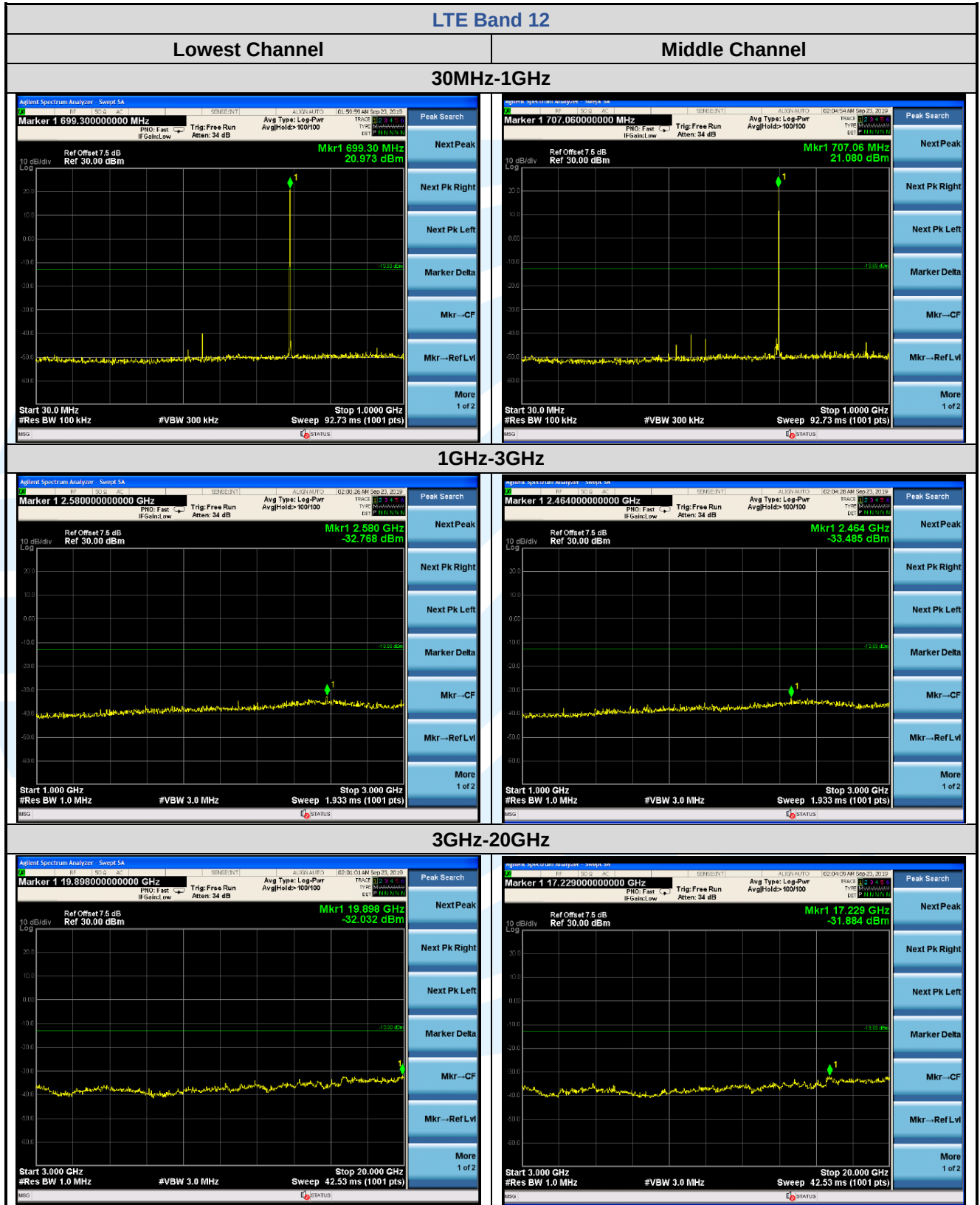
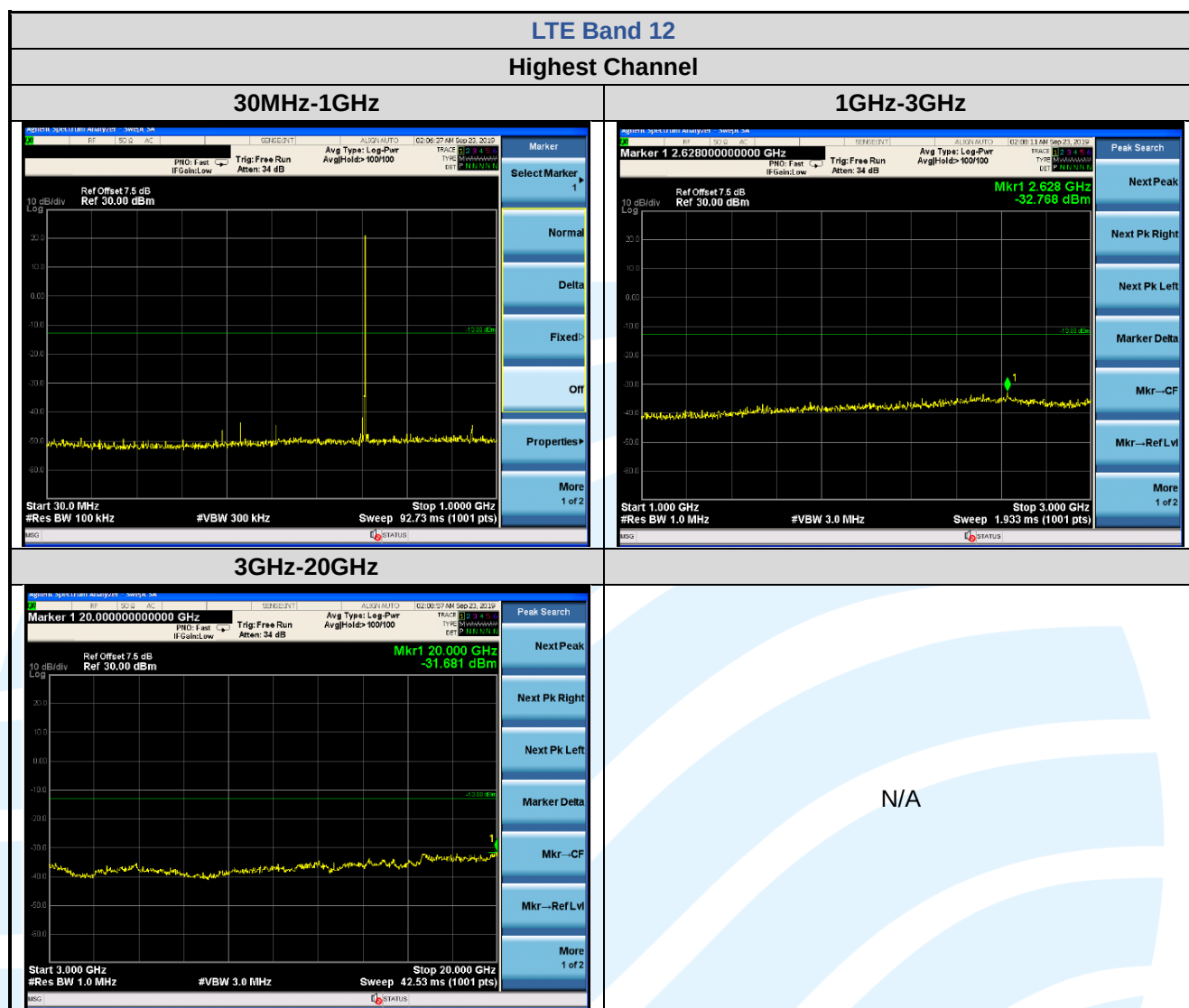
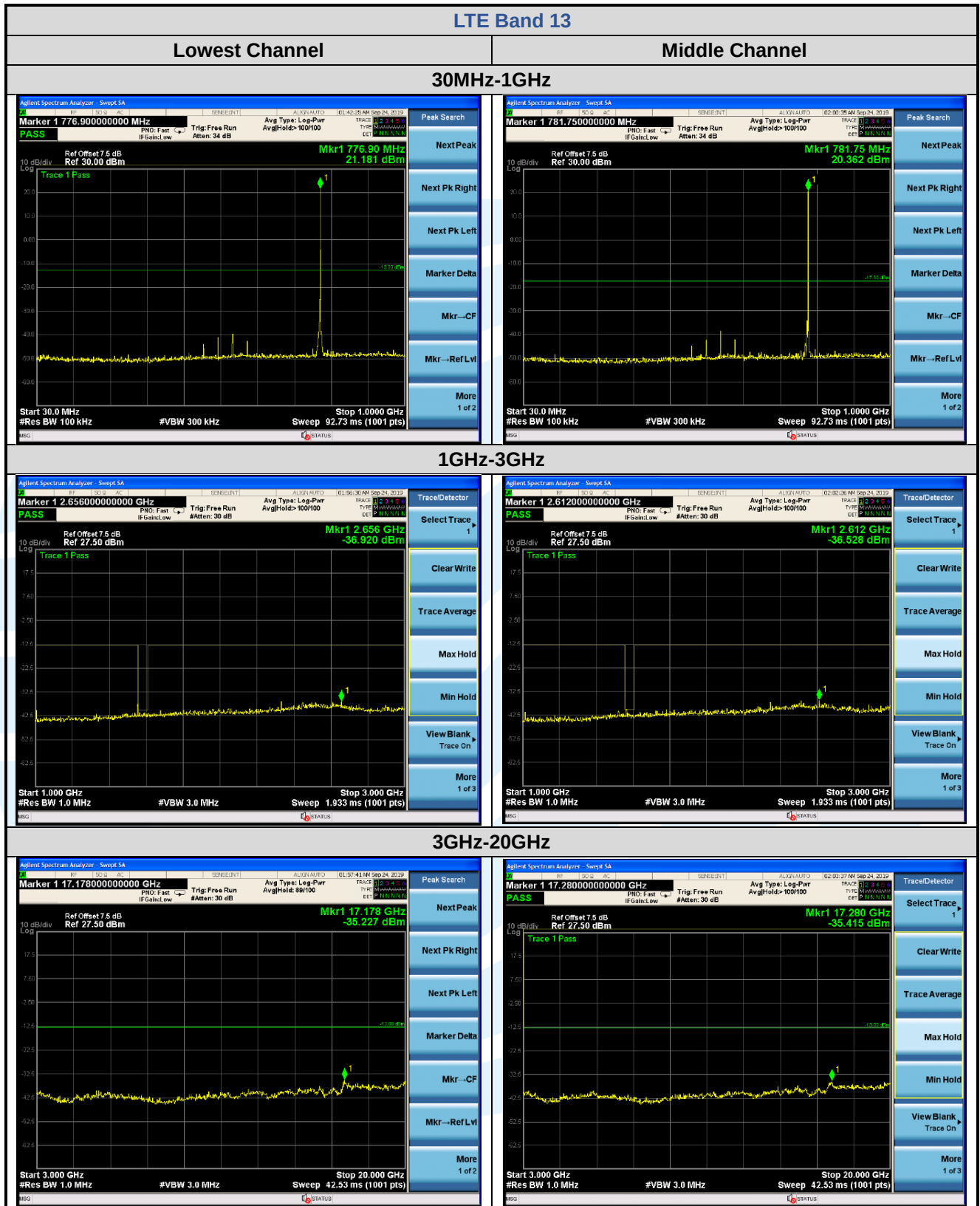


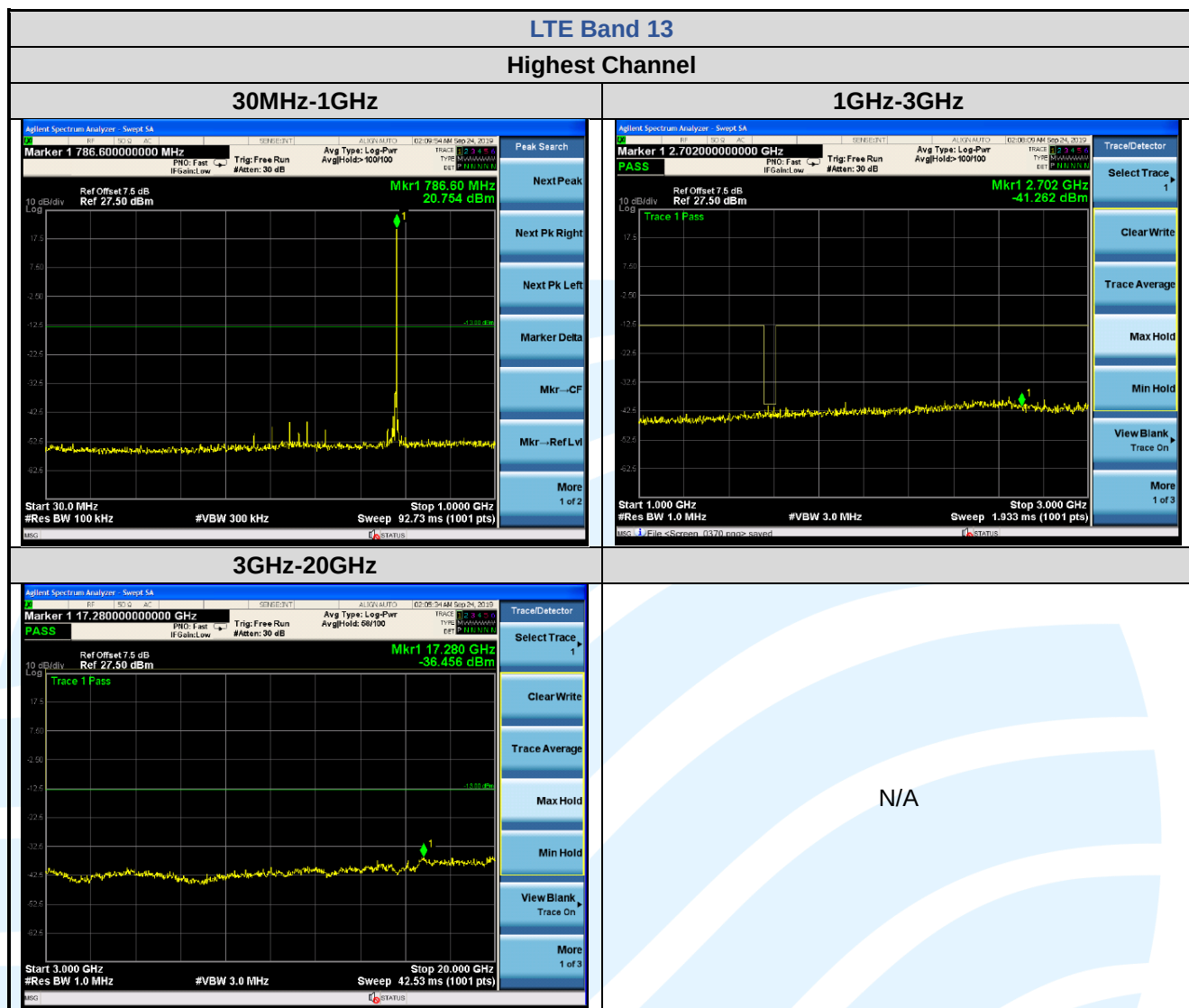
5.7.4 LTE Band 12



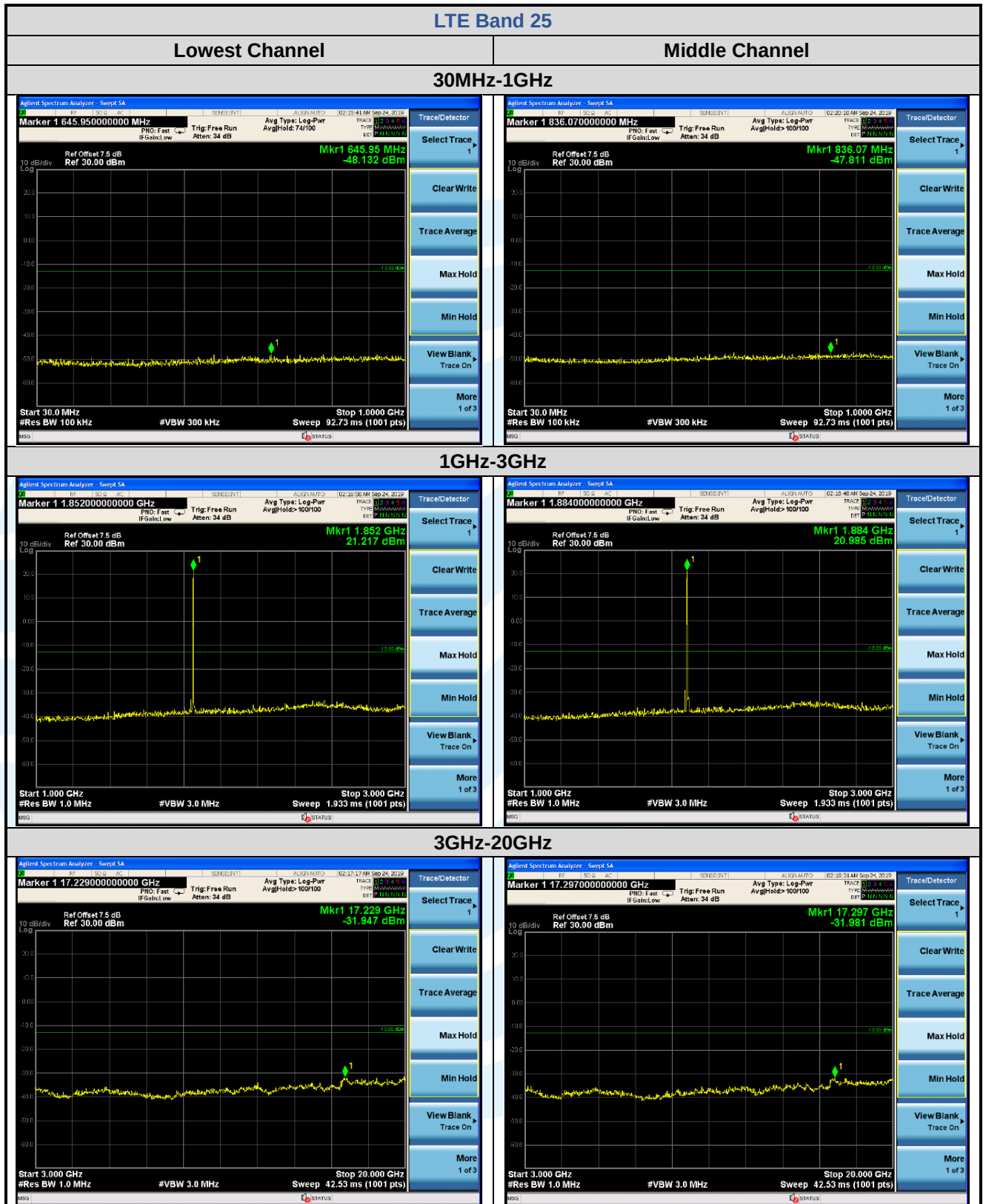


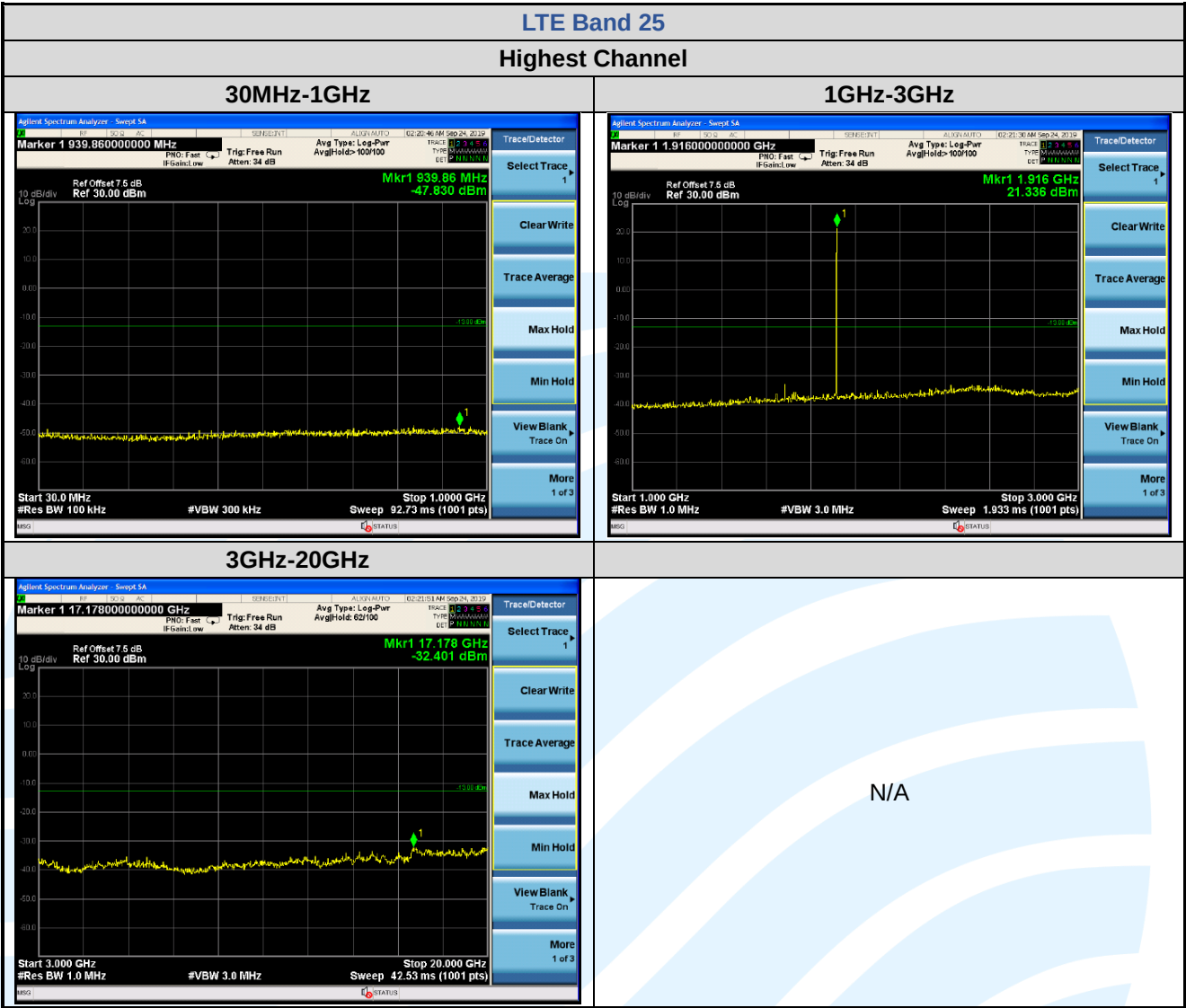
5.7.5 LTE Band 13



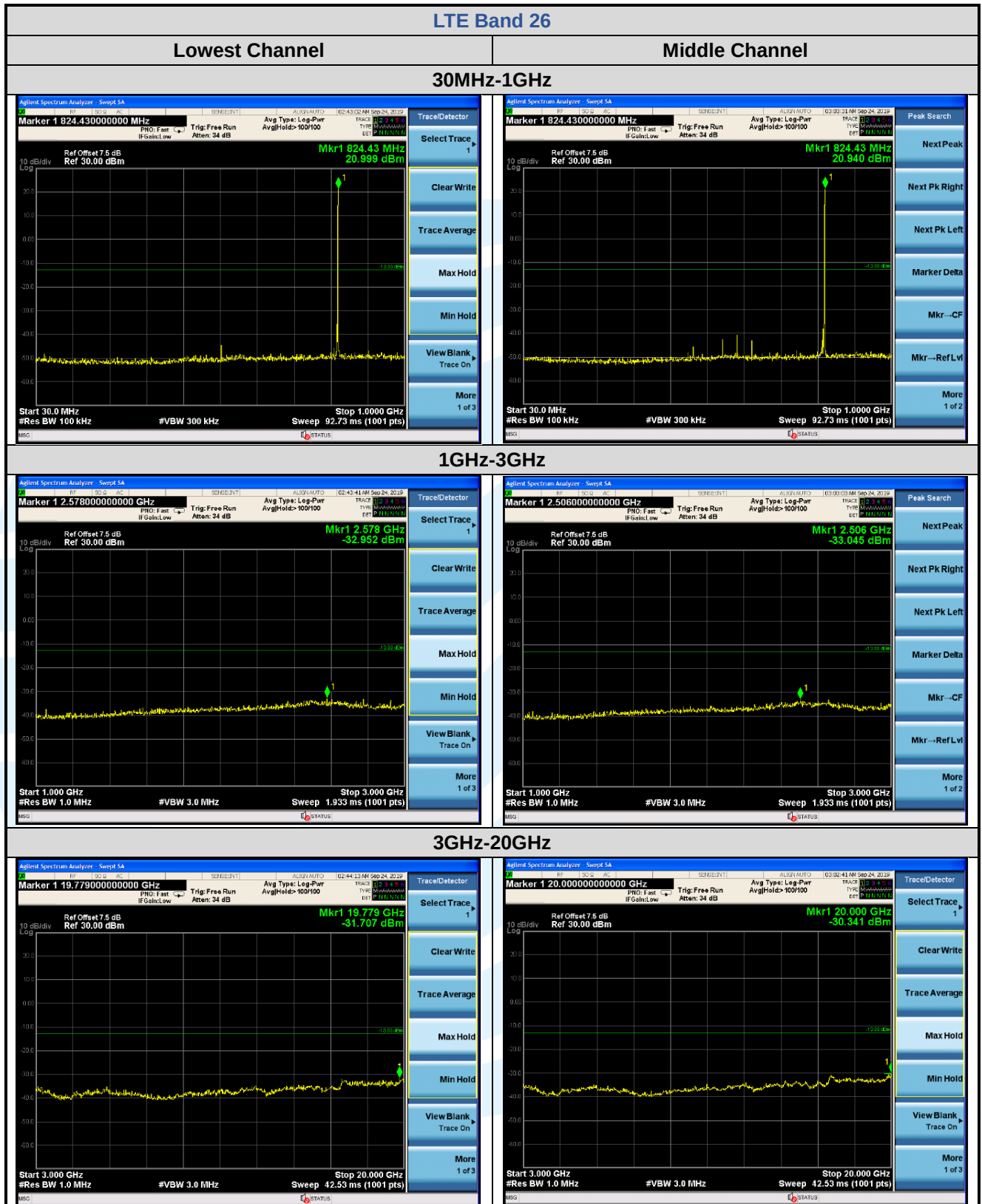


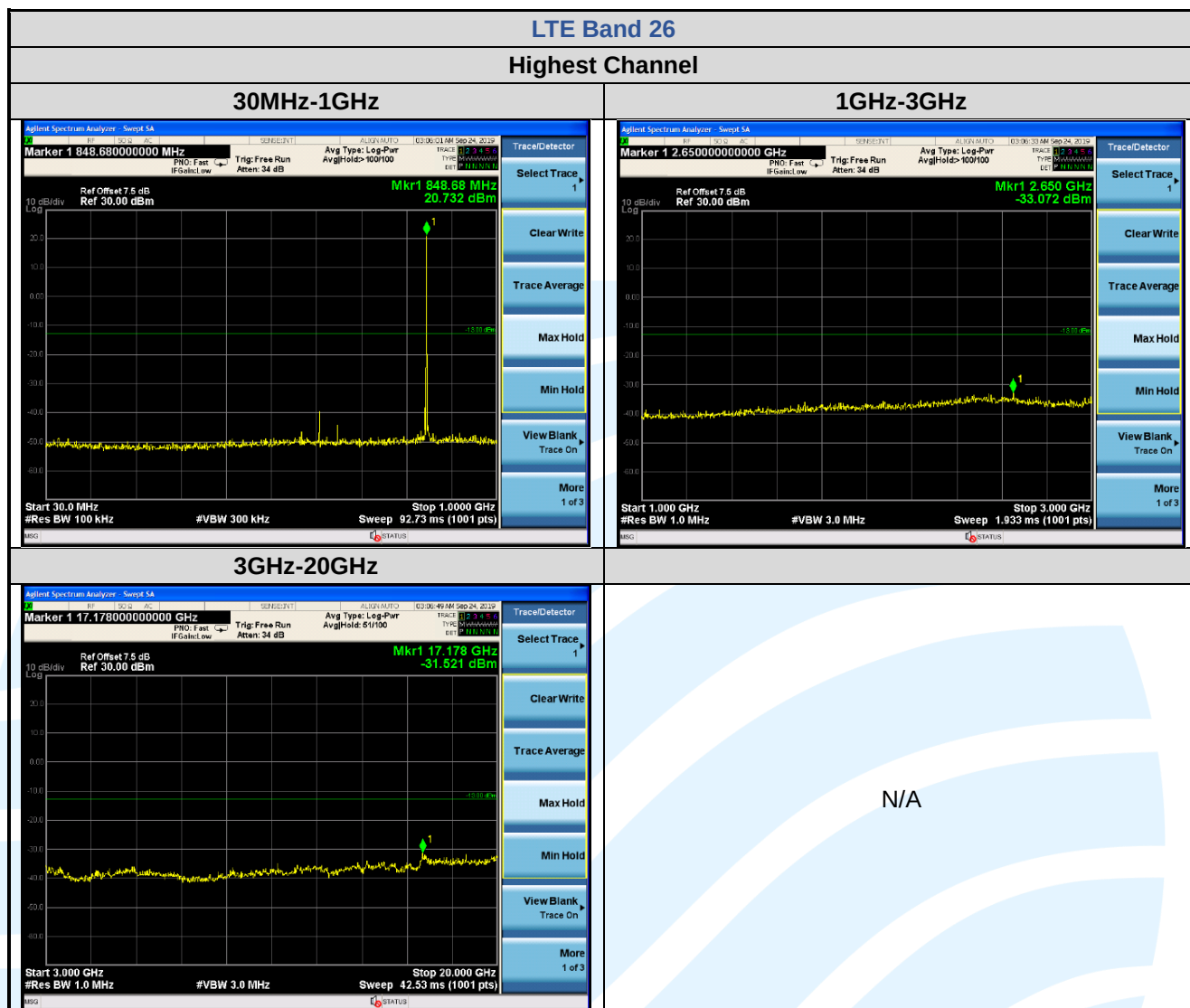
5.7.6 LTE Band 25



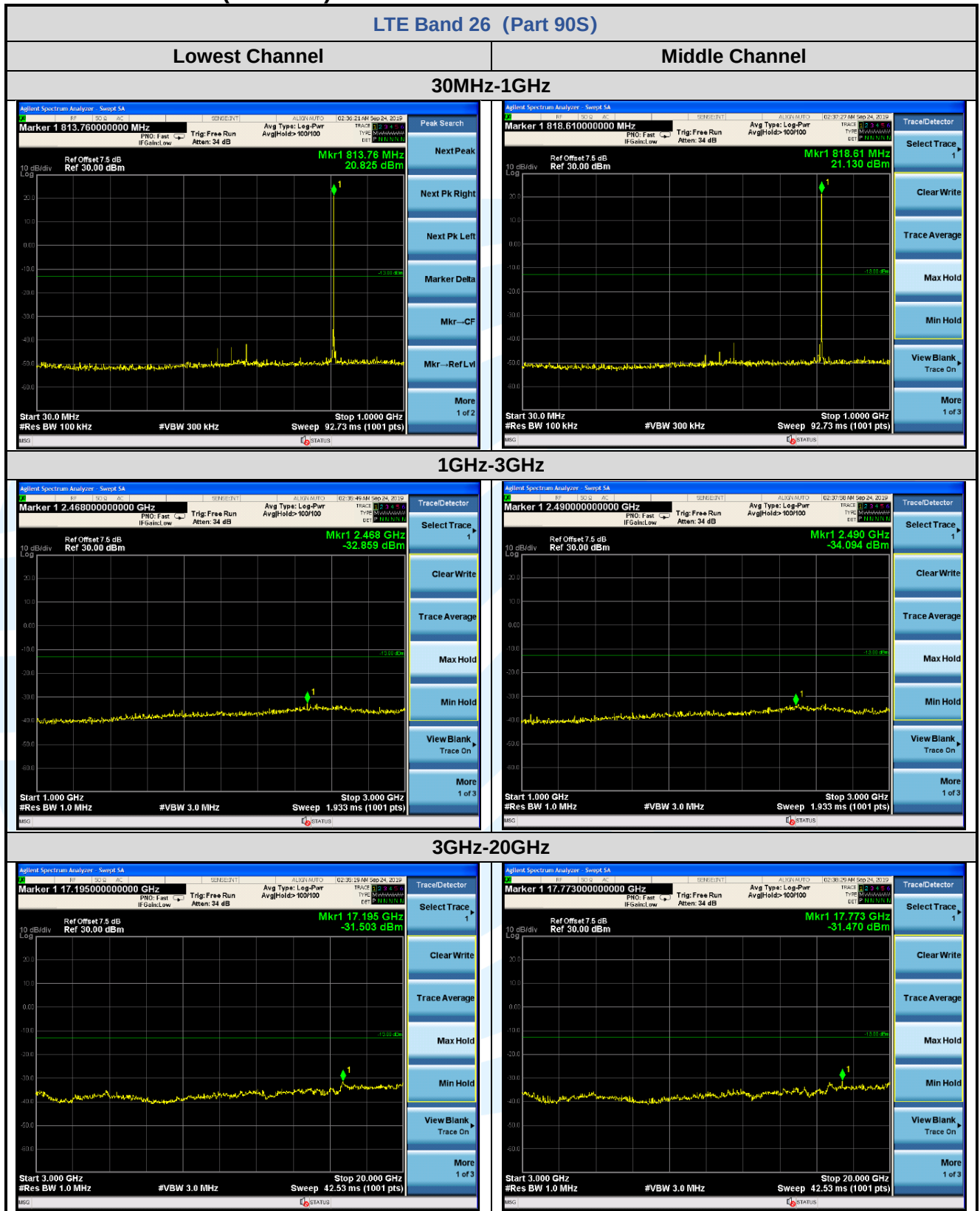


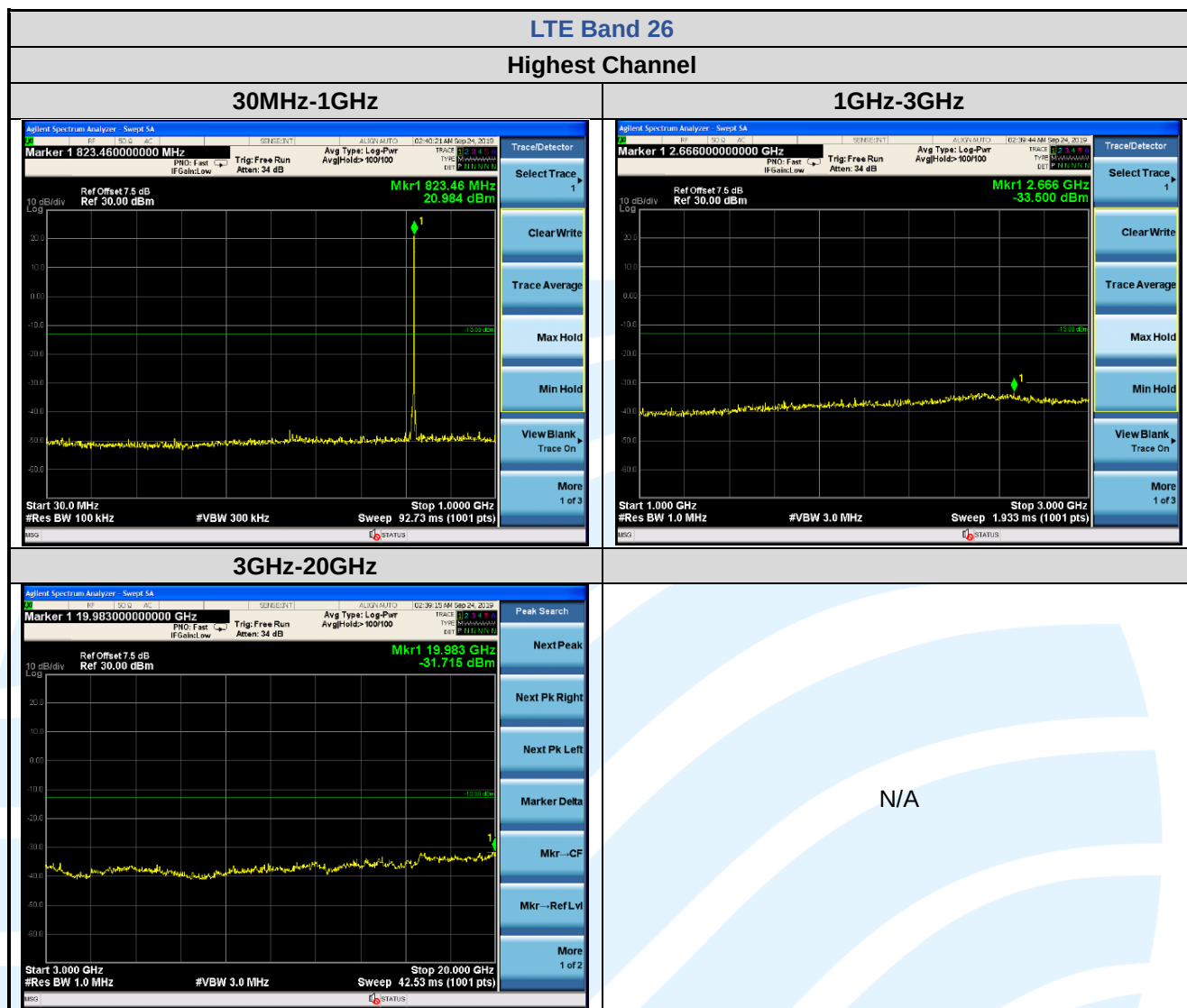
5.7.7 LTE Band 26



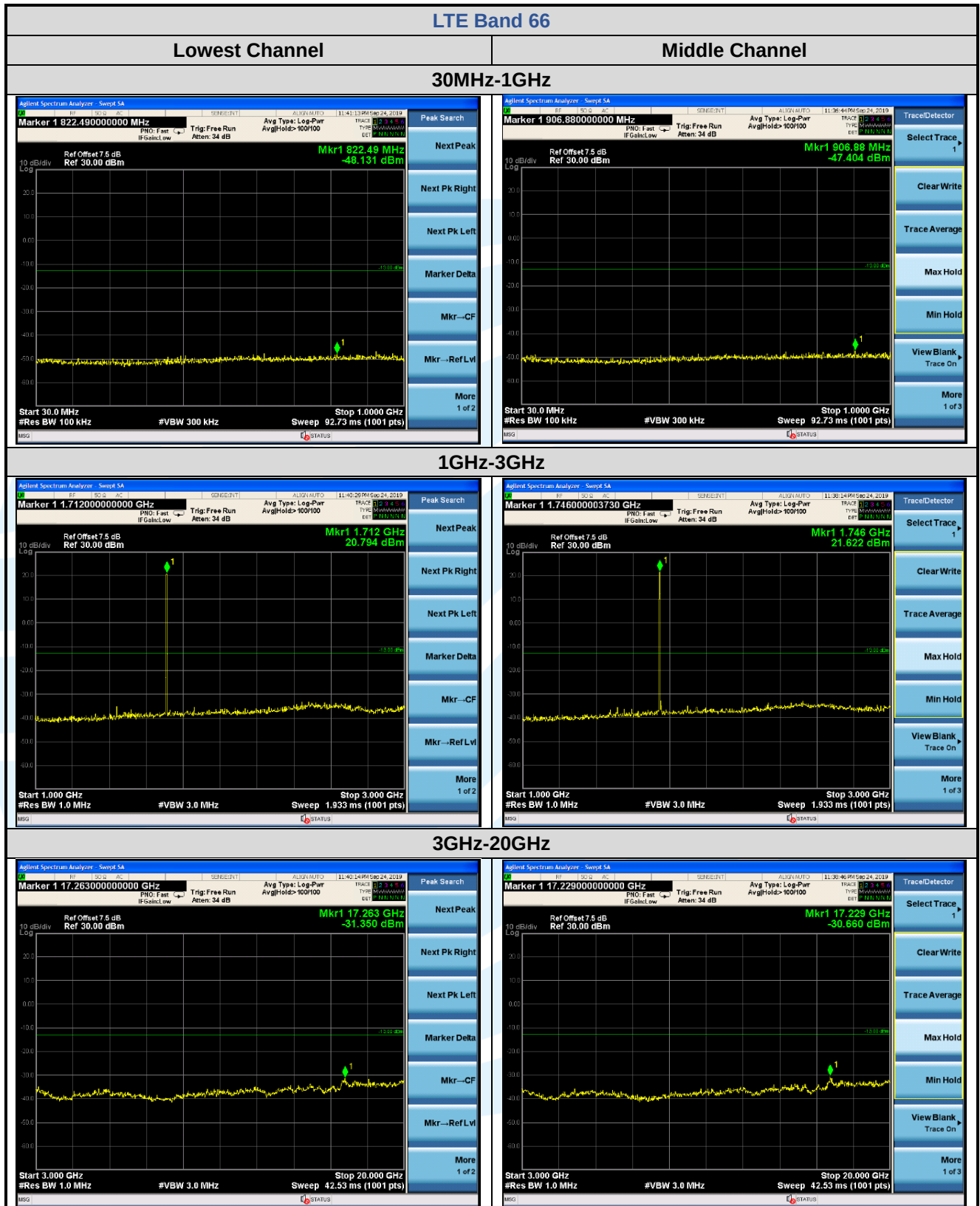


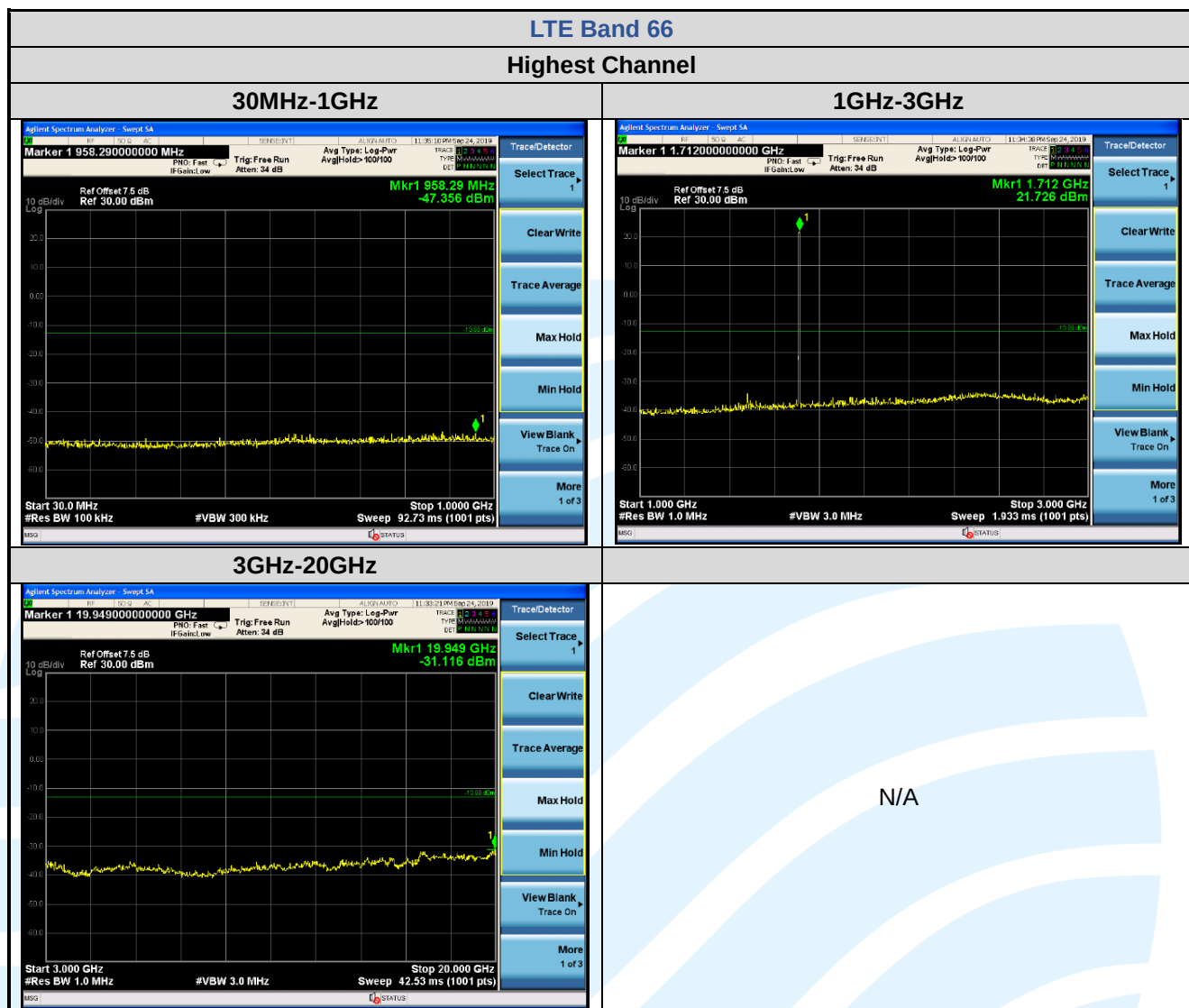
5.7.8 LTE Band 26 (Part 90S)



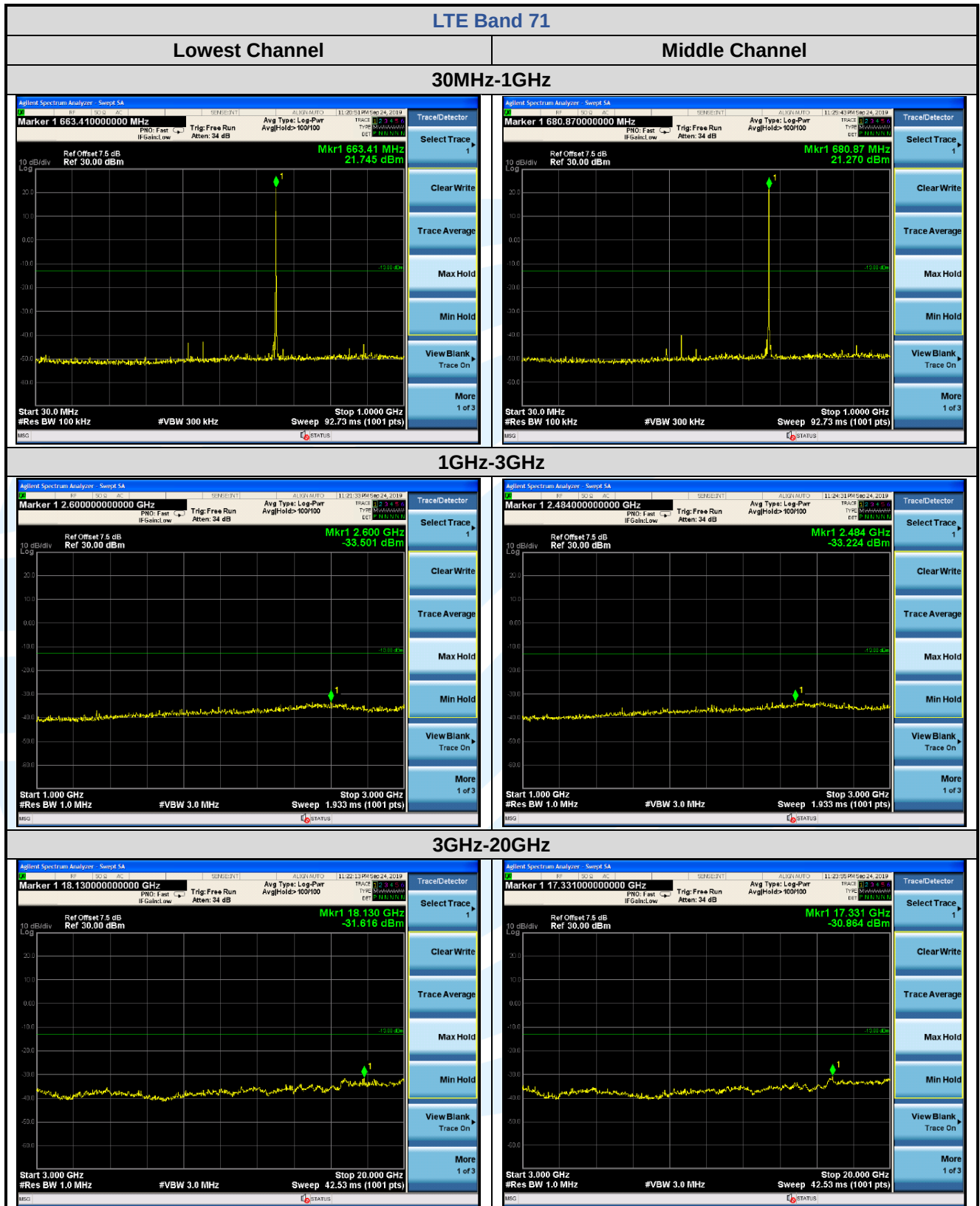


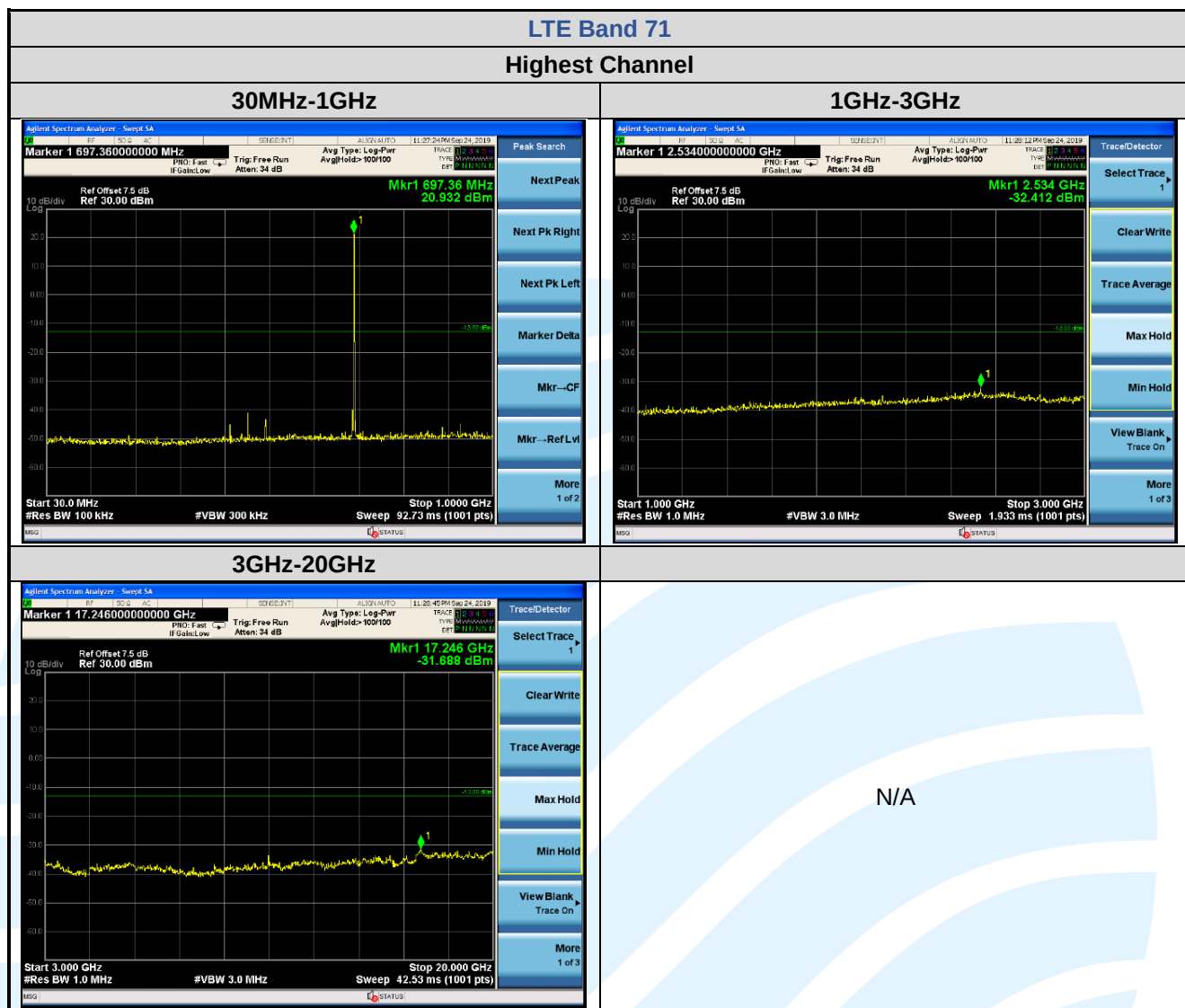
5.7.9 LTE Band 66





5.7.10 LTE Band 71





5.8 FIELD STRENGTH OF SPURIOUS RADIATION

Test Requirement: LTE Band 2 & LTE Band 25: FCC 47 CFR Part 24.238(a)
 LTE Band 4 & LTE Band 66: FCC 47 CFR Part 27.53(h)
 LTE Band 5 & LTE Band 26: FCC 47 CFR Part 22.917(a)
 LTE Band 12 & Band 71: FCC 47 CFR Part 27.53(g)
 LTE Band 13: FCC 47 CFR Part 27.53
 LTE Band 26: FCC 47 CFR Part 90.691

LTE Band 2 & LTE Band 25: RSS-133 Issue 6, Section 6.5
 LTE Band 4 & LTE Band 66: RSS-139 Issue 3, Section 6.6
 LTE Band 5: RSS-132 Issue 3, Section 5.5
 LTE Band 12 & LTE Band 13 & Band 71: RSS-130 Issue 2, Section 4.7

Test Method: ANSI C63.26-2015 & KDB 971168 D01v03r01

Receiver Setup:

Frequency	Detector	RBW	VBW	Remark
0.009 MHz-30 MHz	Peak	10 kHz	30 KHz	Peak
30 MHz-1 GHz	Quasi-peak	100 kHz	300 KHz	Peak
Above 1 GHz	Peak	1 MHz	3 MHz	Peak

Limits:

FCC 47 CFR Part 24.238(a), 27.53(h)(1), 22.917(a), 27.53(g), 27.53(c)(2), 90.691:

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB. The emission limit equal to -13 dBm.

FCC 47 CFR Part 27.53:

(c) The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.

(f) Emissions in the band 1559-1610 MHz shall be limited to -70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals. (-70 dBW/MHz = -40dBm/MHz).

RSS-132 Issue 3, Section 5.5, RSS-133 Issue 6, Section 6.6, RSS-139 Issue 3, Section 6.5, RSS-130 Issue 2, Section 4.7:

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB. The emission limit equal to -13 dBm.

Test Setup: Refer to section 4.2.1 for details.

Test Procedures: KDB 971168 D01v03r01 Section 7

Equipment Used: Refer to section 3 for details.

Test Result: Pass

The measurement data as follows:

5.8.1 LTE Band 2

worst case of the bandwidth

LTE Band 2							
No.	Frequency (MHz)	PMea (dBm)	Pcl (dBm)	Ga (dBd)	Peak ERP (dBm)	Limit (dBm)	Polarization
Lowest Channel							
1	3701.2	-50.72	6.6	7.7	-49.62	-13	Horizontal
2	5552.4	-51.36	8.2	9.5	-50.06	-13	Horizontal
3	7346.4	-52.89	9.6	13.7	-48.79	-13	Vertical
4	9182.8	-54.99	10.5	18.5	-46.99	-13	Vertical
5	10096.4	-52.25	11.3	17.6	-45.95	-13	Vertical
6	11641.2	-48.36	12.2	17.6	-42.96	-13	Horizontal
Middle Channel							
1	3759.6	-50.83	6.6	7.7	-49.73	-13	Horizontal
2	5640.0	-51.49	8.3	10.5	-49.29	-13	Horizontal
3	7449.6	-54.14	9.7	14.6	-49.24	-13	Horizontal
4	9382.4	-54.13	10.7	18.6	-46.23	-13	Horizontal
5	11264.6	-49.91	12.1	18.5	-43.51	-13	Horizontal
6	12929.2	-45.91	13.0	20.2	-38.71	-13	Vertical
Highest Channel							
1	3818.4	-51.91	6.7	7.7	-50.91	-13	Horizontal
2	5714.4	-54.44	8.5	10.5	-52.44	-13	Vertical
3	7655.6	-54.49	9.7	15.3	-48.89	-13	Vertical
4	9544.0	-53.73	10.7	18.6	-45.83	-13	Horizontal
5	11354.2	-50.18	12.1	18.5	-43.78	-13	Horizontal
6	13328.2	-48.66	13.6	21.8	-40.46	-13	Vertical

Remark:

1. Peak ERP = PMea -Ga + Pcl.

5.9 FREQUENCY STABILITY

FCC 47 CFR Part 2.1055 &
FCC 47 CFR Part 22.355 &
FCC 47 CFR Part 24.235 &
FCC 47 CFR Part 27.54,

Test Requirement:

LTE Band 2 & LTE Band 25: RSS-133 Issue 6, Section 6.3
LTE Band 4 & LTE Band 66: RSS-139 Issue 3, Section 6.4
LTE Band 5: RSS-132 Issue 3, Section 5.3
LTE Band 12 & LTE Band 13 & Band 71: RSS-130 Issue 2, Section 4.5

Test Method:

ANSI C63.26-2015 & KDB 971168 D01v03r01

Limits:

FCC 47 CFR Part 22.355, FCC 47 CFR Part 90.213

The carrier frequency shall not depart from the reference frequency in excess of ± 2.5 ppm for mobile stations.

FCC 47 CFR Part 24.235, FCC 47 CFR Part 27.54

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

RSS-132 Issue 3, Section 5.3:

The carrier frequency shall not depart from the reference frequency in excess of ± 2.5 ppm for mobile stations and ± 1.5 ppm for base stations

RSS-133 Issue 6, Section 6.3:

The carrier frequency shall not depart from the reference frequency, in excess of ± 2.5 ppm for mobile stations and ± 1.0 ppm for base stations.

RSS-139 Issue 3, Section 6.4, RSS-130 Issue 2, Section 4.5:

The frequency stability shall be sufficient to ensure that the occupied bandwidth stays within the operating frequency block when tested to the temperature and supply voltage variations specified in RSS-Gen.

Test Setup: Refer to section 4.2.2 for details.

Test Procedures:

- 1) Use CMW 500 or CMU 200 with Frequency Error measurement capability.
 - a) Temp. = -30° to $+50^{\circ}\text{C}$
 - b) Voltage = low voltage, 2.8 Vdc, Normal, 3.8 Vdc and High voltage, 4.6 Vdc.
- 2) Frequency Stability vs Temperature:

The EUT is placed inside a temperature chamber. The temperature is set to 20°C and allowed to stabilize. After sufficient soak time, the transmitting frequency error is measured. The temperature is increased by 10 degrees, allowed to stabilize and soak, and then the measurement is repeated. This is repeated until $+50^{\circ}\text{C}$ is reached.

- 3) Frequency Stability vs Voltage:

The peak frequency error is recorded (worst-case).

Equipment Used: Refer to section 3 for details.

Test Result: Pass

5.9.1 LTE Band 2

Modulation	Channel/ Frequency	Voltage	Temperature	Deviation	Deviation	Limit	Pass/ Fail
	(MHz)	(Vdc)	(°C)	(Hz)	(ppm)	(ppm)	
LTE Band 2							
QPSK	18900 / 1880.0	VL	TN	3.51	0.0019	N/A	Pass
		VN		1.80	0.0010		Pass
		VH		6.27	0.0033		Pass
		VN	50	0.94	0.0005		Pass
			40	3.94	0.0021		Pass
			30	1.49	0.0008		Pass
			20	-3.14	-0.0017		Pass
			10	-8.53	-0.0045		Pass
			0	-5.84	-0.0031		Pass
			-10	1.34	0.0007		Pass
			-20	3.28	0.0017		Pass
			-30	-0.76	-0.0004		Pass

5.9.2 LTE Band 4

Modulation	Channel/ Frequency (MHz)	Voltage (Vdc)	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Pass/ Fail
LTE Band 4							
QPSK	20175 / 1732.5	VL	TN	5.16	0.0030	N/A	Pass
		VN		4.71	0.0027		Pass
		VH		0.30	0.0002		Pass
		VN	50	-2.27	-0.0013		Pass
			40	0.73	0.0004		Pass
			30	-1.72	-0.0010		Pass
			20	-6.35	-0.0037		Pass
			10	-9.64	-0.0056		Pass
			0	-9.05	-0.0052		Pass
			-10	-1.87	-0.0011		Pass
			-20	0.07	0.0000		Pass
			-30	-3.97	-0.0023		Pass

5.9.3 LTE Band 5

Modulation	Channel/ Frequency (MHz)	Voltage (Vdc)	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Result
LTE Band 5							
QPSK	20525 / 836.5	VL	TN	-1.54	-0.0018	± 2.5	Pass
		VN		-1.17	-0.0014	± 2.5	Pass
		VH		-1.21	-0.0014	± 2.5	Pass
		VN	50	3.96	0.0047	± 2.5	Pass
			40	1.41	0.0017	± 2.5	Pass
			30	-1.23	-0.0015	± 2.5	Pass
			20	-3.42	-0.0041	± 2.5	Pass
			10	-1.67	-0.0020	± 2.5	Pass
			0	3.68	0.0044	± 2.5	Pass
			-10	-3.14	-0.0038	± 2.5	Pass
			-20	-4.45	-0.0053	± 2.5	Pass
			-30	0.21	0.0003	± 2.5	Pass

5.9.4 LTE Band 12

Modulation	Channel/ Frequency (MHz)	Voltage (Vdc)	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Result
LTE Band 12							
QPSK	23095 / 707.5	VL	TN	-4.47	-0.0063	N/A	Pass
		VN		1.31	0.0019		Pass
		VH		2.22	0.0031		Pass
		VN	50	-4.67	-0.0066		Pass
			40	-3.14	-0.0044		Pass
			30	-4.45	-0.0063		Pass
			20	0.21	0.0003		Pass
			10	-1.28	-0.0018		Pass
			0	2.34	0.0033		Pass
			-10	0.09	0.0001		Pass
			-20	-3.21	-0.0045		Pass
			-30	-4.23	-0.0060		Pass

5.9.5 LTE Band 13

Modulation	Channel/ Frequency (MHz)	Voltage (Vdc)	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Result
LTE Band 13							
QPSK	23230 / 782	VL	TN	0.11	0.0001	N/A	Pass
		VN		0.78	0.0010		Pass
		VH		-1.43	-0.0018		Pass
		VN	50	-3.21	-0.0041		Pass
			40	-4.23	-0.0054		Pass
			30	-3.91	-0.0050		Pass
			20	2.45	0.0031		Pass
			10	-2.45	-0.0031		Pass
			0	3.21	0.0041		Pass
			-10	-4.09	-0.0052		Pass
			-20	-2.76	-0.0035		Pass
			-30	3.21	0.0041		Pass

5.9.6 LTE Band 25

Modulation	Channel/ Frequency (MHz)	Voltage (Vdc)	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Result
LTE Band 25							
QPSK	26365 / 1882.5	VL	TN	0.11	0.0001	N/A	Pass
		VN		3.98	0.0021		Pass
		VH		-1.43	-0.0008		Pass
		VN	50	-0.98	-0.0005		Pass
			40	-1.39	-0.0007		Pass
			30	3.62	0.0019		Pass
			20	-1.09	-0.0006		Pass
			10	-2.34	-0.0012		Pass
			0	-2.98	-0.0016		Pass
			-10	0.89	0.0005		Pass
			-20	-4.31	-0.0023		Pass
			-30	1.98	0.0011		Pass

5.9.7 LTE Band 26

Modulation	Channel/ Frequency (MHz)	Voltage (Vdc)	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Result
LTE Band 26							
QPSK	26915 / 836.5	VL	TN	6.54	0.0078	± 2.5	Pass
		VN		1.90	0.0023	± 2.5	Pass
		VH		8.34	0.0100	± 2.5	Pass
		VN	50	4.38	0.0052	± 2.5	Pass
			40	7.56	0.0090	± 2.5	Pass
			30	7.09	0.0085	± 2.5	Pass
			20	6.98	0.0083	± 2.5	Pass
			10	11.93	0.0143	± 2.5	Pass
			0	6.98	0.0083	± 2.5	Pass
			-10	6.73	0.0080	± 2.5	Pass
			-20	5.98	0.0071	± 2.5	Pass
			-30	6.31	0.0075	± 2.5	Pass

5.9.8 LTE Band 26 (Part 90S)

Modulation	Channel/ Frequency (MHz)	Voltage (Vdc)	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Result
LTE Band 26							
QPSK	26740 / 819	VL	TN	-0.78	-0.0010	± 2.5	Pass
		VN		-4.55	-0.0056	± 2.5	Pass
		VH		-4.67	-0.0057	± 2.5	Pass
		VN	50	4.98	0.0061	± 2.5	Pass
			40	-3.17	-0.0039	± 2.5	Pass
			30	7.97	0.0097	± 2.5	Pass
			20	8.96	0.0109	± 2.5	Pass
			10	9.67	0.0118	± 2.5	Pass
			0	4.49	0.0055	± 2.5	Pass
			-10	9.79	0.0120	± 2.5	Pass
			-20	6.56	0.0080	± 2.5	Pass
			-30	5.70	0.0070	± 2.5	Pass

5.9.9 LTE Band 66

Modulation	Channel/ Frequency (MHz)	Voltage (Vdc)	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Result
LTE Band 66							
QPSK	132322 / 1745	VL	TN	-3.59	-0.0021	N/A	Pass
		VN		-4.75	-0.0027		Pass
		VH		-7.86	-0.0045		Pass
		VN	50	-3.27	-0.0019		Pass
			40	3.11	0.0018		Pass
			30	-4.98	-0.0029		Pass
			20	-2.19	-0.0013		Pass
			10	10.32	0.0059		Pass
			0	-8.78	-0.0050		Pass
			-10	-1.87	-0.0011		Pass
			-20	0.15	0.0001		Pass
			-30	-3.21	-0.0018		Pass

5.9.10 LTE Band 71

Modulation	Channel/ Frequency (MHz)	Voltage (Vdc)	Temperature (°C)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Result
LTE Band 71							
QPSK	133297 / 680.5	VL	TN	-10.12	-0.0148	N/A	Pass
		VN		-1.87	-0.0027		Pass
		VH		-8.52	-0.0125		Pass
		VN	50	2.17	0.0032		Pass
			40	-6.12	-0.0090		Pass
			30	-4.91	-0.0072		Pass
			20	-4.98	-0.0073		Pass
			10	-0.78	-0.0011		Pass
			0	-9.02	-0.0132		Pass
			-10	-3.19	-0.0047		Pass
			-20	-12.11	-0.0177		Pass
			-30	-11.27	-0.0165		Pass

APPENDIX 1 PHOTOS OF TEST SETUP

See test photos attached in Appendix 1 for the actual connections between Product and support equipment.

APPENDIX 2 PHOTOS OF EUT CONSTRUCTIONAL DETAILS

Refer to Appendix 2 for EUT external and internal photos.

*** End of Report ***

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