

🔤 Keysigh	nt Spectrum A	nalyzer - Swe	pt SA									
L <mark>XI</mark> RL	RF	50 Ω	AC CC	ORREC	SE	NSE:INT	#Avg Typ	ALIGN AUTO	03:44:00 PI TRAC	M Dec 09, 2020	F	requency
10 dB/di	iv Ref	25.00 d	F IF IBm	NO: Wide 😱 Gain:Low	Trig: Fre Atten: 36	e Run 6 dB		Mk	r1 699.0 -23.	00 MHz 33 dBm		Auto Tune
15.0						pomb	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	- Joseph Martin	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	699	Center Freq 9.000000 MHz
-5.00										DI 4, 40,00 #Em	69	Start Freq 7.000000 MHz
-15.0					an on which	v1					70 [.]	Stop Freq 1.000000 MHz
-35.0	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	ar-Van-M	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		- VI						<u>Auto</u>	CF Step 400.000 kHz Man
-55.0												Freq Offset 0 Hz
-65.0												Scale Type
Center #Res B	699.000 W 100 I) MHz (Hz		#VBW	300 kHz			Sweep 2	Span 4 2.000 ms (.000 MHz 1001 pts)	Log	Lin
MSG								STATU	3			

Plot 7-129. Lower Band Edge Plot (LTE Band 12 - 3MHz QPSK – Full RB Configuration)



Plot 7-130. Upper Band Edge Plot (LTE Band 12 - 3MHz QPSK – Full RB Configuration)

FCC ID: ZNFK420TM	Portest.	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dogo 92 of 120
1M2011180184-14.ZNF	12/1 – 1/8/2021	Portable Handset	Fage 05 01 129
© 2021 PCTEST			V1.2 11/4/2020



🔤 Keysi	ight Spect	trum Analy	zer - Swe	pt SA									
LXI RL		RF	50 Ω	AC (ORREC	SEN	NSE:INT	#Avg Typ	ALIGN AUTO	03:48:46 P	MDec 09, 2020	F	requency
10 dB/	div	Ref 2	5.00 d	Bm	PNO: Wide 🏳 IFGain:Low	Trig: Free Atten: 36	e Run 6 dB		Mk	r1 699.0 -17.	00 MHz 76 dBm		Auto Tune
15.0 -								man	- marine and a second s	N. N		69	Center Freq 9.000000 MHz
5.00 -												69	Start Freq 7.000000 MHz
-15.0 -						antown	1			h h h h h h h h h h h h h h h h h h h	DL1 -13.00 dBm	70	Stop Freq 1.000000 MHz
-35.0	www		~~~~	for the second								<u>Auto</u>	CF Step 400.000 kHz Man
-55.0 —													Freq Offset 0 Hz
-65.0													Scale Type
Cente #Res	er 699 BW 1	000 N	1Hz z		#VBW	300 kHz			Sweep 2	Span 4 2.000 ms (.000 MHz 1001 pts)	Log	Lin
MSG									STATU	S			

Plot 7-131. Lower Band Edge Plot (LTE Band 12 – 1.4MHz QPSK – Full RB Configuration)



Plot 7-132. Upper Band Edge Plot (LTE Band 12 – 1.4MHz QPSK – Full RB Configuration)

FCC ID: ZNFK420TM	Portest.	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dogo 94 of 120
1M2011180184-14.ZNF	12/1 – 1/8/2021	Portable Handset	Fage 64 01 129
© 2021 PCTEST			V1.2 11/4/2020



LTE Band 13



Plot 7-133. Lower Band Edge Plot (LTE Band 13 - 10MHz QPSK – Full RB Configuration)



Plot 7-134. Lower Emission Mask Plot (LTE Band 13 - 10MHz QPSK – Full RB Configuration)

FCC ID: ZNFK420TM		PART 27 MEASUREMENT REPORT	🕒 LG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 95 of 120
1M2011180184-14.ZNF	12/1 – 1/8/2021	Portable Handset		Page 65 01 129
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🔤 Keys	sight Spec	trum Analyze	r - Swept SA									
L <mark>XI</mark> RL		RF	50 Ω AC	CORREC	SEI	NSE:INT	#Avg Typ	ALIGN AUTO	01:27:49 PI TRAC	MDec 09, 2020	F	requency
			NFE	PNO: Wide 😱 IFGain:Low	Trig: Free Atten: 36	e Run idB			TYF			
		Dof 25	00 dBm					Mk	r1 787.0 -31	32 MHz 91 dBm		Auto Tune
		Rel 25.	UU UBIII		,	/						
												Center Freq
15.0											78	7.000000 MHz
5.00												
	<u>^~~~~~~~~</u> ^	****	e los en francés en los	and the second	m)							Start Freq
-5.00											78	3.000000 MHz
										DL1 -13.00 dBm		
-15.0												Stop Freq
-25.0					<u> </u>						79	1.000000 MHz
					M.	<u>\</u>						05.04.0
-35.0						a supervision of the second second	and the second starting	man man	and the share and a start of the start of th	han.		CF Step 800.000 kHz
45.0										and the second second	<u>Auto</u>	Man
-45.0												
-55.0												Freq Offset
												0 H2
-65.0												Scale Type
												ocule Type
Cent	er 787	2.000 MI	lz	-43 (15) 44	200 1411-			0	Span 8	.000 MHz	Log	Lin
#Res	BW 1	OU KHZ		#VBW	300 KHZ			sweep 4	.000 ms (1001 pts)		
MSG								STATUS	5			

Plot 7-135. Upper Band Edge Plot (LTE Band 13 - 10MHz QPSK – Full RB Configuration)



Plot 7-136. Upper Emission Mask Plot (LTE Band 13 - 10MHz QPSK – Full RB Configuration)

FCC ID: ZNFK420TM		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dogo 96 of 120
1M2011180184-14.ZNF	12/1 – 1/8/2021	Portable Handset	Fage 60 01 129
© 2021 PCTEST			V1.2 11/4/2020



🔤 Keysight	t Spectrum A	nalyzer - Sw	ept SA									
<mark>lxi</mark> rl	RF	50 Ω	AC CC	DRREC	SEI	ISE:INT	#Avg Typ	ALIGN AUTO e: RMS	12:55:18 Pf TRAC	4 Dec 09, 2020 E 1 2 3 4 5 6	Fi	requency
	- Def	25.00 (NFE F	PNO: Wide ↔ Gain:Low	. Trig: Free Atten: 36	e Run i dB		Mk	r1 777.0 -27.4	00 MHz 81 dBm		Auto Tune
15.0		23.00 (777	Center Freq 7.000000 MHz
-5.00							Carel Concerned	and the second s	am man	un man	77	Start Freq 5.000000 MHz
-15.0						1				DL1 -13.00 dBm	779	Stop Freq 9.000000 MHz
-35.0		, and the second	mann	nton and the second	manna						<u>Auto</u>	CF Step 400.000 kHz Man
-55.0	Marrie											Freq Offset 0 Hz
Contor	777 000								Snon 4		Log	Scale Type
#Res B	W 100	KHZ		#VBW	300 kHz			Sweep 2	span 4 .000 ms (1001 MH2		
MSG								STATUS	;			

Plot 7-137. Lower Band Edge Plot (LTE Band 13 - 5MHz QPSK – Full RB Configuration)



Plot 7-138. Lower Emission Mask Plot (LTE Band 13 - 5MHz QPSK – Full RB Configuration)

FCC ID: ZNFK420TM	Postest*	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dogo 97 of 120
1M2011180184-14.ZNF	12/1 – 1/8/2021	Portable Handset	Fage 07 01 129
© 2021 PCTEST			V1.2 11/4/2020



🔤 Key	/sight Spe	ctrum A	nalyzer - Sv	wept SA											
L <mark>XI</mark> RI		RF	50 9	Ω AC	CORREC		SE	NSE:INT	#Avg	ALIGN	AUTO	01:06:05 P TRA	M Dec 09, 2020 CE 123456	F	requency
				NFE	PNO: V IFGain	Vide ↔ :Low	Trig: Fre Atten: 3	e Run 6 dB			Mk	۳۲ ۵ 1 787.0			Auto Tune
10 dE Log	3/div	Ref	25.00	dBm								-25.9	83 dBm		
								Ĭ							Center Freq
15.0														78	7.000000 MHz
5.00	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~~	<u> </u>	Anna A	~~~~~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	M								Start Fred
-5.00														78	5.000000 MHz
15.0													DL1 -13.00 dBm		
-13.0							l,	1						78	Stop Freq 9.000000 MHz
-25.0							¥	And a start	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	mm	when				
-35.0												- Come As Burger	- marine		CF Step 400.000 kHz
-45.0														<u>Auto</u>	Man
<i></i>															Freq Offset
-55.0															0 Hz
-65.0															Scale Type
Con	tor 70	7 000										- Enon /		Loa	Lin
#Res	BW	100 k	Hz			#VBW	300 kHz	2		Swe	ep 2	.000 ms	(1001 pts)		
MSG											STATUS				

Plot 7-139. Upper Band Edge Plot (LTE Band 13 - 5MHz QPSK – Full RB Configuration)



Plot 7-140. Upper Emission Mask Plot (LTE Band 13 - 5MHz QPSK – Full RB Configuration)

FCC ID: ZNFK420TM		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dogo 99 of 120
1M2011180184-14.ZNF	12/1 – 1/8/2021	Portable Handset	Fage 00 01 129
© 2021 PCTEST			V1.2 11/4/2020



LTE Band 71



Plot 7-141. Lower Band Edge Plot (LTE Band 71 - 20MHz QPSK – Full RB Configuration)



Plot 7-142. Upper Band Edge Plot (LTE Band 71 - 20MHz QPSK – Full RB Configuration)

FCC ID: ZNFK420TM		PART 27 MEASUREMENT REPORT	🕒 LG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 90 of 120
1M2011180184-14.ZNF	12/1 - 1/8/2021	Portable Handset		Page 69 01 129
© 2021 PCTEST				V1.2 11/4/2020



🔤 Keysight Sp	ectrum Analyzer - S	wept SA									
LXI RL	RF 50	Ω AC	CORREC	SEI	ISE:INT	#A.u. T.u.	ALIGN AUTO	12:41:16 P	1Dec 09, 2020	F	requency
		NFE	PNO: Wide +++	Trig: Free Atten: 36	e Run dB	#Avg Typ	e: RIVIS	TYF	E A WWWWW T A NNNN		
10 dB/div	Ref 25.00	dBm					Mk	r1 662.9 -29.	88 MHz 05 dBm		Auto Tune
15.0										66	Center Freq 3.000000 MHz
-5.00							www		- yoon we	65	Start Freq 7.000000 MHz
-15.0					1				DL1 -13.00 dBm	66	Stop Freq 9.000000 MHz
-25.0	www.	man and a second	\sim	mm	j.					Auto	CF Step 1.200000 MHz Map
-45.0										Auto	Man
-55.0											Freq Offset 0 Hz
-65.0											Scale Type
Center 66 #Res BW	3.000 MHz 150 kHz		#VBW	470 kHz			Sweep 1	Span 1 1.000 ms (2.00 MHz 1001 pts)	Log	Lin
MSG							STATU	S			

Plot 7-143. Lower Band Edge Plot (LTE Band 71 - 15MHz QPSK – Full RB Configuration)



Plot 7-144. Upper Band Edge Plot (LTE Band 71 - 15MHz QPSK – Full RB Configuration)

FCC ID: ZNFK420TM		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Baga 00 of 120	
1M2011180184-14.ZNF	12/1 – 1/8/2021	Portable Handset	Page 90 01 129	
© 2021 PCTEST			V1.2 11/4/2020	



🔤 Keysigł	ht Spectrum /	Analyzer - Sv	vept SA									
L <mark>XI</mark> RL	RF	50 S	2 AC	CORREC	SEI	NSE:INT		ALIGN AUTO	12:46:39 PI	MDec 09, 2020	F	requency
			NFE	PNO: Wide	. Trig: Free Atten: 36	e Run 6 dB	#Avg Typ	e:RMS	TYP	E A WWWWW A NNNNN		ioquonoy
10 dB/d	liv Ref	5 25.00	dBm					Mk	r1 662.9 -29.	84 MHz 56 dBm		Auto Tune
15.0											66	Center Freq 3.000000 MHz
-5.00							an a	Aray Harrinkognan (me	يتكر الخريرفتريتينينين للم	and the second secon	65	Start Freq 9.000000 MHz
-15.0						1				DL1 -13.00 dBm	66	Stop Freq 7.000000 MHz
-35.0	the section of the se	-honderfree-Abo	where where we have a second	wywy men na cae a dawy	and a second and the						<u>Auto</u>	CF Step 800.000 kHz Man
-45.0												Freq Offset
-65.0												0 Hz
												Scale Type
Center #Res E	r 663.00 3W 100	0 MHz kHz		#VBW	300 kHz			Sweep 4	Span 8 4.000 ms (.000 MHz 1001 pts)	Log	Lin
MSG								STATU	s			

Plot 7-145. Lower Band Edge Plot (LTE Band 71 - 10MHz QPSK – Full RB Configuration)



Plot 7-146. Upper Band Edge Plot (LTE Band 71 - 10MHz QPSK – Full RB Configuration)

FCC ID: ZNFK420TM		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dogo 01 of 120	
1M2011180184-14.ZNF	12/1 – 1/8/2021	Portable Handset	Page 91 01 129	
© 2021 PCTEST			V1.2 11/4/2020	



Ke	ysight Spec	trum Ana	alyzer - Sw	ept SA									
l,XI R	L	RF	50 Ω	AC	CORREC	SEI	NSE:INT	#Avg Ty	ALIGN AUTO	12:51:20 P TRAC	M Dec 09, 2020	F	requency
10 di	3/div	Ref 2	25.00 (NFE diBm	PNO: Wide IFGain:Low	#Atten: 3	6 dB		M	xr1 662.9 -21.	96 MHz 92 dBm		Auto Tune
15.0								and the second	(pargent (Anton	muno monto	hor when the first of the first	66	Center Freq 3.000000 MHz
5.00 -5.00											DI 1 -13 00 dBm	66	Start Freq 1.000000 MHz
-15.0 -25.0							1) //					66	Stop Freq 5.000000 MHz
-35.0	r and the second	Jan Jan	hallah	ahour Maria	Mangan Marina	ANN ANN						<u>Auto</u>	CF Step 400.000 kHz Man
-55.0													Freq Offset 0 Hz
-65.0												1.00	Scale Type
Cen #Re	ter 663 s BW 1	1.000 00 ki	MHz Iz		#VBW	/ 300 kHz			Sweep :	Span 4 2.000 ms (.000 MHz 1001 pts)	Log	Lin
MSG									STATU	IS			

Plot 7-147. Lower Band Edge Plot (LTE Band 71 - 5MHz QPSK – Full RB Configuration)



Plot 7-148. Upper Band Edge Plot (LTE Band 71 - 5MHz QPSK – Full RB Configuration)

FCC ID: ZNFK420TM	PCTEST	PART 27 MEASUREMENT REPORT	🕒 LG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dogo 02 of 120	
1M2011180184-14.ZNF	12/1 – 1/8/2021	Portable Handset		Page 92 of 129	
© 2021 PCTEST	•			V1.2 11/4/2020	



WCDMA AWS







Plot 7-150. Lower Extended Band Edge Plot (WCDMA AWS – Ch. 1312)

FCC ID: ZNFK420TM		PART 27 MEASUREMENT REPORT	🕑 LG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dege 02 of 120	
1M2011180184-14.ZNF	12/1 – 1/8/2021	Portable Handset		Page 93 of 129	
© 2021 PCTEST	•	•		V1.2 11/4/2020	



🔤 Keysight	Spectrum Analyzer - Swept SA					
L <mark>XI</mark> RL	RF 50 Ω AC	CORREC SE	NSE:INT	ALIGN AUTO	01:09:06 PM Dec 03, 202	Frequency
		PNO: Wide +++ Trig: Fre IFGain:Low Atten: 4	e Run 0 dB	#Avg Type. Kino	TYPE A WWWW DET A NNNN	
10 dB/div Log	Ref 30.00 dBm			Mkr	1 1.755 000 GH -25.793 dBr	z Auto Tune n
20.0						Center Freq 1.755000000 GHz
0.00						Start Freq 1.747500000 GHz
-10.0			1		DL1 -13.00 dB	Stop Freq 1.762500000 GHz
-30.0	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~			~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		CF Step 1.500000 MHz <u>Auto</u> Man
-40.0						Freq Offset 0 Hz
-60.0						Scale Type
Center	1.755000 GHz	43/DW 200 FUE		0	Span 15.00 MH	z Log <u>Lin</u>
#Res Bl	W TOU KHZ	#VBW 300 KHz		Sweep	1.000 ms (1001 pt	<u>श</u>
MSG				STAT	TUS	

Plot 7-151. Upper Band Edge Plot (WCDMA AWS - Ch. 1513)



Plot 7-152. Upper Extended Band Edge Plot (WCDMA AWS – Ch. 1513)

FCC ID: ZNFK420TM		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dogo 04 of 120
1M2011180184-14.ZNF	12/1 – 1/8/2021	Portable Handset	Fage 94 01 129
© 2021 PCTEST			V1.2 11/4/2020



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. For burst transmissions, the spectrum analyzer is set to use an internal "RF Burst" trigger that is synced with an incoming pulse and the measurement interval is set to less than the duration of the "on time" of one burst to ensure that energy is only captured during a time in which the transmitter is operating at maximum power

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: ZNFK420TM	Postest*	PART 27 MEASUREMENT REPORT	🕑 LG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dogo 05 of 120	
1M2011180184-14.ZNF	12/1 – 1/8/2021	Portable Handset		Page 95 of 129	
© 2021 PCTEST	•			V1.2 11/4/2020	



LTE Band 66/4







Plot 7-154. PAR Plot (LTE Band 66/4 - 20MHz 16-QAM - Full RB Configuration)

FCC ID: ZNFK420TM		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 06 of 120
1M2011180184-14.ZNF	12/1 - 1/8/2021	Portable Handset	Fage 90 01 129
© 2021 PCTEST			V1.2 11/4/2020

2021 PCTEST









Plot 7-156. PAR Plot (LTE Band 66/4 - 15MHz QPSK - Full RB Configuration)

FCC ID: ZNFK420TM	Posed to be part of the element	PART 27 MEASUREMENT REPORT	🕒 LG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dogo 07 of 120	
1M2011180184-14.ZNF	12/1 – 1/8/2021	Portable Handset		Page 97 01 129	
© 2021 PCTEST	•			V1.2 11/4/2020	









Plot 7-158. PAR Plot (LTE Band 66/4 - 15MHz 64-QAM - Full RB Configuration)

FCC ID: ZNFK420TM	POTEST Poud to be part of @ element	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dogo 08 of 120
1M2011180184-14.ZNF	12/1 - 1/8/2021	Portable Handset	Fage 90 01 129
© 2021 PCTEST			V1.2 11/4/2020









Plot 7-160. PAR Plot (LTE Band 66/4 - 10MHz 16-QAM - Full RB Configuration)

FCC ID: ZNFK420TM		PART 27 MEASUREMENT REPORT	🕑 LG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 00 of 120
1M2011180184-14.ZNF	12/1 - 1/8/2021	Portable Handset		Fage 99 01 129
© 2021 PCTEST	•	·		V1.2 11/4/2020









Plot 7-162. PAR Plot (LTE Band 66/4 - 5MHz QPSK - Full RB Configuration)

FCC ID: ZNFK420TM		PART 27 MEASUREMENT REPORT	🕒 LG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 100 of 100
1M2011180184-14.ZNF	12/1 – 1/8/2021	Portable Handset		Page 100 01 129
© 2021 PCTEST	•			V1.2 11/4/2020









Plot 7-164. PAR Plot (LTE Band 66/4 - 5MHz 64-QAM - Full RB Configuration)

FCC ID: ZNFK420TM	Posed to be part of the element	PART 27 MEASUREMENT REPORT	🕑 LG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 101 of 120
1M2011180184-14.ZNF	12/1 – 1/8/2021	Portable Handset		Fage 101 01 129
© 2021 PCTEST	•			V1.2 11/4/2020









Plot 7-166. PAR Plot (LTE Band 66/4 - 3MHz 16-QAM - Full RB Configuration)

FCC ID: ZNFK420TM		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dogo 102 of 120
1M2011180184-14.ZNF	12/1 - 1/8/2021	Portable Handset	Fage 102 01 129
© 2021 PCTEST	•	·	V1.2 11/4/2020









Plot 7-168. PAR Plot (LTE Band 66/4 - 1.4MHz QPSK - Full RB Configuration)

FCC ID: ZNFK420TM	Posed to be part of the element	PART 27 MEASUREMENT REPORT	🕒 LG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 102 of 120
1M2011180184-14.ZNF	12/1 – 1/8/2021	Portable Handset		Fage 103 01 129
© 2021 PCTEST	•			V1.2 11/4/2020









Plot 7-170. PAR Plot (LTE Band 66/4 - 1.4MHz 64-QAM - Full RB Configuration)

FCC ID: ZNFK420TM	PCTEST Proud to be part of @viewament	PART 27 MEASUREMENT REPORT	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dogo 104 of 120	
1M2011180184-14.ZNF	12/1 - 1/8/2021	Portable Handset	Fage 104 01 129	
© 2021 PCTEST			V1.2 11/4/2020	



WCDMA AWS



Plot 7-171. PAR Plot (WCDMA, Ch. 1413)

FCC ID: ZNFK420TM		PART 27 MEASUREMENT REPORT	🕒 LG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dogo 105 of 120	
1M2011180184-14.ZNF	12/1 - 1/8/2021	Portable Handset		Page 105 of 129	
© 2021 PCTEST		•		V1.2 11/4/2020	



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. 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 \geq 3 x RBW
- 4. Span = 1.5 times the OBW
- 5. No. of sweep points $\geq 2 \times \text{span} / \text{RBW}$
- 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

FCC ID: ZNFK420TM		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Daga 106 of 120
1M2011180184-14.ZNF	12/1 – 1/8/2021	Portable Handset	Page 106 01 129
© 2021 PCTEST	•		V1.2 11/4/2020



Test Setup

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



Figure 7-6. Radiated Test Setup >1GHz

FCC ID: ZNFK420TM		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dogo 107 of 120	
1M2011180184-14.ZNF	12/1 – 1/8/2021	Portable Handset	Page 107 01 129	
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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 device employs UMTS technology with WCDMA (AMR/RMC) and HSDPA capabilities. The EUT was tested under all configurations and the highest power is reported in WCDMA mode with HSDPA Inactive at 12.2 kbps RMC and TPC bits all set to "1".
- 3) This unit was tested with its standard battery.
- 4) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case setup is reported in the tables below.

FCC ID: ZNFK420TM		PART 27 MEASUREMENT REPORT	🕒 LG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 109 of 120
1M2011180184-14.ZNF	12/1 – 1/8/2021	Portable Handset		Fage 100 01 129
© 2021 PCTEST				V1.2 11/4/2020



Bandwidth	Mod.	Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Ant. Gain [dBi]	RB Size/Offset	Substitute Level [dBm]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
		1720.0	Н	173	19	8.61	1/0	15.74	24.35	0.272	30.00	-5.65
ZH	QPSK	1745.0	Н	171	22	8.61	1 / 50	15.25	23.86	0.243	30.00	-6.14
M		1770.0	Н	200	22	8.62	1 / 50	15.84	24.46	0.279	30.00	-5.54
20	16-QAM	1720.0	Н	173	19	8.61	1/0	15.06	23.67	0.233	30.00	-6.33
	64-QAM	1720.0	Н	173	19	8.61	1/0	13.95	22.56	0.180	30.00	-7.44
		1717.5	Н	173	19	8.61	1/0	19.26	24.32	0.270	30.00	-5.68
ZH	QPSK	1745.0	Н	171	22	8.61	1 / 37	19.03	24.09	0.257	30.00	-5.91
M		1772.5	Н	200	22	8.62	1 / 37	19.12	24.19	0.263	30.00	-5.81
15	16-QAM	1772.5	Н	200	22	8.62	1 / 37	18.50	23.57	0.228	30.00	-6.43
	64-QAM	1717.5	Н	173	19	8.61	1/0	17.52	22.58	0.181	30.00	-7.42
		1715.0	Н	173	19	8.61	1 / 25	19.33	24.39	0.275	30.00	-5.61
Чz	QPSK	1745.0	Н	171	22	8.61	1 / 25	19.02	24.08	0.256	30.00	-5.92
Μ		1775.0	Н	200	22	8.62	1/0	19.21	24.28	0.268	30.00	-5.72
10	16-QAM	1715.0	Н	173	19	8.61	1 / 25	18.41	23.47	0.222	30.00	-6.53
	64-QAM	1715.0	Н	173	19	8.61	1 / 25	17.59	22.65	0.184	30.00	-7.35
		1712.5	Н	173	19	8.61	1 / 12	19.50	24.56	0.285	30.00	-5.44
주	QPSK	1745.0	Н	171	22	8.61	1 / 24	18.76	23.82	0.241	30.00	-6.18
MF		1777.5	Н	200	22	8.62	1 / 12	18.82	23.89	0.245	30.00	-6.11
5	16-QAM	1712.5	Н	173	19	8.61	1 / 12	18.86	23.92	0.246	30.00	-6.08
	64-QAM	1712.5	Н	173	19	8.61	1 / 12	17.63	22.69	0.186	30.00	-7.31
		1711.5	Н	173	19	8.60	1/7	19.58	24.63	0.291	30.00	-5.37
주	QPSK	1745.0	Н	171	22	8.61	1/7	18.59	23.65	0.232	30.00	-6.35
MF		1778.5	Н	200	22	8.62	1/7	19.07	24.14	0.260	30.00	-5.86
3	16-QAM	1711.5	Н	173	19	8.60	1/7	18.63	23.68	0.234	30.00	-6.32
	64-QAM	1711.5	Н	173	19	8.60	1/7	17.83	22.88	0.194	30.00	-7.12
		1710.7	Н	173	19	8.60	1/3	19.37	24.42	0.277	30.00	-5.58
재	QPSK	1745.0	Н	171	22	8.61	1/3	18.95	24.01	0.252	30.00	-5.99
N N		1779.3	Н	200	22	8.62	1/3	19.13	24.20	0.263	30.00	-5.80
1.4	16-QAM	1710.7	Н	173	19	8.60	1/3	18.63	23.68	0.234	30.00	-6.32
	64-QAM	1710.7	Н	173	19	8.60	1/3	17.54	22.59	0.182	30.00	-7.41
20 MHz	Opposite Pol.	1779.3	V	111	59	8.61	1/3	13.20	21.81	0.152	30.00	-8.19

Table 7-2. EIRP Data (LTE Band 66/4)

Bandwidth	Mod.	Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Ant. Gain [dBi]	RB Size/Offset	Substitute Level [dBm]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
		704.0	Н	142	293	1.34	1/0	19.79	21.13	0.130	36.99	-15.86	18.98	0.079	34.77	-15.79
보	QPSK	707.5	Н	141	298	1.33	1/0	19.33	20.66	0.117	36.99	-16.33	18.51	0.071	34.77	-16.26
N		711.0	Н	142	297	1.33	1/0	18.65	19.98	0.099	36.99	-17.01	17.83	0.061	34.77	-16.95
10	16-QAM	704.0	Н	142	293	1.34	1/0	18.87	20.21	0.105	36.99	-16.78	18.06	0.064	34.77	-16.71
	64-QAM	704.0	Н	142	293	1.34	1/0	17.84	19.18	0.083	36.99	-17.81	17.03	0.050	34.77	-17.74
		701.5	Н	142	293	1.35	1 / 12	19.70	21.05	0.127	36.99	-15.94	18.90	0.078	34.77	-15.87
우	QPSK	707.5	Н	141	298	1.33	1 / 12	18.60	19.93	0.098	36.99	-17.06	17.78	0.060	34.77	-16.99
Ξ		713.5	Н	142	297	1.32	1 / 12	18.09	19.41	0.087	36.99	-17.58	17.26	0.053	34.77	-17.51
5	16-QAM	701.5	н	142	293	1.35	1 / 12	18.95	20.30	0.107	36.99	-16.69	18.15	0.065	34.77	-16.62
	64-QAM	701.5	Н	142	293	1.35	1 / 12	17.86	19.21	0.083	36.99	-17.78	17.06	0.051	34.77	-17.71
		700.5	Н	142	293	1.35	1/7	19.63	20.98	0.125	36.99	-16.01	18.83	0.076	34.77	-15.94
원	QPSK	707.5	н	141	298	1.33	1/7	19.73	21.06	0.128	36.99	-15.93	18.91	0.078	34.77	-15.86
Μ		714.5	Н	142	297	1.32	1/7	19.88	21.20	0.132	36.99	-15.79	19.05	0.080	34.77	-15.72
ŝ	16-QAM	714.5	Н	142	297	1.32	1/7	19.12	20.44	0.111	36.99	-16.55	18.29	0.067	34.77	-16.48
	64-QAM	714.5	Н	142	297	1.32	1/7	18.03	19.35	0.086	36.99	-17.64	17.20	0.052	34.77	-17.57
		699.7	Н	142	293	1.35	1/3	18.20	19.55	0.090	36.99	-17.44	17.40	0.055	34.77	-17.37
뙨	QPSK	707.5	Н	141	298	1.33	1/3	18.79	20.12	0.103	36.99	-16.87	17.97	0.063	34.77	-16.80
1.4 MI		715.3	Н	142	297	1.32	1/3	19.04	20.36	0.109	36.99	-16.63	18.21	0.066	34.77	-16.57
	16-QAM	715.3	Н	142	297	1.32	1/3	18.22	19.54	0.090	36.99	-17.45	17.39	0.055	34.77	-17.39
	64-QAM	715.3	Н	142	297	1.32	1/3	17.17	18.49	0.071	36.99	-18.50	16.34	0.043	34.77	-18.44
10 MHz	Opposite Pol.	714.5	V	142	322	1.32	1/7	18.79	20.11	0.103	36.99	-16.88	17.96	34.771	34.77	-16.81

Table 7-3. ERP Data (LTE Band 12)

Bandwidth	Mod.	Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Ant. Gain [dBi]	RB Size/Offset	Substitute Level [dBm]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
Ĥ	QPSK	782.0	V	146	319	1.17	1 / 25	19.73	20.90	0.123	36.99	-16.09	18.75	0.075	34.77	-16.02
2	16-QAM	782.0	V	146	319	1.17	1 / 25	19.01	20.18	0.104	36.99	-16.81	18.03	0.064	34.77	-16.74
10	64-QAM	782.0	V	146	319	1.17	1 / 25	17.89	19.06	0.081	36.99	-17.93	16.91	0.049	34.77	-17.86
	779.5	779.5	V	146	319	1.17	1 / 12	19.42	20.59	0.115	36.99	-16.40	18.44	0.070	34.77	-16.33
부	QPSK	782.0	V	146	319	1.17	1 / 12	19.61	20.78	0.120	36.99	-16.21	18.63	0.073	34.77	-16.14
μ		784.5	V	146	319	1.16	1 / 12	19.88	21.04	0.127	36.99	-15.95	18.89	0.078	34.77	-15.88
ŝ	16-QAM	784.5	V	146	319	1.16	1 / 12	19.26	20.42	0.110	36.99	-16.57	18.27	0.067	34.77	-16.50
	64-QAM	784.5	V	146	319	1.16	1 / 12	18.08	19.24	0.084	36.99	-17.75	17.09	0.051	34.77	-17.68
10 MHz	Opposite Pol.	784.5	Н	245	298	1.16	1 / 12	17.49	18.65	0.073	36.99	-18.34	16.50	0.045	34.77	-18.27

Table 7-4. ERP Data (LTE Band 13)

FCC ID: ZNFK420TM		PART 27 MEASUREMENT REPORT	🕒 LG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 100 of 120
1M2011180184-14.ZNF	12/1 – 1/8/2021	Portable Handset		Fage 109 01 129
© 2021 PCTEST				V/1 2 11///2020



Bandwidth	Mod.	Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Ant. Gain [dBi]	RB Size/Offset	Substitute Level [dBm]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]
		673.0	V	181	333	1.33	1 / 50	20.81	22.14	0.164	36.99	-14.85	19.99	0.100	34.77	-14.78
Hz	QPSK	680.5	V	179	322	1.33	1/0	20.58	21.91	0.155	36.99	-15.07	19.76	0.095	34.77	-15.01
W		688.0	V	173	331	1.34	1/0	20.17	21.51	0.142	36.99	-15.48	19.36	0.086	34.77	-15.41
20	16-QAM	673.0	V	181	333	1.33	1 / 50	19.96	21.29	0.135	36.99	-15.70	19.14	0.082	34.77	-15.63
	64-QAM	673.0	V	181	333	1.33	1 / 50	18.98	20.31	0.107	36.99	-16.68	18.16	0.065	34.77	-16.61
		670.5	V	181	333	1.33	1 / 37	20.89	22.22	0.167	36.99	-14.77	20.07	0.102	34.77	-14.70
재	QPSK	680.5	V	179	322	1.33	1/0	20.51	21.84	0.153	36.99	-15.14	19.69	0.093	34.77	-15.08
M		690.5	V	173	331	1.34	1/0	20.04	21.38	0.138	36.99	-15.61	19.23	0.084	34.77	-15.54
15	16-QAM	670.5	V	181	333	1.33	1 / 37	20.13	21.46	0.140	36.99	-15.53	19.31	0.085	34.77	-15.46
	64-QAM	670.5	V	181	333	1.33	1/37	19.01	20.34	0.108	36.99	-16.65	18.19	0.066	34.77	-16.58
		668.0	V	181	333	1.32	1 / 25	20.64	21.96	0.157	36.99	-15.03	19.81	0.096	34.77	-14.96
재	QPSK	680.5	V	179	322	1.33	1 / 25	20.27	21.60	0.145	36.99	-15.38	19.45	0.088	34.77	-15.32
M		693.0	V	173	331	1.35	1 / 25	19.84	21.19	0.131	36.99	-15.80	19.04	0.080	34.77	-15.74
10	16-QAM	668.0	V	181	333	1.32	1 / 25	19.96	21.28	0.134	36.99	-15.71	19.13	0.082	34.77	-15.64
	64-QAM	668.0	V	181	333	1.32	1 / 25	18.91	20.23	0.106	36.99	-16.76	18.08	0.064	34.77	-16.69
		665.5	V	181	333	1.32	1 / 12	20.40	21.72	0.149	36.99	-15.27	19.57	0.091	34.77	-15.20
주	QPSK	680.5	V	179	322	1.33	1 / 12	20.46	21.79	0.151	36.99	-15.19	19.64	0.092	34.77	-15.13
5 MH		695.5	V	173	331	1.35	1 / 12	19.62	20.97	0.125	36.99	-16.02	18.82	0.076	34.77	-15.95
	16-QAM	665.5	V	181	333	1.32	1 / 12	19.68	21.00	0.126	36.99	-15.99	18.85	0.077	34.77	-15.92
	64-QAM	680.5	V	179	322	1.33	1 / 12	18.62	19.95	0.099	36.99	-17.03	17.80	0.060	34.77	-16.97
20 MHz	Opposite Pol.	670.5	Н	262	3	1.33	1/37	19.71	21.04	0.127	36.99	-15.95	18.89	0.077	34.77	-15.88

Table 7-5. ERP Data (LTE Band 71)

Frequency [MHz]	Mode	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1712.40	WCDMA1700	Н	182	10	15.27	9.46	24.73	0.297	30.00	-5.27
1732.60	WCDMA1700	Н	142	22	15.37	9.34	24.71	0.296	30.00	-5.29
1752.60	WCDMA1700	Н	128	23	15.39	9.24	24.63	0.290	30.00	-5.37
1712.40	WCDMA1700	V	137	51	13.06	9.46	22.52	0.179	30.00	-7.48

Table 7-6. EIRP Data (WCDMA AWS)

FCC ID: ZNFK420TM	POINTEST* Proud to be part of @ element	PART 27 MEASUREMENT REPORT	🕑 LG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Domo 110 of 120
1M2011180184-14.ZNF	12/1 – 1/8/2021	Portable Handset		Page 110 01 129
© 2021 PCTEST	•	·		V1.2 11/4/2020



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 horizontally and vertically 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 average RMS measurements while the EUT is operating at maximum power, and at the appropriate frequencies.

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 $\geq 2 \times \text{span} / \text{RBW}$
- 5. Detector = RMS
- 6. Trace mode = Average (Max Hold for pulsed emissions)
- 7. The trace was allowed to stabilize

FCC ID: ZNFK420TM		PART 27 MEASUREMENT REPORT	🕒 LG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 111 of 120
1M2011180184-14.ZNF	12/1 – 1/8/2021	Portable Handset		Page 111 01 129
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Test Setup



Figure 7-7. Test Instrument & Measurement Setup

Test Notes

- 1) Field strengths are calculated using the Measurement quantity conversions in KDB 971168 Section 5.8.4.
 - a) $E(dB\mu V/m) = Measured amplitude level (dBm) + 107 + Cable Loss (dB) + Antenna Factor (dB/m)$
 - b) EIRP (dBm) = E(dB μ V/m) + 20logD 104.8; where D is the measurement distance in meters.
- 2) 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.
- 3) This device employs UMTS technology with WCDMA (AMR/RMC) and HSDPA capabilities. The EUT was tested under all configurations and the highest power is reported in WCDMA mode with HSDPA Inactive at 12.2 kbps RMC and TPC bits all set to "1".
- 4) This unit was tested with its standard battery.
- 5) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case setup is reported in the tables below.
- 6) The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter. The worst-case emissions are reported.
- 7) 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.
- 8) The "-" shown in the following RSE tables are used to denote a noise floor measurement.

LTE Band 66/4

FCC ID: ZNFK420TM		PART 27 MEASUREMENT REPORT	🕒 LG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 112 of 120
1M2011180184-14.ZNF	12/1 - 1/8/2021	Portable Handset		Fage 112 01 129
© 2021 PCTEST				V1.2 11/4/2020







Bandwidth (MHz):	20
Frequency (MHz):	1720.0
RB / Offset:	1/0

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3440.0	Н	101	44	-70.91	-1.03	35.06	-60.20	-13.00	-47.20
5160.0	Н	109	29	-69.07	2.28	40.21	-55.05	-13.00	-42.05
6880.0	Н	-	-	-79.31	7.00	34.69	-60.57	-13.00	-47.57
8600.0	Н	-	-	-80.61	9.70	36.09	-59.17	-13.00	-46.17
10320.0	Н	-	-	-82.07	13.17	38.10	-57.16	-13.00	-44.16

Table 7-7. Radiated Spurious Data (LTE Band 66/4 – Low Channel)

Bandwidth (MHz):	20
Frequency (MHz):	1745.0
RB / Offset:	1/0

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3490.0	Н	100	16	-71.04	-1.11	34.85	-60.41	-13.00	-47.41
5235.0	Н	110	26	-66.02	2.60	43.58	-51.68	-13.00	-38.68
6980.0	Н	-	-	-79.64	7.29	34.65	-60.61	-13.00	-47.61
8725.0	Н	-	-	-80.54	10.20	36.66	-58.59	-13.00	-45.59
10470.0	Н	-	-	-81.77	12.73	37.96	-57.30	-13.00	-44.30

Table 7-8. Radiated Spurious Data (LTE Band 66/4 – Mid Channel)

FCC ID: ZNFK420TM		PART 27 MEASUREMENT REPORT	🕒 LG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dogo 112 of 120	
1M2011180184-14.ZNF 12/1 – 1/8/2021 Portable Handset		Portable Handset		Fage 113 01 129	
© 2021 PCTEST				\/1.2.11/4/2020	



Bandwidth (MHz):	20
Frequency (MHz):	1770.0
RB / Offset:	1/0

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3540.00	Н	103	18	-67.05	-0.54	39.41	-55.85	-13.00	-42.85
5310.00	Н	101	25	-67.29	3.54	43.25	-52.01	-13.00	-39.01
7080.00	Н	-	-	-79.61	7.49	34.88	-60.38	-13.00	-47.38
8850.00	Н	-	-	-81.00	10.33	36.33	-58.93	-13.00	-45.93
10620.00	Н	-	-	-81.57	13.62	39.05	-56.21	-13.00	-43.21

Table 7-9. Radiated Spurious Data (LTE Band 66/4 – High Channel)

FCC ID: ZNFK420TM	Point of the second sec	PART 27 MEASUREMENT REPORT	🕒 LG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 114 of 120
1M2011180184-14.ZNF 12/1 – 1/8/2021 Portable Handset		Portable Handset		Page 114 01 129
© 2021 PCTEST				V1.2 11/4/2020



LTE Band 12



Plot 7-173. Radiated Spurious Plot (LTE Band 12)

Bandwidth (MHz):	3	3							
Frequency (MHz):	70	0.5							
RB / Offset:	1 /	14							
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1401.0	Н	359	155	-72.76	-8.14	26.10	-69.16	-13.00	-56.16
2101.5	Н	345	165	-58.56	-4.93	43.51	-51.75	-13.00	-38.75
2802.0	Н	-	-	-76.78	-2.51	27.71	-67.55	-13.00	-54.55
3502.5	Н	-	-	-76.26	-1.06	29.68	-65.58	-13.00	-52.58
4203.0	Н	-	-	-76.82	0.77	30.95	-64.31	-13.00	-51.31

Table 7-10. Radiated Spurious Data (LTE Band 12 – Low Channel)

Bandwidth (MHz):	3
Frequency (MHz):	707.5
RB / Offset:	1 / 14

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1415.0	Н	339	154	-72.28	-8.10	26.62	-68.64	-13.00	-55.64
2122.5	Н	332	158	-55.44	-5.00	46.56	-48.70	-13.00	-35.70
2830.0	Н	-	-	-76.07	-2.59	28.34	-66.92	-13.00	-53.92
3537.5	Н	-	-	-76.57	-0.99	29.44	-65.81	-13.00	-52.81
4245.0	Н	-	-	-76.91	0.55	30.64	-64.62	-13.00	-51.62

Table 7-11. Radiated Spurious Data (LTE Band 12 – Mid Channel)

FCC ID: ZNFK420TM		PART 27 MEASUREMENT REPORT	🕒 LG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dogo 115 of 120	
1M2011180184-14.ZNF	12/1 - 1/8/2021	Portable Handset		Page 115 01 129	
© 2021 PCTEST		·		V1.2 11/4/2020	



Bandwidth (MHz):	3
Frequency (MHz):	714.5
RB / Offset:	1 / 14

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1429.0	Н	360	182	-73.38	-8.11	25.51	-69.75	-13.00	-56.75
2143.5	Н	374	167	-57.94	-5.17	43.89	-51.37	-13.00	-38.37
2858.0	Н	-	-	-75.74	-2.68	28.58	-66.68	-13.00	-53.68
3572.5	Н	-	-	-76.32	-0.43	30.25	-65.01	-13.00	-52.01
4287.0	Н	-	-	-76.50	0.67	31.17	-64.09	-13.00	-51.09

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

FCC ID: ZNFK420TM		PART 27 MEASUREMENT REPORT	🕒 LG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 116 of 120
1M2011180184-14.ZNF 12/1 – 1/8/2021		Portable Handset	Page 116 01 129	
© 2021 PCTEST				V1.2 11/4/2020



LTE Band 13



Plot 7-174. Radiated Spurious Plot (LTE Band 13)

Bandwidth (MHz):	5
Frequency (MHz):	779.5
RB / Offset:	1 / 12

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1559.0	Н	364	195	-73.51	-7.51	25.98	-69.28	-40.00	-29.28
2338.5	Н	101	0	-53.01	-3.99	50.00	-45.26	-13.00	-32.26
3118.0	Н	-	-	-76.81	-2.17	28.02	-67.24	-13.00	-54.24
3897.5	Н	309	9	-74.73	0.52	32.79	-62.47	-13.00	-49.47
4677.0	Н	-	-	-77.33	1.20	30.87	-64.39	-13.00	-51.39
5456.5	Н	-	-	-77.80	3.46	32.66	-62.59	-13.00	-49.59
6236.0	Н	-	-	-79.38	5.79	33.41	-61.85	-13.00	-48.85

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

Bandwidth (MHz):	5
Frequency (MHz):	782.0
RB / Offset:	1 / 12

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1564.0	Н	354	187	-72.34	-7.48	27.18	-68.08	-40.00	-28.08
2346.0	Н	101	1	-54.36	-3.93	48.71	-46.55	-13.00	-33.55
3128.0	Н	-	-	-77.01	-2.13	27.86	-67.40	-13.00	-54.40
3910.0	Н	312	8	-73.25	0.72	34.47	-60.78	-13.00	-47.78
4692.0	Н	-	-	-77.25	1.13	30.88	-64.38	-13.00	-51.38
5474.0	Н	-	-	-78.19	3.54	32.35	-62.91	-13.00	-49.91
6256.0	Н	-	-	-79.16	5.70	33.54	-61.72	-13.00	-48.72

Table 7-14. Radiated Spurious Data (LTE Band 13 – Mid Channel)

FCC ID: ZNFK420TM		PART 27 MEASUREMENT REPORT	🕑 LG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 117 of 120
1M2011180184-14.ZNF	12/1 – 1/8/2021	Portable Handset		Fage 117 01 129
© 2021 PCTEST				\/1 2 11///2020



Bandwidth (MHz):	5
Frequency (MHz):	784.5
RB / Offset:	1 / 12
Bandwidth (MHz): Frequency (MHz): RB / Offset:	5 784.5 1 / 12

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1569.0	Н	368	198	-72.40	-7.47	27.13	-68.12	-40.00	-28.12
2353.5	Н	100	355	-52.03	-3.86	51.11	-44.14	-13.00	-31.14
3138.0	Н	-	-	-76.87	-2.04	28.09	-67.17	-13.00	-54.17
3922.5	Н	311	5	-72.51	0.90	35.39	-59.87	-13.00	-46.87
4707.0	Н	-	-	-77.16	1.10	30.94	-64.32	-13.00	-51.32
5491.5	Н	-	-	-78.32	3.92	32.60	-62.65	-13.00	-49.65
6276.0	Н	-	-	-79.16	5.36	33.20	-62.06	-13.00	-49.06

Table 7-15. Radiated Spurious Data (LTE Band 13 – High Channel)

FCC ID: ZNFK420TM		PART 27 MEASUREMENT REPORT	🕒 LG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dogo 119 of 120	
1M2011180184-14.ZNF	12/1 – 1/8/2021 Portable Handset			Page 118 of 129	
© 2021 PCTEST	•	·		V1.2 11/4/2020	



LTE Band 71



Plot 7-175. Radiated Spurious Plot (LTE Band 71)

15
670.5
1 / 74

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1341.0	V	119	164	-71.58	-8.70	26.72	-68.53	-13.00	-55.53
2011.5	V	103	154	-62.60	-5.49	38.91	-56.35	-13.00	-43.35
2682.0	V	-	-	-76.28	-3.00	27.72	-67.54	-13.00	-54.54
3352.5	V	-	-	-76.65	-1.26	29.09	-66.17	-13.00	-53.17
4023.0	V	-	-	-76.81	1.69	31.88	-63.38	-13.00	-50.38

Table 7-16. Radiated Spurious Data (LTE Band 71 – Low Channel)

Bandwidth (MHz):	15
Frequency (MHz):	680.5
RB / Offset:	1/74

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1361.0	V	101	164	-72.64	-8.57	25.79	-69.47	-13.00	-56.47
2041.5	V	108	160	-58.30	-5.24	43.46	-51.80	-13.00	-38.80
2722.0	V	-	-	-76.38	-2.81	27.81	-67.45	-13.00	-54.45
3402.5	V	-	-	-76.65	-1.10	29.25	-66.01	-13.00	-53.01
4083.0	V	-	-	-77.00	1.49	31.49	-63.77	-13.00	-50.77

Table 7-17. Radiated Spurious Data (LTE Band 71 – Mid Channel)

FCC ID: ZNFK420TM	PCTEST [*]	PART 27 MEASUREMENT REPORT	🕒 LG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 110 of 120
1M2011180184-14.ZNF	12/1 - 1/8/2021	Portable Handset		Fage 119 01 129
© 2021 PCTEST				V1.2 11/4/2020



Bandwidth (MHz):	15
Frequency (MHz):	690.5
RB / Offset:	1 / 74

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
1381.0	V	144	174	-71.05	-8.35	27.60	-67.66	-13.00	-54.66
2071.5	V	133	159	-59.86	-4.99	42.15	-53.11	-13.00	-40.11
2762.0	V	-	-	-76.30	-2.62	28.08	-67.17	-13.00	-54.17
3452.5	V	-	-	-77.12	-1.03	28.85	-66.40	-13.00	-53.40
4143.0	V	-	-	-77.14	1.07	30.93	-64.32	-13.00	-51.32

Table 7-18. Radiated Spurious Data (LTE Band 71 – High Channel)

FCC ID: ZNFK420TM		PART 27 MEASUREMENT REPORT	🕑 LG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dage 120 of 120	
1M2011180184-14.ZNF	12/1 - 1/8/2021	Portable Handset		Page 120 01 129	
© 2021 PCTEST				V1 2 11/4/2020	



WCDMA AWS



Plot 7-176. Radiated Spurious Plot (WCDMA AWS)

Mode:	WCDMA RMC
Channel:	1312
Frequency (MHz):	1712.4

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3424.8	Н	100	6	-73.34	-1.19	32.47	-62.79	-13.00	-49.79
5137.2	Н	100	129	-69.59	2.45	39.86	-55.40	-13.00	-42.40
6849.6	Н	-	-	-78.97	6.73	34.76	-60.50	-13.00	-47.50
8562.0	Н	-	-	-79.85	9.55	36.70	-58.56	-13.00	-45.56

7-19. Radiated Spurious Data (WCDMA AWS – Low Channel)

Mode:	WCDMA RMC
Channel:	1413
Frequency (MHz):	1732.6

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3465.2	Н	101	112	-73.80	-1.09	32.11	-63.15	-13.00	-50.15
5197.8	Н	100	126	-70.03	2.34	39.31	-55.95	-13.00	-42.95
6930.4	Н	-	-	-78.93	7.05	35.12	-60.14	-13.00	-47.14
8663.0	Н	-	-	-80.17	10.04	36.87	-58.39	-13.00	-45.39
10395.6	Н	-	-	-81.61	13.04	38.43	-56.83	-13.00	-43.83

Table 7-20. Radiated Spurious Data (WCDMA AWS – Mid Channel)

FCC ID: ZNFK420TM	Poud to be part of @element	PART 27 MEASUREMENT REPORT	🕑 LG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 101 of 100
1M2011180184-14.ZNF	12/1 - 1/8/2021	Portable Handset		Page 121 01 129
© 2021 PCTEST		•		V1.2 11/4/2020



Mode:	WCDMA RMC
Channel:	1513
Frequency (MHz):	1752.6

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBµV/m]	EIRP Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
3505.2	Н	128	113	-75.04	-0.78	31.18	-64.08	-13.00	-51.08
5257.8	Н	116	127	-70.40	2.74	39.34	-55.92	-13.00	-42.92
7010.4	Н	-	-	-79.01	7.08	35.07	-60.18	-13.00	-47.18
8763.0	Н	-	-	-80.48	10.50	37.02	-58.24	-13.00	-45.24
10515.6	Н	-	-	-81.49	12.68	38.19	-57.07	-13.00	-44.07

Table 7-21. Radiated Spurious Data (WCDMA AWS – High Channel)

	CTEST			Approved by:	
FCC ID: ZNI R4201M	Proud to be part of @ element			Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dogo 122 of 120	
1M2011180184-14.ZNF	12/1 - 1/8/2021	Portable Handset		Page 122 0f 129	
© 2021 PCTEST				V1.2 11/4/2020	



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.

For 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-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

FCC ID: ZNFK420TM		PART 27 MEASUREMENT REPORT	LG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dogo 122 of 120	
1M2011180184-14.ZNF	12/1 - 1/8/2021	ortable Handset		Page 123 of 129	
© 2021 PCTEST	•			V1.2 11/4/2020	



LTE Band 66/4						
	Operating	Frequency (Hz):	1,745,0	00,000		
	Ref	Voltage (VDC):	4.4	40		
Voltage (%)	Power (VDC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)	
		- 30	1,745,000,073	121	0.0000069	
		- 20	1,745,000,110	158	0.0000091	
	4.40	- 10	1,744,999,965	13	0.0000007	
		0	1,744,999,943	-9	-0.0000005	
100 %		+ 10	1,745,000,196	244	0.0000140	
		+ 20 (Ref)	1,744,999,952	0	0.0000000	
		+ 30	1,745,000,192	240	0.0000138	
		+ 40	1,745,000,086	134	0.0000077	
		+ 50	1,744,999,962	10	0.0000006	
Battery Endpoint	2.50	+ 20	1,745,000,002	50	0.0000029	

Table 7-22. LTE Band 66/4 Frequency Stability Data





FCC ID: ZNFK420TM		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dogo 124 of 120
1M2011180184-14.ZNF	12/1 - 1/8/2021	Portable Handset	Fage 124 01 129
© 2021 PCTEST	•	·	V1.2 11/4/2020



LTE Band 12						
	Operating	Frequency (Hz):	707,50	00,000		
	Ref	Voltage (VDC):	4.4	40		
Voltage (%)	Power (VDC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)	
	4.40	- 30	707,500,263	76	0.0000107	
		- 20	707,499,925	-262	-0.0000370	
		- 10	707,499,915	-272	-0.0000384	
		0	707,499,942	-245	-0.0000346	
100 %		+ 10	707,500,236	49	0.0000069	
		+ 20 (Ref)	707,500,187	0	0.0000000	
		+ 30	707,499,997	-190	-0.0000269	
		+ 40	707,500,352	165	0.0000233	
		+ 50	707,499,899	-288	-0.0000407	
Battery Endpoint	2.50	+ 20	707,499,756	-431	-0.0000609	

Table 7-23. LTE Band 12 Frequency Stability Data





FCC ID: ZNFK420TM		PART 27 MEASUREMENT REPORT	🕒 LG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 125 of 120
1M2011180184-14.ZNF	12/1 – 1/8/2021	Portable Handset		Page 125 01 129
© 2021 PCTEST	•	·		V1.2 11/4/2020



LTE Band 13						
	Operating	Frequency (Hz):	782,0	00,000		
	Ref	Voltage (VDC):	4.	40]	
Voltage (%)	Power (VDC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)	
	4.40	- 30	782,000,463	593	0.0000758	
		- 20	781,999,915	45	0.0000058	
		- 10	781,999,693	-177	-0.0000226	
		0	782,000,072	202	0.0000258	
100 %		+ 10	781,999,971	101	0.0000129	
		+ 20 (Ref)	781,999,870	0	0.0000000	
		+ 30	781,999,930	60	0.0000077	
		+ 40	781,999,839	-31	-0.0000040	
		+ 50	781,999,980	110	0.0000141	
Battery Endpoint	2.50	+ 20	782,000,055	185	0.0000237	

Table 7-24. LTE Band 13 Frequency Stability Data



Plot 7-179. LTE Band 13 Frequency Stability Chart Frequency Stability / Temperature Variation

FCC ID: ZNFK420TM		PART 27 MEASUREMENT REPORT	🕒 LG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 126 of 120
1M2011180184-14.ZNF	12/1 – 1/8/2021	Portable Handset		Page 126 01 129
© 2021 PCTEST		·		V1.2 11/4/2020



LTE Band 71						
	Operating F	Frequency (Hz):	680,50	00,000	Ī	
	Ref.	Voltage (VDC):	4.	40		
					-	
Voltage (%)	Power (VDC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)	
		- 30	680,500,006	92	0.0000135	
		- 20	680,500,073	159	0.0000234	
		- 10	680,499,941	27	0.0000040	
		0	680,499,720	-194	-0.0000285	
100 %	4.40	+ 10	680,500,197	283	0.0000416	
		+ 20 (Ref)	680,499,914	0	0.0000000	
		+ 30	680,500,175	261	0.0000384	
		+ 40	680,499,713	-201	-0.0000295	
		+ 50	680,499,908	-6	-0.0000009	
Battery Endpoint	2.50	+ 20	680,500,171	257	0.0000378	

Table 7-25. LTE Band 71 Frequency Stability Data



Plot 7-180. LTE Band 71 Frequency Stability Chart

FCC ID: ZNFK420TM	PCTEST [®] Proud to be part of [®] element	PART 27 MEASUREMENT REPORT	🕑 LG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 127 of 120
1M2011180184-14.ZNF	12/1 - 1/8/2021	Portable Handset		Page 127 01 129
© 2021 PCTEST				V1.2 11/4/2020



WCDMA AWS						
	Operating	Frequency (Hz):	1,732,6	600,000		
	Ref	Voltage (VDC):	4.4	40		
Voltage (%)	Power (VDC)	Temp (°C)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)	
	4.40	- 30	1,732,599,865	-343	-0.0000198	
		- 20	1,732,599,847	-361	-0.0000208	
		- 10	1,732,599,998	-210	-0.0000121	
		0	1,732,600,412	204	0.0000118	
100 %		+ 10	1,732,599,837	-371	-0.0000214	
		+ 20 (Ref)	1,732,600,208	0	0.0000000	
		+ 30	1,732,600,270	62	0.0000036	
		+ 40	1,732,599,992	-216	-0.0000125	
		+ 50	1,732,600,365	157	0.0000091	
Battery Endpoint	2.50	+ 20	1,732,600,094	-114	-0.0000066	

Table 7-26. WCDMA AWS Frequency Stability Data





FCC ID: ZNFK420TM	Pottest	PART 27 MEASUREMENT REPORT	🕒 LG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dama 400 at 400
1M2011180184-14.ZNF	12/1 - 1/8/2021	Portable Handset		Page 128 01 129
© 2021 PCTEST		•		V1.2 11/4/2020



8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the LG Portable Handset FCC ID: ZNFK420TM complies with all the requirements of Part 27 of the FCC rules.

FCC ID: ZNFK420TM		PART 27 MEASUREMENT REPORT	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dogo 120 of 120
1M2011180184-14.ZNF	12/1 - 1/8/2021	Portable Handset	Fage 129 01 129
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