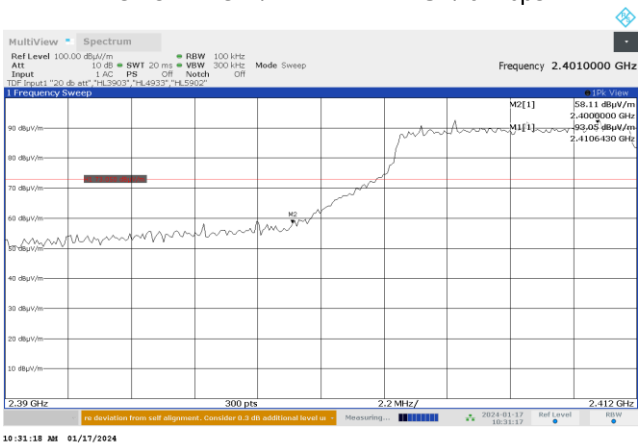
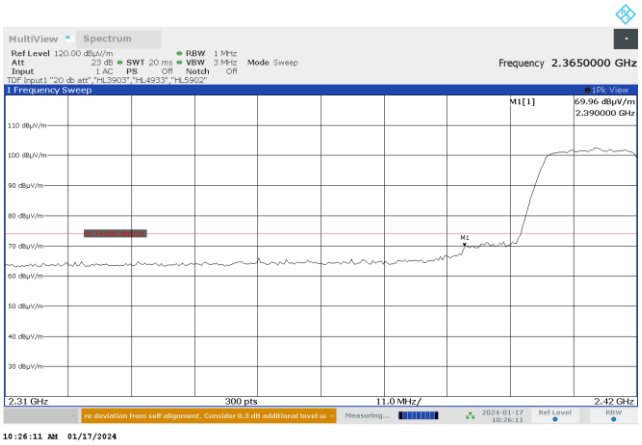
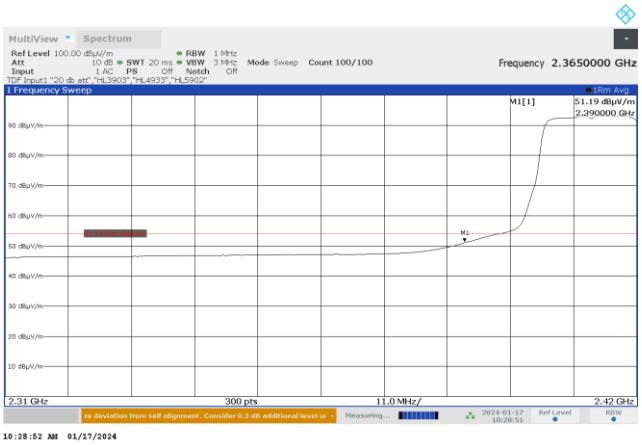
Test specification:	Section 15.247(d) / RSS-247 section 5.5, Band edge emissions		
Test procedure:	ANSI C63.10 section 11.13.2		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-24		
Temperature: 25 ºC	Relative Humidity: 59 %	Air Pressure: 1012 hPa	Power: 4.3 VDC
Remarks:			

Plot 7.4.2 The highest emission level outside restricted band at low carrier frequency

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



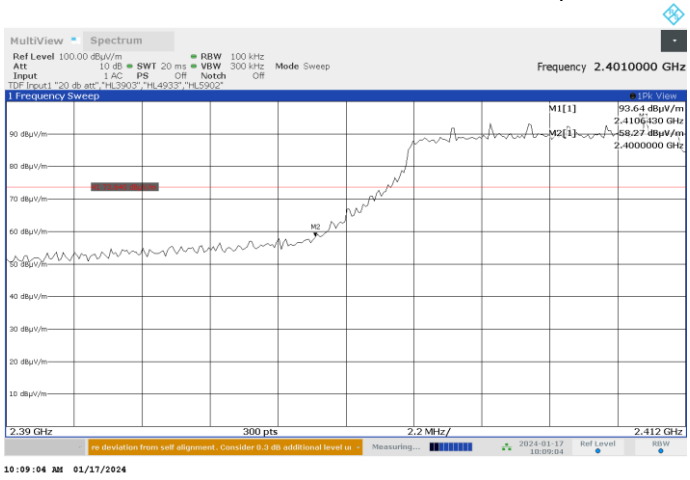


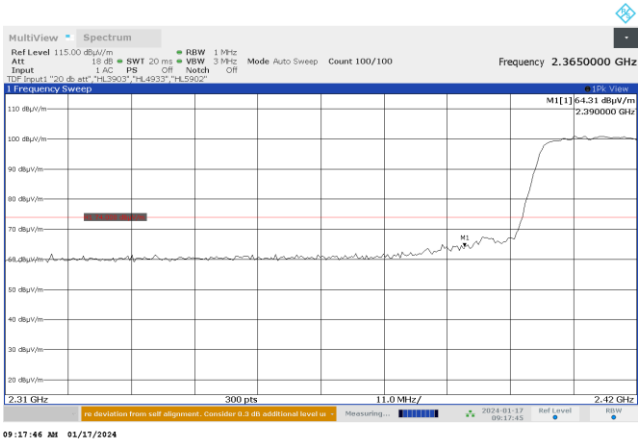


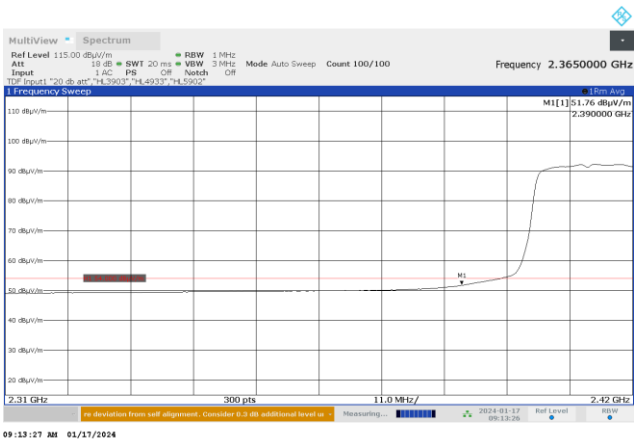
Test specification:	Section 15.247(d) / RSS-247 section 5.5, Band edge emissions		
Test procedure:	ANSI C63.10 section 11.13.2		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-24		
Temperature: 25 ºC	Relative Humidity: 59 %	Air Pressure: 1012 hPa	Power: 4.3 VDC
Remarks:			

Plot 7.4.3 The highest emission level outside restricted band at low carrier frequency

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



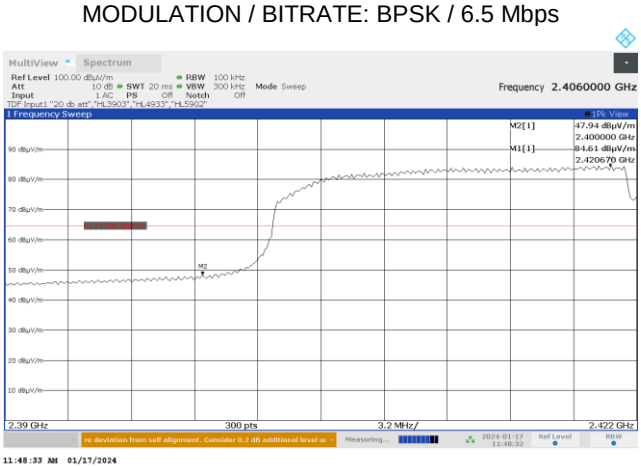


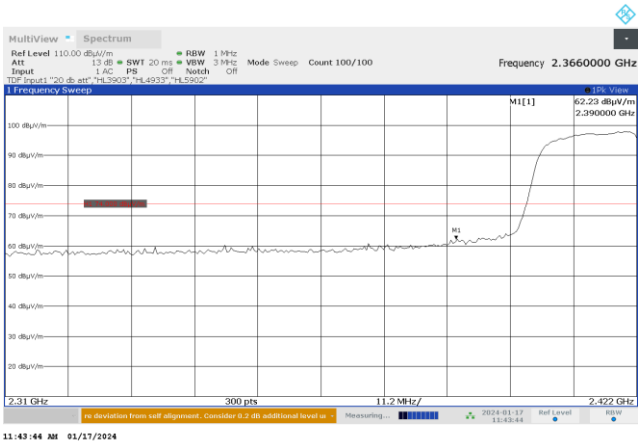


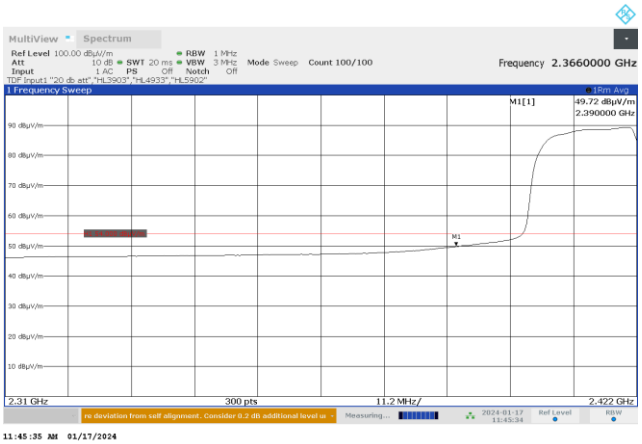
Test specification:	Section 15.247(d) / RSS-247 section 5.5, Band edge emissions		
Test procedure:	ANSI C63.10 section 11.13.2		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-24		
Temperature: 25 ºC	Relative Humidity: 59 %	Air Pressure: 1012 hPa	Power: 4.3 VDC
Remarks:			

Plot 7.4.4 The highest emission level outside restricted band at low carrier frequency

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



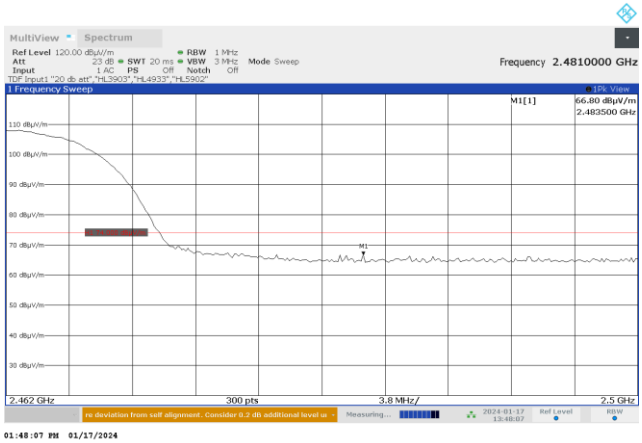


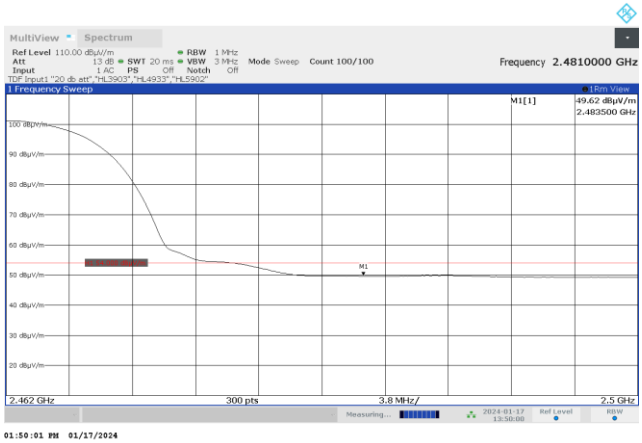


Test specification:	Section 15.247(d) / RSS-247 section 5.5, Band edge emissions		
Test procedure:	ANSI C63.10 section 11.13.2		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-24		
Temperature: 25 ºC	Relative Humidity: 59 %	Air Pressure: 1012 hPa	Power: 4.3 VDC
Remarks:			

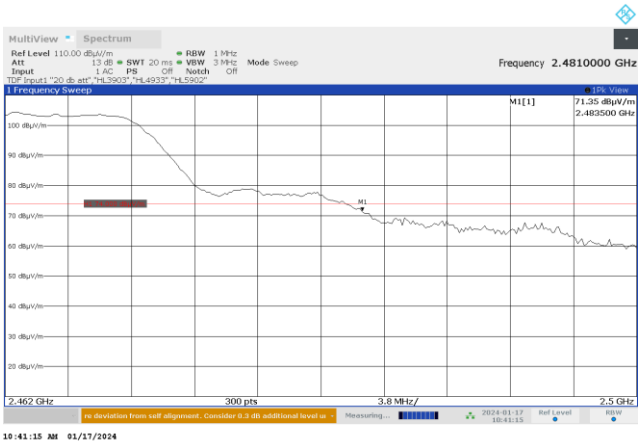
Plot 7.4.5 The highest emission level outside restricted band at high carrier frequency

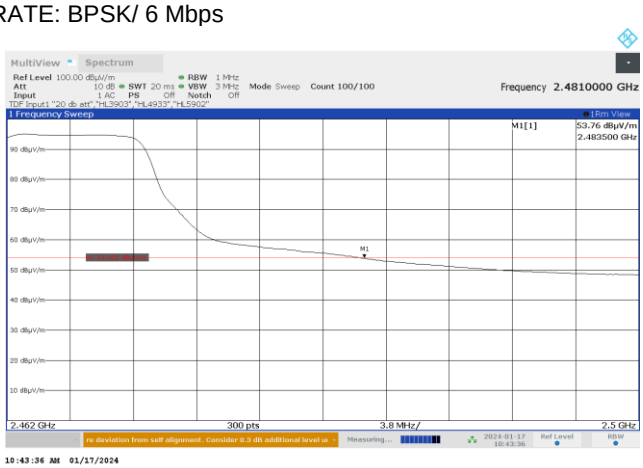
CHANNEL BANDWIDTH: 20 MHz
MODULATION / BITRATE: CCK/ 11 Mbps





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

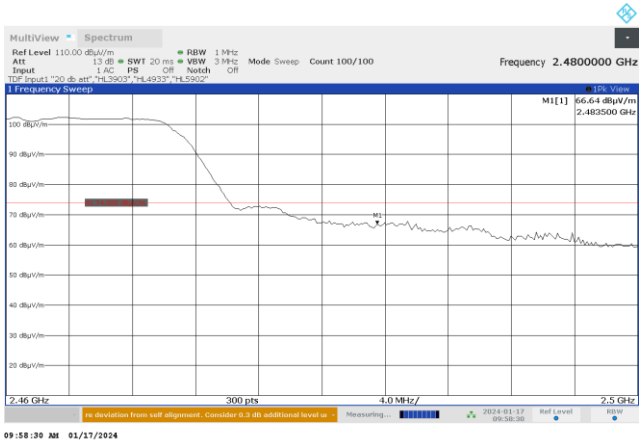


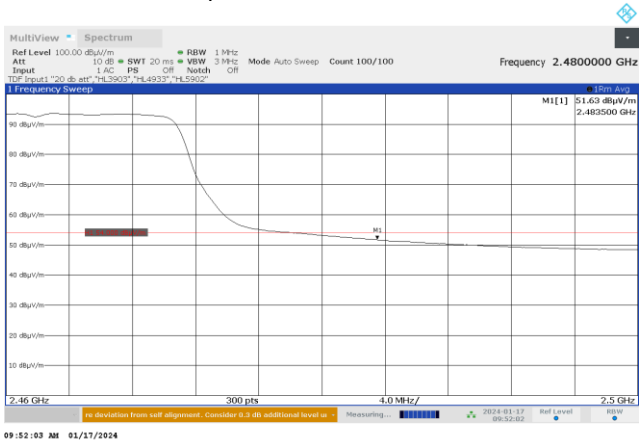


Test specification:	Section 15.247(d) / RSS-247 section 5.5, Band edge emissions		
Test procedure:	ANSI C63.10 section 11.13.2		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-24		
Temperature: 25 ºC	Relative Humidity: 59 %	Air Pressure: 1012 hPa	Power: 4.3 VDC
Remarks:			

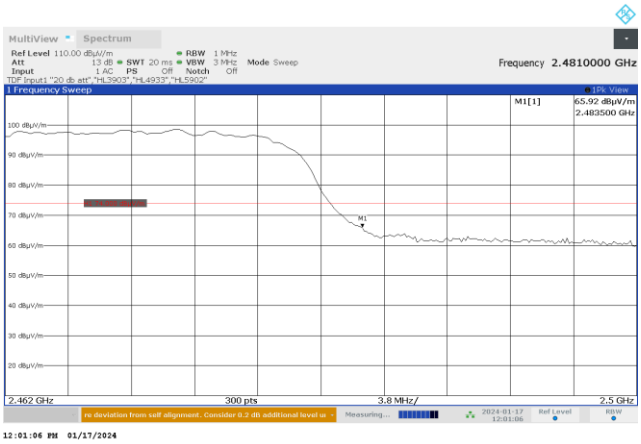
Plot 7.4.6 The highest emission level outside restricted band at high carrier frequency

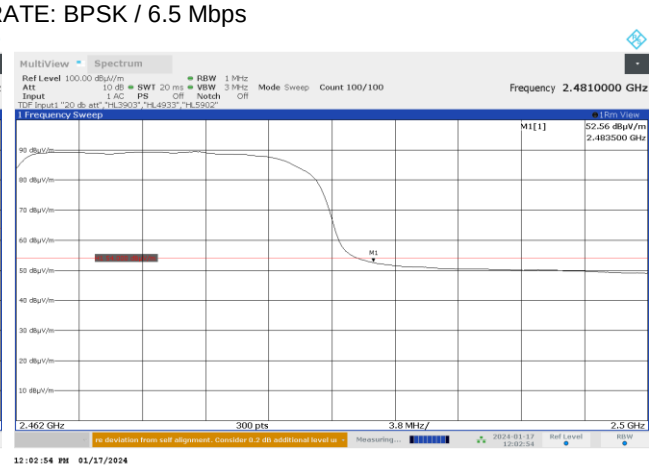
CHANNEL BANDWIDTH: 20 MHz
MODULATION / BITRATE: BPSK / 6.5 Mbps





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





Test specification:	Section 15.247(e) / RSS-247 section 5.2(b), Maximum power spectral density		
Test procedure:	ANSI C63.10 section 11.9.2.2.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	23-Jul-23		
Temperature: 25 ºC	Relative Humidity: 59 %	Air Pressure: 1012 hPa	Power: 4.3 VDC
Remarks:			

7.5 Peak spectral power density

7.5.1 General

This test was performed to measure the peak spectral power density radiated by the transmitter RF antenna. Specification test limits are given in Table 7.5.1.

Table 7.5.1 Peak spectral power density limits

Assigned frequency range, MHz	Measurement bandwidth, kHz	Peak spectral power density, dBm	Equivalent field strength limit @ 3m, dB(μV/m)*
902.0 – 928.0	3.0	8.0	103.2
2400.0 – 2483.5			
5725.0 – 5850.0			

* - Equivalent field strength limit was calculated from the peak spectral power density as follows: E=sqrt(30×P)/r, where P is peak spectral power density and r is antenna to EUT distance in meters.

7.5.2 Test procedure for field strength measurements

7.5.2.1 The EUT was set up as shown in Figure 7.5.1, energized and its proper operation was checked.

7.5.2.2 The EUT was adjusted to produce maximum available to end user RF output power.

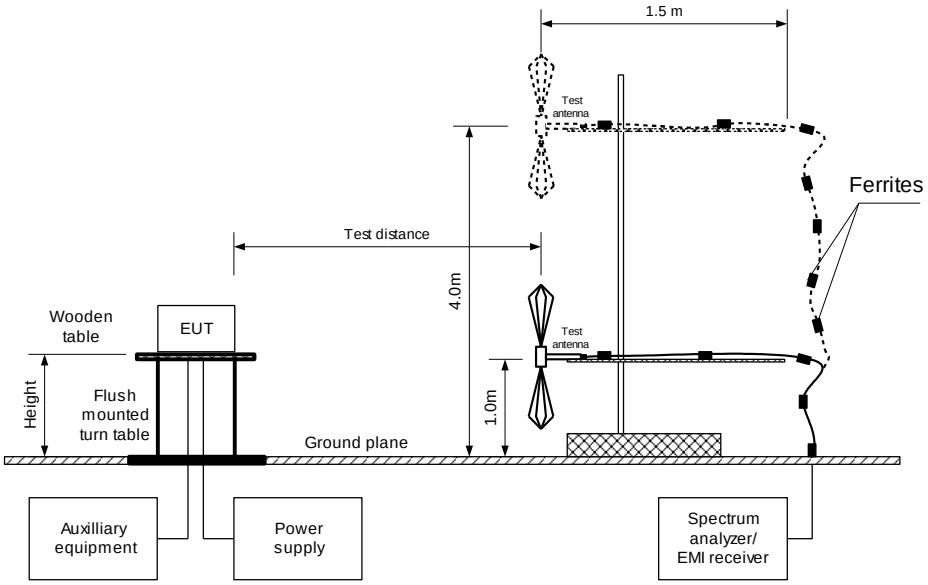
7.5.2.3 The field strength of the EUT carrier frequency was measured with antenna connected to spectrum analyzer/ EMI receiver. To find maximum radiation the turntable was rotated 360^0 and the measuring antenna height was swept in both vertical and horizontal polarizations.

7.5.2.4 The frequency span of spectrum analyzer was set to capture the entire 6 dB band of the transmitter, in peak hold mode with resolution bandwidth set to 3.0 kHz, video bandwidth wider than resolution bandwidth, auto sweep time and sufficient number of sweeps was allowed for trace stabilization. The spectrum lines spacing was verified to be wider than 3 kHz. Otherwise the resolution bandwidth was reduced until individual spectrum lines were resolved and the power of individual spectrum lines was integrated over 3 kHz band.

7.5.2.5 The peak of emission was zoomed with span set just wide enough to capture the emission peak area and sweep time was set equal to span width divided by resolution bandwidth. Spectrum analyzer was set in peak hold mode, sufficient number of sweeps was allowed for trace stabilization and peak spectral power density was measured as provided in Table 7.5.2 and associated plots.

Test specification:	Section 15.247(e) / RSS-247 section 5.2(b), Maximum power spectral density		
Test procedure:	ANSI C63.10 section 11.9.2.2.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	23-Jul-23		
Temperature: 25 ºC	Relative Humidity: 59 %	Air Pressure: 1012 hPa	Power: 4.3 VDC
Remarks:			

Figure 7.5.1 Setup for carrier field strength measurements



Test specification:	**Section 15.247(e) / RSS-247 section 5.2(b), Maximum power spectral density**		
Test procedure:	ANSI C63.10 section 11.9.2.2.4		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	23-Jul-23		
Temperature: 25 ºC	**Relative Humidity:** 59 %	**Air Pressure:** 1012 hPa	**Power:** 4.3 VDC
Remarks:			

Table 7.5.2 Field strength measurement of peak spectral power density

ASSIGNED FREQUENCY: 2400.0 – 2483.5 MHz
TEST DISTANCE: 3 m
TEST SITE: Semi anechoic chamber
EUT HEIGHT: 1.5 m
DETECTOR USED: Peak
RESOLUTION BANDWIDTH: 100 kHz
VIDEO BANDWIDTH: 1 MHz
TEST ANTENNA TYPE: Double ridged guide (above 1000 MHz)
TRANSMITTER OUTPUT POWER SETTINGS: Maximum

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

Frequency, MHz	Peak spectral power density, dB(μV/m)	EUT antenna gain, dBi	Limit, dB(μV/m)	Margin, dB*	Antenna polarization	Antenna height, m	Turn-table position**, degrees	Verdict
2412	88.27	-2	103.2	-12.93	Horizontal	1.5	23	Pass
2437	83.89	-2	103.2	-17.31	Vertical	1.5	-5	Pass
2462	83.07	-2	103.2	-18.13	Vertical	1.5	-22	Pass

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

Frequency, MHz	Peak spectral power density, dB(μV/m)	EUT antenna gain, dBi	Limit, dB(μV/m)	Margin, dB*	Antenna polarization	Antenna height, m	Turn-table position**, degrees	Verdict
2412	82.95	-2	103.2	-18.25	Horizontal	1.5	180	Pass
2437	82.18	-2	103.2	-19.02	Horizontal	1.5	9	Pass
2462	83.29	-2	103.2	-17.91	Vertical	1.5	180	Pass

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

Frequency, MHz	Peak spectral power density, dB(μV/m)	EUT antenna gain, dBi	Limit, dB(μV/m)	Margin, dB*	Antenna polarization	Antenna height, m	Turn-table position**, degrees	Verdict
2412	81.11	-2	103.2	-20.09	Vertical	1.5	-180	Pass
2437	80.03	-2	103.2	-21.17	Vertical	1.5	180	Pass
2462	81.06	-2	103.2	-20.14	Vertical	1.5	180	Pass

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

Frequency, MHz	Peak spectral power density, dB(μV/m)	EUT antenna gain, dBi	Limit, dB(μV/m)	Margin, dB*	Antenna polarization	Antenna height, m	Turn-table position**, degrees	Verdict
2412	80.92	-2	103.2	-20.28	Horizontal	1.5	15	Pass
2437	80.54	-2	103.2	-20.66	Horizontal	1.5	0	Pass
2462	79.84	-2	103.2	-21.36	Horizontal	1.5	15	Pass

Test specification:	**Section 15.247(e) / RSS-247 section 5.2(b), Maximum power spectral density**		
Test procedure:	ANSI C63.10 section 11.9.2.2.4		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	23-Jul-23		
Temperature: 25 ºC	**Relative Humidity:** 59 %	**Air Pressure:** 1012 hPa	**Power:** 4.3 VDC
Remarks:			

Table 7.5.3 Field strength measurement of peak spectral power density

ASSIGNED FREQUENCY: 2400.0 – 2483.5 MHz
TEST DISTANCE: 3 m
TEST SITE: Semi anechoic chamber
EUT HEIGHT: 1.5 m
DETECTOR USED: Peak
RESOLUTION BANDWIDTH: 100 kHz
VIDEO BANDWIDTH: 1 MHz
TEST ANTENNA TYPE: Double ridged guide (above 1000 MHz)
TRANSMITTER OUTPUT POWER SETTINGS: Maximum

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

Frequency, MHz	Peak spectral power density, dB(µV/m)	EUT antenna gain, dBi	Limit, dB(µV/m)	Margin, dB*	Antenna polarization	Antenna height, m	Turn-table position**, degrees	Verdict
2412	81.81	-2	103.2	-19.39	Vertical	1.5	4	Pass
2437	80.36	-2	103.2	-20.84	Horizontal	1.5	10	Pass
2462	80.59	-2	103.2	-20.61	Horizontal	1.5	10	Pass

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

Frequency, MHz	Peak spectral power density, dB(µV/m)	EUT antenna gain, dBi	Limit, dB(µV/m)	Margin, dB*	Antenna polarization	Antenna height, m	Turn-table position**, degrees	Verdict
2412	81.15	-2	103.2	-20.05	Vertical	1.5	0	Pass
2437	79.13	-2	103.2	-22.07	Horizontal	1.5	7	Pass
2462	79.62	-2	103.2	-21.58	Horizontal	1.5	10	Pass

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

Frequency, MHz	Peak spectral power density, dB(µV/m)	EUT antenna gain, dBi	Limit, dB(µV/m)	Margin, dB*	Antenna polarization	Antenna height, m	Turn-table position**, degrees	Verdict
2412	78.70	-2	103.2	-22.5	Horizontal	1.5	33	Pass
2437	77.85	-2	103.2	-23.35	Horizontal	1.5	33	Pass
2462	78.21	-2	103.2	-22.99	Horizontal	1.5	30	Pass

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

Frequency, MHz	Peak spectral power density, dB(µV/m)	EUT antenna gain, dBi	Limit, dB(µV/m)	Margin, dB*	Antenna polarization	Antenna height, m	Turn-table position**, degrees	Verdict
2412	78.09	-2	103.2	-23.11	Vertical	1.5	57	Pass
2437	77.80	-2	103.2	-23.40	Horizontal	1.5	32	Pass
2462	76.94	-2	103.2	-24.26	Horizontal	1.5	35	Pass

*****- Margin = Peak spectral power density - EUT antenna gain - 95.2 - Peak spectral power density limit.
******- EUT front panel refer to 0 degrees position of turntable.

Reference numbers of test equipment used

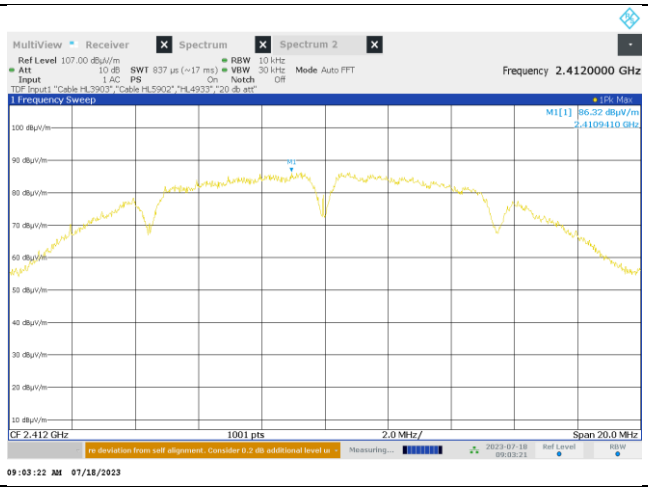
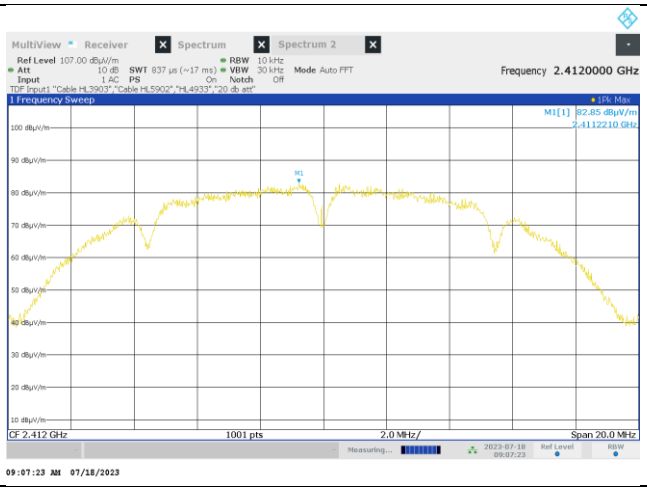
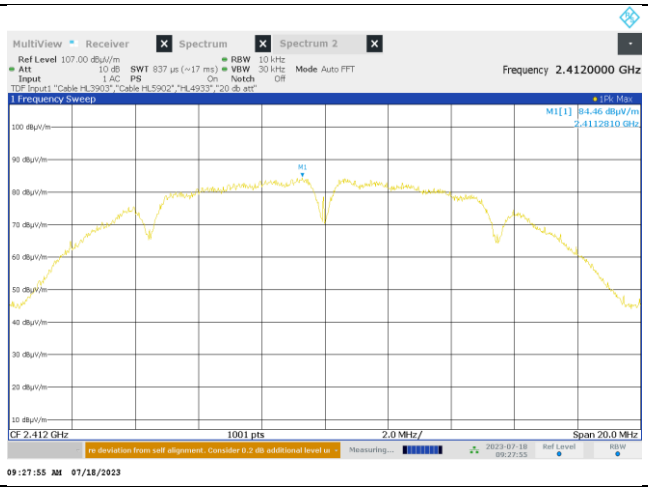
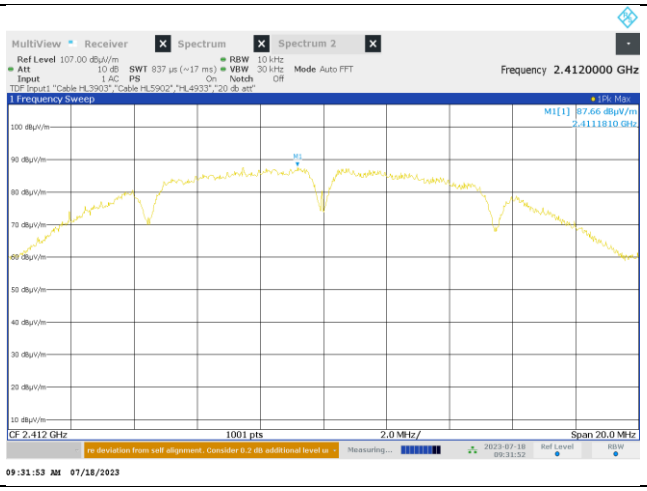
HL 3442	HL 3785	HL 3903	HL 4360	HL 4933	HL 5105		

Full description is given in Appendix A.

Test specification:	Section 15.247(e) / RSS-247 section 5.2(b), Maximum power spectral density		
Test procedure:	ANSI C63.10 section 11.9.2.2.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	23-Jul-23		
Temperature: 25 ºC	Relative Humidity: 59 %	Air Pressure: 1012 hPa	Power: 4.3 VDC
Remarks:			

Plot 7.5.1 Peak spectral power density at low frequency

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

Position X	
Vertical	Horizontal
	
Position Y	
	

Test specification:	Section 15.247(e) / RSS-247 section 5.2(b), Maximum power spectral density		
Test procedure:	ANSI C63.10 section 11.9.2.2.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	23-Jul-23		
Temperature: 25 ºC	Relative Humidity: 59 %	Air Pressure: 1012 hPa	Power: 4.3 VDC
Remarks:			

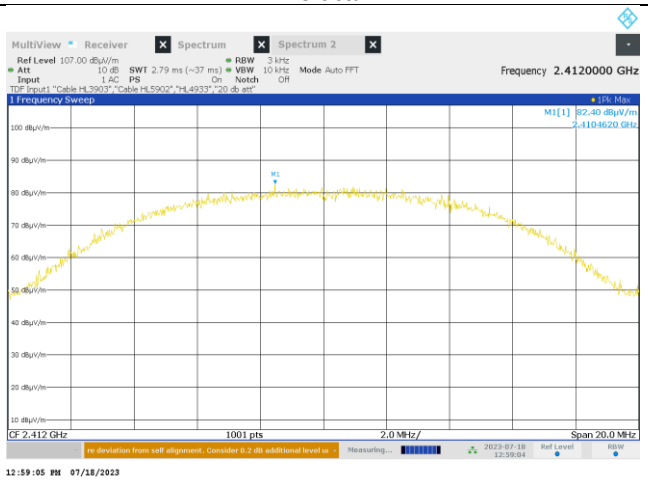
lot 7.5.2 Peak spectral power density at low frequency

Position Z

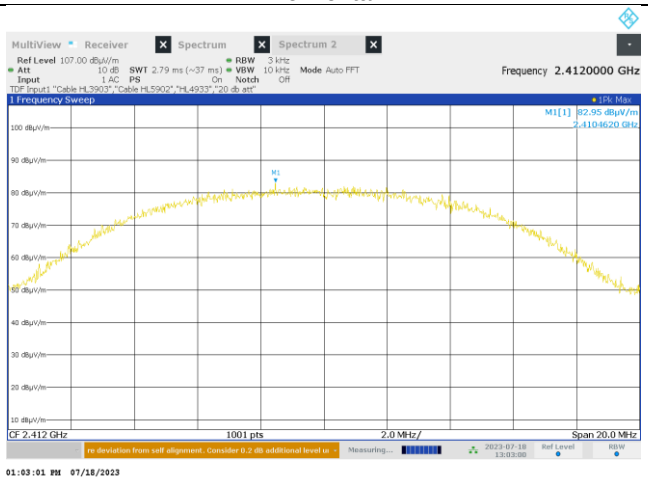
CHANNEL BANDWIDTH: 20 MHz
MODULATION / BITRATE: CCK / 11 Mbps

Position Y (worst case)

Vertical



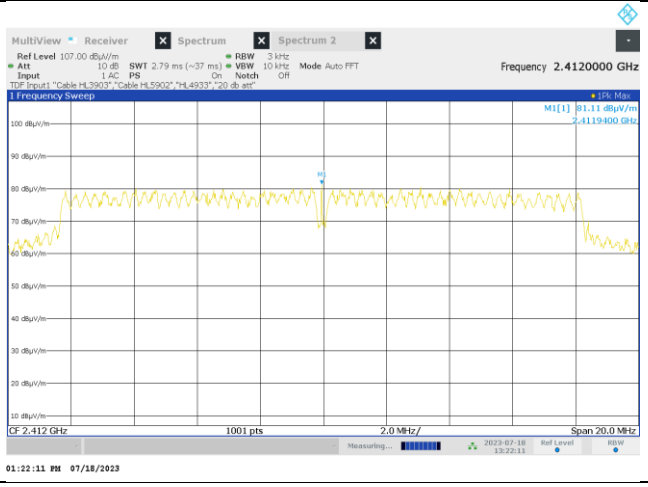
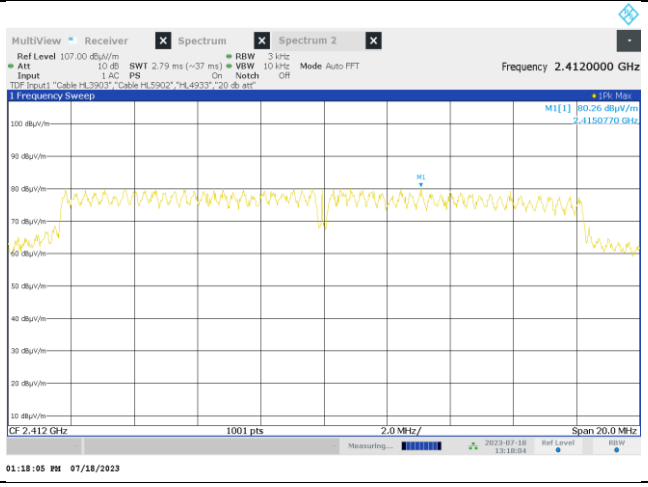
Horizontal



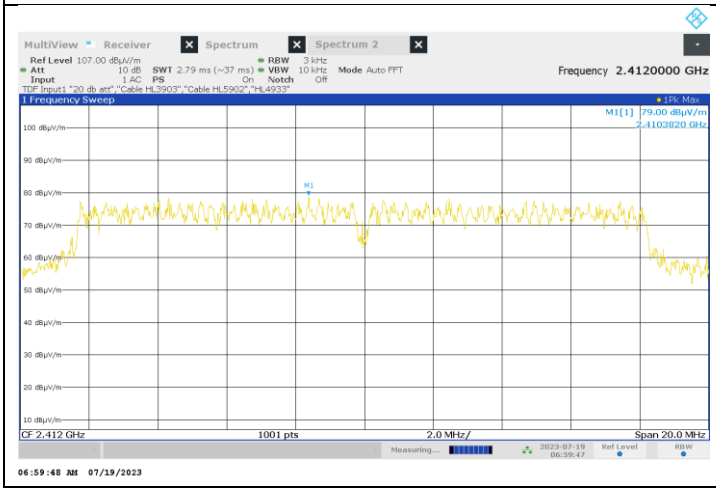
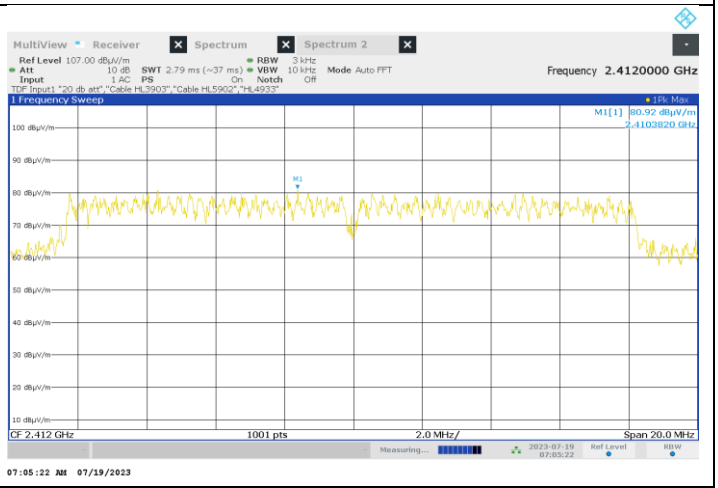
Test specification:	Section 15.247(e) / RSS-247 section 5.2(b), Maximum power spectral density		
Test procedure:	ANSI C63.10 section 11.9.2.2.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	23-Jul-23		
Temperature: 25 ºC	Relative Humidity: 59 %	Air Pressure: 1012 hPa	Power: 4.3 VDC
Remarks:			

Plot 7.5.3 Peak spectral power density at low frequency

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

Position Y (worst case)	
Vertical	Horizontal
	

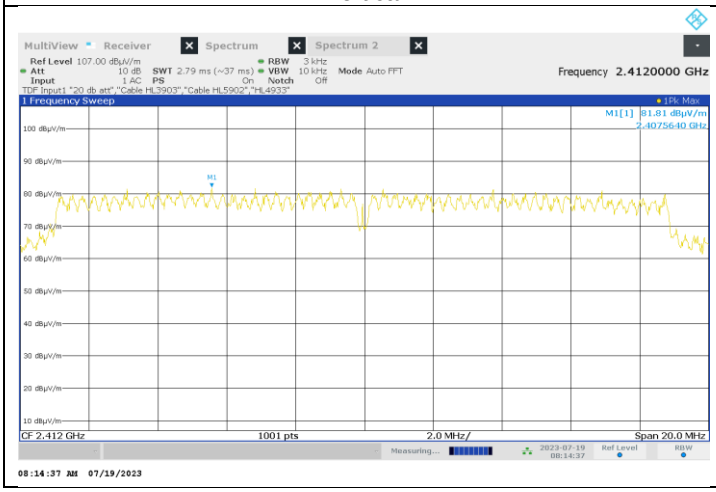
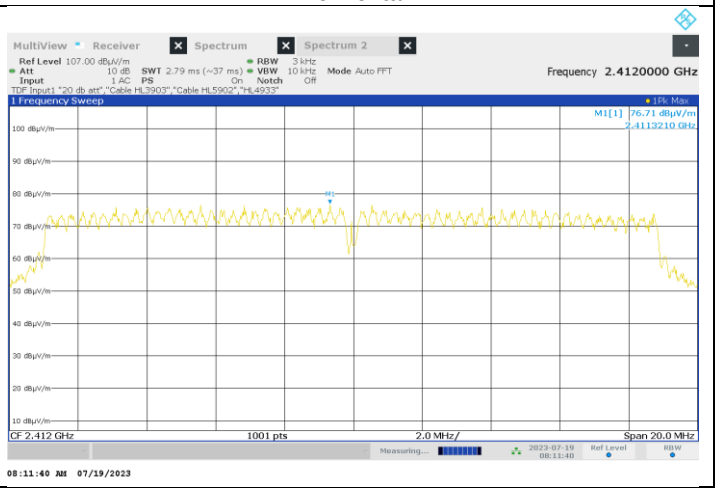
CHANNEL BANDWIDTH: 20 MHz
MODULATION / BITRATE: 64QAM/ 54Mbps

Position Y (worst case)	
Vertical	Horizontal
	

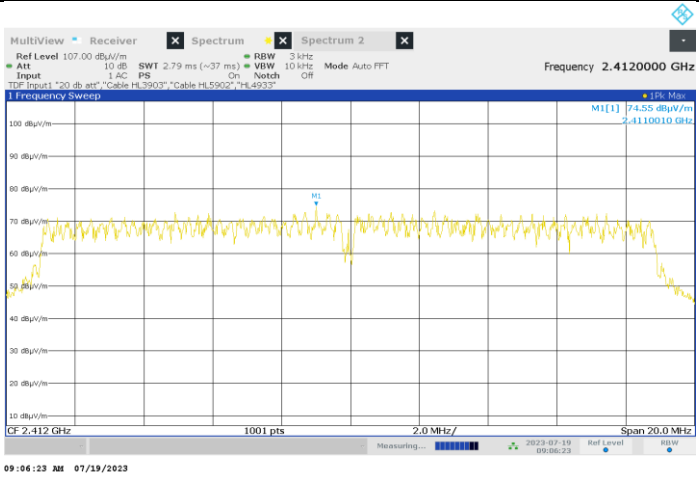
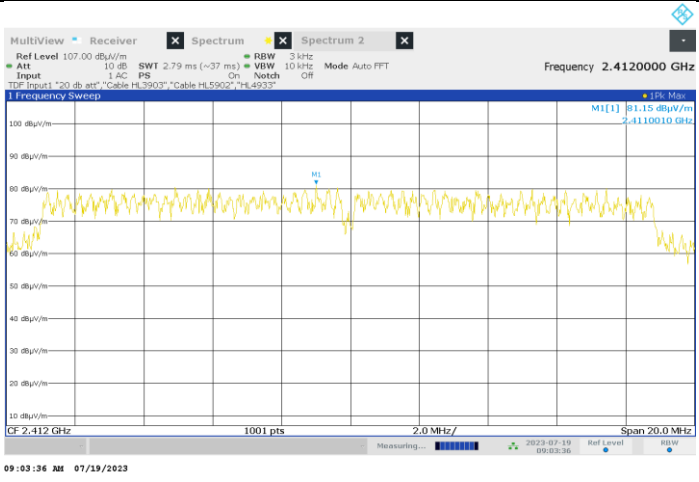
Test specification:	Section 15.247(e) / RSS-247 section 5.2(b), Maximum power spectral density		
Test procedure:	ANSI C63.10 section 11.9.2.2.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	23-Jul-23		
Temperature: 25 ºC	Relative Humidity: 59 %	Air Pressure: 1012 hPa	Power: 4.3 VDC
Remarks:			

Plot 7.5.4 Peak spectral power density at low frequency

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

Position Y (worst case)	
Vertical	Horizontal
	

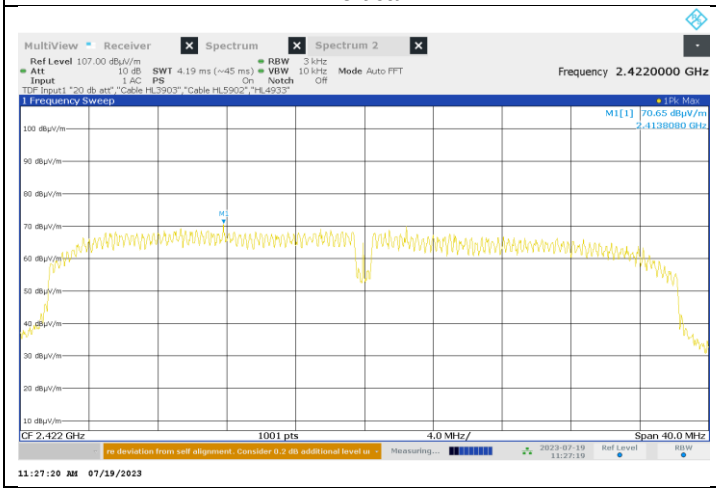
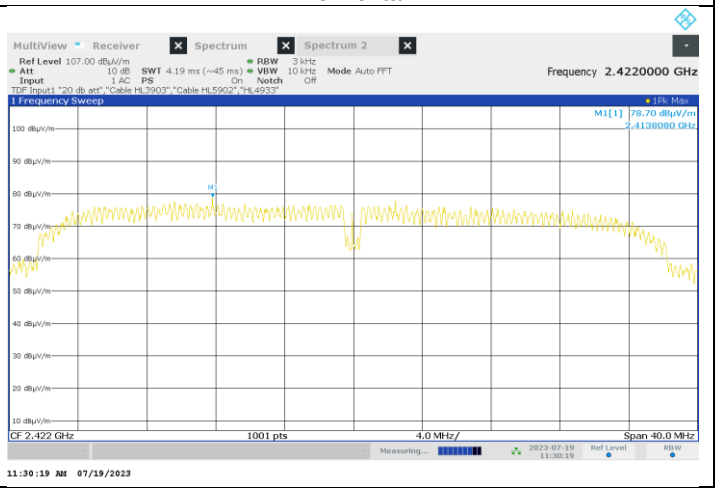
CHANNEL BANDWIDTH: 20 MHz
MODULATION / BITRATE: 64QAM/ 65 Mbps

Position Y (worst case)	
Vertical	Horizontal
	

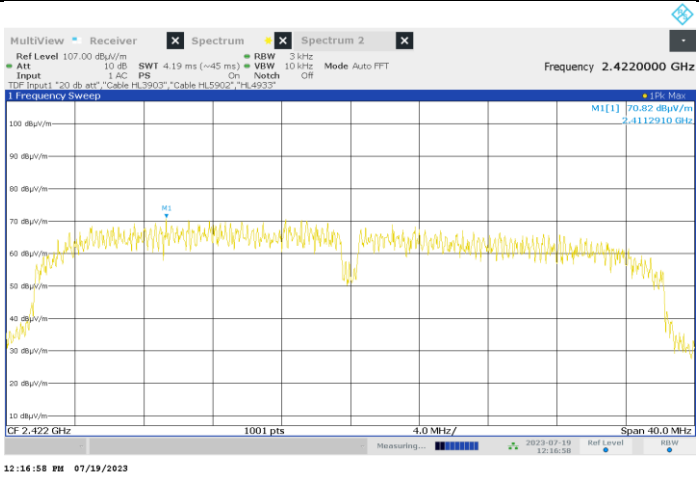
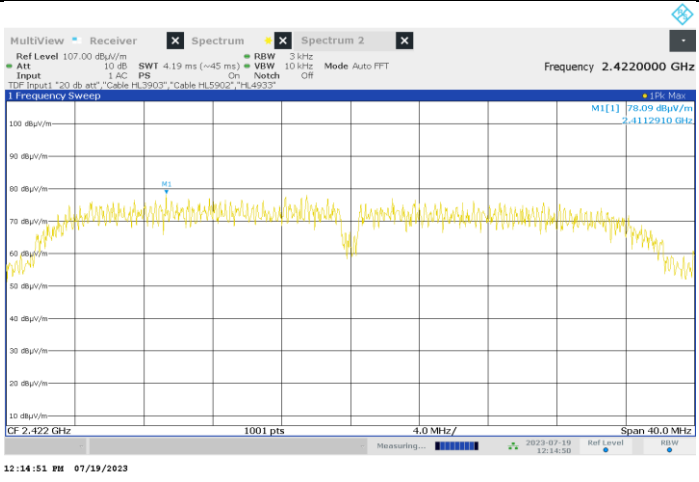
Test specification:	Section 15.247(e) / RSS-247 section 5.2(b), Maximum power spectral density		
Test procedure:	ANSI C63.10 section 11.9.2.2.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	23-Jul-23		
Temperature: 25 ºC	Relative Humidity: 59 %	Air Pressure: 1012 hPa	Power: 4.3 VDC
Remarks:			

Plot 7.5.5 Peak spectral power density at low frequency

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

Position Y (worst case)	
Vertical	Horizontal
	

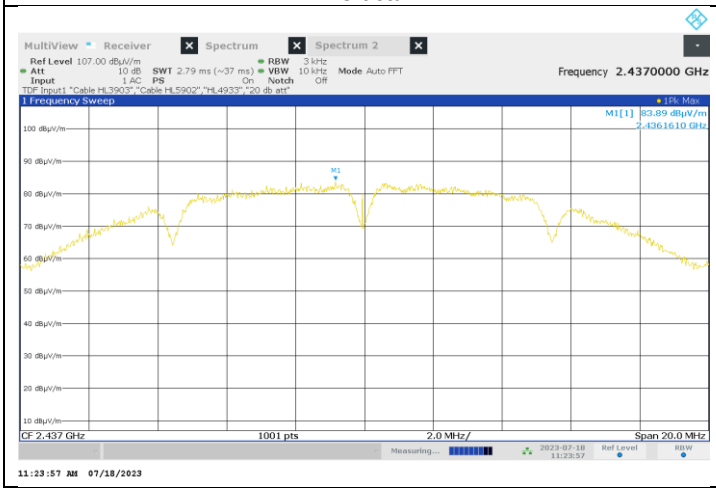
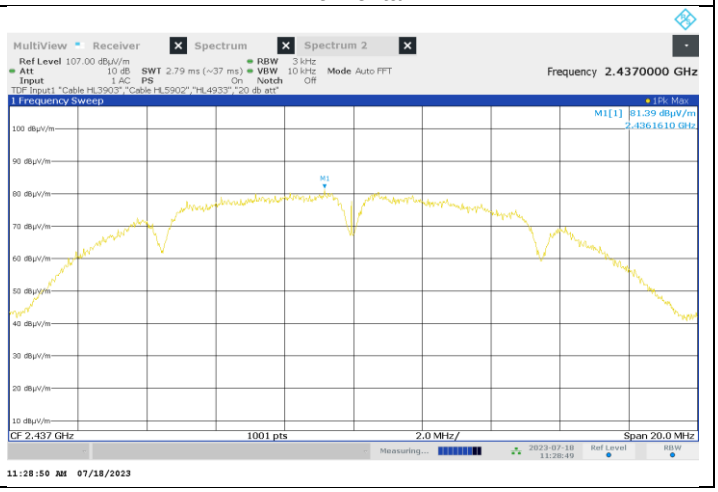
CHANNEL BANDWIDTH: 40 MHz
MODULATION / BITRATE: 64QAM/ 65 Mbps

Position Y (worst case)	
Vertical	Horizontal
	

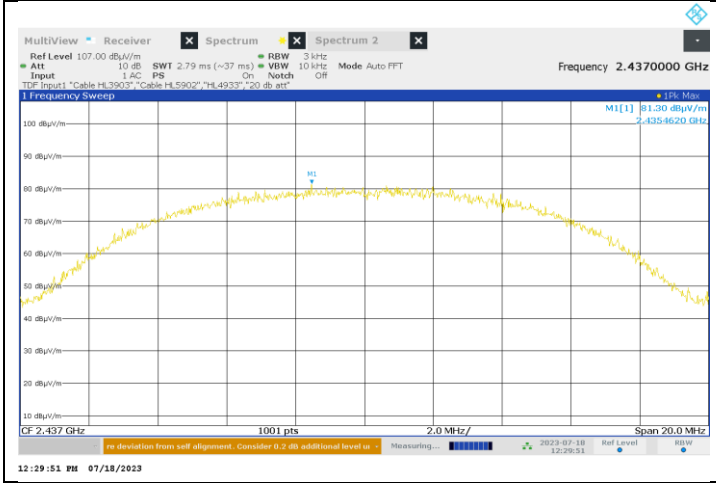
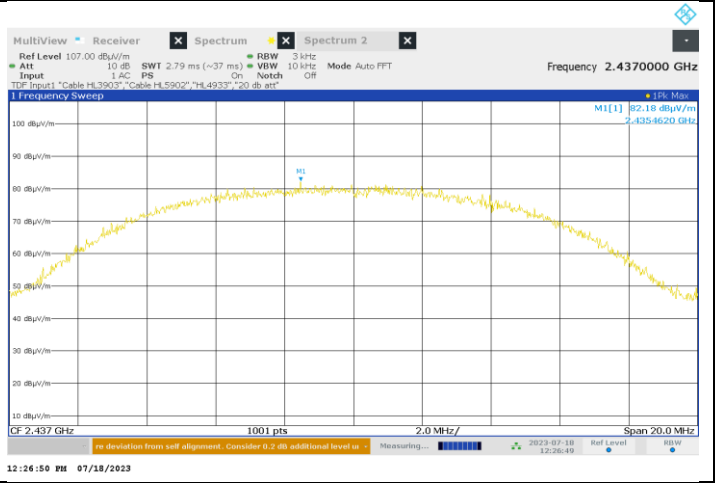
Test specification:	Section 15.247(e) / RSS-247 section 5.2(b), Maximum power spectral density		
Test procedure:	ANSI C63.10 section 11.9.2.2.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	23-Jul-23		
Temperature: 25 ºC	Relative Humidity: 59 %	Air Pressure: 1012 hPa	Power: 4.3 VDC
Remarks:			

Plot 7.5.6 Peak spectral power density at mid frequency

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

Position Y (worst case)	
Vertical	Horizontal
	

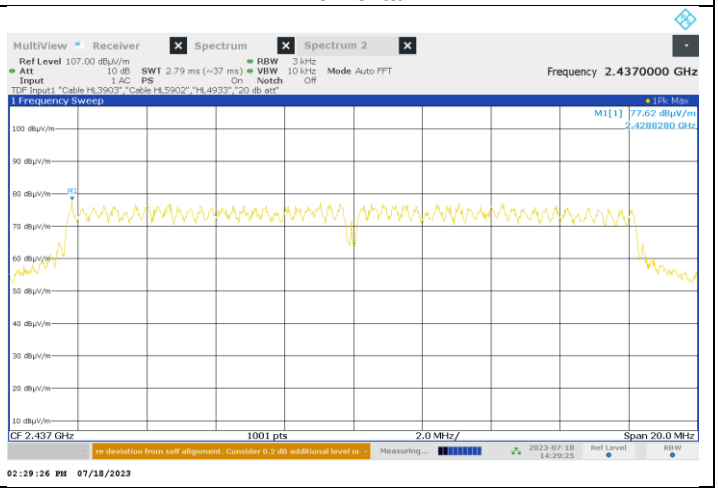
CHANNEL BANDWIDTH: 20 MHz
MODULATION / BITRATE: CCK / 11 Mbps

Position Y (worst case)	
Vertical	Horizontal
	

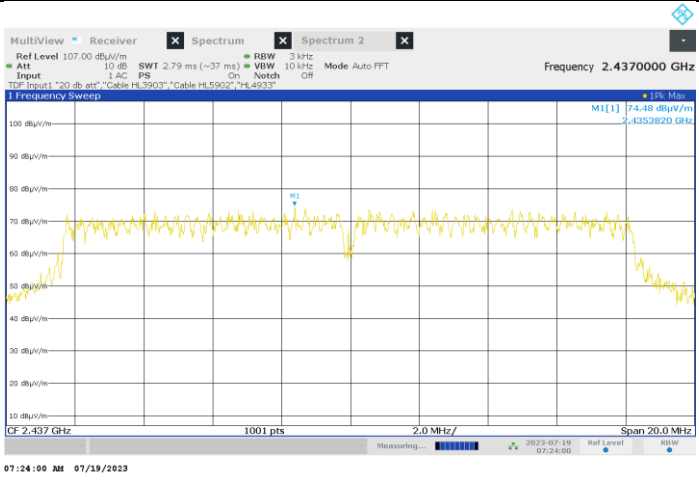
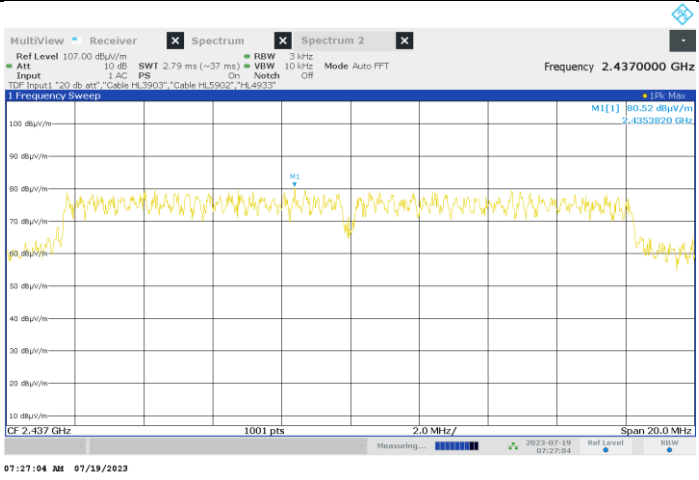
Test specification:	Section 15.247(e) / RSS-247 section 5.2(b), Maximum power spectral density		
Test procedure:	ANSI C63.10 section 11.9.2.2.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	23-Jul-23		
Temperature: 25 ºC	Relative Humidity: 59 %	Air Pressure: 1012 hPa	Power: 4.3 VDC
Remarks:			

Plot 7.5.7 Peak spectral power density at mid frequency

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

Position Y (worst case)	
Vertical	Horizontal
	

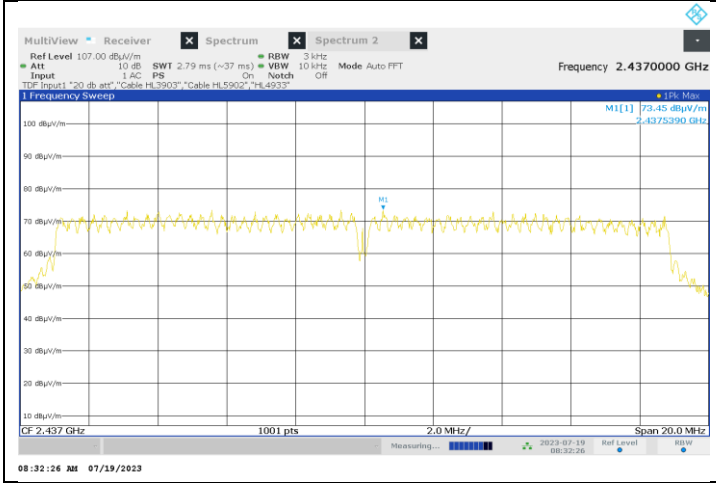
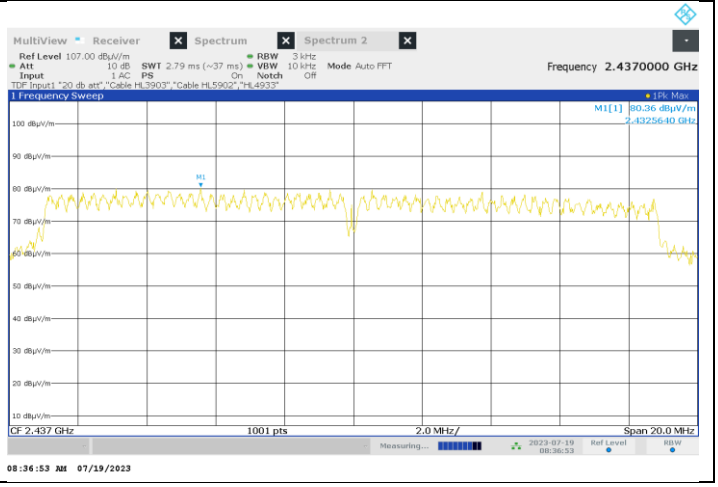
CHANNEL BANDWIDTH: 20 MHz
MODULATION / BITRATE: 64QAM / 54Mbps

Position Y (worst case)	
Vertical	Horizontal
	

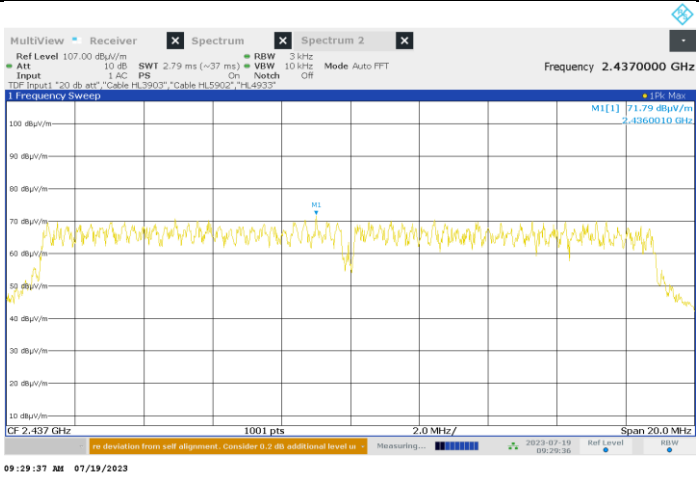
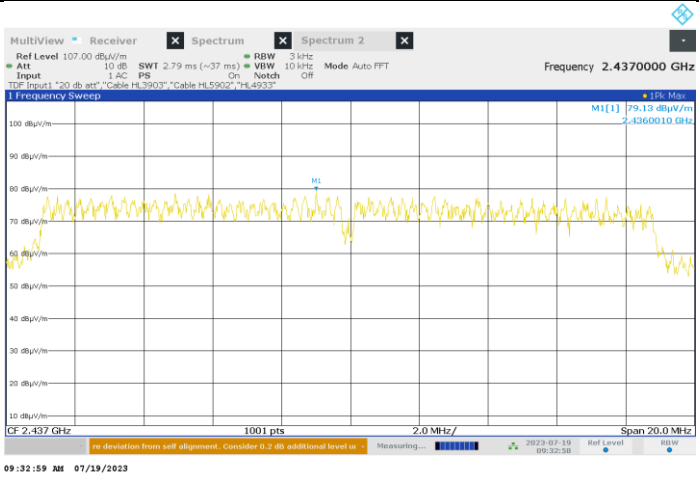
Test specification:	**Section 15.247(e) / RSS-247 section 5.2(b), Maximum power spectral density**		
Test procedure:	ANSI C63.10 section 11.9.2.2.4		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	23-Jul-23		
Temperature: 25 ºC	**Relative Humidity:** 59 %	**Air Pressure:** 1012 hPa	**Power:** 4.3 VDC
Remarks:			

Plot 7.5.8 Peak spectral power density at mid frequency

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

Position Y (worst case)	
Vertical	Horizontal
	

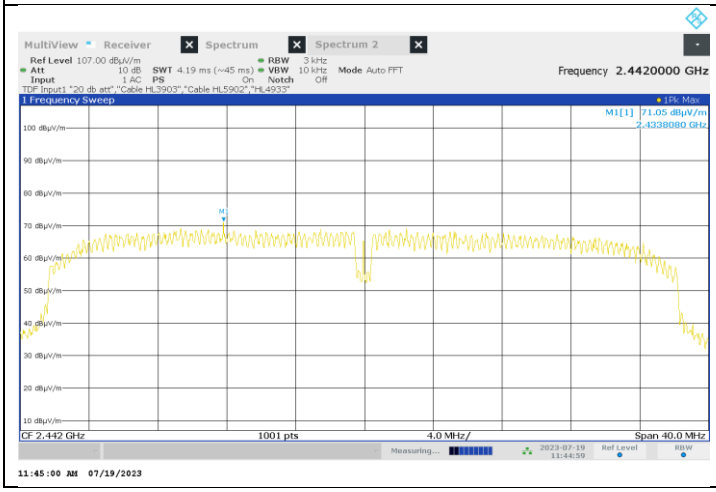
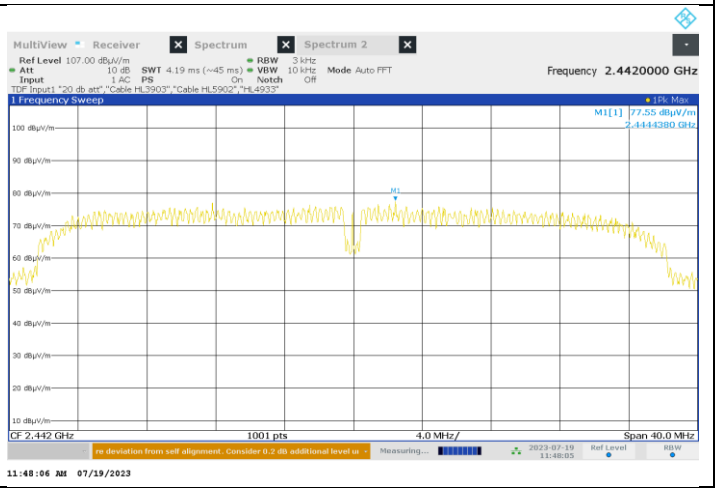
CHANNEL BANDWIDTH: 20 MHz
MODULATION / BITRATE: 64QAM/ 65 Mbps

Position Y (worst case)	
Vertical	Horizontal
	

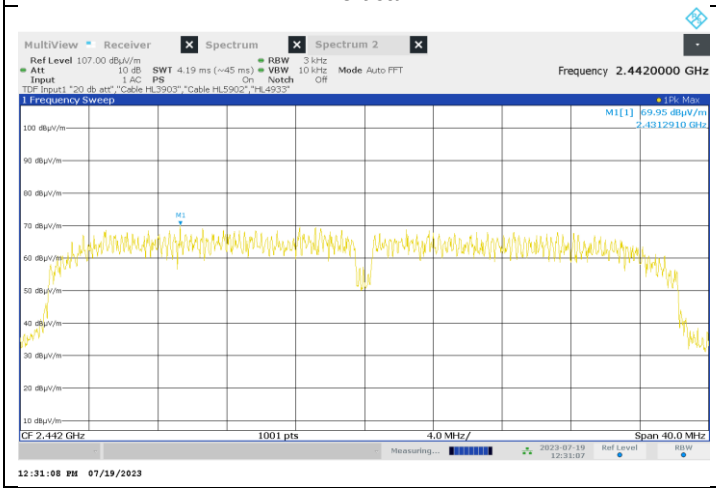
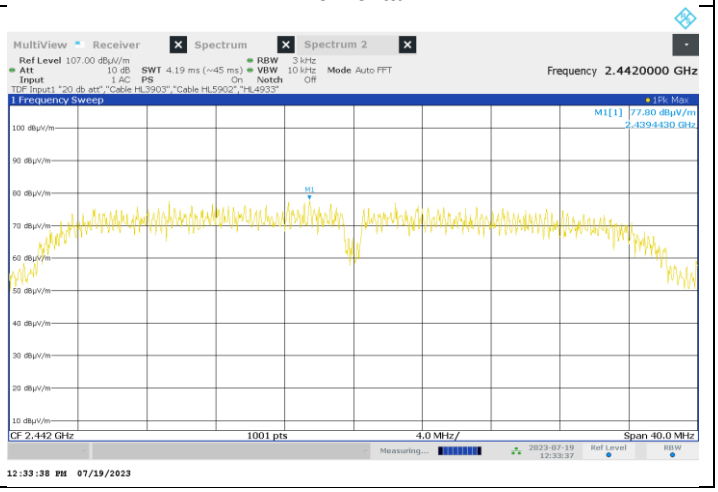
Test specification:	Section 15.247(e) / RSS-247 section 5.2(b), Maximum power spectral density		
Test procedure:	ANSI C63.10 section 11.9.2.2.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	23-Jul-23		
Temperature: 25 ºC	Relative Humidity: 59 %	Air Pressure: 1012 hPa	Power: 4.3 VDC
Remarks:			

Plot 7.5.9 Peak spectral power density at mid frequency

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

Position Y (worst case)	
Vertical	Horizontal
	

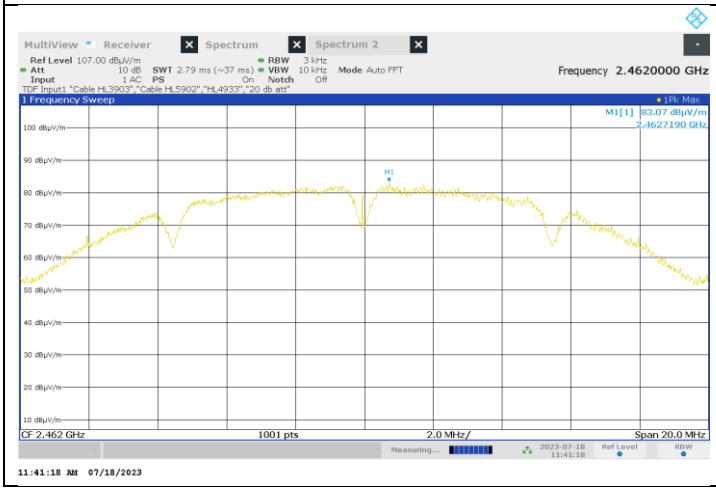
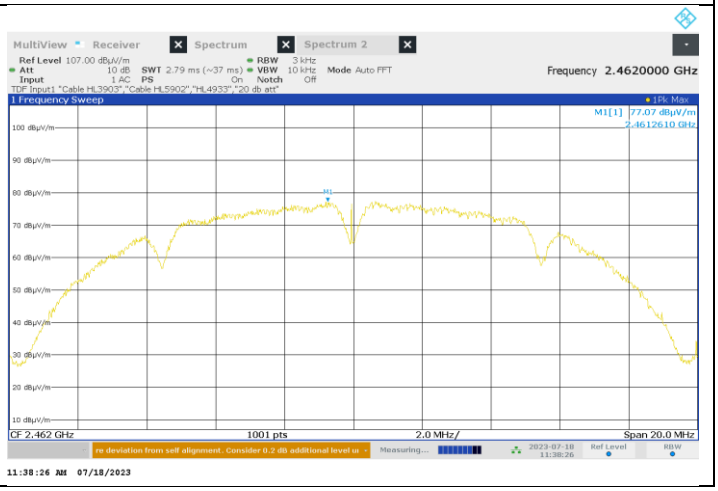
CHANNEL BANDWIDTH: 40 MHz
MODULATION / BITRATE: 64QAM / 65 Mbps

Position Y (worst case)	
Vertical	Horizontal
	

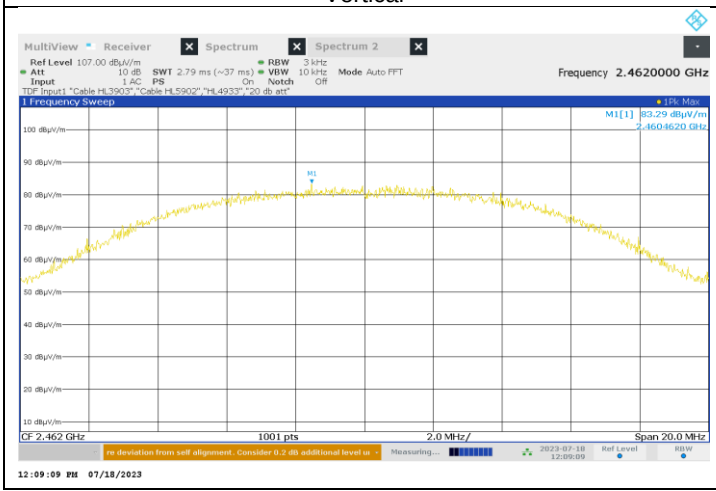
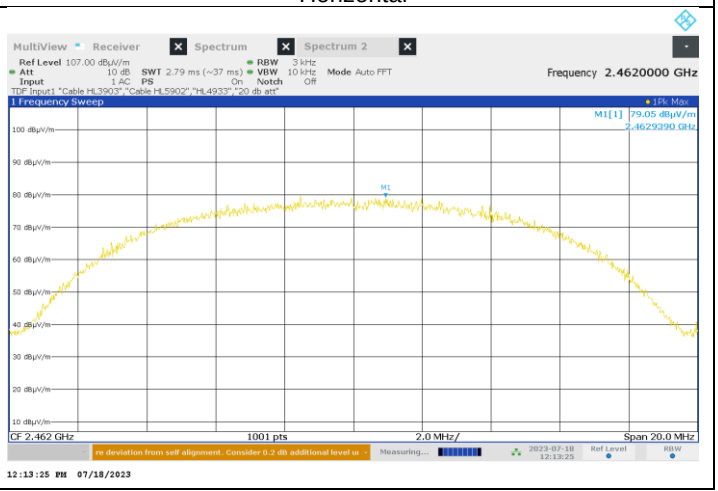
Test specification:	Section 15.247(e) / RSS-247 section 5.2(b), Maximum power spectral density		
Test procedure:	ANSI C63.10 section 11.9.2.2.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	23-Jul-23		
Temperature: 25 ºC	Relative Humidity: 59 %	Air Pressure: 1012 hPa	Power: 4.3 VDC
Remarks:			

Field strength of carrier at high frequency

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

Position Y (worst case)	
Vertical	Horizontal
	

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

Position Y (worst case)	
Vertical	Horizontal
	

Test specification:	**Section 15.247(e) / RSS-247 section 5.2(b), Maximum power spectral density**		
Test procedure:	ANSI C63.10 section 11.9.2.2.4		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	23-Jul-23		
Temperature: 25 ºC	**Relative Humidity:** 59 %	**Air Pressure:** 1012 hPa	**Power:** 4.3 VDC
Remarks:			