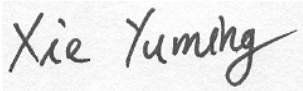


FCC/IC
MEASUREMENT AND TEST REPORT
For
ZXSDR R8882 S1700

FCC ID: Q78-R8882S1700
IC ID: 5200A-R8882S1700

This Report Concerns: ☒ Original Report	Equipment Type: Remote Radio Unit
Test Engineer:  Report No: RF 2015203RP-3 Test Date: May 1 – May 8, 2015 Reviewed By:  Issue Date: May 10, 2015	

Note: The test report is specially limited to the above company and this particular sample only. It may not be duplicated without prior written consent of ZTE Corporation. This report must not be used by the client to claim product certification 、 approval 、 or endorsement by any agency of the US Government.

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1 GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

The ZTE Corporation's product, model number: ZXSDR R8882 S1700 or the "EUT" as referred to in this report is a UMTS and LTE Remote Radio Unit.

Technical specification:

Size: 472 mm x 320 mm x 152 mm (HxWxD)

Input voltage: -37V~-57V

Frequency range: 2110MHz~2155 MHz

Max RF output power: 47.7dBm*2

Gain of the antenna: 15dBi

Modulation type of emission: QPSK,16QAM,64QAM

Appearance of EUT:



FIGURE 1 APPEARANCE OF ZXSDR R8882 S1700

Objective

This Type approval report is prepared on behalf of ZTE Corporation in accordance with RSS-Gen Issue 4 and RSS-139 Issue 2 and FCC part 27.

Related Submittal(s)/Grant(s)

No related submittal(s).

Test Methodology

All tests and measurements indicated in this document were performed in accordance with rss gen and rss195. As well as the following parts:

Applicable Standards: TIA EIA 137-A, TIA EIA 97-D, TIA/EIA 603-C, Land Mobile FM or PM Communications Equipment Measurement and Performance Standards.

All radiated and conducted measurement was performed at ZTE Corporation Reliability Testing Center. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Test Facility

The Test site used by ZTE Corporation to collect test data is located in the ZTE Plaza, Keji Road South, Shenzhen, Guangdong, 518057, P.R.China, Tel: +86-755-26770345, Fax: +86-755-26770347. Test site at ZTE Corporation has been fully described in reports submitted to the IC and the registration number is 5200A. The details of these reports have been found to be in compliance with the requirements of IC Rules. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2009.

2 SYSTEM TEST CONFIGURATION

Description of Test Configuration

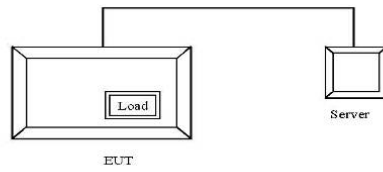
Justification

The EUT was configured for testing according to TIA/EIA-603C.

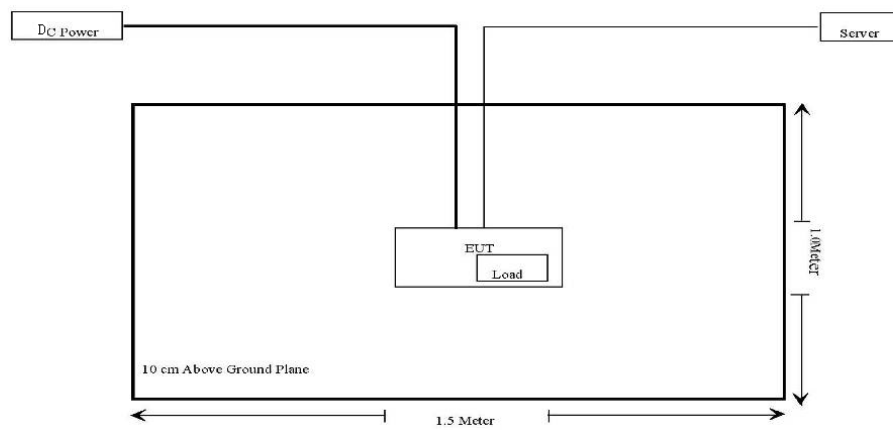
The final qualification test was performed with EUT operating at normal mode.

When EMC test, configure EUT work at single carrier, 10MHz bandwidth and output at rated power, the antennas connected to loads.

Configuration of Test Setup



Block Diagram of Test Setup



3 SUMMARY OF TEST RESULTS

IC RULES	DESCRIPTION OF TEST	RESULT
RSS-139 § 6.1	Frequency Plan	Compliant
RSS-139 § 6.2	Types of Modulation	Compliant
RSS-139 § 6.3	Frequency Stability	Compliant
RSS-Gen § 6.6	Occupied Bandwidth	Compliant
RSS-139 § 6.4	Transmitter Output Power	Compliant
RSS-139 § 6.5	Transmitter Unwanted Emissions	Compliant
RSS-139 § 6.6	Receiver Spurious Emissions	Compliant

FCC RULES	DESCRIPTION OF TEST	RESULT
§ 2.1046 , §27.50	Transmitter output Power	Compliant
§ 2.1091 ,§1.1037	RF Exposure	Compliant
§ 2.1047	Modulation Characteristic	Compliant
§ 2.1053, §27.53	Spurious Radiated Emissions	Compliant
§ 2.1051, §27.53	Spurious Emissions AT Antenna Terminals	Compliant
§ 2.1049,§27.53	Occupied Bandwidth	Compliant
§ 2.1051,§27.53	Band Edge	Compliant
§ 2.1055	Frequency stability	Compliant

4 FREQUENCY PLAN

Applicable Standard: RSS-139 § 6.1

ZXSDR R8882 S1700 will use frequency range: DL: 2110-2155MHz.UL:1710-1755MHz

5 Type Of Modulation

Applicable Standard: RSS-139 § 6.2

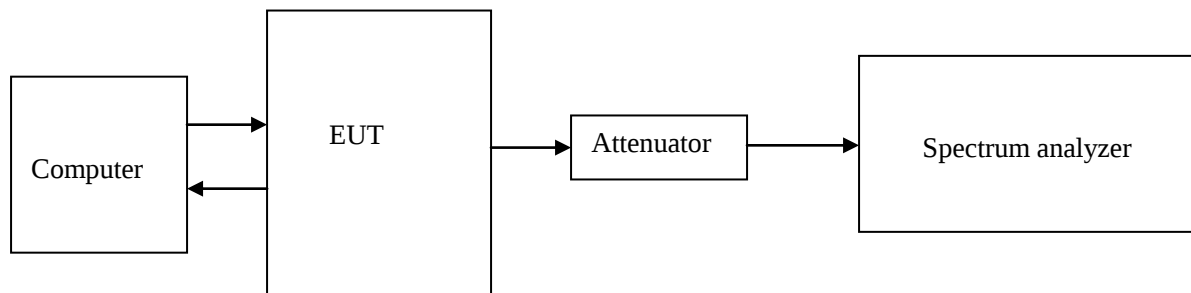
The modulation used shall be digital.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	PXA Series Spectrum Analyzer	N9020A	MY49100652	2014.05.29	2015.05.29
DTS	DTS 50dB Attenuator	DTS400-50-4-B	10081610	2014.09.16	2015.09.16

***statement of traceability:** The Reliability Testing Center attests that all calibration has been performed per the NVLAP requirements, traceable to NIST.

Test Procedure



The EUT is connected to the input of the spectrum analyzer through sufficient attenuation. EUT send different modulation characteristic UMTS signals and test by spectrum analyzer.

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	75 %
ATM Pressure:	1009 mbar

Test Result: Pass

Test Mode: Transmitting UMTS

Configuration 1: Bottom carrier 2112.4 MHz

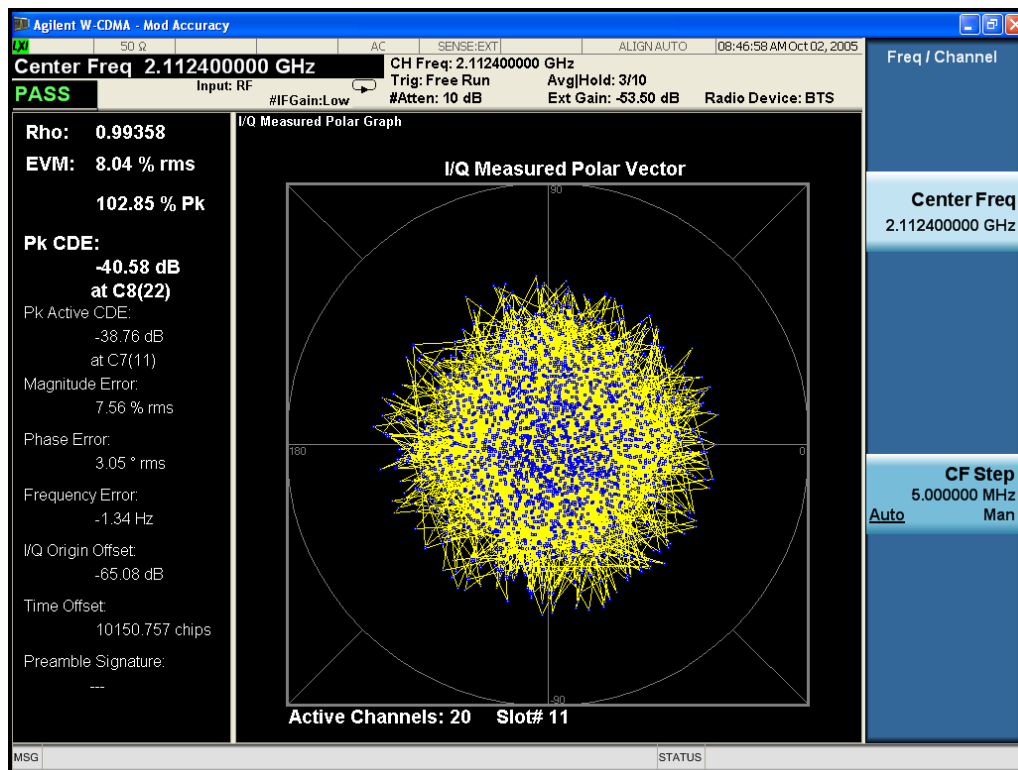
Configuration 2: Middle carrier 2132.4 MHz

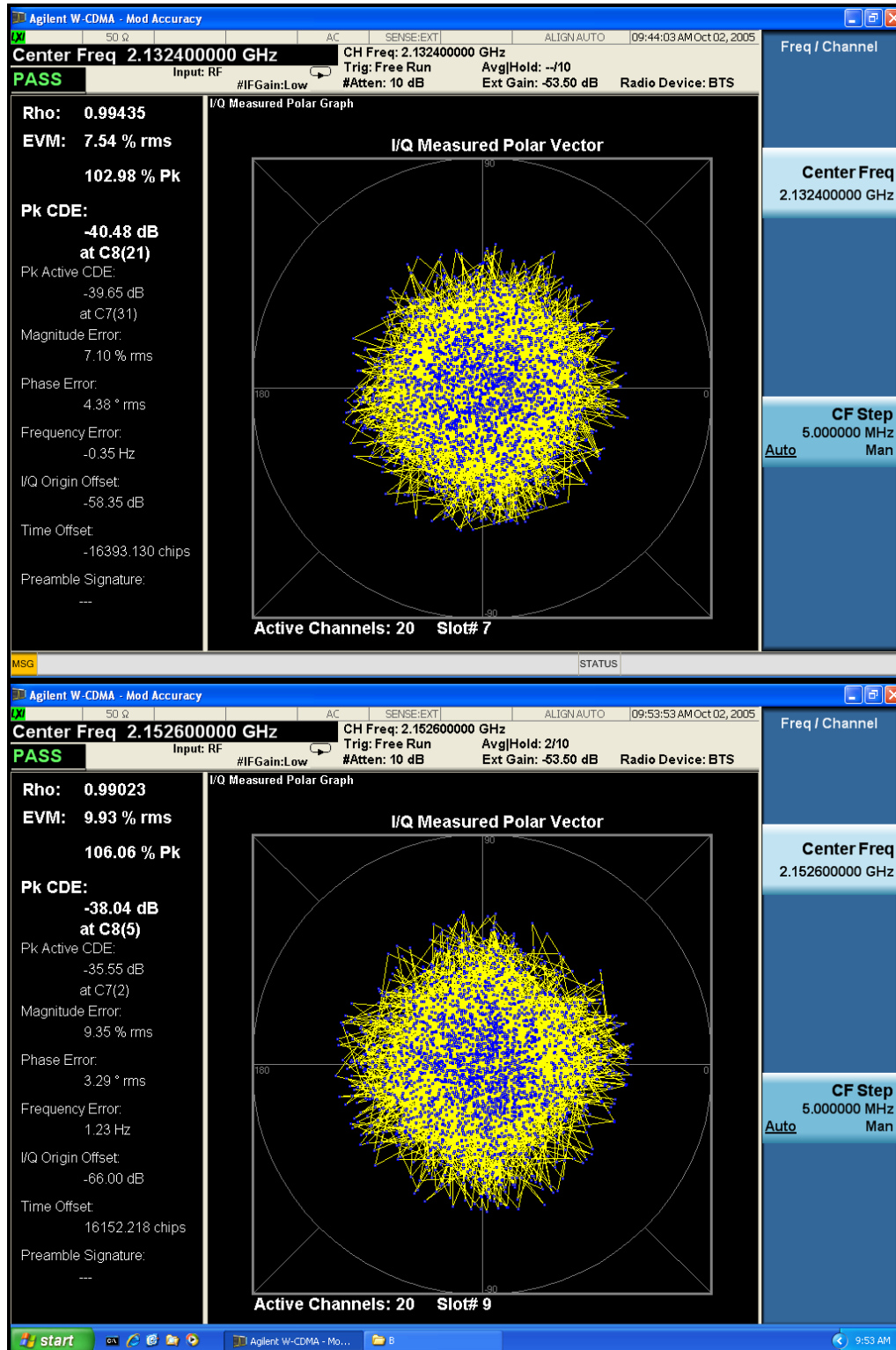
Configuration 3: Top carrier 2152.6 MHz

Test Data:

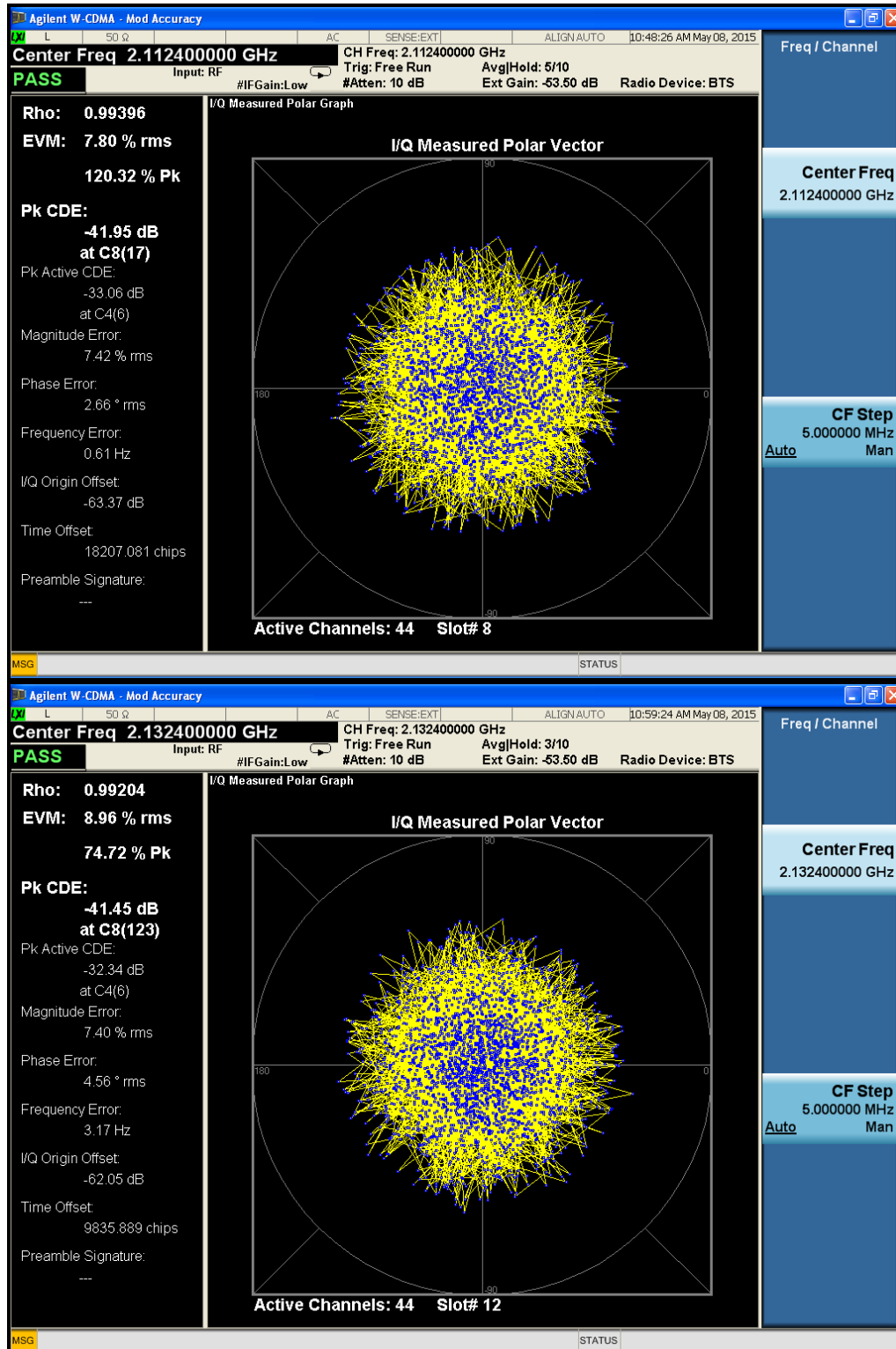
configuration	Frequency (MHz)	QPSK	16QAM	64QAM
1	2112.4	8.04	7.8	7.9
2	2132.4	7.54	8.96	7.5
3	2152.6	9.93	6.99	7.3

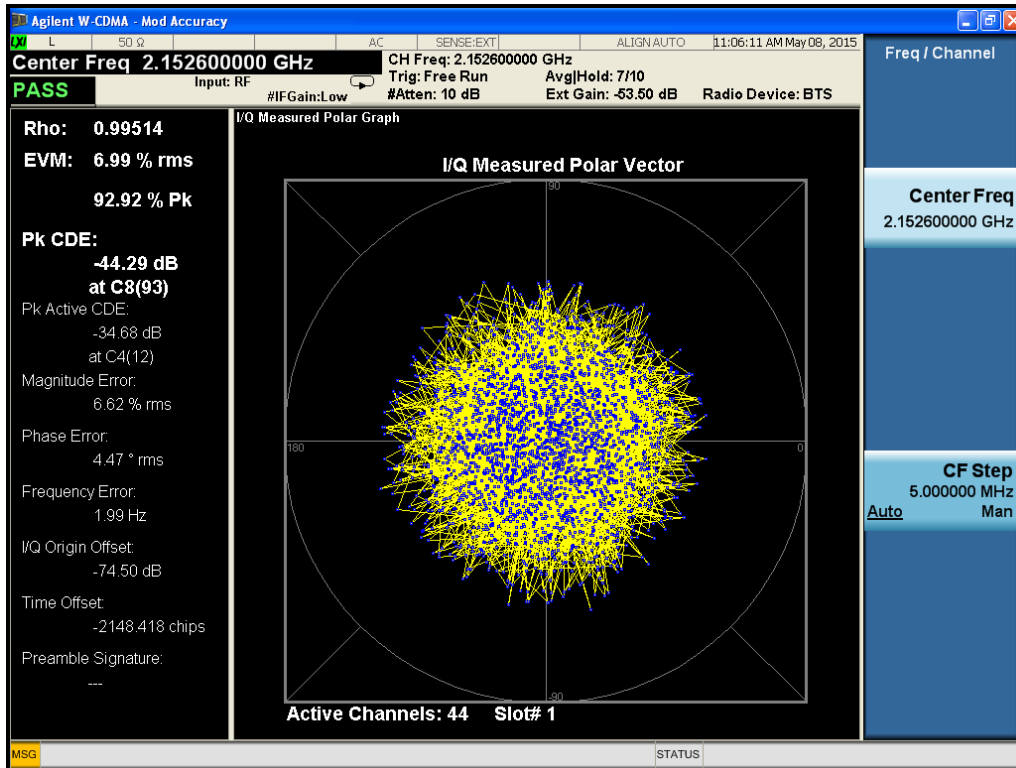
QPSK:



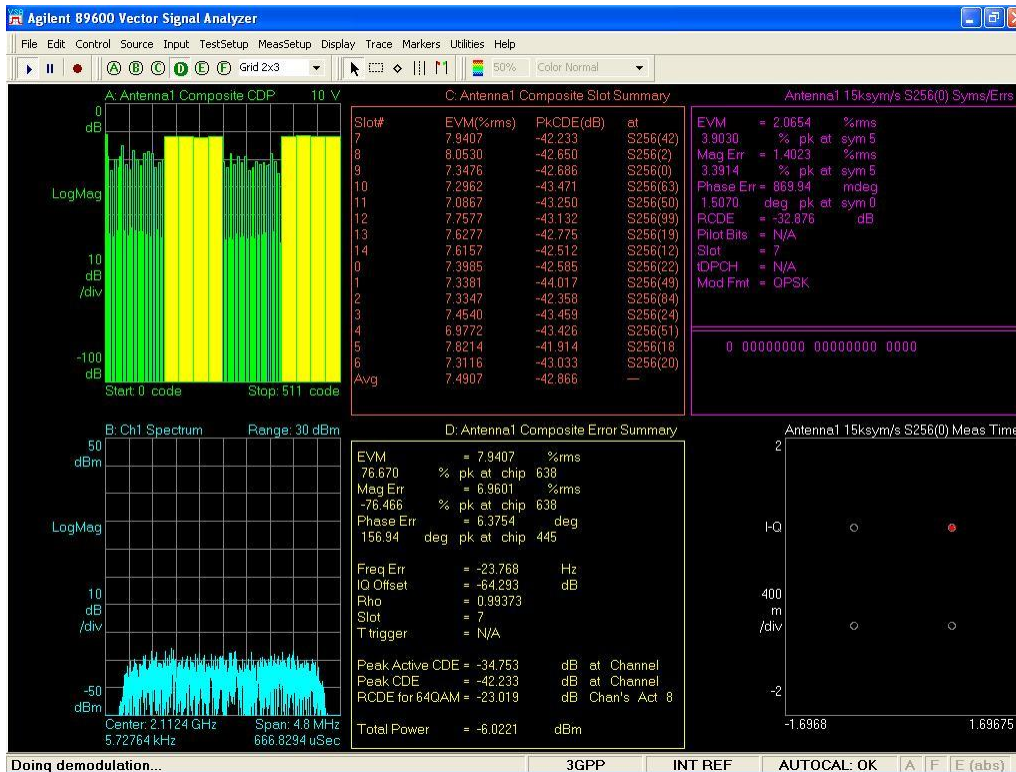


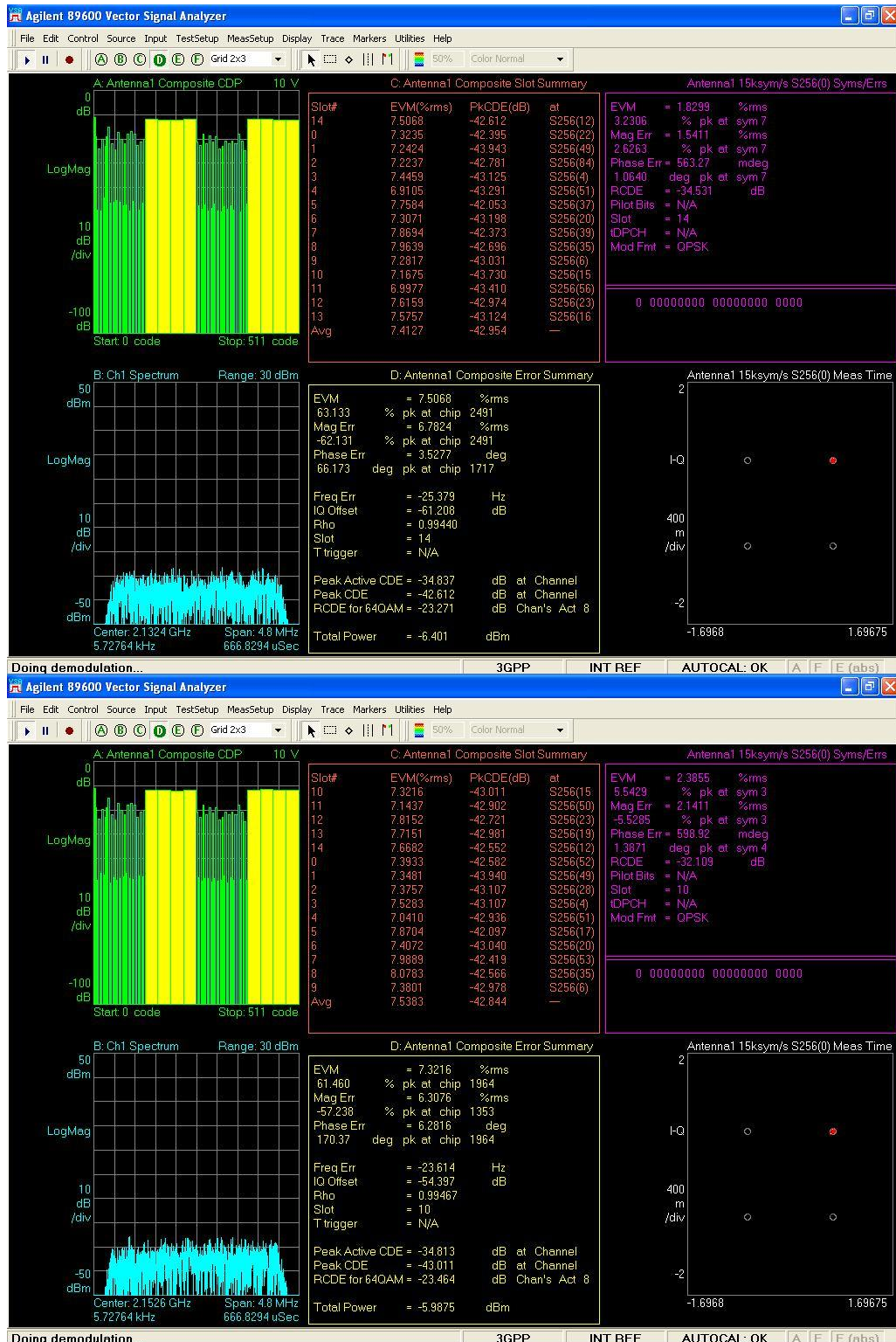
16QAM:





64QAM:





6 Occupied Bandwidth

Applicable Standard: RSS GEN § 4.6.1

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power.

Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	PXA Series Spectrum Analyzer	N9020A	MY49100652	2014.05.29	2015.05.29
DTS	DTS 50dB Attenuator	DTS400-50-4-B	10081610	2014.09.16	2015.09.16

***statement of traceability:** ZTE Corporation Reliability Testing Center attests that all calibration has been performed per the NVLAP requirements, traceable to NIST.

Test Procedure

The RF out of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation. 99% Power bandwidth was recorded.

Environmental Conditions

Temperature:	25 ° C
Relative Humidity:	75%
ATM Pressure:	1009mbar

Test Result: Pass

Test Mode: Transmitting UMTS

Configuration 1: Bottom carrier (1 carrier) 2112.4 MHz

Configuration 2: Middle carrier (1 carrier) 2132.4MHz

Configuration 3: Top carrier (1 carrier) 2152.6 MHz

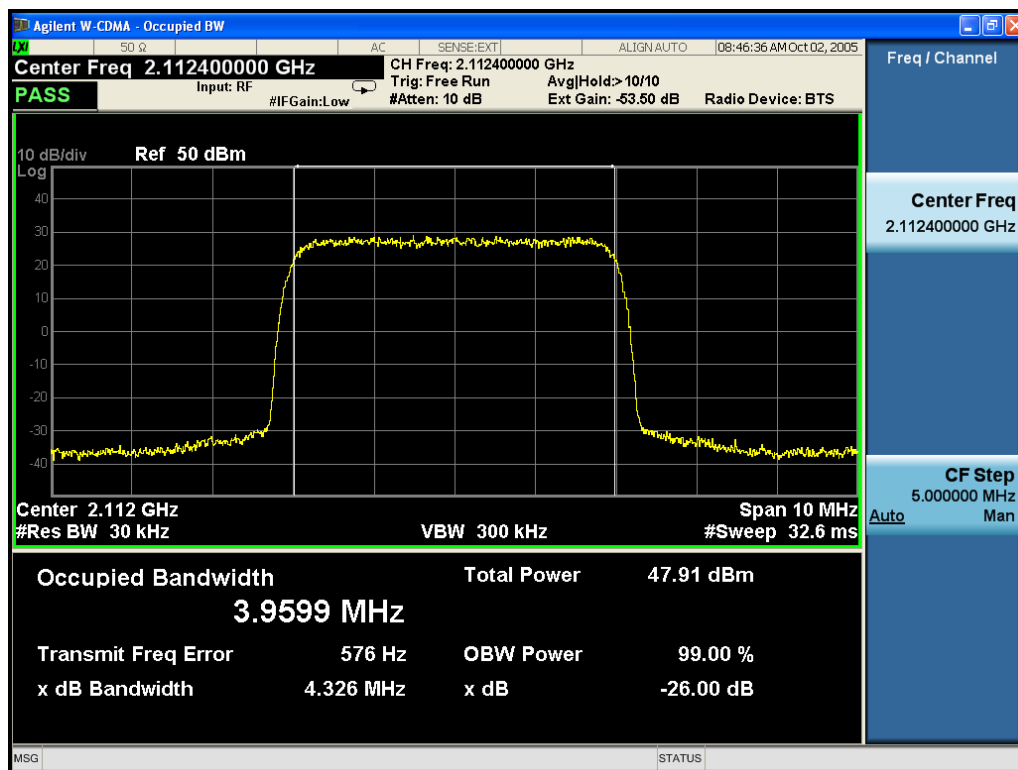
Configuration 4: Bottom carrier (2 carriers) 2112.4 MHz, 2117.4 MHz

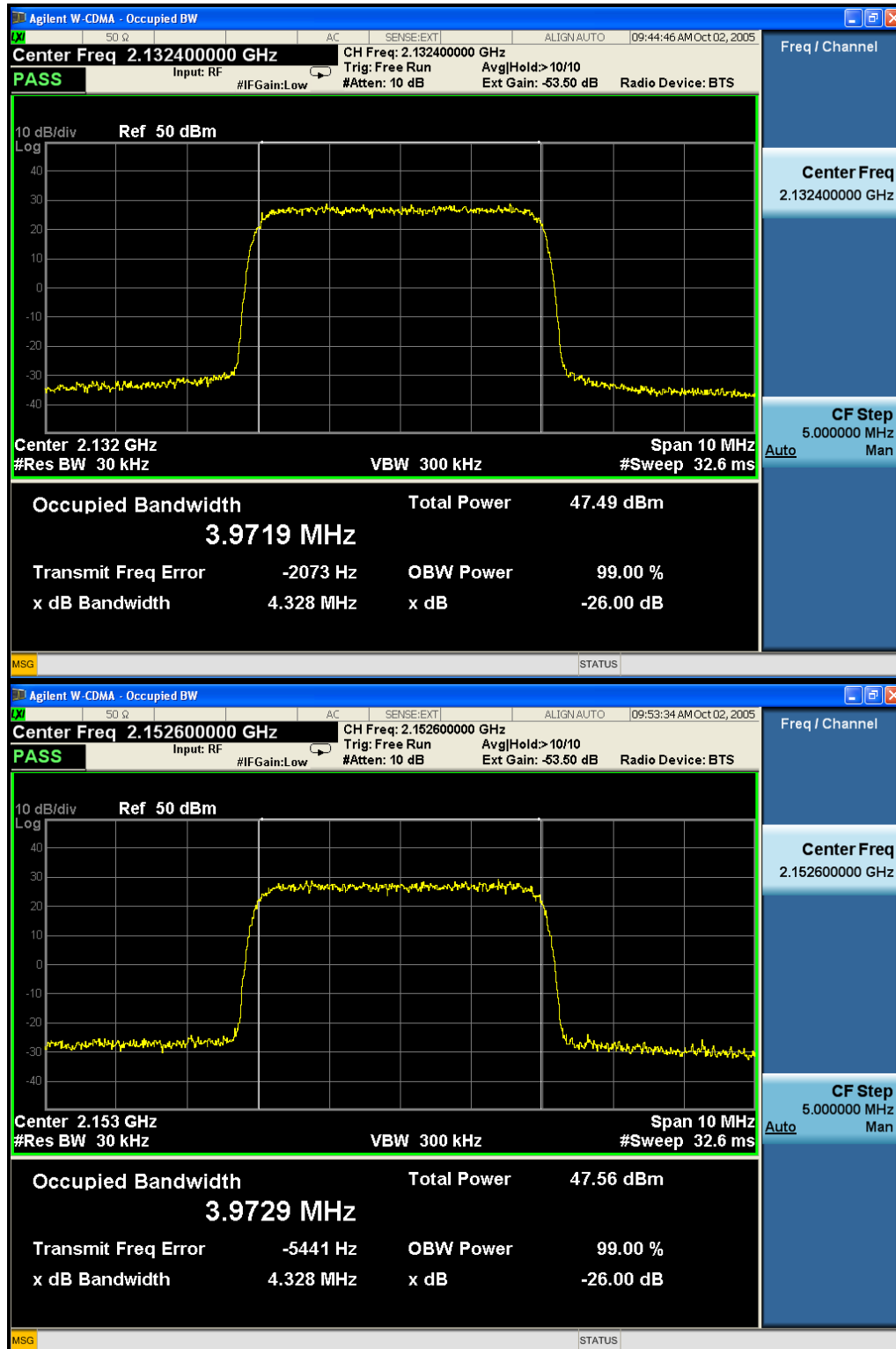
Configuration 5: Middle carrier (2 carriers) 2130 MHz, 2135 MHz

Configuration 6: Top carrier (2 carriers) 2147.6 MHz, 2152.6 MHz

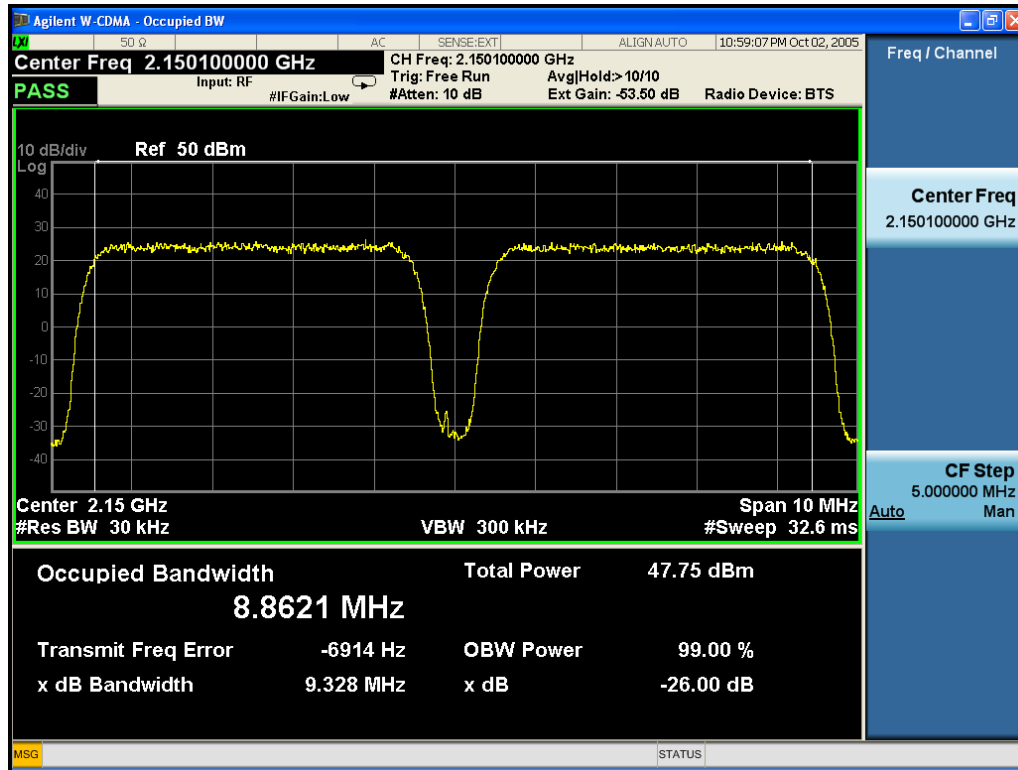
Test Data

configuration	Center Frequency (MHz)	Occupied Bandwidth(MHz)
1	2112.4	3.96
2	2132.4	3.97
3	2152.6	3.97
4	2112.4,2117.4	8.87
5	2130,2135	8.87
6	2147.6,2152.6	8.86









7 Transmitter Frequency Stability

Applicable Standard: RSS-139 § 6.3; RSS-Gen

The applicant shall ensure frequency stability by showing that the occupied bandwidth is maintained within the range of the operating frequency blocks when testing under the temperature and supply voltage variations specified for the frequency stability measurement in RSS-Gen.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	PXA Series Spectrum Analyzer	N9020A	MY49100652	2014.05.29	2015.05.29
DTS	DTS 50dB Attenuator	DTS400-50-4-B	10081610	2014.09.16	2015.09.16

***statement of traceability:** The Reliability Testing Center attest that all calibration have been performed per the NVLAP requirements, traceable to NIST.

Test Procedure

Frequency Stability vs. Temperature: The equipment under test was connected to an external DC power supply and the RF output was connected to a Spectrum Analyzer via feed-through attenuators. The EUT was placed inside the temperature chamber. The DC leads and RF output cable exited the chamber through an opening made for the purpose. After the temperature stabilized for approximately 150 minutes, the frequency output was recorded from the counter.

Frequency Stability vs. Voltage: An external variable DC power supply Source. The voltage was set to 115% of the nominal value and was then decreased until the transmitter light no longer illuminated; i.e., the end point. The output frequency was recorded for each voltage.

Environmental Conditions

Normal condition:	25° C
Relative Humidity:	75%
ATM Pressure:	1011 mbar

Test Result: Pass

Test Mode: Transmitting UMTS

Configuration 1: Bottom carrier 2112.4 MHz

Configuration 2: Middle carrier 2132.4MHz

Configuration 3: Top carrier 2152.6 MHz

Test Data

Frequency Stability versus Temperature

Frequency Stability vs. Temperature						
Temperature (°C)	Power Supplied (V _{DC})	Configuration	Frequency Offset (Hz)	Limit (ppm)	Limit (Hz)	Result
-40	-48	1	1.8	0.05	105.5	Pass

Frequency Stability vs. Temperature						
Temperature (°C)	Power Supplied (V _{DC})	Configuration	Frequency Offset (Hz)	Limit (ppm)	Limit (Hz)	Result
		2	1.1	0.05	105.5	Pass
		3	-2.5	0.05	105.5	Pass
-30	-48	1	3.2	0.05	105.5	Pass
		2	2.6	0.05	105.5	Pass
		3	1.9	0.05	105.5	Pass
20	-48	1	-0.9	0.05	105.5	Pass
		2	-3.6	0.05	105.5	Pass
		3	-1.7	0.05	105.5	Pass
50	-48	1	2.8	0.05	105.5	Pass
		2	-1.6	0.05	105.5	Pass
		3	2.9	0.05	105.5	Pass
55	-48	1	-2.3	0.05	105.5	Pass
		2	-3.6	0.05	105.5	Pass
		3	-2.9	0.05	105.5	Pass

Frequency Stability versus Voltage

Frequency Stability vs. Voltage						
Voltage: Ref=-48V (%)	Temperature (°C)	Configuration	Frequency Offset (Hz)	Limit (ppm)	Limit (Hz)	Result
85%	25°C	1	-2.4	0.05	105.5	Pass
		2	1.1	0.05	105.5	Pass
		3	-3.5	0.05	105.5	Pass
115%	25°C	1	2.3	0.05	105.5	Pass
		2	-1.46	0.05	105.5	Pass
		3	-2.2	0.05	105.5	Pass

8 Transmitter Output Power And EIRP

Applicable Standard: RSS-139 § 6.4 ; srsp516 § 5.1.1

The equivalent isotropically radiated power (e.i.r.p.) of the base and fixed stations³ (with the exception of fixed subscriber stations) operating in the band 2305-2315 MHz or in the band 2350-2360 MHz shall not exceed 400 watts within any 1 MHz band; and shall not exceed 2000 W within any 5 MHz of bandwidth. The peak-to-average power ratio (PAPR) of these transmissions shall comply with the limits specified in RSS-139.

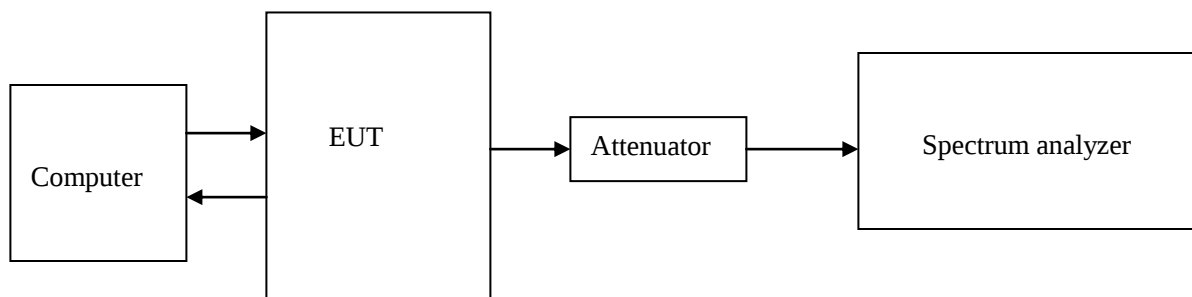
The PAPR of the transmitter output power of base and fixed station equipment shall not exceed 13 dB for more than 0.1% of the time, using a signal that corresponds to the highest PAPR during periods of continuous transmission.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	PXA Series Spectrum Analyzer	N9020A	MY49100652	2014.05.29	2015.05.29
DTS	DTS 50dB Attenuator	DTS400-50-4-B	10081610	2014.09.16	2015.09.16

***statement of traceability:** The Reliability Testing Center attests that all calibration has been performed per the NVLAP requirements, traceable to NIST.

Test Procedure



When conducted power test, The RF output of the EUT was connected to the input of the spectrum analyzer through sufficient external attenuation. External attenuation Loss is 42.6dB. EUT has two antennas, test the power one antenna by another, and add the two antennas power together as last conducted power.

The EIRP design formulas as follows:

$$\text{EIRP (dBm)} = \text{Conducted power (dBm)} + \text{Antenna gain (dBi)} - \text{Signal attenuation in the connecting cable between the transmitter and antenna (dB)}$$

Antenna gain (dBi): 15dBi

Signal attenuation in the connecting cable between the transmitter and antenna (dB):1.5dB

Environmental Conditions

Temperature:	20 °C
Relative Humidity:	53 %
ATM Pressure:	1009 mbar

Test Result: Pass

Test Mode: Transmitting UMTS

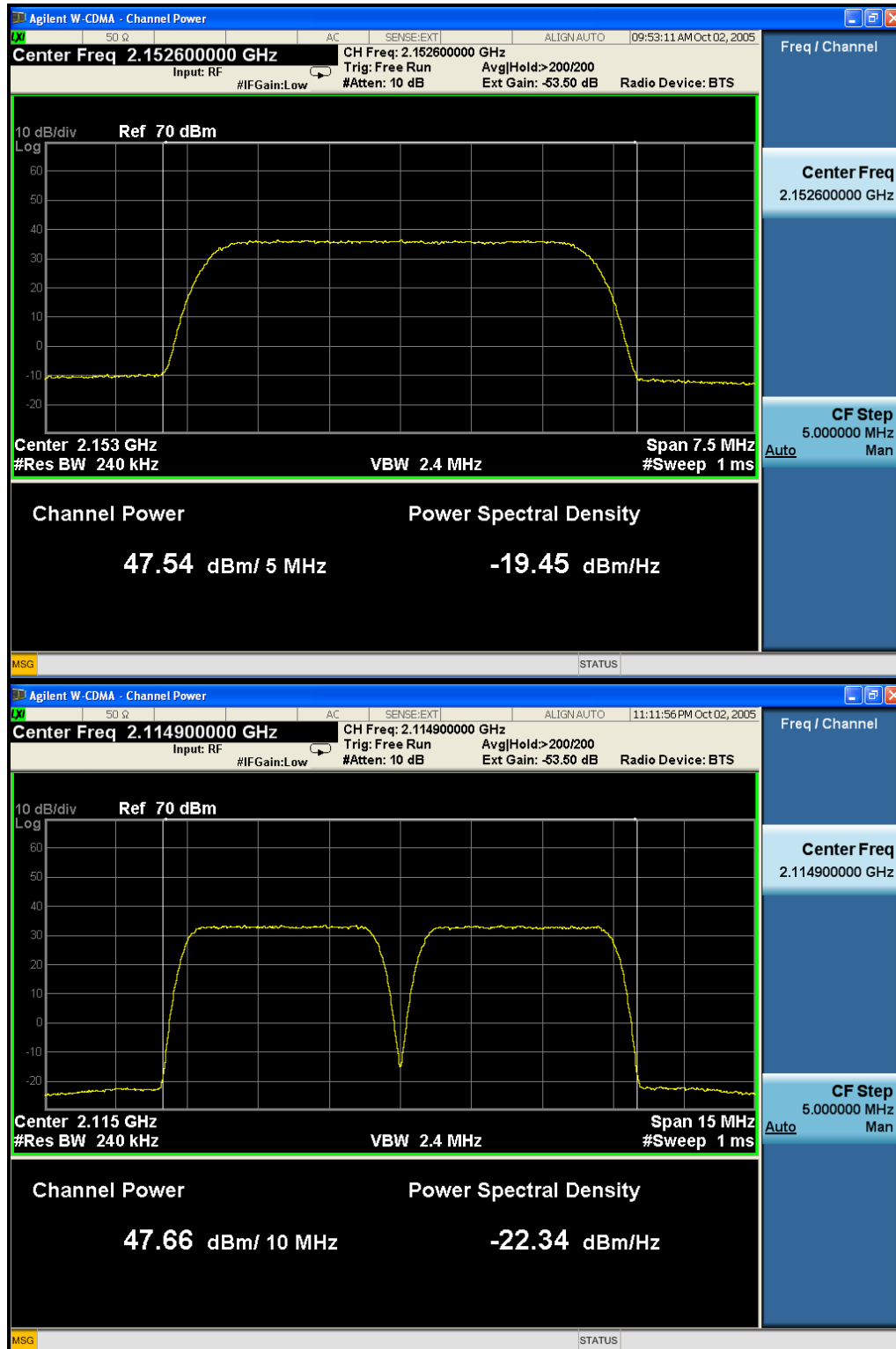
Configuration 1: Bottom carrier (1 carrier) 2112.4 MHz
Configuration 2: Middle carrier (1 carrier) 2132.4MHz
Configuration 3: Top carrier (1 carrier) 2152.6 MHz
Configuration 4: Bottom carrier (2 carriers) 2112.4 MHz, 2117.4 MHz
Configuration 5: Middle carrier (2 carriers) 2130 MHz, 2135 MHz
Configuration 6: Top carrier (2 carriers) 2147.6 MHz, 2152.6 MHz

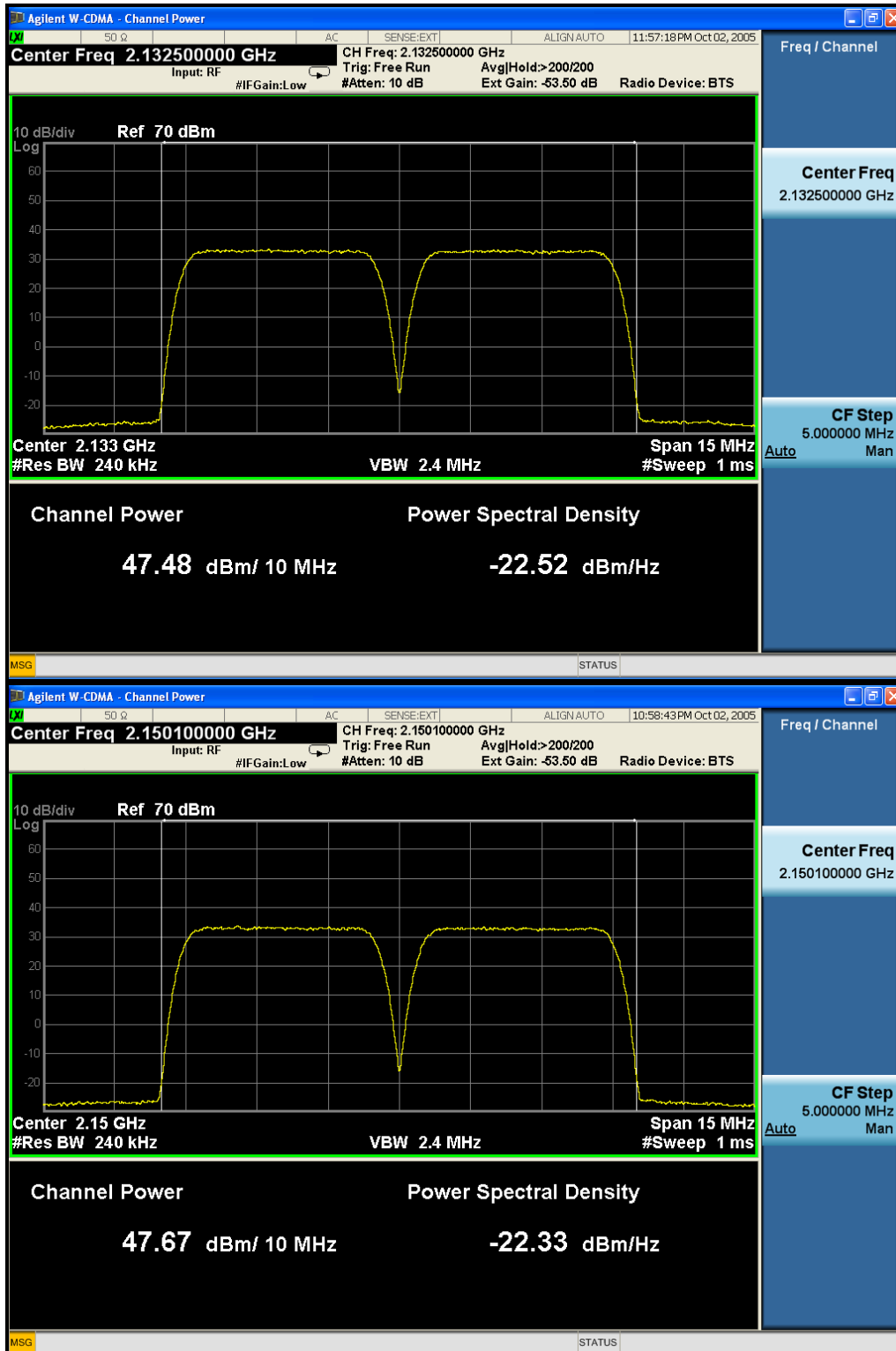
Test Data:

Conducted power and EIRP

configuration	Center Frequency (MHz)	Output Power (dBm)	EIRP(W)
1	2112.4	47.87	918.5
2	2132.4	47.43	830.0
3	2152.6	47.54	851.3
4	2112.4,2117.4	47.66	875.2
5	2130,2135	47.48	839.6
6	2147.6,2152.6	47.67	877.2







9 Transmitter Unwanted Emissions

Applicable Standard: RSS-139 § 6.5

In measuring unwanted emissions, the spectrum shall be investigated from 30 MHz or the lowest radio frequency signal generated in the equipment, whichever is lower, without going below 9 kHz, up to at least the frequency given in (a) and (b):

- (a) If the equipment operates below 10 GHz: to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower. General Requirements and Information for the Certification of Radio Apparatus RSS-Gen13
- (b) If the equipment operates at or above 10 GHz: to the fifth harmonic of the highest fundamental frequency or to 100 GHz, whichever is lower.

The power of any emission outside the frequency range(s) in which the equipment operates shall be attenuated below the transmitter power, P(dBW), by the amount indicated in RSS195§5.6.1 Table 1 and graphically represented in Figure 1, where p is the transmitter output power measured in watts.

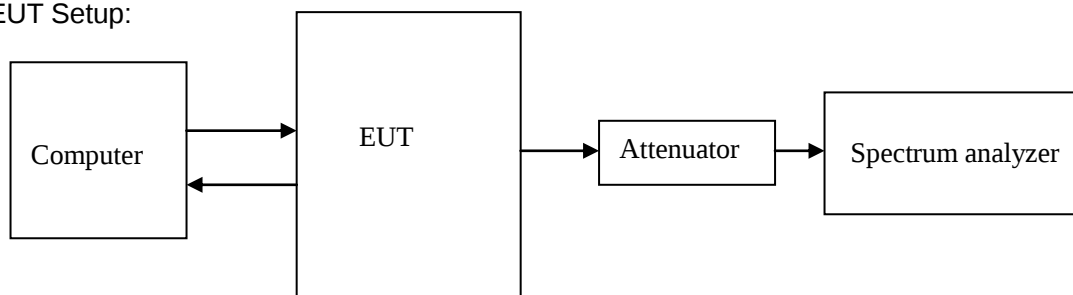
Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	PXA Series Spectrum Analyzer	N9020A	MY49100652	2014.05.29	2015.05.29
DTS	DTS 50dB Attenuator	DTS400-50-4-B	10081610	2014.09.16	2015.09.16

***statement of traceability:** The Reliability Testing Center attest that all calibration have been performed per the NVLAP requirements, traceable to NIST.

Test Procedure

EUT Setup:



The unwanted emissions shall be measured at the frequencies of the highest and lowest channel of all bandwidths and types of modulation that the equipment can operate with a resolution bandwidth of 1 MHz or less, but at least 1% of the occupied bandwidth of the transmitter, provided that the measured power is integrated over a 1 MHz bandwidth.

When conducted unwanted emissions test, configure EUT output at rated power, the EUT output antenna connected to spectrum analyzer, and testing emissions by spectrum analyzer one antenna by another.

When radiated unwanted emissions test, configure EUT output at rated power, the EUT output antenna connected to load.

Test Data Environmental Conditions

Temperature:	20 °C
Relative Humidity:	53 %
ATM Pressure:	1009 mbar

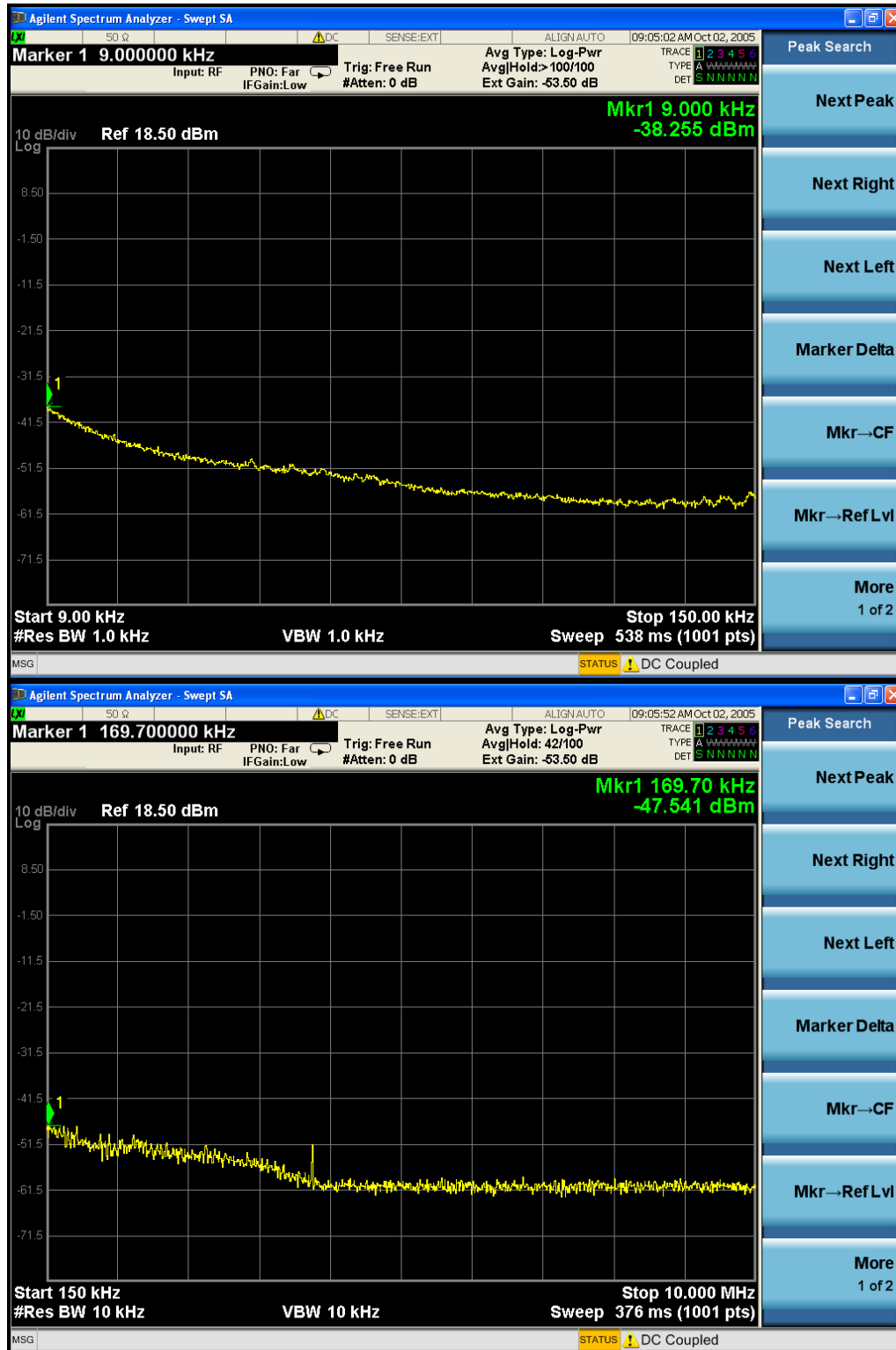
Test Result: Pass

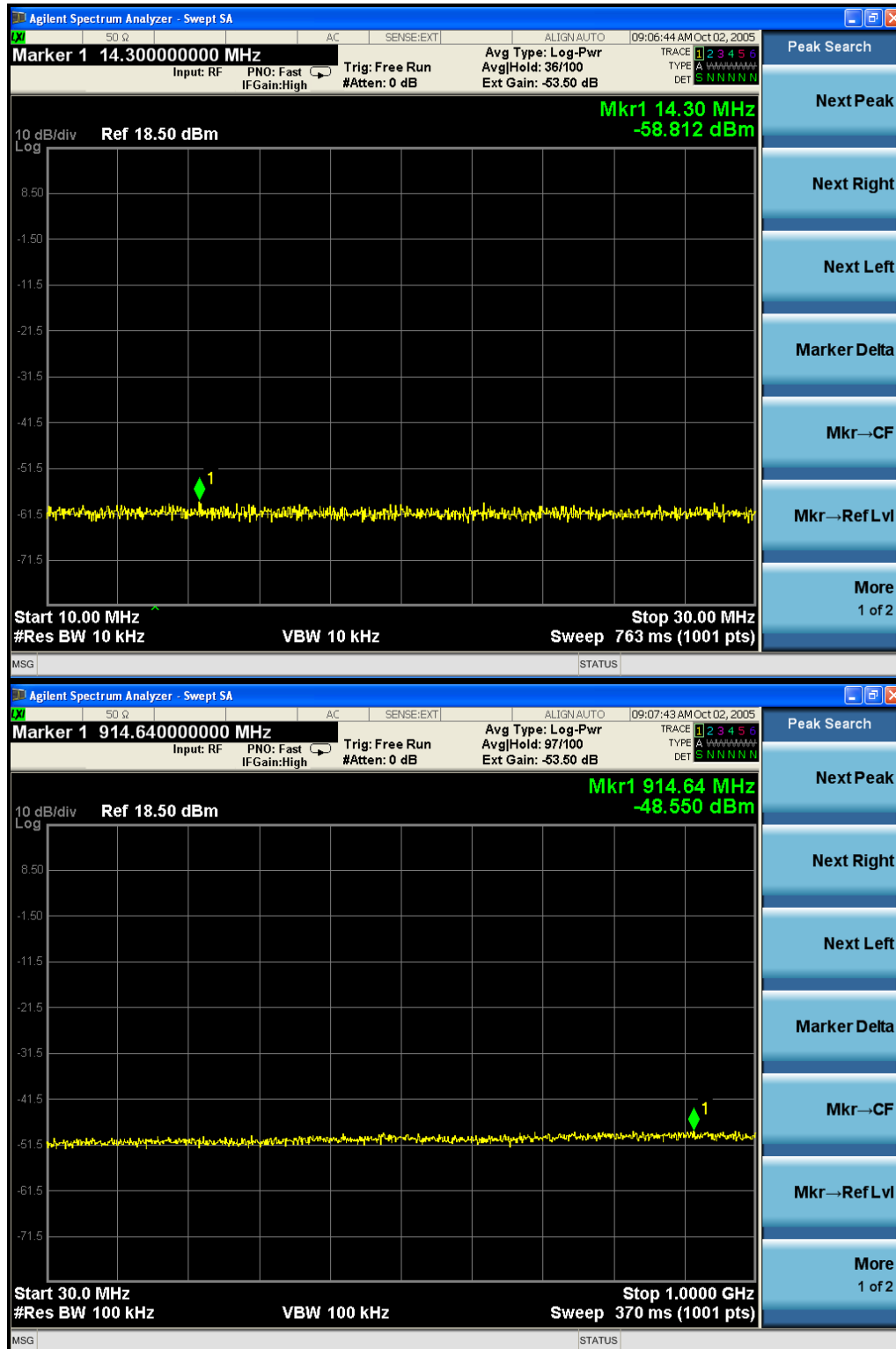
Test Mode: Transmitting UMTS

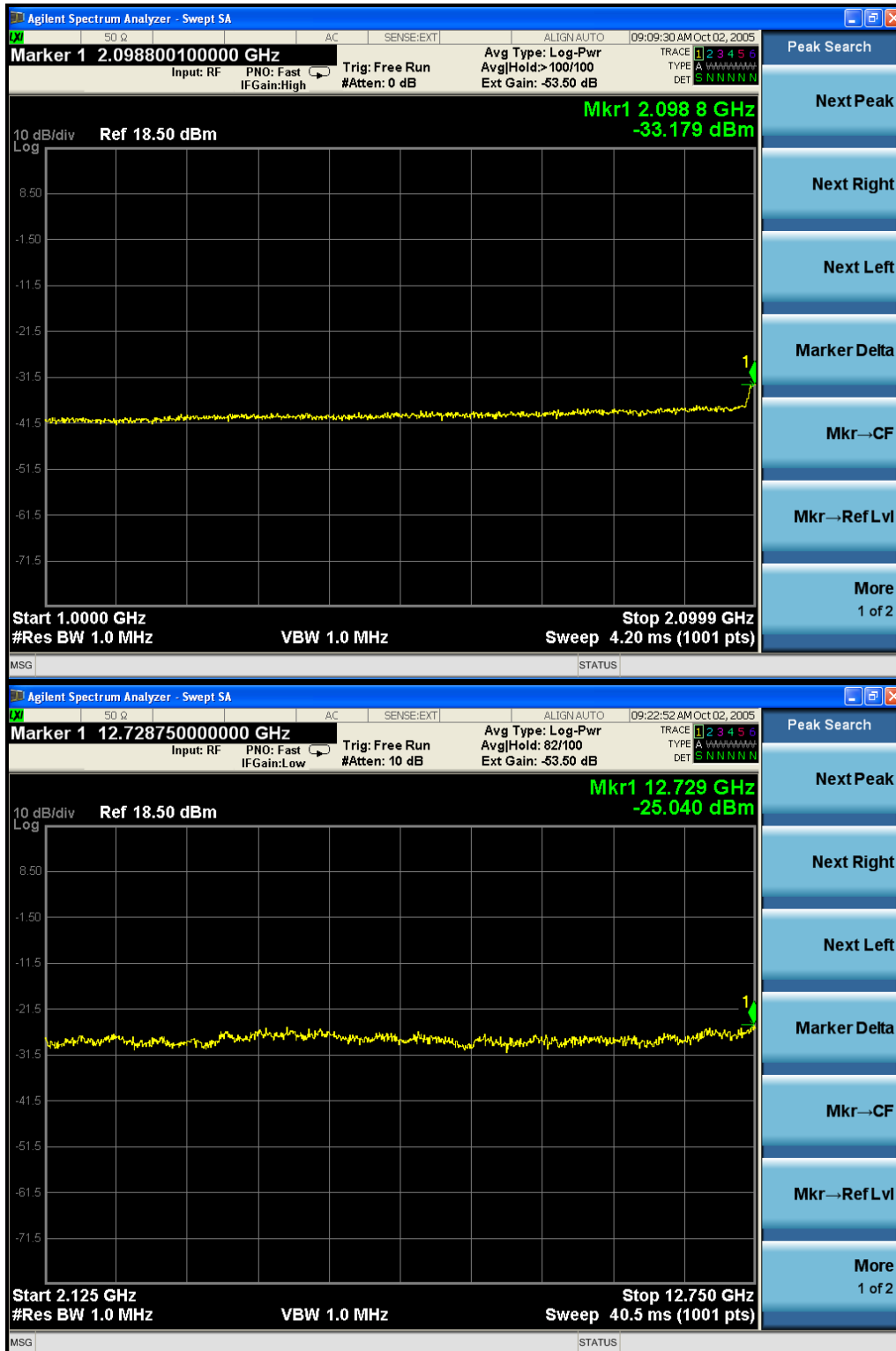
Configuration 1: Bottom carrier (1 carrier) 2112.4 MHz
Configuration 2: Middle carrier (1 carrier) 2132.4MHz
Configuration 3: Top carrier (1 carrier) 2152.6 MHz
Configuration 4: Bottom carrier (2 carriers) 2112.4 MHz, 2117.4 MHz
Configuration 5: Middle carrier (2 carriers) 2130 MHz, 2135 MHz
Configuration 6: Top carrier (2 carriers) 2147.6 MHz, 2152.6 MHz

Test Data:

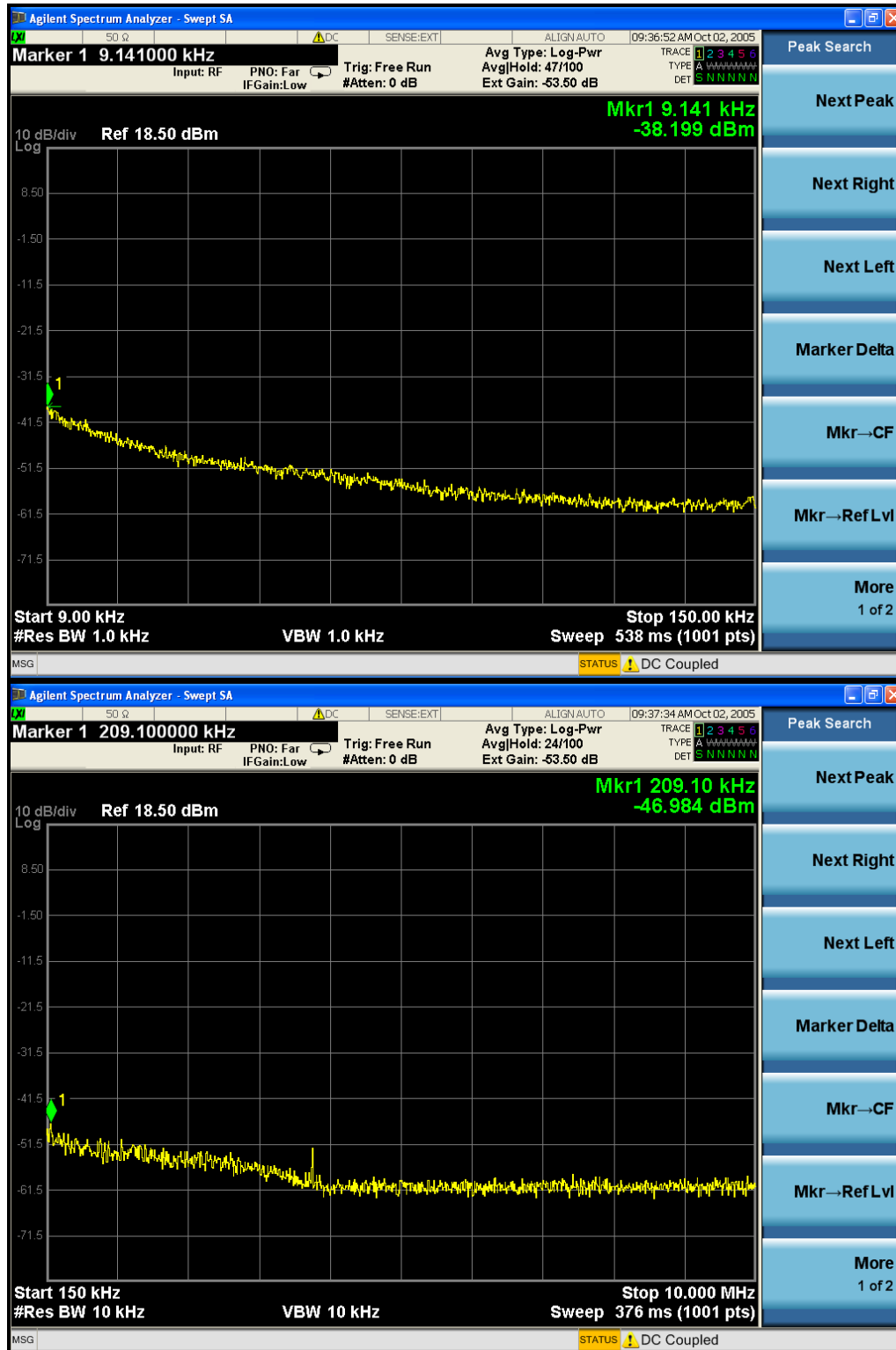
Configuration 1:

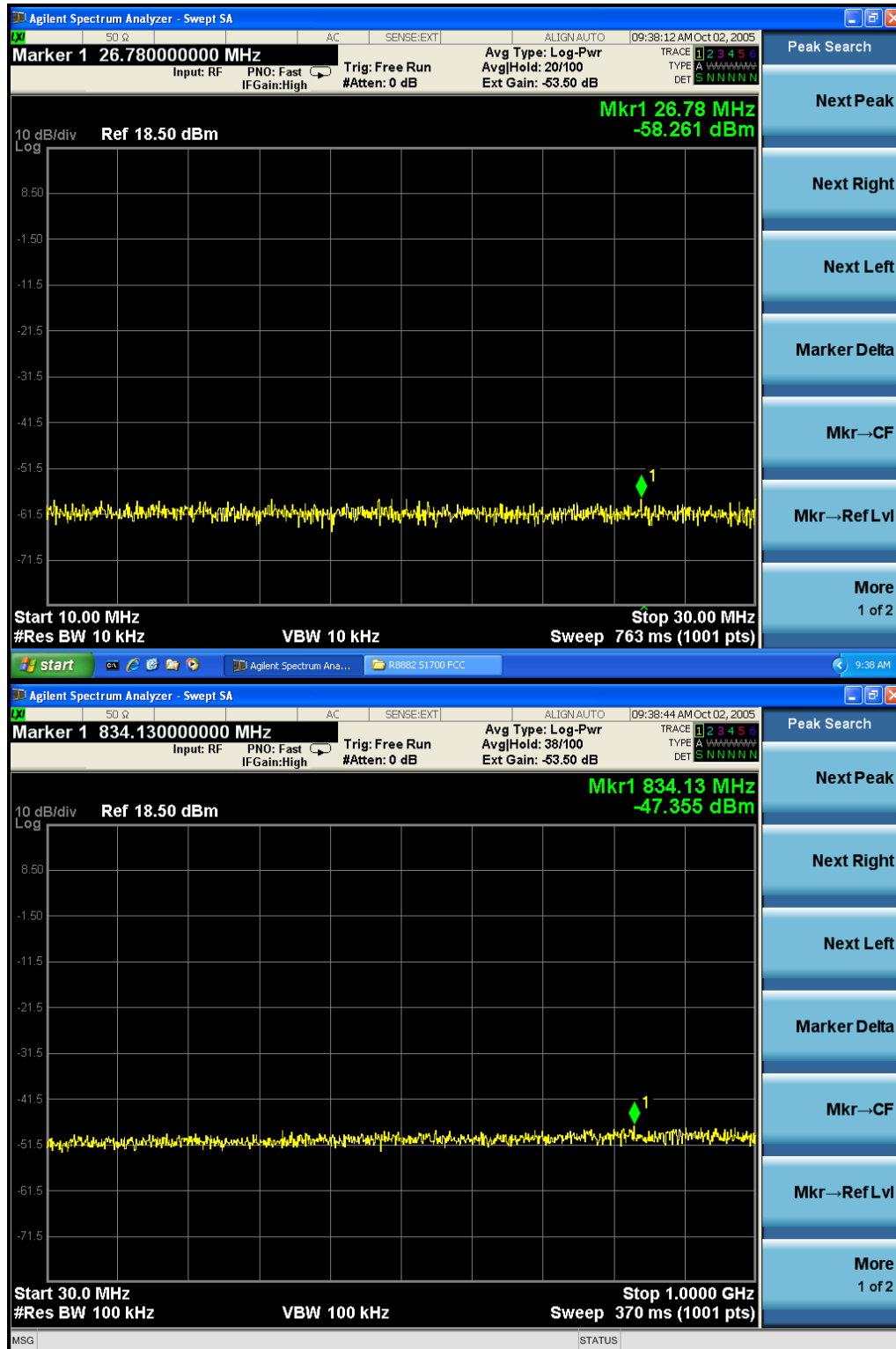


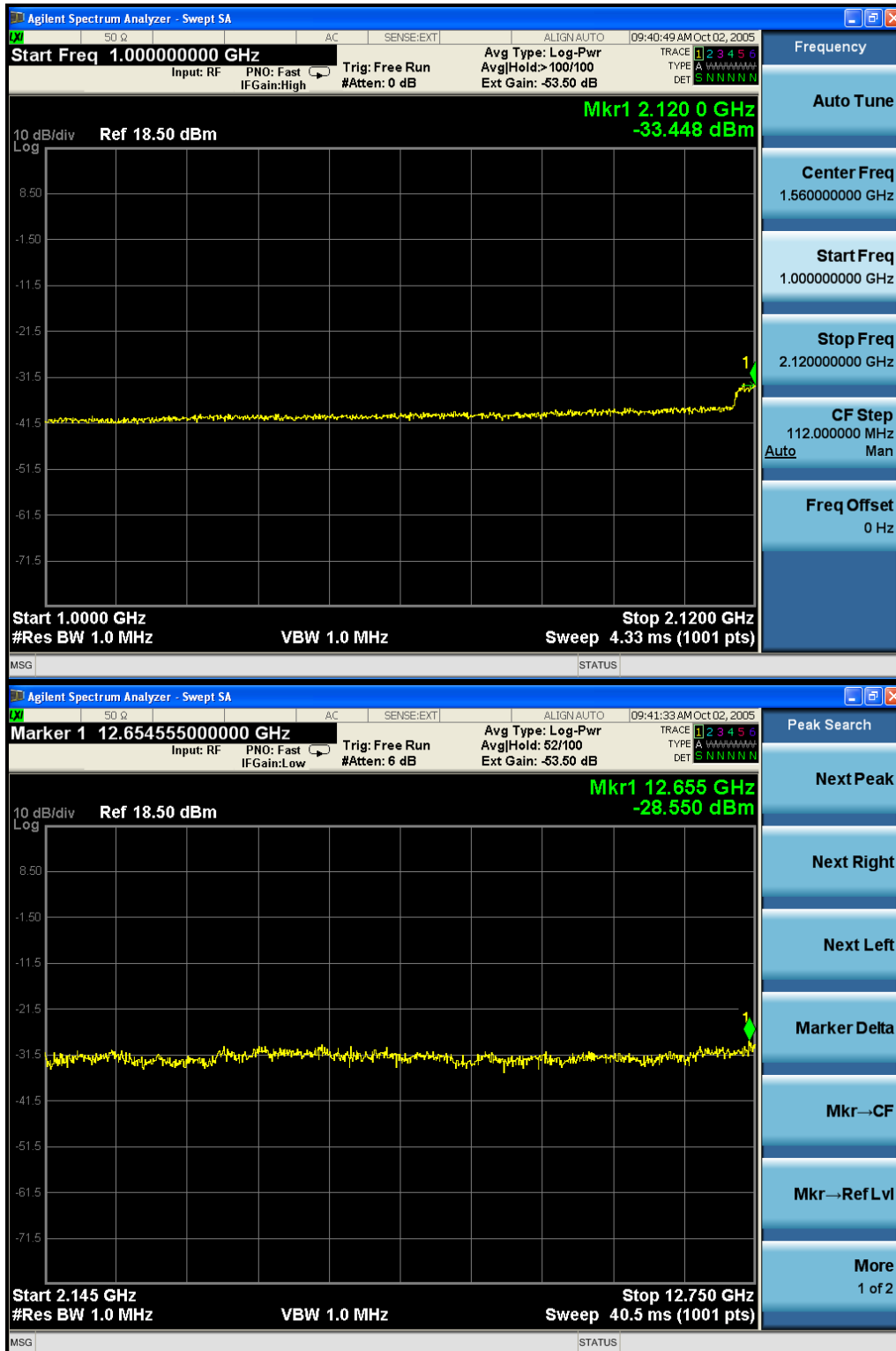




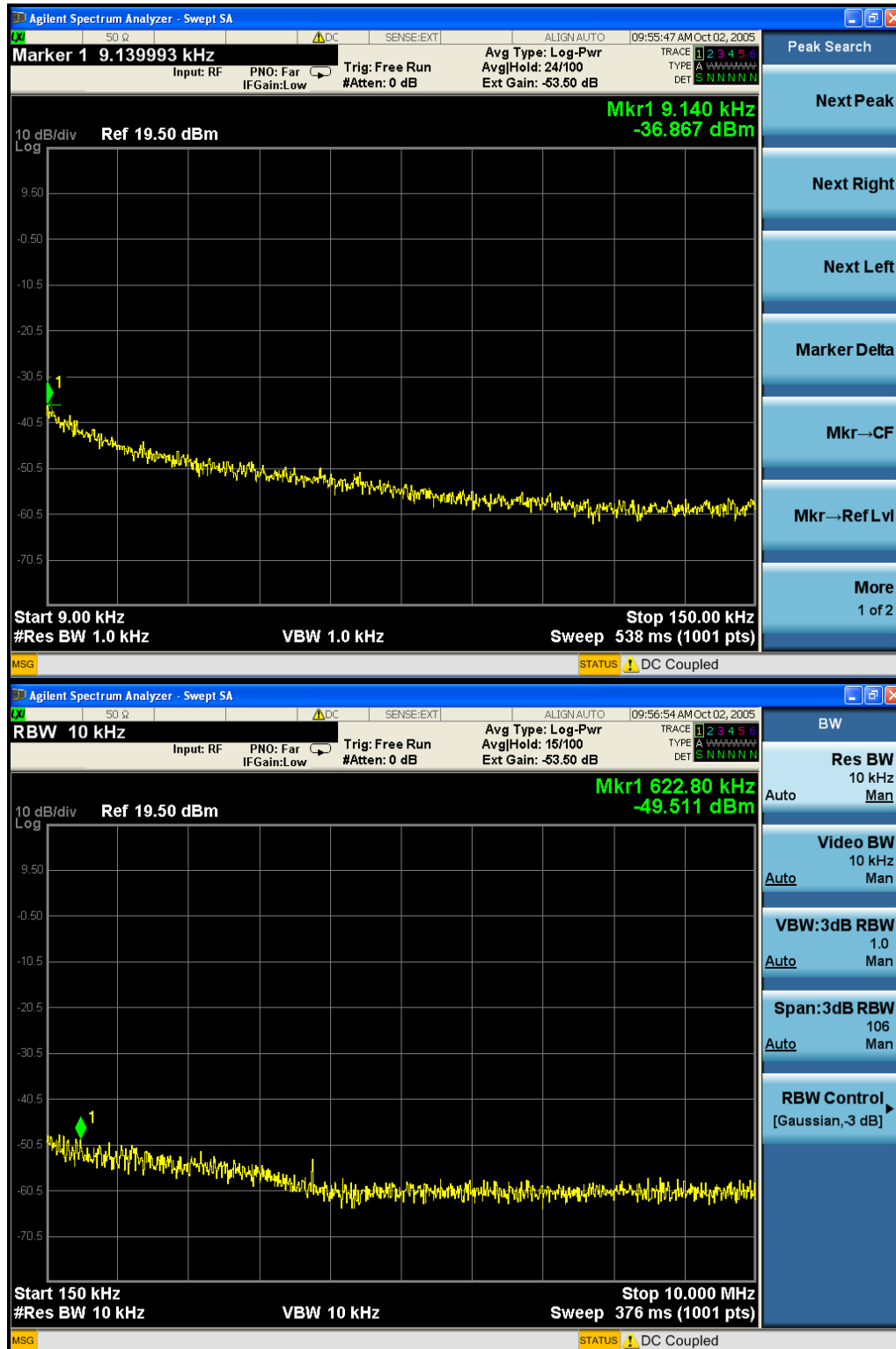
Configuration 2:

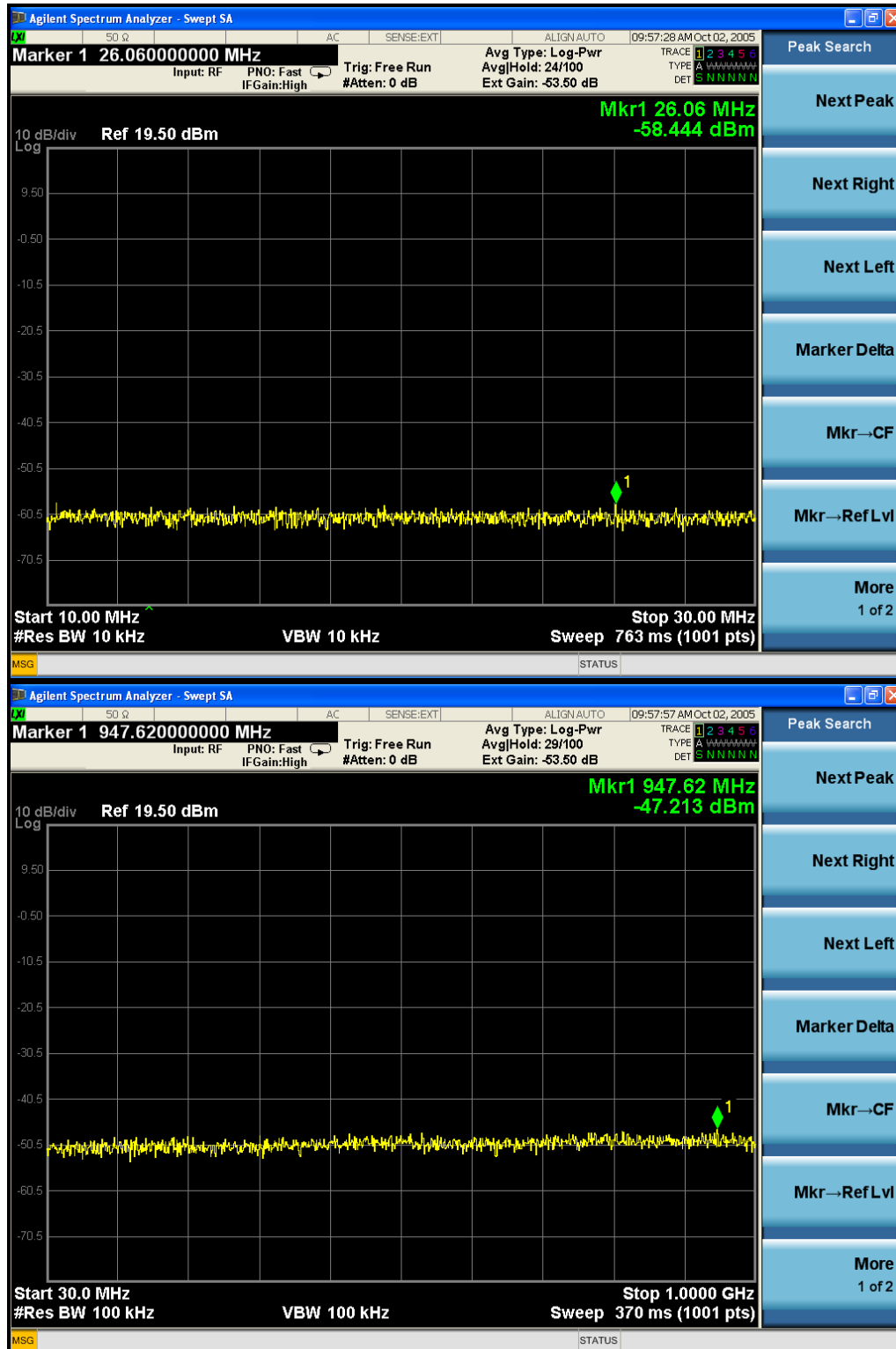






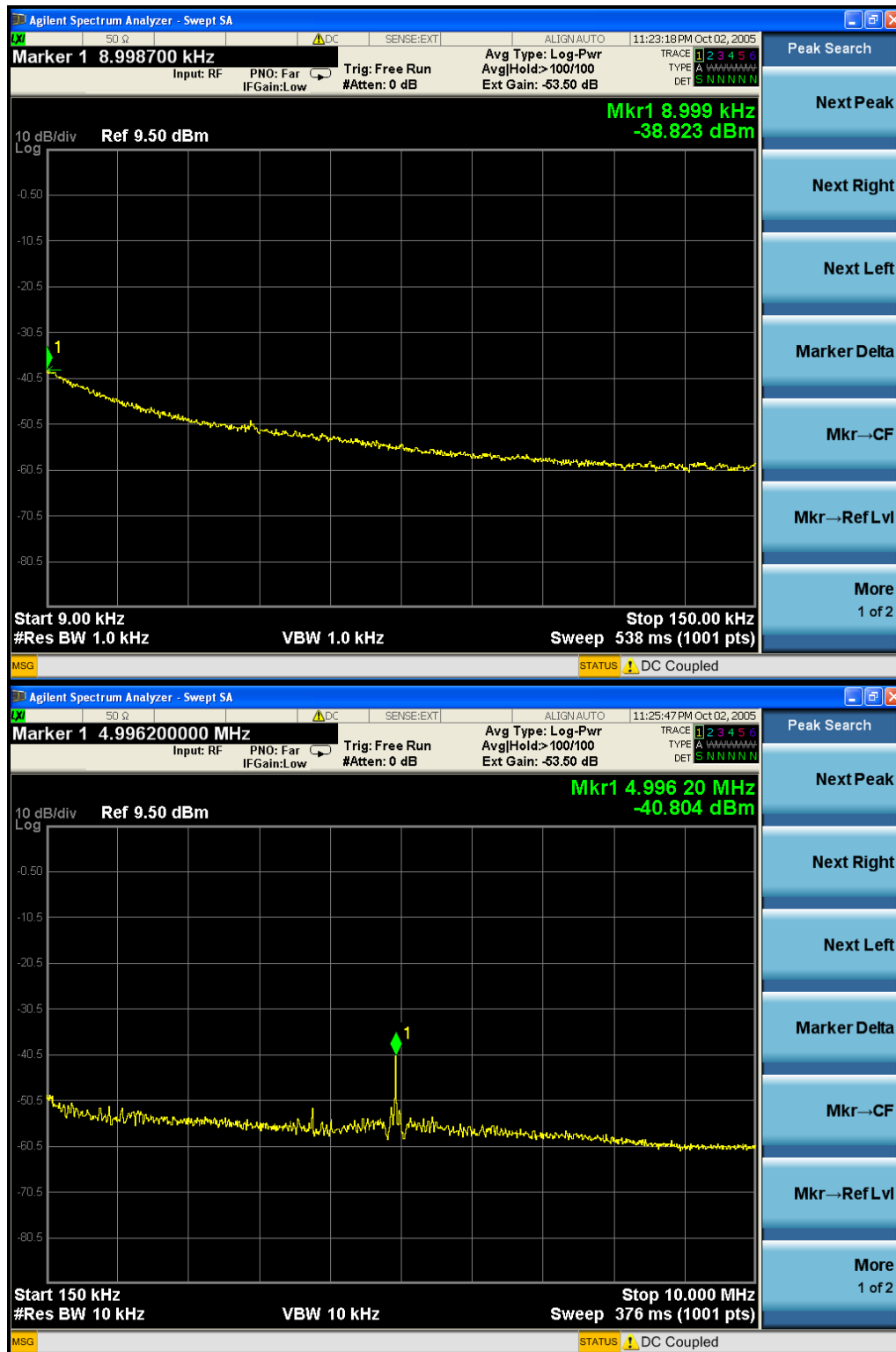
Configuration 3:







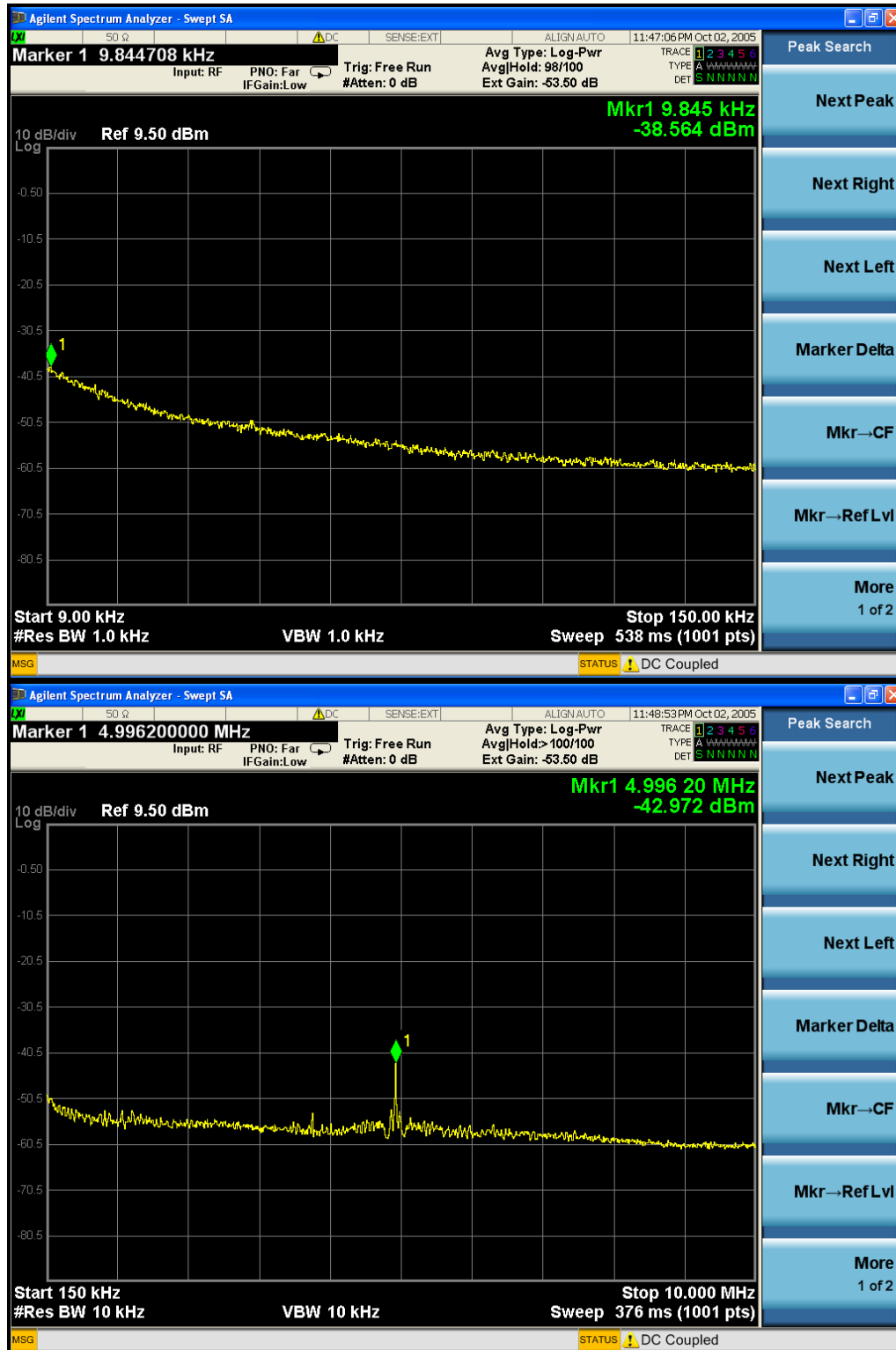
Configuration 4:



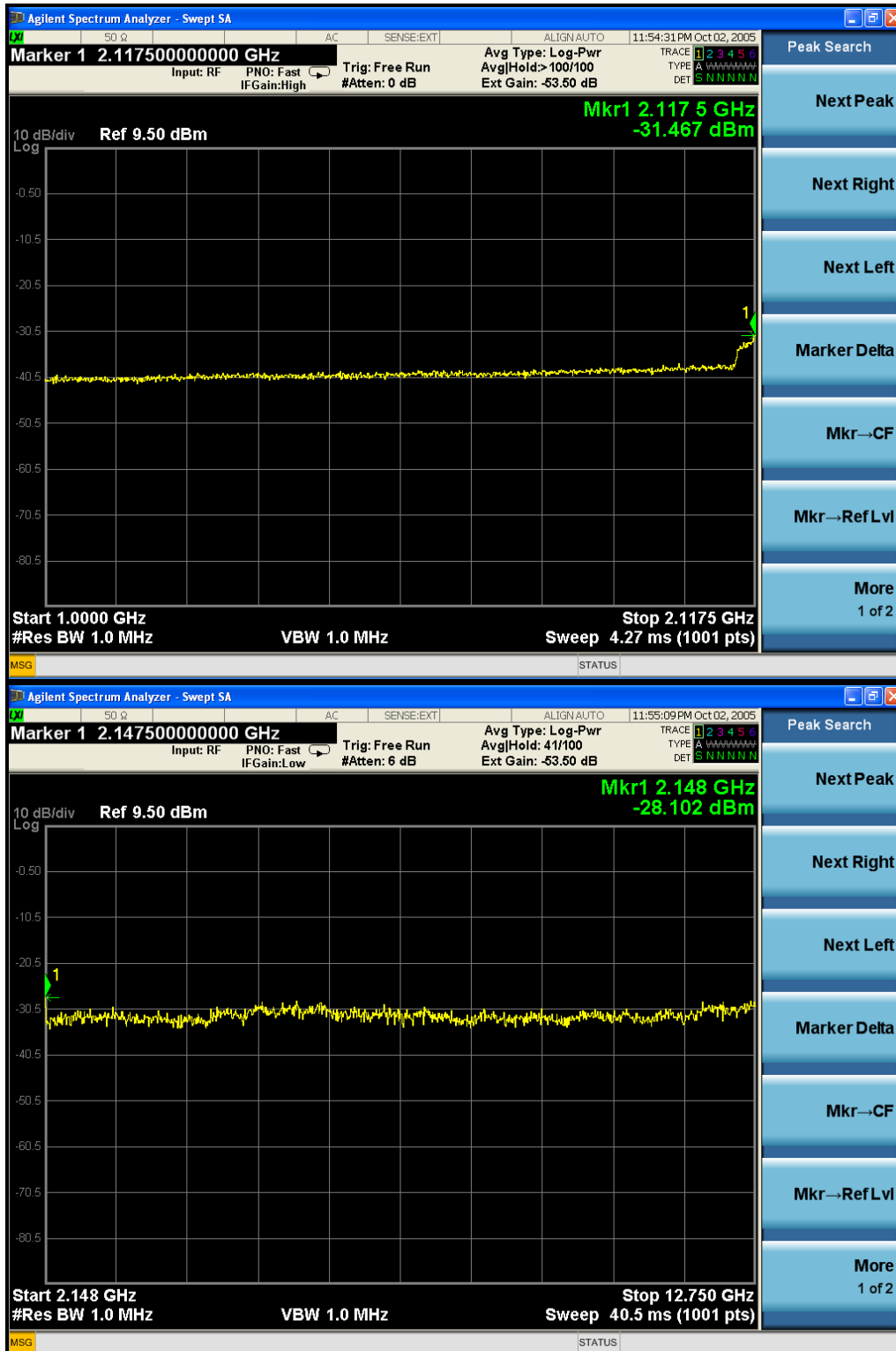




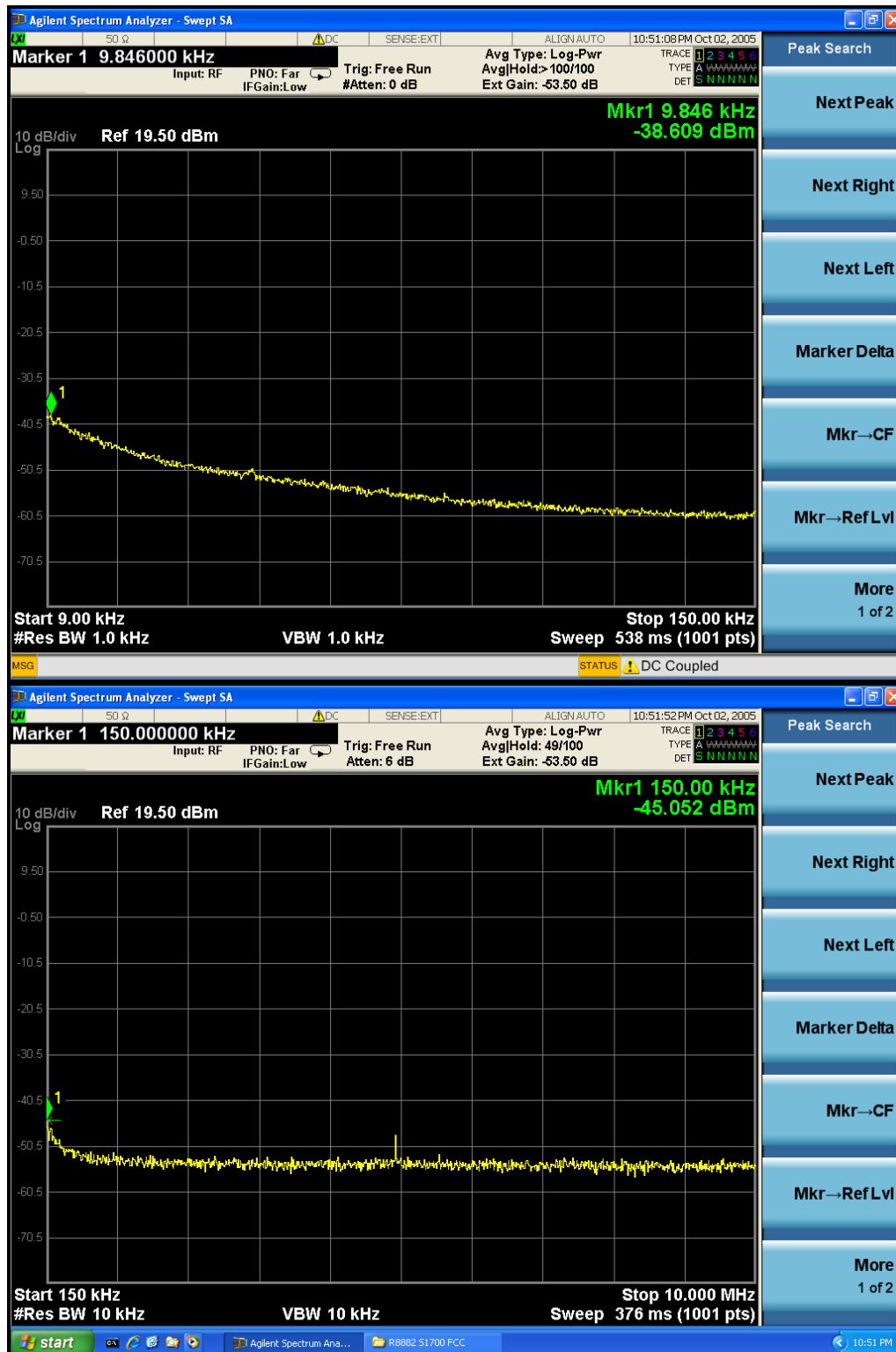
Configuration 5:

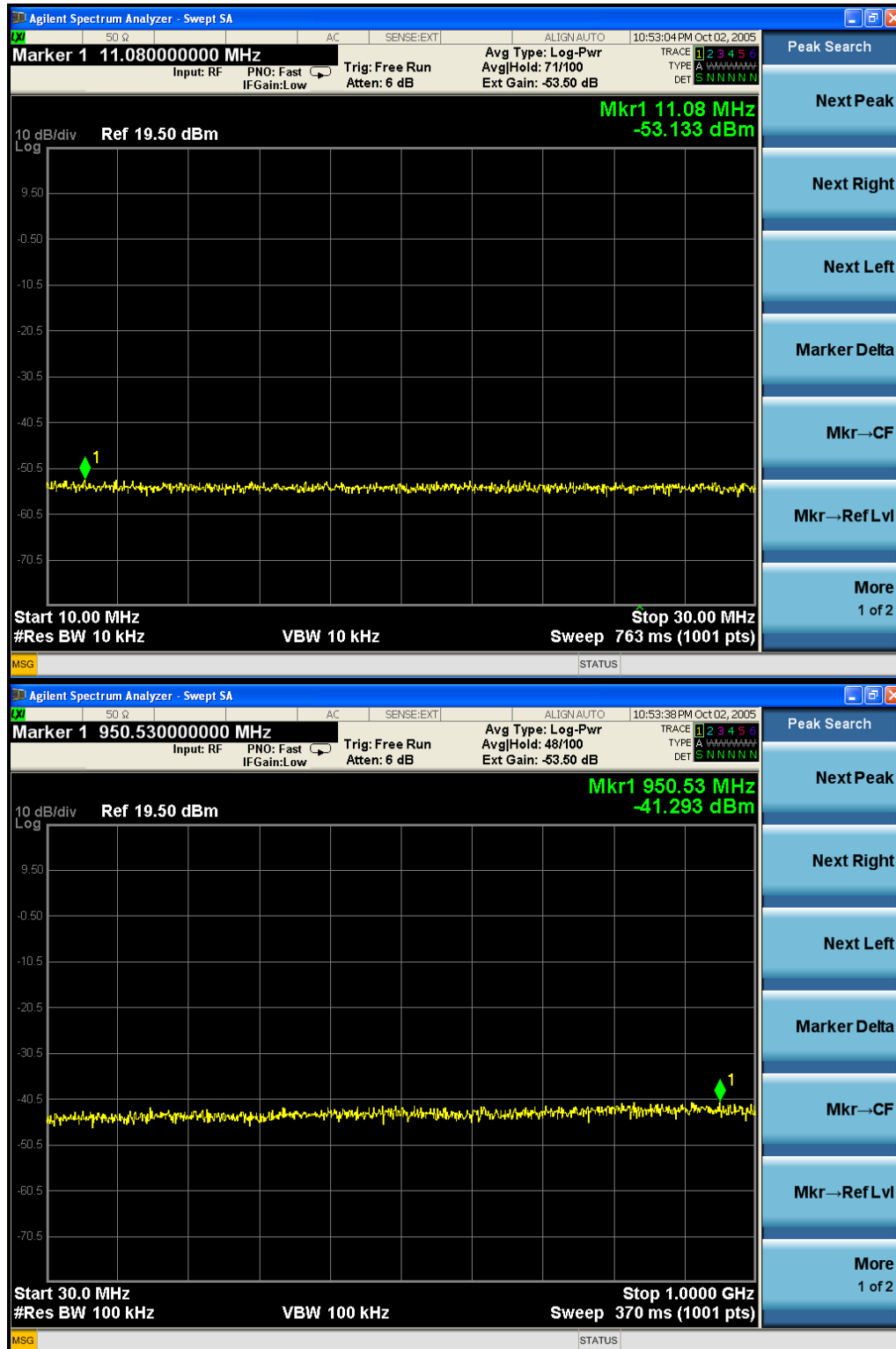


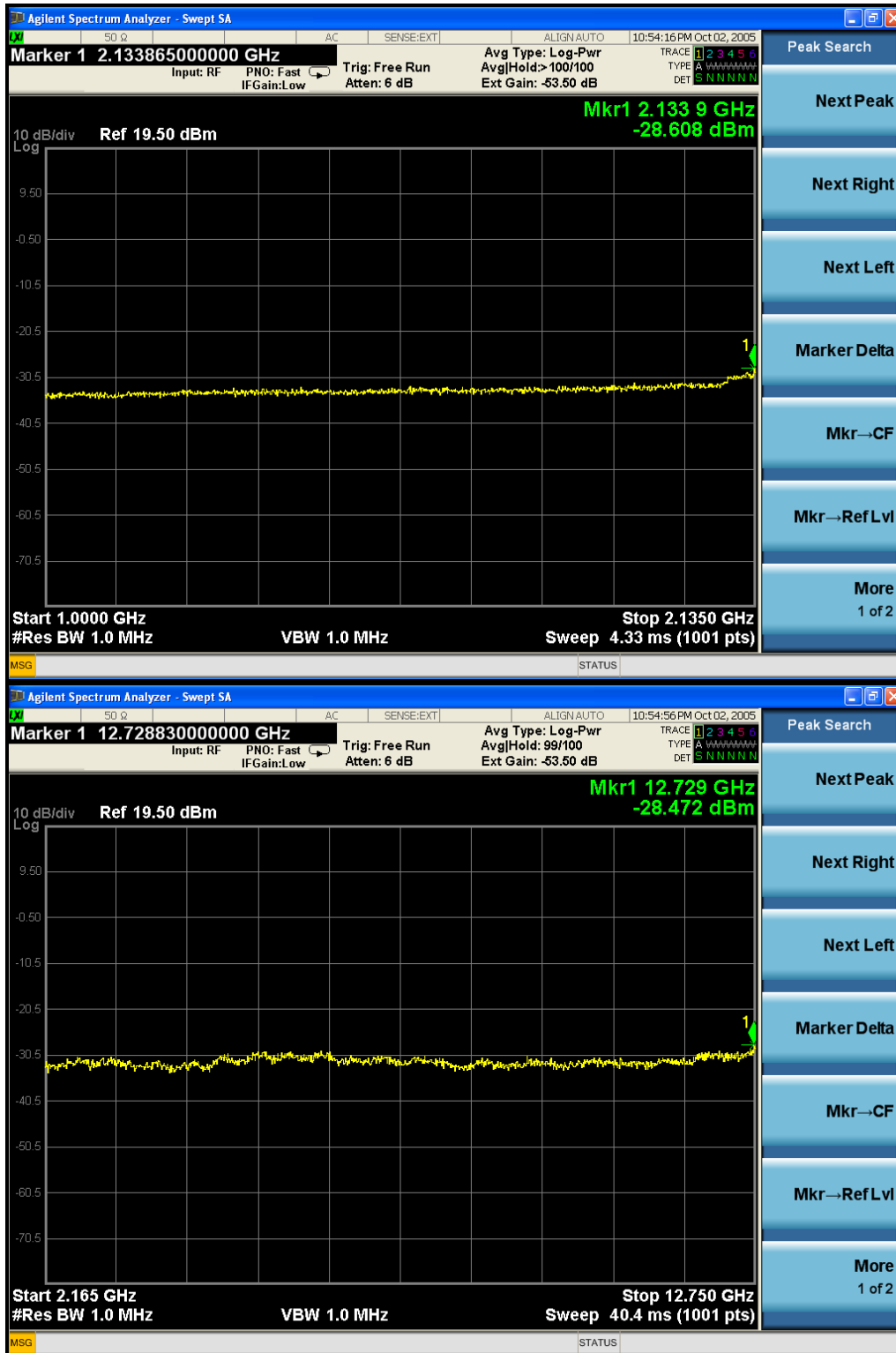




Configuration 6:







10 Receiver Spurious Emissions

Applicable Standard: RSS-139 § 6.6

Receivers, are required to comply with the limits of spurious emissions as set out in this section. Receiver emission measurements are to be performed as per the normative test method referenced in Section 3.

For emissions at frequencies below 1 GHz, measurements shall be performed using a CISPR quasi-peak detector and the related measurement bandwidth. At frequencies above 1 GHz, measurements shall be performed using a linear average detector with a minimum resolution bandwidth of 1 MHz.

As an alternative to CISPR quasi-peak or average measurements, compliance with the emission limit can be demonstrated using measuring equipment employing a peak detector function properly adjusted for factors such as pulse desensitization, as required, with a measurement bandwidth equal to, or greater than, the applicable CISPR quasi-peak bandwidth or 1 MHz bandwidth, respectively.

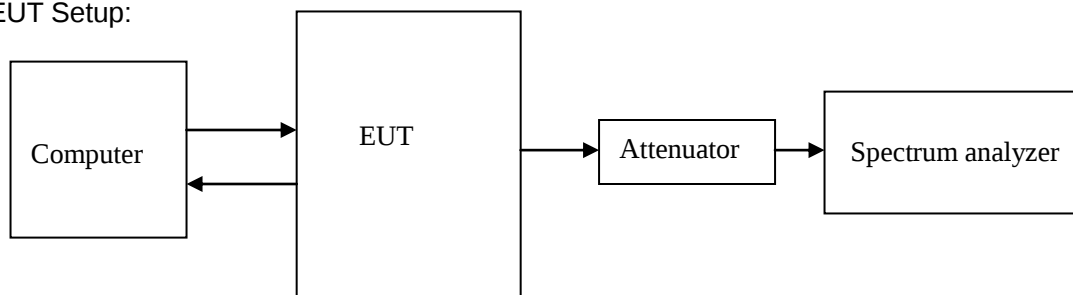
Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	PXA Series Spectrum Analyzer	N9020A	MY49100652	2014.05.29	2015.05.29
DTS	DTS 50dB Attenuator	DTS400-50-4-B	10081610	2014.09.16	2015.09.16

***statement of traceability:** The Reliability Testing Center attest that all calibration have been performed per the NVLAP requirements, traceable to NIST.

Test Procedure

EUT Setup:



The unwanted emissions shall be measured at the frequencies of the highest and lowest channel of all bandwidths and types of modulation that the equipment can operate with a resolution bandwidth of 1 MHz or less, but at least 1% of the occupied bandwidth of the transmitter, provided that the measured power is integrated over a 1 MHz bandwidth.

When conducted unwanted emissions test, configure EUT output at rated power, the EUT output antenna connected to spectrum analyzer, and testing emissions by spectrum analyzer one antenna by another.

When radiated unwanted emissions test, configure EUT output at rated power, the EUT output antenna connected to load.

Test Data Environmental Conditions

Temperature:	20 °C
Relative Humidity:	53 %
ATM Pressure:	1009 mbar

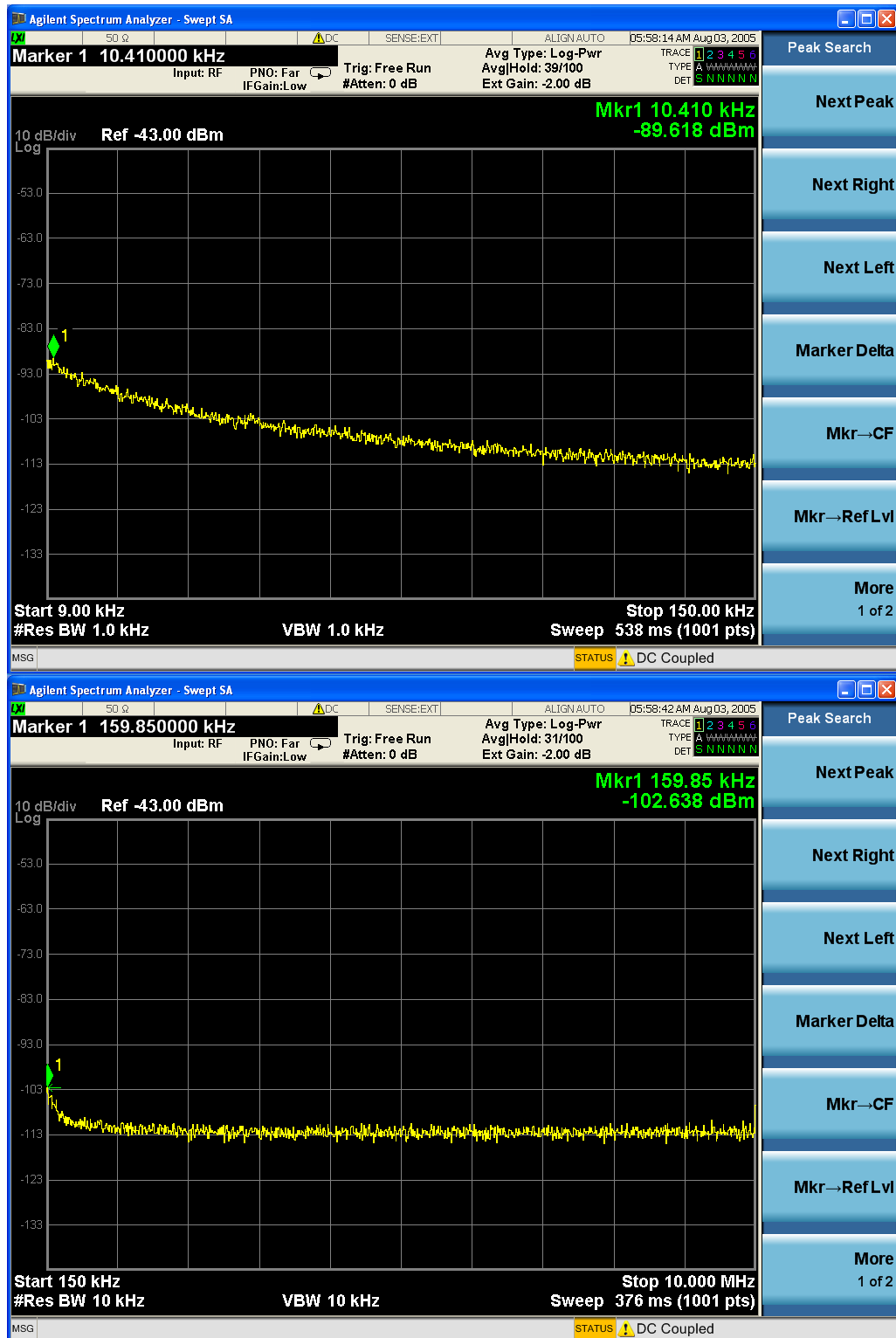
Test Result: Pass

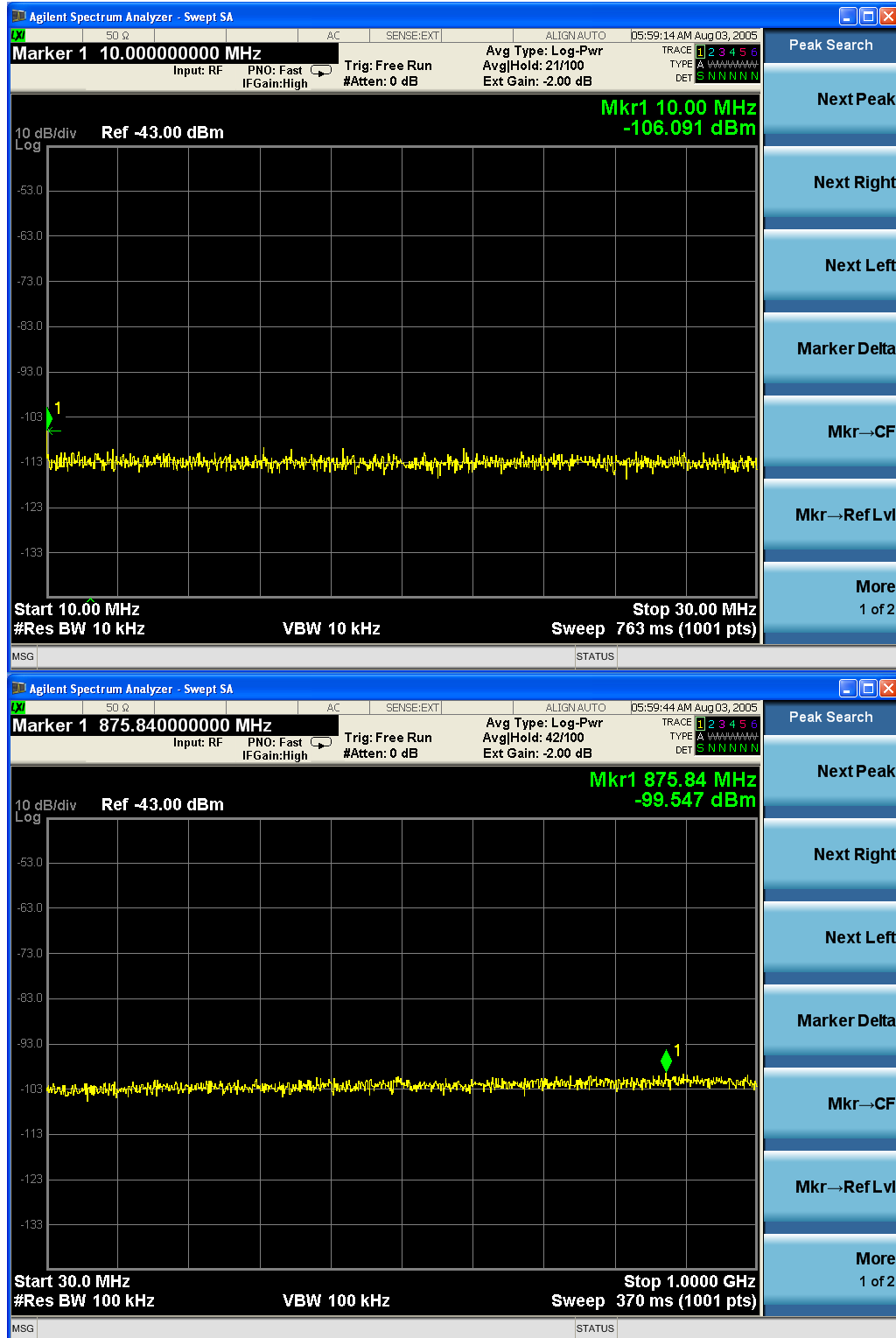
Test Mode: Transmitting UMTS

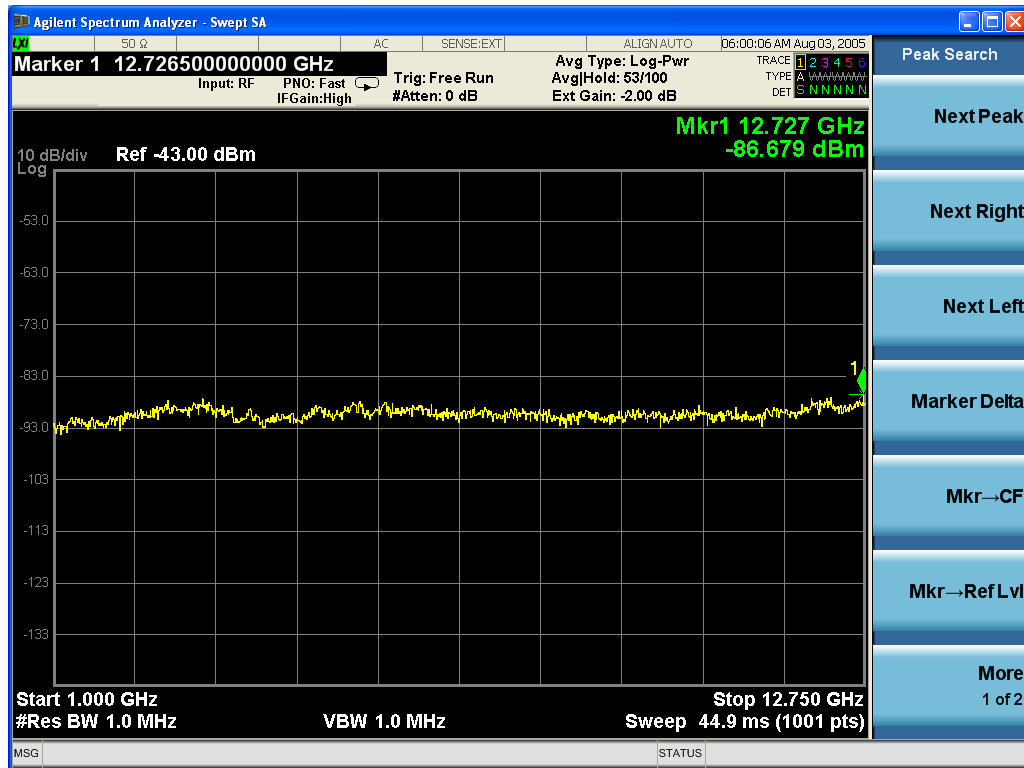
Configuration 1: Bottom carrier (1 carrier)	2112.4 MHz
Configuration 2: Middle carrier (1 carrier)	2132.4MHz
Configuration 3: Top carrier (1 carrier)	2152.6 MHz
Configuration 4: Bottom carrier (2 carriers)	2112.4 MHz, 2117.4 MHz
Configuration 5: Middle carrier (2 carriers)	2130 MHz, 2135 MHz
Configuration 6: Top carrier (2 carriers)	2147.6 MHz, 2152.6 MHz

Test Data:

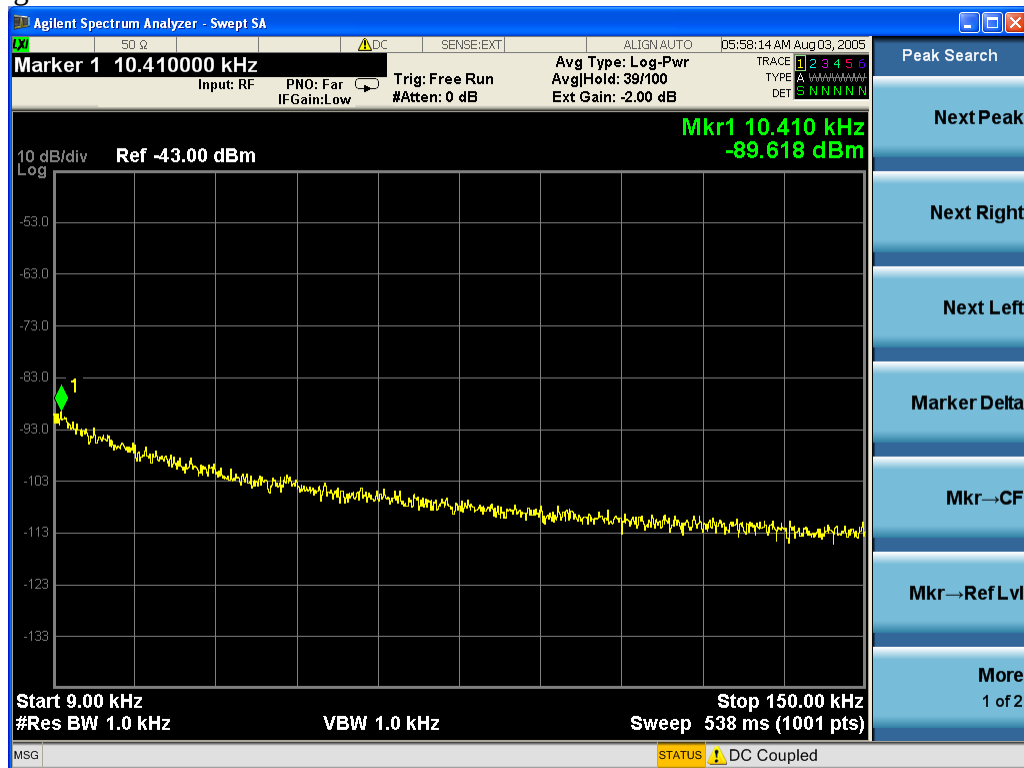
Configuration 1:

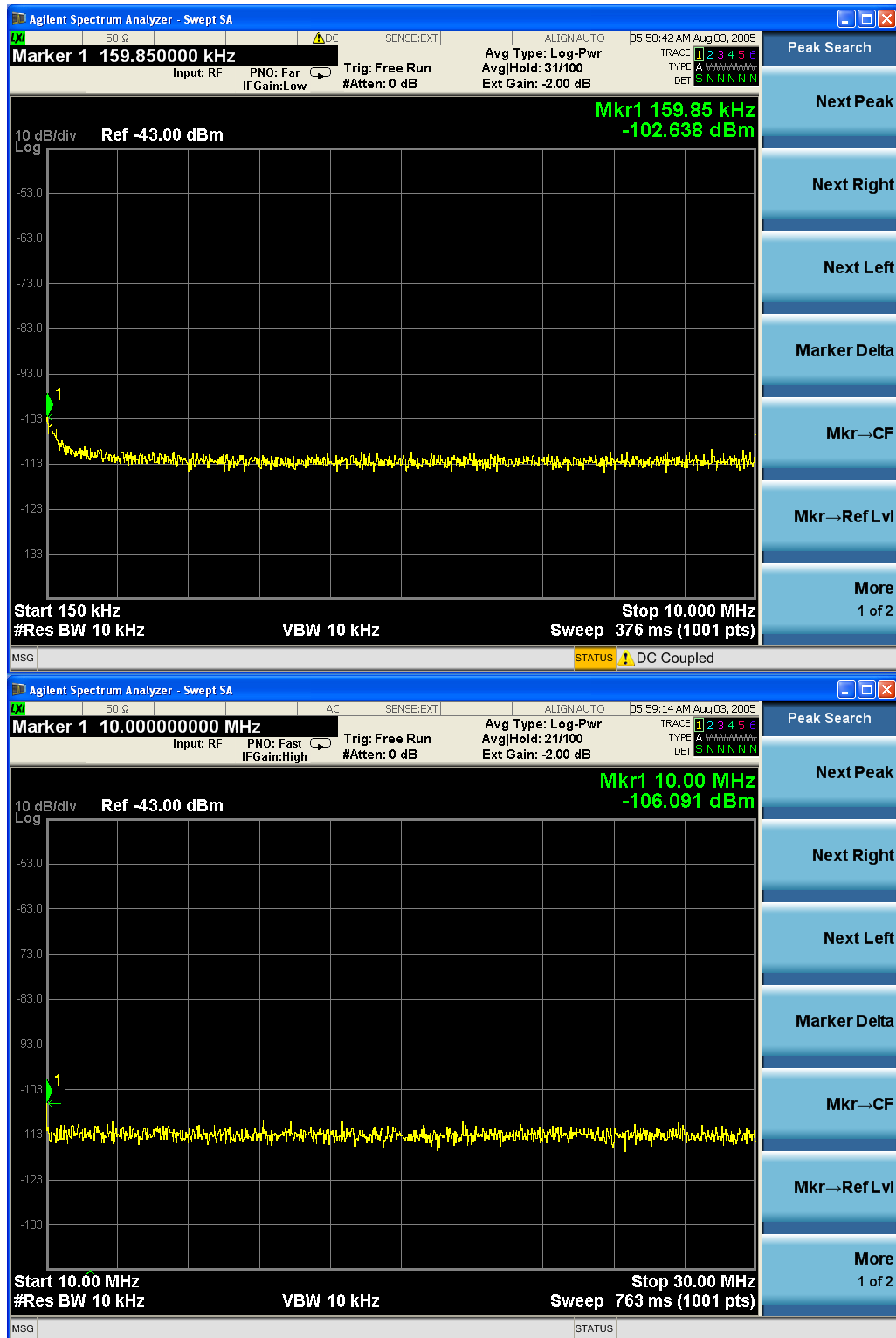


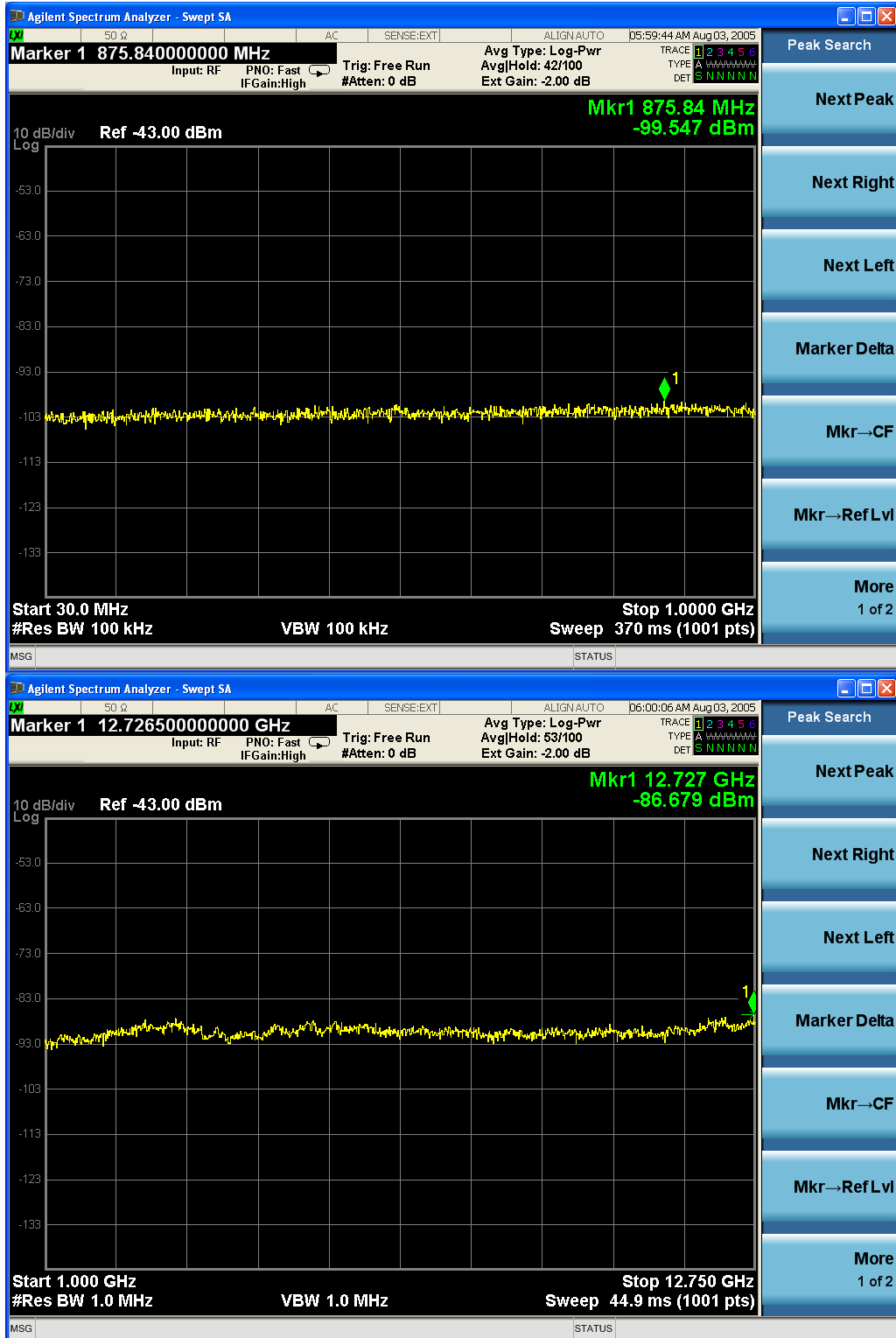




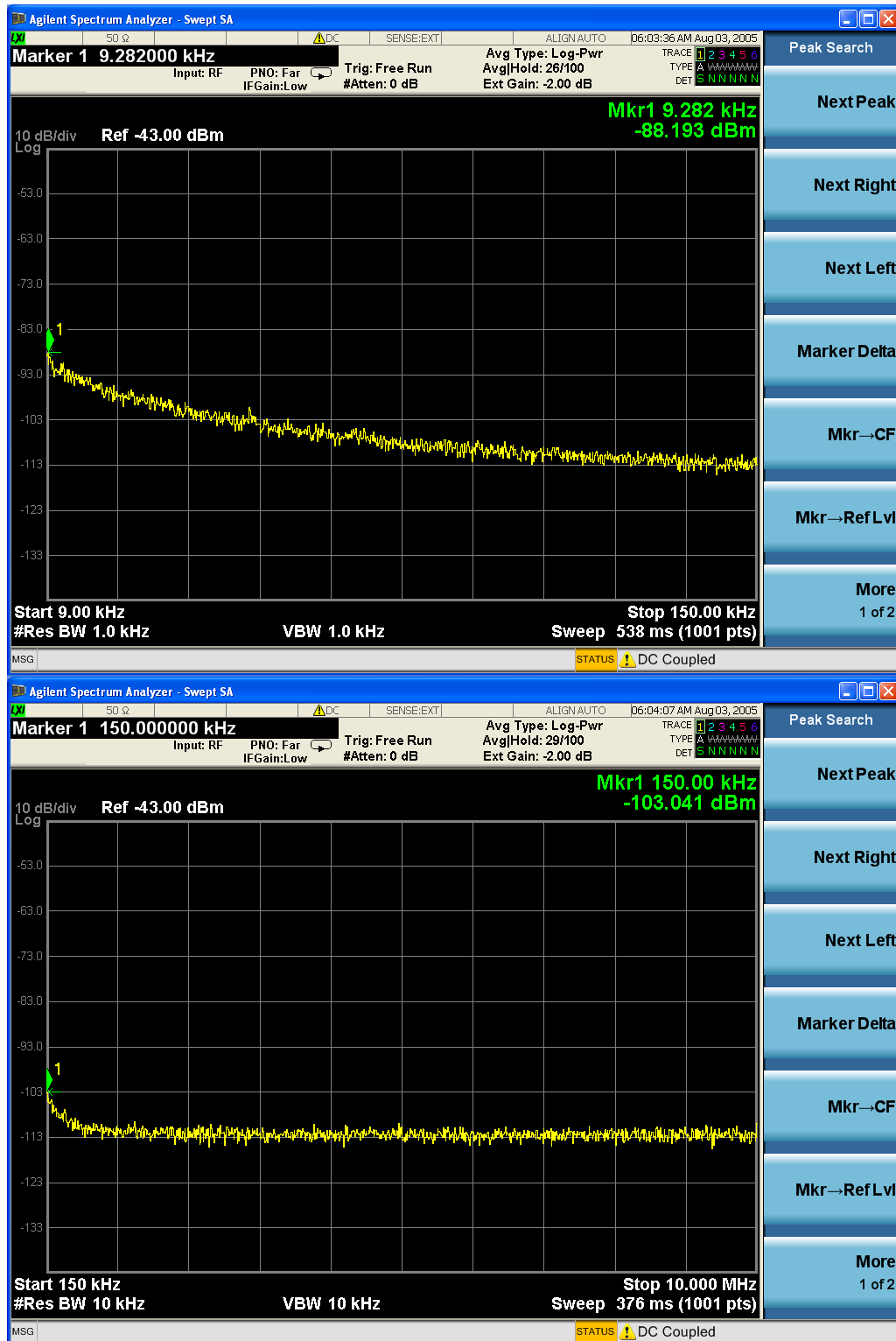
Configuration 2:

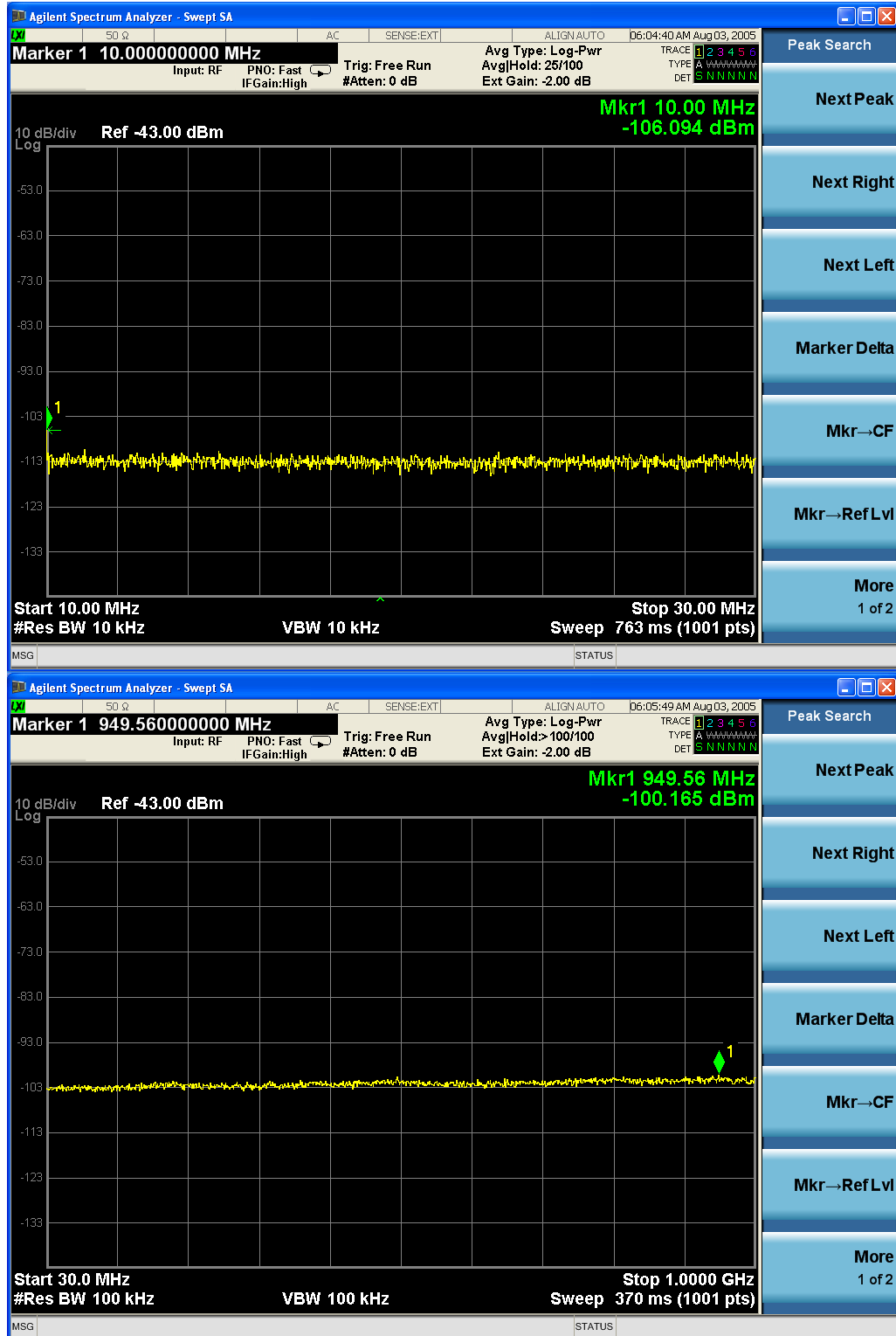


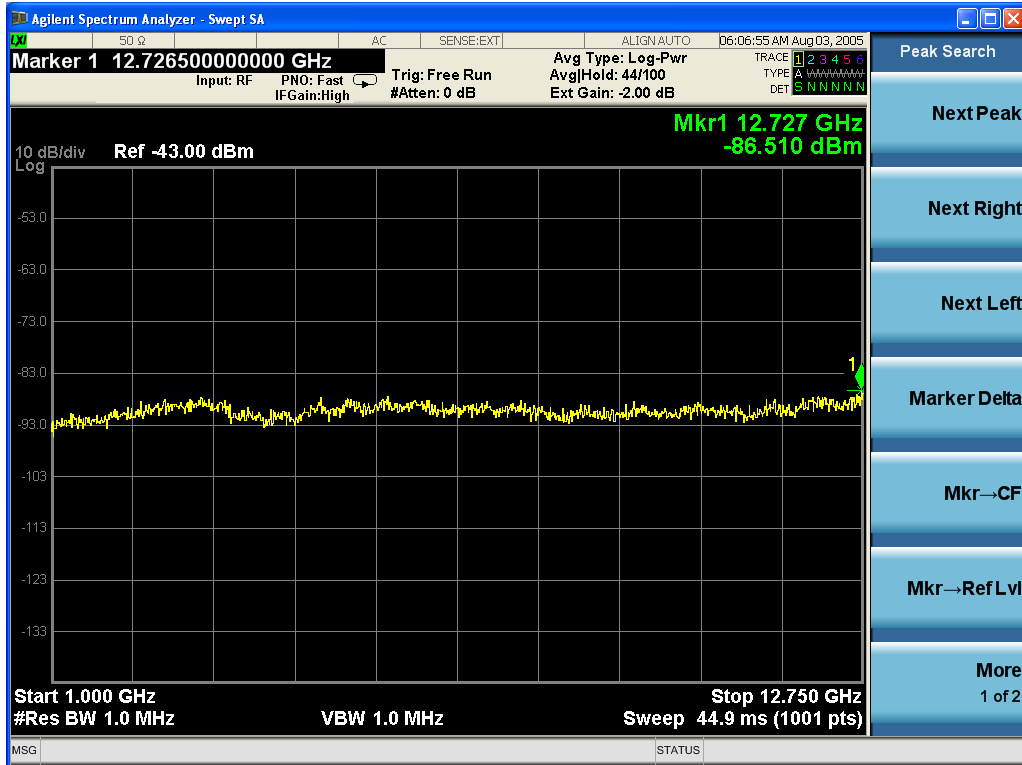




Configuration 3:



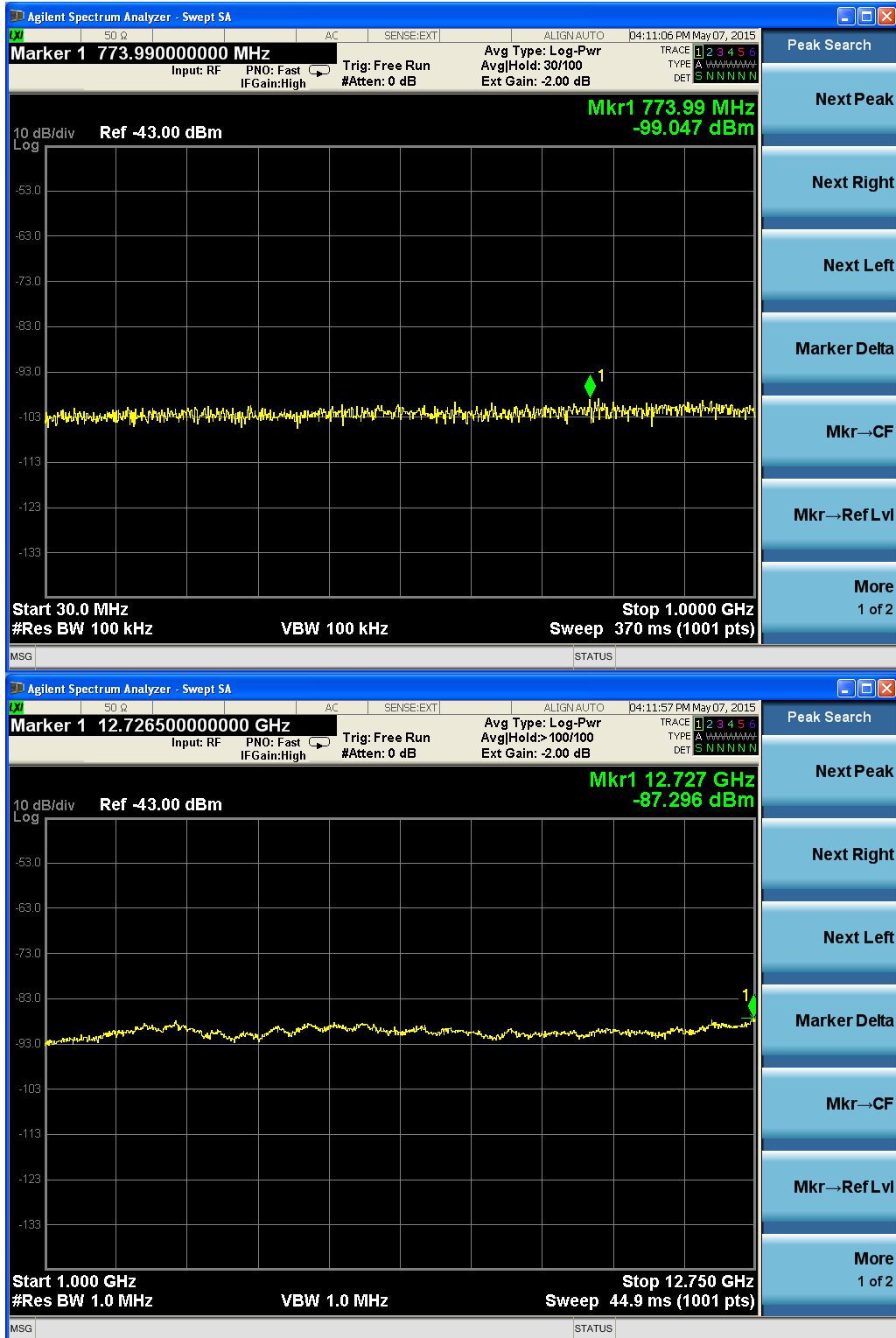




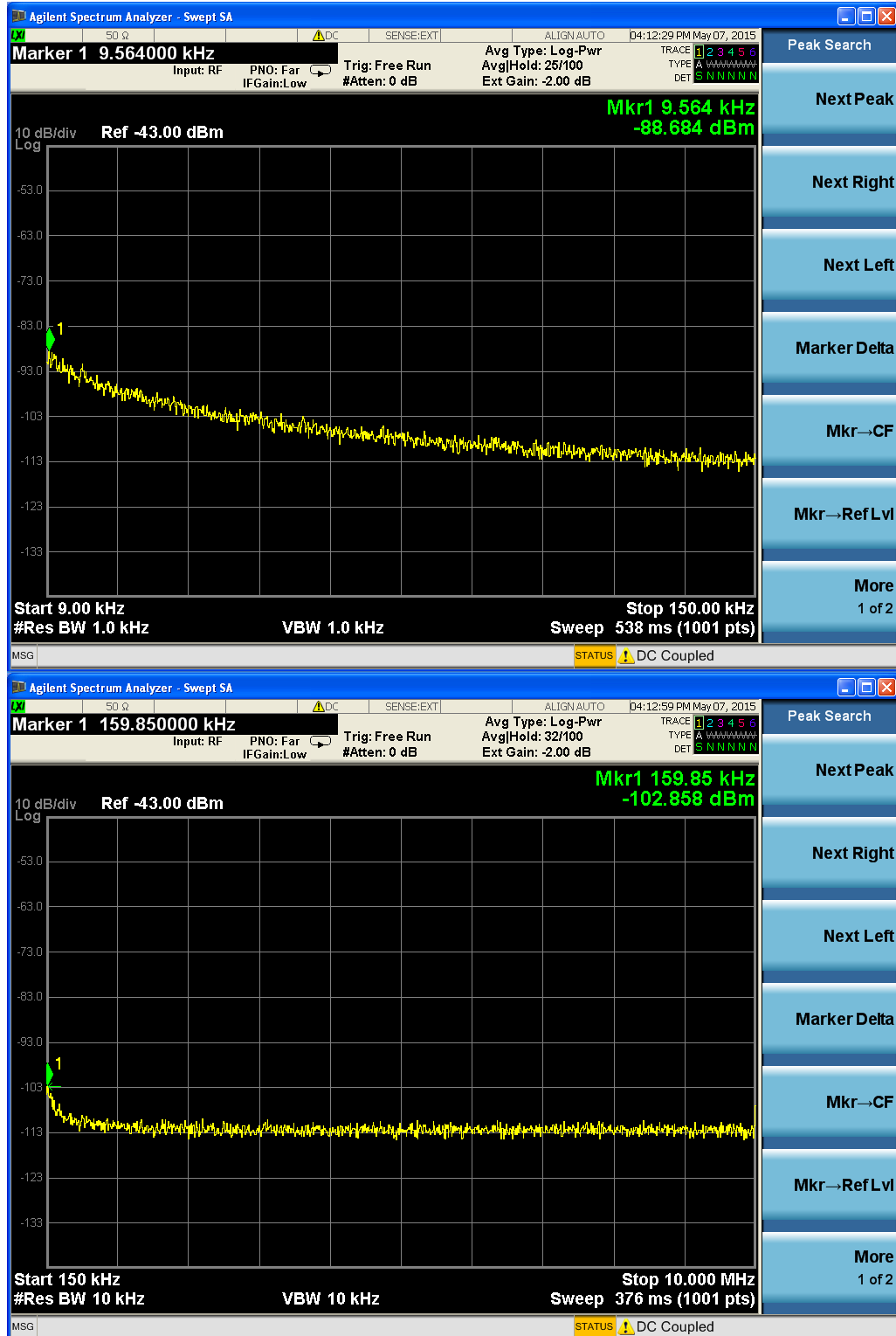
Configuration 4:

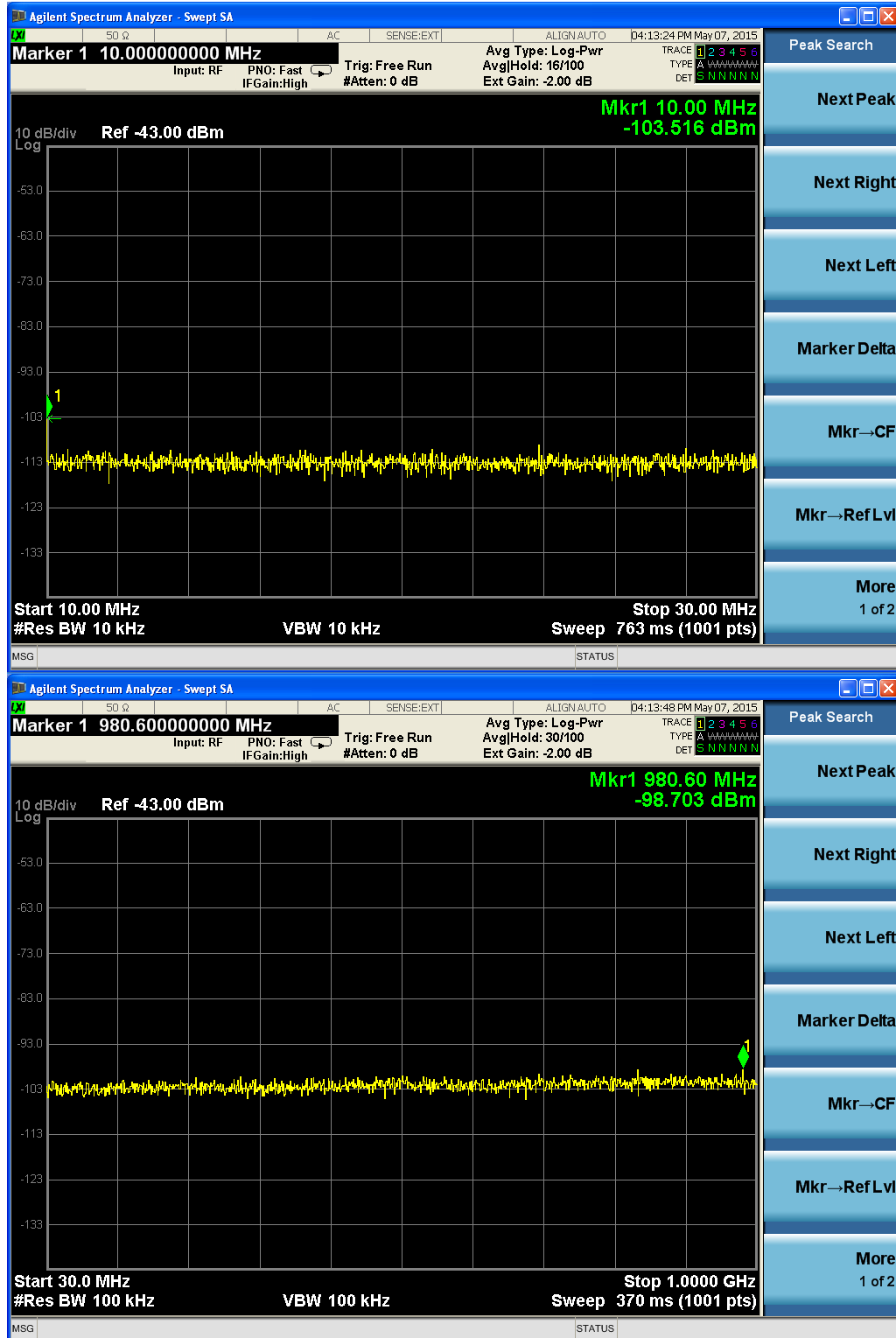


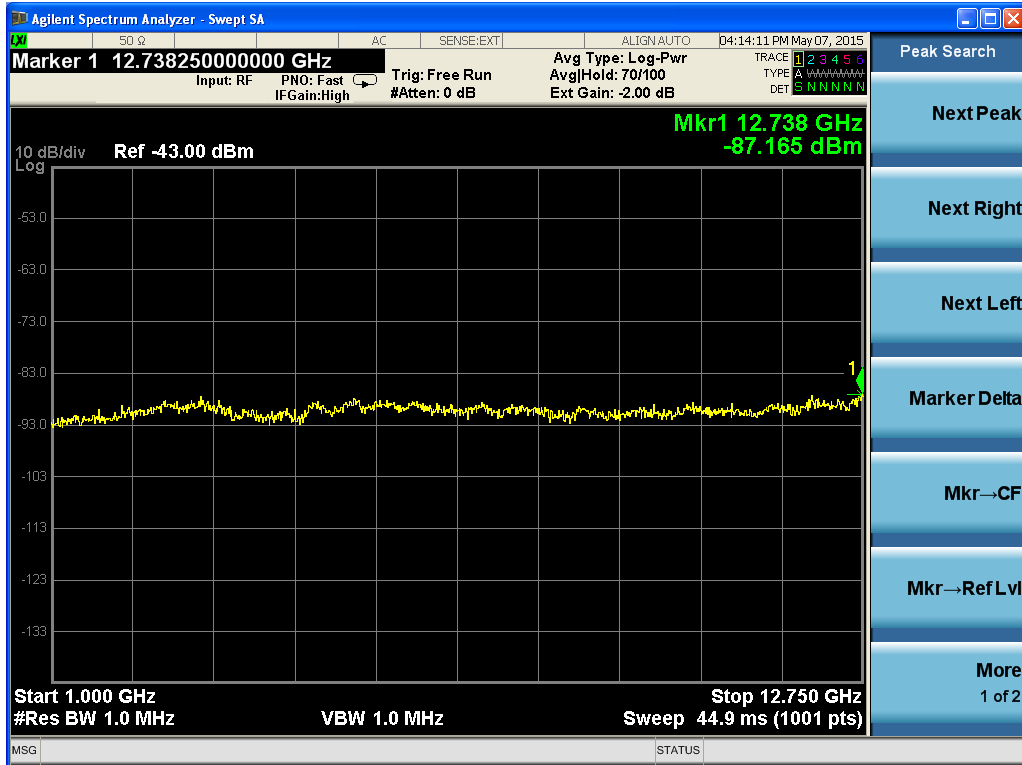




Configuration 5:







Configuration 6:

