

	pectrum Analyz										
LXI RL	RF	50 Ω AC	CORREC		NSE:INT	#Avg Typ	e: RMS	TRAC	Apr 10, 2018	Freque	ncy
		NFE	PNO: Wide 😱 IFGain:Low	Trig: Free Atten: 36				TYF			
							Mkr1	1.755 0	00 GHz	Aut	o Tune
10 dB/div Log	Ref 25	.00 dBm						-29.	56 dBm		
Ĩ					Í					Cent	er Frec
15.0										1.755000	000 GHz
5.00											
5.00	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	www	m							rt Fred
-5.00										1.749000	000 GHz
45.0									DL1 -13.00 dBm		
-15.0											p Fred
-25.0				La la	.1					1.761000	JOU GH2
				SA S	Manna -						FSter
-35.0					- man	~~~~~	· · · · ·	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		1.2000	оо мн
-45.0										<u>Auto</u>	Mar
										Free	Offse
-55.0										Tree	0 H:
-65.0											
03.0										Sca	е Туре
Center 4	.755000 (2H7		,				Snan 1	2.00 MHz	Log	Lin
	/ 150 kHz		#VBW	470 kHz			Sweep 1	.000 ms (1001 pts)		
MSG							STATUS	5			

Plot 7-118. Upper Band Edge Plot (Band 4 - 15.0MHz QPSK - Full RB Configuration)



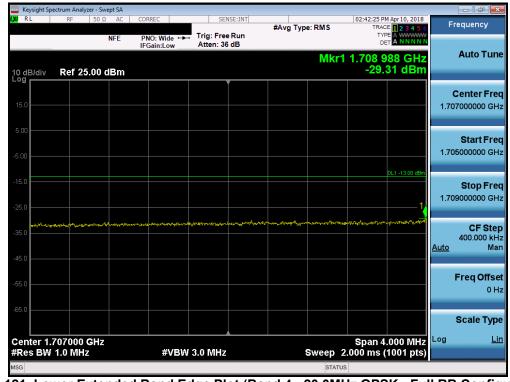
Plot 7-119. Upper Extended Band Edge Plot (Band 4 - 15.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMJ337V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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	pectrum Analyzer								- ē ×
L <mark>XI</mark> RL	RF 5	50 Ω AC	CORREC		NSE:INT	#Avg Typ	e: RMS	02:42:15 PM Apr 10, 2018 TRACE 1 2 3 4 5 6	Frequency
		NFE	PNO: Wide 🖵 IFGain:Low	Trig: Free Atten: 36					
							Mkr1	1.710 000 GHz	Auto Tune
10 dB/div Log	Ref 25.0	0 dBm						-33.09 dBm	
									Center Fred
15.0									1.71000000 GH
5.00					~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	m	monto	Start Fred
-5.00									1.702000000 GH
								DL1 -13.00 dBm	
-15.0									Stop Fred
					A				1.718000000 GH
-25.0					1 🗸				
-35.0				and the	N				CF Step 1.600000 MH
~~~~~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		- Marine Ma	mm					Auto Mar
-45.0									
-55.0									Freq Offse
-30.0									0 H:
-65.0									
									Scale Type
Center 1	.710000 GI	Hz					<u> </u>	Span 16.00 MHz	Log <u>Lir</u>
	/ 200 kHz		#VBW	í 620 kHz			Sweep 1	.000 ms (1001 pts)	
MSG							STATU	S	

Plot 7-120. Lower Band Edge Plot (Band 4 - 20.0MHz QPSK - Full RB Configuration)



Plot 7-121. Lower Extended Band Edge Plot (Band 4 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMJ337V		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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Keysight Spectrum Analyzer -					
<b>LXI RL RF 50</b>	Ω AC CORREC	SENSE:INT	#Avg Type: RMS	02:42:41 PM Apr 10, 2018 TRACE 1 2 3 4 5 6	Frequency
	NFE PNO: Wide 🖵 IFGain:Low	Trig: Free Run Atten: 36 dB	0 71	DET A NNNNN	
10 dB/div Ref 25.00	) dBm		Mkr1	1.755 016 GHz -30.15 dBm	Auto Tune
15.0					Center Freq 1.755000000 GHz
-5.00	warman and and and and and and and and and a			DL1 -13.00 dBm	Start Fred 1.747000000 GHz
-15.0		1			<b>Stop Fred</b> 1.763000000 GHz
-35.0		) Mu many	Mundun	hanne hanne	CF Step 1.600000 MH <u>Auto</u> Mar
-55.0					<b>Freq Offse</b> 0 H
-65.0					Scale Type
Center 1.755000 GH #Res BW 200 kHz		620 kHz	Sweep 1	Span 16.00 MHz .000 ms (1001 pts)	Log <u>Lir</u>
MSG			STATUS	;	

Plot 7-122. Upper Band Edge Plot (Band 4 - 20.0MHz QPSK - Full RB Configuration)



Plot 7-123. Upper Extended Band Edge Plot (Band 4 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMJ337V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Daga 92 of 126
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## Band 2



Plot 7-124. Lower Band Edge Plot (Band 2 - 1.4MHz QPSK - Full RB Configuration)



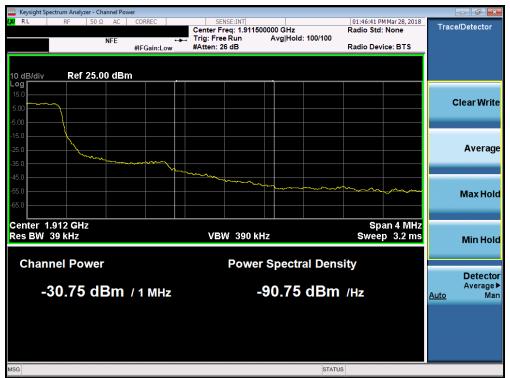
Plot 7-125. Lower Extended Band Edge Plot (Band 2 - 1.4MHz QPSK - Full RB Configuration)

FCC ID: A3LSMJ337V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 94 of 126
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	pectrum Analyzer - Swep								
RL	RF 50 Ω	IFE PN	RREC	SENSE:INT Trig: Free Run Atten: 36 dB	#Avg Ty	pe: RMS	01:46:35 PM Mar TRACE TYPE DET		Frequency
0 dB/div	Ref 25.00 d		Sam:Low	Atten: 00 dB		Mkr	1 1.910 000 -28.27	GHz dBm	Auto Tun
15.0								1.	<b>Center Fre</b> 910000000 GF
5.00 <b></b>		Mulan	Martin And					13.00 dBm	<b>Start Fre</b> 908000000 GF
25.0				1_					<b>Stop Fre</b> 912000000 GF
15.0 <b></b>	where and the second				www.	ma		Auto	CF Ste 400.000 kH 2 Ma
55.0							man	man and	Freq Offs 0 H
65.0									Scale Typ
	.910000 GHz 13 kHz		#VBW	43 kHz		Sweep	Span 4.00 8.867 ms (100	0 MHz ^{Log} 1 pts)	L
ISG				40 KHZ		STATU		n pts/	

Plot 7-126. Upper Band Edge Plot (Band 2 - 1.4MHz QPSK - Full RB Configuration)



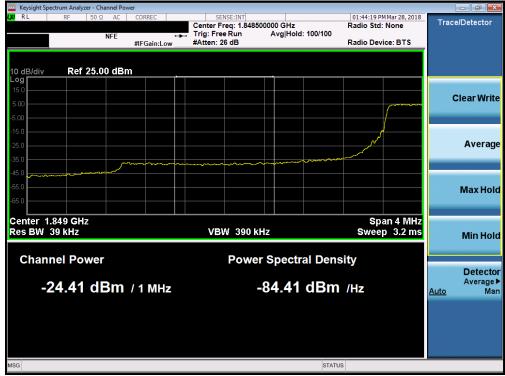
Plot 7-127. Upper Extended Band Edge Plot (Band 2 - 1.4MHz QPSK - Full RB Configuration)

FCC ID: A3LSMJ337V		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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	pectrum Analyze	r - Swept SA									- 6
XU RL	RF	50 Ω AC NFE	PNO: Wide			#Avg Typ	e: RMS	TRAC	Mar 28, 2018 <b>1 2 3 4 5 6</b> E A WWWWW T A NNNNN	Free	quency
10 dB/div	Ref 25.	00 dBm	IFGam:Low	Atten. od			Mkr1	1.849 9 -23.2	96 GHz 23 dBm	4	luto Tun
15.0											enter Fre
-5.00									DL1 -13.00 dBm		Start Fre
-15.0					1						Stop Fre 100000 G⊦
35.0	~~~		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~							4 <u>Auto</u>	CF Ste 00.000 k⊦ Ma
55.0										F	r <b>eq Offs</b> 0 F
	.850000 G	Hz						Span 4.	000 MHz	S Log	cale Typ <u>Li</u>
≇Res B₩	30 kHz		#VBV	V 100 kHz			Sweep 2	2.000 ms (	1001 pts)		

Plot 7-128. Lower Band Edge Plot (Band 2 - 3.0MHz QPSK - Full RB Configuration)



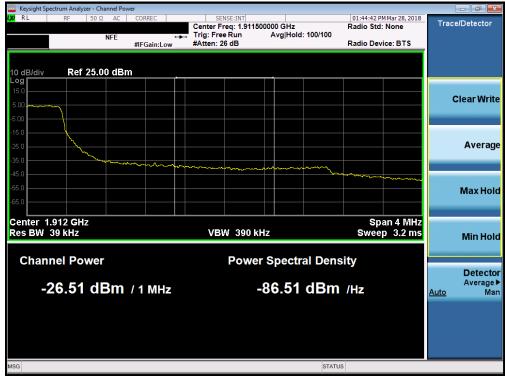
Plot 7-129. Lower Extended Band Edge Plot (Band 2 - 3.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMJ337V		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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								m Analyzer - Swept	
Frequency	01:44:37 PM Mar 28, 2018 TRACE 1 2 3 4 5 6	e: RMS	#Avg Ty	NSE:INT		REC	AC COR	RF 50 Ω	RL
	DET A NNNN				Trig: Free Atten: 30	IO: Wide 🖵 Sain:Low	FE PN IFO	N	
Auto Tune	1.910 000 GHz -25.532 dBm	Mkr1					3m	ef 25.00 dE	dB/div
Center Fred 1.910000000 GHz									.0
Start Fred 1.908000000 GHz	DL1 -13.00 dBm					~~~~~	~~~~~		
<b>Stop Fred</b> 1.912000000 GH:				1					0
CF Step 400.000 kH: <u>Auto</u> Mar	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		·····						o ——
Freq Offse 0 H									o
Scale Type									
Log <u>Lir</u>	Span 4.000 MHz 2.000 ms (1001 pts)	Sweep 2			100 kHz	#VBW		000 GHz kHz	nter 1.9 es BW 3
		STATUS							

Plot 7-130. Upper Band Edge Plot (Band 2 - 3.0MHz QPSK - Full RB Configuration)



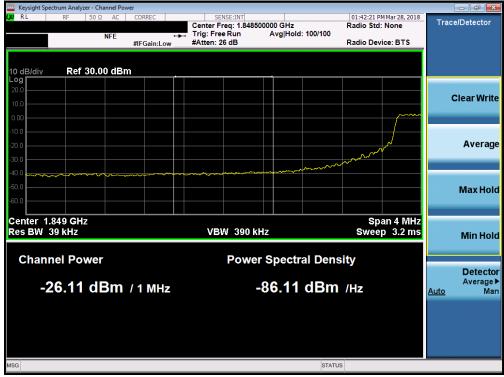
Plot 7-131. Upper Extended Band Edge Plot (Band 2 - 3.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMJ337V		MEASUREMENT REPORT (CERTIFICATION)	MSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 97 of 126
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🔤 Keysight Spectrum Analyzer - Swept SA					
LX RL RF 50Ω AC	CORREC	SENSE:INT	#Avg Type: RMS	01:42:09 PM Mar 28, 2018 TRACE 1 2 3 4 5 6	Frequency
NFE		Free Run n: 36 dB	- //		
10 dB/div Ref 25.00 dBm			Mkr	1 1.849 968 GHz -23.97 dBm	Auto Tune
					Center Freq
15.0					1.850000000 GHz
5.00		~		· · · · · · · · · · · · · · · · · · ·	Start Freq
-5.00					1.848000000 GHz
-15.0				DL1 -13.00 dBm	
					Stop Fred 1.852000000 GHz
-25.0	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	NN -			
-35.0	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~				CF Step 400.000 kHz <u>Auto</u> Mar
-45.0					Freq Offse
-55.0					0 Hz
-65.0					Scale Type
				Onen 4 000 Balle	Log Lir
Center 1.850000 GHz #Res BW 56 kHz	#VBW 180 I	Hz	Sweep	Span 4.000 MHz 2.000 ms (1001 pts)	
MSG			STAT	US	

Plot 7-132. Lower Band Edge Plot (Band 2 - 5.0MHz QPSK - Full RB Configuration)



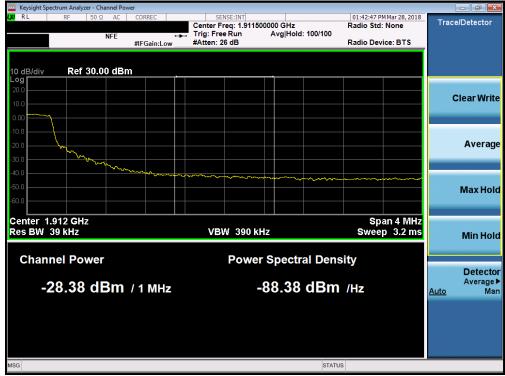
Plot 7-133. Lower Extended Band Edge Plot (Band 2 - 5.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMJ337V		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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	pectrum Analyze										
L <mark>XI</mark> RL	RF	50 Ω AC	CORREC		ISE:INT	#Avg Typ	e: RMS	TRAC	Mar 28, 2018	Fr	equency
		NFE	PNO: Wide 🖵 IFGain:Low	Trig: Free Atten: 36				TYP			
10 dB/div Log	Ref 25.	00 dBm					Mkr	1 1.910 0 -23.	04 GHz 12 dBm		Auto Tune
15.0											Center Freq 0000000 GHz
-5.00	~~~~	~~~~~	······						DL1 -13.00 dBm	1.90	Start Fred B000000 GH;
-15.0				L N	1				DET -13.00 (dBm	1.91	<b>Stop Fred</b> 2000000 GH2
-35.0					Win	www	mm	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~~~~	<u>Auto</u>	CF Ster 400.000 kH Mar
-45.0										l	F <b>req Offse</b> 0 H
-65.0											Scale Type
Center 1. #Res BW	.910000 G / 56 kHz	Hz	#VBW	180 kHz			Sweep 3	Span 4. 2.000 ms ('	000 MHz 1001 pts)	Log	Lir
MSG							STATU				

Plot 7-134. Upper Band Edge Plot (Band 2 - 5.0MHz QPSK - Full RB Configuration)



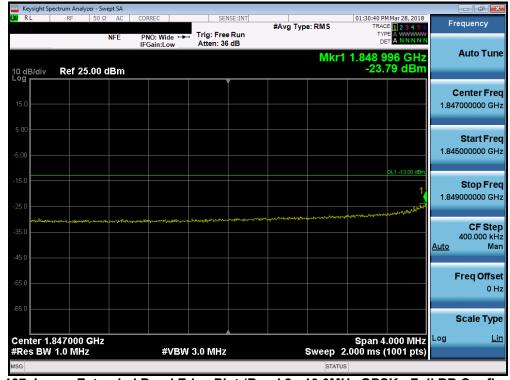
Plot 7-135. Upper Extended Band Edge Plot (Band 2 - 5.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMJ337V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 90 of 126
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	opectrum Analyzer - S									
L <mark>XI</mark> RL	RF 50	Ω AC	CORREC	SEI	SE:INT	#Avg Typ	e: RMS	01:30:31 PM Mar 28, 2018 TRACE 1 2 3 4 5	Fre	quency
		NFE	PNO: Wide IFGain:Low	Trig: Free Atten: 36				DET A NNNN		
10 dB/div Log	Ref 25.00	dBm					Mkr1	1.849 984 GHz -26.64 dBm		Auto Tune
15.0										enter Freq
									1.850	000000 GHz
5.00					~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	en an	weigen Malanara	anne tulige service and the service of the service		Start Fred
-5.00								DL1 -13.00 dBr	1.846	000000 GHz
-15.0										Stop Freq
-25.0									1.854	000000 GHz
-35.0			- + 10457 Marrian Marrian	www.www.www					1	CF Step 800.000 kHz
-45.0	with species where the second s	A.C. Martin							<u>Auto</u>	Mar
-55.0									F	req Offse
-65.0										0 H:
									S	cale Type
	.850000 GHz V 110 kHz	2	#VBW	330 kHz			Sweep 4	Span 8.000 MHz .000 ms (1001 pts	Log	Lir
MSG							STATU			

Plot 7-136. Lower Band Edge Plot (Band 2 - 10.0MHz QPSK - Full RB Configuration)



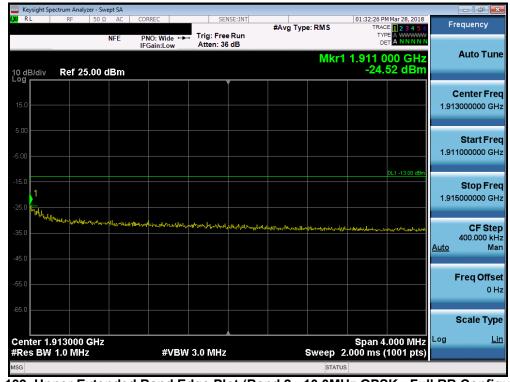
Plot 7-137. Lower Extended Band Edge Plot (Band 2 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMJ337V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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🔤 Keysight Spectru	•										
LXI RL	RF 50 9	Ω AC	CORREC		NSE:INT	#Avg Typ	e: RMS		M Mar 28, 2018	F	requency
		NFE	PNO: Wide 🖵 IFGain:Low	Trig: Free Atten: 36							
							Mkr	1 1.910 (	000 GHz		Auto Tune
10 dB/div	Ref 25.00	dBm						-25.7	54 dBm		
											Center Fred
15.0										1.91	0000000 GH:
5.00											
0.00 Juny Many my	Mar Marine	and a start of the second s	Manuf Anglander Mangla	m							Start Free
-5.00										1.90	6000000 GH:
45.0									DL1 -13.00 dBm		
-15.0				l	1					1.04	Stop Free 4000000 GH
-25.0				- With	<u>'</u>					1.91	4000000 GH
				Ň	Hinny .						CF Ster
-35.0					- Winny w	hydrogen al .		Manggarentonton		0	800.000 kH
-45.0						andrew	Marria Margarah	warmen warden	* When the state	<u>Auto</u>	Mar
											Freq Offse
-55.0											0 H:
-65.0											
											Scale Type
Center 1.91	0000 GHz							Span 8	.000 MHz	Log	Lir
#Res BW 11			#VBW	330 kHz			Sweep	4.000 ms (	(1001 pts)		
MSG							STAT	JS			

Plot 7-138. Upper Band Edge Plot (Band 2 - 10.0MHz QPSK - Full RB Configuration)



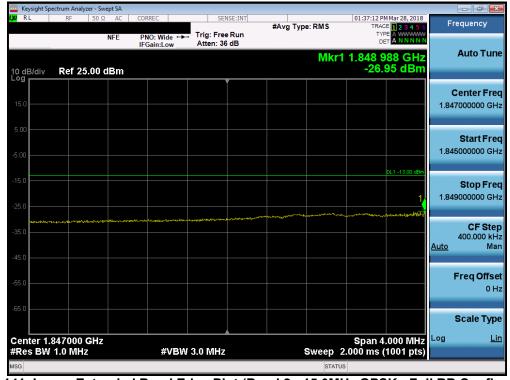
Plot 7-139. Upper Extended Band Edge Plot (Band 2 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMJ337V		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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	Spectrum Analyze										
L <mark>XI</mark> RL	RF	50 Ω AC	CORREC		SE:INT	#Avg Typ	e: RMS	01:37:03 PM M TRACE	1 2 3 4 5 6	Frequ	iency
		NFE	PNO: Wide 😱 IFGain:Low	Trig: Free Atten: 36				TYPE DET	A WWWWW A N N N N N		
							Mkr1	1.849 94	0 GHz	Αι	ito Tune
10 dB/div Log	Ref 25.	00 dBm						-29.5	9 dBm		
										Cer	iter Fred
15.0											0000 GH:
5.00					(	m	·····	mm	mm	S	art Fred
-5.00										1.84400	0000 GH:
								DL	_1 -13.00 dBm		
-15.0										S	top Fred
-25.0					1					1.85600	0000 GH
-23.0					- AND						
-35.0				~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~							CF Step
m	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~								Auto	Mai
-45.0											
-55.0										Fre	qOffse
											0 H
-65.0										S.	ale Typ
	1.850000 G			476 1.14				Span 12	0010112	Log	<u>Lii</u>
#Res BV	V 150 kHz		#VBW	470 kHz				1.000 ms (1)	uun prs)		
JSG							STATU	2			

Plot 7-140. Lower Band Edge Plot (Band 2 - 15.0MHz QPSK - Full RB Configuration)



Plot 7-141. Lower Extended Band Edge Plot (Band 2 - 15.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMJ337V		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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	pectrum Analyzer - Swe										
LXI RL	RF 50 Ω	AC CC	IRREC		ISE:INT	#Avg Typ	e: RMS		PM Mar 28, 2018 ACE 1 2 3 4 5 6	F	requency
		NFE P IF	NO: Wide 🖵 Gain:Low	Trig: Free Atten: 36				T			
10 dB/div Log	Ref 25.00 d	IBm					Mkr	1 1.910 -30	024 GHz .33 dBm		Auto Tune
15.0											Center Fred 0000000 GH
-5.00	www.www.w		······	$\sim$					DL1 -13.00 dBm	1.90	Start Free 4000000 GH:
-15.0					1					1.91	<b>Stop Fred</b> 6000000 GH:
-35.0				hy	Marrin	www	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	·/····	www.	<u>Auto</u>	<b>CF Stej</b> 1.200000 MH Ma
-55.0											Freq Offse 0 H
-65.0											Scale Typ
	.910000 GHz / 150 kHz		#VBW	470 kHz			Sweep	Span 1.000 ms	12.00 MHz (1001 pts)	Log	<u>Lir</u>
MSG							STATU	IS			

Plot 7-142. Upper Band Edge Plot (Band 2 - 15.0MHz QPSK - Full RB Configuration)



Plot 7-143. Upper Extended Band Edge Plot (Band 2 - 15.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMJ337V		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager		
Test Report S/N:	Test Dates:	EUT Type:	Dage 02 of 126		
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🧧 Keysight Spectrum Analyz						
LXI RL RF	50 Ω AC CC	DRREC	SENSE:INT	#Avg Type: RMS	01:39:59 PM Mar 28, 2018 TRACE 1 2 3 4 5 6	Frequency
10 dB/div Ref 25	NFE F IF 5.00 dBm		rig: Free Run Atten: 36 dB	Mkr	1 1.849 840 GHz -32.15 dBm	Auto Tune
15.0						Center Freq 1.850000000 GHz
-5.00					DL1 -13.00 dBm	Start Freq 1.842000000 GHz
-15.0					UL1 -13.00 dbm	<b>Stop Freq</b> 1.858000000 GHz
-35.0	mannon					CF Step 1.600000 MH <u>Auto</u> Mar
-55.0						Freq Offse 0 H
-65.0	0.11-					Scale Type
Center 1.850000 ( #Res BW 200 kHz		#VBW 62	0 kHz	Sweep	Span 16.00 MHz 1.000 ms (1001 pts)	
MSG				STAT	US	

Plot 7-144. Lower Band Edge Plot (Band 2 - 20.0MHz QPSK - Full RB Configuration)



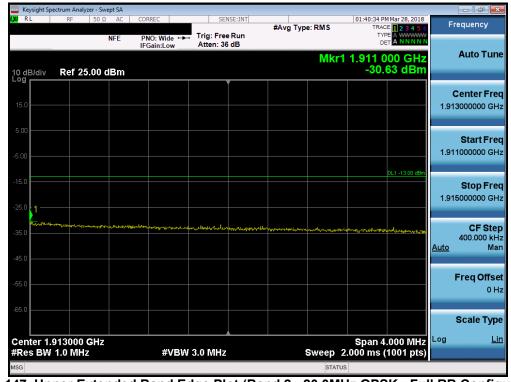
Plot 7-145. Lower Extended Band Edge Plot (Band 2 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMJ337V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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	Spectrum Analyz								
KU RL	RF	50 Ω AC NFE	CORREC	Trig: Free		#Avg Typ	e: RMS	01:40:26 PM Mar 28, 2 TRACE 1 2 3 4 TYPE A WWW DET A N N	Frequency
I0 dB/div	Ref 25	.00 dBm	IFGain:Low	Atten: 36	αB		Mkr'	1 1.910 000 GI -33.95 dE	Hz Auto Tu
15.0									Center F 1.910000000 (
5.00	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	www.	were and the second					DL1 -13.00	Start F 1.902000000 0
25.0									Stop F 1.918000000 (
45.0				Wy.	Morrison	homent	mm	mmmmmm	CF St 1.600000 M Auto
55.0									Freq Off C
55.0									Scale Ty
	l.910000 ( V 200 kHz		#VBW	/ 620 kHz			Sweep	Span 16.00 M 1.000 ms (1001 p	Hz ^{Log} ots)
SG							STATU	IS	

Plot 7-146. Upper Band Edge Plot (Band 2 - 20.0MHz QPSK - Full RB Configuration)

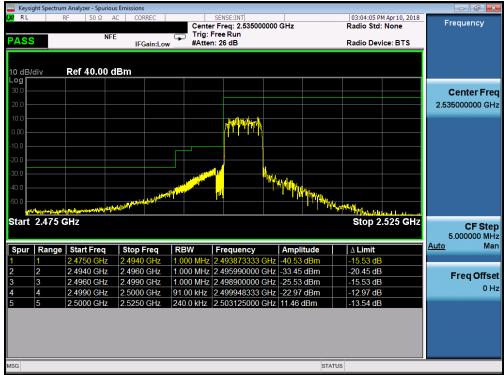


Plot 7-147. Upper Extended Band Edge Plot (Band 2 - 20.0MHz QPSK - Full RB Configuration)

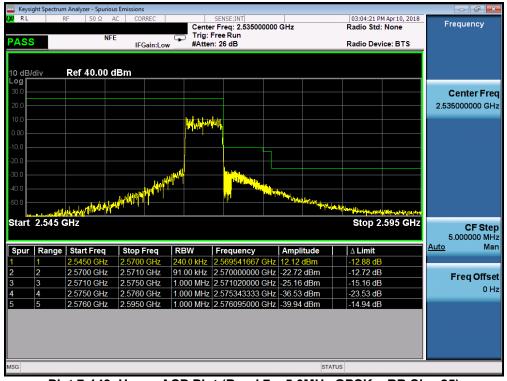
FCC ID: A3LSMJ337V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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#### Band 7



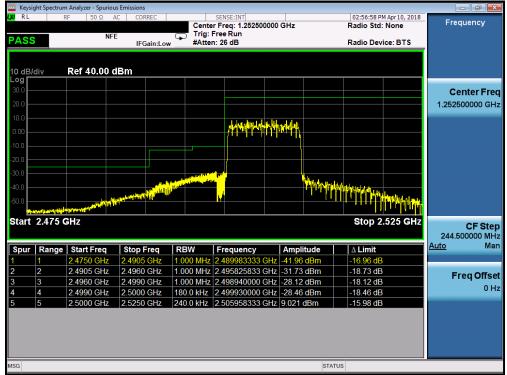
Plot 7-148. Lower ACP Plot (Band 7 – 5.0MHz QPSK – RB Size 25)



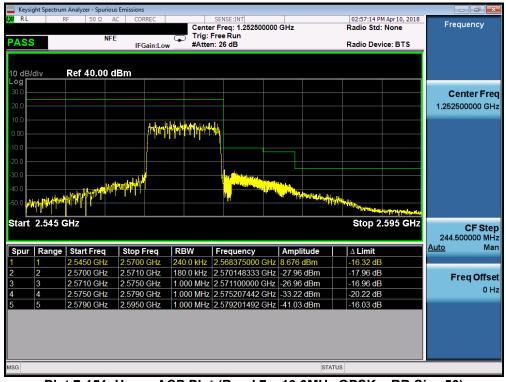
## Plot 7-149. Upper ACP Plot (Band 7 – 5.0MHz QPSK – RB Size 25)

FCC ID: A3LSMJ337V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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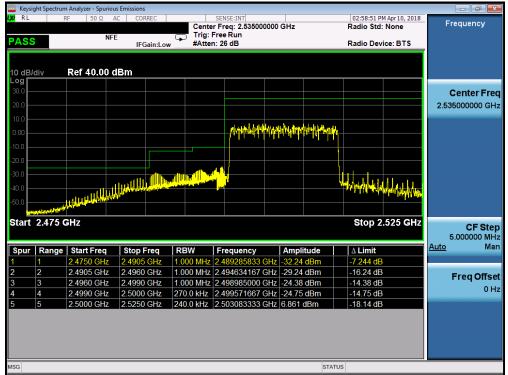
Plot 7-150. Lower ACP Plot (Band 7 - 10.0MHz QPSK - RB Size 50)



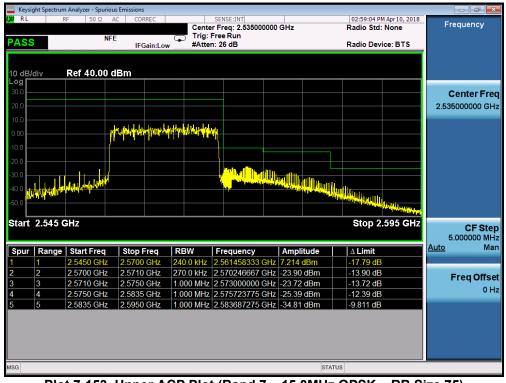
Plot 7-151. Upper ACP Plot (Band 7 – 10.0MHz QPSK – RB Size 50)

FCC ID: A3LSMJ337V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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Plot 7-152. Lower ACP Plot (Band 7 – 15.0MHz QPSK – RB Size 75)



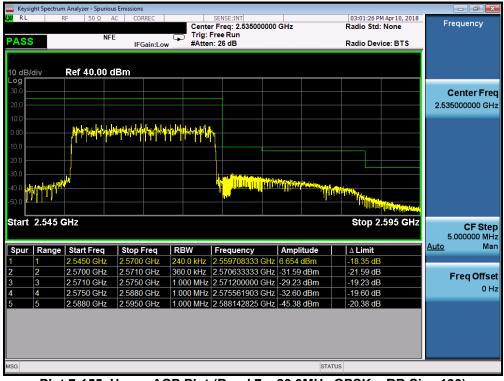
Plot 7-153. Upper ACP Plot (Band 7 – 15.0MHz QPSK – RB Size 75)

FCC ID: A3LSMJ337V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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PAS		ላF 50 Ω NF		Trig:	SENSE:INT r Freq: 2.53500000 Free Run n: 26 dB	0 GHz	03:01:14 PM Apr 10, 2018 Radio Std: None Radio Device: BTS	³ Frequency
10 dB Log <b>F</b>	l/div	Ref 40.00	dBm					-
30.0								Center Fre
20.0								2.535000000 GH
10.0					makhhaluk	kelowelerentriseleren	Lhulen on (yrainla)	
10.0					711	or rate of 1		
20.0								
30.0 L								
40.0							Nyrikinylije gr	
50.0	and the second states of the	en an the second second	- Ali and a second s		·			
50.0 Start	2.475 0	Hz	were with a with the light				Stop 2.525 GHz	UF SIE
start	2.475	302	Stop Freq	RBW	Frequency	Amplitude		Z CF Ste 5.000000 Mł <u>Auto</u> Ma
blari	2.475	302		RBW	Frequency 2.488588333 GH		Stop 2.525 GHz	5.000000 MI
Spur	Range	Start Freq	Stop Freq	RBW 1.000 MHz		z -39.13 dBm	Stop 2.525 GH	5.000000 Mi Auto Mi
Spur	Range	Start Freq 2.4750 GHz	Stop Freq 2.4905 GHz	RBW 1.000 MHz 1.000 MHz	2.488588333 GH	z -39.13 dBm z -36.26 dBm	Stop 2.525 GHz	5.000000 Mi Auto Ma
Spur	Range	<b>Start Freq</b> 2.4750 GHz 2.4905 GHz	<b>Stop Freq</b> 2.4905 GHz 2.4960 GHz	RBW 1.000 MHz 1.000 MHz 1.000 MHz	2.488588333 GH 2.496000000 GH	z -39.13 dBm z -36.26 dBm z -31.30 dBm	Stop 2.525 GH; △ Limit -14.13 dB -23.26 dB	5.000000 Mi Auto Mi
Spur	Range	Start Freq           2.4750 GHz           2.4905 GHz           2.4960 GHz	Stop Freq           2.4905 GHz           2.4960 GHz           2.4990 GHz	RBW 1.000 MHz 1.000 MHz 1.000 MHz 360.0 KHz	2.488588333 GH 2.496000000 GH 2.498460000 GH	z -39.13 dBm z -36.26 dBm z -31.30 dBm z -33.73 dBm	Stop 2.525 GH; △ Limit -14.13 dB -23.26 dB -21.30 dB	5.000000 Mi
-50.0 Start 1 2 3 4 5	Range 1 2 3 4	Start Freq           2.4750 GHz           2.4905 GHz           2.4960 GHz           2.4990 GHz	Stop Freq           2.4905 GHz           2.4960 GHz           2.4990 GHz           2.5000 GHz	RBW 1.000 MHz 1.000 MHz 1.000 MHz 360.0 KHz	2.488588333 GH 2.496000000 GH 2.498460000 GH 2.499746667 GH	z -39.13 dBm z -36.26 dBm z -31.30 dBm z -33.73 dBm	Stop 2.525 GH: △ Limit -14.13 dB -23.26 dB -21.30 dB -23.73 dB	Auto Freq Of

Plot 7-154. Lower ACP Plot (Band 7 – 20.0MHz QPSK – RB Size 100)



Plot 7-155. Upper ACP Plot (Band 7 – 20.0MHz QPSK – RB Size 100)

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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 > Emission bandwidth of signal
- 4. The signal analyzer was set to collect one million samples to generate the CCDF curve
- 5. The measurement interval was set depending on the type of signal analyzed. For continuous signals (>98% duty cycle), the measurement interval was set to 1ms.

## Test Setup

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



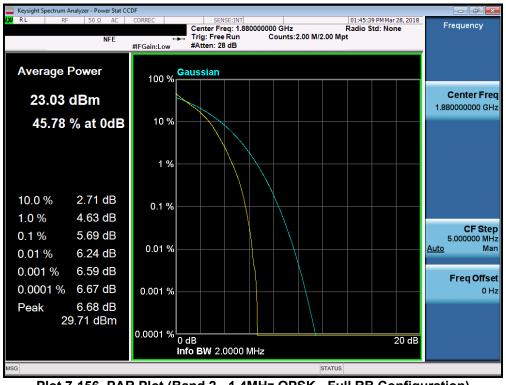
Figure 7-4. Test Instrument & Measurement Setup

#### Test Notes

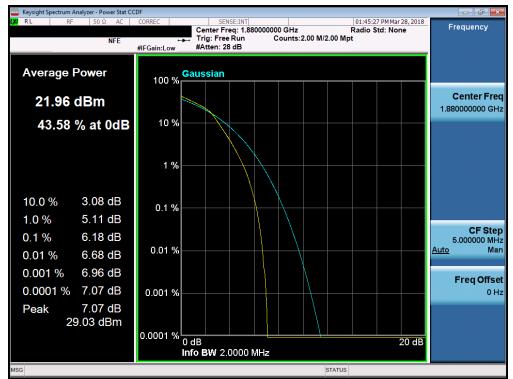
None.

FCC ID: A3LSMJ337V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager	
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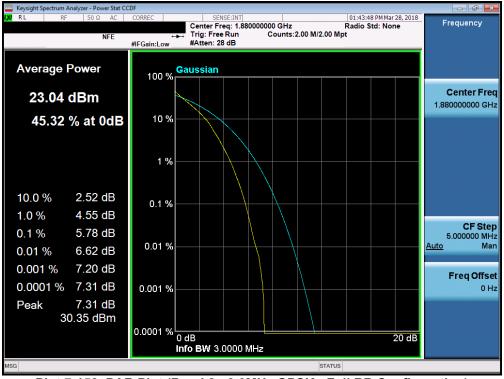


## Plot 7-157. PAR Plot (Band 2 - 1.4MHz 16-QAM - Full RB Configuration)

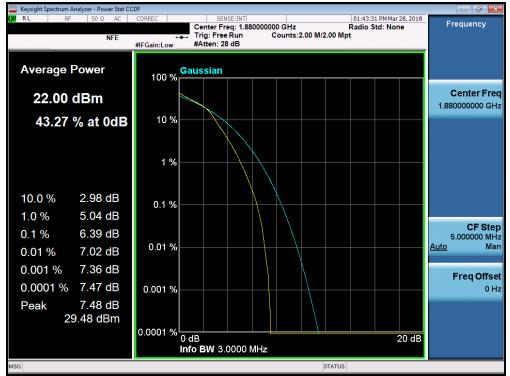
FCC ID: A3LSMJ337V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager	
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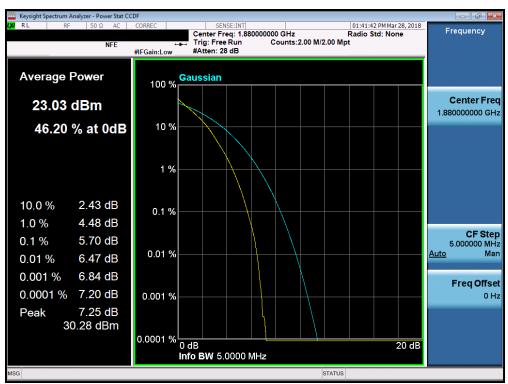




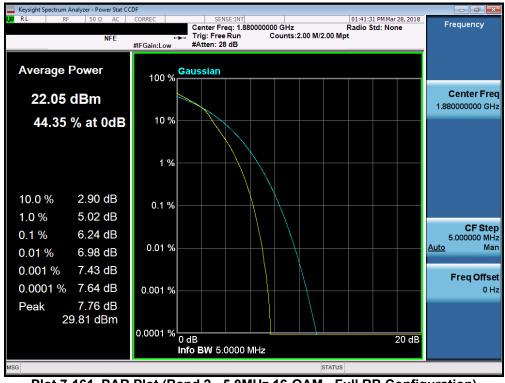
Plot 7-159. PAR Plot (Band 2 - 3.0MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMJ337V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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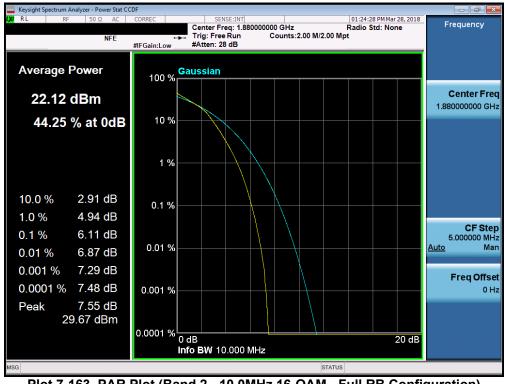
Plot 7-161. PAR Plot (Band 2 - 5.0MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMJ337V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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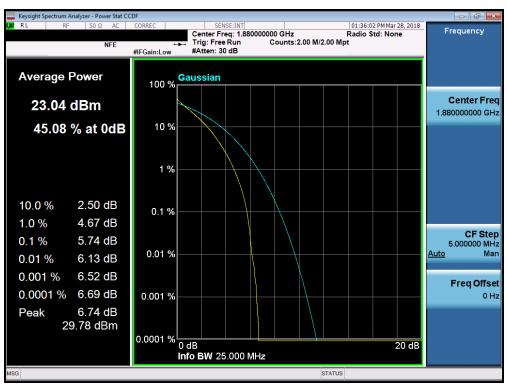




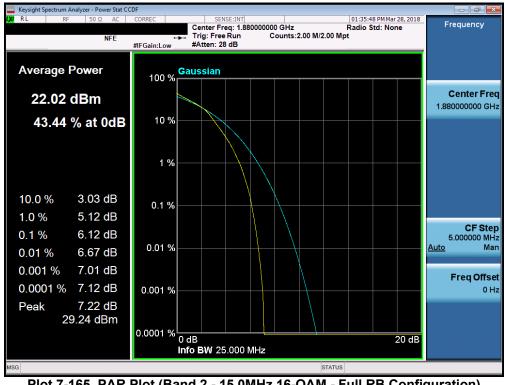
Plot 7-163. PAR Plot (Band 2 - 10.0MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMJ337V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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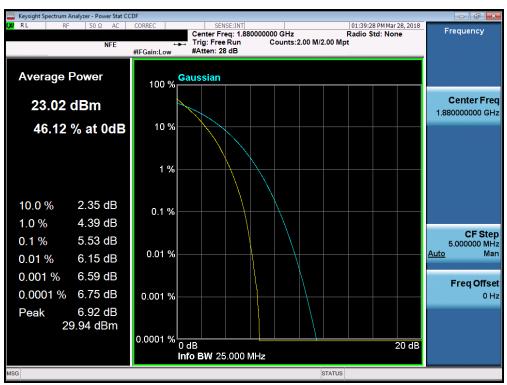




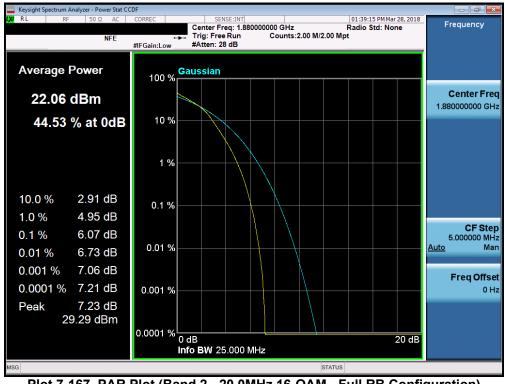
Plot 7-165. PAR Plot (Band 2 - 15.0MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMJ337V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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Plot 7-167. PAR Plot (Band 2 - 20.0MHz 16-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 and horizontally polarized broadband horn antennas. All measurements are performed as RMS average measurements while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

## Test Procedures Used

KDB 971168 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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# Test Setup

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

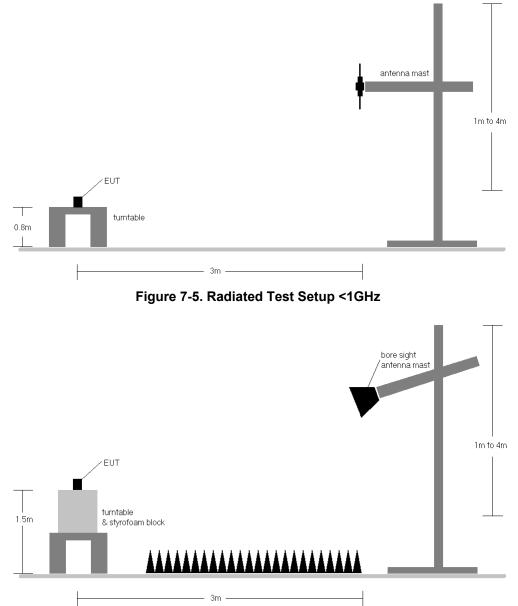


Figure 7-6. Radiated Test Setup >1GHz

# 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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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	Н	150	350	1 / 24	17.87	1.32	17.04	0.051	34.77	-17.73	19.19	0.083	36.99	-17.80
782.00	5	QPSK	Н	150	350	1 / 0	18.02	1.33	17.20	0.052	34.77	-17.57	19.35	0.086	36.99	-17.64
784.50	5	QPSK	Н	150	350	1 / 24	18.52	1.34	17.71	0.059	34.77	-17.06	19.86	0.097	36.99	-17.13
782.00	5	16-QAM	Н	150	350	1 / 24	17.94	1.33	17.12	0.052	34.77	-17.65	19.27	0.084	36.99	-17.72
782.00	10	QPSK	Н	150	356	1 / 49	18.61	1.33	17.79	0.060	34.77	-16.98	19.94	0.099	36.99	-17.05
782.00	10	16-QAM	Н	150	356	1 / 49	17.91	1.33	17.09	0.051	34.77	-17.68	19.24	0.084	36.99	-17.75
782.00	10	QPSK	V	150	8	1 / 74	17.22	1.33	16.40	0.044	34.77	-18.37	18.55	0.072	36.99	-18.44

Table 7-3. ERP Data (Band 13)

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	150	348	1 / 5	19.87	1.50	19.22	0.084	38.45	-19.23	21.37	0.137	40.61	-19.24
836.50	1.4	QPSK	V	150	348	1 / 0	22.33	1.50	21.68	0.147	38.45	-16.77	23.83	0.242	40.61	-16.78
848.30	1.4	QPSK	V	150	348	1 / 0	22.11	1.50	21.46	0.140	38.45	-16.99	23.61	0.230	40.61	-17.00
836.50	1.4	16-QAM	V	150	348	1 / 0	21.59	1.50	20.94	0.124	38.45	-17.51	23.09	0.204	40.61	-17.52
825.50	3	QPSK	V	150	349	1 / 0	19.85	1.50	19.20	0.083	38.45	-19.25	21.35	0.136	40.61	-19.26
836.50	3	QPSK	V	150	349	1 / 0	22.53	1.50	21.88	0.154	38.45	-16.57	24.03	0.253	40.61	-16.58
847.50	3	QPSK	V	150	349	1 / 0	22.14	1.50	21.49	0.141	38.45	-16.96	23.64	0.231	40.61	-16.97
836.50	3	16-QAM	V	150	349	1 / 0	22.01	1.50	21.36	0.137	38.45	-17.09	23.51	0.224	40.61	-17.10
826.50	5	QPSK	V	150	350	1 / 0	19.89	1.50	19.24	0.084	38.45	-19.21	21.39	0.138	40.61	-19.22
836.50	5	QPSK	V	150	350	1 / 0	22.62	1.50	21.97	0.157	38.45	-16.48	24.12	0.258	40.61	-16.49
846.50	5	QPSK	V	150	350	1 / 0	21.94	1.50	21.29	0.135	38.45	-17.16	23.44	0.221	40.61	-17.17
836.50	5	16-QAM	V	150	350	1 / 0	21.92	1.50	21.27	0.134	38.45	-17.18	23.42	0.220	40.61	-17.19
829.00	10	QPSK	V	150	348	1 / 0	19.70	1.50	19.05	0.080	38.45	-19.40	21.20	0.132	40.61	-19.41
836.50	10	QPSK	V	150	348	1 / 0	22.25	1.50	21.60	0.145	38.45	-16.85	23.75	0.237	40.61	-16.86
844.00	10	QPSK	V	150	348	1 / 0	21.57	1.50	20.92	0.124	38.45	-17.53	23.07	0.203	40.61	-17.54
836.50	10	16-QAM	V	150	348	1 / 0	21.50	1.50	20.85	0.122	38.45	-17.60	23.00	0.200	40.61	-17.61
836.50	5	QPSK	Н	150	163	1 / 0	21.93	1.50	21.28	0.134	38.45	-17.17	23.43	0.220	40.61	-17.18

Table 7-4. ERP Data (Band 5)

FCC ID: A3LSMJ337V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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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	V	150	108	3 / 2	16.03	5.65	21.68	0.147	30.00	-8.32
1732.50	1.4	QPSK	V	150	108	3 / 2	16.64	5.41	22.05	0.160	30.00	-7.95
1754.30	1.4	QPSK	V	150	108	3 / 2	16.55	5.17	21.72	0.149	30.00	-8.28
1732.50	1.4	16-QAM	V	150	108	3 / 2	15.78	5.41	21.19	0.131	30.00	-8.81
1711.50	3	QPSK	V	150	278	1 / 0	16.42	5.64	22.06	0.161	30.00	-7.94
1732.50	3	QPSK	V	150	278	1 / 14	16.65	5.41	22.06	0.161	30.00	-7.94
1753.50	3	QPSK	V	150	278	1 / 0	16.23	5.18	21.41	0.138	30.00	-8.59
1711.50	3	16-QAM	V	150	278	1 / 0	15.46	5.64	21.10	0.129	30.00	-8.90
1712.50	5	QPSK	V	150	286	1 / 0	16.18	5.63	21.81	0.152	30.00	-8.19
1732.50	5	QPSK	V	150	286	1 / 24	16.48	5.41	21.89	0.154	30.00	-8.11
1752.50	5	QPSK	V	150	286	1 / 0	16.32	5.19	21.51	0.142	30.00	-8.49
1732.50	5	16-QAM	V	150	286	1 / 0	15.59	5.41	21.00	0.126	30.00	-9.00
1715.00	10	QPSK	V	150	284	1 / 0	16.53	5.60	22.13	0.163	30.00	-7.87
1732.50	10	QPSK	V	150	284	1 / 0	16.74	5.41	22.15	0.164	30.00	-7.85
1750.00	10	QPSK	V	150	284	1 / 0	16.02	5.22	21.24	0.133	30.00	-8.76
1732.50	10	16-QAM	V	150	284	1 / 0	15.93	5.41	21.34	0.136	30.00	-8.66
1717.50	15	QPSK	V	150	285	1 / 0	16.54	5.57	22.11	0.163	30.00	-7.89
1732.50	15	QPSK	V	150	285	1 / 0	16.40	5.41	21.81	0.152	30.00	-8.19
1747.50	15	QPSK	V	150	285	1 / 0	16.23	5.24	21.47	0.140	30.00	-8.53
1717.50	15	16-QAM	V	150	285	1 / 0	15.67	5.57	21.24	0.133	30.00	-8.76
1720.00	20	QPSK	V	150	279	1 / 0	16.37	5.54	21.91	0.155	30.00	-8.09
1732.50	20	QPSK	V	150	279	1/0	16.60	5.41	22.01	0.159	30.00	-7.99
1745.00	20	QPSK	V	150	279	1/0	16.65	5.27	21.92	0.156	30.00	-8.08
1732.50	20	16-QAM	V	150	279	1/0	15.78	5.41	21.19	0.131	30.00	-8.81
1732.50	10	QPSK	Н	150	10	1 / 99	15.14	5.41	20.55	0.113	30.00	-9.45

Table 7-5. EIRP Data (Band 4)

FCC ID: A3LSMJ337V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 110 of 126
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	ENGINEERING LABORATORY, INC.

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	150	17	3 / 2	18.31	4.82	23.13	0.205	33.01	-9.88
1880.00	1.4	QPSK	Н	150	17	3 / 2	17.86	4.74	22.60	0.182	33.01	-10.41
1909.30	1.4	QPSK	Н	150	17	3 / 2	17.72	4.68	22.40	0.174	33.01	-10.61
1880.00	1.4	16-QAM	Н	150	17	3 / 2	17.88	4.74	22.62	0.183	33.01	-10.39
1851.50	3	QPSK	Н	150	16	1 / 0	18.37	4.82	23.19	0.208	33.01	-9.82
1880.00	3	QPSK	Н	150	16	1/0	17.78	4.74	22.52	0.179	33.01	-10.49
1908.50	3	QPSK	Н	150	16	1 / 0	17.90	4.68	22.58	0.181	33.01	-10.43
1851.50	3	16-QAM	Н	150	16	1 / 0	17.52	4.82	22.34	0.171	33.01	-10.67
1852.50	5	QPSK	Н	150	15	1 / 0	18.20	4.81	23.01	0.200	33.01	-10.00
1880.00	5	QPSK	Н	150	15	1 / 0	17.68	4.74	22.42	0.175	33.01	-10.59
1907.50	5	QPSK	Н	150	15	1 / 0	17.79	4.68	22.47	0.177	33.01	-10.54
1852.50	5	16-QAM	Н	150	15	1 / 0	17.15	4.81	21.96	0.157	33.01	-11.05
1855.00	10	QPSK	Н	150	18	1 / 0	18.16	4.81	22.97	0.198	33.01	-10.04
1880.00	10	QPSK	Н	150	16	1 / 0	17.94	4.74	22.68	0.185	33.01	-10.33
1905.00	10	QPSK	Н	150	18	1 / 0	17.74	4.68	22.42	0.175	33.01	-10.59
1855.00	10	16-QAM	Н	150	18	1 / 0	17.33	4.81	22.14	0.164	33.01	-10.87
1857.50	15	QPSK	Н	150	18	1 / 0	18.43	4.80	23.23	0.210	33.01	-9.78
1880.00	15	QPSK	Н	150	18	1 / 0	17.92	4.74	22.66	0.185	33.01	-10.35
1902.50	15	QPSK	Н	150	18	1 / 0	17.77	4.69	22.46	0.176	33.01	-10.55
1857.50	15	16-QAM	Н	150	18	1 / 0	17.46	4.80	22.26	0.168	33.01	-10.75
1860.00	20	QPSK	Н	150	16	1 / 0	18.30	4.79	23.09	0.204	33.01	-9.92
1880.00	20	QPSK	Н	150	16	1/0	17.93	4.74	22.67	0.185	33.01	-10.34
1900.00	20	QPSK	Н	150	16	1/0	17.65	4.69	22.34	0.171	33.01	-10.67
1860.00	20	16-QAM	Н	150	16	1/0	17.37	4.79	22.16	0.165	33.01	-10.85
1857.50	15	QPSK	V	150	337	1 / 99	13.89	3.68	17.57	0.057	33.01	-15.44

Table 7-6. EIRP Data (Band 2)

FCC ID: A3LSMJ337V		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
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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]
2502.50	5	QPSK	Н	150	41	1 / 24	16.58	5.74	22.32	0.171	33.01	-10.69
2535.00	5	QPSK	Н	150	41	1 / 24	18.97	5.86	24.83	0.304	33.01	-8.18
2567.50	5	QPSK	Н	150	41	1 / 0	17.87	5.98	23.85	0.243	33.01	-9.16
2535.00	5	16-QAM	Н	150	41	1 / 24	18.22	5.86	24.08	0.256	33.01	-8.93
2505.00	10	QPSK	Н	150	46	1 / 49	16.87	5.75	22.62	0.183	33.01	-10.39
2535.00	10	QPSK	Н	150	41	1 / 49	18.64	5.86	24.50	0.282	33.01	-8.51
2565.00	10	QPSK	Н	150	46	1 / 49	17.30	5.97	23.27	0.212	33.01	-9.74
2535.00	10	16-QAM	Н	150	41	1 / 49	18.12	5.86	23.98	0.250	33.01	-9.03
2507.50	15	QPSK	Н	150	40	1 / 74	16.58	5.76	22.34	0.171	33.01	-10.67
2535.00	15	QPSK	Н	150	40	1 / 74	18.65	5.86	24.51	0.283	33.01	-8.50
2562.50	15	QPSK	Н	150	40	1 / 74	17.78	5.96	23.74	0.237	33.01	-9.27
2535.00	15	16-QAM	Н	150	40	1 / 74	18.07	5.86	23.93	0.247	33.01	-9.08
2510.00	20	QPSK	Н	150	38	1 / 99	16.12	5.77	21.89	0.154	33.01	-11.12
2535.00	20	QPSK	Н	150	38	1 / 99	18.05	5.86	23.91	0.246	33.01	-9.10
2560.00	20	QPSK	Н	150	38	1/0	17.25	5.95	23.20	0.209	33.01	-9.81
2535.00	20	16-QAM	Н	150	38	1 / 99	17.41	5.86	23.27	0.212	33.01	-9.74
2535.00	5	QPSK	V	150	154	1/0	15.43	5.85	21.28	0.134	33.01	-11.73

Table 7-7. EIRP Data (Band 7)

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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

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EUT turntable 8. styrofoam block 3m ______

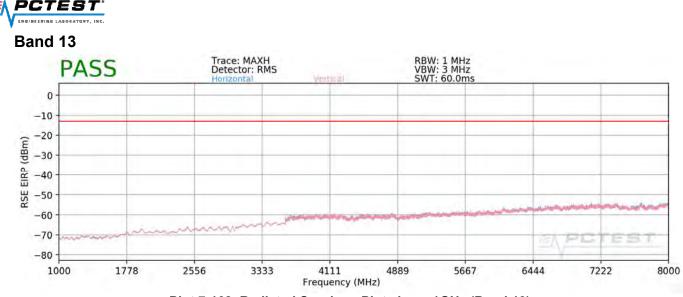
The EUT and measurement equipment were set up as shown in the diagram below.

Figure 7-7. Test Instrument & Measurement Setup

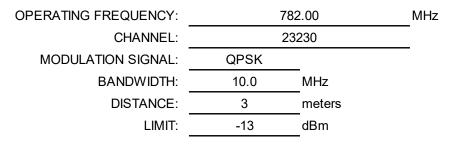
#### Test Notes

- 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 7-168. Radiated Spurious Plot above 1GHz (Band 13)



Frequency [MHz]	Ant. Pol. [H/V]	Height	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
2346.00	Н	-	-	-68.02	4.88	-63.14	-50.1

Table 7-8. Radiated Spurious Data (Band 13 – Mid Channel)

FCC ID: A3LSMJ337V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dego 115 of 126	
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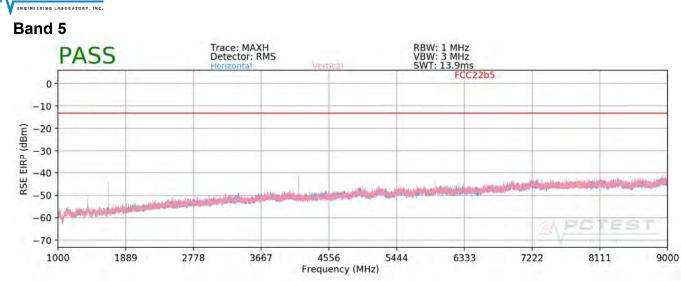


MODULATION SIGNAL:	QPSK	
BANDWIDTH:	10.00	MHz
DISTANCE:	3	meters
NARROWBAND EMISSION LIMIT:	-50	dBm
WIDEBAND EMISSION LIMIT:	-40	dBm/MHz
		-

Frequen [MHz]	cy Ant. Pol. [H/V]	Antenna Height [cm]	Azimuth	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1564.00	) Н	-	-	-71.45	4.50	-66.95	-26.9

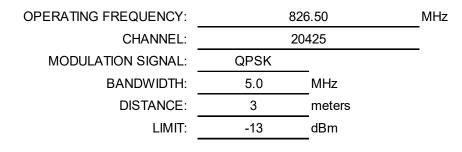
Table 7-9. Radiated Spurious Data (Band 13 – 1559-1610MHz Band)

FCC ID: A3LSMJ337V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dage 116 of 126	
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#### Plot 7-169. Radiated Spurious Plot above 1GHz (Band 5)

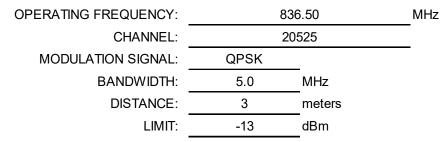


Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1653.00	V	150	285	-53.86	4.82	-49.04	-36.0
2479.50	V	-	-	-66.29	5.01	-61.28	-48.3

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

FCC ID: A3LSMJ337V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 117 of 126
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Frequency [MHz]	Ant. Pol. [H/V]	Height	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1673.00	V	150	73	-55.12	4.86	-50.26	-37.3
2509.50	V	-	-	-66.37	5.10	-61.27	-48.3

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

QPSK

5.0

3

846.50

20625

MHz

dBm

meters

MHz

OPERATING FREQUENCY:

CHANNEL:

MODULATION SIGNAL:

BANDWIDTH:

DISTANCE:

LIMIT: -13

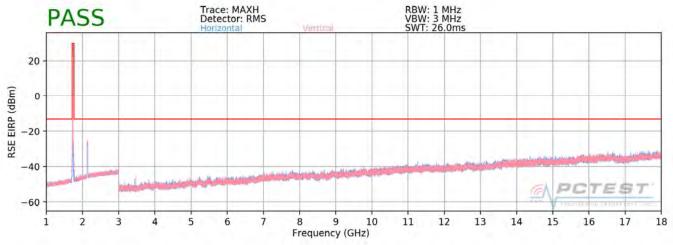
Ant. Antenna Turntable Level at Substitute Spurious Frequency Margin **Emission Level** Pol. Height Azimuth Antenna Antenna Gain [MHz] [dB] [H/V] Terminals [dBm] [cm] [degree] [dBi] [dBm] 1693.00 V 150 259 -56.90 4.90 -52.00 -39.0 2539.50 V -66.65 5.25 -61.40 -48.4--

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

FCC ID: A3LSMJ337V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Daga 119 of 126
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#### FCC27b4



Plot 7-170. Radiated Spurious Plot above 1GHz (Band 4)

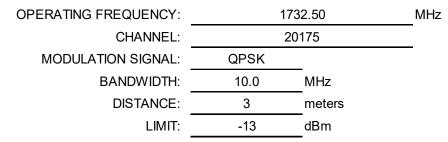
OPERATING FREQUENCY:	17	15.00	MHz
CHANNEL:	20	000	
MODULATION SIGNAL:	QPSK		
BANDWIDTH:	10.0	MHz	
DISTANCE:	3	meters	
LIMIT:	-13	dBm	

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]
3430.00	V	150	185	-56.73	6.49	-50.24	-37.2
5145.00	V	-	-	-66.21	8.43	-57.78	-44.8

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

FCC ID: A3LSMJ337V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 110 of 126
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Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3465.00	V	150	167	-56.98	6.56	-50.42	-37.4
5197.50	V	-	-	-65.88	8.45	-57.43	-44.4

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

1750.00

meters

MHz

OPERATING FREQUENCY:

CHANNEL:20350MODULATION SIGNAL:QPSKBANDWIDTH:10.0MHz

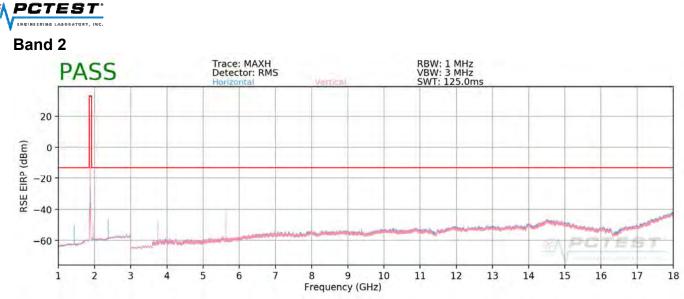
DISTANCE: 3

LIMIT: _____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]
	3500.00	V	150	261	-58.51	6.60	-51.91	-38.9
ľ	5250.00	V	-	-	-65.40	8.41	-56.99	-44.0

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

FCC ID: A3LSMJ337V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 120 of 126
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### Plot 7-171. Radiated Spurious Plot above 1GHz (Band 2)

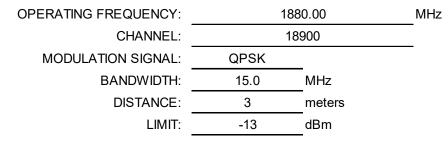
OPERATING FREQUENCY:	185	57.50	MHz
CHANNEL:	18	675	
MODULATION SIGNAL:	QPSK	_	
BANDWIDTH:	15.0	MHz	
DISTANCE:	3	meters	
LIMIT:	-13	dBm	

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]
3715.00	Н	150	259	-56.36	8.34	-48.02	-35.0
5572.50	Н	150	236	-53.17	10.56	-42.60	-29.6
7430.00	Н	-	-	-66.15	11.96	-54.19	-41.2

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

FCC ID: A3LSMJ337V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 101 of 106
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Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3760.00	Н	150	248	-58.20	8.46	-49.74	-36.7
5640.00	Н	150	21	-48.46	10.60	-37.86	-24.9
7520.00	Н	-	-	-65.67	12.11	-53.56	-40.6

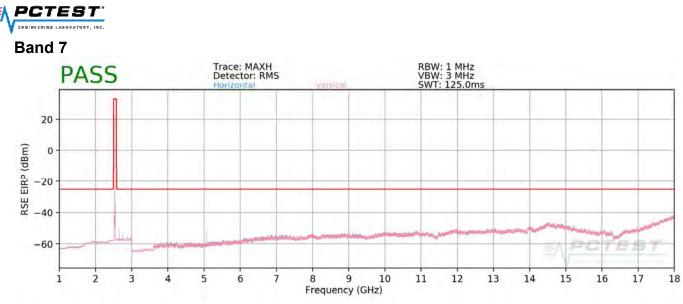
Table 7-17. Radiated Spurious Data (Band 2 – Mid Channel)

OPERATING FREQUENCY:	1902.50		MHz
CHANNEL:	19	9125	
MODULATION SIGNAL:	QPSK		
BANDWIDTH:	15.0	MHz	
DISTANCE:	3	meters	
LIMIT:	-13 dBm		
DISTANCE:	3	meters	

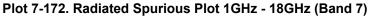
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3805.00	Н	150	253	-57.57	8.56	-49.01	-36.0
5707.50	Н	150	21	-48.04	10.60	-37.44	-24.4
7610.00	Н	-	-	-63.01	12.15	-50.85	-37.9

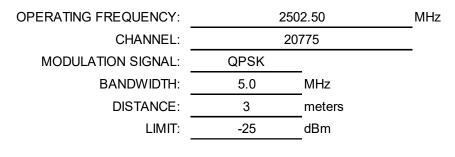
Table 7-18. Radiated Spurious Data (Band 2 – High Channel)

FCC ID: A3LSMJ337V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dama 400 af 400	
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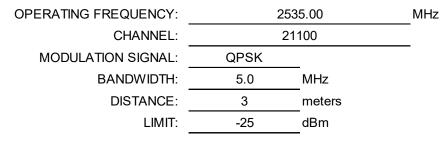


Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5005.00	Н	150	230	-54.29	8.33	-45.95	-21.0
7507.50	Н	-	-	-62.81	8.43	-54.38	-29.4

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

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Frequency [MHz]	Ant. Pol. [H/V]	Height	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5070.00	Н	-	-	-66.61	8.39	-58.22	-33.2

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

OPERATING FREQUENCY:	256	67.50	MHz
CHANNEL:	21	425	
MODULATION SIGNAL:	QPSK		
BANDWIDTH:	5.0	MHz	
DISTANCE:	3	meters	
LIMIT:	-25	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]
5135.00	Н	150	233	-54.36	8.43	-45.94	-20.9
7702.50	Н	-	-	-61.89	8.67	-53.22	-28.2

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

FCC ID: A3LSMJ337V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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### 7.8 Frequency Stability / Temperature Variation

### Test Overview and Limit

Frequency stability testing is performed in accordance with the guidelines of ANSI/TIA-603-E-2016. The frequency stability of the transmitter is measured by:

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

For Part 22, the frequency stability of the transmitter shall be maintained within  $\pm 0.00025\%$  ( $\pm 2.5$  ppm) of the center frequency. For Part 24, 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

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### **Band 13 Frequency Stability Measurements**

OPERATING FREQUENCY:	782,000,000	Hz
CHANNEL:	23230	_
REFERENCE VOLTAGE:	3.80	VDC

VOLTAGE (%)	POWER (VDC)	<b>ТЕМР</b> ( [°] С)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	781,999,965	-35	-0.0000045
100 %		- 30	781,999,956	-44	-0.0000057
100 %		- 20	781,999,861	-139	-0.0000178
100 %		- 10	781,999,993	-7	-0.0000009
100 %		0	781,999,982	-18	-0.0000023
100 %		+ 10	781,999,972	-28	-0.0000036
100 %		+ 20	781,999,823	-177	-0.0000226
100 %		+ 30	781,999,902	-98	-0.0000126
100 %		+ 40	781,999,913	-87	-0.0000111
100 %		+ 50	781,999,817	-183	-0.0000234
BATT. ENDPOINT	3.40	+ 20	781,999,947	-53	-0.0000068

 Table 7-22. Frequency Stability Data (Band 13)

### Note:

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

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**Band 13 Frequency Stability Measurements** 

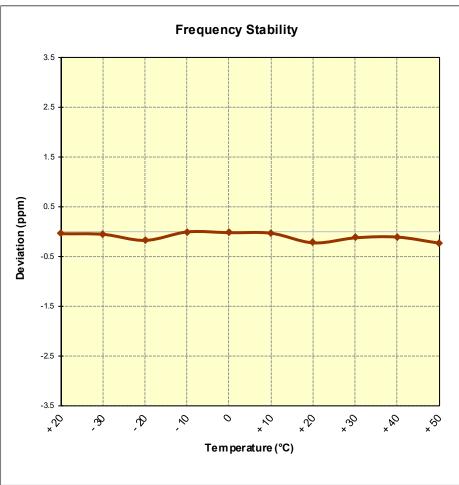


Figure 7-8. Frequency Stability Graph (Band 13)

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# **Band 5 Frequency Stability Measurements**

OPERATING FREQUENCY:	836,500,000	Hz
CHANNEL:	20525	_
REFERENCE VOLTAGE:	3.80	VDC
DEVIATION LIMIT:	± 0.00025 % or 2.5 ppm	

VOLTAGE (%)	POWER (VDC)	<b>ТЕМР</b> (°С)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	836,499,966	-34	-0.0000041
100 %		- 30	836,499,937	-63	-0.0000076
100 %		- 20	836,499,879	-121	-0.0000145
100 %		- 10	836,499,912	-88	-0.0000105
100 %		0	836,499,914	-86	-0.0000102
100 %		+ 10	836,499,922	-78	-0.0000093
100 %		+ 20	836,499,942	-58	-0.0000070
100 %		+ 30	836,499,952	-48	-0.0000058
100 %		+ 40	836,499,883	-117	-0.0000140
100 %		+ 50	836,499,871	-129	-0.0000154
BATT. ENDPOINT	3.40	+ 20	836,499,840	-160	-0.0000191

 Table 7-23. Frequency Stability Data (Band 5)

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## **Band 5 Frequency Stability Measurements**

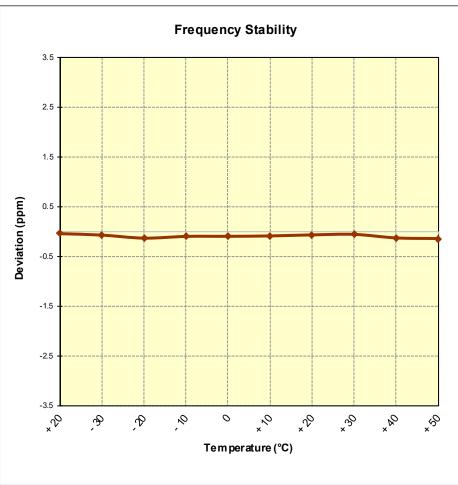


Figure 7-9. Frequency Stability Graph (Band 5)

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

OPERATING FREQUENCY:	1,732,500,000	Hz
CHANNEL:	20175	_
REFERENCE VOLTAGE:	3.80	VDC

VOLTAGE (%)	POWER (VDC)	<b>ТЕМР</b> ( [°] С)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	1,732,499,903	-97	-0.0000056
100 %		- 30	1,732,499,976	-24	-0.0000014
100 %		- 20	1,732,499,826	-174	-0.0000100
100 %		- 10	1,732,499,938	-62	-0.0000036
100 %		0	1,732,499,998	-2	-0.0000001
100 %		+ 10	1,732,499,874	-126	-0.0000073
100 %		+ 20	1,732,499,836	-164	-0.0000095
100 %		+ 30	1,732,499,962	-38	-0.0000022
100 %		+ 40	1,732,499,838	-162	-0.0000094
100 %		+ 50	1,732,499,889	-111	-0.0000064
BATT. ENDPOINT	3.40	+ 20	1,732,499,931	-69	-0.0000040

 Table 7-24. Frequency Stability Data (Band 4)

### Note:

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

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## **Band 4 Frequency Stability Measurements**

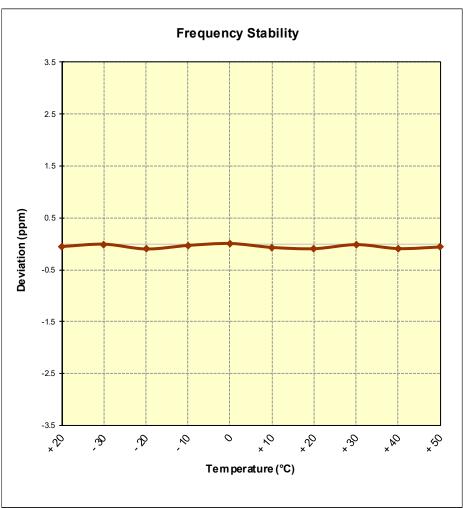


Figure 7-10. Frequency Stability Graph (Band 4)

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# **Band 2 Frequency Stability Measurements**

OPERATING FREQUENCY:	1,880,000,000	Hz
CHANNEL:	18900	_
REFERENCE VOLTAGE:	3.80	VDC
DEVIATION LIMIT:	± 0.00025 % or 2.5 ppm	

VOLTAGE (%)	POWER (VDC)	<b>ТЕМР</b> (°С)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	1,879,999,966	-34	-0.0000018
100 %		- 30	1,879,999,992	-8	-0.0000004
100 %		- 20	1,879,999,902	-98	-0.0000052
100 %		- 10	1,879,999,925	-75	-0.0000040
100 %		0	1,879,999,808	-192	-0.0000102
100 %		+ 10	1,879,999,844	-156	-0.000083
100 %		+ 20	1,879,999,964	-36	-0.0000019
100 %		+ 30	1,879,999,918	-82	-0.0000044
100 %		+ 40	1,879,999,884	-116	-0.0000062
100 %		+ 50	1,879,999,898	-102	-0.0000054
BATT. ENDPOINT	3.40	+ 20	1,879,999,950	-50	-0.0000026

Table 7-25. Frequency Stability Data (Band 2)

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## **Band 2 Frequency Stability Measurements**

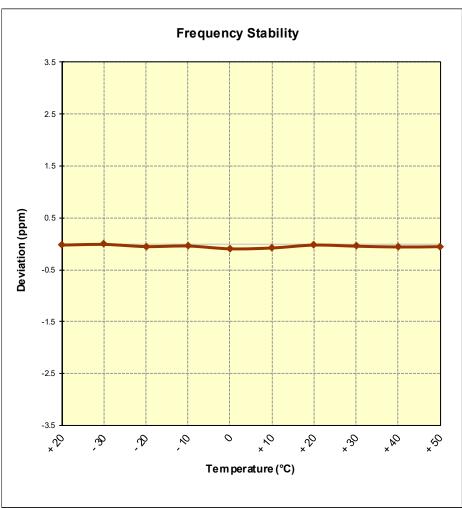


Figure 7-11. Frequency Stability Graph (Band 2)

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### **Band 7 Frequency Stability Measurements**

OPERATING FREQUENCY:	2,535,000,000	Hz
CHANNEL:	21100	_
REFERENCE VOLTAGE:	3.80	VDC

VOLTAGE (%)	POWER (VDC)	<b>ТЕМР</b> ( [°] С)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	3.80	+ 20 (Ref)	2,534,999,912	-88	-0.0000035
100 %		- 30	2,534,999,815	-185	-0.0000073
100 %		- 20	2,534,999,809	-191	-0.0000075
100 %		- 10	2,534,999,857	-143	-0.0000056
100 %		0	2,534,999,817	-183	-0.0000072
100 %		+ 10	2,534,999,989	-11	-0.0000004
100 %		+ 20	2,534,999,911	-89	-0.0000035
100 %		+ 30	2,534,999,870	-130	-0.0000051
100 %		+ 40	2,534,999,843	-157	-0.0000062
100 %		+ 50	2,534,999,934	-66	-0.0000026
BATT. ENDPOINT	3.40	+ 20	2,534,999,833	-167	-0.0000066

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

### Note:

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

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## **Band 7 Frequency Stability Measurements**

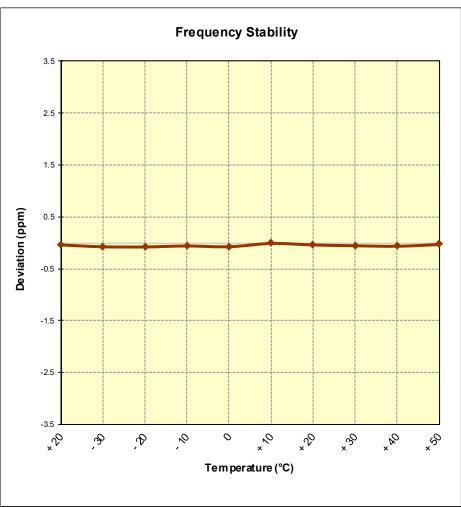


Figure 7-12. Frequency Stability Graph (Band 7)

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# 8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Samsung Portable Handset FCC ID: A3LSMJ337V** complies with all the requirements of Part 22, 24, & 27 of the FCC Rules for LTE operation only.

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