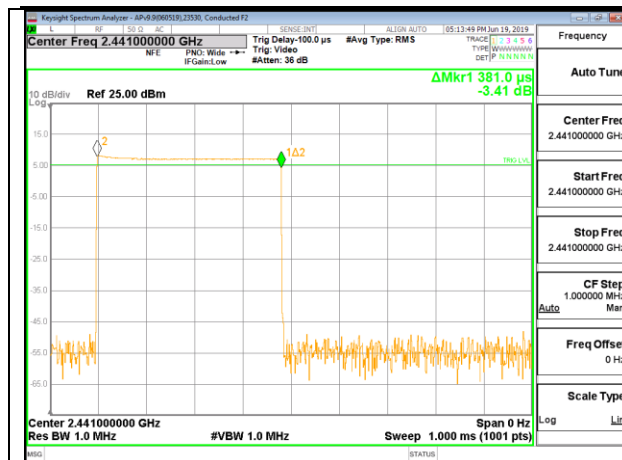
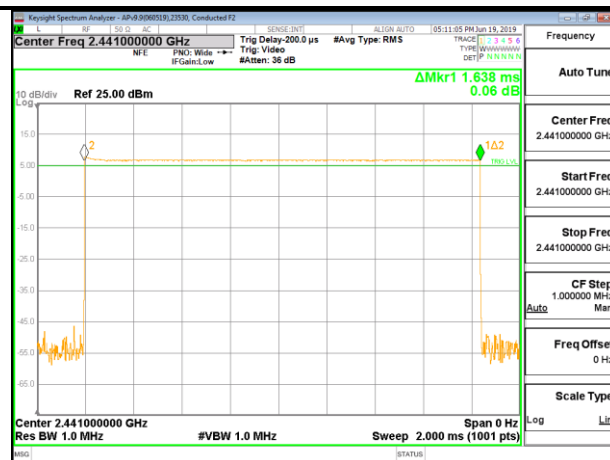
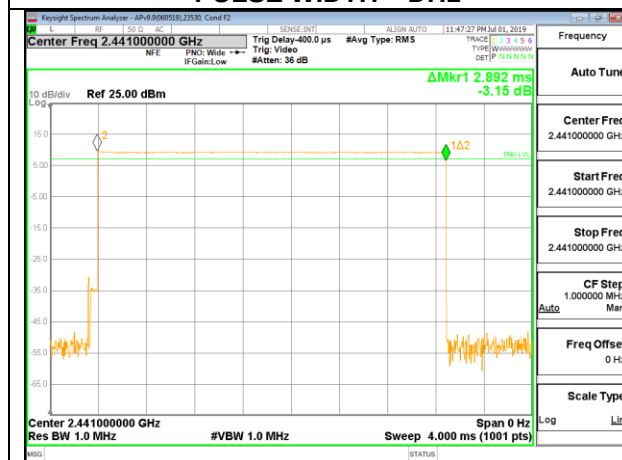




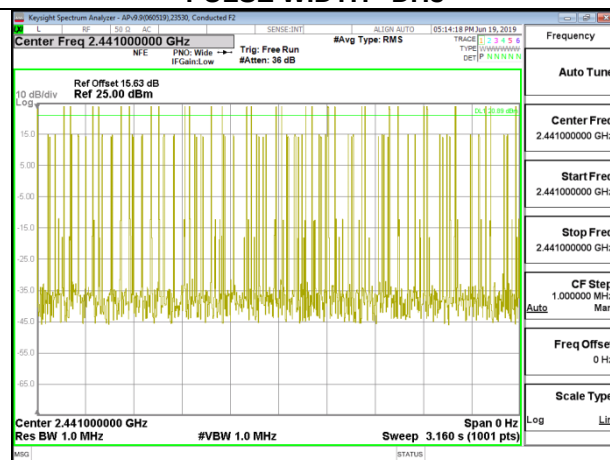
PULSE WIDTH – DH1



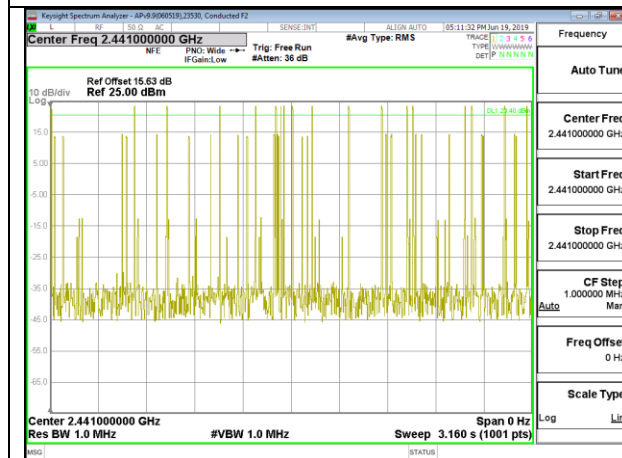
PULSE WIDTH– DH3



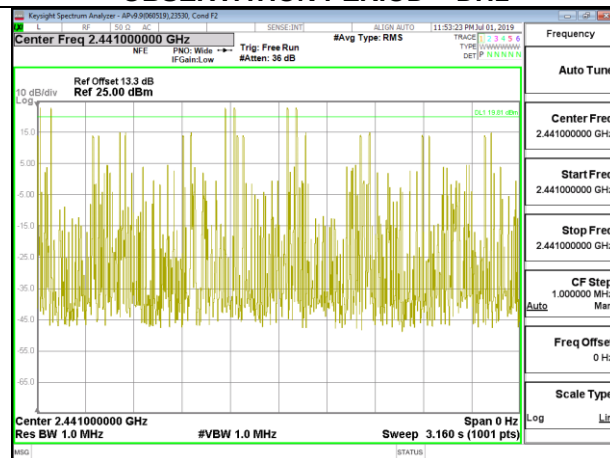
PULSE WIDTH – DH5



NUMBER OF PULSES IN 3.16 SECOND
OBSERVATION PERIOD – DH1



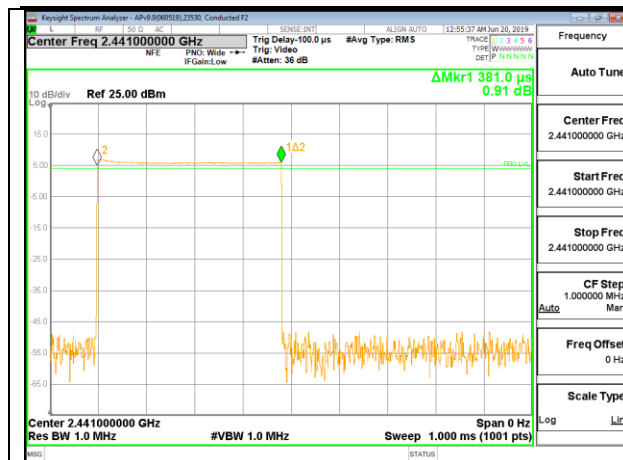
NUMBER OF PULSES IN 3.16 SECOND
OBSERVATION PERIOD – DH3



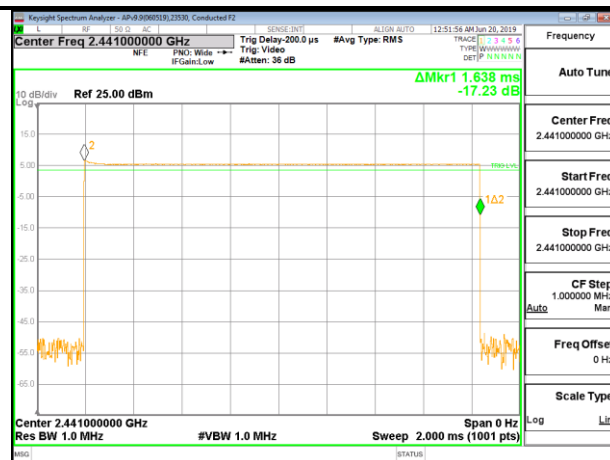
NUMBER OF PULSES IN 3.16 SECOND
OBSERVATION PERIOD – DH5

Antenna 3

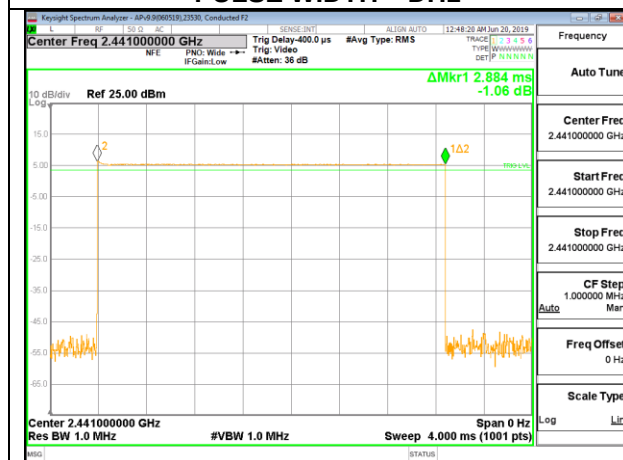
DH Packet	Pulse Width (msec)	Number of Pulses in 3.16 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
GFSK Normal Mode					
DH1	0.381	32	0.1219	0.4	-0.2781
DH3	1.638	15	0.2457	0.4	-0.1543
DH5	2.884	8	0.2307	0.4	-0.1693
DH Packet	Pulse Width (sec)	Number of Pulses in 0.8 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
GFSK AFH Mode					
DH1	0.381	8	0.03048	0.4	-0.3695
DH3	1.638	3.75	0.06143	0.4	-0.3386
DH5	2.884	2	0.05768	0.4	-0.3423



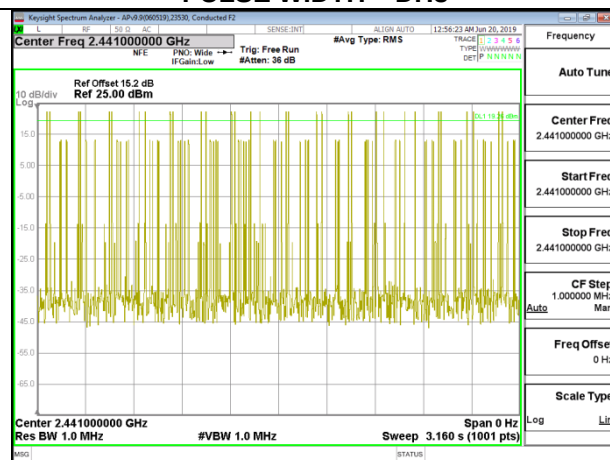
PULSE WIDTH – DH1



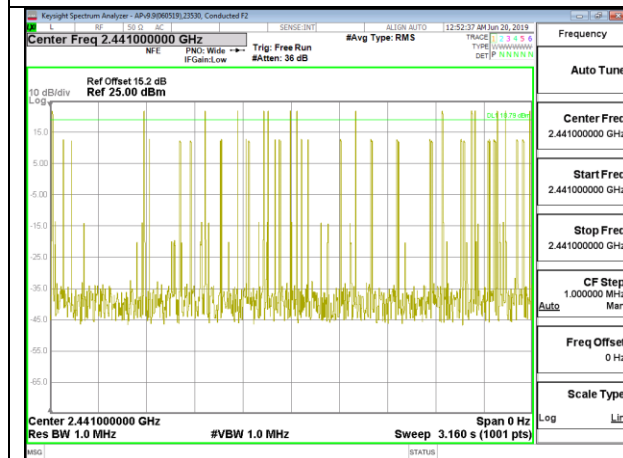
PULSE WIDTH – DH3



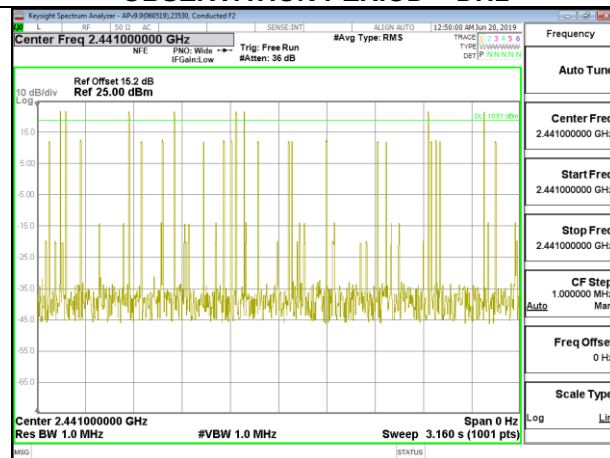
PULSE WIDTH – DH5



NUMBER OF PULSES IN 3.16 SECOND
OBSERVATION PERIOD – DH1



NUMBER OF PULSES IN 3.16 SECOND
OBSERVATION PERIOD – DH3



NUMBER OF PULSES IN 3.16 SECOND
OBSERVATION PERIOD – DH5

8.9.2. HIGH POWER ENHANCED DATA RATE 8PSK MODULATION

Antenna 4

DH Packet	Pulse Width (msec)	Number of Pulses in 3.16 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
8PSK Normal Mode					
3DH1	0.387	32	0.12384	0.4	-0.2762
3DH3	1.638	17	0.27846	0.4	-0.1215
3DH5	2.888	5	0.1444	0.4	-0.2556

Note: for AFH(8PSK) mode, please refer to the results of AFH(GFSK) mode; the channel selection and hopping rate are the same for both EDR and Basic Rate operation, data for Basic Rate demonstrates compliance with channel occupancy when AFH is employed.



Antenna 3

DH Packet	Pulse Width (msec)	Number of Pulses in 3.16 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
8PSK Normal Mode					
3DH1	0.387	33	0.12771	0.4	-0.2723
3DH3	1.638	17	0.27846	0.4	-0.1215
3DH5	2.888	4	0.11552	0.4	-0.2845

Note: for AFH(8PSK) mode, please refer to the results of AFH(GFSK) mode; the channel selection and hopping rate are the same for both EDR and Basic Rate operation, data for Basic Rate demonstrates compliance with channel occupancy when AFH is employed.



8.9.3. LOW POWER BASIC DATA RATE GFSK MODULATION

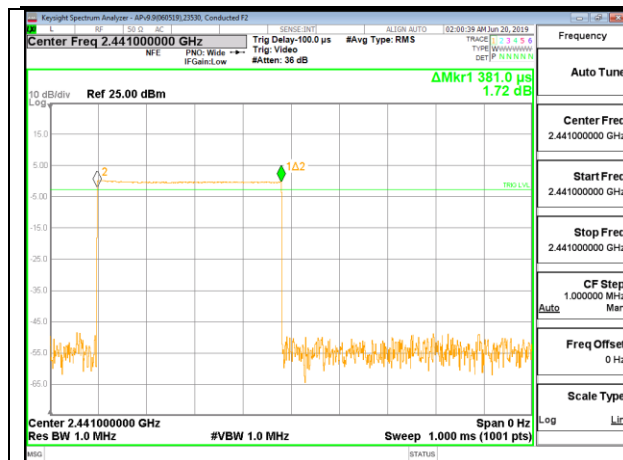
Antenna 4

DH Packet	Pulse Width (msec)	Number of Pulses in 3.16 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
GFSK Normal Mode					
DH1	0.382	34	0.1299	0.4	-0.2701
DH3	1.636	18	0.2945	0.4	-0.1055
DH5	2.888	5	0.1444	0.4	-0.2556
DH Packet	Pulse Width (sec)	Number of Pulses in 0.8 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
GFSK AFH Mode					
DH1	0.382	8.5	0.03247	0.4	-0.3675
DH3	1.636	4.5	0.07362	0.4	-0.3264
DH5	2.888	1.25	0.03610	0.4	-0.3639



Antenna 3

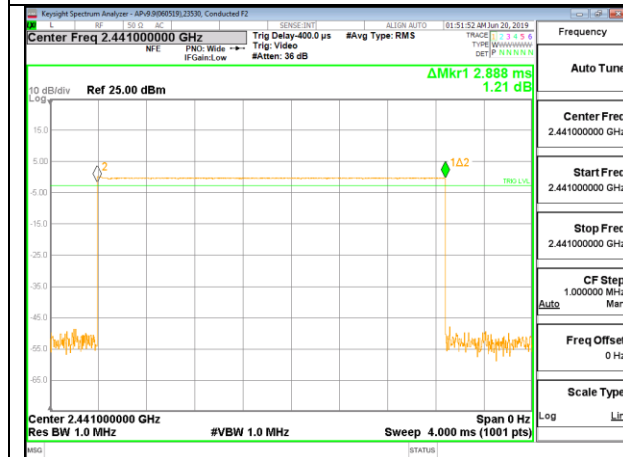
DH Packet	Pulse Width (msec)	Number of Pulses in 3.16 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
GFSK Normal Mode					
DH1	0.382	32	0.1222	0.4	-0.2778
DH3	1.636	17	0.2781	0.4	-0.1219
DH5	2.888	4	0.1155	0.4	-0.2845
DH Packet	Pulse Width (sec)	Number of Pulses in 0.8 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
GFSK AFH Mode					
DH1	0.382	8	0.03056	0.4	-0.3694
DH3	1.636	4.25	0.06953	0.4	-0.3305
DH5	2.888	1	0.02888	0.4	-0.3711



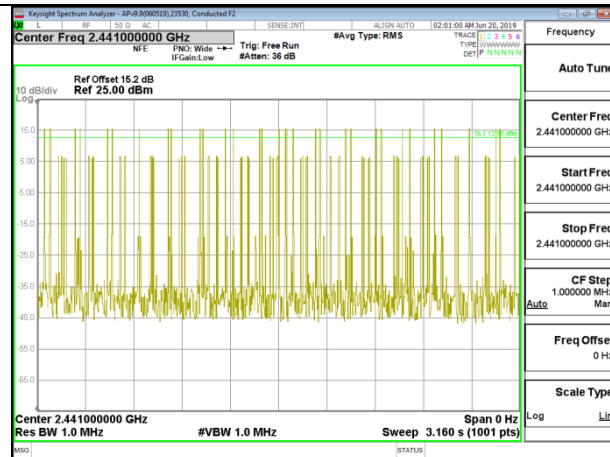
PULSE WIDTH – DH1



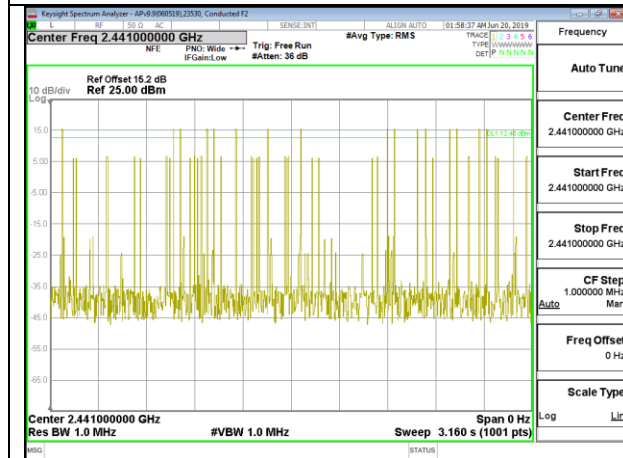
PULSE WIDTH – DH3



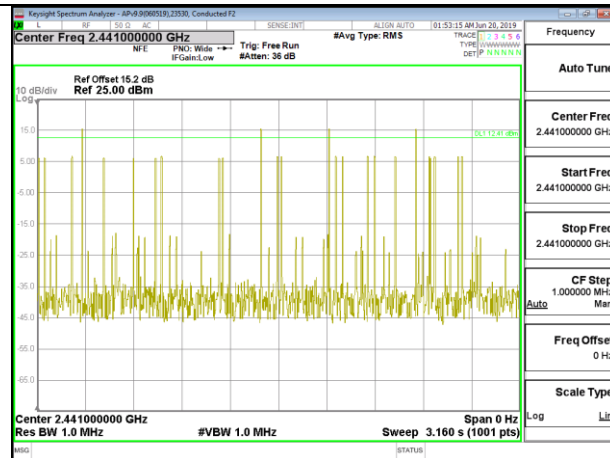
PULSE WIDTH – DH5



NUMBER OF PULSES IN 3.16 SECOND
OBSERVATION PERIOD – DH1



NUMBER OF PULSES IN 3.16 SECOND
OBSERVATION PERIOD – DH3



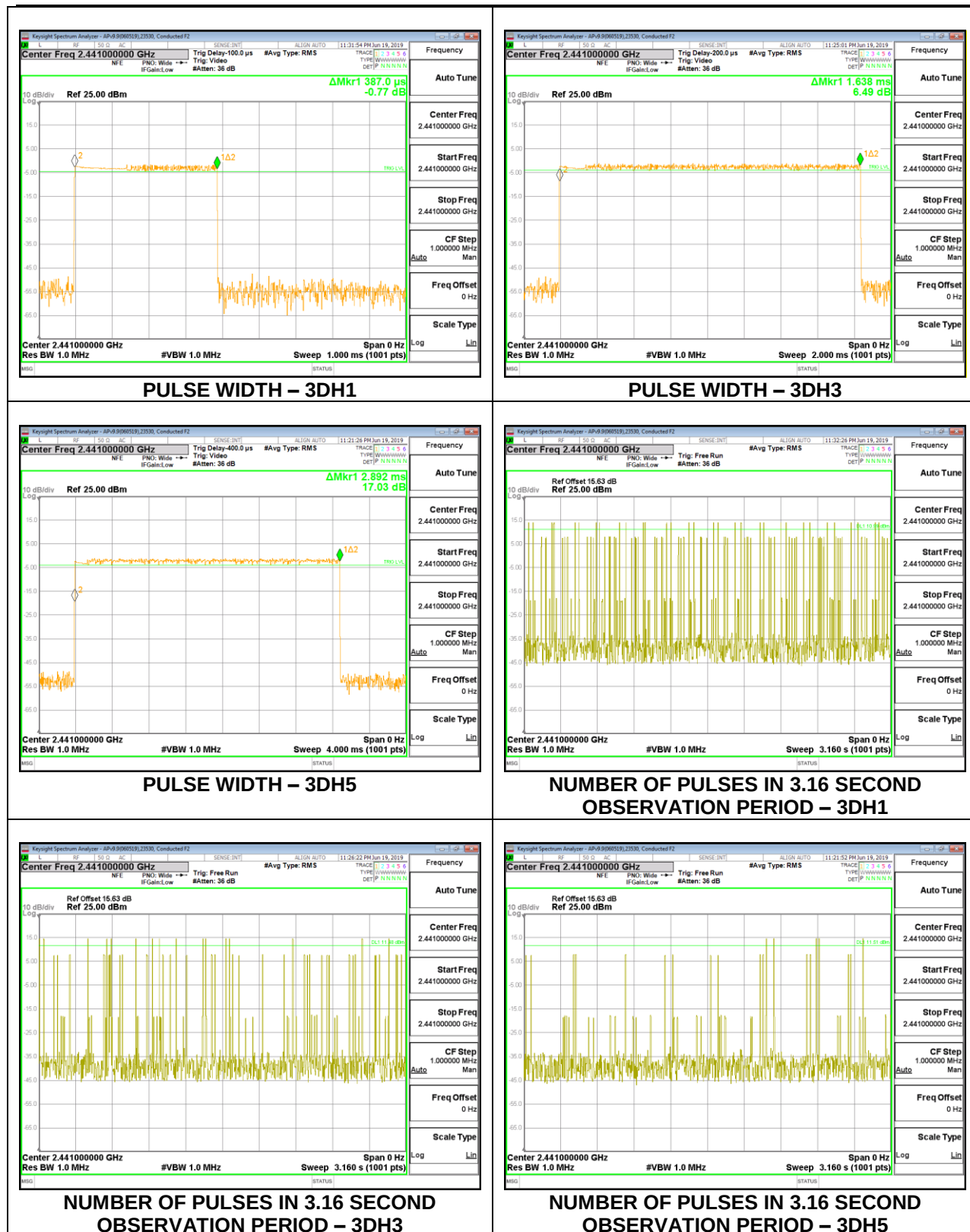
NUMBER OF PULSES IN 3.16 SECOND
OBSERVATION PERIOD – DH5

8.9.4. LOW POWER ENHANCED DATA RATE 8PSK MODULATION

Antenna 4

DH Packet	Pulse Width (msec)	Number of Pulses in 3.16 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
8PSK Normal Mode					
3DH1	0.387	32	0.12384	0.4	-0.2762
3DH3	1.638	16	0.26208	0.4	-0.1379
3DH5	2.892	7	0.20244	0.4	-0.1976

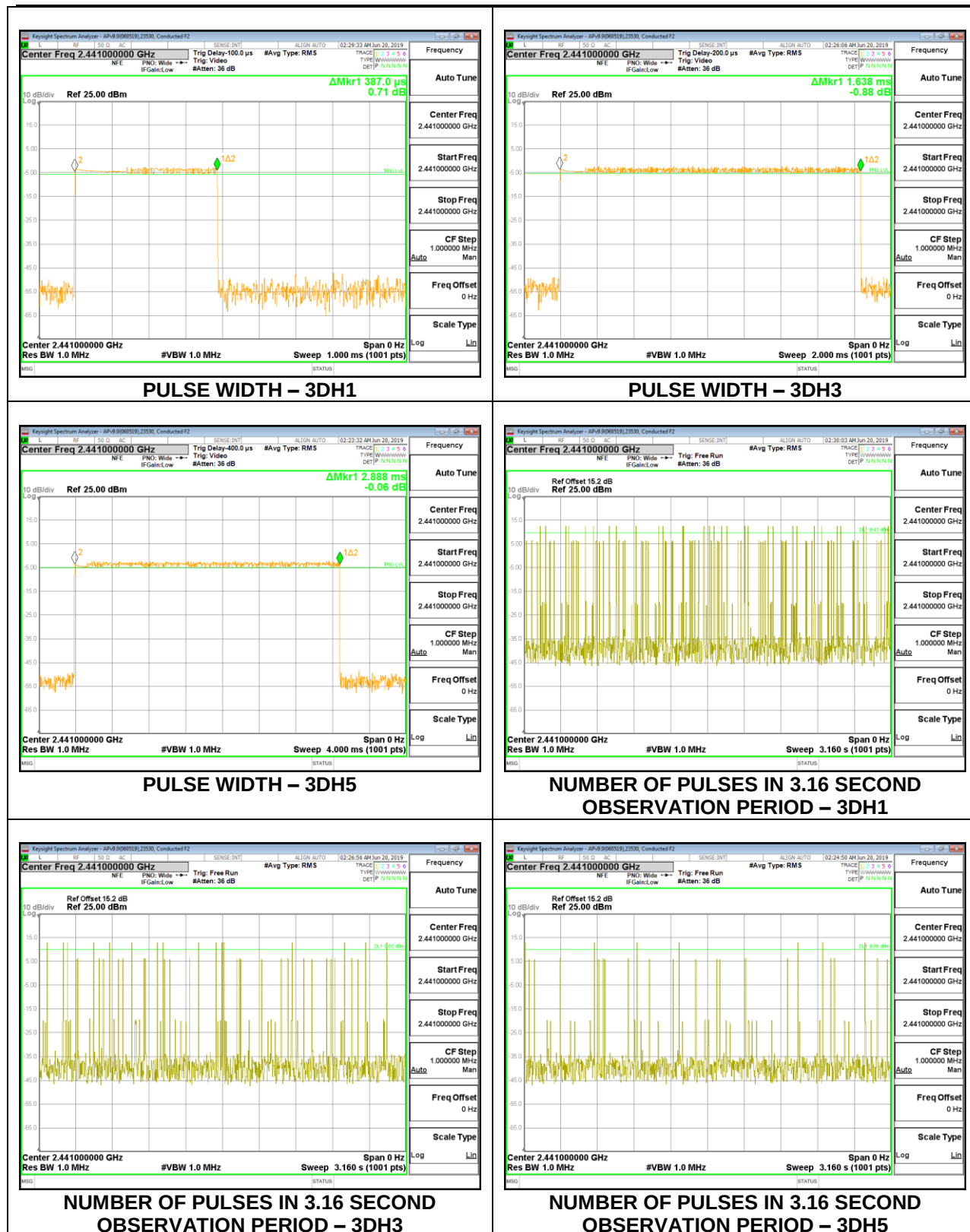
Note: for AFH(8PSK) mode, please refer to the results of AFH(GFSK) mode; the channel selection and hopping rate are the same for both EDR and Basic Rate operation, data for Basic Rate demonstrates compliance with channel occupancy when AFH is employed.



Antenna 3

DH Packet	Pulse Width (msec)	Number of Pulses in 3.16 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
8PSK Normal Mode					
3DH1	0.387	32	0.12384	0.4	-0.2762
3DH3	1.638	16	0.26208	0.4	-0.1379
3DH5	2.888	7	0.20216	0.4	-0.1978

Note: for AFH(8PSK) mode, please refer to the results of AFH(GFSK) mode; the channel selection and hopping rate are the same for both EDR and Basic Rate operation, data for Basic Rate demonstrates compliance with channel occupancy when AFH is employed.



8.10. OUTPUT POWER

LIMITS

§15.247 (b) (1)

RSS-247 (5.4) (b)

The maximum antenna gain is less than 6 dBi, therefore the limit is 30 dBm. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

TEST PROCEDURE

Measurements perform using a wideband gated RF power meter.

The cable assembly insertion loss of 10.5 dB (including 10 dB pad and 0.5 dB cable) was entered as an offset in the power meter to allow for a gated peak reading of power.

RESULTS

8.10.1. HIGH POWER BASIC DATA RATE GFSK MODULATION

Antenna 4

Tested By:	23530
Date:	7/17/2019

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	16.29	21	-4.71
Middle	2441	16.51	21	-4.49
High	2480	16.40	21	-4.6

Antenna 3

Tested By:	23530
Date:	7/17/2019

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	19.51	21	-1.49
Middle	2441	19.54	21	-1.46
High	2480	19.47	21	-1.53

8.10.2. HIGH POWER ENHANCED DATA RATE QPSK MODULATION

Antenna 4

Tested By:	23530
Date:	7/17/2019

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	18.26	21	-2.74
Middle	2441	18.46	21	-2.54
High	2480	18.38	21	-2.62

Antenna 3

Tested By:	23530
Date:	7/17/2019

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	18.33	21	-2.67
Middle	2441	18.41	21	-2.59
High	2480	18.35	21	-2.65

8.10.3. HIGH POWER ENHANCED DATA RATE 8PSK MODULATION

Antenna 4

Tested By:	23530
Date:	7/17/2019

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	18.55	21	-2.45
Middle	2441	18.58	21	-2.42
High	2480	18.54	21	-2.46

Antenna 3

Tested By:	23530
Date:	7/17/2019

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	18.56	21	-2.44
Middle	2441	18.57	21	-2.43
High	2480	18.51	21	-2.49

8.10.4. LOW POWER BASIC DATA RATE GFSK MODULATION

Antenna 4

Tested By:	23530
Date:	7/17/2019

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	12.51	21	-8.49
Middle	2441	12.57	21	-8.43
High	2480	12.53	21	-8.47

Antenna 3

Tested By:	23530
Date:	7/17/2019

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	12.53	21	-8.47
Middle	2441	12.59	21	-8.41
High	2480	12.49	21	-8.51

8.10.5. LOW POWER ENHANCED DATA RATE QPSK MODULATION

Antenna 4

Tested By:	23530
Date:	7/17/2019

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	11.27	21	-9.73
Middle	2441	11.39	21	-9.61
High	2480	11.38	21	-9.62

Antenna 3

Tested By:	23530
Date:	7/17/2019

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	11.47	21	-9.53
Middle	2441	11.51	21	-9.49
High	2480	11.45	21	-9.55

8.10.6. LOW POWER ENHANCED DATA RATE 8PSK MODULATION

Antenna 4

Tested By:	23530
Date:	7/17/2019

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	11.36	21	-9.64
Middle	2441	11.41	21	-9.59
High	2480	11.31	21	-9.69

Antenna 3

Tested By:	23530
Date:	7/17/2019

Channel	Frequency (MHz)	Output Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	11.39	21	-9.61
Middle	2441	11.40	21	-9.6
High	2480	11.36	21	-9.64

8.11. BEAMFORMING OUTPUT POWER

8.11.1. HIGH POWER BASIC DATA RATE GFSK MODULATION

2TX Antenna 4 + Antenna 3 TxBF Mode

Tested By:	23530
Date:	7/17/2019

Channel	Frequency (MHz)	Output Power Antenna 4 (dBm)	Output Power Antenna 3 (dBm)	Total Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	16.38	17.02	19.72	21	-1.28
Middle	2441	16.43	17.05	19.76	21	-1.24
High	2480	16.41	17.03	19.74	21	-1.26

8.11.2. HIGH POWER ENHANCED DATA RATE QPSK MODULATION

2TX Antenna 4 + Antenna 3 TxBF Mode

Tested By:	23530
Date:	7/17/2019

Channel	Frequency (MHz)	Output Power Antenna 4 (dBm)	Output Power Antenna 3 (dBm)	Total Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	17.44	17.51	20.49	21	-0.51
Middle	2441	17.53	17.59	20.57	21	-0.43
High	2480	17.49	17.53	20.52	21	-0.48

8.11.3. HIGH POWER ENHANCED DATA RATE 8PSK MODULATION

2TX Antenna 4 + Antenna 3 TxBF Mode

Tested By:	23530
Date:	7/17/2019

Channel	Frequency (MHz)	Output Power Antenna 4 (dBm)	Output Power Antenna 3 (dBm)	Total Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	17.47	17.53	20.51	21	-0.49
Middle	2441	17.55	17.61	20.59	21	-0.41
High	2480	17.53	17.57	20.56	21	-0.44

8.11.4. LOW POWER BASIC DATA RATE GFSK MODULATION

2TX Antenna 4 + Antenna 3 TxBF Mode

Tested By:	23530
Date:	7/17/2019

Channel	Frequency (MHz)	Output Power Antenna 4 (dBm)	Output Power Antenna 3 (dBm)	Total Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	12.58	12.54	15.57	21	-5.43
Middle	2441	12.61	12.60	15.62	21	-5.38
High	2480	12.59	12.57	15.59	21	-5.41

8.11.5. LOW POWER ENHANCED DATA RATE QPSK MODULATION

2TX Antenna 4 + Antenna 3 TxBF Mode

Tested By:	23530
Date:	7/17/2019

Channel	Frequency (MHz)	Output Power Antenna 4 (dBm)	Output Power Antenna 3 (dBm)	Total Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	11.37	11.46	14.43	21	-6.57
Middle	2441	11.48	11.44	14.47	21	-6.53
High	2480	11.42	11.47	14.46	21	-6.54

8.11.6. LOW POWER ENHANCED DATA RATE 8PSK MODULATION

2TX Antenna 4 + Antenna 3 TxBF Mode

Tested By:	23530
Date:	7/17/2019

Channel	Frequency (MHz)	Output Power Antenna 4 (dBm)	Output Power Antenna 3 (dBm)	Total Power (dBm)	Limit (dBm)	Margin (dB)
Low	2402	11.42	11.56	14.50	21	-6.50
Middle	2441	11.47	11.57	14.53	21	-6.47
High	2480	11.45	11.56	14.52	21	-6.48

8.12. AVERAGE POWER

LIMITS

None; for reporting purposes only

TEST PROCEDURE

Measurements perform using a wideband gated RF power meter.

The cable assembly insertion loss of 10.5 dB (including 10 dB pad and 0.5 dB cable) was entered as an offset in the power meter to allow for a gated average reading of power.

RESULTS

8.12.1. HIGH POWER BASIC DATA RATE GFSK MODULATION

Antenna 4

Tested By:	23530
Date	7/17/2019

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	16.09
Middle	2441	16.23
High	2480	16.20

Antenna 3

Tested By:	23530
Date	7/17/2019

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	19.18
Middle	2441	19.23
High	2480	19.20

8.12.2. HIGH POWER ENHANCED DATA RATE QPSK MODULATION

Antenna 4

Tested By:	23530
Date	7/17/2019

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	15.65
Middle	2441	15.74
High	2480	15.73

Antenna 3

Tested By:	23530
Date	7/17/2019

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	15.68
Middle	2441	15.72
High	2480	15.69

8.12.3. HIGH POWER ENHANCED DATA RATE 8PSK MODULATION

Antenna 4

Tested By:	23530
Date	7/17/2019

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	15.73
Middle	2441	15.75
High	2480	15.73

Antenna 3

Tested By:	23530
Date	7/17/2019

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	15.71
Middle	2441	15.75
High	2480	15.70

8.12.4. LOW POWER BASIC DATA RATE GFSK MODULATION

Antenna 4

Tested By:	23530
Date	7/17/2019

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	12.23
Middle	2441	12.25
High	2480	12.22

Antenna 3

Tested By:	23530
Date	7/17/2019

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	12.19
Middle	2441	12.21
High	2480	12.17

8.12.5. LOW POWER ENHANCED DATA RATE QPSK MODULATION

Antenna 4

Tested By:	23530
Date	7/17/2019

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	8.62
Middle	2441	8.64
High	2480	8.68

Antenna 3

Tested By:	23530
Date	7/17/2019

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	8.66
Middle	2441	8.68
High	2480	8.63

8.12.6. LOW POWER ENHANCED DATA RATE 8PSK MODULATION

Antenna 4

Tested By:	23530
Date	7/17/2019

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	8.68
Middle	2441	8.73
High	2480	8.65

Antenna 3

Tested By:	23530
Date	7/17/2019

Channel	Frequency (MHz)	Average Power (dBm)
Low	2402	8.71
Middle	2441	8.73
High	2480	8.69

8.13. BEAMFORMING AVERAGE POWER

8.13.1. HIGH POWER BASIC DATA RATE GFSK MODULATION

2TX Antenna 4 + Antenna 3 TxBF Mode

Tested By:	23530
Date	7/17/2019

Channel	Frequency (MHz)	Average Power Antenna 4 (dBm)	Average Power Antenna 3 (dBm)	Total Average Power (dBm)
Low	2402	16.11	16.62	19.38
Middle	2441	16.15	16.68	19.43
High	2480	16.13	16.66	19.41

8.13.2. HIGH POWER ENHANCED ENHANCED RATE QPSK MODULATION

2TX Antenna 4 + Antenna 3 TxBF Mode

Tested By:	23530
Date	7/17/2019

Channel	Frequency (MHz)	Average Power Antenna 4 (dBm)	Average Power Antenna 3 (dBm)	Total Average Power (dBm)
Low	2402	14.67	14.69	17.69
Middle	2441	14.70	14.72	17.72
High	2480	14.68	14.69	17.70

8.13.3. HIGH POWER ENHANCED DATA RATE 8PSK MODULATION

2TX Antenna 4 + Antenna 3 TxBF Mode

Tested By:	23530
Date	7/17/2019

Channel	Frequency (MHz)	Average Power Antenna 4 (dBm)	Average Power Antenna 3 (dBm)	Total Average Power (dBm)
Low	2402	14.71	14.72	17.73
Middle	2441	14.75	14.73	17.75
High	2480	14.72	14.70	17.72

8.13.4. LOW POWER BASIC DATA RATE GFSK MODULATION

2TX Antenna 4 + Antenna 3 TxBF Mode

Tested By:	23530
Date	7/17/2019

Channel	Frequency (MHz)	Average Power Antenna 4 (dBm)	Average Power Antenna 3 (dBm)	Total Average Power (dBm)
Low	2402	12.22	12.18	15.21
Middle	2441	12.24	12.21	15.24
High	2480	12.23	12.20	15.23

8.13.5. LOW POWER ENHANCED DATA RATE QPSK MODULATION

2TX Antenna 4 + Antenna 3 TxBF Mode

Tested By:	23530
Date	7/17/2019

Channel	Frequency (MHz)	Average Power Antenna 4 (dBm)	Average Power Antenna 3 (dBm)	Total Average Power (dBm)
Low	2402	8.61	8.67	11.65
Middle	2441	8.66	8.64	11.66
High	2480	8.59	8.63	11.62

8.13.6. LOW POWER ENHANCED DATA RATE 8PSK MODULATION

2TX Antenna 4 + Antenna 3 TxBF Mode

Tested By:	23530
Date	7/17/2019

Channel	Frequency (MHz)	Average Power Antenna 4 (dBm)	Average Power Antenna 3 (dBm)	Total Average Power (dBm)
Low	2402	8.65	8.72	11.70
Middle	2441	8.71	8.70	11.72
High	2480	8.68	8.73	11.72

8.14. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

RSS-247 5.5

Limit = -20 dBc

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

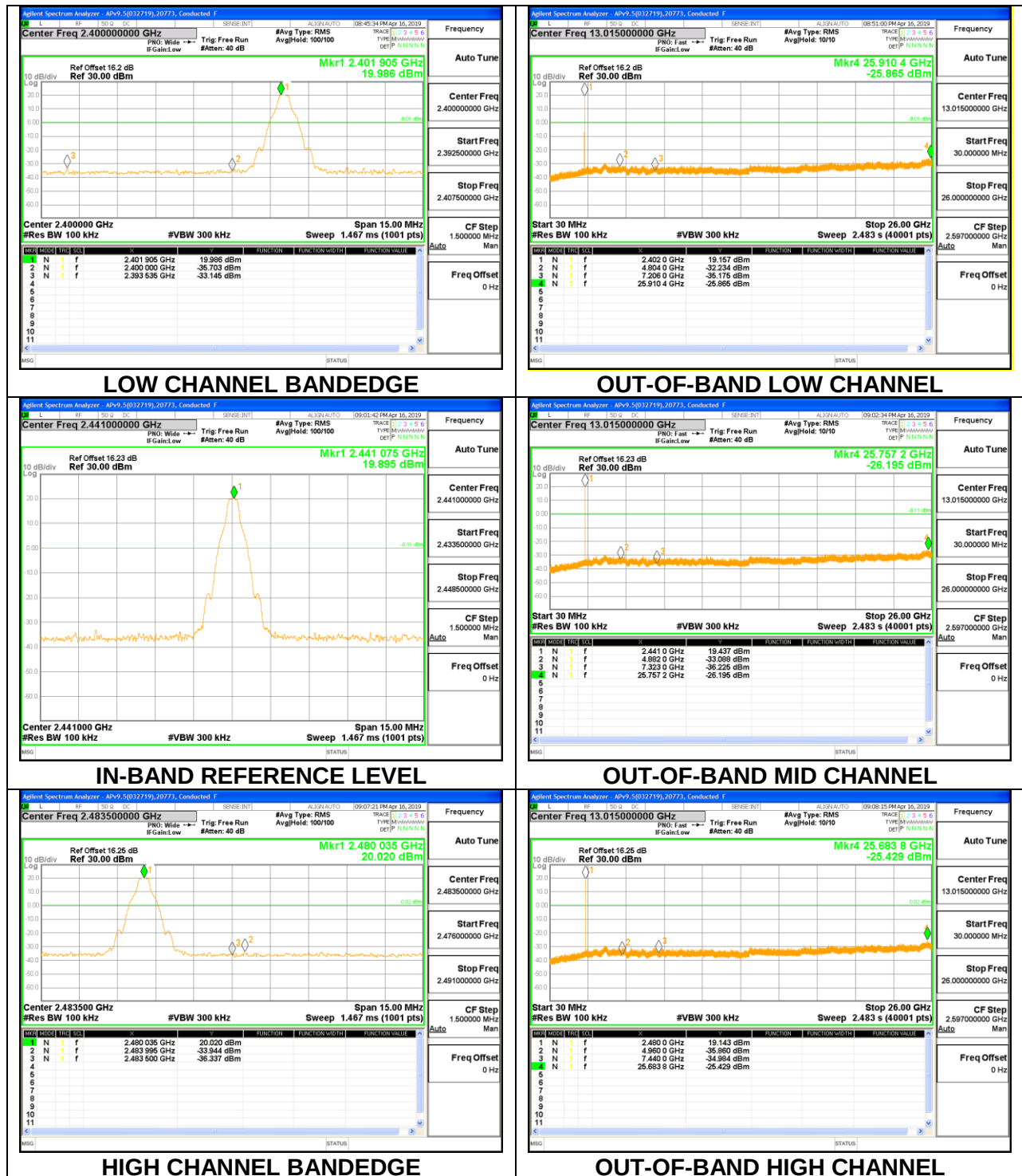
The spectrum from 30 MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

The bandedges at 2.4 and 2.4835 GHz are investigated with the transmitter set to the normal hopping mode.

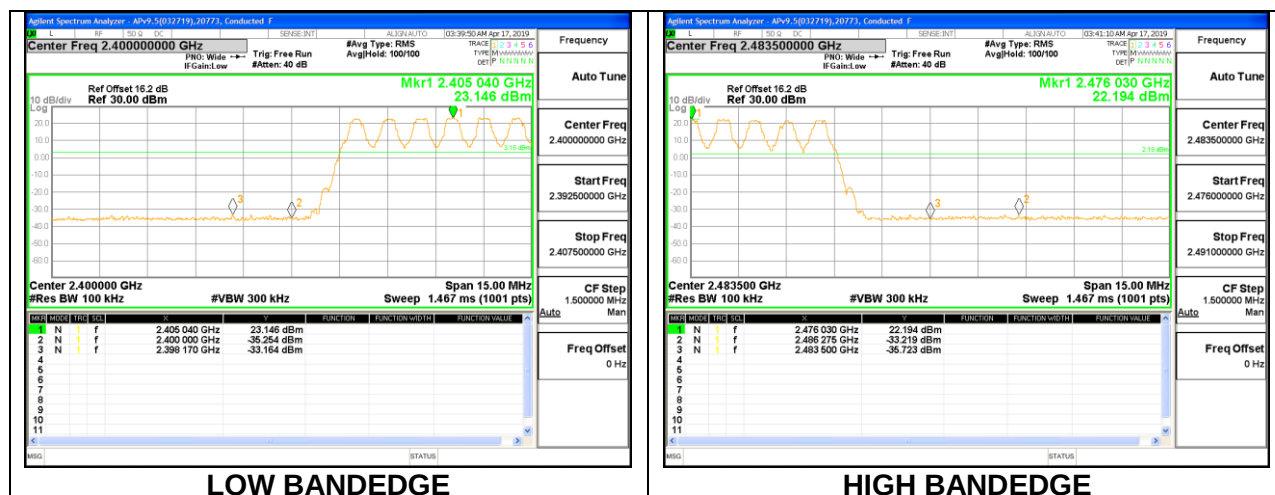
RESULTS

8.14.1. HIGH POWER BASIC DATA RATE GFSK MODULATION

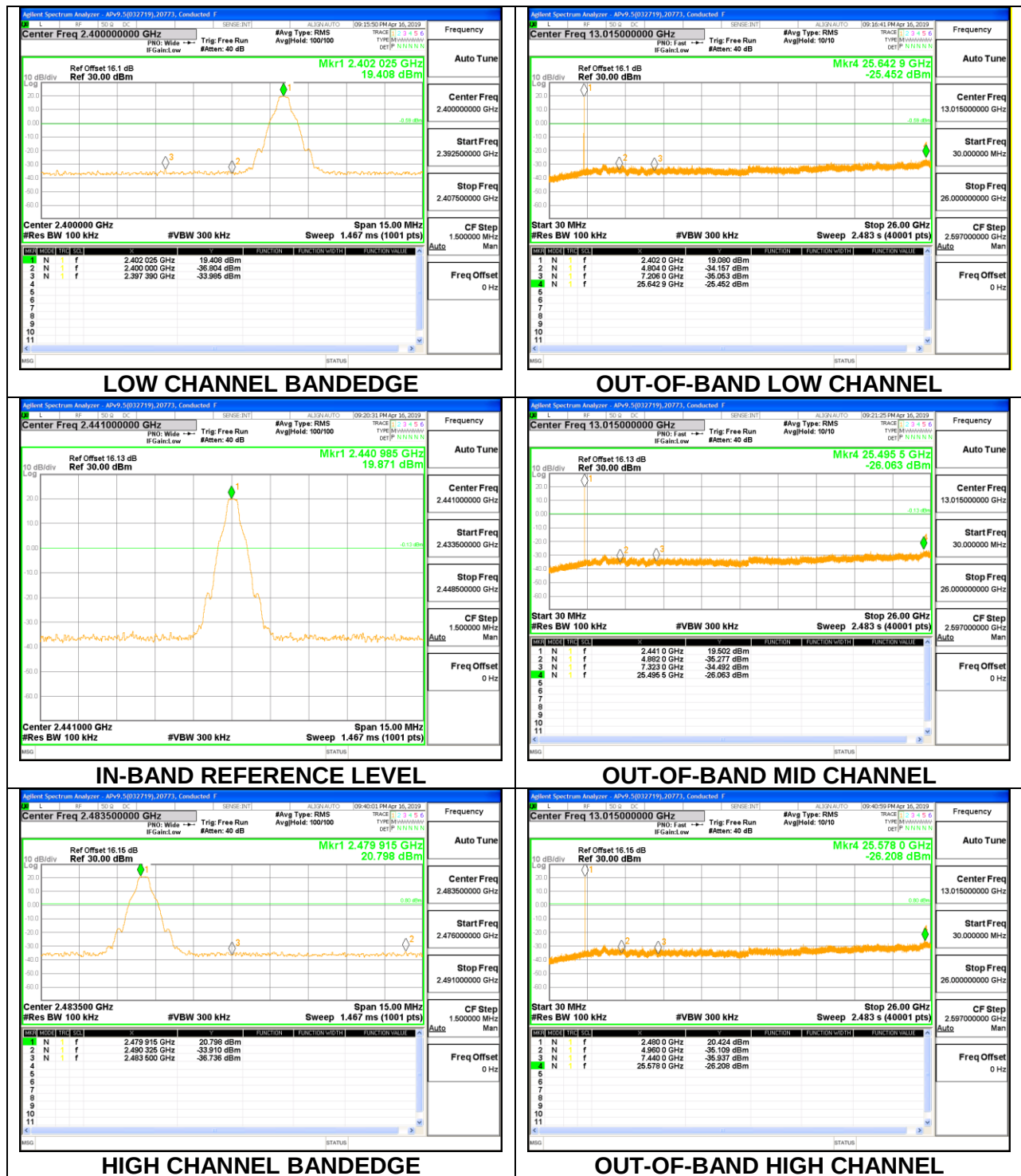
Antenna 4 SPURIOUS EMISSIONS, NON-HOPPING



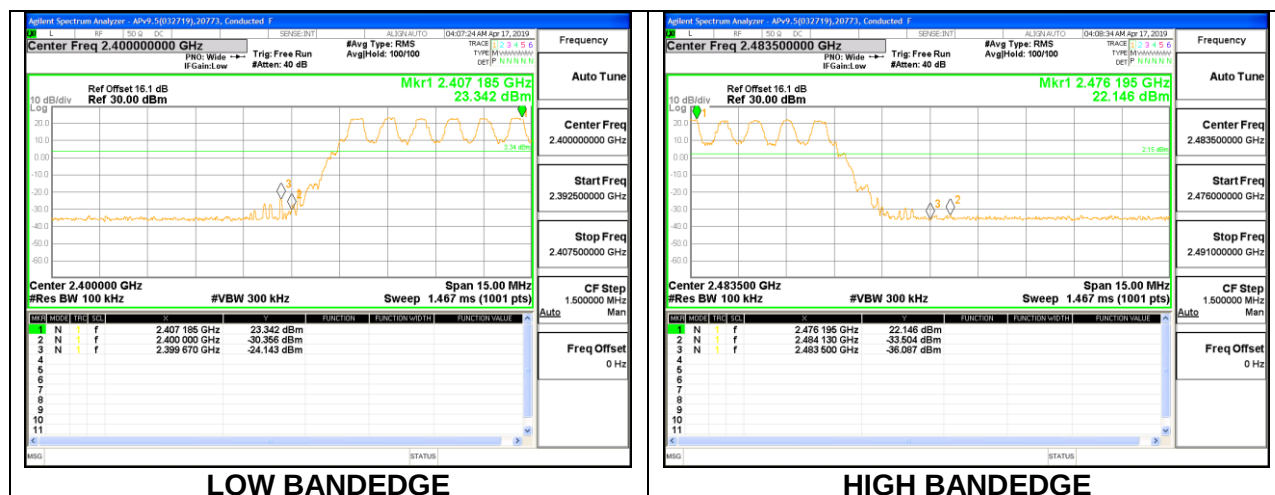
Antenna 4 SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON



Antenna 3 SPURIOUS EMISSIONS, NON-HOPPING

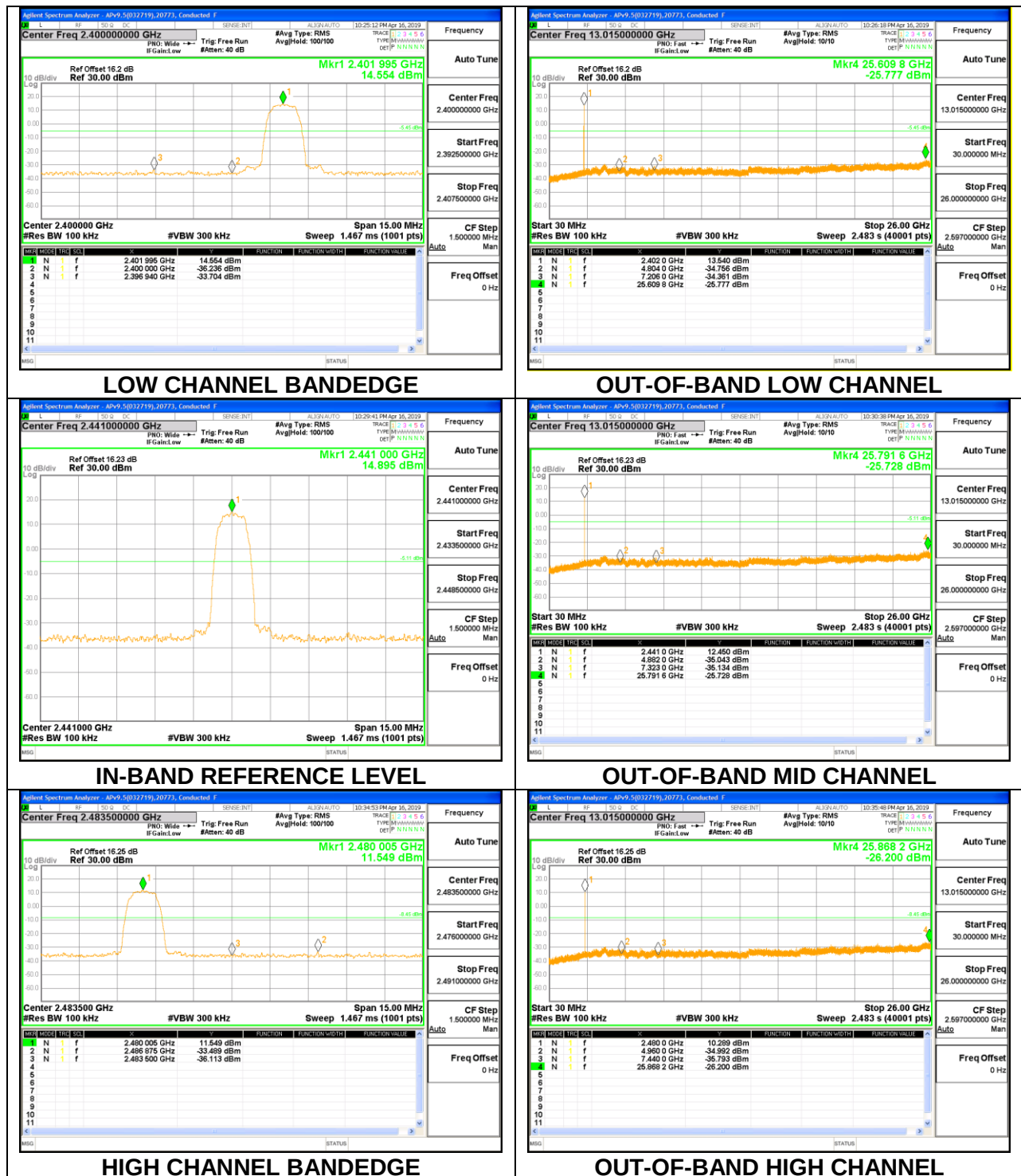


Antenna 3 SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON



8.14.2. HIGH POWER ENHANCED DATA RATE 8PSK MODULATION

Antenna 4 SPURIOUS EMISSIONS, NON-HOPPING



Antenna 4 SPURIOUS BANDEDGE EMISSIONS WITH HOPPING ON

