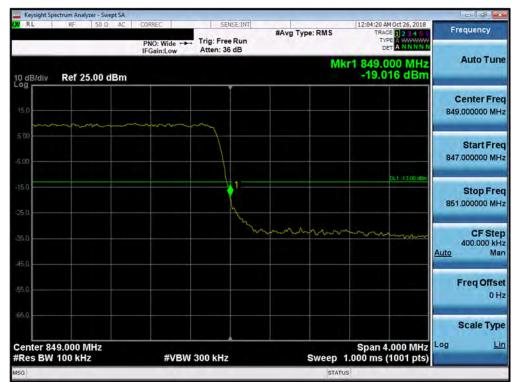


RL RF 50 Ω AC	CORREC	SENSE:INT		12:03:59 AM Oct 26, 2018	Engeneration
	PNO: Wide	Trig: Free Run Atten: 36 dB	#Avg Type: RMS	TRACE 2 3 4 5 0 TYPE A WINNIN DET A NNNNN	Frequency
0 dB/div Ref 25.00 dBm			Mkr	1 824.000 MHz -17.699 dBm	Auto Tun
15.0		~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		Center Fre 824.000000 MF
5.00					Start Fre 822.000000 Mi
25.0		1-		CL1 -13.00 dBm	Stop Fro 826.000000 Mi
35.0	manna				CF Ste 400.000 kl Auto M
56 0					Freq Offs 01
Center 824.000 MHz	#\/D\\/			Span 4.000 MHz	Scale Typ
Res BW 100 kHz	#VBW 3	300 kHz	Sweep 1.	000 ms (1001 pts)	

Plot 7-148. Lower Band Edge Plot (Band 26/5 - 3.0MHz QPSK - Full RB Configuration)



Plot 7-149. Upper Band Edge Plot (Band 26/5 - 3.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Daga 07 of 202	
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 97 of 203	
© 2019 PCTEST Engineering Labor	2019 PCTEST Engineering Laboratory. Inc.				



RL RF 50Ω AC	CORREC	SENSE:INT		12:01:48 AM Oct 26, 2018	Frequency
	PNO: Wide 🖵 IFGain:Low	Trig: Free Run Atten: 36 dB	#Avg Type: RMS	TYPE A WARMAN	Frequency
IO dB/div Ref 25.00 dBm			M	r1 824.000 MHz -21.90 dBm	Auto Tun
15.0			~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		Center Fre 824.000000 MH
5.00					Start Fre 822.000000 MH
25.0				OL1 -13 00 dBm	Stop Fre 826.000000 MH
35.0 45.0	minin	Anna			CF Ste 400,000 kł Auto Ma
56 0					Freq Offs 0 F
66 0 Center 824.000 MHz				opan 4.000 Minz	Scale Typ
Res BW 150 kHz	#VBW :	300 kHz	Sweep	1.000 ms (1001 pts)	

Plot 7-150. Lower Band Edge Plot (Band 26/5 - 5.0MHz QPSK - Full RB Configuration)



Plot 7-151. Upper Band Edge Plot (Band 26/5 - 5.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager		
Test Report S/N:	Test Dates:	EUT Type:		Dage 09 of 202		
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 98 of 203		
© 2019 PCTEST Engineering Labora	2019 PCTEST Engineering Laboratory, Inc.					



XI RL RF 50Ω AC	PNO: Wide	SENSE:INT Trig: Free Run Atten: 36 dB	#Avg Type: RMS	11:53:45 PM Oct 25, 2018 TRACE 2 3 4 5 0 TYPE A WARNIN DET A NNNNN	Frequency
10 dB/div Ref 25.00 dBm			Mk	r1 824.000 MHz -27.71 dBm	Auto Tun
15.0					Center Fre 824.000000 MH
5.00			an marine hits		Start Fre 820.000000 MH
25.0		2		OL1 -13.00 dBm	Stop Fre 828.000000 MF
35.0					CF Ste 800,000 kF Auto Ma
55 0					Freq Offs 0 F
65 0 Center 824.000 MHz #Res BW 150 kHz	#VBW	300 kHz	Sweep	Span 8.000 MHz 1.000 ms (1001 pts)	Scale Typ Log <u>L</u>

Plot 7-152. Lower Band Edge Plot (Band 26/5 - 10.0MHz QPSK - Full RB Configuration)



Plot 7-153. Upper Band Edge Plot (Band 26/5 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dega 00 of 202	
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 99 of 203	
© 2019 PCTEST Engineering Labora	2019 PCTEST Engineering Laboratory, Inc.				



RL RF 50Ω AC	CORREC	SENSE:INT	#Avg Type: RMS	11:51:02 PM Oct 25, 2018 TRACE 2 3 4 5 6	Frequency
	PNO: Wide 😱 IFGain:Low	Trig: Free Run Atten: 36 dB		DET A NNNNN	
0 dB/div Ref 25.00 dBm			M	cr1 824.000 MHz -29.07 dBm	Auto Tun
15,0					Center Fre 824.000000 MH
5.00				han and and the	Start Fre 818,000000 MH
25.0		1.2		CL1 -13.00 dBm	Stop Fre 830.000000 MH
35.0					CF Ste 1.200000 MH Auto Ma
56 0					Freq Offs 0 F
65.0					Scale Typ
Center 824.000 MHz Res BW 150 kHz	#VBW 4	470 kHz	Sweep	Span 12.00 MHz 1.000 ms (1001 pts)	Log L

Plot 7-154. Lower Band Edge Plot (Band 26 - 15.0MHz QPSK - Full RB Configuration)



Plot 7-155. Upper Band Edge Plot (Band 26 - 15.0MHz QPSK - Full RB Configuration)

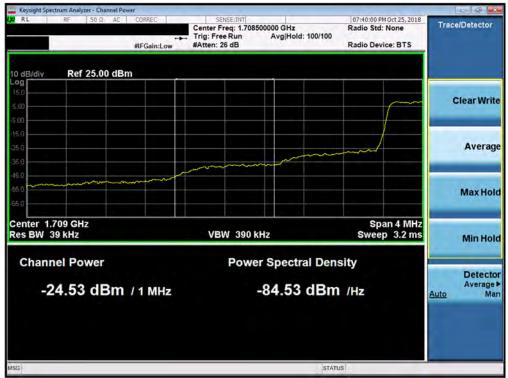
FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager		
Test Report S/N:	Test Dates:	EUT Type:		Daga 100 of 202		
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 100 of 203		
© 2019 PCTEST Engineering Labor	2019 PCTEST Engineering Laboratory, Inc.					



## Band 4



Plot 7-156. Lower Band Edge Plot (Band 4 - 1.4MHz QPSK - Full RB Configuration)



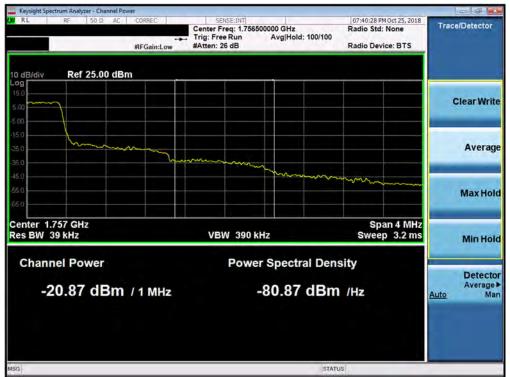
Plot 7-157. Lower Extended Band Edge Plot (Band 4 - 1.4MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 101 of 202
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 101 of 203
© 2019 PCTEST Engineering Labo	ratory. Inc.			V 8.8 11/19/2018



RL RF 50 Ω AC CORREC	SENSE:INT		07:40:20 PM Oct 25, 2018	Frequency
PNO: Wide IFGain:Low	Trig: Free Run Atten: 36 dB	#Avg Type: RMS	TRACE 2 3 4 5 0 TYPE A WHAT	
o dB/div Ref 25.00 dBm		Mkr1	1.755 064 GHz -26.90 dBm	Auto Tur
15.0				Center Fre 1.755000000 GH
00 00 00 00 00 00 00 00 00 00 00 00 00	manner			Start Fre 1.753000000 GH
5.0	1		GL1 -13 00 dBm	Stop Fro 1.757000000 G
150		Amount yours	immethic warman	CF Ste 400,000 kl Auto Ma
				Freq Offs 01
enter 1.755000 GHz Res BW 15 kHz #VE	BW 51 kHz	Sweep 2	Span 4.000 MHz 1.80 ms (1001 pts)	Scale Tyr Log <u>L</u>

Plot 7-158. Upper Band Edge Plot (Band 4 - 1.4MHz QPSK - Full RB Configuration)



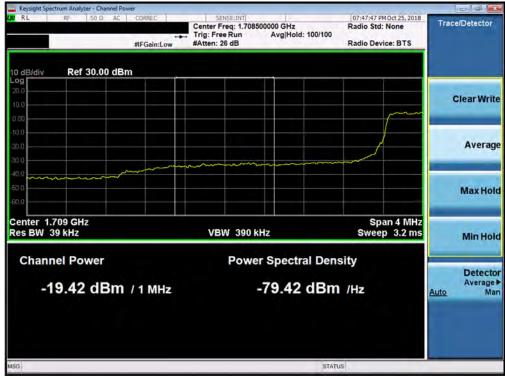
Plot 7-159. Upper Extended Band Edge Plot (Band 4 - 1.4MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager		
Test Report S/N:	Test Dates:	EUT Type:		Dogo 102 of 202		
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 102 of 203		
© 2019 PCTEST Engineering Labor	2019 PCTEST Engineering Laboratory, Inc.					



RL RF 50 Q AC	CORREC	SENSE:INT	#Avg Type: RMS	07:47:39 PM Oct 25, 2018 TRACE 1 2 3 4 5 0	Trace/Detector
	PNO: Wide IFGain:Low	Trig: Free Run Atten: 36 dB		DET A NNNN	Select Trace
0 dB/div Ref 25.00 dBm			Mkr	1 1.710 000 GHz -23.052 dBm	1
15.0					Clear Writ
500		r		an hannen -	Trace Averag
15.0		1		CL1 -13:00 dBm	Max Hol
35.0	mpurin	mount			Min Hol
45 0					View Blank View
66 0 Center 1.710000 GHz				Span 4.000 MHz	Mor 1 of
Res BW 47 kHz	#VBW	160 kHz	Sweep	Span 4.000 MHz 2.267 ms (1001 pts)	-

Plot 7-160. Lower Band Edge Plot (Band 4 - 3.0MHz QPSK - Full RB Configuration)



Plot 7-161. Lower Extended Band Edge Plot (Band 4 - 3.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dago 102 of 202	
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 103 of 203	
© 2019 PCTEST Engineering Labora	2019 PCTEST Engineering Laboratory, Inc.				



RL RF 50 Ω AC	CORREC	SENSE:INT	#Avg Type: RMS	07:48:33 PM Oct 25, 2018 TRACE 2344	Frequency
	PNO: Wide +++	Trig: Free Run Atten: 36 dB	wavy type. Kina	TYPE A WWWWW DET A NNNNN	
dB/div Ref 25.00 dBm			Mkr	1 1.755 000 GHz -23.855 dBm	Auto Tun
.0					Center Free 1.755000000 GH
	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~			Start Fre 1.753000000 GH
0		1		0L1 -13.00 dBm	Stop Fre 1.757000000 GH
.a				man	CF Ste 400.000 kF Auto Ma
0					Freq Offs 0 F
enter 1.755000 GHz				Span 4.000 MHz	Scale Typ
es BW 47 kHz	#VBW	160 kHz	Sweep	2.267 ms (1001 pts)	

Plot 7-162. Upper Band Edge Plot (Band 4 - 3.0MHz QPSK - Full RB Configuration)



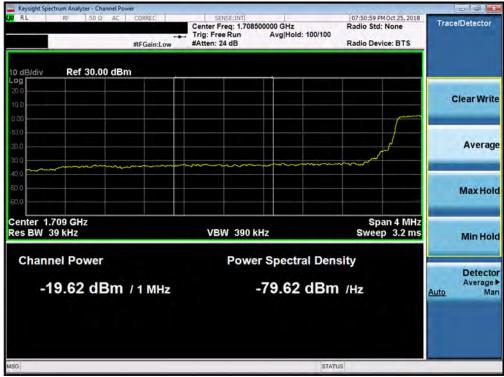
Plot 7-163. Upper Extended Band Edge Plot (Band 4 - 3.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dega 104 of 202	
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	1/26/2019 Portable Handset		Page 104 of 203	
© 2019 PCTEST Engineering Labor	2019 PCTEST Engineering Laboratory, Inc.				



RL RF 50Ω AC	CORREC	SENSE:INT	#Avg Type: RMS	07:50:52 PM Oct 25, 2018 TRACE 2 3 4 5 0	Frequency
	PNO: Wide +++	Trig: Free Run Atten: 36 dB	#Avg Type. Rm3	TYPE A WWWWW	
0 dB/div Ref 25.00 dBm			Mkr	1 1.709 992 GHz -26.30 dBm	Auto Tun
15.0					Center Fre 1.710000000 GH
5.00		(			Start Fre 1.708000000 GH
25.0		1		0L1 -13 00 dBm	Stop Fre 1.712000000 GF
45.0					CF Ste 400.000 kH Auto Ma
56 0					Freq Offs 0 F
Eenter 1.710000 GHz Res BW 75 kHz	#) (D) (L)	240 kHz		Span 4.000 MHz 1.000 ms (1001 pts)	Scale Typ

Plot 7-164. Lower Band Edge Plot (Band 4 - 5.0MHz QPSK - Full RB Configuration)



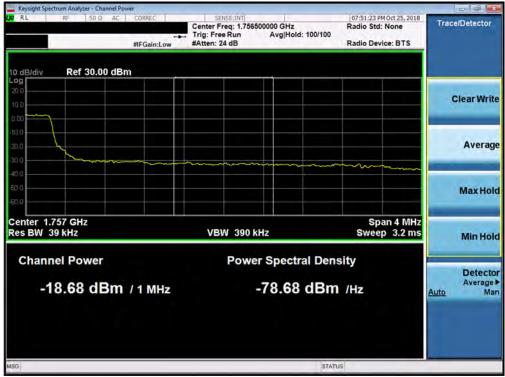
Plot 7-165. Lower Extended Band Edge Plot (Band 4 - 5.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dage 105 of 202	
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 105 of 203	
© 2019 PCTEST Engineering Labora	2019 PCTEST Engineering Laboratory, Inc.				



RL RF 50Ω AC	CORREC	SENSE:INT	#Avg Type: RMS	07:51:18 PM Oct 25, 2018 TRACE 1 2 3 4 5 0	Frequency
	PNO: Wide ++	Trig: Free Run Atten: 36 dB	wavg Type. Rins		
0 dB/div Ref 25.00 dBm			Mkr1	1.755 000 GHz -25.807 dBm	Auto Tun
15.0					Center Fre 1.755000000 GH
5 00	~~~~~	$\gamma$			Start Fre 1.753000000 GH
15.0		1		GL1 -13.00 dBm	Stop Fre 1.757000000 GH
35.0			~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	·	CF Ste 400.000 kł Auto Ma
55.0					Freq Offs 0 F
center 1.755000 GHz				Span 4.000 MHz	Scale Typ
Res BW 75 kHz	#VBW 2	240 kHz	Sweep	1.000 ms (1001 pts)	-

Plot 7-166. Upper Band Edge Plot (Band 4 - 5.0MHz QPSK - Full RB Configuration)



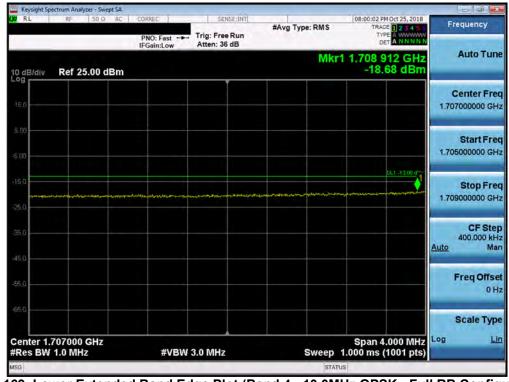
Plot 7-167. Upper Extended Band Edge Plot (Band 4 - 5.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dage 106 of 202	
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 106 of 203	
© 2019 PCTEST Engineering Labora	2019 PCTEST Engineering Laboratory, Inc.				



RL RF 50Ω AC	CORREC	SENSE:INT	#Avg Type: RMS	07:52:03 PM Oct 25, 2018 TRACE 2 3 4 5 6	Frequency
	PNO: Wide IFGain:Low	Trig: Free Run Atten: 36 dB	ming type this	TYPE A WAWWAW DET A NNNNN	
10 dB/div Ref 25.00 dBm			Mkr	1 1.709 968 GHz -26.35 dBm	Auto Tun
15.0					Center Free 1.710000000 GH
5.00		$\int$		mmmm	Start Fre 1.706000000 GH
-150		1		DL1 -13.00 dBm	Stop Fre 1.714000000 GH
35.0	www.	www			CF Ste 800.000 kH Auto Ma
55 0					Freq Offso 0 H
66.0					Scale Typ
Center 1.710000 GHz #Res BW 130 kHz	#VBW	470 kHz	Sweep	Span 8.000 MHz 1.000 ms (1001 pts)	

Plot 7-168. Lower Band Edge Plot (Band 4 - 10.0MHz QPSK - Full RB Configuration)



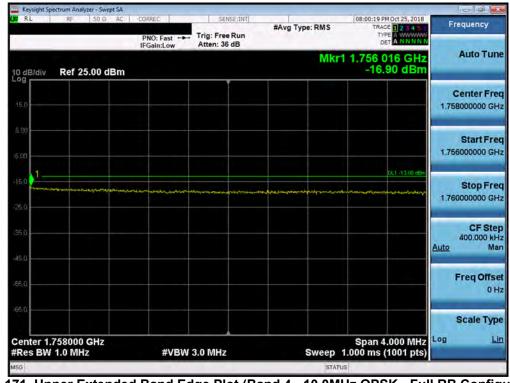
Plot 7-169. Lower Extended Band Edge Plot (Band 4 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dame 107 of 202	
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 107 of 203	
© 2019 PCTEST Engineering Labora	2019 PCTEST Engineering Laboratory, Inc.				



RL RF 50 Ω	AC CORREC	SENSE:INT	#Avg Type: RMS	07:52:36 PM Oct 25, 2018 TRACE 2 3 4 5 0	Frequency
	PNO: Wide ++	Trig: Free Run Atten: 36 dB		DET A NN NN N	
0 dB/div Ref 25.00 dB	m		Mkr	1 1.755 008 GHz -24.28 dBm	Auto Tun
15.0					Center Fre 1.755000000 GH
5.00	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	$\gamma$			Start Fre 1.751000000 GH
15.0		1		0L1 -13.00 dBm	Stop Fre 1.759000000 GF
35.0				m	CF Ste 800,000 kH Auto Ma
55 0					Freq Offs 0 F
Center 1.755000 GHz				Span 8.000 MHz	Scale Typ
Res BW 130 kHz	#VBW 4	470 kHz	Sweep	1.000 ms (1001 pts)	2

Plot 7-170. Upper Band Edge Plot (Band 4 - 10.0MHz QPSK - Full RB Configuration)



Plot 7-171. Upper Extended Band Edge Plot (Band 4 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dega 109 of 202	
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 108 of 203	
© 2019 PCTEST Engineering Labora	2019 PCTEST Engineering Laboratory, Inc.				



RL RF 50Ω AC	CORREC	SENSE:INT	#Avg Type: RMS	07:53:27 PM Oct 25, 2018 TRACE 1 2 3 4 5 0	Frequency
	PNO: Wide	Trig: Free Run Atten: 36 dB		TYPE A WARMAN	And the second
10 dB/div Ref 25.00 dBm			Mkr	1 1.708 200 GHz -25.62 dBm	Auto Tun
15,0					Center Fre 1.710000000 GH
5.00					Start Fre 1.704000000 GH
25.0	1	Jul .		CL1 -13.00 dBm	Stop Fre 1.716000000 GF
35.0					CF Ste 1.200000 Mi <u>Auto</u> Ma
55 0					Freq Offs 0 F
65.0					Scale Typ
Center 1.710000 GHz #Res BW 200 kHz	#VBW	580 kHz	Sweep	Span 12.00 MHz 1.000 ms (1001 pts)	r.a

Plot 7-172. Lower Band Edge Plot (Band 4 - 15.0MHz QPSK - Full RB Configuration)



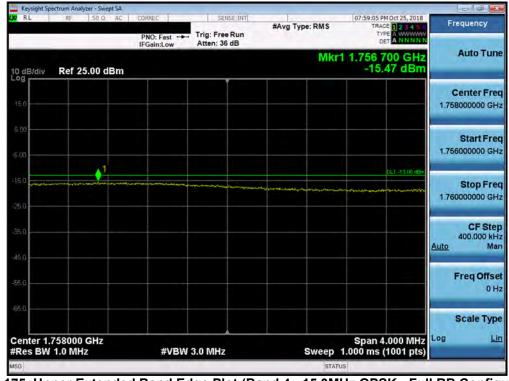
Plot 7-173. Lower Extended Band Edge Plot (Band 4 - 15.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type: Portable Handset		Dage 100 of 202	
1M1811230206-03.A3L	12/14/2018 - 1/26/2019			Page 109 of 203	
© 2019 PCTEST Engineering Labora	V 8.8 11/19/2018				



RL RF 50Ω A	C CORREC	SENSE:INT	#Avg Type: RMS	07:53:57 PM Oct 25, 2018	Frequency
	PNO: Wide +++	Trig: Free Run Atten: 36 dB	#Avg Type: RMS	TRACE 2 3 4 5 6 TYPE A WWWWW DET A NNNNN	
0 dB/div Ref 25.00 dBr	n		Mkr	1.755 072 GHz -22.27 dBm	Auto Tun
15,0					Center Fre 1.755000000 GH
5.00	nn na star an				Start Fre 1.749000000 GH
iso 25.0		the 1	man man	CLI-1300 dBn	Stop Fre 1.761000000 GF
35.0					CF Ste 1.200000 Mi Auto Mi
55 0					Freq Offs 01
Center 1.755000 GHz				Span 12.00 MHz	Scale Typ
Res BW 200 kHz	#VBW (	680 kHz	Sweep	1.000 ms (1001 pts)	

Plot 7-174. Upper Band Edge Plot (Band 4 - 15.0MHz QPSK - Full RB Configuration)



Plot 7-175. Upper Extended Band Edge Plot (Band 4 - 15.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:			Dega 110 of 202
1M1811230206-03.A3L	12/14/2018 - 1/26/2019			Page 110 of 203
© 2019 PCTEST Engineering Labora	V 8.8 11/19/2018			



RL RF 50Ω AC	CORREC	SENSE:INT	#Avg Type: RMS	07:55:16 PM Oct 25, 2018 TRACE 1 2 3 4 5 0	Frequency
	PNO: Fast 😱 IFGain:Low	Trig: Free Run Atten: 36 dB		DET A NNNN	
0 dB/div Ref 25.00 dBm			Mkr	1 1.709 792 GHz -27.02 dBm	Auto Tun
15,0					Center Fre 1.710000000 GH
5.00		ſ		and the constraint and the constraint of the con	Start Fre 1.702000000 GF
25.0		1		DL1 -13 00 dBn	Stop Fre 1.718000000 GF
35.0	ant for order to be				CF Ste 1.600000 MH Auto Ma
55 0					Freq Offs 0 F
65.0					Scale Typ
Center 1.710000 GHz Res BW 240 kHz	#VBW	910 kHz	Sweep	Span 16.00 MHz 1.000 ms (1001 pts)	Log <u>Li</u>

Plot 7-176. Lower Band Edge Plot (Band 4 - 20.0MHz QPSK - Full RB Configuration)



Plot 7-177. Lower Extended Band Edge Plot (Band 4 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager		
Test Report S/N:	Test Dates:	EUT Type:		Daga 111 of 202		
1M1811230206-03.A3L	6-03.A3L 12/14/2018 - 1/26/2019 Portable Handset			Page 111 of 203		
© 2019 PCTEST Engineering Labora	2019 PCTEST Engineering Laboratory, Inc.					



RL RF 50Ω AC	CORREC	SENSE:INT	#Avg Type: RMS	07:55:56 PM Oct 25, 2018 TRACE 2 3 4 5 0	Frequency
	PNO: Fast	Trig: Free Run Atten: 36 dB	wing type. King	TYPE A WWWW DET A NNNN	
dB/div Ref 25.00 dBm			Mkr	1.755 752 GHz -22.12 dBm	Auto Tun
5.0					Center Fre 1.755000000 GH
00		$\gamma$			Start Fre 1.747000000 GF
5.0		Immenter 1	and the second	OLI -13.00 dBm	Stop Fre 1.763000000 GH
5,0					CF Ste 1.600000 MH Auto Ma
50					Freq Offs 0 F
50					Scale Typ
enter 1.755000 GHz Res BW 240 kHz	#VBW	910 kHz	Sweep	Span 16.00 MHz 1.000 ms (1001 pts)	

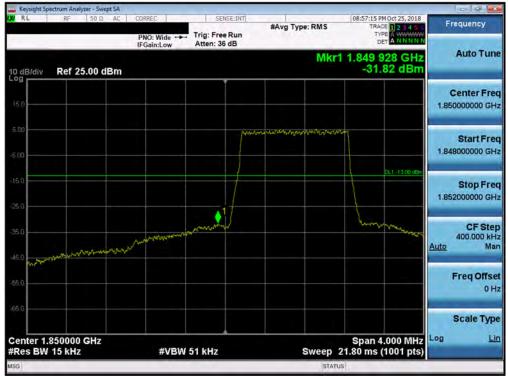
Plot 7-178. Upper Band Edge Plot (Band 4 - 20.0MHz QPSK - Full RB Configuration)



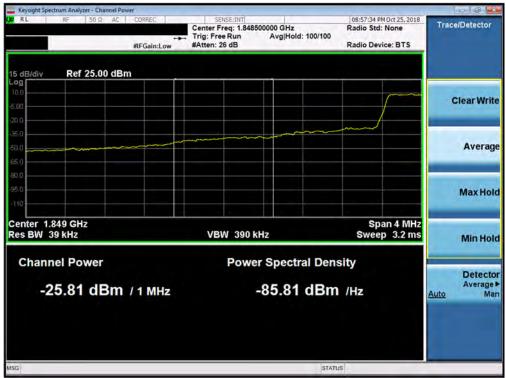
Plot 7-179. Upper Extended Band Edge Plot (Band 4 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:			Dage 110 of 202	
1M1811230206-03.A3L	12/14/2018 - 1/26/2019			Page 112 of 203	
© 2019 PCTEST Engineering Labora	2019 PCTEST Engineering Laboratory, Inc.				





Plot 7-180. Lower Band Edge Plot (Band 25/2 - 1.4MHz QPSK - Full RB Configuration)



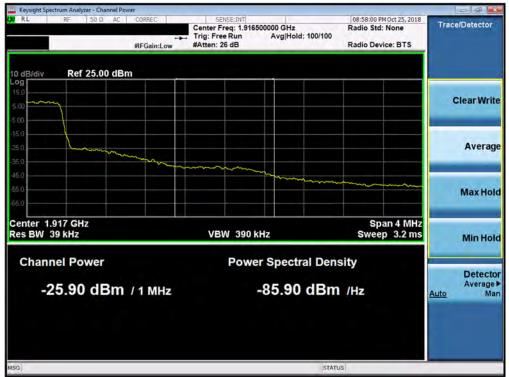
Plot 7-181. Lower Extended Band Edge Plot (Band 25/2 - 1.4MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dage 112 of 202	
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 113 of 203	
© 2019 PCTEST Engineering Labo	2019 PCTEST Engineering Laboratory. Inc.				





Plot 7-182. Upper Band Edge Plot (Band 25/2 - 1.4MHz QPSK - Full RB Configuration)



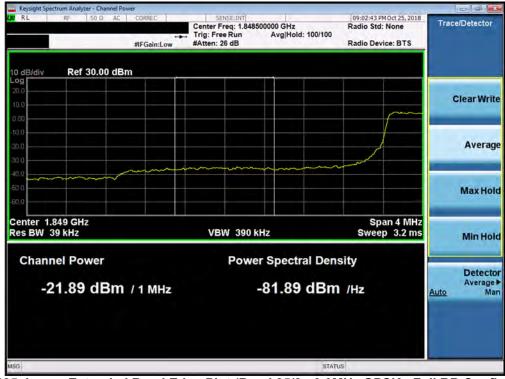
Plot 7-183. Upper Extended Band Edge Plot (Band 25/2 - 1.4MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNE	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 114 of 202
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 114 of 203
© 2019 PCTEST Engineering Labora	V 8.8 11/19/2018			



RL RF 50Ω AC	CORREC	SENSE:INT	#Avg Type: RMS	09:02:37 PM Oct 25, 2018 TRACE 1 2 3 4 5 0	Frequency
	PNO: Wide CP	Trig: Free Run Atten: 36 dB	wavg type, km3	TYPE A WWWWW DET A NNNNN	
0 dB/div Ref 25.00 dBm			Mkr	1 1.850 000 GHz -25.25 dBm	Auto Tune
15.0					Center Free 1.850000000 GH
5.00				mahan	Start Fre 1.848000000 GH
25.0		<b>1</b>		0L1 -13.00 dBm	Stop Fre 1.852000000 GH
35.0	mm	m l			CF Ste 400,000 kH Auto Ma
55 0					Freq Offso 0 H
65.0					Scale Typ
Center 1.850000 GHz Res BW 36 kHz	#VBW	130 kHz	Sweep	Span 4.000 MHz 3.800 ms (1001 pts)	

Plot 7-184. Lower Band Edge Plot (Band 25/2 - 3.0MHz QPSK - Full RB Configuration)



Plot 7-185. Lower Extended Band Edge Plot (Band 25/2 - 3.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		
1M1811230206-03.A3L	12/14/2018 - 1/26/2019 Portable Handset			Page 115 of 203
© 2019 PCTEST Engineering Labor	V 8.8 11/19/2018			



RL	RF	50 Q AC	CORREC	SENSE:INT	HALL THE DATE	09:03:04 PM Oct 25, 2018	Trace/Detector
			PNO: Wide	Trig: Free Run Atten: 36 dB	#Avg Type: RMS	TRACE 23450 TYPE A WWWWW DET A NNNNN	Select Trace
0 dB/div	Ref 25	.00 dBm			Mki	1 1.915 000 GHz -24.080 dBm	1
15.0							Clear Writ
5.00		-	mon	$\sim$			Trace Averag
iā 0						DL i -13.00 dBm	Max Hol
25,0 35,0					· ····································	min	Min Hol
45 0							View Blank View
65 0	0.15000						Mor 1 of
	915000 36 kHz	SHZ	#VBW	130 kHz	Sweep	Span 4.000 MHz 3.800 ms (1001 pts)	
Res BW	36 kHz		#VBW	130 kHz	Sweep		

Plot 7-186. Upper Band Edge Plot (Band 25/2 - 3.0MHz QPSK - Full RB Configuration)



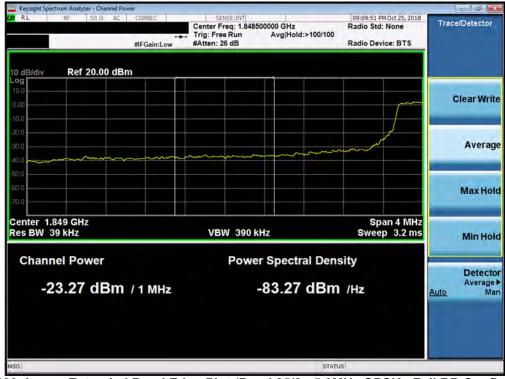
Plot 7-187. Upper Extended Band Edge Plot (Band 25/2 - 3.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 116 of 202
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	9 Portable Handset		Page 116 of 203
© 2019 PCTEST Engineering Labora	V 8.8 11/19/2018			



RL RF 50Ω AC	CORREC	SENSE:INT	the Town Date	09:09:45 PM Oct 25, 2018	Frequency
	PNO: Wide 😱 IFGain:Low	Trig: Free Run Atten: 36 dB	#Avg Type: RMS	TRACE 23456 TYPE A WWWWW DET A NNNNN	
10 dB/div Ref 25.00 dBm			Mkr	1.850 000 GHz -27.80 dBm	Auto Tun
15,0					Center Free 1.850000000 GH
5.00					Start Fre 1.848000000 GH
-15.0				DL1 -13.00 dBm	Stop Fre 1.852000000 GH
35.0					CF Ste 400,000 kH Auto Ma
55 0					Freq Offs 0 F
E5 0 Center 1.850000 GHz				Opan 4.000 Min 2	Scale Typ
Res BW 62 kHz	#VBW	220 kHz	Sweep	1.333 ms (1001 pts)	

Plot 7-188. Lower Band Edge Plot (Band 25/2 - 5.0MHz QPSK - Full RB Configuration)



Plot 7-189. Lower Extended Band Edge Plot (Band 25/2 - 5.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dega 117 of 202	
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 117 of 203	
© 2019 PCTEST Engineering Labora	2019 PCTEST Engineering Laboratory, Inc.				



RL RF 50 Ω AC	CORREC	SENSE:INT		09:10:10 PM Oct 25, 2018	Frequency
	PNO: Wide 😱 IFGain:Low	Trig: Free Run Atten: 36 dB	#Avg Type: RMS	TRACE 23450 TYPE A WWWWW DET A NNNNN	
0 dB/div Ref 25.00 dBm			Mkr	1 1.915 016 GHz -27.64 dBm	Auto Tun
15.0					Center Fre 1.915000000 GH
5 00	~~~~~~				Start Fre 1.913000000 GH
150		1		CL1 -13 00 dBm	Stop Fre 1.917000000 GF
35.0		tin			CF Ste 400,000 kH Auto Ma
56 0					Freq Offs 0 F
55 0 Center 1.915000 GHz Res BW 62 kHz	#VBW 2	220 kHz	Sween	Span 4.000 MHz 1.333 ms (1001 pts)	Scale Typ Log <u>L</u>

Plot 7-190. Upper Band Edge Plot (Band 25/2 - 5.0MHz QPSK - Full RB Configuration)



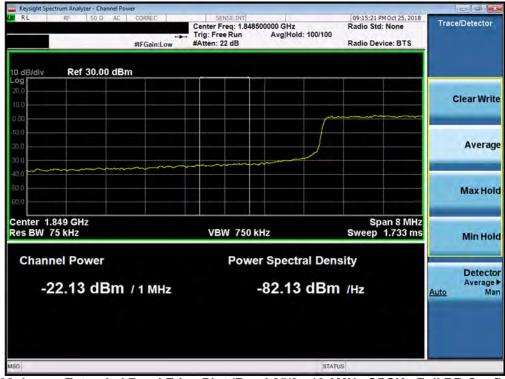
Plot 7-191. Upper Extended Band Edge Plot (Band 25/2 - 5.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dage 110 of 202	
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 118 of 203	
© 2019 PCTEST Engineering Labora	2019 PCTEST Engineering Laboratory, Inc.				



RL RF 50 Q AC	CORREC	SENSE:INT		09:15:13 PM Oct 25, 2018	Frequency
	PNO: Wide C	Trig: Free Run Atten: 36 dB	#Avg Type: RMS	TYPE A WWWWW DET A NNNNN	
10 dB/div Ref 25.00 dBm			Mkr1	1.849 992 GHz -25.99 dBm	Auto Tun
15.0					Center Fred 1.850000000 GH
500		ſ		m	Start Fre 1.846000000 GH
25.0		11		GL1 -13.00 dBn	<b>Stop Fre</b> 1.854000000 GH
35.0 mm	m				CF Ste 800.000 kH Auto Ma
56 0					Freq Offs 0 F
65.0 Center 1.850000 GHz				Span 8.000 MHz	Scale Typ
Res BW 120 kHz	#VBW	430 kHz	Sweep	.000 ms (1001 pts)	

Plot 7-192. Lower Band Edge Plot (Band 25/2 - 10.0MHz QPSK - Full RB Configuration)



Plot 7-193. Lower Extended Band Edge Plot (Band 25/2 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNE	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dage 110 of 202	
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 119 of 203	
© 2019 PCTEST Engineering Labora	2019 PCTEST Engineering Laboratory, Inc.				



	CORREC	SENSE:INT		09:15:40 PM Oct 25, 2018	
	PNO: Wide 😱 IFGain:Low	Trig: Free Run Atten: 36 dB	#Avg Type: RMS	TRACE 23450 TYPE A WWWWW DET A NNNN	Frequency
O dB/div Ref 25.00 dBm			Mkr	1 1.915 000 GHz -28.82 dBm	Auto Tun
15.0					Center Fre 1.915000000 GH
5 00					Start Fre 1.911000000 GF
50		1_1_		OL1 -13.00 dBm	Stop Fre 1.919000000 GF
is 0				non annound	CF Ste 800,000 kł Auto Ma
50					Freq Offs 01
enter 1.915000 GHz Res BW 120 kHz		130 kHz		Span 8.000 MHz 1.000 ms (1001 pts)	Scale Typ Log <u>L</u>

Plot 7-194. Upper Band Edge Plot (Band 25/2 - 10.0MHz QPSK - Full RB Configuration)



Plot 7-195. Upper Extended Band Edge Plot (Band 25/2 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dage 120 of 202	
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 120 of 203	
© 2019 PCTEST Engineering Labora	2019 PCTEST Engineering Laboratory, Inc.				



RL RF 50Ω AC	CORREC	SENSE:INT	#Avg Type: RMS	09:25:12 PM Oct 25, 2018 TRACE 1 2 3 4 5 0	Frequency
	PNO: Wide CP	Atten: 36 dB			in the second
0 dB/div Ref 25.00 dBm			Mkr	1 1.850 000 GHz -29.55 dBm	Auto Tun
15,0					Center Fre 1.850000000 GH
5.00		ſ	ann an		Start Fre 1.844000000 GH
25.0		1,		0L1 -13.00 dBm	Stop Fre 1.856000000 GF
35 0	unyaman				CF Ste 1.200000 Mł <u>Auto</u> Mł
55 0					Freq Offs 0 F
66 0 Center 1.850000 GHz				000an 12.00 min2	Scale Typ
Res BW 180 kHz	#VBW	620 kHz	Sweep	1.000 ms (1001 pts)	

Plot 7-196. Lower Band Edge Plot (Band 25/2 - 15.0MHz QPSK - Full RB Configuration)



Plot 7-197. Lower Extended Band Edge Plot (Band 25/2 - 15.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dage 101 of 202	
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	/26/2019 Portable Handset		Page 121 of 203	
© 2019 PCTEST Engineering Labora	2019 PCTEST Engineering Laboratory, Inc.				



RL RF 50 Ω AC	CORREC	SENSE:INT		09:25:52 PM Oct 25, 2018	Frequency
	PNO: Wide C	Trig: Free Run Atten: 36 dB	#Avg Type: RMS	TRACE 23450 TYPE A WWWWW DET A NNNN	
0 dB/div Ref 25.00 dBm			Mkr	1.915 000 GHz -31.53 dBm	Auto Tune
15.0					Center Free 1.915000000 GH
500					Start Fre 1.909000000 GH
iā 0. 25.0				CL1 -13.00 dBn	Stop Fre 1.921000000 GH
35.0		n and an and a second s	a marine and a second	man .	CF Ste 1.200000 MH Auto Ma
55 0					Freq Offso 0 H
65 0				Span 12.00 MHz	Scale Typ
Res BW 180 kHz	#VBW	620 kHz	Sweep	1.000 ms (1001 pts)	

Plot 7-198. Upper Band Edge Plot (Band 25/2 - 15.0MHz QPSK - Full RB Configuration)



Plot 7-199. Upper Extended Band Edge Plot (Band 25/2 - 15.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Deg 100 of 000
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 122 of 203
© 2019 PCTEST Engineering Labora	V 8.8 11/19/2018			



RL RF 50 Q AC	CORREC	SENSE:INT	#Avg Type: RMS	09:31:04 PM Oct 25, 2018 TRACE 1 2 3 4 5 0	Frequency
	PNO: Fast 😱 IFGain:Low	Trig: Free Run Atten: 36 dB	wavg Type. Kina	TYPE A WARMAN	
10 dB/div Ref 25.00 dBm			Mkr	1 1.849 968 GHz -30.16 dBm	Auto Tun
15,0					Center Fre 1.850000000 GH
5.00		$\int$		and an and a second and a second	Start Fre 1.842000000 GH
25.0		1		CL1 -13 00 dBm	Stop Fre 1.858000000 GF
35.0	anangan sanan s	www.www.mar.			CF Ste 1,600000 Mi Auto Mi
55 0					Freq Offs 0 F
© 0 Center 1.850000 GHz #Res BW 240 kHz	#VBW 3	820 kHz	Swaap	Span 16.00 MHz 1.000 ms (1001 pts)	Scale Typ Log <u>L</u>

Plot 7-200. Lower Band Edge Plot (Band 25/2 - 20.0MHz QPSK - Full RB Configuration)



Plot 7-201. Lower Extended Band Edge Plot (Band 25/2 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 102 of 202
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 123 of 203
© 2019 PCTEST Engineering Labora	V 8.8 11/19/2018			



RL	RF 50 Ω AC	CORREC	SENSE:INT		09:32:05 PM Oct 25, 2018	Frequency
		PNO: Fast 😱 IFGain:Low	Trig: Free Run Atten: 36 dB	#Avg Type: RMS	TRACE 2 3 4 5 0 TYPE A WWWWW DET A NNNNN	Frequency
10 dB/div	Ref 25.00 dBm			Mki	1 1.915 032 GHz -29.79 dBm	Auto Tun
15.0						Center Fre 1.915000000 GH
5.00			$\mathbf{r}$			Start Fre 1.907000000 GH
150 25.0			1-1-		CL1 -13 00 dBm	Stop Fre 1.923000000 GH
35.0			and ment	minimum	- And Marine and	CF Ste 1.600000 MH Auto Ma
55 0						Freq Offs 0 F
65 0 Center 1.91					Span 16.00 MHz	Scale Typ
Res BW 24	0 kHz	#VBW :	820 kHz	Sweep	1.000 ms (1001 pts)	

Plot 7-202. Upper Band Edge Plot (Band 25/2 - 20.0MHz QPSK - Full RB Configuration)



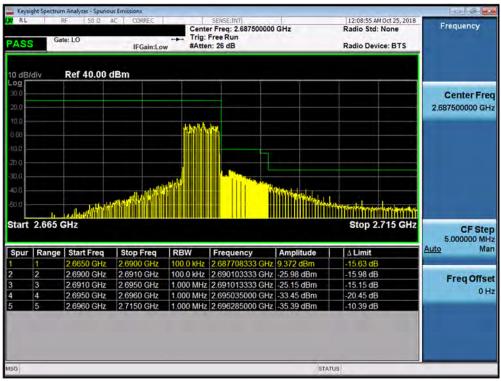
Plot 7-203. Upper Extended Band Edge Plot (Band 25/2 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 124 of 202
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 124 of 203
© 2019 PCTEST Engineering Labora	V 8.8 11/19/2018			



PAS	S Gat	RF 50 Ω	AC CORREC	Trig:	sense:INT r Freq: 2.498500000 Free Run n: 26 dB	GHz	12:07:00 AM Oct 25, 2018 Radio Std: None Radio Device: BTS	Frequency
10 dB	\$/div	Ref 40.00 (	dBm					
30.0 20.0								Center Free 2.498500000 GH
10.0					Autoriteteritik			
10.0				_				
-20.0								
					<b>1</b>			
20.0 30,0 40.0		ALL DOMESTICS			1.	The states	helmen	
20.0 - 30,0 - 40,0 - \$0,0 -	aria) t 2.475 (				<b>I</b> N	WP	Stop 2.517 GHz	CF Stej 5.00000 MH
20 0 30,0 40,0 \$0,0 Start	t 2.475 C	GHz	Stop Freq	RBW	Frequency	Amplitude	Stop 2.517 GHz	5.000000 MH
20.0 30,0 40,0 50,0 Start Start	t 2.475 C	GHZ	Stop Freq 2.4905 GHz	1.000 MHz	2.489905833 GHz	-37.68 dBm	Stop 2.517 GHz	5.000000 MH
-20.0 -30,0 -40,0 -50,0 Start Spur 1 2	1 2.475 C	<b>Start Freq</b> 2.4750 GHz 2.4905 GHz	<b>Stop Freq</b> 2.4905 GHz 2.4950 GHz	1.000 MHz 1.000 MHz	2.489905833 GHz 2.494940000 GHz	-37.68 dBm -22.53 dBm	Stop 2.517 GHz △ Limit -12.68 dB -9.531 dB	
-2010 -30,0 -40,0 -50,0 -50,0 - Start Spur 1	t 2.475 C	GHZ	Stop Freq 2.4905 GHz	1.000 MHz 1.000 MHz 100.0 kHz	2.489905833 GHz	-37.68 dBm -22.53 dBm -25.25 dBm	Stop 2.517 GHz	5.000000 MH

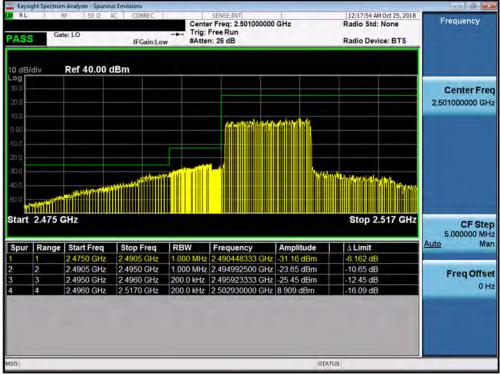
Plot 7-204. Lower ACP Plot (Band 41 PC3 - 5.0MHz QPSK - Full RB Configuration)



Plot 7-205. Upper ACP Plot (Band 41 PC3 - 5.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 125 of 202
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 125 of 203
© 2019 PCTEST Engineering Labor	V 8 8 11/19/2018			





Plot 7-206. Lower ACP Plot (Band 41 PC3- 10.0MHz QPSK - Full RB Configuration)



Plot 7-207. Upper ACP Plot (Band 41 PC3- 10.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dego 126 of 202
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 126 of 203
© 2019 PCTEST Engineering Labor	V 8.8 11/19/2018			





Plot 7-208. Lower ACP Plot (Band 41 PC3 - 15.0MHz QPSK - Full RB Configuration)



Plot 7-209. Upper ACP Plot (Band 41 PC3 - 15.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Daga 107 of 202
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 127 of 203
© 2019 PCTEST Engineering Labor	V 8.8 11/19/2018			





Plot 7-210. Lower ACP Plot (Band 41 PC3 - 20.0MHz QPSK - Full RB Configuration)



Plot 7-211. Upper ACP Plot (Band 41 PC3 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager		
Test Report S/N:	Test Dates:	EUT Type:		Dage 100 of 202		
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 128 of 203		
© 2019 PCTEST Engineering Labor	2019 PCTEST Engineering Laboratory, Inc.					



# 7.5 Peak-Average Ratio

### **Test Overview**

A peak to average ratio measurement is performed at the conducted port of the EUT. The spectrum analyzers Complementary Cumulative Distribution Function (CCDF) measurement profile is used to determine the largest deviation between the average and the peak power of the EUT in a given bandwidth. The CCDF curve shows how much time the peak waveform spends at or above a given average power level. The percent of time the signal spends at or above the level defines the probability for that particular power level.

### Test Procedure Used

KDB 971168 D01 v03r01 - Section 5.7.1

### **Test Settings**

- 1. The signal analyzer's CCDF measurement profile is enabled
- 2. Frequency = carrier center frequency
- 3. Measurement BW ≥ OBW or specified reference bandwidth
- 4. The signal analyzer was set to collect one million samples to generate the CCDF curve
- 5. The measurement interval was set depending on the type of signal analyzed. For continuous signals (>98% duty cycle), the measurement interval was set to 1ms. For burst transmissions, the spectrum analyzer is set to use an internal "RF Burst" trigger that is synced with an incoming pulse and the measurement interval is set to less than the duration of the "on time" of one burst to ensure that energy is only captured during a time in which the transmitter is operating at maximum power

#### Test Setup

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



Figure 7-4. Test Instrument & Measurement Setup

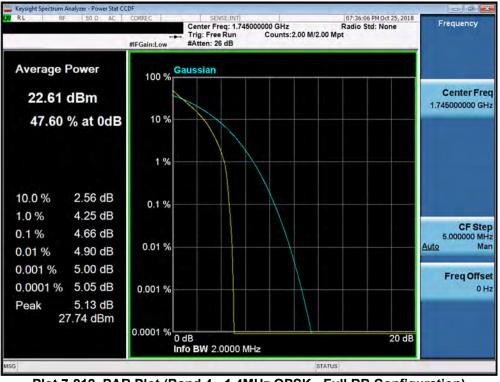
#### Test Notes

None.

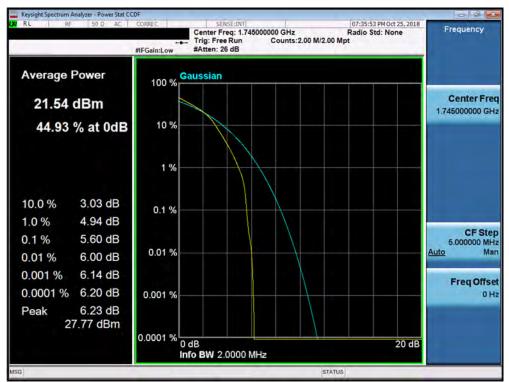
FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 100 of 202
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 129 of 203
© 2019 PCTEST Engineering Labora	V 8.8 11/19/2018			



## Band 4



Plot 7-212. PAR Plot (Band 4 - 1.4MHz QPSK - Full RB Configuration)

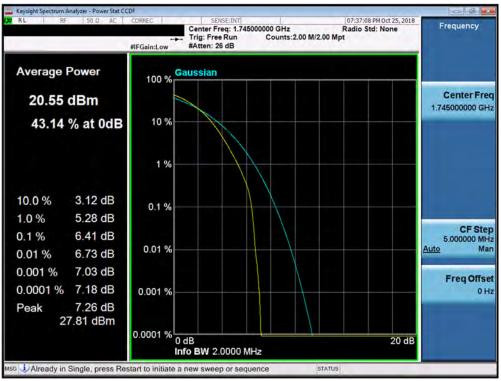


# Plot 7-213. PAR Plot (Band 4 - 1.4MHz 16-QAM - Full RB Configuration)

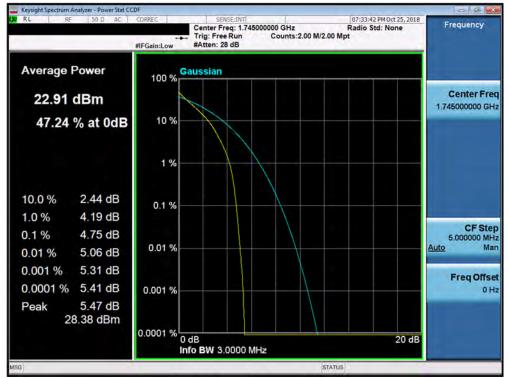
FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Daga 120 of 202
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 130 of 203
© 2010 PCTEST Engineering Labor	atony Inc			V 8 8 11/10/2018

V 8.8 11/19/2018





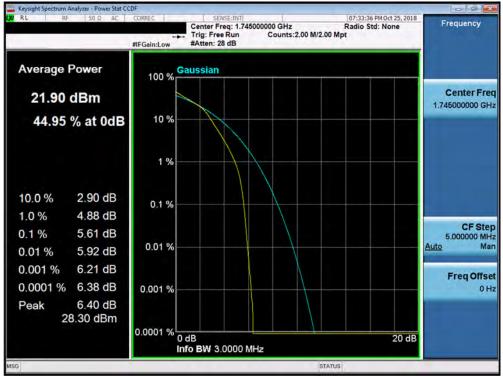
Plot 7-214. PAR Plot (Band 4 - 1.4MHz 64-QAM - Full RB Configuration)



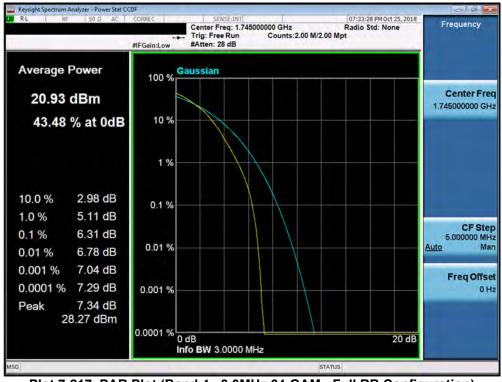
Plot 7-215. PAR Plot (Band 4 - 3.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 131 of 203
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		
© 2019 PCTEST Engineering Labo	V 8.8 11/19/2018			





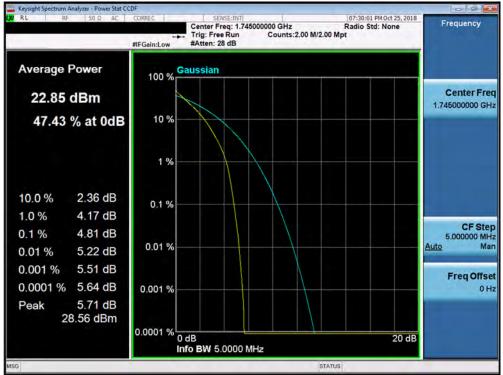




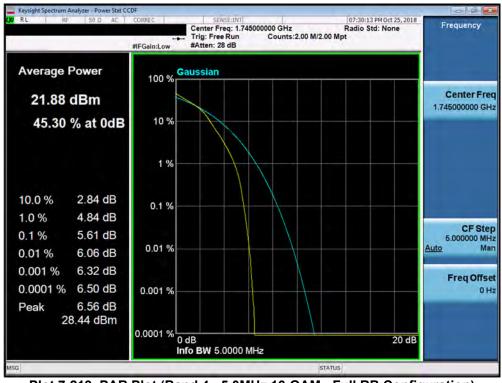
Plot 7-217. PAR Plot (Band 4 - 3.0MHz 64-QAM - Full RB Configuration)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 132 of 203
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		
© 2019 PCTEST Engineering Labora	V 8.8 11/19/2018			





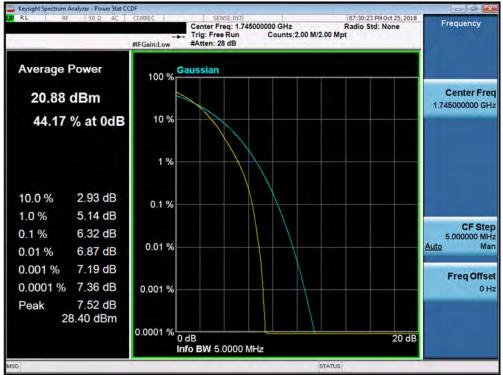




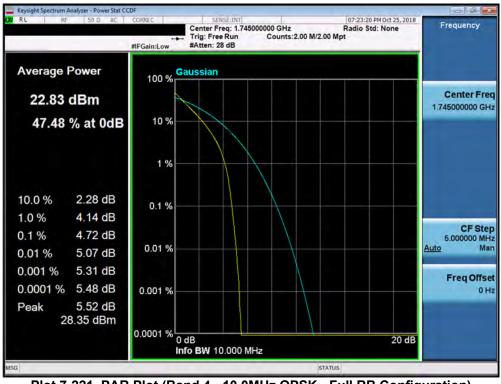
Plot 7-219. PAR Plot (Band 4 - 5.0MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 122 of 202
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 133 of 203
2019 PCTEST Engineering Laboratory, Inc.				V 8.8 11/19/2018





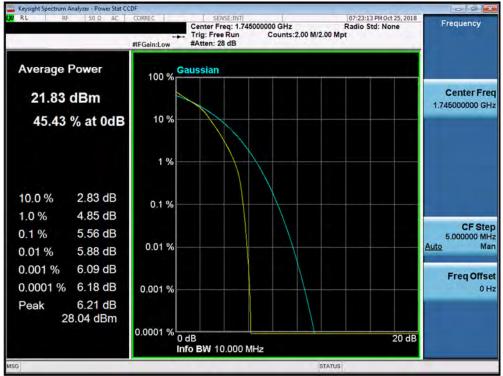
Plot 7-220. PAR Plot (Band 4 - 5.0MHz 64-QAM - Full RB Configuration)



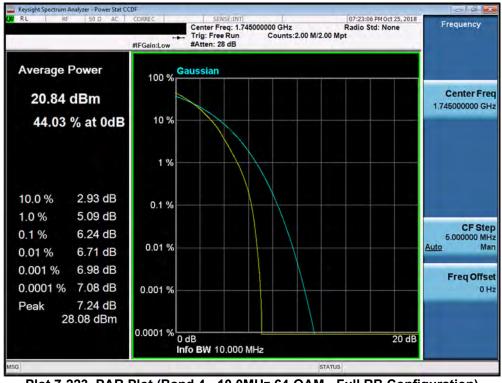
Plot 7-221. PAR Plot (Band 4 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 124 of 202
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 134 of 203
0 2019 PCTEST Engineering Laboratory, Inc.				V 8.8 11/19/2018





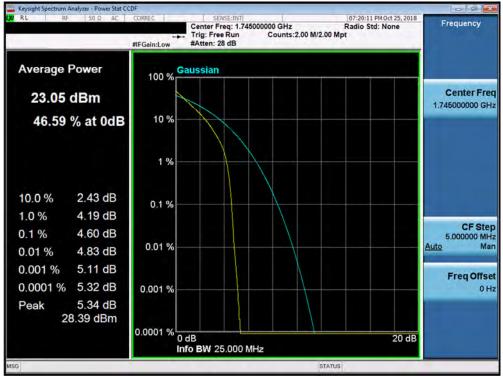
Plot 7-222. PAR Plot (Band 4 - 10.0MHz 16-QAM - Full RB Configuration)



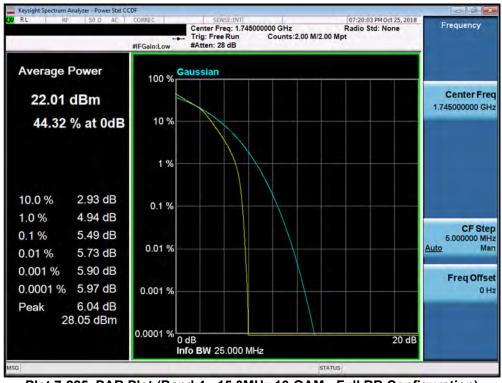
Plot 7-223. PAR Plot (Band 4 - 10.0MHz 64-QAM - Full RB Configuration)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Daga 125 of 202
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 135 of 203
2019 PCTEST Engineering Laboratory. Inc.				V 8.8 11/19/2018





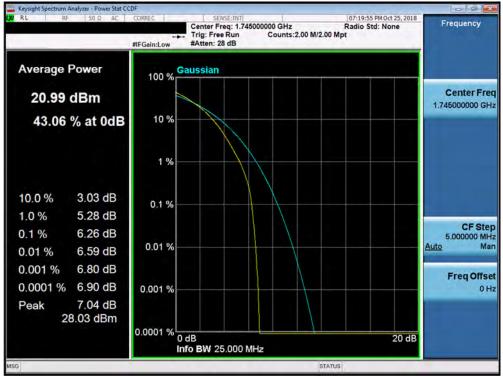




Plot 7-225. PAR Plot (Band 4 - 15.0MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 126 of 202
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 136 of 203
2019 PCTEST Engineering Laboratory, Inc.				V 8.8 11/19/2018



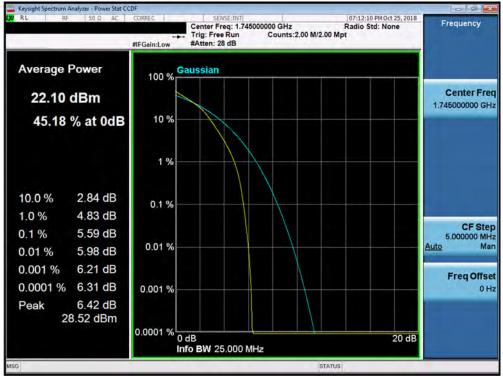


Plot 7-226. PAR Plot (Band 4 - 15.0MHz 64-QAM - Full RB Configuration)

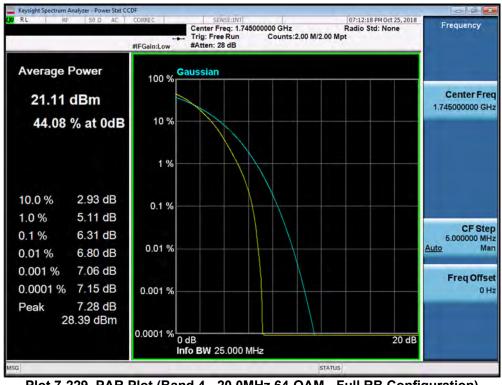


FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 127 of 202
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 137 of 203
2019 PCTEST Engineering Laboratory, Inc.				V 8.8 11/19/2018





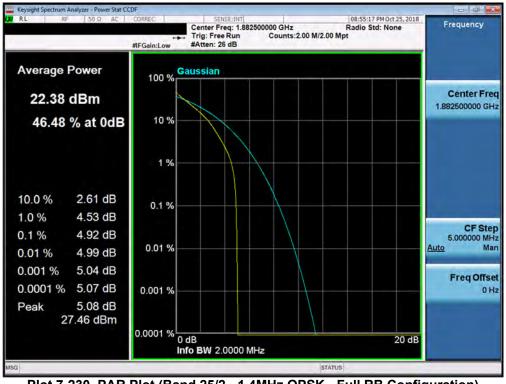
Plot 7-228. PAR Plot (Band 4 - 20.0MHz 16-QAM - Full RB Configuration)



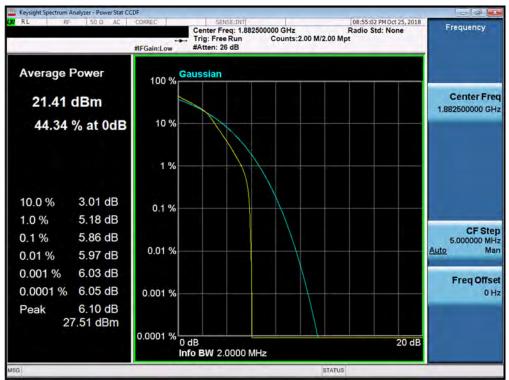
Plot 7-229. PAR Plot (Band 4 - 20.0MHz 64-QAM - Full RB Configuration)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dama 129 of 202
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 138 of 203
2019 PCTEST Engineering Laboratory, Inc.				V 8.8 11/19/2018





Plot 7-230. PAR Plot (Band 25/2 - 1.4MHz QPSK - Full RB Configuration)

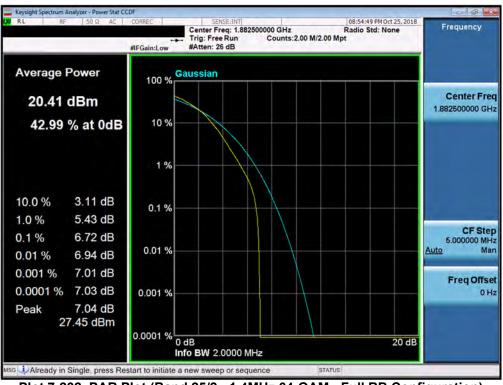


### Plot 7-231. PAR Plot (Band 25/2 - 1.4MHz 16-QAM - Full RB Configuration)

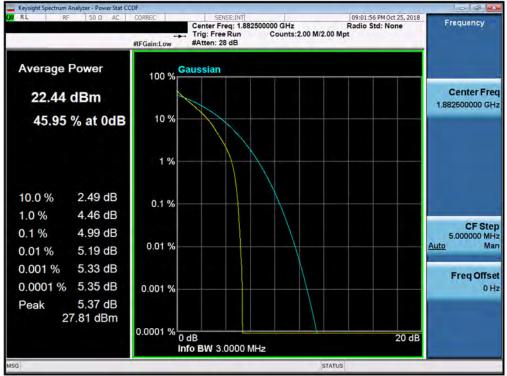
FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 120 of 202
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 139 of 203
2019 PCTEST Engineering Laboratory, Inc.			V 8.8 11/19/2018	

V 8.8 11/19/2018





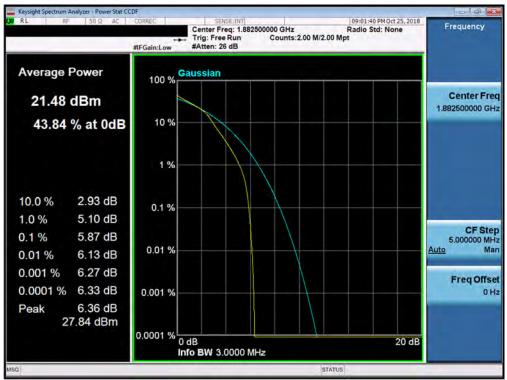
Plot 7-232. PAR Plot (Band 25/2 - 1.4MHz 64-QAM - Full RB Configuration)



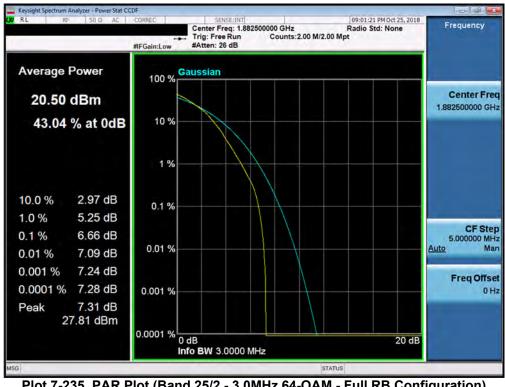
Plot 7-233. PAR Plot (Band 25/2 - 3.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 140 of 202
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 140 of 203
2019 PCTEST Engineering Laboratory. Inc.			V 8.8 11/19/2018	





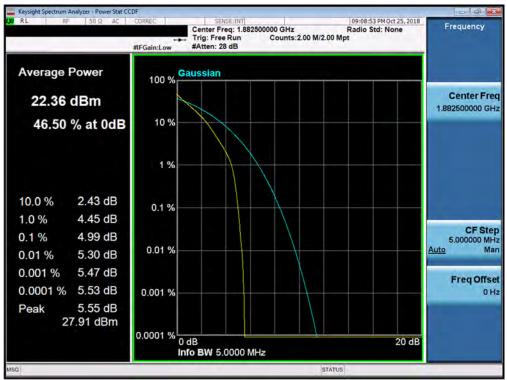
Plot 7-234. PAR Plot (Band 25/2 - 3.0MHz 16-QAM - Full RB Configuration)



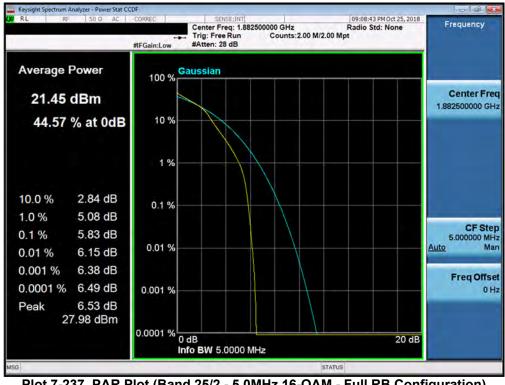
Plot 7-235. PAR Plot (Band 25/2 - 3.0MHz 64-QAM - Full RB Configuration)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Daga 141 of 202
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 141 of 203
2019 PCTEST Engineering Laboratory, Inc.				V 8.8 11/19/2018





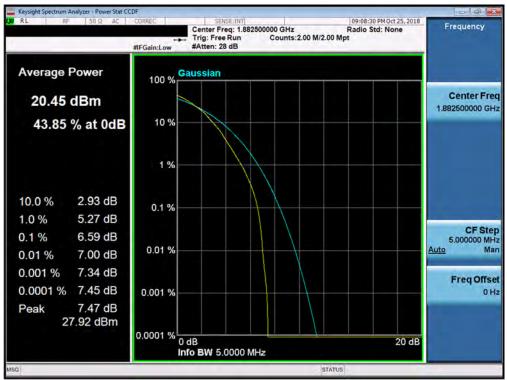
Plot 7-236. PAR Plot (Band 25/2 - 5.0MHz QPSK - Full RB Configuration)



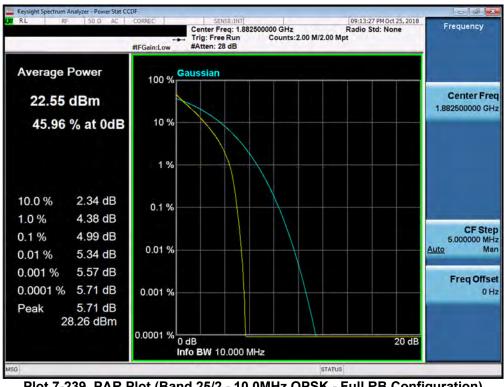
Plot 7-237. PAR Plot (Band 25/2 - 5.0MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 142 of 202
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 142 of 203
2019 PCTEST Engineering Laboratory, Inc.				V 8.8 11/19/2018





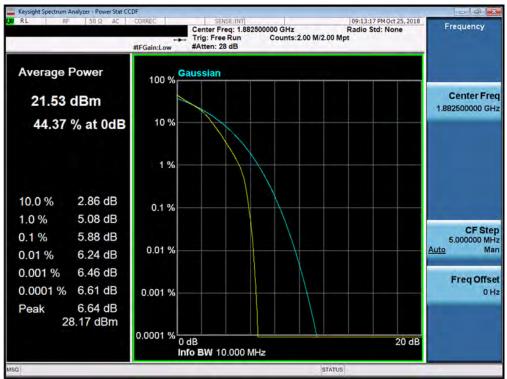
Plot 7-238. PAR Plot (Band 25/2 - 5.0MHz 64-QAM - Full RB Configuration)



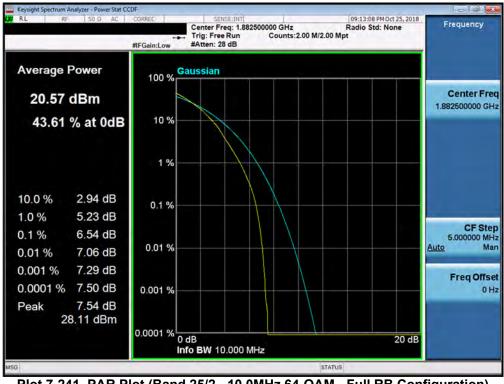
Plot 7-239. PAR Plot (Band 25/2 - 10.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 142 of 202
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 143 of 203
2019 PCTEST Engineering Laboratory, Inc.				V 8.8 11/19/2018





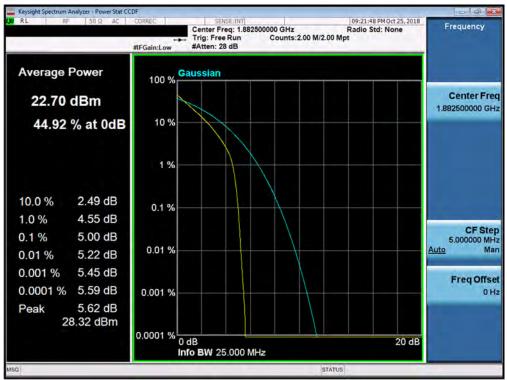
Plot 7-240. PAR Plot (Band 25/2 - 10.0MHz 16-QAM - Full RB Configuration)



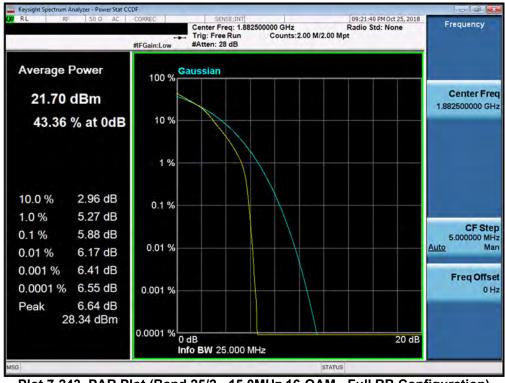
Plot 7-241. PAR Plot (Band 25/2 - 10.0MHz 64-QAM - Full RB Configuration)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 111 of 202
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 144 of 203
2019 PCTEST Engineering Laboratory, Inc.				V 8.8 11/19/2018





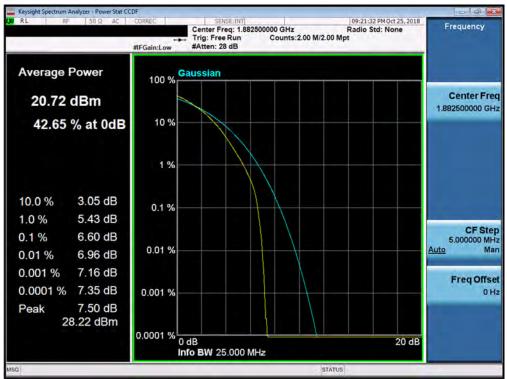
Plot 7-242. PAR Plot (Band 25/2 - 15.0MHz QPSK - Full RB Configuration)



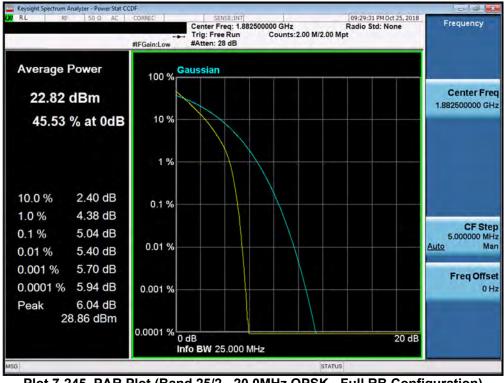
Plot 7-243. PAR Plot (Band 25/2 - 15.0MHz 16-QAM - Full RB Configuration)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 145 of 202
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 145 of 203
© 2019 PCTEST Engineering Laboration	V 8.8 11/19/2018			





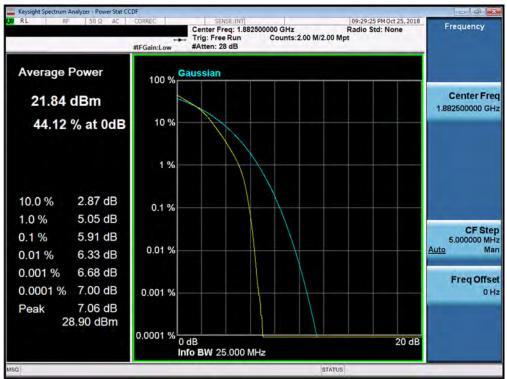




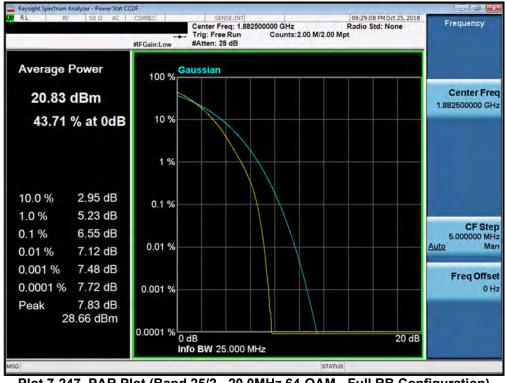
Plot 7-245. PAR Plot (Band 25/2 - 20.0MHz QPSK - Full RB Configuration)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 146 of 202
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 146 of 203
© 2019 PCTEST Engineering Labora	V 8.8 11/19/2018			





Plot 7-246. PAR Plot (Band 25/2 - 20.0MHz 16-QAM - Full RB Configuration)



Plot 7-247. PAR Plot (Band 25/2 - 20.0MHz 64-QAM - Full RB Configuration)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 117 of 202
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 147 of 203
© 2019 PCTEST Engineering Labora	V 8.8 11/19/2018			



# 7.6 Uplink Carrier Aggregation §27.53(m)

### Test Overview

The EUT is set up to transmit two contiguous LTE channels. The power level of both carriers and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10<sup>th</sup> harmonic. 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.

### For Band 41, the minimum permissible attenuation level of any spurious emission is 55 + 10log<sub>10</sub>(P<sub>[Watts]</sub>).

### Test Procedure Used

KDB 971168 D01 v03r01 - Section 6.0

### Test Settings

- 1. Start frequency was set to 30MHz and stop frequency was set to at least 10 \* the fundamental frequency (separated into at least two plots per channel)
- 2. Detector = RMS
- 3. Trace mode = trace average for continuous emissions, max hold for pulse emissions
- 4. Sweep time = auto couple
- 5. The trace was allowed to stabilize
- 6. Please see test notes below for RBW and VBW settings

### Test Setup

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



Figure 7-5. Test Instrument & Measurement Setup

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Daga 149 of 202
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 148 of 203
© 2019 PCTEST Engineering Labor	V 8.8 11/19/2018			



- 1. Uplink carrier aggregation is only supported in this EUT while operating in Power Class 3.
- 2. Conducted power and spurious emissions measurements were evaluated for the two contiguous channels using various combinations of RB size, RB offset, modulation, and channel bandwidth. Channel bandwidth data is shown in the tables below based only on the channel bandwidths that were supported in this device. The worst case (highest) powers were found while operating with QPSK modulation, as shown in Table 7-3 and 7-4 below, with both carriers set to transmit using 1RB.
- 3. Compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater for frequencies less than 1 GHz and 1 MHz or greater for frequencies greater than 1 GHz. However, 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.

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)		Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 140 of 202
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 149 of 203
© 2019 PCTEST Engineering Labora	atory. Inc.	•		V 8.8 11/19/2018

(e)	PCTEST
V	INGINEBRING LABORATORY: INS.
	Band 41C – PC3

				PCC					I	1	scc	l.			Power
Power State	PCC Band	PCC Bandwidth	PCC (UL) Channel	PCC (UL) Frequency	Modulation	PCC UL# RB	PCC UL RB Offset	SCC Band	SCC Bandwidth	SCC (UL) Channel		Modulation	PCC UL# RB	PCC UL RB Offset	ULCA Tx.Power
Maria	175 8 44	[MHz]	20075	[MHz]	ODEK		24	175 0.44	[MHz]		[MHz]	005/		0	(dBm)
Max	LTE B41	5	39675	2498.5	QPSK	1	24	LTE B41	20	39792	2510.2	QPSK	1	0	24.46
Max	LTE B41	10	39700	2501	QPSK	1	49	LTE B41	15	39820	2513	QPSK	1	0	24.41
Max	LTE B41	10	39700	2501	QPSK	1	49	LTE B41	20	39844	2515.4	QPSK	1	0	24.38
Max	LTE B41	15	39725	2503.5	QPSK	1	74	LTE B41	10	39845	2515.5	QPSK	1	0	24.63
Max	LTE B41	15	39725	2503.5	QPSK	1	74	LTE B41	15	39875	2518.5	QPSK	1	0	24.54
Max	LTE B41	15	39725	2503.5	QPSK	1	74	LTE B41	20	39896	2520.6	QPSK	1	0	24.49
Max	LTE B41	20	39750	2506	QPSK	1	99	LTE B41	5	39867	2517.7	QPSK	1	0	24.06
Max	LTE B41	20	39750	2506	QPSK	1	99	LTE B41	10	39894	2520.4	QPSK	1	0	24.51
Max	LTE B41	20	39750	2506	QPSK	1	99	LTE B41	15	39921	2523.1	QPSK	1	0	24.66
Max	LTE B41	20	39750	2506	QPSK	1	99	LTE B41	20	39948	2525.8	QPSK	1	0	24.28
Max	LTE B41	5	40620	2593	QPSK	1	24	LTE B41	20	40737	2604.7	QPSK	1	0	24.72
Max	LTE B41	10	40620	2593	QPSK	1	49	LTE B41	15	40740	2605	QPSK	1	0	24.22
Max	LTE B41	10	40620	2593	QPSK	1	49	LTE B41	20	40764	2607.4	QPSK	1	0	24.19
Max	LTE B41	15	40620	2593	QPSK	1	74	LTE B41	10	40740	2605	QPSK	1	0	24.25
Max	LTE B41	15	40620	2593	QPSK	1	74	LTE B41	15	40770	2608	QPSK	1	0	24.14
Max	LTE B41	15	40620	2593	QPSK	1	74	LTE B41	20	40791	2610.1	QPSK	1	0	24.17
Max	LTE B41	20	40620	2593	QPSK	1	99	LTE B41	5	40737	2604.7	QPSK	1	0	24.29
Max	LTE B41	20	40620	2593	QPSK	1	99	LTE B41	10	40764	2607.4	QPSK	1	0	24.21
Max	LTE B41	20	40620	2593	QPSK	1	99	LTE B41	15	40791	2610.1	QPSK	1	0	24.25
Max	LTE B41	20	40620	2593	QPSK	1	99	LTE B41	20	40818	2612.8	QPSK	1	0	24.74
Max	LTE B41	5	41565	2687.5	QPSK	1	0	LTE B41	20	41448	2675.8	QPSK	1	99	24.30
Max	LTE B41	10	41540	2685	QPSK	1	0	LTE B41	15	41420	2673	QPSK	1	74	24.28
Max	LTE B41	10	41540	2685	QPSK	1	0	LTE B41	20	41396	2670.6	QPSK	1	99	24.33
Max	LTE B41	15	41515	2682.5	QPSK	1	0	LTE B41	10	41395	2670.5	QPSK	1	49	24.12
Max	LTE B41	15	41515	2682.5	QPSK	1	0	LTE B41	15	41365	2667.5	QPSK	1	74	24.14
Max	LTE B41	15	41515	2682.5	QPSK	1	0	LTE B41	20	41344	2665.4	QPSK	1	99	24.17
Max	LTE B41	20	41490	2680	QPSK	1	0	LTE B41	5	41373	2668.3	QPSK	1	24	24.04
Max	LTE B41	20	41490	2680	QPSK	1	0	LTE B41	10	41346	2665.6	QPSK	1	49	24.06
Max	LTE B41	20	41490	2680	QPSK	1	0	LTE B41	15	41319	2662.9	QPSK	1	74	24.13
Max	LTE B41	20	41490	2680	QPSK	1	0	LTE B41	20	41292	2660.2	QPSK	1	99	24.16

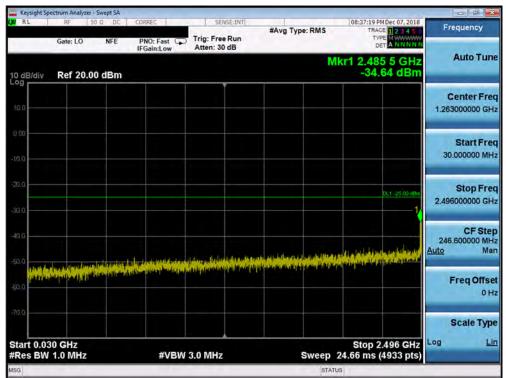
 Table 7-3. Conducted Powers (41C – PC3)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 150 of 202
1M1811230206-03.A3L 12/14/2018 - 1/26/2019 Poi		Portable Handset	Page 150 of 203	
© 2019 PCTEST Engineering Labor	atory Inc			V 8 8 11/19/2018



				PCC				SCC							Power
Power State	PCC Band	PCC Bandwidth [MHz]	PCC (UL) Channel	PCC (UL) Frequency [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	SCC Band	SCC Bandwidth [MHz]	SCC (UL) Channel	Frequency	Modulation	PCC UL# RB	PCC UL RB Offset	ULCA Tx.Power (dBm)
Max	LTE B41	20	40620	2593	QPSK	1	0	LTE B41	20	40818	2612.8	QPSK	1	0	18.57
Max	LTE B41	20	40620	2593	QPSK	1	99	LTE B41	20	40818	2612.8	QPSK	1	99	18.59
Max	LTE B41	20	40620	2593	QPSK	1	0	LTE B41	20	40818	2612.8	QPSK	1	99	15.91
Max	LTE B41	20	40620	2593	QPSK	1	50	LTE B41	20	40818	2612.8	QPSK	1	50	20.02
Max	LTE B41	20	40620	2593	QPSK	1	99	LTE B41	20	40818	2612.8	QPSK	1	0	24.74
Max	LTE B41	20	40620	2593	QPSK	100	0	LTE B41	20	40818	2612.8	QPSK	100	0	22.87
Max	LTE B41	20	40620	2593	16-QAM	100	0	LTE B41	20	40818	2612.8	16-QAM	100	0	21.79
Max	LTE B41	20	40620	2593	64-QAM	100	0	LTE B41	20	40818	2612.8	64-QAM	100	0	21.09

Table 7-4. Conducted Powers (41C – PC3 with Various Combinations for 20MHz Channel Bandwidth)



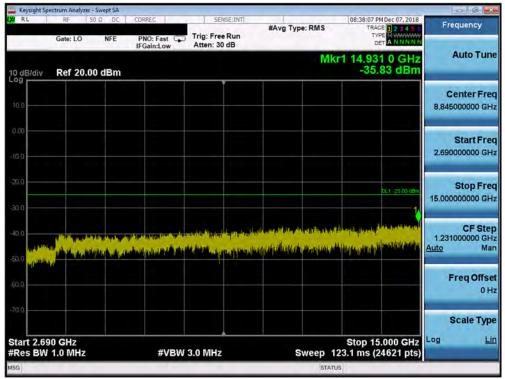
Plot 7-248. Conducted Spurious Plot (Band 41C – 20.0MHz QPSK – PCC 1/99 SCC 1/0 – Mid Channel)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 151 of 202
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 151 of 203
© 2019 PCTEST Engineering Laboration	V 8.8 11/19/2018			



Keysight Spect							6 📈
XI RL	RF Sate: LO	NFE	CORREC	SENSE:INT	#Avg Type: RM	08:48:46 PM Dec 07, 2018 S TRACE 2 3 4 5 TYPE M	Frequency
10 dB/dív	Ref 30.0	0 dBm	IFGain:Low	#Atten: 40 dB		Mkr1 2.602 87 GHz 7.877 dBm	Auto Tun
20.0				M.			Center Fre 2.593000005 GH
0.00							Start Fre 2.496000005 GH
-10.0							Stop Fre 2.690000005 GH
30.0 1101	and the second secon		alan kanalahatin	in the strated	Nillevillenningen	ning sing dia mang bagi kang dipang sa katan Ng sing ng sing sing sing sing sing sing	CF Ste 19.400000 MH <u>Auto</u> Ma
-50.0							Freq Offs 0 F
Center 2.59 #Res BW 1		z	#\/B\M	3.0 MHz	Sug	Span 194.0 MHz ep 1.973 ms (4933 pts	Scale Typ Log <u>L</u>
MSG	10 10112		#VDVV	5.0 10112		status	

Plot 7-249. Conducted Spurious Plot (Band 41C – 20.0MHz QPSK – PCC 1/99 SCC 1/0 – Mid Channel)



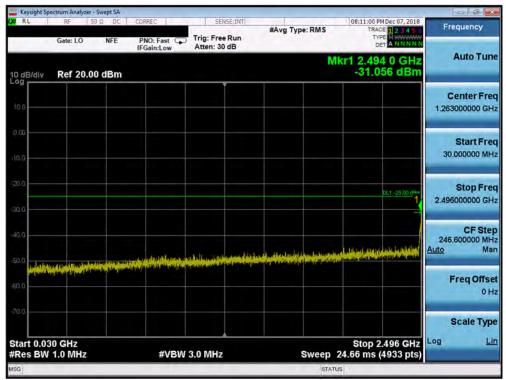
Plot 7-250. Conducted Spurious Plot (Band 41C - 20.0MHz QPSK - PCC 1/99 SCC 1/0 - Mid Channel)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Daga 152 of 202
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 152 of 203
© 2019 PCTEST Engineering Labo	V 8.8 11/19/2018			



Gate		08:38:43 PM Dec 07, 2018 TRACE 1 2 3 4 5 0 TYPE M	RMS	#Avg Typ	SENSE:INT		s	y 2.800 m		Gate
Gat O	On	DET A NNNNN 1 24.155 5 GHz	Mkr		Atten: 10 dB	ain:Low	IF			
		-44.83 dBm			Y	1	Bm	Ref 0.00 d	3/dív	10 dE
Gate View	On									10.0
Gate View		0L1 -25 00 dBm								-20.0
Setup										-30.0
Gate Dela 2.800 m		متار و عقاقله منهم وغرار د	1 540 bit da . 81	مد المعاد ال						-40.Q
		and a stand of the first of the state	and a state of the state	dunka balanca	representation of the providence of the			Production and another		-50 Q
Gate Lengt 400.00 (								and and a second of	Silder for	-60 0
										70.0
Gate Method	G									æ.G
										90.0
Mor 1 of										
1.01		Stop 27.000 GHz .80 ms (24001 pts)	veep 20	5	0 MHz	#VBW 3			t 15.000 s BW 1.	
	-		STATUS							ASG

Plot 7-251. Conducted Spurious Plot (Band 41C – 20.0MHz QPSK – PCC 1/99 SCC 1/0 – Mid Channel)



Plot 7-252. Conducted Spurious Plot (Band 41C - 20.0MHz QPSK - PCC 100/0 SCC 100/0 - Mid Channel)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Daga 152 of 202
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset	Page 153 of 203	
© 2019 PCTEST Engineering Labo	V 8.8 11/19/2018			



	Analyzer - Swept SA						- 6 ×
Gate	F 50 Ω DC	PNO: Fast	SENSE:INT	#Avg Type:		00 PM Dec 07, 2018 TRACE 1 2 3 4 5 0 TYPE M	Frequency
10 dB/div Re	f 20.00 dBm	I Guilleow			Mkr1 2. -3	494 0 GHz 1.056 dBm	Auto Tune
io.o							Center Free 1.263000000 GH
0.00 10.0							Start Fre 30.000000 MH
20.0						DL1 -25.00 (Pen 1	Stop Fre 2.496000000 GH
40 a		an and to take one and	i feltzi, stanlo dia dia	i and a discussion of the	der bisserierer bestinistion	talitik i sinifaliyat	CF Ste 246.600000 MH Auto Ma
60.0		ing a single and a make with a single and	CALIFIC AND A CALIFORNIA (				Freq Offse 0 H
.70.0 Start 0.030 GI #Res BW 1.0		#\/B\//	3.0 MHz		Sto veep 24.66 m	p 2.496 GHz	Scale Typ
ISG	11112	**EVV	5.5 10112	51	STATUS	15 (4555 pts)	

Plot 7-253. Conducted Spurious Plot (Band 41C - 20.0MHz QPSK - PCC 100/0 SCC 100/0 - Mid Channel)



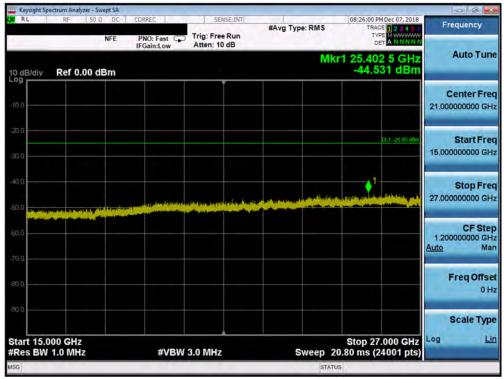
Plot 7-254. Conducted Spurious Plot (Band 41C - 20.0MHz QPSK - PCC 100/0 SCC 100/0 - Mid Channel)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Daga 154 of 202
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset	Page 154 of 203	
© 2019 PCTEST Engineering Labo	V 8.8 11/19/2018			



	ctrum Analyzer -									- 6 -
XI RL	RF 50 Gate: LO	NFE	PNO: Fast	Trig: Free Atten: 30		#Avg Typ	e: RMS	TRA	M Dec 07, 2018 CE 1 2 3 4 5 0 PE M WINN N ET A NNNNN	Frequency
10 dB/div	0 dB/div Ref 20.00 dBm -35.669 dBm									Auto Tun
io.o										Center Fre 8.845000000 G⊦
0.00 10.0										Start Fre 2.690000000 GF
30.0									DL1 -25.00 dBm	Stop Fre 15.00000000 GH
40 0 10 dt al			and the second second	n ganga da mada Naji Angelega mada	bergeline Telestoch				ala Catalog palan Parahi tengintan	CF Ste 1.231000000 GI <u>Auto</u> M
60.0										Freq Offs 01
Start 2.69			#VBW	3.0 MHz		s	weep	Stop 15 123.1 ms (2	5.000 GHz	Scale Typ Log <u>L</u>
ISG						_		TUS		

Plot 7-255. Conducted Spurious Plot (Band 41C - 20.0MHz QPSK - PCC 100/0 SCC 100/0 - Mid Channel)



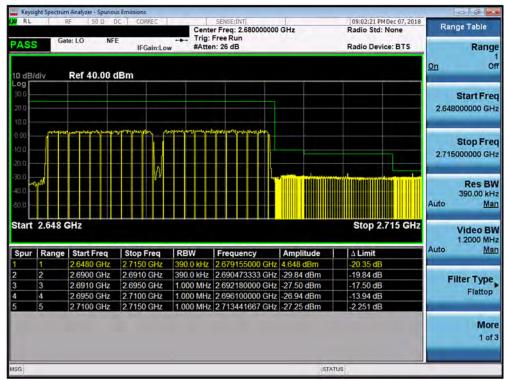
Plot 7-256. Conducted Spurious Plot (Band 41C - 20.0MHz QPSK - PCC 100/0 SCC 100/0 - Mid Channel)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 155 of 202
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset	Page 155 of 203	
© 2019 PCTEST Engineering Labor	V 8.8 11/19/2018			





Plot 7-257. Lower ACP Plot (Band 41C - 20.0MHz QPSK - PCC 100/0 SCC 100/0 - Mid Channel)



Plot 7-258. Upper ACP Plot (Band 41C - 20.0MHz QPSK - PCC 100/0 SCC 100/0 - Mid Channel)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Daga 156 of 202
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset	Page 156 of 203	
© 2019 PCTEST Engineering Labor	V 8.8 11/19/2018			



# 7.7 Radiated Power (ERP/EIRP)

### **Test Overview**

Effective Radiated Power (ERP) and Equivalent Isotropic Radiated Power (EIRP) measurements are performed using the substitution method described in ANSI/TIA-603-E-2016 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using vertically and horizontally polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized tuned broadband horn antennas. All measurements are performed as RMS average measurements while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

### **Test Procedures Used**

KDB 971168 D01 v03r01 - Section 5.2.1

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

### Test Settings

- Radiated power measurements are performed using the signal analyzer's "channel power" measurement capability for signals with continuous operation. For signals with burst transmission, the signal analyzer's "time domain power" measurement capability is used
- 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". Trigger is set to enable triggering only on full power bursts with the sweep time set less than or equal to the transmission burst duration
- 8. The integration bandwidth was roughly set equal to the measured OBW of the signal for signals with continuous operation. For signals with burst transmission, the "gating" function was enabled to ensure that measurements are performed during times in which the transmitter is operating at its maximum power
- 9. Trace mode = trace averaging (RMS) over 100 sweeps
- 10. The trace was allowed to stabilize

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 157 of 202
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset	Page 157 of 203	
© 2019 PCTEST Engineering Labora	V 8.8 11/19/2018			



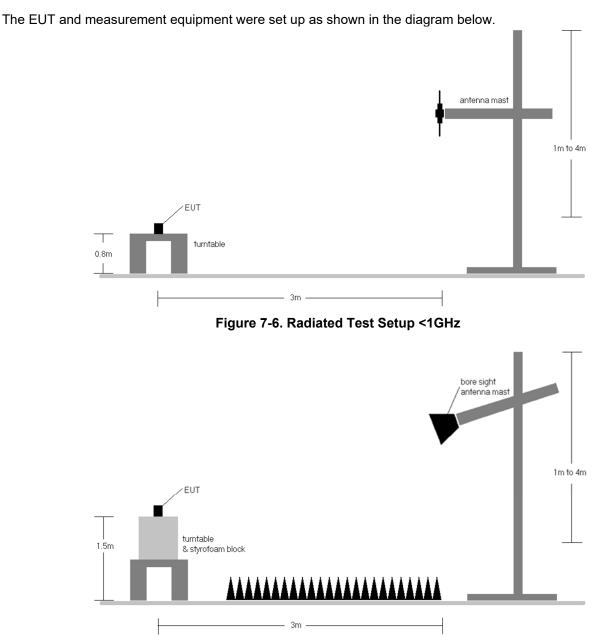


Figure 7-7. Radiated Test Setup >1GHz

### 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.

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager					
Test Report S/N:	Test Dates:	EUT Type:	D 150 -f 000					
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset	Page 158 of 203					
© 2019 PCTEST Engineering Laboratory, Inc. V 8.8 11/19/2018								
All rights reserved. Unless otherwise	specified, no part of this report r	nay be reproduced or utilized in any part, form or by any means, electronic or mechanica	l, including photocopying and					

(en	PCTEST
V	INGINEROING LABORATORY, INC.

# Band 12

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
699.70	1.4	QPSK	н	298	281	1/5	14.98	4.00	16.83	0.048	34.77	-17.94	18.98	0.079	36.99	-18.01
707.50	1.4	QPSK	н	298	281	1/0	14.72	4.22	16.79	0.048	34.77	-17.99	18.94	0.078	36.99	-18.05
715.30	1.4	QPSK	н	298	281	1 / 5	15.03	4.44	17.32	0.054	34.77	-17.45	19.47	0.088	36.99	-17.52
715.30	1.4	16-QAM	Н	298	281	1 / 5	14.51	4.44	16.80	0.048	34.77	-17.97	18.95	0.078	36.99	-18.04
715.30	1.4	64-QAM	н	298	281	1 / 5	13.10	4.44	15.39	0.035	34.77	-19.38	17.54	0.057	36.99	-19.45
700.50	3	QPSK	н	296	279	1 / 14	15.47	4.01	17.33	0.054	34.77	-17.44	19.48	0.089	36.99	-17.51
707.50	3	QPSK	Н	296	279	1/0	15.30	4.22	17.37	0.055	34.77	-17.41	19.52	0.089	36.99	-17.47
714.50	3	QPSK	Н	296	279	1 / 14	15.38	4.41	17.64	0.058	34.77	-17.13	19.79	0.095	36.99	-17.20
714.50	3	16-QAM	н	296	279	1 / 14	14.48	4.41	16.74	0.047	34.77	-18.03	18.89	0.078	36.99	-18.10
714.50	3	64-QAM	Н	296	279	1 / 0	13.49	4.41	15.75	0.038	34.77	-19.02	17.90	0.062	36.99	-19.09
701.50	5	QPSK	Н	296	286	1 / 24	15.49	4.04	17.38	0.055	34.77	-17.39	19.53	0.090	36.99	-17.46
707.50	5	QPSK	Н	300	287	1 / 24	15.61	4.22	17.68	0.059	34.77	-17.10	19.83	0.096	36.99	-17.16
713.50	5	QPSK	Н	302	282	1 / 24	15.54	4.39	17.78	0.060	34.77	-16.99	19.93	0.098	36.99	-17.06
713.50	5	16-QAM	Н	302	282	1 / 24	14.75	4.39	16.99	0.050	34.77	-17.78	19.14	0.082	36.99	-17.85
713.50	5	64-QAM	н	302	282	1 / 24	13.15	4.39	15.39	0.035	34.77	-19.38	17.54	0.057	36.99	-19.45
704.00	10	QPSK	Н	300	272	1 / 49	14.56	4.12	16.53	0.045	34.77	-18.25	18.68	0.074	36.99	-18.31
707.50	10	QPSK	Н	300	272	1 / 49	14.82	4.22	16.89	0.049	34.77	-17.89	19.04	0.080	36.99	-17.95
711.00	10	QPSK	Н	300	272	1 / 49	15.33	4.32	17.50	0.056	34.77	-17.28	19.65	0.092	36.99	-17.34
711.00	10	16-QAM	н	300	272	1 / 49	14.26	4.32	16.43	0.044	34.77	-18.35	18.58	0.072	36.99	-18.41
711.00	10	64-QAM	Н	300	272	1 / 49	13.12	4.32	15.29	0.034	34.77	-19.49	17.44	0.055	36.99	-19.55
713.50	5	QPSK	V	115	217	1 / 24	13.32	4.39	15.56	0.036	34.77	-19.21	17.71	0.059	36.99	-19.28
713.50	5 (WCP)	QPSK	V	276	251	1 / 24	12.72	4.39	14.96	0.031	34.77	-19.81	17.11	0.051	36.99	-19.88

Table 7-5. ERP Data (Band 12)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dego 150 of 202
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset	Page 159 of 203	
© 2019 PCTEST Engineering Labor	atory. Inc.	•		V 8.8 11/19/2018



# 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]
779.50	5	QPSK	V	183	241	1 / 24	14.89	5.71	18.45	0.070	34.77	-16.32	20.60	0.115	36.99	-16.39
782.00	5	QPSK	V	183	241	1 / 0	14.86	5.77	18.48	0.071	34.77	-16.29	20.63	0.116	36.99	-16.36
784.50	5	QPSK	V	183	241	1 / 0	14.88	5.83	18.56	0.072	34.77	-16.21	20.71	0.118	36.99	-16.28
784.50	5	16-QAM	V	183	241	1 / 0	14.10	5.83	17.78	0.060	34.77	-16.99	19.93	0.098	36.99	-17.06
784.50	5	64-QAM	V	183	241	1 / 0	13.19	5.83	16.87	0.049	34.77	-17.90	19.02	0.080	36.99	-17.97
782.00	10	QPSK	V	179	238	1 / 0	14.89	5.77	18.51	0.071	34.77	-16.26	20.66	0.117	36.99	-16.33
782.00	10	16-QAM	V	179	238	1 / 0	14.10	5.77	17.72	0.059	34.77	-17.05	19.87	0.097	36.99	-17.12
782.00	10	64-QAM	V	179	238	1/0	13.49	5.77	17.11	0.051	34.77	-17.66	19.26	0.084	36.99	-17.73
784.50	5	QPSK	Н	250	336	1/0	12.22	5.83	15.90	0.039	34.77	-18.87	18.05	0.064	36.99	-18.94
784.50	5 (WCP)	QPSK	Н	166	121	1/0	9.78	5.83	13.46	0.022	34.77	-21.31	15.61	0.036	36.99	-21.38

Table 7-6. ERP Data (Band 13)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 160 of 202
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 160 of 203
© 2019 PCTEST Engineering Labora	atory Inc			V 8 8 11/19/2018

Frequency [MHz]         Ban [N           824.70	hannel ndwidth [MHz] 1.4 1.4 1.4 1.4 1.4 1.4 1.4 3 3 3	Mod. QPSK QPSK QPSK 16-QAM 64-QAM QPSK	Ant. Pol. [H/V] V V V	Antenna Height [cm] 317 317 317 317 317 317	Turntable           Azimuth           [degree]           316           316           316           316           316	RB Size/Offset 1 / 0 3 / 2 1 / 0	Substitute Level [dBm] 13.62 13.55 12.65	Ant. Gain [dBi] 6.75 6.78	ERP [dBm] 18.22	ERP [Watts]	ERP Limit [dBm] 38.45	Margin [dB] -20.23	EIRP [dBm] 20.37	EIRP [Watts] 0.109	EIRP Limit [dBm] 40.61	Margin [dB] -20.24
836.50           848.30           824.70           824.70	1.4       1.4       1.4       1.4       3	QPSK QPSK 16-QAM 64-QAM	V V V	317 317 317	316 316	3/2 1/0	13.55		-	0.066	38.45	-20.23	20.37	0.109	40.61	-20.24
848.30           824.70           824.70	1.4 1.4 1.4 3	QPSK 16-QAM 64-QAM	V V	317 317	316	1/0		6.78	10 10							
824.70 824.70	1.4 1.4 3	16-QAM 64-QAM	V	317			12.65		10.10	0.066	38.45	-20.28	20.33	0.108	40.61	-20.28
824.70	1.4 3	64-QAM		-	316			6.80	17.30	0.054	38.45	-21.15	19.45	0.088	40.61	-21.16
	3		V	317		1/0	12.85	6.75	17.45	0.056	38.45	-21.00	19.60	0.091	40.61	-21.01
825 50	-	QPSK		517	316	1 / 0	12.06	6.75	16.66	0.046	38.45	-21.79	18.81	0.076	40.61	-21.80
023.30	3		V	135	6	1/0	13.95	6.75	18.55	0.072	38.45	-19.90	20.70	0.118	40.61	-19.90
836.50		QPSK	V	135	6	1 / 0	13.54	6.78	18.17	0.066	38.45	-20.29	20.32	0.108	40.61	-20.29
847.50	3	QPSK	V	135	6	1 / 0	13.54	6.80	18.19	0.066	38.45	-20.26	20.34	0.108	40.61	-20.27
825.50	3	16-QAM	V	135	6	1 / 0	13.20	6.75	17.80	0.060	38.45	-20.65	19.95	0.099	40.61	-20.65
825.50	3	64-QAM	V	135	6	1 / 0	12.55	6.75	17.15	0.052	38.45	-21.30	19.30	0.085	40.61	-21.30
826.50	5	QPSK	V	217	8	1/0	13.79	6.76	18.40	0.069	38.45	-20.06	20.55	0.113	40.61	-20.06
836.50	5	QPSK	V	217	8	1 / 0	13.54	6.78	18.17	0.066	38.45	-20.29	20.32	0.108	40.61	-20.29
846.50	5	QPSK	V	217	8	1 / 24	13.36	6.80	18.01	0.063	38.45	-20.45	20.16	0.104	40.61	-20.45
826.50	5	16-QAM	V	217	8	1 / 0	13.06	6.76	17.67	0.058	38.45	-20.79	19.82	0.096	40.61	-20.79
826.50	5	64-QAM	V	217	8	1/0	12.33	6.76	16.94	0.049	38.45	-21.52	19.09	0.081	40.61	-21.52
829.00	10	QPSK	V	305	141	1 / 0	14.80	6.76	19.41	0.087	38.45	-19.04	21.56	0.143	40.61	-19.05
836.50	10	QPSK	V	305	141	1 / 0	14.09	6.78	18.72	0.074	38.45	-19.74	20.87	0.122	40.61	-19.74
844.00	10	QPSK	V	305	141	1/0	13.94	6.79	18.58	0.072	38.45	-19.87	20.73	0.118	40.61	-19.88
829.00	10	16-QAM	V	305	141	1/0	13.87	6.76	18.48	0.070	38.45	-19.97	20.63	0.116	40.61	-19.98
829.00	10	64-QAM	V	305	141	1/0	12.96	6.76	17.57	0.057	38.45	-20.88	19.72	0.094	40.61	-20.89
829.00	10	QPSK	Н	133	260	1/0	11.62	6.76	16.23	0.042	38.45	-22.22	18.38	0.069	40.61	-22.23
829.00 10 (	(WCP)	QPSK	V	151	90	1/0	13.64	6.76	18.25	0.067	38.45	-20.20	20.40	0.110	40.61	-20.21

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

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	ERP [dBm]	ERP [Watts]	ERP Limit [dBm]	Margin [dB]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
831.50	15	QPSK	V	211	363	1/0	14.06	6.77	18.68	0.074	38.45	-19.78	20.83	0.121	40.61	-19.78
836.50	15	QPSK	V	211	363	1/0	13.96	6.78	18.59	0.072	38.45	-19.87	20.74	0.118	40.61	-19.87
841.50	15	QPSK	V	211	363	1/0	13.82	6.79	18.46	0.070	38.45	-20.00	20.61	0.115	40.61	-20.00
831.50	15	16-QAM	V	211	363	1/0	13.30	6.77	17.92	0.062	38.45	-20.54	20.07	0.102	40.61	-20.54
831.50	15	64-QAM	V	211	363	1/0	12.59	6.77	17.21	0.053	38.45	-21.25	19.36	0.086	40.61	-21.25

Table 7-8. ERP Data (Band 26)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 161 of 202
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 161 of 203
© 2019 PCTEST Engineering Labo	V 8.8 11/19/2018			

G	PCTEST
	INGINEROING LABORATORY, INS.

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	130	85	1/0	11.70	8.16	19.86	0.097	30.00	-10.14
1732.50	1.4	QPSK	Н	130	85	1 / 0	12.36	8.18	20.54	0.113	30.00	-9.46
1754.30	1.4	QPSK	Н	130	85	1 / 0	11.62	8.21	19.83	0.096	30.00	-10.17
1732.50	1.4	16-QAM	Н	130	85	1 / 0	11.67	8.18	19.85	0.097	30.00	-10.15
1732.50	1.4	64-QAM	Н	130	85	1 / 0	11.03	8.18	19.21	0.083	30.00	-10.79
1711.50	3	QPSK	Н	127	88	1 / 0	11.74	8.16	19.90	0.098	30.00	-10.10
1732.50	3	QPSK	Н	127	88	1 / 0	12.29	8.18	20.47	0.111	30.00	-9.53
1753.50	3	QPSK	Н	127	88	1 / 0	11.60	8.21	19.81	0.096	30.00	-10.19
1732.50	3	16-QAM	Н	127	88	1 / 0	11.31	8.18	19.49	0.089	30.00	-10.51
1732.50	3	64-QAM	Н	127	88	1 / 0	10.46	8.18	18.64	0.073	30.00	-11.36
1712.50	5	QPSK	Н	263	89	1 / 0	11.34	8.16	19.50	0.089	30.00	-10.50
1732.50	5	QPSK	Н	263	89	1 / 0	12.01	8.18	20.19	0.104	30.00	-9.81
1752.50	5	QPSK	Н	263	89	1 / 0	11.54	8.20	19.74	0.094	30.00	-10.26
1732.50	5	16-QAM	Н	263	89	1 / 0	11.29	8.18	19.47	0.089	30.00	-10.53
1732.50	5	64-QAM	Н	263	89	1 / 0	10.31	8.18	18.49	0.071	30.00	-11.51
1715.00	10	QPSK	Н	125	81	1 / 0	11.78	8.16	19.94	0.099	30.00	-10.06
1732.50	10	QPSK	Н	125	81	1 / 0	12.77	8.18	20.95	0.124	30.00	-9.05
1750.00	10	QPSK	Н	125	81	1 / 0	11.98	8.20	20.18	0.104	30.00	-9.82
1732.50	10	16-QAM	Н	125	81	1 / 0	12.19	8.18	20.37	0.109	30.00	-9.63
1732.50	10	64-QAM	Н	125	81	1 / 0	11.31	8.18	19.49	0.089	30.00	-10.51
1717.50	15	QPSK	Н	398	79	1 / 0	11.91	8.16	20.07	0.102	30.00	-9.93
1732.50	15	QPSK	Н	398	79	1 / 0	12.41	8.18	20.59	0.115	30.00	-9.41
1747.50	15	QPSK	Н	398	79	1 / 0	12.29	8.20	20.49	0.112	30.00	-9.51
1732.50	15	16-QAM	Н	398	79	1 / 0	11.86	8.18	20.04	0.101	30.00	-9.96
1732.50	15	64-QAM	Н	398	79	1 / 0	11.20	8.18	19.38	0.087	30.00	-10.62
1720.00	20	QPSK	н	106	81	1 / 0	11.43	8.17	19.60	0.091	30.00	-10.40
1732.50	20	QPSK	Н	106	81	1 / 0	13.01	8.18	21.19	0.132	30.00	-8.81
1745.00	20	QPSK	Н	106	81	1 / 0	11.28	8.19	19.47	0.089	30.00	-10.53
1732.50	20	16-QAM	Н	106	81	1/0	11.48	8.18	19.66	0.092	30.00	-10.34
1732.50	20	64-QAM	Н	106	81	1/0	10.89	8.18	19.07	0.081	30.00	-10.93
1732.50	20	QPSK	V	149	255	1/0	11.65	8.18	19.83	0.096	30.00	-10.17
1732.50	20 (WCP)	QPSK	Н	144	271	1/0	12.29	8.18	20.47	0.111	30.00	-9.53

### Table 7-9. EIRP Data (Band 4)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:	Daga 162 of 202
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset	Page 162 of 203
O 0040 DOTEOT En sis series I share	tama la s		1/0.0.44/40/0040

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
1850.70	1.4	QPSK	V	100	134	1 / 5	13.91	8.37	22.28	0.169	33.01	-10.73
1882.50	1.4	QPSK	V	100	134	1 / 5	14.28	8.42	22.70	0.186	33.01	-10.31
1914.30	1.4	QPSK	V	100	134	1 / 5	13.74	8.47	22.21	0.166	33.01	-10.80
1882.50	1.4	16-QAM	V	100	134	1 / 5	13.49	8.42	21.91	0.155	33.01	-11.10
1882.50	1.4	64-QAM	V	100	134	1 / 5	12.90	8.42	21.32	0.135	33.01	-11.69
1851.50	3	QPSK	V	151	132	1 / 0	14.07	8.37	22.44	0.175	33.01	-10.57
1882.50	3	QPSK	V	15	132	1 / 14	13.57	8.42	21.99	0.158	33.01	-11.02
1913.50	3	QPSK	V	151	132	1 / 0	12.47	8.47	20.94	0.124	33.01	-12.07
1851.50	3	16-QAM	V	151	132	1 / 14	13.85	8.37	22.22	0.167	33.01	-10.79
1851.50	3	64-QAM	V	151	132	1 / 14	12.95	8.37	21.32	0.135	33.01	-11.69
1852.50	5	QPSK	V	105	129	1 / 24	14.37	8.37	22.74	0.188	33.01	-10.27
1882.50	5	QPSK	V	105	129	1 / 24	14.05	8.42	22.47	0.177	33.01	-10.54
1912.50	5	QPSK	V	105	129	1 / 24	12.84	8.47	21.31	0.135	33.01	-11.70
1852.50	5	16-QAM	V	105	129	1 / 24	13.57	8.37	21.94	0.156	33.01	-11.07
1852.50	5	64-QAM	V	105	129	1 / 24	12.98	8.37	21.35	0.136	33.01	-11.66
1855.00	10	QPSK	V	102	305	1 / 49	12.98	8.37	21.35	0.137	33.01	-11.66
1882.50	10	QPSK	V	102	305	1 / 49	13.89	8.42	22.31	0.170	33.01	-10.70
1910.00	10	QPSK	V	102	305	1 / 49	13.09	8.46	21.55	0.143	33.01	-11.46
1882.50	10	16-QAM	V	102	305	1 / 49	13.08	8.42	21.50	0.141	33.01	-11.51
1882.50	10	64-QAM	V	102	305	1 / 49	12.28	8.42	20.70	0.117	33.01	-12.31
1857.50	15	QPSK	V	136	313	1 / 0	13.81	8.38	22.19	0.166	33.01	-10.82
1882.50	15	QPSK	V	136	313	1 / 0	13.72	8.42	22.14	0.164	33.01	-10.87
1907.50	15	QPSK	V	136	313	1 / 74	12.37	8.46	20.83	0.121	33.01	-12.18
1857.50	15	16-QAM	V	136	313	1 / 0	13.03	8.38	21.41	0.138	33.01	-11.60
1857.50	15	64-QAM	V	136	313	1 / 0	12.20	8.38	20.58	0.114	33.01	-12.43
1860.00	20	QPSK	V	152	307	1/0	14.68	8.38	23.06	0.202	33.01	-9.95
1882.50	20	QPSK	V	152	307	1 / 0	13.89	8.42	22.31	0.170	33.01	-10.70
1905.00	20	QPSK	V	152	307	1 / 99	13.29	8.45	21.74	0.149	33.01	-11.27
1882.50	20	16-QAM	V	152	307	1 / 0	13.05	8.42	21.47	0.140	33.01	-11.54
1882.50	20	64-QAM	V	152	307	1 / 0	12.42	8.42	20.84	0.121	33.01	-12.17
1860.00	20	QPSK	н	149	275	1 / 0	13.23	8.38	21.61	0.145	33.01	-11.40
1860.00	20 (WCP)	QPSK	Н	149	28	1/0	13.61	8.38	21.99	0.158	33.01	-11.02

## Table 7-10. EIRP Data (Band 25/2)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:	Daga 162 of 202
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset	Page 163 of 203
@ 2010 DOTECT Engineering Labore	ton in a		V 0 0 11/10/2010

PCTEST

Frequency [MHz]	Channel Bandwidth [MHz]	Mod.	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	RB Size/Offset	Substitute Level [dBm]	Ant. Gain [dBi]	EIRP [dBm]	EIRP [Watts]	EIRP Limit [dBm]	Margin [dB]
2502.50	5	QPSK	Н	119	132	1 / 24	12.36	7.89	20.25	0.106	33.01	-12.76
2593.00	5	QPSK	н	114	118	1 / 0	12.81	7.71	20.52	0.113	33.01	-12.49
2687.50	5	QPSK	Н	111	131	1 / 24	12.01	7.52	19.53	0.090	33.01	-13.48
2593.00	5	16-QAM	Н	114	118	1 / 0	11.90	7.71	19.61	0.091	33.01	-13.40
2593.00	5	64-QAM	Н	114	118	1 / 0	10.93	7.71	18.64	0.073	33.01	-14.37
2505.00	10	QPSK	Н	127	204	1 / 49	13.73	7.89	21.62	0.145	33.01	-11.39
2593.00	10	QPSK	Н	108	198	1 / 49	12.18	7.71	19.89	0.097	33.01	-13.12
2685.00	10	QPSK	Н	158	244	1 / 49	13.00	7.53	20.53	0.113	33.01	-12.48
2505.00	10	16-QAM	Н	127	204	1 / 49	13.02	7.89	20.91	0.123	33.01	-12.10
2505.00	10	64-QAM	Н	127	204	1 / 49	11.98	7.89	19.87	0.097	33.01	-13.14
2507.50	15	QPSK	Н	127	205	1 / 74	13.74	7.88	21.62	0.145	33.01	-11.39
2593.00	15	QPSK	Н	113	200	1 / 74	12.23	7.71	19.94	0.099	33.01	-13.07
2682.50	15	QPSK	Н	158	242	1 / 74	11.41	7.53	18.94	0.078	33.01	-14.07
2507.50	15	16-QAM	Н	127	205	1 / 74	13.00	7.88	20.88	0.123	33.01	-12.13
2507.50	15	64-QAM	Н	127	205	1 / 74	12.10	7.88	19.98	0.100	33.01	-13.03
2510.00	20	QPSK	Н	125	199	1 / 99	14.78	7.88	22.66	0.184	33.01	-10.35
2593.00	20	QPSK	Н	111	202	1 / 99	12.43	7.71	20.14	0.103	33.01	-12.87
2680.00	20	QPSK	Н	155	240	1 / 99	11.61	7.54	19.15	0.082	33.01	-13.87
2510.00	20	16-QAM	Н	125	199	1 / 99	13.20	7.88	21.08	0.128	33.01	-11.93
2510.00	20	64-QAM	Н	125	199	1 / 99	12.50	7.88	20.38	0.109	33.01	-12.63
2510.00	20	QPSK	V	108	98	1 / 99	11.91	7.88	19.79	0.095	33.01	-13.22
2510.00	20 (WCP)	QPSK	Н	127	155	1 / 99	10.37	7.88	18.25	0.067	33.01	-14.76

Table 7-11. EIRP Data (Band 41)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 164 of 202
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 164 of 203
© 2019 PCTEST Engineering Labor		V 8.8 11/19/2018		

W 2019 PC TEST Engineering Laboratory, inc. V 8.8 https://www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.action.com/www.a



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

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 165 of 203
© 2019 PCTEST Engineering Labor	V 8.8 11/19/2018			



bore sight antenna mast turntable & styrofoam block and measurement equipment were set up as shown in the diagram below.

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

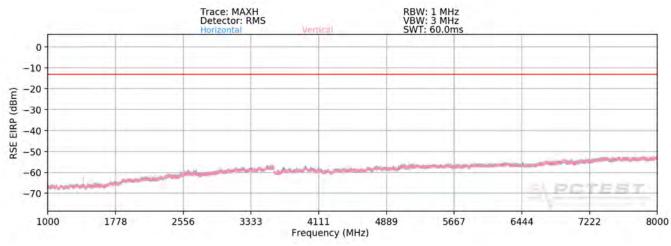
Figure 7-8. Test Instrument & Measurement Setup

### **Test Notes**

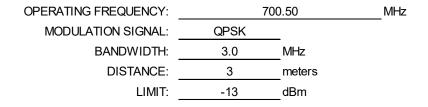
- 1) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the tables below.
- 2) This unit was tested with its standard battery.
- 3) The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter. The worst-case emissions are reported.
- 4) Emissions below 18GHz were measured at a 3 meter test distance while emissions above 18GHz were measured at a 1 meter test distance with the application of a distance correction factor.
- 5) The "-" shown in the following RSE tables are used to denote a noise floor measurement.

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 166 of 202
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 166 of 203
© 2019 PCTEST Engineering Labo	V 8.8 11/19/2018			



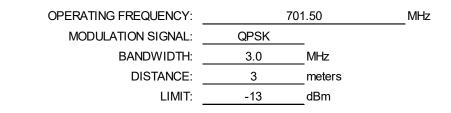


### Plot 7-259. Radiated Spurious Plot above 1GHz (Band 12)



Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1401.00	Н	-	-	-64.00	2.63	-61.37	-48.4
2101.50	Н	-	-	-60.40	3.56	-56.83	-43.8

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

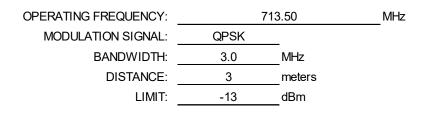


Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1403.00	Н	-	-	-64.14	2.65	-61.48	-48.5
2104.50	Н	-	-	-60.64	3.56	-57.08	-44.1

Table 7-13. Radiated Spurious Data (Band 12 – Mid Channel)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 167 of 202
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 167 of 203
© 2019 PCTEST Engineering Labo	V 8.8 11/19/2018			





Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1427.00	н	-	-	-64.79	2.94	-61.85	-48.9
2140.50	Н	-	-	-60.02	3.59	-56.43	-43.4

Table 7-14. Radiated Spurious Data (Band 12 – High Channel)

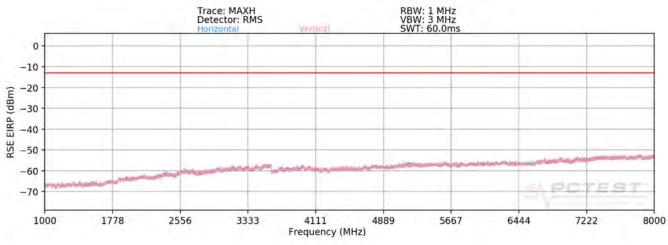
71	3.50	MHz
QPSK		
3.0	MHz	
3	meters	
-13	_dBm	
	QPSK 3.0 3	QPSK           3.0         MHz           3         meters

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]
1427.00	Н	-	-	-64.02	2.94	-61.08	-48.1
2140.50	Н	-	-	-59.99	3.59	-56.40	-43.4

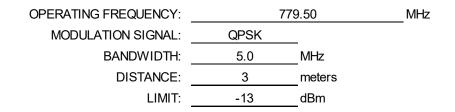
Table 7-15. Radiated Spurious Data with WCP (Band 12 – High Channel)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 169 of 202
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 168 of 203
© 2019 PCTEST Engineering Labor	V 8.8 11/19/2018			



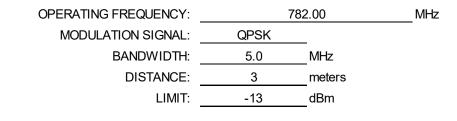


#### Plot 7-260. Radiated Spurious Plot above 1GHz (Band 13)



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]
2338.50	Н	-	-	-62.29	3.99	-58.30	-45.3
3118.00	Н	-	-	-61.77	5.37	-56.40	-43.4

Table 7-16. Radiated Spurious Data (Band 13 – Low Channel)

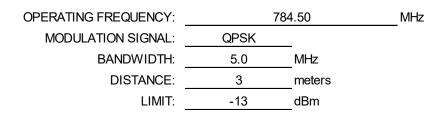


Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
2346.00	Н	-	-	-62.22	4.00	-58.21	-45.2
3128.00	Н	-	-	-61.68	5.38	-56.29	-43.3

Table 7-17. Radiated Spurious Data (Band 13 – Mid Channel)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager				
		EUT Type:		Dega 160 of 202				
		Portable Handset	Page 169 of 203					
© 2019 PCTEST Engineering Labora	2019 PCTEST Engineering Laboratory, Inc.							





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]
2353.50	Н	-	-	-62.30	4.02	-58.28	-45.3
3138.00	Н	-	-	-61.67	5.40	-56.28	-43.3

Table 7-18. Radiated Spurious Data (Band 13 – High Channel)

QPSK	_
5.00	MHz
3	meters
-50	dBm
-40	dBm/MHz
	5.00 3 -50

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]
1559.00	Н	-	-	-65.84	3.53	-62.32	-22.3
1564.00	Н	-	-	-65.96	3.53	-62.43	-22.4
1569.00	Н	-	-	-65.77	3.53	-62.23	-22.2

Table 7-19. Radiated Spurious Data (Band 13 - 1559-1610MHz Band)

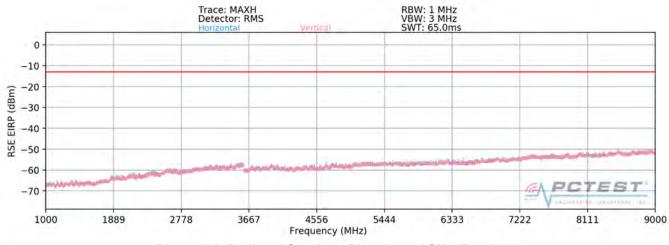
**OPERATING FREQUENCY:** 784.50 MHz MODULATION SIGNAL: **QPSK** BANDWIDTH: 5.0 MHz DISTANCE: 3 meters LIMIT: -13 dBm

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
2353.50	Н	-	-	-62.00	4.02	-57.98	-45.0
3138.00	Н	-	-	-61.61	5.40	-56.22	-43.2

Table 7-20. Radiated Spurious Data with WCP (Band 13 – High Channel)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager			
Test Report S/N: Test Dates:		EUT Type:		Dage 170 of 202			
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 170 of 203			
© 2019 PCTEST Engineering Labor	2019 PCTEST Engineering Laboratory Inc						





### Plot 7-261. Radiated Spurious Plot above 1GHz (Band 26)

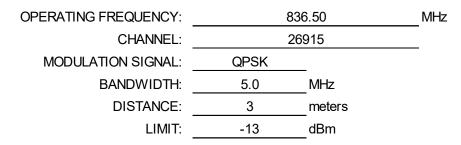
OPERATING FREQUENCY:	82	6.50 MHz	Z
CHANNEL:	26	815	
MODULATION SIGNAL:	QPSK	_	
BANDWIDTH:	5.0	MHz	
DISTANCE:	3	meters	
LIMIT:	-13	dBm	

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1653.00	Н	-	-	-64.88	3.61	-61.27	-48.3
2479.50	Н	-	-	-61.45	4.23	-57.22	-44.2

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

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager				
Test Report S/N: Test Dates:		EUT Type:		Daga 171 of 202				
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 171 of 203				
© 2019 PCTEST Engineering Labor	© 2019 PCTEST Engineering Laboratory, Inc.							





Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Antonna Gain	Spurious Emission Level [dBm]	Margin [dB]
1673.00	Н	-	-	-64.90	3.62	-61.28	-48.3
2509.50	Н	-	-	-61.16	4.33	-56.82	-43.8

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

OPERATING FREQUENCY:	84	6.50	MHz
CHANNEL:	27	015	_
MODULATION SIGNAL:	QPSK	_	
BANDWIDTH:	5.0	MHz	
DISTANCE:	3	meters	
LIMIT:	-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]
1693.00	Н	147	178	-61.04	3.63	-57.41	-44.4
2539.50	Н	-	-	-62.42	4.52	-57.91	-44.9
3386.00	Н	-	-	-62.60	6.09	-56.51	-43.5

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

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 172 of 203
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset	ndset	
© 2019 PCTEST Engineering Labo	V 8.8 11/19/2018			



OPERATING FREQUENCY:	846	6.50	MHz
MODULATION SIGNAL:	QPSK	_	
BANDWIDTH:	5.0	MHz	
DISTANCE:	3	meters	
LIMIT:	-13	dBm	

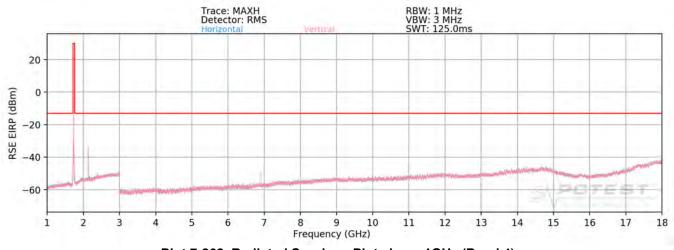
Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
1693.00	Н	147	178	-61.75	3.63	-58.12	-45.1
2539.50	Н	-	-	-61.76	4.52	-57.25	-44.2
3386.00	Н	-	-	-62.96	6.09	-56.87	-43.9

Table 7-24. Radiated Spurious Data with WCP (Band 26 – High Channel)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 172 of 202
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 173 of 203
© 2019 PCTEST Engineering Labora	V 8 8 11/19/2018			



Band 4



### Plot 7-262. Radiated Spurious Plot above 1GHz (Band 4)

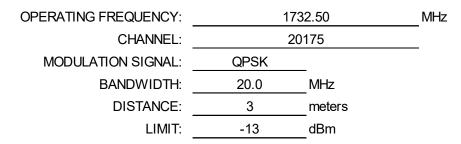
<u>20.00</u> MH	172	OPERATING FREQUENCY:
0050	20	CHANNEL:
	QPSK	MODULATION SIGNAL:
MHz	20.0	BANDWIDTH:
meters	3	DISTANCE:
dBm	-13	LIMIT:

Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3440.00	V	-	-	-61.43	6.22	-55.22	-42.2
5160.00	V	203	337	-61.04	8.68	-52.37	-39.4
6880.00	V	101	330	-54.28	8.76	-45.52	-32.5
8600.00	V	-	-	-58.37	9.17	-49.20	-36.2
10320.00	V	-	-	-57.16	9.64	-47.52	-34.5

Table 7-25. Radiated Spurious Data (Band 4 – Low Channel)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 174 of 202
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 174 of 203
© 2019 PCTEST Engineering Labo	V 8 8 11/19/2018			





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	400	287	-61.01	6.27	-54.75	-41.7
5197.50	V	-	-	-62.65	8.71	-53.94	-40.9
6930.00	V	100	341	-56.22	8.72	-47.51	-34.5
8662.50	V	-	-	-58.24	9.27	-48.97	-36.0
10395.00	V	-	-	-56.79	9.61	-47.18	-34.2

Table 7-26. Radiated Spurious Data (Band 4 – Mid Channel)

QPSK

20.0

3

1745.00

20300

MHz

meters

MHz

OPERATING FREQUENCY:

CHANNEL:

MODULATION SIGNAL:

BANDWIDTH: \_\_\_\_\_ DISTANCE:

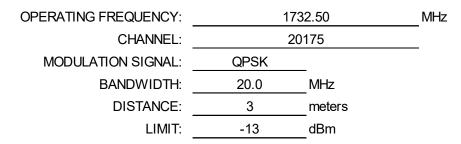
LIMIT: -13 dBm

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	387	252	-61.59	6.32	-55.27	-42.3
5235.00	V	-	-	-62.48	8.71	-53.76	-40.8
6980.00	V	-	-	-59.58	8.74	-50.85	-37.8

Table 7-27. Radiated Spurious Data (Band 4 – High Channel)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Daga 175 of 202
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 175 of 203
© 2019 PCTEST Engineering Labor	V 8 8 11/19/2018			



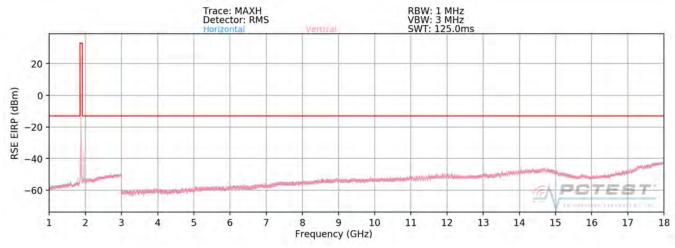


Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3465.00	Н	127	41	-60.45	6.27	-54.19	-41.2
5197.50	Н	-	-	-63.05	8.71	-54.34	-41.3
6930.00	Н	222	152	-57.36	8.72	-48.65	-35.6
8662.50	Н	-	-	-58.70	9.27	-49.43	-36.4
10395.00	Н	-	-	-56.79	9.61	-47.18	-34.2

Table 7-28. Radiated Spurious Data with WCP (Band 4 – Mid Channel)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 176 of 202
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 176 of 203
© 2019 PCTEST Engineering Labor	atory Inc.	•		V 8 8 11/19/2018





### Plot 7-263. Radiated Spurious Plot above 1GHz (Band 25)

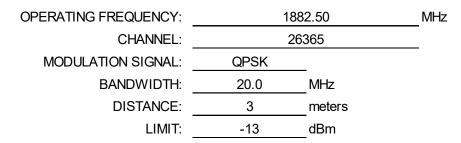
1860.00	OPERATING FREQUENCY:	860.00 MH	Z
26140	CHANNEL:	26140	
PSK	MODULATION SIGNAL:		
0.0 MHz	BANDWIDTH:	MHz	
3 meters	DISTANCE:	meters	
13dBm	LIMIT:	dBm	

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]
3720.00	V	-	-	-62.40	6.58	-55.82	-42.8
5580.00	V	-	-	-61.79	8.74	-53.06	-40.1

Table 7-29. Radiated Spurious Data (Band 25 – Low Channel)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 177 of 202
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 177 of 203
© 2019 PCTEST Engineering Labor	atory. Inc.	·		V 8.8 11/19/2018





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]
3765.00	V	-	-	-61.87	6.70	-55.18	-42.2
5647.50	V	277	169	-60.34	8.83	-51.51	-38.5
7530.00	V	304	164	-54.92	8.46	-46.47	-33.5
9412.50	V	-	-	-55.82	9.32	-46.49	-33.5

Table 7-30. Radiated Spurious Data (Band 25 – Mid Channel)

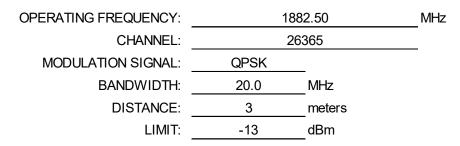
**OPERATING FREQUENCY:** 1905.00 MHz CHANNEL: 26590 MODULATION SIGNAL: QPSK BANDWIDTH: 20.0 MHz 3 DISTANCE: meters LIMIT: -13 dBm

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]
3810.00	V	-	-	-61.78	6.94	-54.84	-41.8
5715.00	V	-	-	-62.47	8.77	-53.71	-40.7

Table 7-31. Radiated Spurious Data (Band 25 – High Channel)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 179 of 202
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 178 of 203
© 2019 PCTEST Engineering Labo	ratory. Inc.			V 8.8 11/19/2018



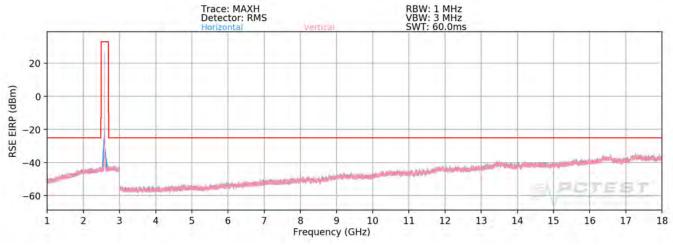


Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
3765.00	Н	-	-	-62.18	6.70	-55.48	-42.5
5647.50	Н	-	-	-62.24	8.83	-53.42	-40.4

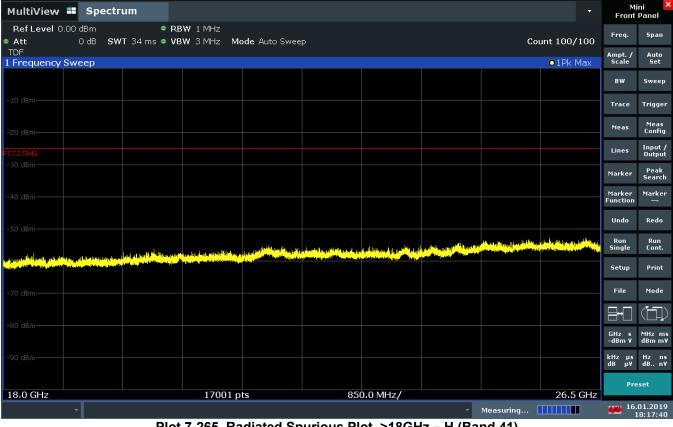
Table 7-32. Radiated Spurious Data with WCP (Band 25 – Mid Channel)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 170 of 202
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 179 of 203
© 2019 PCTEST Engineering Labora	atory Inc			V 8 8 11/19/2018





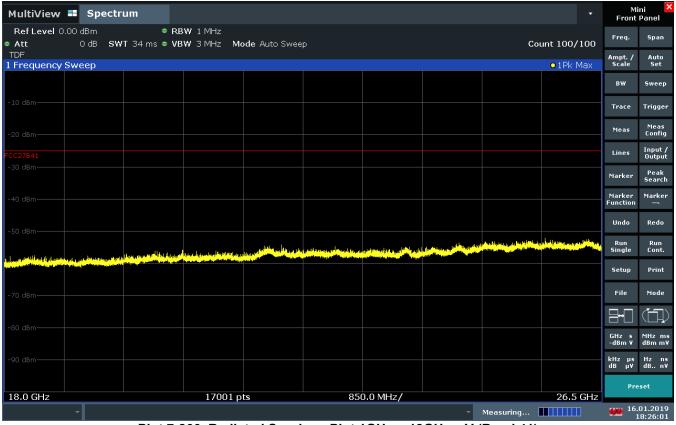




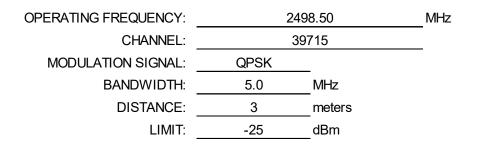
Plot 7-265. Radiated Spurious Plot >18GHz - H (Band 41)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 190 of 202
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 180 of 203
© 2019 PCTEST Engineering Labora	atory, Inc.	·		V 8.8 11/19/2018





Plot 7-266. Radiated Spurious Plot 1GHz ->18GHz - V (Band 41)

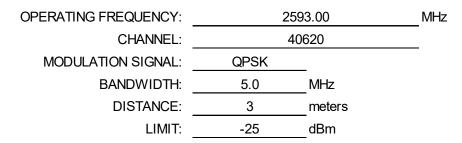


Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
4997.00	Н	-	-	-62.52	8.56	-53.96	-29.0
7495.50	Н	-	-	-58.10	8.53	-49.57	-24.6
9994.00	Н	-	-	-57.52	9.84	-47.69	-22.7

Table 7-33. Radiated Spurious Data (Band 41 – Low Channel)

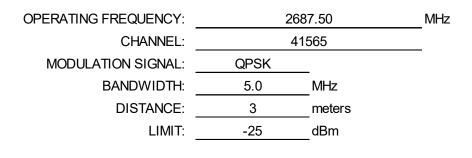
FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager		
Test Report S/N:	Test Dates:	EUT Type:		Dega 191 of 202		
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 181 of 203		
© 2019 PCTEST Engineering Labo	2019 PCTEST Engineering Laboratory, Inc.					





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]
5186.00	Н	-	-	-62.74	8.70	-54.04	-29.0
7779.00	Н	110	231	-52.78	8.69	-44.10	-19.1
10372.00	Н	-	-	-55.20	9.62	-45.57	-20.6
12965.00	Н	-	-	-51.95	8.99	-42.96	-18.0

Table 7-34. Radiated Spurious Data (Band 41 – Mid Channel)

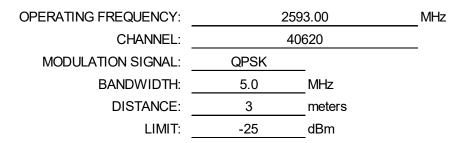


Frequency [MHz]	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Level at Antenna Terminals [dBm]	Substitute Antenna Gain [dBi]	Spurious Emission Level [dBm]	Margin [dB]
5375.00	Н	-	-	-62.21	8.69	-53.52	-28.5
8062.50	Н	-	-	-57.66	8.97	-48.68	-23.7
10750.00	Н	-	-	-54.17	9.29	-44.88	-19.9

Table 7-35. Radiated Spurious Data (Band 41 – High Channel)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Daga 192 of 202	
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 182 of 203	
© 2019 PCTEST Engineering Labor	2019 PCTEST Engineering Laboratory. Inc.				





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]
5186.00	Н	-	-	-62.85	8.70	-54.15	-29.1
7779.00	Н	136	242	-55.25	8.69	-46.57	-21.6
10372.00	Н	-	-	-55.70	9.62	-46.07	-21.1
12965.00	Н	-	-	-52.11	8.99	-43.12	-18.1

Table 7-36. Radiated Spurious Data with WCP (Band 41 – Mid Channel)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager		
Test Report S/N:	Test Dates:	EUT Type:		Dega 192 of 202		
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 183 of 203		
© 2019 PCTEST Engineering Labora	2019 PCTEST Engineering Laboratory, Inc.					



# 7.9 Uplink Carrier Aggregation Radiated Measurements §2.1053, §27.53(m)

### **Test Overview**

Radiated spurious emissions measurements are performed using the substitution method described in ANSI/TIA-603-D-2010 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. All measurements are performed as peak 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 v02r02 - Section 5.8

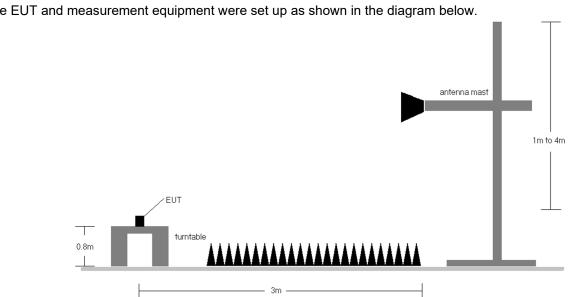
ANSI/TIA-603-D-2010 - Section 2.2.12

### **Test Settings**

- 1. RBW = 100kHz for emissions below 1GHz and 1MHz for emissions above 1GHz
- 2. VBW  $\geq$  3 x RBW
- 3. No. of sweep points  $\geq$  2 x span / RBW
- 4. Detector = RMS
- 5. Trace mode = trace average for continuous emissions, max hold for pulse emissions
- 6. The trace was allowed to stabilize

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dage 194 of 202	
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 184 of 203	
© 2019 PCTEST Engineering Labo	2019 PCTEST Engineering Laboratory. Inc.				





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

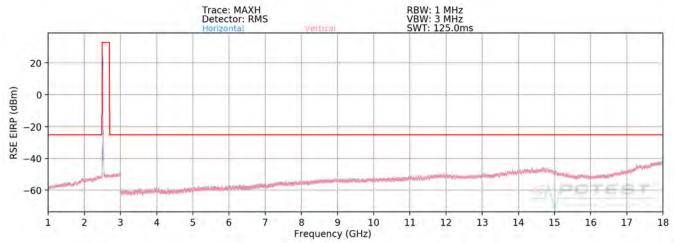
Figure 7-9. Test Instrument & Measurement Setup

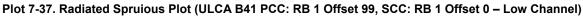
### **Test Notes**

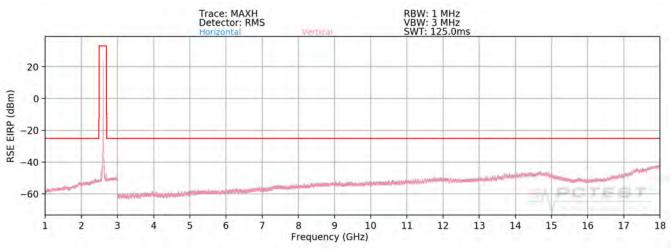
- 1) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the tables below.
- 2) This unit was tested with its standard battery.
- Radiated spurious emissions measurements were evaluated for the two contiguous channels using various combinations of RB size, RB offset, modulation, and channel bandwidth. The worst case (highest) emissions were found while operating with QPSK modulation with both carriers set to transmit using 1RB.
- 4) The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter. The worst-case emissions are reported.
- 5) 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.
- 6) No significant emissions were found as a result of two uplink carriers operating contiguously.

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager	
Test Report S/N:	Test Dates:	EUT Type:		Daga 195 of 202	
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 185 of 203	
© 2019 PCTEST Engineering Labor	2019 PCTEST Engineering Laboratory. Inc.				

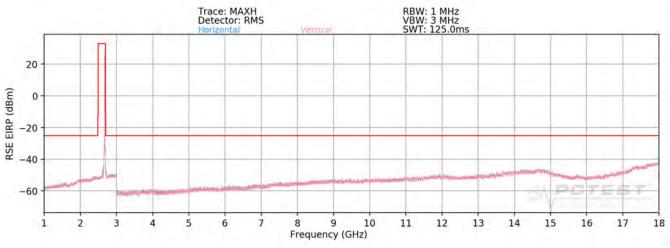


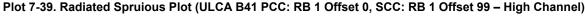






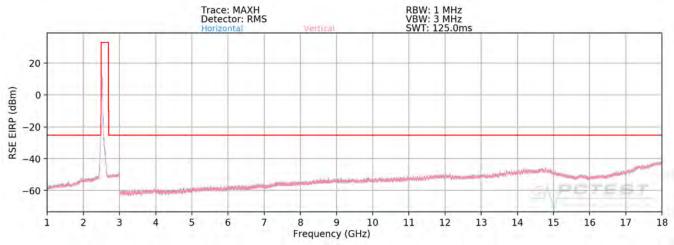
Plot 7-38. Radiated Spruious Plot (ULCA B41 PCC: RB 1 Offset 99, SCC: RB 1 Offset 0 - Mid Channel)



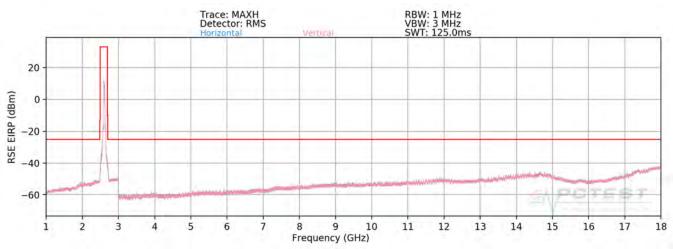


FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager		
Test Report S/N:	Test Dates:	EUT Type:		Dage 196 of 202		
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 186 of 203		
© 2019 PCTEST Engineering Labora	2019 PCTEST Engineering Laboratory, Inc.					

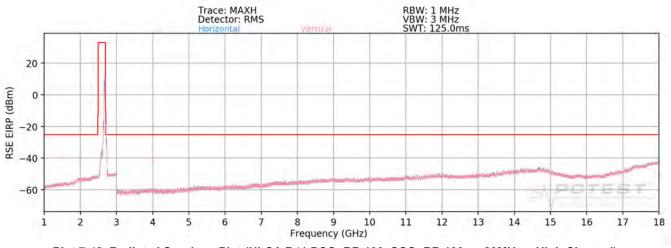








Plot 7-41. Radiated Spruious Plot (ULCA B41 PCC: RB 100, SCC: RB 100 - 20MHz - Mid Channel)



Plot 7-42. Radiated Spruious Plot (ULCA B41 PCC: RB 100, SCC: RB 100 - 20MHz - High Channel)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager		
Test Report S/N:	Test Dates:	EUT Type:		Dega 197 of 202		
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 187 of 203		
© 2019 PCTEST Engineering Labor	2019 PCTEST Engineering Laboratory, Inc.					



250	6.00 MH	łz
252	5.80 MH	łz
39	750	
399	948	
QPSK	_	
20.0	MHz	
3	meters	
-25	dBm	
	252 39 39 QPSK 20.0 3	2525.80     MH       39750     39948       QPSK     20.0       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]
5012.00	V	-	-	-68.52	8.75	-59.77	-34.8
7518.00	V	266	350	-51.31	9.32	-42.00	-17.0
10024.00	V	-	-	-64.07	9.80	-54.26	-29.3
12530.00	V	-	-	-58.88	8.87	-50.01	-25.0

Table 7-43. Radiated Spruious Data (ULCA B41 PCC: RB 1 Offset 99, SCC: RB 1 Offset 0 - Low Channel)

OPERATING FREQUENCY PCC:	2	2593.00	MHz
OPERATING FREQUENCY SCC:	2	2612.80	MHz
CHANNEL:		40620	_
CHANNEL:	40818		_
MODULATION SIGNAL:	QPSK		
BANDWIDTH:	20.0	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]
5186.00	Н	-	-	-70.24	9.03	-61.22	-36.2
7779.00	Н	-	-	-66.98	9.29	-57.69	-32.7
10372.00	Н	-	-	-63.16	9.50	-53.66	-28.7

Table 7-44. Radiated Spruious Data (ULCA B41 PCC: RB 1 Offset 99, SCC: RB 1 Offset 0 - Mid Channel)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates: EUT Type:		Dage 199 of 202	
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 188 of 203
© 2019 PCTEST Engineering Labor	V 8.8 11/19/2018			



OPERATING FREQUENCY PCC:	268	37.50	MHz
OPERATING FREQUENCY SCC:	266	60.20	MHz
CHANNEL:	41	490	
CHANNEL:	41292		
MODULATION SIGNAL:	QPSK	_	
BANDWIDTH:	20.0	MHz	
DISTANCE:	<u> </u>		
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]
5375.00	Н	121	83	-60.08	8.99	-51.09	-26.1
8062.50	Н	-	-	-65.27	9.38	-55.89	-30.9
10750.00	Н	-	-	-61.20	9.36	-51.85	-26.8

Table 7-45. Radiated Spruious Data (ULCA B41 PCC: RB 1 Offset 0, SCC: RB 1 Offset 99 - High Channel)

OPERATING FREQUENCY PCC:	250	06.00	MHz
OPERATING FREQUENCY SCC:	252	25.80	MHz
CHANNEL PCC:	39	9750	
CHANNEL SCC:	39	9948	
MODULATION SIGNAL:	QPSK	_	
BANDWIDTH:	20.0	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]
5012.00	V	-	-	-69.32	8.75	-60.57	-35.6
7518.00	V	251	1	-54.55	9.32	-45.23	-20.2
10024.00	V	-	-	-62.81	9.80	-53.01	-28.0
12530.00	V	-	-	-58.29	8.87	-49.43	-24.4

Table 7-46. Radiated Spruious Data with WCP (ULCA B41 PCC: RB 1 Offset 0, SCC: RB 1 Offset 99 – High Channel)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Report S/N: Test Dates: EUT T			Daga 190 of 202
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 189 of 203
© 2019 PCTEST Engineering Labor	V 8 8 11/19/2018			



### 7.10 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

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 100 of 202
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 190 of 203
© 2019 PCTEST Engineering Labora	V 8.8 11/19/2018			



# **Band 12 Frequency Stability Measurements**

OPERATING FREQUENCY:	707,500,000	Hz
CHANNEL:	23790	
REFERENCE VOLTAGE:	4.31	VDC

VOLTAGE (%)	POWER (VDC)	<b>темр</b> (°С)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.31	- 30	707,500,082	82	0.0000116
100 %		- 20	707,500,352	352	0.0000498
100 %		- 10	707,500,293	293	0.0000414
100 %		0	707,500,095	95	0.0000134
100 %		+ 10	707,499,669	-331	-0.0000468
100 %		+ 20	707,500,183	183	0.0000259
100 %		+ 30	707,500,137	137	0.0000194
100 %		+ 40	707,500,252	252	0.0000356
100 %		+ 50	707,500,234	234	0.0000331
BATT. ENDPOINT	3.48	+ 20	707,499,812	-188	-0.0000266

Table 7-47. Frequency Stability Data (Band 12)

### Note:

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

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager	
Test Report S/N:	Test Dates: EUT Type:		Dega 101 of 202		
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 191 of 203	
© 2019 PCTEST Engineering Labo	V 8.8 11/19/2018				



**Band 12 Frequency Stability Measurements** 

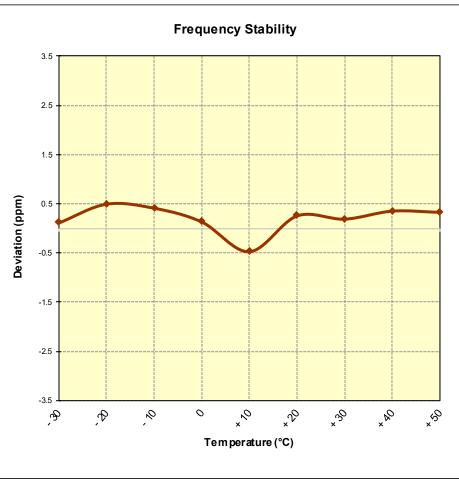


Figure 7-10. Frequency Stability Graph (Band 12)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 102 of 202
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 192 of 203
© 2019 PCTEST Engineering Labor	V 8.8 11/19/2018			



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

OPERATING FREQUENCY:	782,000,000	Hz
CHANNEL:	23230	_
REFERENCE VOLTAGE:	4.31	VDC

VOLTAGE (%)	POWER (VDC)	<b>темр</b> (°С)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.31	- 30	781,999,934	-66	-0.000084
100 %		- 20	782,000,478	478	0.0000611
100 %		- 10	782,000,239	239	0.0000306
100 %		0	781,999,954	-46	-0.0000059
100 %		+ 10	782,000,084	84	0.0000107
100 %		+ 20	782,000,087	87	0.0000111
100 %		+ 30	781,999,649	-351	-0.0000449
100 %		+ 40	782,000,004	4	0.0000005
100 %		+ 50	781,999,986	-14	-0.0000018
BATT. ENDPOINT	3.48	+ 20	781,999,863	-137	-0.0000175

Table 7-48. 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.

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 102 of 202
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 193 of 203
© 2019 PCTEST Engineering Labo	V 8.8 11/19/2018			



**Band 13 Frequency Stability Measurements** 

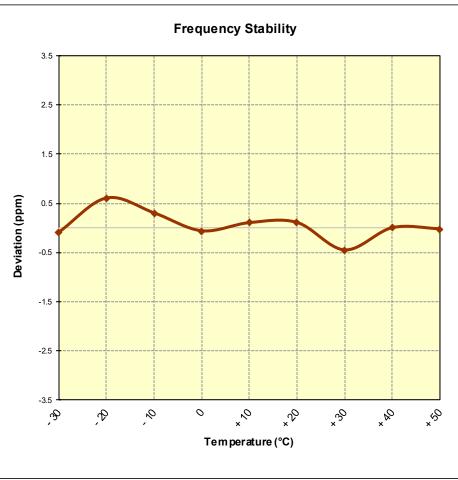


Figure 7-11. Frequency Stability Graph (Band 13)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 104 of 202
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 194 of 203
© 2019 PCTEST Engineering Labora	V 8.8 11/19/2018			



# **Band 26 Frequency Stability Measurements**

OPERATING FREQUENCY:	831,500,000	Hz
CHANNEL:	26865	_
REFERENCE VOLTAGE:	4.31	VDC
DEVIATION LIMIT:	± 0.00025 % or 2.5 ppm	

VOLTAGE (%)	POWER (VDC)	<b>темр</b> (°С)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.31	- 30	831,500,091	91	0.0000109
100 %		- 20	831,499,663	-337	-0.0000405
100 %		- 10	831,499,994	-6	-0.0000007
100 %		0	831,499,869	-131	-0.0000158
100 %		+ 10	831,499,786	-214	-0.0000257
100 %		+ 20	831,499,883	-117	-0.0000141
100 %		+ 30	831,499,826	-174	-0.0000209
100 %		+ 40	831,499,930	-70	-0.000084
100 %		+ 50	831,499,611	-389	-0.0000468
BATT. ENDPOINT	3.48	+ 20	831,500,381	381	0.0000458

Table 7-49. Frequency Stability Data (Band 26)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 105 of 202
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 195 of 203
© 2019 PCTEST Engineering Labora	V 8.8 11/19/2018			



# **Band 26 Frequency Stability Measurements**

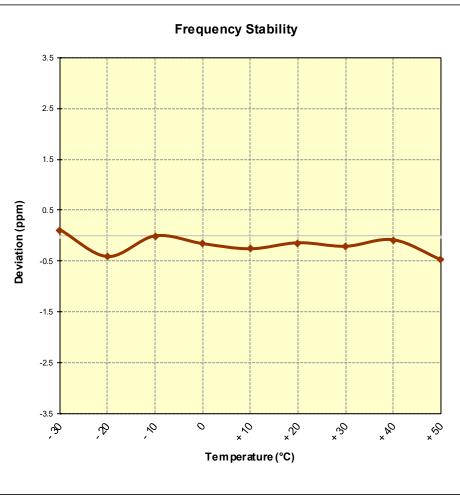


Figure 7-12. Frequency Stability Graph (Band 26)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Daga 106 of 202
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 196 of 203
© 2019 PCTEST Engineering Labora	V 8.8 11/19/2018			



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

OPERATING FREQUENCY:	1,732,500,000	Hz
CHANNEL:	20175	
REFERENCE VOLTAGE:	4.31	VDC

VOLTAGE (%)	POWER (VDC)	<b>темр</b> (°С)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.31	- 30	1,732,499,930	-70	-0.0000040
100 %		- 20	1,732,499,905	-95	-0.0000055
100 %		- 10	1,732,499,955	-45	-0.0000026
100 %		0	1,732,499,764	-236	-0.0000136
100 %		+ 10	1,732,499,901	-99	-0.0000057
100 %		+ 20	1,732,500,384	384	0.0000222
100 %		+ 30	1,732,500,144	144	0.000083
100 %		+ 40	1,732,500,055	55	0.0000032
100 %		+ 50	1,732,499,899	-101	-0.0000058
BATT. ENDPOINT	3.48	+ 20	1,732,500,310	310	0.0000179

Table 7-50. 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.

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 107 of 202
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 197 of 203
© 2019 PCTEST Engineering Labo	V 8.8 11/19/2018			



## **Band 4 Frequency Stability Measurements**

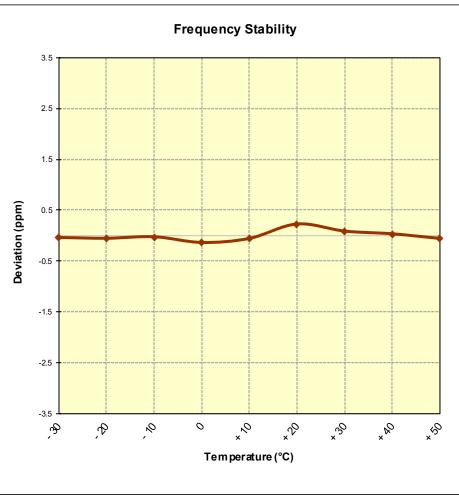


Figure 7-13. Frequency Stability Graph (Band 4)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 198 of 203
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 196 01 203
© 2019 PCTEST Engineering Labora	V 8.8 11/19/2018			



# **Band 25 Frequency Stability Measurements**

OPERATING FREQUENCY:	1,882,500,000	Hz
CHANNEL:	26365	
REFERENCE VOLTAGE:	4.31	VDC

VOLTAGE (%)	POWER (VDC)	TEMP (°C)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.31	- 30	1,882,500,051	51	0.0000027
100 %		- 20	1,882,499,907	-93	-0.0000049
100 %		- 10	1,882,499,904	-96	-0.0000051
100 %		0	1,882,499,896	-104	-0.0000055
100 %		+ 10	1,882,499,520	-480	-0.0000255
100 %		+ 20	1,882,499,775	-225	-0.0000120
100 %		+ 30	1,882,499,893	-107	-0.0000057
100 %		+ 40	1,882,499,846	-154	-0.0000082
100 %		+ 50	1,882,499,995	-5	-0.000003
BATT. ENDPOINT	3.48	+ 20	1,882,500,397	397	0.0000211

Table 7-51. Frequency Stability Data (Band 25)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Dago 100 of 202
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 199 of 203
© 2019 PCTEST Engineering Labor	V 8 8 11/19/2018			



# **Band 25 Frequency Stability Measurements**

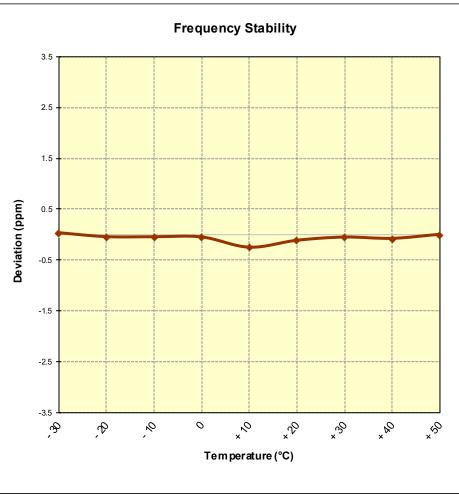


Figure 7-14. Frequency Stability Graph (Band 25)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	UT Type:		Dago 200 of 202
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 200 of 203
© 2019 PCTEST Engineering Labora	V 8.8 11/19/2018			



### **Band 41 Frequency Stability Measurements**

OPERATING FREQUENCY:	2,593,000,000	Hz
CHANNEL:	40620	_
REFERENCE VOLTAGE:	4.31	VDC

VOLTAGE (%)	POWER (VDC)	<b>темр</b> (°С)	FREQUENCY (Hz)	Freq. Dev. (Hz)	Deviation (%)
100 %	4.31	- 30	2,592,999,897	-103	-0.0000040
100 %		- 20	2,592,999,828	-172	-0.0000066
100 %		- 10	2,593,000,171	171	0.0000066
100 %		0	2,593,000,037	37	0.0000014
100 %		+ 10	2,592,999,991	-9	-0.0000003
100 %		+ 20	2,592,999,949	-51	-0.0000020
100 %		+ 30	2,592,999,979	-21	-0.000008
100 %		+ 40	2,593,000,041	41	0.0000016
100 %		+ 50	2,592,999,722	-278	-0.0000107
BATT. ENDPOINT	3.48	+ 20	2,592,999,741	-259	-0.0000100

Table 7-52. Frequency Stability Data (Band 41)

### 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.

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	S/N: Test Dates: EUT Type:		Dega 201 of 202	
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 201 of 203
© 2019 PCTEST Engineering Labo	V 8.8 11/19/2018			



**Band 41 Frequency Stability Measurements** 

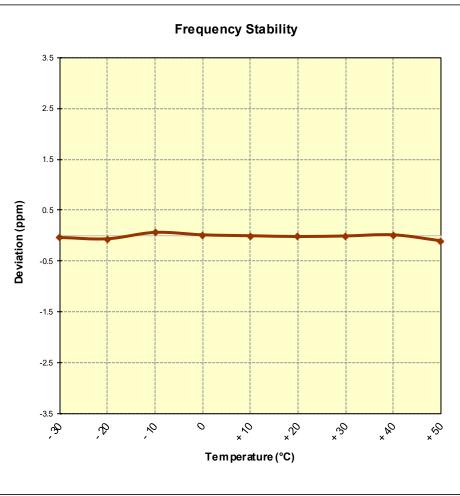


Figure 7-15. Frequency Stability Graph (Band 41)

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 202 of 203
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 202 01 203
© 2019 PCTEST Engineering Labora	V 8.8 11/19/2018			



### 8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Samsung Portable Handset FCC ID: A3LSMG9730** complies with all the requirements of Part 22, 24, & 27 of the FCC Rules for LTE operation only.

FCC ID: A3LSMG9730		MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Quality Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 203 of 203
1M1811230206-03.A3L	12/14/2018 - 1/26/2019	Portable Handset		Page 203 01 203
© 2019 PCTEST Engineering Labora	V 8.8 11/19/2018			