

Plot 7-115. 6dB Bandwidth Plot MIMO ANT1 (20MHz BW 802.11n (UNII Band 3) - Ch. 157)



Plot 7-116. 6dB Bandwidth Plot MIMO ANT1 (20MHz BW 802.11n (UNII Band 3) - Ch. 165)

FCC ID: A3LSMG998B	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Daga 77 of 200
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset	Page 77 of 209
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	sight Spectrum A	Analyzer - Oco	cupied BW									
l <b>xi</b> Ri	- RF	50 Ω	AC COR	REC		NSE:INT		ALIGN AUTO		M Oct 20, 2020	Trac	e/Detector
						req: 5.74500		d: 100/100	Radio Std	: None	mae	cibelector
			#IFO	↔ Gain:Low	#Atten: 2		Avginoid	. 100/100	Radio Dev	vice: BTS		
10 di	3/div	Ref 20.0	0 dBm									
Log 10.0												
				استل الد	hulpment		and the					Clear Write
0.00				A-1944 (March 1944	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	/~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	Kan An Anna					
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-20.0			N					1				
20.0	phone when have	M. W. Walder	Mand Manash					WWWWWWWW	webhavady.Ay	1.154		Average
	phone the second	11 -1-								www.www.www.		Average
-40.0												
-50.0												
-60.0												
												Max Hold
-70.0												
Cen	ter 5.7450								Snan 4	50.00 MHz		
	s BW 100				#\/F	3W 300 k	Hz			p 4.8 ms		
miles.	5 DW 100	ATT2			<i></i>	544 300 N	112		OWCC	p 4.0 m3		Min Hold
	ccupied	Dand	width			Total P	ower	24 7	dBm			
<u>۷</u>	ccupieu	Danu				Total I		2-10	ubm			
			19.0	50 MI	z							Detector
												Peak►
T	ransmit F	req Err	or -	38.340	(Hz	% of O	<b>3W Pow</b>	er 99	.00 %		Auto	<u>Man</u>
	dB Band	width		18.99 M		x dB		-6	00 dB			
^		wiuui		10.33 W	1112	X UB		-0.				
MSG								STATUS				
MSG								STATUS				

Plot 7-117. 6dB Bandwidth Plot MIMO ANT1 (20MHz BW 802.11ax (UNII Band 3) - Ch. 149)



Plot 7-118. 6dB Bandwidth Plot MIMO ANT1 (20MHz BW 802.11ax (UNII Band 3) - Ch. 157)

FCC ID: A3LSMG998B	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 79 of 200
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset		Page 78 of 209
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Keysight Spectrum Analyzer - Occupie	ed BW					
<b>X RL</b> RF 50Ω A		SENSE:INT			1 Oct 20, 2020	Trace/Detector
		Center Freq: 5.82500 Trig: Free Run	Avg Hold: 100/	Radio Std: /100	None	
	#IFGain:Low	#Atten: 20 dB	, traji lola. 100	Radio Devi	ce: BTS	
10 dB/div Ref 20.00 d	IBm					
10.0						
0.00	n at Manuahlan	level your montal and	Marine Mathematic			Clear Write
-10.0			l l			
-20.0						
-20.0 -30.0	w440~		٣^	alatallating population	August at .	Average
-40.0					" " "holkepy	Ŭ
-50.0						
-60.0						Max Hold
-70.0						
Center 5.82500 GHz					0.00 MHz	
#Res BW 100 kHz		#VBW 300 k	Hz	Sweet	o 4.8 ms	Min Hold
Occupied Bandwi	idth	Total P	ower	24.6 dBm		
	19.017 MH	7				Detector
		2				Peak►
Transmit Freq Error	-35.694 kl	Iz % of OE	BW Power	99.00 %		Auto <u>Man</u>
x dB Bandwidth	19.00 MH	z xdB		-6.00 dB		
	13.00 Mil			-0.00 00		
MSG				STATUS		

Plot 7-119. 6dB Bandwidth Plot MIMO ANT1 (20MHz BW 802.11ax (UNII Band 3) - Ch. 165)



Plot 7-120. 6dB Bandwidth Plot MIMO ANT1 (40MHz BW 802.11n (UNII Band 3) - Ch. 151)

FCC ID: A3LSMG998B	PCTEST* Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Baga 70 of 200
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset	Page 79 of 209
© 2020 PCTEST		·	V 9.0 02/01/2019



	/sight Spectrum /	Analyzer - Oc	cupied BW										
<b>l,XI</b> RI	L RF	50 Ω	AC CO	RREC		NSE:INT req: 5.7950	00000 GH-	ALIGN	OTUA I	01:20:11 P	M Oct 20, 2020	Trac	e/Detector
				<b>↔</b>			Avg Hol	d: 100/	100	Raulo Stu	None		
			#IF	Gain:Low	#Atten: 2	20 dB				Radio Dev	ice: BTS		
10 di	3/div	Ref 20.0	0 dBm										
Log													
10.0													Clear Write
0.00				ala Lambria	nolaholadulahan	أسلما ليالتانهم ا	ومعاربا والماروس						
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-20.0				/									
-30.0			den and the	/				1. M. A	4-1-1				Average
-40.0	NANNO MAN	Mar Marker	ALLAN MARINA					1	walt fur	NA WAY AND	My Harland		
-50.0	Man Martin									'	······································		
-60.0													
													Max Hold
-70.0													
Cen	ter 5.7950	0 GHz		- <b>I</b>						Span 1	00.0 MHz		
#Re	s BW 100	) kHz			#VE	300 W	kHz				p 9.6 ms		Min Hold
													Millinoid
0	ccupied	l Band	width			Total F	ower		23.2	dBm			
			36.2	02 MI	H7								Detector
													Peak▶
T T	ransmit F	req Err	ror	-44.619	kHz	% of O	BW Pow	/er	99	.00 %		Auto	<u>Man</u>
x	dB Band	width		36.35 N	١Hz	x dB			-6.0	)0 dB			
MSG									STATUS				

Plot 7-121. 6dB Bandwidth Plot MIMO ANT1 (40MHz BW 802.11n (UNII Band 3) - Ch. 159)



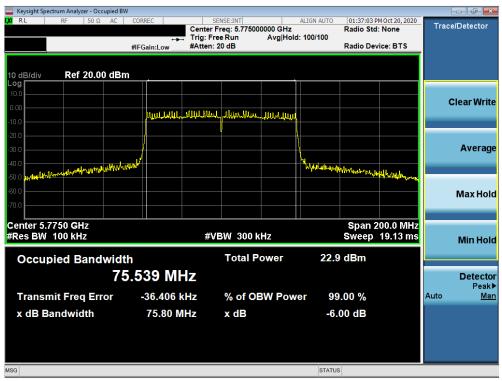
Plot 7-122. 6dB Bandwidth Plot MIMO ANT1 (40MHz BW 802.11ax (UNII Band 3) - Ch. 151)

FCC ID: A3LSMG998B	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Degre 80 of 200
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset	Page 80 of 209
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Keysight Spectrum Analyzer - Occupied B\	N				
XIRL RF 50Ω AC	CORREC	SENSE:INT		AM Oct 20, 2020	Trace/Detector
		r Freq: 5.795000000 GHz Free Run Avg Hole	Radio S1 d: 100/100	d: None	
		n: 20 dB		evice: BTS	
10 dB/div Ref 20.00 dBr	n				
10.0					
0.00					Clear Write
	phylochille and a phylochiller the	el von providellerheiter bestart wie die bestarten			
-10.0					
-20.0					
-30.0	-null -		Malada and a short		Average
-30.0 -40.0 calallhin mythe Will have been with the			When many and a start of the second	WWWWWWWWWW	
				. and stull	
-50.0					
-60.0					Max Hold
-70.0					
Center 5.79500 GHz				100.0 MHz	
#Res BW 100 kHz	#	VBW 300 kHz	Swe	ep 9.6 ms	Min Hold
		T-4-1 D	24.1 dBm		
Occupied Bandwidt	ih	Total Power	24.1 aBm		
3	7.541 MHz				Detector
					Peak►
Transmit Freq Error	-15.456 kHz	% of OBW Pow	ver 99.00 %		Auto <u>Man</u>
x dB Bandwidth	37.67 MHz	x dB	-6.00 dB		
	57.07 MITZ	X UD	-0.00 uB		
MSG			STATUS		

Plot 7-123. 6dB Bandwidth Plot MIMO ANT1 (40MHz BW 802.11ax (UNII Band 3) - Ch. 159)



Plot 7-124. 6dB Bandwidth Plot MIMO ANT1 (80MHz BW 802.11ac (UNII Band 3) - Ch. 155)

FCC ID: A3LSMG998B	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager		
Test Report S/N:	Test Dates:	EUT Type:		Dama 04 of 000		
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset		Page 81 of 209		
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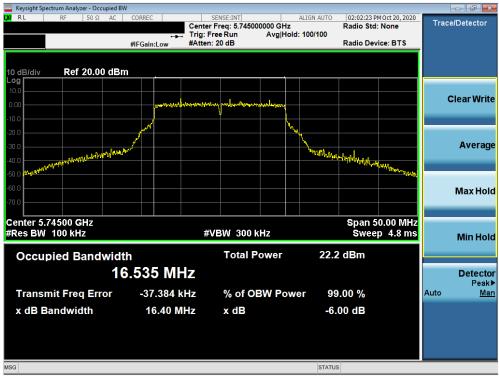
www.www.com analyzer - Occupied BW						
LXI RL RF 50Ω AC	CORREC	SENSE:INT			:16 AM Oct 20, 2020	Trace/Detector
		Center Freq: 5.7750 Trig: Free Run	Avg Hold: 10		Std: None	
	#IFGain:Low	#Atten: 20 dB			Device: BTS	
,						
10 dB/div Ref 20.00 dBm						
10 dB/div Ref 20.00 dBm						
10.0						
0.00						Clear Write
-10.0	Mouthaller	allefter and the production of the	hoppblesseller			
-20.0						
-30.0						Average
-40.0	ф <b>л</b> ья́		\	and along man and along with the work		
-50.0 and the state of the stat					Mary Maple Margaride	
-60.0						
						Max Hold
-70.0						
Center 5.7750 GHz				Sna	n 200.0 MHz	
#Res BW 100 kHz		#VBW 300	kH7		ep 19.13 ms	Min Hala
		#• <b>DH</b> 000			op 10110 110	Min Hold
Occupied Bandwidt	h	Total	Power	23.6 dBm	1	
		_				
/ 6	.816 MH	Z				Detector Peak▶
Transmit Freq Error	24.554 ki	dz % of O	BW Power	99.00 %	,	Auto Man
			Bir I Gwei			
x dB Bandwidth	77.16 MI	lz xdB		-6.00 dE	3	
100				OTATIO		
MSG				STATUS		

Plot 7-125. 6dB Bandwidth Plot MIMO ANT1 (80MHz BW 802.11ax (UNII Band 3) - Ch. 155)

FCC ID: A3LSMG998B	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 82 of 200
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset		Page 82 of 209
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## MIMO Antenna-2 6dB Bandwidth Measurements







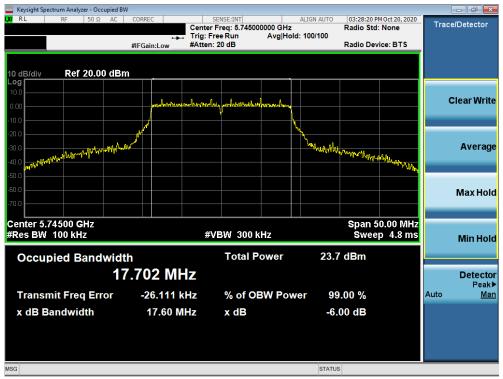
Plot 7-127. 6dB Bandwidth Plot MIMO ANT2 (802.11a (UNII Band 3) - Ch. 157)

FCC ID: A3LSMG998B	Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 02 of 200
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset		Page 83 of 209
© 2020 PCTEST		•		V 9.0 02/01/2019





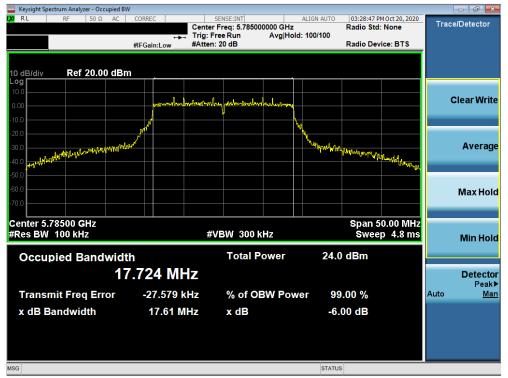




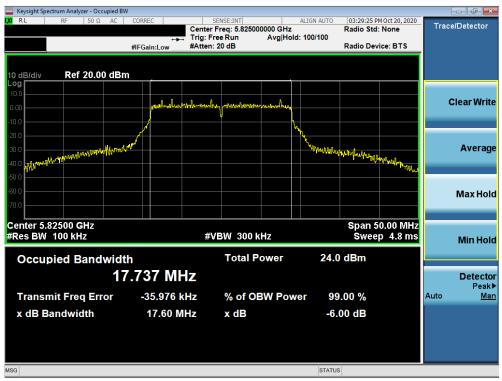
Plot 7-129. 6dB Bandwidth Plot MIMO ANT2 (20MHz BW 802.11n (UNII Band 3) - Ch. 149)

FCC ID: A3LSMG998B	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Daga 84 of 200
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset		Page 84 of 209
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Plot 7-130. 6dB Bandwidth Plot MIMO ANT2 (20MHz BW 802.11n (UNII Band 3) - Ch. 157)



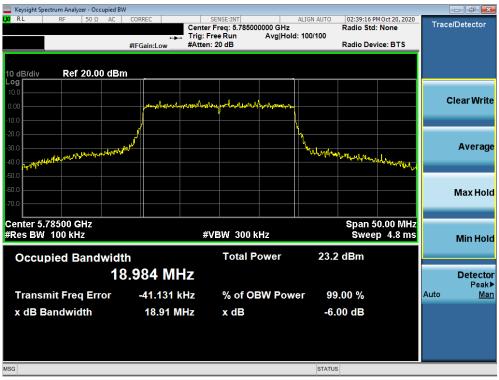
Plot 7-131. 6dB Bandwidth Plot MIMO ANT2 (20MHz BW 802.11n (UNII Band 3) - Ch. 165)

FCC ID: A3LSMG998B	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset	Page 85 of 209	
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Keysight Spectrum Analyzer - Occupied BV	V				
LXI RL RF 50Ω AC		SENSE:INT		PM Oct 20, 2020	Trace/Detector
		Freq: 5.745000000 GHz ree Run Avg Hol	Radio St d: 100/100	d: None	11400120100101
	#IFGain:Low #Atten			evice: BTS	
10 dB/div Ref 20.00 dBn	n				
Log					
	march dependent				Clear Write
0.00	and any ange for any share of the second	and the second			
-10.0					
-20.0	/"		<u> </u>		
-30.0			₩		Average
and the state of the	¥*		how helder with when	6.040	
AND THE REPORT OF A				WAR WHAL WHO WHO WAR	
-50.0				· · · · ·	
-60.0					Max Hold
-70.0					maxinoia
Center 5.74500 GHz			Span	50.00 MHz	
#Res BW 100 kHz	#\	VBW 300 kHz		ep 4.8 ms	Min Hold
					MITTOIG
Occupied Bandwidt	h	Total Power	22.9 dBm		
					D. t t.
18	3.957 MHz				Detector Peak▶
Transmit Freq Error	-37.395 kHz	% of OBW Pow	ver 99.00 %		Auto <u>Man</u>
x dB Bandwidth	18.93 MHz	x dB	-6.00 dB		
	10.93 MHZ	xub	-0.00 aB		
NEC			STATUS		
MSG			STATUS		

Plot 7-132. 6dB Bandwidth Plot MIMO ANT2 (20MHz BW 802.11ax (UNII Band 3) - Ch. 149)



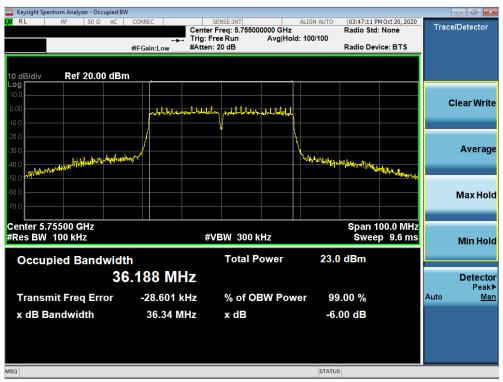
Plot 7-133. 6dB Bandwidth Plot MIMO ANT2 (20MHz BW 802.11ax (UNII Band 3) - Ch. 157)

FCC ID: A3LSMG998B	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMBUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 96 of 200
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset		Page 86 of 209
© 2020 PCTEST				V 9.0 02/01/2019



Keysight Spectrum Analyzer - Occupied B	W				- d <b>X</b>
LX RL RF 50Ω AC		SENSE:INT		M Oct 20, 2020	Trace/Detector
		Freq: 5.825000000 GHz Free Run Avg Hold	Radio Std 1: 100/100	: None	Hacenbereeton
		: 20 dB	Radio De	vice: BTS	
	MI Guill.EGW				
10 dB/div Ref 20.00 dB	m _				
Log					
10.0					Clear Write
0.00	per prover when the contract	lag meter to provide a low ma			
-10.0					
-20.0	A la		1.		
			1		A.v
-30.0	1		Mundal March and a first a		Average
-40.0				May with a	
-50.0					
-60.0					
					Max Hold
-70.0					
Center 5.82500 GHz			Enon /		
#Res BW 100 kHz	-447	VBW 300 kHz		0.00 MHz p 4.8 ms	
#Res BW TOURHZ	#	ADAA JAA KUS	Swee	p 4.8 ms	Min Hold
	41-	Total Power	23.4 dBm		
Occupied Bandwid		Total Power	23.4 UBIII		
1	8.990 MHz				Detector
					Peak▶
Transmit Freq Error	-28.844 kHz	% of OBW Pow	er 99.00 %		Auto <u>Man</u>
x dB Bandwidth	18.88 MHz	x dB	-6.00 dB		
	10.00 MILIZ	X UD	-0.00 uB		
MSG			STATUS		
			314103		

Plot 7-134. 6dB Bandwidth Plot MIMO ANT2 (20MHz BW 802.11ax (UNII Band 3) - Ch. 165)



Plot 7-135. 6dB Bandwidth Plot MIMO ANT2 (40MHz BW 802.11n (UNII Band 3) - Ch. 151)

FCC ID: A3LSMG998B	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 97 of 200
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset		Page 87 of 209
© 2020 PCTEST				V 9.0 02/01/2019





Plot 7-136. 6dB Bandwidth Plot MIMO ANT2 (40MHz BW 802.11n (UNII Band 3) - Ch. 159)



Plot 7-137. 6dB Bandwidth Plot MIMO ANT2 (40MHz BW 802.11ax (UNII Band 3) - Ch. 151)

FCC ID: A3LSMG998B	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 89 of 200
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset	Page 88 of 209
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	/sight Spectrum Analyzer - O	ccupied BW									
L <mark>XI</mark> RI	L RF 50 S	2 AC COR	REC		NSE:INT		ALIGN AUTO		M Oct 20, 2020	Trac	e/Detector
					req: 5.79500		4. 400/400	Radio Std	: None	mac	enderector
		#150	iain:Low	#Atten: 2		Avginoid	d: 100/100	Radio Dev	vice: BTS		
		#IFC		#raten. 2	o uB			Rudio Dei	Nee. B To		
10 di	B/div Ref 20.0	)0 dBm									
Log											
10.0											<b>N</b> I <b>M</b> /:4 -
0.00			to d bade	الماليل	a de la hant de	a lek t k t k					Clear Write
-10.0			14000	1. 4 4 4 <b>1</b> 10 4 14		When any shirt of	l l				
-20.0							\ \				
-30.0											Average
-40.0	www.www.www.	www.					Mur Magalin	An marker			
	www.whenther Marrian							1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	www.uliperez		
-50.0											
-60.0											Max Hold
-70.0											
Cen	ter 5.79500 GHz							Span 1	00.0 MHz		
	s BW 100 kHz			#VE	3W 300 H	Hz			p 9.6 ms		Min Hold
0	ccupied Band	dwidth			Total P	ower	23.5	dBm			
Ĭ	ccupicu Dain										
		37.5	36 MI	Z							Detector
											Peak▶
T	ransmit Freq Er	ror -	48.432	<b>KHz</b>	% of O	BW Pow	er 99	.00 %		Auto	<u>Man</u>
	dB Bandwidth		37.31 N	147	x dB		-6	00 dB			
^			57.51 N	11712	X UD		-0.	00 00			
MSG							STATUS	5			

Plot 7-138. 6dB Bandwidth Plot MIMO ANT2 (40MHz BW 802.11ax (UNII Band 3) - Ch. 159)



Plot 7-139. 6dB Bandwidth Plot MIMO ANT2 (80MHz BW 802.11ac (UNII Band 3) - Ch. 155)

FCC ID: A3LSMG998B	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 80 of 200
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset		Page 89 of 209
© 2020 PCTEST				V 9.0 02/01/2019



Keysight Spectrum Analyzer - Occupied					
📜 RL RF 50Ω AC		SENSE:INT	ALIGN AUTO	03:08:07 PM Oct 20, 20	Trace/Detector
		ter Freq: 5.775000000 G g: Free Run Avg	Hz Hold: 100/100	Radio Std: None	
		ten: 20 dB		Radio Device: BTS	
10 dB/div Ref 20.00 dl	Dm				
Log					
10.0					
0.00					Clear Write
-10.0	MARA BARA AND AND AND AND AND AND AND AND AND AN	Million of the Million of the State of the S	Jalon,		
-20.0					
-30.0			h		Average
-40.0	Mrs <sub>helson</sub> d		Mary Mary Barry	a and the	
-50.0 Man Man				wall Hong where we want	u.th
-60.0					
					Max Hold
-70.0					
Center 5.7750 GHz				Span 200.0 M	H7
#Res BW 100 kHz		#VBW 300 kHz		Sweep 19.13 r	
Occupied Bandwi	dth	Total Power	23.7	7 dBm	
	76.683 MHz				Detecto
	0.003 IVITZ				Detector Peak
Transmit Freg Error	-86.138 kHz	% of OBW P	ower 90	9.00 %	Auto Mar
x dB Bandwidth	76.60 MHz	x dB	-6.	00 dB	
ISG			STATU	e	
150			STATU	5	

Plot 7-140. 6dB Bandwidth Plot MIMO ANT2 (80MHz BW 802.11ax (UNII Band 3) - Ch. 155)

FCC ID: A3LSMG998B	Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)		Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dage 00 of 200	
1M2009280154-09.A3L	9/28/2020-11/25/2020	ortable Handset		Page 90 of 209	
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## 7.4 UNII Output Power Measurement – 802.11a/n/ac/ax §15.407(a.1.iv) §15.407(a.2) §15.407(a.3); RSS-247 [6.2]

## **Test Overview and Limits**

A transmitter antenna terminal of the EUT is connected to the input of an RF pulse power sensor. Measurement is made using a broadband average power meter while the EUT is operating at its maximum duty cycle, at its maximum power control level, as defined in ANSI C63.10-2013 and KDB 789033 D02 v02r01, and at the appropriate frequencies.

In the 5.15 – 5.25GHz band, the maximum permissible conducted output power is 250mW (23.98dBm). The maximum e.i.r.p. shall not exceed the lesser of 200 mW or 10 + 10 log10B, dBm.

In the 5.25 – 5.35GHz band, the maximum permissible conducted output power is the lesser of 250mW (23.98dBm) or 11 dBm +  $10\log_{10}(26dB BW) = 11 dBm + 10\log_{10}(21.15) = 24.25dBm$ . The maximum e.i.r.p. shall not exceed the lesser of 1.0 W or 17 + 10 log10B, dBm.

In the 5.47 – 5.725GHz band, the maximum permissible conducted output power is the lesser of 250mW (23.98dBm) or 11 dBm +  $10\log_{10}(26dB BW) = 11 dBm + 10\log_{10}(21.23) = 24.27dBm$ . The maximum e.i.r.p. shall not exceed the lesser of 1.0 W or 17 + 10 log10B, dBm.

In the 5.725 – 5.850GHz band, the maximum permissible conducted output power is 1W (30dBm). The maximum e.i.r.p. is 36 dBm.

## Test Procedure Used

ANSI C63.10-2013 – Section 12.3.3.2 Method PM-G KDB 789033 D02 v02r01 – Section E)3)b) Method PM-G ANSI C63.10-2013 – Section 14.2 Measure-and-Sum Technique KDB 662911 v02r01 – Section E)1) Measure-and-Sum Technique

## **Test Settings**

Average power measurements were performed only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor. The power meter implemented triggering and gating capabilities which were set up such that power measurements were recorded only during the ON time of the transmitter. The trace was averaged over 100 traces to obtain the final measured average power.

## Test Setup

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



Figure 7-3. Test Instrument & Measurement Setup

## Test Notes

None

FCC ID: A3LSMG998B	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	MSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 01 of 200
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset		Page 91 of 209
© 2020 PCTEST		•		V 9.0 02/01/2019



	Freq [MHz]	Channel	Detector	Conducted Power [dBm]			Conducted Power Limit	Conducted Power
2				ANT1	ANT2	MIMO	[dBm]	Margin [dB]
È	5180	36	AVG	17.61	18.06	20.85	23.98	-3.13
i,	5200	40	AVG	17.66	17.92	20.80	23.98	-3.18
	5220	44	AVG	17.70	17.85	20.79	23.98	-3.19
Bandwidth	5240	48	AVG	17.82	17.81	20.83	23.98	-3.15
m	5260	52	AVG	17.49	17.85	20.68	23.98	-3.30
N	5280	56	AVG	17.51	17.76	20.65	23.98	-3.33
_ <b>T</b>	5300	60	AVG	17.69	17.78	20.75	23.98	-3.23
(20M	5320	64	AVG	15.83	15.76	18.81	23.98	-5.17
50	5500	100	AVG	17.16	17.62	20.41	23.98	-3.57
	5580	120	AVG	17.36	17.42	20.40	23.98	-3.58
Hz	5660	124	AVG	17.51	17.35	20.44	23.98	-3.54
Ċ	5720	144	AVG	17.35	17.43	20.40	23.98	-3.58
Ś	5745	149	AVG	16.62	16.84	19.74	30.00	-10.26
	5785	157	AVG	16.71	16.93	19.83	30.00	-10.17
	5825	165	AVG	16.56	16.87	19.73	30.00	-10.27

Table 7-4. MIMO 20MHz BW 802.11a (UNII) Maximum Conducted Output Power

	Freq [MHz]	Channel	Detector	Detector Conducted Power [dBm]		Conducted Power Limit	Conducted Power	
~				ANT1	ANT2	MIMO	[dBm]	Margin [dB]
È	5180	36	AVG	15.56	14.62	18.13	23.98	-5.85
÷	5200	40	AVG	17.98	17.52	20.77	23.98	-3.21
S S	5220	44	AVG	17.97	17.48	20.74	23.98	-3.24
Bandwidth)	5240	48	AVG	17.94	17.45	20.71	23.98	-3.27
a Ma	5260	52	AVG	17.88	17.48	20.69	23.98	-3.29
N	5280	56	AVG	17.96	17.39	20.69	23.98	-3.29
	5300	60	AVG	17.98	17.44	20.73	23.98	-3.25
(20M	5320	64	AVG	14.94	14.72	17.84	23.98	-6.14
20	5500	100	AVG	17.49	17.44	20.48	23.98	-3.50
N (	5580	120	AVG	17.57	17.30	20.45	23.98	-3.53
Ï	5660	124	AVG	17.86	17.52	20.70	23.98	-3.28
<b>5G</b>	5720	144	AVG	17.64	17.41	20.54	23.98	-3.44
S	5745	149	AVG	16.68	16.91	19.81	30.00	-10.19
	5785	157	AVG	16.74	16.95	19.86	30.00	-10.14
	5825	165	AVG	16.54	16.87	19.72	30.00	-10.28

Table 7-5. MIMO 20MHz BW 802.11n (UNII) Maximum Conducted Output Power

FCC ID: A3LSMG998B	PCTEST <sup>®</sup> Proud to be part of <sup>®</sup> element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager	
Test Report S/N: Test Dates:		EUT Type:		Dage 02 of 200	
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset		Page 92 of 209	
© 2020 PCTEST	•	·		V 9.0 02/01/2019	



	Freq [MHz]	Channel	Detector	Conducted Power [dBm]			Conducted Power Limit	Conducted Power
~				ANT1	ANT2	MIMO	[dBm]	Margin [dB]
È	5180	36	AVG	15.53	14.64	18.12	23.98	-5.86
÷	5200	40	AVG	17.93	17.59	20.77	23.98	-3.21
$\frac{5}{2}$	5220	44	AVG	17.98	17.53	20.77	23.98	-3.21
andwidth)	5240	48	AVG	17.94	17.44	20.71	23.98	-3.27
Ba	5260	52	AVG	17.88	17.49	20.70	23.98	-3.28
N	5280	56	AVG	17.86	17.44	20.67	23.98	-3.31
	5300	60	AVG	17.99	17.45	20.74	23.98	-3.24
(20MI	5320	64	AVG	14.93	14.77	17.86	23.98	-6.12
50	5500	100	AVG	17.35	17.47	20.42	23.98	-3.56
) x	5580	120	AVG	17.61	17.16	20.40	23.98	-3.58
Ï	5660	124	AVG	17.79	17.28	20.55	23.98	-3.43
<b>5</b> G	5720	144	AVG	17.63	17.41	20.53	23.98	-3.45
L C	5745	149	AVG	16.63	16.94	19.80	30.00	-10.20
	5785	157	AVG	16.65	16.93	19.80	30.00	-10.20
	5825	165	AVG	16.54	16.92	19.74	30.00	-10.26

Table 7-6. MIMO 20MHz BW 802.11ac (UNII) Maximum Conducted Output Power

	Freq [MHz]	Channel	Detector	Conc	lucted Power [	dBm]	Conducted Power Limit	Conducted Power
~				ANT1	ANT2	MIMO	[dBm]	Margin [dB]
È	5180	36	AVG	17.73	17.10	20.44	23.98	-3.54
i i i	5200	40	AVG	17.11	17.64	20.39	23.98	-3.59
	5220	44	AVG	17.18	17.68	20.45	23.98	-3.53
Bandwidth)	5240	48	AVG	17.95	17.65	20.81	23.98	-3.17
a M	5260	52	AVG	17.97	17.71	20.85	23.98	-3.13
	5280	56	AVG	17.90	17.60	20.76	23.98	-3.22
Hz	5300	60	AVG	17.99	17.56	20.79	23.98	-3.19
(20MI	5320	64	AVG	15.14	15.01	18.09	23.98	-5.89
20	5500	100	AVG	17.46	17.62	20.55	23.98	-3.43
	5580	120	AVG	17.58	17.54	20.57	23.98	-3.41
HZ	5660	124	AVG	17.78	17.69	20.75	23.98	-3.23
Ċ	5720	144	AVG	17.61	17.63	20.63	23.98	-3.35
Ω.	5745	149	AVG	16.79	17.06	19.94	30.00	-10.06
	5785	157	AVG	16.82	17.11	19.98	30.00	-10.02
	5825	165	AVG	16.67	17.09	19.90	30.00	-10.10

Table 7-7. MIMO 20MHz BW 802.11ax (UNII) Maximum Conducted Output Power

FCC ID: A3LSMG998B		MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Page 93 of 209	
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset		
© 2020 PCTEST			V 9.0 02/01/2019	



	Freq [MHz]	Channel	Detector	Conducted Power [dBm]			Conducted Power Limit	Conducted Power
				ANT1	ANT2	MIMO	[dBm]	Margin [dB]
N C	5190	38	AVG	14.31	13.58	16.97	23.98	-7.01
: (40MH: dwidth)	5230	46	AVG	16.62	16.10	19.38	23.98	-4.60
	5270	54	AVG	16.31	16.94	19.65	23.98	-4.33
	5310	62	AVG	12.63	12.59	15.62	23.98	-8.36
	5510	102	AVG	13.63	13.11	16.39	23.98	-7.59
5GH Ba	5550	110	AVG	16.33	16.82	19.59	23.98	-4.39
	5670	134	AVG	16.61	16.87	19.75	23.98	-4.23
	5710	142	AVG	16.42	16.75	19.60	23.98	-4.38
	5755	151	AVG	15.92	15.63	18.78	30.00	-11.22
	5795	159	AVG	15.94	15.62	18.79	30.00	-11.21

## Table 7-8. MIMO 40MHz BW 802.11n (UNII) Maximum Conducted Output Power

	Freq [MHz] Channe	Channel	Channel Detector		Conducted Power [dBm]			Conducted Power
			Ī	ANT1	ANT2	MIMO	[dBm]	Margin [dB]
P C	5190	38	AVG	14.33	13.56	16.97	23.98	-7.01
0MH; idth)	5230	46	AVG	16.62	16.12	19.39	23.98	-4.59
(40M width	5270	54	AVG	16.34	16.96	19.67	23.98	-4.31
<u>4</u> ¥	5310	62	AVG	12.71	12.64	15.69	23.98	-8.29
hd hd	5510	102	AVG	13.59	13.26	16.44	23.98	-7.54
Ba Ba	5550	110	AVG	16.35	16.93	19.66	23.98	-4.32
50	5670	134	AVG	16.63	16.89	19.77	23.98	-4.21
	5710	142	AVG	16.30	16.78	19.56	23.98	-4.42
	5755	151	AVG	15.82	15.52	18.68	30.00	-11.32
	5795	159	AVG	15.91	15.47	18.71	30.00	-11.29

Table 7-9. MIMO 40MHz BW 802.11ac (UNII) Maximum Conducted Output Power

FCC ID: A3LSMG998B	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N: Test Dates:		EUT Type:		Daga 04 of 200
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset		Page 94 of 209
© 2020 PCTEST	•	·		V 9.0 02/01/2019



	Freq [MHz] Channel	Detector	Conc	Conducted Power [dBm]			Conducted Power	
				ANT1	ANT2	MIMO	[dBm]	Margin [dB]
₽ つ	5190	38	AVG	13.67	12.71	16.23	23.98	-7.75
0MH; idth)	5230	46	AVG	16.94	16.82	19.89	23.98	-4.09
(40M widt	5270	54	AVG	16.75	16.59	19.68	23.98	-4.30
4) dv	5310	62	AVG	13.99	13.94	16.98	23.98	-7.00
	5510	102	AVG	13.91	13.45	16.70	23.98	-7.28
Ва Ва	5550	110	AVG	16.51	16.47	19.50	23.98	-4.48
50 E	5670	134	AVG	16.84	16.62	19.74	23.98	-4.24
	5710	142	AVG	16.63	16.68	19.67	23.98	-4.31
	5755	151	AVG	16.14	15.79	18.98	30.00	-11.02
	5795	159	AVG	16.17	15.73	18.97	30.00	-11.03

Table 7-10. MIMO 40MHz BW 802.11ax (UNII) Maximum Conducted Output Power

N	Freq [MHz] Channel		Detector	Conducted Power [dBm]			Conducted Power Limit	Conducted Power
£ ₩				ANT1	ANT2	MIMO	[dBm]	Margin [dB]
(80MHz width)	5210	42	AVG	13.27	12.73	16.02	23.98	-7.96
	5290	58	AVG	13.04	12.35	15.72	23.98	-8.26
5GHz (80MH Bandwidth)	5530	106	AVG	13.71	13.15	16.45	23.98	-7.53
Ū.	5690	138	AVG	15.15	15.80	18.50	23.98	-5.48
	5775	155	AVG	15.35	15.79	18.59	30.00	-11.41
	Table 7-11.	MIMO 80MI	Hz BW 802.1	1ac (UNII) M	laximum Co	nducted Ou	Itput Power	
N	Freq [MHz]	Channel	Detector	Conducted Power [dBm]			Conducted Power Limit	Conducted Power
€ H				ANT1	ANT2	MIMO	[dBm]	Margin [dB]
GHz (80MHz Bandwidth)	5210	42	AVG	13.58	12.96	16.29	23.98	-7.69
5GHz ( Bandv	5290	58	AVG	13.22	12.63	15.95	23.98	-8.03
ਰ ਦ	5520	106	AVG	13.01	12.42	15.74	23.98	-8.24
m O	5530	100	AVO	10.01	12.42	10.14	20.00	0.24

15.82 Table 7-12. MIMO 80MHz BW 802.11ax (UNII) Maximum Conducted Output Power

15.66

15.47

15.71

23.98

30.00

-5.40

-11.22

18.58

18.78

AVG

AVG

5690

5775

138

155

FCC ID: A3LSMG998B	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 95 of 209
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset	Page 95 01 209
© 2020 PCTEST	•		V 9.0 02/01/2019



Hz AHz idth)	Freq [MHz]	Channel	Detector	Conducted Power [dBm]		Conducted Power Limit	Conducted Power	
· · · · · · · · · · · · · · · · · · ·				ANT1	ANT2	MIMO	[dBm]	Margin [dB]
5( (16 anc	5250	50	AVG	12.55	12.03	15.31	23.98	-8.67
ä	5570	114	AVG	14.51	14.25	17.39	30.00	-12.61

Table 7-13. MIMO 160MHz BW 802.11ac (UNII) Maximum Conducted Output Power

Hz NHz idth)	Freq [MHz]	Channel	Detector	Conducted Power [dBm]		Conducted Power Limit	Conducted Power	
· · · · · · · · · · · · · · · · · · ·				ANT1	ANT2	MIMO	[dBm]	Margin [dB]
5 (16 anc	5250	50	AVG	14.73	14.07	17.42	23.98	-6.56
ä	5570	114	AVG	11.81	11.25	14.55	30.00	-15.45

Table 7-14. MIMO 160MHz BW 802.11ax (UNII) Maximum Conducted Output Power

FCC ID: A3LSMG998B	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 06 of 200
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset	Page 96 of 209
© 2020 PCTEST			V 9.0 02/01/2019



## Note:

Per ANSI C63.10-2013 and KDB 662911 v02r01 Section E)1), the conducted powers at Antenna 1 and Antenna 2 were first measured separately during MIMO transmission as shown in the section above. The measured values were then summed in linear power units then converted back to dBm.

## Sample MIMO Calculation:

At 5180MHz in 802.11n (20MHz BW) mode, the average conducted output power was measured to be 15.56 dBm for Antenna-1 and 14.62 dBm for Antenna-2.

Antenna 1 + Antenna 2 = MIMO

(15.56 dBm + 14.62 dBm) = (35.97 mW + 28.97 mW) = 64.95 mW = 18.13 dBm

FCC ID: A3LSMG998B	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dogo 07 of 200
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset		Page 97 of 209
© 2020 PCTEST	•	•		V 9.0 02/01/2019



## 7.5 Maximum Power Spectral Density – 802.11a/n/ac/ax §15.407(a.1.iv) §15.407(a.2) §15.407(a.3); RSS-247 [6.2]

## **Test Overview and Limit**

The spectrum analyzer was connected to the antenna terminal while the EUT was operating at its maximum duty cycle, at its maximum power control level, as defined in ANSI C63.10-2013 and KDB 789033 D02 v02r01, and at the appropriate frequencies. Method SA-1, as defined in ANSI C63.10-2013 and KDB 789033 D02 v02r01, was used to measure the power spectral density.

# In the 5.15 – 5.25GHz, 5.25 – 5.35GHz, 5.47 – 5.725GHz bands, the maximum permissible power spectral density is 11dBm/MHz.

In the 5.725 – 5.850GHz band, the maximum permissible power spectral density is 30dBm/500kHz.

## Test Procedure Used

ANSI C63.10-2013 – Section 12.3.2.2 KDB 789033 D02 v02r01 – Section F ANSI C63.10-2013 – Section 14.3.2.2 Measure-and-Sum Technique KDB 662911 v02r01 – Section E)2) Measure-and-Sum Technique

## Test Settings

- 1. Analyzer was set to the center frequency of the UNII channel under investigation
- 2. Span was set to encompass the entire emission bandwidth of the signal
- 3. RBW = 1MHz
- 4. VBW = 3MHz
- 5. Number of sweep points  $\geq 2 \times (\text{span/RBW})$
- 6. Sweep time = auto
- 7. Detector = power averaging (RMS)
- 8. Trigger was set to free run for all modes
- 9. Trace was averaged over 100 sweeps
- 10. The peak search function of the spectrum analyzer was used to find the peak of the spectrum.

## Test Setup

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





## Test Notes

#### None

FCC ID: A3LSMG998B	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Daga 08 of 200
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset	Page 98 of 209
© 2020 PCTEST	•		V 9.0 02/01/2019



## Summed MIMO Power Spectral Density Measurements

5180     □       5200     □       5240     □       5240     □       5200     □       5240     □       5240     □       5240     □       5240     □       5240     □       5240     □       5240     □       5240     □       5240     □       5240     □       5240     □       5240     □       5240     □       5210     □       5210     □       5210     □       5220     □       5280     □       5280     □       5280     □       5280     □       5280     □       5280     □       5280     □       5280     □       5290     □       5290     □       5500     □       5500     □	ncy Channel :] No.	802.11 Mode	Data Rate [Mbps]	Antenna-1 Power Density [dBm]	Antenna-2 Power Density [dBm]	Summed MIMO Power Density [dBm]	Max Power Density [dBm/MHz]	Margin [dB]
5240        5180        5200        5240        5240        5240        5240        5240        5240        5240        5240        5240        5240        5240        5230        5210        5210        5210        5210        5210        5210        5210        5220        5280        5280        5280        5280        5280        5280        5280        5280        5280        5280        5280        5290	) 36	а	6	5.50	5.48	8.50	11.0	-2.50
5180     0       5200     0       5240     0       5240     0       5200     0       5200     0       5200     0       5200     0       5200     0       5200     0       5200     0       5230     0       5210     0       5210     0       5210     0       5210     0       5210     0       5210     0       5210     0       5220     0       5280     0       5280     0       5280     0       5280     0       5280     0       5280     0       5280     0       5280     0       5290     0       5290     0       5500     0       5500     0       5500     0       5500     0	) 40	а	6	4.99	5.15	8.08	11.0	-2.92
5200     5       5240     5       5240     5       5200     5       5200     5       5190     5       5230     5       5210     5       5210     5       5210     5       5210     5       5210     5       5250     5       5260     5       5280     5       5280     5       5280     5       5280     5       5280     5       5280     5       5280     5       5280     5       5280     5       5280     5       5280     5       5280     5       5290     5       5290     5       5500     5       5500     5       5500     5       5500     5       5500     5       5500     5	) 48	а	6	4.31	5.30	7.84	11.0	-3.16
5240       5180       5200       5200       5200       5240       5190       5230       5190       5230       5210       5210       5210       5210       5210       5210       5210       5250       5260       5280       5280       5280       5280       5280       5280       5280       5280       5280       5280       5280       5280       5280       5280       5280       5280       5280       5290       5310       5290       5500       5500       5500       5500       5500       5500       5500       5500       5500       5500       5500	) 36	n (20MHz)	6.5/7.2 (MCS0)	5.19	6.16	8.71	11.0	-2.29
5240       5180       5200       5200       5200       5240       5190       5230       5190       5230       5210       5210       5210       5210       5210       5210       5210       5250       5260       5280       5280       5280       5280       5280       5280       5280       5280       5280       5280       5280       5280       5280       5280       5280       5280       5280       5290       5310       5290       5500       5500       5500       5500       5500       5500       5500       5500       5500       5500       5500	) 40	n (20MHz)	6.5/7.2 (MCS0)	4.81	6.05	8.48	11.0	-2.52
5200     5       5240     5       5190     5       5190     5       5230     1       5230     1       5230     1       5230     1       5210     5       5210     1       5210     1       5210     1       5210     1       5210     1       5210     1       5200     1       5210     1       5200     1       5200     1       5280     1       5280     1       5280     1       5280     1       5280     1       5280     1       5290     1       5290     1       5290     1       5500     1       5500     1       5500     1       5500     1       5500     1       5500     1		n (20MHz)	6.5/7.2 (MCS0)	4.93	5.73	8.36	11.0	-2.64
5200     5       5240     5       5190     5       5190     5       5230     1       5230     1       5230     1       5230     1       5210     5       5210     1       5210     1       5210     1       5210     1       5210     1       5210     1       5200     1       5210     1       5200     1       5200     1       5280     1       5280     1       5280     1       5280     1       5280     1       5280     1       5290     1       5290     1       5290     1       5500     1       5500     1       5500     1       5500     1       5500     1       5500     1	) 36	ax (20MHz)	6.5/7.2 (MCS0)	4.96	5.17	8.08	11.0	-2.92
5190       5190       5230       5190       5230       5230       5210       5210       5210       5250       5250       5250       5250       5250       5250       5250       5250       5250       5250       5250       5250       5250       5250       5250       5260       5280       5280       5280       5280       5280       5280       5280       5280       5280       5280       5280       5290       5290       5500       5500       5500       5500       5500       5500       5500       5500       5510       5510       5510       5510		ax (20MHz)	6.5/7.2 (MCS0)	4.77	5.03	7.91	11.0	-3.09
5190       5230       5190       5230       5210       5210       5210       5210       5210       5210       5250       5250       5280       5290       5500       5500       5500       5500       5500       5500       5500       5500       5500       5500       5500       5500       5500       5500		ax (20MHz)	6.5/7.2 (MCS0)	6.21	4.78	8.56	11.0	-2.44
5230        5190        5210        5210        5210        5210        5250        5250        5280        5280        5280        5280        5280        5280        5280        5280        5280        5280        5280        5280        5280        5280        5280        5280        5280        5290        5290        5500        5500        5500        5500        5500        5500        5500        5510		n (40MHz)	13.5/15 (MCS0)	1.44	1.90	4.68	11.0	-6.32
5190       5230       5210       5210       5210       5210       5250       5250       5260       5280       5290       5500       5500       5500       5500       5500       5500       5500       5500       5500       5510       5590       5510       5590       5510       5590       5510		n (40MHz)	13.5/15 (MCS0)	1.65	1.48	4.58	11.0	-6.42
5230       5210       5210       5210       5210       5250       5250       5260       5280       5290       5500       5500       5500       5500       5500       5500       5500       5500       5500       5510       5590       5710       5590       5710       5590       5710		ax (40MHz)	13.5/15 (MCS0)	1.50	1.69	4.60	11.0	-6.40
S210       S210       S210       S210       S210       S210       S220       S290       S290       S5200       S500       S510		ax (40MHz)	13.5/15 (MCS0)	1.41	1.53	4.48	11.0	-6.52
S210       S210       S250       S250       S250       S260       S280       S290       S290       S590       S5800		ac (80MHz)	29.3/32.5 (MCS0)	-2.49	-2.61	0.46	11.0	-10.54
S250       S250       S250       S250       S260       S280       S290       S290       S590       S5800       S6000       S720       S5500       S5500 <td< td=""><td></td><td>ax (80MHz)</td><td>29.3/32.5 (MCS0)</td><td>-2.78</td><td>-2.25</td><td>0.51</td><td>11.0</td><td>-10.49</td></td<>		ax (80MHz)	29.3/32.5 (MCS0)	-2.78	-2.25	0.51	11.0	-10.49
5260       5280       5280       5320       5260       5280       5280       5280       5280       5280       5280       5280       5280       5280       5280       5280       5280       5280       5280       5280       5270       5310       5270       5310       5290       5290       5290       5290       5500       5600       5720       5500       5500       5500       5500       5500       5500       5500       5500       5500       5500       5510       5590       5710       5590       5710       5590       5710       5590       5710		ac (160MHz)	58.5/65 (MCS0)	-6.76	-7.93	-4.30	11.0	-15.30
5260       5280       5280       5320       5260       5280       5280       5280       5280       5280       5280       5280       5280       5280       5280       5280       5280       5280       5280       5280       5270       5310       5290       5290       5290       5290       5500       5600       5720       5500       5500       5500       5500       5500       5500       5500       5500       5500       5500       5500       5500       5510       5590       5710       5590       5710       5590       5710       5590       5710		ax (160MHz)	58.5/65 (MCS0)	-5.34	-5.41	-2.36	11.0	-13.36
5280     5320       5320     5320       5280     5320       5280     5320       5280     5320       5280     5320       5280     5320       5280     5320       5280     5320       5280     5320       5310     5270       5310     5290       5290     5590       5500     5500       5500     5500       5500     5500       5500     5500       5500     5500       5500     5500       5500     5500       5500     5500       5500     5500       5510     5500       5510     5510       5510     5510       5510     5590       5710     5590       5710     5590       5710     5530       5610     5690       5610     5630       5630     5610		a (100ivii 12)	6	5.22	4.99	8.12	11.0	-2.88
5320       5260       5280       5320       5280       5320       5280       5280       5280       5280       5280       5280       5280       5280       5280       5280       5280       5270       5310       5290       5290       5290       5500       5600       5720       5500       5600       5720       5500       5500       5500       5500       5500       5500       5510       5550       5510       5590       5710       5590       5710       5590       5710       5590       5710       5590       5710       5590       5710       5590		a	6	5.01	4.81	7.92	11.0	-3.08
5260       5280       5280       5320       5280       5280       5280       5280       5280       5280       5280       5280       5280       5280       5270       5310       5270       5310       5290       5290       5290       5500       5600       5720       5500       5600       5720       5500       5600       5720       5500       5500       5510       5550       5710       5510       5590       5710       5590       5710       5590       5710       5530       5610       5690       5530       5610		a	6	4.13	4.90	7.54	11.0	-3.46
5280     5320       5320     5320       5280     5320       5280     5320       5280     5320       5310     5270       5310     5270       5310     5290       5290     5290       5500     5600       5600     5500       5600     5500       5600     5500       5500     5500       5500     5510       5550     5510       5550     5510       5550     5510       5550     5510       5550     5510       5550     5510       5550     5510       5550     5510       5550     5510       5550     5510       5550     5510       5550     5510       5550     5510       5530     5610       5630     5610       5630     5610		n (20MHz)	6.5/7.2 (MCS0)	4.79	5.85	8.36	11.0	-2.64
5320       5320       5260       5280       5320       5320       5320       5320       5320       5320       5320       5320       5320       5270       5310       5290       5290       5290       5500       5600       5720       5500       5600       5720       5500       5600       5720       5500       5500       5510       5550       5710       5550       5710       5550       5710       5530       5610       5630       5610       5630       5610		n (20MHz)	6.5/7.2 (MCS0)	4.79	5.81	8.31	11.0	-2.69
S260       5280       5280       5320       5320       5320       5320       5310       5270       5310       5270       5310       5270       5310       5290       5290       5290       5500       5600       5720       5500       5600       5720       5500       5600       5720       5500       5510       55500       5710       5550       5710       5550       5710       5550       5710       5530       5610       5630       5610       5630       5610		, ,	. ,				11.0	
5270       5270       5310       5270       5310       5270       5310       5270       5310       5270       5310       5290       5500       5600       5720       5500       5600       5720       5500       5600       5720       5500       5600       5720       5510       5590       5710       5590       5710       5590       5710       5530       5610       5690       5710       5530       5610       5690       5530       5610		n (20MHz)	6.5/7.2 (MCS0)	4.90	5.55	8.25		-2.75
5270       5270       5310       5270       5310       5270       5310       5270       5310       5270       5310       5290       5290       5500       5600       5720       5500       5600       5720       5500       5600       5720       5500       5600       5720       5510       5590       5710       5590       5710       5530       5610       5690       5710       5530       5610       5690       5530       5610		ax (20MHz)	6.5/7.2 (MCS0)	6.22	4.47	8.44	11.0	-2.56
5270       5270       5310       5270       5310       5270       5310       5270       5310       5270       5310       5290       5500       5600       5720       5500       5600       5720       5500       5600       5720       5500       5600       5720       5510       5590       5710       5590       5710       5590       5710       5530       5610       5690       5710       5530       5610       5690       5530       5610		ax (20MHz)	6.5/7.2 (MCS0)	5.84	4.53	8.24	11.0	-2.76
5310       5270       5310       5290       5290       5500       5600       5720       5500       5600       5720       5500       5600       5720       5500       5600       5720       5500       5500       5500       5510       5530       5610       5610		ax (20MHz)	6.5/7.2 (MCS0)	5.93	4.34	8.22	11.0	-2.78
5270       5310       5290       5290       5500       5600       5720       5500       5600       5720       5500       5600       5720       5500       5600       5720       5500       5500       5500       5510       5530       5610       5610		n (40MHz)	13.5/15 (MCS0)	1.46	2.13	4.82	11.0	-6.18
5310       5290       5290       5500       5500       5600       5720       5500       5500       5500       5500       5500       5500       5500       5500       5500       5500       5500       5510       5530       5610       5530       5610		n (40MHz)	13.5/15 (MCS0)	1.50	2.09	4.82	11.0	-6.18
5290       5290       5500       5600       5720       5500       5500       5500       5500       5500       5500       5500       5500       5500       5500       5500       5510       5530       5610       5530       5610		ax (40MHz)	13.5/15 (MCS0)	1.28	1.64	4.47	11.0	-6.53
5290       5500       5600       5720       5500       5500       5500       5500       5500       5500       5500       5500       5500       5500       5500       5510       5530       5610       5610		ax (40MHz)	13.5/15 (MCS0)	1.57	0.85	4.23	11.0	-6.77
5500       5600       5720       5500       5500       5500       5600       5720       5500       5600       5720       5500       5600       5720       5500       5600       5720       5510       5590       5710       5590       5710       5590       5710       5530       5610       5690       5610       5690       5530       5610		ac (80MHz)	29.3/32.5 (MCS0)	-2.83	-3.01	0.09	11.0	-10.91
5600       5720       5500       5600       5720       5500       5600       5720       5500       5600       5720       5500       5600       5720       5510       5510       5510       5510       5510       5510       5510       5510       5510       5510       5510       5510       5510       5510       5510       5510       5510       5510       5510       5530       5610       5610		ax (80MHz)	29.3/32.5 (MCS0)	-2.68	-3.01	0.17	11.0	-10.83
5720       5500       5600       5720       5500       5600       5720       5500       5600       5720       5510       5510       5510       5510       5590       5710       5590       5710       5530       5610       5690       5610       5630       5630       5630       5610		а	6	4.55	5.00	7.79	11.0	-3.21
5500       5600       5720       5500       5600       5720       5500       5600       5720       5510       5590       5710       5590       5710       5590       5710       5590       5710       5590       5710       5530       5610       5690       5530       5610       5610	) 120	а	6	5.04	4.79	7.93	11.0	-3.07
5600       5720       5500       5600       5720       5510       5510       5590       5710       5510       5710       5510       5710       5510       5510       5510       5510       5510       5510       5510       5510       5510       5510       5530       5610       5530       5530       5610		а	6	5.06	4.82	7.95	11.0	-3.05
5720       5500       5600       5720       5510       5510       5510       5590       5710       5510       5510       5590       5710       5590       5710       5590       5710       5590       5710       5530       5610       5630       5630       5610	) 100	n (20MHz)	6.5/7.2 (MCS0)	4.30	5.83	8.14	11.0	-2.86
5500       5600       5720       5510       5590       5710       5510       5710       5590       5710       5590       5710       5590       5710       5590       5710       5530       5610       5690       5530       5610       5610	) 120	n (20MHz)	6.5/7.2 (MCS0)	4.60	5.77	8.23	11.0	-2.77
5600       5720       5510       5590       5710       5590       5710       5590       5710       5590       5710       5590       5710       5590       5710       5590       5710       5590       5710       5530       5610       5530       5610	) 144	n (20MHz)	6.5/7.2 (MCS0)	4.66	5.73	8.24	11.0	-2.76
5720       5510       5590       5710       5590       5710       5510       5510       5510       5510       5510       5510       5510       5510       5510       5510       5510       5590       5510       5590       5510       5530       5610       5610	0 100	ax (20MHz)	6.5/7.2 (MCS0)	5.40	4.67	8.06	11.0	-2.94
5510       5590       5710       5510       5510       5510       5510       5510       5510       5510       5510       5510       5510       5510       5510       5510       5590       5710       5530       5610       5530       5610       5610	) 120	ax (20MHz)	6.5/7.2 (MCS0)	5.80	4.58	8.24	11.0	-2.76
\$5590       \$5710       \$5710       \$5510       \$5590       \$5710       \$5590       \$5710       \$5590       \$5710       \$5590       \$5710       \$5590       \$5710       \$5590       \$5710       \$5530       \$5610       \$5530       \$5610	) 144	ax (20MHz)	6.5/7.2 (MCS0)	5.83	4.43	8.20	11.0	-2.80
5710       5510       5590       5710       5590       5710       5530       5610       5690       5610       5690       5610       5690       5610       5630       5610       5610	) 102	n (40MHz)	13.5/15 (MCS0)	1.09	2.30	4.75	11.0	-6.25
5710       5510       5590       5710       5590       5710       5530       5610       5690       5610       5690       5610       5690       5610       5630       5610       5610	) 118	n (40MHz)	13.5/15 (MCS0)	1.49	1.97	4.75	11.0	-6.25
5590       5710       5530       5610       5690       5530       5610       5630       5610	) 142	n (40MHz)	13.5/15 (MCS0)	1.52	2.32	4.95	11.0	-6.05
5710 5530 5610 5690 5530 5610	) 102	ax (40MHz)	13.5/15 (MCS0)	1.15	0.88	4.03	11.0	-6.97
5530 5610 5690 5530 5610	) 118	ax (40MHz)	13.5/15 (MCS0)	1.47	1.25	4.37	11.0	-6.63
5530 5610 5690 5530 5610	) 142	ax (40MHz)	13.5/15 (MCS0)	1.19	1.01	4.11	11.0	-6.89
5610 5690 5530 5610		ac (80MHz)	29.3/32.5 (MCS0)	-2.50	-2.36	0.58	11.0	-10.42
5690 5530 5610		ac (80MHz)	29.3/32.5 (MCS0)	-1.84	-2.16	1.01	11.0	-9.99
5530 5610		ac (80MHz)	29.3/32.5 (MCS0)	-5.52	-4.89	-2.19	11.0	-13.19
5610		ax (80MHz)	29.3/32.5 (MCS0)	-3.47	-2.19	0.23	11.0	-10.77
		ax (80MHz)	29.3/32.5 (MCS0)	-2.84	-2.15	0.53	11.0	-10.47
		ax (80MHz)	29.3/32.5 (MCS0)	-5.62	-4.84	-2.20	11.0	-13.20
5570		ac (160MHz)	58.5/65 (MCS0)	-5.90	-6.77	-3.30	11.0	-14.30
5570		ac (160MHz) ax (160MHz)	58.5/65 (MCS0)	-5.90	-9.40	-6.05	11.0	-14.30

Table 7-15. Bands 1, 2A, 2C Conducted Power Spectral Density Measurements MIMO

FCC ID: A3LSMG998B	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 00 of 200
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset	Page 99 of 209
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	Frequency [MHz]	Channel No.	802.11 Mode	Data Rate [Mbps]	Antenn-1 Power Density [dBm]	Antenn-2 Power Density [dBm]	Summed MIMO Power Density [dBm]	Max Permissible Power Density [dBm/500kHz]	Margin [dB]
	5745	149	а	6	2.19	1.88	5.05	30.0	-24.95
	5785	157	а	6	2.15	2.09	5.13	30.0	-24.87
	5825	165	а	6	2.22	2.22	5.23	30.0	-24.77
	5745	149	n (20MHz)	6.5/7.2 (MCS0)	1.95	2.82	5.42	30.0	-24.58
	5785	157	n (20MHz)	6.5/7.2 (MCS0)	1.76	3.08	5.48	30.0	-24.52
	5825	165	n (20MHz)	6.5/7.2 (MCS0)	1.72	3.12	5.49	30.0	-24.51
3	5745	149	ax (20MHz)	6.5/7.2 (MCS0)	2.86	1.61	5.29	30.0	-24.71
Band	5785	157	ax (20MHz)	6.5/7.2 (MCS0)	2.94	1.89	5.46	30.0	-24.54
ä	5825	165	ax (20MHz)	6.5/7.2 (MCS0)	3.08	1.93	5.55	30.0	-24.45
	5755	151	n (40MHz)	13.5/15 (MCS0)	-1.25	1.61	3.42	30.0	-26.58
	5795	159	n (40MHz)	13.5/15 (MCS0)	-1.23	-1.63	1.58	30.0	-28.42
	5755	151	ax (40MHz)	13.5/15 (MCS0)	-1.01	-1.31	1.86	30.0	-28.14
	5795	159	ax (40MHz)	13.5/15 (MCS0)	-1.24	-1.36	1.71	30.0	-28.29
	5775	155	ac (80MHz)	29.3/32.5 (MCS0)	-3.15	-1.31	0.88	30.0	-29.12
	5775	155	ax (80MHz)	29.3/32.5 (MCS0)	-2.68	-2.09	0.64	30.0	-29.36

Table 7-16. Band 3 MIMO Conducted Power Spectral Density Measurements

FCC ID: A3LSMG998B	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:		Dage 100 of 200	
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset		Page 100 of 209	
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## MIMO Antenna-1 Power Spectral Density Measurements





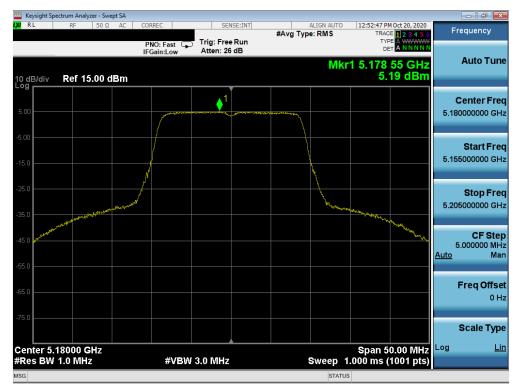
Plot 7-142. Power Spectral Density Plot MIMO ANT1 (802.11a (UNII Band 1) - Ch. 40)

FCC ID: A3LSMG998B	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 101 of 200
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset		Page 101 of 209
© 2020 PCTEST				V 9 0 02/01/2019





Plot 7-143. Power Spectral Density Plot MIMO ANT1 (802.11a (UNII Band 1) - Ch. 48)



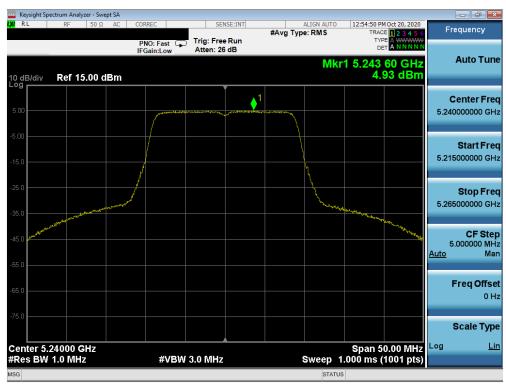
Plot 7-144. Power Spectral Density Plot MIMO ANT1 (20MHz BW 802.11n (UNII Band 1) - Ch. 36)

FCC ID: A3LSMG998B	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Baga 102 of 200
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset	Page 102 of 209
© 2020 PCTEST		·	V 9.0 02/01/2019





Plot 7-145. Power Spectral Density Plot MIMO ANT1 (20MHz BW 802.11n (UNII Band 1) - Ch. 40)



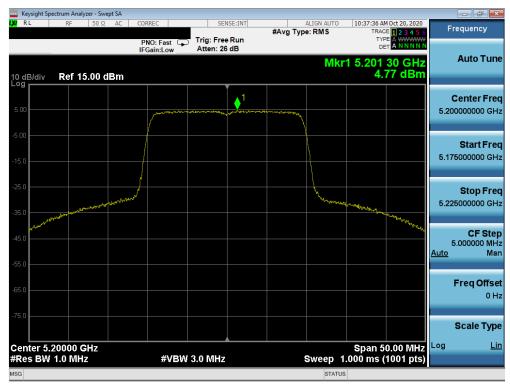
Plot 7-146. Power Spectral Density Plot MIMO ANT1 (20MHz BW 802.11n (UNII Band 1) - Ch. 48)

FCC ID: A3LSMG998B	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Baga 102 of 200
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset	Page 103 of 209
© 2020 PCTEST		·	V 9.0 02/01/2019



	trum Analyzer - Swept S	5A								
LXI RL	RF 50 Ω /	AC CORREC		NSE:INT	#Avg Type	ERMS	TRAC	1 Oct 20, 2020 E 1 2 3 4 5 6	Freque	ncy
10 dB/div	Ref 15.00 dB	PNO: Fa IFGain:Lo M	st 🖵 Trig: Fre ow Atten: 20			Mkr	□ 1 5.175	70 GHz 96 dBm	Auto	o Tune
5.00				and the second second					Cente 5.1800000	e <b>r Freq</b> 000 GHz
-5.00									<b>Sta</b> 5.1550000	r <b>t Freq</b> 100 GHz
-25.0		war fut ad				he way may be	Welson	Price Contraction	<b>Sto</b> 5.2050000	<b>p Freq</b> 100 GHz
-45.0								**************************************		F Step 00 MHz Man
-65.0									Freq	Offset 0 Hz
-75.0										e Type
Center 5.18 #Res BW 1		#	VBW 3.0 MHz		s	Sween 1	5 Span .000 ms (	VIVV 111112	Log	Lin
MSG		"				STATUS		noo r proj		_

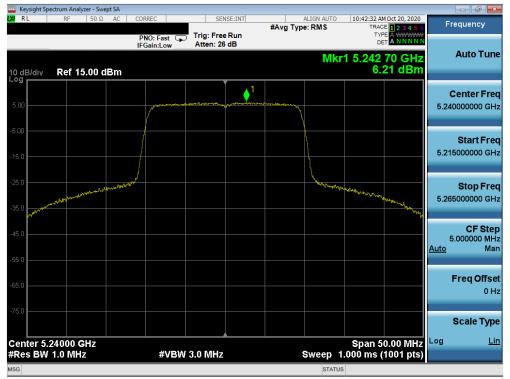
Plot 7-147. Power Spectral Density Plot MIMO ANT1 (20MHz BW 802.11ax (UNII Band 1) – Ch. 36)



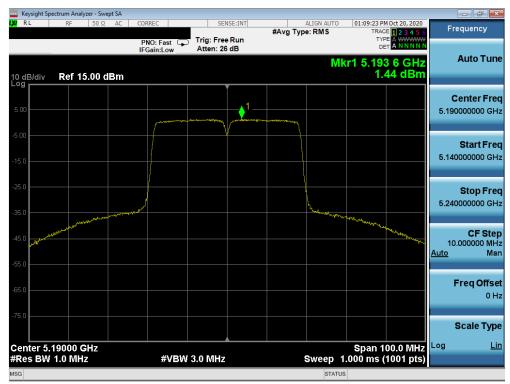
Plot 7-148. Power Spectral Density Plot MIMO ANT1 (20MHz BW 802.11ax (UNII Band 1) - Ch. 40)

FCC ID: A3LSMG998B	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 104 of 200
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset	Page 104 of 209
© 2020 PCTEST			V 9.0 02/01/2019





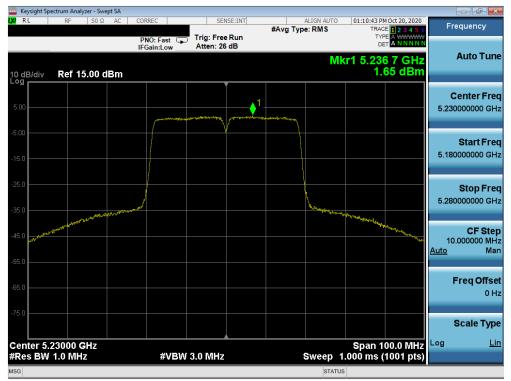
Plot 7-149. Power Spectral Density Plot MIMO ANT1 (20MHz BW 802.11ax (UNII Band 1) - Ch. 48)



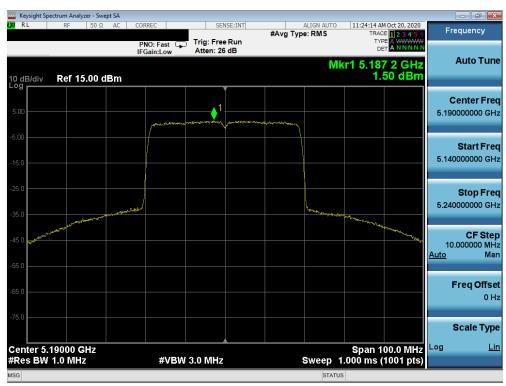
Plot 7-150. Power Spectral Density Plot MIMO ANT1 (40MHz BW 802.11n (UNII Band 1) - Ch. 38)

FCC ID: A3LSMG998B	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 105 of 200
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset	Page 105 of 209
© 2020 PCTEST			V 9.0 02/01/2019





Plot 7-151. Power Spectral Density Plot MIMO ANT1 (40MHz BW 802.11n (UNII Band 1) - Ch. 46)



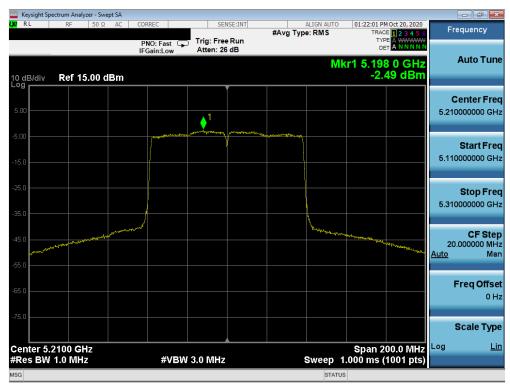
Plot 7-152. Power Spectral Density Plot MIMO ANT1 (40MHz BW 802.11ax (UNII Band 1) - Ch. 38)

FCC ID: A3LSMG998B	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dogo 106 of 200
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset	Page 106 of 209
© 2020 PCTEST		·	V 9.0 02/01/2019





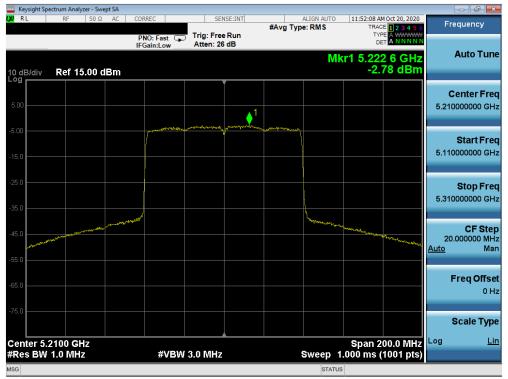
Plot 7-153. Power Spectral Density Plot MIMO ANT1 (40MHz BW 802.11ax (UNII Band 1) - Ch. 46)



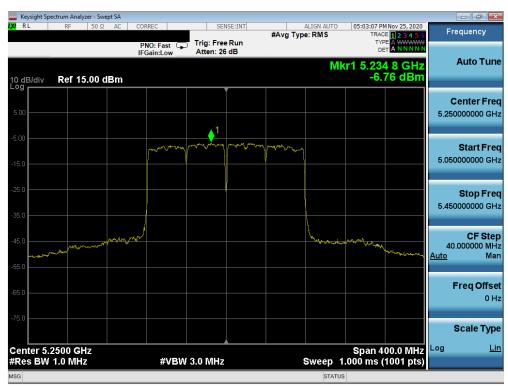
Plot 7-154. Power Spectral Density Plot MIMO ANT1 (80MHz BW 802.11ac (UNII Band 1) - Ch. 42)

FCC ID: A3LSMG998B	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 107 of 200
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset	Page 107 of 209
© 2020 PCTEST			V 9.0 02/01/2019





Plot 7-155. Power Spectral Density Plot MIMO ANT1 (80MHz BW 802.11ax (UNII Band 1) - Ch. 42)



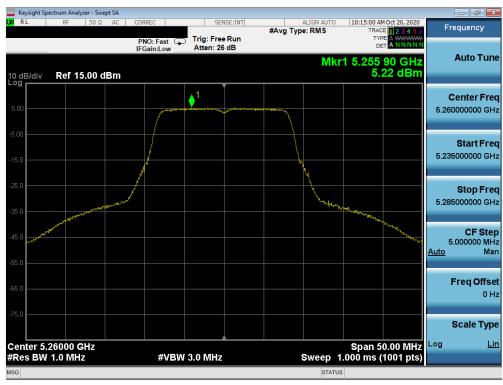
Plot 7-156. Power Spectral Density Plot MIMO ANT1 (160MHz BW 802.11ac (UNII Band 1) - Ch. 50)

FCC ID: A3LSMG998B	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 100 of 200
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset	Page 108 of 209
© 2020 PCTEST		•	V 9.0 02/01/2019





Plot 7-157. Power Spectral Density Plot MIMO ANT1 (160MHz BW 802.11ax (UNII Band 1) - Ch. 50)



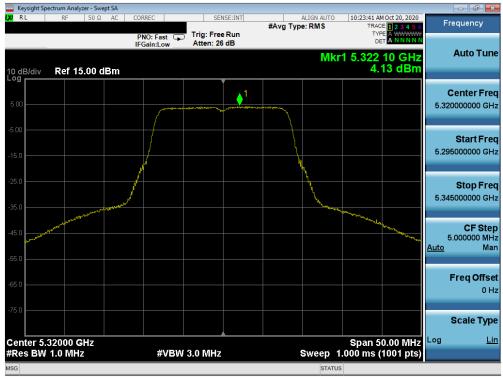
Plot 7-158. Power Spectral Density Plot MIMO ANT1 (802.11a (UNII Band 2A) - Ch. 52)

FCC ID: A3LSMG998B	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dogo 100 of 200
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset	Page 109 of 209
© 2020 PCTEST	•		V 9.0 02/01/2019





Plot 7-159. Power Spectral Density Plot MIMO ANT1 (802.11a (UNII Band 2A) - Ch. 56)



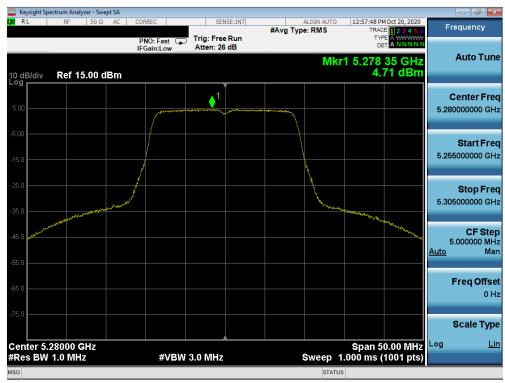
Plot 7-160. Power Spectral Density Plot MIMO ANT1 (802.11a (UNII Band 2A) - Ch. 64)

FCC ID: A3LSMG998B	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dega 110 of 200
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset	Page 110 of 209
© 2020 PCTEST	•		V 9.0 02/01/2019





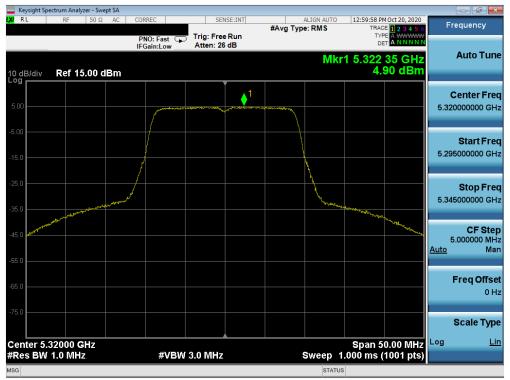
Plot 7-161. Power Spectral Density Plot MIMO ANT1 (20MHz BW 802.11n (UNII Band 2A) - Ch. 52)



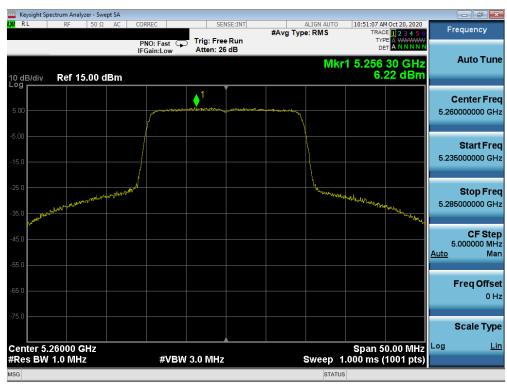
Plot 7-162. Power Spectral Density Plot MIMO ANT1 (20MHz BW 802.11n (UNII Band 2A) - Ch. 56)

FCC ID: A3LSMG998B	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Baga 111 of 200
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset	Page 111 of 209
© 2020 PCTEST			V 9.0 02/01/2019





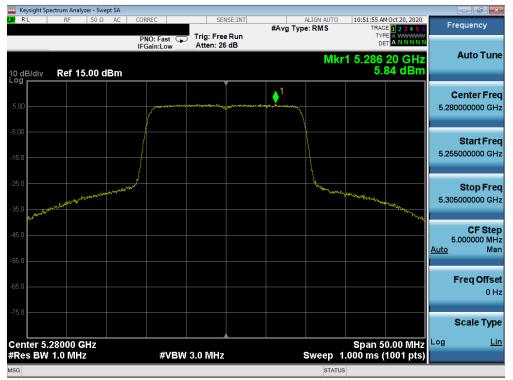
Plot 7-163. Power Spectral Density Plot MIMO ANT1 (20MHz BW 802.11n (UNII Band 2A) - Ch. 64)



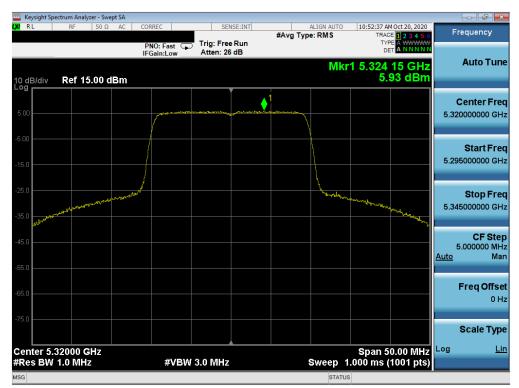
Plot 7-164. Power Spectral Density Plot MIMO ANT1 (20MHz BW 802.11ax (UNII Band 2A) - Ch. 52)

FCC ID: A3LSMG998B	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 112 of 200
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset	Page 112 of 209
© 2020 PCTEST		•	V 9.0 02/01/2019





Plot 7-165. Power Spectral Density Plot MIMO ANT1 (20MHz BW 802.11ax (UNII Band 2A) - Ch. 56)



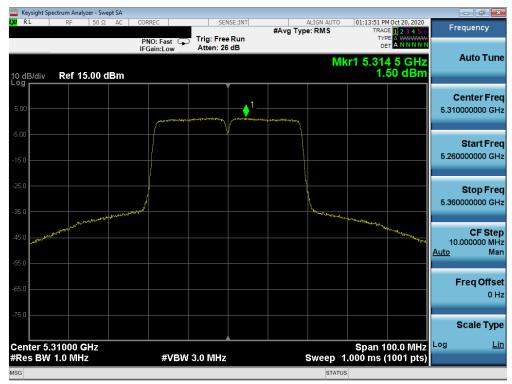
Plot 7-166. Power Spectral Density Plot MIMO ANT1 (20MHz BW 802.11ax (UNII Band 2A) - Ch. 64)

FCC ID: A3LSMG998B	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 112 of 200
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset		Page 113 of 209
© 2020 PCTEST	•			V 9 0 02/01/2019





Plot 7-167. Power Spectral Density Plot MIMO ANT1 (40MHz BW 802.11n (UNII Band 2A) - Ch. 54)



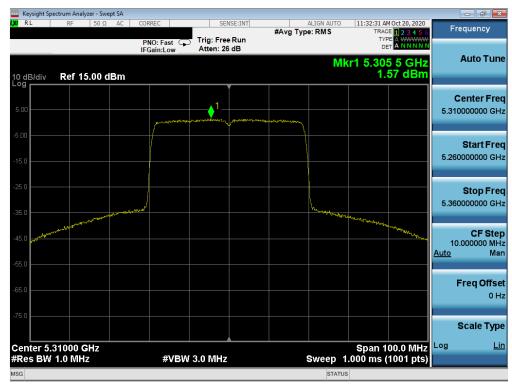
Plot 7-168. Power Spectral Density Plot MIMO ANT1 (40MHz BW 802.11n (UNII Band 2A) - Ch. 62)

FCC ID: A3LSMG998B	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 114 of 209
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset	Page 114 01 209
© 2020 PCTEST	•		V 9.0 02/01/2019





Plot 7-169. Power Spectral Density Plot MIMO ANT1 (40MHz BW 802.11ax (UNII Band 2A) - Ch. 54)



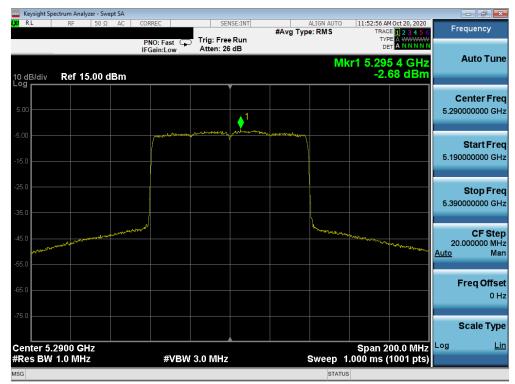
Plot 7-170. Power Spectral Density Plot MIMO ANT1 (40MHz BW 802.11ax (UNII Band 2A) - Ch. 62)

FCC ID: A3LSMG998B	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 115 of 200
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset	Page 115 of 209
© 2020 PCTEST	•		V 9.0 02/01/2019



					m Analyzer - Sw	
SENSE:INT     ALIGN AUTO     01:23:59 PM Oct 20, 2020       #Avg Type: RMS     TRACE     12:34:35 G       Tria: Free Run     TYPE ANY     TYPE ANY	#Avş	Trig: Free Run	RREC		RF 50 Ω	RL
Atten: 26 dB DET ANNNNN Atten: 26 dB Auto Tun -2.83 dBm			NO: Fast 😱 Gain:Low	IFO	ef 15.00 c	B/div R
Center Fre 5.29000000 GH	1					
Start Fre 5.19000000 GH						)
Stop Fre 5.39000000 GH						) 
CF Ste 20.000000 MH <u>Auto</u> Ma				Harden and and a start and a start and a start	and the state of the	)
Freq Offse 0 H						)
Scale Typ						)
Span 200.0 MHz Log Li 0.0 MHz Sweep 1.000 ms (1001 pts)		3.0 MHz	#VBW			nter 5.290 es BW 1.0
STATUS						

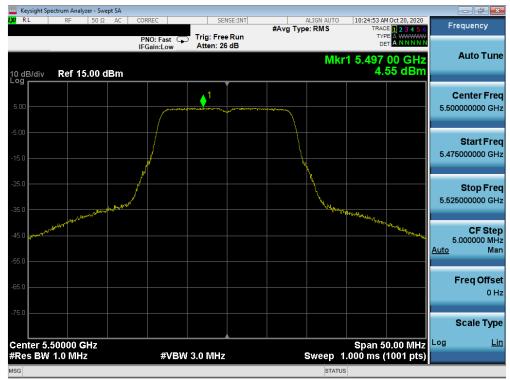
Plot 7-171. Power Spectral Density Plot MIMO ANT1 (80MHz BW 802.11ac (UNII Band 2A) - Ch. 58)



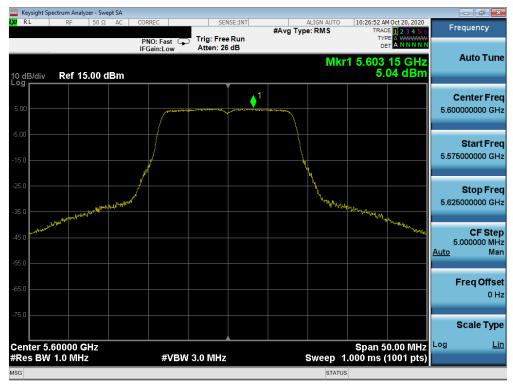
Plot 7-172. Power Spectral Density Plot MIMO ANT1 (80MHz BW 802.11ax (UNII Band 2A) - Ch. 58)

FCC ID: A3LSMG998B	Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dage 116 of 200
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset		Page 116 of 209
© 2020 PCTEST		•		V 9.0 02/01/2019





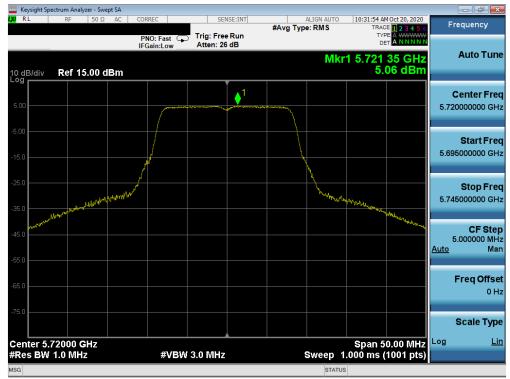
Plot 7-173. Power Spectral Density Plot MIMO ANT1 (802.11a (UNII Band 2C) – Ch. 100)



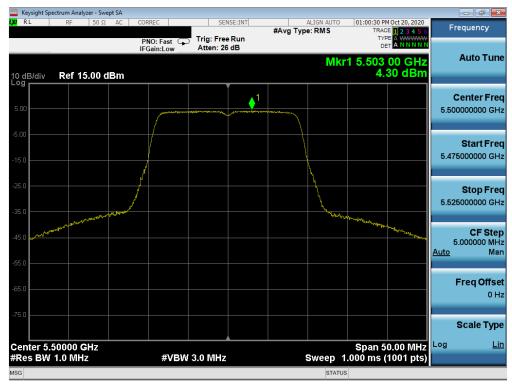
Plot 7-174. Power Spectral Density Plot MIMO ANT1 (802.11a (UNII Band 2C) - Ch. 120)

FCC ID: A3LSMG998B	Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 117 of 200
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset	Page 117 of 209
© 2020 PCTEST	•	·	V 9.0 02/01/2019





Plot 7-175. Power Spectral Density Plot MIMO ANT1 (802.11a (UNII Band 2C) – Ch. 144)



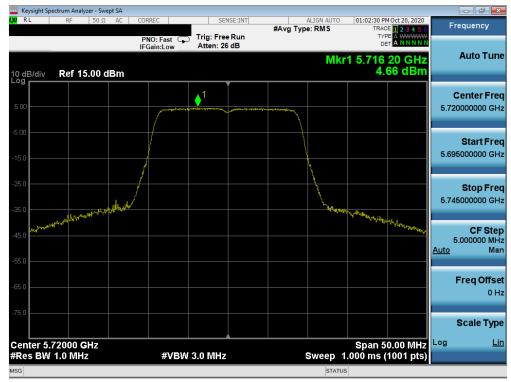
Plot 7-176. Power Spectral Density Plot MIMO ANT1 (20MHz BW 802.11n (UNII Band 2C) - Ch. 100)

FCC ID: A3LSMG998B	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dega 110 of 200
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset	Page 118 of 209
© 2020 PCTEST	•		V 9.0 02/01/2019





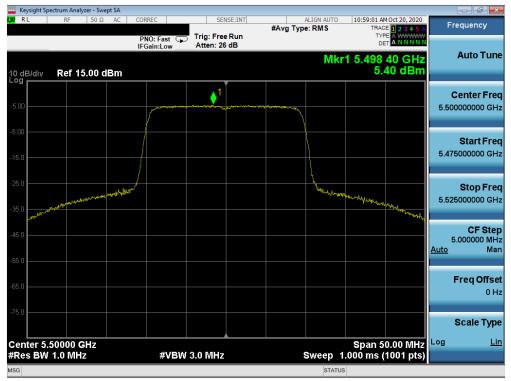
Plot 7-177. Power Spectral Density Plot MIMO ANT1 (20MHz BW 802.11n (UNII Band 2C) - Ch. 120)



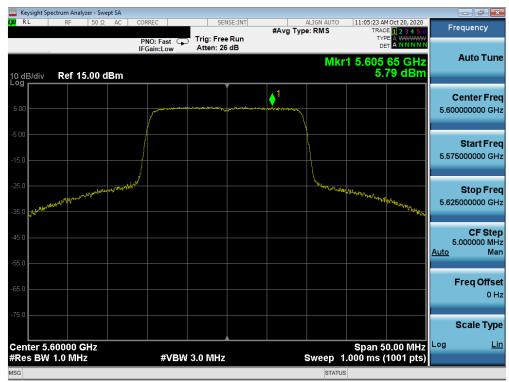
Plot 7-178. Power Spectral Density Plot MIMO ANT1 (20MHz BW 802.11n (UNII Band 2C) - Ch. 144)

FCC ID: A3LSMG998B	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 119 of 209
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset		Page 119 01 209
© 2020 PCTEST				V 9.0 02/01/2019





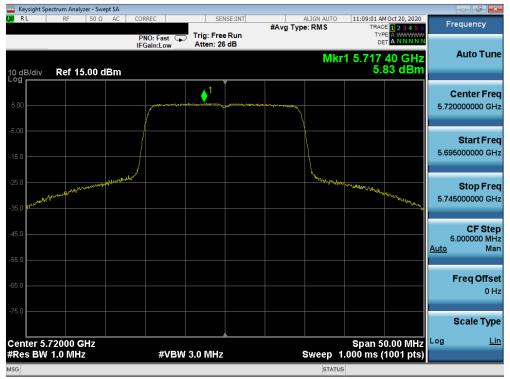
Plot 7-179. Power Spectral Density Plot MIMO ANT1 (20MHz BW 802.11ax (UNII Band 2C) - Ch. 100)



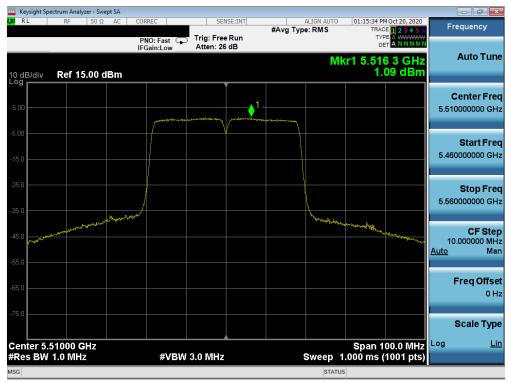
Plot 7-180. Power Spectral Density Plot MIMO ANT1 (20MHz BW 802.11ax (UNII Band 2C) - Ch. 120)

FCC ID: A3LSMG998B	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Daga 120 of 200
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset		Page 120 of 209
© 2020 PCTEST	•			V 9.0 02/01/2019





Plot 7-181. Power Spectral Density Plot MIMO ANT1 (20MHz BW 802.11ax (UNII Band 2C) - Ch. 144)



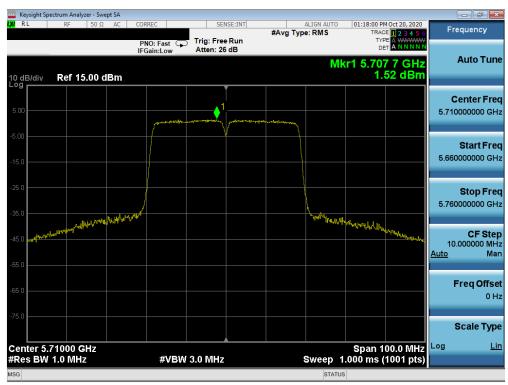
Plot 7-182. Power Spectral Density Plot MIMO ANT1 (40MHz BW 802.11n (UNII Band 2C) - Ch. 102)

FCC ID: A3LSMG998B	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Page 121 of 209
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset	Page 121 01 209
© 2020 PCTEST	•		V 9.0 02/01/2019





Plot 7-183. Power Spectral Density Plot MIMO ANT1 (40MHz BW 802.11n (UNII Band 2C) - Ch. 118)



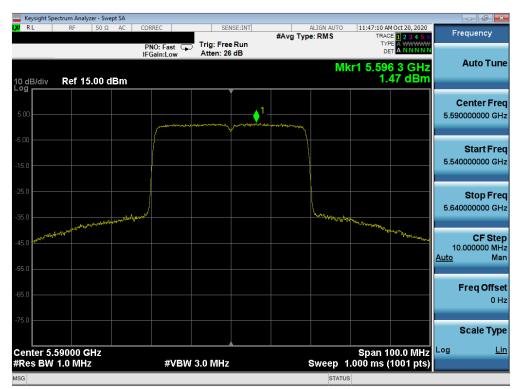
Plot 7-184. Power Spectral Density Plot MIMO ANT1 (40MHz BW 802.11n (UNII Band 2C) - Ch. 142)

FCC ID: A3LSMG998B	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 122 of 200
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset	Page 122 of 209
© 2020 PCTEST	•	•	V 9.0 02/01/2019





Plot 7-185. Power Spectral Density Plot MIMO ANT1 (40MHz BW 802.11ax (UNII Band 2C) - Ch. 102)



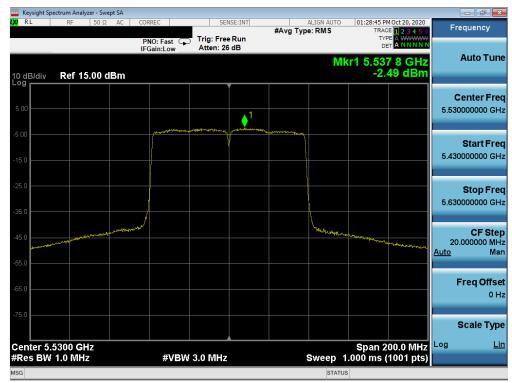
Plot 7-186. Power Spectral Density Plot MIMO ANT1 (40MHz BW 802.11ax (UNII Band 2C) - Ch. 118)

FCC ID: A3LSMG998B	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 102 of 200
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset		Page 123 of 209
© 2020 PCTEST	-			V 9.0 02/01/2019





Plot 7-187. Power Spectral Density Plot MIMO ANT1 (40MHz BW 802.11ax (UNII Band 2C) - Ch. 142)



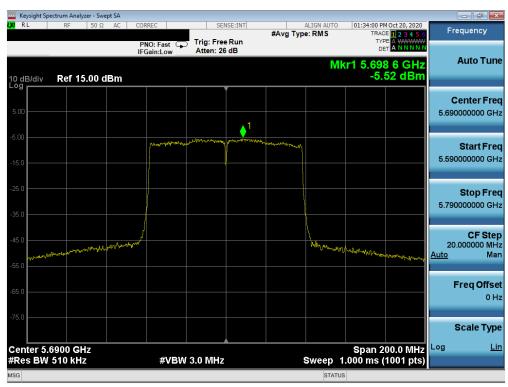
Plot 7-188. Power Spectral Density Plot MIMO ANT1 (80MHz BW 802.11ac (UNII Band 2C) - Ch. 106)

FCC ID: A3LSMG998B	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 104 of 200
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset	Page 124 of 209
© 2020 PCTEST	•		V 9.0 02/01/2019



RL     RF     S0 @. AC     CORREC     SERVECIVIT     ALLON AUTO     Dis207 PMORt 20.2020       PNO: Fast     Trig: Free Run IFGaintLow     Trig: Free Run Atten: 26 dB     Mkr1 5.618 6 GHz -1.84 dBm     Trace PRO: Fast     Auto Tune       0 dB/div     Ref 15.00 dBm     -1.84 dBm     -1.84 dBm     -1.84 dBm     -1.84 dBm       500     -1.84 dBm     -1.84 dBm     -1.84 dBm     -1.84 dBm     -1.84 dBm       500     -1.50     -1.84 dBm     -1.84 dBm     -1.84 dBm     -1.84 dBm       500     -1.50     -1.50     -1.84 dBm     -1.84 dBm     -1.84 dBm       500     -1.50     -1.84 dBm     -1.84 dBm     -1.84 dBm     -1.84 dBm       500     -1.50     -1.50     -1.50     -1.50     -1.50     -1.50       500     -1.50     -1.50     -1.50     -1.50     -1.50     -1.50       500     -1.50     -1.50     -1.50     -1.50     -1.50     -1.50       500     -1.50     -1.50     -1.50     -1.50     -1.50     -1.50       65		ectrum Analyzer - Swept SA					
PRO: Fast   Trig: Free Run   Trig: Free Run   Auto Tune     10 dB/div   Ref 15.00 dBm   -1.84 dBm   Center Freq     500   -1.84 dBm   -1.84 dBm   Start Freq     500   -1.84 dBm   -1.84 dBm   Start Freq     500   -1.84 dBm   -1.84 dBm   Start Freq     500   -1.90   -1.90   -1.90   -1.90     500   -1.90   -1.90   -1.90   -1.90     500   -1.90   -1.90   -1.90   -1.90     500   -1.90   -1.90   -1.90   -1.90     500   -1.90   -1.90   -1.90   -1.90     500   -1.90   -1.90   -1.90   -1.90     500   -1.90   -1.90   -1.90   -1.90     500   -1.90   -1.90   -1.90   -1.90   -1.90     500   -1.90   -1.90   -1.90   -1.90   -1.90     500   -1.90   -1.90   -1.90   -1.90   -1.90     500   -1.90   -1.90   -1.90   -1.90   -1.90	L <mark>XI</mark> RL	RF 50 Ω A0	C CORREC	SENSE:INT		TRACE 1 2 3 4 5 6	Frequency
500   Center Freq     500   Start Freq     500   Start Freq     500   Start Freq     500   Stop Freq     510   Stop Freq     510000000 GHz   Stop Freq     51000 GHz   Stop Freq     5100 GHz   Stop Freq <th>10 dB/div</th> <th>Ref 15.00 dBn</th> <th>IFGain:Low</th> <th></th> <th></th> <th>TYPE A WWWWW DET A NNNN</th> <th>Auto Tune</th>	10 dB/div	Ref 15.00 dBn	IFGain:Low			TYPE A WWWWW DET A NNNN	Auto Tune
-150   Start Freq     -250   Stop Freq     -350   Stop Freq     -450   Stop Freq     -50   Scale Type     -50   Stop Freq     -50   Stop Freq     -50   Scale Type     -50   Stop Freq     -50   Stop Freq     -50   Stop Freq     -50   Stop Freq     -50   Scale Type     -50   Stop Freq     -50   Stop Freq     -50   Stop Freq     -50   Scale Type     -50   Stop Freq     -50   Stop Freq  -	5.00			1			•
35.0 35.0 5.71000000 GHz   45.0 4.0 4.0   40.0 4.0 4.0   40.0 4.0 4.0   40.0 4.0 4.0   40.0 4.0 4.0   40.0 4.0 4.0   40.0 4.0 4.0   40.0 4.0   40.0 4.0 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>							
Auto Man Auto Man Auto Man Freq Offset 0 Hz -75.0 Center 5.6100 GHz #Res BW 1.0 MHz #VBW 3.0 MHz Sweep 1.000 ms (1001 pts)							
-650 -750 Center 5.6100 GHz #Res BW 1.0 MHz #VBW 3.0 MHz Sweep 1.000 ms (1001 pts) + Center 5.6100 GHz -750		and a star of the second of the factor	rafastranar d		hospitatanta	how have a second and the second	20.000000 MHz
Center 5.6100 GHz #Res BW 1.0 MHz #VBW 3.0 MHz Sweep 1.000 ms (1001 pts)	-65.0						•
#Res BW 1.0 MHz     #VBW 3.0 MHz     Sweep     1.000 ms (1001 pts)							
			#\/B\/	3.0 MHz	Sween	Span 200.0 191112	
		170 WIL12	#VDVV	5.0 10112			

Plot 7-189. Power Spectral Density Plot MIMO ANT1 (80MHz BW 802.11ac (UNII Band 2C) - Ch. 122)



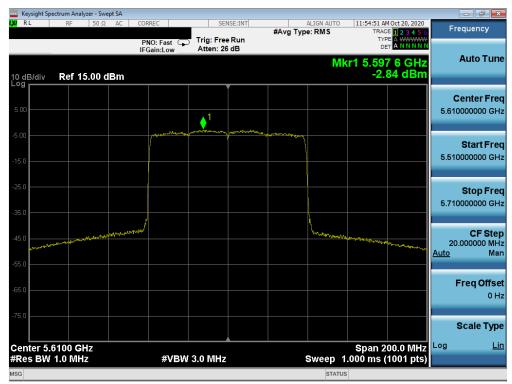
Plot 7-190. Power Spectral Density Plot MIMO ANT1 (80MHz BW 802.11ac (UNII Band 2C) - Ch. 138)

FCC ID: A3LSMG998B	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Bara 125 of 200
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset	Page 125 of 209
© 2020 PCTEST		·	V 9.0 02/01/2019



	trum Analyzer - Swe	pt SA							
LXI RL	RF 50 Ω		REC		#Avg Typ	ALIGN AUTO e: RMS	TRAC	E 1 2 3 4 5 6 E A WWWW	Frequency
10 dB/div	Ref 15.00 d	IFO	NO: Fast 🕞 Gain:Low	Atten: 26		Mł	or 1 5.52	ANNNN	Auto Tune
5.00				∳ <sup>1</sup>					Center Freq 5.530000000 GHz
-5.00									<b>Start Freq</b> 5.430000000 GHz
-25.0									<b>Stop Freq</b> 5.630000000 GHz
-45.0	and the former and the	alar and a second				Land and a start of the start o	M <sup>ande</sup> linetration	the strength and the st	CF Step 20.000000 MHz <u>Auto</u> Man
-65.0									Freq Offset 0 Hz
-75.0							0		Scale Type
Center 5.5 #Res BW 1			#VBW	3.0 MHz		Sweep_1	span 2 .000 ms (	00.0 191112	
MSG						STATUS			

Plot 7-191. Power Spectral Density Plot MIMO ANT1 (80MHz BW 802.11ax (UNII Band 2C) – Ch. 106)



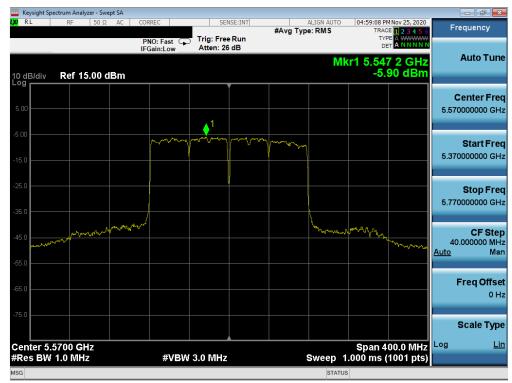
Plot 7-192. Power Spectral Density Plot MIMO ANT1 (80MHz BW 802.11ax (UNII Band 2C) - Ch. 122)

FCC ID: A3LSMG998B	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 126 of 200
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset	Page 126 of 209
© 2020 PCTEST	•		V 9.0 02/01/2019



	ectrum Analy:											_	
RL	RF	50 Ω		ORREC PNO: Fa:		SE Trig: Fre	NSE:INT	#Avg Typ	ALIGN AUTO	TRAC	M Oct 20, 2020 E 1 2 3 4 5 6 E A WWWW	Fr	equency
0 dB/div	Ref 15	.00 dB	1	FGain:Lo		Atten: 2			Mk	r1 5.67	7 6 GHz 62 dBm		Auto Tun
5.00						<b>1</b>							Center Fre 0000000 G⊦
5.0				( star of t	MANNA	hander	mantum	monoral				5.59	Start Fre 0000000 G⊦
5.0												5.79	<b>Stop Fre</b> 0000000 GH
5.0	n of the second second	parga tafa da da	physically	/					Prest Whenk	where	hand an and and and and and and and an and and	20 <u>Auto</u>	CF Ste 0.000000 MI Ma
5.0													Freq Offs 0 I
enter 5.0										Span 2	00.0 MHz		Scale Tyr L
Res BW	510 kHz	2		#	VBW	3.0 MHz			Sweep 1	.000 ms (	1001 pts)		
G									STATUS				

Plot 7-193. Power Spectral Density Plot MIMO ANT1 (80MHz BW 802.11ax (UNII Band 2C) - Ch. 138)



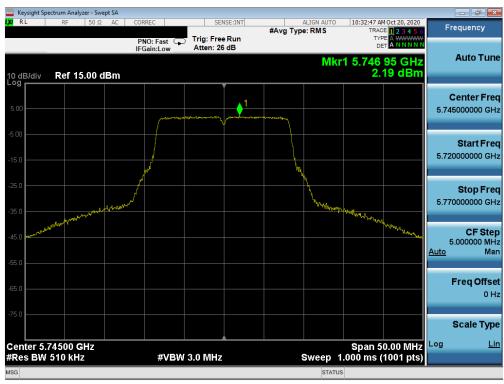
Plot 7-194. Power Spectral Density Plot MIMO ANT1 (160MHz BW 802.11ac (UNII Band 2C) - Ch. 114)

FCC ID: A3LSMG998B	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Page 127 of 209
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset		Page 127 01 209
© 2020 PCTEST	•			V 9.0 02/01/2019



	ht Spectrum Analyzer - Swept					
L <mark>XI</mark> RL	RF 50 Ω	AC CORREC	SENSE:INT	ALIGN AUTO #Avg Type: RMS	04:57:43 PM Nov 25, 2020 TRACE 1 2 3 4 5 6	Frequency
		PNO: Fast G	Trig: Free Run Atten: 26 dB	• *	kr1 5.542 0 GHz	Auto Tune
10 dB/d Log	liv Ref 15.00 dE	3m			-8.74 dBm	
5.00						Center Freq 5.570000000 GHz
-5.00		mon	1	mahrow		Start Freq 5.370000000 GHz
-25.0 —						<b>Stop Freq</b> 5.770000000 GHz
-35.0	- nor	warran		manun	Marana Marana Anala	CF Step 40.000000 MHz Auto Man
-55.0					and a second sec	Freq Offset
-75.0						0 Hz
						Scale Type
	r 5.5700 GHz 3W 1.0 MHz	#VBW	3.0 MHz	Sweep	Span 400.0 MHz 1.000 ms (1001 pts)	Log <u>Lin</u>
MSG				STATU		

Plot 7-195. Power Spectral Density Plot MIMO ANT1 (160MHz BW 802.11ax (UNII Band 2C) - Ch. 114)



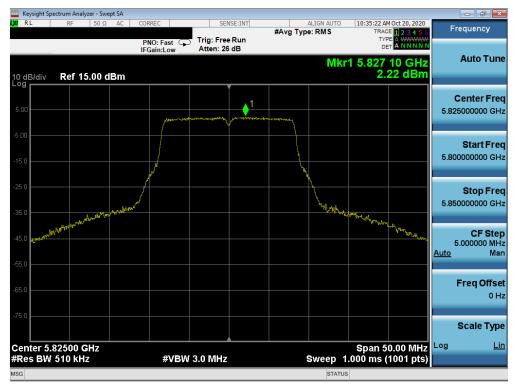
Plot 7-196. Power Spectral Density Plot MIMO ANT1 (802.11a (UNII Band 3) - Ch. 149)

FCC ID: A3LSMG998B	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 100 of 200
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset	Page 128 of 209
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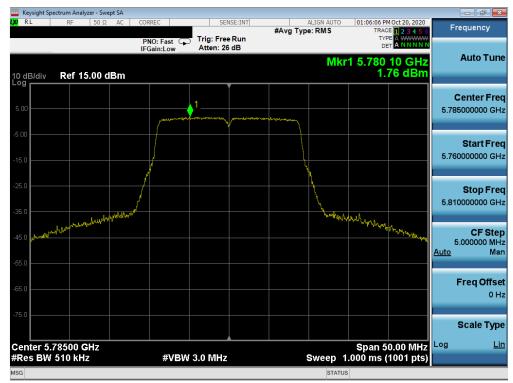
Plot 7-198. Power Spectral Density Plot MIMO ANT1 (802.11a (UNII Band 3) - Ch. 165)

FCC ID: A3LSMG998B	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 120 of 200
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset	Page 129 of 209
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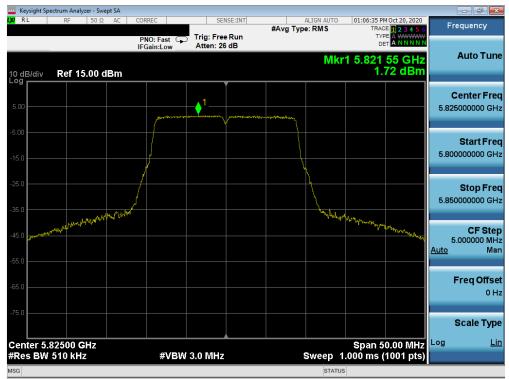
Plot 7-199. Power Spectral Density Plot MIMO ANT1 (20MHz BW 802.11n (UNII Band 3) - Ch. 149)



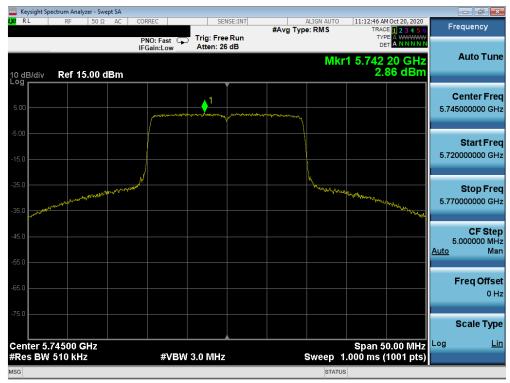
Plot 7-200. Power Spectral Density Plot MIMO ANT1 (20MHz BW 802.11n (UNII Band 3) - Ch. 157)

FCC ID: A3LSMG998B	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 120 of 200
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset	Page 130 of 209
© 2020 PCTEST			V 9.0 02/01/2019





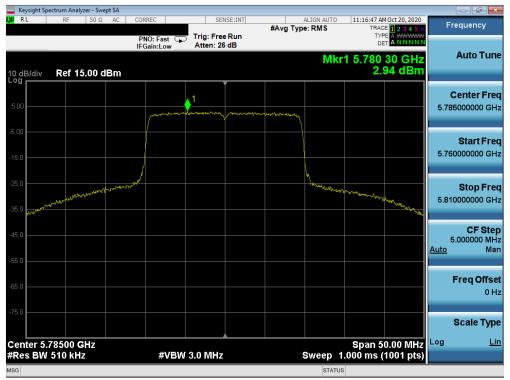
Plot 7-201. Power Spectral Density Plot MIMO ANT1 (20MHz BW 802.11n (UNII Band 3) - Ch. 165)



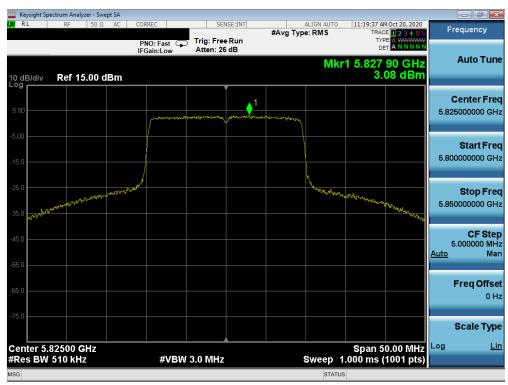
Plot 7-202. Power Spectral Density Plot MIMO ANT1 (20MHz BW 802.11ax (UNII Band 3) - Ch. 149)

FCC ID: A3LSMG998B	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dogo 121 of 200
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset	Page 131 of 209
© 2020 PCTEST	•		V 9.0 02/01/2019





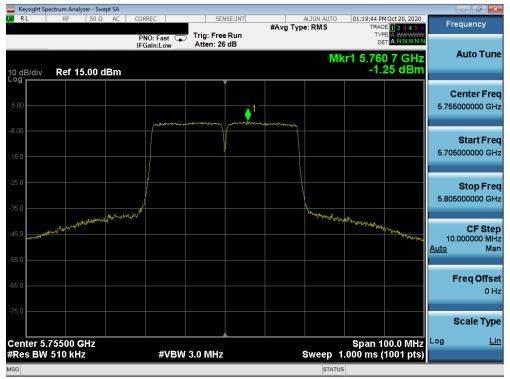
Plot 7-203. Power Spectral Density Plot MIMO ANT1 (20MHz BW 802.11ax (UNII Band 3) - Ch. 157)



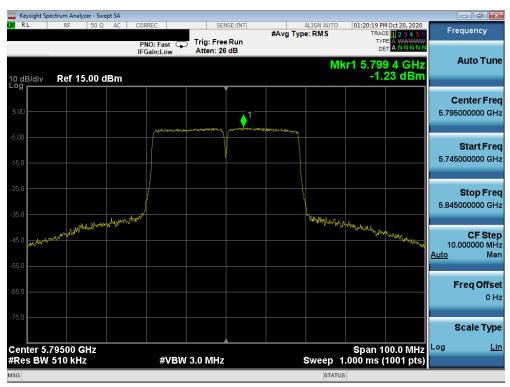
Plot 7-204. Power Spectral Density Plot MIMO ANT1 (20MHz BW 802.11ax (UNII Band 3) - Ch. 165)

FCC ID: A3LSMG998B	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Baga 122 of 200	
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset	Page 132 of 209	
© 2020 PCTEST			V 9.0 02/01/2019	





Plot 7-205. Power Spectral Density Plot MIMO ANT1 (40MHz BW 802.11n (UNII Band 3) - Ch. 151)



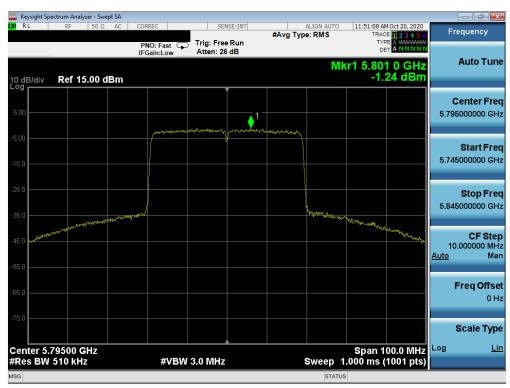
Plot 7-206. Power Spectral Density Plot MIMO ANT1 (40MHz BW 802.11n (UNII Band 3) - Ch. 159)

FCC ID: A3LSMG998B	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Baga 122 of 200
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset	Page 133 of 209
© 2020 PCTEST			V 9.0 02/01/2019





Plot 7-207. Power Spectral Density Plot MIMO ANT1 (40MHz BW 802.11ax (UNII Band 3) - Ch. 151)



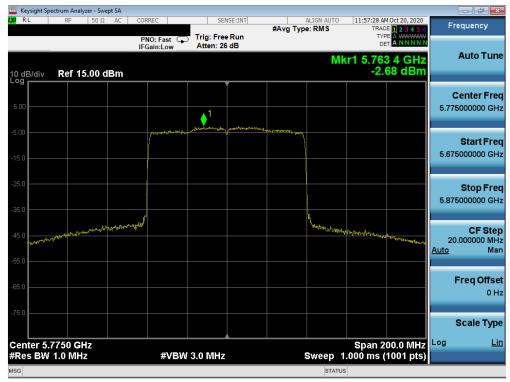
Plot 7-208. Power Spectral Density Plot MIMO ANT1 (40MHz BW 802.11ax (UNII Band 3) - Ch. 159)

FCC ID: A3LSMG998B	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Baga 124 of 200
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset	Page 134 of 209
© 2020 PCTEST			V 9.0 02/01/2019



	ectrum Analy						 		_		_	
RL	RF	50 Ω	AC	CORREC PNO: Fa		Trig: Fre	#Avg Ty	ALIGN AUTO /pe: RMS	TRA	M Oct 20, 2020 DE 1 2 3 4 5 6 PE A WWWW ET A N N N N	Fr	equency
dB/div	Ref 15	5.00 d	Bm	IF Galli.L	.0w			Mk	r1 5.76 -3.	3 4 GHz 15 dBm		Auto Tur
.00						<b>↓</b> <sup>1</sup>						<b>Center Fre</b> 5000000 GI
5.0					na Allen de la constante de la	90994579994979	 Andrew of the Constant of the				5.67	<b>Start Fr</b> 5000000 G
5.0											5.87	<b>Stop Fr</b> 5000000 G
5.0	and a solution	الالمقور ارمو <mark>ل</mark> ور	_M <sub>I</sub> ,					Juniya Bry Maring de	lookepwrd-ry-herthor	Marielandersta	20 <u>Auto</u>	CF St .000000 M M
i.o											1	Freq Offs 0
	7750 GH								Span 2	200.0 MHz		Scale Ty !
Res BW	1.0 MH	Z		#	¢VBW	3.0 MHz		Sweep 1	.000 ms	(1001 pts)		
G								STATUS				

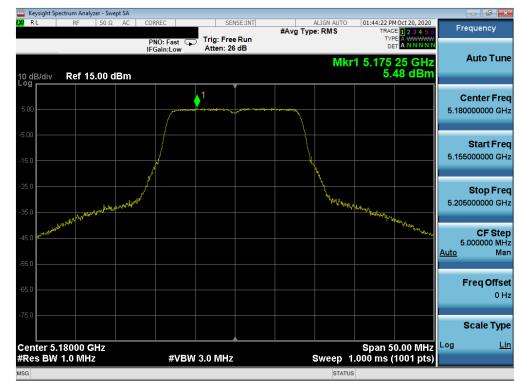
Plot 7-209. Power Spectral Density Plot MIMO ANT1 (80MHz BW 802.11ac (UNII Band 3) - Ch. 155)



Plot 7-210. Power Spectral Density Plot MIMO ANT1 (80MHz BW 802.11ax (UNII Band 3) - Ch. 155)

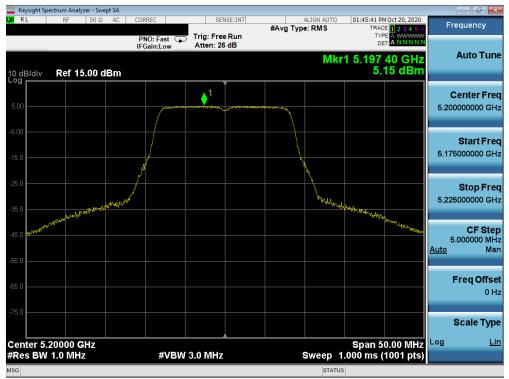
FCC ID: A3LSMG998B	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dage 125 of 200	
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset	Page 135 of 209	
© 2020 PCTEST	•		V 9.0 02/01/2019	





## MIMO Antenna-2 Power Spectral Density Measurements





Plot 7-212. Power Spectral Density Plot MIMO ANT2 (802.11a (UNII Band 1) – Ch. 40)

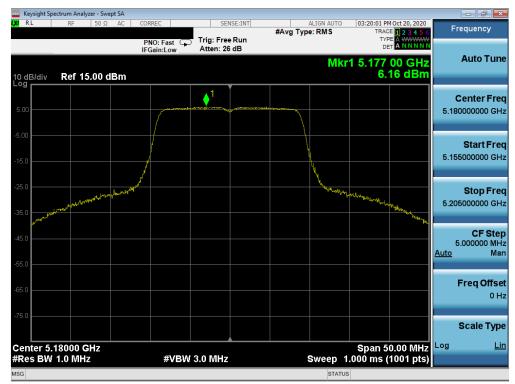
FCC ID: A3LSMG998B	PCTEST <sup>®</sup> Proud to be part of <sup>®</sup> element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager	
Test Report S/N:	Test Dates:	EUT Type:	Dage 126 of 200	
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset	Page 136 of 209	
© 2020 PCTEST			V 9.0 02/01/2019	

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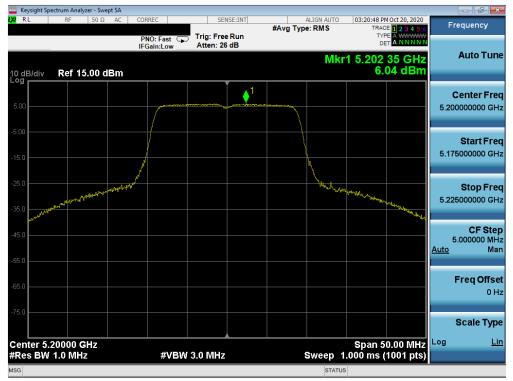
Plot 7-213. Power Spectral Density Plot MIMO ANT2 (802.11a (UNII Band 1) - Ch. 48)



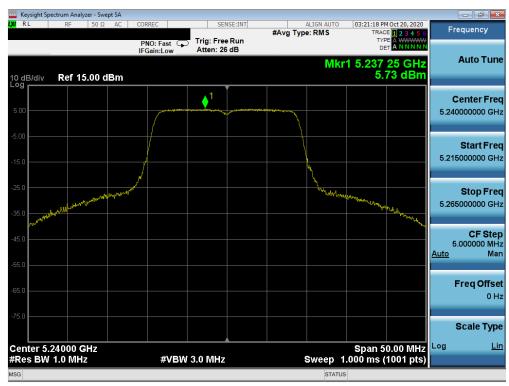
Plot 7-214. Power Spectral Density Plot MIMO ANT2 (20MHz BW 802.11n (UNII Band 1) - Ch. 36)

FCC ID: A3LSMG998B	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	SAMSUNG	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:		Dega 127 of 200
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset		Page 137 of 209
© 2020 PCTEST		•		V 9.0 02/01/2019





Plot 7-215. Power Spectral Density Plot MIMO ANT2 (20MHz BW 802.11n (UNII Band 1) - Ch. 40)



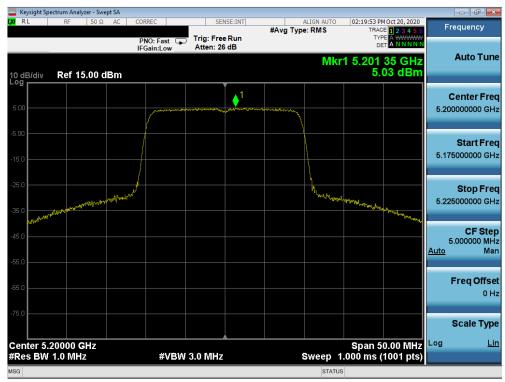
Plot 7-216. Power Spectral Density Plot MIMO ANT2 (20MHz BW 802.11n (UNII Band 1) - Ch. 48)

FCC ID: A3LSMG998B	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 128 of 200
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset	Page 138 of 209
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Keysight Spectrum							
<b>lxi</b> rl RF	50Ω AC	CORREC	SENSE:INT	ALIG	MS TRAC	M Oct 20, 2020 DE 1 2 3 4 5 6 PE A WWWW	Frequency
10 dB/div Rei	f 15.00 dBm	PNO: Fast 🖵 IFGain:Low	Atten: 26 dB		Mkr1 5.178		Auto Tune
5.00		and an experimental second sec		Marine and man			Center Freq 5.180000000 GHz
-5.00							<b>Start Freq</b> 5.155000000 GHz
-25.0	auguan magana magana			<u> </u>	Wignam Williams	Was with may an an an an	<b>Stop Freq</b> 5.205000000 GHz
-45.0 -55.0							<b>CF Step</b> 5.000000 MHz <u>Auto</u> Man
-65.0							Freq Offset 0 Hz
-75.0 Center 5.1800	0 GHz				Span 5	0.00 MHz	Scale Type
#Res BW 1.0 I	MHz	#VBW	3.0 MHz	Sw	eep 1.000 ms (	(1001 pts)	
MSG					STATUS		

Plot 7-217. Power Spectral Density Plot MIMO ANT2 (20MHz BW 802.11ax (UNII Band 1) – Ch. 36)



Plot 7-218. Power Spectral Density Plot MIMO ANT2 (20MHz BW 802.11ax (UNII Band 1) - Ch. 40)

FCC ID: A3LSMG998B	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 120 of 200
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset	Page 139 of 209
© 2020 PCTEST		·	V 9.0 02/01/2019



	trum Analyzer - Swep									
X/RL	RF 50 Ω	AC COR	REC		ISE:INT	#Avg Type	ALIGN AUTO e: RMS	TRAC	1 Oct 20, 2020 E 1 2 3 4 5 6	Frequency
10 dB/div	Ref 15.00 d	IFG	IO: Fast 🕞	Trig: Free Atten: 26	e Run i dB		Mkr	1 5.241	80 GHz 77 dBm	Auto Tune
5.00			(	and a gradient of the state of the	1 powerson	- Company and a second second				Center Freq 5.240000000 GHz
-5.00										Start Freq 5.215000000 GHz
-25.0	un und desperiores and	molowing					hwyhysietten/	how yushe way	how with work and a	<b>Stop Freq</b> 5.265000000 GHz
-45.0										CF Step 5.000000 MHz <u>Auto</u> Man
-65.0										<b>Freq Offset</b> 0 Hz
-75.0 Center 5.24	4000 GHz							Span 5	0.00 MHz	<b>Scale Type</b> Log <u>Lin</u>
#Res BW 1			#VBW	3.0 MHz			Sweep 1		1001 pts)	
MSG							STATUS			

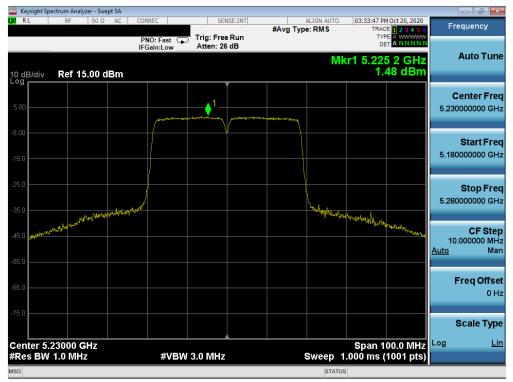
Plot 7-219. Power Spectral Density Plot MIMO ANT2 (20MHz BW 802.11ax (UNII Band 1) - Ch. 48)



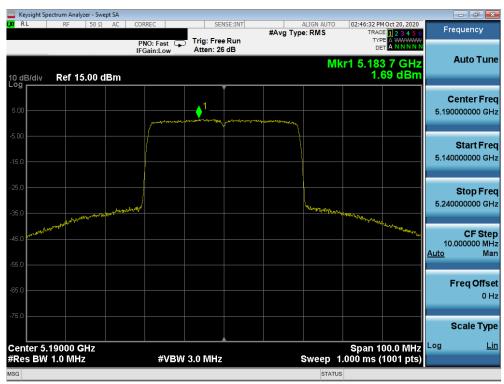
Plot 7-220. Power Spectral Density Plot MIMO ANT2 (40MHz BW 802.11n (UNII Band 1) - Ch. 38)

FCC ID: A3LSMG998B	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 140 of 200
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset	Page 140 of 209
© 2020 PCTEST	•	•	V 9.0 02/01/2019





Plot 7-221. Power Spectral Density Plot MIMO ANT2 (40MHz BW 802.11n (UNII Band 1) - Ch. 46)



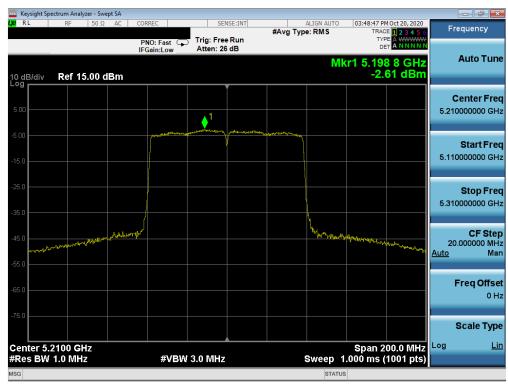
Plot 7-222. Power Spectral Density Plot MIMO ANT2 (40MHz BW 802.11ax (UNII Band 1) - Ch. 38)

FCC ID: A3LSMG998B	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dama 444 af 000
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset	Page 141 of 209
© 2020 PCTEST			V 9.0 02/01/2019





Plot 7-223. Power Spectral Density Plot MIMO ANT2 (40MHz BW 802.11ax (UNII Band 1) - Ch. 46)



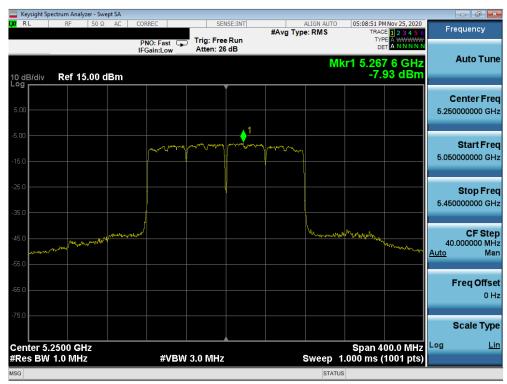
Plot 7-224. Power Spectral Density Plot MIMO ANT2 (80MHz BW 802.11ac (UNII Band 1) - Ch. 42)

FCC ID: A3LSMG998B	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	De
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset	Page 142 of 209
© 2020 PCTEST			V 9.0 02/01/2019





Plot 7-225. Power Spectral Density Plot MIMO ANT2 (80MHz BW 802.11ax (UNII Band 1) - Ch. 42)



Plot 7-226. Power Spectral Density Plot MIMO ANT2 (160MHz BW 802.11ac (UNII Band 1) - Ch. 50)

FCC ID: A3LSMG998B	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Daga 142 of 200
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset	Page 143 of 209
© 2020 PCTEST			V 9.0 02/01/2019





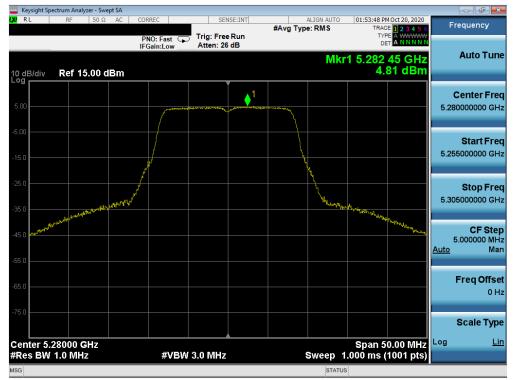
Plot 7-227. Power Spectral Density Plot MIMO ANT2 (160MHz BW 802.11ax (UNII Band 1) - Ch. 50)



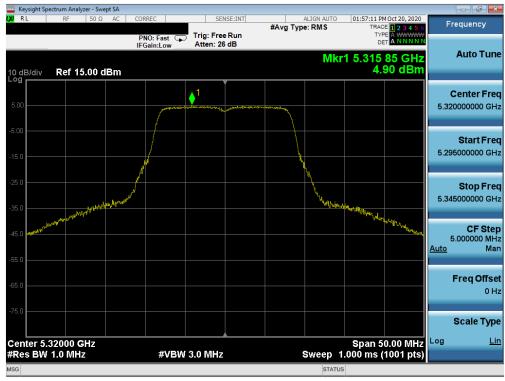
Plot 7-228. Power Spectral Density Plot MIMO ANT2 (802.11a (UNII Band 2A) - Ch. 52)

FCC ID: A3LSMG998B	Proud to be part of element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dogo 111 of 200
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset	Page 144 of 209
© 2020 PCTEST	•		V 9.0 02/01/2019





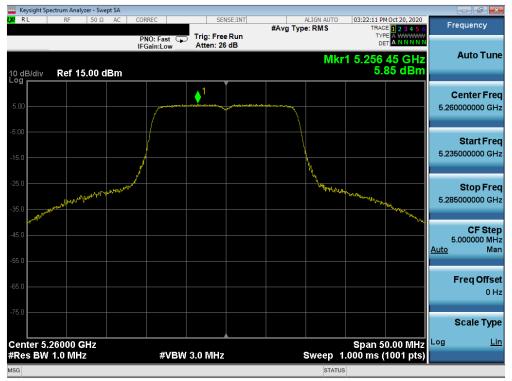
Plot 7-229. Power Spectral Density Plot MIMO ANT2 (802.11a (UNII Band 2A) - Ch. 56)



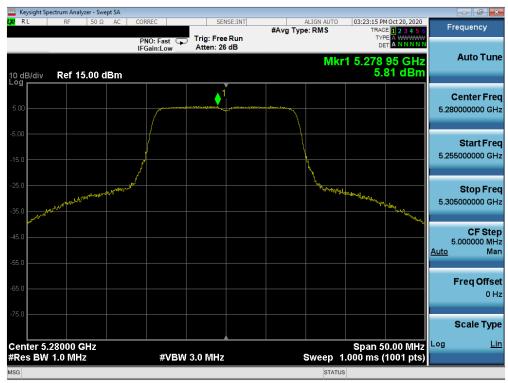
Plot 7-230. Power Spectral Density Plot MIMO ANT2 (802.11a (UNII Band 2A) - Ch. 64)

FCC ID: A3LSMG998B	PCTEST° Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 145 of 200
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset	Page 145 of 209
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Plot 7-231. Power Spectral Density Plot MIMO ANT2 (20MHz BW 802.11n (UNII Band 2A) - Ch. 52)



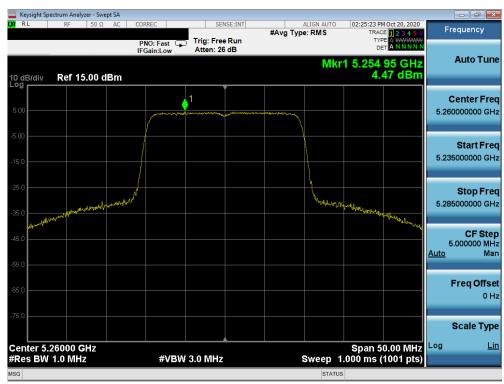
Plot 7-232. Power Spectral Density Plot MIMO ANT2 (20MHz BW 802.11n (UNII Band 2A) - Ch. 56)

FCC ID: A3LSMG998B	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 146 of 200
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset	Page 146 of 209
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	ectrum Analyzer - Swept S						- # ×
Center F	RF   50 Ω / req 5.3200000	AC CORREC	SENSE:I	#Avg Type	:RMS TR/	PM Oct 20, 2020 ACE 1 2 3 4 5 6	Frequency
		PNO: Fast 🕞	Trig: Free Ru Atten: 26 dB				
10 dB/div Log	Ref 15.00 dBi	m			Mkr1 5.317 5	7 85 GHz .55 dBm	Auto Tune
			<u>_</u> 1 Ì				Center Freq
5.00							5.320000000 GHz
-5.00		/					
		/					Start Freq 5.295000000 GHz
-15.0		<i></i>			L		5.295000000 GH2
-25.0		NY NY NY			Maul		Stop Freq
	a source of a state of the source of the	More .			Window, and Window and a few	N. dawa	5.345000000 GHz
-35.0	Police -					L. Darth will be	
-45.0							CF Step 5.000000 MHz
-55.0							<u>Auto</u> Man
-00.0							Ener Offerst
-65.0							Freq Offset 0 Hz
-75.0							
							Scale Type
Center 5.	32000 GHz				Span	50.00 MHz	Log <u>Lin</u>
#Res BW		#VBW	3.0 MHz	8	weep 1.000 ms	(1001 pts)	
MSG					STATUS		

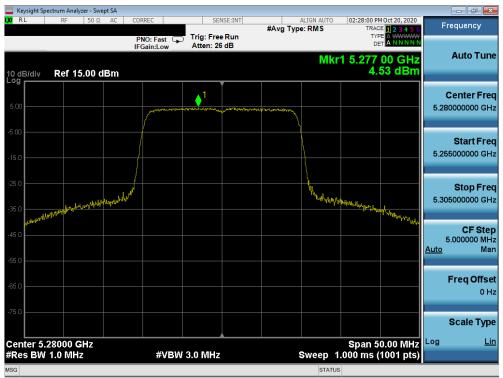
Plot 7-233. Power Spectral Density Plot MIMO ANT2 (20MHz BW 802.11n (UNII Band 2A) - Ch. 64)



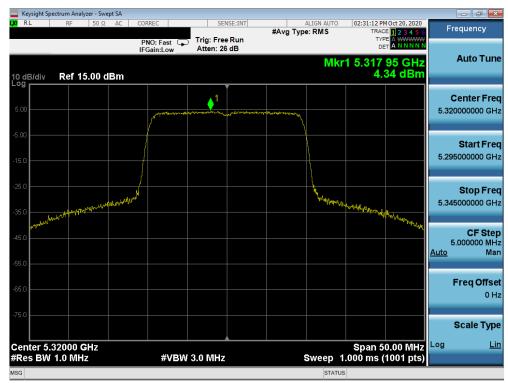
Plot 7-234. Power Spectral Density Plot MIMO ANT2 (20MHz BW 802.11ax (UNII Band 2A) - Ch. 52)

FCC ID: A3LSMG998B	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Dage 147 of 200
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset	Page 147 of 209
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Plot 7-235. Power Spectral Density Plot MIMO ANT2 (20MHz BW 802.11ax (UNII Band 2A) - Ch. 56)



Plot 7-236. Power Spectral Density Plot MIMO ANT2 (20MHz BW 802.11ax (UNII Band 2A) - Ch. 64)

FCC ID: A3LSMG998B	Proud to be part of @ element	MEASUREMENT REPORT (CERTIFICATION)	Approved by: Technical Manager
Test Report S/N:	Test Dates:	EUT Type:	Baga 149 of 200
1M2009280154-09.A3L	9/28/2020-11/25/2020	Portable Handset	Page 148 of 209
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