

🔤 Keysight Sp	ectrum Analyzer - S	wept SA									
LXI RL	RF 50	Ω AC	CORREC	SEN	ISE:INT SOUR	CE OFF #Avg Typ	ALIGN AUTO	08:11:36 PM TRAC	E 1 2 3 4 5 6	F	requency
10 dB/div	Ref 25.00	NFE dBm	PNO: Wide 😱 IFGain:Low	Atten: 36	dB		Mkr	1 1.910 0 -25.4	08 GHz 41 dBm		Auto Tune
15.0										1.91	Center Freq 0000000 GHz
-5.00		~~~~~		\sim						1.90	Start Freq 6000000 GHz
-15.0				- to	1				UL1 -13.00 dBm	1.91	Stop Freq 4000000 GHz
-35.0					~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~			······		<u>Auto</u>	CF Step 800.000 kHz Man
-55.0											Freq Offset 0 Hz
-65.0										1.00	Scale Type
Center 1. #Res BW	910000 GHz 120 kHz	2	#VBM	430 kHz			Sween	Span 8	.000 MHz 1001 pts)	Log	Lin
MSG			<i></i>	TOUTNIL			STATU	JS	roor pts)		

Plot 7-264. Upper Band Edge Plot (Band 2 - 10.0MHz QPSK - Full RB Configuration)



Plot 7-265. Upper Extended Band Edge Plot (Band 2 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFQ620WA		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dage 157 of 244	
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🦲 Keysight Spe	ectrum Analyzer - Sv	vept SA									
(XI RL	RF 50 S	AC	CORREC	SEN	ISE:INT SOUP	#Avg Ty	ALIGN AUTO	07:04:02 P	M Sep 26, 2019 E 1 2 3 4 5 6	Fr	requency
10 dB/div	Ref 25.00	NFE dBm	PNO: Wide IFGain:Low	Atten: 36	dB		Mkr	1 1.915 (-22.	00 GHz 63 dBm		Auto Tune
15.0										(1.91	Center Freq 5000000 GHz
-5.00		,							DL1 -13.00 dBm	1.91	Start Freq 1000000 GHz
-15.0				h	1					1.91	Stop Freq 9000000 GHz
-35.0										<u>Auto</u>	CF Step 800.000 kHz Man
-55.0											Freq Offset 0 Hz
-65.0										Log	Scale Type
#Res BW	915000 GHz 120 kHz		#VBW	430 kHz			Sweep	Span 8 1.000 ms	.000 MHz (1001 pts)	Log	<u></u>
MSG							STAT	TUS			

Plot 7-266. Upper Band Edge Plot (Band 25 - 10.0MHz QPSK - Full RB Configuration)



Plot 7-267. Upper Extended Band Edge Plot (Band 25 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFQ620WA		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dega 159 of 244	
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🔤 Keysight Sp	ectrum Analyzer - Swep	t SA							
(XI RL	RF 50 Ω	AC CORREC	Triat	SENSE:INT SOU	RCE OFF #Avg Typ	ALIGN AUTO e: RMS	07:23:46 PM Sep 2 TRACE 1 2	6,2019 3 4 5 6	Frequency
10 dB/div	N Ref 25.00 dE	FE PNO: W IFGain: 3m	ide 🎧 mg. .ow Atter	h: 36 dB		Mkr	1 1.850 000 -18.40 c	GHz dBm	Auto Tune
15.0									Center Freq 1.850000000 GHz
-5.00						<u>)))////////////////////////////////</u>	DI 1 -13	3 00 dBm	Start Freq 1.844000000 GHz
-15.0	nong and ange and		mann						Stop Freq 1.856000000 GHz
-35.0								Au	CF Step 1.200000 MHz <u>uto</u> Man
-55.0									Freq Offset 0 Hz
Center 1.	850000 GHz						Span 12.00	MHz La	Scale Type
#Res BW	180 kHz		#VBW 620 k	Hz		Sweep	1.000 ms (1001	1 pts)	
MSG						STAT	s		

Plot 7-268. Lower Band Edge Plot (Band 25/2 - 15.0MHz QPSK - Full RB Configuration)



Plot 7-269. Lower Extended Band Edge Plot (Band 25/2 - 15.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFQ620WA		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dage 150 of 244	
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🔤 Keysight Spe	ectrum Analyzer - Swept	t SA					- 6 ×
LXI RL	RF 50 Ω	AC CORREC	SENSE:INT	SOURCE OFF A	ERMS	08:16:31 PM Sep 26, 2019 TRACE 1 2 3 4 5 6	Frequency
10 dB/div	Ref 25.00 dB	FE PNO: Wide G IFGain:Low	Atten: 36 dB		Mkr	1 1.910 036 GHz -21.79 dBm	Auto Tune
15.0							Center Freq 1.910000000 GHz
-5.00	<u>,</u>	www.corry.corry.corry.corry.corry.corry.corry.corry.corry.corry.corry.corry.corry.corry.corry.corry.corry.corry					Start Freq 1.904000000 GHz
-15.0			hand 1		~~~~~	UL1 -13.00 dbm	Stop Freq 1.916000000 GHz
-35.0							CF Step 1.200000 MHz <u>Auto</u> Man
-55.0							Freq Offset 0 Hz
-65.0							Scale Type
Center 1.9 #Res BW	910000 GHz	#\/B\/	620 kHz	9	Sween	Span 12.00 MHz 1 000 ms (1001 pts)	
MSG	103 1112	<i>"</i> , , D,			STATU	is	

Plot 7-270. Upper Band Edge Plot (Band 2 - 15.0MHz QPSK - Full RB Configuration)



Plot 7-271. Upper Extended Band Edge Plot (Band 2 - 15.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFQ620WA		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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🦲 Keysight Spe	ectrum Analyzer - S	wept SA									
LXU RL	RF 50	Ω AC	CORREC	SEN	ISE:INT SOU	RCE OFF #Avg Typ	ALIGN AUTO	07:25:25 P	M Sep 26, 2019 CE 1 2 3 4 5 6	Fi	requency
10 dB/div	Ref 25.00	NFE dBm	PNO: Wide 😱 IFGain:Low	Atten: 36	dB		Mkr	-1 1.915 (-21.	000 GHz 17 dBm		Auto Tune
15.0										(1.91	Center Freq 5000000 GHz
-5.00	1 m		man and a start and a start a s						DL1 -13.00 dBm	1.90	Start Freq 9000000 GHz
-15.0				h	1	Varra Martin		ngna ngnagaa		1.92	Stop Freq 1000000 GHz
-35.0										, <u>Auto</u>	CF Step I.200000 MHz Man
-55.0											Freq Offset 0 Hz
-65.0											Scale Type
Center 1. #Res BW	915000 GHz 180 kHz	Z	#VBW	620 kHz			Sweep	Span 1 1.000 ms	2.00 MHz (1001 pts)	Log	Lin
MSG				020 M12			STAT	rus	neor proj		

Plot 7-272. Upper Band Edge Plot (Band 25 - 15.0MHz QPSK - Full RB Configuration)



Plot 7-273. Upper Extended Band Edge Plot (Band 25 - 15.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFQ620WA		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dage 161 of 044	
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🔤 Keysight Sp	ectrum Analyzer - Swe	ept SA								
l,XI RL	RF 50 Ω	AC (CORREC	SENS	SE:INT SOUR	CE OFF	ALIGN AUTO	07:28:29 PM TRAC	Sep 26, 2019	Frequency
10 dB/div	Ref 25.00 d	NFE IBm	PNO: Wide 😱 IFGain:Low	Atten: 36	dB		Mkr	1 1.849 8 -20.1	56 GHz 9 dBm	Auto Tune
15.0										Center Freq 1.850000000 GHz
-5.00								<u>⇔⊴4≕Ъ∞ъйоль∞66∞</u>	01 -13 00 dBm	Start Freq 1.842000000 GHz
-15.0	whenter	and the state of t		mannen	1 کسرم					Stop Fred 1.858000000 GHz
-35.0										CF Step 1.600000 MHz <u>Auto</u> Man
-55.0										Freq Offsel 0 Hz
-65.0	850000 GHz							Snan 1	3 00 MHz	Scale Type
#Res BW	240 kHz		#VBW	820 kHz			Sweep	1.000 ms (1001 pts)	
MSG							STAT	US		

Plot 7-274. Lower Band Edge Plot (Band 25/2 - 20.0MHz QPSK - Full RB Configuration)



Plot 7-275. Lower Extended Band Edge Plot (Band 25/2 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFQ620WA		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dega 162 of 244	
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Image: Note of the set of the s	/
NEE PNO: Wide C Ing. Free Kun	
IFGain:Low Atten: 36 dB Der A Nummer 10 dB/div Ref 25.00 dBm -21.79 dBm	une
15.0 Center 1.910000000	F req GHz
5.00 Start 1 -5.00 Start 1 -5.00 Start 1 -5.00 Start 1	Freq GHz
-150 Stop I -250 Stop I 1.918000000	Freq GHz
-35.0 CF 9 1.600000 Auto	Step MHz Man
-55.0 Freq 0	f fset 0 Hz
Scale T	Гуре
Center 1.910000 GHz Span 16.00 MHz L ⁰⁹	Lin
wes Sweep 1.000 Ins (1001 pts)	

Plot 7-276. Upper Band Edge Plot (Band 2 - 20.0MHz QPSK - Full RB Configuration)



Plot 7-277. Upper Extended Band Edge Plot (Band 2 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFQ620WA		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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🦲 Keysight Spe	ectrum Analyzer - S	wept SA								
L <mark>XI</mark> RL	RF 50	Ω AC	CORREC	SEN	SE:INT SOUP	#Avg Typ	ALIGN AUTO	07:29:03 P TRA	M Sep 26, 2019 CE 1 2 3 4 5 6 PE A WWWW	Frequency
10 dB/div	Ref 25.00	dBm	IFGain:Low	Atten: 36	dB		Mki	1 1.915 (-22.)32 GHz 25 dBm	Auto Tune
15.0										Center Freq 1.915000000 GHz
-5.00	60., 60.44,		1						DL1 -13.00 dBm	Start Freq 1.907000000 GHz
-15.0				~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	1	M. Marin Jak	menter	~~		Stop Freq 1.923000000 GHz
-35.0									Jerry Market	CF Step 1.600000 MHz <u>Auto</u> Man
-55.0										Freq Offset 0 Hz
-66.U	015000 00									Scale Type
#Res BW	240 kHz		#VBW	820 kHz			Sweep	5pan 1.000 ms	(1001 pts)	
MSG							STAT	rus		

Plot 7-278. Upper Band Edge Plot (Band 25 - 20.0MHz QPSK - Full RB Configuration)



Plot 7-279. Upper Extended Band Edge Plot (Band 25 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFQ620WA		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Band 7



Plot 7-280. Lower ACP Plot (Band 7 - 5.0MHz QPSK - Full RB Configuration)



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M RL RF 50 Ω AC CORREC SENSE:HTI 11:02:04 PM Sep 18, 2019 Radio Std: None PASS IFGain:Low Free Run Radio Device: BTS Radio Device: BTS Radio Device: BTS 10 dB/div Ref 40.00 dBm										s	irious Emission	Analyzer - Spu	ght Spectrum	🔤 Keysi
10 dB/div Ref 40.00 dBm 20 0	requency		Sep 18, 2019 None ce: BTS	11:02:04 PM Radio Std: Radio Devi			0 GHz	se:INT eq: 2.535000 Run dB	Center F Trig: Fre #Atten: 2	Gain:Low	AC CO	F 50 Ω	R	PASS
300 200										1	0 dBm	Ref 40.00	div	10 dB/ Log F
100 100 <td>Center Freq 35000000 GHz</td> <th>2</th> <td></td> <td>30.0 — 20.0 —</td>	Center Freq 35000000 GHz	2												30.0 — 20.0 —
Spur Range Start Freq Stop Freq RBW Frequency Amplitude Δ Limit Δ <t< td=""><td></td><th></th><td></td><td></td><td></td><td>1</td><td>~4444400</td><td>an sign and the second</td><td></td><td></td><td></td><td></td><td></td><td>-10.0</td></t<>						1	~44 44400	an sign and the second						-10.0
40.0 50.0 2 2 2 40.0 50.0 60.					````` ***	l.								-20.0 -30.0
Start 2.475 GHz Stop 2.525 GHz 5.0 Spur Range Start Freq Stop Freq RBW Frequency Amplitude Δ Limit Δ 1 1 2.4750 GHz 2.4905 GHz 1.000 MHz 2.490396667 GHz -31.63 dBm -6.631 dB Δ			and the second										*****	-40.0 — -50.0 —
Spur Range Start Freq Stop Freq RBW Frequency Amplitude △ Limit 1 1 2.4750 GHz 2.4905 GHz 1.000 MHz 2.490396667 GHz -31.63 dBm -6.631 dB 2 2 2.4905 GHz 2.4960 GHz 1.000 MHz 2.492012500 GHz -23.92 dBm -10.92 dB 3 3 2.4960 GHz 2.4990 GHz 1.000 MHz 2.498750000 GHz -23.08 dBm -13.08 dB 4 4 2.4990 GHz 2.5000 GHz 180.0 kHz 2.499778333 GHz -26.02 dBm -16.02 dB 5 5 2.5000 GHz 2.40.0 kHz 2.5076666667 GHz 8.039 dBm -16.96 dB	CF Step 5.000000 MHz		525 GHz	Stop 2.								Hz	2.475 G	Start
1 2.4750 GHz 2.4905 GHz 1.000 MHz 2.490396667 GHz -31.63 GBm -6.631 dB 2 2 2.4905 GHz 2.4960 GHz 1.000 MHz 2.49012500 GHz -23.92 dBm -10.92 dB 3 3 2.4960 GHz 2.4900 GHz 2.492012500 GHz -23.08 dBm -10.92 dB 4 2.4990 GHz 2.4900 GHz 2.499750000 GHz -23.08 dBm -13.08 dB 5 5 2.5000 GHz 2.400 kHz 2.499778333 GHz -26.02 dBm -16.02 dB 5 5 2.5000 GHz 2.400 kHz 2.5076666667 GHz 8.039 dBm -16.96 dB	Widit	Aut		∆ Limit	•	plitud	Amp	equency	BW F	Freq R	Stop	Start Freq	Range	Spur
2 2 2.4905 GHz 2.4960 GHz 1.000 MHz 2.492012500 GHz -23.92 dBm -10.92 dB 3 3 2.4960 GHz 2.4990 GHz 1.000 MHz 2.498750000 GHz -23.08 dBm -13.08 dB 4 4 2.4990 GHz 2.5000 GHz 180.0 KHz 2.499978333 GHz -26.02 dBm -16.02 dB 5 5 2.5000 GHz 2.5250 GHz 240.0 KHz 2.5076666667 GHz 8.039 dBm -16.96 dB				-6.631 dB	n 📃	63 dE	z -31.6	90396667 0	000 MHz 2.	5 GHz 1.0	z 2.4905	2.4750 GH	1	1
3 2.4960 GHZ 2.4990 GHZ 1.000 MHZ 2.498750000 GHZ 12.08 dBm -13.08 dB 4 4 2.4990 GHZ 2.5000 GHZ 180.0 kHz 2.49978333 GHZ -26.02 dBm -16.02 dB 5 5 2.5000 GHZ 2.5250 GHZ 240.0 kHz 2.5076666667 GHz 8.039 dBm -16.96 dB	Freq Offset			-10.92 dB	1	J2 dB	z -23.9	92012500 0	000 MHz 2.4	JGHz 1.0	z 2.4960	2.4905 GH	2	2
4 4 2.4990 GHz 2.3000 GHz 1800 KHz 2.4999/8333 GHz -26.02 dBm -16.02 dB 5 5 2.5000 GHz 2.5250 GHz 240.0 kHz 2.5076666667 GHz 8.039 dBm -16.96 dB	0 Hz			-13.08 dB		18.GE	z -23.0	98750000 (000 MHz 2.4	GHZ 1.0	Z 2.4990	2.4960 GH	3	3
				-10.02 dB		0 dB	z -20.0	999765533 (07666667 (z 2.5000	2.4990 GH	4	5
				10.30 00	STATUS						2.0200			MSG





Plot 7-283. Upper ACP Plot (Band 7 - 10.0MHz QPSK - Full RB Configuration)

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🔤 Keys	ight Spectrun	n Analyzer - Spu	rious Emissio	ns							
DASS	S	RF 50 Ω	AC C	ORREC	Cento Trig: #Atte	SENSE:INT SOU er Freq: 13.255 Free Run pr: 26 dB	RCE OFF	ALIGN AUTC	09:15:42 Al Radio Std:	None	Frequency
10 dB	/div	Ref 40.00	0 dBm	-Gain:Lo	W	M. 20 GD					
30.0 20.0											Center Freq 13.255000000 GHz
0.00 -10.0						- Putricky	un haine an	**************************************	1		
-20.0 - -30.0 - -40.0 -	يىلىنى مىلىنى تىرىنى تىرىن تىرىنى تەرىپى تىرىنى		wight official		ni da internationali				hi Altratelege	n/Wengaathopiana	
Start	2.475 (GHz							Stop 2	.525 GHz	CF Step 2.649000000 GHz
Spur	Range	Start Freq	Stop	Freq	RBW	Frequency	Amp	litude	∆ Limit		<u>Auto</u> Man
1	1	2.4750 GH	z 2.490)5 GHz	1.000 MHz	2.490112500	GHz -26.7	2 dBm	-1.720 dB		
2	2	2.4905 GH	z 2.496	60 GHz	1.000 MHz	2.495990833	GHz -26.5	9 dBm	-13.59 dB		Frea Offset
3	3	2.4960 GH	z 2.499	0 GHz	1.000 MHz	2.498465000	GHz -25.0	4 dBm	-15.04 dB		0 Hz
4	4	2.4990 GH	Z 2.500	O GHZ	300.0 KHZ	2.499960000	GHZ -24.6	1 dBm	-14.61 dB		
		2.0000 011	2 2.020		240.0 1012	2.010010000	0112 0.000	, abiii	-15.00 dB		





Plot 7-285. Upper ACP Plot (Band 7 - 15.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFQ620WA		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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🔤 Keysig	ght Spectrun	n Analyzer - Spurio	us Emissions						- d -
PASS	F	¥F 50 Ω	AC CORREC	Cente Trig: I #Atter	SENSE:INT r Freq: 1.2525000 Free Run h: 26 dB	000 GHz	10:56:09 PM Radio Std: Radio Devie	Sep 18, 2019 None ce: BTS	Frequency
10 dB/	div	Ref 40.00	dBm						
30.0 20.0									Center Freq 1.252500000 GHz
-10.0					Jakitusipusierre	angi ang dagan dapat sa pad	Net retractor		
-20.0 — -30.0 —					•••				
-40.0	A CONTRACTOR OF THE OWNER								
Start	2.475 0	GHz					Stop 2.	525 GHz	CF Step 244.500000 MHz
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	∆ Limit		<u>Auto</u> Mari
1	1	2.4750 GHz	2.4905 GHz	1.000 MHz	2.488769167 G	Hz -30.14 dBm	-5.136 dB		
2	2	2.4905 GHz	2.4960 GHz	1.000 MHz	2.495715833 G	Hz -29.34 dBm	-16.34 dB		Freq Offset
3	3	2.4960 GHz	2.4990 GHz	1.000 MHz	2.497645000 G	Hz -27.46 dBm	-17.46 dB		0 Hz
4	4	2.4990 GHz	2.5000 GHz	360.0 kHz	2.499975000 G	Hz -26.62 dBm	-16.62 dB		0112
5		2.5000 GHZ	2.9250 GHZ	240.0 KHZ	2.515125000 G	172 4.229 dB M	-20.77 dB		
MSG						SI	4105		

Plot 7-286. Lower ACP Plot (Band 7 - 20.0MHz QPSK - Full RB Configuration)



Plot 7-287. Upper ACP Plot (Band 7 - 20.0MHz QPSK - Full RB Configuration)

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Plot 7-288. Lower ACP Plot (Band 41 (PC2) - 5.0MHz QPSK - Full RB Configuration)



Plot 7-289. Upper ACP Plot (Band 41 (PC2) - 5.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFQ620WA		MEASUREMENT REPORT (CERTIFICATION)	💽 LG	Approved by: Quality Manager
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Plot 7-290. Lower ACP Plot (Band 41 (PC2) - 10.0MHz QPSK - Full RB Configuration)



Plot 7-291. Upper ACP Plot (Band 41 (PC2) - 10.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFQ620WA		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Plot 7-292. Lower ACP Plot (Band 41 (PC2) - 15.0MHz QPSK - Full RB Configuration)



Plot 7-293. Upper ACP Plot (Band 41 (PC2) - 15.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFQ620WA		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Plot 7-294. Lower ACP Plot (Band 41 (PC2) - 20.0MHz QPSK - Full RB Configuration)



Plot 7-295. Upper ACP Plot (Band 41 (PC2) - 20.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFQ620WA		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Plot 7-296. Lower ACP Plot (Band 41 (PC3) - 5.0MHz QPSK - Full RB Configuration)



Plot 7-297. Upper ACP Plot (Band 41 (PC3) - 5.0MHz QPSK - Full RB Configuration)

FCC ID: ZNFQ620WA		MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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Plot 7-298. Lower ACP Plot (Band 41 (PC3) - 10.0MHz QPSK - Full RB Configuration)



Plot 7-299. Upper ACP Plot (Band 41 (PC3) - 10.0MHz QPSK - Full RB Configuration)

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Plot 7-300. Lower ACP Plot (Band 41 (PC3) - 15.0MHz QPSK - Full RB Configuration)



Plot 7-301. Upper ACP Plot (Band 41 (PC3) - 15.0MHz QPSK - Full RB Configuration)

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Plot 7-302. Lower ACP Plot (Band 41 (PC3) - 20.0MHz QPSK - Full RB Configuration)



Plot 7-303. Upper ACP Plot (Band 41 (PC3) - 20.0MHz QPSK - Full RB Configuration)

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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.

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Plot 7-307. PAR Plot (Band 66/4 - 3.0MHz QPSK - Full RB Configuration)

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Plot 7-309. PAR Plot (Band 66/4 - 3.0MHz 64-QAM - 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 \geq 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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	ST*											
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]
665.50	5	QPSK	н	150	312	1 / 24	14.23	2.90	14.98	0.031	34.77	-19.79
680.50	5	QPSK	н	141	310	1 / 24	14.29	3.20	15.34	0.034	34.77	-19.43
695.50	5	QPSK	н	140	308	1 / 24	14.84	3.30	15.99	0.040	34.77	-18.78
695.50	5	16-QAM	н	140	308	1 / 24	13.60	3.30	14.75	0.030	34.77	-20.02
695.50	5	64-QAM	н	140	308	1 / 24	12.65	3.30	13.80	0.024	34.77	-20.97
668.00	10	QPSK	н	311	112	1 / 49	13.79	2.90	14.54	0.028	34.77	-20.23
680.50	10	QPSK	н	296	123	1 / 49	14.12	3.20	15.17	0.033	34.77	-19.60
693.00	10	QPSK	н	304	126	1 / 49	14.61	3.30	15.76	0.038	34.77	-19.01
693.00	10	16-QAM	н	304	126	1 / 49	13.40	3.30	14.55	0.029	34.77	-20.22
693.00	10	64-QAM	н	304	126	1 / 49	12.54	3.30	13.69	0.023	34.77	-21.08
670.50	15	QPSK	н	148	116	1/0	14.19	3.00	15.04	0.032	34.77	-19.73
680.50	15	QPSK	н	147	116	1/0	14.75	3.20	15.80	0.038	34.77	-18.97
690.50	15	QPSK	н	143	117	1/0	14.17	3.30	15.32	0.034	34.77	-19.45
680.50	15	16-QAM	н	147	116	1 / 0	13.28	3.20	14.33	0.027	34.77	-20.44
680.50	15	64-QAM	н	147	116	1/0	12.25	3.20	13.30	0.021	34.77	-21.47
673.00	20	QPSK	н	100	112	1 / 99	13.99	3.10	14.94	0.031	34.77	-19.83
680.50	20	QPSK	н	100	107	1 / 99	14.47	3.20	15.52	0.036	34.77	-19.25
688.00	20	QPSK	н	100	113	1 / 99	13.99	3.30	15.14	0.033	34.77	-19.63
680.50	20	16-QAM	Н	100	107	1 / 99	13.96	3.20	15.01	0.032	34.77	-19.76
680.50	20	64-QAM	Н	100	107	1 / 99	12.08	3.20	13.13	0.021	34.77	-21.64
695.50	5	QPSK	V	111	74	1 / 24	13.01	4.20	15.06	0.032	34.77	-19.71

(c)

Table 7-3. ERP Data (Band 71)

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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]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
699.70	1.4	QPSK	V	171	22	1/5	14.23	4.50	16.58	0.045	34.77	-18.19	18.73	0.075	36.99	-18.26
707.50	1.4	QPSK	V	171	48	1/5	15.08	4.60	17.53	0.057	34.77	-17.24	19.68	0.093	36.99	-17.31
715.30	1.4	QPSK	V	166	50	1/5	15.07	4.63	17.55	0.057	34.77	-17.22	19.70	0.093	36.99	-17.29
715.30	1.4	16-QAM	V	166	50	1/5	13.89	4.63	16.37	0.043	34.77	-18.40	18.52	0.071	36.99	-18.47
715.30	1.4	64-QAM	V	166	50	1/5	13.04	4.63	15.52	0.036	34.77	-19.25	17.67	0.058	36.99	-19.32
700.50	3	QPSK	V	172	52	1 / 14	14.42	4.55	16.82	0.048	34.77	-17.95	18.97	0.079	36.99	-18.02
707.50	3	QPSK	V	174	51	1 / 14	15.22	4.60	17.67	0.058	34.77	-17.10	19.82	0.096	36.99	-17.17
714.50	3	QPSK	V	171	104	1 / 14	15.15	4.60	17.60	0.058	34.77	-17.17	19.75	0.094	36.99	-17.24
707.50	3	16-QAM	V	174	51	1 / 14	13.61	4.60	16.06	0.040	34.77	-18.71	18.21	0.066	36.99	-18.78
707.50	3	64-QAM	V	174	51	1 / 14	12.73	4.60	15.18	0.033	34.77	-19.59	17.33	0.054	36.99	-19.66

Table 7-4. ERP Data (Band 12)

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]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
701.50	5	QPSK	V	172	53	1 / 24	14.71	4.60	17.16	0.052	34.77	-17.61	19.31	0.085	36.99	-17.68
707.50	5	QPSK	V	174	56	1 / 24	15.22	4.60	17.67	0.058	34.77	-17.10	19.82	0.096	36.99	-17.17
713.50	5	QPSK	V	176	98	1 / 24	15.58	4.60	18.03	0.064	34.77	-16.74	20.18	0.104	36.99	-16.81
713.50	5	16-QAM	V	176	98	1 / 24	14.32	4.60	16.77	0.048	34.77	-18.00	18.92	0.078	36.99	-18.07
713.50	5	64-QAM	V	176	98	1 / 24	13.63	4.60	16.08	0.041	34.77	-18.69	18.23	0.067	36.99	-18.76
704.00	10	QPSK	V	102	91	1 / 49	15.02	4.50	17.37	0.055	34.77	-17.40	19.52	0.090	36.99	-17.47
707.50	10	QPSK	V	102	100	1 / 49	15.06	4.60	17.51	0.056	34.77	-17.26	19.66	0.092	36.99	-17.33
711.00	10	QPSK	V	100	77	1 / 49	15.27	4.60	17.72	0.059	34.77	-17.05	19.87	0.097	36.99	-17.12
711.00	10	16-QAM	V	100	77	1 / 49	13.94	4.60	16.39	0.044	34.77	-18.38	18.54	0.071	36.99	-18.45
711.00	10	64-QAM	V	100	77	1 / 49	13.03	4.60	15.48	0.035	34.77	-19.29	17.63	0.058	36.99	-19.36
713.50	5	QPSK	Н	198	102	1 / 24	15.71	3.20	16.76	0.047	34.77	-18.01	18.91	0.078	36.99	-18.08

Table 7-5. ERP Data (Band 12/17)

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]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
779.50	5	QPSK	V	167	107	1 / 24	13.88	5.70	17.43	0.055	34.77	-17.34	19.58	0.091	36.99	-17.41
782.00	5	QPSK	V	169	110	1 / 24	13.88	5.80	17.53	0.057	34.77	-17.24	19.68	0.093	36.99	-17.31
784.50	5	QPSK	V	168	117	1 / 24	13.76	5.80	17.41	0.055	34.77	-17.36	19.56	0.090	36.99	-17.43
782.00	5	16-QAM	V	169	110	1 / 24	12.48	5.80	16.13	0.041	34.77	-18.64	18.28	0.067	36.99	-18.71
782.00	5	64-QAM	V	169	110	1 / 24	11.44	5.80	15.09	0.032	34.77	-19.68	17.24	0.053	36.99	-19.75
782.00	10	QPSK	V	154	11	1 / 49	14.43	5.80	18.08	0.064	34.77	-16.69	20.23	0.105	36.99	-16.76
782.00	10	16-QAM	V	154	11	1 / 49	12.97	5.80	16.62	0.046	34.77	-18.15	18.77	0.075	36.99	-18.22
782.00	10	64-QAM	V	154	11	1 / 49	11.96	5.80	15.61	0.036	34.77	-19.16	17.76	0.060	36.99	-19.23
782.00	10	QPSK	н	239	90	1 / 49	11.94	5.80	15.59	0.036	34.77	-19.18	17.74	0.059	36.99	-19.25

Table 7-6. ERP Data (Band 13)

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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]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
824.70	1.4	QPSK	V	138	94	1/5	13.35	6.30	17.50	0.056	38.45	-20.95	19.65	0.092	40.61	-20.96
836.50	1.4	QPSK	V	150	99	1 / 5	13.87	6.40	18.12	0.065	38.45	-20.33	20.27	0.106	40.61	-20.34
848.30	1.4	QPSK	V	141	97	1/5	12.68	6.50	17.03	0.050	38.45	-21.42	19.18	0.083	40.61	-21.43
836.50	1.4	16-QAM	V	150	99	1/5	12.47	6.40	16.72	0.047	38.45	-21.73	18.87	0.077	40.61	-21.74
836.50	1.4	64-QAM	V	150	99	1 / 5	11.50	6.40	15.75	0.038	38.45	-22.70	17.90	0.062	40.61	-22.71
825.50	3	QPSK	V	136	93	1 / 14	13.13	6.30	17.28	0.053	38.45	-21.17	19.43	0.088	40.61	-21.18
836.50	3	QPSK	V	149	104	1 / 14	13.61	6.40	17.86	0.061	38.45	-20.59	20.01	0.100	40.61	-20.60
847.50	3	QPSK	V	142	94	1 / 14	12.52	6.50	16.87	0.049	38.45	-21.58	19.02	0.080	40.61	-21.59
836.50	3	16-QAM	V	149	104	1 / 14	12.13	6.40	16.38	0.043	38.45	-22.07	18.53	0.071	40.61	-22.08
836.50	3	64-QAM	V	149	104	1 / 14	11.30	6.40	15.55	0.036	38.45	-22.90	17.70	0.059	40.61	-22.91
826.50	5	QPSK	V	134	106	1 / 24	13.59	6.30	17.74	0.059	38.45	-20.71	19.89	0.097	40.61	-20.72
836.50	5	QPSK	V	147	94	1 / 24	13.91	6.40	18.16	0.065	38.45	-20.29	20.31	0.107	40.61	-20.30
846.50	5	QPSK	V	143	116	1 / 24	12.74	6.50	17.09	0.051	38.45	-21.36	19.24	0.084	40.61	-21.37
836.50	5	16-QAM	V	147	94	1 / 24	12.49	6.40	16.74	0.047	38.45	-21.71	18.89	0.077	40.61	-21.72
836.50	5	64-QAM	V	147	94	1 / 24	11.54	6.40	15.79	0.038	38.45	-22.66	17.94	0.062	40.61	-22.67
829.00	10	QPSK	V	143	107	1/0	12.97	6.30	17.12	0.052	38.45	-21.33	19.27	0.085	40.61	-21.34
836.50	10	QPSK	V	139	106	1/0	13.80	6.40	18.05	0.064	38.45	-20.40	20.20	0.105	40.61	-20.41
844.00	10	QPSK	V	147	109	1/0	13.70	6.40	17.95	0.062	38.45	-20.50	20.10	0.102	40.61	-20.51
836.50	10	16-QAM	V	139	106	1/0	12.27	6.40	16.52	0.045	38.45	-21.93	18.67	0.074	40.61	-21.94
836.50	10	64-QAM	V	139	106	1/0	11.26	6.40	15.51	0.036	38.45	-22.94	17.66	0.058	40.61	-22.95

Table 7-7. ERP Data (Band 26/5)

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]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
831.50	15	QPSK	V	139	116	1 / 74	13.80	6.35	18.00	0.063	38.45	-20.45	20.15	0.104	40.61	-20.46
836.50	15	QPSK	V	146	107	1/0	13.93	6.40	18.18	0.066	38.45	-20.27	20.33	0.108	40.61	-20.28
841.50	15	QPSK	V	140	102	1/0	13.94	6.40	18.19	0.066	38.45	-20.26	20.34	0.108	40.61	-20.27
841.50	15	16-QAM	V	140	102	1/0	12.51	6.40	16.76	0.047	38.45	-21.69	18.91	0.078	40.61	-21.70
841.50	15	64-QAM	V	140	102	1/0	11.50	6.40	15.75	0.038	38.45	-22.70	17.90	0.062	40.61	-22.71
841.50	15	QPSK	н	221	86	1/0	12.79	6.40	17.04	0.051	38.45	-21.41	19.19	0.083	40.61	-21.42

Table 7-8. ERP Data (Band 26)

FCC ID: ZNFQ620WA		MEASUREMENT REPORT (CERTIFICATION)	.G	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 200 of 244
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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	182	177	1/5	12.02	9.44	21.46	0.140	30.00	-8.54
1745.00	1.4	QPSK	Н	105	173	1/0	12.13	9.23	21.36	0.137	30.00	-8.64
1779.30	1.4	QPSK	н	227	176	1/0	11.47	9.26	20.73	0.118	30.00	-9.27
1710.70	1.4	16-QAM	н	182	177	1 / 5	11.74	9.44	21.18	0.131	30.00	-8.82
1710.70	1.4	64-QAM	Н	182	177	1 / 5	10.80	9.44	20.24	0.106	30.00	-9.76
1711.50	3	QPSK	Н	188	179	1 / 14	12.02	9.44	21.46	0.140	30.00	-8.54
1745.00	3	QPSK	н	101	172	1/0	12.13	9.23	21.36	0.137	30.00	-8.64
1778.50	3	QPSK	н	220	180	1/0	11.47	9.26	20.73	0.118	30.00	-9.27
1711.50	3	16-QAM	Н	188	179	1 / 14	11.74	9.44	21.18	0.131	30.00	-8.82
1711.50	3	64-QAM	Н	188	179	1 / 14	10.80	9.44	20.24	0.106	30.00	-9.76
1712.50	5	QPSK	н	186	177	1 / 24	12.02	9.43	21.45	0.140	30.00	-8.55
1745.00	5	QPSK	н	100	169	1/0	12.13	9.23	21.36	0.137	30.00	-8.64
1777.50	5	QPSK	н	225	175	1/0	11.47	9.26	20.73	0.118	30.00	-9.27
1712.50	5	16-QAM	Н	186	177	1 / 24	11.74	9.43	21.17	0.131	30.00	-8.83
1712.50	5	64-QAM	Н	186	177	1 / 24	10.80	9.43	20.23	0.105	30.00	-9.77
1715.00	10	QPSK	Н	188	172	1 / 49	12.03	9.42	21.45	0.140	30.00	-8.55
1745.00	10	QPSK	н	102	168	1/0	12.13	9.23	21.36	0.137	30.00	-8.64
1775.00	10	QPSK	н	227	170	1/0	11.47	9.25	20.72	0.118	30.00	-9.28
1715.00	10	16-QAM	Н	188	172	1 / 49	11.74	9.42	21.16	0.130	30.00	-8.84
1715.00	10	64-QAM	Н	188	172	1 / 49	10.80	9.42	20.22	0.105	30.00	-9.78
1717.50	15	QPSK	н	190	175	1 / 74	12.02	9.40	21.42	0.139	30.00	-8.58
1745.00	15	QPSK	Н	100	177	1/0	12.13	9.23	21.36	0.137	30.00	-8.64
1772.50	15	QPSK	н	225	176	1/0	11.47	9.25	20.72	0.118	30.00	-9.28
1717.50	15	16-QAM	Н	190	175	1 / 74	11.74	9.40	21.14	0.130	30.00	-8.86
1717.50	15	64-QAM	Н	190	175	1 / 74	10.80	9.40	20.20	0.105	30.00	-9.80
1720.00	20	QPSK	Н	182	177	1 / 99	12.02	9.38	21.40	0.138	30.00	-8.60
1745.00	20	QPSK	Н	100	175	1/0	12.02	9.23	21.25	0.133	30.00	-8.75
1770.00	20	QPSK	Н	228	174	1/0	11.36	9.24	20.60	0.115	30.00	-9.40
1720.00	20	16-QAM	Н	182	177	1 / 99	11.63	9.38	21.01	0.126	30.00	-8.99
1720.00	20	64-QAM	Н	182	177	1 / 99	10.69	9.38	20.07	0.102	30.00	-9.93
1710.70	1.4	QPSK	V	116	149	1/5	11.54	9.28	20.82	0.121	30.00	-9.18

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 Table 7-9.
 EIRP Data (Band 66/4)

FCC ID: ZNFQ620WA		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 201 of 211
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			1/0 0 00/01/0010

PCTE	ST [*]											
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	Н	112	350	1/0	11.84	9.48	21.32	0.136	33.01	-11.69
1882.50	1.4	QPSK	Н	110	352	1 / 5	12.18	9.94	22.12	0.163	33.01	-10.90
1914.30	1.4	QPSK	н	111	351	1 / 5	12.55	10.29	22.84	0.192	33.01	-10.17
1914.30	1.4	16-QAM	н	111	351	1 / 5	11.97	10.29	22.26	0.168	33.01	-10.75
1914.30	1.4	64-QAM	Н	111	351	1 / 5	11.61	10.29	21.90	0.155	33.01	-11.11
1851.50	3	QPSK	н	115	351	1/0	11.72	9.50	21.22	0.132	33.01	-11.79
1882.50	3	QPSK	н	112	355	1 / 14	12.35	9.94	22.29	0.169	33.01	-10.73
1913.50	3	QPSK	н	114	350	1 / 14	12.43	10.29	22.72	0.187	33.01	-10.30
1913.50	3	16-QAM	н	114	350	1 / 14	11.96	10.29	22.25	0.168	33.01	-10.77
1913.50	3	64-QAM	н	114	350	1 / 14	11.43	10.29	21.72	0.148	33.01	-11.30
1852.50	5	QPSK	н	110	355	1/0	11.95	9.51	21.46	0.140	33.01	-11.55
1882.50	5	QPSK	н	111	350	1 / 24	12.50	9.94	22.44	0.175	33.01	-10.58
1912.50	5	QPSK	н	115	352	1 / 24	12.47	10.28	22.75	0.188	33.01	-10.26
1912.50	5	16-QAM	н	115	352	1 / 24	11.96	10.28	22.24	0.167	33.01	-10.77
1912.50	5	64-QAM	н	115	352	1 / 24	11.41	10.28	21.69	0.147	33.01	-11.32
1855.00	10	QPSK	н	114	352	1/0	11.83	9.55	21.38	0.137	33.01	-11.63
1882.50	10	QPSK	н	113	355	1 / 49	12.57	9.94	22.51	0.178	33.01	-10.51
1910.00	10	QPSK	н	110	350	1 / 49	12.62	10.26	22.88	0.194	33.01	-10.13
1910.00	10	16-QAM	н	110	350	1 / 49	12.12	10.26	22.38	0.173	33.01	-10.63
1910.00	10	64-QAM	н	110	350	1 / 49	11.45	10.26	21.71	0.148	33.01	-11.30
1857.50	15	QPSK	н	112	355	1/0	11.94	9.58	21.52	0.142	33.01	-11.49
1882.50	15	QPSK	н	115	352	1 / 74	12.52	9.94	22.46	0.176	33.01	-10.56
1907.50	15	QPSK	н	109	354	1 / 74	12.59	10.24	22.83	0.192	33.01	-10.18
1907.50	15	16-QAM	н	109	354	1 / 74	12.18	10.24	22.42	0.175	33.01	-10.59
1907.50	15	64-QAM	н	109	354	1 / 74	11.55	10.24	21.79	0.151	33.01	-11.22
1860.00	20	QPSK	н	113	355	1/0	11.93	9.62	21.55	0.143	33.01	-11.46
1882.50	20	QPSK	н	117	356	1 / 99	12.37	9.94	22.31	0.170	33.01	-10.71
1905.00	20	QPSK	н	110	352	1 / 99	12.53	10.22	22.75	0.188	33.01	-10.26
1905.00	20	16-QAM	н	110	352	1 / 99	12.16	10.22	22.38	0.173	33.01	-10.63
1905.00	20	64-QAM	н	110	352	1 / 99	11.29	10.22	21.51	0.142	33.01	-11.50
1910.00	10	QPSK	V	123	364	1 / 49	10.44	9.94	20.38	0.109	33.01	-12.64
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Table 7-10. EIRP Data (Band 25/2)

FCC ID: ZNFQ620WA		MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 202 of 244
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	ST [*]											
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]
2502.50	5	QPSK	V	120	322	1/0	8.85	9.40	18.25	0.067	33.01	-14.77
2535.00	5	QPSK	V	127	315	1 / 0	11.11	9.38	20.49	0.112	33.01	-12.52
2567.50	5	QPSK	V	114	338	1 / 24	8.93	9.45	18.38	0.069	33.01	-14.63
2535.00	5	16-QAM	V	127	315	1 / 0	10.42	9.38	19.80	0.096	33.01	-13.21
2535.00	5	64-QAM	V	127	315	1/0	9.18	9.38	18. 56	0.072	33.01	-14.45
2505.00	10	QPSK	V	117	320	1/0	8.98	9.39	18.37	0.069	33.01	-14.64
2535.00	10	QPSK	V	123	318	1/0	11.03	9.38	20.41	0.110	33.01	-12.60
2565.00	10	QPSK	V	109	342	1 / 49	9.00	9.44	18.44	0.070	33.01	-14.57
2535.00	10	16-QAM	V	123	318	1 / 0	10.33	9.38	19.71	0.094	33.01	-13.30
2535.00	10	64-QAM	V	123	318	1 / 0	9.32	9.38	18.70	0.074	33.01	-14.31
2507.50	15	QPSK	V	115	322	1 / 0	9.21	9.39	18.60	0.072	33.01	-14.41
2535.00	15	QPSK	V	125	315	1/0	11.00	9.38	20.38	0.109	33.01	-12.63
2562.50	15	QPSK	V	107	340	1 / 74	9.02	9.43	18.45	0.070	33.01	-14.56
2535.00	15	16-QAM	V	125	315	1 / 0	10.55	9.38	19.93	0.098	33.01	-13.08
2535.00	15	64-QAM	V	125	315	1 / 0	9.27	9.38	18.65	0.073	33.01	-14.36
2510.00	20	QPSK	V	112	319	1 / 0	9.29	9.39	18.68	0.074	33.01	-14.33
2535.00	20	QPSK	V	127	317	1 / 0	10.94	9.38	20.32	0.108	33.01	-12.69
2560.00	20	QPSK	V	105	341	1 / 99	9.14	9.42	18.56	0.072	33.01	-14.45
2535.00	20	16-QAM	V	127	317	1 / 0	10.59	9.38	19.97	0.099	33.01	-13.04
2535.00	20	64-QAM	V	127	317	1 / 0	9.54	9.38	18.92	0.078	33.01	-14.09
2535.00	5	QPSK	н	121	143	1/0	9.70	9.39	19.09	0.081	33.01	-13.92

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Table 7-11. EIRP Data (Band 7)

FCC ID: ZNFQ620WA		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:	Dogo 202 of 244
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	ST [*]											
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]
2498.50	5	QPSK	V	155	322	1 / 24	14.45	9.40	23.85	0.243	33.01	-9.16
2593.00	5	QPSK	V	130	330	1 / 24	14.48	9.56	24.04	0.253	33.01	-8.97
2687.50	5	QPSK	V	141	333	1 / 24	13.70	9.69	23.39	0.218	33.01	-9.62
2498.50	5	16-QAM	V	155	322	1 / 24	12.84	9.40	22.24	0.168	33.01	-10.77
2498.50	5	64-QAM	V	155	322	1 / 24	12.09	9.40	21.49	0.141	33.01	-11.52
2501.00	10	QPSK	V	161	300	1 / 49	14.49	9.40	23.89	0.245	33.01	-9.12
2593.00	10	QPSK	V	134	321	1 / 49	14.28	9.56	23.84	0.242	33.01	-9.17
2685.00	10	QPSK	V	141	333	1 / 49	13.67	9.68	23.35	0.216	33.01	-9.66
2501.00	10	16-QAM	V	161	300	1 / 49	12.94	9.40	22.34	0.171	33.01	-10.67
2501.00	10	64-QAM	V	161	300	1 / 49	12.42	9.40	21.82	0.152	33.01	-11.19
2503.50	15	QPSK	V	164	330	1 / 74	14.66	9.39	24.05	0.254	33.01	-8.96
2593.00	15	QPSK	V	134	321	1 / 74	14.58	9.56	24.14	0.259	33.01	-8.87
2682.50	15	QPSK	V	141	333	1 / 74	13.90	9.68	23.58	0.228	33.01	-9.43
2503.50	15	16-QAM	V	164	330	1 / 74	13.13	9.39	22.52	0.179	33.01	-10.49
2503.50	15	64-QAM	V	164	330	1 / 74	12.13	9.39	21.52	0.142	33.01	-11.49
2506.00	20	QPSK	V	157	319	1 / 99	14.00	9.39	23.39	0.218	33.01	-9.62
2593.00	20	QPSK	V	122	334	1 / 99	13.50	9.56	23.06	0.202	33.01	-9.95
2680.00	20	QPSK	V	141	333	1 / 99	10.40	9.68	20.08	0.102	33.01	-12.93
2593.00	20	16-QAM	V	122	334	1 / 99	12.74	9.56	22.30	0.170	33.01	-10.71
2593.00	20	64-QAM	V	122	334	1 / 99	10.57	9.56	20.13	0.103	33.01	-12.88
2593.00	15	QPSK	Н	150	160	1 / 74	12.79	9.39	22.18	0.165	33.01	-10.83

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Table 7-12. EIRP Data (Band 41 – PC2)

FCC ID: ZNFQ620WA		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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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: ZNFQ620WA		MEASUREMENT REPORT (CERTIFICATION)	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.

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Plot 7-340. Radiated Spurious Plot above 1GHz (Band 71)

OPERATING FREQUENCY:	673.00		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]
1346.00	Н	264	287	-59.41	3.15	-56.25	-43.3
2019.00	Н	-	-	-66.15	3.52	-62.63	-49.6
2692.00	Н	-	-	-65.90	4.77	-61.13	-48.1

Table 7-13. Radiated Spurious Data (Band 71 – Low Channel)

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OPERATING FREQUENCY:	680.50		
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]
1361.00	Н	117	294	-60.01	3.04	-56.96	-44.0
2041.50	Н	-	-	-65.80	3.49	-62.32	-49.3
2722.00	Н	-	-	-65.25	4.83	-60.42	-47.4

Table 7-14. Radiated Spurious Data (Band 71 – Mid Channel)

OPERATING FREQUENCY:	688	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]
1376.00	Н	113	292	-62.03	2.88	-59.15	-46.1
2064.00	Н	-	-	-65.10	3.50	-61.60	-48.6
2752.00	Н	-	-	-65.16	4.88	-60.28	-47.3

Table 7-15. Radiated Spurious Data (Band 71 – High Channel)

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Plot 7-341. Radiated Spurious Plot above 1GHz (Band 12/17)

MHz	1.50	70	OPERATING FREQUENCY:
	_	QPSK	MODULATION SIGNAL:
	MHz	5.0	BANDWIDTH:
	meters	3	DISTANCE:
	dBm	-13	LIMIT:

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]
1403.00	Н	102	209	-54.27	2.71	-51.55	-38.6
2104.50	Н	-	-	-66.10	3.57	-62.54	-49.5
2806.00	Н	-	-	-67.04	4.98	-62.06	-49.1

Table 7-16. Radiated Spurious Data (Band 12/17 - Low Channel)

FCC ID: ZNFQ620WA		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager	
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OPERATING FREQUENCY:	707.50		
MODULATION SIGNAL:	QPSK		
BANDWIDTH:	5.0	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]
1415.00	Н	160	207	-53.45	2.80	-50.65	-37.7
2122.50	Н	-	-	-65.67	3.57	-62.10	-49.1
2830.00	Н	-	-	-66.47	5.02	-61.45	-48.4

Table 7-17. Radiated Spurious Data (Band 12/17 – Mid Channel)

OPERATING FREQUENCY:	713	MHz	
MODULATION SIGNAL:	QPSK	_	
BANDWIDTH:	5.0	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]
1427.00	Н	160	204	-51.70	2.88	-48.82	-35.8
2140.50	Н	-	-	-65.86	3.58	-62.28	-49.3
2854.00	Н	-	-	-66.82	5.07	-61.75	-48.8

Table 7-18. Radiated Spurious Data (Band 12/17 – High Channel)

FCC ID: ZNFQ620WA		MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager	
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Plot 7-342. Radiated Spurious Plot above 1GHz (Band 13)

OPERATING FREQUENCY:	78	2.00	MHz
MODULATION SIGNAL:	QPSK	_	
BANDWIDTH:	10.0	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]
2346.00	V	109	334	-66.76	4.00	-62.76	-49.8
3128.00	V	-	-	-68.40	5.38	-63.01	-50.0

Table 7-19. Radiated Spurious Data (Band 13 – Mid Channel)

FCC ID: ZNFQ620WA		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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QPSK	
10.00	MHz
3	meters
-50	dBm
-40	dBm/MHz
	QPSK 10.00 3 -50 -40

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]
1564.00	V	228	78	-69.61	3.53	-66.08	-26.1

Table 7-20. Radiated Spurious Data (Band 13 - 1559-1610MHz Band)

FCC ID: ZNFQ620WA		MEASUREMENT REPORT (CERTIFICATION)	🔁 LG	Approved by: Quality Manager
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Plot 7-343. Radiated Spurious Plot above 1GHz (Band 26/5)

OPERATING FREQUENCY:	831	I.50 MHz
MODULATION SIGNAL:	QPSK	
BANDWIDTH:	15.0	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]
1663.00	V	261	290	-65.21	3.12	-62.10	-49.1
2494.50	V	-	-	-56.85	3.87	-52.98	-40.0
3326.00	V	-	-	-57.96	6.02	-51.94	-38.9

Table 7-21. Radiated Spurious Data (Band 26 – Low Channel)

FCC ID: ZNFQ620WA		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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OPERATING FREQUENCY:	836	6.50 MHz
MODULATION SIGNAL:	QPSK	_
BANDWIDTH:	15.0	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]
1673.00	V	141	275	-63.49	3.10	-60.39	-47.4
2509.50	V	-	-	-65.61	4.02	-61.59	-48.6
3346.00	V	-	-	-66.66	6.03	-60.63	-47.6

Table 7-22. Radiated Spurious Data (Band 26 – Mid Channel)

OPERATING FREQUENCY:	842	1.50	MHz
MODULATION SIGNAL:	QPSK	_	
BANDWIDTH:	15.0	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]
1683.00	V	247	291	-65.47	3.15	-62.32	-49.3
2524.50	V	-	-	-65.62	4.07	-61.55	-48.5
3366.00	V	-	-	-66.33	6.10	-60.23	-47.2

Table 7-23. Radiated Spurious Data (Band 26 – High Channel)

FCC ID: ZNFQ620WA		MEASUREMENT REPORT (CERTIFICATION)	🕒 LG	Approved by: Quality Manager
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OPERATING FREQUENCY:	82	6.50 N	/IHz
MODULATION SIGNAL:	QPSK	_	
BANDWIDTH:	5.0	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]
1653.00	V	168	58	-66.16	3.61	-62.55	-49.6
2479.50	V	-	-	-66.10	4.23	-61.87	-48.9
3306.00	V	-	-	-67.41	5.80	-61.61	-48.6

Table 7-24. Radiated Spurious Data (Band 5 – Low Channel)

MHz

OPERATING FREQUENCY:

MODULATI

FREQUENCY:	83	6.50
TION SIGNAL:	QPSK	
BANDWIDTH:	5.0	MHz
DISTANCE:	3	meters
	10	

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]
1673.00	V	110	277	-67.67	3.62	-64.05	-51.1
2509.50	V	-	-	-67.16	4.33	-62.83	-49.8
3346.00	V	-	-	-67.62	5.92	-61.70	-48.7

Table 7-25. Radiated Spurious Data (Band 5 – Mid Channel)

FCC ID: ZNFQ620WA		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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OPERATING FREQUENCY:	846.50	
MODULATION SIGNAL:	QPSK	_
BANDWIDTH:	5.0	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]
1693.00	V	108	304	-69.16	3.63	-65.53	-52.5
2539.50	V	-	-	-68.39	4.52	-63.87	-50.9
3386.00	V	-	-	-67.69	6.09	-61.59	-48.6

Table 7-26. Radiated Spurious Data (Band 5 – High Channel)

FCC ID: ZNFQ620WA		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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