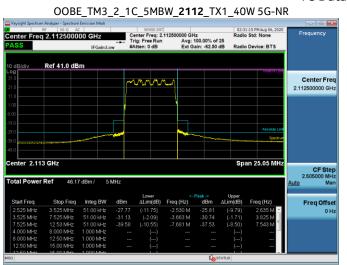
4.2 Edge of band Emissions

The Edge of Band emissions of the EUT at the external antenna connector (EAC) were measured using a Keysight MXA Signal Analyzer. The RF power level was continuously measured using a RF broadband power meter. The RF output from the EAC port to spectrum analyzer was reduced (to an amplitude usable by the spectrum analyzer) by using a calibrated attenuator and test coupler. The path attenuation was offset on the display and the signal for single carrier was adjusted to the corrected RF power level for the resolution bandwidth used for the transmit signal. All mask values were adjusted based upon the designated signal bandwidth and measurement bandwidths. The Top of Mask corresponds to the set rated power level as confirmed by the RF power meter.

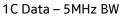
4.2.1 Edge of Band Emissions - Plots.

All of the measurements met the requirements of Part 27.53 when measured per Part 2.1049. limit is derived using the 10 Log (n) rule for limits with n=64

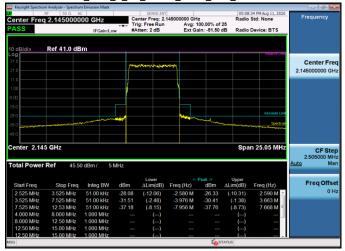
NOTE: Only a sample of the plots are used in this report. The full suite of raw data resides at the MH, New Jersey location.



OOBE_TM3_1_1C_5MBW_2177_TX1_33W 5G-NR



OOBE TM3 1 1C 5MBW **2145** TX1 33W 5G-NR



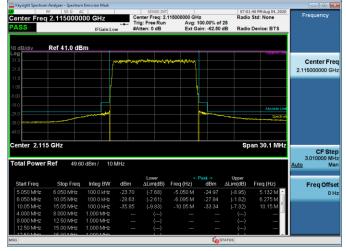
Title 47 Code of Federal Regulations Test Report

Global Product Compliance Laboratory

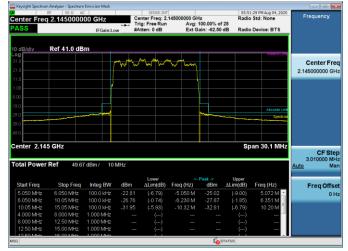
Report No: TR-2020-0102-FCC2-27 Product: AWS LTE B66a RRH 4x45W

	m Analyzer - Spectrui RF 50 Ω A			SENSE:INT			05:47	:39 PM Aug 11, 2020	
enter Frec	2.1775000	00 GHz		inter Freq: 2.	177500000 GH	z 00.00% of		Std: None	Frequency
ASS		IFGain:Lo		tten: 2 dB		ain: -62.50		Device: BTS	
dB/div	Ref 41.0 dE	3m							
og 1.0								FORMUS LINE	Contra Fra
					~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~				Center Fre
1.0									2.177500000 GH
1.0									
.00									
.00									
9.0									
9.0								Absolute Limit	
1.0								Spectrum	
9.0									
enter 2.17	8 GHz						Spa	an 25.05 MHz	CF Ste 2.505000 MH
otal Power	Ref 45.1	3 dBm / 5	MHz						Auto Ma
				Lower		Peak ->	Upper		
Start Freq	Stop Freq	Integ BW	dBm	∆Lim(dB)	Freq (Hz)	dBm	$\Delta Lim(dB)$	Freq (Hz)	Freq Offse
2.525 MHz	3.525 MHz	51.00 kHz	-25.87	(-9.85)	-2.525 M	-27.14	(-11.12)	2.570 M	0 H
3.525 MHz	7.525 MHz	51.00 kHz	-31.01	(-1.98)	-3.688 M	-31.27	(-2.24)	3.550 M	
7.525 MHz	12.53 MHz	51.00 kHz	-37.46	(-8.43)	-7.969 M	-38.23	(-9.20)	7.531 M 📱	
4.000 MHz	8.000 MHz 12.50 MHz	1.000 MHz		()			()		
		1.000 MHz		()			()		
8.000 MHz		4.000 1411-							
8.000 MHz 12.50 MHz 12.50 MHz	15.00 MHz 15.00 MHz	1.000 MHz 1.000 MHz		() ()			()		

### 1C Data – 10MHz BW OOBE_TM3_1a_1C_10MBW_**2115**_TX1 90W 5G-NR



OOBE_TM3_2_1C_10MBW_2145_TX1 90W 5G-NR



OOBE_TM3_1_1C_10MBW_2175_TX1 90W 5G-NR

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### **Global Product Compliance Laboratory**

enter Fred	RF 50 Ω AC				175000000 GH		Radio	14 PM Aug 04, 2020 Std: None	Frequency
PASS		IFGain:Lo		g: Free Run tten: 0 dB		00.00% of ain: -62.50		Device: BTS	
I0 dB/div	Ref 41.0 dB	m .							
_ <b>og</b>								Relevanting	
		1	an manager	housenser	mound				Center Fr
21.0									2.175000000 G
11.0									
1.00					<b>\</b>				
9.60									
19.0								Absolute Limit	
29.0								Spectrum	
39.0									
49.0									
Center 2.17	5 GHz						Sp	an 30.1 MHz	
									CF St
Total Power	Ref 49.30	)dBm / 10	MHz						3.010000 M Auto M
									<u></u>
				Lower		Peak ->	Upper		
					Freq (Hz)	dBm	$\Delta Lim(dB)$	Freq (Hz)	Freq Offs
Start Freq	Stop Freq	Integ BW	dBm	∆Lim(dB)					
5.050 MHz	6.050 MHz	100.0 kHz	-24.09	(-8.07)	-5.050 M	-24.77	(-8.75)	5.057 M 🔶	0
5.050 MHz 6.050 MHz	6.050 MHz 10.05 MHz	100.0 kHz 100.0 kHz	-24.09 -28.49	(-8.07) (-2.47)	-5.050 M -6.140 M	-24.77 -28.39		6.110 M	0
5.050 MHz 6.050 MHz 10.05 MHz	6.050 MHz 10.05 MHz 15.05 MHz	100.0 kHz 100.0 kHz 100.0 kHz	-24.09	(-8.07)	-5.050 M	-24.77			0
5.050 MHz 6.050 MHz 10.05 MHz 4.000 MHz	6.050 MHz 10.05 MHz 15.05 MHz 8.000 MHz	100.0 kHz 100.0 kHz 100.0 kHz 100.0 kHz 1.000 MHz	-24.09 -28.49	(-8.07) (-2.47) (-5.59) ()	-5.050 M -6.140 M	-24.77 -28.39	(-2.37) (-8.45) ()	6.110 M	0
5.050 MHz 6.050 MHz 10.05 MHz 4.000 MHz 8.000 MHz	6.050 MHz 10.05 MHz 15.05 MHz 8.000 MHz 12.50 MHz	100.0 kHz 100.0 kHz 100.0 kHz 1.000 MHz 1.000 MHz	-24.09 -28.49 -31.61	(-8.07) (-2.47) (-5.59) () ()	-5.050 M -6.140 M -10.20 M	-24.77 -28.39 -34.47	(-2.37) (-8.45) () ()	6.110 M	0
5.050 MHz 6.050 MHz 10.05 MHz 4.000 MHz	6.050 MHz 10.05 MHz 15.05 MHz 8.000 MHz	100.0 kHz 100.0 kHz 100.0 kHz 100.0 kHz 1.000 MHz	-24.09 -28.49 -31.61	(-8.07) (-2.47) (-5.59) ()	-5.050 M -6.140 M -10.20 M	-24.77 -28.39 -34.47	(-2.37) (-8.45) ()	6.110 M	01

	Analyzer - Spectrum								
	RF 50 Ω A0			SENSE:INT				6:13 PM Aug 05, 2020	Frequency
Center Fred	2.1175000	00 GHz		ia: Free Run	117500000 GH	lz 100.00% of		o Std: None	riequoney
PASS		IFGain:Lo		tten: 0 dB		ain: -62.50		Device: BTS	
		ii Gamee							
10 dB/div	Ref 41.0 dB	m .							
Log								Robotyce Links	
31.0		- m	me and	on mand	Summer of the second	(mm)			Center Fre
21.0						t_			2.117500000 GH
11.0									
1.00									
-9.00									
-19.0								Absolute Limit	
-29.0						1000		Spectrum	
-39.0									
-49.0									
Center 2.11	s GHZ						sp	an 35.15 MHz	CF Ste
									3.515000 MH
Total Power	Ref 49.66	dBm / 15	MHz						Auto Ma
				Lower		Peak ->	Upper		
Start Freq	Stop Freq	Integ BW	dBm	$\Delta Lim(dB)$	Freq (Hz)	dBm	∆Lim(dB)	Freq (Hz)	Freq Offs
7.575 MHz	8.575 MHz	150.0 kHz	-22.17	(-6.15)	-7.575 M	-23.58	(-7.56)	7.575 M 🔶	01
8.575 MHz	12.58 MHz	150.0 kHz	-29.18	(-4.92)	-8.856 M	-25.72	(-1.46)	8,593 M	
12.58 MHz	17.58 MHz	150.0 kHz	-34.39	(-10.13)	-12.66 M	-29.73	(-5.47)	13.14 M	
4.000 MHz	8.000 MHz	1.000 MHz							
	12.50 MHz	1.000 MHz							
8.000 MHz									
8.000 MHz 12.50 MHz	15.00 MHz	1.000 MHz							
	15.00 MHz	1.000 MHz		()			TATUS		

#### 1C Data – 15MHz BW OOBE_TM3_2_1C_15MBW_**2117**_TX1 90W 5G-NR



enter Fred	RF 50 Ω A			SENSE:INT Inter Freq: 2 Ig: Free Run	145000000 GH	lz 100.00% of	Radio	2:06 PM Aug 05, 2020 o Std: None	Frequency
ASS		IFGain:Lo		tten: 0 dB		ain: -62.50		o Device: BTS	
) d <u>B/div</u>	Ref 41.0 dB	im							
og 1.0								Relative Lint	Contor Fr
1.0		1		a descent of the second of the second se		· · · · ·			Center Fre 2.14500000 GH
		1				l			2.145000000 G
1.0		J							
.00									
.00									
9.0								Absolute Limit	
9.0						No.		Spectrum	
9.0									
9.0									
9.0									
	5 GHz						Sp	an 35.15 MHz	
9.0	5 GHz						Sp	an 35.15 MHz	
enter 2.14		3 dBm / 15	MHZ				Sp	an 35.15 MHz	3.515000 M
9.0		3 dBm / 15 l	MHz				Sp	an 35.15 MHz	3.515000 M
enter 2.14	Ref 49.5		MHz	Lower		Peak >	Sp	an 35.15 MHz	3.515000 Mi
enter 2.14		Integ BW	MHz	Lower ∆Lim(dB)	Freq (Hz)	Peak -> dBm		Freq (Hz)	3.515000 Mi <u>Auto</u> Mi
enter 2.14 otal Power Start Freq 7.575 MHz	<b>Ref 49.5</b> Stop Freq 8.575 MHz	Integ BW 150.0 kHz	dBm -22.74	ΔLim(dB) (-6.72)	Freq (Hz) -7.575 M	dBm -24.20	Upper ΔLim(dB) (-8.18)	Freq (Hz) 7.575 M 🛀	3.515000 Mi <u>Auto</u> M Freq Offs
enter 2.14 otal Power Start Freq 7.575 MHz 8.575 MHz	Stop Freq 8.575 MHz 12.58 MHz	Integ BW 150.0 kHz 150.0 kHz	dBm -22.74 -26.50	ΔLim(dB) (-6.72) (-2.25)	Freq (Hz) -7.575 M -9.452 M	dBm -24.20 -25.53	Upper ΔLim(dB) (-8.18) (-1.27)	Freq (Hz) 7.575 M 8.645 M	3.515000 Mi <u>Auto</u> M Freq Offs
enter 2.14 otal Power Start Freq 7.575 MHz 8.575 MHz 12.58 MHz	Ref 49.53 Stop Freq 8.575 MHz 12.58 MHz 17.58 MHz	Integ BW 150.0 kHz 150.0 kHz 150.0 kHz	dBm -22.74 -26.50 -29.16	ΔLim(dB) (-6.72) (-2.25) (-4.90)	Freq (Hz) -7.575 M	dBm -24.20	Upper ΔLim(dB) (-8.18) (-1.27) (-5.66)	Freq (Hz) 7.575 M 🛀	3.515000 Mi <u>Auto</u> M Freq Offs
enter 2.14 otal Power Start Freq 7.575 MHz 8.575 MHz 12.58 MHz 4.000 MHz	Ref 49.53 Stop Freq 8.575 MHz 12.58 MHz 17.58 MHz 8.000 MHz	Integ BW 150.0 kHz 150.0 kHz 150.0 kHz 150.0 kHz 1.000 MHz	dBm -22.74 -26.50 -29.16	ΔLim(dB) (-6.72) (-2.25) (-4.90) ()	Freq (Hz) -7.575 M -9.452 M -12.82 M	dBm -24.20 -25.53 -29.92 	Upper <u>∆Lim(dB)</u> (-8.18) (-1.27) (-5.66) ()	Freq (Hz) 7.575 M 8.645 M	3.515000 Mi <u>Auto</u> M Freq Offs
enter 2.14 otal Power Start Freq 7.575 MHz 8.575 MHz 12.58 MHz	Ref 49.53 Stop Freq 8.575 MHz 12.58 MHz 17.58 MHz	Integ BW 150.0 kHz 150.0 kHz 150.0 kHz	dBm -22.74 -26.50 -29.16	ΔLim(dB) (-6.72) (-2.25) (-4.90)	Freq (Hz) -7.575 M -9.452 M -12.82 M	dBm -24.20 -25.53	Upper ΔLim(dB) (-8.18) (-1.27) (-5.66)	Freq (Hz) 7.575 M 8.645 M	CF Ste 3.51500 Mi <u>Auto</u> Mi Freq Offs 0 I

#### OOBE_TM3_1_1C_15MBW_2172_TX1 90W 5G-NR

		Emission Mask							
enter Freq	RF 50 Ω AC 2.1725000	00 GHz	- Tr	ig: Free Run	172500000 GH Avg: 1	100.00% of	Radio 25	4:12 PM Aug 05, 2020 Std: None	Frequency
ASS		IFGain:Lo	w #A	tten: 0 dB	Ext G	ain: -62.50	dB Radio	Device: BTS	
odB/div og	Ref 41.0 dB	m						Reserve Line	
		pm	u*a***a	ner al han an a	and the last and a second s				Center Fr 2.172500000 G
00									
.0								Absokte Linit	
9.0						***		Spectrum	
9.0	3 GHz						Spa	an 35.15 MHz	
enter 2.17		4 dBm / 15	MHz				Spa	an 35.15 MHz	3.515000 M
enter 2.173		4 dBm / 15 I	MHz dBm	Lower ∆Lim(dB)	Freq (Hz)	Peak → dBm	Spa Upper ΔLim(dB)	an 35.15 MHz Freq (Hz)	3.515000 M <u>Auto</u> M
otal Power Start Freq 7.575 MHz	Ref 49.54 Stop Freq 8.575 MHz	Integ BW 150.0 kHz	dBm -24.26	∆Lim(dB) (-8.24)	Freq (Hz) -7.575 M	dBm -24.71	Upper ΔLim(dB) (-8.69)	Freq (Hz)	3.515000 M Auto M Freq Offs
enter 2.173 otal Power	Ref 49.54 Stop Freq 8.575 MHz 12.58 MHz	Integ BW 150.0 kHz 150.0 kHz	dBm	ΔLim(dB) (-8.24) (-3.41)	Freq (Hz) -7.575 M -8.926 M	dBm -24.71 -27.06	Upper ∆Lim(dB)	Freq (Hz) 7.626 M ^ 8.593 M	3.515000 M <u>Auto</u> M Freq Offs
enter 2.17: otal Power Start Freq 7.575 MHz 12.58 MHz	Ref 49.54 Stop Freq 8.575 MHz 12.58 MHz 17.58 MHz	Integ BW 150.0 kHz 150.0 kHz 150.0 kHz	dBm -24.26	ΔLim(dB) (-8.24) (-3.41) (-5.40)	Freq (Hz) -7.575 M	dBm -24.71	Upper ΔLim(dB) (-8.69) (-2.80) (-7.46)	Freq (Hz)	3.515000 M <u>Auto</u> M Freq Offs
8.575 MHz 12.58 MHz 4.000 MHz	Ref 49.54 Stop Freq 8.575 MHz 12.58 MHz 17.58 MHz 8.000 MHz	Integ BW 150.0 kHz 150.0 kHz 150.0 kHz 150.0 kHz 1.000 MHz	dBm -24.26 -27.66	ΔLim(dB) (-8.24) (-3.41) (-5.40) ()	Freq (Hz) -7.575 M -8.926 M	dBm -24.71 -27.06	Upper ΔLim(dB) (-8.69) (-2.80)	Freq (Hz) 7.626 M ^ 8.593 M	3.515000 M <u>Auto</u> M Freq Offs
enter 2.17: otal Power Start Freq 7.575 MHz 12.58 MHz	Ref 49.54 Stop Freq 8.575 MHz 12.58 MHz 17.58 MHz	Integ BW 150.0 kHz 150.0 kHz 150.0 kHz	dBm -24.26 -27.66 -29.66	ΔLim(dB) (-8.24) (-3.41) (-5.40)	Freq (Hz) -7.575 M -8.926 M -12.77 M	dBm -24.71 -27.06 -31.72	Upper ΔLim(dB) (-8.69) (-2.80) (-7.46)	Freq (Hz) 7.626 M ^ 8.593 M	3.515000 M <u>Auto</u> M Freq Offs
enter 2.17: otal Power Start Freq 7.575 MHz 8.575 MHz 12.58 MHz 4.000 MHz	Ref 49.54 Stop Freq 8.575 MHz 12.58 MHz 17.58 MHz 8.000 MHz	Integ BW 150.0 kHz 150.0 kHz 150.0 kHz 150.0 kHz 1.000 MHz	dBm -24.26 -27.66 -29.66	ΔLim(dB) (-8.24) (-3.41) (-5.40) ()	Freq (Hz) -7.575 M -8.926 M -12.77 M	dBm -24.71 -27.06 -31.72	Upper ΔLim(dB) (-8.69) (-2.80) (-7.46) ()	Freq (Hz) 7.626 M ^ 8.593 M	CF Str 3.515000 M M Freq Offs 01

Center Freq	Analyzer - Spectrum RF 50 Ω AC 2.1200000	2	Ce	SENSE:INT Inter Freq: 2.	120000000 GH	z 100.00% of	Radio	0:02 PM Aug 05, 2020 5 Std: None	Frequency
PASS		IFGain:Lo		tten: 0 dB	Ext G	ain: -62.50	dB Radio	Device: BTS	
10 dB/div	Ref 41.0 dB	m							
Log								Reserve Lint	
31.0		processer	Color and	participant and	and a second	mount			Center Fre
21.0								_	2.120000000 GH
11.0									
1.00									
-9.00									
-19.0	r							Absolute Line	
-79.0							-	Spectrum	
								the state of the s	
-									
-39.0									
-									
-39.0	GHz						S	pan 40.2 MHz	
-39.0		2 dBm / 20	MHz				S	pan 40.2 MHz	4.020000 MH
Center 2.12	Ref 49.72			Lower		Peak ->	Upper		
Center 2.12	Ref 49.72 Stop Freq	Integ BW	dBm	∆Lim(dB)	Freq (Hz)	dBm	Upper ∆Lim(dB)	Freq (Hz)	4.020000 MH <u>Auto</u> Ma
Center 2.12 Total Power Start Freq 10.10 MHz	Ref 49.72 Stop Freq 11.10 MHz	Integ BW 200.0 kHz	dBm -23.70	∆Lim(dB) (-7.68)	Freq (Hz) -10.10 M	dBm -24.40	Upper ΔLim(dB) (-8.38)	Freq (Hz)	4.020000 MH Auto Ma Freq Offse
430 430 Center 2.12 Total Power Start Freq 10.10 MHz 11.10 MHz	Ref 49.72 Stop Freq 11.10 MHz 15.10 MHz	Integ BW 200.0 kHz 200.0 kHz	dBm -23.70 -28.27	ΔLim(dB) (-7.68) (-5.26)	Freq (Hz) -10.10 M -11.10 M	dBm -24.40 -25.91	Upper ΔLim(dB) (-8.38) (-2.90)	Freq (Hz) 10.64 M _ 11.20 M	4.020000 MH Auto Ma Freq Offse
390	Ref 49.72 Stop Freq 11.10 MHz 15.10 MHz 20.10 MHz	Integ BW 200.0 kHz 200.0 kHz 200.0 kHz	dBm -23.70 -28.27 -32.88	ΔLim(dB) (-7.68) (-5.26) (-9.87)	Freq (Hz) -10.10 M -11.10 M -15.18 M	dBm -24.40 -25.91 -29.33	Upper ∆Lim(dB) (-8.38) (-2.90) (-6.32)	Freq (Hz)	4.020000 MH
390	Ref 49.72 Stop Freq 11.10 MHz 15.10 MHz 20.10 MHz 8.000 MHz	Integ BW 200.0 kHz 200.0 kHz 200.0 kHz 1.000 MHz	dBm -23.70 -28.27 -32.88 	ΔLim(dB) (-7.68) (-5.26) (-9.87) ()	Freq (Hz) -10.10 M -11.10 M -15.18 M	dBm -24.40 -25.91 -29.33	Upper <u>∆Lim(dB)</u> (-8.38) (-2.90) (-6.32) ()	Freq (Hz) 10.64 M _ 11.20 M	4.020000 MH Auto Ma Freq Offse
390	Ref 49.72 Stop Freq 11.10 MHz 15.10 MHz 20.10 MHz	Integ BW 200.0 kHz 200.0 kHz 200.0 kHz	dBm -23.70 -28.27 -32.88	ΔLim(dB) (-7.68) (-5.26) (-9.87)	Freq (Hz) -10.10 M -11.10 M -15.18 M	dBm -24.40 -25.91 -29.33	Upper ∆Lim(dB) (-8.38) (-2.90) (-6.32)	Freq (Hz) 10.64 M _ 11.20 M	4.020000 MH <u>Auto</u> Ma Freq Offse

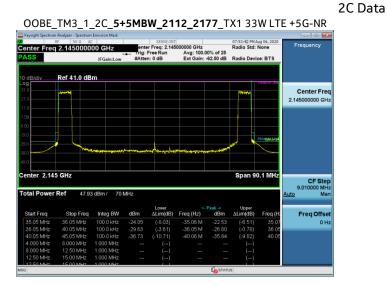
#### 1C Data – 20MHz BW OOBE_TM3_1_1C_20MBW_2120_TX1 90W 5G-NR



enter Frec ASS	RF 50 Ω AG	00 GHz IFGain:Lo	Tr	sense:INT inter Freq: 2. ig: Free Run itten: 0 dB	145000000 GH Avg: 1	z 100.00% of ain: -62.50	Radio 25	3:31 PM Aug 05, 2020 5 Std: None 5 Device: BTS	Frequency
0 dB/div og	Ref 41.0 dB	m						Reserve Line	
1.0		Contraction of the second	m m	-	rinen yannan (	h			Center Fre 2.145000000 GH
1.0									
.00	r							Absolute Unit	
9.0							*****	Spectrum	
9.0									
								pan 40.2 MHz	
enter 2.14	5 GHz						2	5011 40.2 WH 12	
enter 2.14 otal Power		9 dBm / 20	MHz				5	5411 4012 WITE	4.020000 MH
		dBm / 20	MHz dBm	Lower ∆Lim(dB)	<-I Freq (Hz)	Peak → dBm	Upper ∆Lim(dB)	Freq (Hz)	4.020000 MH <u>Auto</u> Ma
otal Power	Ref 49.49						Upper		4.020000 Mł Auto Ma Freq Offs
otal Power	Ref 49.48 Stop Freq	Integ BW	dBm	∆Lim(dB)	Freq (Hz)	dBm	Upper ∆Lim(dB)	Freq (Hz)	4.020000 Mł Auto Ma Freq Offs
otal Power Start Freq 10.10 MHz	Ref 49.49 Stop Freq 11.10 MHz	Integ BW 200.0 kHz	dBm -24.27	ΔLim(dB) (-8.25)	Freq (Hz) -10.10 M	dBm -23.60	Upper ΔLim(dB) (-7.58)	Freq (Hz)	CF Ste 4.020000 MH Auto Ma Freq Offs 0 H
otal Power Start Freq 10.10 MHz 11.10 MHz	Ref 49.49 Stop Freq 11.10 MHz 15.10 MHz	Integ BW 200.0 kHz 200.0 kHz	dBm -24.27 -26.69	ΔLim(dB) (-8.25) (-3.68)	Freq (Hz) -10.10 M -11.72 M	dBm -23.60 -26.38	Upper ΔLim(dB) (-7.58) (-3.37)	Freq (Hz) 10.26 M - 11.12 M	4.020000 Mł Auto Ma Freq Offs
otal Power Start Freq 10.10 MHz 11.10 MHz 15.10 MHz	Ref 49.49 Stop Freq 11.10 MHz 15.10 MHz 20.10 MHz	Integ BW 200.0 kHz 200.0 kHz 200.0 kHz	dBm -24.27 -26.69 -28.30	∆Lim(dB) (-8.25) (-3.68) (-5.29)	Freq (Hz) -10.10 M -11.72 M -15.22 M	dBm -23.60 -26.38	Upper ∆Lim(dB) (-7.58) (-3.37) (-6.40)	Freq (Hz) 10.26 M - 11.12 M	4.020000 Mł Auto Ma Freq Offs
otal Power Start Freq 10.10 MHz 11.10 MHz 15.10 MHz 4.000 MHz	Ref 49.49 Stop Freq 11.10 MHz 15.10 MHz 20.10 MHz 8.000 MHz	Integ BW 200.0 kHz 200.0 kHz 200.0 kHz 200.0 kHz 1.000 MHz	dBm -24.27 -26.69 -28.30	ΔLim(dB) (-8.25) (-3.68) (-5.29) ()	Freq (Hz) -10.10 M -11.72 M -15.22 M	dBm -23.60 -26.38 -29.41	Upper <u>∆Lim(dB)</u> (-7.58) (-3.37) (-6.40) ()	Freq (Hz) 10.26 M - 11.12 M	4.020000 Mł Auto Ma Freq Offs

#### OOBE_TM3_1a_1C_20MBW_2170_TX1 90W 5G-NR

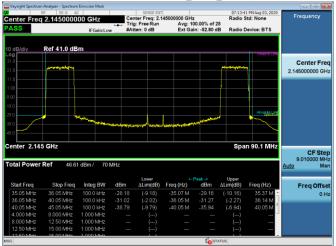
Center Fi Conter Fi	enter Fred	RF 50 Ω A0 2.1700000			SENSE:INT enter Freq: 2. ig: Free Run	170000000 GH	lz 100.00% of	Radio	5:49 PM Aug 05, 2020 Std: None	Frequency
Pg         Pg<	ASS		IFGain:Lo						Device: BTS	
Center Fill         Center Fill           2         7000 Mtz         2000 Mtz         200		Ref 41.0 dB	m							
Constrained         Constrained <thconstrained< th=""> <thconstrained< th=""></thconstrained<></thconstrained<>									Relative Links	
Image: Constraint of the second se			harden		angen af an an	and the stand and				
Start Freq         Stop Freq         Integ BW         dBm         Lower         CF St         Upper           10 10 MHz         11 10 MHz         20 0 HHz         50 0 HHz <td>1.0</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>2.17000000 G</td>	1.0									2.17000000 G
CF st         Span 40.2 MHz           Otal Power Ref         49 53 dBm / 20 MHz         Cer st           Start Freq         Stop Freq         Integ BW         dBm         Lower         CPMA - 3         Upper           10 10 MHz         11 0 MHz         200 0 Hz	1.0									
No         Annual Cer           0         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         - <t< td=""><td>00</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>	00									
Start Freq         Stop Freq         Integ BW         dBm         Lower ALIMAGE         CF st. BDm         Upper ALIMAGE         CF st. CF st. CF st.           Start Freq         Stop Freq         Integ BW         dBm         ALIm(dB)         Freq (H2)         dBm         ALIm(dB)         Freq (H2)         ALIm(dB)         Freq (H2)         ALIm(dB)         Freq (H2)         To all Mark           Start Freq         Stop Freq         Integ BW         dBm         ALIm(dB)         Freq (H2)         dBm         ALIm(dB)         Freq (H2)         To all Mark         ALIm(dB)         Freq (H2)         To all Mark         ALIM         ALIM         ALIM         ALIM         ALIM         ALIM         ALIM         To all Mark         ALIM	00									
Start Freq         Stop Freq         Integ BW         dBm         Lower ALIMAGE         CF st. BDm         Upper ALIMAGE         CF st. CF st. CF st.           Start Freq         Stop Freq         Integ BW         dBm         ALIm(dB)         Freq (H2)         dBm         ALIm(dB)         Freq (H2)         ALIm(dB)         Freq (H2)         ALIm(dB)         Freq (H2)         To all Mark           Start Freq         Stop Freq         Integ BW         dBm         ALIm(dB)         Freq (H2)         dBm         ALIm(dB)         Freq (H2)         To all Mark         ALIm(dB)         Freq (H2)         To all Mark         ALIM         ALIM         ALIM         ALIM         ALIM         ALIM         ALIM         To all Mark         ALIM	3.0								Abard to Line	
Diametric         Span 40.2 MHz           Start Freq         Stop Freq         Integ BW         dBm         Lower         C Fist         Autroid         Material         Autroid         Material         Materia         Materia         Materia								1 m		
Image: Start Freq         Stop Freq         Integration         Stop Freq         I									Spectrum	
Span 40.2 MHz           Start Freq         Start Freq         Lower         CF St 4.020000 Mz           Start Freq         Stop Freq         Integ BW         dBm         Lower         C Pak.3         Upper           10.10 MHz         11.10 MHz         200 0 Hz         -2641         (-10.39)         -10.12 M27.23         (-42.2)         11.16 M           15.10 MHz         200 0 Hz         -27.62         (-461)         -11.12 M27.23         (-42.2)         11.16 M           15.10 MHz         200 0 Hz         -26.53         (-552)         -15.12 M30.75         (-7.74)         15.14 M           0.000 MHz         3000 MHz         1000 MHz           ()            2120 MHz         1000 MHz           ()             2120 MHz         1000 MHz           ()              2120 MHz         1000 MHz										
Start Freq         Stop Freq         Integ BW         dBm         Lower         CF 84.3         Upper         4020000 /r         Auto         Auto           Start Freq         Stop Freq         Integ BW         dBm         Autin(dB)         Freq (H2)         dBm         Auto         Auto <t< td=""><td>9.0</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>	9.0									
Start Freq         Stop Freq         Integ BW         dBm         Lower         CF 84.3         Upper         4020000 /r         Auto         Auto           Start Freq         Stop Freq         Integ BW         dBm         Autin(dB)         Freq (H2)         dBm         Auto         Auto <t< th=""><th>optor 217</th><th>CH2</th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th></t<>	optor 217	CH2								
Start Freq         Stop Freq         Integ BW         dBm         Lower         C Petk 3         Upper         4 202000 M         Auto         Auto         N           Start Freq         Stop Freq         Integ BW         dBm         Limid(B)         Freq (Hz)         BM         Limid(B)         Freq (Hz)         Auto         N		GHZ						5	5an 40.2 minz	CF St
Start Freq         Stop Freq         Integ BW         dBm         Lome(B)         Freq (Hz)         Upper         Upper         Freq (Hz)         Freq (Hz)           10 10 MHz         11 10 MHz         2000 0Hz         -06 41         (-10.39)         -10 12 M         -25 22         (-9.20)         10 56 M         G           11 10 MHz         15 10 MHz         2000 0Hz         -27 62         (-461)         -11 42 M         -27 52         (-9.20)         10 56 M         G           15 10 MHz         2010 0Hz         2000 0Hz         -26 53         (-55 2)         -15 12 M         -30 75         (-7 74)         15 14 M         -           4000 MHz         1000 MHz         1000 MHz         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         - <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>										
Start Freq         Stop Freq         Integ BW         dBm         ALIm(dB)         Freq (Hz)         dBm         ALIm(dB)         Freq (Hz)         Freq Off           10 10 MHz         11 10 MHz         2000 1Hz         -26 41         (-10.39)         -10 12 M         -25 22         (-9.20)         10 36 M         0           11 10 MHz         15 10 MHz         2000 1Hz         -27 62         (-46 H)         -11 42 M         -27 23         (-42 2)         11 16 M           15 10 MHz         2000 0Hz         -28 53         (-55 2)         -15 12 M         -30 75         (-7 74)         15 14 M           15 10 0MHz         2000 0Hz         -20 00 0Hz         -0 <td></td>										
Start Freq         Stop Freq         Integ BW         dBm         ALIm(dB)         Freq (Hz)         dBm         ALIm(dB)         Freq (Hz)         Freq Off           10 10 MHz         11 10 MHz         2000 1Hz         -26 41         (-10.39)         -10 12 M         -25 22         (-9.20)         10 36 M         0           11 10 MHz         15 10 MHz         2000 1Hz         -27 62         (-46 H)         -11 42 M         -27 23         (-42 2)         11 16 M           15 10 MHz         2000 0Hz         -28 53         (-55 2)         -15 12 M         -30 75         (-7 74)         15 14 M           15 10 0MHz         2000 0Hz         -20 00 0Hz         -0 <th>otal Power</th> <th>Ref 49.53</th> <th>3 dBm / 20</th> <th>MHz</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th>	otal Power	Ref 49.53	3 dBm / 20	MHz						
10 10 MHz         11 10 MHz         200 0 HHz         -26.41         (-10.39)         -10 12 M         -25.22         (-9.20)         10.36 M         -11 10 MHz         15 10 MHz         200 0 HHz         -27.62         (-4.61)         -11 42 M         -27.73         (-4.22)         11 10 MHz         200 0 HHz         200 0 HHz         -26.21         (-1.16 MHz         200 0 HHz         -20.00 HHz         -26.21         (-1.16 MHz         -11.16 MHz         -11.16 MHz         -11.16 MHz         -20.00 HHz         -26.20         (-1.51 LHZ         -11.16 MHz         -11.16	otal Power	Ref 49.53	3 dBm / 20	MHz	Louar		Pask >	Hener		
1110MHz 1510MHz 2000Hz 2762 (461) .1142M .7733 (422) 1116M 1510MHz 2010MHz 2000Hz .552) .1512M .3075 (-7.74) 1514M 4 000MHz 1800MHz 1000MHz () () 8000MHz 1250MHz 1000MHz () () 1250MHz 1500MHz 1000MHz () ()									Freq (Hz)	
4.000 MHz 8.000 MHz 1.000 MHz () () () 8.000 MHz 1250 MHz 1.000 MHz () () ()	Start Freq	Stop Freq	Integ BW	dBm	∆Lim(dB)	Freq (Hz)	dBm	∆Lim(dB)		<u>Auto</u> M
8 000 MHz 12 50 MHz 1.000 MHz () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () () ()	Start Freq 10.10 MHz	Stop Freq 11.10 MHz	Integ BW 200.0 kHz	dBm -26.41	∆Lim(dB) (-10.39)	Freq (Hz) -10.12 M	dBm -25.22	ΔLim(dB) (-9.20)	10.36 M 🔶	Auto M Freq Offs
12.50 MHz 15.00 MHz 1.000 MHz () ()	Start Freq 10.10 MHz 11.10 MHz	Stop Freq 11.10 MHz 15.10 MHz 20.10 MHz	Integ BW 200.0 kHz 200.0 kHz 200.0 kHz	dBm -26.41 -27.62	ΔLim(dB) (-10.39) (-4.61)	Freq (Hz) -10.12 M -11.42 M	dBm -25.22 -27.23	ΔLim(dB) (-9.20) (-4.22)	10.36 M ^ 11.16 M	Auto M Freq Offs
	Start Freq 10.10 MHz 11.10 MHz 15.10 MHz 4.000 MHz	Stop Freq 11.10 MHz 15.10 MHz 20.10 MHz 8.000 MHz	Integ BW 200.0 kHz 200.0 kHz 200.0 kHz 200.0 kHz 1.000 MHz	dBm -26.41 -27.62 -28.53	∆Lim(dB) (-10.39) (-4.61) (-5.52) ()	Freq (Hz) -10.12 M -11.42 M -15.12 M	dBm -25.22 -27.23 -30.75	ΔLim(dB) (-9.20) (-4.22) (-7.74)	10.36 M ^ 11.16 M	Auto M Freq Offs
	Start Freq 10.10 MHz 11.10 MHz 15.10 MHz 4.000 MHz 8.000 MHz	Stop Freq 11.10 MHz 15.10 MHz 20.10 MHz 8.000 MHz 12.50 MHz	Integ BW 200.0 kHz 200.0 kHz 200.0 kHz 1.000 MHz 1.000 MHz	dBm -26.41 -27.62 -28.53	∆Lim(dB) (-10.39) (-4.61) (-5.52) ()	Freq (Hz) -10.12 M -11.42 M -15.12 M	dBm -25.22 -27.23 -30.75 	ΔLim(dB) (-9.20) (-4.22) (-7.74) ()	10.36 M ^ 11.16 M	Auto M Freq Offs

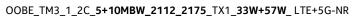


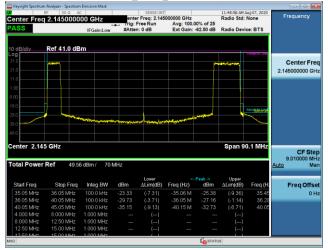
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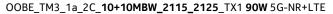


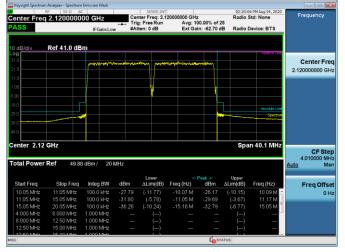
OOBE_TM3_1_2C_10+10MBW_2115_2175_TX2 45W











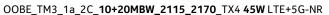
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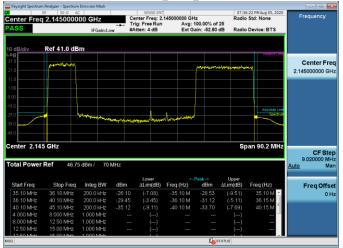
#### **Global Product Compliance Laboratory**

Report No: TR-2020-0102-FCC2-27 Product: AWS LTE B66a RRH 4x45W

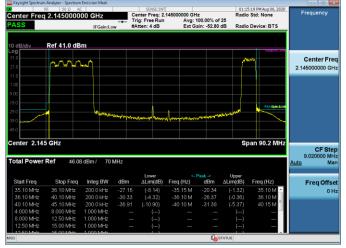
OOBE_TM3_2_2C_10+15MBW_2115_2172_TX1 90W LTE+5G-NR

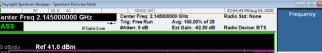
#### nter Freq: 2.14 g: Free P nter Freg 2,14500 000 GHz Avg: 10 Ext Gair 52.80 dE Radio Device: BTS Ref 41.0 dBn Center Free 2.145000000 G 2.145 GHz Span 90.2 MH CF St 9.020 otal Power Pef 46.86 dBm 70 MH Stop Freq Integ BW dBr Freq (Hz Freq Offs 0 F

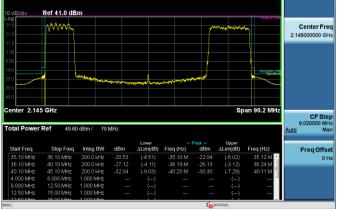




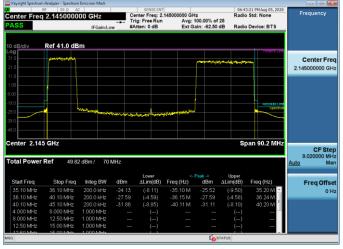
OOBE_TM3_2_2C_15+5MBW_2117_2177_TX4 25W+20W 5G-NR+LTE

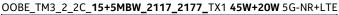


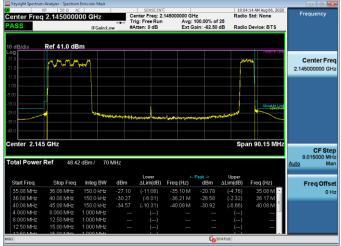




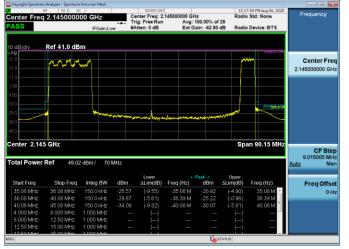




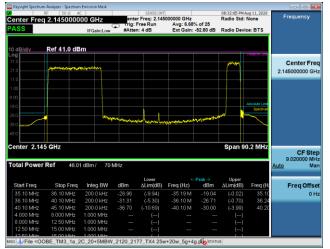




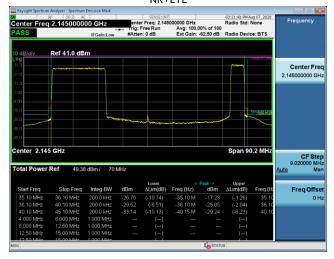
### OOBE_TM3_2_2C_15+5MBW_2117_2177_TX1 45W+33W 5G-NR+LTE



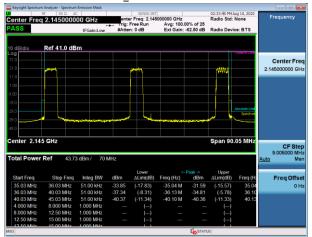
OOBE_TM3_1a_2C_**20+5MBW_2120_2177**_TX4 **25W+20W_**5G-NR+LTE



#### OOBE_TM3_1a_2C_**20+5MBW_2120_2177**_TX1_**33W+57W_**5G-NR+LTE



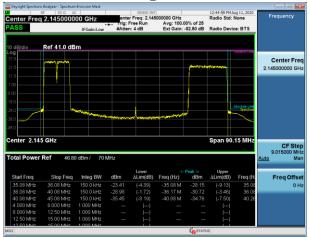




OOBE_TM3_2_3C_**5+5+10MBW_2112_2117_2175**_TX4 **15W+15W+15W**_LTE+LTE+5G-NR

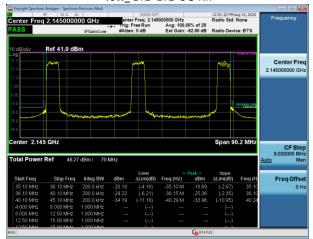


OOBE_TM3_1_3C_5+5+15MBW_2112_2117_2172_TX4 15W+15W+15W_LTE+LTE+5G-NR

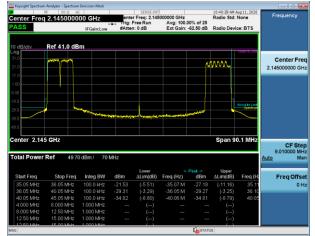




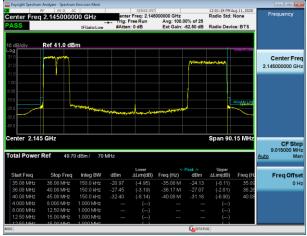
OOBE_TM3_2_3C_**5+5+5MBW_2112_2145_2177**_TX1 **46W**_LTE+LTE+5G-NR



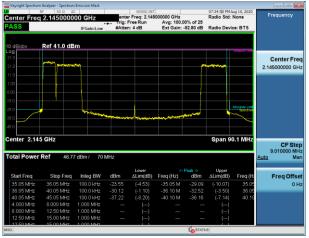
OOBE_TM3_2_3C_5+5+10MBW_2112_2117_2175_TX1 30W+30W+30W_LTE+LTE+5G-NR



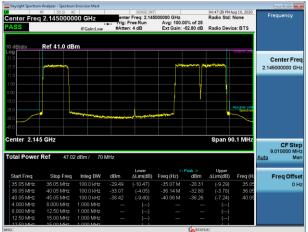
OOBE_TM3_1_3C_5+5+15MBW_2112_2117_2172_TX1 90W_LTE+LTE+5G-NR



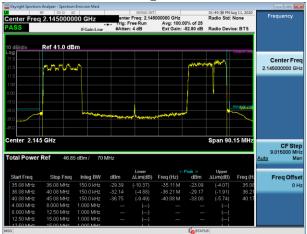
#### OOBE_TM3_1_3C_**5+10+10MBW_2112_2120_2175**_TX4 **15W+15W+15W**_LTE+LTE+5G-NR



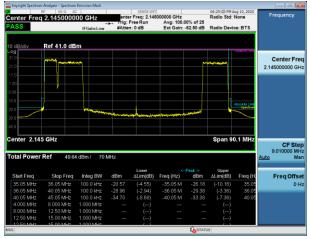
OOBE_TM3_1a_3C_**10+10+10MBW_2115_2165_2175**_TX4 **45W** 5G-NR+LTE+LTE



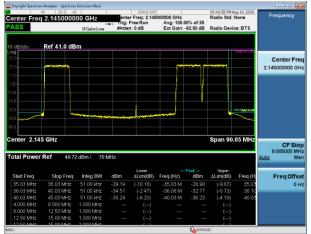
OOBE_TM3_2_3C_**15+10+5MBW_2117_2170_2177**_TX4 **15W+15W+15W**_5G-NR+LTE+LTE



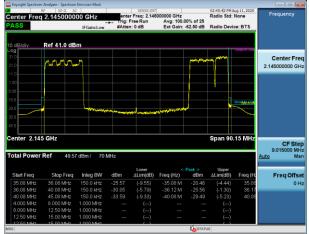
#### OOBE_TM3_1_3C_5+10+10MBW_2112_2120_2175_TX1 30W+30W+30W_ LTE+LTE+5G-NR



OOBE_TM3_2_3C_**10+10+10MBW_2115_2165_2175**_TX1 **30W+30W+30W_**5G-NR+LTE+LTE



OOBE_TM3_1_3C_**15+10+5MBW_2117_2170_2177**_TX1 **90W**_LTE+LTE+5G-NR



# 5. FCC Section 2.1051 - Spurious Emissions at Transmit Antenna Port

## 5.1 Measurement of Spurious Emissions at Transmit Antenna Port

Spurious Emissions at the transmit-antenna terminals were investigated over the frequency range of 10 MHz to beyond the 10th harmonic of the specific transmit band. Carrier Bandwidth is exempt. For this band of operation, the measurements were performed up to 10 GHz. Measurements were made using a Keysight MXA Signal Analyzer. The RF output from the transmitter was reduced (to an amplitude usable by the receivers) using calibrated attenuators. The RF power level was continuously monitored via a coupled RF Power Meter.

The required emission limitation is specified as appropriate in 27.53. The measured spurious emission levels were plotted for the frequency range as specified in 2.1057. There were no reportable emissions. Data below documents performance up to 10 GHz. The limit is derived using the 10 Log (n) rule for limits with n=64

## 5.1.1 Spurious Emissions at Tx Port - Plots

NOTE: Only a sample of the plots are used in this report. The full suite of raw data resides at the MH, New Jersey location.

enter F		5000000 GHz		2.175000000 GHz	Radio Std:	1Aug 04, 2020 None	Frequency
ASS		IFGain:	Low #Atten: 0 dB	n Avg Hold: 50/5 Ext Gain: -60.5		ice: BTS	
dB/div	Ref 0	.00 dBm				.37 kHz 86 dBm	
<b>Pg</b> 10 10					,1		Center Fre 2.175000000 GH
1.0	~~~~			~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	M		
1.0							
1.0							
art 9 k	Hz				Stop	150 kHz FFT	CF Ste 2.000000 MH
Spur	Range	Frequency	Amplitude	Limit	∆ Limit	A	uto Ma
1 2	1	112.4 kHz 118.7 kHz	-25.69 dBm -30.77 dBm	-16.02 dBm -16.02 dBm	-9.666 dB -14.75 dB	<u> </u>	FreqOffs
3	1	109.1 kHz	-34.29 dBm	-16.02 dBm	-18.27 dB	=	0 H
4	1	101.5 kHz	-35.55 dBm	-16.02 dBm	-19.53 dB		
5	1	100.5 kHz	-36.42 dBm	-16.02 dBm	-20.40 dB		
6	1	97.03 kHz	-36.54 dBm	-16.02 dBm	-20.52 dB		
7	1	99.20 kHz	-37.28 dBm	-16.02 dBm	-21.26 dB	*	

## 1C Data - TM3.1 / 10MBW / 2175MHz CF/ TX1 90W

enter F		5000000 GH	-+-	Center Fr Trig: Free		Avg Hold		Radio Sto		Ra	inge Table
455		IFG	Sain:Low	#Atten: 0	dB	Ext Gain:	-60.50 dB	Radio De	vice: BTS		Rang
dB/div	Ref 0	.00 dBm							0.00 kHz 888 dBm	<u>On</u>	(
g											Start Fre
											150.000 ki
ĩ <u>1</u>											150.000 K
ii 🗧											
								and an a			Stop Fr
			-	lariagian (Prof. of	The lot of	ALC: NOT THE OWNER OF		The section	THE PROPERTY	3	D.000000 M
.0											
.0											
.0											
1.0										Auto	10.000 k
	0 kHz							Sto	op 30 MHz	Auto	10.000 k
.0	0 kHz							Sto	p 30 MHz FFT	Auto	Res B 10.000 ki M Video B
.0	0 kHz Range	Frequency	/ Am;	olitude		Limit	Δ	Sto		Auto Auto	10.000 k M Video E 30.000 k
art 150		Frequency 150.0 kHz		olitude 16 dBm		Limit 16.02 dBr					10.000 ki M Video B 30.000 ki
art 150	Range		-34.9				n -18	Limit		Auto	10.000 k M Video B 30.000 k M
art 150 Spur	Range 1	150.0 kHz	- <mark>34.9</mark> -35.5	6 dBm		16.02 dBr	n -18 n -19	Limit .94 dB		Auto	10.000 k M Video B 30.000 k M Filter Type
art 150 Spur 1 2	Range 1 1	150.0 kHz 178.4 kHz	- <mark>34.9</mark> -35.5 -37.8	<mark>6 dBm</mark> 2 dBm		<mark>16.02 dBr</mark> 16.02 dBr	n -18 n -19 n -21	Limit .94 dB .50 dB		Auto	10.000 ki M
art 150 Spur 1 2 3	Range 1 1 1	150.0 kHz 178.4 kHz 200.7 kHz	-34.9 -35.5 -37.8 -38.8	<mark>l6 dBm</mark> i2 dBm i4 dBm		<mark>16.02 dBr</mark> 16.02 dBr 16.02 dBr	n -18 n -19 n -21 n -22	Limit .94 dB .50 dB .82 dB		Auto	10.000 k M Video B 30.000 k M Filter Type Gaussian
Spur 1 2 3 4	Range 1 1 1 1	150.0 KHz 178.4 KHz 200.7 KHz 214.2 KHz	-34.9 -35.5 -37.8 -38.8 -40.6	<mark>6 dBm</mark> 2 dBm 4 dBm 7 dBm		16.02 dBr 16.02 dBr 16.02 dBr 16.02 dBr	n -18 n -19 n -21 n -22 n -24	Limit 3.94 dB 0.50 dB 1.82 dB 2.85 dB		Auto	10.000 k M Video E 30.000 k M Filter Typ

neysignt spe		Spurious Emissions	SENSE	INT	07:20-20 05	Aug 04, 2020
enter F		5000000 GHz	Center Freq Trig: Free R	: 2.175000000 GHz un Avg Hold: 50/	Radio Std: 50	None Range Table
dB/div	Ref 0.	.00 dBm	Low Miller of C	Extern. or.	894.	37 MHz 70 dBm
						Start Fr 30.000000 M
.0 .0 .0						Stop Fr 1.000000000 G
10						Res B 100.00 ki Auto <u>M</u>
art 30	MHz					op 1 GHz Video B 300.00 k
Spur	Range	Frequency	Amplitude	Limit	∆ Limit	Auto M
		894.4 MHz	-38.47 dBm	-16.02 dBm	-22.45 dB	â
2	1	898.7 MHz	-38.52 dBm	-16.02 dBm	-22.50 dB	Filter Type
3	1	945.8 MHz	-38.55 dBm	-16.02 dBm	-22.53 dB	Gaussian
4	1	810.0 MHz	-38.58 dBm	-16.02 dBm	-22.56 dB	
5	1	887.1 MHz	-38.61 dBm	-16.02 dBm	-22.59 dB	Mo
6 7	1	956.3 MHz	-38.62 dBm	-16.02 dBm	-22.60 dB	10
	1	892.3 MHz	-38.64 dBm	-16.02 dBm	-22.62 dB	

		50 Q AC 5000000 GH		SENSE:INT Center Freq: 2.17 Irig: Free Run	Avg Hold: 50/5	Radio Sto		Ra	nge Table
ASS		IF	Gain:Low 📫	Atten: 0 dB	Ext Gain: -62.7	0 dB Radio De	vice: BTS		Rang
0 dB/div	Ref 0.	.00 dBm					453 GHz 48 dBm	<u>On</u>	0
og									Otract Free
0.0								1.00	Start Fre 0000000 GH
							- second	1.00	0000000 GH
0.0									
n o									Stop Fre
a.o								2.16	0000000 GH
0.0 0.0									
0.0									Res B
									1.0000 MH
0.0								Auto	Ma
tart 1 C	Hz		·			Stop	2.16 GHz		
tart 1 G	Range	Frequenc	y Ampl	itude	Limit	Stop A Limit	2.16 GHz	Auto	3.0000 MH
		Frequenc			Limit -16.02 dBm		2.16 GHz	Auto	Video B 3.0000 MH Ma
			-20.45	dBm		∆ Limit	2.16 GHz		3.0000 M⊦ <u>M</u> a
Spur 1		2.145 GHz	-20.45 -20.55	dBm dBm	-16.02 dBm	Δ Limit -4.428 dB	2.16 GHz		3.0000 MH Ma Filter Type
Spur 1 2		2.145 GHz 2.145 GHz	-20.45 -20.55 -23.13	dBm dBm dBm	-16.02 dBm -16.02 dBm	∆ Limit -4.428 dB -4.529 dB	2.16 GHz		3.0000 MH Ma Filter Type
Spur 1 2 3	Range 1 1 1	2.145 GHz 2.145 GHz 2.116 GHz	-20.45 -20.55 -23.13	dBm dBm dBm dBm	-16.02 dBm -16.02 dBm -16.02 dBm	Δ Limit -4.428 dB -4.529 dB -7.109 dB	2.16 GHz		3.0000 M⊦ <u>Ma</u> Filter Type Gaussian
Spur 1 2 3 4	Range 1 1 1	2.145 GHz 2.145 GHz 2.116 GHz 2.112 GHz	-20.45 -20.55 -23.13 -23.15	dBm dBm dBm dBm dBm	-16.02 dBm -16.02 dBm -16.02 dBm -16.02 dBm	Δ Limit -4.428 dB -4.529 dB -7.109 dB -7.126 dB	2.16 GHz		3.0000 MH Ma Filter Type

nter F SS		50 Ω AC   5000000 GHz IFGain:	Trig: Free R	: 2.175000000 GHz un Avg Hold: 50/5	Radio Std:		Rar	nge Table Ran
d <u>B/div</u>	Ref 0.	.00 dBm				47 GHz 64 dBm	<u>On</u>	
							2.190	Start F
							10.000	Stop F
5							Auto	Res 1.0000
art 2.1	9 GHz				Sto	p 10 GHz		Video 3.0000
Spur	Range	Frequency	Amplitude	Limit	∆ Limit		Auto	0.00001
1	1	5.335 GHz	-20.46 dBm	-16.02 dBm	-4.444 dB	<u>^</u>		
2	1	4.833 GHz	-20.89 dBm	-16.02 dBm	-4.872 dB		F	ilter Ty
3	1	5.308 GHz	-21.02 dBm	-16.02 dBm	-5.004 dB	2		Gaussi
4	1	2.666 GHz	-21.17 dBm	-16.02 dBm	-5.152 dB			
5	1	5.894 GHz	-21.23 dBm	-16.02 dBm	-5.206 dB			
6	1	6.414 GHz	-21.31 dBm	-16.02 dBm	-5.286 dB			M 1
7	1	5.262 GHz	-21.34 dBm	-16.02 dBm	-5.320 dB	~		1

File <Spurious_TM3_1_1C_10MBW_2175_TX1 90w 5g_30_to_1000.state> sate

Report No: TR-2020-0102-FCC2-27 Product: AWS LTE B66a RRH 4x45W

vsight Spectrum Analyzer - Spuric

ter Freg 2,145000000 GH

## 2C Data - TM3.2 / 15+5 MHz BW / 2117+2177 / TX1 / 45W+33W / 5G-NR+ LTE

Center F PASS		50 Q AC 5000000 G	Hz FGain:Low	Center Fr	0000 GHz Avg Hold: Ext Gain: -		Radio De		Rai	nge Table Rand
10 dB/div	Ref 0	.00 dBm					883 -38.1	.07 MHz 29 dBm	<u>On</u>	(
-og 10.0										Start Fre
20.0									30	.000000 Mi
30.0							<b>.</b>	1		
40.0							<b>?</b>			
50.0								تعتقل		Stop Fre
60.0									1.00	0000000 G
70.0										
80.0										Res B
90.0									Auto	100.00 k
									Auto	m
Start 30	MHz						s	top 1 GHz		Video B
										300.00 k
Spur	Range	Frequent	cy An	plitude	Limit	Δ	Limit		Auto	M
1		883.1 MH		13 dBm	16.02 dBn	-22	.11 dB	<u>_</u>		
2	1	884.4 MH		36 dBm	16.02 dBn	ı -22	.34 dB		F	ilter Typ
3	1	978.6 MH		56 dBm	16.02 dBm		.54 dB	-		Gaussian
4	1	786.9 MH		60 dBm	16.02 dBm		.58 dB			
5	1	813.7 MH		61 dBm	16.02 dBn		.59 dB			Ma
6	1	830.5 MH		63 dBm	16.02 dBm		.61 dB			1 o
7	1	957.8 MH	z -38.	66 dBm	16.02 dBn	ı -22	2.64 dB	~		10

enter F		5000000 GHz IFGain	Trig: Free Ru	2.145000000 GHz	0 dB Radio Dev	: None Frequ vice: BTS	iency
0 dB/div	Ref 0	.00 dBm				0.00 kHz 63 dBm	
.og 10.0						Cer	ter Fred
0.0						2.14500	0000 GH:
0.0							
0.0							
0.0 <b>- 1</b> 0				and the second secon	un and the second states	andre experience	
0.0							
1.0							
0.0							
0.0							
tart 150	) kHz	^			Sto	p 30 MHz	
							CF Ste
Spur	Range	Frequency	Amplitude	Limit	∆ Limit	Auto 7.30	Ma Ma
1	1	150.0 kHz	-35.32 dBm	-16.02 dBm	-19.30 dB	4	
	1	170.9 kHz	-36.16 dBm	-16.02 dBm	-20.14 dB	Ere	a Offse
2	1	170.9 KHZ	-00.10 ubiii	-10.02 0011	-20.14 ub		
3	1	211.2 kHz	-38.87 dBm	-16.02 dBm	-22.85 dB	-	
3 4	1 1	211.2 kHz 227.6 kHz	-38.87 dBm -39.00 dBm	-16.02 dBm -16.02 dBm	-22.85 dB -22.98 dB		
3 4 5	1 1 1	211.2 kHz 227.6 kHz 244.0 kHz	-38.87 dBm -39.00 dBm -40.17 dBm	-16.02 dBm -16.02 dBm -16.02 dBm	-22.85 dB -22.98 dB -24.15 dB		
3 4 5 6	1 1 1 1	211.2 kHz 227.6 kHz 244.0 kHz 269.4 kHz	-38.87 dBm -39.00 dBm -40.17 dBm -41.56 dBm	-16.02 dBm -16.02 dBm -16.02 dBm -16.02 dBm	-22.85 dB -22.98 dB -24.15 dB -25.54 dB		
3 4 5	1 1 1	211.2 kHz 227.6 kHz 244.0 kHz	-38.87 dBm -39.00 dBm -40.17 dBm	-16.02 dBm -16.02 dBm -16.02 dBm	-22.85 dB -22.98 dB -24.15 dB	-	он

	RF	- Spurious Emissions 50 Q AC 50000000 GHz	Trig: Free Run	2.145000000 GHz Avg Hold: 50/5		lone Rai
PASS		IFGain:	Low #Atten: 0 dB	Ext Gain: -62.5	0 dB Radio Device	E BTS
10 dB/div	Ref 4	4.26 dBm			2.128 -17.61	0 GHz 6 dBm
Log 34.3						
24.3						2.12
4.26						
-5.74						
						2.17
- Address	the section of the se	and the second second second				History
-35.7						
45.7						
						Auto
Start 2.1	27 GHz				Stop 2.1	73 GHz
	Range	Frequency	Amplitude	Limit	∆ Limit	Auto
Spur						
Spur 1		2.128 GHz	-17.62 dBm	-16.00 dBm	-1.616 dB	÷
Spur 1 2	1 1	2.128 GHz 2.173 GHz	-17.62 dBm -17.69 dBm	-16.00 dBm -16.00 dBm	-1.616 dB -1.688 dB	Î F
1	1 1 1					Ē
1 2		2.173 GHz	-17.69 dBm	-16.00 dBm	-1.688 dB	Ē
1 2 3	1	2.173 GHz 2.130 GHz	-17.69 dBm -17.75 dBm	-16.00 dBm -16.00 dBm	-1.688 dB -1.747 dB	Ē
1 2 3 4	1	2.173 GHz 2.130 GHz 2.127 GHz	-17.69 dBm -17.75 dBm -18.07 dBm	-16.00 dBm -16.00 dBm -16.00 dBm	-1.688 dB -1.747 dB -2.069 dB	F

10 dB/div	Ref 0	.00 dBm				810 GHz 468 dBm	<u>On</u>	-1 Off
-10.0 -20.0						•	1.00	Start Freq
40.0 50.0 60.0							2.10	Stop Free
-70.0							Auto	Res BW 1.0000 MHa <u>Mar</u>
Start 1 C	Range	Frequency	Amplitude	Limit	Sto Δ Limit	op 2.1 GHz	Auto	Video BW 3.0000 MHz Man
1 2 3 4	1 1 1	2.081 GHz 1.983 GHz 2.054 GHz 2.037 GHz	-25.47 dBm -25.73 dBm -25.79 dBm -25.84 dBm	-16.02 dBr -16.02 dBr -16.02 dBr -16.02 dBr	m -9.706 dB m -9.769 dB		'	Filter Type Gaussian
5 6 7	1 1 1	2.060 GHz 2.093 GHz 2.057 GHz	-25.87 dBm -25.89 dBm -25.93 dBm	-16.02 dBr -16.02 dBr -16.02 dBr	n -9.866 dB			More 1 of 3

: -62.70 dB

MSG 🕹 File <Spurious_TM3_2_2C_15+5MBW_2117_2177_TX1 45w+339w ...

	RF	- Spurious Emissions 50 Ω AC		SE:INT		PM Aug 06, 2020	_	Table
Center F	req 2.14	5000000 GHz	Center From Trig: Free m:Low #Atten: 0		50/50	td: None evice: BTS	Range	Rang
0 dB/div	Ref 0	.00 dBm				362 GHz 953 dBm	<u>On</u>	0
-og 10.0 20.0 30.0	<b>,</b> ¹							tart Fre 10000 GH
43.0 50.0 50.0							<b>S</b> 10.00000	<b>top Fre</b> 10000 GH
70.0 30.0 30.0								Res B 0000 MI <u>M</u> a
itart 2.1	9 GHz					top 10 GHz	3.	ideo B .0000 Mi
Spur	Range	Frequency	Amplitude	Limit	∆ Limit		Auto	M
1		3.136 GHz	-20.95 dBm	-16.02 dBm		<u></u>		
2	1	5.309 GHz	-20.99 dBm	-16.02 dBm			Filt	er Typ
3	1	4.877 GHz	-21.18 dBm	-16.02 dBm		2	G	aussia
4	1	6.325 GHz	-21.23 dBm	-16.02 dBm				
5	1	3.119 GHz	-21.27 dBm	-16.02 dBm				M
	1	5.364 GHz	-21.29 dBm	-16.02 dBm	-5.275 dB			1 0
6 7	1	5.853 GHz	-21.31 dBm	-16.02 dBm	-5.290 dB			

Report No: TR-2020-0102-FCC2-27 Product: AWS LTE B66a RRH 4x45W

## 3C Data - TM3.1 / 5+10+10MHz BW / 2112_2120_2175 / TX4 / 15W+15W+15W / LTE + LTE +5G-NR

PASS	109 2.120	0000000 GHz	#Atten: 4 dB	Avg Hold: 50/50 Ext Gain: -51.00 dB	Radio Device: BTS	
TA55		IFGain:Lo	w #Atten: 4 db	Ext Gain: -01.00 dB		Ran
10 dB/div	Def 0	.00 dBm			150.00 kHz -40.054 dBm	<u>On</u>
Log	Reru	.00 aBm			40.004 abii	
-10.0						Start Fr
-20.0						150.000 k
-30.0 1						
-40.0						
-50.0						Stop Fr 30.000000 M
-60.0					and the second plant of the second part of the second second second second second second second second second s	30.000000 M
-70.0						
-80.0						Res B 10.000 k
-90.0						Auto M
Start 15	0 647				Stop 30 MHz	
Start 15	U KHZ				Stop Jo MHZ	Video E
						30.000 k Auto M
Spur	Range	Frequency	Amplitude	Limit	∆ Limit	Auto
1	1	150.0 kHz	-39.98 dBm	-19.02 dBm	-20.96 dB	
2	1	167.9 kHz	-41.68 dBm	-19.02 dBm	-22.66 dB	Filter Typ
3	1	181.3 kHz	-42.89 dBm	-19.02 dBm	-23.87 dB	Gaussia
4	1	196.3 kHz	-43.66 dBm	-19.02 dBm	-24.64 dB	
5 6	1	226.1 kHz	-44.81 dBm	-19.02 dBm	-25.79 dB	Mo
6 7		218.7 kHz	-45.06 dBm	-19.02 dBm	-26.04 dB	1 0
1	1	269.4 kHz	-46.71 dBm	-19.02 dBm	-27.69 dB	

enter F	RF 5	Spurious Emissions	enter Freq: 2.12		07:41:27 PM Aug 10, 2020 Radio Std: None	Range Table
ASS		IFGain:Lo	w #Atten: 4 dB	Ext Gain: -52.80 dE	Radio Device: BTS	Range
0 dB/div	Ref 0.	.00 dBm			2.0761 GHz -30.901 dBm	<u>On</u> Of
.og 10.0						Start Fre
30.0					<b>•</b>	1.00000000 GH
40.0 50.0	and the second	a and find the second		الالاطألات ليتتعنينيني ين	التنتقيق فتعقده	Stop Fre
30.0						2.10000000 GH
70.0						
30.0 30.0						Res BV 1.0000 MH
						Auto <u>Ma</u>
itart 1 G	Hz				Stop 2.1 GHz	Video B
Spur	Range	Frequency	Amplitude	Limit	∆ Limit	Auto <u>Ma</u>
1		2.076 GHz	-30.90 dBm	-19.02 dBm	-11.88 dB	
2	1	2.081 GHz	-31.13 dBm	-19.02 dBm	-12.11 dB	Filter Type
3	1	2.097 GHz	-31.17 dBm	-19.02 dBm	-12.15 dB	Gaussian
4	1	2.093 GHz	-31.23 dBm	-19.02 dBm	-12.21 dB	
5	1	2.053 GHz	-31.32 dBm	-19.02 dBm	-12.30 dB	Mo
6	1	2.074 GHz	-31.34 dBm -31.41 dBm	-19.02 dBm -19.02 dBm	-12.32 dB -12.39 dB	1 of
7	1	2.098 GHz				

MSG VFile <spurious_tm3_1_3c_5+10+10mbw_2112_2120_2175_tx4< th=""><th></th><th></th><th></th><th></th><th></th><th></th></spurious_tm3_1_3c_5+10+10mbw_2112_2120_2175_tx4<>						
	MSG 🧼 File <spurious< th=""><th>_TM3_1_3C</th><th>5+10+10MBW</th><th>2112_2120</th><th>_2175_TX4</th><th>0</th></spurious<>	_TM3_1_3C	5+10+10MBW	2112_2120	_2175_TX4	0

enter F	RF	Spurious Emissions	enter Freq: 2.12	0000000 GHz Avg Hold: 50/50	07:41:36 PM Aug 10, 2020 Radio Std: None	Range Table
ASS		IFGain:Lo	w #Atten: 4 dB	Ext Gain: -57.40 dE		Rang
0 dB/div	Ref 0	.00 dBm			6.3059 GHz -26.933 dBm	<u>On</u> 0
. <b>0</b> .0						Start Fre
10.0			<b>↓</b> 1 –			2.19000000 GH
0.0						
0.0						Stop Fre
0.0						10.00000000 GH
0.0						Res B
0.0						1.0000 MH
						Auto <u>Ma</u>
itart 2.1	9 GHz				Stop 10 GHz	Video BI 3.0000 MH
Spur	Range	Frequency	Amplitude	Limit	∆ Limit	Auto Ma
1	1	6.306 GHz	-26.93 dBm	-19.02 dBm	-7.913 dB	
2	1	5.339 GHz	-26.95 dBm	-19.02 dBm	-7.927 dB	Filter Type
3	1	3.200 GHz	-27.11 dBm	-19.02 dBm	-8.086 dB	Gaussian
4	1	5.323 GHz	-27.14 dBm	-19.02 dBm	-8.123 dB	
5	1	2.664 GHz	-27.17 dBm	-19.02 dBm	-8.149 dB	Mo
6 7	1	4.856 GHz 5.342 GHz	-27.20 dBm -27.20 dBm	-19.02 dBm -19.02 dBm	-8.178 dB -8.183 dB	1 of
1		5.542 GHZ	-27.20 0610	-19.02 dBm	-6.163 QD	

Frequency	07:41:12 PM Aug 10, 2020 Radio Std: None		00000 GHz	SENSE:INT		00 GHz	50 g <u>A</u> DC 000000	RF 5	enter Fi
	Radio Device: BTS		Avg Hold Ext Gain:		#Atten:	H IFGain:Low			SS
	111.77 kHz -35.446 dBm					m	.00 dBn	Ref 0.	dB/div
Center Fred									<b>9</b>
2.12000000 GHz									0
		<b>●</b> ¹							.0
		$\Lambda M$	~~~				^ _		.0
	~~~~~								
CF Step 5.000000 MHz	Stop 150 kHz FFT							HZ	art 9 ki
Auto Mar	∆ Limit	it	Lim	de	Amplitu	uency	Frequ	Range	Spur
	-16.43 dB		-19.02		-35.45 di		111.8		
Freq Offse	-18.65 dB		-19.02		-37.67 di		118.6	1	2
0 Ha	-22.27 dB		-19.02		-41.29 di		120.8	1	3
	-23.96 dB		-19.02		-42.98 dE		100.6	1	4
	-24.98 dB -25.13 dB		-19.02 -19.02		-44.00 de		104.3 106.2	1	5 6
	-25.15 UB				-44.15 di				
	-25.24 dB		-19.02				34.14	1	7

🔤 Keysight Spe		Spurious Emissions				
Center F		50 Ω AC 000000 GHz	enter Freq: 2.12	20000000 GHz	07:41:25 PM Aug 10, 2020 Radio Std: None	Range Table
PASS		IFGain:Low	#Atten: 4 dB	Avg Hold: 50/50 Ext Gain: -51.00 dB	Radio Device: BTS	Range
					817.20 MHz	
10 dB/div	Ref 0	.00 dBm			-44.981 dBm	
-10.0						Start Free
-20.0						30.000000 MHz
-30.0						00.000000 1111
-40.0					<u>_1</u>	
50.0	and other star		and the second			Stop Free
-60.0						1.00000000 GH
-70.0						
.80.0						Res BW
-90.0						100.00 kHa Auto Mar
Start 30	MHz				Stop 1 GHz	Video BW
						300.00 kHz
Spur	Range	Frequency	Amplitude	Limit	∆ Limit	Auto Mar
1	1	817.2 MHz	-44.98 dBm	-19.02 dBm	-25.96 dB	
2	1	811.0 MHz	-45.11 dBm	-19.02 dBm	-26.09 dB	Filter Type
3	1	804.6 MHz	-45.12 dBm	-19.02 dBm	-26.10 dB	Gaussian
4	1	883.0 MHz	-45.20 dBm	-19.02 dBm	-26.18 dB	
5	1	903.0 MHz	-45.22 dBm	-19.02 dBm	-26.20 dB	More
6	1	811.6 MHz	-45.23 dBm	-19.02 dBm	-26.21 dB	1 of 3
7	1	864.4 MHz	-45.28 dBm	-19.02 dBm	-26.26 dB	Tors

MSG VFile <Spurious_TM3_1_3C_5+10+10MBW_2112_2120_2175_TX4...

Keysight Sp		- Spurious Emissions				
enter -		0000000 GHz	enter Freq: 2.120	000000 GHz	07:41:38 PM Aug 10, 2020 Radio Std: None	Range Table
ASS		IFGain:Low	#Atten: 4 dB	Avg Hold: 50/50 Ext Gain: -52.80 dB	Radio Device: BTS	Ran
) dB/div	Ref 0	.00 dBm			2.1451 GHz -20.158 dBm	<u>On</u>
) (, I		Start Fr
10 10	When the days					2.127000000 G
1.0					تكتنف تتخلفه	
1.0						Stop Fr 2.158000000 G
1.0						2.158000000 G
1.0						Res E
10						1.0000 M Auto M
	27 GHz				Stop 2.158 GHz	
lari z.i					Stop 2.158 GHZ	Video E 3.0000 M
Spur	Range	Frequency	Amplitude	Limit	Δ Limit	Auto M
			-20.16 dBm	40.00 40	-1.138 dB	
1	1	2.145 GHz		-19.02 dBm		
1 2 2	1	2.145 GHz	-20.43 dBm	-19.02 dBm	-1.414 dB	Filter Typ
3	1 1 1	2.145 GHz 2.145 GHz	-20.43 dBm -20.56 dBm	-19.02 dBm -19.02 dBm	-1.414 dB -1.538 dB	
	1 1 1 1	2.145 GHz	-20.43 dBm	-19.02 dBm	-1.414 dB	Gaussia
3 4	1 1 1 1 1	2.145 GHz 2.145 GHz 2.145 GHz	-20.43 dBm -20.56 dBm -20.60 dBm	-19.02 dBm -19.02 dBm -19.02 dBm	-1.414 dB -1.538 dB -1.576 dB	

Report No: TR-2020-0102-FCC2-27 Product: AWS LTE B66a RRH 4x45W

Photographs



Test Equipment

Asset ID	Manufacturer	Туре	Description	Model	Serial	Calibration Date	Calibration Due
E831	Agilent Technologies	MXA Signal Analyzer	20Hz- 26.5GHz	N9020A	MY48011791	2020-06-16	2022-06-16
E896	Agilent Technologies	Network Analyzer	10 MHz - 40 GHz	N5230C	MY49000897	2019-01-31	2021-01-31
E1022	Weinschel	Attenuator	10dB DC- 18GHz 25W	46-10- 34-LIM	BN3118	CNR-V	CNR-V

Customer Provided Equipment

Manufacturer	Туре	Description	Model	Serial	Calibration Date	Calibration Due
Weinschel	Attenuator	20dB DC-18GHz 100W	48-20-43	BC5416	CNR-V	CNR-V
Weinschel	Attenuator	30dB DC-18GHz 150W	66-30-34	BJ5923	CNR-V	CNR-V
True Blue	RF Cable		90-095-144	MFR-57500 04-040741	CNR-V	CNR-V
Mini Circuits	Modular Test System (switch)		ZTM-53	11701250030	CNR-V	CNR-V

CNR-V: Calibration Not Required; Must be Verified

6. FCC Section 2.1053 - Field strength of spurious radiation.

6.1 Section 2.1053 Field Strength of Spurious Emissions

Field strength measurements of radiated spurious emissions were made in an FCC registered 3m Semi-Anechoic Chamber which is maintained by Nokia Bell Labs in Murray Hill, New Jersey. A complete description and full measurement data for the site is on file with the Commission (Site Registration Number: 515091).

The spectrum from 30 MHz to beyond the tenth harmonic of the carrier, 10 GHz, was searched for spurious radiation. Measurements were made using both horizontally and vertically polarized broadband antennas. Per FCC regulations, the comparison of out of band spurious emissions directly to the limit is appropriately made using the substitution method. However, when the emissions are more than 20 dB below the specification limit, the use of field strength measurements for compliance determination is acceptable and those emissions are considered not reportable (Section 2.1053 and the FCC Interpretive database for 2.1053). For this case the evaluation of acceptable radiated field strength is as follows.

6.2 Field Strength of Spurious Emissions - Limits

Sections 2.1053 and 27.53 contain the requirements for the levels of spurious radiation as a function of the level of the unmodulated carrier. The reference level for the unmodulated carrier is calculated as the field produced by an ideal dipole excited by the transmitter output power according to the following relation taken from Reference Data for Radio Engineers, page 676, 4th edition, IT&T Corp.

E= [(30*P)^{1/2}]/R

20 log (E*10⁶) – (43 + 10 log P) = 82.23 dBµV/meter

Where:

E = Field Intensity in Volts/meterP = Transmitted Power in WattsR = Measurement distance in meters = 3 m

The Part 27 Limit is 82.23 dBuV/m at 3m and 91.77 dBuV/m at 1m The Part 27 non-report level is 62.23 dBuV/m at 3m.

The calculated emission levels were found by:

Measured level (dB μ V) + Cable Loss(dB)+Antenna Factor(dB) = Field Strength (dB μ V/m)

RESULTS:

For compliance with 47CFR Parts 2 and 27, the field strength of any spurious radiation, measured at 3m, is required to be less than 82.23 dB μ V/meter (82.23 @ 3m). Emissions equal to or less than 62.23 dB μ V/meter at 3m are not reportable and may be verified using field strength measurements and broadband antennas. Over the out of band spectrum investigated from 30 MHz to beyond the tenth harmonic of the carrier (up to 10 GHz), no reportable spurious emissions were detected.

7. NVLAP Certificate of Accreditation



For the National Voluntary Laboratory Accreditation Program