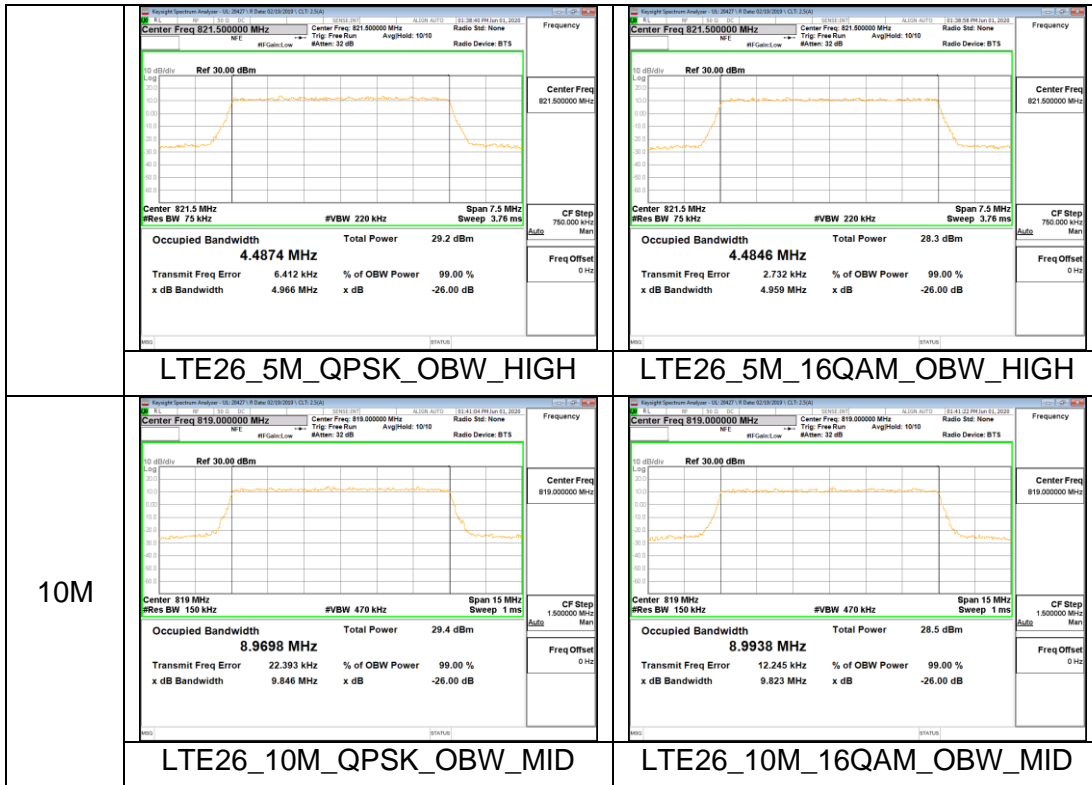
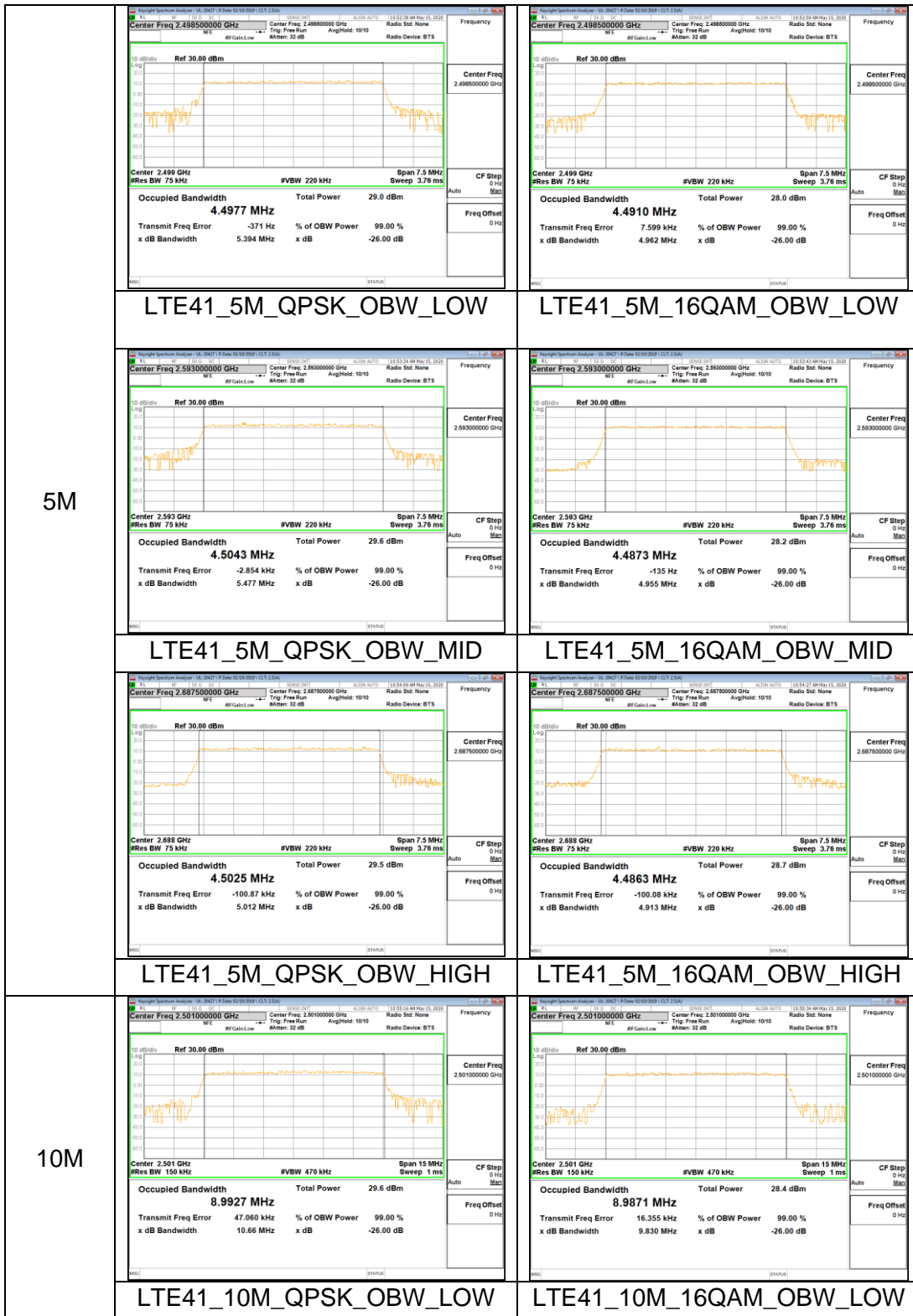
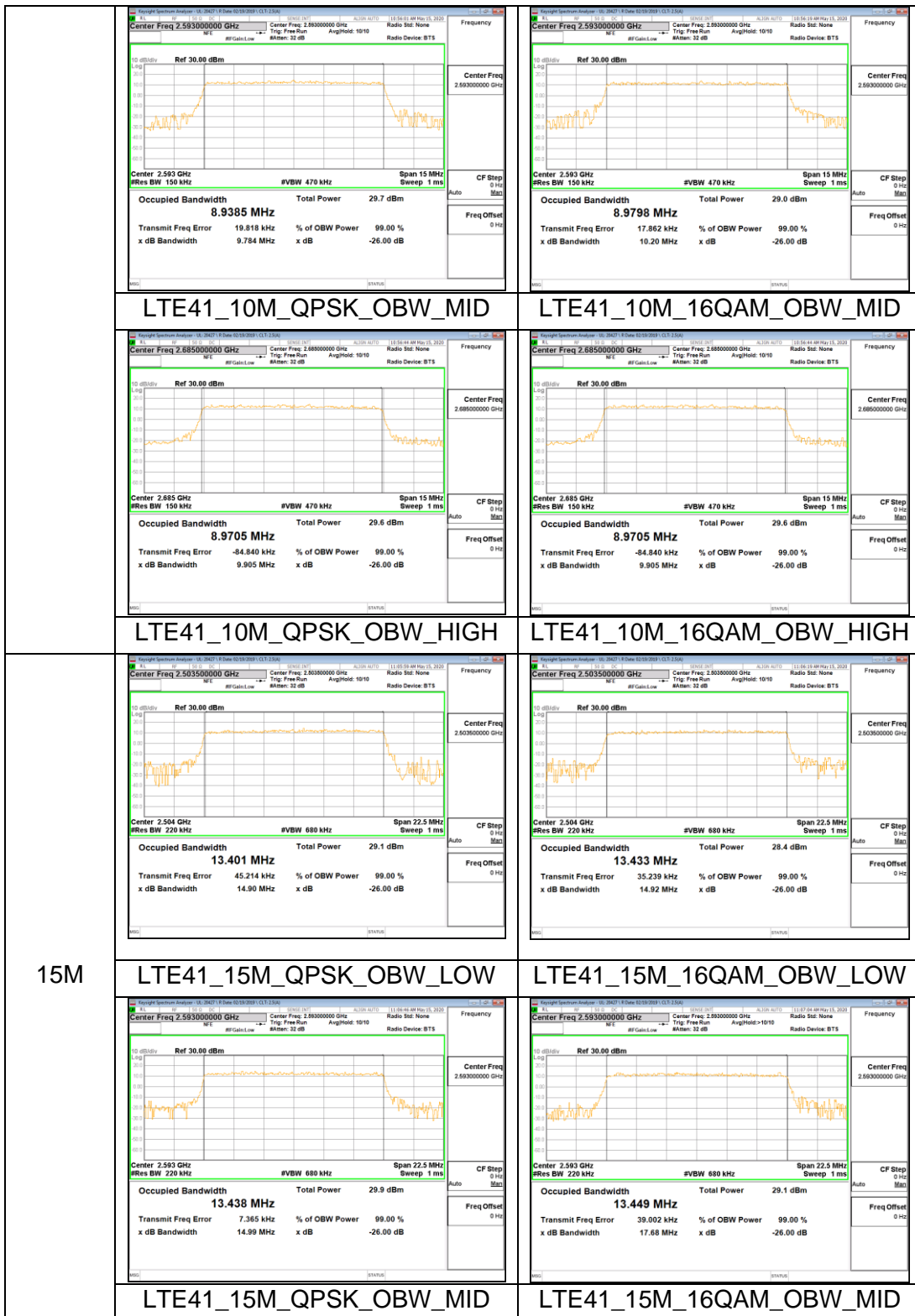


5M



LTE Band 41

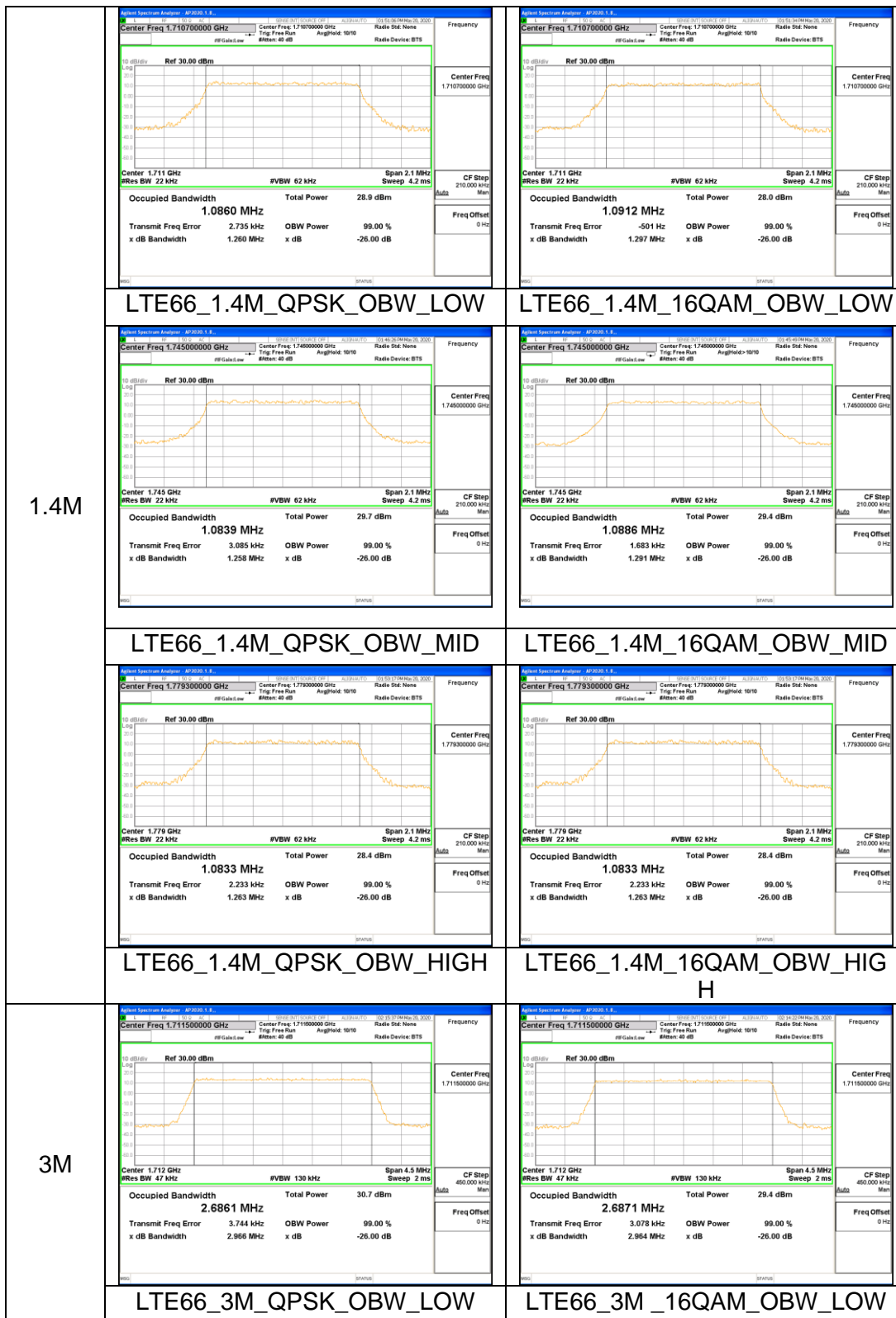


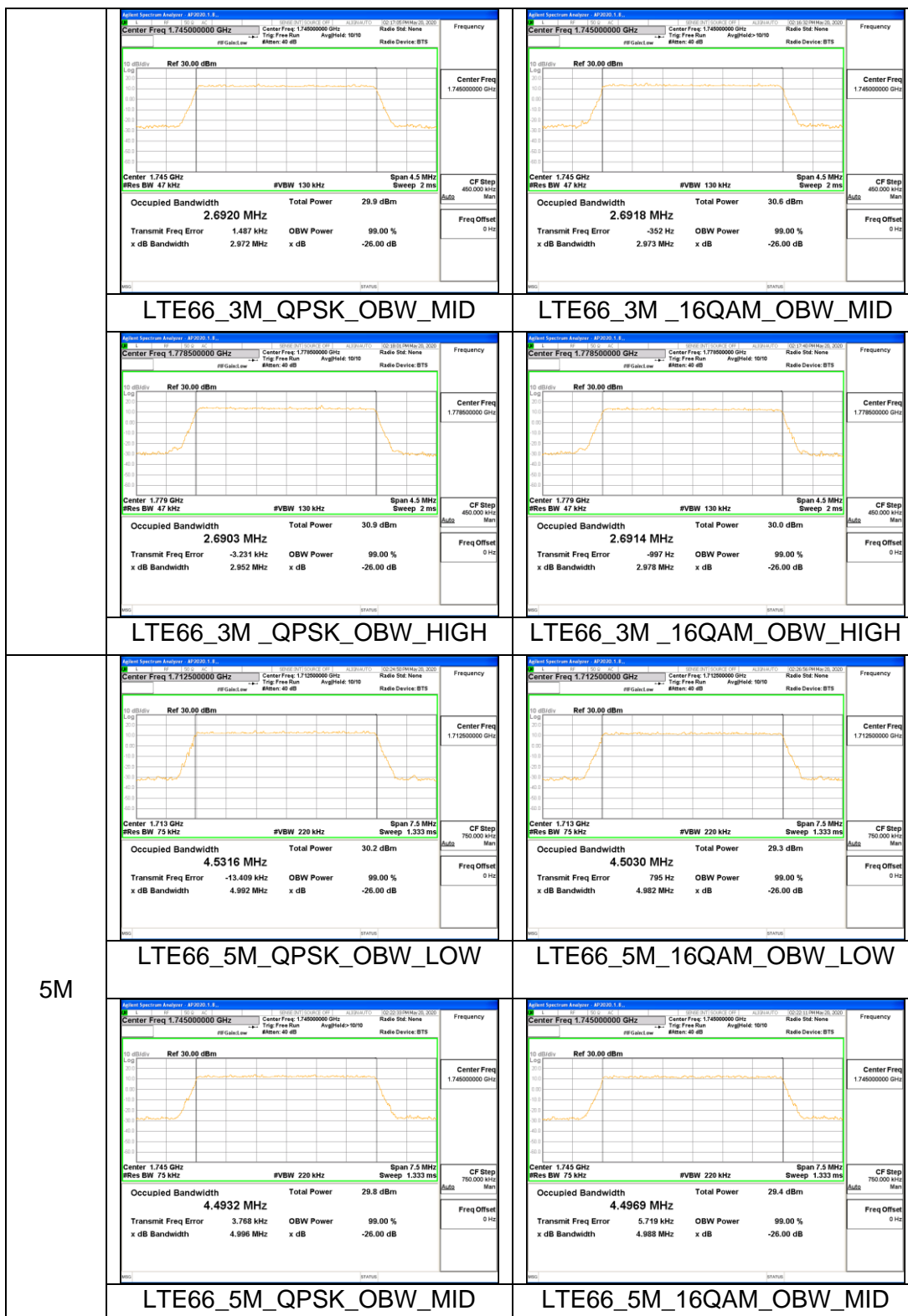




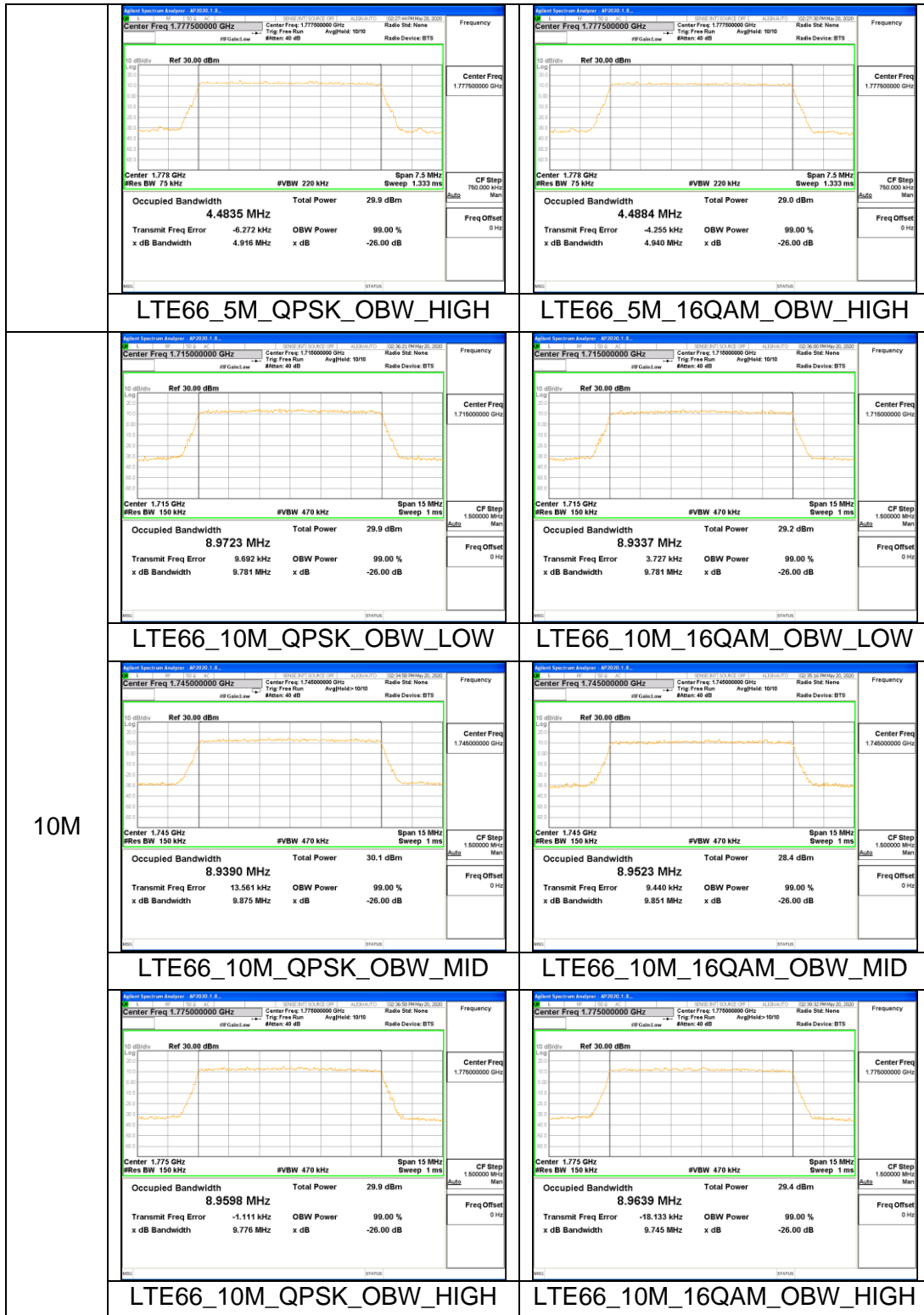
20M

LTE Band 66

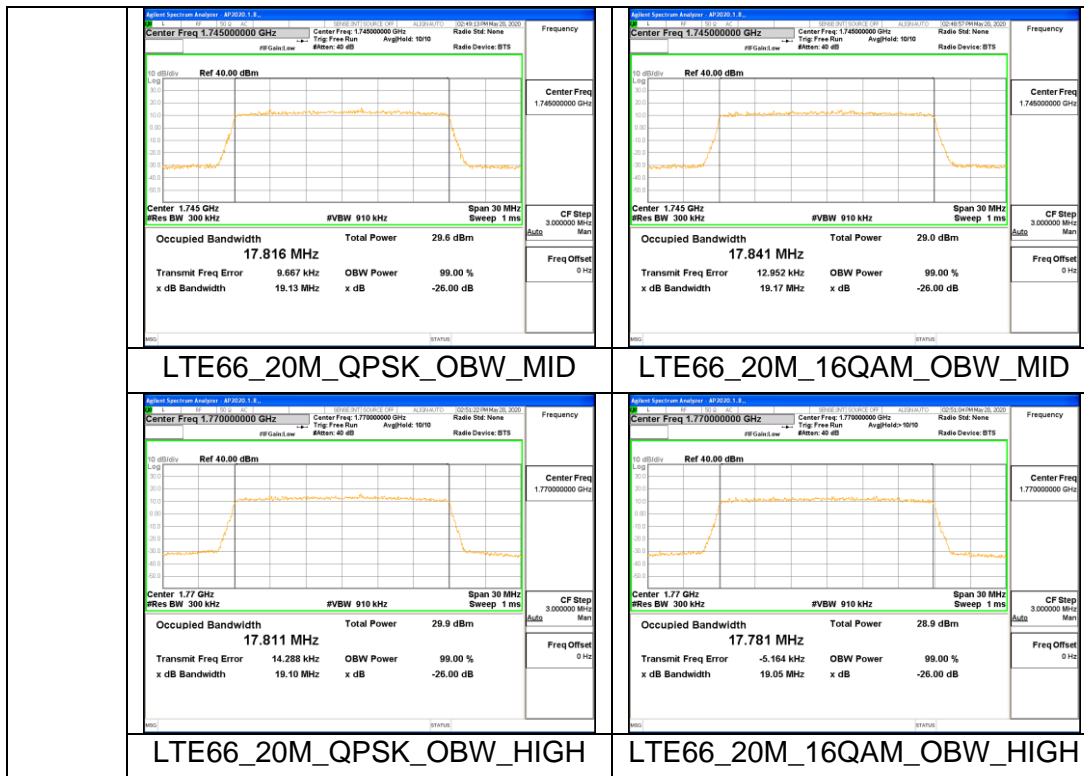




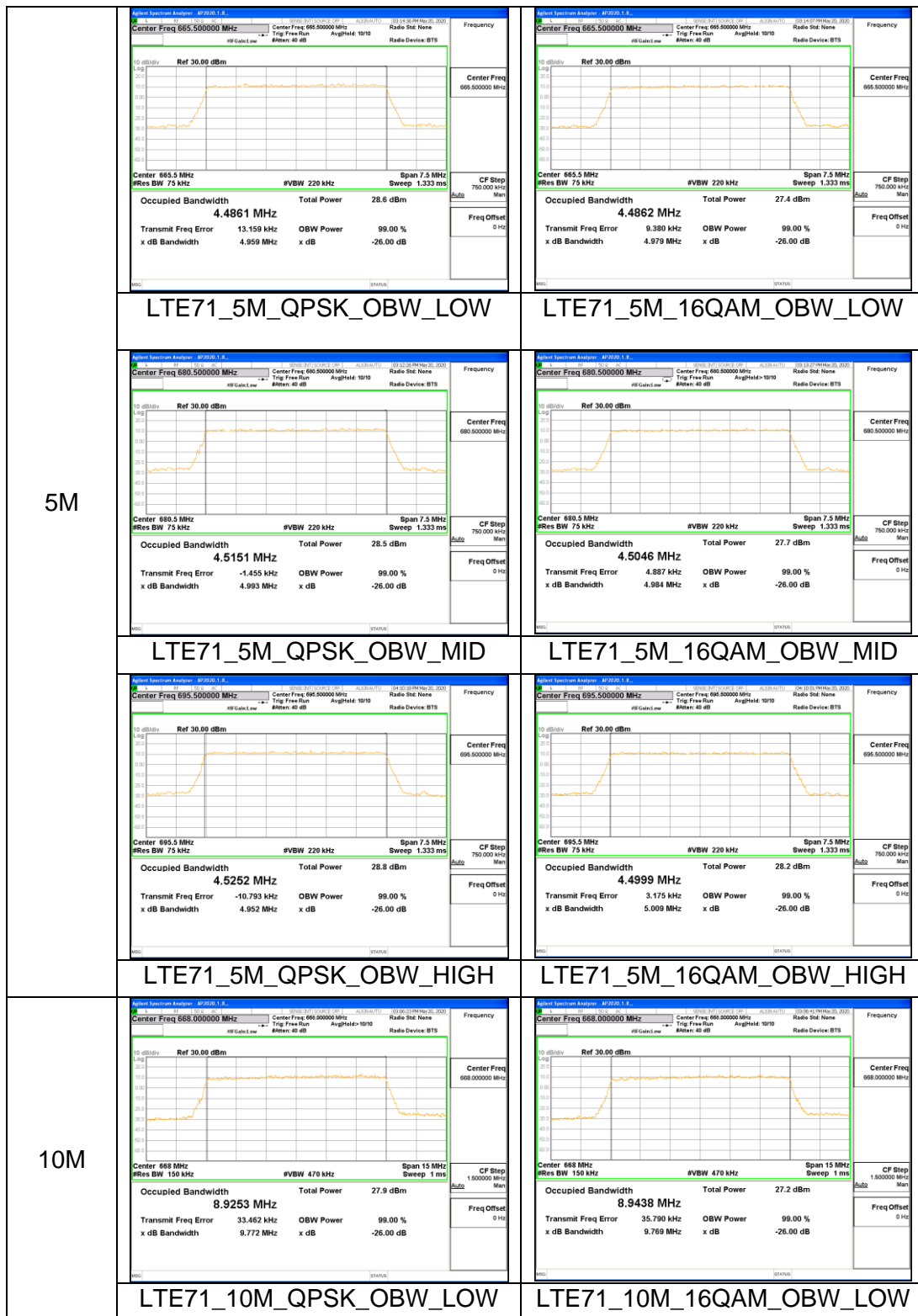
5M

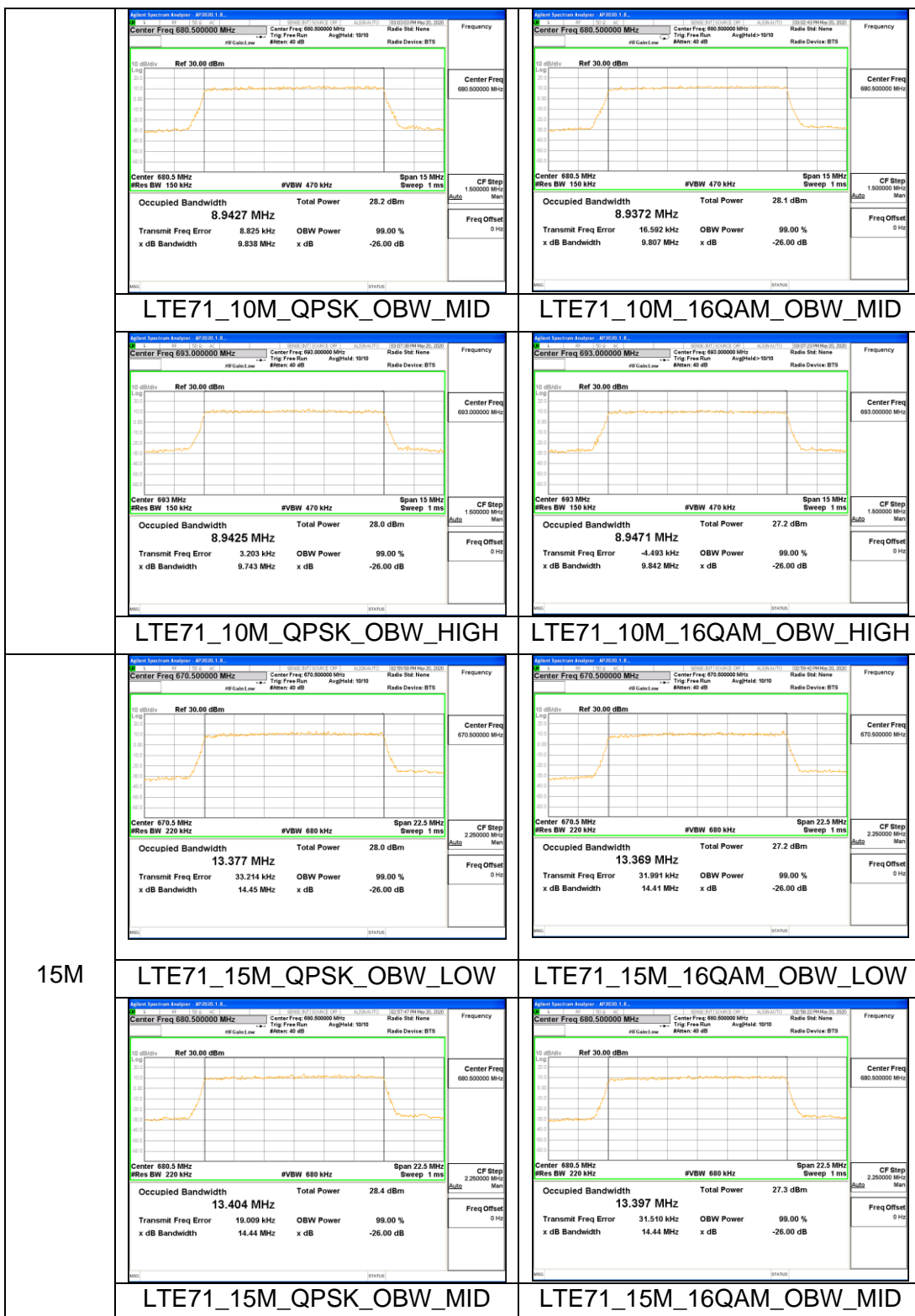






LTE Band 71







20M

6.4 FREQUENCY STABILITY

RULE PART(S)

FCC: §2.1055, §22.355, §24.235, §27.54, §90.213.

LIMITS

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

§24.235 and §27.54 - The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

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

TEST PROCEDURE

Per KDB 971168 D01 Power Meas License Digital Systems v03r01.

RESULTS

See the following pages.

Test Mode	Test Conditions		Frequency Deviation Middle Channel			
			Frequency Error	Frequency Error	Limit	
LTE Band 2	Power (VDC)	Temperature (°C)	Hz	ppm	2.5	
			-30	-2.62		-0.0014
			-20	-2.69		-0.0014
			-10	-3.12		-0.0017
			0	-3.03		-0.0016
			+10	-3.26		-0.0017
			+20	-2.20		-0.0012
			+30	-4.05		-0.0022
	+40	-4.82	-0.0026			
	+50	-4.98	-0.0026			
	VL	TN	-5.78	-0.0031		
	VH		-0.84	-0.0004		
	End Point		-0.73	-0.0004		

Test Mode	Test Conditions		Frequency Deviation Middle Channel			
			Frequency Error	Frequency Error	Limit	
LTE Band 4	Power (VDC)	Temperature (°C)	Hz	ppm	2.5	
			-30	0.72		0.0004
			-20	0.84		0.0005
			-10	0.60		0.0003
			0	-0.07		0.0000
			+10	0.29		0.0002
			+20	1.44		0.0008
			+30	0.07		0.0000
	+40	-0.36	-0.0002			
	+50	0.06	0.0000			
	VL	TN	-0.53	-0.0003		
	VH		1.40	0.0008		
	End Point		1.69	0.0010		

Test Mode	Test Conditions		Frequency Deviation Middle Channel				
			Frequency Error	Frequency Error	Limit		
LTE Band 5	Power (VDC)	Temperature (°C)	Hz	ppm	ppm		
			VN	-30	-0.13	-0.0002	2.5
				-20	0.31	0.0004	
				-10	-0.70	-0.0008	
				0	-1.12	-0.0013	
				+10	-0.82	-0.0010	
				+20	-0.33	-0.0004	
				+30	-0.23	-0.0003	
	+40	-0.54		-0.0006			
	+50	-0.46	-0.0005				
	VL	TN	-1.07	-0.0013			
	VH		-1.43	-0.0017			
	End Point		-1.50	-0.0018			

Test Mode	Test Conditions		Frequency Deviation Middle Channel				
			Frequency Error	Frequency Error	Limit		
LTE Band 12	Power (VDC)	Temperature (°C)	Hz	ppm	ppm		
			VN	-30	-1.40	-0.0020	2.5
				-20	-0.72	-0.0010	
				-10	-1.70	-0.0024	
				0	-1.44	-0.0020	
				+10	-1.36	-0.0019	
				+20	-1.43	-0.0020	
				+30	-0.41	-0.0006	
	+40	-0.10		-0.0001			
	+50	-0.40	-0.0006				
	VL	TN	-0.76	-0.0011			
	VH		-0.44	-0.0006			
	End Point		-0.57	-0.0008			

Test Mode	Test Conditions		Frequency Deviation Middle Channel				
			Frequency Error	Frequency Error	Limit		
LTE Band 13	Power (VDC)	Temperature (°C)	Hz	ppm	ppm		
			VN	-30	-1.00	-0.0013	2.5
				-20	-0.92	-0.0012	
				-10	-1.46	-0.0019	
				0	-1.07	-0.0014	
				+10	-0.90	-0.0012	
				+20	-1.03	-0.0013	
				+30	-1.57	-0.0020	
	+40	-1.30		-0.0017			
	+50	-2.29	-0.0029				
	VL	TN	-1.14	-0.0015			
	VH		-1.85	-0.0024			
	End Point		-0.90	-0.0012			

Test Mode	Test Conditions		Frequency Deviation Middle Channel				
			Frequency Error	Frequency Error	Limit		
LTE Band 25	Power (VDC)	Temperature (°C)	Hz	ppm	ppm		
			VN	-30	0.92	0.0005	2.5
				-20	1.92	0.0010	
				-10	1.14	0.0006	
				0	1.80	0.0010	
				+10	1.56	0.0008	
				+20	1.87	0.0010	
				+30	-0.36	-0.0002	
	+40	0.14		0.0001			
	+50	-0.96	-0.0005				
	VL	TN	-0.06	0.0000			
	VH		2.00	0.0011			
	End Point		2.69	0.0014			

Test Mode	Test Conditions		Frequency Deviation Middle Channel			
			Frequency Error	Frequency Error	Limit	
LTE Band 26	VN	TN	Hz	ppm	2.5	
			-30	3.32		0.0041
			-20	0.97		0.0012
			-10	2.32		0.0028
			0	-0.75		-0.0009
			+10	1.25		0.0015
			+20	0.89		0.0011
			+30	-2.21		-0.0027
	+40	-2.57	-0.0031			
	+50	-0.84	-0.0010			
	VL	TN	1.26	0.0015		
	VH		1.28	0.0016		
	End Point		1.75	0.0021		

Test Mode	Test Conditions		Frequency Deviation Middle Channel			
			Frequency Error	Frequency Error	Limit	
LTE Band 41	VN	TN	Hz	ppm	2.5	
			-30	12.13		0.0047
			-20	10.83		0.0042
			-10	13.86		0.0053
			0	10.87		0.0042
			+10	12.25		0.0047
			+20	13.07		0.0050
			+30	12.26		0.0047
	+40	11.76	0.0045			
	+50	13.73	0.0053			
	VL	TN	13.58	0.0052		
	VH		12.90	0.0050		
	End Point		11.90	0.0046		

Test Mode	Test Conditions		Frequency Deviation Middle Channel				
			Frequency Error	Frequency Error	Limit		
LTE Band 66	Power (VDC)	Temperature (°C)	Hz	ppm	ppm		
			VN	-30	-2.30	-0.0013	2.5
				-20	-2.40	-0.0014	
				-10	-2.80	-0.0016	
				0	-2.60	-0.0015	
				+10	-2.98	-0.0017	
				+20	-2.15	-0.0012	
				+30	-3.85	-0.0022	
	+40	-3.45		-0.0020			
	VN	+50	-2.98	-0.0017			
		VL	TN	-3.40	-0.0020		
		VH		-2.50	-0.0014		
	End Point	-1.33		-0.0008			

Test Mode	Test Conditions		Frequency Deviation Middle Channel				
			Frequency Error	Frequency Error	Limit		
LTE Band 71	Power (VDC)	Temperature (°C)	Hz	ppm	ppm		
			VN	-30	-1.37	-0.0020	2.5
				-20	-1.32	-0.0019	
				-10	-0.74	-0.0011	
				0	-1.39	-0.0020	
				+10	-1.50	-0.0022	
				+20	-1.69	-0.0025	
				+30	-1.70	-0.0025	
	+40	-3.06		-0.0045			
	VN	+50	-2.53	-0.0037			
		VL	TN	-1.93	-0.0028		
		VH		-1.92	-0.0028		
	End Point	-1.02		-0.0015			

6.5 BAND EDGE EMISSIONS

RULE PART(S)

FCC: §2.1051, §22.917, §24.238, §27.53, §90.691.

LIMITS

FCC: §2.1051, §22.917, §24.238, §27.53

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.

FCC: §90.691 Emission mask requirements for EA-based systems.

(a) Out-of-band emission requirement shall apply only to the "outer" channels included in an EA license and to spectrum adjacent to interior channels used by incumbent licensees. The emission limits are as follows:

(1) For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $116 \log_{10}(f/6.1)$ decibels or $50 + 10 \log_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.

(2) For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

TEST PROCEDURE

Per KDB 971168 D01 Power Meas License Digital Systems v03r01:

The transmitter output was connected to a CMW500 Test Set and configured to operate at maximum power. The band edge emissions were measured at the required operating frequencies in each band on the Spectrum Analyzer.

Set the RBW = $1 \sim 1.5$ % of OBW (Typically limited to a minimum RBW of 1% of the OBW)

- b) Set VBW $\geq 3 \times$ RBW;
- c) Set span ≥ 1.5 times the OBW;
- d) Sweep time = Auto;
- e) Detector = RMS;
- f) Ensure that the number of measurement points $\geq 2 \times$ Span/RBW;
- g) Trace mode = Average (100).

TEST PROCEDURE (LTE Band41)

(m)(6) Measurement procedure. Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed; for mobile digital stations, in the 1 megahertz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least two percent may be employed, except when the 1 megahertz band is 2495-2496 MHz, in which case a resolution bandwidth of at least one percent may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 1 megahertz or 1 percent of emission bandwidth, as specified; or 1 megahertz or 2 percent for mobile digital stations, except in the band 2495-2496 MHz). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power. With respect to television operations, measurements must be made of the separate visual and aural operating powers at sufficiently frequent intervals to ensure compliance with the rules.

RESULTS

See the following pages.

LTE Band 2

