Appendix B

LTE-NB1 BAND26(824MHz-849MHz)

CONTENT

Page

1 Effective (Isotropic) Radiated Power Output Data

Effective Isotropic Radiated Power of Transmitter (EIRP) for LTE-NB1 BAND26

Test Band	Test Mode	Sub-carrier Spacing (kHz)	Test channel	Number of T	Measured (dBm)	ERP (dBm)	limit (dBm)	Verdict
BAND26	TM1	3.75	LCH	1T0	22.85	19.3	38.45	PASS
				1T47	22.88	19.33	38.45	PASS
			MCH	1T0	22.91	19.36	38.45	PASS
				1T47	22.82	19.27	38.45	PASS
			HCH	1T0	22.81	19.26	38.45	PASS
				1T47	22.76	19.21	38.45	PASS
	TM2	3.75	LCH	1T0	22.71	19.16	38.45	PASS
				1T47	22.72	19.17	38.45	PASS
			MCH	1T0	22.78	19.23	38.45	PASS
				1T47	22.77	19.22	38.45	PASS
			HCH	1T0	22.84	19.29	38.45	PASS
				1T47	22.72	19.17	38.45	PASS

Test Band	Test Mode	Sub-carrier Spacin (kHz)	Test channel	Number of T	Measured (dBm)	ERP (dBm)	limit (dBm)	Verdict
BAND26	TM1	15	LCH	1T0	22.88	19.33	38.45	PASS
				1T11	22.75	19.2	38.45	PASS
			MCH	1T0	23.32	19.77	38.45	PASS
				1T11	23.29	19.74	38.45	PASS
			HCH	1T0	22.88	19.33	38.45	PASS
				1T11	22.91	19.36	38.45	PASS
	TM2	15	LCH	1T0	22.91	19.36	38.45	PASS
				1T11	22.84	19.29	38.45	PASS
				12T0	21.15	17.6	38.45	PASS
			MCH	1T0	23.27	19.72	38.45	PASS
				1T11	23.34	19.79	38.45	PASS
				12T0	21.45	17.9	38.45	PASS
			HCH	1T0	22.95	19.4	38.45	PASS
				1T11	23	19.45	38.45	PASS
				12T0	21.26	17.71	38.45	PASS

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

ERP [dBm] = SGP [dBm] – Cable Loss [dB] + Gain [dBd]

b: SGP=Signal Generator Level

2 Peak-to-Average Ratio

Part I - Test Results

Test Band	Test Mode	Test Channel	Measured[dB]	Limit [dB]	Verdict
BAND26	TM1/1T	LCH	4.67	13	PASS
		MCH	4.70	13	PASS
		HCH	4.72	13	PASS
	TM2/1T	LCH	4.70	13	PASS
		MCH	4.20	13	PASS
		HCH	4.72	13	PASS
	TM2/Full T	LCH	3.10	13	PASS
		MCH	3.36	13	PASS
		HCH	3.94	13	PASS

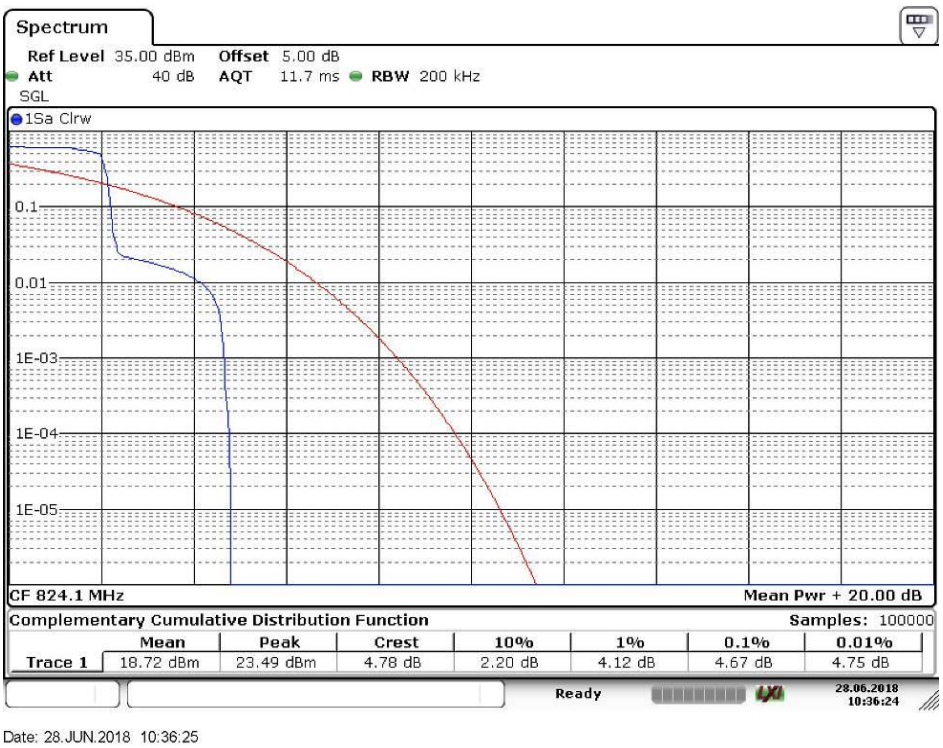
Part II - Test Plots

2.1 For LTE-NB1

2.1.1 Test Band = LTE-NB1 BAND26(824MHz-849MHz)

2.1.1.1 Test Mode = LTE-NB1/TM1.Sub-carrier spacing=15kHz.T size=1T0

2.1.1.1.1 Test Channel = LCH



Date: 28.JUN.2018 10:36:25

2.1.1.1.2 Test Channel = MCH

Date: 28.JUN.2018 10:37:32

2.1.1.1.3 Test Channel = HCH

Date: 28.JUN.2018 11:02:58

2.1.1.2 Test Mode = LTE-NB1/TM2.Sub-carrier spacing=15kHz.T size=1T0

2.1.1.2.1 Test Channel = LCH

Date: 28.JUN.2018 10:35:22

2.1.1.2.2 Test Channel = MCH

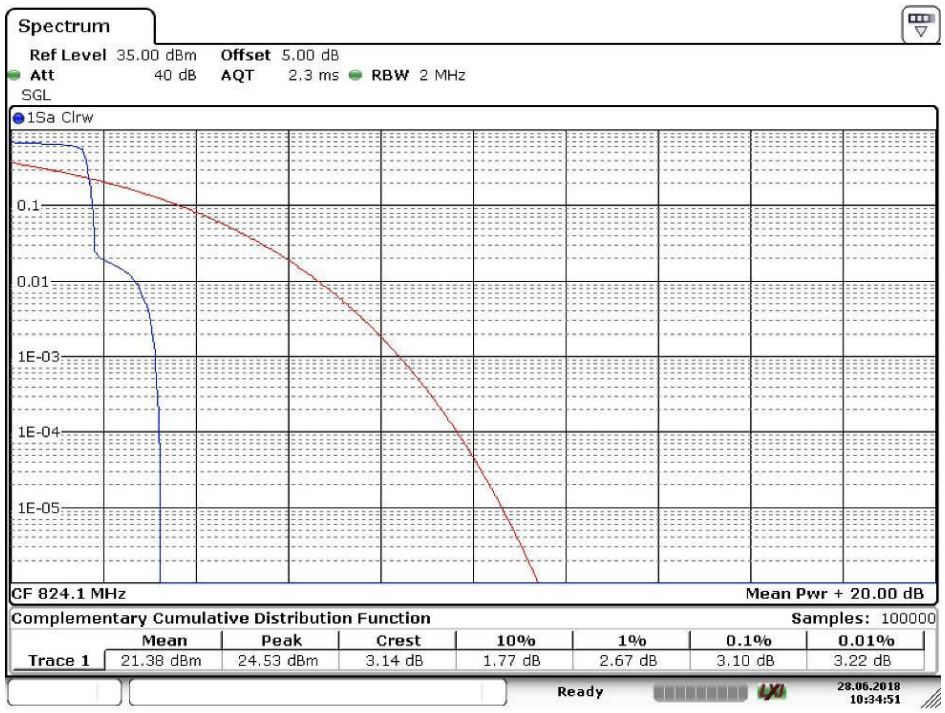
Date: 28.JUN.2018 10:37:56

2.1.1.2.3 Test Channel = HCH

Date: 28.JUN.2018 11:02:14

2.1.1.3 Test Mode = LTE-NB1/TM2.Sub-carrier spacing=15kHz.T size=12T0

2.1.1.3.1 Test Channel = LCH



Date: 28.JUN.2018 10:34:52

2.1.1.3.2 Test Channel = MCH

Date: 28.JUN.2018 10:39:09

2.1.1.3.3 Test Channel = HCH

Date: 28.JUN.2018 11:01:43

3 Modulation Characteristics

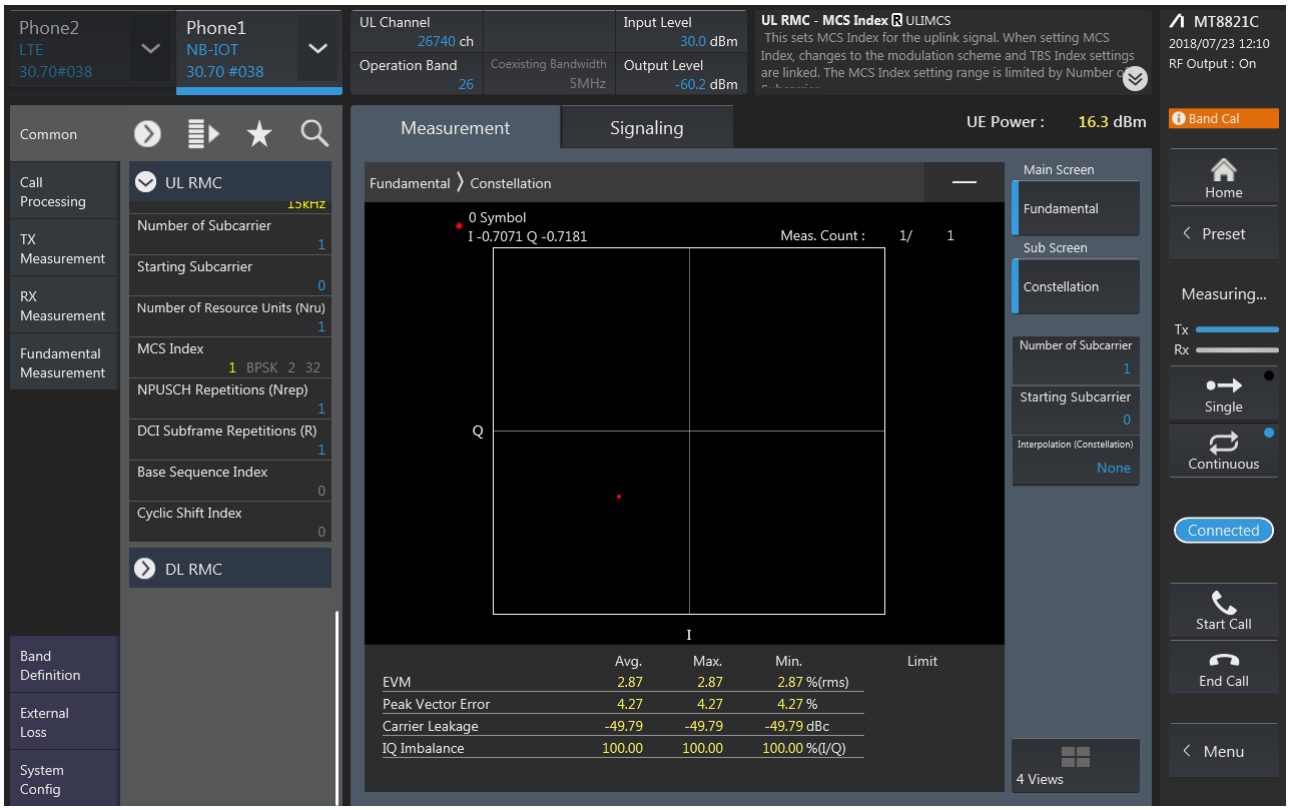
Part I - Test Plots

3.1 For LTE-NB1

3.1.1 Test Band = LTE-NB1 BAND26(824MHz-849MHz)

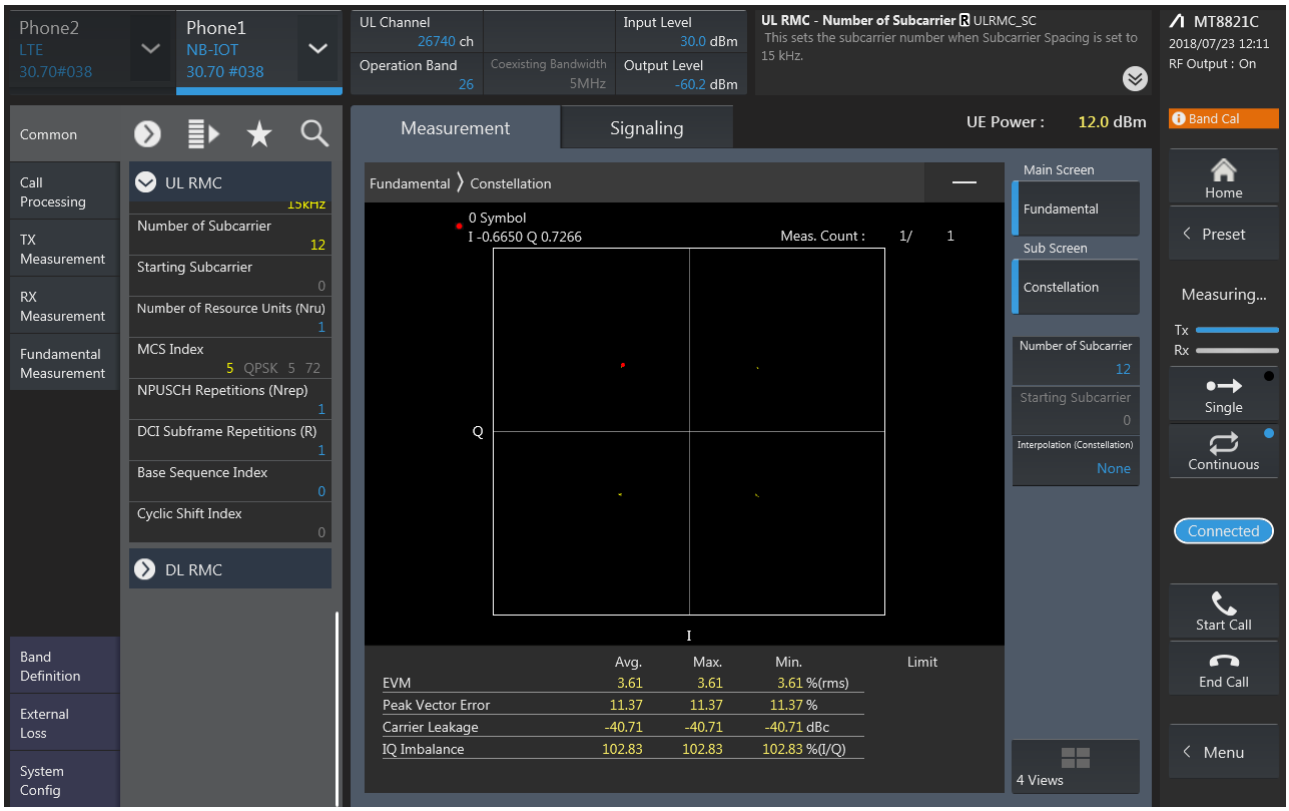
3.1.1.1 Test Mode = LTE-NB1/TM1.Sub-carrier spacing=15kHz.T size=1T0

3.1.1.1.1 Test Channel = MCH



3.1.1.2 Test Mode = LTE-NB1/TM2.Sub-carrier spacing=15kHz.T size=12T0

3.1.1.2.1 Test Channel = MCH



4 Bandwidth

Part I - Test Results

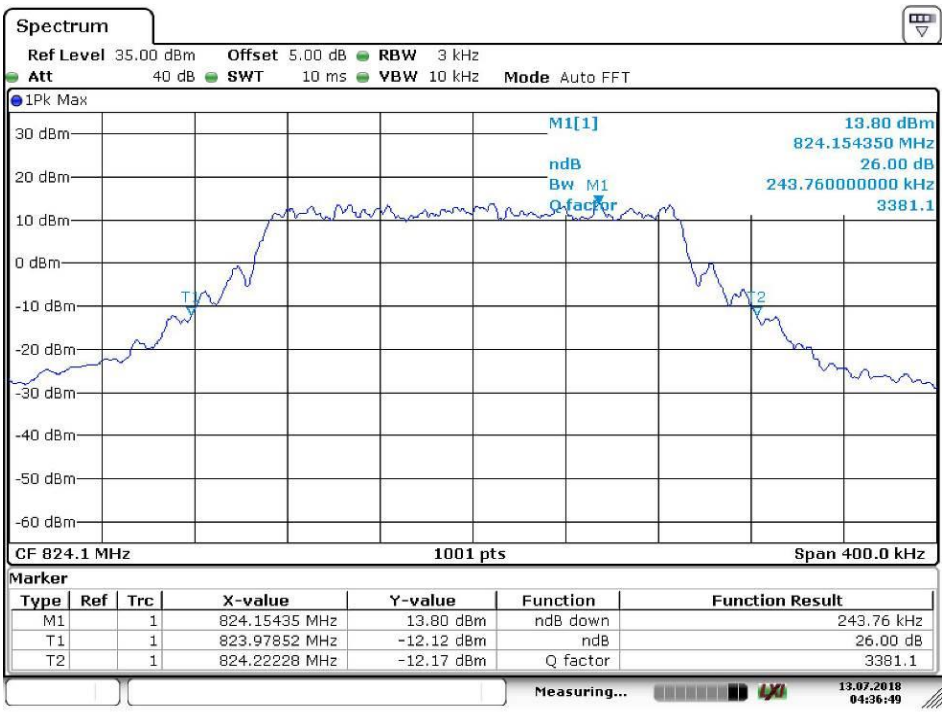
Test Band	Test Mode	Test Channel	Occupied Bandwidth [kHz]	Emission Bandwidth [kHz]	Verdict
Band 13	TM2/15kHz	LCH	185.01	243.76	PASS
		MCH	185.01	243.76	PASS
		HCH	185.01	243.36	PASS

4.1 For LTE-NB1

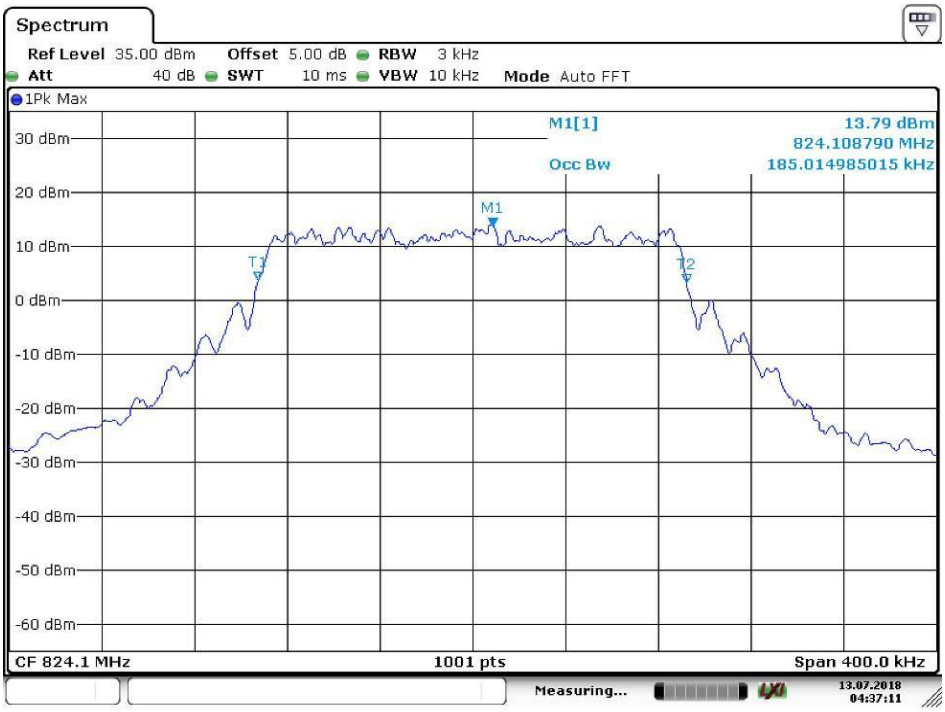
4.1.1 Test Band = LTE-NB1 BAND26(824MHz-849MHz)

4.1.1.1 Test Mode = LTE-NB1/TM2.Sub-carrier spacing=15kHz.T size=12T0

4.1.1.1.1 Test Channel = LCH

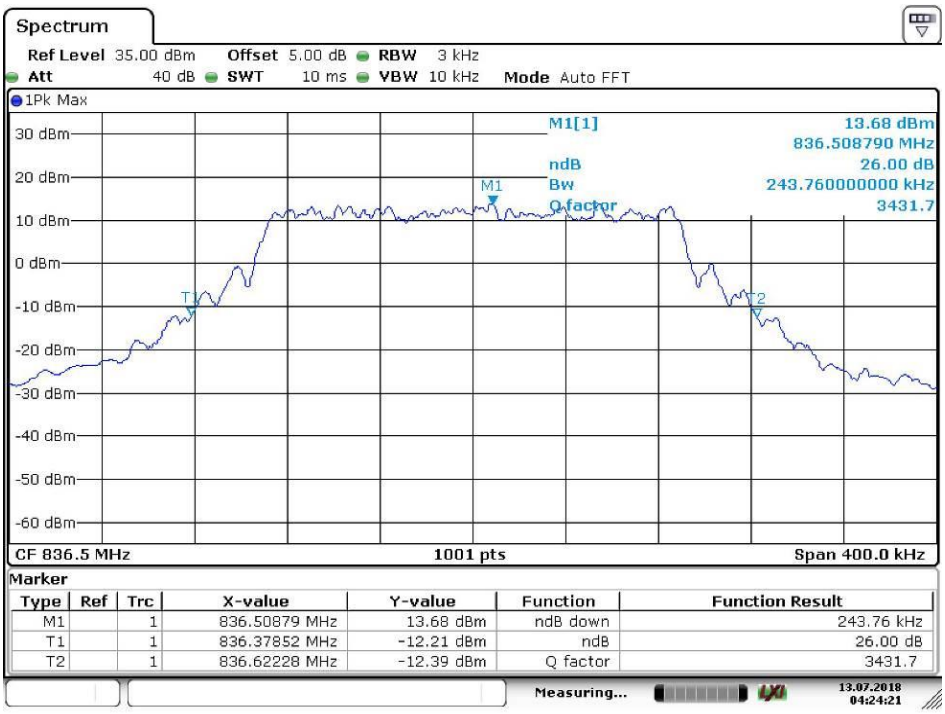


Date: 13.JUL.2018 04:36:49

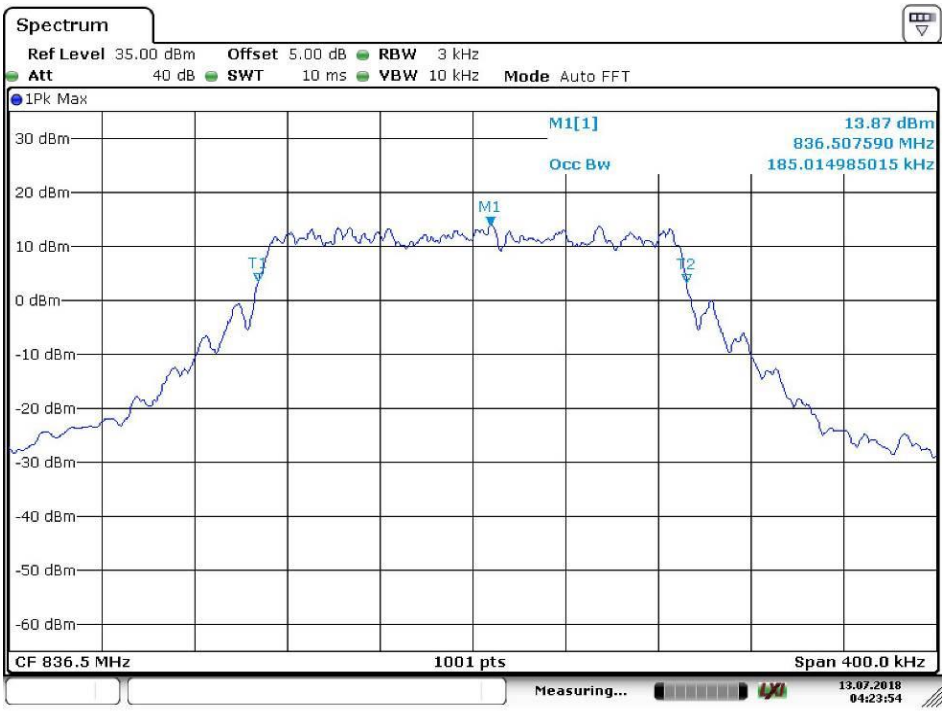


Date: 13.JUL.2018 04:37:11

4.1.1.1.2 Test Channel = MCH

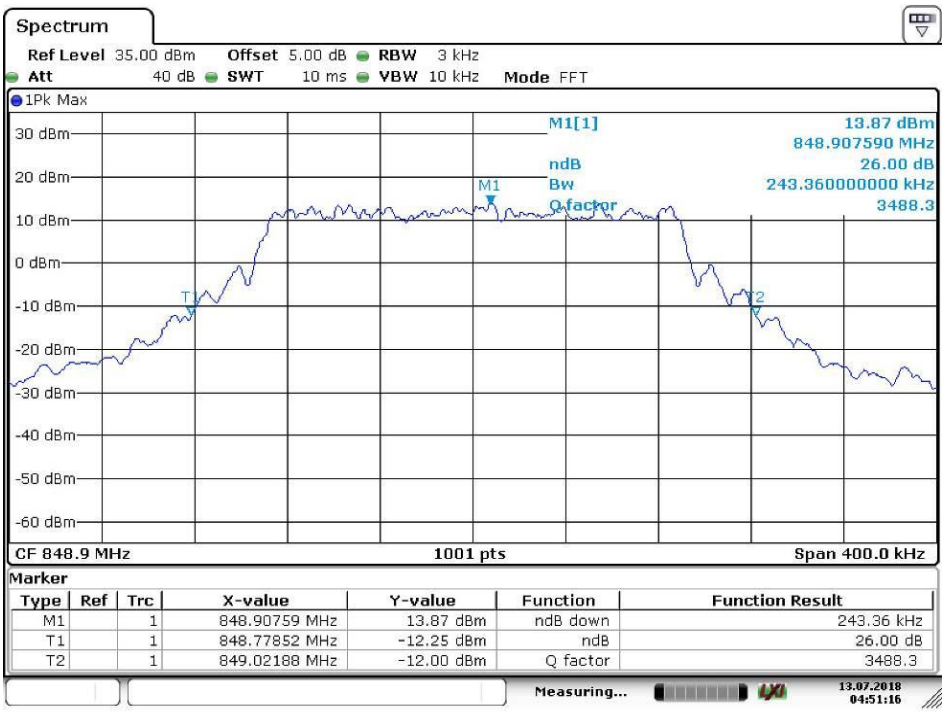


Date: 13.JUL.2018 04:24:21

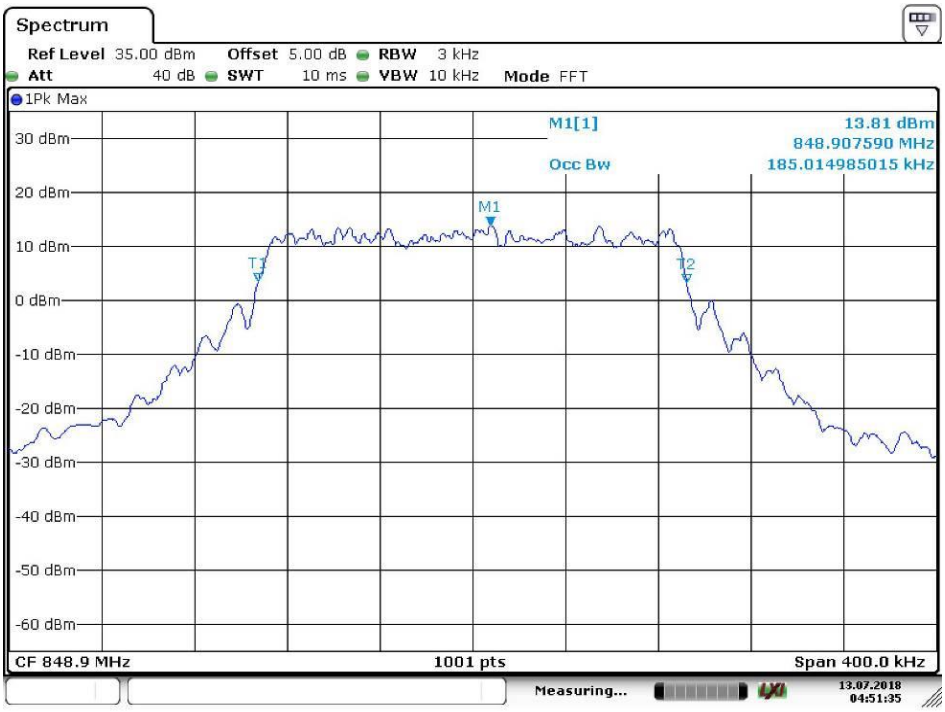


Date: 13.JUL.2018 04:23:54

4.1.1.1.3 Test Channel = HCH



Date: 13.JUL.2018 04:51:17



Date: 13.JUL.2018 04:51:35

5 Band Edges Compliance

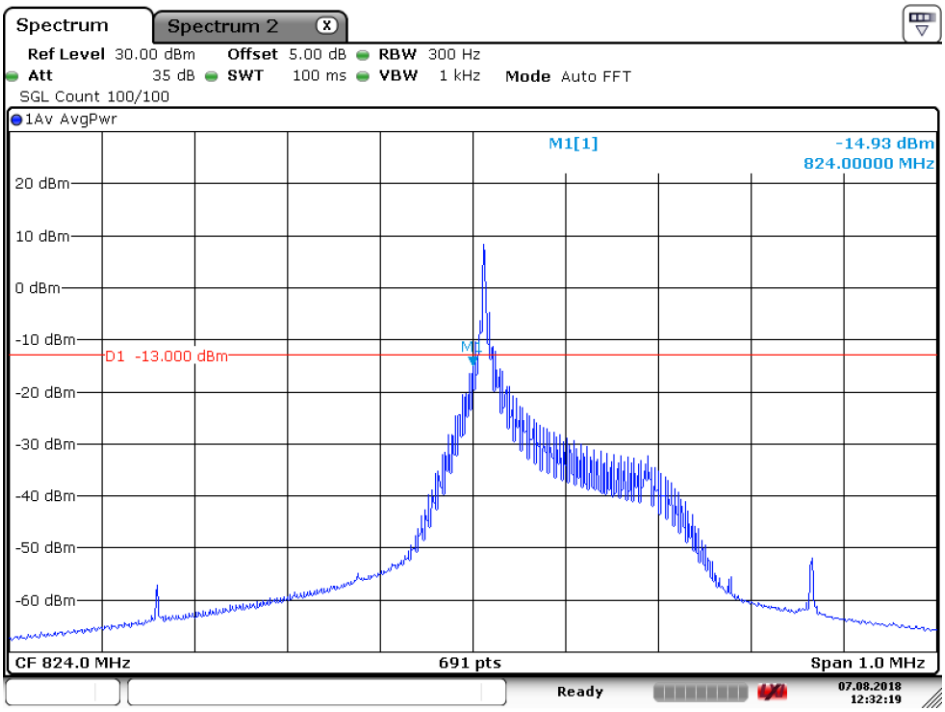
5.1 For LTE-NB1

5.1.1 Test Band = LTE-NB1 BAND26(824MHz-849MHz)

5.1.1.1 Test Mode = LTE-NB1/TM1.Sub-carrier spacing=3.75kHz

5.1.1.1.1 Test Channel = LCH

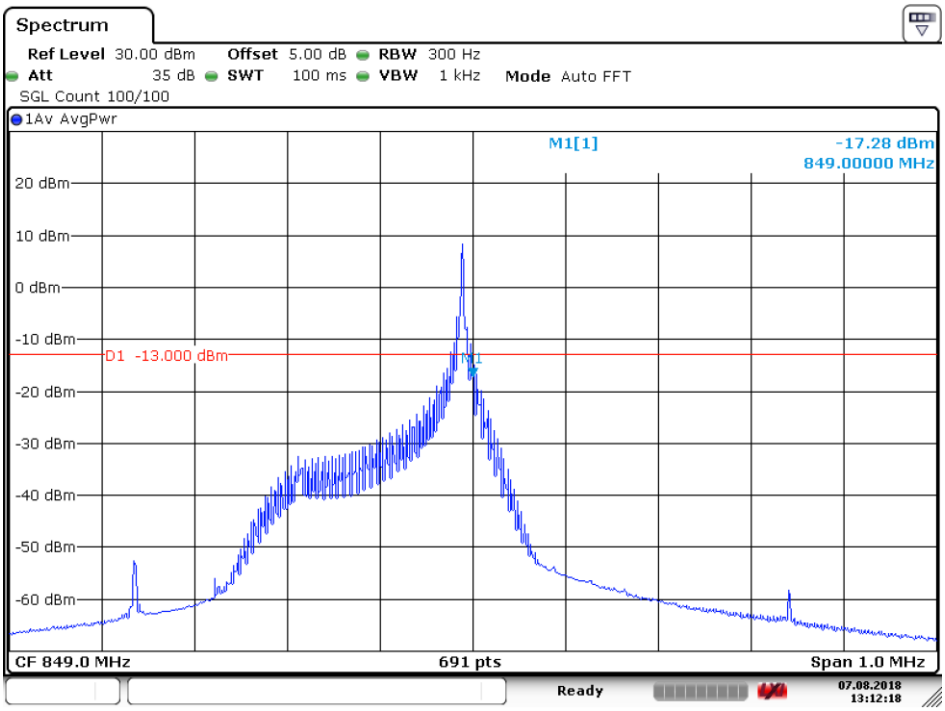
5.1.1.1.1.1 Test T size=1T



Date: 7.AUG.2018 12:32:20

5.1.1.1.2 Test Channel = HCH

5.1.1.1.2.1 Test T size=1T

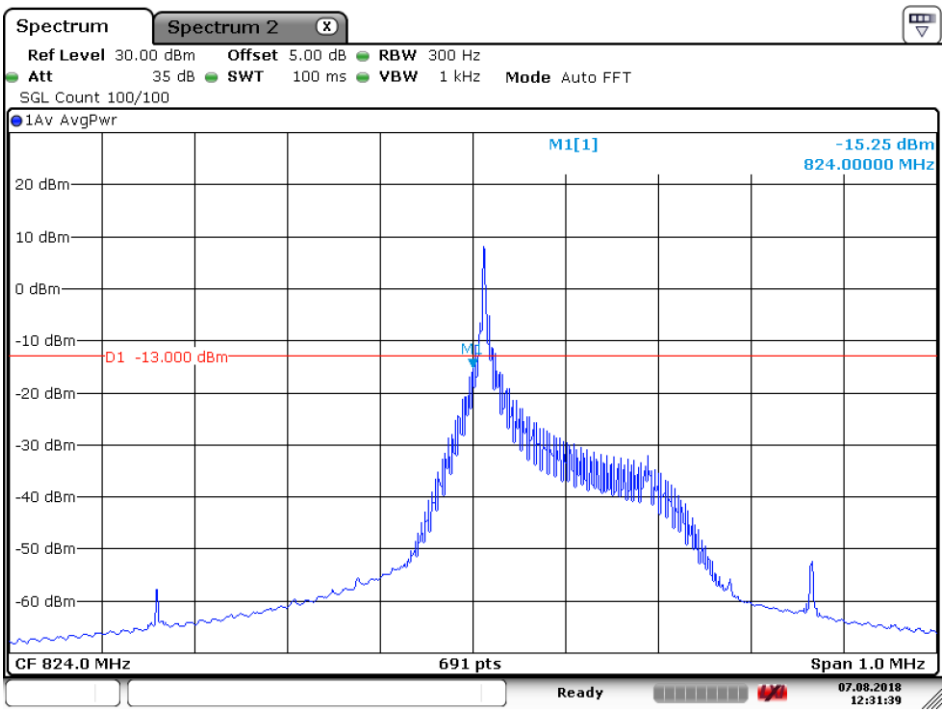


Date: 7.AUG.2018 13:12:19

5.1.1.2 Test Mode = LTE-NB1/TM2.Sub-carrier spacing=3.75kHz

5.1.1.2.1 Test Channel = LCH

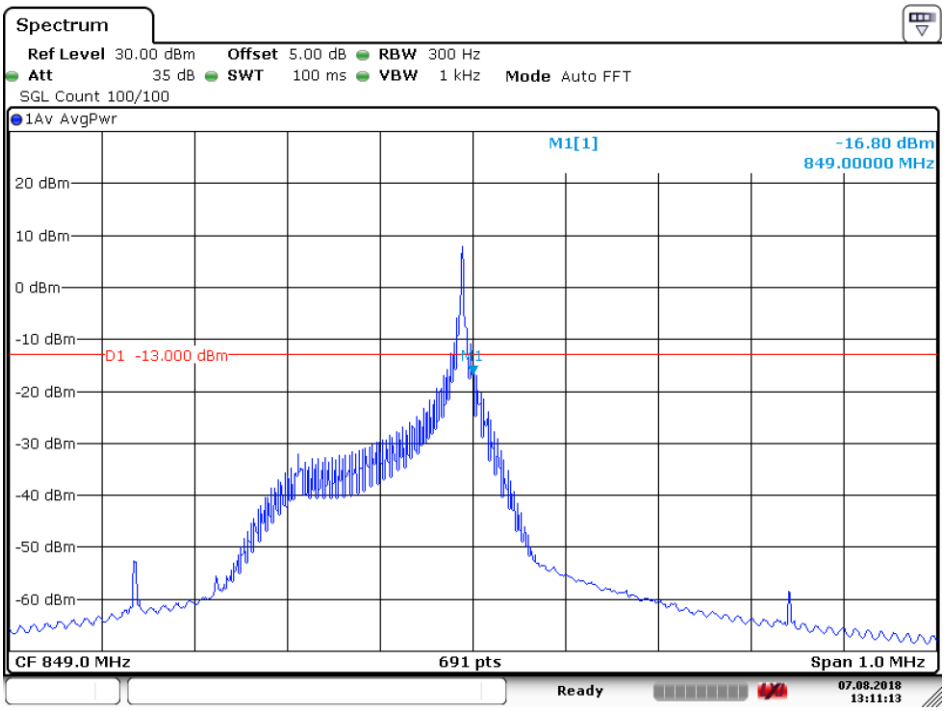
5.1.1.2.1.1 Test T size=1T



Date: 7.AUG.2018 12:31:39

5.1.1.2.2 Test Channel = HCH

5.1.1.2.2.1 Test T size=1T

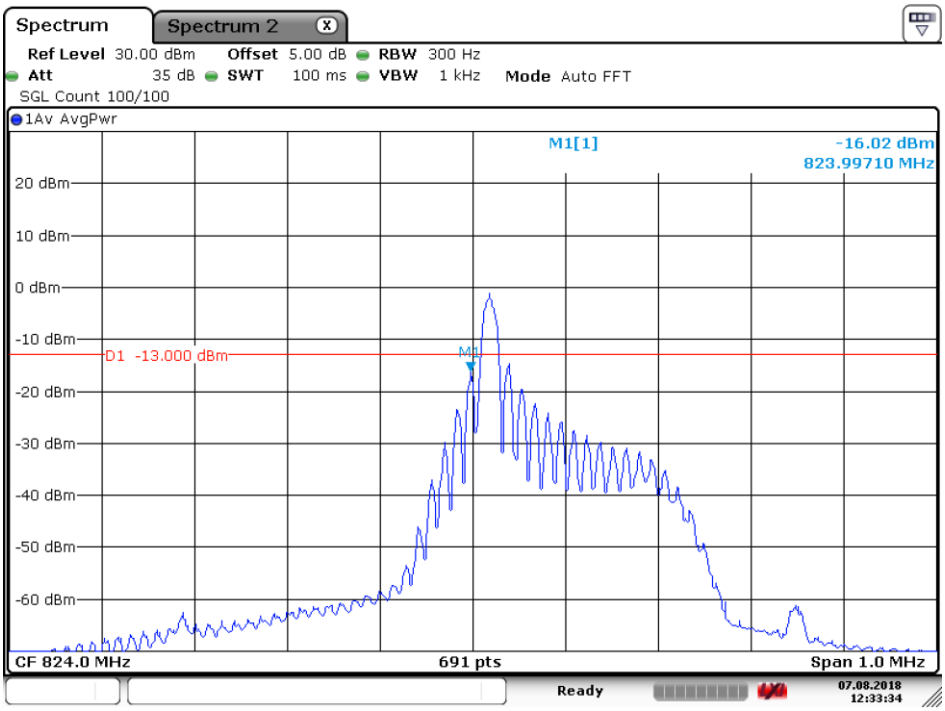


Date: 7.AUG.2018 13:11:13

5.1.1.3 Test Mode = LTE-NB1/TM1.Sub-carrier spacing=15kHz

5.1.1.3.1 Test Channel = LCH

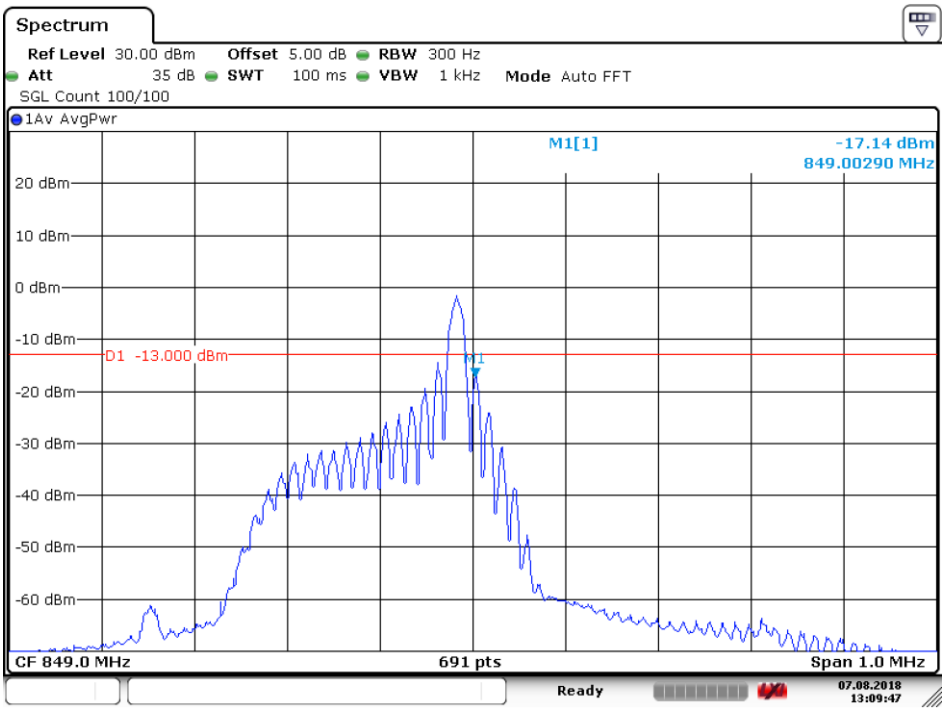
5.1.1.3.1.1 Test T size=1T



Date: 7.AUG.2018 12:33:35

5.1.1.3.2 Test Channel = HCH

5.1.1.3.2.1 Test T size=1T

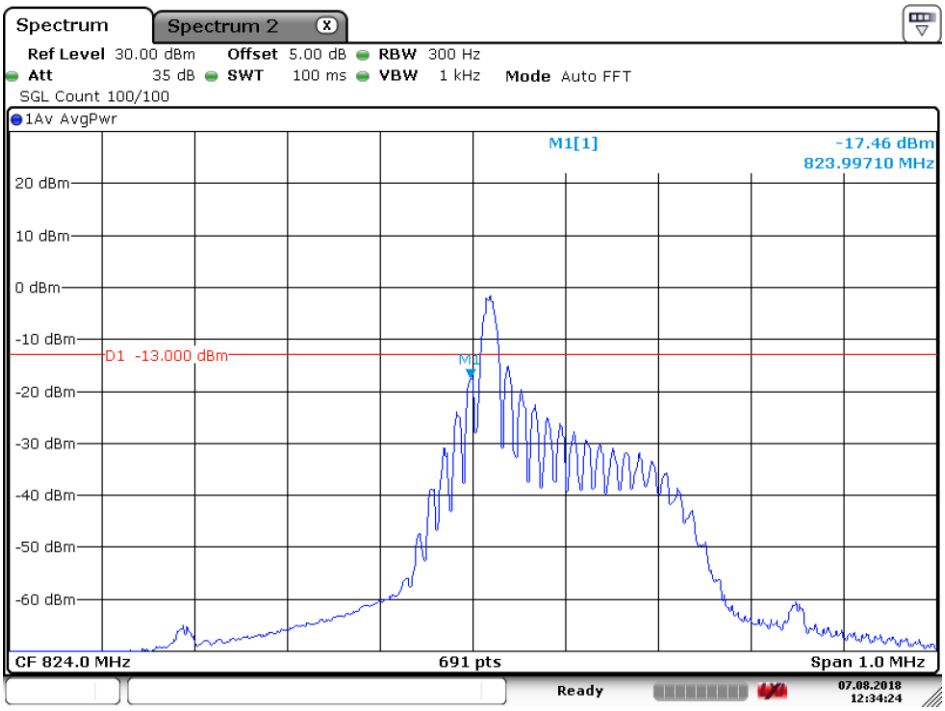


Date: 7.AUG.2018 13:09:47

5.1.1.4 Test Mode = LTE-NB1/TM2.Sub-carrier spacing=15kHz

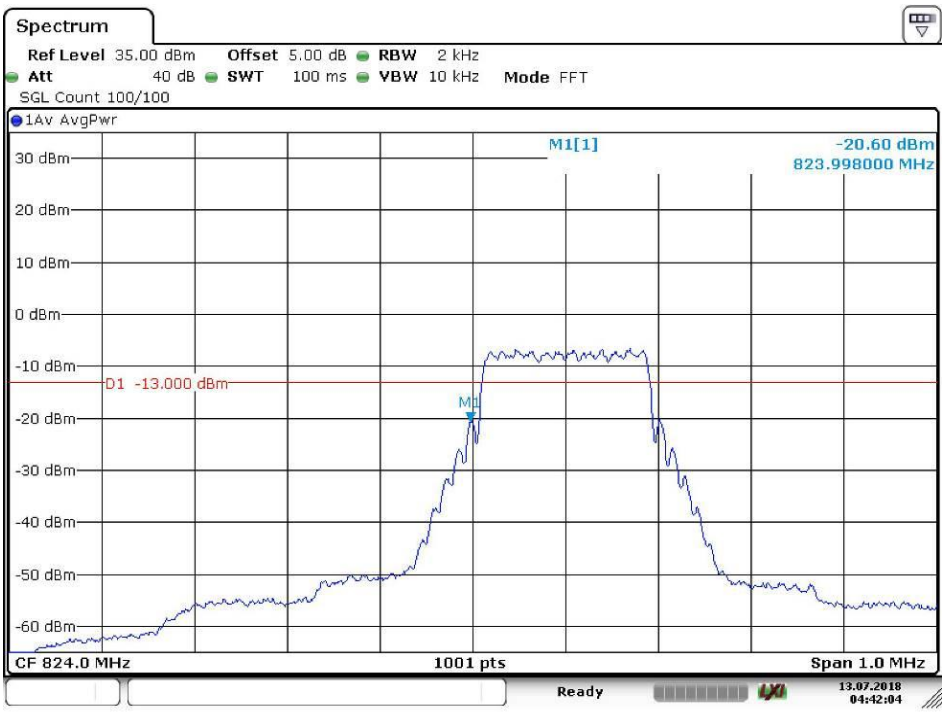
5.1.1.4.1 Test Channel = LCH

5.1.1.4.1.1 Test T size=1T



Date: 7.AUG.2018 12:34:25

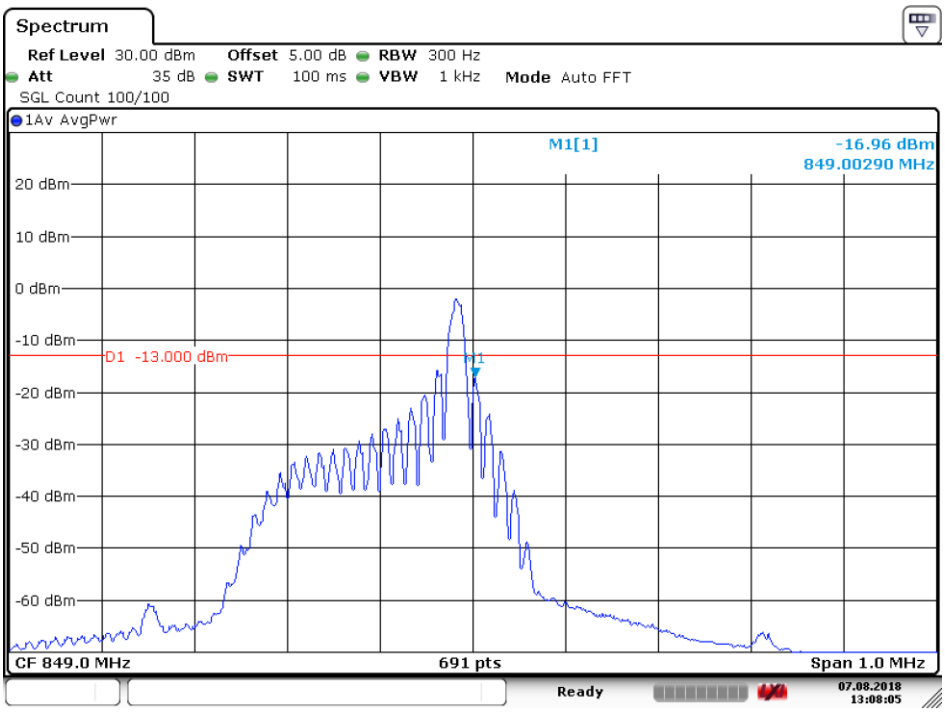
5.1.1.4.1.2 Test T size=Full T



Date: 13.JUL.2018 04:42:04

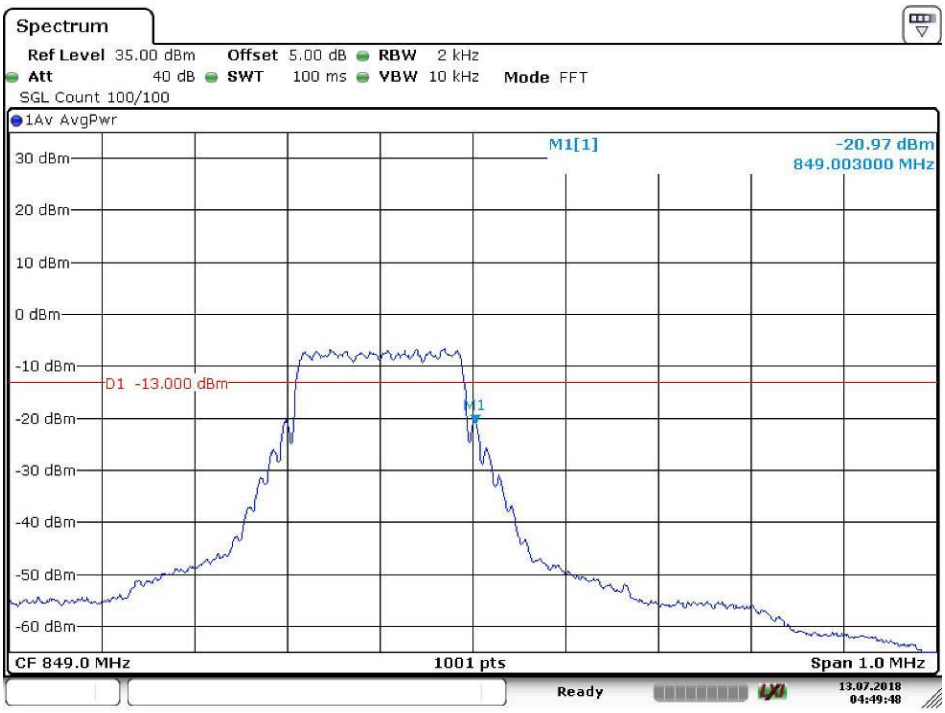
5.1.1.4.2 Test Channel = HCH

5.1.1.4.2.1 Test T size=1T



Date: 7.AUG.2018 13:08:05

5.1.1.4.2.2 Test T size=Full T



Date: 13.JUL.2018 04:49:49

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.

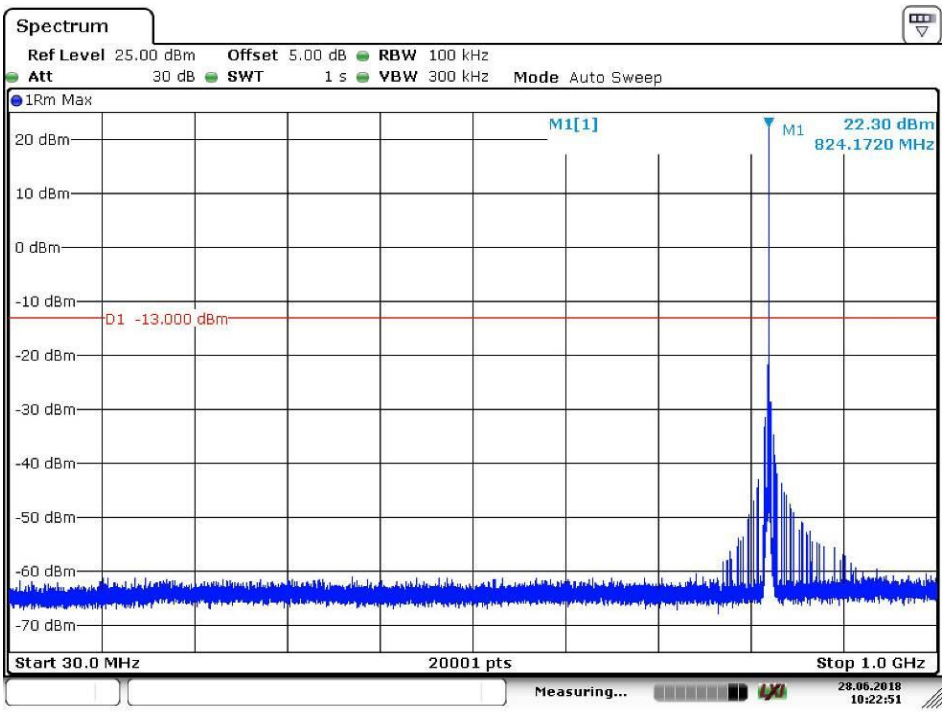
Part I - Test Plots

6.1 For LTE-NB1

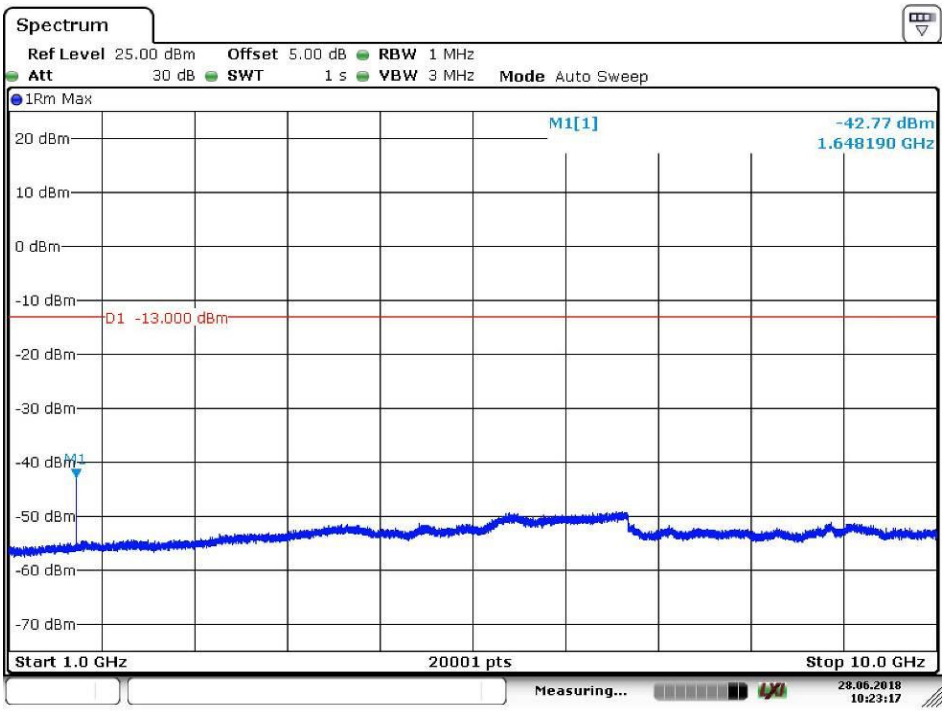
6.1.1 Test Band = LTE-NB1 BAND26(824MHz-849MHz)

6.1.1.1 Test Mode = LTE-NB1/TM1.Sub-carrier spacing=3.75kHz

6.1.1.1.1 Test Channel = LCH

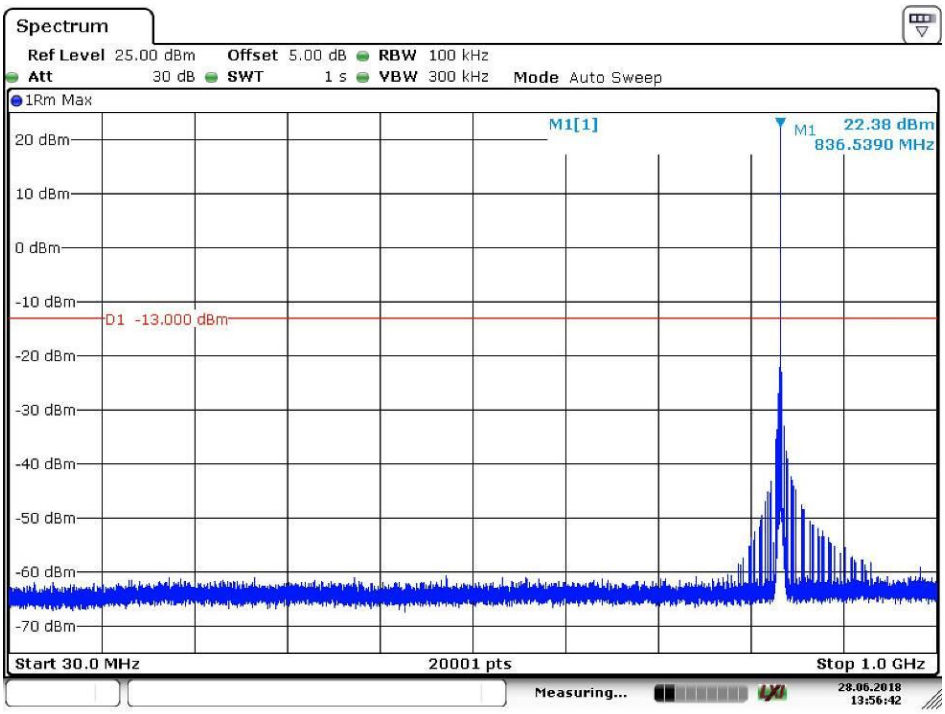


Date: 28.JUN.2018 10:22:51

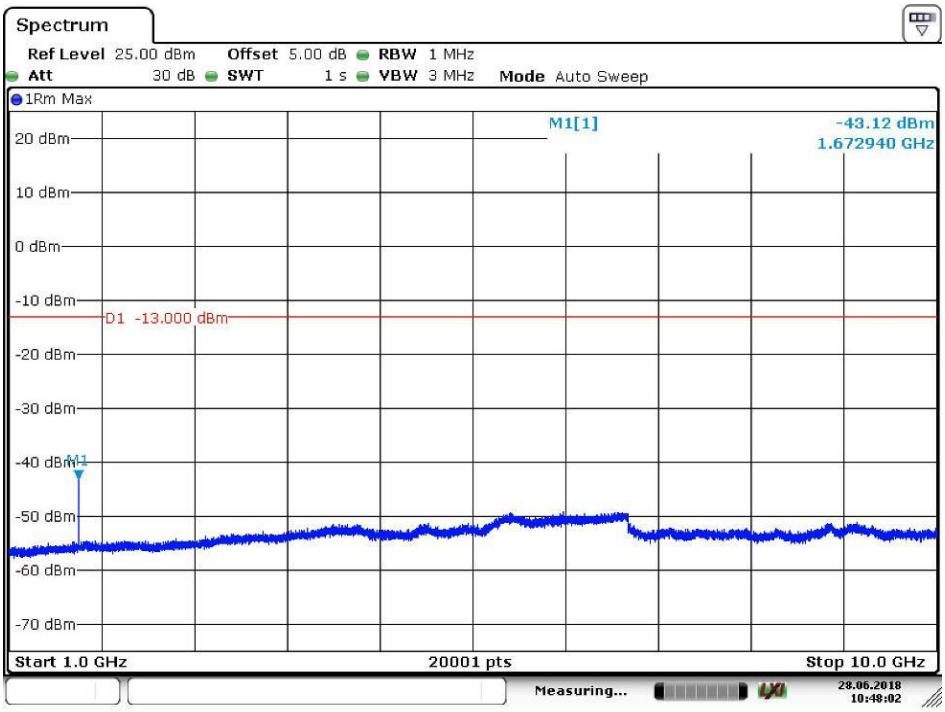


Date: 28.JUN.2018 10:23:18

6.1.1.1.2 Test Channel = MCH

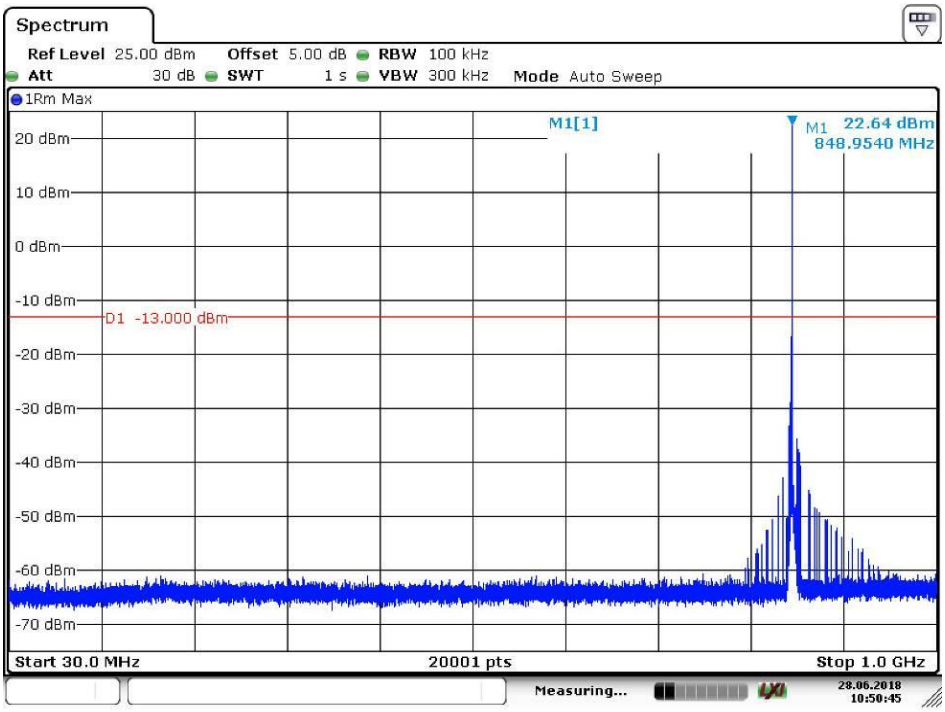


Date: 28.JUN.2018 13:56:42

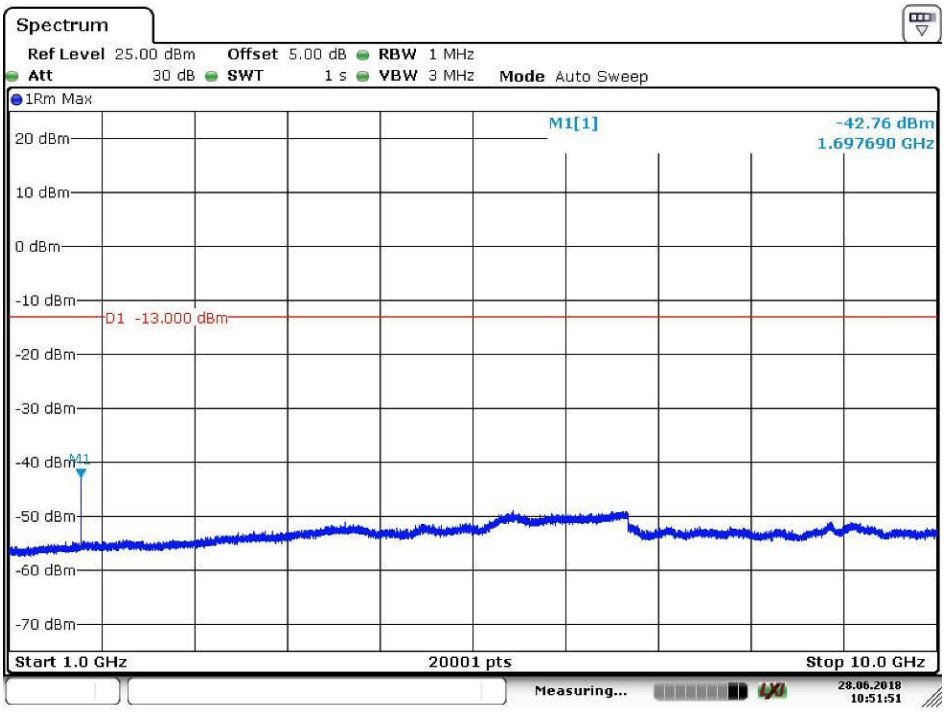


Date: 28.JUN.2018 10:48:03

6.1.1.1.3 Test Channel = HCH



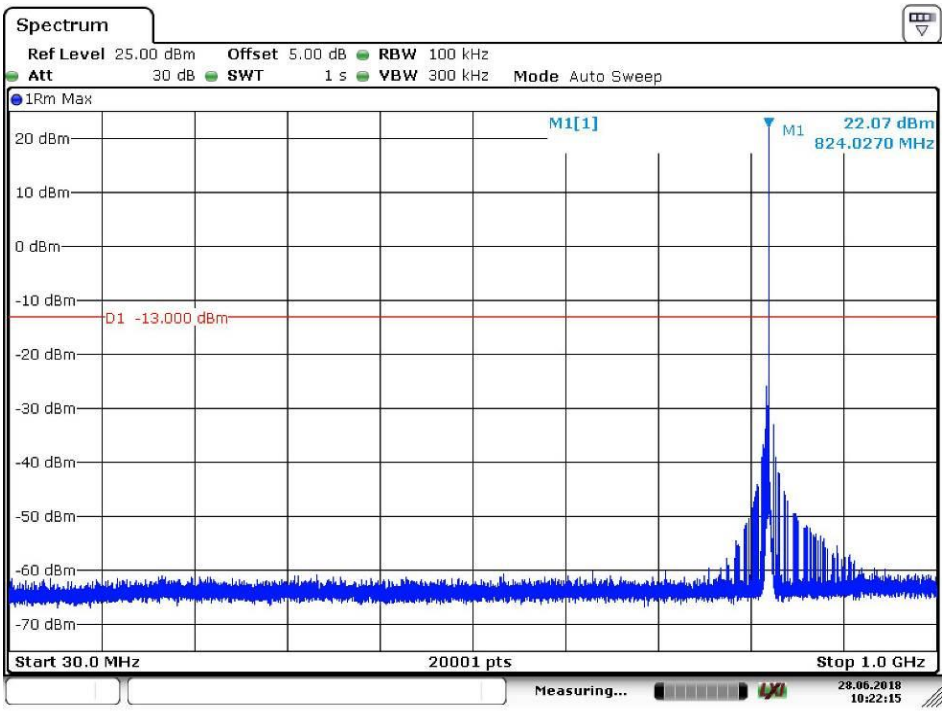
Date: 28.JUN.2018 10:50:46



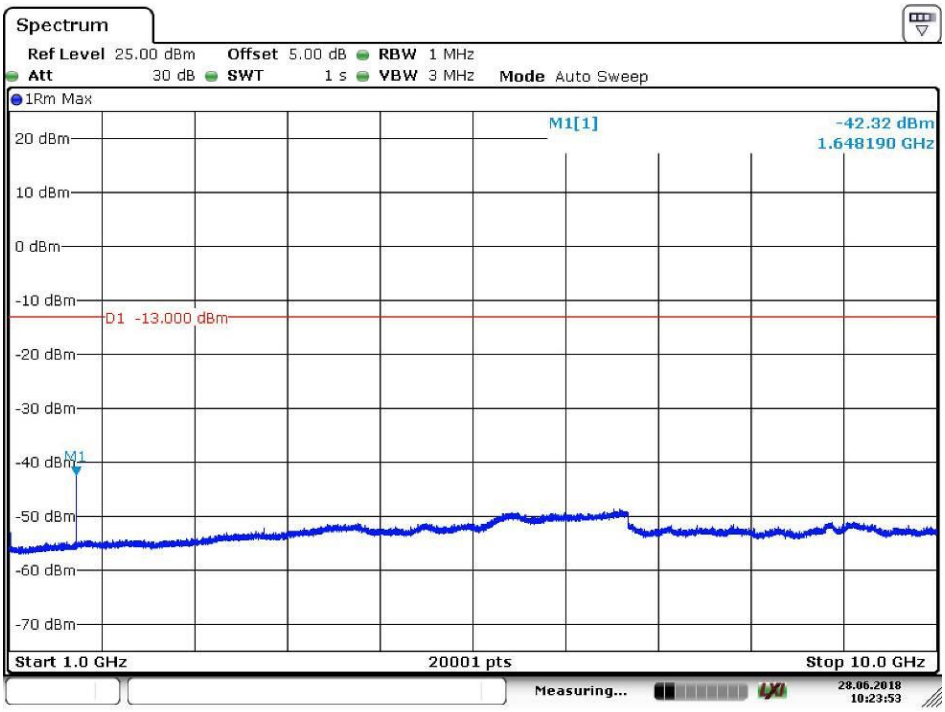
Date: 28.JUN.2018 10:51:51

6.1.1.2 Test Mode = LTE-NB1/TM2.Sub-carrier spacing=3.75kHz

6.1.1.2.1 Test Channel = LCH

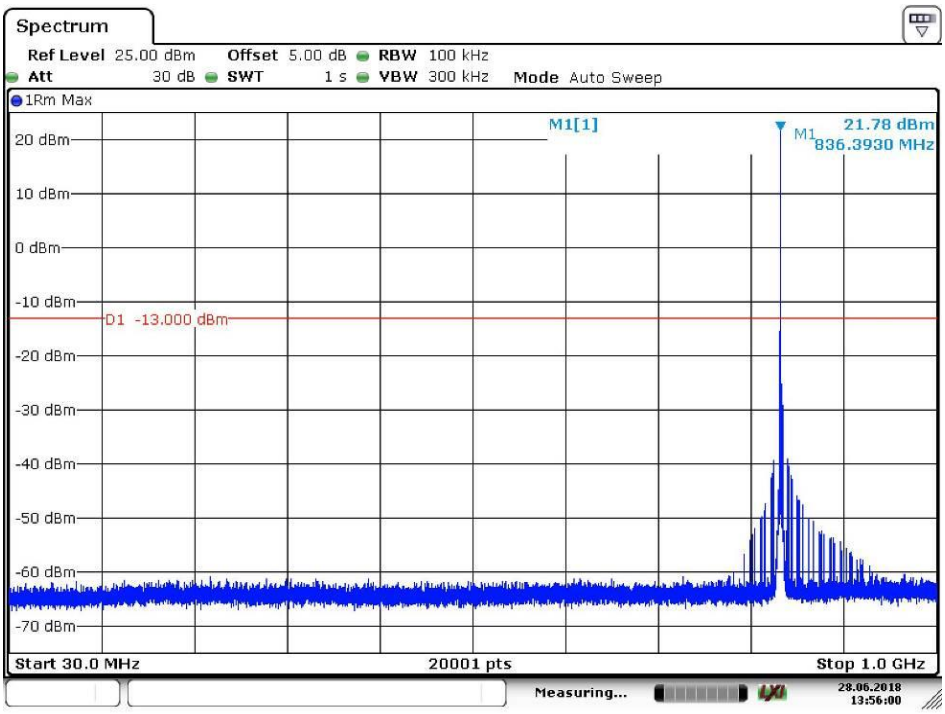


Date: 28.JUN.2018 10:22:15

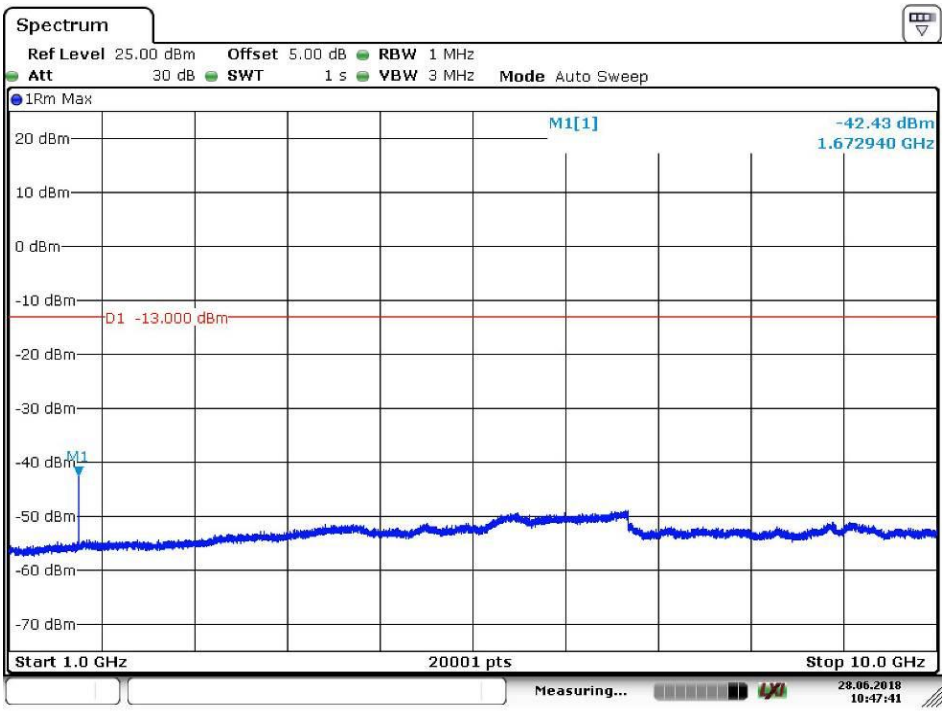


Date: 28.JUN.2018 10:23:53

6.1.1.2.2 Test Channel = MCH

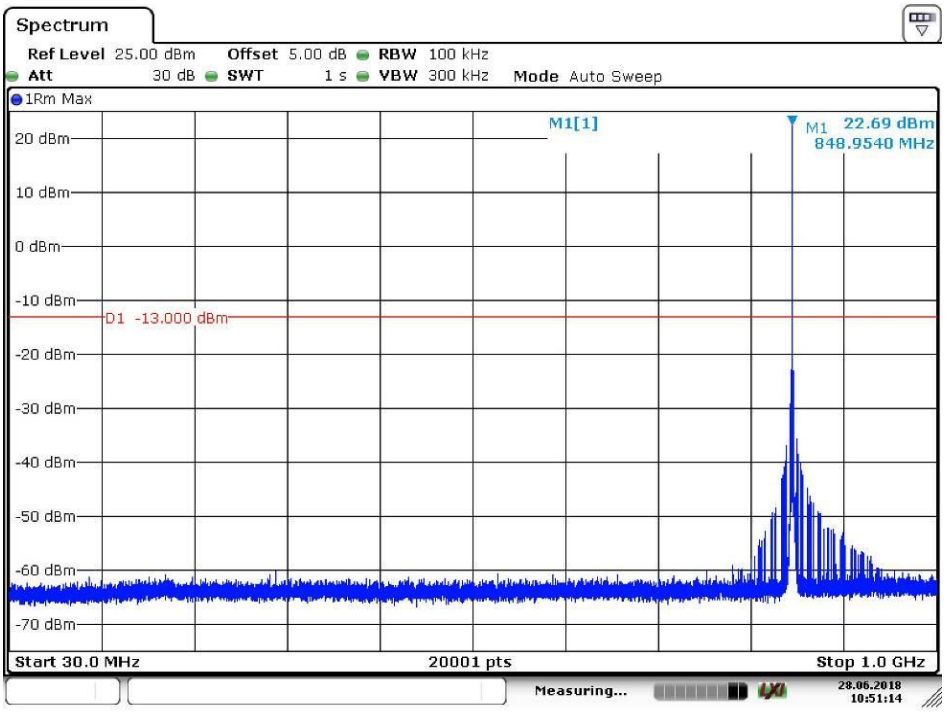


Date: 28.JUN.2018 13:56:00

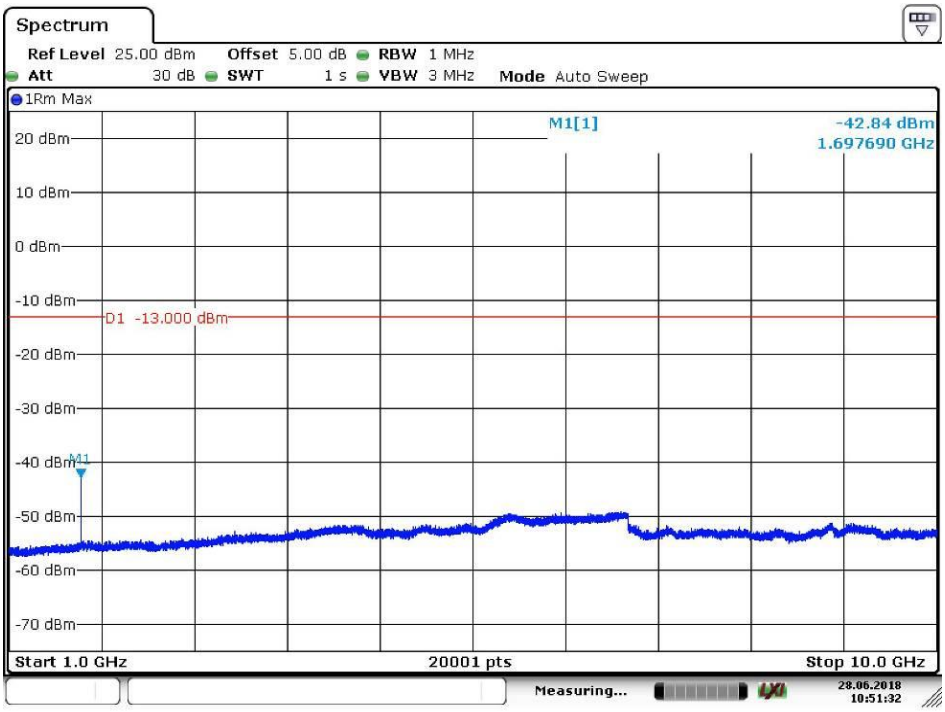


Date: 28.JUN.2018 10:47:41

6.1.1.2.3 Test Channel = HCH



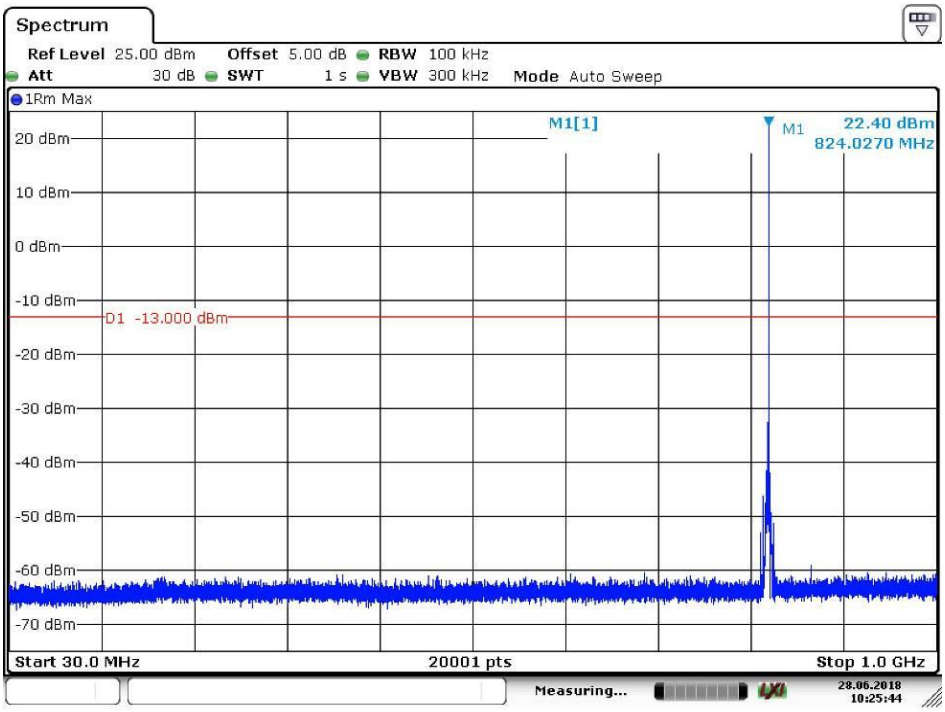
Date: 28.JUN.2018 10:51:14



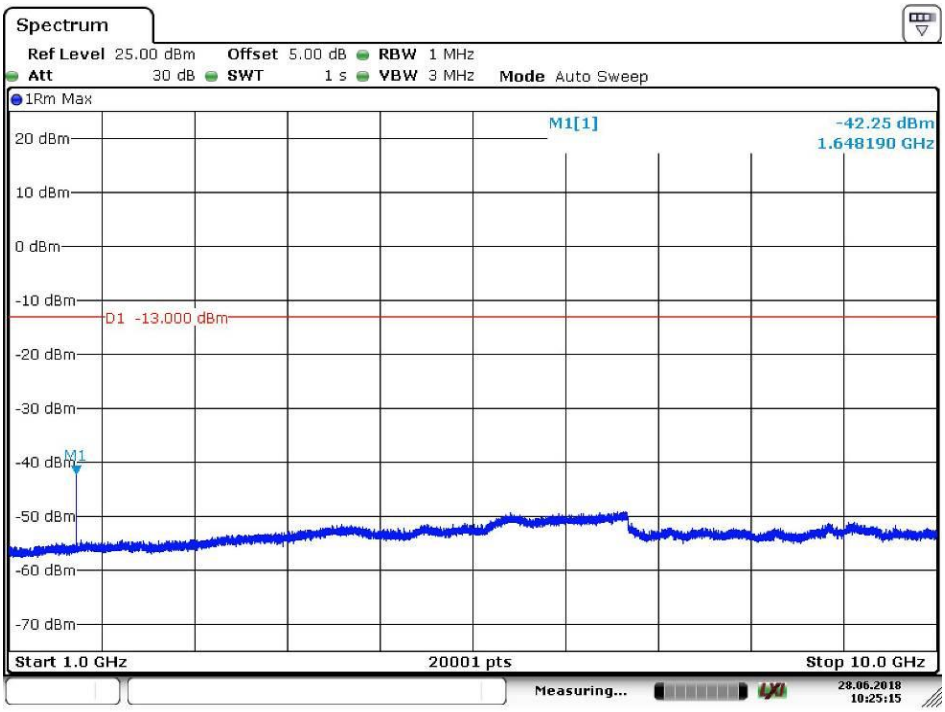
Date: 28.JUN.2018 10:51:32

6.1.1.3 Test Mode = LTE-NB1/TM1.Sub-carrier spacing=15kHz

6.1.1.3.1 Test Channel = LCH

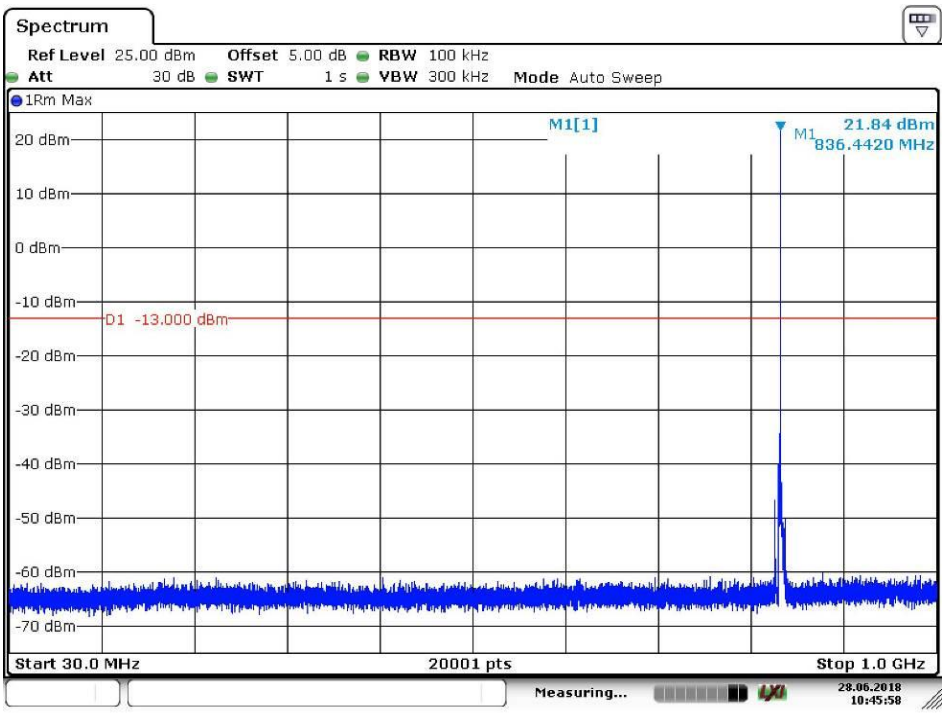


Date: 28.JUN.2018 10:25:44

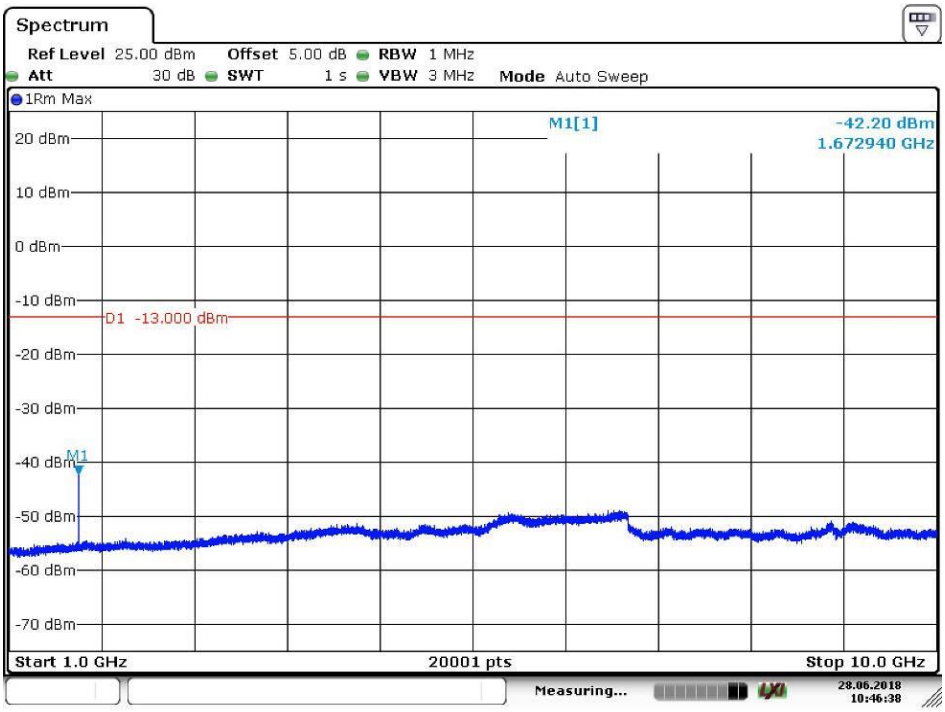


Date: 28.JUN.2018 10:25:15

6.1.1.3.2 Test Channel = MCH

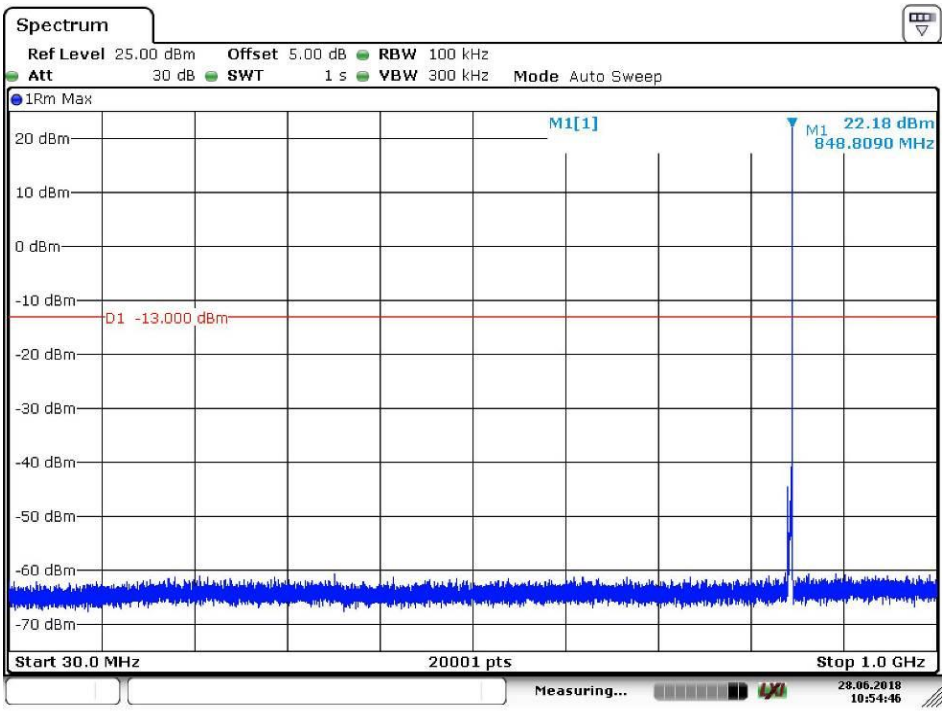


Date: 28.JUN.2018 10:45:59

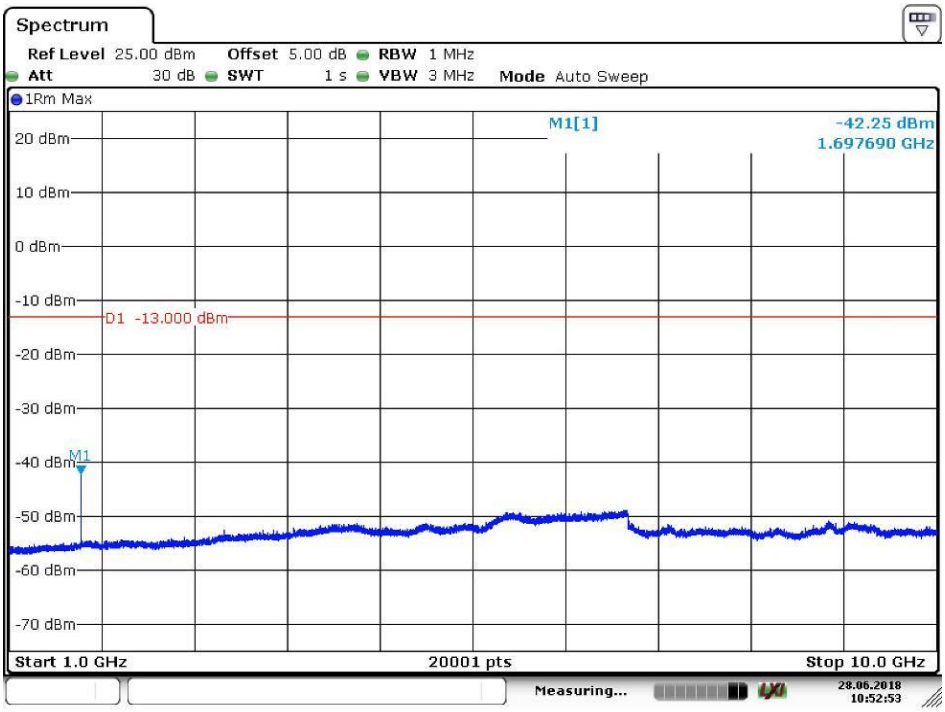


Date: 28.JUN.2018 10:46:39

6.1.1.3.3 Test Channel = HCH



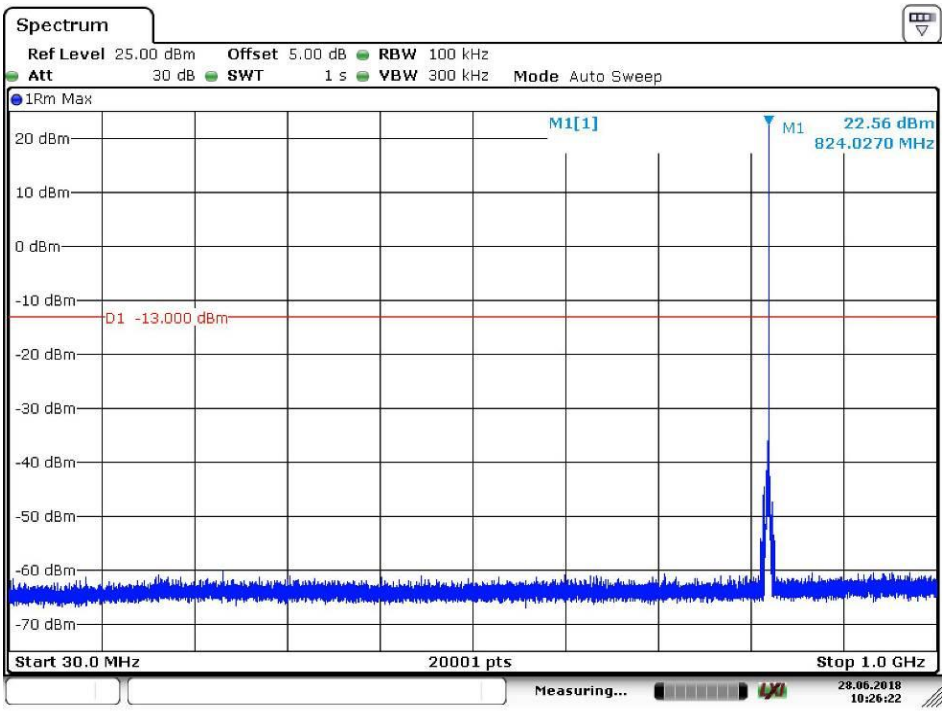
Date: 28.JUN.2018 10:54:46



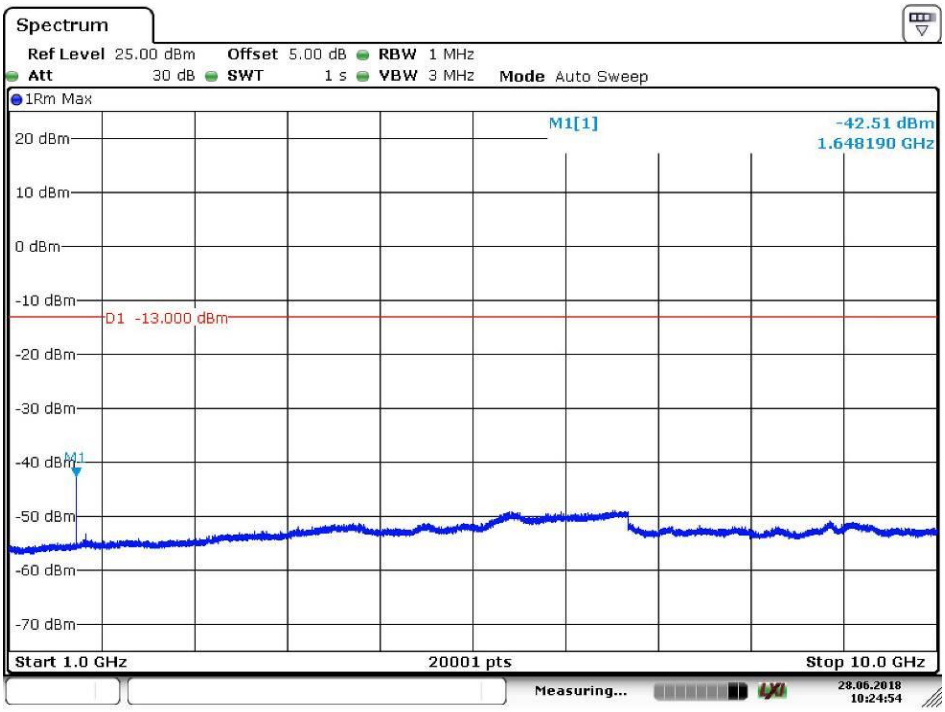
Date: 28.JUN.2018 10:52:53

6.1.1.4 Test Mode = LTE-NB1/TM2.Sub-carrier spacing=15kHz

6.1.1.4.1 Test Channel = LCH

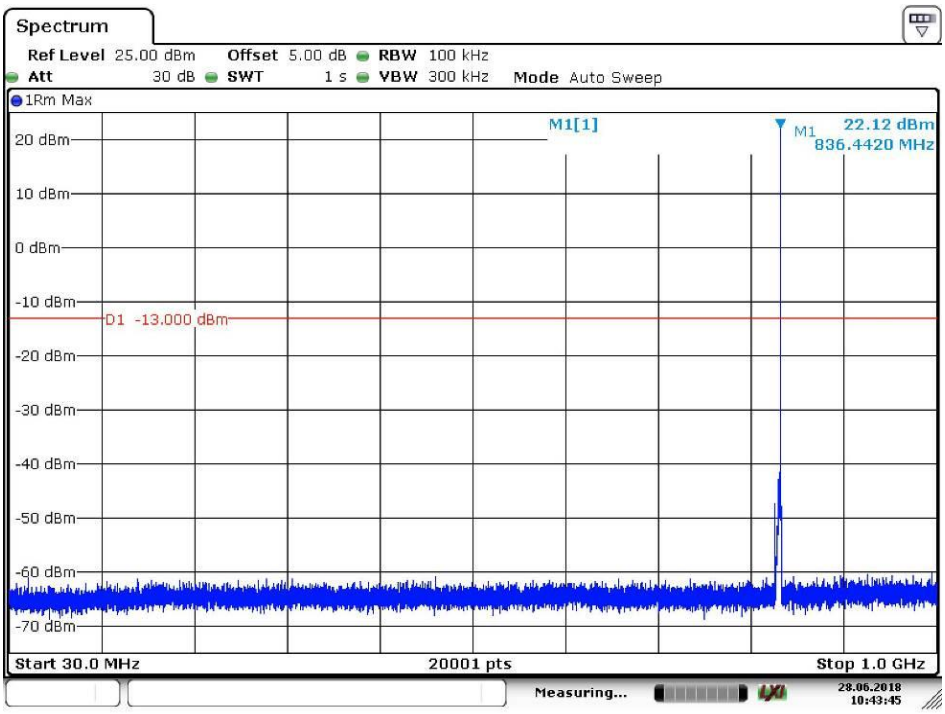


Date: 28.JUN.2018 10:26:22

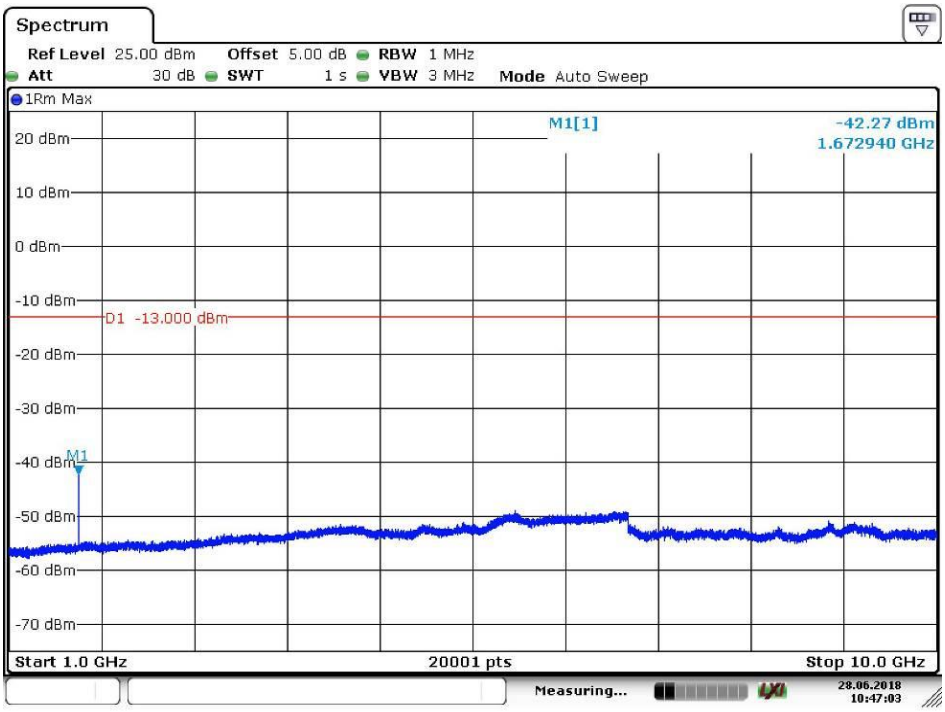


Date: 28.JUN.2018 10:24:54

6.1.1.4.2 Test Channel = MCH

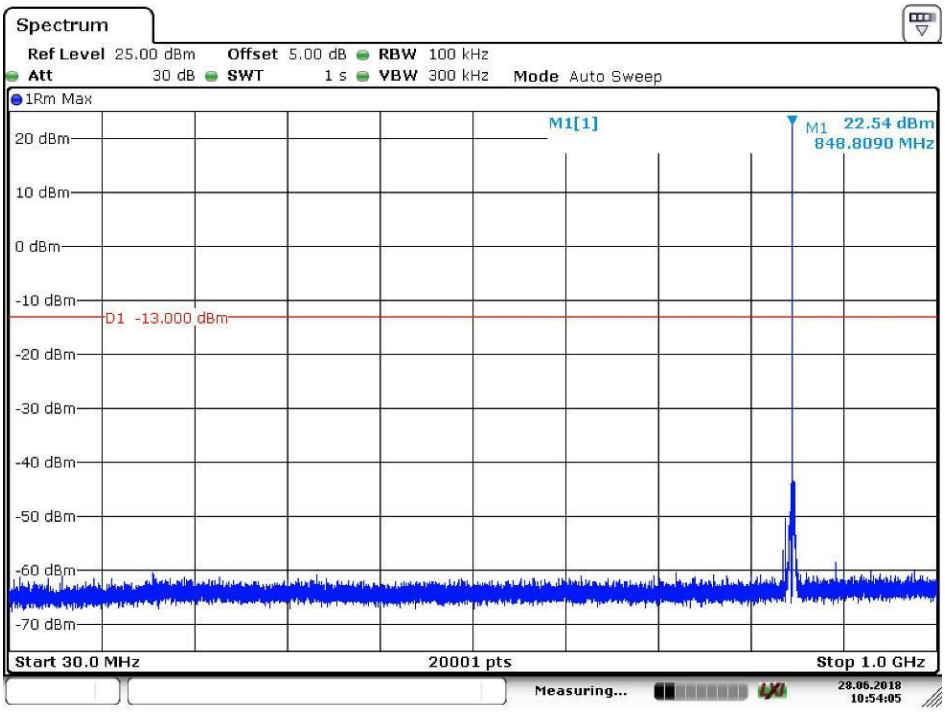


Date: 28.JUN.2018 10:43:46

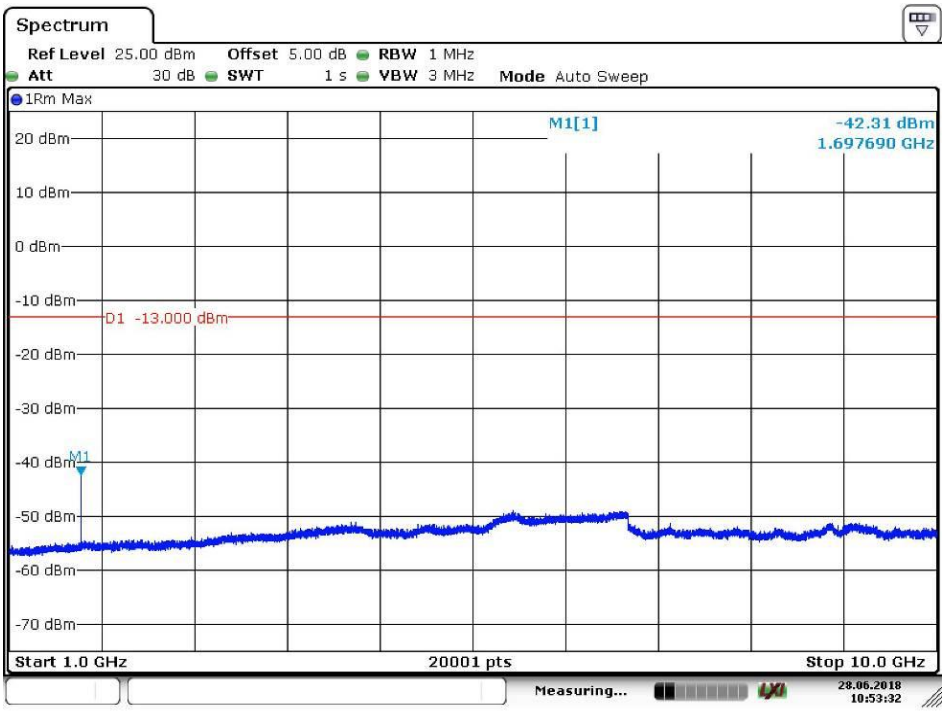


Date: 28.JUN.2018 10:47:04

6.1.1.4.3 Test Channel = HCH



Date: 28.JUN.2018 10:54:05



Date: 28.JUN.2018 10:53:31

7 Field Strength of Spurious Radiation

7.1 For LTE-NB1

7.1.1 Test Band = LTE-NB1 BAND26(824MHz-849MHz)

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

7.1.1.1.1 Test Channel = LCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Over Limit (dB)	Polarization
62.993333	-82.38	-13.00	-69.38	Vertical
104.293333	-83.26	-13.00	-70.26	Vertical
355.593333	-86.15	-13.00	-73.15	Vertical
1653.000000	-61.24	-13.00	-48.24	Vertical
3305.175000	-68.37	-13.00	-55.37	Vertical
6503.175000	-65.01	-13.00	-52.01	Vertical
63.180000	-77.48	-13.00	-64.48	Horizontal
104.293333	-86.44	-13.00	-73.44	Horizontal
260.860000	-87.38	-13.00	-74.38	Horizontal
1653.000000	-56.51	-13.00	-43.51	Horizontal
3306.150000	-64.34	-13.00	-51.34	Horizontal
3485.550000	-65.74	-13.00	-52.74	Horizontal

7.1.1.1.2 Test Channel = MCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Over Limit (dB)	Polarization
63.460000	-82.11	-13.00	-69.11	Vertical
104.293333	-84.81	-13.00	-71.81	Vertical
1003.500000	-61.31	-13.00	-48.31	Vertical
1673.000000	-60.08	-13.00	-47.08	Vertical
3346.125000	-66.00	-13.00	-53.00	Vertical
6583.612500	-65.44	-13.00	-52.44	Vertical
62.480000	-77.77	-13.00	-64.77	Horizontal
104.293333	-84.48	-13.00	-71.48	Horizontal
1003.500000	-55.07	-13.00	-42.07	Horizontal
1673.000000	-58.20	-13.00	-45.20	Horizontal
3526.012500	-68.03	-13.00	-55.03	Horizontal
7917.900000	-64.48	-13.00	-51.48	Horizontal

7.1.1.1.3 Test Channel = HCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Over Limit (dB)	Polarization
64.440000	-82.24	-13.00	-69.24	Vertical
104.293333	-84.88	-13.00	-71.88	Vertical
358.393333	-85.85	-13.00	-72.85	Vertical
1693.000000	-63.10	-13.00	-50.10	Vertical
3386.100000	-68.78	-13.00	-55.78	Vertical
6476.850000	-65.12	-13.00	-52.12	Vertical
62.153333	-77.96	-13.00	-64.96	Horizontal
104.293333	-89.14	-13.00	-76.14	Horizontal
272.900000	-87.73	-13.00	-74.73	Horizontal
1692.500000	-64.13	-13.00	-51.13	Horizontal
3386.100000	-66.73	-13.00	-53.73	Horizontal
6951.675000	-65.39	-13.00	-52.39	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) We have tested all modulation and all bandwidth, but only the worst case data presented in this report.

8 Frequency Stability

8.1 Frequency Error VS. Voltage

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
BAND26	TM1/15k	LCH	TN	VL	-4.57	-0.005550	PASS
				VN	-6.35	-0.007702	PASS
				VH	-5.50	-0.006671	PASS
		MCH	TN	VL	4.62	0.005523	PASS
				VN	6.01	0.007188	PASS
				VH	1.82	0.002177	PASS
		HCH	TN	VL	2.35	0.002773	PASS
				VN	9.40	0.011074	PASS
				VH	4.84	0.005698	PASS
	TM2/15k	LCH	TN	VL	2.05	0.002482	PASS
				VN	7.79	0.009453	PASS
				VH	3.48	0.004217	PASS
		MCH	TN	VL	-7.97	-0.009523	PASS
				VN	-2.13	-0.002546	PASS
				VH	-4.94	-0.005903	PASS
		HCH	TN	VL	4.77	0.005621	PASS
				VN	8.37	0.009860	PASS
				VH	4.45	0.005237	PASS

8.2 Frequency Error VS. Temperature

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
BAND26	TM1 15kHz	LCH	VN	-30	-8.26	-0.010029	PASS
				-20	2.92	0.003540	PASS
				-10	5.08	0.006170	PASS
				0	-9.05	-0.010976	PASS
				10	-7.25	-0.008799	PASS
				20	-3.76	-0.004561	PASS
				30	3.24	0.003929	PASS
				40	-5.82	-0.007067	PASS
				50	-5.59	-0.006781	PASS
		MCH	VN	-30	2.22	0.002657	PASS
				-20	7.76	0.009278	PASS
				-10	2.66	0.003175	PASS
				0	7.56	0.009042	PASS
				10	-6.62	-0.007919	PASS
				20	-3.19	-0.003818	PASS
				30	-2.33	-0.002786	PASS
				40	0.48	0.000579	PASS
				50	0.13	0.000154	PASS
		HCH	VN	-30	-0.31	-0.000364	PASS
				-20	7.92	0.009326	PASS
				-10	3.39	0.003999	PASS
				0	8.10	0.009545	PASS
				10	7.66	0.009026	PASS
				20	4.18	0.004927	PASS
				30	-2.09	-0.002459	PASS
				40	-7.23	-0.008518	PASS
				50	1.73	0.002041	PASS

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
BAND26	TM2 15kHz	LCH	VN	-30	0.62	0.000753	PASS
				-20	4.18	0.005078	PASS
				-10	-2.22	-0.002694	PASS
				0	-7.24	-0.008789	PASS
				10	1.91	0.002323	PASS
				20	-6.66	-0.008083	PASS
				30	4.61	0.005589	PASS
				40	-5.84	-0.007090	PASS
				50	-3.62	-0.004393	PASS
		MCH	VN	-30	9.46	0.011310	PASS
				-20	7.85	0.009387	PASS
				-10	5.88	0.007034	PASS
				0	-5.73	-0.006850	PASS
				10	2.74	0.003274	PASS
				20	3.69	0.004411	PASS
				30	-3.83	-0.004584	PASS
				40	1.06	0.001263	PASS
				50	-0.83	-0.000995	PASS
		HCH	VN	-30	7.99	0.009410	PASS
				-20	-0.77	-0.000908	PASS
				-10	-5.60	-0.006598	PASS
				0	0.70	0.000822	PASS
				10	-9.18	-0.010813	PASS
				20	9.23	0.010872	PASS
				30	-0.44	-0.000520	PASS
				40	-7.13	-0.008402	PASS
				50	1.94	0.002280	PASS

The End