

# 6.4 Band Edge Emissions at Antenna Terminal §2.1051 §22.917(a) §24.238(a) §27.53(g) §27.53(h) §27.53(m)

### **Test Overview**

All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

# The minimum permissible attenuation level of any spurious emission is $43 + \log_{10}(P_{[Watts]})$ , where P is the transmitter power in Watts.

# The minimum permissible attenuation level for Band 7 is as noted in the Test Notes on the following page.

### Test Procedure Used

KDB 971168 v02r02 - Section 6.0

### Test Settings

- 1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
- 2. Span was set large enough so as to capture all out of band emissions near the band edge
- 3. RBW  $\geq$  1% of the emission bandwidth
- 4. VBW <u>></u> 3 x RBW
- 5. Detector = RMS
- 6. Number of sweep points  $\geq 2 \times \text{Span/RBW}$
- 7. Trace mode = trace average for continuous emissions, max hold for pulse emissions
- 8. Sweep time = auto couple
- 9. The trace was allowed to stabilize

#### Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.



Figure 6-3. Test Instrument & Measurement Setup

#### Test Notes

Per 22.917(b) 24.238(a) 27.53(h) 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 to demonstrate compliance with the out-of-band emissions limit. 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 emission are attenuated at least 26 dB below the transmitter power.

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Per 27.53(g) for operations in the 698-746 MHz band, in the 100 kHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least 30 kHz may be employed to demonstrate compliance with the out-of-band emissions limit.

Per 27.53(m) for operations in the BRS/EBS bands, the attenuation factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz.



Plot 6-94. Lower Band Edge Plot (Band 12 – 1.4MHz QPSK – RB Size 6)

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Agilent Spectrun	n Analyzer	- Swept S	A									
LXI RL	RF	50 Ω	AC CO	DRREC	SEN	SE:INT		ALIGN AUTO	07:51:03 PM	4 Mar 23, 2015	Fraguanay	
			F	PNO: Wide ↔ -Gain:Low	Trig: Free Atten: 36	Run dB	#Avg Type	: RMS	TRAC TYF DE	E 1 2 3 4 5 6 E M M M M M T A N N N N N	Frequency	
10 dB/div	Ref 2	5.00 dl	Bm					Mk	1 697.8 -34.	44 MHz 12 dBm	Auto Tur	ne
15.0											Center Fre 695.900000 MH	<b>:q</b> ⊦z
-5.00										10.00 (Em	Start Fre 693.900000 MH	<b>:q</b> −lz
-15.0										-13.00 (801)	Stop Fre 697.900000 MH	eq Hz
-35.0								North States and States		1	CF Ste 400.000 kH <u>Auto</u> Ma	<b>p</b> Iz
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#Res BW	5.900 KH	Z		#VBW	300 kHz			#Sweep	span 4 3.000 s (	1001 MHZ 1001 pts)		
MSG								STATUS	;			

Plot 6-95. Lower Extended Band Edge Plot (Band 12 – 1.4MHz QPSK – RB Size 6)



Plot 6-96. Upper Band Edge Plot (Band 12 – 1.4MHz QPSK – RB Size 6)

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Agilent Spe	ectrum Analy:	zer - Swept :	5A									
L <mark>XI</mark> RL	RF	50 Ω	AC	CORREC	SEN	SE:INT	#Aug Type		07:52:02 Pf	4 Mar 23, 2015	Frequency	,
				PNO: Mide ↔	Trig: Free	Run	#Avg Typ	E. RIVIS	TYI	PE M WWWWWW		
				IFGain:Low	Atten: 36	dB			DI			
								Mk	r1 716.1	04 MHz	Auto T	une
10 dB/d	iv Ref	25.00 d	IBm						-19.	73 dBm		
											Center F	req
15.0											718.100000	MHz
												_
5.00												
											Start F	req
-5.00											716.100000	MHz
-15 0 1										-13.00 dBm		
											StopF	req
<del>سر</del> بی	-marineting	_									720.100000	MHz
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					and a second						Auto	Man
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							and the second s	ward and the second	and and the second		Freg Of	fset
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	740 400	. B.41.1-							0			
#Pac F	718.100			#\/D\/	200 642			#Cwoon	Span 4	1001 MHz		
#Res -		112		#VBW	300 KHZ			#Sweep	3.000 S (	roo r pis)		
MSG								STATUS	6			

Plot 6-97. Upper Extended Band Edge Plot (Band 12 – 1.4MHz QPSK – RB Size 6)



Plot 6-98. Lower Band Edge Plot (Band 12 – 3.0MHz QPSK – RB Size 15)

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Plot 6-99. Lower Extended Band Edge Plot (Band 12 – 3.0MHz QPSK – RB Size 15)



Plot 6-100. Upper Band Edge Plot (Band 12 – 3.0MHz QPSK – RB Size 15)

FCC ID: ZNFV495		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕒 LG	Reviewed by: Quality Manager			
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Agilent Sp	pectrum	Analyze	r - Swept S	A								
LXI RL		RF	50 Ω	AC	CORREC	SEN	SE:INT	HOurs Turn		07:47:32 Pf	4 Mar 23, 2015	Frequency
						Tria: Free	Run	#Avg Typ	e: Kivio	TYI	23456 M <del>WWWWW</del>	, ,
					IFGain:Low	Atten: 36	dB			DI	ANNNN	
									Mk	r1 716.1	00 MHz	Auto Tune
10 dB/	div	Ref 2	5 00 di	Bm						-22.	97 dBm	
Log	ui s		u							1		
												Center Fred
15.0												718 100000 MHz
5.00												
5.00												Start Fred
												716,100000 MHz
-5.00												
											-13.00 dBm	
-15.0												Stop Free
												720.100000 MHz
-25.0												
					The strain and	have a state						
-35.0								×				CF Step
								-				400.000 KHz
45.0										man management	······	Auto Man
-43.0												
												Freq Offset
-55.0												0 Hz
-65.0												
		100								On on 4		
#Poe	814/-2	5. TUU I			#\/P\M	300 642			#Swoon	- Span 4	1001 WHZ	
wittes	DWV		12		#0000	500 KHZ			"oweep	3.000 S (	roor prsj	
MSG									STATUS	6		

Plot 6-101. Upper Extended Band Edge Plot (Band 12 – 3.0MHz QPSK – RB Size 15)



Plot 6-102. Lower Band Edge Plot (Band 12 – 5.0MHz QPSK – RB Size 25)

FCC ID: ZNFV495		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕒 LG	Reviewed by: Quality Manager			
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Agilent Spe	ctrum Ana	lyzer - Swe	pt SA								
L <mark>XI</mark> RL	R	F 50	Ω AC	CORREC	SEM	VSE:INT		ALIGN AUTO	07:23:17 P	M Mar 23, 2015	Frequency
					Tuin: Enc.		#Avg Type	: RMS	TRAG		riequency
				PNO: Wide	Atten: 36	dB			D	TANNNN	
				IF Galli.LUW	Theten. 00	40					Auto Tune
								MK	r1 697.8	88 MHZ	Auto Fulle
10 dB/di	iv Re	f 25.00	dBm						-27.	37 dBm	
											Center Freq
15.0											695 900000 MHz
E 00											
5.00											Start From
											StartFrey
-5.00										I	693.900000 MHz
15.0										-13.00 dBm	
-15.0											Stop Freq
										1	697.900000 MHz
-25.0											
								- Color and a color			
-35.0						and the second s	A Strategy and the second second				CF Step
											400.000 kHz
											<u>Auto</u> Man
-45.0	thitson and the second	and the second secon									
											Erog Offect
-55.0											Frequise
											0 Hz
-65.0											
Center	695.9	JO MHZ							Span 4	.000 MHz	
#Res B	SW 100	KHZ		#VBW	300 KHZ			#Sweep	3.000 s (	1001 pts)	
MSG								STATUS	3		

Plot 6-103. Lower Extended Band Edge Plot (Band 12 – 5.0MHz QPSK – RB Size 25)



Plot 6-104. Upper Band Edge Plot (Band 12 – 5.0MHz QPSK – RB Size 25)

FCC ID: ZNFV495		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕒 LG	Reviewed by: Quality Manager			
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Agilent Sp	ectrum An	alyzer - Swe	pt SA								
L <mark>XI</mark> RL		RF 50	Ω AC	CORREC	SEN	SE:INT	dura Tura	ALIGN AUTO	07:24:02 Pf	4 Mar 23, 2015	Frequency
					Tria: Free	Run	#Avg typ	e: Kivio	TYI	PE MWWWWWW	
				IFGain:Low	Atten: 36	dB			DI	ANNNN	
								Mk	r1 716.1	00 MHz	Auto Tune
	lia D.	of 25 0(	dBm						-24	32 dBm	
			ubili				1				
											Center Freq
15.0											718 100000 MHz
											718.100000 141112
5.00											Start Fred
											716 100000 MHz
-5.00											710.100000 10112
										-13.00 dBm	
-15.0											Stop Fred
1											720 100000 MHz
-25 0											720.100000 141112
~~ 0								and a second and a second as			CF Step
-35.0											400.000 kHz
											<u>Auto</u> Man
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											Freg Offset
-55.0											0.47
											0112
-65.0											
Center	r 718 <u>.1</u>	00 MHz						_	Span 4	.000 MHz	
#Res	<b>BW 10</b>	0 kHz		#VBW	300 kHz			#Sweep	3.000 s (	1001 pts)	
MSG								STATUS	3		

Plot 6-105. Upper Extended Band Edge Plot (Band 12 – 5.0MHz QPSK – RB Size 25)



Plot 6-106. Lower Band Edge Plot (Band 12 – 10.0MHz QPSK – RB Size 50)

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Plot 6-107. Upper Band Edge Plot (Band 12 – 10.0MHz QPSK – RB Size 50)



Plot 6-108. Lower Band Edge Plot (Band 5 – 1.4MHz QPSK – RB Size 6)

FCC ID: ZNFV495		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕒 LG	Reviewed by: Quality Manager
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Agilent S	pectrum	n Analyze	r - Swept	SA								
L <mark>XI</mark> RL		RF	50 Ω	AC	CORREC	SEN	ISE:INT	HOur Turn	ALIGN AUTO	09:22:37 Pf	4 Mar 23, 2015	Frequency
						Tria: Free	Run	#Avg Type	e: Kivio	TYI	23456 M <del>WWWWW</del>	
					IFGain:Low	Atten: 36	dB			DI	A N N N N N	
									Mk	1 823 0	00 MHz	Auto Tune
40 10		Def 1	E 00 -	ID						-32	14 dBm	
	aiv	Reiz	: <b>5.</b> 00 (	10III								
- 1												Contor From
15.0												Center Frey
15.0												821.000000 MHz
5.00												Otort From
												StartFreq
-5.00												819.000000 MHz
-15.0											-13.00 dBm	
10.0												StopFreq
												823.000000 MHz
-25.0											1	
												CE Stop
-35.0												400.000 kHz
												Auto Man
-45.0									AND ADDRESS OF	warman .		
												Freq Offset
-55.0												0 Hz
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										A		
Cente			VIEZ		#\ (B)4	200 64-			#Curoon	span 4	1001 WIHZ	
#Res	DW1	TUU KI	12		#404	300 KHZ			#Sweep	3.000 S (	roor pis)	
MSG									STATUS	3		

Plot 6-109. Lower Extended Band Edge Plot (Band 5 – 1.4MHz QPSK – RB Size 6)



Plot 6-110. Upper Band Edge Plot (Band 5 – 1.4MHz QPSK – RB Size 6)

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Agilent :	Spectrun	n Analyze	r - Swept	SA									
IXI RL		RF	50 Ω	AC	CORREC	SEN	ISE:INT	Hours Turns	ALIGN AUTO	09:24:18 Pf	4 Mar 23, 2015	Freau	iencv
					PNO: Mido ↔	Trig: Free	Run	#Avg iyp	e: Rivio	TYI	23456 MW////////		
					IFGain:Low	Atten: 36	dB			DI	ANNNN		
									Mk	r1 850.0	00 MHz	AL	ito Tune
10 dB	lídiv	Ref 2	5 00 6	d <b>B</b> m						-31.	21 dBm		
Log								Ì					
												Cen	ter Frea
15.0												852.00	0000 MHz
5.00													
5.00												St	art Freq
												850.00	0000 MHz
-5.00													
											-13.00 dBm		
-15.0												S	top Freq
												854.00	0000 MHz
-25.0	1												
	<u>)</u>												
-35.0												10	CF Step
												Auto 40	0.000 KHZ Man
-45.0				AND A DESCRIPTION OF THE OWNER OF	a second							rato	man
40.0						And and a second							
						and a second			Warner and the second sec			Fre	q Offset
-55.U													0 Hz
-65.0													
Cont	or 05	2 000	MU-7							Enan /	000 MHz		
#Res	BW	100 kF	1Z		#VBW	300 kHz			#Sween	3.000 s.f	1001 pts)		
MEG		100 111			" O BIN	0.00 11112			CTATUS		ree i pis)		
MSG									STATUS				

Plot 6-111. Upper Extended Band Edge Plot (Band 5 – 1.4MHz QPSK – RB Size 6)



Plot 6-112. Lower Band Edge Plot (Band 5 – 3.0MHz QPSK – RB Size 15)

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Agilent Spec	ctrum Analyz	er - Swept	SA									
L <mark>XI</mark> RL	RF	50 Ω	AC	CORREC	SEI	VSE:INT		ALIGN AUTO	08:42:13 P	M Mar 23, 2015	Erequency	
					Televice Free		#Avg Type	e: RMS	TRA	<sup>E</sup> 123456	Frequency	
				PNO: Wide 🔸	Trig: Free	e Run			D			
				IFGain:Low	Atten. 30	aD					Auto Ti	Ino
								Mk	r1 822.9	84 MHz	Autori	JIIE
10 dB/di	v Ref	25.00 d	dBm						-28.	12 dBm		
Log		20100			1					1		
											Center E	roa
47.0											Centerr	eq
15.0											821.000000 N	NHZ
5.00												
											Start F	req
											819.000000 N	ИНz
-5.00												
										-13.00 dBm		
-15.0											Oton F	
											StopF	req
										1	823.000000 N	٨Hz
-25.0										'(		
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-35.0							Same Carrier	All and a state of the second s			CF St	tep
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-45.0				- and a second								
	and a second and a second and a	and and a second se										
<i>77</i> 0											Freq Off	set
-55.0											0	) Hz
-65.0										I		
Center	821.000	MHz		-					Span 4	.000 MHz		
#Res B	W 100 k	Hz		#VBV	/ 300 kHz			#Sween	3.000 s	1001 pts)		
					0.000 10112					100 Pt3)		_
MSG								STATUS	3			

Plot 6-113. Lower Extended Band Edge Plot (Band 5 – 3.0MHz QPSK – RB Size 15)



Plot 6-114. Upper Band Edge Plot (Band 5 – 3.0MHz QPSK – RB Size 15)

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Agilent	Spectrun	n Analyzer ·	Swept SA								
IXI RL		RF	50 Ω AC	CORREC	SEN	ISE:INT	#Aug Type		08:45:27 Pf	4 Mar 23, 2015	Frequency
				PNO Mide ↔►	. Trig: Free	Run	#Avg Typ	E. RIVIS	TYI	PE M WWWWWW	
				IFGain:Low	Atten: 36	dB			DI		
								Mk	r1 850.0	00 MHz	Auto Tune
10 dB	/div	Ref 25	.00 dBm						-25.	25 dBm	
Log											
											Center Freq
15.0											852.000000 MHz
5.00											
											Start Freq
-5.00											850.000000 MHz
-15.0										-13.00 dBm	04 E
	4										StopFreq
25 0											854.000000 MHz
-20.0											
											CF Step
-35.0				,		_					400.000 kHz
											<u>Auto</u> Man
-45.0											
											Freq Offset
-55.0											0 Hz
-65.0											
A	0E	2 000-1							On an 4		
Tent #Doc	ET 85.	2.000 IV	172	#\/B\/	300 647			#Sween	Span 4	1001 MHZ	
witter-				#VDVV	300 KHZ			"aweeh	3.000 S (	ioo r pis)	
MSG								STATUS	\$		

Plot 6-115. Upper Extended Band Edge Plot (Band 5 – Band 5 – 3.0MHz QPSK – RB Size 15)



Plot 6-116. Lower Band Edge Plot (Band 5 – 5.0MHz QPSK – RB Size 25)

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Agilent Sp	ectrum Ar	nalyzer - Sv	vept SA								
L <mark>XI</mark> RL		RF 5	50Ω AC	CORREC	SEN	SE:INT	HOurs Turn	ALIGN AUTO	08:38:37 Pl	4 Mar 23, 2015	Frequency
				DNO. Wills	Tria: Free	Run	#Avg Typ	e: Kivið	TY		
				IFGain:Low	Atten: 36	dB			D	A N N N N N	
								Mk	r1 822 7	48 MH7	Auto Tune
	<b>D</b>	of 25 0	0 dBm						-30	85 dBm	
		er 20.0	U UBIII								
											Center Fred
15.0											
13.0											821.000000 WH2
5.00											Start From
											StartFrey
-5.00											819.00000 MHz
										12.00 dBm	
-15.0										-13.00 0.011	Oton From
											StopFreq
ar a											823.000000 MHz
-25.0											
								and the second			CE Sten
-35.0			and the second s		and the second						400.000 kHz
											<u>Auto</u> Man
-45.0											
-55.0											Freq Offset
-35.8											0 Hz
-65.0											
Cente	971.0		7						Snan 4	000 MH2	
#Res	3W 10	0 kHz	2	#VBM	300 kHz			#Sween	3.000 s	1001 nts)	
		0-141 IZ		WADAA	000-1112			"oncep		roor pts)	
MSG								STATUS	5		

Plot 6-117. Lower Extended Band Edge Plot (Band 5 – 5.0MHz QPSK – RB Size 25)



Plot 6-118. Upper Band Edge Plot (Band 5 – 5.0MHz QPSK – RB Size 25)

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Agilent 9	Spectrum	n Analyze	r - Swept	SA								
L <mark>XI</mark> RL		RF	50 Ω	AC	CORREC	SEN	SE:INT		ALIGN AUTO	08:39:39 Pf	4 Mar 23, 2015	Frequency
_						Tria: Eroo	Dun	#Avg Typ	e: RMS	TRAC		riequency
					PNO: Wide +++	Atten: 36	dB			DI	TANNNN	
					IFGam.LOW	Theen. oo	40					Auto Tune
									IVIK	r1 850.0	64 IVIHZ	nato rano
10 dB	/div	Ref 2	25.00 0	dBm						-27.	56 dBm	
Log												
												Center Freq
15.0												852 000000 MHz
												002.000000 11112
5.00												Otort Eror
												StartFreq
-5.00												850.000000 MHz
45.0											-13.00 dBm	
-15.0												Stop Freq
	. 4											854.000000 MHz
-25.0	<b>♦</b> '											
h	COLUMN THE PROPERTY OF			- many								
~~ ~						and a second						CF Step
-35.0												400.000 kHz
										- Participation and participation	man man	<u>Auto</u> Man
-45.0												
- ee o												Freq Offset
-55.0												0 Hz
-65.0												
L												
Cent	er 85:	2.000	MHz							Span 4	.000 MHz	
#Res	BW	100 kl	z		#VBW	300 kHz			#Sweep	3.000 s (	1001 pts)	
MSG									STATUS			
mod									STATUS			

Plot 6-119. Upper Extended Band Edge Plot (Band 5 – 5.0MHz QPSK – RB Size 25)



Plot 6-120. Lower Band Edge Plot (Band 5 – 10.0MHz QPSK – RB Size 50)

FCC ID: ZNFV495		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕒 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 75 of 120
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Plot 6-121. Upper Band Edge Plot (Band 5 – 10.0MHz QPSK – RB Size 50)



Plot 6-122. Lower Band Edge Plot (Band 4 – 1.4MHz QPSK – RB Size 6)

FCC ID: ZNFV495		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕒 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 76 of 120
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Plot 6-123. Lower Extended Band Edge Plot (Band 4 – 1.4MHz QPSK – RB Size 6)



Plot 6-124. Upper Band Edge Plot (Band 4 – 1.4MHz QPSK – RB Size 6)

FCC ID: ZNFV495		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕒 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 77 of 120
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Plot 6-125. Upper Extended Band Edge Plot (Band 4 – 1.4MHz QPSK – RB Size 6)



Plot 6-126. Lower Band Edge Plot (Band 4 – 3.0MHz QPSK – RB Size 15)

FCC ID: ZNFV495		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕒 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 70 of 120
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Plot 6-127. Lower Extended Band Edge Plot (Band 4 – 3.0MHz QPSK – RB Size 15)



Plot 6-128. Upper Band Edge Plot (Band 4 – 3.0MHz QPSK – RB Size 15)

FCC ID: ZNFV495		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕒 LG	Reviewed by: Quality Manager		
Test Report S/N:	Test Dates:	EUT Type:		Dogo 70 of 120		
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Plot 6-129. Upper Extended Band Edge Plot (Band 4 – 3.0MHz QPSK – RB Size 15)



Plot 6-130. Lower Band Edge Plot (Band 4 – 5.0MHz QPSK – RB Size 25)

FCC ID: ZNFV495		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕒 LG	Reviewed by: Quality Manager		
Test Report S/N:	Test Dates:	EUT Type:		Daga 90 of 120		
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Plot 6-131. Lower Extended Band Edge Plot (Band 4 – 5.0MHz QPSK – RB Size 25)



Plot 6-132. Upper Band Edge Plot (Band 4 – 5.0MHz QPSK – RB Size 25)

FCC ID: ZNFV495		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕒 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dege 01 of 120
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Plot 6-133. Upper Extended Band Edge Plot (Band 4 – 5.0MHz QPSK – RB Size 25)



Plot 6-134. Lower Band Edge Plot (Band 4 – 10.0MHz QPSK – RB Size 50)

FCC ID: ZNFV495		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕒 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 92 of 120
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Agilent Spec	trum Analyzer - Swept S	A					
l <mark>XI</mark> RL	RF 50 Ω	AC CORREC	SENSE:INT	ALIGN /	AUTO 06:13:20 PM	Mar 23, 2015	Frequency
			Tria: Free Run	#Avg Type: Rivi	TYPI	123456 MW////////	1 ,
		IFGain:Low	Atten: 36 dB		DE	ANNNN	
				M	/kr1 1 708 9	96 GHz	Auto Tune
10 40/46		Bm			-20.4	5 dBm	
	Rei 25.00 ul	-)111					
							Center Fred
15.0							1 70700000 CH-
.0.0							1.707000000 GH2
5.00							
5.00							Start Fred
							1 70500000 GHz
-5.00							1.705000000 GH2
						-13.00 dBm	
-15.0						1	Stop Fred
							1 70000000 CH-
-25.0							1.70900000 GH2
20.0							
05.0							CF Step
-35.0							400.000 kHz
							<u>Auto</u> Man
-45.0							
							Fred Offset
-55.0							0 Hz
							0112
-65.0							
Center	1.707000 GHz				Span 4.	000 MHz	
#Res B	W 1.0 MHz	#VBW	3.0 MHz	#Sw	veep 3.000 s (1	001 pts)	
MSG					STATUS		

Plot 6-135. Lower Extended Band Edge Plot (Band 4 – 10.0MHz QPSK – RB Size 50)



Plot 6-136. Upper Band Edge Plot (Band 4 – 10.0MHz QPSK – RB Size 50)

FCC ID: ZNFV495		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕒 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 92 of 120
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Agilent S	Spectrun	n Analyzer	- Swept SA								
LXI RL		RF	50 Ω AC	CORREC	SEN	ISE:INT	#0	ALIGN AUTO	06:14:15 P	4 Mar 23, 2015	Frequency
				DNO: Fast a ba	Tria: Free	Run	#Avg Typ	e: RIVIS	TY	23456 M <del>WWWWW</del>	
				IFGain:Low	Atten: 36	dB			DI	ANNNN	
								Mkr1	1 756 0	00 GHz	Auto Tune
40 -107		Dof 2/	00 dBm						-19	23 dBm	
	aiv	Rel Z	о.00 авті								
-											Center Fred
15.0											4 750000000 GUI-
13.0											1.758000000 GHZ
5.00											Start From
-5.00											1.756000000 GHZ
										13.00 dBm	
-15.0	1									-10.00 dbm	Stop From
											Stop Freq
~~ 0				*****					and the second second second	-	1.76000000 GHz
-25.0											
											CF Step
-35.0											400.000 kHz
											<u>Auto</u> Man
-45.0											
											Eren Offent
-55.0											Frequise
											0 Hz
~~~											
-05.0											
Cente	er 1.Z	58000	GHz						Span 4	.000 MHz	
#Res	BW	1.0 MH	Z	#VBW	3.0 MHz			#Sweep	3.000 s (	1001 pts)	
MSG								STATUS	5		

Plot 6-137. Upper Extended Band Edge Plot (Band 4 – 10.0MHz QPSK – RB Size 50)



Plot 6-138. Lower Band Edge Plot (Band 4 – 15.0MHz QPSK – RB Size 75)

FCC ID: ZNFV495		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕒 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dege 94 of 120
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W RL RF 50 Ω AC CORREC SENSE:INT ALIGNAUTO 06:07:33 PM Mar 23, 2015 Frequint   PNO: Fast Frig: Free Run #Avg Type: RMS TRace [] 2:3 4:56 Frequint   IFGain:Low Atten: 36 dB Der A NINNING	ency
PNO: Fast Trig: Free Run IFGain:Low Atten: 36 dB Der ANNNH	
IFGain:Low Atten: 36 dB DET A N N N N	
Mkr1 1.709 000 GHz	o Tune
40 dB/div _ Pef 25 00 dBm	
Cen	er Freg
150	
	000 GH2
5.00 St.	art Fred
170500	
-5.00	000 GH2
-13 00 dBm	
-15.0	on Fred
	000 GH2
	F Step
-39.0 400	.000 kHz
	Man
-45.0	
Free	Offect
-5.0	
	0 H2
Center 1.707000 GHz Span 4.000 MHz	
#Res BW 1.0 MHz #VBW 3.0 MHz #Sweep 3.000 s (1001 pts)	
MSG	

Plot 6-139. Lower Extended Band Edge Plot (Band 4 – 15.0MHz QPSK – RB Size 75)



Plot 6-140. Upper Band Edge Plot (Band 4 – 15.0MHz QPSK – RB Size 75)

FCC ID: ZNFV495		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕒 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 95 of 120
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Agilent 9	Spectrun	n Analyzer	- Swept SA								
I <mark>,XI</mark> RL		RF	50 Ω AC	CORREC	SEN	SE:INT	#A	ALIGN AUTO	06:08:26 Pf	4 Mar 23, 2015	Frequency
				DNO: Fast a b	Tria: Free	Run	#Avg Type	e: RIVIS	TY	23456 M <del>WWWWW</del>	
				IFGain:Low	Atten: 36	dB			DI	ANNNN	
								Mkr1	1 756 0	00 GHz	Auto Tune
40 -10	2.11	Dof 2	5 00 dBm						-21	69 dBm	
	alv	Rel 2	5.00 UBII								
-											Center Fred
15.0											4 750000000 000-
13.0											1.758000000 GHZ
5.00											Otort Eror
											StartFreq
-5.00											1.756000000 GHz
										40.00 JD-	
-15.0										-13.00 abri	04 E
- N	1										StopFreq
		·····-	·····								1.760000000 GHz
-25.0											
											CE Sten
-35.0											400.000 kHz
											<u>Auto</u> Man
-45.0											
-55 0											Freq Offset
-33.0											0 Hz
-65.U											
Cent	er 1.7	58000	GH7						Snan 4	000 MHz	
#Res	BW	1.0 MH	7	#VBW	3.0 MHz			#Sween	3.000 s.(	1001 pts)	
NEO	- 44			(a) =/A				CTATIV	i i	, , , , , , , , , , , , , , , , , , ,	
MSG								STATUS			

Plot 6-141. Upper Extended Band Edge Plot (Band 4 – 15.0MHz QPSK – RB Size 75)



Plot 6-142. Lower Band Edge Plot (Band 4 – 20.0MHz QPSK – RB Size 100)

FCC ID: ZNFV495		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕒 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 96 of 120
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Agilent Spectre	um Analyzei	r - Swept SA	۱								
LX/ RL	RF	50 Ω	AC COP	REC	SEN	ISE:INT		ALIGN AUTO	06:03:02 Pf	4 Mar 23, 2015	Fraguanay
			PI IF(	NO: Fast 🔸	Trig: Free Atten: 36	Run dB	#Avg Typ	e: RMS	TRAC TYI DI	CE 123456 PE MAAAAAAA ET A N N N N N	Frequency
10 dB/div	Ref 2	5.00 dE	3m					Mkr1	1.708 9 -23.	80 GHz 51 dBm	Auto Tune
15.0											Center Freq 1.707000000 GHz
-5.00											Start Freq 1.705000000 GHz
-15.0							neterrere en			-13.00 dBm	<b>Stop Freq</b> 1.709000000 GHz
-35.0											<b>CF Step</b> 400.000 kHz <u>Auto</u> Man
-55.0											<b>Freq Offset</b> 0 Hz
-65.0	707000	GH7							Snan-4	000 MHz	
#Res BW	1.0 MH	z		#VBW	3.0 MHz			#Sweep	3.000 s (	1001 pts)	
MSG								STATUS	6		

Plot 6-143. Lower Extended Band Edge Plot (Band 4 – 20.0MHz QPSK – RB Size 100)



Plot 6-144. Upper Band Edge Plot (Band 4 – 20.0MHz QPSK – RB Size 100)

FCC ID: ZNFV495		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕒 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 97 of 120
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Agilent Spectrur	n Analyzer	- Swept SA								
LXI RL	RF	50 Ω AC	CORREC	SEN	SE:INT		ALIGN AUTO	06:04:49 PM	4 Mar 23, 2015	Frequency
			DNO: Fast a ba	Trig: Free	Run	#Avg Type	e: RMS	TYP	E 1 2 3 4 5 6 E M <del>WWWWW</del>	, requeries
			IFGain:Low	Atten: 36	dB			DE	T A N N N N N	
							Mkr1	1 756 0	12 GH7	Auto Tune
40 -10/-10-	Dof 3	5 00 dBm						-22	91 dBm	
Log	Rel 2	3.00 UBIII				1				
- 1										Center Free
15.0										4 750000000 000
13.0										1.758000000 GH
5.00										Otort Eror
										StartFree
-5.00										1.756000000 GH
									40.00.00	
-15.0									-13.00 dBm	
1										StopFred
				MM Domousomed						1.76000000 GH:
-25.0										
										CE Stor
-35.0										400.000 kH
										Auto Mar
-45.0										
										Freq Offse
-55.0										0 H:
-65.0										
Center 1.7	58000	GHZ	40 (5)44	0.0.0411-			<b>#0</b>	Span 4	.000 MHz	
#Res BW	T.U IVIH	2	#VBW	3.0 WIFIZ			#Sweep	3.000 S (	1001 pts)	
MSG							STATUS	;		

Plot 6-145. Upper Extended Band Edge Plot (Band 4 – 20.0MHz QPSK – RB Size 100)



Plot 6-146. Lower Band Edge Plot (Band 2 – 1.4MHz QPSK – RB Size 6)

FCC ID: ZNFV495		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕒 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 99 of 120
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Plot 6-147. Lower Extended Band Edge Plot (Band 2 – 1.4MHz QPSK – RB Size 6)



Plot 6-148. Upper Band Edge Plot (Band 2 – 1.4MHz QPSK – RB Size 6)

FCC ID: ZNFV495		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕒 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 90 of 120
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Plot 6-149. Upper Extended Band Edge Plot (Band 2 – 1.4MHz QPSK – RB Size 6)



Plot 6-150. Lower Band Edge Plot (Band 2 – 3.0MHz QPSK – RB Size 15)

FCC ID: ZNFV495		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕒 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 00 of 120
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Plot 6-151. Lower Extended Band Edge Plot (Band 2 – 3.0MHz QPSK – RB Size 15)



Plot 6-152. Upper Band Edge Plot (Band 2 – 3.0MHz QPSK – RB Size 15)

FCC ID: ZNFV495		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕒 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 01 of 120
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Plot 6-153. Upper Extended Band Edge Plot (Band 2 – 3.0MHz QPSK – RB Size 15)



Plot 6-154. Lower Band Edge Plot (Band 2 - 5.0MHz QPSK - RB Size 25)

FCC ID: ZNFV495		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕒 LG	Reviewed by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dogo 02 of 120	
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Plot 6-155. Lower Extended Band Edge Plot (Band 2 – 5.0MHz QPSK – RB Size 25)



Plot 6-156. Upper Band Edge Plot (Band 2 – 5.0MHz QPSK – RB Size 25)

FCC ID: ZNFV495		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕒 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 02 of 120
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Plot 6-157. Upper Extended Band Edge Plot (Band 2 – 5.0MHz QPSK – RB Size 25)



Plot 6-158. Lower Band Edge Plot (Band 2 – 10.0MHz QPSK – RB Size 50)

FCC ID: ZNFV495		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕒 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 04 of 120
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Agilent S	Spectrum	n Analyze	r - Swept	SA								
L <mark>XI</mark> RL		RF	50 Ω	AC	CORREC	SEN	ISE:INT	HO.u.e. Tum	ALIGN AUTO	05:34:10 Pf	4 Mar 23, 2015	Frequency
						. Tria: Free	Run	#Avg Typ	e: Kivio	TYI	PE MWWWWW	, ,
					IFGain:Low	Atten: 36	dB			DI	ANNNN	
									Mkr1	1.848.9	96 GHz	Auto Tune
10 404	(alice	Dof 1	05 00 z	Bm						-20	21 dBm	
	/alv	Kel 4	25.00 (									
												Center Fred
15.0												1 947000000 CH-
10.0												1.847000000 GH2
F 00												
5.00												Start Fred
												1 845000000 CH-
-5.00												1.84500000 GH2
											-13.00 dBm	
-15.0											1	Stop Fred
												1 849000000 CU-
-25.0												1.84900000 GH2
ar a												CF Step
-35.0												400.000 kHz
												<u>Auto</u> Man
-45.0												
												Fred Offset
-55.0												
												0112
-65.0												
Cente	er 1.8	47000	) GHz							Span 4	.000 MHz	
#Res	BW	1.0 MI	z		#VBW	3.0 MHz			#Sweep	3.000 s (	1001 pts)	
MSG									STATUS	3		

Plot 6-159. Lower Extended Band Edge Plot (Band 2 – 10.0MHz QPSK – RB Size 50)



Plot 6-160. Upper Band Edge Plot (Band 2 – 10.0MHz QPSK – RB Size 50)

FCC ID: ZNFV495		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕒 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 05 of 120
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Agilent 9	5pectrun	n Analyze	r - Swept	SA								
L <mark>XI</mark> RL		RF	50 Ω	AC	CORREC	SEN	ISE:INT	HO.u.e. Tum	ALIGN AUTO	05:35:06 Pf	4 Mar 23, 2015	Frequency
						. Tria: Free	Run	#Avg Typ	e: Kivio	TYI	PE MWWWWW	
					IFGain:Low	Atten: 36	dB			DI	ANNNN	
									Mkr1	1 911 0	00 GH7	Auto Tune
40 40	lali	Dof 5	05 00 c	Bm						-21	12 dBm	
Log	alv	Kel 2	25.00 0									
												Center Fred
15.0												1 013000000 CH-
												1.913000000 GH2
- oo												
5.00												Start Fred
												1 91100000 GH7
-5.00												1.911000000 GHz
											-13.00 dBm	
-15.0	1											Stop Fred
												1 01500000 CH-
-25.0	Contraction and to place					و و و بود مشو که و کور در محد واحد اصا						1.91500000 GHZ
												CF Step
-35.0												400.000 kHz
												<u>Auto</u> Man
-45.0												
												Freq Offset
-55.0												0 47
												0112
-65.0												
Cent	er 1.9	13000	) GHz							Span 4	.000 MHz	
#Res	BW	1.0 MI	z		#VBW	3.0 MHz			#Sweep	3.000 s (	1001 pts)	
MSG									STATUS	3		

Plot 6-161. Upper Extended Band Edge Plot (Band 2 – 10.0MHz QPSK – RB Size 50)



Plot 6-162. Lower Band Edge Plot (Band 2 – 15.0MHz QPSK – RB Size 75)

FCC ID: ZNFV495		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕒 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 06 of 120
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Agilent Spectru	m Analyzer - Swept SA							
L <mark>XI</mark> RL	RF 50 Ω	AC CORREC	SENSE:INT	HOur Turn	ALIGN AUTO	05:20:42 PM	4 Mar 23, 2015	Frequency
			Tria: Free Run	#Avg Type	E RIVIS	TYP	E MWWWWW	
		IFGain:Low	Atten: 36 dB			DE	TANNNN	
					Mkr1	1.848.9	84 GHz	Auto Tune
	Dof 25.00 dE	tm				-22.	66 dBm	
Log	Rei 25.00 dL							
								Center Freq
15.0								1 847000000 GHz
								1.847000000 0112
F 00								
5.00								Start Fred
								1 84500000 CH-
-5.00								1.04000000 0112
							-13.00 dBm	
-15.0								Ston Fred
							1	1 84900000 GHz
-25 0						····		1.84900000 0112
25.0								CF Step
-30.0								400.000 kHz
								<u>Auto</u> Man
-45.0								
								Freg Offset
-55.0								0 Hz
								0112
-65.0								
Center 1.	847000 GHz					Span 4	.000 MHz	
#Res BW	1.0 MHz	#VBW	3.0 MHz		#Sweep	3.000 s (	1001 pts)	
MSG					STATUS	5		

Plot 6-163. Lower Extended Band Edge Plot (Band 2 – 15.0MHz QPSK – RB Size 75)



Plot 6-164. Upper Band Edge Plot (Band 2 – 15.0MHz QPSK – RB Size 75)

FCC ID: ZNFV495		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕒 LG	Reviewed by: Quality Manager		
Test Report S/N:	Test Dates:	EUT Type:		Dogo 07 of 120		
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Agilent S	pectrum	n Analyze	r - Swept	SA								
L <mark>XI</mark> RL		RF	50 Ω	AC	CORREC	SEN	ISE:INT		ALIGN AUTO	05:29:36 PM	4 Mar 23, 2015	Fraguanov
					PNO: Fast 🔸 IFGain:Low	. Trig: Free Atten: 36	e Run dB	#Avg Type	e: RMS	TRAC TYF DE	E 1 2 3 4 5 6 E MWAAAAAA A N N N N N	Frequency
10 dB/	/div	Ref 2	25.00 (	dBm					Mkr1	1.911 0 -22.	04 GHz 93 dBm	Auto Tune
15.0												Center Freq 1.913000000 GHz
5.00 - -5.00 -												<b>Start Freq</b> 1.911000000 GHz
-15.0	1		****.u~.u~u~u~u								-13.00 dBm	<b>Stop Freq</b> 1.915000000 GHz
-35.0												CF Step 400.000 kHz <u>Auto</u> Man
-55.0 —												<b>Freq Offset</b> 0 Hz
-65.0	ər 1 0	13000	GHZ							Snap 4	000 MHz	
#Res	BW 1.9	1.0 MI	1z		#VBW	3.0 MHz			#Sweep	3.000 s (	1001 pts)	
MSG									STATUS	6		

Plot 6-165. Upper Extended Band Edge Plot (Band 2 – 15.0MHz QPSK – RB Size 75)



Plot 6-166. Lower Band Edge Plot (Band 2 – 20.0MHz QPSK – RB Size 100)

FCC ID: ZNFV495		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕒 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dago 09 of 120
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Agilent Spectr	rum Analyzer	- Swept SA								
l <mark>XI</mark> RL	RF	50 Ω AC	CORREC	SENS	E:INT	Hours Turn	ALIGN AUTO	04:59:14 Pf	4 Mar 23, 2015	Frequency
				Trig: Free	Run	#Avg typ	e: Rivio	TYI	PE M WWWWWW	1 2
			IFGain:Low	Atten: 36	1B			DI		
							Mkr1	1.848 9	88 GHz	Auto Tune
10 dB/div	Ref 2	5.00 dBm						-23.	32 dBm	
Log										
										Center Freq
15.0										1.847000000 GHz
5.00										
										Start Freq
-5.00										1.845000000 GHz
-9.00										
									-13.00 dBm	
-15.0									1	Stop Freq
										1.849000000 GHz
-25.0		N/107412-10-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-								
										CE Sten
-35.0										400.000 kHz
										<u>Auto</u> Man
-45.0										
										Erea Offect
-55.0										Freq Onset
										0 H2
-65.0										
Center 1	.847000	GHz						Span 4	.000 MHz	
#Res BW	/ 1.0 MH	Z	#VBW	3.0 MHz			#Sweep	3.000 s (	1001 pts)	
MSG							STATUS	5		

Plot 6-167. Lower Extended Band Edge Plot (Band 2 - 20.0MHz QPSK - RB Size 100)



Plot 6-168. Upper Band Edge Plot (Band 2 – 20.0MHz QPSK – RB Size 100)

FCC ID: ZNFV495		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕒 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 00 of 120
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Agilent Spectru	m Analyzer ·	- Swept SA								
L <mark>XI</mark> RL	RF	50 Ω AC	CORREC	SEN	SE:INT	#Ava Typ	ALIGNAUTO	05:00:55 PM	4 Mar 23, 2015	Frequency
			PNO: Fast ↔	Trig: Free	Run	word the	e. 1400	TYF	E M <del>WAAAAA</del>	
			IFGain:Low	Atten: 36	dB			DE	TANNNNN	Auto Tur
							Mkr1	1.911 0	20 GHz	Auto Tune
10 dB/div	Ref 25	5.00 dBm						-24.	05 dBm	
										Center Free
15.0										1.913000000 GH
5.00										Start Fre
										1 91100000 GH
-5.00										1.311000000 GH
									-13.00 dBm	
-15.0										Stop Free
<b>↓</b> 1										1.91500000 GH
-25.0			*****			*****				
										CE Otor
-35.0										400.000 kH
										<u>Auto</u> Mar
-45.0										
										Erog Offen
-55.0										riegonse
										011
-65.0										
Center 1.	913000	GHz	-#\/D\A	2.0 MILL-			#Curo on	Span 4	.000 MHz	
#Res BW	1.0 WIH		#VBVV	3.0 WHZ			#Sweep	3.000 S (	TOUT PLS)	
MSG							STATUS			

Plot 6-169. Upper Extended Band Edge Plot (Band 2 – 20.0MHz QPSK – RB Size 100)



Plot 6-170. Lower ACP Plot (Band 7 – 5.0MHz QPSK – RB Size 25)

FCC ID: ZNFV495		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕒 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 100 of 120
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Agilent S	pectrum Ana	lyzer - Spurious E	missions					
LXI RL	R	F 50Ω.	AC CORREC		SENSE:INT	ALIGN AUT	07:14:07 PM Mar 23, 2015	Frequency
				Cente	r Freq: 2.535000000	GHZ alHold: 100/100	Radio Std: None	rioquonoy
PASS			IFGain:Lov	/ #Atter	: 36 dB	giriola. Ioorioo	Radio Device: BTS	
	_							
10 dB/	div	Ref 35.00 (	dBm					
LOg								0
25.0								Center Freq
								2.535000000 GHz
15.0					~			
5 00								
3.00				1				
-5.00								
-15.0								
25.0								
-25.0				and a				
-35.0								
						~ I		
-45.0								CF Step
								5.000000 MHz
-55.0								<u>Auto</u> Ivian
Start	2.545 C	Hz					Stop 2.595 GHz	Freg Offset
								0 Hz
Spur	Range	Start Fred	Stop Fred	RBW	Frequency	Amplitude	A Limit	
1	1	2 5450 GHz	2 5700 GHz	1 000 MHz	2 568083333 GHz	14 79 dBm	-10.21 dB	
2	2	2.5700 GHz	2.5710 GHz	91 00 kHz	2.570011667 GHz	-29.75 dBm	-19.75 dB	
3	3	2.5710 GHz	2.5750 GHz	1.000 MHz	2.571053333 GHz	-27.22 dBm	-17.22 dB	
4	4	2.5750 GHz	2.5760 GHz	1.000 MHz	2.575083333 GHz	-37.93 dBm	-24.93 dB	
5	5	2.5760 GHz	2.5950 GHz	1.000 MHz	2.576095000 GHz	-39.93 dBm	-14.93 dB	
MSG						ST	ATUS	

Plot 6-171. Upper ACP Plot (Band 7 – 5.0MHz QPSK – RB Size 25)



Plot 6-172. Lower ACP Plot (Band 7 – 10.0MHz QPSK – RB Size 50)

FCC ID: ZNFV495		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕒 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 101 of 120
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M     RL     RF     50.0     AC     CORREC     SERVISE: INT     ALIGNAUTO     D07/09:52 PM Mar 23, 2015     Radio Std: None       PASS     IFGain:Low     Trig: Free Run     Avg Hold: 100/100     Radio Device: BTS     Radio Device: BTS       10 dB/div     Ref 35.00 dBm	
PASS IFGeRun Avg Hold: 100/100 #Atten: 28 dB Radio Device: BTS Radio Device: BTS Radio Device: BTS Radio Device: BTS Cen 2.535000 Con 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0	encv
PASS     IFGain:Low     #Atten: 28 dB     Radio Device: BTS       10 dB/div     Ref 35.00 dBm     Cen       250	
10 dB/div     Ref 35.00 dBm       250	
Log     Ref 35.00 dBm     Cen       25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.00     25.00     25.00     25.00     25.00     25.00     25.00     25.00     25.00     25.00     25.00     25.00     25.00     25.00     25.00     25.00     25.00     25.00     25.00     25.00     25.00     25.00     25.00     25.00     25.00     25.00     25.00     25.00     25.00     25.00     25.00     25.00     25.00     25.00     25.00     25.00     25.00     25.00     25.00     25.00     25.00     25.00     25.00     25.00     25.00     25.00     25.00     25.00     25.00     25.00     25.00     25.00     25.00     25.00     25.00     25.00     25.00     25.00     25.00     25.00     25.00     25.00 <t< th=""><th></th></t<>	
10 dB/div     Ref 35.00 dBm       Log	
Cen     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0     25.0 <td< th=""><td></td></td<>	
25.0	_
15.0   2.535001     5.00   -     5.00   -     5.00   -     5.00   -     5.00   -     5.00   -     5.00   -     5.00   -     5.00   -     5.00   -     5.00   -     5.00   -     35.0   -     45.0   -     45.0   -     45.0   -     55.0   -     55.0   -     Start 2.545 GHz   Stop 2.595 GHz     Spur   Range     Start Freq   Stop Freq   RBW     Frequency   Amplitude   Δ Limit	ter Freq
15.0	)000 GHz
5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00     5.00 <t< th=""><td></td></t<>	
5.00	
6.00	
15.0	
15.0   25.0     25.0   35.0     45.0   45.0     55.0   55.0     Start 2.545 GHz   Stop 2.595 GHz     Spur   Range     Start Freq   Stop Freq   RBW     Frequency   Amplitude   Δ Limit	
25.0   35.0     35.0   45.0     45.0   55.0     Start 2.545 GHz   Stop 2.595 GHz     Spur   Range     Start Freq   Stop Freq   RBW     Frequency   Amplitude   Δ Limit	
25 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0   45 0	
35.0 45.0   45.0 45.0   55.0 55.0   Start 2.545 GHz Stop 2.595 GHz   Spur   Range   Start Freq   Stop Freq   RBW   Frequency   Amplitude   ΔLimit	
45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0   45.0	
45.0   50.0   Auto   Auto   Auto   Auto   Auto   Auto   Auto   Free     Start 2.545 GHz   Stop 2.595 GHz   Free   Stop 2.595 GHz   Free   Free   Stop 2.595 GHz   Free   Stop 2.595 GHz   Free   Stop 2.595 GHz   Free   Stop 2.595 GHz   Stop 2.595 GHz   Free   Stop 2.595 GHz   Stop	
455.0 Auto Free   Start 2.545 GHz Stop 2.595 GHz Free Free Auto Free Free   Spur Range Start Freq Stop Freq RBW Frequency Amplitude Δ Limit	CF Step
55.0   Auto     Start 2.545 GHz   Stop 2.595 GHz     Spur   Range   Start Freq   Stop Freq   RBW   Frequency   Amplitude   △Limit	000 MHz
Start 2.545 GHz   Stop 2.595 GHz   Fre     Spur   Range   Start Freq   Stop Freq   RBW   Frequency   Amplitude   △Limit   ▲Limit	Man
Start 2.545 GHz Stop 2.595 GHz Fre   Spur Range Start Freq Stop Freq RBW Frequency Amplitude △Limit	
Spur   Range   Start Freq   Stop Freq   RBW   Frequency   Amplitude     △ Limit	
Spur Range Start Freq Stop Freq RBW Frequency Amplitude	q Onser
Spur Range Start Freq Stop Freq RBW Frequency Amplitude ALImit	0 112
1 1 2.3430 GHZ 2.3700 GHZ 1.000 MHZ 2.30002000 GHZ 11.78 0B/II -13.22 0B	
2 2 2.5700 GHZ 25710 GHZ 180.0 KHZ 2.5700 H000 GHZ -52.82 dBHT -22.82 dB	
4 4 2 5750 GHz 2 5750 GHz 1 000 MHz 2 5750 5864 GHz 25 00 UBIII - 10.02 UB	
H 2.5750 CHZ 2.5750 CHZ 1.000 MHz 2.575000H 912 -57118200 (Hz - 10.81 UB	
MSG STATUS	

Plot 6-173. Upper ACP Plot (Band 7 – 10.0MHz QPSK – RB Size 50)



Plot 6-174. Lower ACP Plot (Band 7 – 15.0MHz QPSK – RB Size 75)

FCC ID: ZNFV495		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕒 LG	Reviewed by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 102 of 120
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Agilent Sp	ectrum Ana	lyzer - Spuriou	s Emissions											
LXI RL	R	F 50 Ω	AC C	ORREC		SENSE:INT		Al	IGN AUTO		07:06:00	PM Mar 23, 2015	E	requency
					Cente	r Freq: 2.535000	0000	GHz	00/400	R	adio St	d: None		equency
PASS				- ECaind out	urig:r #∆tter	28 dB	Avg		00/100	R	adio De	vice: BTS		
				FGam.LUW	#1 itee1		_				dulo Bo	Cinec. Dite		
10 dB/	div	Ref 35.00	) dBm											
Log														
25.0													(	Center Freq
20.0													2.53	5000000 GHz
15.0														
5.00			(			<u>}</u>						_		
			1											
-5.00														
45.0		Í												
-15.0														
-25 0														
20.0		لمستعدد												
-35.0							-		_					
									~	.				
-45.0										~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~				CF Step
														5.000000 MHz
-55.0													Auto	Man
Start	2.545 C	Hz									Stop	2.595 GHz		
														Freq Onser
			Lat	-	<b>DD</b> )//					_				0 Hz
Spur	Range	Start Freq	Stop	bFreq	RBW	Frequency		Ampliti	Ide	- 1	4 Limit			
1	1	2.5450 GHz	2.570	JOGHz	1.000 MHz	2.563208333 (	ЭHz	10.09 di	⊰m	-	14.91 c	B		
2	2	2.5700 GHz	z 2.571	10 GHz	270.0 kHz	2.570013333 (	ЭНz	-34.75 c	Bm	-	24.75 c	B		
3	3	2.5710 GHz	2.575	50 GHz	1.000 MHz	2.572400000	ЭНz	-31.76 c	Bm	-	21.76 c	B		
4	4	2.5750 GHz	z 2.583	34 GHz	1.000 MHz	2.575435085 (	SHz	-33.55 c	Bm	-	20.55 c	B		
5	5	2.5834 GHz	z  2.595	50 GHz	1.000 MHz	2.583498193 (	3Hz	-41.50 c	Bm	-	16.50 c	B		
MSG									STAT	rus				
							-				_		_	

Plot 6-175. Upper ACP Plot (Band 7 – 15.0MHz QPSK – RB Size 75)



Plot 6-176. Lower ACP Plot (Band 7 – 20.0MHz QPSK – RB Size 100)

FCC ID: ZNFV495		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕒 LG	Reviewed by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dage 102 of 120	
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IXI RI	-							
	RI	F 50Ω	AC CORREC		SENSE:INT	ALIGN AUTO	07:07:49 PM Mar 23, 2015	Frequency
				Cente	r Freq: 2.535000000	GHz	Radio Std: None	Frequency
PASS				Trig: F	reeRun Av	g Hold: 100/100	Dadia Daviana BTC	
Acc			IFGain:Low	#Atter	1: 26 ab		Radio Device: 615	-
10 dB/di		Dof 35.00	dBm					
Loa	v	Kel 33.00	ubiii					
								Contor From
25.0								CenterFreq
								2.535000000 GHz
15.0								
					× .			
5.00								
E 00								
-5.00								
-15.0		ļ						
-15.0								
-25.0								
-35.0	·							
							-	
-45.0								CF Step
								5.000000 MHz
-55.0								<u>Auto</u> Man
Start 2	545 C	Hz	I				Stop 2 595 GHz	
oturt 2		2112					0top 2.555 GHz	Freq Offset
								0 Hz
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	∆ Limit	
1 1	1	2.5450 GHz	2.5700 GHz	1.000 MHz	2.561208333 GHz	8.848 dBm	-16.15 dB	
2 2	>	2.5700 GHz	2.5710 GHz	360.0 kHz	2.570016667 GHz	-38 21 dBm	-28.21 dB	
3 3	3	2 5710 GHz	2 5750 GHz	1 000 MHz	2 571073333 GHz	-35 54 dBm	-25 54 dB	
4 4	1	2 5750 GHz	2 5879 GHz	1.000 MHz	2 575064270 GHz	-38.01 dBm	-25.01 dB	
5 5	5	2.5879 GHz	2 5950 GHz	1.000 MHz	2 587901640 GHz	-44 89 dBm	-19.89 dB	
		2.0010 0112	2.0000 0112	1.000 1011 12	2.001.001.040 0112			
MSG						STAT	TUS	

Plot 6-177. Upper ACP Plot (Band 7 – 20.0MHz QPSK – RB Size 100)

FCC ID: ZNFV495		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕒 LG	Reviewed by: Quality Manager	
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# 6.5 Peak-Average Ratio §24.232(d)

# Test Overview

A peak to average ratio measurement is performed at the conducted port of the EUT. The spectrum analyzers Complementary Cumulative Distribution Function (CCDF) measurement profile is used to determine the largest deviation between the average and the peak power of the EUT in a given bandwidth. The CCDF curve shows how much time the peak waveform spends at or above a given average power level. The percent of time the signal spends at or above the level defines the probability for that particular power level.

### Test Procedure Used

KDB 971168 v02r02 - Section 5.7.1

# Test Settings

- 1. The signal analyzer's CCDF measurement profile is enabled
- 2. Frequency = carrier center frequency
- 3. Measurement BW > Emission bandwidth of signal
- 4. The signal analyzer was set to collect one million samples to generate the CCDF curve
- 5. The measurement interval was set depending on the type of signal analyzed. For continuous signals (>98% duty cycle), the measurement interval was set to 1ms.

### Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.



Figure 6-4. Test Instrument & Measurement Setup

# Test Notes

None.

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Plot 6-179. PAR Plot (Band 2 – 1.4MHz 16-QAM – RB Size 6)

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Plot 6-181. PAR Plot (Band 2 – 3.0MHz 16-QAM – RB Size 15)

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Plot 6-183. PAR Plot (Band 2 - 5.0MHz 16-QAM - RB Size 25)

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Plot 6-185. PAR Plot (Band 2 - 10.0MHz 16-QAM - RB Size 50)

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Plot 6-187. PAR Plot (Band 2 - 15.0MHz 16-QAM - RB Size 75)

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Plot 6-189. PAR Plot (Band 2 – 20.0MHz 16-QAM – RB Size 100)

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# 6.6 Radiated Power (ERP/EIRP) §22.913(a.2) §24.232(c.2) §27.50(h.2) §27.50(c.10) §27.50(d.4)

### **Test Overview**

Effective Radiated Power (ERP) and Equivalent Isotropic Radiated Power (EIRP) measurements are performed using the substitution method described in ANSI/TIA-603-C-2004 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using vertically polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically polarized broadband horn antennas. All measurements are performed as RMS average measurements while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

#### Test Procedures Used

KDB 971168 v02r02 - Section 5.2.1

ANSI/TIA-603-C-2004 - Section 2.2.17

#### Test Settings

- 1. Radiated power measurements are performed using the signal analyzer's "channel power" measurement capability for signals with continuous operation.
- 2. RBW = 1 5% of the expected OBW, not to exceed 1MHz
- 3. VBW  $\ge$  3 x RBW
- 4. Span = 1.5 times the OBW
- 5. No. of sweep points > 2 x span / RBW
- 6. Detector = RMS
- 7. Trigger is set to "free run" for signals with continuous operation with the sweep times set to "auto".
- 8. The integration bandwidth was roughly set equal to the measured OBW of the signal for signals with continuous operation.
- 9. Trace mode = trace averaging (RMS) over 100 sweeps
- 10. The trace was allowed to stabilize

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### Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.



#### Test Notes

- 1) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the tables below.
- 2) This unit was tested with its standard battery.
- 3) The ERP's and EIRP's listed in the tables below were measured using the Class II Permissive Change sample, and were found to be within the measurement tolerances of the original certification samples for radiated power. It has been determined that the output power was not changed for these Class II Permissive Change samples.

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Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Battery	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBd]	Ant. Pol. [H/V]	ERP [dBm]	ERP Limit [dBm]	Margin [dB]
699.70	1.4	QPSK	Standard	1 / 5	15.82	0.90	V	16.72	34.77	-18.05
707.50	1.4	QPSK	Standard	1 / 5	17.01	1.07	V	18.08	34.77	-16.69
715.30	1.4	QPSK	Standard	1 / 0	17.10	1.23	V	18.33	34.77	-16.45
699.70	1.4	16-QAM	Standard	1 / 5	14.72	0.90	V	15.62	34.77	-19.15
707.50	1.4	16-QAM	Standard	1 / 5	15.90	1.07	V	16.97	34.77	-17.80
715.30	1.4	16-QAM	Standard	1 / 0	15.85	1.23	V	17.08	34.77	-17.70
700.50	3	QPSK	Standard	1 / 14	16.79	0.92	V	17.71	34.77	-17.06
707.50	3	QPSK	Standard	1 / 14	17.51	1.07	V	18.58	34.77	-16.19
714.50	3	QPSK	Standard	1 / 0	17.54	1.21	V	18.75	34.77	-16.02
700.50	3	16-QAM	Standard	1 / 14	15.47	0.92	V	16.39	34.77	-18.38
707.50	3	16-QAM	Standard	1 / 14	16.28	1.07	V	17.35	34.77	-17.42
714.50	3	16-QAM	Standard	1 / 0	16.30	1.21	V	17.51	34.77	-17.26
701.50	5	QPSK	Standard	1 / 24	16.97	0.94	V	17.91	34.77	-16.86
707.50	5	QPSK	Standard	1 / 24	17.72	1.07	V	18.79	34.77	-15.98
713.50	5	QPSK	Standard	1 / 0	17.88	1.19	V	19.07	34.77	-15.70
701.50	5	16-QAM	Standard	1 / 24	15.83	0.94	V	16.77	34.77	-18.00
707.50	5	16-QAM	Standard	1 / 24	16.55	1.07	V	17.62	34.77	-17.15
713.50	5	16-QAM	Standard	1 / 0	16.63	1.19	V	17.82	34.77	-16.95
704.00	10	QPSK	Standard	1 / 49	17.52	1.00	V	18.52	34.77	-16.25
707.50	10	QPSK	Standard	1 / 49	17.72	1.07	V	18.79	34.77	-15.98
711.00	10	QPSK	Standard	1 / 49	17.34	1.14	V	18.48	34.77	-16.29
704.00	10	16-QAM	Standard	1 / 49	16.20	1.00	V	17.20	34.77	-17.57
707.50	10	16-QAM	Standard	1 / 49	16.53	1.07	V	17.60	34.77	-17.17
711.00	10	16-QAM	Standard	1 / 49	16.02	1.14	V	17.16	34.77	-17.61

Table 6-2. ERP Data (Band 12)

FCC ID: ZNFV495		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	LG	Reviewed by: Quality Manager	
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Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Battery	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBd]	Ant. Pol. [H/V]	ERP [dBm]	ERP Limit [dBm]	Margin [dB]
824.70	1.4	QPSK	Standard	1 / 5	16.29	2.98	V	19.27	38.45	-19.18
836.50	1.4	QPSK	Standard	1 / 5	15.52	3.04	V	18.56	38.45	-19.89
848.30	1.4	QPSK	Standard	1 / 0	15.69	3.10	V	18.79	38.45	-19.66
824.70	1.4	16-QAM	Standard	1 / 5	15.49	2.98	V	18.47	38.45	-19.98
836.50	1.4	16-QAM	Standard	1 / 5	14.39	3.04	V	17.43	38.45	-21.02
848.30	1.4	16-QAM	Standard	1 / 0	14.52	3.10	V	17.62	38.45	-20.83
825.50	3	QPSK	Standard	1 / 14	14.40	2.98	V	17.38	38.45	-21.07
836.50	3	QPSK	Standard	1 / 14	14.76	3.04	V	17.80	38.45	-20.65
847.50	3	QPSK	Standard	1 / 14	15.35	3.10	V	18.45	38.45	-20.00
825.50	3	16-QAM	Standard	1 / 14	13.14	2.98	V	16.12	38.45	-22.33
836.50	3	16-QAM	Standard	1 / 14	13.47	3.04	V	16.51	38.45	-21.94
847.50	3	16-QAM	Standard	1 / 14	14.31	3.10	V	17.41	38.45	-21.04
826.50	5	QPSK	Standard	1 / 24	16.39	2.99	V	19.38	38.45	-19.07
836.50	5	QPSK	Standard	1 / 24	15.94	3.04	V	18.98	38.45	-19.47
846.50	5	QPSK	Standard	1 / 24	15.70	3.09	V	18.79	38.45	-19.66
826.50	5	16-QAM	Standard	1 / 24	15.08	2.99	V	18.07	38.45	-20.38
836.50	5	16-QAM	Standard	1 / 24	14.70	3.04	V	17.74	38.45	-20.71
846.50	5	16-QAM	Standard	1 / 24	14.46	3.09	V	17.55	38.45	-20.90
829.00	10	QPSK	Standard	1 / 49	16.83	3.00	V	19.83	38.45	-18.62
836.50	10	QPSK	Standard	1 / 49	17.01	3.04	V	20.05	38.45	-18.40
844.00	10	QPSK	Standard	1 / 49	17.04	3.08	V	20.12	38.45	-18.33
829.00	10	16-QAM	Standard	1 / 49	15.54	3.00	V	18.54	38.45	-19.91
836.50	10	16-QAM	Standard	1 / 49	15.68	3.04	V	18.72	38.45	-19.73
844.00	10	16-QAM	Standard	1 / 49	16.44	3.08	V	19.52	38.45	-18.93

Table 6-3. ERP Data (Band 5)

FCC ID: ZNFV495		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕒 LG	Reviewed by: Quality Manager
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Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Battery	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	Ant. Pol. [H/V]	EIRP [dBm]	EIRP Limit [dBm]	Margin [dB]
1710.70	1.4	QPSK	Standard	1 / 0	12.83	9.28	v	22.11	30.00	-7.89
1732.50	1.4	QPSK	Standard	1 / 5	13.54	9.00	V	22.54	30.00	-7.46
1754.30	1.4	QPSK	Standard	1 / 5	13.06	8.72	V	21.78	30.00	-8.22
1710.70	1.4	16-QAM	Standard	1 / 0	11.97	9.28	V	21.25	30.00	-8.75
1732.50	1.4	16-QAM	Standard	1 / 5	12.75	9.00	V	21.75	30.00	-8.25
1754.30	1.4	16-QAM	Standard	1/5	12.08	8.72	V	20.80	30.00	-9.20
1711.50	3	QPSK	Standard	1 / 0	13.23	9.27	V	22.50	30.00	-7.50
1732.50	3	QPSK	Standard	1 / 14	13.92	9.00	V	22.92	30.00	-7.08
1753.50	3	QPSK	Standard	1 / 0	13.24	8.73	V	21.97	30.00	-8.03
1711.50	3	16-QAM	Standard	1 / 0	12.41	9.27	V	21.68	30.00	-8.32
1732.50	3	16-QAM	Standard	1 / 14	13.02	9.00	V	22.02	30.00	-7.98
1753.50	3	16-QAM	Standard	1 / 0	12.28	8.73	V	21.01	30.00	-8.99
1712.50	5	QPSK	Standard	1/0	9.45	9.26	V	18.71	30.00	-11.29
1732.50	5	QPSK	Standard	1 / 24	9.97	9.00	V	18.97	30.00	-11.03
1752.50	5	QPSK	Standard	1 / 0	9.56	8.74	V	18.30	30.00	-11.70
1712.50	5	16-QAM	Standard	1 / 0	8.39	9.26	V	17.65	30.00	-12.35
1732.50	5	16-QAM	Standard	1 / 24	9.06	9.00	V	18.06	30.00	-11.94
1752.50	5	16-QAM	Standard	1 / 0	8.38	8.74	V	17.12	30.00	-12.88
1715.00	10	QPSK	Standard	1/0	9.67	9.22	V	18.89	30.00	-11.11
1732.50	10	QPSK	Standard	1 / 49	9.81	9.00	V	18.81	30.00	-11.19
1750.00	10	QPSK	Standard	1 / 0	9.41	8.77	V	18.18	30.00	-11.82
1715.00	10	16-QAM	Standard	1 / 0	8.67	9.22	V	17.89	30.00	-12.11
1732.50	10	16-QAM	Standard	1 / 49	8.87	9.00	V	17.87	30.00	-12.13
1750.00	10	16-QAM	Standard	1 / 0	8.62	8.77	V	17.39	30.00	-12.61
1717.50	15	QPSK	Standard	1 / 0	10.04	9.19	V	19.23	30.00	-10.77
1732.50	15	QPSK	Standard	1 / 74	9.49	9.00	V	18.49	30.00	-11.51
1747.50	15	QPSK	Standard	1 / 0	9.99	8.80	V	18.79	30.00	-11.21
1717.50	15	16-QAM	Standard	1 / 0	8.82	9.19	V	18.01	30.00	-11.99
1732.50	15	16-QAM	Standard	1 / 74	8.90	9.00	V	17.90	30.00	-12.10
1747.50	15	16-QAM	Standard	1 / 0	8.86	8.80	V	17.66	30.00	-12.34
1720.00	20	QPSK	Standard	1 / 0	9.73	9.16	V	18.89	30.00	-11.11
1732.50	20	QPSK	Standard	1 / 99	9.45	9.00	V	18.45	30.00	-11.55
1745.00	20	QPSK	Standard	1 / 0	9.66	8.83	V	18.49	30.00	-11.51
1720.00	20	16-QAM	Standard	1/0	8.81	9.16	V	17.97	30.00	-12.03
1732.50	20	16-QAM	Standard	1 / 99	8.56	9.00	V	17.56	30.00	-12.44
1745.00	20	16-QAM	Standard	1/0	8.62	8.83	V	17.45	30.00	-12.55

Table 6-4. EIRP Data (Band 4)

FCC ID: ZNFV495	PCTEST'	FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕒 LG	Reviewed by: Quality Manager
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Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Battery	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	Ant. Pol. [H/V]	EIRP [dBm]	EIRP Limit [dBm]	Margin [dB]
1850.70	1.4	QPSK	Standard	1 / 0	14.24	8.34	v	22.58	33.01	-10.43
1880.00	1.4	QPSK	Standard	1 / 0	15.28	8.46	V	23.74	33.01	-9.27
1909.30	1.4	QPSK	Standard	1 / 5	14.90	8.64	V	23.54	33.01	-9.47
1850.70	1.4	16-QAM	Standard	1 / 0	13.10	8.34	V	21.44	33.01	-11.57
1880.00	1.4	16-QAM	Standard	1 / 0	14.34	8.46	V	22.80	33.01	-10.21
1909.30	1.4	16-QAM	Standard	1/5	13.95	8.64	V	22.59	33.01	-10.42
1851.50	3	QPSK	Standard	1 / 14	14.72	8.35	V	23.07	33.01	-9.94
1880.00	3	QPSK	Standard	1/0	15.79	8.46	V	24.25	33.01	-8.76
1908.50	3	QPSK	Standard	1 / 0	15.63	8.63	V	24.26	33.01	-8.75
1851.50	3	16-QAM	Standard	1 / 14	13.66	8.35	V	22.01	33.01	-11.00
1880.00	3	16-QAM	Standard	1/0	14.84	8.46	V	23.30	33.01	-9.71
1908.50	3	16-QAM	Standard	1/0	14.67	8.63	V	23.30	33.01	-9.71
1852.50	5	QPSK	Standard	1 / 24	12.72	8.35	V	21.07	33.01	-11.94
1880.00	5	QPSK	Standard	1 / 0	13.75	8.46	V	22.21	33.01	-10.80
1907.50	5	QPSK	Standard	1/0	14.04	8.62	V	22.66	33.01	-10.35
1852.50	5	16-QAM	Standard	1 / 24	11.79	8.35	V	20.14	33.01	-12.87
1880.00	5	16-QAM	Standard	1/0	12.75	8.46	V	21.21	33.01	-11.80
1907.50	5	16-QAM	Standard	1/0	12.78	8.62	V	21.40	33.01	-11.61
1855.00	10	QPSK	Standard	1 / 49	13.35	8.36	V	21.71	33.01	-11.30
1880.00	10	QPSK	Standard	1 / 49	12.77	8.46	V	21.23	33.01	-11.78
1905.00	10	QPSK	Standard	1 / 0	12.16	8.59	V	20.75	33.01	-12.26
1855.00	10	16-QAM	Standard	1 / 49	12.40	8.36	V	20.76	33.01	-12.25
1880.00	10	16-QAM	Standard	1 / 49	11.82	8.46	V	20.28	33.01	-12.73
1905.00	10	16-QAM	Standard	1 / 0	11.18	8.59	V	19.77	33.01	-13.24
1857.50	15	QPSK	Standard	1 / 0	13.10	8.37	V	21.47	33.01	-11.54
1880.00	15	QPSK	Standard	1 / 74	13.04	8.46	V	21.50	33.01	-11.51
1902.50	15	QPSK	Standard	1 / 0	12.26	8.56	V	20.82	33.01	-12.19
1857.50	15	16-QAM	Standard	1 / 0	12.02	8.37	V	20.39	33.01	-12.62
1880.00	15	16-QAM	Standard	1 / 74	11.97	8.46	V	20.43	33.01	-12.58
1902.50	15	16-QAM	Standard	1 / 0	11.23	8.56	V	19.79	33.01	-13.22
1860.00	20	QPSK	Standard	1 / 0	13.19	8.38	V	21.57	33.01	-11.44
1880.00	20	QPSK	Standard	1 / 99	12.05	8.46	V	20.51	33.01	-12.50
1900.00	20	QPSK	Standard	1/0	11.99	8.53	V	20.52	33.01	-12.49
1860.00	20	16-QAM	Standard	1/0	11.91	8.38	V	20.29	33.01	-12.72
1880.00	20	16-QAM	Standard	1 / 99	11.16	8.46	V	19.62	33.01	-13.39
1900.00	20	16-QAM	Standard	1/0	10.94	8.53	V	19.47	33.01	-13.54

Table 6-5. EIRP Data (Band 2)

FCC ID: ZNFV495		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕒 LG	Reviewed by: Quality Manager
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Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Battery	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	Ant. Pol. [H/V]	EIRP [dBm]	EIRP Limit [dBm]	Margin [dB]
2502.50	5	QPSK	Standard	1 / 24	12.25	7.09	V	19.34	33.01	-13.67
2535.00	5	QPSK	Standard	1 / 0	12.24	7.26	V	19.50	33.01	-13.51
2567.50	5	QPSK	Standard	1 / 0	11.03	7.42	V	18.45	33.01	-14.56
2502.50	5	16-QAM	Standard	1 / 24	11.05	7.09	V	18.14	33.01	-14.87
2535.00	5	16-QAM	Standard	1 / 0	11.16	7.26	V	18.42	33.01	-14.59
2567.50	5	16-QAM	Standard	1 / 0	10.01	7.42	V	17.43	33.01	-15.58
2505.00	10	QPSK	Standard	1 / 49	12.42	7.10	V	19.53	33.01	-13.48
2535.00	10	QPSK	Standard	1 / 0	11.89	7.26	V	19.15	33.01	-13.86
2565.00	10	QPSK	Standard	1 / 0	10.70	7.41	V	18.11	33.01	-14.90
2505.00	10	16-QAM	Standard	1 / 49	11.45	7.10	V	18.56	33.01	-14.45
2535.00	10	16-QAM	Standard	1 / 0	11.00	7.26	V	18.26	33.01	-14.75
2565.00	10	16-QAM	Standard	1 / 0	9.78	7.41	V	17.19	33.01	-15.82
2507.50	15	QPSK	Standard	1 / 74	12.38	7.12	V	19.50	33.01	-13.51
2535.00	15	QPSK	Standard	1 / 74	11.29	7.26	V	18.55	33.01	-14.46
2562.50	15	QPSK	Standard	1 / 0	11.44	7.39	V	18.84	33.01	-14.17
2507.50	15	16-QAM	Standard	1 / 74	11.55	7.12	V	18.67	33.01	-14.34
2535.00	15	16-QAM	Standard	1 / 74	10.23	7.26	V	17.49	33.01	-15.52
2562.50	15	16-QAM	Standard	1 / 0	10.55	7.39	V	17.95	33.01	-15.06
2510.00	20	QPSK	Standard	1 / 99	11.16	7.13	V	18.29	33.01	-14.72
2535.00	20	QPSK	Standard	1 / 99	11.18	7.26	V	18.44	33.01	-14.57
2560.00	20	QPSK	Standard	1 / 0	11.29	7.38	V	18.68	33.01	-14.33
2510.00	20	16-QAM	Standard	1 / 99	10.43	7.13	V	17.56	33.01	-15.45
2535.00	20	16-QAM	Standard	1 / 99	10.14	7.26	V	17.40	33.01	-15.61
2560.00	20	16-QAM	Standard	1/0	10.38	7.38	V	17.77	33.01	-15.24

Table 6-6. EIRP Data (Band 7)

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# 6.7 Radiated Spurious Emissions Measurements §2.1053 §22.917(a) §24.238(a) §27.53(g) §27.53(h) §27.53(m)

#### **Test Overview**

Radiated spurious emissions measurements are performed using the substitution method described in ANSI/TIA-603-C-2004 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using vertically and horizontally polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized broadband horn antennas. All measurements are performed as peak measurements while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

#### **Test Procedures Used**

KDB 971168 v02r02 - Section 5.8

ANSI/TIA-603-C-2004 – Section 2.2.12

#### **Test Settings**

- 1. RBW = 100kHz for emissions below 1GHz and 1MHz for emissions above 1GHz
- 2. VBW  $\geq$  3 x RBW
- 3. Span = 1.5 times the OBW
- 4. No. of sweep points  $\geq$  2 x span / RBW
- 5. Detector = Peak
- 6. Trace mode = max hold
- 7. The trace was allowed to stabilize

### Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.



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#### Test Notes

- 1) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the tables below.
- 2) This unit was tested with its standard battery.
- 3) The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter. The worst-case emissions are reported.
- 4) Emissions below 18GHz were measured at a 3 meter test distance while emissions above 18GHz were measured at a 1 meter test distance with the application of a distance correction factor.

OPERATING FREQUENCY:	701.50		MHz
CHANNEL:	23035		
MEASURED OUTPUT POWER:	17.91	dBm =	0.062 W
MODULATION SIGNAL:	QPSK		
BANDWIDTH:	5.0	MHz	
DISTANCE:	3	meters	
LIMIT:	43 + 10 log <sub>10</sub> (W) =	30.91	dBc

Frequency [MHz]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	Ant. Pol. [H/V]	[dBc]
1403.00	-60.41	5.66	-54.74	Н	72.7
2104.50	-63.16	6.63	-56.53	Н	74.4

Table 6-7. Radiated Spurious Data (Band 12 – Low Channel)

OPERATING FREQUENCY:	707.50		MHz
CHANNEL:	23095		
MEASURED OUTPUT POWER:	18.79	dBm =	0.076 W
MODULATION SIGNAL:	QPSK		
BANDWIDTH:	5.0	MHz	
DISTANCE:	3	meters	
LIMIT:	43 + 10 log <sub>10</sub> (W) =	31.79	dBc

	Freque [MHz	ncy ː]	Level Anten Termir [dBn	at na nals n]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	Ant. Pol. [H/V]	[dBc]	
	1415.0	00	-61.5	57	5.73	-55.84	Н	74.6	
	2122.5	50	-61.8	9	6.73	-55.16	Н	74.0	
FCC ID: Z	NFV495			FCC Pt. 22, 24, & 27 LTE (CLASS II PERM		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		G Reviewe Quality N	<b>ed by:</b> /lanager
Test Repo 0Y155031	ort S/N: 60552.ZNF	Test Dat 3/16 - 4/*	es: 1/2015	EUT Typ	<b>e:</b> Tablet			Page 12	0 of 139

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# Table 6-8. Radiated Spurious Data (Band 12 – Mid Channel)



Frequency [MHz]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	Ant. Pol. [H/V]	[dBc]
1427.00	-60.97	5.80	-55.17	Н	74.2
2140.50	-63.94	6.83	-57.11	Н	76.2

Table 6-9. Radiated Spurious Data (Band 12 – High Channel)

OPERATING FREQUENCY:	829.00		MHz
CHANNEL:	20450		•
MEASURED OUTPUT POWER:	19.83	dBm =	0.096 W
MODULATION SIGNAL:	QPSK		
BANDWIDTH:	10.0	MHz	
DISTANCE:	3	meters	
LIMIT:	43 + 10 log <sub>10</sub> (W) =	32.83	dBc

Frequency [MHz]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	Ant. Pol. [H/V]	[dBc]
1658.00	-65.70	6.56	-59.14	Н	79.0
2487.00	-64.49	7.32	-57.17	Н	77.0

Table 6-10. Radiated Spurious Data (Band 5 – Low Channel)

FCC ID: ZNFV495		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕒 LG	Reviewed by: Quality Manager
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OPERATING FREQUENCY:	836.50		MHz	
CHANNEL:	2052			
MEASURED OUTPUT POWER:	20.05	dBm =	0.101	W
MODULATION SIGNAL:	QPSK	_		
BANDWIDTH:	10.0	MHz		
DISTANCE:	3	meters		
LIMIT:	43 + 10 log <sub>10</sub> (W) =	33.05	dBc	

Frequency [MHz]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	Ant. Pol. [H/V]	[dBc]
1673.00	-66.11	6.55	-59.55	Н	79.6
2509.50	-65.07	7.34	-57.73	Н	77.8

Table 6-11. Radiated Spurious Data (Band 5 – Mid Channel)

OPERATING FREQUENCY:	844.00		MHz
CHANNEL:	20600		
MEASURED OUTPUT POWER:	20.12	dBm =	0.103 W
MODULATION SIGNAL:	QPSK		
BANDWIDTH:	10.0	MHz	
DISTANCE:	3	meters	
LIMIT:	43 + 10 log <sub>10</sub> (W) =	33.12	dBc

Frequency [MHz]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBd]	Spurious Emission Level [dBm]	Ant. Pol. [H/V]	[dBc]
1688.00	-64.39	6.55	-57.85	Н	78.0
2532.00	-65.40	7.35	-58.05	Н	78.2

Table 6-12. Radiated Spurious Data (Band 5 – High Channel)

FCC ID: ZNFV495		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕒 LG	Reviewed by: Quality Manager
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OPERATING FREQUENCY:	1711	.50	MHz
CHANNEL:	1996	65	_
MEASURED OUTPUT POWER:	22.50	dBm =	0.178 W
MODULATION SIGNAL:	QPSK	_	
BANDWIDTH:	3.0	MHz	
DISTANCE:	3	meters	
LIMIT:	43 + 10 log <sub>10</sub> (W) =	35.50	dBc

Frequency [MHz]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Ant. Pol. [H/V]	[dBc]
3423.00	-48.12	9.68	-38.44	Н	60.9
5134.50	-47.30	10.68	-36.62	Н	59.1
6846.00	-56.43	11.74	-44.69	Н	67.2
8557.50	-52.26	11.05	-41.21	Н	63.7
10269.00	-52.71	12.26	-40.45	Н	63.0

Table 6-13. Radiated Spurious Data (Band 4 – Low Channel)



Frequency [MHz]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Ant. Pol. [H/V]	[dBc]
3465.00	-45.60	9.71	-35.90	Н	58.8
5197.50	-46.52	10.59	-35.94	Н	58.9
6930.00	-51.01	11.75	-39.25	Н	62.2
8662.50	-44.00	11.06	-32.93	Н	55.8
10395.00	-50.41	12.37	-38.04	Н	61.0
12127.50	-51.86	12.83	-39.02	Н	61.9

Table 6-14. Radiated Spurious Data (Band 4 – Mid Channel)

FCC ID: ZNFV495		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕒 LG	Reviewed by:
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OPERATING FREQUENCY:	1753	.50	MHz	
CHANNEL:	2038	20385		
MEASURED OUTPUT POWER:	21.97	dBm =	0.157	W
MODULATION SIGNAL:	QPSK	_		
BANDWIDTH:	3.0	MHz		
DISTANCE:	3	meters		
LIMIT:	43 + 10 log <sub>10</sub> (W) =	34.97	dBc	

Frequency [MHz]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Ant. Pol. [H/V]	[dBc]
3507.00	-54.76	9.73	-45.03	Н	67.0
5260.50	-45.21	10.64	-34.56	Н	56.5
7014.00	-56.86	11.75	-45.10	Н	67.1
8767.50	-52.79	11.00	-41.80	Н	63.8
10521.00	-53.27	12.48	-40.80	Н	62.8

Table 6-15. Radiated Spurious Data (Band 4 – High Channel)



Frequency [MHz]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Ant. Pol. [H/V]	[dBc]
3703.00	-44.02	8.40	-35.62	Н	58.7
5554.50	-48.88	10.56	-38.32	Н	61.4
7406.00	-52.10	12.05	-40.04	Н	63.1
9257.50	-54.18	13.22	-40.97	Н	64.0
11109.00	-48.20	13.25	-34.95	Н	58.0

Table 6-16. Radiated Spurious Data (Band 2 – Low Channel)

FCC ID: ZNFV495		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕒 LG	Reviewed by: Quality Manager
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OPERATING FREQUENCY:	1880	.00	MHz	
CHANNEL:	1890	00		
MEASURED OUTPUT POWER:	24.25	dBm =	0.266 V	N
MODULATION SIGNAL:	QPSK	_		
BANDWIDTH:	3.0	MHz		
DISTANCE:	3	meters		
LIMIT:	43 + 10 log <sub>10</sub> (W) =	37.25	dBc	

Frequency [MHz]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Ant. Pol. [H/V]	[dBc]
3760.00	-44.99	8.38	-36.61	Н	60.9
5640.00	-53.84	10.70	-43.14	Н	67.4
7520.00	-52.99	12.10	-40.89	Н	65.1
9400.00	-53.80	13.19	-40.61	Н	64.9
11280.00	-43.99	13.31	-30.67	Н	54.9

Table 6-17. Radiated Spurious Data (Band 2 – Mid Channel)



Frequency [MHz]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Ant. Pol. [H/V]	[dBc]
3817.00	-43.83	8.40	-35.42	Н	59.7
5725.50	-50.52	10.76	-39.76	Н	64.0
7634.00	-45.72	12.21	-33.51	Н	57.8
9542.50	-52.08	13.18	-38.90	Н	63.2
11451.00	-40.34	13.33	-27.01	Н	51.3

Table 6-18. Radiated Spurious Data (Band 2 – High Channel)

FCC ID: ZNFV495		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕒 LG	Reviewed by: Quality Manager
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OPERATING FREQUENCY:	2505.00		MHz
CHANNEL:	208		
MEASURED OUTPUT POWER:	19.53	dBm =	0.090 W
MODULATION SIGNAL:	QPSK	_	
BANDWIDTH:	10.0	MHz	
DISTANCE:	3	meters	
LIMIT:	55 + 10 log10 (W) =	= 44.53	dBc

Frequency [MHz]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Ant. Pol. [H/V]	[dBc]
5010.00	-42.12	10.91	-31.21	Н	50.7
7515.00	-43.92	10.96	-32.95	Н	52.5
10020.00	-51.83	12.04	-39.78	Н	59.3
12525.00	-51.43	13.45	-37.99	Н	57.5
15030.00	-49.50	13.45	-36.06	Н	55.6

Table 6-19. Radiated Spurious Data (Band 7 – Low Channel)



Frequency [MHz]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Ant. Pol. [H/V]	[dBc]
5070.00	-43.28	10.79	-32.49	Н	51.6
7605.00	-46.27	11.15	-35.12	Н	54.3
10140.00	-51.57	12.14	-39.44	Н	58.6
12675.00	-53.15	13.65	-39.49	Н	58.6
15210.00	-49.52	14.42	-35.10	Н	54.3

Table 6-20. Radiated Spurious Data (Band 7 – Mid Channel)

FCC ID: ZNFV495		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕒 LG	Reviewed by: Quality Manager
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OPERATING FREQUENCY:	2565.00		MHz
CHANNEL:	214		
MEASURED OUTPUT POWER:	18.11	dBm =	0.065 W
MODULATION SIGNAL:	QPSK	_	
BANDWIDTH:	10.0	MHz	
DISTANCE:	3	meters	
LIMIT:	55 + 10 log10 (W) :	43.11	dBc

Frequency [MHz]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Ant. Pol. [H/V]	[dBc]
5130.00	-40.05	10.69	-29.36	Н	47.5
7695.00	-43.33	11.22	-32.11	Н	50.2
10260.00	-48.87	12.25	-36.62	Н	54.7
12825.00	-49.03	13.47	-35.57	Н	53.7
15390.00	-52.07	15.56	-36.50	Н	54.6

Table 6-21. Radiated Spurious Data (Band 7 – High Channel)

FCC ID: ZNFV495		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕒 LG	Reviewed by: Quality Manager
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# 6.8 Frequency Stability / Temperature Variation §2.1055 §22.355 §24.235 §27.54

#### **Test Overview and Limit**

Frequency stability testing is performed in accordance with the guidelines of ANSI/TIA-603-C-2004. The frequency stability of the transmitter is measured by:

- a.) **Temperature:** The temperature is varied from -30°C to +50°C in 10°C increments using an environmental chamber.
- b.) **Primary Supply Voltage:** The primary supply voltage is varied from 85% to 115% of the nominal value for non hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

For Part 22, the frequency stability of the transmitter shall be maintained within  $\pm 0.00025\%$  ( $\pm 2.5$  ppm) of the center frequency. For Part 24 and Part 27, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

#### Test Procedure Used

ANSI/TIA-603-C-2004

#### Test Settings

- 1. The carrier frequency of the transmitter is measured at room temperature (20°C to provide a reference).
- 2. The equipment is turned on in a "standby" condition for fifteen minutes before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.
- 3. Frequency measurements are made at 10°C intervals ranging from -30°C to +50°C. A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.

#### Test Setup

The EUT was connected via an RF cable to a spectrum analyzer with the EUT placed inside an environmental chamber.

#### Test Notes

None

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# Band 12 Frequency Stability Measurements §2.1055 §27.54

OPERATING FREQUENCY:	707,500,000	Hz
CHANNEL:	23790	_
REFERENCE VOLTAGE:	3.70	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.70	+ 20 (Ref)	707,499,925	-75	-0.0000106
100 %		- 30	707,499,978	-22	-0.0000031
100 %		- 20	707,500,190	190	0.0000269
100 %		- 10	707,500,001	1	0.0000001
100 %		0	707,500,049	49	0.0000069
100 %		+ 10	707,500,055	55	0.0000078
100 %		+ 20	707,500,048	48	0.0000068
100 %		+ 30	707,500,090	90	0.0000127
100 %		+ 40	707,499,788	-212	-0.0000300
100 %		+ 50	707,499,849	-151	-0.0000213
BATT. ENDPOINT	3.40	+ 20	707,500,223	223	0.0000315

Table 6-22. Frequency Stability Data (Band 12)

# Note:

Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain inband when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

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# Band 12 Frequency Stability Measurements §2.1055 §27.54



Figure 6-7. Frequency Stability Graph (Band 12)

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# Band 5 Frequency Stability Measurements §2.1055 §22.355

OPERATING FREQUENCY:	836,500,000	Hz
CHANNEL:	20525	_
REFERENCE VOLTAGE:	3.70	VDC
<b>DEVIATION LIMIT</b> :	± 0.00025 % or 2.5 ppm	

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.70	+ 20 (Ref)	836,499,736	-264	-0.0000316
100 %		- 30	836,500,132	132	0.0000158
100 %		- 20	836,499,976	-24	-0.0000029
100 %		- 10	836,499,842	-158	-0.0000189
100 %		0	836,500,082	82	0.0000098
100 %		+ 10	836,500,069	69	0.0000082
100 %		+ 20	836,500,027	27	0.0000032
100 %		+ 30	836,499,665	-335	-0.0000400
100 %		+ 40	836,500,451	451	0.0000539
100 %		+ 50	836,499,765	-235	-0.0000281
BATT. ENDPOINT	3.40	+ 20	836,499,915	-85	-0.0000102

Table 6-23. Frequency Stability Data (Band 5)

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# Band 5 Frequency Stability Measurements §2.1055 §22.355



Figure 6-8. Frequency Stability Graph (Band 5)

FCC ID: ZNFV495		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕒 LG	Reviewed by: Quality Manager
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# Band 4 Frequency Stability Measurements §2.1055 §§27.54

OPERATING FREQUENCY:	1,732,500,000	Hz
CHANNEL:	20175	_
REFERENCE VOLTAGE:	3.70	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.70	+ 20 (Ref)	1,732,500,256	256	0.0000148
100 %		- 30	1,732,499,941	-59	-0.0000034
100 %		- 20	1,732,499,973	-27	-0.0000016
100 %		- 10	1,732,499,919	-81	-0.0000047
100 %		0	1,732,500,289	289	0.0000167
100 %		+ 10	1,732,500,346	346	0.0000200
100 %		+ 20	1,732,500,068	68	0.0000039
100 %		+ 30	1,732,500,146	146	0.0000084
100 %		+ 40	1,732,500,339	339	0.0000196
100 %		+ 50	1,732,500,238	238	0.0000137
BATT. ENDPOINT	3.40	+ 20	1,732,500,086	86	0.0000050

Table 6-24. Frequency Stability Data (Band 4)

#### Note:

Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain inband when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

FCC ID: ZNFV495		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕒 LG	Reviewed by: Quality Manager
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## Band 4 Frequency Stability Measurements §2.1055 §§27.54



Figure 6-9. Frequency Stability Graph (Band 4)

FCC ID: ZNFV495		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕒 LG	Reviewed by: Quality Manager
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# Band 2 Frequency Stability Measurements §2.1055 §24.235

OPERATING FREQUENCY:	1,880,000,000	Hz
CHANNEL:	18900	_
REFERENCE VOLTAGE:	3.70	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.70	+ 20 (Ref)	1,879,999,774	-226	-0.0000120
100 %		- 30	1,879,999,950	-50	-0.0000027
100 %		- 20	1,880,000,076	76	0.0000040
100 %		- 10	1,879,999,990	-10	-0.0000005
100 %		0	1,879,999,964	-36	-0.0000019
100 %		+ 10	1,879,999,847	-153	-0.0000081
100 %		+ 20	1,879,999,631	-369	-0.0000196
100 %		+ 30	1,879,999,980	-20	-0.0000011
100 %		+ 40	1,880,000,215	215	0.0000114
100 %		+ 50	1,879,999,972	-28	-0.0000015
BATT. ENDPOINT	3.40	+ 20	1,879,999,889	-111	-0.0000059

Table 6-25. Frequency Stability Data (Band 2)

#### Note:

Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain inband when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

FCC ID: ZNFV495		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕒 LG	Reviewed by: Quality Manager
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### Band 2 Frequency Stability Measurements §2.1055 §24.235



Figure 6-10. Frequency Stability Graph (Band 2)

FCC ID: ZNFV495		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕒 LG	Reviewed by: Quality Manager
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# Band 7 Frequency Stability Measurements §2.1055 §27.54

OPERATING FREQUENCY:	2,535,000,000	Hz
CHANNEL:	21100	_
REFERENCE VOLTAGE:	3.70	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.70	+ 20 (Ref)	2,535,000,180	180	0.0000071
100 %		- 30	2,534,999,660	-340	-0.0000134
100 %		- 20	2,534,999,545	-455	-0.0000179
100 %		- 10	2,534,999,869	-131	-0.0000052
100 %		0	2,534,999,802	-198	-0.0000078
100 %		+ 10	2,534,999,883	-117	-0.0000046
100 %		+ 20	2,535,000,083	83	0.0000033
100 %		+ 30	2,535,000,131	131	0.0000052
100 %		+ 40	2,535,000,154	154	0.0000061
100 %		+ 50	2,534,999,584	-416	-0.0000164
BATT. ENDPOINT	3.40	+ 20	2,535,000,134	134	0.0000053

 Table 6-26. Frequency Stability Data (Band 7)

#### Note:

Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very small. As such it is determined that the channels at the band edge would remain inband when the maximum measured frequency deviation noted during the frequency stability tests is applied. Therefore the device is determined to remain operating in band over the temperature and voltage range as tested.

FCC ID: ZNFV495		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕒 LG	Reviewed by: Quality Manager
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## Band 7 Frequency Stability Measurements §2.1055 §27.54



Figure 6-11. Frequency Stability Graph (Band 7)

FCC ID: ZNFV495		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕒 LG	Reviewed by: Quality Manager
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#### 7.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **LG Portable Tablet FCC ID: ZNFV495** complies with all the requirements of Parts 22, 24, & 27 of the FCC rules for LTE operation only.

FCC ID: ZNFV495		FCC Pt. 22, 24, & 27 LTE MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	🕒 LG	Reviewed by: Quality Manager
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