

Test Report

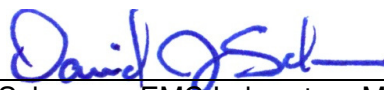
Bluetooth Supplemental Report

Project Number: 3044696**Report Number:** 3044696EMC25**Revision Level:** 0**Client:** Intermec**Equipment Under Test:** Mobile Computer with CDMA/EVDO/GSM/UMTS/BT/WiFi**Marketing Name:** Catalina**Model:** CN51 (1015CP01S)**Applicable Standards:** RSS 210: Issue 8

Frequency Hopping Requirements

Report issued on: 5 September 2013**Test Result:** Compliant

Tested by:

A handwritten signature in blue ink, appearing to read 'David Schramm', written over a horizontal line.

David Schramm, EMC Laboratory Manager

Reviewed by:

A handwritten signature in black ink, appearing to read 'Brian Forster', written over a horizontal line.

Brian Forster, EMC Engineer

Remarks:

This report details the results of the testing carried out on one sample, the results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

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1 Summary of Test Results

Test Description	Test Specification	Test Result
Pseudo-Random Hop Sequence	RSS-210 A8.1(a)	Compliant ⁽¹⁾
Channel Separation	RSS-210 A8.1(b)	Compliant
Number of Hopping Channels	RSS-210 A8.1(d)	Compliant
Dwell Time	RSS-210 A8.1(d)	Compliant

1.1 Modifications Required for Compliance

None

2 General Information

2.1 Client Information

Name: Intermec
Address: 6001 36th Avenue West
City, State, Zip, Country: Everett, WA 98203 - 1264
6001 36th Avenue West

2.2 Test Laboratory

Name: SGS North America, Inc.
Address: 620 Old Peachtree Road NW, Suite 100
City, State, Zip, Country: Suwanee, GA 30024, USA

2.3 General Information of EUT

Marketing Name: Catalina
Model: 1015CP01S
Serial Number: 346X1200015 (conducted measurements)
EUT Firmware Version: 1.0.0.0334
FCC ID: 1015CP01SX1
Frequency Range: 2402 to 2480 MHz
Number of channels: 79
Modulation type: GFSK, DQPSK, 8DPSK
Channel spacing: 1 MHz
Antenna: Integral

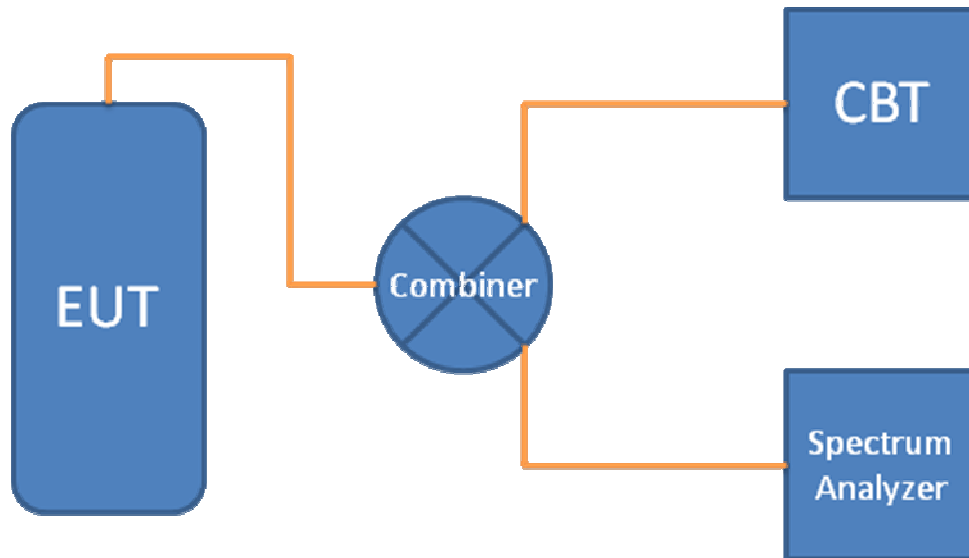
Rated Voltage: 3.8 VDC Internal Battery

Sample Received Date: 18APR2013
Dates of testing: 5 September 2013

Operating Modes and Conditions

The EUT was placed into test mode and controlled by the Bluetooth Tester for Hopping Sequence, Data Rates and Packet Types.

2.4 EUT Connection Block Diagram



2.5 System Configurations

Device reference	Manufacturer	Description	Model Number	Serial Number
EUT	Intermec	EUT	1015CP01S	346X1200015
CBT	R&S	Bluetooth Tester	CBT	See Equipment List
Spectrum Analyzer	R&S	Spectrum Analyzer	FSV	See Equipment List

3 Pseudo-Random Hop Sequence

3.1 Test Result

Test Description	Test Specification	Test Result
Pseudo-Random Hop Sequence	RSS-210 A8.1(a)	Compliant ⁽¹⁾

Note (1): The theory of operation states that the device is Bluetooth and operates using a pseudo-random hopping technique.

3.2 Test Method

Compliance is demonstrated by Manufacturer's declaration or is stated in the Theory of Operation.

Requirement

The hopset shall be such that the near-term distribution of frequencies appears random, with sequential hops randomly distributed in both direction and magnitude of change in the hopset, while the long-term distribution appears evenly distributed.

4 Channel Separation

4.1 Test Result

Test Description	Test Specification	Test Result
Number of Hopping Channels	RSS-210 A8.1(b)	Compliant

4.2 Test Method

The test data was measured using a spectrum analyzer with Peak detector (max hold) and a resolution bandwidth of 100 kHz. The trace was allowed to stabilize until all channels were displayed.

Requirement

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the -20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the band 2400-2483.5 MHz 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 that the systems operate with an output power no greater than 0.125 W.

4.3 Test Site

SGS EMC Laboratory, Suwanee, GA

Environmental Conditions

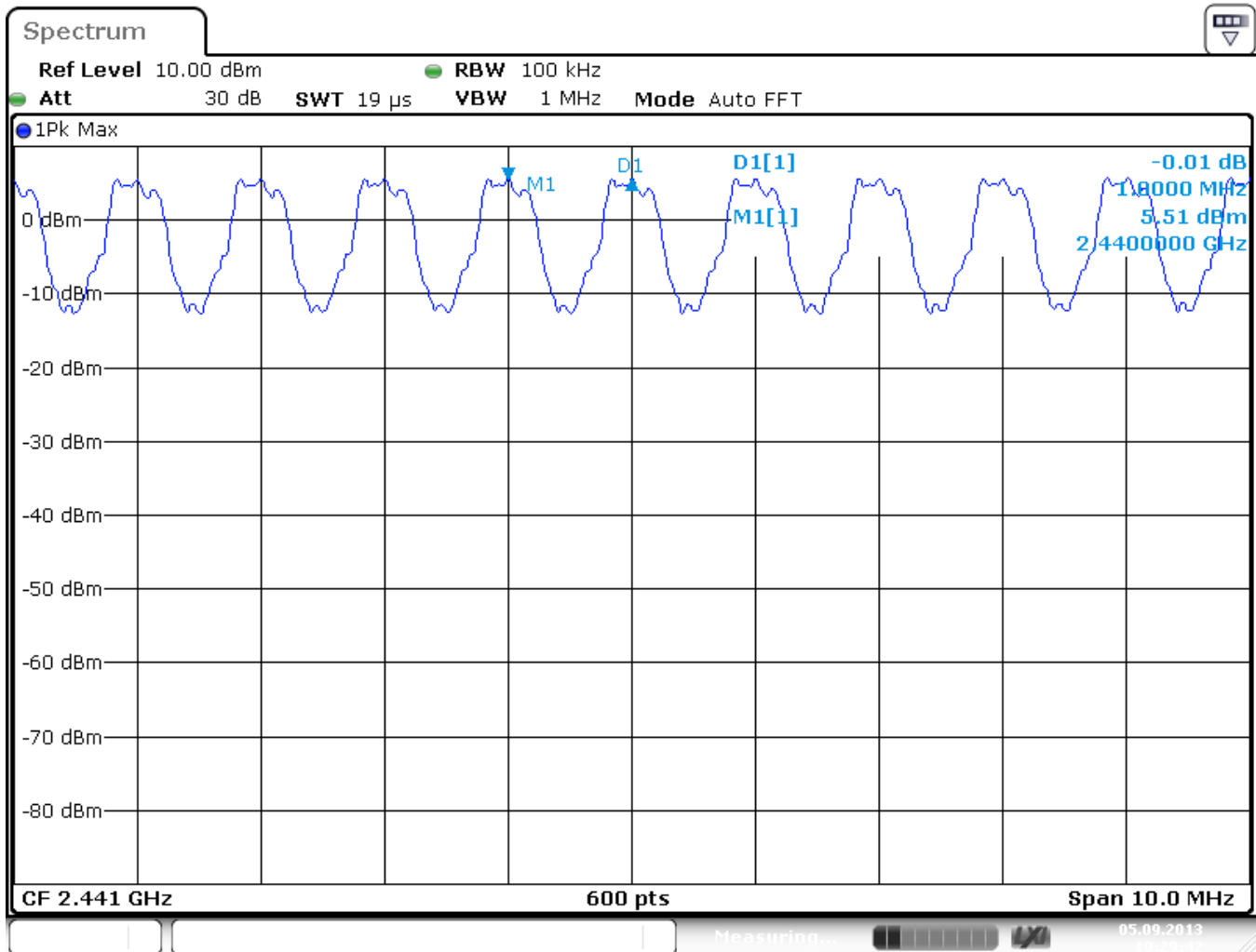
Temperature: 21.7 °C
Relative Humidity: 46.9 %

4.4 Test Equipment

Equipment	Model	Manufacturer	Asset Number	Cal Due Date
Spectrum Analyzer	FSV 30	R&S	101595	28 Aug 2014
Bluetooth Tester	CBT	R&S	100011	CNR

Note: The calibration period equipment is 1 year.

4.5 Test Data



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5 Number of Hopping Channels

5.1 Test Result

Test Description	Test Specification	Test Result
Number of Hopping Channels	RSS-210 A8.1(d)	Compliant

5.2 Test Method

The test data was measured using a spectrum analyzer with Peak detector (max hold) and a resolution bandwidth of 30 kHz. The trace was allowed to stabilize until all channels were displayed.

Requirement

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

5.3 Test Site

SGS EMC Laboratory, Suwanee, GA

Environmental Conditions

Temperature: 21.7 °C

Relative Humidity: 46.9 %

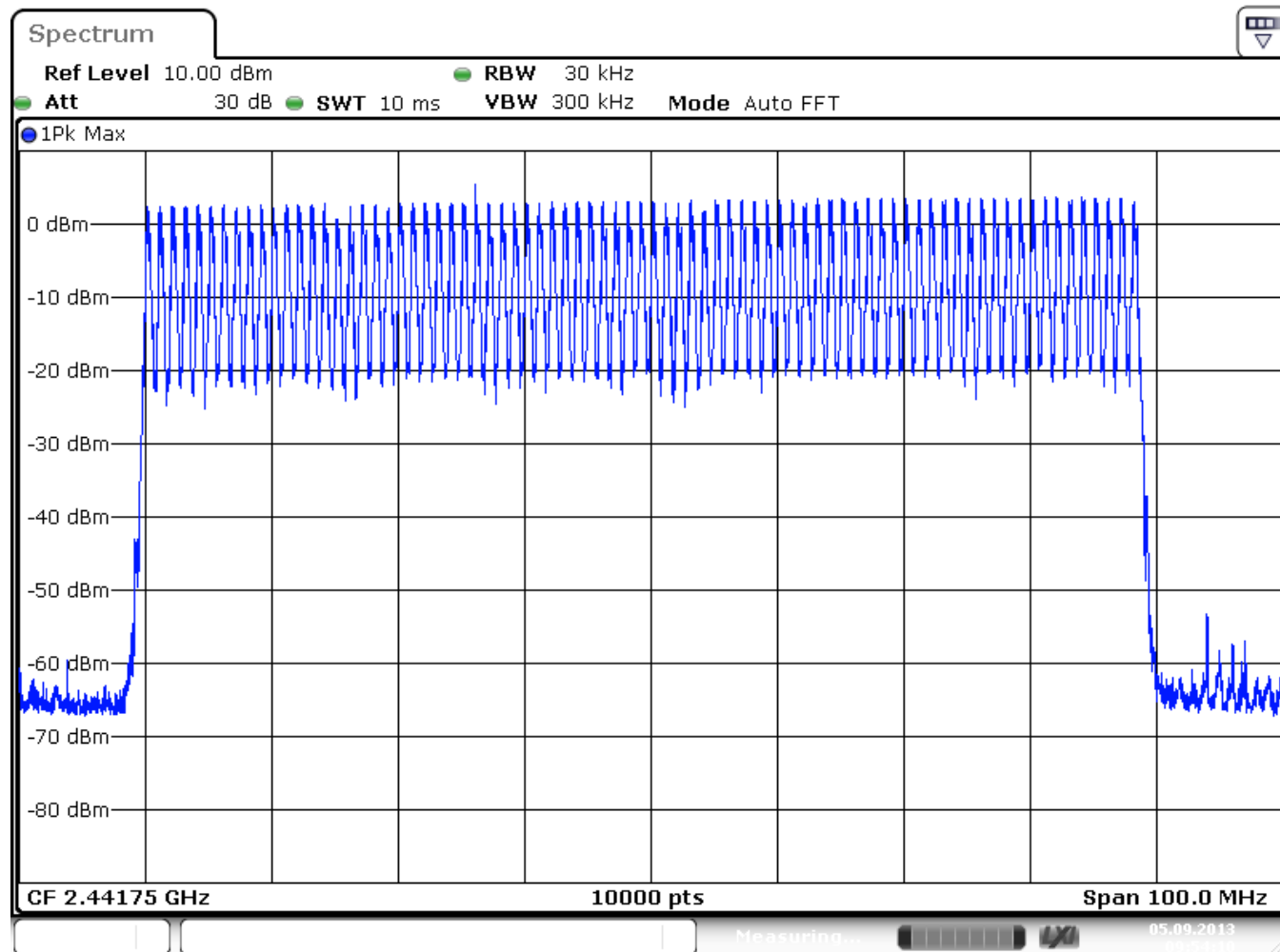
5.4 Test Equipment

Equipment	Model	Manufacturer	Asset Number	Cal Due Date
Spectrum Analyzer	FSV 30	R&S	101595	28 Aug 2014
Bluetooth Tester	CBT	R&S	100011	CNR

Note: The calibration period equipment is 1 year.

5.5 Test Data

There are 79 Channel.



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6 Dwell Time

6.1 Test Result

Test Description	Test Specification	Test Result
Dwell Time	RSS-210 A8.1(d)	Compliant

6.2 Test Method

The EUT was set to test mode which allowed it to be controlled by the Bluetooth Tester. The Bluetooth Tester was then set to operate on US/EU Hopping Scheme with pseudo-random data. For each packet type and data rate, the pulse width of the packet was measured and the number of pulses were counted over the total observation period.

Requirement

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.

6.3 Test Site

SGS EMC Laboratory, Suwanee, GA

Environmental Conditions

Temperature: 21.7 °C

Relative Humidity: 46.9 %

6.4 Test Equipment

Equipment	Model	Manufacturer	Asset Number	Cal Due Date
Spectrum Analyzer	FSV 30	R&S	101595	28 Aug 2014
Bluetooth Tester	CBT	R&S	100011	CNR

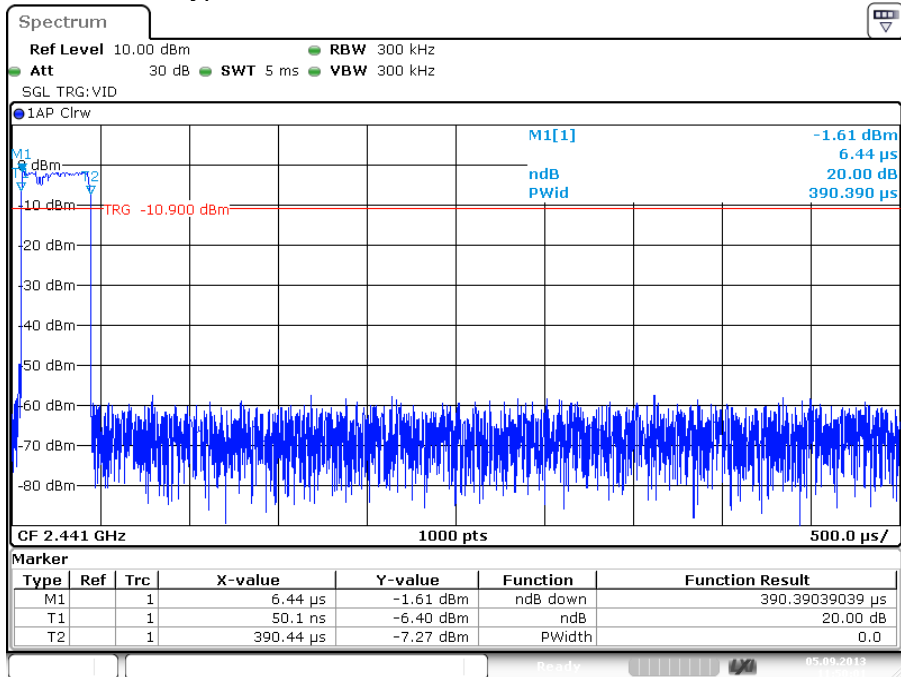
Note: The calibration period equipment is 1 year.

6.5 Test Data

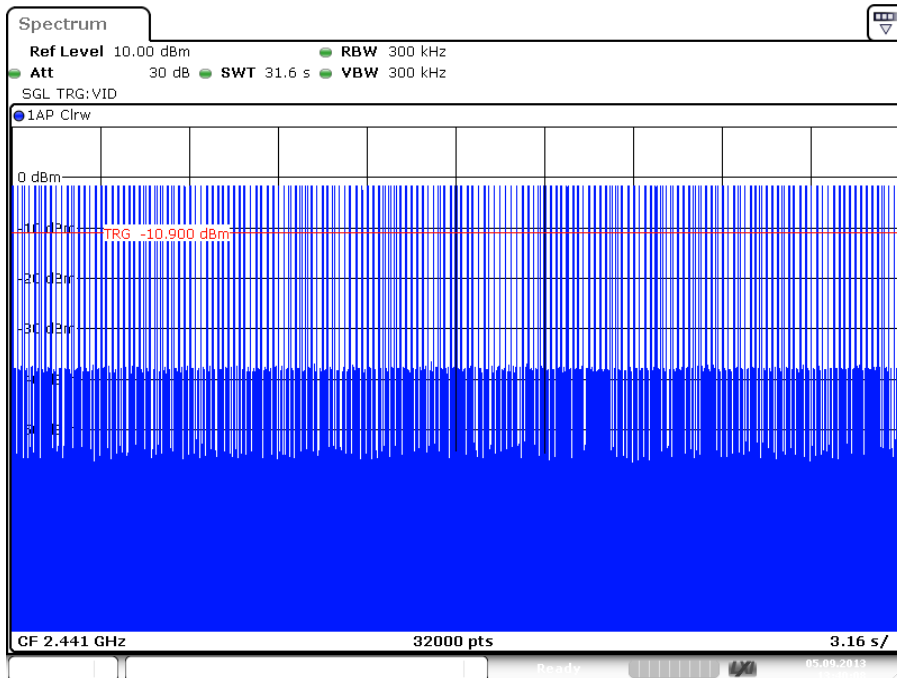
	Packet Type	Pulse Width ms	Pulses per 31.6 sec	Dwell Time Sec	Limit	Result
BR	DH1	0.390	322	0.126	0.4	PASS
	DH3	1.647	165	0.272	0.4	PASS
	DH5	2.893	119	0.344	0.4	PASS
EDR2	DH1	0.4004	321	0.129	0.4	PASS
	DH3	1.652	165	0.273	0.4	PASS
	DH5	2.898	110	0.319	0.4	PASS
EDR3	DH1	0.4004	321	0.129	0.4	PASS
	DH3	1.652	165	0.273	0.4	PASS
	DH5	2.898	110	0.319	0.4	PASS

6.6 Plots

DH1 Packet Type, Basic Rate

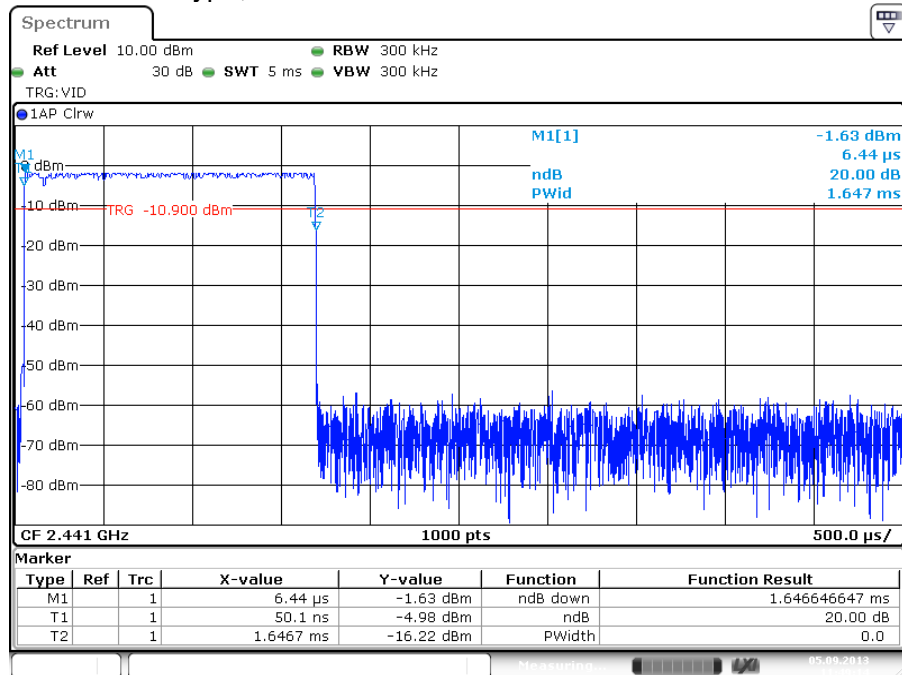


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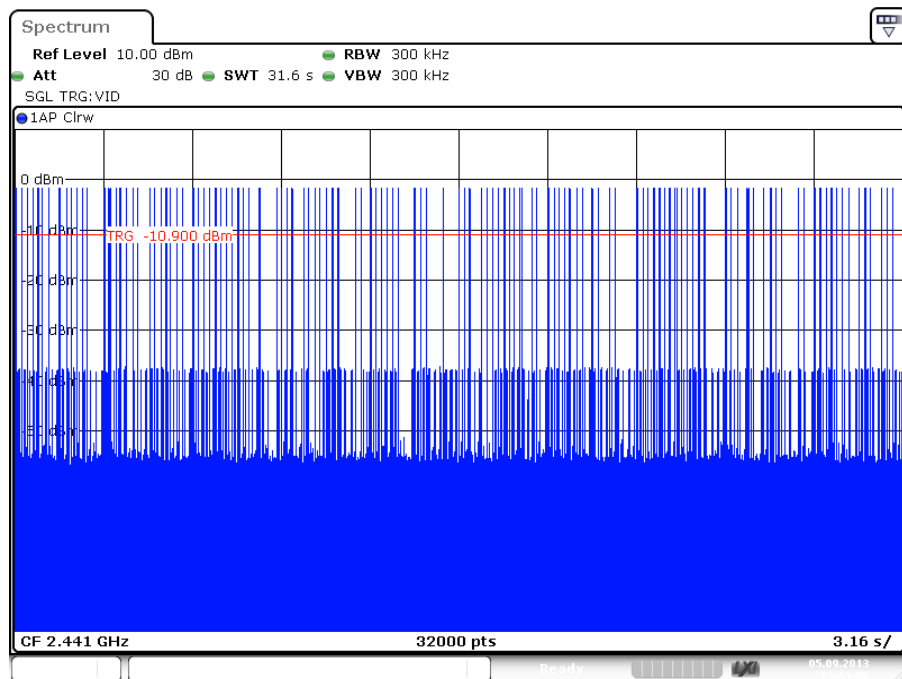


Date: 5.SEP.2013 13:40:09

DH3 Packet Type, Basic Rate

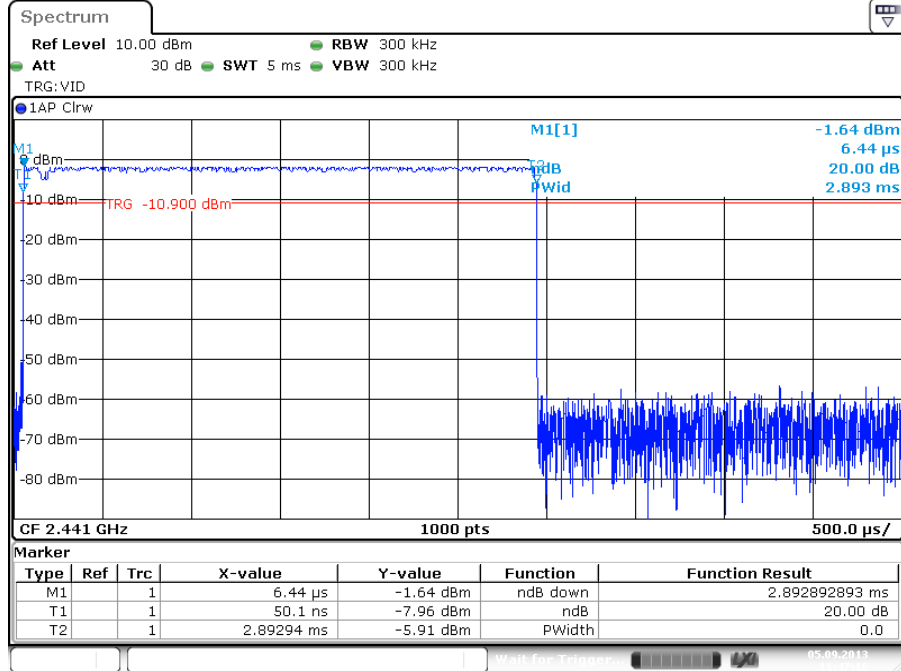


Date: 5.SEP.2013 11:49:14

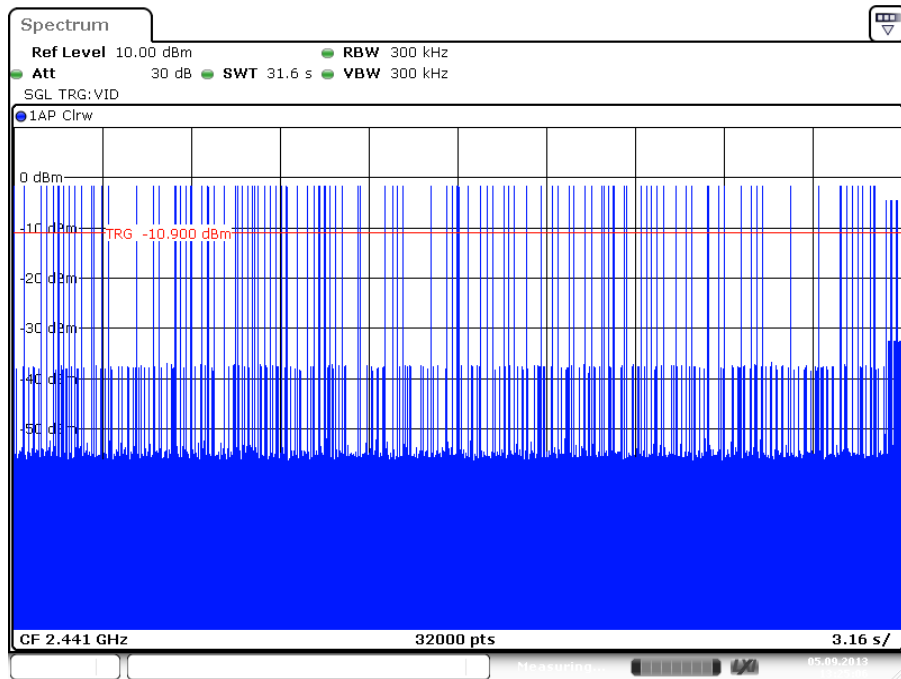


Date: 5.SEP.2013 13:33:06

DH5 Packet Type, Basic Rate

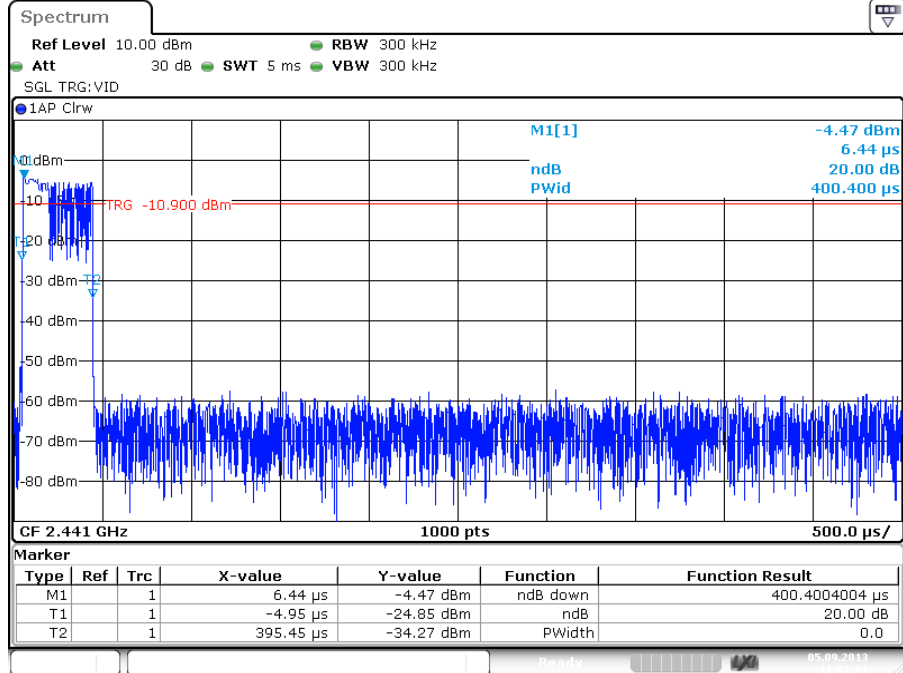


Date: 5.SEP.2013 11:47:16

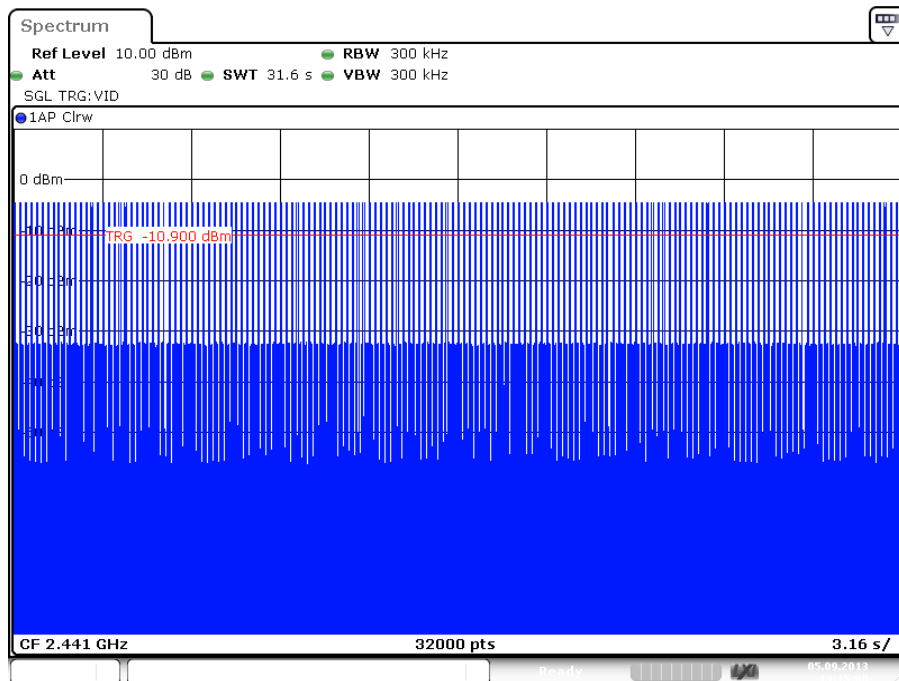


Date: 5.SEP.2013 13:25:06

DH1 Packet Type, EDR 2

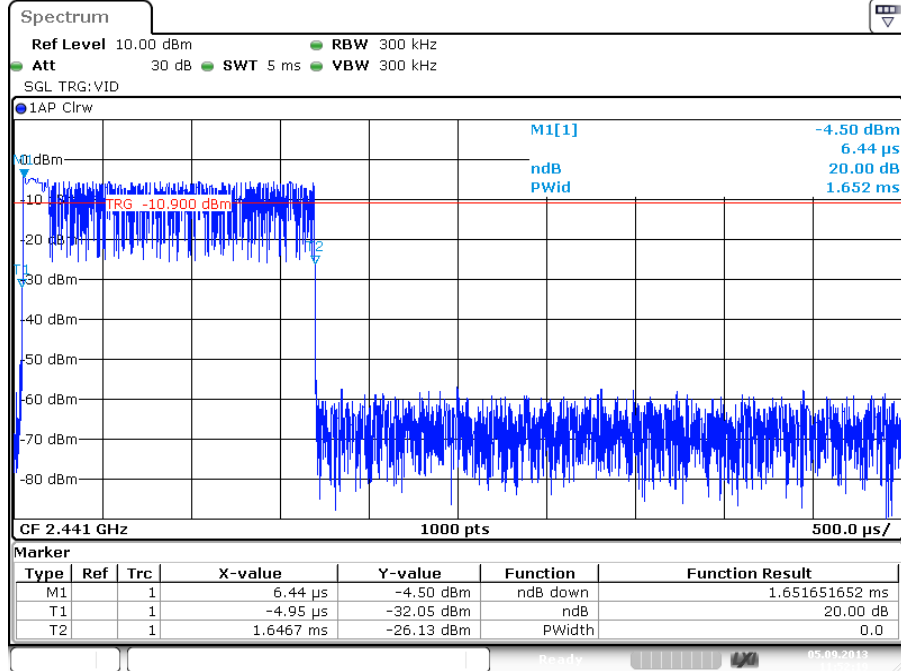


Date: 5.SEP.2013 11:51:02

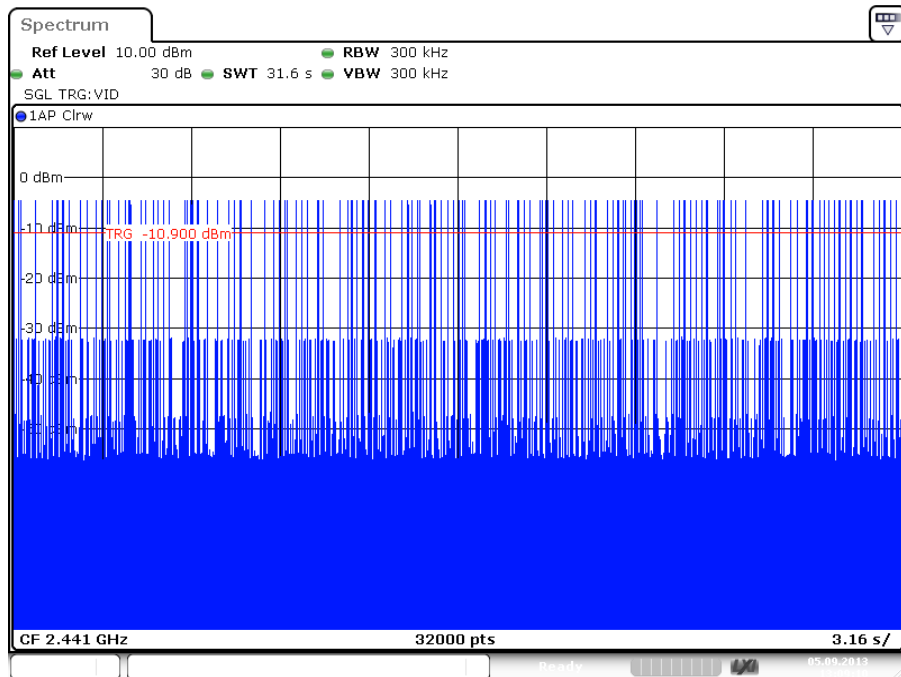


Date: 5.SEP.2013 13:15:01

DH3 Packet Type, EDR 2

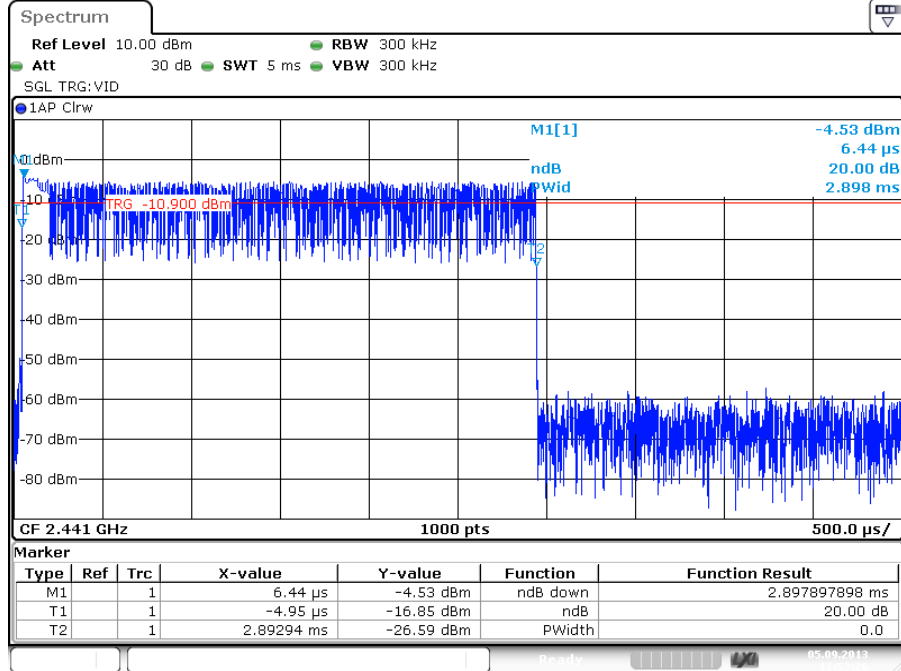


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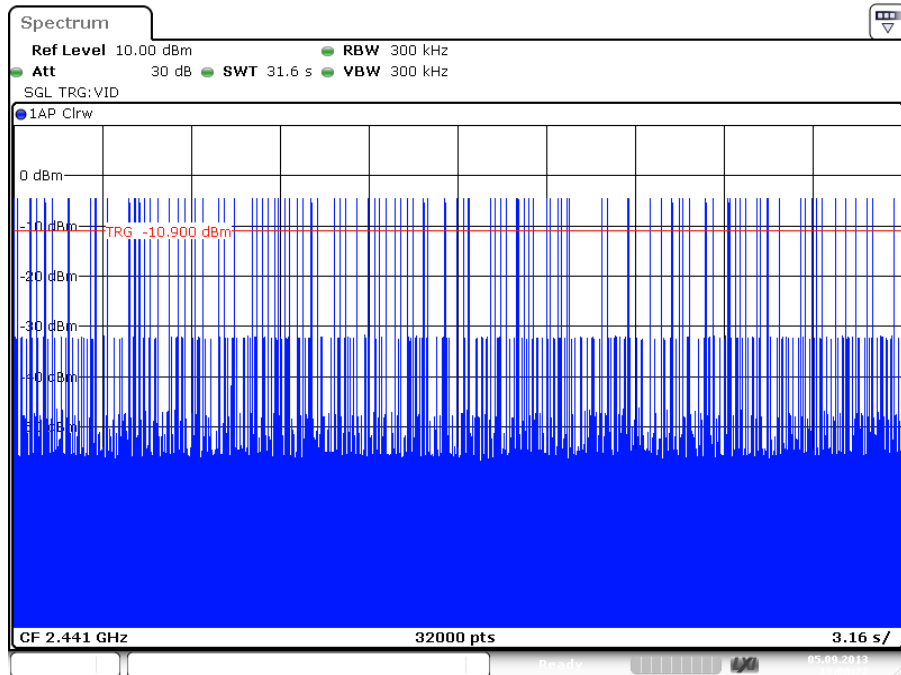


Date: 5.SEP.2013 13:09:10

DH5 Packet Type, EDR 2

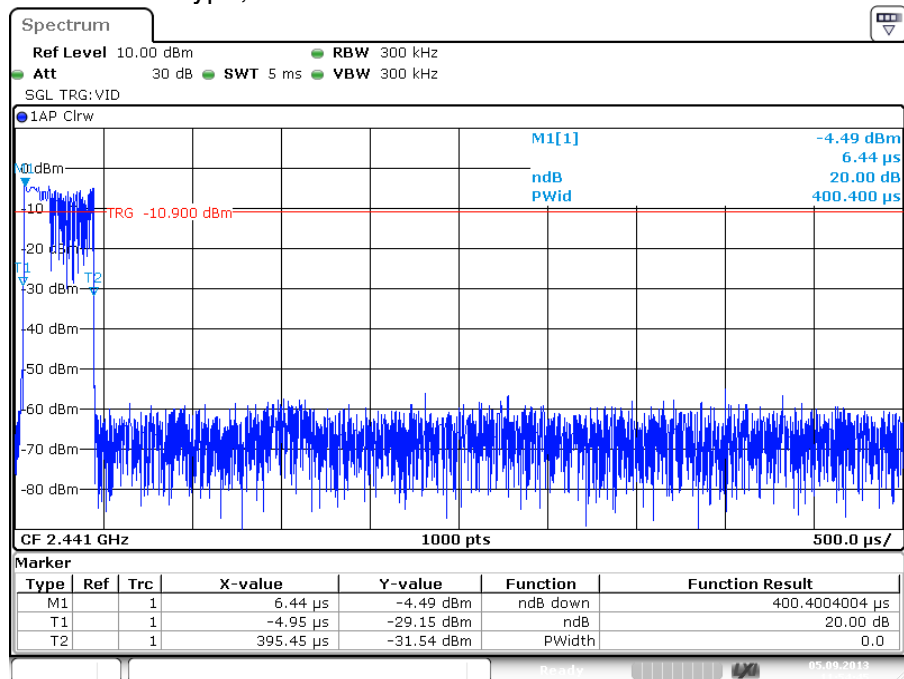


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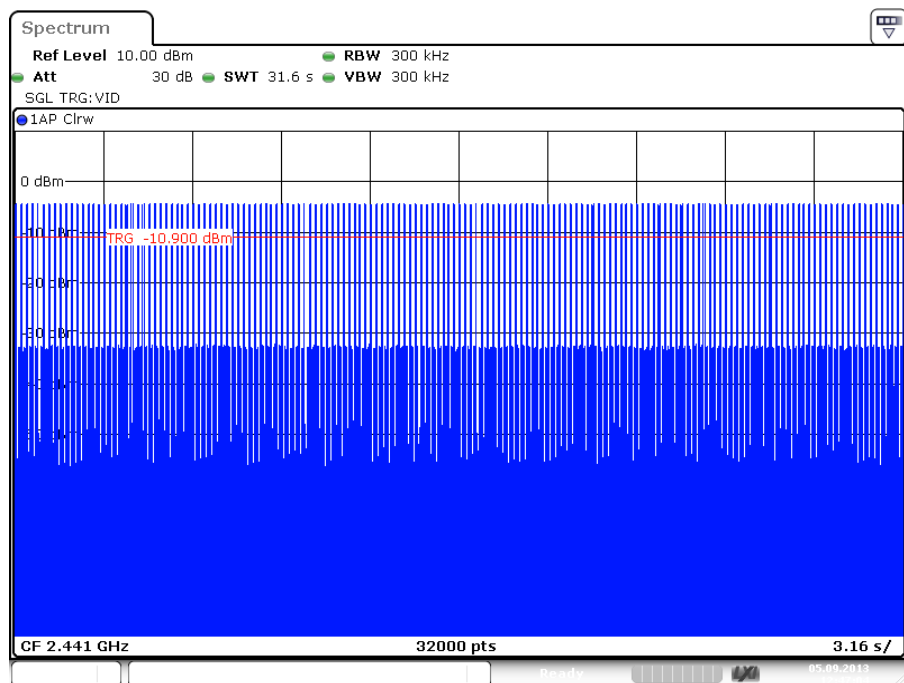


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DH1 Packet Type, EDR 3

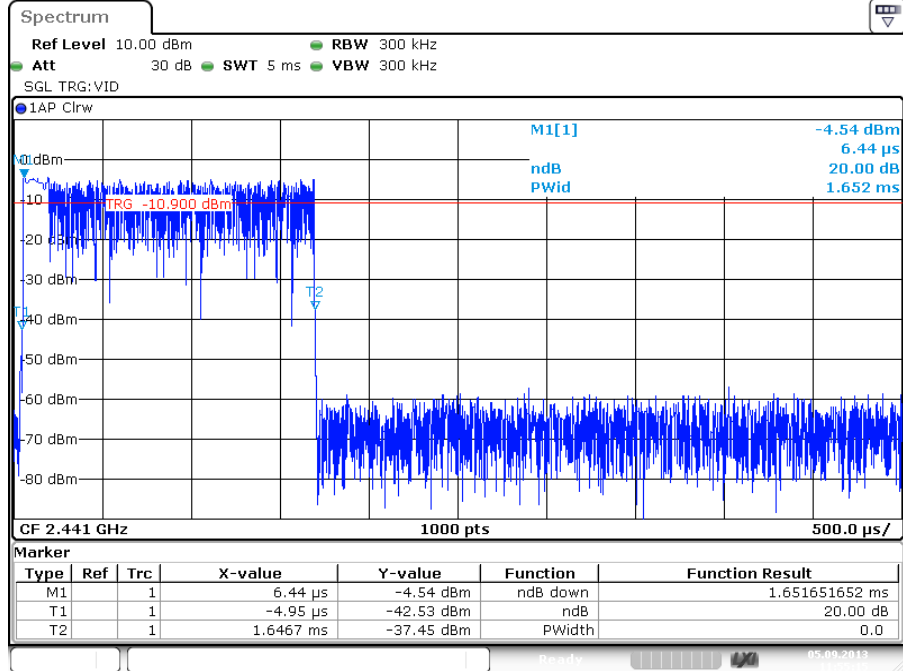


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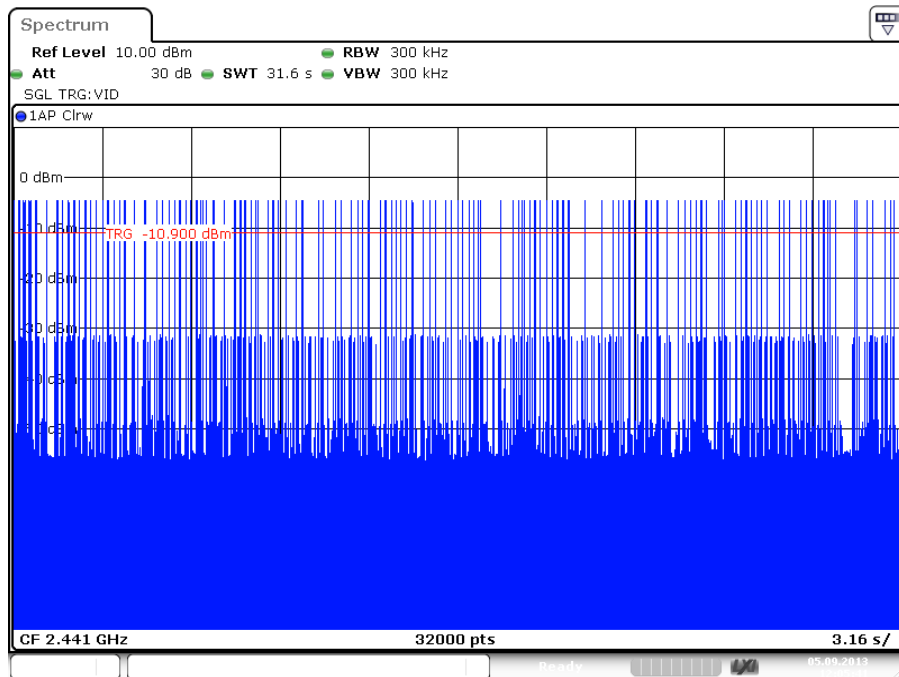


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DH3 Packet Type, EDR 3

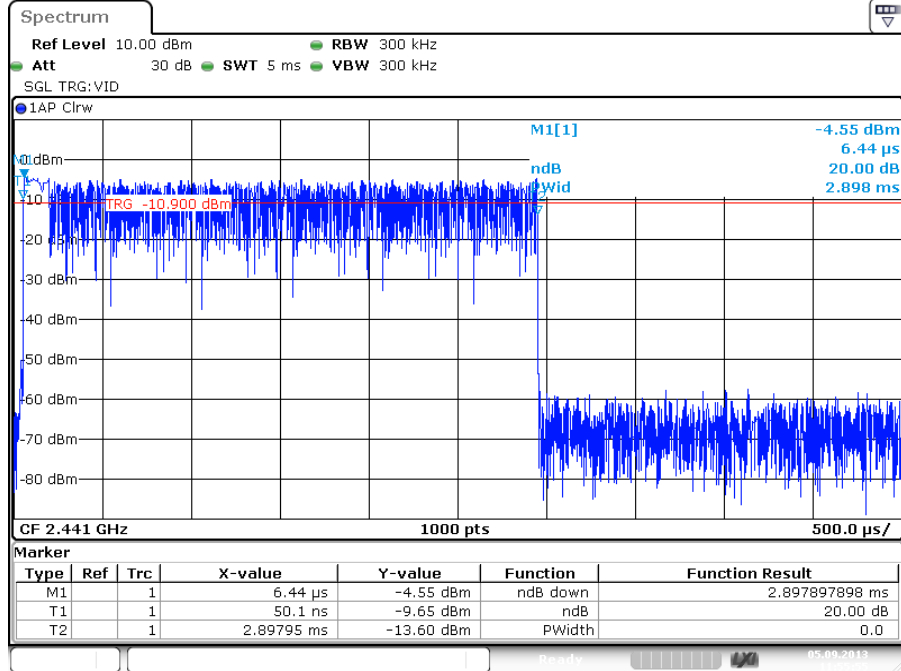


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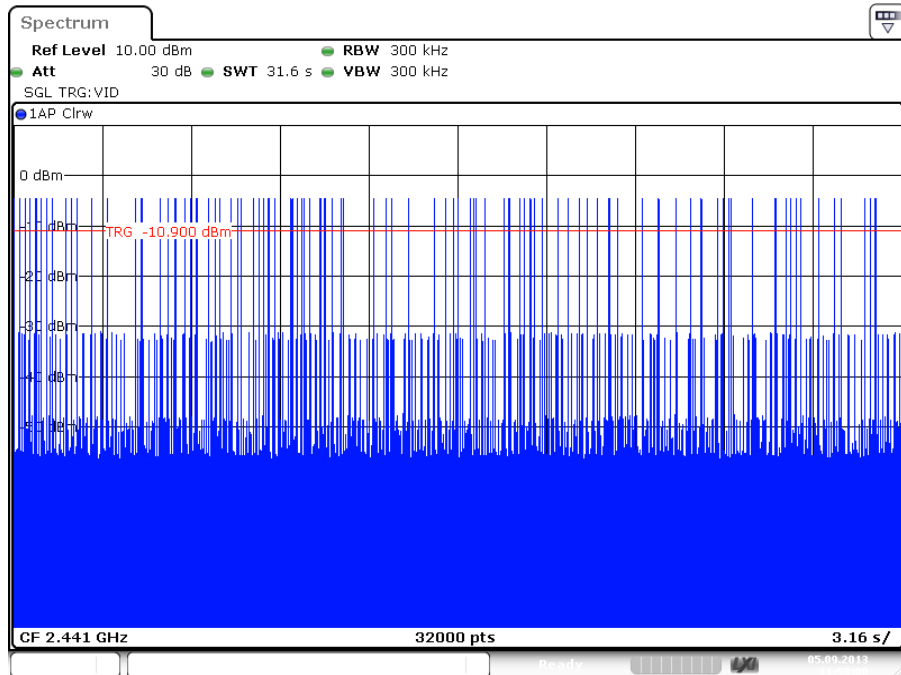


Date: 5.SEP.2013 12:05:42

DH5 Packet Type, EDR 3



Date: 5.SEP.2013 11:55:55



Date: 5.SEP.2013 11:58:00

7 Revision History

Revision Level	Description of changes	Revision Date
0	Initial release	5 Sep 2013