



Appendix B

LTE-NB1 Band 66



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1 Effective (Isotropic) Radiated Power Output Data

1.1 Test Result for LTE NB1 Band 66

Test Band	Test Mode	Sub-carrier Spacing (kHz)	Test channel	Number of T	Conducted Power (dBm)	EIRP (dBm)	limit (dBm)	Verdict
NB1 Band 66	BPSK	3.75	131973	1T0	20.57	22.17	30.00	PASS
NB1 Band 66	BPSK	3.75	132322	1T0	20.61	22.21	30.00	PASS
NB1 Band 66	BPSK	3.75	132671	1T0	20.52	22.12	30.00	PASS
NB1 Band 66	QPSK	3.75	131973	1T0	20.54	22.14	30.00	PASS
NB1 Band 66	QPSK	3.75	132322	1T0	20.62	22.22	30.00	PASS
NB1 Band 66	QPSK	3.75	132671	1T0	20.53	22.13	30.00	PASS

Test Band	Test Mode	Sub-carrier Spacing (kHz)	Test channel	Number of T	Conducted Power (dBm)	EIRP (dBm)	limit (dBm)	Verdict
NB1 Band 66	BPSK	15	131973	1T0	20.18	21.78	30.00	PASS
NB1 Band 66	BPSK	15	132322	1T0	20.37	21.97	30.00	PASS
NB1 Band 66	BPSK	15	132671	1T0	20.89	22.49	30.00	PASS
NB1 Band 66	QPSK	15	131973	1T0	20.22	21.82	30.00	PASS
NB1 Band 66	QPSK	15	131973	12T0	20.31	21.91	30.00	PASS
NB1 Band 66	QPSK	15	132322	1T0	20.33	21.93	30.00	PASS
NB1 Band 66	QPSK	15	132322	12T0	20.12	21.72	30.00	PASS
NB1 Band 66	QPSK	15	132671	1T0	20.86	22.46	30.00	PASS
NB1 Band 66	QPSK	15	132671	12T0	20.02	21.62	30.00	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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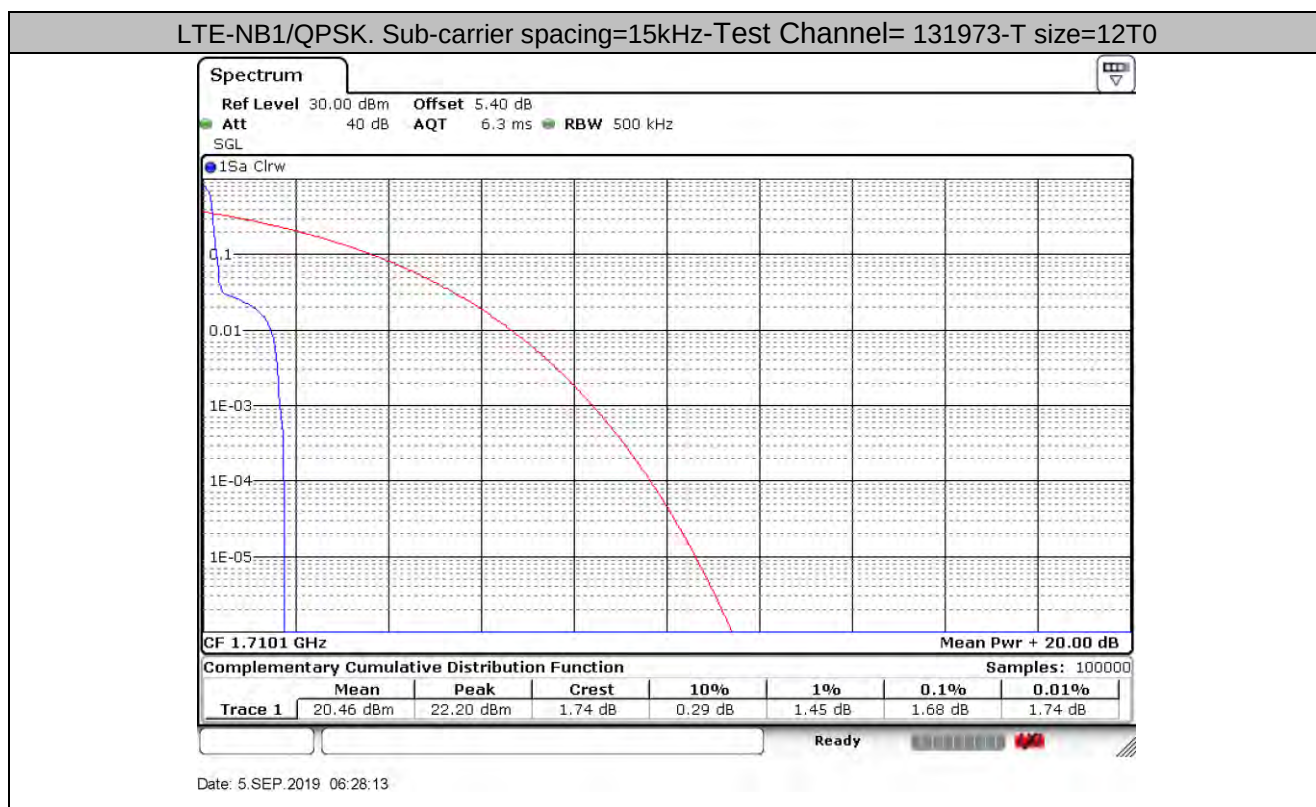


2 Peak-to-Average Ratio

Test Band	Test Mode	Test Channel	Measured[dB]	Limit [dB]	Verdict
NB1 Band 66	QPSK/12T0	131973	1.68	13	PASS
NB1 Band 66	QPSK/12T0	132322	2.64	13	PASS
NB1 Band 66	QPSK/12T0	132671	2.20	13	PASS

2.1 For LTE-NB1

2.1.1 Test Band = LTE-NB1 Band 66



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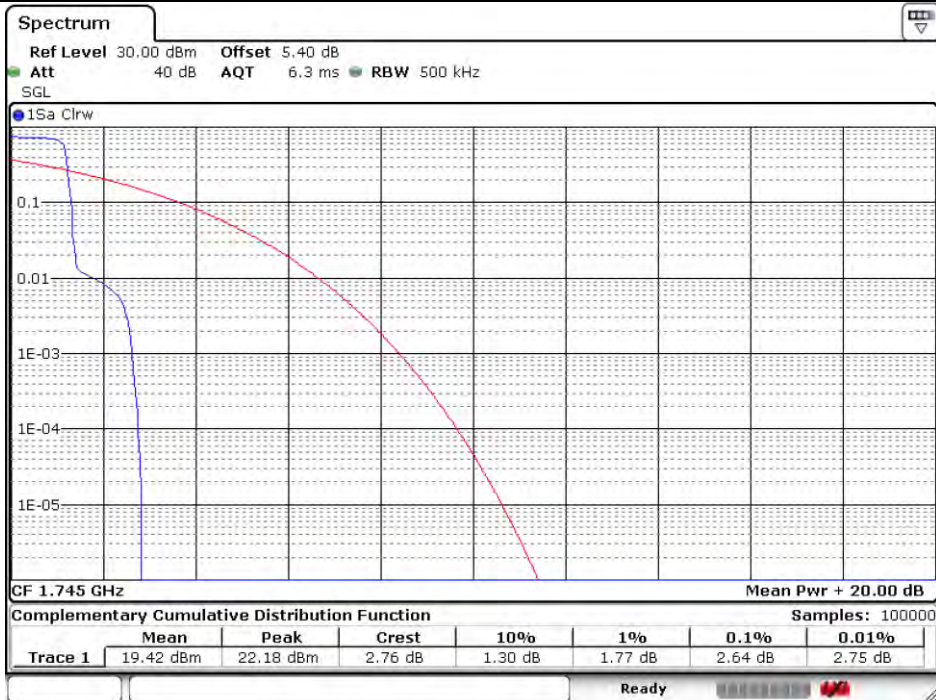
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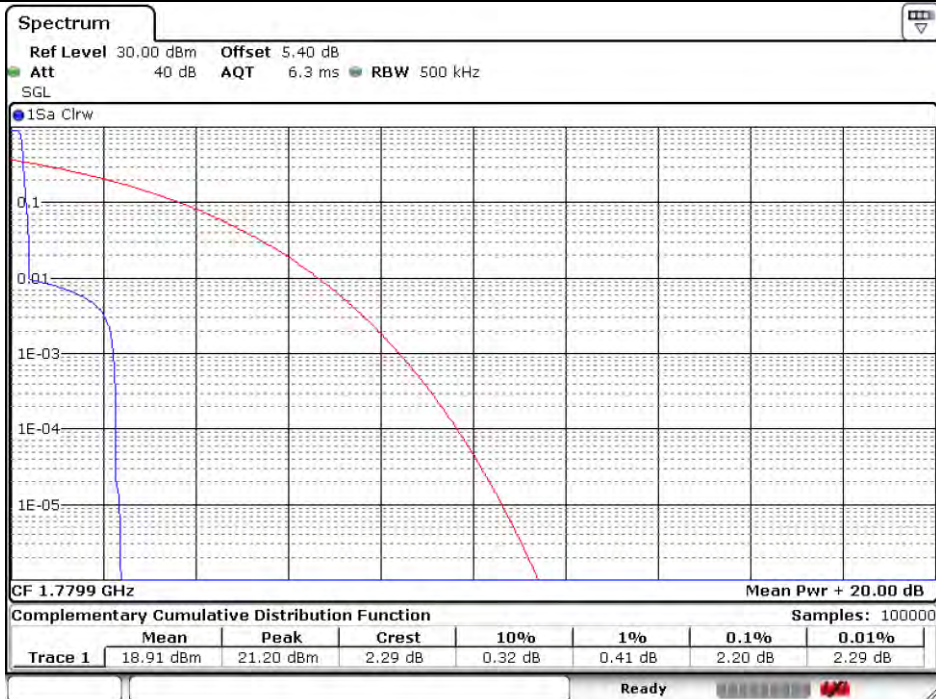


LTE-NB1/QPSK. Sub-carrier spacing=15kHz-Test Channel= 132322-T size=12T0



Date: 5.SEP.2019 06:58:19

LTE-NB1/QPSK. Sub-carrier spacing=15kHz-Test Channel= 132671-T size=12T0



Date: 6.SEP.2019 02:08:49



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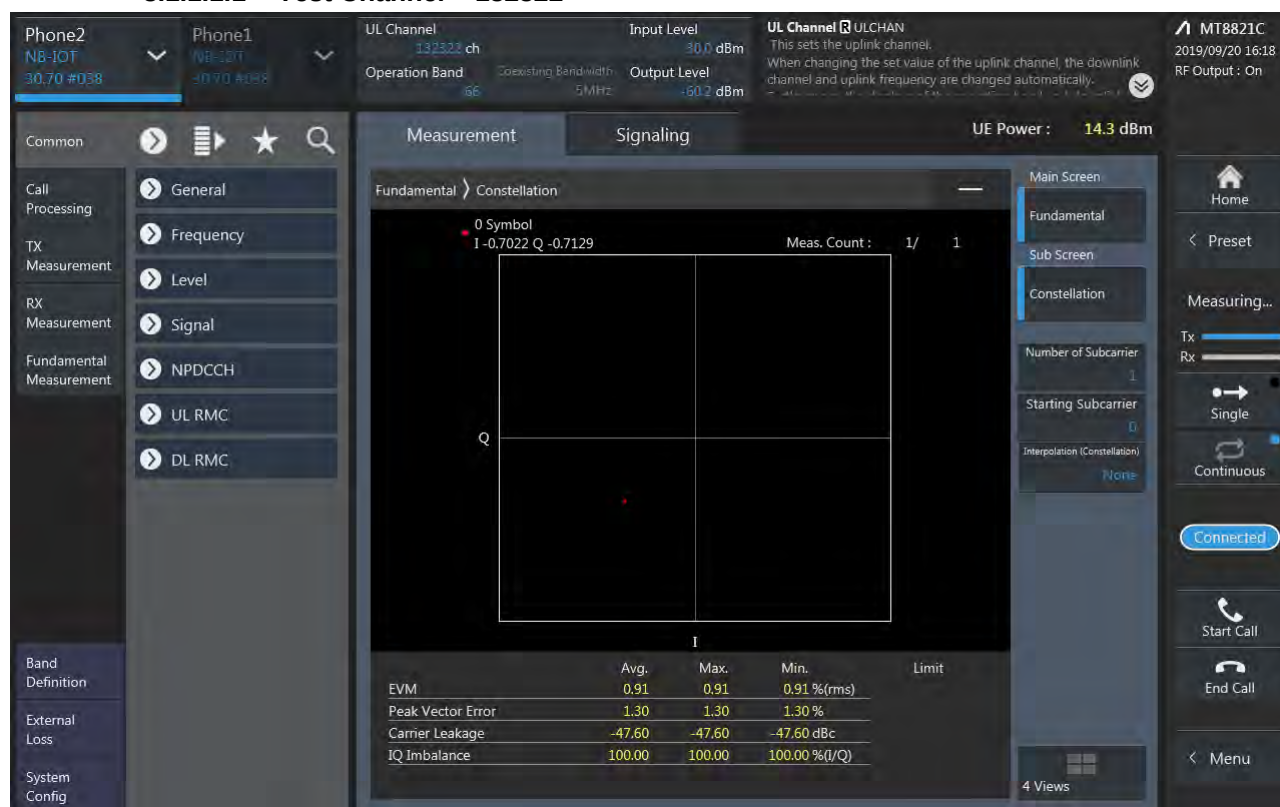
3 Modulation Characteristics

3.1 For LTE-NB1

3.1.1 Test Band = LTE-NB1 Band 66

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

3.1.1.1.1 Test Channel = 132322

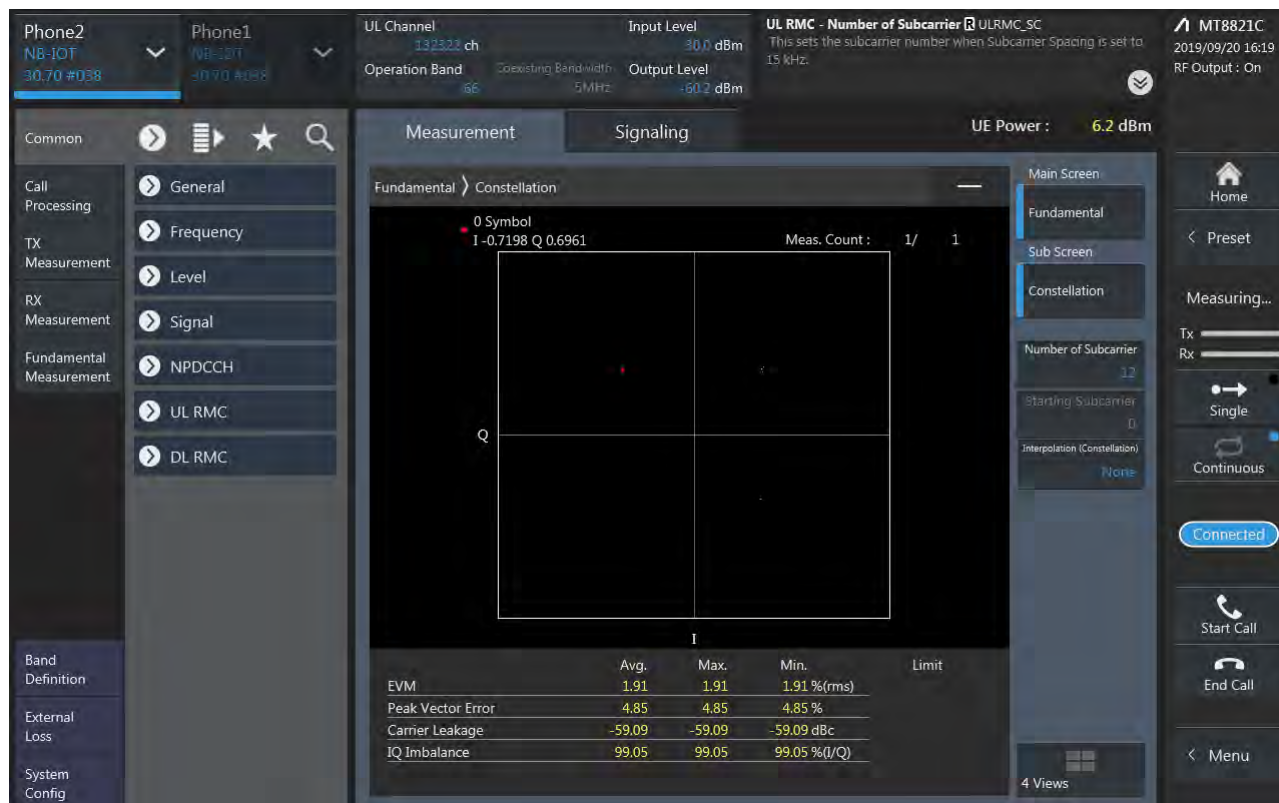


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3.1.1.2 Test Mode = LTE-NB1/QPSK. Sub-carrier spacing=15kHz.T size=12T0

3.1.1.2.1 Test Channel = 132322



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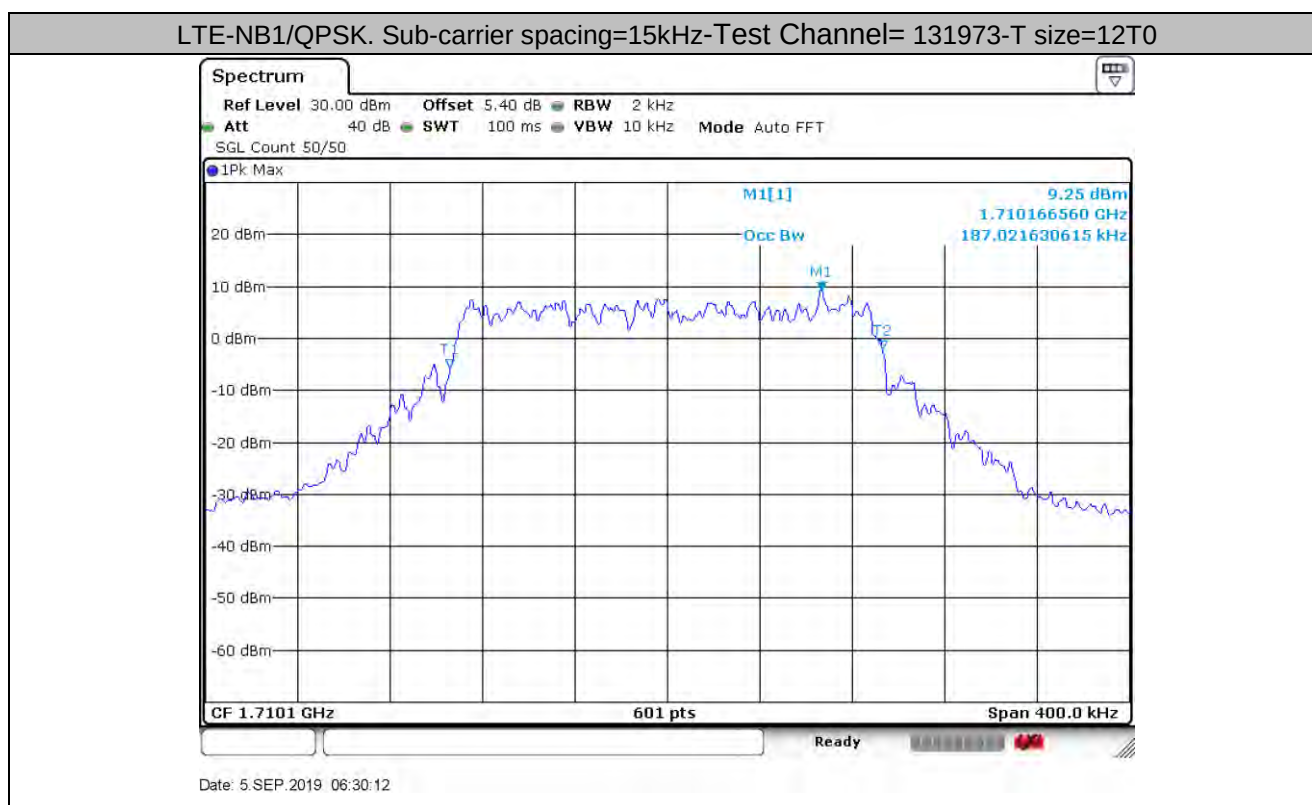


4 26dB Bandwidth and Occupied Bandwidth

Test Band	Test Mode	T size	Test Channel	Occupied Bandwidth [kHz]	Emission Bandwidth [kHz]	Verdict
NB1 Band 66	QPSK/15kHz	12T0	131973	187.02	242.93	PASS
NB1 Band 66	QPSK/15kHz	12T0	132322	187.02	242.93	PASS
NB1 Band 66	QPSK/15kHz	12T0	132671	187.02	244.26	PASS

4.1 For LTE-NB1

4.1.1 Test Band = LTE-NB1 Band 66



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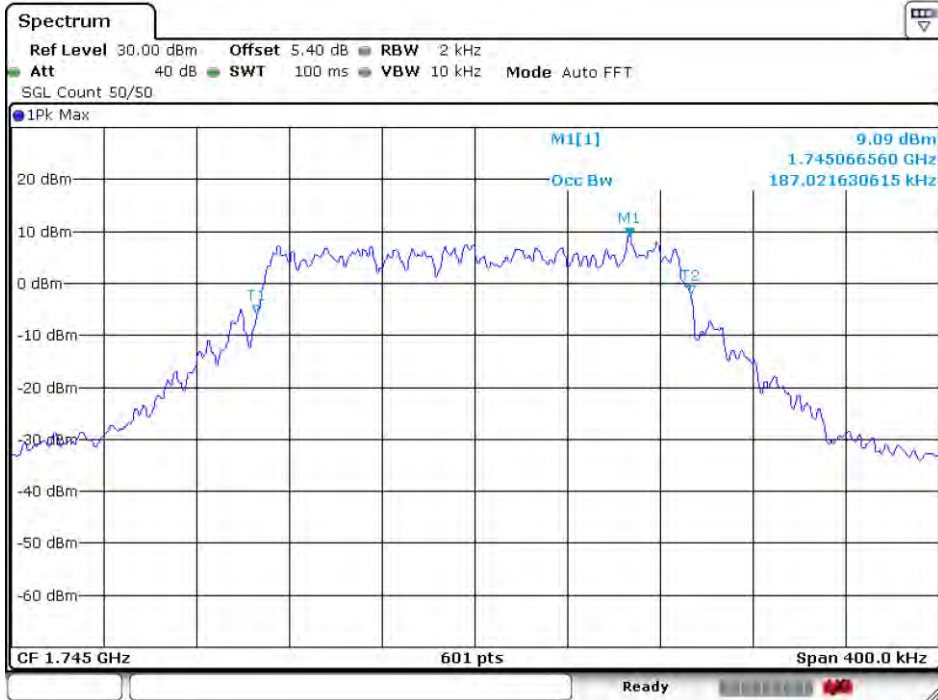
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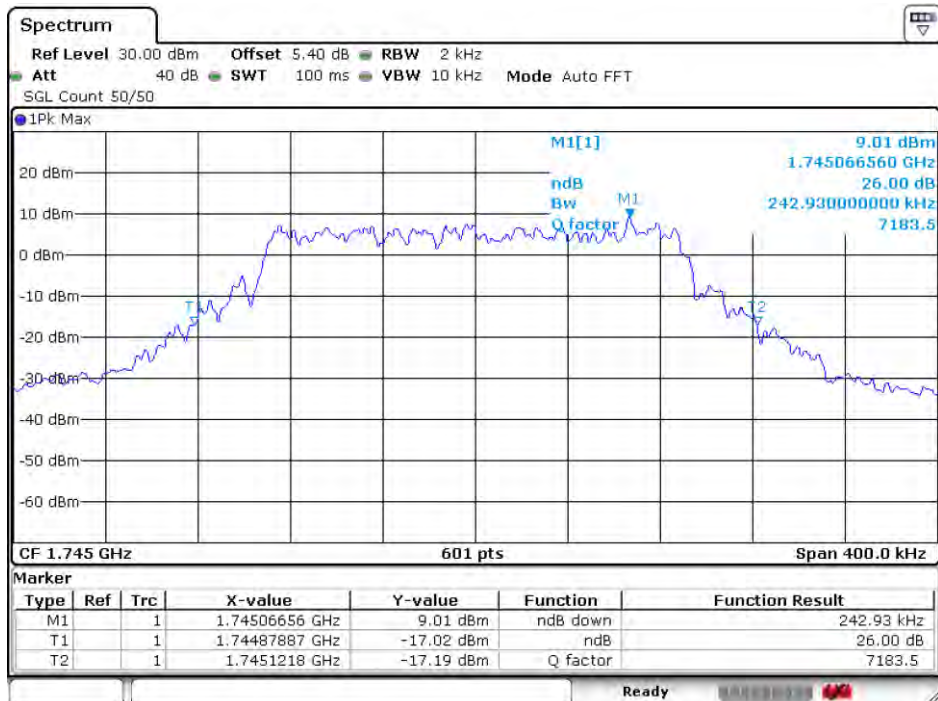
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LTE-NB1/QPSK. Sub-carrier spacing=15kHz-Test Channel= 132322-T size=12T0



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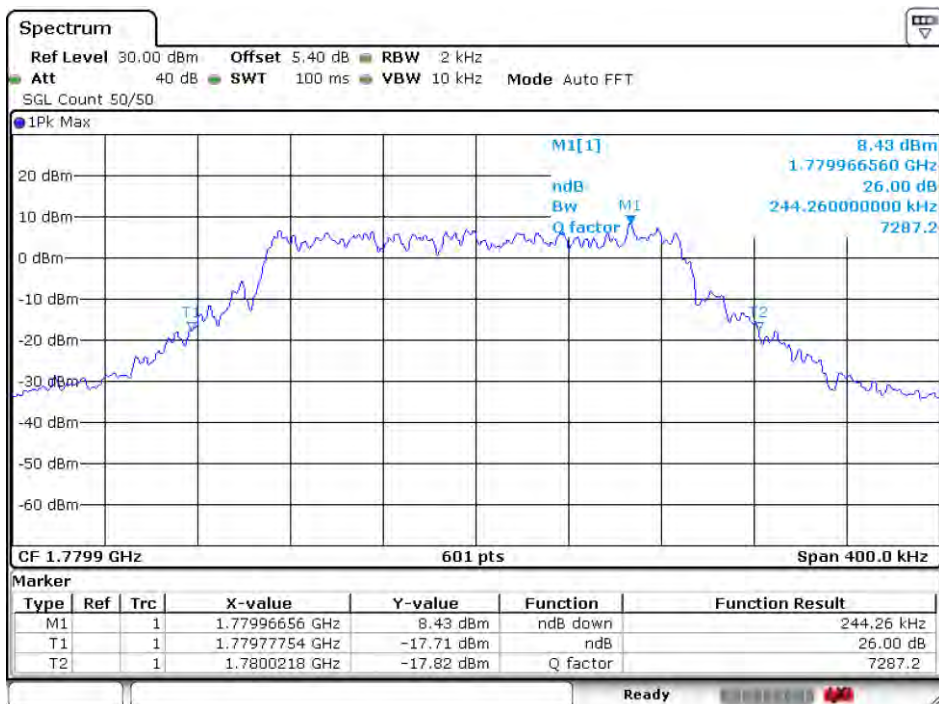




LTE-NB1/QPSK. Sub-carrier spacing=15kHz-Test Channel= 132671-T size=12T0



Date: 6.SEP.2019 02:02:48



Date: 6.SEP.2019 02:04:42



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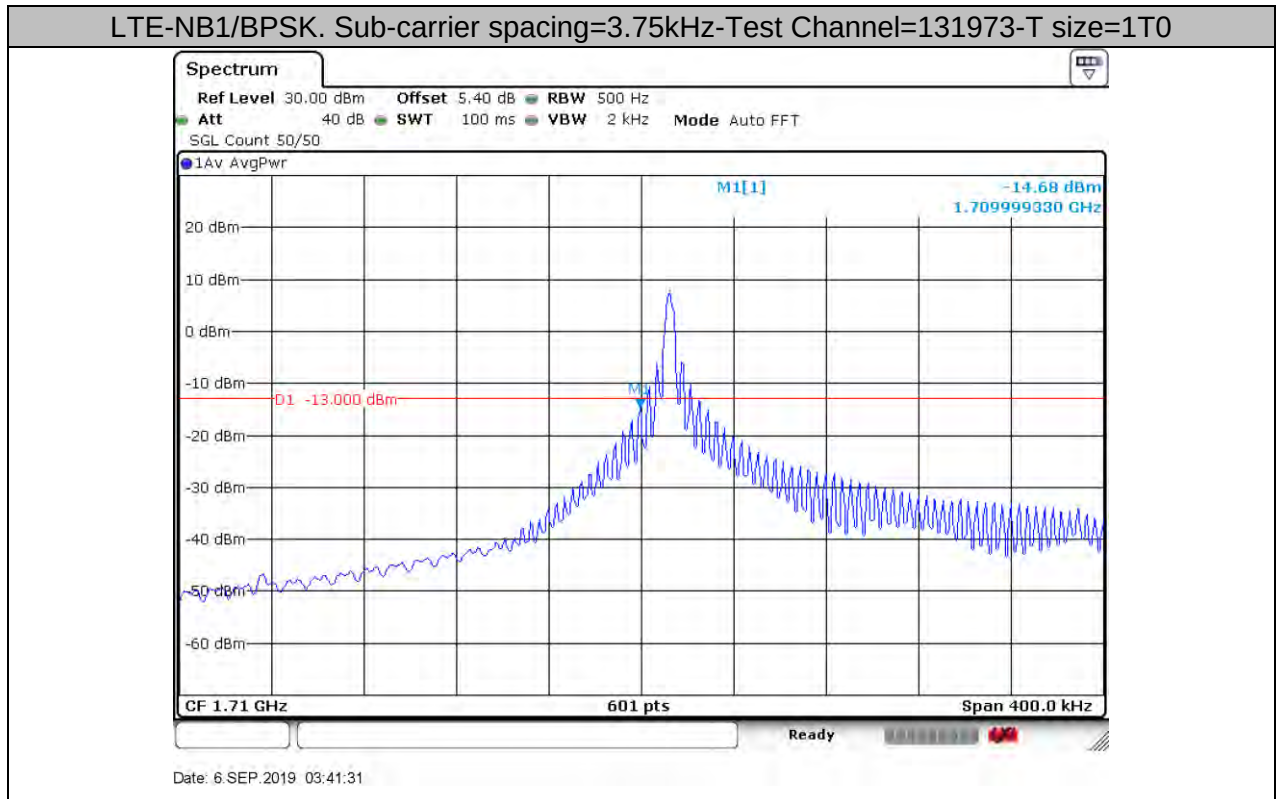
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5 Band Edges Compliance

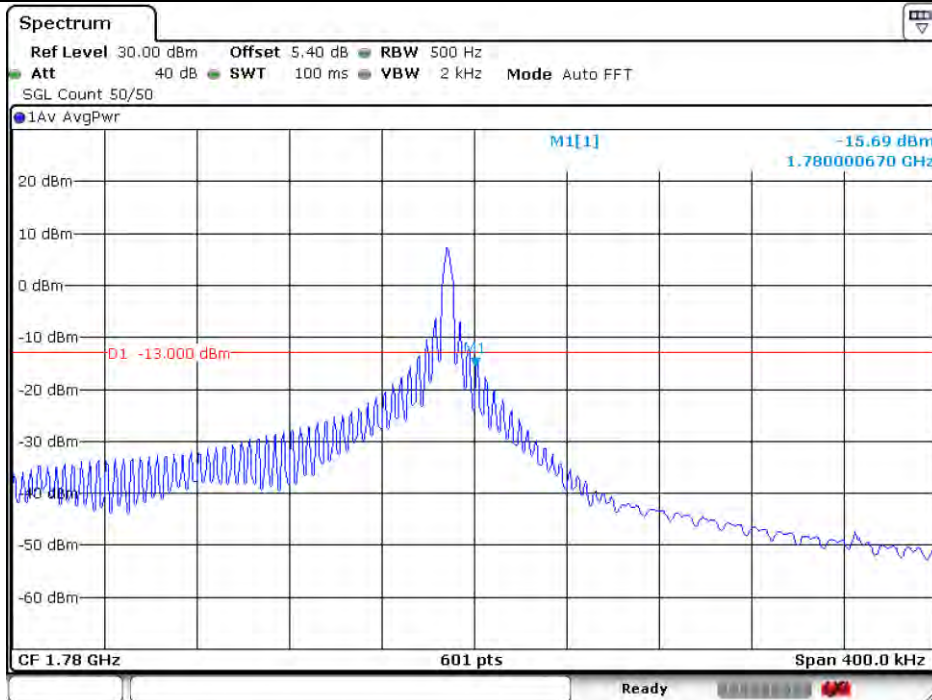
5.1 For LTE-NB1

5.1.1 Test Band = LTE-NB1 Band 66



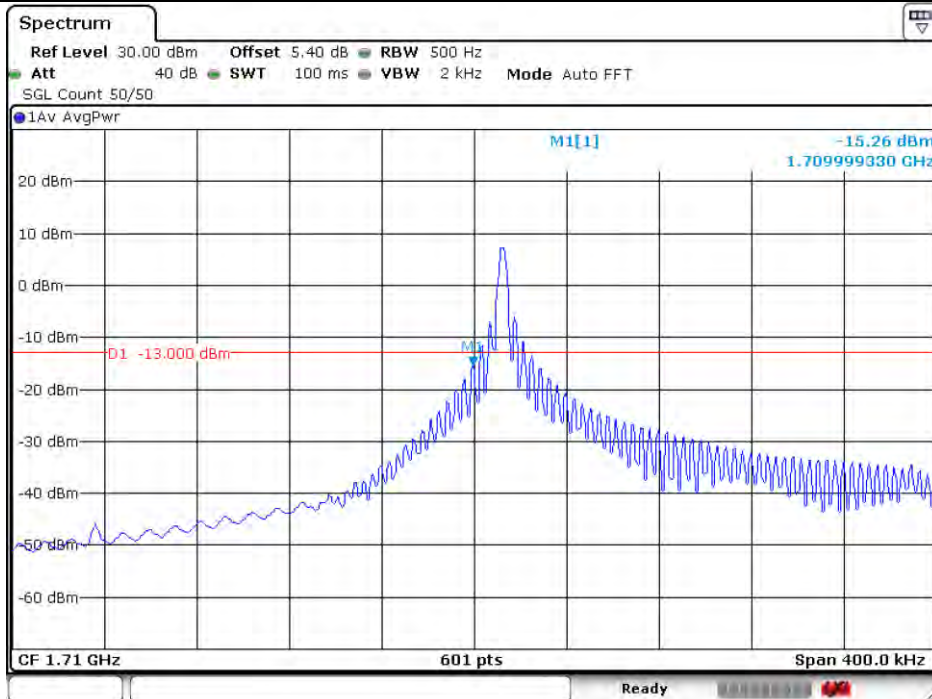


LTE-NB1/BPSK. Sub-carrier spacing=3.75kHz-Test Channel=132671-T size=1T47



Date: 6 SEP. 2019 03:50:31

LTE-NB1/QPSK. Sub-carrier spacing=3.75kHz-Test Channel=131973-T size=1T0



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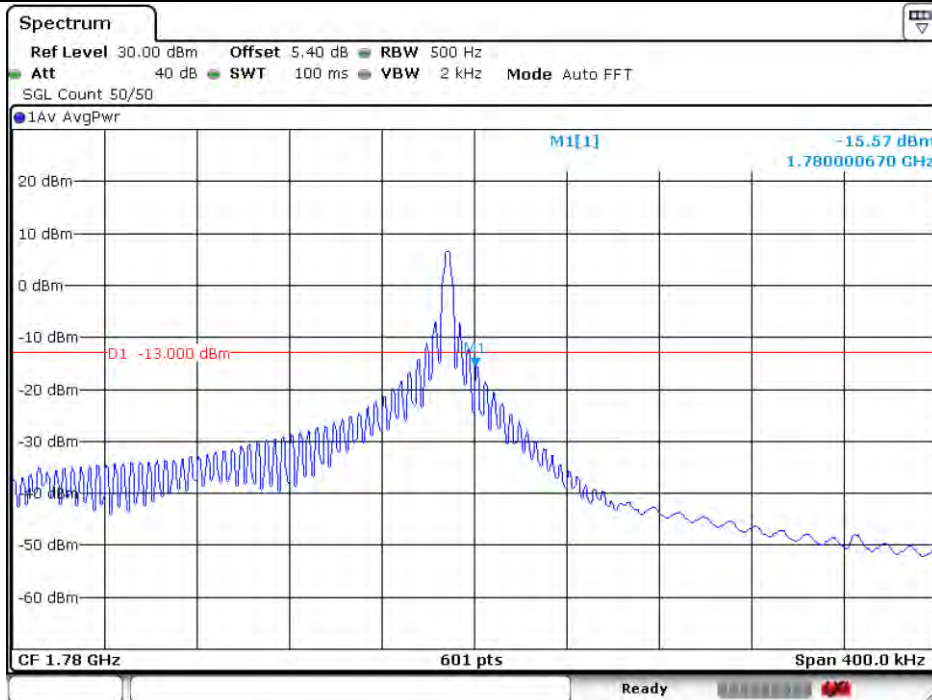
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LTE-NB1/QPSK. Sub-carrier spacing=3.75kHz-Test Channel=132671-T size=1T47



Date: 6 SEP. 2019 03:49:58

LTE-NB1/BPSK. Sub-carrier spacing=15kHz-Test Channel=131973-T size=1T0



Date: 6 SEP. 2019 03:42:42



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LTE-NB1/BPSK. Sub-carrier spacing=15kHz-Test Channel=132671-T size=1T11



Date: 6.SEP.2019 03:46:36

LTE-NB1/QPSK. Sub-carrier spacing=15kHz-Test Channel=131973-T size=1T0



Date: 6.SEP.2019 03:42:19



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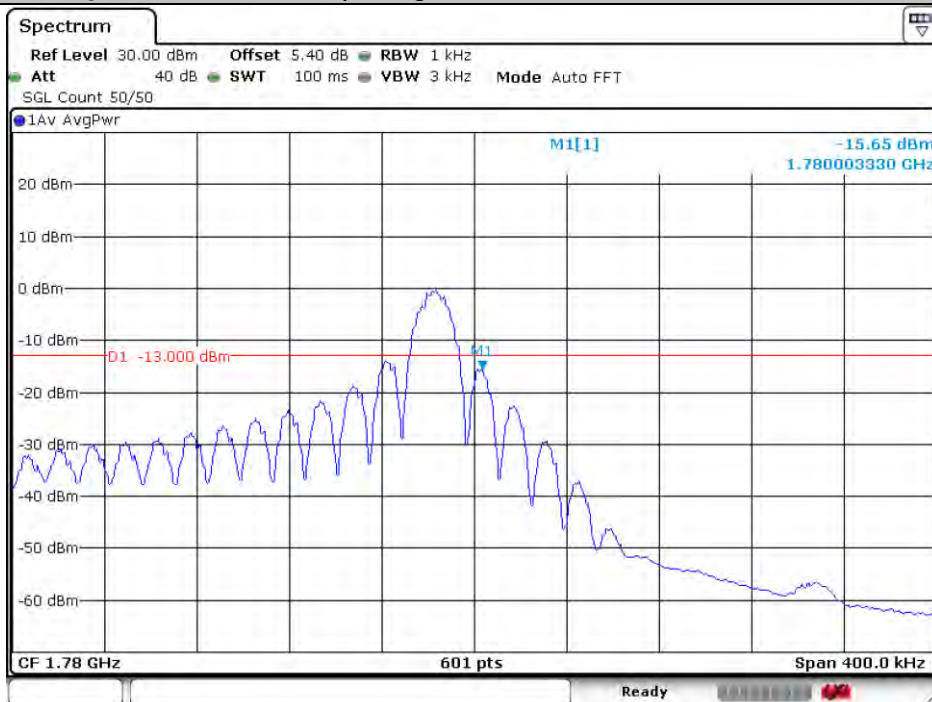


LTE-NB1/QPSK. Sub-carrier spacing=15kHz-Test Channel=131973-T size=12T0



Date: 6 SEP. 2019 03:43:10

LTE-NB1/QPSK. Sub-carrier spacing=15kHz-Test Channel=132671-T size=1T11



Date: 6 SEP. 2019 03:46:13

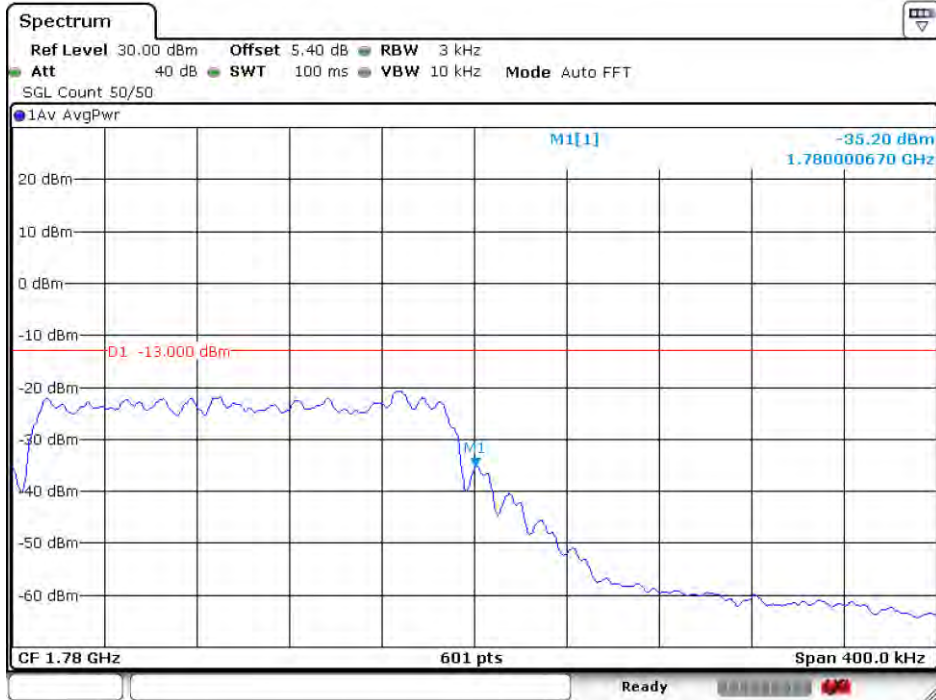


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LTE-NB1/QPSK. Sub-carrier spacing=15kHz-Test Channel=132671-T size=12T0



Date: 6 SEP. 2019 03:45:38



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6 Spurious Emission at Antenna Terminal

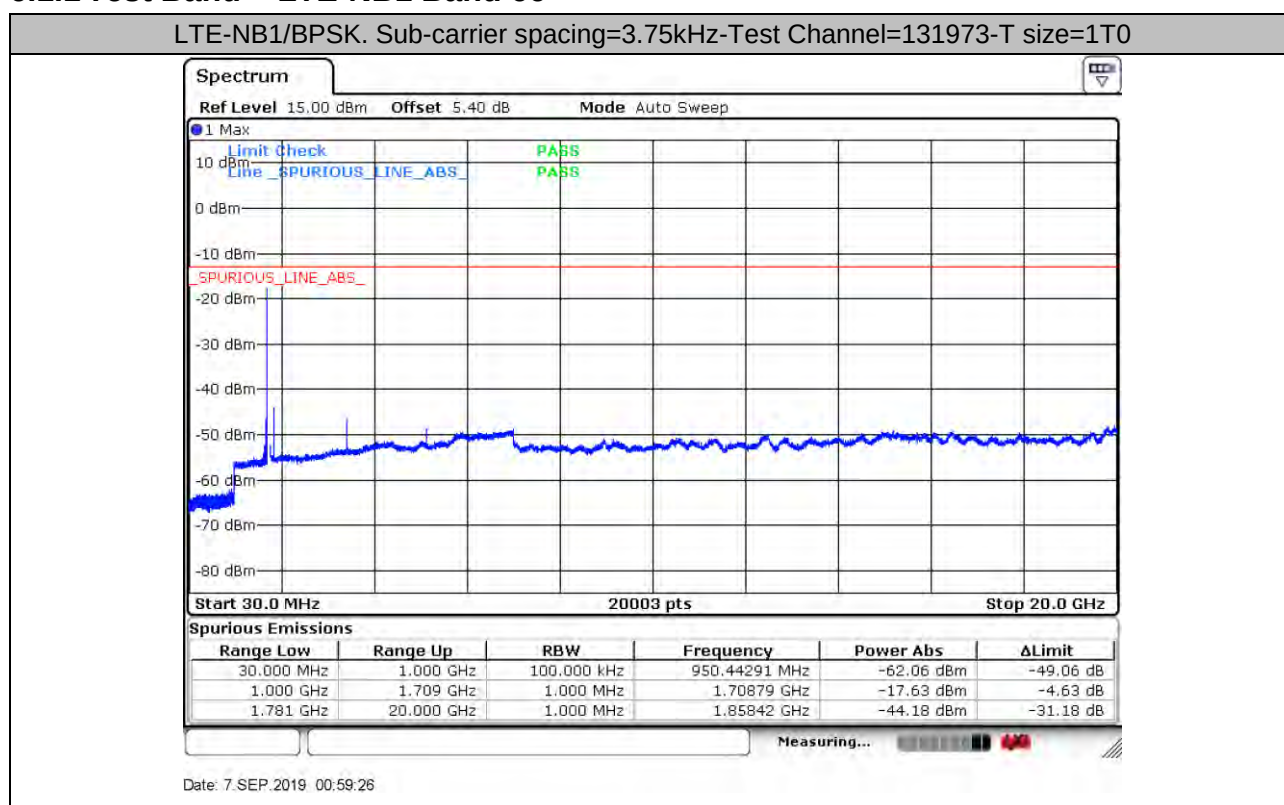
NOTE1: For the averaged unwanted emissions measurements, the measurement points in each sweep is greater than twice the Span/RBW in order to ensure bin-to-bin spacing of $< RBW/2$ so that narrowband signals are not lost between frequency bins. As to the present test item, the "Measurement Points = $k * (Span / RBW)$ " 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 66

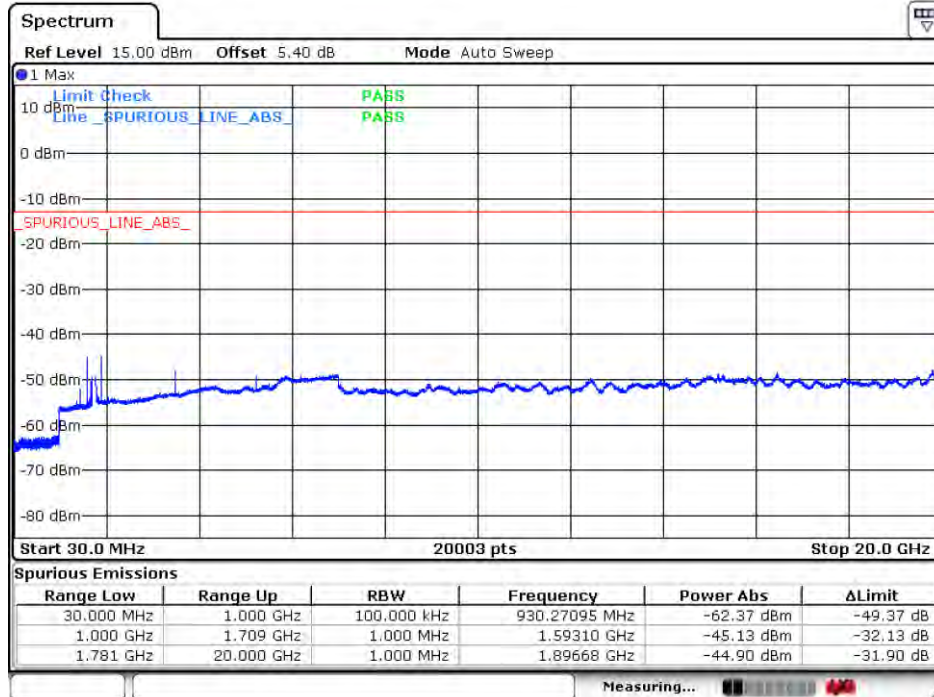


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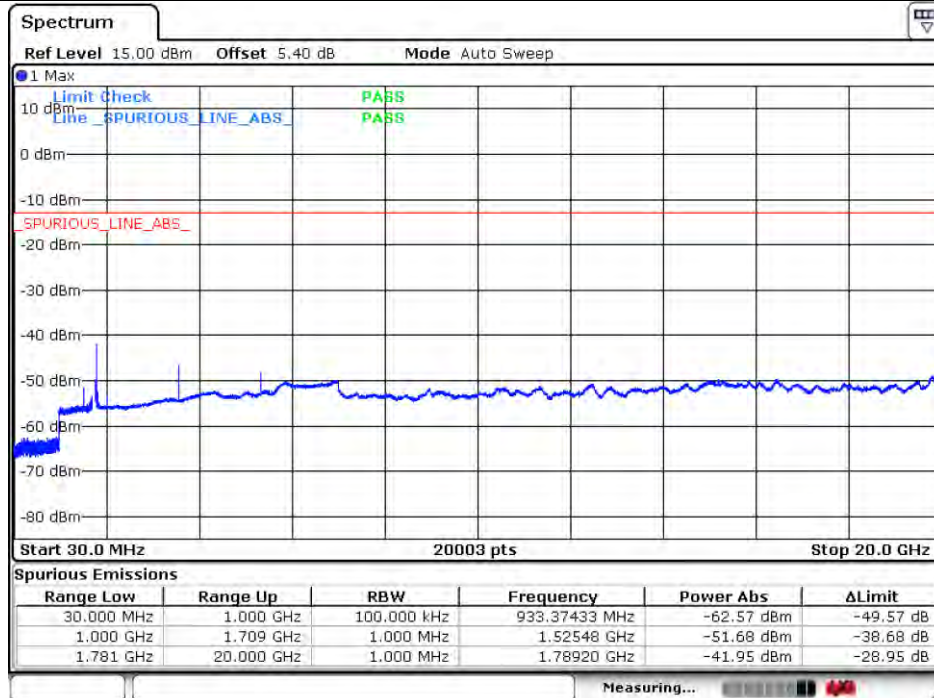
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LTE-NB1/BPSK. Sub-carrier spacing=3.75kHz-Test Channel=132322-T size=1T0



Date: 7.SEP.2019 01:01:45

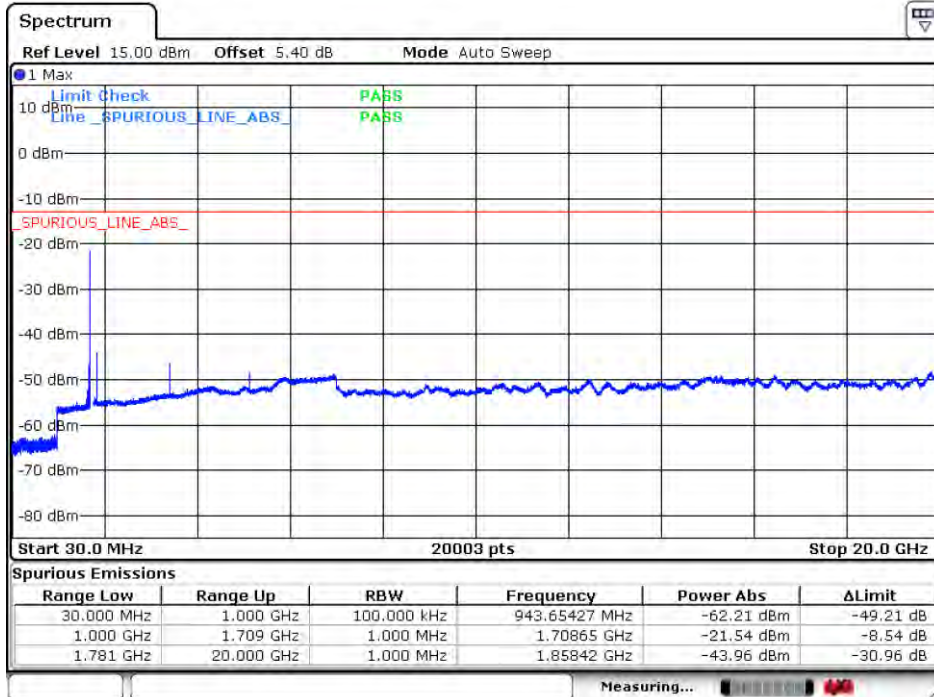
LTE-NB1/BPSK. Sub-carrier spacing=3.75kHz-Test Channel=132671-T size=1T0



Date: 7.SEP.2019 01:11:26

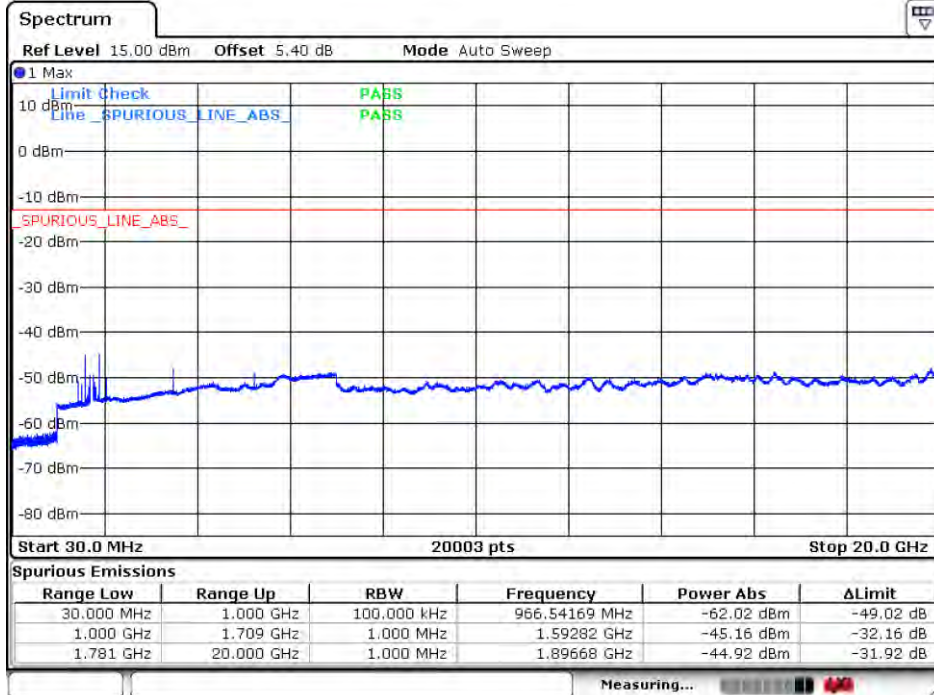


LTE-NB1/QPSK. Sub-carrier spacing=3.75kHz-Test Channel=131973-T size=1T0



Date: 7.SEP.2019 00:58:57

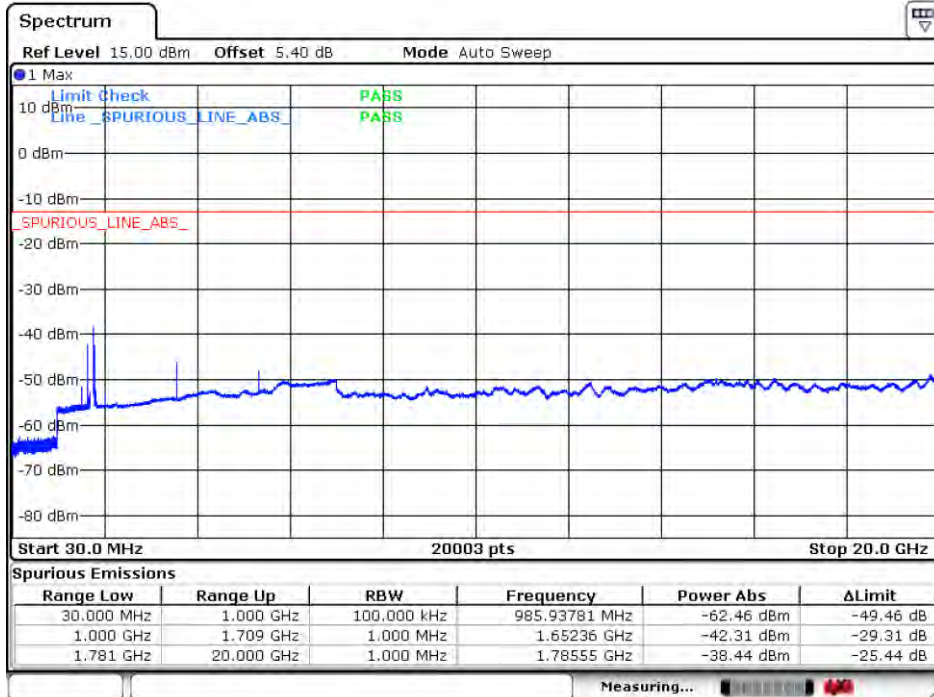
LTE-NB1/QPSK. Sub-carrier spacing=3.75kHz-Test Channel=132322-T size=1T0



Date: 7.SEP.2019 01:03:09

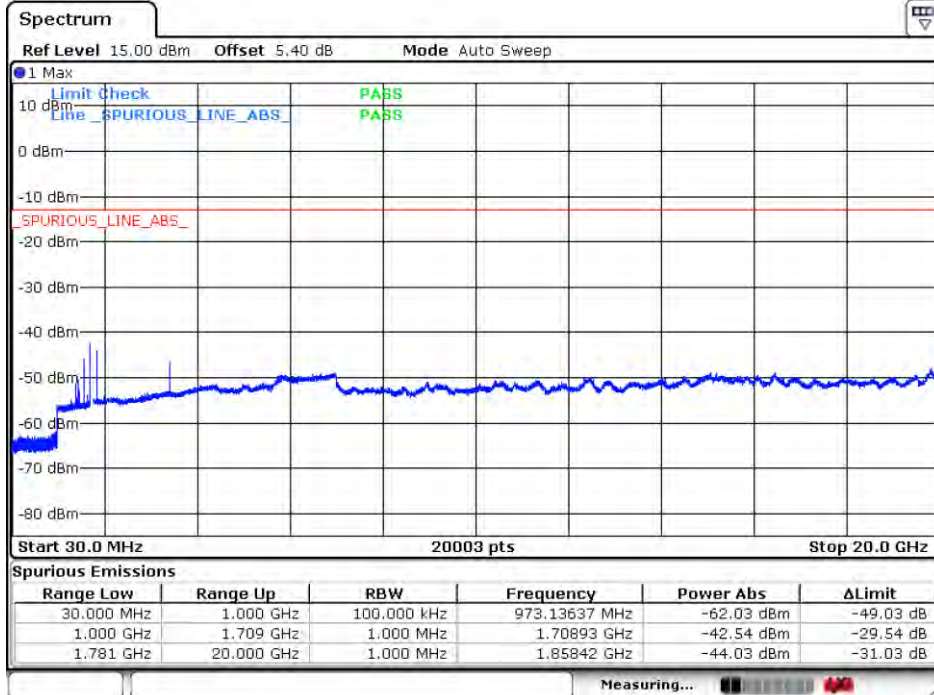


LTE-NB1/QPSK. Sub-carrier spacing=3.75kHz-Test Channel=132671-T size=1T0



Date: 7.SEP.2019 01:10:46

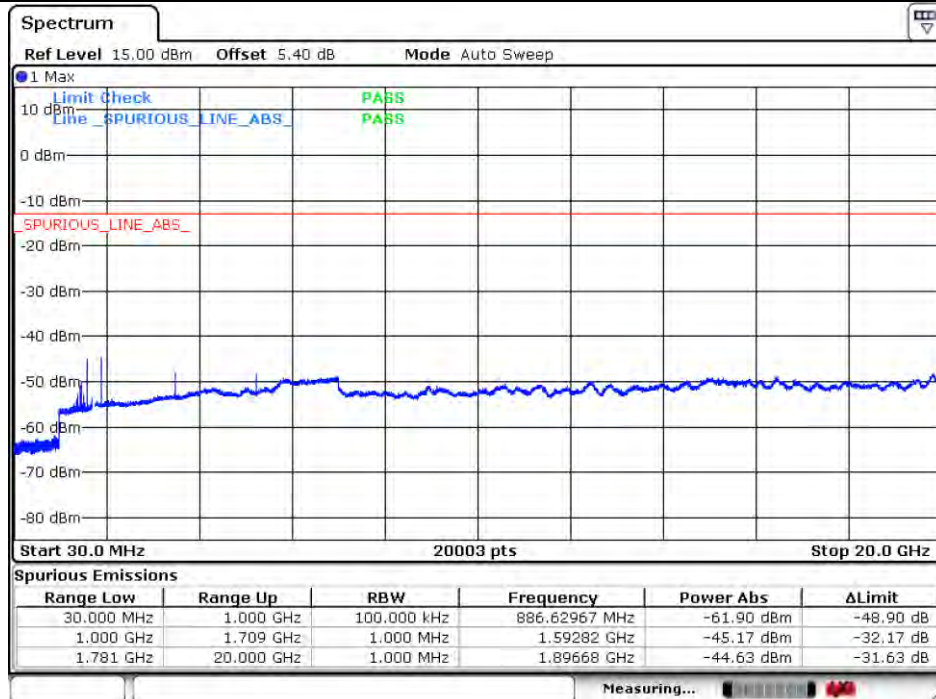
LTE-NB1/BPSK. Sub-carrier spacing=15kHz-Test Channel=131973-T size=1T0



Date: 7.SEP.2019 00:56:42

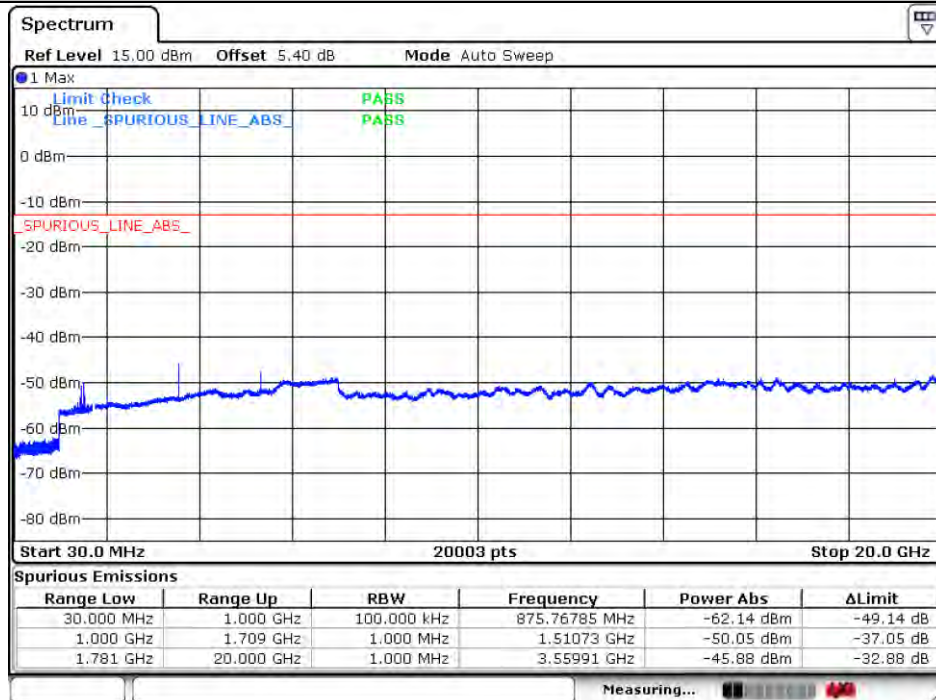


LTE-NB1/BPSK. Sub-carrier spacing=15kHz-Test Channel=132322-T size=1T0



Date: 7.SEP.2019 01:04:50

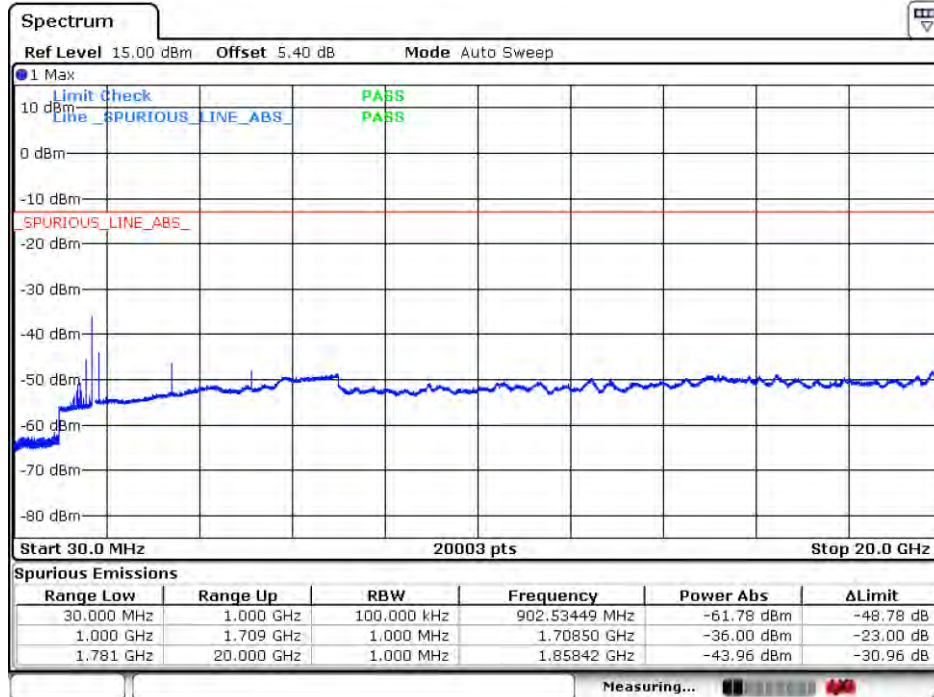
LTE-NB1/BPSK. Sub-carrier spacing=15kHz-Test Channel=132671-T size=1T0



Date: 7.SEP.2019 01:07:00

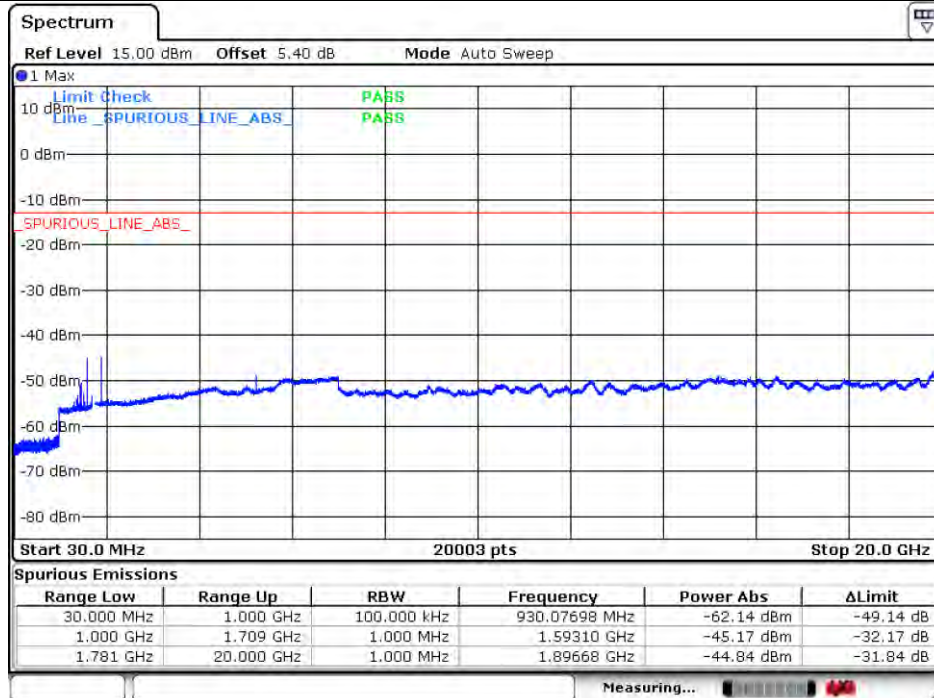


LTE-NB1/QPSK. Sub-carrier spacing=15kHz-Test Channel=131973-T size=1T0



Date: 7.SEP.2019 00:58:20

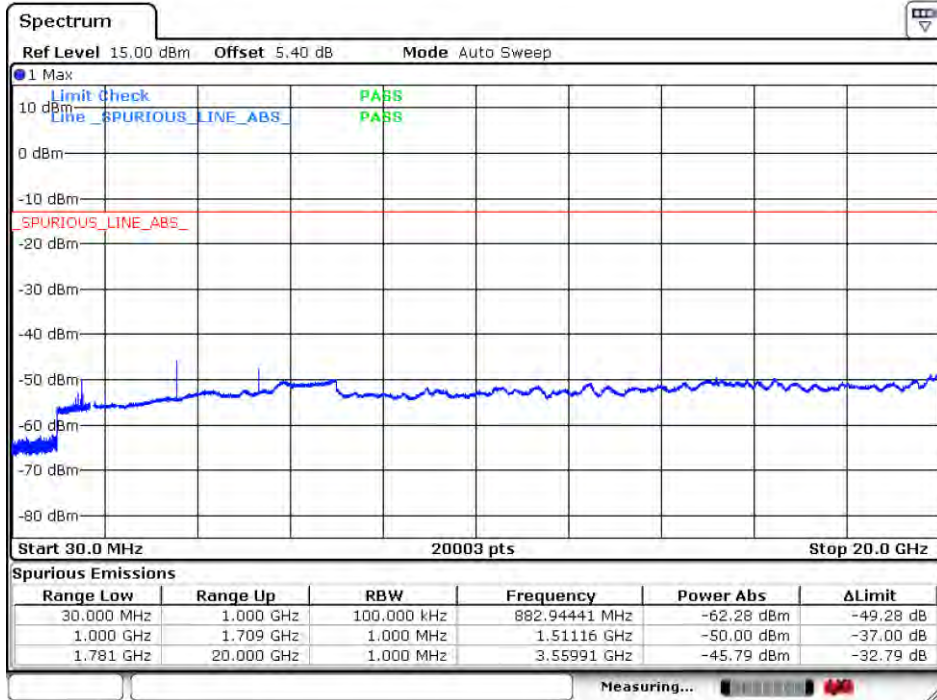
LTE-NB1/QPSK. Sub-carrier spacing=15kHz-Test Channel=132322-T size=1T0



Date: 7.SEP.2019 01:03:55



LTE-NB1/QPSK. Sub-carrier spacing=15kHz-Test Channel=132671-T size=1T0



Date: 7.SEP.2019 01:08:24



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7 Field Strength of Spurious Radiation

7.1 For LTE-NB1

7.1.1 Test Band = LTE-NB1 Band 66

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

7.1.1.1.1 Test Channel = 131973

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Over Limit (dB)	Polarization
109.6410	-74.80	-13.00	61.80	Vertical
379.8965	-79.85	-13.00	66.85	Vertical
2709.5419	-37.46	-13.00	24.46	Vertical
7396.6466	-52.58	-13.00	39.58	Vertical
14526.8842	-42.69	-13.00	29.69	Vertical
17996.4999	-34.74	-13.00	21.74	Vertical
41.5436	-68.67	-13.00	55.67	Horizontal
372.8636	-78.77	-13.00	65.77	Horizontal
2670.3341	-37.09	-13.00	24.09	Horizontal
3420.0140	-41.72	-13.00	28.72	Horizontal
5130.0710	-47.27	-13.00	34.27	Horizontal
16935.9645	-39.07	-13.00	26.07	Horizontal

7.1.1.1.2 Test Channel = 132322

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Over Limit (dB)	Polarization
84.0802	-74.08	-13.00	61.08	Vertical
371.3601	-76.92	-13.00	63.92	Vertical
2155.0310	-33.67	-13.00	20.67	Vertical
7393.1464	-53.05	-13.00	40.05	Vertical
14704.3901	-42.73	-13.00	29.73	Vertical
17997.4999	-33.12	-13.00	20.12	Vertical
47.1214	-76.48	-13.00	63.48	Horizontal
228.9084	-75.78	-13.00	62.78	Horizontal
2154.6309	-35.17	-13.00	22.17	Horizontal
3510.0170	-53.40	-13.00	40.40	Horizontal
16406.4469	-38.45	-13.00	25.45	Horizontal
17989.4997	-37.70	-13.00	24.70	Horizontal



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7.1.1.1.3 Test Channel = 132671

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Over Limit (dB)	Polarization
110.1745	-74.67	-13.00	61.67	Vertical
898.9694	-63.17	-13.00	50.17	Vertical
2711.5423	-37.61	-13.00	24.61	Vertical
7472.1491	-52.16	-13.00	39.16	Vertical
14541.3847	-42.58	-13.00	29.58	Vertical
17964.9988	-34.90	-13.00	21.90	Vertical
40.7190	-70.41	-13.00	57.41	Horizontal
333.3342	-78.73	-13.00	65.73	Horizontal
2701.5403	-36.30	-13.00	23.30	Horizontal
3559.0186	-47.19	-13.00	34.19	Horizontal
5338.5780	-47.63	-13.00	34.63	Horizontal
17981.9994	-39.26	-13.00	26.26	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 66	180KHz	BPSK/15KHz	131973	12T0	VL	TN	13.35	0.007806	±2.5	PASS
NB1 Band 66	180KHz	BPSK/15KHz	131973	12T0	VN	TN	-6.38	-0.003729	±2.5	PASS
NB1 Band 66	180KHz	BPSK/15KHz	131973	12T0	VH	TN	-2.50	-0.001459	±2.5	PASS
NB1 Band 66	180KHz	BPSK/15KHz	132322	12T0	VL	TN	3.03	0.001738	±2.5	PASS
NB1 Band 66	180KHz	BPSK/15KHz	132322	12T0	VN	TN	-8.49	-0.004866	±2.5	PASS
NB1 Band 66	180KHz	BPSK/15KHz	132322	12T0	VH	TN	0.71	0.000409	±2.5	PASS
NB1 Band 66	180KHz	BPSK/15KHz	132671	12T0	VL	TN	-10.95	-0.006154	±2.5	PASS
NB1 Band 66	180KHz	BPSK/15KHz	132671	12T0	VN	TN	-7.29	-0.004094	±2.5	PASS
NB1 Band 66	180KHz	BPSK/15KHz	132671	12T0	VH	TN	-7.63	-0.004287	±2.5	PASS
NB1 Band 66	180KHz	QPSK/15KHz	131973	12T0	VL	TN	-10.23	-0.005984	±2.5	PASS
NB1 Band 66	180KHz	QPSK/15KHz	131973	12T0	VN	TN	-13.44	-0.007860	±2.5	PASS
NB1 Band 66	180KHz	QPSK/15KHz	131973	12T0	VH	TN	14.24	0.008326	±2.5	PASS
NB1 Band 66	180KHz	QPSK/15KHz	132322	12T0	VL	TN	11.98	0.006868	±2.5	PASS
NB1 Band 66	180KHz	QPSK/15KHz	132322	12T0	VN	TN	0.53	0.000306	±2.5	PASS
NB1 Band 66	180KHz	QPSK/15KHz	132322	12T0	VH	TN	-10.84	-0.006210	±2.5	PASS
NB1 Band 66	180KHz	QPSK/15KHz	132671	12T0	VL	TN	7.07	0.003970	±2.5	PASS
NB1 Band 66	180KHz	QPSK/15KHz	132671	12T0	VN	TN	-4.67	-0.002622	±2.5	PASS
NB1 Band 66	180KHz	QPSK/15KHz	132671	12T0	VH	TN	-6.29	-0.003534	±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 66	180KHz	BPSK/15KHz	131973	12T0	NV	-30	5.97	0.003488	±2.5	PASS
NB1 Band 66	180KHz	BPSK/15KHz	131973	12T0	NV	-20	3.00	0.001756	±2.5	PASS
NB1 Band 66	180KHz	BPSK/15KHz	131973	12T0	NV	0	-3.84	-0.002246	±2.5	PASS
NB1 Band 66	180KHz	BPSK/15KHz	131973	12T0	NV	10	2.71	0.001586	±2.5	PASS
NB1 Band 66	180KHz	BPSK/15KHz	131973	12T0	NV	20	0.92	0.000537	±2.5	PASS
NB1 Band 66	180KHz	BPSK/15KHz	131973	12T0	NV	30	7.24	0.004234	±2.5	PASS
NB1 Band 66	180KHz	BPSK/15KHz	131973	12T0	NV	40	9.45	0.005526	±2.5	PASS
NB1 Band 66	180KHz	BPSK/15KHz	131973	12T0	NV	50	-6.34	-0.003708	±2.5	PASS
NB1 Band 66	180KHz	BPSK/15KHz	132322	12T0	NV	-30	3.53	0.002022	±2.5	PASS
NB1 Band 66	180KHz	BPSK/15KHz	132322	12T0	NV	-20	5.73	0.003284	±2.5	PASS
NB1 Band 66	180KHz	BPSK/15KHz	132322	12T0	NV	0	-4.68	-0.002682	±2.5	PASS
NB1 Band 66	180KHz	BPSK/15KHz	132322	12T0	NV	10	9.37	0.005370	±2.5	PASS
NB1 Band 66	180KHz	BPSK/15KHz	132322	12T0	NV	20	-14.12	-0.008094	±2.5	PASS
NB1 Band 66	180KHz	BPSK/15KHz	132322	12T0	NV	30	-7.93	-0.004544	±2.5	PASS
NB1 Band 66	180KHz	BPSK/15KHz	132322	12T0	NV	40	1.73	0.000989	±2.5	PASS
NB1 Band 66	180KHz	BPSK/15KHz	132322	12T0	NV	50	0.65	0.000371	±2.5	PASS
NB1 Band 66	180KHz	BPSK/15KHz	132671	12T0	NV	-30	0.19	0.000105	±2.5	PASS
NB1 Band 66	180KHz	BPSK/15KHz	132671	12T0	NV	-20	-3.16	-0.001773	±2.5	PASS
NB1 Band 66	180KHz	BPSK/15KHz	132671	12T0	NV	0	-1.97	-0.001107	±2.5	PASS



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NB1 Band 66	180KHz	BPSK/15KHz	132671	12T0	NV	10	14.34	0.008058	±2.5	PASS
NB1 Band 66	180KHz	BPSK/15KHz	132671	12T0	NV	20	-8.99	-0.005049	±2.5	PASS
NB1 Band 66	180KHz	BPSK/15KHz	132671	12T0	NV	30	-0.98	-0.000553	±2.5	PASS
NB1 Band 66	180KHz	BPSK/15KHz	132671	12T0	NV	40	-13.68	-0.007683	±2.5	PASS
NB1 Band 66	180KHz	BPSK/15KHz	132671	12T0	NV	50	-1.04	-0.000583	±2.5	PASS
NB1 Band 66	180KHz	QPSK/15KHz	131973	12T0	NV	-30	-9.25	-0.005408	±2.5	PASS
NB1 Band 66	180KHz	QPSK/15KHz	131973	12T0	NV	-20	-12.19	-0.007128	±2.5	PASS
NB1 Band 66	180KHz	QPSK/15KHz	131973	12T0	NV	0	4.19	0.002450	±2.5	PASS
NB1 Band 66	180KHz	QPSK/15KHz	131973	12T0	NV	10	-6.61	-0.003864	±2.5	PASS
NB1 Band 66	180KHz	QPSK/15KHz	131973	12T0	NV	20	0.36	0.000213	±2.5	PASS
NB1 Band 66	180KHz	QPSK/15KHz	131973	12T0	NV	30	-0.74	-0.000435	±2.5	PASS
NB1 Band 66	180KHz	QPSK/15KHz	131973	12T0	NV	40	7.56	0.004420	±2.5	PASS
NB1 Band 66	180KHz	QPSK/15KHz	131973	12T0	NV	50	4.64	0.002714	±2.5	PASS
NB1 Band 66	180KHz	QPSK/15KHz	132322	12T0	NV	-30	2.45	0.001403	±2.5	PASS
NB1 Band 66	180KHz	QPSK/15KHz	132322	12T0	NV	-20	4.46	0.002557	±2.5	PASS
NB1 Band 66	180KHz	QPSK/15KHz	132322	12T0	NV	0	-2.98	-0.001707	±2.5	PASS
NB1 Band 66	180KHz	QPSK/15KHz	132322	12T0	NV	10	-13.23	-0.007583	±2.5	PASS
NB1 Band 66	180KHz	QPSK/15KHz	132322	12T0	NV	20	0.99	0.000565	±2.5	PASS
NB1 Band 66	180KHz	QPSK/15KHz	132322	12T0	NV	30	10.38	0.005946	±2.5	PASS
NB1 Band 66	180KHz	QPSK/15KHz	132322	12T0	NV	40	-8.81	-0.005049	±2.5	PASS
NB1 Band 66	180KHz	QPSK/15KHz	132322	12T0	NV	50	13.16	0.007543	±2.5	PASS
NB1 Band 66	180KHz	QPSK/15KHz	132671	12T0	NV	-30	-14.44	-0.008111	±2.5	PASS
NB1 Band 66	180KHz	QPSK/15KHz	132671	12T0	NV	-20	-12.41	-0.006975	±2.5	PASS
NB1 Band 66	180KHz	QPSK/15KHz	132671	12T0	NV	0	-5.48	-0.003081	±2.5	PASS
NB1 Band 66	180KHz	QPSK/15KHz	132671	12T0	NV	10	8.80	0.004942	±2.5	PASS
NB1 Band 66	180KHz	QPSK/15KHz	132671	12T0	NV	20	8.80	0.004943	±2.5	PASS
NB1 Band 66	180KHz	QPSK/15KHz	132671	12T0	NV	30	-7.71	-0.004333	±2.5	PASS
NB1 Band 66	180KHz	QPSK/15KHz	132671	12T0	NV	40	5.07	0.002849	±2.5	PASS
NB1 Band 66	180KHz	QPSK/15KHz	132671	12T0	NV	50	10.61	0.005961	±2.5	PASS

The End



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Appendix B

LTE-NB1 Band 71



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1 Effective Radiated Power Output Data

1.1 Test Result for LTE NB1 Band 71

Test Band	Test Mode	Sub-carrier Spacing (kHz)	Test channel	Number of T	Conducted Power (dBm)	ERP (dBm)	limit (dBm)	Verdict
NB1 Band 71	BPSK	3.75	133123	1T0	20.83	17.18	34.77	PASS
NB1 Band 71	BPSK	3.75	133297	1T0	20.63	16.98	34.77	PASS
NB1 Band 71	BPSK	3.75	133471	1T0	20.67	17.02	34.77	PASS
NB1 Band 71	QPSK	3.75	133123	1T0	20.72	17.07	34.77	PASS
NB1 Band 71	QPSK	3.75	133297	1T0	20.61	16.96	34.77	PASS
NB1 Band 71	QPSK	3.75	133471	1T0	20.75	17.1	34.77	PASS

Test Band	Test Mode	Sub-carrier Spacing (kHz)	Test channel	Number of T	Conducted Power (dBm)	ERP (dBm)	limit (dBm)	Verdict
NB1 Band 71	BPSK	15	133123	1T0	20.73	17.08	34.77	PASS
NB1 Band 71	BPSK	15	133297	1T0	20.61	16.96	34.77	PASS
NB1 Band 71	BPSK	15	133471	1T0	20.76	17.11	34.77	PASS
NB1 Band 71	QPSK	15	133123	1T0	20.78	17.13	34.77	PASS
NB1 Band 71	QPSK	15	133123	12T0	20.61	16.96	34.77	PASS
NB1 Band 71	QPSK	15	133297	1T0	20.68	17.03	34.77	PASS
NB1 Band 71	QPSK	15	133297	12T0	20.59	16.94	34.77	PASS
NB1 Band 71	QPSK	15	133471	1T0	20.81	17.16	34.77	PASS
NB1 Band 71	QPSK	15	133471	12T0	20.56	16.91	34.77	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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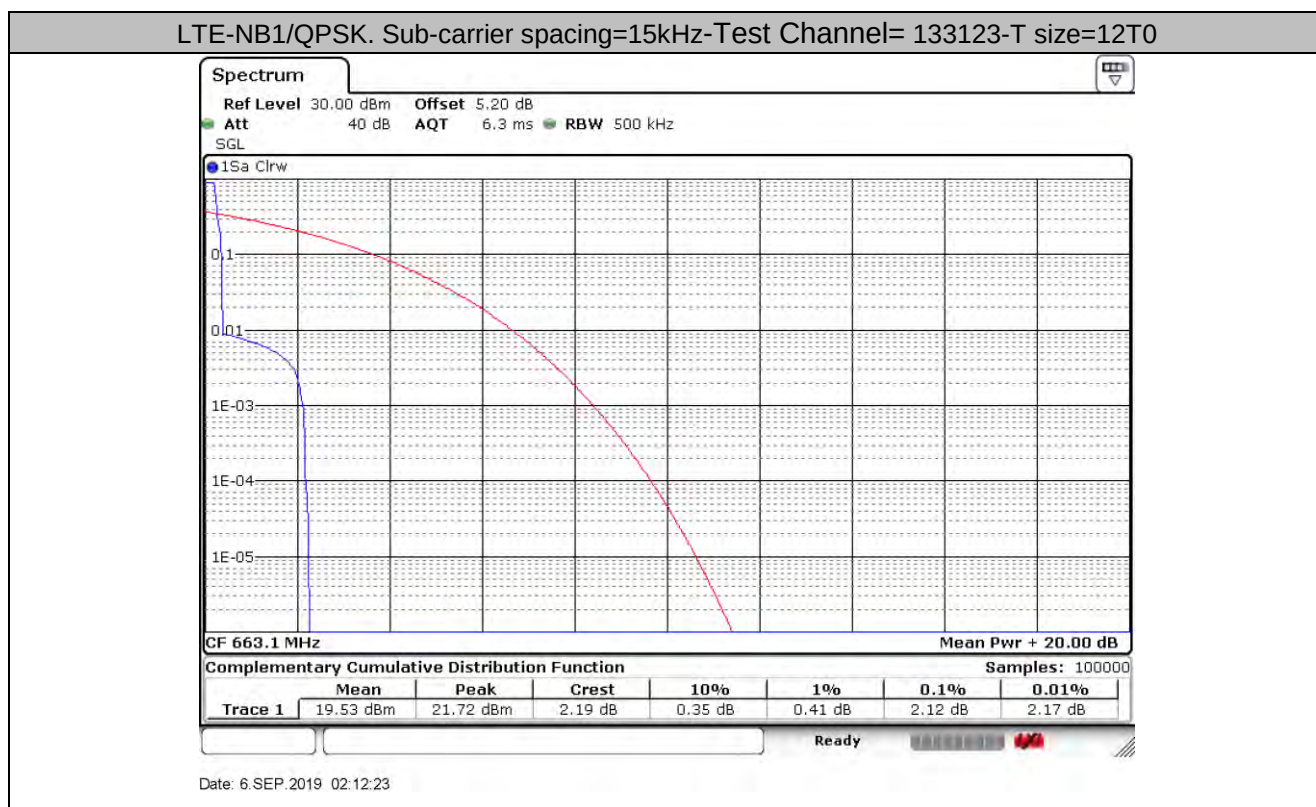


2 Peak-to-Average Ratio

Test Band	Test Mode	Test Channel	Measured[dB]	Limit [dB]	Verdict
NB1 Band 71	QPSK/12T0	133123	2.12	13	PASS
NB1 Band 71	QPSK/12T0	133297	1.77	13	PASS
NB1 Band 71	QPSK/12T0	133471	2.17	13	PASS

2.1 For LTE-NB1

2.1.1 Test Band = LTE-NB1 Band 71



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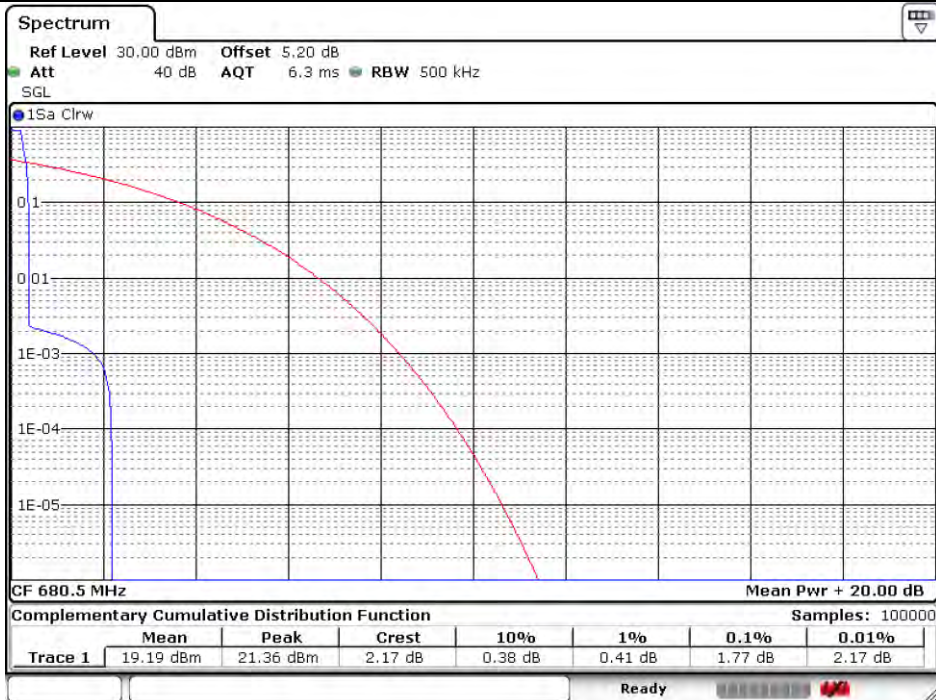
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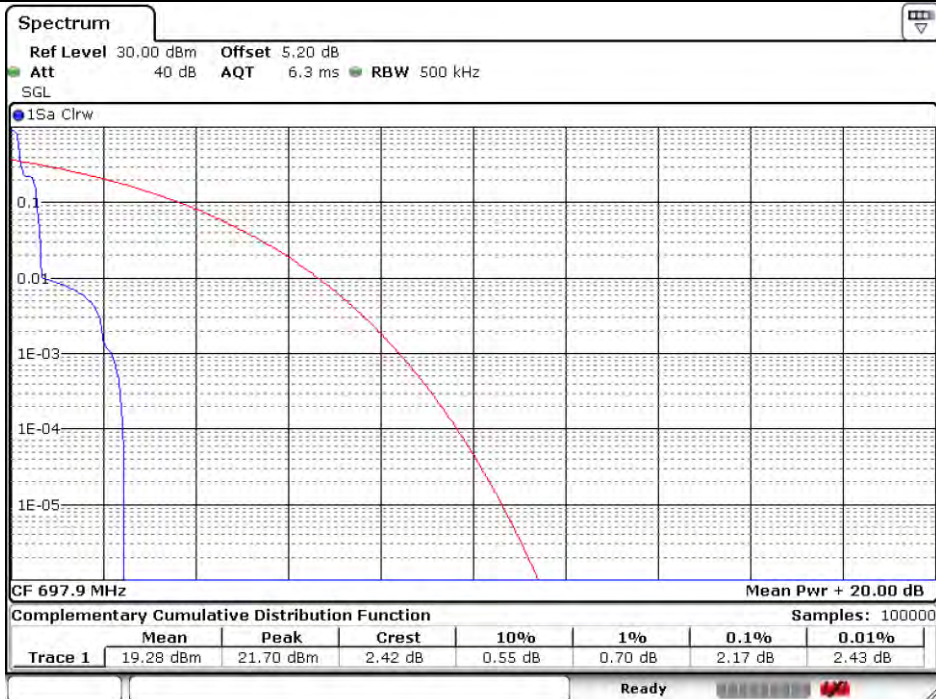


LTE-NB1/QPSK. Sub-carrier spacing=15kHz-Test Channel= 133297-T size=12T0



Date: 6.SEP.2019 02:26:00

LTE-NB1/QPSK. Sub-carrier spacing=15kHz-Test Channel= 133471-T size=12T0



Date: 6.SEP.2019 02:26:43



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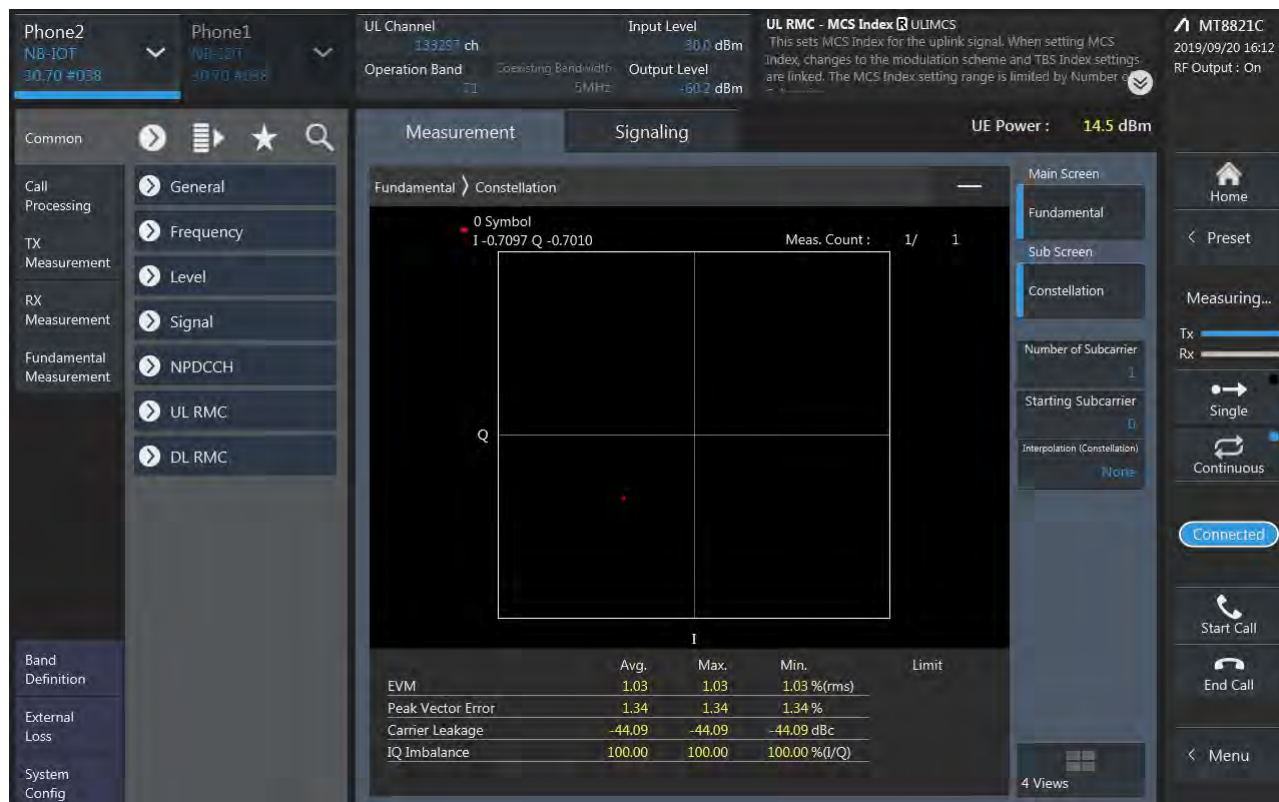
3 Modulation Characteristics

3.1 For LTE-NB1

3.1.1 Test Band = LTE-NB1 Band 71

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

3.1.1.1.1 Test Channel = 133297



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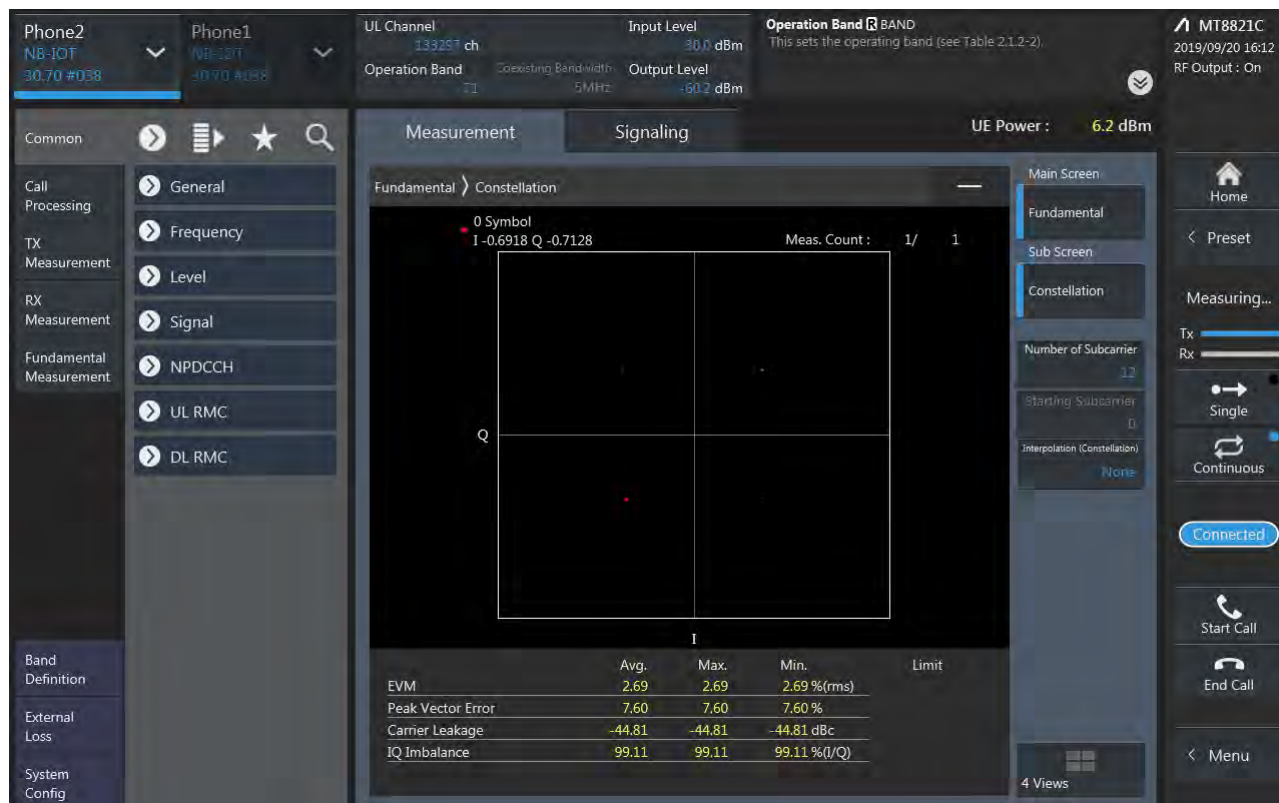
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3.1.1.2 Test Mode = LTE-NB1/QPSK. Sub-carrier spacing=15kHz.T size=12T0

3.1.1.2.1 Test Channel = 133297



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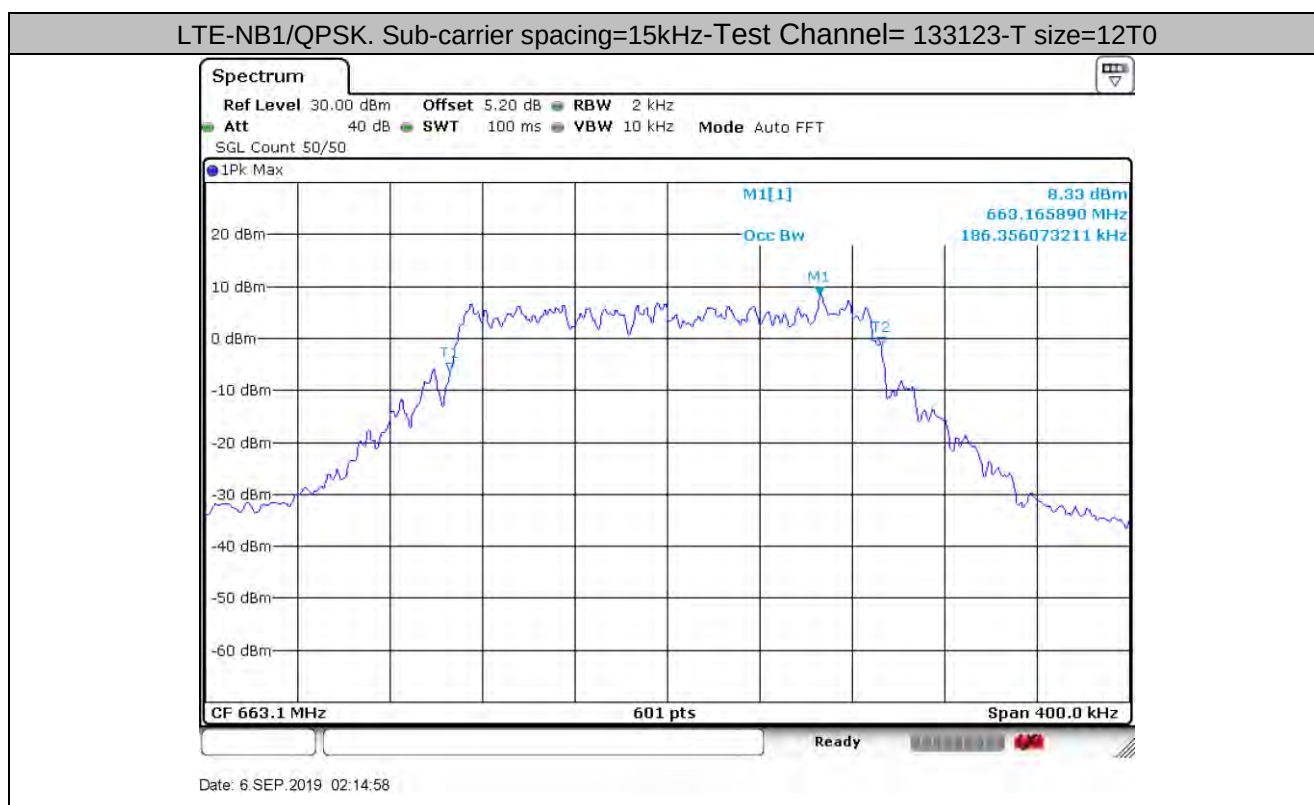
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4 26dB Bandwidth and Occupied Bandwidth

Test Band	Test Mode	T size	Test Channel	Occupied Bandwidth [kHz]	Emission Bandwidth [kHz]	Verdict
NB1 Band 71	QPSK/15kHz	12T0	133123	186.36	242.93	PASS
NB1 Band 71	QPSK/15kHz	12T0	133297	186.36	242.93	PASS
NB1 Band 71	QPSK/15kHz	12T0	133471	186.36	242.26	PASS

4.1 For LTE-NB1

4.1.1 Test Band = LTE-NB1 Band 71



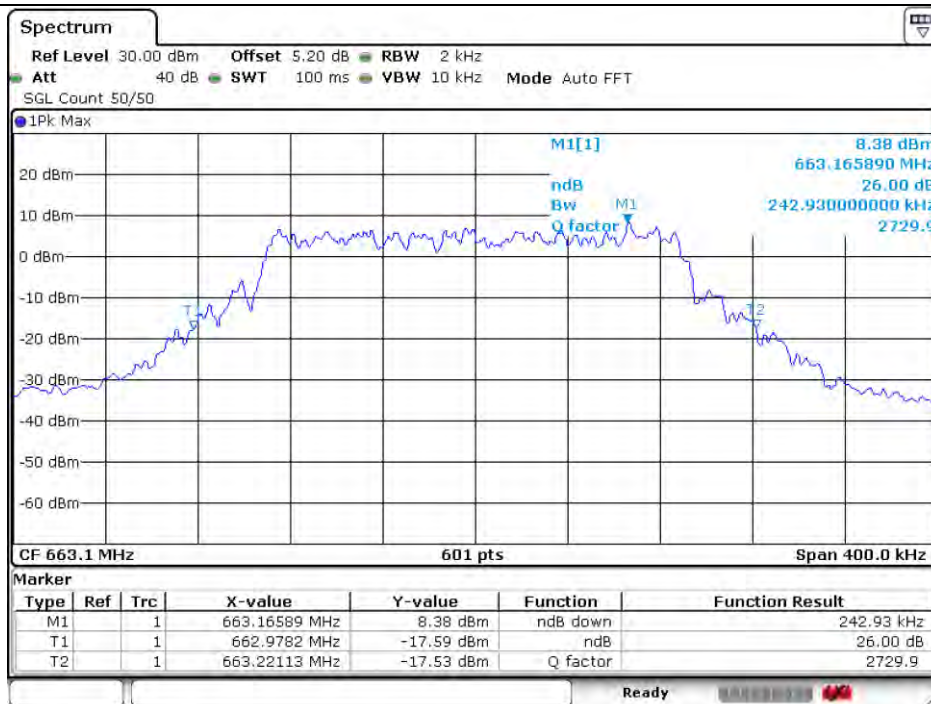
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Date: 6 SEP.2019 02:15:21



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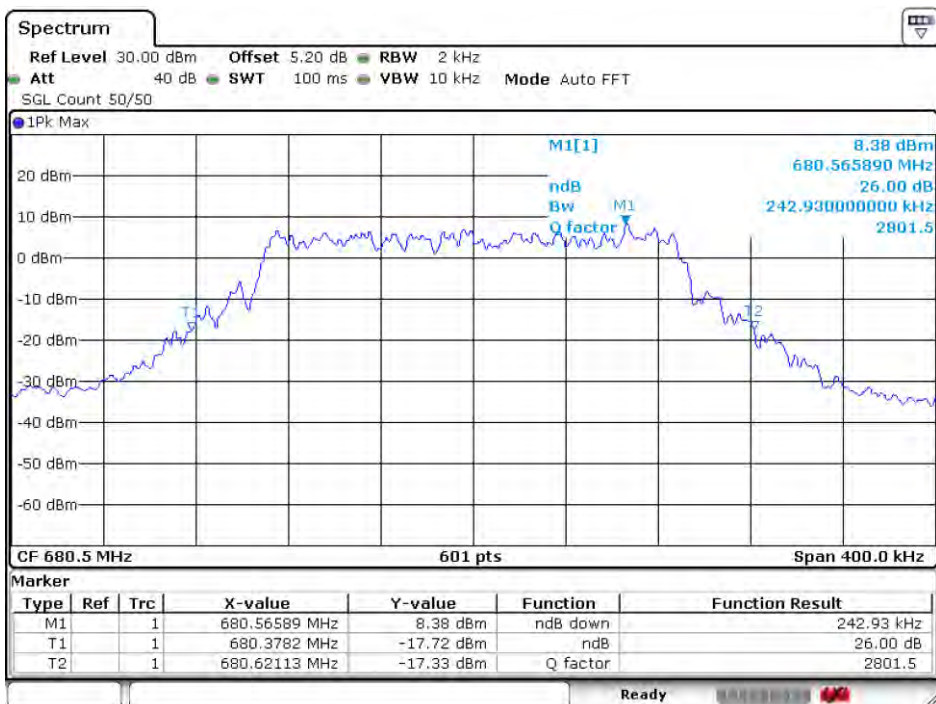
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LTE-NB1/QPSK. Sub-carrier spacing=15kHz-Test Channel= 133297-T size=12T0



Date: 6.SEP.2019 02:23:05



Date: 6.SEP.2019 02:22:26



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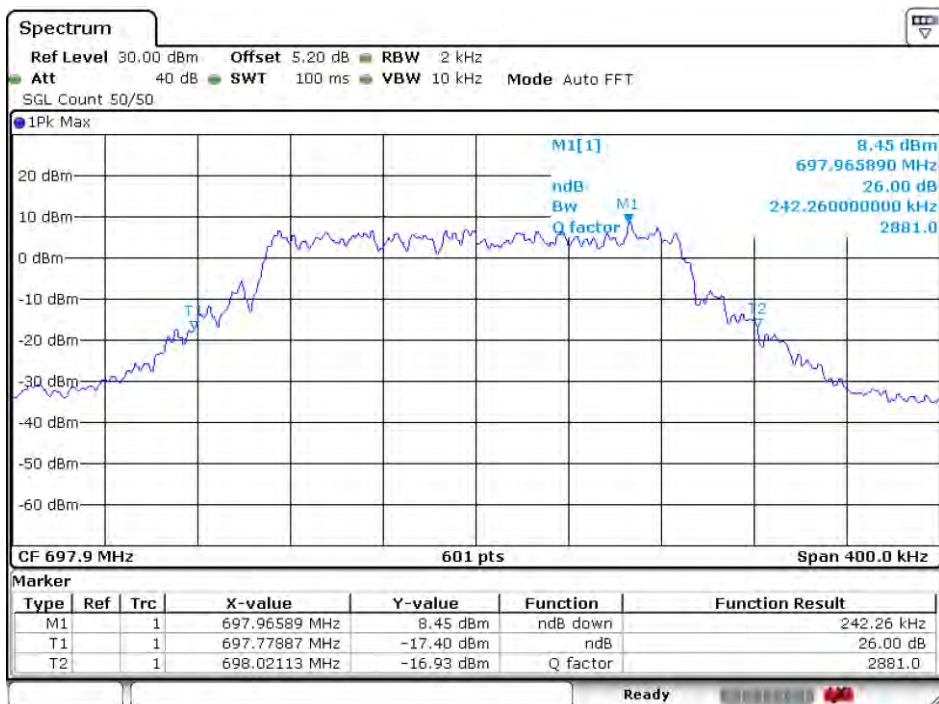
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LTE-NB1/QPSK. Sub-carrier spacing=15kHz-Test Channel= 133471-T size=12T0



Date: 6.SEP.2019 02:30:11



Date: 6.SEP.2019 02:30:53



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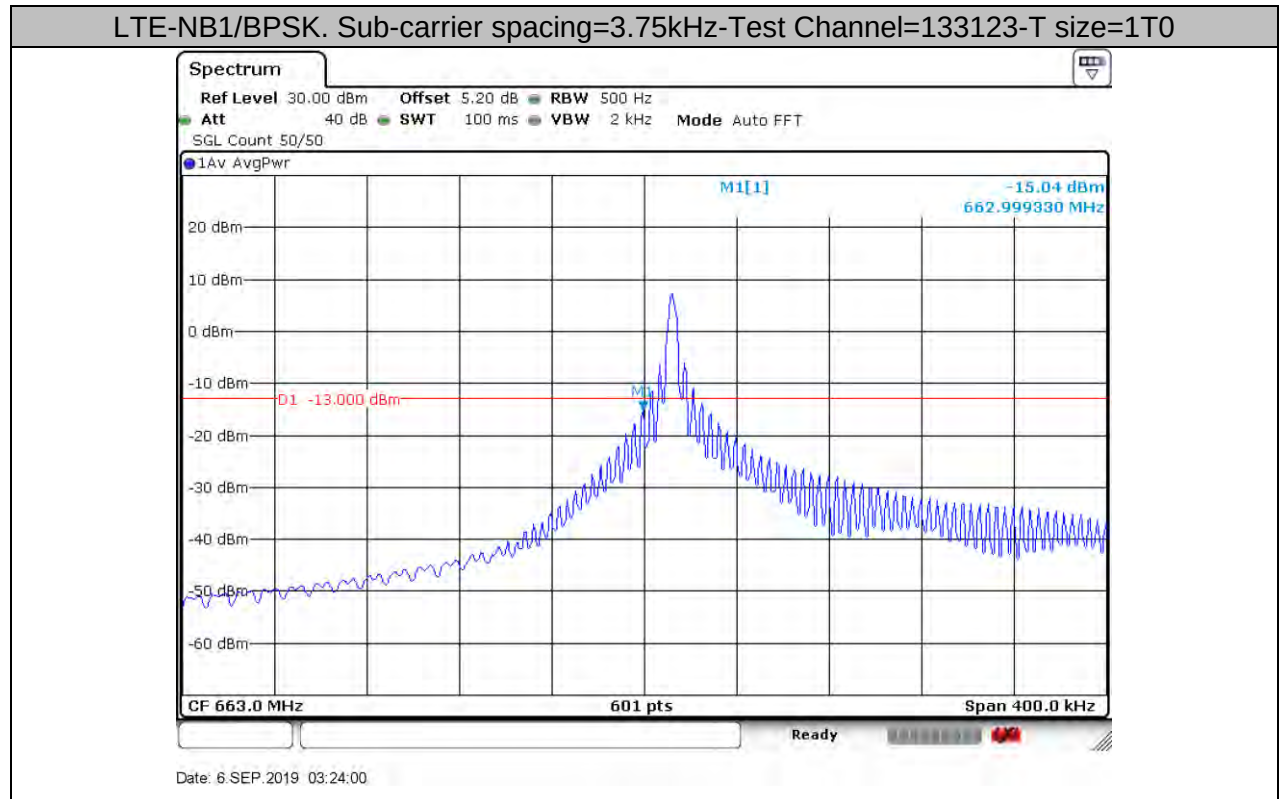
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5 Band Edges Compliance

5.1 For LTE-NB1

5.1.1 Test Band = LTE-NB1 Band 71



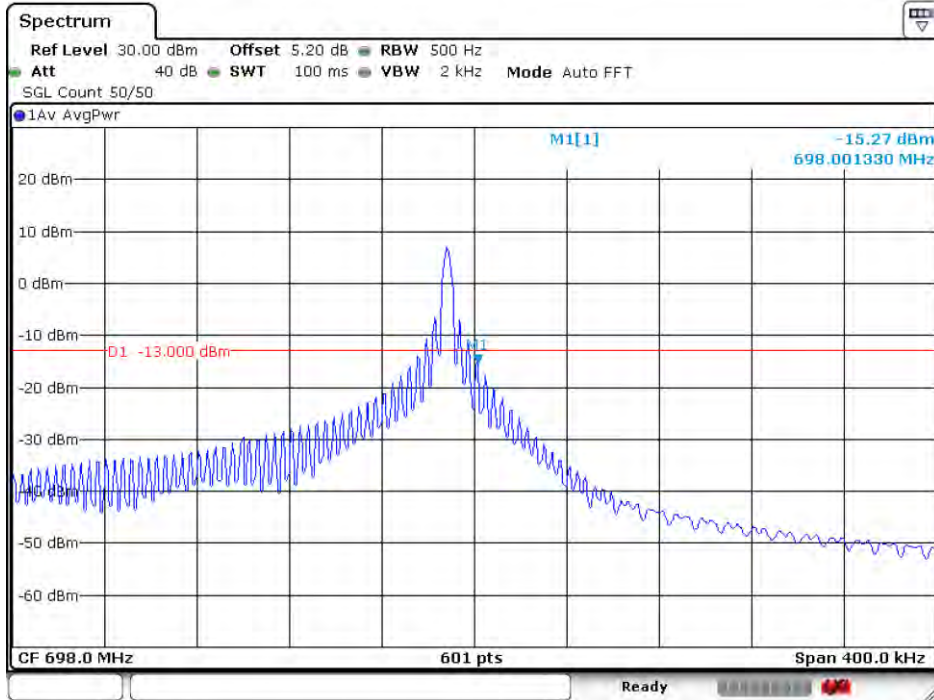
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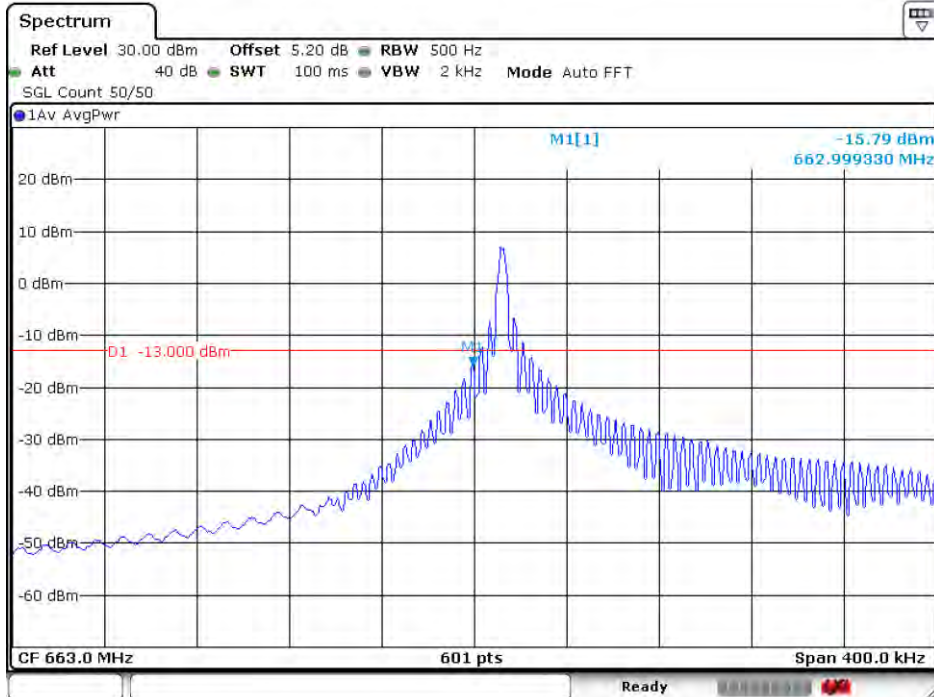
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LTE-NB1/BPSK. Sub-carrier spacing=3.75kHz-Test Channel=133471-T size=1T47



Date: 6.SEP.2019 03:33:26

LTE-NB1/QPSK. Sub-carrier spacing=3.75kHz-Test Channel=133123-T size=1T0



Date: 6.SEP.2019 03:24:25



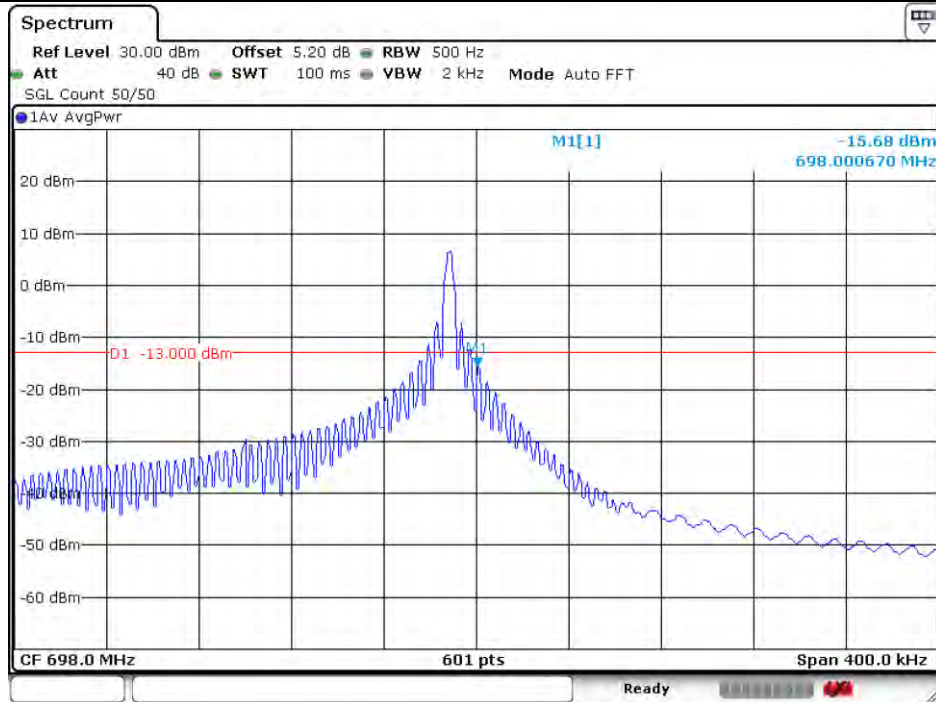
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LTE-NB1/QPSK. Sub-carrier spacing=3.75kHz-Test Channel=133471-T size=1T47



Date: 6.SEP.2019 03:33:06

LTE-NB1/BPSK. Sub-carrier spacing=15kHz-Test Channel=133123-T size=1T0



Date: 6.SEP.2019 03:25:23



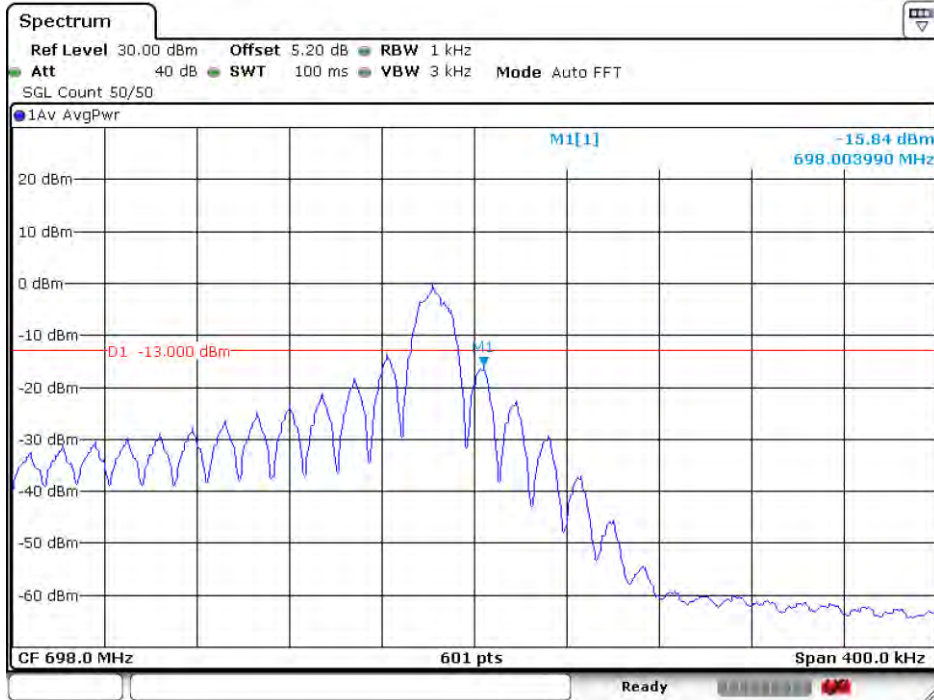
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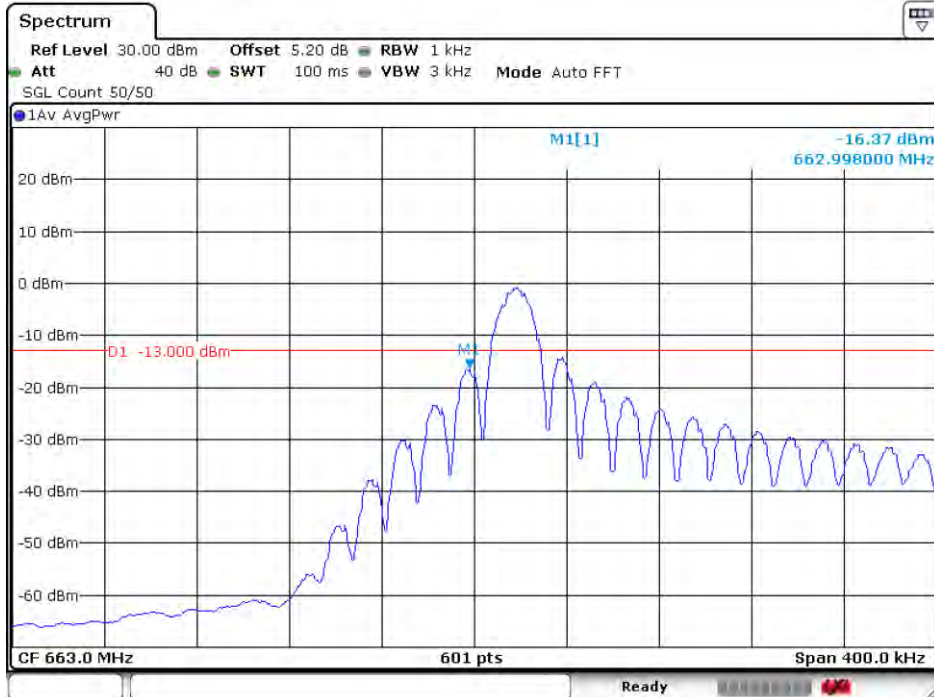
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LTE-NB1/BPSK. Sub-carrier spacing=15kHz-Test Channel=133471-T size=1T11



Date: 6.SEP.2019 03:30:45

LTE-NB1/QPSK. Sub-carrier spacing=15kHz-Test Channel=133123-T size=1T0



Date: 6.SEP.2019 03:25:02



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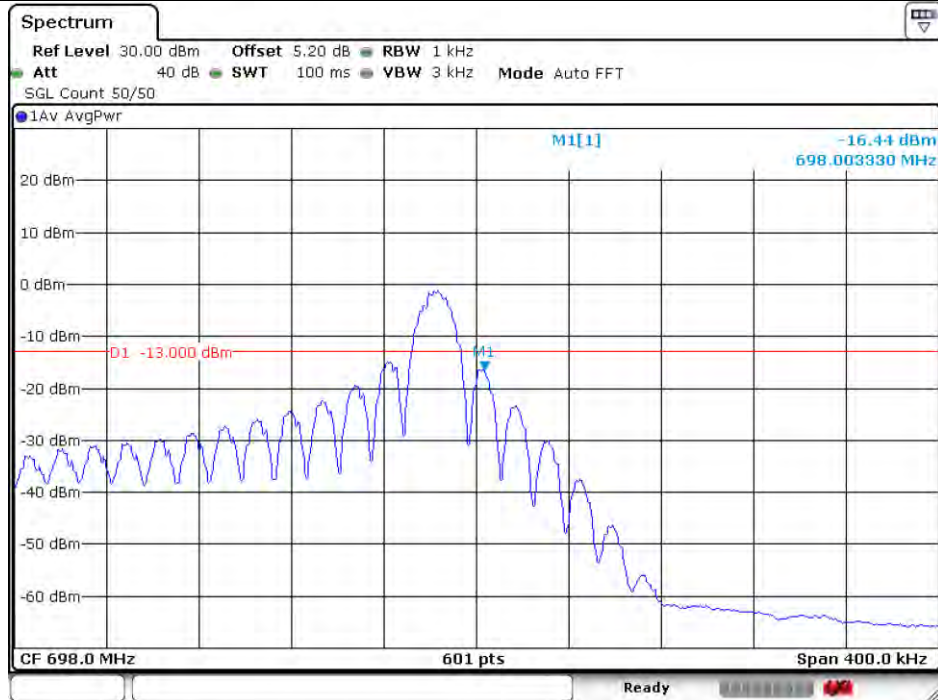
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LTE-NB1/QPSK. Sub-carrier spacing=15kHz-Test Channel=133123-T size=12T0



Date: 6 SEP. 2019 03:26:40

LTE-NB1/QPSK. Sub-carrier spacing=15kHz-Test Channel=133471-T size=1T11



Date: 6 SEP. 2019 03:29:21



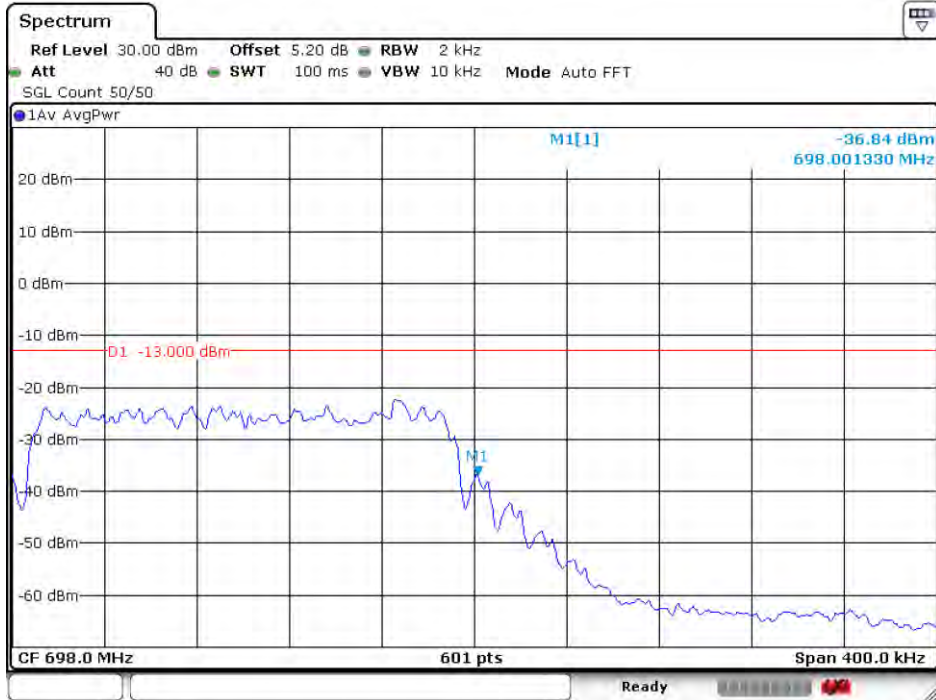
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LTE-NB1/QPSK. Sub-carrier spacing=15kHz-Test Channel=133471-T size=12T0



Date: 6 SEP. 2019 03:28:51



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6 Spurious Emission at Antenna Terminal

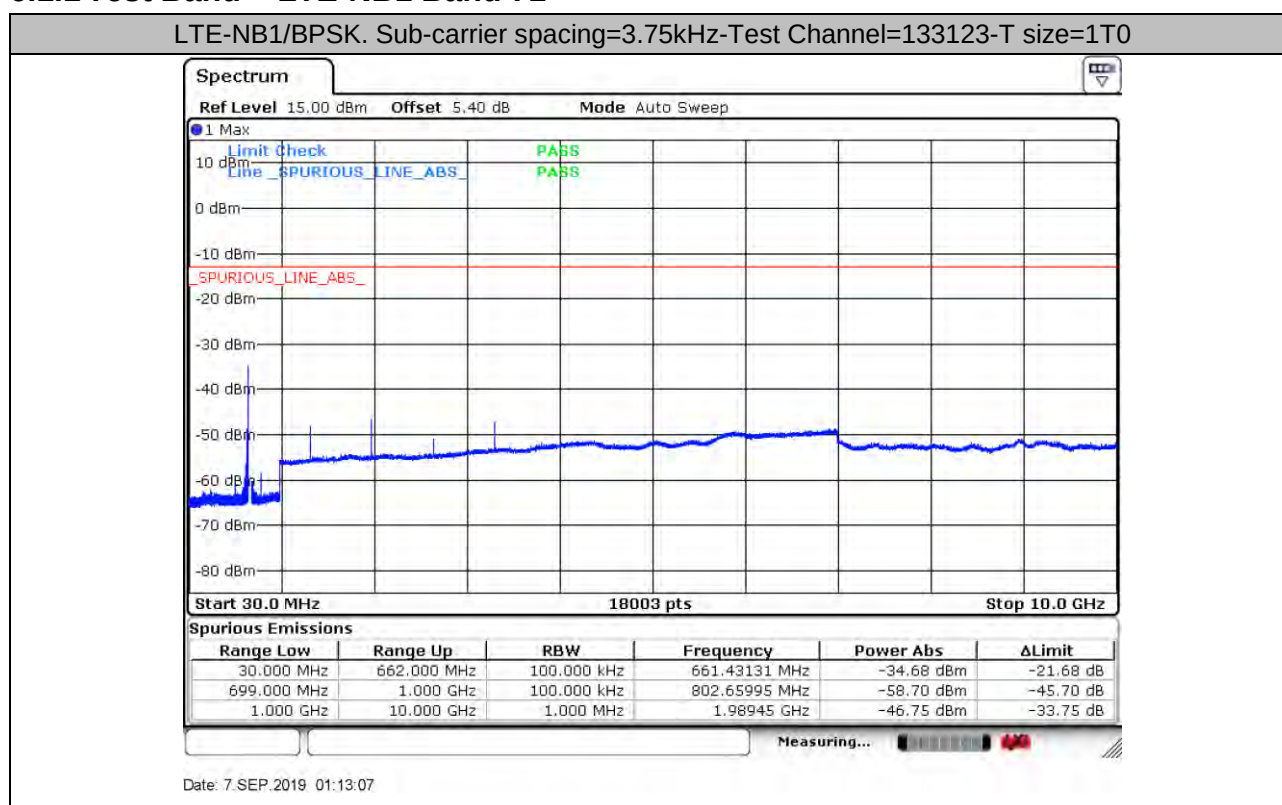
NOTE1: For the averaged unwanted emissions measurements, the measurement points in each sweep is greater than twice the Span/RBW in order to ensure bin-to-bin spacing of $< RBW/2$ so that narrowband signals are not lost between frequency bins. As to the present test item, the "Measurement Points = $k \cdot (\text{Span} / \text{RBW})$ " 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 71



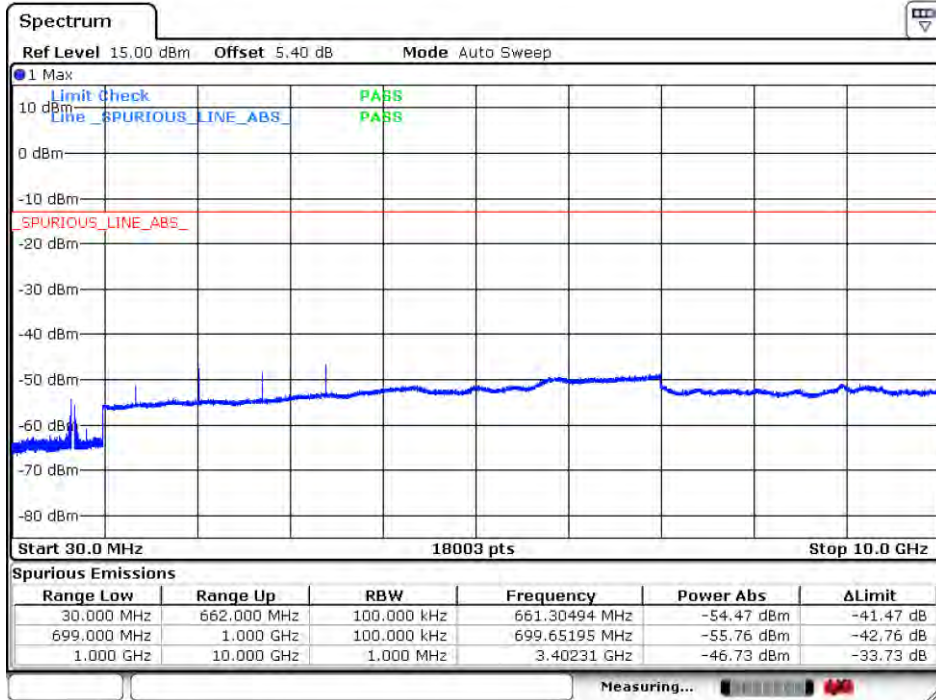
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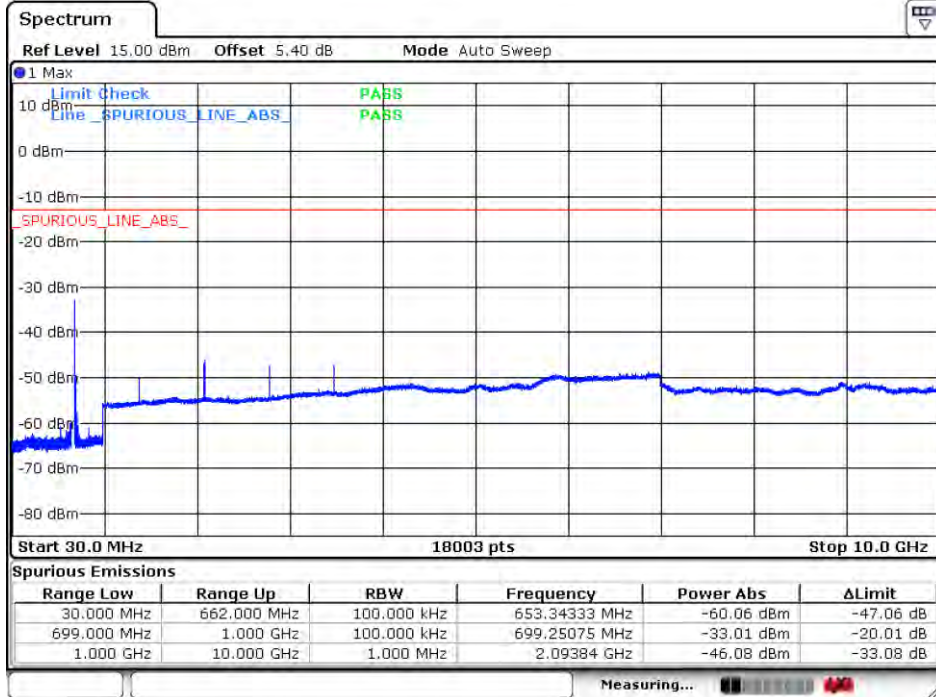
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LTE-NB1/BPSK. Sub-carrier spacing=3.75kHz-Test Channel=133297-T size=1T0



Date: 7.SEP.2019 01:20:42

LTE-NB1/BPSK. Sub-carrier spacing=3.75kHz-Test Channel=133471-T size=1T0



Date: 7.SEP.2019 01:24:58



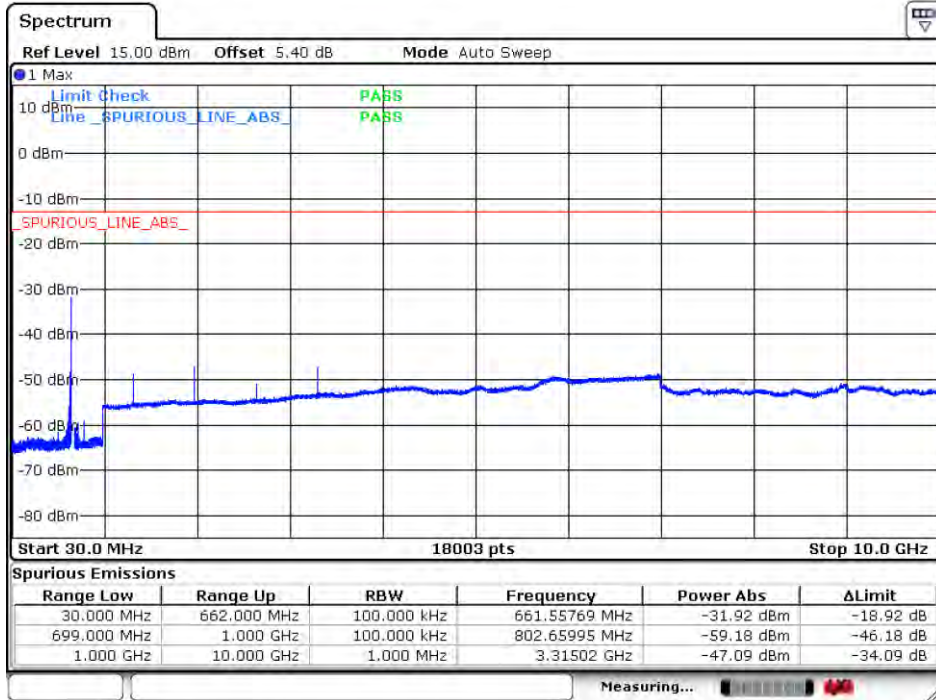
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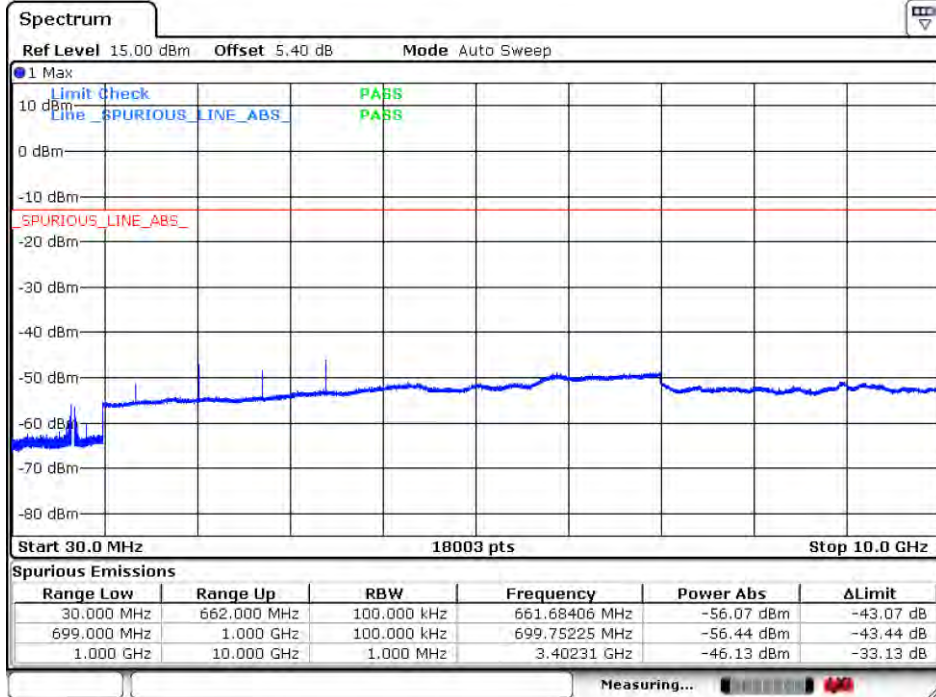
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LTE-NB1/QPSK. Sub-carrier spacing=3.75kHz-Test Channel=133123-T size=1T0



Date: 7.SEP.2019 01:15:03

LTE-NB1/QPSK. Sub-carrier spacing=3.75kHz-Test Channel=133297-T size=1T0



Date: 7.SEP.2019 01:19:57



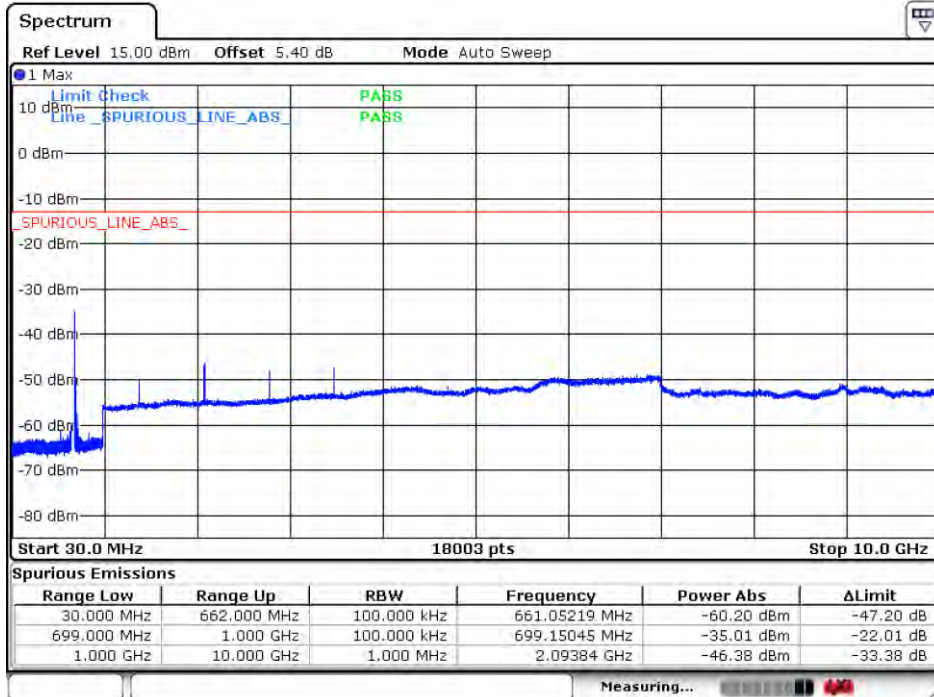
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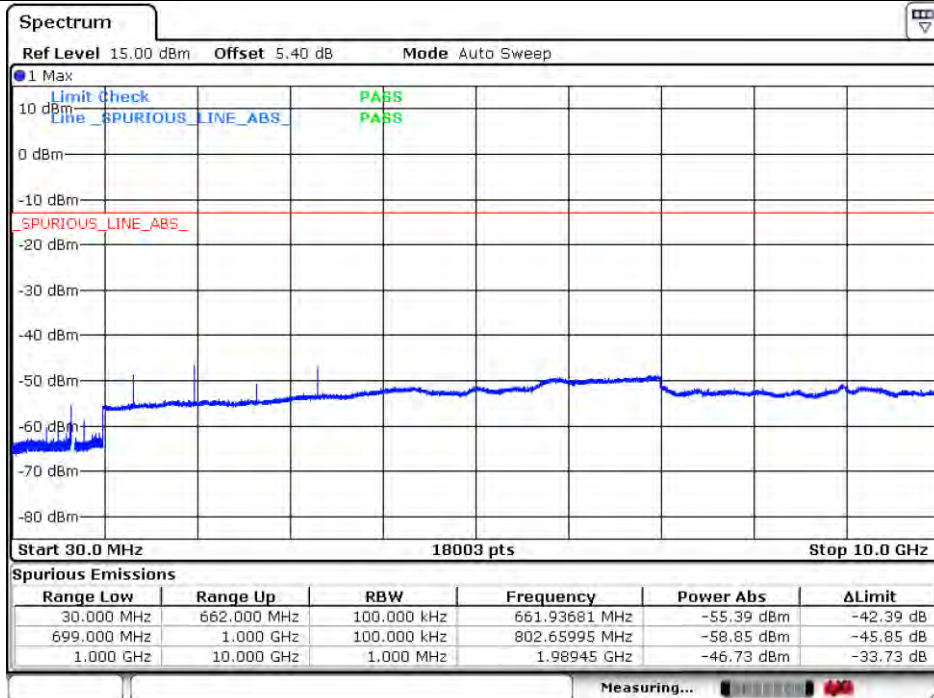
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LTE-NB1/QPSK. Sub-carrier spacing=3.75kHz-Test Channel=133471-T size=1T0



Date: 7.SEP.2019 01:25:57

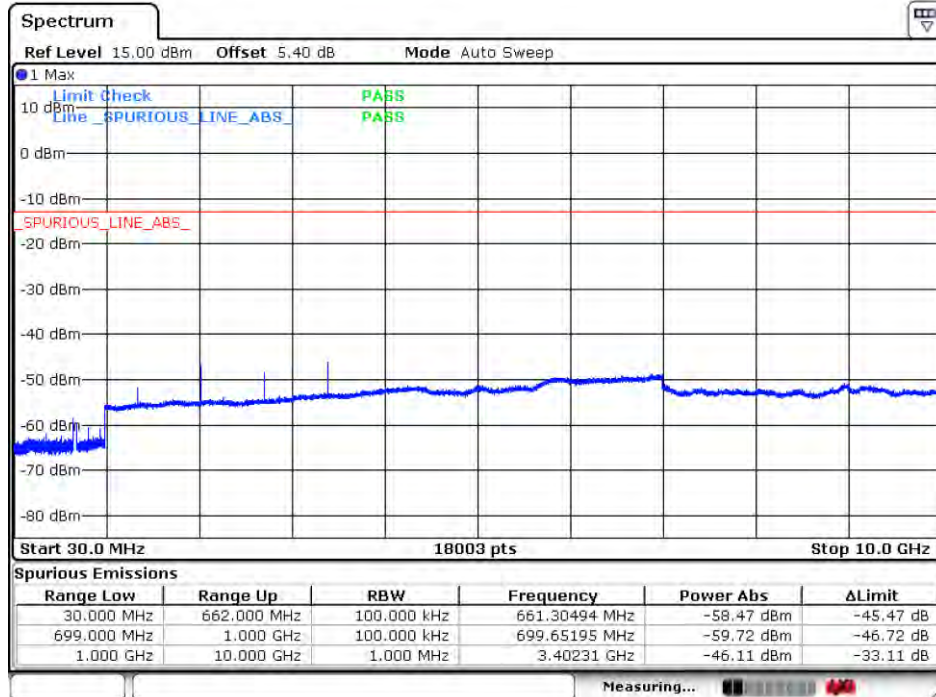
LTE-NB1/BPSK. Sub-carrier spacing=15kHz-Test Channel=133123-T size=1T0



Date: 7.SEP.2019 01:16:47

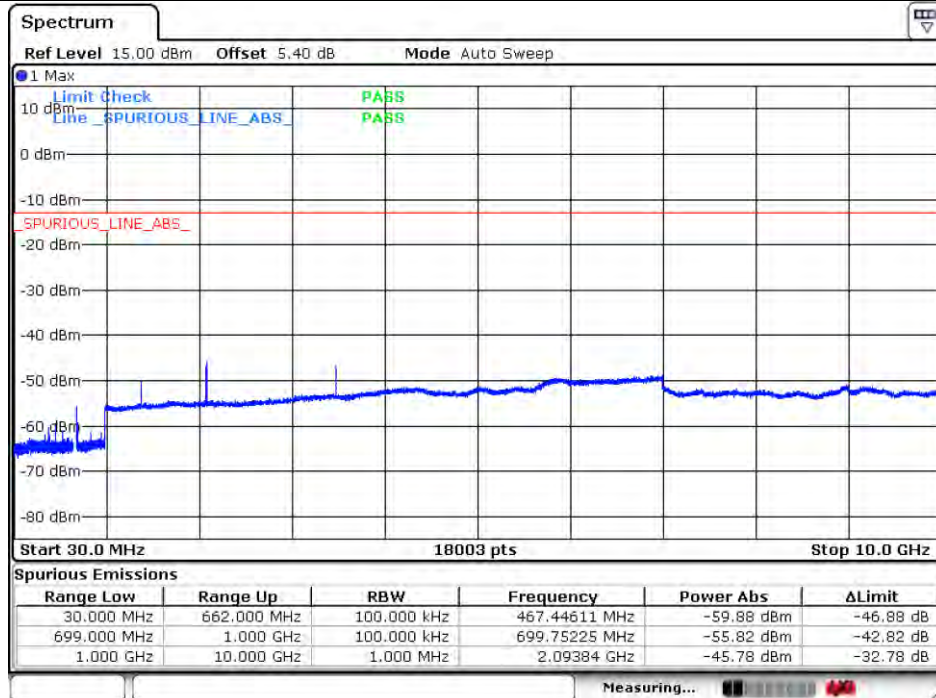


LTE-NB1/BPSK. Sub-carrier spacing=15kHz-Test Channel=133297-T size=1T0



Date: 7.SEP.2019 01:18:39

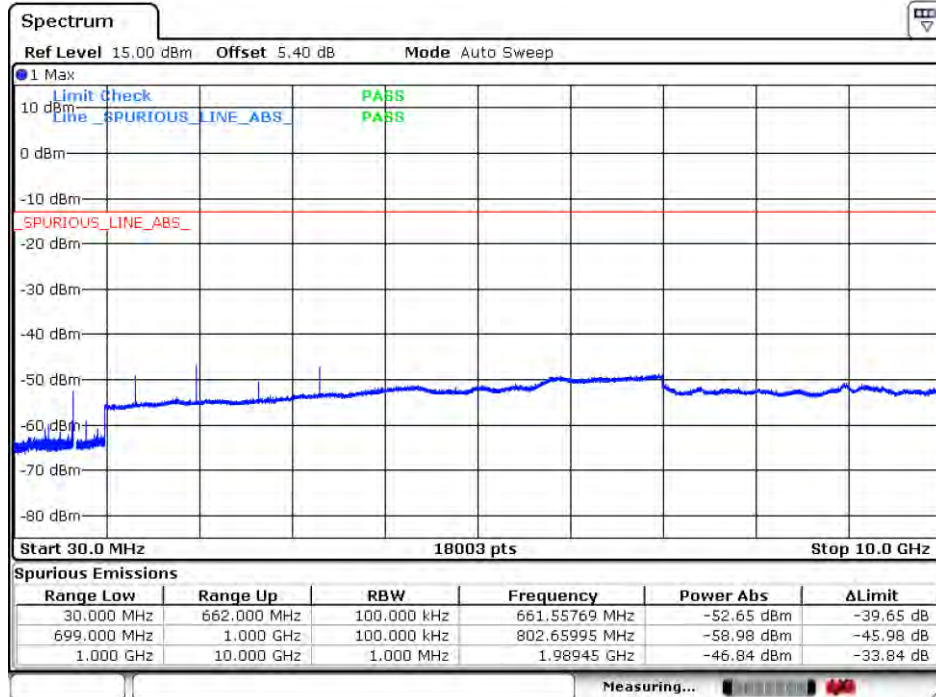
LTE-NB1/BPSK. Sub-carrier spacing=15kHz-Test Channel=133471-T size=1T0



Date: 7.SEP.2019 01:27:52

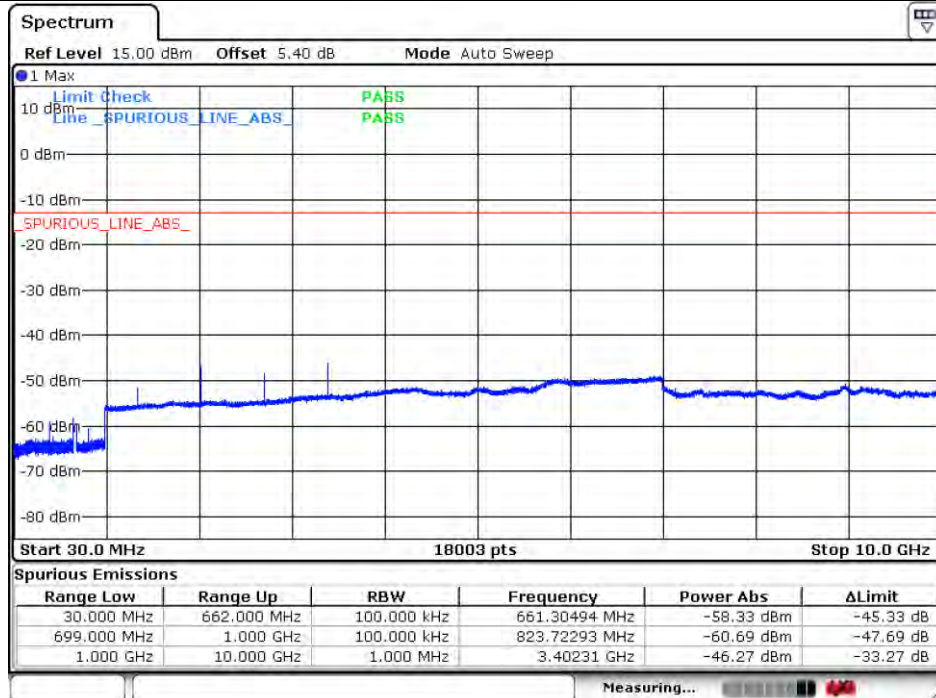


LTE-NB1/QPSK. Sub-carrier spacing=15kHz-Test Channel=133123-T size=1T0



Date: 7.SEP.2019 01:16:10

LTE-NB1/QPSK. Sub-carrier spacing=15kHz-Test Channel=133297-T size=1T0



Date: 7.SEP.2019 01:19:05



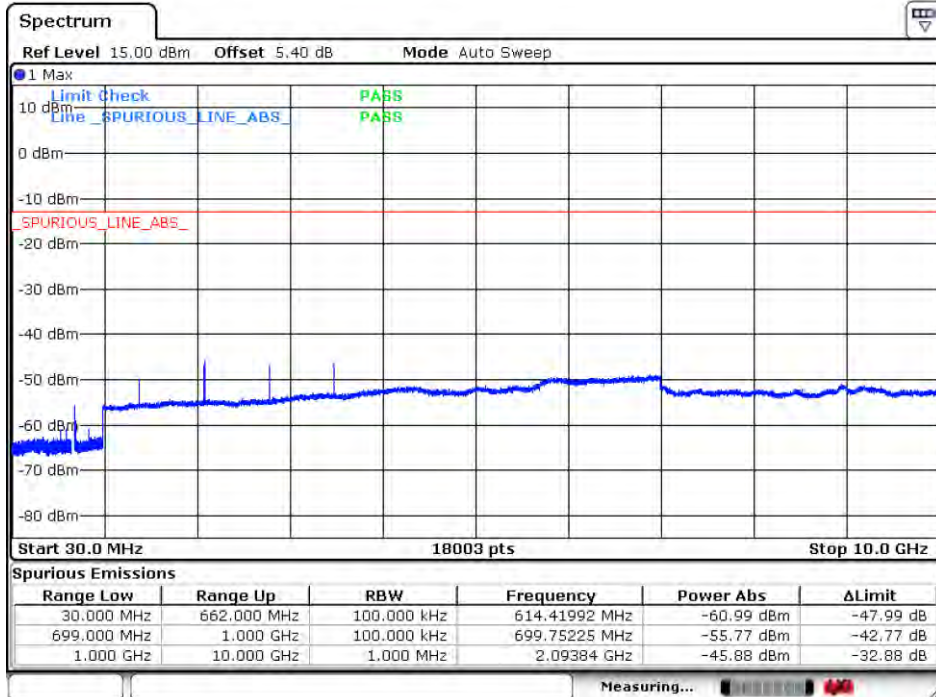
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LTE-NB1/QPSK. Sub-carrier spacing=15kHz-Test Channel=133471-T size=1T0



Date: 7.SEP.2019 01:27:21

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7 Field Strength of Spurious Radiation

7.1 For LTE-NB1

7.1.1 Test Band = LTE-NB1 Band 71

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

7.1.1.1.1 Test Channel = 133123

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Over Limit (dB)	Polarization
109.3985	-64.71	-13.00	51.71	Vertical
1326.0652	-56.63	-13.00	43.63	Vertical
2465.4931	-53.52	-13.00	40.52	Vertical
9300.8520	-48.68	-13.00	35.68	Vertical
14724.4690	-43.01	-13.00	30.01	Vertical
17994.5998	-35.12	-13.00	22.12	Vertical
42.3681	-62.86	-13.00	49.86	Horizontal
225.9498	-69.08	-13.00	56.08	Horizontal
1325.6651	-51.13	-13.00	38.13	Horizontal
1988.9978	-50.95	-13.00	37.95	Horizontal
3315.0126	-50.09	-13.00	37.09	Horizontal
16936.7575	-39.66	-13.00	26.66	Horizontal

7.1.1.1.2 Test Channel = 133297

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Over Limit (dB)	Polarization
110.1745	-65.38	-13.00	52.38	Vertical
907.7969	-56.78	-13.00	43.78	Vertical
2041.4083	-58.88	-13.00	45.88	Vertical
2473.0946	-53.95	-13.00	40.95	Vertical
14618.2647	-43.40	-13.00	30.40	Vertical
17999.4000	-33.37	-13.00	20.37	Vertical
41.7376	-64.31	-13.00	51.31	Horizontal
233.5162	-67.98	-13.00	54.98	Horizontal
1360.4721	-57.00	-13.00	44.00	Horizontal
2469.4939	-46.62	-13.00	33.62	Horizontal
3402.0161	-48.87	-13.00	35.87	Horizontal
17992.7997	-37.80	-13.00	24.80	Horizontal



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7.1.1.1.3 Test Channel = 133471

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Over Limit (dB)	Polarization
108.6709	-64.78	-13.00	51.78	Vertical
586.5653	-64.10	-13.00	51.10	Vertical
996.8473	-57.38	-13.00	44.38	Vertical
2465.8932	-53.74	-13.00	40.74	Vertical
14937.4775	-43.27	-13.00	30.27	Vertical
17957.3983	-34.67	-13.00	21.67	Vertical
42.3681	-65.06	-13.00	52.06	Horizontal
245.7388	-68.28	-13.00	55.28	Horizontal
997.8174	-57.07	-13.00	44.07	Horizontal
2093.0186	-44.01	-13.00	31.01	Horizontal
3487.8195	-48.68	-13.00	35.68	Horizontal
17974.7990	-39.56	-13.00	26.56	Horizontal

NOTE:

- 1) The disturbance 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 71	180KHz	BPSK/15KHz	133123	12T0	VL	TN	-11.27	-0.017000	±2.5	PASS
NB1 Band 71	180KHz	BPSK/15KHz	133123	12T0	VN	TN	1.77	0.002662	±2.5	PASS
NB1 Band 71	180KHz	BPSK/15KHz	133123	12T0	VH	TN	10.79	0.016274	±2.5	PASS
NB1 Band 71	180KHz	BPSK/15KHz	133297	12T0	VL	TN	-0.19	-0.000285	±2.5	PASS
NB1 Band 71	180KHz	BPSK/15KHz	133297	12T0	VN	TN	-6.04	-0.008873	±2.5	PASS
NB1 Band 71	180KHz	BPSK/15KHz	133297	12T0	VH	TN	0.93	0.001368	±2.5	PASS
NB1 Band 71	180KHz	BPSK/15KHz	133471	12T0	VL	TN	-7.39	-0.010586	±2.5	PASS
NB1 Band 71	180KHz	BPSK/15KHz	133471	12T0	VN	TN	-0.69	-0.000987	±2.5	PASS
NB1 Band 71	180KHz	BPSK/15KHz	133471	12T0	VH	TN	7.23	0.010361	±2.5	PASS
NB1 Band 71	180KHz	QPSK/15KHz	133123	12T0	VL	TN	4.89	0.007378	±2.5	PASS
NB1 Band 71	180KHz	QPSK/15KHz	133123	12T0	VN	TN	11.80	0.017797	±2.5	PASS
NB1 Band 71	180KHz	QPSK/15KHz	133123	12T0	VH	TN	6.92	0.010441	±2.5	PASS
NB1 Band 71	180KHz	QPSK/15KHz	133297	12T0	VL	TN	-5.81	-0.008541	±2.5	PASS
NB1 Band 71	180KHz	QPSK/15KHz	133297	12T0	VN	TN	-2.61	-0.003840	±2.5	PASS
NB1 Band 71	180KHz	QPSK/15KHz	133297	12T0	VH	TN	-10.05	-0.014773	±2.5	PASS
NB1 Band 71	180KHz	QPSK/15KHz	133471	12T0	VL	TN	-13.32	-0.019088	±2.5	PASS
NB1 Band 71	180KHz	QPSK/15KHz	133471	12T0	VN	TN	0.33	0.000472	±2.5	PASS
NB1 Band 71	180KHz	QPSK/15KHz	133471	12T0	VH	TN	-8.76	-0.012549	±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 71	180KHz	BPSK/15KHz	133123	12T0	NV	-30	-7.24	-0.010920	±2.5	PASS
NB1 Band 71	180KHz	BPSK/15KHz	133123	12T0	NV	-20	13.06	0.019701	±2.5	PASS
NB1 Band 71	180KHz	BPSK/15KHz	133123	12T0	NV	0	14.00	0.021117	±2.5	PASS
NB1 Band 71	180KHz	BPSK/15KHz	133123	12T0	NV	10	10.48	0.015800	±2.5	PASS
NB1 Band 71	180KHz	BPSK/15KHz	133123	12T0	NV	20	-2.87	-0.004330	±2.5	PASS
NB1 Band 71	180KHz	BPSK/15KHz	133123	12T0	NV	30	5.49	0.008276	±2.5	PASS
NB1 Band 71	180KHz	BPSK/15KHz	133123	12T0	NV	40	0.21	0.000312	±2.5	PASS
NB1 Band 71	180KHz	BPSK/15KHz	133123	12T0	NV	50	-6.37	-0.009608	±2.5	PASS
NB1 Band 71	180KHz	BPSK/15KHz	133297	12T0	NV	-30	2.59	0.003799	±2.5	PASS
NB1 Band 71	180KHz	BPSK/15KHz	133297	12T0	NV	-20	-10.11	-0.014864	±2.5	PASS
NB1 Band 71	180KHz	BPSK/15KHz	133297	12T0	NV	0	8.06	0.011837	±2.5	PASS
NB1 Band 71	180KHz	BPSK/15KHz	133297	12T0	NV	10	-13.97	-0.020526	±2.5	PASS
NB1 Band 71	180KHz	BPSK/15KHz	133297	12T0	NV	20	-6.54	-0.009614	±2.5	PASS
NB1 Band 71	180KHz	BPSK/15KHz	133297	12T0	NV	30	-0.27	-0.000391	±2.5	PASS
NB1 Band 71	180KHz	BPSK/15KHz	133297	12T0	NV	40	1.39	0.002036	±2.5	PASS
NB1 Band 71	180KHz	BPSK/15KHz	133297	12T0	NV	50	-12.25	-0.018002	±2.5	PASS
NB1 Band 71	180KHz	BPSK/15KHz	133471	12T0	NV	-30	9.21	0.013199	±2.5	PASS
NB1 Band 71	180KHz	BPSK/15KHz	133471	12T0	NV	-20	7.71	0.011047	±2.5	PASS
NB1 Band 71	180KHz	BPSK/15KHz	133471	12T0	NV	0	-2.29	-0.003275	±2.5	PASS



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NB1 Band 71	180KHz	BPSK/15KHz	133471	12T0	NV	10	7.57	0.010848	±2.5	PASS
NB1 Band 71	180KHz	BPSK/15KHz	133471	12T0	NV	20	-9.00	-0.012891	±2.5	PASS
NB1 Band 71	180KHz	BPSK/15KHz	133471	12T0	NV	30	-13.18	-0.018879	±2.5	PASS
NB1 Band 71	180KHz	BPSK/15KHz	133471	12T0	NV	40	8.95	0.012830	±2.5	PASS
NB1 Band 71	180KHz	BPSK/15KHz	133471	12T0	NV	50	14.65	0.020986	±2.5	PASS
NB1 Band 71	180KHz	QPSK/15KHz	133123	12T0	NV	-30	13.88	0.020931	±2.5	PASS
NB1 Band 71	180KHz	QPSK/15KHz	133123	12T0	NV	-20	-9.89	-0.014916	±2.5	PASS
NB1 Band 71	180KHz	QPSK/15KHz	133123	12T0	NV	0	10.22	0.015415	±2.5	PASS
NB1 Band 71	180KHz	QPSK/15KHz	133123	12T0	NV	10	9.68	0.014592	±2.5	PASS
NB1 Band 71	180KHz	QPSK/15KHz	133123	12T0	NV	20	1.49	0.002246	±2.5	PASS
NB1 Band 71	180KHz	QPSK/15KHz	133123	12T0	NV	30	-12.00	-0.018099	±2.5	PASS
NB1 Band 71	180KHz	QPSK/15KHz	133123	12T0	NV	40	9.06	0.013662	±2.5	PASS
NB1 Band 71	180KHz	QPSK/15KHz	133123	12T0	NV	50	12.74	0.019212	±2.5	PASS
NB1 Band 71	180KHz	QPSK/15KHz	133297	12T0	NV	-30	12.96	0.019038	±2.5	PASS
NB1 Band 71	180KHz	QPSK/15KHz	133297	12T0	NV	-20	2.55	0.003745	±2.5	PASS
NB1 Band 71	180KHz	QPSK/15KHz	133297	12T0	NV	0	0.60	0.000876	±2.5	PASS
NB1 Band 71	180KHz	QPSK/15KHz	133297	12T0	NV	10	-10.08	-0.014818	±2.5	PASS
NB1 Band 71	180KHz	QPSK/15KHz	133297	12T0	NV	20	13.88	0.020399	±2.5	PASS
NB1 Band 71	180KHz	QPSK/15KHz	133297	12T0	NV	30	10.37	0.015234	±2.5	PASS
NB1 Band 71	180KHz	QPSK/15KHz	133297	12T0	NV	40	-11.00	-0.016168	±2.5	PASS
NB1 Band 71	180KHz	QPSK/15KHz	133297	12T0	NV	50	4.70	0.006911	±2.5	PASS
NB1 Band 71	180KHz	QPSK/15KHz	133471	12T0	NV	-30	-12.40	-0.017761	±2.5	PASS
NB1 Band 71	180KHz	QPSK/15KHz	133471	12T0	NV	-20	-3.64	-0.005216	±2.5	PASS
NB1 Band 71	180KHz	QPSK/15KHz	133471	12T0	NV	0	-7.18	-0.010282	±2.5	PASS
NB1 Band 71	180KHz	QPSK/15KHz	133471	12T0	NV	10	7.34	0.010524	±2.5	PASS
NB1 Band 71	180KHz	QPSK/15KHz	133471	12T0	NV	20	11.16	0.015989	±2.5	PASS
NB1 Band 71	180KHz	QPSK/15KHz	133471	12T0	NV	30	-2.06	-0.002947	±2.5	PASS
NB1 Band 71	180KHz	QPSK/15KHz	133471	12T0	NV	40	-9.99	-0.014321	±2.5	PASS
NB1 Band 71	180KHz	QPSK/15KHz	133471	12T0	NV	50	-8.42	-0.012060	±2.5	PASS

The End



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Appendix B

LTE-NB1 Band 85



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1 Effective Radiated Power Output Data

1.1 Test Result for LTE NB1 Band 85

Test Band	Test Mode	Sub-carrier Spacing (kHz)	Test channel	Number of T	Conducted Power (dBm)	ERP (dBm)	limit (dBm)	Verdict
NB1 Band 85	BPSK	3.75	134003	1T0	20.61	17.76	34.77	PASS
NB1 Band 85	BPSK	3.75	134092	1T0	20.71	17.86	34.77	PASS
NB1 Band 85	BPSK	3.75	134181	1T0	20.53	17.68	34.77	PASS
NB1 Band 85	QPSK	3.75	134003	1T0	20.62	17.77	34.77	PASS
NB1 Band 85	QPSK	3.75	134092	1T0	20.73	17.88	34.77	PASS
NB1 Band 85	QPSK	3.75	134181	1T0	20.52	17.67	34.77	PASS

Test Band	Test Mode	Sub-carrier Spacing (kHz)	Test channel	Number of T	Conducted Power (dBm)	ERP (dBm)	limit (dBm)	Verdict
NB1 Band 85	BPSK	15	134003	1T0	20.44	17.59	34.77	PASS
NB1 Band 85	BPSK	15	134092	1T0	20.64	17.79	34.77	PASS
NB1 Band 85	BPSK	15	134181	1T0	20.35	17.50	34.77	PASS
NB1 Band 85	QPSK	15	134003	1T0	20.47	17.62	34.77	PASS
NB1 Band 85	QPSK	15	134003	12T0	20.68	17.83	34.77	PASS
NB1 Band 85	QPSK	15	134092	1T0	20.62	17.77	34.77	PASS
NB1 Band 85	QPSK	15	134092	12T0	20.11	17.26	34.77	PASS
NB1 Band 85	QPSK	15	134181	1T0	20.37	17.52	34.77	PASS
NB1 Band 85	QPSK	15	134181	12T0	20.20	17.35	34.77	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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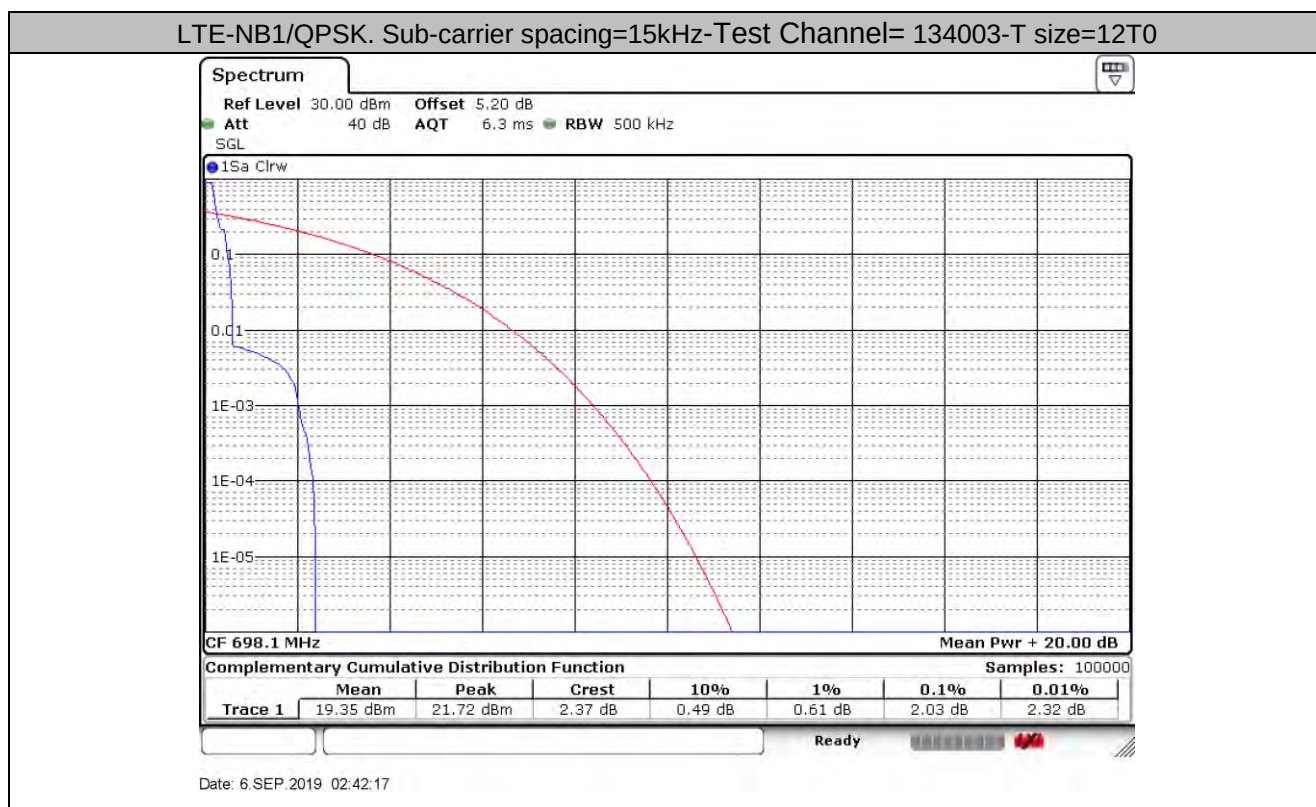


2 Peak-to-Average Ratio

Test Band	Test Mode	Test Channel	Measured[dB]	Limit [dB]	Verdict
NB1 Band 85	QPSK/12T0	134003	2.03	13	PASS
NB1 Band 85	QPSK/12T0	134092	2.06	13	PASS
NB1 Band 85	QPSK/12T0	134181	1.74	13	PASS

2.1 For LTE-NB1

2.1.1 Test Band = LTE-NB1 Band 85



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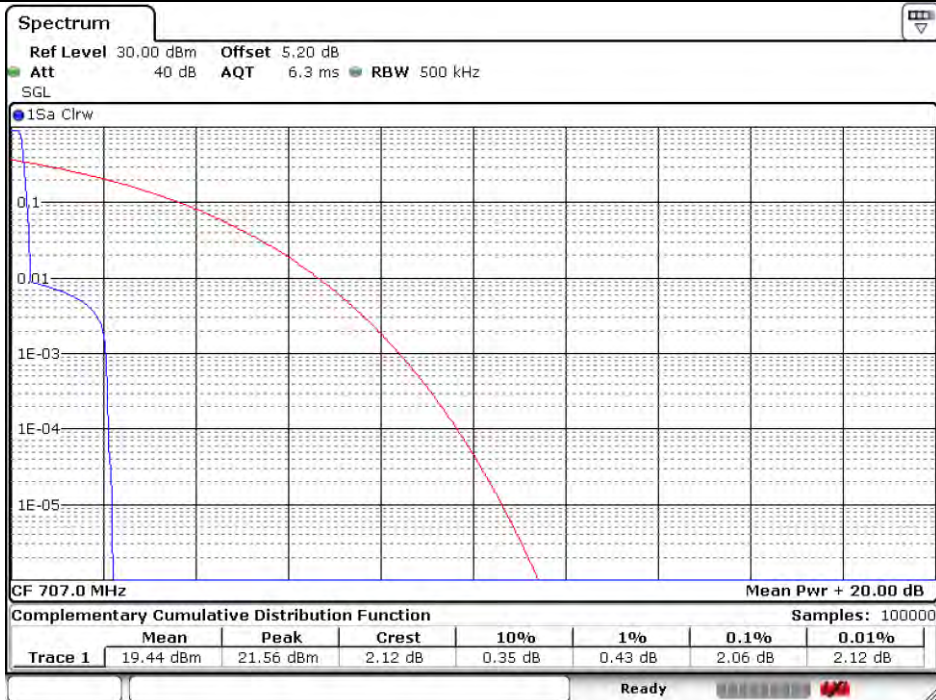
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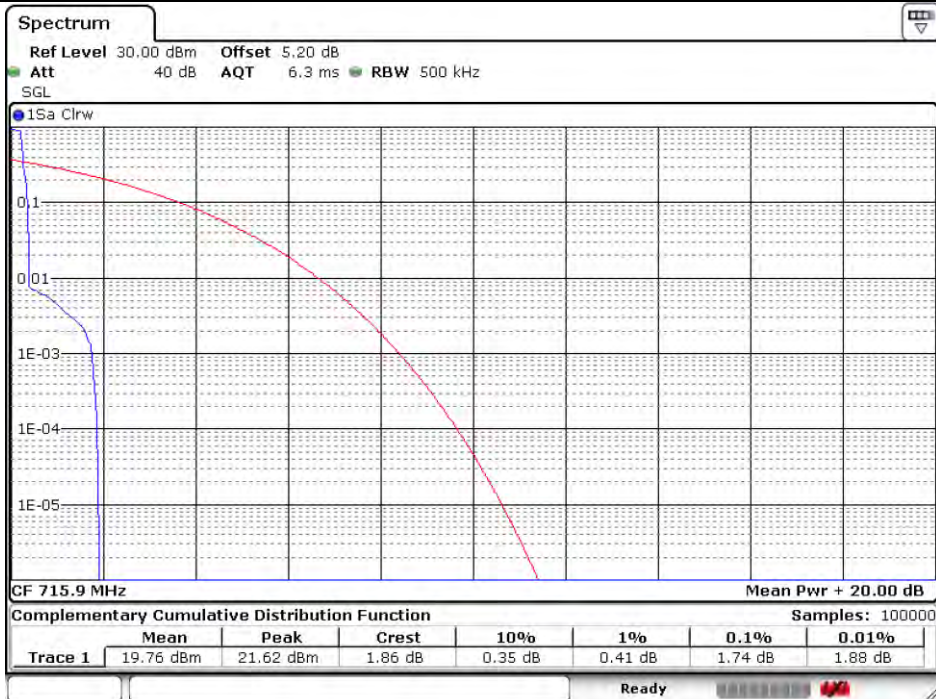


LTE-NB1/QPSK. Sub-carrier spacing=15kHz-Test Channel= 134092-T size=12T0



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LTE-NB1/QPSK. Sub-carrier spacing=15kHz-Test Channel= 134181-T size=12T0



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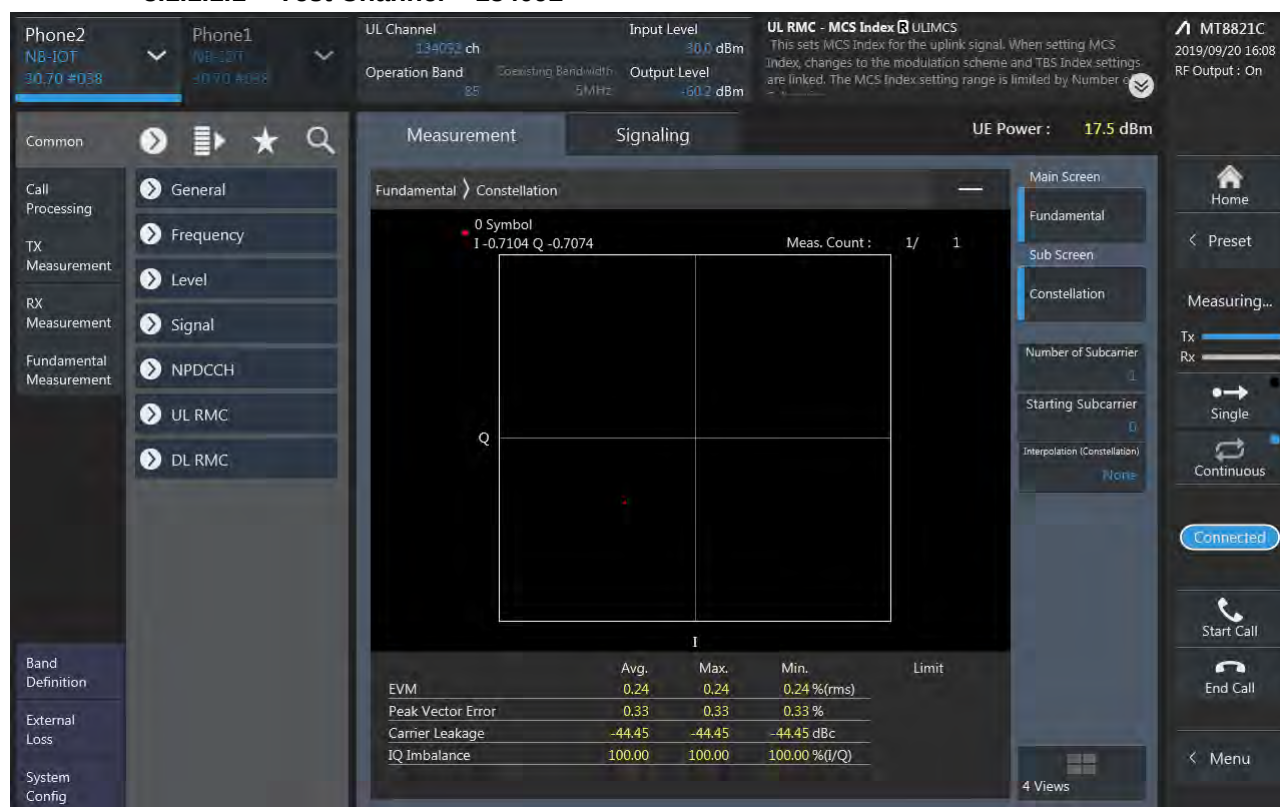
3 Modulation Characteristics

3.1 For LTE-NB1

3.1.1 Test Band = LTE-NB1 Band 85

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

3.1.1.1.1 Test Channel = 134092



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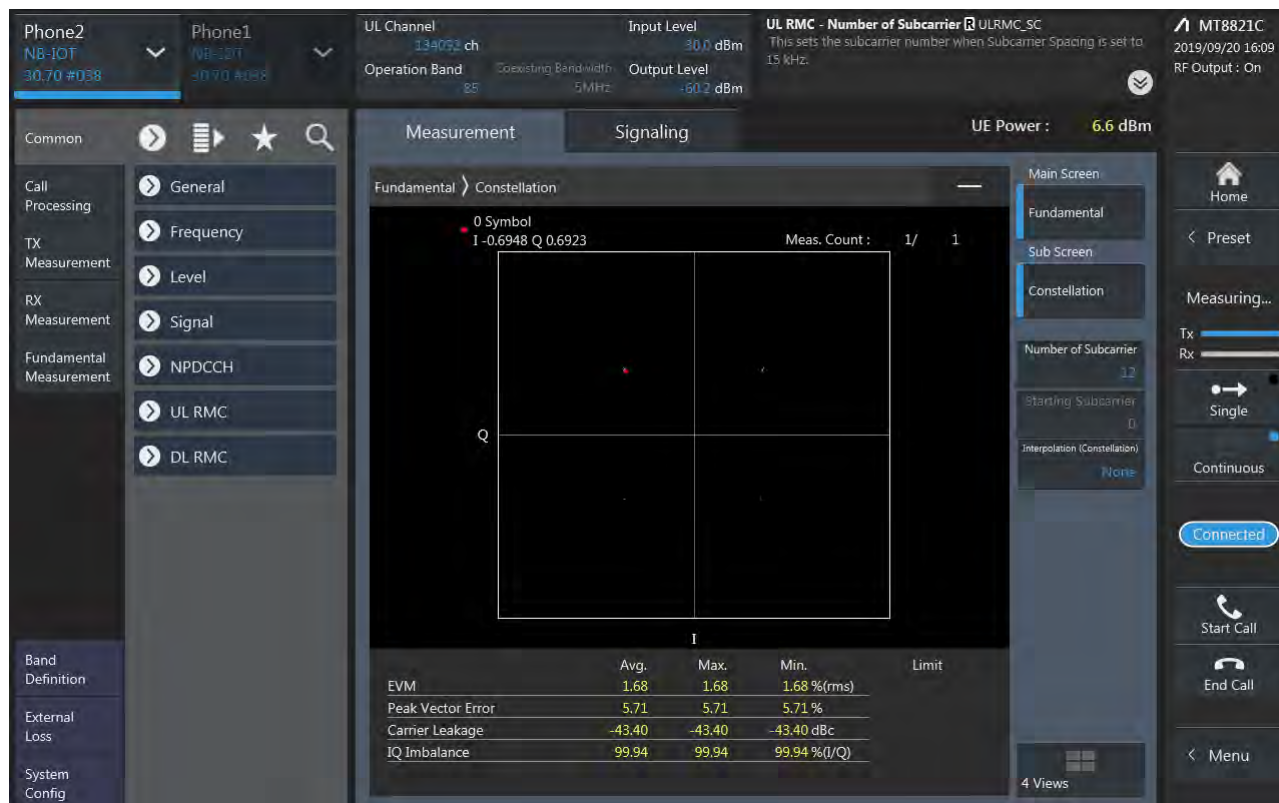
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3.1.1.2 Test Mode = LTE-NB1/QPSK. Sub-carrier spacing=15kHz.T size=12T0

3.1.1.2.1 Test Channel = 134092



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4 26dB Bandwidth and Occupied Bandwidth

Test Band	Test Mode	T size	Test Channel	Occupied Bandwidth [kHz]	Emission Bandwidth [kHz]	Verdict
NB1 Band 85	QPSK/15kHz	12T0	134003	186.36	243.59	PASS
NB1 Band 85	QPSK/15kHz	12T0	134092	186.36	242.26	PASS
NB1 Band 85	QPSK/15kHz	12T0	134181	186.36	252.26	PASS

4.1 For LTE-NB1

4.1.1 Test Band = LTE-NB1 Band 85

LTE-NB1/QPSK. Sub-carrier spacing=15kHz-Test Channel= 134003-T size=12T0



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LTE-NB1/QPSK. Sub-carrier spacing=15kHz-Test Channel= 134092-T size=12T0



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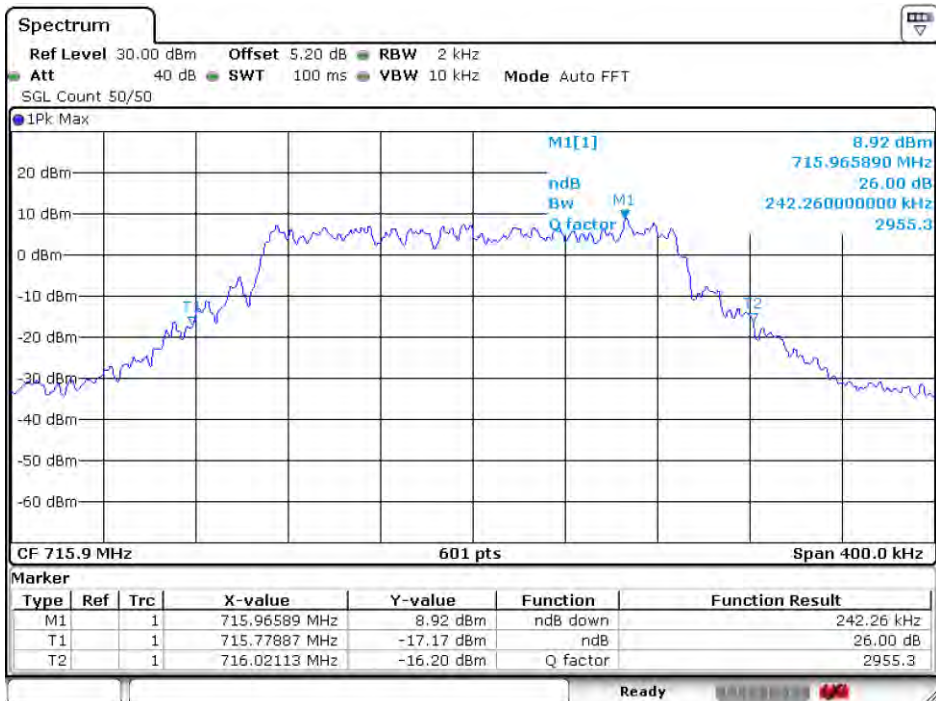
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LTE-NB1/QPSK. Sub-carrier spacing=15kHz-Test Channel= 134181-T size=12T0



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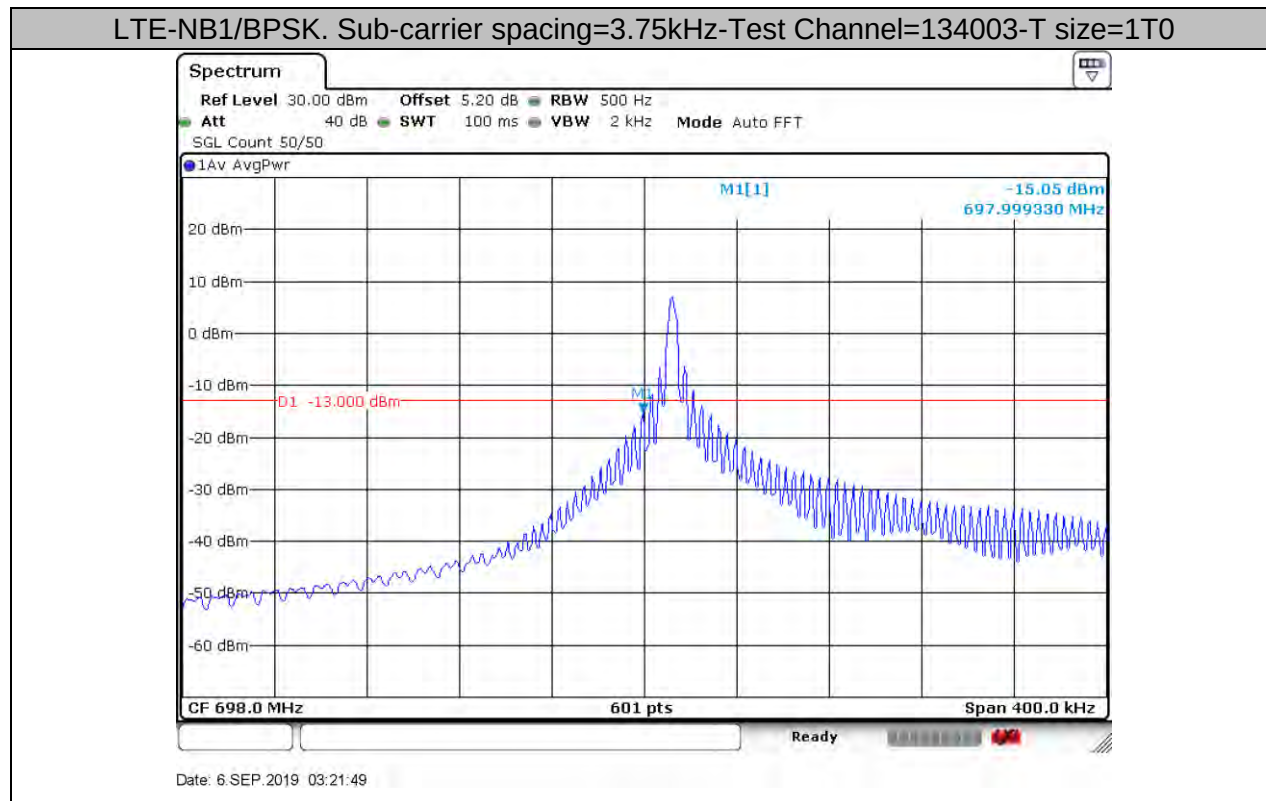
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5 Band Edges Compliance

5.1 For LTE-NB1

5.1.1 Test Band = LTE-NB1 Band 85



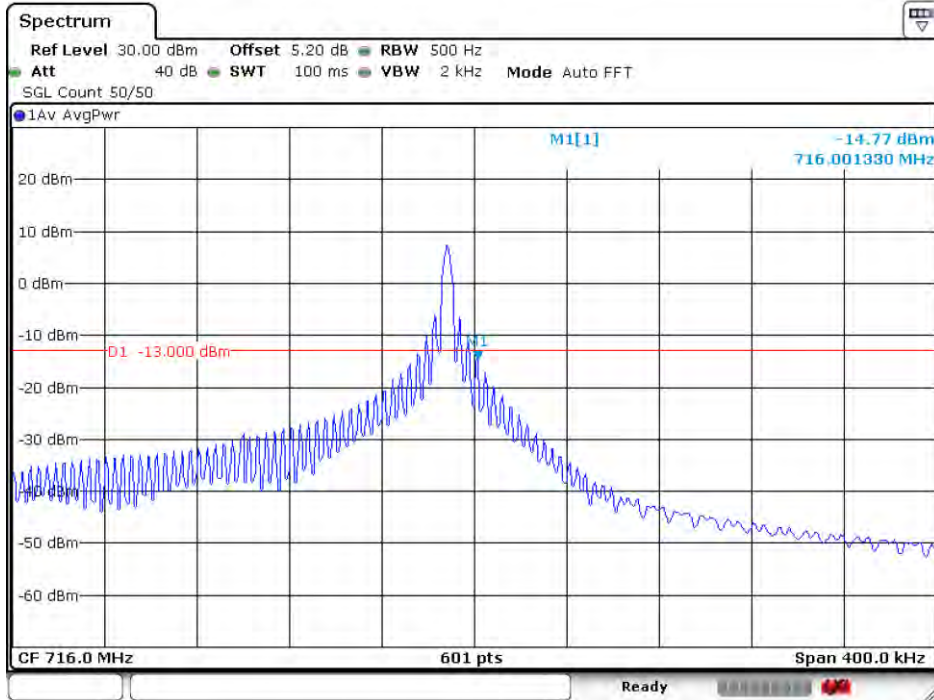
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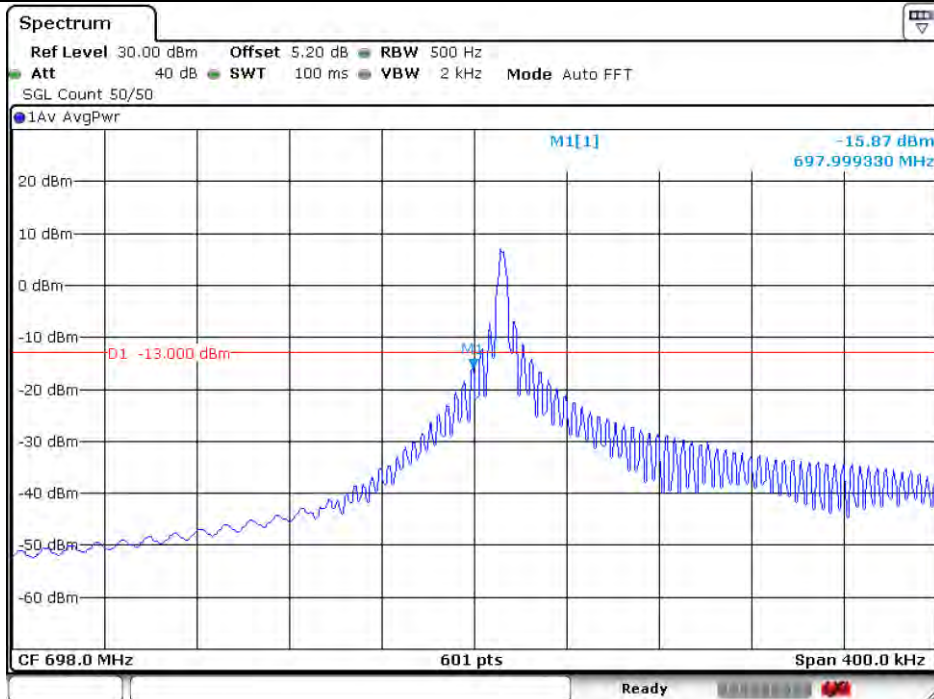
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LTE-NB1/BPSK. Sub-carrier spacing=3.75kHz-Test Channel=134181-T size=1T47



Date: 6.SEP.2019 03:16:30

LTE-NB1/QPSK. Sub-carrier spacing=3.75kHz-Test Channel=134003-T size=1T0



Date: 6.SEP.2019 03:21:21



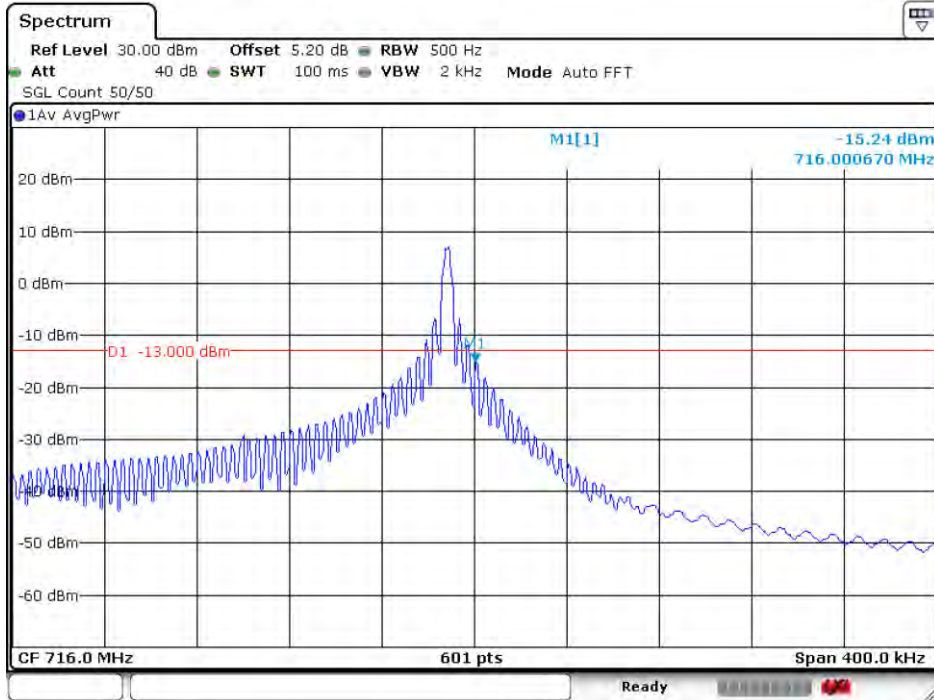
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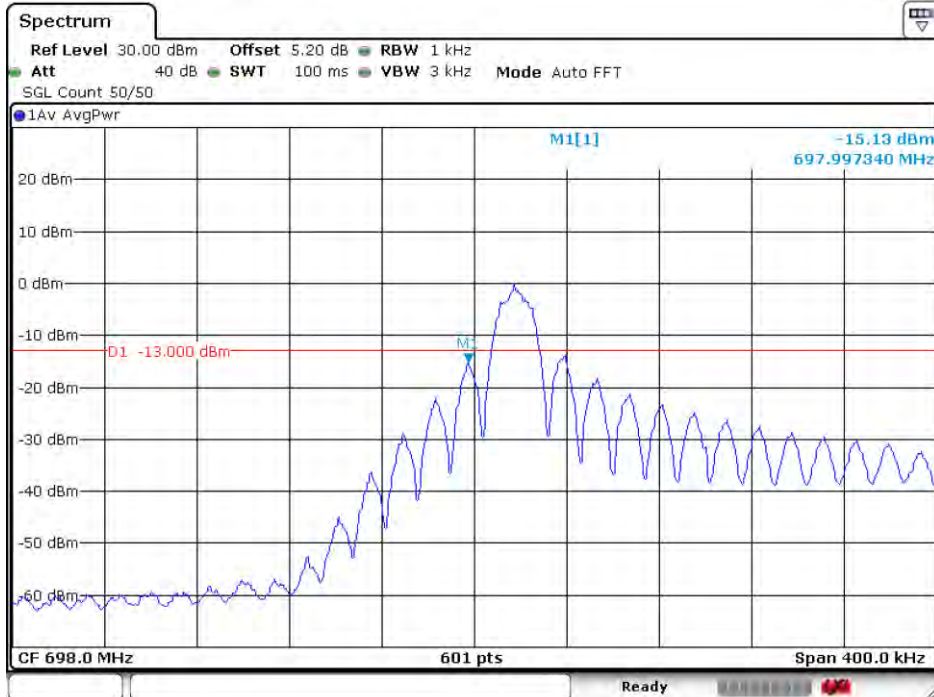
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LTE-NB1/QPSK. Sub-carrier spacing=3.75kHz-Test Channel=134181-T size=1T47



Date: 6.SEP.2019 03:16:04

LTE-NB1/BPSK. Sub-carrier spacing=15kHz-Test Channel=134003-T size=1T0



Date: 6.SEP.2019 03:20:20



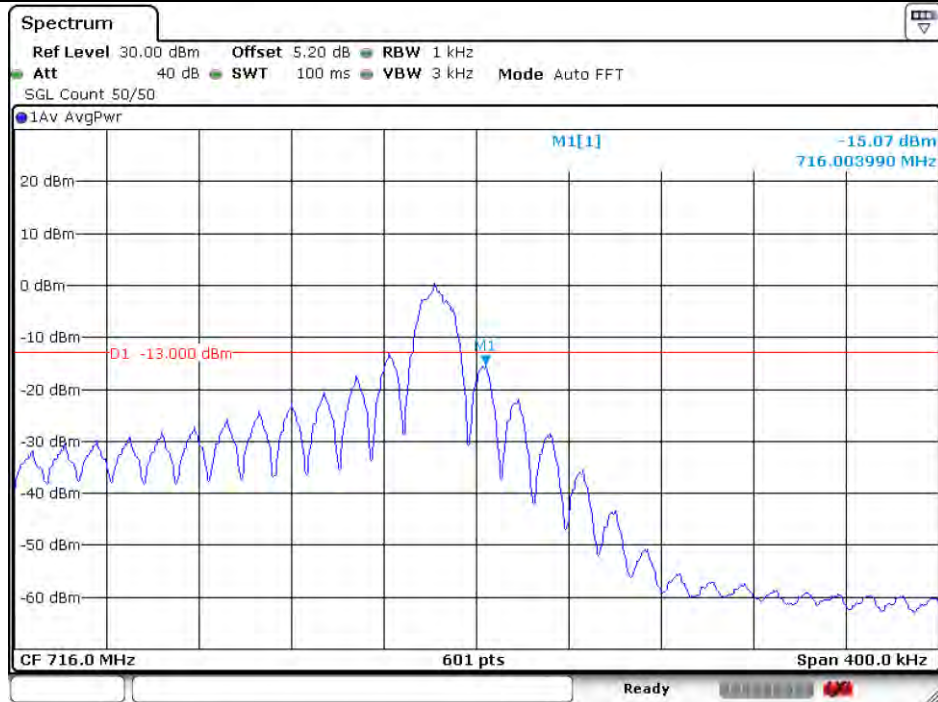
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LTE-NB1/BPSK. Sub-carrier spacing=15kHz-Test Channel=134181-T size=1T11



Date: 6.SEP.2019 03:17:20

LTE-NB1/QPSK. Sub-carrier spacing=15kHz-Test Channel=134003-T size=1T0



Date: 6.SEP.2019 03:19:43



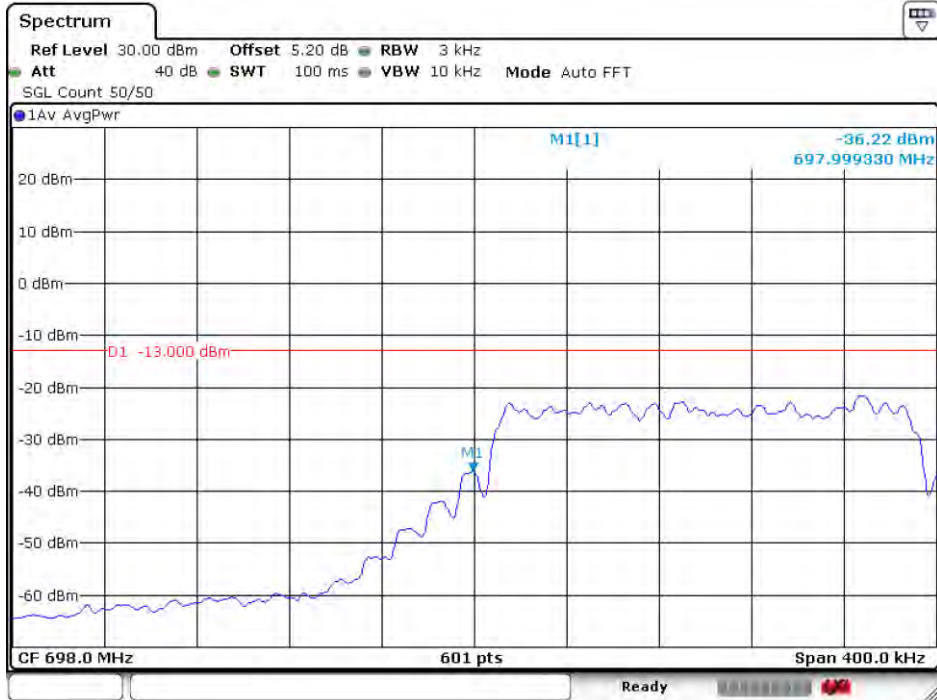
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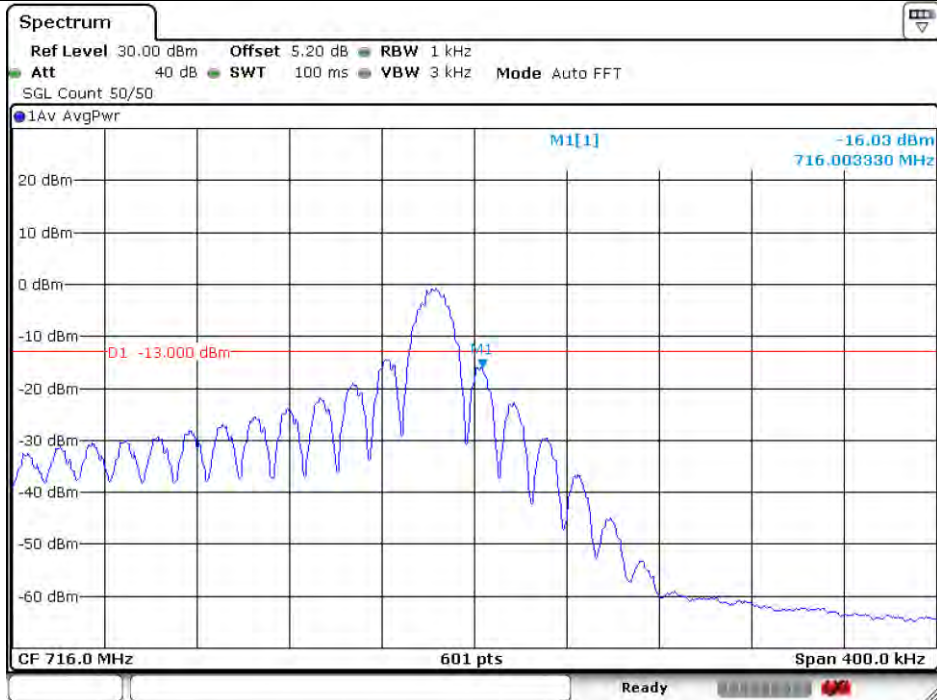
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LTE-NB1/QPSK. Sub-carrier spacing=15kHz-Test Channel=134003-T size=12T0



Date: 6 SEP. 2019 03:19:14

LTE-NB1/QPSK. Sub-carrier spacing=15kHz-Test Channel=134181-T size=1T11



Date: 6 SEP. 2019 03:18:12



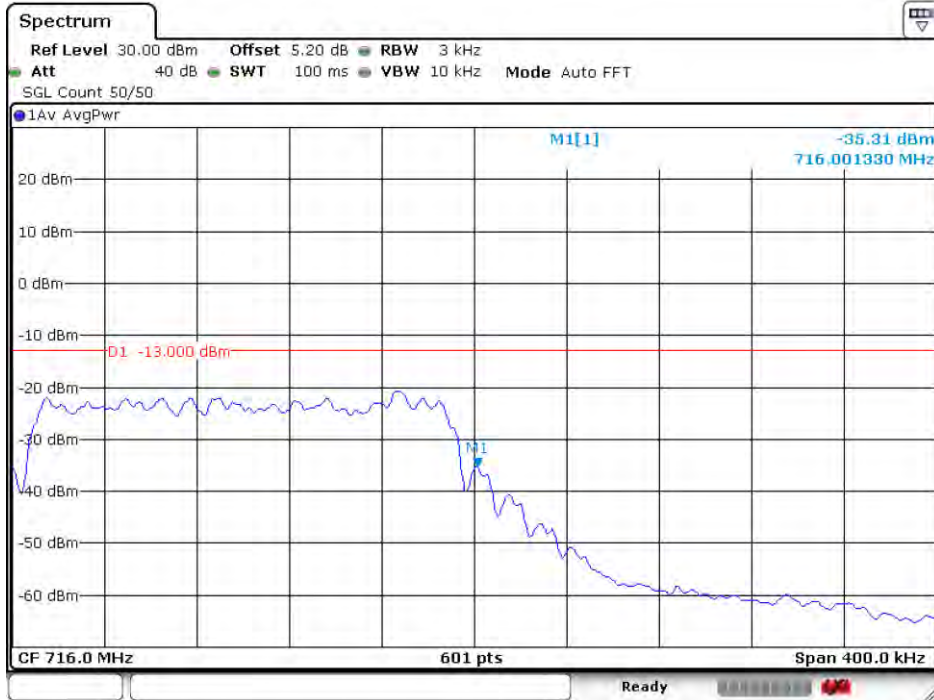
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LTE-NB1/QPSK. Sub-carrier spacing=15kHz-Test Channel=134181-T size=12T0



Date: 6 SEP. 2019 03:18:39



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6 Spurious Emission at Antenna Terminal

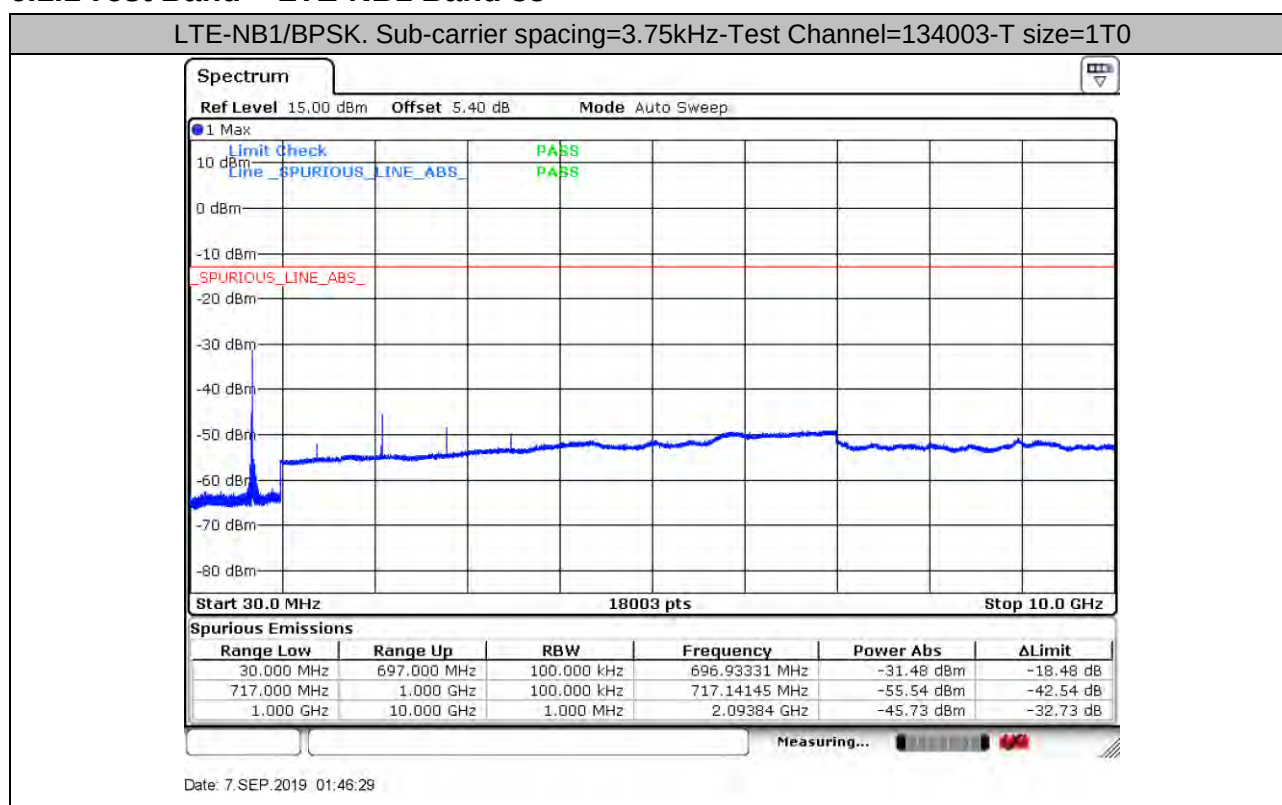
NOTE1: For the averaged unwanted emissions measurements, the measurement points in each sweep is greater than twice the Span/RBW in order to ensure bin-to-bin spacing of $< RBW/2$ so that narrowband signals are not lost between frequency bins. As to the present test item, the "Measurement Points = $k * (Span / RBW)$ " 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 85



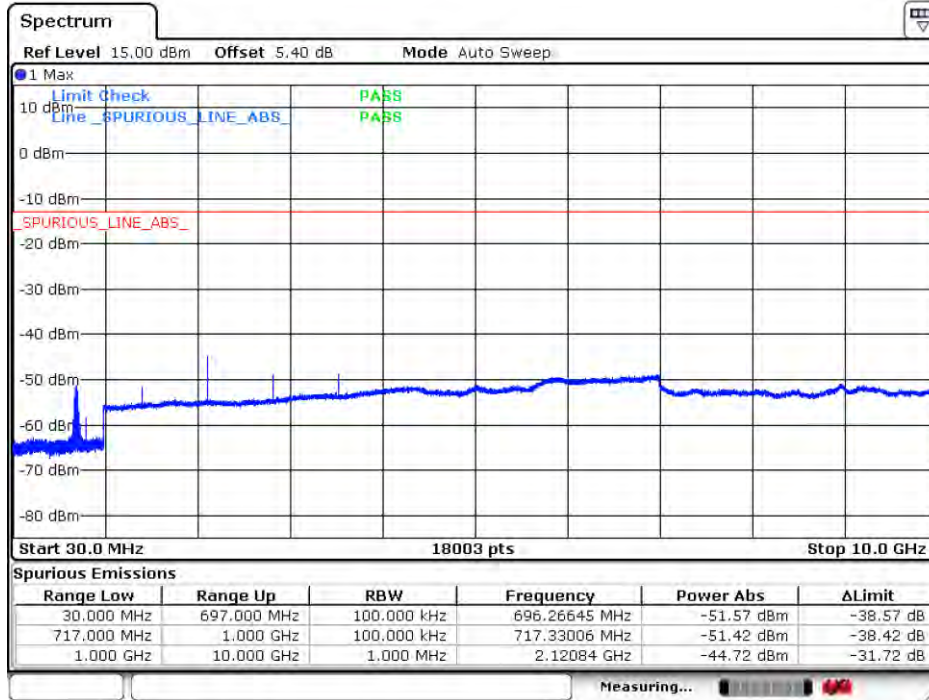
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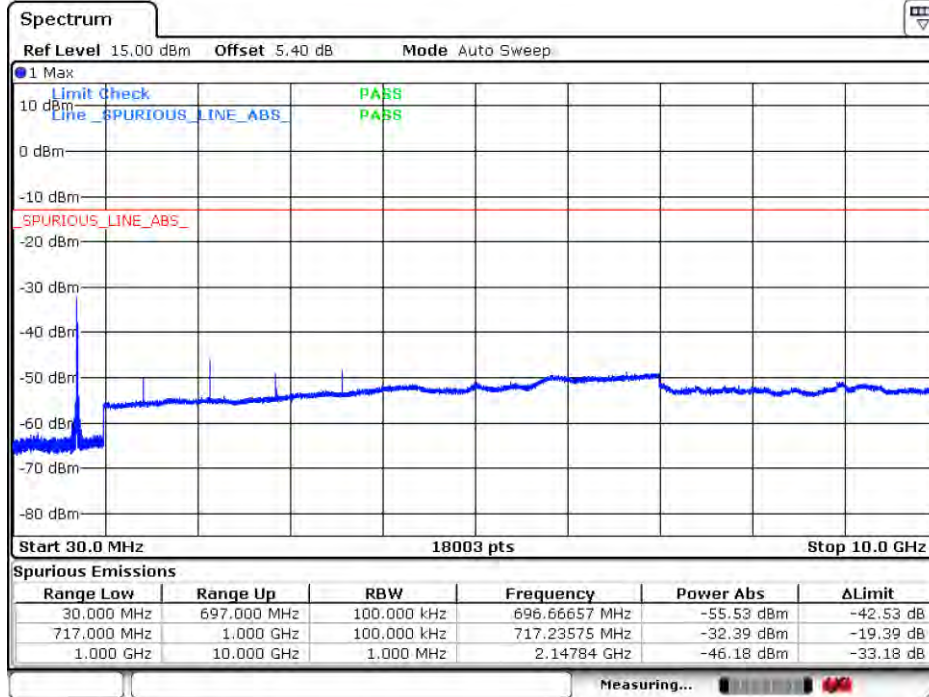
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LTE-NB1/BPSK. Sub-carrier spacing=3.75kHz-Test Channel=134092-T size=1T0



Date: 7.SEP.2019 01:52:42

LTE-NB1/BPSK. Sub-carrier spacing=3.75kHz-Test Channel=134181-T size=1T0



Date: 7.SEP.2019 01:54:37



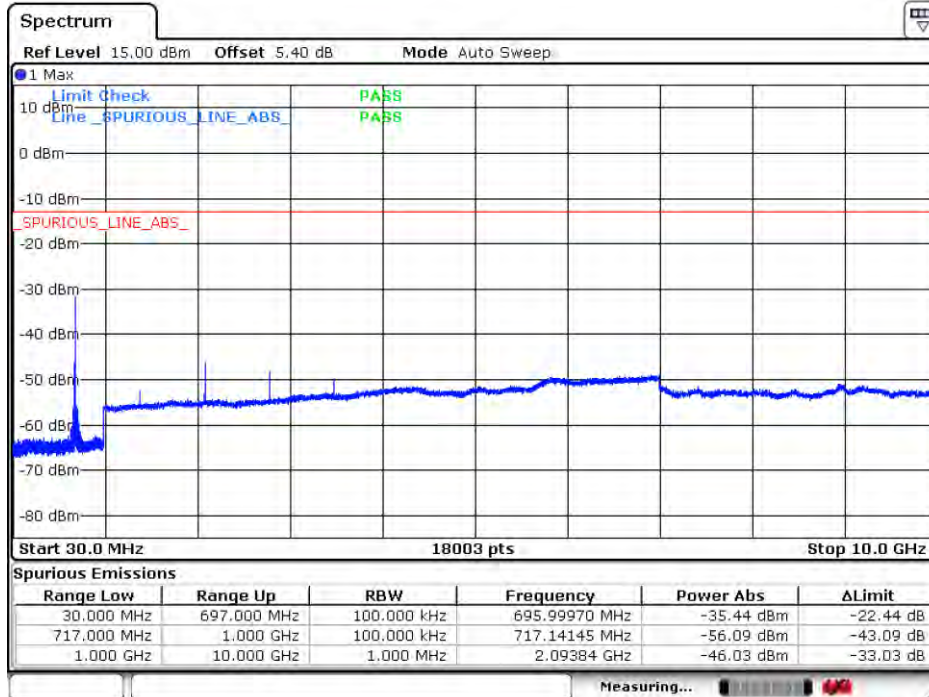
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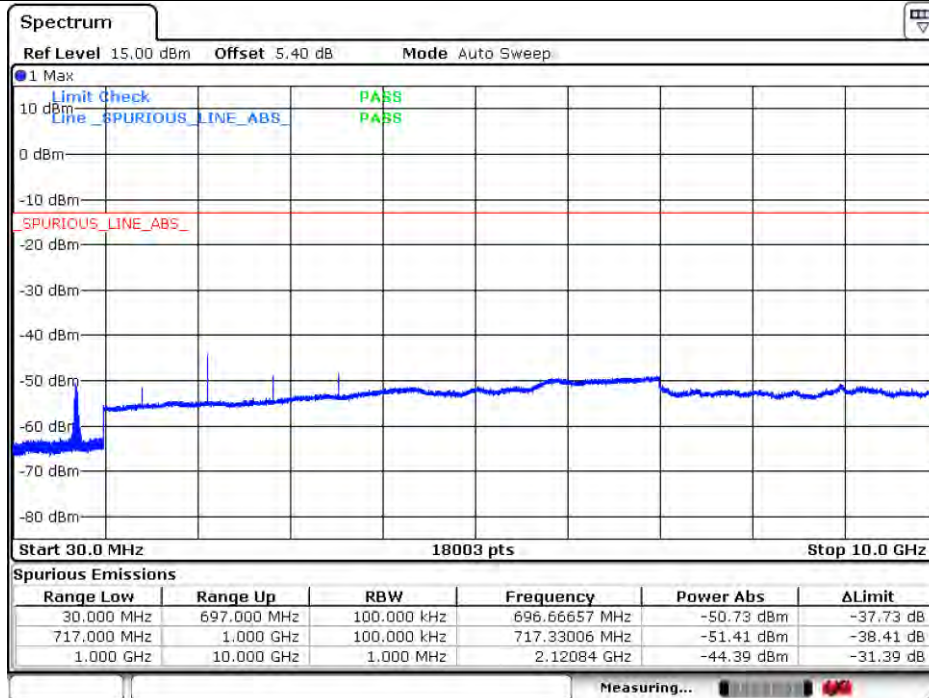
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LTE-NB1/QPSK. Sub-carrier spacing=3.75kHz-Test Channel=134003-T size=1T0



Date: 7.SEP.2019 01:45:36

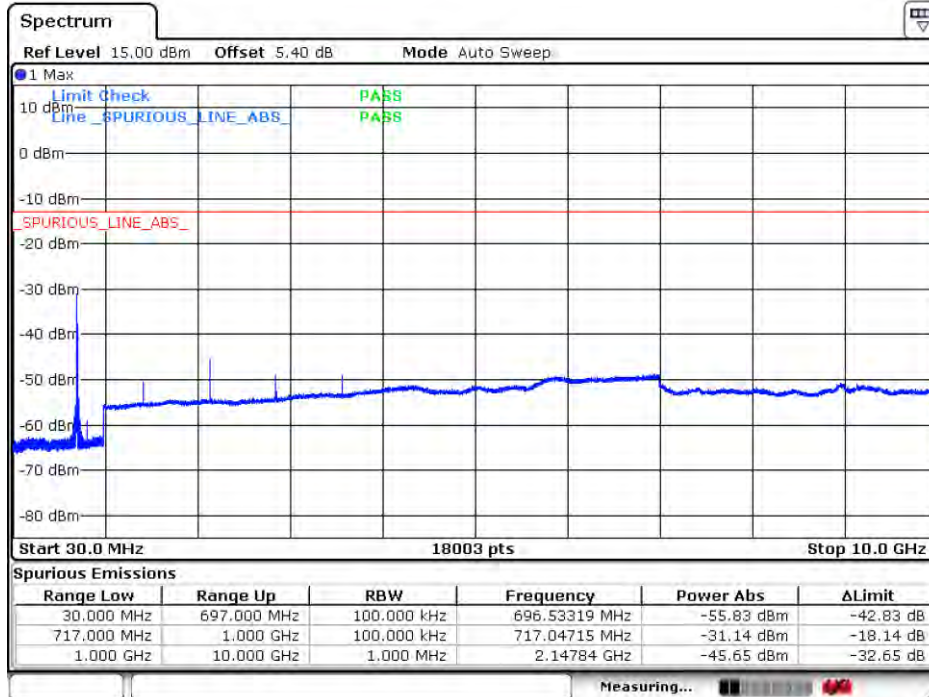
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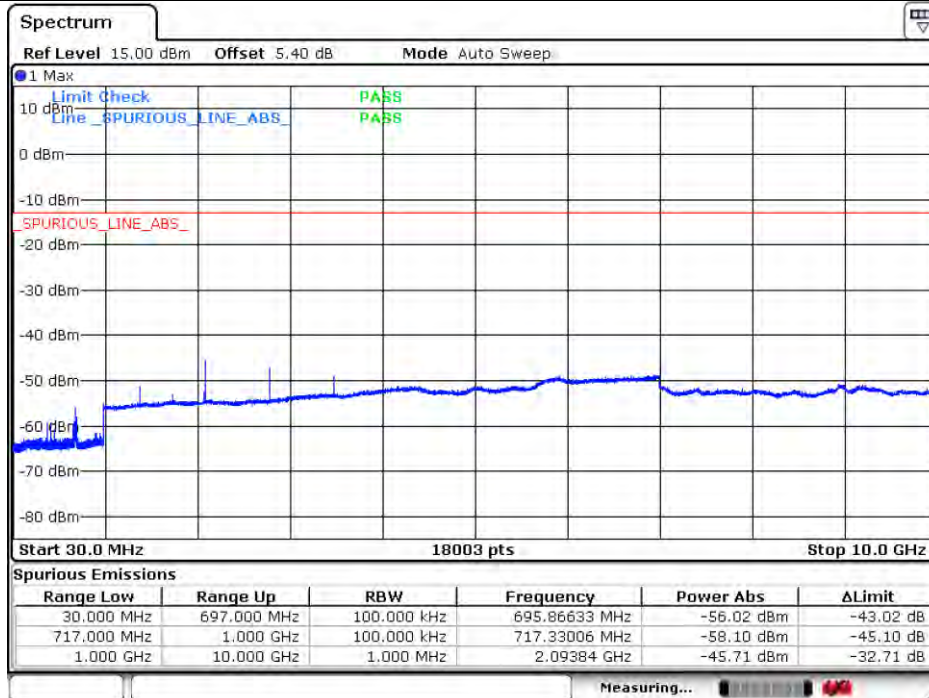


LTE-NB1/QPSK. Sub-carrier spacing=3.75kHz-Test Channel=134181-T size=1T0



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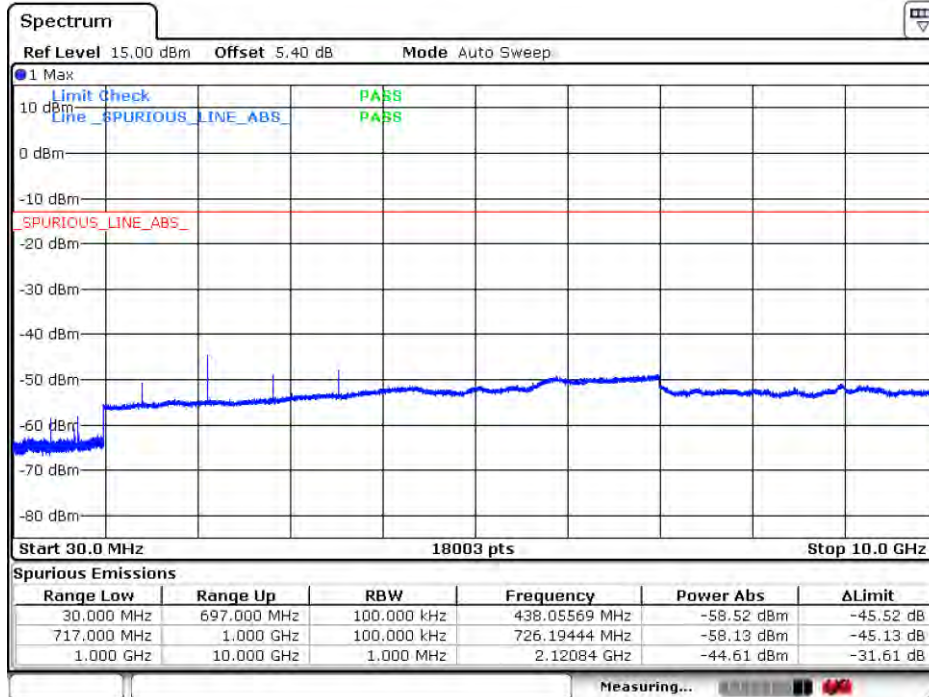
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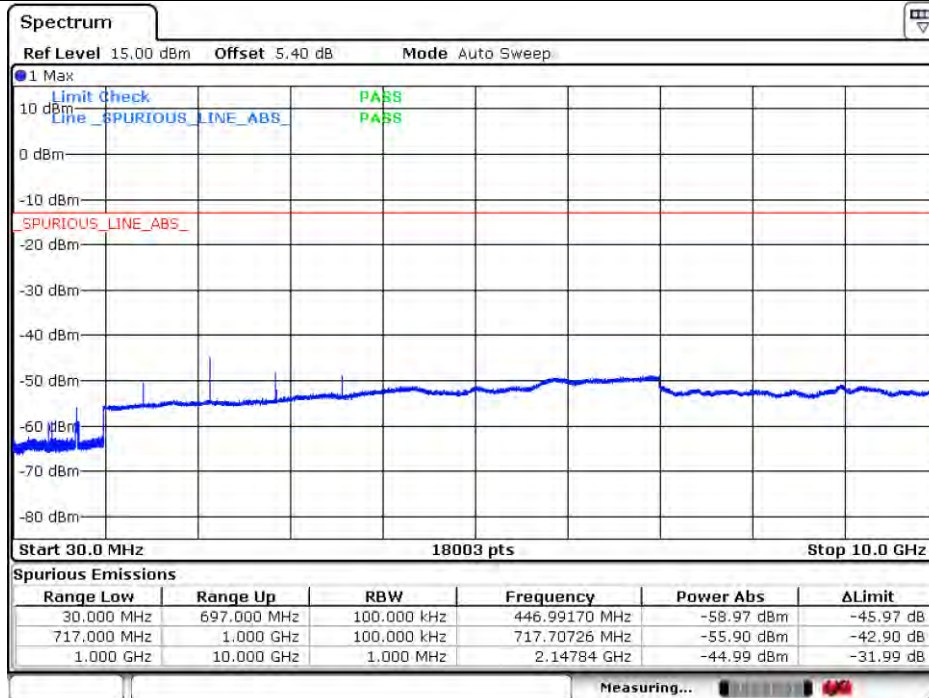


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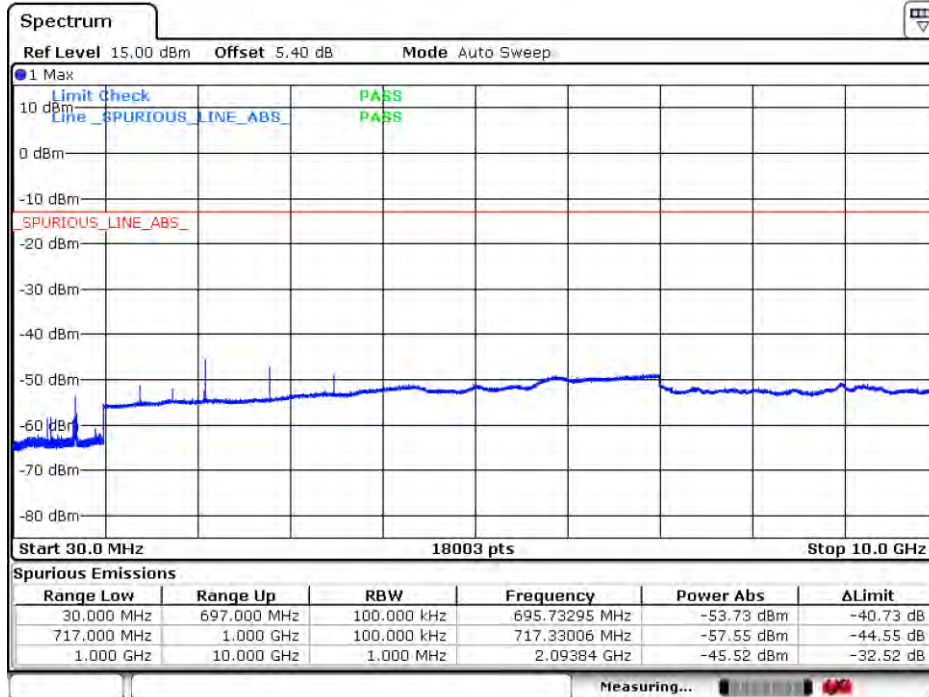
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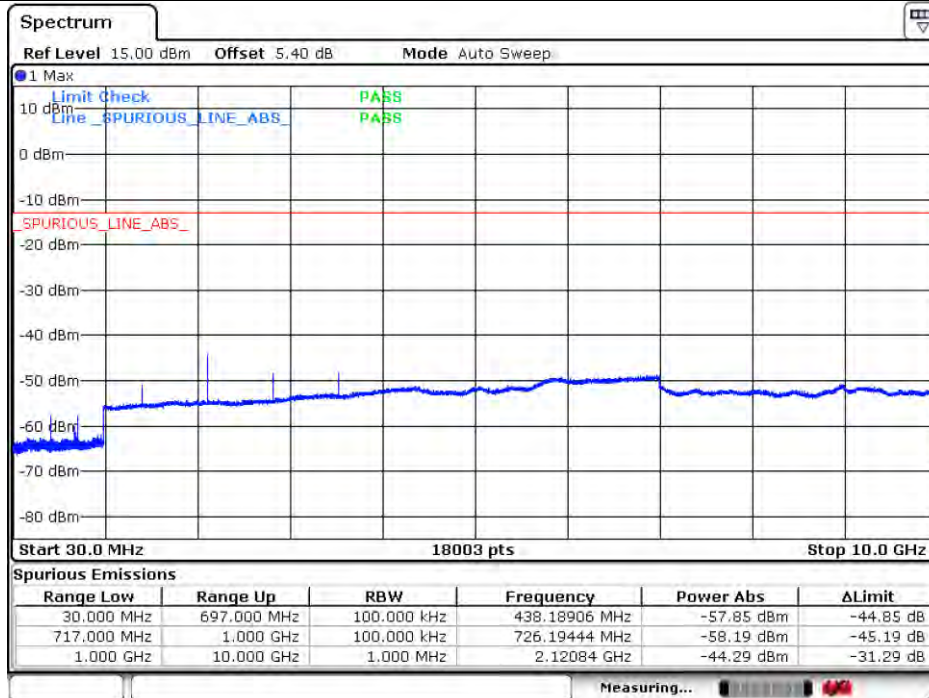


LTE-NB1/QPSK. Sub-carrier spacing=15kHz-Test Channel=134003-T size=1T0



Date: 7.SEP.2019 01:49:26

LTE-NB1/QPSK. Sub-carrier spacing=15kHz-Test Channel=134092-T size=1T0



Date: 7.SEP.2019 01:50:48



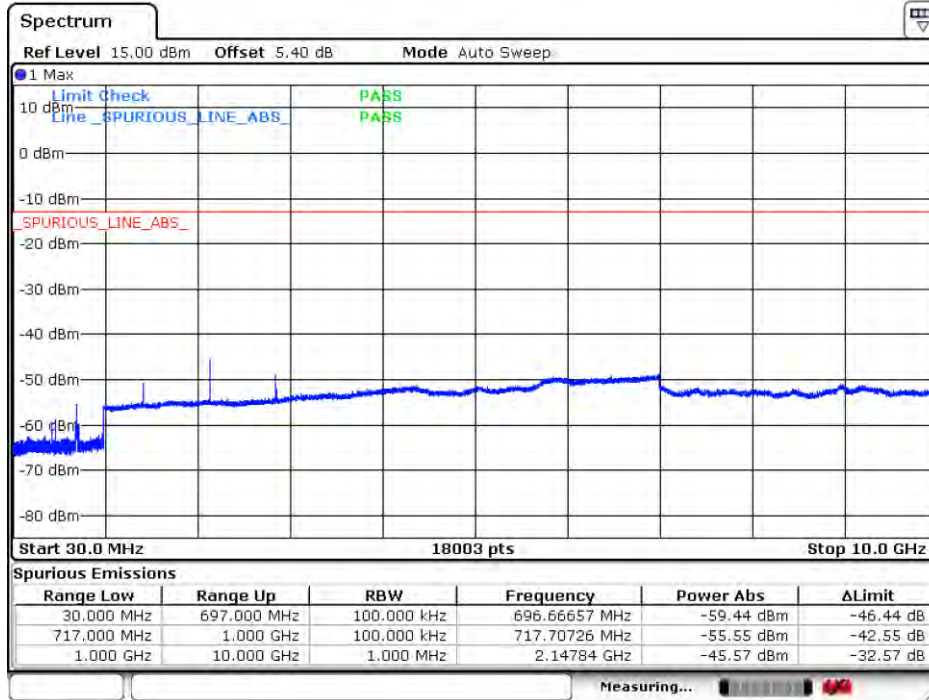
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Date: 7.SEP.2019 01:56:08



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7 Field Strength of Spurious Radiation

7.1 For LTE-NB1

7.1.1 Test Band = LTE-NB1 Band 85

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

7.1.1.1.1 Test Channel = 134003

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Over Limit (dB)	Polarization
112.6481	-65.13	-13.00	52.13	Vertical
595.8778	-63.77	-13.00	50.77	Vertical
998.7389	-56.16	-13.00	43.16	Vertical
2094.2188	-55.12	-13.00	42.12	Vertical
14527.6611	-42.88	-13.00	29.88	Vertical
17872.1949	-37.89	-13.00	24.89	Vertical
40.3310	-64.12	-13.00	51.12	Horizontal
517.4009	-65.56	-13.00	52.56	Horizontal
997.3324	-56.66	-13.00	43.66	Horizontal
2094.2188	-44.72	-13.00	31.72	Horizontal
3489.6196	-51.36	-13.00	38.36	Horizontal
16960.1584	-39.10	-13.00	26.10	Horizontal

7.1.1.1.2 Test Channel = 134092

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Over Limit (dB)	Polarization
107.8949	-64.25	-13.00	51.25	Vertical
502.7046	-67.22	-13.00	54.22	Vertical
992.6276	-57.25	-13.00	44.25	Vertical
2464.2929	-51.95	-13.00	38.95	Vertical
14500.0600	-42.63	-13.00	29.63	Vertical
17923.1969	-34.83	-13.00	21.83	Vertical
42.7561	-65.11	-13.00	52.11	Horizontal
237.8814	-69.10	-13.00	56.10	Horizontal
1413.6827	-52.93	-13.00	39.93	Horizontal
2464.6929	-42.53	-13.00	29.53	Horizontal
16368.5347	-39.26	-13.00	26.26	Horizontal
17990.3996	-38.01	-13.00	25.01	Horizontal



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7.1.1.1.3 Test Channel = 134181

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Over Limit (dB)	Polarization
106.1488	-64.70	-13.00	51.70	Vertical
590.1545	-64.97	-13.00	51.97	Vertical
907.6999	-57.21	-13.00	44.21	Vertical
1431.2863	-60.70	-13.00	47.70	Vertical
2466.2933	-53.96	-13.00	40.96	Vertical
17998.8000	-35.19	-13.00	22.19	Vertical
44.8902	-63.78	-13.00	50.78	Horizontal
568.0859	-65.41	-13.00	52.41	Horizontal
898.9209	-55.51	-13.00	42.51	Horizontal
1431.2863	-54.63	-13.00	41.63	Horizontal
2147.0294	-48.81	-13.00	35.81	Horizontal
16986.5595	-39.57	-13.00	26.57	Horizontal

NOTE:

- 1) The disturbance 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 85	180KHz	BPSK/15KHz	134003	12T0	VL	TN	6.39	0.009155	±2.5	PASS
NB1 Band 85	180KHz	BPSK/15KHz	134003	12T0	VN	TN	-12.86	-0.018427	±2.5	PASS
NB1 Band 85	180KHz	BPSK/15KHz	134003	12T0	VH	TN	-11.68	-0.016737	±2.5	PASS
NB1 Band 85	180KHz	BPSK/15KHz	134092	12T0	VL	TN	-11.55	-0.016343	±2.5	PASS
NB1 Band 85	180KHz	BPSK/15KHz	134092	12T0	VN	TN	12.14	0.017172	±2.5	PASS
NB1 Band 85	180KHz	BPSK/15KHz	134092	12T0	VH	TN	9.35	0.013224	±2.5	PASS
NB1 Band 85	180KHz	BPSK/15KHz	134181	12T0	VL	TN	8.01	0.011182	±2.5	PASS
NB1 Band 85	180KHz	BPSK/15KHz	134181	12T0	VN	TN	-1.03	-0.001436	±2.5	PASS
NB1 Band 85	180KHz	BPSK/15KHz	134181	12T0	VH	TN	-1.17	-0.001632	±2.5	PASS
NB1 Band 85	180KHz	QPSK/15KHz	134003	12T0	VL	TN	3.81	0.005462	±2.5	PASS
NB1 Band 85	180KHz	QPSK/15KHz	134003	12T0	VN	TN	-6.87	-0.009847	±2.5	PASS
NB1 Band 85	180KHz	QPSK/15KHz	134003	12T0	VH	TN	-0.86	-0.001228	±2.5	PASS
NB1 Band 85	180KHz	QPSK/15KHz	134092	12T0	VL	TN	-11.08	-0.015671	±2.5	PASS
NB1 Band 85	180KHz	QPSK/15KHz	134092	12T0	VN	TN	-11.29	-0.015965	±2.5	PASS
NB1 Band 85	180KHz	QPSK/15KHz	134092	12T0	VH	TN	-4.20	-0.005944	±2.5	PASS
NB1 Band 85	180KHz	QPSK/15KHz	134181	12T0	VL	TN	-12.23	-0.017079	±2.5	PASS
NB1 Band 85	180KHz	QPSK/15KHz	134181	12T0	VN	TN	-5.48	-0.007652	±2.5	PASS
NB1 Band 85	180KHz	QPSK/15KHz	134181	12T0	VH	TN	13.90	0.019416	±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 85	180KHz	BPSK/15KHz	134003	12T0	NV	-30	-2.22	-0.003174	±2.5	PASS
NB1 Band 85	180KHz	BPSK/15KHz	134003	12T0	NV	-20	3.86	0.005527	±2.5	PASS
NB1 Band 85	180KHz	BPSK/15KHz	134003	12T0	NV	0	-7.40	-0.010595	±2.5	PASS
NB1 Band 85	180KHz	BPSK/15KHz	134003	12T0	NV	10	5.65	0.008093	±2.5	PASS
NB1 Band 85	180KHz	BPSK/15KHz	134003	12T0	NV	20	-3.74	-0.005352	±2.5	PASS
NB1 Band 85	180KHz	BPSK/15KHz	134003	12T0	NV	30	8.85	0.012682	±2.5	PASS
NB1 Band 85	180KHz	BPSK/15KHz	134003	12T0	NV	40	1.72	0.002458	±2.5	PASS
NB1 Band 85	180KHz	BPSK/15KHz	134003	12T0	NV	50	-0.28	-0.000408	±2.5	PASS
NB1 Band 85	180KHz	BPSK/15KHz	134092	12T0	NV	-30	1.17	0.001654	±2.5	PASS
NB1 Band 85	180KHz	BPSK/15KHz	134092	12T0	NV	-20	-9.10	-0.012873	±2.5	PASS
NB1 Band 85	180KHz	BPSK/15KHz	134092	12T0	NV	0	-6.17	-0.008728	±2.5	PASS
NB1 Band 85	180KHz	BPSK/15KHz	134092	12T0	NV	10	3.17	0.004478	±2.5	PASS
NB1 Band 85	180KHz	BPSK/15KHz	134092	12T0	NV	20	3.02	0.004272	±2.5	PASS
NB1 Band 85	180KHz	BPSK/15KHz	134092	12T0	NV	30	-12.02	-0.017007	±2.5	PASS
NB1 Band 85	180KHz	BPSK/15KHz	134092	12T0	NV	40	10.68	0.015107	±2.5	PASS
NB1 Band 85	180KHz	BPSK/15KHz	134092	12T0	NV	50	1.02	0.001441	±2.5	PASS
NB1 Band 85	180KHz	BPSK/15KHz	134181	12T0	NV	-30	0.44	0.000609	±2.5	PASS
NB1 Band 85	180KHz	BPSK/15KHz	134181	12T0	NV	-20	-14.88	-0.020782	±2.5	PASS
NB1 Band 85	180KHz	BPSK/15KHz	134181	12T0	NV	0	12.78	0.017854	±2.5	PASS



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NB1 Band 85	180KHz	BPSK/15KHz	134181	12T0	NV	10	-7.60	-0.010610	±2.5	PASS
NB1 Band 85	180KHz	BPSK/15KHz	134181	12T0	NV	20	-0.02	-0.000031	±2.5	PASS
NB1 Band 85	180KHz	BPSK/15KHz	134181	12T0	NV	30	-12.79	-0.017861	±2.5	PASS
NB1 Band 85	180KHz	BPSK/15KHz	134181	12T0	NV	40	-10.65	-0.014874	±2.5	PASS
NB1 Band 85	180KHz	BPSK/15KHz	134181	12T0	NV	50	5.05	0.007059	±2.5	PASS
NB1 Band 85	180KHz	QPSK/15KHz	134003	12T0	NV	-30	-2.04	-0.002925	±2.5	PASS
NB1 Band 85	180KHz	QPSK/15KHz	134003	12T0	NV	-20	14.09	0.020179	±2.5	PASS
NB1 Band 85	180KHz	QPSK/15KHz	134003	12T0	NV	0	9.87	0.014132	±2.5	PASS
NB1 Band 85	180KHz	QPSK/15KHz	134003	12T0	NV	10	0.32	0.000457	±2.5	PASS
NB1 Band 85	180KHz	QPSK/15KHz	134003	12T0	NV	20	4.98	0.007132	±2.5	PASS
NB1 Band 85	180KHz	QPSK/15KHz	134003	12T0	NV	30	12.90	0.018473	±2.5	PASS
NB1 Band 85	180KHz	QPSK/15KHz	134003	12T0	NV	40	8.95	0.012820	±2.5	PASS
NB1 Band 85	180KHz	QPSK/15KHz	134003	12T0	NV	50	5.93	0.008492	±2.5	PASS
NB1 Band 85	180KHz	QPSK/15KHz	134092	12T0	NV	-30	12.68	0.017940	±2.5	PASS
NB1 Band 85	180KHz	QPSK/15KHz	134092	12T0	NV	-20	13.51	0.019107	±2.5	PASS
NB1 Band 85	180KHz	QPSK/15KHz	134092	12T0	NV	0	3.92	0.005548	±2.5	PASS
NB1 Band 85	180KHz	QPSK/15KHz	134092	12T0	NV	10	-8.27	-0.011690	±2.5	PASS
NB1 Band 85	180KHz	QPSK/15KHz	134092	12T0	NV	20	-13.01	-0.018395	±2.5	PASS
NB1 Band 85	180KHz	QPSK/15KHz	134092	12T0	NV	30	-1.30	-0.001843	±2.5	PASS
NB1 Band 85	180KHz	QPSK/15KHz	134092	12T0	NV	40	5.76	0.008141	±2.5	PASS
NB1 Band 85	180KHz	QPSK/15KHz	134092	12T0	NV	50	1.16	0.001647	±2.5	PASS
NB1 Band 85	180KHz	QPSK/15KHz	134181	12T0	NV	-30	-4.19	-0.005856	±2.5	PASS
NB1 Band 85	180KHz	QPSK/15KHz	134181	12T0	NV	-20	8.78	0.012269	±2.5	PASS
NB1 Band 85	180KHz	QPSK/15KHz	134181	12T0	NV	0	-13.94	-0.019475	±2.5	PASS
NB1 Band 85	180KHz	QPSK/15KHz	134181	12T0	NV	10	-3.23	-0.004508	±2.5	PASS
NB1 Band 85	180KHz	QPSK/15KHz	134181	12T0	NV	20	-9.58	-0.013383	±2.5	PASS
NB1 Band 85	180KHz	QPSK/15KHz	134181	12T0	NV	30	1.02	0.001431	±2.5	PASS
NB1 Band 85	180KHz	QPSK/15KHz	134181	12T0	NV	40	-8.83	-0.012336	±2.5	PASS
NB1 Band 85	180KHz	QPSK/15KHz	134181	12T0	NV	50	-11.87	-0.016585	±2.5	PASS

The End



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