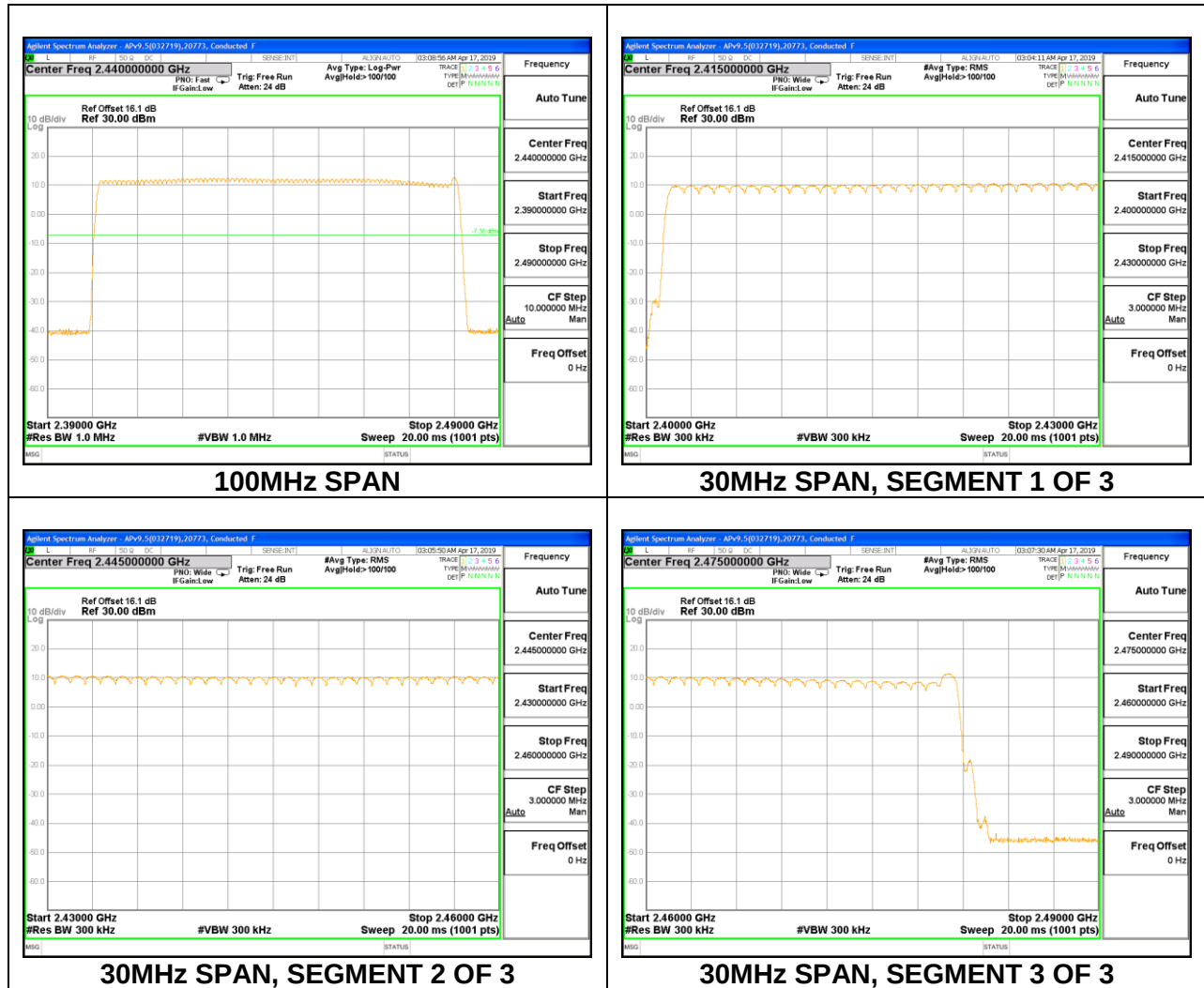


Antenna 3



8.7. BEAMFORMING NUMBER OF HOPPING CHANNELS

LIMITS

FCC §15.247 (a) (1) (iii)

RSS-247 (5.1) (d)

Frequency hopping systems in the 2400 – 2483.5 MHz band shall use at least 15 non-overlapping channels.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The span is set to cover the entire authorized band, in either a single sweep or in multiple contiguous sweeps. The RBW is set to a maximum of 1 % of the span. The analyzer is set to Max Hold.

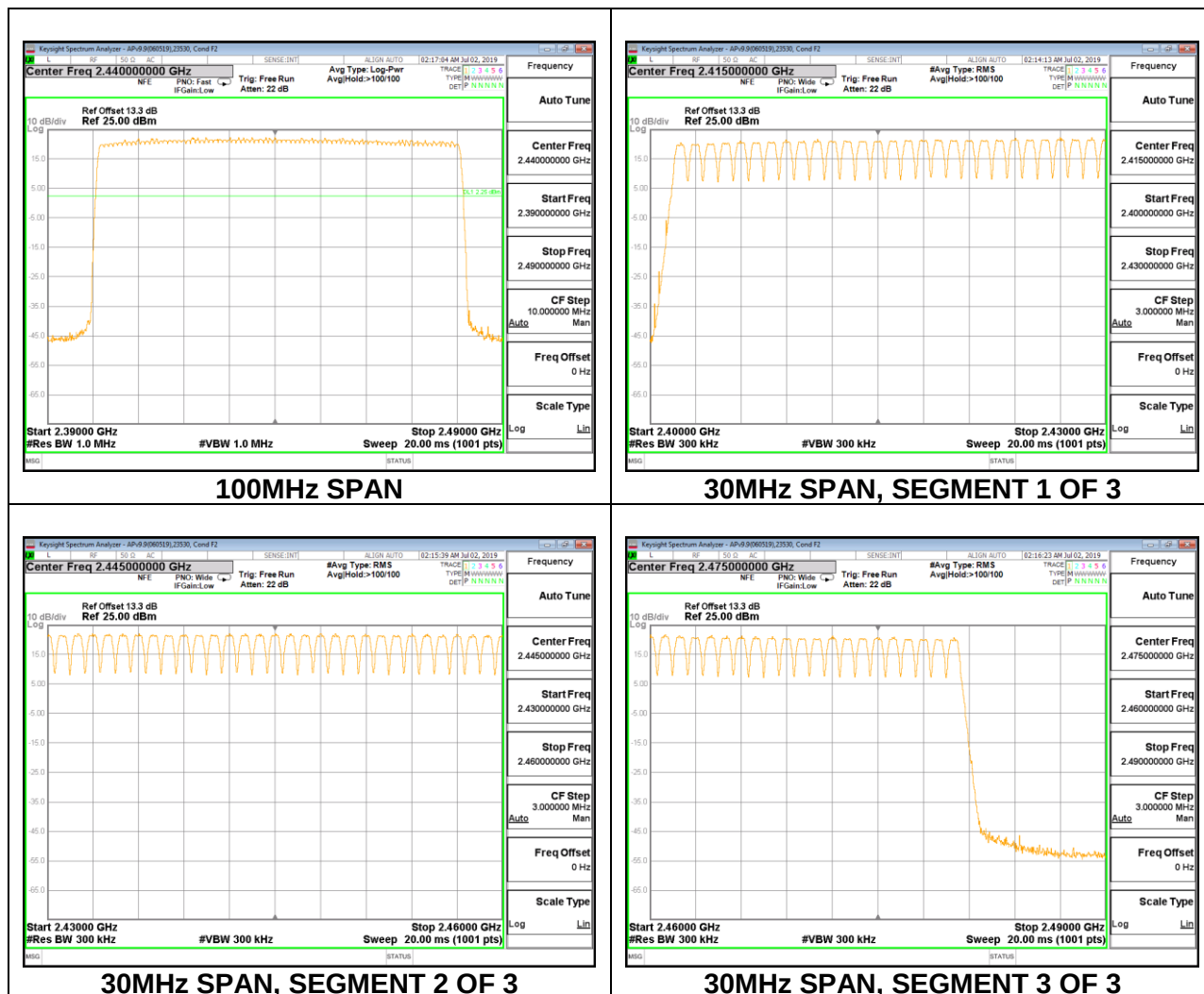
Note: Test procedure on beamforming mode is same as BT basic and EDR mode

RESULTS

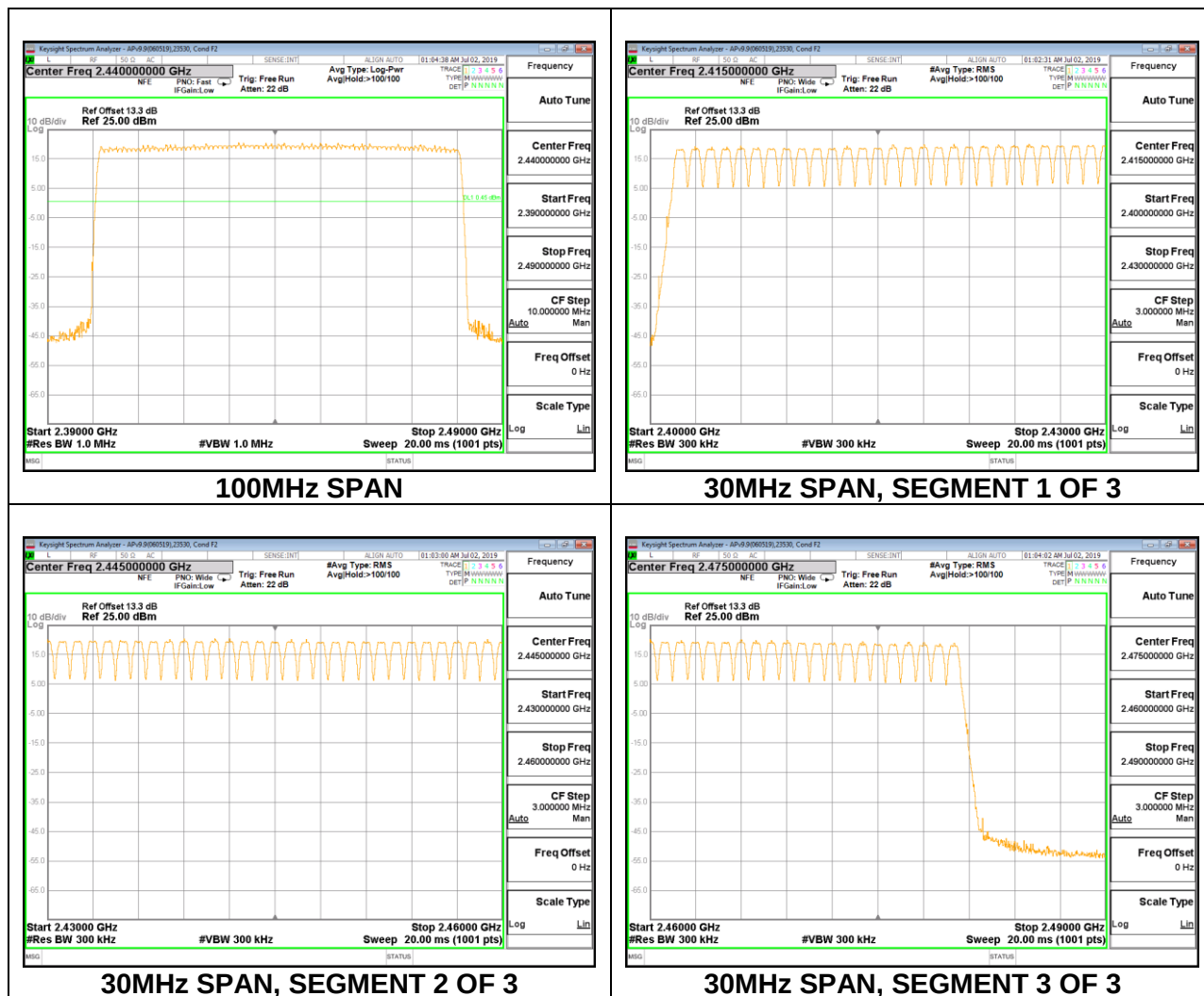
Normal Mode: 79 Channels Observed

8.7.1. HIGH POWER BASIC DATA RATE GFSK MODULATION

Antenna 4

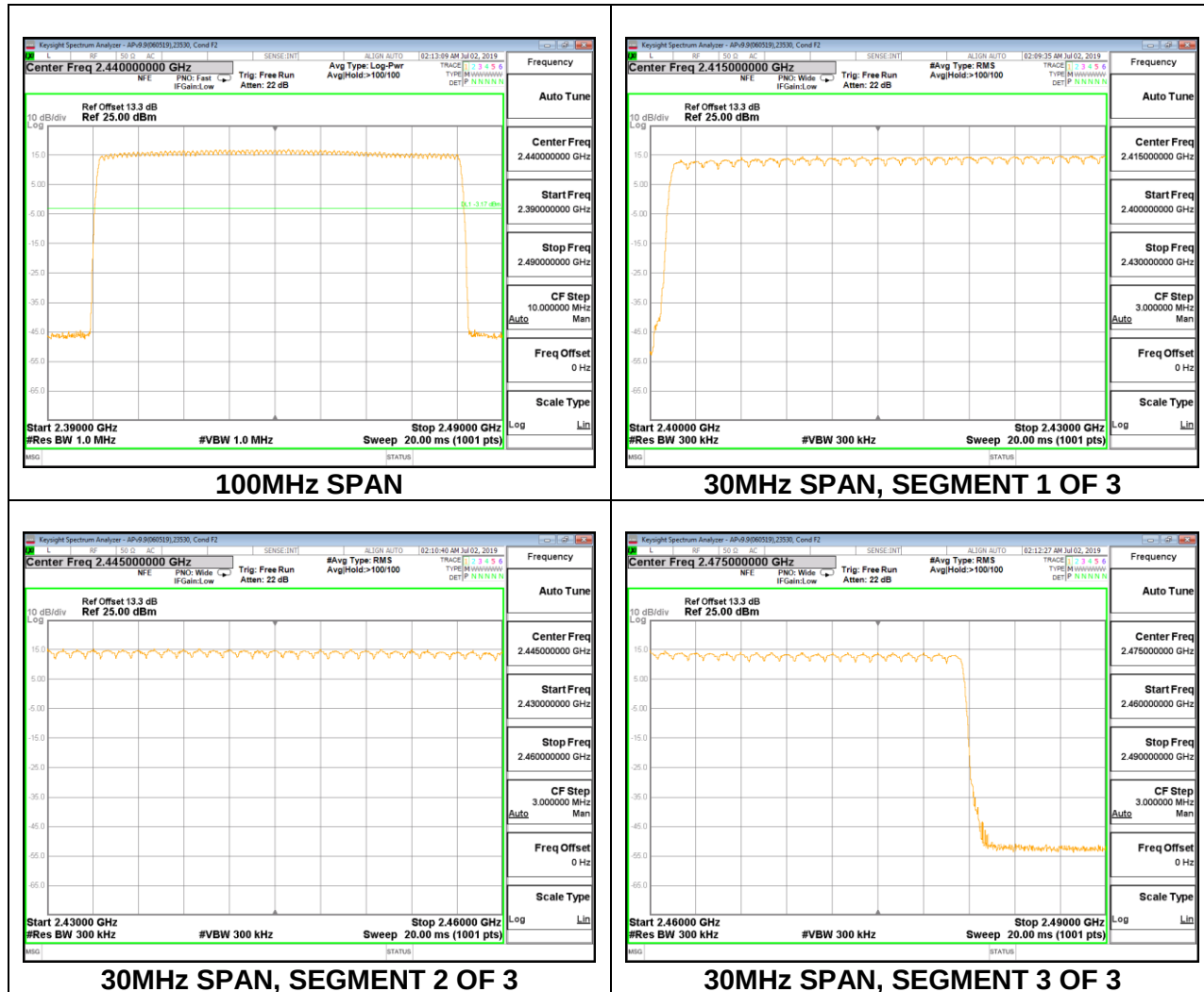


Antenna 3

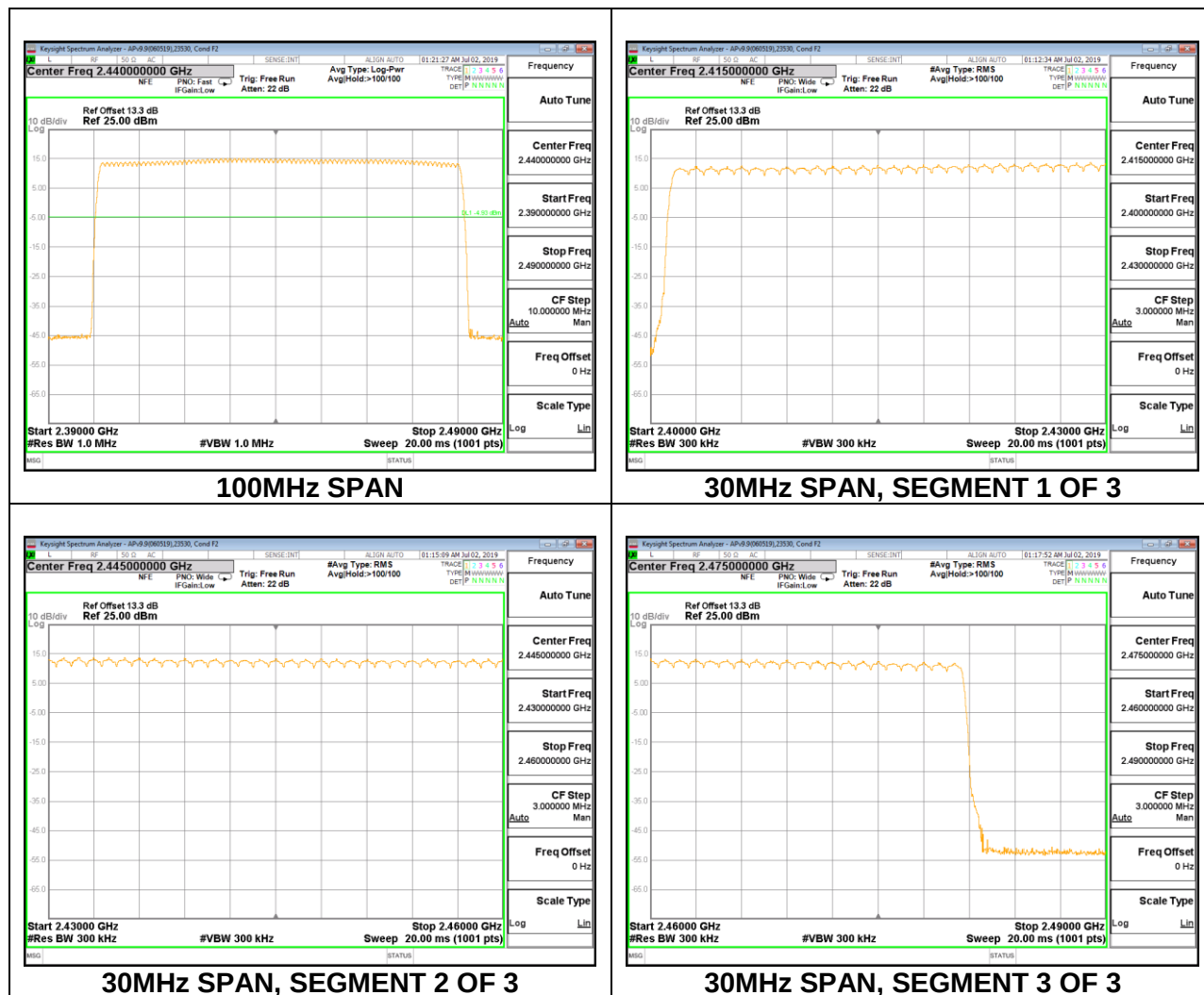


8.7.2. HIGH POWER ENHANCED DATA RATE 8PSK MODULATION

Antenna 4

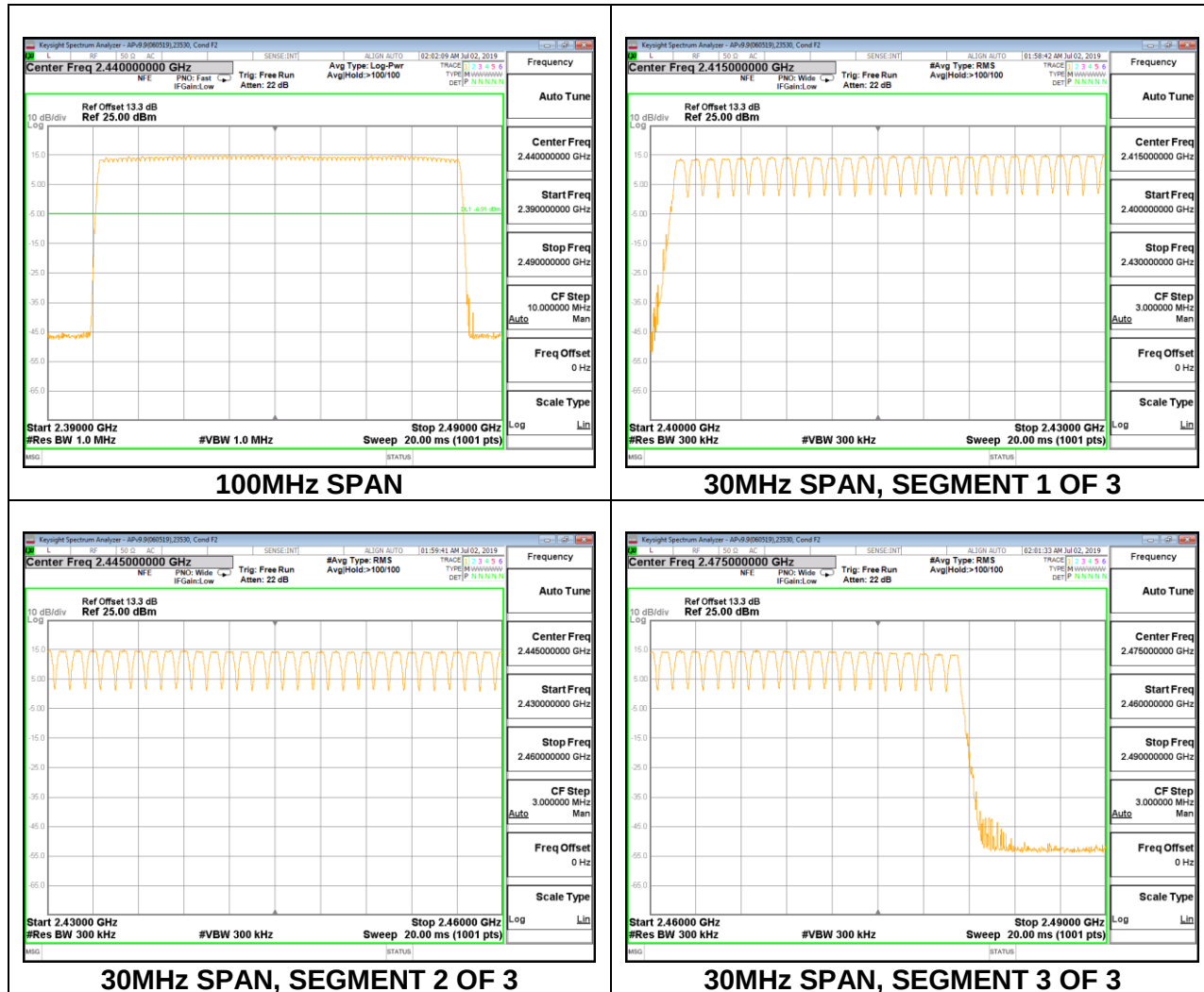


Antenna 3

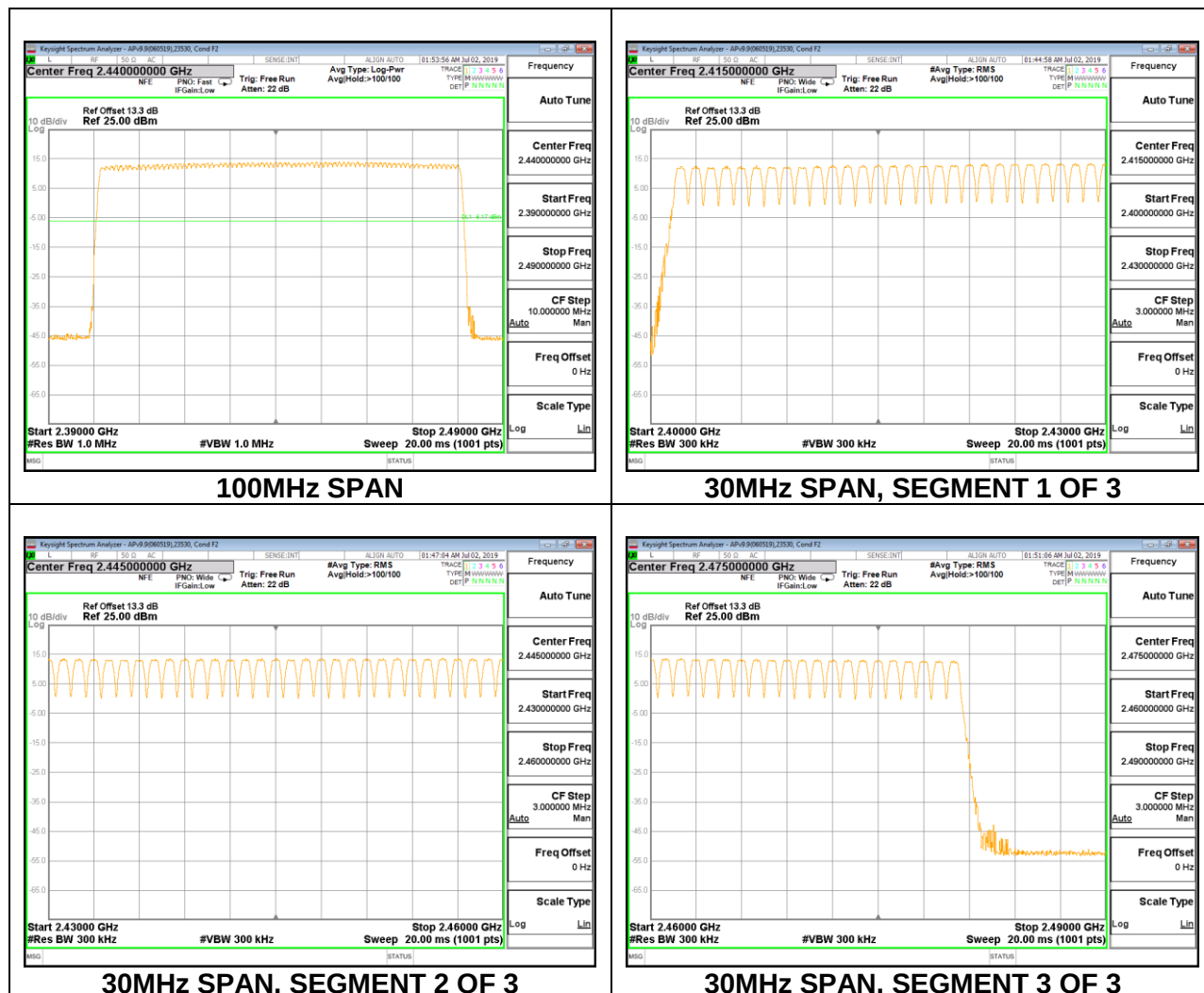


8.7.3. LOW POWER BASIC DATA RATE GFSK MODULATION

Antenna 4



Antenna 3

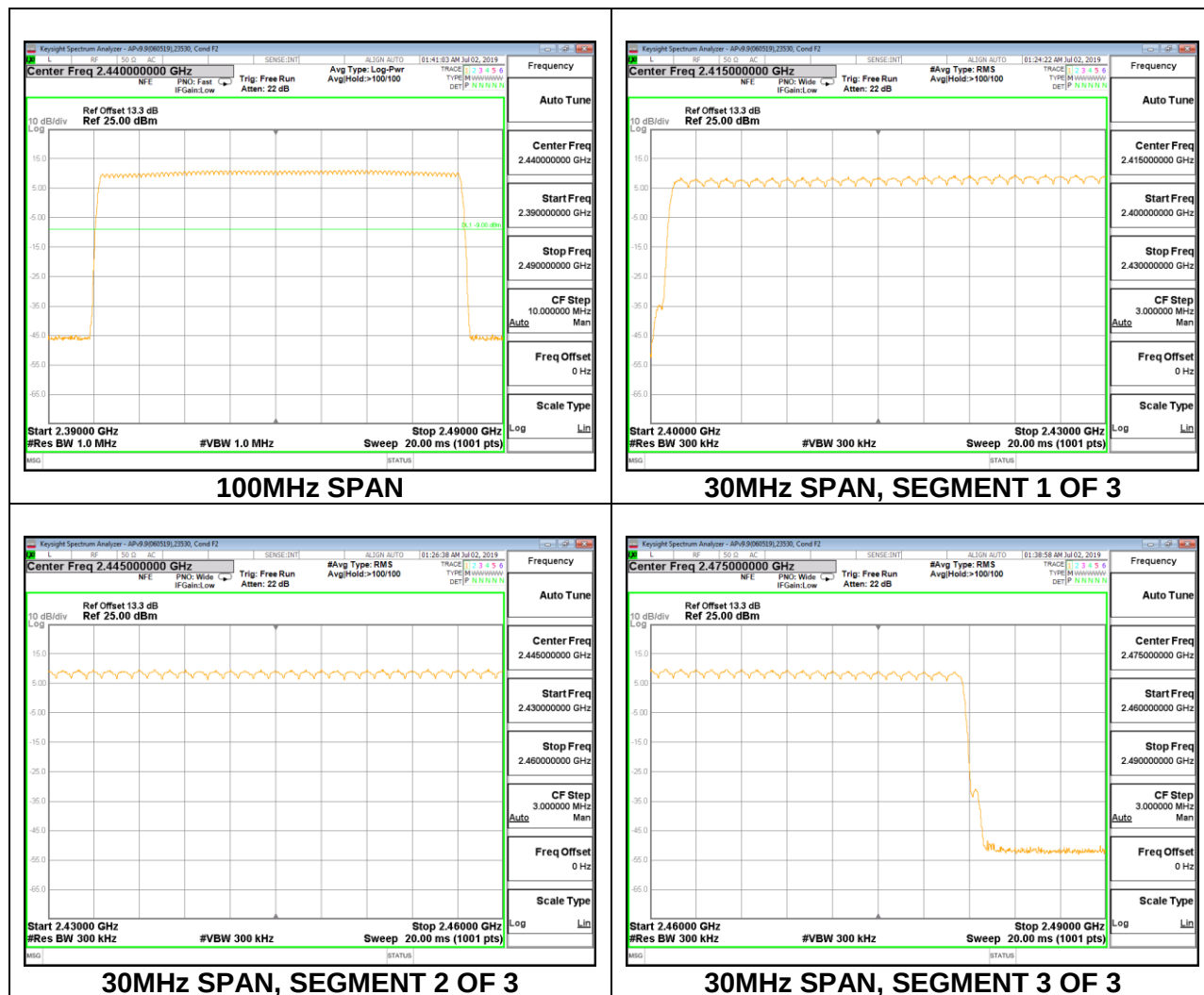


8.7.4. LOW POWER ENHANCED DATA RATE 8PSK MODULATION

Antenna 4



Antenna 3



8.8. AVERAGE TIME OF OCCUPANCY

LIMITS

FCC §15.247 (a) (1) (iii)

RSS-247 (5.1) (d)

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The span is set to 0 Hz, centered on a single, selected hopping channel. The width of a single pulse is measured in a fast scan. The number of pulses is measured in a 3.16 second scan, to enable resolution of each occurrence.

The average time of occupancy in the specified 3.16 second period (79 channels * 0.4 s) is equal to $10 * (\# \text{ of pulses in } 3.16 \text{ s}) * \text{pulse width}$.

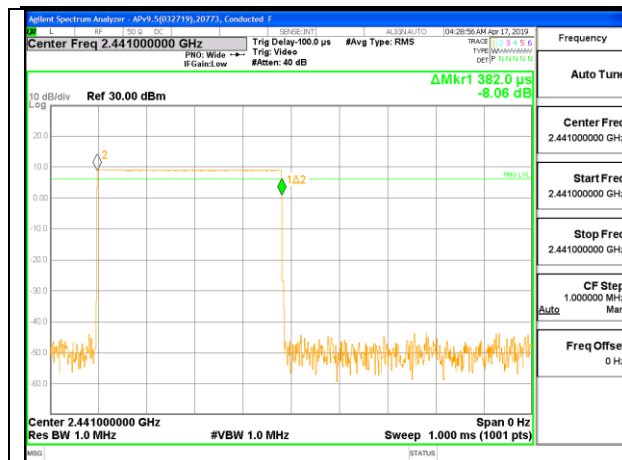
For AFH mode, the average time of occupancy in the specified 8 second period (20 channels * 0.4 seconds) is equal to $10 * (\# \text{ of pulses in } 0.8 \text{ s}) * \text{pulse width}$.

RESULTS

8.8.1. HIGH POWER BASIC DATA RATE GFSK MODULATION

Antenna 4

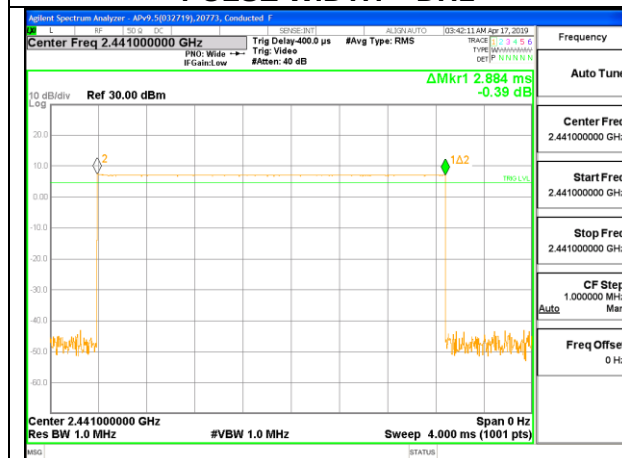
DH Packet	Pulse Width (msec)	Number of Pulses in 3.16 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
GFSK Normal Mode					
DH1	0.382	30	0.1146	0.4	-0.2854
DH3	1.638	17	0.2785	0.4	-0.1215
DH5	2.884	5	0.1442	0.4	-0.2558
DH Packet	Pulse Width (sec)	Number of Pulses in 0.8 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
GFSK AFH Mode					
DH1	0.382	7.5	0.02865	0.4	-0.3714
DH3	1.638	4.25	0.06962	0.4	-0.3304
DH5	2.884	1.25	0.03605	0.4	-0.3640



PULSE WIDTH – DH1



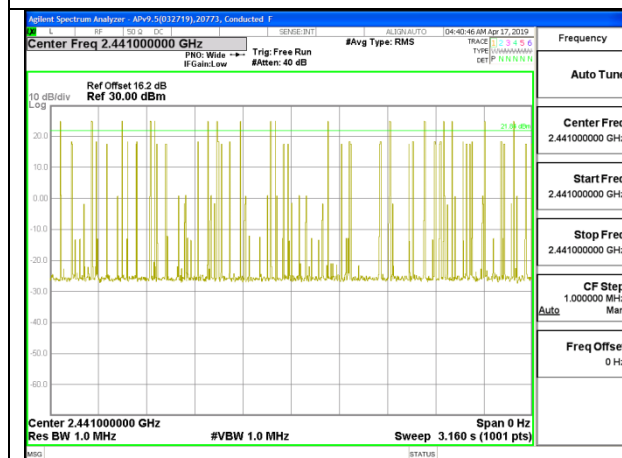
PULSE WIDTH – DH3



PULSE WIDTH – DH5



NUMBER OF PULSES IN 3.16 SECOND
OBSERVATION PERIOD – DH1



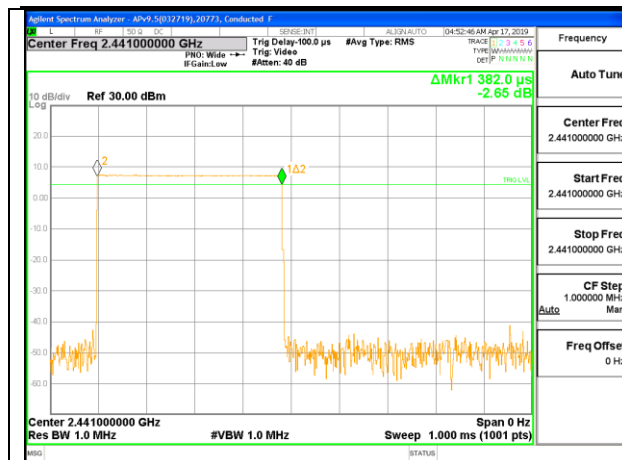
NUMBER OF PULSES IN 3.16 SECOND
OBSERVATION PERIOD –DH3



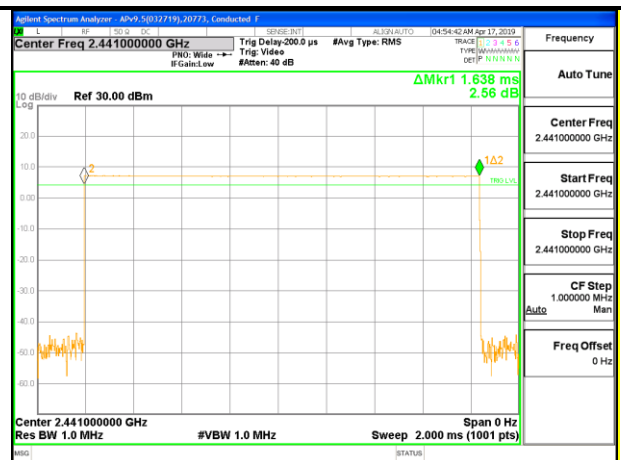
NUMBER OF PULSES IN 3.16 SECOND
OBSERVATION PERIOD –DH5

Antenna 3

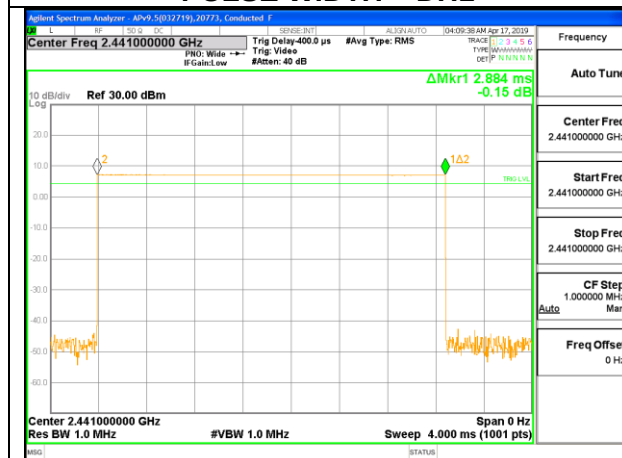
DH Packet	Pulse Width (msec)	Number of Pulses in 3.16 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
GFSK Normal Mode					
DH1	0.382	32	0.1222	0.4	-0.2778
DH3	1.638	13	0.2129	0.4	-0.1871
DH5	2.884	10	0.2884	0.4	-0.1116
DH Packet	Pulse Width (sec)	Number of Pulses in 0.8 seconds	Average Time of Occupancy (sec)	Limit (sec)	Margin (sec)
GFSK AFH Mode					
DH1	0.382	8	0.03056	0.4	-0.3694
DH3	1.638	3.25	0.05324	0.4	-0.3468
DH5	2.884	2.5	0.07210	0.4	-0.3279



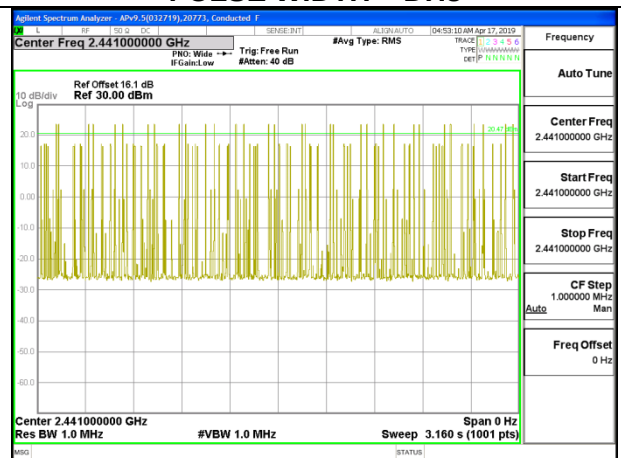
PULSE WIDTH – DH1



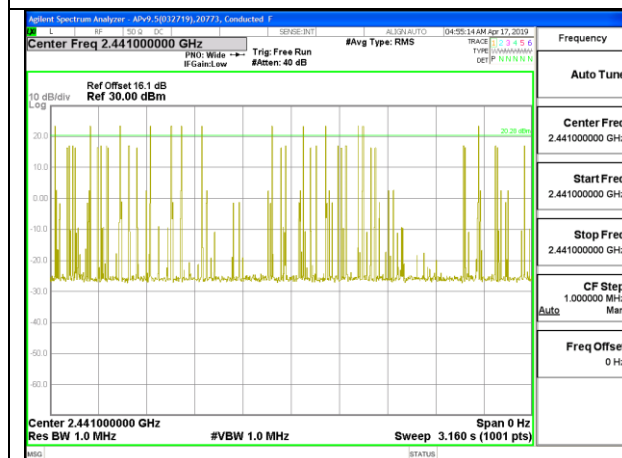
PULSE WIDTH – DH3



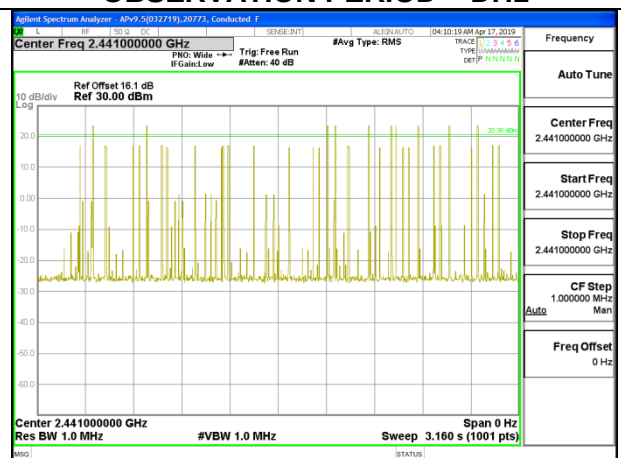
PULSE WIDTH – DH5



NUMBER OF PULSES IN 3.16 SECOND
OBSERVATION PERIOD – DH1



NUMBER OF PULSES IN 3.16 SECOND
OBSERVATION PERIOD – DH3



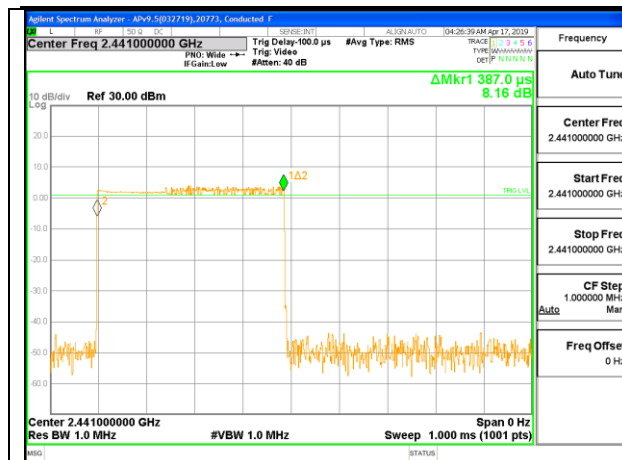
NUMBER OF PULSES IN 3.16 SECOND
OBSERVATION PERIOD – DH5

8.8.2. 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	2.892	8	0.23136	0.4	-0.1686

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.



PULSE WIDTH – 3DH1



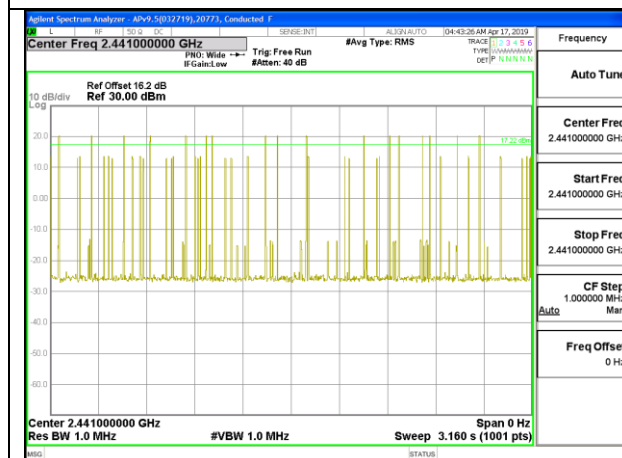
PULSE WIDTH – 3DH3



PULSE WIDTH – 3DH5



**NUMBER OF PULSES IN 3.16 SECOND
OBSERVATION PERIOD – 3DH1**



**NUMBER OF PULSES IN 3.16 SECOND
OBSERVATION PERIOD – 3DH3**

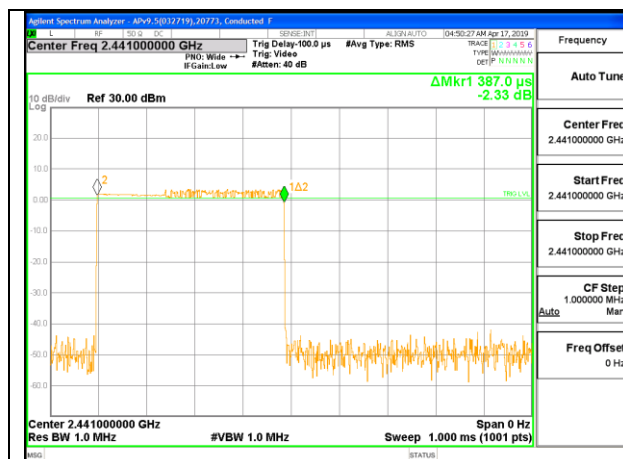


**NUMBER OF PULSES IN 3.16 SECOND
OBSERVATION PERIOD – 3DH5**

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	5	0.1444	0.4	-0.2556

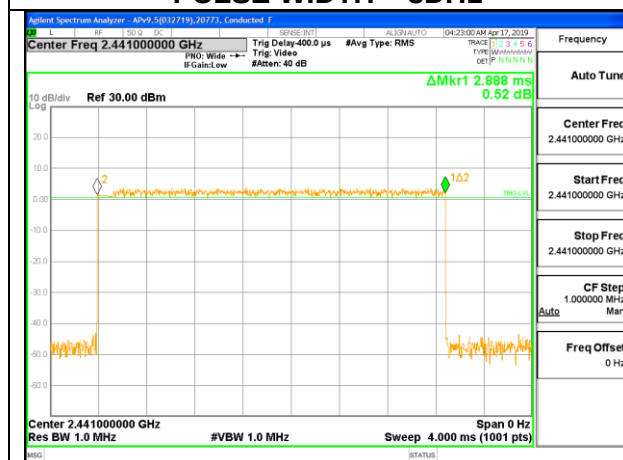
Note: for AFH(8PSK) mode, please refer to the results of AFH(GFSK) mode; the channel selection and hopping rate are the same for both EDR and Basic Rate operation, data for Basic Rate demonstrates compliance with channel occupancy when AFH is employed.



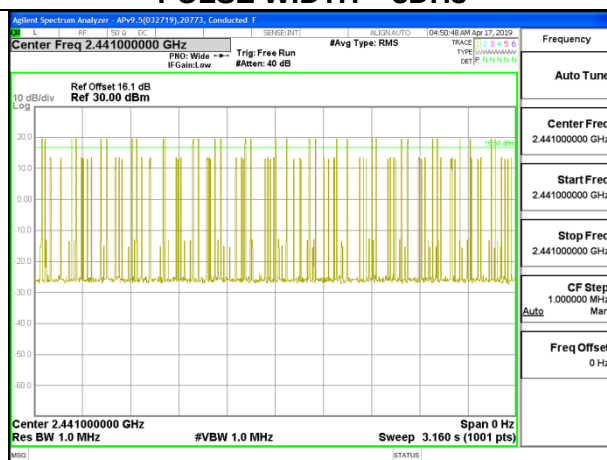
PULSE WIDTH – 3DH1



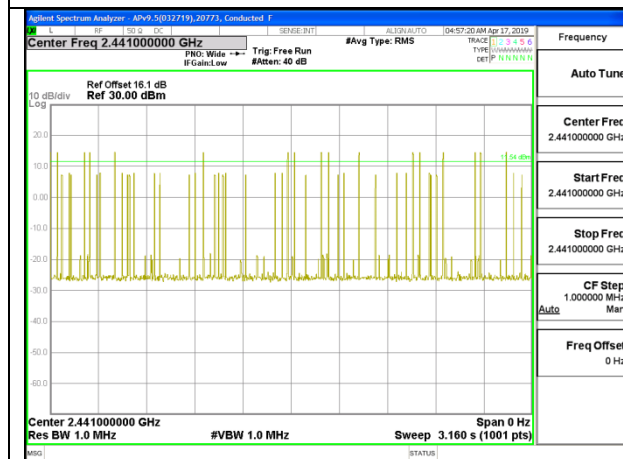
PULSE WIDTH – 3DH3



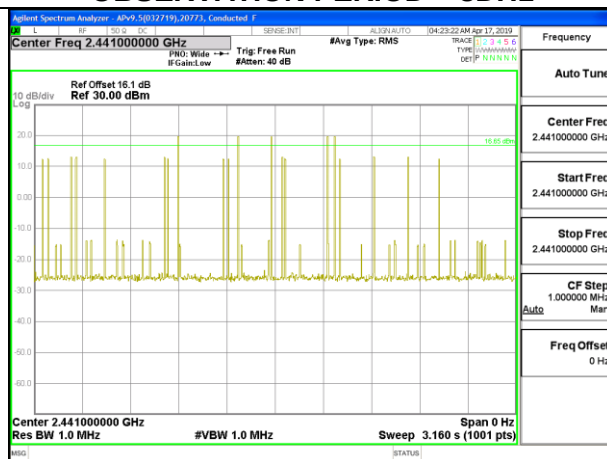
PULSE WIDTH – 3DH5



**NUMBER OF PULSES IN 3.16 SECOND
OBSERVATION PERIOD – 3DH1**



**NUMBER OF PULSES IN 3.16 SECOND
OBSERVATION PERIOD – 3DH3**

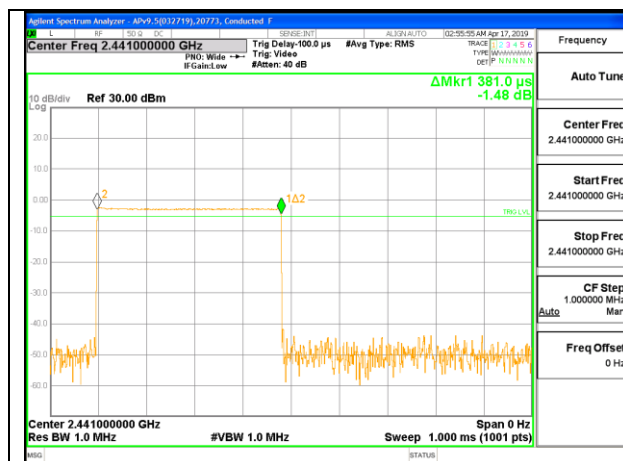


**NUMBER OF PULSES IN 3.16 SECOND
OBSERVATION PERIOD – 3DH5**

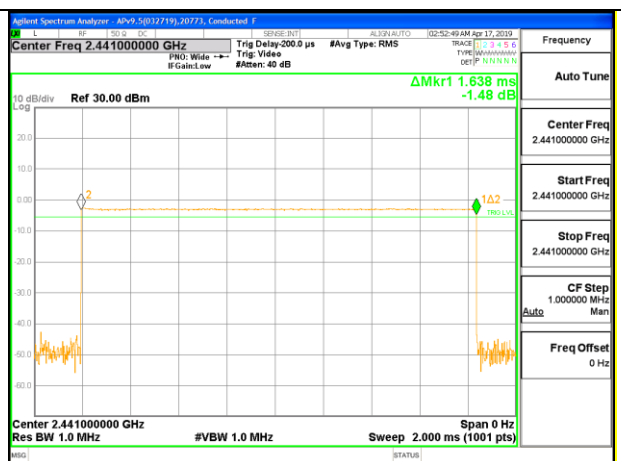
8.8.3. LOW POWER BASIC DATA RATE GFSK MODULATION

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	0.381	32	0.1219	0.4	-0.2781
DH3	1.638	20	0.3276	0.4	-0.0724
DH5	2.884	11	0.3172	0.4	-0.0828
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	5	0.08190	0.4	-0.3181
DH5	2.884	2.75	0.07931	0.4	-0.3207



PULSE WIDTH – 3DH1



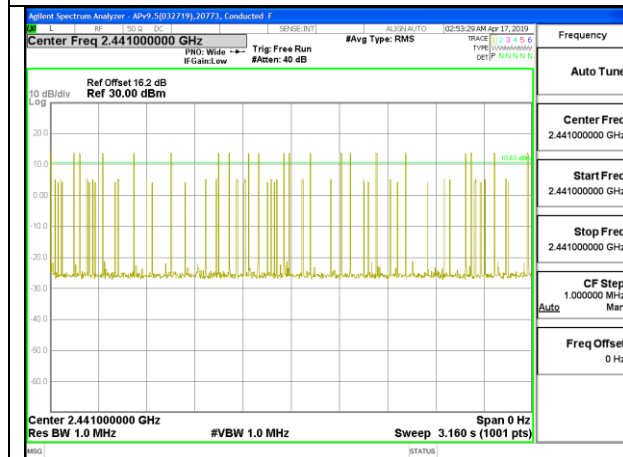
PULSE WIDTH – 3DH3



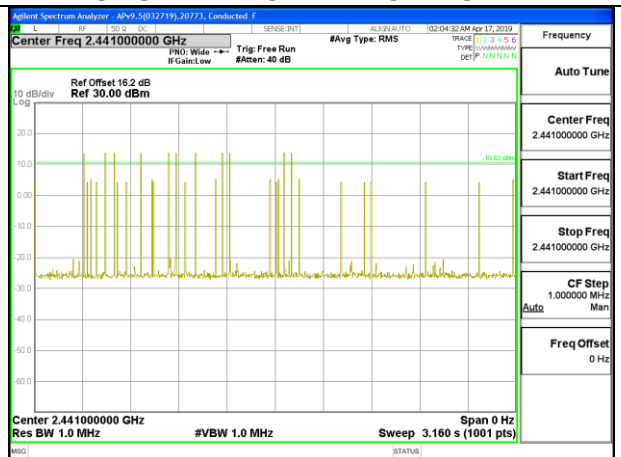
PULSE WIDTH – 3DH5



**NUMBER OF PULSES IN 3.16 SECOND
OBSERVATION PERIOD – 3DH1**



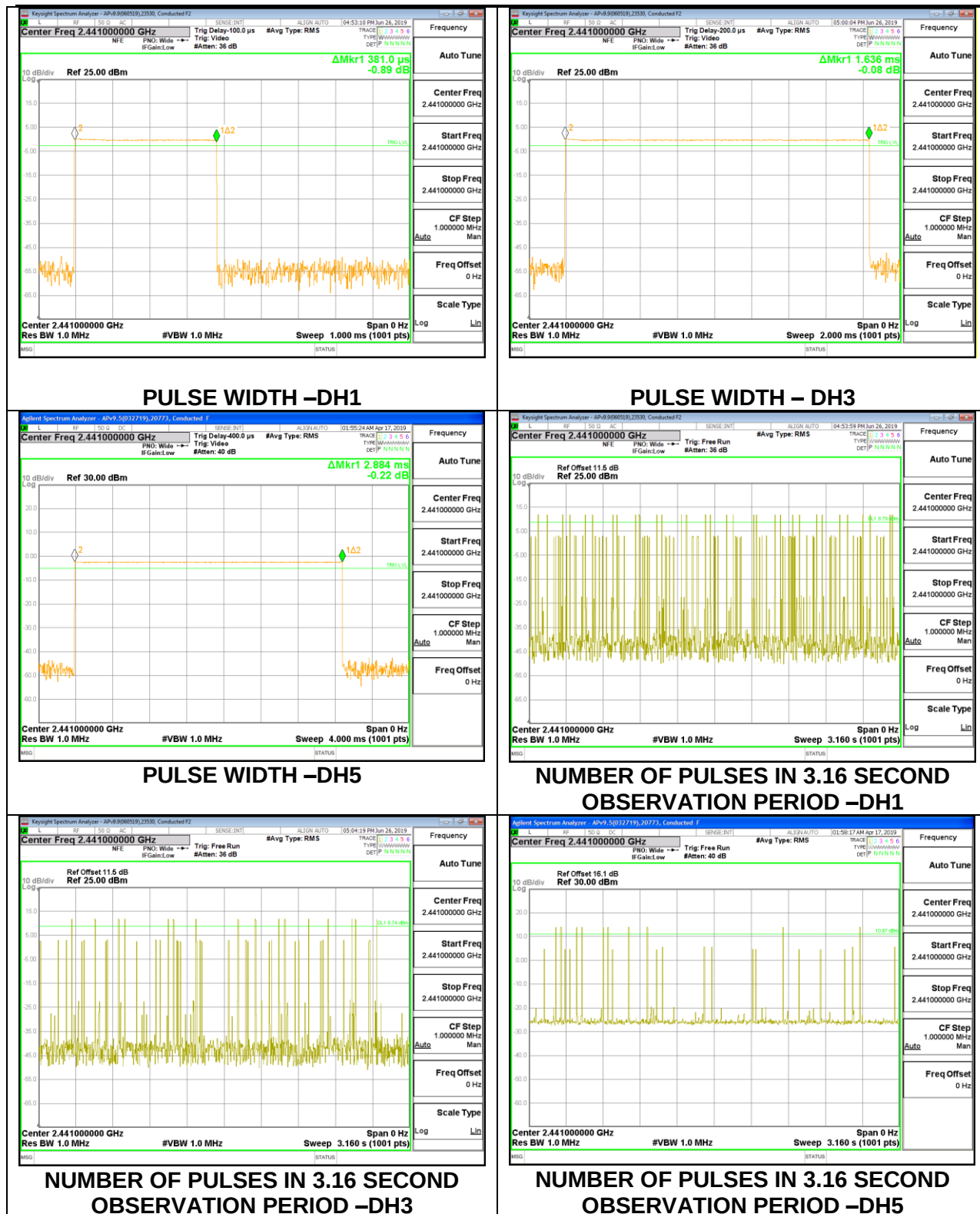
**NUMBER OF PULSES IN 3.16 SECOND
OBSERVATION PERIOD – 3DH3**



**NUMBER OF PULSES IN 3.16 SECOND
OBSERVATION PERIOD – 3DH5**

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	1.636	16	0.2618	0.4	-0.1382
DH5	2.884	10	0.2884	0.4	-0.1116
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	1.636	4	0.06544	0.4	-0.3346
DH5	2.884	2.5	0.07210	0.4	-0.3279

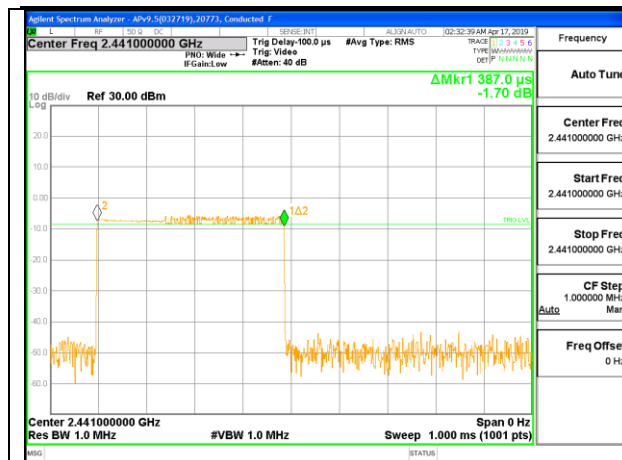


8.8.4. LOW POWER ENHANCED DATA RATE 8PSK MODULATION

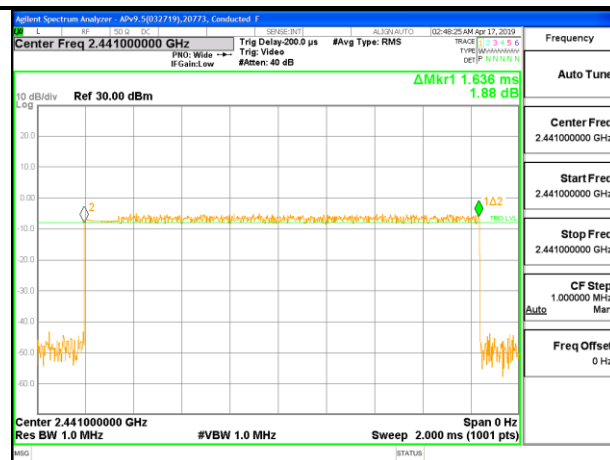
Antenna 4

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	1.636	16	0.26176	0.4	-0.1382
3DH5	2.888	4	0.11552	0.4	-0.2845

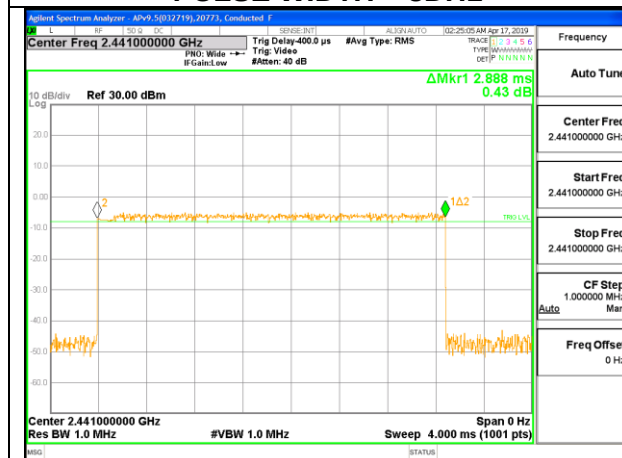
Note: for AFH(8PSK) mode, please refer to the results of AFH(GFSK) mode; the channel selection and hopping rate are the same for both EDR and Basic Rate operation, data for Basic Rate demonstrates compliance with channel occupancy when AFH is employed.



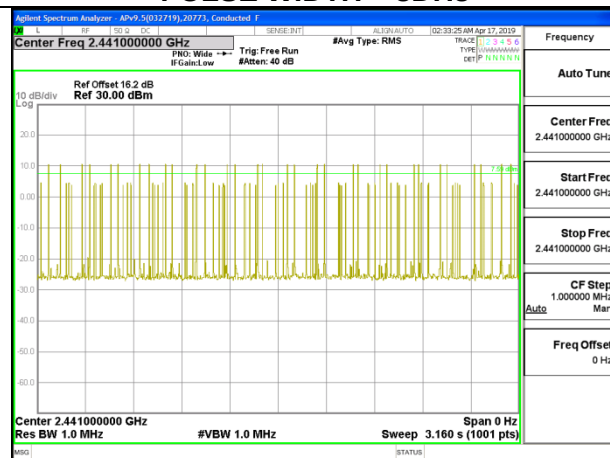
PULSE WIDTH – 3DH1



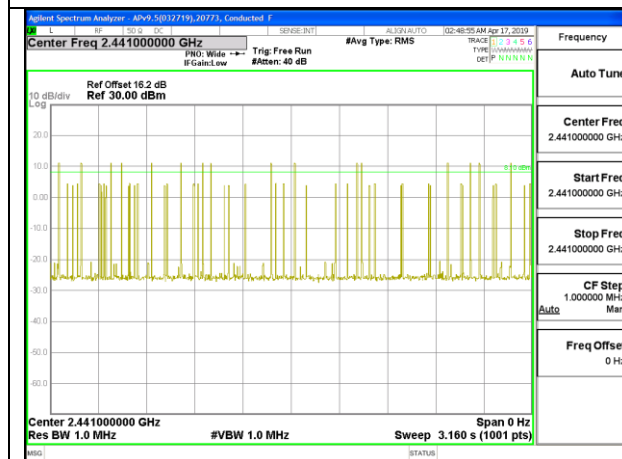
PULSE WIDTH – 3DH3



PULSE WIDTH – 3DH5



**NUMBER OF PULSES IN 3.16 SECOND
OBSERVATION PERIOD – 3DH1**



**NUMBER OF PULSES IN 3.16 SECOND
OBSERVATION PERIOD – 3DH3**

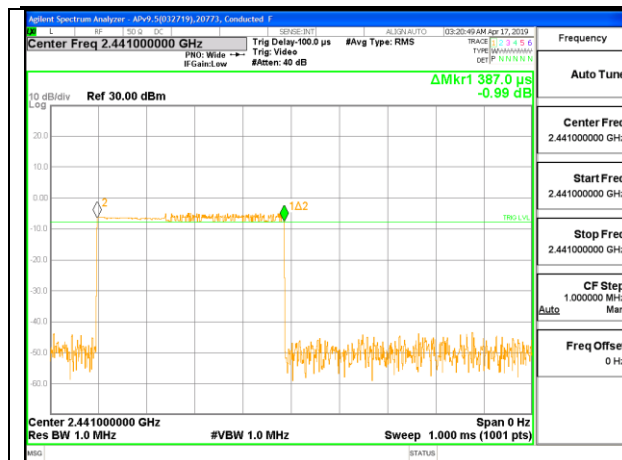


**NUMBER OF PULSES IN 3.16 SECOND
OBSERVATION PERIOD – 3DH5**

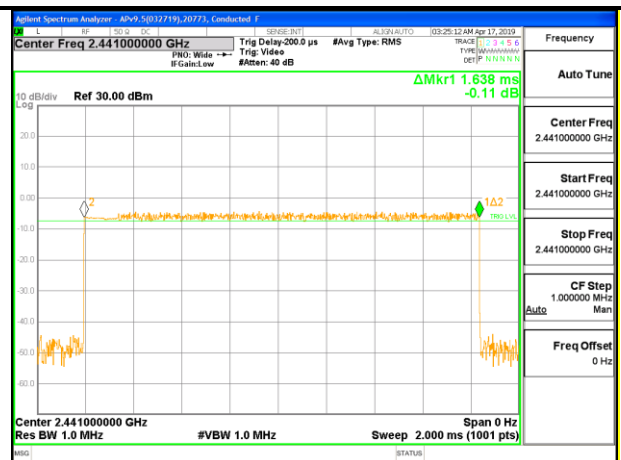
Antenna 3

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	30	0.1161	0.4	-0.2839
3DH3	1.638	14	0.22932	0.4	-0.1707
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.



PULSE WIDTH – 3DH1



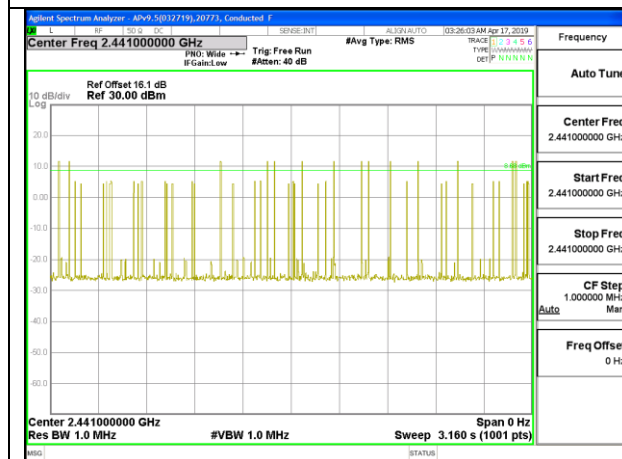
PULSE WIDTH – 3DH3



PULSE WIDTH – 3DH5



NUMBER OF PULSES IN 3.16 SECOND
OBSERVATION PERIOD – 3DH1



NUMBER OF PULSES IN 3.16 SECOND
OBSERVATION PERIOD – 3DH3



NUMBER OF PULSES IN 3.16 SECOND
OBSERVATION PERIOD – 3DH5

8.9. BEAMFORMING AVERAGE TIME OF OCCUPANCY

LIMITS

FCC §15.247 (a) (1) (iii)

RSS-247 (5.1) (d)

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The span is set to 0 Hz, centered on a single, selected hopping channel. The width of a single pulse is measured in a fast scan. The number of pulses is measured in a 3.16 second scan, to enable resolution of each occurrence.

The average time of occupancy in the specified 3.16 second period (79 channels * 0.4 s) is equal to $10 * (\# \text{ of pulses in } 3.16 \text{ s}) * \text{pulse width}$.

For AFH mode, the average time of occupancy in the specified 8 second period (20 channels * 0.4 seconds) is equal to $10 * (\# \text{ of pulses in } 0.8 \text{ s}) * \text{pulse width}$.

Note: Test procedure on beamforming mode is same as BT basic and EDR mode

RESULTS

8.9.1. HIGH 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	0.381	32	0.1219	0.4	-0.2781
DH3	1.638	18	0.2948	0.4	-0.1052
DH5	2.892	6	0.1735	0.4	-0.2265
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	4.5	0.07371	0.4	-0.3263
DH5	2.892	1.5	0.04338	0.4	-0.3566