



Appendix B

LTE-NB1 Band 25





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1 Effective (Isotropic) Radiated Power Output Data

1.1 Test Result for LTE NB1 Band 25

Test Band	Test Mode	Sub-carrier Spacing (kHz)	Test channel	Number of T	Conducted Power (dBm)	EIRP (dBm)	limit (dBm)	Verdict
NB1 Band 25	BPSK	3.75	26041	1T0	23.13	26.05	33.00	PASS
NB1 Band 25	BPSK	3.75	26041	1T47	22.87	25.79	33.00	PASS
NB1 Band 25	BPSK	3.75	26365	1T0	23.19	26.11	33.00	PASS
NB1 Band 25	BPSK	3.75	26365	1T47	23.06	25.98	33.00	PASS
NB1 Band 25	BPSK	3.75	26689	1T0	23.18	26.10	33.00	PASS
NB1 Band 25	BPSK	3.75	26689	1T47	23.07	25.99	33.00	PASS
NB1 Band 25	QPSK	3.75	26041	1T0	22.84	25.76	33.00	PASS
NB1 Band 25	QPSK	3.75	26041	1T47	23.11	26.03	33.00	PASS
NB1 Band 25	QPSK	3.75	26365	1T0	23.15	26.07	33.00	PASS
NB1 Band 25	QPSK	3.75	26365	1T47	22.90	25.82	33.00	PASS
NB1 Band 25	QPSK	3.75	26689	1T0	22.83	25.75	33.00	PASS
NB1 Band 25	QPSK	3.75	26689	1T47	23.07	25.99	33.00	PASS

Test Band	Test Mode	Sub-carrier Spacing (kHz)	Test channel	Number of T	Conducted Power (dBm)	EIRP (dBm)	limit (dBm)	Verdict
NB1 Band 25	BPSK	15	26041	1T0	22.98	25.90	33.00	PASS
NB1 Band 25	BPSK	15	26041	1T11	23.00	25.92	33.00	PASS
NB1 Band 25	BPSK	15	26365	1T0	23.20	26.12	33.00	PASS
NB1 Band 25	BPSK	15	26365	1T11	22.93	25.85	33.00	PASS
NB1 Band 25	BPSK	15	26689	1T0	22.99	25.91	33.00	PASS
NB1 Band 25	BPSK	15	26689	1T11	22.80	25.72	33.00	PASS
NB1 Band 25	QPSK	15	26041	1T0	22.85	25.77	33.00	PASS
NB1 Band 25	QPSK	15	26041	1T11	22.95	25.87	33.00	PASS
NB1 Band 25	QPSK	15	26041	12T0	21.11	24.03	33.00	PASS
NB1 Band 25	QPSK	15	26365	1T0	22.88	25.80	33.00	PASS
NB1 Band 25	QPSK	15	26365	1T11	23.18	26.10	33.00	PASS
NB1 Band 25	QPSK	15	26365	12T0	21.28	24.20	33.00	PASS
NB1 Band 25	QPSK	15	26689	1T0	23.06	25.98	33.00	PASS
NB1 Band 25	QPSK	15	26689	1T11	23.04	25.96	33.00	PASS
NB1 Band 25	QPSK	15	26689	12T0	21.31	24.23	33.00	PASS

Note:

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

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

$ERP [dBm] = \text{Conducted Power} [dBm] + \text{Gain} [dBi] - 2.15$



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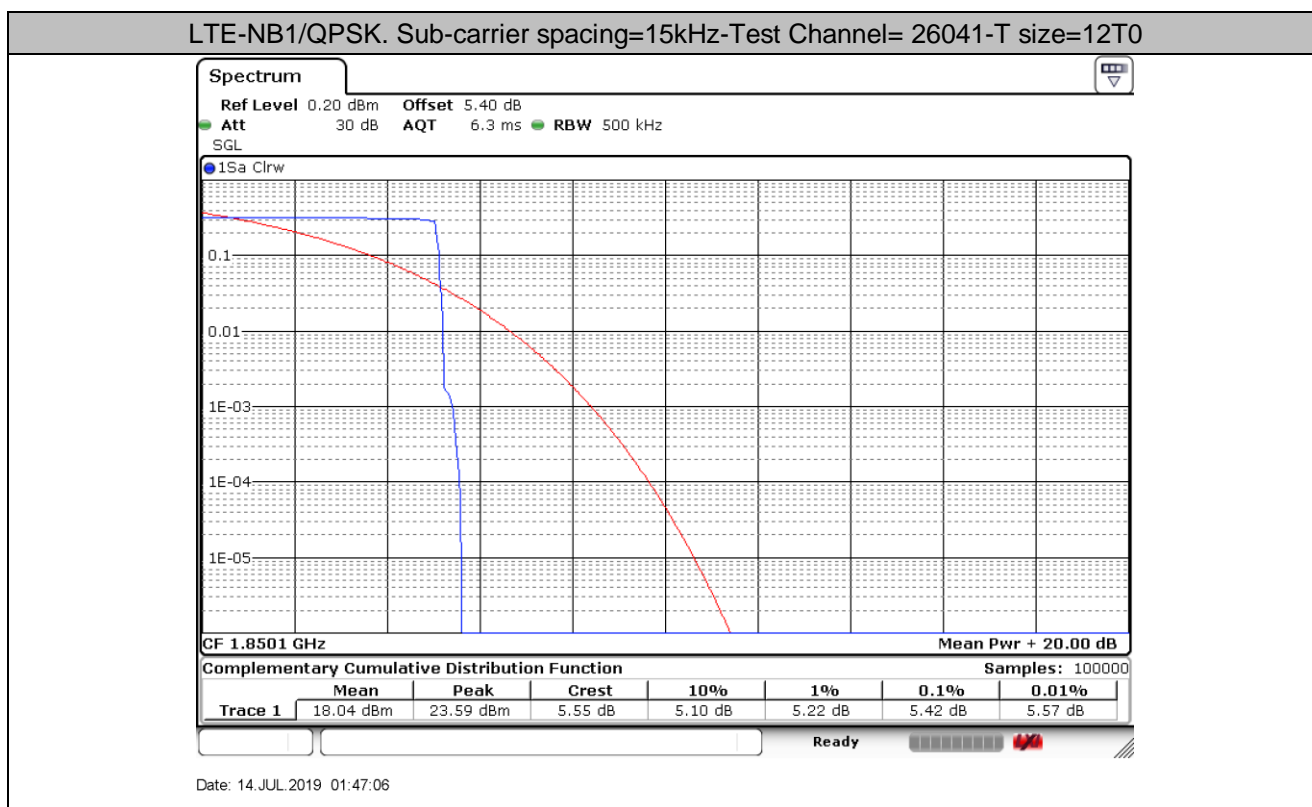


2 Peak-to-Average Ratio

Test Band	Test Mode	Test Channel	Measured[dB]	Limit [dB]	Verdict
NB1 Band 25	QPSK/12T0	26041	5.42	13	PASS
NB1 Band 25	QPSK/12T0	26365	5.91	13	PASS
NB1 Band 25	QPSK/12T0	26689	5.57	13	PASS

2.1 For LTE-NB1

2.1.1 Test Band = LTE-NB1 Band 25



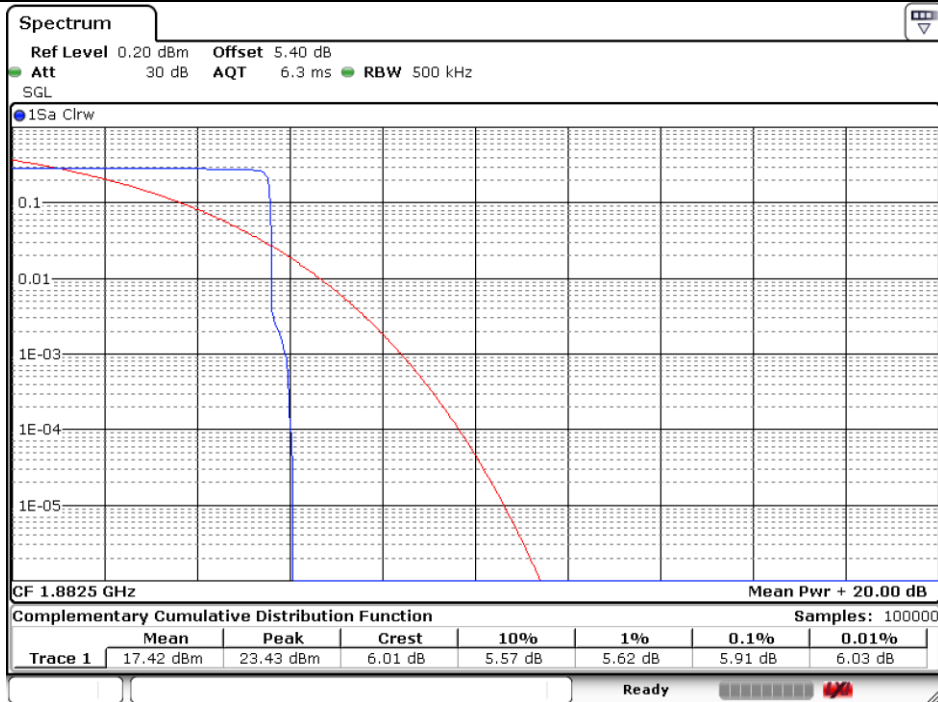
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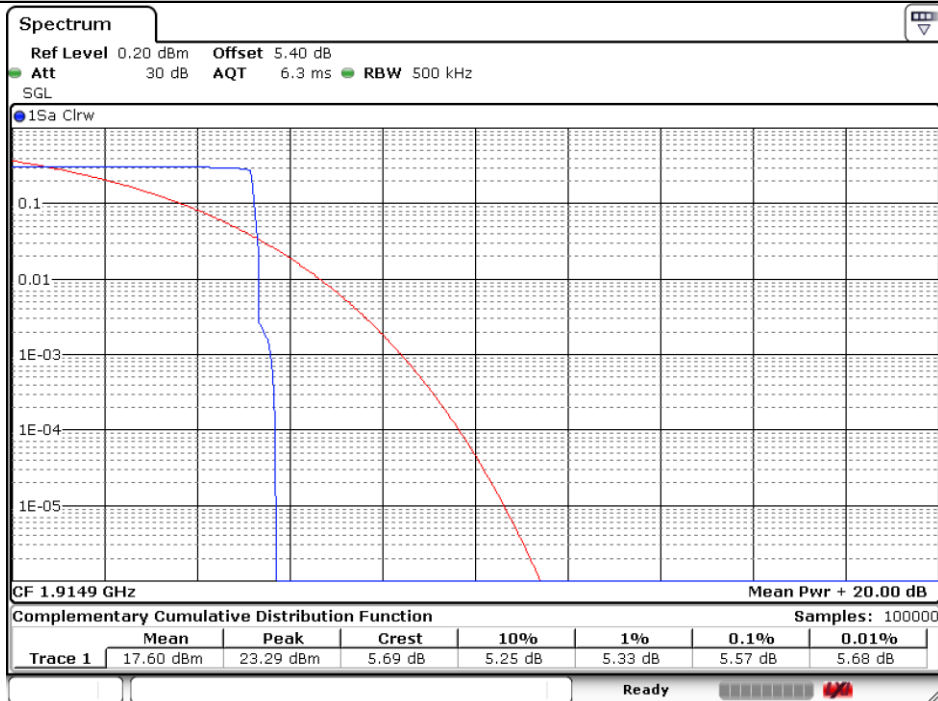
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LTE-NB1/QPSK. Sub-carrier spacing=15kHz-Test Channel= 26365-T size=12T0



Date: 14.JUL.2019 01:49:05

LTE-NB1/QPSK. Sub-carrier spacing=15kHz-Test Channel= 26689-T size=12T0



Date: 14.JUL.2019 01:52:55



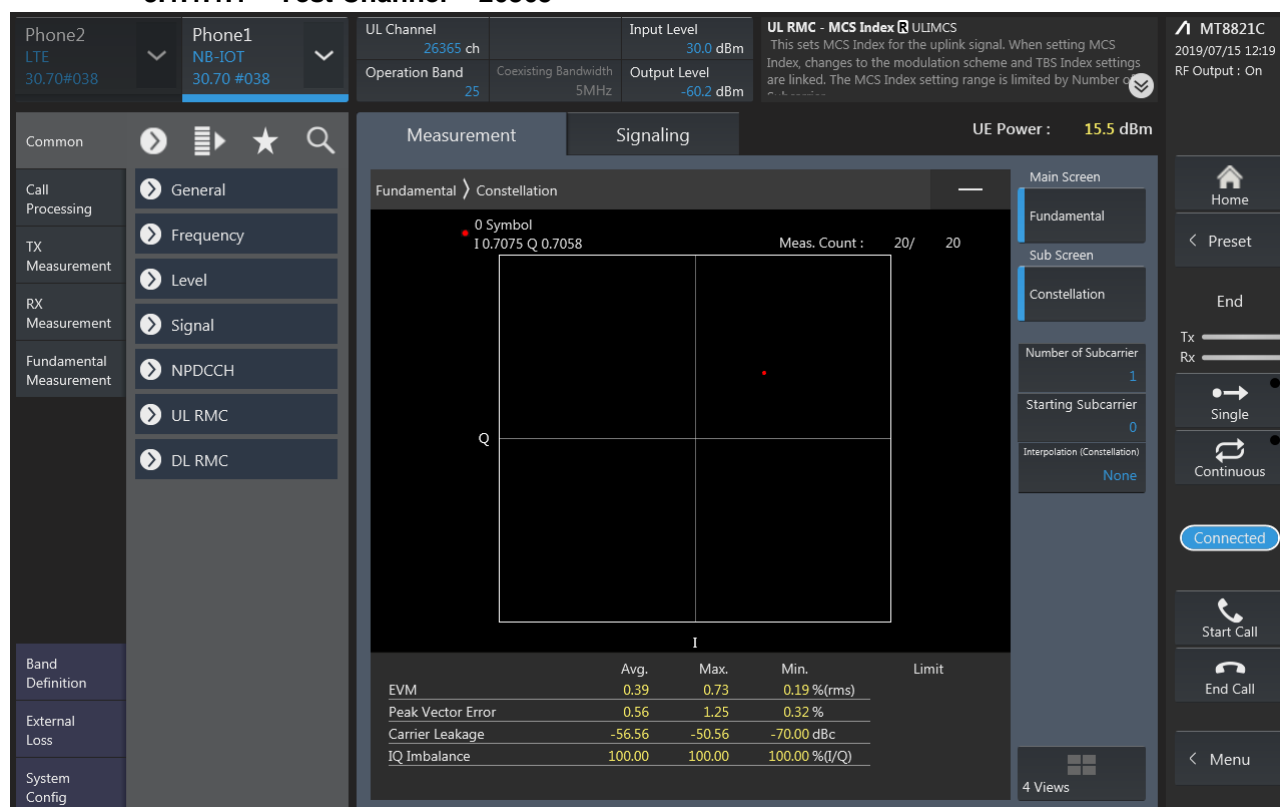
3 Modulation Characteristics

3.1 For LTE-NB1

3.1.1 Test Band = LTE-NB1 Band 25

3.1.1.1 Test Mode = LTE-NB1/BPSK. Sub-carrier spacing=15kHz.T size=12T0

3.1.1.1.1 Test Channel = 26365

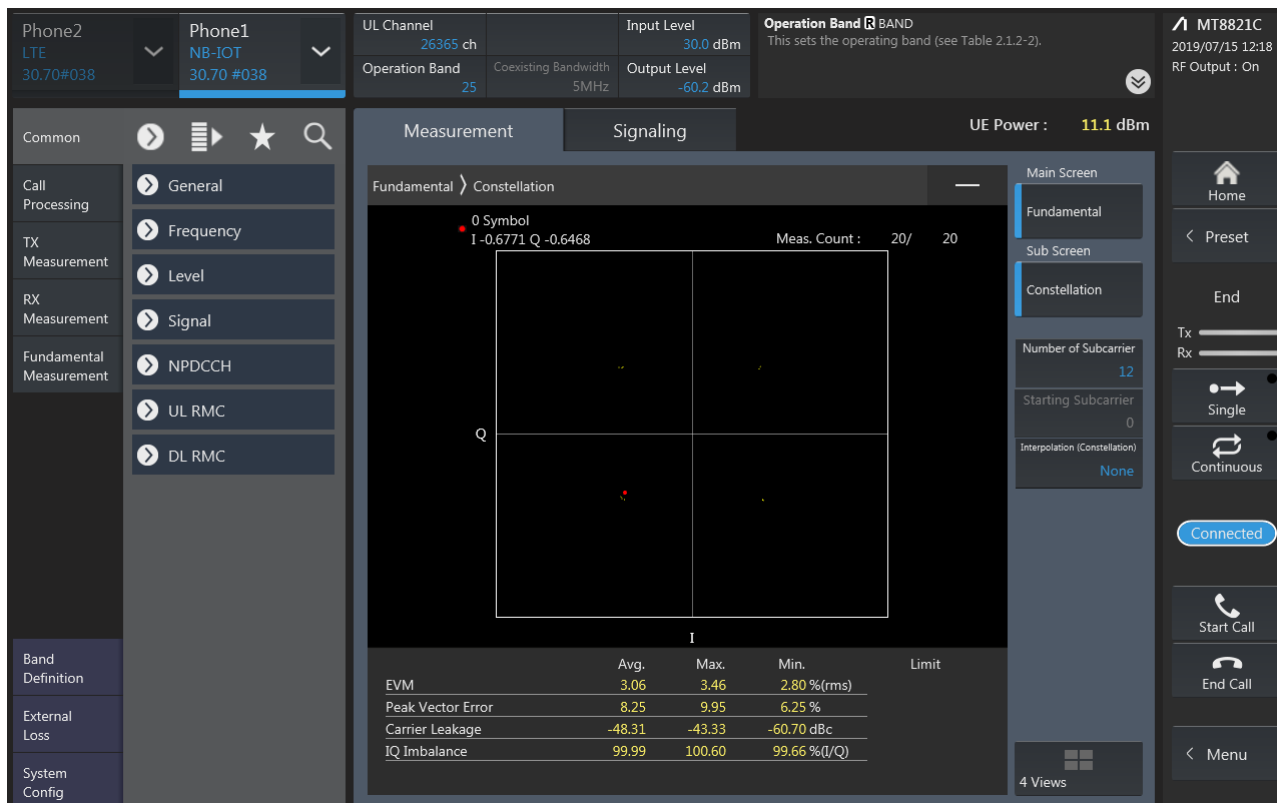


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3.1.1.2 Test Mode = LTE-NB1/QPSK. Sub-carrier spacing=15kHz.T size=12T0

3.1.1.2.1 Test Channel = 26365

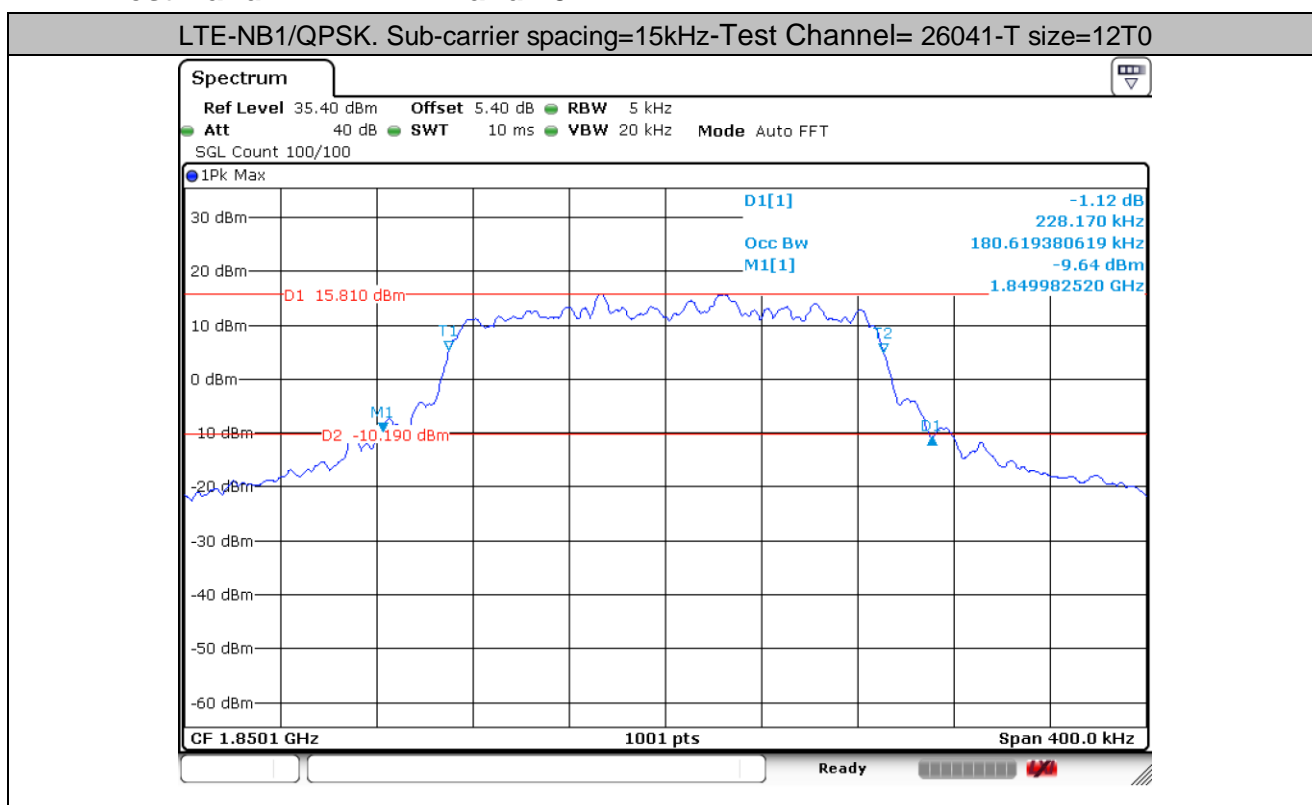


4 Bandwidth

Test Band	Test Mode	T size	Test Channel	Occupied Bandwidth [kHz]	Emission Bandwidth [kHz]	Verdict
NB1 Band 25	QPSK/15kHz	12T0	26041	180.62	228.17	PASS
NB1 Band 25	QPSK/15kHz	12T0	26365	180.62	244.96	PASS
NB1 Band 25	QPSK/15kHz	12T0	26689	180.22	242.56	PASS

4.1 For LTE-NB1

4.1.1 Test Band = LTE-NB1 Band 25



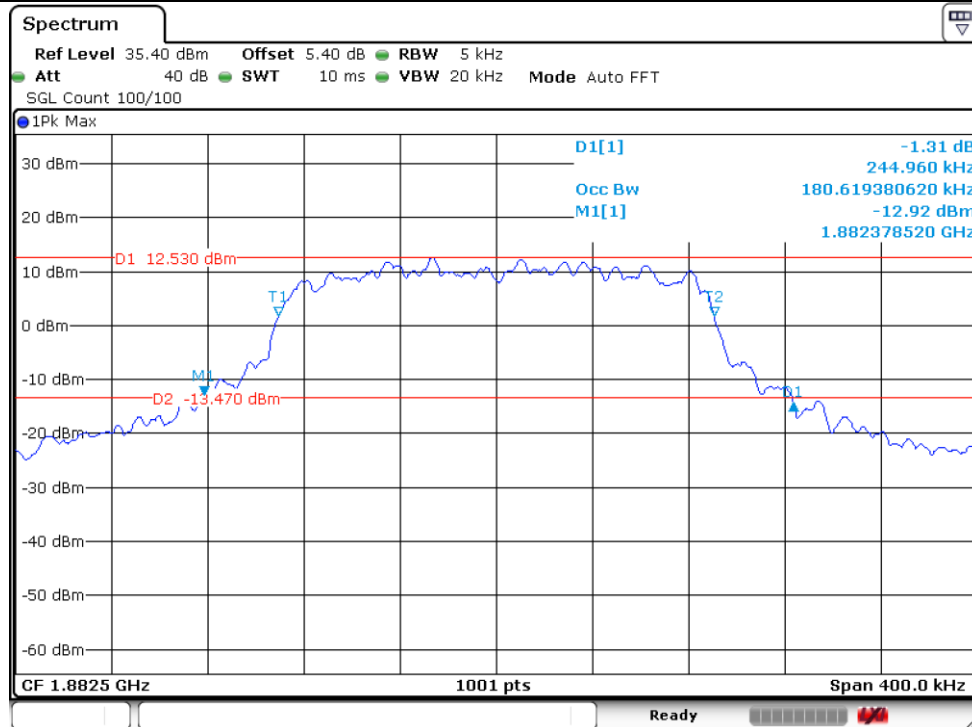
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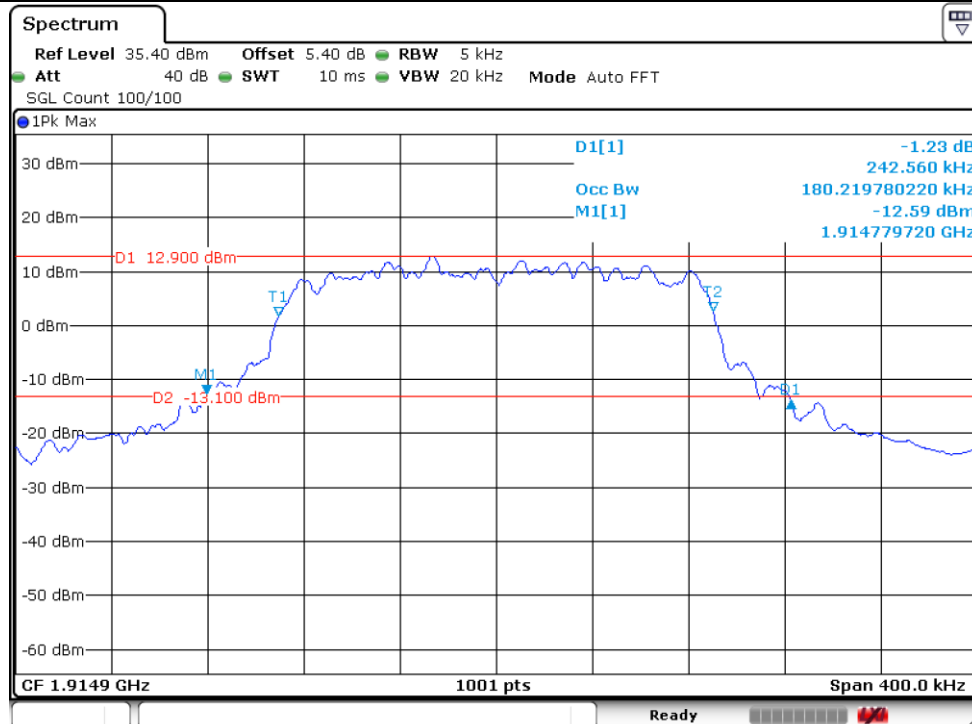
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LTE-NB1/QPSK. Sub-carrier spacing=15kHz-Test Channel= 26365-T size=12T0



LTE-NB1/QPSK. Sub-carrier spacing=15kHz-Test Channel= 26689-T size=12T0

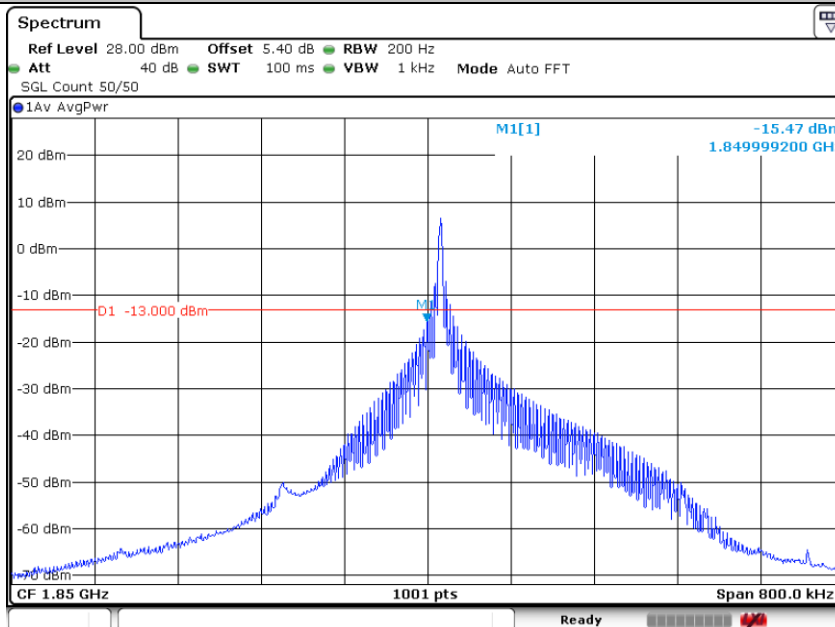


5 Band Edges Compliance

5.1 For LTE-NB1

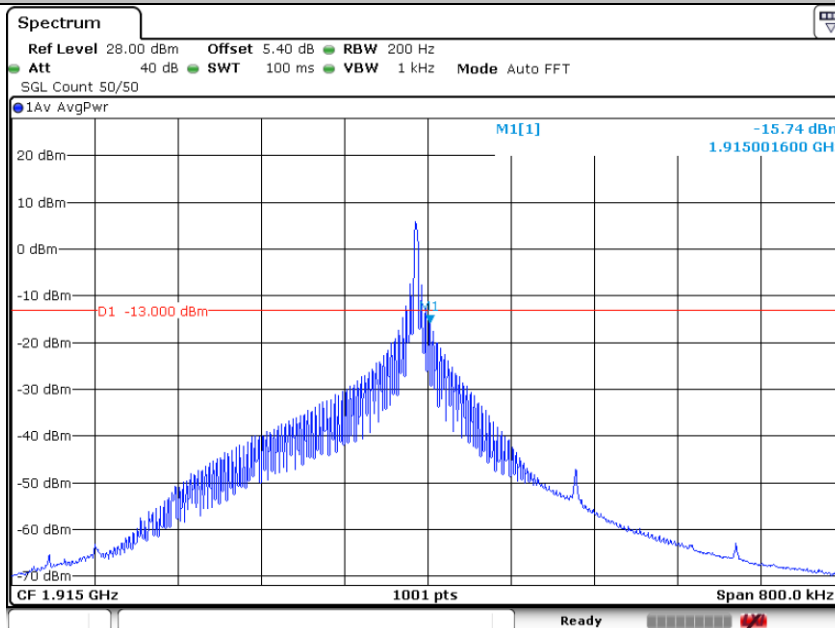
5.1.1 Test Band = LTE-NB1 Band 25

LTE-NB1/BPSK. Sub-carrier spacing=3.75kHz-Test Channel=26041-T size=1T0



Date: 20.AUG.2019 06:42:23

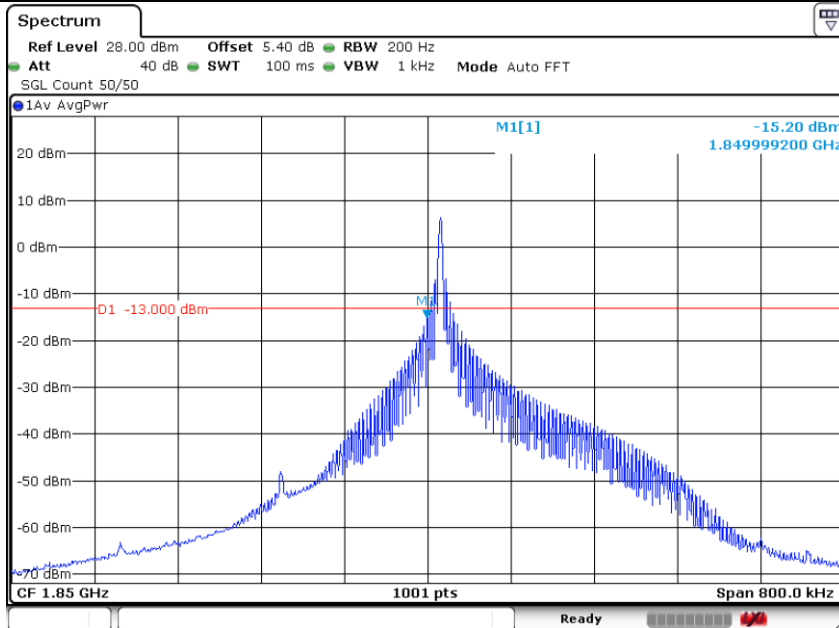
LTE-NB1/BPSK. Sub-carrier spacing=3.75kHz-Test Channel=26689-T size=1T47



Date: 20.AUG.2019 19:51:34

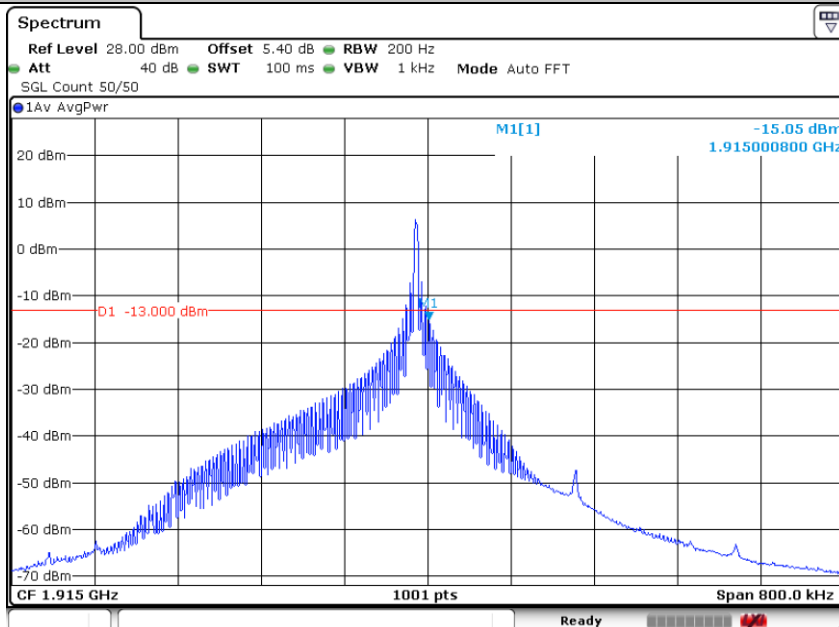


LTE-NB1/QPSK. Sub-carrier spacing=3.75kHz-Test Channel=26041-T size=1T0



Date: 20.AUG.2019 06:42:58

LTE-NB1/QPSK. Sub-carrier spacing=3.75kHz-Test Channel=26689-T size=1T47



Date: 20.AUG.2019 19:52:43

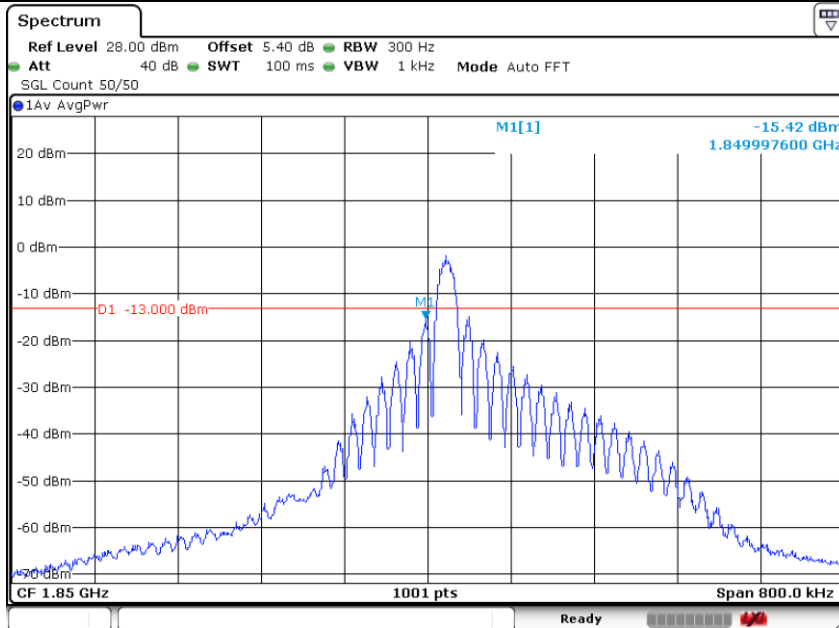


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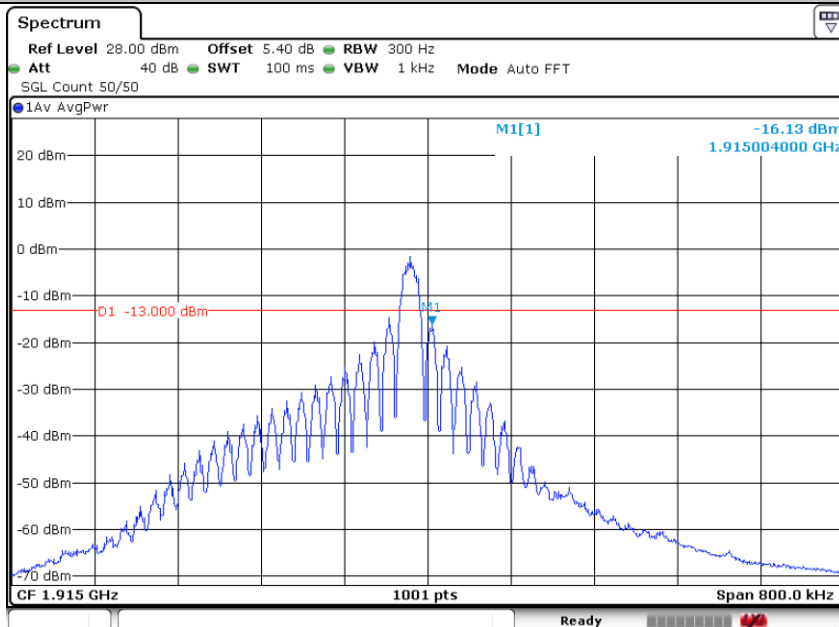
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LTE-NB1/BPSK. Sub-carrier spacing=15kHz-Test Channel=26041-T size=1T0



Date: 20.AUG.2019 06:45:41

LTE-NB1/BPSK. Sub-carrier spacing=15kHz-Test Channel=26689-T size=1T11



Date: 20.AUG.2019 07:08:59

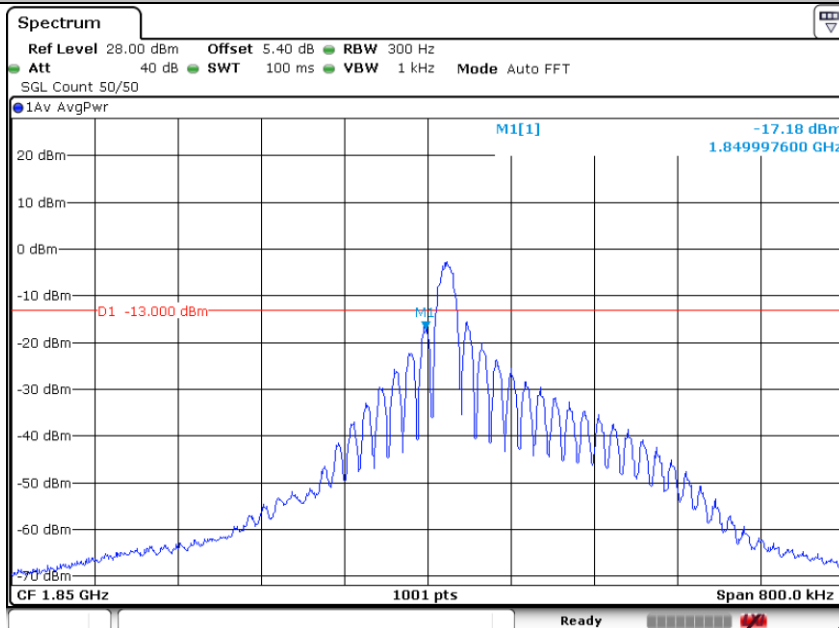


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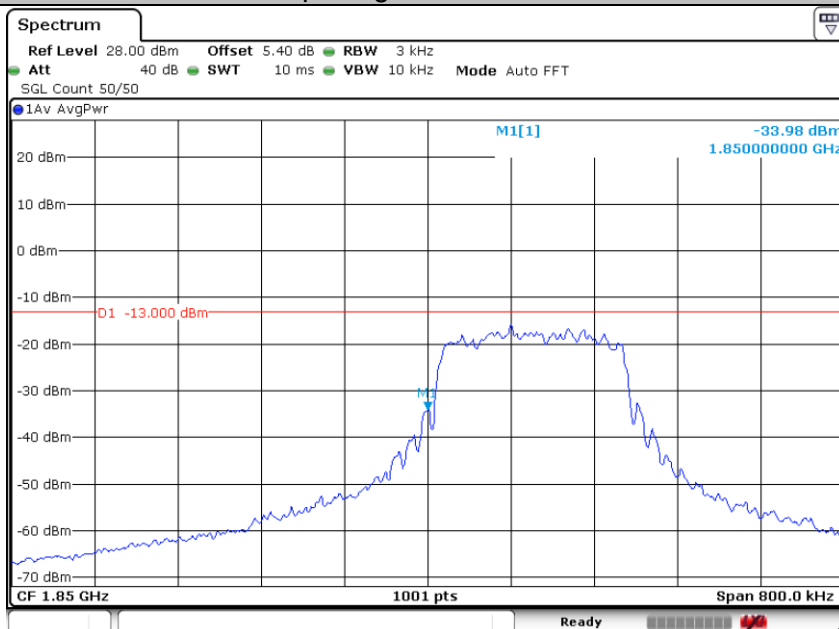
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LTE-NB1/QPSK. Sub-carrier spacing=15kHz-Test Channel=26041-T size=1T0



Date: 20.AUG.2019 06:44:26

LTE-NB1/QPSK. Sub-carrier spacing=15kHz-Test Channel=26041-T size=12T0



Date: 20.AUG.2019 06:46:27

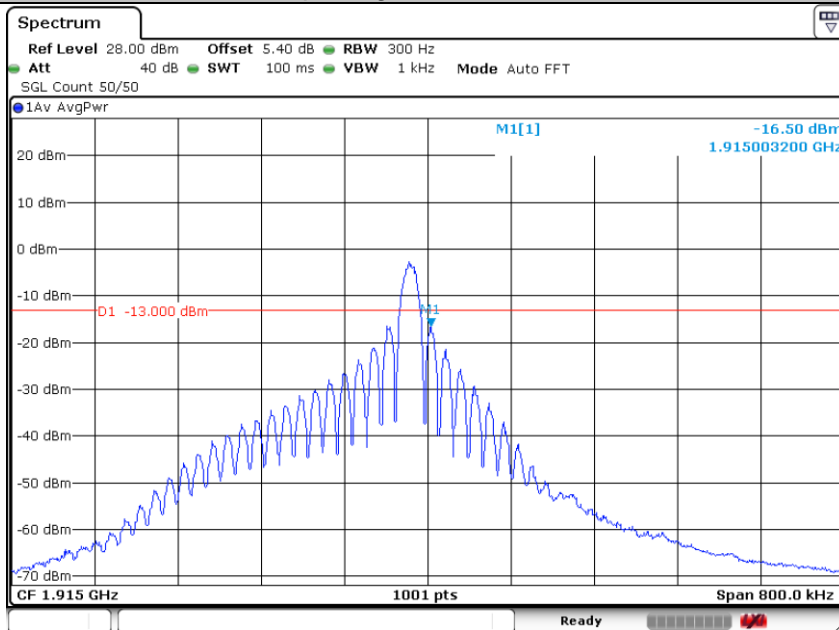


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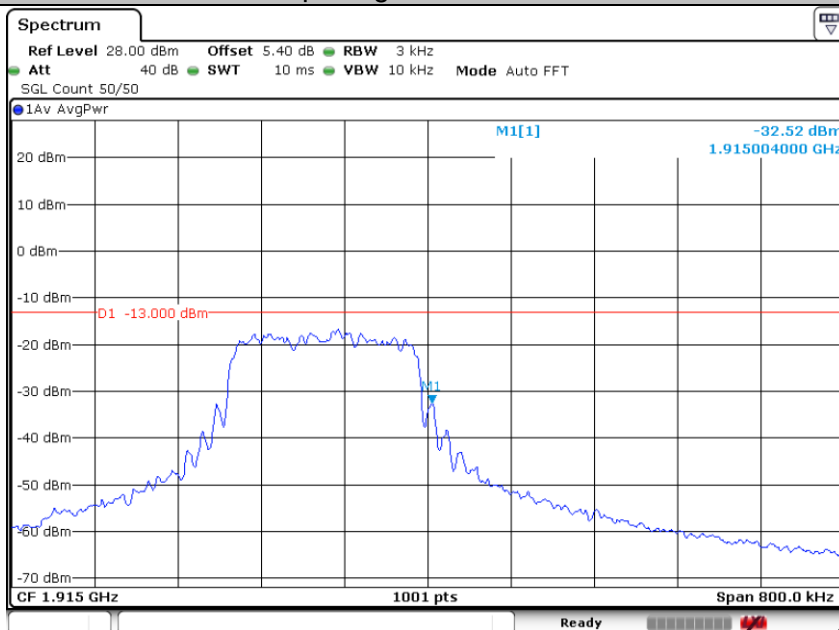
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LTE-NB1/QPSK. Sub-carrier spacing=15kHz-Test Channel=26689-T size=1T11



Date: 20.AUG.2019 07:09:20

LTE-NB1/QPSK. Sub-carrier spacing=15kHz-Test Channel=26689-T size=12T0



Date: 20.AUG.2019 07:09:56



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6 Spurious Emission at Antenna Terminal

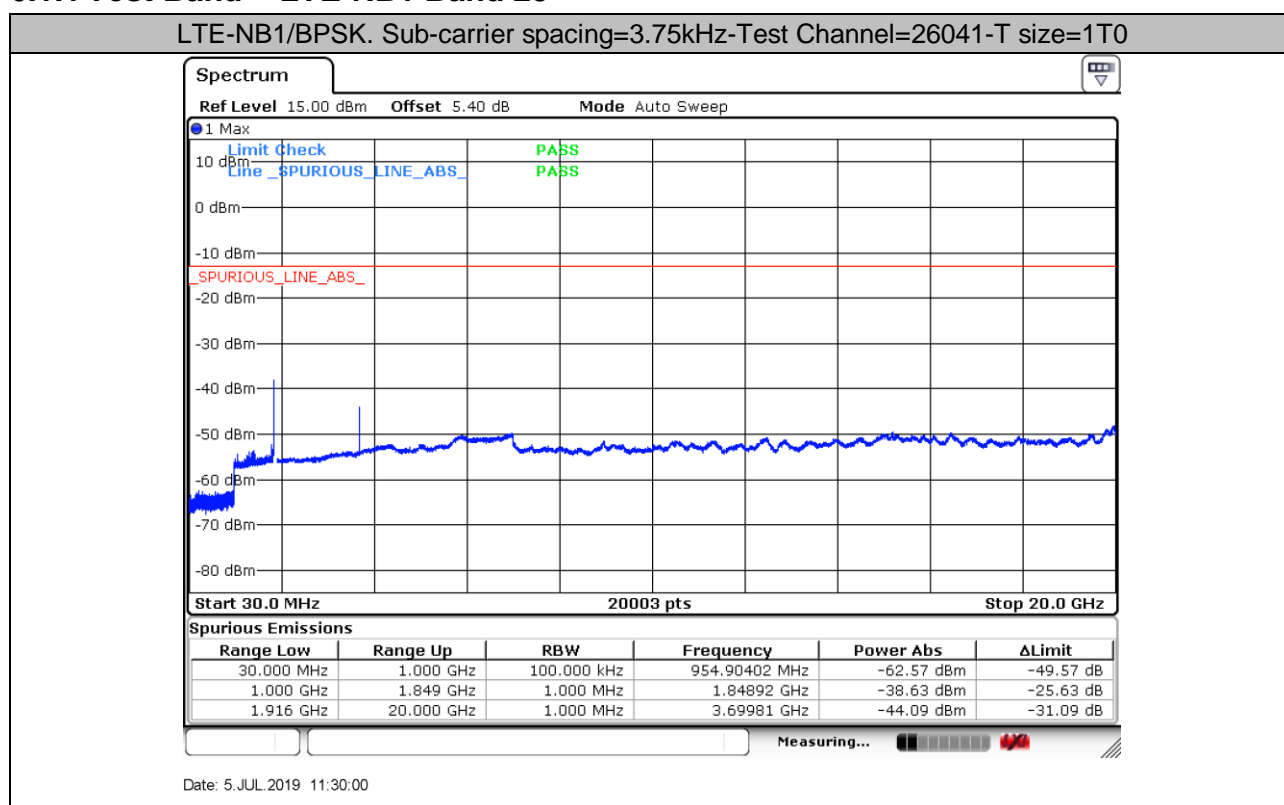
NOTE1: For the averaged unwanted emissions measurements, the measurement points in each sweep is greater than twice the Span/RBW in order to ensure bin-to-bin spacing of $< RBW/2$ so that narrowband signals are not lost between frequency bins. As to the present test item, the "Measurement Points = $k * (Span / RBW)$ " with k between 4 and 5, which results in an acceptable level error of less than 0.5 dB.

NOTE2: only the worst case data displayed in this report.

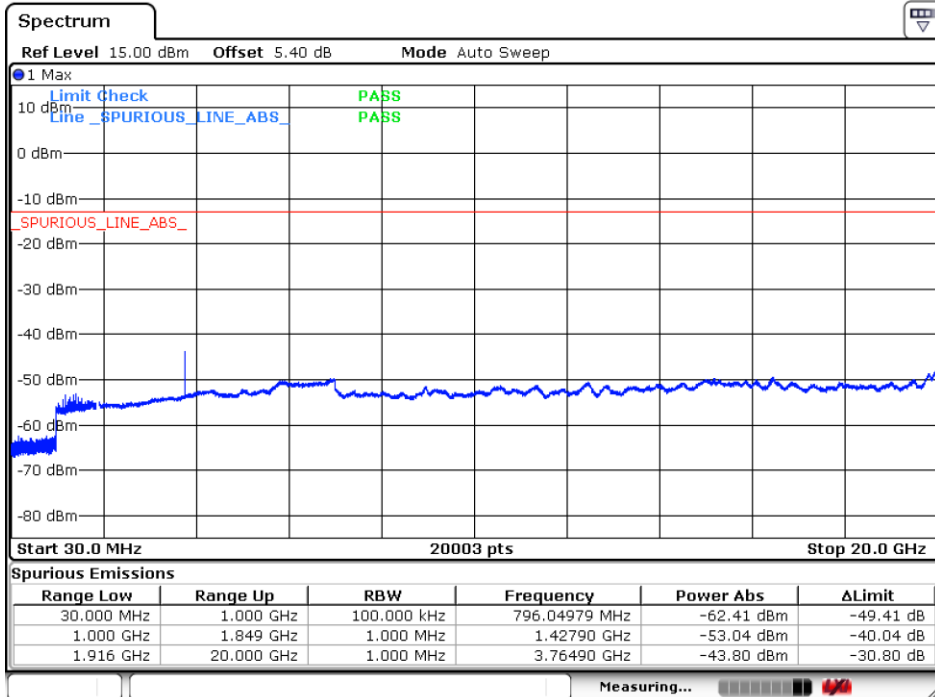
Part I - Test Plots

6.1 For LTE-NB1

6.1.1 Test Band = LTE-NB1 Band 25

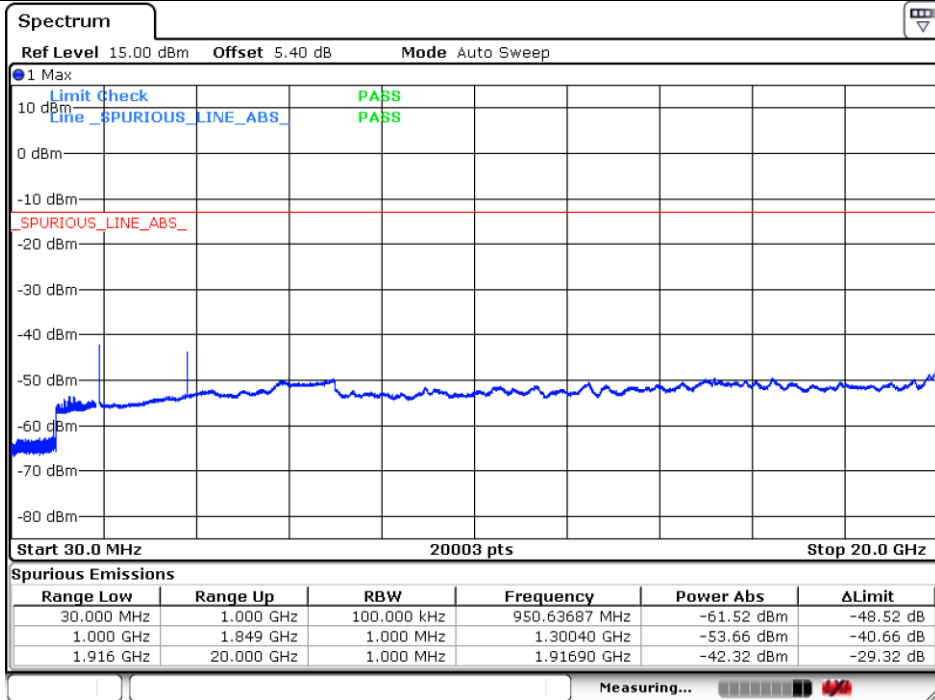


LTE-NB1/BPSK. Sub-carrier spacing=3.75kHz-Test Channel=26365-T size=1T0



Date: 5 JUL 2019 11:36:57

LTE-NB1/BPSK. Sub-carrier spacing=3.75kHz-Test Channel=26689-T size=1T0



Date: 5 JUL 2019 11:38:25

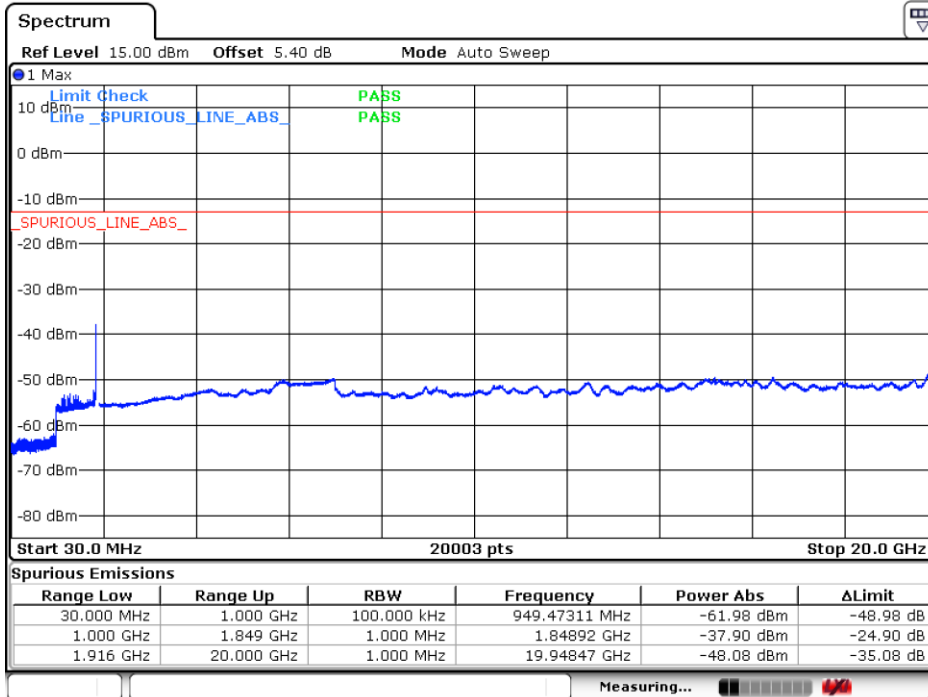


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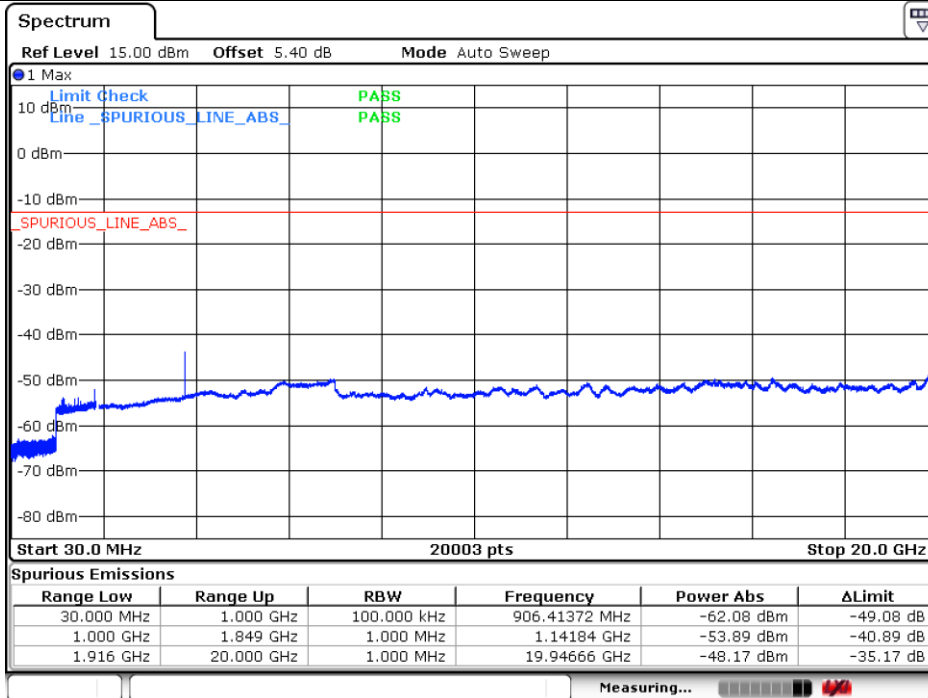
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LTE-NB1/QPSK. Sub-carrier spacing=3.75kHz-Test Channel=26041-T size=1T0



Date: 5 JUL 2019 11:30:57

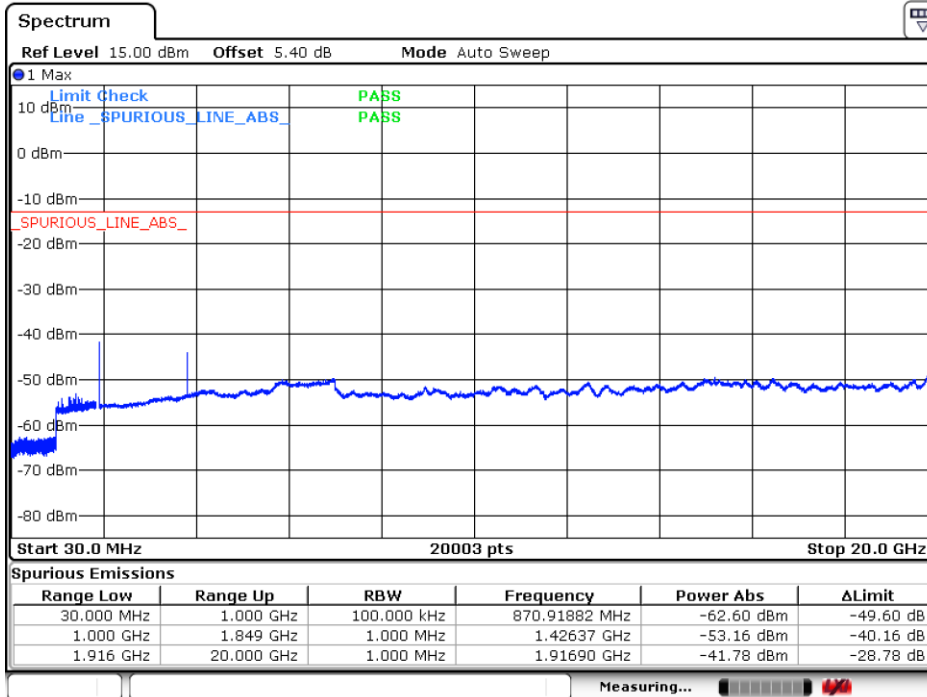
LTE-NB1/QPSK. Sub-carrier spacing=3.75kHz-Test Channel=26365-T size=1T0



Date: 5 JUL 2019 11:36:23

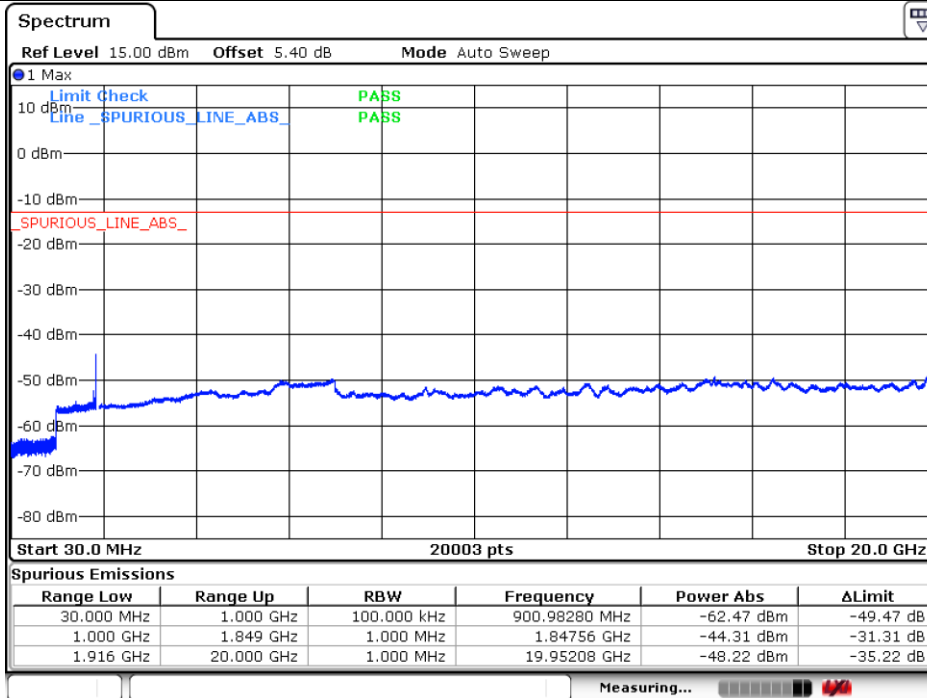


LTE-NB1/QPSK. Sub-carrier spacing=3.75kHz-Test Channel=26689-T size=1T0



Date: 5 JUL 2019 11:38:53

LTE-NB1/BPSK. Sub-carrier spacing=15kHz-Test Channel=26041-T size=1T0



Date: 5 JUL 2019 11:33:07

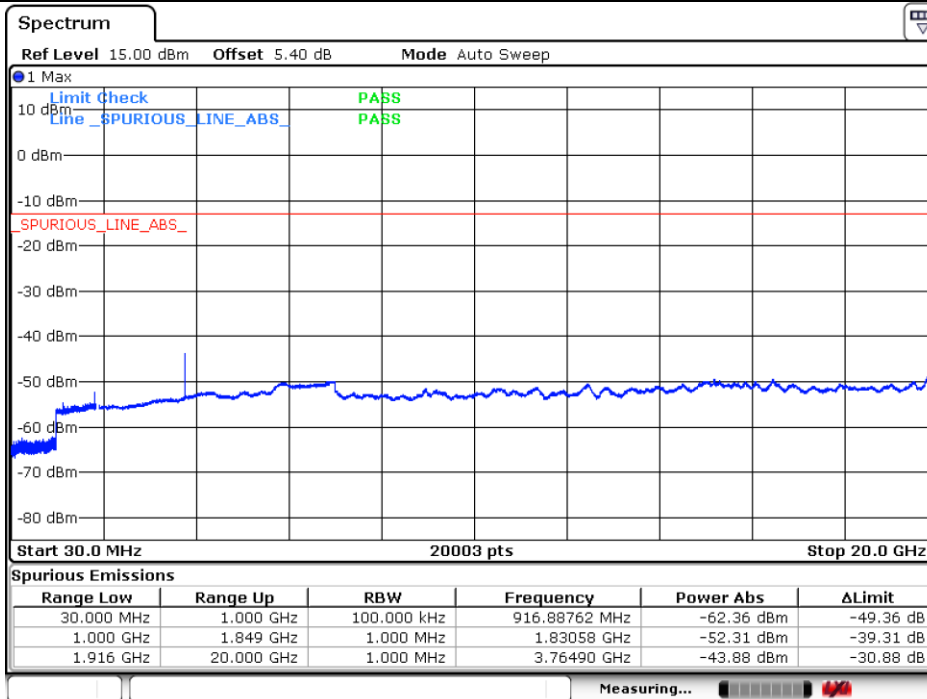


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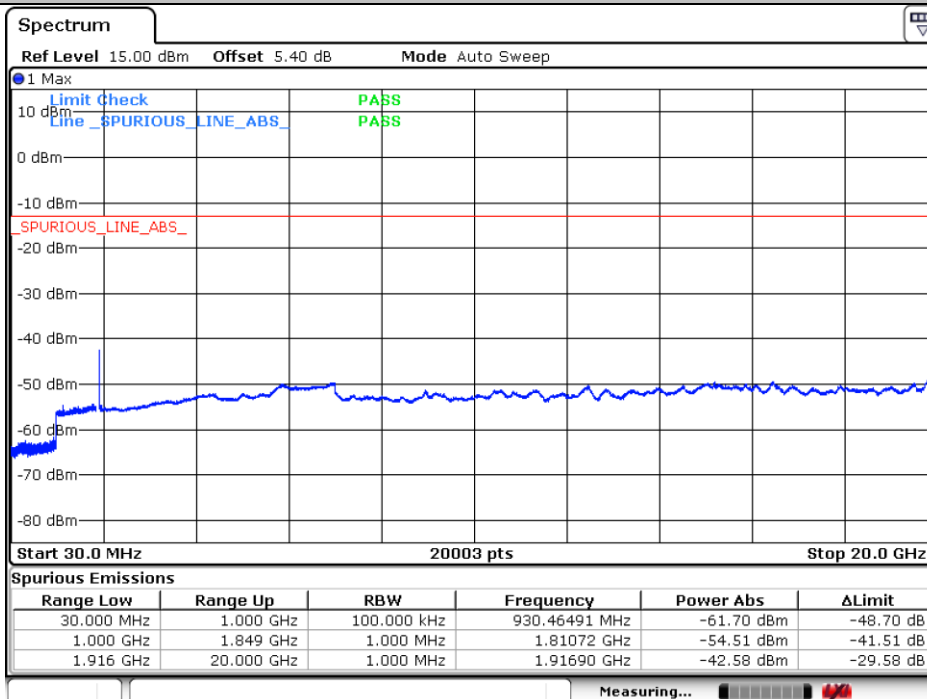
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LTE-NB1/BPSK. Sub-carrier spacing=15kHz-Test Channel=26365-T size=1T0



Date: 5 JUL 2019 11:34:27

LTE-NB1/BPSK. Sub-carrier spacing=15kHz-Test Channel=26689-T size=1T0



Date: 5 JUL 2019 11:41:32

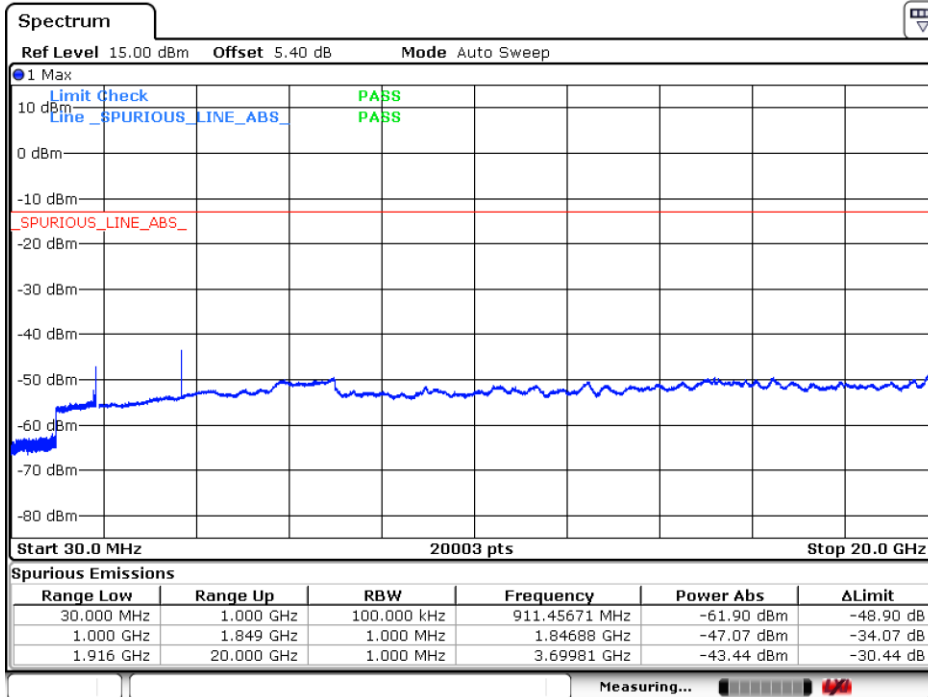


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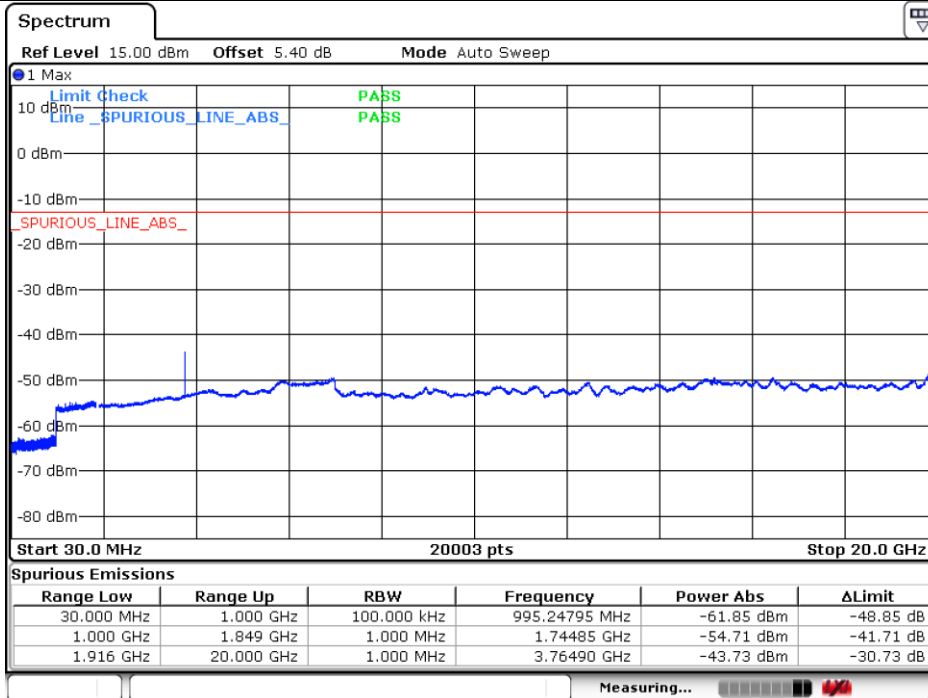
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LTE-NB1/QPSK. Sub-carrier spacing=15kHz-Test Channel=26041-T size=1T0



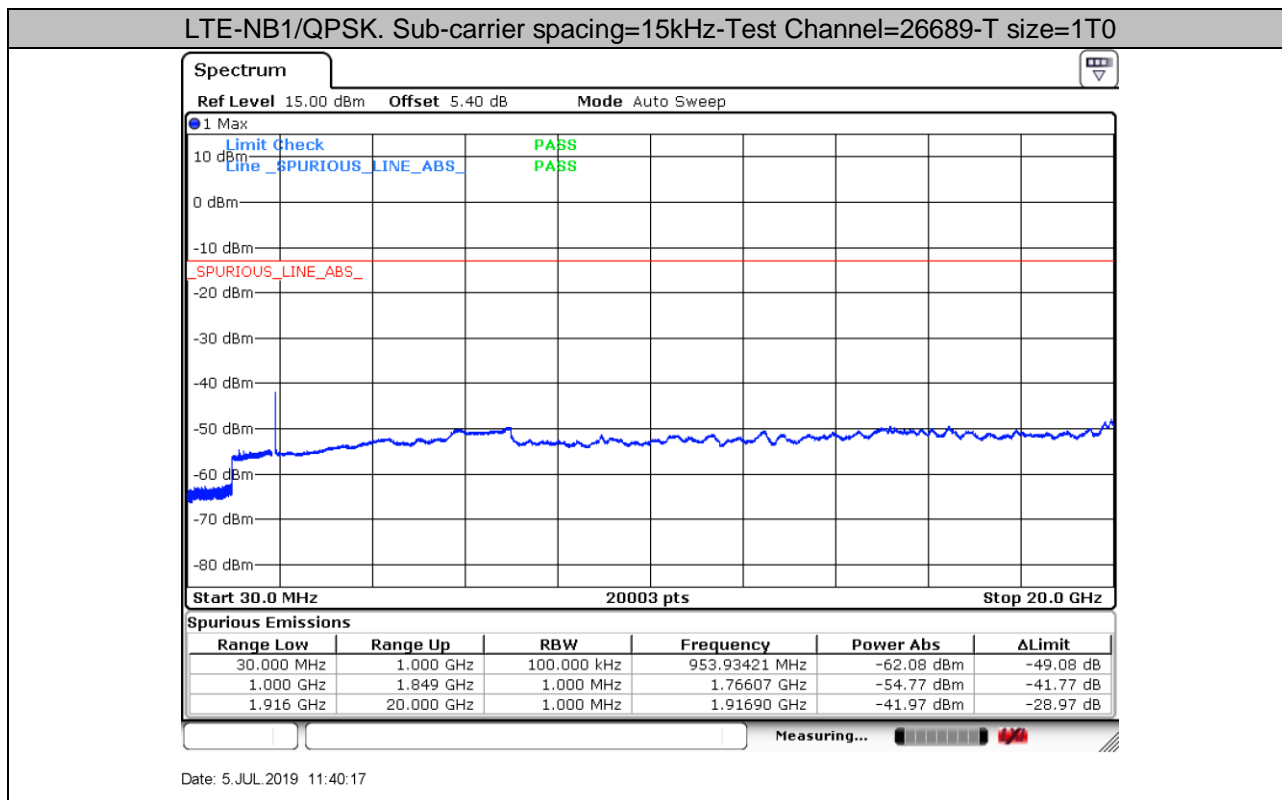
Date: 5 JUL 2019 11:32:31

LTE-NB1/QPSK. Sub-carrier spacing=15kHz-Test Channel=26365-T size=1T0



Date: 5 JUL 2019 11:35:35





7 Field Strength of Spurious Radiation

7.1 For LTE-NB1

7.1.1 Test Band = LTE-NB1 Band 25

7.1.1.1 Test Mode = LTE-NB1/BPSK. Sub-carrier spacing=3.75kHz

7.1.1.1.1 Test Channel = 26041

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Over Limit (dB)	Polarization
63.500000	-80.31	-13.00	67.31	Vertical
104.300000	-82.20	-13.00	69.20	Vertical
932.945833	-75.89	-13.00	62.89	Vertical
3704.600000	-57.62	-13.00	44.62	Vertical
5557.750000	-63.55	-13.00	50.55	Vertical
7409.600000	-58.22	-13.00	45.22	Vertical
62.500000	-75.96	-13.00	62.96	Horizontal
104.300000	-85.70	-13.00	72.70	Horizontal
917.500000	-74.14	-13.00	61.14	Horizontal
3704.600000	-50.84	-13.00	37.84	Horizontal
6055.650000	-63.35	-13.00	50.35	Horizontal
9253.000000	-61.08	-13.00	48.08	Horizontal

7.1.1.1.2 Test Channel = 26365

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Over Limit (dB)	Polarization
64.400000	-79.55	-13.00	66.55	Vertical
104.300000	-81.69	-13.00	68.69	Vertical
895.729167	-76.61	-13.00	63.61	Vertical
3765.050000	-61.20	-13.00	48.20	Vertical
5647.775000	-60.92	-13.00	47.92	Vertical
7529.525000	-58.76	-13.00	45.76	Vertical
63.100000	-76.36	-13.00	63.36	Horizontal
104.300000	-84.61	-13.00	71.61	Horizontal
950.408333	-72.75	-13.00	59.75	Horizontal
3764.725000	-51.50	-13.00	38.50	Horizontal
6023.800000	-63.50	-13.00	50.50	Horizontal
7529.525000	-60.11	-13.00	47.11	Horizontal



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7.1.1.1.3 Test Channel = 26689

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Over Limit (dB)	Polarization
65.350000	-79.49	-13.00	66.49	Vertical
104.300000	-82.34	-13.00	69.34	Vertical
944.037500	-76.05	-13.00	63.05	Vertical
3824.850000	-59.18	-13.00	46.18	Vertical
5737.150000	-60.41	-13.00	47.41	Vertical
7650.100000	-60.18	-13.00	47.18	Vertical
62.500000	-76.22	-13.00	63.22	Horizontal
104.300000	-86.74	-13.00	73.74	Horizontal
918.279167	-74.31	-13.00	61.31	Horizontal
3824.850000	-53.13	-13.00	40.13	Horizontal
6036.800000	-63.54	-13.00	50.54	Horizontal
7649.775000	-61.80	-13.00	48.80	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.
- 2) only the worst case data presented in this report.



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8 Frequency Stability

8.1 Frequency Error VS. Voltage

BAND	Band width	Modulation	Channel	Number of T	Voltage [Vdc]	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
NB1 Band 25	180KHz	BPSK/15KHz	26041	12T0	VL	TN	-5.75	-0.003109	±2.5	PASS
NB1 Band 25	180KHz	BPSK/15KHz	26041	12T0	VN	TN	-0.76	-0.000412	±2.5	PASS
NB1 Band 25	180KHz	BPSK/15KHz	26041	12T0	VH	TN	-8.08	-0.004368	±2.5	PASS
NB1 Band 25	180KHz	BPSK/15KHz	26365	12T0	VL	TN	5.96	0.003165	±2.5	PASS
NB1 Band 25	180KHz	BPSK/15KHz	26365	12T0	VN	TN	-12.55	-0.006668	±2.5	PASS
NB1 Band 25	180KHz	BPSK/15KHz	26365	12T0	VH	TN	-12.76	-0.006777	±2.5	PASS
NB1 Band 25	180KHz	BPSK/15KHz	26689	12T0	VL	TN	-8.52	-0.004451	±2.5	PASS
NB1 Band 25	180KHz	BPSK/15KHz	26689	12T0	VN	TN	4.50	0.002352	±2.5	PASS
NB1 Band 25	180KHz	BPSK/15KHz	26689	12T0	VH	TN	-0.53	-0.000276	±2.5	PASS
NB1 Band 25	180KHz	QPSK/15KHz	26041	12T0	VL	TN	-3.45	-0.001864	±2.5	PASS
NB1 Band 25	180KHz	QPSK/15KHz	26041	12T0	VN	TN	11.31	0.006113	±2.5	PASS
NB1 Band 25	180KHz	QPSK/15KHz	26041	12T0	VH	TN	12.72	0.006873	±2.5	PASS
NB1 Band 25	180KHz	QPSK/15KHz	26365	12T0	VL	TN	-13.46	-0.007152	±2.5	PASS
NB1 Band 25	180KHz	QPSK/15KHz	26365	12T0	VN	TN	-2.18	-0.001159	±2.5	PASS
NB1 Band 25	180KHz	QPSK/15KHz	26365	12T0	VH	TN	-9.40	-0.004993	±2.5	PASS
NB1 Band 25	180KHz	QPSK/15KHz	26689	12T0	VL	TN	5.77	0.003016	±2.5	PASS
NB1 Band 25	180KHz	QPSK/15KHz	26689	12T0	VN	TN	-9.12	-0.004764	±2.5	PASS
NB1 Band 25	180KHz	QPSK/15KHz	26689	12T0	VH	TN	-2.18	-0.001139	±2.5	PASS

8.2 Frequency Error VS. Temperature

BAND	Band width	Modulation	Channel	Number of T	Voltage [Vdc]	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
NB1 Band 25	180KHz	BPSK/15KHz	26041	12T0	NV	-30	14.08	0.007608	±2.5	PASS
NB1 Band 25	180KHz	BPSK/15KHz	26041	12T0	NV	-20	0.70	0.000379	±2.5	PASS
NB1 Band 25	180KHz	BPSK/15KHz	26041	12T0	NV	0	4.71	0.002546	±2.5	PASS
NB1 Band 25	180KHz	BPSK/15KHz	26041	12T0	NV	10	9.18	0.004962	±2.5	PASS
NB1 Band 25	180KHz	BPSK/15KHz	26041	12T0	NV	20	-5.42	-0.002928	±2.5	PASS
NB1 Band 25	180KHz	BPSK/15KHz	26041	12T0	NV	30	-4.64	-0.002507	±2.5	PASS
NB1 Band 25	180KHz	BPSK/15KHz	26041	12T0	NV	40	-1.43	-0.000773	±2.5	PASS
NB1 Band 25	180KHz	BPSK/15KHz	26041	12T0	NV	50	-9.04	-0.004887	±2.5	PASS
NB1 Band 25	180KHz	BPSK/15KHz	26365	12T0	NV	-30	-5.99	-0.003183	±2.5	PASS
NB1 Band 25	180KHz	BPSK/15KHz	26365	12T0	NV	-20	14.15	0.007514	±2.5	PASS
NB1 Band 25	180KHz	BPSK/15KHz	26365	12T0	NV	0	-14.18	-0.007531	±2.5	PASS
NB1 Band 25	180KHz	BPSK/15KHz	26365	12T0	NV	10	-6.51	-0.003461	±2.5	PASS
NB1 Band 25	180KHz	BPSK/15KHz	26365	12T0	NV	20	1.53	0.000813	±2.5	PASS
NB1 Band 25	180KHz	BPSK/15KHz	26365	12T0	NV	30	-10.30	-0.005470	±2.5	PASS
NB1 Band 25	180KHz	BPSK/15KHz	26365	12T0	NV	40	-0.98	-0.000523	±2.5	PASS
NB1 Band 25	180KHz	BPSK/15KHz	26365	12T0	NV	50	-0.87	-0.000462	±2.5	PASS
NB1 Band 25	180KHz	BPSK/15KHz	26689	12T0	NV	-30	-3.19	-0.001665	±2.5	PASS
NB1 Band 25	180KHz	BPSK/15KHz	26689	12T0	NV	-20	-2.78	-0.001452	±2.5	PASS
NB1 Band 25	180KHz	BPSK/15KHz	26689	12T0	NV	0	-10.12	-0.005286	±2.5	PASS
NB1 Band 25	180KHz	BPSK/15KHz	26689	12T0	NV	10	-9.88	-0.005160	±2.5	PASS



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NB1 Band 25	180KHz	BPSK/15KHz	26689	12T0	NV	20	-14.00	-0.007309	±2.5	PASS
NB1 Band 25	180KHz	BPSK/15KHz	26689	12T0	NV	30	-13.05	-0.006816	±2.5	PASS
NB1 Band 25	180KHz	BPSK/15KHz	26689	12T0	NV	40	4.05	0.002116	±2.5	PASS
NB1 Band 25	180KHz	BPSK/15KHz	26689	12T0	NV	50	9.77	0.005102	±2.5	PASS
NB1 Band 25	180KHz	QPSK/15KHz	26041	12T0	NV	-30	9.14	0.004940	±2.5	PASS
NB1 Band 25	180KHz	QPSK/15KHz	26041	12T0	NV	-20	-2.50	-0.001349	±2.5	PASS
NB1 Band 25	180KHz	QPSK/15KHz	26041	12T0	NV	0	-4.01	-0.002167	±2.5	PASS
NB1 Band 25	180KHz	QPSK/15KHz	26041	12T0	NV	10	5.37	0.002905	±2.5	PASS
NB1 Band 25	180KHz	QPSK/15KHz	26041	12T0	NV	20	-4.93	-0.002663	±2.5	PASS
NB1 Band 25	180KHz	QPSK/15KHz	26041	12T0	NV	30	-1.12	-0.000607	±2.5	PASS
NB1 Band 25	180KHz	QPSK/15KHz	26041	12T0	NV	40	11.66	0.006300	±2.5	PASS
NB1 Band 25	180KHz	QPSK/15KHz	26041	12T0	NV	50	1.21	0.000655	±2.5	PASS
NB1 Band 25	180KHz	QPSK/15KHz	26365	12T0	NV	-30	-5.77	-0.003064	±2.5	PASS
NB1 Band 25	180KHz	QPSK/15KHz	26365	12T0	NV	-20	-9.71	-0.005158	±2.5	PASS
NB1 Band 25	180KHz	QPSK/15KHz	26365	12T0	NV	0	13.12	0.006968	±2.5	PASS
NB1 Band 25	180KHz	QPSK/15KHz	26365	12T0	NV	10	9.74	0.005176	±2.5	PASS
NB1 Band 25	180KHz	QPSK/15KHz	26365	12T0	NV	20	-13.76	-0.007311	±2.5	PASS
NB1 Band 25	180KHz	QPSK/15KHz	26365	12T0	NV	30	-12.89	-0.006846	±2.5	PASS
NB1 Band 25	180KHz	QPSK/15KHz	26365	12T0	NV	40	-7.42	-0.003941	±2.5	PASS
NB1 Band 25	180KHz	QPSK/15KHz	26365	12T0	NV	50	14.01	0.007444	±2.5	PASS
NB1 Band 25	180KHz	QPSK/15KHz	26689	12T0	NV	-30	-0.87	-0.000456	±2.5	PASS
NB1 Band 25	180KHz	QPSK/15KHz	26689	12T0	NV	-20	-12.71	-0.006636	±2.5	PASS
NB1 Band 25	180KHz	QPSK/15KHz	26689	12T0	NV	0	-4.63	-0.002417	±2.5	PASS
NB1 Band 25	180KHz	QPSK/15KHz	26689	12T0	NV	10	12.24	0.006393	±2.5	PASS
NB1 Band 25	180KHz	QPSK/15KHz	26689	12T0	NV	20	-12.14	-0.006338	±2.5	PASS
NB1 Band 25	180KHz	QPSK/15KHz	26689	12T0	NV	30	13.26	0.006923	±2.5	PASS
NB1 Band 25	180KHz	QPSK/15KHz	26689	12T0	NV	40	0.71	0.000371	±2.5	PASS
NB1 Band 25	180KHz	QPSK/15KHz	26689	12T0	NV	50	-12.04	-0.006287	±2.5	PASS

The End

