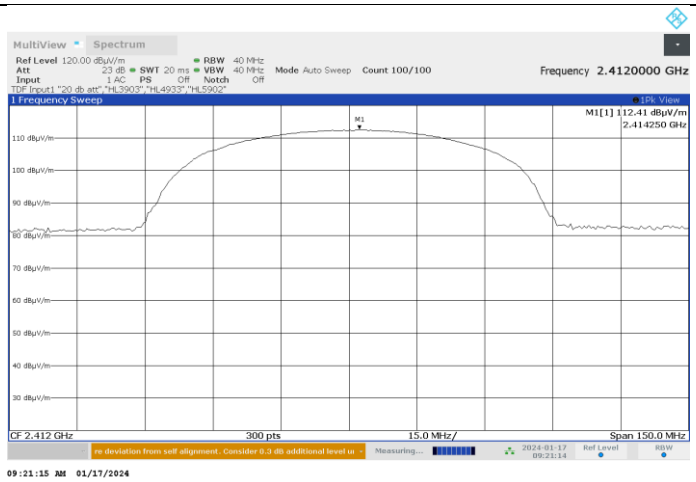
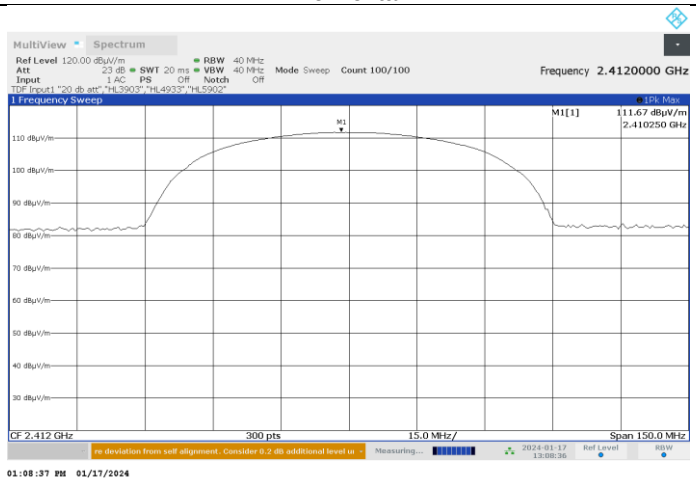
Test specification:	**Section 15.247(b)3/ RSS-247 section 5.4(d), Maximum output power**		
Test procedure:	ANSI C63.10 section 11.9.2.2.4		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	17-Jan-24		
Temperature: 25 ºC	**Relative Humidity:** 45 %	**Air Pressure:** 1010 hPa	**Power:** 4.37 VDC
Remarks:			

Plot 7.2.5 Field strength of carrier at low frequency

CHANNEL BANDWIDTH: 20 MHz
MODULATION / BITRATE: BPSK / 6.5Mbps

Position Y (worst case)
Horizontal


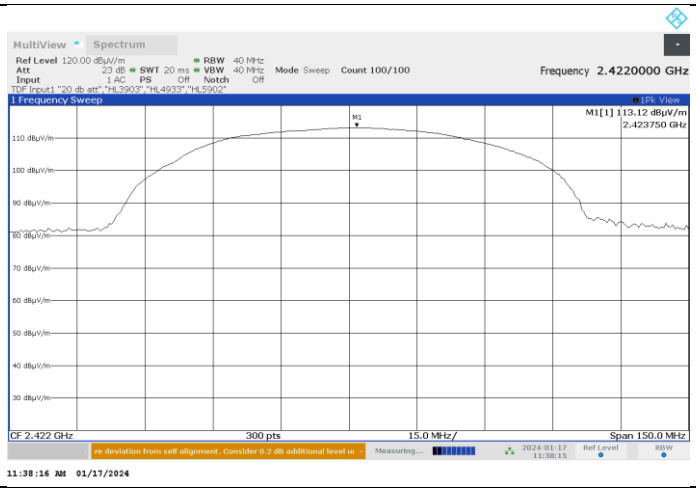
CHANNEL BANDWIDTH: 20 MHz
MODULATION / BITRATE: 64QAM / 65 Mbps

Position Y (worst case)
Horizontal


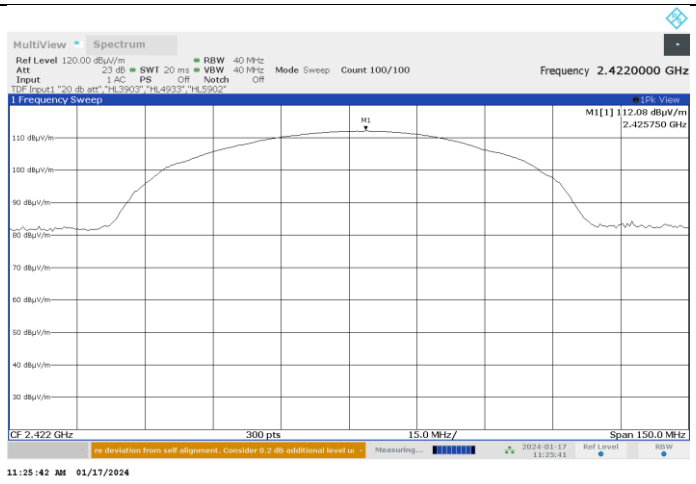
Test specification:	**Section 15.247(b)3/ RSS-247 section 5.4(d), Maximum output power**		
Test procedure:	ANSI C63.10 section 11.9.2.2.4		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	17-Jan-24		
Temperature: 25 ºC	**Relative Humidity:** 45 %	**Air Pressure:** 1010 hPa	**Power:** 4.37 VDC
Remarks:			

Plot 7.2.6 Field strength of carrier at low frequency

CHANNEL BANDWIDTH: 40 MHz
MODULATION / BITRATE: BPSK / 6.5 Mbps

Position Y (worst case)
Horizontal


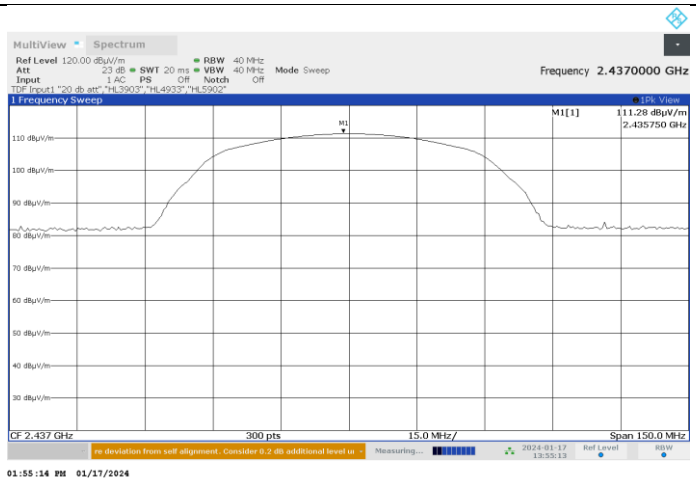
CHANNEL BANDWIDTH: 40 MHz
MODULATION / BITRATE: 64QAM / 65 Mbps

Position Y (worst case)
Horizontal


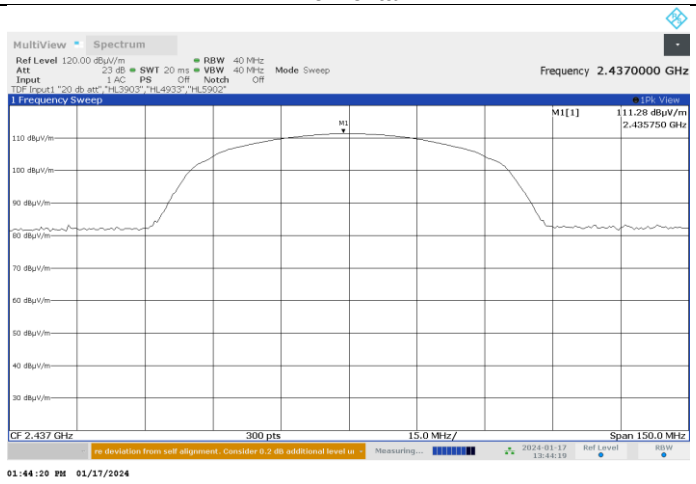
Test specification:	**Section 15.247(b)3/ RSS-247 section 5.4(d), Maximum output power**		
Test procedure:	ANSI C63.10 section 11.9.2.2.4		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	17-Jan-24		
Temperature: 25 ºC	**Relative Humidity:** 45 %	**Air Pressure:** 1010 hPa	**Power:** 4.37 VDC
Remarks:			

Plot 7.2.7 Field strength of carrier at mid frequency

CHANNEL BANDWIDTH: 20 MHz
MODULATION / BITRATE: CCK / 1 Mbps

Position Y (worst case)
Horizontal


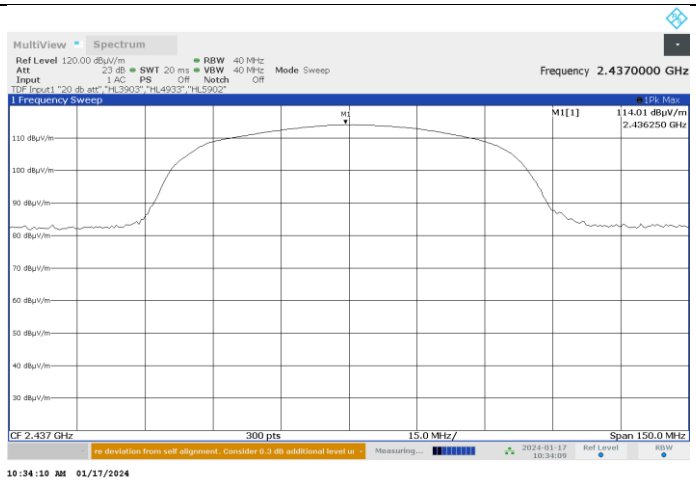
CHANNEL BANDWIDTH: 20 MHz
MODULATION / BITRATE: CCK / 11 Mbps

Position Y (worst case)
Horizontal


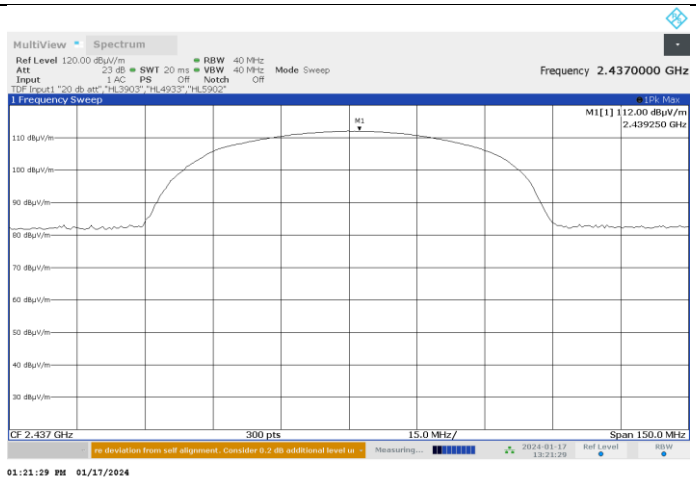
Test specification:	Section 15.247(b)3/ RSS-247 section 5.4(d), Maximum output power		
Test procedure:	ANSI C63.10 section 11.9.2.2.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-24		
Temperature: 25 ºC	Relative Humidity: 45 %	Air Pressure: 1010 hPa	Power: 4.37 VDC
Remarks:			

Plot 7.2.8 Field strength of carrier at mid frequency

CHANNEL BANDWIDTH: 20 MHz
MODULATION / BITRATE: BPSK/ 6 Mbps

Position Y (worst case)
Horizontal


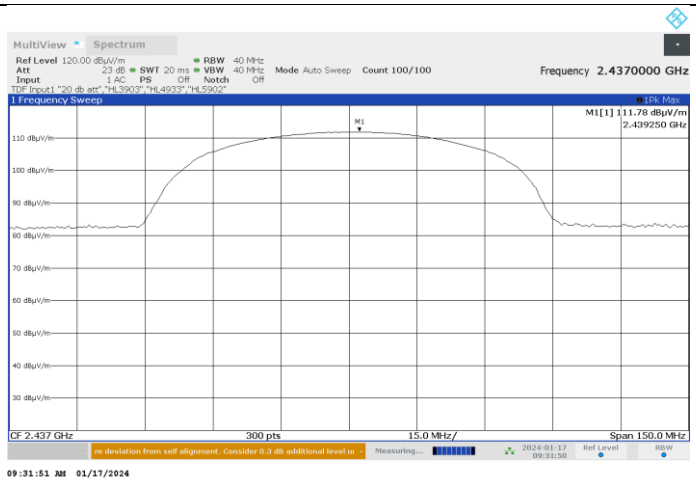
CHANNEL BANDWIDTH: 20 MHz
MODULATION / BITRATE: 64QAM / 54 Mbps

Position Y (worst case)
Horizontal


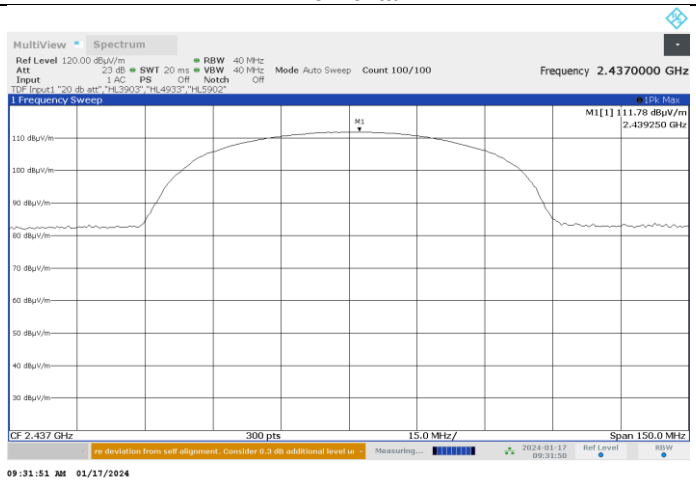
Test specification:	**Section 15.247(b)3/ RSS-247 section 5.4(d), Maximum output power**		
Test procedure:	ANSI C63.10 section 11.9.2.2.4		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	17-Jan-24		
Temperature: 25 ºC	**Relative Humidity:** 45 %	**Air Pressure:** 1010 hPa	**Power:** 4.37 VDC
Remarks:			

Plot 7.2.9 Field strength of carrier at mid frequency

CHANNEL BANDWIDTH: 20 MHz
MODULATION / BITRATE: BPSK / 6.5 Mbps

Position Y (worst case)
Horizontal


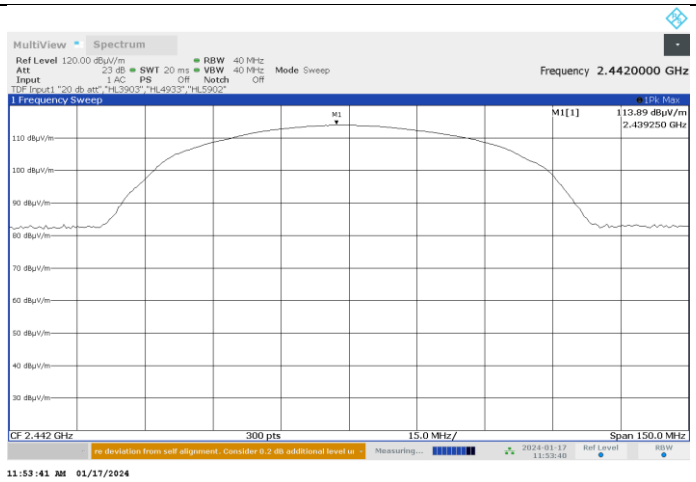
CHANNEL BANDWIDTH: 20 MHz
MODULATION / BITRATE: 64QAM / 65 Mbps

Position Y (worst case)
Horizontal


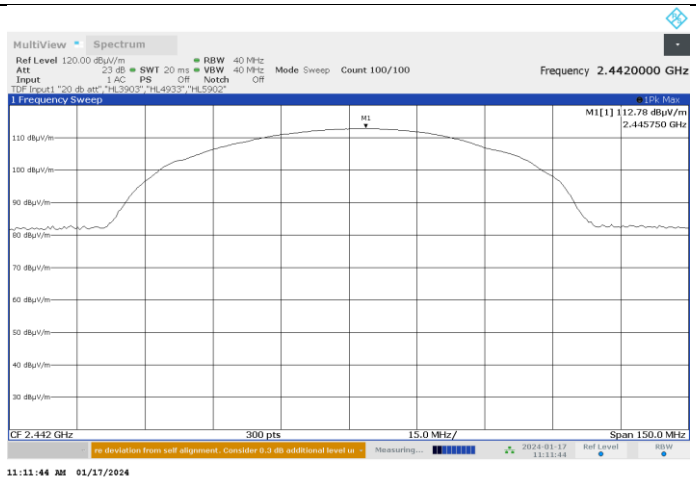
Test specification:	Section 15.247(b)3/ RSS-247 section 5.4(d), Maximum output power		
Test procedure:	ANSI C63.10 section 11.9.2.2.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-24		
Temperature: 25 ºC	Relative Humidity: 45 %	Air Pressure: 1010 hPa	Power: 4.37 VDC
Remarks:			

Plot 7.2.10 Field strength of carrier at mid frequency

CHANNEL BANDWIDTH: 40 MHz
MODULATION / BITRATE: BPSK/ 6.5 Mbps

Position Y (worst case)
Horizontal


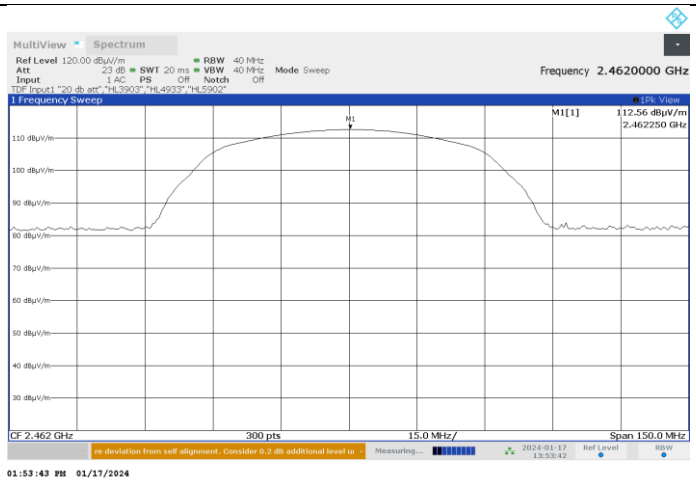
CHANNEL BANDWIDTH: 40 MHz
MODULATION / BITRATE: QPSK / 65 Mbps

Position Y (worst case)
Horizontal


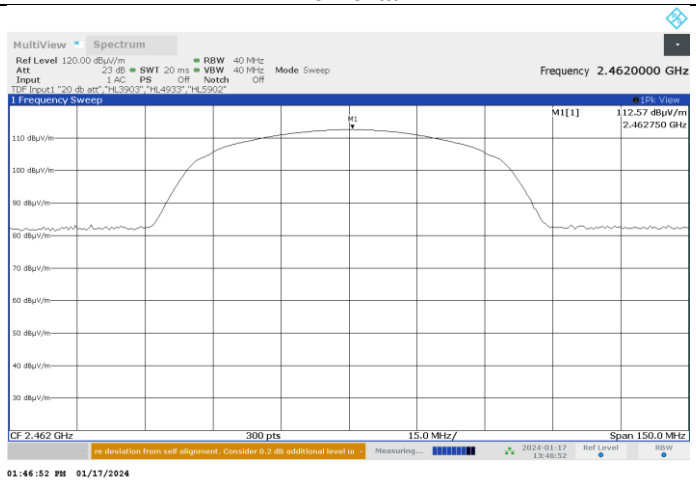
Test specification:	**Section 15.247(b)3/ RSS-247 section 5.4(d), Maximum output power**		
Test procedure:	ANSI C63.10 section 11.9.2.2.4		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	17-Jan-24		
Temperature: 25 ºC	**Relative Humidity:** 45 %	**Air Pressure:** 1010 hPa	**Power:** 4.37 VDC
Remarks:			

Plot 7.2.11 Field strength of carrier at high frequency

CHANNEL BANDWIDTH: 20 MHz
MODULATION / BITRATE: CCK / 1 Mbps

Position Y (worst case)
Horizontal


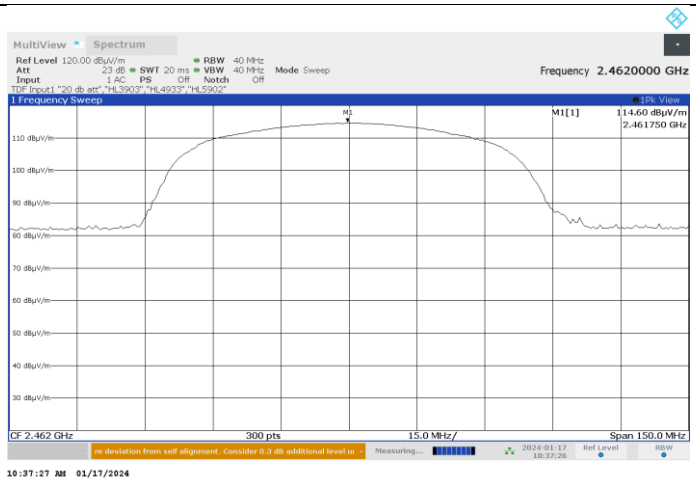
CHANNEL BANDWIDTH: 20 MHz
MODULATION / BITRATE: CCK / 11 Mbps

Position Y (worst case)
Horizontal


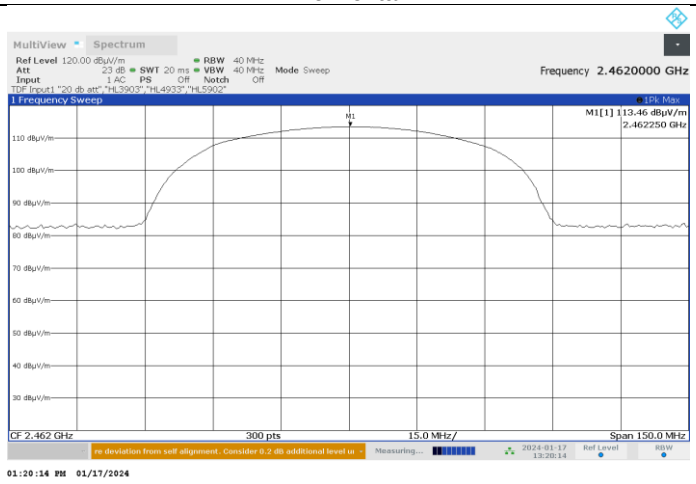
Test specification:	Section 15.247(b)3/ RSS-247 section 5.4(d), Maximum output power		
Test procedure:	ANSI C63.10 section 11.9.2.2.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-24		
Temperature: 25 ºC	Relative Humidity: 45 %	Air Pressure: 1010 hPa	Power: 4.37 VDC
Remarks:			

Plot 7.2.12 Field strength of carrier at high frequency

CHANNEL BANDWIDTH: 20 MHz
MODULATION / BITRATE: BPSK / 6 Mbps

Position Y (worst case)
Horizontal


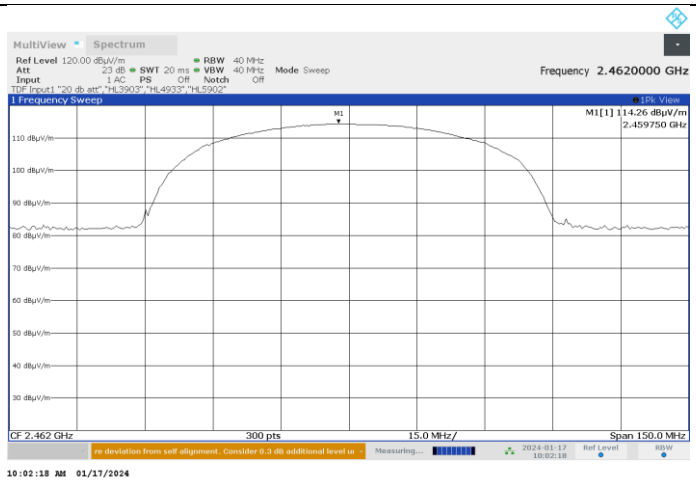
CHANNEL BANDWIDTH: 20 MHz
MODULATION / BITRATE: 64QAM / 54 Mbps

Position Y
Horizontal


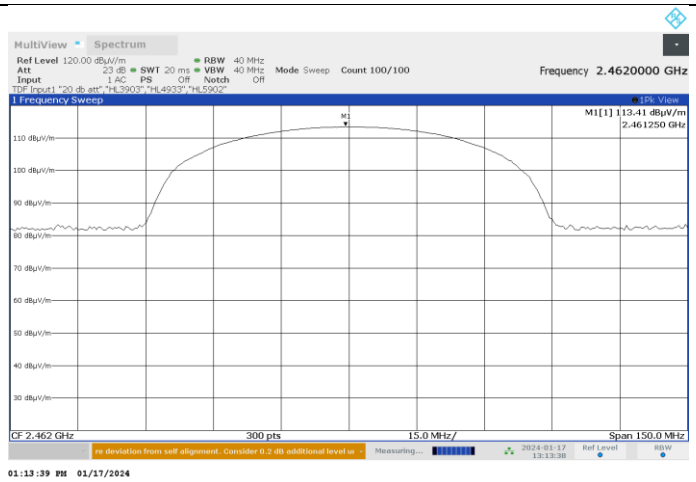
Test specification:	**Section 15.247(b)3/ RSS-247 section 5.4(d), Maximum output power**		
Test procedure:	ANSI C63.10 section 11.9.2.2.4		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	17-Jan-24		
Temperature: 25 ºC	**Relative Humidity:** 45 %	**Air Pressure:** 1010 hPa	**Power:** 4.37 VDC
Remarks:			

Plot 7.2.13 Field strength of carrier at high frequency

CHANNEL BANDWIDTH: 20 MHz
MODULATION / BITRATE: BPSK / 6.5 Mbps

Position Y (worst case)
Horizontal


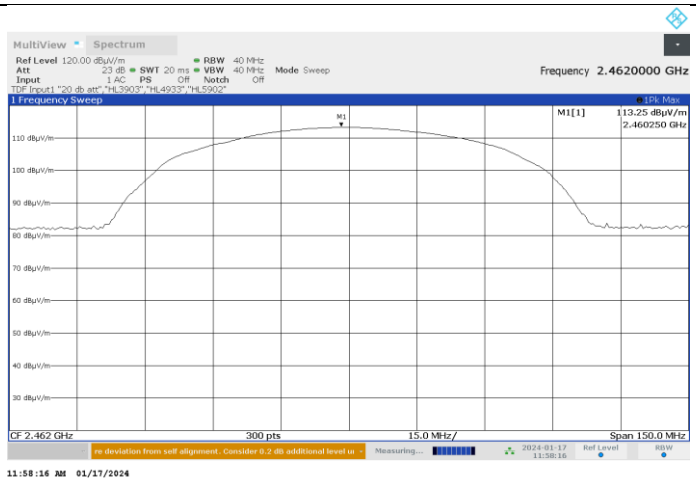
CHANNEL BANDWIDTH: 20 MHz
MODULATION / BITRATE: 64QAM / 65 Mbps

Position Y (worst case)
Horizontal


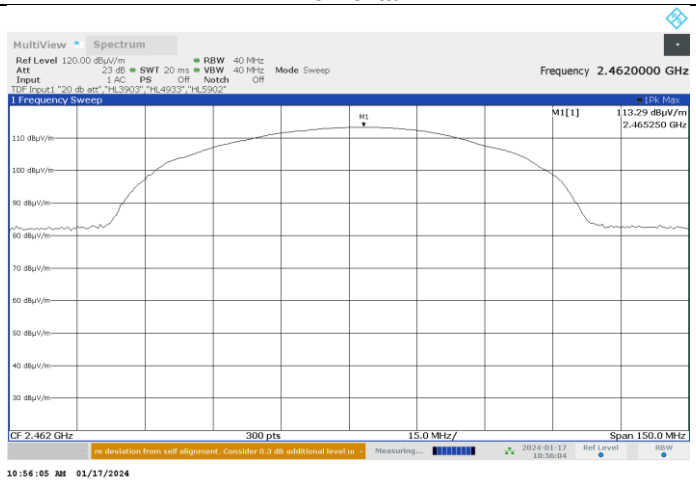
Test specification:	Section 15.247(b)3/ RSS-247 section 5.4(d), Maximum output power		
Test procedure:	ANSI C63.10 section 11.9.2.2.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-24		
Temperature: 25 ºC	Relative Humidity: 45 %	Air Pressure: 1010 hPa	Power: 4.37 VDC
Remarks:			

Plot 7.2.14 Field strength of carrier at high frequency

CHANNEL BANDWIDTH: 40 MHz
MODULATION / BITRATE: BPSK / 6.5 Mbps

Position Y (worst case)
Horizontal


CHANNEL BANDWIDTH: 40 MHz
MODULATION / BITRATE: 64QAM / 65 Mbps

Position Y (worst case)
Horizontal


Test specification:	Section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions		
Test procedure:	ANSI C63.10 section 11.12.1		
Test mode:	Compliance	Verdict:	PASS
Date(s):	31-Aug-23		
Temperature: 24 ºC	Relative Humidity: 53 %	Air Pressure: 1012 hPa	Power: 4.37 VDC
Remarks:			

7.3 Field strength of spurious emissions

7.3.1 General

This test was performed to measure field strength of spurious emissions from the EUT. Specification test limits are given in Table 7.3.1.

Table 7.3.1 Radiated spurious emissions limits

Frequency, MHz	Field strength at 3 m within restricted bands, dB(μV/m)*			Attenuation of field strength of spurious versus carrier outside restricted bands, dBc***
	Peak	Quasi Peak	Average	
0.009 – 0.090	148.5 – 128.5	NA	128.5 – 108.5**	20.0
0.090 – 0.110	NA	108.5 – 106.8**	NA	
0.110 – 0.490	126.8 – 113.8	NA	106.8 – 93.8**	
0.490 – 1.705	NA	73.8 – 63.0**	NA	
1.705 – 30.0*		69.5		
30 – 88		40.0		
88 – 216		43.5		
216 – 960		46.0		
960 - 1000		54.0		
1000 – 10th harmonic	74.0	NA	54.0	

*- The limit for 3 m test distance was calculated using the inverse square distance extrapolation factor as follows:

$$Lim_{S2} = Lim_{S1} + 40 \log (S_1/S_2),$$

where S_1 and S_2 – standard defined and test distance respectively in meters.

**- The limit decreases linearly with the logarithm of frequency.

*** - The field strength limits applied from the lowest radio frequency generated in the device, without going below 9 kHz up to the tenth harmonic of the highest fundamental frequency.

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

7.3.2.1 The EUT was set up as shown in Figure 7.3.1, energized and the performance check was conducted.

7.3.2.2 The specified frequency range was investigated with antenna connected to spectrum analyzer/ EMI receiver. To find maximum radiation the turntable was rotated 360^0 and the measuring antenna was rotated around its vertical axis.

7.3.2.3 The worst test results (the lowest margins) were recorded and shown in the associated plots.

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

7.3.3.1 The EUT was set up as shown in Figure 7.3.2, Figure 7.3.3 , energized and the performance check was conducted.

7.3.3.2 The specified frequency range was investigated with antenna connected to spectrum analyzer/ EMI receiver. To find maximum radiation the turntable was rotated 360^0, the measuring antenna height was changed from 1 to 4 m, its polarization was switched from vertical to horizontal.

7.3.3.3 The worst test results (the lowest margins) were recorded and shown in the associated plots.

Test specification:	Section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions		
Test procedure:	ANSI C63.10 section 11.12.1		
Test mode:	Compliance	Verdict:	PASS
Date(s):	31-Aug-23		
Temperature: 24 ºC	Relative Humidity: 53 %	Air Pressure: 1012 hPa	Power: 4.37 VDC
Remarks:			

Figure 7.3.1 Setup for spurious emission field strength measurements below 30 MHz

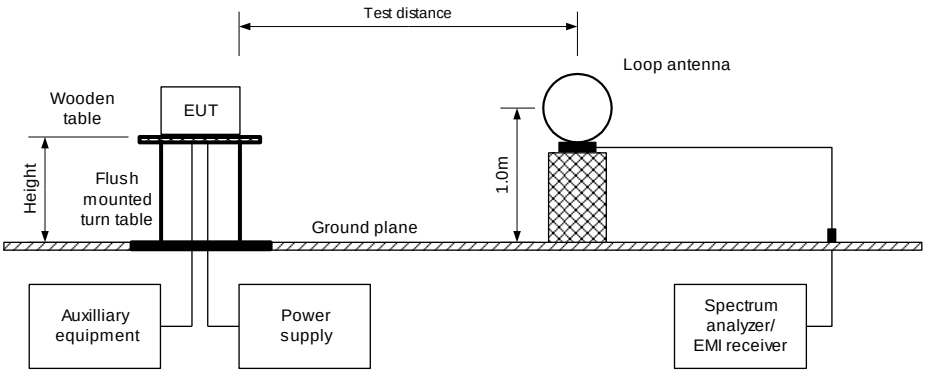
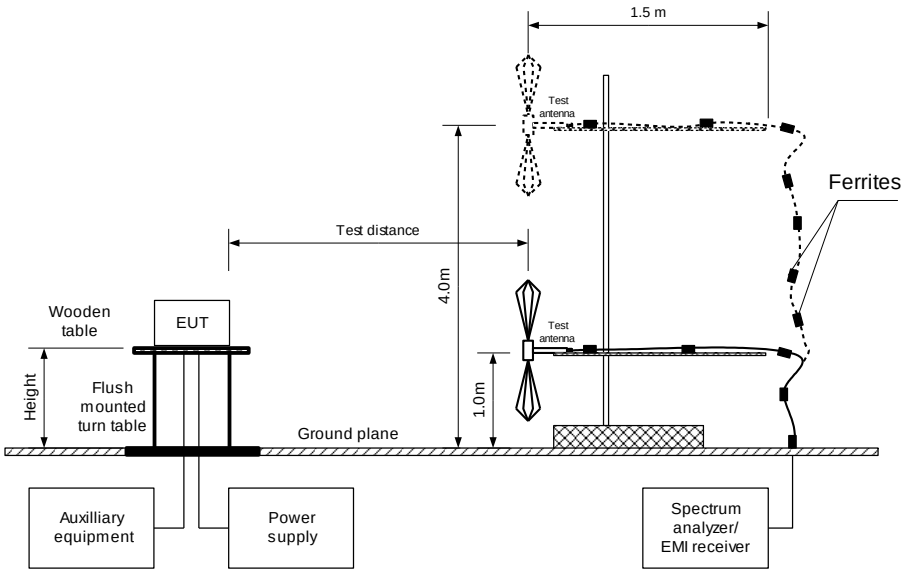
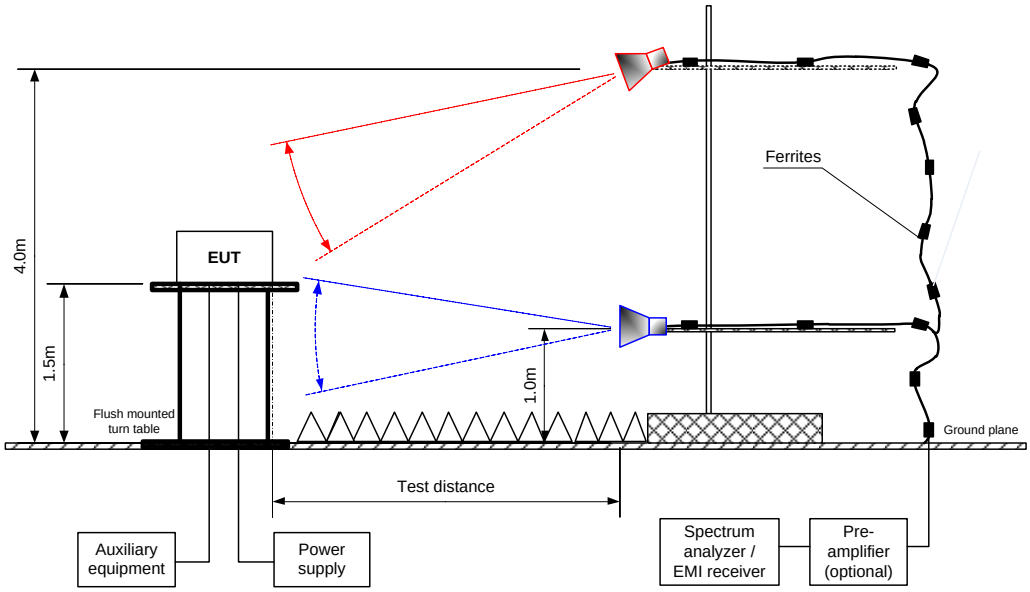


Figure 7.3.2 Setup for spurious emission field strength measurements in 30 – 1000 MHz



Test specification:	Section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions		
Test procedure:	ANSI C63.10 section 11.12.1		
Test mode:	Compliance	Verdict:	PASS
Date(s):	31-Aug-23		
Temperature: 24 ºC	Relative Humidity: 53 %	Air Pressure: 1012 hPa	Power: 4.37 VDC
Remarks:			

Figure 7.3.3 Setup for spurious emission field strength measurements above 1000 MHz



Test specification:	**Section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions**		
Test procedure:	ANSI C63.10 section 11.12.1		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	31-Aug-23		
Temperature: 24 ºC	**Relative Humidity:** 53 %	**Air Pressure:** 1012 hPa	**Power:** 4.37 VDC
Remarks:			

Table 7.3.2 Field strength of emissions outside restricted bands

ASSIGNED FREQUENCY:	2400-2483.5 MHz
INVESTIGATED FREQUENCY RANGE:	0.009 - 25000 MHz
TEST DISTANCE:	3 m
MODULATION:	BPSK
BIT RATE:	6 Mbps
DUTY CYCLE:	100 %
DETECTOR USED:	Peak
RESOLUTION BANDWIDTH:	100 kHz
VIDEO BANDWIDTH:	300 kHz
TEST ANTENNA TYPE:	Active loop (9 kHz – 30 MHz) Biconilog (30 MHz – 1000 MHz) Double ridged guide (above 1000 MHz)

Frequency, GHz	Field strength of spurious, dB(µV/m)	Antenna polarization	Antenna height, m	Azimuth, degrees*	Field strength of carrier, dB(µV/m)	Attenuation below carrier, dBc	Limit, dBc	Margin, dB**	Verdict
Low carrier frequency									
9.6478	65.07	H	1.0	-35	104.56	39.49	20.0	19.49	Pass
Mid carrier frequency									
9.7476	61.96	H	1.23	-25	102.44	40.48	20.0	20.48	Pass
High carrier frequency									
9.847	62.78	H	1.02	-35	103.41	40.63	20.0	20.63	Pass

*****- EUT front panel refers to 0 degrees position of turntable.
******- Margin = Attenuation below carrier – specification limit.

Test specification:	Section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions		
Test procedure:	ANSI C63.10 section 11.12.1		
Test mode:	Compliance	Verdict:	PASS
Date(s):	31-Aug-23		
Temperature: 24 ºC	Relative Humidity: 53 %	Air Pressure: 1012 hPa	Power: 4.37 VDC
Remarks:			

Table 7.3.3 Field strength of spurious emissions above 1 GHz within restricted bands

ASSIGNED FREQUENCY:	2400-2483.5 MHz
INVESTIGATED FREQUENCY RANGE:	1000 -25000 MHz
TEST DISTANCE:	3 m
MODULATION:	BPSK
BIT RATE:	6 Mbps
DUTY CYCLE:	100 %
DETECTOR USED:	Peak
RESOLUTION BANDWIDTH:	1000 kHz
TEST ANTENNA TYPE:	Double ridged guide

Frequency, MHz	Antenna		Azimuth, degrees*	Peak field strength(VBW=3 MHz)			Average field strength(VBW=10 Hz)				Verdict
	Polarization	Height, m		Measured, dB(μV/m)	Limit, dB(μV/m)	Margin, dB**	Measured, dB(μV/m)	Calculated, dB(μV/m)	Limit, dB(μV/m)	Margin, dB***	
Low carrier frequency											
No emission where found											Pass
Mid carrier frequency											
No emission where found											Pass
High carrier frequency											
7389.04	Horizontal	1.87	11	56.62	74	-17.3	41.15	NA	54	-12.85	Pass

*****- EUT front panel refers to 0 degrees position of turntable.
******- Margin = Measured field strength - specification limit.
***- Margin = Calculated field strength - specification limit,
where Calculated field strength = Measured field strength + average factor.

Table 7.3.4 Average factor calculation

Transmission pulse		Transmission burst		Transmission train duration, ms	Average factor, dB
Duration, ms	Period, ms	Duration, ms	Period, ms		
NA	NA	NA	NA	NA	NA

*- Average factor was calculated as follows

for pulse train shorter than 100 ms: $$Average\ factor = 20 \times \log_{10}\left(\frac{Pulse\ duration}{Pulse\ period} \times \frac{Burst\ duration}{Train\ duration} \times Number\ of\ bursts\ within\ pulse\ train\right)$$

for pulse train longer than 100 ms: $$Average\ factor = 20 \times \log_{10}\left(\frac{Pulse\ duration}{Pulse\ period} \times \frac{Burst\ duration}{100\ ms} \times Number\ of\ bursts\ within\ 100\ ms\right)$$

Test specification:	**Section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions**		
Test procedure:	ANSI C63.10 section 11.12.1		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	31-Aug-23		
Temperature: 24 ºC	**Relative Humidity:** 53 %	**Air Pressure:** 1012 hPa	**Power:** 4.37 VDC
Remarks:			

Table 7.3.5 Field strength of spurious emissions below 1 GHz within restricted bands

ASSIGNED FREQUENCY:	2400-2483.5 MHz
INVESTIGATED FREQUENCY RANGE:	0.009 – 1000 MHz
TEST DISTANCE:	3 m
MODULATION:	BPSK
BIT RATE:	6 Mbps
DUTY CYCLE:	100 %
RESOLUTION BANDWIDTH:	0.2 kHz (9 kHz – 150 kHz) 9.0 kHz (150 kHz – 30 MHz) 120 kHz (30 MHz – 1000 MHz)
VIDEO BANDWIDTH:	> Resolution bandwidth
TEST ANTENNA TYPE:	Active loop (9 kHz – 30 MHz) Biconilog (30 MHz – 1000 MHz)

Frequency, MHz	**Peak emission, dB(μV/m)**	**Quasi-peak**			**Antenna polarization**	**Antenna height, m**	**Turn-table position**, degrees**	**Verdict**
		Measured emission, dB(μV/m)	**Limit, dB(μV/m)**	**Margin, dB***				
Low carrier frequency								
No emission where found								Pass
Mid carrier frequency								
No emission where found								Pass
High carrier frequency								
No emission where found								Pass

*****- Margin = Measured emission - specification limit.
******- EUT front panel refer to 0 degrees position of turntable.

Reference numbers of test equipment used

HL 0802	HL 3903	HL 4339	HL 4933	HL 5288	HL 5902		

Full description is given in Appendix A.

Test specification:	**Section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions**		
Test procedure:	ANSI C63.10 section 11.12.1		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	31-Aug-23		
Temperature: 24 ºC	**Relative Humidity:** 53 %	**Air Pressure:** 1012 hPa	**Power:** 4.37 VDC
Remarks:			

Table 7.3.6 Restricted bands according to FCC section 15.205

MHz	MHz	MHz	MHz	MHz	GHz
0.09 - 0.11	8.37625 - 8.38675	73 - 74.6	399.9 - 410	2690 - 2900	10.6 - 12.7
0.495 - 0.505	8.41425 - 8.41475	74.8 - 75.2	608 - 614	3260 - 3267	13.25 - 13.4
2.1735 - 2.1905	12.29 - 12.293	108 - 121.94	960 - 1240	3332 - 3339	14.47 - 14.5
4.125 - 4.128	12.51975 - 12.52025	123 - 138	1300 - 1427	3345.8 - 3358	15.35 - 16.2
4.17725 - 4.17775	12.57675 - 12.57725	149.9 - 150.05	1435 - 1626.5	3600 - 4400	17.7 - 21.4
4.20725 - 4.20775	13.36 - 13.41	156.52475 - 156.52525	1645.5 - 1646.5	4500 - 5150	22.01 - 23.12
6.215 - 6.218	16.42 - 16.423	156.7 - 156.9	1660 - 1710	5350 – 5460	23.6 - 24
6.26775 - 6.26825	16.69475 - 16.69525	162.0125 - 167.17	1718.8 - 1722.2	7250 - 7750	31.2 - 31.8
6.31175 - 6.31225	16.80425 - 16.80475	167.72 - 173.2	2200 - 2300	8025 – 8500	36.43 - 36.5
8.291 - 8.294	25.5 - 25.67	240 - 285	2310 - 2390	9000 - 9200	Above 38.6
8.362 - 8.366	37.5 - 38.25	322 - 335.4	2483.5 - 2500	9300 - 9500	

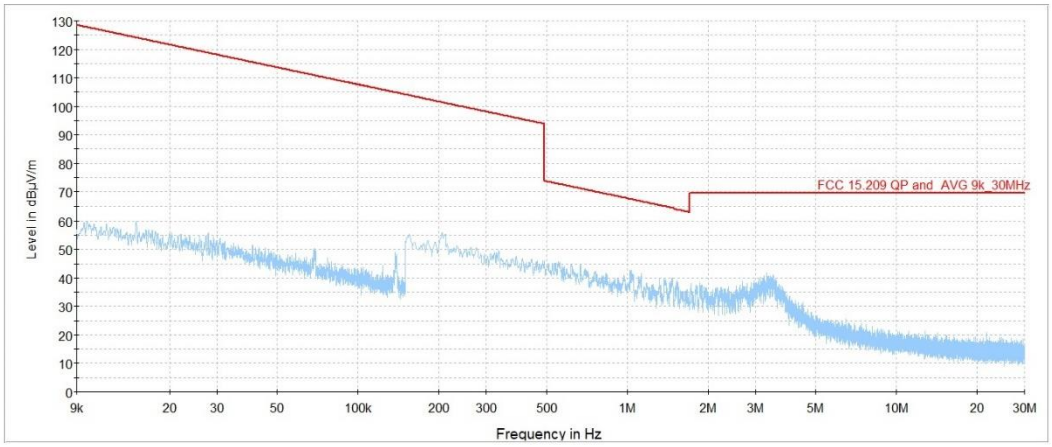
Table 7.3.7 Restricted bands according to RSS-Gen

MHz	MHz	MHz	MHz	MHz	GHz
0.09 - 0.11	8.291 - 8.294	16.80425 - 16.80475	399.9 - 410	3260 - 3267	10.6 - 12.7
2.1735 - 2.1905	8.362 - 8.366	25.5 - 25.67	608 - 614	3332 – 3339	13.25 - 13.4
3.020 – 3.026	8.37625 - 8.38675	37.5 - 38.25	960 – 1427	3345.8 – 3358	14.47 – 14.5
4.125 – 4.128	8.41425 - 8.41475	73 - 74.6	1435 – 1626.5	3500 – 4400	15.35 – 16.2
4.17725 – 4.17775	12.29 – 12.293	74.8 - 75.2	1645.5 – 1646.5	4500 – 5150	17.7 – 21.4
4.20725 – 4.20775	12.51975 – 12.52025	108 – 138	1660 - 1710	5350 – 5460	22.01 – 23.12
5.677 – 5.683	12.57675 – 12.57725	156.52475 – 156.52525	1718.8 - 1722.2	7250 - 7750	23.6 - 24
6.215 - 6.218	13.36 – 13.41	156.7 - 156.9	2200 - 2300	8025 – 8500	31.2 - 31.8
6.26775 - 6.26825	16.42 - 16.423	240 - 285	2310 - 2390	9000 - 9200	36.43 - 36.5
6.31175 - 6.31225	16.69475 - 16.69525	322 - 335.4	2655 - 2900	9300 - 9500	Above 38.6

Test specification:	Section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions		
Test procedure:	ANSI C63.10 section 11.12.1		
Test mode:	Compliance	Verdict:	PASS
Date(s):	31-Aug-23		
Temperature: 24 ºC	Relative Humidity: 53 %	Air Pressure: 1012 hPa	Power: 4.37 VDC
Remarks:			

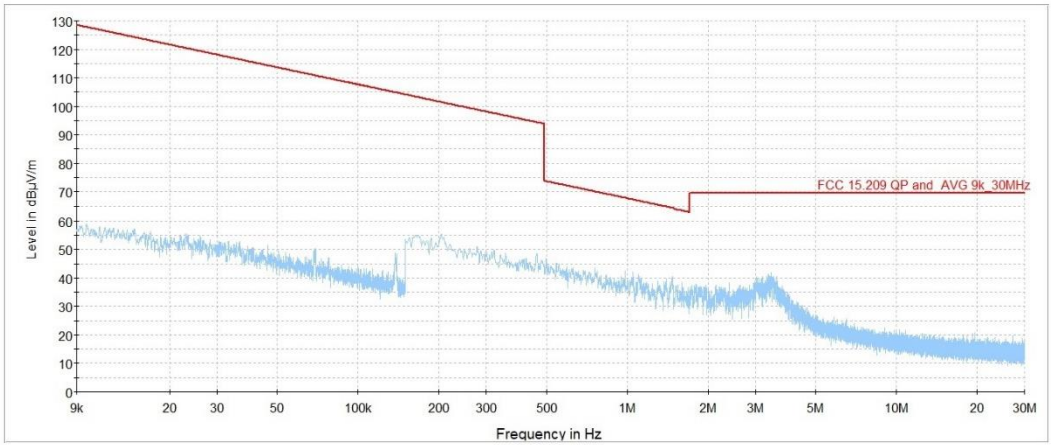
Plot 7.3.1 Radiated emission measurements from 9 kHz to 30 MHz at the low carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical



Plot 7.3.2 Radiated emission measurements from 9 kHz to 30 MHz at the mid carrier frequency

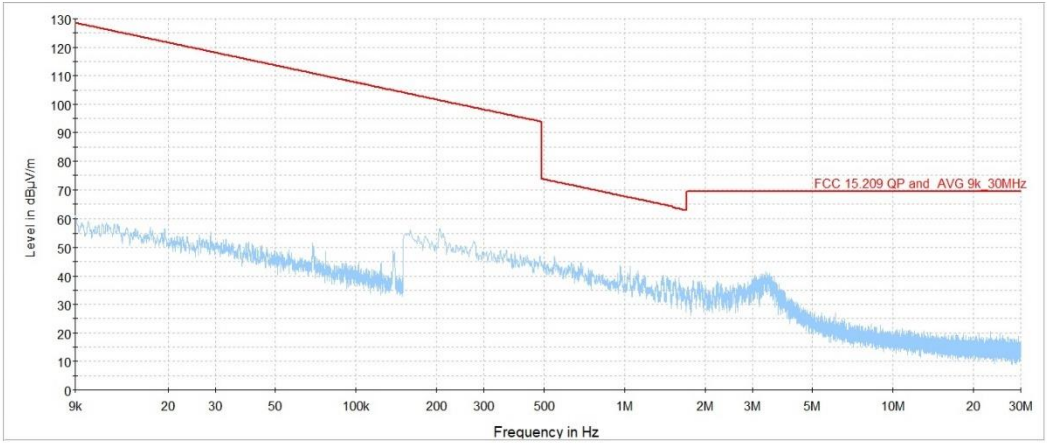
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical



Test specification:	Section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions		
Test procedure:	ANSI C63.10 section 11.12.1		
Test mode:	Compliance	Verdict:	PASS
Date(s):	31-Aug-23		
Temperature: 24 ºC	Relative Humidity: 53 %	Air Pressure: 1012 hPa	Power: 4.37 VDC
Remarks:			

Plot 7.3.3 Radiated emission measurements from 9 kHz to 30 MHz at the high carrier frequency

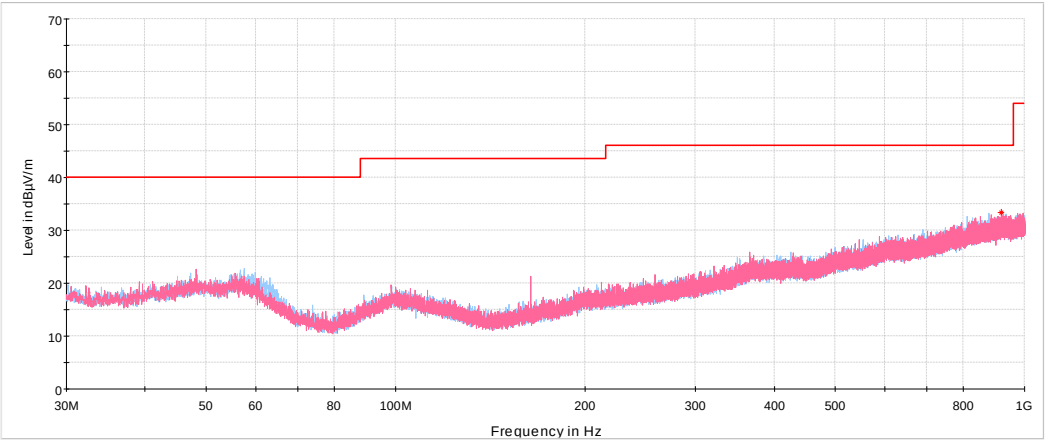
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical



Test specification:	Section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions		
Test procedure:	ANSI C63.10 section 11.12.1		
Test mode:	Compliance	Verdict:	PASS
Date(s):	31-Aug-23		
Temperature: 24 ºC	Relative Humidity: 53 %	Air Pressure: 1012 hPa	Power: 4.37 VDC
Remarks:			

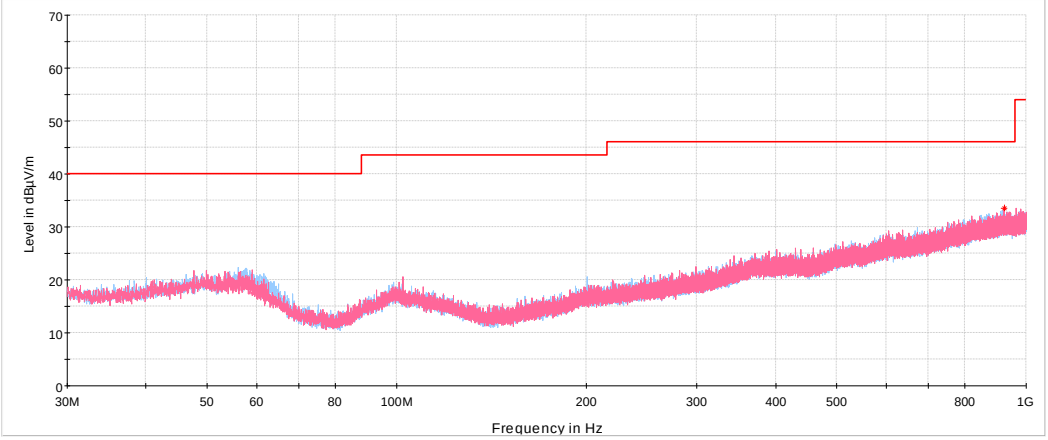
Plot 7.3.4 Radiated emission measurements from 30 to 1000 MHz at the low carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 7.3.5 Radiated emission measurements from 30 to 1000 MHz at the mid carrier frequency

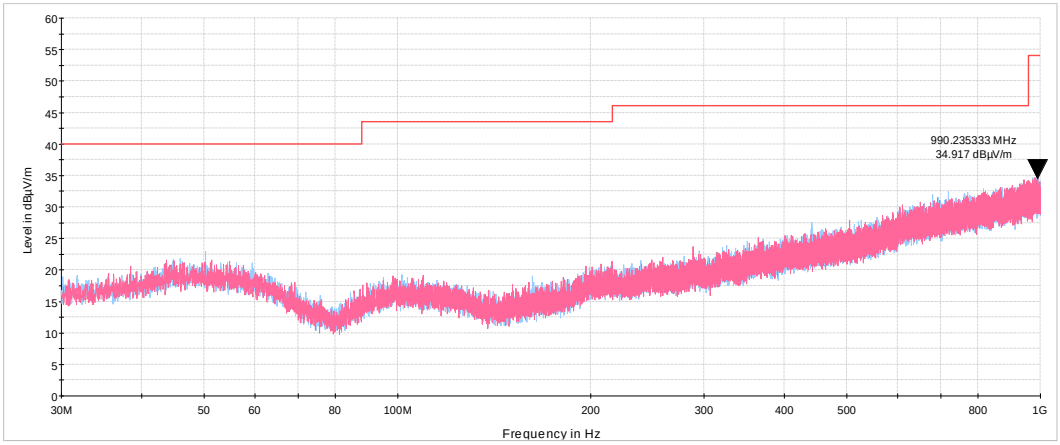
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	**Section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions**		
Test procedure:	ANSI C63.10 section 11.12.1		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	31-Aug-23		
Temperature: 24 ºC	**Relative Humidity:** 53 %	**Air Pressure:** 1012 hPa	**Power:** 4.37 VDC
Remarks:			

Plot 7.3.6 Radiated emission measurements from 30 to 1000 MHz at the high carrier frequency

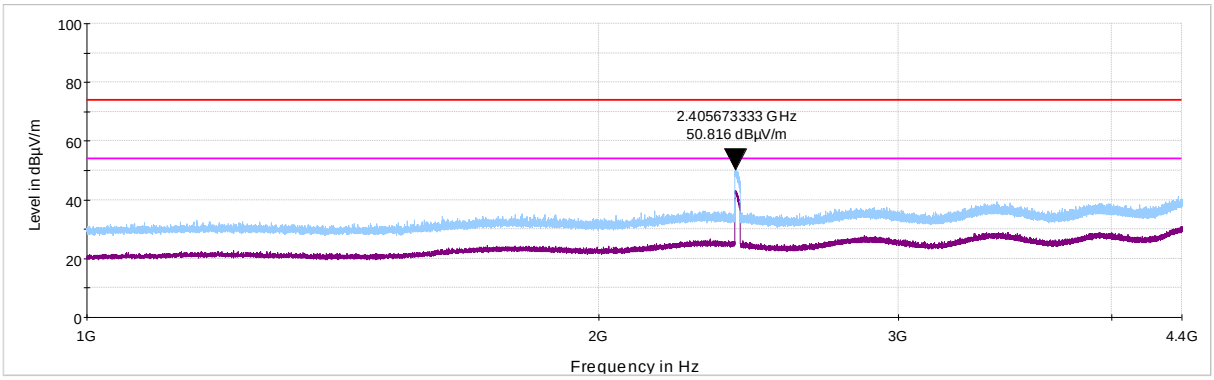
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	Section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions		
Test procedure:	ANSI C63.10 section 11.12.1		
Test mode:	Compliance	Verdict:	PASS
Date(s):	31-Aug-23		
Temperature: 24 ºC	Relative Humidity: 53 %	Air Pressure: 1012 hPa	Power: 4.37 VDC
Remarks:			

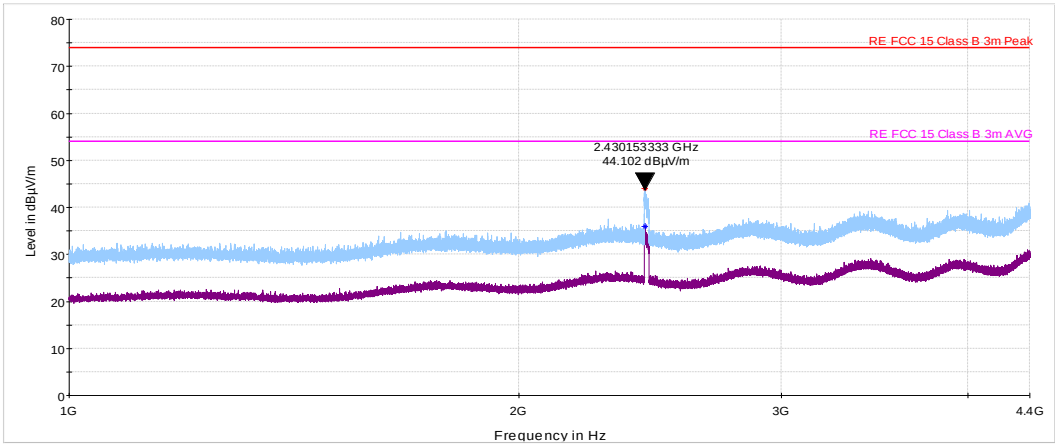
Plot 7.3.7 Radiated emission measurements from 1000 to 4400 MHz at the low carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 7.3.8 Radiated emission measurements from 1000 to 4400 MHz at the mid carrier frequency

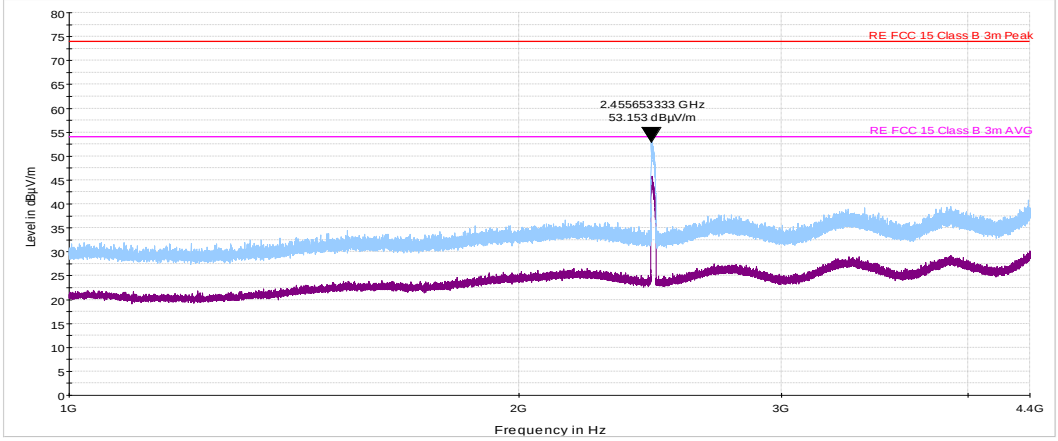
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	Section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions		
Test procedure:	ANSI C63.10 section 11.12.1		
Test mode:	Compliance	Verdict:	PASS
Date(s):	31-Aug-23		
Temperature: 24 ºC	Relative Humidity: 53 %	Air Pressure: 1012 hPa	Power: 4.37 VDC
Remarks:			

Plot 7.3.9 Radiated emission measurements from 1000 to 4400 MHz at the high carrier frequency

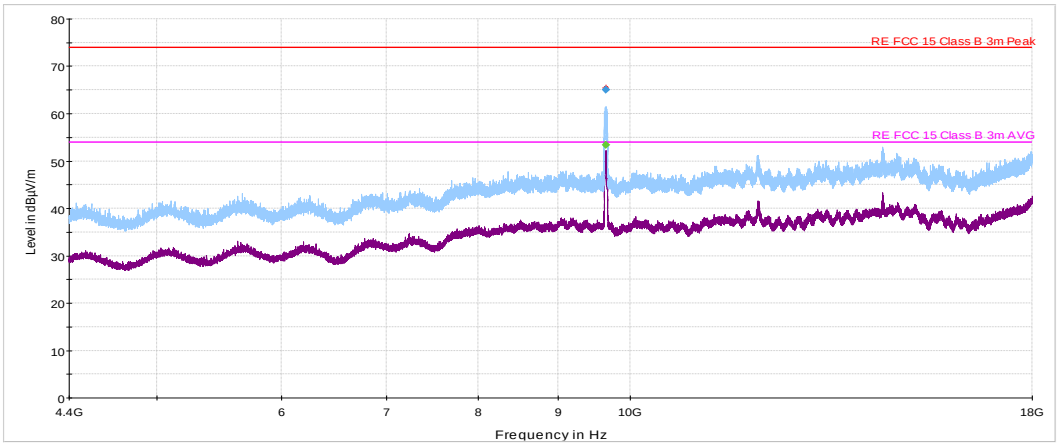
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	Section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions		
Test procedure:	ANSI C63.10 section 11.12.1		
Test mode:	Compliance	Verdict:	PASS
Date(s):	31-Aug-23		
Temperature: 24 ºC	Relative Humidity: 53 %	Air Pressure: 1012 hPa	Power: 4.37 VDC
Remarks:			

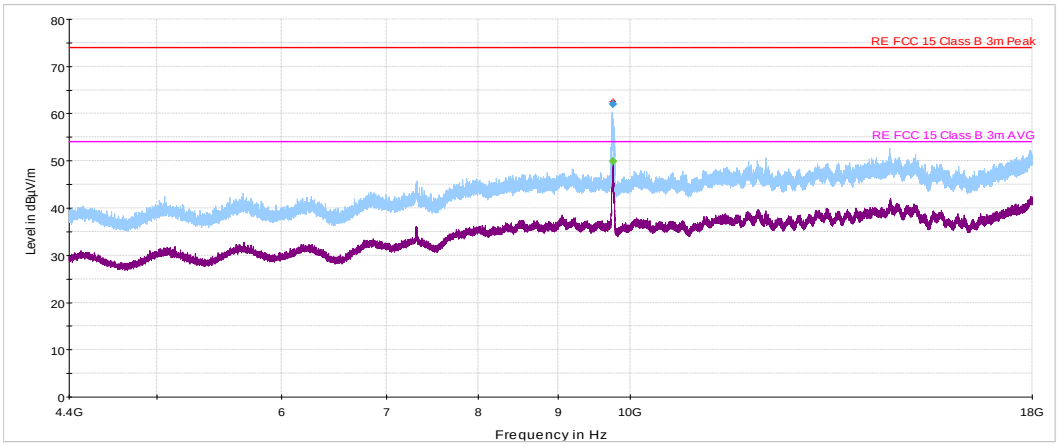
Plot 7.3.10 Radiated emission measurements from 4.4 GHz to 18 GHz at the low carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 7.3.11 Radiated emission measurements from 4.4 GHz to 18 GHz at the mid carrier frequency

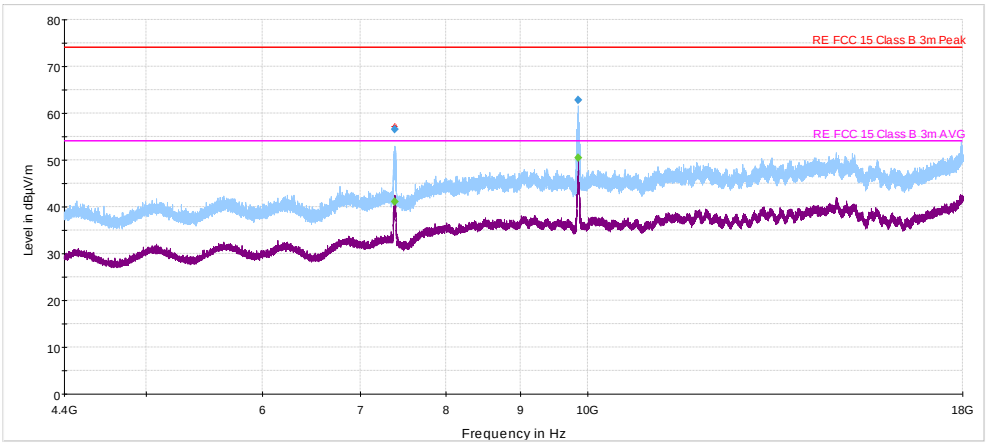
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	Section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions		
Test procedure:	ANSI C63.10 section 11.12.1		
Test mode:	Compliance	Verdict:	PASS
Date(s):	31-Aug-23		
Temperature: 24 ºC	Relative Humidity: 53 %	Air Pressure: 1012 hPa	Power: 4.37 VDC
Remarks:			

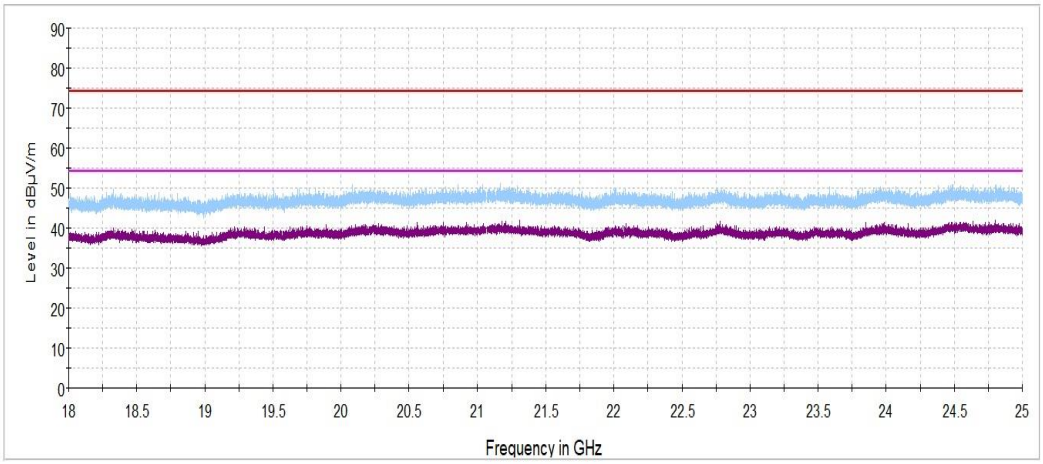
Plot 7.3.12 Radiated emission measurements from 4.4 GHz to 18 GHz at the high carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 7.3.13 Radiated emission measurements from 18 GHz to 25 GHz at the low carrier frequency

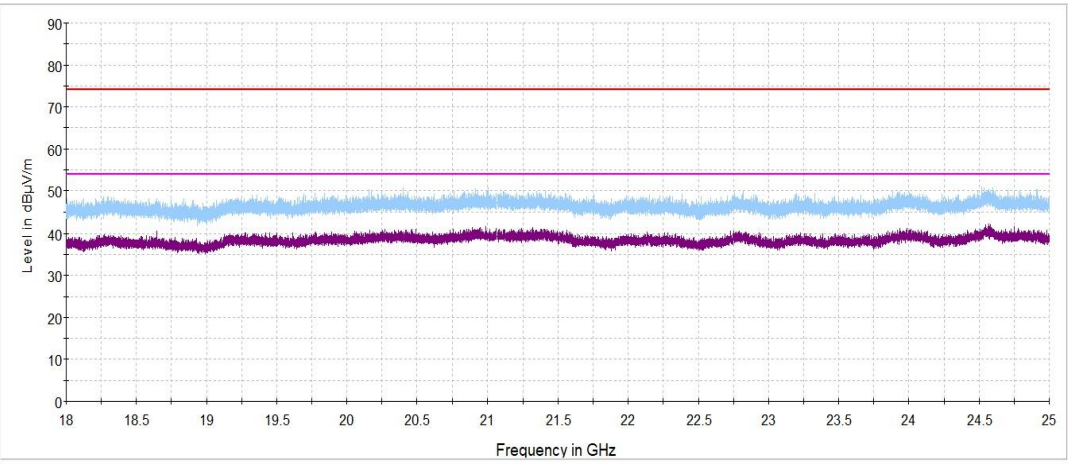
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	Section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions		
Test procedure:	ANSI C63.10 section 11.12.1		
Test mode:	Compliance	Verdict:	PASS
Date(s):	31-Aug-23		
Temperature: 24 ºC	Relative Humidity: 53 %	Air Pressure: 1012 hPa	Power: 4.37 VDC
Remarks:			

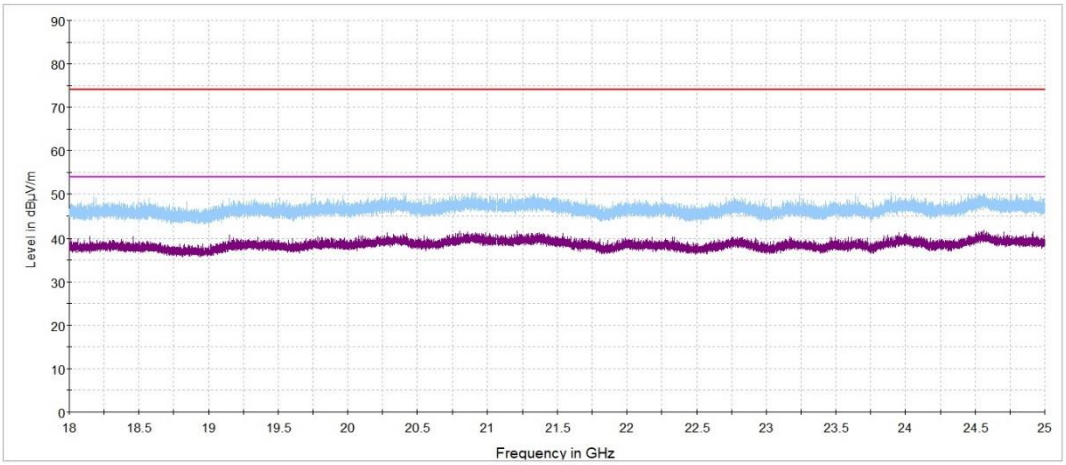
Plot 7.3.14 Radiated emission measurements from 18 GHz to 25 GHz at the mid carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 7.3.15 Radiated emission measurements from 18 GHz to 25 GHz at the high carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	Section 15.247(d) / RSS-247 section 5.5, Band edge emissions		
Test procedure:	ANSI C63.10 section 11.13.2		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-24		
Temperature: 25 ºC	Relative Humidity: 59 %	Air Pressure: 1012 hPa	Power: 4.3 VDC
Remarks:			

7.4 Band edge radiated emissions

7.4.1 General

This test was performed to measure emissions, radiated from the EUT at the assigned frequency band edges. Specification test limits are given in Table 7.4.1.

Table 7.4.1 Band edge emission limits

Output power	Assigned frequency, MHz	Attenuation below carrier*, dBc	Field strength at 3 m within restricted bands, dB(µV/m)	
			Peak	Average
Peak	2400.0 – 2483.5	20.0	74.0	54.0

* - Band edge emission limit is provided in terms of attenuation below the peak of modulated carrier measured with the same resolution bandwidth.

7.4.2 Test procedure

7.4.2.1 The EUT was set up as shown in Figure 7.4.1, energized normally modulated at the maximum data rate and its proper operation was checked.

7.4.2.2 The EUT was adjusted to produce maximum available to end user RF output power at the lowest carrier frequency.

7.4.2.3 The spectrum analyzer span was set to capture the carrier frequency and associated modulation products. The resolution bandwidth was set wider than 1 % of the frequency span.

7.4.2.4 The spectrum analyzer was set in max hold mode and allowed trace to stabilize. The highest emission level within the authorized band was measured.

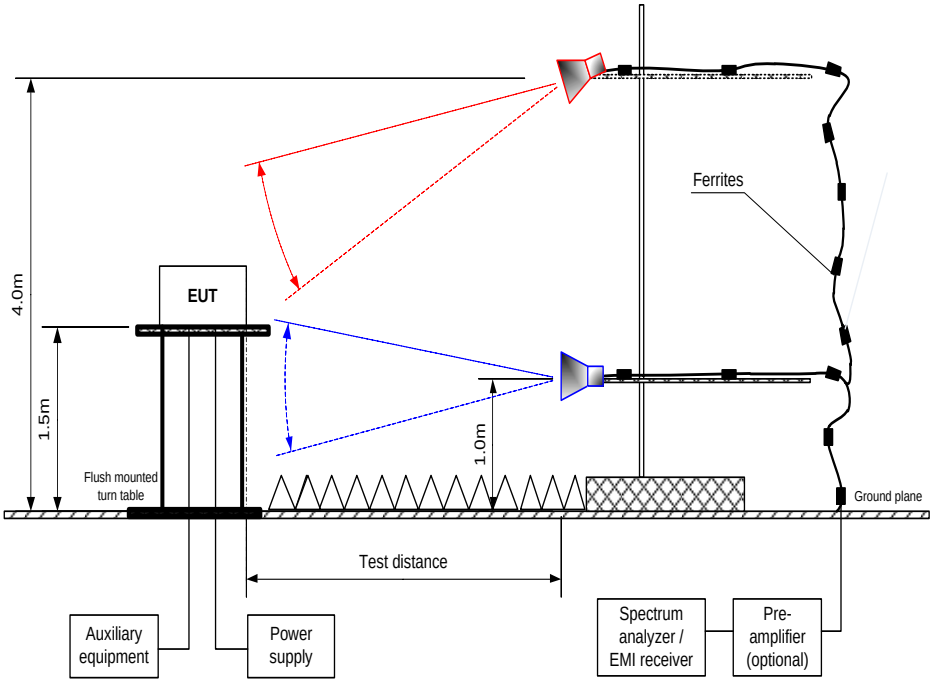
7.4.2.5 The maximum band edge emission and modulation product outside of the band were measured as provided in Table 7.4.2 and associated plots and referenced to the highest emission level measured within the authorized band.

7.4.2.6 The above procedure was repeated with the EUT adjusted to produce maximum RF output power at the highest carrier frequency.

7.4.2.7 The above procedure was repeated with the frequency hopping function enabled.

Test specification:	Section 15.247(d) / RSS-247 section 5.5, Band edge emissions		
Test procedure:	ANSI C63.10 section 11.13.2		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-24		
Temperature: 25 ºC	Relative Humidity: 59 %	Air Pressure: 1012 hPa	Power: 4.3 VDC
Remarks:			

Figure 7.4.1 Band edge emission test setup



Test specification:	Section 15.247(d) / RSS-247 section 5.5, Band edge emissions		
Test procedure:	ANSI C63.10 section 11.13.2		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-24		
Temperature: 25 ºC	Relative Humidity: 59 %	Air Pressure: 1012 hPa	Power: 4.3 VDC
Remarks:			

Table 7.4.2 Band edge emission outside restricted bands test results

ASSIGNED FREQUENCY RANGE: 2400.0 – 2483.5 MHz
DETECTOR USED: Peak
TRANSMITTER OUTPUT POWER SETTINGS: Maximum
RESOLUTION BANDWIDTH: 100 kHz
VIDEO BANDWIDTH: ≥ RBW

CHANNEL BANDWIDTH: 20 MHz
MODULATION/BITRATE: CCK / 11 Mbps

Frequency, MHz	Band edge emission, dBµV/m	Emission at carrier, dBµV/m	Attenuation below carrier, dBc	Limit, dBc	Margin, dB*	Verdict
2400.000	50.49	97.87	-47.38	20.0	-27.38	Pass

CHANNEL BANDWIDTH: 20 MHz
MODULATION/BITRATE: BPSK / 6 Mbps

Frequency, MHz	Band edge emission, dBµV/m	Emission at carrier, dBµV/m	Attenuation below carrier, dBc	Limit, dBc	Margin, dB*	Verdict
2400.000	58.11	93.05	-34.94	20.0	-14.94	Pass

CHANNEL BANDWIDTH: 20 MHz
MODULATION/BITRATE: BPSK / 6.5 Mbps

Frequency, MHz	Band edge emission, dBµV/m	Emission at carrier, dBµV/m	Attenuation below carrier, dBc	Limit, dBc	Margin, dB*	Verdict
2400.000	58.27	93.64	-35.37	20.0	-15.37	Pass

CHANNEL BANDWIDTH: 40 MHz
MODULATION/BITRATE: BPSK / 6.5 Mbps

Frequency, MHz	Band edge emission, dBµV/m	Emission at carrier, dBµV/m	Attenuation below carrier, dBc	Limit, dBc	Margin, dB*	Verdict
2400.000	47.94	84.61	-36.67	20.0	-16.67	Pass

*- Margin = Attenuation below carrier – specification limit.

Test specification:	**Section 15.247(d) / RSS-247 section 5.5, Band edge emissions**		
Test procedure:	ANSI C63.10 section 11.13.2		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	17-Jan-24		
Temperature: 25 ºC	**Relative Humidity:** 59 %	**Air Pressure:** 1012 hPa	**Power:** 4.3 VDC
Remarks:			

Table 7.4.3 Band edge emission inside restricted bands test results

ASSIGNED FREQUENCY RANGE: 2400.0 – 2483.5 MHz
DETECTOR USED: Peak
TRANSMITTER OUTPUT POWER SETTINGS: Maximum
RESOLUTION BANDWIDTH: 100 kHz
VIDEO BANDWIDTH: ≥ RBW

CHANNEL BANDWIDTH: 20 MHz
MODULATION/BITRATE: CCK / 11 Mbps

Frequency, MHz	Peak field strength(VBW=8 MHz)			Average field strength(VBW=1 kHz)			Verdict
	Measured, dB(µV/m)	Limit, dB(µV/m)	Margin, dB**	Measured, dB(µV/m)	Limit, dB(µV/m)	Margin, dB**	
2390.0	59.12	74	-14.88	47.52	54	-6.48	Pass
2483.5	66.80	74	-7.20	49.62	54	-4.38	Pass

CHANNEL BANDWIDTH: 20 MHz
MODULATION/BITRATE: BPSK / 6 Mbps

Frequency, MHz	Peak field strength(VBW=8 MHz)			Average field strength(VBW=1 kHz)			Verdict
	Measured, dB(µV/m)	Limit, dB(µV/m)	Margin, dB**	Measured, dB(µV/m)	Limit, dB(µV/m)	Margin, dB**	
2390.0	69.96	74	-4.04	51.19	54	-2.81	Pass
2483.5	71.35	74	-2.65	53.76	54	-0.24	Pass

CHANNEL BANDWIDTH: 20 MHz
MODULATION/BITRATE: BPSK / 6.5 Mbps

Frequency, MHz	Peak field strength(VBW=8 MHz)			Average field strength(VBW=1 kHz)			Verdict
	Measured, dB(µV/m)	Limit, dB(µV/m)	Margin, dB**	Measured, dB(µV/m)	Limit, dB(µV/m)	Margin, dB**	
2390.0	64.31	74	-9.69	51.76	54	-2.24	Pass
2483.5	66.64	74	-7.36	51.63	54	-2.37	Pass

CHANNEL BANDWIDTH: 40 MHz
MODULATION/BITRATE: BPSK / 6.5 Mbps

Frequency, MHz	Peak field strength(VBW=8 MHz)			Average field strength(VBW=1 kHz)			Verdict
	Measured, dB(µV/m)	Limit, dB(µV/m)	Margin, dB**	Measured, dB(µV/m)	Limit, dB(µV/m)	Margin, dB**	
2390.0	62.23	74	-11.77	49.72	54	-4.28	Pass
2483.5	65.92	74	-8.08	52.56	54	-1.44	Pass

*****- Margin = Attenuation below carrier – specification limit.

Reference numbers of test equipment used

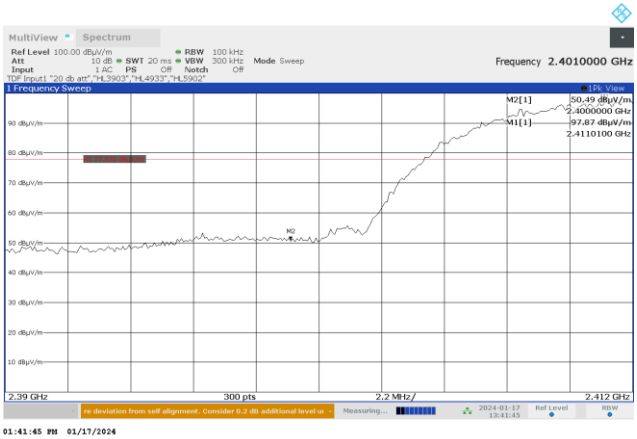
HL 3903	HL 4933	HL 5902	HL 7585				

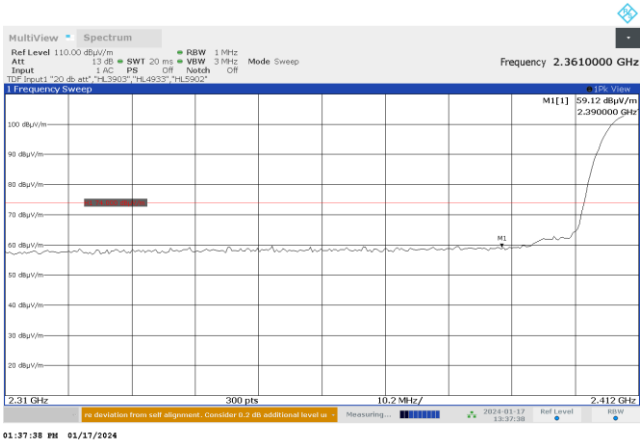
Full description is given in Appendix A.

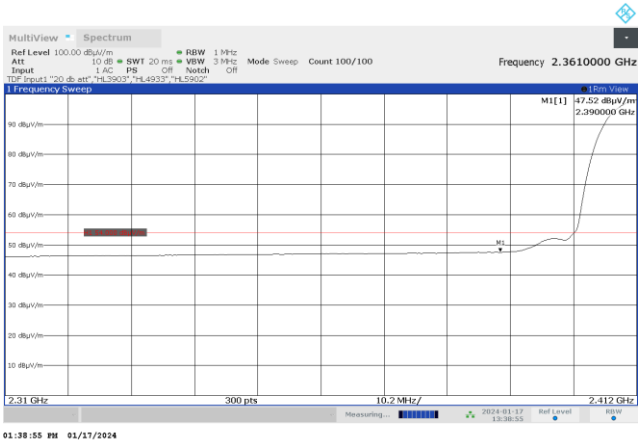
Test specification:	Section 15.247(d) / RSS-247 section 5.5, Band edge emissions		
Test procedure:	ANSI C63.10 section 11.13.2		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-24		
Temperature: 25 ºC	Relative Humidity: 59 %	Air Pressure: 1012 hPa	Power: 4.3 VDC
Remarks:			

Plot 7.4.1 The highest emission level outside restricted band at low carrier frequency

CHANNEL BANDWIDTH: 20 MHz
MODULATION / BITRATE: CCK/ 11 Mbps







Test specification:	**Section 15.247(d) / RSS-247 section 5.5, Band edge emissions**		
Test procedure:	ANSI C63.10 section 11.13.2		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	17-Jan-24		
Temperature: 25 ºC	**Relative Humidity:** 59 %	**Air Pressure:** 1012 hPa	**Power:** 4.3 VDC
Remarks:			