



Appendix B

LTE-NB1 Band 26 (824-849)



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1 Effective Radiated Power Output Data

1.1 Test Result for LTE NB1 Band 26

Test Band	Test Mode	Sub-carrier Spacing (kHz)	Test channel	Number of T	Conducted Power (dBm)	ERP (dBm)	limit (dBm)	Verdict
NB1 Band 26	BPSK	3.75	26791	1T0	20.47	17.32	38.45	PASS
NB1 Band 26	BPSK	3.75	26915	1T0	20.52	17.37	38.45	PASS
NB1 Band 26	BPSK	3.75	27039	1T0	20.36	17.21	38.45	PASS
NB1 Band 26	QPSK	3.75	26791	1T0	20.27	17.12	38.45	PASS
NB1 Band 26	QPSK	3.75	26915	1T0	20.50	17.35	38.45	PASS
NB1 Band 26	QPSK	3.75	27039	1T0	20.49	17.34	38.45	PASS

Test Band	Test Mode	Sub-carrier Spacing (kHz)	Test channel	Number of T	Conducted Power (dBm)	ERP (dBm)	limit (dBm)	Verdict
NB1 Band 26	BPSK	15	26791	1T0	20.55	17.40	38.45	PASS
NB1 Band 26	BPSK	15	26915	1T0	20.62	17.47	38.45	PASS
NB1 Band 26	BPSK	15	27039	1T0	20.36	17.21	38.45	PASS
NB1 Band 26	QPSK	15	26791	1T0	20.59	17.44	38.45	PASS
NB1 Band 26	QPSK	15	26791	12T0	20.59	17.44	38.45	PASS
NB1 Band 26	QPSK	15	26915	1T0	20.60	17.45	38.45	PASS
NB1 Band 26	QPSK	15	26915	12T0	20.06	16.91	38.45	PASS
NB1 Band 26	QPSK	15	27039	1T0	20.47	17.32	38.45	PASS
NB1 Band 26	QPSK	15	27039	12T0	20.10	16.95	38.45	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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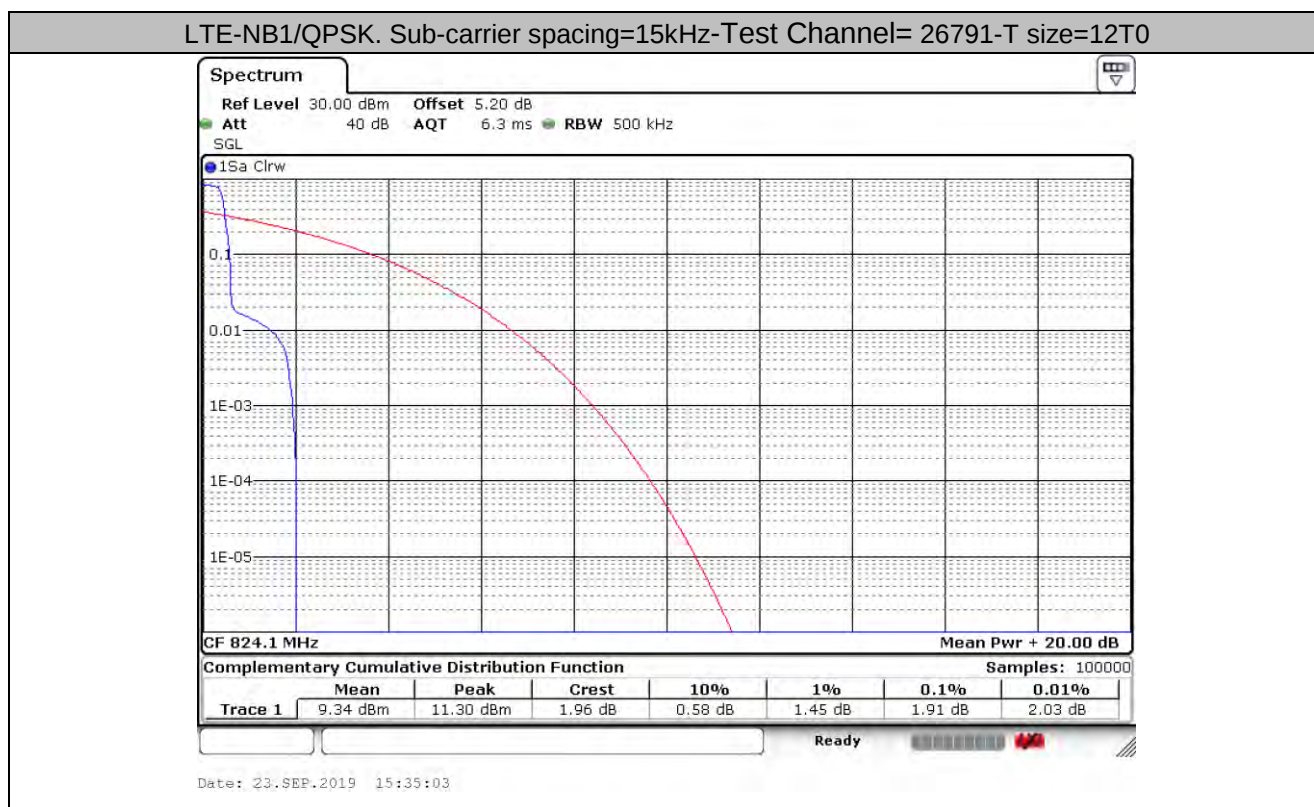


2 Peak-to-Average Ratio

Test Band	Test Mode	Test Channel	Measured[dB]	Limit [dB]	Verdict
NB1 Band 26	QPSK/12T0	26791	1.91	13	PASS
NB1 Band 26	QPSK/12T0	26915	3.31	13	PASS
NB1 Band 26	QPSK/12T0	27039	2.43	13	PASS

2.1 For LTE-NB1

2.1.1 Test Band = LTE-NB1 Band 26



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LTE-NB1/QPSK. Sub-carrier spacing=15kHz-Test Channel= 26915-T size=12T0



Date: 23.SEP.2019 15:36:13

LTE-NB1/QPSK. Sub-carrier spacing=15kHz-Test Channel= 27039-T size=12T0



Date: 23.SEP.2019 15:56:04



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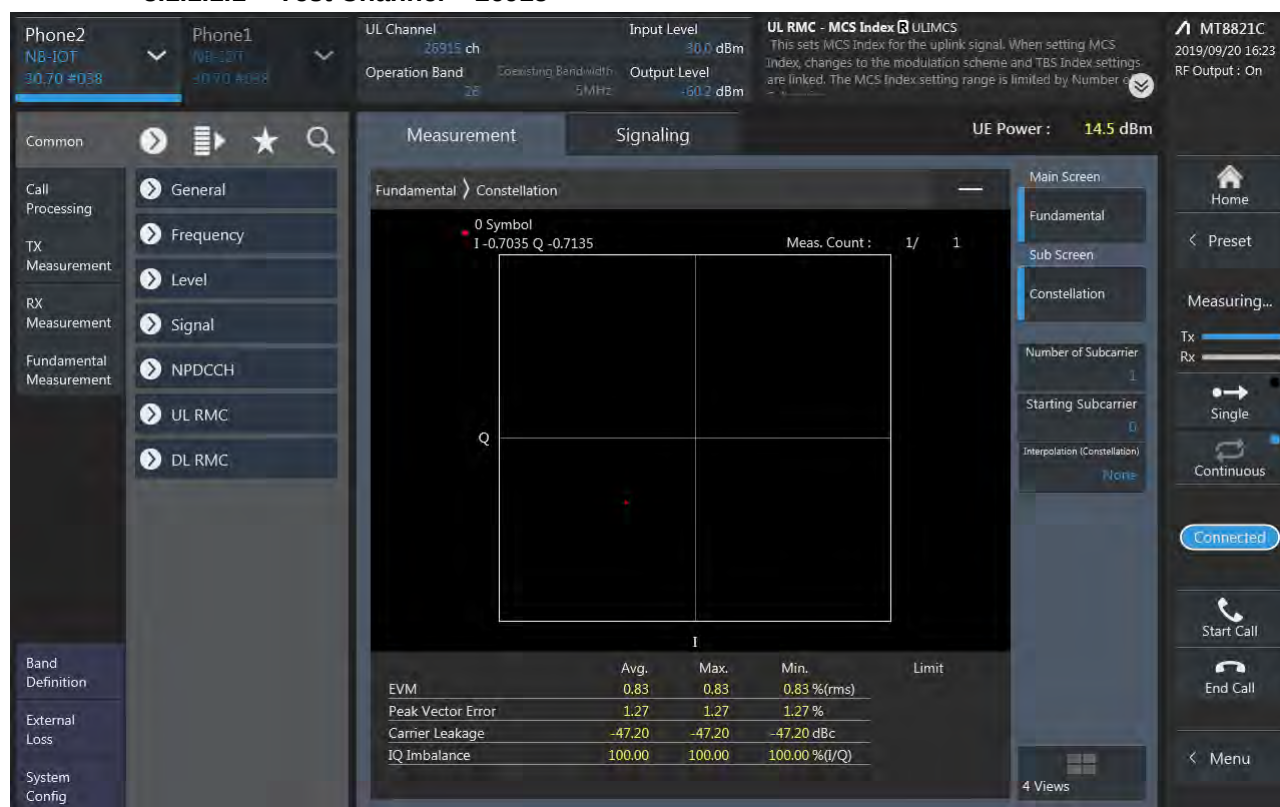
3 Modulation Characteristics

3.1 For LTE-NB1

3.1.1 Test Band = LTE-NB1 Band 26

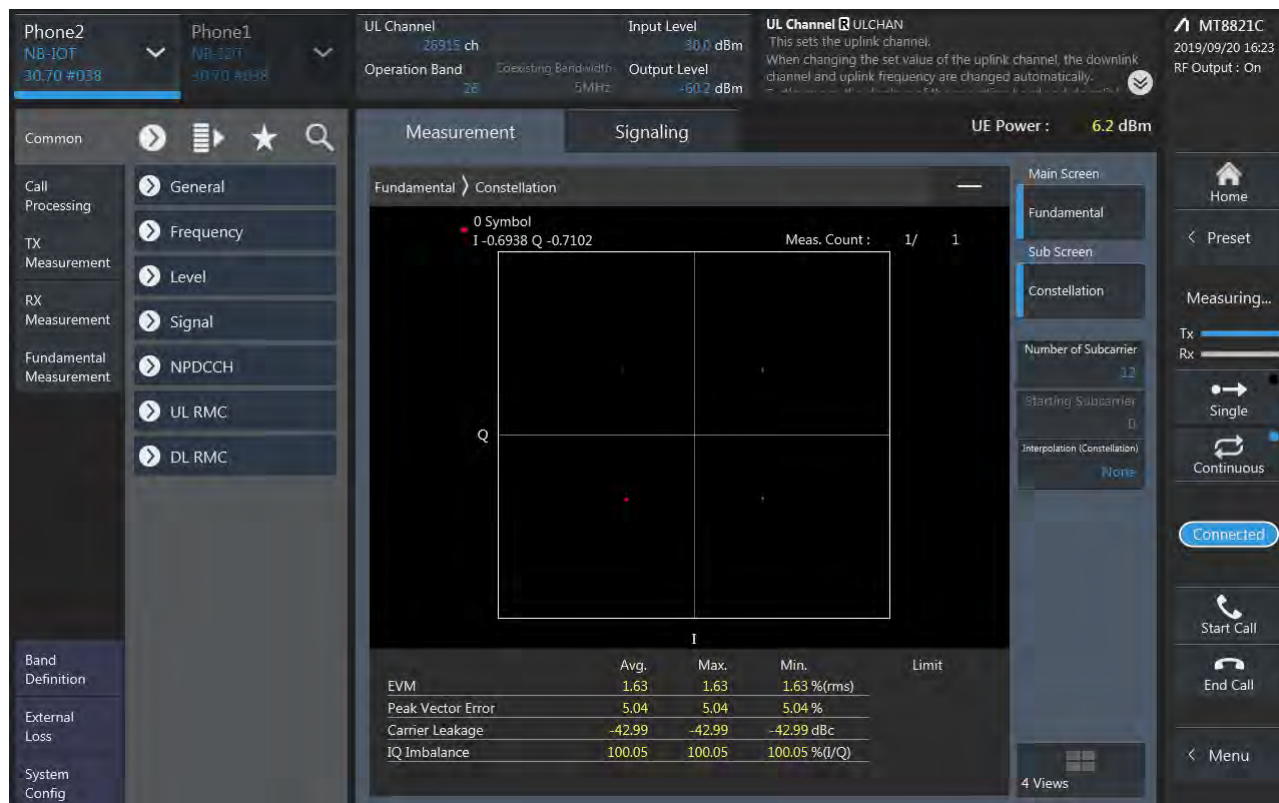
3.1.1.1 Test Mode = LTE-NB1/BPSK. Sub-carrier spacing=15kHz.T size=1T0

3.1.1.1.1 Test Channel = 26915



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

3.1.1.2.1 Test Channel = 26915



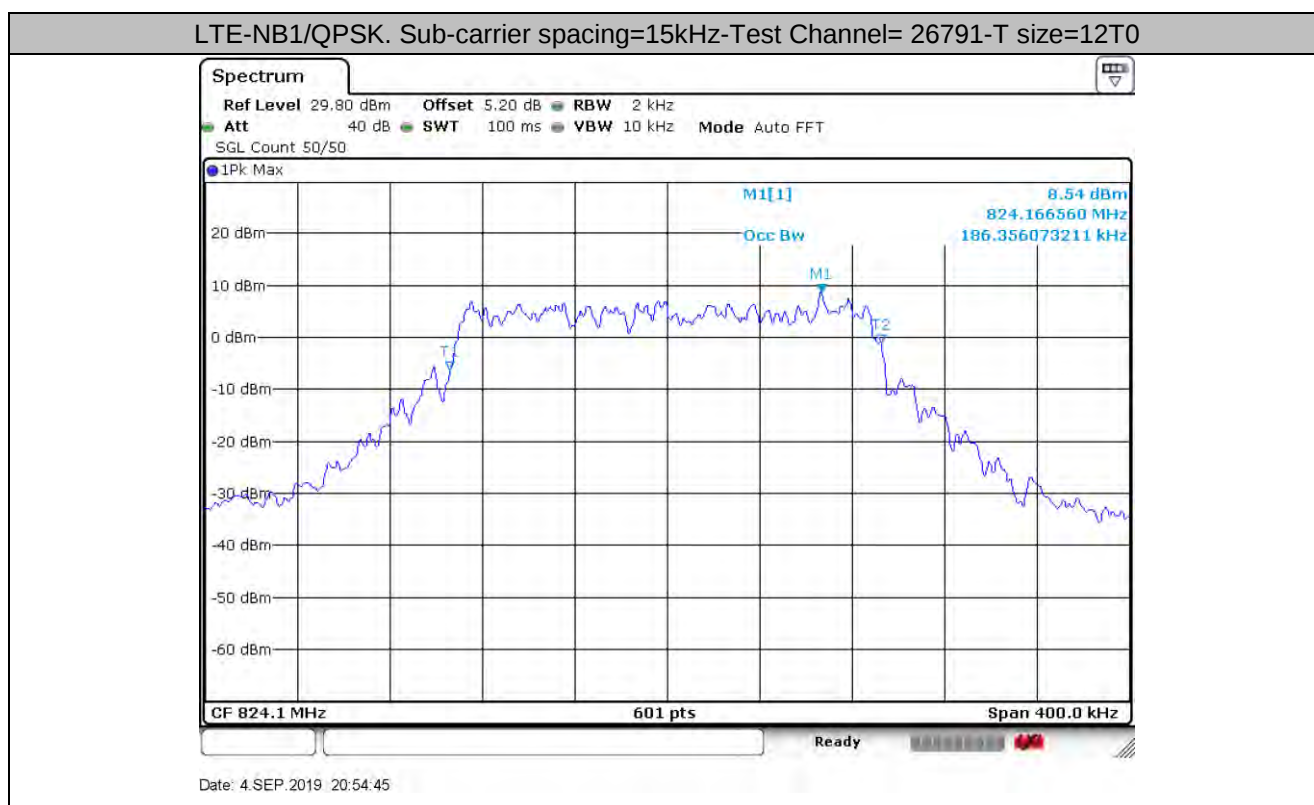


4 26dB Bandwidth and Occupied Bandwidth

Test Band	Test Mode	T size	Test Channel	Occupied Bandwidth [kHz]	Emission Bandwidth [kHz]	Verdict
NB1 Band 26	QPSK/15kHz	12T0	26791	186.36	244.26	PASS
NB1 Band 26	QPSK/15kHz	12T0	26915	186.36	243.59	PASS
NB1 Band 26	QPSK/15kHz	12T0	27039	186.36	242.93	PASS

4.1 For LTE-NB1

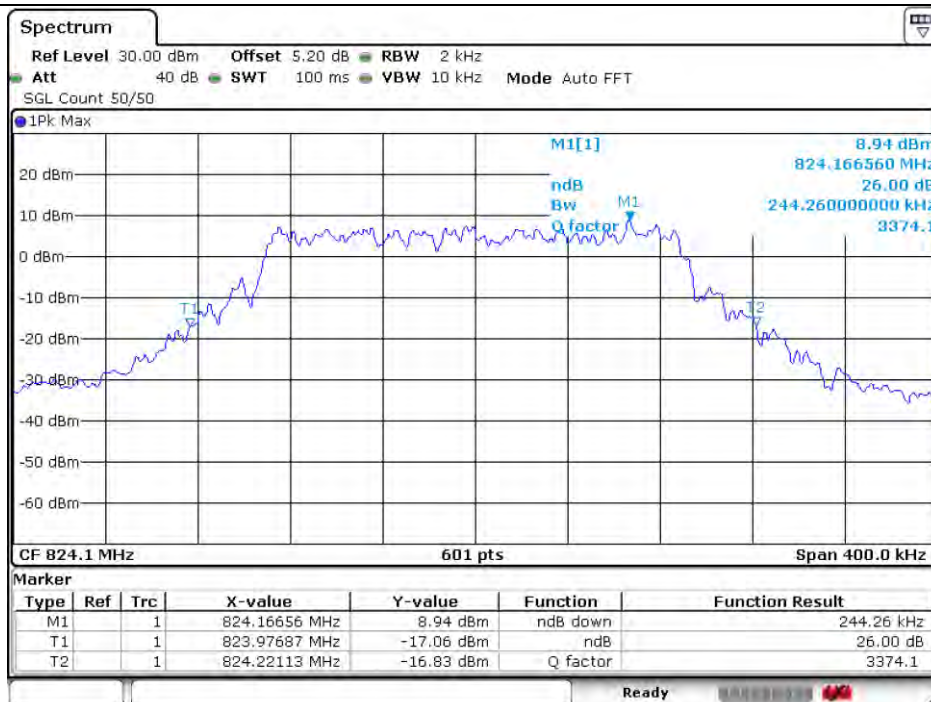
4.1.1 Test Band = LTE-NB1 Band 26



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Date: 4-SEP-2019 21:06:42

LTE-NB1/QPSK. Sub-carrier spacing=15kHz-Test Channel= 26915-T size=12T0



Date: 4-SEP-2019 21:12:17



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Date: 4.SEP.2019 21:22:12

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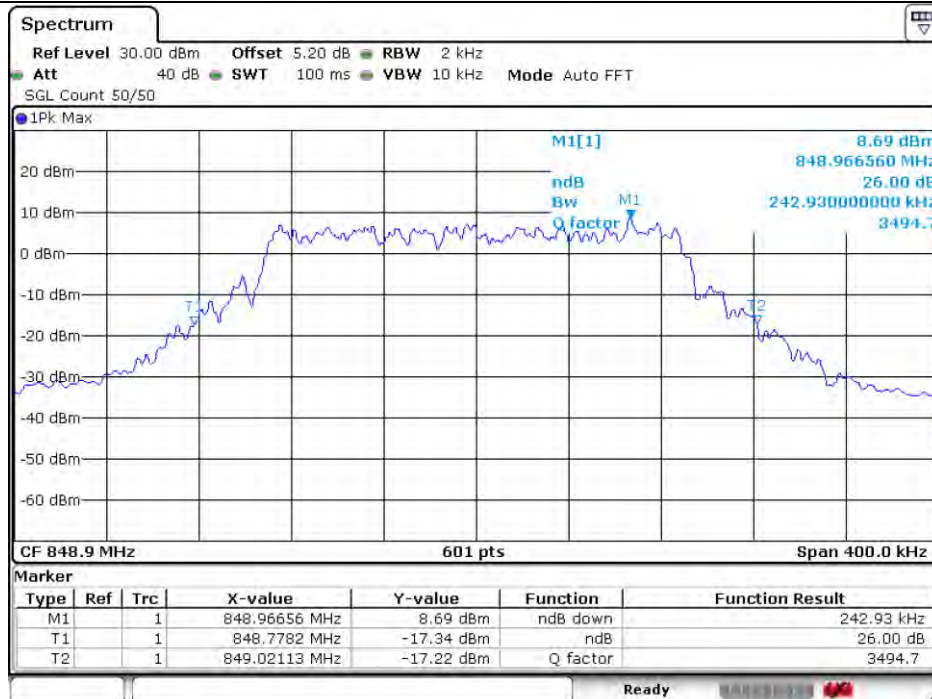


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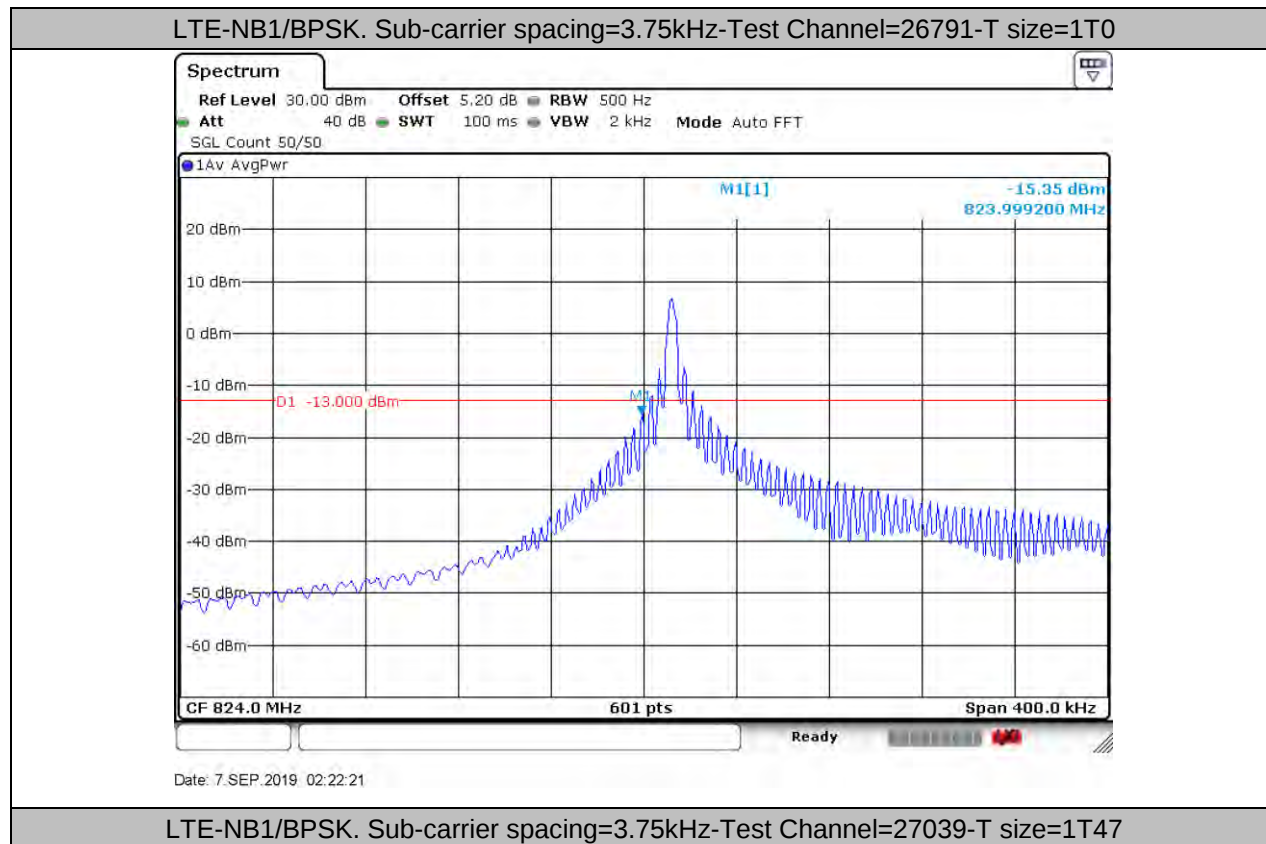
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5 Band Edges Compliance

5.1 For LTE-NB1

5.1.1 Test Band = LTE-NB1 Band 26

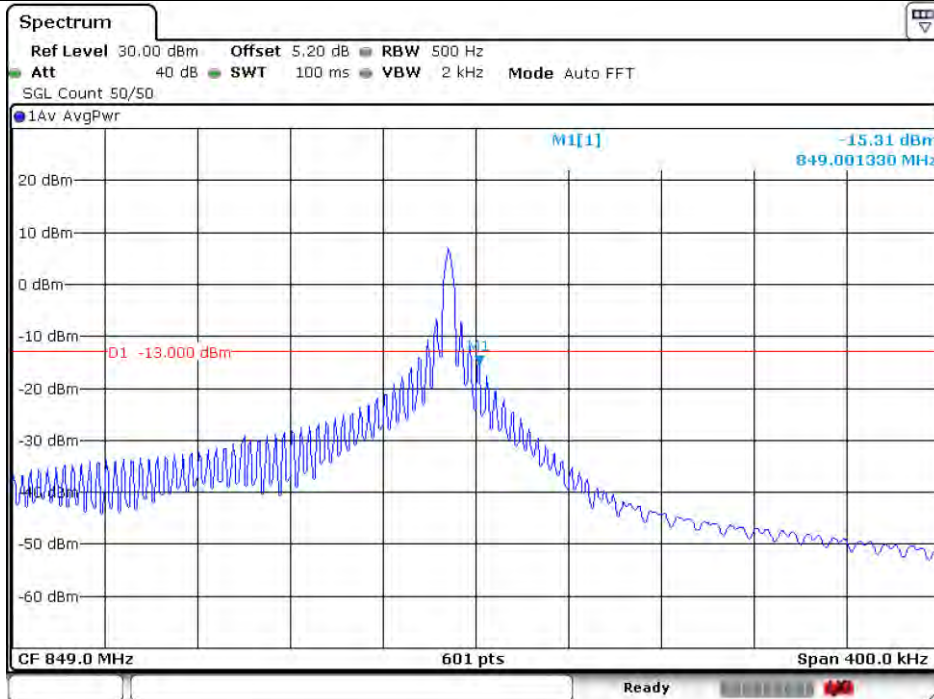


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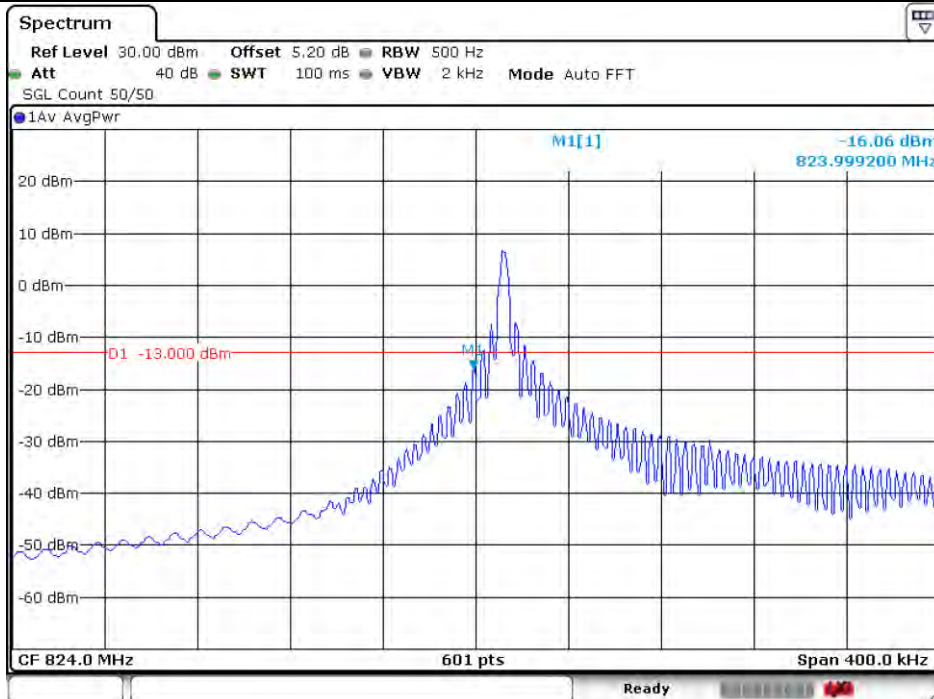
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Date: 7.SEP.2019 02:24:06

LTE-NB1/QPSK. Sub-carrier spacing=3.75kHz-Test Channel=26791-T size=1T0



Date: 7.SEP.2019 02:22:02

LTE-NB1/QPSK. Sub-carrier spacing=3.75kHz-Test Channel=27039-T size=1T47

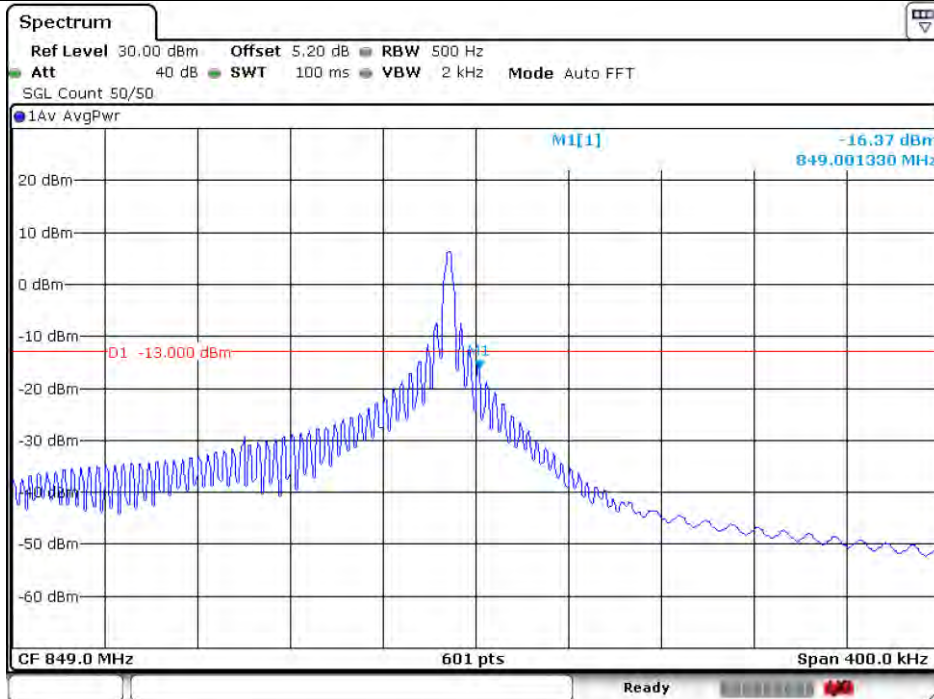


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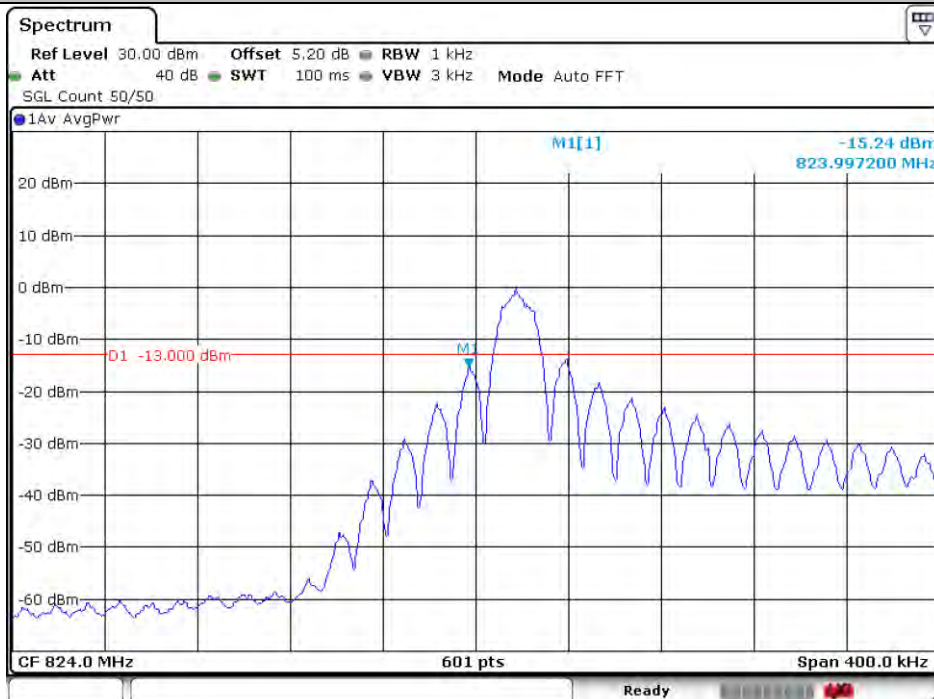
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Date: 7.SEP.2019 02:24:24

LTE-NB1/BPSK. Sub-carrier spacing=15kHz-Test Channel=26791-T size=1T0



Date: 7.SEP.2019 02:19:42

LTE-NB1/BPSK. Sub-carrier spacing=15kHz-Test Channel=27039-T size=1T11

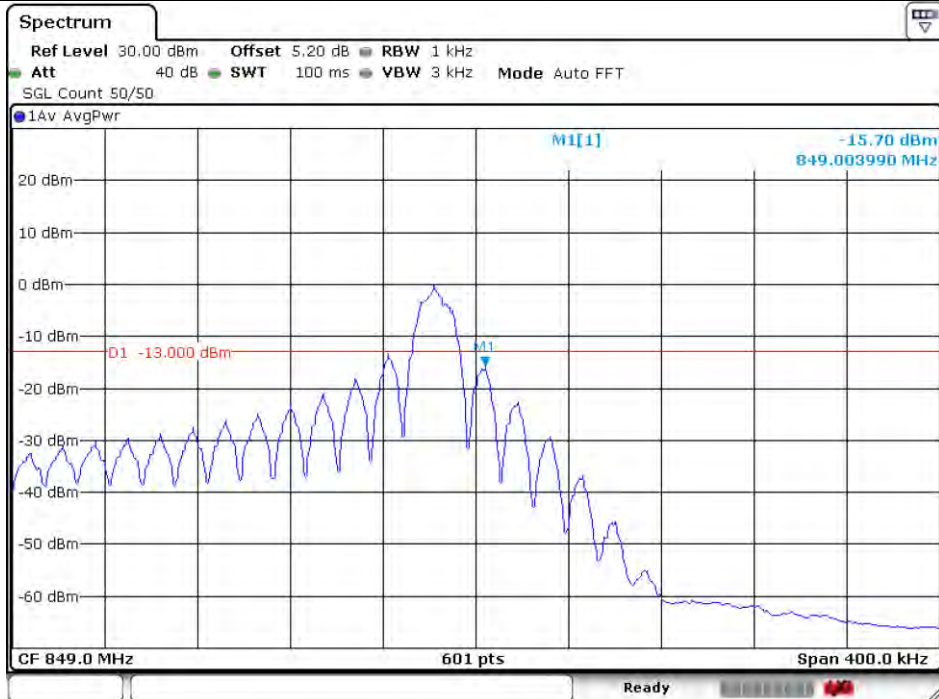


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Date: 7.SEP.2019 02:25:26

LTE-NB1/QPSK. Sub-carrier spacing=15kHz-Test Channel=26791-T size=1T0



Date: 7.SEP.2019 02:21:05

LTE-NB1/QPSK. Sub-carrier spacing=15kHz-Test Channel=26791-T size=12T0



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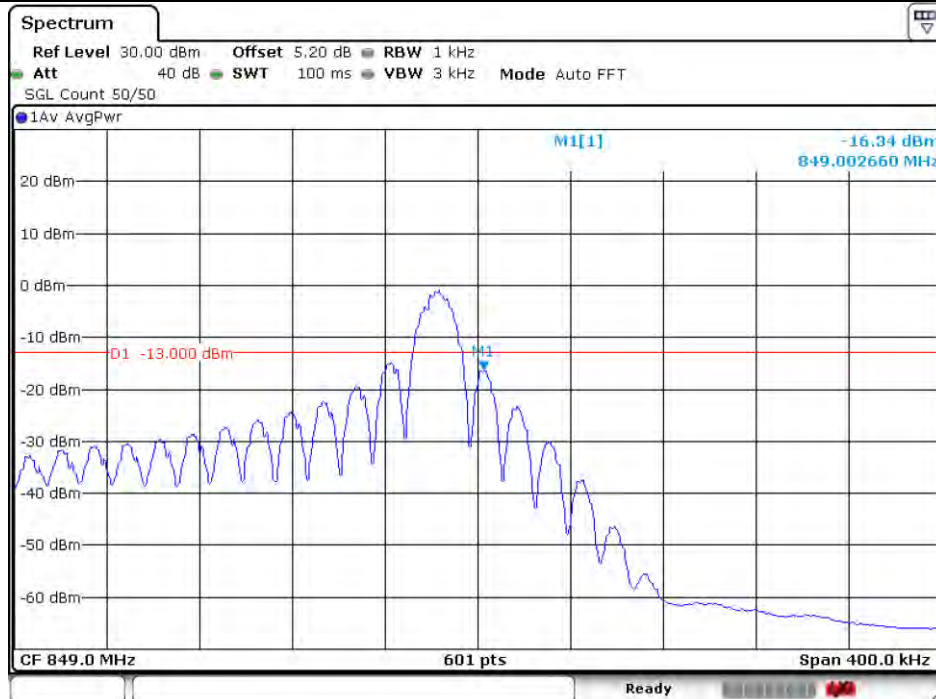
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Date: 7.SEP.2019 02:21:26

LTE-NB1/QPSK. Sub-carrier spacing=15kHz-Test Channel=27039-T size=1T11



Date: 7.SEP.2019 02:25:02

LTE-NB1/QPSK. Sub-carrier spacing=15kHz-Test Channel=27039-T size=12T0



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6 Spurious Emission at Antenna Terminal

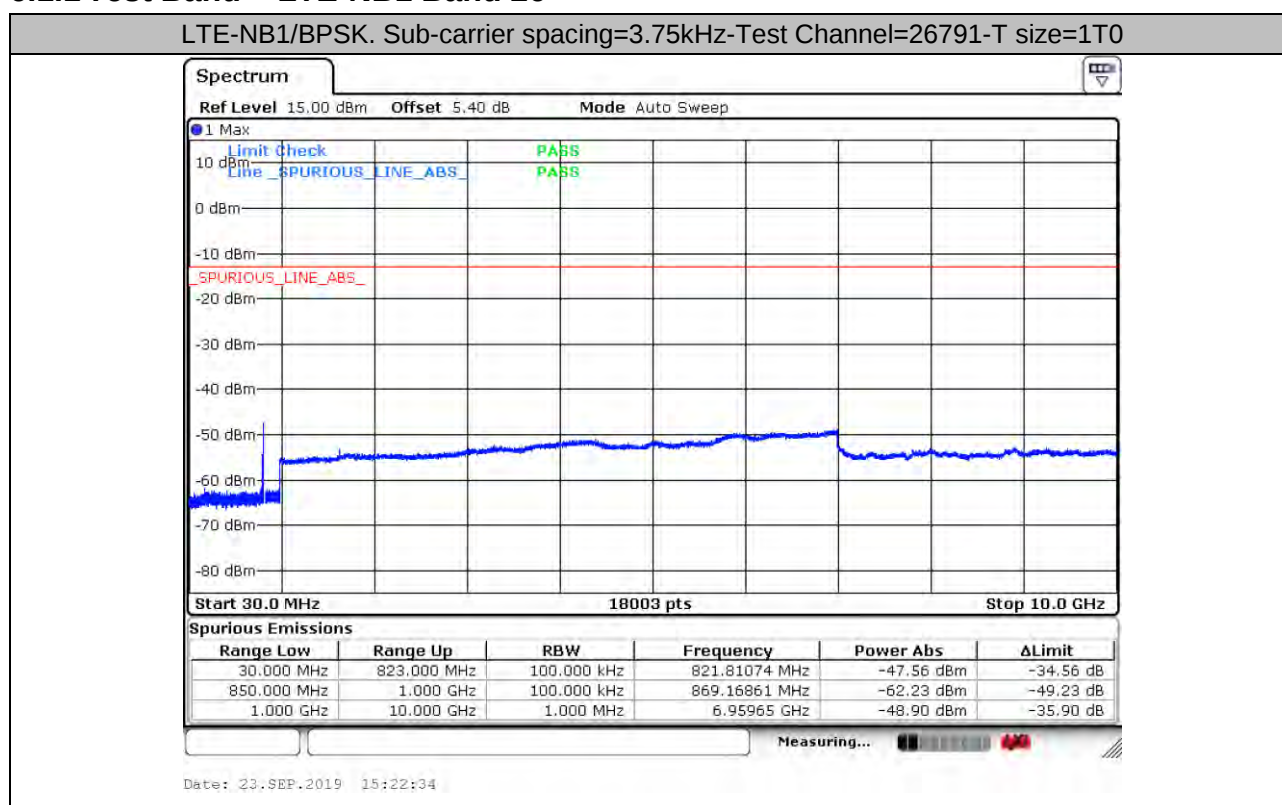
NOTE1: For the averaged unwanted emissions measurements, the measurement points in each sweep is greater than twice the Span/RBW in order to ensure bin-to-bin spacing of $< RBW/2$ so that narrowband signals are not lost between frequency bins. As to the present test item, the "Measurement Points = $k * (Span / RBW)$ " 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 26



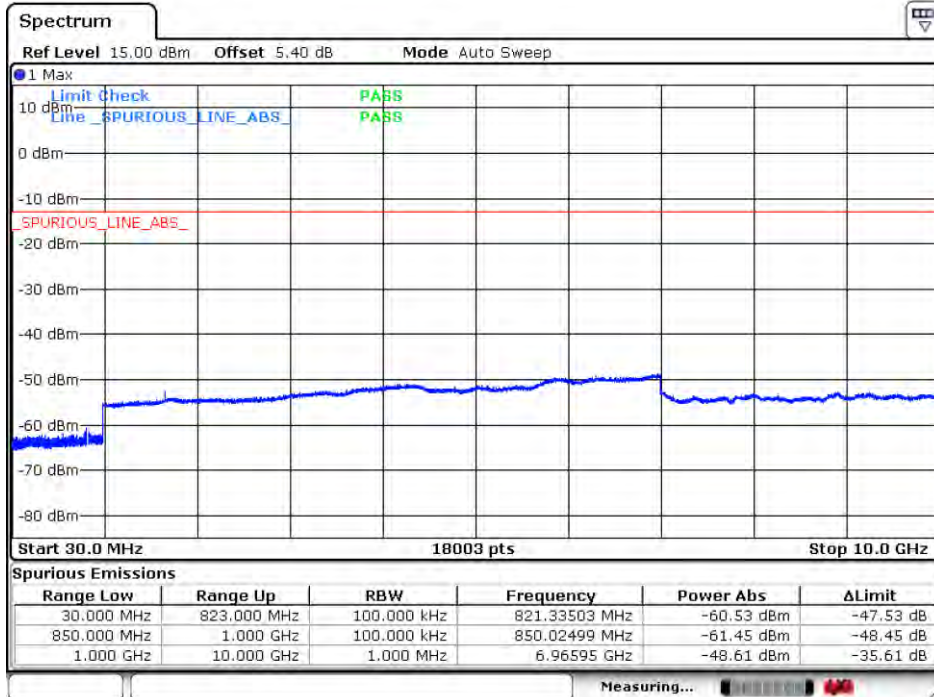
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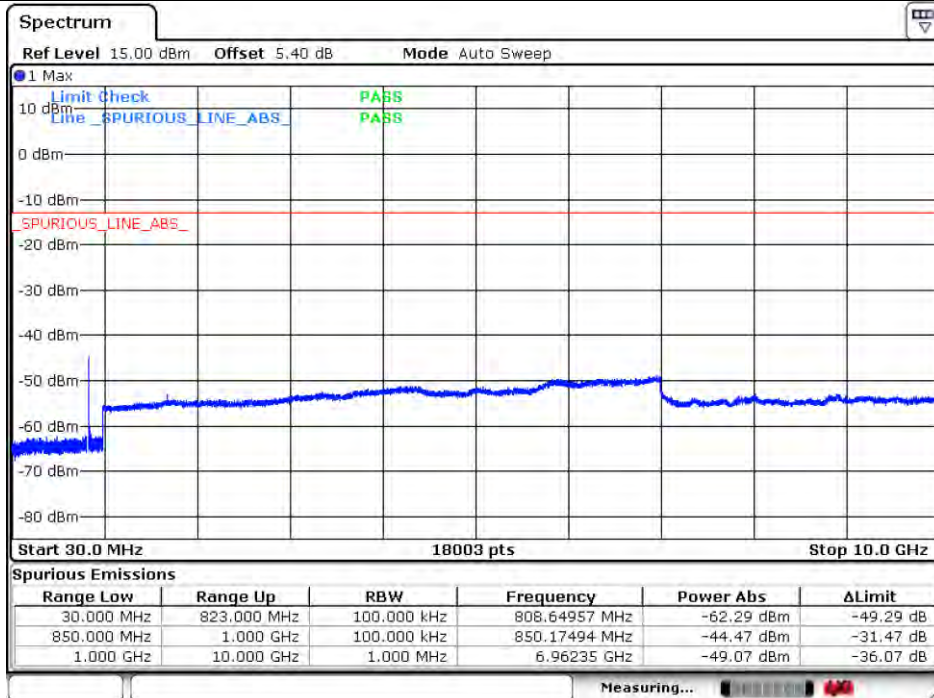
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LTE-NB1/BPSK. Sub-carrier spacing=3.75kHz-Test Channel=26915-T size=1T0



Date: 23.SEP.2019 15:21:14

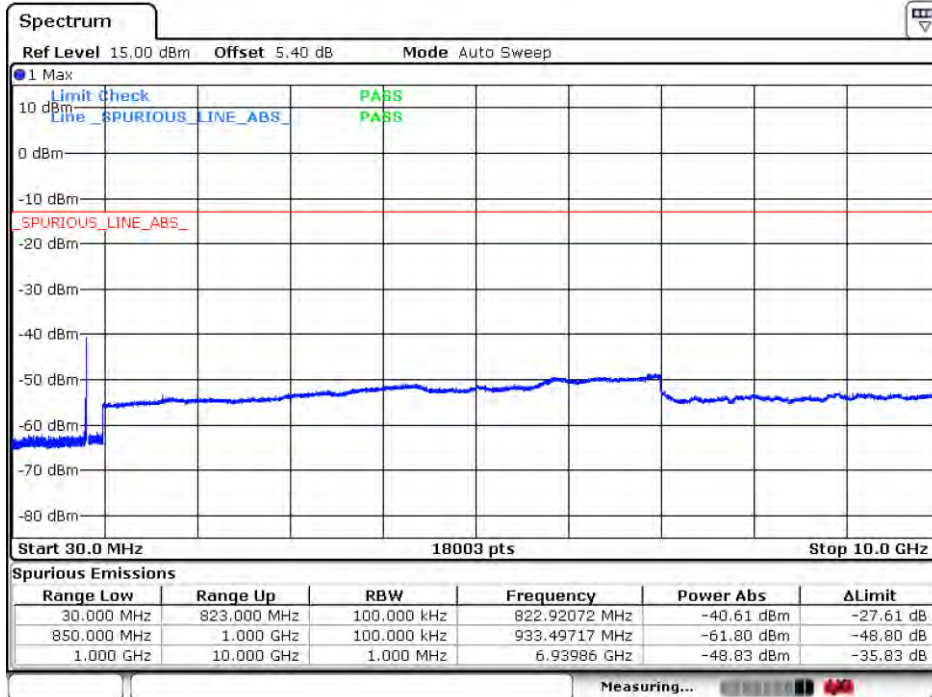
LTE-NB1/BPSK. Sub-carrier spacing=3.75kHz-Test Channel=27039-T size=1T0



Date: 23.SEP.2019 13:25:44

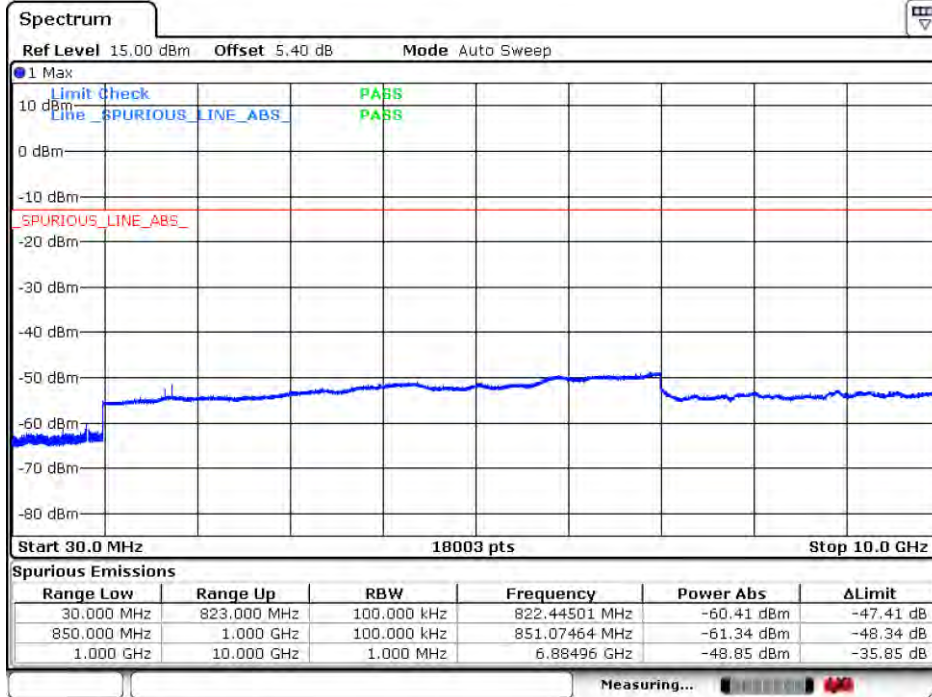


LTE-NB1/QPSK. Sub-carrier spacing=3.75kHz-Test Channel=26791-T size=1T0



Date: 23.SEP.2019 15:23:39

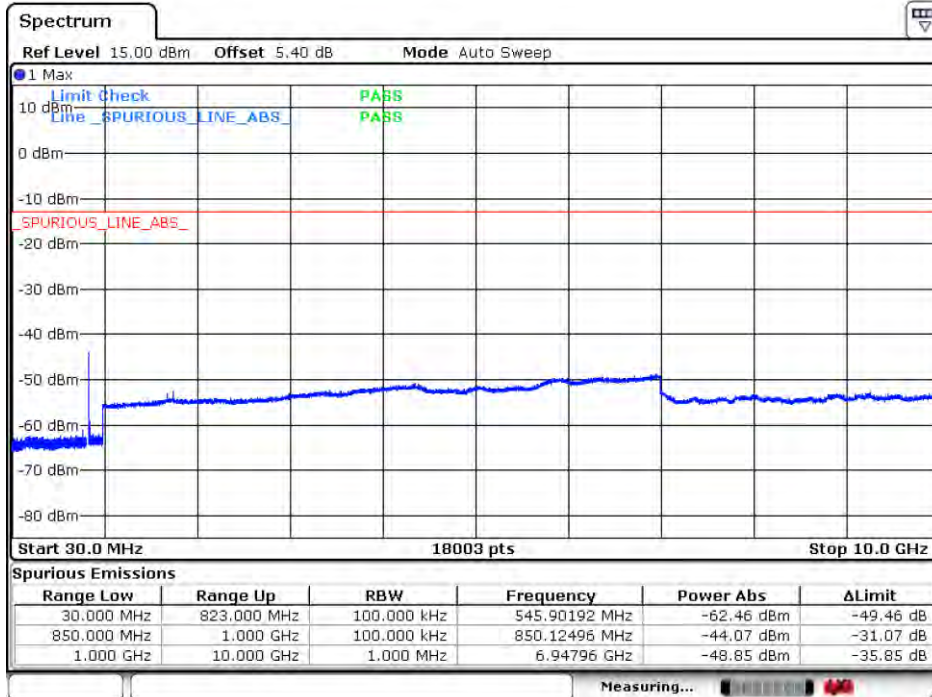
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Date: 23.SEP.2019 15:20:08

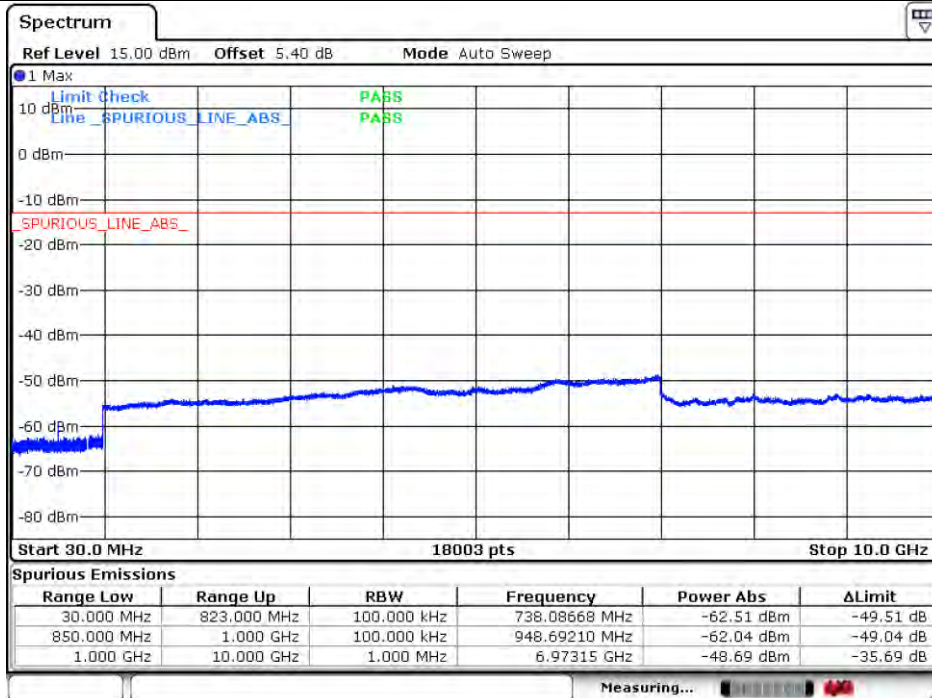


LTE-NB1/QPSK. Sub-carrier spacing=3.75kHz-Test Channel=27039-T size=1T0



Date: 23.SEP.2019 13:28:07

LTE-NB1/BPSK. Sub-carrier spacing=15kHz-Test Channel=26791-T size=1T0



Date: 23.SEP.2019 15:24:53

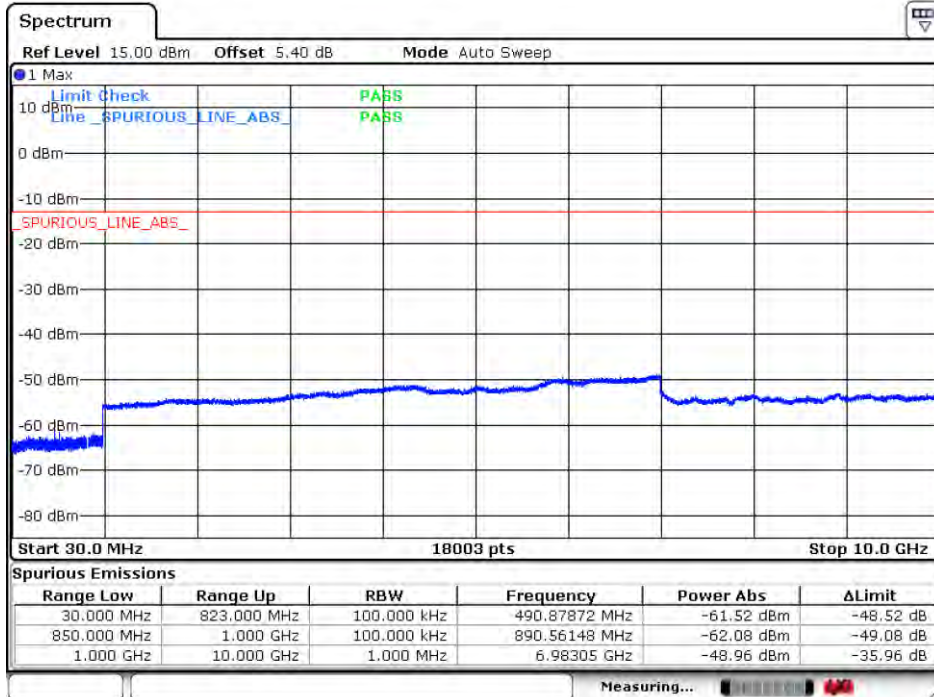
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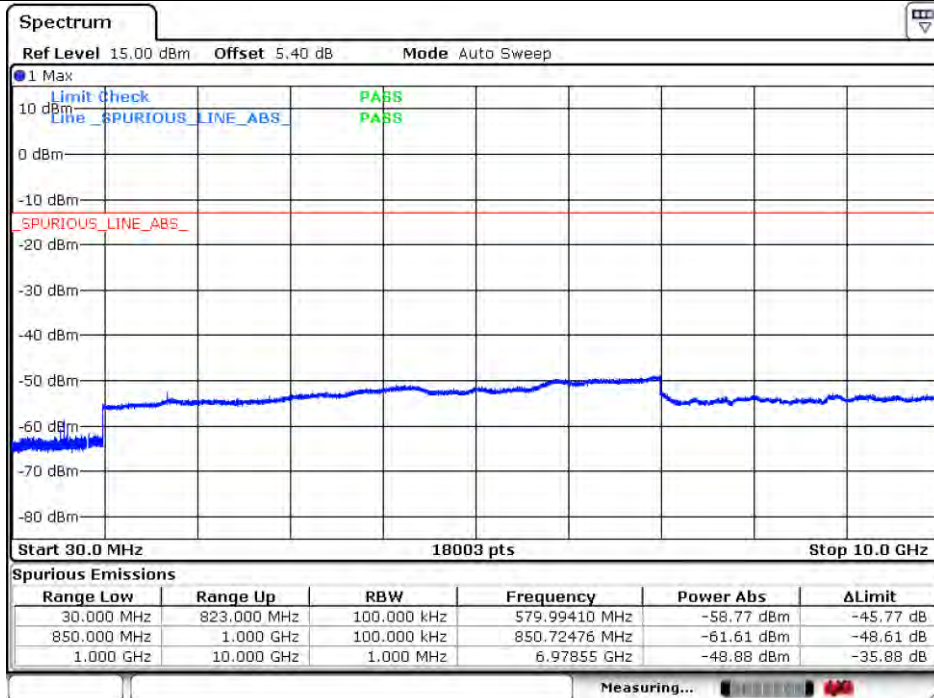
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LTE-NB1/BPSK. Sub-carrier spacing=15kHz-Test Channel=26915-T size=1T0



Date: 23.SEP.2019 15:18:01

LTE-NB1/BPSK. Sub-carrier spacing=15kHz-Test Channel=27039-T size=1T0



Date: 23.SEP.2019 13:29:36

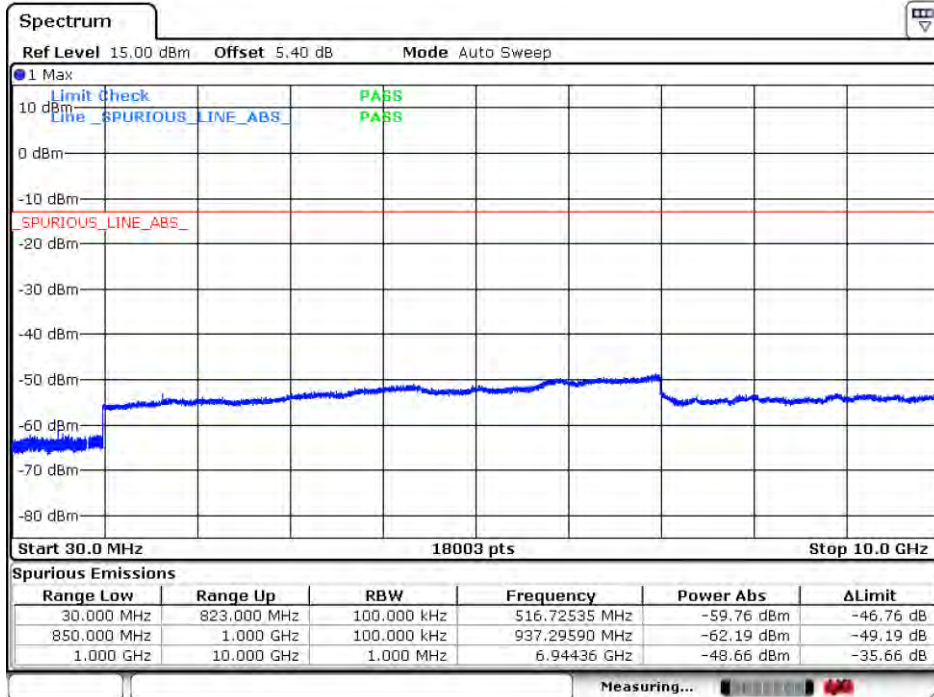
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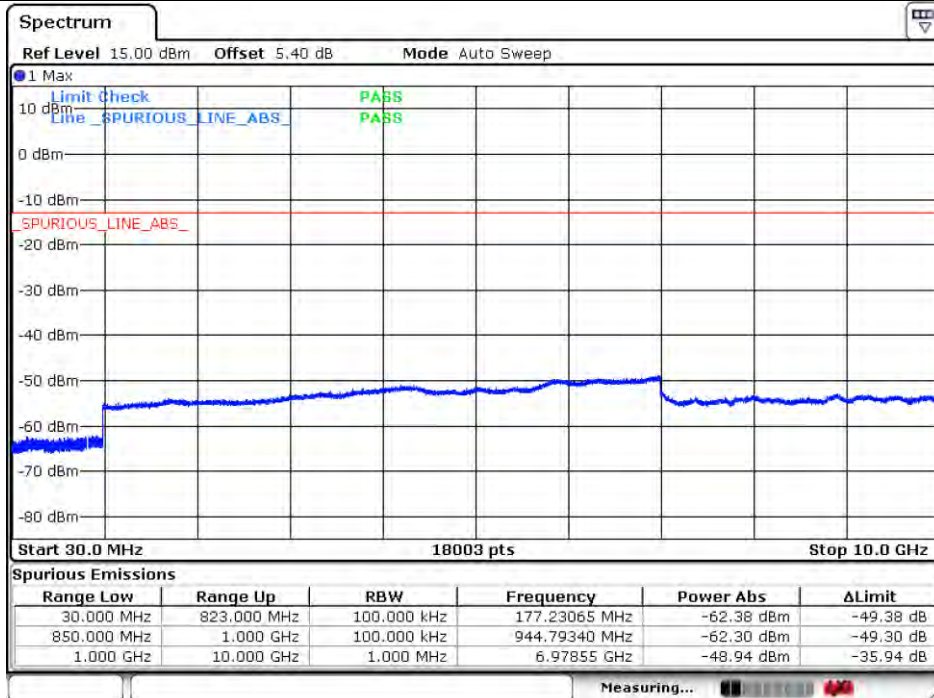
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LTE-NB1/QPSK. Sub-carrier spacing=15kHz-Test Channel=26791-T size=1T0



Date: 23.SEP.2019 15:24:24

LTE-NB1/QPSK. Sub-carrier spacing=15kHz-Test Channel=26915-T size=1T0



Date: 23.SEP.2019 15:18:40

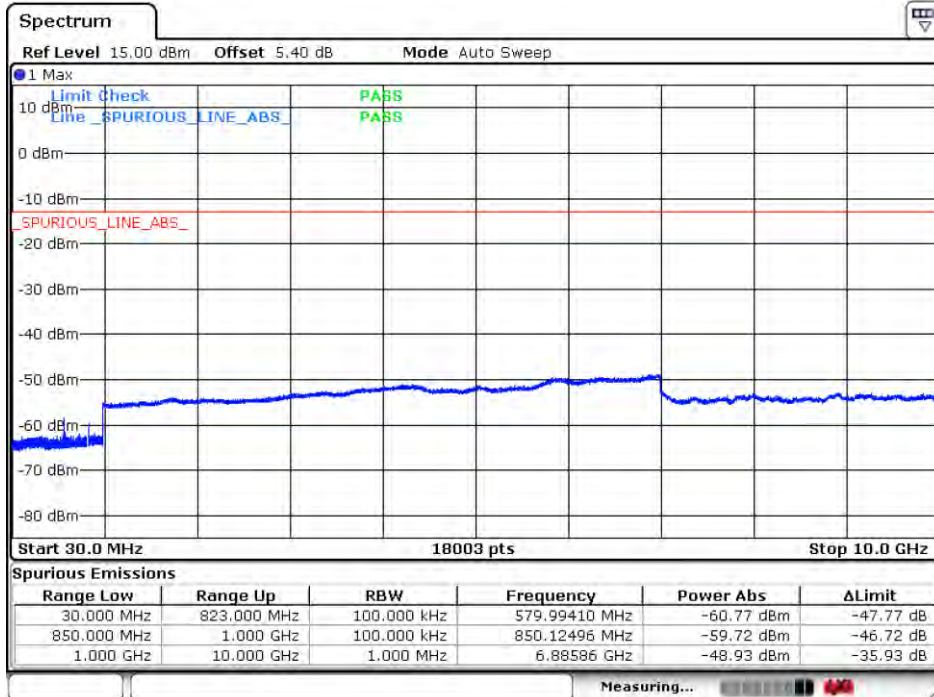
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LTE-NB1/QPSK. Sub-carrier spacing=15kHz-Test Channel=27039-T size=1T0



Date: 23.SEP.2019 13:28:58

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7 Field Strength of Spurious Radiation

7.1 For LTE-NB1

7.1.1 Test Band = LTE-NB1 Band 26

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

7.1.1.1.1 Test Channel = 26791

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Over Limit (dB)	Polarization
111.6059	-63.12	-13.00	50.12	Vertical
639.0400	-58.76	-13.00	45.76	Vertical
1162.3733	-63.22	-13.00	50.22	Vertical
2430.1929	-44.89	-13.00	31.89	Vertical
7286.3134	-54.37	-13.00	41.37	Vertical
8602.0058	-46.24	-13.00	33.24	Vertical
40.0835	-66.30	-13.00	53.30	Horizontal
236.6457	-67.47	-13.00	54.47	Horizontal
1163.8142	-67.48	-13.00	54.48	Horizontal
2470.2109	-41.13	-13.00	28.13	Horizontal
5838.2387	-51.04	-13.00	38.04	Horizontal
8726.8185	-46.21	-13.00	33.21	Horizontal

7.1.1.1.2 Test Channel = 26915

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Over Limit (dB)	Polarization
108.5350	-60.24	-13.00	47.24	Vertical
643.5012	-67.00	-13.00	54.00	Vertical
1169.1108	-61.29	-13.00	48.29	Vertical
2431.4429	-43.86	-13.00	30.86	Vertical
7285.5352	-55.34	-13.00	42.34	Vertical
8600.8333	-53.78	-13.00	40.78	Vertical
45.0973	-62.00	-13.00	49.00	Horizontal
237.5028	-70.60	-13.00	57.60	Horizontal
1168.6223	-62.90	-13.00	49.90	Horizontal
2474.3890	-40.02	-13.00	27.02	Horizontal
5835.9012	-53.81	-13.00	40.81	Horizontal
8723.0092	-52.28	-13.00	39.28	Horizontal



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7.1.1.1.3 Test Channel = 27039

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Over Limit (dB)	Polarization
110.0290	-62.89	-13.00	49.89	Vertical
643.2647	-62.75	-13.00	49.75	Vertical
1166.4333	-63.97	-13.00	50.97	Vertical
2434.2869	-48.61	-13.00	35.61	Vertical
7281.3427	-52.42	-13.00	39.42	Vertical
8605.7869	-50.37	-13.00	37.37	Vertical
42.4166	-63.90	-13.00	50.90	Horizontal
239.5305	-67.52	-13.00	54.52	Horizontal
1166.4333	-64.32	-13.00	51.32	Horizontal
2475.0950	-43.47	-13.00	30.47	Horizontal
5836.0945	-55.71	-13.00	42.71	Horizontal
8726.9909	-50.82	-13.00	37.82	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 26	180KHz	BPSK/15KHz	26791	12T0	VL	TN	9.15	0.01111	±2.5	PASS
NB1 Band 26	180KHz	BPSK/15KHz	26791	12T0	VN	TN	-4.60	-0.00559	±2.5	PASS
NB1 Band 26	180KHz	BPSK/15KHz	26791	12T0	VH	TN	-1.83	-0.00222	±2.5	PASS
NB1 Band 26	180KHz	BPSK/15KHz	26915	12T0	VL	TN	7.15	0.00855	±2.5	PASS
NB1 Band 26	180KHz	BPSK/15KHz	26915	12T0	VN	TN	4.22	0.00505	±2.5	PASS
NB1 Band 26	180KHz	BPSK/15KHz	26915	12T0	VH	TN	-2.52	-0.00301	±2.5	PASS
NB1 Band 26	180KHz	BPSK/15KHz	27039	12T0	VL	TN	8.09	0.00953	±2.5	PASS
NB1 Band 26	180KHz	BPSK/15KHz	27039	12T0	VN	TN	-1.80	-0.00212	±2.5	PASS
NB1 Band 26	180KHz	BPSK/15KHz	27039	12T0	VH	TN	-8.93	-0.01052	±2.5	PASS
NB1 Band 26	180KHz	QPSK/15KHz	26791	12T0	VL	TN	-9.35	-0.01135	±2.5	PASS
NB1 Band 26	180KHz	QPSK/15KHz	26791	12T0	VN	TN	-3.91	-0.00475	±2.5	PASS
NB1 Band 26	180KHz	QPSK/15KHz	26791	12T0	VH	TN	-2.50	-0.00303	±2.5	PASS
NB1 Band 26	180KHz	QPSK/15KHz	26915	12T0	VL	TN	1.58	0.00189	±2.5	PASS
NB1 Band 26	180KHz	QPSK/15KHz	26915	12T0	VN	TN	4.90	0.00585	±2.5	PASS
NB1 Band 26	180KHz	QPSK/15KHz	26915	12T0	VH	TN	1.94	0.00232	±2.5	PASS
NB1 Band 26	180KHz	QPSK/15KHz	27039	12T0	VL	TN	-0.94	-0.00111	±2.5	PASS
NB1 Band 26	180KHz	QPSK/15KHz	27039	12T0	VN	TN	8.35	0.00984	±2.5	PASS
NB1 Band 26	180KHz	QPSK/15KHz	27039	12T0	VH	TN	3.59	0.00423	±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 26	180KHz	BPSK/15KHz	26791	12T0	NV	-30	1.91	0.00232	±2.5	PASS
NB1 Band 26	180KHz	BPSK/15KHz	26791	12T0	NV	-20	-4.10	-0.00497	±2.5	PASS
NB1 Band 26	180KHz	BPSK/15KHz	26791	12T0	NV	0	-0.16	-0.00019	±2.5	PASS
NB1 Band 26	180KHz	BPSK/15KHz	26791	12T0	NV	10	-4.96	-0.00601	±2.5	PASS
NB1 Band 26	180KHz	BPSK/15KHz	26791	12T0	NV	20	6.15	0.00746	±2.5	PASS
NB1 Band 26	180KHz	BPSK/15KHz	26791	12T0	NV	30	-7.42	-0.00901	±2.5	PASS
NB1 Band 26	180KHz	BPSK/15KHz	26791	12T0	NV	40	-2.98	-0.00361	±2.5	PASS
NB1 Band 26	180KHz	BPSK/15KHz	26791	12T0	NV	50	-6.16	-0.00748	±2.5	PASS
NB1 Band 26	180KHz	BPSK/15KHz	26915	12T0	NV	-30	-8.49	-0.01031	±2.5	PASS
NB1 Band 26	180KHz	BPSK/15KHz	26915	12T0	NV	-20	4.54	0.00543	±2.5	PASS
NB1 Band 26	180KHz	BPSK/15KHz	26915	12T0	NV	0	-5.25	-0.00627	±2.5	PASS
NB1 Band 26	180KHz	BPSK/15KHz	26915	12T0	NV	10	-6.16	-0.00737	±2.5	PASS
NB1 Band 26	180KHz	BPSK/15KHz	26915	12T0	NV	20	2.15	0.00257	±2.5	PASS
NB1 Band 26	180KHz	BPSK/15KHz	26915	12T0	NV	30	3.20	0.00382	±2.5	PASS
NB1 Band 26	180KHz	BPSK/15KHz	26915	12T0	NV	40	-6.93	-0.00828	±2.5	PASS
NB1 Band 26	180KHz	BPSK/15KHz	26915	12T0	NV	50	0.13	0.00015	±2.5	PASS
NB1 Band 26	180KHz	BPSK/15KHz	27039	12T0	NV	-30	5.91	0.00706	±2.5	PASS
NB1 Band 26	180KHz	BPSK/15KHz	27039	12T0	NV	-20	-5.66	-0.00677	±2.5	PASS
NB1 Band 26	180KHz	BPSK/15KHz	27039	12T0	NV	0	1.02	0.00120	±2.5	PASS



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NB1 Band 26	180KHz	BPSK/15KHz	27039	12T0	NV	10	-9.86	-0.01162	±2.5	PASS
NB1 Band 26	180KHz	BPSK/15KHz	27039	12T0	NV	20	4.73	0.00557	±2.5	PASS
NB1 Band 26	180KHz	BPSK/15KHz	27039	12T0	NV	30	-6.16	-0.00725	±2.5	PASS
NB1 Band 26	180KHz	BPSK/15KHz	27039	12T0	NV	40	4.40	0.00518	±2.5	PASS
NB1 Band 26	180KHz	BPSK/15KHz	27039	12T0	NV	50	-9.81	-0.01156	±2.5	PASS
NB1 Band 26	180KHz	QPSK/15KHz	26791	12T0	NV	-30	-1.10	-0.00129	±2.5	PASS
NB1 Band 26	180KHz	QPSK/15KHz	26791	12T0	NV	-20	0.47	0.00055	±2.5	PASS
NB1 Band 26	180KHz	QPSK/15KHz	26791	12T0	NV	0	8.73	0.01029	±2.5	PASS
NB1 Band 26	180KHz	QPSK/15KHz	26791	12T0	NV	10	1.91	0.00232	±2.5	PASS
NB1 Band 26	180KHz	QPSK/15KHz	26791	12T0	NV	20	-4.10	-0.00497	±2.5	PASS
NB1 Band 26	180KHz	QPSK/15KHz	26791	12T0	NV	30	-0.16	-0.00019	±2.5	PASS
NB1 Band 26	180KHz	QPSK/15KHz	26791	12T0	NV	40	-4.96	-0.00601	±2.5	PASS
NB1 Band 26	180KHz	QPSK/15KHz	26791	12T0	NV	50	6.15	0.00746	±2.5	PASS
NB1 Band 26	180KHz	QPSK/15KHz	26915	12T0	NV	-30	-7.42	-0.00901	±2.5	PASS
NB1 Band 26	180KHz	QPSK/15KHz	26915	12T0	NV	-20	-2.98	-0.00361	±2.5	PASS
NB1 Band 26	180KHz	QPSK/15KHz	26915	12T0	NV	0	-6.16	-0.00748	±2.5	PASS
NB1 Band 26	180KHz	QPSK/15KHz	26915	12T0	NV	10	-8.49	-0.01031	±2.5	PASS
NB1 Band 26	180KHz	QPSK/15KHz	26915	12T0	NV	20	4.54	0.00543	±2.5	PASS
NB1 Band 26	180KHz	QPSK/15KHz	26915	12T0	NV	30	-5.25	-0.00627	±2.5	PASS
NB1 Band 26	180KHz	QPSK/15KHz	26915	12T0	NV	40	-6.16	-0.00737	±2.5	PASS
NB1 Band 26	180KHz	QPSK/15KHz	26915	12T0	NV	50	2.15	0.00257	±2.5	PASS
NB1 Band 26	180KHz	QPSK/15KHz	27039	12T0	NV	-30	3.20	0.00382	±2.5	PASS
NB1 Band 26	180KHz	QPSK/15KHz	27039	12T0	NV	-20	-6.93	-0.00828	±2.5	PASS
NB1 Band 26	180KHz	QPSK/15KHz	27039	12T0	NV	0	0.13	0.00015	±2.5	PASS
NB1 Band 26	180KHz	QPSK/15KHz	27039	12T0	NV	10	5.91	0.00706	±2.5	PASS
NB1 Band 26	180KHz	QPSK/15KHz	27039	12T0	NV	20	-5.66	-0.00677	±2.5	PASS
NB1 Band 26	180KHz	QPSK/15KHz	27039	12T0	NV	30	1.02	0.00120	±2.5	PASS
NB1 Band 26	180KHz	QPSK/15KHz	27039	12T0	NV	40	-9.86	-0.01162	±2.5	PASS
NB1 Band 26	180KHz	QPSK/15KHz	27039	12T0	NV	50	4.73	0.00557	±2.5	PASS

The End



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