



Appendix B

WCDMA BAND II & IV & V



SGS-CSTC Standards Technical Services Co., Ltd.
Shenzhen Branch (CMAA) Testing Laboratory

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1. Effective (Isotropic) Radiated Power

1.1. Test Result

BAND	Channel	Conducted Power(dBm)	EIRP(dBm)	Limit(dBm)	Verdict
Band II	9262	24.65	25.65	33.00	PASS
Band II	9400	24.64	25.64	33.00	PASS
Band II	9538	24.74	25.74	33.00	PASS
Band IV	1312	24.70	25.70	30.00	PASS
Band IV	1413	24.69	25.69	30.00	PASS
Band IV	1513	24.60	25.60	30.00	PASS

BAND	Channel	Conducted Power(dBm)	ERP(dBm)	Limit(dBm)	Verdict
Band V	4132	23.93	22.78	38.45	PASS
Band V	4182	23.82	22.67	38.45	PASS
Band V	4233	24.02	22.87	38.45	PASS

Remark:

a: For getting the EIRP (Efficient Isotropic Radiated Power), 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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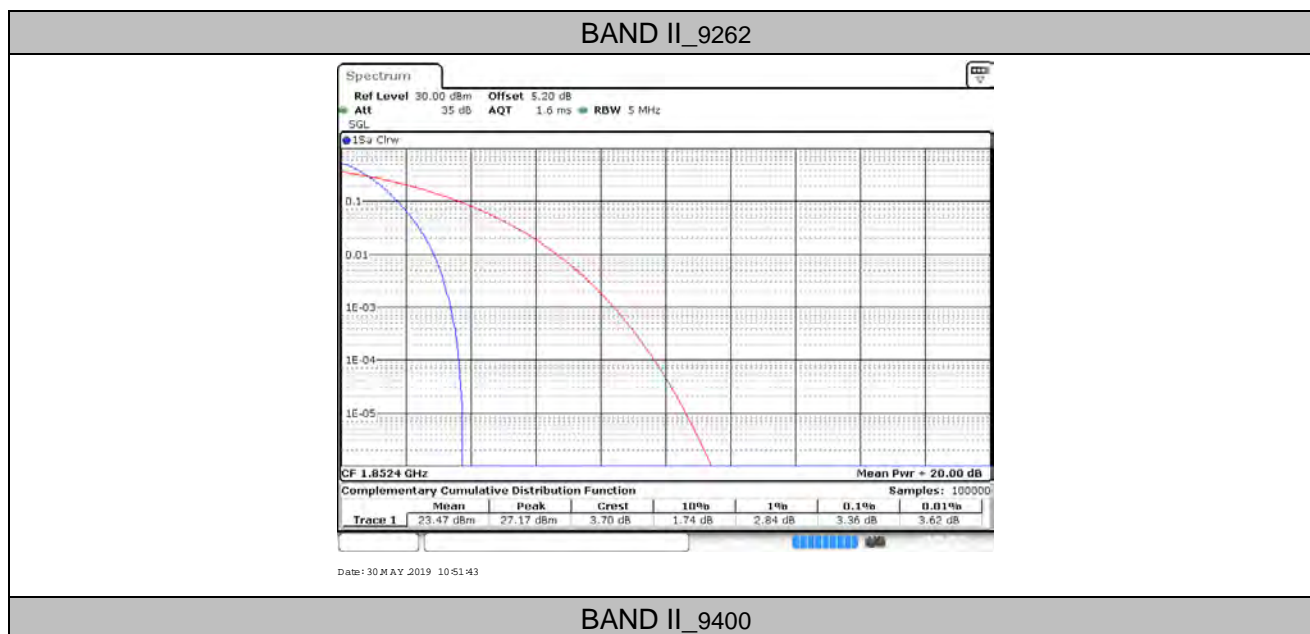


2. Peak-to-Average Ratio(CCDF)

2.1. Test Result

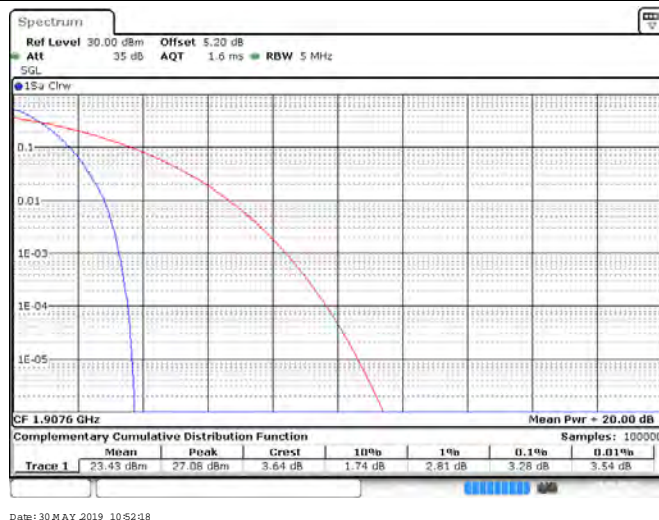
BAND	Channel	Peak-to-Average Ratio(dB)	Limit(dB)	Verdict
Band II	9262	3.36	13	PASS
Band II	9400	3.39	13	PASS
Band II	9538	3.28	13	PASS
Band IV	1312	2.96	13	PASS
Band IV	1413	3.25	13	PASS
Band IV	1513	3.07	13	PASS
Band V	4132	3.22	13	PASS
Band V	4182	3.04	13	PASS
Band V	4233	2.96	13	PASS

2.2. Test Plots





BAND II_9538

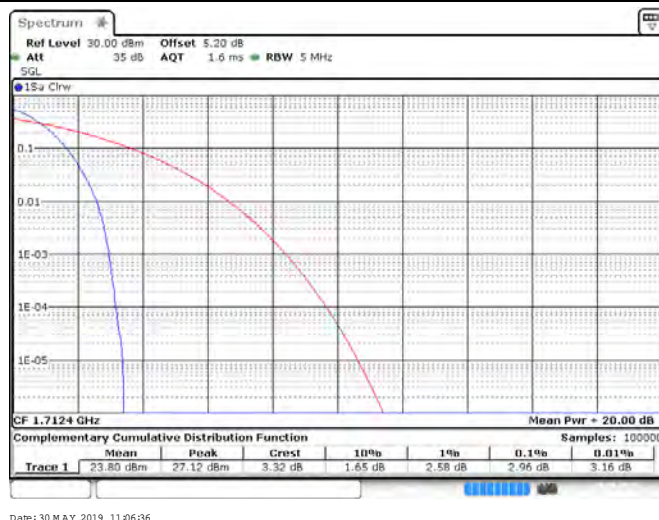


BAND IV_1312

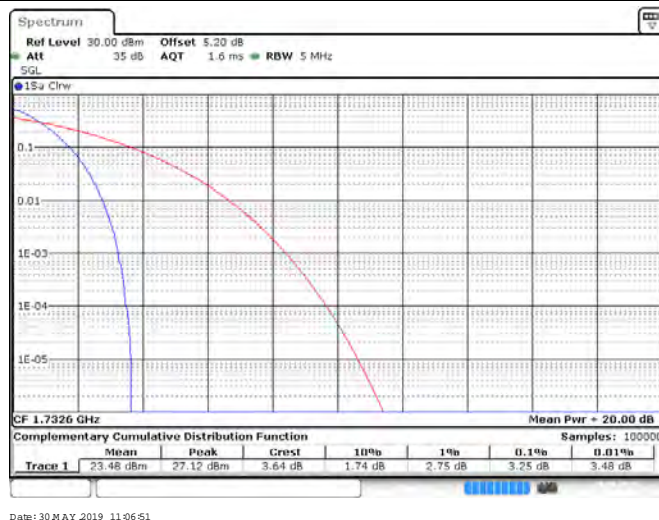


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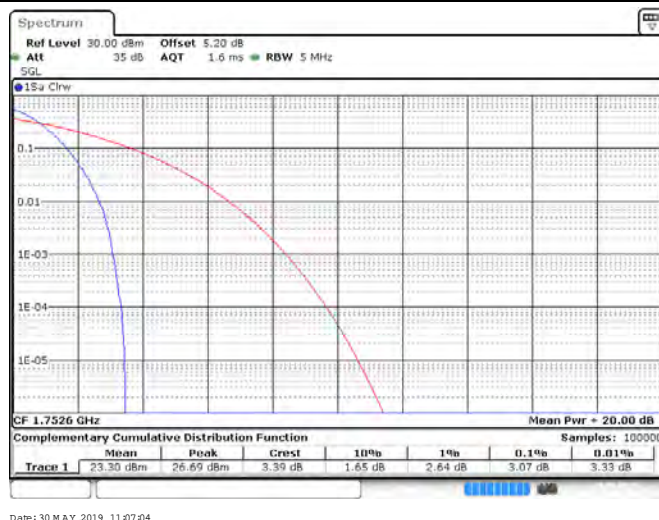


BAND IV_1413

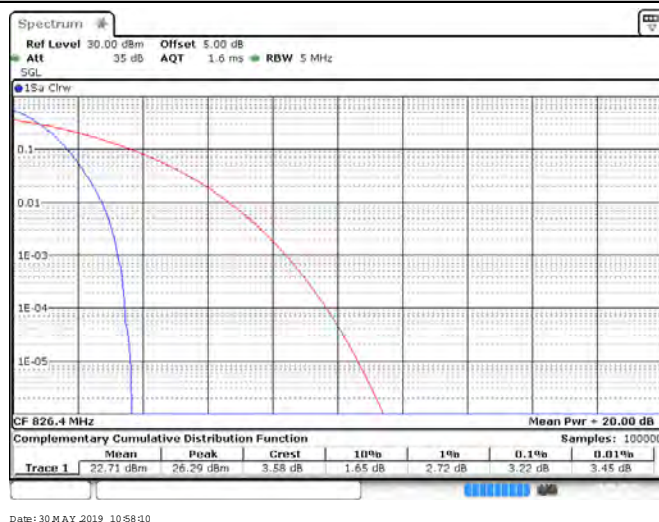


BAND IV_1513





BAND V_4132

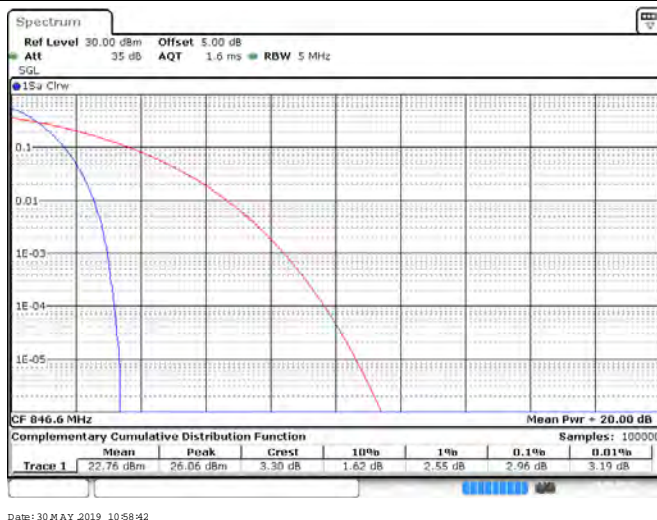


BAND V_4182





BAND V_4233



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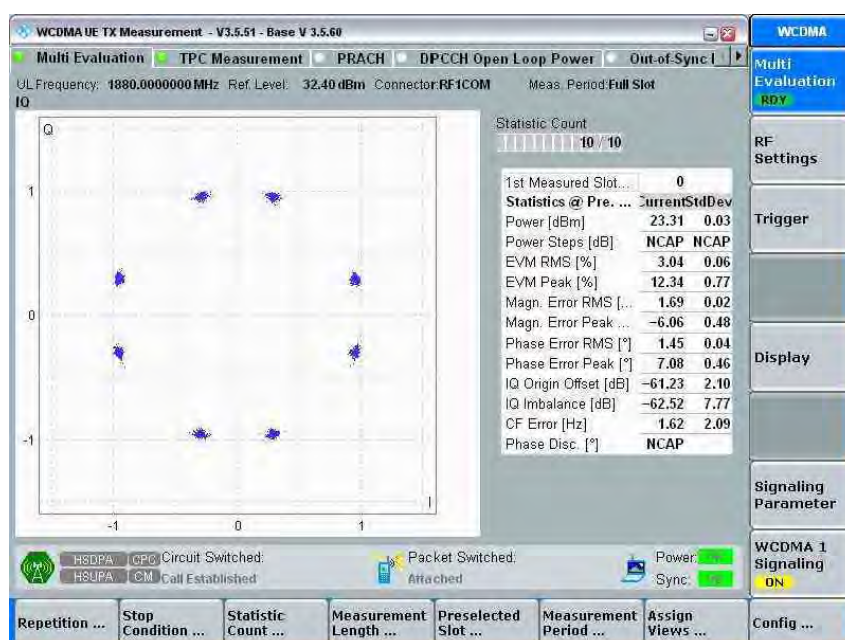
3. Modulation Characteristics

3.1. Test BAND = LTE Band 2

3.2. Test BAND = WCDMA BAND II

3.2.1. Test Mode = UMTS/TM1

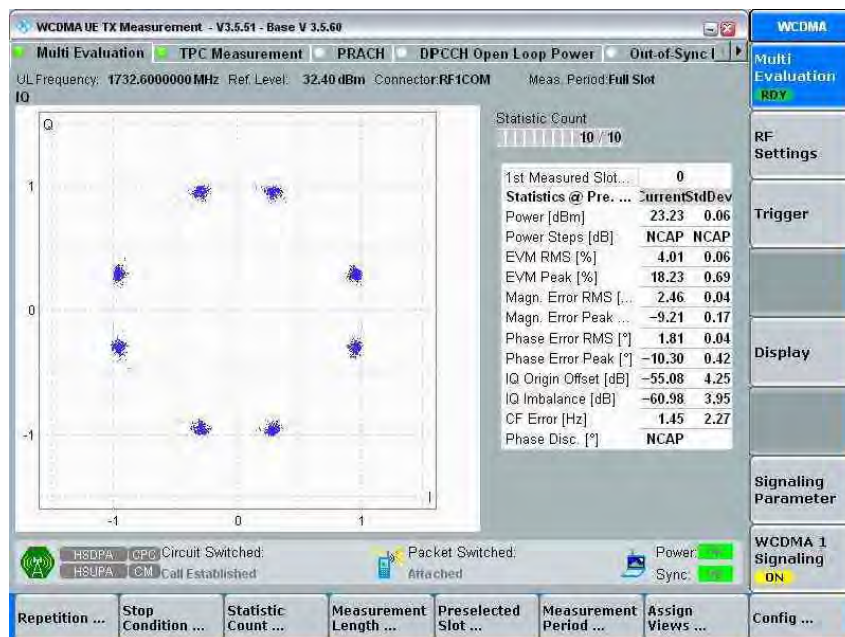
3.2.1.1. Test Channel = MCH



3.3. Test BAND = WCDMA BAND IV

3.3.1. Test Mode = UMTS/TM1

3.3.1.1. Test Channel = MCH



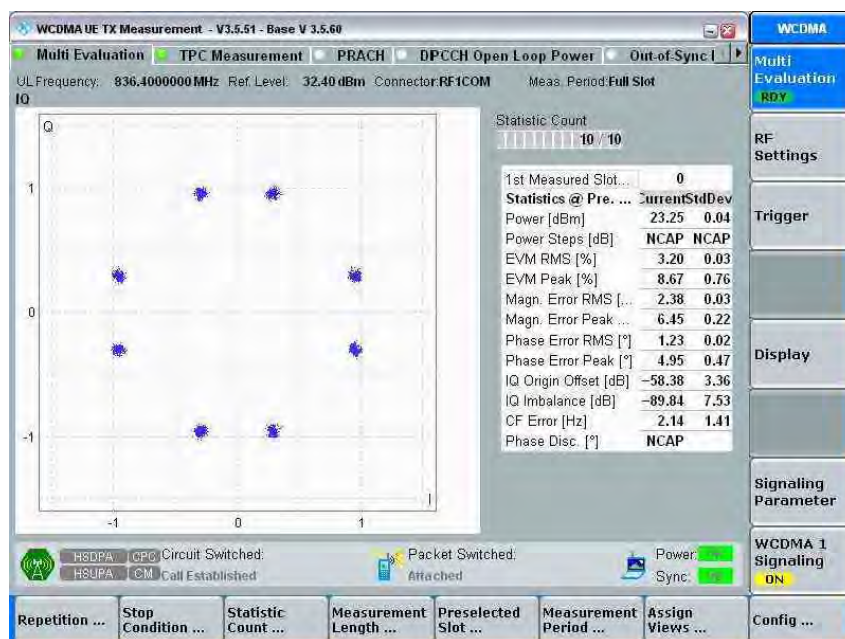
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3.4. Test BAND = WCDMA BAND V

3.4.1. Test Mode = UMTS/TM1

3.4.1.1. Test Channel = MCH



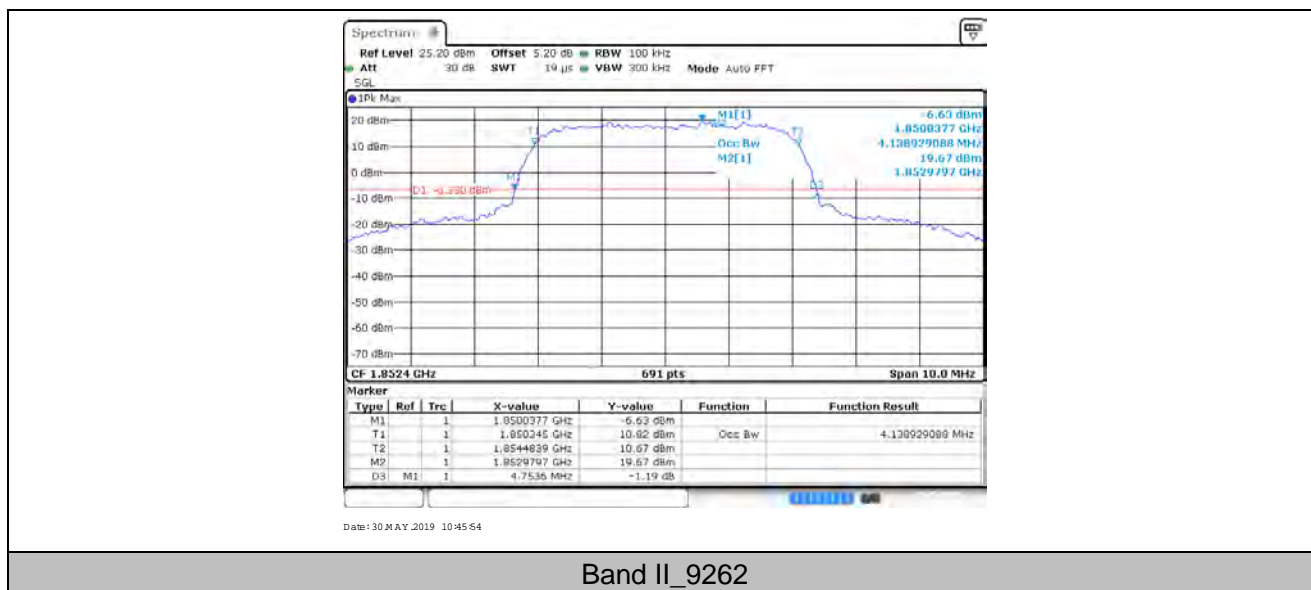


4. 26dB Bandwidth and Occupied Bandwidth

4.1. Test Result

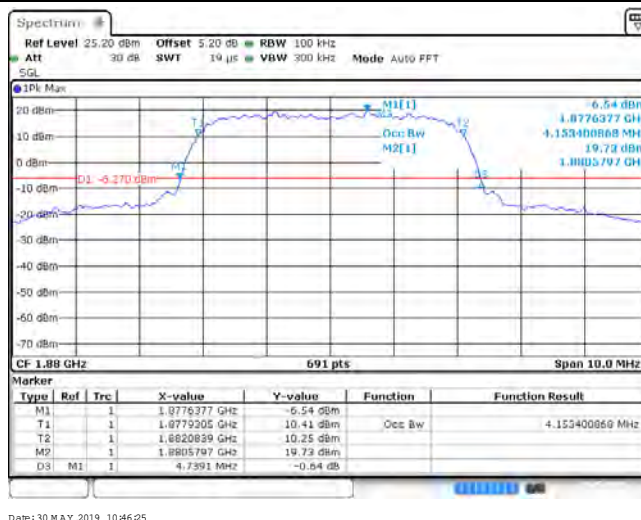
BAND	Channel	Occupied Bandwidth (kHz)	26dB Bandwidth (kHz)	Limit(kHz)	Verdict
Band II	9262	4138.9	4754	---	PASS
Band II	9400	4153.4	4739	---	PASS
Band II	9538	4138.9	4739	---	PASS
Band IV	1312	4124.5	4754	---	PASS
Band IV	1413	4124.5	4739	---	PASS
Band IV	1513	4124.5	4754	---	PASS
Band V	4132	4138.9	4754	---	PASS
Band V	4182	4124.5	4725	---	PASS
Band V	4233	4110.0	4725	---	PASS

4.2. Test Plots

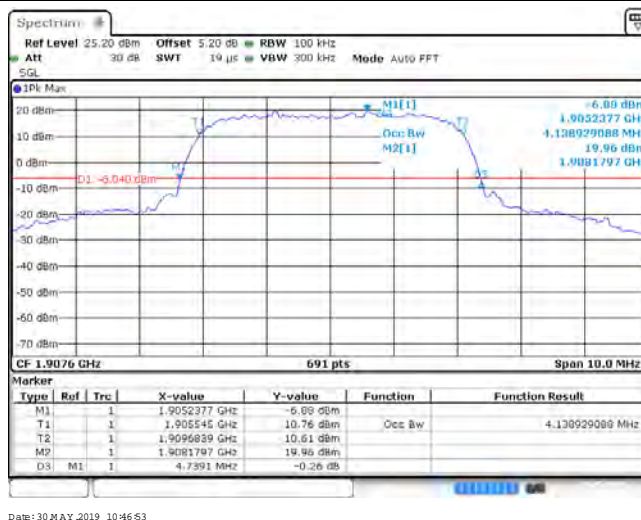


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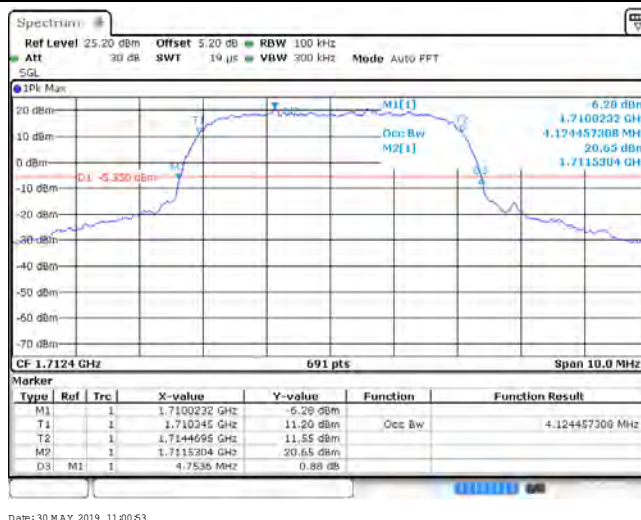


Band II_9400

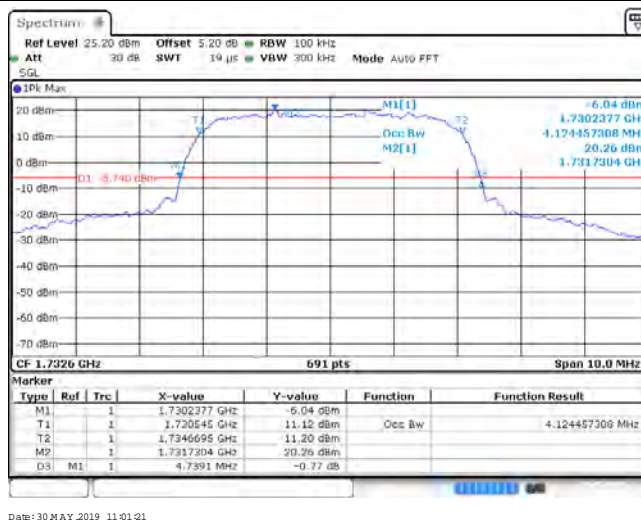


Band II_9538



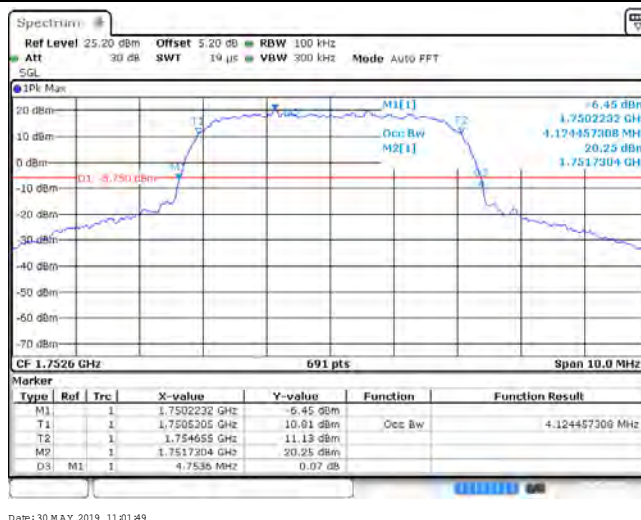


Band IV_1312

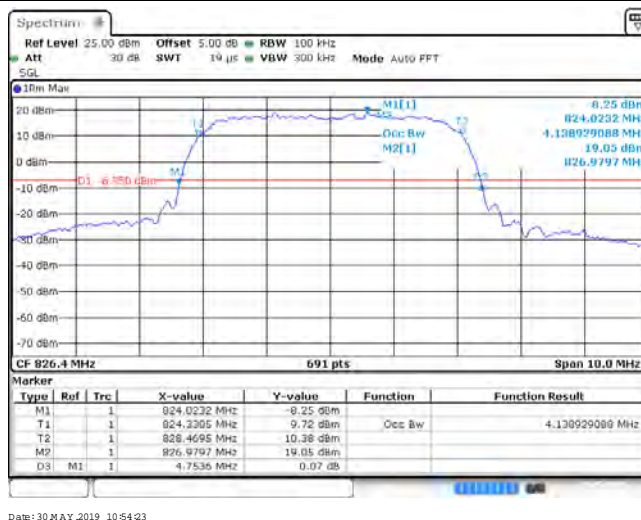


Band IV_1413



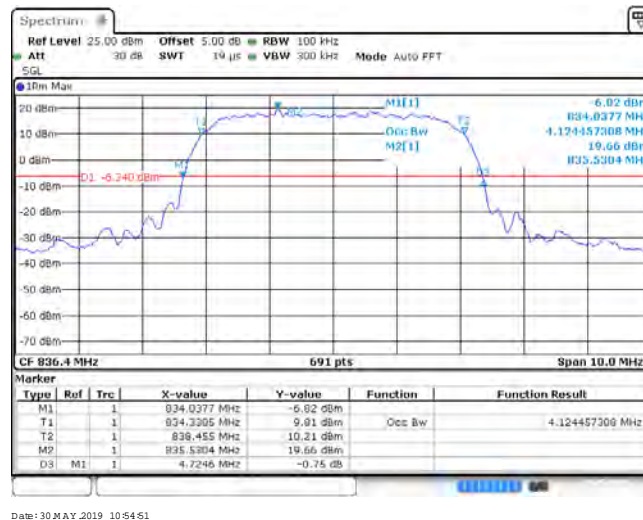


Band IV_1513

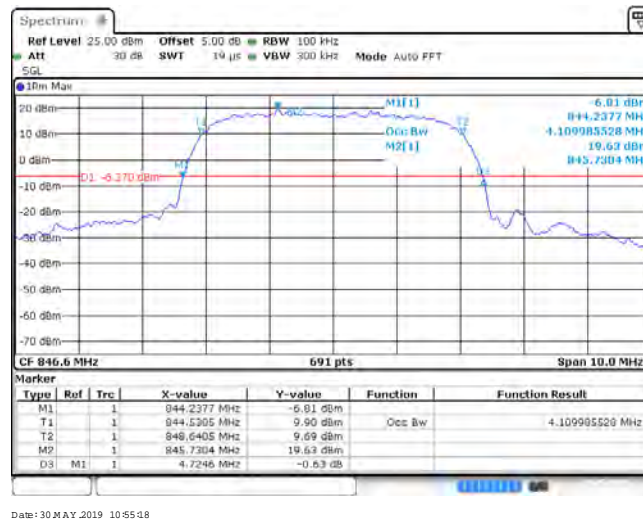


Band V_4132





Band V_4182



Band V_4233



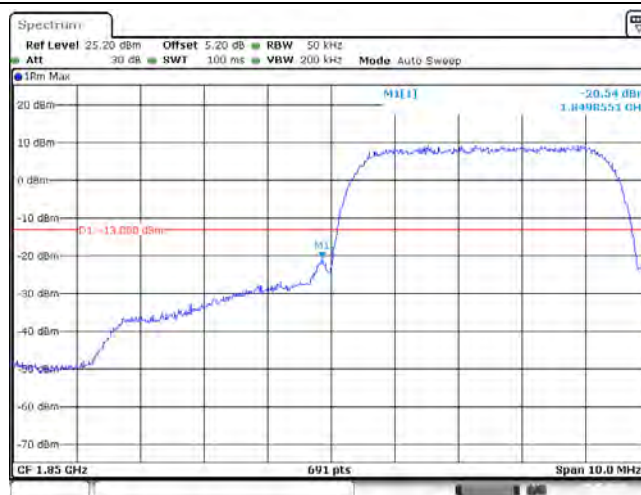
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5. Band Edge Compliance

5.1. Test Plots



Date: 30 MAY 2019 10:47:23

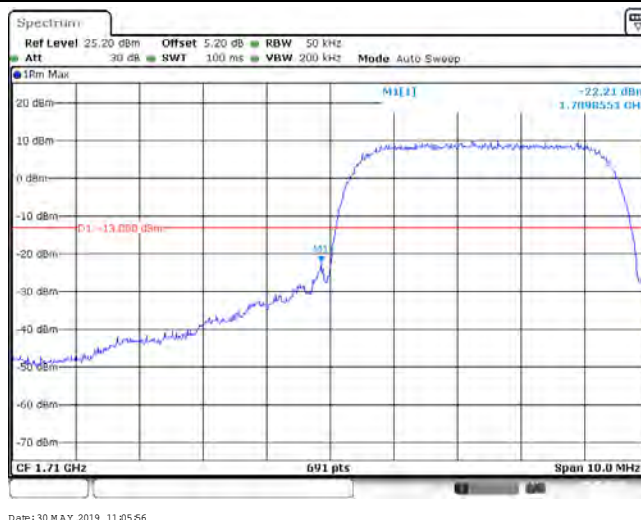
Band II_9262



Date: 30 MAY 2019 10:47:40

Band II_9538



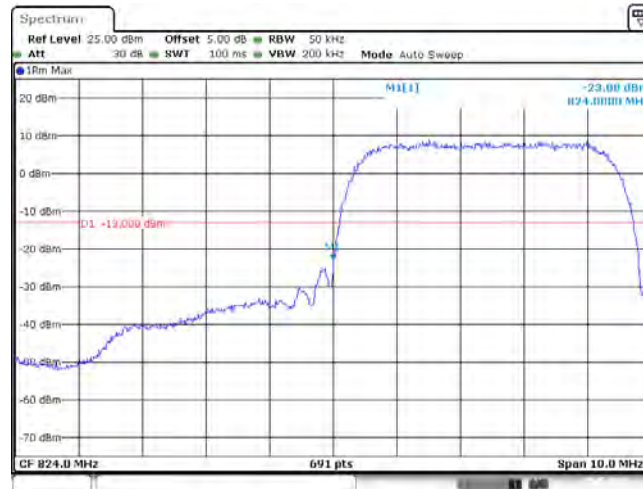


Band IV_1312



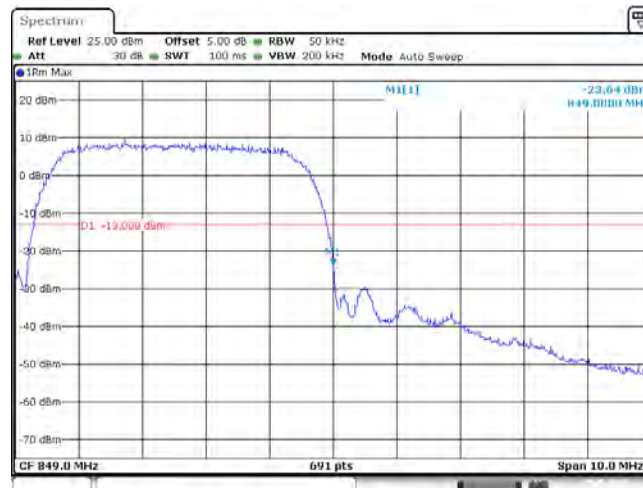
Band IV_1513





Date: 30 MAY 2019 10:53:21

Band V_4132



Date: 30 MAY 2019 10:53:39

Band V_4233



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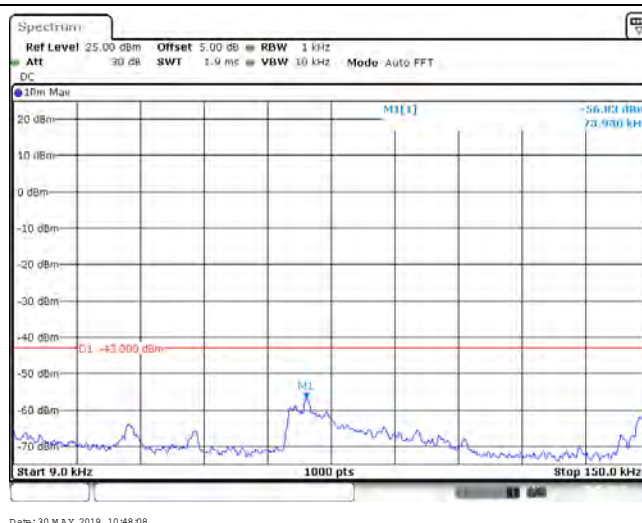


6. Spurious Emission at Antenna Terminal

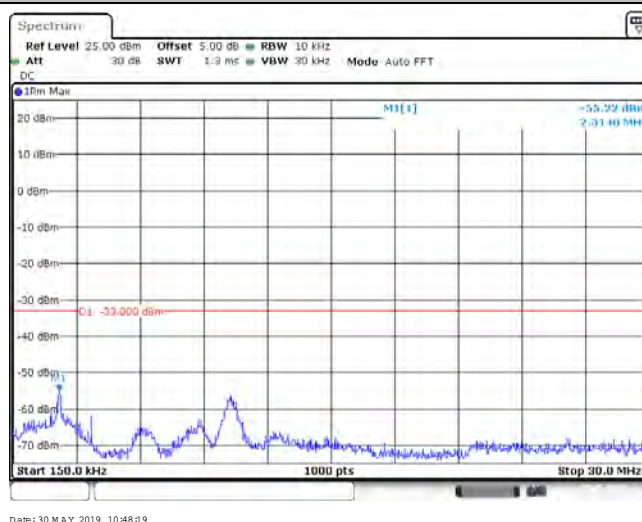
Remark1: For the averaged unwanted emissions measurements, the measurement points in each sweep is greater than twice the Span/RBW in order to ensure bin-to-bin spacing of $< RBW/2$ so that narrowband signals are not lost between frequency bins. As to the present test item, the "Measurement Points = $k * (\text{Span} / RBW)$ " 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

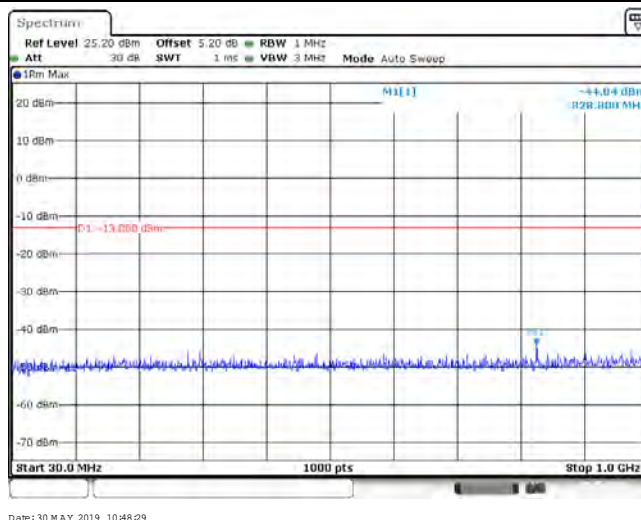


Band II_9262

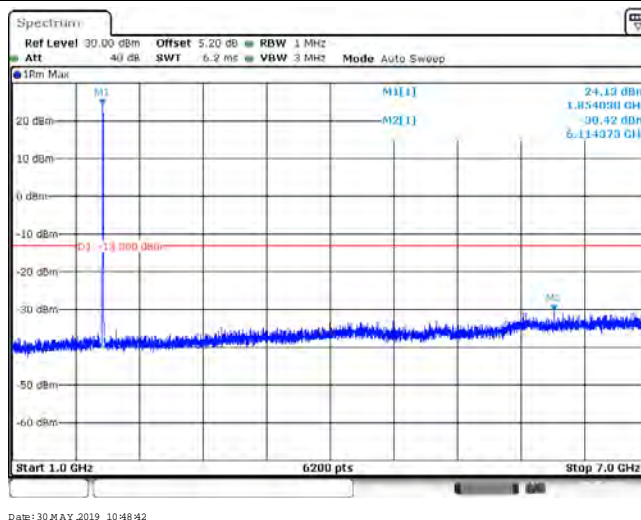


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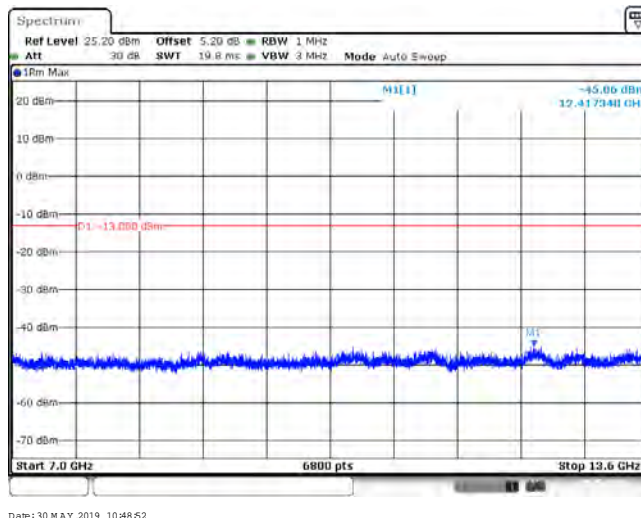


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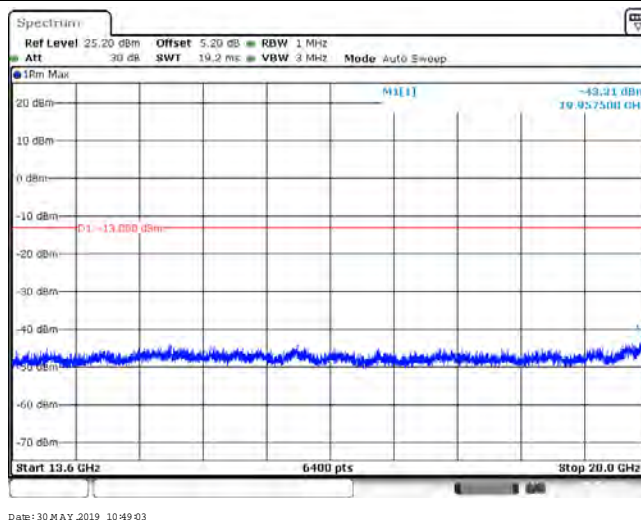


Band II_9262





Band II_9262



Band II_9262



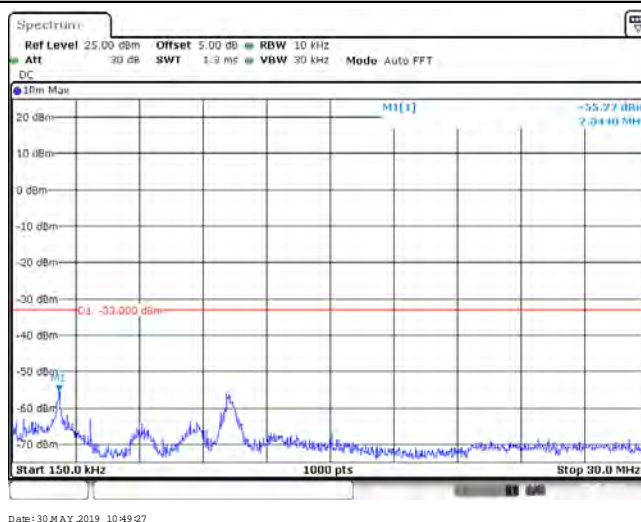
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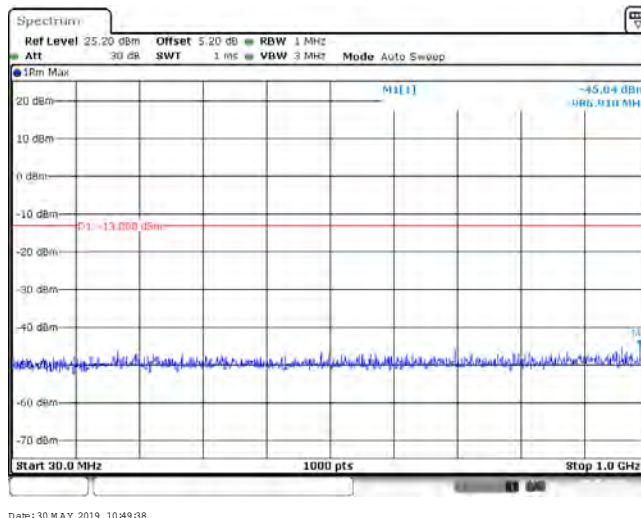


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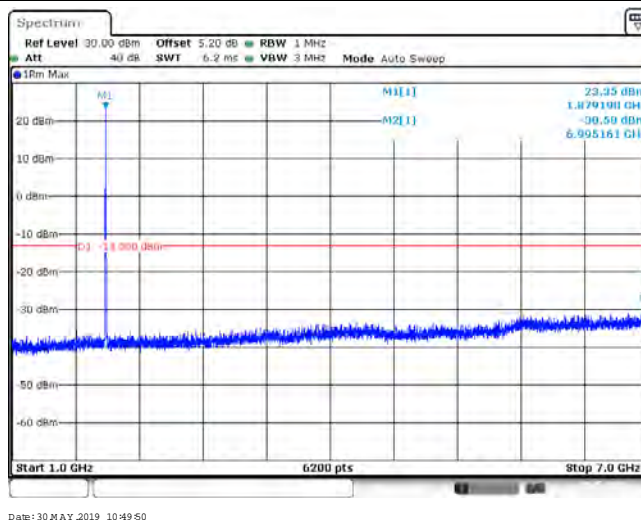


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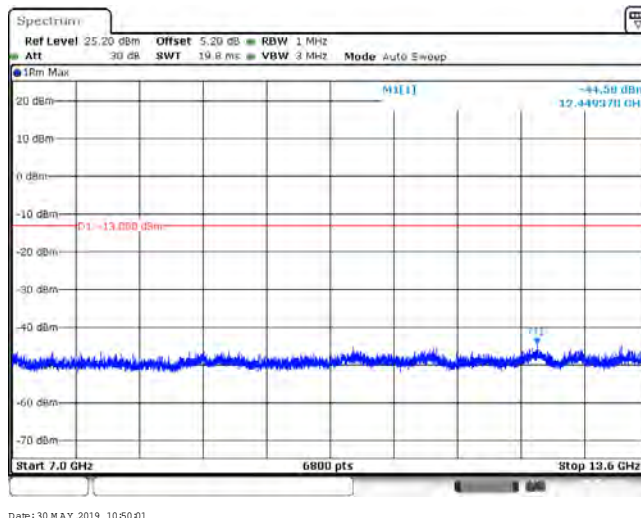


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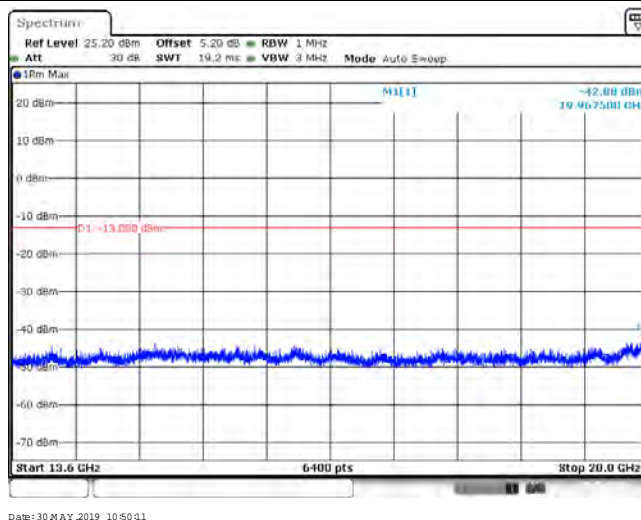


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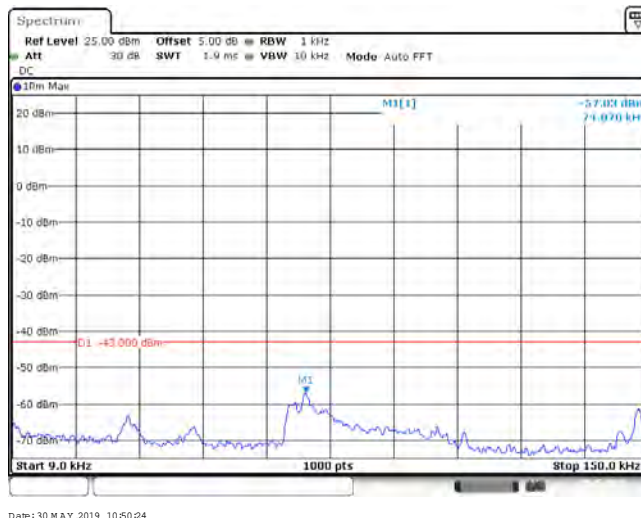


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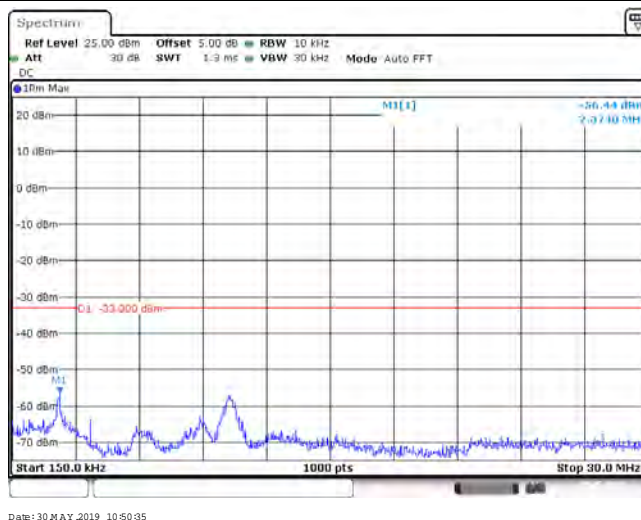


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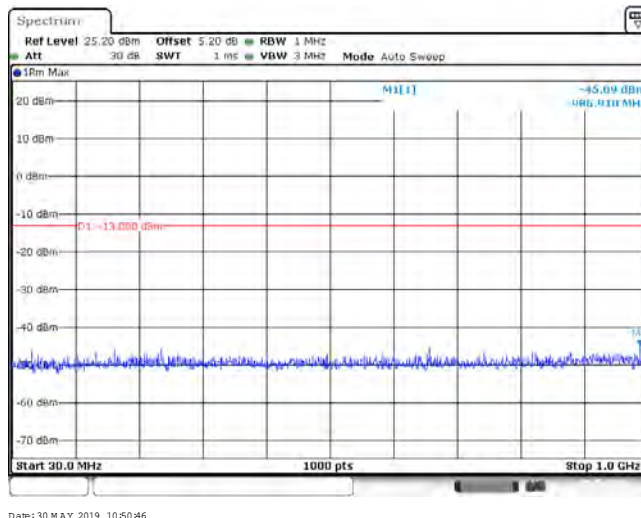


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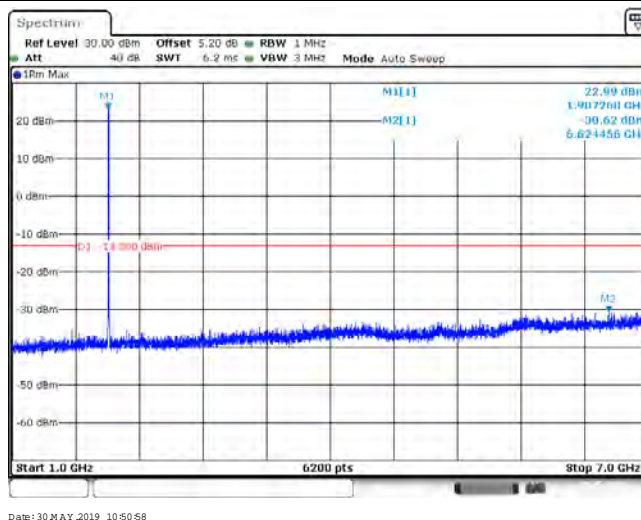


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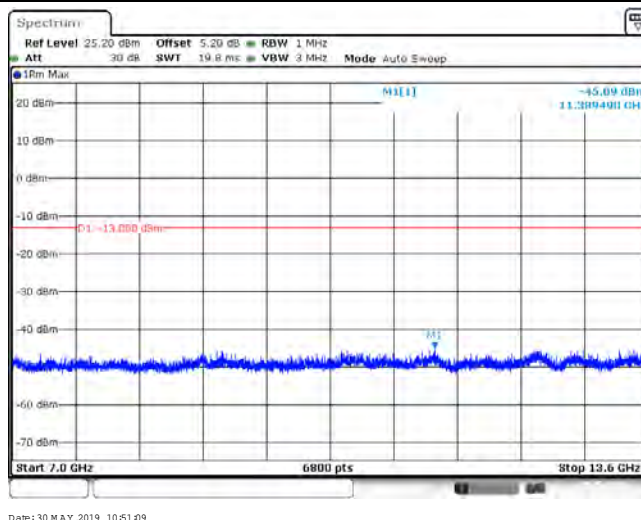


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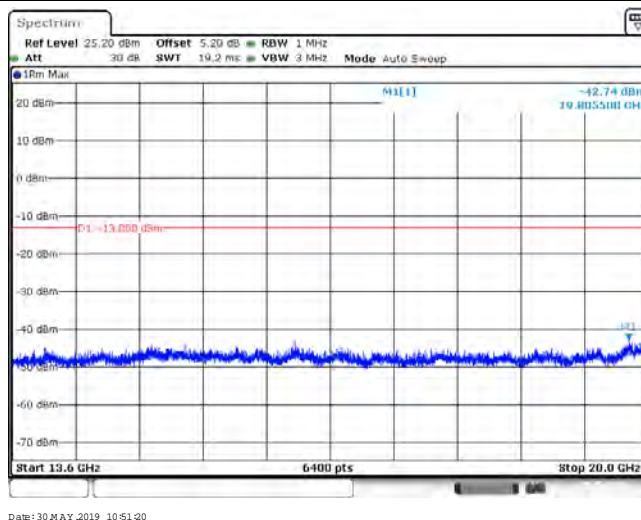


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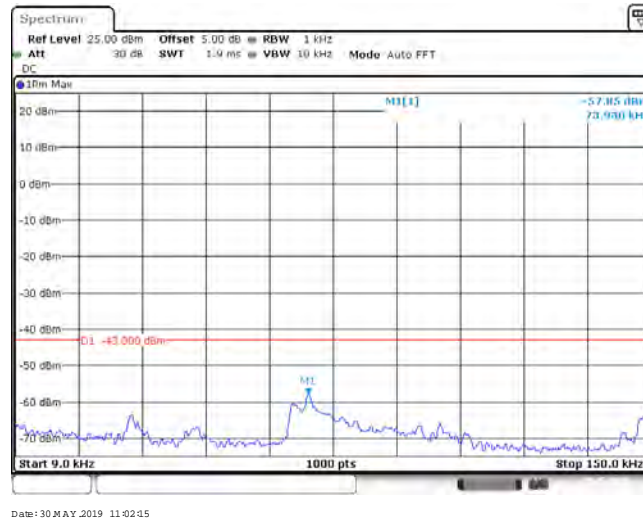


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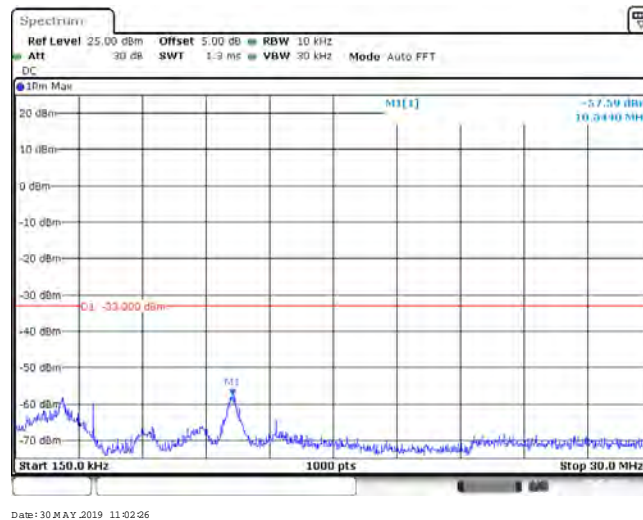


Band II_9538





Band IV_1312

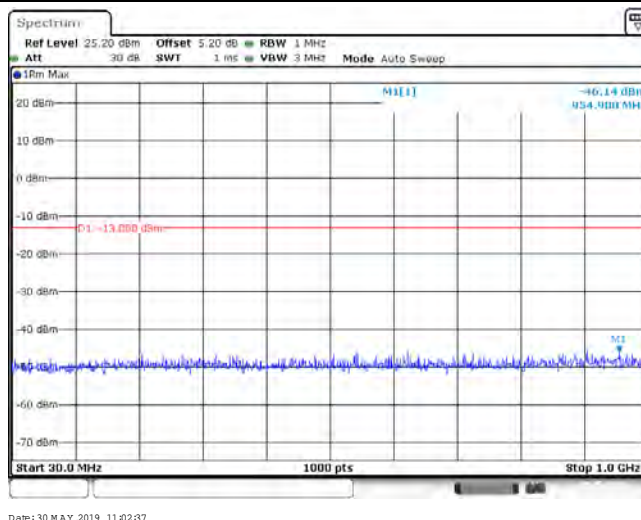


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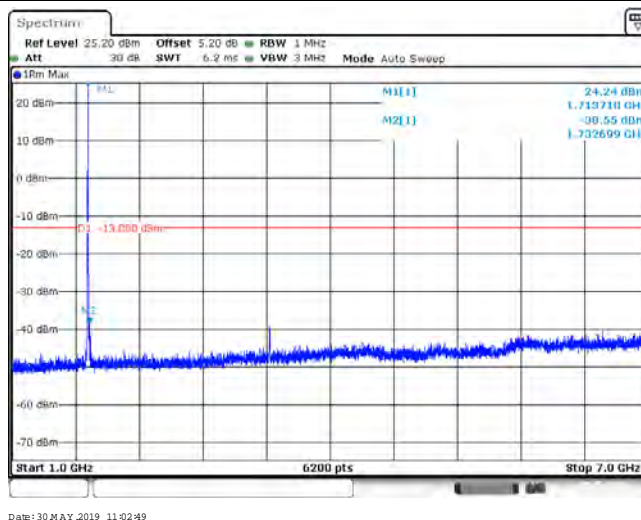


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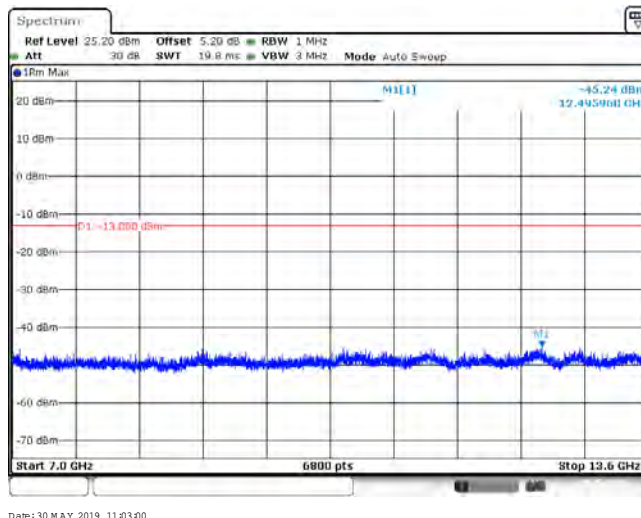


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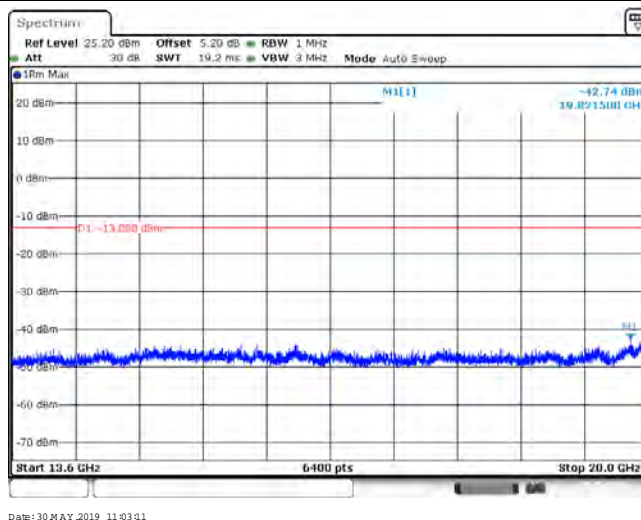


Band IV_1312





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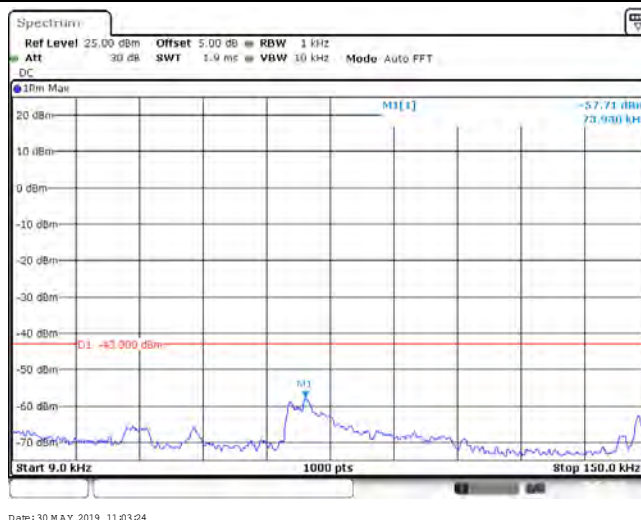


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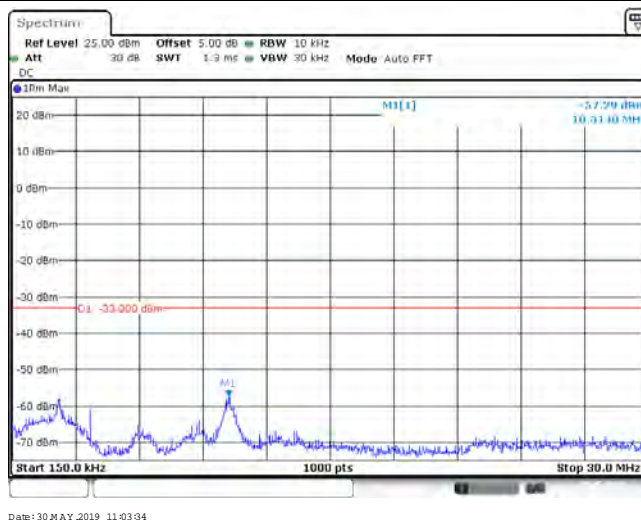


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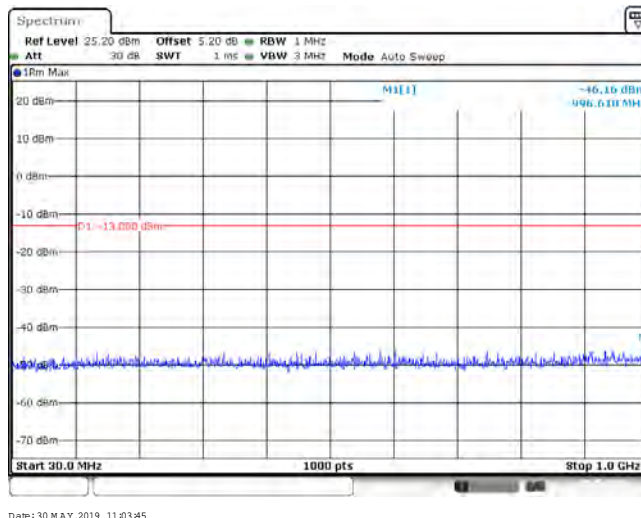


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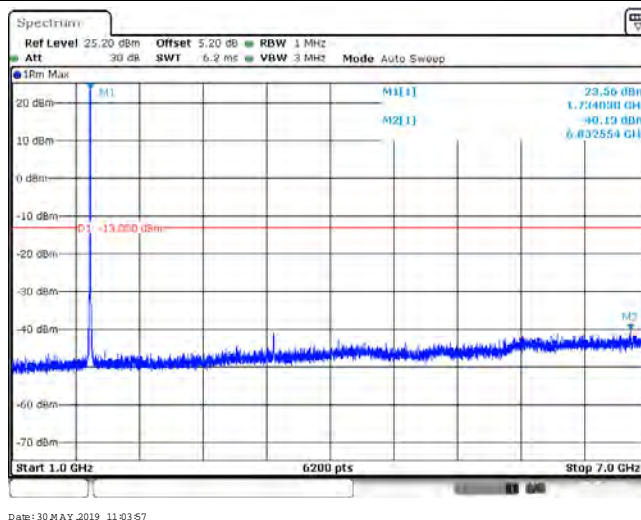


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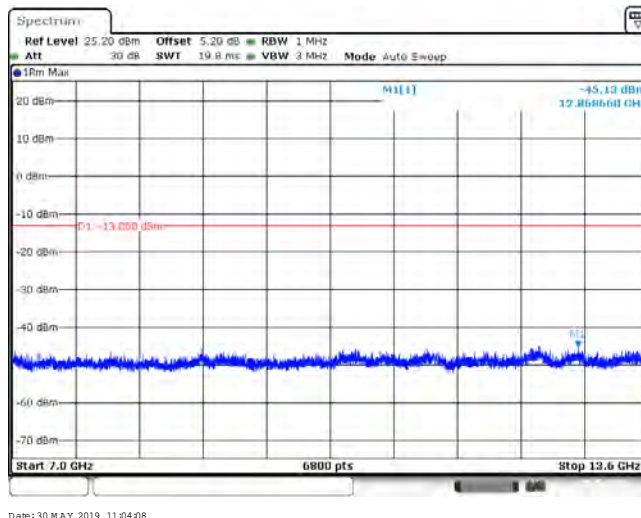


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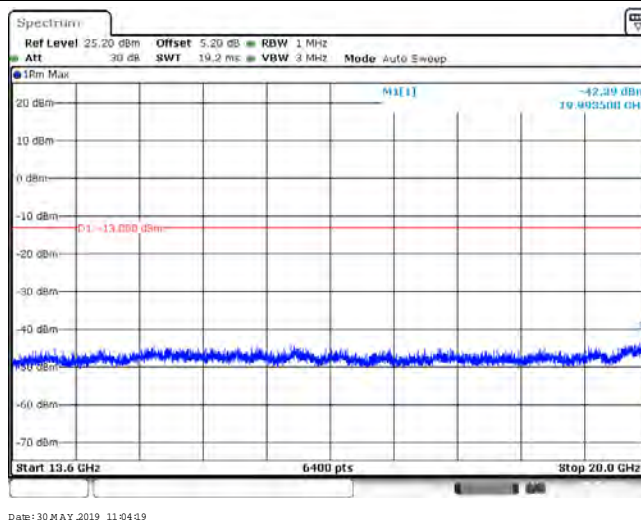


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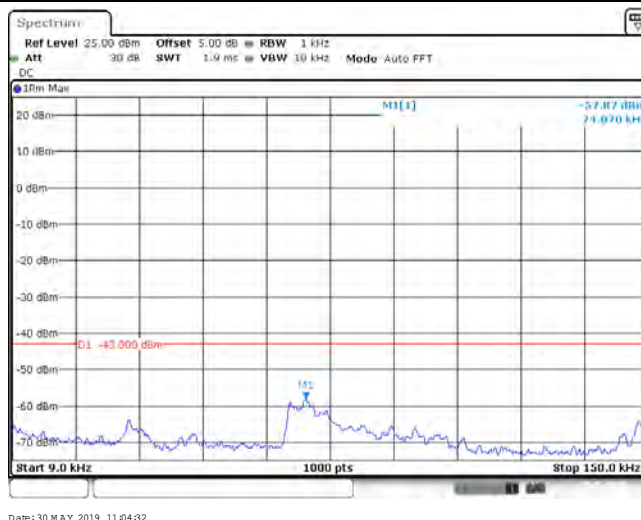


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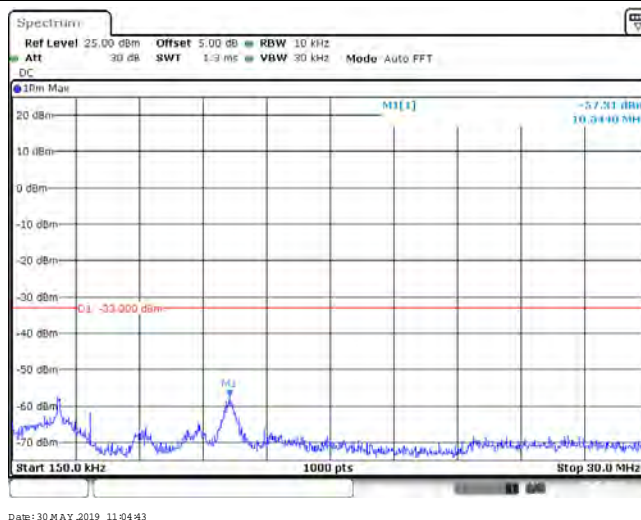


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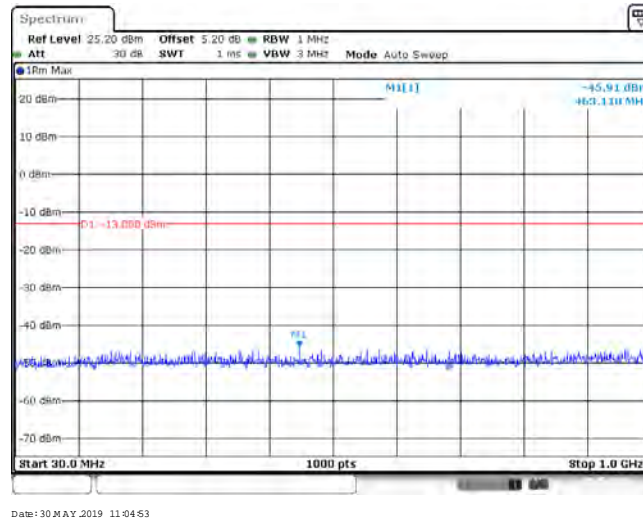


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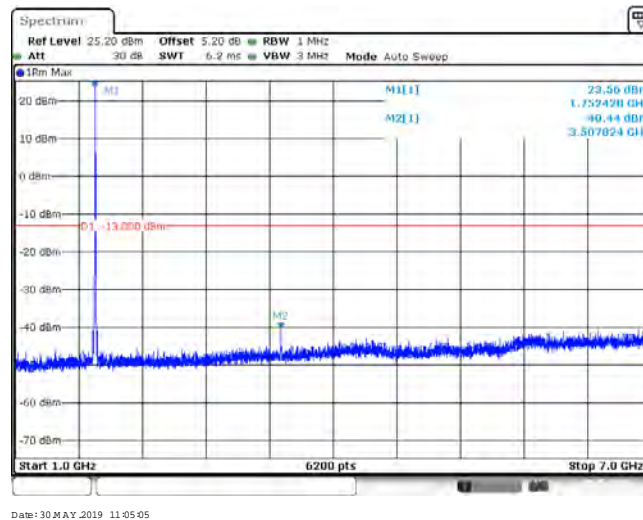


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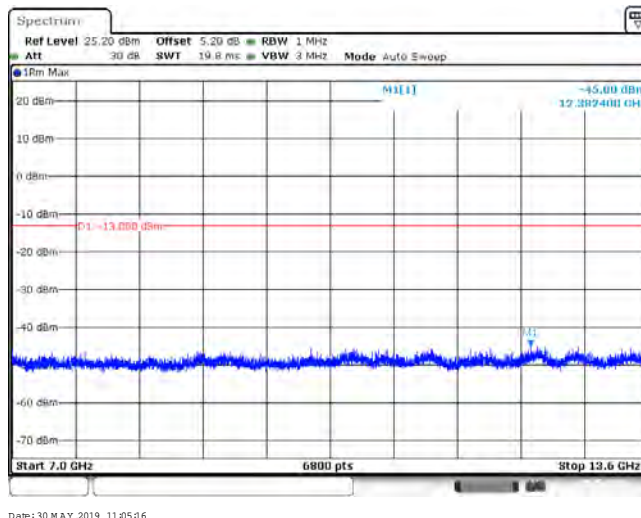


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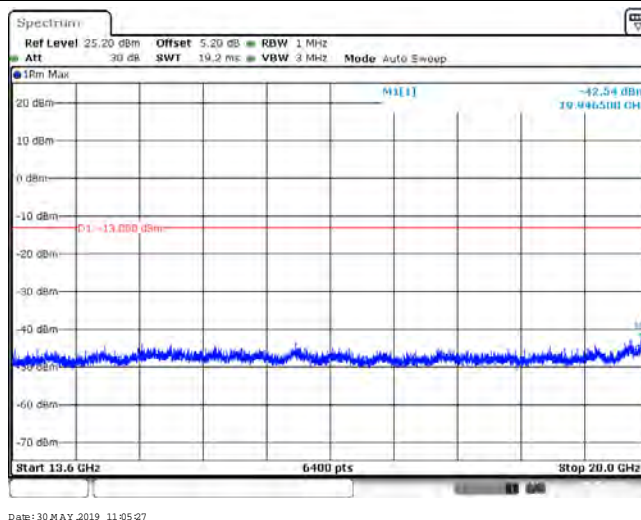


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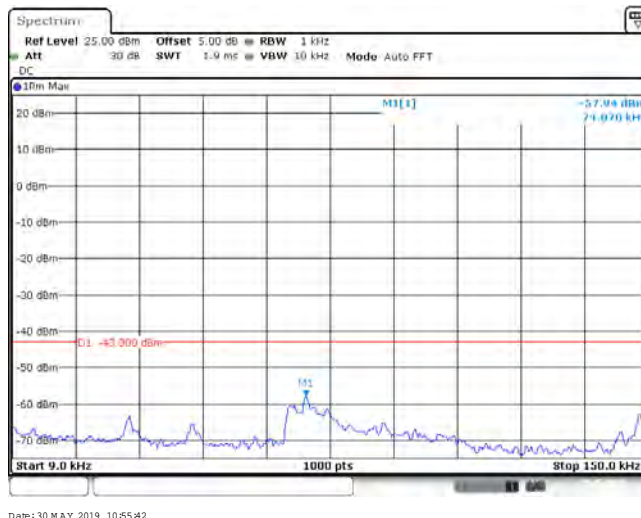
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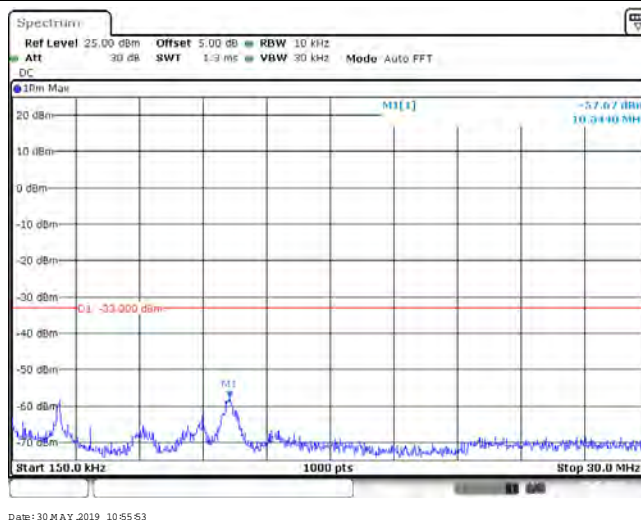
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Band IV_1513



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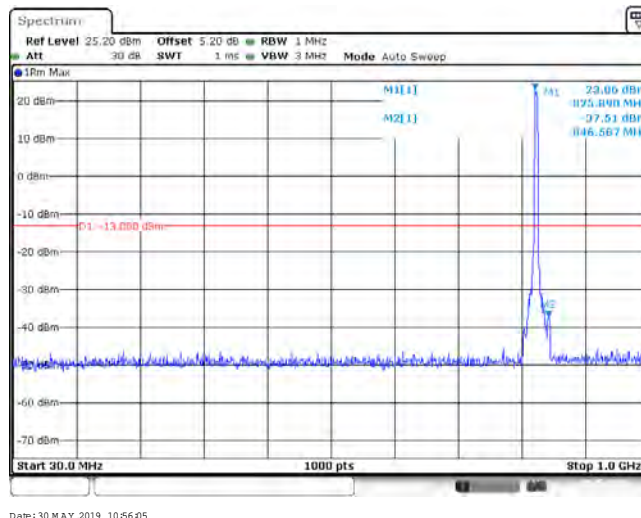


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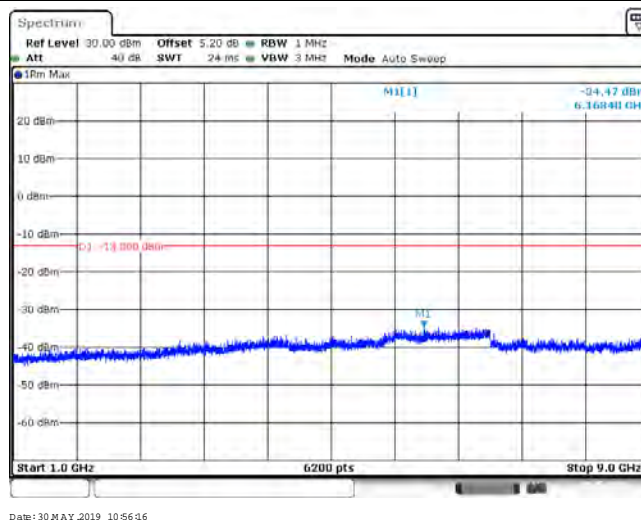


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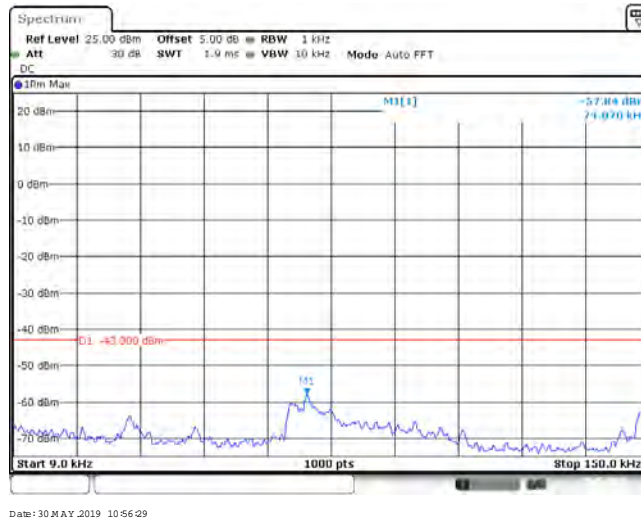


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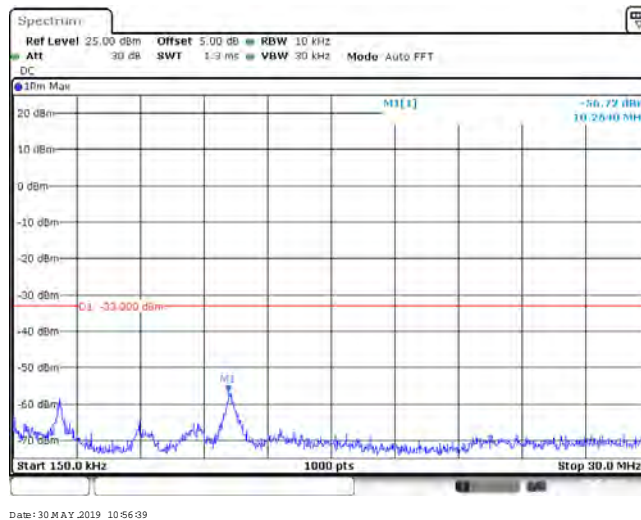


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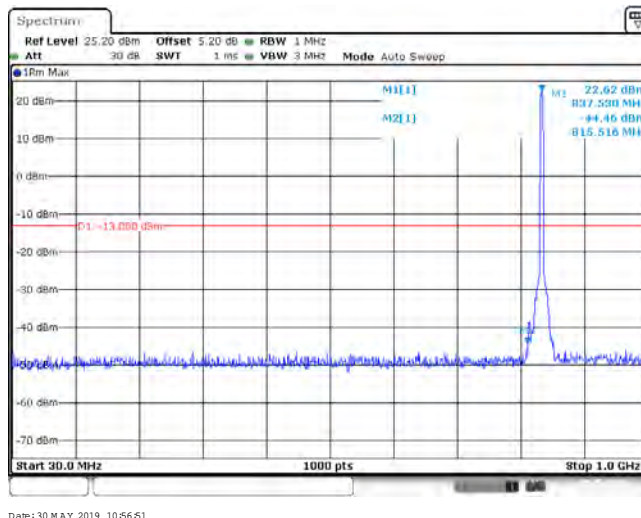


Band V_4182

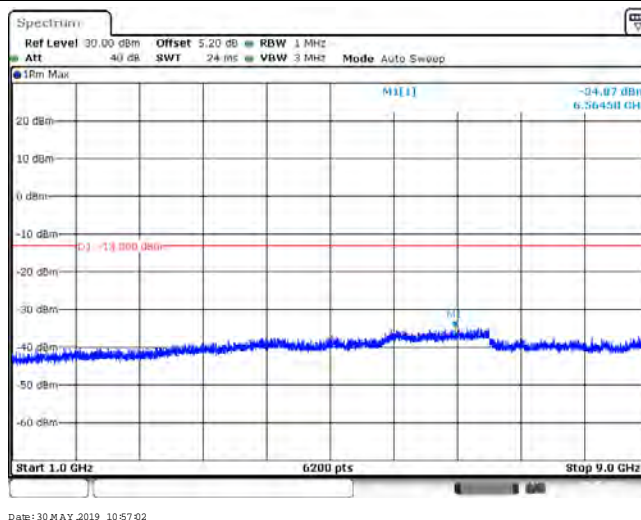


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Band V_4182

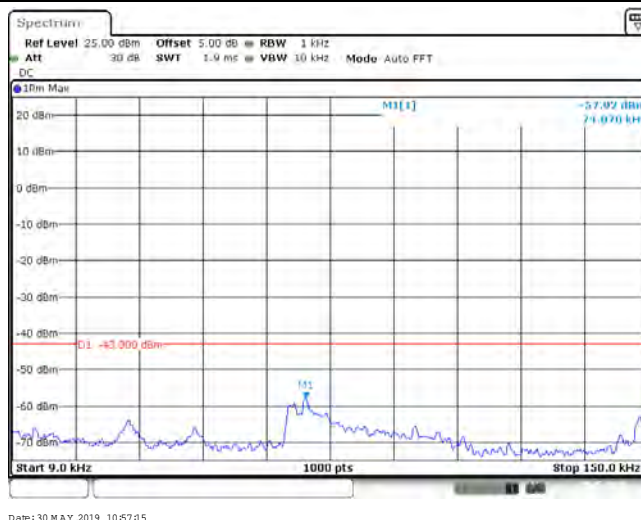


Band V_4182

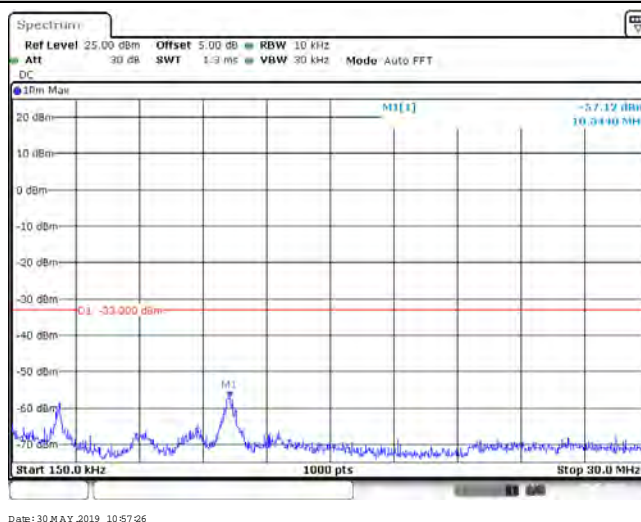


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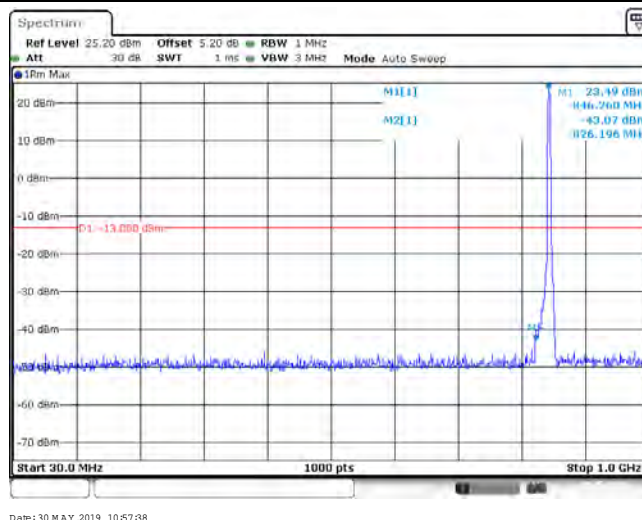


Band V_4233

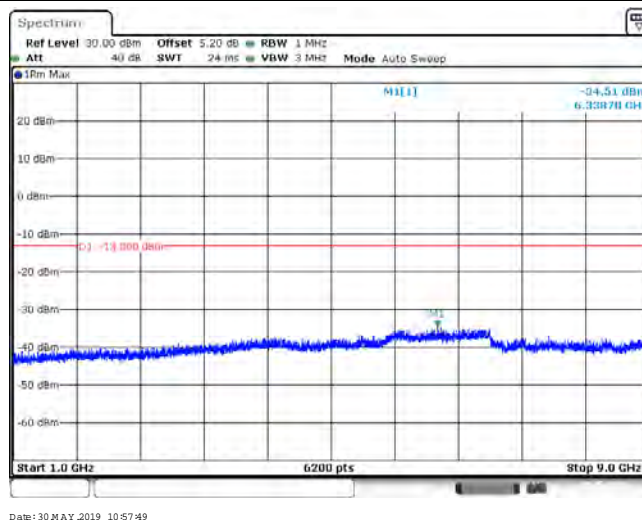


Band V_4233





Band V_4233



Band V_4233





7. Field Strength of Spurious Radiation

7.1. Test BAND = WCDMA BAND II

7.1.1. Test Mode = WCDMA/TM1

7.1.1.1. Test Channel = LCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
65.400000	-80.67	-13.00	67.67	Vertical
127.500000	-84.21	-13.00	71.21	Vertical
938.125000	-76.05	-13.00	63.05	Vertical
3706.387500	-59.24	-13.00	46.24	Vertical
5559.375000	-59.63	-13.00	46.63	Vertical
7862.325000	-62.78	-13.00	49.78	Vertical
61.750000	-76.75	-13.00	63.75	Horizontal
104.300000	-84.55	-13.00	71.55	Horizontal
944.175000	-75.63	-13.00	62.63	Horizontal
3705.900000	-59.20	-13.00	46.20	Horizontal
5554.012500	-62.62	-13.00	49.62	Horizontal
7953.975000	-62.58	-13.00	49.58	Horizontal

7.1.1.2. Test Channel = MCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
64.450000	-81.00	-13.00	68.00	Vertical
104.250000	-83.14	-13.00	70.14	Vertical
948.575000	-75.57	-13.00	62.57	Vertical
3758.550000	-60.64	-13.00	47.64	Vertical
5636.887500	-61.54	-13.00	48.54	Vertical
7523.025000	-63.05	-13.00	50.05	Vertical
62.650000	-76.39	-13.00	63.39	Horizontal
104.300000	-84.32	-13.00	71.32	Horizontal
966.541667	-75.65	-13.00	62.65	Horizontal
3757.575000	-60.58	-13.00	47.58	Horizontal
5642.737500	-64.89	-13.00	51.89	Horizontal
7835.025000	-62.80	-13.00	49.80	Horizontal



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7.1.1.3. Test Channel = HCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
64.900000	-80.17	-13.00	67.17	Vertical
104.250000	-83.06	-13.00	70.06	Vertical
949.308333	-76.30	-13.00	63.30	Vertical
3816.562500	-57.68	-13.00	44.68	Vertical
5726.100000	-59.25	-13.00	46.25	Vertical
7627.350000	-62.84	-13.00	49.84	Vertical
62.500000	-76.44	-13.00	63.44	Horizontal
104.300000	-83.84	-13.00	70.84	Horizontal
966.862500	-75.41	-13.00	62.41	Horizontal
3813.637500	-62.45	-13.00	49.45	Horizontal
5719.762500	-61.57	-13.00	48.57	Horizontal
7859.400000	-62.40	-13.00	49.40	Horizontal

7.2. Test BAND = WCDMA BAND IV

7.2.1. Test Mode = WCDMA/TM1

7.2.1.1. Test Channel = LCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
65.850000	-80.99	-13.00	67.99	Vertical
104.250000	-82.97	-13.00	69.97	Vertical
944.266667	-75.62	-13.00	62.62	Vertical
3422.662500	-52.83	-13.00	39.83	Vertical
5134.275000	-63.54	-13.00	50.54	Vertical
6846.375000	-59.30	-13.00	46.30	Vertical
62.750000	-75.52	-13.00	62.52	Horizontal
104.300000	-83.68	-13.00	70.68	Horizontal
966.816667	-75.63	-13.00	62.63	Horizontal
3422.662500	-52.67	-13.00	39.67	Horizontal
5134.275000	-64.92	-13.00	51.92	Horizontal
7920.337500	-62.68	-13.00	49.68	Horizontal





7.2.1.2. Test Channel = MCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
65.000000	-81.00	-13.00	68.00	Vertical
104.250000	-82.91	-13.00	69.91	Vertical
942.158333	-75.97	-13.00	62.97	Vertical
3463.125000	-52.98	-13.00	39.98	Vertical
5194.725000	-64.24	-13.00	51.24	Vertical
6926.325000	-62.41	-13.00	49.41	Vertical
62.550000	-76.54	-13.00	63.54	Horizontal
104.300000	-83.85	-13.00	70.85	Horizontal
967.366667	-75.63	-13.00	62.63	Horizontal
3467.025000	-47.95	-13.00	34.95	Horizontal
6027.862500	-64.33	-13.00	51.33	Horizontal
7919.850000	-62.71	-13.00	49.71	Horizontal

7.2.1.3. Test Channel = HCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
64.550000	-80.26	-13.00	67.26	Vertical
104.250000	-82.56	-13.00	69.56	Vertical
956.595833	-75.64	-13.00	62.64	Vertical
3506.512500	-58.40	-13.00	45.40	Vertical
5157.187500	-65.47	-13.00	52.47	Vertical
7005.787500	-61.13	-13.00	48.13	Vertical
62.750000	-75.96	-13.00	62.96	Horizontal
104.300000	-83.95	-13.00	70.95	Horizontal
964.662500	-75.17	-13.00	62.17	Horizontal
3507.000000	-57.48	-13.00	44.48	Horizontal
6057.600000	-63.94	-13.00	50.94	Horizontal
9208.800000	-62.28	-13.00	49.28	Horizontal



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7.3. Test BAND = WCDMA BAND V

7.3.1. Test Mode = WCDMA/TM1

7.3.1.1. Test Channel = LCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
63.550000	-80.88	-13.00	67.88	Vertical
104.250000	-82.08	-13.00	69.08	Vertical
1654.500000	-62.39	-13.00	49.39	Vertical
2474.500000	-58.96	-13.00	45.96	Vertical
4397.662500	-66.28	-13.00	53.28	Vertical
7972.500000	-62.80	-13.00	49.80	Vertical
63.950000	-76.12	-13.00	63.12	Horizontal
104.300000	-83.90	-13.00	70.90	Horizontal
1654.500000	-63.04	-13.00	50.04	Horizontal
2474.500000	-59.12	-13.00	46.12	Horizontal
4198.762500	-66.22	-13.00	53.22	Horizontal
7855.987500	-62.66	-13.00	49.66	Horizontal

7.3.1.2. Test Channel = MCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
64.400000	-79.98	-13.00	66.98	Vertical
104.250000	-82.67	-13.00	69.67	Vertical
1671.000000	-61.46	-13.00	48.46	Vertical
2505.000000	-59.11	-13.00	46.11	Vertical
3210.112500	-67.67	-13.00	54.67	Vertical
6024.937500	-64.27	-13.00	51.27	Vertical
62.700000	-76.44	-13.00	63.44	Horizontal
104.300000	-83.78	-13.00	70.78	Horizontal
1674.500000	-61.45	-13.00	48.45	Horizontal
2510.500000	-59.30	-13.00	46.30	Horizontal
4310.400000	-65.78	-13.00	52.78	Horizontal
7916.925000	-62.78	-13.00	49.78	Horizontal





7.3.1.3. Test Channel = HCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Margin (dB)	Polarization
63.450000	-80.23	-13.00	67.23	Vertical
104.250000	-82.87	-13.00	69.87	Vertical
1695.000000	-62.29	-13.00	49.29	Vertical
2542.500000	-59.03	-13.00	46.03	Vertical
4298.700000	-65.84	-13.00	52.84	Vertical
7838.437500	-62.68	-13.00	49.68	Vertical
62.500000	-76.28	-13.00	63.28	Horizontal
104.300000	-83.89	-13.00	70.89	Horizontal
1691.500000	-63.03	-13.00	50.03	Horizontal
2541.500000	-59.38	-13.00	46.38	Horizontal
4315.275000	-65.76	-13.00	52.76	Horizontal
7936.425000	-62.71	-13.00	49.71	Horizontal

Remark:

The disturbance 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.

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	Channel	Voltage (Vdc)	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
Band II	9262	VL	TN	1.59	0.000857	±2.5	PASS
Band II	9262	VN	TN	2.27	0.001224	±2.5	PASS
Band II	9262	VH	TN	1.69	0.000911	±2.5	PASS
Band II	9400	VL	TN	-2.35	-0.001248	±2.5	PASS
Band II	9400	VN	TN	-1.73	-0.000921	±2.5	PASS
Band II	9400	VH	TN	-2.02	-0.001073	±2.5	PASS
Band II	9538	VL	TN	-5.86	-0.003071	±2.5	PASS
Band II	9538	VN	TN	-5.79	-0.003037	±2.5	PASS
Band II	9538	VH	TN	-6.76	-0.003543	±2.5	PASS
Band IV	1312	VL	TN	13.73	0.008016	±2.5	PASS
Band IV	1312	VN	TN	14.03	0.008195	±2.5	PASS
Band IV	1312	VH	TN	15.27	0.008918	±2.5	PASS
Band IV	1413	VL	TN	-2.50	-0.001441	±2.5	PASS
Band IV	1413	VN	TN	-1.86	-0.001073	±2.5	PASS
Band IV	1413	VH	TN	-2.70	-0.001556	±2.5	PASS
Band IV	1513	VL	TN	-13.75	-0.007844	±2.5	PASS
Band IV	1513	VN	TN	-13.17	-0.007513	±2.5	PASS
Band IV	1513	VH	TN	-12.75	-0.007273	±2.5	PASS
Band V	4132	VL	TN	-0.18	-0.000216	±2.5	PASS
Band V	4132	VN	TN	0.71	0.000857	±2.5	PASS
Band V	4132	VH	TN	0.09	0.000113	±2.5	PASS
Band V	4182	VL	TN	-0.72	-0.000864	±2.5	PASS
Band V	4182	VN	TN	0.26	0.000308	±2.5	PASS
Band V	4182	VH	TN	-0.04	-0.000051	±2.5	PASS
Band V	4233	VL	TN	-1.09	-0.001284	±2.5	PASS
Band V	4233	VN	TN	-1.97	-0.002332	±2.5	PASS
Band V	4233	VH	TN	-2.12	-0.002501	±2.5	PASS



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8.2. Frequency Vs Temperature

Temperature							
BAND	Channel	Voltage (Vdc)	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
Band II	9262	VN	-30	1.66	0.000896	±2.5	PASS
Band II	9262	VN	-20	2.01	0.001085	±2.5	PASS
Band II	9262	VN	-10	1.77	0.000958	±2.5	PASS
Band II	9262	VN	0	1.24	0.000668	±2.5	PASS
Band II	9262	VN	10	1.39	0.000753	±2.5	PASS
Band II	9262	VN	20	1.34	0.000726	±2.5	PASS
Band II	9262	VN	30	1.95	0.001050	±2.5	PASS
Band II	9262	VN	40	2.00	0.001077	±2.5	PASS
Band II	9262	VN	50	0.98	0.000529	±2.5	PASS
Band II	9400	VN	-30	-1.46	-0.000776	±2.5	PASS
Band II	9400	VN	-20	-1.64	-0.000871	±2.5	PASS
Band II	9400	VN	-10	-2.27	-0.001206	±2.5	PASS
Band II	9400	VN	0	-2.17	-0.001157	±2.5	PASS
Band II	9400	VN	10	-2.73	-0.001450	±2.5	PASS
Band II	9400	VN	20	-2.60	-0.001381	±2.5	PASS
Band II	9400	VN	30	-2.41	-0.001282	±2.5	PASS
Band II	9400	VN	40	-1.97	-0.001046	±2.5	PASS
Band II	9400	VN	50	-2.37	-0.001259	±2.5	PASS
Band II	9538	VN	-30	-5.88	-0.003082	±2.5	PASS
Band II	9538	VN	-20	-6.01	-0.003150	±2.5	PASS
Band II	9538	VN	-10	-5.69	-0.002985	±2.5	PASS
Band II	9538	VN	0	-6.27	-0.003285	±2.5	PASS
Band II	9538	VN	10	-5.04	-0.002640	±2.5	PASS
Band II	9538	VN	20	-4.14	-0.002171	±2.5	PASS
Band II	9538	VN	30	-6.29	-0.003296	±2.5	PASS
Band II	9538	VN	40	-5.91	-0.003097	±2.5	PASS
Band II	9538	VN	50	-6.22	-0.003258	±2.5	PASS
Band IV	1312	VN	-30	12.86	0.007510	±2.5	PASS
Band IV	1312	VN	-20	14.08	0.008220	±2.5	PASS
Band IV	1312	VN	-10	14.10	0.008233	±2.5	PASS
Band IV	1312	VN	0	14.26	0.008329	±2.5	PASS
Band IV	1312	VN	10	13.98	0.008162	±2.5	PASS
Band IV	1312	VN	20	14.46	0.008442	±2.5	PASS



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Band IV	1312	VN	30	14.24	0.008316	±2.5	PASS
Band IV	1312	VN	40	15.69	0.009164	±2.5	PASS
Band IV	1312	VN	50	15.19	0.008872	±2.5	PASS
Band IV	1413	VN	-30	-1.21	-0.000698	±2.5	PASS
Band IV	1413	VN	-20	-0.70	-0.000405	±2.5	PASS
Band IV	1413	VN	-10	-2.94	-0.001697	±2.5	PASS
Band IV	1413	VN	0	-6.72	-0.003881	±2.5	PASS
Band IV	1413	VN	10	-2.11	-0.001218	±2.5	PASS
Band IV	1413	VN	20	-1.02	-0.000590	±2.5	PASS
Band IV	1413	VN	30	-1.14	-0.000656	±2.5	PASS
Band IV	1413	VN	40	-2.00	-0.001152	±2.5	PASS
Band IV	1413	VN	50	-5.59	-0.003224	±2.5	PASS
Band IV	1513	VN	-30	-14.85	-0.008472	±2.5	PASS
Band IV	1513	VN	-20	-13.89	-0.007926	±2.5	PASS
Band IV	1513	VN	-10	-13.83	-0.007893	±2.5	PASS
Band IV	1513	VN	0	-13.86	-0.007909	±2.5	PASS
Band IV	1513	VN	10	-14.32	-0.008170	±2.5	PASS
Band IV	1513	VN	20	-13.24	-0.007554	±2.5	PASS
Band IV	1513	VN	30	-13.93	-0.007950	±2.5	PASS
Band IV	1513	VN	40	-14.08	-0.008036	±2.5	PASS
Band IV	1513	VN	50	-13.10	-0.007473	±2.5	PASS
Band V	4132	VN	-30	0.12	0.000147	±2.5	PASS
Band V	4132	VN	-20	1.12	0.001350	±2.5	PASS
Band V	4132	VN	-10	0.21	0.000251	±2.5	PASS
Band V	4132	VN	0	0.56	0.000675	±2.5	PASS
Band V	4132	VN	10	0.36	0.000433	±2.5	PASS
Band V	4132	VN	20	0.76	0.000917	±2.5	PASS
Band V	4132	VN	30	0.48	0.000580	±2.5	PASS
Band V	4132	VN	40	0.13	0.000156	±2.5	PASS
Band V	4132	VN	50	0.59	0.000710	±2.5	PASS
Band V	4182	VN	-30	-0.41	-0.000487	±2.5	PASS
Band V	4182	VN	-20	0.30	0.000359	±2.5	PASS
Band V	4182	VN	-10	0.02	0.000026	±2.5	PASS
Band V	4182	VN	0	-0.36	-0.000428	±2.5	PASS
Band V	4182	VN	10	0.11	0.000128	±2.5	PASS
Band V	4182	VN	20	-0.17	-0.000205	±2.5	PASS
Band V	4182	VN	30	-0.18	-0.000214	±2.5	PASS
Band V	4182	VN	40	0.03	0.000034	±2.5	PASS



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Band V	4182	VN	50	-0.04	-0.000051	±2.5	PASS
Band V	4233	VN	-30	-1.57	-0.001850	±2.5	PASS
Band V	4233	VN	-20	-1.60	-0.001884	±2.5	PASS
Band V	4233	VN	-10	-1.33	-0.001571	±2.5	PASS
Band V	4233	VN	0	-2.11	-0.002492	±2.5	PASS
Band V	4233	VN	10	-2.27	-0.002678	±2.5	PASS
Band V	4233	VN	20	-1.57	-0.001859	±2.5	PASS
Band V	4233	VN	30	-1.60	-0.001884	±2.5	PASS
Band V	4233	VN	40	-2.30	-0.002712	±2.5	PASS
Band V	4233	VN	50	-1.97	-0.002332	±2.5	PASS

The End



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