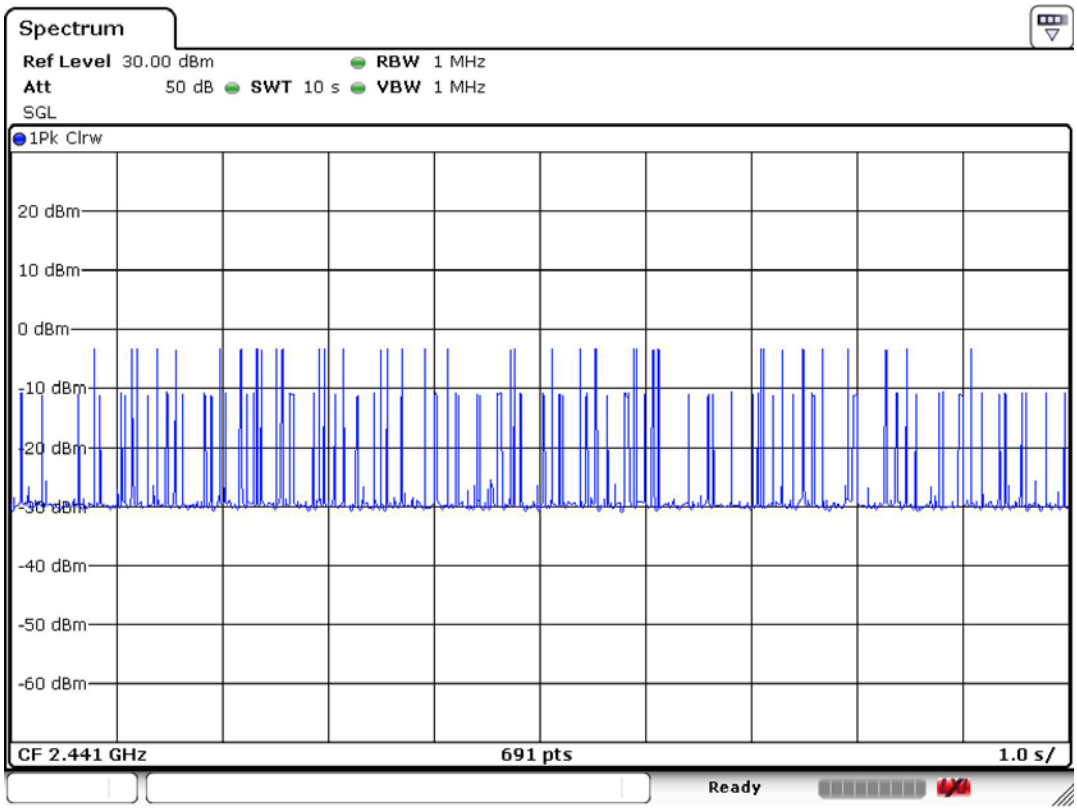
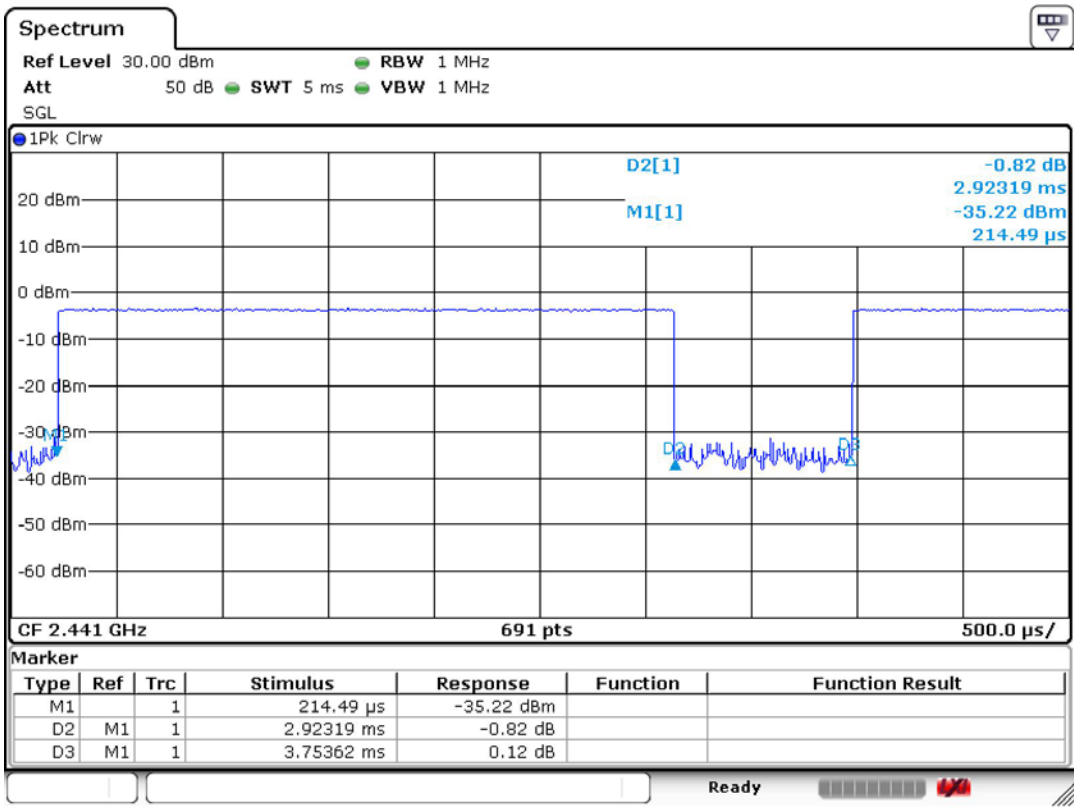
Test Mode : BT (1Mbps) DH5 Channel : 2441

Average Number of Pulses Per sec

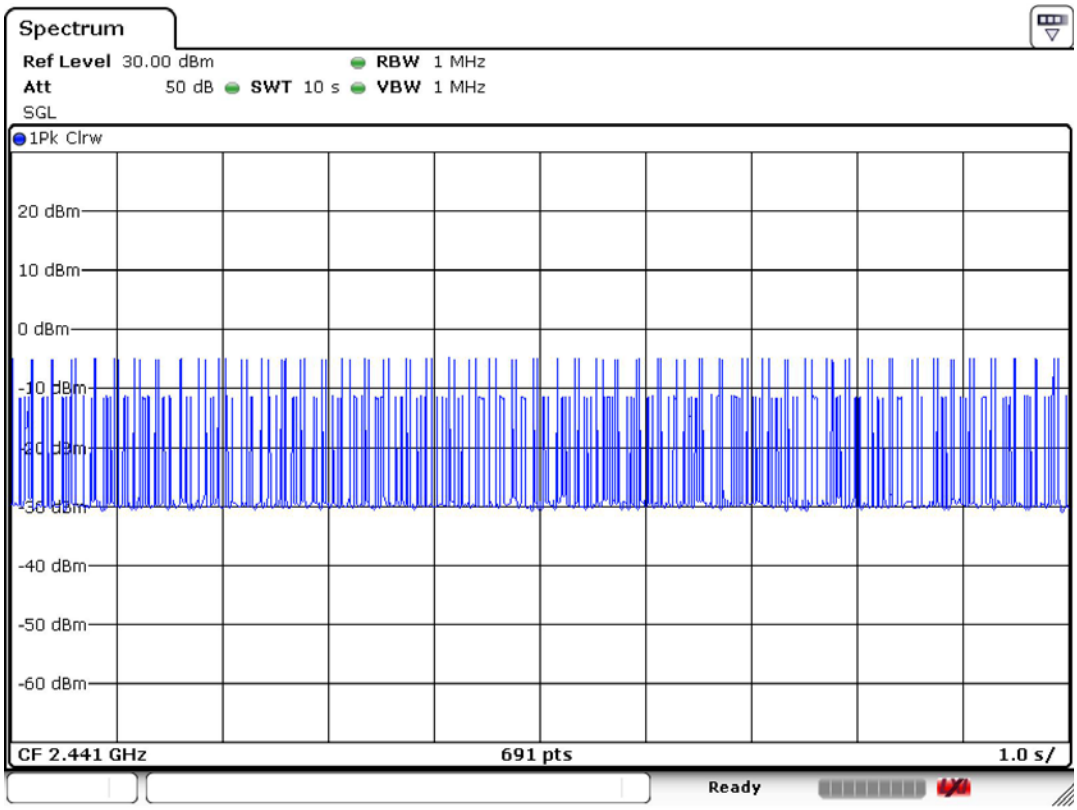


Pulse Width (sec)

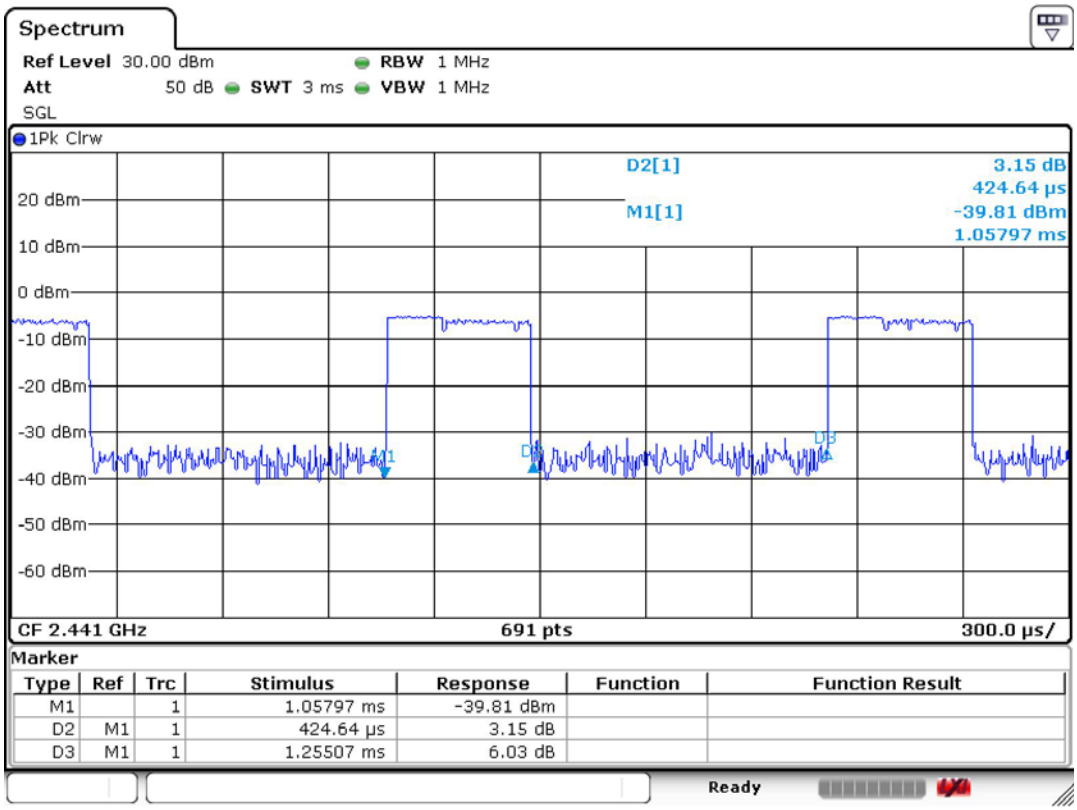


Test Mode : BT EDR (2Mbps) DH1 Channel : 2441

Average Number of Pulses Per sec

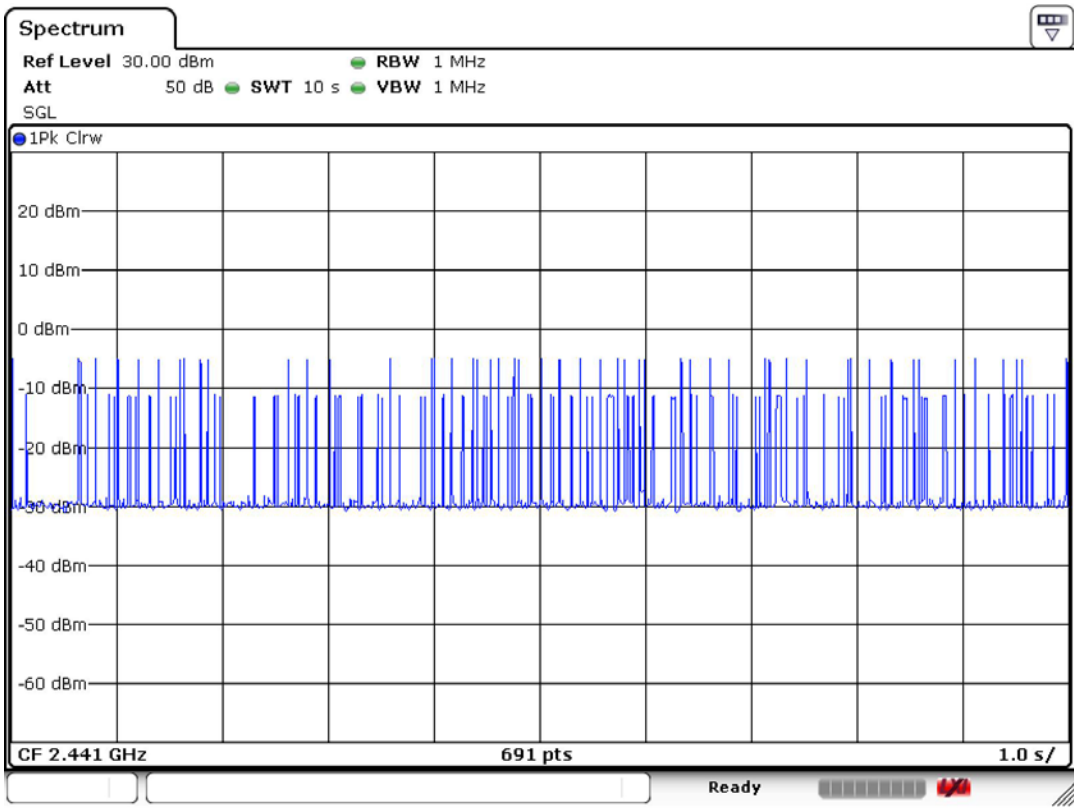


Pulse Width (sec)

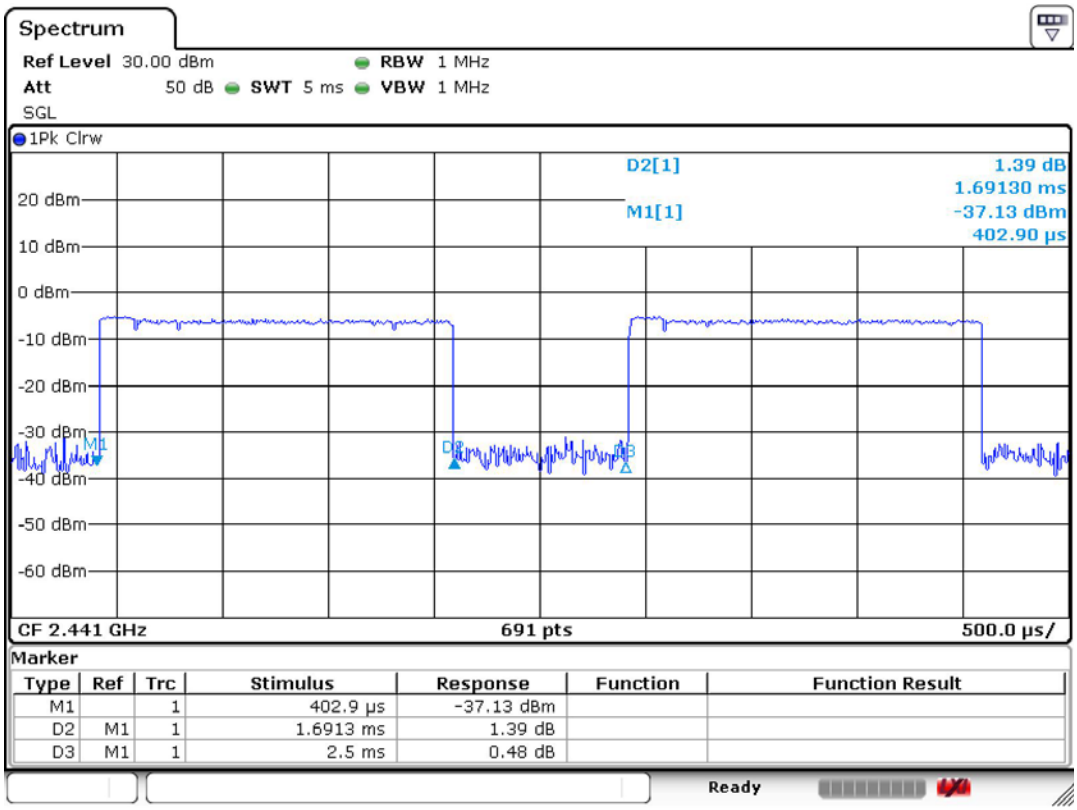


Test Mode : BT EDR (2Mbps) DH3 Channel : 2441

Average Number of Pulses Per sec

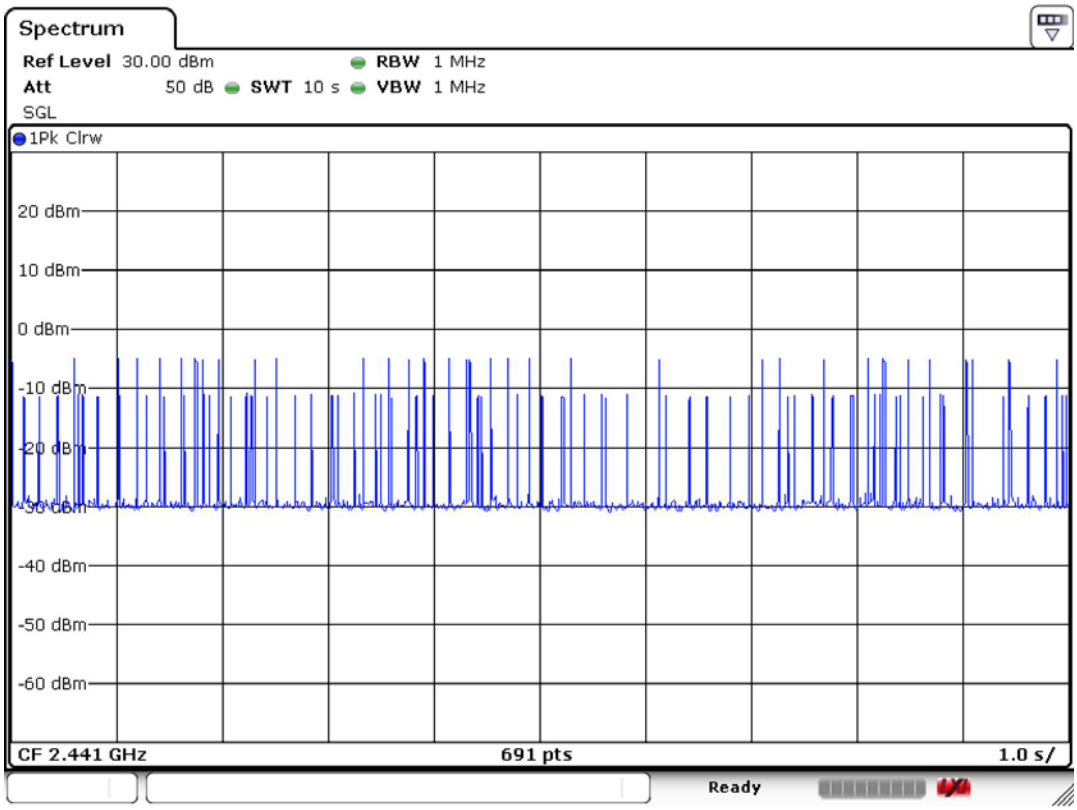


Pulse Width (sec)

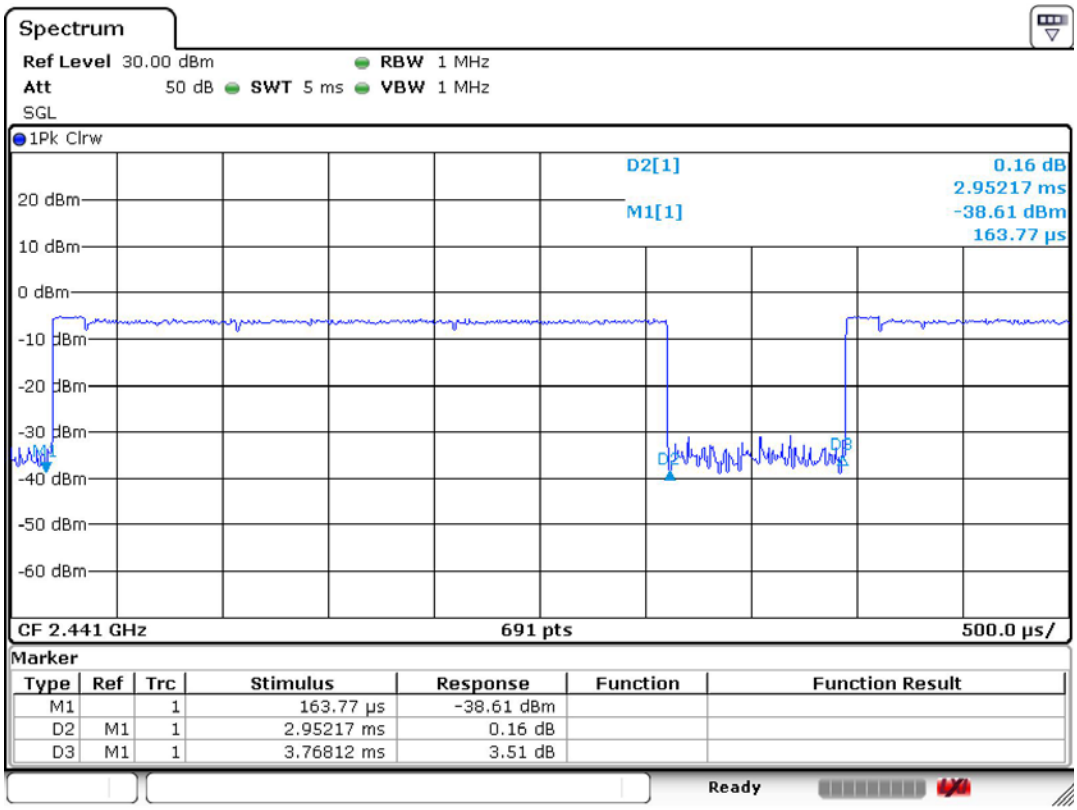


Test Mode : BT EDR (2Mbps) DH5 Channel : 2441

Average Number of Pulses Per sec

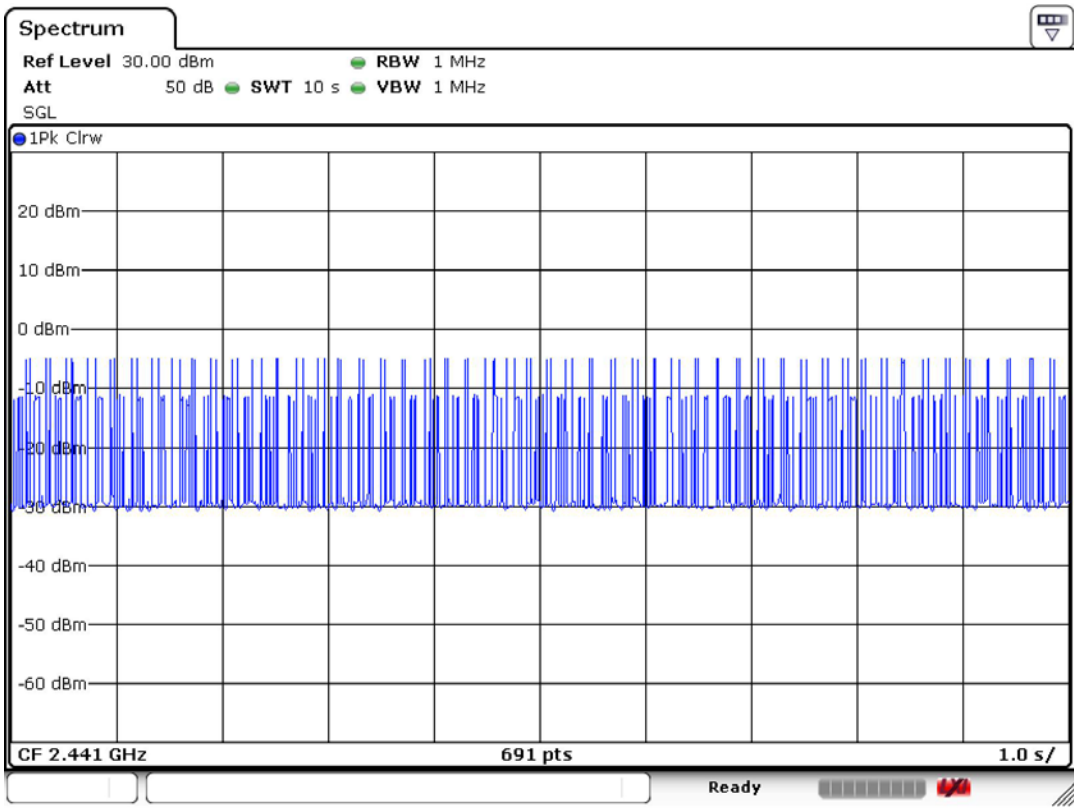


Pulse Width (sec)

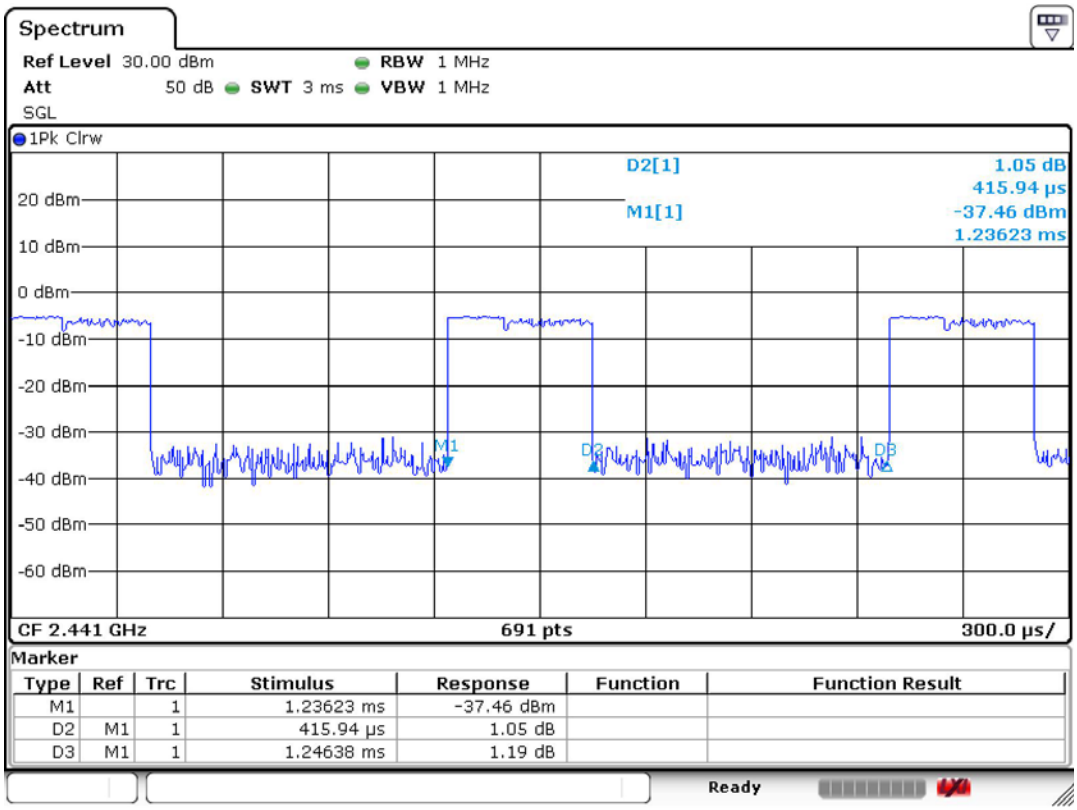


Test Mode : BT EDR (3Mbps) DH1 Channel : 2441

Average Number of Pulses Per sec

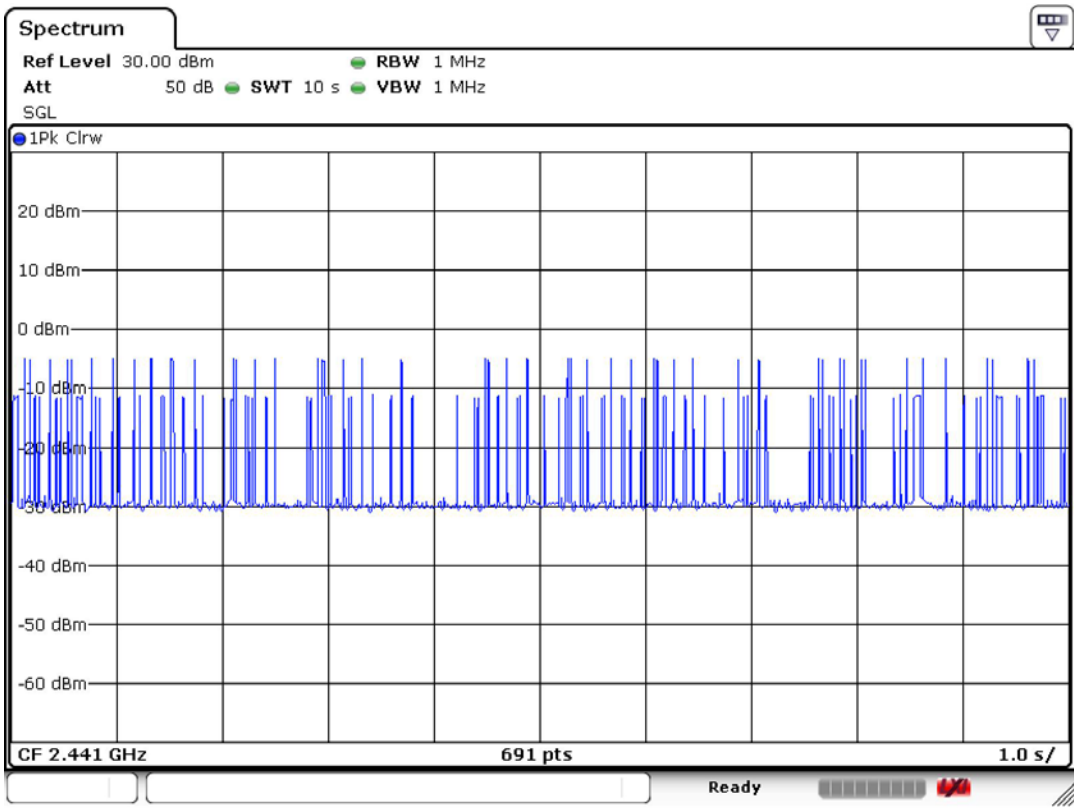


Pulse Width (sec)

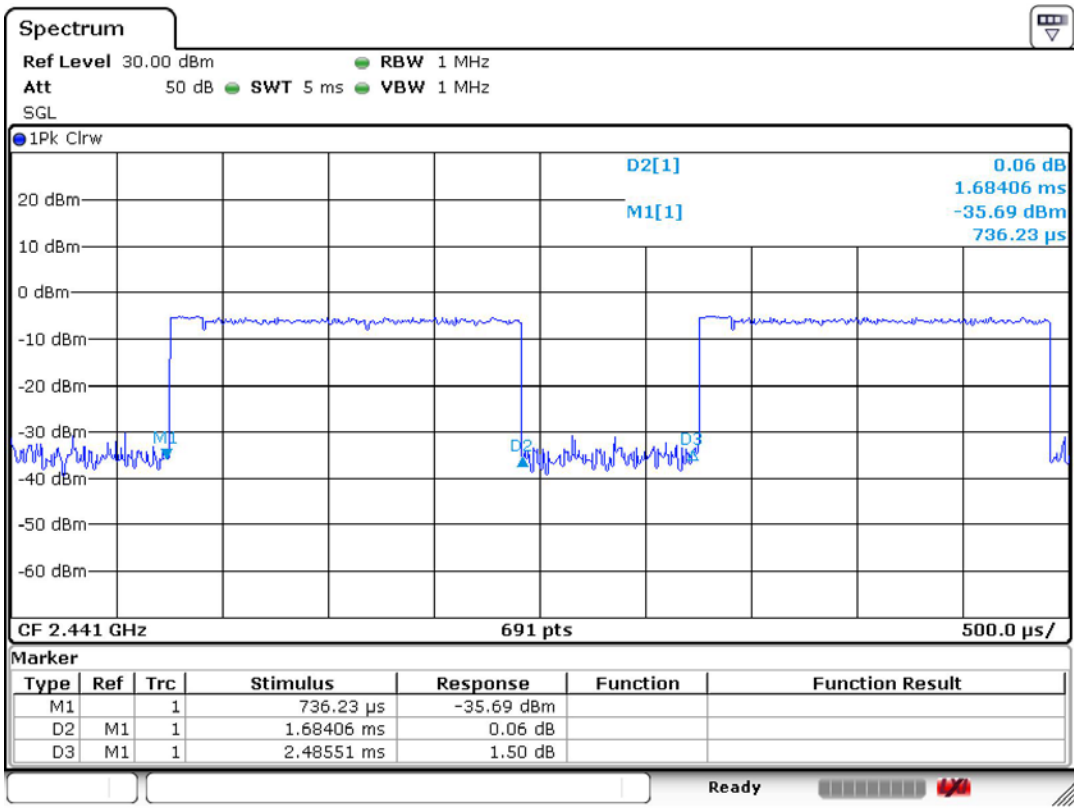


Test Mode : BT EDR (3Mbps) DH3 Channel : 2441

Average Number of Pulses Per sec

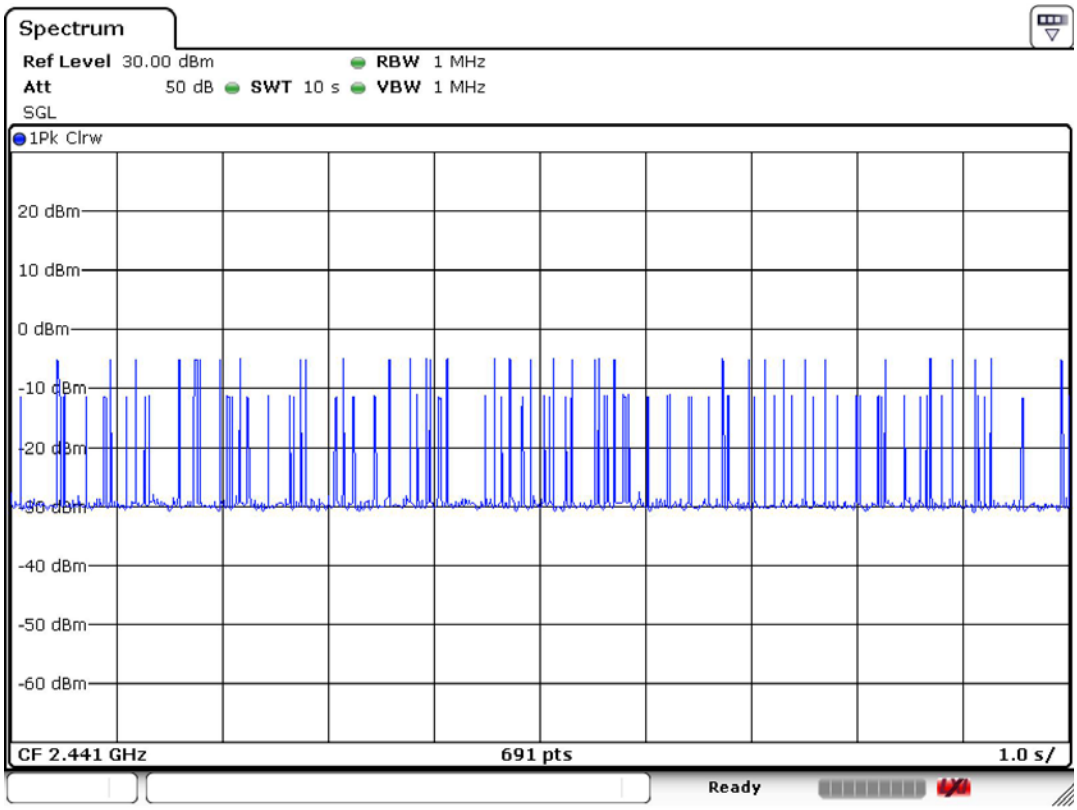


Pulse Width (sec)

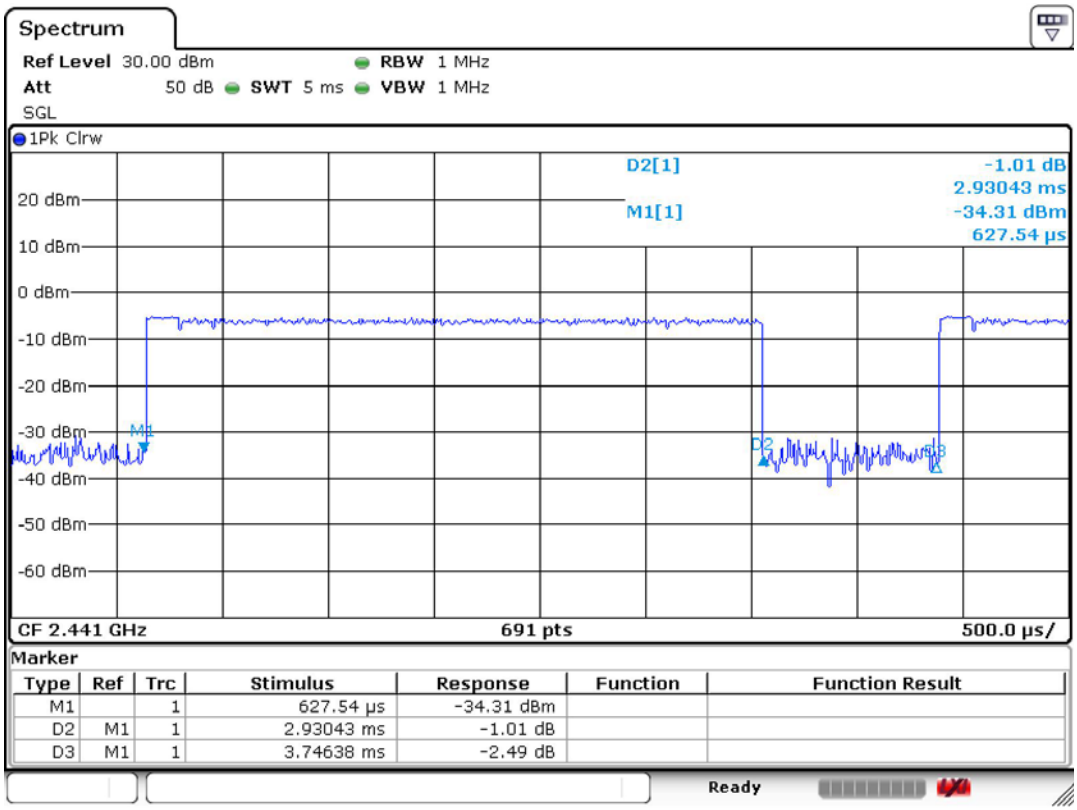


Test Mode : BT EDR (3Mbps) DH5 Channel : 2441

Average Number of Pulses Per sec

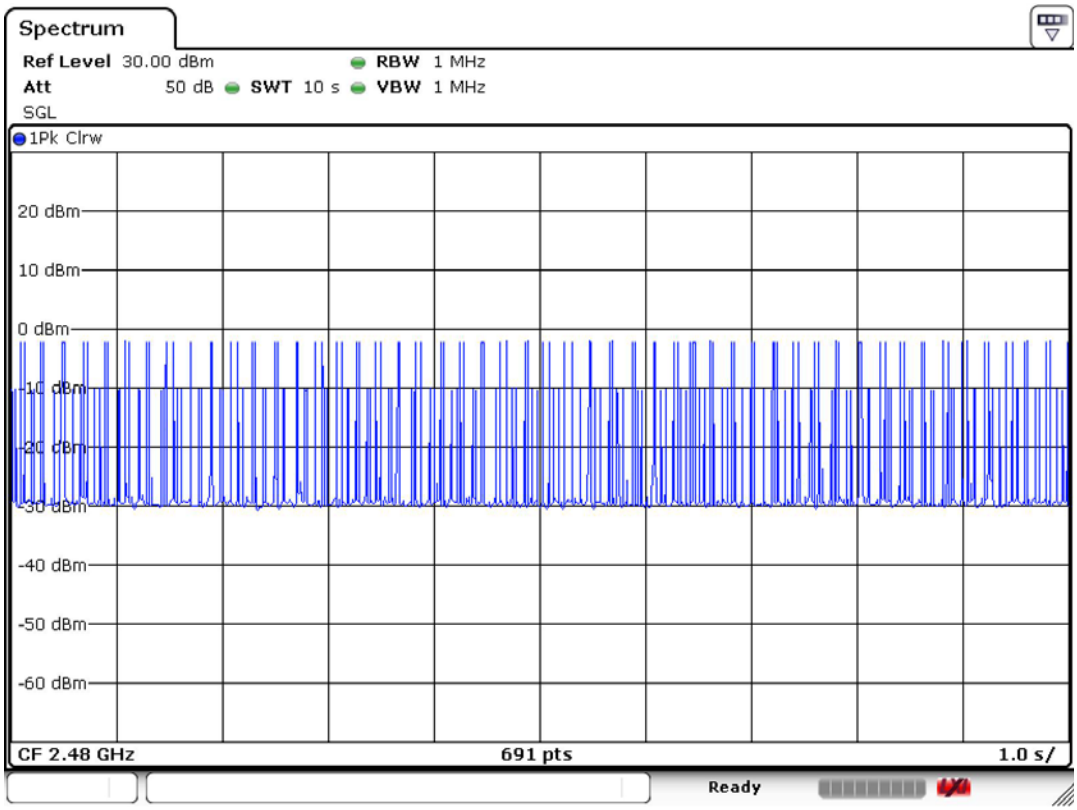


Pulse Width (sec)

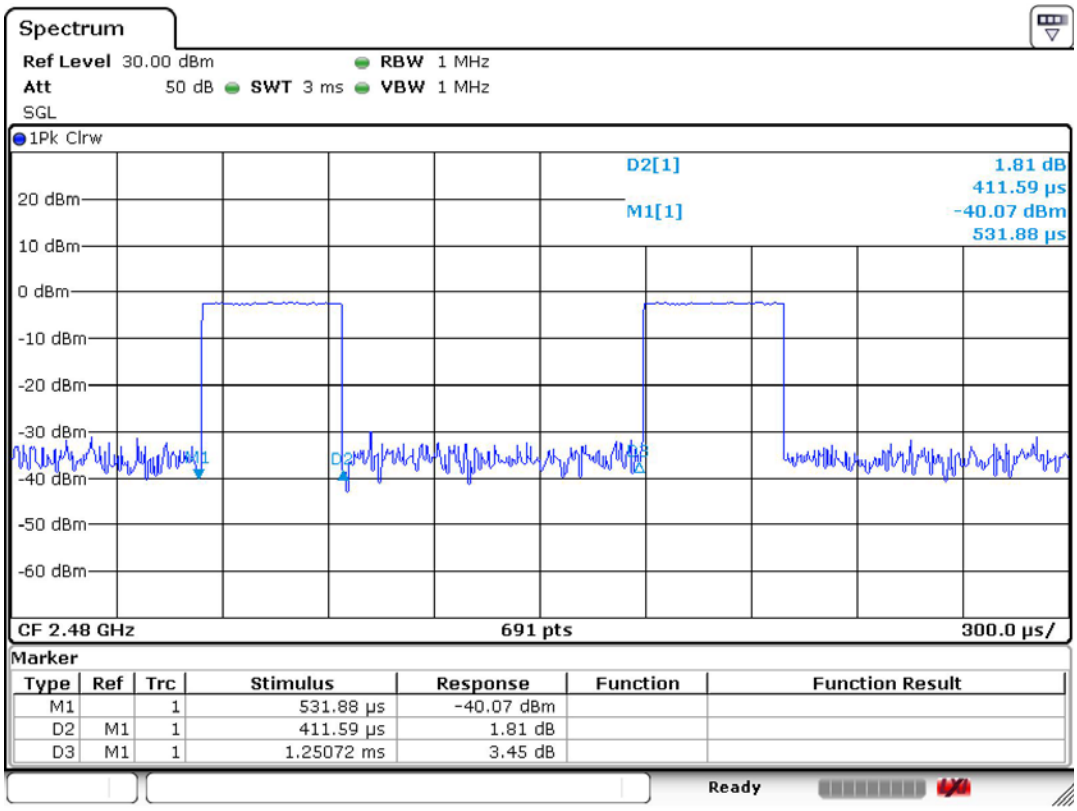


Temperature	:	22℃	Humidity	:	51%
Test Date	:	14-Jan-2014	Tested by	:	Kidd Liao
Test Mode	:	BT (1Mbps) DH1	Channel	:	2480

Average Number of Pulses Per sec

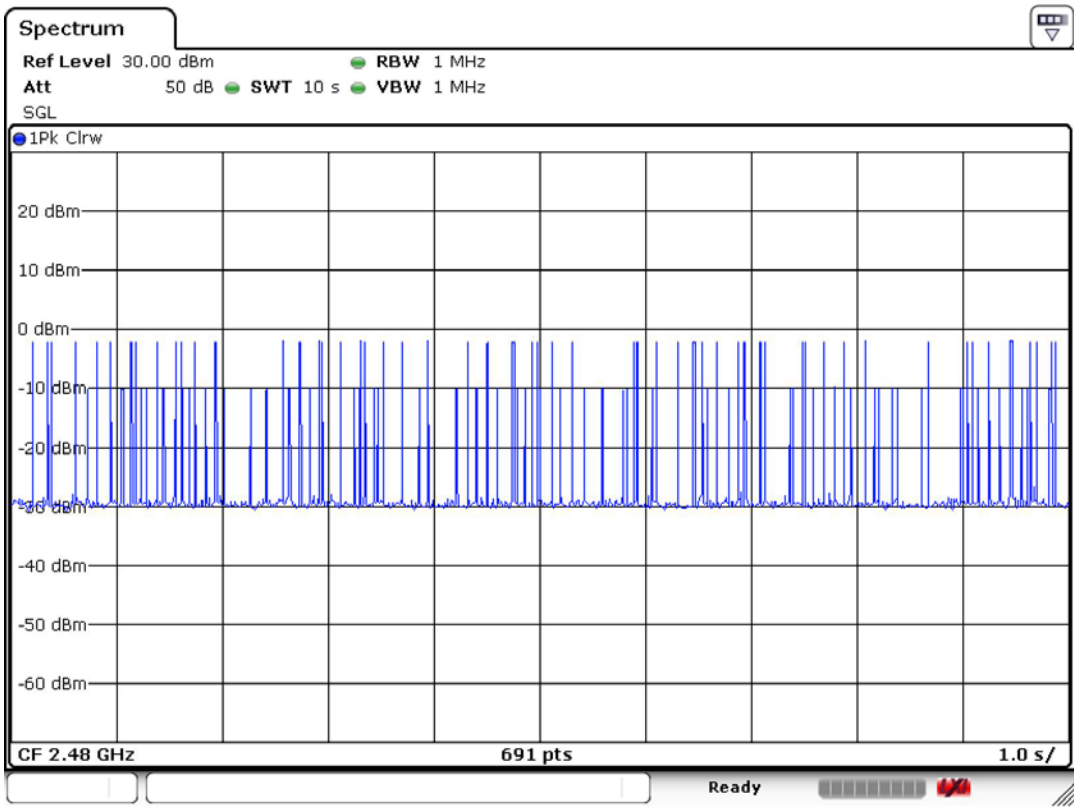


Pulse Width (sec)

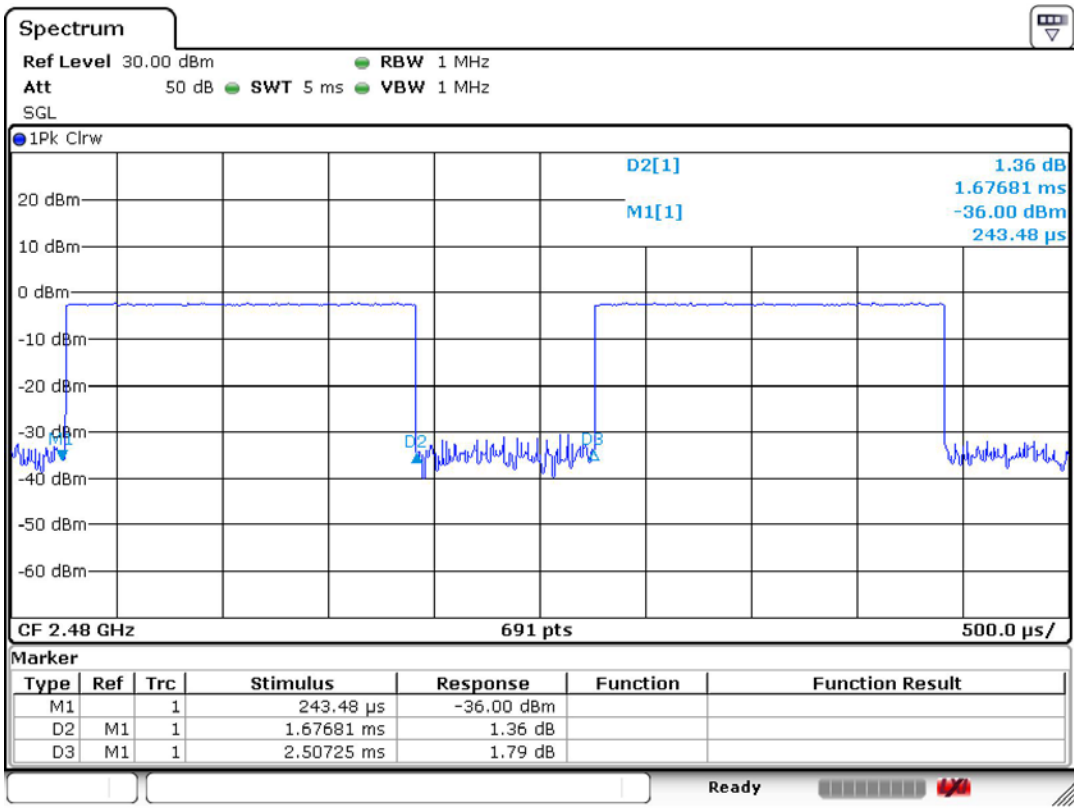


Test Mode : BT (1Mbps) DH3 Channel : 2480

Average Number of Pulses Per sec

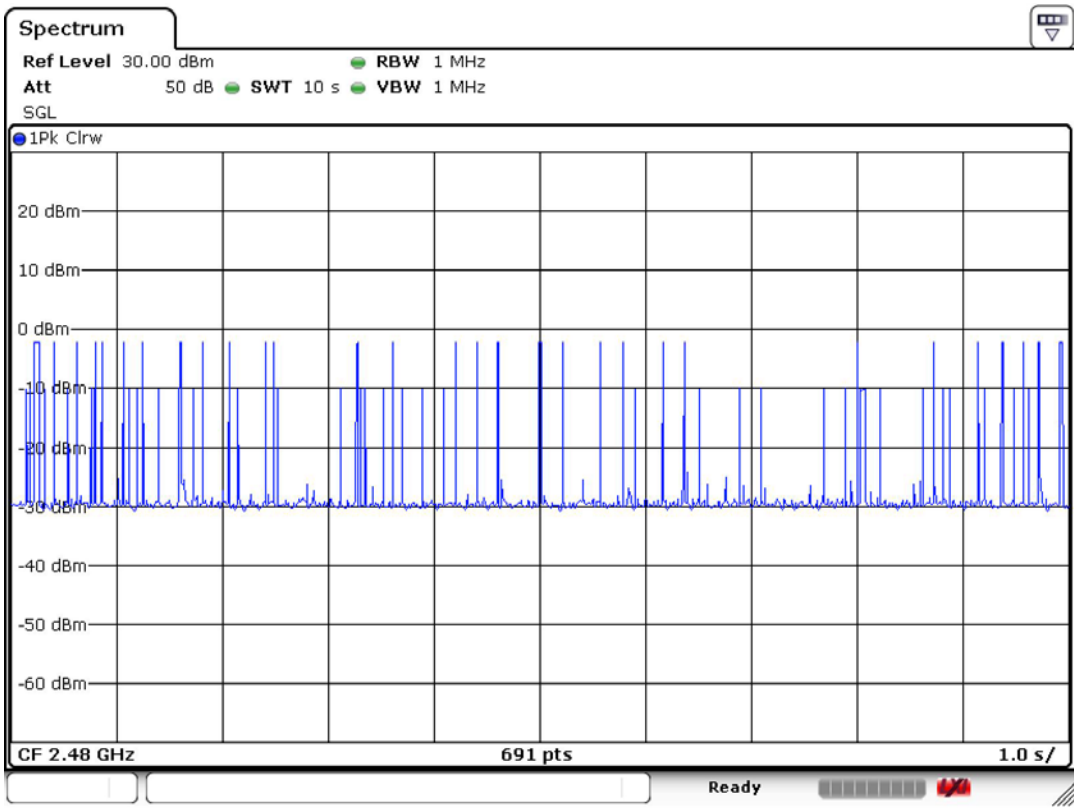


Pulse Width (sec)

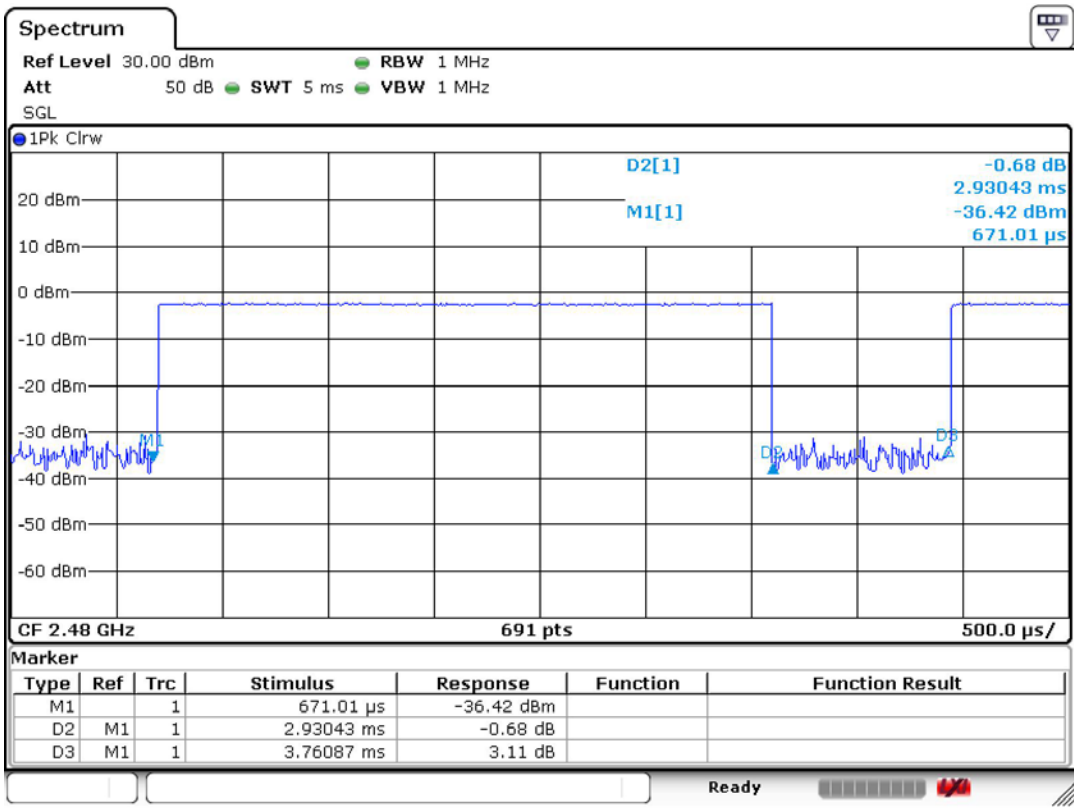


Test Mode : BT (1Mbps) DH5 Channel : 2480

Average Number of Pulses Per sec

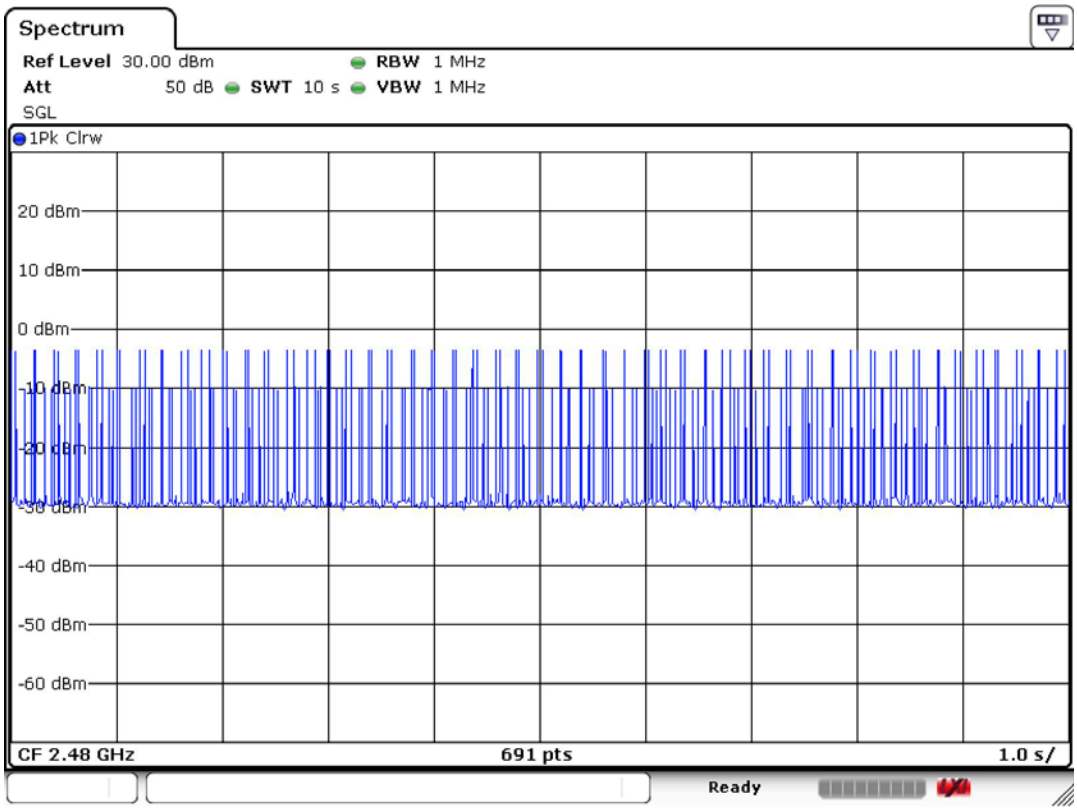


Pulse Width (sec)

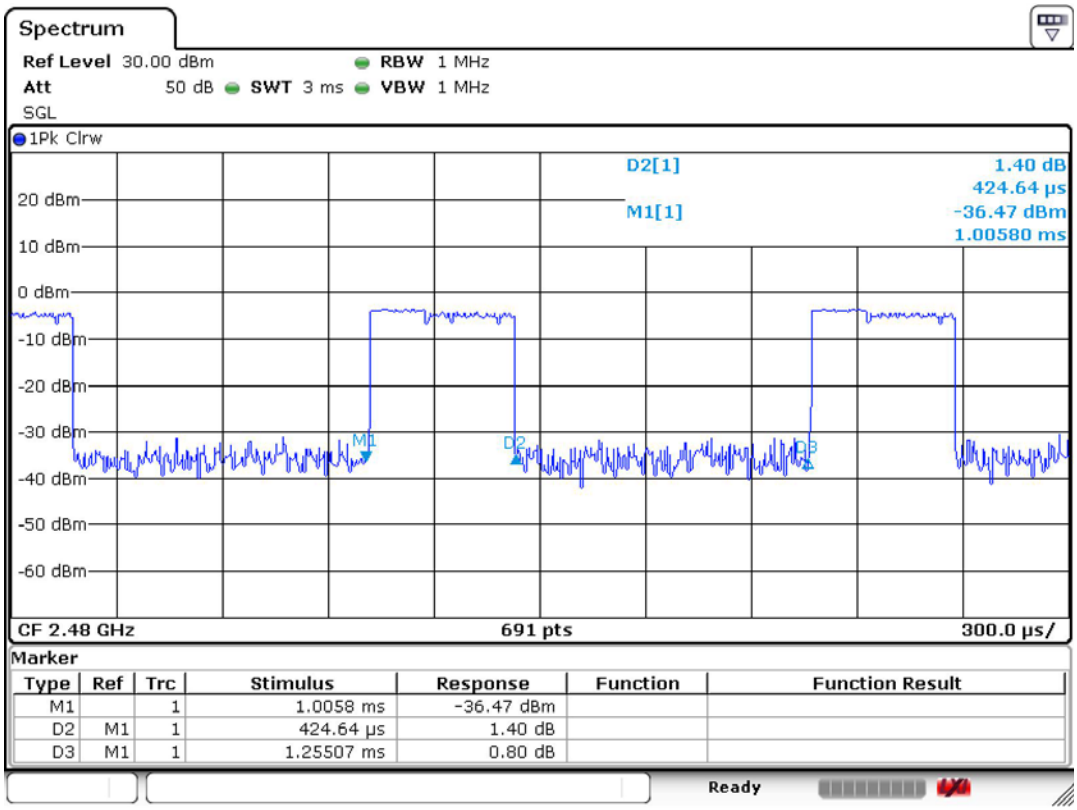


Test Mode : BT EDR (2Mbps) DH1 Channel : 2480

Average Number of Pulses Per sec

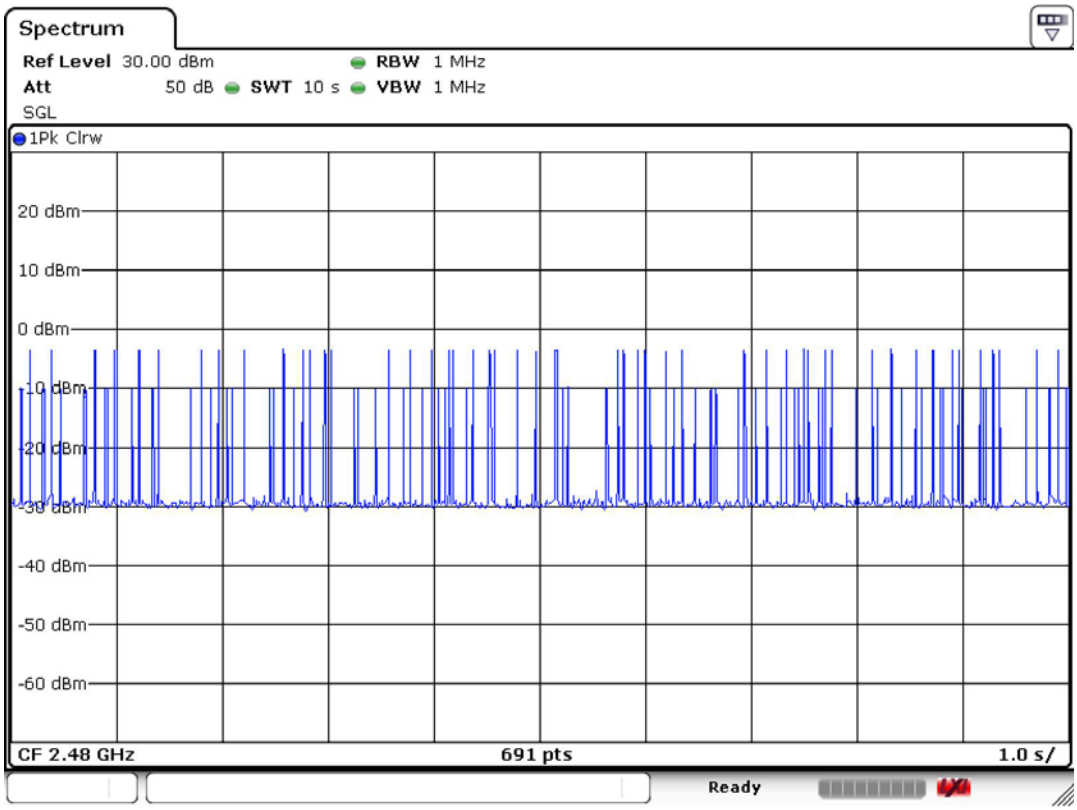


Pulse Width (sec)

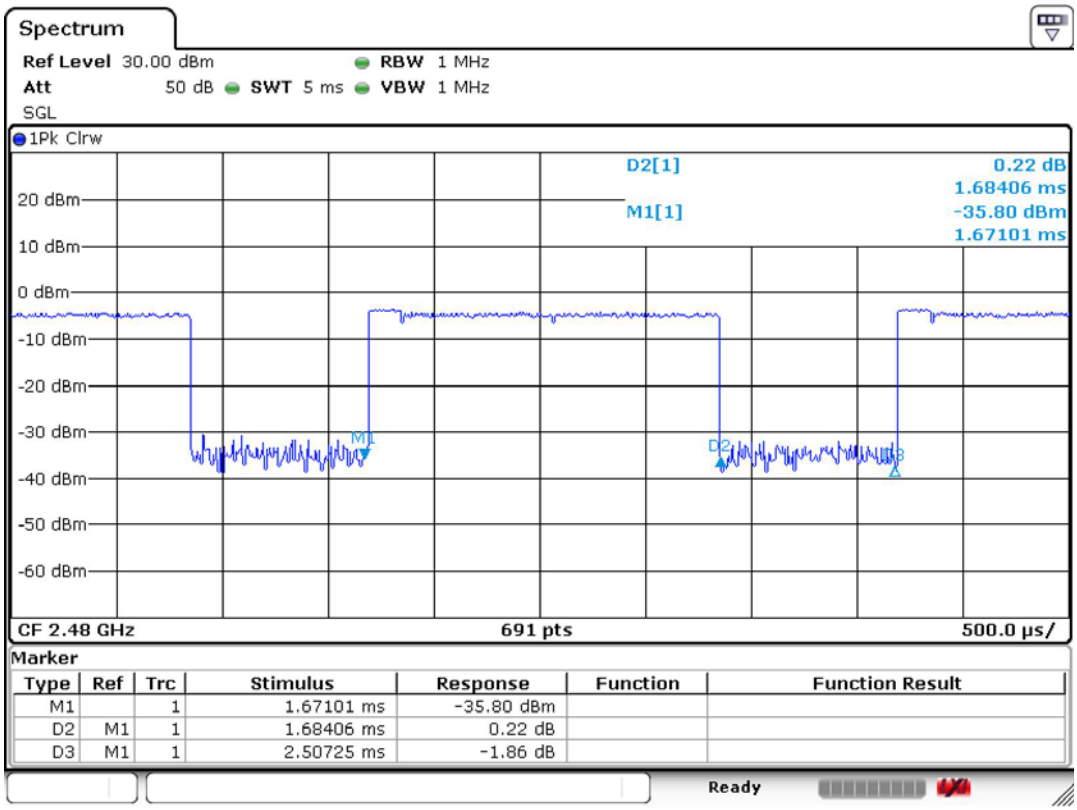


Test Mode : BT EDR (2Mbps) DH3 Channel : 2480

Average Number of Pulses Per sec

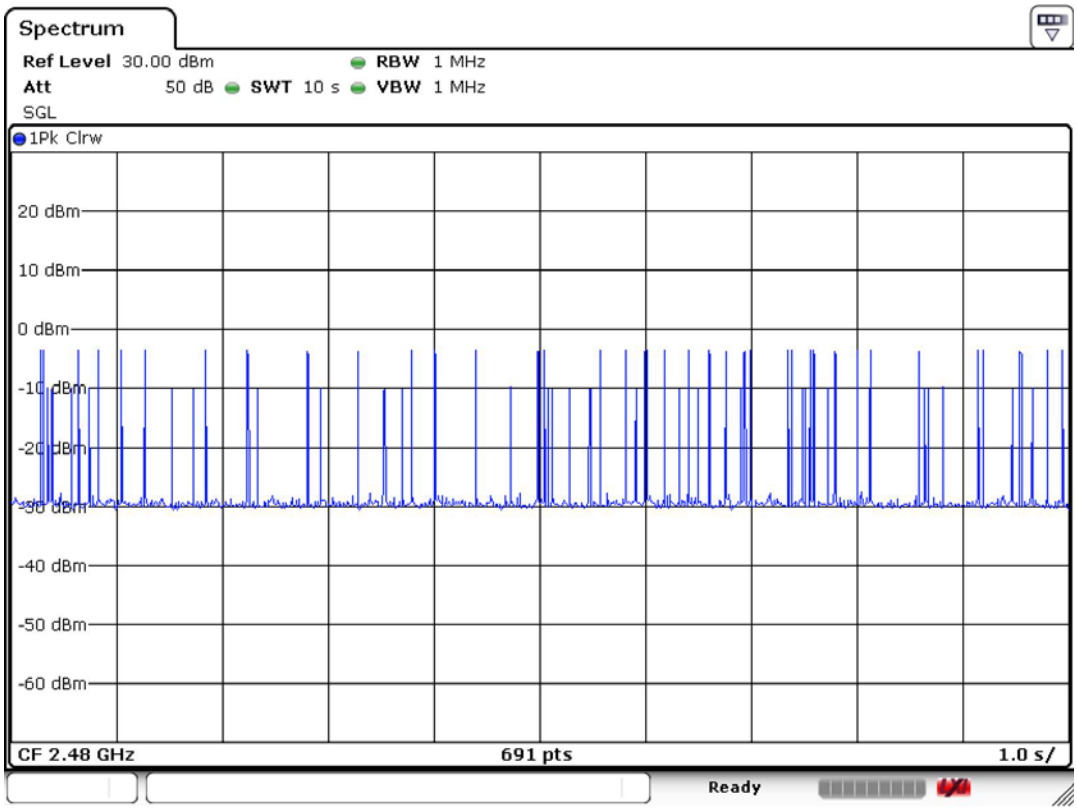


Pulse Width (sec)

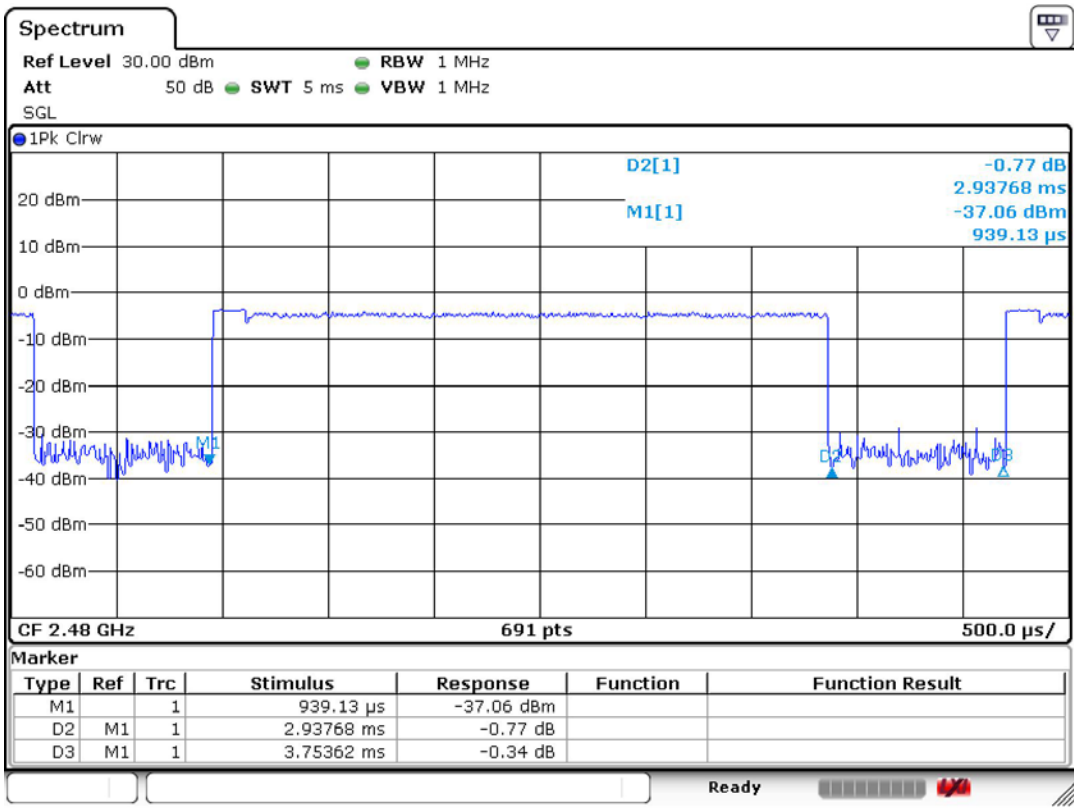


Test Mode : BT EDR (2Mbps) DH5 Channel : 2480

Average Number of Pulses Per sec

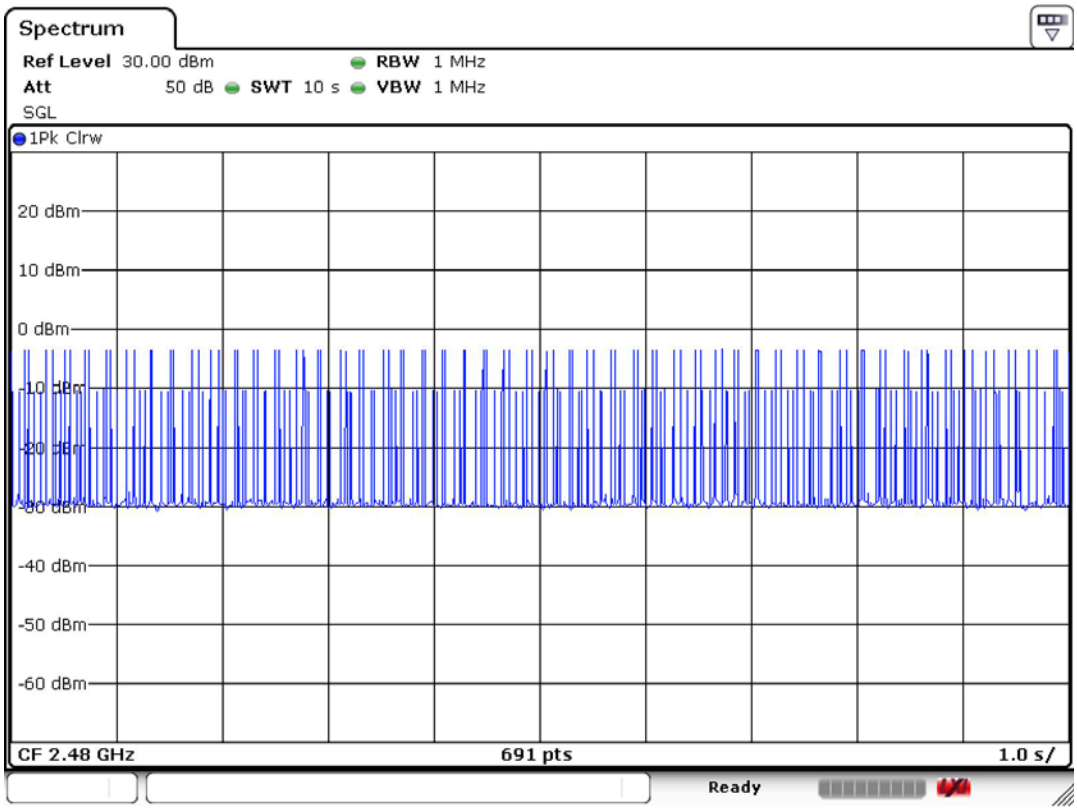


Pulse Width (sec)

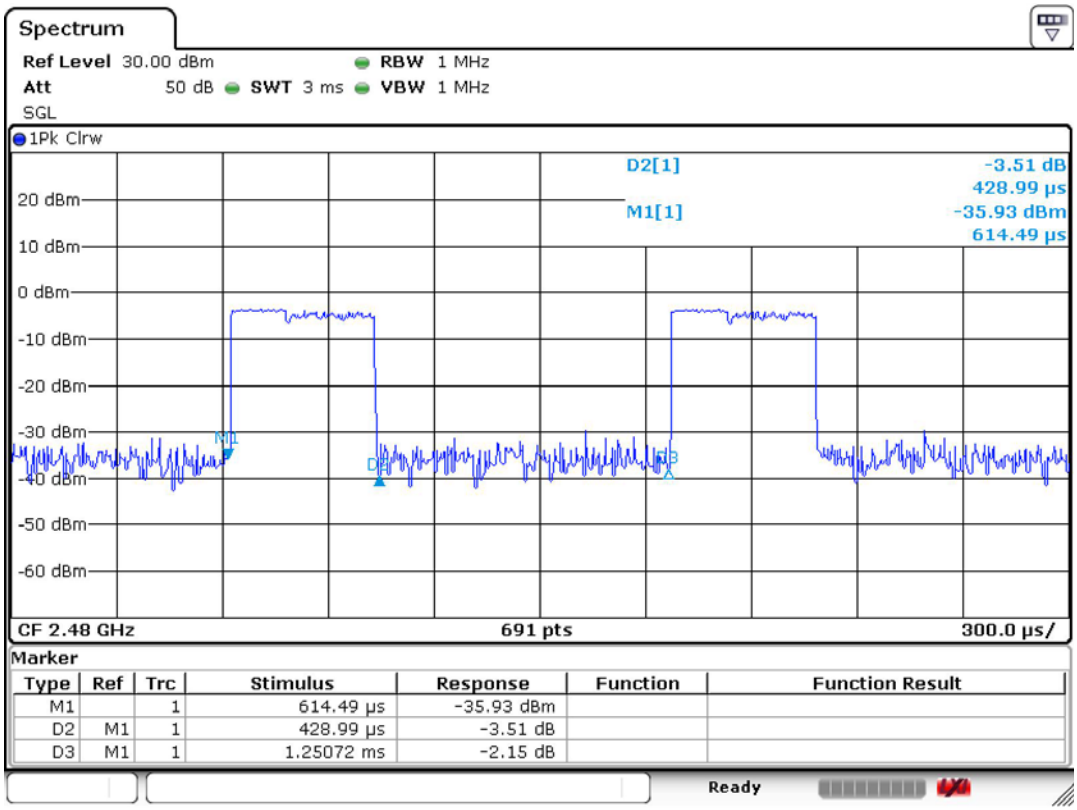


Test Mode : BT EDR (3Mbps) DH1 Channel : 2480

Average Number of Pulses Per sec

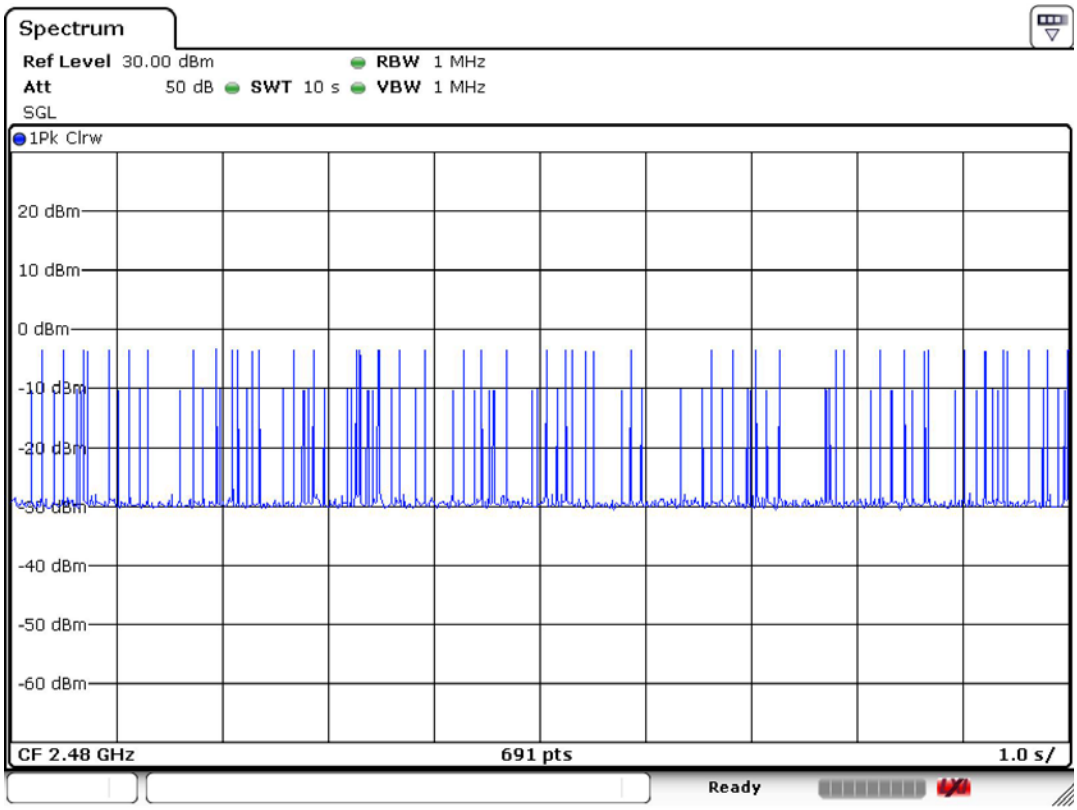


Pulse Width (sec)

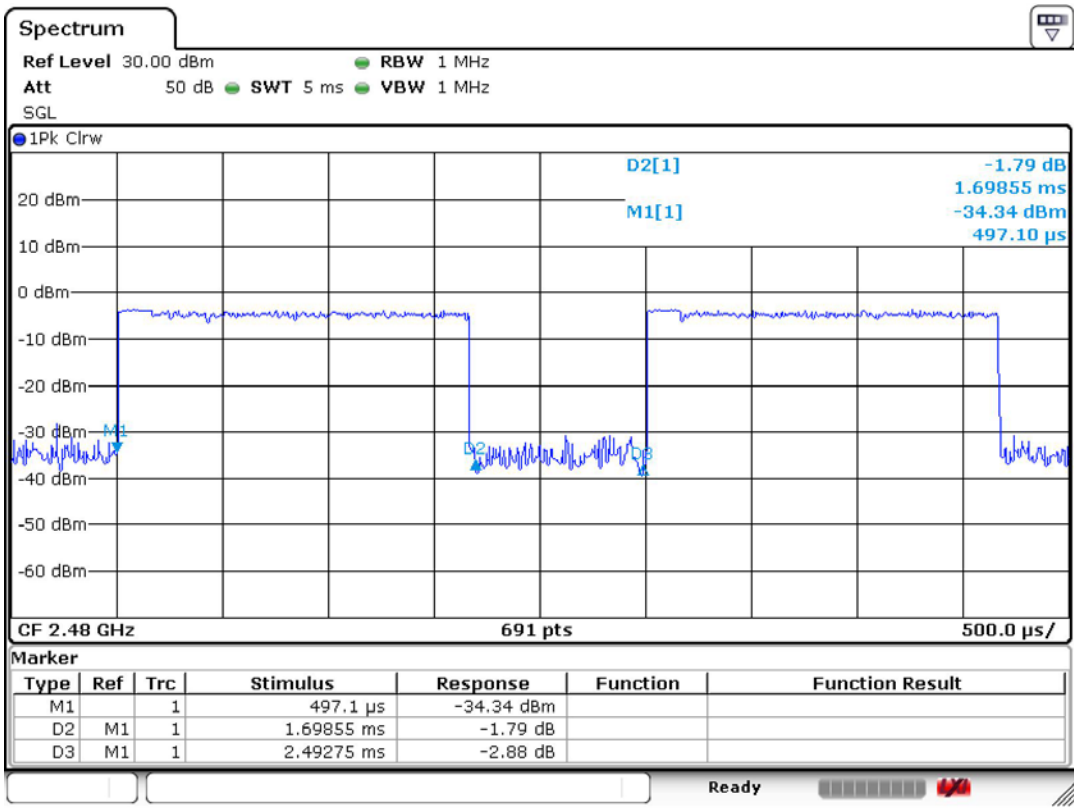


Test Mode : BT EDR (3Mbps) DH3 Channel : 2480

Average Number of Pulses Per sec

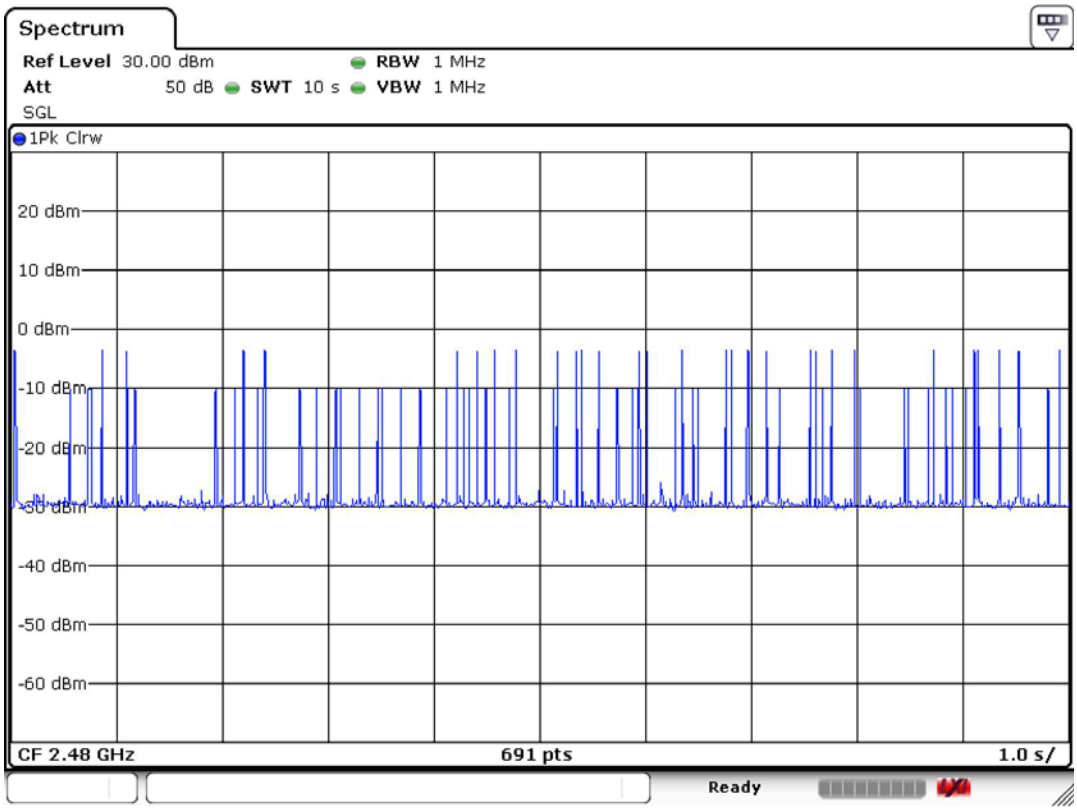


Pulse Width (sec)

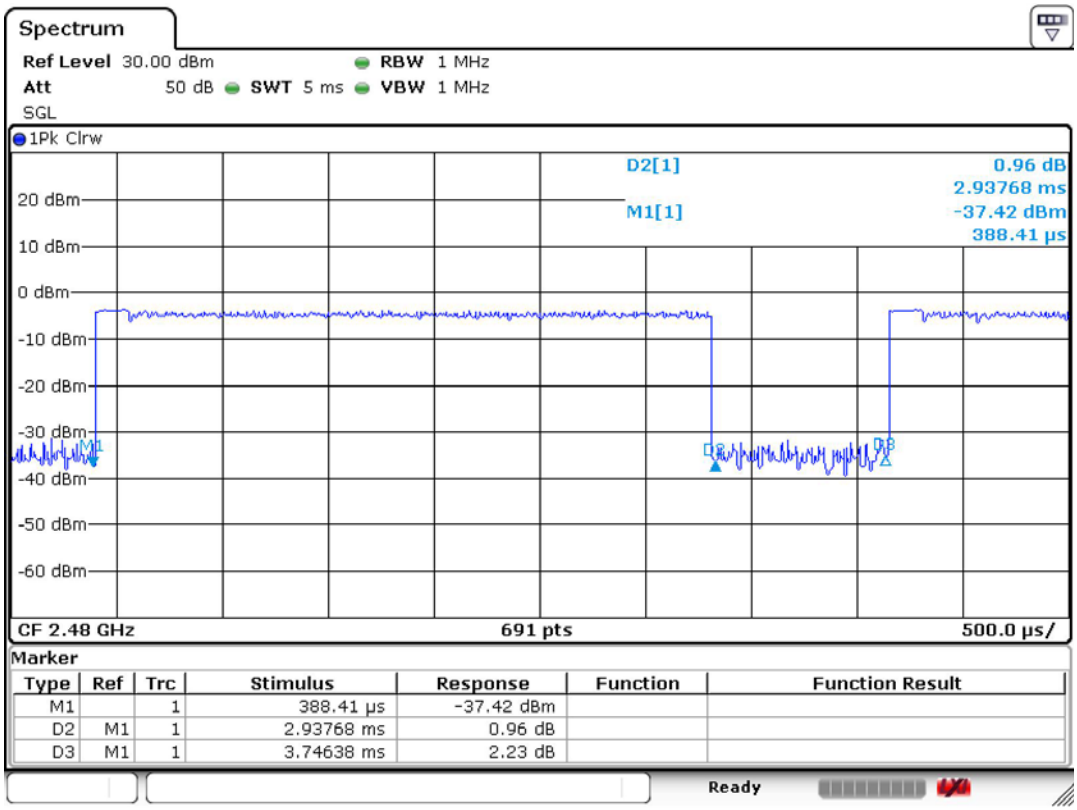


Test Mode : BT EDR (3Mbps) DH5 Channel : 2480

Average Number of Pulses Per sec



Pulse Width (sec)

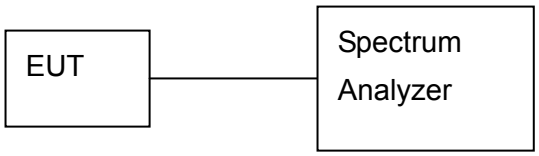


8 Peak Output Power

8.1 Test Instruments

Refer to Sec. 1.2 Test Instruments.

8.2 Test Arrangement and Procedure



1. The transmitter output was connected to a spectrum analyzer (through an attenuator, if it's necessary).
2. The RBW is set to 3MHz and VBW is set to 3MHz. Span set to 5MHz.
3. Max Hold..

8.3 Limit (§ 15.247(b))

15.247(b) - The maximum peak conducted output power of the intentional radiator shall not exceed the following:

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.

15.247(b)(4) - The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

The maximum antenna gain is 1.8 dBi, therefore, the limit is 30 dBm.

8.4 Test Result

Compliance.

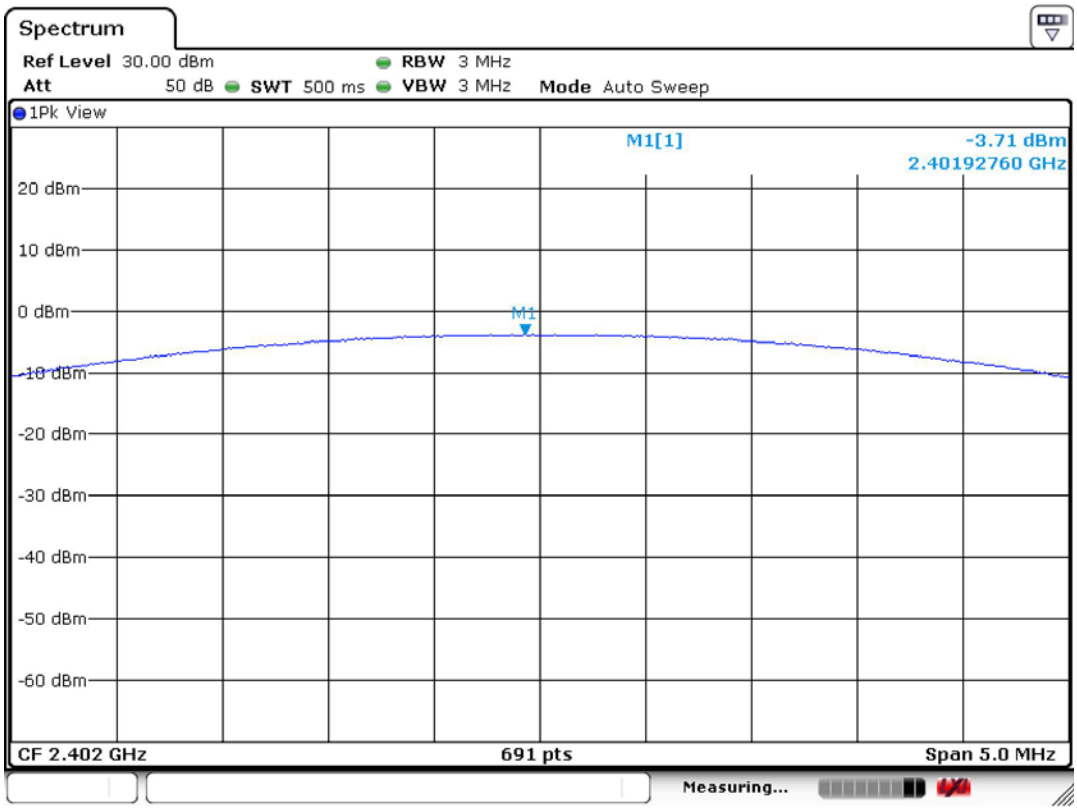
The final test data are shown on the following page(s).

Bluetooth 1 Mbps			
Channel	**Frequency (MHz)**	**Result (dBm)**	**Limit (dBm)**
00	2402	-3.71	30
39	2441	-2.72	30
78	2480	-1.54	30

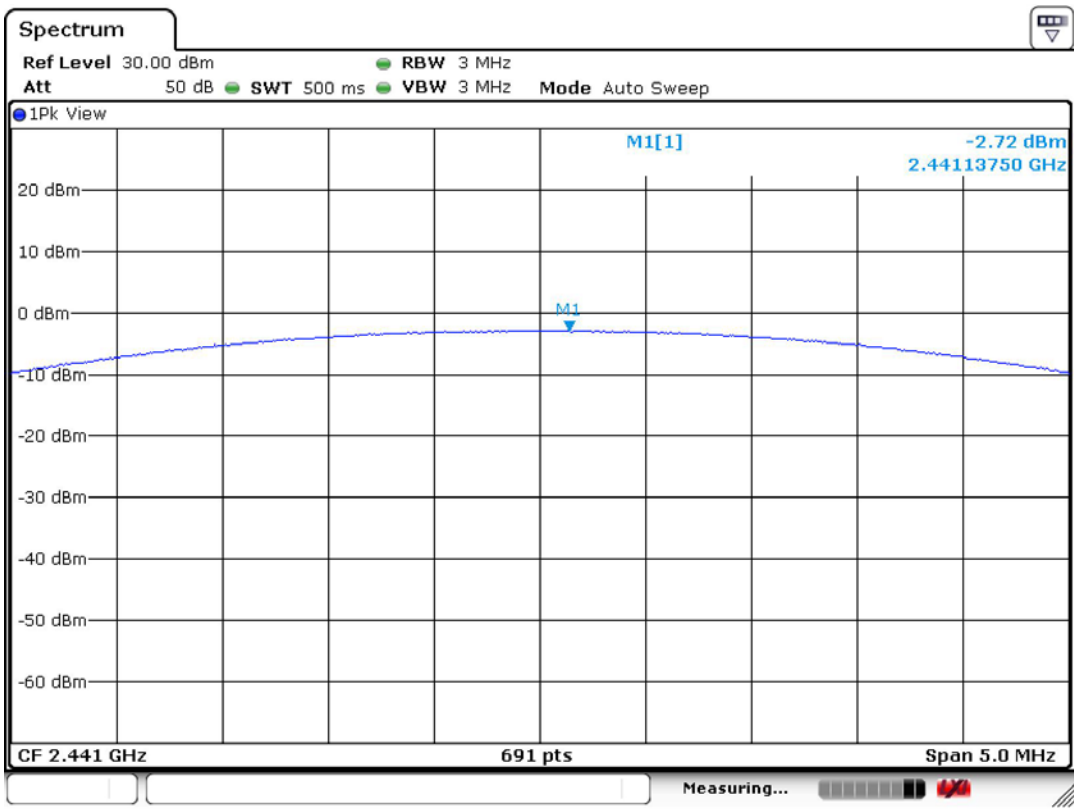
Bluetooth EDR 2 Mbps			
Channel	**Frequency (MHz)**	**Result (dBm)**	**Limit (dBm)**
00	2402	-5.21	30
39	2441	-4.16	30
78	2480	-2.71	30

Bluetooth EDR 3 Mbps			
Channel	**Frequency (MHz)**	**Result (dBm)**	**Limit (dBm)**
00	2402	-5.27	30
39	2441	-4.03	30
78	2480	-2.74	30

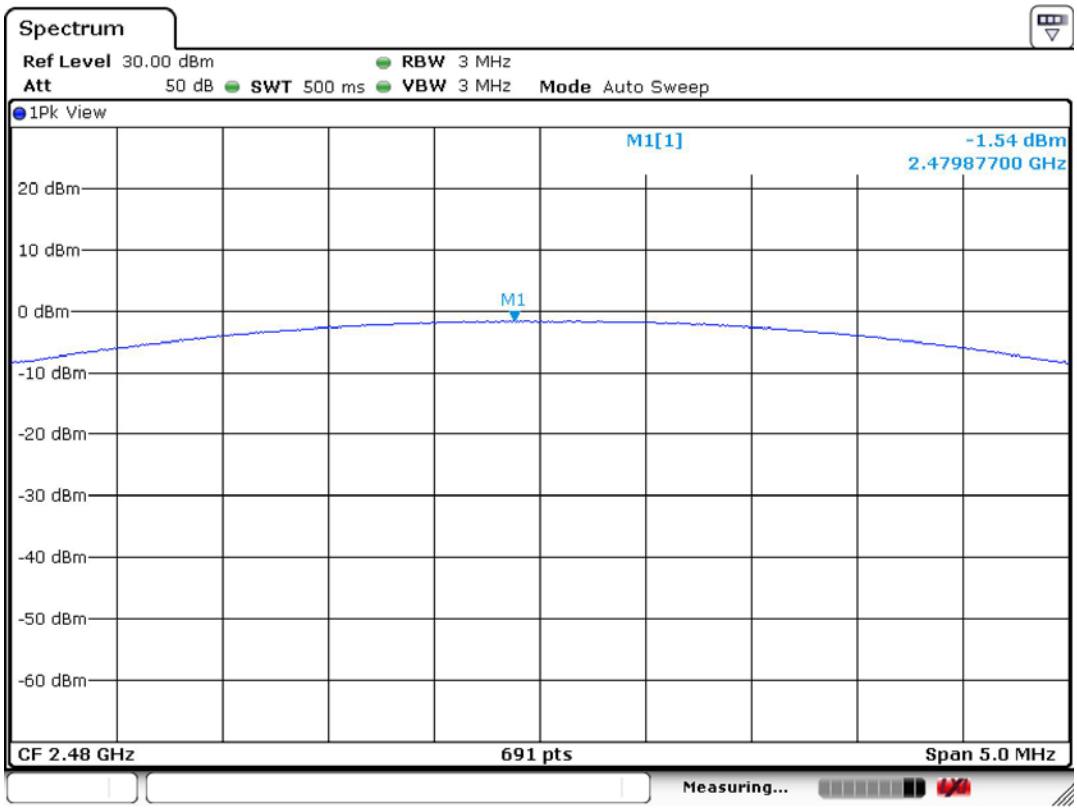
Temperature	:	22℃	Humidity	:	51%
Test Date	:	14-Jan-2014	Tested by	:	Kidd Liao
Test Mode	:	BT (1Mbps)	Channel	:	2402



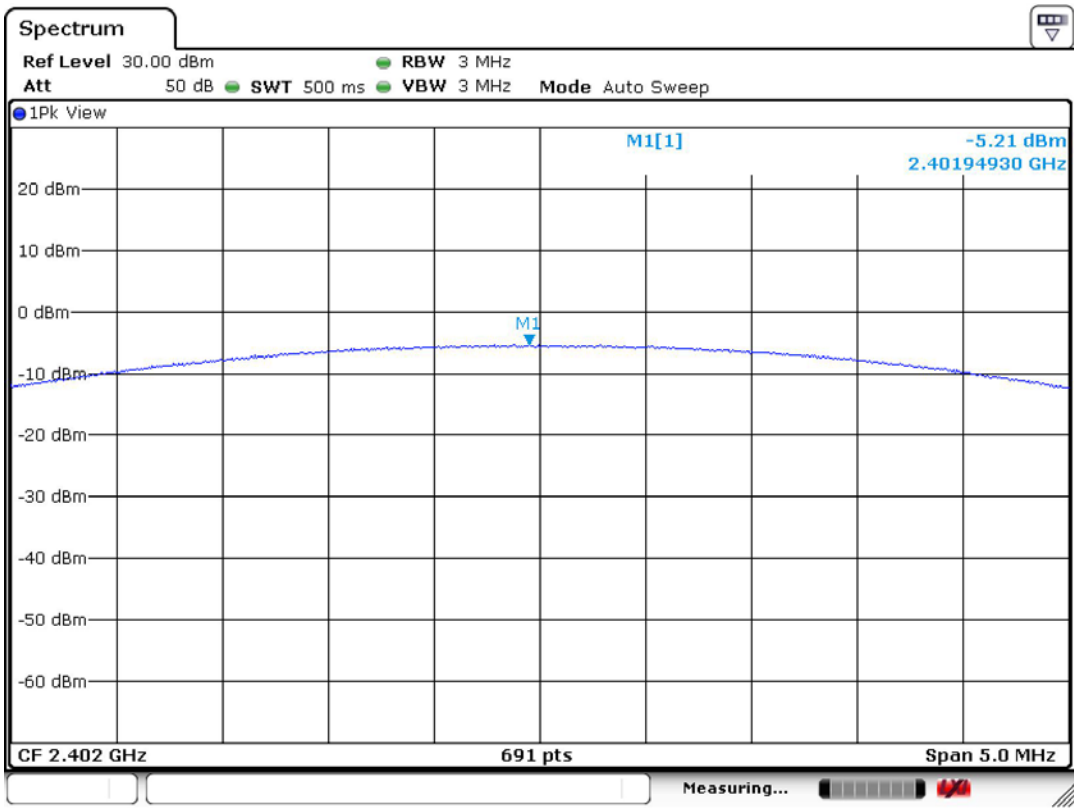
Test Mode	:	BT (1Mbps)	Channel	:	2441



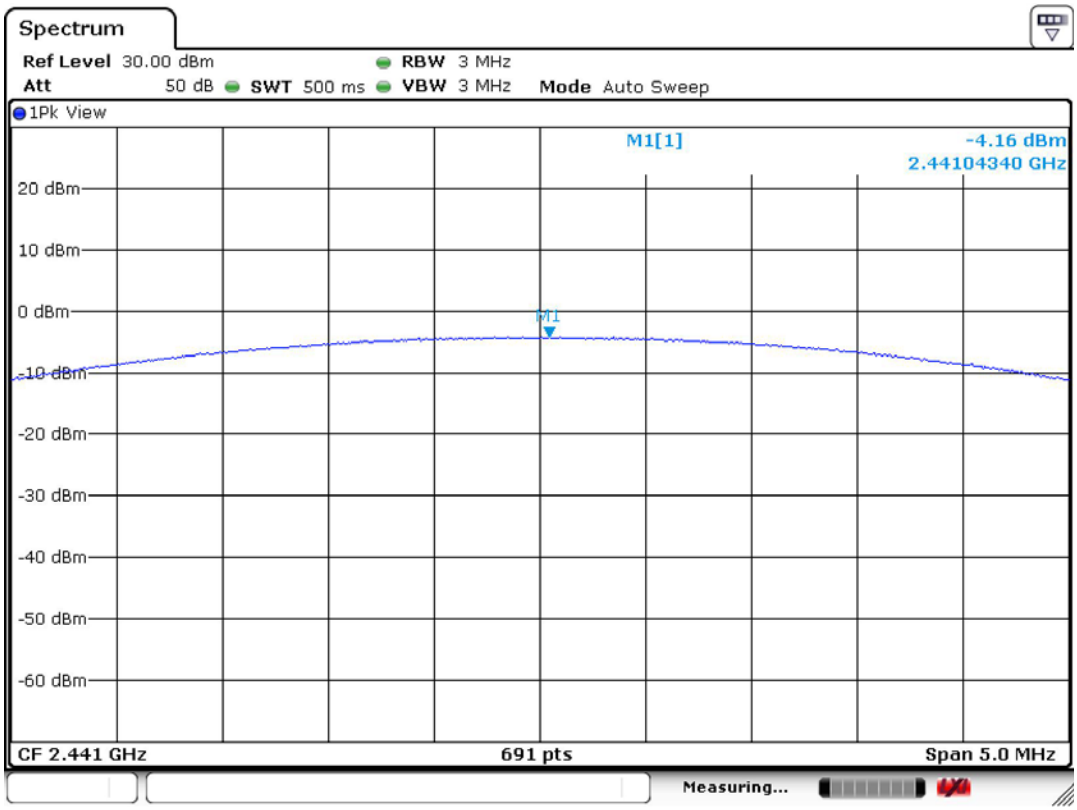
Test Mode : BT (1 Mbps) Channel : 2480



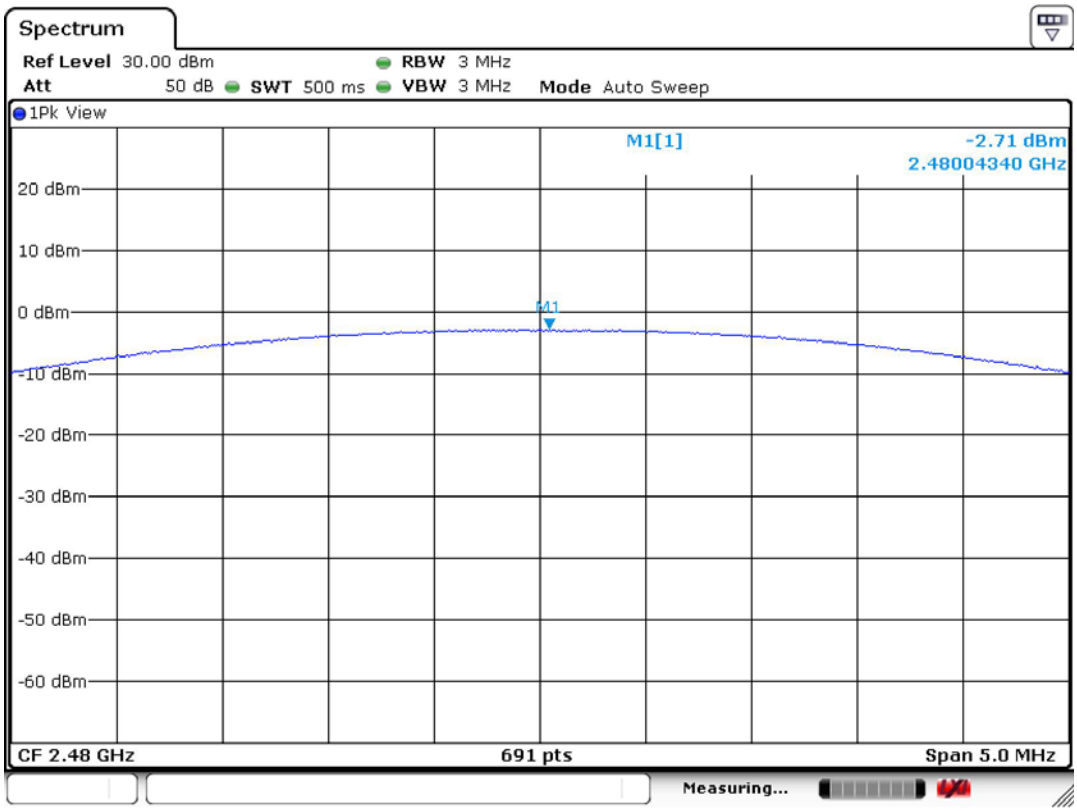
Test Mode : BT EDR (2 Mbps) Channel : 2402



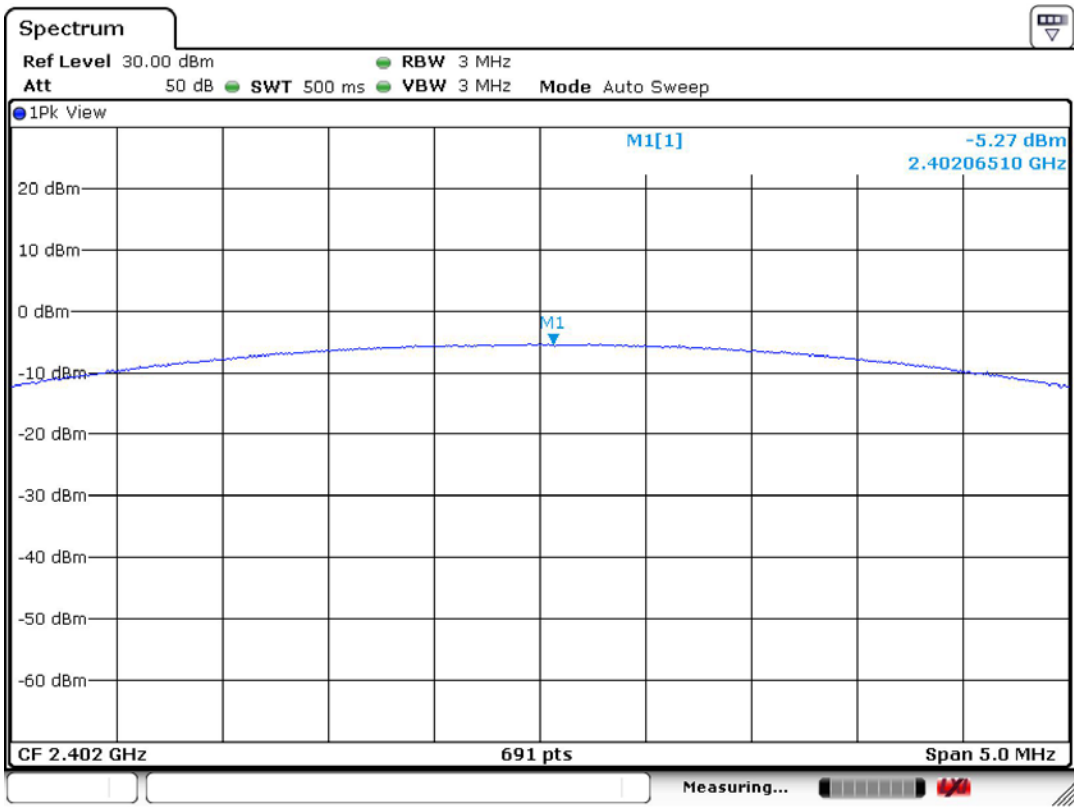
Test Mode : BT EDR (2 Mbps) Channel : 2441



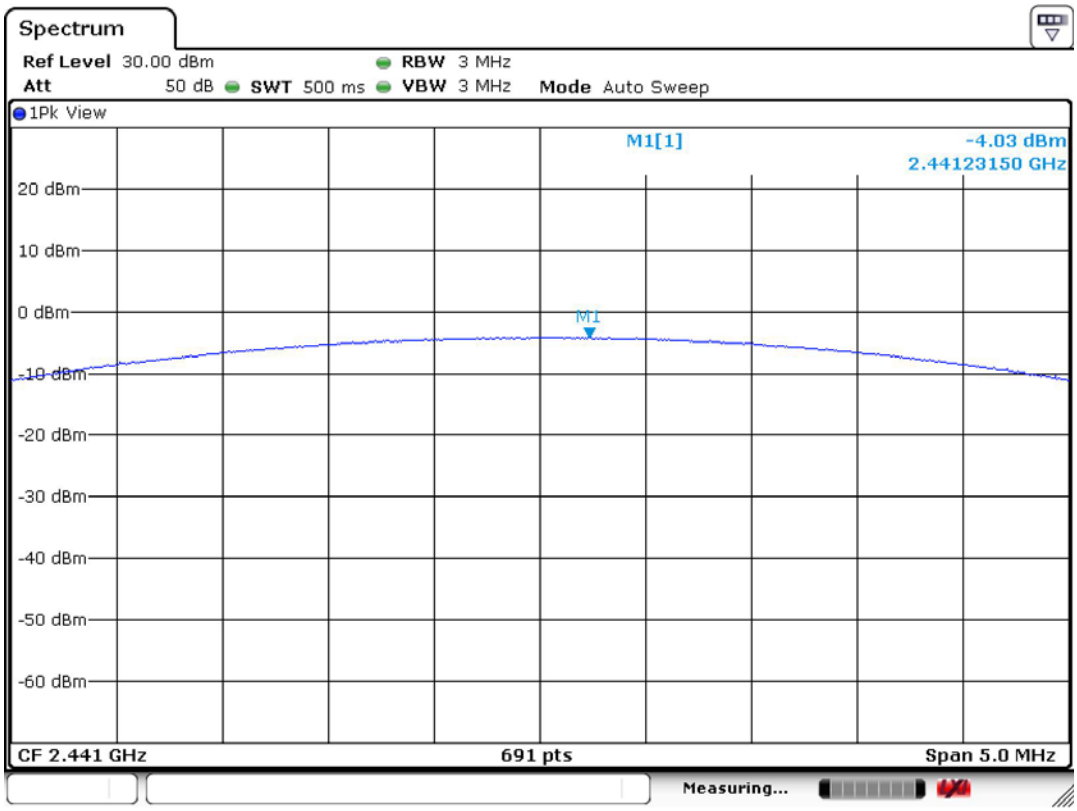
Test Mode : BT EDR (2 Mbps) Channel : 2480



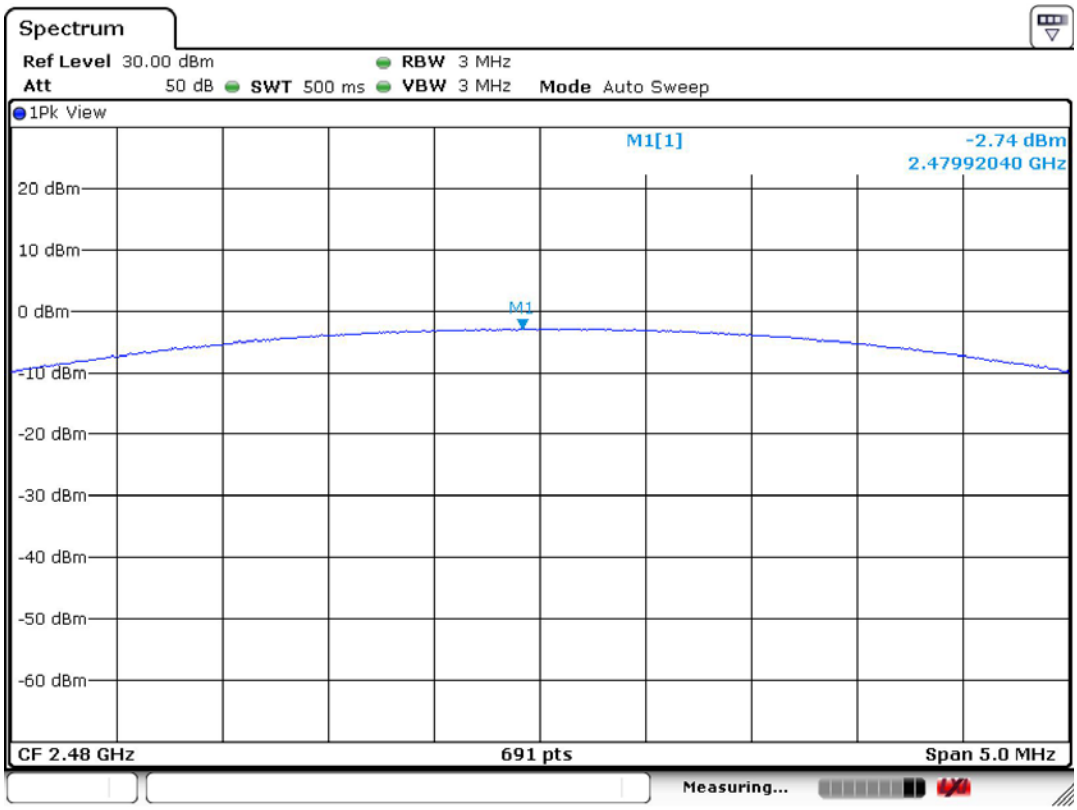
Test Mode : BT EDR (3 Mbps) Channel : 2402



Test Mode : BT EDR (3 Mbps) Channel : 2441



Test Mode : BT EDR (3 Mbps) Channel : 2480

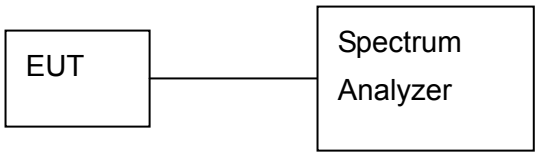


9 100kHz Bandwidth of Band Edges

9.1 Test Instruments

Refer to Sec. 1.2 Test Instruments.

9.2 Test Arrangement and Procedure



1. Remove the antenna from the transmitter and connected it to a spectrum analyzer through a low loss RF cable (connect an attenuator, if it's necessary).
2. The RBW is set to 100 kHz and VBW is set to 100 kHz. Sweep set to Auto. Span set to 100MHz.
3. . Max Hold. Mark Peak and record max level.

9.3 Limit (§ 15.247(d))

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in § 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

9.4 Test Result

Compliance.

The final test data are shown on the following page(s).

Bluetooth (1Mbps) Channel: 00					
Measured Result				Result (dB)	Limit (dB)
Lower Channel (MHz)	Max Peak Power (dBm)	Highest Freq. at Lower Band edge (MHz)	Max Peak Power at Lower Band edge (dBm)		
2401.77	-5.02	2400	-41.07	36.05	20

Remark: Result (dB) = Max Peak Power – Max Peak power at lower band edge. When Result > Limit, it's a pass.

Bluetooth EDR (2Mbps) Channel: 00					
Measured Result				Result (dB)	Limit (dB)
Lower Channel (MHz)	Max Peak Power (dBm)	Highest Freq. at Lower Band edge (MHz)	Max Peak Power at Lower Band edge (dBm)		
2401.77	-6.42	2399.57	-39.47	33.05	20

Remark: Result (dB) = Max Peak Power – Max Peak power at lower band edge. When Result > Limit, it's a pass.

Bluetooth EDR (3Mbps) Channel: 00					
Measured Result				Result (dB)	Limit (dB)
Lower Channel (MHz)	Max Peak Power (dBm)	Highest Freq. at Lower Band edge (MHz)	Max Peak Power at Lower Band edge (dBm)		
2401.77	-6.53	2400	-41.55	35.02	20

Remark: Result (dB) = Max Peak Power – Max Peak power at lower band edge. When Result > Limit, it's a pass.

Bluetooth (1Mbps) Channel: 78					
Measured Result				Result (dB)	Limit (dB)
Upper Channel (MHz)	Max Peak Power (dBm)	Highest Freq. at Upper Band edge (MHz)	Max Peak Power at Upper Band edge (dBm)		
2479.82	-2.31	2483.5	-40.3	37.99	20

Remark: Result (dB) = Max Peak Power – Max Peak power at upper band edge. When Result > Limit, it's a pass.

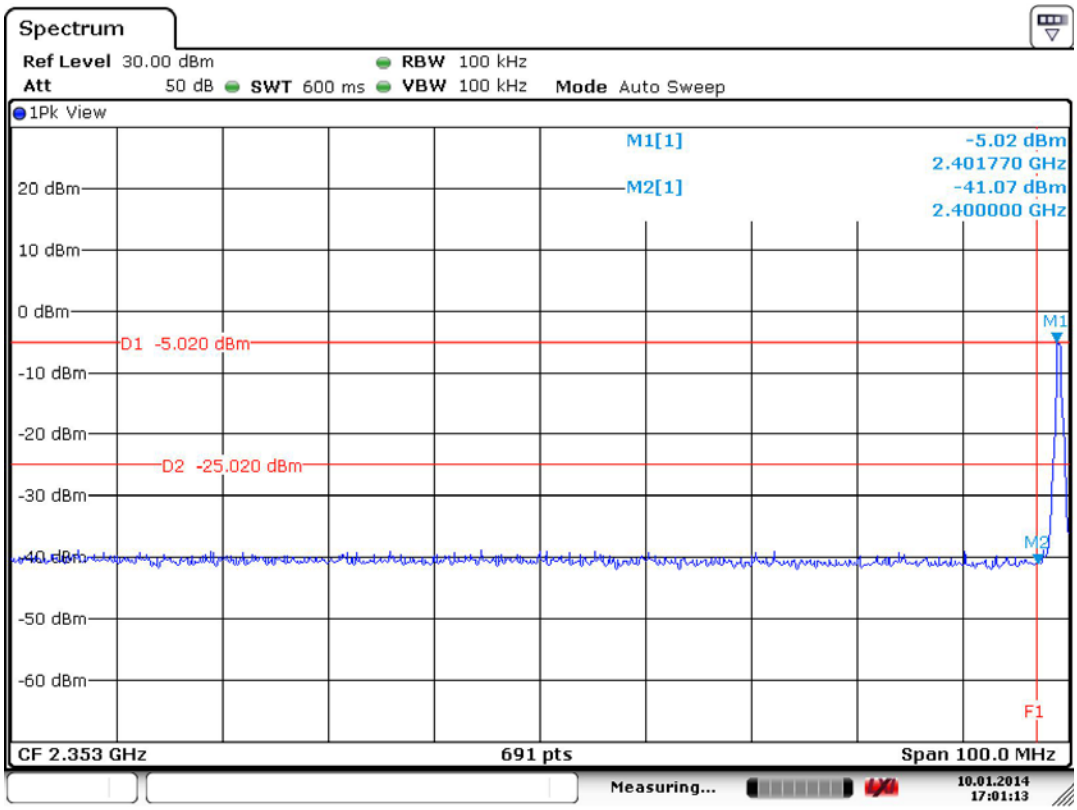
Bluetooth EDR (2Mbps) Channel: 78					
Measured Result				Result (dB)	Limit (dB)
Upper Channel (MHz)	Max Peak Power (dBm)	Highest Freq. at Upper Band edge (MHz)	Max Peak Power at Upper Band edge (dBm)		
2479.82	-3.77	2483.79	-39.4	35.63	20

Remark: Result (dB) = Max Peak Power – Max Peak power at Upper band edge. When Result > Limit, it's a pass.

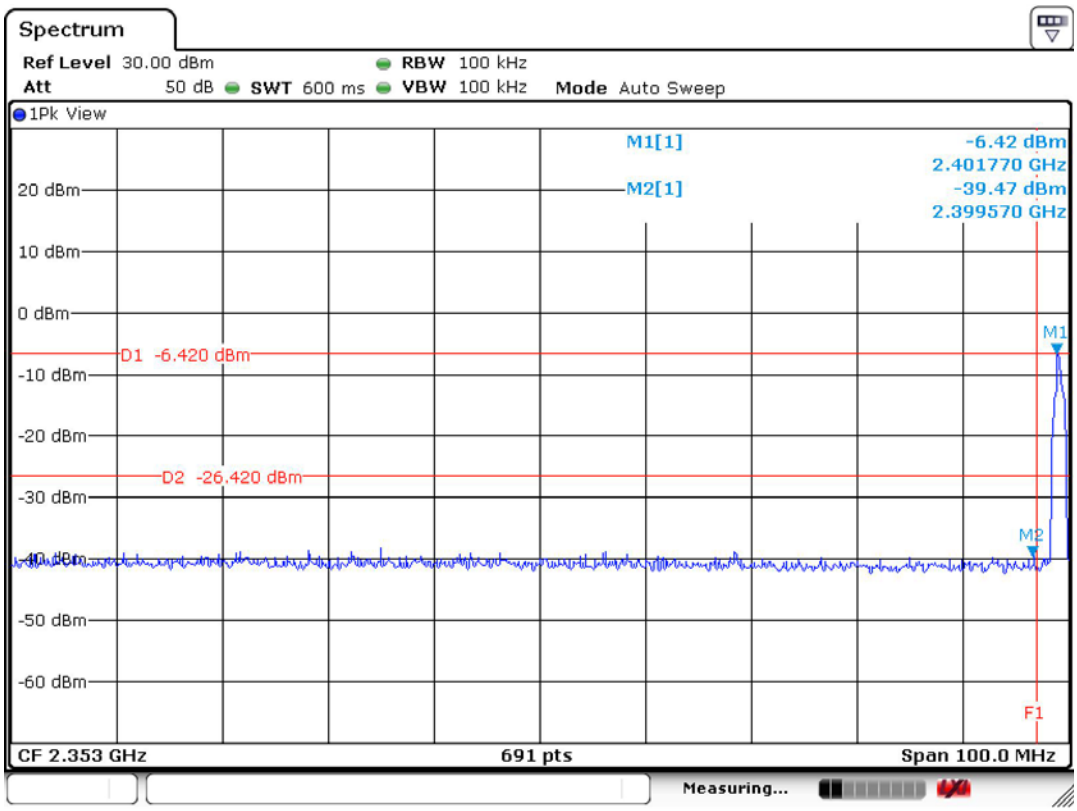
Bluetooth EDR (3Mbps) Channel: 78					
Measured Result				Result (dB)	Limit (dB)
Upper Channel (MHz)	Max Peak Power (dBm)	Highest Freq. at Upper Band edge (MHz)	Max Peak Power at Upper Band edge (dBm)		
2479.82	-3.71	2483.5	-40.14	36.43	20

Remark: Result (dB) = Max Peak Power – Max Peak power at Upper band edge. When Result > Limit, it's a pass.

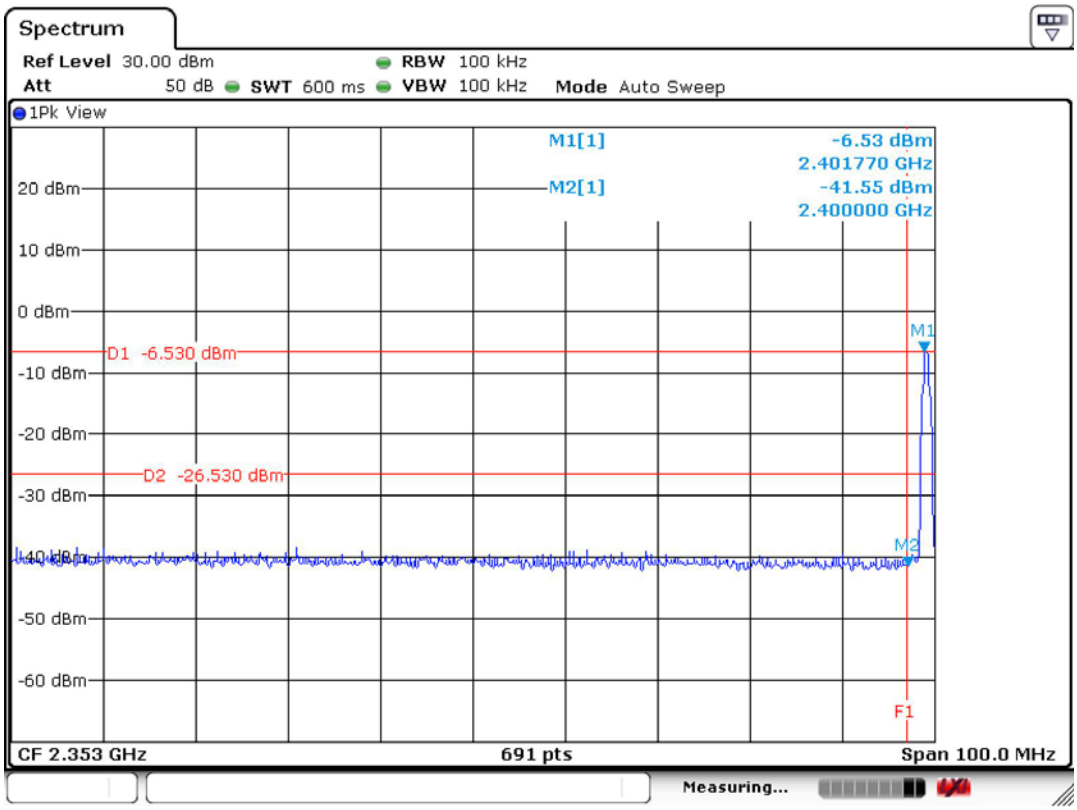
Temperature	:	22℃	Humidity	:	51%
Test Date	:	14-Jan-2014	Tested by	:	Kidd Liao
Test Mode	:	BT (1Mbps)	Channel	:	2402



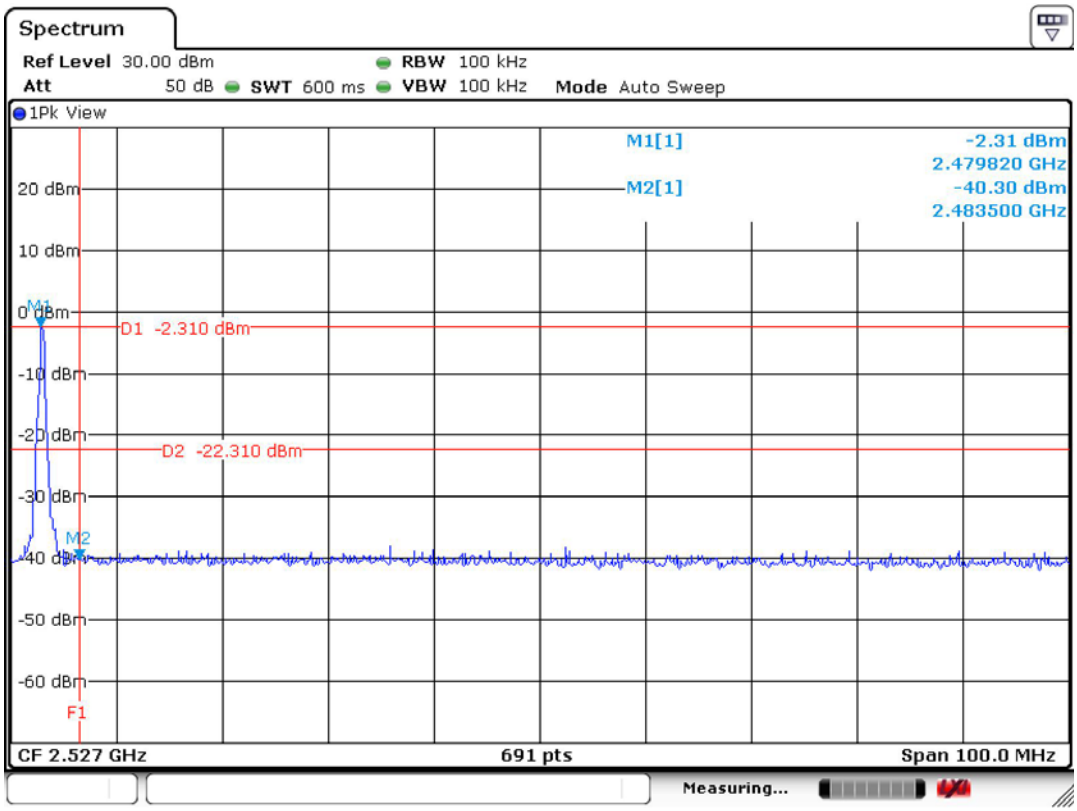
Test Mode	:	BT EDR (2 Mbps)	Channel	:	2402



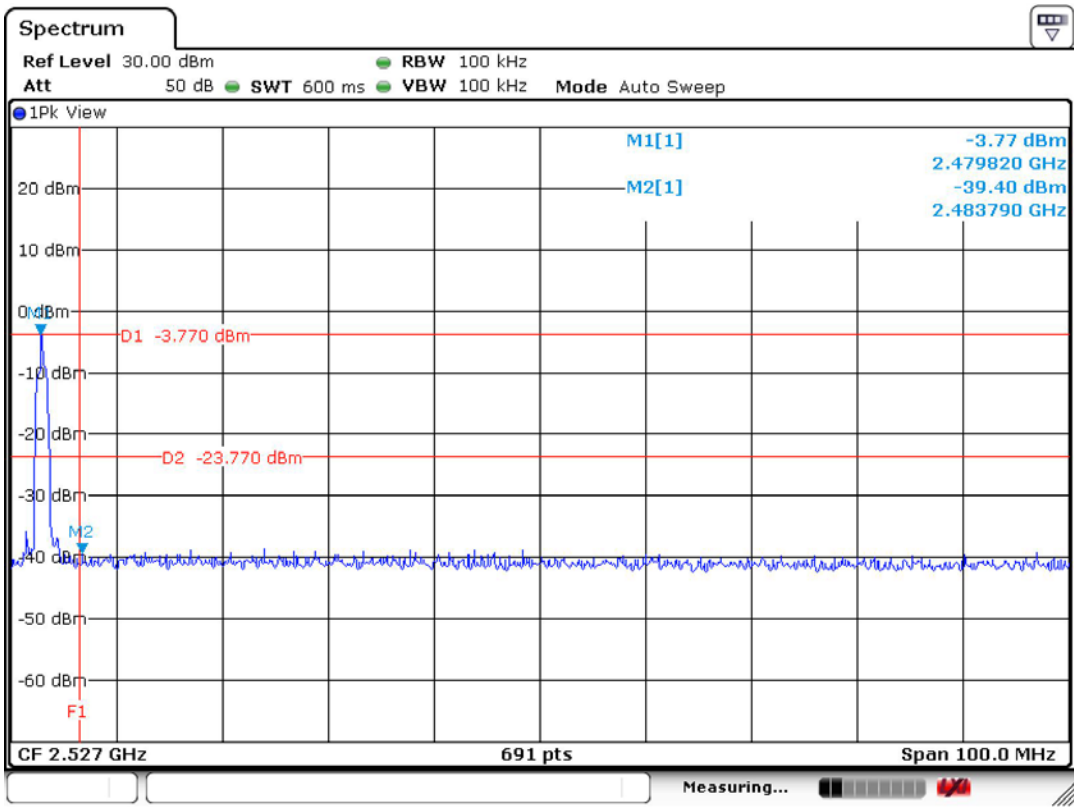
Test Mode : BT EDR (3 Mbps) Channel : 2402



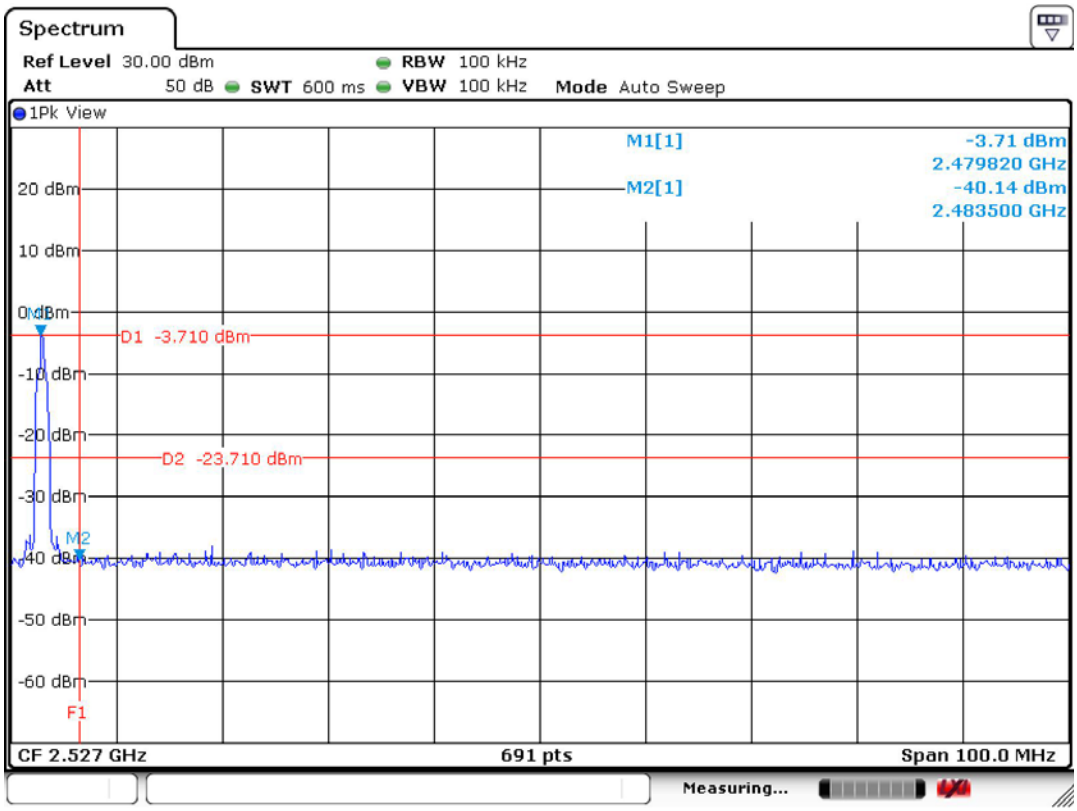
Test Mode : BT (1 Mbps) Channel : 2480



Test Mode : BT EDR (2 Mbps) Channel : 2480



Test Mode : BT EDR (3 Mbps) Channel : 2480



10 Antenna requirement

10.1 Limit (§ 15.203)

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a uniue coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of § 15.211, § 15.213, § 15.217, § 15.219, or § 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with § 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

10.2 Test Result

Compliance.

The EUT applies a Chip antenna.

11 RF Exposure Compliance Requirements

11.1 Limit (§ 1.1310(4))

Both the MPE limits listed in Table 1 of paragraph (e) of this section and the SAR limits as set forth in paragraph (a) through (c) of this section and in §2.1093 of this chapter are for continuous exposure, that is, for indefinite time periods. Exposure levels higher than the limits are permitted for shorter exposure times, as long as the average exposure over the specified averaging time in Table 1 is less than the limits.

Limits for Maximum Permissible Exposure (MPE)				
Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm2)	Averaging time (minutes)
(A) Limits for Occupational/ Controlled Exposure				
0.3-3.0	614	1.63	*100	6
3.0-30	1842/f	4.89/f	*900/f^2	6
30-300	61.4	0.163	1.0	6
300-1,500			f/300	6
1,500-100,000			5	6
(B) Limits for General Population/ Uncontrolled Exposure				
0.3-1.34	614	1.63	*100	30
1.34-30	824/f	2.19/f	*180/f^2	30
30-300	27.5	0.073	0.2	30
300-1,500			f/1500	30
1,500-100,000			1.0	30

f = frequency in MHz * = Plane-wave equivalent power desity

11.2 Test Result

Compliance.

According to Supplement C, Edition 01-01 to OET Bulletin 65, Edition 97-01 this spread spectrum transmitter is categorically excluded from routine environment evaluation because of the low power level, where there is a high likelihood of compliance with RF exposure standards.

The antenna used for this Bluetooth transceiver module must not be co-located or operating in conjunction with any other antenna or transmitter.