

Test specification:	Section 90.210, Emission mask							
Test procedure:	47 CFR, Sections 2.1051, 2.1047 and 90.210(m)							
Test mode:	Compliance	Vardiate	DASS					
Date(s):	27-Dec-23	verdict:	PASS					
Temperature: 23 °C	Relative Humidity: 47 %	Air Pressure: 1014 hPa	Power: 48 VDC					
Remarks:								

Plot 7.3.13 Emission mask test results at low, mid, high carrier frequency, 25 MHz CBW

OPERATING FREQUENCY RANGE: DETECTOR USED: MODULATION: MODULATING SIGNAL: TRANSMITTER OUTPUT POWER SETTINGS: ANTENA CHAIN 4945.0 – 4985.0 MHz Peak QPSK PRBS Maximum 2







Test specification:	Section 90.210, Emission mask							
Test procedure:	47 CFR, Sections 2.1051, 2.1047 and 90.210(m)							
Test mode:	Compliance	Vardiate	DAGG					
Date(s):	27-Dec-23	verdict.	FA33					
Temperature: 23 °C	Relative Humidity: 47 %	Air Pressure: 1014 hPa	Power: 48 VDC					
Remarks:								

Plot 7.3.14 Emission mask test results at low, mid, high carrier frequency, 25 MHz CBW







Test specification:	Section 90.210, Emission mask								
Test procedure:	47 CFR, Sections 2.1051, 2.1047 and 90.210(m)								
Test mode:	Compliance	Vardiate							
Date(s):	27-Dec-23	veraici.	FA33						
Temperature: 23 °C	Relative Humidity: 47 %	Air Pressure: 1014 hPa	Power: 48 VDC						
Remarks:									

Plot 7.3.15 Emission mask test results at low, mid, high carrier frequency, 25 MHz CBW



KEYSIGH RL PASS	T Input. RF Coupling: DC Align: Auto	Input Z: 50 Ω Corr Freq Ref: Int (S)	Alten: 10 dB	Trig Cab IF G	: Free Run e: LO iain: Low	Center Fred Radio Std: I	(; 4.977500000 G None	iHz		
1 Graph	•			Ref L	vi Offset 30.	00 dB				
Scale/Div 10	dB			Ref V	alue -27.0 d	Bm				
Log										
13.0				1 301	Part in the	MAN PARA	1			
3.00				1 1	cas tacare					
7.00							1			
17.0										
27.0			_	-						
-37.0							Contractor 1	~		
47.0	h tan kabu da tu kata ta	and the second	States and the second	144			The second	(Anderson A	in the other states	ering and independent of the second
57.0	a second de							L. Headler	110,001,01	وليقتر فالتلك المتلا
67.0										
-07.0										
Disp Center	4.97750 GHz		#Cha	n Det: Av	erage, #Off	s Det: Avera	ige			Span 100.24 M 2001 pts
2 Table		Power	Spe	ctrum Pe	ak Ref					
		28.75 dBm /	20 MHz	15.	55 dBm					
		1			Lower			Upper		7
	Start Freq	Stop Freq	Integ BW	dBm	∆Limit(dB)	Freg (Hz)	dBm	∆Limit(dB)	Freg (Hz)	-
	0.0 H	z 11.25 MHz	240.0 kHz		()			()		1
	11.25 MH	z 12.50 MHz	240.0 kHz	-38.07	(-28.44)	-12.58 M	-35.14	(-24.69)	12.62 M	1
	12.50 MH	z 13.75 MHz	240.0 kHz	-34.62	(-20.27)	-13.43 M	-36.06	(-19.61)	13.87 M	
	13.75 MH	z 25.00 MHz	240.0 kHz	-39.45	(-5.09)	-25.06 M	-40.24	(-7.49)	24.06 M	
	25.00 MH	z 50.00 MHz	240.0 kHz	-37.85	(-11.40)	-29.52 M	-39.32	(-12.87)	30.82 M	Loca
	25.00 MH	z 150.0 MHz	390.0 kHz		()			()		
	12.50 MH	z 15.00 MHz	1 000 MHz		((
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Test specification:	Section 90.210, Emission mask						
Test procedure:	47 CFR, Sections 2.1051, 2.1047 and 90.210(m)						
Test mode:	Compliance	Vardiate	DASS				
Date(s):	27-Dec-23	veraici.	FA33				
Temperature: 23 °C	Relative Humidity: 47 %	Air Pressure: 1014 hPa	Power: 48 VDC				
Remarks:							



Plot 7.3.16 Emission mask test results at low, mid, high carrier frequency, 25 MHz CBW

KEYSIGHT	oupling: DC Jign: Auto	Input Z: 50 Ω Corr Freq Ref: Int (S)	Atten: 10 dB	Trig. Cate	Free Run : LO ain: Low	Center Fred Radio Std: I	1, 4.977500000 G None	Hz		
Graph	•			RefL	vi Offset 30.	.00 dB				
cale/Div 10 dB				Ref V	alue -27.0 d	Bm				
12.0				_			-			
				7 1111	124-112-1174	要对于使用中国的	1			
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7.0	ويوادر سال فطورها الات	a marin makel	such the	4W			THEFT	at a banch	والدر مرافر أرزور	as the lease of
2.0 1.4.0 10000	ALC: LA PRIMA	and a state of the	hall have				Contraction of the state	a a di aka	A MARKAUN LA	A NUMBER OF TANKS
7.0										
7.0										
isp Center 4.97	750 GHz		#Ch	an Det: Av	erage, #Off	s Det: Avera	age			Span 100.24 M 2001 pts
Table		Power 28.56 dBm / 3	20 MHz Sp	ectrum Pei 15.6	ak Ref 6 dBm					
					Lower			Upper		
	Start Freq	Stop Freq	Integ BW	dBm	∆Limit(dB)	Freq (Hz)	dBm	∆Limit(dB)	Freq (Hz)	-
	0.0 Hz	11.25 MHz	240.0 kHz		()			()		
	11.25 MHz	12.50 MHz	240.0 kHz	-37.43	(-27.08)	-12.62 M	-39.30	(-29.78)	12.58 M	
	12.50 MHz	13.75 MHz	240.0 kHz	-34.90	(-20.18)	-13.53 M	-32.56	(-19.04)	13.28 M	
	13.75 MHz	25.00 MHz	240.0 kHz	-37.72	(-7.32)	-22.65 M	-42.07	(-7.74)	25.11 M	- 100
	25.00 MHz	50.00 MHz	240.0 kHz	-38.72	(-12.38)	-25.71 M	-38.73	(-12.39)	39.34 M	LOCA
	25.00 MHz	150.0 MHz	390.0 kHz		()			()		-
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Test specification:	Section 90.210, Emission mask							
Test procedure:	47 CFR, Sections 2.1051, 2.104	7 and 90.210(m)						
Test mode:	Compliance	Vordict	DASS					
Date(s):	27-Dec-23	verdict.	FA33					
Temperature: 23 °C	Relative Humidity: 47 %	Air Pressure: 1014 hPa	Power: 48 VDC					
Remarks:								



Plot 7.3.17 Emission mask test results at mid carrier frequency, 50 MHz CBW



Test specification:	Section 90.210, Emission mask								
Test procedure:	47 CFR, Sections 2.1051, 2.1047 and 90.210(m)								
Test mode:	Compliance	Vardiate	DASS						
Date(s):	27-Dec-23	verdict:	PASS						
Temperature: 23 °C	Relative Humidity: 47 %	Air Pressure: 1014 hPa	Power: 48 VDC						
Remarks:									

Plot 7.3.18 Emission mask test results at mid carrier frequency, 50 MHz CBW

OPERATING FI DETECTOR US MODULATION: MODULATING TRANSMITTER ANTENA CHAII	REQU SED: SIGN/ COUT N KEYSIC RL (GE:	IGS:	0 dB	Trig: Gate	Free Run 2 2 5	4952.5 Peak 16QAN PRBS Maximu 1 Center Fre Radio Std:	– 4977.5 1 Jm ^{q: 4.965000000 G} None	MHz		
	Da PA	SS											
	1 Graph		•				Ref L	vl Offset 30	.00 dB				
	Scale/Div	10 dB					Ref V	alue -25.0 d	IBm				
	15.0												
	5.00						/ //	Kalinahandra	Khaninininininini I				
	-5.00									¥			
	-15.0									\wedge			
	-25.0												
	-35.0					العدارين	1			Without the store of			
	-45.0 📌 🦏	ally hydroddiadada	MAN PANAL AND	a and the provident of the st	uhiteten antalaise	A manual and					phillips and the second	Allow and a selection of	hitereneristik Phyllinger fister freiterspiele
	-55.0												
	-65.0												
	Disp Cent	ter 4.9650	GHz			#Chan E	et: Av	erage, #Of	fs Det: Aver	age			Span 250.51 MHz 2001 pts
	2 Table		•	Power		Spectr	um Pea	ak Ref					
				28.86 dBm /	40 MHz		14.3	36 dBm					
		[_	Lower			Upper		
		-	Start Freq	Stop Freq	Integ B	N d	Bm	∆Limit(dB)	Freq (Hz)	dBm	∆Limit(dB)	Freq (Hz)	-
		-	22.50 MHz	22.50 MHz	510.0	kHz .	-38 52	(-26.88)	-25 26 M	-37.45	()	25.22 M	-
		-	25.00 MHz	27.50 MHz	510.0	kHz ·	-37.40	(-19.83)	-27.72 M	-37.80	(-20.23)	27.72 M	
			27.50 MHz	50.00 MHz	510.0	kHz	-40.62	(-8.28)	-46.12 M	-42.15	(-7.01)	49.63 M	
			50.00 MHz	125.0 MHz	510.0	kHz	-41.22	(-13.57)	-61.00 M	-39.98	(-12.33)	51.23 M	Local
		-	25.00 MHz	150.0 MHz	390.0 1.000 M	KHZ 1Hz		()			()		-
	4) (1	■?	Jan 02, 2024 10:26:11	\square								



Test specification:	Section 90.210, Emission mask							
Test procedure:	47 CFR, Sections 2.1051, 2.1047 and 90.210(m)							
Test mode:	Compliance	Vardiate	DASS					
Date(s):	27-Dec-23	veraici.	FA33					
Temperature: 23 °C	Relative Humidity: 47 %	Air Pressure: 1014 hPa	Power: 48 VDC					
Remarks:								

Plot 7.3.19 Emission mask test results at mid carrier frequency, 50 MHz CBW

OPERATING FI DETECTOR US MODULATION: MODULATING TRANSMITTER ANTENA CHAIL	REC SED : SIG R OL	QUEN : SNAL: JTPU	NCY : IT F	' RANG POWEI	GE: R SETTII	NGS	:			4 F 6 F N 1	l952.5 Peak S4QAN PRBS Naximu	– 4977.5 1 um	5 MHz			
	KEY	SIGHT	Input:	RF	Input Z: 50 Ω	Atter	n: 10 dB	Т	ig: Free R	lun	Center Fre	q: 4.965000000	GHz			
	RL		Coupl	ing: DC Auto	Corr Frog Pof: Int (S	.		G	ate: LO		Radio Std:	None				
	LXI	PASS	Aligii.	Auto	Freq Ker. Int (5	, I		"	Gain. Lov	iv.						
	1 Gra	ph		v						-4 00	00 -I D					
	Scale	/Div 10 d	iB					Re	Value -2	et 30. 25.0 di	ov ab Bm					
	Log															
	15.0							T		in the later	Manager					
	5.00										1 n n					
	-5.00															
	-15.0						/									
	-25.0															
	45.0	chard old of	hada ata		الالعاديد وحواريه والا	بلغه بليديد	Hughert	the state of the s				Mar any here is an in the	والمستعد والمستعد والمستعد	والمالية والمعالية والمعالية	ne ha a her with	Monte restantiant del conte
	-55.0	e Astrophysically a	- Marilla a	And Allala in	al contra a substanti a substanti a	1.11.11.11.1		_				1.10	a second second by	and a providence of	on Aslanda	la des redere admentes
	-65.0															
	Dian	Contor 4	0650	24-			#Char	Det	A.v.or.o.c.o.		Dot: Aver				Eno	250 54 MUZ
	Disp	Center 4.	9000	JΠZ			#Chai	T Det:	everage,	, #011	s Del: Aver	aye			2001	pts
	2 Tabl	0			Power		Spe	ctrum P	Peak Ref	1						
	2 100				28.65 dBm	40 MHz	2	1	4.77 dBm	1						
									L	.ower			Upper			
				Start Freq	Stop Freq	Integ	BW	dBm	ΔLimi	t(dB)	Freq (Hz)	dBm	∆Limit(dB)	Freq (Hz)		
				0.0 H	z 22.50 MHz	510	0 kHz	05		()			- ()		-	
			_	22.50 MH	z 25.00 MHz	510	0 kHz	-35.	+2 (-2	0.49	-24.97 M	1 -37.5	(-26.68)	25.22 M	-	
				27.50 MH	z 50.00 MHz	510		-40	37 (-	7 24)	-47.63 M	-37.3	7 (-21.43)	50.26 M		
				50.00 MH	z 125.0 MHz	510	0 kHz	-40.	74 (-1	3.50)	-56.49 M	1 -39.0	1 (-11.78)	57.12 M	-	Local
	25.00 MHz 150.0 MHz 390.0 kHz						()			- ()						
							()		• •	- ()						
	4	ょ	2	■ ?	Jan 02, 2024 10:29:36	@ /									-	



Test specification:	Section 90.210, Emission mask							
Test procedure:	47 CFR, Sections 2.1051, 2.1047 and 90.210(m)							
Test mode:	Compliance	Vardiate						
Date(s):	27-Dec-23	verdict.	FA33					
Temperature: 23 °C	Relative Humidity: 47 %	Air Pressure: 1014 hPa	Power: 48 VDC					
Remarks:								

Plot 7.3.20 Emission mask test results at mid carrier frequency, 50 MHz CBW

OPERATING FI DETECTOR US MODULATION: MODULATING TRANSMITTER ANTENA CHAIN	REQU SED: SIGN, OUT N	IENC AL: PUT I	Y RANG POWEF	GE: SETTIN	IGS:	0 dB	Trig:	2 F 2 F 1 Free Run	1952.5- Peak 256QAI PRBS Maximu I	– 4977.5 M Jm	MHz		
	RL (Cou Aligr	pling: DC n: Auto	Corr Freq Ref: Int (S)			Gate	: LO ain: Low	Radio Std:	None			
	1 Graph Scale/Div	10 dB	•				Ref L Ref V	vi Offset 30. alue -25.0 d	.00 dB Bm				
	15.0 5.00 -5.00						100	erandi karakan (rana)	wany yak haran				
	-15.0 -25.0 -35.0			to a file solution	a . 10 (1)		H			Antipha Mary I shake a start	set sinhe totato		lite or reliers to an or trade o
	-45.0 -55.0 -65.0	a baadaanaa a	. Alimens Alfondes A.M.	aller of the second	a strategic						and a start of the	والمراجد والمراجع	an a
	Disp Cen	ter 4.9650	GHz			#Chan D	et: Av	erage, #Off	s Det: Avera	age			Span 250.51 MHz 2001 pts
	2 Table			Power 28.86 dBm /	40 MHz	Spectru	m Pea 14.2	ak Ref 7 dBm					_
			Start Freq	Stop Freg	Integ B	N di	Bm	Lower	Frea (Hz)	dBm	Upper ALimit(dB)	Freg (Hz)	-
			0.0 Hz	22.50 MHz	510.0	kHz		()			()		
			22.50 MHz	25.00 MHz	510.0	kHz -	37.57	(-27.49)	-25.10 M	-37.52	(-25.80)	25.26 M	
			25.00 MHz	27.50 MHz	510.0	kHz -	37.59	(-20.84)	-27.35 M	-37.47	(-21.02)	27.22 M	_
		-	27.50 MHz	50.00 MHz	510.0	KHZ -	39.86	(-4.33)	-50.00 M	-40.69	(-6.67)	48.13 M	Local
			25.00 MHz	125.0 MHz	390.0	kHz -	41.65	(-13.93)	-66.14 M	-39.44	(-11.71)	55.99 M	
			12.50 MHz	15 00 MHz	1 000 1	/Hz		()			()		
			2	Jan 02, 2024 10:31:27									



Test specification:	Section 90.210, Emission mask							
Test procedure:	47 CFR, Sections 2.1051, 2.104	7 and 90.210(m)						
Test mode:	Compliance	Vardiate	DASS					
Date(s):	27-Dec-23	verdict:	PASS					
Temperature: 23 °C	Relative Humidity: 47 %	Air Pressure: 1014 hPa	Power: 48 VDC					
Remarks:	•							

Plot 7.3.21 Emission mask test results at mid carrier frequency, 50 MHz CBW

OPERATING F	G FREQUENCY RANGE:								4952.5– 4977.5 MHz				
								NPSK					
MODULATING	SIGN	Δι٠						PRRS					
TDANGMITTED								Movimi	m				
		FUI	FOVE		NGS.								
ANTENA CHAIR			It DE	Input 7: 50 O	Atton	IO dB T	ria: Eroo Dun	Contor Fro	a: 4.065000000 G	H7			
	RI		pling: DC	Corr	Auen.	C	ate: LO	Radio Std:	None	112			
			n: Auto	Freq Ref: Int (S)		1	Gain: Low						
	1 Graph		•		1		61 Offer et 0						
	Scale/Div	v 10 dB				Re	f Value -25.0	dBm					
	Log												
	15.0					Γ	a state and the state of the st	(hally)))))					
	5.00												
	15.0								1				
	25.0												
	35.0												
	-45.0	the statistics		a malially Almenti	where the states	WHAT AND A MARKED		ny.	an hardet bei higher het han eine	and the second second	a liter was a second at the	esta hadrowiki temba antikana da a	
	-55.0	Nation And And And And And And And And And An	all However, fr.	htteres and						e i consider	The second second	a talan san sa talan da ta	
	-65.0												
	Disp Cen	ter 4 9650) GHz			#Chan Det:	Average #0	ffs Det: Aver	апе			Span 250 51 MHz	
	Biop Col					"enan bea	Arciuge, ne		ugo			2001 pts	
	2 Table		•	Power		Spectrum	Peak Ref						
				28.79 dBm /	40 MHz	1	3.77 dBm					_	
			01-15-1	01	late a Di	A/	Lowe	r Frank (Univ		Upper	5		
			Start Freq	Stop Freq	Integ B	VV aBm) Freq (HZ)	aBm	ALIMIT(GB)	Freq (HZ)	-	
			22.50 MH	z 25.00 MHz	510.0	kHz -35.	28 (-23.40) -25.22 M	-37.02	(-25.14)	25.22 M	-	
			25.00 MH	z 27.50 MHz	510.0	kHz -37.	02 (-19.76) -27.35 M	-36.69	(-18.83)	27.60 M		
			27.50 MH	z 50.00 MHz	510.0	kHz -40.	99 (-5.46) -49.38 M	-41.59	(-5.56)	50.00 M		
			50.00 MH	lz 125.0 MHz	510.0	kHz -40.	31 (-12.08) -64.01 M	-40.54	(-12.31)	97.07 M	Local	
			25.00 MH	z 150.0 MHz	390.0	kHz	()		()			
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Test specification:	Section 90.210, Emission mask							
Test procedure:	47 CFR, Sections 2.1051, 2.104	7 and 90.210(m)						
Test mode:	Compliance	Vardiate						
Date(s):	27-Dec-23	veraici.	FA33					
Temperature: 23 °C	Relative Humidity: 47 %	Air Pressure: 1014 hPa	Power: 48 VDC					
Remarks:								

Plot 7.3.22 Emission mask test results at mid carrier frequency, 50 MHz CBW

OPERATING FI DETECTOR US MODULATION: MODULATING TRANSMITTER ANTENA CHAIN	REQU SED: SIGN/ OUTI N KEYSIG	ENC` AL: PUT I	Y RAN POWE	IGE: ER SETTIN	NGS:	10 dB	Trig: Free Run Gate: I O	4952.5 Peak 16QAN PRBS Maxim 2	5— 4977.5 Л um eq: 4.965000000 (MHz		
		→ Aligr	n: Auto	Freq Ref: Int (S)			IF Gain: Low					
	1 Graph	55	T			_						
	Scale/Div	10 dB				F F	ef LVI Offset ef Value -25.	30.00 dB 0 dBm				
	Log 15.0					,	atel, ille M. L. for	and a star	-			
	5.00						Terri a davidation	ANHALANA SA				
	-5.00						-		1			
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	-25.0					الاسلام	1					
	-35.0 45.0 million		مام فرخرون	ومراجع المرجع والمرجع	Marshuke	MY WANDAL AL	r	4	and the second second	the second second second	Helensia and bas	and a second second second second
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	-65.0											
	Disp Cent	er 4.9650	GHz			#Chan Def	: Average, #	Offs Det: Ave	erage			Span 250.51 MHz
	2 Table		v [Power		Spectrum	Peak Ref					2001 pts
			[28.59 dBm /	40 MHz		14.36 dBm					
							Lov	/er		Upper		
		-	Start Fre	q Stop Freq	Integ B	W dBr	n ∆Limit(c	B) Freq (Hz) dBm	∆Limit(dB)	Freq (Hz)	-
		-	22.50 M	Hz 25.00 MHz	510.0	kHz -3	3.75 (-23.)	76) -25.10	M -36.05	(-26.06)	25.10 M	-
		-	25.00 M	Hz 27.50 MHz	510.0	kHz -3	2.84 (-16.)	77) -27.10	M -32.41	(-16.05)	27.22 M	-
			27.50 M	Hz 50.00 MHz	510.0	kHz -4	0.25 (-6.	11) -48.38	M -38.17	(-5.23)	46.88 M	
			50.00 M	Hz 125.0 MHz	510.0	kHz -3	7.87 (-10.)	23) -51.35	M -40.21	(-12.57)	58.87 M	Local
			25.00 M	Hz 150.0 MHZ	1 000 M	MHZ MHZ	()		()		-
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Test specification:	Section 90.210, Emission n	nask	
Test procedure:	47 CFR, Sections 2.1051, 2.104	7 and 90.210(m)	
Test mode:	Compliance	Vardiate	DASS
Date(s):	27-Dec-23	verdict:	PASS
Temperature: 23 °C	Relative Humidity: 47 %	Air Pressure: 1014 hPa	Power: 48 VDC
Remarks:			

Plot 7.3.23 Emission mask test results at mid carrier frequency, 50 MHz CBW

OPERATING FF DETECTOR US MODULATION: MODULATING S TRANSMITTER ANTENA CHAIN	REQUENC' ED: SIGNAL: OUTPUT F N KEYSIGHT IMPL	Y RANG POWER It RF pling: DC	E: SETTIN	IGS:	10 dB	2 F F I Z Z Trig: Free Run Sate: LO	1952.5– Peak 64QAM PRBS Maximu 2 Center Free Radio Std:	- 4977.5 m 1 4.965000000 G None	MHz		
		n: Auto	Freq Ref: Int (S)		1	F Gain: Low					
	1 Graph	T			Pr	f I vi Offect 20					
	Scale/Div 10 dB				Re	f Value -25.0 c	iBm				
	Log										
	5.00					Union physical and a state	helen the state of				
	-5.00										
	-15.0				- +						
	-25.0										
	-35.0				where we have been and the second		- Mark	And Anthony			
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	-55.0										
	-65.0										
	Disp Center 4.9650) GHz			#Chan Det:	Average, #Of	fs Det: Avera	age			Span 250.51 MHz 2001 pts
	2 Table	•	Power		Spectrum	Peak Ref					
			28.53 dBm /	40 MHz		4.06 dBm					
	[Lower			Upper		
		Start Freq	Stop Freq	Integ B	N dBm ⊭⊔⊸	∆Limit(dB)	Freq (Hz)	dBm	∆Limit(dB)	Freq (Hz)	-
		22.50 MHz	22.50 MHz	510.0	kHz -32	82 (-21.24)	 -25.22 M	-36.78	(-24.84)	25.26 M	-
		25.00 MHz	27.50 MHz	510.0	kHz -34	80 (-16.87	-27.76 M	-33.45	(-17.09)	27.10 M	
		27.50 MHz	50.00 MHz	510.0	kHz -39	62 (-6.09)	-47.25 M	-39.46	(-4.52)	49.00 M	
		50.00 MHz	125.0 MHz	510.0	kHz -39	63 (-11.70)) -51.35 M	-39.49	(-11.55)	59.25 M	Local
		25.00 MHZ	150.0 MHZ	390.0 1 000 M	KHZ /Hz	(()		-
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Test specification:	Section 90.210, Emission n	nask	
Test procedure:	47 CFR, Sections 2.1051, 2.104	7 and 90.210(m)	
Test mode:	Compliance	Vardiate	DASS
Date(s):	27-Dec-23	verdict:	PASS
Temperature: 23 °C	Relative Humidity: 47 %	Air Pressure: 1014 hPa	Power: 48 VDC
Remarks:			

Plot 7.3.24 Emission mask test results at mid carrier frequency, 50 MHz CBW

OPERATING FI DETECTOR US MODULATION: MODULATING TRANSMITTER	REC SED SIG	QUE : NAL	NC) _: _T F		NG	E:	IGS.				4952. Peak 256Q PRBS Maxin	.5– AN S	- 4977.5 Л m	MHz		
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	1 Cror			-												
	Coolo	/Div 40	-						Ref	Lvi Offset	0.00 dB					
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	65.0															
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	2 Table	э		•		Power		Spectr	um Pe	eak Ref						
						28.54 dBm /	40 MHz		13	.50 dBm						
										Low	ər			Upper		
				Start F	req	Stop Freq	Integ E	3W c	lBm	∆Limit(d	B) Freq (H	Hz)	dBm	∆Limit(dB)	Freq (Hz)	
			_	0	.0 Hz	22.50 MHz	510.0) kHz		- (-	-)			()		
			-	22.50	MHZ	25.00 MHz	510.0) KHZ	-33.30	6 (-21.2	1) -25.22	2 M	-33.67	(-21.17)	25.26 M	
			-	25.00		27.50 MHZ	510.0		-32.10	6 (-14.3 5 (5.1	5) -27.4		-34.96	(-17.14)	27.47 M	
			-	50.00	MHz	125.0 MHz	510.0	kHz	-33.7	B (-12.6	B) -60.29	5 M	-40.10	(-4.30)	50 73 M	Local
			-	25.00	MHz	150.0 MHz	390.0	kHz		- (-	-)			()		
				12.50	MH7	15.00 MHz	1 000	MH7		- <u>`</u>	-í			()		
		ょ	C		?	Jan 02, 2024 10:39:57										እ 🔀



Test specification:	Section 90.210, Radiated spurious emissions							
Test procedure:	47 CFR, Sections 2.1053 and 90.210(m); TIA/EIA-603-A, Section 2.2.12							
Test mode:	Compliance	Vardiot: DASS						
Date(s):	04-Jan-24	verdict.	FA33					
Temperature: 24 °C	Relative Humidity: 47 %	Air Pressure: 1018 hPa	Power: 48 VDC					
Remarks:								

7.4 Radiated spurious emission measurements

7.4.1 General

This test was performed to measure radiated spurious emissions from the EUT. Specification test limits are given in Table 7.4.1.

Table 7.4.1 Radiated spurious emission test limits

Frequency,	EIRP of spurious,	Equivalent field strength limit @ 3m,
MHz	dBm	dB(µV/m)**
0.09 – 10th harmonic*	-25	72.4

* - Excluding the in band emission within ± 150 % of the authorized bandwidth from the carrier. The high frequency is the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower

** - Equivalent field strength limit was calculated from maximum allowed ERP of spurious as follows: $E=sqrt(30 \times P \times 1.64)/r$, where P is ERP in Watts, 1.64 is numeric gain of ideal dipole and r is antenna to EUT distance in meters

7.4.2 Test procedure for spurious emission field strength measurements in 9 kHz to 30 MHz band

- 7.4.2.1 The EUT was set up as shown in Figure 7.4.1, energized and the performance check was conducted.
- **7.4.2.2** The specified frequency range was investigated with antenna connected to spectrum analyzer. To find maximum radiation the turntable was rotated 360⁰ and the measuring antenna was rotated around its vertical axis.
- **7.4.2.3** The worst test results (the lowest margins) were recorded in Table 7.4.2 and shown in the associated plots.

7.4.3 Test procedure for spurious emission field strength measurements above 30 MHz

- 7.4.3.1 The EUT was set up as shown in Figure 7.4.2, energized and the performance check was conducted.
- **7.4.3.2** The specified frequency range was investigated with antenna connected to spectrum analyzer. To find maximum radiation the turntable was rotated 360⁰ and the measuring antenna height was swept from 1 to 4 m in both, vertical and horizontal, polarizations.
- 7.4.3.3 The worst test results (the lowest margins) were recorded in Table 7.4.2 and shown in the associated plots.



Test specification:	Section 90.210, Radiated spurious emissions							
Test procedure:	47 CFR, Sections 2.1053 and 90	0.210(m); TIA/EIA-603-A, Sectio	on 2.2.12					
Test mode:	Compliance	Vordiot	DASS					
Date(s):	04-Jan-24	verdict:	PASS					
Temperature: 24 °C	Relative Humidity: 47 %	Air Pressure: 1018 hPa	Power: 48 VDC					
Remarks:								

Figure 7.4.1 Setup for spurious emission field strength measurements in 9 kHz to 30 MHz band









Test specification:	Section 90.210, Radiated spurious emissions				
Test procedure:	47 CFR, Sections 2.1053 and 90.210(m); TIA/EIA-603-A, Section 2.2.12				
Test mode:	Compliance	Vardiate	DASS		
Date(s):	04-Jan-24	verdict.	FA33		
Temperature: 24 °C	Relative Humidity: 47 %	Air Pressure: 1018 hPa	Power: 48 VDC		
Remarks:					

Photograph 7.4.1 Setup for radiated emission measurements





Test specification:	Section 90.210, Radiated spurious emissions					
Test procedure:	47 CFR, Sections 2.1053 and 90	0.210(m); TIA/EIA-603-A, Section 2.2.12				
Test mode:	Compliance	Vordiot	DASS			
Date(s):	04-Jan-24	verdict.	PASS			
Temperature: 24 °C	Relative Humidity: 47 %	Air Pressure: 1018 hPa	Power: 48 VDC			
Remarks:						



Test specification:	Section 90.210, Radiated spurious emissions					
Test procedure:	47 CFR, Sections 2.1053 and 90	0.210(m); TIA/EIA-603-A, Section 2.2.12				
Test mode:	Compliance	Vardiate	DASS			
Date(s):	04-Jan-24	verdict:	PASS			
Temperature: 24 °C	Relative Humidity: 47 %	Air Pressure: 1018 hPa	Power: 48 VDC			
Remarks:						

Table 7.4.2 Spurious emission field strength test results

ASSIGNED FREQUENCY RANGE: TEST DISTANCE: TEST SITE: INVESTIGATED FREQUENCY RANGE: DETECTOR USED: TEST ANTENNA TYPE: MODULATION:				4940.0 – 4990.0 MHz 3 m Semi anechoic chamber 0.009 – 40000 MHz Peak Active loop (9 kHz – 30 MHz) Biconilog (30 MHz – 1000 MHz) Horn antenna (above 1000MHz) QPSK (worst case variant)				
MODULATING SIGNAL:				PRBS				
TRANSMITTER OUTPUT POWER SETTINGS:				Maximum				
CHANNEL BANDWIDTH:				10 MHz***				
Frequency, MHz	Field strength, dB(μV/m)	Limit****, dB(µV/m)	Margin, dB*	RBW, kHz	Antenna polarization	Antenna height, m	Turn-table position**, degrees	

No emissions were found

*- Margin = Field strength of spurious – calculated field strength limit.

**- EUT front panel refers to 0 degrees position of turntable.

*** - The 10 MHz channel bandwidth is configuration with the greatest aggregate power.

Reference numbers of test equipment used

HL 0446	HL 3230	HL 3903	HL 4015	HL 4933	HL 4956	HL 5112	HL 5288
HL 5902	HL 7585						

Full description is given in Appendix A.