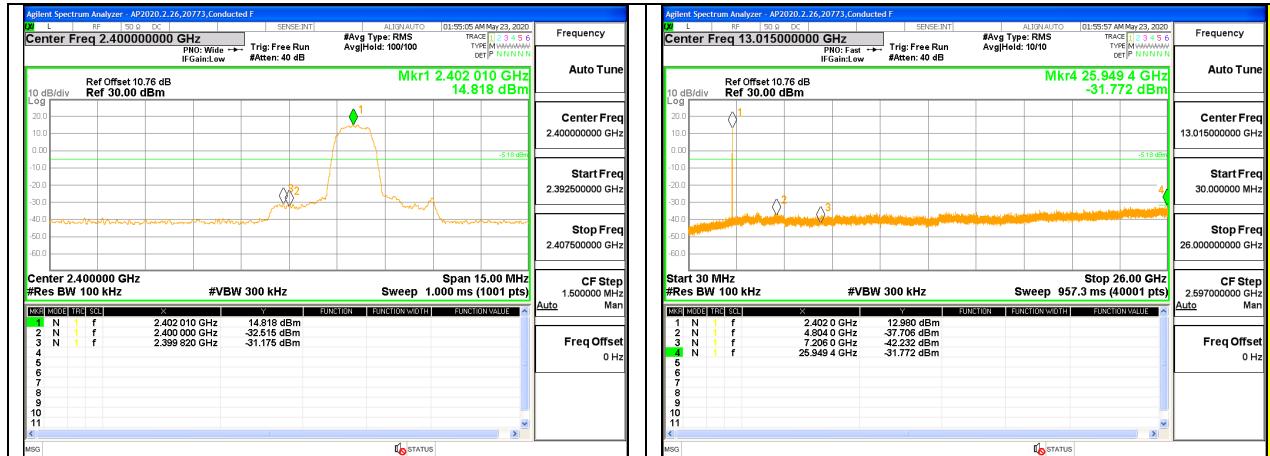
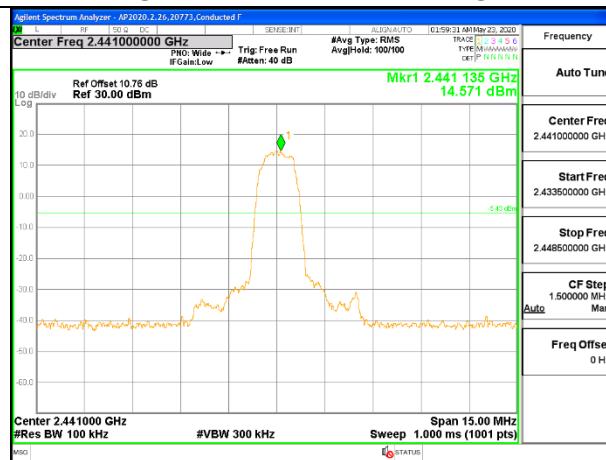


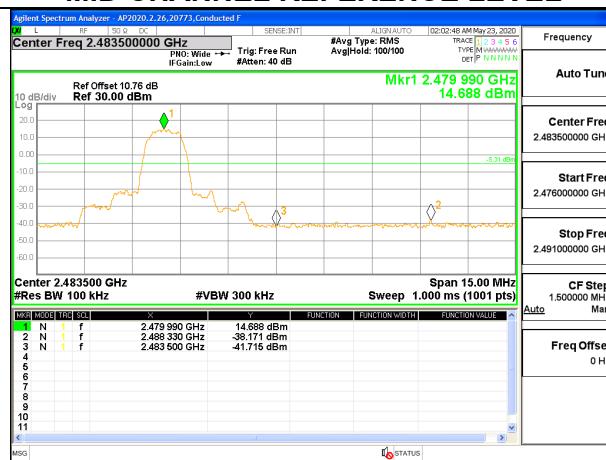
Antenna 3 SPURIOUS EMISSIONS, NON-HOPPING



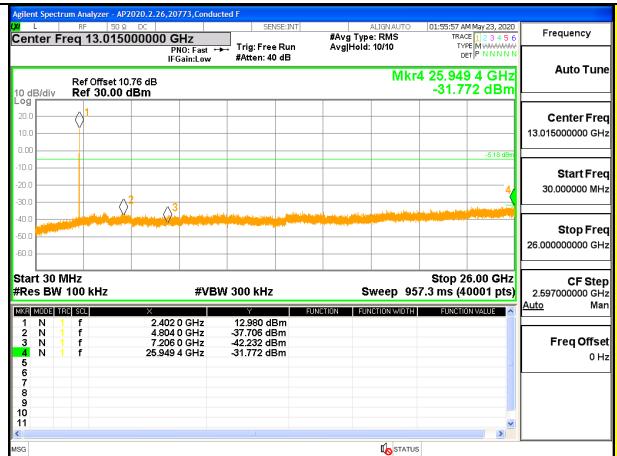
LOW CHANNEL BANDEDGE



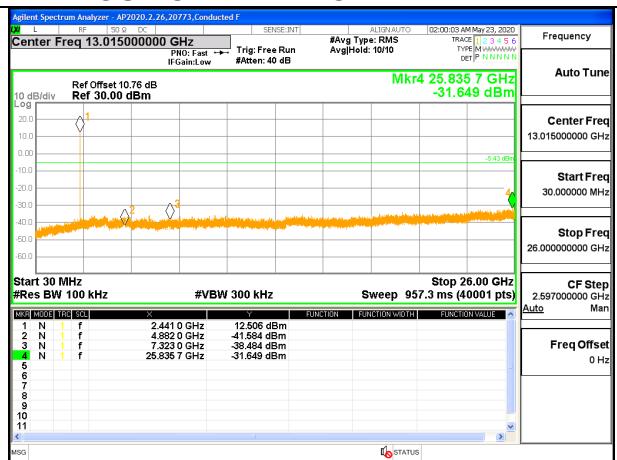
MID CHANNEL REFERENCE LEVEL



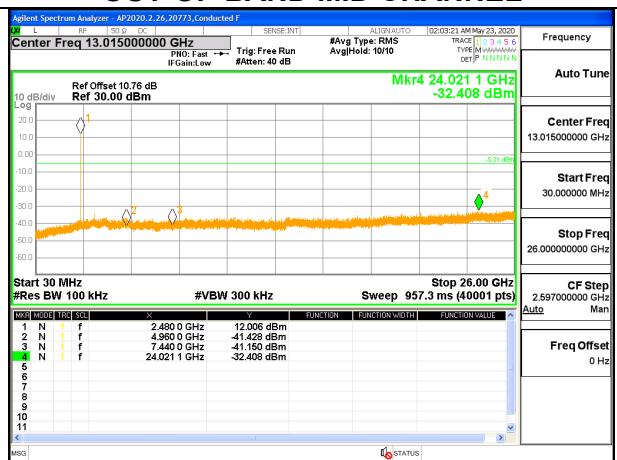
HIGH CHANNEL BANDEDGE



OUT-OF-BAND LOW CHANNEL

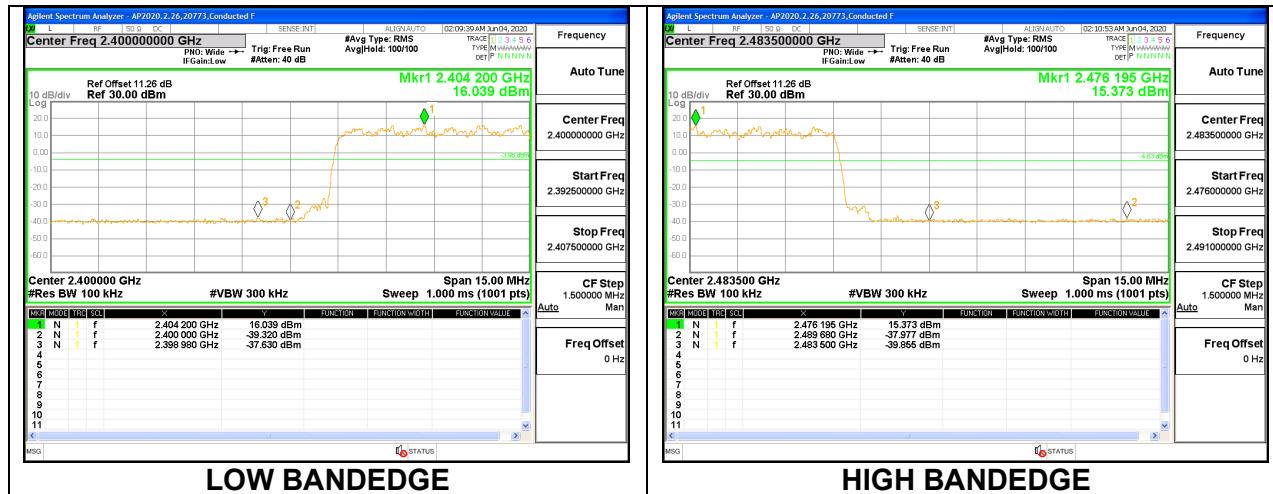


OUT-OF-BAND MID CHANNEL



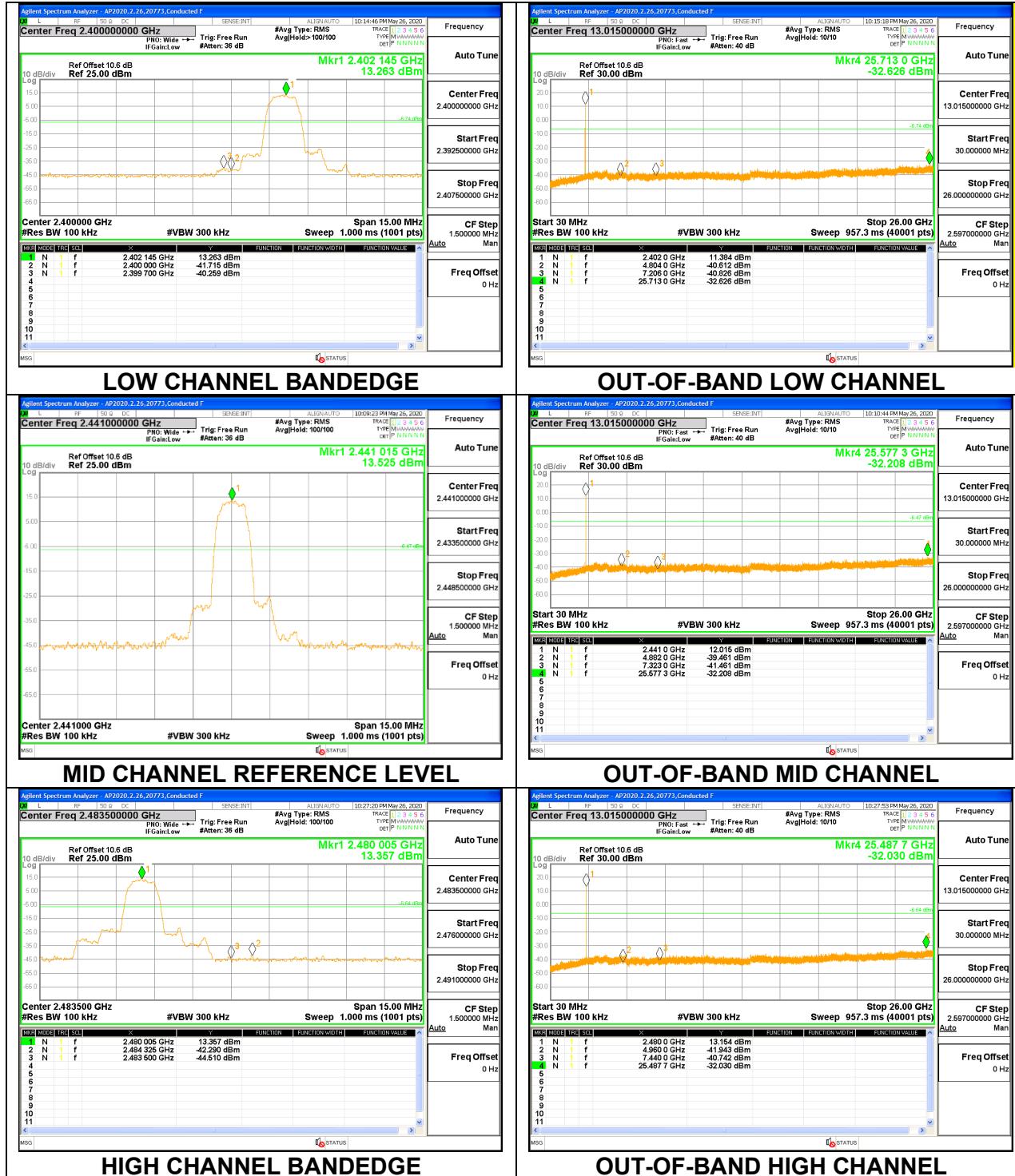
OUT-OF-BAND HIGH CHANNEL

Antenna 3 SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON

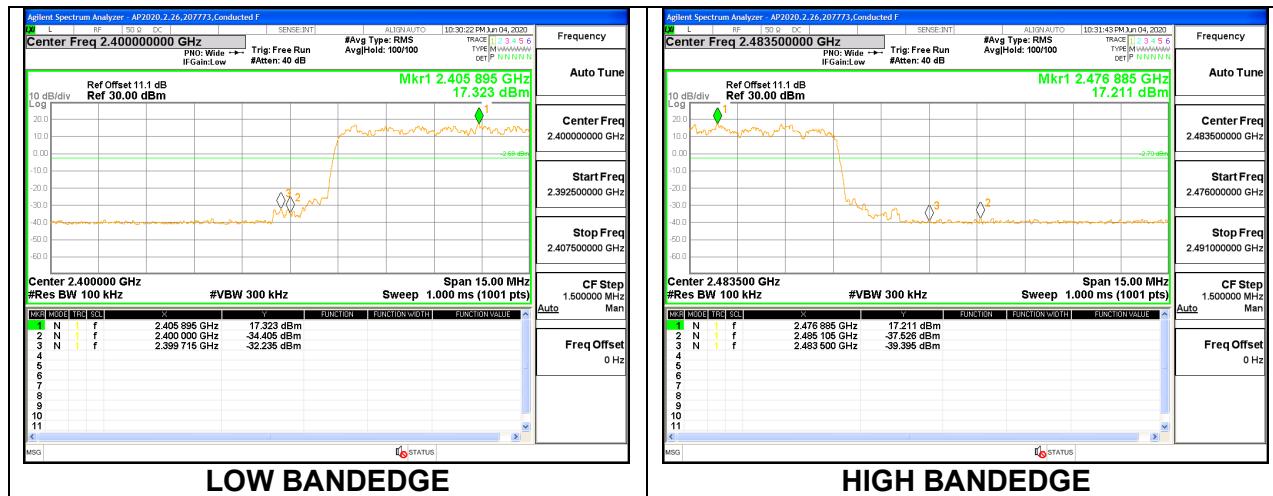


9.8.4. HIGH POWER ENHANCED DATA RATE TXBF 8PSK MODULATION

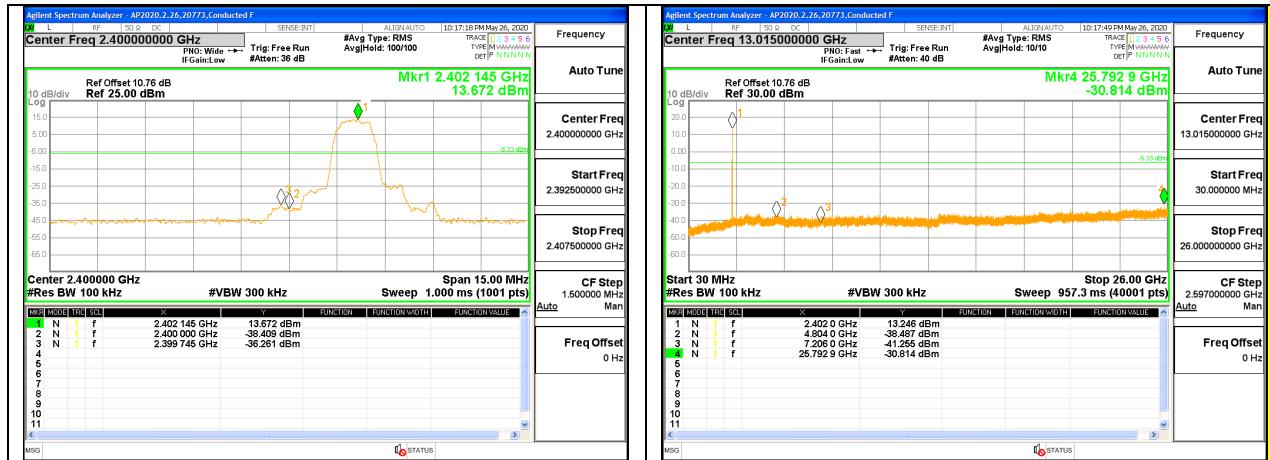
Antenna 4 SPURIOUS EMISSIONS, NON-HOPPING



Antenna 4 SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON



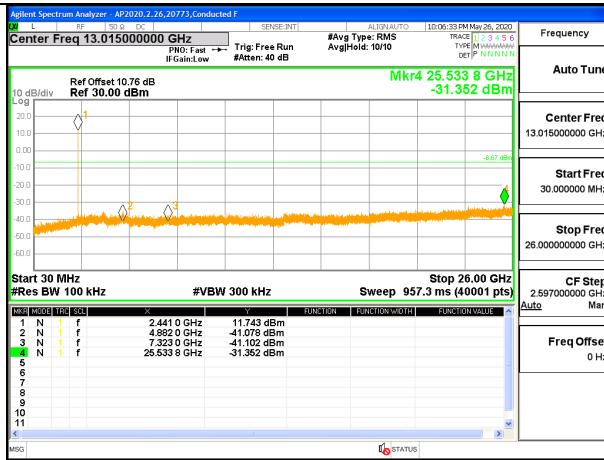
Antenna 3 SPURIOUS EMISSIONS, NON-HOPPING



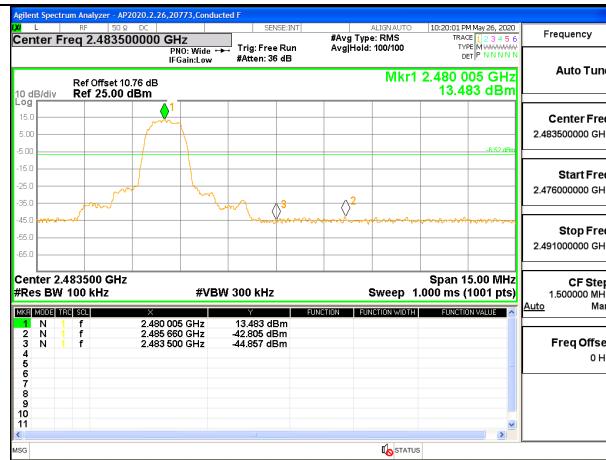
LOW CHANNEL BANDEDGE



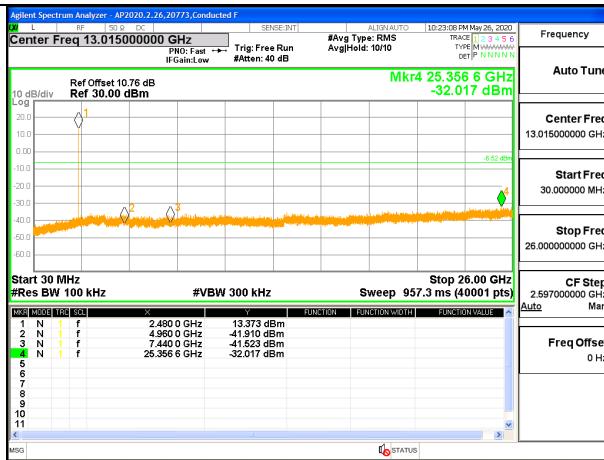
OUT-OF-BAND LOW CHANNEL



MID CHANNEL REFERENCE LEVEL



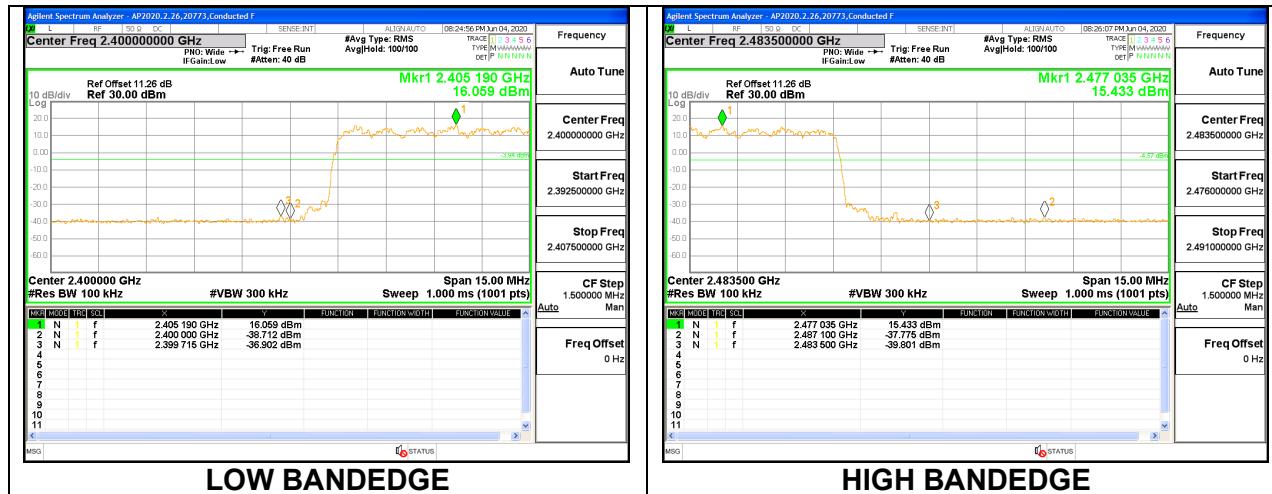
OUT-OF-BAND MID CHANNEL



HIGH CHANNEL BANDEDGE

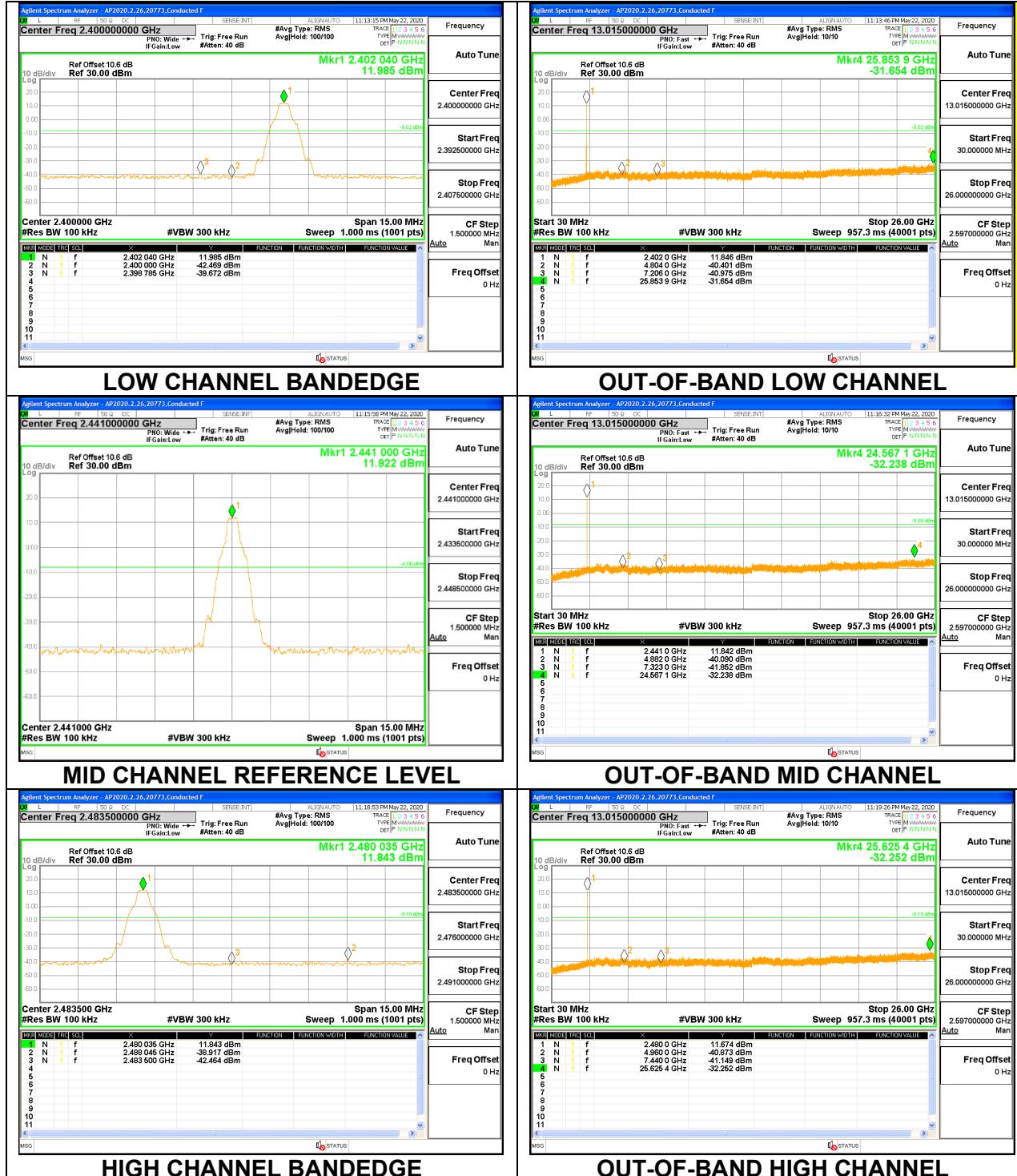
OUT-OF-BAND HIGH CHANNEL

Antenna 3 SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON

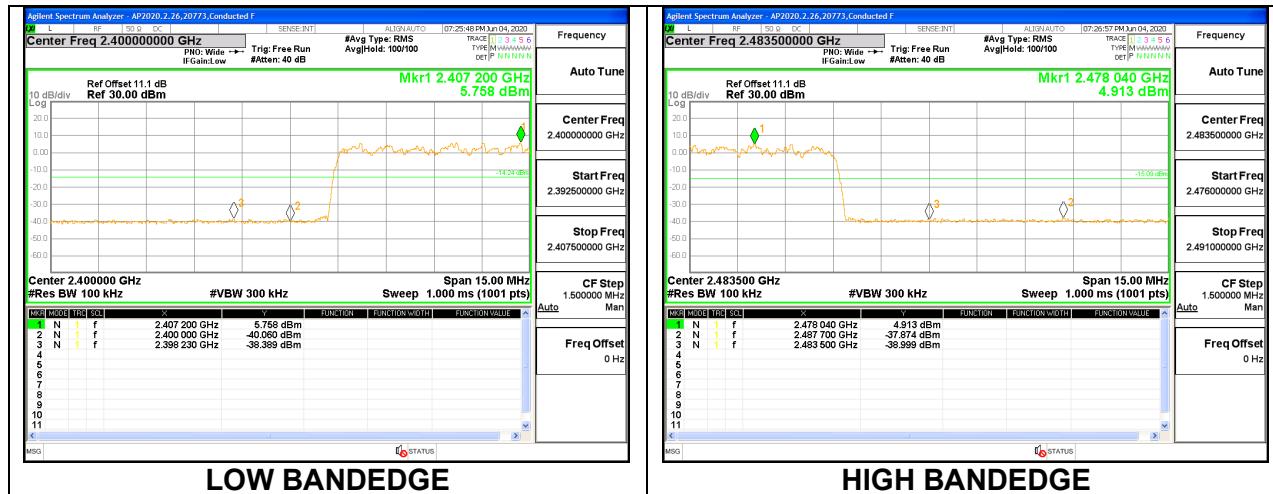


9.8.5. LOW POWER BASIC DATA RATE GFSK MODULATION

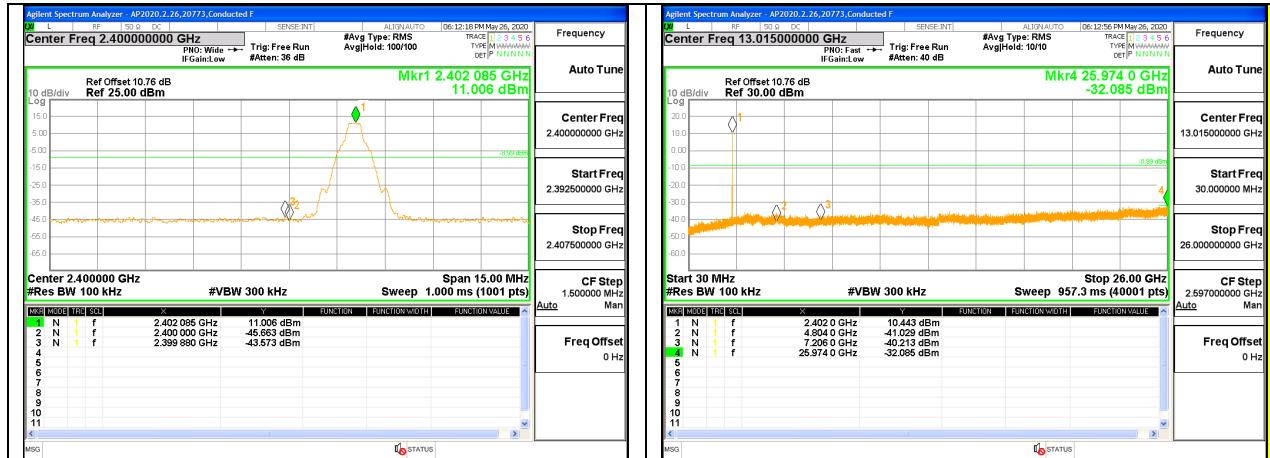
Antenna 4 SPURIOUS EMISSIONS, NON-HOPPING



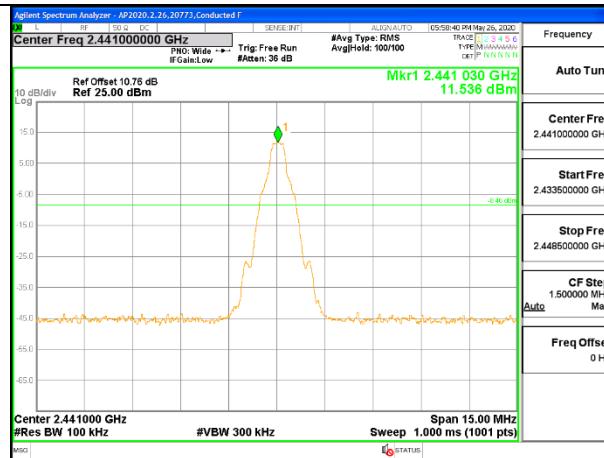
Antenna 4 SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON



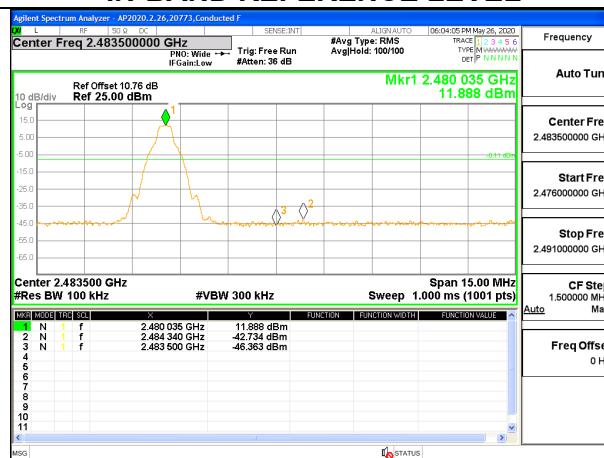
Antenna 3 SPURIOUS EMISSIONS, NON-HOPPING



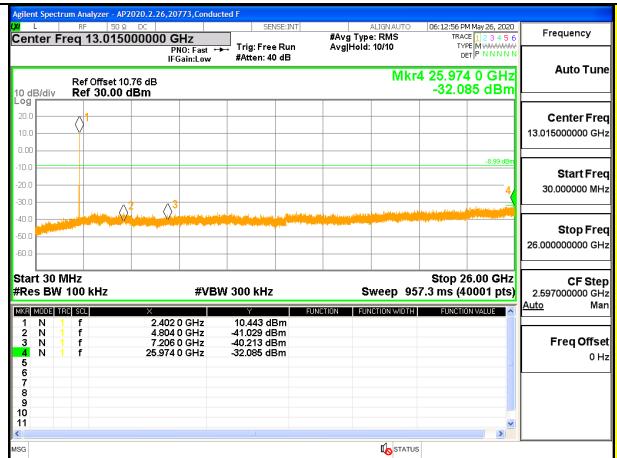
LOW CHANNEL BANDEDGE



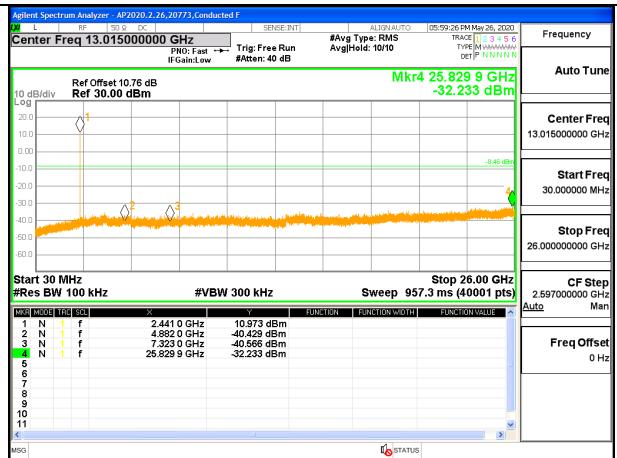
IN-BAND REFERENCE LEVEL



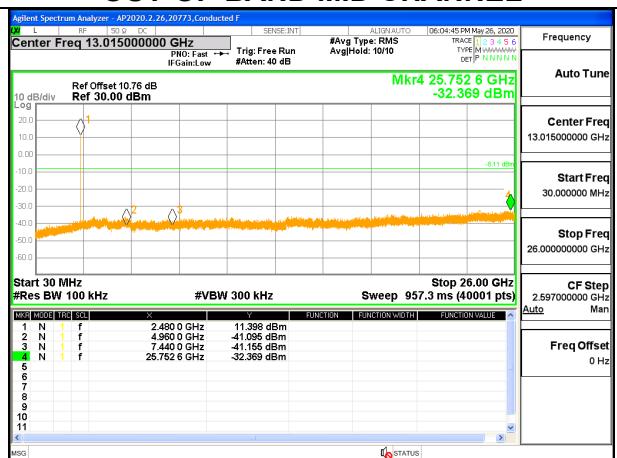
HIGH CHANNEL BANDEDGE



OUT-OF-BAND LOW CHANNEL

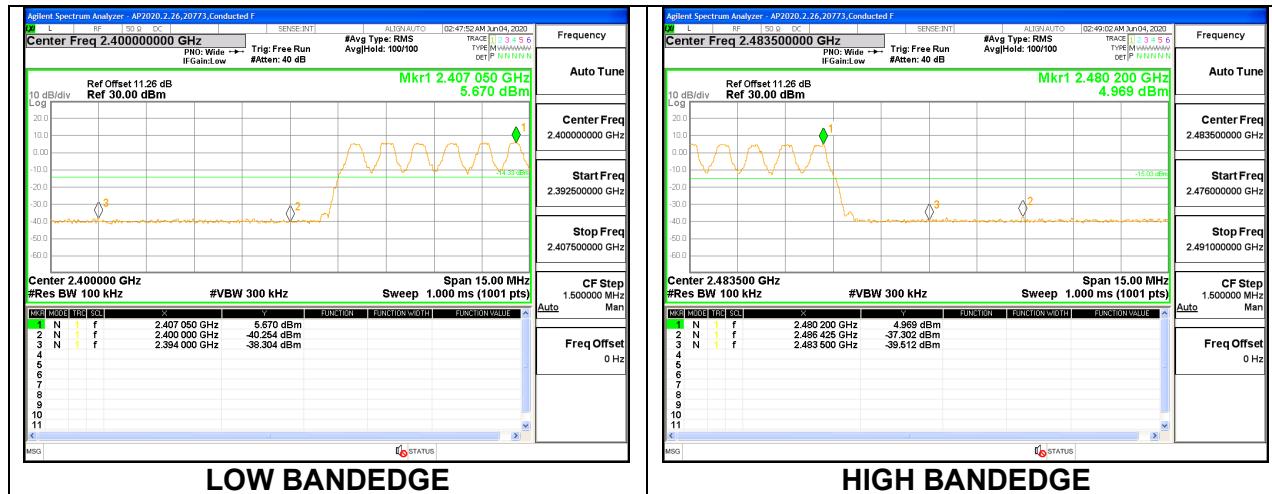


OUT-OF-BAND MID CHANNEL



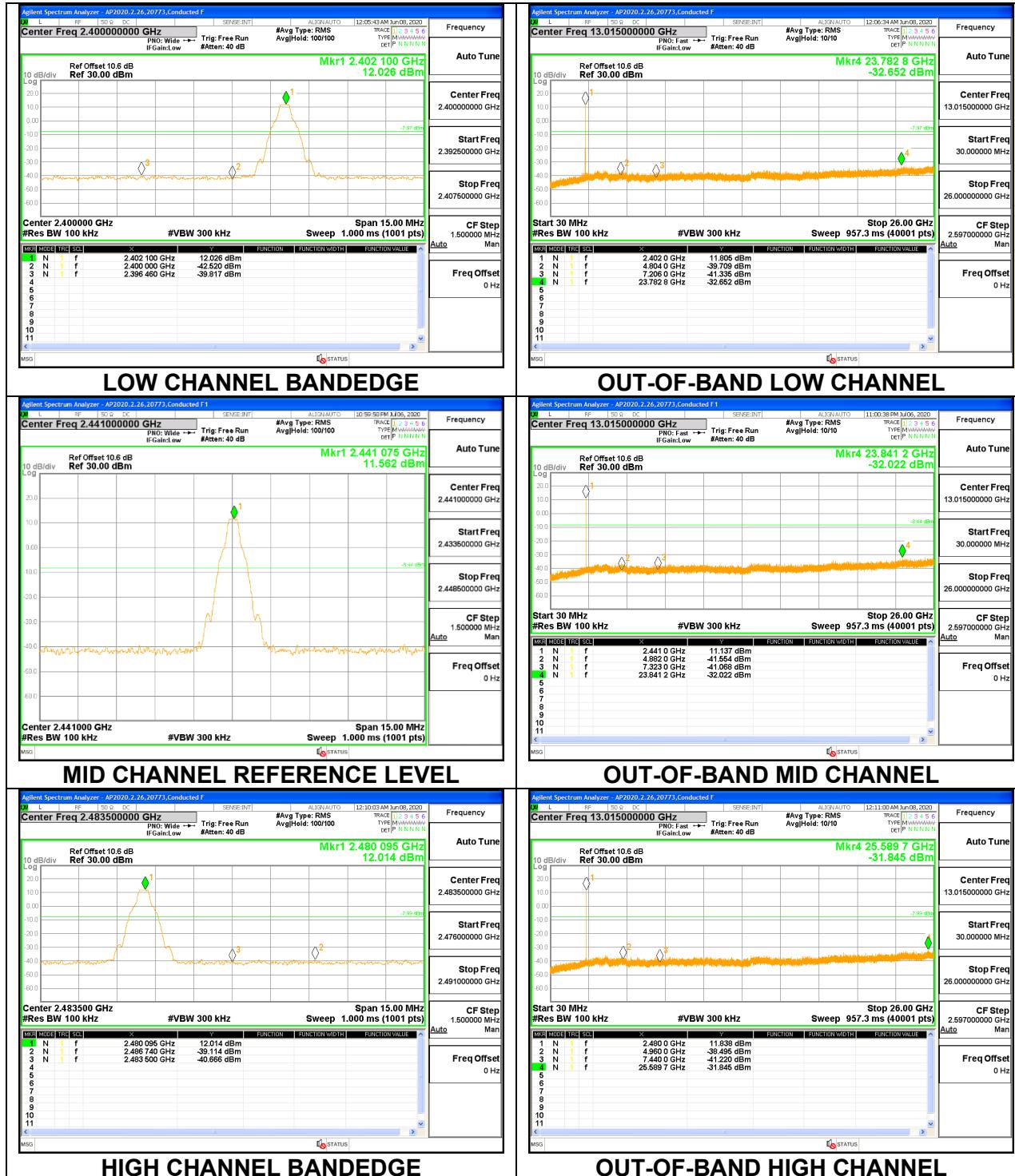
OUT-OF-BAND HIGH CHANNEL

Antenna 3 SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON



9.8.6. LOW POWER BASIC DATA RATE TXBF GFSK MODULATION

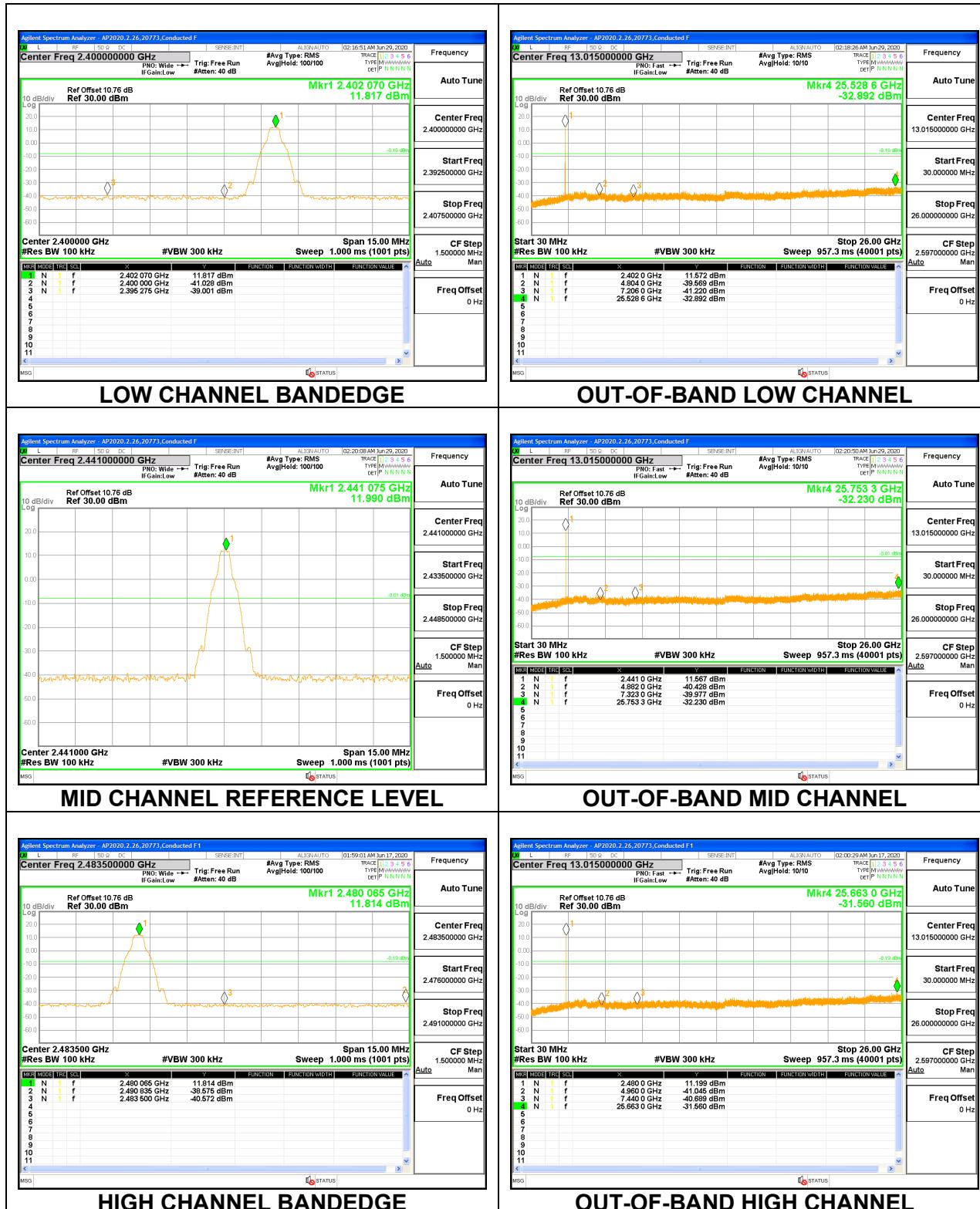
Antenna 4 SPURIOUS EMISSIONS, NON-HOPPING



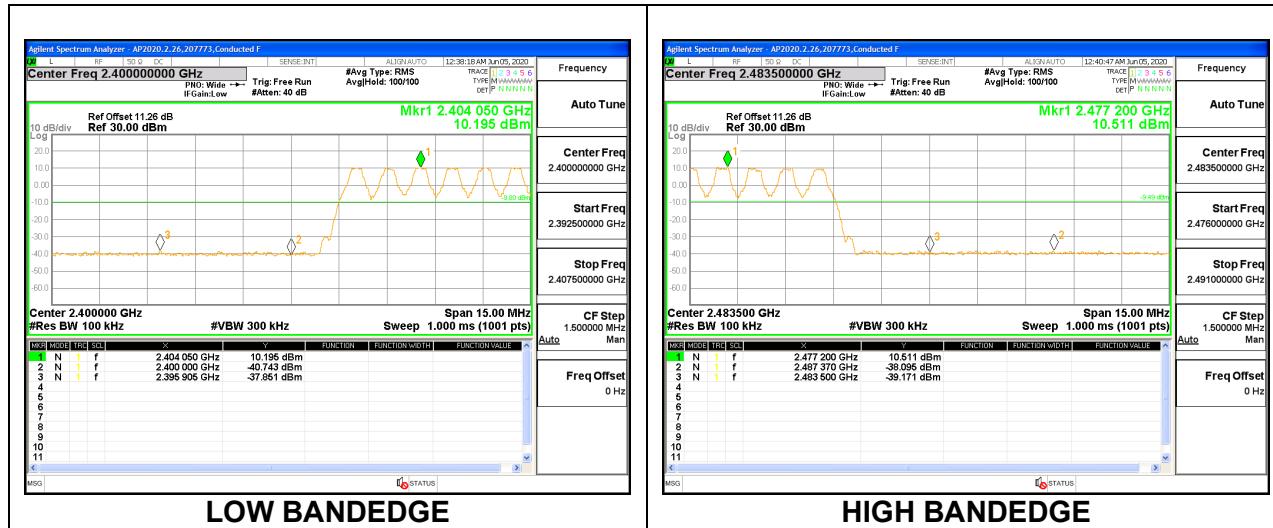
Antenna 4 SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON



Antenna 3 SPURIOUS EMISSIONS, NON-HOPPING

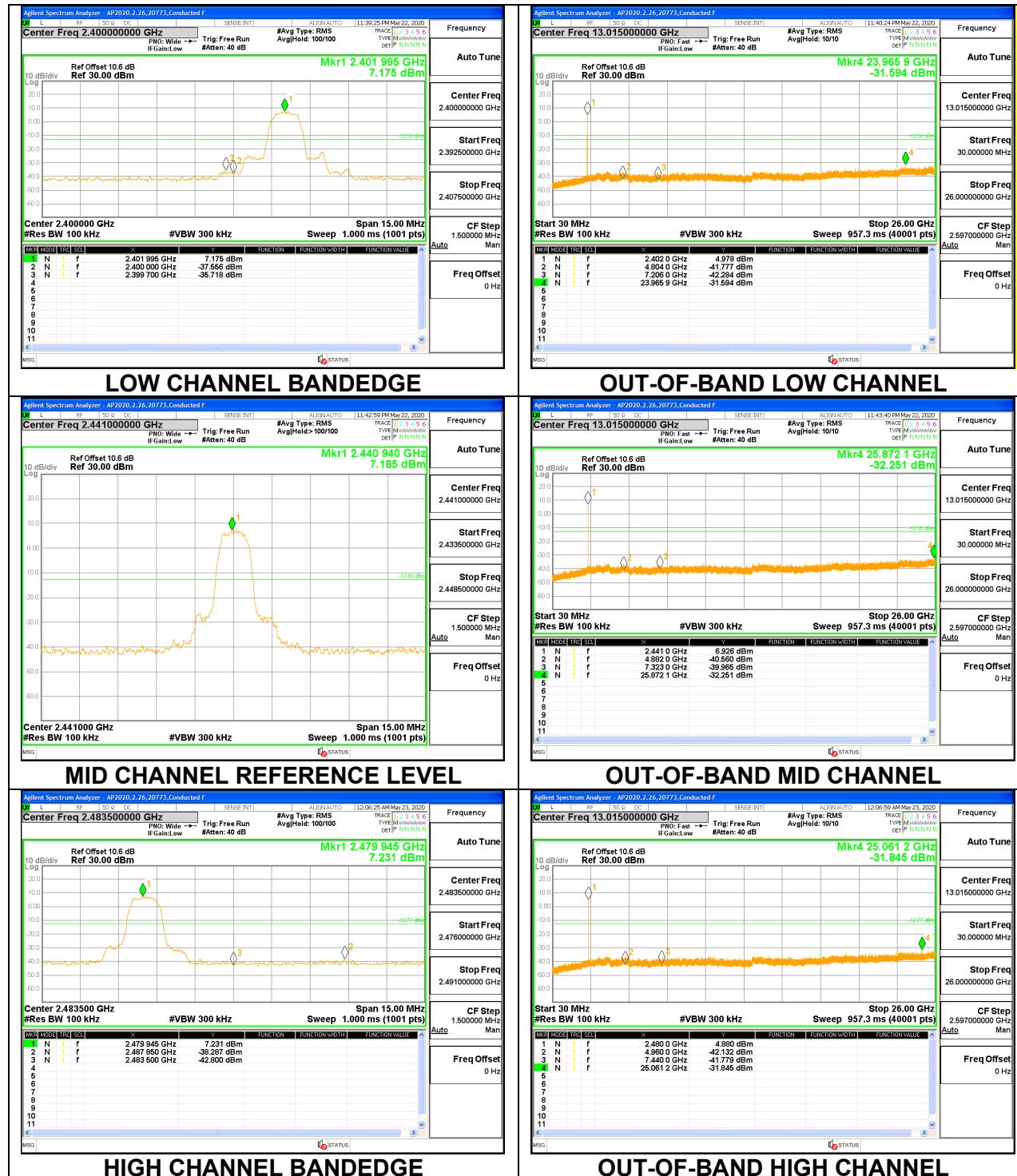


Antenna 3 SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON

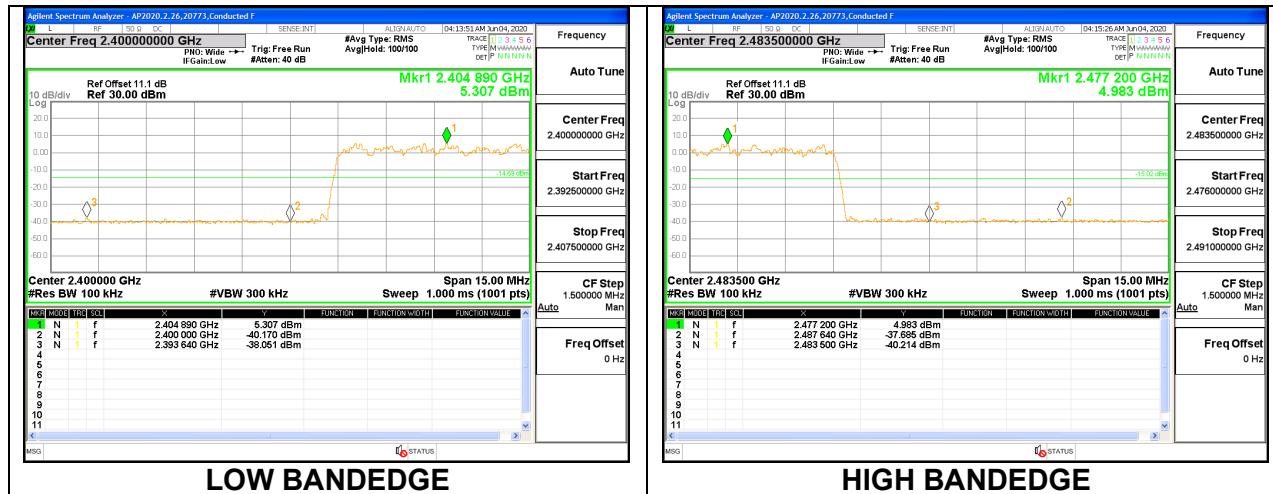


9.8.7. LOW POWER ENHANCED DATA RATE 8PSK MODULATION

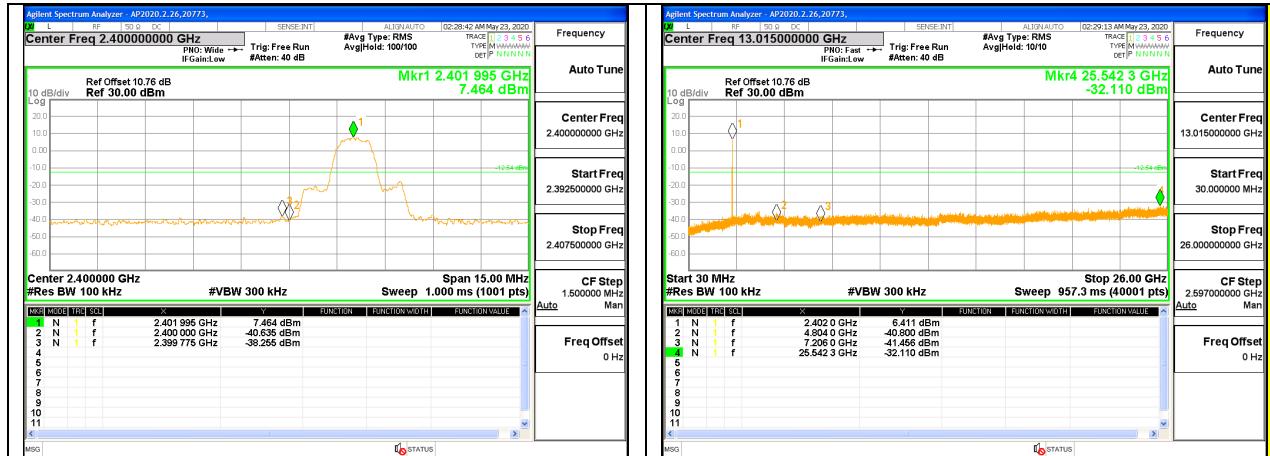
Antenna 4 SPURIOUS EMISSIONS, NON-HOPPING



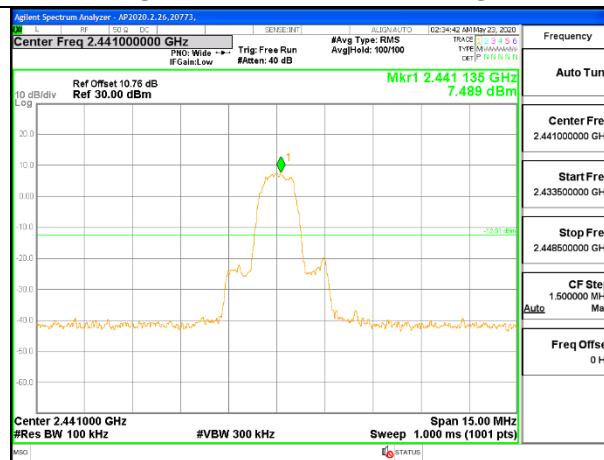
Antenna 4 SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON



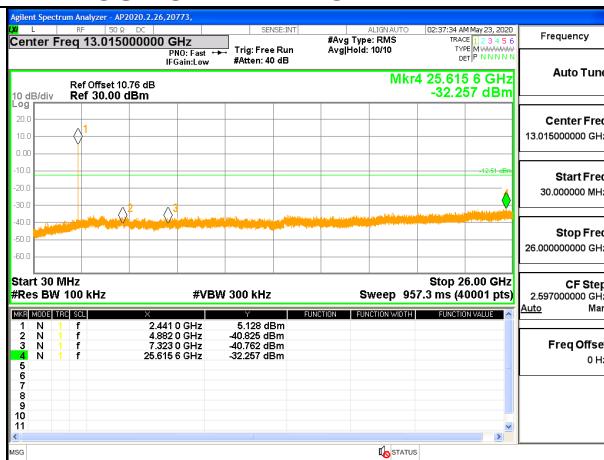
Antenna 3 SPURIOUS EMISSIONS, NON-HOPPING



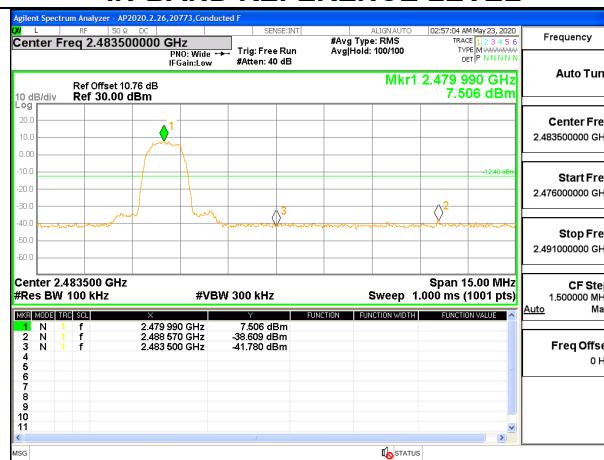
LOW CHANNEL BANDEDGE



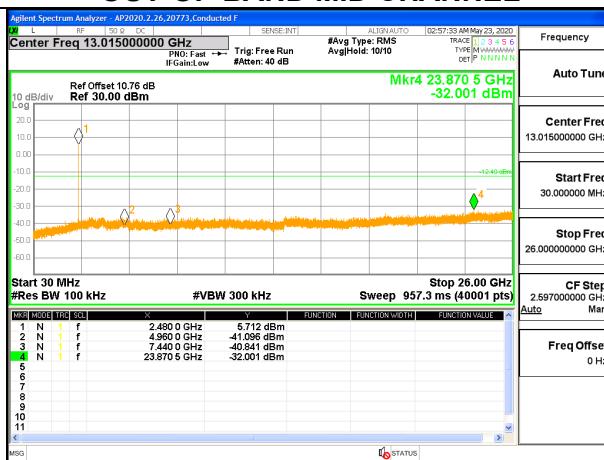
OUT-OF-BAND LOW CHANNEL



IN-BAND REFERENCE LEVEL



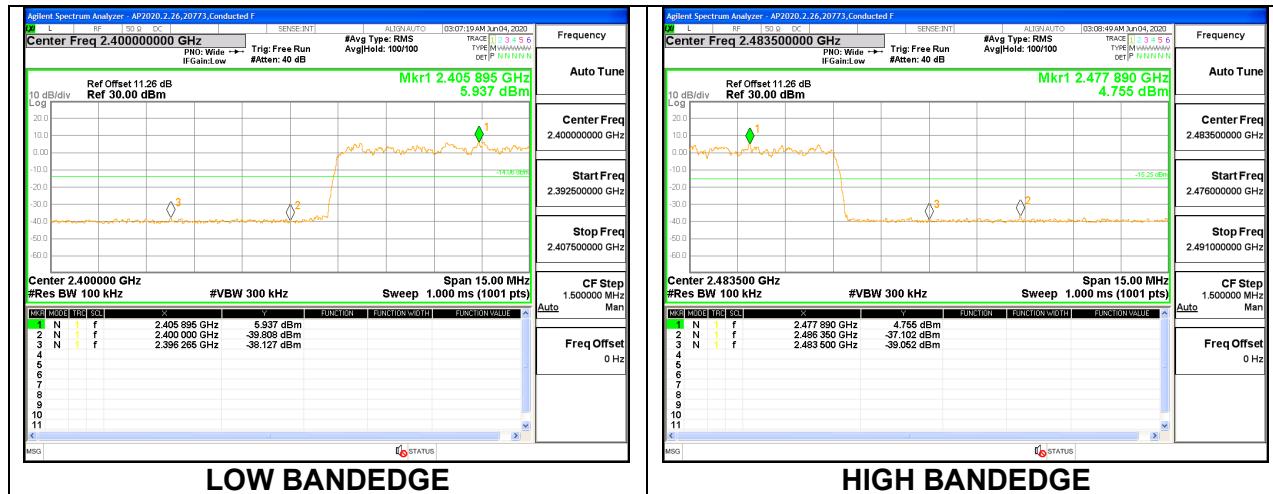
OUT-OF-BAND MID CHANNEL



HIGH CHANNEL BANDEDGE

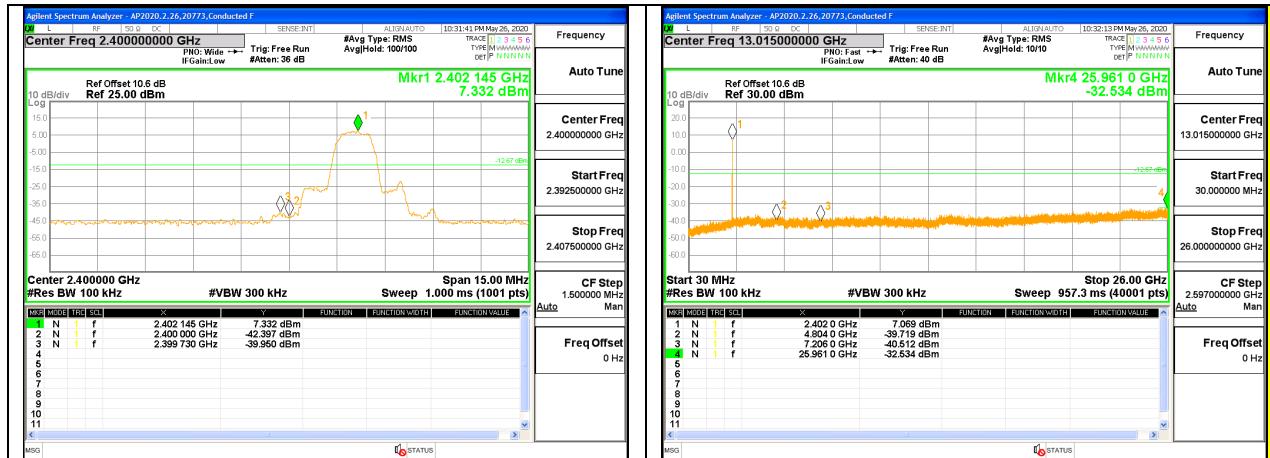
OUT-OF-BAND HIGH CHANNEL

Antenna 3 SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON



9.8.8. LOW POWER ENHANCED DATA RATE TXBF 8PSK MODULATION

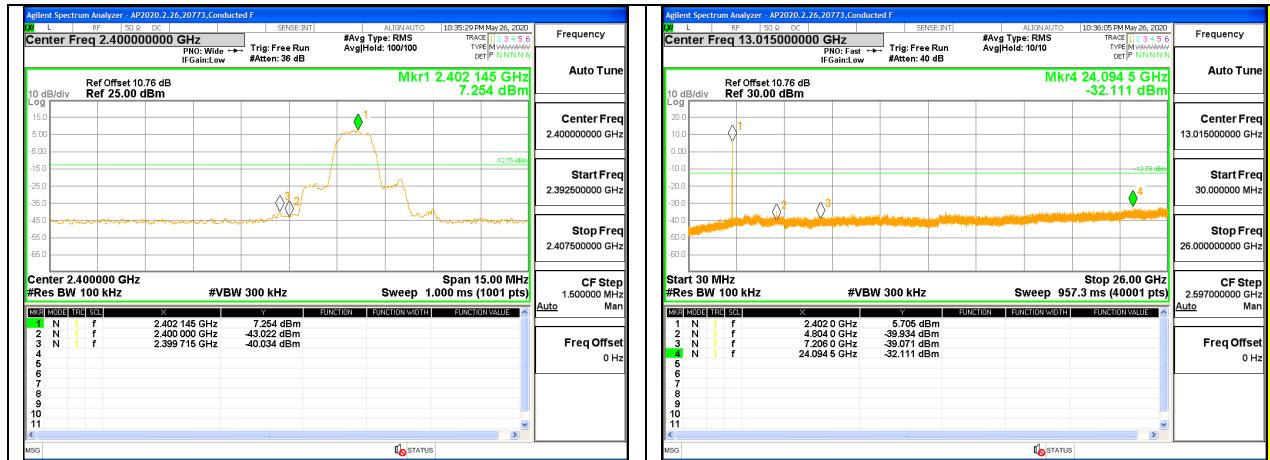
Antenna 4 SPURIOUS EMISSIONS, NON-HOPPING



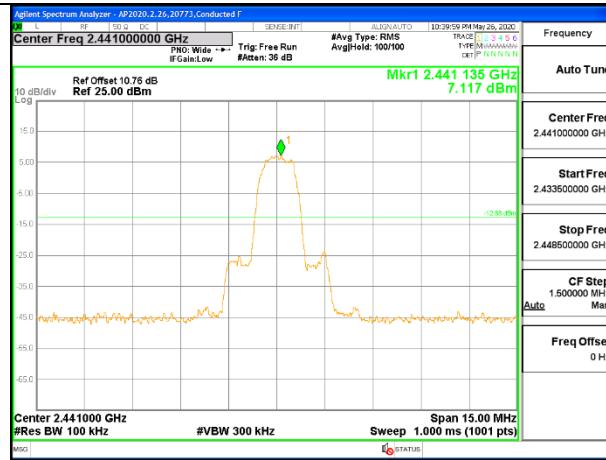
Antenna 4 SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON



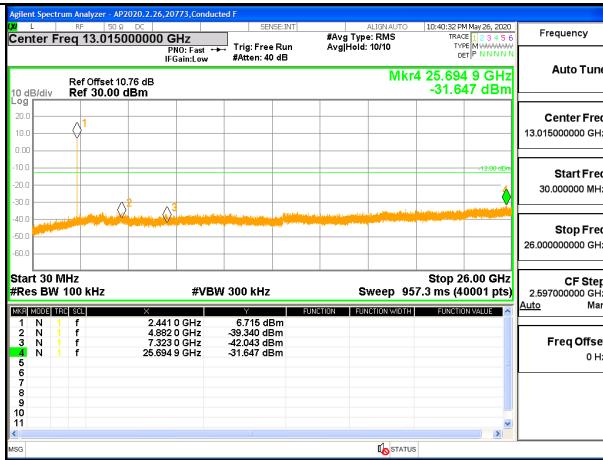
Antenna 3 SPURIOUS EMISSIONS, NON-HOPPING



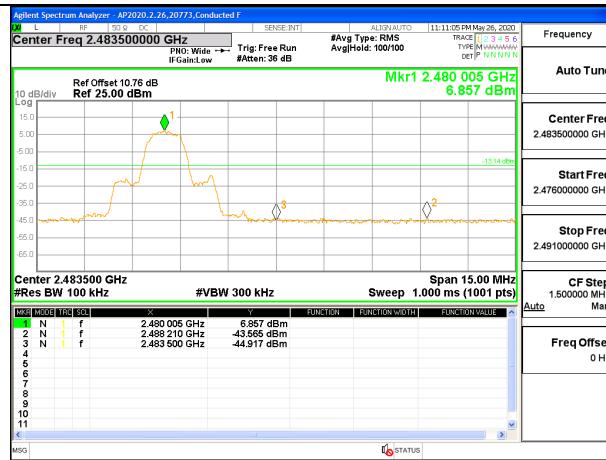
LOW CHANNEL BANDEDGE



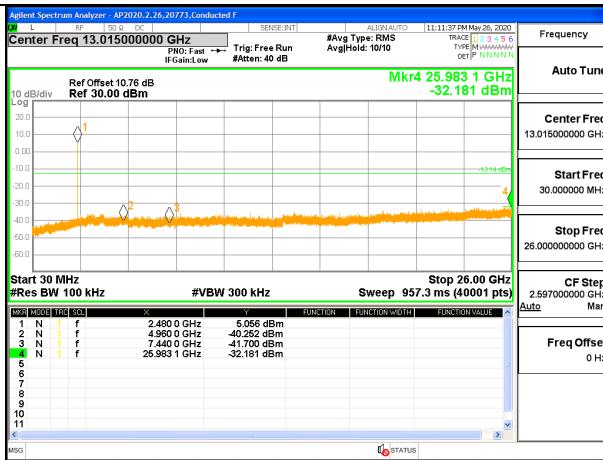
OUT-OF-BAND LOW CHANNEL



MID CHANNEL REFERENCE LEVEL



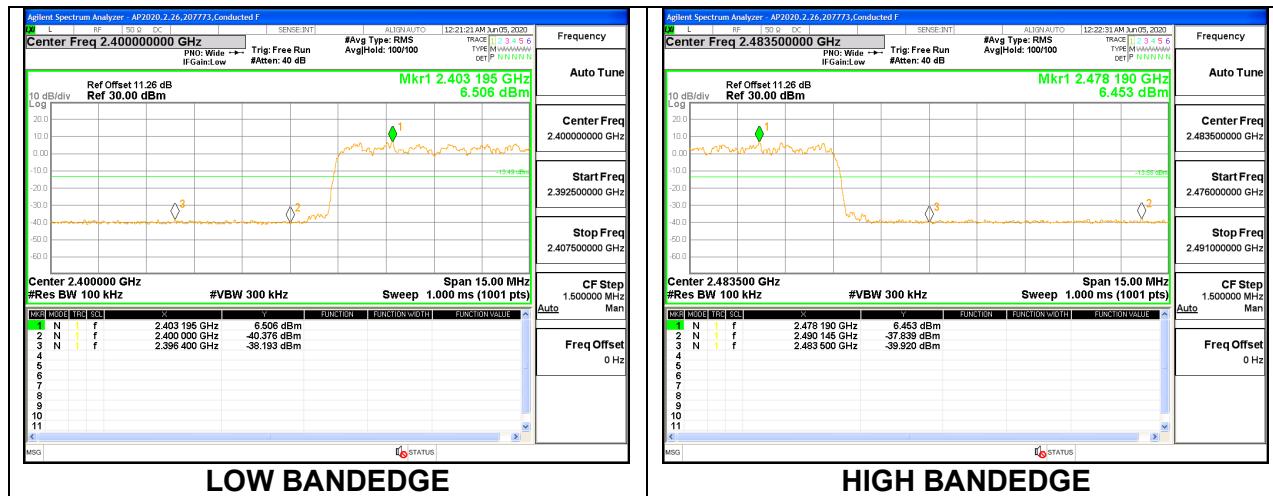
OUT-OF-BAND MID CHANNEL



HIGH CHANNEL BANDEDGE

OUT-OF-BAND HIGH CHANNEL

Antenna 3 SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON



10. RADIATED TEST RESULTS

LIMITS

FCC §15.205 and §15.209

RSS-GEN, Section 8.9 and 8.10.

Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
0.009-0.490	2400/F(kHz) @ 300 m	-
0.490-1.705	24000/F(kHz) @ 30 m	-
1.705 - 30	30 @ 30m	-
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane for measurement below 1GHz; 1.5 m above the ground plane for measurement above 1GHz. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.10. The EUT is set to transmit in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For pre-scans above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 30 KHz for peak measurements.

For final measurements above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 3 MHz for peak measurements and 1 MHz resolution bandwidth with 1/T video bandwidth with peak detector for average measurements.

The spectrum from 1 GHz to 18 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band. Below 1GHz and above 18GHz emissions, the channel with the highest output power was tested.

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

For below 30MHz testing, investigation was done on three antenna orientations (parallel, perpendicular, and ground-parallel), parallel and perpendicular are the worst orientations, therefore testing was performed on these two orientations only.

KDB 414788 Open Field Site(OFS) and Chamber Correlation Justification

Base on FCC 15.31 (f) (2): measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field.

OFS and chamber correlation testing had been performed and chamber measured test result is the worst-case test result.

KDB 558074 D01 15.247 Meas Guidance v05r02

Use of a duty cycle correction factor (DCCF) is permitted for calculating average radiated field strength emission levels for an FHSS device in 15.247. This DCCF can be applied when the field strength limit (e.g., within a Government Restricted band) and the conditions specified in Section 15.35(c) can be satisfied. The average radiated field strength is calculated by subtracting the DCCF from the maximum radiated field strength level as determined through measurement. The maximum radiated field strength level represents the worst-case (maximum amplitude) RMS measurement of the emission(s) during continuous transmission (i.e., not including any time intervals during which the transmitter is off or is transmitting at a reduced power level). It is also acceptable to apply the DCCF to a measurement performed with a peak detector instead of the specified RMS power averaging detector. Note that Section 15.35(c) specifies that the DCCF shall represent the worst-case (greatest duty cycle) over any 100 msec transmission period.

Results

High Power Beamforming GFSK mode is set to maximum power per chain to cover both SISO and MIMO modes to complies with radiated spurious emissions limits in the restricted bands between 1GHz and 18GHz low/mid/high channel (except the band edge).

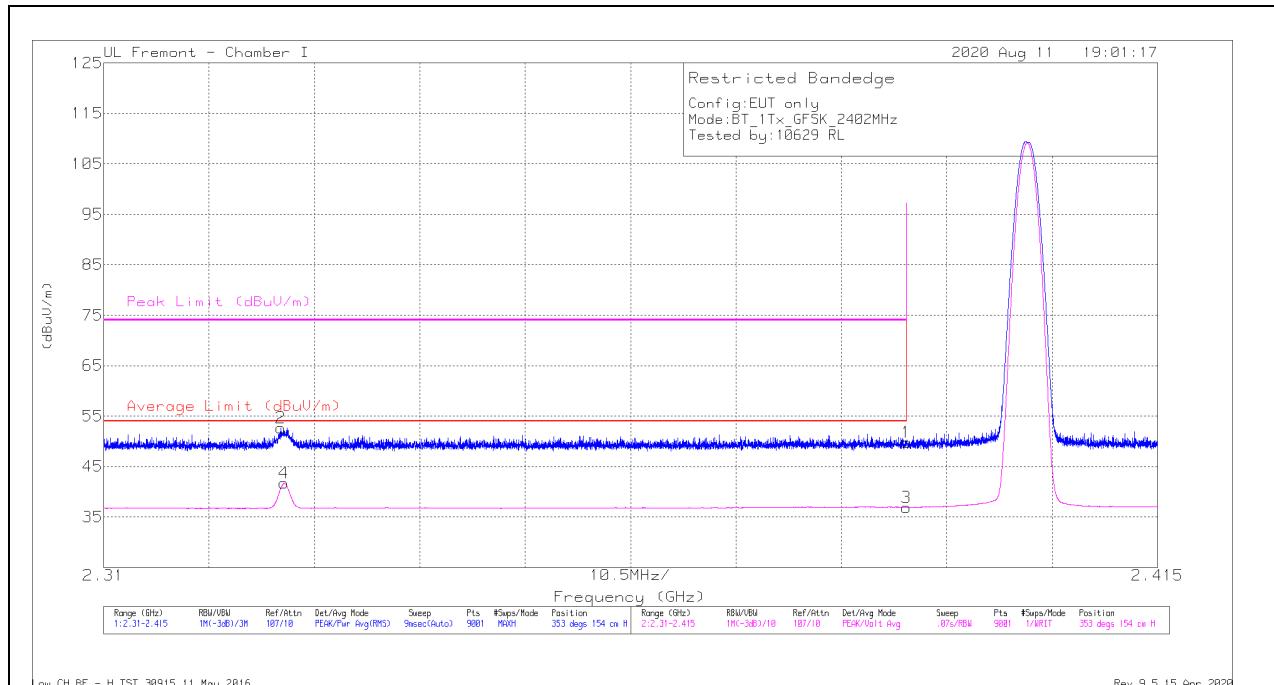
Spurious emissions for frequencies below 1GHz and above 18GHz were limited to the middle channel as preliminary testing indicated that changing the operating frequency had no significant impact on the emissions in those frequency bands.

10.1. TRANSMITTER ABOVE 1 GHz

10.1.1. HIGH POWER BASIC DATA RATE GFSK MODULATION ANTENNA 4

BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULT



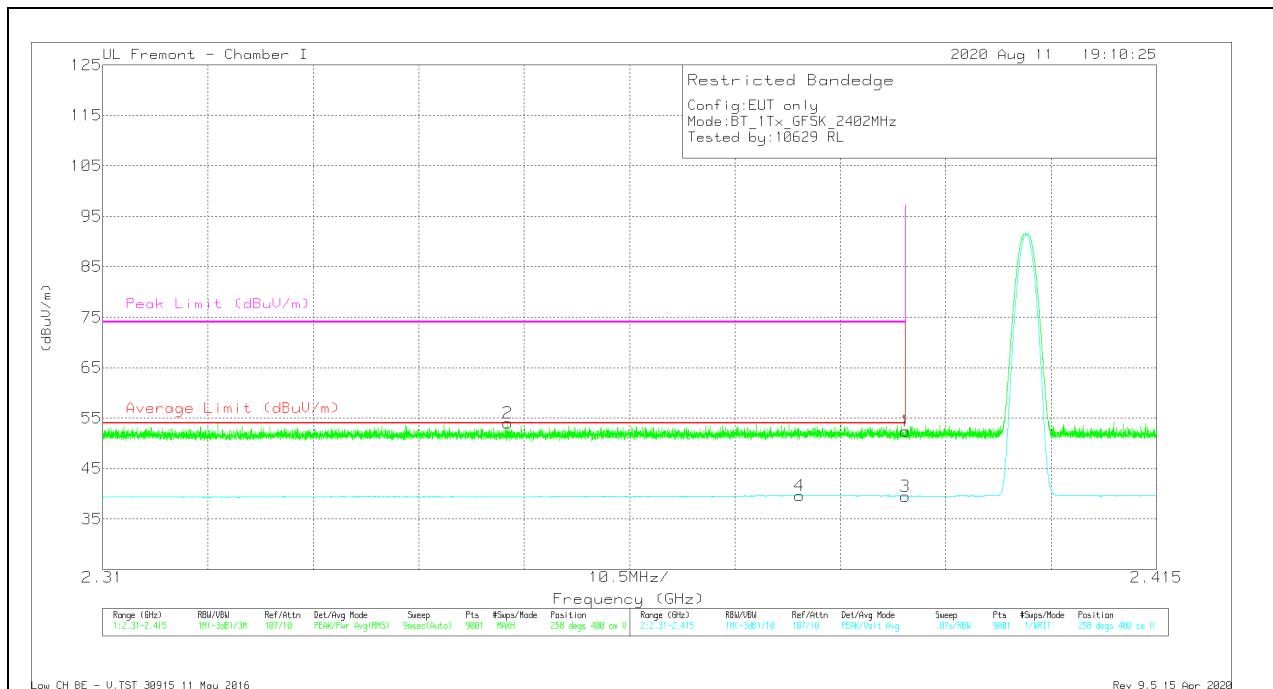
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.38999	35.08	PK	32	-17.3	49.78	-	-	74	-24.22	353	154	H
2	* 2.32763	38.19	PK	31.7	-17.2	52.69	-	-	74	-21.31	353	154	H
3	* 2.38999	22.18	VA1T	32	-17.3	36.88	54	-17.12	-	-	353	154	H
4	* 2.32799	27.17	VA1T	31.7	-17.2	41.67	54	-12.33	-	-	353	154	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

PK - Peak detector

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.38999	37.71	Pk	32	-17.3	52.41	-	-	74	-21.59	258	400	V
2	* 2.35037	39.45	Pk	31.8	-17.2	54.05	-	-	74	-19.95	258	400	V
3	* 2.38999	24.82	VA1T	32	-17.3	39.52	54	-14.48	-	-	258	400	V
4	* 2.37945	24.97	VA1T	32	-17.3	39.67	54	-14.33	-	-	258	400	V

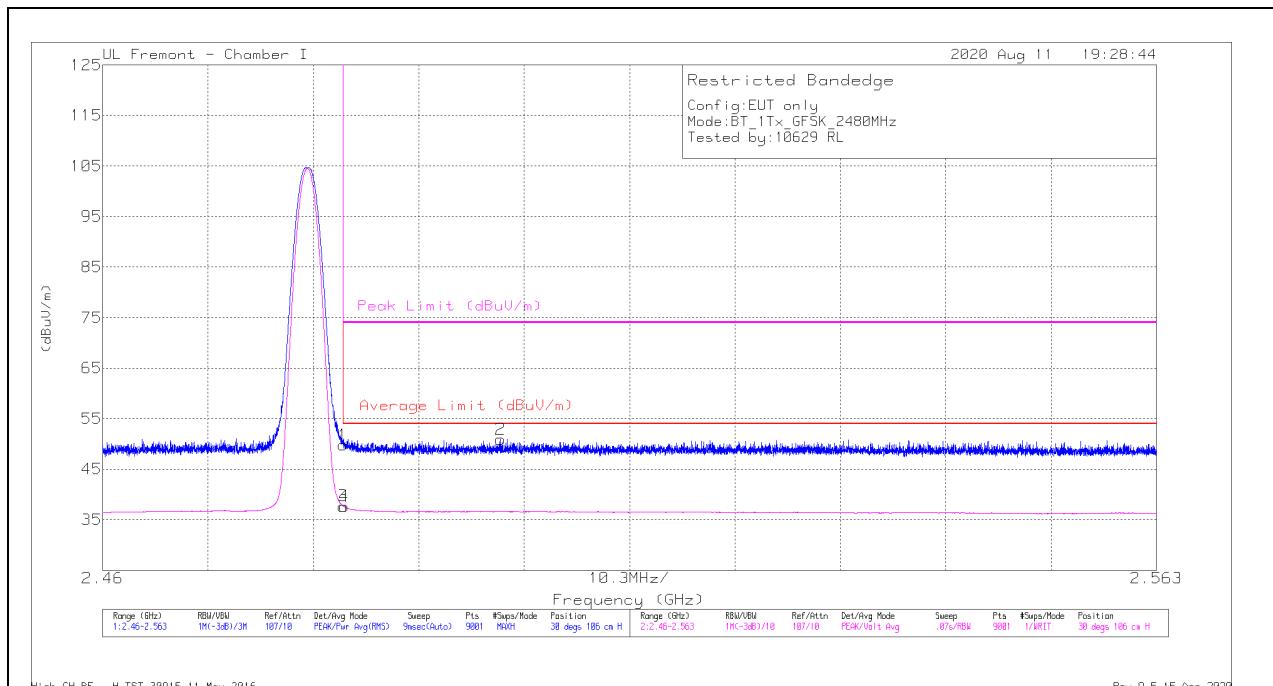
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

PK - Peak detector

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

BANDEDGE (HIGH CHANNEL)

HORIZONTAL RESULT



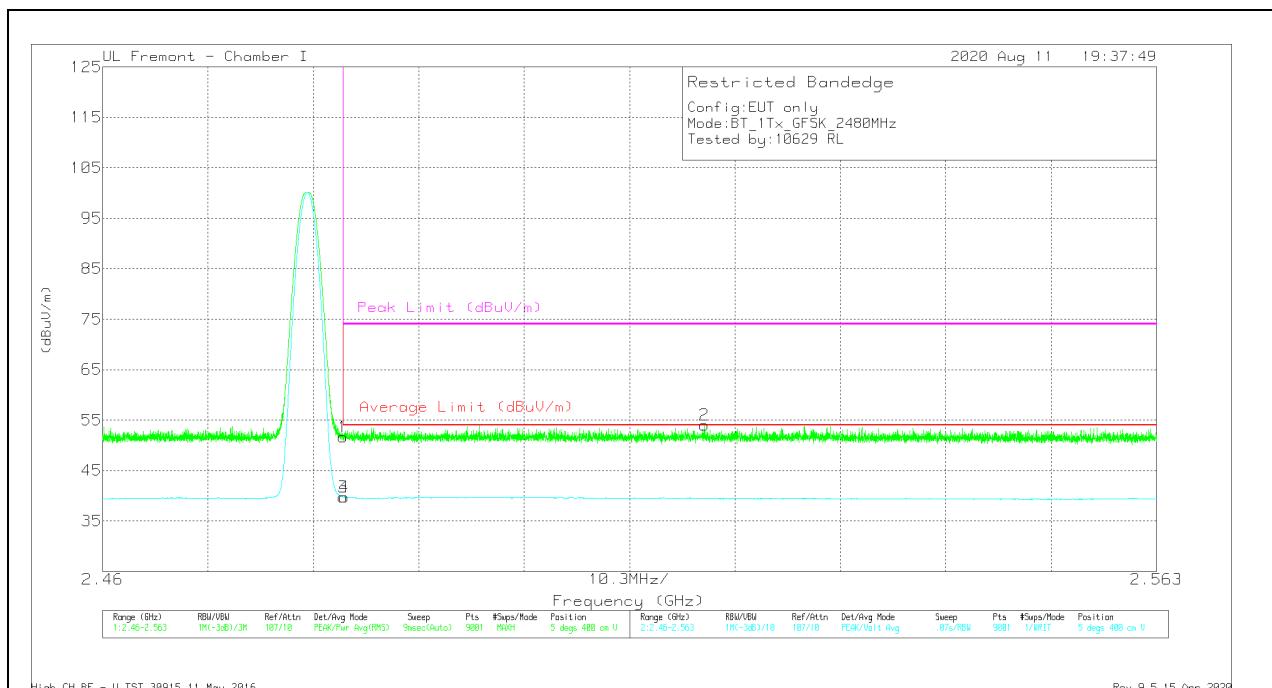
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T346 (dB/m)	Amp/Cb/Filt/Pa d (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.48351	35.15	Pk	32.4	-17.7	49.85	-	-	74	-24.15	30	106	H
2	* 2.49889	36.2	Pk	32.5	-17.8	50.9	-	-	74	-23.1	30	106	H
3	* 2.48351	22.99	VA1T	32.4	-17.7	37.69	54	-16.31	-	-	30	106	H
4	* 2.4836	22.89	VA1T	32.4	-17.7	37.59	54	-16.41	-	-	30	106	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

PK - Peak detector

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T346 (dB/m)	Amp/Cb/Filtr/Pad (dB)	Corrected Reading (dBm/m)	Average Limit (dBm/m)	Margin (dB)	Peak Limit (dBm/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.48351	36.98	Pk	32.4	-17.7	51.68	-	-	74	-22.32	5	400	V
2	2.51879	39.33	Pk	32.5	-17.8	54.03	-	-	74	-19.97	5	400	V
3	* 2.48351	25.07	VA1T	32.4	-17.7	39.77	54	-14.23	-	-	5	400	V
4	* 2.4836	25	VA1T	32.4	-17.7	39.7	54	-14.3	-	-	5	400	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

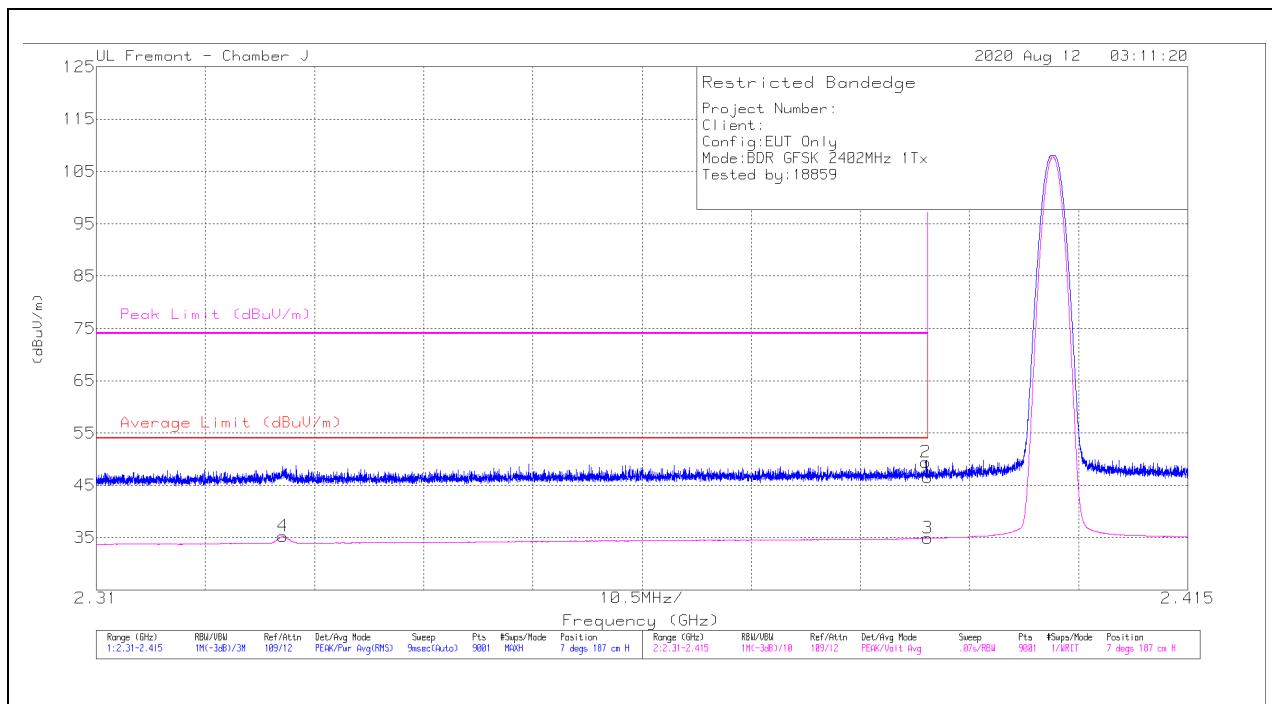
PK - Peak detector

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

ANTENNA 3

BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULT



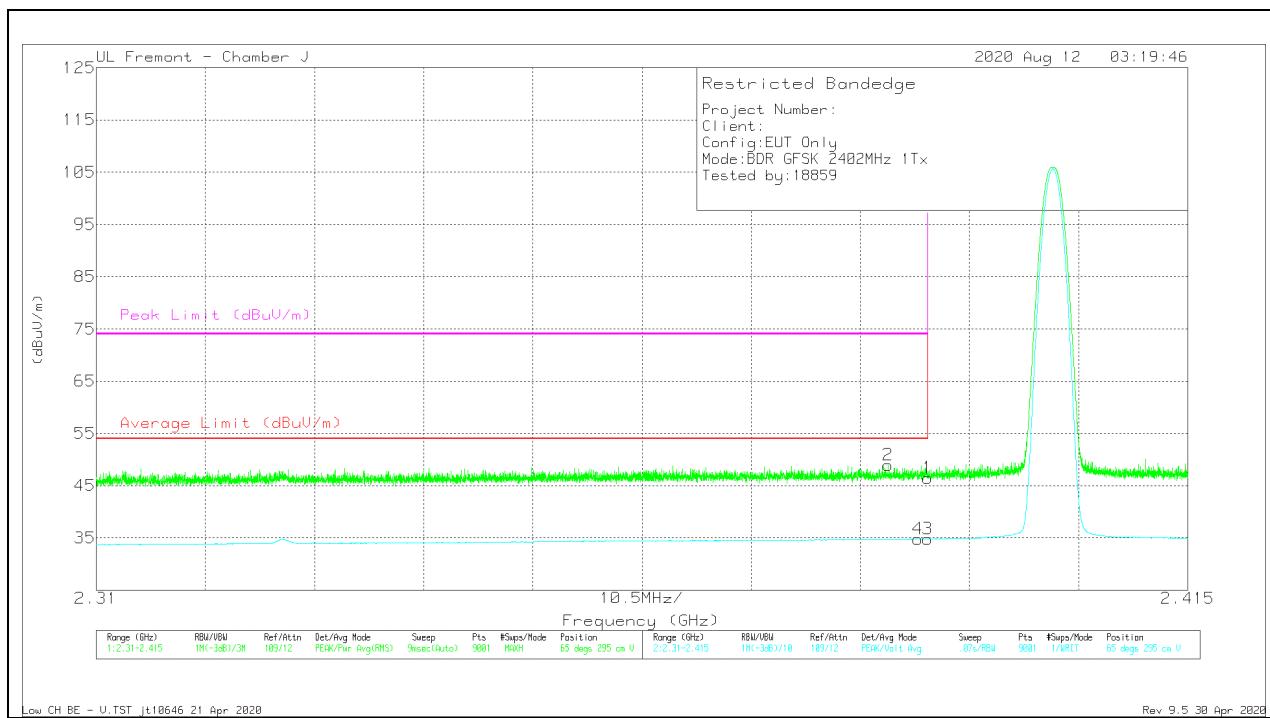
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T963 (dB/m)	Amp/Cbl/Filt/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.38999	32.29	Pk	29	-14.7	46.59	-	-	74	-27.41	7	187	H
2	* 2.38979	35.15	Pk	29	-14.7	49.45	-	-	74	-24.55	7	187	H
3	* 2.38999	20.54	VA1T	29	-14.7	34.84	54	-19.16	-	-	7	187	H
4	* 2.32796	21.22	VA1T	28.9	-14.9	35.22	54	-18.78	-	-	7	187	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBm)	Det	AF T963 (dB/m)	Amp/Chl/Ftr/Pa d (dB)	Corrected Reading (dBm)	Average Limit (dBm/m)	Margin (dB)	Peak Limit (dBm/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.38999	32.16	Pk	29	-14.7	46.46	-	-	74	-27.54	65	295	V
2	* 2.38616	34.63	Pk	29	-14.7	49.93	-	-	74	-25.07	65	295	V
3	* 2.38999	20.49	VA1T	29	-14.7	34.79	54	-19.21	-	-	65	295	V
4	* 2.38906	20.52	VA1T	29	-14.7	34.82	54	-19.18	-	-	65	295	V

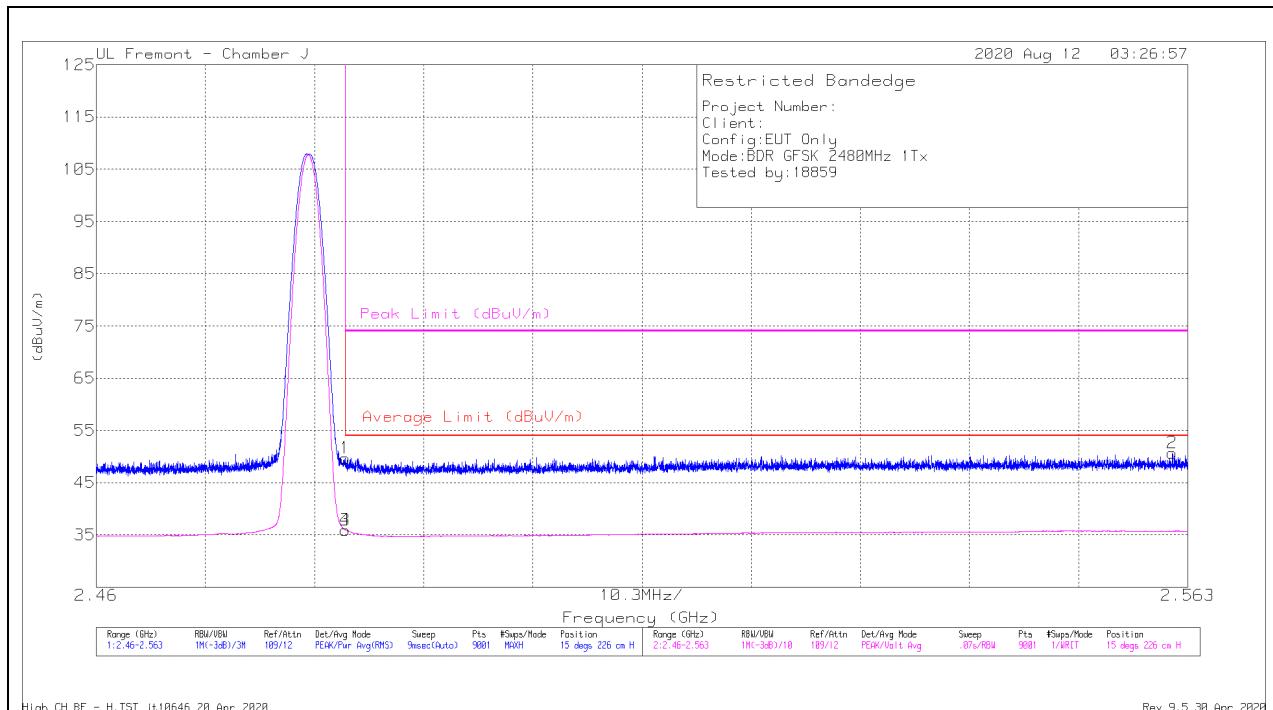
* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

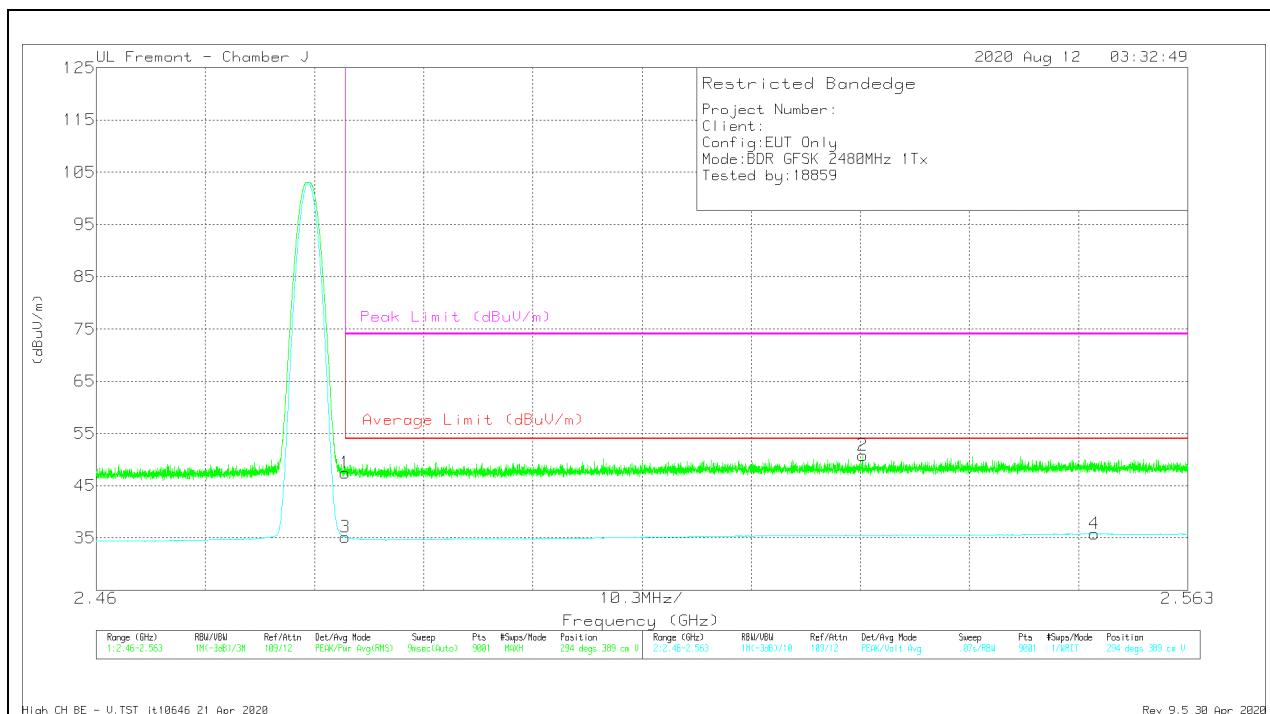
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

BANDEDGE (HIGH CHANNEL)

HORIZONTAL RESULT



VERTICAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T963 (dB/m)	Amp/Cbl/Filt/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.48351	32.49	Pk	29.5	-14.6	47.39	-	-	74	-26.61	294	389	V
2	2.53231	35.52	Pk	29.8	-14.5	50.82	-	-	74	-23.18	294	389	V
3	* 2.48351	20.23	VA1T	29.5	-14.6	35.13	54	-18.87	-	-	294	389	V
4	2.55418	20.27	VA1T	29.9	-14.4	35.77	54	-18.23	-	-	294	389	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

PK - Peak detector

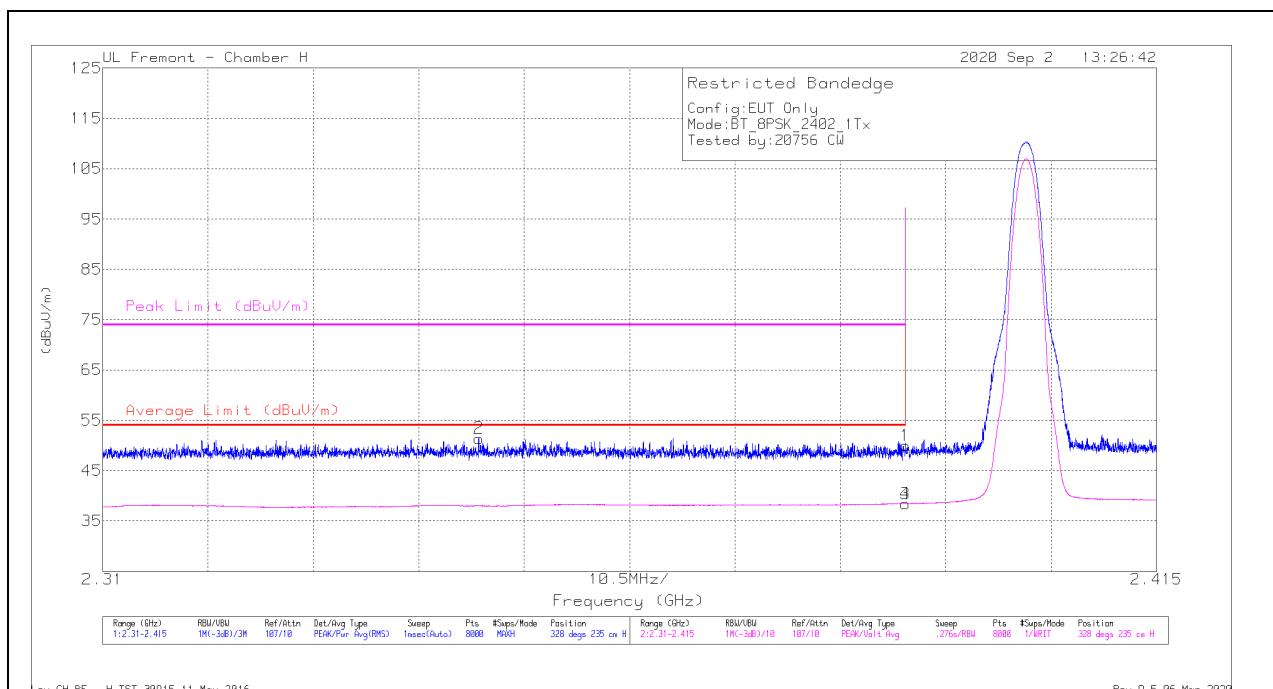
VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration

10.1.2. HIGH POWER ENHANCED DATA RATE 8PSK MODULATION

ANTENNA 4

BANDEDGE (LOW CHANNEL)

HORIZONTAL RESULT



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl/Filt/Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	41.97	Pk	31.8	-23.8	49.97	-	-	74	-24.03	328	235	H
2	* 2.34746	43.44	Pk	31.9	-23.9	51.44	-	-	74	-22.56	328	235	H
3	* 2.39	30.44	VA1T	31.8	-23.8	38.44	54	-15.56	-	-	328	235	H
4	* 2.38996	30.45	VA1T	31.8	-23.8	38.45	54	-15.55	-	-	328	235	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

VA1T - FHSS: Linear Voltage Average VB=1/Ton where: Ton is transmit duration