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#### Conducted spurious emissions 30MHz-25GHz

Keysight S	pectrum Analyzer -	Swept SA								_	
Start Fr	eq 30.0000	0 Q AC 000 MHz	<b>D</b> NO 5		T REF SOURCE		ALIGN OFF Log-Pwr 100/100	10:31:02 A TRA	M Sep 14, 2024 CE 1 2 3 4 5 6 PE M	Freq	uency
10 dB/div	Ref Offset Ref 30.0	1 dB 0 dBm	IFGain:Low	#Atten: 40 o	dB	Angli Iola.	Mk	r2 1.63 -49.5	3 8 GHz 39 dBm	A	uto Tune
20.0 10.0 0.00								^1		Ce 1.51500	n <b>ter Freq</b> 00000 GHz
-10.0 -20.0 -30.0									-13,64 dBm	S 30.00	<b>tart Freq</b> 00000 MHz
-40.0 -50.0 -60.0	ala tahay kaominin'i Jacoba	naial dan Shicharday	indaphilipating-agine ng		2		Lingenski farde	-	n an tri añ lej.	S 3.00000	<b>Stop Freq</b> 200000 GHz
Start 0.0 #Res BV	30 GHz V 100 kHz		#VB	W 300 kHz		s	Sweep 2	Stop 3 84.0 ms (	.000 GHz 4001 pts)	297.00 Auto	CF Step
MKR MODE 1 N 2 N 3 4 5 6	TRC SCL 1 f 1 f	× 2.4 1.6	80 3 GHz 33 8 GHz	¥ 6.294 dBn -49.539 dBn	FUNCTI n	ION FUN	CTION WIDTH	FUNCTI	ON VALUE	Fr	e <b>q Offset</b> 0 Hz
7 8 9 10 11				III />					•	Sc Log	ale Type <u>Lin</u>
MSG							STATUS				

Keysight Spect	trum Analyzer - Swept SA						
Start Fred	RF 50 Ω AC 3.000000000	GHz	INT R	EF SOURCE OFF	ALIGN OFF	10:32:06 AM Sep 14, 20 TRACE 2 3 4	Frequency
10 dB/div	Ref Offset 1 dB Ref 30.00 dBm	PNO: Fast + IFGain:Low	<ul> <li>Trig: Free Run #Atten: 40 dB</li> </ul>	n Avg	Hold: 10/10	r2 5.381 5 GH -45.182 dB	Auto Tune
20.0 10.0							Center Freq 14.000000000 GHz
-10.0 -20.0 -30.0						-13.64 0	Start Freq 3.00000000 GHz
-40.0 -50.0	,	a ta a t	an a	and the second	interest of the state of the st		Stop Freq 25.00000000 GHz
Start 3.00 #Res BW 1	GHz 100 kHz	#VB	W 300 kHz	EUNCTION	Sweep	Stop 25.00 GH 2.103 s (4001 pt	z CF Step 2.200000000 GHz Auto Man
1 N 1 2 N 1 3 4 5 6	f 2 f	4.450 0 GHz 5.381 5 GHz	-32.342 dBm -45.182 dBm	- Chierion		Tone non theor	Freq Offset 0 Hz
7 8 9 10 11							Scale Type
MSG					STATUS	5	

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Figure 25: Conducted Spurious Emission & Authorized-band band-edge, 2402MHz, 8-DPSK Carrier Level



#### Band Edge

Keysight Spectrum Analyzer - Swept SA				
Center Freg 2.40000000	INT	r REF SOURCE OFF ALL Avg Type: Lo	IGN OFF 05:39:53 PM Sep 13 og-Pwr TRACE 128	,2024 Frequency
Ref Offset 1 dB	PNO: Wide ++ Trig: Free R IFGain:Low #Atten: 30 o	Run Avg Hold: 10 dB	Mkr1 2.400 000 C	Auto Tune
10 dB/div Ref 20.00 dBm	Ť			Center Freq 2.40000000 GHz
-10.0 -20.0 -30.0 -40.0				Start Freq 2.395000000 GHz
-50.0 -60.0	m		10 hrow	<b>Stop Freq</b> 2.405000000 GHz
Center 2.400000 GHz #Res BW 100 kHz	#VBW 300 kHz	FUNCTION FUNCTI	Span 10.00 l weep 1.000 ms (601	MHz CF Step 1.000000 MHz Auto Man
2 2 3 4 5 6	00 000 GHz -53.478 dBn			Freq Offset
7 8 9 9 9				Scale Type
				,
MSG			STATUS	

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#### Conducted spurious emissions 30MHz-25GHz

Keysight Specific Control	ectrum Analyzer - Sw	rept SA					- 6 <b>- X</b>
Start Fre	RF 50 ຊ <b>30.00000</b>	O MHz	Trig: Fre	INT REF SOURCE OF	F ALIGN OFF	05:39:06 PM Sep 13, 202 TRACE 1 2 3 4 5 TYPE M WWWWW	Frequency
10 dB/div	Ref Offset 1 Ref 30.00	dB dBm	st Hig. He bw #Atten: 4	10 dB	Mi	cr2 1.390 3 GH -50.474 dBr	Auto Tune
20.0 10.0 0.00						1	Center Freq 1.515000000 GHz
-10.0 -20.0 -30.0						-14.28 dE	Start Freq 30.000000 MHz
-40.0 -50.0 -60.0	yahaya ya Afalli yaketi ku	المانغة الأربية الأومينية الموجود المراجع المراجع المراجع المراجع المراجع المراجع المراجع المراجع ال	2-	ningi tashararishti ta			Stop Freq 3.000000000 GHz
Start 0.03 #Res BW	0 GHz 100 kHz	#	VBW 300 kHz		Sweep 2	Stop 3.000 GH 84.0 ms (4001 pt	Z CF Step 297.000000 MHz Auto Man
MKR MODE TH 1 N 1 2 N 1 3 4 5 6		X 2.401 5 GHz 1.390 3 GHz	z <u>6.000 d</u> z <u>-50.474 d</u>	FUNCTION Bm Bm	FUNCTION WIDTH	FUNCTION VALUE	Freq Offset
7 8 9 10 11			m			, ,	Scale Type
MSG					STATU	5	

Keysight Spectrum Analyze	er - Swept SA					
Start Freg 3.0000	50 Ω AC 000000 GHz	INT RE	F SOURCE OFF	ALIGN OFF	05:39:47 PM Sep 13, 2024 TRACE 1 2 3 4 5 6	Frequency
Ref Offs	PNO: Fast IFGain:Low	Trig: Free Run #Atten: 40 dB	n Avg ⊦	lold: 10/10 Mkr	2 18.928 0 GHz	Auto Tune
20.0 10.0						Center Freq 14.000000000 GHz
-10.0				2	-14.28 dBm	Start Freq 3.000000000 GHz
-40.0 -50.0 -60.0	handrid names and a state of the		مين المالية المنظمة المستولي معرفي المرابعة المنطقة المستولي المرابع المرابع المرابع المرابع المرابع المرابع ال			<b>Stop Freq</b> 25.00000000 GHz
Start 3.00 GHz #Res BW 100 kHz	#VE	300 kHz	FUNCTION	Sweep	Stop 25.00 GHz 2.103 s (4001 pts)	CF Step 2.20000000 GHz <u>Auto</u> Man
1 N 1 f 2 N 1 f 3 4 5 6	24.488 5 GHz 18.928 0 GHz	-34.365 dBm -38.385 dBm			ŧ	Freq Offset 0 Hz
7 8 9 10 11		III				Scale Type Log <u>Lin</u>
MSG				STATUS		

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Figure 26: Conducted Spurious Emission & Authorized-band band-edge, 2441MHz, 8-DPSK Carrier Level



Conducted spurious emissions 30MHz-25GHz

NR.L         RF         50 g Ac         INT REF SUBJECOFF         Autonoff         Call No ff	Keysight Spe	ctrum Analyzer - Sv	wept SA								- 6
Ref Offset 1 dB         Mkr2 1.515 0 GHz         Auto Tune           0 dB/div         Ref 0ffset 1 dB         Mkr2 1.515 0 GHz         Auto Tune           0 dB/div         Ref 30.00 dBm         -49.710 dBm         -49.710 dBm         Center Freq           100         -49.710 dBm         -49.710 dBm         -49.710 dBm         Start Freq         30.000000 GHz           200         -40.71         -49.710 dBm         -49.710 dBm         -49.710 dBm         Start Freq           30.0000000 GHz         -49.710 dBm         -49.710 dBm         -49.710 dBm         -49.710 dBm         Start Freq           30.0000000 GHz         -49.710 dBm         -40.010         -40.010         -40.010         -40.010         -40.010	Start Fred	RF 50 \$			IN	T REF SOURCE OFF	ALIGN OFF	05:41:45 P	M Sep 13, 2024	Fre	quency
Ref Offset 1 dB         Mkr2 1.515 0 GHz         Auto 1 une           10 dB/div         Ref 30.00 dBm         -49.710 dBm         Center Freq           200         1         1         1         1         151500000 GHz           200         1         1         1         1         151500000 GHz         Start Freq           200         200         200         200         1         1         151500000 GHz         Start Freq           200         200         200         200         200         200         1         151500000 GHz         Start Freq           200         200         200         200         200         200         200         200         200         1         151500000 GHz         Start Freq         30.0000000 GHz         30.0000000 GHz         30.0000000 GHz         30.00000000 GHz         207.00000 GHz         207.00000 GHz         207.000000 GHz         207.00000 MHz         207.00000 MH		1 00.00000	50 mii 12	PNO: Fast + IFGain:Low	Trig: Free F #Atten: 40	Run Avg dB	Hold: 100/100	TY D			
Construction         Center Freq           100         1 <td>10 dB/div</td> <td>Ref Offset 1 Ref 30.00</td> <td>dB dBm</td> <td></td> <td></td> <td></td> <td>Μ</td> <td>kr2 1.51 -49.7</td> <td>5 0 GHz 10 dBm</td> <td>í í</td> <td>Auto i une</td>	10 dB/div	Ref Offset 1 Ref 30.00	dB dBm				Μ	kr2 1.51 -49.7	5 0 GHz 10 dBm	í í	Auto i une
100       101       1	20.0 10.0 0.00							¢ <sup>1</sup>		C 1.515	e <b>nter Freq</b> 000000 GHz
40.0       2       Stop Freq         50.0       50.0       50.0       50.0         50.0       50.0       50.0       50.0         Start 0.030 GHz       #VBW 300 kHz       Stop 3.000 GHz         #Res BW 100 kHz       #VBW 300 kHz       Sweep 284.0 ms (4001 pts)         MKR MODE TRC  SCL        X       Y       FUNCTION       FUNCTION WIDTH       FUNCTION VALUE         1       N       1       f       1.515.0 GHz       6.382 dBm       449.710 dBm       Function width       FUNCTION VALUE       Freq Offset         3       4       4       6       6       6       6       6       6         7       8	-10.0 -20.0 -30.0								-13.11 dBm	30.0	Start Freq 000000 MHz
Start 0.030 GHz #Res BW 100 kHz         Stop 3.000 GHz #VBW 300 kHz         Stop 3.000 GHz Sweep 284.0 ms (4001 pts)         CF Step 297.000000 MHz           1         N         1         f         2.440 9 GHz         6.882 dBm         Function         Function width         Function value         Auto         Man           1         N         1         f         2.440 9 GHz         6.882 dBm         Function         Function value         Freq Offset           3         - <t< td=""><td>-40.0 -50.0 -60.0</td><td>ورحاله فأتبت وترقعه ارد</td><td>مليونيو الاخرار</td><td></td><td></td><td>2 </td><td>an an a</td><td></td><td><del>**********</del>*</td><td>3.000</td><td>Stop Freq 000000 GHz</td></t<>	-40.0 -50.0 -60.0	ورحاله فأتبت وترقعه ارد	مليونيو الاخرار			2 	an a		<del>**********</del> *	3.000	Stop Freq 000000 GHz
1         N         1         f         2.440.9 GHz         6.882.dBm           2         N         1         f         1.515.0 GHz         -49,710 dBm           3         -         -         -         -         -           4         -         -         -         -         0 Hz           5         -         -         -         -         0 Hz           6         -         -         -         -         -         -           7         -         -         -         -         -         -         Scale Type	Start 0.03 #Res BW	0 GHz 100 kHz	X	#VB	W 300 kHz Y	FUNCTION	Sweep	Stop 3 284.0 ms (	000 GHz 4001 pts)	297.0 <u>Auto</u>	CF Step 000000 MHz Man
7 Scale Type	1 N 1 2 N 1 3 4 5 6	f	2.4 1.5	40 9 GHz 15 0 GHz	6.882 dBr -49.710 dBr	n			-	F	req Offset 0 Hz
	7 8 9									s	cale Type
10 11 12 12 12 12 12 12 12 12 12 12 12 12	10								-	Log	Lin
K NSG	MSG				m		STAT	us	,		

Date:

2024-11-07

ALIGN OFF Avg Type: Log-Pwr Avg|Hold: 10/10 05:43:54 PM Sep 13, 2024 TRACE 1 2 3 4 5 6 TYPE M DET P N N N N N RL INT REF SOURCE OFF Frequency Start Freq 3.000000000 GHz Trig: Free Run #Atten: 40 dB PNO: Fast IFGain:Low Auto Tune Mkr2 5.717 0 GHz -45.383 dBm Ref Offset 1 dB Ref 30.00 dBm 10 dB/div Log r **Center Freq** 14.00000000 GHz Start Freq 3.00000000 GHz ¢¹ 2 25.00000000 GHz Start 3.00 GHz #Res BW 100 kHz Stop 25.00 GHz Sweep 2.103 s (4001 pts) #VBW 300 kHz Auto -37.572 dBm -45.383 dBm 20.891 5 GHz 5.717 0 GHz N Freq Offset 0 Hz Scale Type Log Lin

Figure 27: Conducted Spurious Emission & Authorized-band band-edge, 2480MHz, 8-DPSK **Carrier Level** 

Keysight Spectrum Analyzer - Swept SA ALIGN OFF Avg Type: Log-Pwr Avg|Hold: 100/100 05:44:32 PM Sep 13, 2024 TRACE 1 2 3 4 5 6 TYPE M Center Freq 2.48000000 GHz PNO: Wide IFGain:Low INT REF SOURCE OFF Frequency Trig: Free Run #Atten: 40 dB Auto Tune Mkr1 2.480 160 GHz 6.249 dBm Ref Offset 1 dB Ref 30.00 dBm 10 dB/div Log **r Center Freq** 2.48000000 GHz Start Freq 2.478500000 GHz Stop Freq 2.481500000 GHz Center 2.480000 GHz #Res BW 100 kHz Span 3.000 MHz Sweep 1.000 ms (601 pts) CF Step 300.000 kHz Man #VBW 300 kHz Auto 2.480 160 GHz 6.249 dBm Ν 1 | f Freq Offset 0 Hz Scale Type 10 Log Lin STATUS





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#### Band Edge



Conducted spurious emissions 30MHz-25GHz

Keysight Spectru	m Analyzer - Swept SA					
Start Freq 3	RF 50 Ω AC 80.000000 MH	z	INT REF S	Aug Type: Log-Pwr	05:46:11 PM Sep 13, 2024 TRACE 1 2 3 4 5 6 TYPE M	Frequency
10 dB/div R	tef Offset 1 dB tef 30.00 dBm	PNO: Fast ↔ IFGain:Low	#Atten: 40 dB	Mk	r2 1.559 6 GHz -48.370 dBm	Auto Tune
20.0 10.0 0.00					↓1	Center Freq 1.515000000 GHz
-10.0 -20.0 -30.0					-13./5 dein	Start Freq 30.000000 MHz
-40.0 -50.0 -60.0	استحد الرجاء والمتحار والمتحار ومتكاور	andramter-nelima-streamter	2- 			Stop Freq 3.000000000 GHz
Start 0.030 C #Res BW 10	GHz 10 kHz SCL X	#VBV	V 300 kHz	Sweep 2	Stop 3.000 GHz 84.0 ms (4001 pts) FUNCTION VALUE	CF Step 297.000000 MHz Auto Man
1 N 1 2 N 1 3 4 5 6		2.479 5 GHz 1.559 6 GHz	6.230 dBm -48.370 dBm		E	Freq Offset 0 Hz
7 8 9 10						Scale Type
MSG			( <b>III</b> 7)-	STATUS	5	

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Date:

Keysight Spe RL Avg Type: Log-Pwr Avg|Hold: 10/10 05:48:02 PM Sep 13, 2024 TRACE 1 2 3 4 5 6 TYPE M DET P N N N N INT REF SOURCE OFF Frequency Start Freq 3.000000000 GHz Trig: Free Run #Atten: 40 dB PNO: Fast IFGain:Low Auto Tune Mkr2 6.987 5 GHz -45.962 dBm Ref Offset 1 dB Ref 30.00 dBm 10 dB/div Log **r Center Freq** . 14.00000000 GHz Start Freq 3.00000000 GHz Ŷ Stop Freq 25.00000000 GHz CF Step 2.20000000 GHz uto Man Start 3.00 GHz #Res BW 100 kHz Stop 25.00 GHz Sweep 2.103 s (4001 pts) #VBW 300 kHz Auto 21.914 5 GHz 6.987 5 GHz -37.817 dBm -45.962 dBm 1 f 1 f N Freq Offset 0 Hz Scale Type Log Lin

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Figure 28: Conducted Spurious Emission & Authorized-band band-edge, Hopping Mode, GFSK Carrier Level

STATUS

🔤 Keys	ight S	Spectr	um A	nalyzer - Sw	rept SA														×
Cent	er	Fre	RF q 2	ຸ <sub>50 ຊ</sub> 2.44100	2 AC	0 GH	z		Tria: Fre		EF SOUR		A Type	ALIGN OFF	04:12:04 P	M Oct 31, 202	4	Frequency	
10 dB	/div		Ref Ref	Offset 1 5 <b>30.00</b>	dB dBm	PN IFG	IO: Fast ain:Lov	t -∔ ₩	#Atten: 4	40 dB	3		1010.	Mkr	1 2.437 6.2	00 GH	Z	Auto Tun	ne
20.0 10.0				նորկությո	NAUUN	ากกฏกณ์	ເຮັດເປັນ	ለበሰቢ	1 11111001	i Nan A	וואנטעט	זונענוע	14[]14	ስታህን የሆኑ በ	nannana hok			Center Fre 2.441000000 GH	eq Hz
-10.0 -20.0 -30.0				a kan kad k	1 UYY	זיוויי	TANA LI	IN A D D	IAALLANUU		MALAN	Y I I I I I	Ψľ	AUUAAUUN	ALAAAAAAAA Alaaaaaaaaaaaaaaaaaaaaaaaaaaa			<b>Start Fre</b> 2.391000000 GH	eq Hz
-40.0 -50.0 -60.0	~~~fr	aare (18	~													menterso	2	<b>Stop Fre</b> 2.491000000 GH	eq Hz
Cent #Res	er 2 BV	2.44 V 1	10 00	0 GHz kHz	×	(	#\	/BW	300 kHz Y		FUNC	TION	FUN	Sweep	Span 1 9.560 ms	00.0 MH (601 pts	23)	CF Ste 10.000000 MH <u>Auto</u> Ma	p Iz
1 2 3 4 5 6	N	1	f		2	2.437 00	) GHz		6.263 d	Bm								Freq Offse 0 H	et Iz
7 8 9 10 11																		Scale Typ	ie in
MSG	_			_	_	_		_	ш	_		_	_	STATUS	6	,	_		



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#### Band Edge(Low)



#### Band Edge(High)

Keysight Spectrum Analyzer - Swept SA								X I
Center Freg 2.483500000	GHz	INT RE	F SOURCE OFF Avg Typ	ALIGN OFF	06:04:05 PM Oc TRACE	t 31, 2024	Frequency	
	PNO: Wide	<ul> <li>Trig: Free Rur #Atten: 40 dB</li> </ul>	Avg Hol	d: 500/500	TYPE DET	NNNNN		
	II Guilleon			Mkr2	2,483 500	GHz	Auto Tun	ie
10 dB/div Ref 30.00 dBm					-49.797	dBm		
20.0							Conter Fra	
10.0 1							2.483500000 GH	÷Ч ⊣z
0.00								
-10.0						-14.98 dBm	Start Fre	
-20.0 L							2.478500000 GH	ч Iz
-30.0								
-40.0	1	2-					Stop Fre	a
-50.0	manne	and the second s	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		man	-\î+~ <u>}</u> 7~	2.488500000 GH	Iz
-60.0								
Center 2.483500 GHz				_	Span 10.0	00 MHz	CF Ste	р
#Res BW 100 kHz	#VBV	/ 300 kHz		Sweep	1.000 ms (6	01 pts)	1.000000 MF Auto Ma	iz in
MKR MODE TRC SCL X	8 917 GHz	Y 5.023 dBm	FUNCTION FU	JNCTION WIDTH	FUNCTION V	ALUE ^		
2 N 1 f 2.48	3 500 GHz	-49.797 dBm					Freq Offse	et
4						_	0 +	١z
6								
8							Scale Typ	е
10							Log <u>Li</u>	in
						- + -		
MSG				STATUS				

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#### Conducted spurious emissions 30MHz-25GHz

Keysight Sp	ectrum Analyzer - Swept SA						- 6 <b>X</b>
Start Fre	RF 50 Ω AC q 30.000000 MH	Z	INT RE	F SOURCE OFF	ALIGN OFF Type: Log-Pwr Hold: 100/100	04:14:35 PM Oct 31, 2024 TRACE 1 2 3 4 5 TYPE M	Frequency
10 dB/div	Ref Offset 1 dB Ref 30.00 dBm	IFGain:Low	#Atten: 40 dB		Mk	r2 1.191 3 GH -48.106 dBn	Auto Tune
20.0 10.0 0.00						<u>↓</u> 1	Center Freq 1.515000000 GHz
-10.0 -20.0 -30.0						-13.74 dB	Start Freq 30.000000 MHz
-40.0 -50.0 -60.0	syndry cinellar (allowed and galet f		2		sa riingigini ya Decebilin	n agirigan pilingan ganga juning	Stop Freq 3.000000000 GHz
Start 0.03 #Res BW	30 GHz 100 kHz RC  SCL  X	#VBW	7 300 kHz	FUNCTION	Sweep 2	Stop 3.000 GH2 84.0 ms (4001 pts	CF Step 297.000000 MHz Auto Man
1 N 1 2 N 1 3 4 5 6		2.420 9 GHz 1.191 3 GHz	6.611 dBm -48.106 dBm				Freq Offset 0 Hz
7 8 9 10							Scale Type
MSG			ш		STATUS	•	

🔤 Keysight Sp	ectrum Analyzer - Sw	ept SA					
Start Fre	RF 50 Ω		INT R	EF SOURCE OFF	ALIGN OFF Type: Log-Pwr	04:16:21 PM Oct 31, 202 TRACE 1 2 3 4 5	Frequency
	Ref Offset 1	PNO: Fast IFGain:Low dB	+++ Trig: Free Ru #Atten: 40 dB	n Avg	Hold: 10/10	r2 6.289 0 GH -45,169 dBr	Z Auto Tune
							Center Freq 14.00000000 GHz
-10.0 -20.0 -30.0						-13.74 de	Start Freq 3.00000000 GHz
-40.0 -50.0 0000000000000000000000000000000000	2		and a second and a second at the	alas de cale de la consecutiva de la co	and a start of the	and a second a second	<b>Stop Freq</b> 25.000000000 GHz
Start 3.00 #Res BW	) GHz 100 kHz	#VE	300 kHz	SUBSTIC	Sweep	Stop 25.00 GH 2.103 s (4001 pts	Z CF Step 2.200000000 GHz Auto Man
1 N 7 2 N 7 3 4 5 5		× 24.323 5 GHz 6.289 0 GHz	-32.978 dBm -45.169 dBm	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	Freq Offset
7 8 9 10 11							Scale Type
MSG			- <b>III</b> / -		STATU	5	

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Figure 29: Conducted Spurious Emission & Authorized-band band-edge, Hopping Mode,  $\pi$  /4-DQPSK Carrier Level

Keysight Spectrum Analyzer - Swept SA					- # <b>*</b>
RL         RF         50 Ω         AC           Center Freq 2.441000000	GHz BNO: Fast and Trig	INT REF SOURCE OF	F ALIGN OFF	04:19:48 PM Oct 31, 2024 TRACE 1 2 3 4 5 0 TYPE MUM	Frequency
Ref Offset 1 dB 10 dB/div Ref 30.00 dBm	IFGain:Low #Att	en: 40 dB	Mkr	1 2.465 83 GHz 8.146 dBm	Auto Tune
20.0 10.0 0.00	uahvarahhlahviru	enventhrapping	1 halesergly), gr	mudaphy	Center Freq 2.441000000 GHz
-10.0					<b>Start Freq</b> 2.391000000 GHz
-40.0 -50.0 -60.0				hardondara	<b>Stop Freq</b> 2.491000000 GHz
Center 2.44100 GHz #Res BW 100 kHz	#VBW 300	KHz FUNCTION	Sweep	Span 100.0 MHz 9.560 ms (601 pts) FUNCTION VALUE	CF Step 10.000000 MHz <u>Auto</u> Man
1 N 1 f 2.40 2 3 4 4 5 6 6	65 83 GHz 8.1	46 dBm		E	Freq Offset 0 Hz
7 8 9 10 11 11 11 11 11 11 11 11 11		7			Scale Type Log <u>Lin</u>
MSG			STATUS		

#### Band Edge(Low)

Keysight Spe	ctrum Analyzer -	Swept SA									-   #   <del>X</del>
Center Fi	RF 50	Ω AC	z	INT	REF SOURC	Avg Typ	ALIGN OFF	06:08:37 PI TRAC	M Oct 31, 2024	Fre	quency
10 dB/div	Ref Offset Ref 30.00	PN IFG 1 dB 0 dBm	O: Wide ↔ Sain:Low	Atten: 40 d	un iB	Avg Hold	i: 500/500 Mkr1	2.402 8 2.8	<sup>™</sup> 00 GHz 47 dBm		Auto Tune
Log 20.0 10.0 0.00						alman	m	A	A.M	C ( 2.4000	enter Freq 000000 GHz
-10.0 -20.0 -30.0									-17.15 dBm	2.3950	<b>Start Freq</b> 000000 GHz
-40.0 -50.0 -60.0	n an	\$P~~~		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~M					2.405	Stop Freq 000000 GHz
Center 2.4 #Res BW	100000 GH 100 kHz	z	#VBW	V 300 kHz Y	FUNC	TION FU	Sweep	Span 1 1.000 ms	0.00 MHz (601 pts)	1.0 <u>Auto</u>	CF Step 000000 MHz Man
1 N 1 2 N 1 3 4 5 6		2.402 800 2.400 000	) GHz ) GHz	2.847 dBm -47.511 dBm						F	req Offset 0 Hz
7 8 9										S	cale Type
10				191					-	Log	Lin
MSG							STATUS	5			

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#### Band Edge(High)



Conducted spurious emissions 30MHz-25GHz

Keysight Spectrum Analyzer - Swept SA					- # <b>-</b>
K         RL         RF         50 Ω         AC           Start Freq 30.000000 M	Hz	INT REF SOU	ALIGN OFF Avg Type: Log-Pwr	04:23:08 PM Oct 31, 2024 TRACE 1 2 3 4 5 6	Frequency
Ref Offset 1 dB	PNO: Fast	Trig: Free Run #Atten: 40 dB	Avg Hold: 100/100	r2 1.646 4 GHz	Auto Tune
10 dB/div Ref 30.00 dBn Log 20.0 10.0				-49.017 UBIII	Center Freq 1.515000000 GHz
-10.0 -20.0 -30.0					Start Freq 30.000000 MHz
-40.0 -50.0 -60.0	ىرىدىنى <sub>بىلىرى</sub> بىلىرى بىلى	¢ <sup>2</sup> -	n ja nel griga a sedir il na spañadone e fanistal	III even a se mander quigto en	Stop Freq 3.000000000 GHz
Start 0.030 GHz #Res BW 100 kHz	#VBW	300 kHz Y FUN	Sweep 2	Stop 3.000 GHz 84.0 ms (4001 pts)	CF Step 297.000000 MHz <u>Auto</u> Man
1 N 1 f 2 N 1 f 3 4 5 6	2.466 9 GHz 1.646 4 GHz	7.596 dBm -49.577 dBm		E.	Freq Offset 0 Hz
7 8 9 10 11					Scale Type
MSG			STATU	\$	

Keysight Spectrum RL ALIGN OFF Avg Type: Log-Pwr Avg|Hold: 10/10 04:24:45 PM Oct 31, 2024 TRACE 1 2 3 4 5 6 TYPE M DET P NNNN INT REF SOURCE OFF Frequency Start Freq 3.000000000 GHz Trig: Free Run #Atten: 40 dB PNO: Fast IFGain:Low Auto Tune Mkr2 7.059 0 GHz -44.933 dBm Ref Offset 1 dB Ref 30.00 dBm 10 dB/div Log r **Center Freq** 14.00000000 GHz Start Freq 3.000000000 GHz  $\Diamond^1$ 2 Stop Freq 25.00000000 GHz CF Step 2.20000000 GHz Auto Man Start 3.00 GHz #Res BW 100 kHz Stop 25.00 GHz Sweep 2.103 s (4001 pts) #VBW 300 kHz Auto FUN 24.274 0 GHz 7.059 0 GHz -33.488 dBm -44.933 dBm 1 f 1 f N Freq Offset

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Figure 30: Conducted Spurious Emission & Authorized-band band-edge, Hopping Mode, 8-DPSK **Carrier Level** 

STATUS

0 Hz

Lin

Scale Type

Log

Keysight Spectrum Analyzer - Swept SA				
Center Freq 2.441000000 0		OURCE OFF ALIGN OFF 0 Avg Type: Log-Pwr Avg Hold: 500/500	4:39:34 PM Oct 31, 2024 TRACE 1 2 3 4 5 6 TYPE M	Frequency
Ref Offset 1 dB 10 dB/div Ref 30.00 dBm	IFGain:Low #Atten: 40 dB	Mkr1 2	2.436 83 GHz 8.481 dBm	Auto Tune
200 10.0 0.00	1	hetHAaagppyhaanaagaphaas	kriaty-	Center Freq 2.441000000 GHz
-10.0 -20.0 -30.0				Start Freq 2.391000000 GHz
-40.0 -50.0			2	<b>Stop Freq</b> 2.491000000 GHz
Center 2.44100 GHz #Res BW 100 kHz	#VBW 300 kHz	Sweep 9.5	Span 100.0 MHz 60 ms (601 pts)	CF Step 10.000000 MHz <u>Auto</u> Man
1         N         1         f         2.436           2         3         - <td>5 83 GHz 8.481 dBm</td> <td></td> <td>E</td> <td>Freq Offset 0 Hz</td>	5 83 GHz 8.481 dBm		E	Freq Offset 0 Hz
7 8 9 10 11			-	Scale Type
MSG	ш.	STATUS	,	

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#### Band Edge(Low)



#### Band Edge(High)

Keysight Spectrum Analyzer - Swept SA								
Cepter Freq 2 483500000	GHz	INT RE	F SOURCE OFF	ALIGN OFF	06:13:39 PM TRACE	Oct 31, 2024	Frequ	uency
	PNO: Wide	Trig: Free Run #Atten: 40 dB	Avg Hold	: 500/500	TYPE			
	IFGain:Low	#Atten: 40 ab		Mkr1	2 479 0		A	uto Tune
Ref Offset 1 dB				WIKI I	2.473 0	3 dBm		
		The second secon						
20.0							Cer	nter Freq
							2.48350	0000 GHz
0.00 mgmgggggggg								
-10.0						-17.75 dBm	S	tart Freq
-20.0							2.47850	0000 GHz
-30.0								
-40.0	m	2 2					S	top Freq
-50.0		and the second s				~~~~~~	2.48850	0000 GHz
-60.0								
Center 2.483500 GHz				_	Span 10	0.00 MHz		CF Step
#Res BW 100 kHz	#VBV	V 300 kHz		Sweep	1.000 ms (	(601 pts)	1.00 Auto	0000 MHz Man
MKR MODE TRC SCL X	0.067.045	Y 2.542.4Dm	FUNCTION FUN	NCTION WIDTH	FUNCTIO	N VALUE	Auto	India
2 N 1 f 2.48	3 500 GHz	-50.393 dBm					Ere	
3							ГЦ	0 Hz
5						E .		0112
7								
9							50	ale Type
10							Log	Lin
						•		
MSG				STATUS				

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#### Conducted spurious emissions 30MHz-25GHz

Keysight Spectrum Analyzer - Swept SA				
M RL RF 50 Ω AC Start Freq 30.000000 MHz			GN OFF 04:42:08 PM Oct 31, 2024 og-Pwr TRACE 2 3 4 5 6 0/100 TYPE	Frequency
Ref Offset 1 dB 10 dB/div Ref 30.00 dBm	IFGain:Low #Atten: 40	dB	Mkr2 1.221 7 GHz -49.487 dBm	Auto Tune
20.0 10.0 0.00				Center Freq 1.515000000 GHz
-10.0			11.52.dBm	Start Freq 30.000000 MHz
-40.0 -50.0 -60.0	evieto Marsi Inno eviente Auro autoria		and the second second	<b>Stop Freq</b> 3.000000000 GHz
Start 0.030 GHz #Res BW 100 kHz MKR MODE TRC SCL X	#VBW 300 kHz	SW FUNCTION FUNCTIO	Stop 3.000 GHz eep 284.0 ms (4001 pts)	CF Step 297.00000 MHz Auto Man
1 N 1 f 2. 2 N 1 f 1. 3 4 5 6 6	458 7 GHz 6.052 dE 221 7 GHz -49.487 dE	3m 3m 	-	Freq Offset 0 Hz
7 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9				Scale Type
MSG			STATUS	

Keysight Spect	rum Analyzer - Swej	pt SA					
Center Fre	RF 50 Ω	AC 00000 GHz	INT	REF SOURCE OFF	ALIGN OFF	04:49:46 PM Oct 31, TRACE 1 2 3	2024 4 5 6 Frequency
	Ref Offset 1 d	PNO: Fast IFGain:Low	#Atten: 40 dl	un Avg B	Hold: 10/10 Mi	(r2 5.343 0 G	Auto Tune
10 dB/div Log 20.0	Ref 30.00 d	Bm				-47.917 a	Center Freq 14.00000000 GHz
-10.0 -20.0 -30.0						.11.5	Start Freq 3.000000000 GHz
-40.0 -50.0 -60.0	2	Webip.J.A. Market georgeous	ور ماندون در مارور ماندور ماندور ماندور مراجع المراجع ماندور	and a state of the			Stop Free 25.00000000 GHz
Center 14.0 #Res BW 1	00 GHz 00 kHz	# <b>V</b>	BW 300 kHz	FUNCTION	Sweep	Span 22.00 ( 2.103 s (4001) FUNCTION VALUE	CF Step 2.200000000 GHz Auto Man
1 N 1 2 N 1 3 4 5 6	f f	24.472 0 GHz 5.343 0 GHz	-32.927 dBm -47.917 dBm				Freq Offset
7 8 9 10 11							Scale Type
MSG			-)W/		STATU	5	

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### 4.1.5 Radiated Spurious Emission

**RESULT:** 

PASS

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Test standard	:	FCC Part 15.247(d), 15.205, 15.209
Requirement	:	ANSI C63.10-2013, Clause 7.8.8
Kind of test site	:	3m Semi-Anechoic Chamber

#### Test setup

Test Channel	:	Low/Middle/High
Operation Mode	:	А
Ambient temperature	:	22.5°C
Relative humidity	:	47%

#### Notes

Test plots please refer to the annex document "SHE24080045-02CE DATA BR&EDR-TX EXHIBIT A".

1. For 9 kHz  $\sim$  30 MHz, the amplitude of spurious emissions that are attenuated by more than 20dB below the permissible. The value has no need to be reported.

2. The spurious above 18GHz is noise only and 20dB below the limit. The value has no need to be reported.

3. All test mode had been pre-test. Only the worst mode data of GFSK&8DPSK-hopping-DH5

and GFSK&8DPSK\_Middle channel (below 1GHz) were recorded in the test report.

4. The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement -X, Y, and Z-plane. The X-plane results were found as the worst case and were shown in this report.

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#### 4.1.6 Band Edge (Restricted-band band-edge)

**RESULT:** 

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PASS

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Test standard	:	FCC Part 15.247(d), 15.205, 15.209
Requirement	:	ANSI C63.10-2013, Clause 7.8.6
Kind of test site	:	3m Semi-Anechoic Chamber

#### Test setup

Test Channel	:	Low/High
Operation Mode	:	A.1
Ambient temperature	:	22.5°C
Relative humidity	:	47%

Notes

1. Test plots please refer to the annex document "SHE24080045-02CE DATA BR&EDR-TX EXHIBIT A".

2. The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement -X, Y, and Z-plane. The X-plane results were found as the worst case and were shown in this report.

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4.1.7 Hoppin	g Frequency Separati	on			
RESULT:					PASS
Test standard		:	FCC	Part 15.247(a)(1)	
Requirement		:	ANS	l C63.10-2013, Clause 7.8.2	
			KDB	558074 D01 v05r02, Clause 2.2	
Kind of test site		:	Shie	lded room	
Test setup					
Test Channel		:	Норр	ping	
Operation Mode		:	A.1.a	a.iv	
Ambient tempera	ture	:	24.7	°C	
Relative humidity	,	:	38%		

#### Table 3: Hopping Frequency Separation

Mode	Frequency (MHz)	Channel Separation (MHz)	Limit (MHz)
GFSK	2441	0.995	0.9630
π /4-DQPSK	2441	1.030	0.8347
8-DPSK	2441	1.012	0.8480

\*Note: The systems operate with an output power no greater than 125mW (  $\pi$  /4-DQPSK, 8-DPSK).

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Figure 31: Hopping Frequency Separation, Hopping Mode, GFSK

Figure 32: Hopping Frequency Separation, Hopping Mode, #/4-DQPSK



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Figure 33: Hopping Frequency Separation, Hopping Mode, 8DPSK

🔤 Keysight Spe	ectrum Analyzer - Swept	t SA				
Center Fi	RF 50 Ω		INT REF	SOURCE OFF ALIGN OF	F 02:24:48 PM Sep 13, 2024 VI TRACE 1 2 3 4 5 6	Frequency
		PNO: Wide + IFGain:Low	<ul> <li>Trig: Free Run #Atten: 40 dB</li> </ul>	Avg Hold: 1000/10	DO TYPE M	Auto Tupe
10 dB/div	Ref 30.00 dE	3m		Mk	r2 2.441 015 GHz -1.186 dBm	
20.0			Ť			Center Freq
0.00		· · ·	2		American and a company	2.441000000 GHz
-10.0	· Martine	WITT They we	(jm)	and have a		Start Freq
-20.0						2.439500000 GHz
-40.0						Stop Freq
-50.0						2.442500000 GHz
Center 2.4 #Res BW	441000 GHz 100 kHz	#VB	W 300 kHz	#Swee	Span 3.000 MHz p 1.000 ms (601 pts)	CF Step 300.000 kHz
MKR MODE TR	RC  SCL	X	Y	FUNCTION FUNCTION WID	TH FUNCTION VALUE	<u>Auto</u> Man
1 N 1 2 N 1 3	f	2.440 003 GHZ 2.441 015 GHz	-0.072 dBm -1.186 dBm			Freq Offset
4 5						0 Hz
7 8						Scale Type
9 10						Log <u>Lin</u>
			.tt.,		•	
MSG				STA	TUS	

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#### 4.1.8 Number of Hopping Frequency

**RESULT**:

Relative humidity

Test standard : FCC Part 15.247(a)(1)(iii) Requirement : ANSI C63.10-2013, Clause 7.8.3 KDB 558074 D01 v05r02, Clause 2.2 : Shielded room Kind of test site Test setup Test Channel : Hopping **Operation Mode** : A.1.a.iv Ambient temperature : 24.7°C

: 38%

#### **Table 4: Number of Hopping Frequency**

Mode	Frequency Range	Measured Quantity of Hopping Channel	Limit
GFSK	2400 – 2483.5	79	≥15
π /4-DQPSK	2400 – 2483.5	79	≥15
8-DPSK	2400 – 2483.5	79	≥15

### PASS

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Figure 34: Number of Hopping Frequency, Hopping Mode, GFSK

Figure 35: Number of Hopping Frequency, Hopping Mode, #/4-DQPSK

Keysight Spectrum Analyzer - Swept SA					
RL         RF         50 Ω         AC           Center Freq 2.441750000         β           β <th< th=""><th></th><th>NT REF SOURCE OFF</th><th>ALIGN OFF 1 ac: Log-Pwr d: 5000/5000</th><th>0:46:04 AM Sep 13, 2024 TRACE 1 2 3 4 5 6 TYPE M</th><th>Frequency</th></th<>		NT REF SOURCE OFF	ALIGN OFF 1 ac: Log-Pwr d: 5000/5000	0:46:04 AM Sep 13, 2024 TRACE 1 2 3 4 5 6 TYPE M	Frequency
Ref Offset 1 dB 10 dB/div Ref 30.00 dBm	IFGain:Low #Atten: 40	0 dB		DET PNNNN	Auto Tune
20.0					Center Freq 2.441750000 GHz
0.00 MANAMANAMANA		NAMWWWWAA	MMMMM	MMMM	Start Freq 2.400000000 GHz
-10.0					Stop Freq 2.483500000 GHz
-30.0					CF Step 8.350000 MHz <u>Auto</u> Man
-50.0				h	Freq Offset 0 Hz
Center 2 44175 GHz				nan 83 50 MHz	Scale Type
#Res BW 200 kHz	#VBW 620 kHz		Sweep 2.0	02 ms (835 pts)	
MSG			STATUS		

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11:08:50 AM Sep 13, 2024 TRACE 1 2 3 4 5 6 TYPE DET PNNNNN INT REF SOURCE OFF AVG Type: Log-Pwr Avg Type: Log-Pwr Avg|Hold: 5000/5000 RL Frequency Center Freq 2.441750000 GHz PNO: Fast Trig: Free Run #Atten: 40 dB Auto Tune Ref Offset 1 dB Ref 30.00 dBm 10 dB/div Log **Center Freq** 2.441750000 GHz Start Freq 2.40000000 GHz Stop Freq 2.483500000 GHz CF Step 8.350000 MHz Man Auto **Freq Offset** 0 Hz Scale Type Center 2.44175 GHz #Res BW 200 kHz Span 83.50 MHz Sweep 2.002 ms (835 pts) Lin #VBW 620 kHz

Figure 36: Number of Hopping Frequency, Hopping Mode, 8-DPSK

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#### 4.1.9 Time of Occupancy

**RESULT:** 

Test standard	:	FCC Part 15.247(a)(1)(iii)
Requirement	:	ANSI C63.10-2013, Clause 7.8.4
		KDB 558074 D01 v05r02, Clause 2.2
Kind of test site	:	Shielded room
Test setup		
Test Channel	:	Middle
Operation Mode	:	A.1.a
Ambient temperature	:	24.7°C

#### Table 5: Time of Occupancy

Relative humidity

Mode	Packet Type	Pulse Time (ms)	Total of Dwell Time (ms)	Total of Dwell Time (s)	Limit (s)
	DH1	0.3800	121.600	0.1216	0.4
GFSK	DH3	1.6400	262.400	0.2624	0.4
	DH5	2.8870	307.947	0.3079	0.4
π /4-DQPSK	DH1	0.3883	124.256	0.1243	0.4
	DH3	1.6400	262.400	0.2624	0.4
	DH5	2.8870	307.947	0.3079	0.4
8-DPSK	DH1	0.3883	124.256	0.1243	0.4
	DH3	1.6350	261.600	0.2616	0.4
	DH5	2.8870	307.947	0.3079	0.4

: 38%

Note:

For DH1 package type:

Total of Dwell = Pulse Time\*(1600/2)/Number of Hopping Frequency\*Period

Period = 0.4\* Number of Hopping Frequency

For DH3 package type:

Total of Dwell = Pulse Time\*(1600/4)/Number of Hopping Frequency\*Period

Period = 0.4\* Number of Hopping Frequency

For DH5 package type:

Total of Dwell = Pulse Time\*(1600/6)/Number of Hopping Frequency\*Period

Period = 0.4\* Number of Hopping Frequency

PASS

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Figure 37: Time of Occupancy, 2441MHz, GFSK DH1



