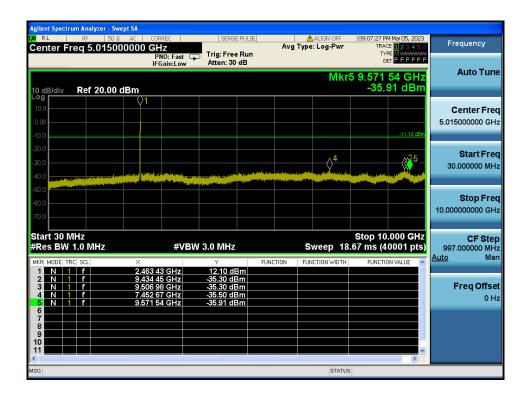


Agilent Spectrum Analyzer - Swept SA				
RL RF 50 2 ▲ DC Center Freq 15.004500 MI	CORREC SENSE:PULS	ALIGN OFF	09:07:19 PM Mar 05, 2023 TRACE 1 2 3 4 5 6	Frequency
10 dB/div Ref 20.00 dBm	PNO: Fast  Trig: Free Run IFGain:Low Atten: 30 dB		TRACE 1 2 3 4 5 6 TYPE MWWWWW DET PPPPPP Mkr1 291.7 kHz -44.37 dBm	Auto Tune
- og				Center Fre 15.004500 MH
20.0 30.0 40.0				Start Fre 9.000 kH
50.0 Manufinghilaningh	nan-typeisitentetaan tifetadi mitmiside site taak	ha bilan serel sing the rich new grip reference in the prior and the pri	hirefolius, regenslinedry (Mildodgethur, natur	Stop Fre 30.000000 MH
Start 9 kHz Res BW 100 kHz	<b>#VBW 300 kHz</b>	Sweep 5.	Stop 30.00 MHz 333 ms (40001 pts)	<b>CF Ste</b> 2.999100 MH <u>Auto</u> Ma
1         N         1         f           2         -         -         -           3         -         -         -           4         -         -         -           5         -         -         -           6         -         -         -	291.7 kHz -44.37 dBm			Freq Offso 0 ⊦
8 7 8 9 10 11				
sg	al	STATU	DC Coupled	





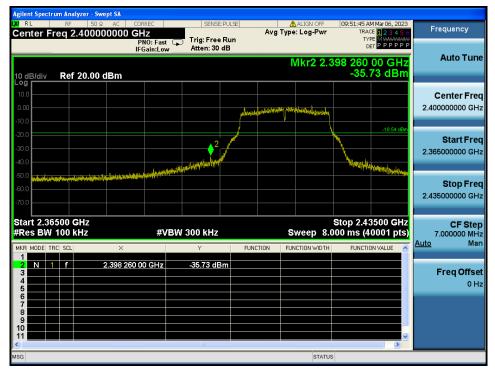
gilent Spectrum Analyzer - Swept SA					
RL RF 50Ω AC Center Freq 17.5000000	000 GHz	SENSE:PULSE	ALIGN OFF Avg Type: Log-Pwr	09:07:35 PM Mar 05, 2023 TRACE 123456	Frequency
		rig: Free Run Atten: 30 dB		TYPE MWWWWW DET PPPPP	
10 dB/div Ref 20.00 dBm			Mkr3 2	4.479 500 GHz -26.15 dBm	Auto Tune
0.00 10.0				-11.18 dBm	<b>Center Fre</b> 17.500000000 GH
20.0 20.0 30.0 40.0				3	<b>Start Fred</b> 10.000000000 GH:
50.0					<b>Stop Fre</b> 25.000000000 GH
tart 10.000 GHz Res BW 1.0 MHz	#VBW 3.	0 MHz	Sweep 40	Stop 25.000 GHz 00 ms (40001 pts)	CF Ste 1.50000000 GH
	802 750 GHz	Y FUNC 25.46 dBm	TION FUNCTION WIDTH	FUNCTION VALUE	<u>Auto</u> Ma
3 N 1 f 24. 4 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5		25.48 dBm 26.15 dBm		=	<b>Freq Offse</b> 0 H
6 7 8 9 10					
		шı		×	
5G			STATUS		

# TM 2 & ANT 2 & 2412

#### Reference

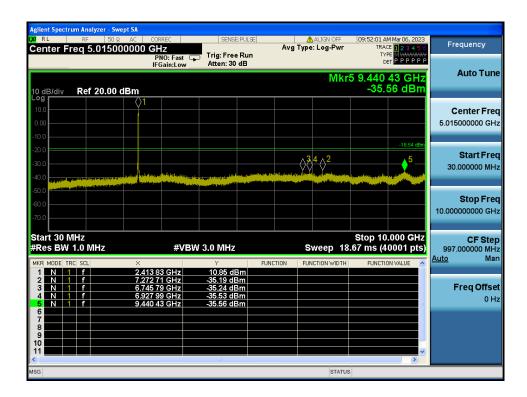


#### Low Band-edge





Agilent Spectrum Analyzer - Swep							
RL RF 50 Ω <u>▲</u> Center Freq 15.00450		SENSE:PULSE		ALIGN OFF	TRAC	4 Mar 06, 2023 E <mark>1 2 3 4 5 6</mark>	Frequency
	PNO: Fast G IFGain:Low	Trig: Free Run Atten: 30 dB			TYP DE		Auto Tune
10 dB/div Ref 20.00 dl	3m				-45.1	l1 dBm	
10.0							Center Free
0.00							15.004500 MH
20.0						-18.54 dBm	
-30.0							Start Fre 9.000 kH
-40.0							9.000 KH
50.0	undef aller and a second state and a second	hallman monard barrow	No. of the state of the state	يس والاستخاصة المرابع المالية	an iber and shire a	the Assault	Stop Fre
80.0			and a second of the second		ar de la construction de la construcción de la construcción de la construcción de la construcción de la constru La construcción de la construcción d	and the second second	30.000000 MH
-70.0							
Start 9 kHz #Res BW 100 kHz	#VB\	№ 300 kHz		Sweep 5.3	Stop 30 33 ms (40		<b>CF Ste</b> 2.999100 MH Auto Ma
MKR MODE TRC SCL	× 281.9 kHz	ץ -45.11 dBm	FUNCTION	FUNCTION WIDTH	FUNCTIO	N VALUE	<u>Auto</u> wa
2 2 2							Freq Offse
4 5							0+
6							
8							
10							
SG				STATUS	L DC Cou	pled	





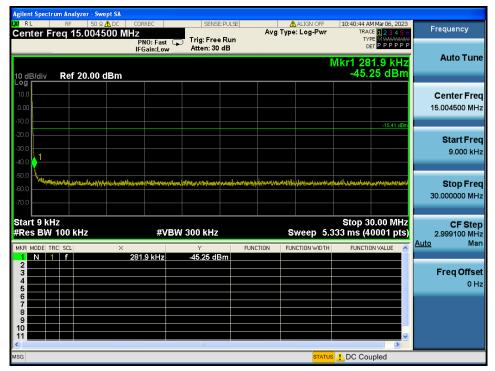
Agilent Spectrum										
X/ RL Center Fred	RF 50Ω			SENSE:P			ALIGN OFF	TRA	M Mar 06, 2023	Frequency
	tef 20.00 dE	PNC IFGa	: Fast 😱 in:Low	Trig: Free F Atten: 30 d			Mkr3 2	TY D 4.266 5	00 GHz	Auto Tune
										Center Fred 17.500000000 GHz
-20.0 -30.0 -40.0				an the state of the base of th	na li forgan (na linera de sera	an a			-18 5 3 50	Start Fred 10.000000000 GHz
-50.0 -60.0 -70.0										Stop Free 25.000000000 GH:
Start 10.000 ⊄Res BW 1.0			#VBW	3.0 MHz		s	weep 40	Stop 25 .00 ms (4	.000 GHz 0001 pts)	CF Ster 1.50000000 GH
MKR MODE TRC S	f	× 24.720 625 (		۲ -25.43 dBn		IN FUN	ICTION WIDTH	FUNCTI	ON VALUE	<u>Auto</u> Mai
		24.900 625 24.266 500		-26.15 dBn -26.76 dBn						Freq Offse 0 H
7 8 9 10										
				ш					>	
SG							STATUS			

# TM 2 & ANT 2 & 2437

#### Reference



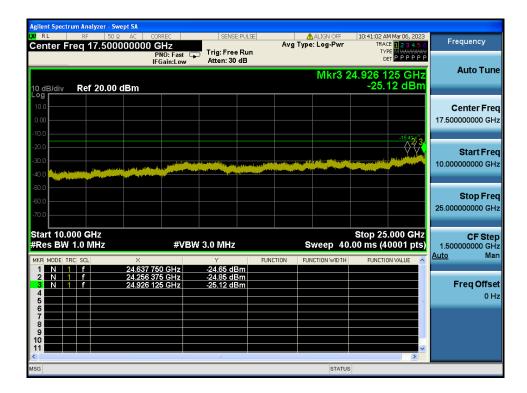
#### **Conducted Spurious Emissions**



Pages: 78 / 122



Agilent Spectrum Analyzer - Swep					
X RL RF 50 Ω Center Freq 5.01500	AC CORREC	SENSE:PULSE	ALIGN OF	r TRACE 123456	Frequency
10 dB/div Ref 20.00 d	PNO: Fast G IFGain:Low	Trig: Free Run Atten: 30 dB	M	түре Муминий Det P P P P P P kr5 9.512 97 GHz -35.36 dBm	Auto Tune
	V1				Center Fred 5.015000000 GHz
-20.0				-15.41 dBm	Start Free 30.000000 MHz
-50.0 Another and left his rest life, his high a first hi					Stop Free 10.000000000 GH:
Start 30 MHz #Res BW 1.0 MHz	#VBV	V 3.0 MHz	Sweep	Stop 10.000 GHz 18.67 ms (40001 pts)	CF Step 997.000000 MH
MKR MODE TRC SCL	× 2.436 26 GHz	ү 13.53 dBm	FUNCTION FUNCTION WID	TH FUNCTION VALUE	Auto Mai
2 N 1 f 3 N 1 f 4 N 1 f 5 N 1 f	9.399 06 GHz 9.461 12 GHz 6.925 50 GHz 9.512 97 GHz	-34.19 dBm -34.90 dBm -34.97 dBm -35.36 dBm			Freq Offse 0 Hi
6 7 8 9 10					
11		ш		×	
ISG			STA	TUS	



# TM 2 & ANT 2 & 2462





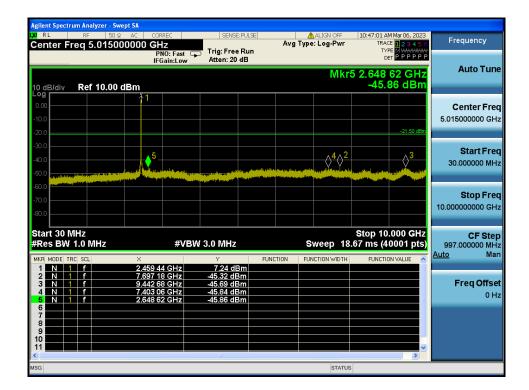
### **High Band-edge**



Pages: 80 / 122



Agilent Spectrum Analyzer - Swept SA						
XIRL RF 50Ω 🛕 DC			ALIGN OFF	10:46:52 AM Ma	ar 06, 2023	Frequency
Center Freq 15.004500 M	PNO: Fast Trig: Free IFGain:Low Atten: 20	e Run - ···	be. Log-Pwr		23456 1 <del>www.w</del> PPPPP	
10 dB/div Ref 10.00 dBm			ſ	/lkr1 290.: -53.07		Auto Tune
0.00						Center Fre
10.0						15.004500 MH
20.0					-21.50 dBm	
30.0						Start Fre
40.0						9.000 kH
-50.0						
70.0	leichritzbelehzinsteansbagterzentegansteileitekeide	al and a state of the	ingrated and an and a state of the state of	white the weather that	himmenia	Stop Fre
80.0						30.000000 MH
Start 9 kHz #Res BW 100 kHz	#VBW 300 kHz	<u> </u>	Sweep 5.3	Stop 30.0 33 ms (400	0 MHz 01 pts)	<b>CF Ste</b> 2.999100 MH
MKR MODE TRC SCL X	Y		UNCTION WIDTH	FUNCTION V.	ALUE	<u>Auto</u> Ma
1 N 1 f	290.2 kHz -53.07 dl	3m				En a Offe
3 4						Freq Offse 0 H
5						
7 8 11 1 11 1 11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1						
9						
					~	
SG			STATUS	1 DC Couple	ed	





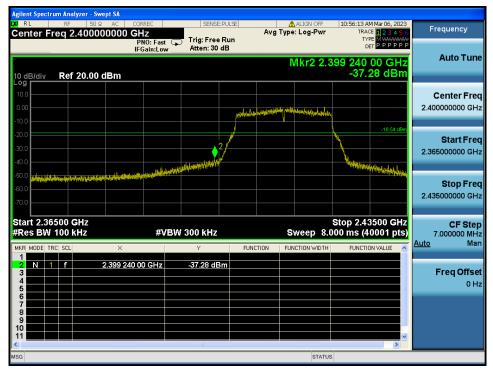
gilent Spectrum Analyzer - Swept SA					
RL RF 50 Q AC Center Freq 17.50000000		SENSE:PULSE	ALIGN OFF	10:47:09 AM Mar 06, 2023 TRACE 1 2 3 4 5 6	Frequency
	PNO: Fast	ig: Free Run tten: 20 dB		4.233 125 GHz	Auto Tune
10 dB/div Ref 10.00 dBm _og 0.00				-35.86 dBm	Center Freq
-10.0				-21.50 dBm	17.500000000 GHz
-30.0					Start Fred 10.000000000 GHz
60.0 70.0 80.0					Stop Fred 25.000000000 GH2
start 10.000 GHz Res BW 1.0 MHz	#VBW 3.0	) MHz	Sweep 40.	Stop 25.000 GHz 00 ms (40001 pts)	CF Stej 1.500000000 GH Auto Mai
IKR MODE TRC SCL X	5 000 GHz -3	Y FUNC 5.04 dBm	TION FUNCTION WIDTH	FUNCTION VALUE	<u>Auto</u> Mai
2 N 1 f 24.62 3 N 1 f 24.23 4 5	5 750 GHz -3	5.85 dBm 5.86 dBm			Freq Offse 0 Ha
6 7 8 9 10					
				×	
SG			STATUS		

# TM 3 & ANT 2 & 2412

#### Reference



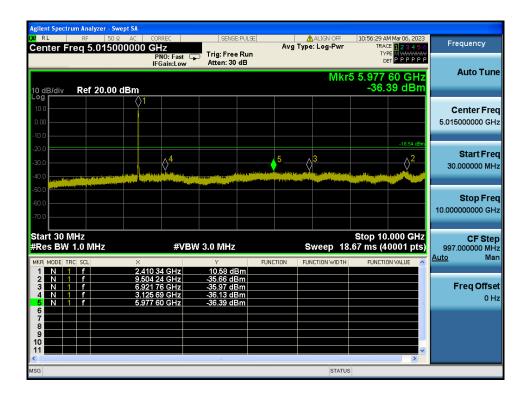
#### Low Band-edge



#### Pages: 83 / 122



Agilent Spectrum Analyzer - Swept SA				
X RL RF 50 Ω ▲DC Center Freq 15.004500 M	CORREC SENSE:PUL!	E ALIGN OFF Avg Type: Log-Pwr	10:56:21 AM Mar 06, 2023 TRACE 1 2 3 4 5 6	Frequency
	PNO: Fast Trig: Free Run IFGain:Low Atten: 30 dB		TRACE 123456 TYPE MWWWW DET P P P P P P Mkr1 281.9 kHz	Auto Tune
10 dB/div Ref 20.00 dBm			-41.72 dBm	Center Freq
0.00				15.004500 MH
-20.0			-18.54 dBm	Start Fred
-40.0				9.000 kHz
-50.0 -60.0 -70.0	thilyess, chosensethic cycartigraetrike-coloraditarytteetre	มระหน้าที่เขาและสารที่ได้ขัดสารไปสารใหญ่ใหม่สายใหญ่ใหญ่ใหญ่ 	an paranteri yang bana kan ban	Stop Free 30.000000 MH:
Start 9 kHz #Res BW 100 kHz	#VBW 300 kHz	Sweep 5.	Stop 30.00 MHz 333 ms (40001 pts)	CF Step 2.999100 MH Auto Mai
MKR MODE TRC SCL X	281.9 kHz -41.72 dBm	FUNCTION FUNCTION WIDTH	FUNCTION VALUE	<u>Auto</u> Mar
3 4 5				Freq Offse 0 H:
6 7 8 9				
			×	
ISG		STATL	DC Coupled	





gilent Spectrum Analyzer - Swept SA				
RL RF 50Ω AC Center Freq 17.50000000		ALIGN OFF	10:56:37 AM Mar 06, 2023 TRACE 1 2 3 4 5 6	Frequency
10 dB/div Ref 20.00 dBm	PNO: Fast 💭 Trig: Free Run IFGain:Low Atten: 30 dB	Mkr3 2	түре Милинин Det P P P P P P 24.217 750 GHz -26.35 dBm	Auto Tune
• g				Center Fre 17.500000000 GH
20.0 30.0 40.0			-19, 3 25	<b>Start Free</b> 10.000000000 GH
50.0 50.0 70.0				Stop Fre 25.000000000 GH
tart 10.000 GHz Res BW 1.0 MHz	#VBW 3.0 MHz	Sweep 40	Stop 25.000 GHz .00 ms (40001 pts)	CF Ste 1.500000000 GH Auto Ma
2 N 1 f 24.454	9 750 GHz -26.10 dBm 4 000 GHz -26.33 dBm 7 750 GHz -26.35 dBm	FUNCTION FUNCTION WIDTH	FUNCTION VALUE	Freq Offse 0 H
8 9 10 11 11 sg		STATUS	×	

# TM 3 & ANT 2 & 2437

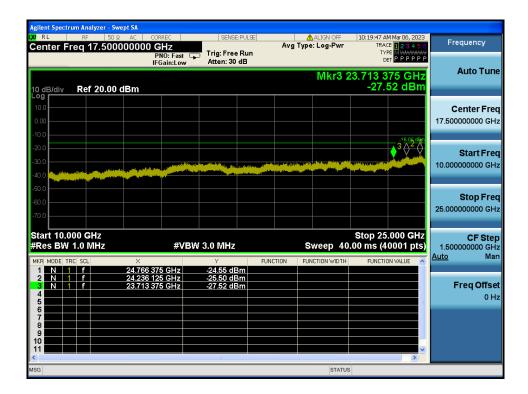


#### Reference

Agilent Spectrum Analyzer - Swept SA					
🗶 RL RF   50 Ω 🛕 DC   Center Freq 15.004500 M	CORREC HZ	SENSE:PULSE	ALIGN OFF Avg Type: Log-Pwr	10:19:31 AM Mar 06, 2023 TRACE 1 2 3 4 5 6	Frequency
	PNO: East	Trig: Free Run Atten: 30 dB		TYPE MWWWWW DET PPPPP	
	II Galil.2000			Mkr1 281.9 kHz	Auto Tune
10 dB/div Ref 20.00 dBm				-44.01 dBm	
10.0					Conton Enor
0.00					Center Freq 15.004500 MHz
-10.0					13.004300 Mil 12
-20.0				-16.05 dBm	
-30.0					Start Freq
-40.0					9.000 kHz
-50.0					
-60.0	ulanturation patienting of	and a child of the second of the	<b>uthorn</b> inionantestimentellise	electrolyledelectronectorylectrologies	Stop Freq
-70.0					30.000000 MHz
Start 9 kHz #Res BW 100 kHz	#VBW 3	00 kHz	Sweep 5.3	Stop 30.00 MHz 333 ms (40001 pts)	CF Step 2.999100 MHz
MKRI MODEI TRCI SCL X		Y FUN	CTION FUNCTION WIDTH	FUNCTION VALUE	<u>Auto</u> Man
1 N 1 f	281.9 kHz	-44.01 dBm			
3					Freq Offset
5				=	0 Hz
6					
8					
10					
<				>	
MSG			STATUS	DC Coupled	

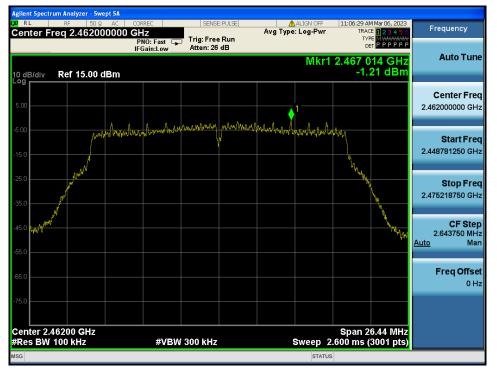


Agilent Spectrum Analyzer - Sv					
	2 AC CORREC	SENSE:PULSE	ALIGN OFF Avg Type: Log-Pwr	10:19:40 AM Mar 06, 2023	Frequency
Center Freq 5.0150	DUUUU GHZ PNO: Fast IFGain:Low	Trig: Free Run Atten: 30 dB	Avg Type: Log-Pwr	TRACE 123456 TYPE MWWWWW DET PPPPP	
10 dB/div Ref 20.00			Mkr	5 3.176 78 GHz -35.47 dBm	Auto Tune
Log 10.0 0.00 -10.0				-16.05 dBm	Center Frec 5.015000000 GHz
-20.0					Start Free 30.000000 MH:
50.0 60.0 70.0					Stop Fre 10.000000000 GH
Start 30 MHz #Res BW 1.0 MHz	#VBW	/ 3.0 MHz	Sweep 18	Stop 10.000 GHz .67 ms (40001 pts)	CF Stej 997.000000 MH
MKR MODE TRC SCL	× 2.438 00 GHz	Y FU 12.46 dBm	NCTION FUNCTION WIDTH	FUNCTION VALUE	<u>Auto</u> Ma
2 N 1 f 3 N 1 f 4 N 1 f 5 N 1 f	9.401 80 GHz 9.455 89 GHz 7.447 93 GHz 3.176 78 GHz	-34.65 dBm -34.82 dBm -35.24 dBm -35.47 dBm			Freq Offse 0 H
6 7 8 9 10					
<		Ш		×	
SG			STATUS	5	



# TM 3 & ANT 2 & 2462



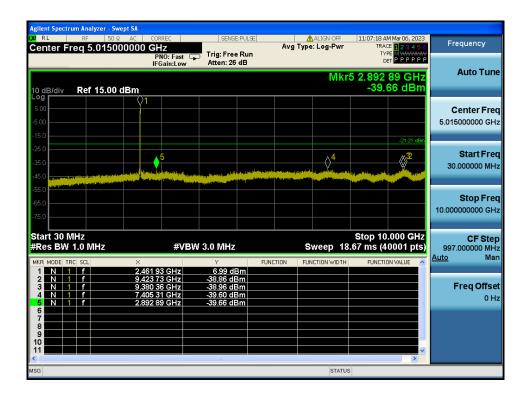


### **High Band-edge**





Agilent Spectrum Analyzer - Swept SA				
X/RL RF 50 Ω ▲DC Center Freq 15.004500 MI	CORREC SENSE:PULS	Avg Type: Log-Pwr	11:07:10 AM Mar 06, 2023 TRACE 123456	Frequency
10 dB/div Ref 15.00 dBm	PN0: Fast Trig: Free Rur IFGain:Low Atten: 26 dB		туре Милини Det P P P P P P Mkr1 281.9 kHz -48.24 dBm	Auto Tune
5.00 -5.00 -15.0			-21 21 dBm	Center Fred 15.004500 MHz
-25.0			-21.21 upri	Start Fred 9.000 kH;
-55.0 When the last of the las	Harthon ya atara atara ya kata da	nal <sub>taa</sub> lkaleytaataistaanaalka	gydr <sub>af yw</sub> rdd felefan yfar y gdar yf yf ygar yr yfelyd,	Stop Free 30.000000 MH
Start 9 kHz #Res BW 100 kHz	#VBW 300 kHz	Sweep 5.	Stop 30.00 MHz .333 ms (40001 pts)	<b>CF Stej</b> 2.999100 MH <u>Auto</u> Ma
	281.9 kHz -48.24 dBm			Freq Offse 0 H
7 8 9 10 11			×	
ISG			JS DC Coupled	





Center Freq 17.500000000 GHz         Trig: Free Run Ref 15.00 dBm         Avg Type: Log-Pwr         Trig: Free Quency         Auto Tune           0 dB/div         Ref 15.00 dBm         -29.97 dBm         -29.97 dBm         -29.97 dBm         -29.97 dBm         -29.97 dBm         -29.97 dBm         -29.0000000000000 GHz         -29.00000000 GHz         -29.97 dBm         -29.00000000 GHz         -29.97 dBm         -29.07 dBm <td< th=""><th>gilent Spectrum Analyzer - Swept SA</th><th></th><th></th><th></th><th></th><th></th></td<>	gilent Spectrum Analyzer - Swept SA					
Non-trice       Trig: Free Run IF Gain:Low       Trig: Free Run Atten: 26 dB       Mkr3 24.486 625 GHz -29.97 dBm       Auto Tune         0 dB/div       Ref 15.00 dBm       -29.97 dBm       -29.97 dBm       -29.97 dBm       Center Free 17.50000000 GHz         25 0			SENSE:PULSE		11:07:26 AM Mar 06, 2023	Frequency
Mikr3 24.486 625 GHz       -29.97 dBm         -29.97 dBm       -29.97 dBm         -500       -29.97 dBm         -500       -20.97 dBm         -1       -24.291 875 GHz         -29.7 dBm       -29.7 dBm         -1       -24.486 625 GHz         -29.97 dBm       -29.97 dBm <tr< th=""><th></th><th>PNO: Fast 😱</th><th></th><th></th><th>TYPE MWWWWW DET PPPPP</th><th>Auto Tupo</th></tr<>		PNO: Fast 😱			TYPE MWWWWW DET PPPPP	Auto Tupo
5.00	10 dB/div Ref 15.00 dBm	Auto Tune				
250       Start Freq         350       Start Freq         360       Start Freq         370       Start Freq         380       Start Freq         39       Start Freq         39       Start Freq         30       Start Freq         31       Start Freq         32       Start Freq         33       Start Freq         34       Start Freq         35       Start Freq         35       Start Freq         34       Start Freq         35       Star Freq	5.00 					<b>Center Freq</b> 17.500000000 GHz
660       Stop Free         750       Stop 25.000 GHz         561       Stop 25.000 GHz         562       WID         563       Stop 25.000 GHz         564       Stop 25.000 GHz         565       Stop 25.000 GHz         566       Stop 25.000 GHz         2       N         1       F         24.496 625 GHz       -29.97 dBm         3       N         1       F         24.496 625 GHz       -29.97 dBm         3       Stop 25.000 GHz         3       Stop 7 GBm         3       Stop 7 GHz         4       Stop 7 GHz         5       Stop 7 GHz         5       Stop 7 GHz         6       Stop 7 GHz         7       Stop 7 GHz         8       Stop 7 GHz         9       Stop 7 GHz <td>25.0 -35.0 -45.0</td> <td></td> <td></td> <td>ter al la position aposta and la factoria della del Net della della</td> <td></td> <td><b>Start Freq</b> 10.000000000 GHz</td>	25.0 -35.0 -45.0			ter al la position aposta and la factoria della del Net della		<b>Start Freq</b> 10.000000000 GHz
KR     MODE     THC     Streep     40.00     ms     (40001 pts)       1     N     1     f     24.821 875 GHz     -28.57 dBm     -28.57 dBm       2     N     1     f     24.821 875 GHz     -29.79 dBm     -       3     N     1     f     24.426 625 GHz     -29.97 dBm     -       4     -     -     -     -     -     -       5     -     -     -     -     -     -       6     -     -     -     -     -     -       9     -     -     -     -     -     -       10     -     -     -     -     -     -						<b>Stop Freq</b> 25.000000000 GHz
ARR MODE THE SEL         X         Y         28.57 dBm         FUNCTION VIDTH         FUNC	Start 10.000 GHz #Res BW 1.0 MHz	#VBW	3.0 MHz	Sweep 4	Stop 25.000 GHz 0.00 ms (40001 pts)	1.50000000 GHz
3       N       1       f       24.486 625 GHz       -29.97 dBm       Freq Offset       0 Hz         4       5       1	1 N 1 f 24.821		-28.57 dBm	UNCTION FUNCTION WIDTH	FUNCTION VALUE	<u>Auto</u> Mar
	3 N 1 f 24.486 4 5					Freq Offset 0 Hz
	7 8					
	<		Ш	STATI		

# 5.5. Unwanted Emissions (Radiated)

# Test Requirements and limit,

# Part 15.247(d), Part 15.205, Part 15.209 & RSS-247 [5.5], RSS-Gen [8.9], RSS-Gen [8.10]

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of Part 15.247 the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

- Fall 15.209 & R55-Genje	Part 15.209 & RSS-Gen[6.9]. General requirement									
Frequency (MHz)	FCC Limit (uV/m)	IC Limit (μA/m)	Measurement Distance (m)							
0.009 - 0.490	2 400 / F (kHz)	6.37/F (F in kHz)	300							
0.490 – 1.705	24 000 / F (kHz)	63.7/F (F in kHz)	30							
1.705 - 30.0	30	0.08	30							

#### - Part 15.209 & RSS-Gen[8.9]: General requirement

Frequency (MHz)	FCC Limit (uV/m)	IC Limit (uV/m)	Measurement Distance (m)
30 ~ 88	100 **	100	3
88 ~ 216	150 **	150	3
216 ~ 960	200 **	200	3
Above 960	500	500	3

\*\*Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§15.231 and 15.241.

#### - Part 15.205(a): Restricted band of operation

MHz	MHz	MHz	MHz	GHz	GHz
0.009 ~ 0.110	8.414 25 ~ 8.414 75	108 ~ 121.94	1 300 ~ 1 427	4.5 ~ 5.15	14.47 ~ 14.5
0.495 ~ 0.505	12.29 ~ 12.293	123 ~ 138	1 435 ~ 1 626.5	5.35 ~ 5.46	15.35 ~ 16.2
2.173 5 ~ 2.190 5	12.519 75 ~ 12.520 25	149.9 ~ 150.05	1 645.5 ~ 1 646.5	7.25 ~ 7.75	17.7 ~ 21.4
4.125 ~ 4.128	12.576 75 ~ 12.577 25	156.524 75 ~ 156.525 25	1 660 ~ 1 710	8.025 ~ 8.5	22.01 ~ 23.12
4.177 25 ~ 4.177 75	13.36 ~ 13.41	156.7 ~ 156.9	1 718.8 ~ 1 722.2	9.0 ~ 9.2	23.6 ~ 24.0
4.207 25 ~ 4.207 75	16.42 ~ 16.423	162.012 5 ~ 167.17	2 200 ~ 2 300	9.3 ~ 9.5	31.2 ~ 31.8
6.215 ~ 6.218	16.694 75 ~ 16.695 25	167.72 ~ 173.2	2 310 ~ 2 390	10.6 ~ 12.7	36.43 ~ 36.5
6.267 75 ~ 6.268 25	16.804 25 ~ 16.804 75	240 ~ 285	2 483.5 ~ 2 500	13.25 ~ 13.4	Above 38.6
6.311 75 ~ 6.312 25	25.5 ~ 25.67	322 ~ 335.4	2 655 ~ 2 900		
8.291 ~ 8.294	37.5 ~ 38.25	399.90 ~ 410	3 260 ~ 3 267		
8.362 ~ 8.366	73 ~ 74.6	608 ~ 614	3 332 ~ 3 339		
8.376 25 ~ 8.386 75	74.8 ~ 75.2	960 ~ 1 240	3 345.8 ~ 3 358		
			3 600 ~ 4 400		

#### - RSS-Gen[8.10]: Restricted frequency bands

MHz	MHz	MHz	MHz	MHz	GHz
0.090 ~ 0.110	8.362 ~ 8.366	73 ~ 74.6	608 ~ 614	3 345.8 ~ 3 358	9.0 ~ 9.2
0.495 ~ 0.505	8.376 25 ~ 8.386 75	74.8 ~ 75.2	960 ~ 1 427	3 500 ~ 4 400	9.3 ~ 9.5
2.173 5 ~ 2.190 5	8.414 25 ~ 8.414 75	108 ~ 138	1 435 ~ 1 626.5	4 500 ~ 5 150	10.6 ~ 12.7
3.020 ~ 3.026	12.29 ~ 12.293	149.9 ~ 150.05	1 645.5 ~ 1 646.5	5 350 ~ 5 460	13.25 ~ 13.4
4.125 ~ 4.128	12.519 75 ~ 12.520 25	156.524 75 ~	1 660 ~ 1 710	7 250 ~ 7 750	14.47 ~ 14.5
4.177 25 ~ 4.177 75	12.576 75 ~ 12.577 25	156.525 25	1 718.8 ~ 1 722.2	8 025 ~ 8 500	15.35 ~ 16.2
4.207 25 ~ 4.207 75	13.36 ~ 13.41	156.7 ~ 156.9	2 200 ~ 2 300		17.7 ~ 21.4
5.677 ~ 5.683	16.42 ~ 16.423	162.01 25 ~ 167.17	2 310 ~ 2 390		22.01 ~ 23.12
6.215 ~ 6.218	16.694 75 ~ 16.695 25	167.72 ~ 173.2	2 483.5 ~ 2 500		23.6 ~ 24.0
6.267 75 ~ 6.268 25	16.804 25 ~ 16.804 75	240 ~ 285	2 655 ~ 2 900		31.2 ~ 31.8
6.311 75 ~ 6.312 25	25.5 ~ 25.67	322 ~ 335.4	3 260 ~ 3 267		36.43 ~ 36.5
8.291 ~ 8.294	37.5 ~ 38.25	399.90 ~ 410	3 332 ~ 3 339		Above 38.6



# 5.5.1. Test Setup

Refer to the APPENDIX I.

# 5.5.2. Test Procedures

- 1. The EUT is placed on a non-conductive table. For emission measurements at or below 1 GHz, the table height is 80 cm. For emission measurements above 1 GHz, the table height is 1.5 m.
- 2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
- 3. EUT is set 3 m away from the receiving antenna, which is varied from 1 m to 4 m to find out the highest emissions.
- 4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- 6. Repeat above procedures until the measurements for all frequencies are complete.

### Note: Measurement Instrument Setting for Radiated Emission Measurements.

- KDB558074 D01v05r02 Section 8.6
- ANSI C63.10-2013 Section 11.12

### 1. Frequency Range Below 1 GHz

RBW = 100 or 120 kHz, VBW = 3 x RBW, Detector = Peak or Quasi Peak

#### 2. Frequency Range > 1 GHz

Peak Measurement > 1 GHz

RBW = 1 MHz, VBW = 3 MHz, Detector = Peak, Sweep time = Auto, Trace mode = Max Hold until the trace stabilizes Average Measurement > 1 GHz

- 1. RBW = 1 MHz (unless otherwise specified).
- 2. VBW ≥ 3 x RBW.
- 3. Detector = RMS (Number of points  $\geq$  2 x Span / RBW)
- 4. Averaging type = power (i.e., RMS).
- 5. Sweep time = auto.
- 6. Perform a trace average of at least 100 traces.
- 7. A correction factor shall be added to the measurement results prior to comparing to the emission limit in order to compute the emission level that would have been measured had the test been performed at 100 percent duty cycle. The correction factor is computed as follows:
  - 1) If power averaging (RMS) mode was used in step 4, then the applicable correction factor is  $10 \log(1 / D)$ , where D is the duty cycle.
  - 2) If linear voltage averaging mode was used in step 4, then the applicable correction factor is 20 log(1 / D), where D is the duty cycle.
  - 3) If a specific emission is demonstrated to be continuous (≥ 98 percent duty cycle) rather than turning on and off with the transmit cycle, then no duty cycle correction is required for that emission.

est Mode	Date rate	T <sub>on</sub> (ms)	T <sub>on+off</sub> (ms) D = T <sub>on</sub> / (T <sub>on+off</sub> )		DCCF = 10 log(1/D) (dB)
TM 1	1 Mbps	8.610	8.700	0.989 7	0.04
TM 2	6 Mbps	1.428	1.527	0.935 2	0.29
TM 3	MCS 0	1.335	1.435	0.930 3	0.31
TM 3		1.335	_	0.930 3	

#### **Duty Cycle Correction factor**

Note1: Where, T= Transmission duration / D= Duty cycle Note2: Please refer to the appendix II for duty cycle plots.

# 5.5.3. Test Results

#### **Test Notes** -

1. The radiated emissions were investigated 9 kHz to 25 GHz. And no other spurious and harmonic emissions were found below listed frequencies. 2. Information of Distance Correction Factor

For finding emissions, measurements may be performed at a distance closer than that specified in the regulations.

In this case, the distance factor is applied to the result.

- Calculation of distance correction factor

At frequencies below 30 MHz = 40 log( tested distance / specified distance )

At frequencies at or above 30 MHz = 20 log( tested distance / specified distance )

When distance factor is "N/A", the measurements were performed at the specified distance and distance factor is not applied.

3. Sample Calculation.

Margin = Limit - Result / Result = Reading + TF + DCCF + DCF / TF = AF + CL + HL + AL - AG

Where, TF = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain, HL = High pass filter Loss, AL = Attenuator Loss, DCCF = Duty Cycle Correction Factor, DCF = Distance Correction Factor

Tested Frequency (MHz)	Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	TF (dB/m)	DCCF (dB)	DCF (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin(dB)
	2 389.93	Н	Z	PK	54.06	4.60	N/A	N/A	58.66	74.00	15.34
2 412	2 389.44	Н	Z	AV	43.57	4.60	N/A	N/A	48.17	54.00	5.83
2 412	4 823.92	Н	Y	PK	54.89	2.34	N/A	N/A	57.23	74.00	16.77
	4 823.93	Н	Y	AV	48.44	2.34	N/A	N/A	50.78	54.00	3.22
2 437	4 873.78	Н	Y	PK	55.02	2.18	N/A	N/A	57.20	74.00	16.80
2 437	4 874.01	Н	Y	AV	49.22	2.18	N/A	N/A	51.40	54.00	2.60
	2 486.71	Н	Z	PK	53.24	5.66	N/A	N/A	58.90	74.00	15.10
2 462	2 486.37	Н	Z	AV	44.29	5.66	N/A	N/A	49.95	54.00	4.05
2 402	4 923.96	Н	Y	PK	53.50	2.57	N/A	N/A	56.07	74.00	17.93
	4 923.92	Н	Y	AV	48.23	2.57	N/A	N/A	50.80	54.00	3.20

# Radiated Emissions data(9 kHz ~ 25 GHz) : TM 1

# Radiated Emissions data(9 kHz ~ 25 GHz) : TM 2

Tested Frequency (MHz)	Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	TF (dB/m)	DCCF (dB)	DCF (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin(dB)
	2 388.36	Н	Z	PK	57.67	4.60	N/A	N/A	62.27	74.00	11.73
2 412	2 388.08	Н	Z	AV	43.96	4.61	0.29	N/A	48.86	54.00	5.14
2412	4 823.86	Н	Y	PK	52.40	2.34	N/A	N/A	54.74	74.00	19.26
	4 824.41	Н	Y	AV	42.56	2.34	0.29	N/A	45.19	54.00	8.81
2 427	4 874.23	Н	Y	PK	52.88	2.18	N/A	N/A	55.06	74.00	18.94
2 437	4 874.60	Н	Y	AV	42.80	2.19	0.29	N/A	45.28	54.00	8.72
	2 483.96	Н	Z	PK	56.80	5.62	N/A	N/A	62.42	74.00	11.58
0.460	2 484.02	Н	Z	AV	44.98	5.62	0.29	N/A	50.89	54.00	3.11
2 462	4 924.82	Н	Y	PK	50.27	2.57	N/A	N/A	52.84	74.00	21.16
	4 923.99	Н	Y	AV	40.22	2.57	0.29	N/A	43.08	54.00	10.92



# Radiated Emissions data(9 kHz ~ 25 GHz) : TM 3

Tested Frequency (MHz)	Frequency (MHz)	ANT Pol	EUT Position (Axis)	Detector Mode	Reading (dBuV)	TF (dB/m)	DCCF (dB)	DCF (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin(dB)
	2 389.33	Н	Z	PK	55.69	4.60	N/A	N/A	60.29	74.00	13.71
2 412	2 389.79	Н	Z	AV	44.42	4.60	0.31	N/A	49.33	54.00	4.67
2412	4 826.34	Н	Y	PK	51.87	2.33	N/A	N/A	54.20	74.00	19.80
	4 826.45	Н	Y	AV	41.83	2.33	0.31	N/A	44.47	54.00	9.53
2 437	4 874.03	Н	Y	PK	53.65	2.18	N/A	N/A	55.83	74.00	18.17
2 437	4 874.01	Н	Y	AV	42.06	2.18	0.31	N/A	44.55	54.00	9.45
	2 485.18	Н	Z	PK	53.32	5.64	N/A	N/A	58.96	74.00	15.04
2 462	2 484.84	Н	Z	AV	42.97	5.63	0.31	N/A	48.91	54.00	5.09
2 402	4 931.91	Н	Y	PK	50.97	2.60	N/A	N/A	53.57	74.00	20.43
	4 932.05	Н	Y	AV	40.40	2.60	0.31	N/A	43.31	54.00	10.69



# 5.6. AC Power-Line Conducted Emissions

#### Test Requirements and limit, Part 15.207 & RSS-Gen [8.8]

An intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 uH/50 ohm line impedance stabilization network (LISN).

Compliance with the provision of this paragraph shall on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower applies at the boundary between the frequency ranges.

	Conducted Limit (dBuV)					
Frequency Range (MHz)	Quasi-Peak	Average				
0.15 ~ 0.5	66 to 56 *	56 to 46 *				
0.5 ~ 5.0	56	46				
5 ~ 30	60	50				

\* Decreases with the logarithm of the frequency

#### 5.6.1. Test Setup

See test photographs for the actual connections between EUT and support equipment.

### 5.6.2. Test Procedures

Conducted emissions from the EUT were measured according to the ANSI C63.10-2013.

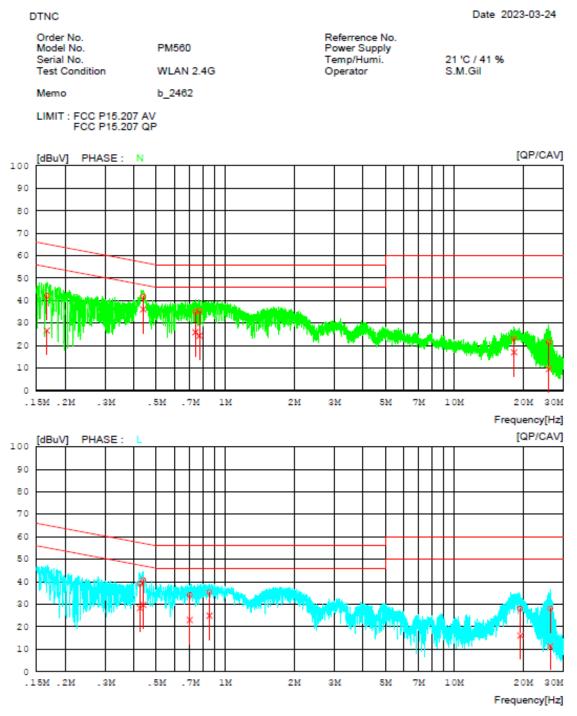
- The test procedure is performed in a 6.5 m × 3.5 m × 3.5 m (L × W × H) shielded room. The EUT along with its peripherals were placed on a 1.0 m (W) × 1.5 m (L) and 0.8 m in height wooden table and the EUT was adjusted to maintain a 0.4 meter space from a vertical reference plane.
- 2. The EUT was connected to power mains through a line impedance stabilization network (LISN) which provides 50 ohm coupling impedance for measuring instrument and the chassis ground was bounded to the horizontal ground plane of shielded room.
- 3. All peripherals were connected to the second LISN and the chassis ground also bounded to the horizontal ground plane of shielded room.
- 4. The excess power cable between the EUT and the LISN was bundled. The power cables of peripherals were unbundled. All connecting cables of EUT and peripherals were moved to find the maximum emission.

### 5.6.3. Test Results

Refer to the next page. (The worst case data was reported. The worst data is TM 1 & Highest)

# AC Power-Line Conducted Emissions (Graph)

# Results of Conducted Emission



# AC Power-Line Conducted Emissions (List)

# **Results of Conducted Emission**

DTNC				Date	2023-03-24
Order No. Model No. Serial No. Test Condition	PM560 WLAN 2.4G	Po Te	eferrence No. ower Supply emp/Humi. perator	21 'C / 41 9 S.M.Gil	6
Memo	b_2462				
LIMIT : FCC P15.207 FCC P15.207					
~ QI	ADING C.FACTOR CAV V][dBuV] [dB]	RESULT QP CAV [dBuV][dBuV]	LIMIT QP CAV [dBuV][dBuV]	MARGIN QP CAV [dBuV][dBuV	PHASE
4 0.77286 25. 5 18.26960 12. 6 25.95120 10. 7 0.42450 29. 8 0.43846 30. 9 0.70085 24.	126.21 10.00 116.00 9.99 214.40 9.99 66.51 10.55 7-1.00 10.61 2518.40 9.89 6619.78 9.90 913.14 9.89 913.14 9.89 913.502 9.90 56 5.73 10.35	$\begin{array}{c} 41.81\ 36.21\\ 35.00\ 25.99\\ 35.51\ 24.39\\ 23.21\ 17.06\\ 21.48\ 9.61\\ 39.14\ 28.29\\ 40.76\ 29.68\\ 34.08\ 23.03\\ 35.31\ 24.92\\ 28.01\ 16.08\\ \end{array}$	$\begin{array}{ccccccc} 65.12 & 55.12 \\ 57.08 & 47.08 \\ 56.00 & 46.00 \\ 56.00 & 50.00 \\ 60.00 & 50.00 \\ 60.00 & 50.00 \\ 57.36 & 47.36 \\ 57.09 & 47.09 \\ 56.00 & 46.00 \\ 56.00 & 46.00 \\ 56.00 & 50.00 \\ 60.00 & 50.00 \end{array}$	$\begin{array}{c} 22.8928.46\\ 15.2710.87\\ 21.0020.01\\ 20.4921.61\\ 36.7932.94\\ 38.5240.39\\ 18.2219.07\\ 16.3317.41\\ 1.9222.97\\ 20.6921.08\\ 31.9933.92\\ 31.9238.57 \end{array}$	N N N N L L L L



# 5.7. Occupied Bandwidth

# Test Requirements, RSS-Gen [6.7]

When an occupied bandwidth value is not specified in the applicable RSS, the transmitted signal bandwidth to be reported is to be its 99 % emission bandwidth, as calculated or measured.

# 5.7.1. Test Setup

Refer to the APPENDIX I.

# 5.7.2. Test Procedures

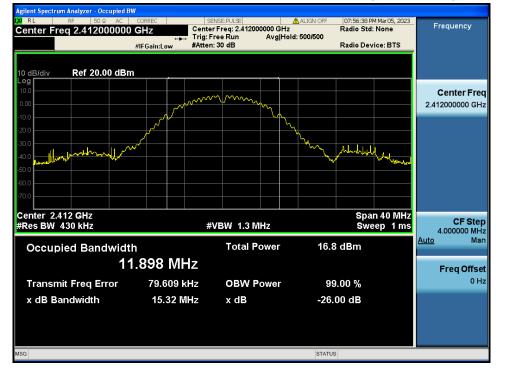
The 99 % power bandwidth was measured with a calibrated spectrum analyzer.

The resolution bandwidth (RBW) shall be in the range of 1 % to 5 % of the occupied bandwidth (OBW) and video bandwidth (VBW) shall be approximately 3 × RBW.

# 5.7.3. Test Results

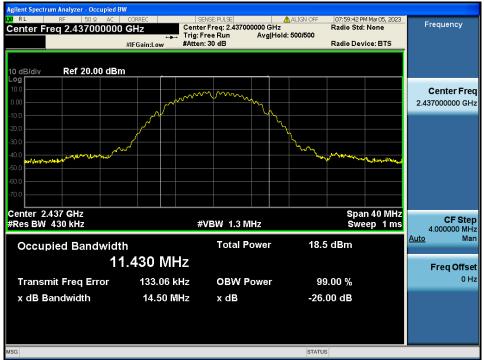
Test Mode	Fromuonov	Test Res	ults[MHz]
Test Mode	Frequency	ANT 1	ANT 2
	2 412	11.90	11.94
TM1	2 437	11.43	11.34
	2 462	11.52	11.39
	2 412	17.16	16.89
TM 2	2 437	17.20	16.92
	2 462	17.14	16.93
	2 412	18.19	17.93
ТМ 3	2 437	18.29	17.96
	2 462	18.23	17.94

TM 1 & ANT 1 & 2412



#### 6 dB Bandwidth

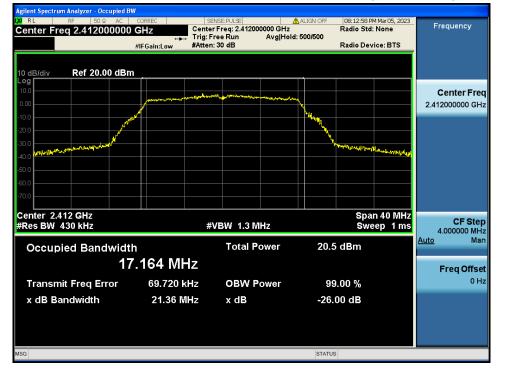
TM 1 & ANT 1 & 2437



TM 1 & ANT 1 & 2462



TM 2 & ANT 1 & 2412



#### 6 dB Bandwidth

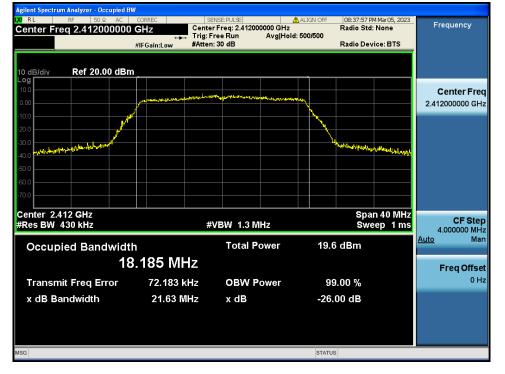
TM 2 & ANT 1 & 2437



TM 2 & ANT 1 & 2462



TM 3 & ANT 1 & 2412

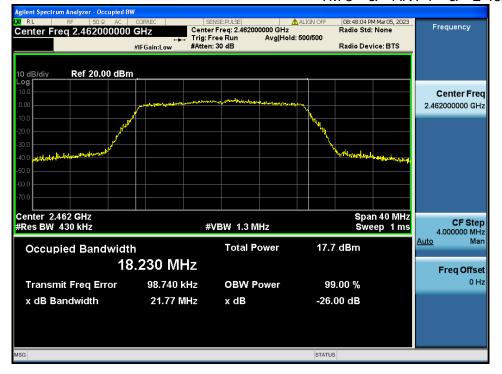


#### 6 dB Bandwidth

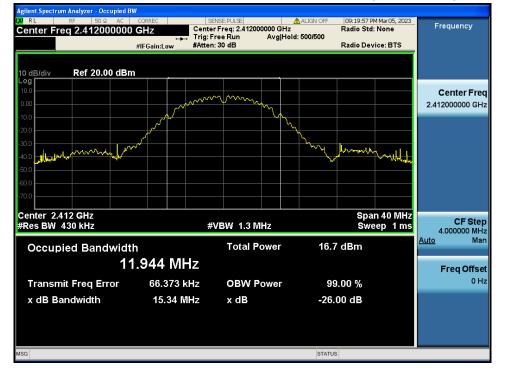
TM 3 & ANT 1 & 2437



TM 3 & ANT 1 & 2462

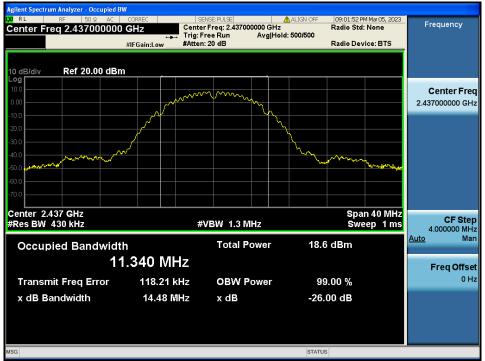


TM 1 & ANT 2 & 2412

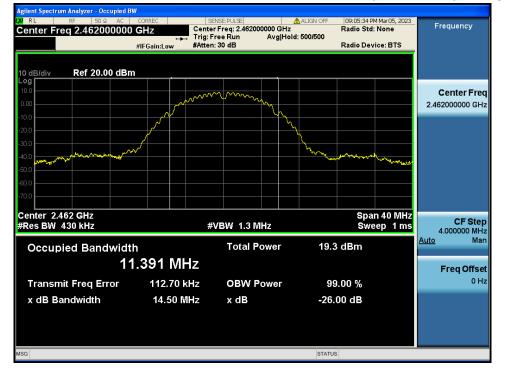


#### 6 dB Bandwidth

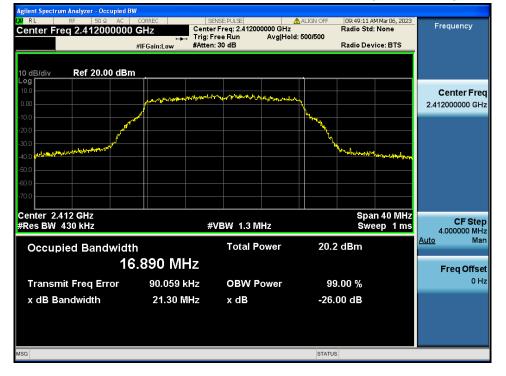
TM 1 & ANT 2 & 2437



TM 1 & ANT 2 & 2462



TM 2 & ANT 2 & 2412



#### 6 dB Bandwidth

TM 2 & ANT 2 & 2437

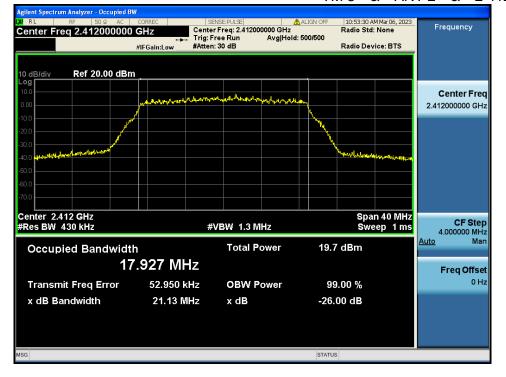


### 6 dB Bandwidth



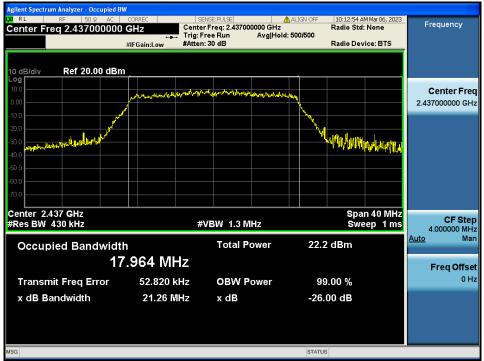
#### 6 dB Bandwidth

TM 3 & ANT 2 & 2412



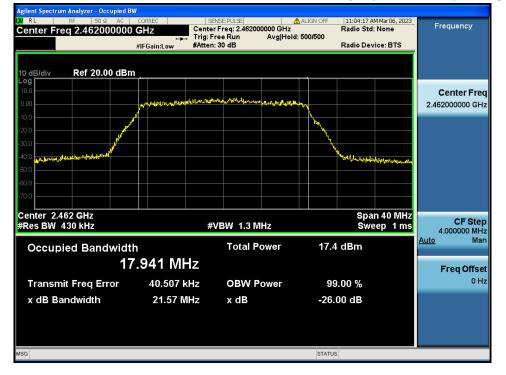
#### 6 dB Bandwidth

TM 3 & ANT 2 & 2437



### 6 dB Bandwidth

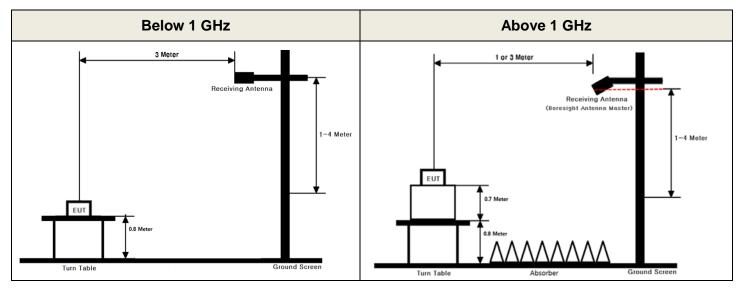
TM 3 & ANT 2 & 2462



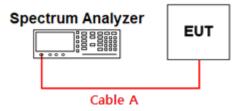
# **APPENDIX I**

# Test set up diagrams

Radiated Measurement



Conducted Measurement





# **APPENDIX II**

# **Duty cycle plots**

Test Procedures

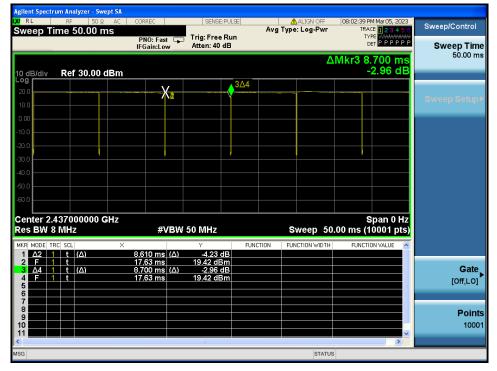
## - KDB558074 D01v05r02 - Section 6

The zero-span mode on a spectrum analyzer or EMI receiver if the response time and spacing between bins on the sweep are sufficient to permit accurate measurements of the on and off times of the transmitted signal. Set the center frequency of the instrument to the center frequency of the transmission. Set RBW  $\geq$  OBW if possible; otherwise, set RBW to the largest available value. Set VBW  $\geq$  RBW. Set detector = peak or average.

The zero-span measurement method shall not be used unless both RBW and VBW are > 50 /T and the number of sweep points across duration T exceeds 100. (For example, if VBW and/or RBW are limited to 3 MHz, then the zero-span method of measuring duty cycle shall not be used if T  $\leq$  16.7 microseconds.)

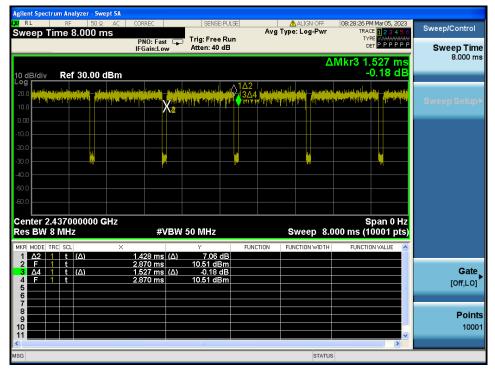
## **Duty Cycle**

TM 1 & 2 437 MHz



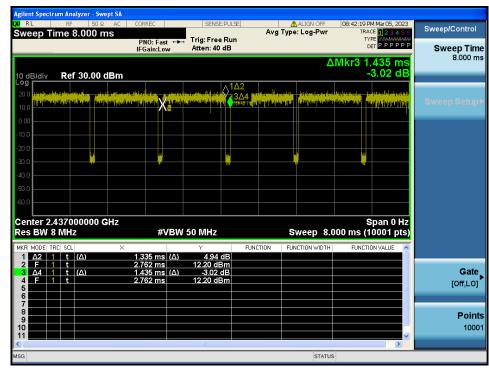
# **Duty Cycle**

TM 2 & 2 437 MHz



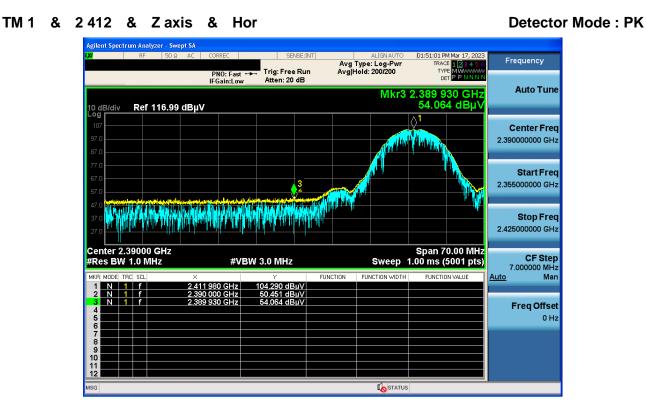
# **Duty Cycle**

# TM 3 & 2 437 MHz



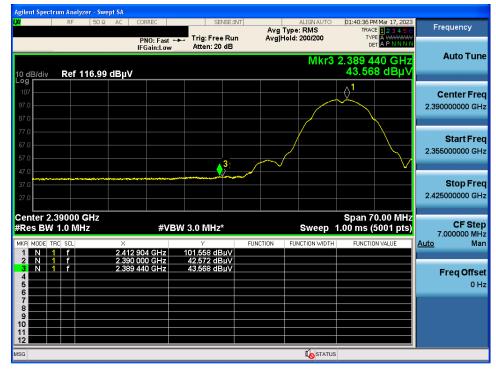
# APPENDIX III

# **Unwanted Emissions (Radiated) Test Plot**



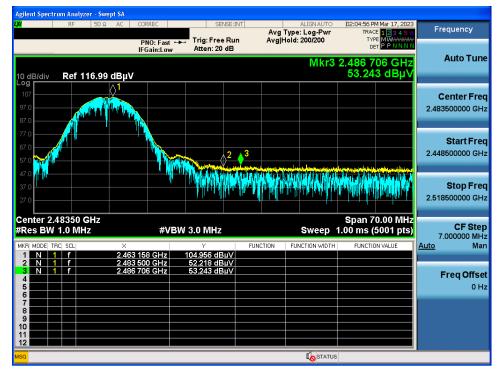
TM 1 & 2412 & Zaxis & Hor

Detector Mode : AV





### TM 1 & 2462 & Zaxis & Hor



#### TM 1 & 2462 & Zaxis & Hor

# Detector Mode : AV

# 



# TM 2 & 2412 & Zaxis & Hor

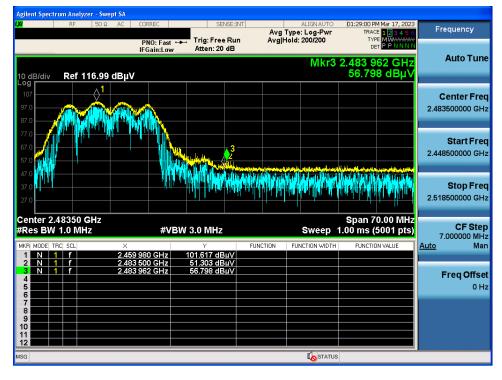


### TM 2 & 2412 & Zaxis & Hor





### TM 2 & 2462 & Zaxis & Hor



#### TM 2 & 2462 & Zaxis & Hor

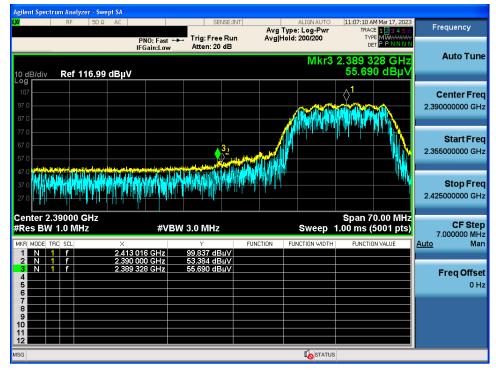
# Detector Mode : AV



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## TM 3 & 2 412 & Z axis & Hor

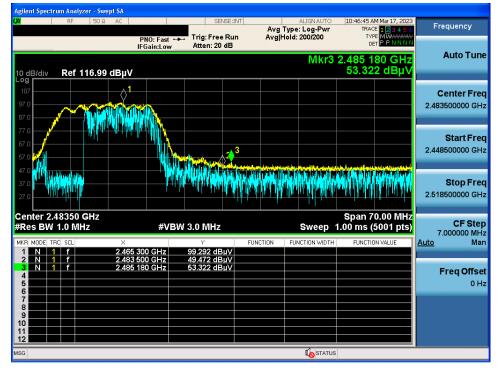


#### TM 3 & 2412 & Zaxis & Hor





# TM 3 & 2462 & Zaxis & Hor



#### TM 3 & 2462 & Zaxis & Hor





### Detector Mode : AV

### TM 1 & 2 437 & Yaxis & Hor



#### TM 2 & 2437 & Yaxis & Hor





## **Detector Mode : AV**

### TM 3 & 2 437 & Y axis & Hor

	RF	50 Ω	AC	CORREC			ENSE:INT		ALIGN AUTO	TRAC	M Mar 17, 2023	Frequency
				PNO: Fa IFGain:L		Trig: Fre Atten: 6		Avg Ho	ld: 200/200	TY D	PE A WWWWWW ET A P N N N N	
dB/div	Ref 66	6.99 d	Βμ∨						Mkr1	4.874 0 42.05	012 GHz 56 dBµV	Auto Tur
2.0												Center Fre 4.874000000 GH
.0												<b>Start Fr</b> 4.864000000 Gi
2.0		thethethethethethethethethethethethethet		Writeday, Laborat	a the state	frend a distant	<b>1</b>	an an air a tha air an an an air an	Lun v – Asking on s			<b>Stop Fr</b> 4.884000000 G
			- Alla III	and the second		UAN		And and see from	hin wand dit in the second	alihika kapata	leisedingup operations of	CF Ste
2.0												2.437000000 GI Auto <u>M</u>
.0												Freq Offs 0
2.0												
enter 4.87400 GHz Res BW 1.0 MHz #VBW 3.0 MHz*								Sweep				