FCC RF TEST REPORT

Report Number	:	RP20170313032_03	Date of Issue:	12 Mar 2017

FCC ID	:	Q78-R8872AS1900
Model / Serial No.	:	ZXSDR R8872A S1900
Product Type	:	Macro Remote Radio Unit
Applicant	:	ZTE Corporation
Address	:	ZTE Plaza, Keji Road South, Hi-Tech Industrial Park, Nanshan District,Shenzhen,Guangdong,P.R.China
Production Facility	:	ZTE Corporation
Address	:	ZTE Plaza, Keji Road South, Hi-Tech Industrial Park, Nanshan District,Shenzhen,Guangdong,P.R.China
Test Result	:	■ Positive ☐ Negative
Total pages including Appendices	:	62

Table of Content

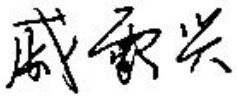
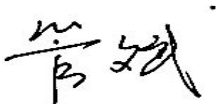
1 General Information

1.1 Notes

It is the test results from all the tests which are performed in the RF Laboratory of Shenzhen Zoom Rel Testing Technology Co., Ltd. The RF Lab was certificated by CNAS and the registration number was L0611.

Test site has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on May 10, 2016.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 373926. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

Prepared By RF Test Engineer	**2017-03-12** **Date**	**Qi Luxing** **Name**	 **Signature**
Reviewed By Laboratory Manager	**2017-03-12** **Date**	**Wu Shuzhong** **Name**	 **Signature**
Approved by EMC/RF Project Manager	**2017-03-12** **Date**	**Guan Bin** **Name**	 **Signature**

1.2 Testing Laboratory

Shenzhen Zoom Rel Testing Technology Co., Ltd.

Address: 1/F, B2 Wing, ZTE plaza, Keji Road South, Hi-Tech industrial park, Shenzhen, Guangdong, 518057

Country: China
Phone: +86 755 26770349
FAX: +86 755 26770347

1.3 Details of Manufacture

Manufacture : ZTE Corporation

ADDRESS: ZTE Plaza, Keji Road South, Hi-Tech Industrial Park, Nanshan District,Shenzhen,Guangdong,P.R.China

PRODUCT DESCRIPTION: Macro Radio Remote Unit

MANUFACTURERS MODEL/SERIAL NUMBER: ZXSDR R8872A S1900(UMTS)

FCC ID : Q78-R8872AS1900

SAMPLE NUMBER: S20170313032

1.4 Application Details

Date of receipt of order: 2017-01-04
Date of receipt of test item: 2017-01-04
Date of test: 2017-01-04~2017-03-05

1.5 Test Item

Refer to Chapter 2.

1.6 Applied Standard

APPLIED PRODUCT STANDARD	TIA/EIA 603-C:2004
TEST METHODS	FCC 47 CFR Part1 FCC 47 CFR Part2 FCC 47 CFR Part15 FCC 47 CFR Part24

2 Summary of Results

FCC RULES	DESCRIPTION OF TEST	RESULT
§ 2.1046 , §24.232	Transmitter output Power	Compliant
§ 2.1091 ,§1.1037	RF Exposure	Compliant
§ 2.1047	Modulation Characteristic	Compliant
§ 2.1053, §24.238	Spurious Radiated Emissions	Compliant
§ 2.1051, §24.238	Spurious Emissions AT Antenna Terminals	Compliant
§ 2.1049	Occupied Bandwidth	Compliant
§ 2.1051,§24.238	Band Edge	Compliant
§ 2.1055, ,§24.235	Frequency stability	Compliant

3 Equipment Specification

3.1 Technical specification

Size: 415 mm × 352 mm × 137 mm (H x W x D)
Input voltage: -48VDC
Frequency range: 1930MHz to 1990MHz
Max RF output power: 49dBm
Gain of the antenna: 15dBi,
Appearance of EUT:

fig 1. FIGURE 1 APPEARANCE OF ZXSDR R8872A S1900

4 Test Methodology

All tests and measurements indicated in this document were performed in accordance with the Code of federal Regulations Title 47 Part 2. as well as the following parts:
Part 24 Wireless Communication Services
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.

5 Test configuration

The EUT was configured for testing according to TIA/EIA-603C.
The final qualification test was performed with EUT operating at normal mode.
Equipment Modifications
ZTE Corporation has not done any modification on the EUT.

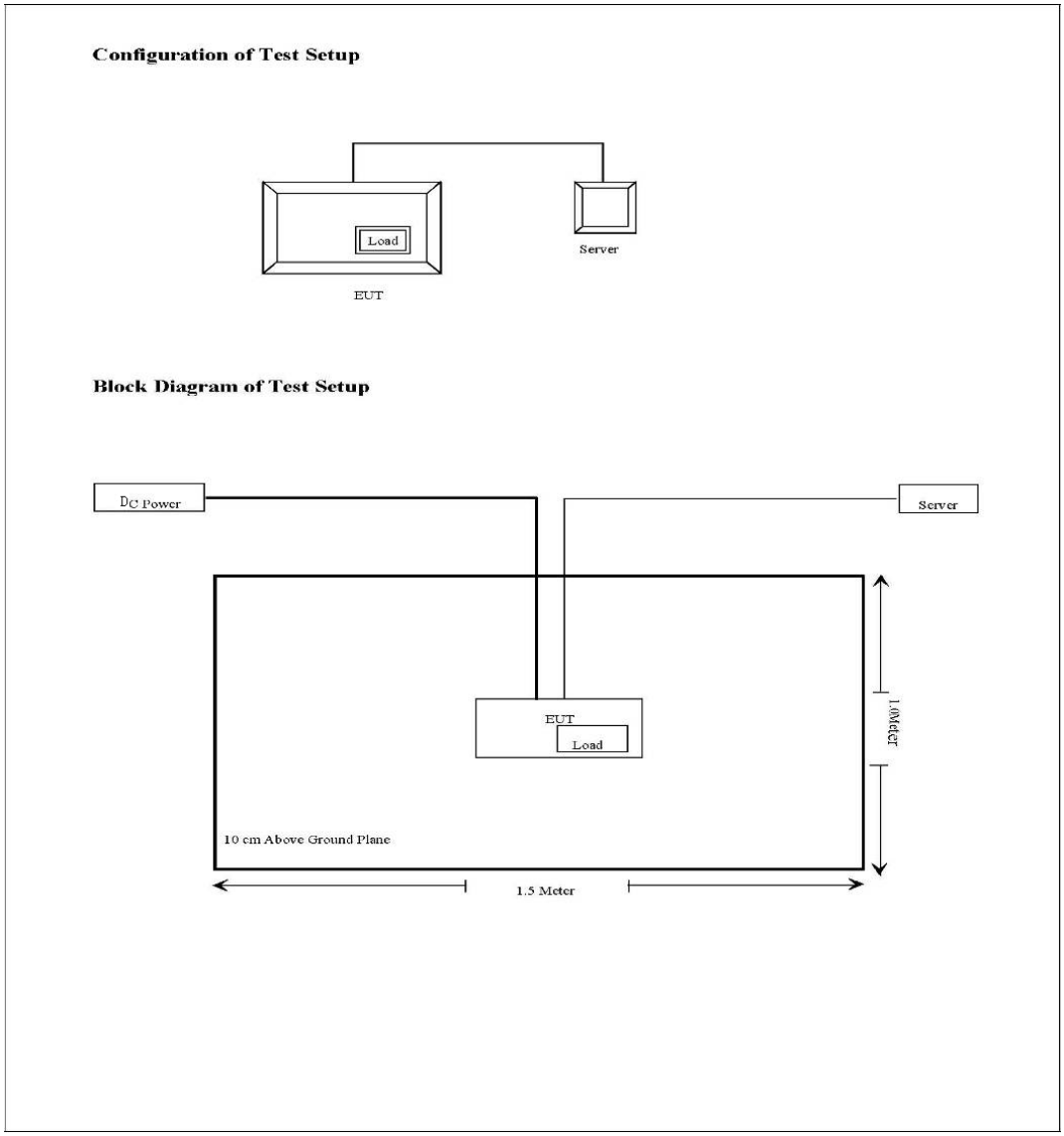


fig 2. Test configuration

6 TRANSMITTER OUTPUT POWER

6.1 Applicable Standard：FCC §2.1046 §24.232

According to FCC §2.1046 &24.232, the EIRP(equivalent isotropically radiated power) must not exceed 1640 Watts.
According to RSS-133, SRSP 510 5.1.1the EIRP(equivalent isotropically radiated power) must not exceed 3280Watts/MHz for base station transmitters operating in the band of 1930 MHz to 1995MHz with the antenna height above average terrain up to 300 meters. If used in urban area, the limit should be 1640Watts/MHz.

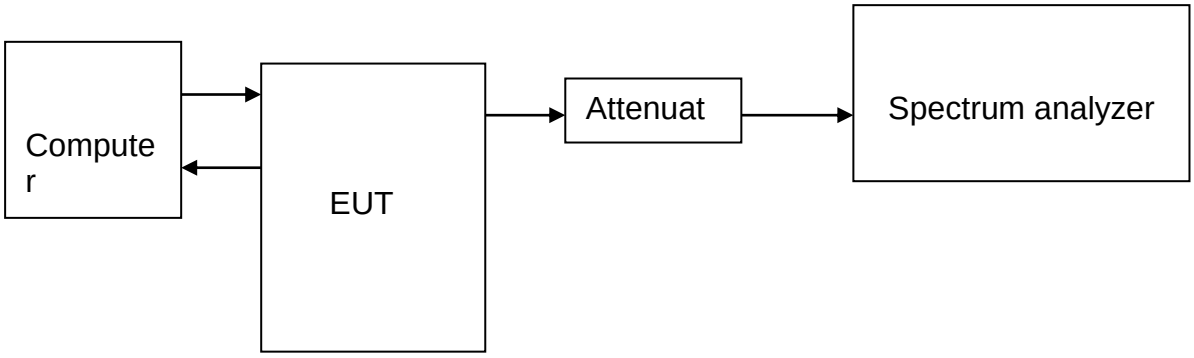
Note: EIRP= Max output Power+ Antenna gain- Cable Loss

6.2 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	MXA Series Spectrum Analyzer	N9020A	MY51160170	2016-6-22	2017-6-21
YLT	40dB Attenuator	SJ-SN-200	2009010555	N.A	N.A
Forstar	Forstar RF Cable	031-D	1034	N.A	N.A

*__statement of traceability:__ ZTE Corporation Reliability Testing Center attest that all calibration have been performed per the NVLAP requirements , traceable to NIST.

6.3 Test Procedure



The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation. External attenuation Loss is 40dB, Cable Loss is about 2.5 dB.

6.4 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	53 %
ATM Pressure:	1009 mbar

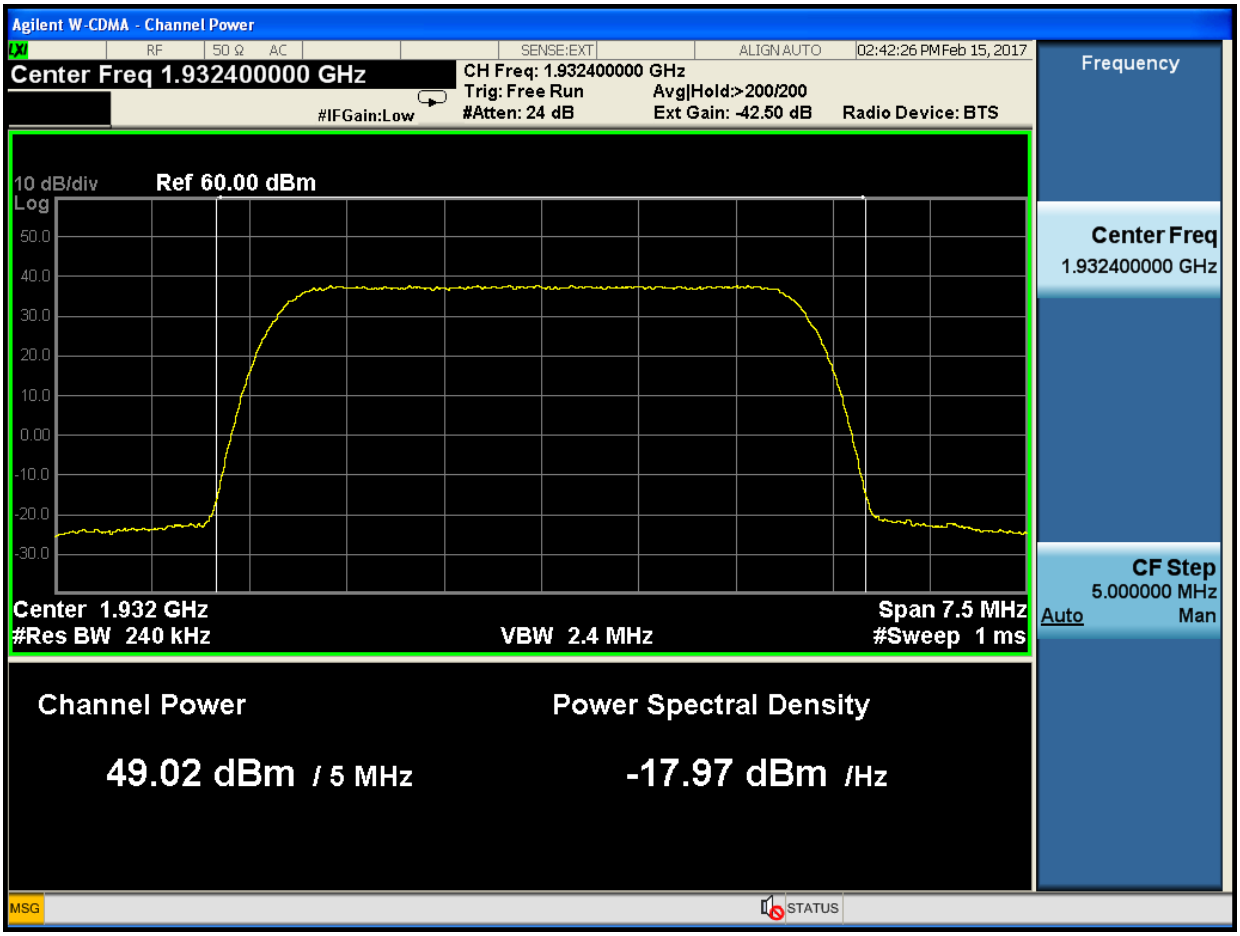
6.5 Test Result: Pass

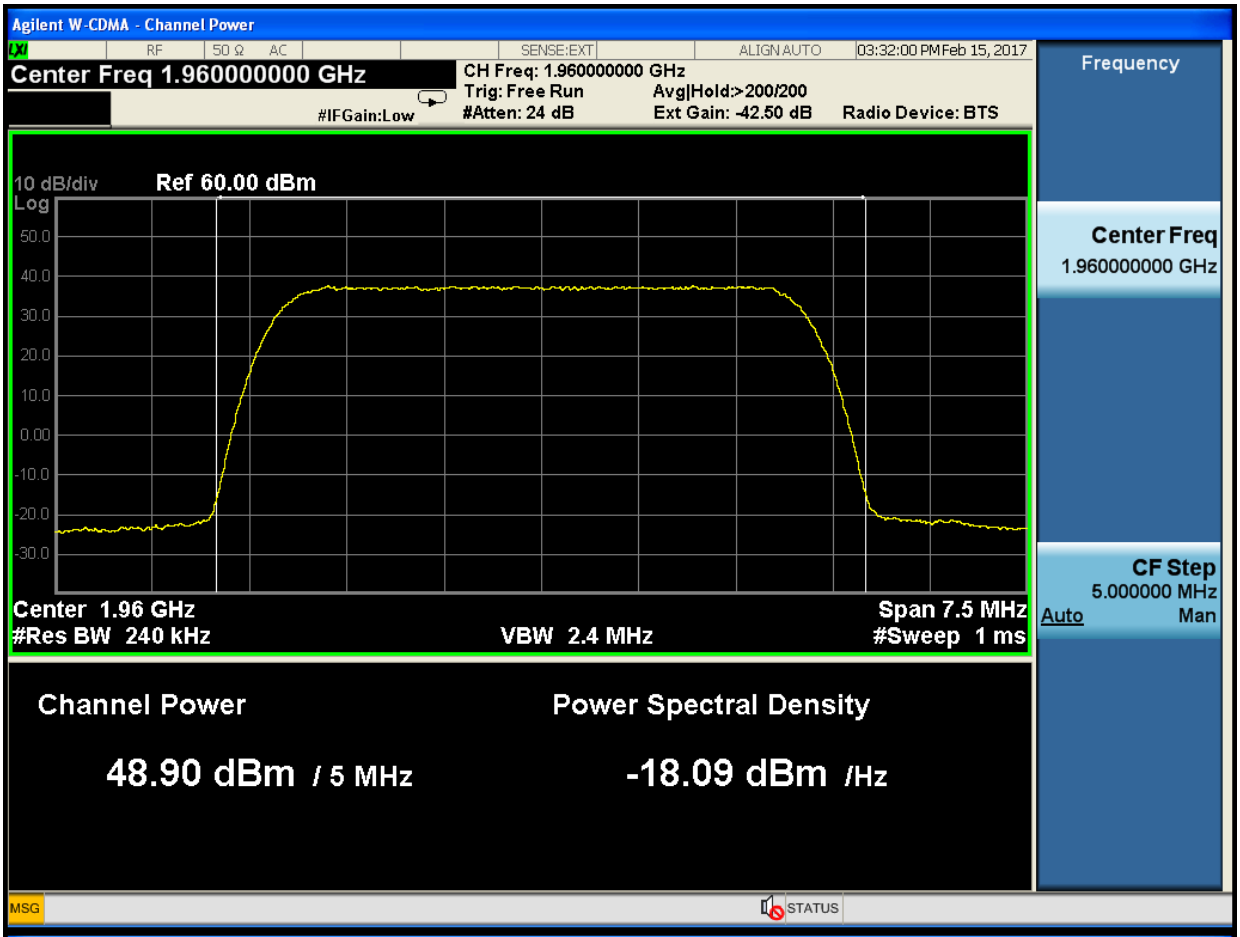
6.6 Test Mode: Transmitting UMTS

6.7 Test Data

One carrier

Center Freq. (MHz)	Frequency (MHz)	Max output Power (dBm)
1932.4	1932.4	49.02
1960	1960	48.90
1987.6	1987.6	48.86




Agilent W-CDMA - Channel Power
RF 50 Ω AC
SENSE:EXT
ALIGN AUTO
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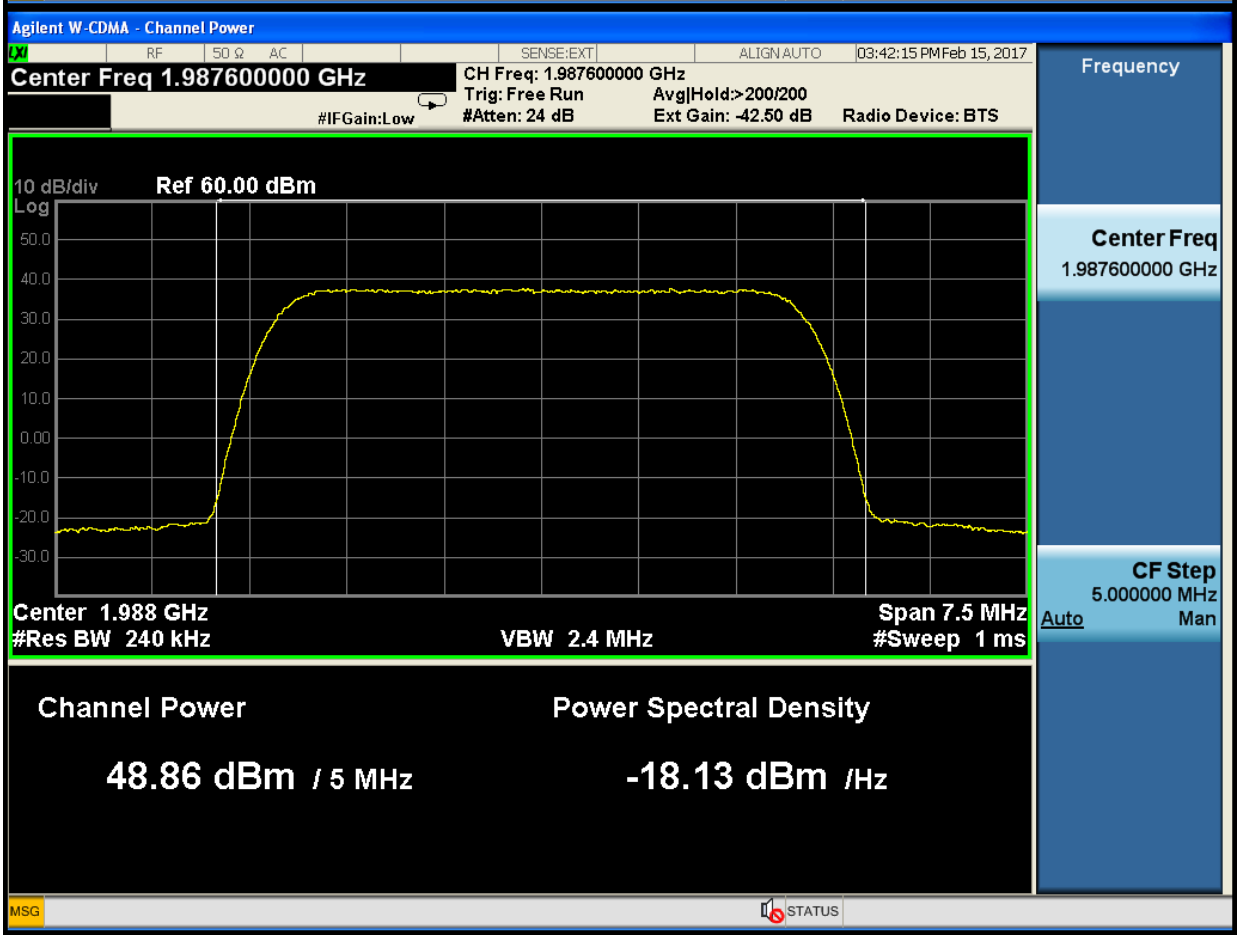
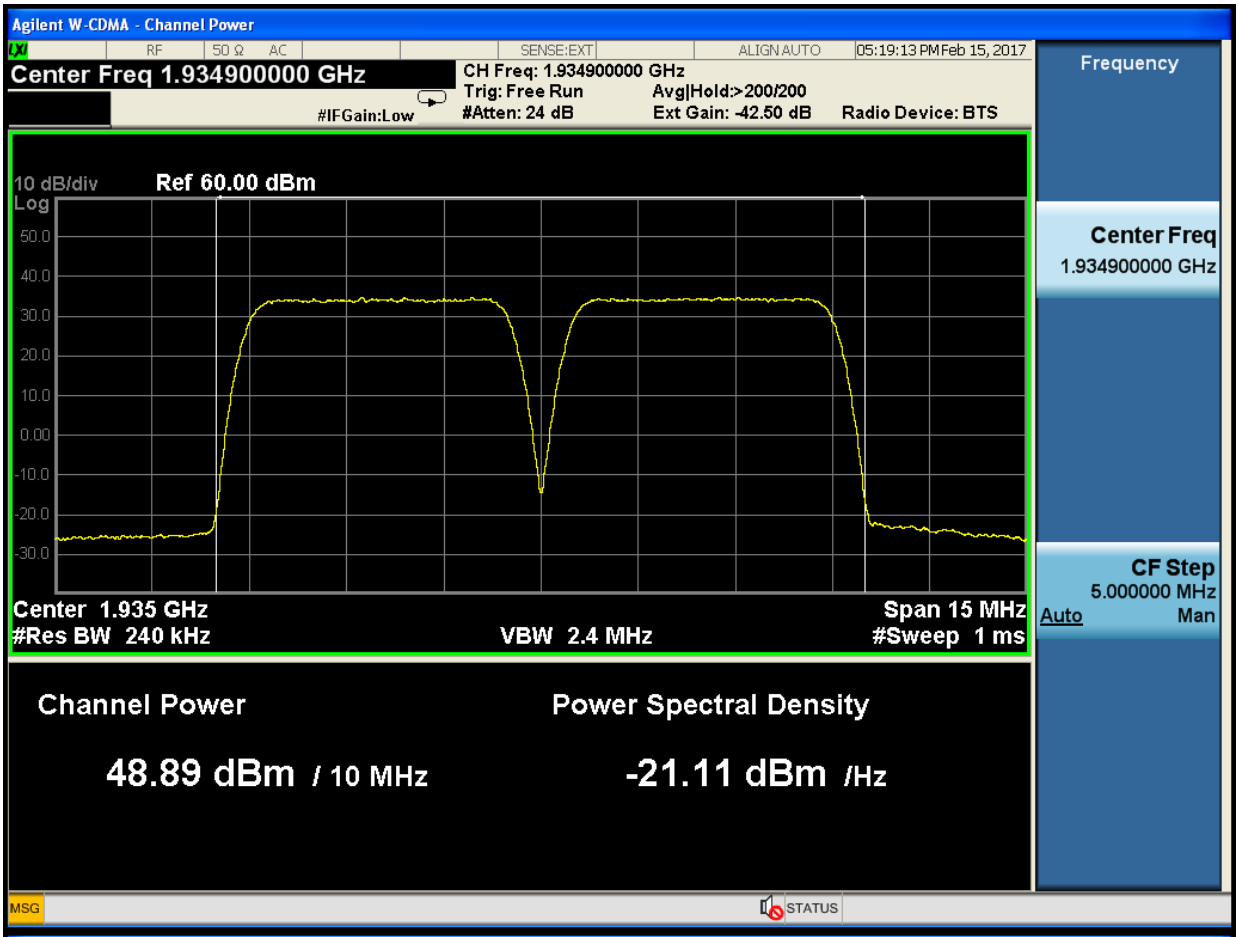
Center Freq 1.960000000 GHz
#IFGain:Low
CH Freq: 1.960000000 GHz
Trig: Free Run
Avg|Hold:>200/200
#Atten: 24 dB
Ext Gain: -42.50 dB
Radio Device: BTS
Frequency
10 dB/div
Log
Ref 60.00 dBm
50.0
40.0
30.0
20.0
10.0
0.00
-10.0
-20.0
-30.0
Center Freq
1.960000000 GHz
Center 1.96 GHz
#Res BW 240 kHz
VBW 2.4 MHz
Span 7.5 MHz
#Sweep 1 ms
CF Step
5.000000 MHz
Auto
Man
Channel Power
48.90 dBm / 5 MHz
Power Spectral Density
-18.09 dBm /Hz
MSG
STATUS


Agilent W-CDMA - Channel Power
RF 50 Ω AC
SENSE:EXT
ALIGN AUTO
03:42:15 PM Feb 15, 2017
Center Freq 1.987600000 GHz
#IFGain:Low
CH Freq: 1.987600000 GHz
Trig: Free Run
Avg|Hold:>200/200
#Atten: 24 dB
Ext Gain: -42.50 dB
Radio Device: BTS
Frequency
10 dB/div
Log
Ref 60.00 dBm
50.0
40.0
30.0
20.0
10.0
0.00
-10.0
-20.0
-30.0
Center Freq
1.987600000 GHz
Center 1.988 GHz
#Res BW 240 kHz
VBW 2.4 MHz
Span 7.5 MHz
#Sweep 1 ms
CF Step
5.000000 MHz
Auto
Man
Channel Power
48.86 dBm / 5 MHz
Power Spectral Density
-18.13 dBm /Hz
MSG
STATUS

Two carriers

Center Freq. (MHz)	Frequency (MHz)	Max output Power (dBm)
1934.9	1932.4/1937.4	48.89
1959.9	1957.4/1962.4	49.00
1985.1	1982.6/1987.6	48.84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RF 50 Ω AC
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ALIGN AUTO
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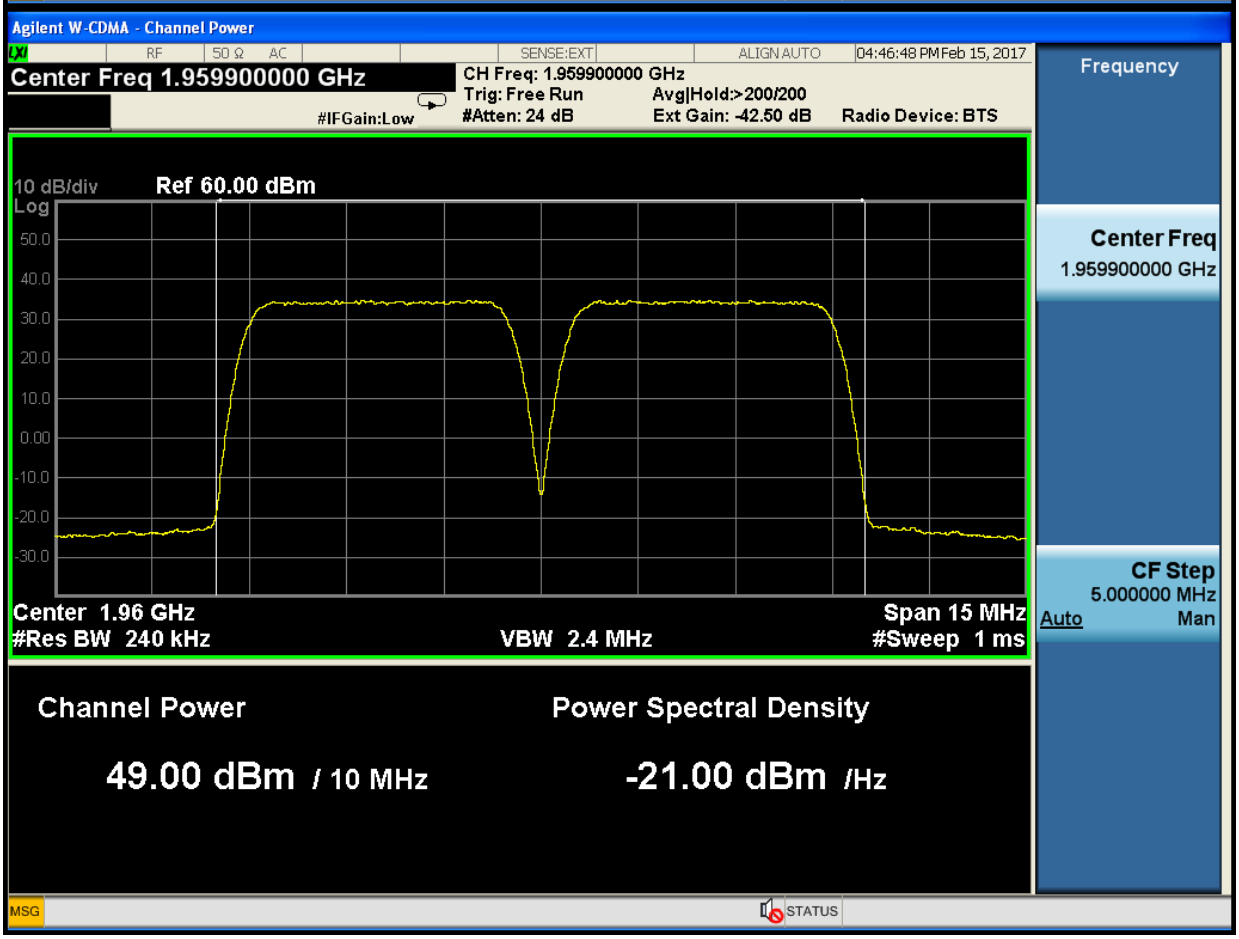
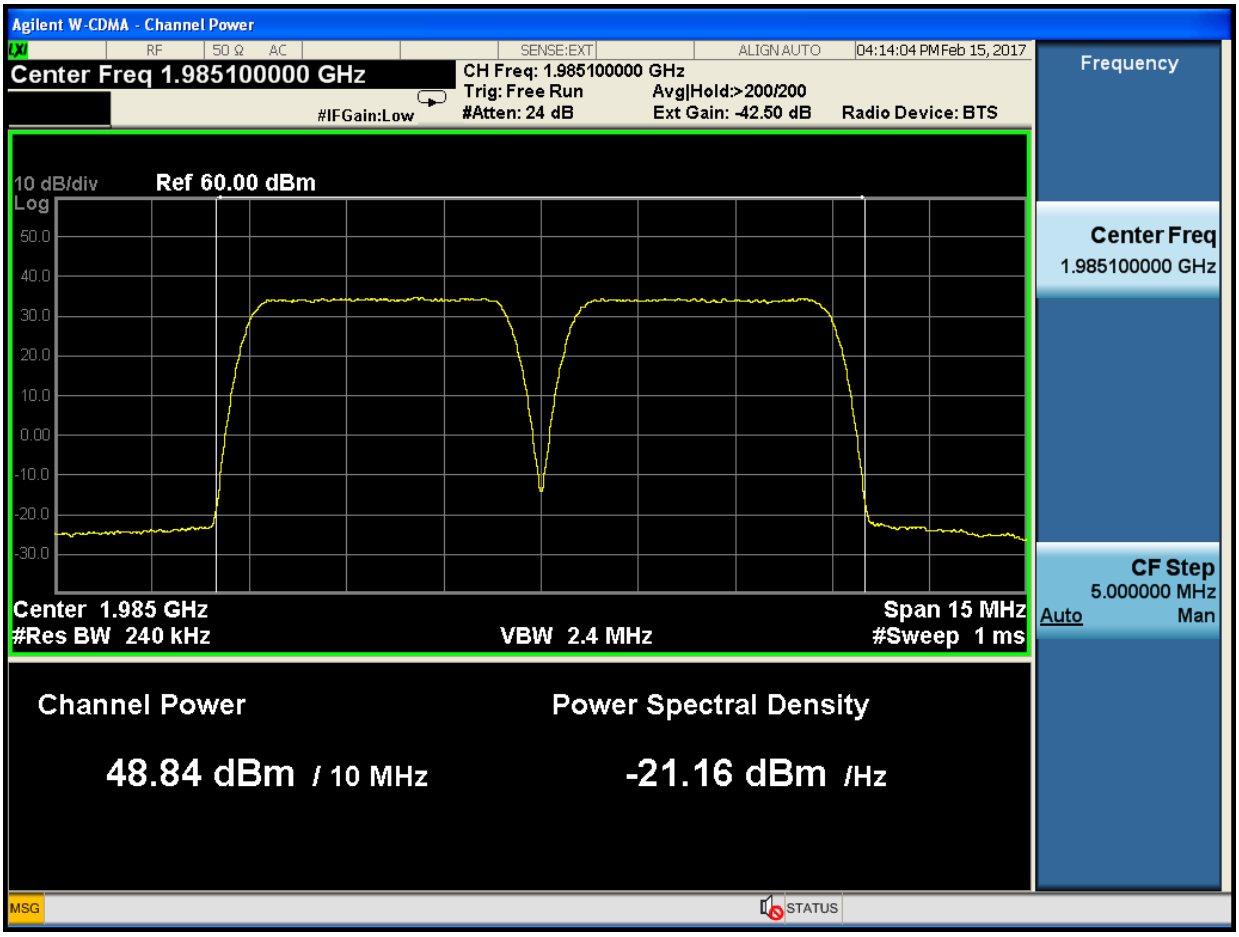
Center Freq 1.934900000 GHz
#IFGain:Low
CH Freq: 1.934900000 GHz
Trig: Free Run
Avg|Hold:>200/200
#Atten: 24 dB
Ext Gain: -42.50 dB
Radio Device: BTS
Frequency
10 dB/div
Log
Ref 60.00 dBm
50.0
40.0
30.0
20.0
10.0
0.00
-10.0
-20.0
-30.0
Center Freq
1.934900000 GHz
Center 1.935 GHz
#Res BW 240 kHz
VBW 2.4 MHz
Span 15 MHz
#Sweep 1 ms
CF Step
5.000000 MHz
Auto
Man
Channel Power
48.89 dBm / 10 MHz
Power Spectral Density
-21.11 dBm /Hz
MSG
STATUS


Agilent W-CDMA - Channel Power
RF 50 Ω AC
SENSE:EXT
ALIGN AUTO
04:46:48 PM Feb 15, 2017
Center Freq 1.959900000 GHz
#IFGain:Low
CH Freq: 1.959900000 GHz
Trig: Free Run
Avg|Hold:>200/200
#Atten: 24 dB
Ext Gain: -42.50 dB
Radio Device: BTS
Frequency
10 dB/div
Log
Ref 60.00 dBm
50.0
40.0
30.0
20.0
10.0
0.00
-10.0
-20.0
-30.0
Center Freq
1.959900000 GHz
Center 1.96 GHz
#Res BW 240 kHz
VBW 2.4 MHz
Span 15 MHz
#Sweep 1 ms
CF Step
5.000000 MHz
Auto
Man
Channel Power
49.00 dBm / 10 MHz
Power Spectral Density
-21.00 dBm /Hz
MSG
STATUS


Agilent W-CDMA - Channel Power
RF
50 Ω AC
SENSE:EXT
ALIGN AUTO
04:14:04 PM Feb 15, 2017
Center Freq 1.985100000 GHz
CH Freq: 1.985100000 GHz
Trig: Free Run
Avg|Hold:>200/200
#IFGain:Low
#Atten: 24 dB
Ext Gain: -42.50 dB
Radio Device: BTS
10 dB/div
Ref 60.00 dBm
Log
50.0
40.0
30.0
20.0
10.0
0.00
-10.0
-20.0
-30.0
Center 1.985 GHz
#Res BW 240 kHz
VBW 2.4 MHz
Span 15 MHz
#Sweep 1 ms
Channel Power
48.84 dBm / 10 MHz
Power Spectral Density
-21.16 dBm /Hz
MSG
STATUS
Frequency
Center Freq
1.985100000 GHz
CF Step
5.000000 MHz
Auto
Man

7 RF EXPOSURE

7.1 Applicable standard: FCC §2.1091 and §1.1310

7.2 Limit

According to §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

According to §1.1310 and §2.1091 RF exposure is calculated. Limits for Maximum Permissible Exposure (MPE)

(B) Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $\|E\|^2$, $\|H\|^2$ or S (minutes)
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
300-1500	--	--	f/1500	30
1500-100,000	--	--	1.0	30

7.3 Test Data

Predication of MPE limit at a given distance
Equation from page 18 of OET Bulletin 65, Edition 97-01
$S = EIRP/ 4\pi R^2$
Where: S = power density
EIRP = equivalent isotropically radiated power=ERP+2.15dB
R = distance to the center of radiation of the antenna=$[(ERP+2.15\ dB)/ 4\pi S]^{1/2}$

Maximum EIRP, In general, the equivalent isotropically radiated power (EIRP) of base transmitters and cellular repeaters must not exceed 1640 Watts.
Frequency is between 1500MHz and 100,000MHz, and the Maximum S=1.0mW/cm^2, so R=3.61m. This equipment should be installed and operated with minimum distance 3.61m between the radiator& your body.

7.4 Test Result: pass

8 MODULATION CHARACTERISTIC

8.1 Applicable Standard: FCC §2.1047

8.2 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	MXA Series Spectrum Analyzer	N9020A	MY51160170	2016-6-22	2017-6-21
YLT	40dB Attenuator	SJ-SN-200	2009010555	N.A	N.A
Forstar	Forstar RF Cable	031-D	1034	N.A	N.A

*__statement of traceability:__ ZTE Corporation Reliability Testing Center attest that all calibration have been performed per the NVLAP requirements , traceable to NIST.

8.3 Test Procedure

UMTS digital mode is used by EUT.

8.4 Test Data Environmental Conditions

Temperature:	25 °C
Relative Humidity:	53 %
ATM Pressure:	1009 mbar

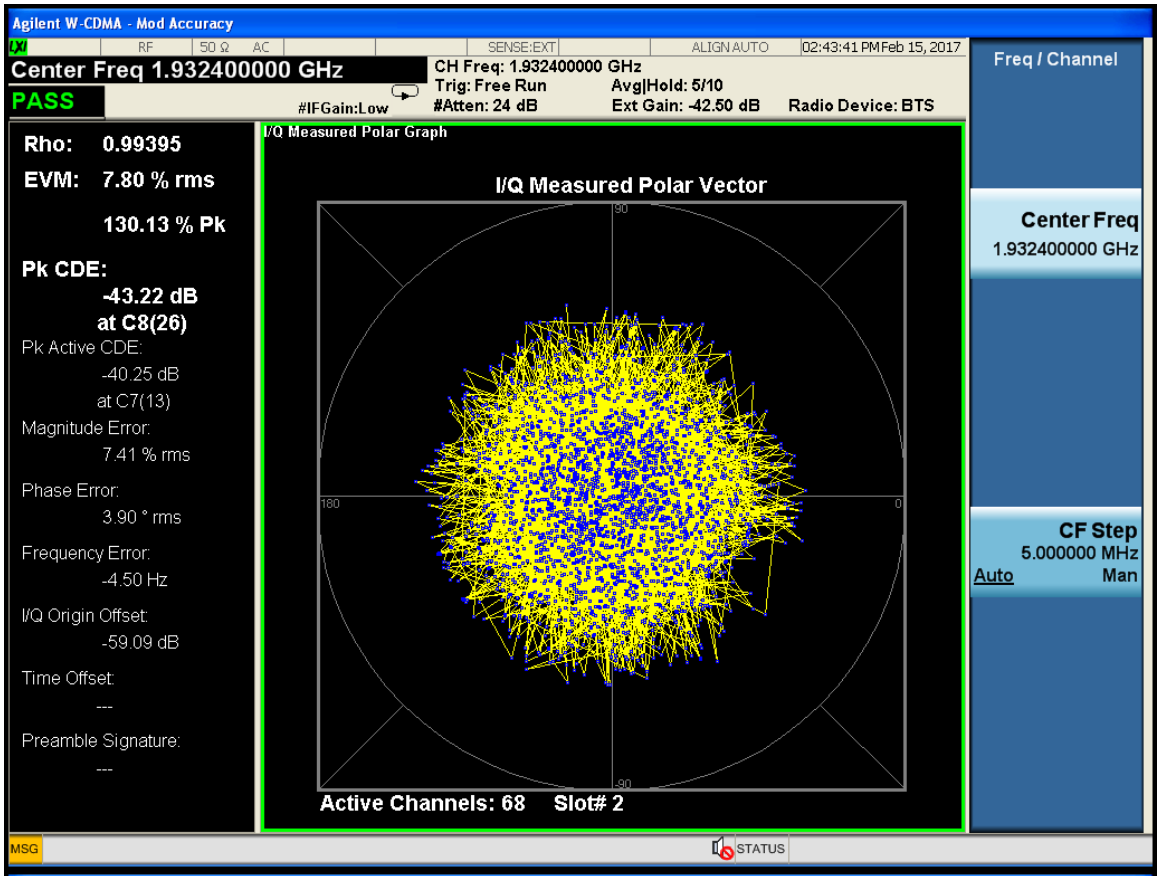
8.5 Test Result: Pass

8.6 Test Mode: Transmitting UMTS

8.7 Test Data

One carrier

Frequency (MHz)	EVM(%rms)
1932.4	7.8
1960	9.0
1987.6	9.17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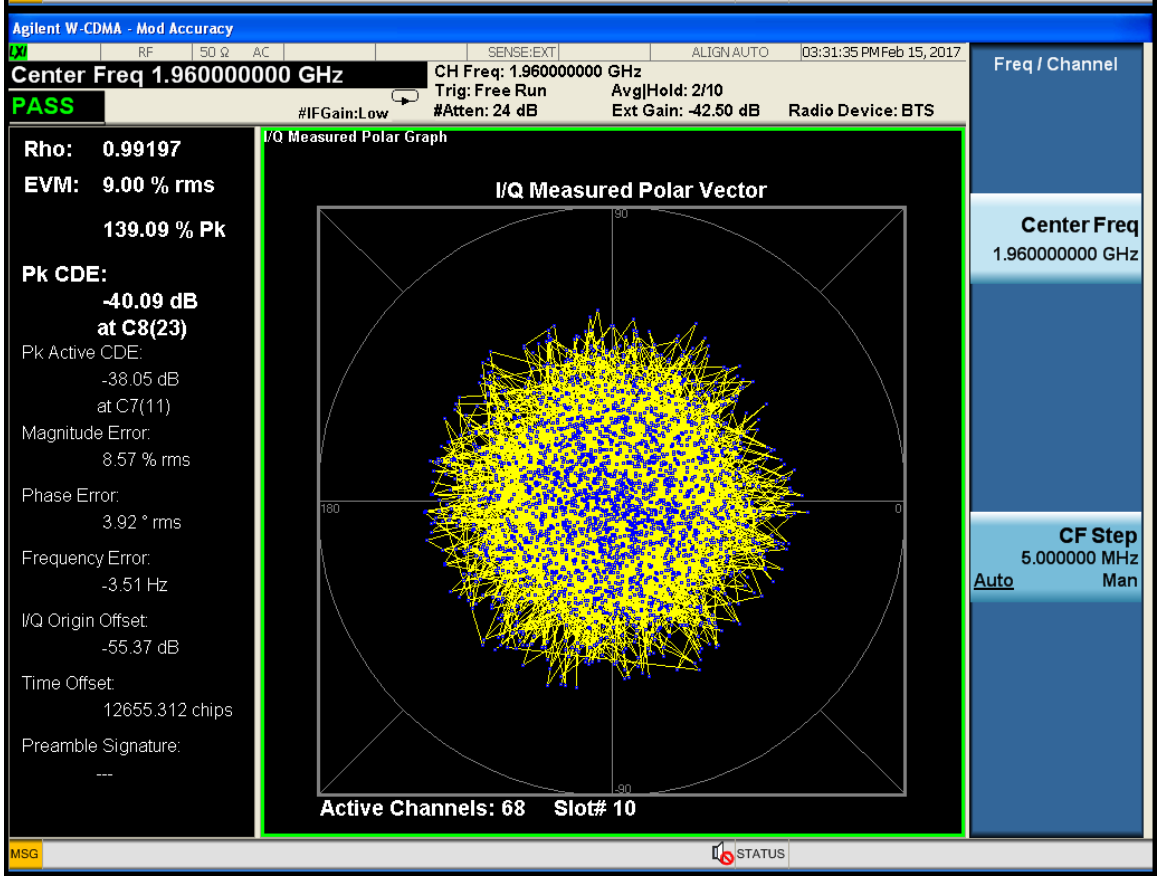
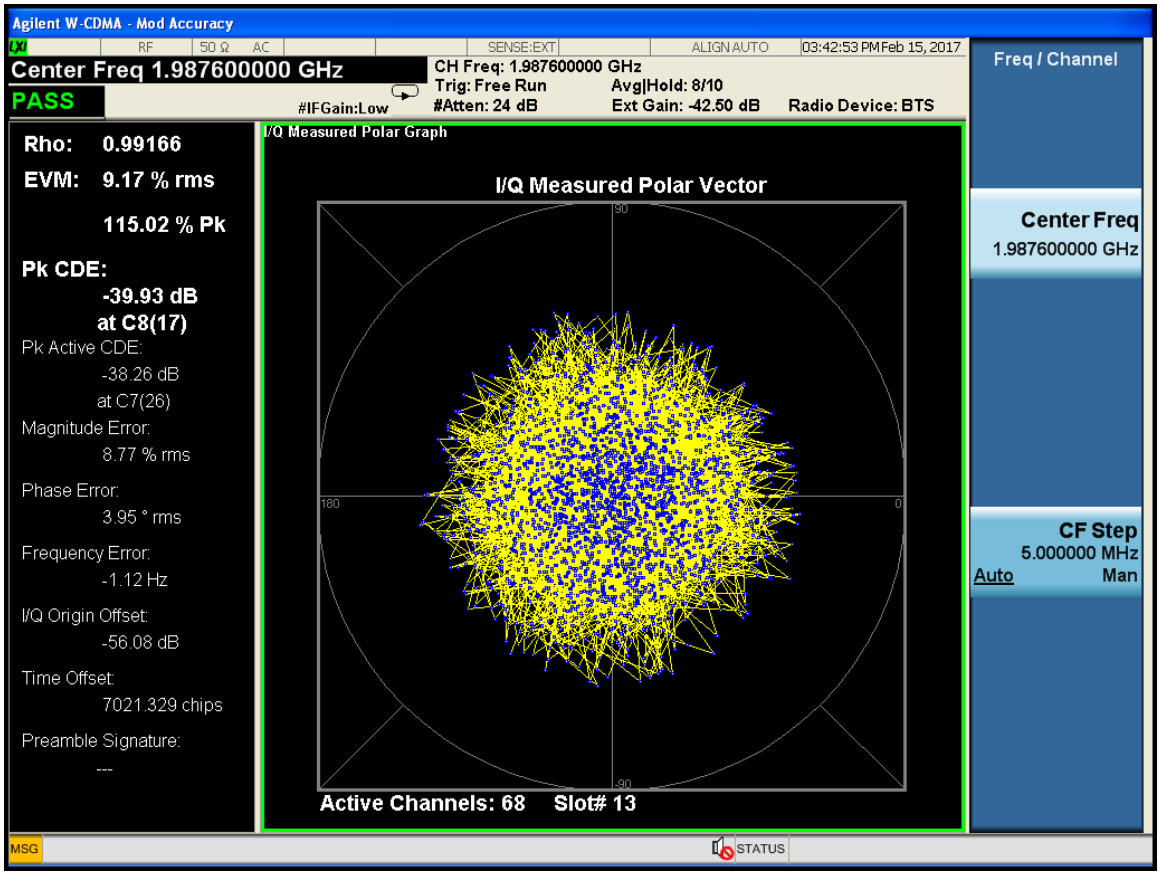
RF 50 Ω AC
SENSE:EXT
ALIGN AUTO
02:43:41 PM Feb 15, 2017
Center Freq 1.932400000 GHz
PASS
#IFGain:Low
CH Freq: 1.932400000 GHz
Trig: Free Run
Avg|Hold: 5/10
#Atten: 24 dB
Ext Gain: -42.50 dB
Radio Device: BTS
Freq / Channel
Rho: 0.99395
EVM: 7.80 % rms
130.13 % Pk
Pk CDE:
-43.22 dB
at C8(26)
Pk Active CDE:
-40.25 dB
at C7(13)
Magnitude Error:
7.41 % rms
Phase Error:
3.90 ° rms
Frequency Error:
-4.50 Hz
I/Q Origin Offset:
-59.09 dB
Time Offset:

Preamble Signature:

I/Q Measured Polar Graph
I/Q Measured Polar Vector
90
180
0
-90
Active Channels: 68 Slot# 2
Center Freq
1.932400000 GHz
CF Step
5.000000 MHz
Auto Man
MSG
STATUS

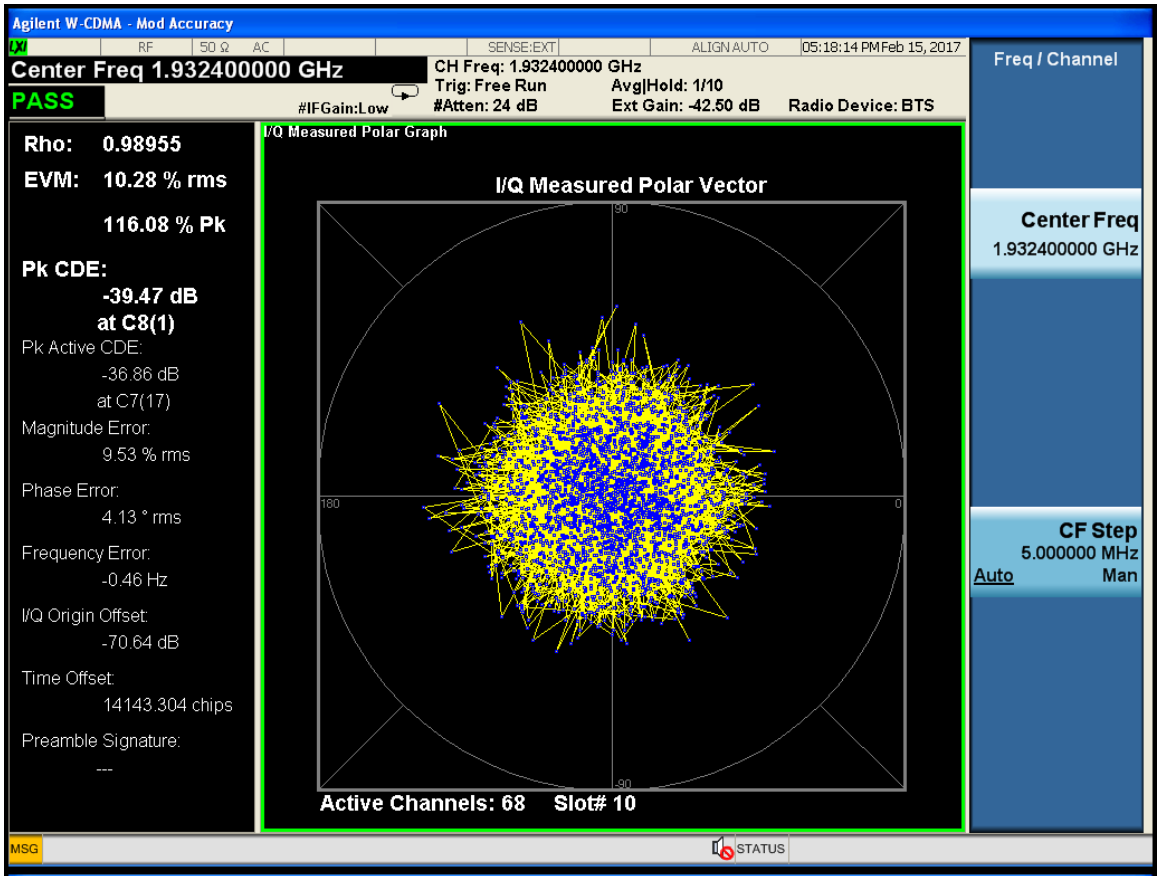

Agilent W-CDMA - Mod Accuracy
RF 50 Ω AC
SENSE:EXT
ALIGN AUTO
03:31:35 PM Feb 15, 2017
Center Freq 1.960000000 GHz
PASS
#IFGain:Low
CH Freq: 1.960000000 GHz
Trig: Free Run
Avg|Hold: 2/10
#Atten: 24 dB
Ext Gain: -42.50 dB
Radio Device: BTS
Freq / Channel
Rho: 0.99197
EVM: 9.00 % rms
139.09 % Pk
Pk CDE:
-40.09 dB
at C8(23)
Pk Active CDE:
-38.05 dB
at C7(11)
Magnitude Error:
8.57 % rms
Phase Error:
3.92 ° rms
Frequency Error:
-3.51 Hz
I/Q Origin Offset:
-55.37 dB
Time Offset:
12655.312 chips
Preamble Signature:

I/Q Measured Polar Graph
I/Q Measured Polar Vector
90
180
0
-90
Active Channels: 68 Slot# 10
Center Freq
1.960000000 GHz
CF Step
5.000000 MHz
Auto Man
MSG
STATUS



Two carriers

Center Frequency (MHz)	Frequency (MHz)	EVM(%rms)
1934.9	1932.4	10.28
	1937.4	8.9
1959.9	1957.4	10.49
	1962.4	9.29
1985.1	1982.6	9.8
	1987.6	9.6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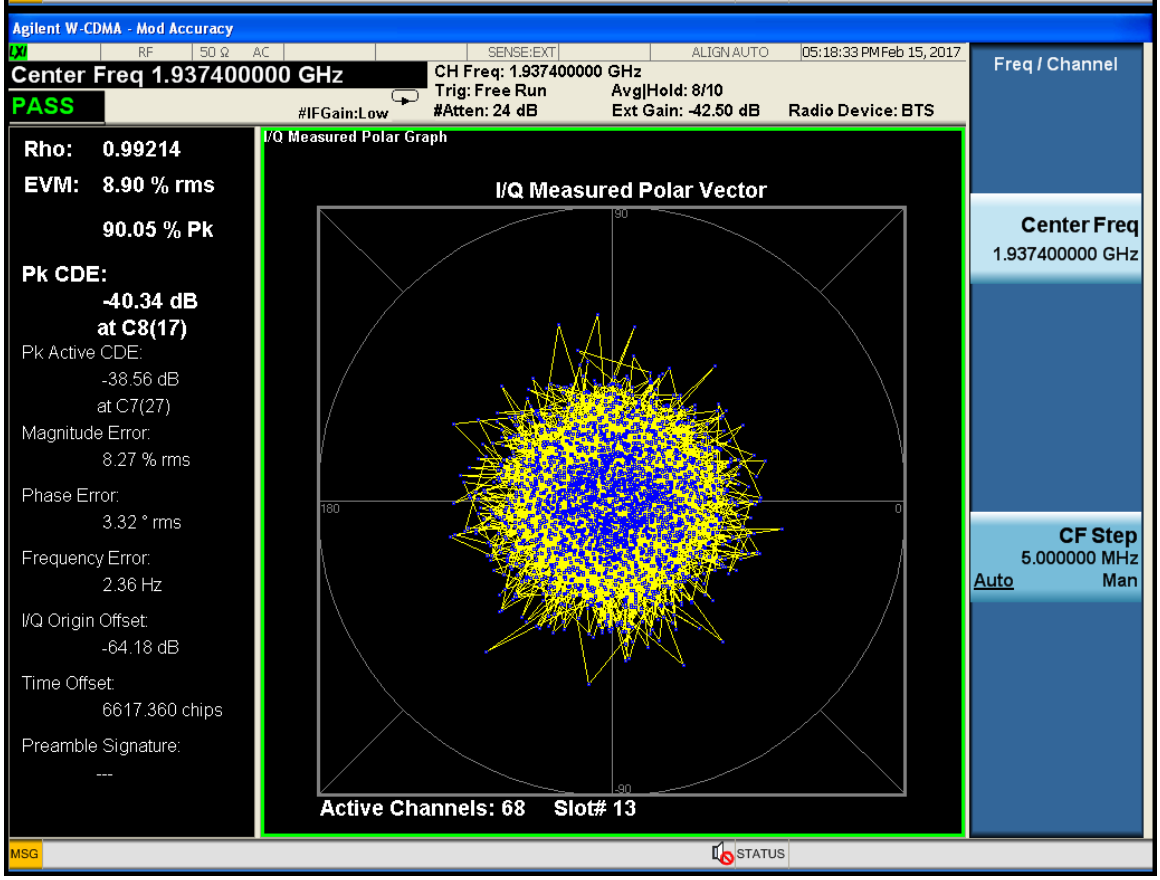
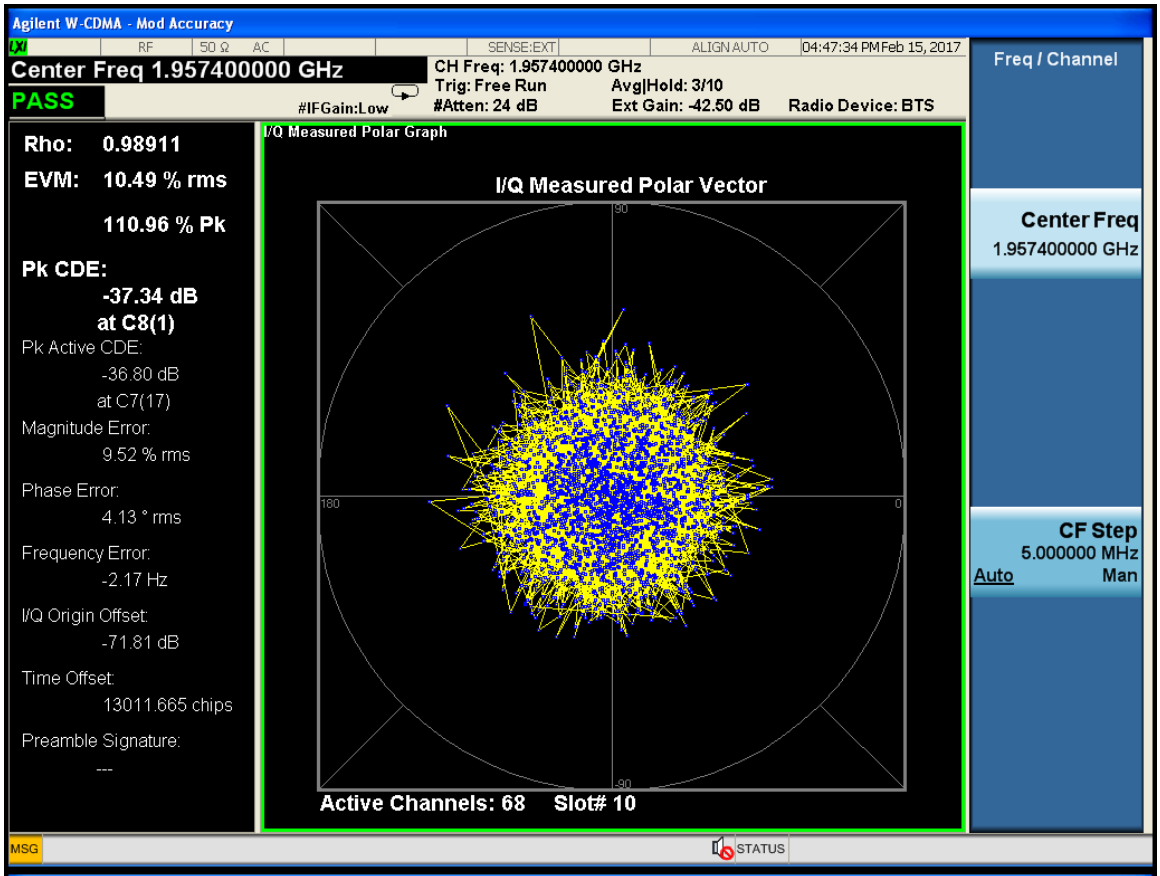
RF 50 Ω AC
SENSE:EXT
ALIGN AUTO
05:18:14 PM Feb 15, 2017
Center Freq 1.932400000 GHz
PASS
#IFGain:Low
CH Freq: 1.932400000 GHz
Trig: Free Run
Avg|Hold: 1/10
#Atten: 24 dB
Ext Gain: -42.50 dB
Radio Device: BTS
Freq / Channel
Rho: 0.98955
EVM: 10.28 % rms
116.08 % Pk
Pk CDE:
-39.47 dB
at C8(1)
Pk Active CDE:
-36.86 dB
at C7(17)
Magnitude Error:
9.53 % rms
Phase Error:
4.13 ° rms
Frequency Error:
-0.46 Hz
I/Q Origin Offset:
-70.64 dB
Time Offset:
14143.304 chips
Preamble Signature:

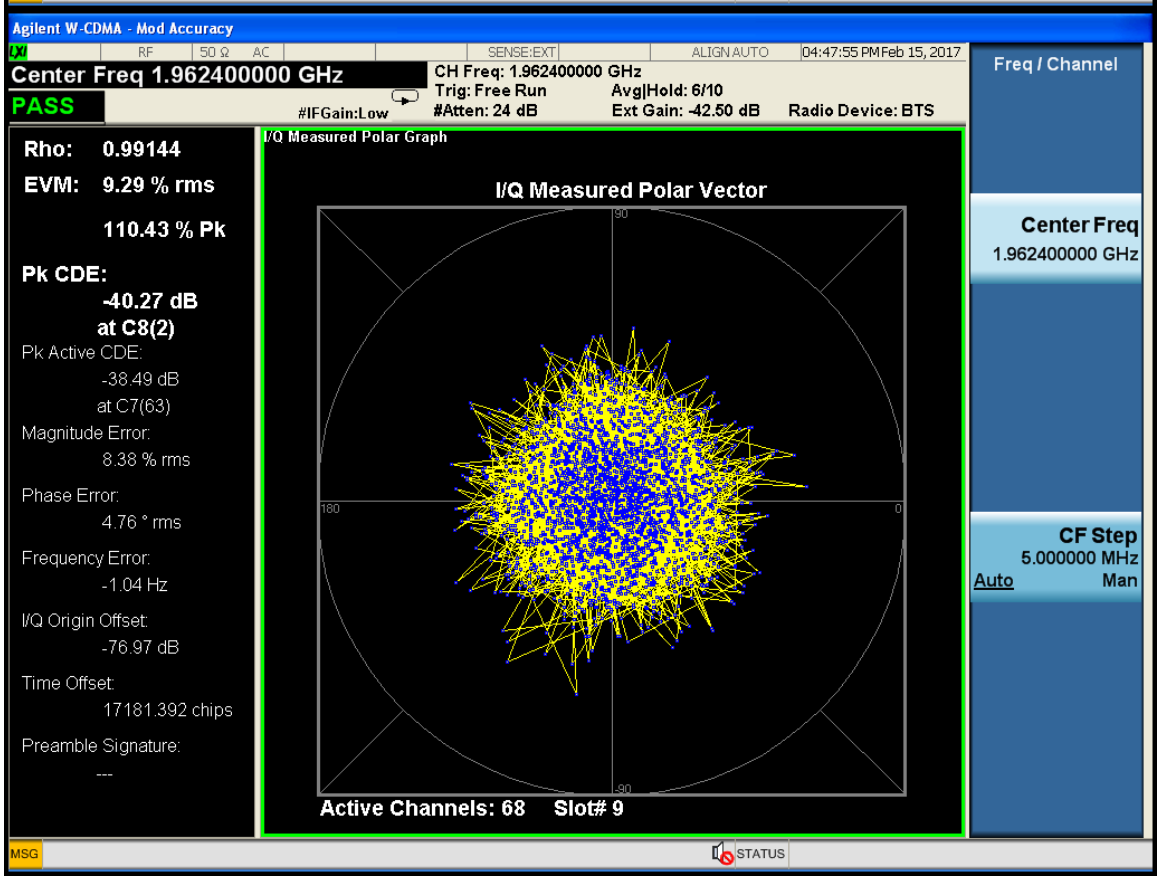
I/Q Measured Polar Graph
I/Q Measured Polar Vector
90
180
0
-90
Active Channels: 68 Slot# 10
Center Freq
1.932400000 GHz
CF Step
5.000000 MHz
Auto
Man
MSG
STATUS


Agilent W-CDMA - Mod Accuracy
RF 50 Ω AC
SENSE:EXT
ALIGN AUTO
05:18:33 PM Feb 15, 2017
Center Freq 1.937400000 GHz
PASS
#IFGain:Low
CH Freq: 1.937400000 GHz
Trig: Free Run
Avg|Hold: 8/10
#Atten: 24 dB
Ext Gain: -42.50 dB
Radio Device: BTS
Freq / Channel
Rho: 0.99214
EVM: 8.90 % rms
90.05 % Pk
Pk CDE:
-40.34 dB
at C8(17)
Pk Active CDE:
-38.56 dB
at C7(27)
Magnitude Error:
8.27 % rms
Phase Error:
3.32 ° rms
Frequency Error:
2.36 Hz
I/Q Origin Offset:
-64.18 dB
Time Offset:
6617.360 chips
Preamble Signature:

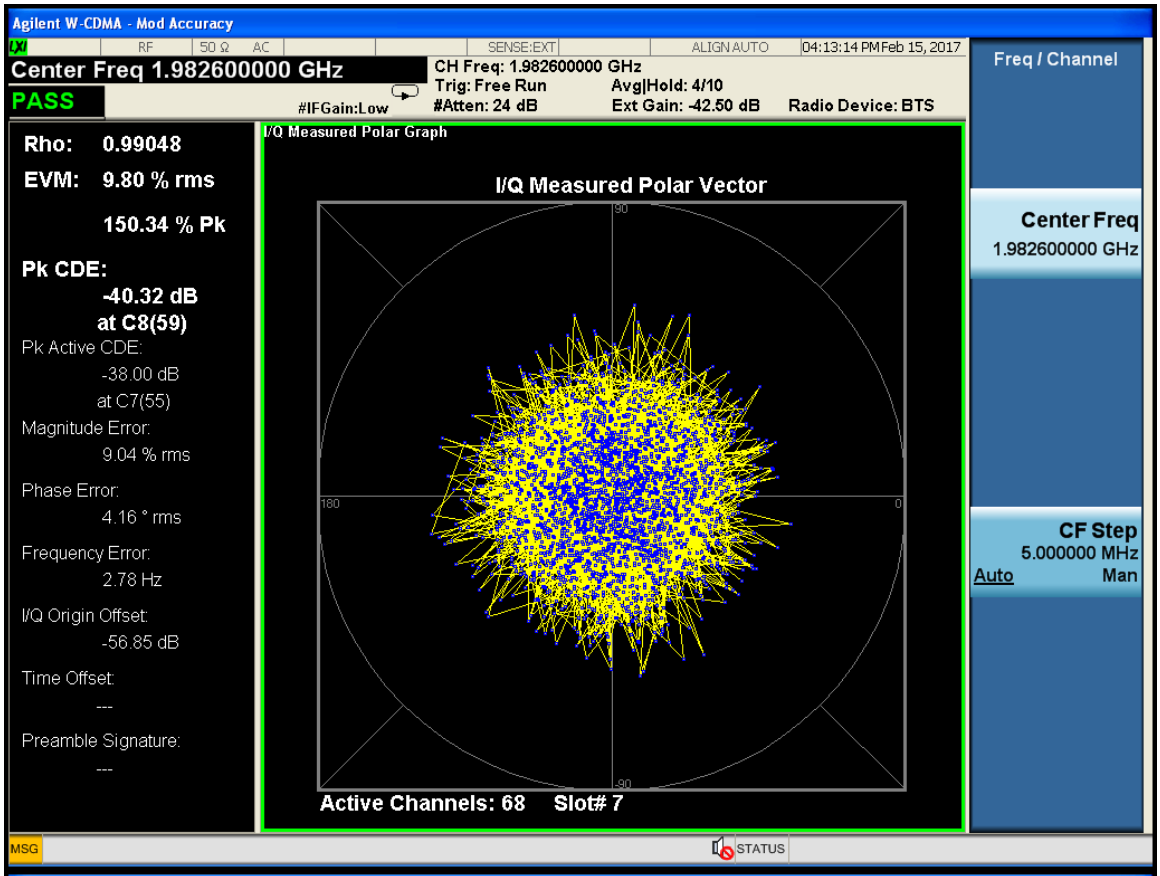
I/Q Measured Polar Graph
I/Q Measured Polar Vector
90
180
0
-90
Active Channels: 68 Slot# 13
Center Freq
1.937400000 GHz
CF Step
5.000000 MHz
Auto
Man
MSG
STATUS


Agilent W-CDMA - Mod Accuracy
RF 50 Ω AC
SENSE:EXT
ALIGN AUTO
04:47:34 PM Feb 15, 2017
Center Freq 1.957400000 GHz
PASS
#IFGain:Low
CH Freq: 1.957400000 GHz
Trig: Free Run
Avg|Hold: 3/10
#Atten: 24 dB
Ext Gain: -42.50 dB
Radio Device: BTS
Freq / Channel
Rho: 0.98911
EVM: 10.49 % rms
110.96 % Pk
Pk CDE:
-37.34 dB
at C8(1)
Pk Active CDE:
-36.80 dB
at C7(17)
Magnitude Error:
9.52 % rms
Phase Error:
4.13 ° rms
Frequency Error:
-2.17 Hz
I/Q Origin Offset:
-71.81 dB
Time Offset:
13011.665 chips
Preamble Signature:

I/Q Measured Polar Graph
I/Q Measured Polar Vector
90
180
0
-90
Active Channels: 68 Slot# 10
Center Freq
1.957400000 GHz
CF Step
5.000000 MHz
Auto
Man
MSG
STATUS

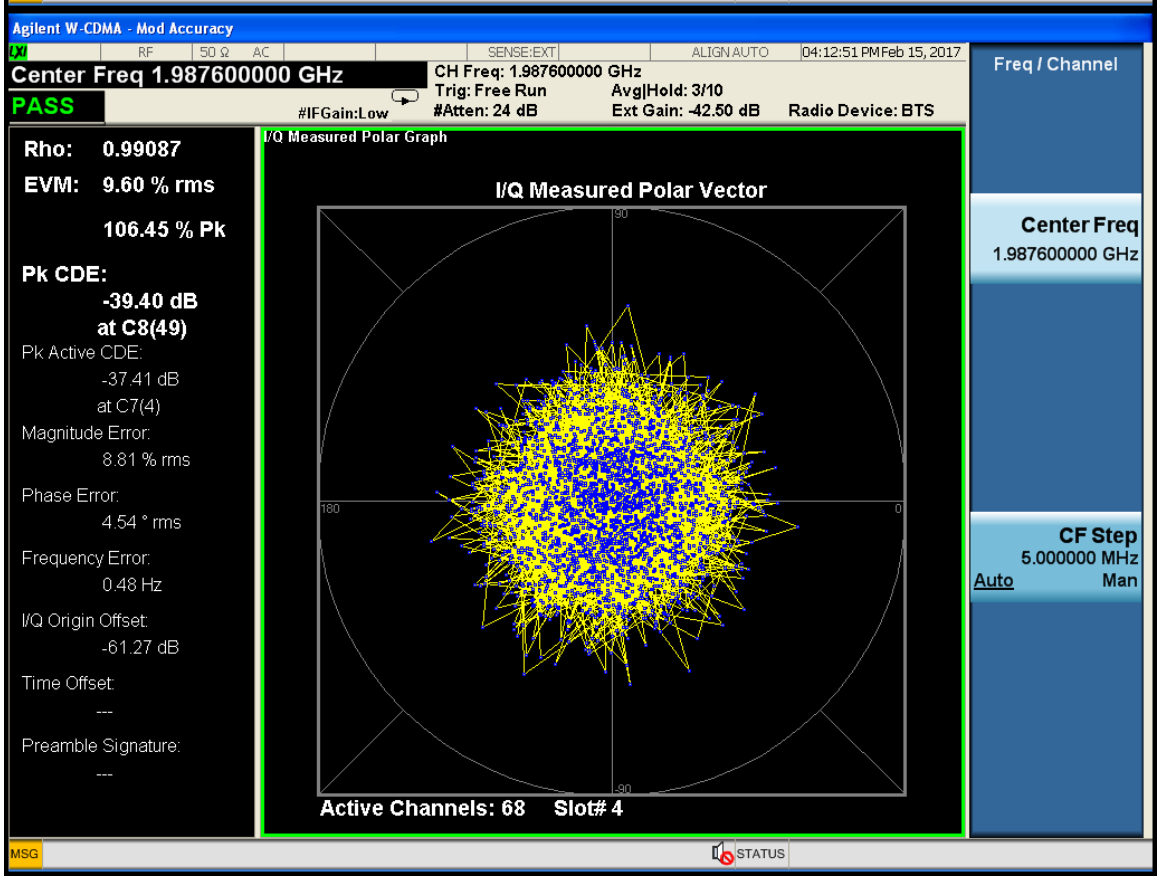

Agilent W-CDMA - Mod Accuracy
RF 50 Ω AC
SENSE:EXT
ALIGN AUTO
04:47:55 PM Feb 15, 2017
Center Freq 1.962400000 GHz
PASS
#IFGain:Low
CH Freq: 1.962400000 GHz
Trig: Free Run
Avg|Hold: 6/10
#Atten: 24 dB
Ext Gain: -42.50 dB
Radio Device: BTS
Freq / Channel
Rho: 0.99144
EVM: 9.29 % rms
110.43 % Pk
Pk CDE:
-40.27 dB
at C8(2)
Pk Active CDE:
-38.49 dB
at C7(63)
Magnitude Error:
8.38 % rms
Phase Error:
4.76 ° rms
Frequency Error:
-1.04 Hz
I/Q Origin Offset:
-76.97 dB
Time Offset:
17181.392 chips
Preamble Signature:

I/Q Measured Polar Graph
I/Q Measured Polar Vector
90
180
0
-90
Active Channels: 68 Slot# 9
Center Freq
1.962400000 GHz
CF Step
5.000000 MHz
Auto
Man
MSG
STATUS


Agilent W-CDMA - Mod Accuracy
RF 50 Ω AC
SENSE:EXT
ALIGN AUTO
04:13:14 PM Feb 15, 2017
Center Freq 1.982600000 GHz
PASS
#IFGain:Low
CH Freq: 1.982600000 GHz
Trig: Free Run
Avg|Hold: 4/10
#Atten: 24 dB
Ext Gain: -42.50 dB
Radio Device: BTS
Freq / Channel
Rho: 0.99048
EVM: 9.80 % rms
150.34 % Pk
Pk CDE:
-40.32 dB
at C8(59)
Pk Active CDE:
-38.00 dB
at C7(55)
Magnitude Error:
9.04 % rms
Phase Error:
4.16 ° rms
Frequency Error:
2.78 Hz
I/Q Origin Offset:
-56.85 dB
Time Offset:

Preamble Signature:

I/Q Measured Polar Graph
I/Q Measured Polar Vector
90
180
0
-90
Active Channels: 68 Slot# 7
Center Freq
1.982600000 GHz
CF Step
5.000000 MHz
Auto
Man
MSG
STATUS


Agilent W-CDMA - Mod Accuracy
RF 50 Ω AC
SENSE:EXT
ALIGN AUTO
04:12:51 PM Feb 15, 2017
Center Freq 1.987600000 GHz
PASS
#IFGain:Low
CH Freq: 1.987600000 GHz
Trig: Free Run
Avg|Hold: 3/10
#Atten: 24 dB
Ext Gain: -42.50 dB
Radio Device: BTS
Freq / Channel
Rho: 0.99087
EVM: 9.60 % rms
106.45 % Pk
Pk CDE:
-39.40 dB
at C8(49)
Pk Active CDE:
-37.41 dB
at C7(4)
Magnitude Error:
8.81 % rms
Phase Error:
4.54 ° rms
Frequency Error:
0.48 Hz
I/Q Origin Offset:
-61.27 dB
Time Offset:

Preamble Signature:

I/Q Measured Polar Graph
I/Q Measured Polar Vector
90
180
0
-90
Active Channels: 68 Slot# 4
Center Freq
1.987600000 GHz
CF Step
5.000000 MHz
Auto
Man
MSG
STATUS

9 SPURIOUS RADIATED EMISSIONS

9.1 Applicable Standard: FCC CFR 47, §2.1053

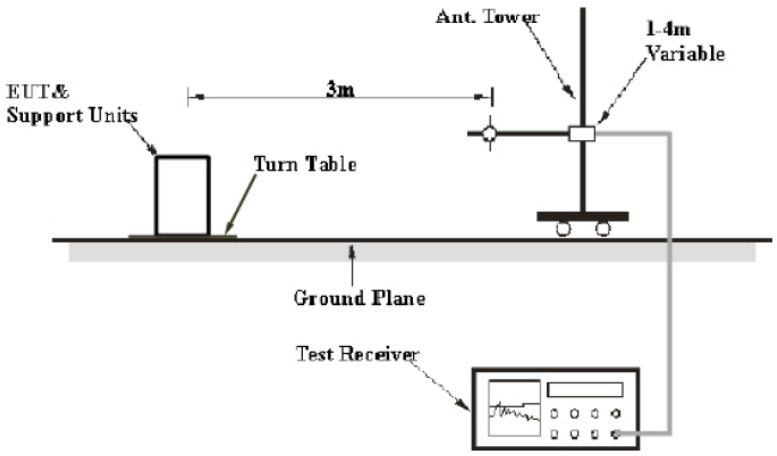
9.2 Test Equipment List and Details

Manufacturer	9.2.1.1.1 Equipment	Model	Serial Number	Last Cal.	Cal. Interval
Albatross	Anechoic Chamber	3m Site	A00017354	2016-11-18	1 year
R&S	EMI Test Receiver	ESI26	100058	2016-8-1	1 year
R&S	Log periodic Antenna	SWB-VUBA9163	9163-282	2016-12-7	1 year
R&S	Double-Ridged Waveguide Horn Antenna	HF906 TX	100032	2016-6-29	1 year

***statement of traceability:** ZTE Corporation Testing lab attest that all calibration have been performed per the NVLAP requirements, traceable to NIST.

Measurement Uncertainty
All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.
Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiated emissions measurement at the EMC lab of ZTE Corp. is 3.6dB.

EUT Setup



The radiated emission tests were performed in the 3-meter Chamber, using the setup accordance with the FCC part 2.1053.The specification used was the FCC 2.1053 limits.

9.3 Test Procedure

The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load, which was also placed on the turntable.
The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in

order to identify the maximum level of emissions from the EUT .The test was performed by placing the EUT on 3-orthogonal axis.
The frequency range up to teeth harmonic of the fundamental frequency was investigated.
Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.
Spurious emissions in dB =10 1g (TX pwr in Watts/0.001)-the absolute level
Spurious attenuation limit in dB =43+10 Lg P (power out in Watts)
The resolution bandwidth of the spectrum analyzer was set at 100KHz for 30MHz to 1GHz scanning, set at 1MHz or 3MHz for 1GHz to 20GHz scanning.

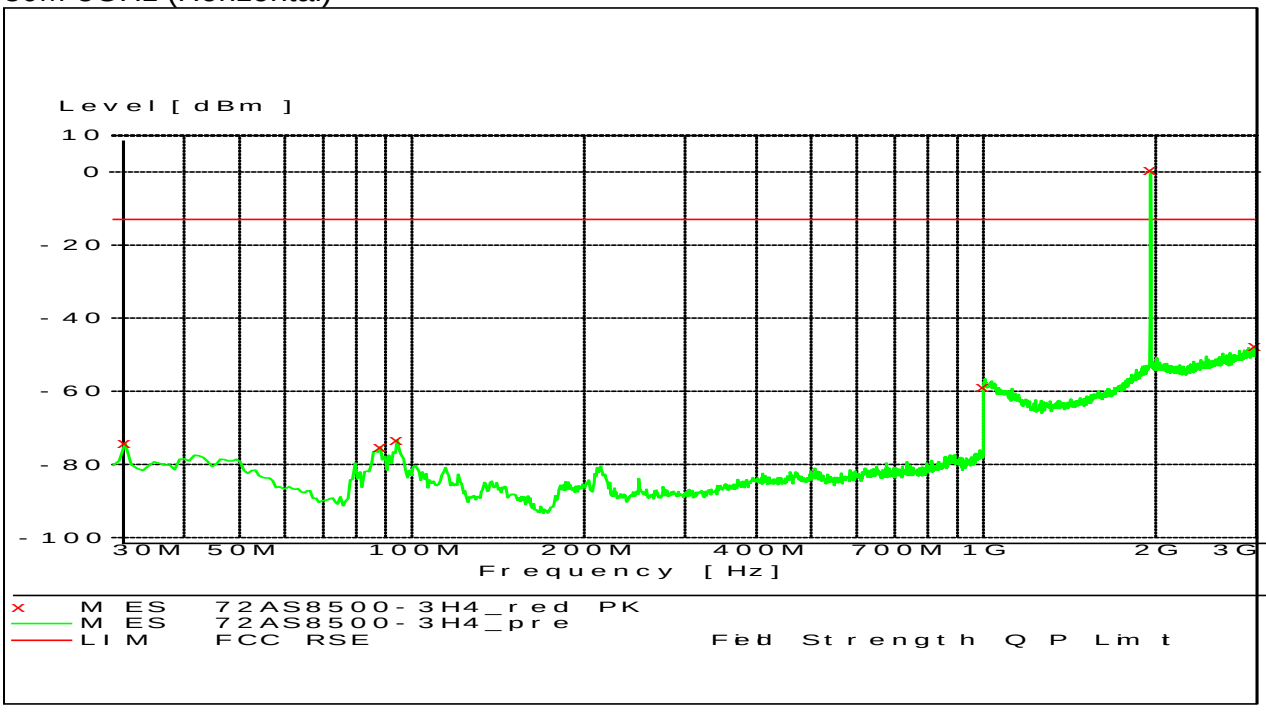
9.4 Test Results Summary: PASS

9.5 Environmental Conditions

Temperature:	26°C
Relative Humidity:	60 %
ATM Pressure:	1009 mbar

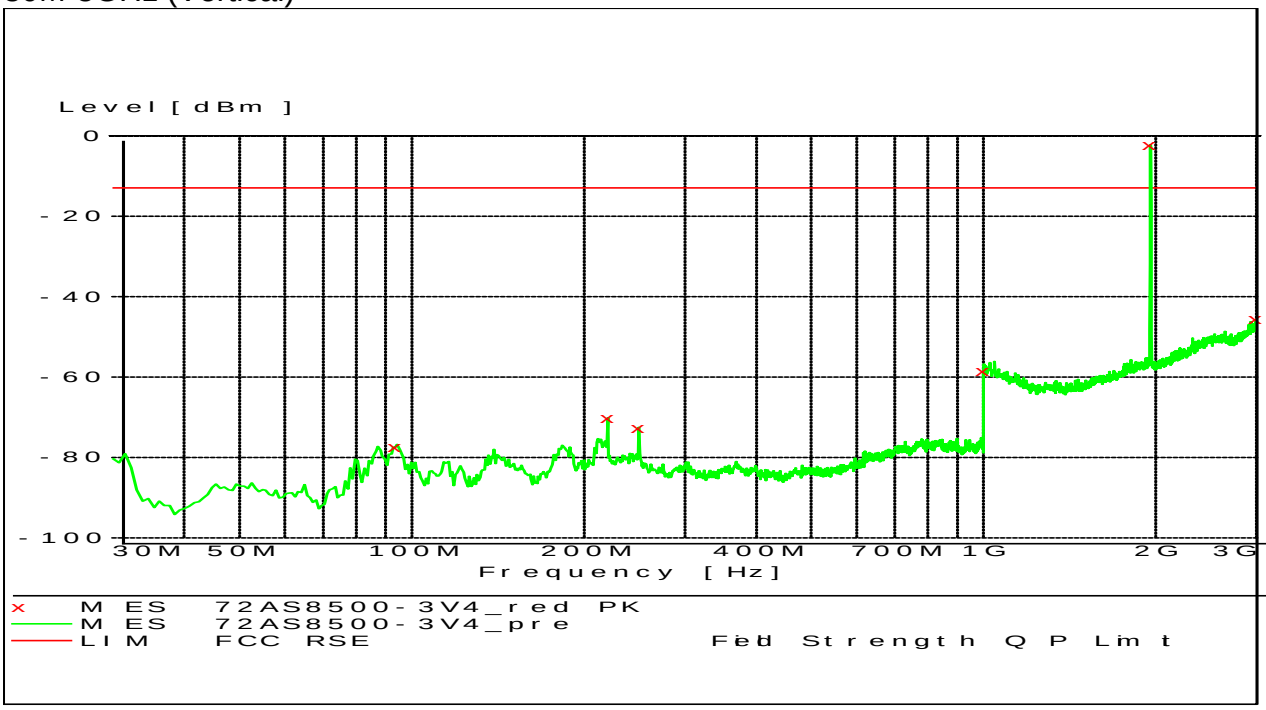
9.6 Test data

30M-3GHz (Horizontal)



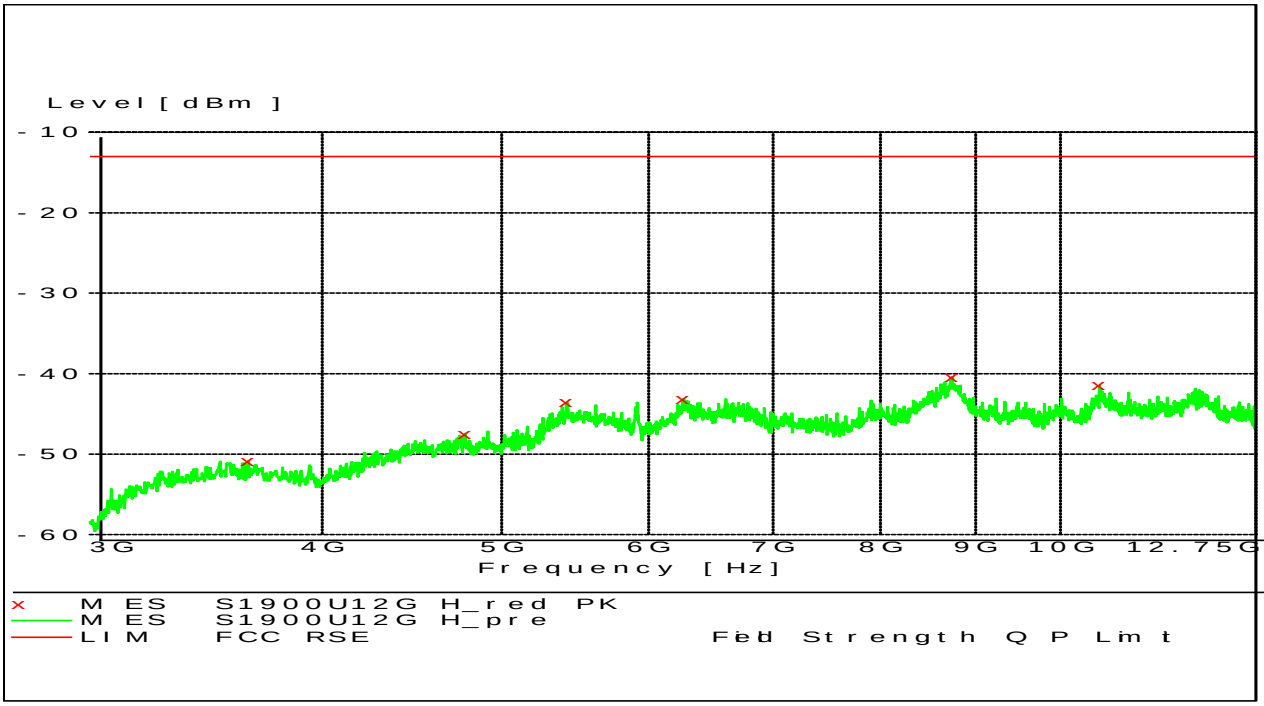
Frequency (MHz)	Level (dBm)	Azimuth (deg)	Height (cm)	Polarisation	Transd (dB)	Limit (dBm)	Margin (dB)
31.552	-74.14	23.6	200	HOR	-125.3	-13	61.1
88.2	-75.07	133.4	200	HOR	-130.1	-13	62.1
94.408	-73.29	155.8	200	HOR	-129.1	-13	60.3
1000	-58.76	148.9	100	HOR	-109.1	-13	45.8
2984	-47.54	105	100	HOR	-98.8	-13	34.5

30M-3GHz (Vertical)



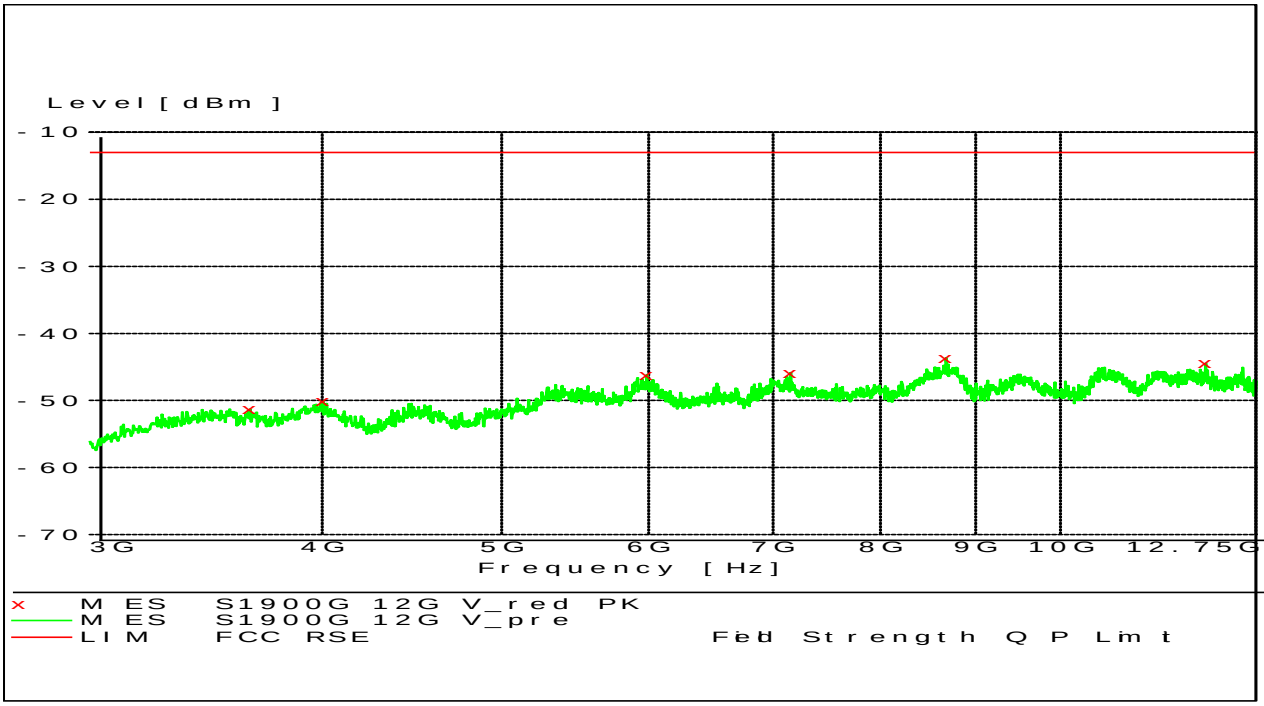
Frequency (MHz)	Level (dBm)	Azimuth (deg)	Height (cm)	Polarisation	Transd (dB)	Limit (dBm)	Margin (dB)
93.632	-77.33	6.7	100	VER	-126.4	-13	64.3
220.12	-70.19	6.7	100	VER	-126.4	-13	57.2
249.608	-72.5	326.8	100	VER	-124.2	-13	59.5
1000	-58.37	20.3	100	VER	-108.9	-13	45.4
2992	-45.65	81	200	VER	-97	-13	32.7

3-12.75GHz (Horizontal)



Frequency (MHz)	Level (dBm)	Azimuth (deg)	Height (cm)	Polarisation	Transd (dB)	Limit (dBm)	Margin (dB)
3649.6	-50.81	13.6	100	HOR	-89.2	-13	37.8
4779.2	-47.44	329.4	200	HOR	-84.5	-13	34.4
5422.4	-43.53	63.4	200	HOR	-80.3	-13	30.5
6264	-43.1	118.7	100	HOR	-77.2	-13	30.1
8748	-40.4	53	100	HOR	-72.4	-13	27.4
10500.6	-41.45	359.7	100	HOR	-73	-13	28.5

3-12.75GHz (Verticall)



Frequency (MHz)	Level (dBm)	Azimuth (deg)	Height (cm)	Polarisation	Transd (dB)	Limit (dBm)	Margin (dB)
3659.2	-51.27	99.7	100	VER	-89.5	-13	38.3
4008	-50.15	9.2	200	VER	-87.3	-13	37.1
5988.8	-46.17	155.7	200	VER	-81.4	-13	33.2
7156.4	-45.85	237.4	100	VER	-80.7	-13	32.9
8683.6	-43.62	210.1	100	VER	-76.6	-13	30.6
11977.2	-44.47	195.9	100	VER	-76.3	-13	31.5

10 SPURIOUS EMISSIONS AT ANTENNA TERMINALS

10.1 Applicable Standard: FCC§2.1051, §24.238

The spectrum was to be investigated to the tenth harmonics of the highest fundamental frequency as specified.

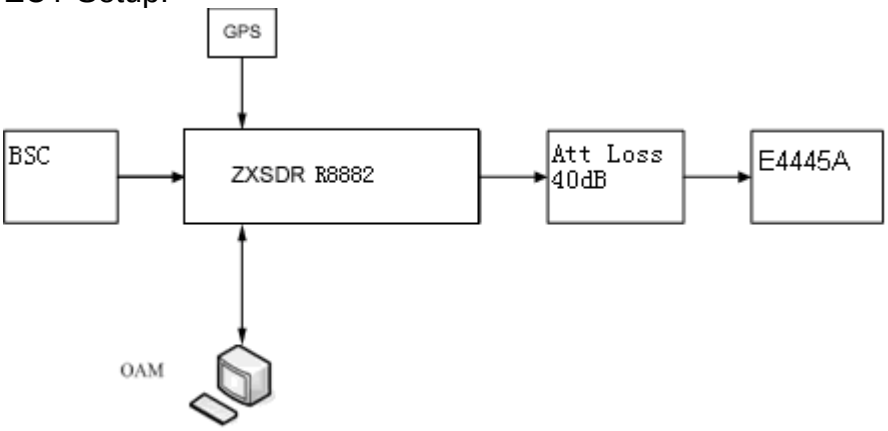
10.2 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	MXA Series Spectrum Analyzer	N9020A	MY51160170	2016-6-22	2017-6-21
YLT	40dB Attenuator	SJ-SN-200	2009010555	N.A	N.A
Forstar	Forstar RF Cable	031-D	1034	N.A	N.A

*__statement of traceability:__ ZTE Corporation Reliability Testing Center attest that all calibration have been performed per the NVLAP requirements , traceable to NIST.

10.3 Test Procedure

EUT Setup:



REMARKS: Attenuator loss (dB)=40dB, Cable Loss (dB)=2.5dB.

The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 1MHz for 30MHz to 1GHz scaning, set at 1MHz for 1GHz to 20GHz scaning. Sufficient scans were taken to show any out of band emissions up to 10th harmonic.

10.4 Test Data Environmental Conditions

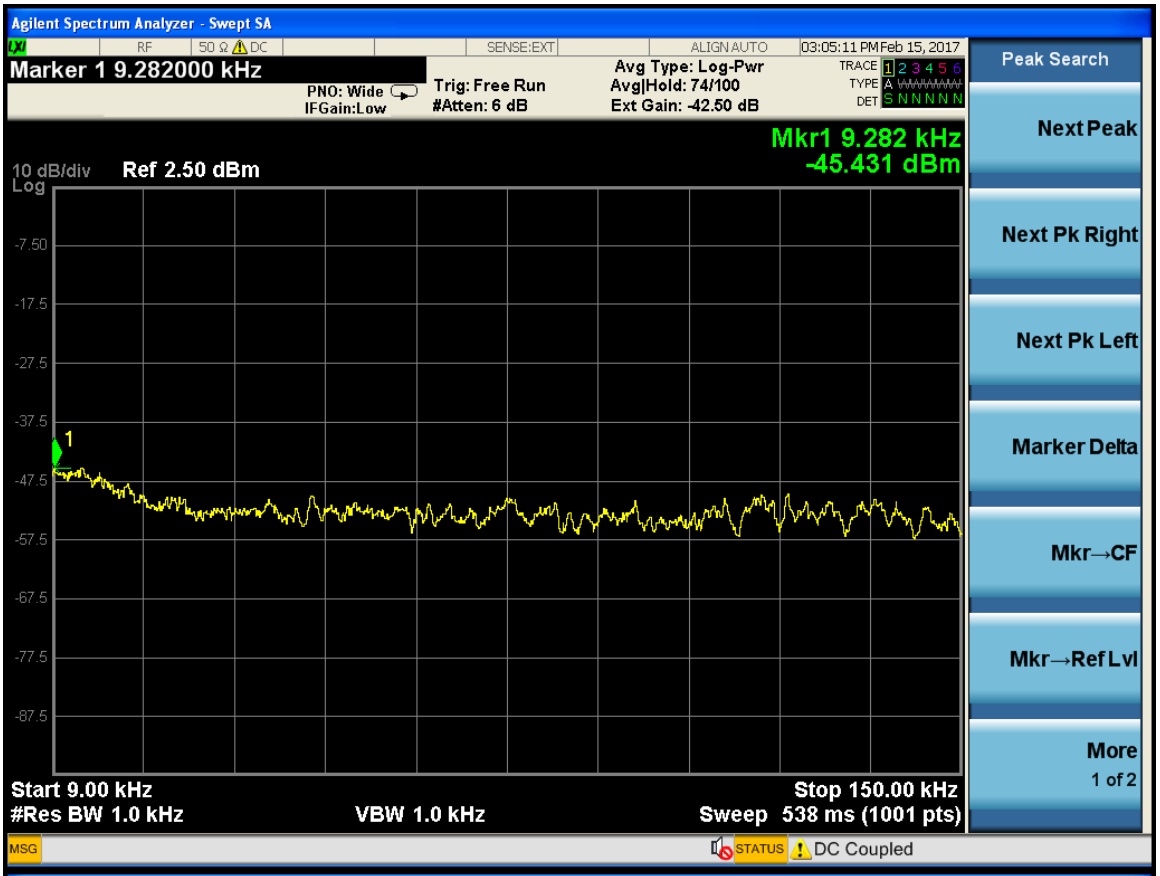
Temperature:	25 °C
Relative Humidity:	53 %
ATM Pressure:	1009 mbar

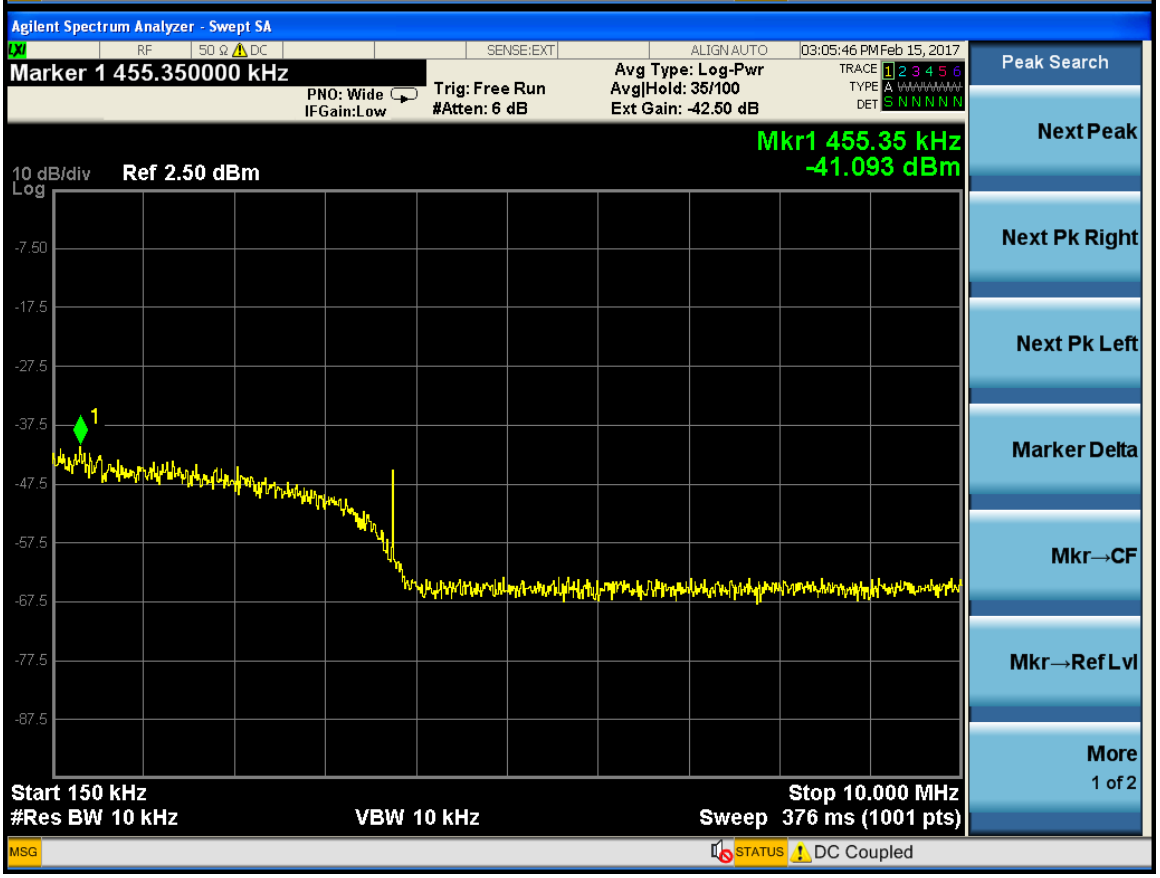
10.5 Test Result: Pass

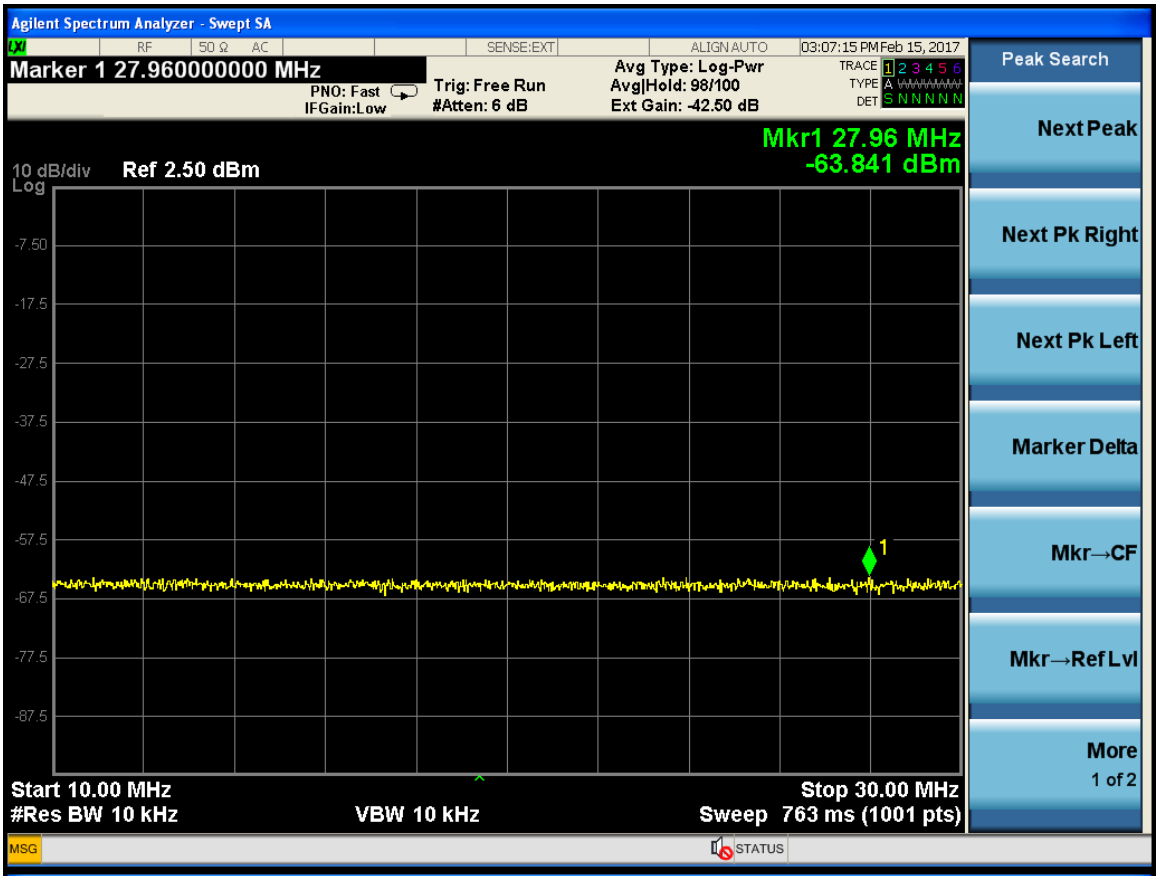
10.6 Test Mode: Transmitting UMTS

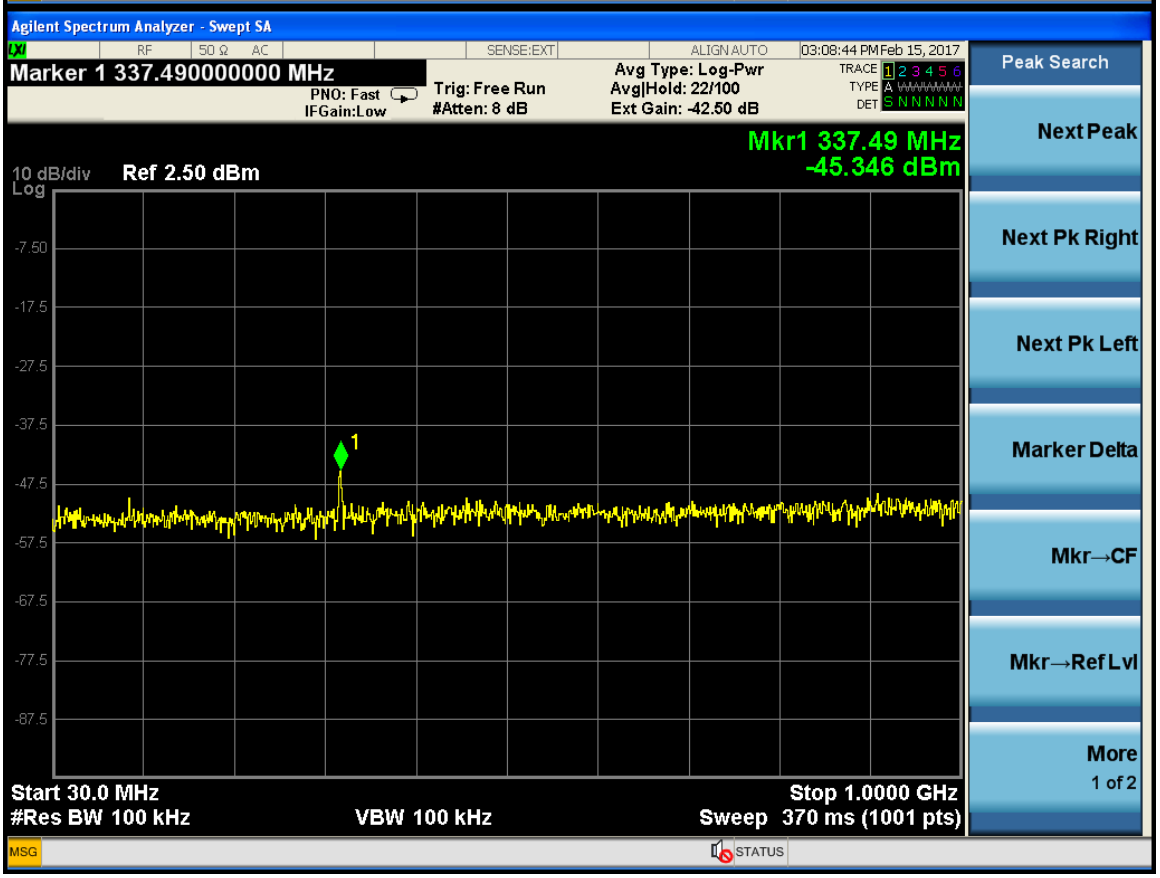
10.7 Test Data

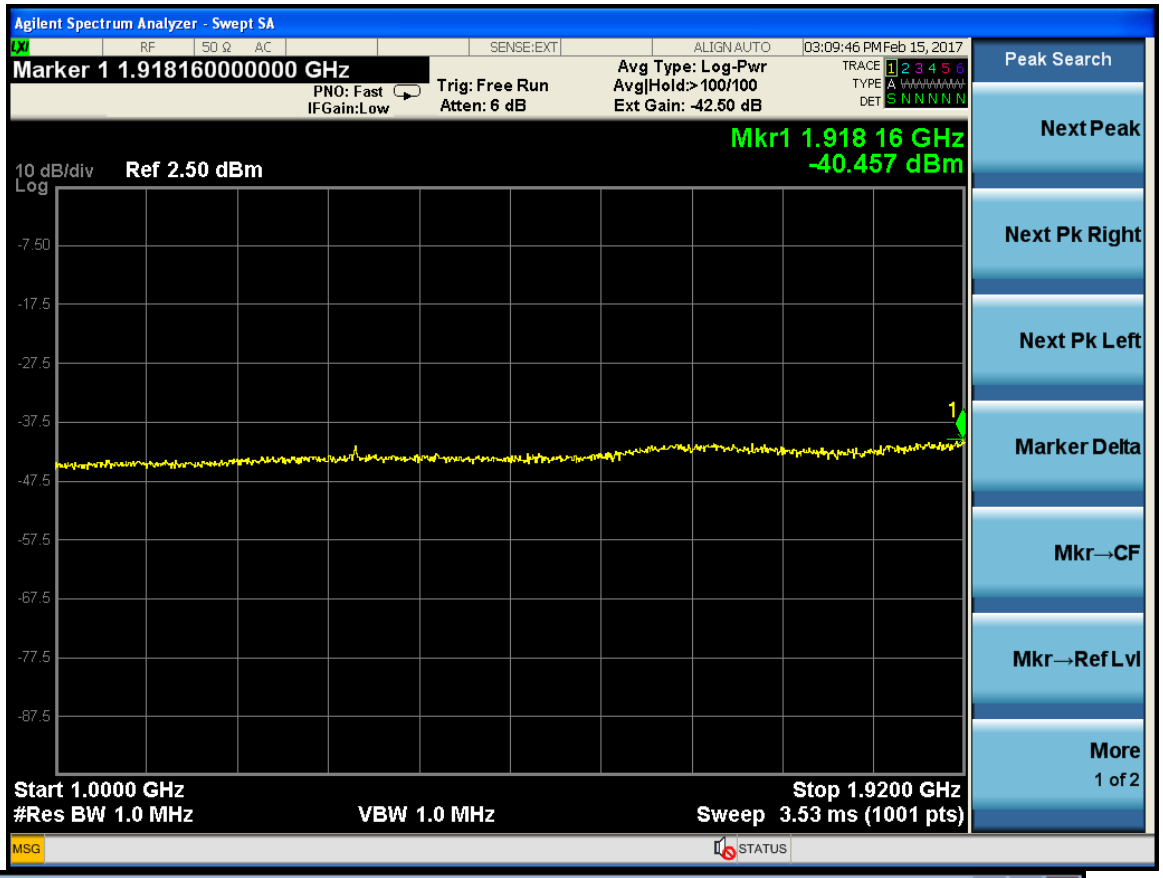
One carrier (working in bottom frequency)


Agilent Spectrum Analyzer - Swept SA
RF
50 Ω DC
SENSE:EXT
ALIGN AUTO
03:05:11 PM Feb 15, 2017
Marker 1 9.282000 kHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 6 dB
Avg Type: Log-Pwr
Avg|Hold: 74/100
Ext Gain: -42.50 dB
TRACE 1 2 3 4 5 6
TYPE A WWWWW
DET S N N N N N
Mkr1 9.282 kHz
-45.431 dBm
10 dB/div
Log
Ref 2.50 dBm
-7.50
-17.5
-27.5
-37.5
-47.5
-57.5
-67.5
-77.5
-87.5
1
Start 9.00 kHz
#Res BW 1.0 kHz
VBW 1.0 kHz
Stop 150.00 kHz
Sweep 538 ms (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
MSG
STATUS
DC Coupled

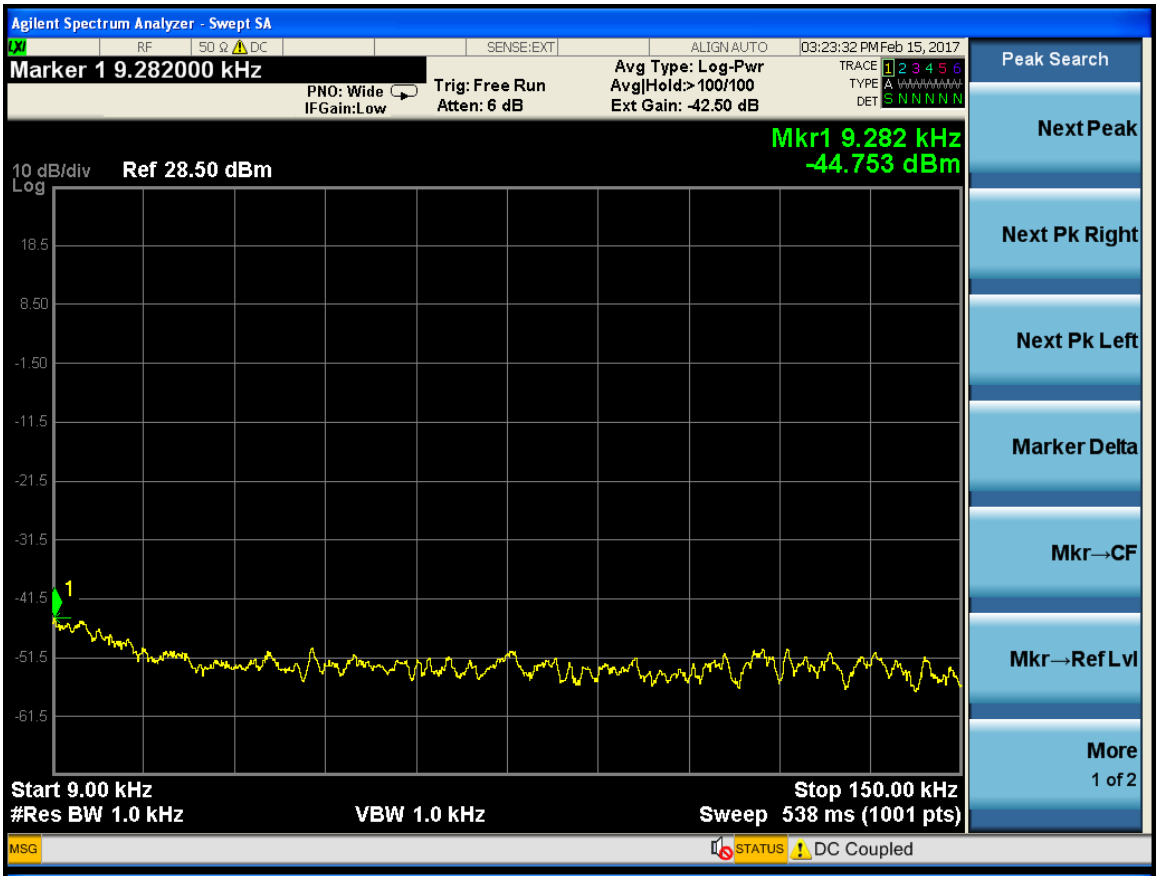

Agilent Spectrum Analyzer - Swept SA
RF
50 Ω DC
SENSE:EXT
ALIGN AUTO
03:05:46 PM Feb 15, 2017
Marker 1 455.350000 kHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 6 dB
Avg Type: Log-Pwr
Avg|Hold: 35/100
Ext Gain: -42.50 dB
TRACE 1 2 3 4 5 6
TYPE A WWWWW
DET S N N N N N
Mkr1 455.35 kHz
-41.093 dBm
10 dB/div
Log
Ref 2.50 dBm
-7.50
-17.5
-27.5
-37.5
-47.5
-57.5
-67.5
-77.5
-87.5
1
Start 150 kHz
#Res BW 10 kHz
VBW 10 kHz
Stop 10.000 MHz
Sweep 376 ms (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
MSG
STATUS
DC Coupled

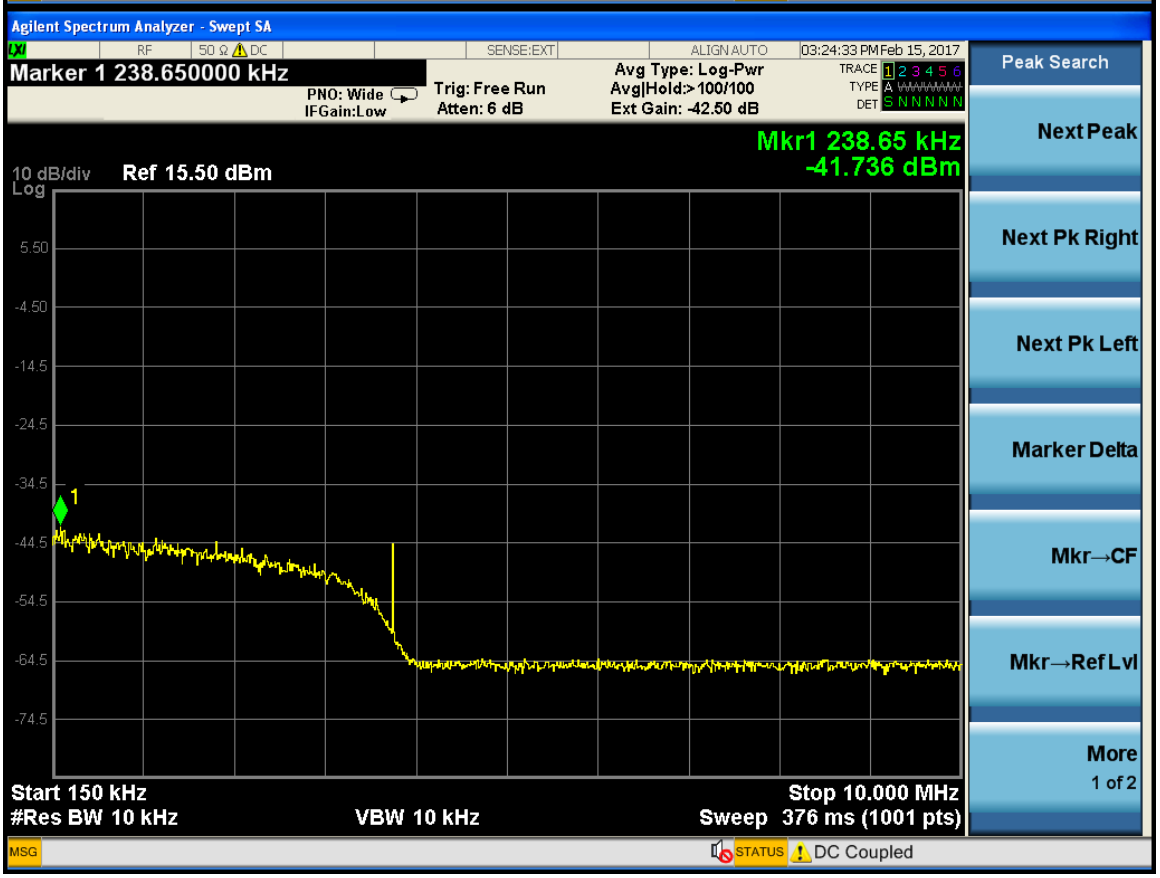

Agilent Spectrum Analyzer - Swept SA
RF 50 Ω AC
SENSE:EXT
ALIGN AUTO
03:07:15 PM Feb 15, 2017
Marker 1 27.960000000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 6 dB
Avg Type: Log-Pwr
Avg|Hold: 98/100
Ext Gain: -42.50 dB
TRACE 1 2 3 4 5 6
TYPE A WWWWW
DET S N N N N N
Mkr1 27.96 MHz
-63.841 dBm
10 dB/div
Log
Ref 2.50 dBm
-7.50
-17.5
-27.5
-37.5
-47.5
-57.5
-67.5
-77.5
-87.5
1
Start 10.00 MHz
#Res BW 10 kHz
VBW 10 kHz
Stop 30.00 MHz
Sweep 763 ms (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
MSG
STATUS

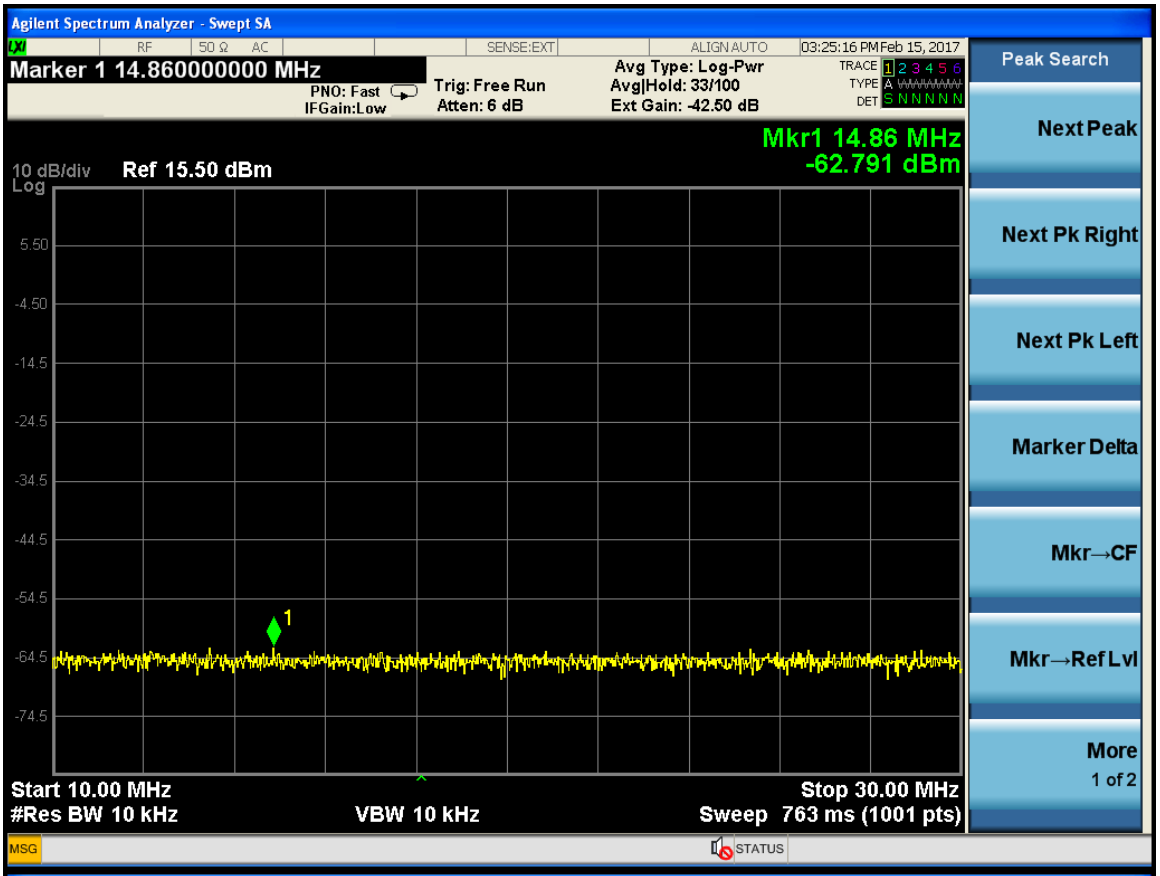

Agilent Spectrum Analyzer - Swept SA
RF 50 Ω AC
SENSE:EXT
ALIGN AUTO
03:08:44 PM Feb 15, 2017
Marker 1 337.490000000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 8 dB
Avg Type: Log-Pwr
Avg|Hold: 22/100
Ext Gain: -42.50 dB
TRACE 1 2 3 4 5 6
TYPE A WWWWW
DET S N N N N N
Mkr1 337.49 MHz
-45.346 dBm
10 dB/div
Log
Ref 2.50 dBm
-7.50
-17.5
-27.5
-37.5
-47.5
-57.5
-67.5
-77.5
-87.5
1
Start 30.0 MHz
#Res BW 100 kHz
VBW 100 kHz
Stop 1.0000 GHz
Sweep 370 ms (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
MSG
STATUS

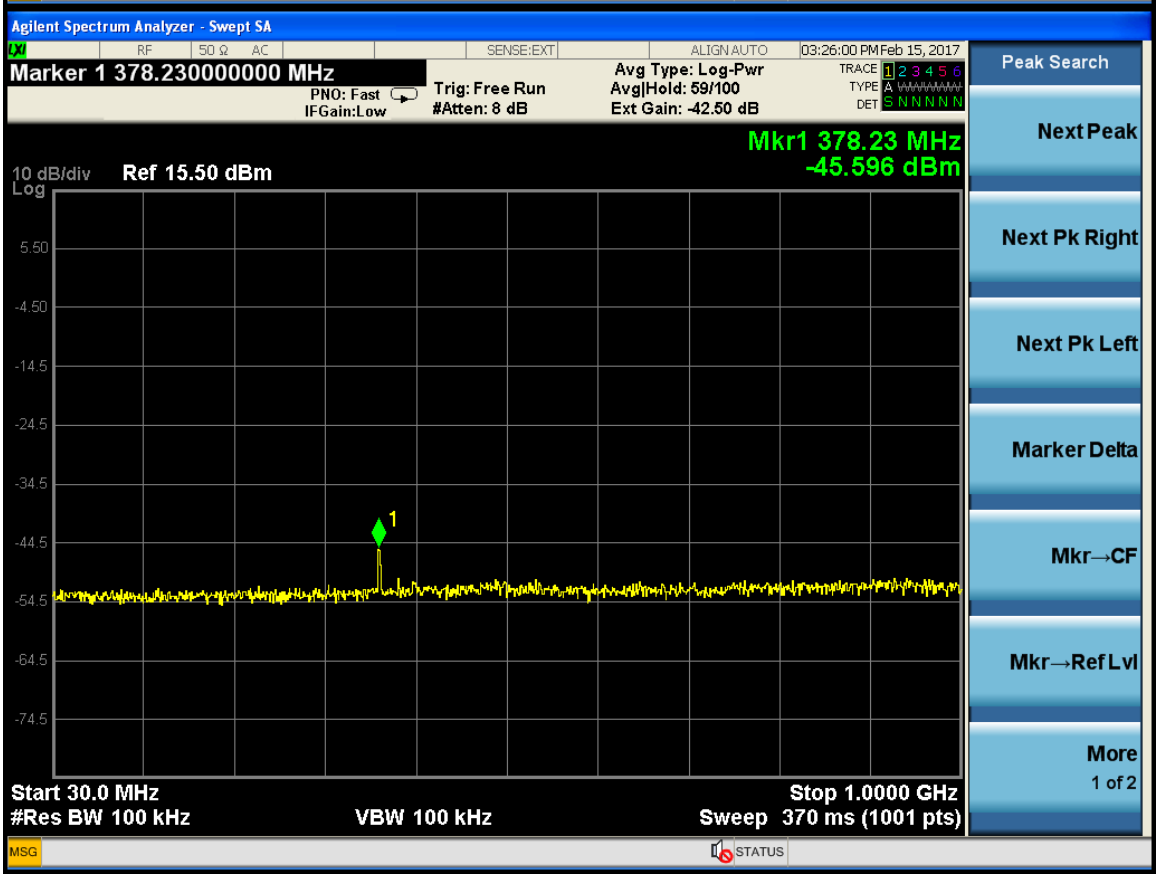


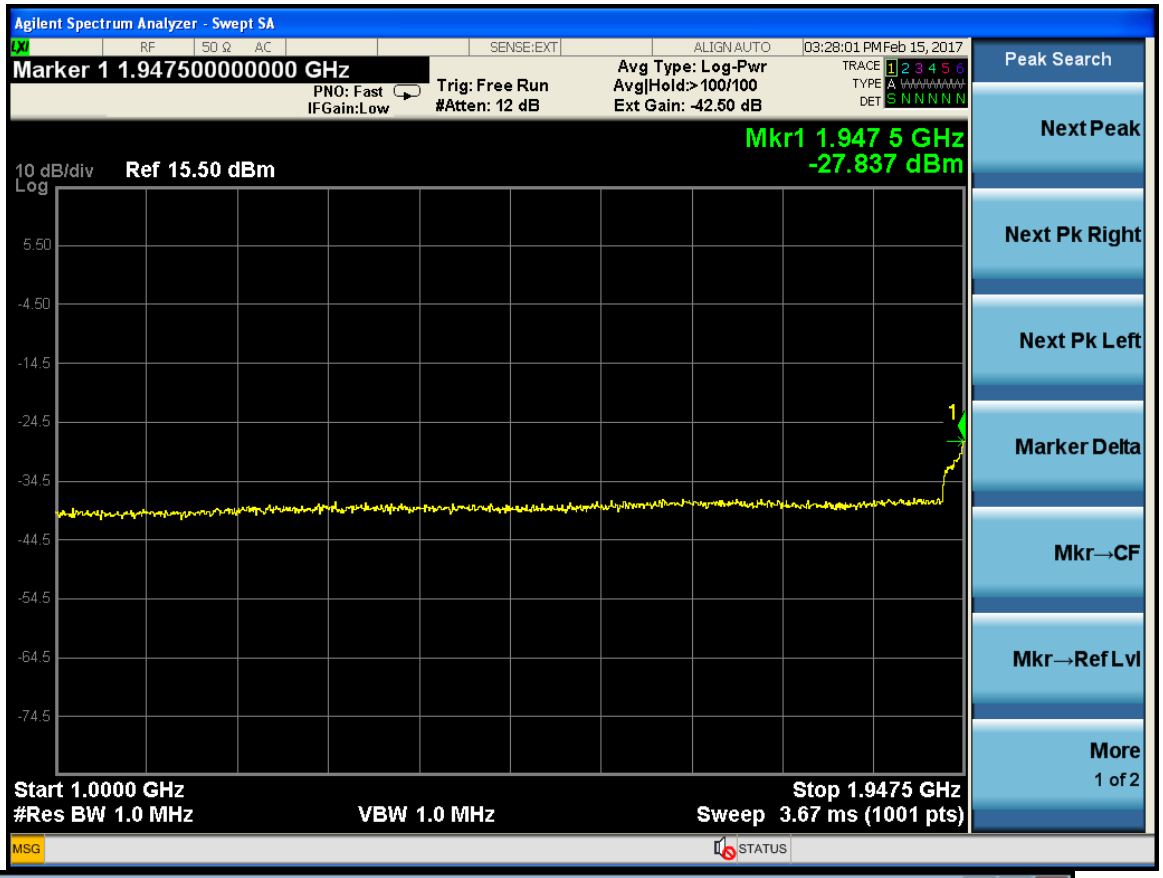
One carrier (working in middle frequency)


Agilent Spectrum Analyzer - Swept SA
RF 50 Ω DC
SENSE:EXT
ALIGN AUTO
03:23:32 PM Feb 15, 2017
Marker 1 9.282000 kHz
PNO: Wide
IFGain:Low
Trig: Free Run
Atten: 6 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
Ext Gain: -42.50 dB
TRACE 1 2 3 4 5 6
TYPE A WWWWW
DET S N N N N N
Mkr1 9.282 kHz
-44.753 dBm
10 dB/div
Log
Ref 28.50 dBm
18.5
8.50
-1.50
-11.5
-21.5
-31.5
-41.5
-51.5
-61.5
1
Start 9.00 kHz
#Res BW 1.0 kHz
VBW 1.0 kHz
Stop 150.00 kHz
Sweep 538 ms (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
MSG
STATUS
DC Coupled

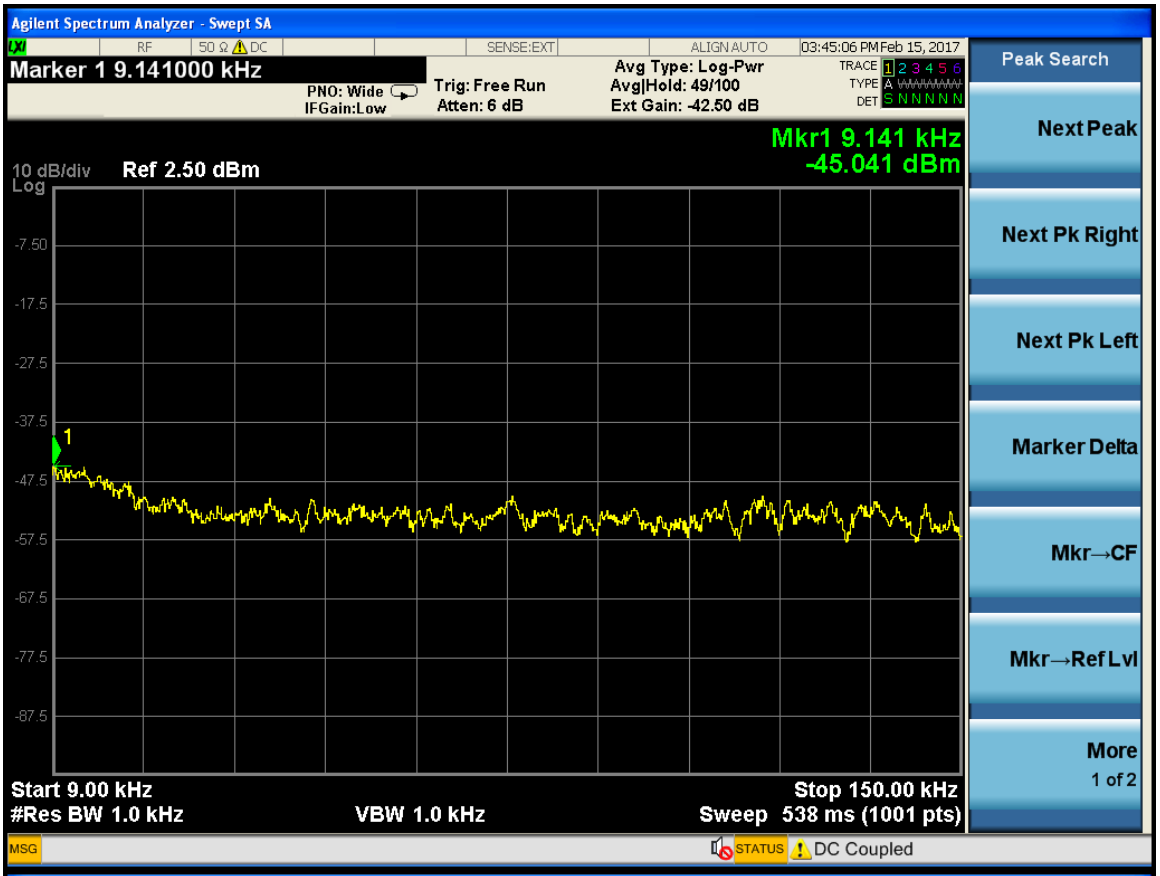

Agilent Spectrum Analyzer - Swept SA
RF 50 Ω DC
SENSE:EXT
ALIGN AUTO
03:24:33 PM Feb 15, 2017
Marker 1 238.650000 kHz
PNO: Wide
IFGain:Low
Trig: Free Run
Atten: 6 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
Ext Gain: -42.50 dB
TRACE 1 2 3 4 5 6
TYPE A WWWWW
DET S N N N N N
Mkr1 238.65 kHz
-41.736 dBm
10 dB/div
Log
Ref 15.50 dBm
5.50
-4.50
-14.5
-24.5
-34.5
-44.5
-54.5
-64.5
-74.5
1
Start 150 kHz
#Res BW 10 kHz
VBW 10 kHz
Stop 10.000 MHz
Sweep 376 ms (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
MSG
STATUS
DC Coupled

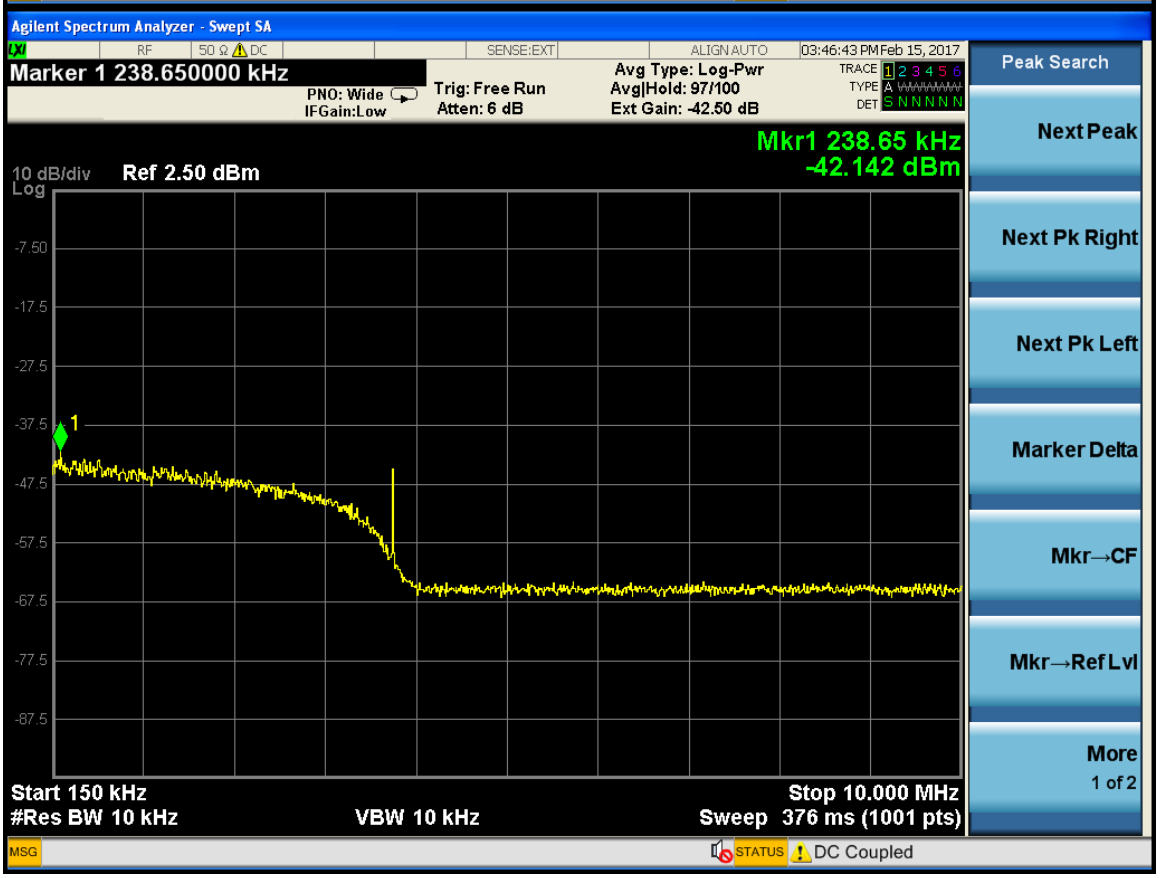

Agilent Spectrum Analyzer - Swept SA
RF 50 Ω AC
SENSE:EXT
ALIGN AUTO
03:25:16 PM Feb 15, 2017
Marker 1 14.860000000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 6 dB
Avg Type: Log-Pwr
Avg|Hold: 33/100
Ext Gain: -42.50 dB
TRACE 1 2 3 4 5 6
TYPE A WWWWW
DET S N N N N N
Mkr1 14.86 MHz
-62.791 dBm
10 dB/div
Log
Ref 15.50 dBm
5.50
-4.50
-14.5
-24.5
-34.5
-44.5
-54.5
-64.5
-74.5
Start 10.00 MHz
#Res BW 10 kHz
VBW 10 kHz
Stop 30.00 MHz
Sweep 763 ms (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
MSG
STATUS

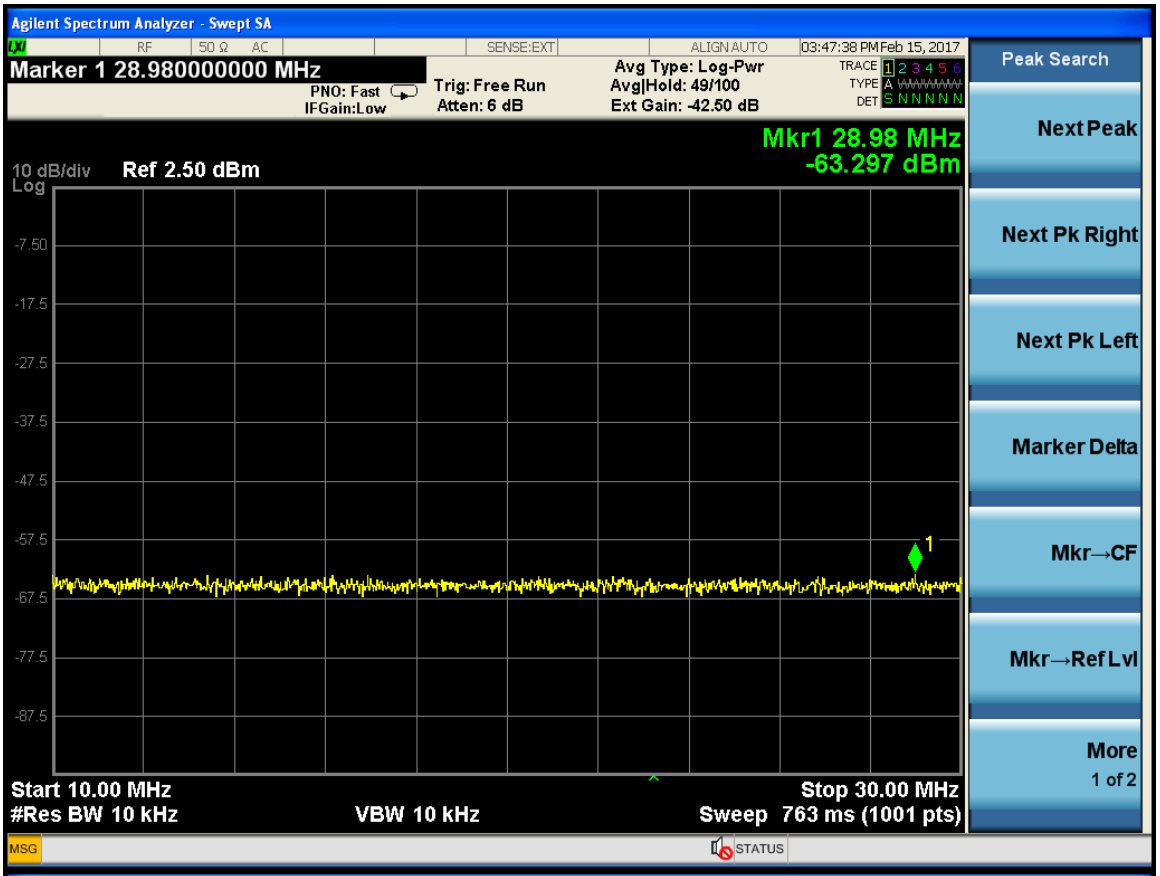

Agilent Spectrum Analyzer - Swept SA
RF 50 Ω AC
SENSE:EXT
ALIGN AUTO
03:26:00 PM Feb 15, 2017
Marker 1 378.230000000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 8 dB
Avg Type: Log-Pwr
Avg|Hold: 59/100
Ext Gain: -42.50 dB
TRACE 1 2 3 4 5 6
TYPE A WWWWW
DET S N N N N N
Mkr1 378.23 MHz
-45.596 dBm
10 dB/div
Log
Ref 15.50 dBm
5.50
-4.50
-14.5
-24.5
-34.5
-44.5
-54.5
-64.5
-74.5
Start 30.0 MHz
#Res BW 100 kHz
VBW 100 kHz
Stop 1.0000 GHz
Sweep 370 ms (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
MSG
STATUS

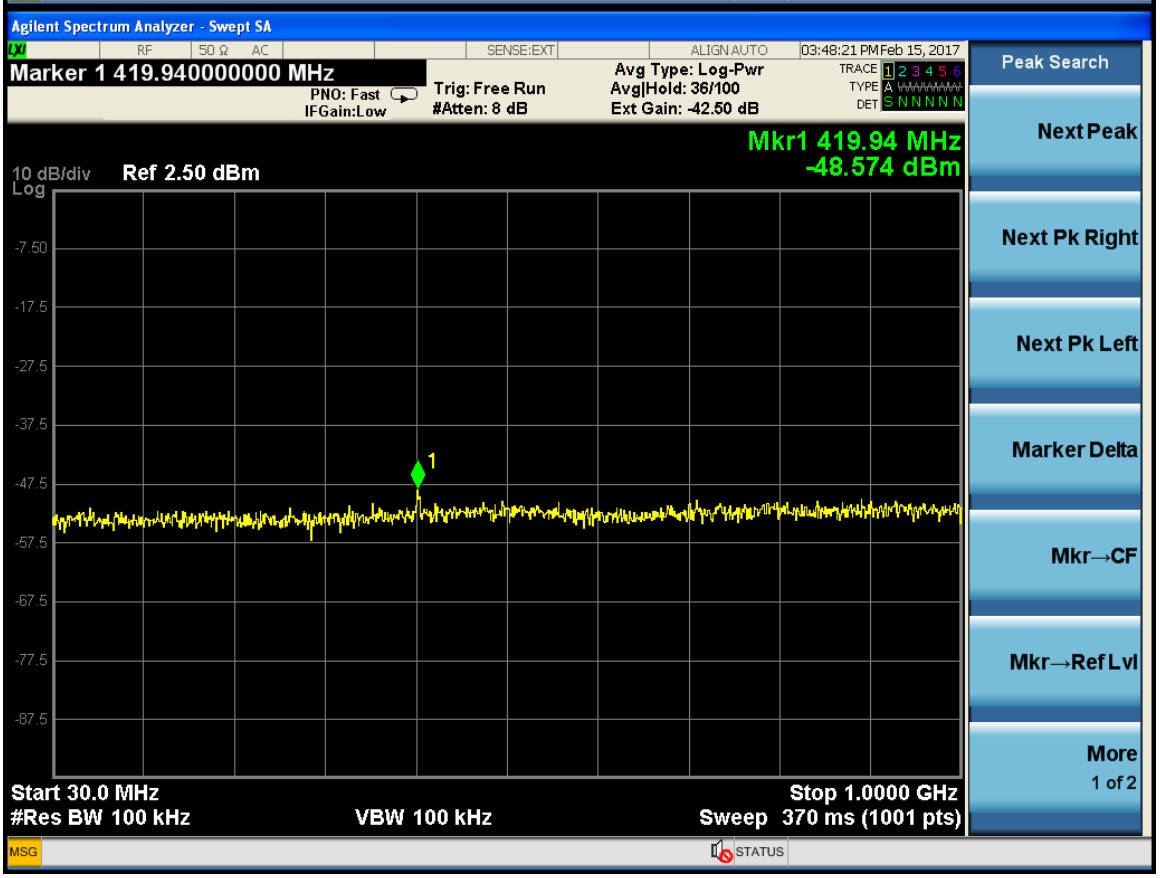


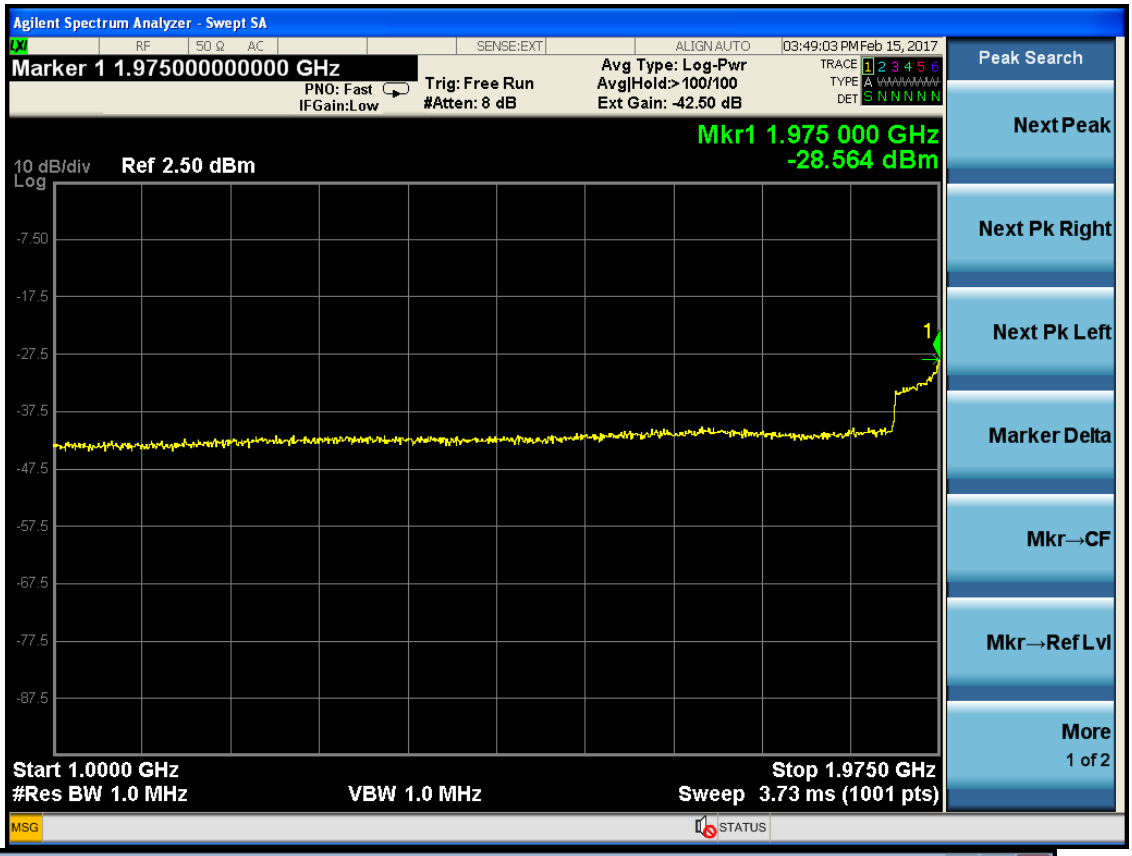
One carrier (working in top frequency)

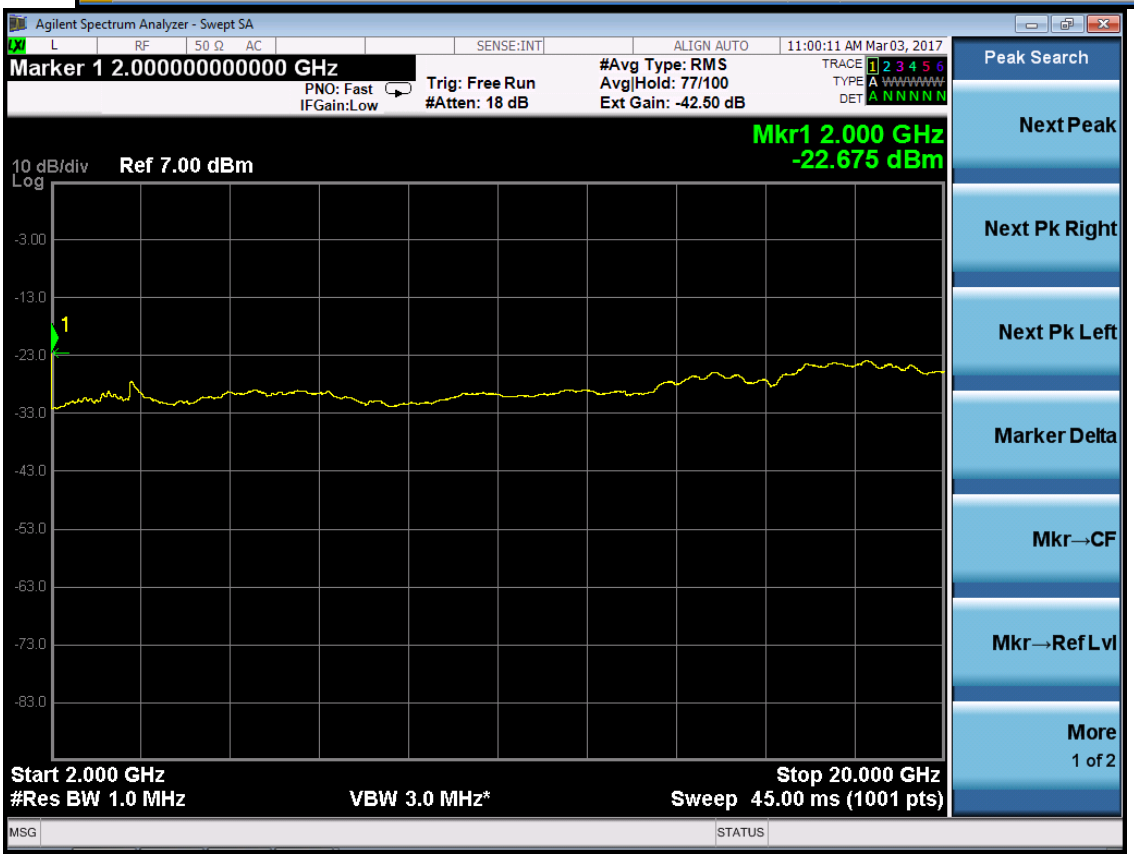

Agilent Spectrum Analyzer - Swept SA
RF
50 Ω DC
SENSE:EXT
ALIGN AUTO
03:45:06 PM Feb 15, 2017
Marker 1 9.141000 kHz
PNO: Wide
IFGain:Low
Trig: Free Run
Atten: 6 dB
Avg Type: Log-Pwr
Avg|Hold: 49/100
Ext Gain: -42.50 dB
TRACE 1 2 3 4 5 6
TYPE A WWWWW
DET S N N N N N
Mkr1 9.141 kHz
-45.041 dBm
10 dB/div
Log
Ref 2.50 dBm
-7.50
-17.5
-27.5
-37.5
-47.5
-57.5
-67.5
-77.5
-87.5
1
Start 9.00 kHz
#Res BW 1.0 kHz
VBW 1.0 kHz
Stop 150.00 kHz
Sweep 538 ms (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
MSG
STATUS
DC Coupled


Agilent Spectrum Analyzer - Swept SA
RF
50 Ω DC
SENSE:EXT
ALIGN AUTO
03:46:43 PM Feb 15, 2017
Marker 1 238.650000 kHz
PNO: Wide
IFGain:Low
Trig: Free Run
Atten: 6 dB
Avg Type: Log-Pwr
Avg|Hold: 97/100
Ext Gain: -42.50 dB
TRACE 1 2 3 4 5 6
TYPE A WWWWW
DET S N N N N N
Mkr1 238.65 kHz
-42.142 dBm
10 dB/div
Log
Ref 2.50 dBm
-7.50
-17.5
-27.5
-37.5
-47.5
-57.5
-67.5
-77.5
-87.5
1
Start 150 kHz
#Res BW 10 kHz
VBW 10 kHz
Stop 10.000 MHz
Sweep 376 ms (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
MSG
STATUS
DC Coupled

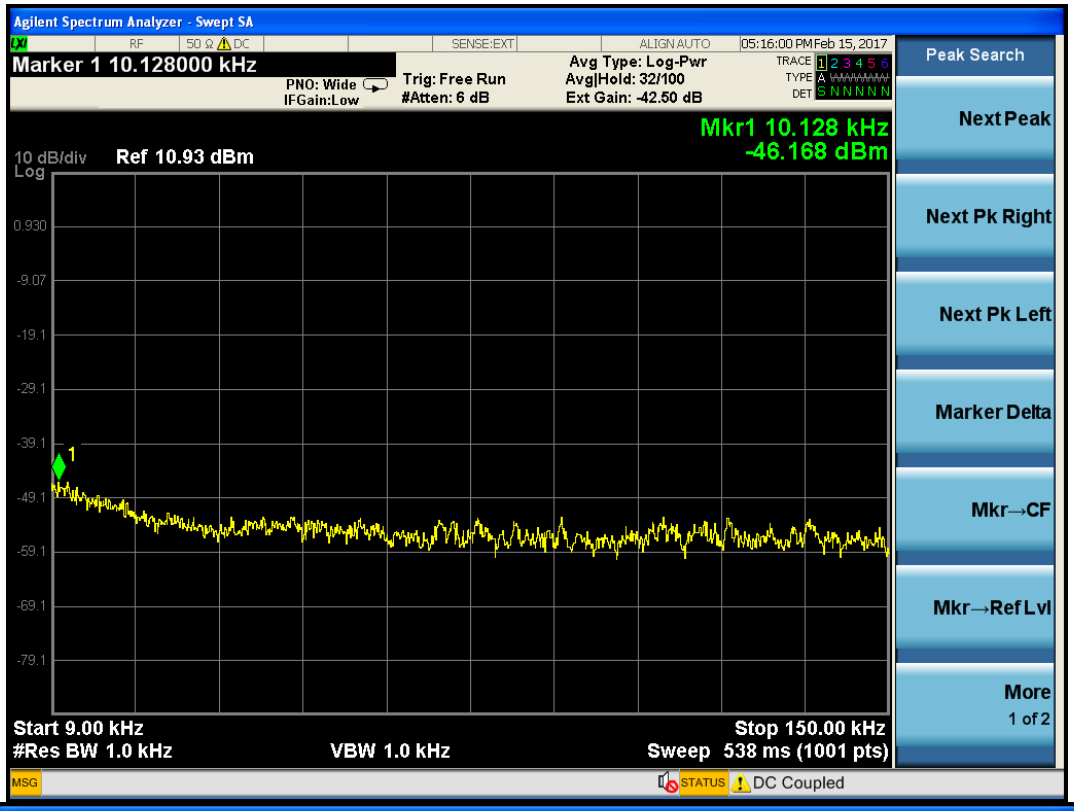

Agilent Spectrum Analyzer - Swept SA
RF 50 Ω AC
SENSE:EXT
ALIGN AUTO
03:47:38 PM Feb 15, 2017
Marker 1 28.980000000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 6 dB
Avg Type: Log-Pwr
Avg|Hold: 49/100
Ext Gain: -42.50 dB
TRACE 1 2 3 4 5 6
TYPE A WWWWW
DET S N N N N N
Mkr1 28.98 MHz
-63.297 dBm
10 dB/div
Log
Ref 2.50 dBm
-7.50
-17.5
-27.5
-37.5
-47.5
-57.5
-67.5
-77.5
-87.5
1
Start 10.00 MHz
#Res BW 10 kHz
VBW 10 kHz
Stop 30.00 MHz
Sweep 763 ms (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
MSG
STATUS

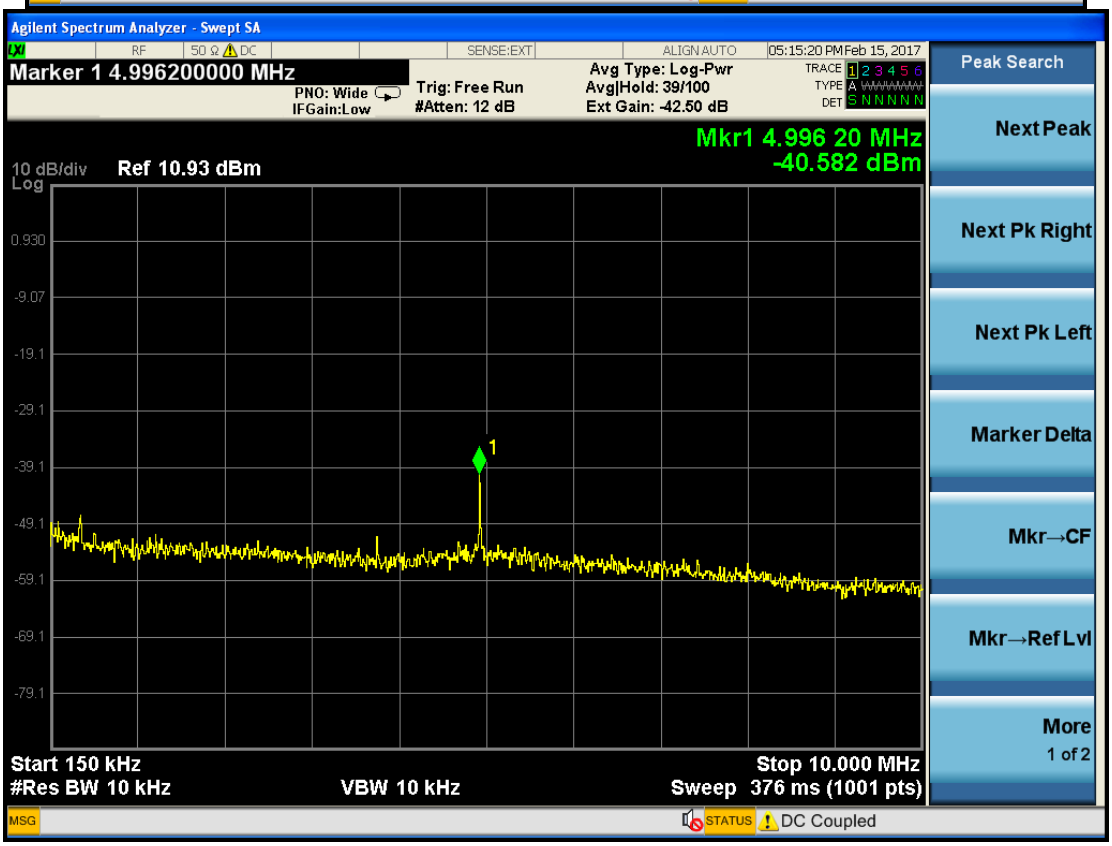

Agilent Spectrum Analyzer - Swept SA
RF 50 Ω AC
SENSE:EXT
ALIGN AUTO
03:48:21 PM Feb 15, 2017
Marker 1 419.940000000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 8 dB
Avg Type: Log-Pwr
Avg|Hold: 36/100
Ext Gain: -42.50 dB
TRACE 1 2 3 4 5 6
TYPE A WWWWW
DET S N N N N N
Mkr1 419.94 MHz
-48.574 dBm
10 dB/div
Log
Ref 2.50 dBm
-7.50
-17.5
-27.5
-37.5
-47.5
-57.5
-67.5
-77.5
-87.5
1
Start 30.0 MHz
#Res BW 100 kHz
VBW 100 kHz
Stop 1.0000 GHz
Sweep 370 ms (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
MSG
STATUS

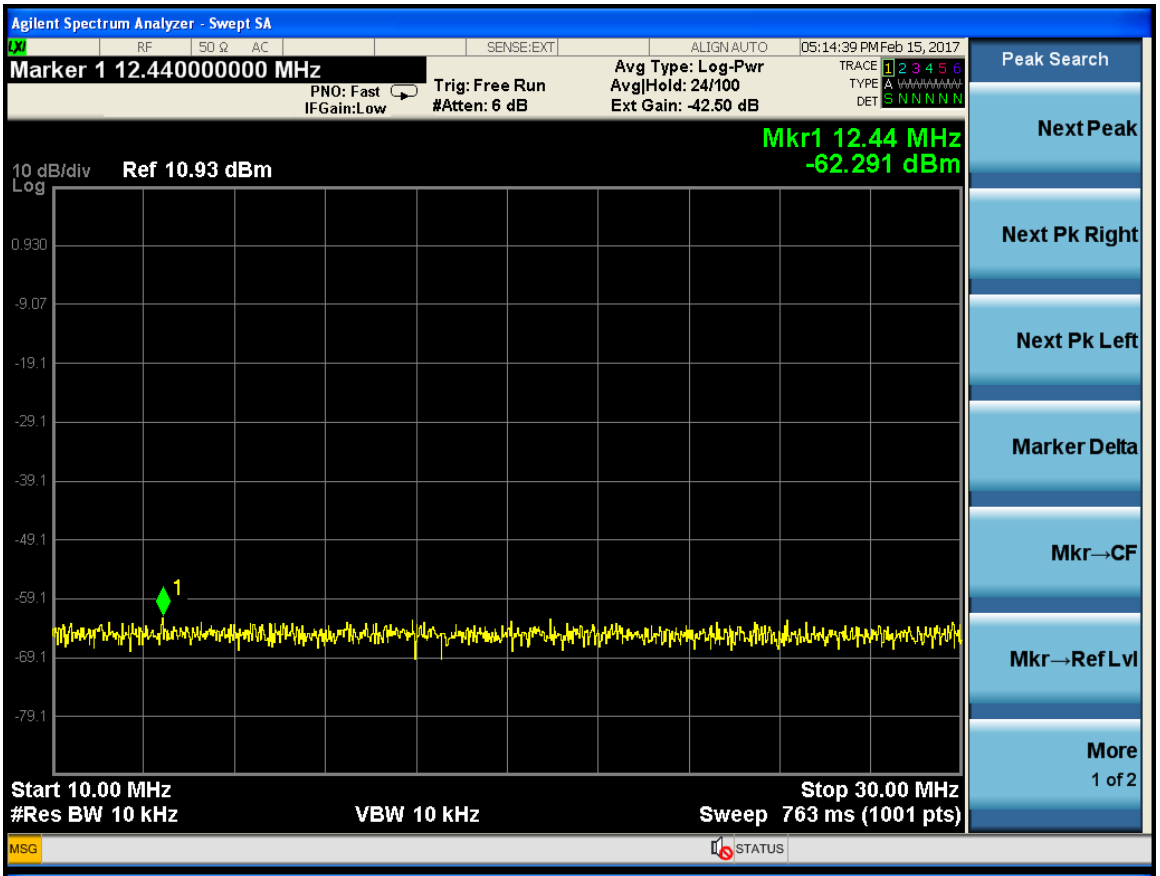


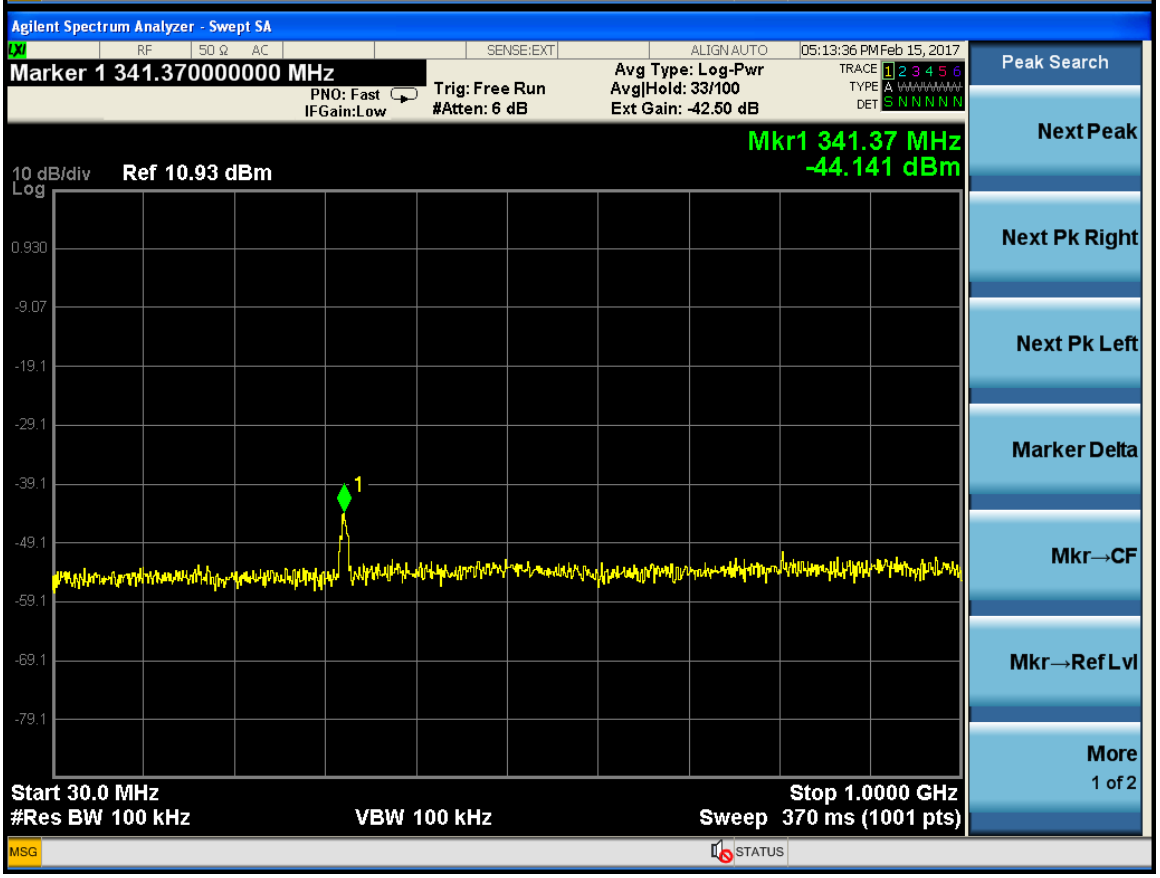


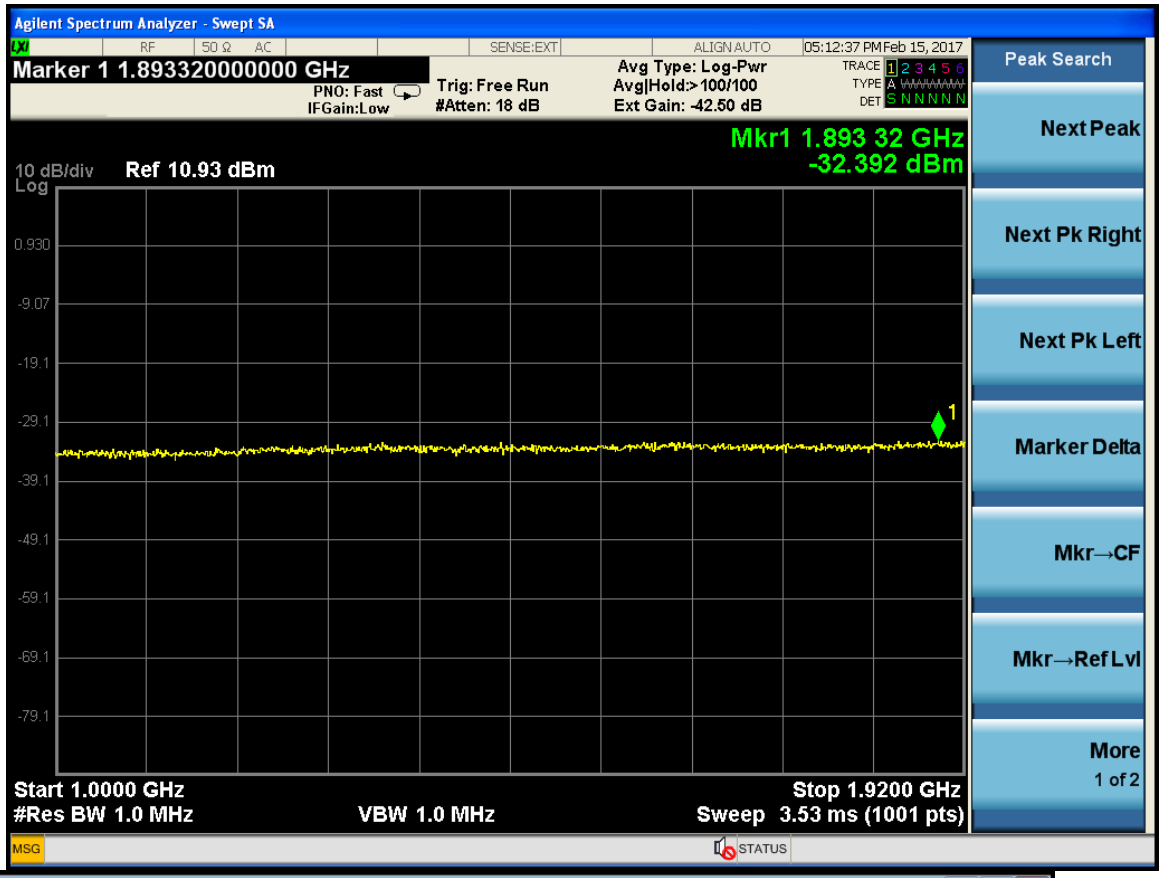
Two carrier (working in bottom frequency)

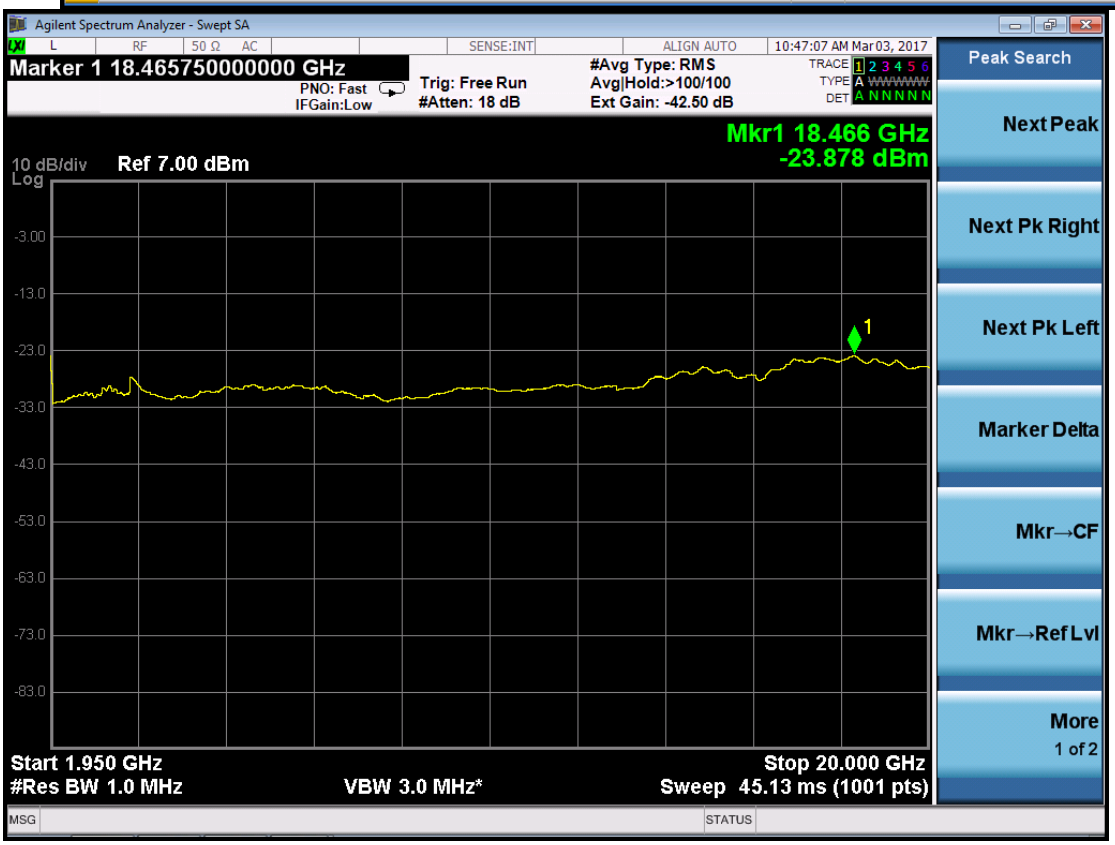

Agilent Spectrum Analyzer - Swept SA
RF 50 Ω DC
SENSE:EXT
ALIGN AUTO
05:16:00 PM Feb 15, 2017
Marker 1 10.128000 kHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 6 dB
Avg Type: Log-Pwr
Avg|Hold: 32/100
Ext Gain: -42.50 dB
TRACE 1 2 3 4 5 6
TYPE A WWWWW
DET S N N N N N
Mkr1 10.128 kHz
-46.168 dBm
10 dB/div
Log
Ref 10.93 dBm
0.930
-9.07
-19.1
-29.1
-39.1
-49.1
-59.1
-69.1
-79.1
1
Start 9.00 kHz
#Res BW 1.0 kHz
VBW 1.0 kHz
Stop 150.00 kHz
Sweep 538 ms (1001 pts)
MSG
STATUS
DC Coupled
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2


Agilent Spectrum Analyzer - Swept SA
RF 50 Ω DC
SENSE:EXT
ALIGN AUTO
05:15:20 PM Feb 15, 2017
Marker 1 4.996200000 MHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 12 dB
Avg Type: Log-Pwr
Avg|Hold: 39/100
Ext Gain: -42.50 dB
TRACE 1 2 3 4 5 6
TYPE A WWWWW
DET S N N N N N
Mkr1 4.996 20 MHz
-40.582 dBm
10 dB/div
Log
Ref 10.93 dBm
0.930
-9.07
-19.1
-29.1
-39.1
-49.1
-59.1
-69.1
-79.1
1
Start 150 kHz
#Res BW 10 kHz
VBW 10 kHz
Stop 10.000 MHz
Sweep 376 ms (1001 pts)
MSG
STATUS
DC Coupled
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2

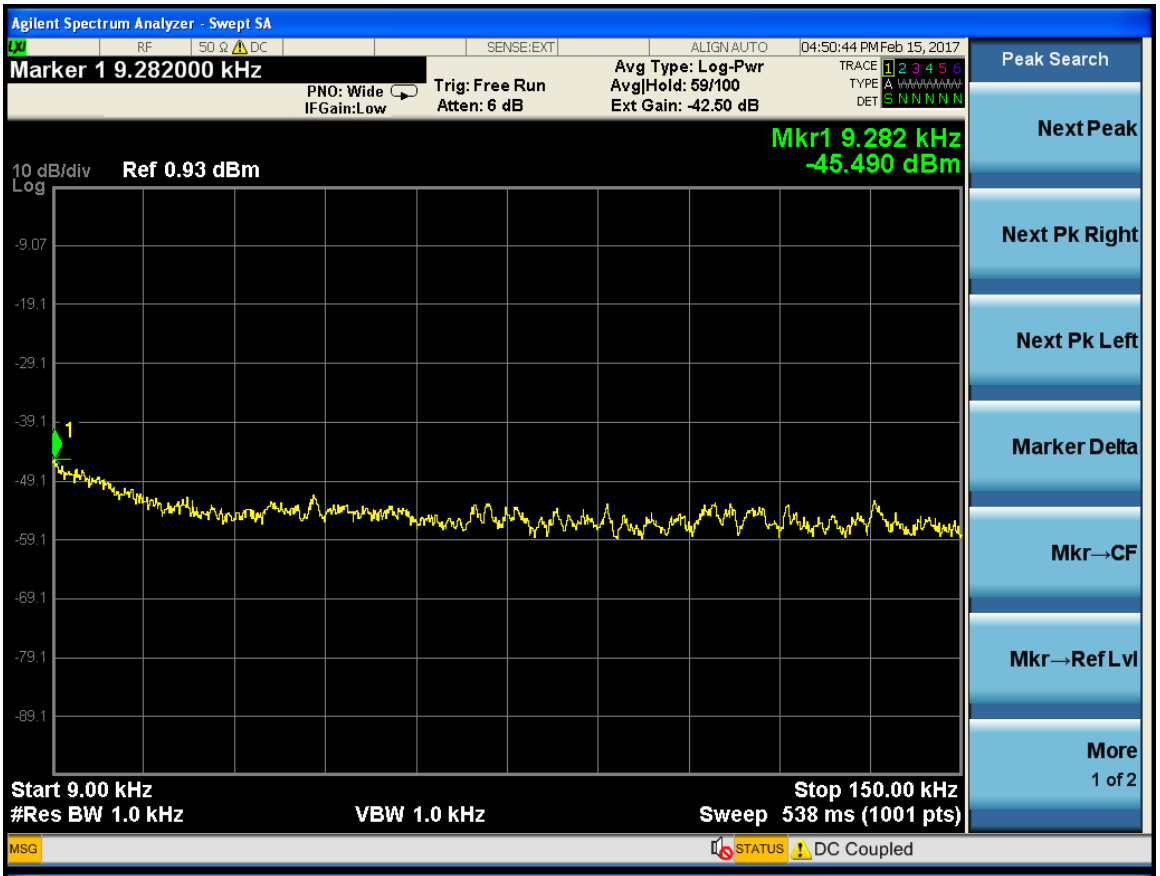

Agilent Spectrum Analyzer - Swept SA
RF 50 Ω AC
SENSE:EXT
ALIGN AUTO
05:14:39 PM Feb 15, 2017
Marker 1 12.440000000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 6 dB
Avg Type: Log-Pwr
Avg|Hold: 24/100
Ext Gain: -42.50 dB
TRACE 1 2 3 4 5 6
TYPE A WWWWW
DET S N N N N N
Mkr1 12.44 MHz
-62.291 dBm
10 dB/div
Log
Ref 10.93 dBm
0.930
-9.07
-19.1
-29.1
-39.1
-49.1
-59.1
-69.1
-79.1
Start 10.00 MHz
#Res BW 10 kHz
VBW 10 kHz
Stop 30.00 MHz
Sweep 763 ms (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
MSG
STATUS

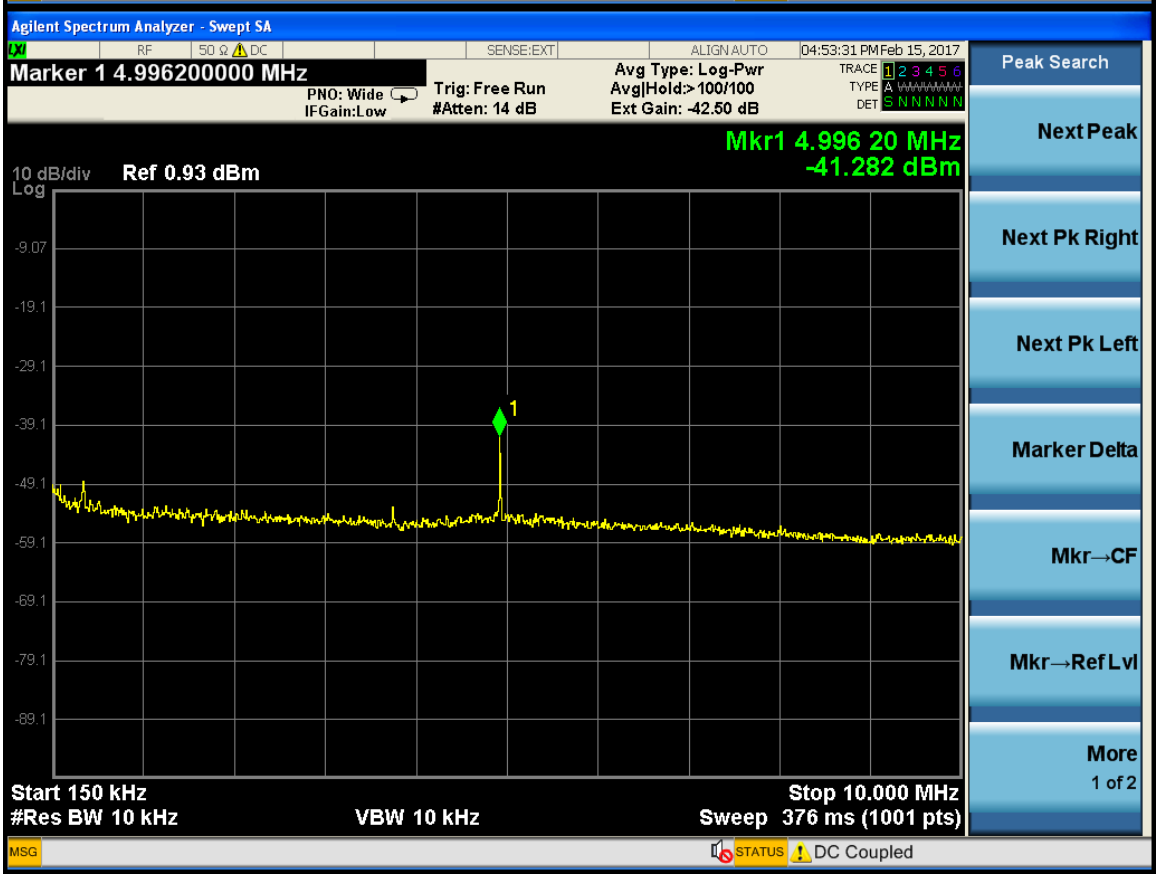

Agilent Spectrum Analyzer - Swept SA
RF 50 Ω AC
SENSE:EXT
ALIGN AUTO
05:13:36 PM Feb 15, 2017
Marker 1 341.370000000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 6 dB
Avg Type: Log-Pwr
Avg|Hold: 33/100
Ext Gain: -42.50 dB
TRACE 1 2 3 4 5 6
TYPE A WWWWW
DET S N N N N N
Mkr1 341.37 MHz
-44.141 dBm
10 dB/div
Log
Ref 10.93 dBm
0.930
-9.07
-19.1
-29.1
-39.1
-49.1
-59.1
-69.1
-79.1
Start 30.0 MHz
#Res BW 100 kHz
VBW 100 kHz
Stop 1.0000 GHz
Sweep 370 ms (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
MSG
STATUS

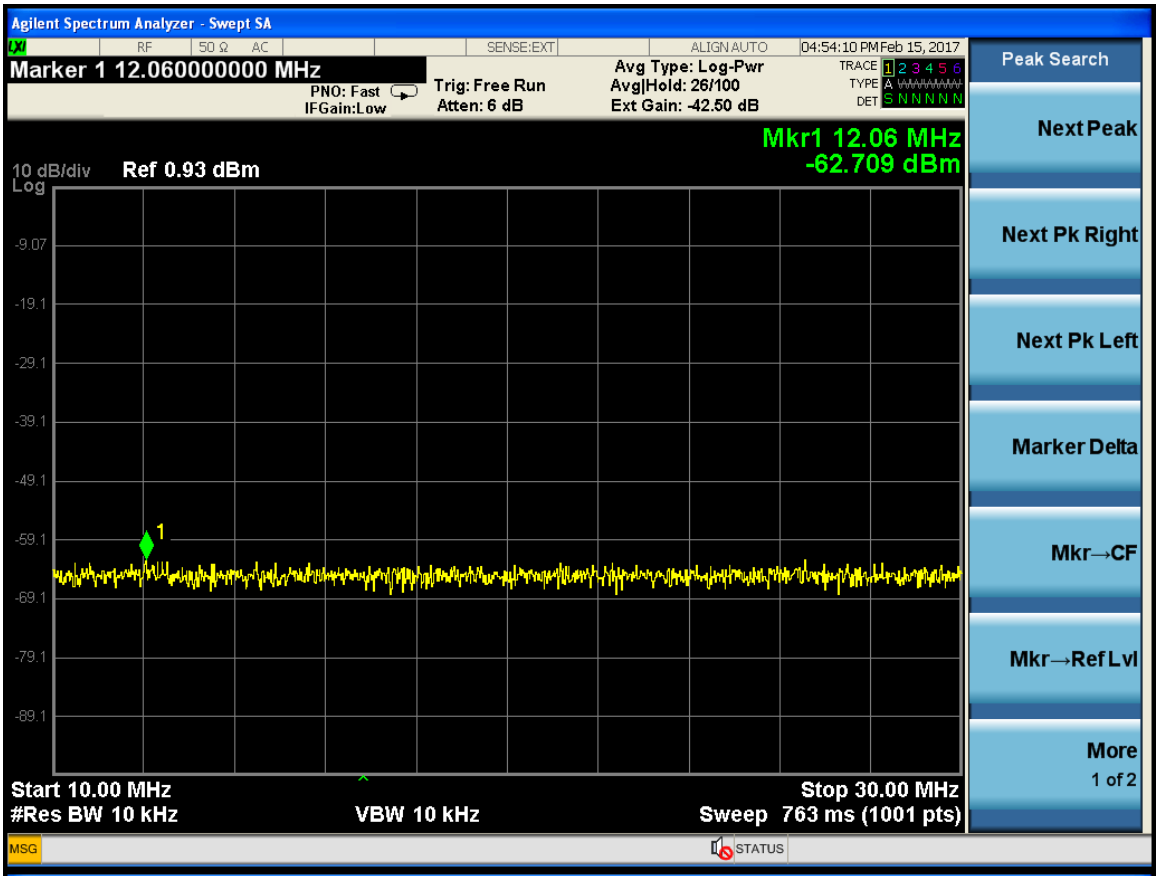


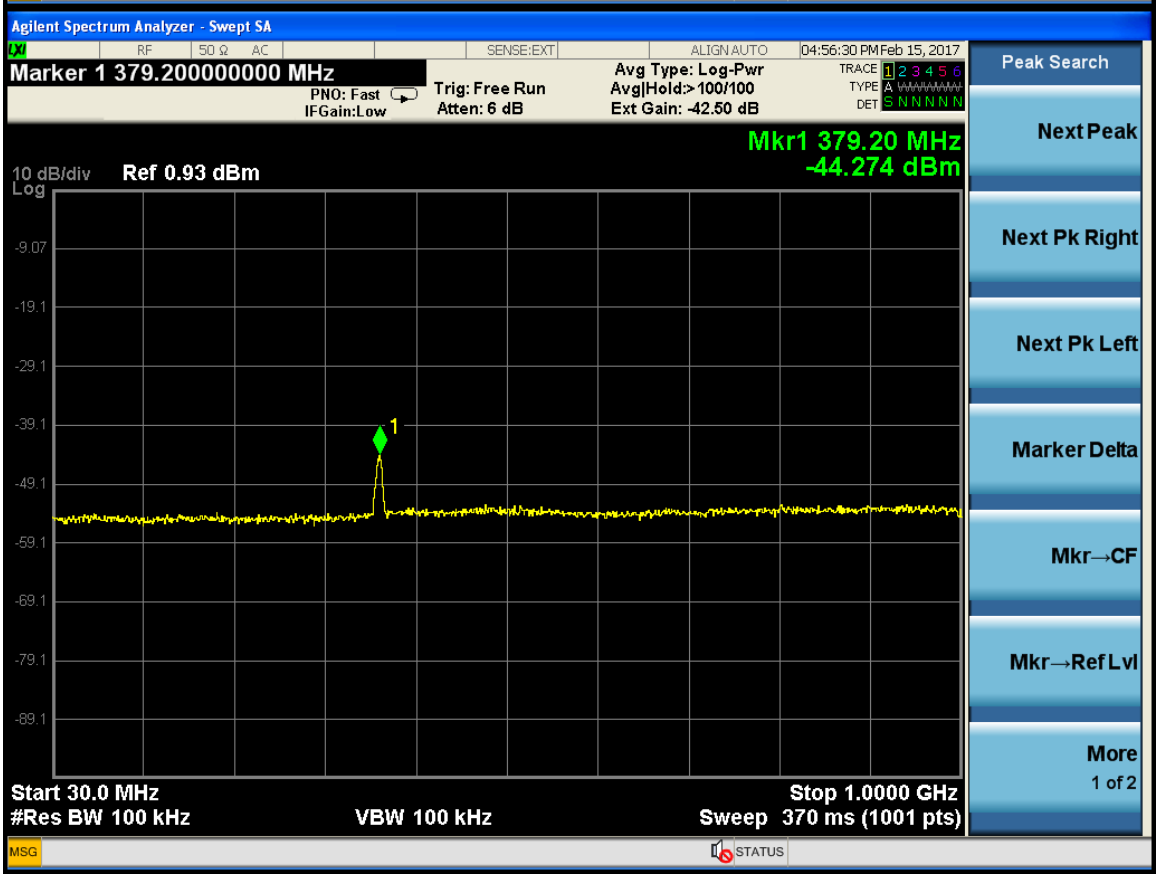


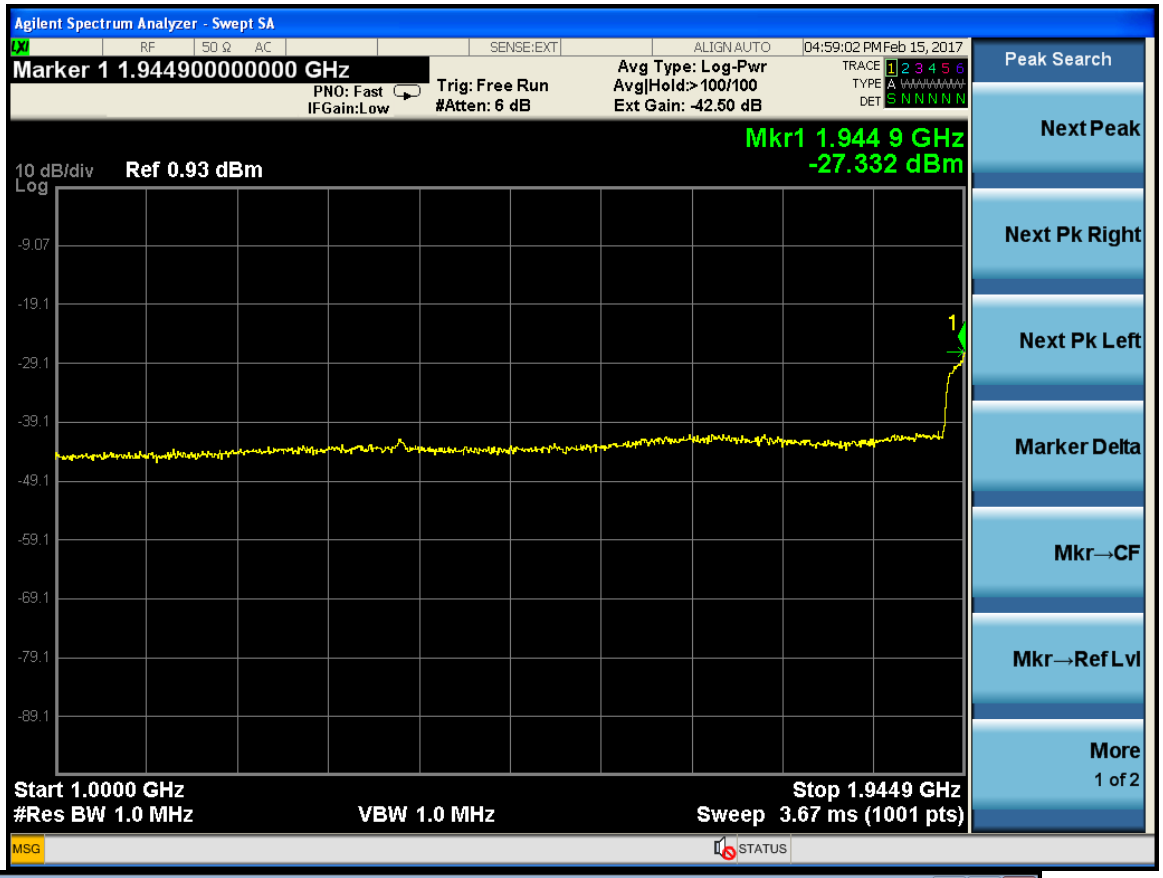
Two carriers (working in middle frequency)


Agilent Spectrum Analyzer - Swept SA
RF
50 Ω DC
SENSE:EXT
ALIGN AUTO
04:50:44 PM Feb 15, 2017
Marker 1 9.282000 kHz
PNO: Wide
IFGain:Low
Trig: Free Run
Atten: 6 dB
Avg Type: Log-Pwr
Avg|Hold: 59/100
Ext Gain: -42.50 dB
TRACE 1 2 3 4 5 6
TYPE A WWWWW
DET S N N N N N
Mkr1 9.282 kHz
-45.490 dBm
10 dB/div
Log
Ref 0.93 dBm
-9.07
-19.1
-29.1
-39.1
-49.1
-59.1
-69.1
-79.1
-89.1
Start 9.00 kHz
#Res BW 1.0 kHz
VBW 1.0 kHz
Stop 150.00 kHz
Sweep 538 ms (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
MSG
STATUS
DC Coupled

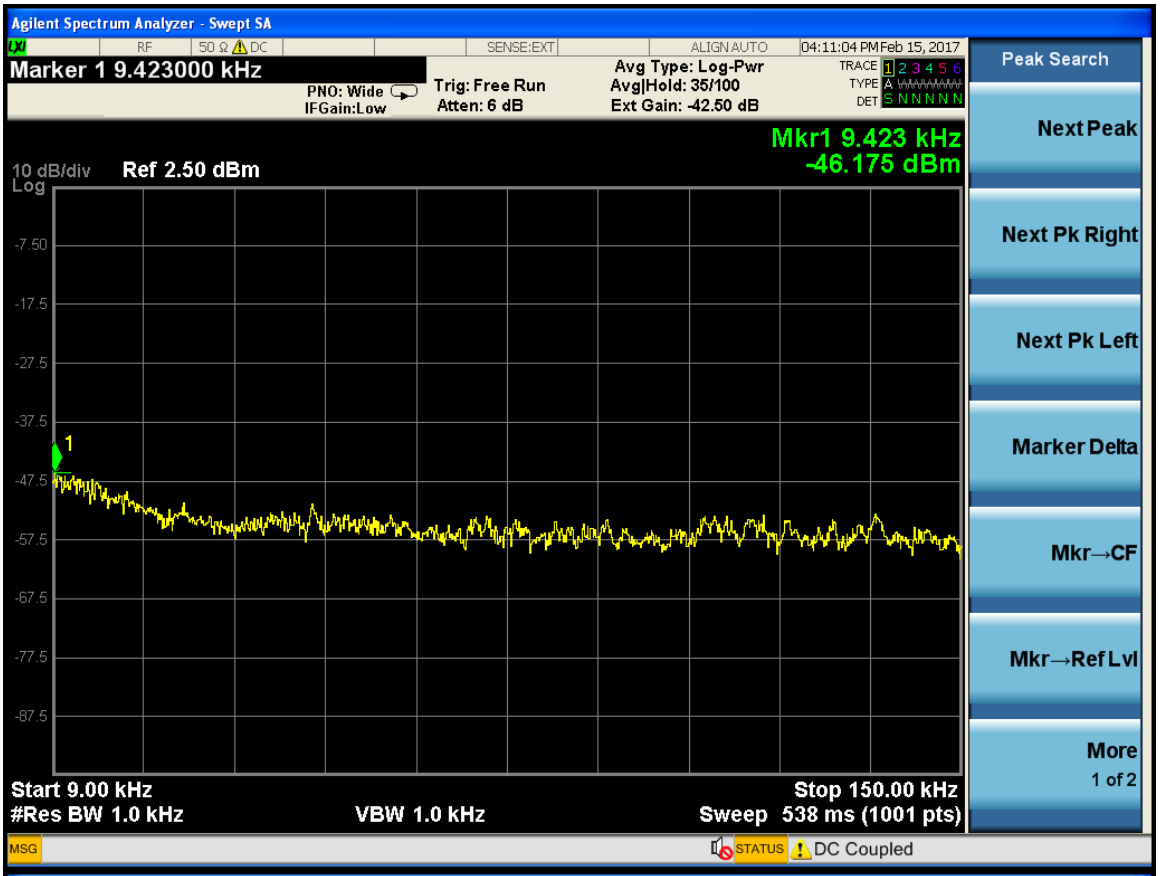

Agilent Spectrum Analyzer - Swept SA
RF
50 Ω DC
SENSE:EXT
ALIGN AUTO
04:53:31 PM Feb 15, 2017
Marker 1 4.996200000 MHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 14 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
Ext Gain: -42.50 dB
TRACE 1 2 3 4 5 6
TYPE A WWWWW
DET S N N N N N
Mkr1 4.996 20 MHz
-41.282 dBm
10 dB/div
Log
Ref 0.93 dBm
-9.07
-19.1
-29.1
-39.1
-49.1
-59.1
-69.1
-79.1
-89.1
Start 150 kHz
#Res BW 10 kHz
VBW 10 kHz
Stop 10.000 MHz
Sweep 376 ms (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
MSG
STATUS
DC Coupled

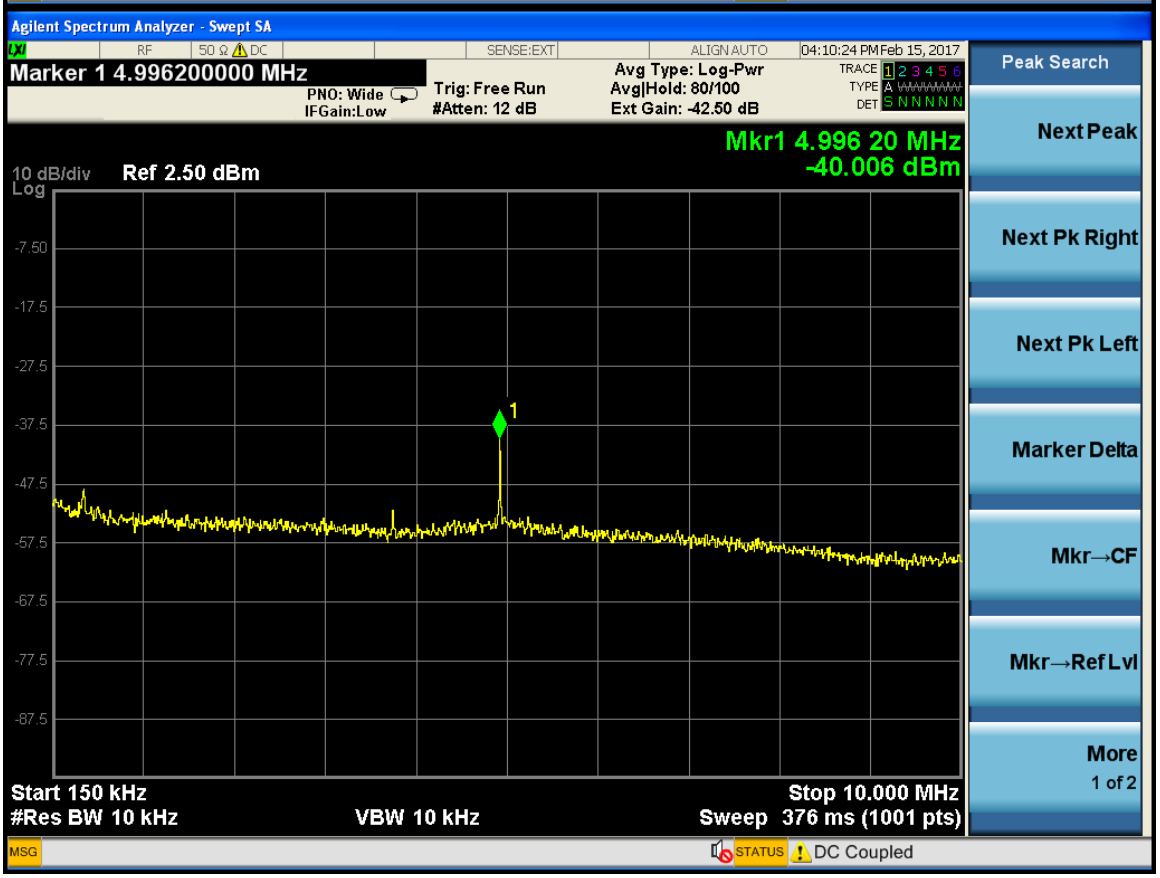

Agilent Spectrum Analyzer - Swept SA
RF 50 Ω AC
SENSE:EXT
ALIGN AUTO
04:54:10 PM Feb 15, 2017
Marker 1 12.060000000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 6 dB
Avg Type: Log-Pwr
Avg|Hold: 26/100
Ext Gain: -42.50 dB
TRACE 1 2 3 4 5 6
TYPE A WWWWW
DET S N N N N N
Mkr1 12.06 MHz
-62.709 dBm
10 dB/div
Log
Ref 0.93 dBm
-9.07
-19.1
-29.1
-39.1
-49.1
-59.1
-69.1
-79.1
-89.1
1
Start 10.00 MHz
#Res BW 10 kHz
VBW 10 kHz
Stop 30.00 MHz
Sweep 763 ms (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
MSG
STATUS

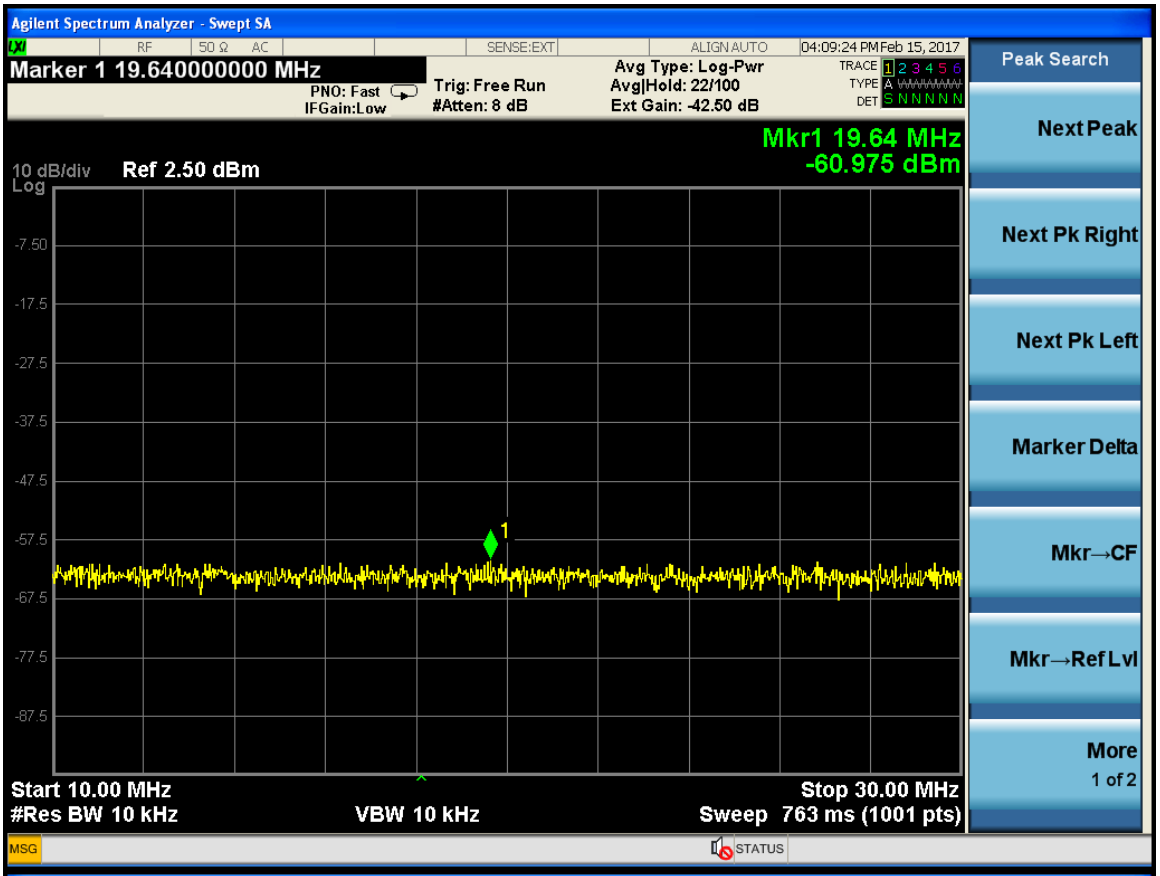

Agilent Spectrum Analyzer - Swept SA
RF 50 Ω AC
SENSE:EXT
ALIGN AUTO
04:56:30 PM Feb 15, 2017
Marker 1 379.200000000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 6 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
Ext Gain: -42.50 dB
TRACE 1 2 3 4 5 6
TYPE A WWWWW
DET S N N N N N
Mkr1 379.20 MHz
-44.274 dBm
10 dB/div
Log
Ref 0.93 dBm
-9.07
-19.1
-29.1
-39.1
-49.1
-59.1
-69.1
-79.1
-89.1
1
Start 30.0 MHz
#Res BW 100 kHz
VBW 100 kHz
Stop 1.0000 GHz
Sweep 370 ms (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
MSG
STATUS

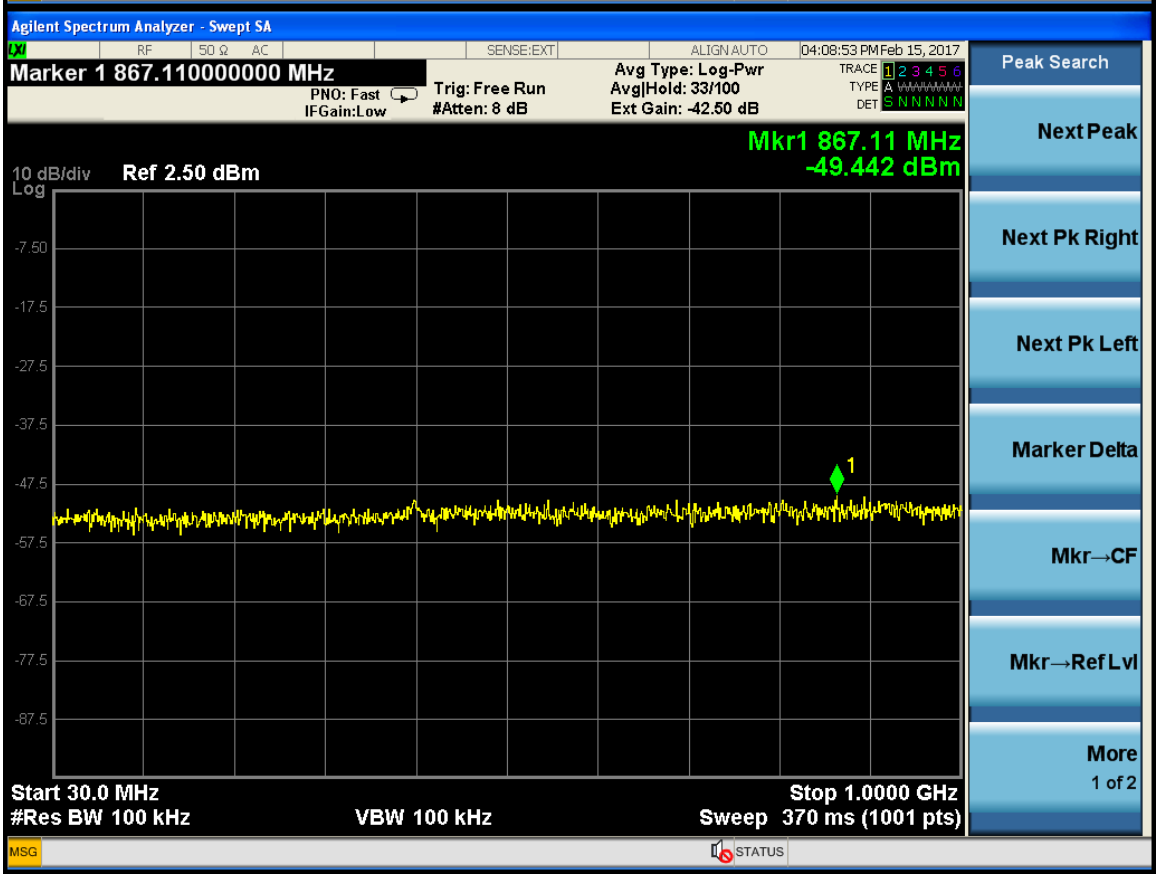


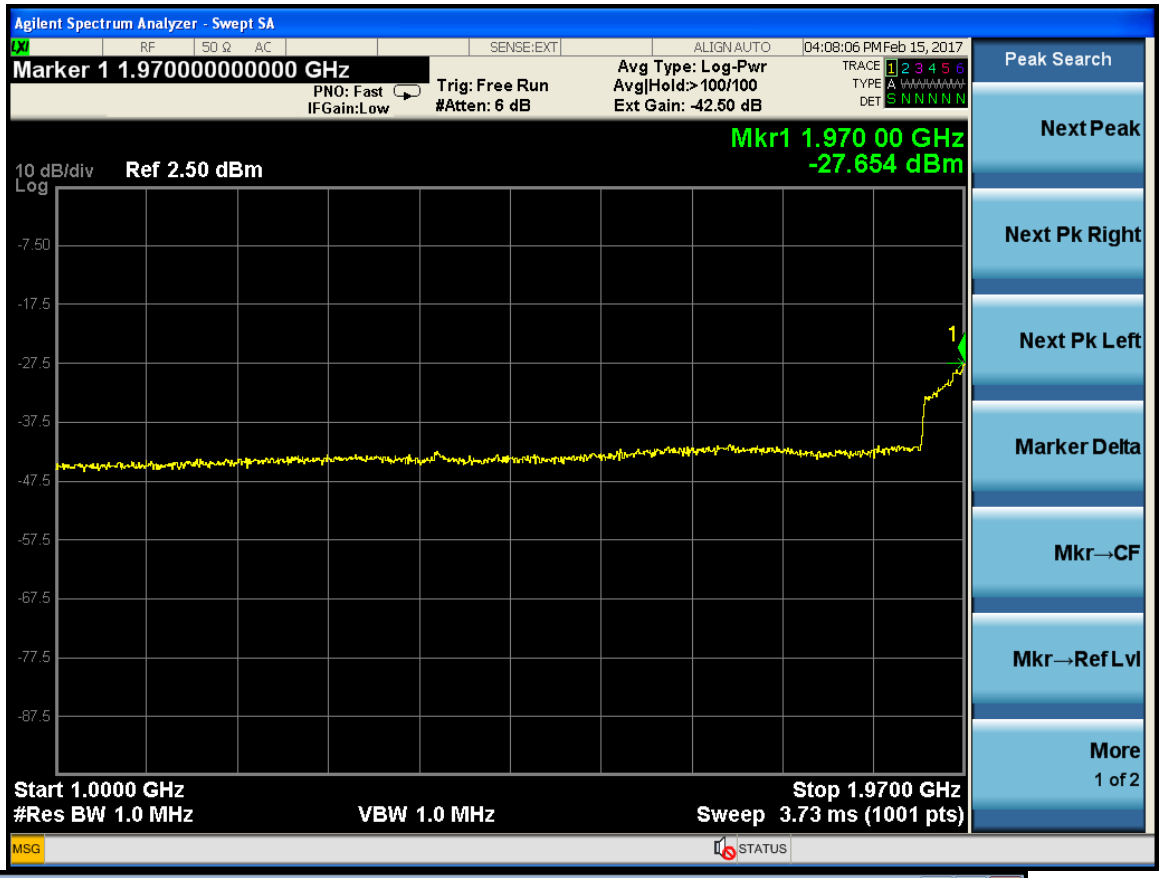
Two carriers (working in top frequency)


Agilent Spectrum Analyzer - Swept SA
RF
50 Ω DC
SENSE:EXT
ALIGN AUTO
04:11:04 PM Feb 15, 2017
Marker 1 9.423000 kHz
PNO: Wide
IFGain:Low
Trig: Free Run
Atten: 6 dB
Avg Type: Log-Pwr
Avg|Hold: 35/100
Ext Gain: -42.50 dB
TRACE 1 2 3 4 5 6
TYPE A WWWWW
DET S N N N N N
Mkr1 9.423 kHz
-46.175 dBm
10 dB/div
Log
Ref 2.50 dBm
-7.50
-17.5
-27.5
-37.5
-47.5
-57.5
-67.5
-77.5
-87.5
1
Start 9.00 kHz
#Res BW 1.0 kHz
VBW 1.0 kHz
Stop 150.00 kHz
Sweep 538 ms (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
MSG
STATUS
DC Coupled


Agilent Spectrum Analyzer - Swept SA
RF
50 Ω DC
SENSE:EXT
ALIGN AUTO
04:10:24 PM Feb 15, 2017
Marker 1 4.996200000 MHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 12 dB
Avg Type: Log-Pwr
Avg|Hold: 80/100
Ext Gain: -42.50 dB
TRACE 1 2 3 4 5 6
TYPE A WWWWW
DET S N N N N N
Mkr1 4.996 20 MHz
-40.006 dBm
10 dB/div
Log
Ref 2.50 dBm
-7.50
-17.5
-27.5
-37.5
-47.5
-57.5
-67.5
-77.5
-87.5
1
Start 150 kHz
#Res BW 10 kHz
VBW 10 kHz
Stop 10.000 MHz
Sweep 376 ms (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
MSG
STATUS
DC Coupled


Agilent Spectrum Analyzer - Swept SA
RF 50 Ω AC
SENSE:EXT
ALIGN AUTO
04:09:24 PM Feb 15, 2017
Marker 1 19.640000000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 8 dB
Avg Type: Log-Pwr
Avg|Hold: 22/100
Ext Gain: -42.50 dB
TRACE 1 2 3 4 5 6
TYPE A WWWWW
DET S N N N N N
Mkr1 19.64 MHz
-60.975 dBm
10 dB/div
Log
Ref 2.50 dBm
-7.50
-17.5
-27.5
-37.5
-47.5
-57.5
-67.5
-77.5
-87.5
1
Start 10.00 MHz
#Res BW 10 kHz
VBW 10 kHz
Stop 30.00 MHz
Sweep 763 ms (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
MSG
STATUS


Agilent Spectrum Analyzer - Swept SA
RF 50 Ω AC
SENSE:EXT
ALIGN AUTO
04:08:53 PM Feb 15, 2017
Marker 1 867.110000000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 8 dB
Avg Type: Log-Pwr
Avg|Hold: 33/100
Ext Gain: -42.50 dB
TRACE 1 2 3 4 5 6
TYPE A WWWWW
DET S N N N N N
Mkr1 867.11 MHz
-49.442 dBm
10 dB/div
Log
Ref 2.50 dBm
-7.50
-17.5
-27.5
-37.5
-47.5
-57.5
-67.5
-77.5
-87.5
1
Start 30.0 MHz
#Res BW 100 kHz
VBW 100 kHz
Stop 1.0000 GHz
Sweep 370 ms (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
MSG
STATUS


Agilent Spectrum Analyzer - Swept SA
RF 50 Ω AC
SENSE:EXT
ALIGN AUTO
04:08:06 PM Feb 15, 2017
Marker 1 1.970000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 6 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
Ext Gain: -42.50 dB
TRACE 1 2 3 4 5 6
TYPE A WWWWW
DET S N N N N N
Mkr1 1.970 00 GHz
-27.654 dBm
10 dB/div
Log
Ref 2.50 dBm
-7.50
-17.5
-27.5
-37.5
-47.5
-57.5
-67.5
-77.5
-87.5
Start 1.0000 GHz
#Res BW 1.0 MHz
VBW 1.0 MHz
Stop 1.9700 GHz
Sweep 3.73 ms (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
MSG
STATUS


Agilent Spectrum Analyzer - Swept SA
L RF 50 Ω AC
SENSE:INT
ALIGN AUTO
11:09:07 AM Mar 03, 2017
Marker 1 18.470000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 18 dB
#Avg Type: RMS
Avg|Hold: 48/100
Ext Gain: -42.50 dB
TRACE 1 2 3 4 5 6
TYPE A WWWWW
DET A N N N N N
Mkr1 18.470 GHz
-23.862 dBm
10 dB/div
Log
Ref 37.00 dBm
27.0
17.0
7.00
-3.00
-13.0
-23.0
-33.0
-43.0
-53.0
Start 2.000 GHz
#Res BW 1.0 MHz
VBW 3.0 MHz*
Stop 20.000 GHz
Sweep 45.00 ms (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
MSG
STATUS

11 OCCUPIED BANDWIDTH

11.1 Applicable Standard: FCC §2.1049 §24.229 §24.238

11.2 Test Equipment List and Details:

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	MXA Series Spectrum Analyzer	N9020A	MY51160170	2016-6-22	2017-6-21
YLT	40dB Attenuator	SJ-SN-200	2009010555	N.A	N.A
Forstar	Forstar RF Cable	031-D	1034	N.A	N.A

*__statement of traceability:__ ZTE Corporation Reliability Testing Center attest that all calibration have been performed per the NVLAP requirements, traceable to NIST.

11.3 Test Procedure

The RF out of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation. The resolution bandwidth of the spectrum analyzer was set at 1% of the span or higher and 99%Power bandwidth was recorded.

11.4 Environmental Conditions

Temperature:	25 ° C
Relative Humidity:	53%
ATM Pressure:	1009mbar

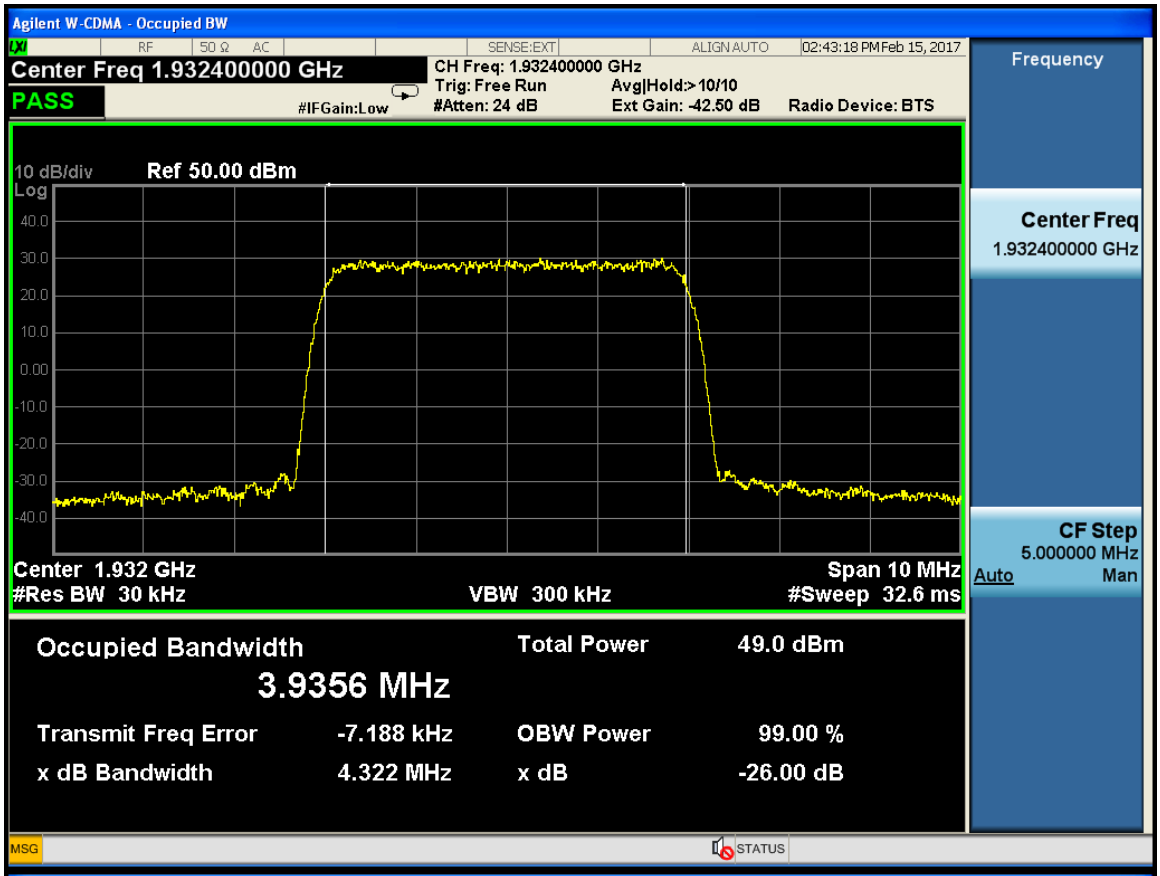
11.5 Test Result: Pass

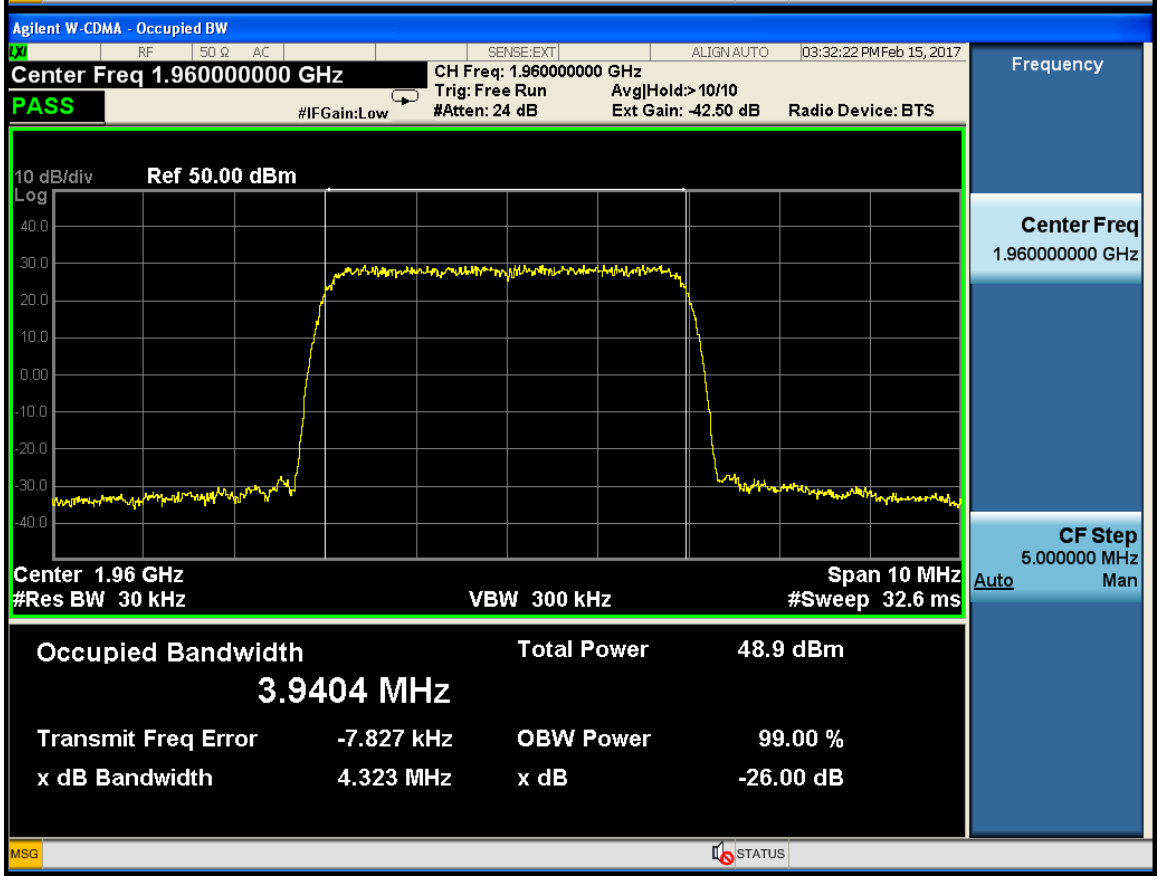
11.6 Test Mode: Transmitting UMTS

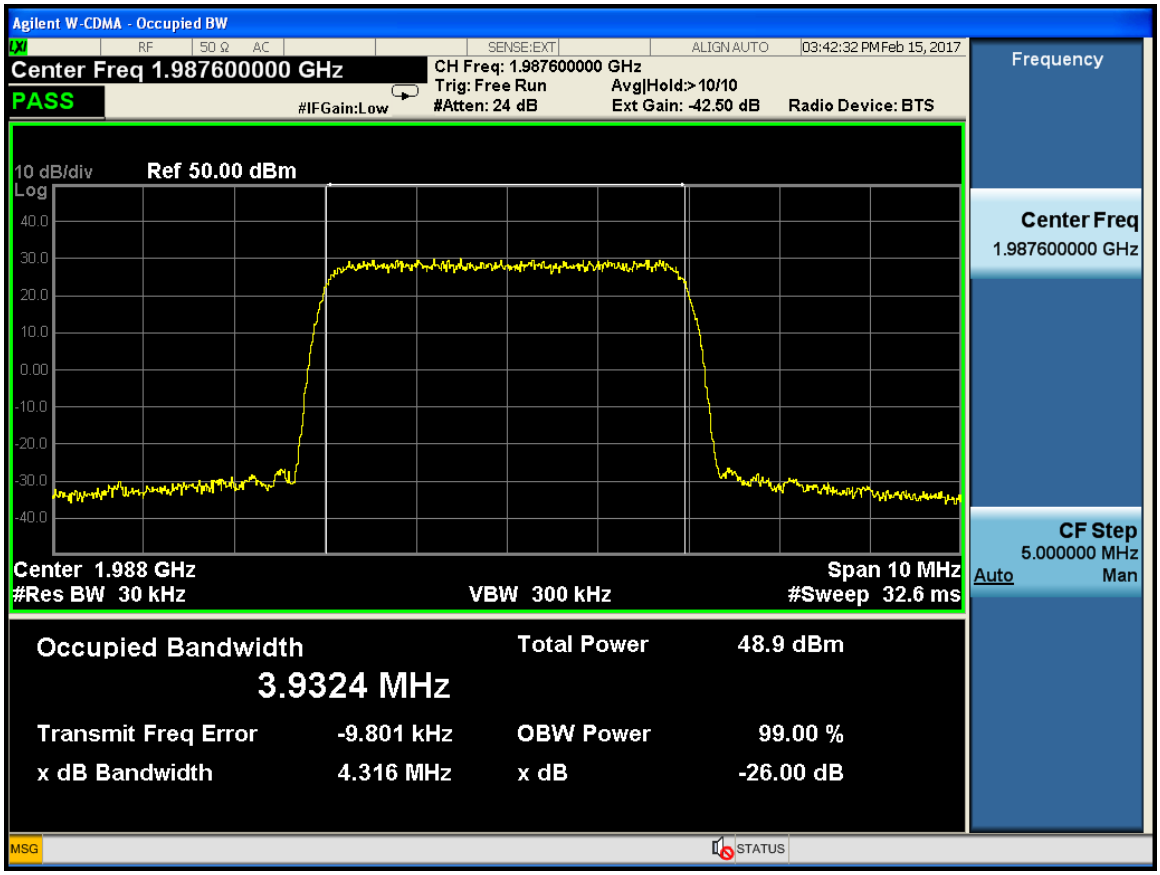
11.7 Test Data

One carrier

Frequency (MHz)	99% Power Bandwidth (MHz)	Limit (MHz)
1932.4	3.9356	<5
1960	3.9404	<5
1987.6	3.9324	<5

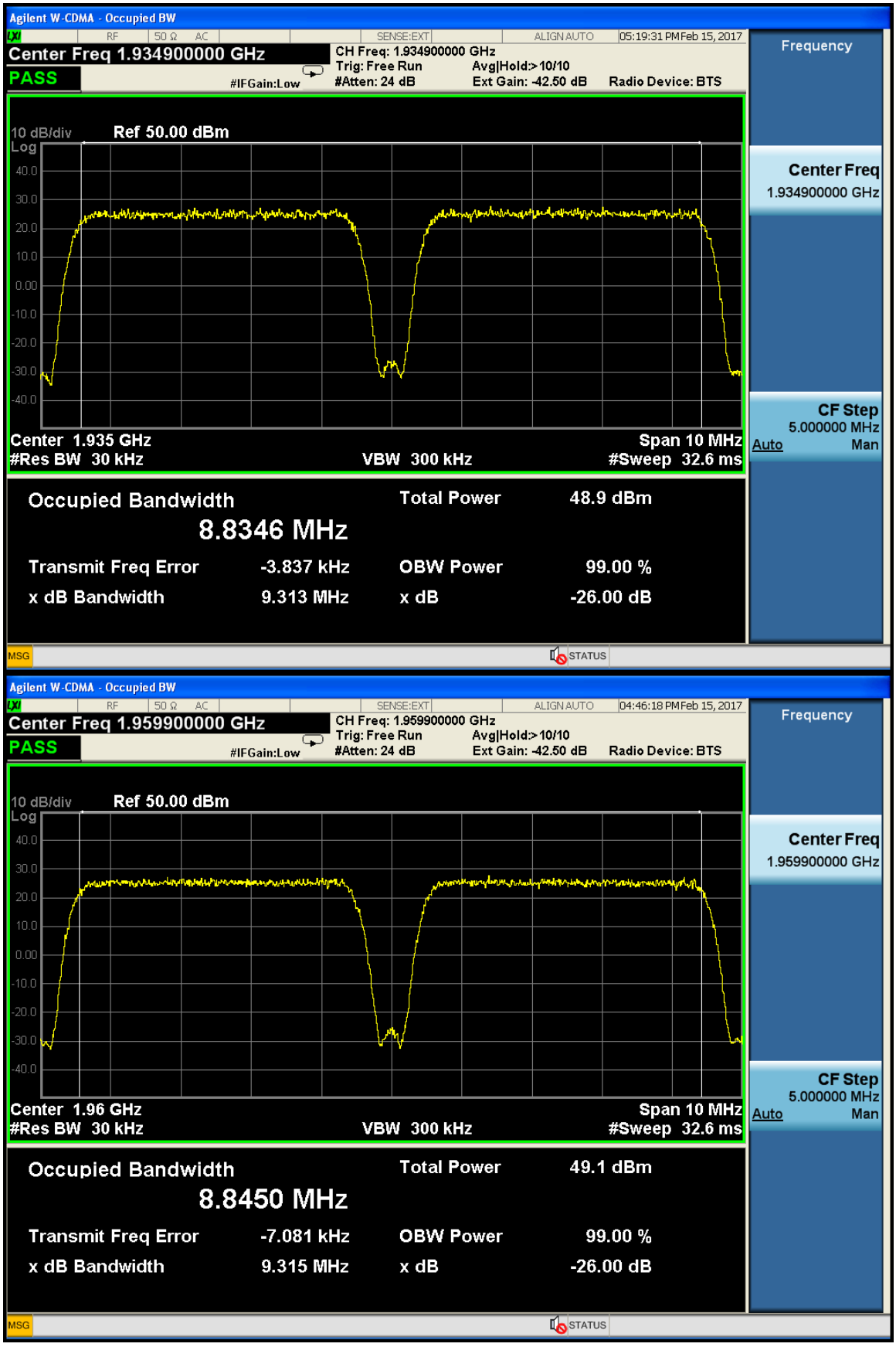

Agilent W-CDMA - Occupied BW
RF 50 Ω AC
SENSE:EXT
ALIGN AUTO
02:43:18 PM Feb 15, 2017
Center Freq 1.932400000 GHz
PASS
#IFGain:Low
CH Freq: 1.932400000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 24 dB
Ext Gain: -42.50 dB
Radio Device: BTS
Frequency
10 dB/div
Log
Ref 50.00 dBm
40.0
30.0
20.0
10.0
0.00
-10.0
-20.0
-30.0
-40.0
Center Freq
1.932400000 GHz
CF Step
5.000000 MHz
Auto
Man
Center 1.932 GHz
#Res BW 30 kHz
VBW 300 kHz
Span 10 MHz
#Sweep 32.6 ms
Occupied Bandwidth
3.9356 MHz
Total Power
49.0 dBm
Transmit Freq Error
-7.188 kHz
OBW Power
99.00 %
x dB Bandwidth
4.322 MHz
x dB
-26.00 dB
MSG
STATUS

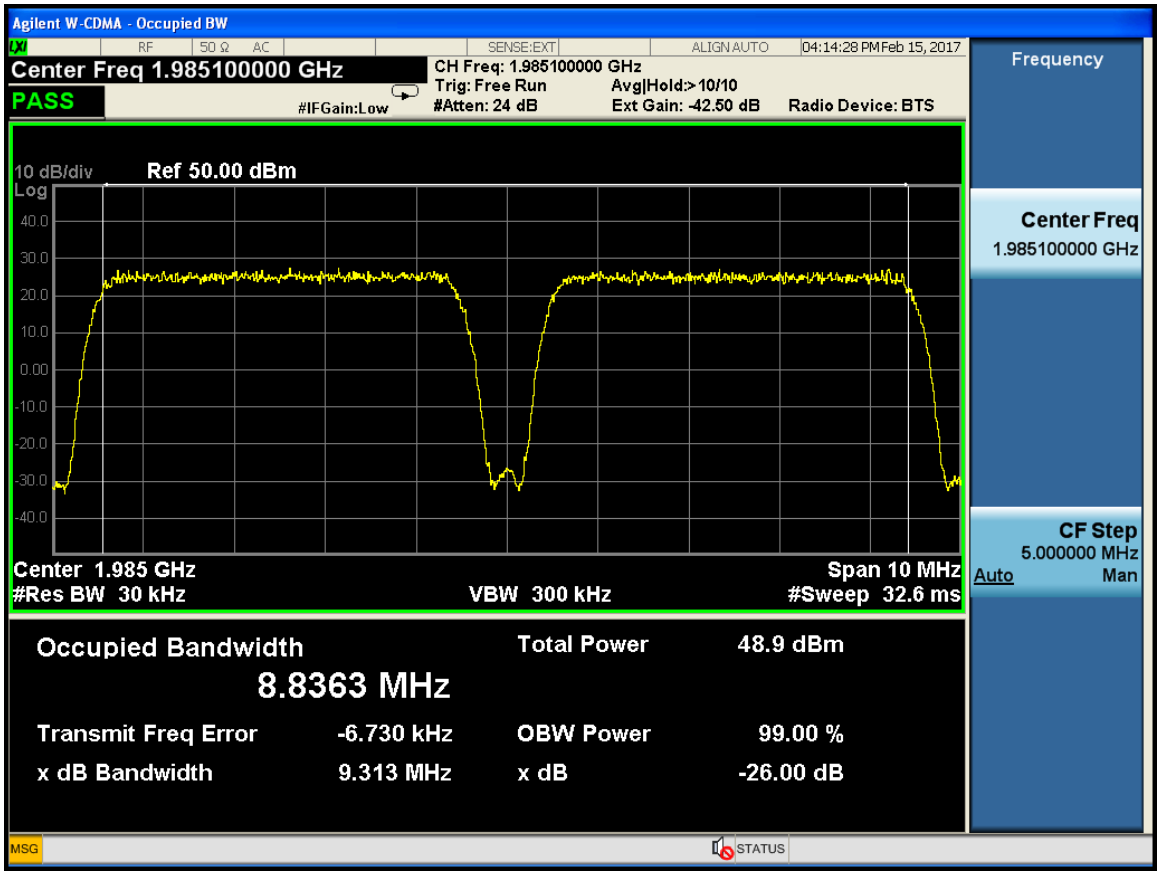

Agilent W-CDMA - Occupied BW
RF 50 Ω AC
SENSE:EXT
ALIGN AUTO
03:32:22 PM Feb 15, 2017
Center Freq 1.960000000 GHz
PASS
#IFGain:Low
CH Freq: 1.960000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 24 dB
Ext Gain: -42.50 dB
Radio Device: BTS
Frequency
10 dB/div
Log
Ref 50.00 dBm
40.0
30.0
20.0
10.0
0.00
-10.0
-20.0
-30.0
-40.0
Center Freq
1.960000000 GHz
CF Step
5.000000 MHz
Auto
Man
Center 1.96 GHz
#Res BW 30 kHz
VBW 300 kHz
Span 10 MHz
#Sweep 32.6 ms
Occupied Bandwidth
3.9404 MHz
Total Power
48.9 dBm
Transmit Freq Error
-7.827 kHz
OBW Power
99.00 %
x dB Bandwidth
4.323 MHz
x dB
-26.00 dB
MSG
STATUS



Two carriers

Frequency (MHz)	99% Power Bandwidth (MHz)	Limit (MHz)
1932.4/1937.4	8.8346	<10
1957.4/1962.4	8.845	<10
1982.6/1987.6	8.8363	<10


Agilent W-CDMA - Occupied BW
RF 50 Ω AC
SENSE:EXT
ALIGN AUTO
05:19:31 PM Feb 15, 2017
Center Freq 1.934900000 GHz
PASS
#IFGain:Low
CH Freq: 1.934900000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 24 dB
Ext Gain: -42.50 dB
Radio Device: BTS
Frequency
10 dB/div
Log
Ref 50.00 dBm
40.0
30.0
20.0
10.0
0.00
-10.0
-20.0
-30.0
-40.0
Center Freq
1.934900000 GHz
Center 1.935 GHz
#Res BW 30 kHz
VBW 300 kHz
Span 10 MHz
#Sweep 32.6 ms
CF Step
5.000000 MHz
Auto
Man
Occupied Bandwidth
8.8346 MHz
Total Power
48.9 dBm
Transmit Freq Error
-3.837 kHz
OBW Power
99.00 %
x dB Bandwidth
9.313 MHz
x dB
-26.00 dB
MSG
STATUS
Agilent W-CDMA - Occupied BW
RF 50 Ω AC
SENSE:EXT
ALIGN AUTO
04:46:18 PM Feb 15, 2017
Center Freq 1.959900000 GHz
PASS
#IFGain:Low
CH Freq: 1.959900000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 24 dB
Ext Gain: -42.50 dB
Radio Device: BTS
Frequency
10 dB/div
Log
Ref 50.00 dBm
40.0
30.0
20.0
10.0
0.00
-10.0
-20.0
-30.0
-40.0
Center Freq
1.959900000 GHz
Center 1.96 GHz
#Res BW 30 kHz
VBW 300 kHz
Span 10 MHz
#Sweep 32.6 ms
CF Step
5.000000 MHz
Auto
Man
Occupied Bandwidth
8.8450 MHz
Total Power
49.1 dBm
Transmit Freq Error
-7.081 kHz
OBW Power
99.00 %
x dB Bandwidth
9.315 MHz
x dB
-26.00 dB
MSG
STATUS


Agilent W-CDMA - Occupied BW
RF
50 Ω AC
SENSE:EXT
ALIGN AUTO
04:14:28 PM Feb 15, 2017
Center Freq 1.985100000 GHz
PASS
#IFGain:Low
CH Freq: 1.985100000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 24 dB
Ext Gain: -42.50 dB
Radio Device: BTS
Frequency
10 dB/div
Log
Ref 50.00 dBm
40.0
30.0
20.0
10.0
0.00
-10.0
-20.0
-30.0
-40.0
Center Freq
1.985100000 GHz
CF Step
5.000000 MHz
Auto
Man
Center 1.985 GHz
#Res BW 30 kHz
VBW 300 kHz
Span 10 MHz
#Sweep 32.6 ms
Occupied Bandwidth
8.8363 MHz
Total Power
48.9 dBm
Transmit Freq Error
-6.730 kHz
OBW Power
99.00 %
x dB Bandwidth
9.313 MHz
x dB
-26.00 dB
MSG
STATUS

12 BAND EDGES

12.1 Applicable Standard: FCC §2.1051 §24.238

According to §2.1051 and §24.238, the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (p) by a factor of at least 43 + 10 log (p) dB. The limit (dBm) should < P –(43+10log(P)) = -13dBm.

12.2 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	MXA Series Spectrum Analyzer	N9020A	MY51160170	2016-6-22	2017-6-21
YLT	40dB Attenuator	SJ-SN-200	2009010555	N.A	N.A
Forstar	Forstar RF Cable	031-D	1034	N.A	N.A

*__statement of traceability:__ ZTE Corporation Reliability Testing Center attest that all calibration have been performed per the NVLAP requirements, traceable to NIST.

12.3 Test Procedure

The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.
The center of the spectrum analyzer was set to block edge frequency.

12.4 Test Data Environmental Conditions

Temperature:	25 °C
Relative Humidity:	53%
ATM Pressure:	1009mbar

12.5 Test Result: Pass

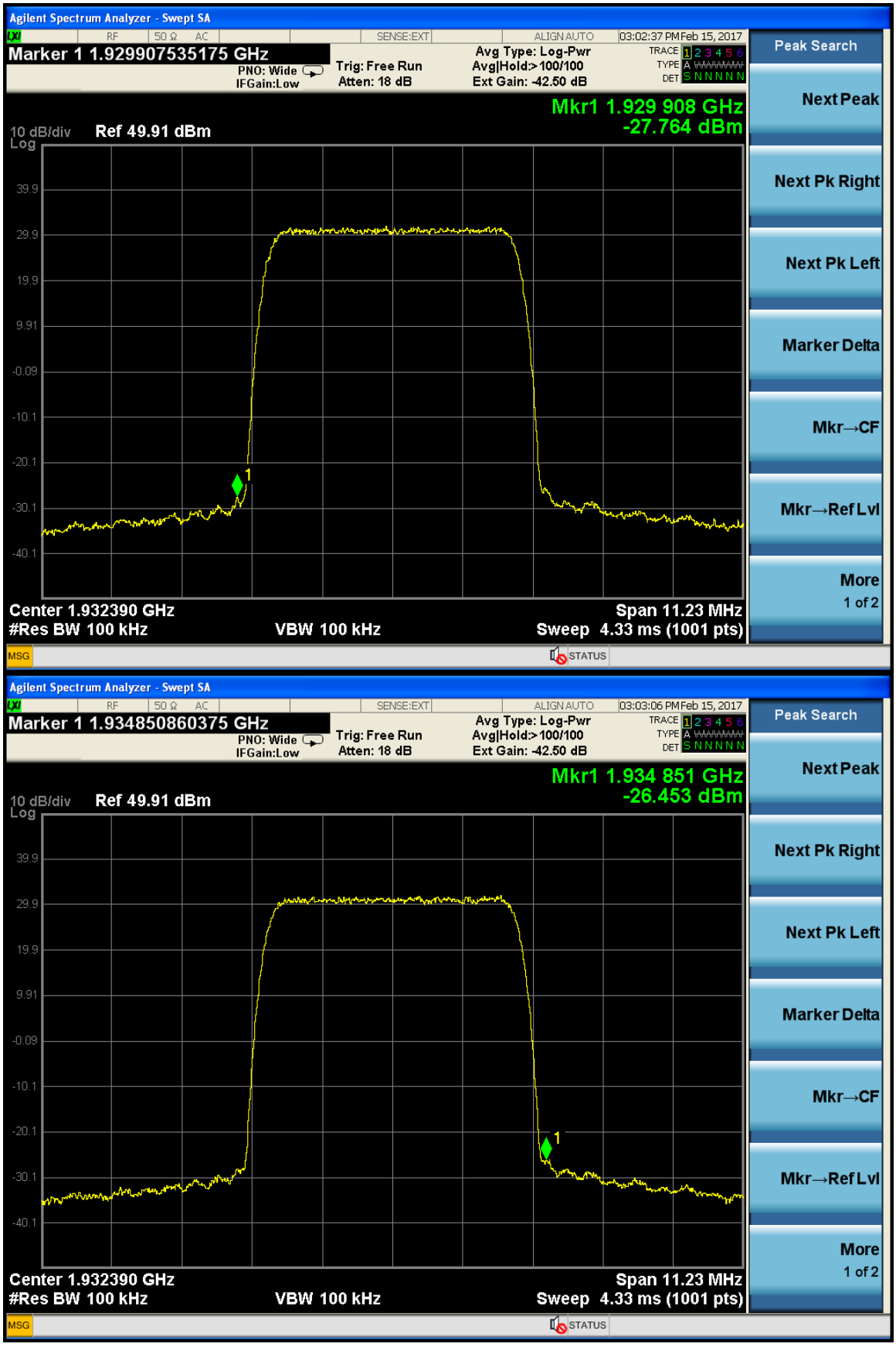
12.6 Test Mode: Transmitting UMTS

12.7 Test Data

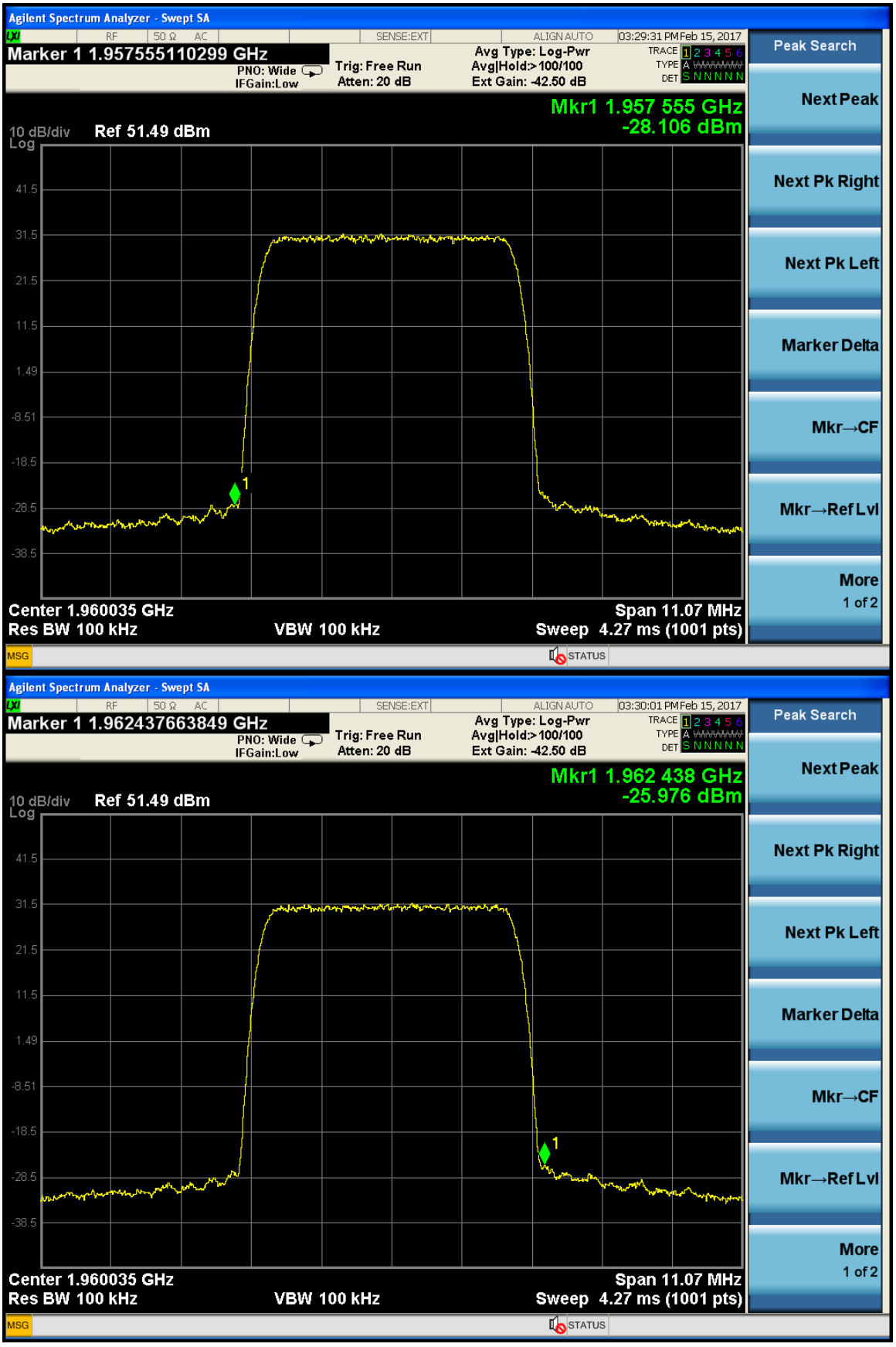
One carrier

Frequency channel	Max bandedge Emission (dBm)	Limit (dBm)
1932.4	27.76 / 26.45	-13.00
1960	28.11 / 25.98	-13.00
1987.6	26.92 / 25.63	-13.00

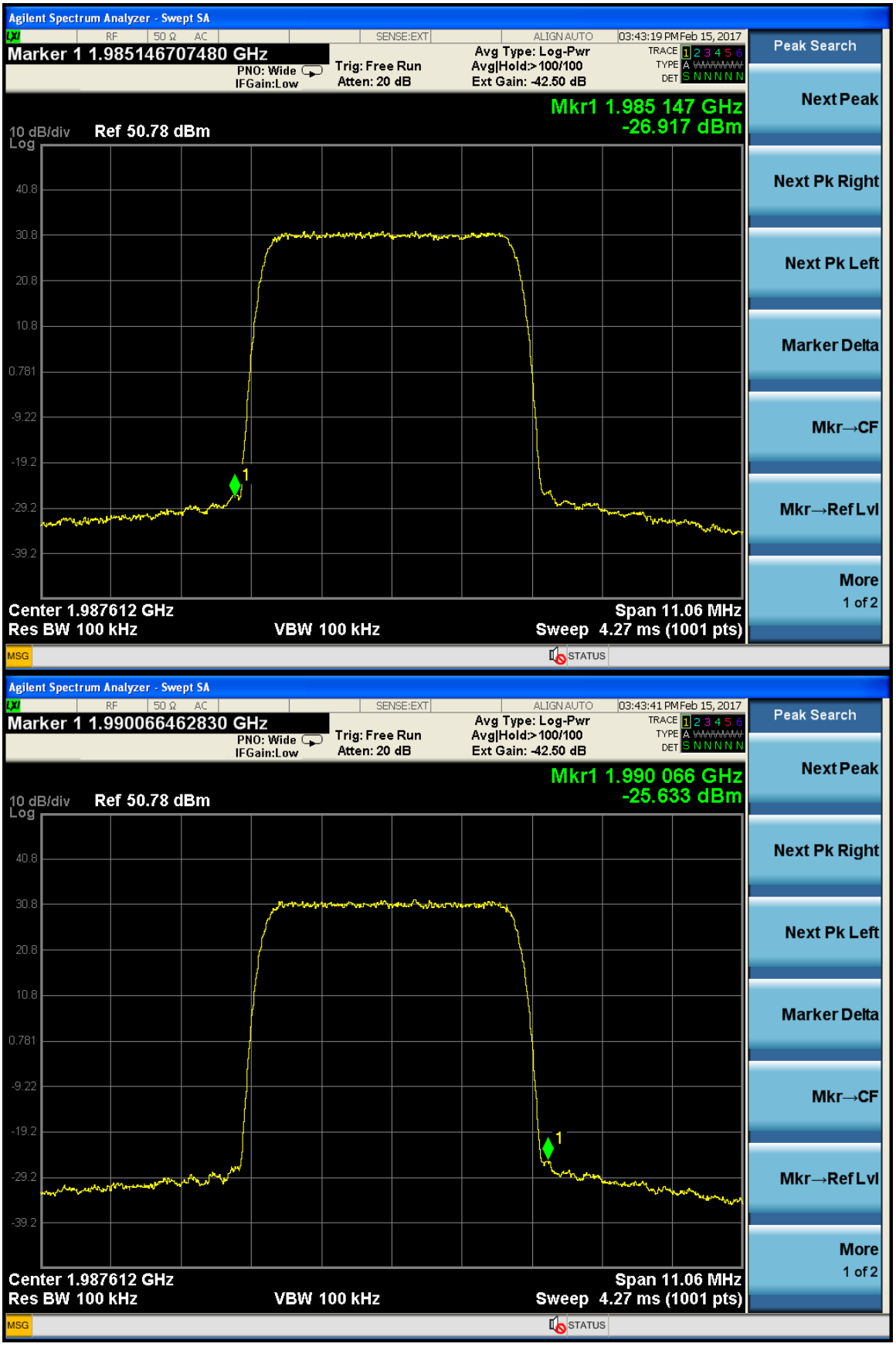
For One carrier (working in bottom frequency)



For One carrier (working in middle frequency)



For One carrier (working in top frequency)

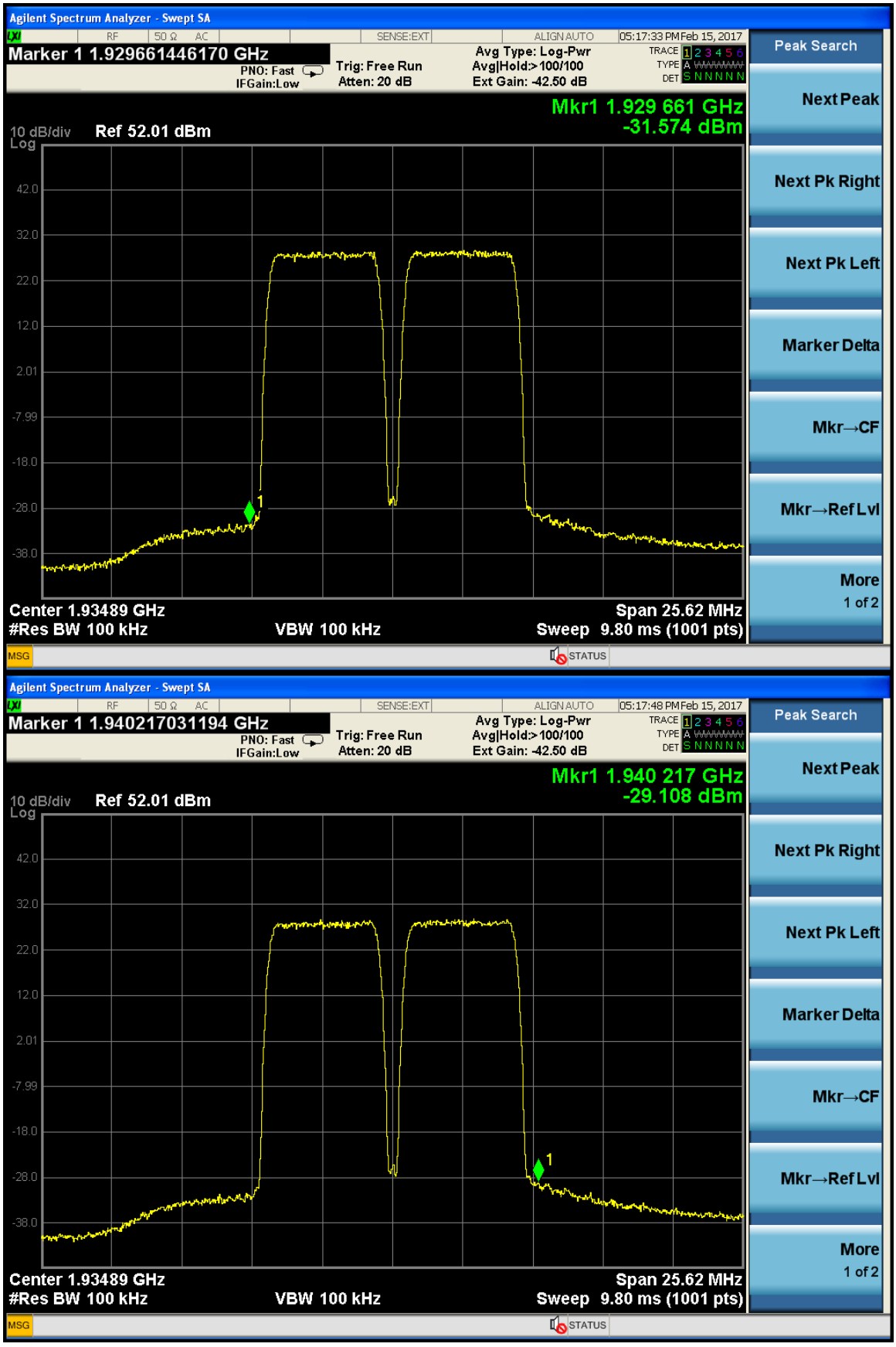


Two carriers

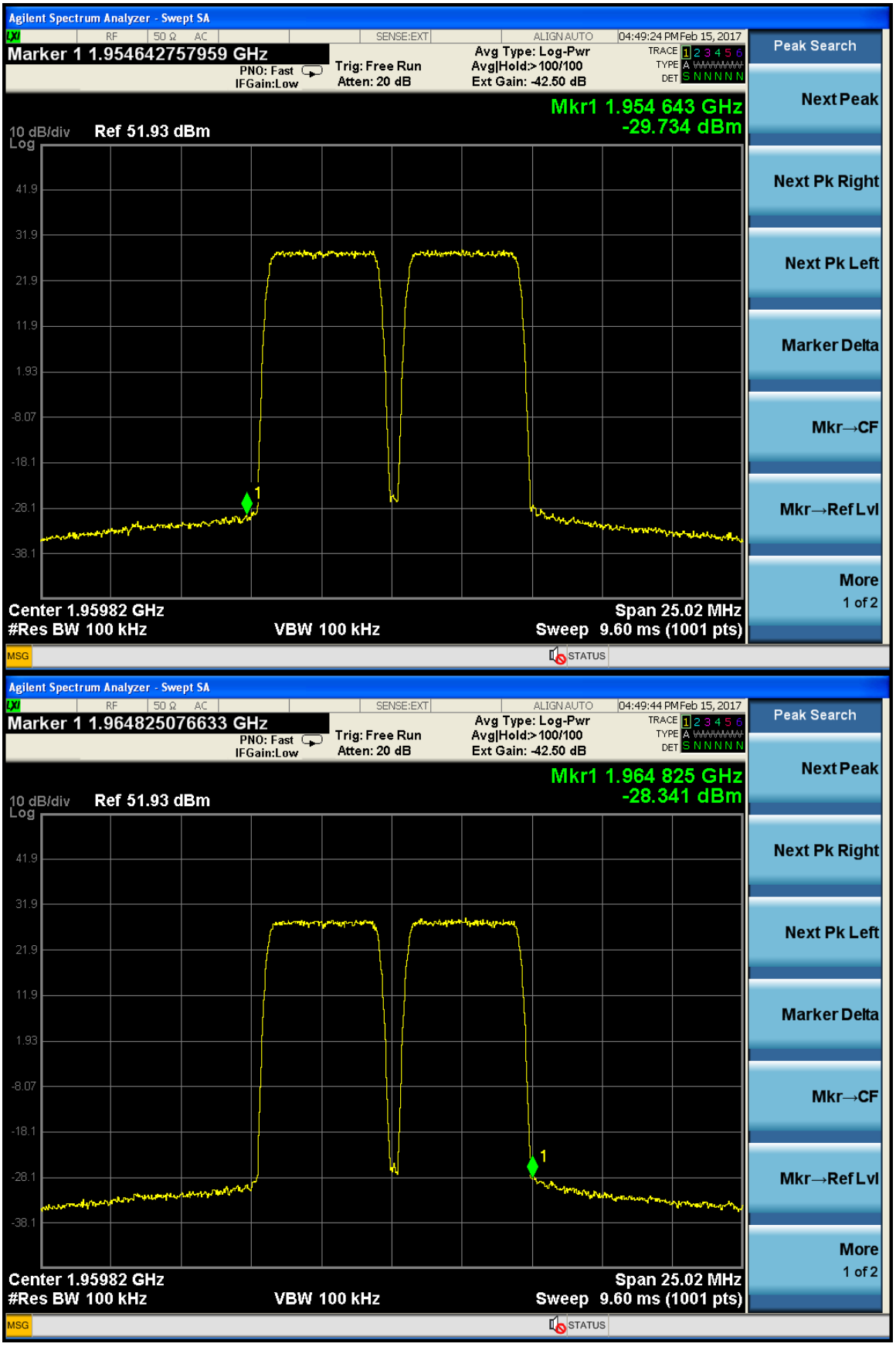
Frequency channel	Max bandedge	Limit (dBm)

	Emission (dBm)	
1932.4/1937.4	31.57 / 29.11	-13.00
1957.4/1962.4	29.73 / 28.34	-13.00
1982.6/1987.6	30.28 / 25.63	-13.00

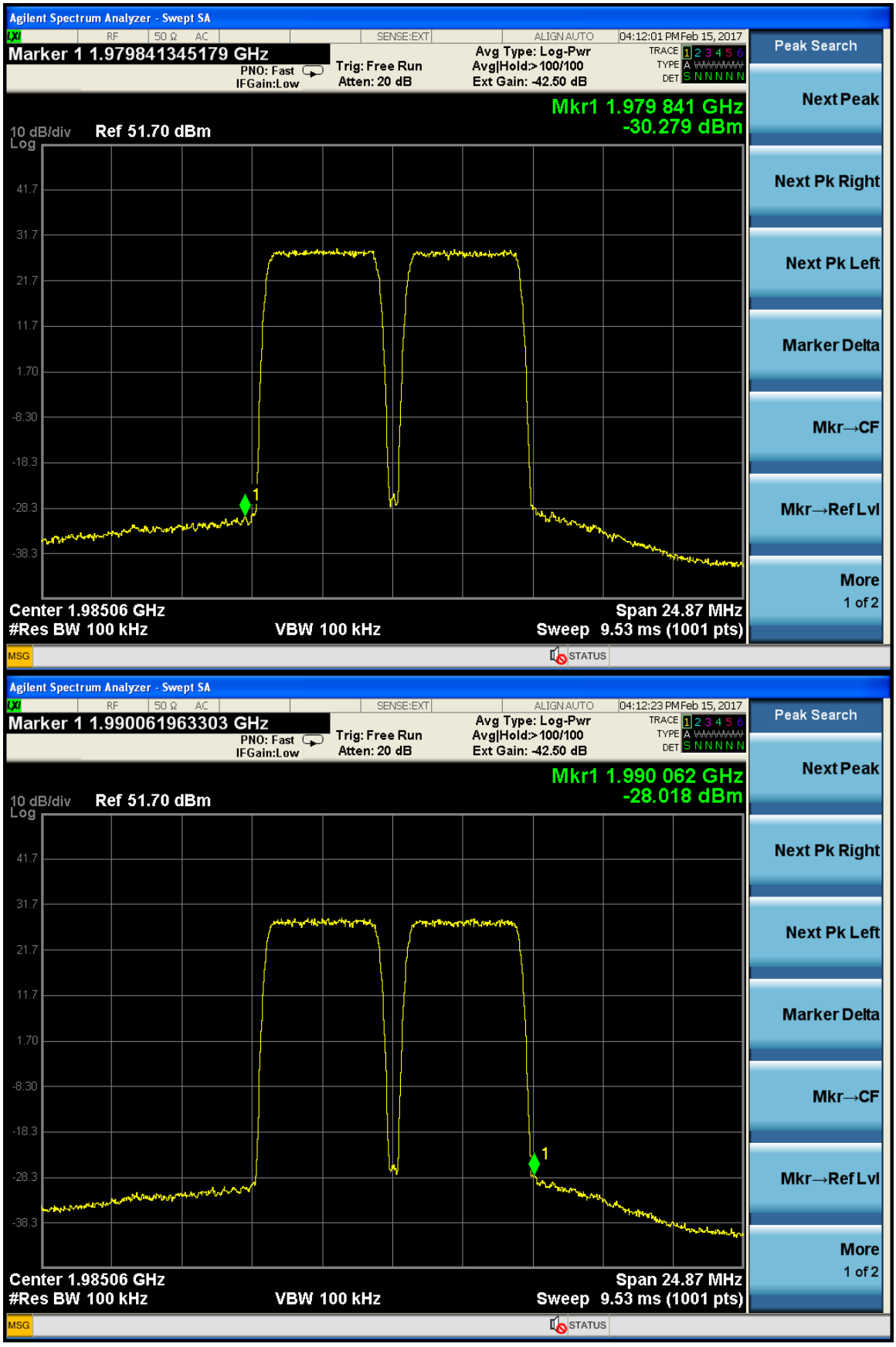
For Two carriers (working in bottom frequency)



For Two carriers (working in middle frequency)



For Two carriers (working in top frequency)


Agilent Spectrum Analyzer - Swept SA
RF 50 Ω AC
SENSE:EXT
ALIGN AUTO
04:12:01 PM Feb 15, 2017
Marker 1 1.979841345179 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
Ext Gain: -42.50 dB
TRACE 1 2 3 4 5 6
TYPE A WWWWW
DET S N N N N N
Mkr1 1.979 841 GHz
-30.279 dBm
10 dB/div
Log
Ref 51.70 dBm
41.7
31.7
21.7
11.7
1.70
-8.30
-18.3
-28.3
-38.3
Center 1.98506 GHz
#Res BW 100 kHz
VBW 100 kHz
Span 24.87 MHz
Sweep 9.53 ms (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
MSG
STATUS
Agilent Spectrum Analyzer - Swept SA
RF 50 Ω AC
SENSE:EXT
ALIGN AUTO
04:12:23 PM Feb 15, 2017
Marker 1 1.990061963303 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>100/100
Ext Gain: -42.50 dB
TRACE 1 2 3 4 5 6
TYPE A WWWWW
DET S N N N N N
Mkr1 1.990 062 GHz
-28.018 dBm
10 dB/div
Log
Ref 51.70 dBm
41.7
31.7
21.7
11.7
1.70
-8.30
-18.3
-28.3
-38.3
Center 1.98506 GHz
#Res BW 100 kHz
VBW 100 kHz
Span 24.87 MHz
Sweep 9.53 ms (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
MSG
STATUS

13 FREQUENCY STABILITY

13.1 Applicable Standard: FCC § 2.1055 § 24.235

Requirements: FCC § 2.1055 (a)(d) .The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

13.2 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	MXA Series Spectrum Analyzer	N9020A	MY51160170	2016-6-22	2017-6-21
YLT	40dB Attenuator	SJ-SN-200	2009010555	N.A	N.A
Forstar	Forstar RF Cable	031-D	1034	N.A	N.A

*__statement of traceability:__ ZTE Corporation Reliability Testing Center attest that all calibration have been performed per the NVLAP requirements , traceable to NIST.

13.3 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.

13.4 Environmental Conditions

Normal condition:	25° C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

13.5 Test Result: Pass

13.6 Test Mode: Transmitting UMTS

13.7 Test Data

13.7.1 Frequency Stability Versus Temperature

Frequency Stability vs. Temperature					
Temperature ℃	**Power Supplied VDC**	**Frequency Measure Error Hz**	**Limit (ppm)**	**Limit (Hz)**	**Result**
B(1932.4MHz)					

-40	-48	-4.5	0.05	96.62	PASS
-30	-48	-3.9	0.05	96.62	PASS
-20	-48	-4.2	0.05	96.62	PASS
-10	-48	3.8	0.05	96.62	PASS
0	-48	2.7	0.05	96.62	PASS
10	-48	-3.3	0.05	96.62	PASS
20	-48	4.1	0.05	96.62	PASS
30	-48	-5.7	0.05	96.62	PASS
40	-48	-4.3	0.05	96.62	PASS
50	-48	4.2	0.05	96.62	PASS
55	-48	-5.5	0.05	96.62	PASS
M(1960MHz)					
-40	-48	-4.5	0.05	98	PASS
-30	-48	-3.8	0.05	98	PASS
-20	-48	3.5	0.05	98	PASS
-10	-48	4.2	0.05	98	PASS
0	-48	-5.4	0.05	98	PASS
10	-48	3.9	0.05	98	PASS
20	-48	-5.4	0.05	98	PASS
30	-48	-3.6	0.05	98	PASS
40	-48	-4.2	0.05	98	PASS
50	-48	4.3	0.05	98	PASS
55	-48	-5.8	0.05	98	PASS
T (1987.6MHz)					
-40	-48	-4.4	0.05	99.38	PASS
-30	-48	-3.8	0.05	99.38	PASS
-20	-48	4.3	0.05	99.38	PASS
-10	-48	-4.6	0.05	99.38	PASS
0	-48	4.8	0.05	99.38	PASS
10	-48	-3.5	0.05	99.38	PASS
20	-48	-4.2	0.05	99.38	PASS
30	-48	-3.5	0.05	99.38	PASS
40	-48	3.2	0.05	99.38	PASS
50	-48	-4.8	0.05	99.38	PASS
55	-48	-5.2	0.05	99.38	PASS

13.7.2 Frequency Stability Versus Voltage

Frequency Stability vs. Voltage					
Voltage Vdc	**Temperature**	**Frequency Measure Error Hz**	**Limit (ppm)**	**Limit (Hz)**	**Result**
B(1932.4M)					

-37	20	-4.9	0.05	96.62	PASS
-42	20	3.8	0.05	96.62	PASS
-48	20	4.2	0.05	96.62	PASS
-54	20	-4.6	0.05	96.62	PASS
-60	20	-4.9	0.05	96.62	PASS
M(1960M)					
-37	20	-5.0	0.05	98	PASS
-42	20	4.5	0.05	98	PASS
-48	20	-3.8	0.05	98	PASS
-54	20	-4.4	0.05	98	PASS
-60	20	-4.6	0.05	98	PASS
T(1987.6M)					
-37	20	-3.8	0.05	99.38	PASS
-42	20	-4.9	0.05	99.38	PASS
-48	20	4.8	0.05	99.38	PASS
-54	20	-4.2	0.05	99.38	PASS
-60	20	-4.9	0.05	99.38	PASS

---End of Report---