



Appendix B

WCDMA BAND II & IV & V



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1. Effective (Isotropic) Radiated Power Output Data

1.1. Test Result

BAND	Channel	Power(dBm)	EIRP(dBm)	Limit(dBm)	Verdict
Band II	9262	23.42	14.62	33.00	PASS
Band II	9400	23.55	14.75	33.00	PASS
Band II	9538	23.60	14.80	33.00	PASS
Band IV	1312	23.35	13.55	30.00	PASS
Band IV	1413	23.39	13.59	30.00	PASS
Band IV	1513	23.41	13.61	30.00	PASS

BAND	Channel	Power(dBm)	ERP(dBm)	Limit(dBm)	Verdict
Band V	4132	23.57	13.27	38.45	PASS
Band V	4182	23.52	13.22	38.45	PASS
Band V	4233	23.61	13.31	38.45	PASS

Remark:

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

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

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

b: SGP=Signal Generator Level

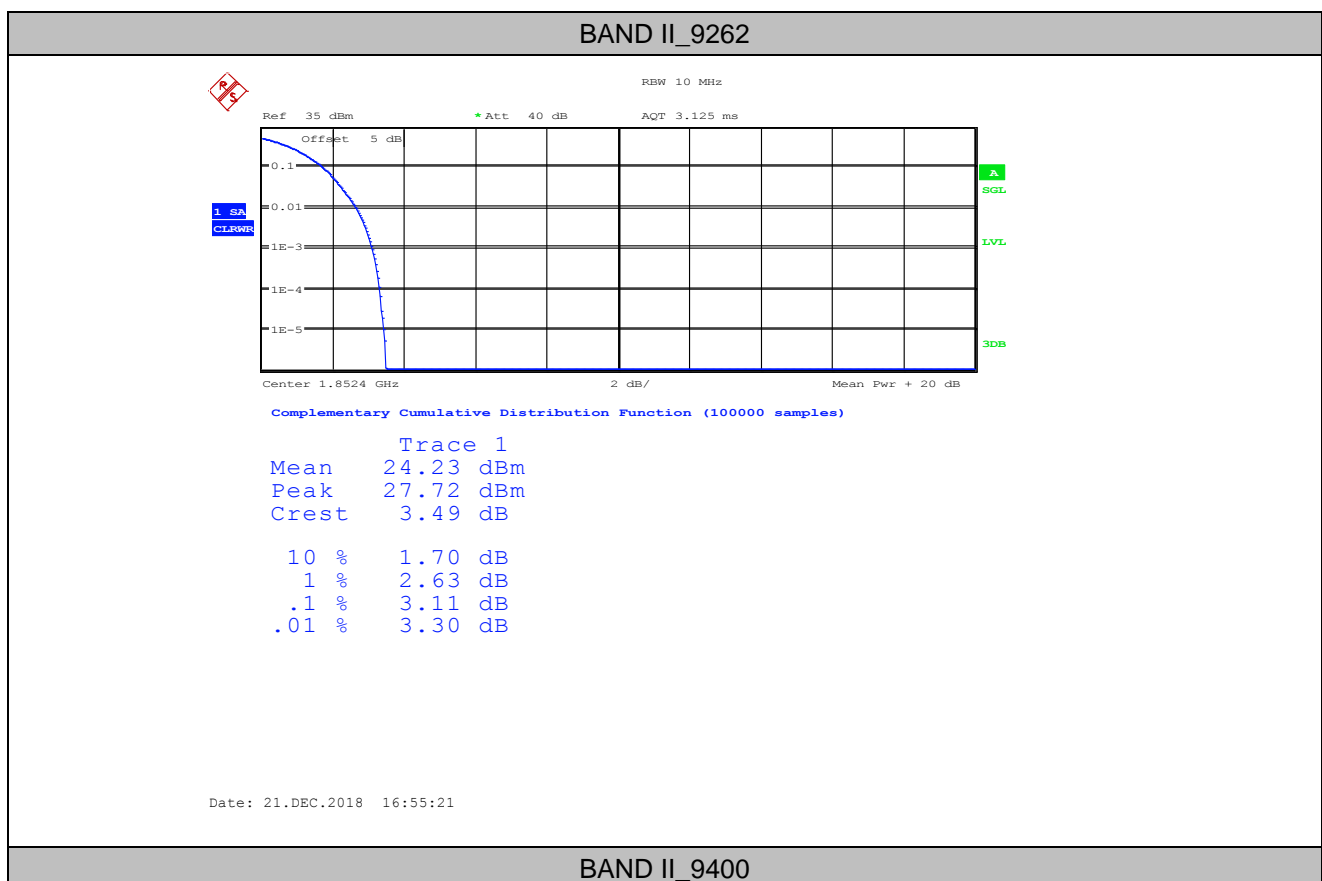


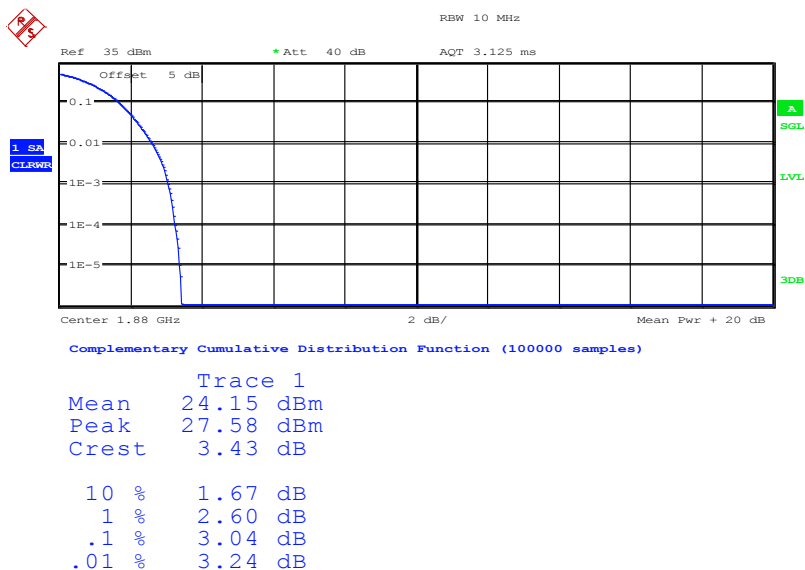
2. Peak-to-Average Ratio

2.1. Test Result

BAND	Channel	Peak-to-Average Ratio(dB)	Limit(dB)	Verdict
Band II	9262	3.11	13	PASS
Band II	9400	3.04	13	PASS
Band II	9538	3.14	13	PASS
Band IV	1312	2.82	13	PASS
Band IV	1413	3.01	13	PASS
Band IV	1513	2.82	13	PASS
Band V	4132	2.50	13	PASS
Band V	4182	3.14	13	PASS
Band V	4233	2.82	13	PASS

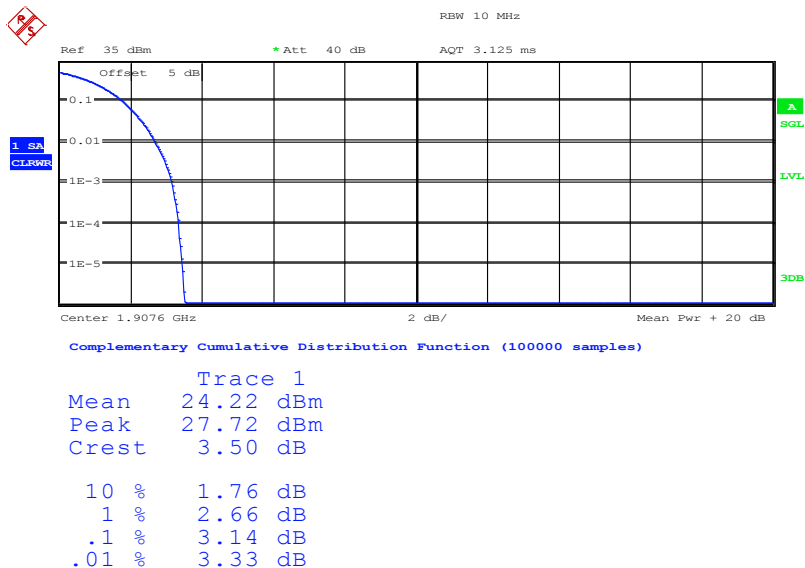
2.2. Test Plots





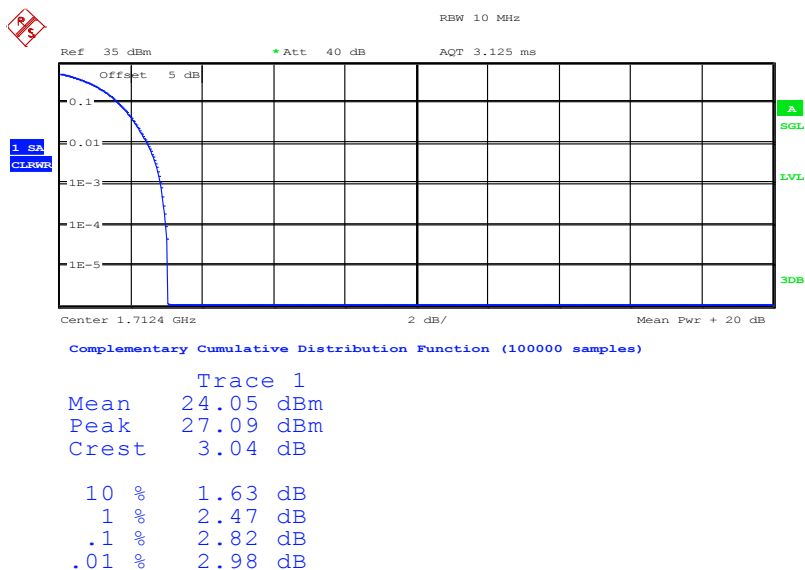
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BAND II_9538



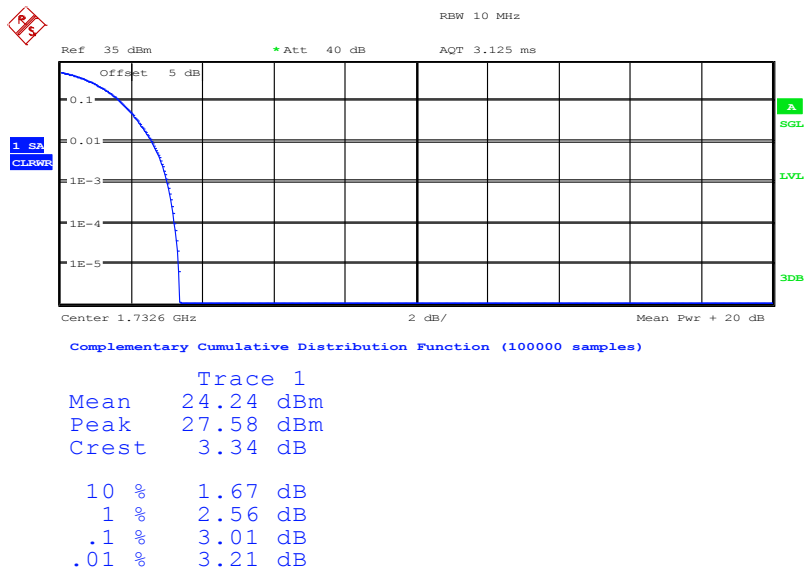
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BAND IV_1312



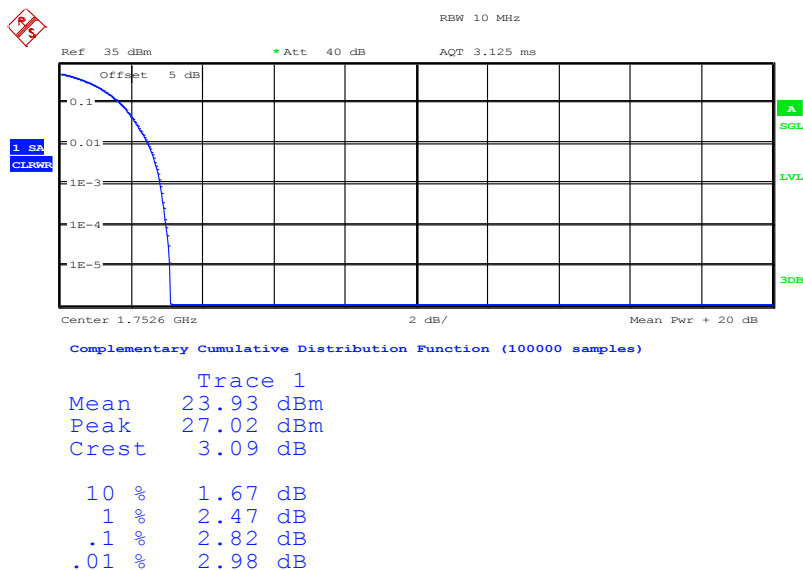
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BAND IV_1413



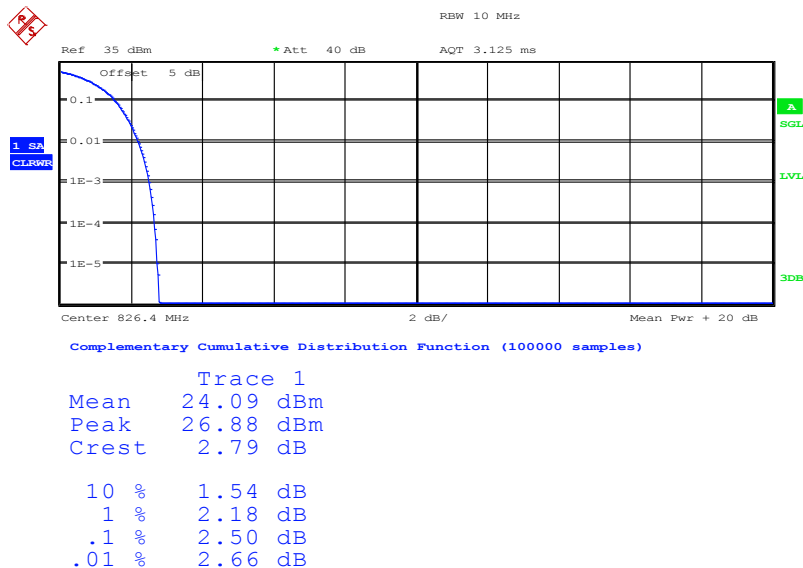
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BAND IV_1513



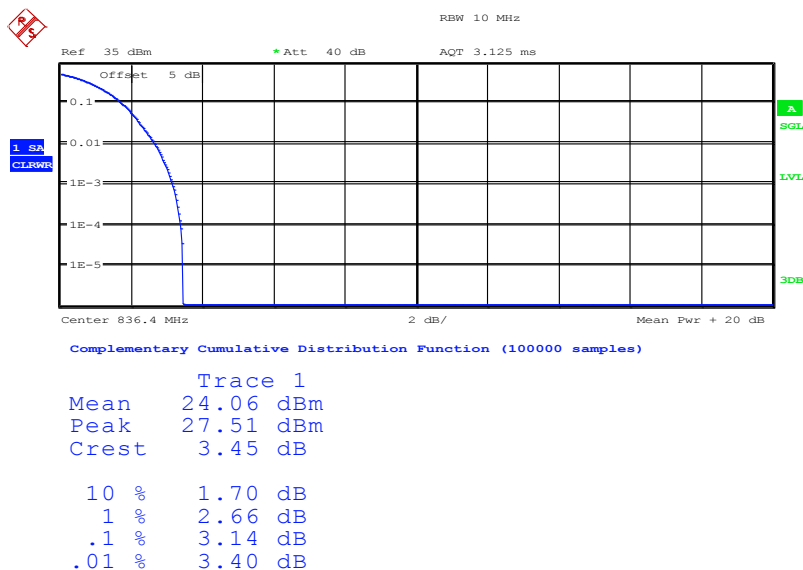
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BAND V_4132



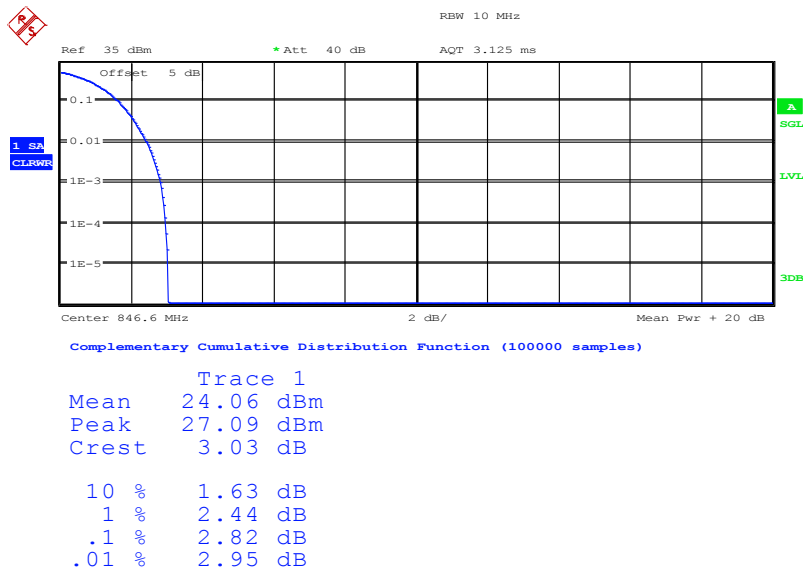
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BAND V_4182



Date: 21.DEC.2018 16:50:18

BAND V_4233



Date: 21.DEC.2018 16:48:44

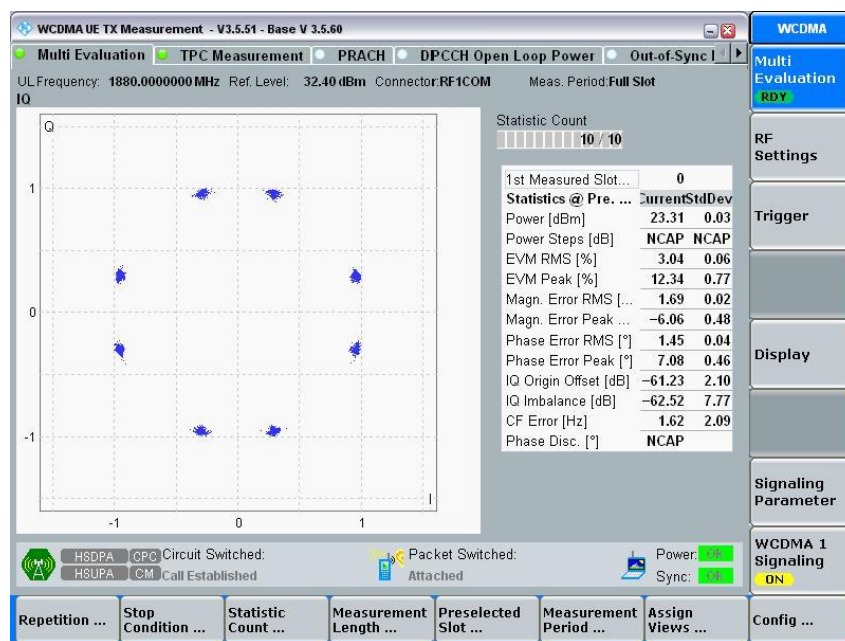
3. Modulation Characteristics

3.1. For WCDMA

3.1.1. Test BAND = WCDMA BAND II

3.1.1.1. Test Mode = UMTS/TM1

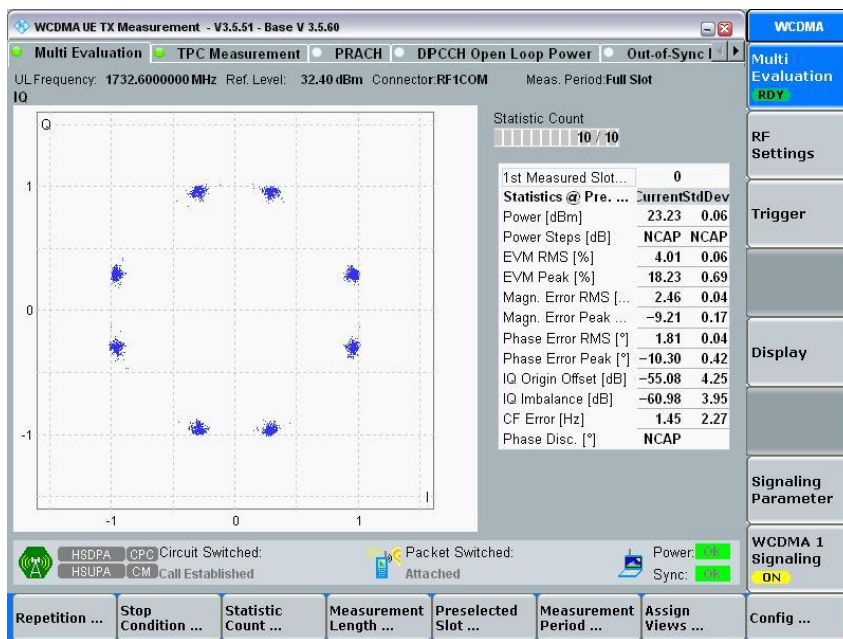
3.1.1.1.1. Test Channel = MCH



3.1.2. Test BAND = WCDMA BAND IV

3.1.2.1. Test Mode = UMTS/TM1

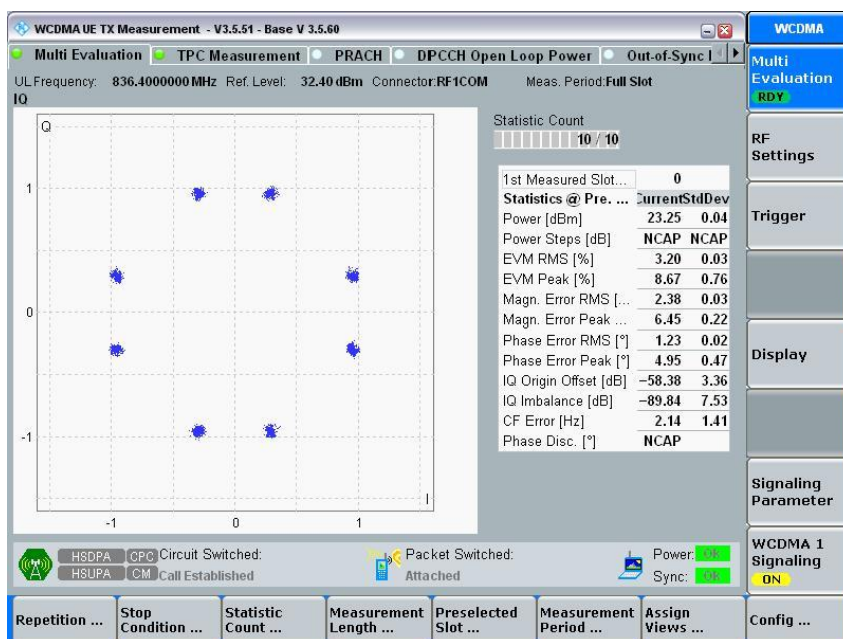
3.1.2.1.1. Test Channel = MCH



3.1.3. Test BAND = WCDMA BAND V

3.1.3.1. Test Mode = UMTS /TM1

3.1.3.1.1. Test Channel = MCH





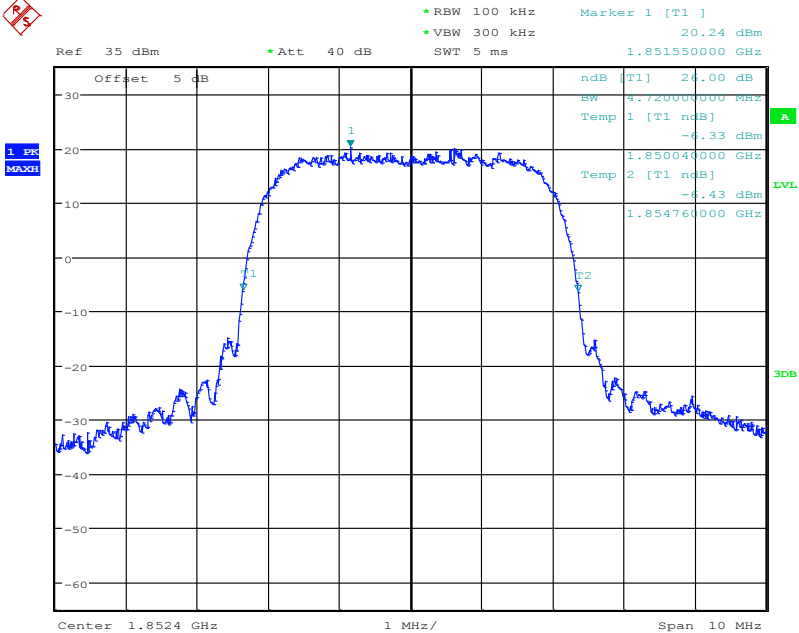
4. 26dB Bandwidth and Occupied Bandwidth

4.1. Test Result

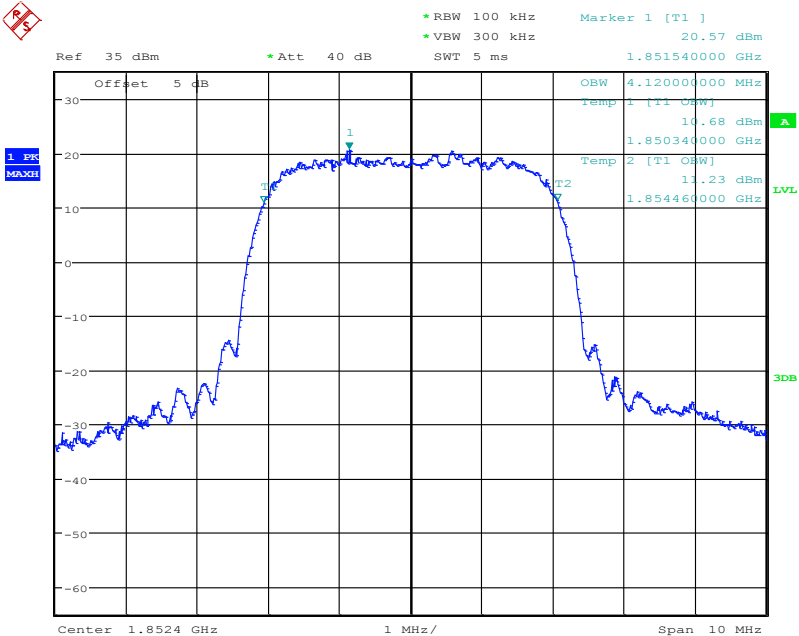
BAND	Channel	Occupied Bandwidth (MHz)	26dB Bandwidth (MHz)	Limit(kHz)	Verdict
Band II	9262	4.12	4.72	---	PASS
Band II	9400	4.13	4.70	---	PASS
Band II	9538	4.13	4.70	---	PASS
Band IV	1312	4.13	4.71	---	PASS
Band IV	1413	4.14	4.70	---	PASS
Band IV	1513	4.13	4.73	---	PASS
Band V	4132	4.15	4.74	---	PASS
Band V	4182	4.14	4.69	---	PASS
Band V	4233	4.14	4.75	---	PASS



4.2. Test Plots

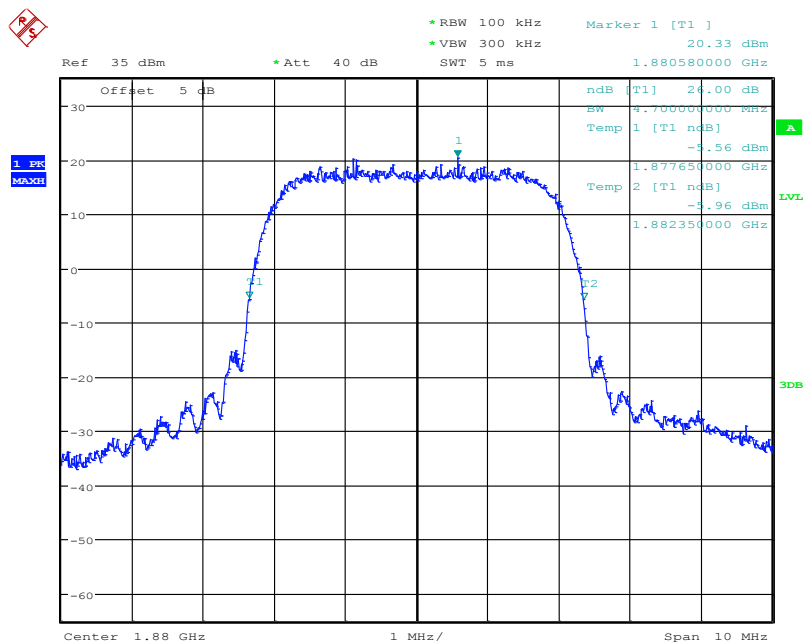


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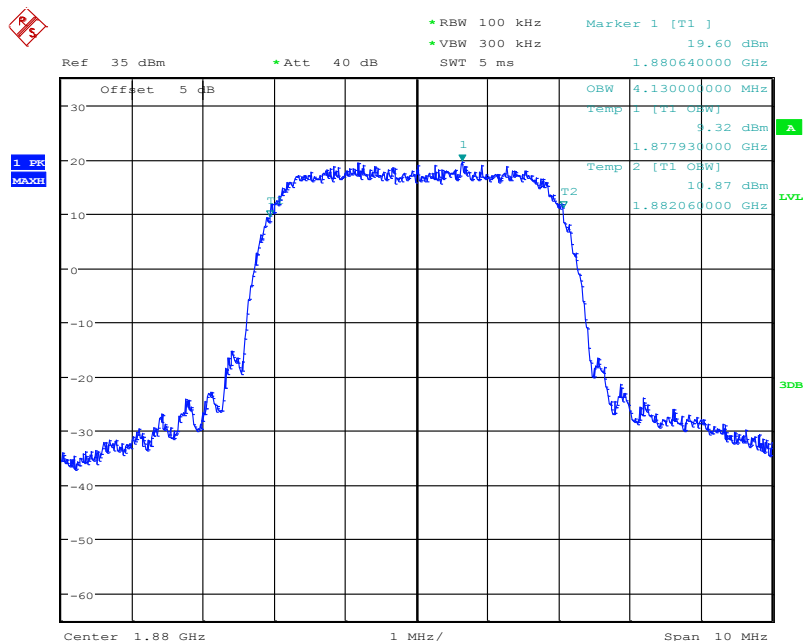


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Band II_9262

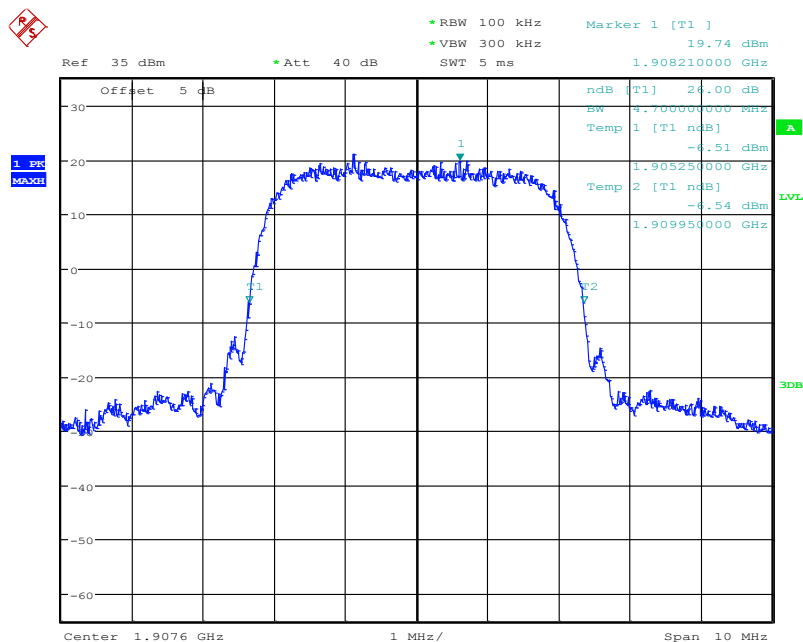


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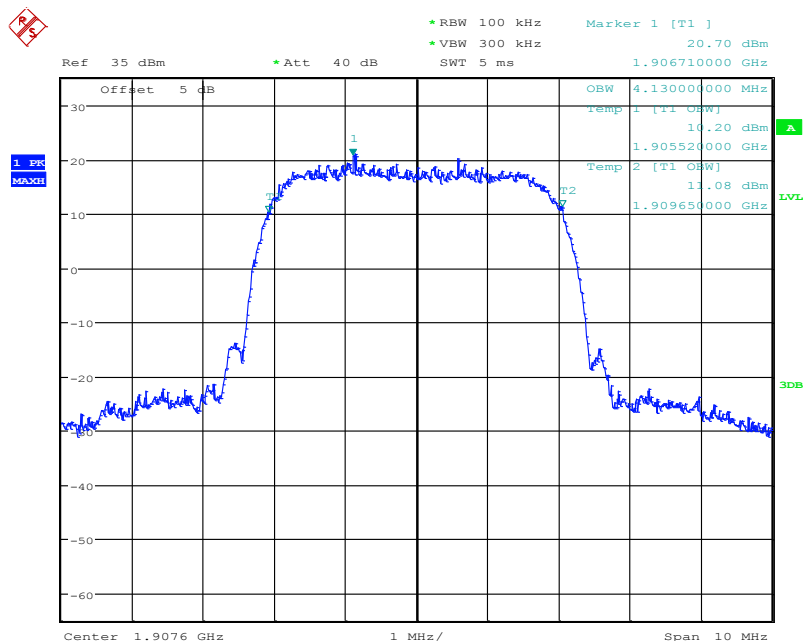


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Band II_9400

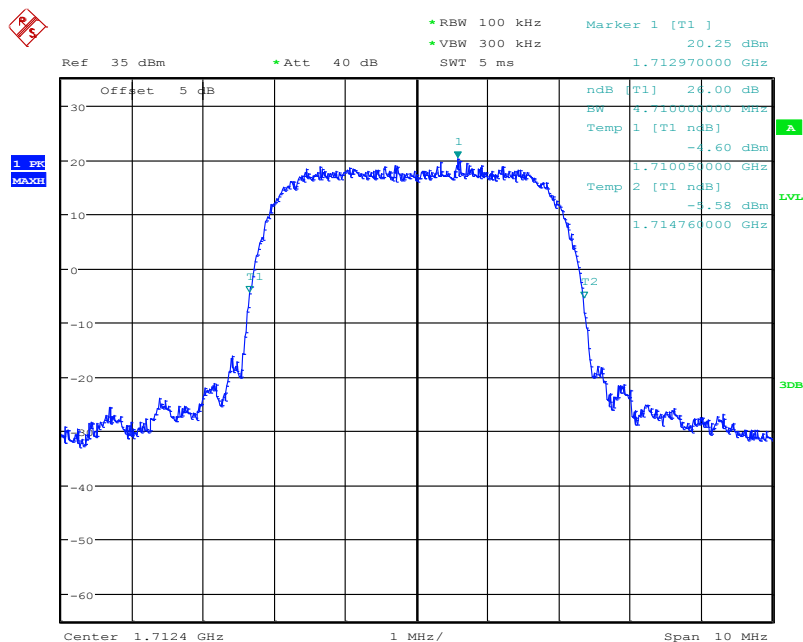


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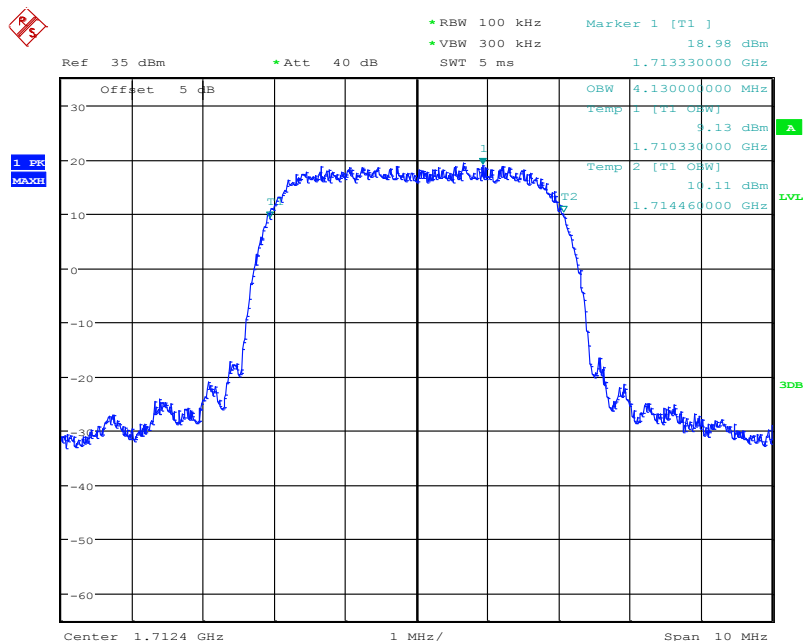


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Band II_9538

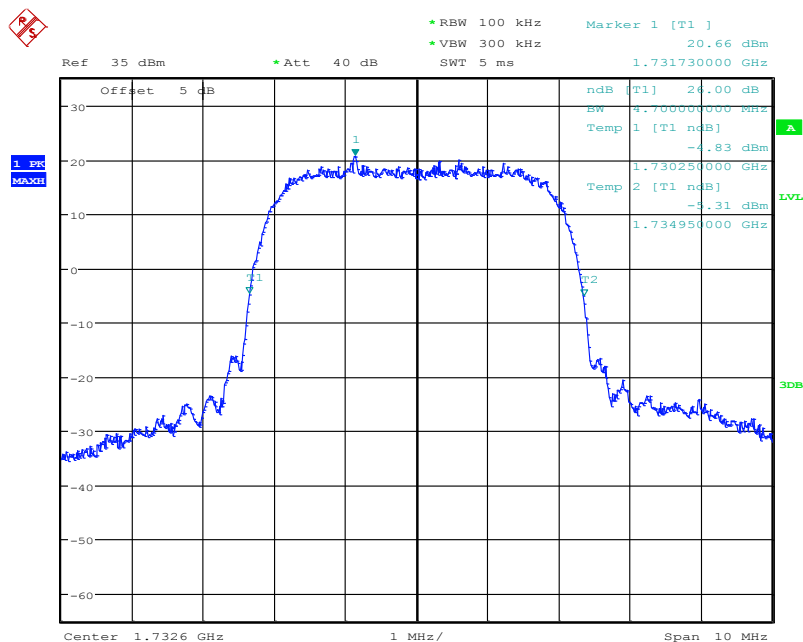


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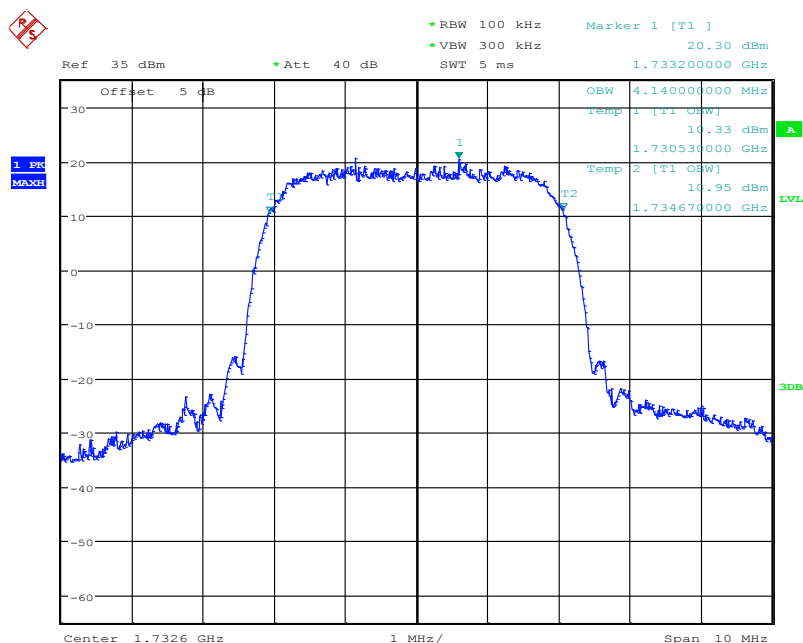


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Band IV_1312

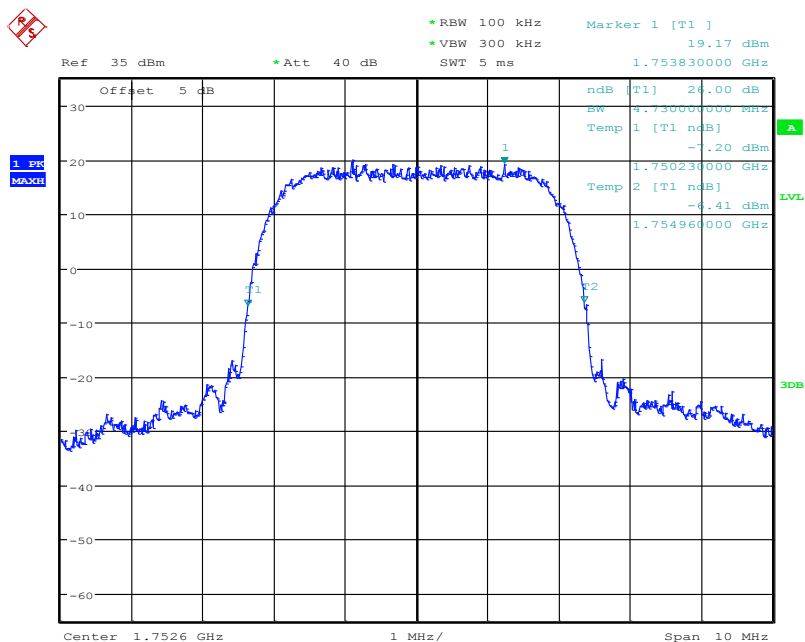


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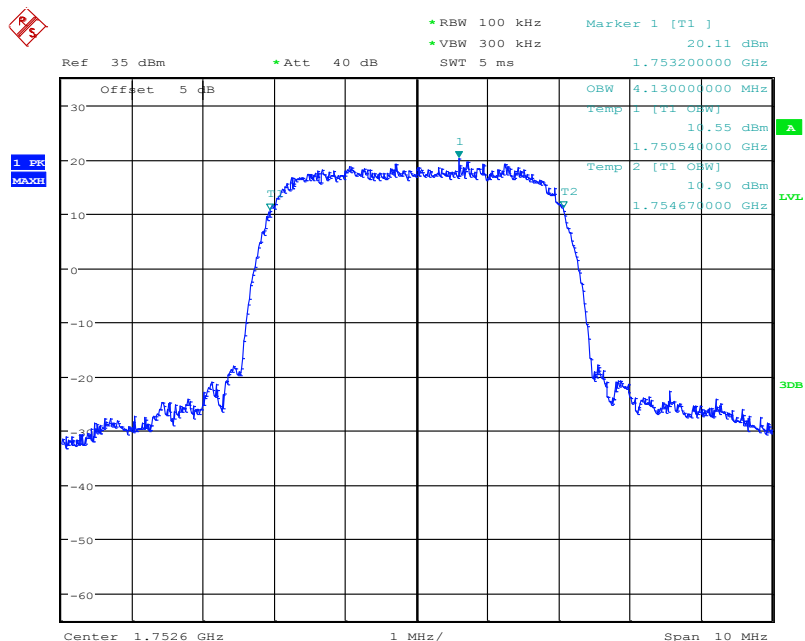


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Band IV_1413

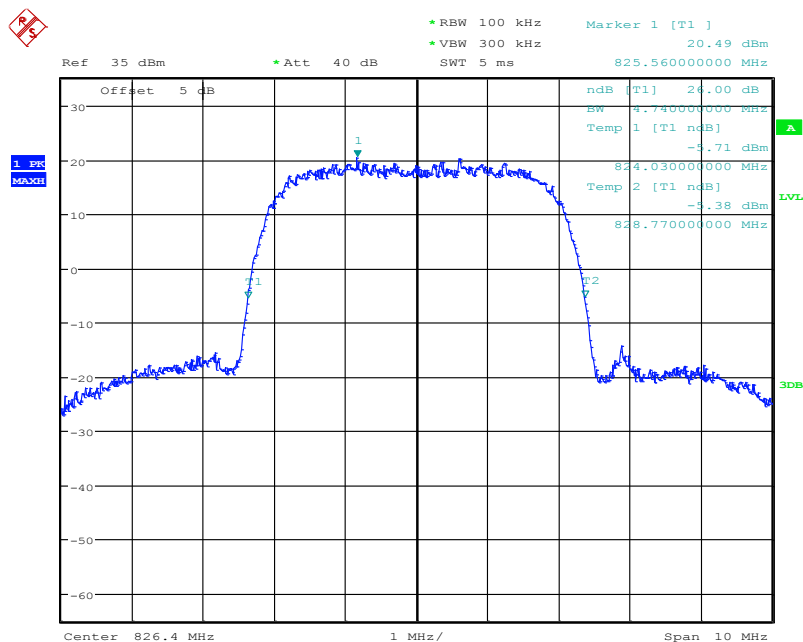


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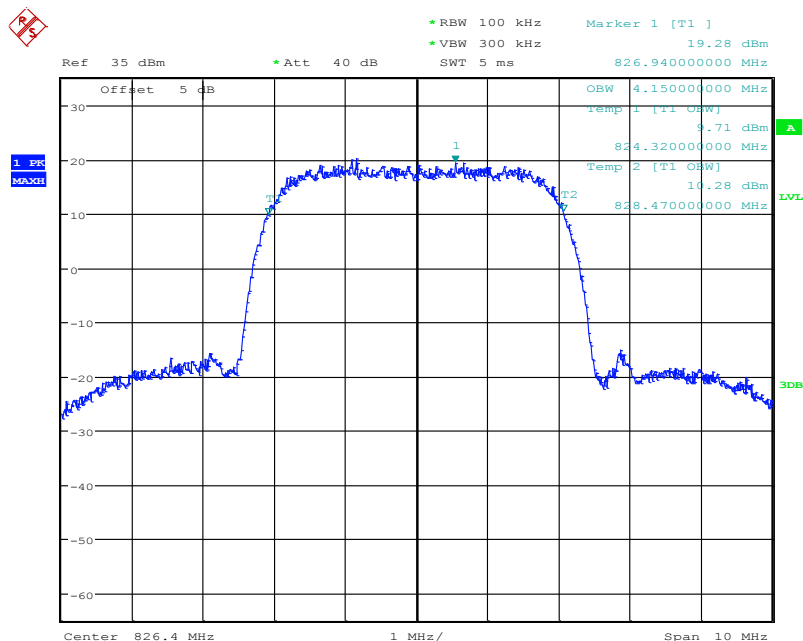


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Band IV_1513

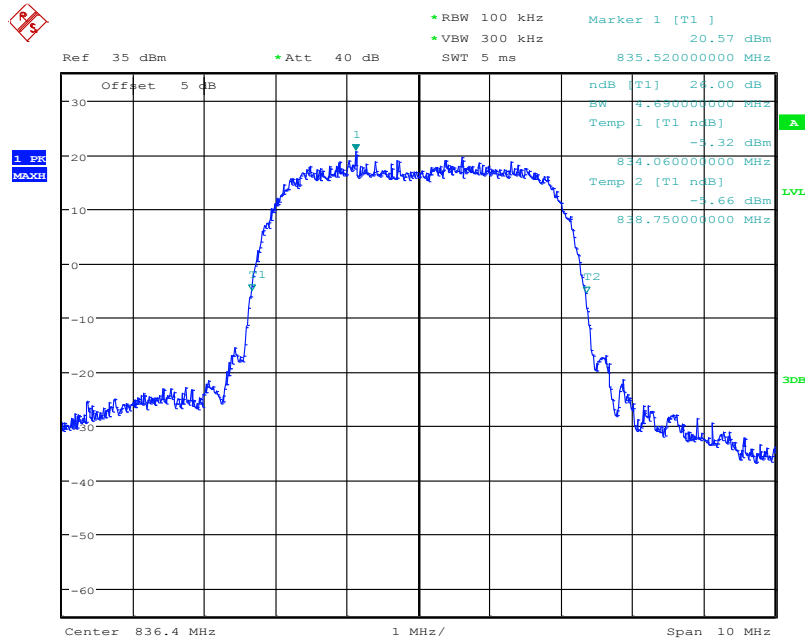


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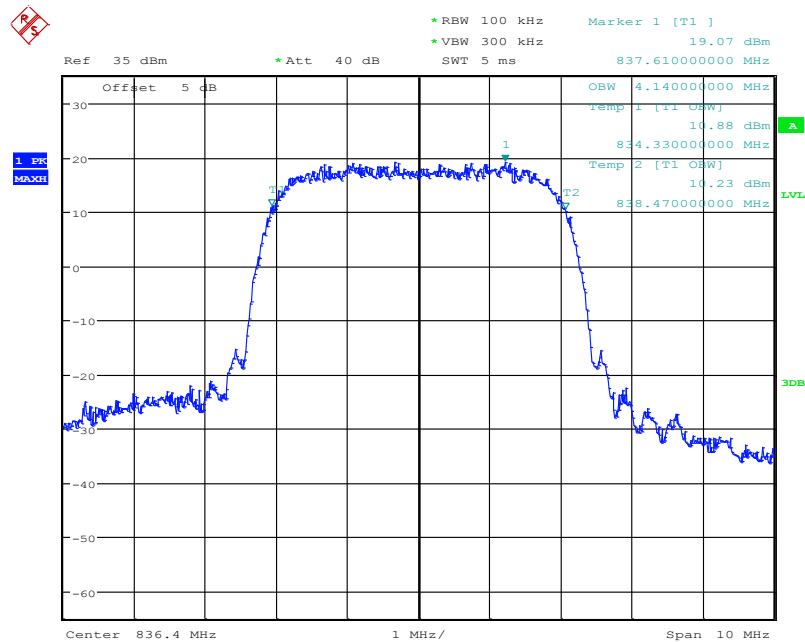


Date: 21.DEC.2018 15:15:30

Band V_4132

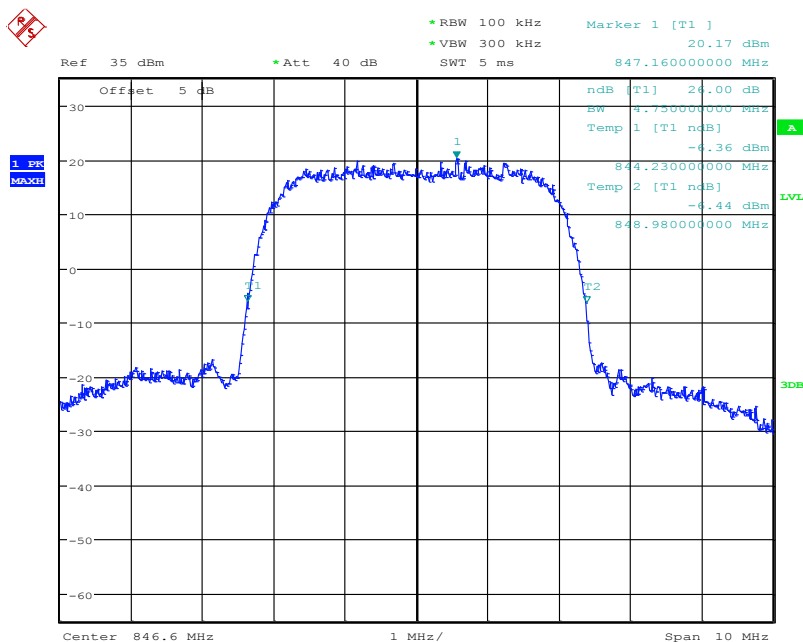


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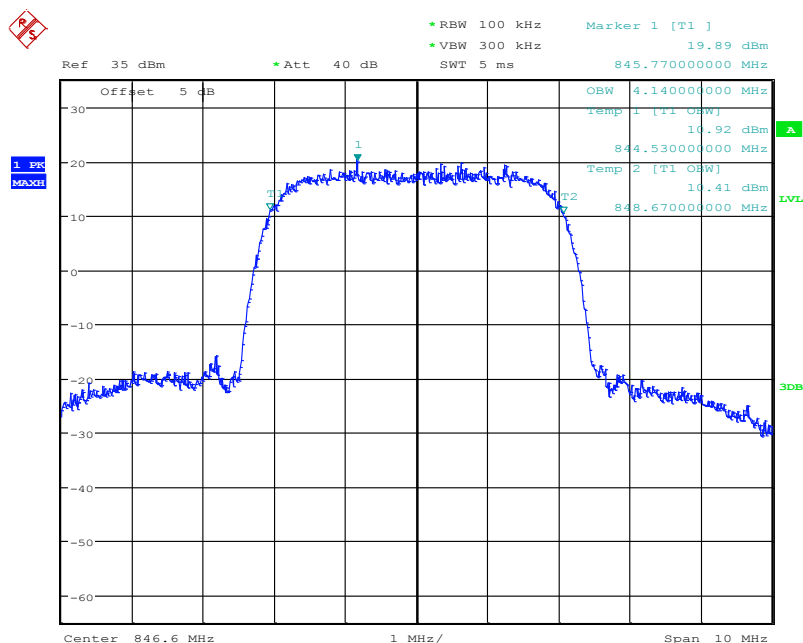


Date: 21.DEC.2018 15:18:37

Band V_4182



Date: 21.DEC.2018 15:19:30

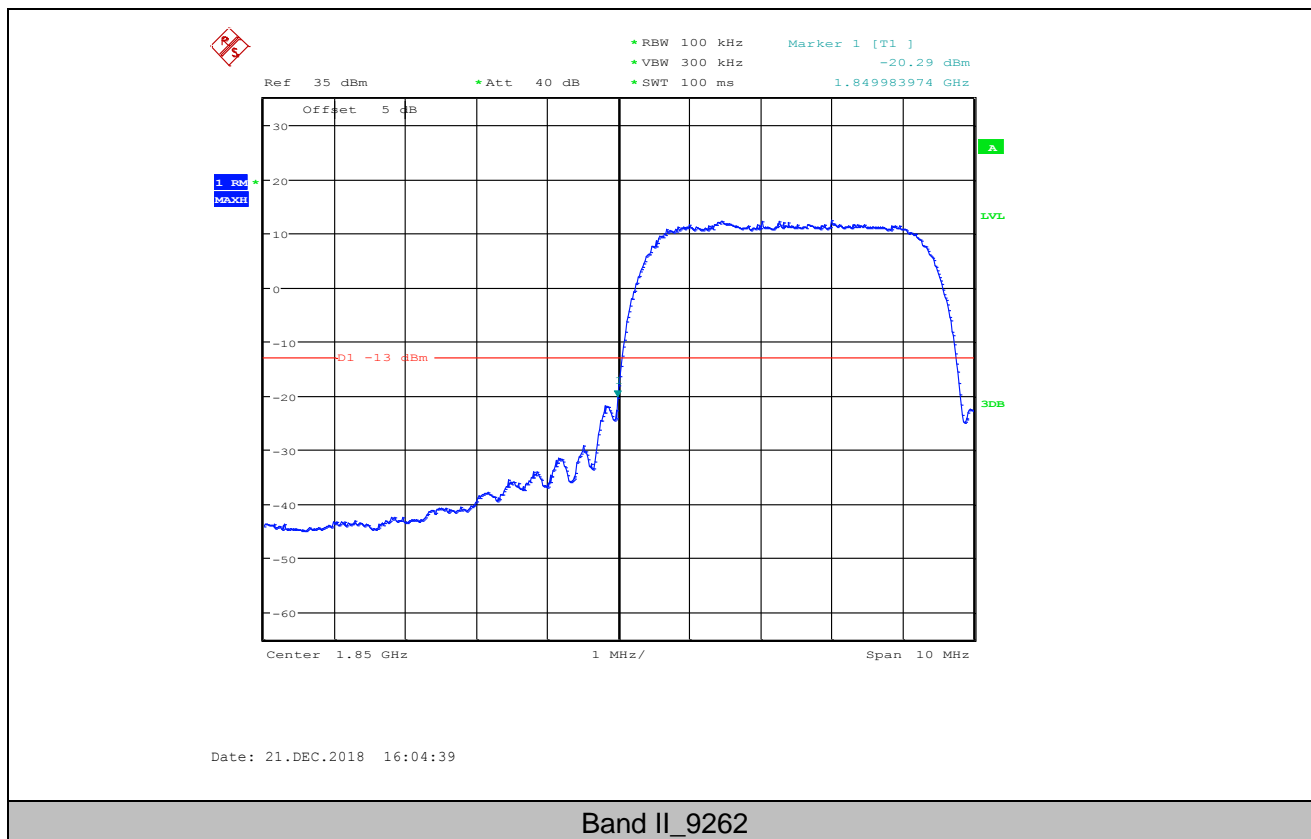


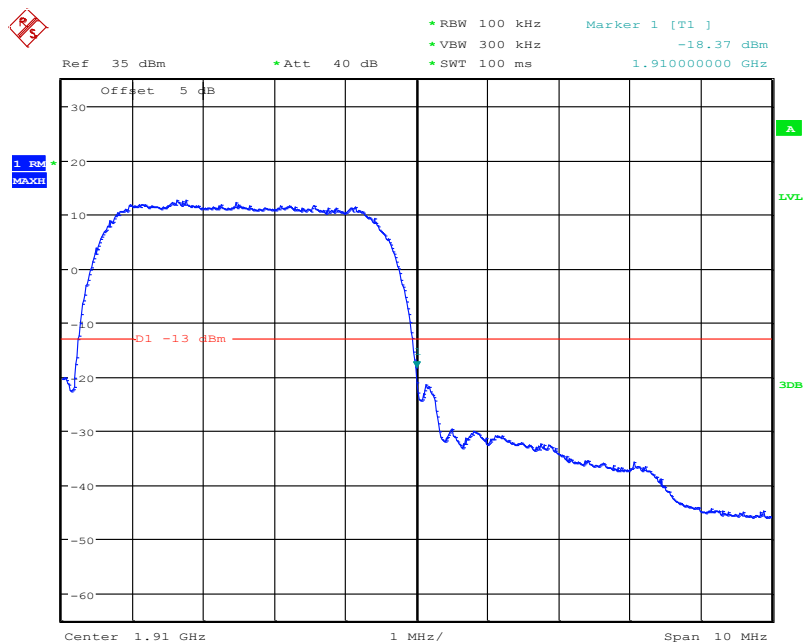
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Band V_4233

5. Band Edge Compliance

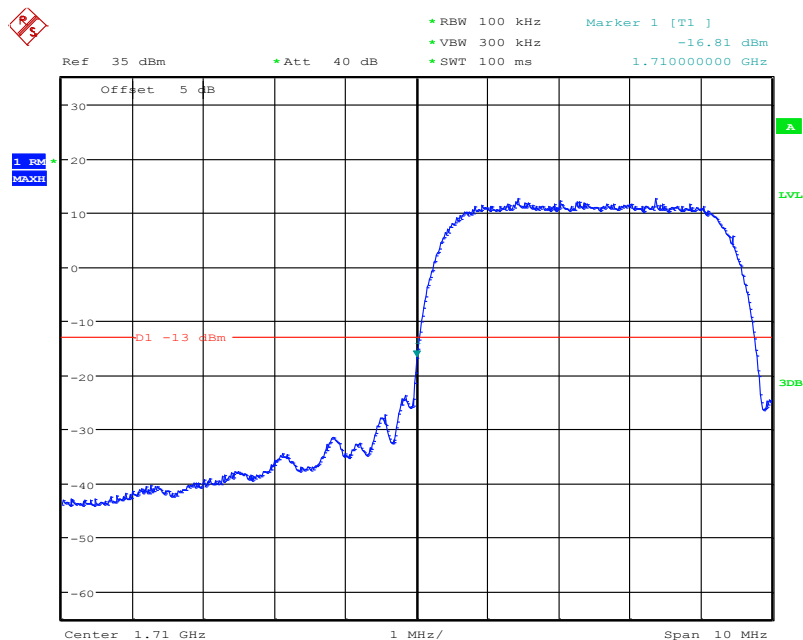
5.1. Test Plots





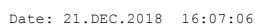
Date: 21.DEC.2018 16:06:11

Band II_9538



Date: 21.DEC.2018 16:08:02

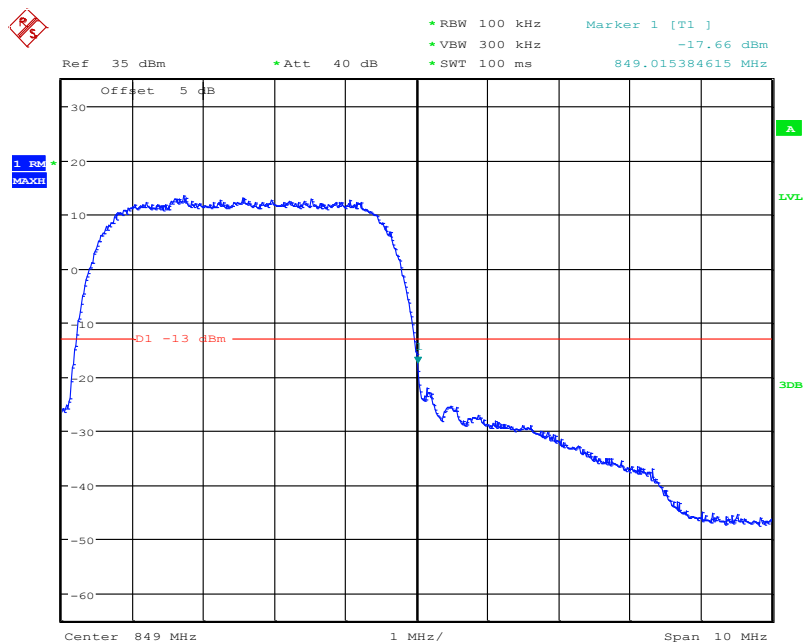
Band IV_1312



Band IV_1513



Band V_4132



Date: 21.DEC.2018 15:31:16

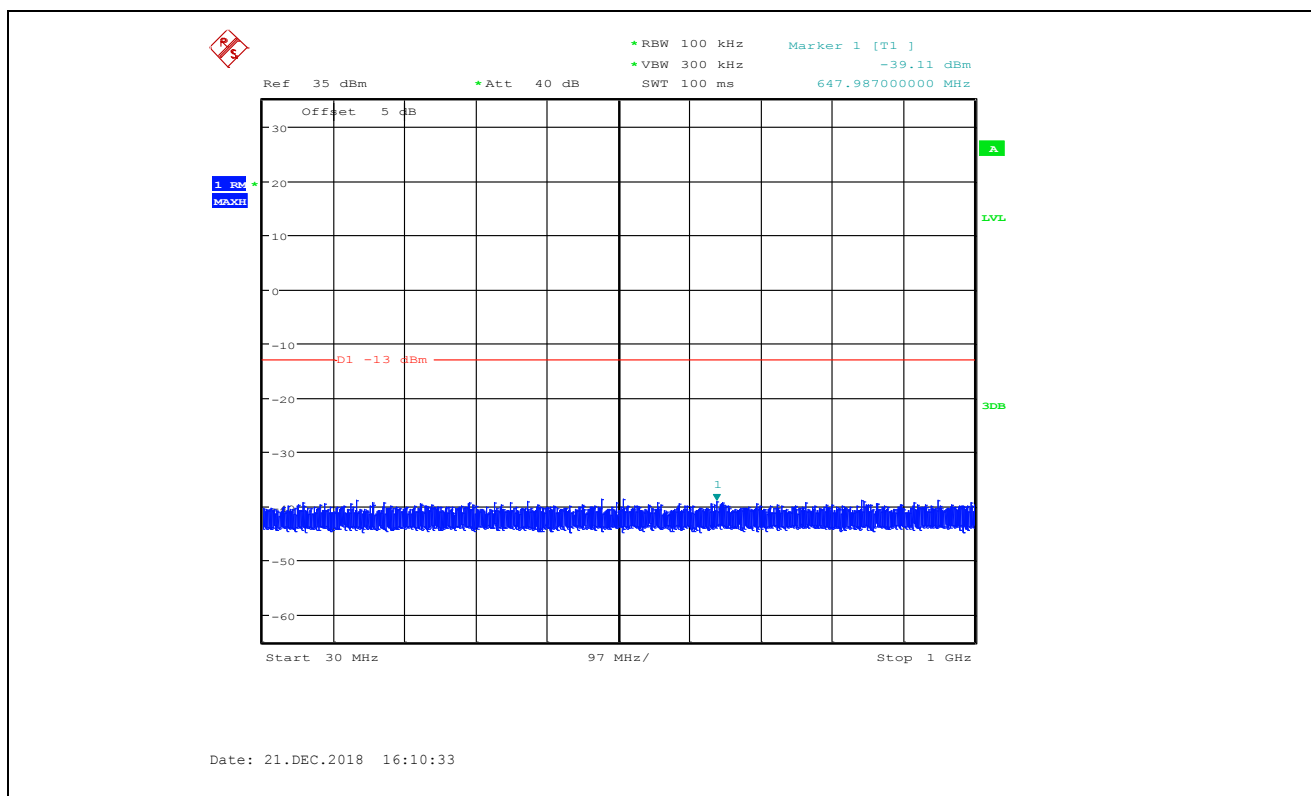
Band V_4233

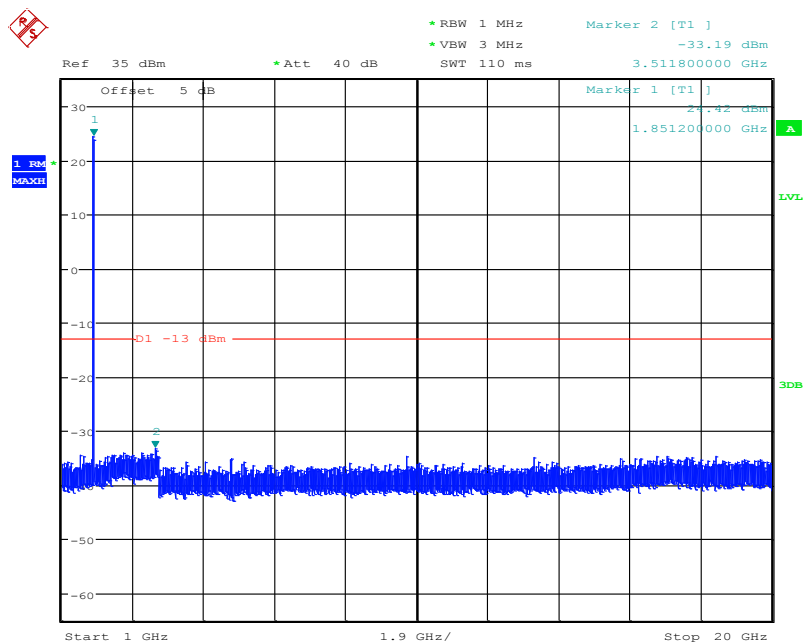
6. Spurious Emission at Antenna Terminal

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 = $k * (\text{Span} / RBW)$ " 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.

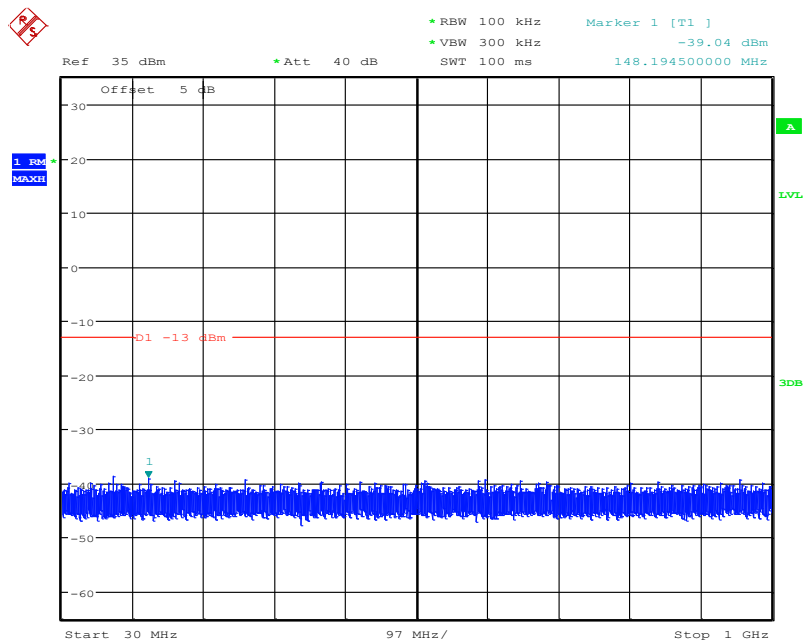
6.1. Test Plots



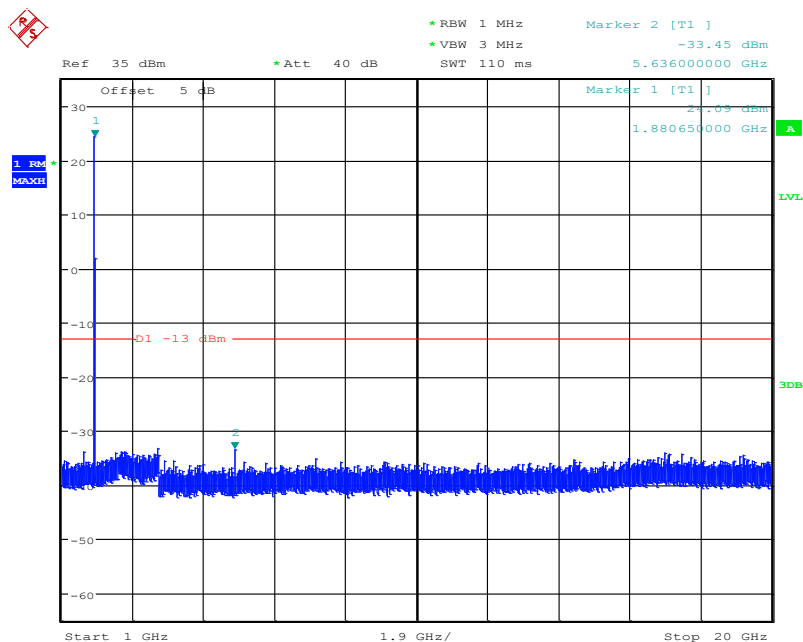


Date: 21.DEC.2018 16:16:27

Band II_9400

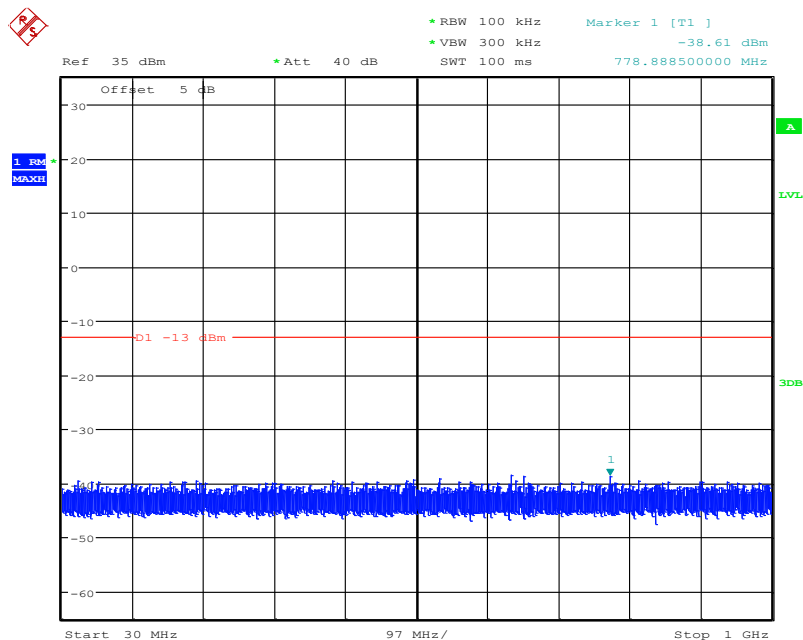


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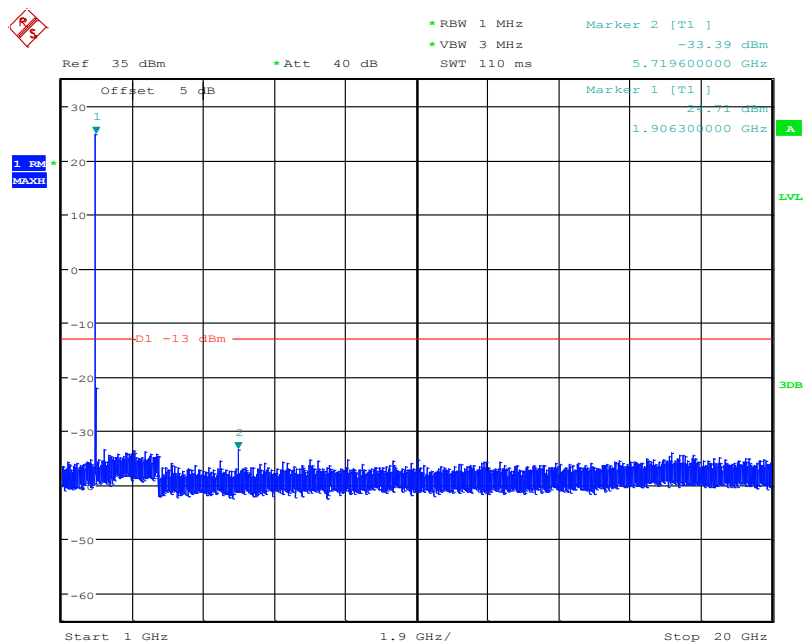


Date: 21.DEC.2018 16:14:46

Band II_9538

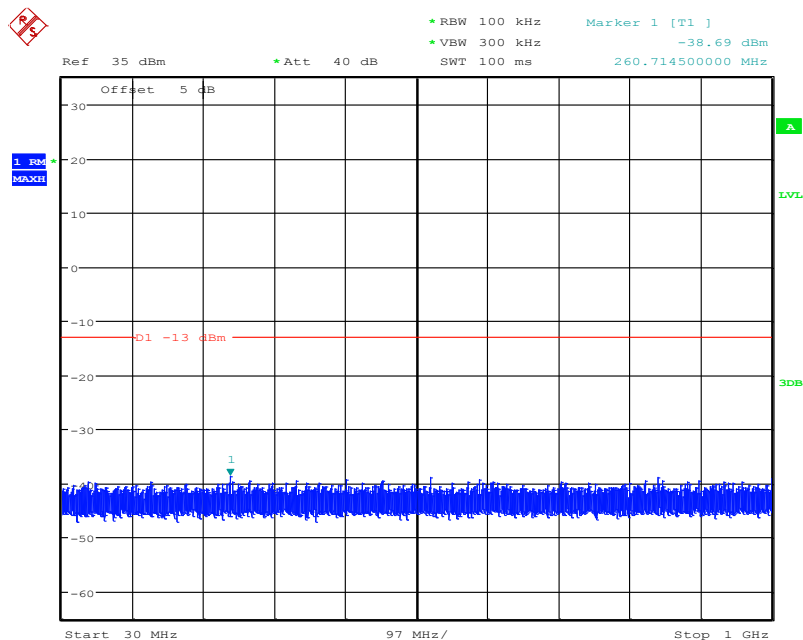


Date: 21.DEC.2018 16:11:40

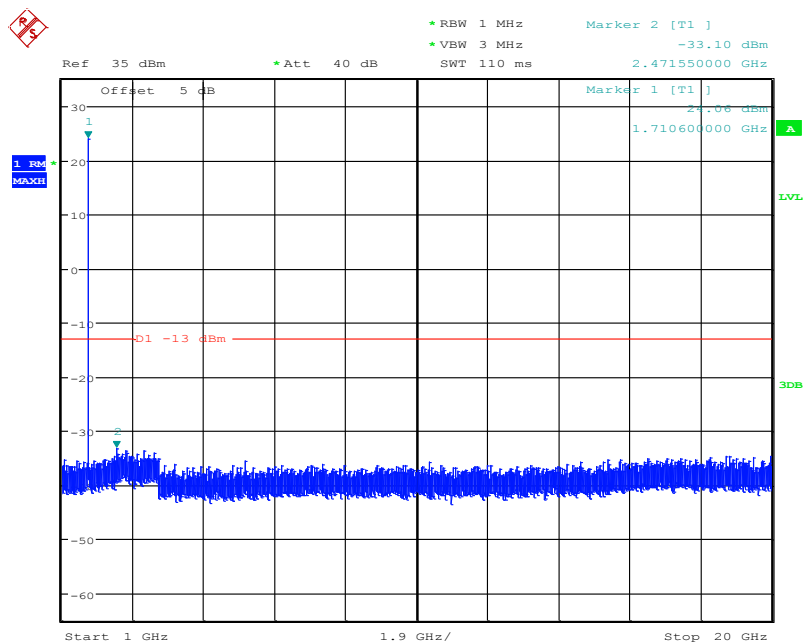


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Band IV_1312

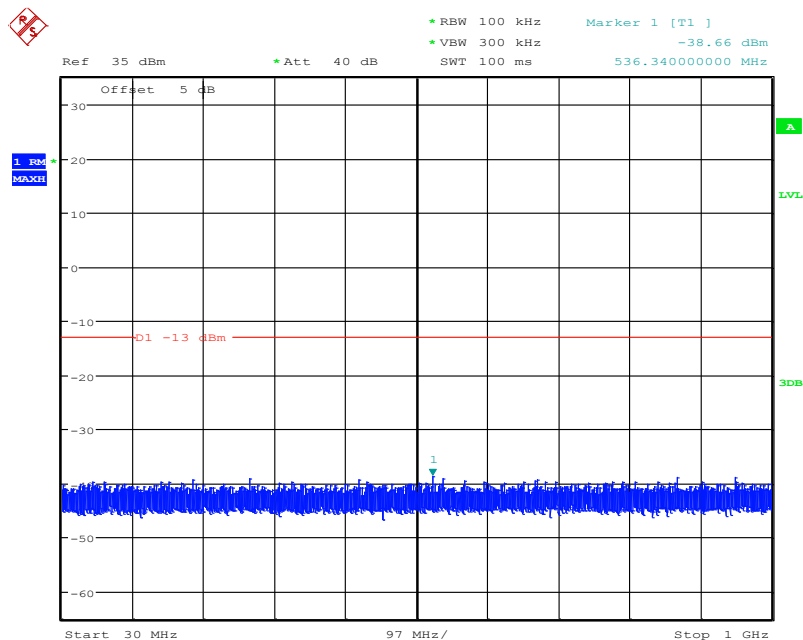


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Date: 21.DEC.2018 16:17:44

Band IV_1413

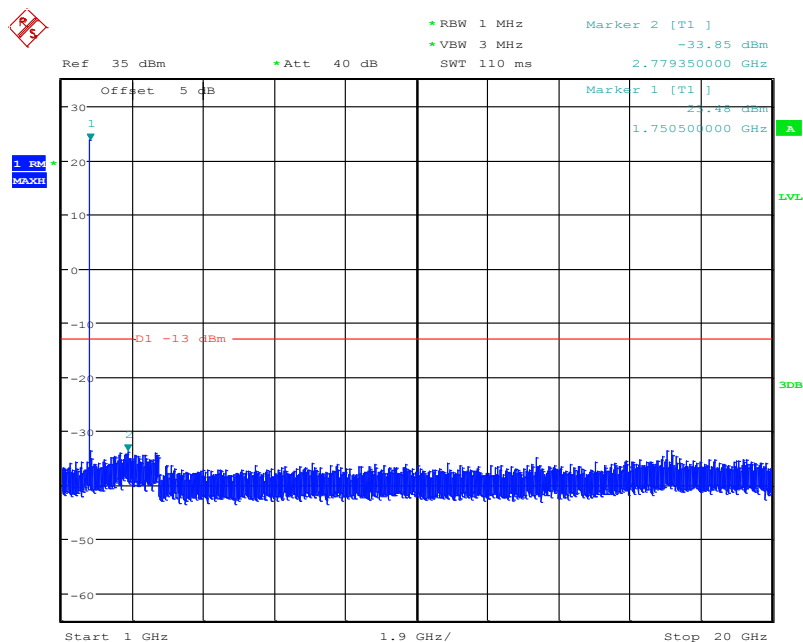


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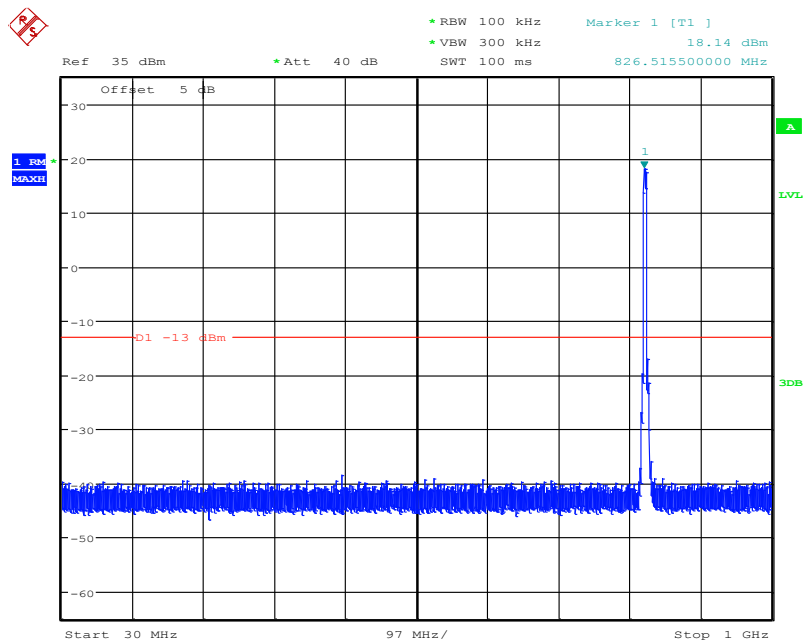
Band IV_1513



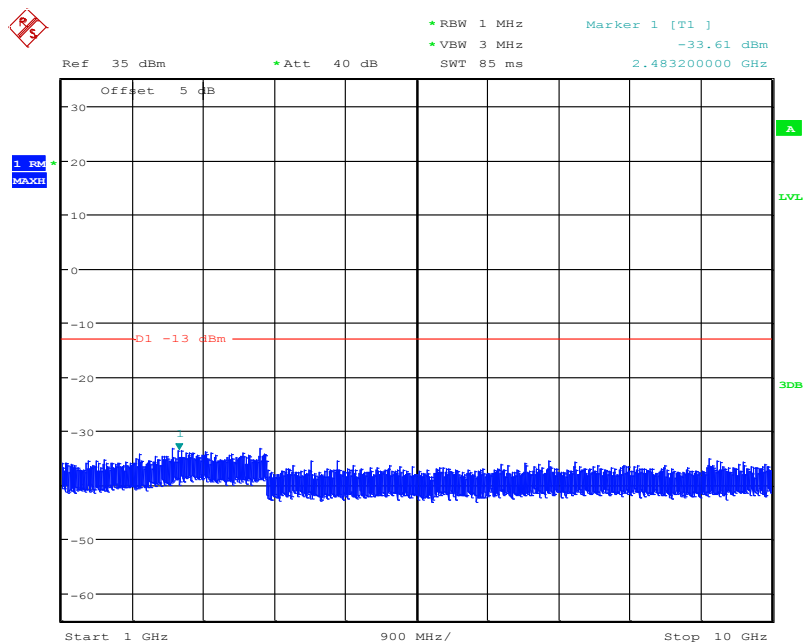


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Band V_4132

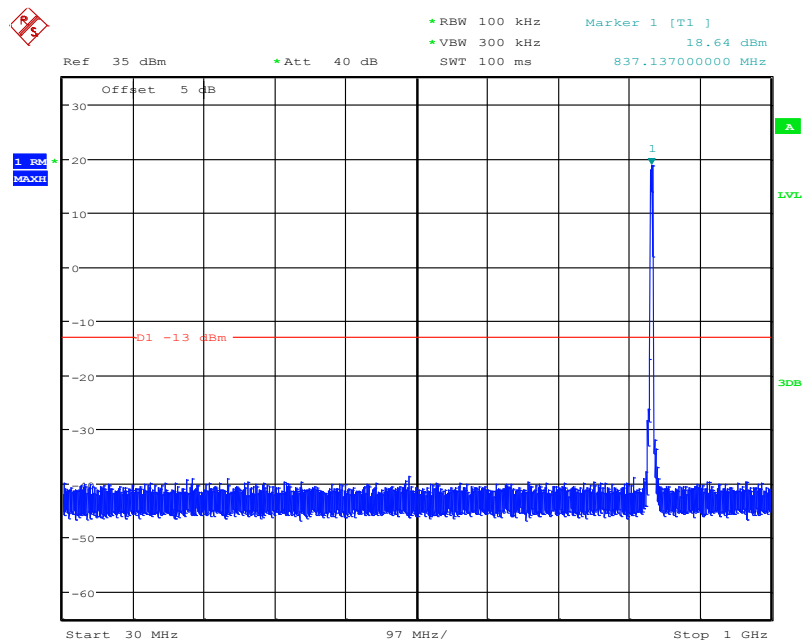


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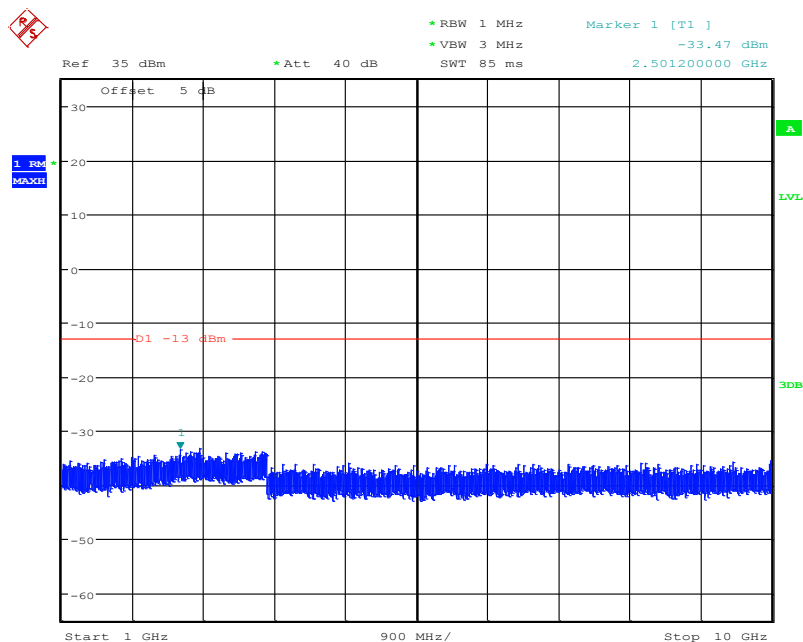


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Band V_4182

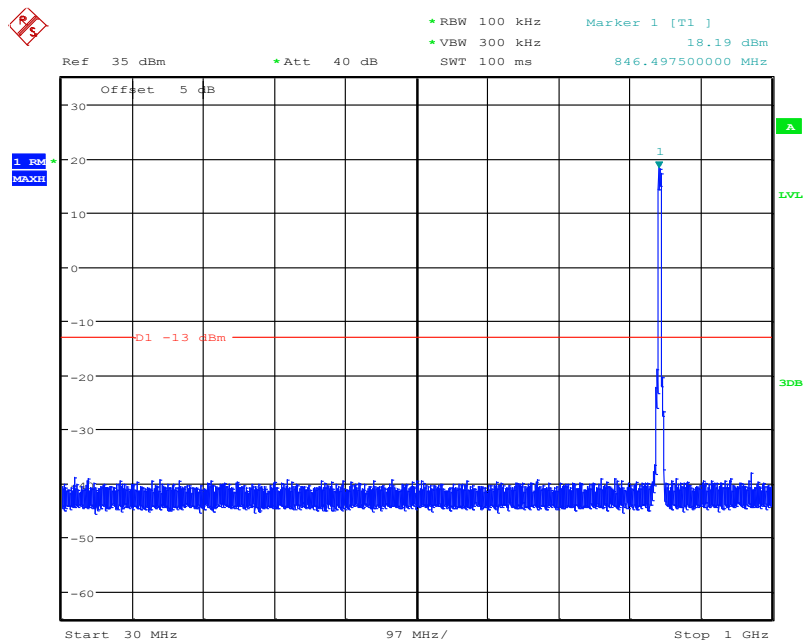


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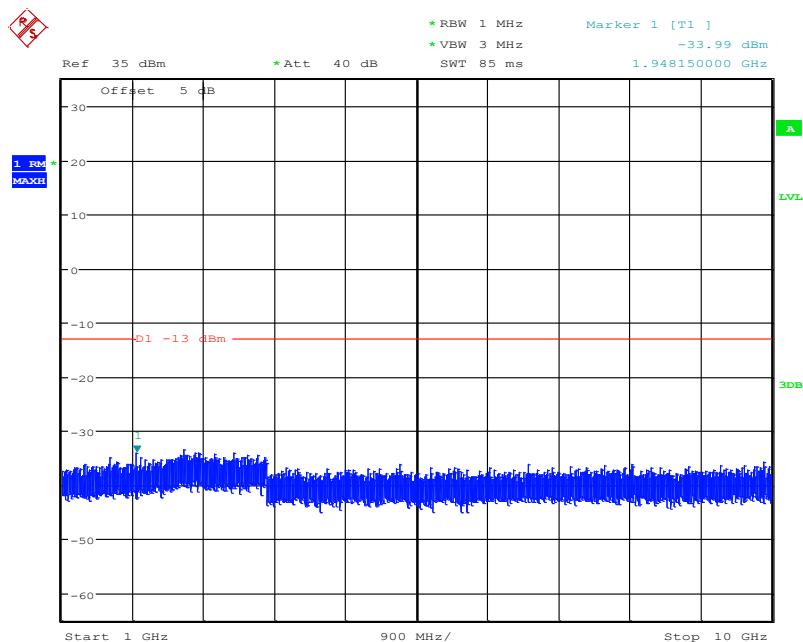


Date: 21.DEC.2018 16:29:54

Band V_4233



Date: 21.DEC.2018 16:26:20



Date: 21.DEC.2018 16:31:18

7. Field Strength of Spurious Radiation

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
105.300000	-81.12	-13.00	68.12	Vertical
3706.387500	-65.46	-13.00	52.46	Vertical
5559.862500	-59.67	-13.00	46.67	Vertical
7406.512500	-58.52	-13.00	45.52	Vertical
9266.325000	-59.36	-13.00	46.36	Vertical
11108.587500	-61.97	-13.00	48.97	Vertical
63.200000	-77.36	-13.00	64.36	Horizontal
3706.387500	-64.53	-13.00	51.53	Horizontal
5559.862500	-63.82	-13.00	50.82	Horizontal
7412.362500	-58.86	-13.00	45.86	Horizontal
9257.550000	-58.47	-13.00	45.47	Horizontal
12293.212500	-62.68	-13.00	49.68	Horizontal

7.1.1.1.2. Test Channel = MCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
63.350000	-81.71	-13.00	68.71	Vertical
104.250000	-67.06	-13.00	54.06	Vertical
3758.550000	-67.45	-13.00	54.45	Vertical
5636.887500	-60.17	-13.00	47.17	Vertical
7523.025000	-58.26	-13.00	45.26	Vertical
9404.287500	-61.12	-13.00	48.12	Vertical
63.050000	-77.40	-13.00	64.40	Horizontal
104.300000	-77.73	-13.00	64.73	Horizontal
443.550000	-80.82	-13.00	67.82	Horizontal
3758.062500	-64.14	-13.00	51.14	Horizontal
5636.887500	-64.06	-13.00	51.06	Horizontal
7523.025000	-58.05	-13.00	45.05	Horizontal



7.1.1.1.3. Test Channel = HCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
105.900000	-80.43	-13.00	67.43	Vertical
3816.562500	-63.94	-13.00	50.94	Vertical
5725.612500	-56.90	-13.00	43.90	Vertical
7633.200000	-54.23	-13.00	41.23	Vertical
9542.737500	-57.43	-13.00	44.43	Vertical
11440.087500	-60.85	-13.00	47.85	Vertical
62.750000	-77.41	-13.00	64.41	Horizontal
3816.562500	-62.69	-13.00	49.69	Horizontal
5725.612500	-62.93	-13.00	49.93	Horizontal
7633.200000	-56.57	-13.00	43.57	Horizontal
9542.250000	-59.94	-13.00	46.94	Horizontal
11443.500000	-62.66	-13.00	49.66	Horizontal

7.1.2. Test Band = WCDMA BAND IV

7.1.2.1. Test Mode = UMTS/TM1

7.1.2.1.1. Test Channel = LCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
63.800000	-81.63	-13.00	68.63	Vertical
126.650000	-80.80	-13.00	67.80	Vertical
3423.150000	-66.82	-13.00	53.82	Vertical
6050.775000	-64.73	-13.00	51.73	Vertical
7956.900000	-63.39	-13.00	50.39	Vertical
11979.750000	-62.14	-13.00	49.14	Vertical
56.450000	-77.56	-13.00	64.56	Horizontal
104.300000	-82.25	-13.00	69.25	Horizontal
3423.150000	-65.89	-13.00	52.89	Horizontal
6050.775000	-64.81	-13.00	51.81	Horizontal
7956.412500	-63.43	-13.00	50.43	Horizontal
10626.450000	-62.60	-13.00	49.60	Horizontal



7.1.2.1.2. Test Channel = MCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
64.500000	-81.56	-13.00	68.56	Vertical
104.900000	-80.80	-13.00	67.80	Vertical
3463.125000	-68.01	-13.00	55.01	Vertical
5194.237500	-65.97	-13.00	52.97	Vertical
6926.325000	-63.90	-13.00	50.90	Vertical
10612.800000	-62.50	-13.00	49.50	Vertical
63.450000	-77.22	-13.00	64.22	Horizontal
104.300000	-81.88	-13.00	68.88	Horizontal
3466.537500	-67.57	-13.00	54.57	Horizontal
5048.962500	-66.08	-13.00	53.08	Horizontal
6927.300000	-64.31	-13.00	51.31	Horizontal
10613.287500	-62.55	-13.00	49.55	Horizontal

7.1.2.1.3. Test Channel = HCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
64.400000	-81.61	-13.00	68.61	Vertical
105.050000	-80.96	-13.00	67.96	Vertical
4283.100000	-66.80	-13.00	53.80	Vertical
6047.850000	-64.83	-13.00	51.83	Vertical
7962.262500	-63.46	-13.00	50.46	Vertical
10638.637500	-62.38	-13.00	49.38	Vertical
62.500000	-77.06	-13.00	64.06	Horizontal
104.300000	-79.43	-13.00	66.43	Horizontal
3506.512500	-68.15	-13.00	55.15	Horizontal
4315.275000	-66.31	-13.00	53.31	Horizontal
7246.612500	-64.02	-13.00	51.02	Horizontal
10619.625000	-62.34	-13.00	49.34	Horizontal



7.1.3. Test Band = WCDMA BAND V

7.1.3.1. Test Mode = UMTS/TM1

7.1.3.1.1. Test Channel = LCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
65.400000	-81.55	-13.00	68.55	Vertical
106.550000	-80.92	-13.00	67.92	Vertical
1655.000000	-64.95	-13.00	51.95	Vertical
2476.000000	-58.12	-13.00	45.12	Vertical
4127.587500	-64.11	-13.00	51.11	Vertical
7954.462500	-63.59	-13.00	50.59	Vertical
62.950000	-77.27	-13.00	64.27	Horizontal
106.550000	-83.20	-13.00	70.20	Horizontal
1651.000000	-65.07	-13.00	52.07	Horizontal
2476.000000	-57.71	-13.00	44.71	Horizontal
4127.587500	-65.64	-13.00	52.64	Horizontal
7597.125000	-64.96	-13.00	51.96	Horizontal

7.1.3.1.2. Test Channel = MCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
63.600000	-81.29	-13.00	68.29	Vertical
104.900000	-80.77	-13.00	67.77	Vertical
1674.500000	-62.60	-13.00	49.60	Vertical
2512.000000	-55.59	-13.00	42.59	Vertical
4186.087500	-64.90	-13.00	51.90	Vertical
7851.112500	-63.89	-13.00	50.89	Vertical
62.750000	-77.34	-13.00	64.34	Horizontal
104.300000	-80.81	-13.00	67.81	Horizontal
1675.500000	-64.88	-13.00	51.88	Horizontal
2506.500000	-57.17	-13.00	44.17	Horizontal
3348.075000	-68.75	-13.00	55.75	Horizontal
7965.675000	-63.57	-13.00	50.57	Horizontal



7.1.3.1.3. Test Channel = HCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
64.600000	-81.73	-13.00	68.73	Vertical
90.500000	-82.03	-13.00	69.03	Vertical
1695.000000	-63.22	-13.00	50.22	Vertical
2537.000000	-54.33	-13.00	41.33	Vertical
4228.012500	-63.80	-13.00	50.80	Vertical
7854.525000	-63.75	-13.00	50.75	Vertical
63.000000	-77.15	-13.00	64.15	Horizontal
104.250000	-82.50	-13.00	69.50	Horizontal
1695.000000	-64.25	-13.00	51.25	Horizontal
2537.000000	-57.71	-13.00	44.71	Horizontal
3383.175000	-68.25	-13.00	55.25	Horizontal
7954.462500	-63.62	-13.00	50.62	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.



8. Frequency Stability

8.1. Frequency Vs Voltage

Voltage							
BAND	Channel	Voltage (Vdc)	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
Band II	9262	VL	TN	0.62	0.000332	±2.5	PASS
Band II	9262	VN	TN	-7.11	-0.003836	±2.5	PASS
Band II	9262	VH	TN	4.16	0.002244	±2.5	PASS
Band II	9400	VL	TN	5.64	0.002999	±2.5	PASS
Band II	9400	VN	TN	6.97	0.003708	±2.5	PASS
Band II	9400	VH	TN	0.14	0.000077	±2.5	PASS
Band II	9538	VL	TN	7.91	0.004146	±2.5	PASS
Band II	9538	VN	TN	-0.40	-0.000212	±2.5	PASS
Band II	9538	VH	TN	12.88	0.006754	±2.5	PASS
Band IV	1312	VL	TN	-1.21	-0.001461	±2.5	PASS
Band IV	1312	VN	TN	-1.72	-0.002076	±2.5	PASS
Band IV	1312	VH	TN	-3.75	-0.004538	±2.5	PASS
Band IV	1413	VL	TN	0.78	0.000931	±2.5	PASS
Band IV	1413	VN	TN	-13.31	-0.015918	±2.5	PASS
Band IV	1413	VH	TN	-3.62	-0.004330	±2.5	PASS
Band IV	1513	VL	TN	12.95	0.015295	±2.5	PASS
Band IV	1513	VN	TN	-8.41	-0.009931	±2.5	PASS
Band IV	1513	VH	TN	-3.29	-0.003883	±2.5	PASS
Band V	4132	VL	TN	0.62	0.000332	±2.5	PASS
Band V	4132	VN	TN	-7.11	-0.003836	±2.5	PASS
Band V	4132	VH	TN	4.16	0.002244	±2.5	PASS
Band V	4182	VL	TN	5.64	0.002999	±2.5	PASS
Band V	4182	VN	TN	6.97	0.003708	±2.5	PASS
Band V	4182	VH	TN	0.14	0.000077	±2.5	PASS
Band V	4233	VL	TN	7.91	0.004146	±2.5	PASS
Band V	4233	VN	TN	-0.40	-0.000212	±2.5	PASS
Band V	4233	VH	TN	12.88	0.006754	±2.5	PASS

8.2. Frequency Vs Temperature

Temperature							
BAND	Channel	Voltage (Vdc)	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
Band II	9262	VN	-30	6.17	0.003329	±2.5	PASS
Band II	9262	VN	-20	13.62	0.007355	±2.5	PASS
Band II	9262	VN	-10	-1.94	-0.001046	±2.5	PASS
Band II	9262	VN	0	-5.50	-0.002969	±2.5	PASS
Band II	9262	VN	10	10.97	0.005923	±2.5	PASS
Band II	9262	VN	20	-12.38	-0.006686	±2.5	PASS
Band II	9262	VN	30	-8.36	-0.004510	±2.5	PASS
Band II	9262	VN	40	9.17	0.004950	±2.5	PASS
Band II	9262	VN	50	-0.57	-0.000305	±2.5	PASS
Band II	9400	VN	-30	-4.28	-0.002277	±2.5	PASS



Band II	9400	VN	-20	6.00	0.003192	±2.5	PASS
Band II	9400	VN	-10	-14.86	-0.007904	±2.5	PASS
Band II	9400	VN	0	1.19	0.000635	±2.5	PASS
Band II	9400	VN	10	-6.80	-0.003615	±2.5	PASS
Band II	9400	VN	20	-7.44	-0.003958	±2.5	PASS
Band II	9400	VN	30	-14.19	-0.007547	±2.5	PASS
Band II	9400	VN	40	7.31	0.003886	±2.5	PASS
Band II	9400	VN	50	-14.77	-0.007858	±2.5	PASS
Band II	9538	VN	-30	-1.99	-0.001041	±2.5	PASS
Band II	9538	VN	-20	9.06	0.004750	±2.5	PASS
Band II	9538	VN	-10	11.63	0.006097	±2.5	PASS
Band II	9538	VN	0	-10.75	-0.005636	±2.5	PASS
Band II	9538	VN	10	3.20	0.001676	±2.5	PASS
Band II	9538	VN	20	6.04	0.003167	±2.5	PASS
Band II	9538	VN	30	5.01	0.002627	±2.5	PASS
Band II	9538	VN	40	0.38	0.000199	±2.5	PASS
Band II	9538	VN	50	6.25	0.003278	±2.5	PASS
Band IV	1312	VN	-30	-11.05	-0.013377	±2.5	PASS
Band IV	1312	VN	-20	5.61	0.006794	±2.5	PASS
Band IV	1312	VN	-10	8.39	0.010157	±2.5	PASS
Band IV	1312	VN	0	11.30	0.013675	±2.5	PASS
Band IV	1312	VN	10	-12.94	-0.015652	±2.5	PASS
Band IV	1312	VN	20	12.81	0.015503	±2.5	PASS
Band IV	1312	VN	30	12.84	0.015534	±2.5	PASS
Band IV	1312	VN	40	-9.68	-0.011713	±2.5	PASS
Band IV	1312	VN	50	11.84	0.014333	±2.5	PASS
Band IV	1413	VN	-30	8.91	0.010649	±2.5	PASS
Band IV	1413	VN	-20	0.43	0.000512	±2.5	PASS
Band IV	1413	VN	-10	14.98	0.017912	±2.5	PASS
Band IV	1413	VN	0	11.34	0.013562	±2.5	PASS
Band IV	1413	VN	10	7.71	0.009216	±2.5	PASS
Band IV	1413	VN	20	-11.18	-0.013367	±2.5	PASS
Band IV	1413	VN	30	1.67	0.001994	±2.5	PASS
Band IV	1413	VN	40	11.06	0.013227	±2.5	PASS
Band IV	1413	VN	50	-2.45	-0.002929	±2.5	PASS
Band IV	1513	VN	-30	5.41	0.006387	±2.5	PASS
Band IV	1513	VN	-20	-12.22	-0.014436	±2.5	PASS
Band IV	1513	VN	-10	2.05	0.002420	±2.5	PASS
Band IV	1513	VN	0	-12.25	-0.014474	±2.5	PASS
Band IV	1513	VN	10	5.94	0.007012	±2.5	PASS
Band IV	1513	VN	20	3.80	0.004485	±2.5	PASS
Band IV	1513	VN	30	1.09	0.001292	±2.5	PASS
Band IV	1513	VN	40	5.75	0.006787	±2.5	PASS
Band IV	1513	VN	50	0.46	0.000544	±2.5	PASS
Band V	4132	VN	-30	6.17	0.003329	±2.5	PASS
Band V	4132	VN	-20	13.62	0.007355	±2.5	PASS
Band V	4132	VN	-10	-1.94	-0.001046	±2.5	PASS
Band V	4132	VN	0	-5.50	-0.002969	±2.5	PASS
Band V	4132	VN	10	10.97	0.005923	±2.5	PASS
Band V	4132	VN	20	-12.38	-0.006686	±2.5	PASS
Band V	4132	VN	30	-8.36	-0.004510	±2.5	PASS



Band V	4132	VN	40	9.17	0.004950	±2.5	PASS
Band V	4132	VN	50	-0.57	-0.000305	±2.5	PASS
Band V	4182	VN	-30	-4.28	-0.002277	±2.5	PASS
Band V	4182	VN	-20	6.00	0.003192	±2.5	PASS
Band V	4182	VN	-10	-14.86	-0.007904	±2.5	PASS
Band V	4182	VN	0	1.19	0.000635	±2.5	PASS
Band V	4182	VN	10	-6.80	-0.003615	±2.5	PASS
Band V	4182	VN	20	-7.44	-0.003958	±2.5	PASS
Band V	4182	VN	30	-14.19	-0.007547	±2.5	PASS
Band V	4182	VN	40	7.31	0.003886	±2.5	PASS
Band V	4182	VN	50	-14.77	-0.007858	±2.5	PASS
Band V	4233	VN	-30	-1.99	-0.001041	±2.5	PASS
Band V	4233	VN	-20	9.06	0.004750	±2.5	PASS
Band V	4233	VN	-10	11.63	0.006097	±2.5	PASS
Band V	4233	VN	0	-10.75	-0.005636	±2.5	PASS
Band V	4233	VN	10	3.20	0.001676	±2.5	PASS
Band V	4233	VN	20	6.04	0.003167	±2.5	PASS
Band V	4233	VN	30	5.01	0.002627	±2.5	PASS
Band V	4233	VN	40	0.38	0.000199	±2.5	PASS
Band V	4233	VN	50	6.25	0.003278	±2.5	PASS

The End