FCC RF TEST REPORT

Report Number	:	RP20170314030_04	Date of Issue:	13 Mar 2017

FCC ID	:	Q78-R8862AS8500
Model / Serial No.	:	ZXSDR R8862A S8500
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	:	47

Table of Content

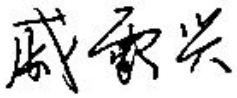
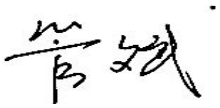
1 General Information

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	**2017-03-13** **Date**	**Wu Shuzhong** **Name**	 **Signature**
Approved by EMC/RF Project Manager	**2017-03-13** **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 Remote Radio Unit

MANUFACTURERS MODEL/SERIAL NUMBER: ZXSDR R8862A S8500(LTE)

FCC ID : Q78-R8862AS8500

SAMPLE NUMBER: S20170314030

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 Part1:2016 FCC 47 CFR Part2:2016 FCC 47 CFR Part22:2016

2 Summary of Results

FCC RULES	DESCRIPTION OF TEST	RESULT
§ 2.1046 , §22.913	Transmitter output Power	Compliant
§ 2.1091 ,§1.1037	RF Exposure	Compliant
§ 2.1047	Modulation Characteristic	Compliant
§ 2.1053, §22.917	Spurious Radiated Emissions	Compliant
§ 2.1051, §22.917	Spurious Emissions AT Antenna Terminals	Compliant
§ 2.1049	Occupied Bandwidth	Compliant
§ 2.1051,§22.917	Band Edge	Compliant
§ 2.1055,	Frequency stability	Compliant

3 Equipment Specification

3.1 Technical specification

Size: 422 mm x 218 mm x 133 mm (HxWxD)
Input voltage: -37V~-60V
Frequency range: UL:824MHz~849MHz; DL: 869MHz~894MHz
Max RF output power: 47.7dBm
Gain of the antenna: 15dBi
Appearance of EUT:

fig 1. FIGURE 1 APPEARANCE OF ZXSDR R8862A S8500

4 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.

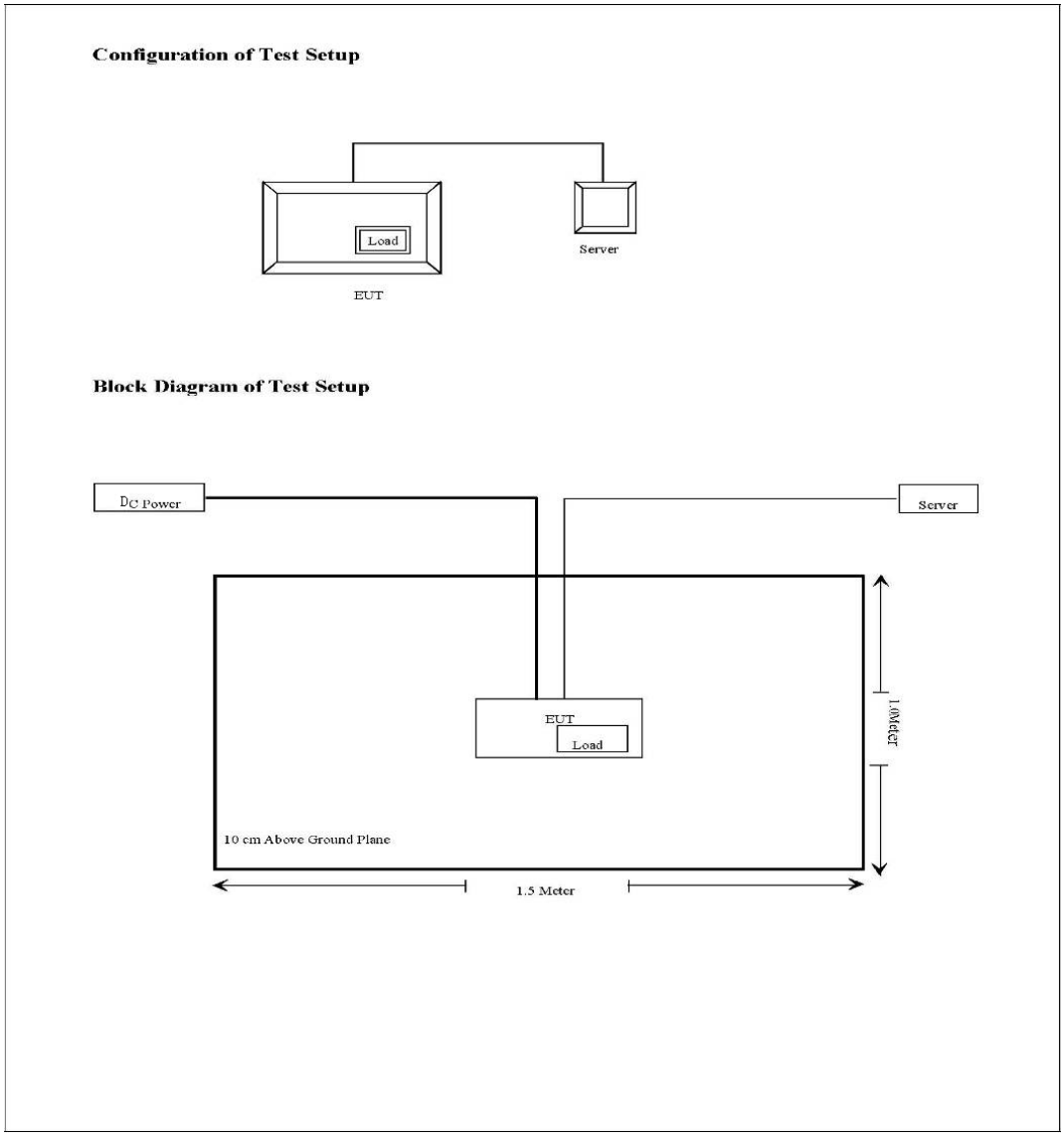


fig 2. Test configuration

5 TRANSMITTER OUTPUT POWER

5.1 Applicable Standard：FCC §2.1046, §22.913

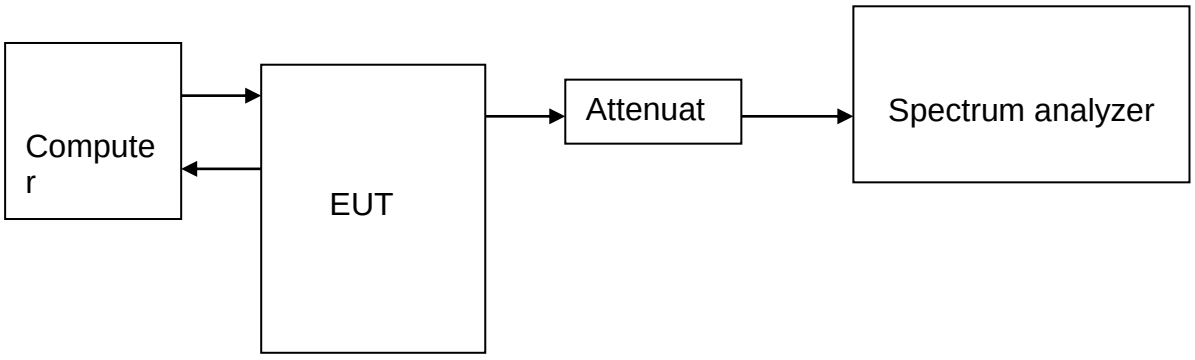
According to FCC §2.1046 &22.913, the ERP (the effective radiated power) must not exceed 1000Watts.

5.2 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	MXA Series Spectrum Analyzer	N9030A	MY49431143	2016.04.17	2017.04.17
DTS	DTS 40dB Attenuator	DTS100-40-3-1	09112005	2016.04.17	2017.04.17
Silverline	Silverline RF Cable	SLA18-NMN1T	100311-04-0001	N/A	N/A

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

5.3 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 1.5dB

5.4 Environmental Conditions

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

5.5 Test Result: Pass

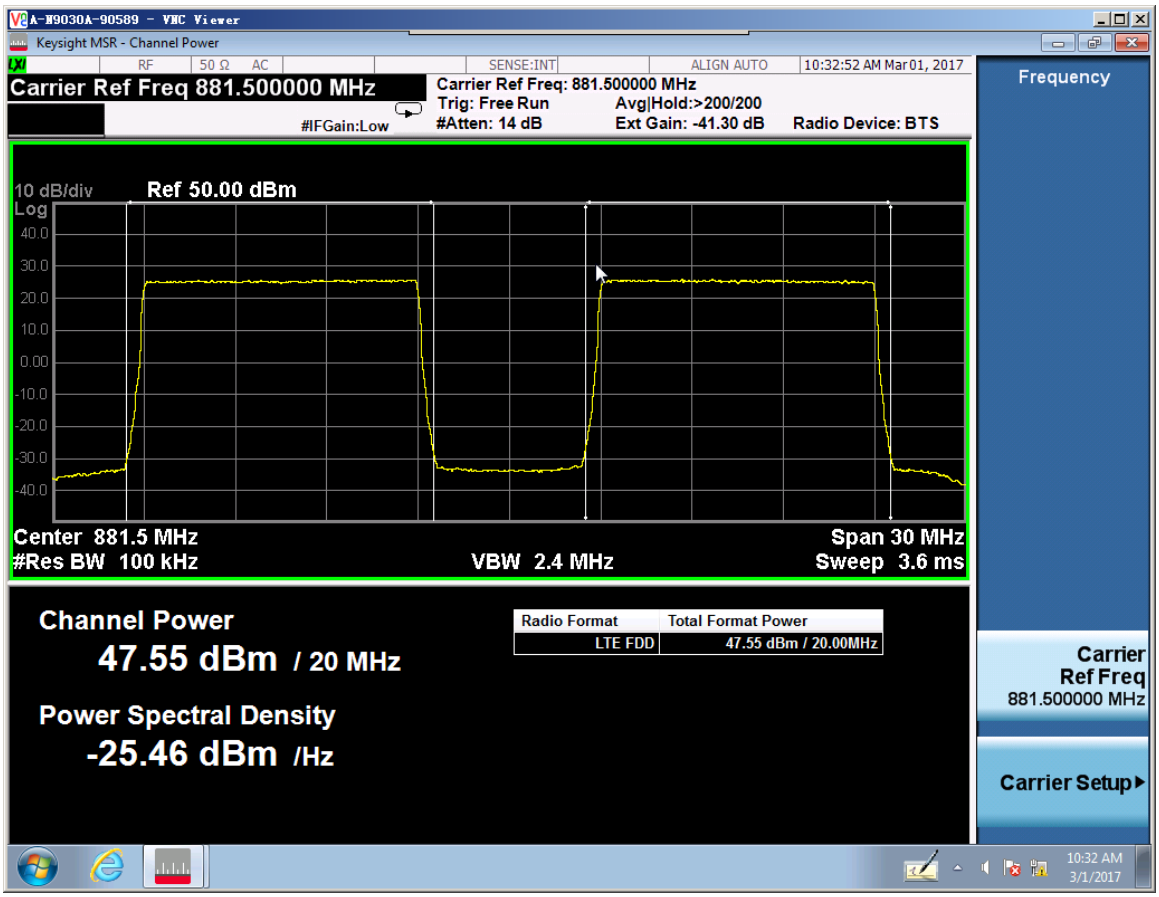
5.6 Test Mode: Transmitting LTE

5.7 Test Data

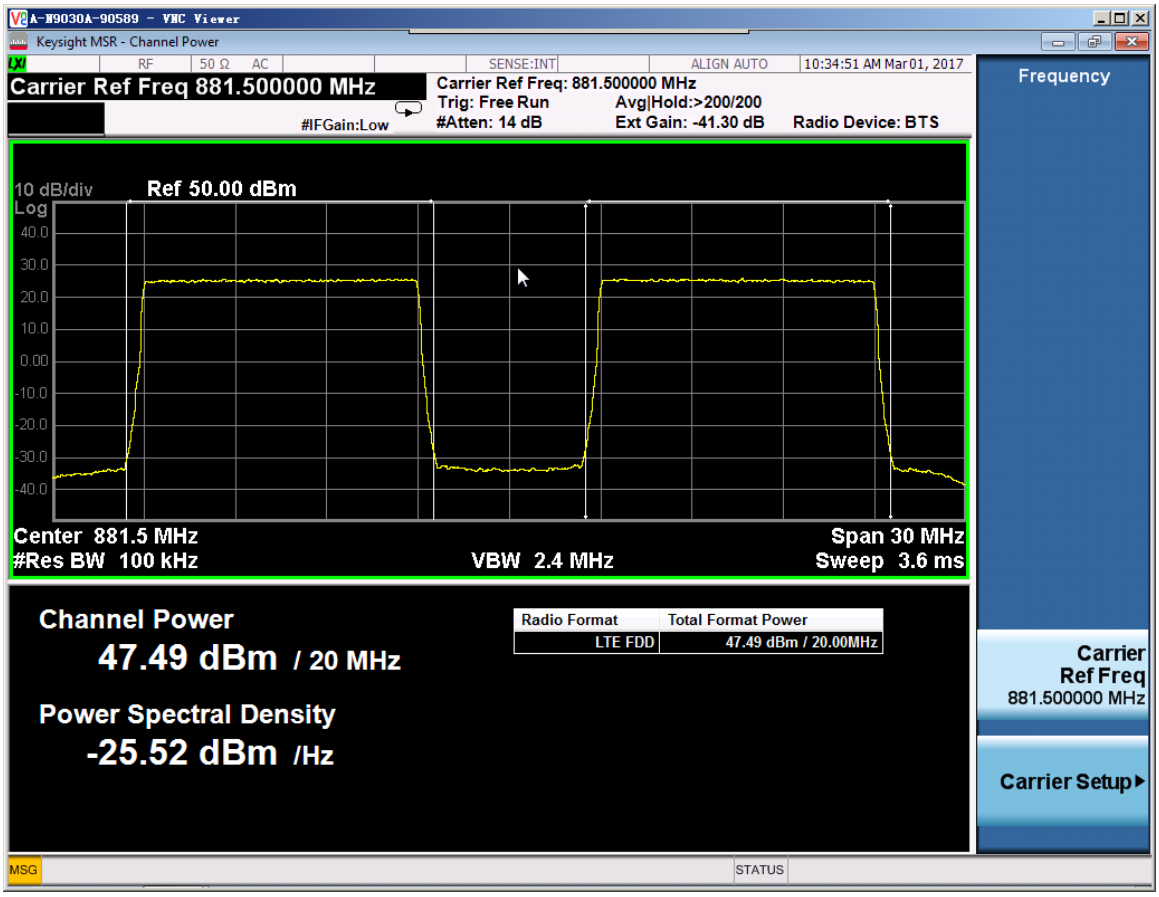
RF Bandwidth :25M(10M+10M)

Port	Center Freq. (MHz)	Carry Frequency. (MHz)	Max output Power in dBm
1	881.5	874	47.55
4	881.5	889	47.49

Port 1


A-N9030A-90589 - VNC Viewer
Keysight MSR - Channel Power
RF 50 Ω AC
SENSE:INT
ALIGN AUTO
10:32:52 AM Mar 01, 2017
Carrier Ref Freq 881.500000 MHz
Carrier Ref Freq: 881.500000 MHz
Trig: Free Run
Avg|Hold:>200/200
#IFGain:Low
#Atten: 14 dB
Ext Gain: -41.30 dB
Radio Device: BTS
Frequency
10 dB/div
Ref 50.00 dBm
Log
40.0
30.0
20.0
10.0
0.00
-10.0
-20.0
-30.0
-40.0
Center 881.5 MHz
#Res BW 100 kHz
VBW 2.4 MHz
Span 30 MHz
Sweep 3.6 ms
Channel Power
47.55 dBm / 20 MHz
Power Spectral Density
-25.46 dBm /Hz
Radio Format
Total Format Power
LTE FDD
47.55 dBm / 20.00MHz
Carrier
Ref Freq
881.500000 MHz
Carrier Setup
10:32 AM
3/1/2017

Port 4


A-N9030A-90589 - VNC Viewer
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RF 50 Ω AC
SENSE:INT
ALIGN AUTO
10:34:51 AM Mar 01, 2017
Carrier Ref Freq 881.500000 MHz
Carrier Ref Freq: 881.500000 MHz
Trig: Free Run
Avg|Hold:>200/200
#IFGain:Low
#Atten: 14 dB
Ext Gain: -41.30 dB
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10 dB/div
Ref 50.00 dBm
Log
40.0
30.0
20.0
10.0
0.00
-10.0
-20.0
-30.0
-40.0
Center 881.5 MHz
#Res BW 100 kHz
VBW 2.4 MHz
Span 30 MHz
Sweep 3.6 ms
Channel Power
47.49 dBm / 20 MHz
Power Spectral Density
-25.52 dBm /Hz
Radio Format
Total Format Power
LTE FDD
47.49 dBm / 20.00MHz
Carrier
Ref Freq
881.500000 MHz
Carrier Setup
MSG
STATUS

6 RF EXPOSURE

6.1 Applicable standard: FCC §2.1091 §1.1037

6.2 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

6.3 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
R = distance to the center of radiation of the antenna= $[EIRP /4\pi S]^{1/2}$

According to §22.913, the the effective radiated power (ERP) of base transmitters and cellular repeaters must not exceed 1000 Watts.
Frequency 869MHz is between 300MHz and 1500MHz, and the Maximum S=f/1500(mW/cm2)

⇨ R=4.75m.

This equipment should be installed and operated with minimum distance 4.75m between the radiator& your body.

6.4 Test Result: pass

7 MODULATION CHARACTERISTIC

7.1 Applicable Standard: FCC §2.1047

7.2 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	MXA Series Spectrum Analyzer	N9030A	MY49431143	2016.04.17	2017.04.17
DTS	DTS 40dB Attenuator	DTS100-40-3-1	09112005	2016.04.17	2017.04.17
Silverline	Silverline RF Cable	SLA18-NMN1T	100311-04-0001	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.

7.3 Test Procedure

LTE digital mode is used by EUT.

7.4 Test Data Environmental Conditions

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

7.5 Test Result: Pass

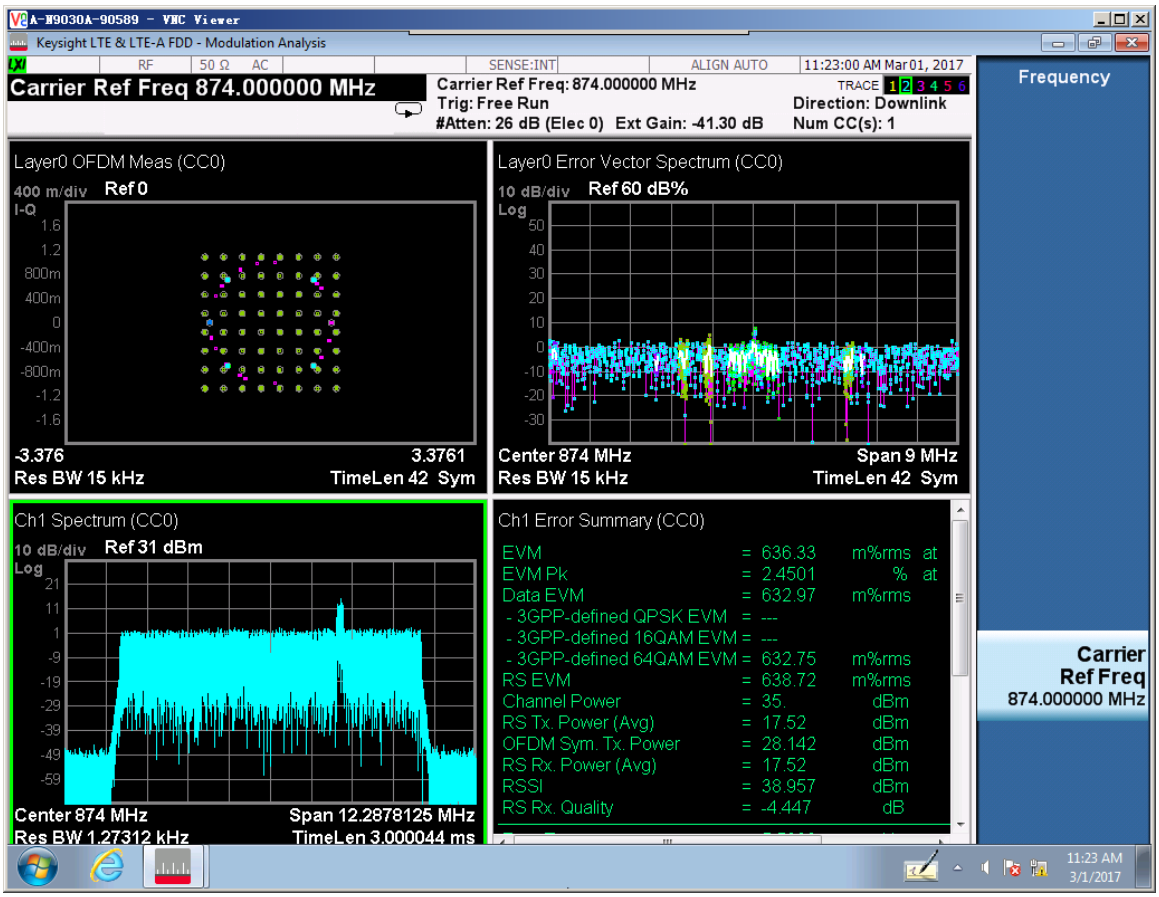
7.6 Test Mode: Transmitting LTE

7.7 Test Data

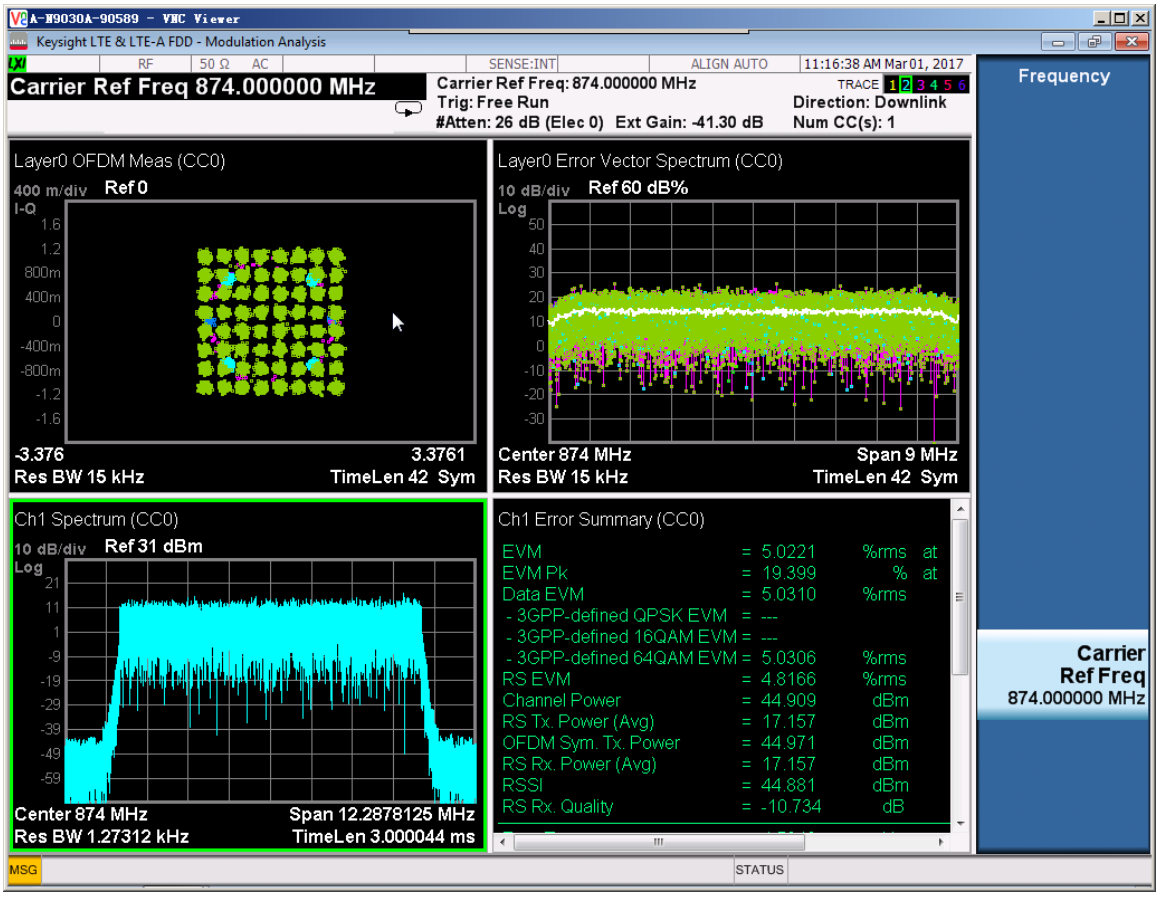
RF Bandwidth :25M(10M+10M)

Port	Frequency (MHz)	Test mode	EVM%
1	874	TM2.0	0.63275
		TM3.1	5.0306
		TM3.2	6.0769
		TM3.3	7.8698
	889	TM2.0	0.68112
		TM3.1	5.0120
		TM3.2	5.9859
		TM3.3	7.8272
4	874	TM2.0	0.85066
		TM3.1	5.0440
		TM3.2	6.0687
		TM3.3	7.8810
	889	TM2.0	0.99102
		TM3.1	5.0512
		TM3.2	5.4987
		TM3.3	7.8263

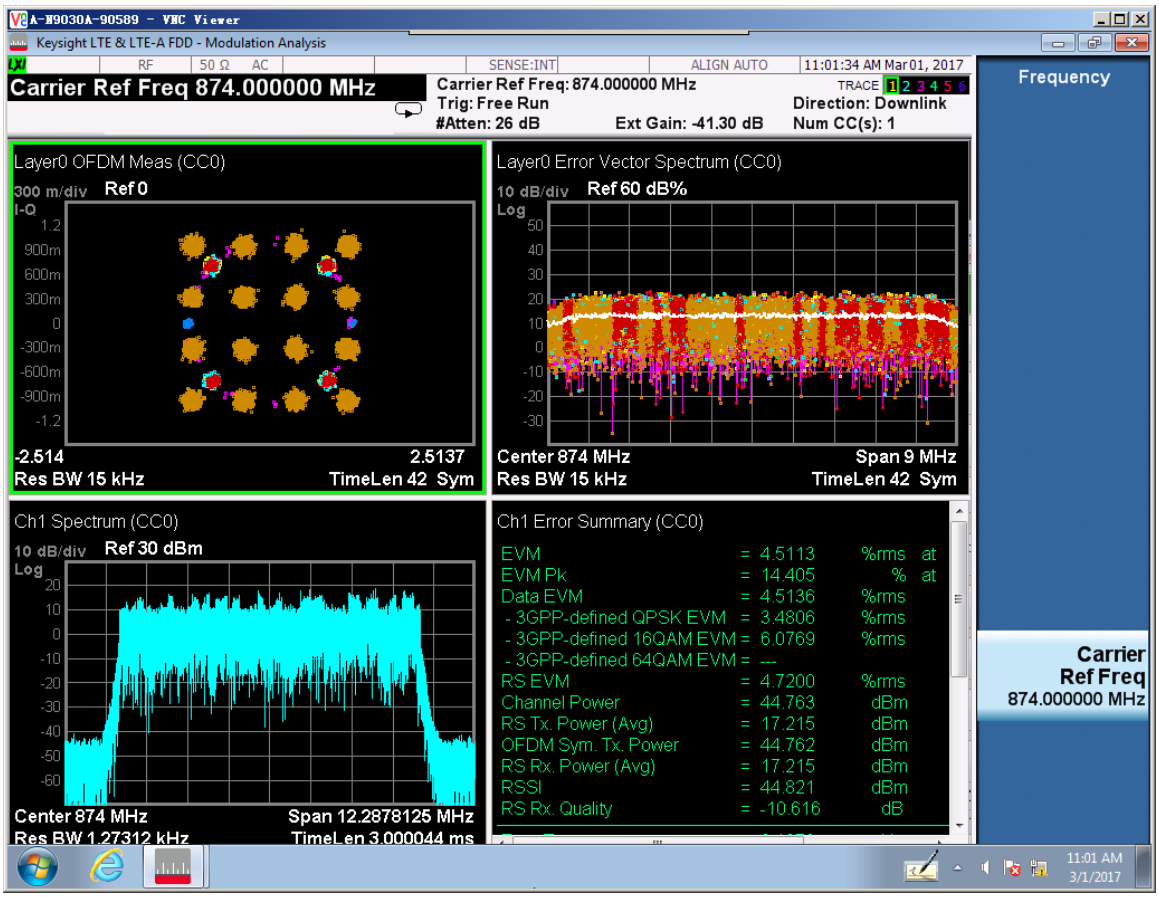
Port 1 -874MHz-TM2.0



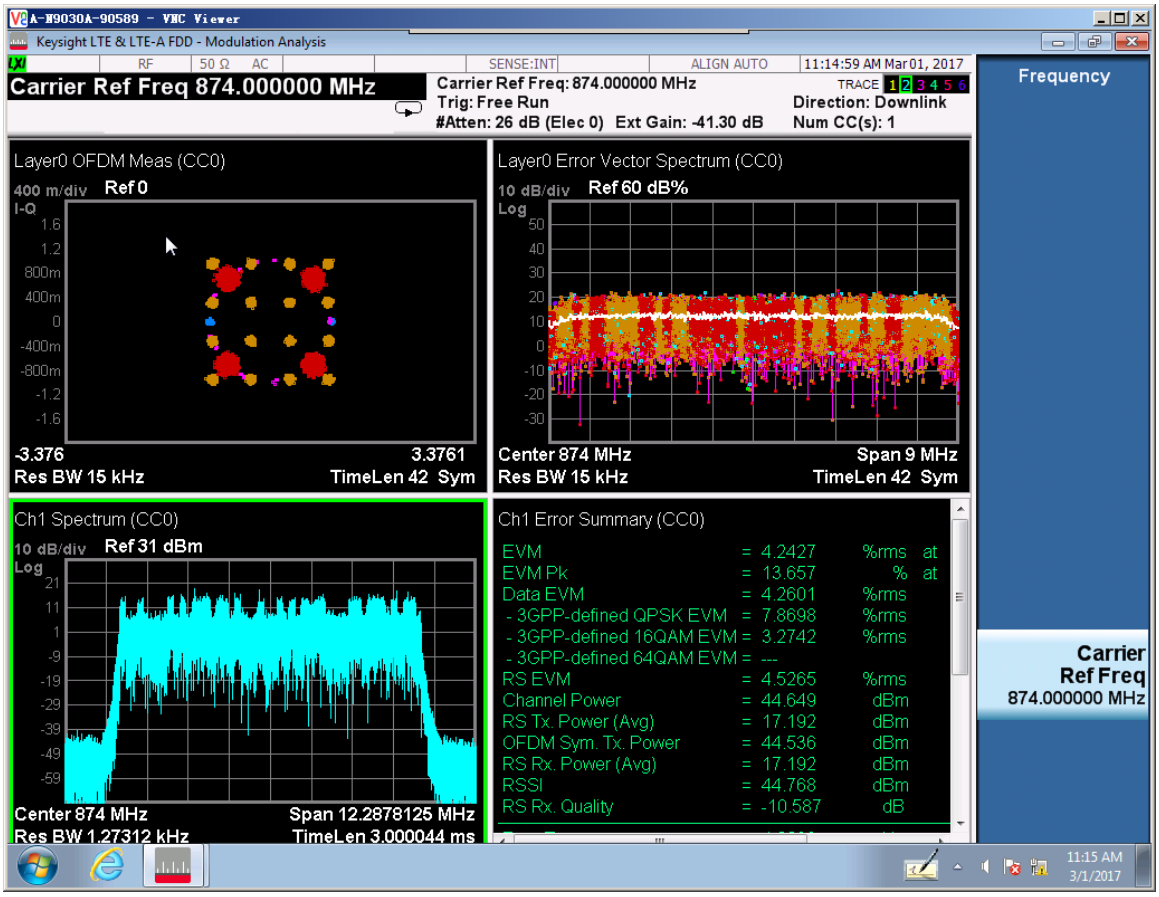
Port 1 -874MHz -TM3.1



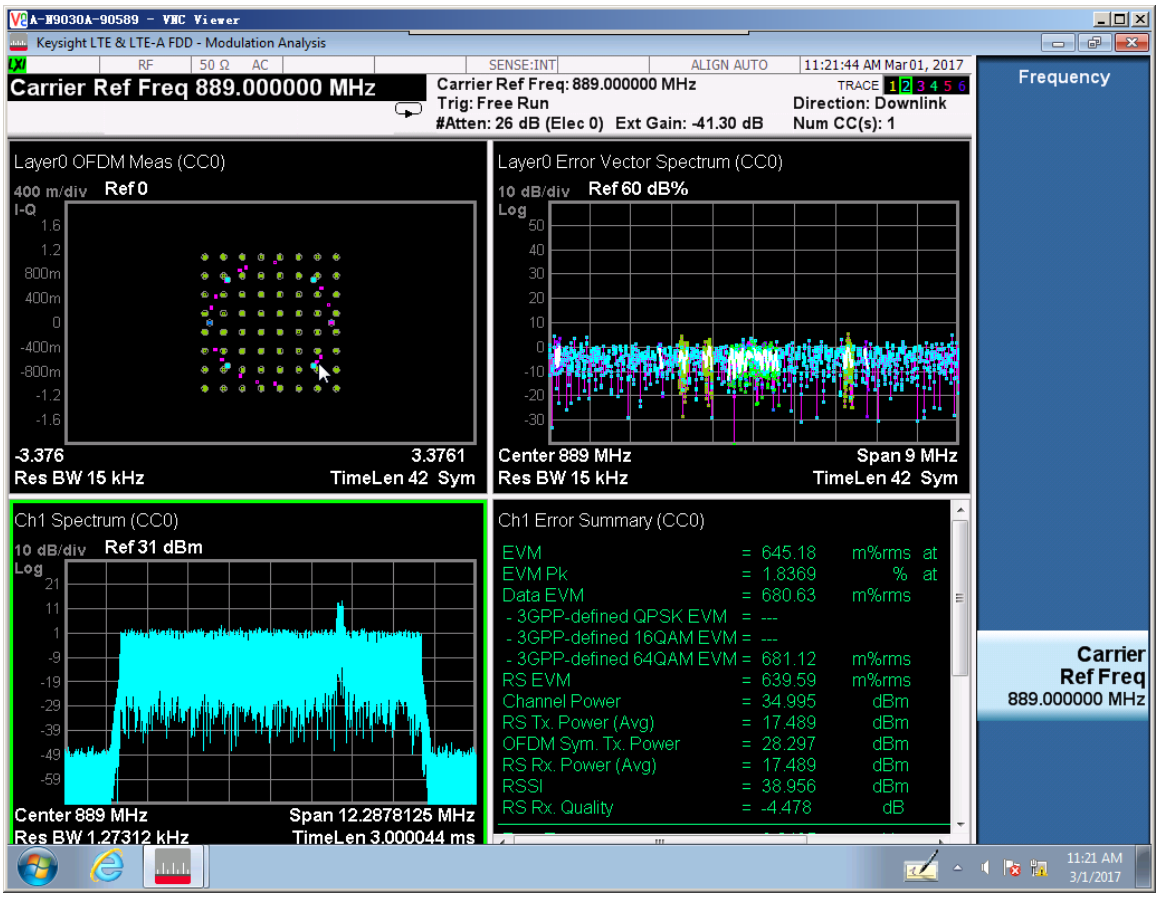
Port 1 -874MHz -TM3.2



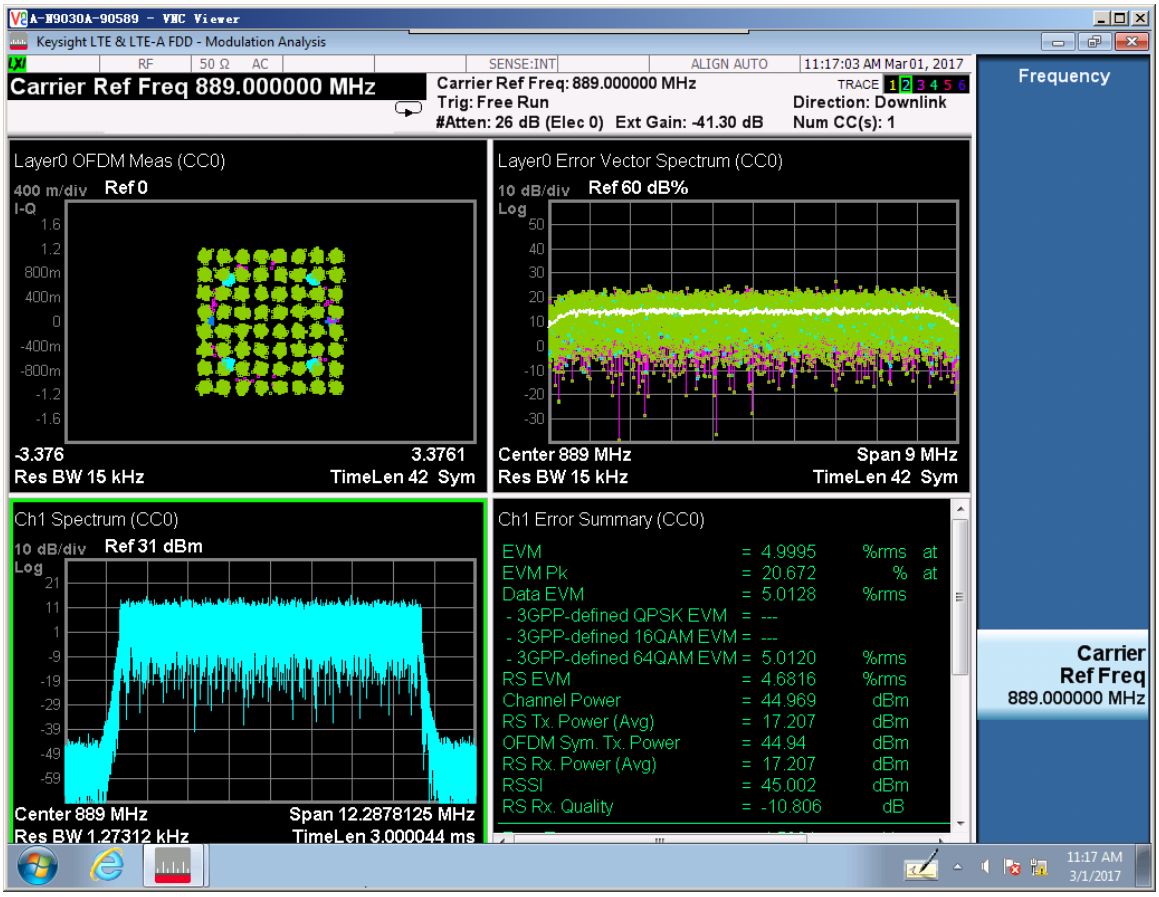
Port 1 -874MHz -TM3.3



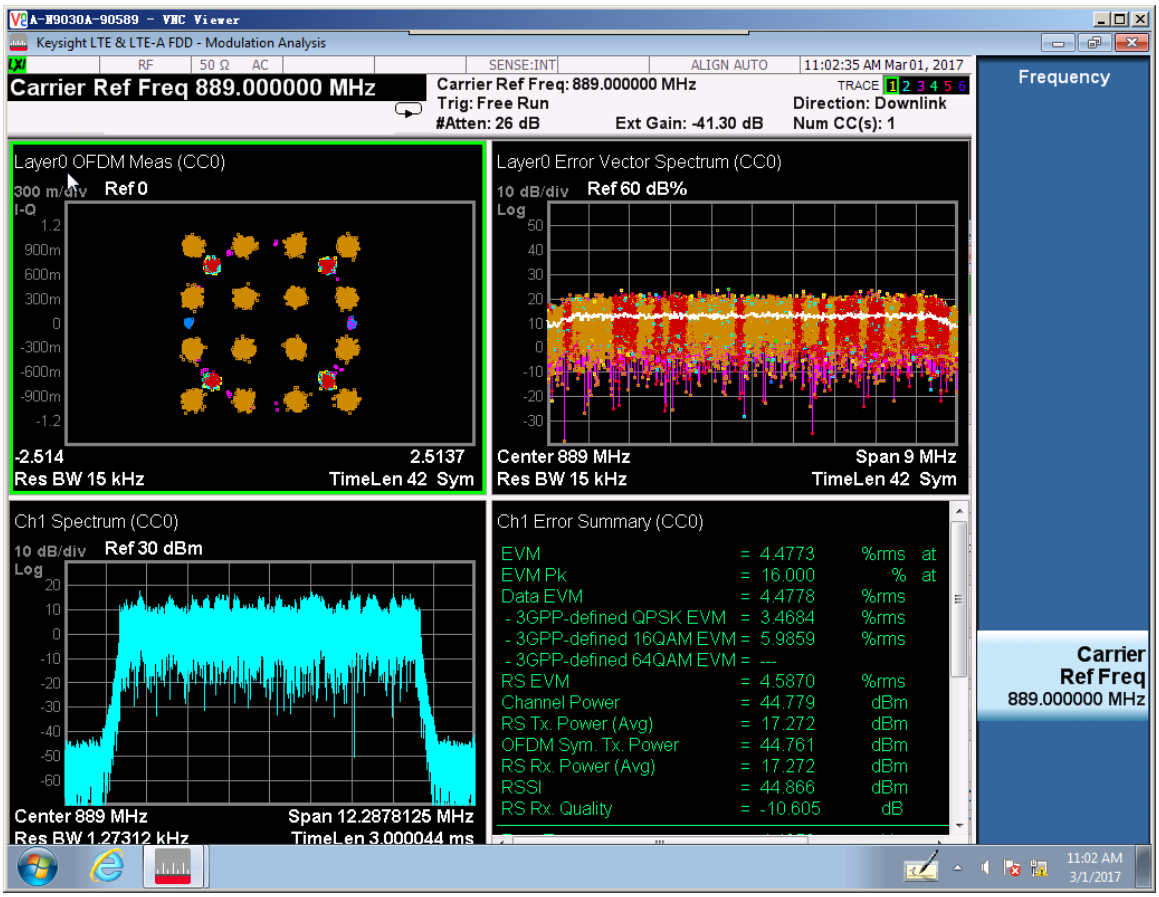
Port 1 -889MHz-TM2.0



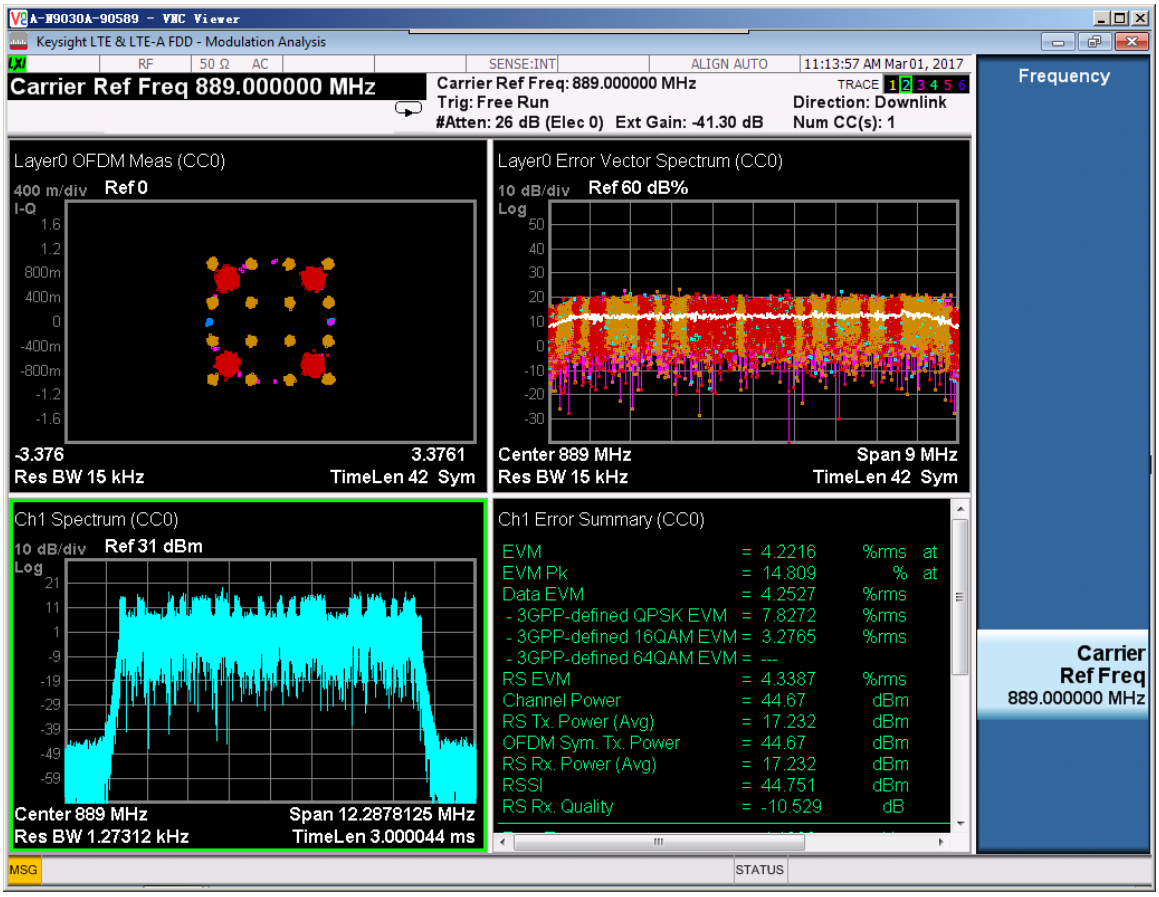
Port 1 -889MHz -TM3.1



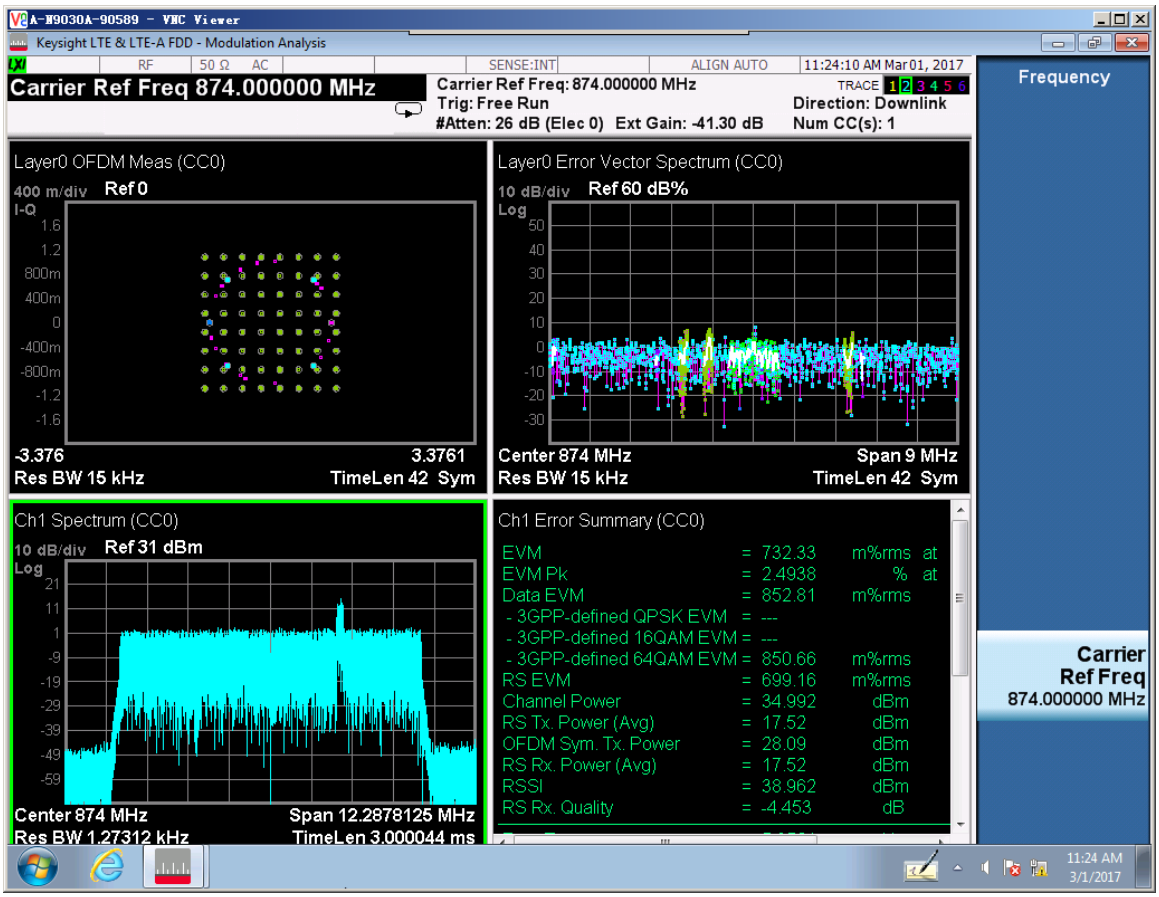
Port 1 -889MHz -TM3.2



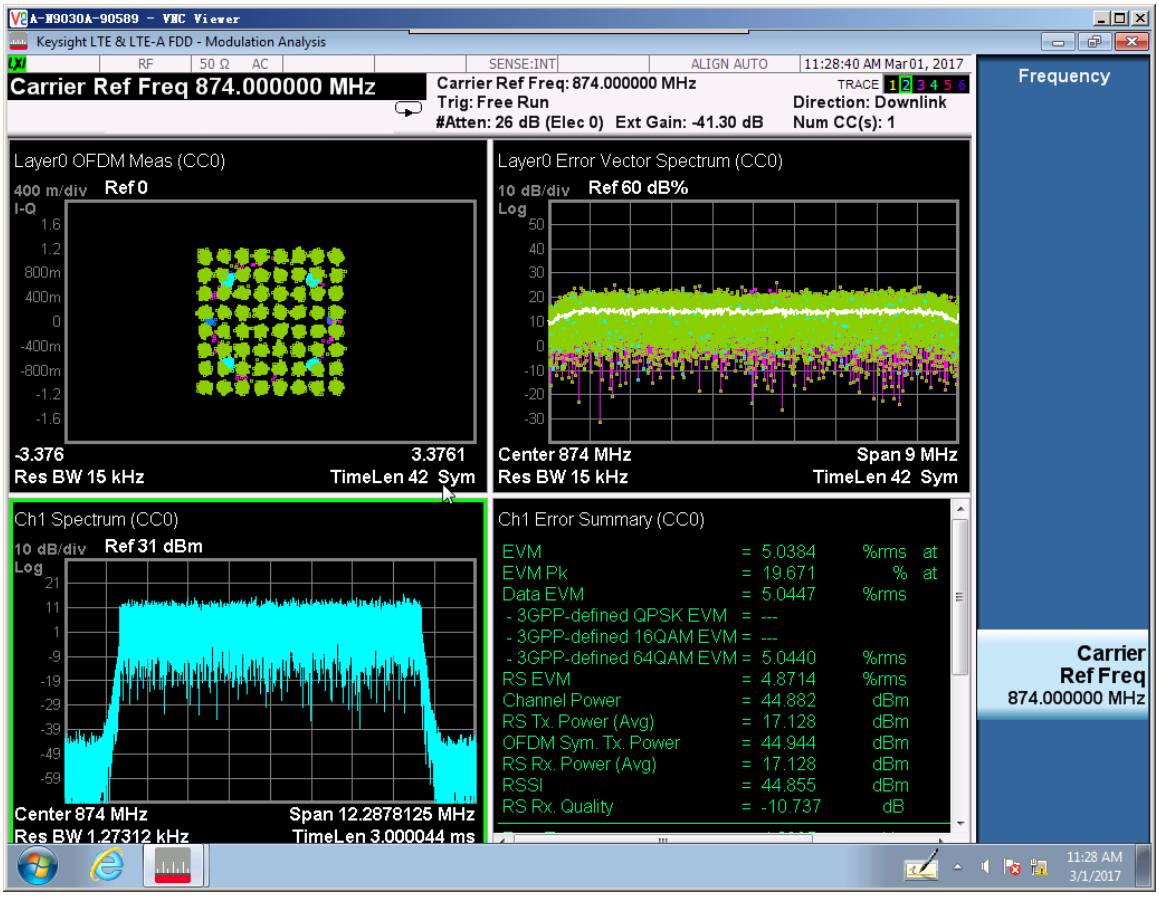
Port 1 -889MHz -TM3.3



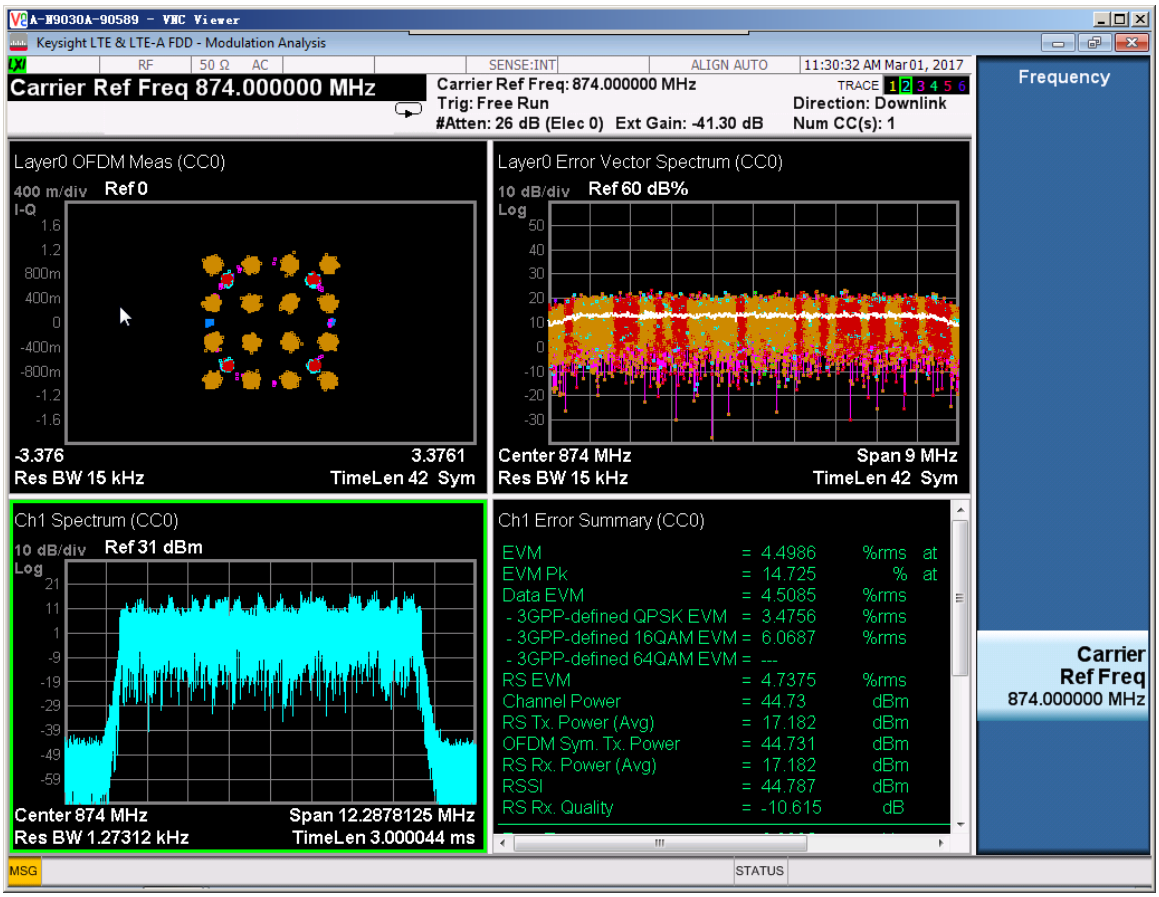
Port 4 -874MHz-TM2.0



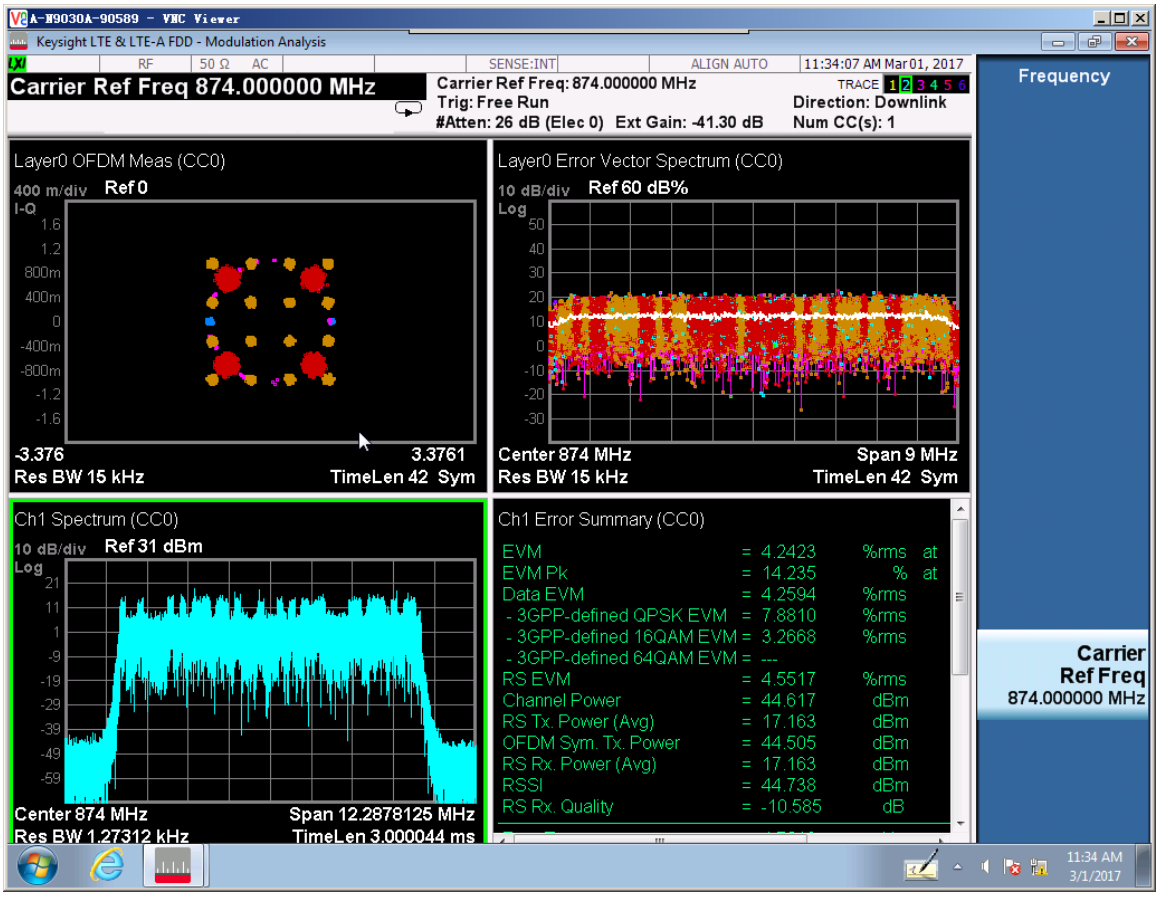
Port 4 -874MHz -TM3.1



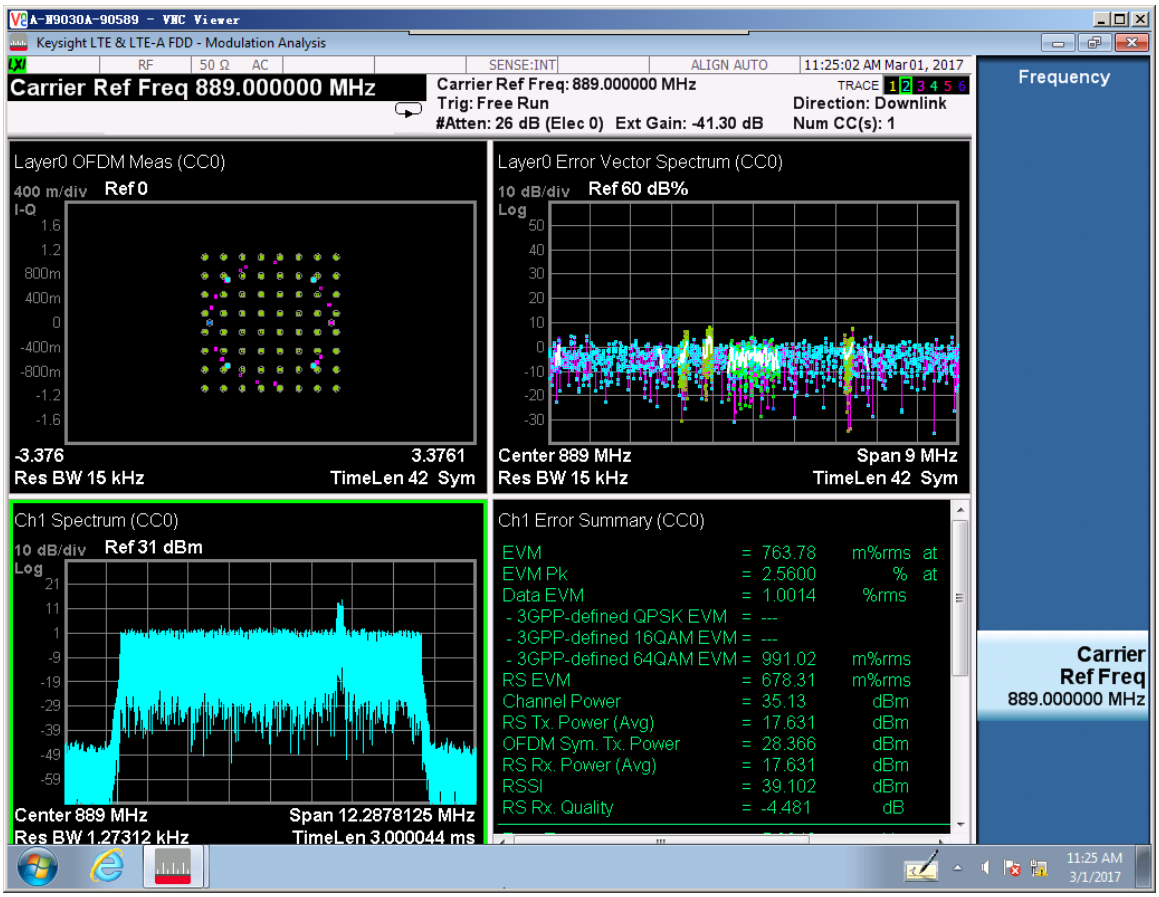
Port 4 -874MHz -TM3.2



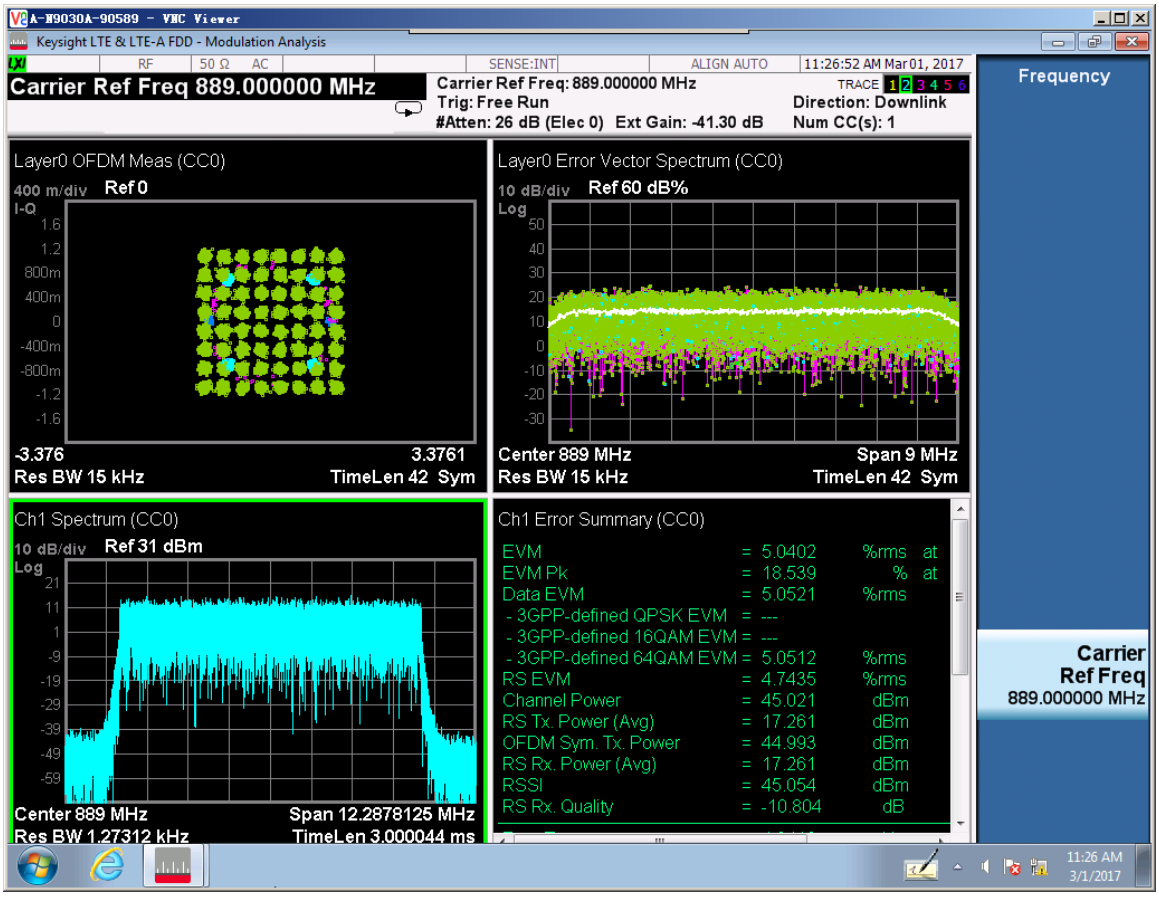
Port 4 -874MHz -TM3.3



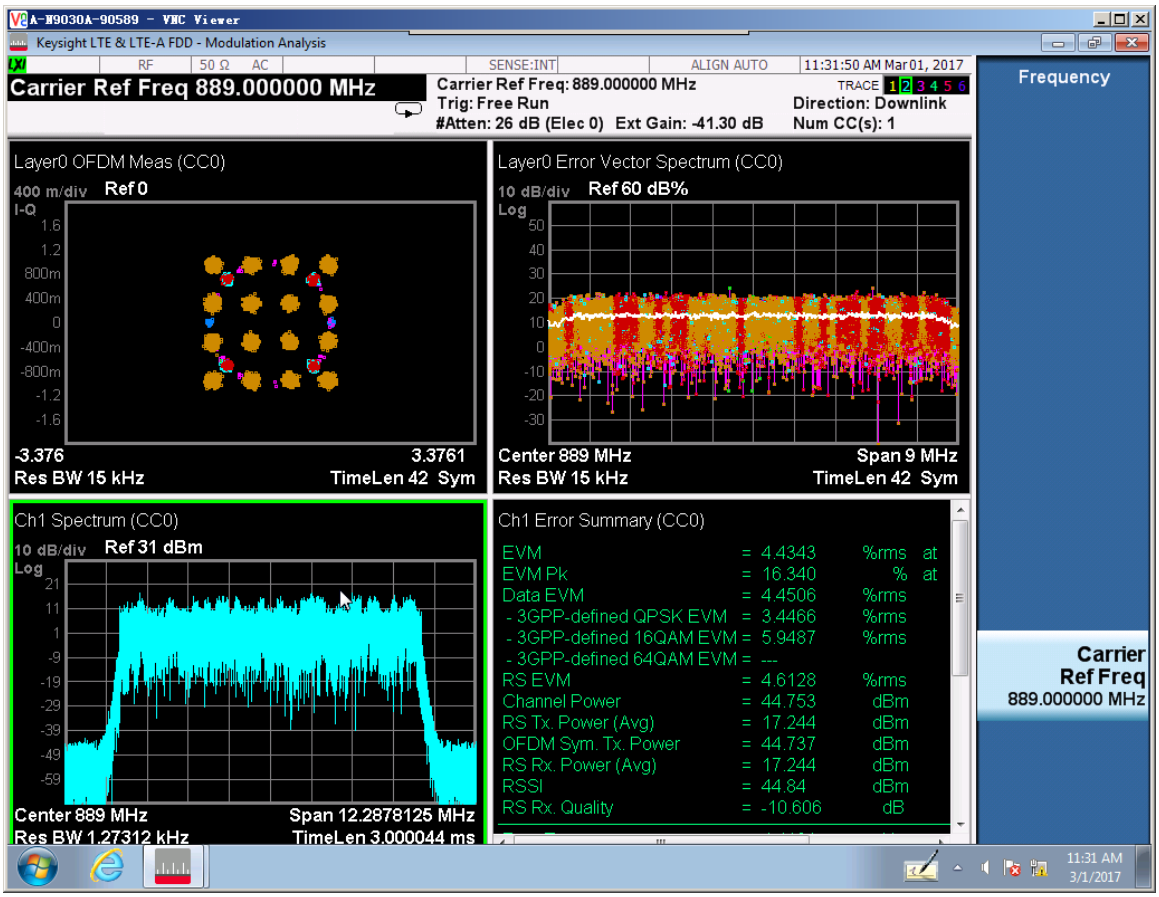
Port 4 -889MHz-TM2.0



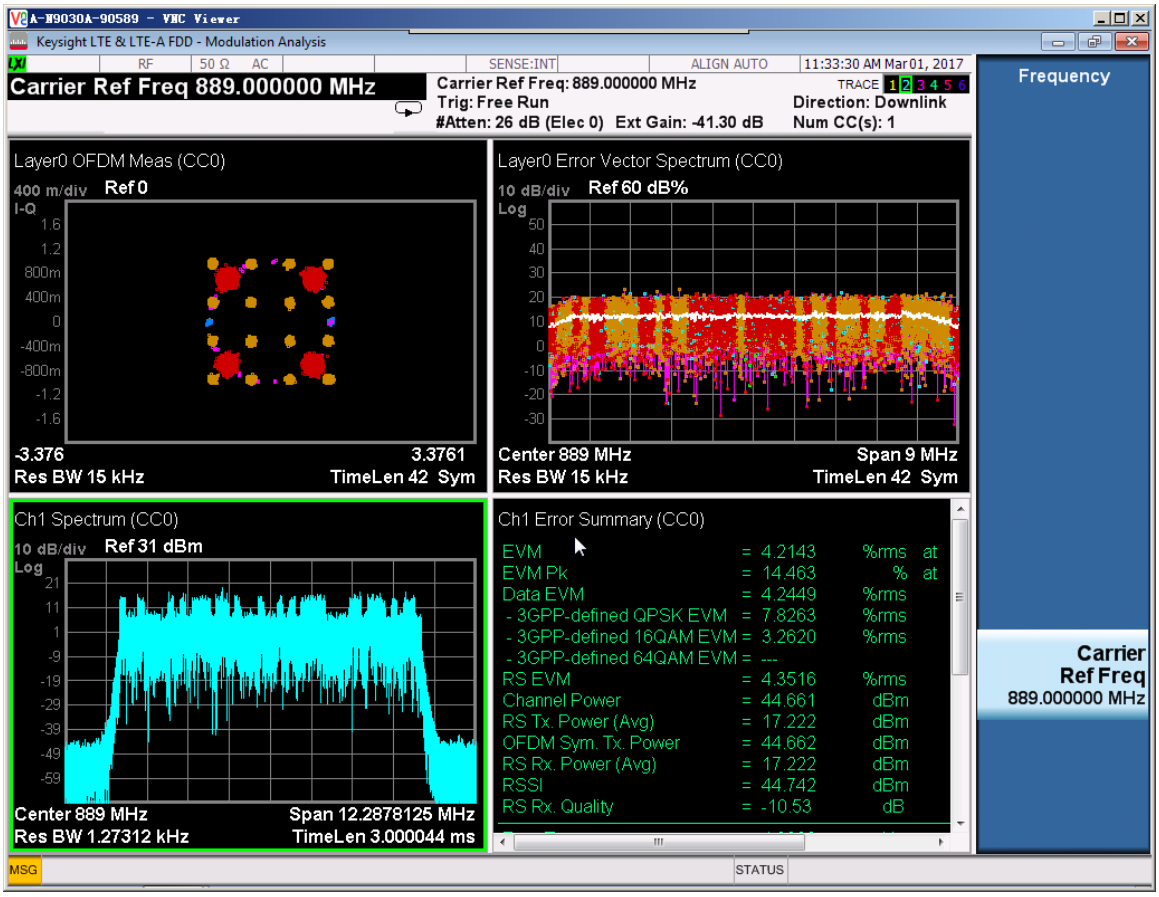
Port 4 -889MHz -TM3.1



Port 4 -889MHz -TM3.2



Port 4 -889MHz -TM3.3



8 SPURIOUS RADIATED EMISSIONS

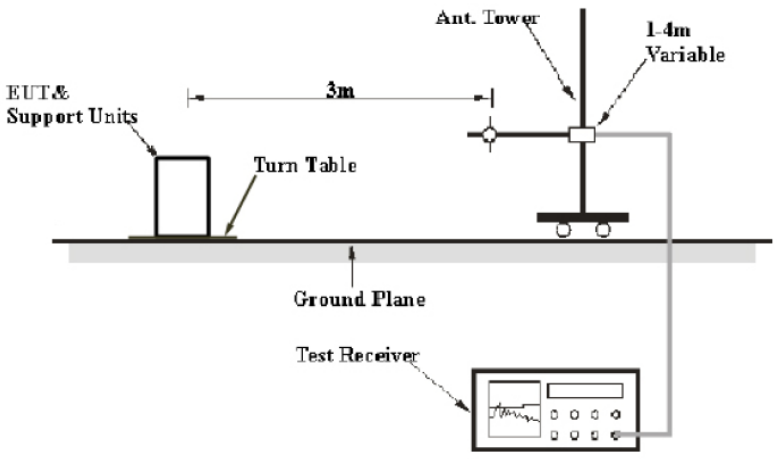
8.1 Applicable Standard: FCC CFR 47 §2.1053

8.2 Test Equipment List and Details

Manufacturer	8.2.1.1.1 Equipment	Model	Serial Number	Last Cal.	Cal. Interval
R&S	SIGNAL GENERATOR	SMR20	A00017351	2016-10-29	1 year
Albatross	Anechoic Chamber	3m Site	A00017354	2016-6-30	1 year
R&S	EMI Test Receiver	ESIB26	100058	2016-10-29	1 year
R&S	Ultra Breitband Antennas	HL562	100022	2016-8-5	1 year
R&S	Double-Ridged Waveguide Horn Antenna	HF906	100032	2016-8-5	1 year
R&S	Double-Ridged Waveguide Horn Antenna	HF906	100446	2016-8-5	1 year
SCHWARZ-BECK	Biconical Antenna	VUBA9117	9117-122	2016-8-5	1 year

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. 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.

8.3 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 1 percent as specified for 30MHz to 1GHz scaning, set at 1MHz for 1GHz to 20GHz scaning.

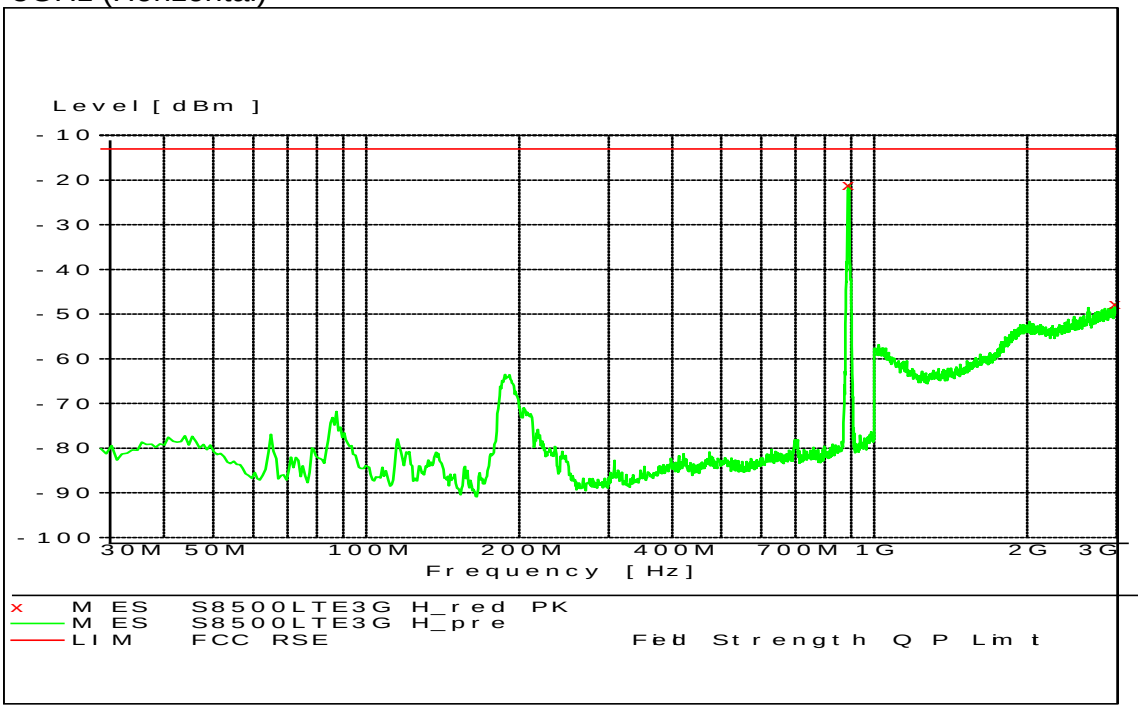
8.4 Test Results Summary: PASS

8.5 Environmental Conditions

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

8.6 Test data

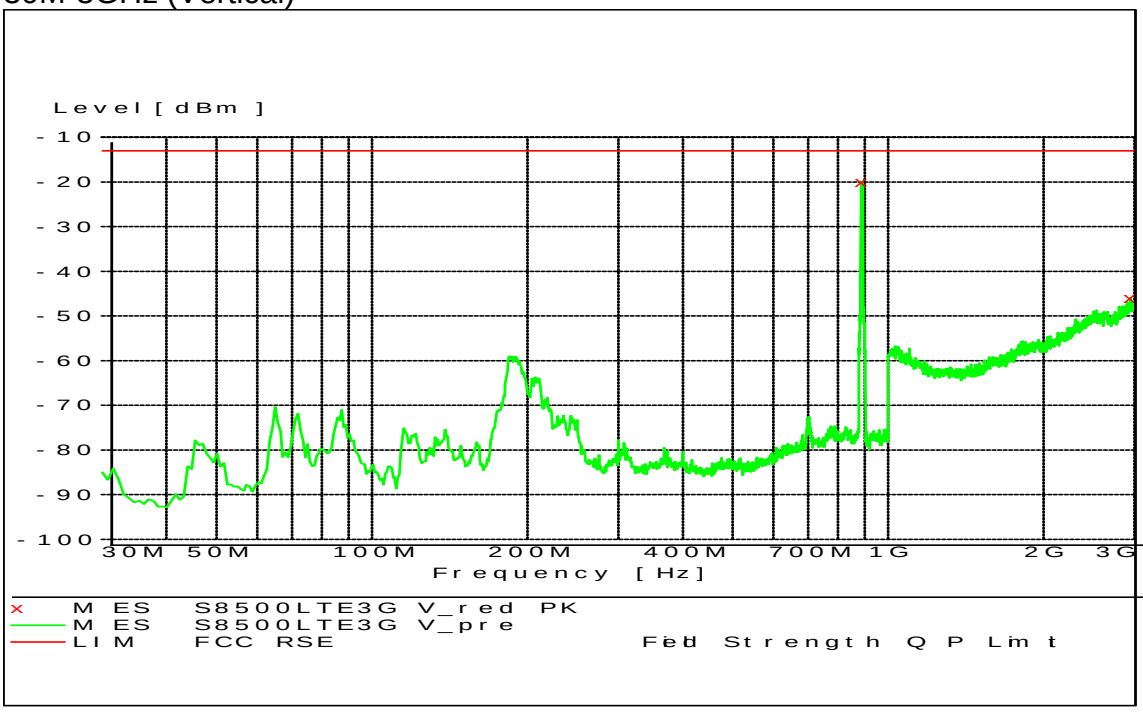
30M-3GHz (Horizontal)



Frequency	Level	Azimuth	Height	Polarisation	Transd	Limit	Margin

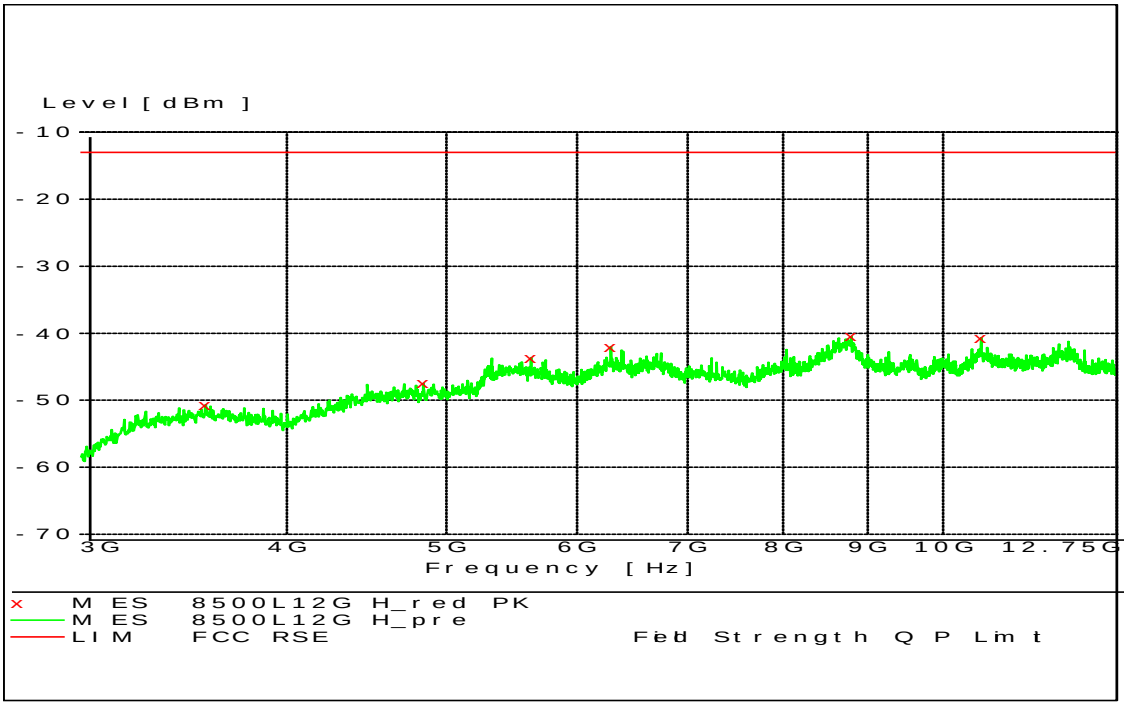
MHz	dBm	deg	cm		dBm	dBm	dB
893.688000	-21.06	61.90	100.0	HOR	-122.1	-13	8.1
2987.200000	-47.66	260.90	100.0	HOR	-98.7	-13	34.7

30M-3GHz (Vertical)



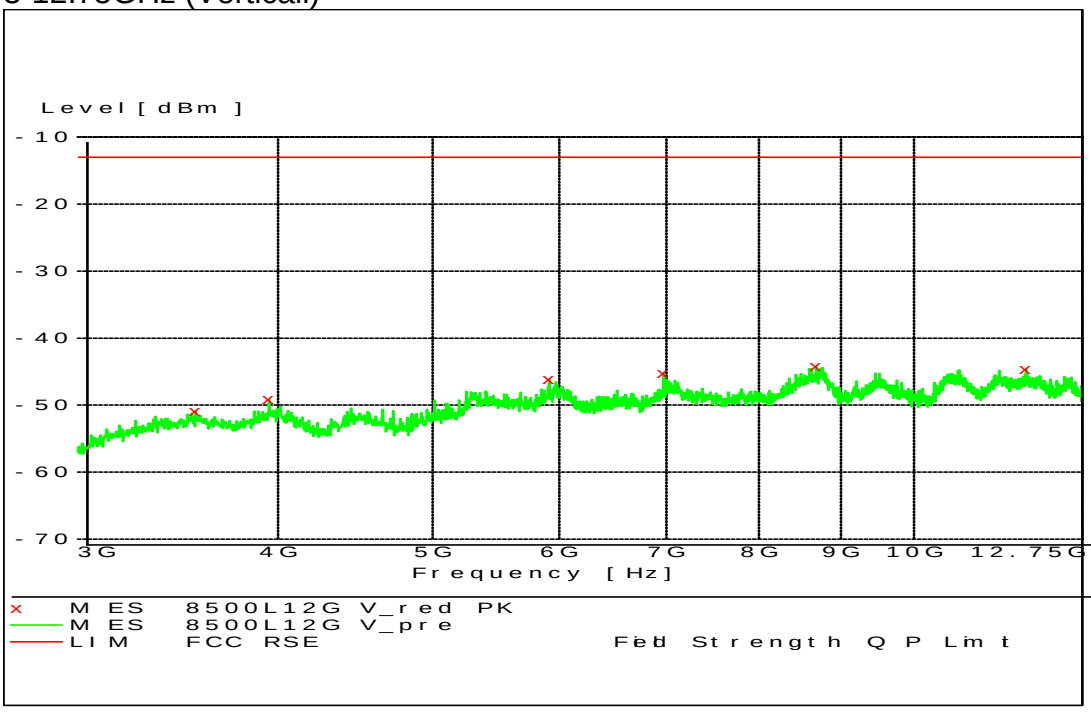
Frequency	Level	Azimuth	Height	Polarisation	Transd	Limit	Margin
MHz	dBm	deg	cm		dBm	dBm	dB
887.480000	-19.95	8.20	100.0	VER	-119.9	-13	6.9
948.800000	-45.93	126.00	100.0	VER	-97.3	-13	32.9

3-12.75GHz (Horizontal)



Frequency	Level	Azimuth	Height	Polarisation	Transd	Limit	Margin
MHz	dBm	deg	cm		dBm	dBm	dB
3572.800000	-50.69	28.90	100.0	HOR	-89.3	-13	37.7
4840.000000	-47.46	233.40	200.0	HOR	-84.3	-13	34.5
5627.200000	-43.64	261.30	200.0	HOR	-79.5	-13	30.6
6292.800000	-41.97	122.90	200.0	HOR	-77.3	-13	29.0
8803.200000	-40.47	183.00	100.0	HOR	-73.1	-13	27.5
0551.200000	-40.67	204.00	100.0	HOR	-73.1	-13	27.7

3-12.75GHz (Verticall)



Frequency	Level	Azimuth	Height	Polarisation	Transd	Limit	Margin
MHz	dBm	deg	cm		dBm	dBm	dB
3553.600000	-50.85	198.80	200.0	VER	-89.5	-13	37.9
3950.400000	-49.07	289.40	200.0	VER	-87.7	-13	36.1
5912.000000	-46.12	244.30	100.0	VER	-81.9	-13	33.1
6971.200000	-45.15	329.00	100.0	VER	-80.1	-13	32.2
8688.200000	-44.14	126.50	100.0	VER	-76.6	-13	31.1
11756.400000	-44.59	70.30	100.0	VER	-75.9	-13	31.6

9 SPURIOUS EMISSIONS AT ANTENNA TERMINALS

9.1 Applicable Standard: FCC§2.1051, §22.917

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

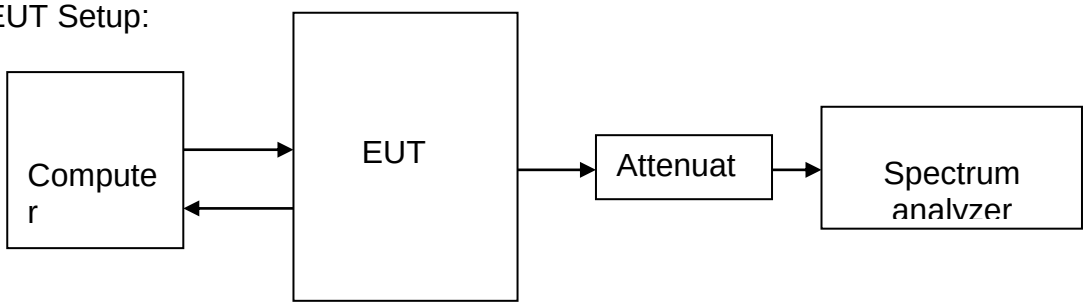
9.2 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	MXA Series Spectrum Analyzer	N9030A	MY49431143	2016.04.17	2017.04.17
DTS	DTS 40dB Attenuator	DTS100-40-3-1	09112005	2016.04.17	2017.04.17

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

9.3 Test Procedure

EUT Setup:



REMARKS: Attenuator loss (dB)=40dB, Cable Loss (dB)=1.3dB.

The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed. Sufficient scans were taken to show any out of band emissions up to 10th harmonic.

9.4 Test Data Environmental Conditions

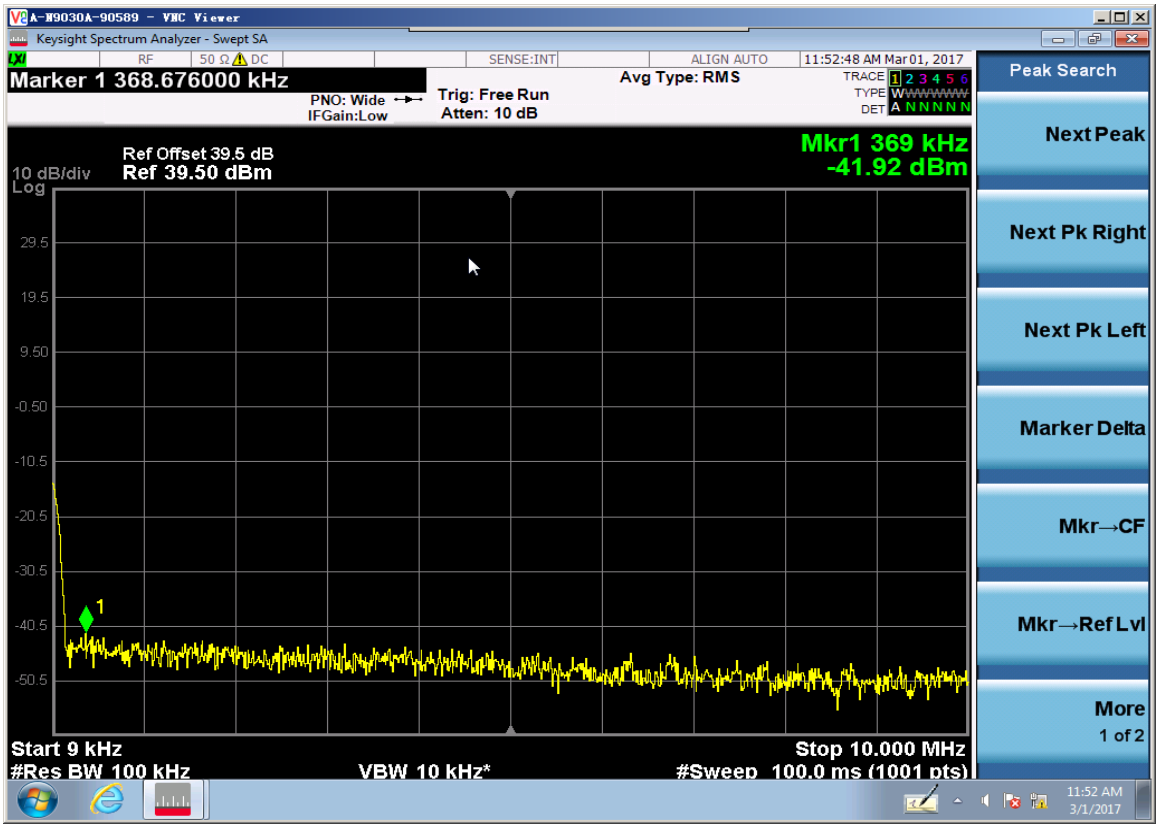
Temperature:	20 °C
Relative Humidity:	53 %
ATM Pressure:	1009 mbar

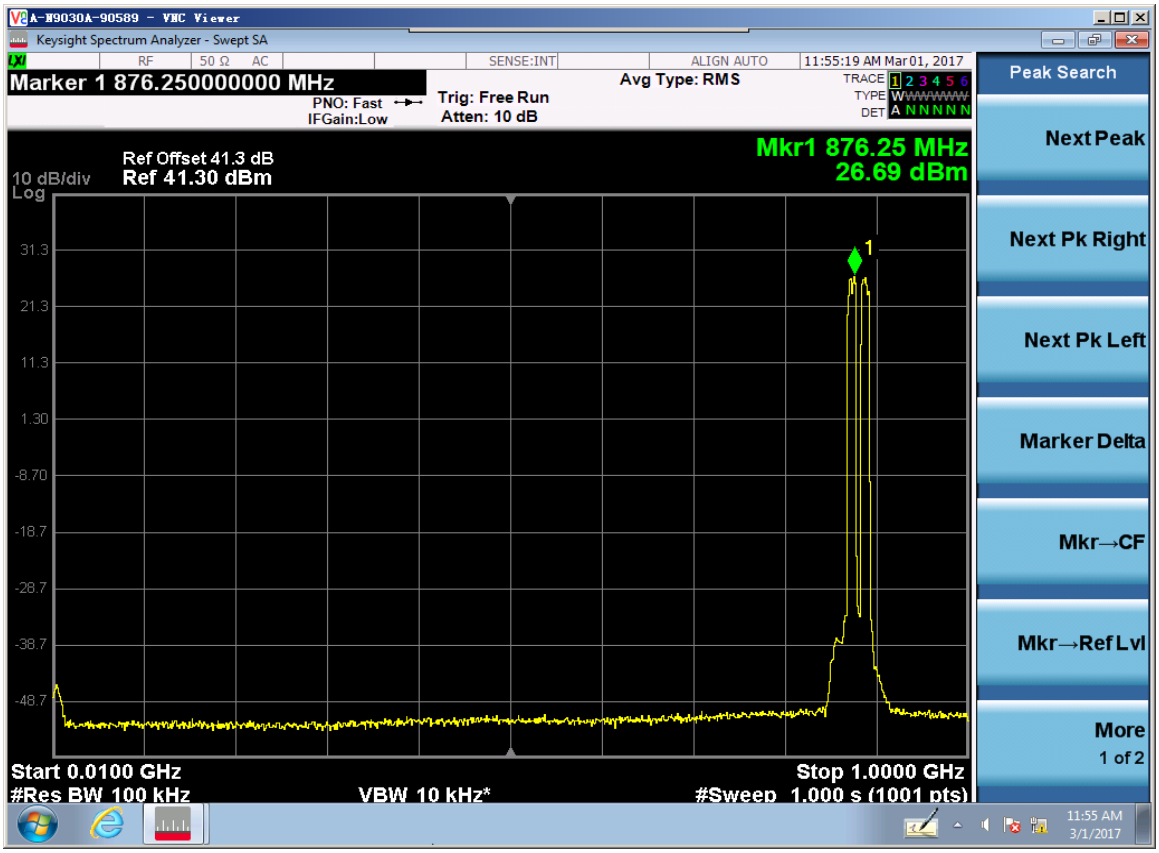
9.5 Test Result: Pass

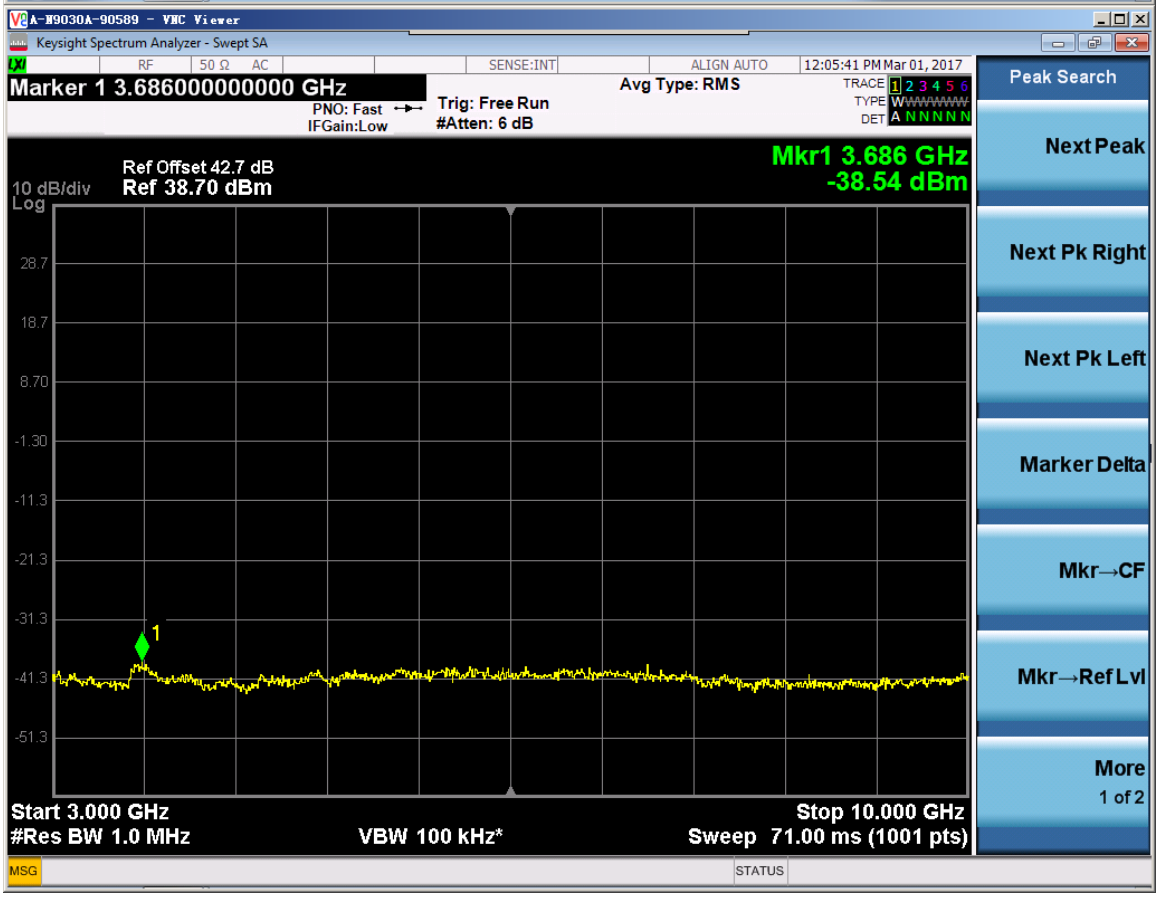
9.6 Test Mode: Transmitting LTE

9.7 Test Data

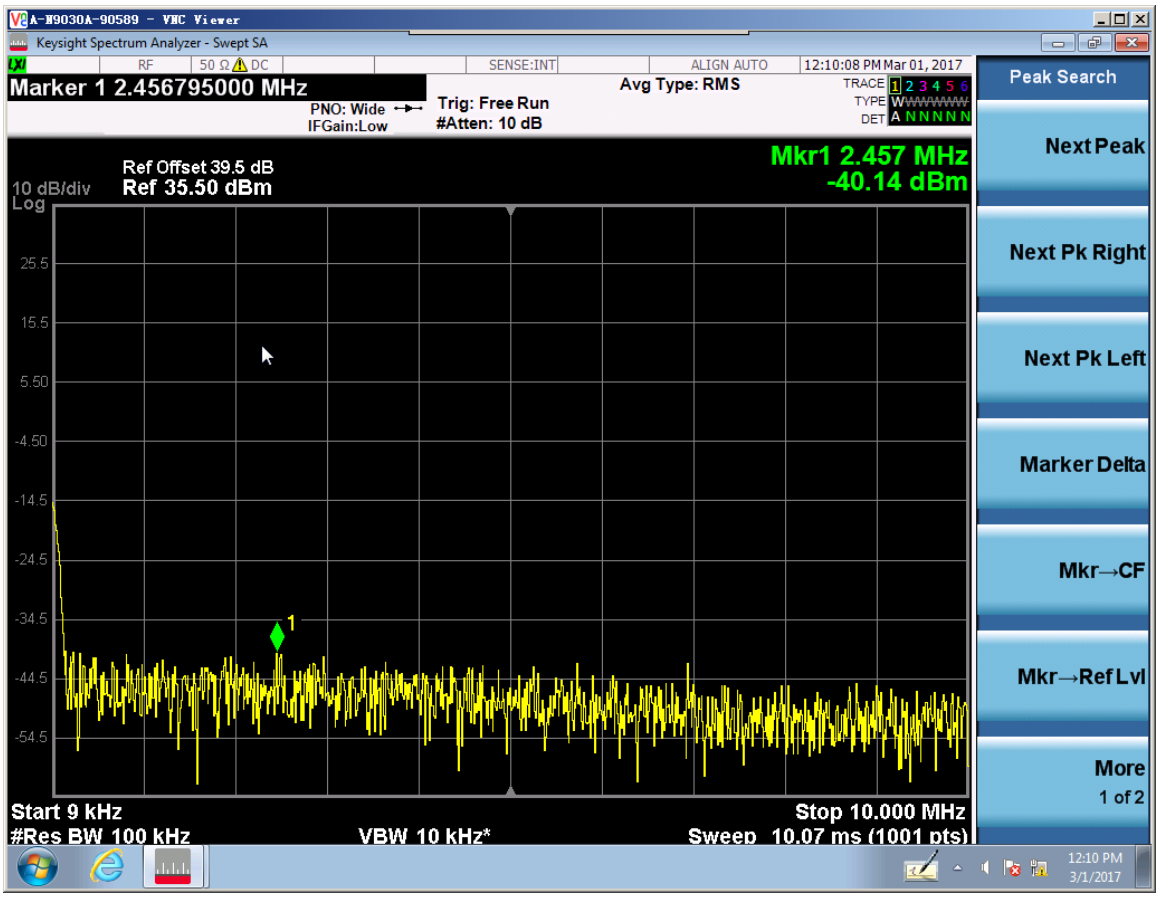
Port 1-RF Bandwidth :25M(10M+10M)

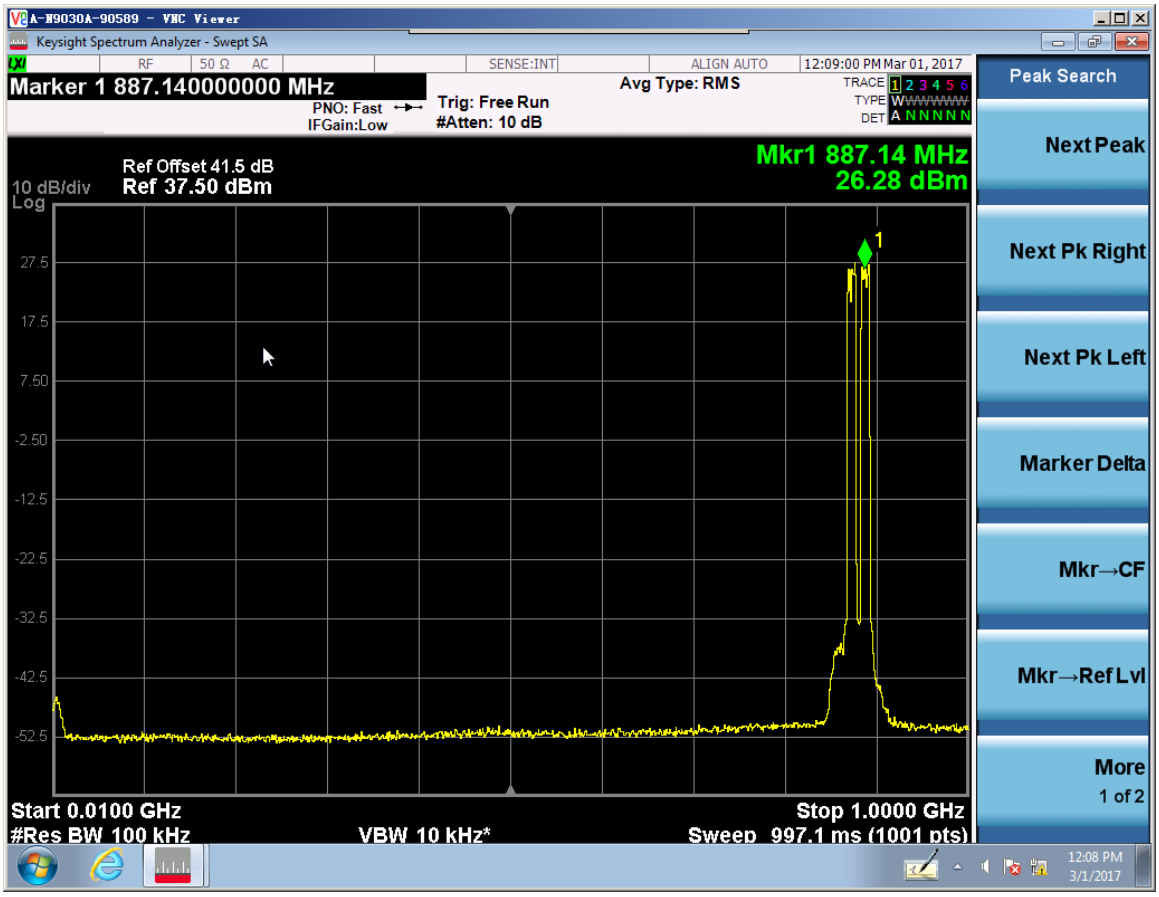

A-N9030A-90589 - VNC Viewer
Keysight Spectrum Analyzer - Swept SA
RF 50 Ω DC
SENSE:INT
ALIGN AUTO
11:52:48 AM Mar 01, 2017
Marker 1 368.676000 kHz
PNO: Wide
IFGain:Low
Trig: Free Run
Atten: 10 dB
Avg Type: RMS
TRACE 1 2 3 4 5 6
TYPE W
DET A N N N N N
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
Ref Offset 39.5 dB
10 dB/div
Ref 39.50 dBm
Log
Mkr1 369 kHz
-41.92 dBm
29.5
19.5
9.50
-0.50
-10.5
-20.5
-30.5
-40.5
-50.5
1
Start 9 kHz
#Res BW 100 kHz
VBW 10 kHz*
Stop 10.000 MHz
#Sweep 100.0 ms (1001 pts)
11:52 AM
3/1/2017


A-N9030A-90589 - VNC Viewer
Keysight Spectrum Analyzer - Swept SA
RF 50 Ω AC
SENSE:INT
ALIGN AUTO
11:55:19 AM Mar 01, 2017
Marker 1 876.250000000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 10 dB
Avg Type: RMS
TRACE 1 2 3 4 5 6
TYPE W
DET A N N N N N
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
Ref Offset 41.3 dB
10 dB/div
Ref 41.30 dBm
Log
Mkr1 876.25 MHz
26.69 dBm
31.3
21.3
11.3
1.30
-8.70
-18.7
-28.7
-38.7
-48.7
1
Start 0.0100 GHz
#Res BW 100 kHz
VBW 10 kHz*
Stop 1.0000 GHz
#Sweep 1.000 s (1001 pts)
11:55 AM
3/1/2017

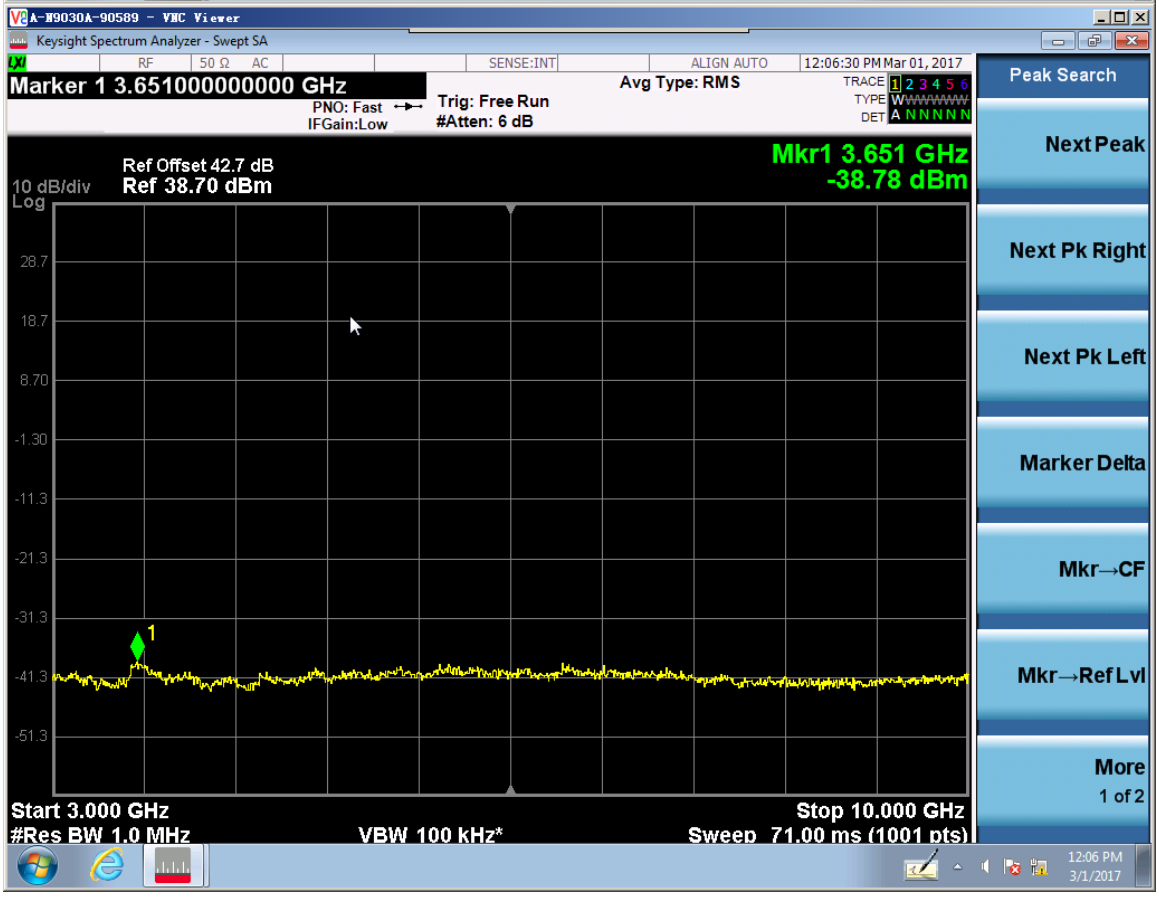


Port 4-RF Bandwidth :25M(10M+10M)


A-N9030A-90589 - VNC Viewer
Keysight Spectrum Analyzer - Swept SA
RF 50 Ω DC
SENSE:INT
ALIGN AUTO
12:10:08 PM Mar 01, 2017
Marker 1 2.456795000 MHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 10 dB
Avg Type: RMS
TRACE 1 2 3 4 5 6
TYPE W
DET A N N N N N
Ref Offset 39.5 dB
10 dB/div
Log
Ref 35.50 dBm
Mkr1 2.457 MHz
-40.14 dBm
25.5
15.5
5.50
-4.50
-14.5
-24.5
-34.5
-44.5
-54.5
Start 9 kHz
#Res BW 100 kHz
VBW 10 kHz*
Stop 10.000 MHz
Sweep 10.07 ms (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
12:10 PM
3/1/2017


A-N9030A-90589 - VNC Viewer
Keysight Spectrum Analyzer - Swept SA
RF 50 Ω AC
SENSE:INT
ALIGN AUTO
12:09:00 PM Mar 01, 2017
Marker 1 887.140000000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 10 dB
Avg Type: RMS
TRACE 1 2 3 4 5 6
TYPE W
DET A N N N N N
Ref Offset 41.5 dB
10 dB/div
Log
Ref 37.50 dBm
Mkr1 887.14 MHz
26.28 dBm
27.5
17.5
7.50
-2.50
-12.5
-22.5
-32.5
-42.5
-52.5
Start 0.0100 GHz
#Res BW 100 kHz
VBW 10 kHz*
Stop 1.0000 GHz
Sweep 997.1 ms (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
12:08 PM
3/1/2017


A-N9030A-90589 - VNC Viewer
Keysight Spectrum Analyzer - Swept SA
RF 50 Ω AC
SENSE:INT
ALIGN AUTO
12:08:13 PM Mar 01, 2017
Avg Type: RMS
TRACE 1 2 3 4 5 6
TYPE W
DET A N N N N N
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 6 dB
Ref Offset 41.5 dB
10 dB/div
Log
Ref 37.50 dBm
Mkr1 1.814 GHz
-47.29 dBm
27.5
17.5
7.50
-2.50
-12.5
-22.5
-32.5
-42.5
-52.5
1
Start 1.000 GHz
#Res BW 100 kHz
VBW 10 kHz*
Stop 3.000 GHz
Sweep 2.014 s (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
12:08 PM
3/1/2017


A-N9030A-90589 - VNC Viewer
Keysight Spectrum Analyzer - Swept SA
RF 50 Ω AC
SENSE:INT
ALIGN AUTO
12:06:30 PM Mar 01, 2017
Marker 1 3.651000000000 GHz
Avg Type: RMS
TRACE 1 2 3 4 5 6
TYPE W
DET A N N N N N
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 6 dB
Ref Offset 42.7 dB
10 dB/div
Log
Ref 38.70 dBm
Mkr1 3.651 GHz
-38.78 dBm
28.7
18.7
8.70
-1.30
-11.3
-21.3
-31.3
-41.3
-51.3
1
Start 3.000 GHz
#Res BW 1.0 MHz
VBW 100 kHz*
Stop 10.000 GHz
Sweep 71.00 ms (1001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
12:06 PM
3/1/2017

10 10 OCCUPIED BANDWIDTH

10.1 Applicable Standard: FCC §2.1049

10.2 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	MXA Series Spectrum Analyzer	N9030A	MY49431143	2016.04.17	2017.04.17
DTS	DTS 40dB Attenuator	DTS100-40-3-1	09112005	2016.04.17	2017.04.17

***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

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

10.4 Environmental Conditions

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

10.5 Test Result: Pass

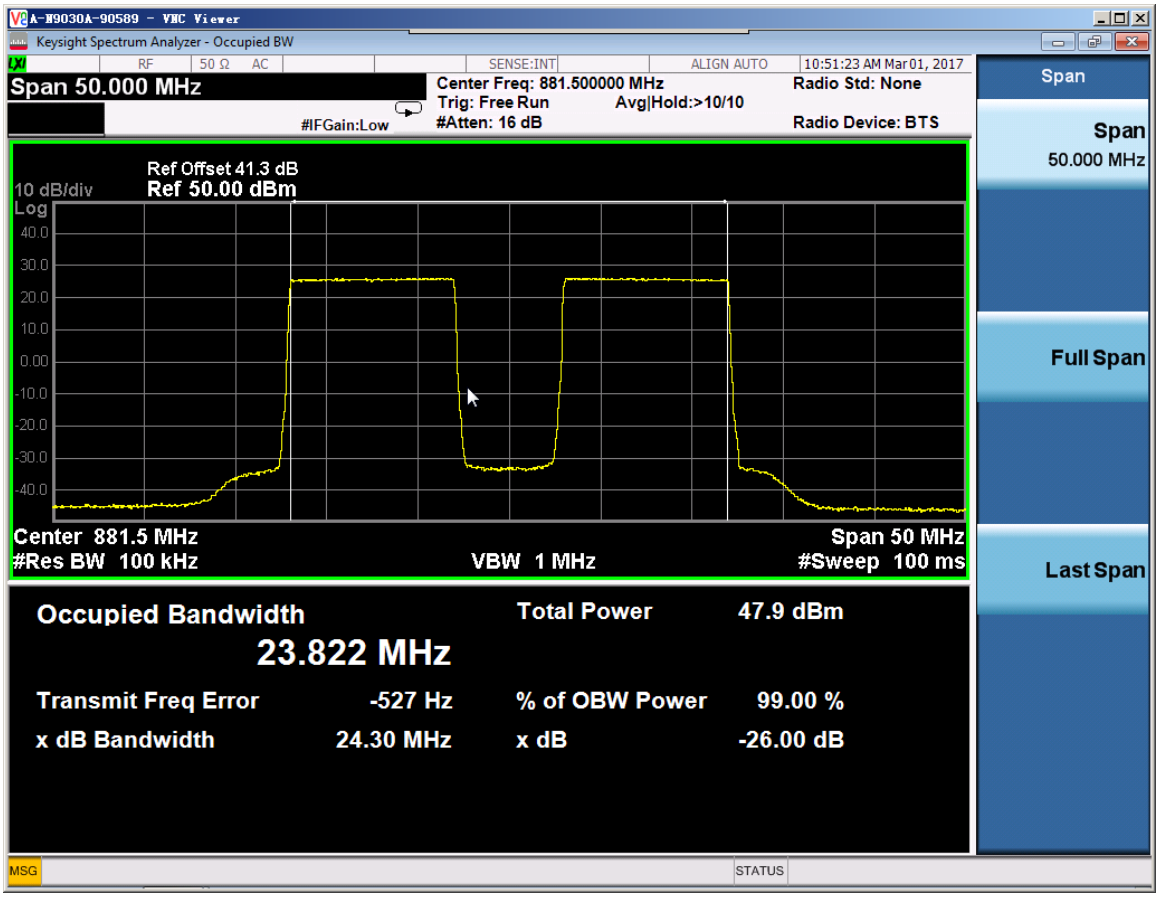
10.6 Test Mode: Transmitting LTE

10.7 Test Data

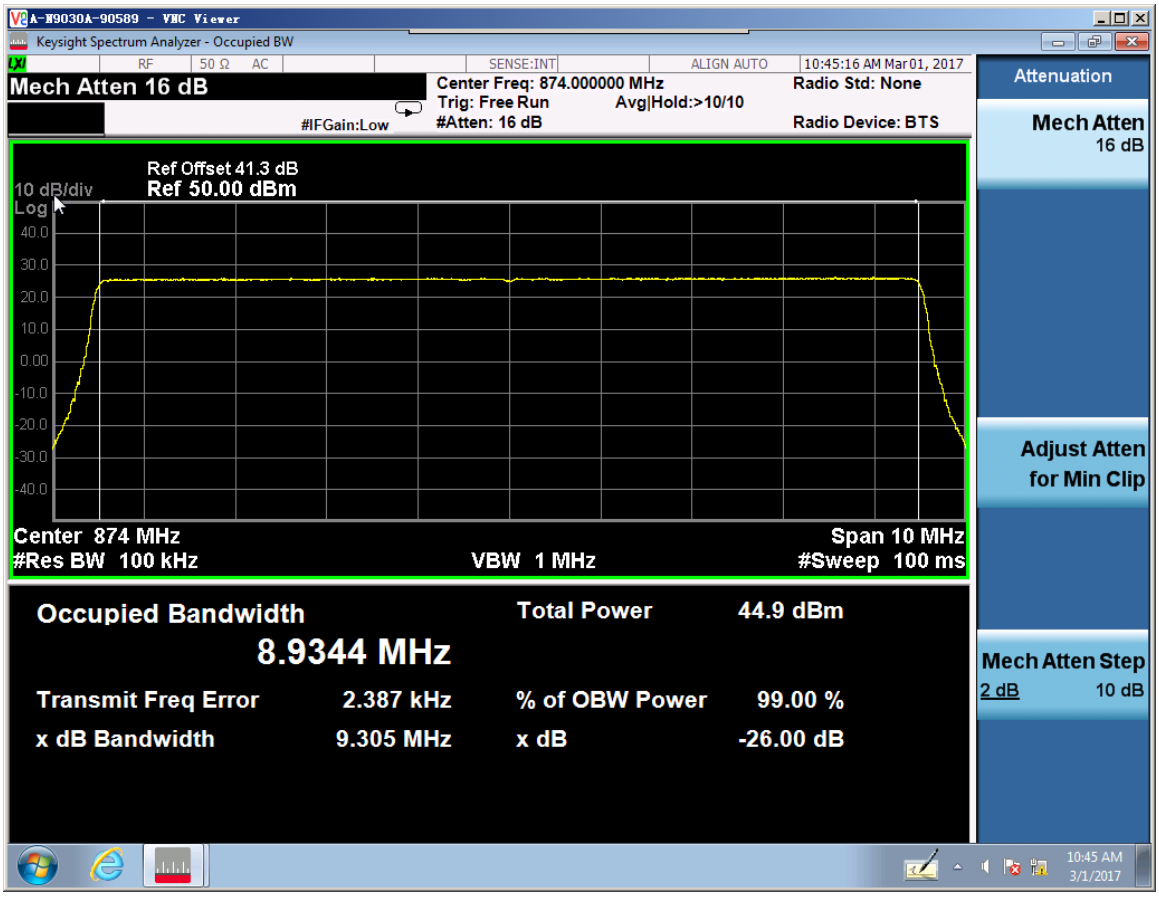
RF Bandwidth :25M(10M+10M)

Port	Center Freq. (MHz)	99% Power Bandwidth (MHz)	Limit (MHz)
1	881.5	23.822	25
	874	8.9344	10
	889	8.9328	10
4	881.5	23.825	25
	874	8.9344	10
	889	8.9319	10

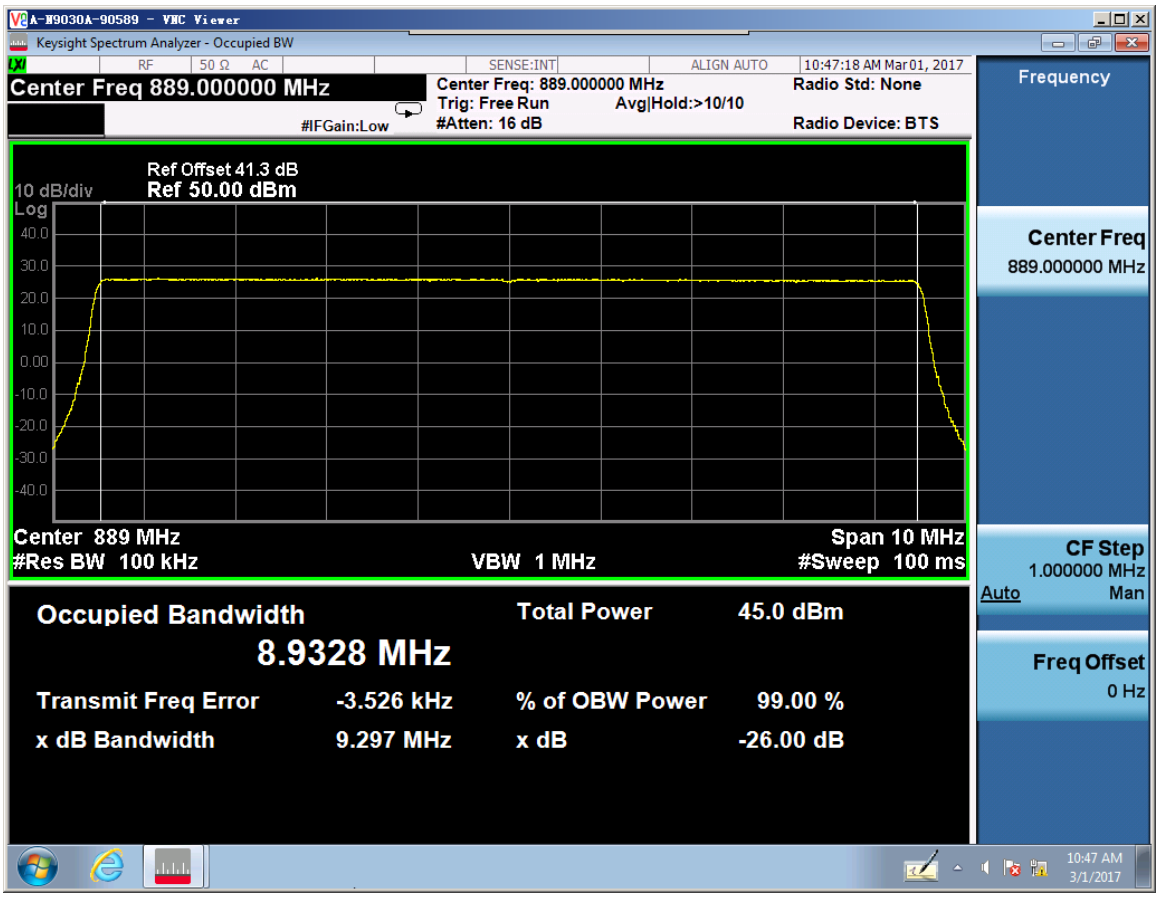
Port 1 –RF 25M-881.5MHz



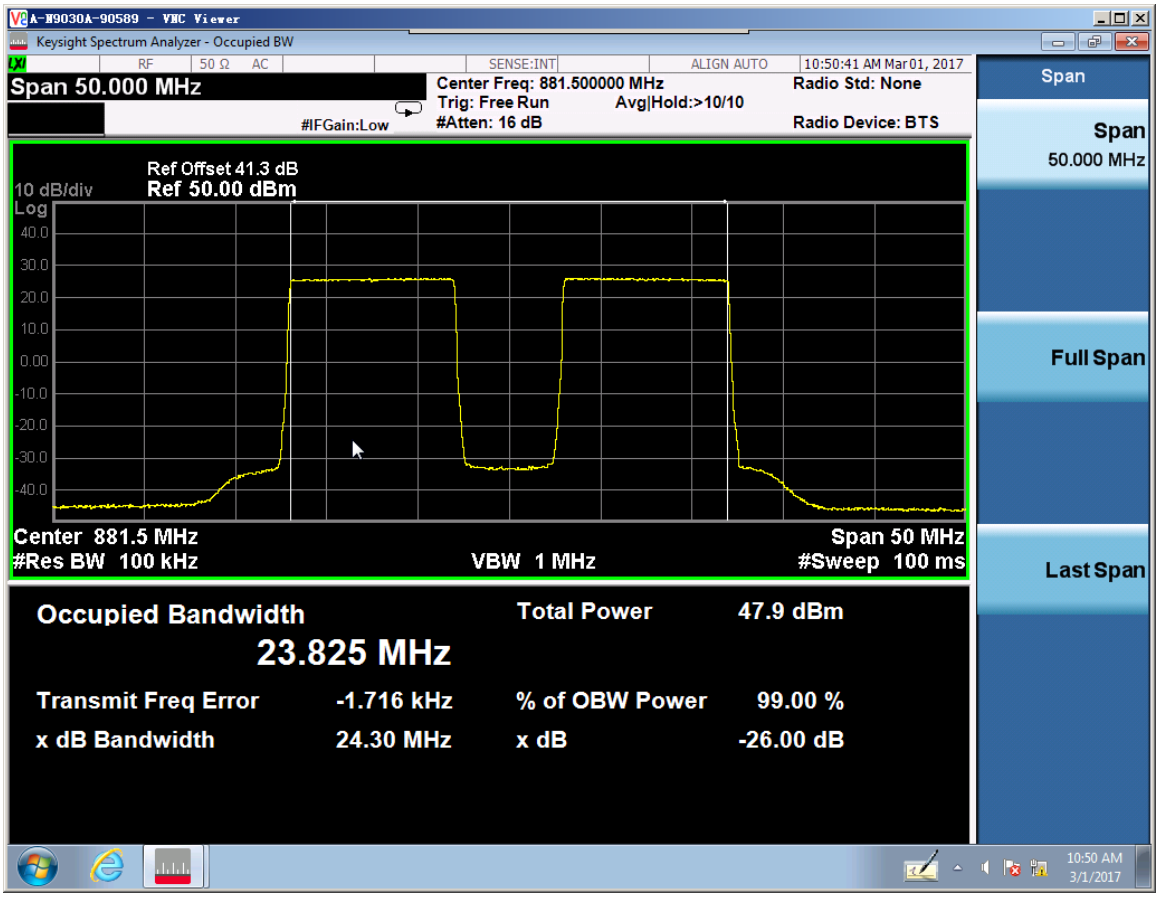
Port 1 –RF 25M-874MHz



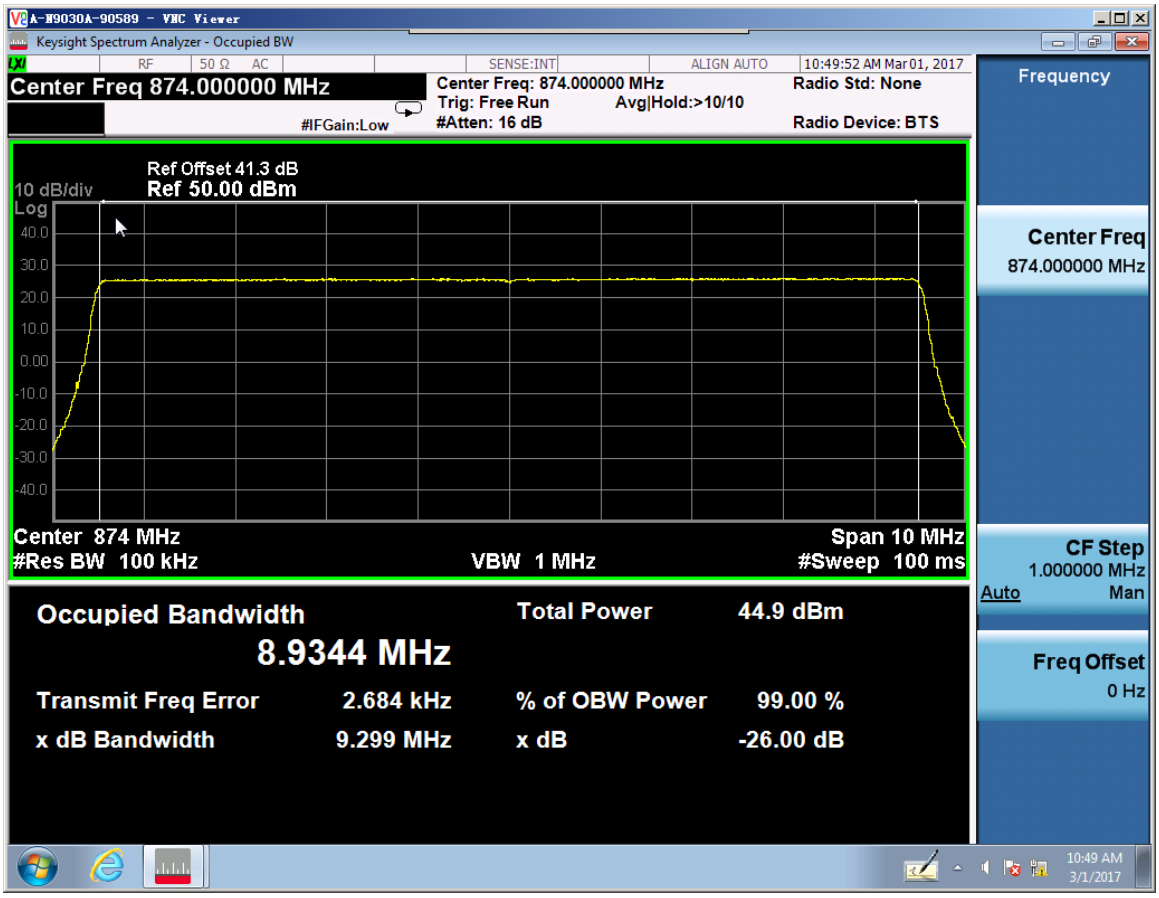
Port 1 –RF 25M-889MHz



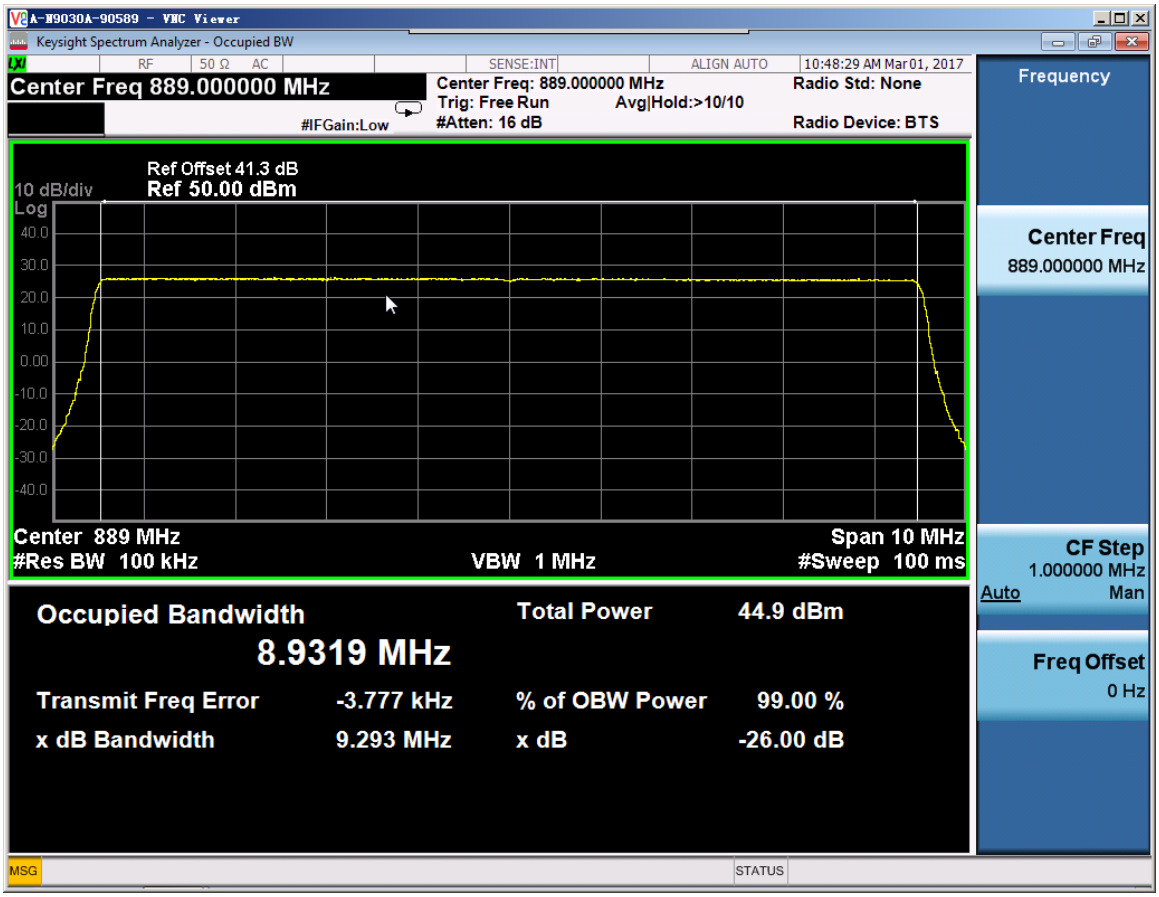
Port 4 - RF 25M 881.5MHz



Port 4 - RF 25M 874MHz



Port 4 –RF 25M-889MHz


A-N9030A-90589 - VNC Viewer
Keysight Spectrum Analyzer - Occupied BW
RF
50 Ω AC
SENSE:INT
ALIGN AUTO
10:48:29 AM Mar 01, 2017
Center Freq 889.000000 MHz
Center Freq: 889.000000 MHz
Trig: Free Run
Avg|Hold:>10/10
#IFGain:Low
#Atten: 16 dB
Radio Std: None
Radio Device: BTS
Frequency
Ref Offset 41.3 dB
10 dB/div
Ref 50.00 dBm
Log
40.0
30.0
20.0
10.0
0.00
-10.0
-20.0
-30.0
-40.0
Center 889 MHz
#Res BW 100 kHz
VBW 1 MHz
Span 10 MHz
#Sweep 100 ms
Center Freq
889.000000 MHz
CF Step
1.000000 MHz
Auto
Man
Freq Offset
0 Hz
Occupied Bandwidth
8.9319 MHz
Total Power
44.9 dBm
Transmit Freq Error
-3.777 kHz
% of OBW Power
99.00 %
x dB Bandwidth
9.293 MHz
x dB
-26.00 dB
MSG
STATUS

11 11 BAND EDGES

11.1 Applicable Standard: FCC §2.1051, §22.917

According to §2.1051, 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.

11.2 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	MXA Series Spectrum Analyzer	N9030A	MY49431143	2016.04.17	2017.04.17
DTS	DTS 40dB Attenuator	DTS100-40-3-1	09112005	2016.04.17	2017.04.17

*__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 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.

11.4 Test Data Environmental Conditions

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

11.5 Test Result: Pass

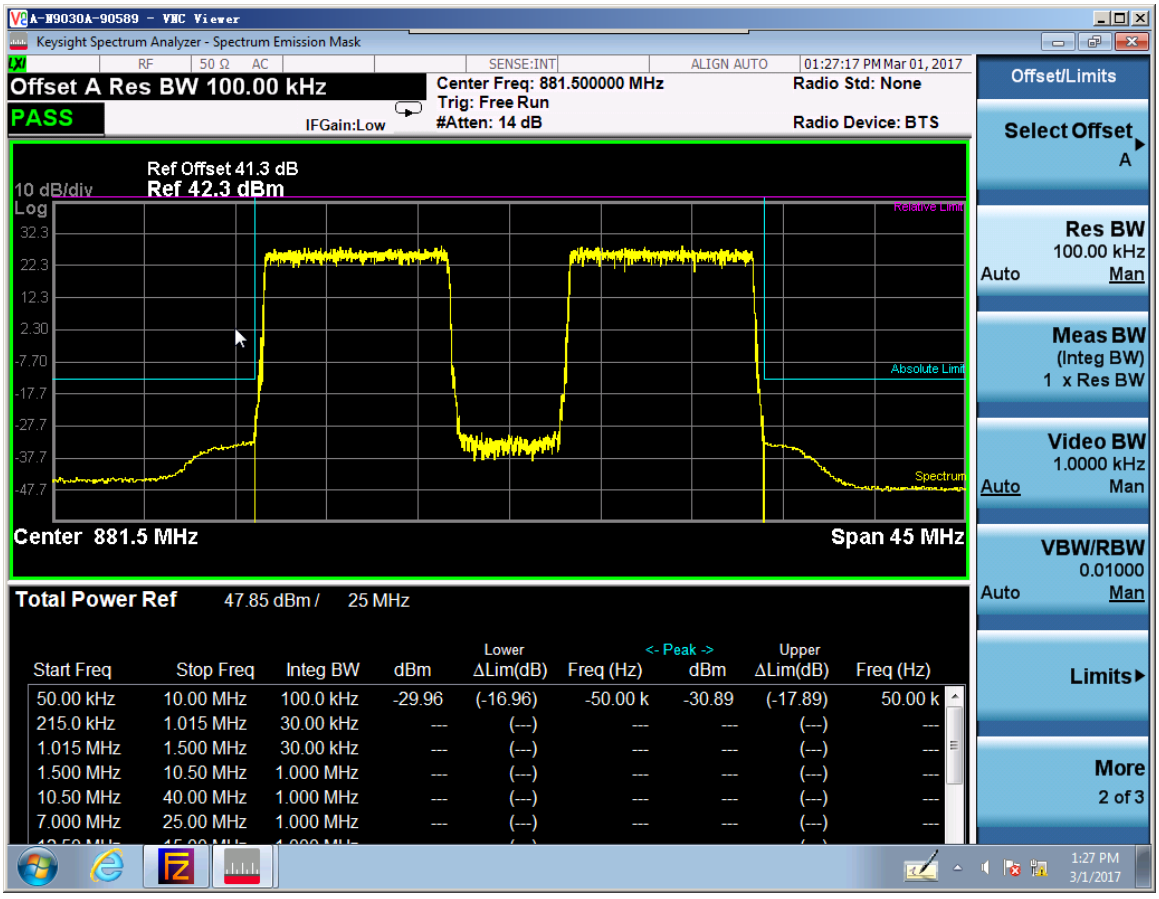
11.6 Test Mode: Transmitting LTE

11.7 Test Data

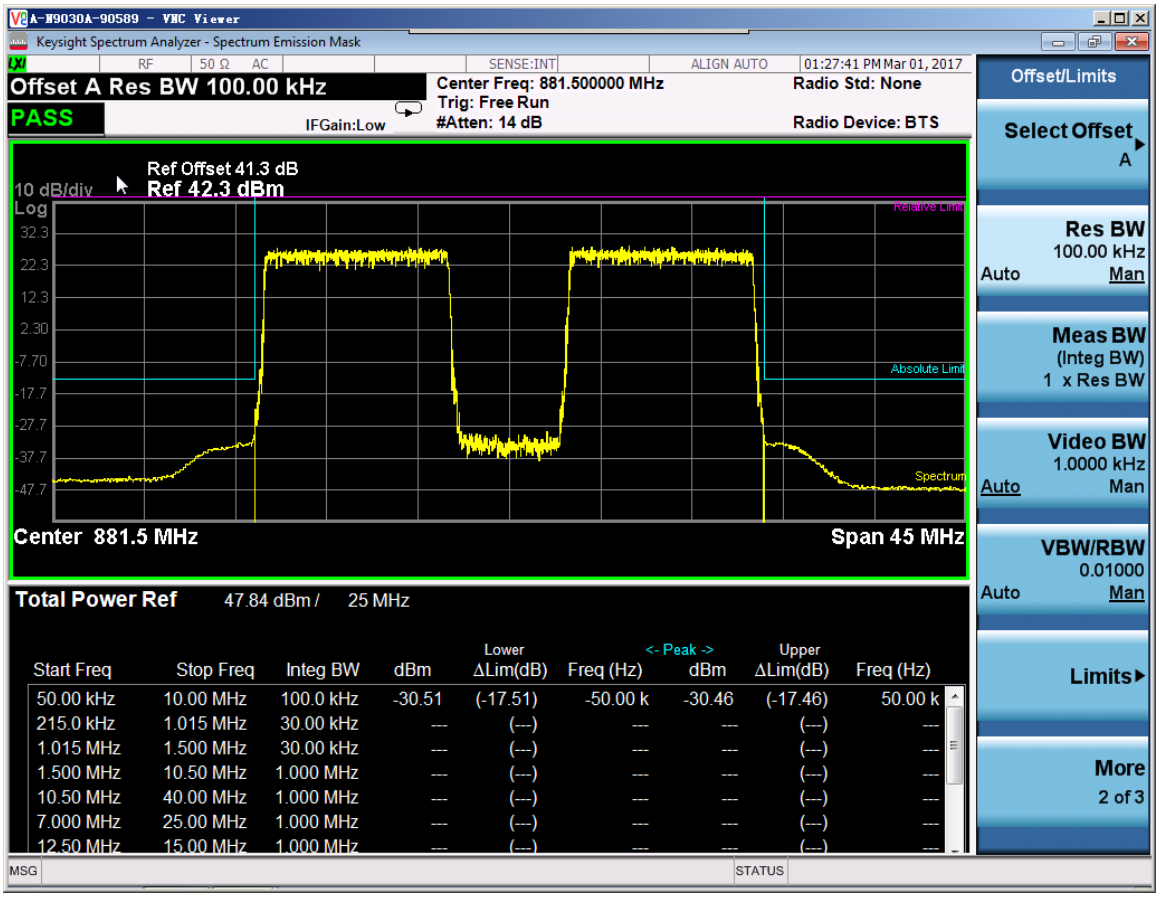
RF Bandwidth :25M(10M+10M)

Port	Center Freq. (MHz)	Carry Frequency. (MHz)	Max bandedge Emission (dBm)	Limit (dBm)
1	881.5	874	-29.96	-13
4	881.5	889	-30.46	-13

Port 1 -881.5MHz



Port 4 -881.5MHz



12 12 FREQUENCY STABILITY

12.1 Applicable Standard: FCC § 2.1055

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.

12.2 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
GZ-ESPEC	Temperature Chamber	EW0470	06113028	2016.04.17	2017.04.17
Agilent	MXA Series Spectrum Analyzer	N9030A	MY49431143	2016.04.17	2017.04.17
DTS	DTS 40dB Attenuator	DTS100-40-3-1	09112005	2016.04.17	2017.04.17

*__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

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.

12.4 Environmental Conditions

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

12.5 Test Result: Pass

12.6 Test Mode: Transmitting LTE

12.7 Test Data

12.7.1 Frequency Stability Versus Temperature

Frequency Stability vs Temperature（Channel Bandwidth:10M Frequency :874MHz）							
Temperature (℃)	**Power Supplied (V_{DC})**	**Port**	**Frequency Measure Error (Hz)**	**E-TM**	**Limit (**	**Limit (Hz)**	**Result**

					ppm)		
			0.784	TM2.0	0.05	43.7	PASS
			0.797	TM3.1	0.05	43.7	PASS
			1.382	TM3.2	0.05	43.7	PASS
		1	0.867	TM3.3	0.05	43.7	PASS
			1.626	TM2.0	0.05	43.7	PASS
			1.000	TM3.1	0.05	43.7	PASS
			0.891	TM3.2	0.05	43.7	PASS
-40		4	2.061	TM3.3	0.05	43.7	PASS
			1.351	TM2.0	0.05	43.7	PASS
			0.667	TM3.1	0.05	43.7	PASS
			1.241	TM3.2	0.05	43.7	PASS
		1	0.402	TM3.3	0.05	43.7	PASS
			0.527	TM2.0	0.05	43.7	PASS
			1.869	TM3.1	0.05	43.7	PASS
			0.775	TM3.2	0.05	43.7	PASS
-30		4	0.996	TM3.3	0.05	43.7	PASS
			0.684	TM2.0	0.05	43.7	PASS
			0.516	TM3.1	0.05	43.7	PASS
			0.287	TM3.2	0.05	43.7	PASS
		1	1.388	TM3.3	0.05	43.7	PASS
			1.106	TM2.0	0.05	43.7	PASS
			0.751	TM3.1	0.05	43.7	PASS
			0.488	TM3.2	0.05	43.7	PASS
-20		4	0.736	TM3.3	0.05	43.7	PASS
			0.989	TM2.0	0.05	43.7	PASS
			0.482	TM3.1	0.05	43.7	PASS
			1.105	TM3.2	0.05	43.7	PASS
		1	1.035	TM3.3	0.05	43.7	PASS
			0.582	TM2.0	0.05	43.7	PASS
			0.955	TM3.1	0.05	43.7	PASS
			1.006	TM3.2	0.05	43.7	PASS
-10		4	1.119	TM3.3	0.05	43.7	PASS
			0.355	TM2.0	0.05	43.7	PASS
			0.158	TM3.1	0.05	43.7	PASS
			1.053	TM3.2	0.05	43.7	PASS
		1	0.709	TM3.3	0.05	43.7	PASS
			0.352	TM2.0	0.05	43.7	PASS
			0.395	TM3.1	0.05	43.7	PASS
			1.195	TM3.2	0.05	43.7	PASS
0	-48	2	0.403	TM3.3	0.05	43.7	PASS

			0.668	TM2.0	0.05	43.7	PASS
			0.378	TM3.1	0.05	43.7	PASS
			0.231	TM3.2	0.05	43.7	PASS
		1	0.904	TM3.3	0.05	43.7	PASS
			0.165	TM2.0	0.05	43.7	PASS
			0.369	TM3.1	0.05	43.7	PASS
			0.849	TM3.2	0.05	43.7	PASS
10		4	1.128	TM3.3	0.05	43.7	PASS
			0.811	TM2.0	0.05	43.7	PASS
			0.554	TM3.1	0.05	43.7	PASS
			0.474	TM3.2	0.05	43.7	PASS
		1	0.488	TM3.3	0.05	43.7	PASS
			0.713	TM2.0	0.05	43.7	PASS
			1.056	TM3.1	0.05	43.7	PASS
			0.371	TM3.2	0.05	43.7	PASS
20		4	0.555	TM3.3	0.05	43.7	PASS
			0.701	TM2.0	0.05	43.7	PASS
			1.235	TM3.1	0.05	43.7	PASS
			1.004	TM3.2	0.05	43.7	PASS
		1	0.770	TM3.3	0.05	43.7	PASS
			2.045	TM2.0	0.05	43.7	PASS
			1.764	TM3.1	0.05	43.7	PASS
			1.711	TM3.2	0.05	43.7	PASS
30		4	0.709	TM3.3	0.05	43.7	PASS
			0.125	TM2.0	0.05	43.7	PASS
			0.583	TM3.1	0.05	43.7	PASS
			0.787	TM3.2	0.05	43.7	PASS
		1	0.955	TM3.3	0.05	43.7	PASS
			0.802	TM2.0	0.05	43.7	PASS
			0.741	TM3.1	0.05	43.7	PASS
			0.274	TM3.2	0.05	43.7	PASS
40		4	0.210	TM3.3	0.05	43.7	PASS
			0.995	TM2.0	0.05	43.7	PASS
			1.655	TM3.1	0.05	43.7	PASS
			1.095	TM3.2	0.05	43.7	PASS
		1	0.929	TM3.3	0.05	43.7	PASS
			2.123	TM2.0	0.05	43.7	PASS
			1.324	TM3.1	0.05	43.7	PASS
			1.198	TM3.2	0.05	43.7	PASS
50		4	0.971	TM3.3	0.05	43.7	PASS
55		1	1.067	TM2.0	0.05	43.7	PASS

			1.822	TM3.1	0.05	43.7	PASS
			0.647	TM3.2	0.05	43.7	PASS
			1.530	TM3.3	0.05	43.7	PASS
			1.803	TM2.0	0.05	43.7	PASS
			1.935	TM3.1	0.05	43.7	PASS
			1.174	TM3.2	0.05	43.7	PASS
		4	0.956	TM3.3	0.05	43.7	PASS

Frequency Stability vs Temperature（Channel Bandwidth:10M Frequency :889MHz）							
Temperature (℃)	**Power Supplied (V_{DC})**	**Port**	**Frequency Measure Error (Hz)**	**E-TM**	**Limit (ppm)**	**Limit (Hz)**	**Result**
			1.262	TM2.0	0.05	44.45	PASS
			0.467	TM3.1	0.05	44.45	PASS
			1.543	TM3.2	0.05	44.45	PASS
		1	0.510	TM3.3	0.05	44.45	PASS
			1.417	TM2.0	0.05	44.45	PASS
			0.256	TM3.1	0.05	44.45	PASS
			0.142	TM3.2	0.05	44.45	PASS
-40		4	1.936	TM3.3	0.05	44.45	PASS
			1.492	TM2.0	0.05	44.45	PASS
			0.613	TM3.1	0.05	44.45	PASS
			1.099	TM3.2	0.05	44.45	PASS
		1	0.828	TM3.3	0.05	44.45	PASS
			0.720	TM2.0	0.05	44.45	PASS
			2.166	TM3.1	0.05	44.45	PASS
			1.052	TM3.2	0.05	44.45	PASS
-30		4	1.068	TM3.3	0.05	44.45	PASS
			0.790	TM2.0	0.05	44.45	PASS
			0.808	TM3.1	0.05	44.45	PASS
			0.883	TM3.2	0.05	44.45	PASS
		1	0.947	TM3.3	0.05	44.45	PASS
			0.479	TM2.0	0.05	44.45	PASS
			0.322	TM3.1	0.05	44.45	PASS
			0.711	TM3.2	0.05	44.45	PASS
-20		4	0.606	TM3.3	0.05	44.45	PASS
-10	-48	1	0.990	TM2.0	0.05	44.45	PASS

			0.267	TM3.1	0.05	44.45	PASS
			1.088	TM3.2	0.05	44.45	PASS
			0.690	TM3.3	0.05	44.45	PASS
			0.161	TM2.0	0.05	44.45	PASS
			0.211	TM3.1	0.05	44.45	PASS
			1.035	TM3.2	0.05	44.45	PASS
		4	0.910	TM3.3	0.05	44.45	PASS
			0.115	TM2.0	0.05	44.45	PASS
			0.657	TM3.1	0.05	44.45	PASS
			0.385	TM3.2	0.05	44.45	PASS
		1	0.738	TM3.3	0.05	44.45	PASS
			0.425	TM2.0	0.05	44.45	PASS
			0.653	TM3.1	0.05	44.45	PASS
			1.392	TM3.2	0.05	44.45	PASS
0		2	1.193	TM3.3	0.05	44.45	PASS
			0.979	TM2.0	0.05	44.45	PASS
			0.679	TM3.1	0.05	44.45	PASS
			0.676	TM3.2	0.05	44.45	PASS
		1	0.195	TM3.3	0.05	44.45	PASS
			0.683	TM2.0	0.05	44.45	PASS
			0.663	TM3.1	0.05	44.45	PASS
			0.161	TM3.2	0.05	44.45	PASS
10		4	0.193	TM3.3	0.05	44.45	PASS
			0.874	TM2.0	0.05	44.45	PASS
			0.743	TM3.1	0.05	44.45	PASS
			0.396	TM3.2	0.05	44.45	PASS
		1	0.283	TM3.3	0.05	44.45	PASS
			0.876	TM2.0	0.05	44.45	PASS
			1.150	TM3.1	0.05	44.45	PASS
			0.391	TM3.2	0.05	44.45	PASS
20		4	0.185	TM3.3	0.05	44.45	PASS
			0.280	TM2.0	0.05	44.45	PASS
			1.142	TM3.1	0.05	44.45	PASS
			0.775	TM3.2	0.05	44.45	PASS
		1	1.106	TM3.3	0.05	44.45	PASS
			1.708	TM2.0	0.05	44.45	PASS
			1.356	TM3.1	0.05	44.45	PASS
			1.567	TM3.2	0.05	44.45	PASS
30		4	1.175	TM3.3	0.05	44.45	PASS
			0.814	TM2.0	0.05	44.45	PASS
40		1	0.808	TM3.1	0.05	44.45	PASS

			0.406	TM3.2	0.05	44.45	PASS
			0.484	TM3.3	0.05	44.45	PASS
			1.684	TM2.0	0.05	44.45	PASS
			0.665	TM3.1	0.05	44.45	PASS
			0.842	TM3.2	0.05	44.45	PASS
		4	0.585	TM3.3	0.05	44.45	PASS
			0.587	TM2.0	0.05	44.45	PASS
			0.993	TM3.1	0.05	44.45	PASS
			1.000	TM3.2	0.05	44.45	PASS
		1	0.851	TM3.3	0.05	44.45	PASS
			2.326	TM2.0	0.05	44.45	PASS
			1.912	TM3.1	0.05	44.45	PASS
			1.061	TM3.2	0.05	44.45	PASS
50		4	1.198	TM3.3	0.05	44.45	PASS
			1.066	TM2.0	0.05	44.45	PASS
			1.867	TM3.1	0.05	44.45	PASS
			0.701	TM3.2	0.05	44.45	PASS
		1	0.670	TM3.3	0.05	44.45	PASS
			1.658	TM2.0	0.05	44.45	PASS
			1.405	TM3.1	0.05	44.45	PASS
			0.849	TM3.2	0.05	44.45	PASS
55		4	1.829	TM3.3	0.05	44.45	PASS

12.7.2 Frequency Stability Versus Voltage

Frequency Stability vs Voltage（Channel Bandwidth:10M Frequency :874MHz）							
Power Supplied (V_{DC})	**Temperature (℃)**	**Port**	**Frequency Measure Error (Hz)**	**E-TM**	**Limit (ppm)**	**Limit (Hz)**	**Result**
			1.833	TM2.0	0.05	44.37	PASS
			0.991	TM3.1	0.05	44.37	PASS
			1.166	TM3.2	0.05	44.37	PASS
		1	0.979	TM3.3	0.05	44.37	PASS
			2.160	TM2.0	0.05	44.37	PASS
			1.780	TM3.1	0.05	44.37	PASS
			1.077	TM3.2	0.05	44.37	PASS
-37		4	0.783	TM3.3	0.05	44.37	PASS
-42	20	1	0.693	TM2.0	0.05	44.37	PASS

			1.529	TM3.1	0.05	44.37	PASS
			1.321	TM3.2	0.05	44.37	PASS
			2.754	TM3.3	0.05	44.37	PASS
			1.783	TM2.0	0.05	44.37	PASS
			0.596	TM3.1	0.05	44.37	PASS
			0.894	TM3.2	0.05	44.37	PASS
		4	1.284	TM3.3	0.05	44.37	PASS
			0.459	TM2.0	0.05	44.37	PASS
			1.025	TM3.1	0.05	44.37	PASS
			0.750	TM3.2	0.05	44.37	PASS
		1	0.690	TM3.3	0.05	44.37	PASS
			0.481	TM2.0	0.05	44.37	PASS
			1.129	TM3.1	0.05	44.37	PASS
			0.928	TM3.2	0.05	44.37	PASS
-48		4	1.155	TM3.3	0.05	44.37	PASS
			0.741	TM2.0	0.05	44.37	PASS
			1.463	TM3.1	0.05	44.37	PASS
			1.409	TM3.2	0.05	44.37	PASS
		1	2.143	TM3.3	0.05	44.37	PASS
			1.243	TM2.0	0.05	44.37	PASS
			1.025	TM3.1	0.05	44.37	PASS
			1.347	TM3.2	0.05	44.37	PASS
-54		4	1.123	TM3.3	0.05	44.37	PASS
			1.001	TM2.0	0.05	44.37	PASS
			1.511	TM3.1	0.05	44.37	PASS
			0.965	TM3.2	0.05	44.37	PASS
		1	0.859	TM3.3	0.05	44.37	PASS
			1.252	TM2.0	0.05	44.37	PASS
			1.154	TM3.1	0.05	44.37	PASS
			1.125	TM3.2	0.05	44.37	PASS
-60		4	0.587	TM3.3	0.05	44.37	PASS

Frequency Stability vs Voltage（Channel Bandwidth:10M Frequency :889MHz）							
Power Supplied (V_{DC})	**Temperature (℃)**	**Port**	**Frequency Measure Error (Hz)**	**E-TM**	**Limit (ppm)**	**Limit (Hz)**	**Result**
-37	20	1	1.277	TM2.0	0.05	44.45	PASS

			0.490	TM3.1	0.05	44.45	PASS
			0.403	TM3.2	0.05	44.45	PASS
			0.549	TM3.3	0.05	44.45	PASS
			2.027	TM2.0	0.05	44.45	PASS
			1.930	TM3.1	0.05	44.45	PASS
			1.325	TM3.2	0.05	44.45	PASS
		4	0.193	TM3.3	0.05	44.45	PASS
			0.308	TM2.0	0.05	44.45	PASS
			1.706	TM3.1	0.05	44.45	PASS
			1.834	TM3.2	0.05	44.45	PASS
		1	2.641	TM3.3	0.05	44.45	PASS
			2.058	TM2.0	0.05	44.45	PASS
			0.569	TM3.1	0.05	44.45	PASS
			1.242	TM3.2	0.05	44.45	PASS
-42		4	1.544	TM3.3	0.05	44.45	PASS
			0.231	TM2.0	0.05	44.45	PASS
			0.986	TM3.1	0.05	44.45	PASS
			0.266	TM3.2	0.05	44.45	PASS
		1	0.358	TM3.3	0.05	44.45	PASS
			0.936	TM2.0	0.05	44.45	PASS
			0.871	TM3.1	0.05	44.45	PASS
			0.460	TM3.2	0.05	44.45	PASS
-48		4	0.667	TM3.3	0.05	44.45	PASS
			1.500	TM2.0	0.05	44.45	PASS
			0.795	TM3.1	0.05	44.45	PASS
			0.580	TM3.2	0.05	44.45	PASS
		1	2.845	TM3.3	0.05	44.45	PASS
			1.147	TM2.0	0.05	44.45	PASS
			0.786	TM3.1	0.05	44.45	PASS
			1.223	TM3.2	0.05	44.45	PASS
-54		4	1.179	TM3.3	0.05	44.45	PASS
			1.441	TM2.0	0.05	44.45	PASS
			0.768	TM3.1	0.05	44.45	PASS
			0.831	TM3.2	0.05	44.45	PASS
		1	1.100	TM3.3	0.05	44.45	PASS
			1.203	TM2.0	0.05	44.45	PASS
			1.690	TM3.1	0.05	44.45	PASS
			1.461	TM3.2	0.05	44.45	PASS
-60		4	0.972	TM3.3	0.05	44.45	PASS

---End of Report---