

## 7.4 Band Edge Emissions at Antenna Terminal

#### **Test Overview**

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

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

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

#### **Test Procedure Used**

KDB 971168 D01 v03 - Section 6.0

#### **Test Settings**

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

#### Test Setup

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

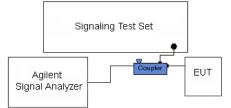


Figure 7-3. Test Instrument & Measurement Setup

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#### Test Notes

Per 22.917(b) 24.238(a) 27.53(h) in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to demonstrate compliance with the out-of-band emissions limit. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emission are attenuated at least 26 dB below the transmitter power.

27.53(c)(5) for operations in the 776-788 MHz band, in the 100 kHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least 30 kHz may be employed to demonstrate compliance with the out-of-band emissions limit.

For all plots showing emissions in the 763 - 775MHz and 793 - 805MHz band, the FCC limit per 27.53(c)(4) is  $65 + 10log_{10}(P) = -35dBm$  in a 6.25kHz bandwidth.

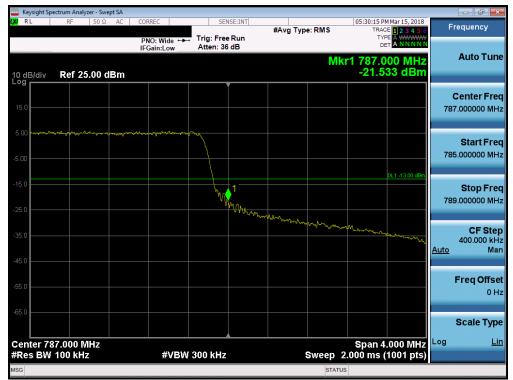
Per 27.53(m) for operations in the BRS/EBS bands, the attenuation factor shall be not less than  $40 + 10 \log (P) dB$  on all frequencies between the channel edge and 5 megahertz from the channel edge,  $43 + 10 \log (P) dB$  on all frequencies between 5 megahertz and X megahertz from the channel edge,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

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Plot 7-84. Lower Band Edge Plot (Band 13 - 5.0MHz QPSK - Full RB Configuration)



Plot 7-85. Upper Band Edge Plot (Band 13 - 5.0MHz QPSK - Full RB Configuration)

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a Rey	sight Spectrur				CORREC		SE	NSE:INT				05:51:40 F	M Mar 15, 2018	_	
						Vide 🕞		e Run		#Avg Typ	e:RMS	TRA	CE 1 2 3 4 5 6 PE A WWWWW ET A N N N N N	F	requency
0 dB	3/div R	ef 25.0	0 dE		IFGalli	LOW	Atten: 0				Mk	r1 776.9	968 MHz 52 dBm		Auto Tun
. <b>og</b> 15.0															Center Fre 7.000000 M⊦
5.00 - 5.00 -									m	- yeleyn prospiel a ym	Myson and the second	Muser (Mariler V		77	<b>Start Fre</b> 3.000000 Mi
15.0 25.0							Jhr						DL1 -13.00 dBm	78	<b>Stop Fr</b> 1.000000 M
15.0 - 15.0 -						ar and a start and a start	photon With a							<u>Auto</u>	CF Ste 800.000 ki M
i5.0	May may may and the start of th	UMala Maria	w.prost	ann an	www										Freq Offs 0
i5.0 -															Scale Typ
	ter 777.0 s BW 101		Z			#VBW	/ 300 kHz				Sweep 4	Span 8 .000 ms	3.000 MHz (1001 pts)	Log	L
SG											STATUS	3			

Plot 7-86. Lower Band Edge Plot (Band 13 - 10.0MHz QPSK - Full RB Configuration)

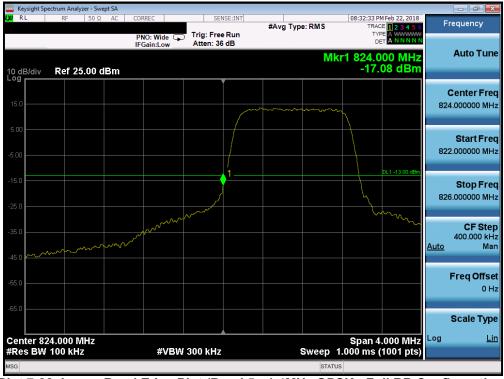


Plot 7-87. Upper Band Edge Plot (Band 13 - 10.0MHz QPSK - Full RB Configuration)

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## Band 5



Plot 7-88. Lower Band Edge Plot (Band 5 - 1.4MHz QPSK - Full RB Configuration)

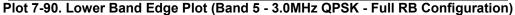


Plot 7-89. Upper Band Edge Plot (Band 5 - 1.4MHz QPSK - Full RB Configuration)

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Keysight Spectr R R L	rum Analyzer - Swej	000050		ICE THE			00.05.57.0	15 1 22 2010	_	
KL	RF 50 Ω	CORREC PNO: Wide C			#Avg Typ	e: RMS	TRAC	M Feb 22, 2018 E 1 2 3 4 5 6 PE A WWWWW	F	requency
0 dB/div	Ref 25.00 d	IFGain:Low	Atten: 30			M	(r1 823.9			Auto Tun
15.0							~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~			Center Fre 4.000000 M⊦
5.00									82	<b>Start Fre</b> 2.000000 Mi
25.0			- A	/ /				DL1 -13.00 dBm	82	<b>Stop Fre</b> 6.000000 Mi
15.0	~~~~~	 							<u>Auto</u>	CF Ste 400.000 kl M
5.0										Freq Offs 01
i5.0										Scale Typ
enter 824. Res BW 1		#VB	W 300 kHz			Sweep	Span 4 1.000 ms (		Log	Ŀ
SG						STATU	IS			





Plot 7-91. Upper Band Edge Plot (Band 5 - 3.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMJ737V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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	trum Analyzer - Swep										
LXI RL	RF 50 Ω	AC COR	REC		ISE:INT	#Avg Typ	e: RMS	TRAC	Feb 22, 2018	Fr	equency
10 dB/div	Ref 25.00 d	IFG	O: Wide ⊂ ain:Low	Trig: Free Atten: 36			Mk	□ 1 823.9	96 MHz 54 dBm		Auto Tune
15.0											enter Freq .000000 MHz
-5.00									DL1 -13.00 dBm	822	Start Freq
-15.0				Mrm.	1					826	Stop Freq .000000 MHz
-35.0	<del></del>	~~~~	~~~~~	~ 						<u>Auto</u>	CF Step 400.000 kHz Man
-55.0										i	F <b>req Offse</b> 0 Hz
-65.0 Center 824	.000 MHz							Span 4	.000 MHz	: Log	Scale Type <u>Lin</u>
#Res BW 1			#VBW	300 kHz			Sweep 1	.000 ms (	1001 pts)		
MSG							STATUS				



Plot 7-92. Lower Band Edge Plot (Band 5 - 5.0MHz QPSK - Full RB Configuration)

Plot 7-93. Upper Band Edge Plot (Band 5 - 5.0MHz QPSK - Full RB Configuration)

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Keysight Spectrum Analyzer - Swept SA					
X/RL RF 50Ω AC	CORREC	SENSE:INT	#Avg Type: RMS	08:42:15 PM Feb 22, 2018 TRACE 1 2 3 4 5 6	Frequency
10 dB/div Ref 25.00 dBm	PNO: Wide IFGain:Low	Trig: Free Run Atten: 36 dB	Mł	r1 823.848 MHz -29.80 dBm	Auto Tune
15.0					Center Fred 824.000000 MHz
-5.00				DL1 -13.00 dBm	Start Fred 820.000000 MH;
-15.0		1			Stop Fred 828.000000 MHz
-35.0	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~				CF Step 800.000 kH <u>Auto</u> Mar
-55.0					<b>Freq Offse</b> 0 H
-65.0					Scale Type
Center 824.000 MHz #Res BW 100 kHz	#VBW 3	800 kHz	Sweep	Span 8.000 MHz 1.000 ms (1001 pts)	Log <u>Lir</u>
MSG			STATU	JS	

Plot 7-94. Lower Band Edge Plot (Band 5 - 10.0MHz QPSK - Full RB Configuration)

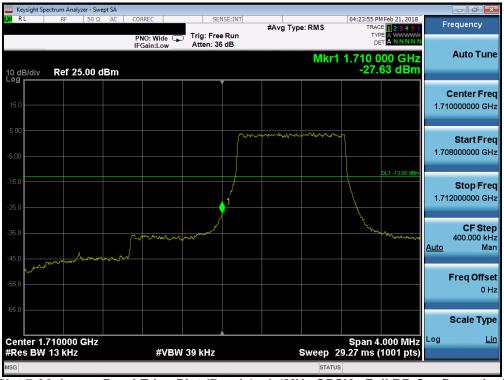


Plot 7-95. Upper Band Edge Plot (Band 5 - 10.0MHz QPSK - Full RB Configuration)

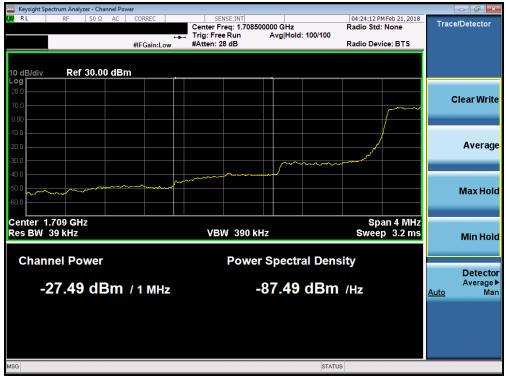
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#### Band 4



Plot 7-96. Lower Band Edge Plot (Band 4 - 1.4MHz QPSK - Full RB Configuration)



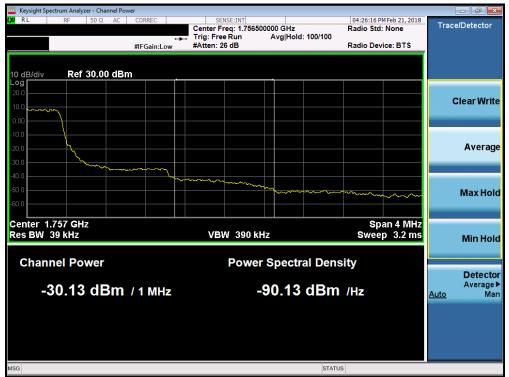
Plot 7-97. Lower Extended Band Edge Plot (Band 4 - 1.4MHz QPSK - Full RB Configuration)

FCC ID: A3LSMJ737V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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	ctrum Analyzer - Swept S					
RL	RF 50 Ω 4	AC CORREC	Trig: Free Run	#Avg Type: RMS	04:25:58 PM Feb 21, 2018 TRACE 1 2 3 4 5 6 TYPE A WWWWW DET A N N N N N	Frequency
) dB/div	Ref 25.00 dB	IFGain:Low _	Atten: 36 dB	Mkr	1 1.755 000 GHz -29.629 dBm	Auto Tur
5.0						Center Fre 1.755000000 GI
00		₩₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽₽			DL1 -13.00 dBm	<b>Start Fr</b> 1.753000000 G
5.0			.1		UC1 - 13.00 dem	<b>Stop Fr</b> 1.757000000 G
5.0	www.www.			management		<b>CF St</b> e 400.000 k <u>Auto</u> M
5.0					man man man	Freq Offs 0
5.0						Scale Ty
enter 1.7 Res BW	755000 GHz 13 kHz	#VB	N 39 kHz	Sweep	Span 4.000 MHz 29.27 ms (1001 pts)	Log <u>l</u>
G				STATI	JS	

Plot 7-98. Upper Band Edge Plot (Band 4 - 1.4MHz QPSK - Full RB Configuration)



Plot 7-99. Upper Extended Band Edge Plot (Band 4 - 1.4MHz QPSK - Full RB Configuration)

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	ectrum Analy													
LXI RL	RF	50 Ω	AC	CORREC			SENSE		#Avg Typ	e: RMS	TF	PM Feb 21, 2018 RACE 1 2 3 4 5 6	F	requency
				PNO: Wi IFGain:L	ide 🖵 .ow	Trig: F								
10 dB/div Log	Ref 2	5.00 dE	₿m							Mkr	1 1.710 -24	000 GHz 4.50 dBm		Auto Tune
15.0														Center Free 10000000 GH
-5.00									h	chan and and and and and and and and and a	un mon	DL1 -13.00 dBm	1.7	<b>Start Fre</b> 08000000 GH
-15.0							1 M	<u> </u>					1.7	<b>Stop Fre</b> 12000000 GH
-35.0	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~~	Am	yh-men		w	r*						<u>Auto</u>	CF Ste 400.000 kH Ma
-55.0														Freq Offse 0 ⊦
-65.0														Scale Typ
Center 1. #Res BW		GHz		#	/VBW	100 ki	Ηz			Sweep	Span 5.467 ms	4.000 MHz s (1001 pts)	Log	Li
ISG										STAT				

Plot 7-100. Lower Band Edge Plot (Band 4 - 3.0MHz QPSK - Full RB Configuration)



Plot 7-101. Lower Extended Band Edge Plot (Band 4 - 3.0MHz QPSK - Full RB Configuration)

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	Analyzer - Swept SA						
L <mark>XI</mark> RL RI	= 50 Ω AC	CORREC	SENSE:	INT #Avg Ty	pe: RMS	04:41:33 PM Feb 21, 2018 TRACE 1 2 3 4 5 6	Frequency
		PNO: Wide 🖵 IFGain:Low	Trig: Free R Atten: 36 dE				
		II GAILLON			Mkr1	1.755 020 GHz	Auto Tune
10 dB/div Re	f 25.00 dBm					-26.26 dBm	
			Ĭ				Center Fred
15.0							1.755000000 GHz
5.00							
5.00 ·····	mm	in the second second	m				Start Free
-5.00							1.753000000 GHz
						DL1 -13.00 dBm	
-15.0			L L				Stop Fred
-25.0			h 1				1.757000000 GHz
			h				
-35.0				In my way			CF Step 400.000 kHz
-45.0				- www.	www.	· ····································	<u>Auto</u> Mar
-43.0							
-55.0							Freq Offset
							0 11.
-65.0							Scale Type
Center 1.7550 #Res BW 30 k		#\/R\A	100 kHz		Sween 5	Span 4.000 MHz .467 ms (1001 pts)	Log <u>Lir</u>
MSG	112		100 112		status		

Plot 7-102. Upper Band Edge Plot (Band 4 - 3.0MHz QPSK - Full RB Configuration)



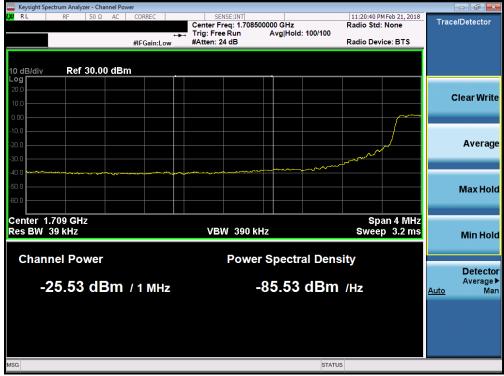
Plot 7-103. Upper Extended Band Edge Plot (Band 4 - 3.0MHz QPSK - Full RB Configuration)

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ABURT 17.09 372 GH2           Center Freq           Center Freq <th< th=""><th></th><th>um Analyzer - Swej</th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th></th<>		um Analyzer - Swej										
Atten: 36 dB Mkr1 1.709 972 GHz -23.92 dBm Center Free 1.710000000 GHz Atten: 36 dB Mkr1 1.709 972 GHz -23.92 dBm Center Free 1.71000000 GHz Center Free 1.710000000 GHz Center Free 1.71000000 GHz Center Free 1.71000000 GHz Center Free 1.71000000 GHz Center Free 1.71000000 GHz Center Free 1.71000000 GHz Center Free 1.710000000 GHz Center Free 1.71000000 GHz Center Free 1.71000000 GHz Center Free 1.71000000 GHz	LXU RL	RF 50 Ω	AC CO	RREC			#Avg Typ	e: RMS	TRACE	123456	Fr	equency
Operation         Center Free           00         -23.92 GBm           01         -23.92 GBm           02         -23.92 GBm           03         -23.92 GBm           0400.000 GH2         -23.92 GBm           05         -23.92 GBm			P	NO:Wide 🖵 Gain:Low					TYPE DET	A WWWWW A N N N N N		
29 50 50 50 50 50 50 50 50 50 50 50 50 50								Mkr1	1.709 97	2 GHz		Auto Tune
5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0	10 dB/div	Ref 25.00 d	Bm						-23.9	2 dBm		
so the start Free the start Free t						Í					c	Center Freq
Start Freq Start	15.0											
Start Freq Start												
50     0     01.1.300 dHr       50     1     1       50 <td>5.00</td> <td></td> <td></td> <td></td> <td></td> <td><math>\sim</math></td> <td>~~~~~</td> <td></td> <td></td> <td>~~~~</td> <td></td> <td>Start Freq</td>	5.00					$\sim$	~~~~~			~~~~		Start Freq
50 50 50 50 50 50 50 50 50 50	-5.00										1.70	8000000 GHz
50 50 50 50 50 50 50 50 50 50									D	L1 -13.00 dBm		
50 50 50 50 50 50 50 50 50 50	-15.0					1 /						Stop Freq
50 50 50 50 50 50 50 50 50 50	-25.0					<u>`</u>					1.71	2000000 GHz
5.0     400.000 kHz       5.0     Freq Offse       5.0     0       0     0       0     0       0     0       0     0       0     0       0     0       0     0       0     0       0     0       0     0       0     0       0     0       0     0       0     0       0     0       0     0       0     0					~~~~							
5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0	-35.0	· ·····	~~~~~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~							CF Step 400.000 kHz
5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0											<u>Auto</u>	Mar
50 50 0 Hz Span 4.000 MHz Log Lin	-45.0											
50 Scale Type enter 1.710000 GHz Span 4.000 MHz Log Lin	-55.0											
enter 1.710000 GHz Scale Type												0 H2
enter 1.710000 GHz Span 4.000 MHz	-65.0											Scale Type
Sweep 1.000 ms (100 r pts)				#\/B\M	190 647			Sween 1	Span 4.0	000 MHz	Log	Lin
IG STATUS		7 M12		# • • • • •						oor pis)		

Plot 7-104. Lower Band Edge Plot (Band 4 - 5.0MHz QPSK - Full RB Configuration)



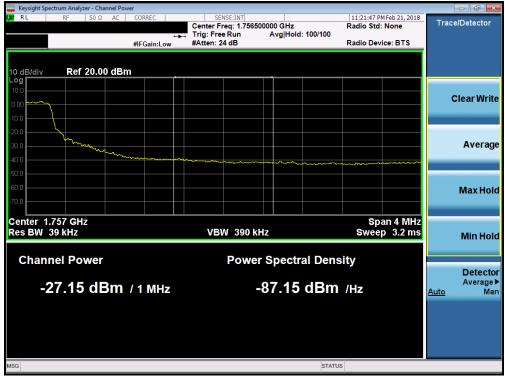
Plot 7-105. Lower Extended Band Edge Plot (Band 4 - 5.0MHz QPSK - Full RB Configuration)

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	pectrum Analy	zer - Swept	t SA										
X/RL	RF	50 Ω	AC	CORREC PNO: W	ide 🖵	Trig: Free		#Avg Typ	e: RMS	TRA	PM Feb 21, 2018 CE 1 2 3 4 5 6 PE A WWWWW DET A NNNNN	F	requency
10 dB/div	Ref 25	.00 dE	3m	IFGain:L	.ow	Atten: 36	dB		Mkr'	1 1.755 (	000 GHz .50 dBm		Auto Tun
15.0													Center Fre 5000000 GH
5.00			~~~	~~~								1.75	<b>Start Fre</b> 3000000 G⊦
-15.0						t de la construcción de la const	1				DL1 -13.00 dBm	1.75	<b>Stop Fre</b> 7000000 G⊦
45.0							×~~~	2. 	·	<b>^</b>	~~~~~	<u>Auto</u>	CF Ste 400.000 k⊢ Ma
55.0													Freq Offs 0 H
65.0													Scale Typ
	.755000 V 56 kHz	GHZ		#	VBW	180 kHz			Sweep	Span 4 1.600 ms	l.000 MHz (1001 pts)	LUg	Li
ISG									STATU	IS			

Plot 7-106. Upper Band Edge Plot (Band 4 - 5.0MHz QPSK - Full RB Configuration)



Plot 7-107. Upper Extended Band Edge Plot (Band 4 - 5.0MHz QPSK - Full RB Configuration)

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www.www.com.com.com.com.com.com.com.com.com.com					
<b>RL</b> RF 50 Ω AC	C CORREC	SENSE:INT	#Avg Type: RMS	11:25:07 PM Feb 21, 2018 TRACE 1 2 3 4 5 6	Frequency
10 dB/div Ref 25.00 dBn	PNO: Wide F IFGain:Low	Trig: Free Run Atten: 36 dB	Mkr1	1.709 984 GHz -28.35 dBm	Auto Tune
15.0					<b>Center Fred</b> 1.710000000 GH;
-5.00				DL1 -13.00 dBm	<b>Start Fred</b> 1.706000000 GH:
-15.0		1.00			<b>Stop Fred</b> 1.714000000 GH;
-35.0	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~				CF Step 800.000 kH <u>Auto</u> Ma
-55.0					<b>Freq Offse</b> 0 H
-65.0					Scale Type
Center 1.710000 GHz #Res BW 110 kHz	#VBW 3	330 kHz	Sweep 1	Span 8.000 MHz .000 ms (1001 pts)	Log <u>Lir</u>
MSG			STATUS	3	

Plot 7-108. Lower Band Edge Plot (Band 4 - 10.0MHz QPSK - Full RB Configuration)



Plot 7-109. Lower Extended Band Edge Plot (Band 4 - 10.0MHz QPSK - Full RB Configuration)

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Keysight Spectrum Analy:									
LXV RL RF	50 Ω AC 0	ORREC	SEN	SE:INT	#Avg Type	e: RMS	11:27:20 PM Feb 2 TRACE 1 2		Frequency
		PNO: Wide 😱 IFGain:Low	Trig: Free Atten: 36					www.	
10 dB/div Ref 25	.00 dBm					Mkr1	1.755 000 -27.77 (	GHz dBm	Auto Tune
15.0									<b>Center Freq</b> 1.755000000 GHz
-5.00		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~					3.00 dBm	<b>Start Fred</b> 1.751000000 GH;
-15.0			-	1					<b>Stop Fred</b> 1.759000000 GH:
-35.0				Jur and	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	·····	<u>A</u> L	CF Stej 800.000 kH Ito Mar
-55.0									<b>Freq Offse</b> 0 H
-65.0									Scale Type
Center 1.755000 ( #Res BW 110 kHz		#VBW	330 kHz			Sweep 1	Span 8.000 .000 ms (100	MHz <sup>Lo</sup> 1 pts)	g <u>Lir</u>
MSG						STATUS			

Plot 7-110. Upper Band Edge Plot (Band 4 - 10.0MHz QPSK - Full RB Configuration)



Plot 7-111. Upper Extended Band Edge Plot (Band 4 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMJ737V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 77 of 125
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	rum Analyzer - Sv									
XV RL	RF 50 \$	Ω AC	CORREC		NSE:INT	#Avg Typ	e: RMS		23456	Frequency
			PNO: Wide G	Trig: Free Atten: 36				DET	A WWWWWW A N N N N N	
	Ref 25.00	dBm					Mkr	1 1.709 98 -29.42	8 GHz 2 dBm	Auto Tun
- <sup>og</sup>				)	Í					Center Fre
15.0										1.710000000 GH
5.00										
						h	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		Start Fre
-5.00										1.704000000 GH
15.0								DL	1 -13.00 dBm	Stop Fre
										1.716000000 GF
-25.0					Jund -					
35.0										CF Ste 1.200000 MH
										<u>Auto</u> Ma
45.0										_
-55.0										Freq Offs 0 H
-65.0										
0.0										Scale Typ
Center 1.71	10000 GHz							Span 12.	00 MHz	Log <u>Li</u>
#Res BW 1			#VBW	i 470 kHz			Sweep	1.000 ms (10	01 pts)	
ISG							STATU	IS		

Plot 7-112. Lower Band Edge Plot (Band 4 - 15.0MHz QPSK - Full RB Configuration)



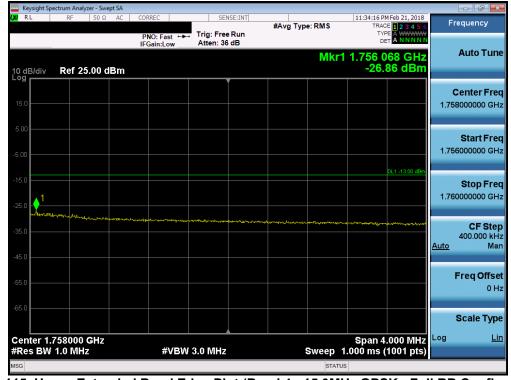
Plot 7-113. Lower Extended Band Edge Plot (Band 4 - 15.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMJ737V		MEASUREMENT REPORT (CERTIFICATION)	G	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 70 of 125
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	ectrum Analyzer - Sw										X
LXI RL	RF 50 Ω	AC	CORREC		NSE:INT	#Avg Typ	e: RMS	11:34:04 PM TRACE	Feb 21, 2018	Frequen	су
			PNO: Wide G	Trig: Free Atten: 30				TYPE	A WWWWW A N N N N N		
10 dB/div Log	Ref 25.00 (	dBm					Mkr1	1.755 03 -28.6	36 GHz 3 dBm	Auto	Tune
15.0										Cente 1.75500000	
-5.00	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	·····	m							Star 1.74900000	t Frec 10 GH:
-15.0					1				L1 -13.00 dBm	<b>Stop</b> 1.76100000	Fred
-35.0					how	h	~~~~s		~~~~~	CF 1.20000 <u>Auto</u>	<b>Stej</b> 0 MH Mai
-55.0										Freq	Offse 0 H
-65.0										Scale	Тур
Center 1.7 #Res BW	755000 GHz 160 kHz		#VBW	470 kHz			Sweep 1	Span 12 .000 ms (1	.00 19112	Log	Lir
MSG							STATUS	5			

Plot 7-114. Upper Band Edge Plot (Band 4 - 15.0MHz QPSK - Full RB Configuration)



Plot 7-115. Upper Extended Band Edge Plot (Band 4 - 15.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMJ737V		MEASUREMENT REPORT (CERTIFICATION)	AMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 70 of 125
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	pectrum Analy													- 6
X/RL	RF	50 Ω	AC	CORREC			NSE:INT	#Avç	у Туре	RMS	TR	ACE 1 2 3 4 5 6	Fr	equency
				PNO: Fa	ast 🖵 .ow	Trig: Fre Atten: 3					ī			
10 dB/div Log	Ref 25	5.00 dE	3m							Mkr1	1.709 -32	920 GHz 2.25 dBm		Auto Tun
15.0														Center Free
5.00								~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	the second se			1.702	<b>Start Fre</b> 2000000 GH
-15.0												DL1 -13.00 dBm	1.718	<b>Stop Fre</b> 3000000 GH
35.0		mm	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	- and a start of the	after and a	-	M.N.						1 <u>Auto</u>	<b>CF Ste</b> .600000 MH Ma
55.0													ľ	FreqOffso 0⊦
-65.0														Scale Typ
Center 1. #Res BW				#	≠vвw	620 kHz			5	weep	Span 1.000 ms	16.00 MHz (1001 pts)	Log	Li
ISG										STATU				

Plot 7-116. Lower Band Edge Plot (Band 4 - 20.0MHz QPSK - Full RB Configuration)



Plot 7-117. Lower Extended Band Edge Plot (Band 4 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMJ737V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 90 of 125
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	pectrum Analy												
X/RL	RF	50 Ω A		RREC			ISE:INT	#Avg Ty	pe: RMS	TRA	PM Feb 21, 2018 ACE 1 2 3 4 5 6	F	requency
			P	NO:Fast ( Gain:Low		g: Free ten: 36				T			
10 dB/div Log	Ref 25	i.00 dBi	m						Mkr	1 1.755 -33	000 GHz .40 dBm		Auto Tune
15.0													Center Free 5000000 GH
-5.00	- un han gen			~~~~~	m							1.74	<b>Start Fre</b> 7000000 GH
-15.0											DL1 -13.00 dBm	1.76	<b>Stop Fre</b> 3000000 GH
35.0						Truc	1	monor	Margan Markan	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	Auto	<b>CF Ste</b> 1.600000 M⊢ Ma
55.0													Freq Offs 0 ⊦
-65.0													Scale Typ
	.755000 / 200 kH:			#VB	W 620	) kHz			Sweep	Span 1.000 ms	16.00 MHz (1001 pts)	Log	Li
ISG									STAT		,,		

Plot 7-118. Upper Band Edge Plot (Band 4 - 20.0MHz QPSK - Full RB Configuration)



Plot 7-119. Upper Extended Band Edge Plot (Band 4 - 20.0MHz QPSK - Full RB Configuration)

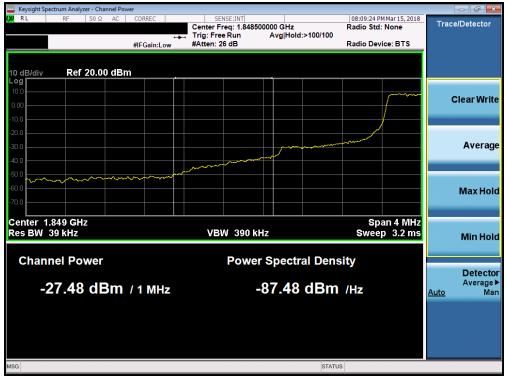
FCC ID: A3LSMJ737V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 91 of 125
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## Band 2



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



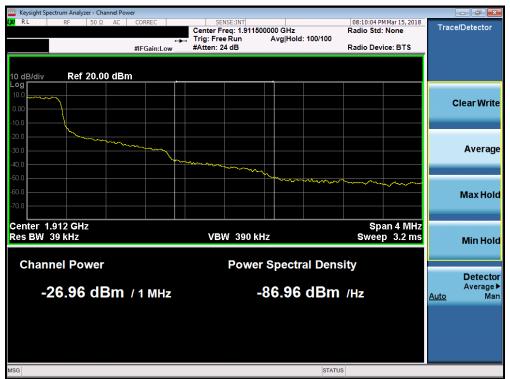
Plot 7-121. Lower Extended Band Edge Plot (Band 2 - 1.4MHz QPSK - Full RB Configuration)

FCC ID: A3LSMJ737V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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R		RF	50 Ω AC	COR	EC	SEI	NSE:INT	#Avg Typ	o: DMS		M Mar 15, 2018 CE <b>1 2 3 4 5 6</b>	F	requency
				PN IFG	D:Wide ⊂ ain:Low	Trig: Free Atten: 36		#Avg typ	e. Rivis	TY E			
0 dE	3/div	Ref 25.0	00 dBm	1					Mkr1	1.910 -23	004 GHz .97 dBm		Auto Tur
5.0													Center Fre
.00 .00				~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	yan Mana							1.90	<b>Start Fr</b> 08000000 G
5.0 5.0		and the marked	/				1				DL1 -13.00 dBm	1.91	<b>Stop Fr</b> 12000000 G
5.0 5.0	~~~~~							hhand	- Connor	margare		<u>Auto</u>	CF Ste 400.000 ki M
5.0											hornor		Freq Offs 01
5.0													Scale Ty
	ter 1.9′ s BW 1	10000 G 3 kHz	Hz		#VBV	V 43 kHz			Sweep 8	Span 4 8.867 ms	.000 MHz (1001 pts)	Log	L
G									STATUS	6			

Plot 7-122. Upper Band Edge Plot (Band 2 - 1.4MHz QPSK - Full RB Configuration)



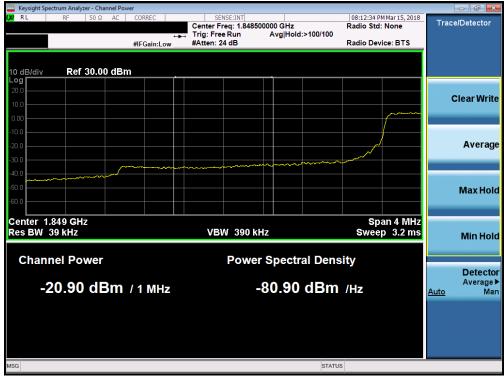
Plot 7-123. Upper Extended Band Edge Plot (Band 2 - 1.4MHz QPSK - Full RB Configuration)

FCC ID: A3LSMJ737V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager				
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	trum Analyzer - Swep									_	
L <mark>XI</mark> RL	RF 50 Ω	AC COR	REC	SEI	NSE:INT	#Avg Typ	e: RMS		Mar 15, 2018	Fr	equency
			0:Wide ⊂ ain:Low	Trig: Free Atten: 36				TYP			
10 dB/div Log	Ref 25.00 df	Зm					Mkr1	1.850 0 -23.7	00 GHz 77 dBm		Auto Tune
15.0											Center Fred
-5.00									DL1 -13.00 dBm	1.84	Start Free B000000 GH
-15.0				(	1				DET -13.00 dbm	1.85	<b>Stop Fred</b> 2000000 GH:
-35.0			<u></u>	~~~~~						<u>Auto</u>	CF Stej 400.000 kH Ma
-55.0											F <b>req Offse</b> 0 H
-65.0											Scale Type
Center 1.8 #Res BW 3			#VBW	100 kHz			Sweep 2	Span 4. 2.000 ms (1	000 MHz 1001 pts)	Log	<u>Lir</u>
MSG							STATU	-			

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



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

FCC ID: A3LSMJ737V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager					
Test Report S/N:	Test Dates:	EUT Type:		Dage 94 of 125					
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	pectrum Analy											_	
<mark>U</mark> RL	RF	50 Ω	AC	CORREC	ide 🕟	Trig: Fr		#Avg Typ	e: RMS	TRA	PM Mar 15, 2018 CE 1 2 3 4 5 6 (PE A WWWWW DET A NNNNN	Fr	requency
I0 dB/div	Ref 2	5.00 dB	3m	IFGain:L	.ow	Atten: 3	36 dB		Mkr		000 GHz 85 dBm		Auto Tur
15.0													Center Fre
5.00		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~	~~~~	~~~						DL1 -13.00 dBm	1.90	<b>Start Fr</b> 8000000 G
25.0							1	~ -				1.91	<b>Stop Fr</b> 2000000 G
15.0										·····	·····	<u>Auto</u>	<b>CF Ste</b> 400.000 k M
5.0													Freq Offs 0
65.0												Log	Scale Tyj
	.910000 30 kHz			;	≠vbw	100 kH	z		Sweep 2	Span 4 2.000 ms	1.000 MHz (1001 pts)	Log	L
SG									STATU	IS			

Plot 7-126. Upper Band Edge Plot (Band 2 - 3.0MHz QPSK - Full RB Configuration)



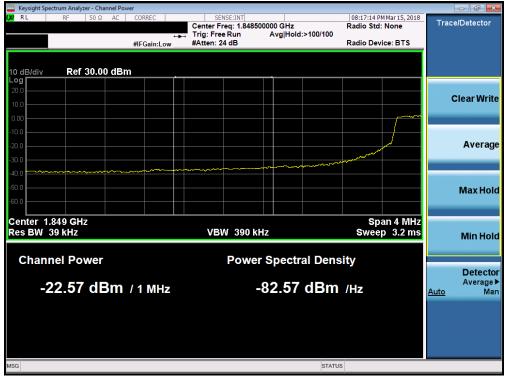
Plot 7-127. Upper Extended Band Edge Plot (Band 2 - 3.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMJ737V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager	
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	ectrum Analyzer - Sv									
LXI RL	RF 50 \$	AC AC	CORREC	SEN	ISE:INT	#Avg Typ	e: RMS	08:16:49 PM Mar 15, 2018 TRACE 1 2 3 4 5		quency
			PNO: Wide 🖵 IFGain:Low	Trig: Free Atten: 36		• ,,		DET A NNNN	¥ N	A
10 dB/div Log	Ref 25.00	dBm					Mkr	1 1.849 992 GH -22.74 dBn		Auto Tune
15.0										enter Fred 000000 GH2
-5.00					$\int$		·····	DL1 -13.00 dBr	1.848	Start Fred 000000 GH;
-15.0					1				1.852	Stop Fred
-35.0	~A		~~~~~~						Auto	CF Step 400.000 kH Mar
-55.0									F	r <b>eq Offse</b> 0 H
-65.0										Scale Type
Center 1. #Res BW	850000 GHz 56 kHz		#VBW	160 kHz			Sweep :	Span 4.000 MH: 2.000 ms (1001 pts	Log	Lir
MSG							STATU	JS		

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



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

FCC ID: A3LSMJ737V		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager					
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	Spectrum Analy	/zer - Swep	et SA										
X/RL	RF	50 Ω	AC	CORREC	ide 😱	SE Trig: Fre	e Run	#Avg Ty	pe: RMS	TRA	PM Mar 15, 2018 CE 1 2 3 4 5 6 (PE A WWWWW DET A NNNNN	Fr	equency
				IFGain:L	.ow	Atten: 30			Mkr	1 1.910 (	000 GHz		Auto Tun
10 dB/div Log	Ref 2	5.00 dE	Вm							-21.9	94 dBm		
15.0													Center Fre
5.00												1.91	000000 GH
-5.00	m	~~~	~~~~~	~~~~	~~~~							1.90	Start Fre
											DL1 -13.00 dBm		
-15.0						WW	1					1.91	<b>Stop Fre</b> 2000000 G⊦
25.0									~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	www	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		CF Ste
35.0												<u>Auto</u>	400.000 kl Ma
45.0													_
-55.0													FreqOffso 0⊦
-65.0													Scale Typ
	I.910000 V 56 kHz				žvraw	160 kHz			Sween	Span 4	.000 MHz (1001 pts)	Log	Ľ
ISG									STATU		(noor plo)		

Plot 7-130. Upper Band Edge Plot (Band 2 - 5.0MHz QPSK - Full RB Configuration)



Plot 7-131. Upper Extended Band Edge Plot (Band 2 - 5.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMJ737V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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	ectrum Analyzer - Swe									
L <mark>XI</mark> RL	RF 50 Ω	AC C	ORREC		VSE:INT	#Avg Typ	e: RMS	08:23:54 PM Mar TRACE	23456	Frequency
10 dB/div	Ref 25.00 c		PNO: Wide 🕞 FGain:Low	Trig: Free Atten: 36			Mkr1		GHz dBm	Auto Tune
15.0										Center Freq 1.85000000 GHz
-5.00						~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	for the second sec		13.00 dBm	<b>Start Freq</b> 1.846000000 GHz
-15.0					1					<b>Stop Freq</b> 1.854000000 GHz
-35.0	nutain frankriker (VL)	and a start of the	and the second secon	www.hand						CFStep 800.000 kH Auto Mar
-55.0										Freq Offse 0 H
	850000 GHz							Span 8.00		Scale Type
#Res BW	100 kHz		#VBW	/ 330 kHz				.000 ms (100	01 pts)	
100							STATUS	·		

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



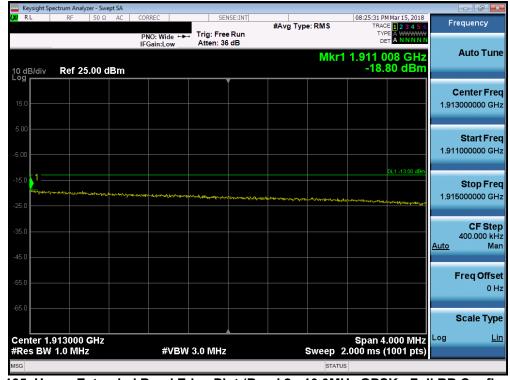
Plot 7-133. Lower Extended Band Edge Plot (Band 2 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMJ737V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager					
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	pectrum Analy		SA										
X/RL	RF	50 Ω	AC C	ORREC		SEI	NSE:INT	#Avg Typ	e: RMS		M Mar 15, 2018 CE 1 2 3 4 5 6	Fr	equency
				PNO: Wide FGain:Low		rig: Free Atten: 36				TY C			A
10 dB/div Log	Ref 2	5.00 dB	im						Mkr	1 1.910 -25	024 GHz .29 dBm		Auto Tune
													Center Free
15.0												1.91	0000000 GH
5.00	een mona	han and the second	www.www.	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	er and a second	γ							Start Fre
-5.00												1.90	6000000 GH
15.0					_						DL1 -13.00 dBm		Stop Fre
-25.0						Myle	1					1.91	4000000 GH
						¥.4	Marginan	an the second and the second and the second s	and all and and	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	moulunanontera		CF Ste
45.0												<u>Auto</u>	800.000 kH Ma
45.0													Freq Offs
-55.0													0 H
65.0													Scale Typ
Center 1										Span 8	3.000 MHz		Li
#Res BW	100 kH	z		#V	BW 33	30 kHz					(1001 pts)		
ISG									STATI	JS			

Plot 7-134. Upper Band Edge Plot (Band 2 - 10.0MHz QPSK - Full RB Configuration)



Plot 7-135. Upper Extended Band Edge Plot (Band 2 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMJ737V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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	pectrum Analy											×
L <mark>XI</mark> RL	RF	50 Ω	AC CC	IRREC		NSE:INT	#Avg Typ	e: RMS	TRAC	Mar 15, 2018	Frequency	
				NO:Wide G Gain:Low	Trig: Fre Atten: 3				TYF			
								Mkr′	1 1.849 8	56 GHz	Auto T	une
10 dB/div Log	Ref 2	5.00 dB	m						-29.	16 dBm		
						Ĭ					Center F	re
15.0											1.850000000	GH
5.00												
5.00						~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	m	Start F	re
-5.00											1.844000000	GH
										DL1 -13.00 dBm		
-15.0											Stop F	
-25.0					<u> </u>	1 - 1					1.856000000	GH
20.0					Jun Mar	W						
-35.0	m	mont	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	m	s- a d						CF S 1.200000	
												Ma
-45.0												
-55.0											Freq Of	
												0 Н
-65.0											Scale T	
											Scale T	уþ
Center 1.				40 ( <b>D</b> )	4701.0				Span 1	2.00 191112	Log	Li
#Res BW	160 KH	Z		#VBV	V 470 kHz				1.000 ms (	1001 pts)		
DG								STATU	15			

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



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

FCC ID: A3LSMJ737V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 00 of 125
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	pectrum Anal												7 X
X/RL	RF	50 Ω	AC	CORREC		SE	NSE:INT	#Avg Typ	e: RMS		M Mar 15, 2018 CE 1 2 3 4 5 6	Frequen	су
	_			PNO: Wie IFGain:Lo	de 😱 ow	Trig: Fre Atten: 30				די		0.uto	<b>T</b>
10 dB/div Log	Ref 2	5.00 dE	3m						Mkr	1 1.910 26-	096 GHz .74 dBm	Auto	Tun
							Ĭ					Center	
15.0												1.9100000	0 GH
5.00	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~~~~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	m m	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~						Start	Fre
-5.00												1.90400000	0 GH
15.0											DL1 -13.00 dBm	Stop	Fre
.25.0						ha.	<b>1</b>					1.91600000	
						ۍر	how	min	······		J.M.	CE	Ste
35.0												1.20000 Auto	
45.0													
-55.0												Freq C	Offso ⊦0
65.0													
												Scale	
	.910000 V 160 kH			#	VBW	470 kHz			Sweep	Span ′ 1.000 ms	12.00 MHz (1001 pts)	Log	L
ISG									STATU				

Plot 7-138. Upper Band Edge Plot (Band 2 - 15.0MHz QPSK - Full RB Configuration)



Plot 7-139. Upper Extended Band Edge Plot (Band 2 - 15.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMJ737V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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	pectrum Anal													
XI RL	RF	50 Ω	AC	CORREC		SE	NSE:INT	#Avg	Type: RMS			M Mar 15, 2018	F	requency
				PNO: W IFGain:	/ide 🖵 Low	Trig: Fre Atten: 36					TYI Di			
10 dB/div Log	Ref 2	5.00 dl	Зm						M	kr1 1.	.849 8 -30.	872 GHz 80 dBm		Auto Tune
15.0														Center Fre 50000000 GH
-5.00								m		~~~~~	~~~~~	DL1 -13.00 dBm	1.84	Start Fre 12000000 GH
-15.0													1.8	<b>Stop Fre</b> 58000000 GH
35.0	مرسوا مردا معروا معروا	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	*~ <b>4</b> €_*	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	ᡔᡘᢧ᠆ᡐᡐᡙᡇᠰ	manner	,						<u>Auto</u>	<b>CF Ste</b> 1.600000 MH Ma
55.0														Freq Offs 0 H
-65.0														Scale Typ
Center 1. #Res BW					#VBW	620 kHz			Swee	؛ p 1.00	Span 1 )0 ms (	6.00 MHz (1001 pts)	Log	Li
ISG									S	TATUS				

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



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

FCC ID: A3LSMJ737V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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	pectrum Analyz									
L <mark>XI</mark> RL	RF	50 Ω AC	CORREC	SEN	NSE:INT	#Avg Typ	e: RMS	08:39:22 PM Mar 15, 201 TRACE 1 2 3 4 5		equency
	_		PNO: Wide 🕞 IFGain:Low	Trig: Free Atten: 36				DET A WWW	N	
10 dB/div Log	Ref 25	.00 dBm					Mkr1	1.910 112 GH -29.78 dBr	1	Auto Tune
15.0										Center Freq
									1.91	0000000 GHz
5.00	· · · · · · · · · · · · · · · · · · ·	mm	mann						1.00	Start Freq 2000000 GHz
-5.00								DL1 -13.00 dB		2000000 GH2
-15.0									1.91	Stop Fred 8000000 GHz
-25.0				- Maria	• <sup>1</sup>					
-35.0					نىسى مىرىمى ا		- Marco - Marco		Auto 1	CF Step 600000 MH Mar
-55.0										Freq Offse
-65.0										0 H:
										Scale Type
	.910000 ( 200 kHz		#VBW	620 kHz			Sweep_1	Span 16.00 MH 1.000 ms (1001 pts	z Log ()	Lir
MSG							STATU	s	_	

Plot 7-142. Upper Band Edge Plot (Band 2 - 20.0MHz QPSK - Full RB Configuration)

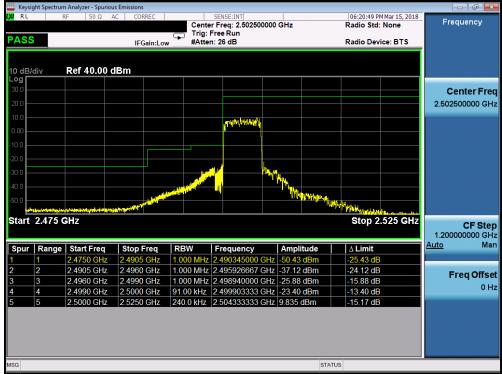


Plot 7-143. Upper Extended Band Edge Plot (Band 2 - 20.0MHz QPSK - Full RB Configuration)

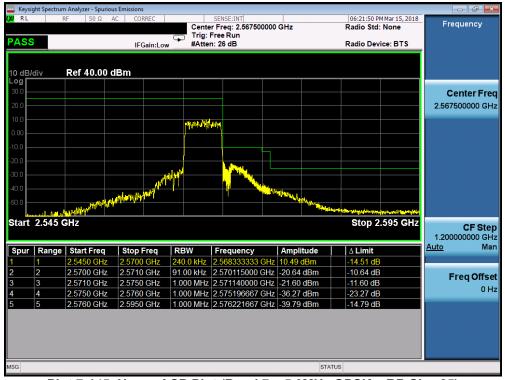
FCC ID: A3LSMJ737V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 02 of 125
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### Band 7



Plot 7-144. Lower ACP Plot (Band 7 – 5.0MHz QPSK – RB Size 25)



#### Plot 7-145. Upper ACP Plot (Band 7 – 5.0MHz QPSK – RB Size 25)

FCC ID: A3LSMJ737V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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	. F	KF 50 Ω	AC CORREC	Cente	SENSE:INT Freg: 2.50500000	CH7	06:35:25 PM Mar 15, 2 Radio Std: None	Frequency
PAS	s		IFGain:Lov	Trig:	Free Run n: 26 dB	- GHZ	Radio Device: BTS	_
10 dE	3/div	Ref 40.00	dBm					
Log 30.0								Center Fre
20.0								2.505000000 GI
10.0					ALL DALL AND DUNCE	waada		
0.00					Appropriate and a second se	T PT'N		
-10.0								
20.0					ا مد ال	14		
-30.0						The the rate	Mu	
-40.0					. dl			
			and the second	10-				
	hing the second second			<u></u>			all when the second second	1 <mark>11</mark>
2	t 2.475 C	GHz					Stop 2.525 G	UF SIE
Star	t 2.475 (	GHz	And a second		Frequency	Amplitude	Stop 2.525 G	Hz CF Ste 1.200000000 GI Auto Mi
2	t 2.475 (	GHz Start Freq	Stop Freq	RBW	Frequency 2 489983333 GHz	Amplitude	Stop 2.525 G	1.200000000 GI
Stari Spur	t 2.475 C	GHz Start Freq 2.4750 GHz	<b>Stop Freq</b> 2.4905 GHz	RBW 1.000 MHz	2.489983333 GHz	-47.44 dBm	Stop 2.525 G	1.200000000 GI
Star	t 2.475 C r Range 1	GHz Start Freq	Stop Freq	RBW 1.000 MHz 1.000 MHz		-47.44 dBm -33.31 dBm	Stop 2.525 G	1.200000000 GI Auto Mi Freq Offs
Start Spur	t 2.475 C	<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	2.489983333 GHz 2.495917500 GHz	-47.44 dBm -33.31 dBm -23.65 dBm	Stop 2.525 G	1.200000000 GI
							dawa ukatek	
tari Spur	t 2.475 ( Range 1 2 3	Start Freq           2.4750 GHz           2.4905 GHz           2.4960 GHz	<b>Stop Freq</b> 2.4905 GHz 2.4960 GHz 2.4990 GHz	RBW 1.000 MHz 1.000 MHz 1.000 MHz	2.489983333 GHz 2.495917500 GHz 2.498940000 GHz	-47.44 dBm -33.31 dBm -23.65 dBm	Stop 2.525 G △ Limit -22.44 dB -20.31 dB -13.65 dB	1.200000000 0 Auto M
Start	t 2.475 ( Range 1 2 3	Start Freq           2.4750 GHz           2.4905 GHz           2.4960 GHz	<b>Stop Freq</b> 2.4905 GHz 2.4960 GHz 2.4990 GHz	RBW 1.000 MHz 1.000 MHz 1.000 MHz 1.000 MHz 180.0 kHz	2.489983333 GHz 2.495917500 GHz 2.498940000 GHz	-47.44 dBm -33.31 dBm -23.65 dBm -26.44 dBm	Stop 2.525 G △ Limit -22.44 dB -20.31 dB -13.65 dB	1.200000000 G Auto M Freq Offs
Start	t 2.475 C	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 1.000 MHz 180.0 kHz	2.489983333 GHz 2.495917500 GHz 2.498940000 GHz 2.499830000 GHz	-47.44 dBm -33.31 dBm -23.65 dBm -26.44 dBm	Stop 2.525 G     Δ Limit     -22 44 dB     -20.31 dB     -13.65 dB     -16.44 dB	1.200000000 GI Auto Mi Freq Offs

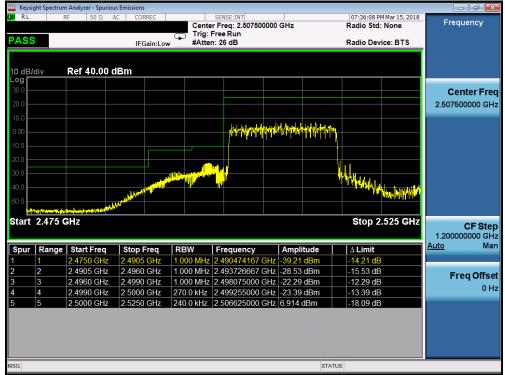
Plot 7-146. Lower ACP Plot (Band 7 - 10.0MHz QPSK - RB Size 50)



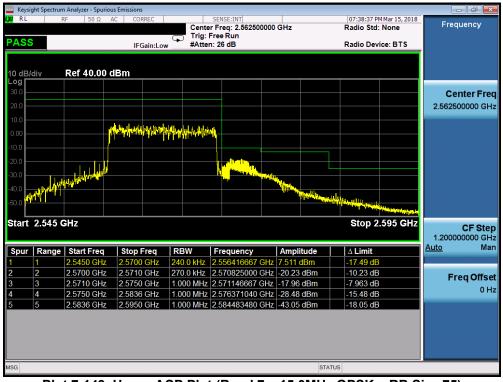
Plot 7-147. Upper ACP Plot (Band 7 – 10.0MHz QPSK – RB Size 50)

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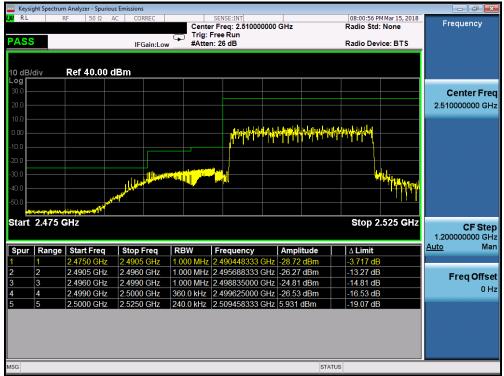
Plot 7-148. Lower ACP Plot (Band 7 – 15.0MHz QPSK – RB Size 75)



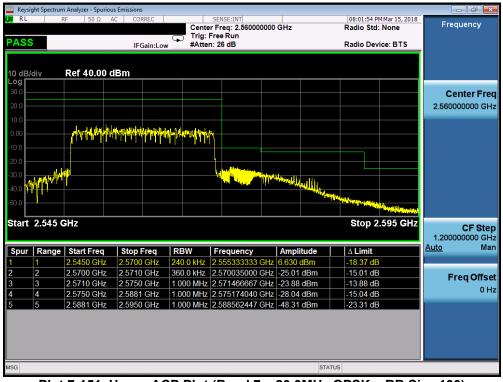
Plot 7-149. Upper ACP Plot (Band 7 – 15.0MHz QPSK – RB Size 75)

FCC ID: A3LSMJ737V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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Plot 7-150. Lower ACP Plot (Band 7 – 20.0MHz QPSK – RB Size 100)



Plot 7-151. 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 v03 - 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.

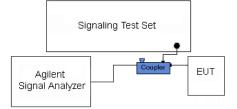


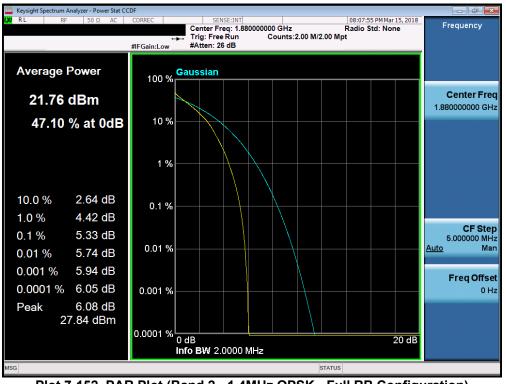
Figure 7-4. Test Instrument & Measurement Setup

#### Test Notes

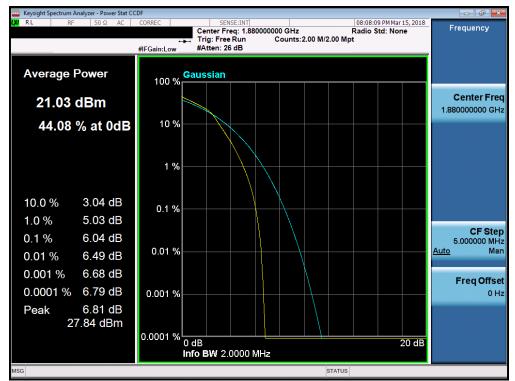
None.

FCC ID: A3LSMJ737V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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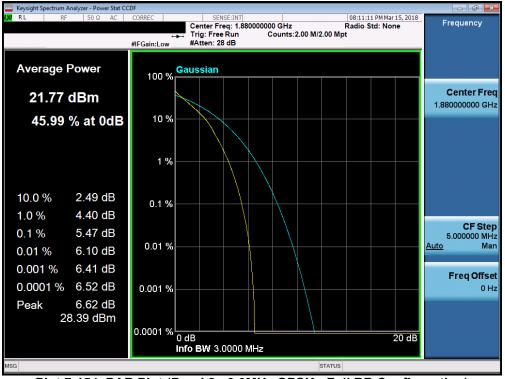


#### Plot 7-153. PAR Plot (Band 2 - 1.4MHz 16-QAM - Full RB Configuration)

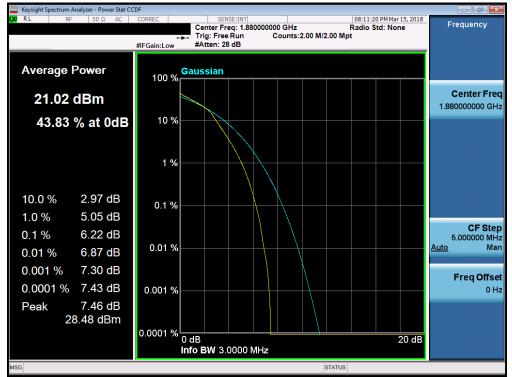
FCC ID: A3LSMJ737V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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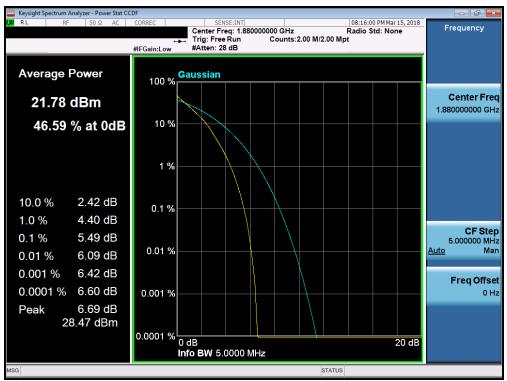




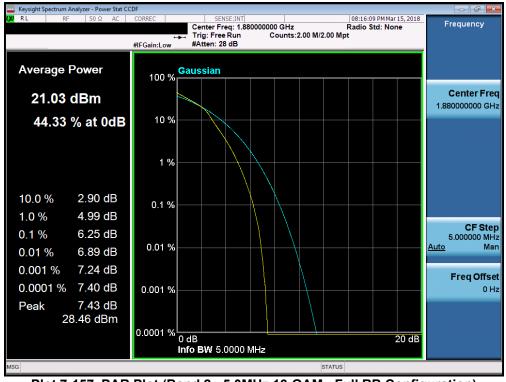
Plot 7-155. PAR Plot (Band 2 - 3.0MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMJ737V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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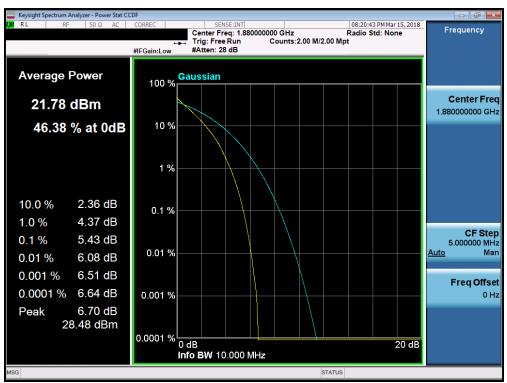
Plot 7-156. PAR Plot (Band 2 - 5.0MHz QPSK - Full RB Configuration)



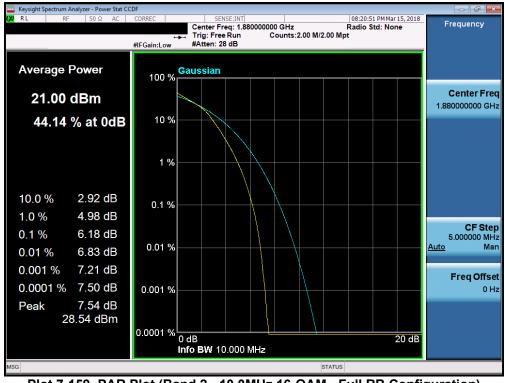
Plot 7-157. PAR Plot (Band 2 - 5.0MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMJ737V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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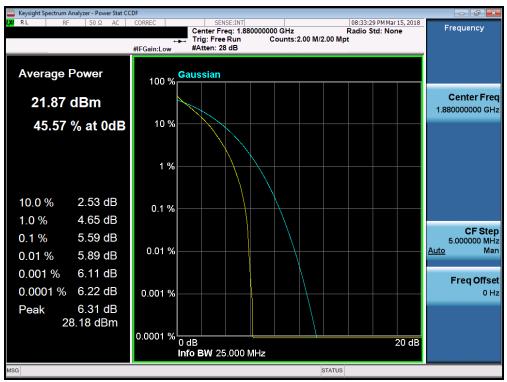




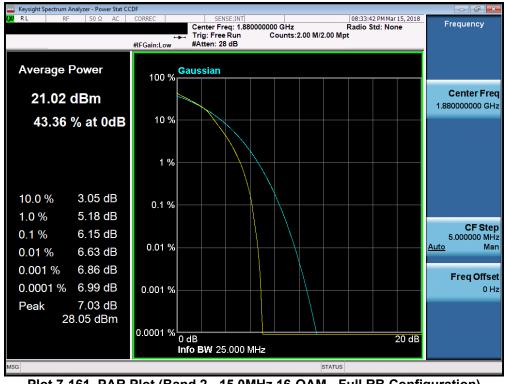
Plot 7-159. PAR Plot (Band 2 - 10.0MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMJ737V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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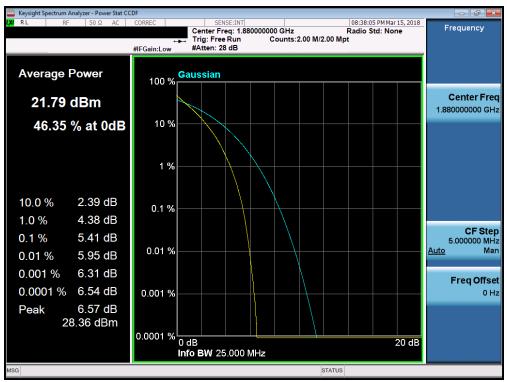




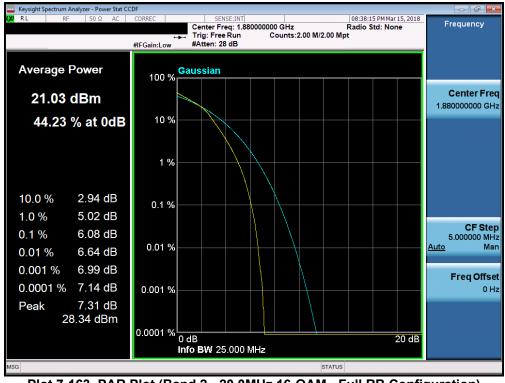
Plot 7-161. PAR Plot (Band 2 - 15.0MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMJ737V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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Plot 7-163. 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 v03 - Section 5.2.1

ANSI/TIA-603-E-2016 - Section 2.2.17

#### Test Settings

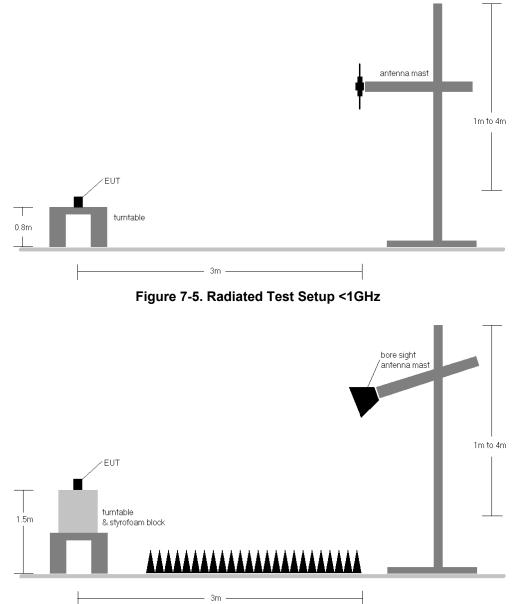
- 1. Radiated power measurements are performed using the signal analyzer's "channel power" measurement capability for signals with continuous operation.
- 2. RBW = 1 5% of the expected OBW, not to exceed 1MHz
- 3. VBW  $\ge$  3 x RBW
- 4. Span = 1.5 times the OBW
- 5. No. of sweep points  $\geq$  2 x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

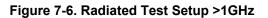
FCC ID: A3LSMJ737V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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### Test Setup

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





#### Test Notes

- 1) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the tables below.
- 2) This unit was tested with its standard battery.

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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]
779.50	5	QPSK	V	150	3	1 / 0	20.11	1.32	19.28	0.085	34.77	-15.49
782.00	5	QPSK	V	150	353	1 / 0	21.22	1.33	20.40	0.110	34.77	-14.37
784.50	5	QPSK	V	150	353	1 / 0	21.02	1.34	20.21	0.105	34.77	-14.56
784.50	5	16-QAM	V	150	353	1 / 0	20.09	1.34	19.28	0.085	34.77	-15.49
782.00	10	QPSK	V	150	348	1 / 0	21.23	1.33	20.41	0.110	34.77	-14.36
782.00	10	16-QAM	V	150	348	1 / 0	20.30	1.33	19.48	0.089	34.77	-15.29
782.00	10	QPSK	Н	150	282	1/0	19.23	1.33	18.41	0.069	34.77	-16.36

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]
824.70	1.4	QPSK	Н	150	8	1 / 5	18.98	1.50	18.33	0.068	38.45	-20.12
836.50	1.4	QPSK	н	150	7	1 / 5	19.39	1.50	18.74	0.075	38.45	-19.71
848.30	1.4	QPSK	н	150	6	1 / 5	19.29	1.50	18.64	0.073	38.45	-19.81
836.50	1.4	16-QAM	Н	150	7	1 / 5	18.27	1.50	17.62	0.058	38.45	-20.83
825.50	3	QPSK	Н	150	3	1 / 14	18.92	1.50	18.27	0.067	38.45	-20.18
836.50	3	QPSK	Н	150	4	1 / 14	19.33	1.50	18.68	0.074	38.45	-19.77
847.50	3	QPSK	Н	150	10	1 / 14	19.28	1.50	18.63	0.073	38.45	-19.82
836.50	3	16-QAM	Н	150	4	1 / 14	18.30	1.50	17.65	0.058	38.45	-20.80
826.50	5	QPSK	Н	150	12	1 / 24	19.06	1.50	18.41	0.069	38.45	-20.04
836.50	5	QPSK	Н	150	10	1 / 24	19.55	1.50	18.90	0.078	38.45	-19.55
846.50	5	QPSK	Н	150	13	1 / 24	19.03	1.50	18.38	0.069	38.45	-20.07
836.50	5	16-QAM	Н	150	10	1 / 24	18.61	1.50	17.96	0.063	38.45	-20.49
829.00	10	QPSK	Н	150	13	1 / 49	19.09	1.50	18.44	0.070	38.45	-20.01
836.50	10	QPSK	Н	150	8	1 / 49	19.54	1.50	18.89	0.077	38.45	-19.56
844.00	10	QPSK	Н	150	4	1 / 49	19.59	1.50	18.94	0.078	38.45	-19.51
844.00	10	16-QAM	Н	150	4	1 / 49	18.73	1.50	18.08	0.064	38.45	-20.37
844.00	10	QPSK	V	150	353	1 / 74	18.58	1.50	17.93	0.062	38.45	-20.52

Table 7-4. ERP Data (Band 5)

FCC ID: A3LSMJ737V		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	Н	150	5	1 / 5	19.57	5.56	25.13	0.326	30.00	-4.87
1732.50	1.4	QPSK	Н	150	3	1 / 5	19.63	5.41	25.04	0.319	30.00	-4.96
1754.30	1.4	QPSK	Н	150	0	1 / 5	19.44	5.26	24.70	0.295	30.00	-5.30
1710.70	1.4	16-QAM	Н	150	5	1 / 5	18.58	5.56	24.14	0.259	30.00	-5.86
1711.50	3	QPSK	н	150	3	1 / 14	19.62	5.55	25.17	0.329	30.00	-4.83
1732.50	3	QPSK	н	150	358	1 / 14	19.47	5.41	24.88	0.307	30.00	-5.12
1753.50	3	QPSK	н	150	357	1 / 14	19.42	5.26	24.68	0.294	30.00	-5.32
1711.50	3	16-QAM	н	150	3	1 / 14	18.70	5.55	24.25	0.266	30.00	-5.75
1712.50	5	QPSK	н	150	3	1 / 24	19.52	5.55	25.07	0.321	30.00	-4.93
1732.50	5	QPSK	н	150	358	1 / 24	19.54	5.41	24.95	0.312	30.00	-5.05
1752.50	5	QPSK	н	150	358	1 / 24	19.62	5.27	24.89	0.308	30.00	-5.11
1732.50	5	16-QAM	н	150	358	1 / 24	18.69	5.41	24.10	0.257	30.00	-5.90
1715.00	10	QPSK	Н	150	360	1 / 49	19.61	5.53	25.14	0.326	30.00	-4.86
1732.50	10	QPSK	н	150	355	1 / 49	19.13	5.41	24.54	0.284	30.00	-5.46
1750.00	10	QPSK	Н	150	358	1 / 49	19.55	5.29	24.84	0.305	30.00	-5.16
1715.00	10	16-QAM	н	150	360	1 / 49	18.81	5.53	24.34	0.272	30.00	-5.66
1717.50	15	QPSK	Н	150	2	1 / 74	19.55	5.51	25.06	0.321	30.00	-4.94
1732.50	15	QPSK	Н	150	1	1 / 74	19.47	5.41	24.88	0.307	30.00	-5.12
1747.50	15	QPSK	Н	150	0	1 / 74	19.59	5.31	24.90	0.309	30.00	-5.10
1717.50	15	16-QAM	н	150	2	1 / 74	18.67	5.51	24.18	0.262	30.00	-5.82
1720.00	20	QPSK	н	150	4	1 / 0	19.70	5.49	25.19	0.331	30.00	-4.81
1732.50	20	QPSK	Н	150	2	1/0	19.62	5.41	25.03	0.318	30.00	-4.97
1745.00	20	QPSK	н	150	2	1 / 0	19.69	5.32	25.01	0.317	30.00	-4.99
1720.00	20	16-QAM	Н	150	4	1/0	18.84	5.49	24.33	0.271	30.00	-5.67
1720.00	20	QPSK	V	150	261	1 / 0	16.99	5.64	22.63	0.183	30.00	-7.37

Table 7-5. EIRP Data (Band 4)

FCC ID: A3LSMJ737V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager			
Test Report S/N:	Test Dates:	EUT Type:		Dage 109 of 125			
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Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1850.70	1.4	QPSK	Н	150	359	1 / 0	20.91	4.82	25.73	0.374	33.01	-7.28
1880.00	1.4	QPSK	н	150	358	1 / 0	20.69	4.74	25.43	0.349	33.01	-7.58
1909.30	1.4	QPSK	н	150	357	1 / 0	20.46	4.68	25.14	0.327	33.01	-7.87
1850.70	1.4	16-QAM	н	150	359	1 / 0	20.01	4.82	24.83	0.304	33.01	-8.18
1851.50	3	QPSK	н	150	1	1 / 0	20.70	4.82	25.52	0.356	33.01	-7.49
1880.00	3	QPSK	н	150	2	1 / 0	20.57	4.74	25.31	0.340	33.01	-7.70
1908.50	3	QPSK	н	150	356	1 / 0	20.41	4.68	25.09	0.323	33.01	-7.92
1851.50	3	16-QAM	н	150	1	1 / 0	19.83	4.82	24.65	0.291	33.01	-8.36
1852.50	5	QPSK	н	150	2	1 / 0	20.82	4.81	25.63	0.366	33.01	-7.38
1880.00	5	QPSK	н	150	350	1 / 0	20.52	4.74	25.26	0.336	33.01	-7.75
1907.50	5	QPSK	н	150	357	1 / 0	20.64	4.68	25.32	0.341	33.01	-7.69
1852.50	5	16-QAM	н	150	2	1 / 0	19.97	4.81	24.78	0.301	33.01	-8.23
1855.00	10	QPSK	н	150	355	1 / 0	20.66	4.81	25.47	0.352	33.01	-7.54
1880.00	10	QPSK	н	150	1	1 / 0	20.67	4.74	25.41	0.348	33.01	-7.60
1905.00	10	QPSK	н	150	360	1 / 0	20.48	4.68	25.16	0.328	33.01	-7.85
1855.00	10	16-QAM	Н	150	355	1 / 0	19.84	4.81	24.65	0.291	33.01	-8.36
1857.50	15	QPSK	Н	150	356	1 / 0	20.81	4.80	25.61	0.364	33.01	-7.40
1880.00	15	QPSK	Н	150	348	1 / 0	20.57	4.74	25.31	0.340	33.01	-7.70
1902.50	15	QPSK	Н	150	354	1 / 0	20.41	4.69	25.10	0.323	33.01	-7.91
1880.00	15	16-QAM	н	150	348	1 / 0	19.73	4.74	24.47	0.280	33.01	-8.54
1860.00	20	QPSK	Н	150	360	1 / 0	20.88	4.79	25.67	0.369	33.01	-7.34
1880.00	20	QPSK	н	150	352	1 / 0	20.85	4.74	25.59	0.362	33.01	-7.42
1900.00	20	QPSK	Н	150	358	1/0	20.45	4.69	25.14	0.326	33.01	-7.87
1860.00	20	16-QAM	Н	150	360	1/0	20.01	4.79	24.80	0.302	33.01	-8.21
1880.00	20	16-QAM	н	150	352	1/0	20.10	4.74	24.84	0.305	33.01	-8.17
1900.00	20	16-QAM	Н	150	358	1/0	19.55	4.69	24.24	0.265	33.01	-8.77
1850.70	1.4	QPSK	V	150	91	1 / 0	20.20	4.79	24.99	0.316	33.01	-8.02

Table 7-6. EIRP Data (Band 2)

FCC ID: A3LSMJ737V		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]
2502.50	5	QPSK	н	150	340	1 / 24	19.23	5.74	24.97	0.314	33.01	-8.04
2535.00	5	QPSK	н	150	342	1 / 24	19.68	5.86	25.54	0.358	33.01	-7.47
2567.50	5	QPSK	н	150	341	1 / 24	19.33	5.98	25.31	0.340	33.01	-7.70
2535.00	5	16-QAM	н	150	342	1 / 24	18.54	5.86	24.40	0.275	33.01	-8.61
2505.00	10	QPSK	Н	150	343	1 / 49	19.55	5.75	25.30	0.339	33.01	-7.71
2535.00	10	QPSK	Н	150	342	1 / 49	19.69	5.86	25.55	0.359	33.01	-7.46
2565.00	10	QPSK	Н	150	341	1 / 49	19.49	5.97	25.46	0.352	33.01	-7.55
2535.00	10	16-QAM	Н	150	342	1 / 49	18.51	5.86	24.37	0.274	33.01	-8.64
2507.50	15	QPSK	Н	150	341	1 / 74	19.42	5.76	25.18	0.329	33.01	-7.83
2535.00	15	QPSK	Н	150	343	1 / 74	19.68	5.86	25.54	0.358	33.01	-7.47
2562.50	15	QPSK	Н	150	343	1 / 74	19.49	5.96	25.45	0.351	33.01	-7.56
2562.50	15	16-QAM	Н	150	343	1 / 74	18.50	5.96	24.46	0.279	33.01	-8.55
2510.00	20	QPSK	Н	150	343	1 / 0	19.51	5.77	25.28	0.337	33.01	-7.73
2535.00	20	QPSK	н	150	345	1/0	19.63	5.86	25.49	0.354	33.01	-7.52
2560.00	20	QPSK	Н	150	344	1 / 99	19.45	5.95	25.40	0.347	33.01	-7.61
2560.00	20	16-QAM	Н	150	344	1 / 99	18.38	5.95	24.33	0.271	33.01	-8.68
2535.00	10	QPSK	V	150	101	1/49	17.76	6.07	23.83	0.242	33.01	-9.18

Table 7-7. EIRP Data (Band 7)

FCC ID: A3LSMJ737V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	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 v03 - 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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bore sight antenna mast 1m to 4m EUT turntable 1.5m & styrofoam block

3m -

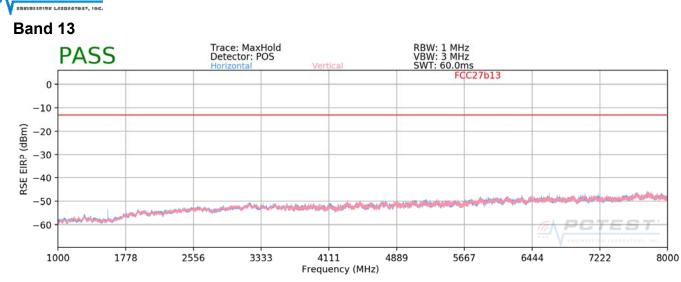
The EUT and measurement equipment were set up as shown in the diagram below.

Figure 7-7. Test Instrument & Measurement Setup

#### **Test Notes**

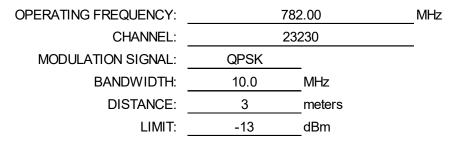
- 1) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the tables below.
- 2) This unit was tested with 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 7-164. Radiated Spurious Plot above 1GHz (Band 13)



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	Н	328	158	-69.09	5.72	-63.36	-50.4
3128.00	Н	-	-	-70.58	6.93	-63.65	-50.6

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

FCC ID: A3LSMJ737V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager			
Test Report S/N:	Test Dates:	EUT Type:		Dage 112 of 125			
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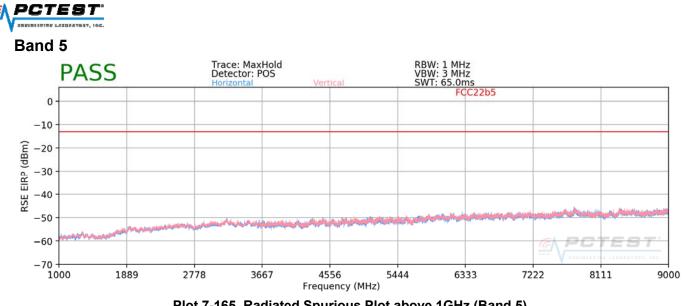


MODULATION SIGNAL:	QPSK	_
BANDWIDTH:	10.00	MHz
DISTANCE:	3	meters
NARROWBAND EMISSION LIMIT:	-50	dBm
WIDEBAND EMISSION LIMIT:	-40	dBm/MHz

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	Н	191	320	-62.80	5.88	-56.92	-16.9

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

FCC ID: A3LSMJ737V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dama 444 of 425	
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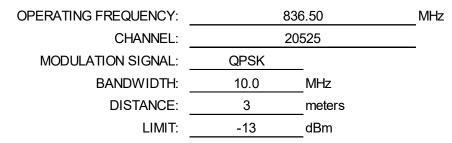
MHz	0	829.00		OPERATING FREQUENCY:
_	)	20450		CHANNEL:
			QPSK	MODULATION SIGNAL:
	Hz	MHz	10.0	BANDWIDTH:
	eters	meters	3	DISTANCE:
	3m	dBm	-13	LIMIT:

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]
1658.00	Н	117	10	-72.57	5.78	-66.79	-53.8
2487.00	Н	111	41	-69.58	5.73	-63.86	-50.9
3316.00	Н	-	-	-71.53	7.87	-63.66	-50.7

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

FCC ID: A3LSMJ737V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager	
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Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1673.00	Н	279	306	-72.34	5.73	-66.61	-53.6
2509.50	Н	109	28	-68.85	5.77	-63.09	-50.1
3346.00	Н	-	-	-70.79	7.91	-62.88	-49.9

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

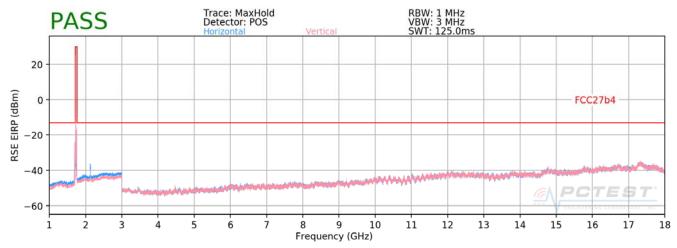
OPERATING FREQUENCY:	844	4.00 MHz
CHANNEL:	200	600
MODULATION SIGNAL:	QPSK	_
BANDWIDTH:	10.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

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]
1688.00	Н	109	29	-70.55	5.67	-64.88	-51.9
2532.00	Н	110	27	-69.72	5.85	-63.87	-50.9
3376.00	Н	-	-	-71.31	7.94	-63.36	-50.4

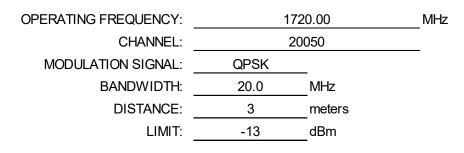
Table 7-12. Radiated Spurious Data (Band 5 – High Channel)

FCC ID: A3LSMJ737V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager	
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Plot 7-166. Radiated Spurious Plot above 1GHz (Band 4)

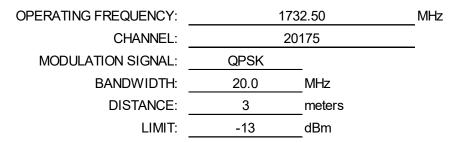


Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3440.00	V	109	91	-68.69	8.25	-60.44	-47.4
5160.00	V	110	79	-64.84	10.29	-54.55	-41.6
6880.00	V	-	-	-70.99	11.42	-59.57	-46.6

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

FCC ID: A3LSMJ737V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dage 117 of 125	
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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	115	74	-61.70	8.30	-53.40	-40.4
5197.50	V	110	91	-66.58	10.25	-56.33	-43.3
6930.00	V	-	-	-71.16	11.45	-59.71	-46.7

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

OPERATING FREQUENCY:	174	5.00 MHz
CHANNEL:	203	300
MODULATION SIGNAL:	QPSK	_
BANDWIDTH:	20.0	MHz
DISTANCE:	3	meters
LIMIT:	-13	dBm

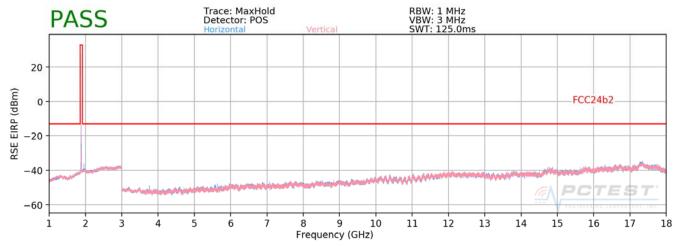
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3490.00	V	129	77	-65.74	8.35	-57.39	-44.4
5235.00	V	109	94	-63.66	10.29	-53.37	-40.4
6980.00	V	110	104	-71.38	11.50	-59.89	-46.9
8725.00	V	-	-	-71.99	13.20	-58.79	-45.8

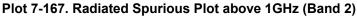
Table 7-15. Radiated Spurious Data (Band 4 – High Channel)

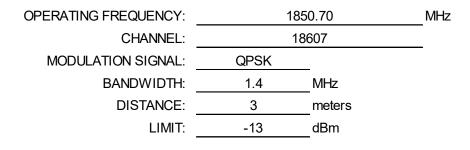
FCC ID: A3LSMJ737V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 119 of 125
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Band 2





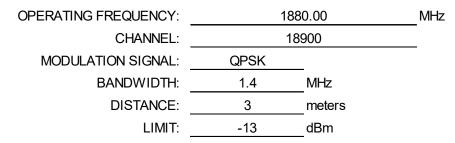


Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3701.40	Н	113	190	-67.75	8.30	-59.45	-46.5
5552.10	Н	111	14	-59.66	10.53	-49.14	-36.1
7402.80	Н	360	113	-64.79	11.91	-52.88	-39.9
9253.50	Н	-	-	-72.50	13.41	-59.09	-46.1

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

FCC ID: A3LSMJ737V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager			
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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	120	163	-64.75	8.46	-56.29	-43.3
5640.00	Н	116	15	-61.95	10.60	-51.35	-38.4
7520.00	Н	360	114	-63.57	12.11	-51.47	-38.5
9400.00	Н	-	-	-72.09	13.35	-58.74	-45.7

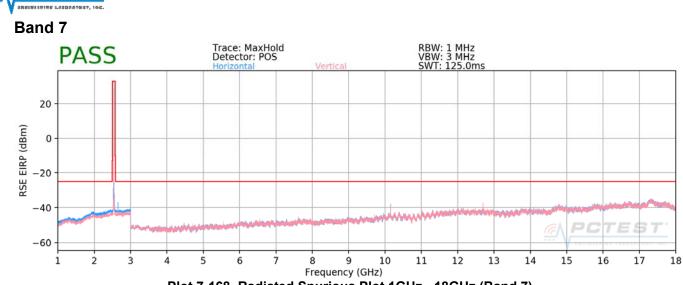
Table 7-17. Radiated Spurious Data (Band 2 – Mid Channel)

OPERATING FREQUENCY: 1909.30 MHz CHANNEL: 19193 MODULATION SIGNAL: QPSK BANDWIDTH: 1.4 MHz DISTANCE: 3 meters LIMIT: -13 dBm

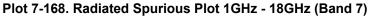
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3818.60	Н	111	37	-57.99	8.56	-49.43	-36.4
5727.90	Н	113	23	-64.49	10.64	-53.85	-40.9
7637.20	Н	113	277	-65.24	12.19	-53.05	-40.1
9546.50	Н	-	-	-71.57	13.30	-58.28	-45.3

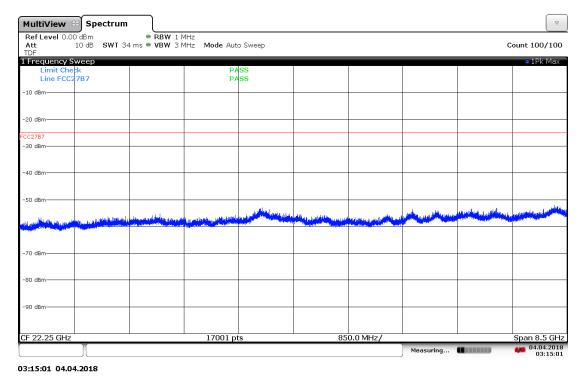
Table 7-18. Radiated Spurious Data (Band 2 – High Channel)

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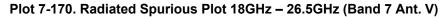
Plot 7-169. Radiated Spurious Plot 18GHz – 26.5GHz (Band 7 Ant. H)

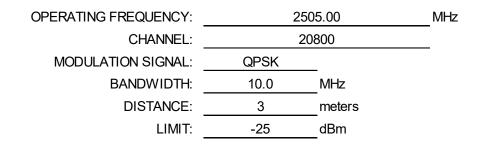
FCC ID: A3LSMJ737V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dage 101 of 125	
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Ref Level 0.00 Att	0 dBm 10 dB <b>SWT</b> 34			Culoop				- -	ount 100/10
TDF	10 0B 5W1 34		nz Mode Auto	o sweep				L. L.	ount 100/10
Frequency S									●1Pk Ma:
Limit Che Line FCC2			PA PA						
	767			33					
10 dBm									
20 dBm									
CC27B7									
30 dBm									
40 dBm									
40 UBIII									
50 dBm									
	المتحد فبالأسيد	والتعبير والمعارفة الشافر ومعتقه	والمتعقبة العراري ومعالمه والمعر		Land In the second second	and the second	ومتعقب والجنوريان والألبين	والمتعادة والمتارية والتلاقية	al contract of the state of the
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F 22.25 GHz			17001 pt			50.0 MHz/			Span 8.5 G





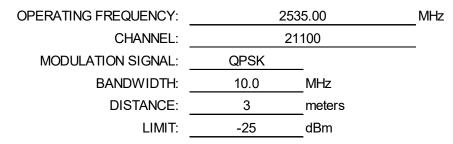


Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5010.00	Н	150	163	-64.96	8.34	-56.63	-31.6
7515.00	Н	150	134	-62.88	8.44	-54.44	-29.4
10020.00	Н	150	296	-48.01	9.87	-38.15	-13.1
12525.00	Н	150	306	-44.73	9.34	-35.39	-10.4
15030.00	Н	-	-	-56.77	9.39	-47.37	-22.4

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

FCC ID: A3LSMJ737V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager			
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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]
5070.00	Н	150	155	-64.45	8.39	-56.06	-31.1
7605.00	Н	150	123	-58.92	8.51	-50.41	-25.4
10140.00	H	150	303	-49.21	9.70	-39.51	-14.5
12675.00	H	150	305	-51.16	9.24	-41.92	-16.9
15210.00	Н	-	-	-56.44	9.31	-47.13	-22.1

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

QPSK

10.0

3

2565.00

21400

MHz

meters

MHz

OPERATING FREQUENCY:

CHANNEL:

MODULATION SIGNAL:

BANDWIDTH:

DISTANCE:

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]
5130.00	Н	150	153	-65.88	8.43	-57.45	-32.5
7695.00	Н	150	240	-57.73	8.66	-49.07	-24.1
10260.00	Н	150	302	-42.23	9.72	-32.51	-7.5
12825.00	Н	150	306	-43.92	9.22	-34.70	-9.7
15390.00	Н	-	-	-56.53	9.17	-47.36	-22.4

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

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### 7.8 Frequency Stability / Temperature Variation

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

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

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

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:	4.30	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.30	+ 20 (Ref)	781,999,959	-41	-0.0000052
100 %		- 30	781,999,752	-248	-0.0000317
100 %		- 20	782,000,024	24	0.0000031
100 %		- 10	781,999,823	-177	-0.0000226
100 %		0	781,999,665	-335	-0.0000428
100 %		+ 10	781,999,938	-62	-0.0000079
100 %		+ 20	781,999,942	-58	-0.0000074
100 %		+ 30	782,000,295	295	0.0000377
100 %		+ 40	781,999,752	-248	-0.0000317
100 %		+ 50	781,999,992	-8	-0.0000010
BATT. ENDPOINT	3.70	+ 20	781,999,599	-401	-0.0000513

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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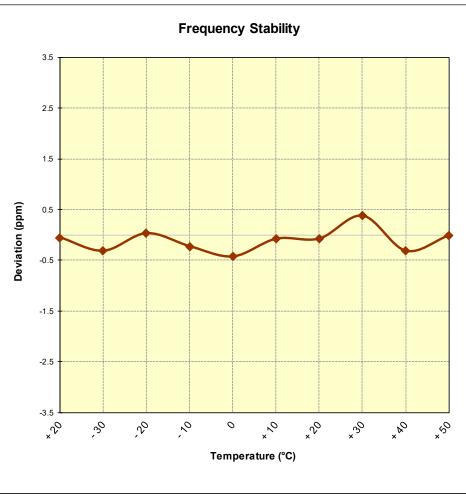


Figure 7-8. Frequency Stability Graph (Band 13)

FCC ID: A3LSMJ737V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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## **Band 5 Frequency Stability Measurements**

OPERATING FREQUENCY:	836,500,000	Hz
CHANNEL:	20525	_
REFERENCE VOLTAGE:	4.30	VDC
DEVIATION LIMIT:	± 0.00025 % or 2.5 ppm	_

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.30	+ 20 (Ref)	836,499,898	-102	-0.0000122
100 %		- 30	836,500,040	40	0.0000048
100 %		- 20	836,500,265	265	0.0000317
100 %		- 10	836,500,076	76	0.0000091
100 %		0	836,499,979	-21	-0.0000025
100 %		+ 10	836,499,839	-161	-0.0000192
100 %		+ 20	836,499,705	-295	-0.0000353
100 %		+ 30	836,500,244	244	0.0000292
100 %		+ 40	836,500,105	105	0.0000126
100 %		+ 50	836,500,055	55	0.0000066
BATT. ENDPOINT	3.70	+ 20	836,500,254	254	0.0000304

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

FCC ID: A3LSMJ737V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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## **Band 5 Frequency Stability Measurements**

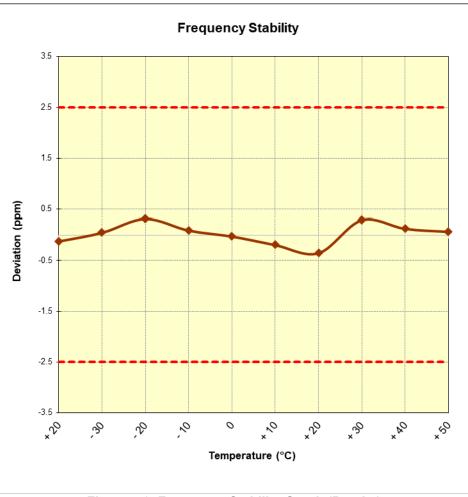


Figure 7-9. Frequency Stability Graph (Band 5)

FCC ID: A3LSMJ737V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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### **Band 4 Frequency Stability Measurements**

OPERATING FREQUENCY:	1,732,500,000	Hz
CHANNEL:	20175	_
REFERENCE VOLTAGE:	4.30	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.30	+ 20 (Ref)	1,732,499,754	-246	-0.0000142
100 %		- 30	1,732,500,335	335	0.0000193
100 %		- 20	1,732,500,024	24	0.0000014
100 %		- 10	1,732,500,286	286	0.0000165
100 %		0	1,732,499,998	-2	-0.0000001
100 %		+ 10	1,732,500,076	76	0.0000044
100 %		+ 20	1,732,499,891	-109	-0.0000063
100 %		+ 30	1,732,500,266	266	0.0000154
100 %		+ 40	1,732,500,303	303	0.0000175
100 %		+ 50	1,732,499,957	-43	-0.0000025
BATT. ENDPOINT	3.70	+ 20	1,732,499,972	-28	-0.0000016

 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**

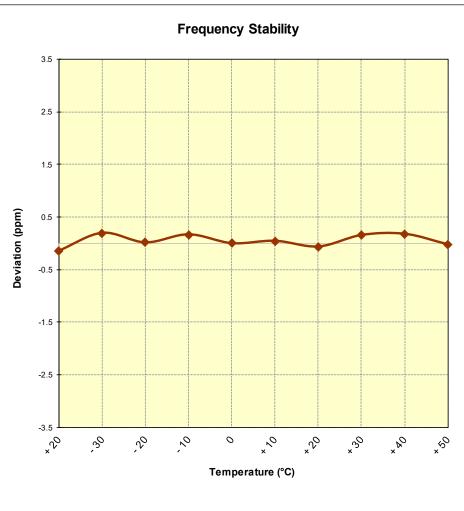


Figure 7-10. Frequency Stability Graph (Band 4)

FCC ID: A3LSMJ737V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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## **Band 2 Frequency Stability Measurements**

 OPERATING FREQUENCY:
 1,880,000,000
 Hz

 CHANNEL:
 18900

 REFERENCE VOLTAGE:
 4.30
 VDC

 DEVIATION LIMIT:
 ± 0.00025 % or 2.5 ppm

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.30	+ 20 (Ref)	1,880,000,280	280	0.0000149
100 %		- 30	1,880,000,042	42	0.0000022
100 %		- 20	1,879,999,822	-178	-0.0000095
100 %		- 10	1,879,999,815	-185	-0.0000098
100 %		0	1,880,000,203	203	0.0000108
100 %		+ 10	1,879,999,749	-251	-0.0000134
100 %		+ 20	1,879,999,875	-125	-0.0000066
100 %		+ 30	1,880,000,296	296	0.0000157
100 %		+ 40	1,880,000,081	81	0.0000043
100 %		+ 50	1,879,999,701	-299	-0.0000159
BATT. ENDPOINT	3.70	+ 20	1,879,999,797	-203	-0.0000108

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

FCC ID: A3LSMJ737V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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## **Band 2 Frequency Stability Measurements**

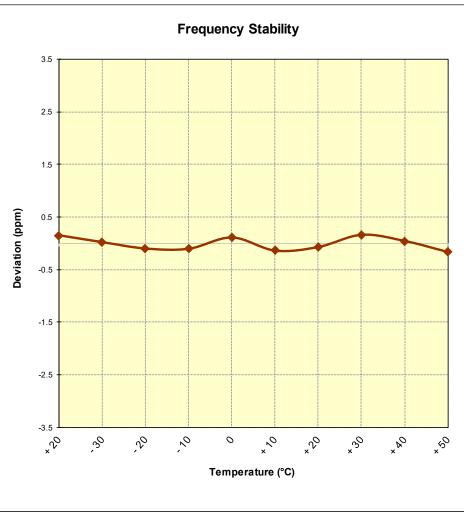


Figure 7-11. Frequency Stability Graph (Band 2)

FCC ID: A3LSMJ737V		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
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### **Band 7 Frequency Stability Measurements**

OPERATING FREQUENCY:	2,535,000,000	Hz
CHANNEL:	21100	
REFERENCE VOLTAGE:	4.30	VDC

VOLTAGE (%)	POWER (VDC)	<b>ТЕМР</b> ( <sup>°</sup> С)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.30	+ 20 (Ref)	2,534,999,990	-10	-0.0000004
100 %		- 30	2,534,999,798	-202	-0.0000080
100 %		- 20	2,535,000,034	34	0.0000013
100 %		- 10	2,535,000,023	23	0.0000009
100 %		0	2,534,999,995	-5	-0.0000002
100 %		+ 10	2,534,999,624	-376	-0.0000148
100 %		+ 20	2,535,000,358	358	0.0000141
100 %		+ 30	2,535,000,126	126	0.0000050
100 %		+ 40	2,535,000,043	43	0.0000017
100 %		+ 50	2,534,999,994	-6	-0.0000002
BATT. ENDPOINT	3.70	+ 20	2,534,999,877	-123	-0.0000049

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**

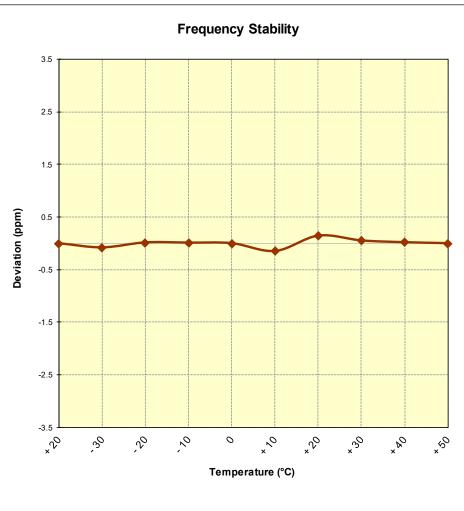


Figure 7-12. Frequency Stability Graph (Band 7)

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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: A3LSMJ737V complies with all the requirements of Part 22, 24, & 27 of the FCC Rules for LTE operation only.

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