8.8. CONDUCTED SPURIOUS EMISSIONS

<u>LIMITS</u>

FCC §15.247 (d)

RSS-247 5.5

Limit = -20 dBc

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

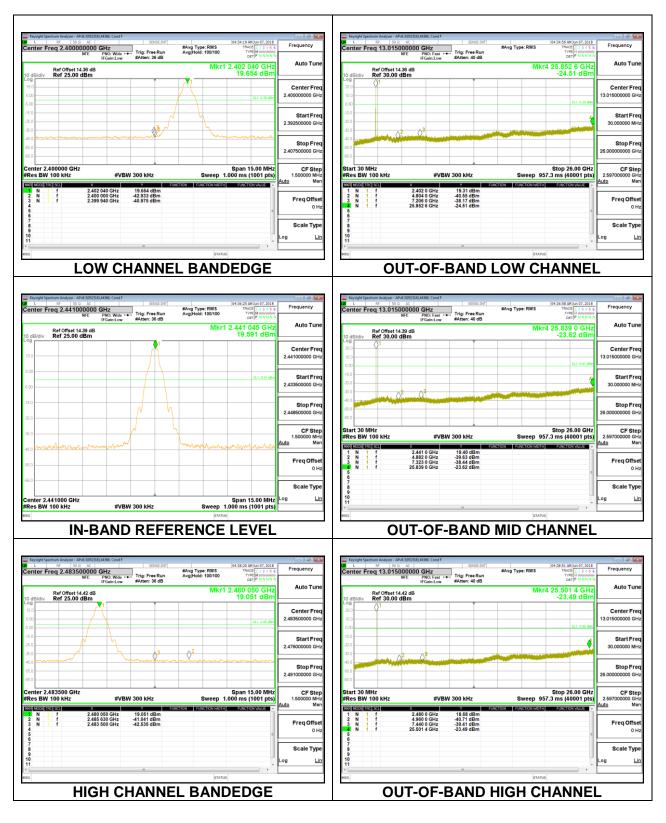
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

The band edges at 2.4 and 2.4835 GHz are investigated with the transmitter set to the normal hopping mode.

RESULTS

8.8.1. HIGH POWER BASIC DATA RATE GFSK MODULATION

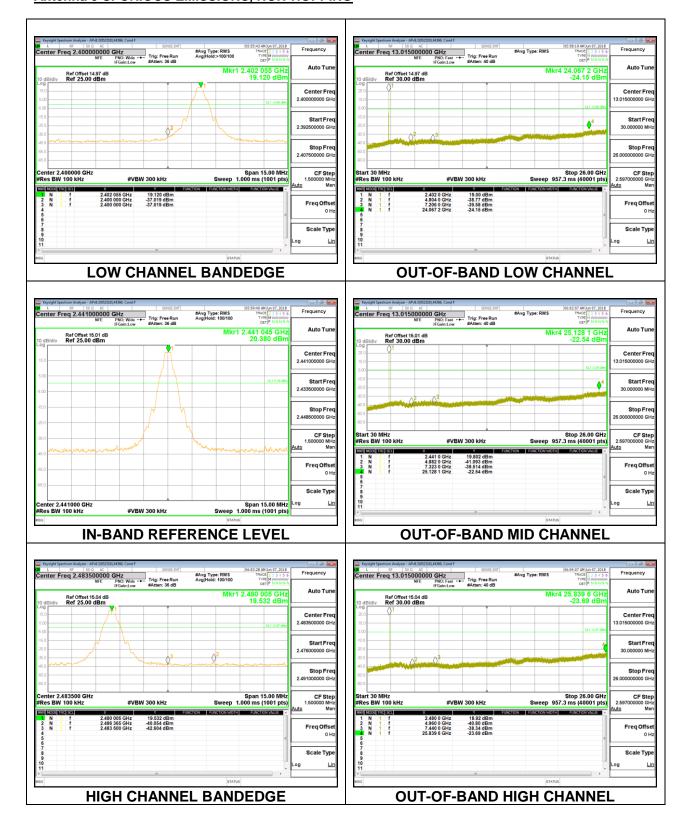
Antenna 2 SPURIOUS EMISSIONS, NON-HOPPING



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Center Freq 2.40000000 GHz PNO: Wide ---Trig: Free Run SAtten: 40 dB kryse Spectra margin and the second TRACE 1 2 3 4 5 6 01 PM Jun 28, 2018 Frequency Frequency #Avg Type: RMS Avg|Hold: 100/100 #Avg Type: RMS Avg|Hold: 100/100 Mkr1 2.407 005 GH 20.495 dBn Auto Tun Auto Tur /kr1 2.477 845 GHz 19.290 dBm Ref Offset 14.36 dB Ref 30.00 dBm Ref Offset 14.36 dB Ref 30.00 dBm Center Fre Center Fre 2.4 2.483500000 G 00 Gł Start Fre Start Fre 2.392500000 GH 2.476000000 G Stop Fre Stop Fre 2.491000000 GH 2.407500000 GH enter 2.483500 GHz Res BW 100 kHz ter 2.400000 GHz s BW 100 kHz Span 15.00 MHz 1.000 ms (1001 pts) CF Step 1.500000 MH Span 15.00 MHz 1.000 ms (1001 pts) CF Step 1.500000 MHz 300 kHz #VBW 300 kHz 20.495 dBm -37.370 dBm -32.964 dBm 19.290 dBm -35.394 dBm -38.061 dBm 2.407 005 GHz 2.400 000 GHz 2.399 805 GHz 2.477 845 GHz 2.488 015 GHz 2.483 500 GHz NNN N N 11 11 Freq Offs Freq Offse 0 ⊦ 0 ⊢ Scale Typ Scale Typ 10 LOW BANDEDGE **HIGH BANDEDGE**

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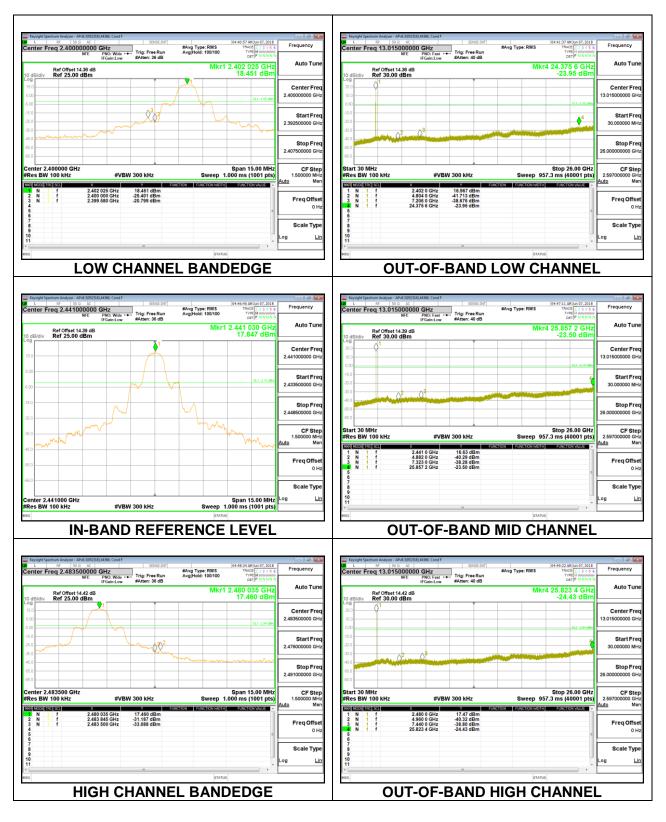
DATE: 8/23/2018 IC: 579C-E3220A

Center Freq 2.483500000 GHz NFE PNO: Wide → Trig: Free Run KFE photom State of the State of t Center Freq 2.40000000 GHz NFE PN0: Wide ←→ Trig: Free Run #Atten: 36 dB 8:40 AM Jun 07, 2018 Frequency Frequency #Avg Type: RMS Avg|Hold: 100/100 #Avg Type: RMS Avg|Hold: 100/100 Auto Tun Auto Tur 1kr1 2.404 155 GHz 21.163 dBm lkr1 2.477 155 GHz 20.669 dBm Ref Offset 14.97 dB Ref 25.00 dBm Ref Offset 14.97 dB Ref 25.00 dBm Center Fre Center Fre 2.40 2.483500000 G 00 Gł Start Fre Start Fre 2.392500000 GH 2.476000000 G $\sqrt{3}$ $\sqrt{2}$ ()² Stop Fre Stop Fre 2.491000000 GH 2.407500000 G enter 2.483500 GHz Res BW 100 kHz ter 2.400000 GHz s BW 100 kHz Span 15.00 MHz 1.000 ms (1001 pts) CF Step 1.500000 MH Span 15.00 MHz 1.000 ms (1001 pts) CF Step 1.500000 MHz 300 kHz #VBW 300 kHz 2.404 155 GHz 2.400 000 GHz 2.399 190 GHz 21.163 dBm -43.065 dBm -38.205 dBm 20.669 dBm -40.971 dBm -41.768 dBm 2.477 155 GHz 2.488 300 GHz 2.483 500 GHz NNN N N 11 11 Freq Offs Freq Offse 0 ⊦ 0 ⊢ Scale Typ Scale Typ 10 LOW BANDEDGE **HIGH BANDEDGE**

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8.8.2. HIGH POWER ENCHANCED DATA RATE 8PSK MODULATION

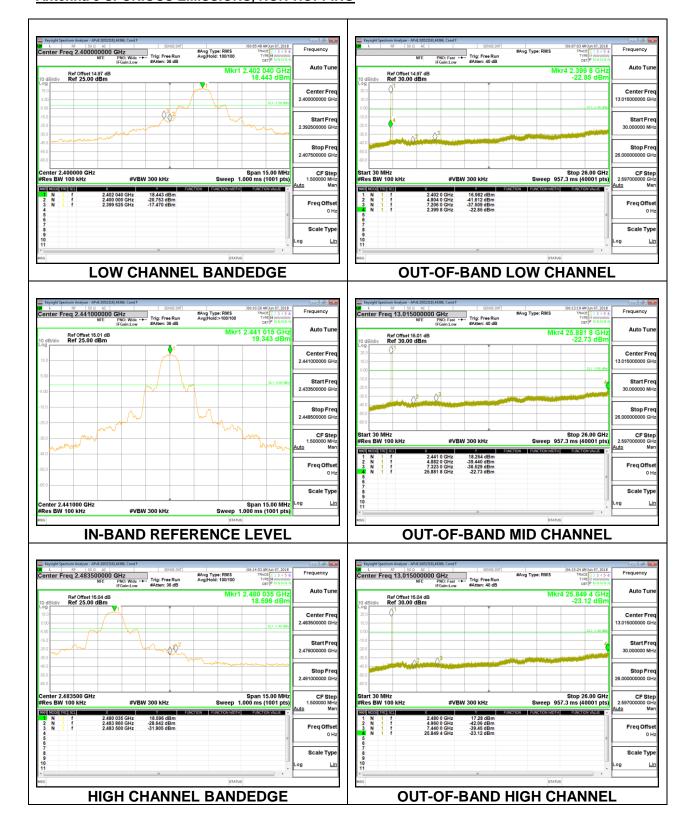
Antenna 2 SPURIOUS EMISSIONS, NON-HOPPING



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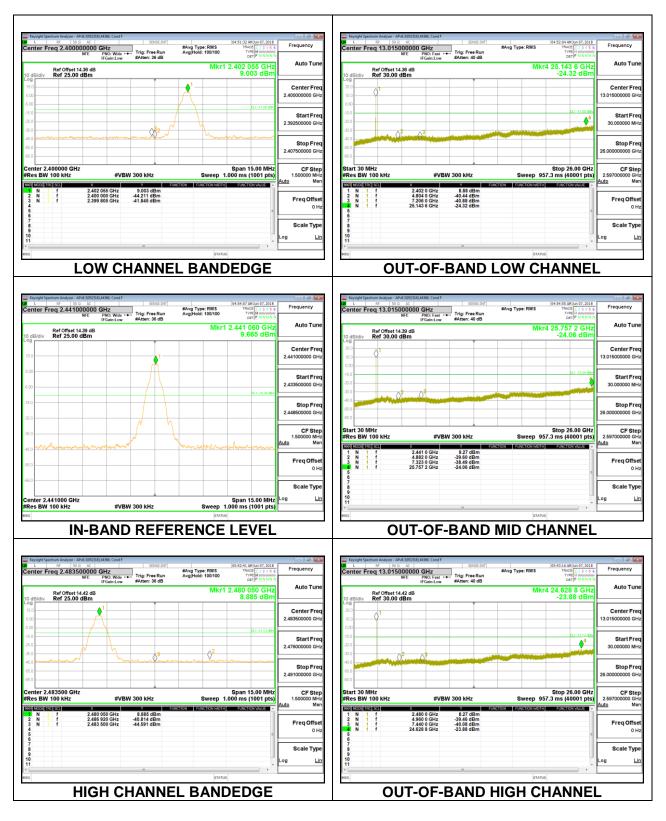
DATE: 8/23/2018 IC: 579C-E3220A

Center Freq 2.483500000 GHz NFE PNO: Wide → Trig: Free Run KFE photom State of the State of t Center Freq 2.40000000 GHz NFE PN0: Wide ←→ Trig: Free Run #Atten: 36 dB 30 AM Jun 07, 2018 Frequency Frequency #Avg Type: RMS Avg|Hold: 100/100 #Avg Type: RMS Avg|Hold: 100/100 Auto Tun Auto Tur 1kr1 2.404 995 GH 20.960 dBn lkr1 2.477 155 GHz 20.061 dBm Ref Offset 14.97 dB Ref 25.00 dBm Ref Offset 14.97 dB Ref 25.00 dBm Center Fre Center Fre 2.483500000 G 2.4 00 G Start Fre Start Fre 2.392500000 GH 2.476000000 G Stop Fre Stop Fre 2.491000000 GH 2.407500000 G enter 2.483500 GHz Res BW 100 kHz ter 2.400000 GHz s BW 100 kHz Span 15.00 MHz 1.000 ms (1001 pts) CF Step 1.500000 MH Span 15.00 MHz 1.000 ms (1001 pts) CF Step 1.500000 MHz 300 kHz 300 kHz 2.404 995 GHz 2.400 000 GHz 2.399 925 GHz 20.960 dBm -25.245 dBm -22.141 dBm 20.061 dBm -27.043 dBm -27.043 dBm 2.477 155 GHz 2.483 500 GHz 2.483 500 GHz NNN N N 11 11 Freq Offs Freq Offse 0 ⊦ 0 ⊢ Scale Typ Scale Typ 10 LOW BANDEDGE **HIGH BANDEDGE**

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8.8.3. LOW POWER BASIC DATA RATE GFSK MODULATION

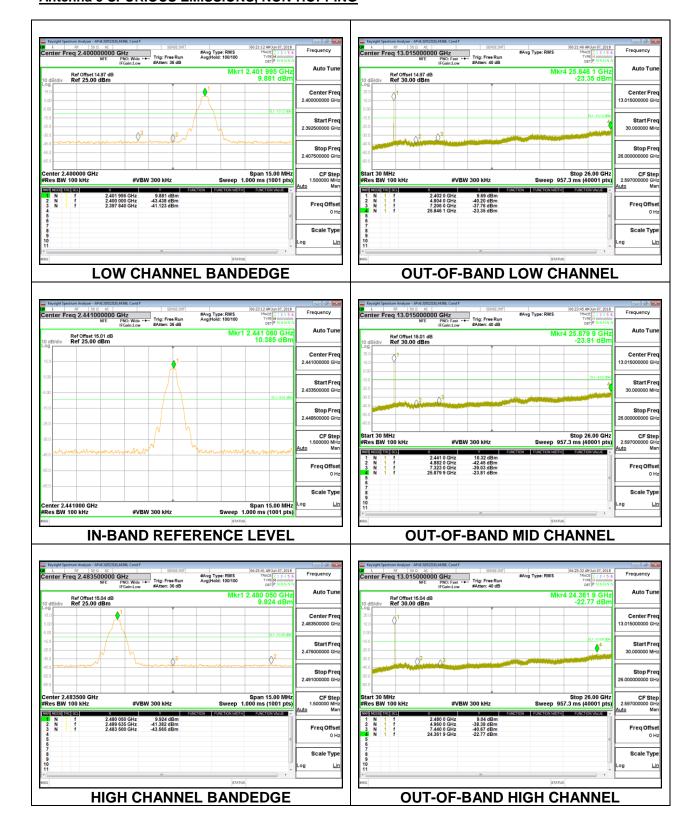
Antenna 2 SPURIOUS EMISSIONS, NON-HOPPING



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Center Freq 2.483500000 GHz NFE PNO: Wide → Trig: Free Run KFE photom State of the State of t 18 AM Jun 07, 2018 Center Freq 2.40000000 GHz NFE PN0: Wide ↔ Trig: Free Run #Atten: 36 dB Frequency Frequency #Avg Type: RMS Avg|Hold: 100/100 #Avg Type: RMS Avg|Hold: 100/100 DET P Auto Tun Auto Tur Mkr1 2.406 165 GHz 10.012 dBm lkr1 2.478 010 GHz 7.525 dBm Ref Offset 14.36 dB Ref 25.00 dBm Ref Offset 14.36 dB Ref 25.00 dBm **∮**¹ Center Fre Center Fre **o** 2.483500000 G 2.4000 00 Gł Start Fre Start Fre 2.392500000 GH 2.476000000 G 0 Stop Fre Stop Fre 2.491000000 GH 2.407500000 G enter 2.483500 GHz Res BW 100 kHz ter 2.400000 GHz s BW 100 kHz Span 15.00 MHz p 1.000 ms (1001 pts) CF Step 1.500000 MH Span 15.00 MHz 1.000 ms (1001 pts) CF Step 1.500000 MHz 300 kHz 300 kHz 10.012 dBm -42.669 dBm -41.054 dBm 7.525 dBm -40.729 dBm -42.522 dBm 2.406 165 GHz 2.400 000 GHz 2.395 440 GHz 2.478 010 GHz 2.490 490 GHz 2.483 500 GHz NNN N N 11 11 Freq Offs Freq Offse 0 ⊦ 0 ⊢ Scale Typ Scale Typ 10 LOW BANDEDGE **HIGH BANDEDGE**

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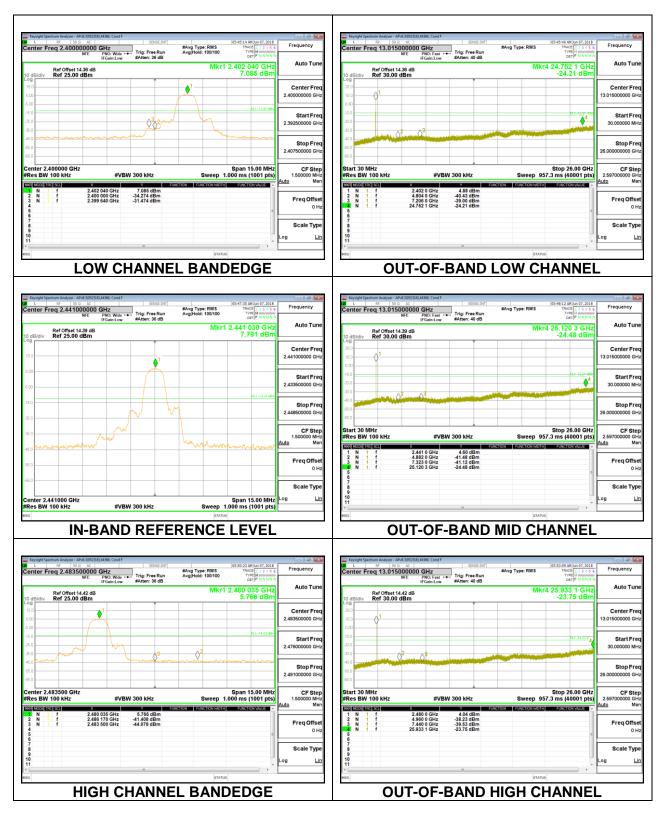
DATE: 8/23/2018 IC: 579C-E3220A

Center Freq 2.483500000 GHz NFE PNO: Wide → Trig: Free Run KFE photom State of the State of t Center Freq 2.40000000 GHz NFE PN0: Wide ↔ Trig: Free Run #Atten: 36 dB TRACE 1 2 3 4 5 6 33 AM Jun 07, 2018 Frequency Frequency #Avg Type: RMS Avg|Hold: 100/100 #Avg Type: RMS Avg|Hold: 100/100 Mkr1 2.407 155 GHz 9.059 dBm Auto Tun Auto Tur 1kr1 2.478 160 GHz 7.372 dBm Ref Offset 14.97 dB Ref 25.00 dBm Ref Offset 14.97 dB Ref 25.00 dBm 1 Center Fre Center Fre **)** 2.483500000 G 2.4000 00 Gł Start Fre Start Fre 2.476000000 G 2.392500000 GH Stop Fre 2.491000000 GH Stop Fre 2.407500000 GH enter 2.483500 GHz Res BW 100 kHz ter 2.400000 GHz s BW 100 kHz Span 15.00 MHz p 1.000 ms (1001 pts) CF Step 1.500000 MH Span 15.00 MHz 1.000 ms (1001 pts) CF Step 1.500000 MHz 300 kHz 300 kHz 2.407 155 GHz 2.400 000 GHz 2.395 575 GHz 9.059 dBm -43.235 dBm -40.276 dBm 7.372 dBm -40.075 dBm -40.635 dBm 2.478 160 GHz 2.486 305 GHz 2.483 500 GHz NNN N N 11 11 Freq Offs Freq Offse 0 ⊦ 0 ⊢ Scale Typ Scale Typ 10 LOW BANDEDGE **HIGH BANDEDGE**

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8.8.4. LOW POWER ENCHANCED DATA RATE 8PSK MODULATION

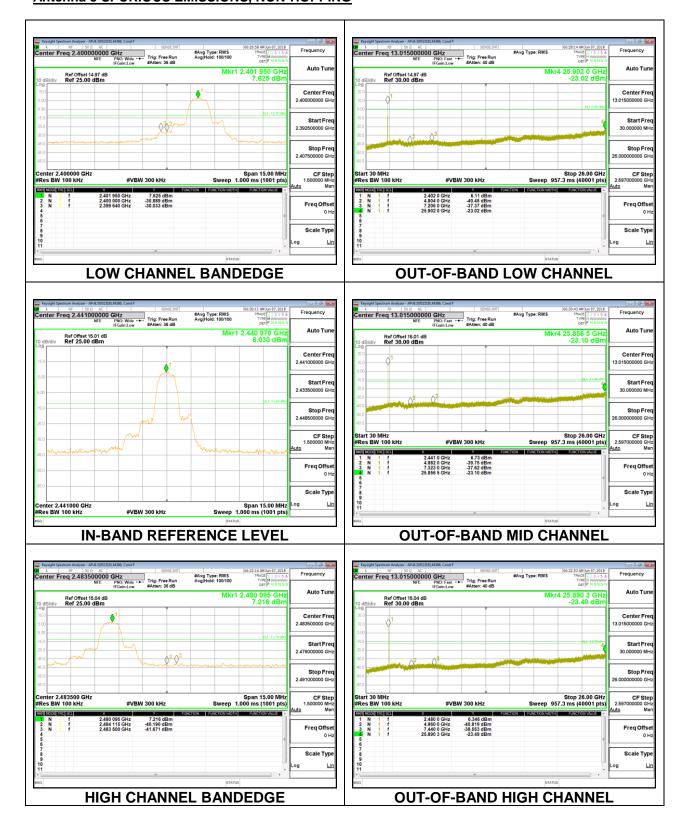
Antenna 2 SPURIOUS EMISSIONS, NON-HOPPING



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Center Freq 2.40000000 GHz #Avg Type: RMS NFE PNO: Wide +++ Trig: Free Run Avg[Hold: 100/100	09:25:21 AM Jun 07, 2018 TRACE 1 2.3 4 5 6 TYPE M WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW	■ Copylot Section Anders - 364.335238,4386, Cost F	Frequency	
Ref Offset 14.36 dB Mkr1 2. 10 dB/div Ref 25.00 dBm	403 165 GHz 8.741 dBm	Ref Offset 14.36 dB Mkr1 2.477 005 GHz 10 dB/div Ref 25.00 dBm 5.402 dBm	Auto Tune	
	Center Freq 2.40000000 GHz		Center Free 2.483500000 GHz	
-150 	2.392500000 GHz	150 21.1469 dbs	Start Fre 2.476000000 GH	
450	Stop Freq 2.407500000 GHz		Stop Fre 2.491000000 GH	
#Res BW 100 kHz #VBW 300 kHz Sweep 1.00	Span 15.00 MHz 1.50000 MHz 1.500000 MHz Auto Man	Center 2.483500 GHz Span 15.00 MHz Res BW 100 kHz #VBW 300 kHz Sweep 1.000 ms (1001 pts) Double 201 2 V Research Researc	CF Step 1.500000 MH Auto Mar	
I f 2.403 165 GHz 8.741 dBm 2 N f 2.400 000 GHz -35.884 dBm 3 N f 2.399 490 GHz -32.626 dBm 4 5 5 5 5	Freq Offset	I N 1 f 2.477 005 GHz 5.402 dBm 2 N 1 f 2.490 340 GHz -40.224 dBm 3 N f 2.483 560 GHz -42.542 dBm 4 - - - - 5 - - - -	FreqOffse 0⊦	
6 7 8 9 9 10 11	Scale Type	6 7 8 9 9 10 11	Scale Typ	
* m MSG STATUS	•	AL BIA		
LOW BANDEDGE		HIGH BANDEDGE		

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Keysight Spectrum Analyzer - APv8-3(052318),44366, Cond F		- a a 💌	Keysight Spectrum Analyzer - APv83052388;4396; Cond F	0 8	
Center Freq 2.400000000 GHz NFE PNO: Wide →→ Trig: Free Run	10:20:58 AM Jun 07, 2018 #Avg Type: RMS TRACE Avg Hold: 100/100 TYPE M WWWWW TYPE M WWWWW	Frequency	B S00 AC SENSEINT 10:21:58 AM bin 07,2018 Center Freq 2.483500000 GHz #Avg Type: RM 10:21:58 AM bin 07,2018 TMCE [12:34:56 NEE PRO: Wide +++ Trig: Free Run AvgIHold: 100100 TMCE [12:34:56	Frequency	
IFGain:Low #Atten: 36 dB Ref Offset 14.97 dB 10 dB/div Ref 25.00 dBm	Mkr1 2.402 010 GHz 8.124 dBm	Auto Tune	IFGainLow #Atten: 36 dB Certification Ref Offset 14.97 dB Mkr1 2.477 dB 5.445 dBm 0 dBldiv Ref 25.00 dBm 5.445 dBm	Auto Tur	
500	mannon	Center Freq 2.40000000 GHz		Center Fre 2.483500000 GF	
150 250 350	2.1.1180.dbn	Start Freq 2.392500000 GHz	150 x1 455 x0 1 150 x3 x 1455 x0 1 350 x3 x 1455 x0 1 350 x 1455 x0 1 x 1455 x0	Start Fr 2.476000000 G	
50		Stop Freq 2.407500000 GHz		Stop Fr 2.491000000 G	
	Span 15.00 MHz Sweep 1.000 ms (1001 pts) UNCTION FUNCTION WALKE	CF Step 1.500000 MHz <u>Auto</u> Man	MKRI MODELTRC SCL X Y FUNCTION WDTH FUNCTION VALUE A	CF St 1.500000 M Auto M	
1 N 1 f 2.402.010 GHz 8.124 dBm 2 N 1 f 2.400.000 GHz -35.011 dBm 3 N 1 f 2.309 775 GHz -31.969 dBm 5 6 6 6 6 6		Freq Offset 0 Hz	I N 1 f 2.477 860 GHz 5.485 dBm 2 3.1 1 f 2.480 952 GHz -3.923 dBm 3. 3. N 1 f 2.483 600 GHz -4.2262 dBm 4.2 4.2 2.62 dBm 4.2 5. 7. 5. 5. 5. 5. 5. 5. 5. 5. 5. 5. 5. 5. 5. 5. 5. 5. 5. 5. 5. <td>Freq Off</td>	Freq Off	
7 8 9 10		Scale Type Log <u>Lin</u>		Scale Ty	
et and a status			MIG STATUS		
LOW BANDEDGE			HIGH BANDEDGE		

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