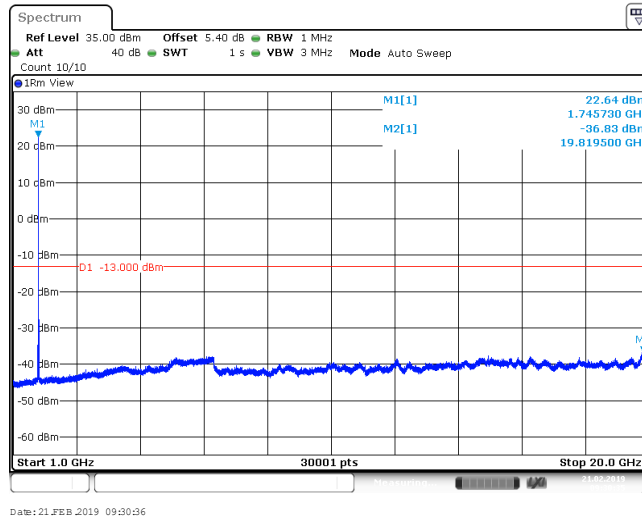
Band4\_10MHz\_QPSK\_20350\_1RB#0



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**Band4\_10MHz\_QPSK\_20350\_1RB#0**



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## 7. Field Strength of Spurious Radiation

### 7.1. Test BAND = LTE BAND 4

#### 7.1.1. Test Mode = LTE/TM1 10MHz

##### 7.1.1.1. Test Channel = LCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
111.400000	-78.39	-13.00	65.39	Vertical
703.916667	-71.35	-13.00	58.35	Vertical
3420.875000	-32.96	-13.00	19.96	Vertical
5131.675000	-36.82	-13.00	23.82	Vertical
6842.150000	-36.69	-13.00	23.69	Vertical
10263.750000	-56.37	-13.00	43.37	Vertical
63.350000	-77.60	-13.00	64.60	Horizontal
509.720833	-73.06	-13.00	60.06	Horizontal
3421.200000	-33.07	-13.00	20.07	Horizontal
5131.675000	-34.26	-13.00	21.26	Horizontal
6842.150000	-37.02	-13.00	24.02	Horizontal
8552.950000	-54.04	-13.00	41.04	Horizontal

##### 7.1.1.2. Test Channel = MCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
109.600000	-79.01	-13.00	66.01	Vertical
946.695833	-69.64	-13.00	56.64	Vertical
3455.975000	-33.90	-13.00	20.90	Vertical
5184.325000	-38.48	-13.00	25.48	Vertical
6912.350000	-37.36	-13.00	24.36	Vertical
10368.725000	-58.45	-13.00	45.45	Vertical
62.450000	-77.36	-13.00	64.36	Horizontal
509.720833	-72.59	-13.00	59.59	Horizontal



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3455.975000	-32.85	-13.00	19.85	Horizontal
5184.000000	-36.78	-13.00	23.78	Horizontal
6912.350000	-37.81	-13.00	24.81	Horizontal
8640.375000	-55.07	-13.00	42.07	Horizontal

**7.1.1.3. Test Channel = HCH**

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
112.450000	-78.56	-13.00	65.56	Vertical
703.916667	-71.49	-13.00	58.49	Vertical
3491.075000	-36.13	-13.00	23.13	Vertical
4134.575000	-61.72	-13.00	48.72	Vertical
5236.650000	-41.05	-13.00	28.05	Vertical
6982.225000	-40.50	-13.00	27.50	Vertical
63.200000	-77.33	-13.00	64.33	Horizontal
509.720833	-72.48	-13.00	59.48	Horizontal
3491.075000	-37.28	-13.00	24.28	Horizontal
5236.650000	-40.95	-13.00	27.95	Horizontal
6982.225000	-40.31	-13.00	27.31	Horizontal
8727.800000	-57.92	-13.00	44.92	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 Vs Voltage

Voltage										
BAND	Bandwidth	Modulation	Channel	RB Configure	Voltage [Vdc]	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
Band4	10MHz	QPSK	20000	50RB#0	VL	NT	-11.47	-0.006688	±2.5	PASS
Band4	10MHz	QPSK	20000	50RB#0	VN	NT	12.82	0.007475	±2.5	PASS
Band4	10MHz	QPSK	20000	50RB#0	VH	NT	-9.33	-0.005440	±2.5	PASS
Band4	10MHz	QPSK	20175	50RB#0	VL	NT	-11.54	-0.006661	±2.5	PASS
Band4	10MHz	QPSK	20175	50RB#0	VN	NT	-12.07	-0.006967	±2.5	PASS
Band4	10MHz	QPSK	20175	50RB#0	VH	NT	-11.26	-0.006499	±2.5	PASS
Band4	10MHz	QPSK	20350	50RB#0	VL	NT	-13.73	-0.007846	±2.5	PASS
Band4	10MHz	QPSK	20350	50RB#0	VN	NT	11.26	0.006434	±2.5	PASS
Band4	10MHz	QPSK	20350	50RB#0	VH	NT	11.57	0.006611	±2.5	PASS

### 8.2. Frequency Vs Temperature

Temperature										
BAND	Bandwidth	Modulation	Channel	RB Configure	Voltage [Vdc]	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
Band4	10MHz	QPSK	20000	50RB#0	NV	-30	11.76	0.006857	±2.5	PASS
Band4	10MHz	QPSK	20000	50RB#0	NV	-20	16.47	0.009603	±2.5	PASS
Band4	10MHz	QPSK	20000	50RB#0	NV	0	12.50	0.007289	±2.5	PASS
Band4	10MHz	QPSK	20000	50RB#0	NV	10	-10.36	-0.006041	±2.5	PASS
Band4	10MHz	QPSK	20000	50RB#0	NV	20	10.14	0.005913	±2.5	PASS
Band4	10MHz	QPSK	20000	50RB#0	NV	30	10.46	0.006099	±2.5	PASS
Band4	10MHz	QPSK	20000	50RB#0	NV	40	-15.88	-0.009259	±2.5	PASS
Band4	10MHz	QPSK	20000	50RB#0	NV	50	-13.29	-0.007749	±2.5	PASS
Band4	10MHz	QPSK	20175	50RB#0	NV	-30	-12.36	-0.007134	±2.5	PASS
Band4	10MHz	QPSK	20175	50RB#0	NV	-20	-11.33	-0.006540	±2.5	PASS
Band4	10MHz	QPSK	20175	50RB#0	NV	0	-12.30	-0.007100	±2.5	PASS
Band4	10MHz	QPSK	20175	50RB#0	NV	10	-11.34	-0.006545	±2.5	PASS
Band4	10MHz	QPSK	20175	50RB#0	NV	20	-11.07	-0.006390	±2.5	PASS
Band4	10MHz	QPSK	20175	50RB#0	NV	30	-11.54	-0.006661	±2.5	PASS
Band4	10MHz	QPSK	20175	50RB#0	NV	40	-17.01	-0.009818	±2.5	PASS
Band4	10MHz	QPSK	20175	50RB#0	NV	50	-11.10	-0.006407	±2.5	PASS
Band4	10MHz	QPSK	20350	50RB#0	NV	-30	14.16	0.008091	±2.5	PASS
Band4	10MHz	QPSK	20350	50RB#0	NV	-20	-12.87	-0.007354	±2.5	PASS
Band4	10MHz	QPSK	20350	50RB#0	NV	0	11.57	0.006611	±2.5	PASS
Band4	10MHz	QPSK	20350	50RB#0	NV	10	14.02	0.008011	±2.5	PASS
Band4	10MHz	QPSK	20350	50RB#0	NV	20	11.30	0.006457	±2.5	PASS
Band4	10MHz	QPSK	20350	50RB#0	NV	30	11.44	0.006537	±2.5	PASS
Band4	10MHz	QPSK	20350	50RB#0	NV	40	10.59	0.006051	±2.5	PASS
Band4	10MHz	QPSK	20350	50RB#0	NV	50	-12.12	-0.006926	±2.5	PASS



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