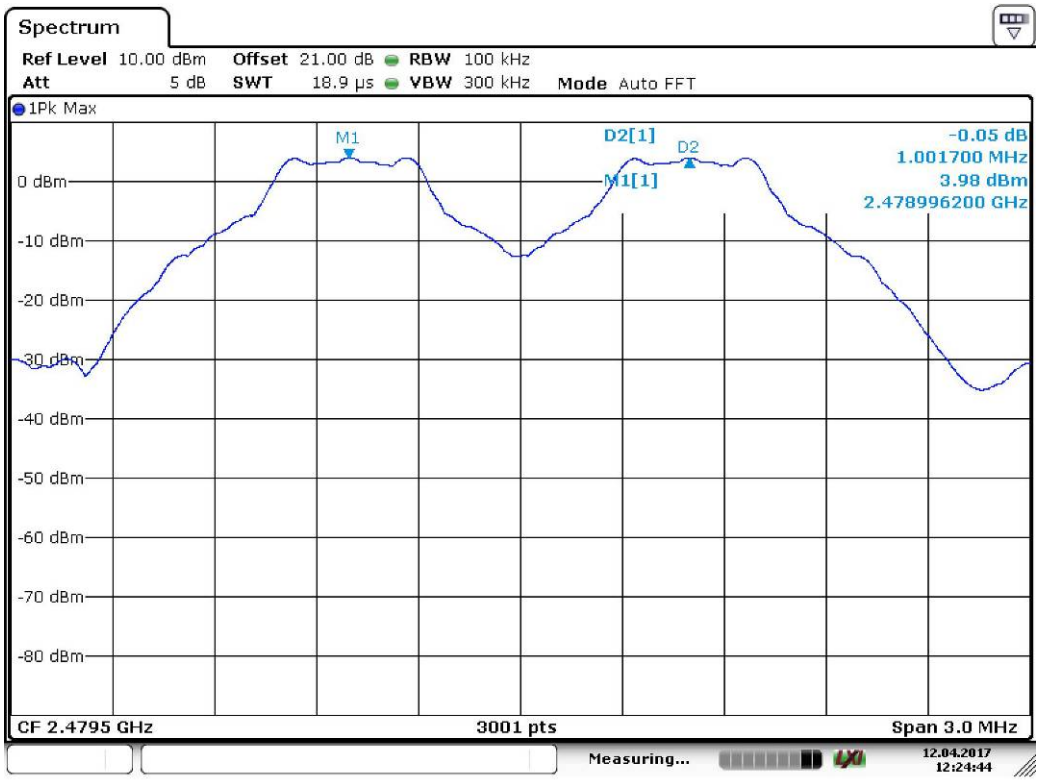
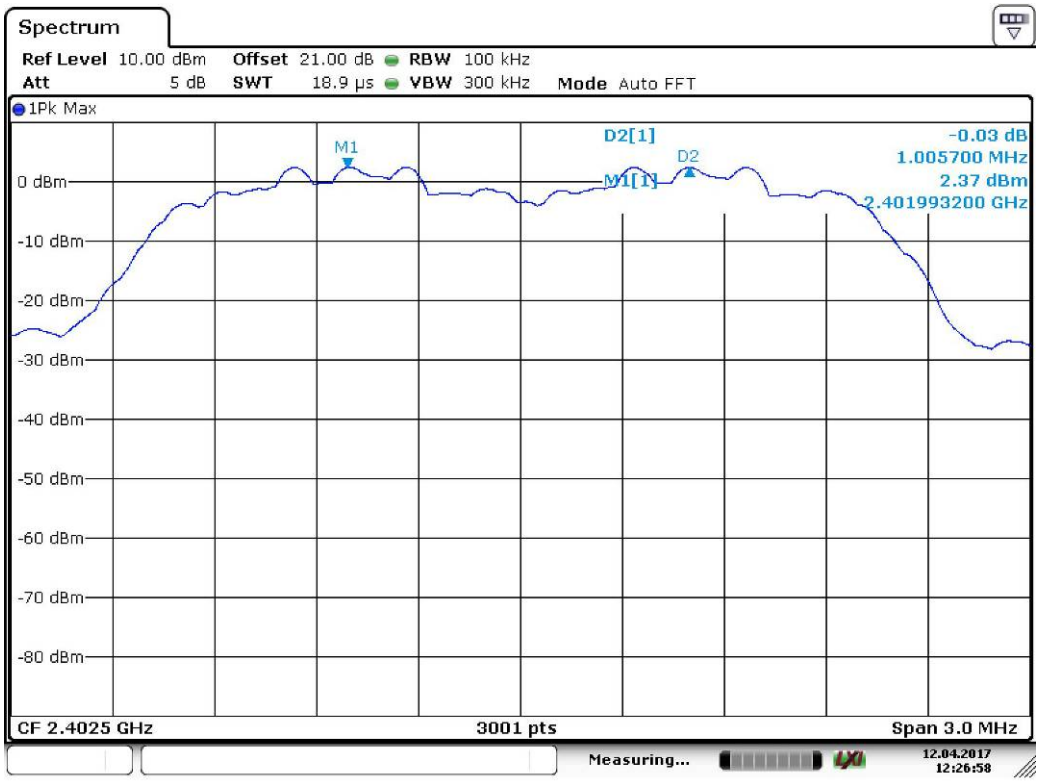
GFSK Highest Channels:



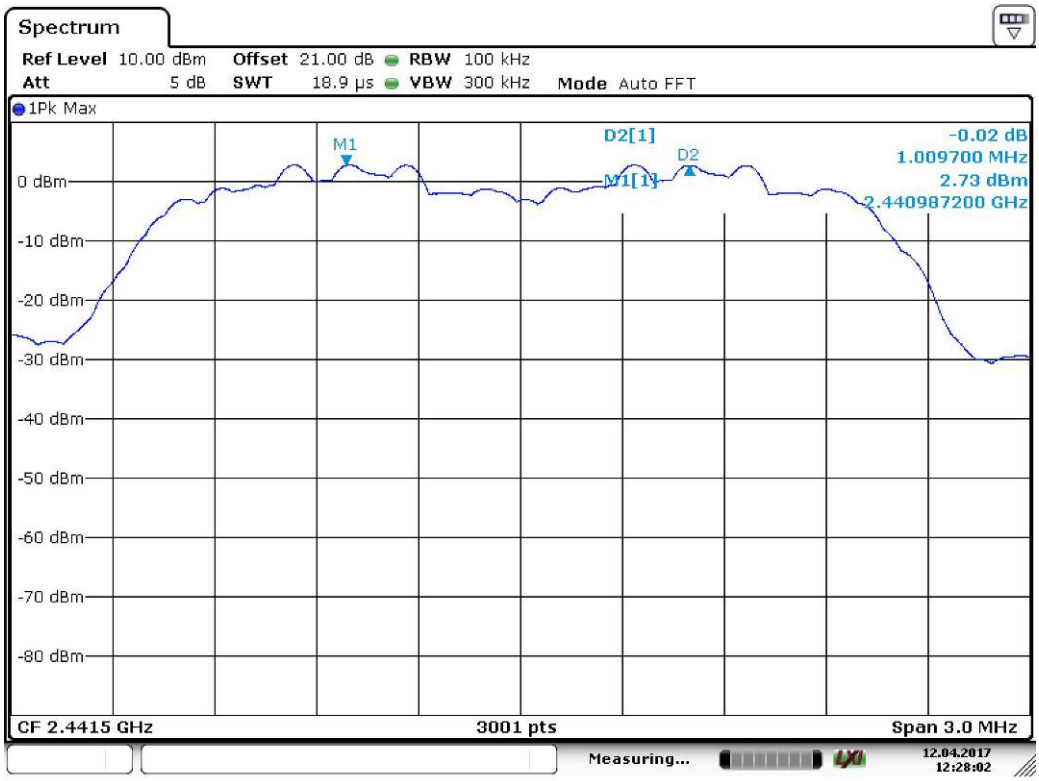
Date: 12.APR.2017 12:24:44

8DPSK Lowest Channels:



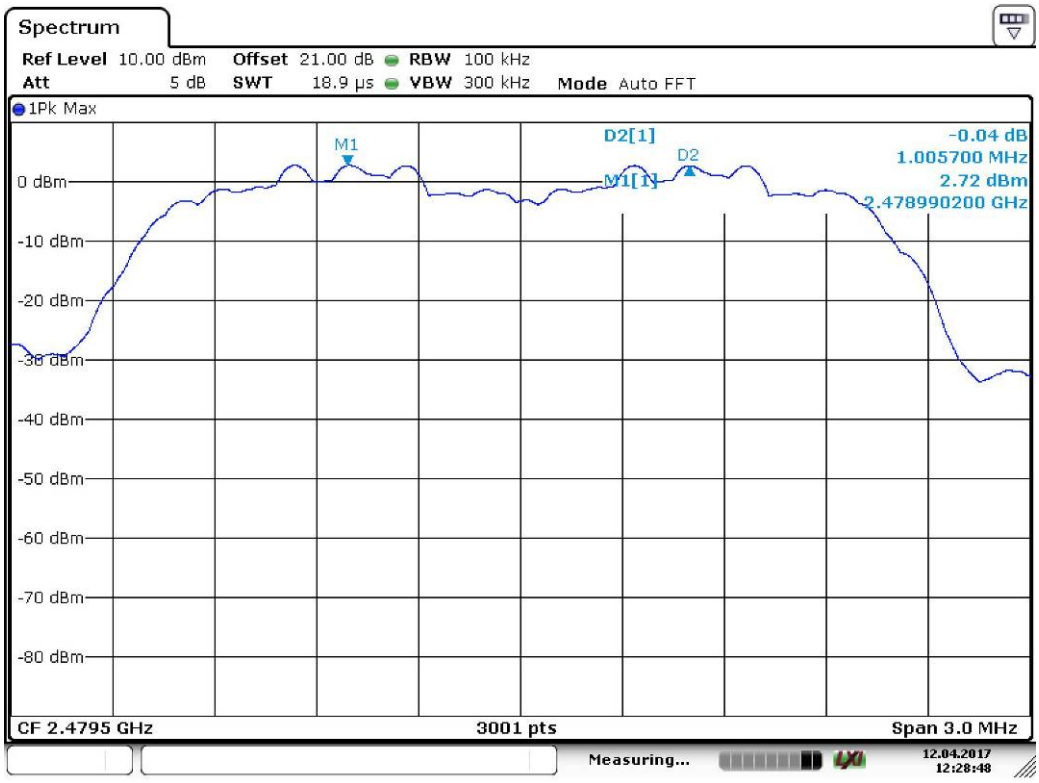
Date: 12.APR.2017 12:26:57

8DPSK Middle Channels:



Date: 12.APR.2017 12:28:02

8DPSK Highest Channels:



Date: 12.APR.2017 12:28:48

Test result: The unit does meet the FCC requirements.

4.5 HOPPING CHANNEL NUMBER

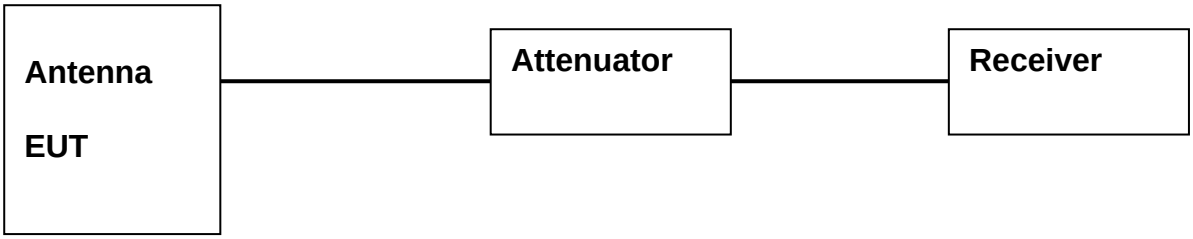
4.5.1 LIMITS

Regulation 15.247 (a) (1)(iii) Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.

4.5.2 TEST PROCEDURES

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 100 kHz. VBW = 100 kHz. Sweep = auto; Detector Function = Peak. Trace = Max hold.
3. Allow the trace to stabilize. It may prove necessary to break the span up to sections. in order to clearly show all of the hopping frequencies. The limit is specified in one of the subparagraphs of this Section.
4. Set the spectrum analyzer: start frequency = 2400MHz. stop frequency = 2483.5MHz. Submit the test result graph.

4.5.3 TEST SETUP

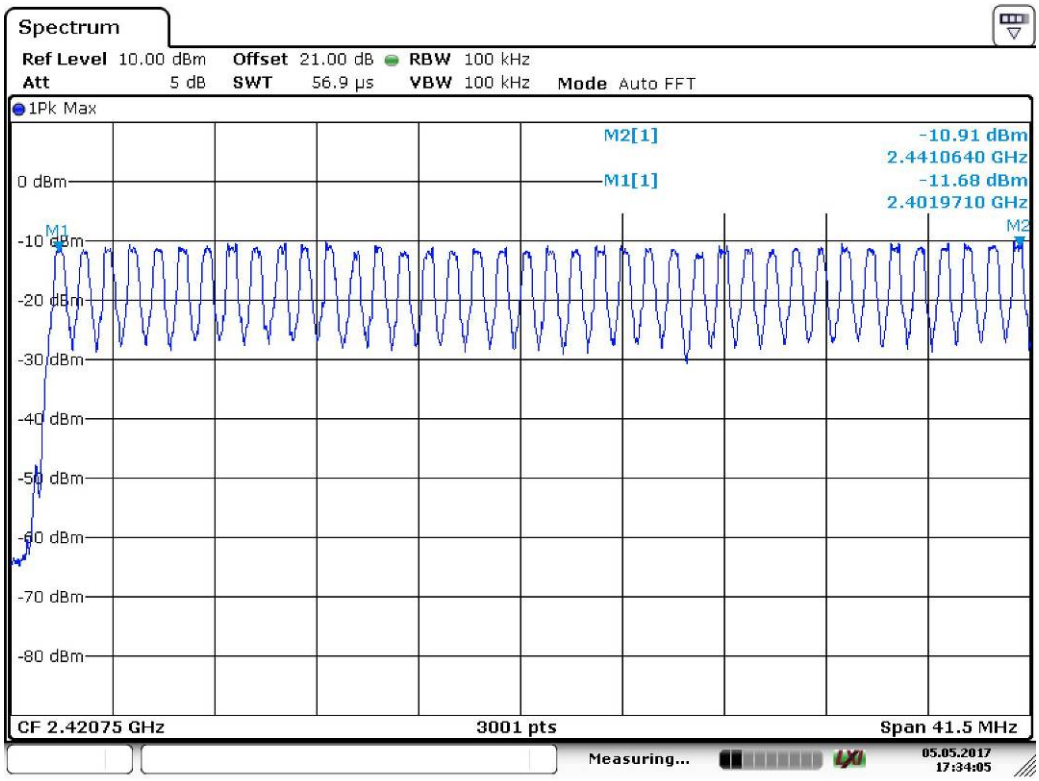


4.5.4 TEST RESULTS

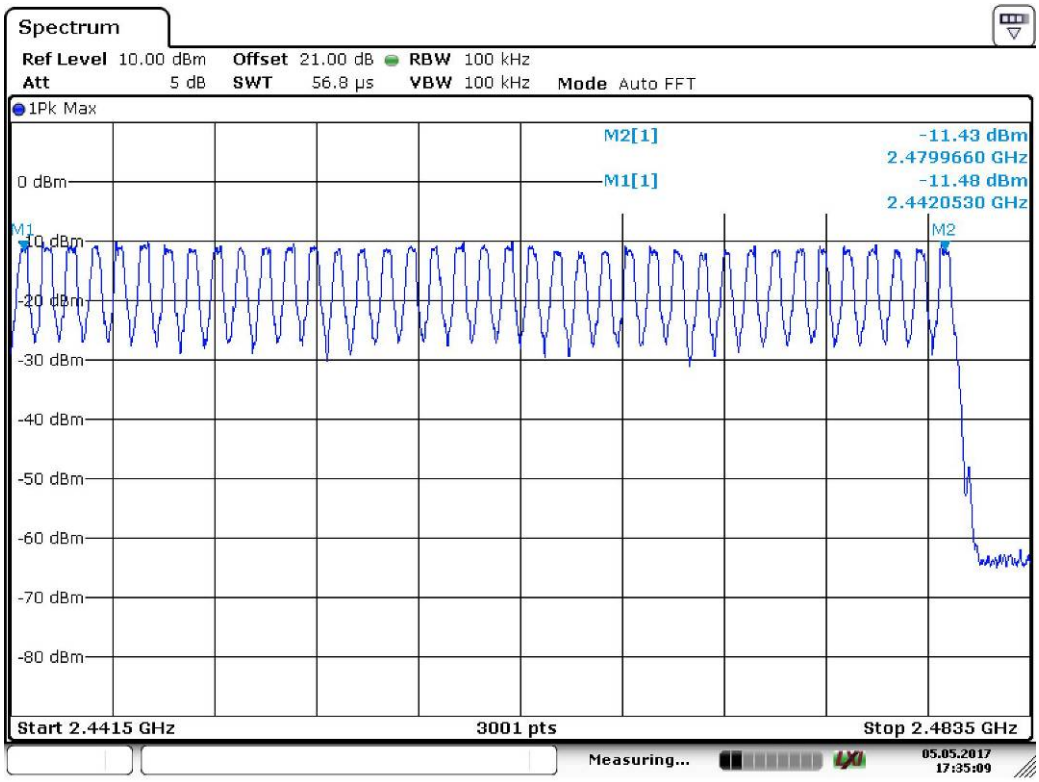
Test result: Total channels are 79 channels.

Result plot as follows:

BT1:

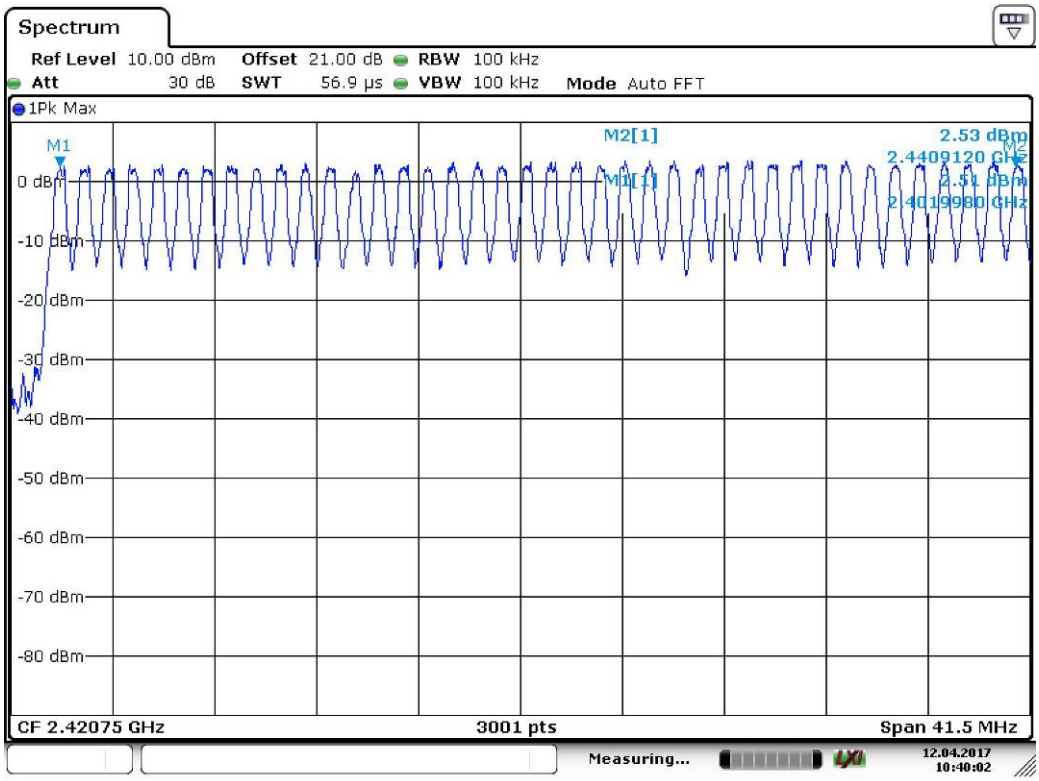


Date: 5.MAY.2017 17:34:06

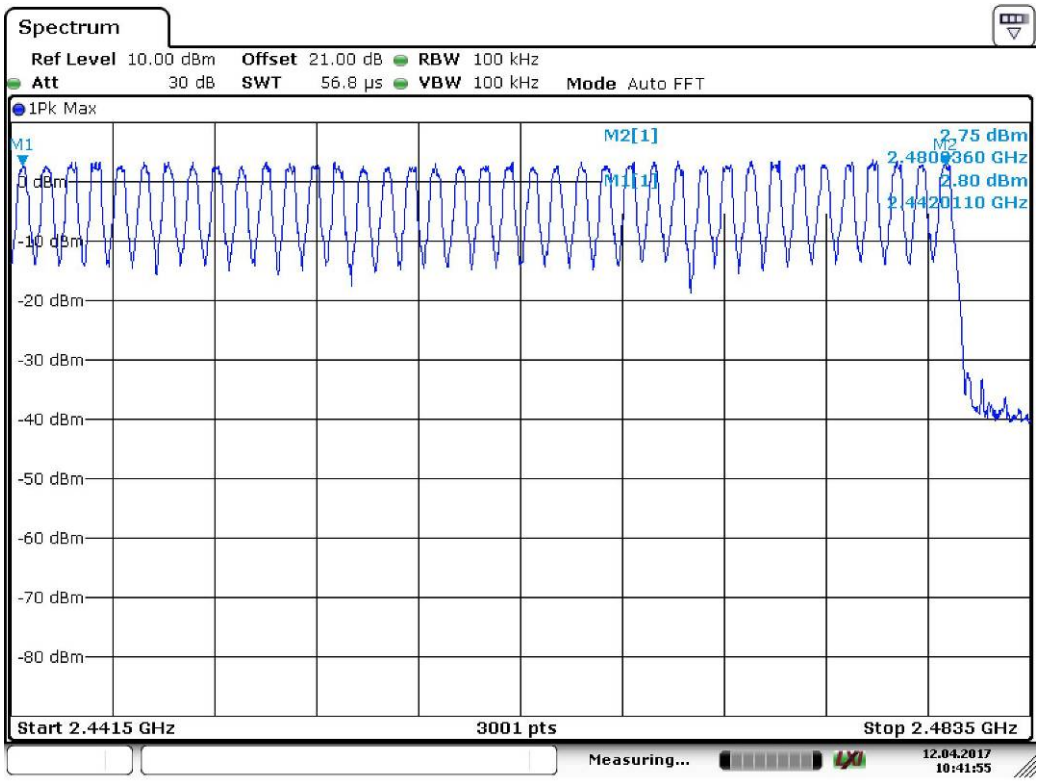


Date: 5.MAY.2017 17:35:10

BT2:

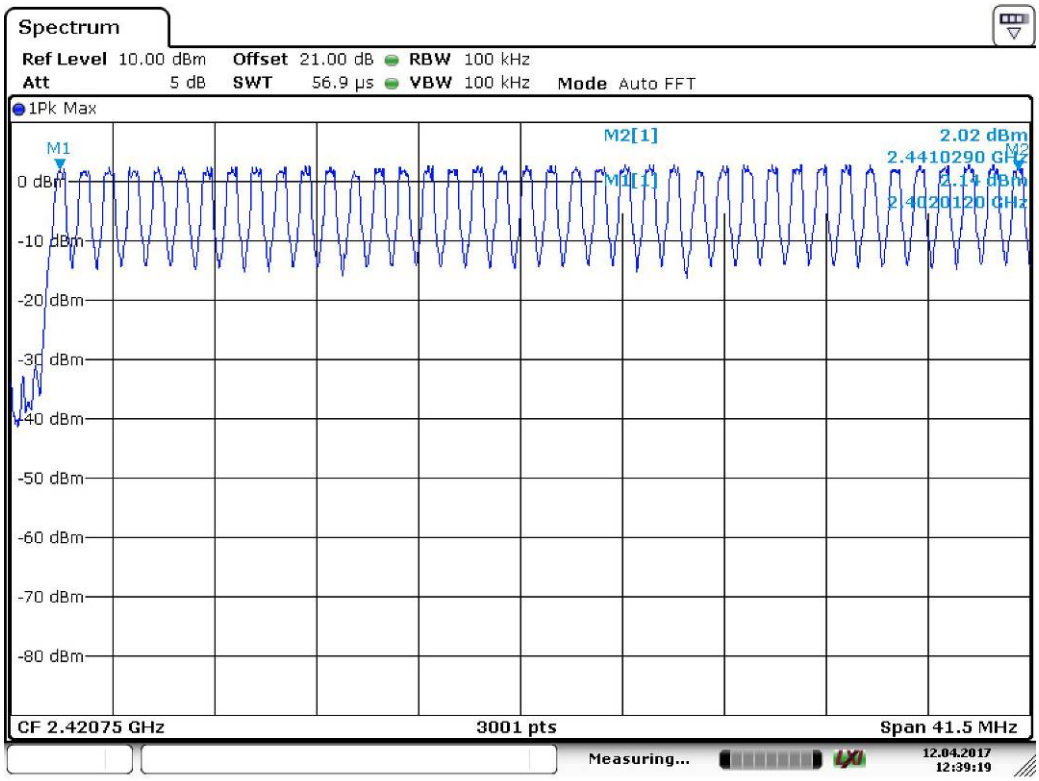


Date: 12.APR.2017 10:40:02

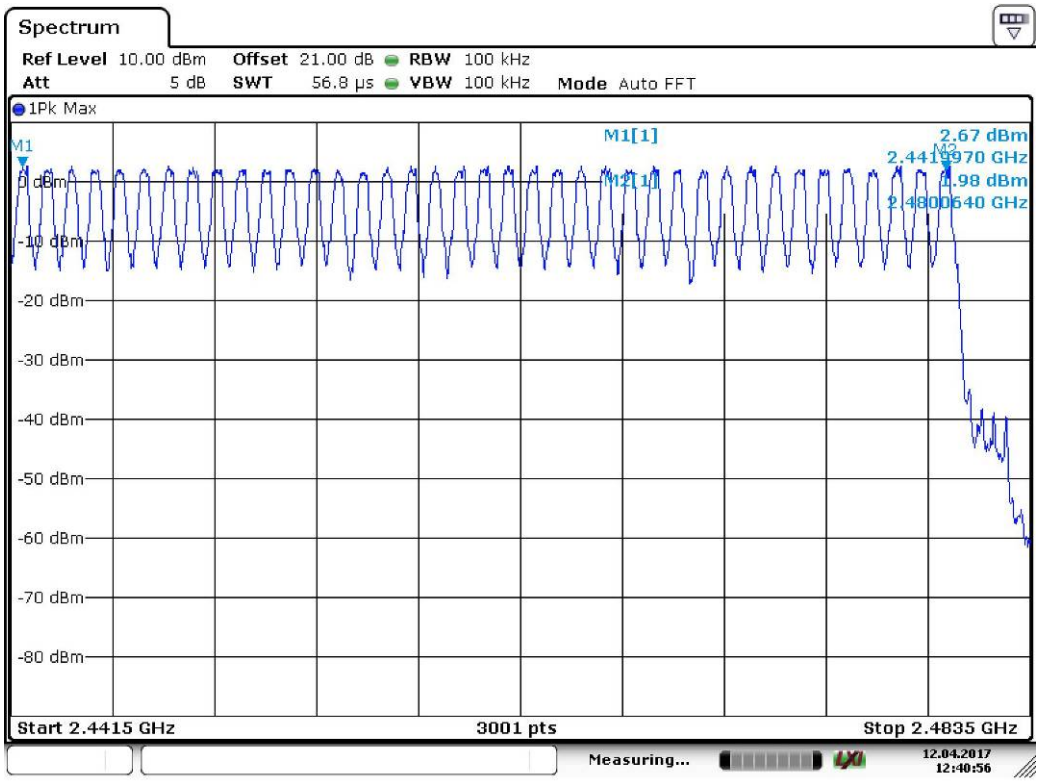


Date: 12.APR.2017 10:41:55

BT3:



Date: 12.APR.2017 12:39:20



Date: 12.APR.2017 12:40:56

Test result: The unit does meet the FCC requirements.

4.6 DWELL TIME

4.6.1 LIMITS

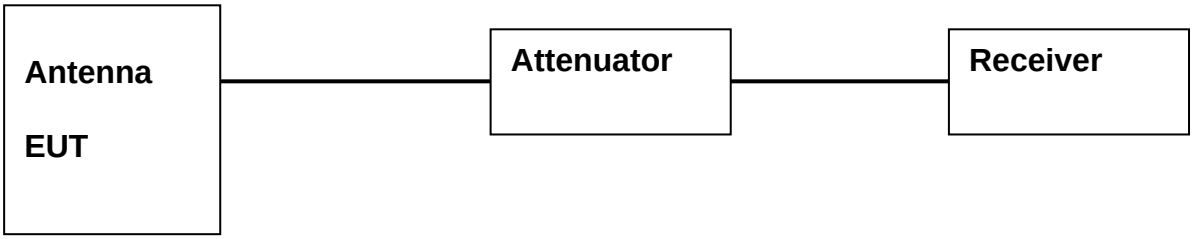
Regulation 15.247(a)(1)(iii) Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

4.6.2 TEST PROCEDURES

1. Remove the antenna from the EUT and then connect a low attenuation cable from the antenna port to the spectrum.
The analyzer shall be set as follows:
Centre Frequency: Equal to the hopping frequency being investigated
Frequency Span: 0 Hz
RBW: ~ 50 % of the Occupied Channel Bandwidth
VBW: ⩾ RBW
Detector Mode: RMS
Sweep time: Equal to the Dwell Time × Minimum number of hopping frequencies (N)
Number of sweep points: 30 000
Trace mode: Clear / Write
Trigger: Free Run
2. Save the trace data to a file for further analysis by a computing device using an appropriate software application or program.
3. Indentify the data points related to the frequency being investigated by applying a threshold. The data points resulting from transmissions on the hopping frequency being investigated are assumed to have much higher levels compared to data points resulting from transmissions on adjacent hopping frequencies. If a clear determination between these transmissions is not possible, the RBW in step 1 shall be further reduced. In addition, a channel filter may be used. Count the number of data points identified as resulting from transmissions on the frequency being investigated and multiply this number by the time difference between two consecutive data points.
4. The result in step 3 is the accumulated Dwell Time which shall comply with the limit and which shall be recorded in the test report.
5. Make the following changes on the analyzer and repeat steps 2 and 3.Sweep time: 4 × Dwell Time × Actual numbers of hopping frequencies in use
6. The hopping frequencies occupied by the system without having transmissions during the dwell time (blacklisted frequencies) should be taken into account in the actual number of hopping frequencies in use. If this number cannot be determined (number of blacklisted frequencies unknown) it shall be assumed that the equipment uses the minimum number of hopping frequencies .The result shall be compared to the limit for the Minimum Frequency Occupation Time. This value shall be recorded in the test report.
7. Make the following changes on the analyzer:
Start Frequency: 2 400 MHz
Stop Frequency: 2 483,5 MHz
RBW: ~ 50 % of the Occupied Channel Bandwidth (single hop)

VBW: ⩾ RBW
Detector Mode: RMS
Sweep time: Auto
Trace Mode: Max Hold
Trigger: Free Run
When the trace has completed, indentify the number of hopping frequencies used by the hopping sequence.The result shall be compared to the limit (value N). This value shall be recorded in the test report.For equipment with blacklisted frequencies, it might not be possible to verify the number of hopping frequencies in use. However they shall comply with the requirement for accumulated Dwell time and Minimum Frequency Occupation Time assuming the minimum number of hopping frequencies is in use.
8. For adaptive systems, using the lowest and highest -20 dB points from the total spectrum envelope obtained in step 6, it shall be verified whether the system uses 70 % of the band specified in clause 1. The result shall be recorded in the test report.
9. Use the marker-delta function to determine the dwell time. If this value varies with different modes of operation (e.g.. data rate. modulation format. etc.). Repeat this test for each variation. The limit is specified in one of the subparagraphs of this Section. Submit this plot(s). An oscilloscope may be used instead of a spectrum analyzer.

4.6.3 TEST SETUP



4.6.4 TEST RESULTS

BT1:

Frequency (MHz)	Modulation	Packet	Accumulated Transmit Time Per Hop(ms)	Number of Hopping Channel in 31.6s	Maxinum Accumulated Transmit Time (s)	Limit (s)	Result
2441	8DPSK	3DH1	0.388	320	0.124	0.4	Pass
		3DH3	1.638	140	0.229	0.4	Pass
		3DH5	2.880	130	0.374	0.4	Pass

BT2:

Frequency (MHz)	Modulation	Packet	Accumulated Transmit Time Per Hop(ms)	Number of Hopping Channel in 31.6s	Maxinum Accumulated Transmit Time (s)	Limit (s)	Result
2441	8DPSK	3DH1	0.409	320	0.131	0.4	Pass
		3DH3	1.656	160	0.265	0.4	Pass
		3DH5	2.906	110	0.320	0.4	Pass

BT3:

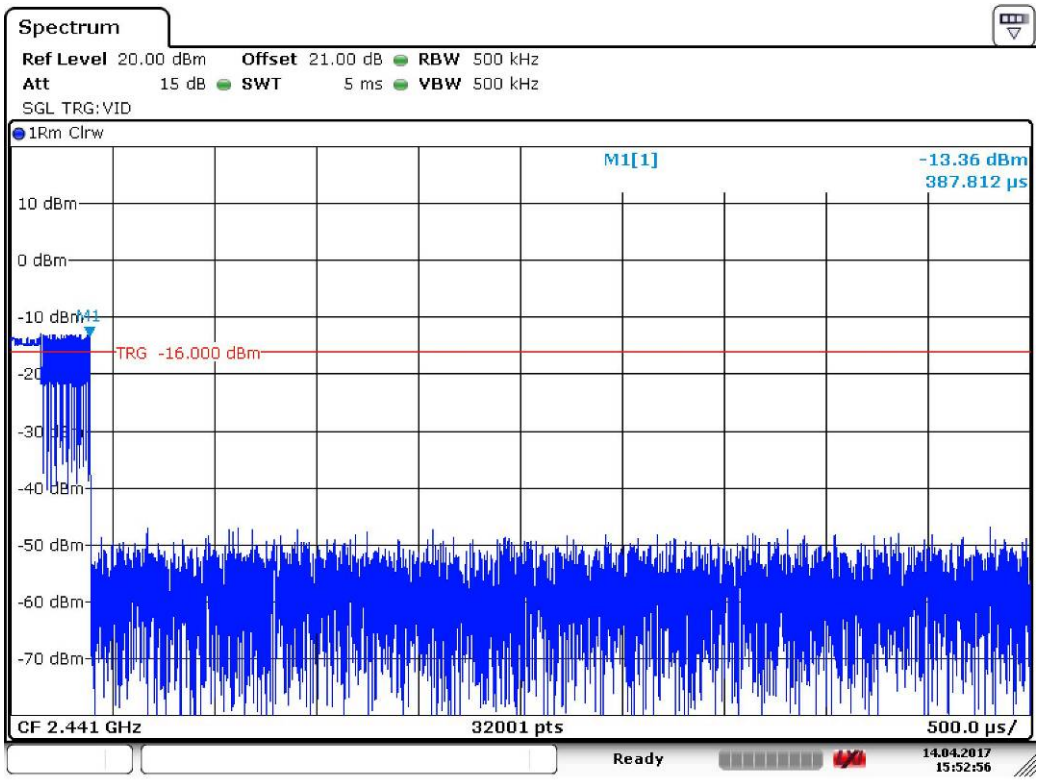
Frequency (MHz)	Modulation	Packet	Accumulated Transmit Time Per Hop(ms)	Number of Hopping Channel in 31.6s	Maxinum Accumulated Transmit Time (s)	Limit (s)	Result
2441	8DPSK	3DH1	0.410	320	0.131	0.4	Pass
		3DH3	1.658	160	0.265	0.4	Pass
		3DH5	2.907	110	0.320	0.4	Pass

Remark: The average time of occupancy in the specified 31.6 second period is equal to pulse width*(time of pulse in observation period)*(test period / observation period)

The results are not greater than 0.4 seconds.
The unit does meet the requirements.

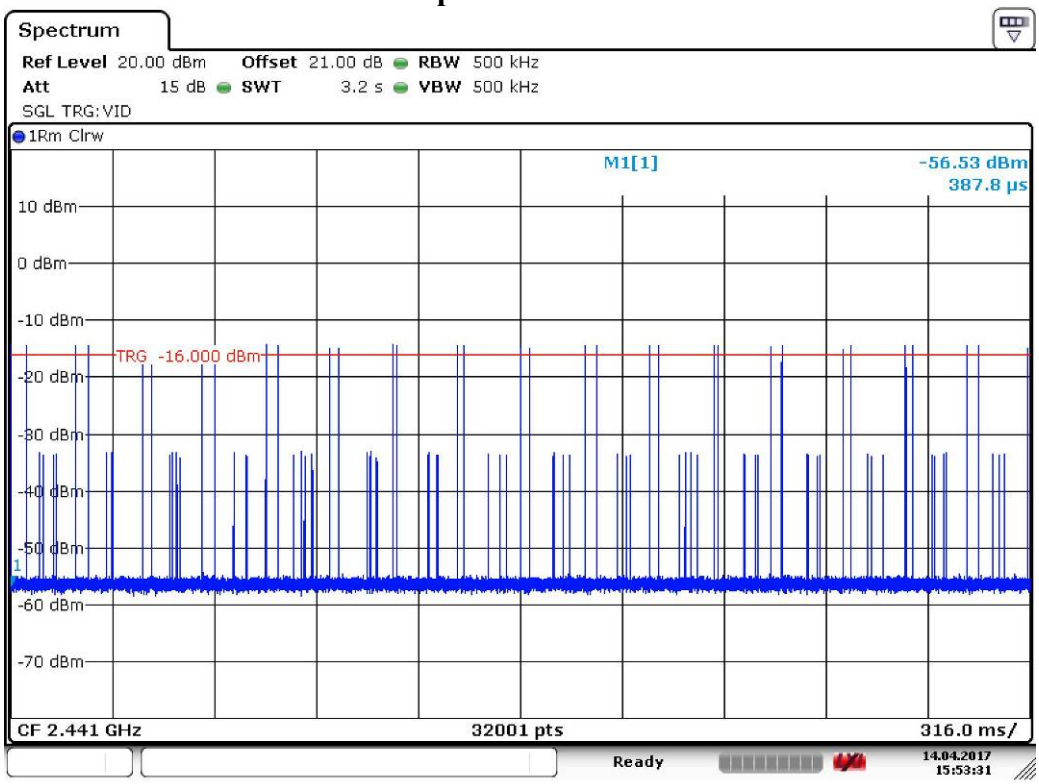
Please refer the graph as below:

BT1:
For 3DH1:
Pulse Width:



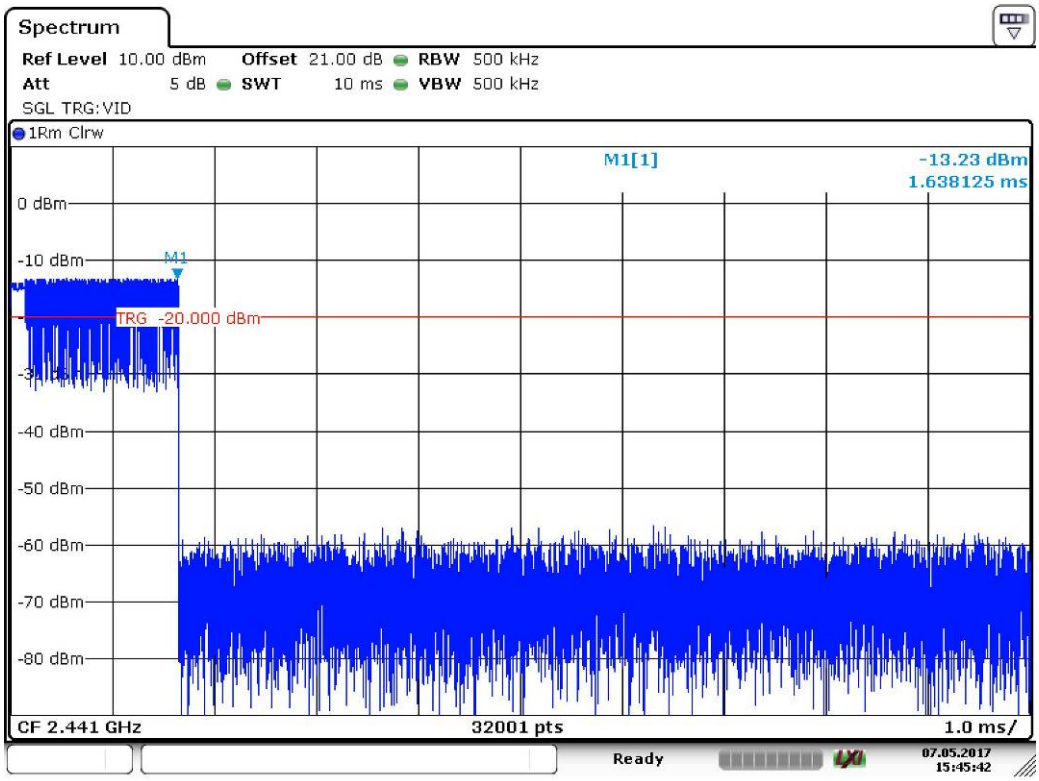
Date: 14.APR.2017 15:52:56

Number of Pulses in 3.16 S observation periods:



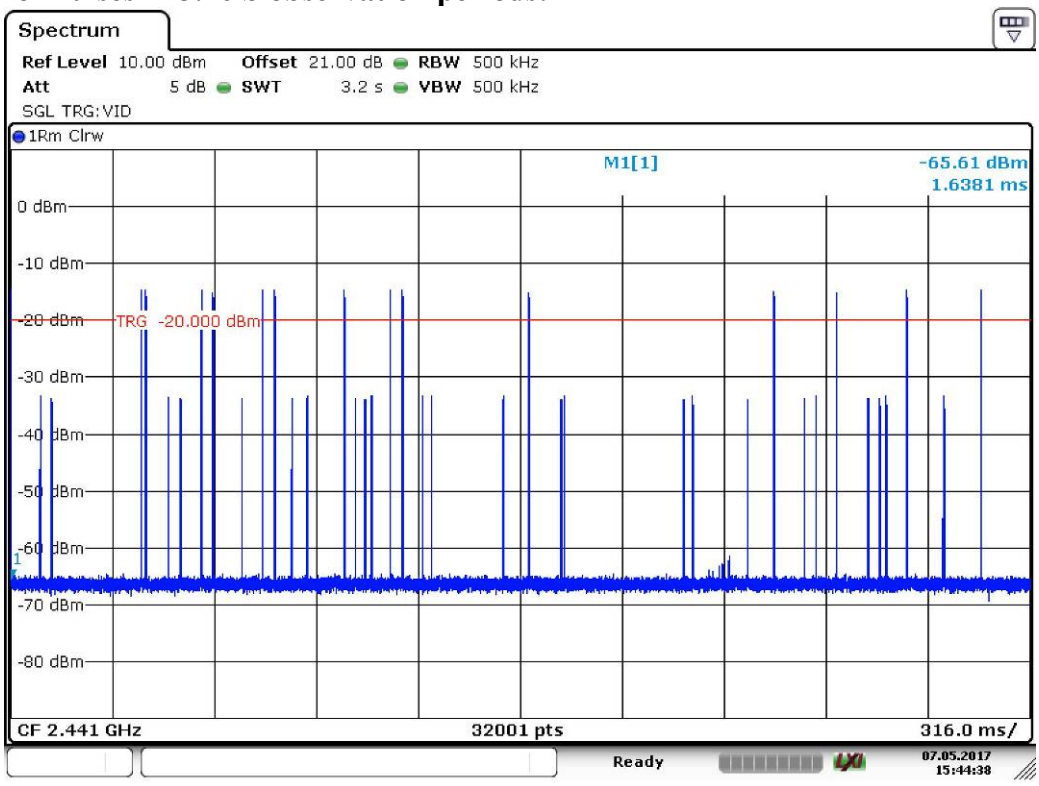
Date: 14.APR.2017 15:53:32

For 3DH3:
Pulse Width:



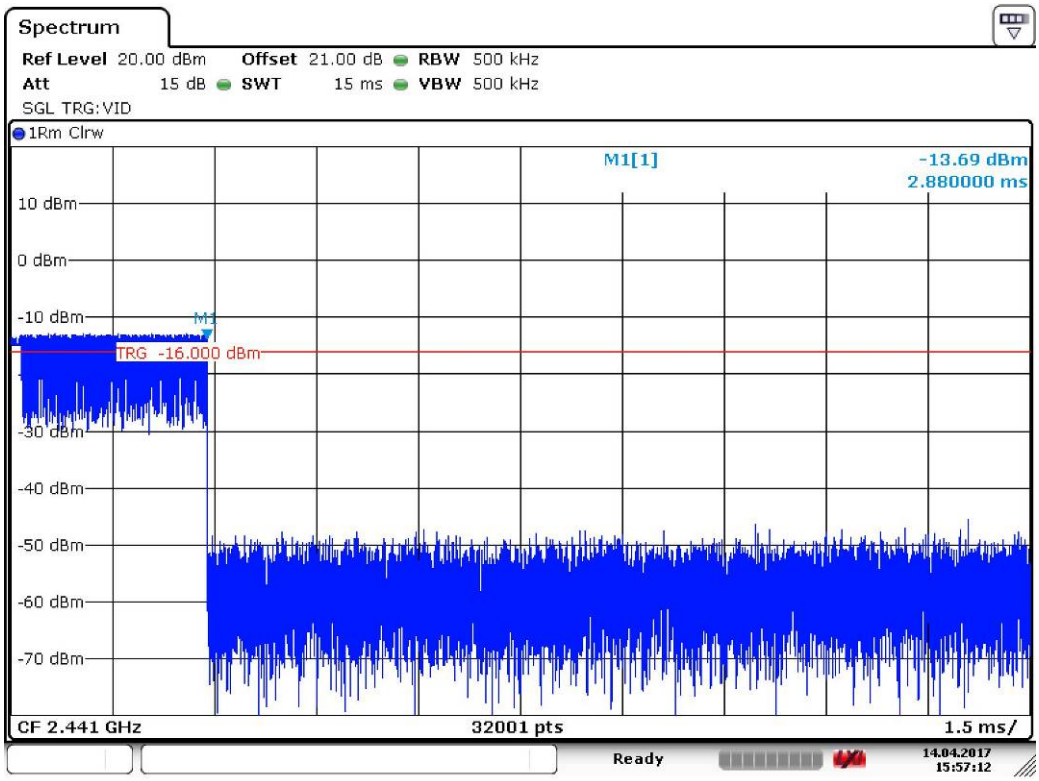
Date: 7.MAY.2017 15:45:43

Number of Pulses in 3.16 S observation periods:



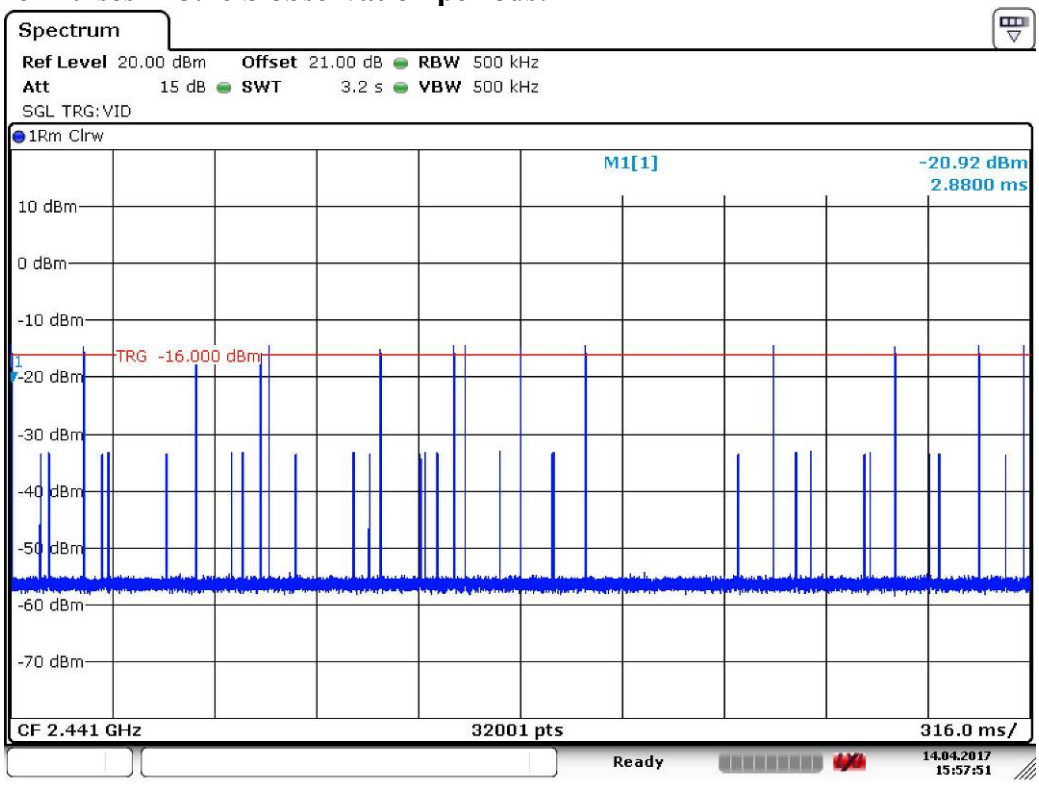
Date: 7.MAY.2017 15:44:39

For 3DH5:
Pulse Width:



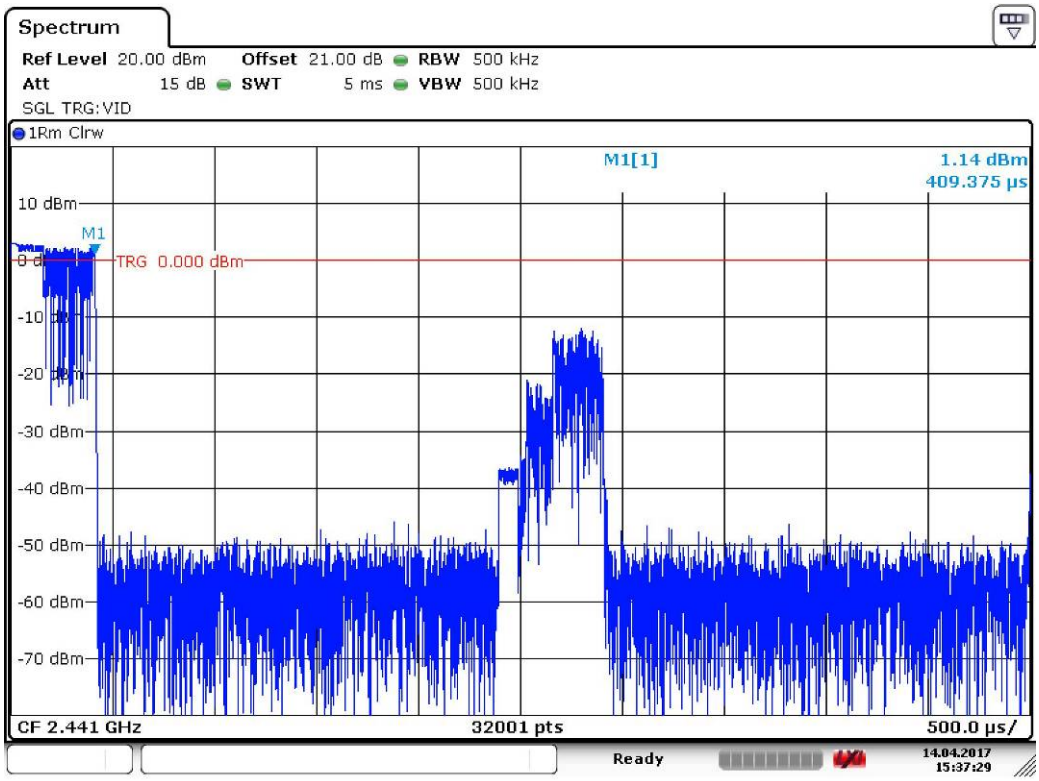
Date: 14.APR.2017 15:57:13

Number of Pulses in 3.16 S observation periods:



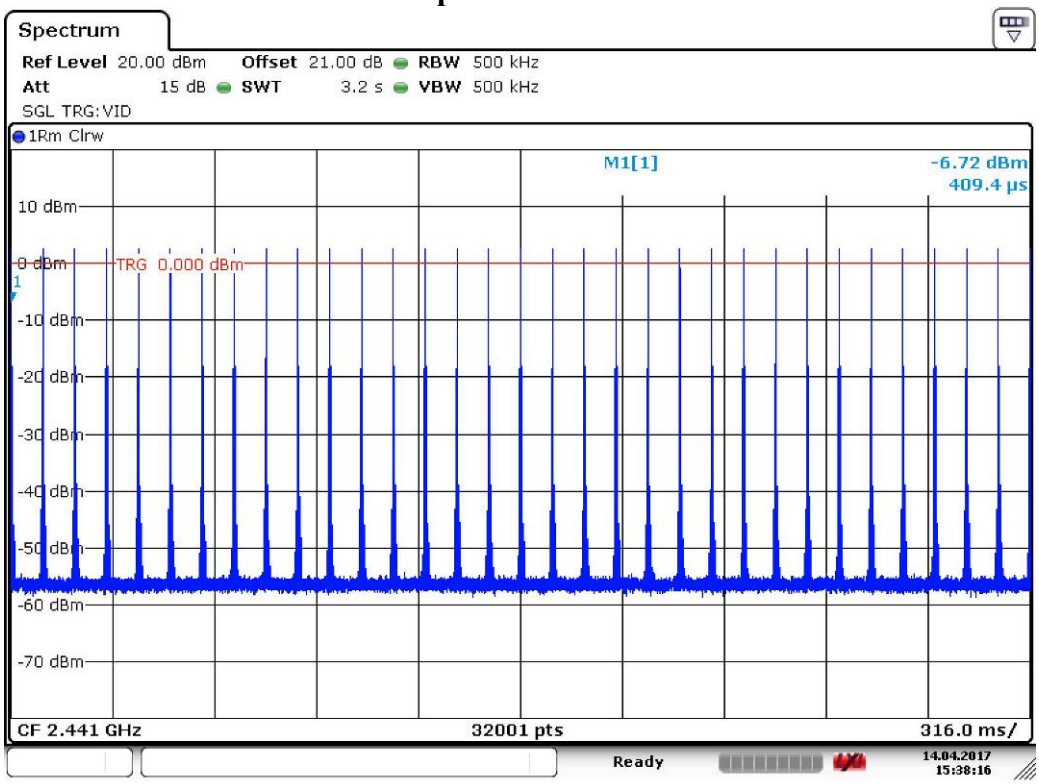
Date: 14.APR.2017 15:57:51

BT2:
For 3DH1:
Pulse Width:



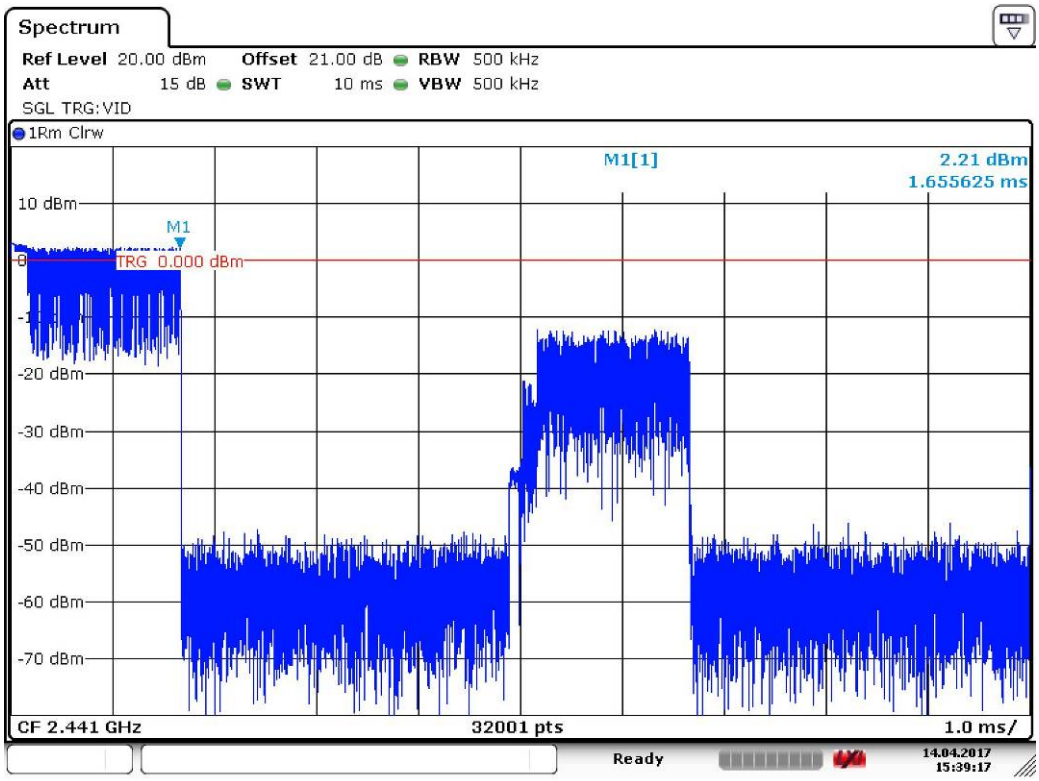
Date: 14.APR.2017 15:37:29

Number of Pulses in 3.16 S observation periods:



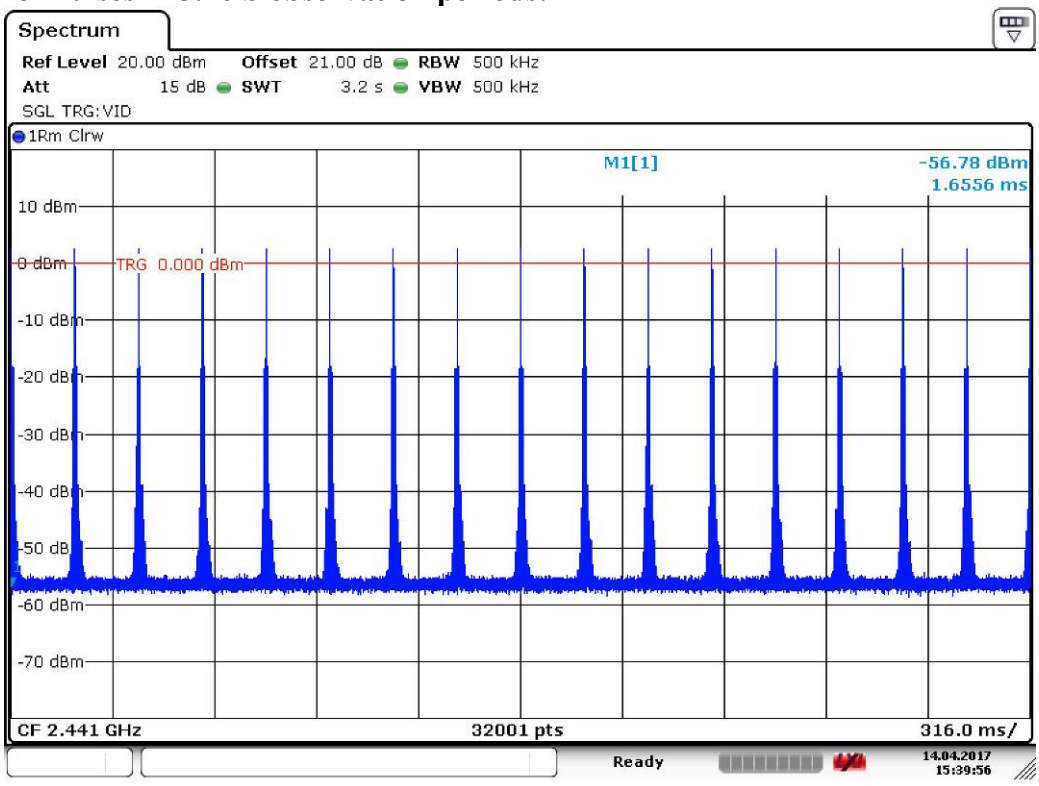
Date: 14.APR.2017 15:38:15

For 3DH3:
Pulse Width:



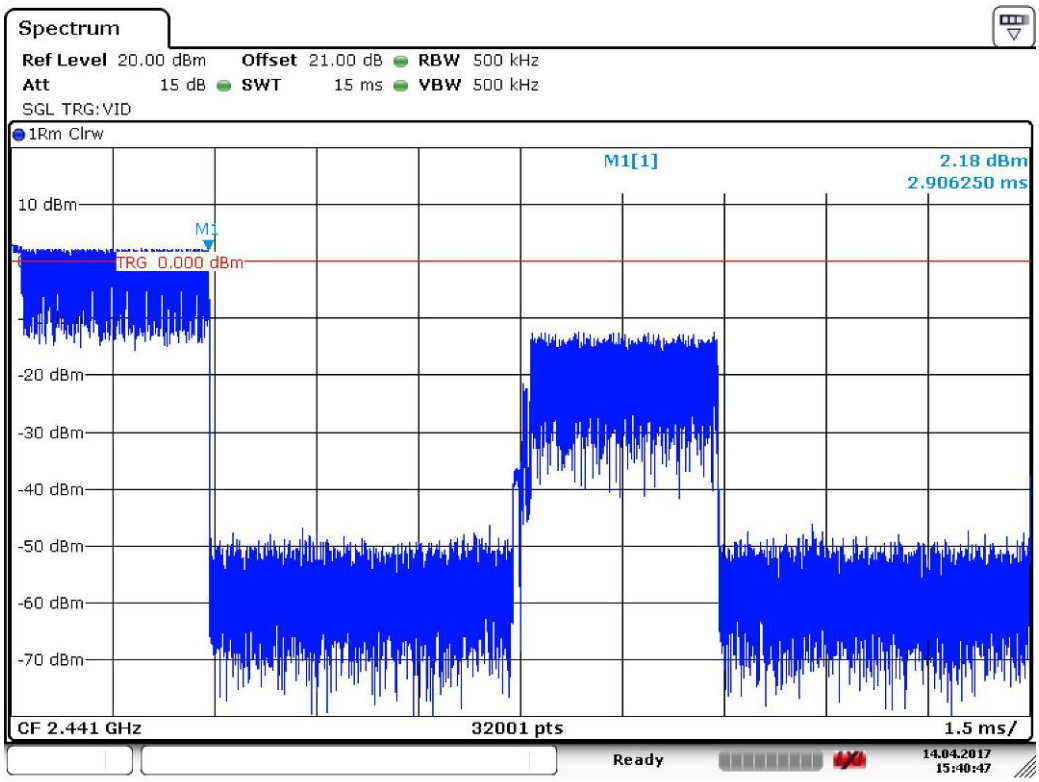
Date: 14.APR.2017 15:39:16

Number of Pulses in 3.16 S observation periods:



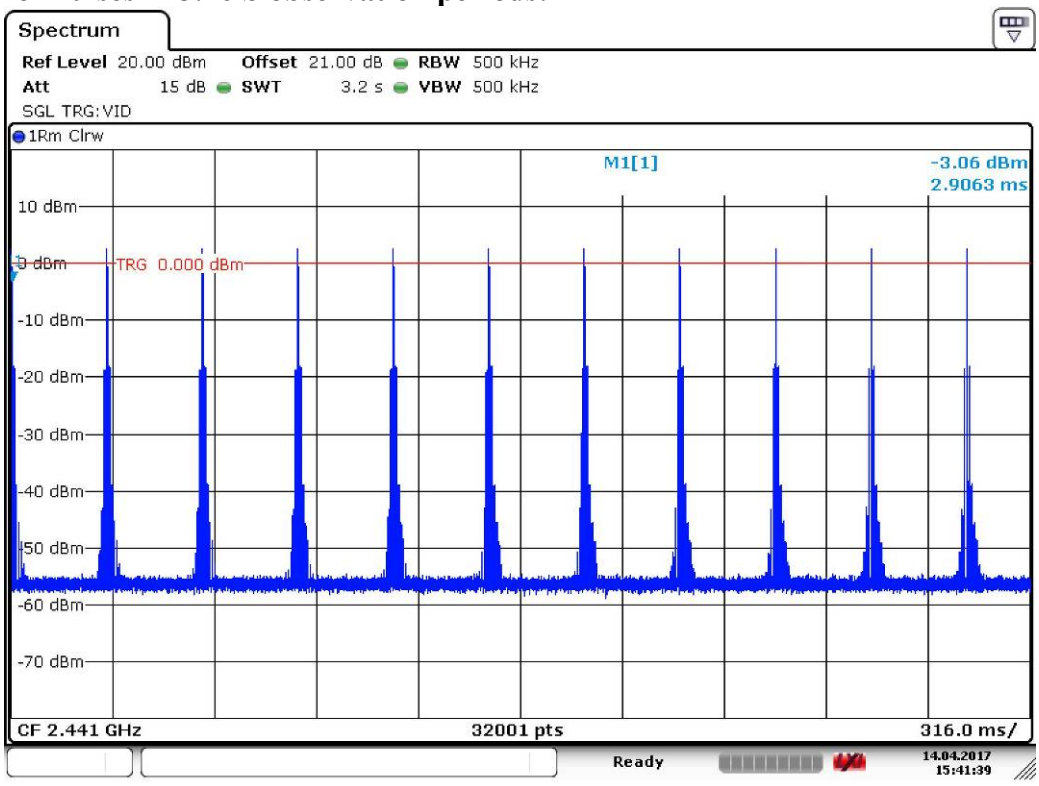
Date: 14.APR.2017 15:39:56

For 3DH5:
Pulse Width:



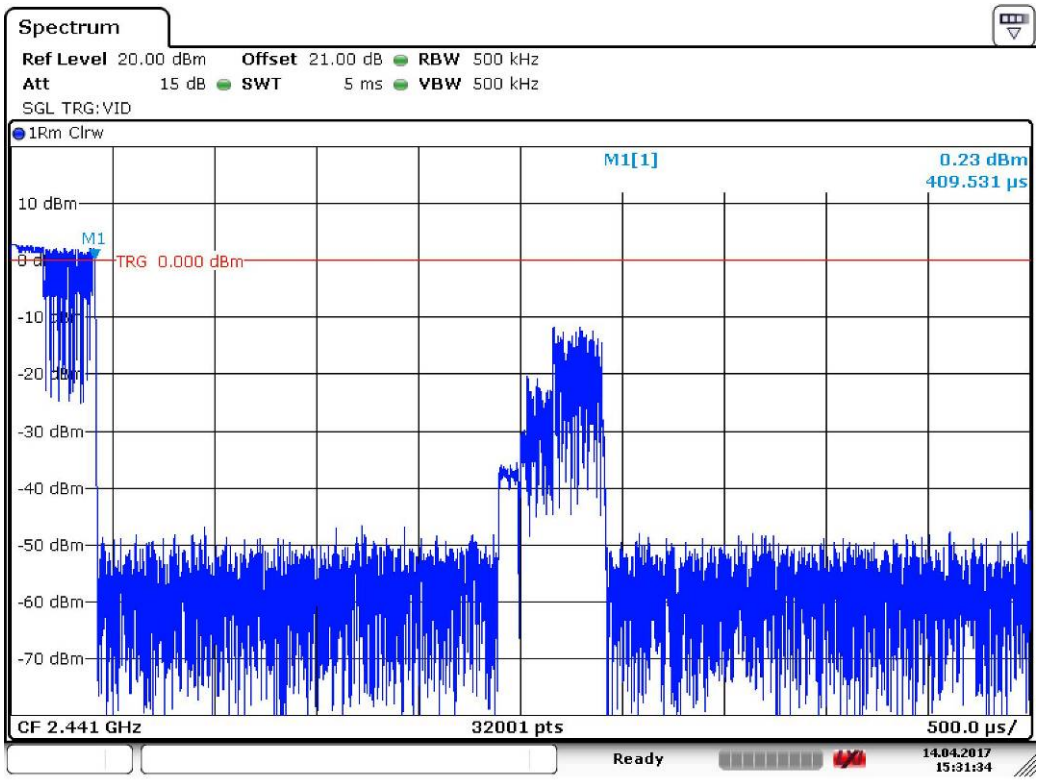
Date: 14.APR.2017 15:40:47

Number of Pulses in 3.16 S observation periods:



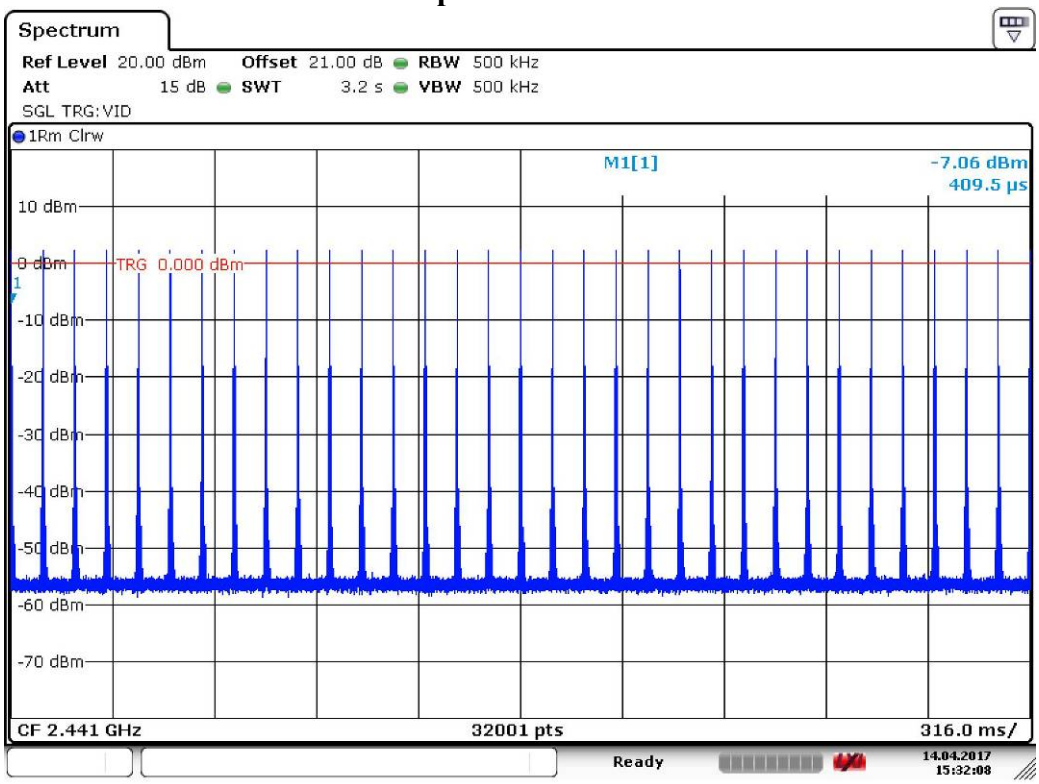
Date: 14.APR.2017 15:41:38

BT3:
For 3DH1:
Pulse Width:



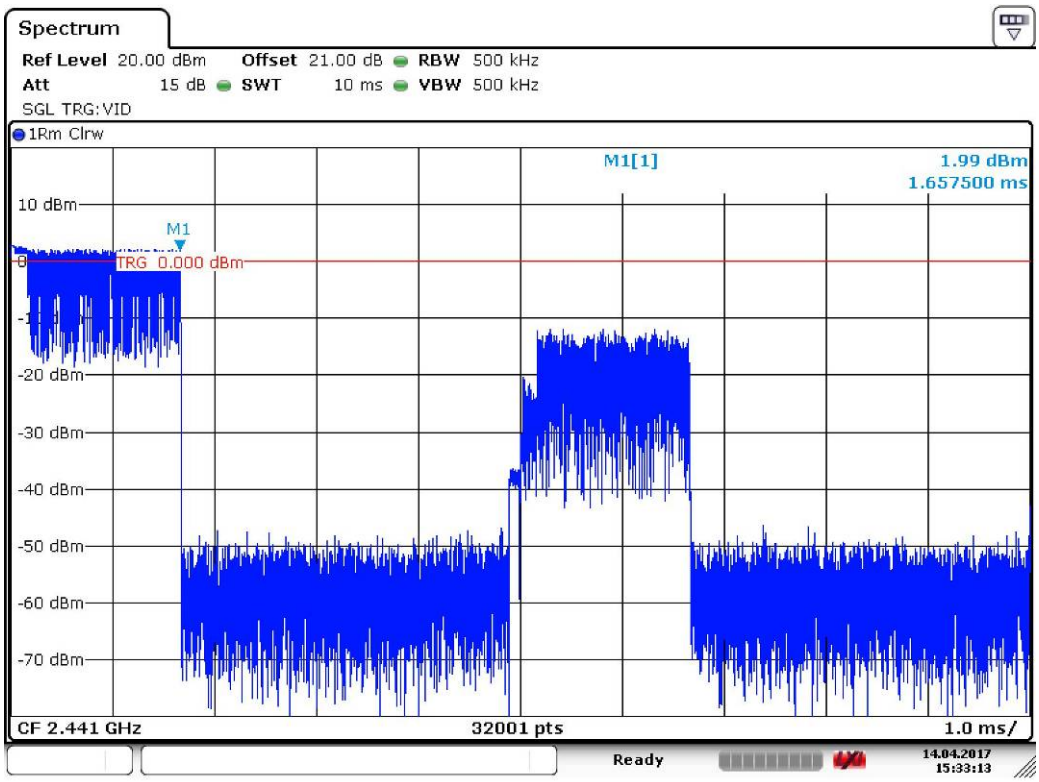
Date: 14.APR.2017 15:31:35

Number of Pulses in 3.16 S observation periods:



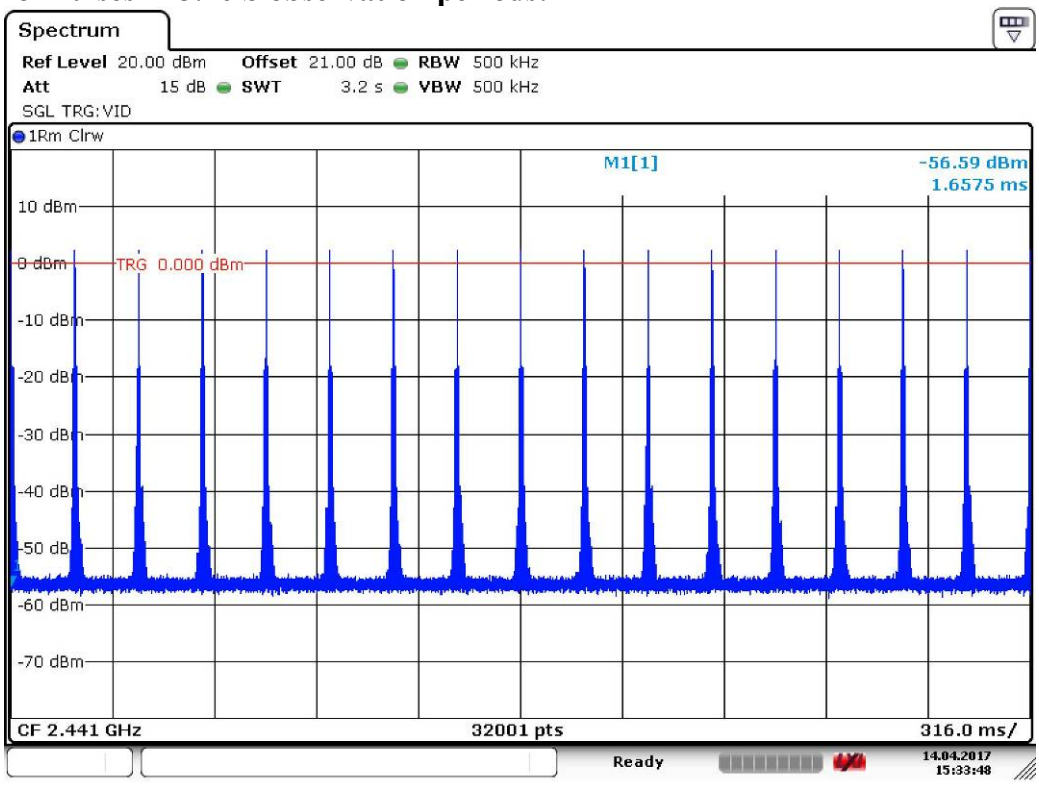
Date: 14.APR.2017 15:32:08

For 3DH3:
Pulse Width:



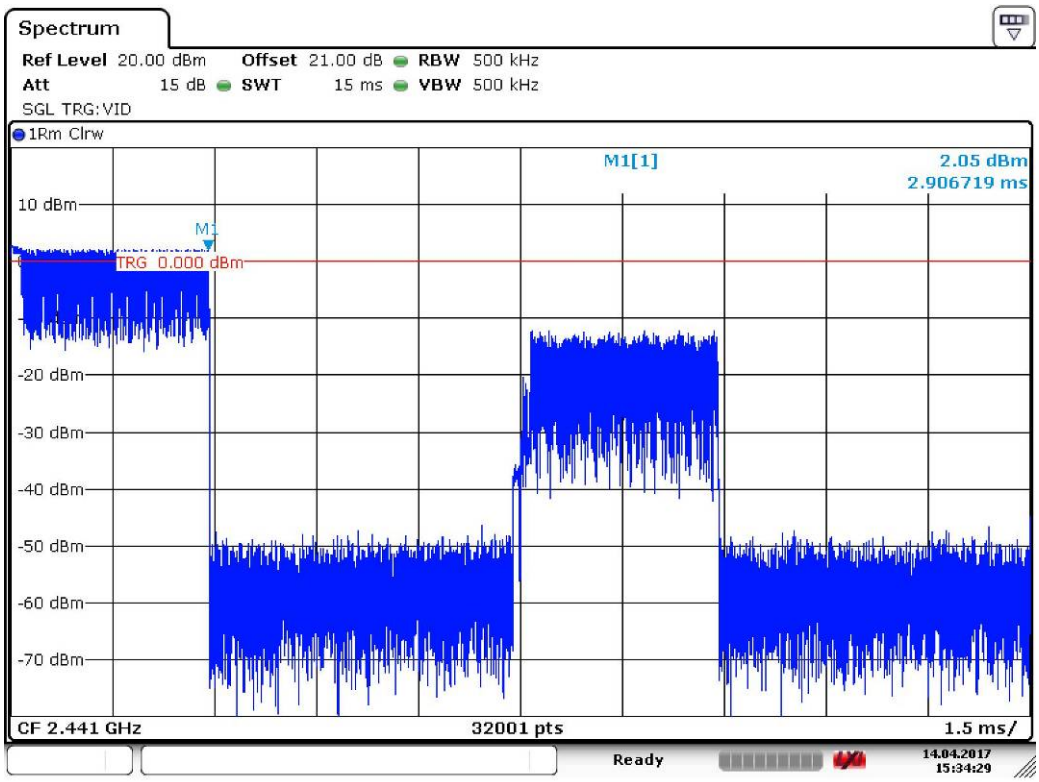
Date: 14.APR.2017 15:33:13

Number of Pulses in 3.16 S observation periods:



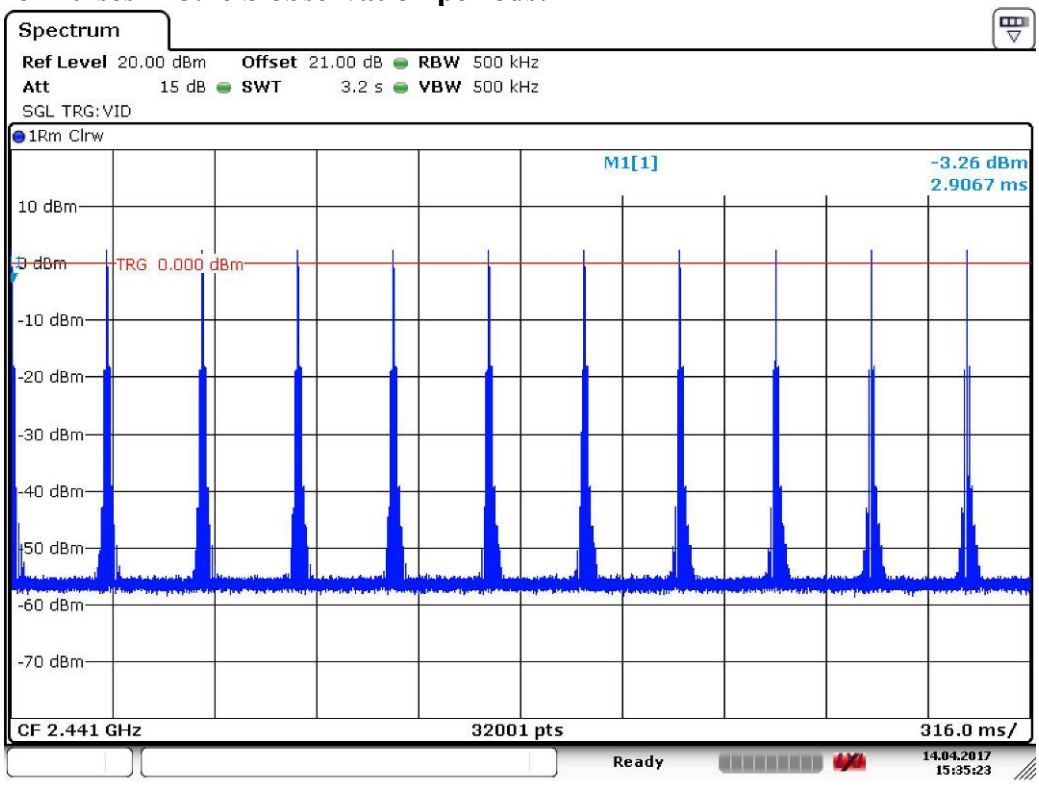
Date: 14.APR.2017 15:33:49

For 3DH5:
Pulse Width:



Date: 14.APR.2017 15:34:29

Number of Pulses in 3.16 S observation periods:



Date: 14.APR.2017 15:35:23

4.7 CONDUCTED EMISSION MEASUREMENT

4.7.1 LIMITS

Frequency range	Limits (dBμV)	
	Quasi-peak	Average
150kHz ～ 0.5MHz	66～56	56～46
0.5 MHz ～ 5 MHz	56	46
5 MHz ～ 30 MHz	60	50

4.7.2 TEST PROCEDURES

Procedure of Preliminary Test

For measurement of the disturbance voltage the equipment under test (EUT) is connected to the power supply mains and any other extended network via one or more artificial network(s). An EUT, whether intended to be grounded or not, and which is to be used on a table is configured as follows:

– Either the bottom or the rear of the EUT shall be at a controlled distance of 40 cm from a reference ground plane. This ground plane is normally the wall or floor of a shielded room. It may also be a grounded metal plane of at least 2 m by 2 m. This is physically accomplished as follows:

1) Place the EUT on a table of non-conducting material which is at least 80 cm high. Place the EUT so that it is 40 cm from the wall of the shielded room, or

2) place the EUT on a table of non-conducting material which is 40 cm high so that the bottom of the EUT is 40 cm above the ground plane;

– All other conductive surfaces of the EUT shall be at least 80 cm from the reference ground plane;

– The EUT are placed on the floor that one side of the housings is 40 cm from the vertical reference ground plane and other metallic parts;

– Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth forming a bundle 30 cm to 40 cm long, hanging approximately in the middle between the ground plane and the table.

– I/O cables that are connected to a peripheral shall be bundled in the centre. The end of the cable may be terminated if required using correct terminating impedance. The total length shall not exceed 1 m.

The test mode(s) described in Item 2.4 were scanned during the preliminary test. After the preliminary scan, we found the test mode described in Item 2.4 producing the highest emission level. The EUT configuration and cable configuration of the above highest emission levels were recorded for reference of the final test.

Procedure of Final Test

EUT and support equipment were set up on the test bench as per the configuration with highest emission level in the preliminary test. A scan was taken on both power lines, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. The test data of the worst-case condition(s) was recorded.

Remark:

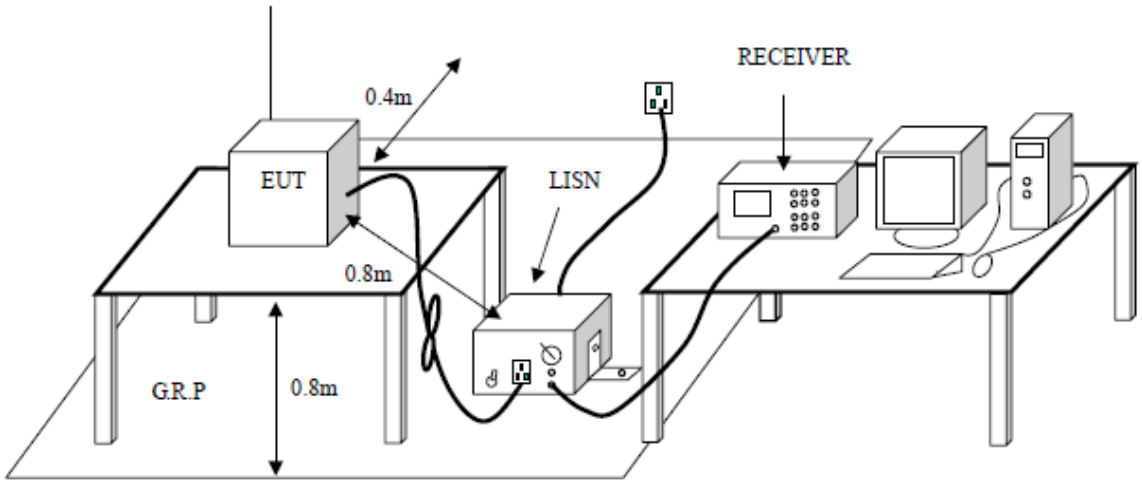
BT1:Pre-test for normal mode and EDR mode, to find the packet type 3DH5 for the EDR mode and

channel 2402MHz is the worst case. The worst case emissions were reported.

BT2:Pre-test for normal mode and EDR mode, to find the packet type 3DH5 for the EDR mode and channel 2402MHz is the worst case. The worst case emissions were reported.

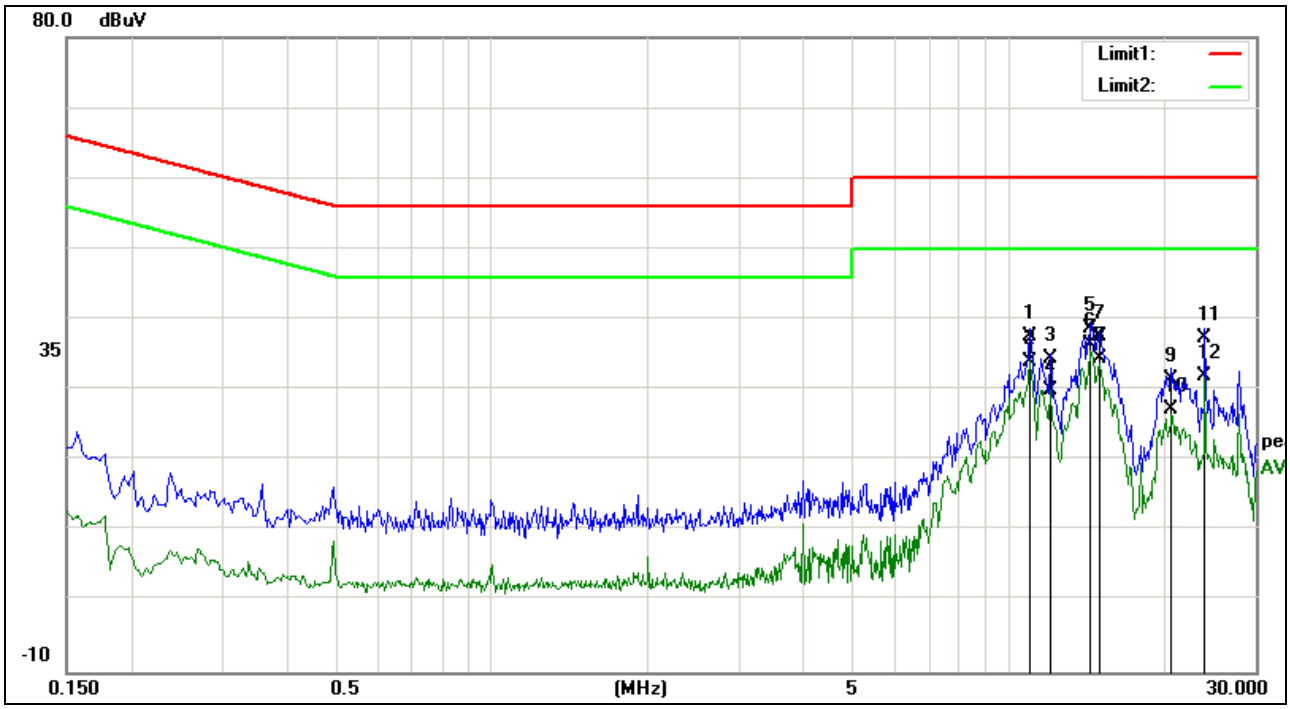
BT3:Pre-test for normal mode and EDR mode, to find the packet type 3DH5 for the EDR mode and channel 2402MHz is the worst case. The worst case emissions were reported.

4.7.3 TEST SETUP



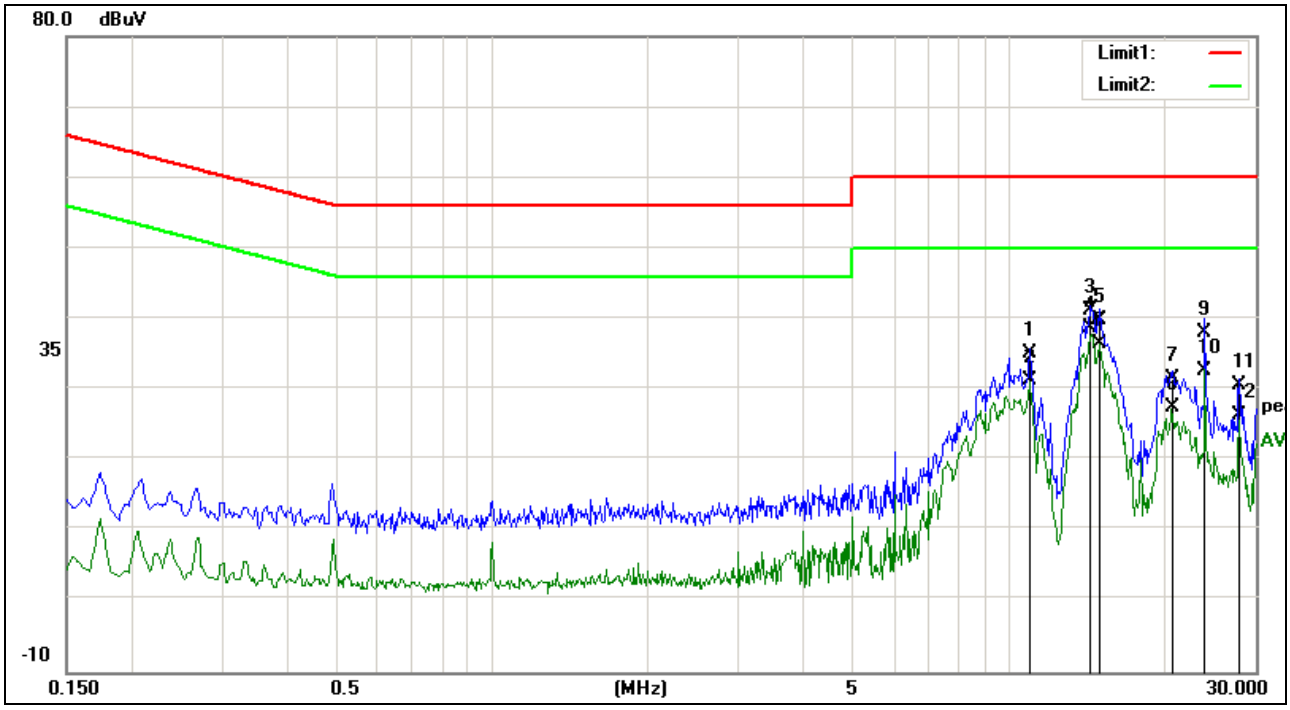
4.7.4 TEST RESULTS

Project No.:	**E201609264085**	**Probe:**	**+**
Standard:	**(CE)FCC PART 15 class B_QP**	**Power Source:**	**DC 12V**
Test item:	**Conduction Test**	**Date:**	**2017-5-19**
Temp./Hum.(%RH):	**21.9℃/53%RH**	**Time:**	**11:20:16**
EUT:	**Infotainment headunit**		
Model:	**HONDA JF0T**	**Test Result:**	**Pass**
Note:	**BT1:8DPSK 2402MHz**		



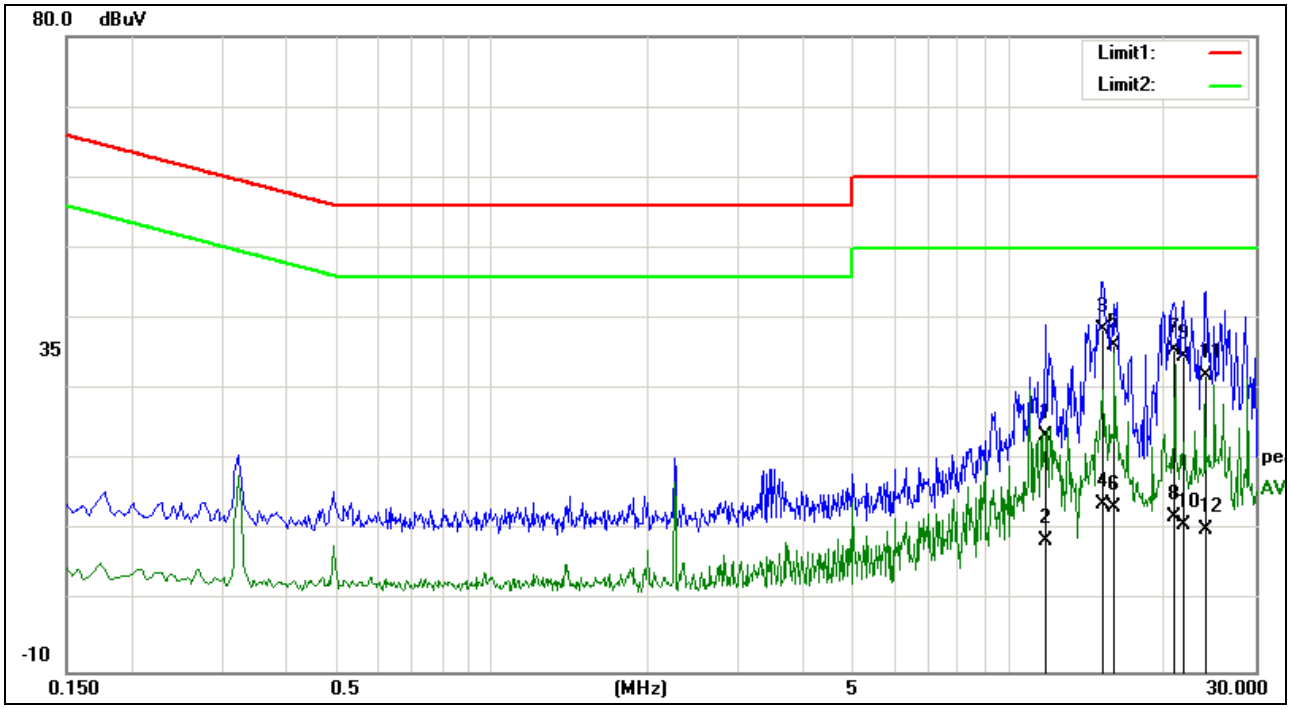
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	11.0009	31.33	6.33	37.66	60.00	-22.34	QP
2	11.0009	27.73	6.33	34.06	50.00	-15.94	AVG
3	12.0003	28.03	6.35	34.38	60.00	-25.62	QP
4	12.0003	23.66	6.35	30.01	50.00	-19.99	AVG
5	14.4005	32.36	6.38	38.74	60.00	-21.26	QP
6	14.4005	29.98	6.38	36.36	50.00	-13.64	AVG
7	15.0013	31.24	6.39	37.63	60.00	-22.37	QP
8	15.0013	28.02	6.39	34.41	50.00	-15.59	AVG
9	20.6408	25.12	6.46	31.58	60.00	-28.42	QP
10	20.6408	20.76	6.46	27.22	50.00	-22.78	AVG
11	24.0009	30.81	6.51	37.32	60.00	-22.68	QP
12	24.0009	25.47	6.51	31.98	50.00	-18.02	AVG

Project No.:	**E201609264085**	**Probe:**	**-**
Standard:	**(CE)FCC PART 15 class B_QP**	**Power Source:**	**DC 12V**
Test item:	**Conduction Test**	**Date:**	**2017-5-19**
Temp./Hum.(%RH):	**21.9℃/53%RH**	**Time:**	**11:25:07**
EUT:	**Infotainment headunit**		
Model:	**HONDA JF0T**	**Test Result:**	**Pass**
Note:	**BT1:8DPSK 2402MHz**		



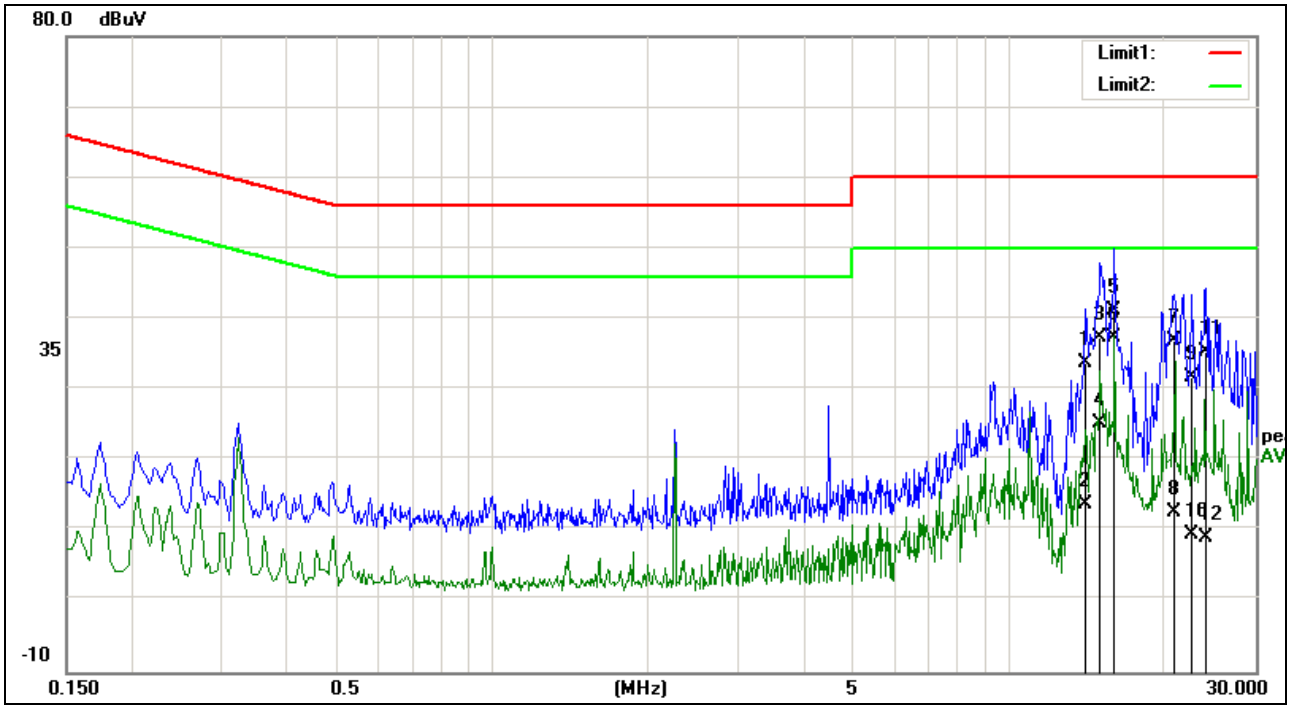
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	11.0004	28.73	6.33	35.06	60.00	-24.94	QP
2	11.0004	25.06	6.33	31.39	50.00	-18.61	AVG
3	14.4008	34.90	6.38	41.28	60.00	-18.72	QP
4	14.4008	32.44	6.38	38.82	50.00	-11.18	AVG
5	15.0016	33.35	6.39	39.74	60.00	-20.26	QP
6	15.0016	30.06	6.39	36.45	50.00	-13.55	AVG
7	20.6808	25.16	6.46	31.62	60.00	-28.38	QP
8	20.6808	20.97	6.46	27.43	50.00	-22.57	AVG
9	24.0016	31.52	6.51	38.03	60.00	-21.97	QP
10	24.0016	26.07	6.51	32.58	50.00	-17.42	AVG
11	28.0007	23.95	6.56	30.51	60.00	-29.49	QP
12	28.0007	19.83	6.56	26.39	50.00	-23.61	AVG

Project No.:	**E201609264085**	**Probe:**	**+**
Standard:	**(CE)FCC PART 15 class B_QP**	**Power Source:**	**DC 12V**
Test item:	**Conduction Test**	**Date:**	**2017-5-19**
Temp./Hum.(%RH):	**21.9℃/53%RH**	**Time:**	**10:57:11**
EUT:	**Infotainment headunit**		
Model:	**HONDA JF0T**	**Test Result:**	**Pass**
Note:	**BT2:8DPSK 2402MHz**		



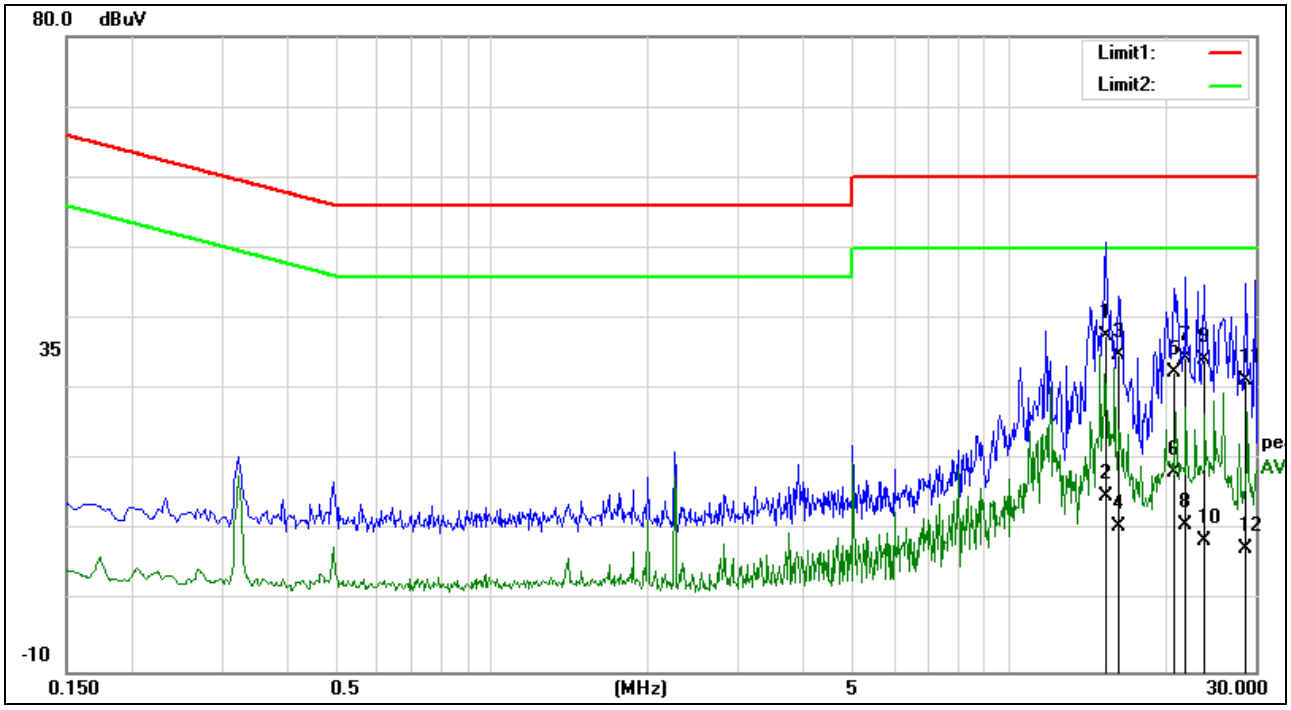
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	11.7739	17.04	6.34	23.38	60.00	-36.62	QP
2	11.7739	2.30	6.34	8.64	50.00	-41.36	AVG
3	15.2027	32.00	6.39	38.39	60.00	-21.61	QP
4	15.2027	7.44	6.39	13.83	50.00	-36.17	AVG
5	16.0783	29.80	6.40	36.20	60.00	-23.80	QP
6	16.0783	6.96	6.40	13.36	50.00	-36.64	AVG
7	20.8814	29.10	6.46	35.56	60.00	-24.44	QP
8	20.8814	5.45	6.46	11.91	50.00	-38.09	AVG
9	21.7223	28.18	6.47	34.65	60.00	-25.35	QP
10	21.7223	4.38	6.47	10.85	50.00	-39.15	AVG
11	24.0350	25.54	6.51	32.05	60.00	-27.95	QP
12	24.0350	3.53	6.51	10.04	50.00	-39.96	AVG

Project No.:	**E201609264085**	**Probe:**	**-**
Standard:	**(CE)FCC PART 15 class B_QP**	**Power Source:**	**DC 12V**
Test item:	**Conduction Test**	**Date:**	**2017-5-19**
Temp./Hum.(%RH):	**21.9℃/53%RH**	**Time:**	**11:02:23**
EUT:	**Infotainment headunit**		
Model:	**HONDA JF0T**	**Test Result:**	**Pass**
Note:	**BT2:8DPSK 2402MHz**		



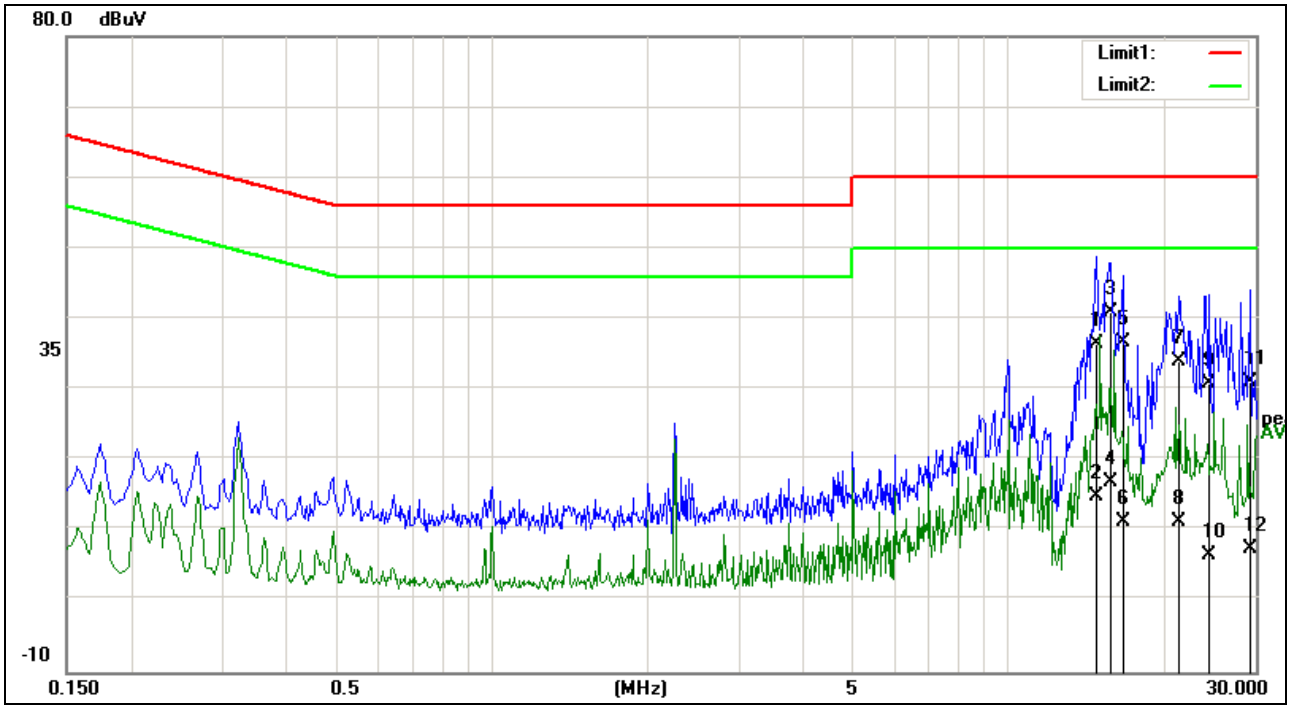
No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	14.1188	27.36	6.38	33.74	60.00	-26.26	QP
2	14.1188	7.44	6.38	13.82	50.00	-36.18	AVG
3	15.0039	31.02	6.39	37.41	60.00	-22.59	QP
4	15.0039	18.82	6.39	25.21	50.00	-24.79	AVG
5	16.0008	34.85	6.40	41.25	60.00	-18.75	QP
6	16.0008	31.00	6.40	37.40	50.00	-12.60	AVG
7	20.8405	30.48	6.46	36.94	60.00	-23.06	QP
8	20.8405	6.25	6.46	12.71	50.00	-37.29	AVG
9	22.6387	25.20	6.49	31.69	60.00	-28.31	QP
10	22.6387	2.89	6.49	9.38	50.00	-40.62	AVG
11	24.1192	28.78	6.51	35.29	60.00	-24.71	QP
12	24.1192	2.61	6.51	9.12	50.00	-40.88	AVG

Project No.:	**E201609264085**	**Probe:**	**+**
Standard:	**(CE)FCC PART 15 class B_QP**	**Power Source:**	**DC 12V**
Test item:	**Conduction Test**	**Date:**	**2017-5-19**
Temp./Hum.(%RH):	**21.9℃/53%RH**	**Time:**	**11:12:24**
EUT:	**Infotainment headunit**		
Model:	**HONDA JF0T**	**Test Result:**	**Pass**
Note:	**BT3:8DPSK 2402MHz**		



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	15.4038	31.09	6.40	37.49	60.00	-22.51	QP
2	15.4038	8.54	6.40	14.94	50.00	-35.06	AVG
3	16.2821	28.42	6.41	34.83	60.00	-25.17	QP
4	16.2821	4.15	6.41	10.56	50.00	-39.44	AVG
5	20.8353	26.04	6.46	32.50	60.00	-27.50	QP
6	20.8353	11.75	6.46	18.21	50.00	-31.79	AVG
7	22.0416	27.93	6.48	34.41	60.00	-25.59	QP
8	22.0416	4.44	6.48	10.92	50.00	-39.08	AVG
9	23.8394	27.68	6.50	34.18	60.00	-25.82	QP
10	23.8394	2.14	6.50	8.64	50.00	-41.36	AVG
11	28.6766	24.64	6.57	31.21	60.00	-28.79	QP
12	28.6766	0.95	6.57	7.52	50.00	-42.48	AVG

Project No.:	**E201609264085**	**Probe:**	**-**
Standard:	**(CE)FCC PART 15 class B_QP**	**Power Source:**	**DC 12V**
Test item:	**Conduction Test**	**Date:**	**2017-5-19**
Temp./Hum.(%RH):	**21.9℃/53%RH**	**Time:**	**11:07:58**
EUT:	**Infotainment headunit**		
Model:	**HONDA JF0T**	**Test Result:**	**Pass**
Note:	**BT3:8DPSK 2402MHz**		



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	14.7958	30.12	6.39	36.51	60.00	-23.49	QP
2	14.7958	8.54	6.39	14.93	50.00	-35.07	AVG
3	15.7583	34.67	6.40	41.07	60.00	-18.93	QP
4	15.7583	10.41	6.40	16.81	50.00	-33.19	AVG
5	16.5991	30.27	6.41	36.68	60.00	-23.32	QP
6	16.5991	4.91	6.41	11.32	50.00	-38.68	AVG
7	21.3603	27.44	6.47	33.91	60.00	-26.09	QP
8	21.3603	4.82	6.47	11.29	50.00	-38.71	AVG
9	24.4556	24.22	6.51	30.73	60.00	-29.27	QP
10	24.4556	0.01	6.51	6.52	50.00	-43.48	AVG
11	29.2872	24.44	6.58	31.02	60.00	-28.98	QP
12	29.2872	0.78	6.58	7.36	50.00	-42.64	AVG

4.8 MAXIMUM PEAK OUTPUT POWER

4.8.1 LIMITS

Regulation 15.247 (b)(1)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. Refer to the result “Hopping channel number” of this document.
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.
The 125 mW limit applies.

4.8.2 TEST PROCEDURES

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 3 MHz. VBW = 3 MHz. Sweep = auto; Detector Function = Peak.
3. Keep the EUT in transmitting at lowest, medium and highest channel individually. Record the max value.

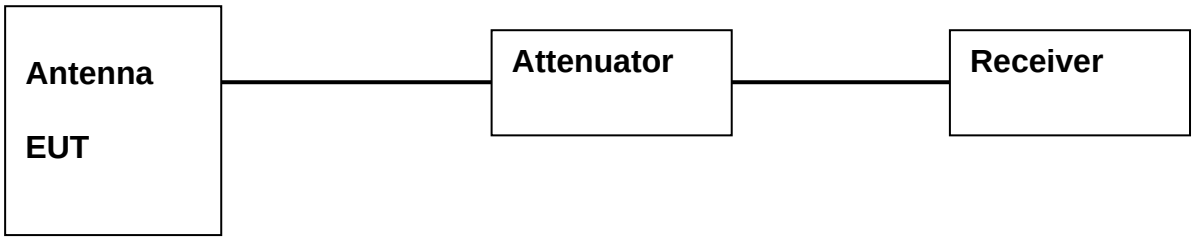
Remark:

BT1:Pre-test the 3 modulation to find GFSK and 8DPSK is worse case, so only record GFSK and 8DPSK test data.

BT2:Pre-test the 3 modulation to find GFSK and 8DPSK is worse case, so only record GFSK and 8DPSK test data.

BT3:Pre-test the 3 modulation to find GFSK and 8DPSK is worse case, so only record GFSK and 8DPSK test data.

4.8.3 TEST SETUP



4.8.4 TEST RESULTS

BT1:
For GFSK:

Test Channel	Fundamental Frequency (GHz)	Max Output Power(dBm)	Limit (dBm)	Pass/Fail
Lowest	2.402	-10.53	20.97	**Pass**
Middle	2.441	-10.11	20.97	**Pass**
Highest	2.480	-10.46	20.97	**Pass**

For 8DPSK:

Test Channel	Fundamental Frequency (GHz)	Max Output Power(dBm)	Limit (dBm)	Pass/Fail
Lowest	2.402	-11.34	20.97	**Pass**
Middle	2.441	-10.84	20.97	**Pass**
Highest	2.480	-11.32	20.97	**Pass**

BT2:
For GFSK:

Test Channel	Fundamental Frequency (GHz)	Max Output Power(dBm)	Limit (dBm)	Pass/Fail
Lowest	2.402	3.18	20.97	**Pass**
Middle	2.441	3.75	20.97	**Pass**
Highest	2.480	4.08	20.97	**Pass**

For 8DPSK:

Test Channel	Fundamental Frequency (GHz)	Max Output Power(dBm)	Limit (dBm)	Pass/Fail
Lowest	2.402	2.84	20.97	**Pass**
Middle	2.441	3.24	20.97	**Pass**
Highest	2.480	3.39	20.97	**Pass**

BT3:
For GFSK:

Test Channel	Fundamental Frequency (GHz)	Max Output Power(dBm)	Limit (dBm)	Pass/Fail
Lowest	2.402	3.27	20.97	**Pass**
Middle	2.441	3.89	20.97	**Pass**
Highest	2.480	4.24	20.97	**Pass**

For 8DPSK:

Test Channel	Fundamental Frequency (GHz)	Max Output Power(dBm)	Limit (dBm)	Pass/Fail
Lowest	2.402	2.96	20.97	**Pass**
Middle	2.441	3.43	20.97	**Pass**
Highest	2.480	3.66	20.97	**Pass**

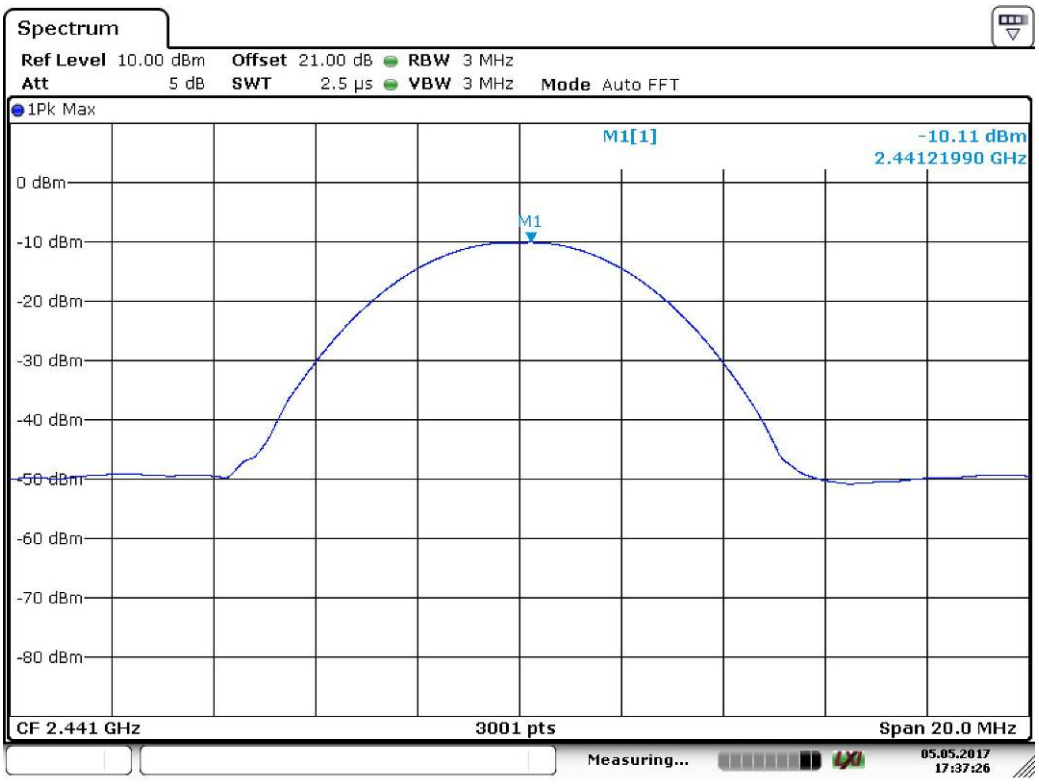
Test result: The unit does meet the FCC requirements.
Test result plot as follows:

BT1:

GFSK Lowest Channel:

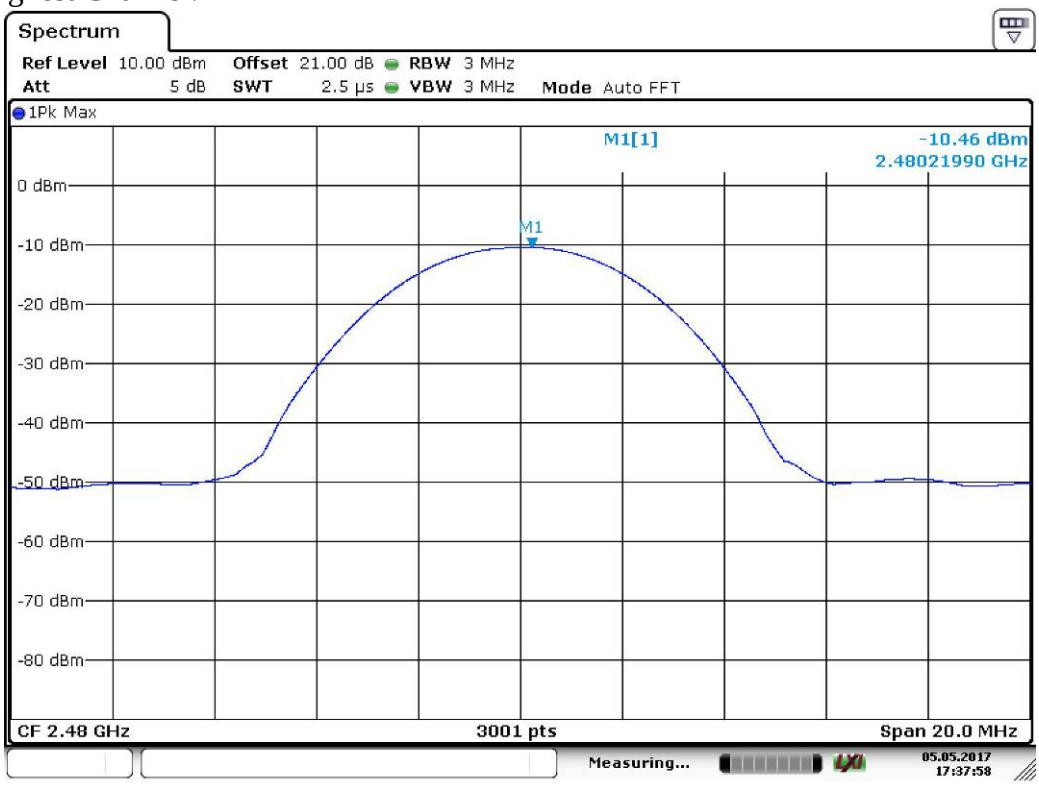
Date: 5.MAY.2017 17:36:39

GFSK Middle Channel:



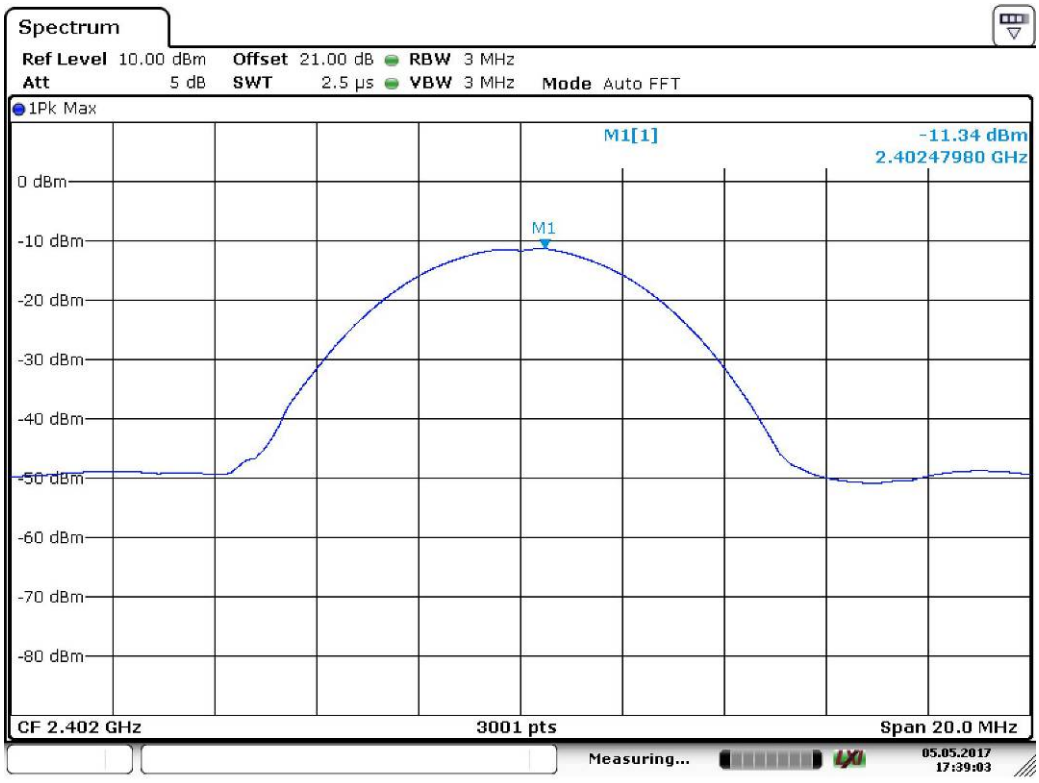
Date: 5.MAY.2017 17:37:27

GFSK Highest Channel:



Date: 5.MAY.2017 17:37:58

8DPSK Lowest Channel:



Date: 5.MAY.2017 17:39:02

8DPSK Middle Channel:

Date: 5.MAY.2017 17:39:48

8DPSK Highest Channel:

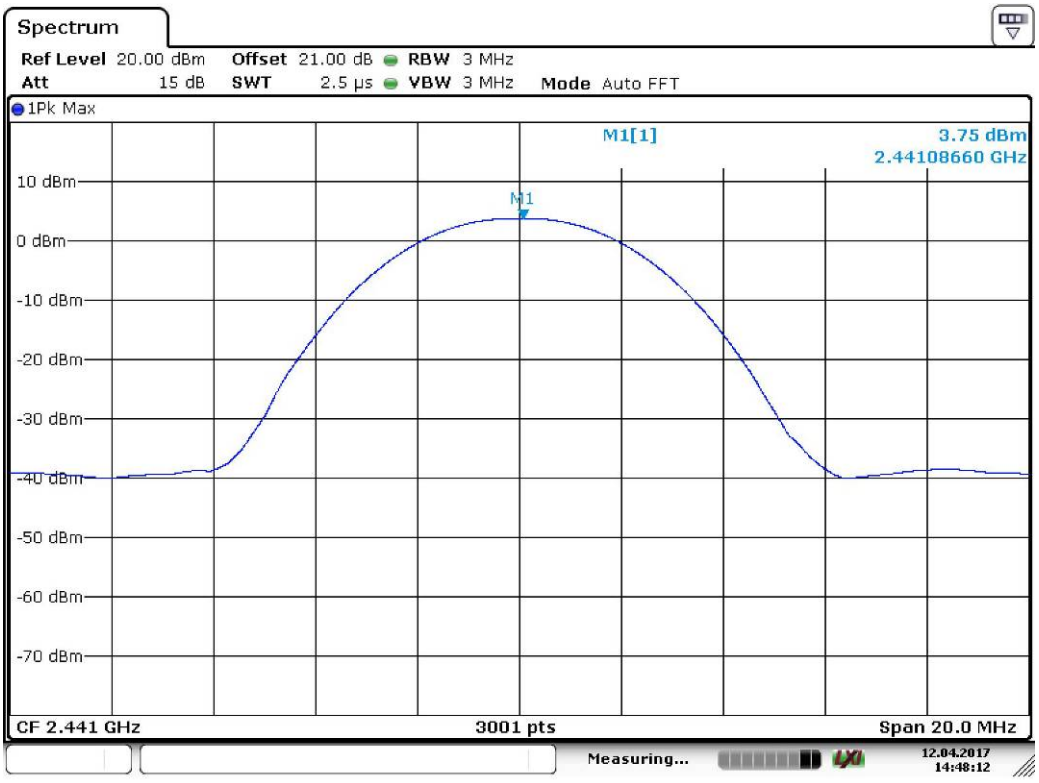
Date: 5.MAY.2017 17:40:27

BT2:

GFSK Lowest Channel:

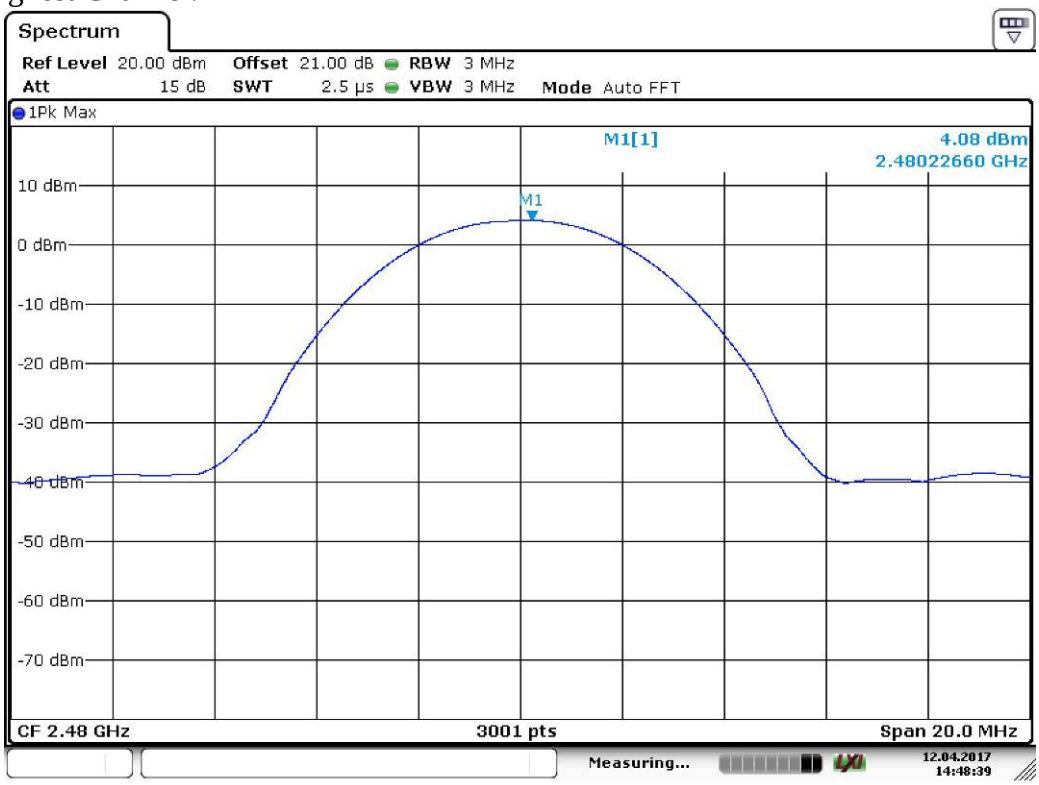
Date: 12.APR.2017 14:47:27

GFSK Middle Channel:



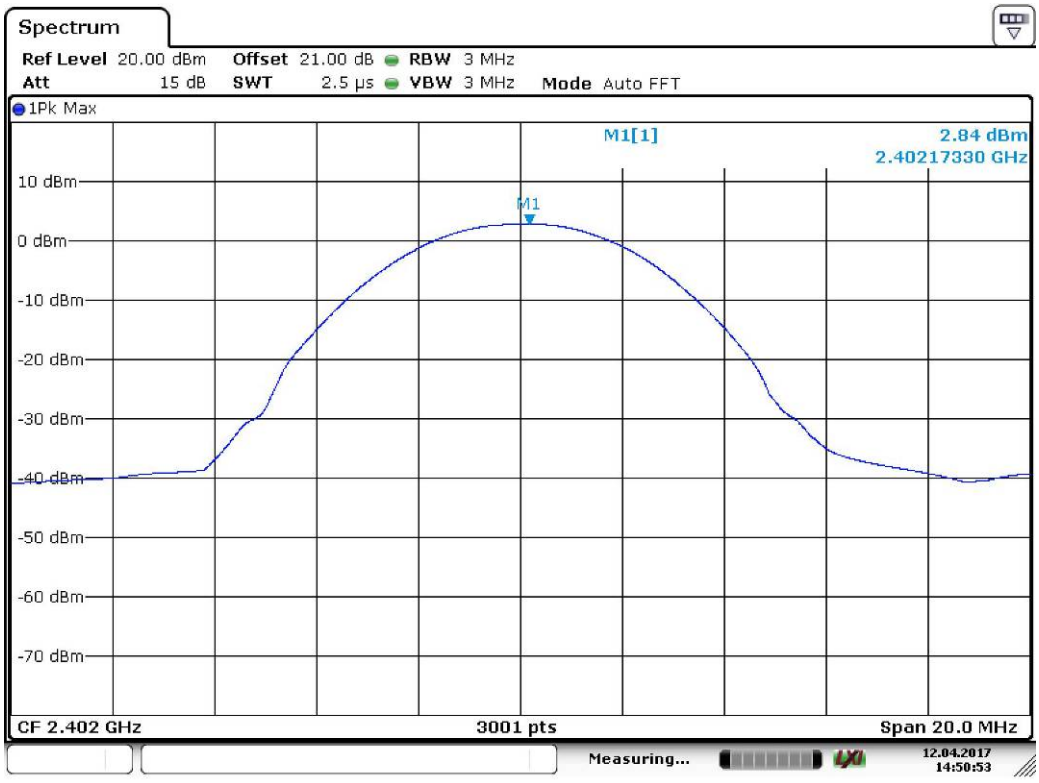
Date: 12.APR.2017 14:48:12

GFSK Highest Channel:



Date: 12.APR.2017 14:48:40

8DPSK Lowest Channel:



Date: 12.APR.2017 14:50:53