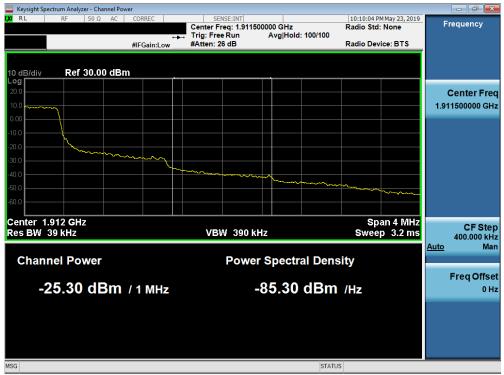


🚾 Keysight Spectrum Analyzer - Swept SA					
LX/RL RF 50Ω AC	CORREC	SENSE:INT	#Avg Type: RMS	10:09:54 PM May 23, 2019 TRACE 1 2 3 4 5 6	Frequency
	PNO: Wide ↔→ IFGain:Low	Trig: Free Run Atten: 36 dB	• //		Auto Tune
10 dB/div Ref 25.00 dBm				-23.731 dBm	
15.0					Center Freq 1.910000000 GHz
-5.00	,0000,000,000,000,000,000,000,000,000,				Start Freq 1.908000000 GHz
-15.0				DL1 -13.00 dBm	Stop Freq 1.912000000 GHz
-25.0		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	manut	man	CF Step 400.000 kHz <u>Auto</u> Man
-45.0					Freq Offset 0 Hz
-65.0					Scale Type
Center 1.910000 GHz #Res BW 16 kHz	#VBW :		Swoon	Span 4.000 MHz 6.667 ms (1001 pts)	Log <u>Lin</u>
#Res DW TO KHZ	#VDVV	JU KH2	Sweep c		

Plot 7-120. Upper Band Edge Plot (Band 2 - 1.4MHz QPSK - Full RB Configuration)



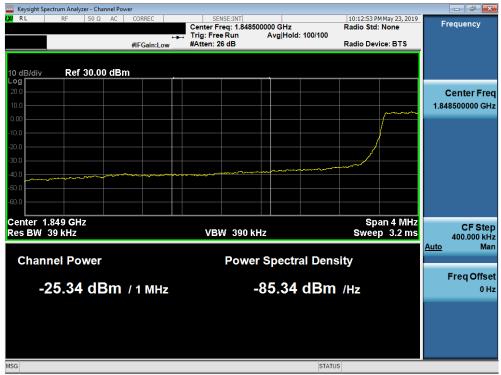
Plot 7-121. Upper Extended Band Edge Plot (Band 2 - 1.4MHz QPSK - Full RB Configuration)

FCC ID: ZNFX320APM		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 01 of 120
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	t Spectrum /	•		ot SA											
RL	RF	5	50 Ω	AC	CORRE	C	SE	NSE:INT	#410	Type: RI	MS.		M May 23, 2019	F	requency
					PNO	:Wide ↔	Trig: Fre		#419	j i ype. Ki	15	TY	PE A WWWWW		
						n:Low	Atten: 36	6 dB				-	ET A N N N N N		
											Mkr1	1.850 (	000 GHz		Auto Tu
) dB/div	v Ref	F 25.0	i0 di	Вm								-26.0	77 dBm		
° <sup>g</sup> 🗖								Ĭ							
															Center Fr
5.0														1.8	50000000 G
.00								- Joseph	mon	mm	ᡟᢛᢪᠬᢦᡪᡗᢧᡮ	man marken	Mar Martin		0 fa a f
															Start Fr
.00														1.84	8000000
													DL1 -13.00 dBm		
5.0													Der -15.00 dom		Stop Fr
															52000000 G
5.0								<u> </u>						1.8	52000000 G
							)	1							
5.0							mand								CF St
		nn	m	www.	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	man	1-4-4-								400.000 k
	any and													<u>Auto</u>	N
5.0															
															Freq Offs
5.0															. 0
5.0															
															Scale Ty
ontor	1.8500	00 01	u					<u> </u>				- Chan-(	.000 MHz	Log	
	1.8500 W 36 k		12			#\/BV	/ 130 kHz			Curr	on 4	5pan 4	(1001 pts)	209	
_	W 30 K	112				#VDV	7 130 KHZ			SWG	_		(1001 pts)		
3											STATU	S			

Plot 7-122. Lower Band Edge Plot (Band 2 - 3.0MHz QPSK - Full RB Configuration)



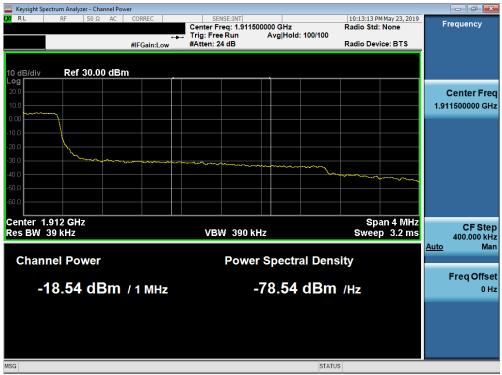
Plot 7-123. Lower Extended Band Edge Plot (Band 2 - 3.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFX320APM		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager	
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	ctrum Analyzer -										
L <mark>XI</mark> RL	RF 5	0Ω AC	CORREC	SEN	ISE:INT	#Avg Typ	e: RMS	TRAC	MMay 23, 2019	F	requency
			PNO: Wide ↔ IFGain:Low	Trig: Free Atten: 36							
			in Guineon				Mkr1	1.910 0	00 GHz		Auto Tune
10 dB/div Log	Ref 25.0	0 dBm						-24.2	18 dBm		
209				) i i i i i i i i i i i i i i i i i i i	Í					(	Center Freq
15.0											0000000 GHz
5.00 <mark>~~~~~</mark> ^	W Walter all and the	᠂᠃ᠬᢍᡐᢪᡀᡳᡔ᠈᠇ᠴ᠁ᡟ	My water of Marson and	my							Start Freq
-5.00										1.90	8000000 GHz
									DL1 -13.00 dBm		
-15.0					1						Stop Freq
-25.0					<u>'</u>					1.91	2000000 GHz
-23.0					www.wash	www.www.	and the second	~			
-35.0							a - ya vonta	1 martine	mmunghing		CF Step 400.000 kHz
										<u>Auto</u>	Man
-45.0											
-55.0											Freq Offset
											0 Hz
-65.0											
											Scale Type
Center 1.9		lz						Span 4	.000 MHz	Log	<u>Lin</u>
#Res BW	36 kHz		#VBW	130 kHz				_	1001 pts)		
MSG							STATU	S			

Plot 7-124. Upper Band Edge Plot (Band 2 - 3.0MHz QPSK - Full RB Configuration)



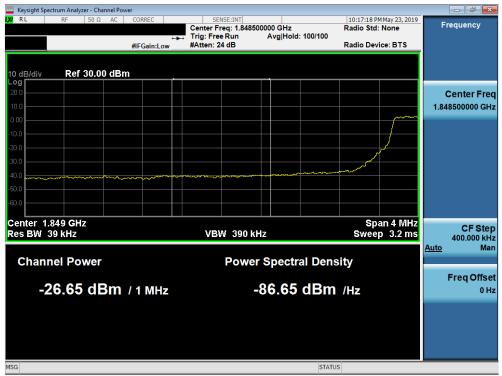
Plot 7-125. Upper Extended Band Edge Plot (Band 2 - 3.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFX320APM		MEASUREMENT REPORT (CERTIFICATION)	🕕 LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 02 of 120
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	pectrum Anal												
RL	RF	50 Ω	AC	CORREC			NSE:INT	#Avg Ty	pe: RMS	TR	PM May 23, 2019 ACE 1 2 3 4 5 6	F	requency
	-			PNO: V IFGain:	/ide ⊶⊷ Low_	Trig: Free Atten: 36			Mk				Auto Tur
0 dB/div	Ref 2	5.00 dl	Bm							-27.	000 GH2 081 dBm		
							Ĭ						Center Fr
5.0												1.8	50000000 G
.00							/*	۵ گی ایس سیار انداز ا		<u>Marina and Marina</u>	<del>د.</del>		Start Fr
.00												1.84	18000000 G
											DL1 -13.00 dBm		
5.0							_ 10					1.94	Stop Fr 2000000 G
5.0						(	2 <sup>11</sup>					1.00	2000000
5.0				www.	wanteren (*	and a start							CF St 400.000 F
5.0	have been and	the water and	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~									<u>Auto</u>	N
													Freq Offs
5.0													0
5.0													Ocolo To
													Scale Ty
	.850000 62 kHz				#\/D\M	220 kHz			Swoon	Span	4.000 MHz (1001 pts)	Log	
G G					# V D VV	220 802			SWEED		(1001 pts)		

Plot 7-126. Lower Band Edge Plot (Band 2 - 5.0MHz QPSK - Full RB Configuration)



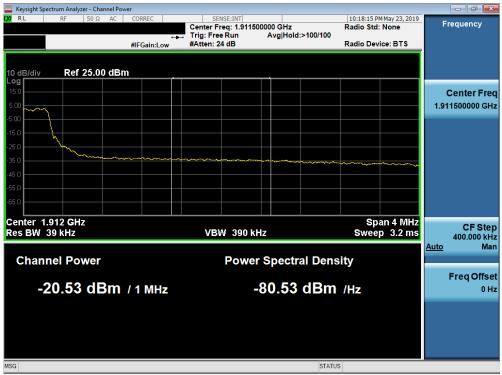
Plot 7-127. Lower Extended Band Edge Plot (Band 2 - 5.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFX320APM		MEASUREMENT REPORT (CERTIFICATION)	ì	Approved by: Quality Manager
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	rum Analyzer - Sw										- <b>•</b> ×
L <mark>XI</mark> RL	RF 50 Ω	AC	CORREC	SEN	ISE:INT	#Avg Typ	e: RMS		M May 23, 2019	F	requency
			PNO: Wide ↔ IFGain:Low	Trig: Free Atten: 36		• *		TY			
10 dB/div Log	Ref 25.00 d	dBm					Mkr1	1.910 0 -25.	)16 GHz 85 dBm		Auto Tune
				Ì							Center Freq
15.0										1.91	0000000 GHz
5.00 Arrangen	- And the set for the set of the set	an a	Managara Aristo Managara	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~							Start Freq
-5.00										1.90	8000000 GHz
-15.0									DL1 -13.00 dBm		Oton Erog
				L L	1					1.91	Stop Freq 2000000 GHz
-25.0				×	hunner warden	J. Marine Lange Alaphen	and	muner of the the	Merila		05.044.5
-35.0									ato attended	Auto	CF Step 400.000 kHz Man
-45.0										Auto	Wan
-55.0											Freq Offset 0 Hz
-65.0											0 HZ
											Scale Type
Center 1.91								Span 4	.000 10112	Log	Lin
#Res BW 6	2 kHz		#VBN	220 kHz			Sweep 6	6.667 ms (	(1001 pts)		
MSG							STATU	S			

Plot 7-128. Upper Band Edge Plot (Band 2 - 5.0MHz QPSK - Full RB Configuration)



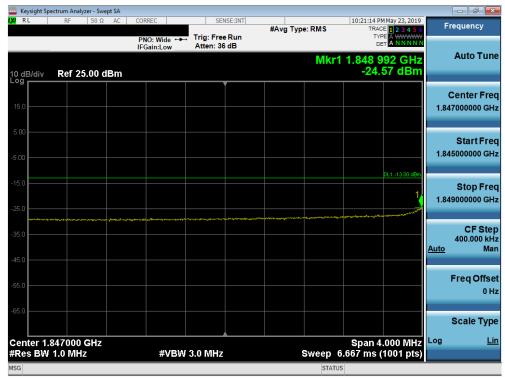
Plot 7-129. Upper Extended Band Edge Plot (Band 2 - 5.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFX320APM		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Keysight Spectrum Analyzer - Swept S	A				
<mark>X/RL</mark> RF 50ΩA	C CORREC	SENSE:INT	#Avg Type: RMS	10:20:44 PM May 23, 2019 TRACE 1 2 3 4 5 6	Frequency
	PNO: Wide ↔ IFGain:Low	Trig: Free Run Atten: 36 dB	Mk	TYPE A WWWW DET A NNNN r1 1.850 000 GHz	Auto Tune
10 dB/div Ref 25.00 dBr	n			-30.293 dBm	
15.0					Center Freq 1.85000000 GHz
-5.00			1.vvev/36/80vev4/vvg/vvgv/sva/s800vev		Start Fred 1.846000000 GHz
-15.0		1.1		DL1 -13.00 dBm	Stop Fred 1.854000000 GHz
-35.0	an a	and the second sec			CF Step 800.000 kH <u>Auto</u> Mar
-55.0					Freq Offse 0 H:
-65.0					Scale Type
Center 1.850000 GHz #Res BW 120 kHz	#VBW	430 kHz	Sween	Span 8.000 MHz 13.33 ms (1001 pts)	Log <u>Lin</u>
MSG				TUS	

Plot 7-130. Lower Band Edge Plot (Band 2 - 10.0MHz QPSK - Full RB Configuration)



Plot 7-131. Lower Extended Band Edge Plot (Band 2 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFX320APM		MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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Keysight Spectrum Analyzer - Swept SA									- 6 ×
XV RL RF 50Ω AC	CORREC	SENS	E:INT	#Avg Typ	e: RMS	TRAC	M May 23, 2019 CE 1 2 3 4 5 6 DE A WWWW	Fr	equency
10 dB/div <b>Ref 25.00 dBm</b>	PNO: Wide ↔ IFGain:Low	Atten: 36 o			Mkr	DI 1 1.910 (			Auto Tune
15.0									enter Fred
5.00	apontation and an an	xman _						1.900	Start Free
-15.0		h h	1				DL1 -13.00 dBm	1.914	Stop Free
-35.0			and the growth and and and	an a	ALL AND LONG AND A	and and a stance of the stance	al mathematical and a state of the second state of	<u>Auto</u>	CFStej 800.000 kH Ma
55.0								ľ	Freq Offse 0 H
-65.0 Center 1.910000 GHz						Span 8	.000 10112		Scale Type <u>Lii</u>
#Res BW 120 kHz	#VBW -	430 kHz			Sweep	13.33 ms (	(1001 pts)		
4SG					STAT	US			

Plot 7-132. Upper Band Edge Plot (Band 2 - 10.0MHz QPSK - Full RB Configuration)



Plot 7-133. Upper Extended Band Edge Plot (Band 2 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFX320APM		MEASUREMENT REPORT (CERTIFICATION)	ų	Approved by: Quality Manager		
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Keysight Spectrum Analyzer - Swept SA					
🗶 RE 50 Ω A0		SENSE:INT	#Avg Type: RMS	10:24:11 PM May 23, 2019 TRACE 1 2 3 4 5 6	Frequency
	IFGain:Low A	ig: Free Run tten: 36 dB	Mkr	1 1.850 000 GHz -32.946 dBm	Auto Tune
10 dB/div Ref 25.00 dBn	n	•		-32.946 aBm	
15.0					Center Fre 1.850000000 GH
5.00				and the second s	Start Fre 1.844000000 GH
				DL1 -13.00 dBm	
-15.0					Stop Fre 1.856000000 GH
35.0		1 1			CF Ste
45.0					1.200000 MH <u>Auto</u> Ma
55.0					Freq Offs
05.0					0 H
.65.0					Scale Typ
Center 1.850000 GHz		<b>A</b>		Span 12.00 MHz	Log <u>Li</u>
#Res BW 180 kHz	#VBW 62	0 kHz	Sweep	1.000 ms (1001 pts)	
ISG			STAT	US	

Plot 7-134. Lower Band Edge Plot (Band 2 - 15.0MHz QPSK - Full RB Configuration)



Plot 7-135. Lower Extended Band Edge Plot (Band 2 - 15.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFX320APM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type: Portable Handset		Page 88 of 138	
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Keysight Spectrum Analyzer - Swept SA						
XX RL RF 50Ω AC	CORREC	SENSE	#Avg T	ype: RMS	10:25:15 PM May 23, 2019 TRACE 1 2 3 4 5 6	
10 dB/div Ref 25.00 dBm	PNO: Wide ↔ IFGain:Low	Trig: Free R Atten: 36 dl		Mkr	1 1.910 000 GHz -27.868 dBm	Auto Tune
15.0						Center Freq 1.910000000 GHz
5.00	And Verman				DL1 -13.00 dBm	Start Fred 1.904000000 GHz
-15.0						Stop Fred 1.916000000 GH;
-35.0				you way and a second		CF Step 1.200000 MH: <u>Auto</u> Mar
-55.0						Freq Offse 0 H:
-65.0						Scale Type
Center 1.910000 GHz #Res BW 180 kHz	#VBW	620 kHz		Sweep	Span 12.00 MHz 1.000 ms (1001 pts)	
MSG				STAT		

Plot 7-136. Upper Band Edge Plot (Band 2 - 15.0MHz QPSK - Full RB Configuration)



Plot 7-137. Upper Extended Band Edge Plot (Band 2 - 15.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFX320APM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager	
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	ectrum Ana												
RL	RF	50 Ω	AC	CORREC			#	Avg Typ	e: RMS	TR	PM May 23, 2019 ACE 1 2 3 4 5 6 TYPE A WWWW	F	requency
0 dB/div	Ref 2	5.00 d	Bm	PNO: IFGain	Wide ↔ n:Low	Atten: 3			Mk	r1 1.850	000 GHz 034 dBm		Auto Tur
. <b>og</b> 15.0													Center Fre
5.00								ᠰᠾᡊᠰᠶᢑᢂᠱ᠊ᢩ				1.84	Start Fre
25.0											DL1 -13.00 dBm	1.85	Stop Fr 8000000 G
35.0 ~~~~	,	,	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	mon	- Anna Mariana Mariana Mariana Mariana M	and the second second second second						<u>Auto</u>	CF Sto 1.600000 M M
5.0													Freq Offs 0
:5.0													Scale Ty
enter 1.					#\/D\A	/ 820 kHz			Cwoon	Span	16.00 MHz	Log	L
Res BW	240 KI	Z			#10	7 820 KH2			Sweep	1.000 ms	; (1001 pts)		

Plot 7-138. Lower Band Edge Plot (Band 2 - 20.0MHz QPSK - Full RB Configuration)



Plot 7-139. Lower Extended Band Edge Plot (Band 2 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFX320APM		MEASUREMENT REPORT (CERTIFICATION)	i.	Approved by: Quality Manager	
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Keysight Spectrum Analyzer - Swept SA						
XV RL RF 50Ω AC	CORREC	SENSE:IN	#Avg Typ	e: RMS	10:28:02 PM May 23, 2019 TRACE 1 2 3 4 5 6 TYPE A WWWWW	
10 dB/div <b>Ref 25.00 dBm</b>	PNO: Wide ↔ IFGain:Low	Atten: 36 dB	1	Mkr	1 1.910 000 GHz -29.973 dBm	Auto Tune
15.0						Center Fred 1.910000000 GH;
5.00	addar farfar and an Ar					Start Fred 1.902000000 GH
25.0					DL1 -13.00 dBm	Stop Free 1.918000000 GH
-35.0		The former	en all and a second and a second and a second and a second	manne	anne ann ann ann ann ann ann ann ann ann	CF Ste 1.600000 MH <u>Auto</u> Ma
55.0						Freq Offse 0 H
-65.0 Center 1.910000 GHz					Span 16.00 MHz	Scale Type
#Res BW 240 kHz	#VBW	820 kHz		Sweep	1.000 ms (1001 pts)	
ISG				STATI		

Plot 7-140. Upper Band Edge Plot (Band 2 - 20.0MHz QPSK - Full RB Configuration)



Plot 7-141. Upper Extended Band Edge Plot (Band 2 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFX320APM		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager	
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# 7.5 Peak-Average Ratio

# **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 D01 v03r01 - Section 5.7.1

# Test Settings

- 1. The signal analyzer's CCDF measurement profile is enabled
- 2. Frequency = carrier center frequency
- 3. Measurement BW ≥ OBW or specified reference bandwidth
- 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 7-4. Test Instrument & Measurement Setup

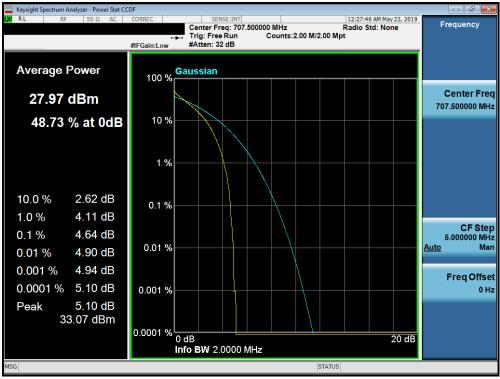
# Test Notes

None.

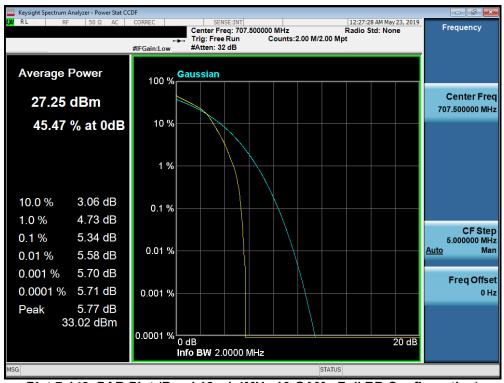
FCC ID: ZNFX320APM		MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager	
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#### Band 12



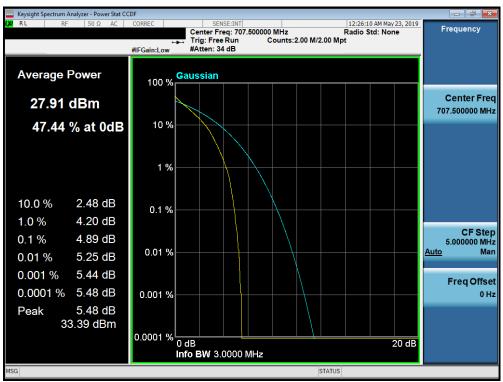
Plot 7-142. PAR Plot (Band 12 - 1.4MHz QPSK - Full RB Configuration)



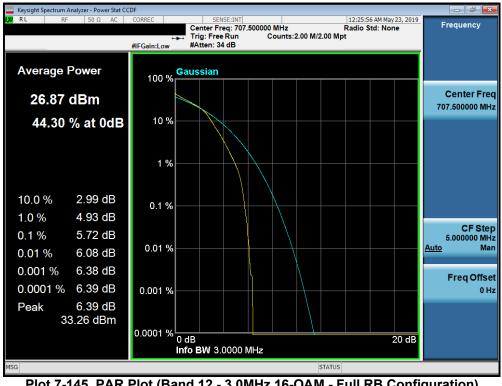
Plot 7-143. PAR Plot (Band 12 - 1.4MHz 16-QAM - Full RB Configuration)

FCC ID: ZNFX320APM		MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager	
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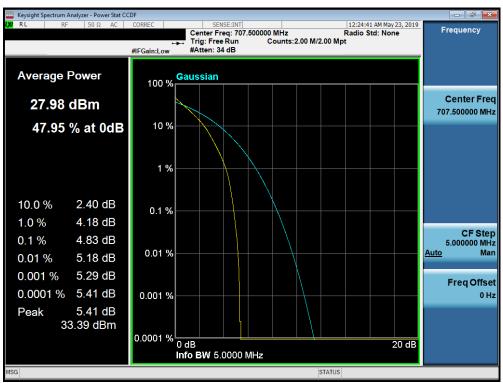
Plot 7-144. PAR Plot (Band 12 - 3.0MHz QPSK - Full RB Configuration)



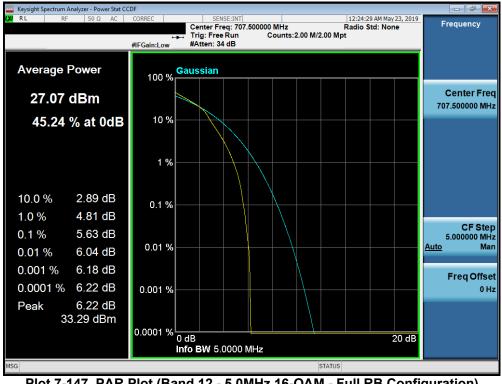
Plot 7-145. PAR Plot (Band 12 - 3.0MHz 16-QAM - Full RB Configuration)

FCC ID: ZNFX320APM		MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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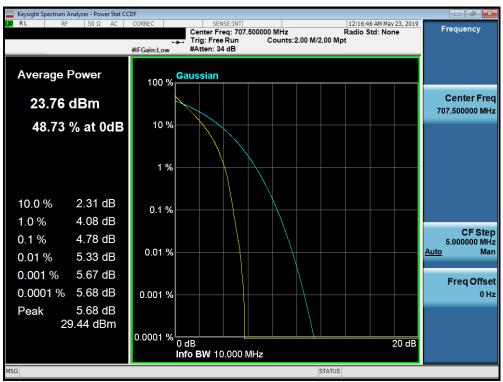
Plot 7-146. PAR Plot (Band 12 - 5.0MHz QPSK - Full RB Configuration)



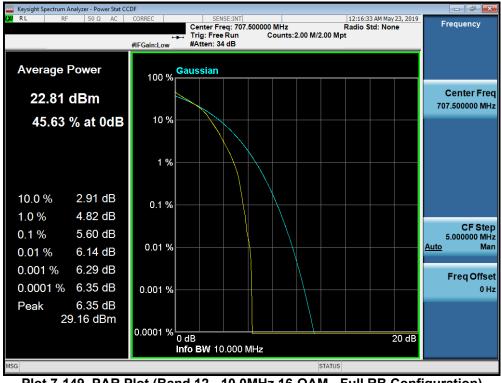
Plot 7-147. PAR Plot (Band 12 - 5.0MHz 16-QAM - Full RB Configuration)

FCC ID: ZNFX320APM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
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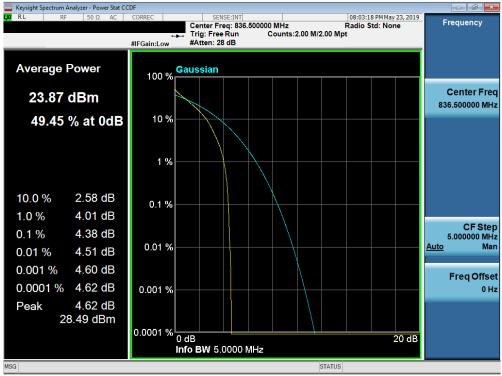


Plot 7-149. PAR Plot (Band 12 - 10.0MHz 16-QAM - Full RB Configuration)

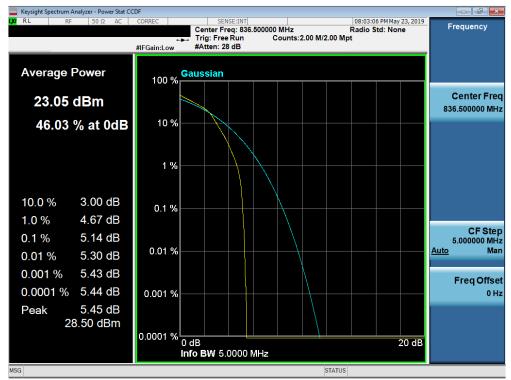
FCC ID: ZNFX320APM		MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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#### Band 5



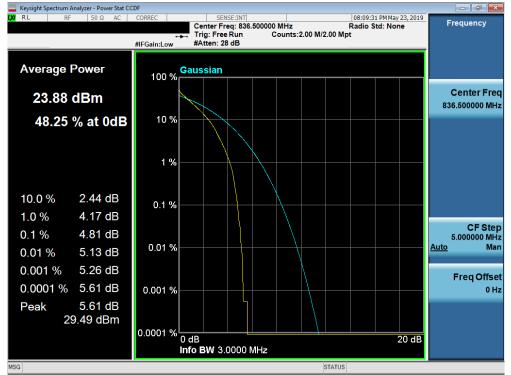
Plot 7-150. PAR plot Bandwidth Plot (Band 5 - 1.4MHz QPSK - Full RB Configuration)

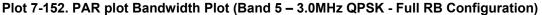


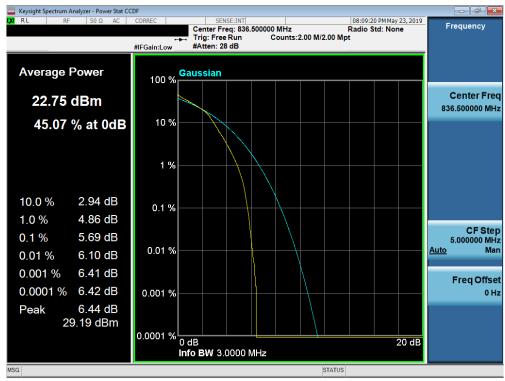
Plot 7-151. PAR plot Bandwidth Plot (Band 5 - 1.4MHz 16QAM - Full RB Configuration)

FCC ID: ZNFX320APM		MEASUREMENT REPORT (CERTIFICATION)	LG	Approved by: Quality Manager
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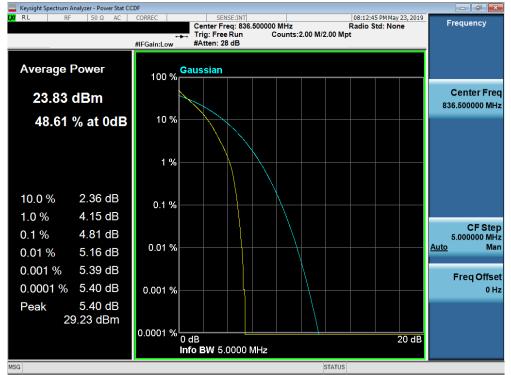


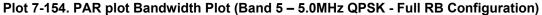


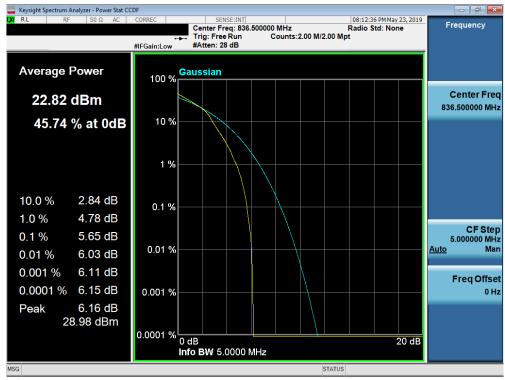
Plot 7-153. PAR plot Bandwidth Plot (Band 5 – 3.0MHz 16QAM - Full RB Configuration)

FCC ID: ZNFX320APM		MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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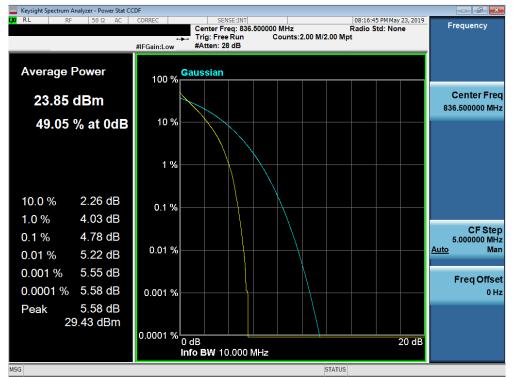


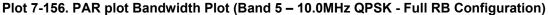


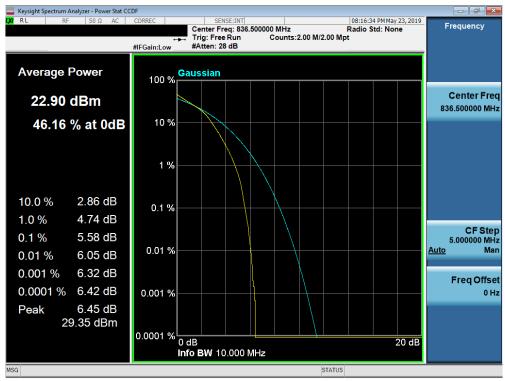
Plot 7-155. PAR plot Bandwidth Plot (Band 5 – 5.0MHz 16QAM - Full RB Configuration)

FCC ID: ZNFX320APM		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager	
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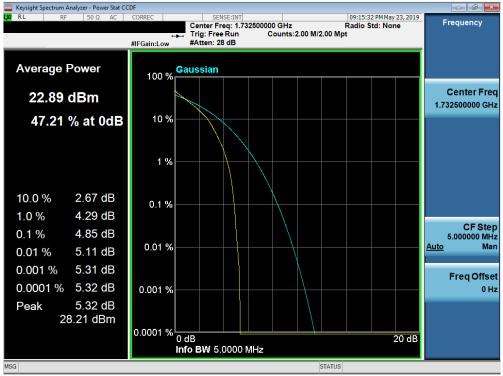


Plot 7-157. PAR plot Bandwidth Plot (Band 5 – 10.0MHz 16QAM - Full RB Configuration)

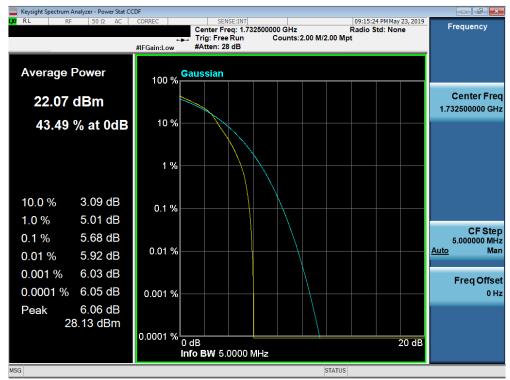
FCC ID: ZNFX320APM		MEASUREMENT REPORT (CERTIFICATION)	.G	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 100 of 120
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#### Band 4



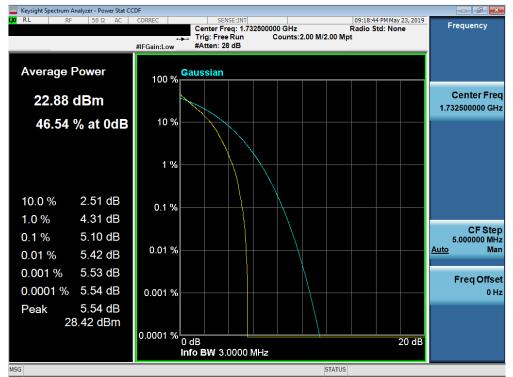
Plot 7-158. PAR plot Bandwidth Plot (Band 4 - 1.4MHz QPSK - Full RB Configuration)

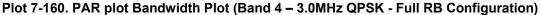


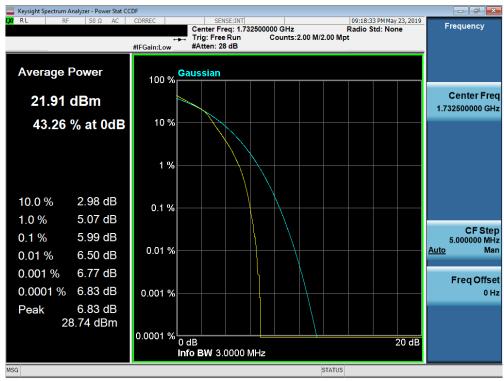
Plot 7-159. PAR plot Bandwidth Plot (Band 4 - 1.4MHz 16QAM - Full RB Configuration)

FCC ID: ZNFX320APM		MEASUREMENT REPORT (CERTIFICATION)	🕕 LG	Approved by: Quality Manager
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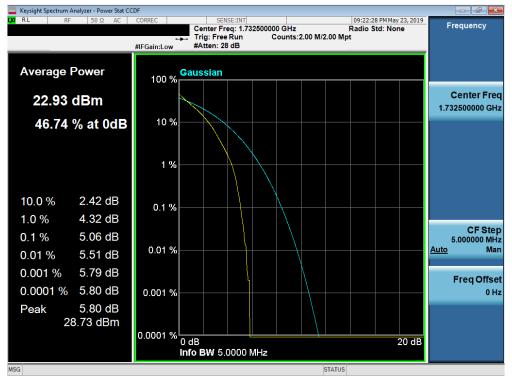


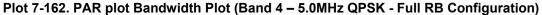


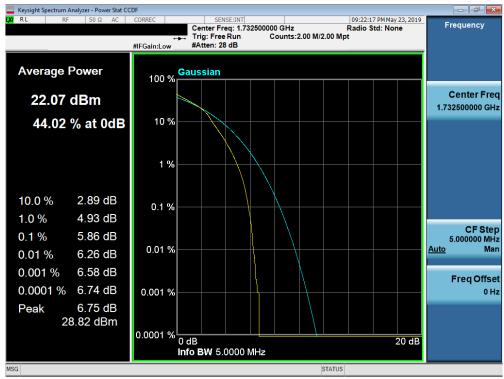
Plot 7-161. PAR plot Bandwidth Plot (Band 4 – 3.0MHz 16QAM - Full RB Configuration)

FCC ID: ZNFX320APM		MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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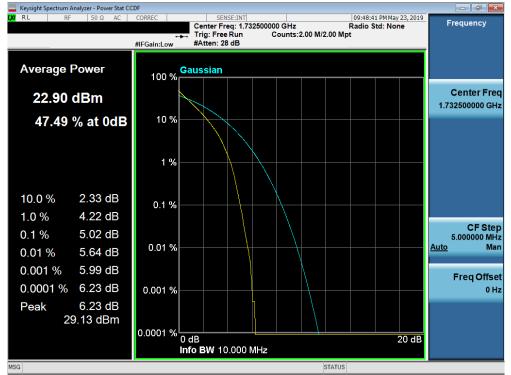


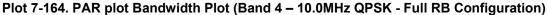


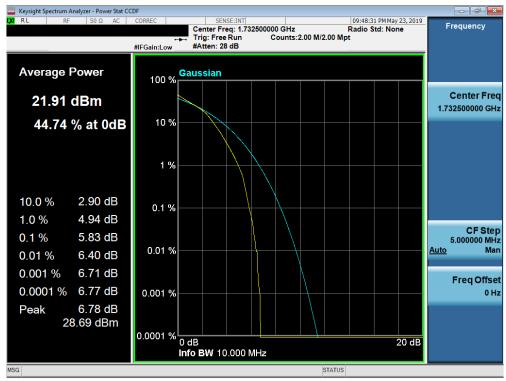
Plot 7-163. PAR plot Bandwidth Plot (Band 4 – 5.0MHz 16QAM - Full RB Configuration)

FCC ID: ZNFX320APM		MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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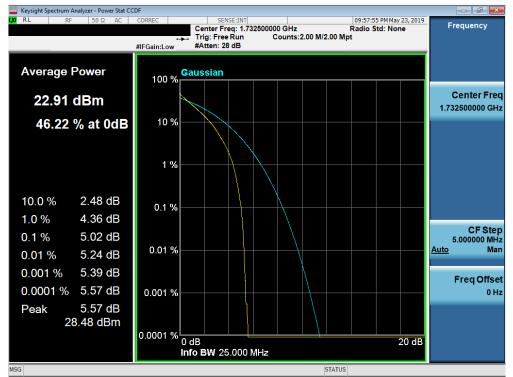


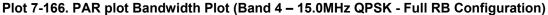


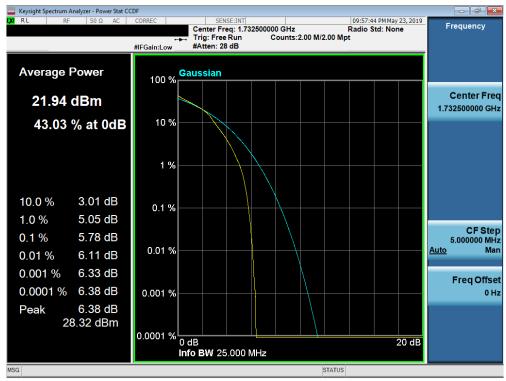
Plot 7-165. PAR plot Bandwidth Plot (Band 4 – 10.0MHz 16QAM - Full RB Configuration)

FCC ID: ZNFX320APM		MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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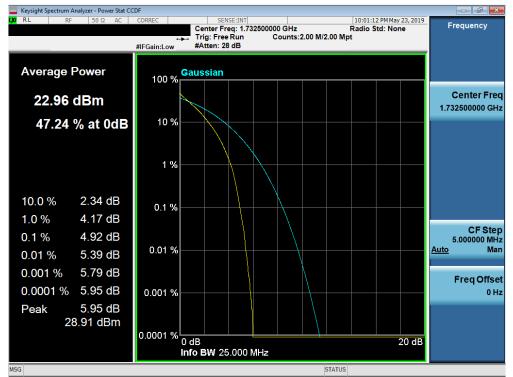


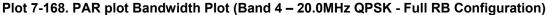
Plot 7-167. PAR plot Bandwidth Plot (Band 4 – 15.0MHz 16QAM - Full RB Configuration)

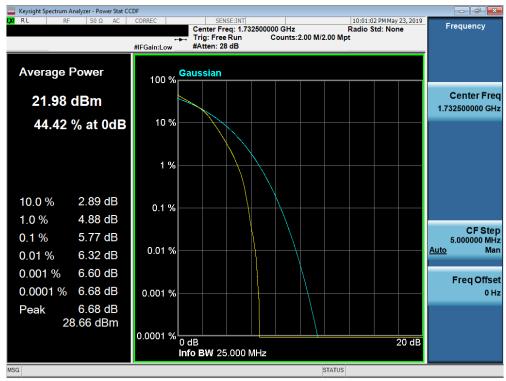
FCC ID: ZNFX320APM		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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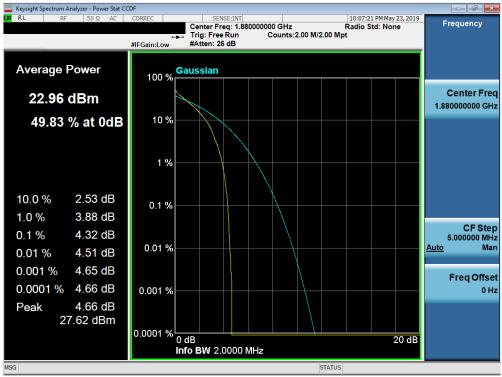


Plot 7-169. PAR plot Bandwidth Plot (Band 4 – 20.0MHz 16QAM - Full RB Configuration)

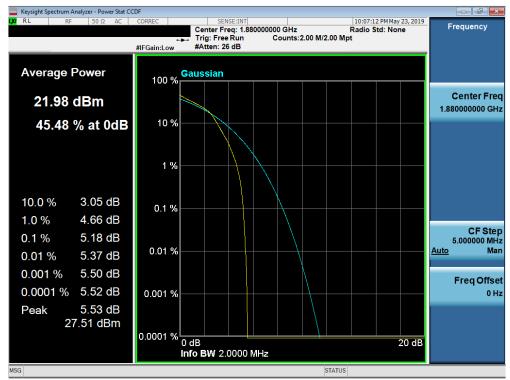
FCC ID: ZNFX320APM		MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Degs 106 of 129	
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#### Band 2



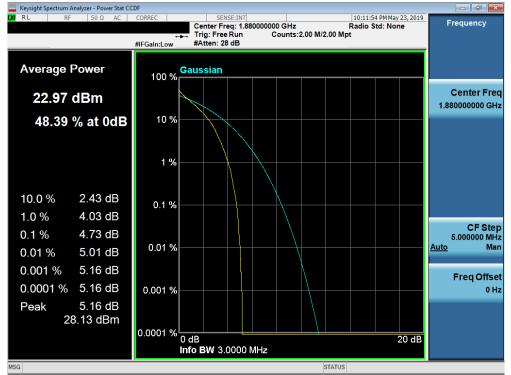
Plot 7-170. PAR plot Bandwidth Plot (Band 2 - 1.4MHz QPSK - Full RB Configuration)

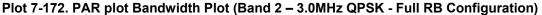


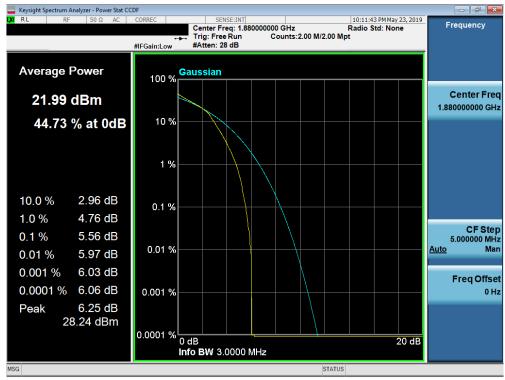
Plot 7-171. PAR plot Bandwidth Plot (Band 2 - 1.4MHz 16QAM - Full RB Configuration)

FCC ID: ZNFX320APM		MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager	
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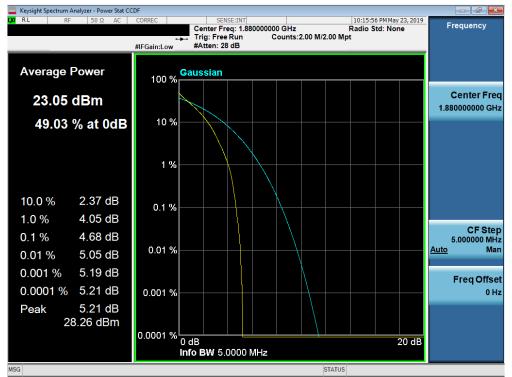


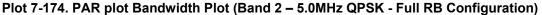


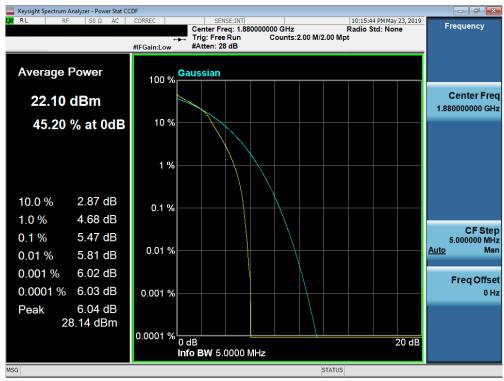
Plot 7-173. PAR plot Bandwidth Plot (Band 2 – 3.0MHz 16QAM - Full RB Configuration)

FCC ID: ZNFX320APM		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager				
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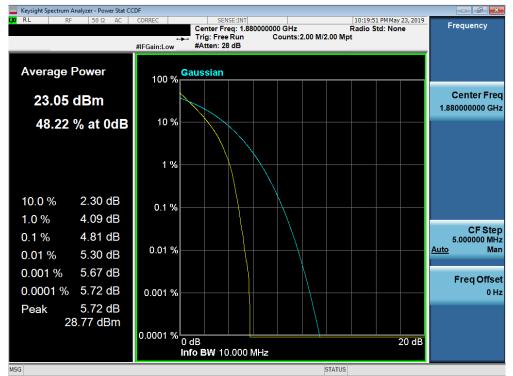


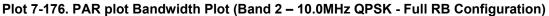


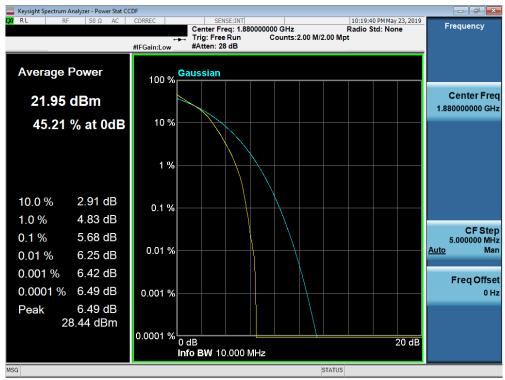
Plot 7-175. PAR plot Bandwidth Plot (Band 2 – 5.0MHz 16QAM - Full RB Configuration)

FCC ID: ZNFX320APM		MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager				
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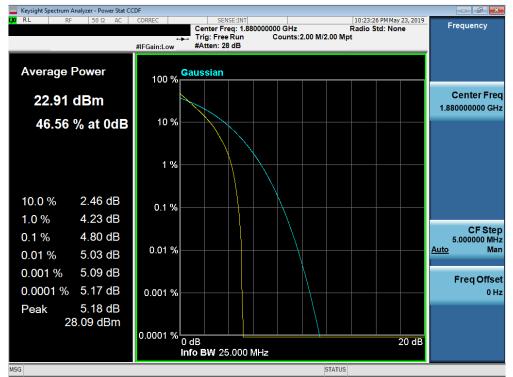


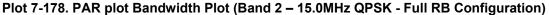


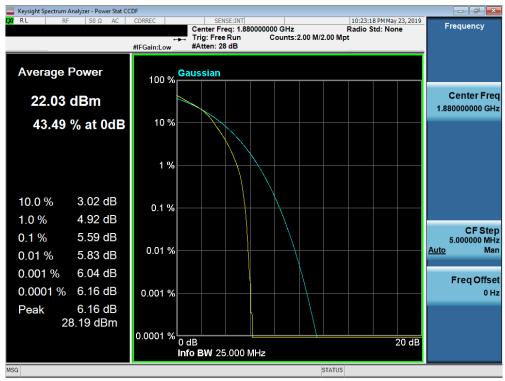
Plot 7-177. PAR plot Bandwidth Plot (Band 2 – 10.0MHz 16QAM - Full RB Configuration)

FCC ID: ZNFX320APM		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager					
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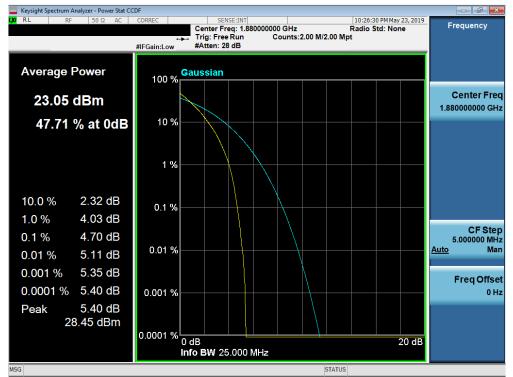


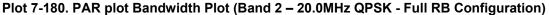


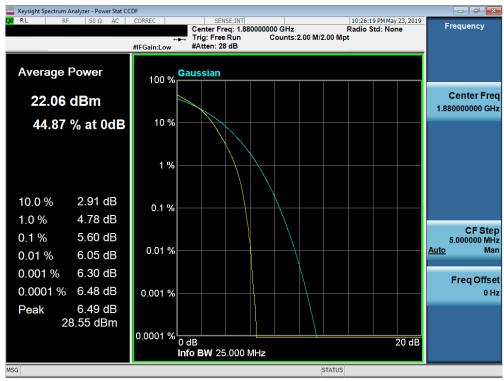
Plot 7-179. PAR plot Bandwidth Plot (Band 2 – 15.0MHz 16QAM - Full RB Configuration)

FCC ID: ZNFX320APM		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Plot 7-181. PAR plot Bandwidth Plot (Band 2 – 20.0MHz 16QAM - Full RB Configuration)

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# 7.6 Radiated Power (ERP/EIRP)

# Test Overview

Effective Radiated Power (ERP) and Equivalent Isotropic Radiated Power (EIRP) measurements are performed using the substitution method described in ANSI/TIA-603-E-2016 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 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 D01 v03r01 - Section 5.2.1

ANSI/TIA-603-E-2016 - 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  $\geq$  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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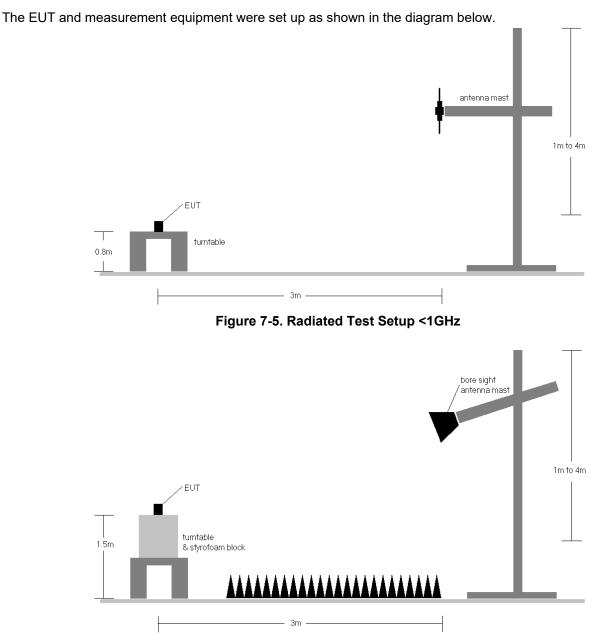


Figure 7-6. Radiated Test Setup >1GHz

# 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.

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# 7.6.1 Radiated Power (ERP/EIRP)

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
699.70	1.4	QPSK	Н	292	280	1 / 5	14.17	3.40	15.42	0.035	34.77	-19.35
707.50	1.4	QPSK	Н	303	271	1 / 0	14.48	3.65	15.98	0.040	34.77	-18.79
715.30	1.4	QPSK	Н	307	273	1 / 5	14.72	3.70	16.27	0.042	34.77	-18.50
707.50	1.4	16-QAM	Н	303	271	1 / 0	13.45	3.65	14.95	0.031	34.77	-19.82
700.50	3	QPSK	Н	290	281	1 / 14	14.41	3.40	15.66	0.037	34.77	-19.11
707.50	3	QPSK	Н	297	276	1 / 14	15.07	3.65	16.57	0.045	34.77	-18.20
714.50	3	QPSK	Н	305	277	1 / 0	15.11	3.70	16.66	0.046	34.77	-18.11
707.50	3	16-QAM	Н	297	276	1 / 14	14.21	3.65	15.71	0.037	34.77	-19.06
701.50	5	QPSK	Н	301	283	1 / 24	14.41	3.40	15.66	0.037	34.77	-19.11
707.50	5	QPSK	Н	296	110	1 / 24	14.95	3.65	16.45	0.044	34.77	-18.32
713.50	5	QPSK	Н	301	274	1 / 0	14.90	3.70	16.45	0.044	34.77	-18.32
713.50	5	16-QAM	Н	301	274	1 / 0	13.77	3.70	15.32	0.034	34.77	-19.45
704.00	10	QPSK	Н	292	110	1 / 49	14.68	3.50	16.03	0.040	34.77	-18.74
707.50	10	QPSK	Н	291	109	1 / 49	15.22	3.65	16.72	0.047	34.77	-18.05
711.00	10	QPSK	Н	303	112	1 / 49	15.14	3.70	16.69	0.047	34.77	-18.08
707.50	10	16-QAM	Н	291	109	1 / 49	13.76	3.65	15.26	0.034	34.77	-19.51
707.50	10	QPSK	V	354	225	1 / 49	14.79	3.65	16.29	0.043	34.77	-18.48

Table 7-3. ERP Data (Band 12)

FCC ID: ZNFX320APM		MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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	PCTEST°											
Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
824.70	1.4	QPSK	V	139	236	1 / 0	15.42	6.30	19.57	0.091	38.45	-18.88
836.50	1.4	QPSK	V	125	232	1/5	15.20	6.40	19.45	0.088	38.45	-19.00
848.30	1.4	QPSK	V	137	224	1/5	15.18	6.50	19.53	0.090	38.45	-18.92
824.70	1.4	16-QAM	V	139	236	1 / 0	14.11	6.30	18.26	0.067	38.45	-20.19
825.50	3	QPSK	V	139	236	1/0	15.13	6.30	19.28	0.085	38.45	-19.17
836.50	3	QPSK	V	125	232	1 / 14	14.99	6.40	19.24	0.084	38.45	-19.21
847.50	3	QPSK	V	137	224	1 / 14	14.93	6.50	19.28	0.085	38.45	-19.17
825.50	3	16-QAM	V	139	236	1/0	13.67	6.30	17.82	0.061	38.45	-20.63
826.50	5	QPSK	V	139	236	1/0	14.82	6.30	18.97	0.079	38.45	-19.48
836.50	5	QPSK	V	125	232	1 / 24	14.98	6.40	19.23	0.084	38.45	-19.22
846.50	5	QPSK	V	137	224	1 / 24	14.92	6.50	19.27	0.085	38.45	-19.18
826.50	5	16-QAM	V	139	236	1/0	13.71	6.30	17.86	0.061	38.45	-20.59
829.00	10	QPSK	V	139	236	1 / 0	12.80	6.30	16.95	0.050	38.45	-21.50
836.50	10	QPSK	V	125	232	1 / 49	14.07	6.40	18.32	0.068	38.45	-20.13
844.00	10	QPSK	V	137	224	1 / 49	15.05	6.40	19.30	0.085	38.45	-19.15
844.00	10	16-QAM	V	137	224	1 / 49	13.84	6.40	18.09	0.064	38.45	-20.36
824.70	1	QPSK	Н	180	21	1 / 0	12.91	6.70	17.46	0.056	38.45	-20.99

<u>(</u>

Table 7-4. ERP Data (Band 5)

FCC ID: ZNFX320APM		MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 116 of 138
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Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1710.70	1.4	QPSK	Н	100	39	1 / 5	15.06	9.44	24.50	0.282	30.00	-5.50
1732.50	1.4	QPSK	Н	100	22	1 / 5	15.19	9.31	24.50	0.282	30.00	-5.50
1754.30	1.4	QPSK	Н	100	24	1 / 0	15.30	9.21	24.51	0.282	30.00	-5.49
1732.50	1.4	16-QAM	Н	100	22	1 / 5	13.04	9.31	22.35	0.172	30.00	-7.65
1711.50	3	QPSK	Н	100	39	1 / 14	15.05	9.44	24.49	0.281	30.00	-5.51
1732.50	3	QPSK	Н	100	22	1 / 14	15.22	9.31	24.53	0.284	30.00	-5.47
1753.50	3	QPSK	Н	100	24	1 / 0	15.30	9.21	24.51	0.282	30.00	-5.49
1711.50	3	16-QAM	Н	100	39	1 / 14	13.12	9.44	22.56	0.180	30.00	-7.44
1712.50	5	QPSK	Н	100	39	1 / 24	15.08	9.43	24.51	0.282	30.00	-5.49
1732.50	5	QPSK	Н	100	22	1 / 24	15.08	9.31	24.39	0.275	30.00	-5.61
1752.50	5	QPSK	Н	100	24	1 / 0	15.33	9.21	24.54	0.284	30.00	-5.46
1752.50	5	16-QAM	Н	100	24	1 / 0	12.90	9.21	22.11	0.163	30.00	-7.89
1715.00	10	QPSK	Н	100	39	1 / 49	15.08	9.42	24.50	0.282	30.00	-5.50
1732.50	10	QPSK	Н	100	22	1 / 49	15.30	9.31	24.61	0.289	30.00	-5.39
1750.00	10	QPSK	Н	100	24	1 / 0	15.39	9.20	24.59	0.288	30.00	-5.41
1732.50	10	16-QAM	Н	100	22	1 / 49	13.24	9.31	22.55	0.180	30.00	-7.45
1717.50	15	QPSK	Н	100	39	1 / 74	15.45	9.40	24.85	0.305	30.00	-5.15
1732.50	15	QPSK	Н	100	22	1 / 74	15.53	9.31	24.84	0.305	30.00	-5.16
1747.50	15	QPSK	Н	100	24	1 / 0	15.45	9.22	24.67	0.293	30.00	-5.33
1747.50	15	16-QAM	Н	100	24	1/0	13.95	9.22	23.17	0.207	30.00	-6.83
1720.00	20	QPSK	Н	100	39	1 / 99	15.33	9.38	24.71	0.296	30.00	-5.29
1732.50	20	QPSK	Н	100	22	1 / 99	15.53	9.31	24.84	0.305	30.00	-5.16
1745.00	20	QPSK	Н	100	24	1/0	15.79	9.23	25.02	0.318	30.00	-4.98
1720.00	20	16-QAM	Н	100	39	1 / 99	14.17	9.38	23.55	0.227	30.00	-6.45
1745.00	20	QPSK	V	110	61	1 / 0	14.75	9.11	23.86	0.243	30.00	-6.14

<u>(</u>

Table 7-5. EIRP Data (Band 4)

FCC ID: ZNFX320APM		MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dego 117 of 129	
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Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1850.70	1.4	QPSK	V	108	63	1 / 0	12.88	9.88	22.76	0.189	33.01	-10.25
1880.00	1.4	QPSK	V	102	64	1 / 0	12.25	10.10	22.35	0.172	33.01	-10.66
1909.30	1.4	QPSK	V	100	63	1 / 0	12.07	10.31	22.38	0.173	33.01	-10.63
1850.70	1.4	16-QAM	V	108	63	1 / 0	10.79	9.88	20.67	0.117	33.01	-12.34
1851.50	3	QPSK	V	108	63	1 / 0	14.48	9.88	24.36	0.273	33.01	-8.65
1880.00	3	QPSK	V	102	64	1 / 0	14.07	10.10	24.17	0.261	33.01	-8.84
1908.50	3	QPSK	V	100	63	1 / 0	14.18	10.30	24.48	0.281	33.01	-8.53
1908.50	3	16-QAM	V	100	63	1 / 0	11.86	10.30	22.16	0.164	33.01	-10.85
1852.50	5	QPSK	V	108	63	1 / 0	14.42	9.89	24.31	0.270	33.01	-8.70
1880.00	5	QPSK	V	102	64	1 / 0	14.04	10.10	24.14	0.259	33.01	-8.87
1907.50	5	QPSK	V	100	63	1 / 0	14.05	10.30	24.35	0.272	33.01	-8.66
1907.50	5	16-QAM	V	100	63	1 / 0	12.11	10.30	22.41	0.174	33.01	-10.60
1855.00	10	QPSK	V	108	63	1 / 0	14.58	9.91	24.49	0.281	33.01	-8.52
1880.00	10	QPSK	V	102	64	1 / 0	14.31	10.10	24.41	0.276	33.01	-8.60
1905.00	10	QPSK	V	100	63	1 / 0	14.28	10.28	24.56	0.286	33.01	-8.45
1905.00	10	16-QAM	V	100	63	1 / 0	12.13	10.28	22.41	0.174	33.01	-10.60
1857.50	15	QPSK	V	108	63	1 / 0	14.29	9.93	24.22	0.264	33.01	-8.79
1880.00	15	QPSK	V	102	64	1 / 0	14.32	10.10	24.42	0.277	33.01	-8.59
1902.50	15	QPSK	V	100	63	1 / 0	14.25	10.27	24.52	0.283	33.01	-8.49
1902.50	15	16-QAM	V	100	63	1/0	12.36	10.27	22.63	0.183	33.01	-10.38
1860.00	20	QPSK	V	108	63	1/0	16.40	9.95	24.60	0.288	33.01	-8.41
1880.00	20	QPSK	V	102	64	1/0	16.08	10.10	24.43	0.278	33.01	-8.58
1900.00	20	QPSK	V	100	63	1/0	15.42	10.26	23.93	0.247	33.01	-9.08
1860.00	20	16-QAM	V	108	63	1/0	15.01	9.95	23.21	0.209	33.01	-9.80
1860.00	20	QPSK	Н	120	18	1 / 0	16.17	9.62	24.04	0.254	33.01	-8.97

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Table 7-6. EIRP Data (Band 2)

FCC ID: ZNFX320APM		MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Degs 110 of 120	
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## 7.7 Radiated Spurious Emissions Measurements

#### **Test Overview**

Radiated spurious emissions measurements are performed using the substitution method described in ANSI/TIA-603-E-2016 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 broadband horn antennas.

#### **Test Procedures Used**

KDB 971168 D01 v03r01 - Section 5.8

ANSI/TIA-603-E-2016 - 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 > 2 x span / RBW
- 5. Detector = RMS
- 6. Trace mode = Average (Max Hold for pulsed emissions)
- 7. The trace was allowed to stabilize

FCC ID: ZNFX320APM		MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager	
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EUT turntable & styrofoam block

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

Figure 7-7. Test Instrument & Measurement Setup

#### **Test Notes**

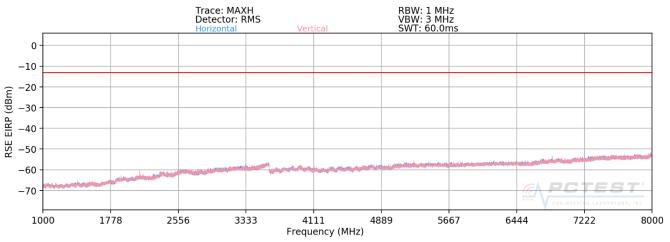
- 1) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the tables below.
- 2) This unit was tested with 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.
- 5) The "-" shown in the following RSE tables are used to denote a noise floor measurement.

FCC ID: ZNFX320APM		MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager	
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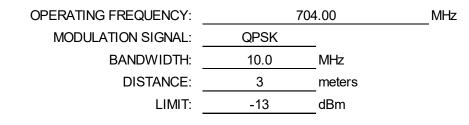


## 7.7.1 Radiated Spurious Emissions Measurements





Plot 7-182. Radiated Spurious Plot above 1GHz (Band 12)

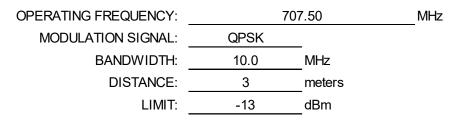


Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1408.00	H	-	-	-69.85	2.71	-67.13	-54.1
2112.00	Н	100	322	-62.90	3.57	-59.33	-46.3
2816.00	Н	-	-	-68.23	4.98	-63.25	-50.3
3520.00	Н	-	-	-68.84	6.33	-62.51	-49.5

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

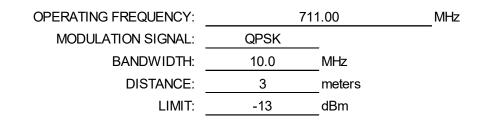
FCC ID: ZNFX320APM		MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dage 121 of 129	
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Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1415.00	Н	-	-	-70.02	2.80	-67.22	-54.2
2122.50	Н	157	331	-62.89	3.57	-59.31	-46.3
2830.00	Н	-	-	-68.32	5.02	-63.30	-50.3
3537.50	Н	-	-	-68.73	6.31	-62.42	-49.4

Table 7-8. Radiated Spurious Data (Band 12 - Mid Channel)



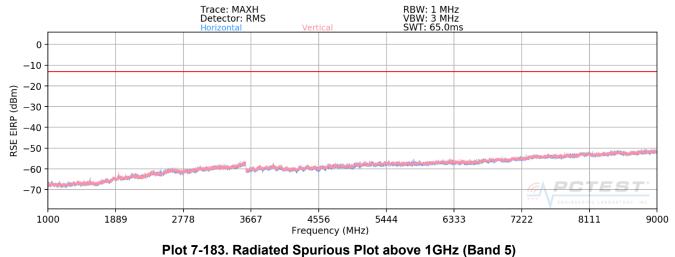
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1422.00	H	-	-	-70.08	2.88	-67.20	-54.2
2133.00	H	105	323	-62.39	3.58	-58.81	-45.8
2844.00	Н	-	-	-68.44	5.07	-63.37	-50.4
3555.00	Н	-	-	-68.68	6.31	-62.37	-49.4

Table 7-9.. Radiated Spurious Data (Band 12 - High Channel)

FCC ID: ZNFX320APM		MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dage 100 of 100	
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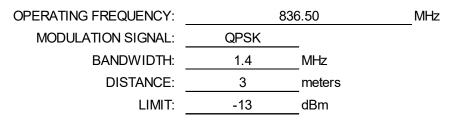
OPERATING FREQUENCY:	82	4.70	MHz
MODULATION SIGNAL:	QPSK	_	
BANDWIDTH:	1.4	MHz	
DISTANCE:	3	meters	
LIMIT:	-13	dBm	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1649.40	V	-	-	-69.05	3.08	-65.97	-53.0
2474.10	V	-	-	-66.44	3.84	-62.60	-49.6

Table 7-10. Radiated Spurious Data (Band 5 - Low Channel)

FCC ID: ZNFX320APM		MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dage 102 of 129	
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Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1673.00	V	-	-	-68.73	3.10	-65.63	-52.6
2509.50	V	-	-	-67.14	4.02	-63.13	-50.1

Table 7-11. Radiated Spurious Data (Band 5 - Mid Channel)

OPERATING FREQUENCY:		8.30	MHz
MODULATION SIGNAL:	QPSK	_	
BANDWIDTH:	1.4	MHz	
DISTANCE:	3	meters	
LIMIT:	-13	dBm	

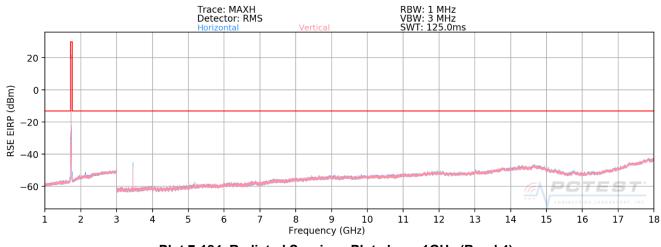
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1696.60	V	-	-	-68.96	3.15	-65.80	-52.8
2544.90	V	-	-	-66.87	4.14	-62.73	-49.7

Table 7-12.. Radiated Spurious Data (Band 5 - High Channel)

FCC ID: ZNFX320APM		MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dage 124 of 129	
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Band 4



Plot 7-184. Radiated Spurious Plot above 1GHz (Band 4)

OPERATING FREQUENCY:	172	20.00	MHz
MODULATION SIGNAL:	QPSK	_	
BANDWIDTH:	20.0	MHz	
DISTANCE:	3	meters	
LIMIT:	-13	dBm	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3440.00	Н	103	125	-51.56	6.22	-45.34	-32.3
5160.00	Н	118	226	-61.65	8.68	-52.98	-40.0
6880.00	Н	-	-	-66.39	8.76	-57.63	-44.6
8600.00	Н	-	-	-66.24	9.17	-57.06	-44.1

Table 7-13. Radiated Spurious Data (Band 4 - Low Channel)

FCC ID: ZNFX320APM		MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 125 of 129
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OPERATING FREQUENCY:	173	MHz	
MODULATION SIGNAL:	QPSK	_	
BANDWIDTH:	20.0	MHz	
DISTANCE:	3	meters	
LIMIT:	-13	dBm	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3465.00	Н	118	126	-49.81	6.27	-43.54	-30.5
5197.50	Н	102	225	-63.49	8.71	-54.78	-41.8
6930.00	Н	-	-	-67.15	8.72	-58.43	-45.4
8662.50	Н	-	-	-66.13	9.27	-56.86	-43.9

Table 7-14. Radiated Spurious Data (Band 4 - Mid Channel)

OPERATING FREQUENCY:	174	45.00	MHz
MODULATION SIGNAL:	QPSK		
BANDWIDTH:	20.0	MHz	
DISTANCE:	3	meters	
LIMIT:	-13	dBm	

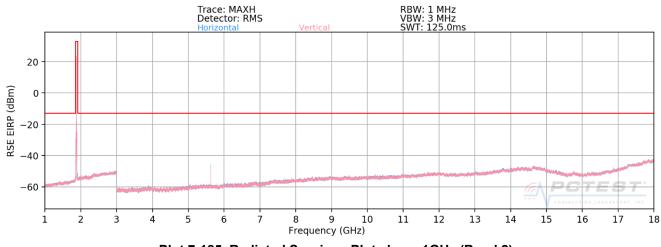
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3490.00	Н	116	127	-49.86	6.32	-43.54	-30.5
5235.00	Н	108	221	-63.77	8.71	-55.06	-42.1
6980.00	Н	-	-	-66.38	8.74	-57.65	-44.6
8725.00	Н	-	-	-66.11	9.42	-56.70	-43.7

Table 7-15. Radiated Spurious Data (Band 4 - High Channel)

FCC ID: ZNFX320APM		MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager	
Test Report S/N: Test Dates:		EUT Type:		Dage 126 of 129	
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#### Plot 7-185. Radiated Spurious Plot above 1GHz (Band 2)

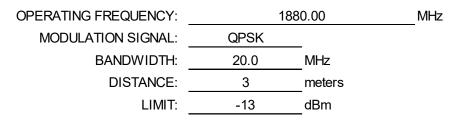
OPERATING FREQUENCY:	186	MHz	
MODULATION SIGNAL:	QPSK		
BANDWIDTH:	20.0	MHz	
DISTANCE:	3	meters	
LIMIT:	-13	dBm	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3720.00	V	110	287	-58.19	6.58	-51.61	-38.6
5580.00	V	105	288	-58.43	8.74	-49.70	-36.7
7440.00	V	-	-	-65.20	8.41	-56.79	-43.8
9300.00	V	-	-	-64.84	9.33	-55.51	-42.5

Table 7-16. Radiated Spurious Data (Band 2 - Low Channel)

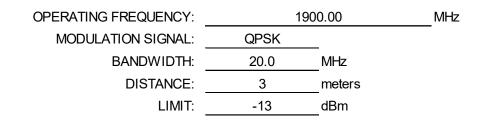
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Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3760.00	V	110	95	-64.52	6.67	-57.85	-44.8
5640.00	V	152	323	-55.03	8.81	-46.22	-33.2
7520.00	V	-	-	-65.31	8.48	-56.82	-43.8
9400.00	V	-	-	-65.66	9.32	-56.34	-43.3

Table 7-17. Radiated Spurious Data (Band 2 - Mid Channel)



Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3800.00	V	133	278	-60.06	6.87	-53.18	-40.2
5700.00	V	118	327	-51.84	8.76	-43.08	-30.1
7600.00	V	-	-	-65.27	8.47	-56.79	-43.8
9500.00	V	-	-	-65.69	9.37	-56.32	-43.3

Table 7-18.. Radiated Spurious Data (Band 2 - High Channel)

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## 7.8 Frequency Stability / Temperature Variation

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

Frequency stability testing is performed in accordance with the guidelines of ANSI/TIA-603-E-2016. 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.

#### Test Procedure Used

ANSI/TIA-603-E-2016

#### **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**

OPERATING FREQUENCY:	707,500,000	Hz
CHANNEL:	23790	_
REFERENCE VOLTAGE:	3.85	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	- 30	707,499,950	-50	-0.0000071
100 %		- 20	707,499,933	-67	-0.0000095
100 %		- 10	707,500,017	17	0.0000024
100 %		0	707,499,596	-404	-0.0000571
100 %		+ 10	707,500,074	74	0.0000105
100 %		+ 20	707,500,020	20	0.0000028
100 %		+ 30	707,500,135	135	0.0000191
100 %		+ 40	707,499,836	-164	-0.0000232
100 %		+ 50	707,500,102	102	0.0000144
BATT. ENDPOINT	2.80	+ 20	707,499,772	-228	-0.0000322

Table 7-19. 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 in-band 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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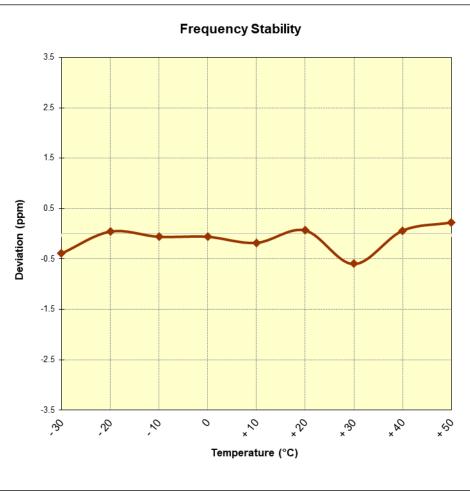


Figure 7-8. frequency Stability Graph (Band 12)

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### **Band 5 Frequency Stability Measurements**

OPERATING FREQUENCY:	836,500,000	Hz
CHANNEL:	20525	
REFERENCE VOLTAGE:	3.85	VDC
<b>DEVIATION LIMIT</b> :	± 0.00025 % or 2.5 ppm	

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	- 30	836,499,880	-120	-0.0000143
100 %		- 20	836,500,108	108	0.0000129
100 %		- 10	836,500,006	6	0.0000007
100 %		0	836,499,927	-73	-0.0000087
100 %		+ 10	836,499,630	-370	-0.0000442
100 %		+ 20	836,499,944	-56	-0.0000067
100 %		+ 30	836,500,061	61	0.0000073
100 %		+ 40	836,500,462	462	0.0000552
100 %		+ 50	836,499,880	-120	-0.0000143
BATT. ENDPOINT	2.80	+ 20	836,499,740	-260	-0.0000311

Table 7-20. Frequency Stability Data (Band 5)

### 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 in-band 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 5 Frequency Stability Measurements**

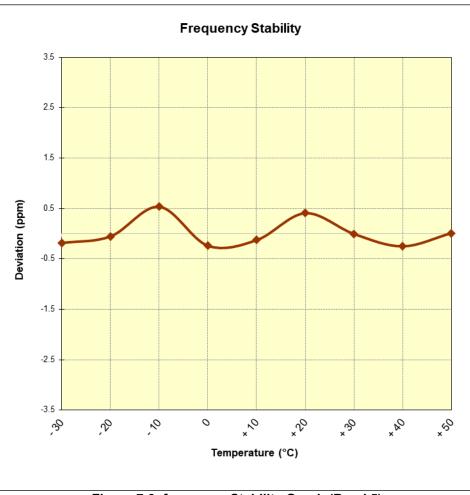


Figure 7-9. frequency Stability Graph (Band 5)

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### **Band 4 Frequency Stability Measurements**

OPERATING FREQUENCY:	1,732,500,000	Hz
CHANNEL:	20175	_
REFERENCE VOLTAGE:	3.85	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	- 30	1,732,500,101	101	0.0000058
100 %		- 20	1,732,500,146	146	0.0000084
100 %		- 10	1,732,499,829	-171	-0.0000099
100 %		0	1,732,499,908	-92	-0.0000053
100 %		+ 10	1,732,499,736	-264	-0.0000152
100 %		+ 20	1,732,499,822	-178	-0.0000103
100 %		+ 30	1,732,500,006	6	0.0000003
100 %		+ 40	1,732,499,879	-121	-0.0000070
100 %		+ 50	1,732,500,014	14	0.000008
BATT. ENDPOINT		+ 20	1,732,500,256	256	0.0000148

Table 7-21. 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 in-band 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 4 Frequency Stability Measurements**

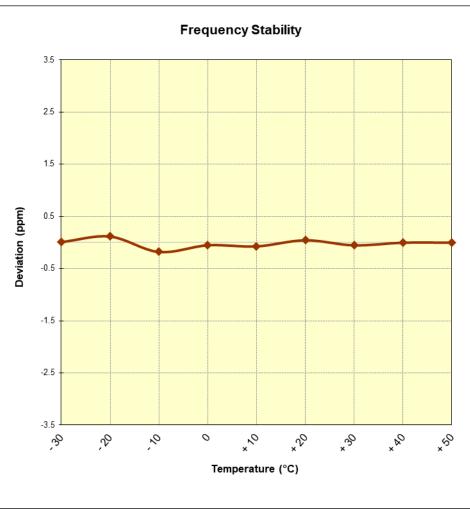


Figure 7-10. frequency Stability Graph (Band 4)

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### **Band 2 Frequency Stability Measurements**

OPERATING FREQUENCY:	1,880,000,000	Hz
CHANNEL:	18900	_
REFERENCE VOLTAGE:	3.85	VDC
<b>DEVIATION LIMIT</b> :	± 0.00025 % or 2.5 ppm	

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.85	- 30	1,880,000,239	239	0.0000127
100 %		- 20	1,880,000,024	24	0.0000013
100 %		- 10	1,879,999,896	-104	-0.0000055
100 %		0	1,880,000,391	391	0.0000208
100 %		+ 10	1,879,999,810	-190	-0.0000101
100 %		+ 20	1,880,000,172	172	0.0000091
100 %		+ 30	1,879,999,876	-124	-0.0000066
100 %		+ 40	1,879,999,686	-314	-0.0000167
100 %		+ 50	1,880,000,024	24	0.0000013
BATT. ENDPOINT		+ 20	1,880,000,126	126	0.0000067

 Table 7-22. 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 in-band 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 2 Frequency Stability Measurements**

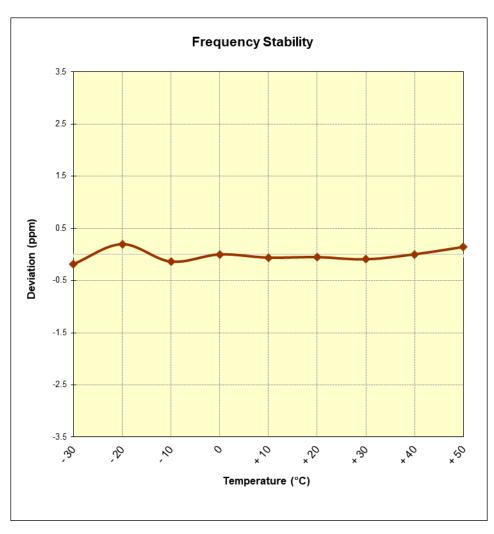


Figure 7-11. frequency Stability Graph (Band 2)

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## 8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **LG Portable Handset FCC ID: ZNFX320APM** complies with all the requirements of Part 22, 24, & 27 of the FCC Rules for LTE operation only.

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