

Test report No:  
NIE: 02647bRCB.002A1

## Test report

### Test and Certification for Citizens Broadband Radio Service (CBRS): WINNF-TS-0122

Identification of item tested	CPE ARA-CPE12000PRO3X
Trademark	Telrad
Model and /or type reference	WLTGG-122
Other identification of the product	FCC ID: ARA-CPE12000PRO3X HW version: V00A SW version: 01.02.01.029.03
Features	4G TD LTE
Manufacturer	Telrad Networks Ltd 1 Bat Sheva Street, P.O.B. 6118, Lod, Israel 711600
Test method requested, standard	940660 D02 CPE-CBSD Handshake Procedures
Approved by (name / position & signature)	Gonzalo Casado (Lab Manager) 
Date of issue	2020-May-27
Report template No	FDT08_22

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## Competences and guarantees

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DEKRA Certification Inc. is a testing laboratory competent to carry out the tests described in this report.

DEKRA Certification Inc. is a testing laboratory accredited by A2LA (The American Association for Laboratory Accreditation) to perform the test indicated in the Certificate 2764.01.

DEKRA Certification Inc. is a CBSD testing laboratory approved by WinnForum.

In order to assure the traceability to other national and international laboratories, DEKRA Certification has a calibration and maintenance program for its measurement equipment.

DEKRA Certification guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated on the report and, it is based on the knowledge and technical facilities available at DEKRA Certification at the time of performance of the test.

DEKRA Certification is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.

The results presented in this Test Report apply only to the particular item under test established in this document.

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## General conditions

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1. This report is only referred to the item that has undergone the test.
2. This report does not constitute or imply on its own an approval of the product by the Certification Bodies or competent Authorities.
3. This document is only valid if complete; no partial reproduction can be made without previous written permission of DEKRA Certification.
4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of DEKRA Certification and the Accreditation Bodies.

## Abbreviations

Abbreviation	Meaning
CBRS	Citizens Broadband Radio Services
CBSD	Citizens Broadband Radio Service Device
DP	Domain Proxy
DUT	Device Under Test
SAS	Spectrum Access System
UUT	Unit Under Test
CPI	Certified Professional Installer
N/A	Not Applicable
SA	Spectrum Analyzer

## Uncertainty

Uncertainty (factor k=2) was calculated according to the DEKRA Certification internal document PODT000.

## Data provided by the client

DEKRA declines any responsibility with respect to the information provided by the client and that may affect the validity of results.

## Usage of samples

Samples undergoing test have been selected by: the client

Sample M/01 is composed of the following elements:

Control N°	Description	Model	Serial N°	Date of reception
02647b.007	CPE-CBSD	CPE12000	GMK180706007060	2020-Jan-15
02647b.008	CPE-CBSD	CPE12000	GMK180706007011	2020-Jan-15

1. Sample M/01 has undergone the test(s) specified in subclause “Test method requested”.

## Supported Features

Condition	Feature Description	Supported
DP	CBSD with Domain Proxy	Y
CPE	CBSD is CPE-CBSD device	Y

## Identification of the client

Same as manufacturer

## Testing period and place

Test Location	DEKRA Certification Inc
	405 Glenn Drive, Suite 12, Sterling, Virginia, USA, 20164
Date (start)	2020-March-16
Date (finish)	2020-March-31

## Document history

Report number	Date	Description
02647bRCB.002	2020-April-2	First release
02647bRCB.002A1	2020-May-27	Second Release. Updated FCC ID in cover page as per client request

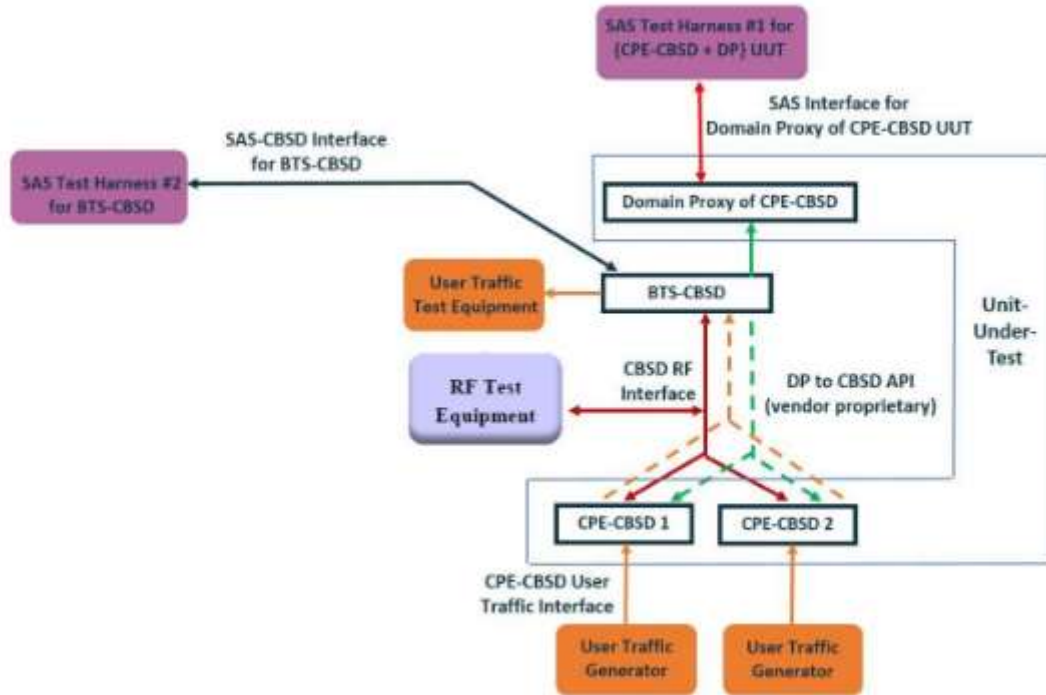
## Remarks and comments

Testing performed by Gonzalo Casado

## List of equipment used during the test

Description	Model	Test Equipment		
		Control Number	SW Version	Serial Number
Signal Analyzer	MXA N9020A	0382	A.04.26	R9-L2D1V
Test SAS Harness	N/A	N/A	Test Harness:1.0.3	N/A
Compliant CBSD	CMP.XT-BS- 3.4.3.7	-	7.0	95032353 & LKT- COMPACT3X

## Test Setup Diagram



Note: Only one CPE-CBSD unit used

## Testing verdicts

Not applicable :	N/A
Pass :	P
Fail :	F
Not measured :	N/M

## Test Results Summary

Test Cases Verdicts	Number of Test Cases
Not applicable :	0
Pass :	5
Fail :	0
Not measured :	0
<b>Total Number of Test Cases</b>	<b>5</b>

## Appendix A: Test results

Test Case Name	Description	Verdict	Date	Sample
CPE.KDB.1	CPE Handshake transmissions are used only for communicating to the SAS for registration and authorization of the device	P	29-March-2020	M/01
CPE.KDB.3	CPE Handshake transmissions are on a channel used by or indicated by the BTS-CBSD after receiving an authorization signal from the BTS-CBSD	P	29-March-2020	M/01
CPE.KDB.4	CPE Handshake transmissions are limited in duration and duty cycle to the minimum time necessary to get a grant from the SAS; this time should not exceed 1 second within any 10-second period, 10seconds within any 300-second period, or 20 seconds within any 3600-second period	P	29-March-2020	M/01
CPE.KDB.6	In the event the CPE-CBSD needs to reconnect to a SAS or renew its connection for registration and (re)authorization purposes, the device can use the same or a shortened protocol to reestablish connection.	P	29-March-2020	M/01
CPE.KDB.7	Verify that the CPE-CBSD register with SAS even with transmit power level below 23dBm EIRP	P	29-March-2020	M/01

Notes:

- Signal Analyzer Screenshots for test cases CPE.KDB.3, CPE.KDB.4 and CPE.KDB.7 included in appendix D
- Test cases steps described in appendix C

## Appendix B: Photographs

**Figure B1.** Top View of DUT



**Figure B2.** DUT rear view





# Appendix C: Test Cases Details

1) [WINNF.FT.D.REG.6] Domain Proxy Single-Step registration for CBSD with CPI signed data  
 This test is mandatory for DP with CBSDs which report all Required and REG-Conditional parameters in the Registration request to the SAS using CPI signed data. This test validates that each of the required and REG-Conditional parameters appear within the registration request message. This test case applies to Domain Proxy supervising two CBSDs.

All Category B devices, and Category A devices not able to determine its own location require installation by a CPI. This test is for devices where the CPI enters data into the CBSD and this information along with the CPI signature are sent in the request message. Excluded from this test are devices which require the CPI to enter the information into a SAS interface. These devices would follow the multiple step registration test [WINNF.FT.D.REG.2].

#	Test Execution Steps	Results	
1	Ensure the following conditions are met for test entry: <ul style="list-style-type: none"> <li>• UUT has successfully completed SAS Discovery and Authentication with SAS Test Harness</li> <li>• UUT is in the Unregistered state</li> <li>• All of the required and REG-Conditional parameters shall be configured, and CPI signature provided</li> </ul>	--	--

2) CPE.KDB.1: CPE Handshake transmissions are used only for communicating to the SAS for registration and authorization of the device

Test Case applicable only to CPE-CBSD

#	Test Execution Steps
1	Connect a laptop to DUT and start a ping to an equipment connected behind CBSD
2	Verify that Laptop doesn't have ping connectivity to the machine targeted in step #1
3	Start test WINNF-0122 WINNF.FT.C.HBT.10
4	Verify that Laptop has ping connectivity to the machine targeted in step #1 once it has been authorized by the SAS and with a valid Grant
5	Wait until execution of test WINNF.FT.C.HBT.10 is completed
6	Verify that Laptop doesn't have ping connectivity to the machine targeted in step #1

3) CPE.KDB.3: CPE Handshake transmissions are on a channel used by or indicated by the BTS-CBSD after receiving an authorization signal from the BTS-CBSD

Test Case applicable only to CPE-CBSD

#	Test Execution Steps
1	Note the channel and channel BW used by the CBSD-CBSD
2	Power cycle DUT and verify that the CPE doesn't have a valid grant

3	Verify using a SA that the CPE is using the channel and channel BW used by the CBSD-CBSD
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- 4) CPE.KDB.4: CPE Handshake transmissions are limited in duration and duty cycle to the minimum time necessary to get a grant from the SAS; this time should not exceed 1 second within any 10-second period, 10seconds within any 300-second period, or 20 seconds within any 3600-second period

Test Case applicable only to CPE-CBSD

#	Test Execution Steps
1	Start test WINNF-0122 WINNF.FT.C.GRA.1
2	Keep CPE-CBSD in registered state with SAS, but no grant.
3	Measure CPE-CBSD transmission durations
4	Verify that CPE-CBDS transmission duration doesn't exceed 1 second within 10seconds, 10 seconds within 300seconds and 20seconds within 3600seconds

- 5) CPE.KDB.6: In the event the CPE-CBSD needs to reconnect to a SAS or renew its connection for registration and (re)authorization purposes, the device can use the same or a shortened protocol to reestablish connection.

Test Case applicable only to CPE-CBSD

#	Test Execution Steps
1	Configure SA to perform a new sweep of 1ms only when it detects signal from the DUT
2	Start test WINNF-0122 WINNF.FT.C.HBT.10
3	Wait until execution of test WINNF.FT.C.HBT.10 is completed
4	Start a timer once the first transmission from DUT is detected and start counting the number of sweeps performed. This is, count each transmission from DUT detected
5	Wait ten seconds
6	Verify that the number of data transmissions from DUT is less than 1000 (Totally one second of data transmissions)
7	Repeat steps #1 through 5 verifying that the DUT sends less than 10000 data transmissions of 1ms in 300seconds and less than 20000 data transmissions of 1m in 3600secods

- 6) CPE.KDB.7: Verify that the CPE-CBSD register with SAS even with transmit power level below 23dBm EIRP

Test Case applicable only to CPE-CBSD

#	Test Execution Steps
1	Adjust RF path attenuation between CPE-CBSD and CBSD so that the CPE-CBSD transmit power is below 23dBm EIRP
2	Start test WINNF-0122 WINNF.FT.C.HBT.10
3	Once CPE-CBSD is registered with SAS, verify transmit power is below 23dBm

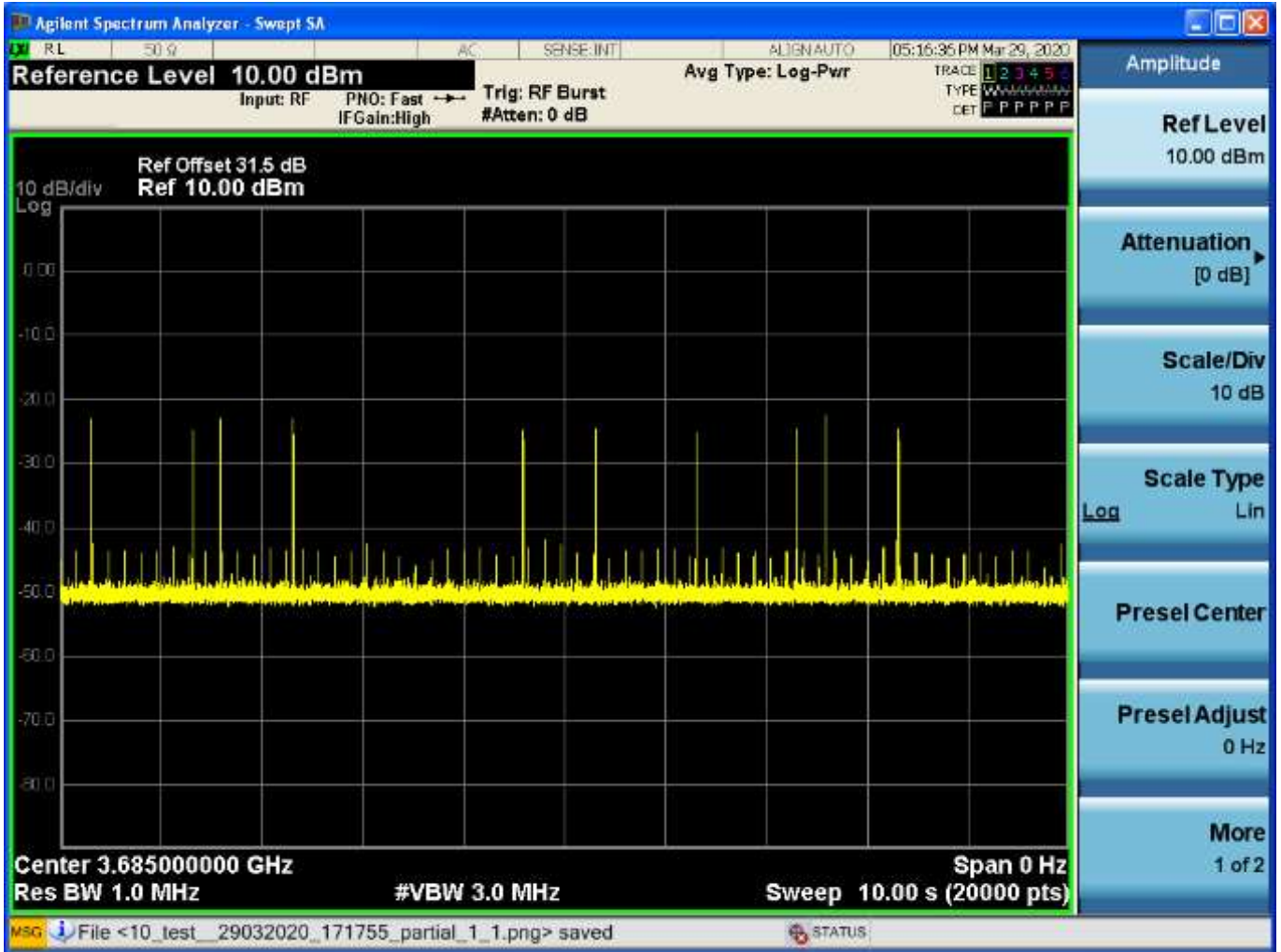
# Appendix D: Spectrum Analyzer Screenshots

1. CPE.KDB.4: Results for CPE-CBSD transmission duty cycle without grant

Time Period (s)	Time Limit (s)	DUT Tx Duration Measured (s)	Result	Measurement time resolution	Sweep time	Sweep points
10	1	0.03	PASS	0.5ms	10s	20000
300	10	2.21	PASS	0.5ms	20s	40000
3600	20	16.07	PASS	0.5ms	20s	40000

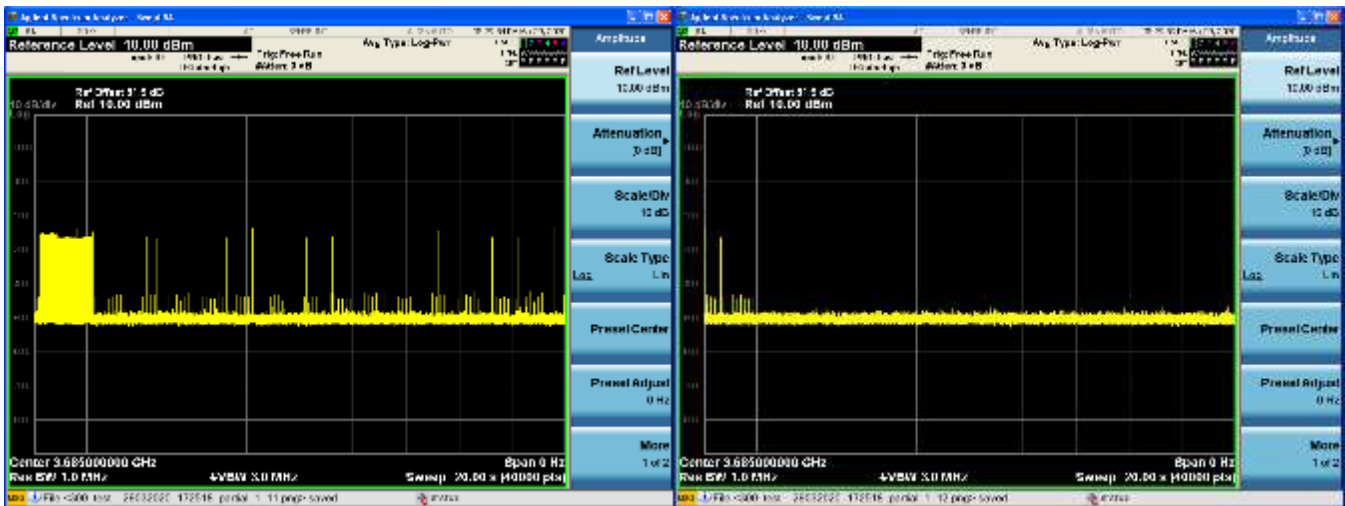
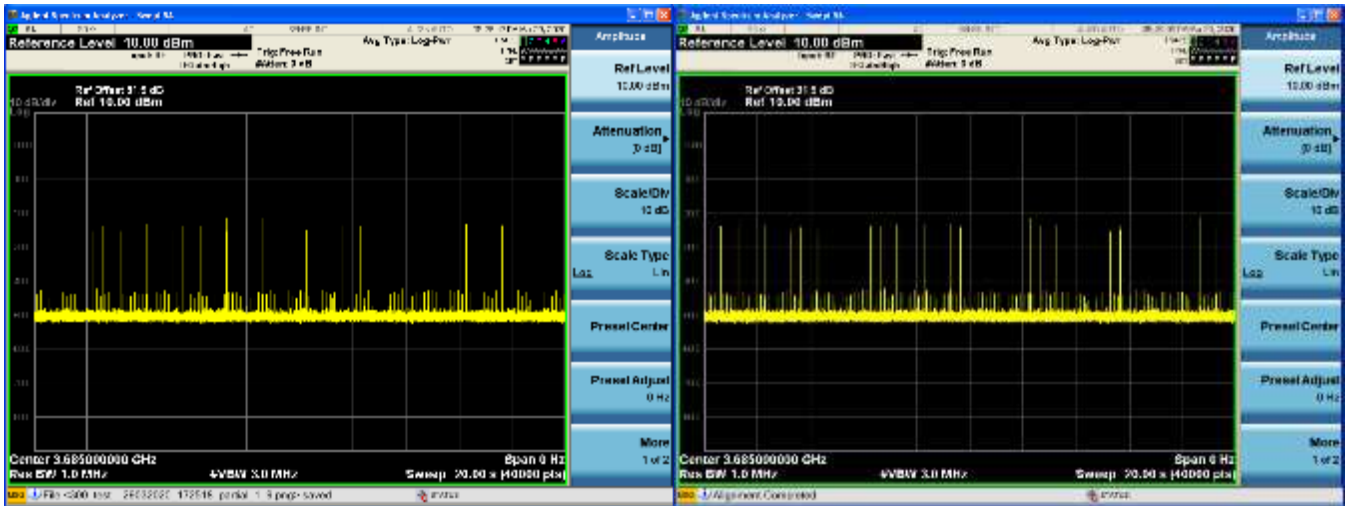
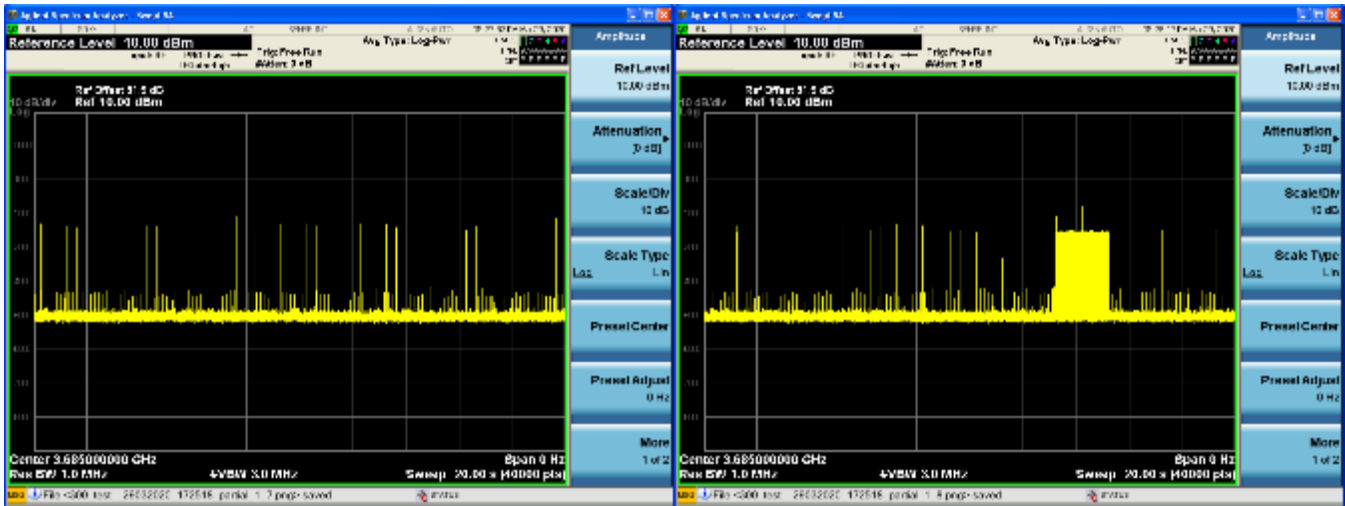
Note: The 300s and 3600-period test was measured by doing multiple consecutive automatic sweeps of 40seconds. The value reported is the aggregated time of all the sweeps where signal was detected by the signal analyzer

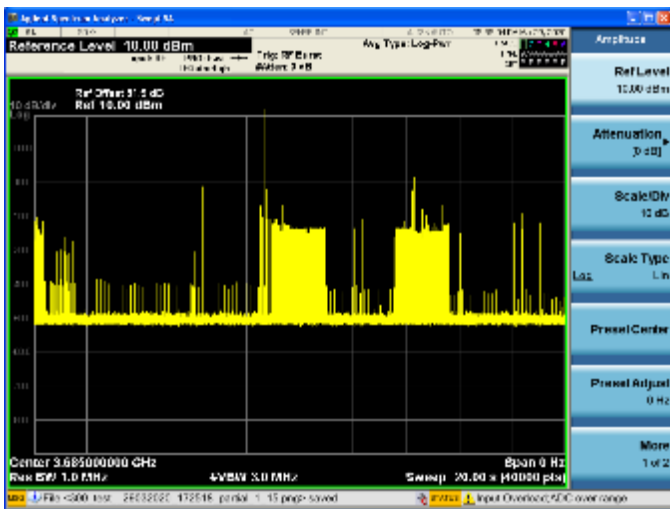
1.1. 1 seconds within 10 second period



1.2. 10 seconds within 300 second period

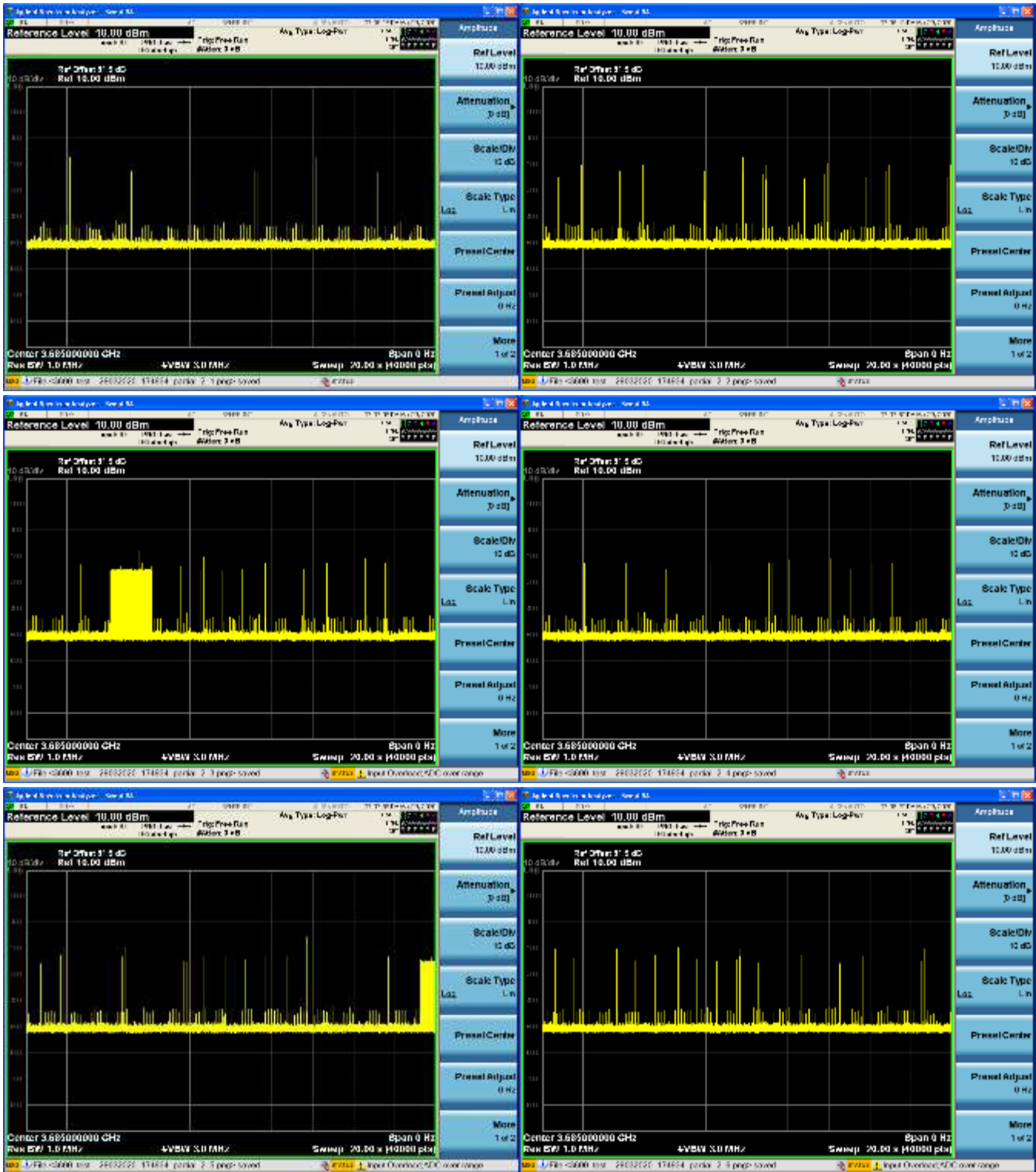




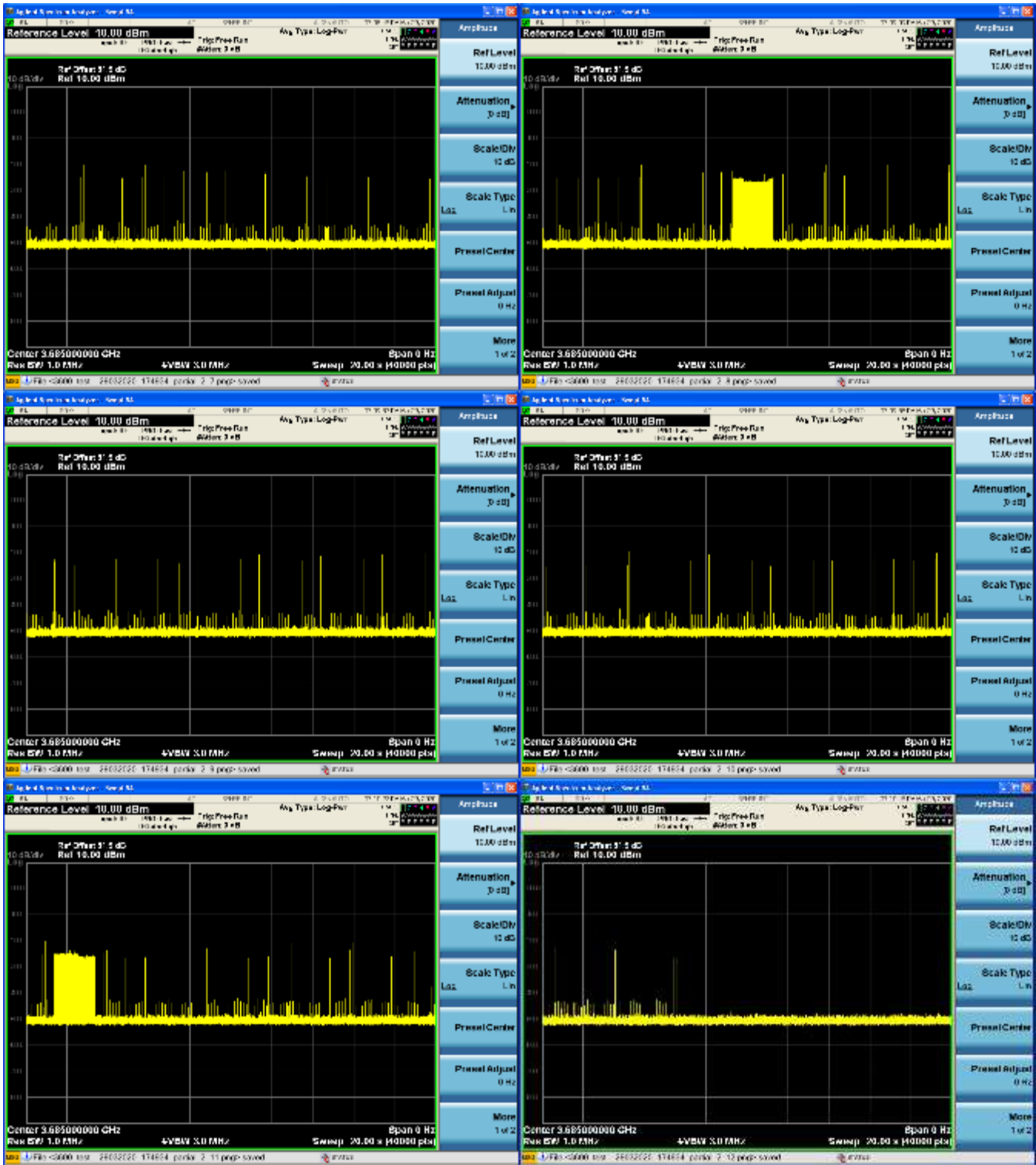


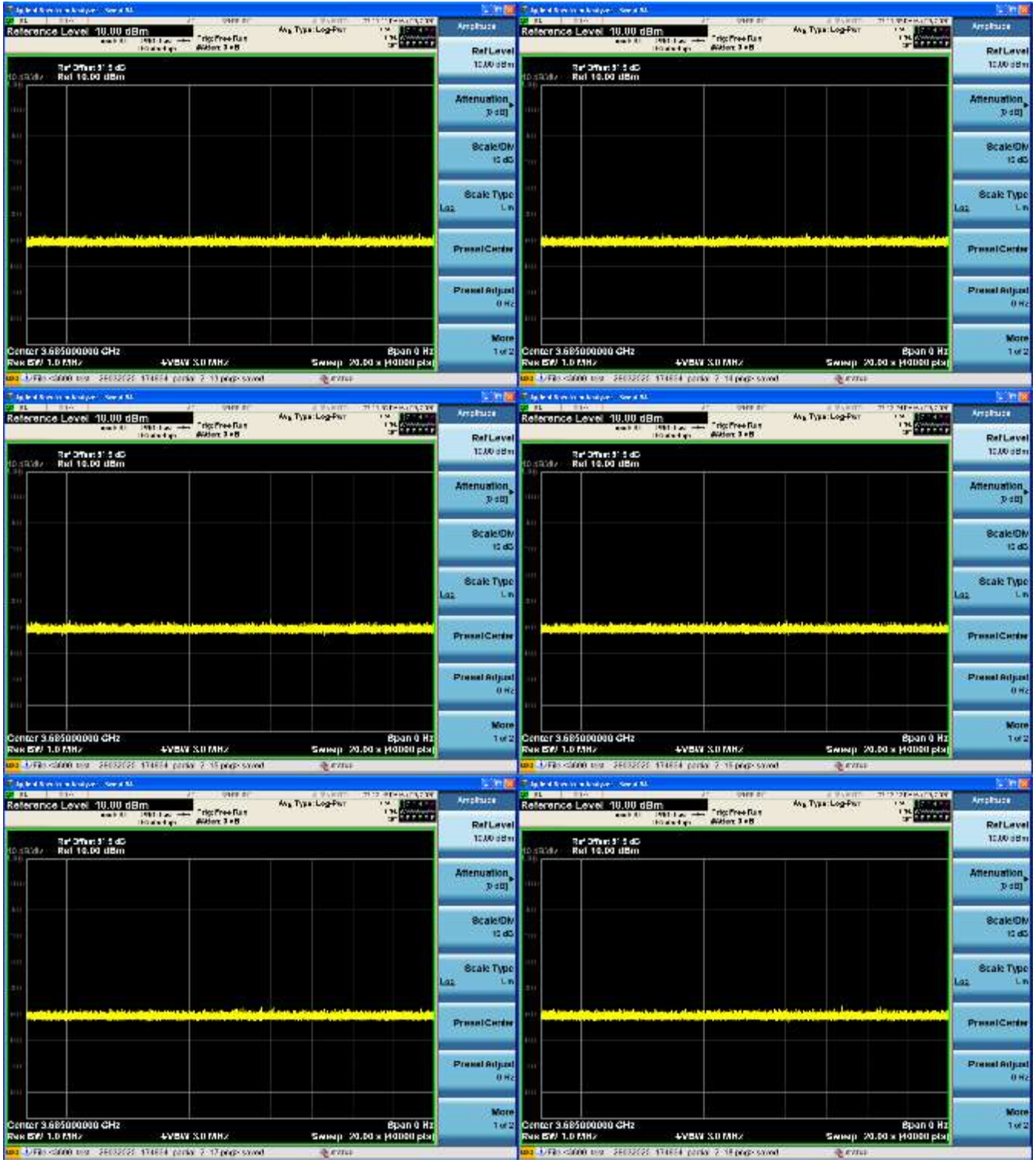
### 1.3. 20 seconds within 3600 second period

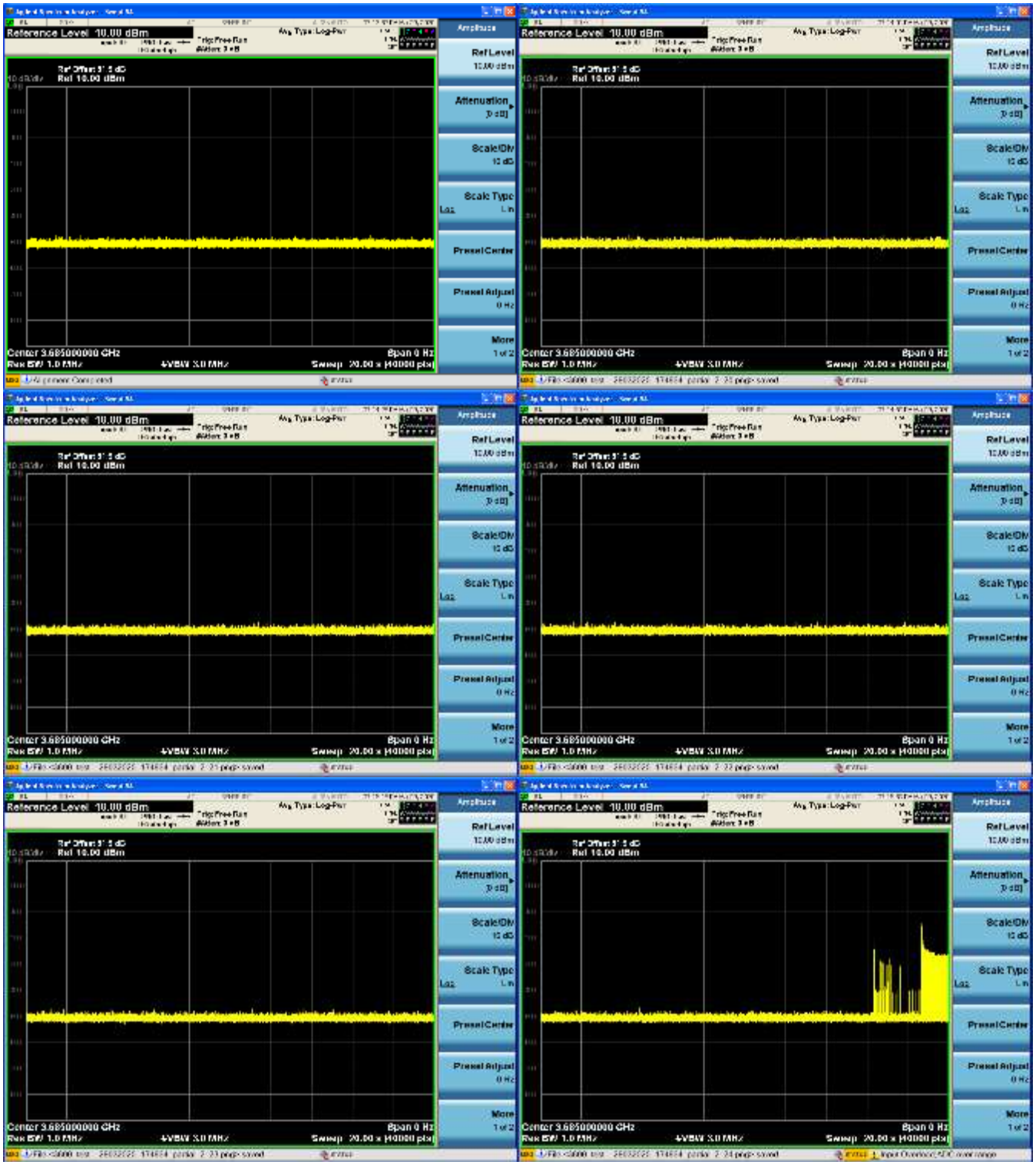
Note: The 3600-period test was measured by doing 180 consecutive automatic sweeps of 40seconds. The value reported is the aggregated time of all the sweeps where signal was detected by the signal analyzer

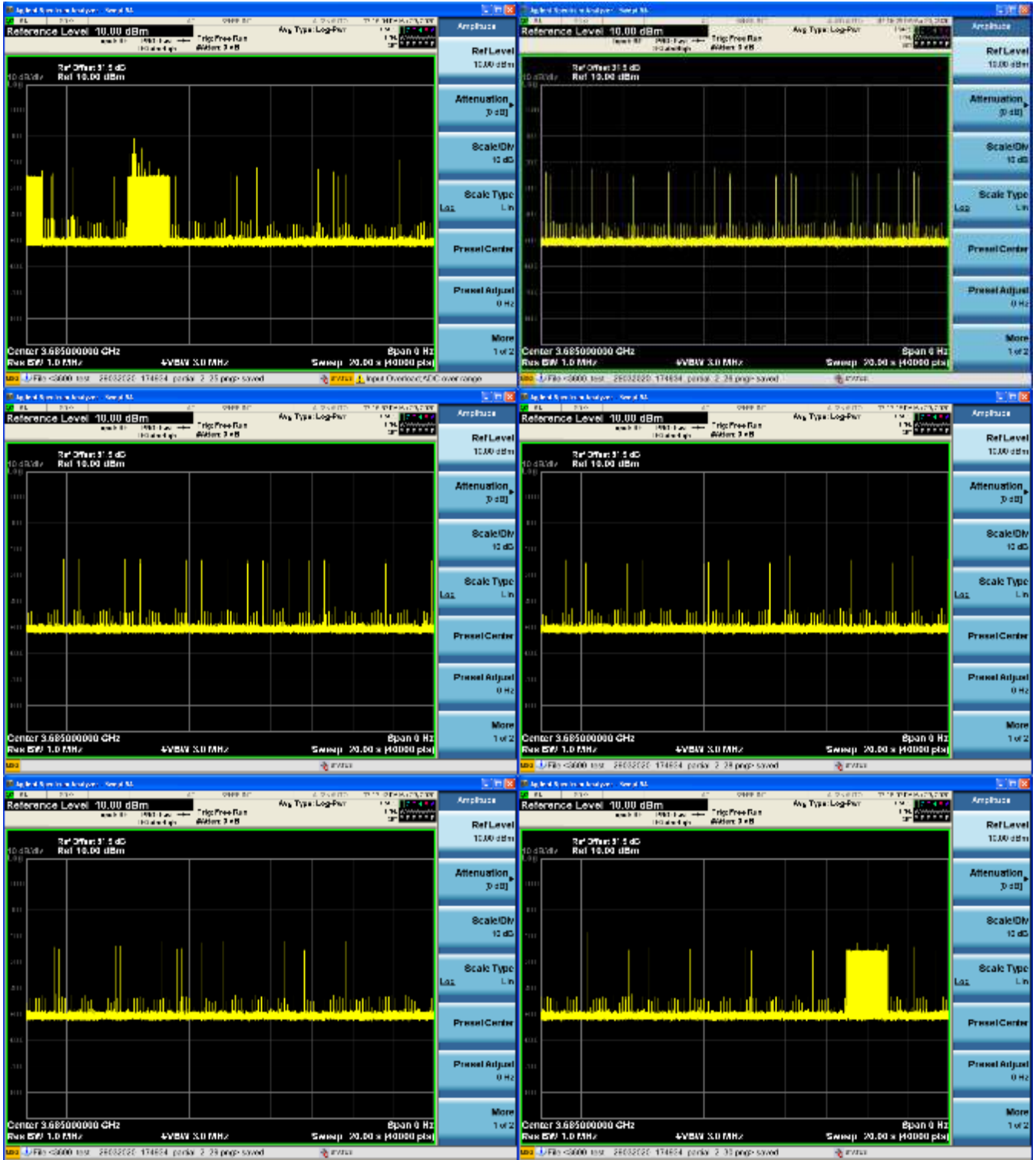


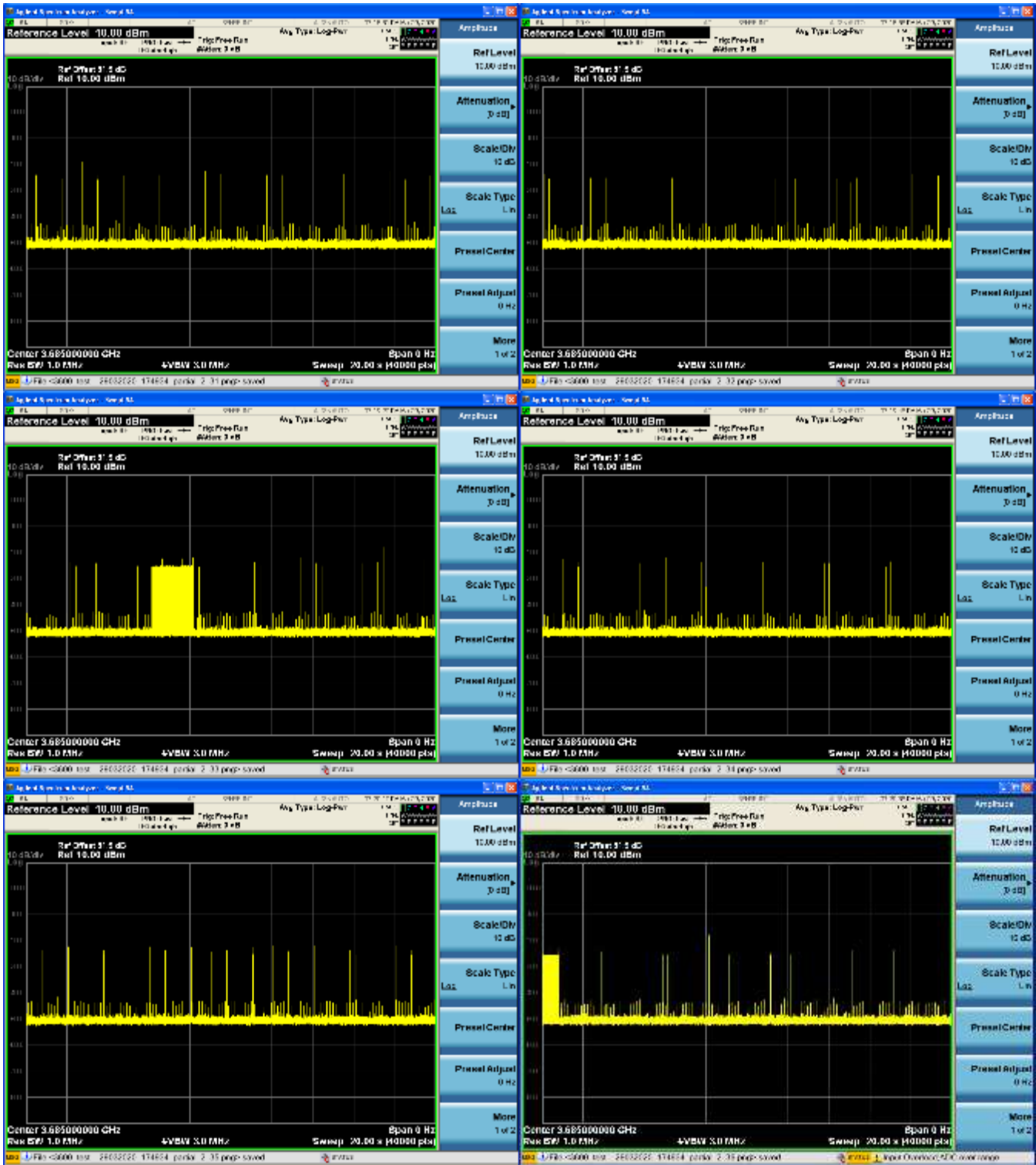


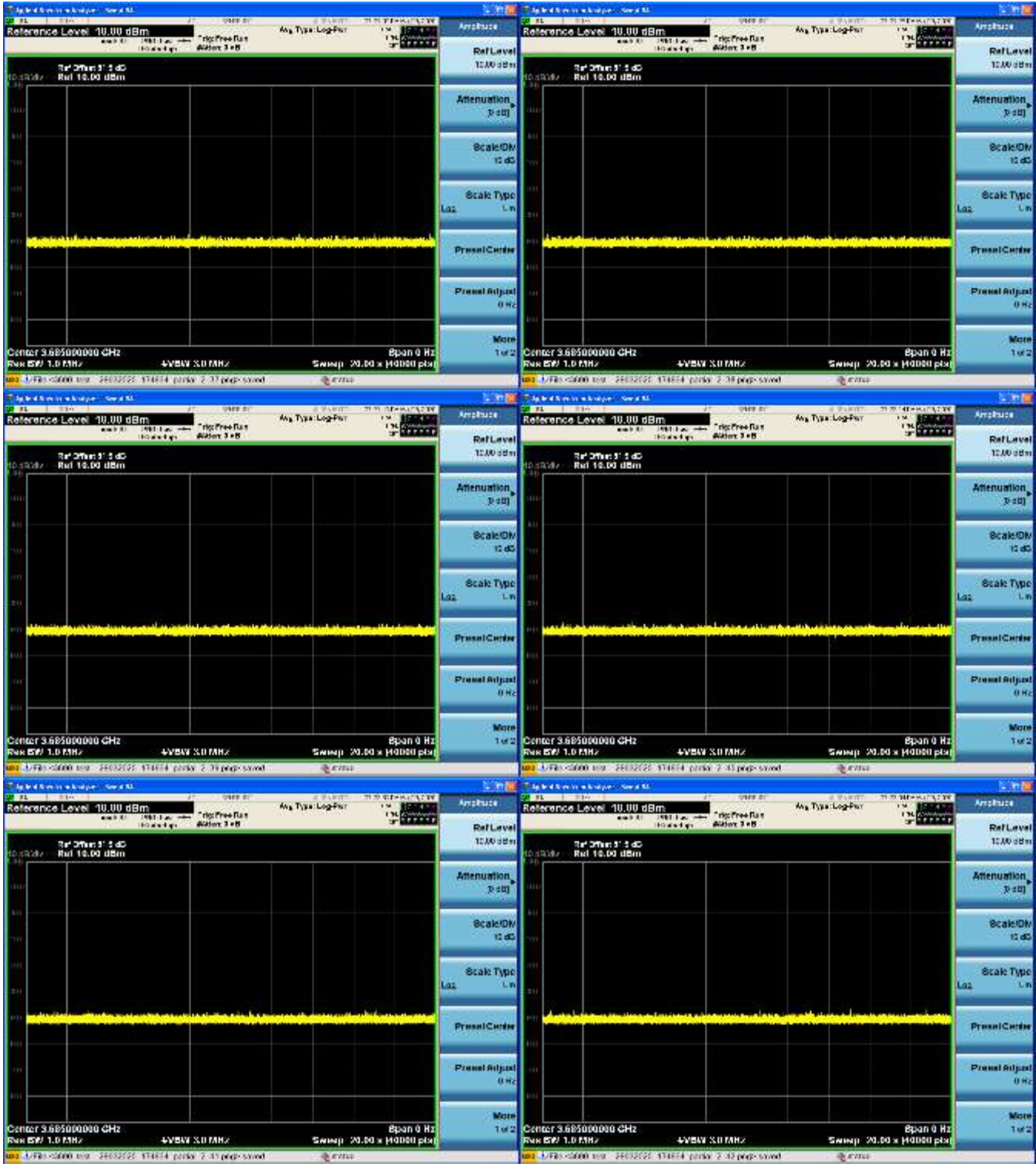


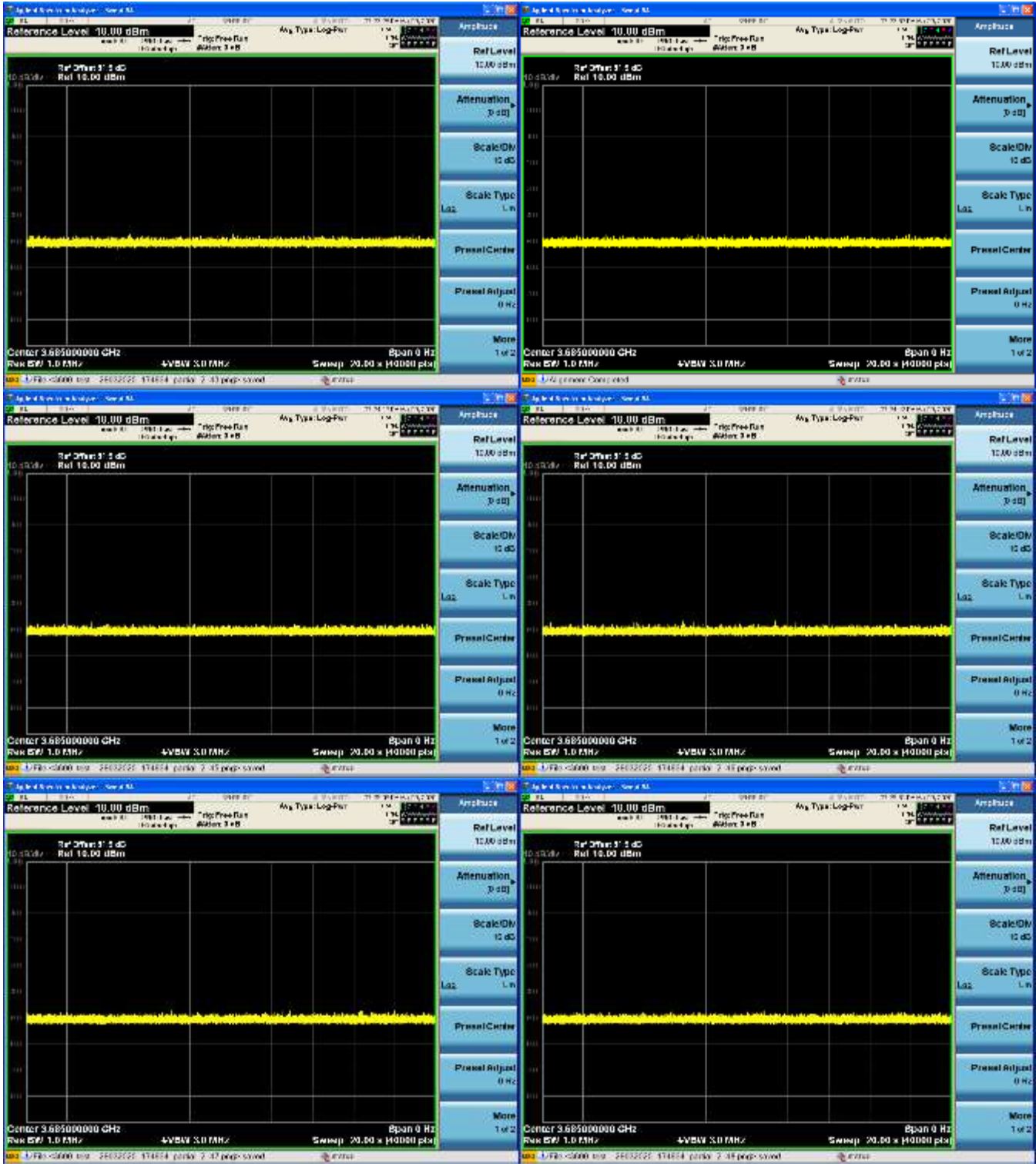


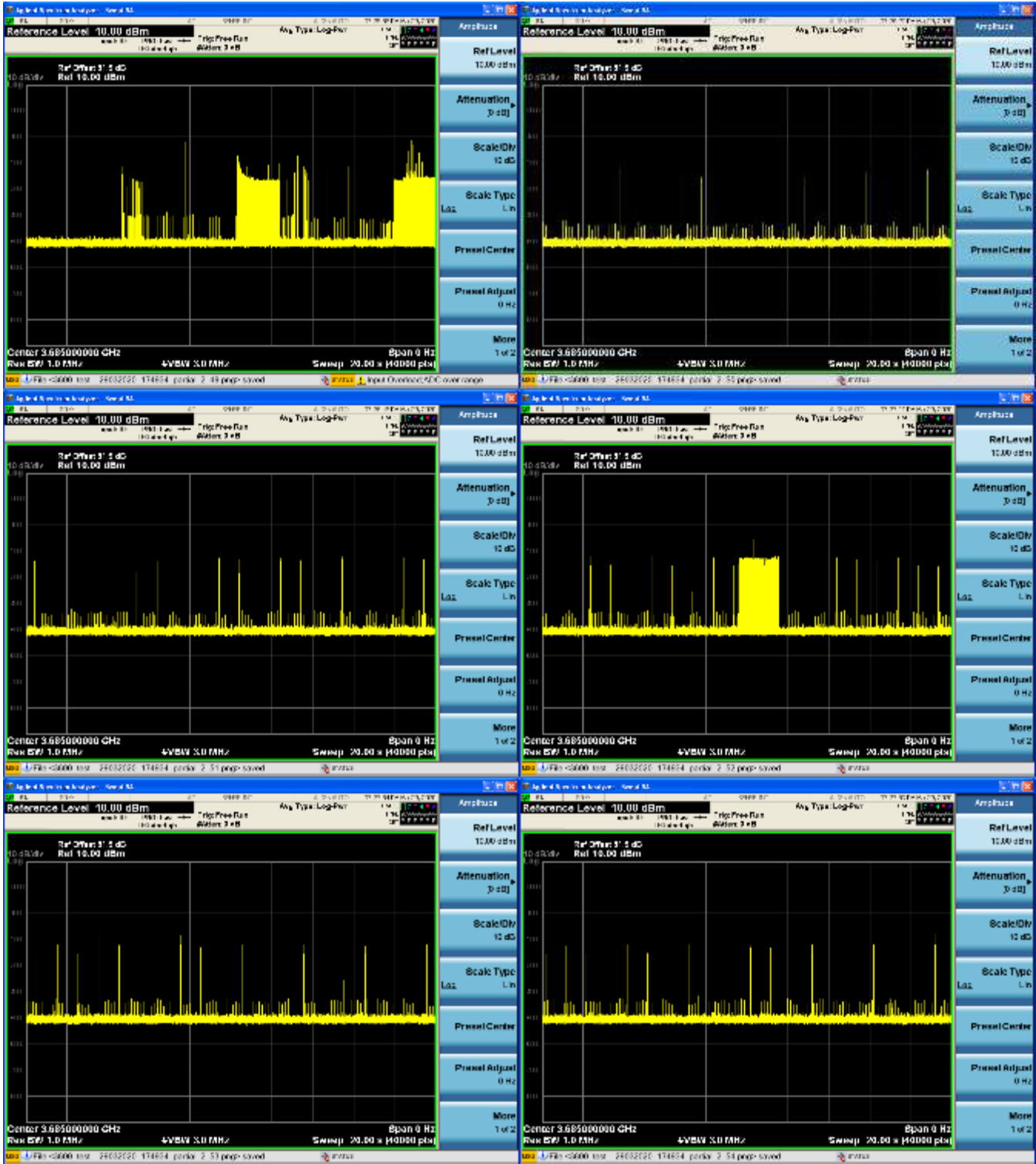




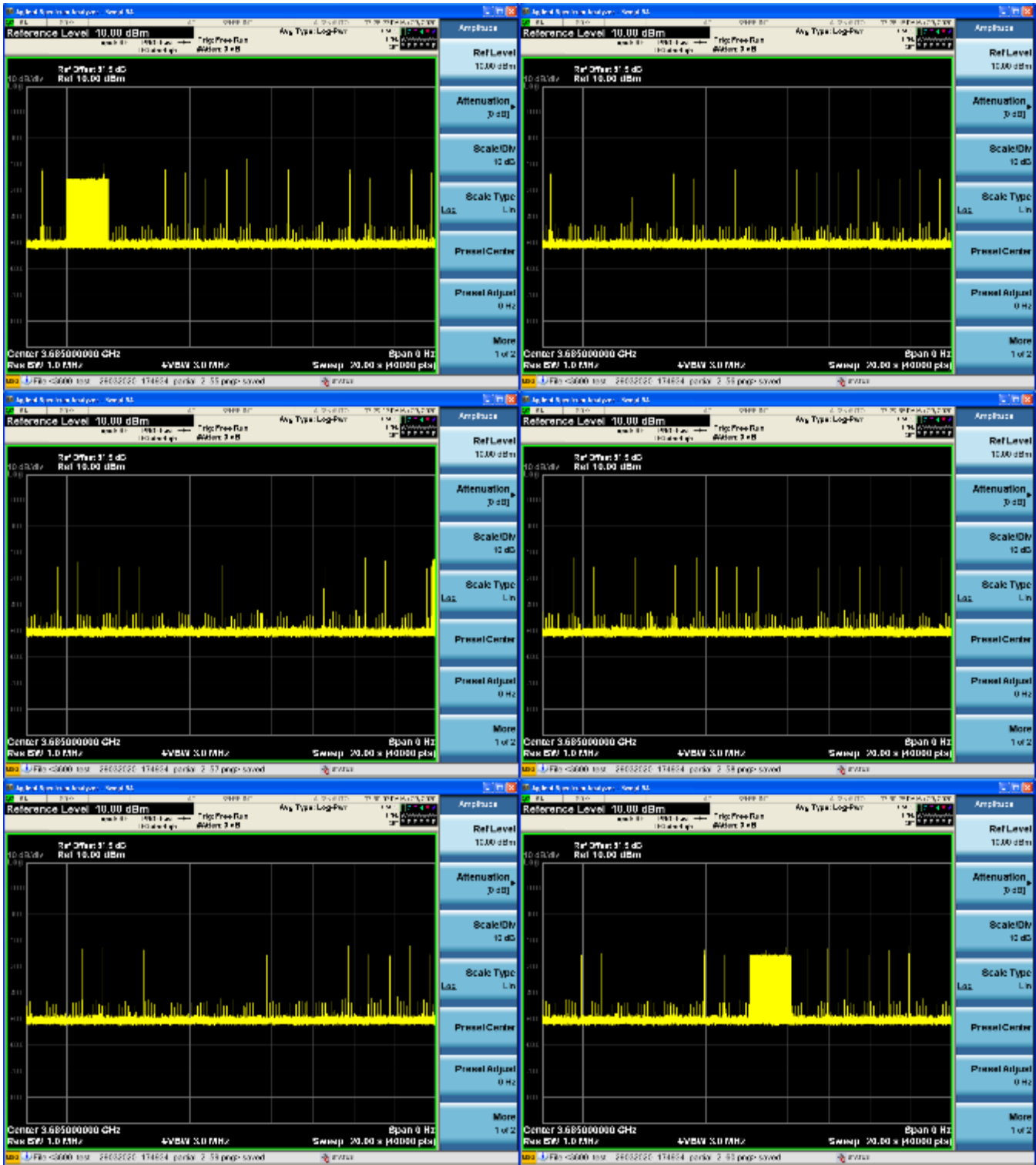


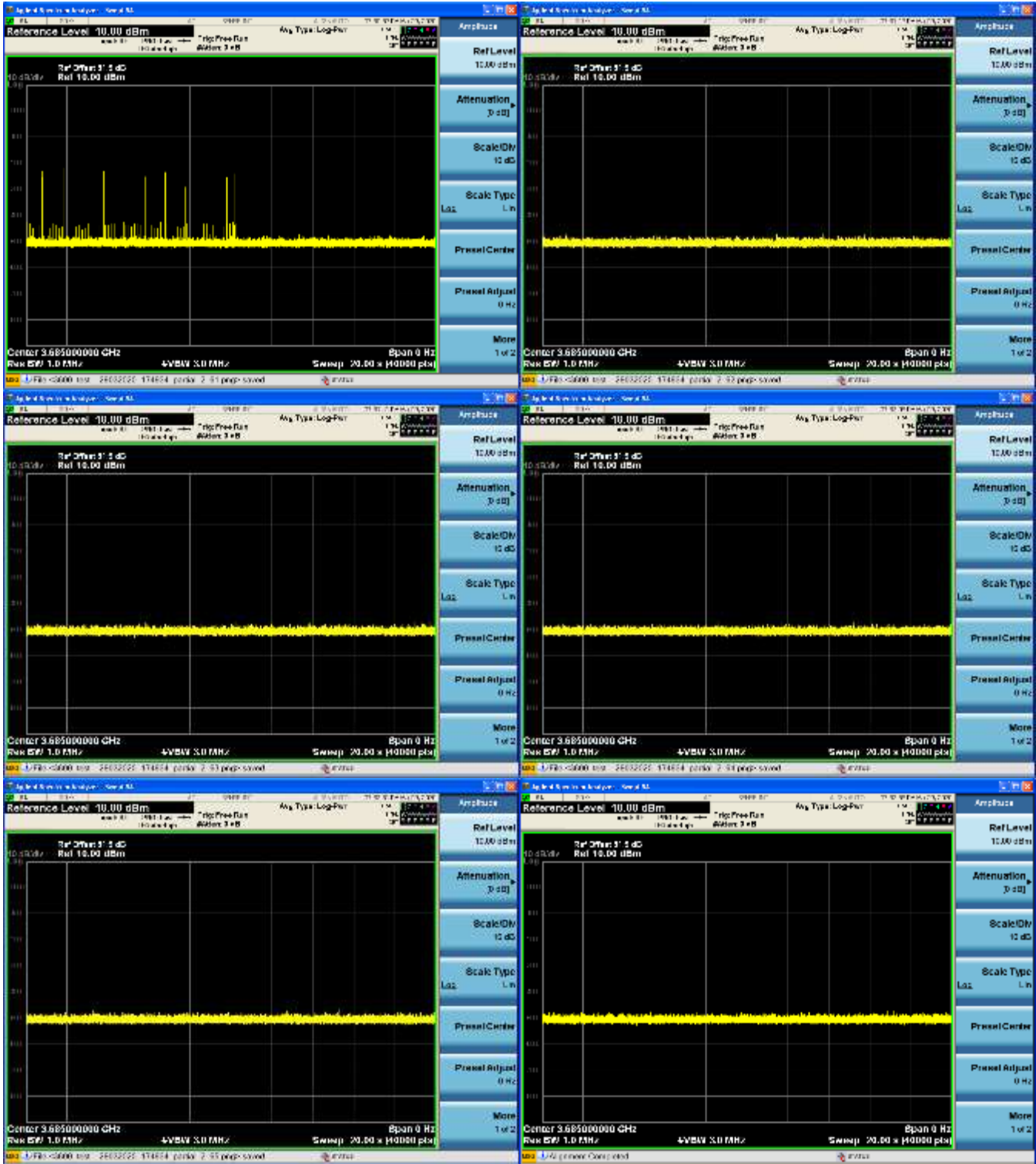


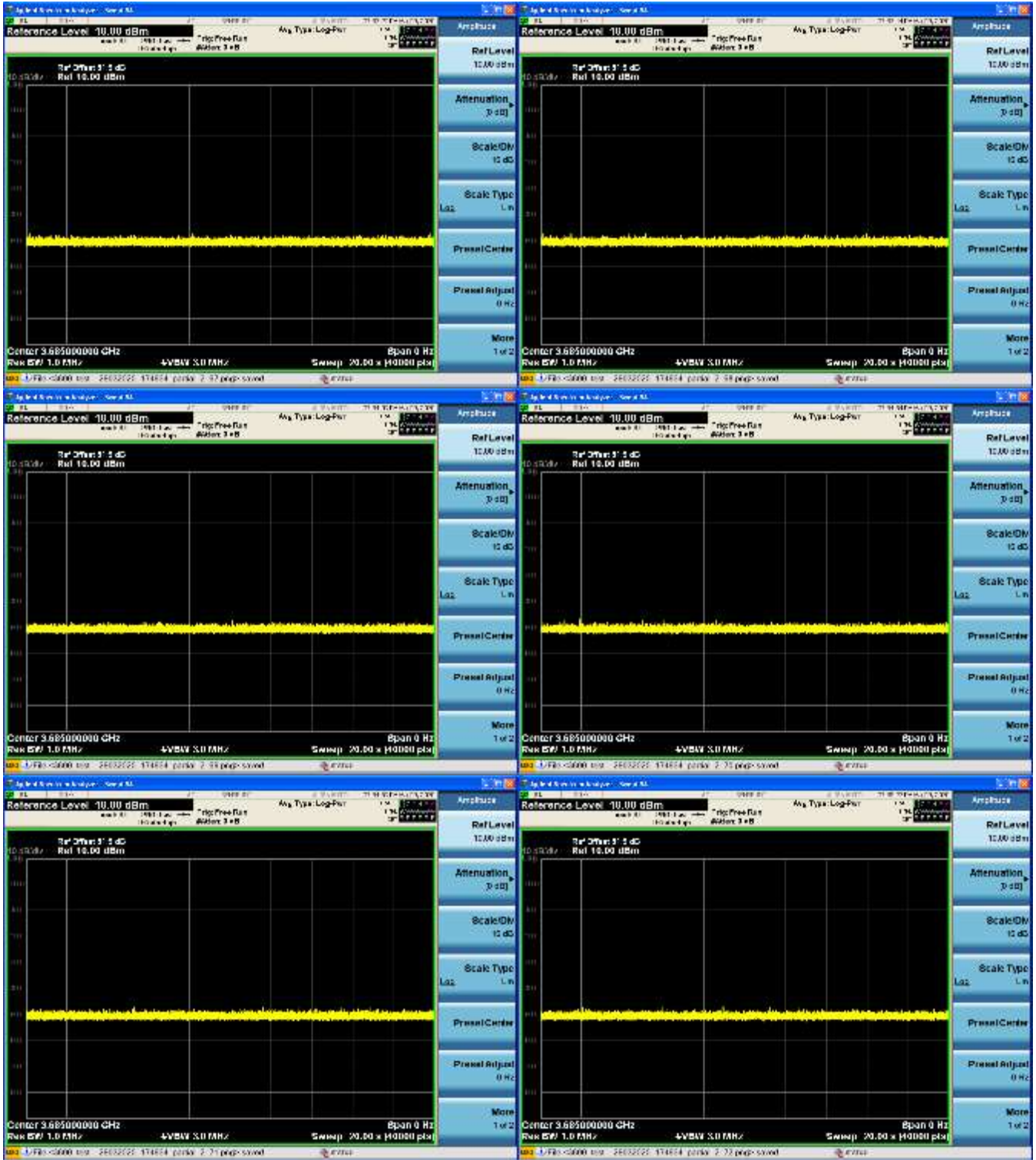


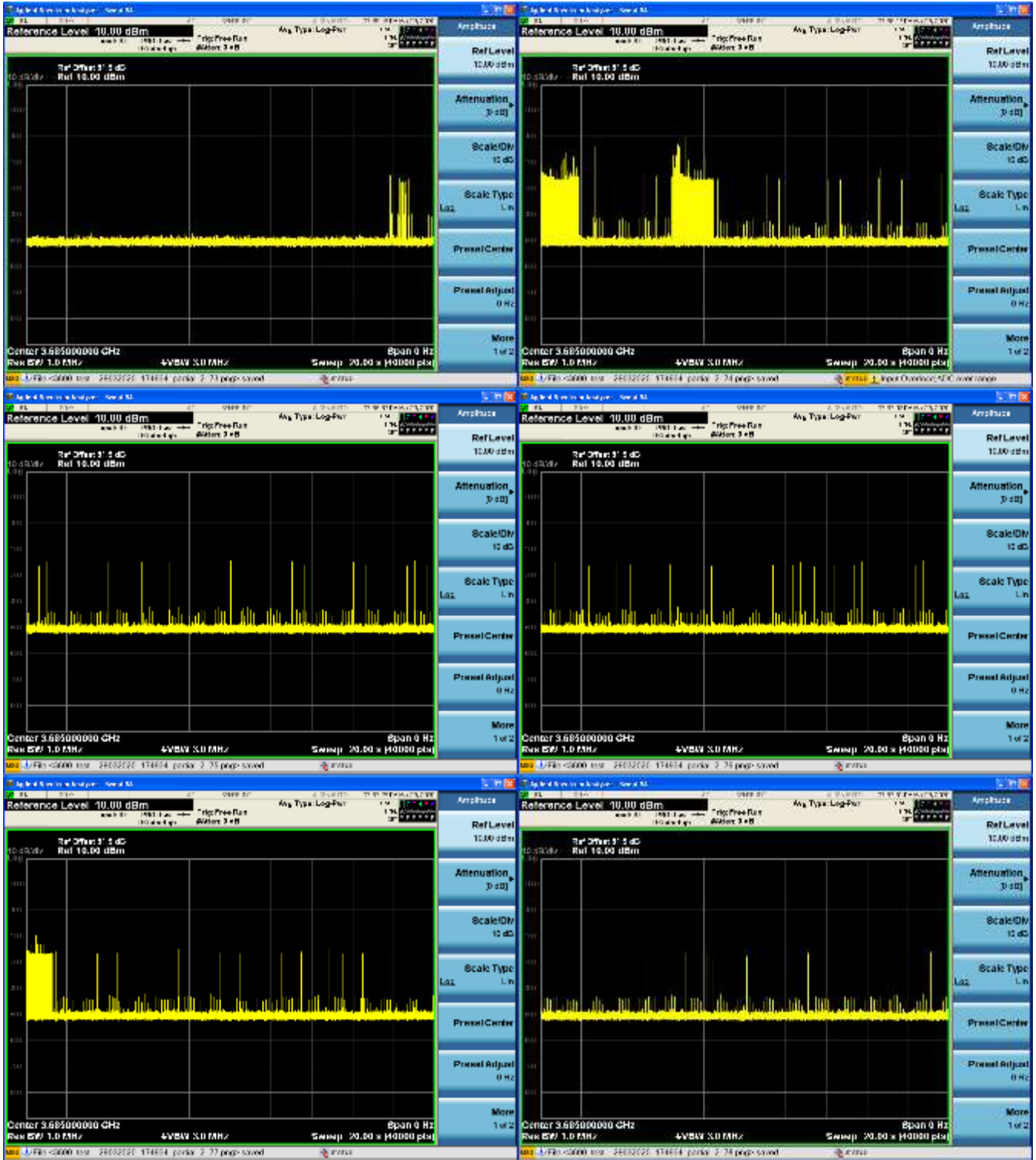


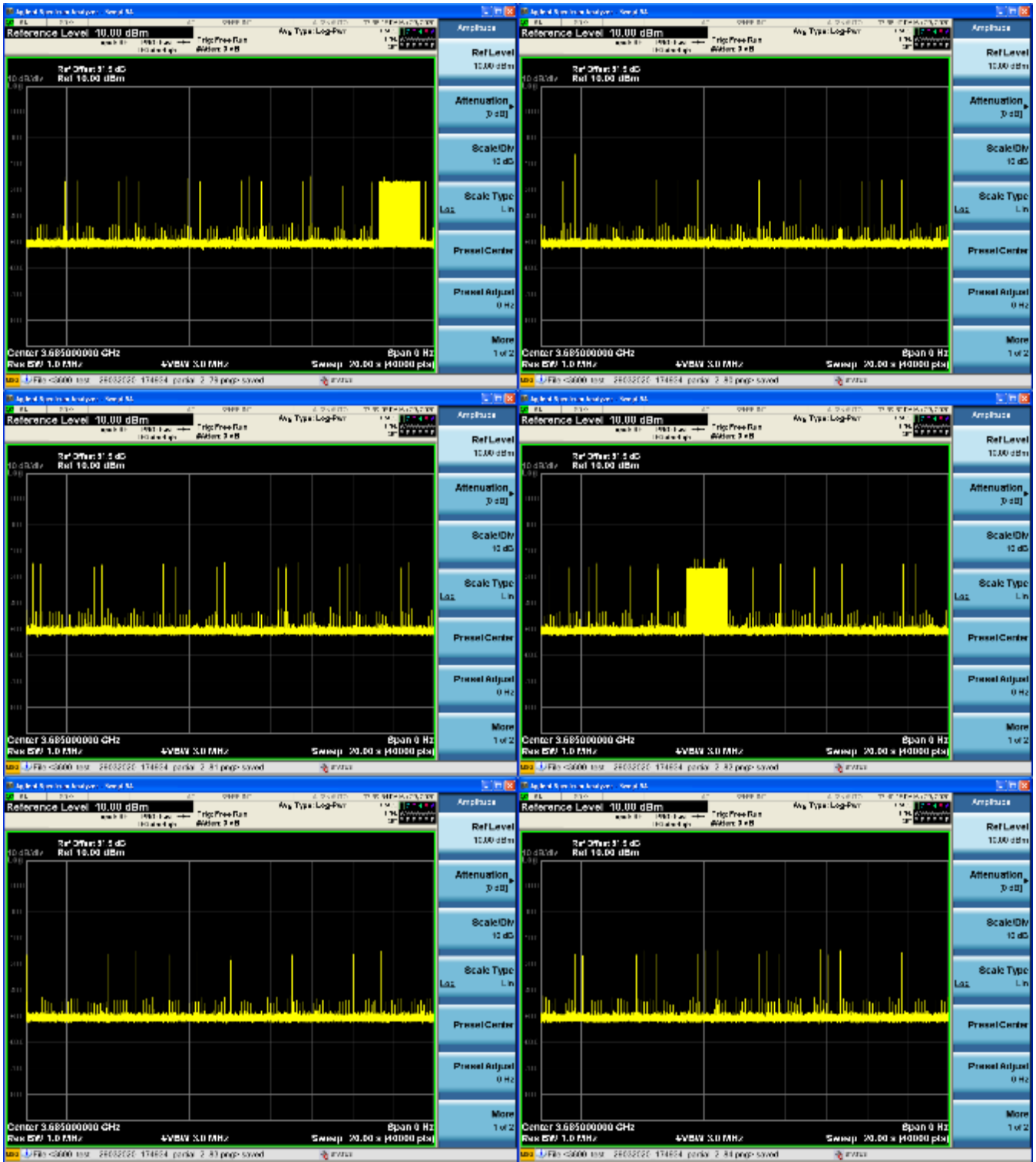


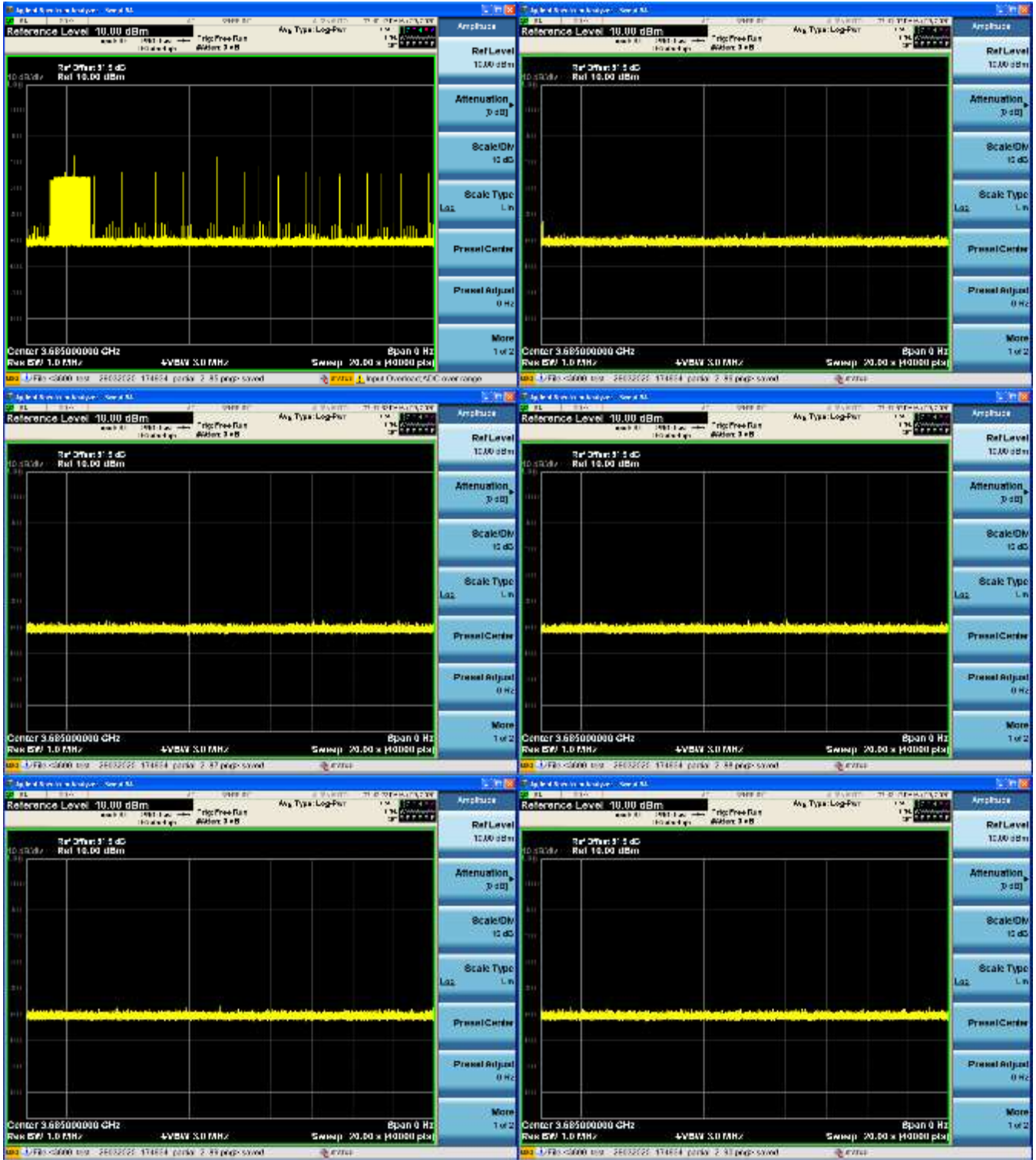


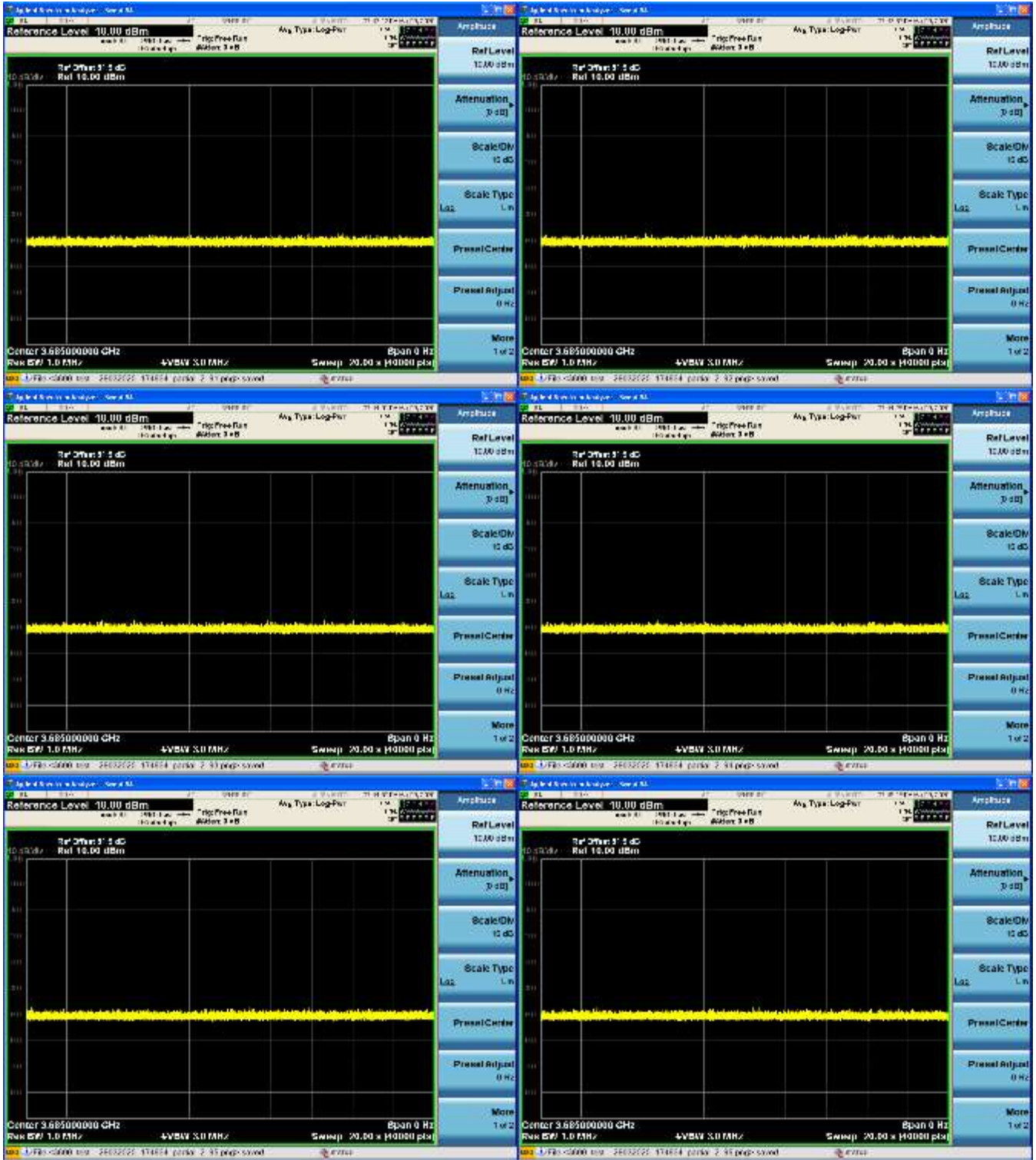


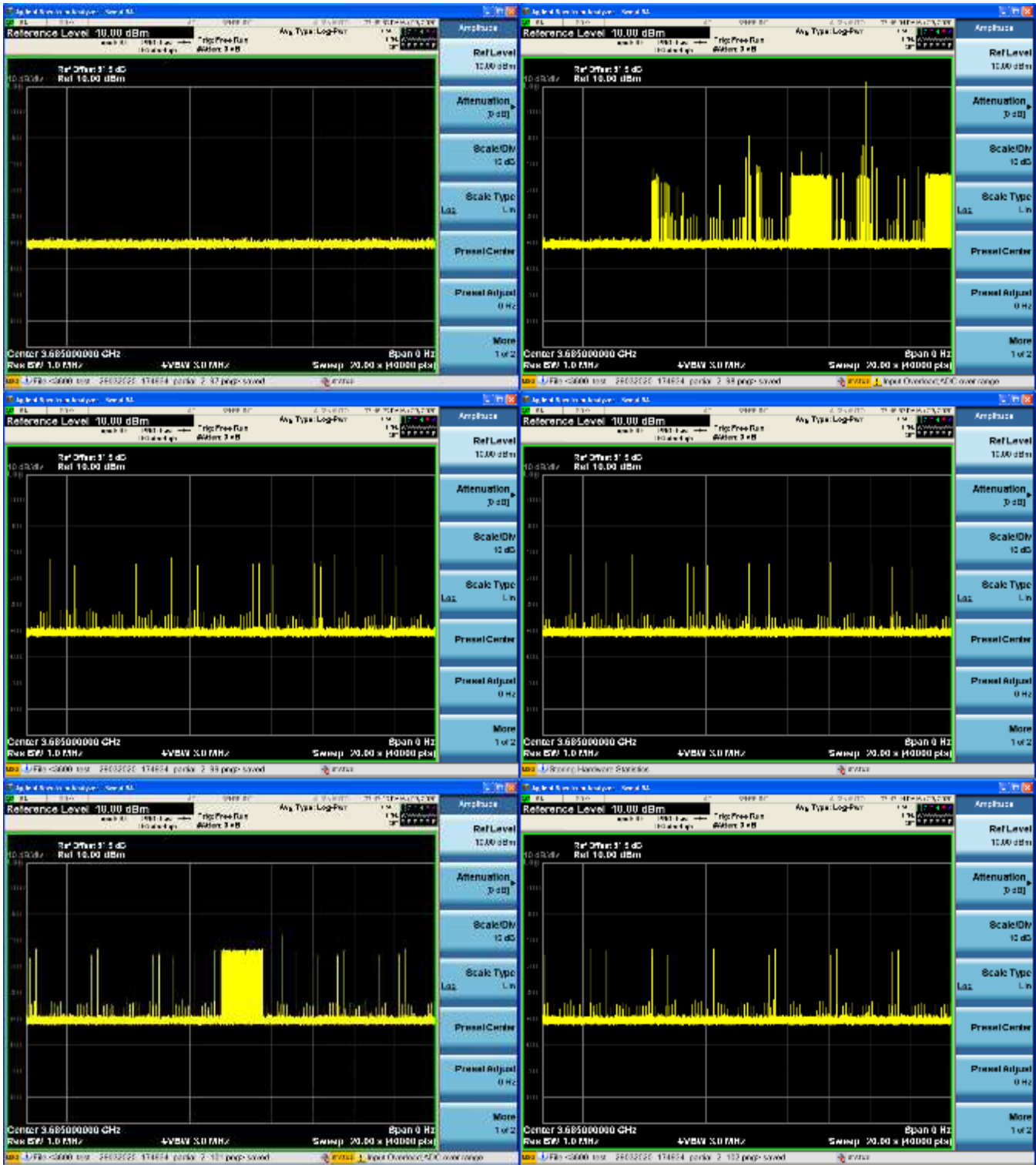




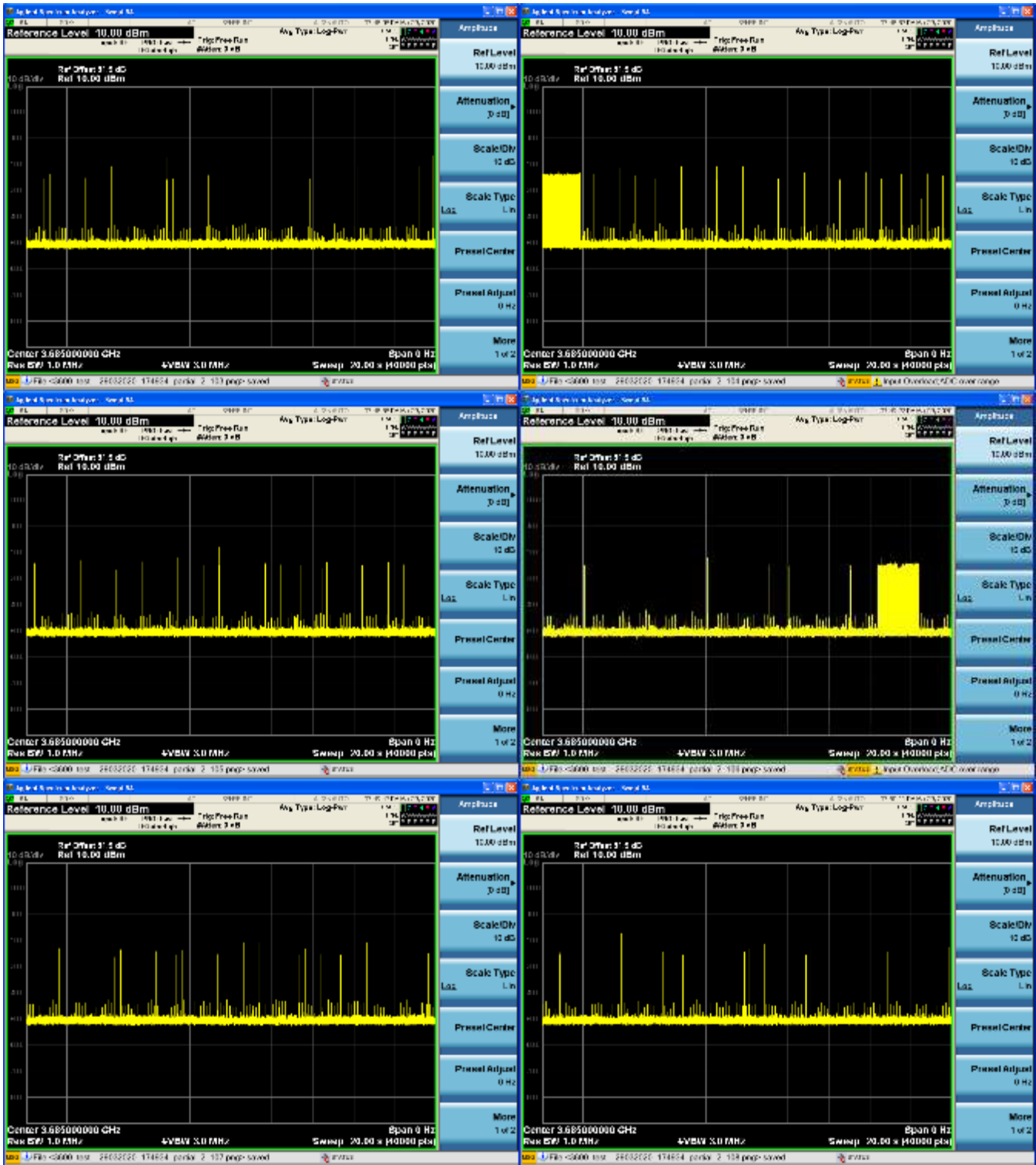


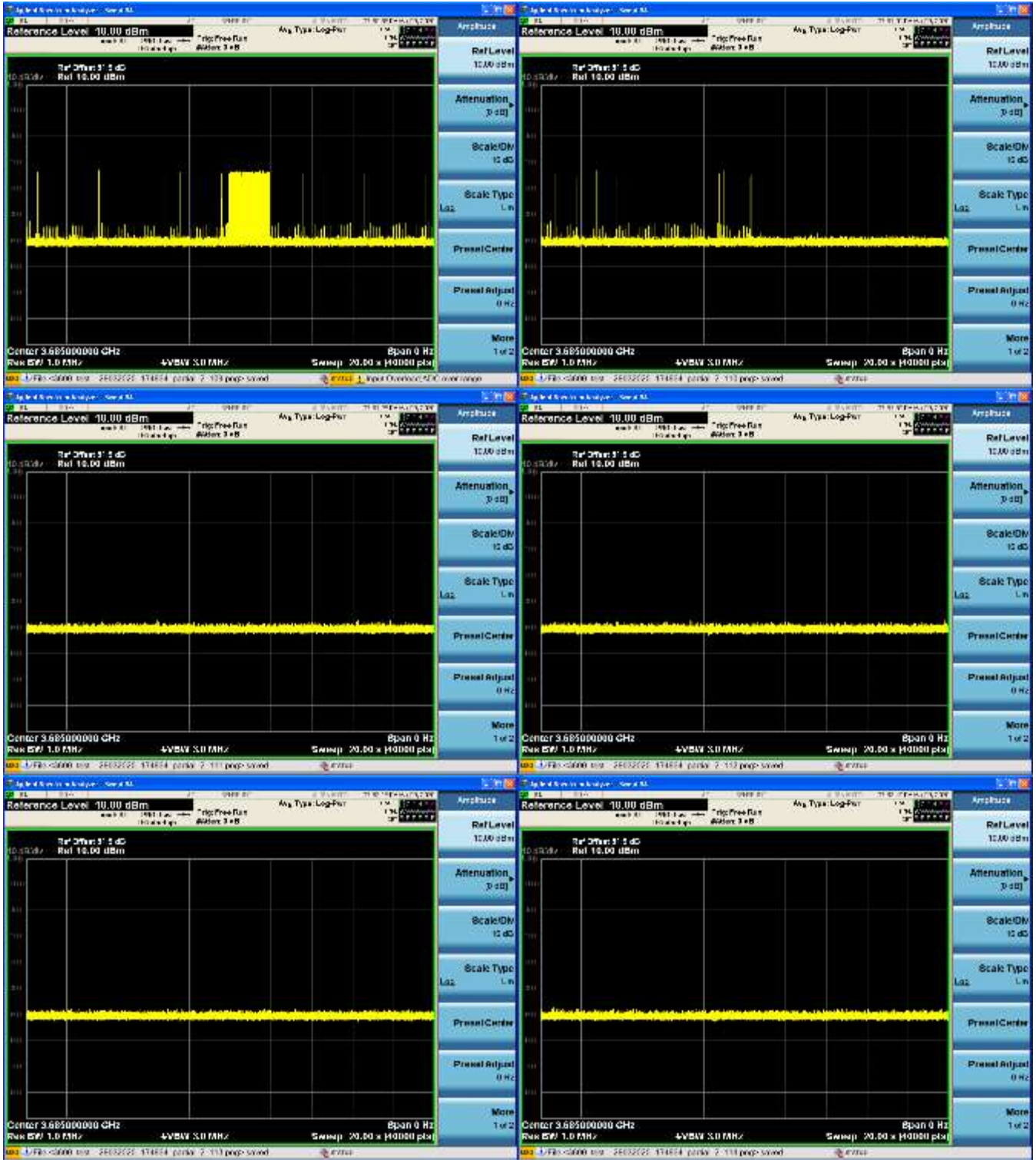


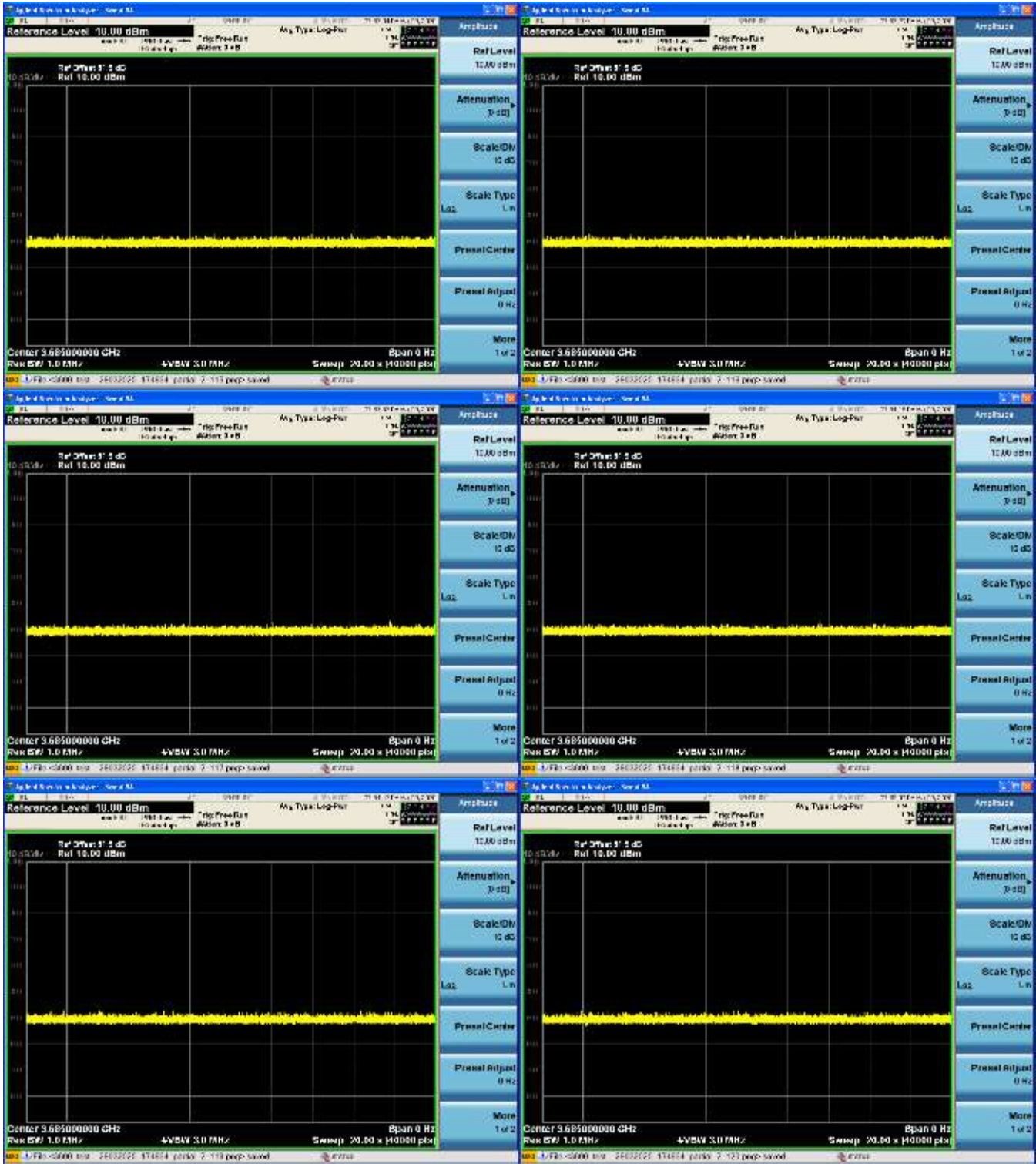


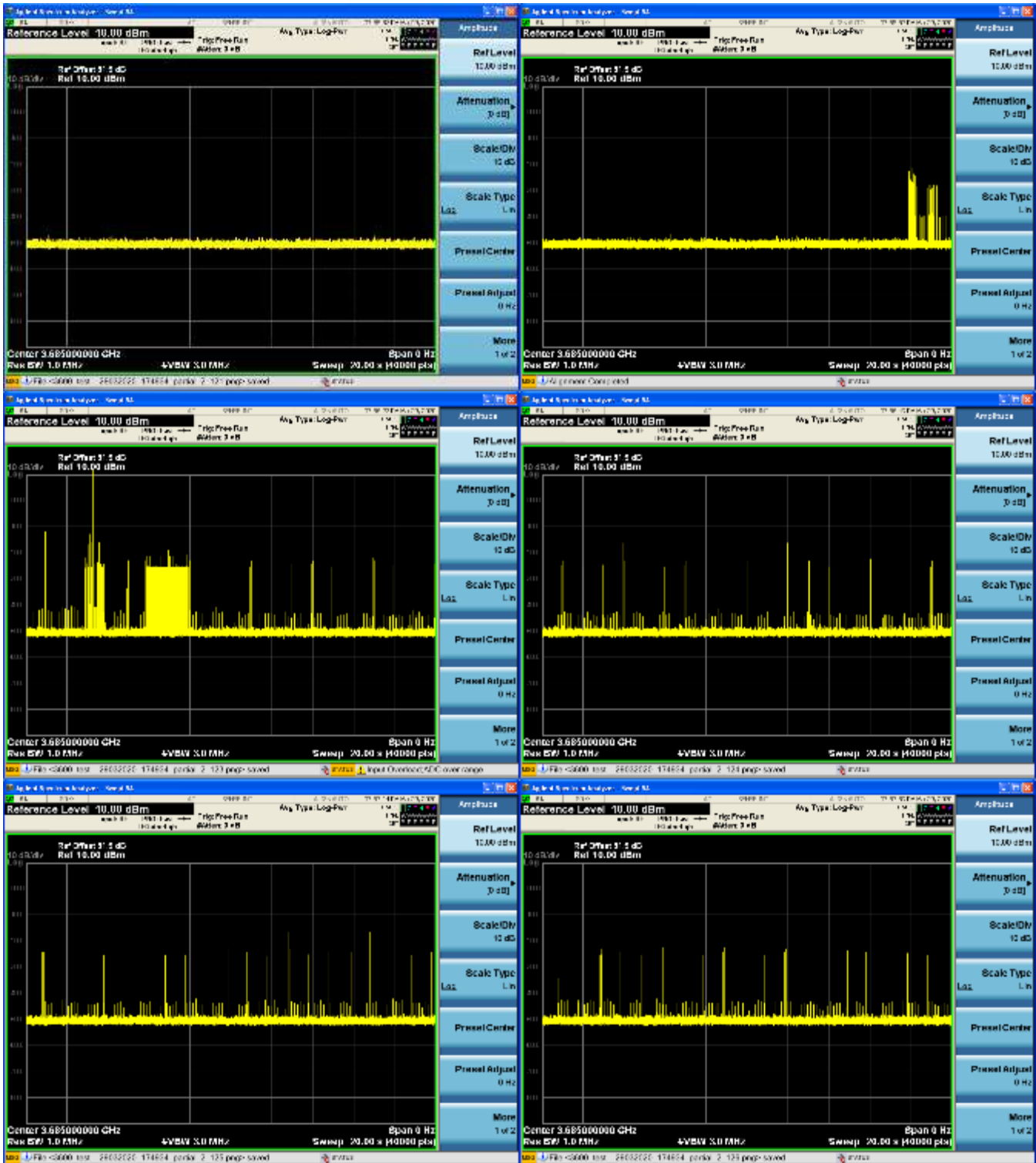


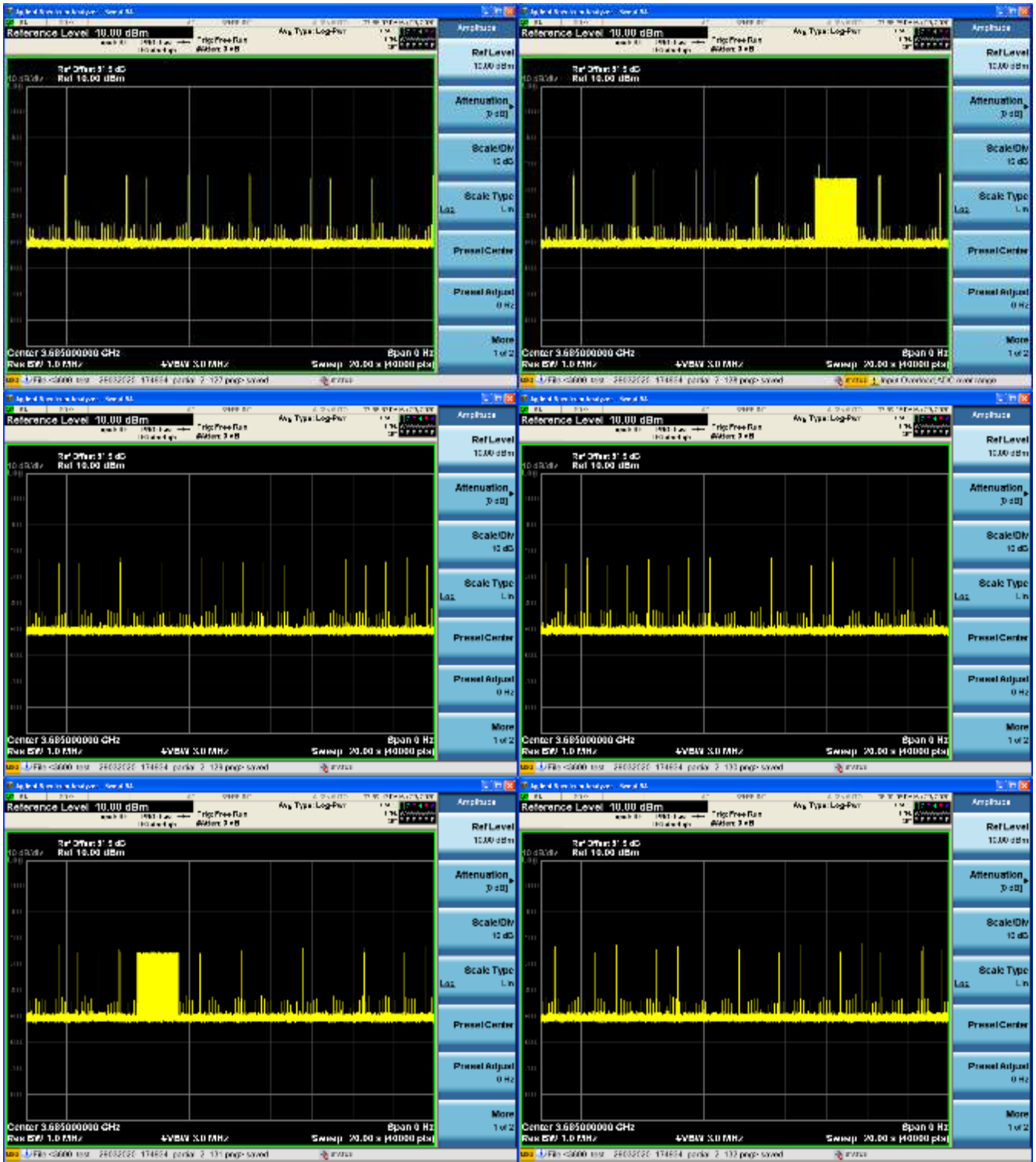


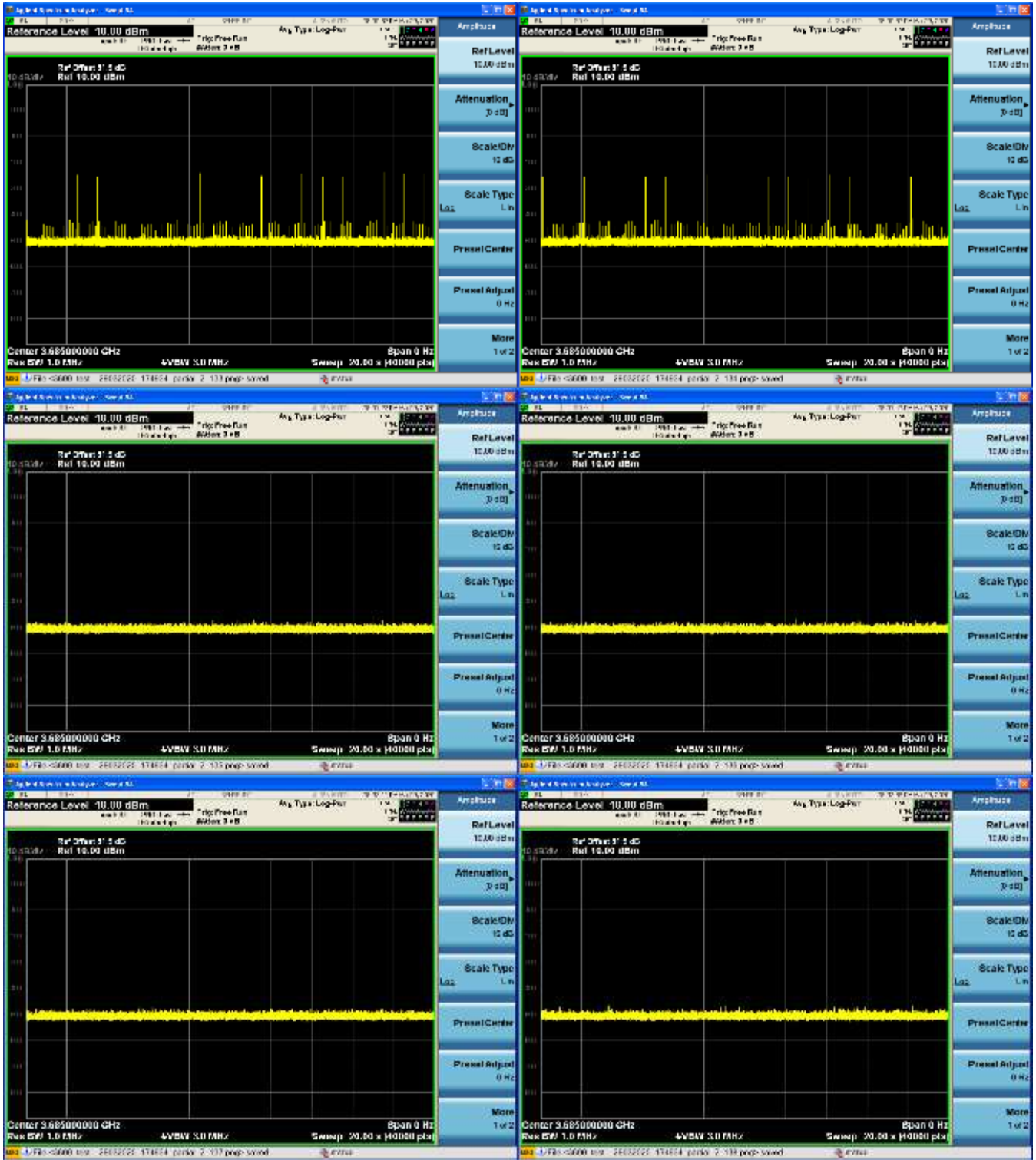


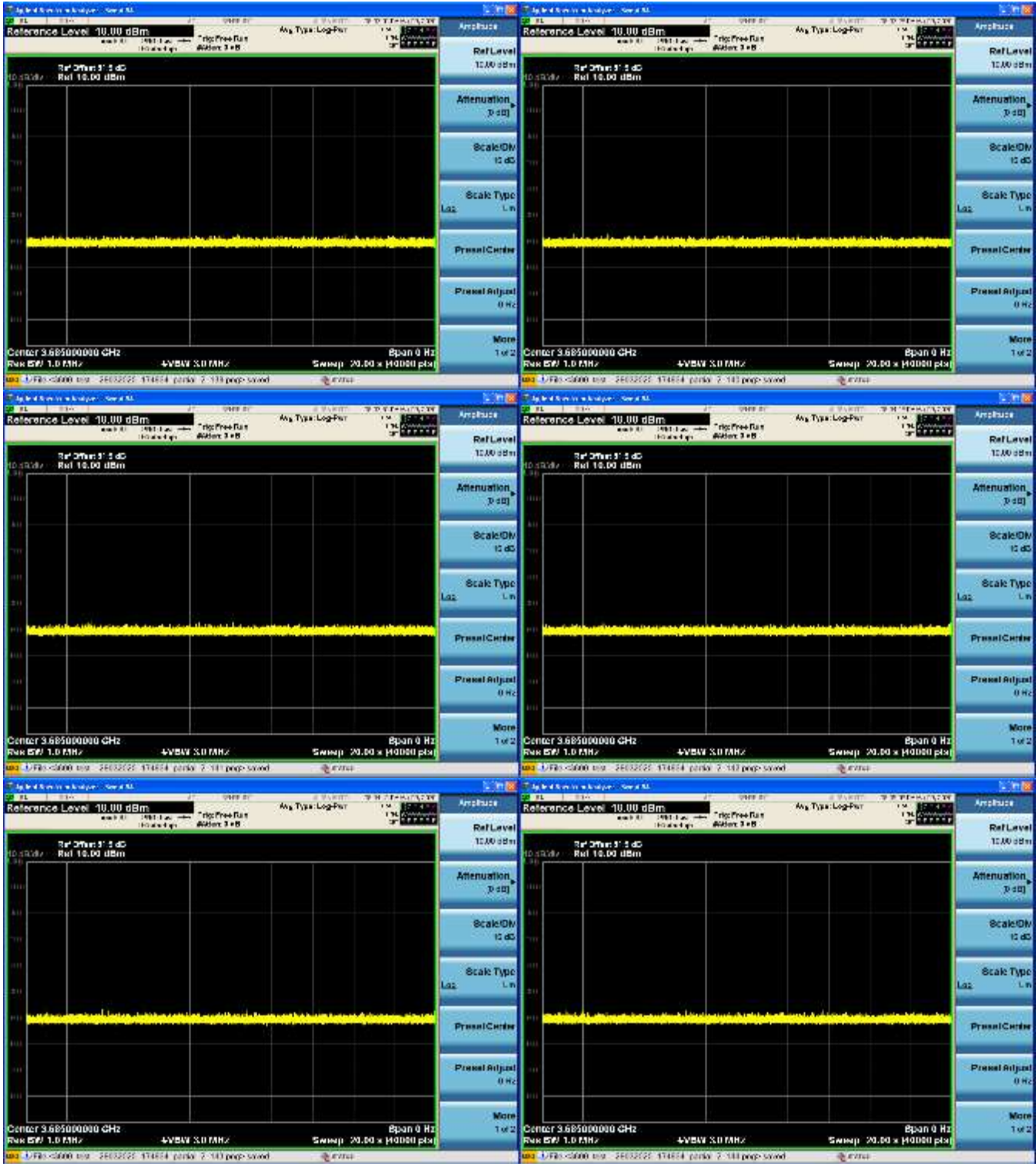


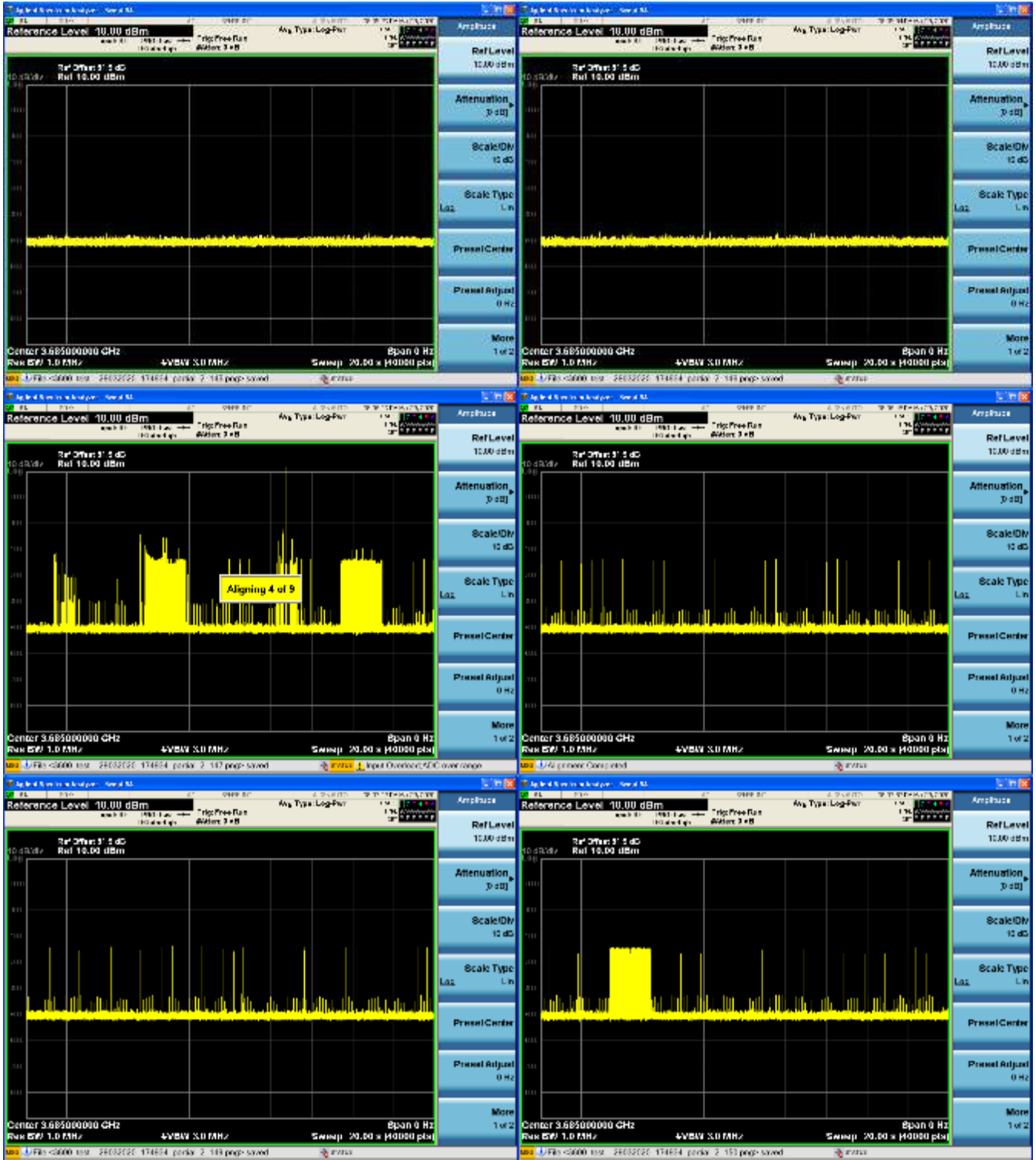




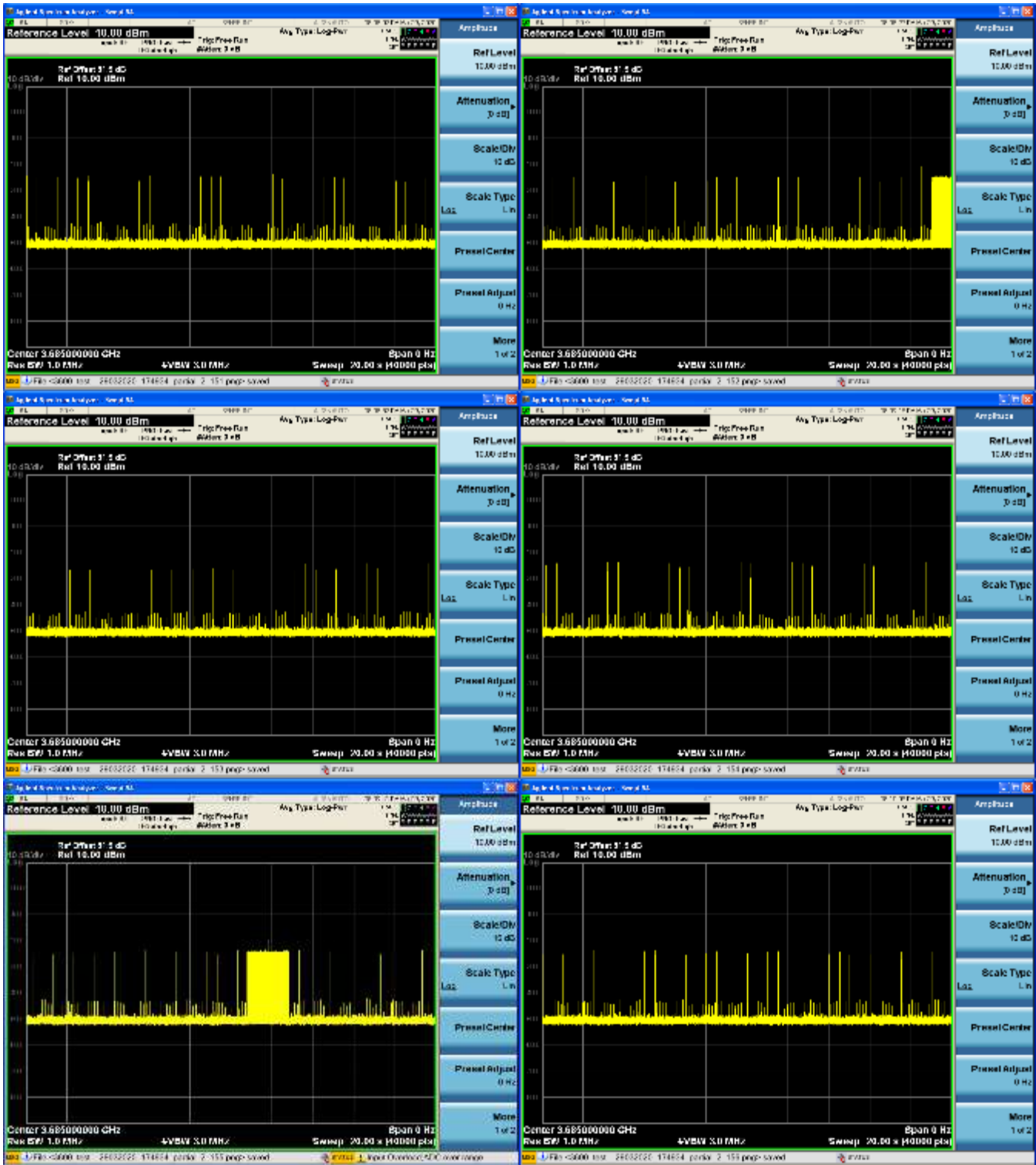


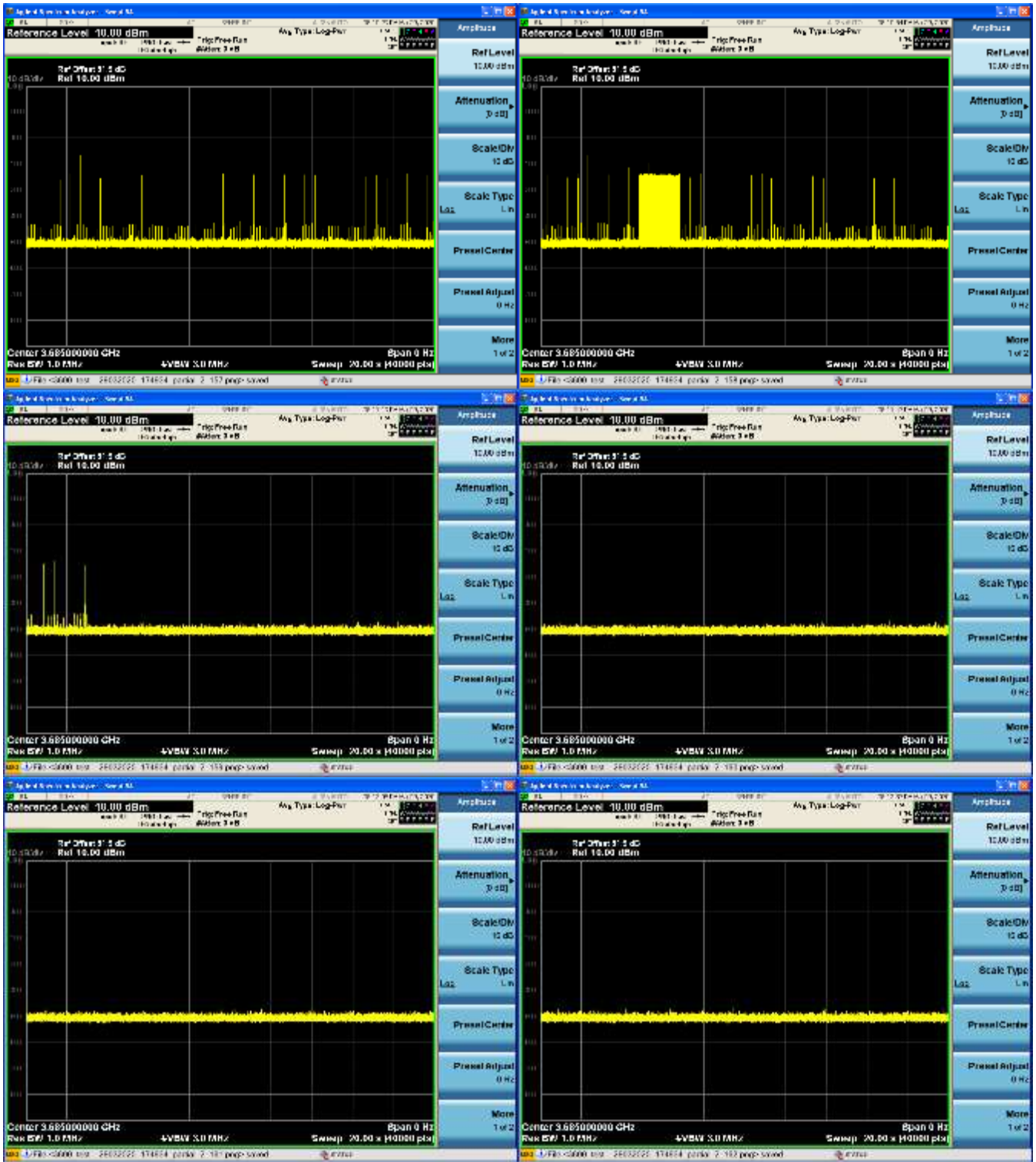


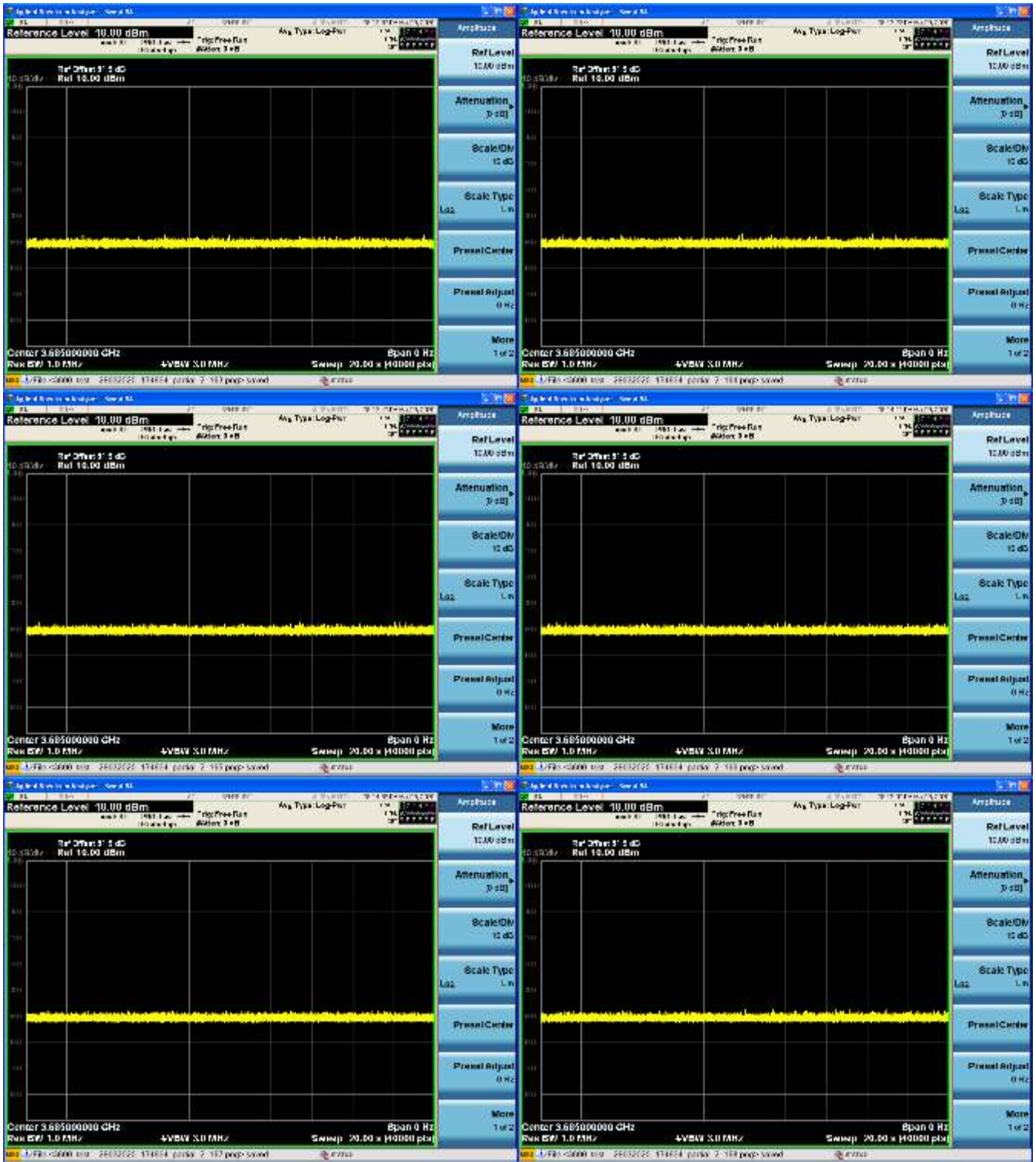


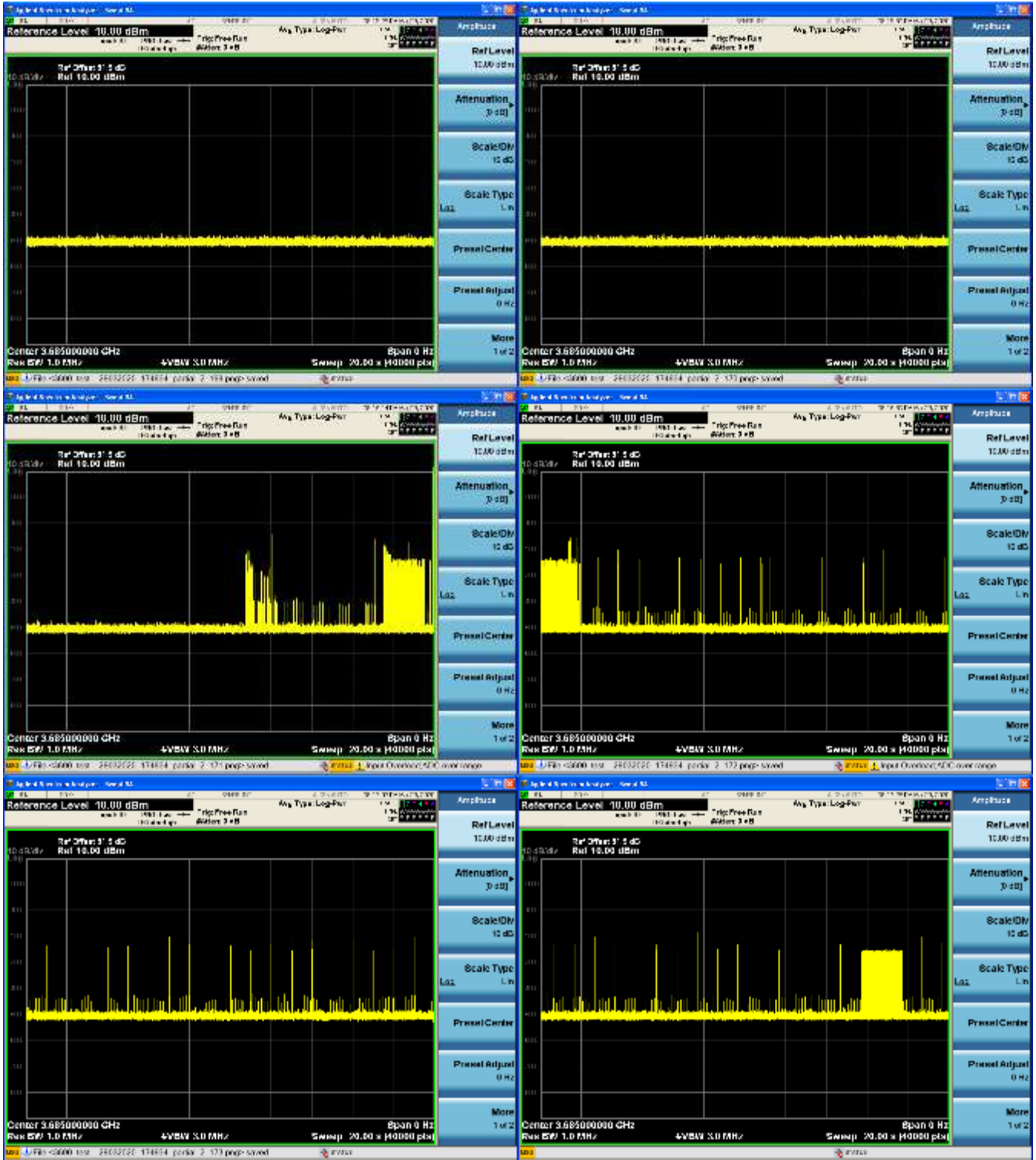


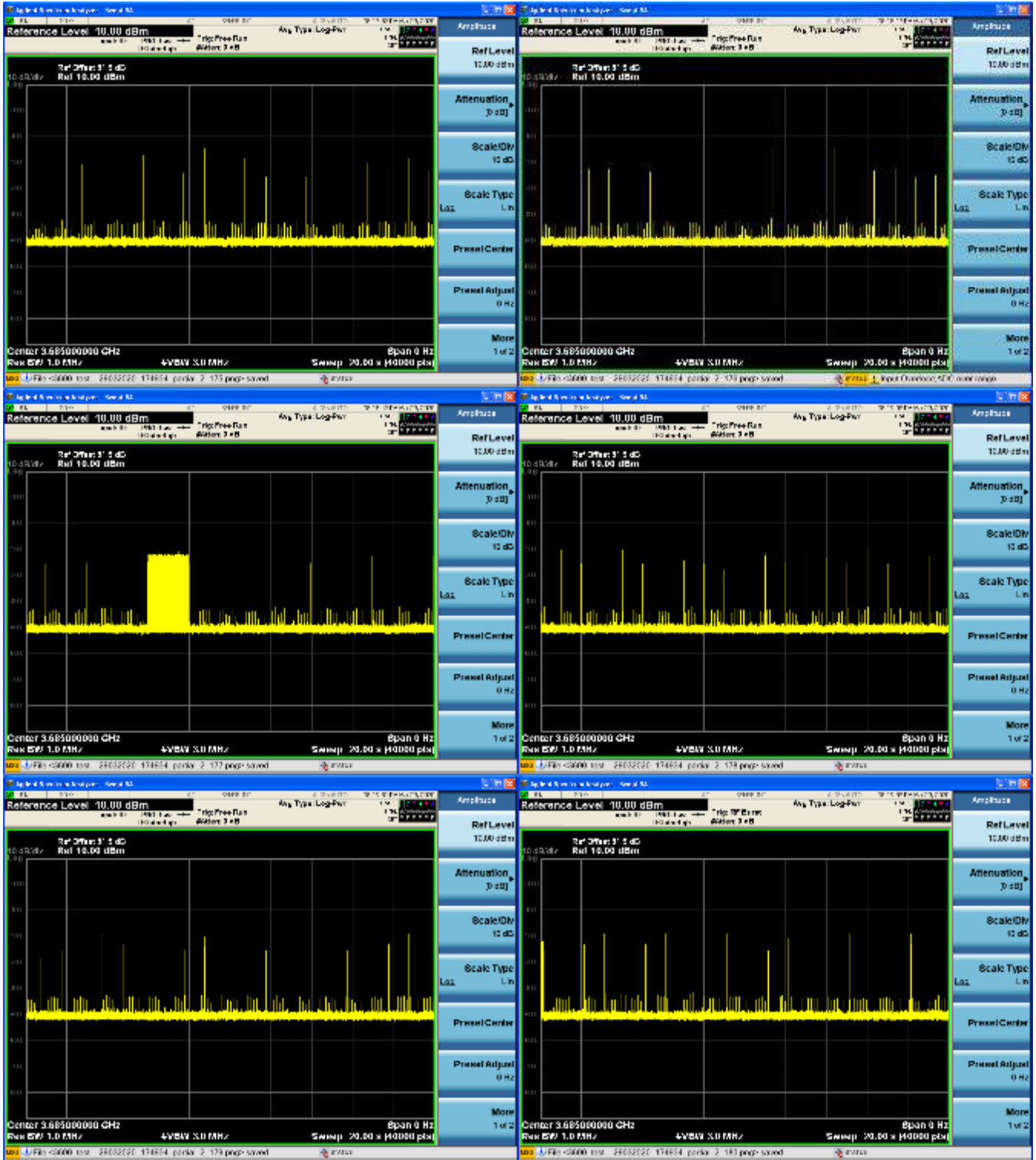




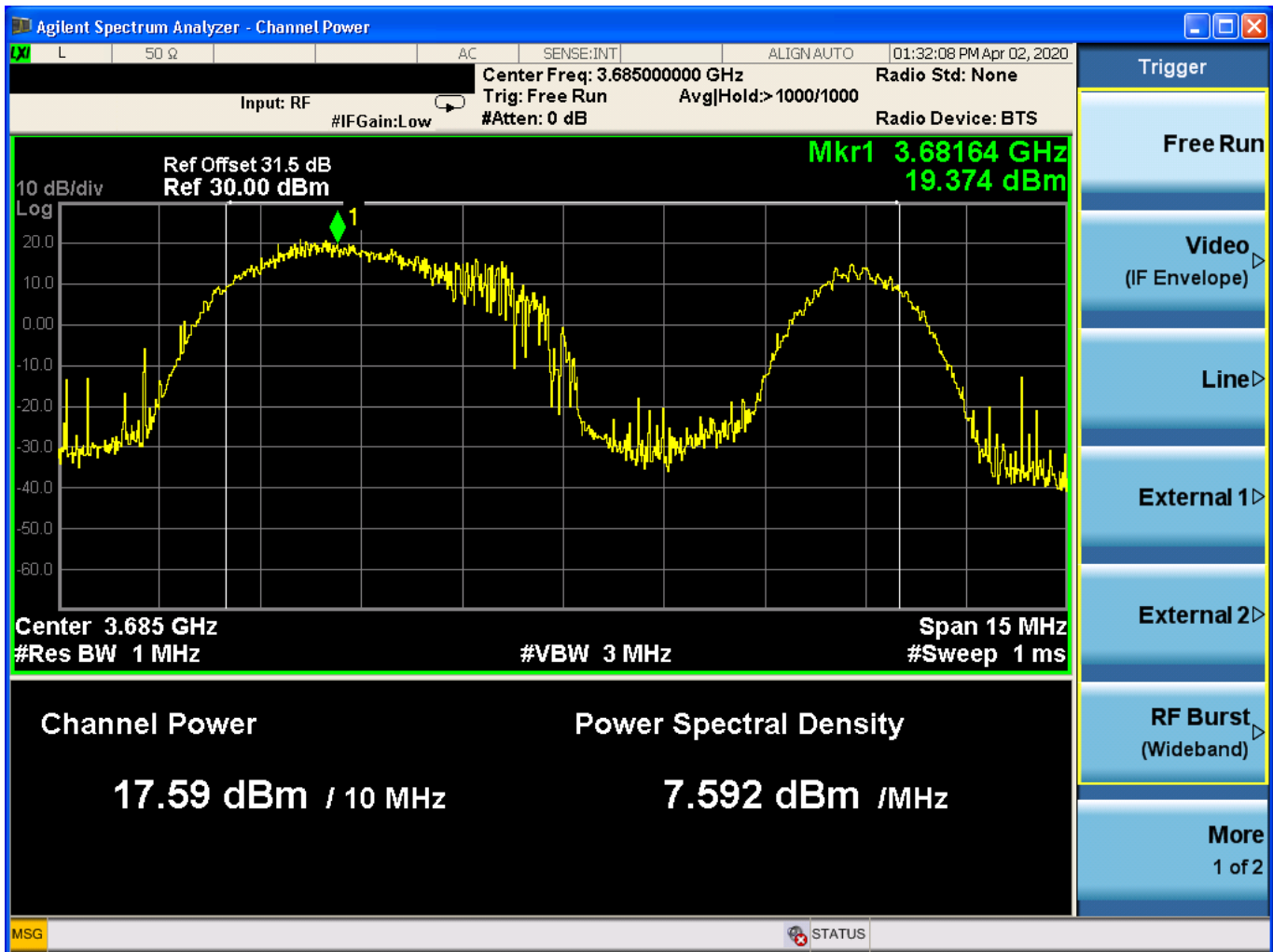








2. CPE.KDB.7: Verify CPE-CBSD can register with SAS with transmit power below 23dBm EIRP



Note 1:

Peak conducted CPE-CBSD Channel Power measured is 17.59 dBm / 10 MHz same as EIRP as the antenna gain configured in the device under test is 0dB.

Note 2:

Test setup RF path losses (31.5dB) considered in signal analyzer Channel Power measurement using ref. offset parameter