FCC RF TEST REPORT

Report Number	:	RP20170313031_04 **Date of Issue:** 13 Mar 2017
FCC ID	:	Q78- R8872AS8500
Model / Serial No.	:	ZXSDR R8872A 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	:	45

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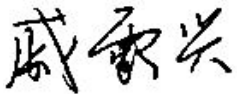
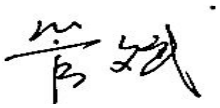
1 General Information

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 R8872A S8500

FCC ID : Q78- R8872AS8500

SAMPLE NUMBER: S20170313031

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: 415 mm x 352 mm x 137 mm (HxWxD)
Input voltage: -37V~-60V
Frequency range: UL:824MHz~849MHz; DL: 869MHz~894MHz
Max RF output power: 49dBm
Gain of the antenna: 15dBi
Appearance of EUT:

fig 1. FIGURE 1 APPEARANCE OF ZXSDR R8872A S8500

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.

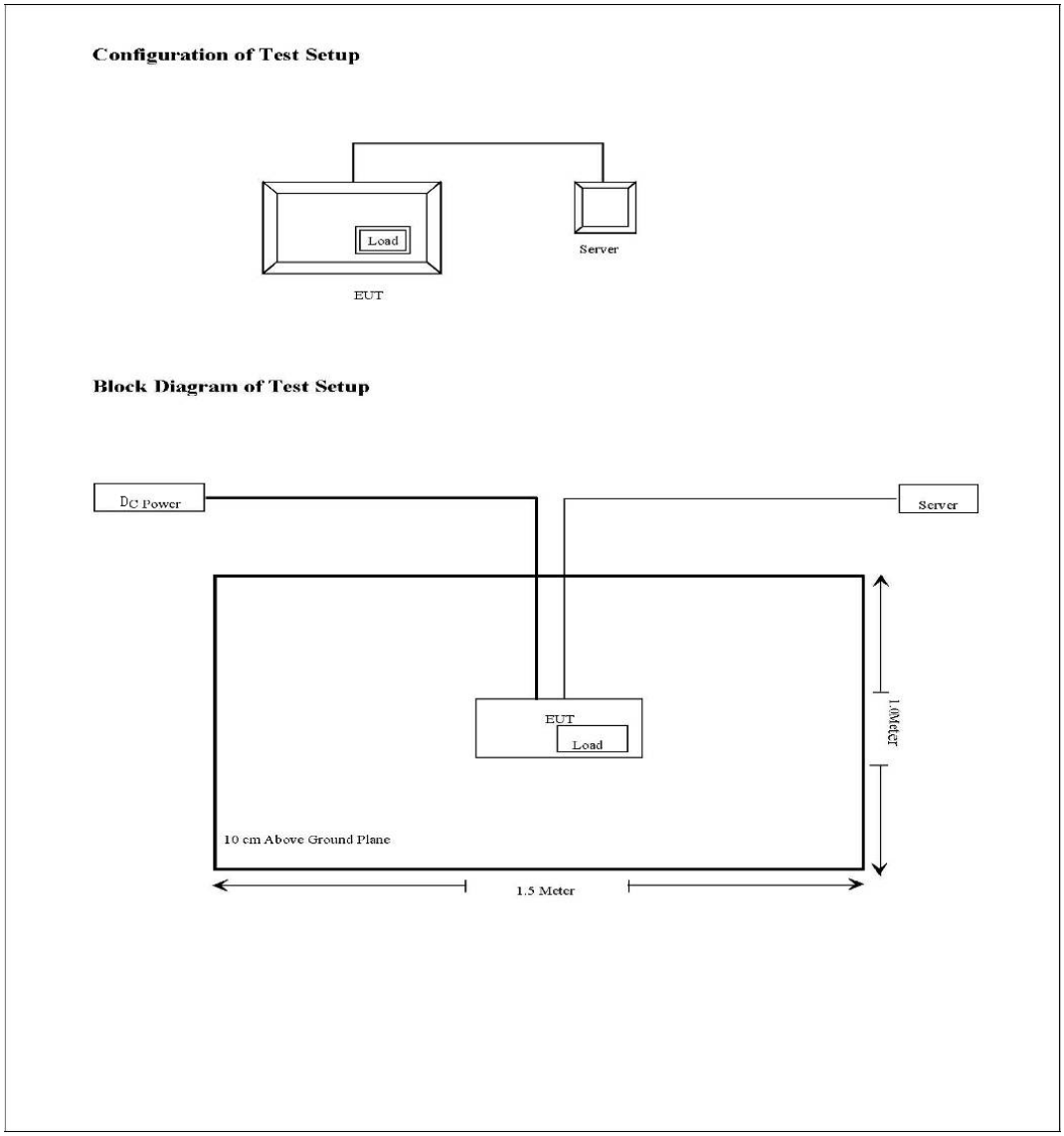


fig 2. Test configuration

6 TRANSMITTER OUTPUT POWER

6.1 Applicable Standard：FCC §2.1046, §22.913

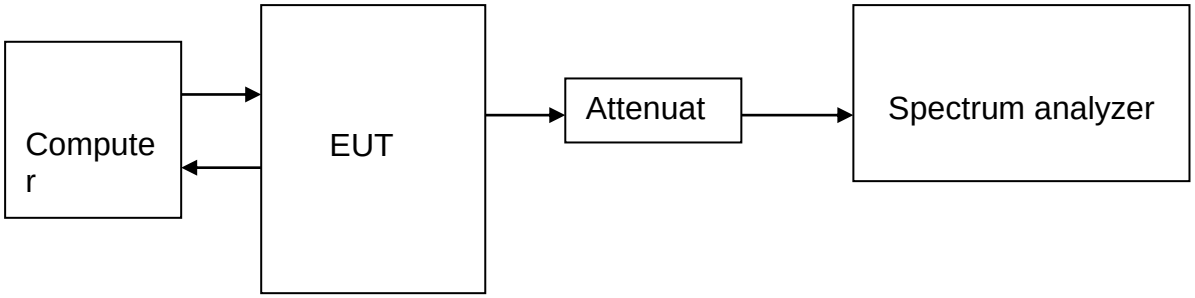
According to FCC §2.1046 &22.913, the ERP (the effective radiated power) must not exceed 1000Watts.

6.2 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	MXA Series Spectrum Analyzer	N9030A	MY49431143	2016.09.12	2017.09.12
DTS	DTS 40dB Attenuator	DTS100-40-3-1	09112005	2016.09.12	2017.09.12
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.

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 38.5dB, Cable Loss is about 1.5dB

6.4 Environmental Conditions

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

6.5 Test Result: Pass

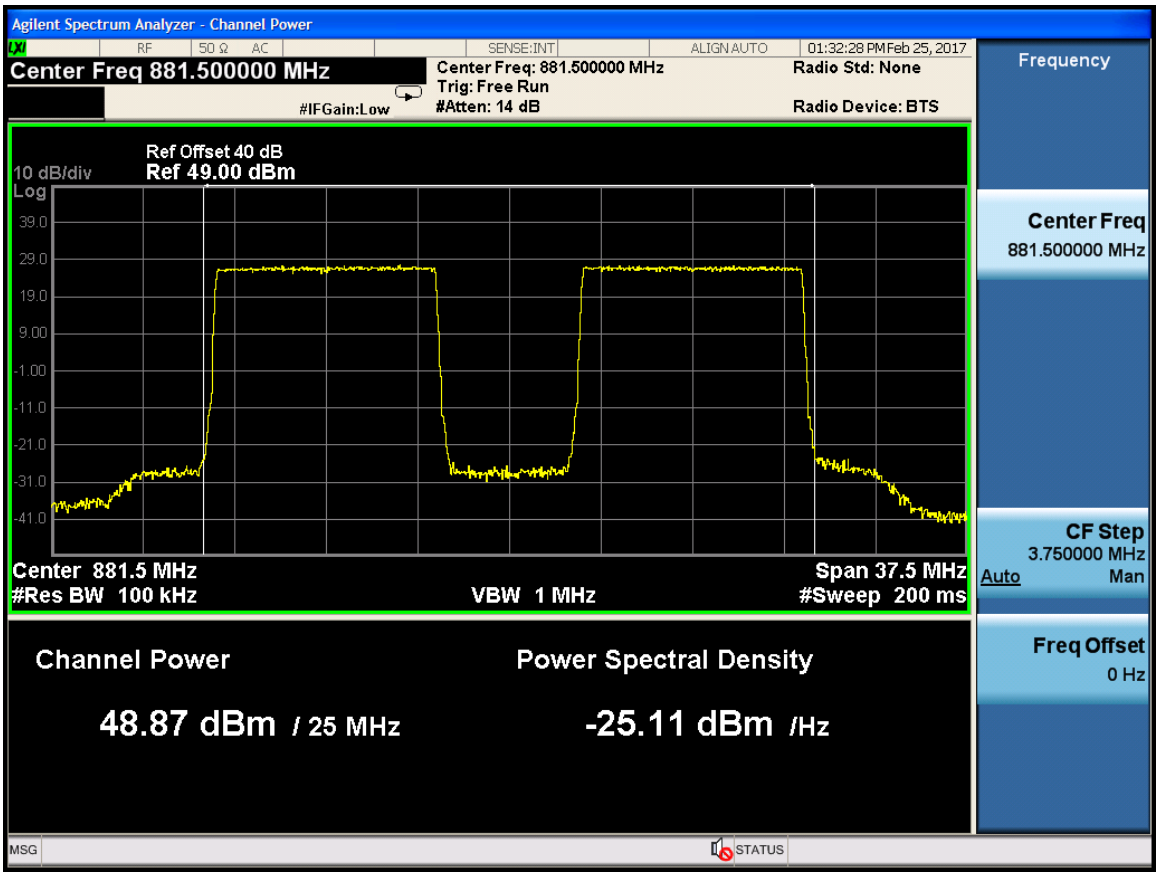
6.6 Test Mode: Transmitting LTE

6.7 Test Data:

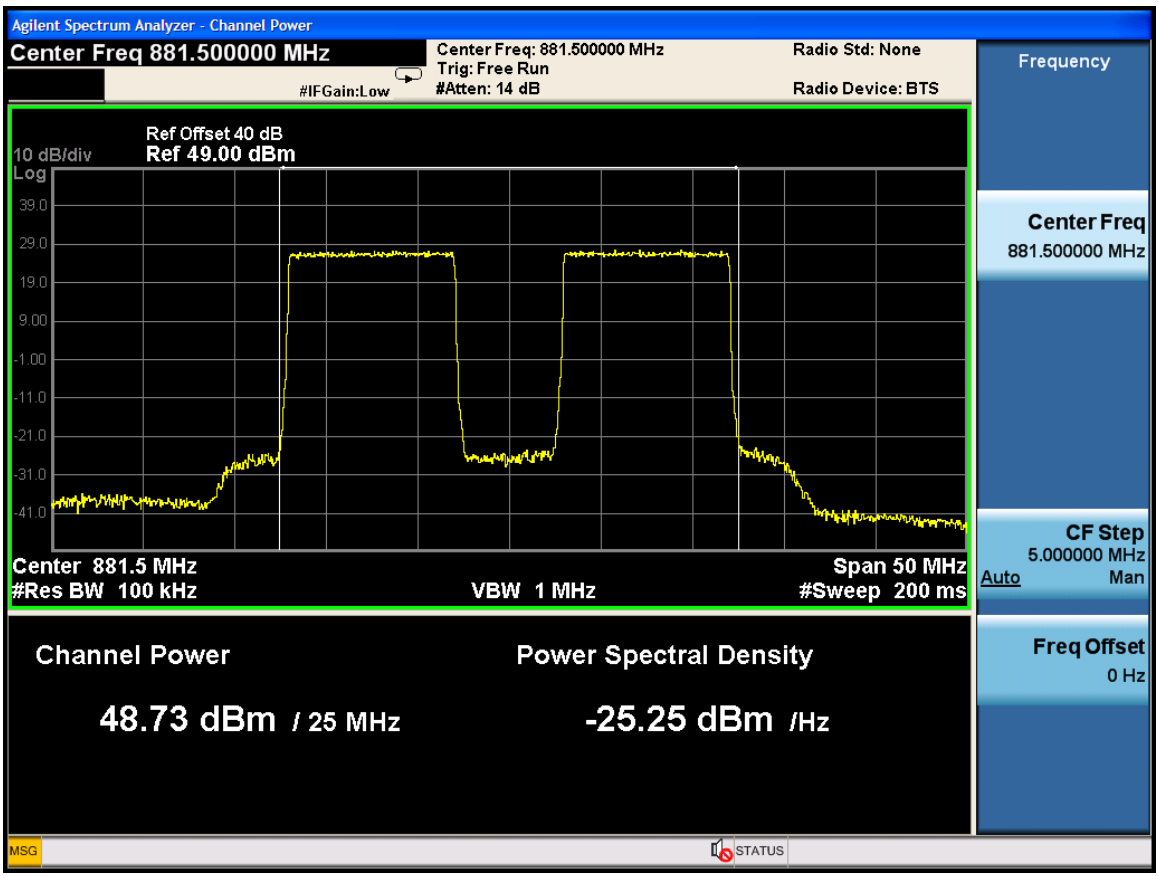
RF Bandwidth :IBW 25M(LTE 10M+LTE 10M)

Port	Center Freq. (MHz)	Max output Power in dBm	Antenna gain dBi	Cable Loss dB	Dipole Antenna	the effective radiated power dBm Of single antenna	Total Power in W Of single antenna
1	881.5	48.87	15	4	2.15	57.72	591.562
4	881.5	48.73	15	4	2.15	57.58	572.796

Port 1 -881.5MHz



Port 4 -881.5MHz



7 RF EXPOSURE

7.1 Applicable standard: FCC §2.1091 §1.1037

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
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.

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	N9030A	MY49431143	2016.09.12	2017.09.12
DTS	DTS 40dB Attenuator	DTS100-40-3-1	09112005	2016.09.12	2017.09.12
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.

8.3 Test Procedure

LTE digital mode is used by EUT.

8.4 Test Data Environmental Conditions

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

8.5 Test Result: Pass

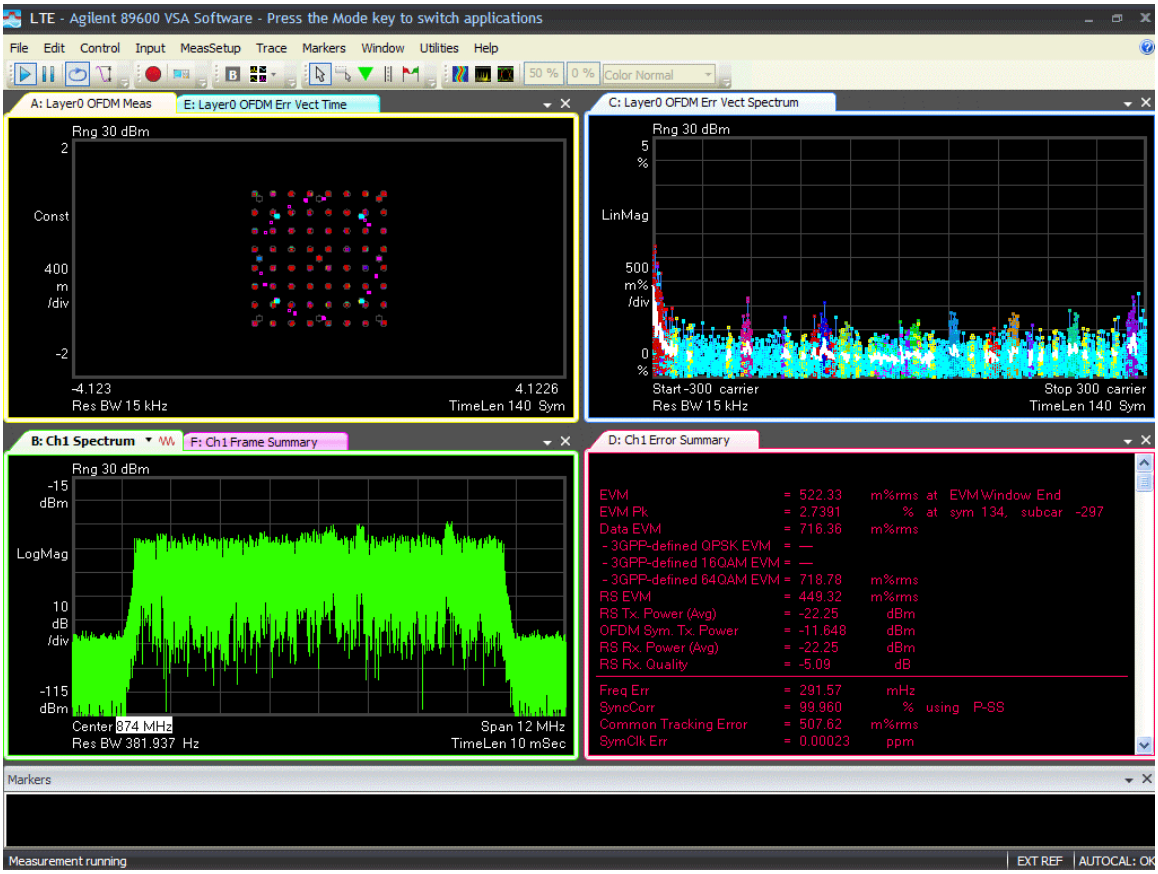
8.6 Test Mode: Transmitting LTE

8.7 Test Data:

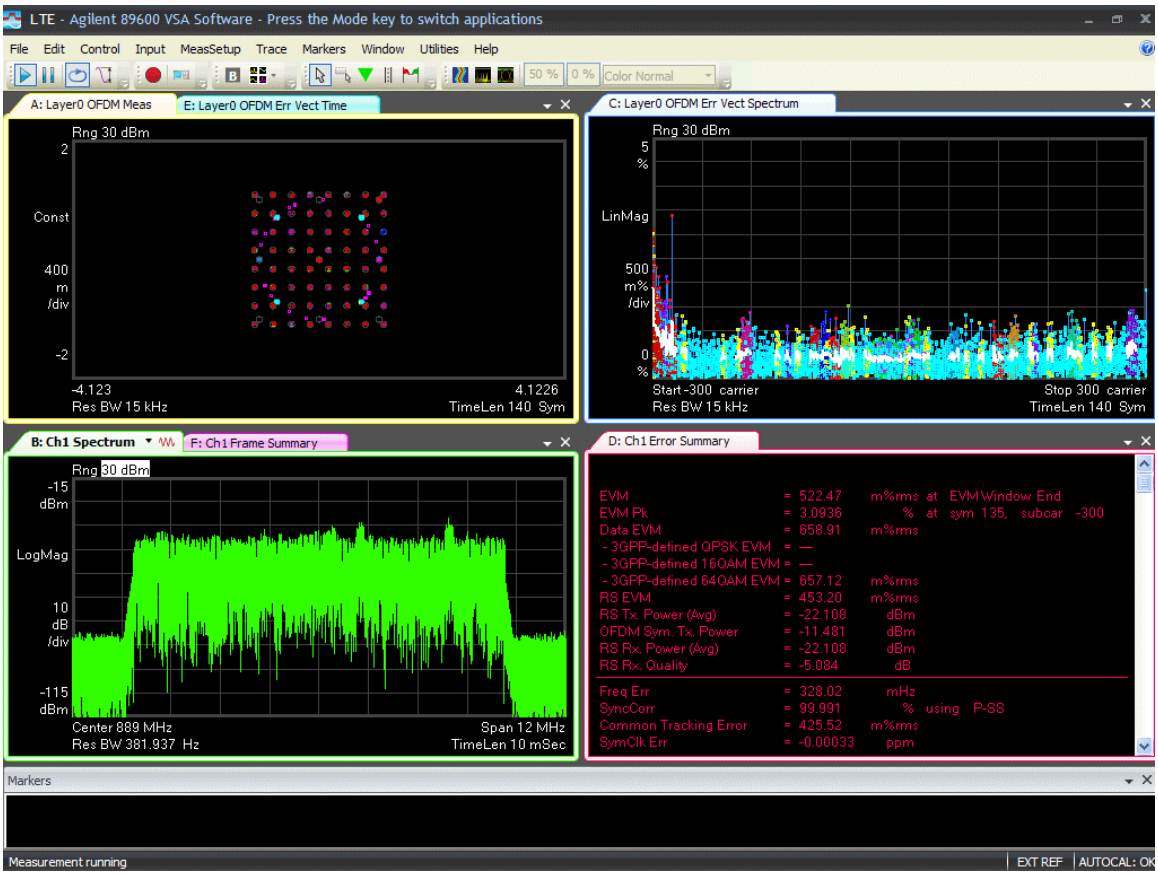
RF Bandwidth :IBW 25M(LTE 10M+LTE 10M)

Port	RF Center Freq. (MHz)	LTE Center Freq. (MHz) (MHz)	Test mode	EVM%
1	881.5	874	E-TM2	0.71878
			E-TM3.1	5.2874
			E-TM 3.2	6.1959
			E-TM 3.3	8.2773
		889	E-TM2	0.65712
			E-TM3.1	5.2713
			E-TM 3.2	6.3872
			E-TM 3.3	8.1903
4	881.5	874	E-TM2	0.7288
			E-TM3.1	5.2824
			E-TM 3.2	6.2008
			E-TM 3.3	8.2401
		889	E-TM2	0.9494
			E-TM3.1	5.2826
			E-TM 3.2	6.1521
			E-TM 3.3	8.2305

RF 881.5M:
LTE 10M-Port 1-874MHz-E-TM2



LTE 10M-Port 1-889MHz-E-TM2



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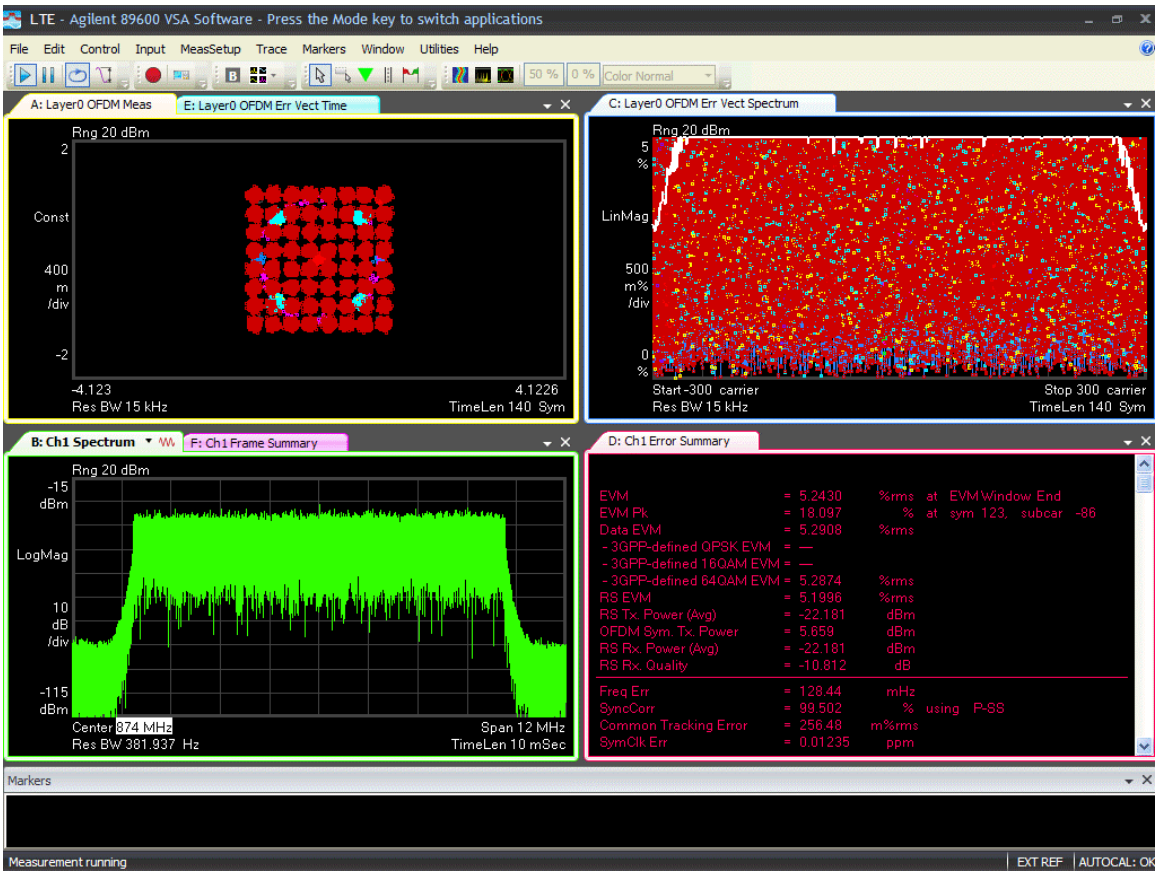
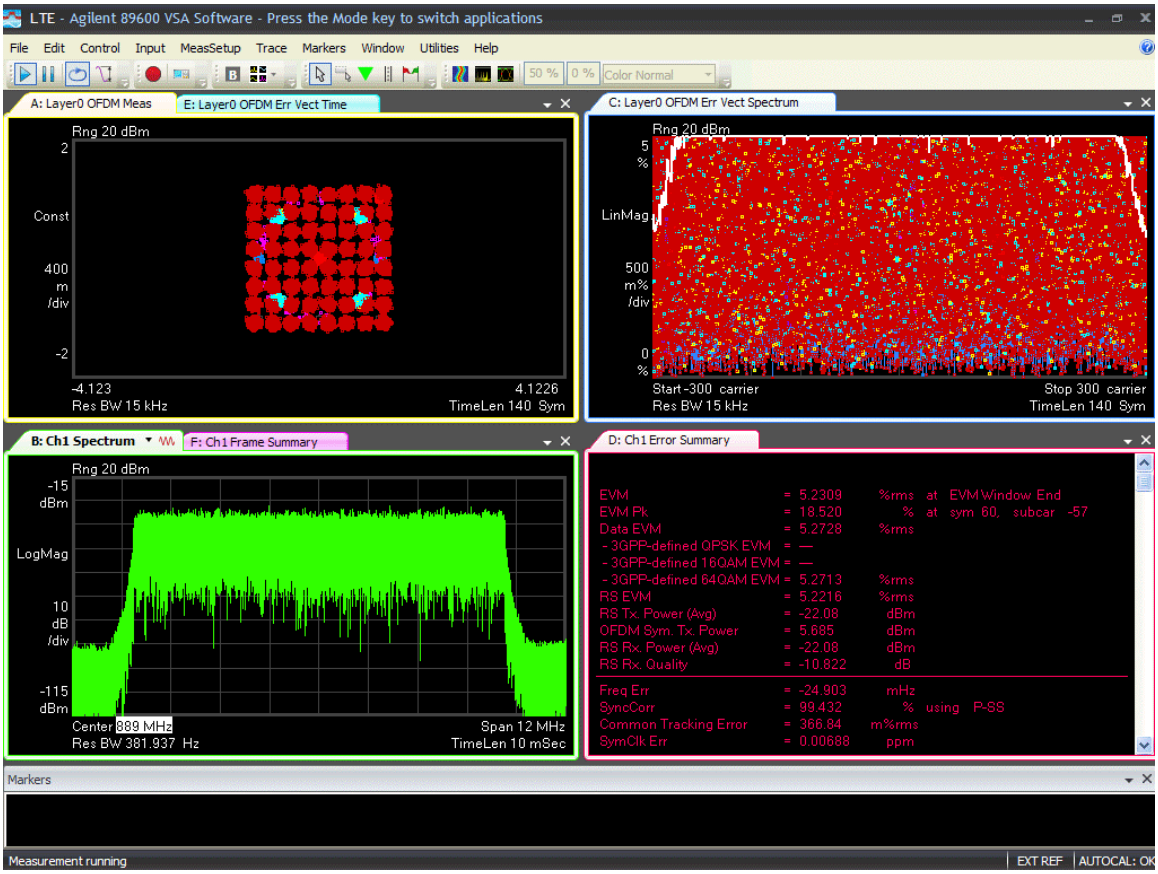


LTE 10M-Port 1-889MHz-E-TM3.1



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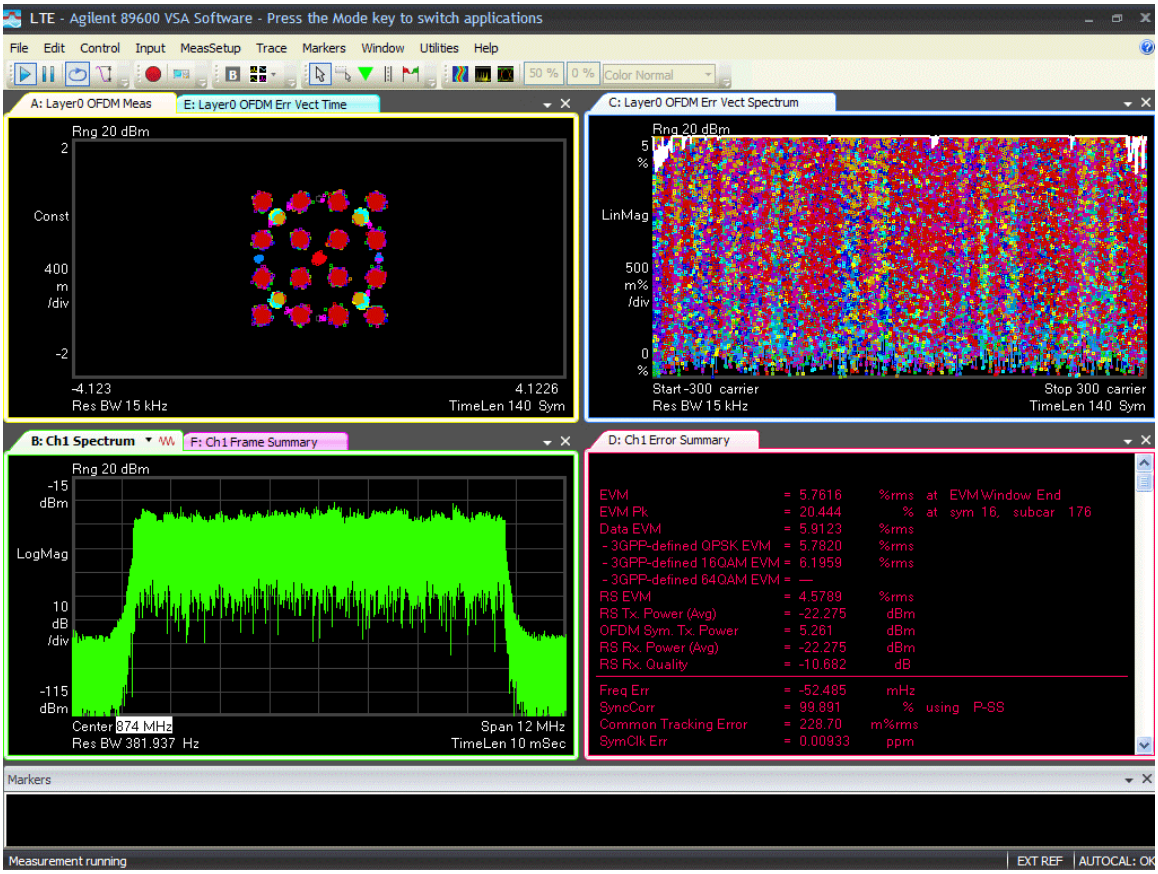
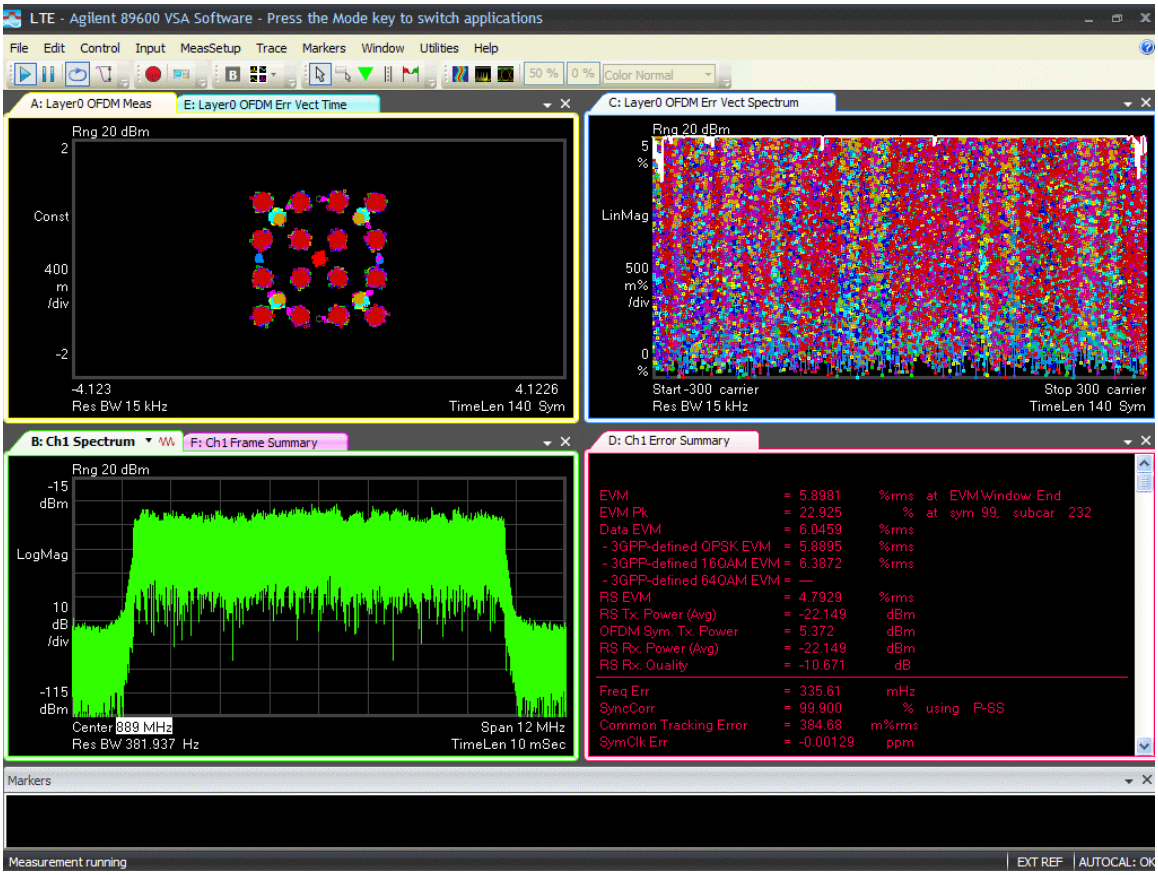
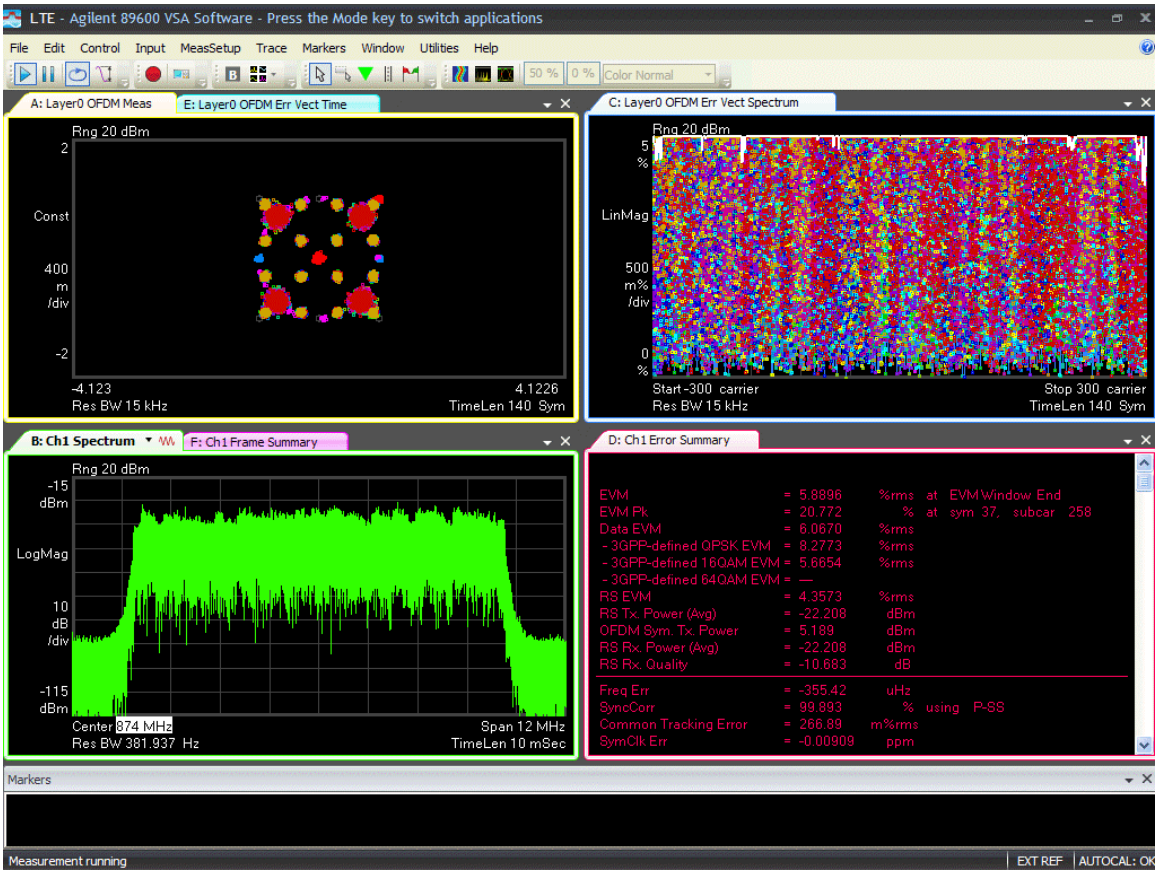


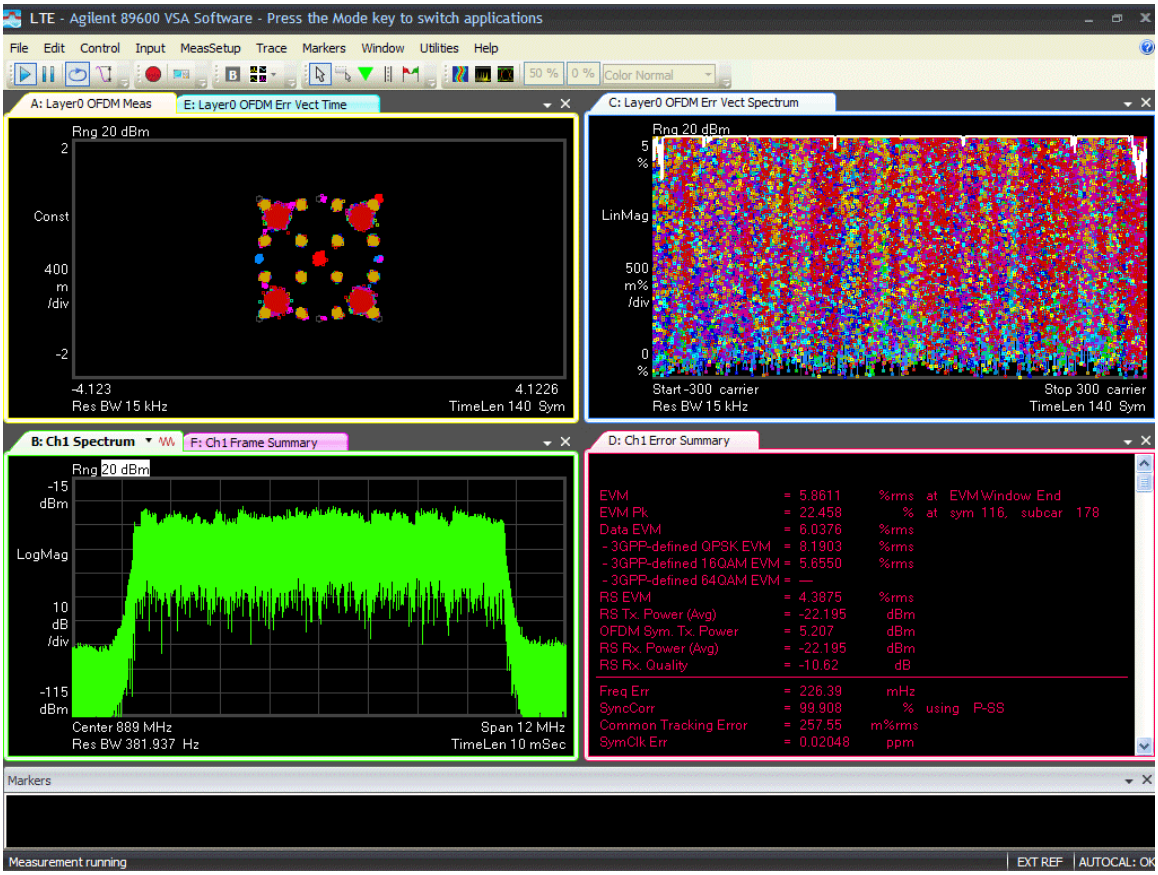
LTE 10M-Port 1-889MHz-E-TM3.2



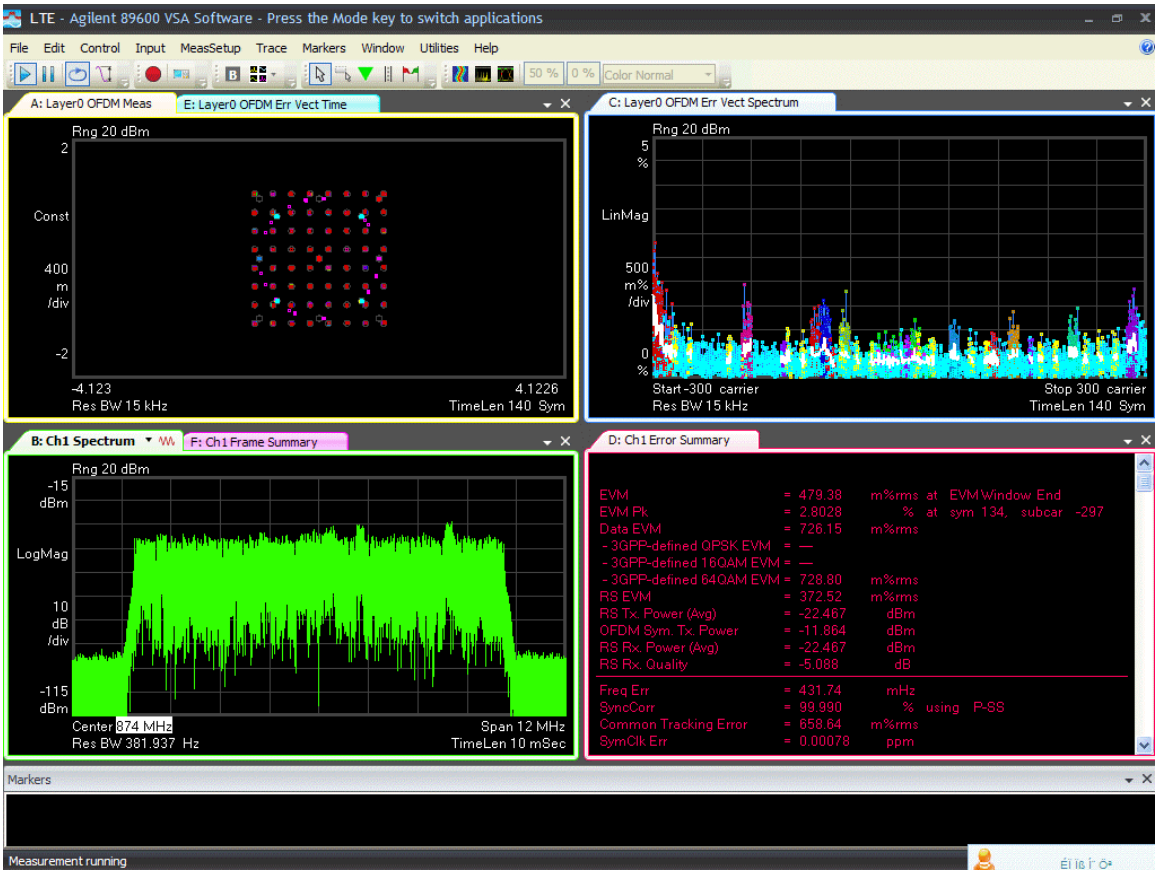
LTE 10M-Port 1-874MHz-E-TM3.3



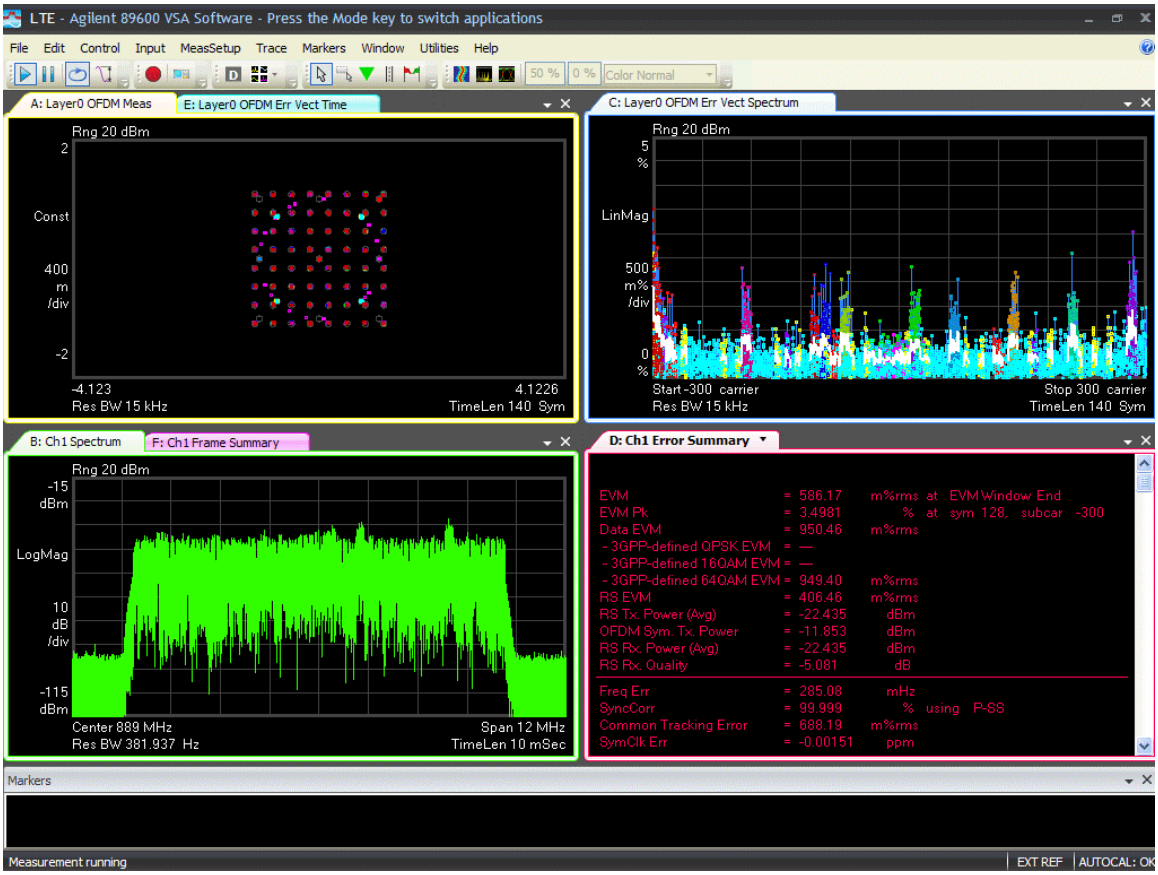
LTE 10M-Port 1-889MHz-E-TM3.3



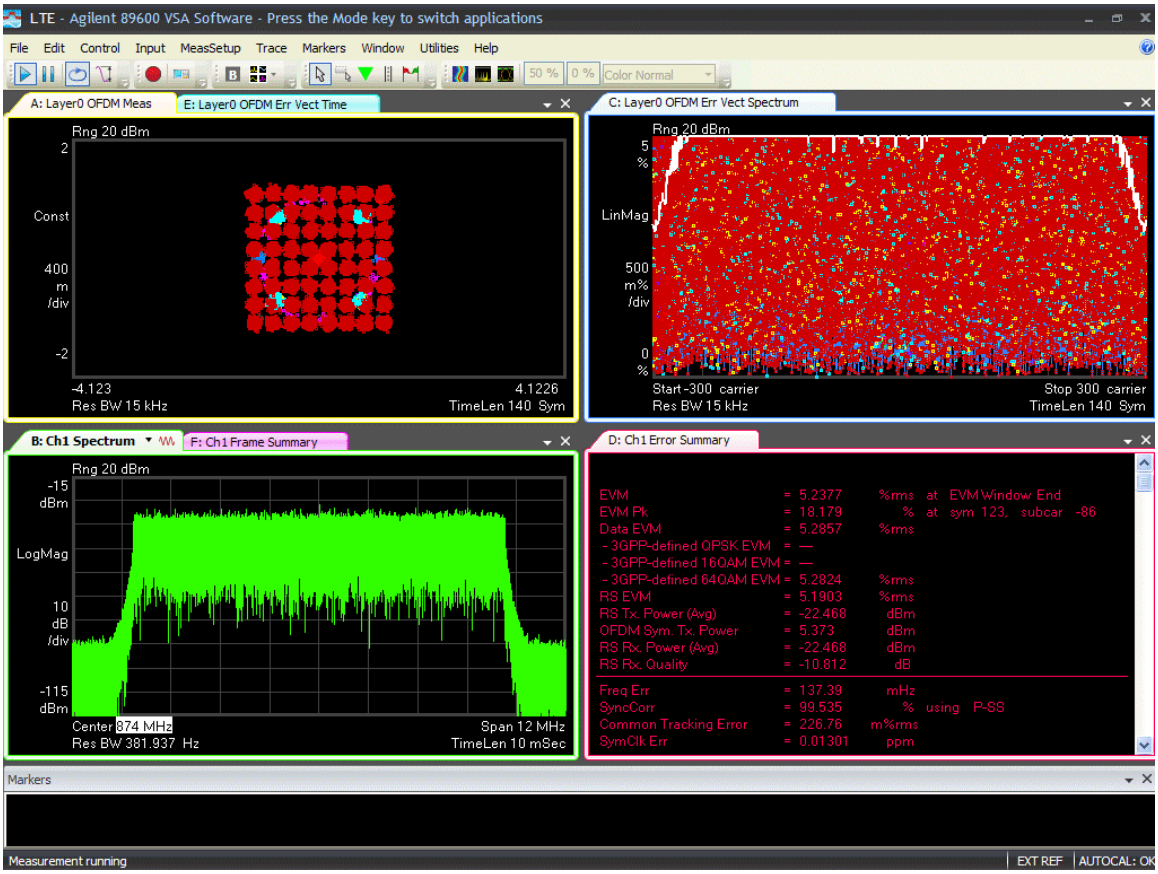
LTE 10M-Port 4-874MHz-E-TM2



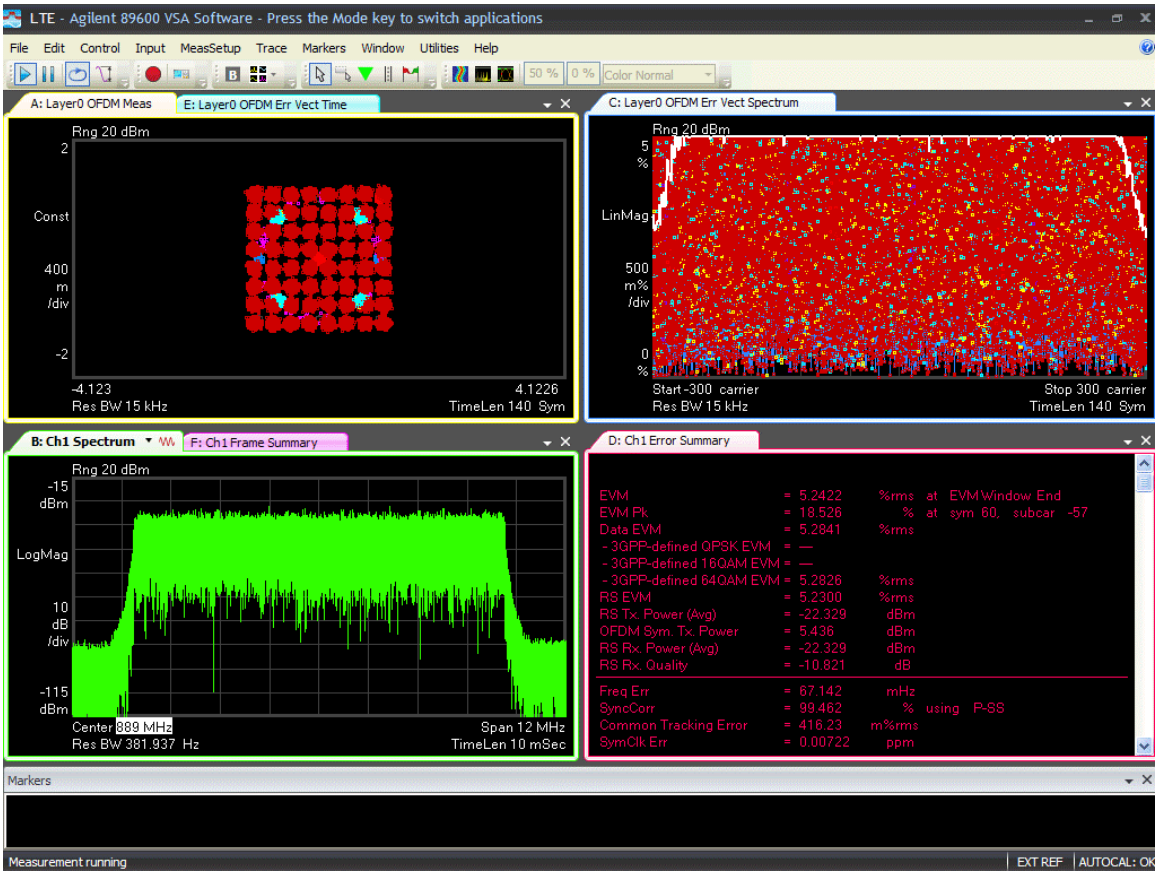
LTE 10M-Port 4-889MHz-E-TM2



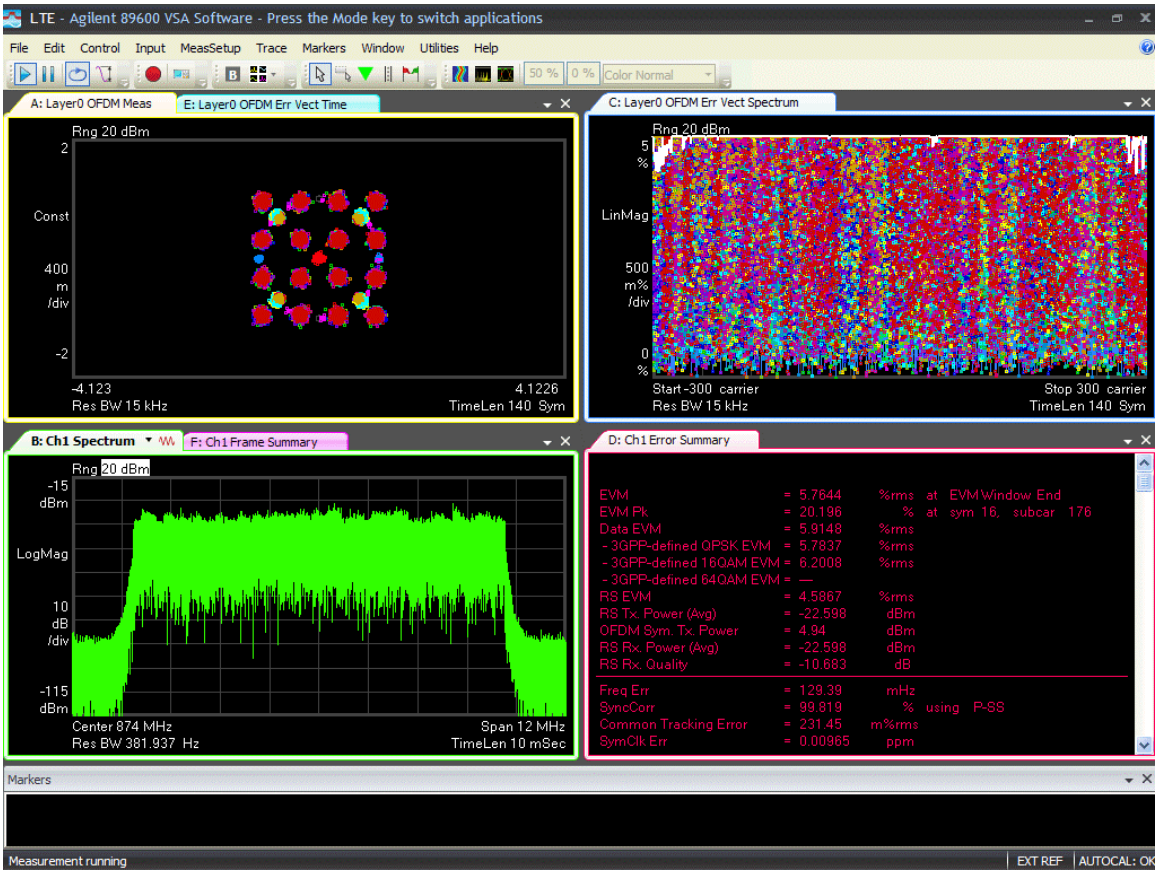
LTE 10M-Port 4-874MHz-E-TM3.1



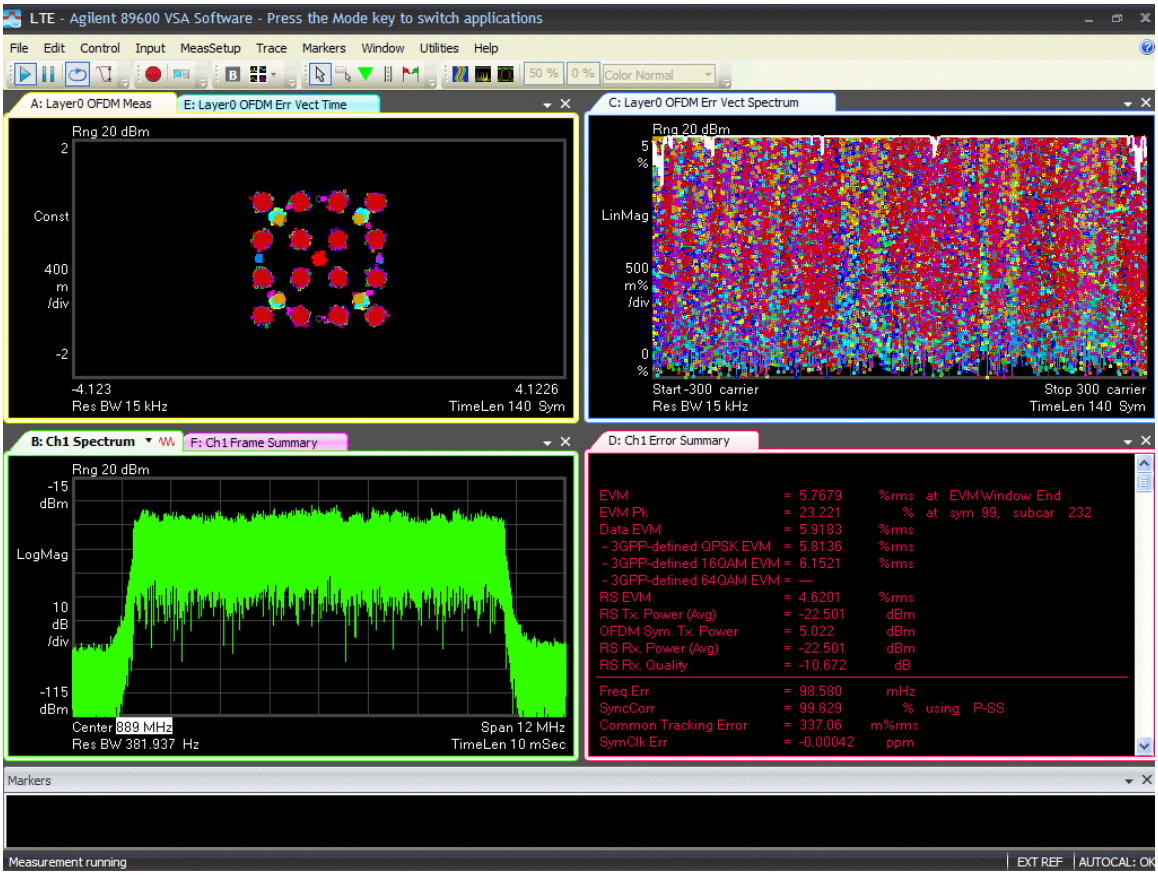
LTE 10M-Port 4-889MHz-E-TM3.1



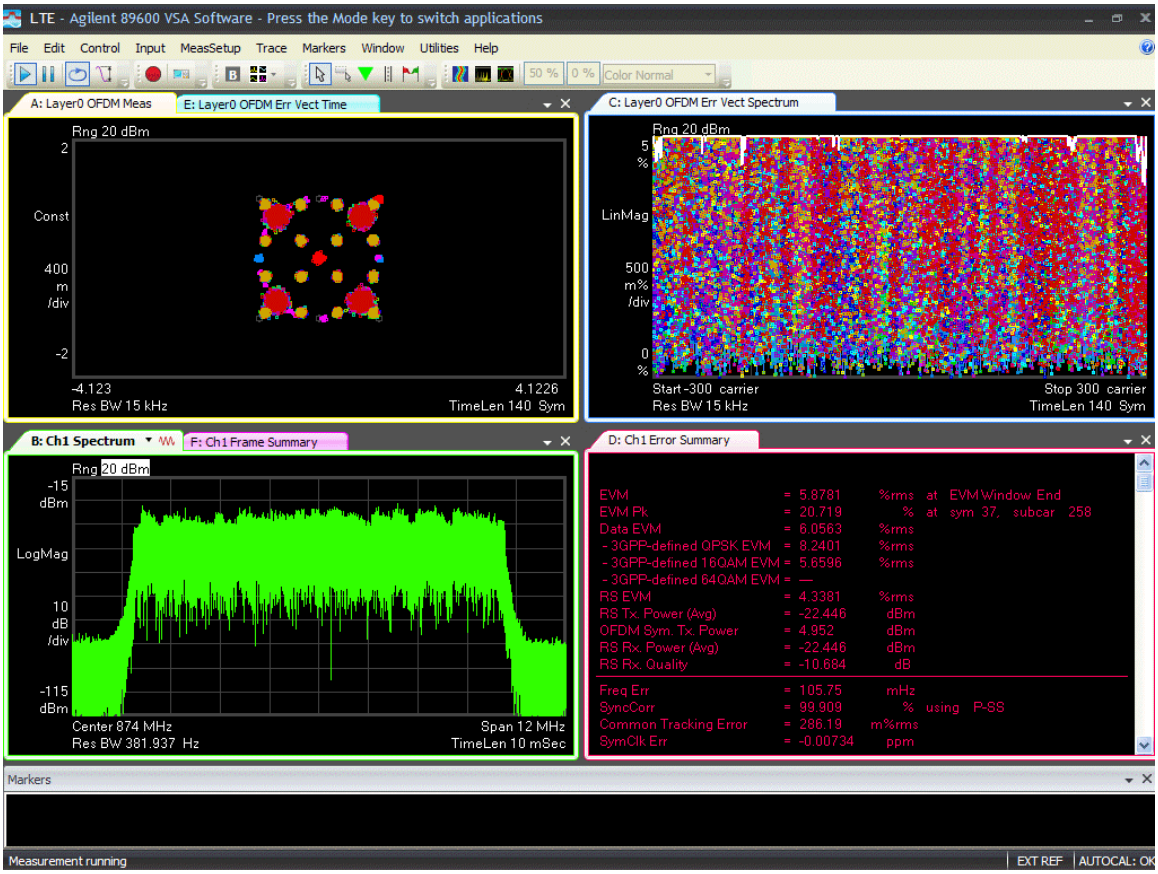
LTE 10M-Port 4-874MHz-E-TM3.2



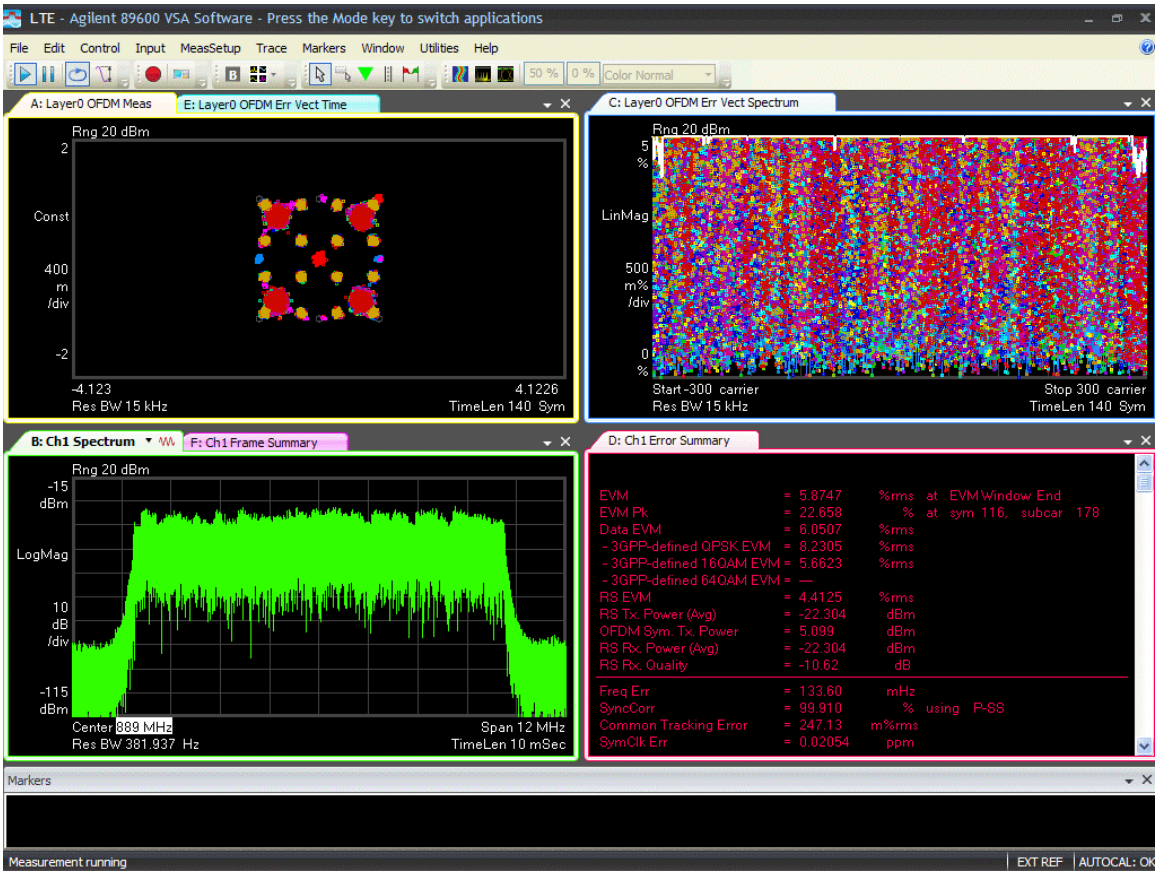
LTE 10M-Port 4-889MHz-E-TM3.2



LTE 10M-Port 4-874MHz-E-TM3.3



LTE 10M-Port 4-889MHz-E-TM3.3



9 SPURIOUS RADIATED EMISSIONS

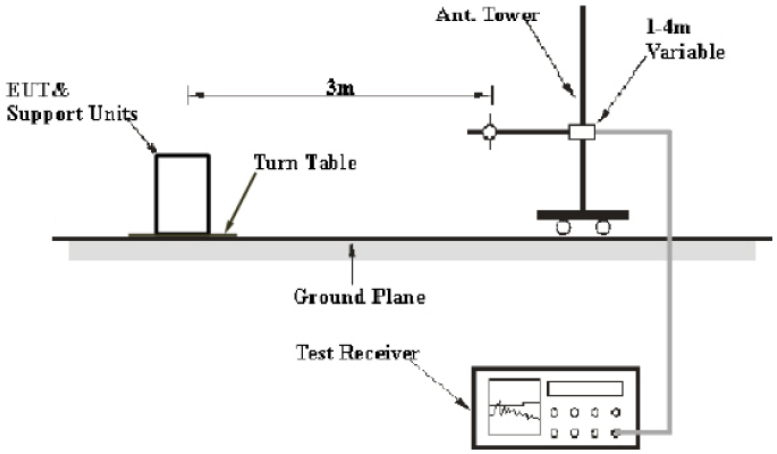
9.1 Applicable Standard: FCC CFR 47 §2.1053

9.2 Test Equipment List and Details

Manufacturer	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

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.

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

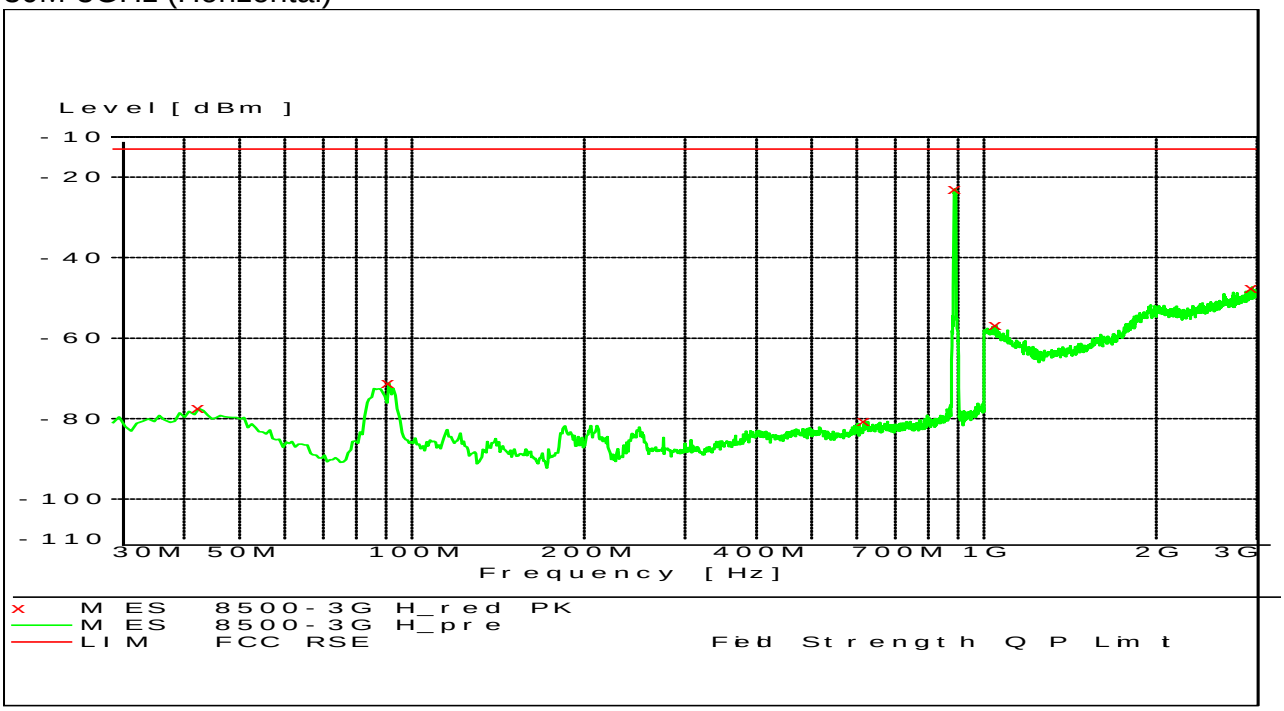
9.4 Test Results Summary: PASS

9.5 Environmental Conditions

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

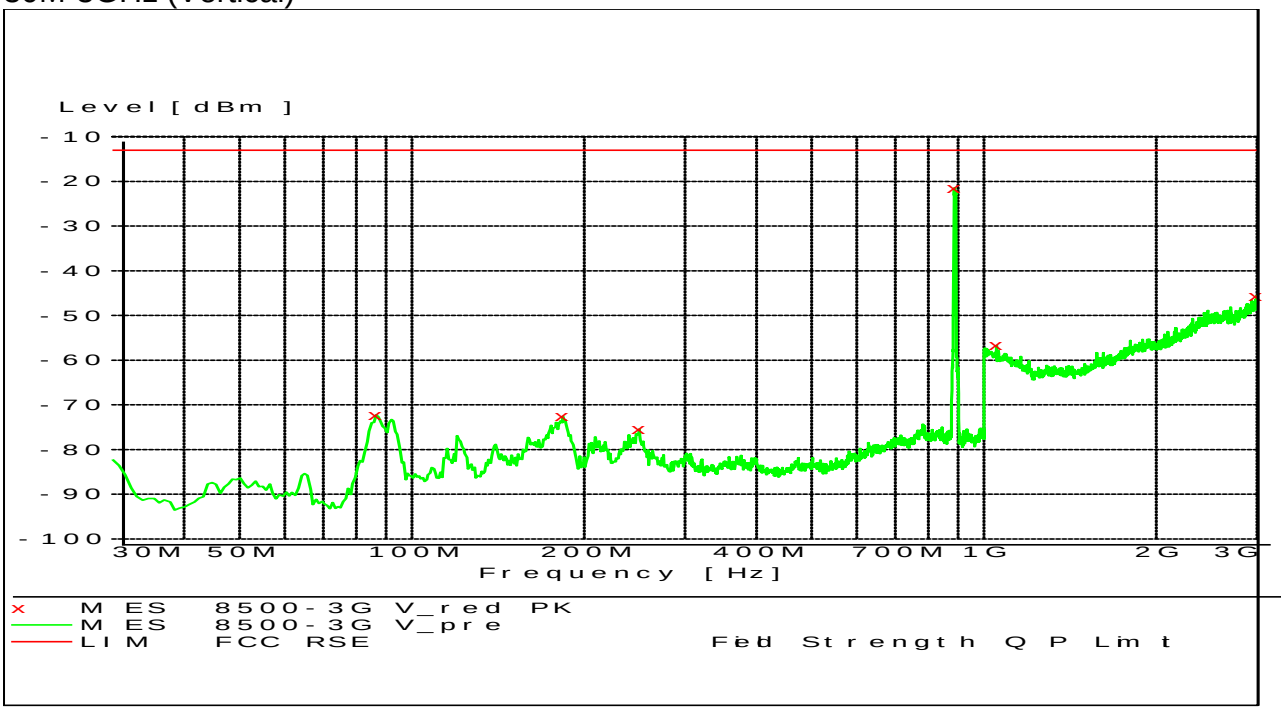
9.6 Test data

30M-3GHz (Horizontal)



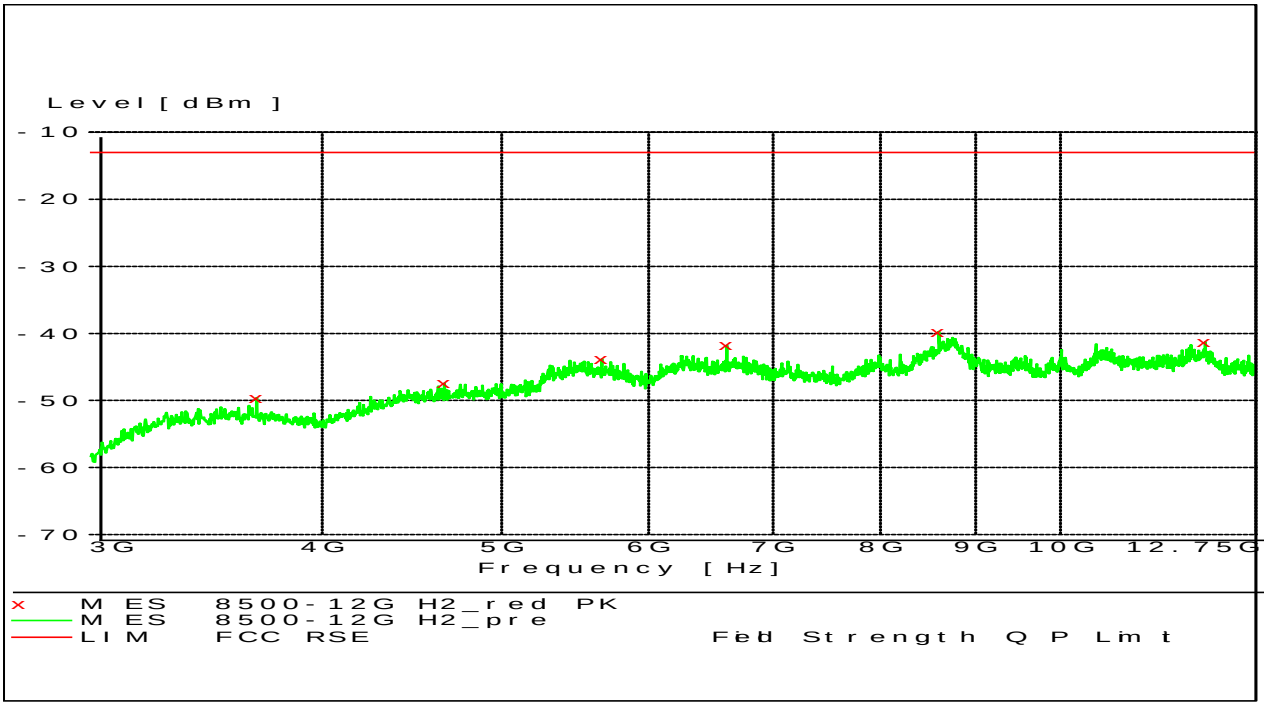
Frequency (MHz)	Level (dBm)	Azimuth (deg)	Height (cm)	Polarisation	Transd (dB)	Limit (dBm)	Margin (dB)
42.416	-77.47	254.7	100	HOR	-121.9	-13	64.5
91.304	-71.15	197.3	200	HOR	-129.3	-13	58.2
617.432	-80.66	203	100	HOR	-125.4	-13	67.7
890.584	-22.9	347.9	100	HOR	-122.2	-13	9.9
1048	-56.85	172	100	HOR	-109.6	-13	43.9
2940.8	-47.42	218.9	200	HOR	-98.6	-13	34.4

30M-3GHz (Vertical)



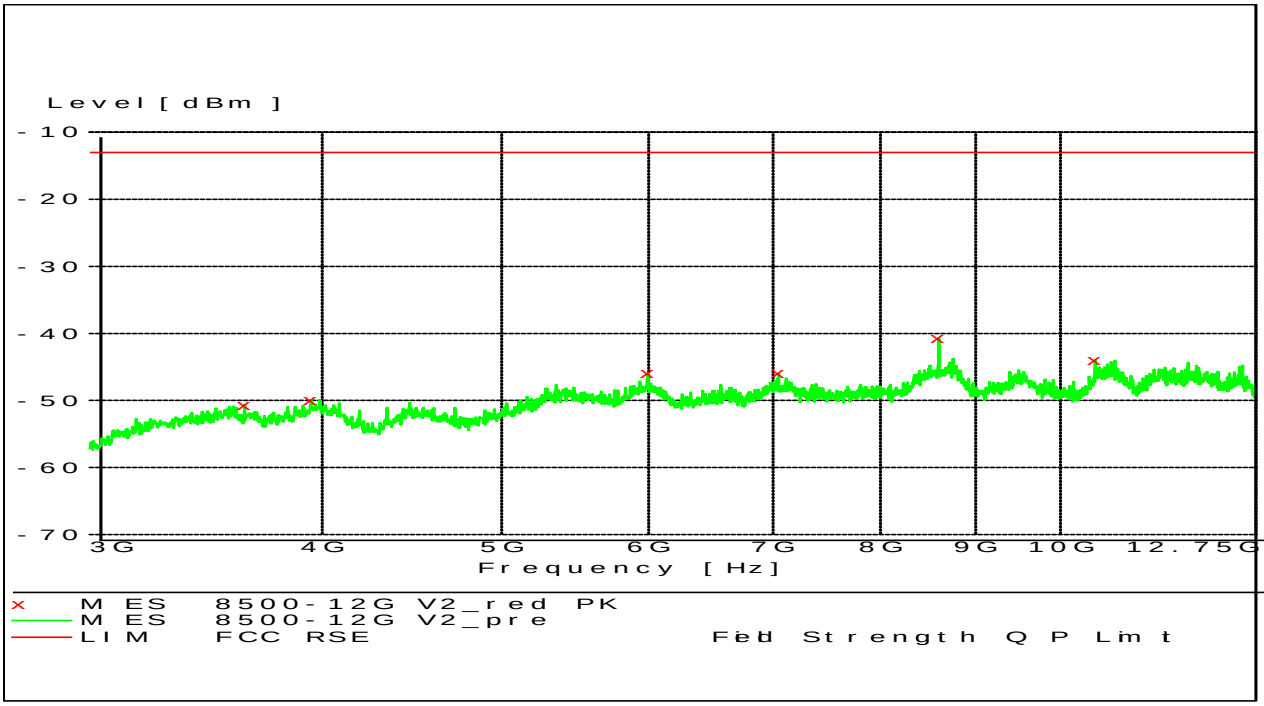
Frequency (MHz)	Level (dBm)	Azimuth (deg)	Height (cm)	Polarisation	Transd (dB)	Limit (dBm)	Margin (dB)
86.648	-72.21	61.1	200	VER	-130.8	-13	59.2
183.648	-72.51	135.2	100	VER	-131.7	-13	59.5
249.608	-75.38	329.2	100	VER	-124.2	-13	62.4
887.48	-21.53	356.1	100	VER	-119.9	-13	8.5
1051.2	-56.69	360	100	VER	-109.4	-13	43.7
2990.4	-45.63	253.3	200	VER	-97	-13	32.6

3-12.75GHz (Horizontal)



Frequency (MHz)	Level (dBm)	Azimuth (deg)	Height (cm)	Polarisation	Transd (dB)	Limit (dBm)	Margin (dB)
3688	-49.59	215.6	100	HOR	-89	-13	36.6
4657.6	-47.44	300.7	100	HOR	-84.5	-13	34.4
5662.4	-43.82	349.2	200	HOR	-79.4	-13	30.8
6612.8	-41.79	215.6	100	HOR	-77.8	-13	28.8
8600.8	-39.74	143	100	HOR	-73.5	-13	26.7
11968	-41.36	180.7	200	HOR	-72.8	-13	28.4

3-12.75GHz (Verticall)



Frequency (MHz)	Level (dBm)	Azimuth (deg)	Height (cm)	Polarisation	Transd (dB)	Limit (dBm)	Margin (dB)
3633.6	-50.64	360	200	VER	-89.5	-13	37.6
3947.2	-49.91	78.6	200	VER	-87.7	-13	36.9
5995.2	-45.96	276	200	VER	-81.4	-13	33
7050.6	-45.9	3.4	100	VER	-80	-13	32.9
8600.8	-40.67	77.9	100	VER	-77	-13	27.7
10445.4	-43.95	39.1	100	VER	-76.9	-13	30.9

10 SPURIOUS EMISSIONS AT ANTENNA TERMINALS

10.1 Applicable Standard: FCC§2.1051, §22.917

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

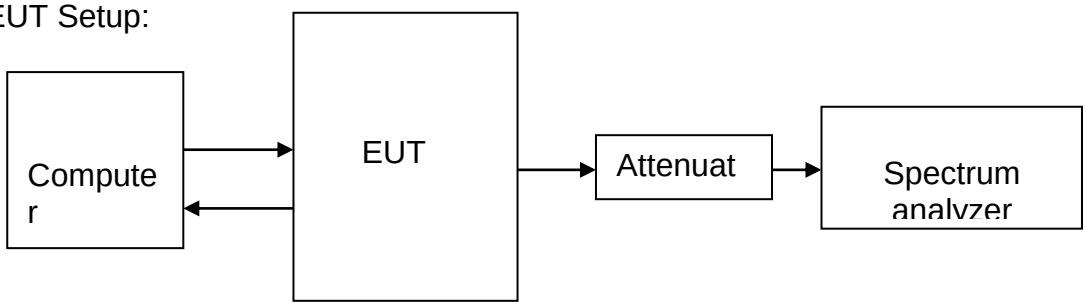
10.2 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	MXA Series Spectrum Analyzer	N9030A	MY49431143	2016.09.12	2017.09.12
DTS	DTS 40dB Attenuator	DTS100-40-3-1	09112005	2016.09.12	2017.09.12

*__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)=38.5dB, Cable Loss (dB)=1.5dB.

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.

10.4 Test Data Environmental Conditions

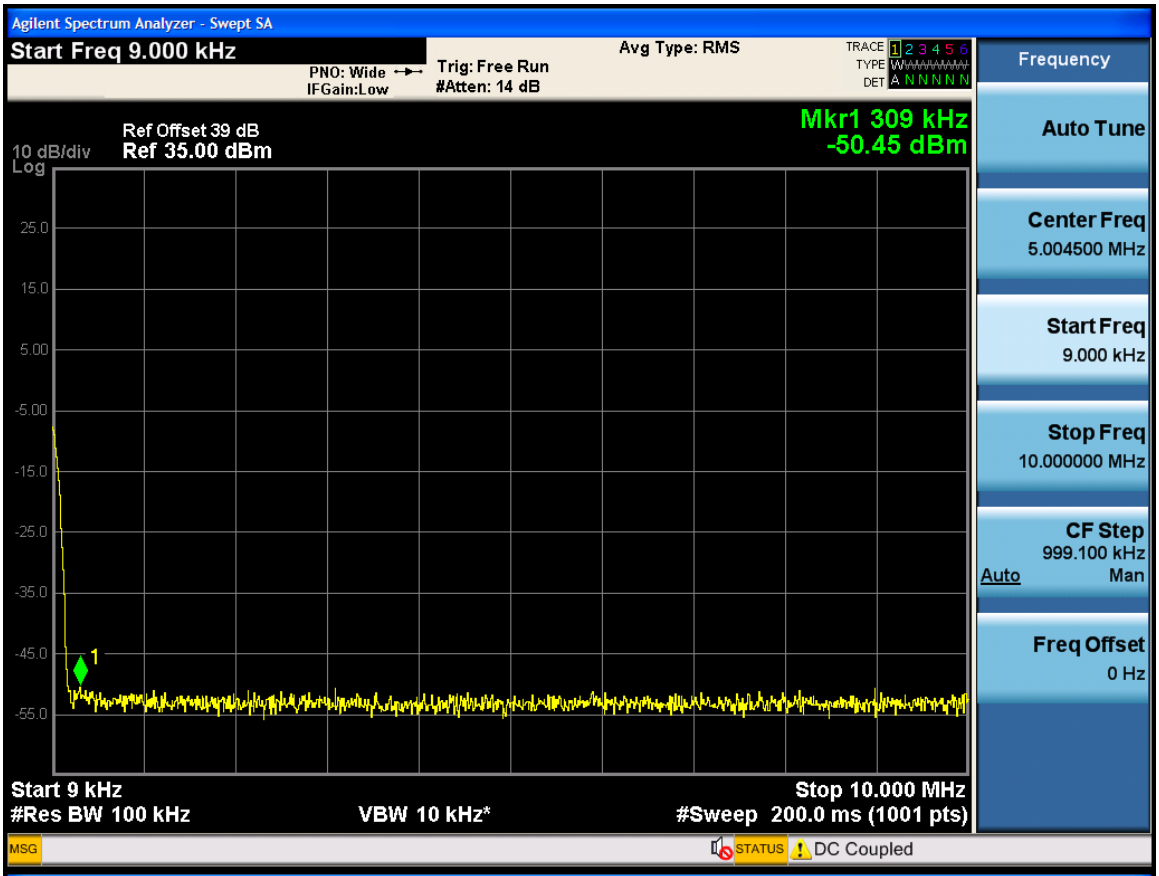
Temperature:	20 °C
Relative Humidity:	53 %
ATM Pressure:	1009 mbar

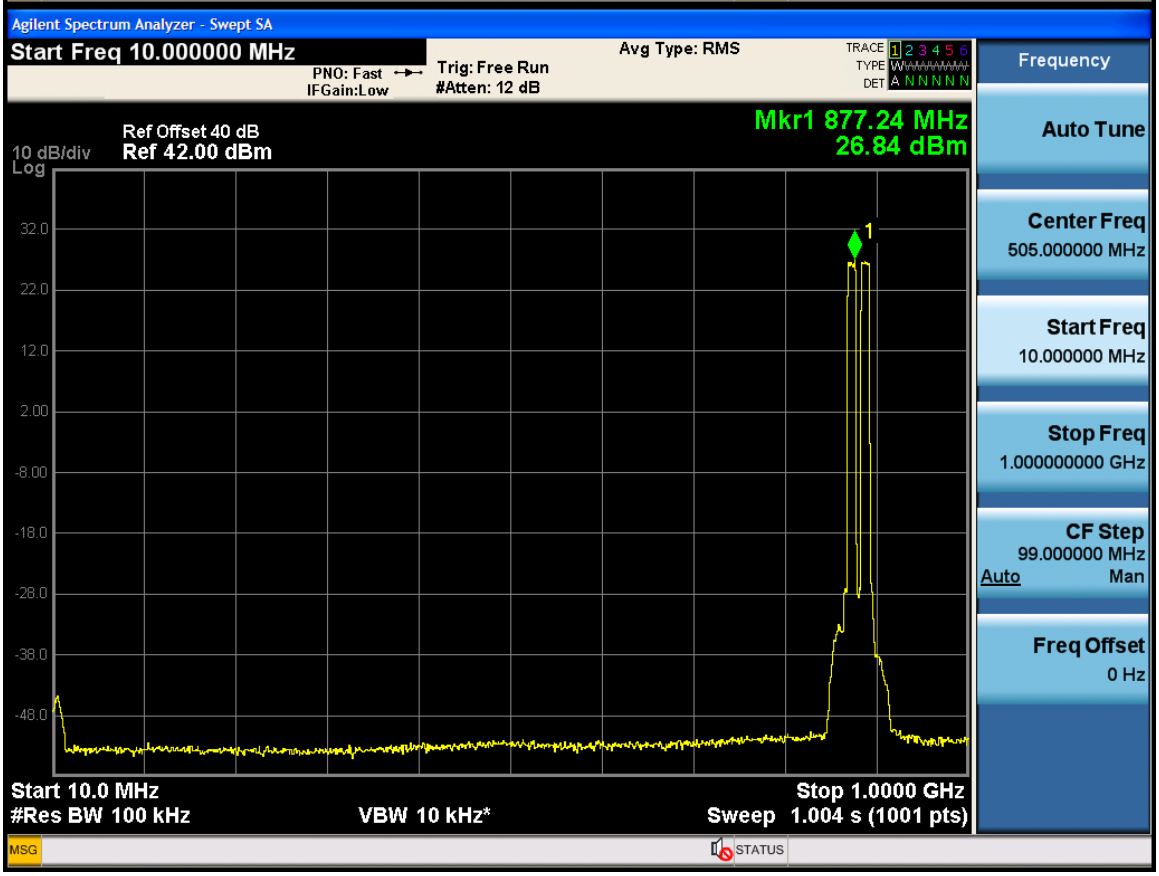
10.5 Test Result: Pass

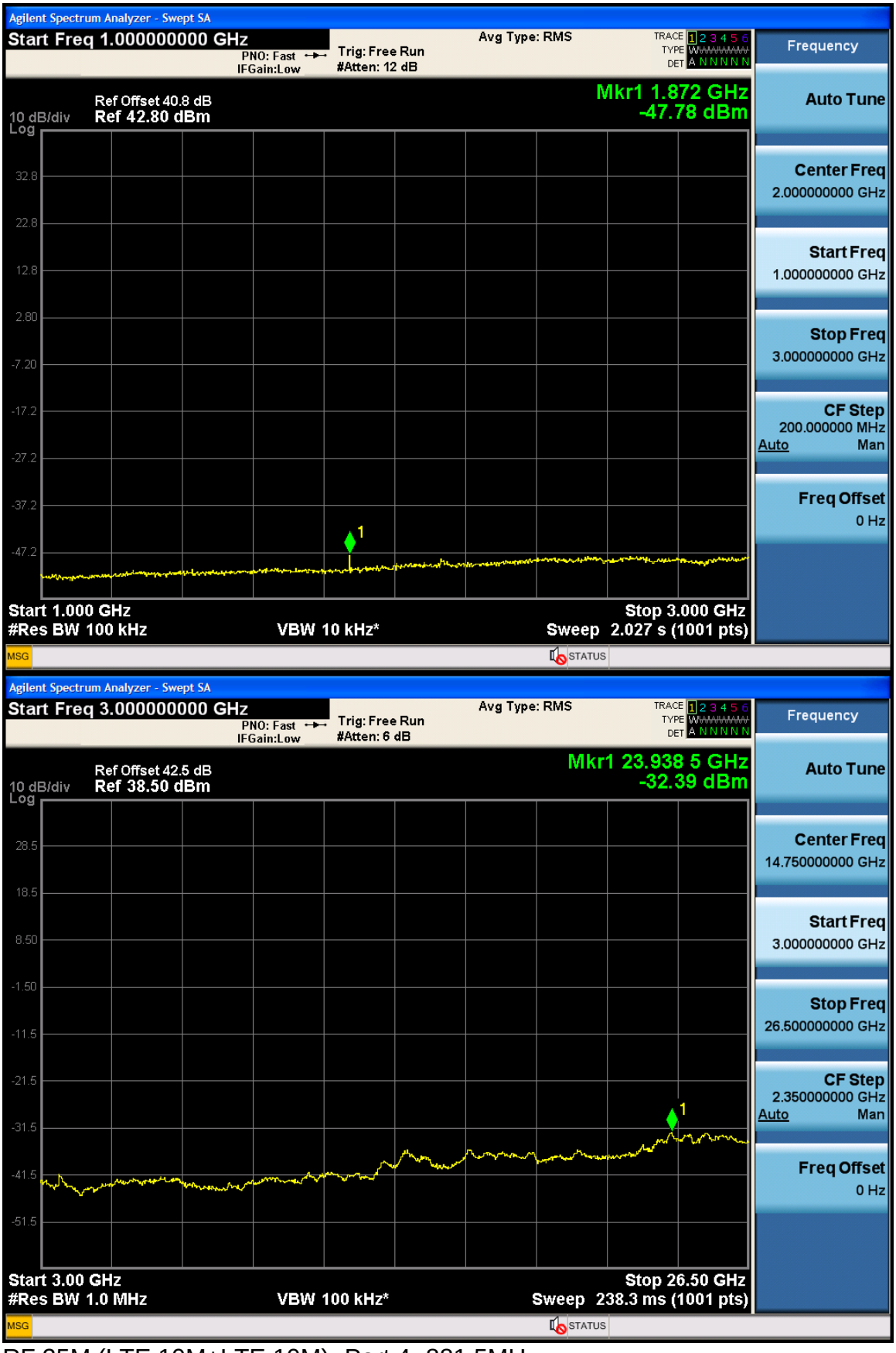
10.6 Test Mode: Transmitting LTE

10.7 Test Data

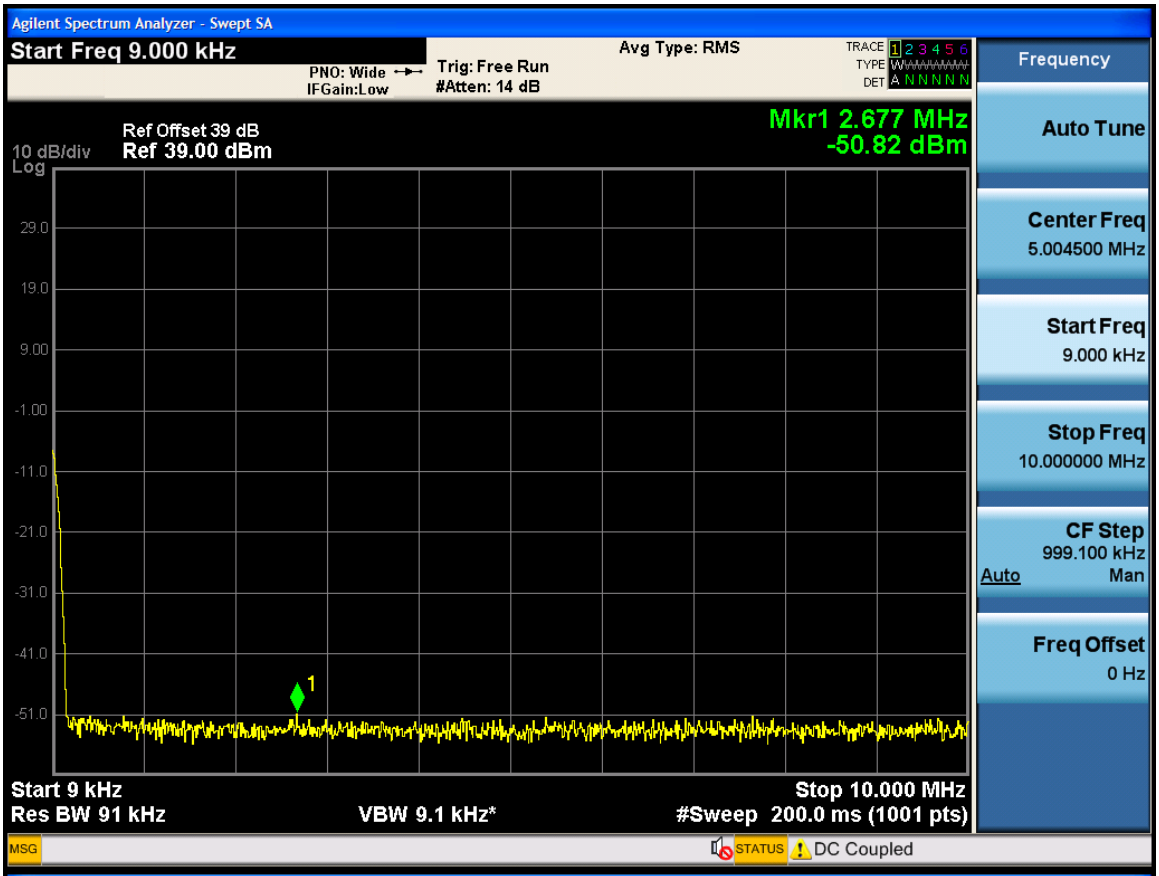
RF 25M (LTE 10M+LTE 10M):
RF 25M (LTE 10M+LTE 10M) -Port 1 -881.5MHz

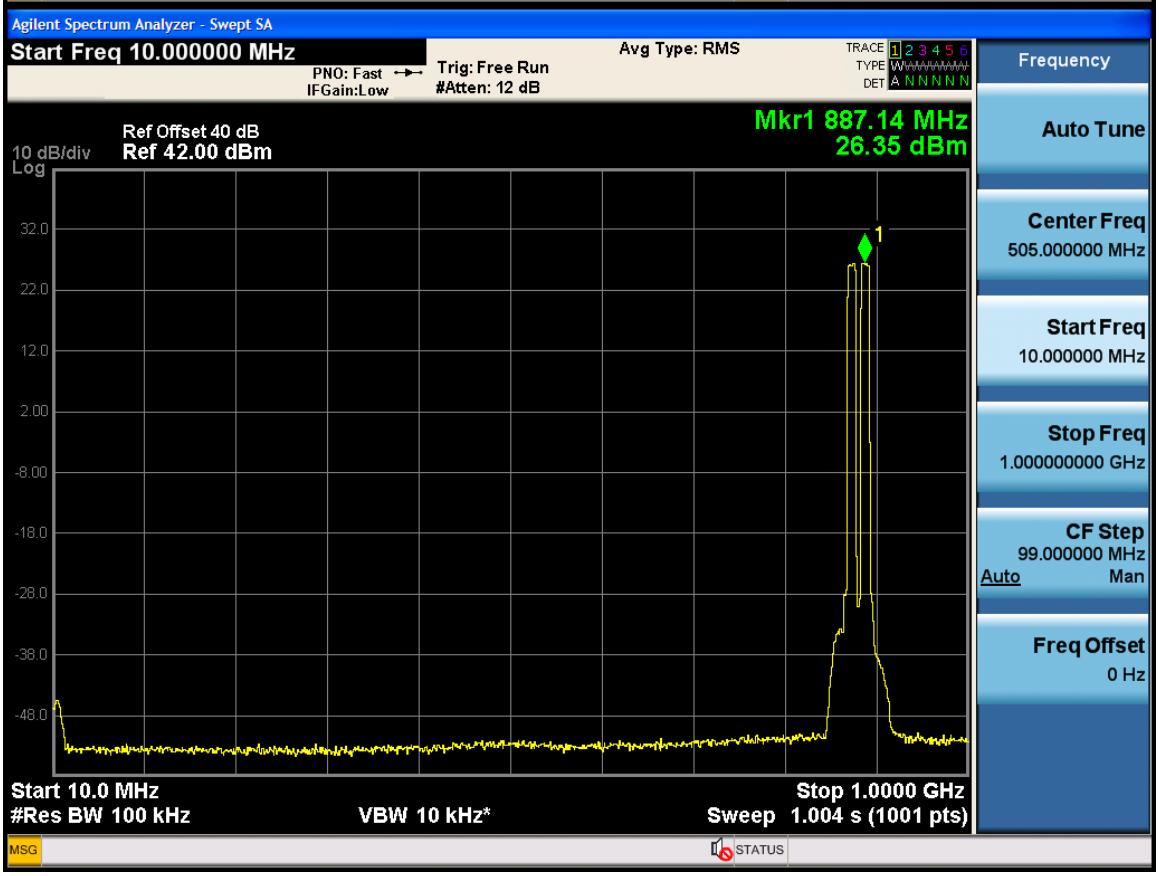

Agilent Spectrum Analyzer - Swept SA
Start Freq 9.000 kHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 14 dB
Avg Type: RMS
TRACE 1 2 3 4 5 6
TYPE A WWWWW
DET A N N N N N
Ref Offset 39 dB
10 dB/div Ref 35.00 dBm
Log
Mkr1 309 kHz
-50.45 dBm
25.0
15.0
5.00
-5.00
-15.0
-25.0
-35.0
-45.0
-55.0
Start 9 kHz
#Res BW 100 kHz
VBW 10 kHz*
Stop 10.000 MHz
#Sweep 200.0 ms (1001 pts)
Frequency
Auto Tune
Center Freq
5.004500 MHz
Start Freq
9.000 kHz
Stop Freq
10.000000 MHz
CF Step
999.100 kHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS
DC Coupled

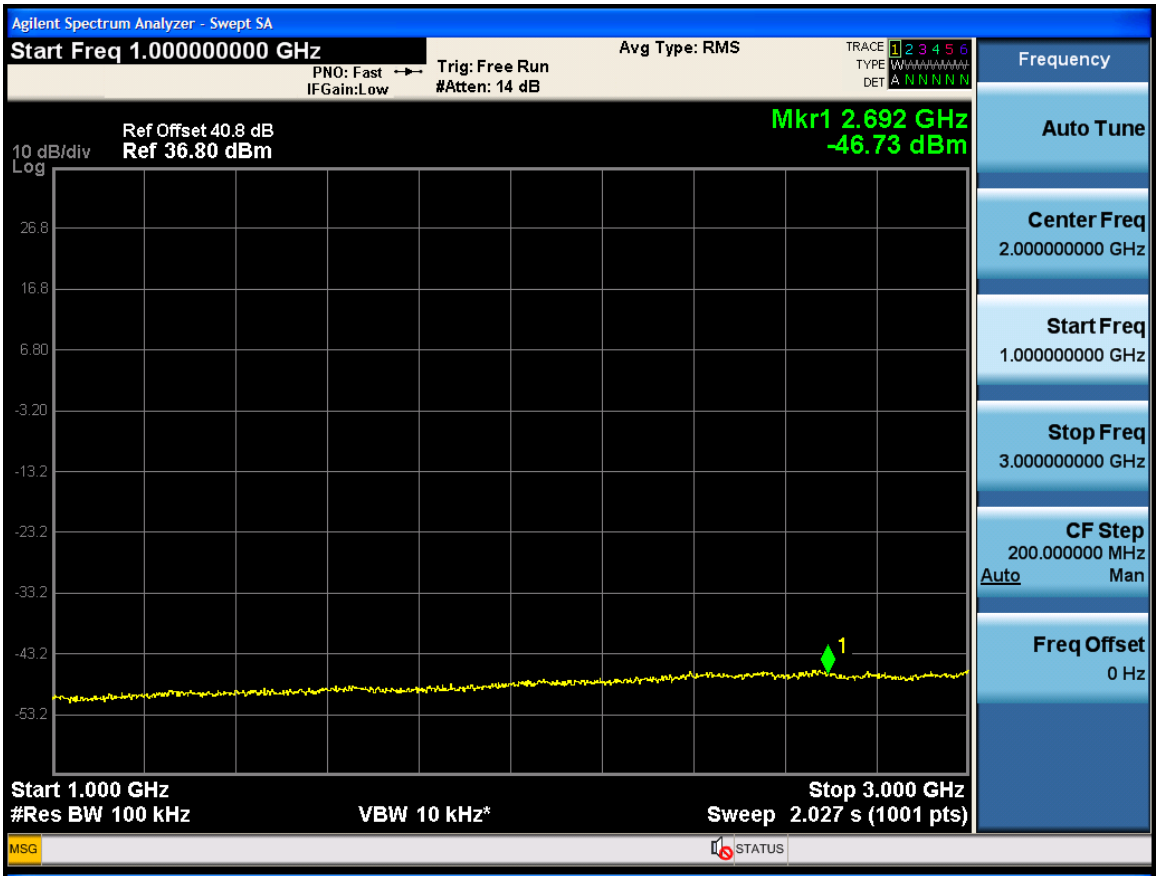

Agilent Spectrum Analyzer - Swept SA
Start Freq 10.000000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 12 dB
Avg Type: RMS
TRACE 1 2 3 4 5 6
TYPE W WWWWW
DET A N N N N N
Ref Offset 40 dB
10 dB/div Ref 42.00 dBm
Log
Mkr1 877.24 MHz
26.84 dBm
32.0
22.0
12.0
2.00
-8.00
-18.0
-28.0
-38.0
-48.0
Start 10.0 MHz
#Res BW 100 kHz
VBW 10 kHz*
Stop 1.0000 GHz
Sweep 1.004 s (1001 pts)
Frequency
Auto Tune
Center Freq
505.000000 MHz
Start Freq
10.000000 MHz
Stop Freq
1.000000000 GHz
CF Step
99.000000 MHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS



RF 25M (LTE 10M+LTE 10M) -Port 4 -881.5MHz


Agilent Spectrum Analyzer - Swept SA
Start Freq 9.000 kHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 14 dB
Avg Type: RMS
TRACE 1 2 3 4 5 6
TYPE A WWWWW
DET A N N N N N
Ref Offset 39 dB
10 dB/div Ref 39.00 dBm
Log
Mkr1 2.677 MHz
-50.82 dBm
29.0
19.0
9.00
-1.00
-11.0
-21.0
-31.0
-41.0
-51.0
Start 9 kHz
Res BW 91 kHz
VBW 9.1 kHz*
Stop 10.000 MHz
#Sweep 200.0 ms (1001 pts)
Frequency
Auto Tune
Center Freq
5.004500 MHz
Start Freq
9.000 kHz
Stop Freq
10.000000 MHz
CF Step
999.100 kHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS
DC Coupled


Agilent Spectrum Analyzer - Swept SA
Start Freq 10.000000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 12 dB
Avg Type: RMS
TRACE 1 2 3 4 5 6
TYPE W WWWWW
DET A N N N N N
Ref Offset 40 dB
10 dB/div Ref 42.00 dBm
Log
Mkr1 887.14 MHz
26.35 dBm
32.0
22.0
12.0
2.00
-8.00
-18.0
-28.0
-38.0
-48.0
Start 10.0 MHz
#Res BW 100 kHz
VBW 10 kHz*
Stop 1.0000 GHz
Sweep 1.004 s (1001 pts)
Frequency
Auto Tune
Center Freq
505.000000 MHz
Start Freq
10.000000 MHz
Stop Freq
1.000000000 GHz
CF Step
99.000000 MHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS


Agilent Spectrum Analyzer - Swept SA
Start Freq 1.000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 14 dB
Avg Type: RMS
TRACE 1 2 3 4 5 6
TYPE A WWWWW
DET A N N N N N
Ref Offset 40.8 dB
10 dB/div Ref 36.80 dBm
Log
Mkr1 2.692 GHz
-46.73 dBm
26.8
16.8
6.80
-3.20
-13.2
-23.2
-33.2
-43.2
-53.2
Start 1.000 GHz
#Res BW 100 kHz
VBW 10 kHz*
Stop 3.000 GHz
Sweep 2.027 s (1001 pts)
Frequency
Auto Tune
Center Freq
2.000000000 GHz
Start Freq
1.000000000 GHz
Stop Freq
3.000000000 GHz
CF Step
200.000000 MHz
Auto Man
Freq Offset
0 Hz
MSG
STATUS


Agilent Spectrum Analyzer - Swept SA
Start Freq 3.000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 6 dB
Avg Type: RMS
TRACE 1 2 3 4 5 6
TYPE A WWWWW
DET A N N N N N
Ref Offset 42.5 dB
10 dB/div Ref 38.50 dBm
Log
Mkr1 25.113 5 GHz
-32.59 dBm
28.5
18.5
8.50
-1.50
-11.5
-21.5
-31.5
-41.5
-51.5
Start 3.00 GHz
#Res BW 1.0 MHz
VBW 100 kHz*
Stop 26.50 GHz
Sweep 238.3 ms (1001 pts)
Frequency
Auto Tune
Center Freq
14.750000000 GHz
Start Freq
3.000000000 GHz
Stop Freq
26.500000000 GHz
CF Step
2.350000000 GHz
Auto Man
Freq Offset
0 Hz
MSG
STATUS

11 10 OCCUPIED BANDWIDTH

11.1 Applicable Standard: FCC §2.1049

11.2 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	MXA Series Spectrum Analyzer	N9030A	MY49431143	2016.09.12	2017.09.12
DTS	DTS 40dB Attenuator	DTS100-40-3-1	09112005	2016.09.12	2017.09.12

***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. 99%Power bandwidth was recorded.

11.4 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

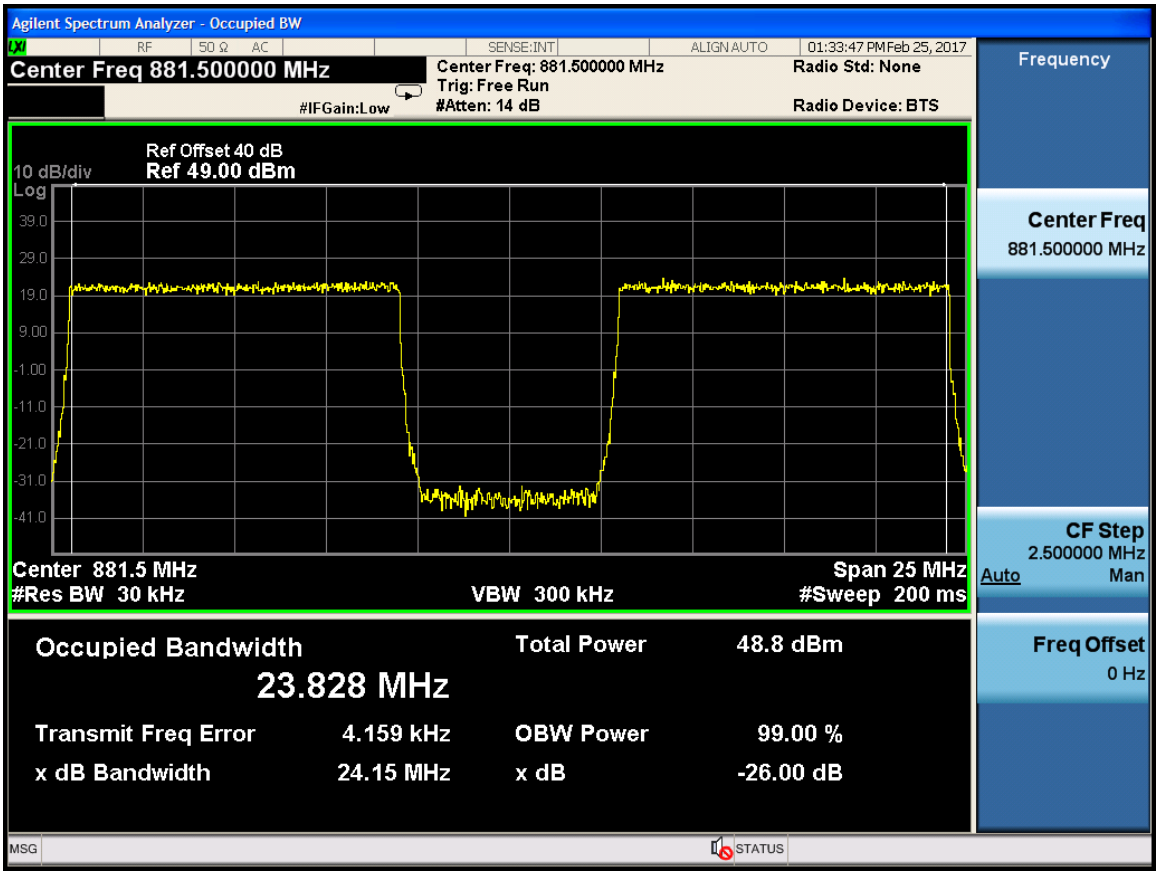
RF Bandwidth :IBW 25M(LTE 10M+LTE 10M)

Port	RF Center Freq. (MHz)	99% Power Bandwidth (MHz)	Limit (MHz)
1	881.5	23.828	25M
4	881.5	23.826	25M

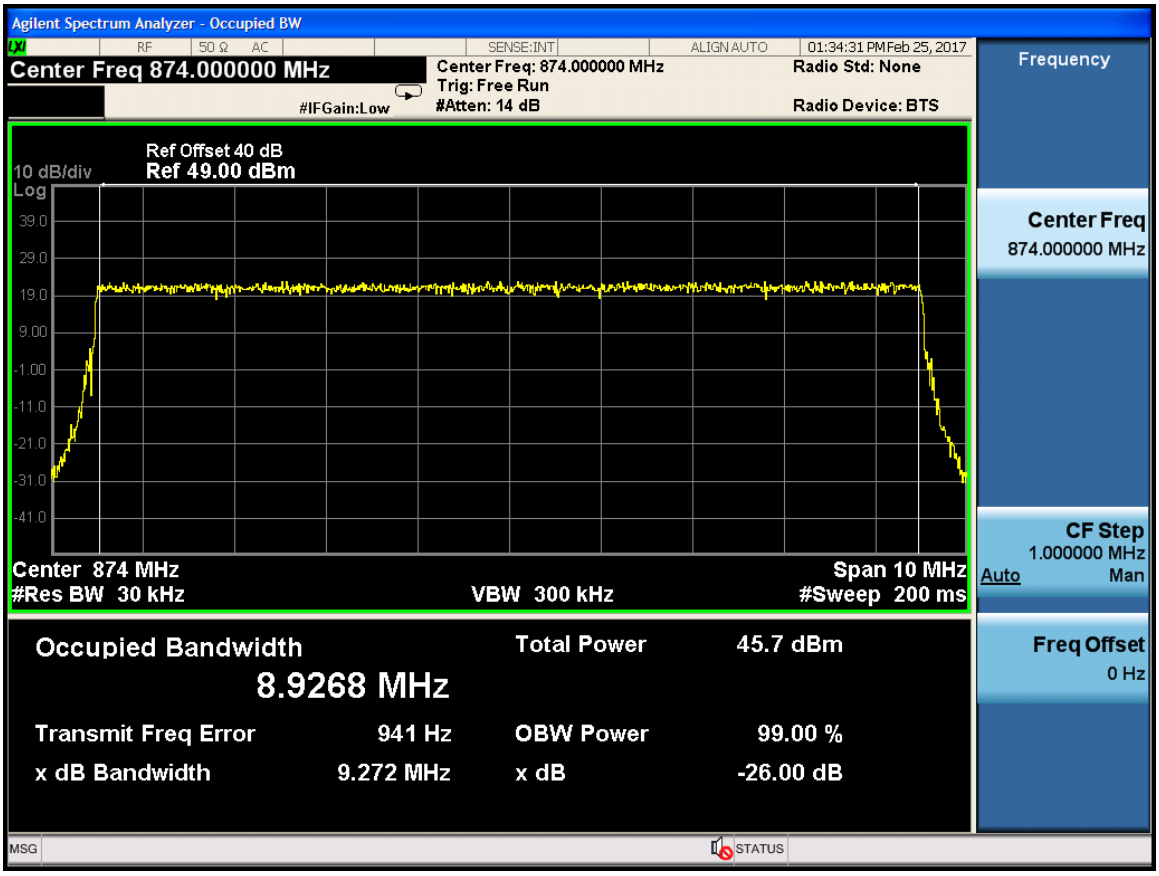
Channel Bandwidth : LTE 10M+LTE 10M (IBW 25M)

Port	RF Center Freq. (MHz)	LTE Center Freq. (MHz)	99% Power Bandwidth (MHz)	Limit (MHz)
1	881.5	874	8.9268	10M
		889	8.9241	10M
4	881.5	874	8.9292	10M
		889	8.9248	10M

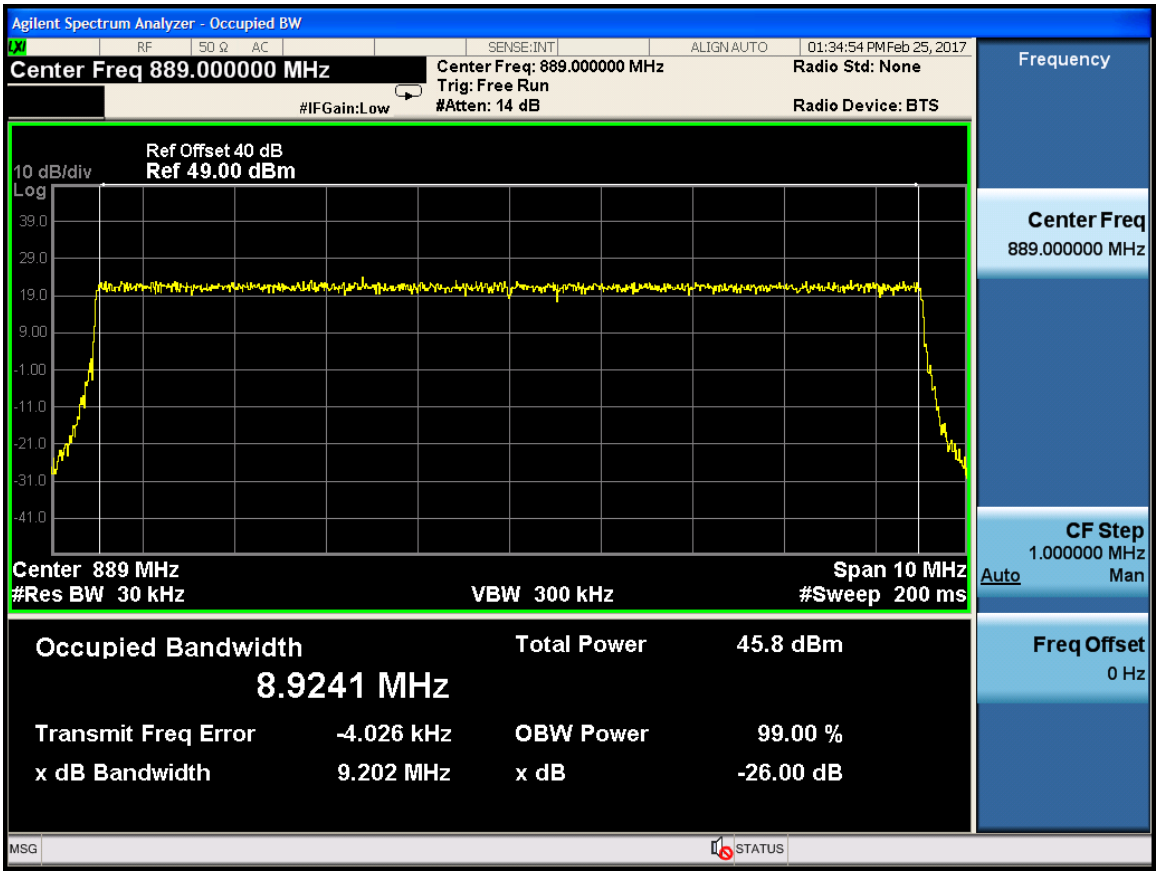
RF 25M(LTE 10M+LTE 10M) -Port 1-881.5MHz



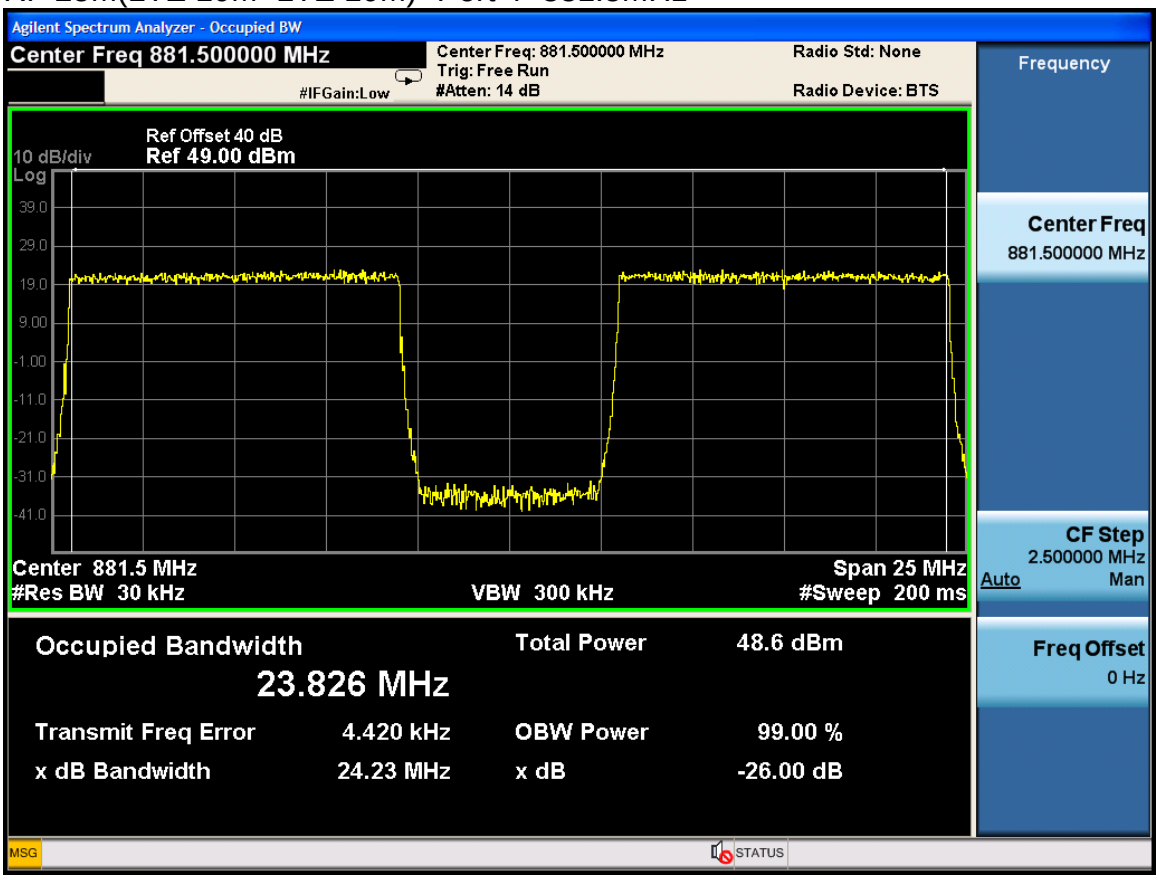
LTE 10M -Port 1-874MHz



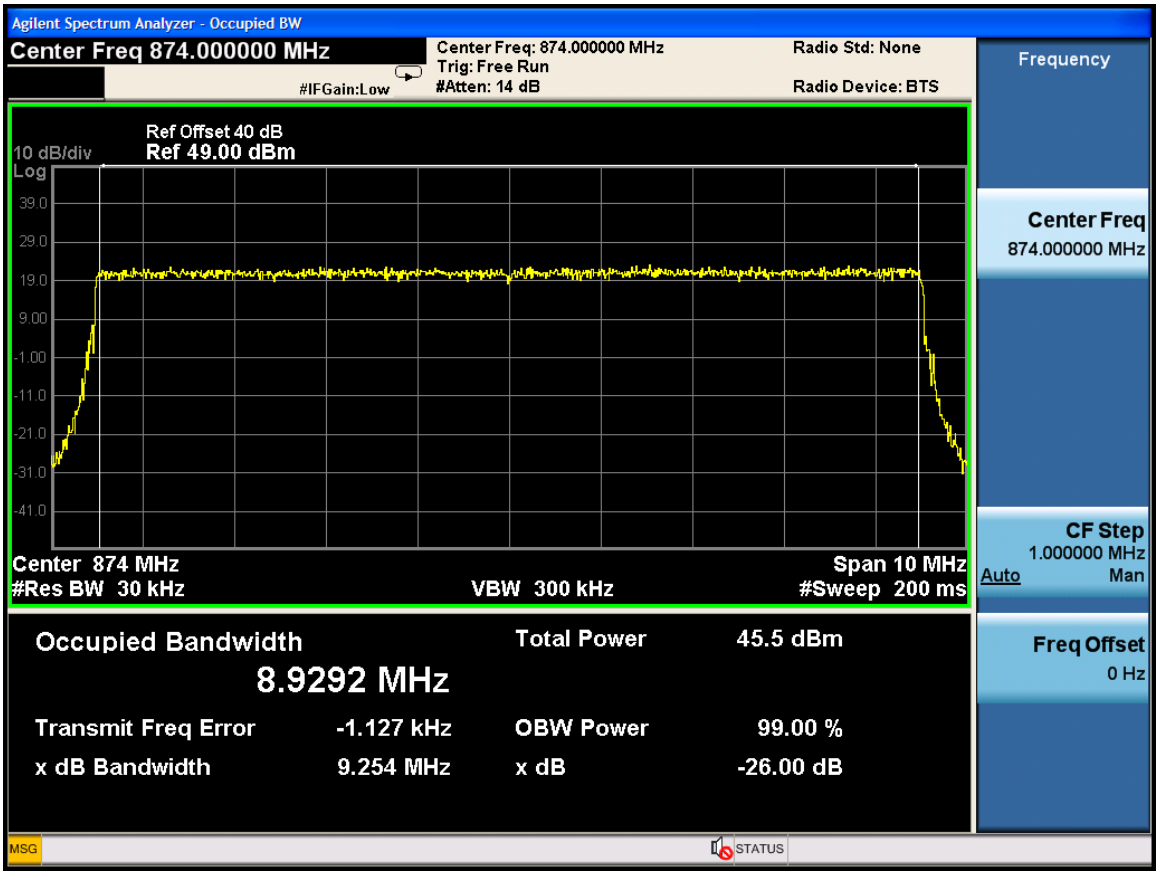
LTE 10M -Port 1-889MHz



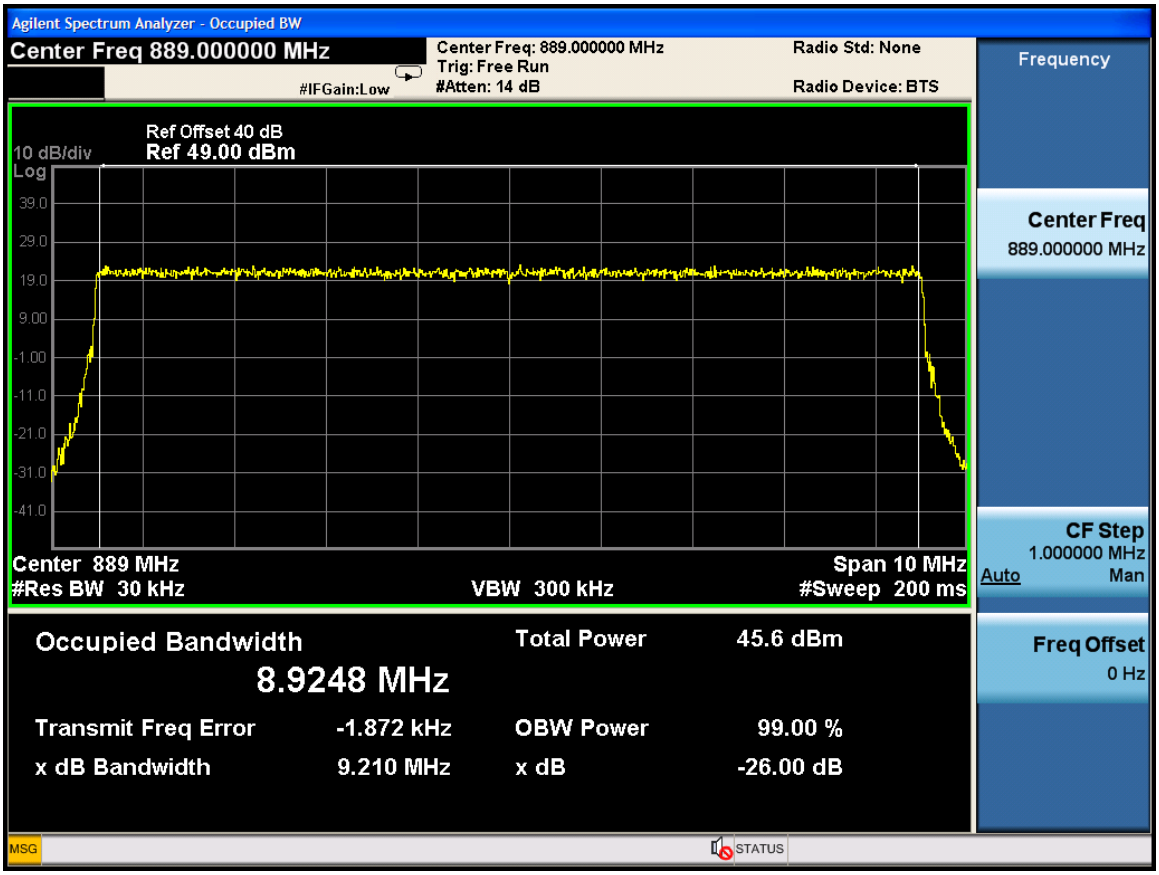
RF 25M(LTE 10M+LTE 10M) -Port 4 -881.5MHz



LTE 10M -Port 4-874MHz



LTE 10M -Port 4-889MHz



12 11 BAND EDGES

12.1 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.

12.2 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	MXA Series Spectrum Analyzer	N9030A	MY49431143	2016.09.12	2017.09.12
DTS	DTS 40dB Attenuator	DTS100-40-3-1	09112005	2016.09.12	2017.09.12

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

12.5 Test Result: Pass

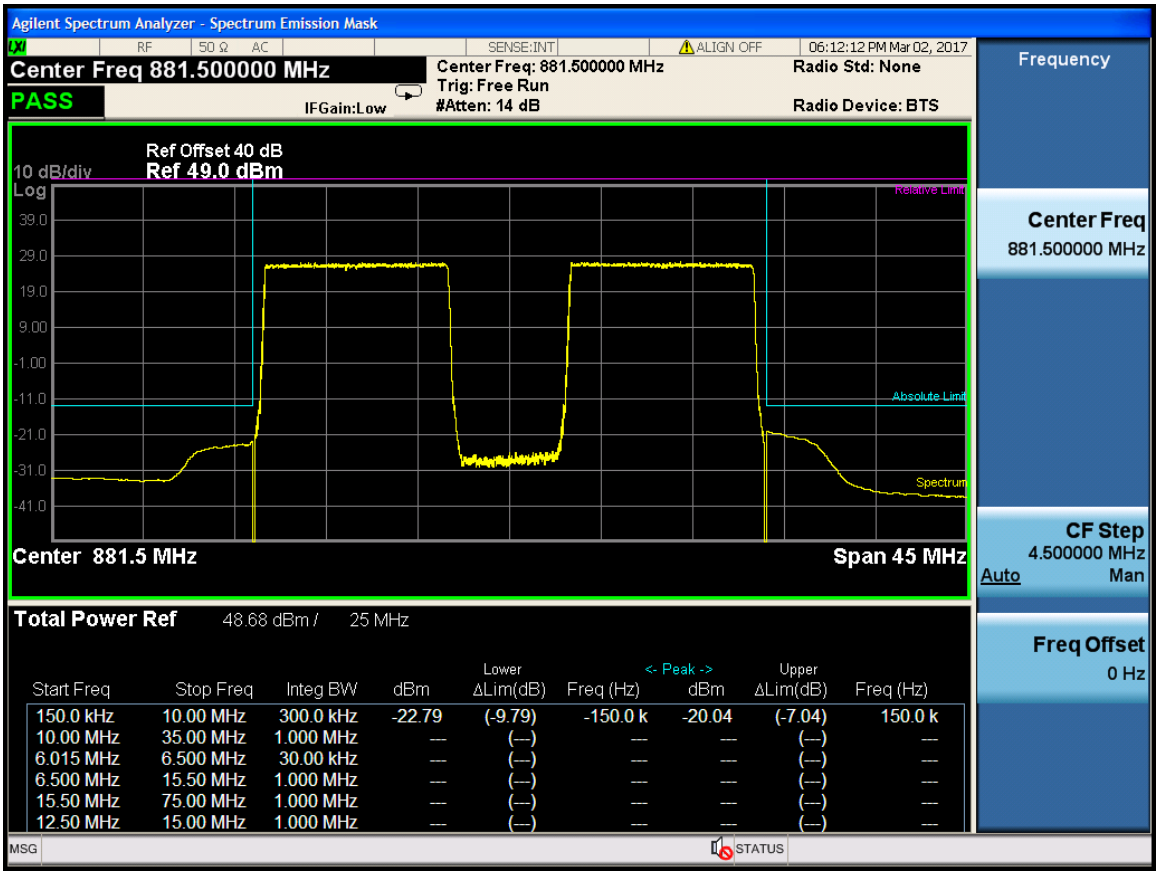
12.6 Test Mode: Transmitting LTE

12.7 Test Data

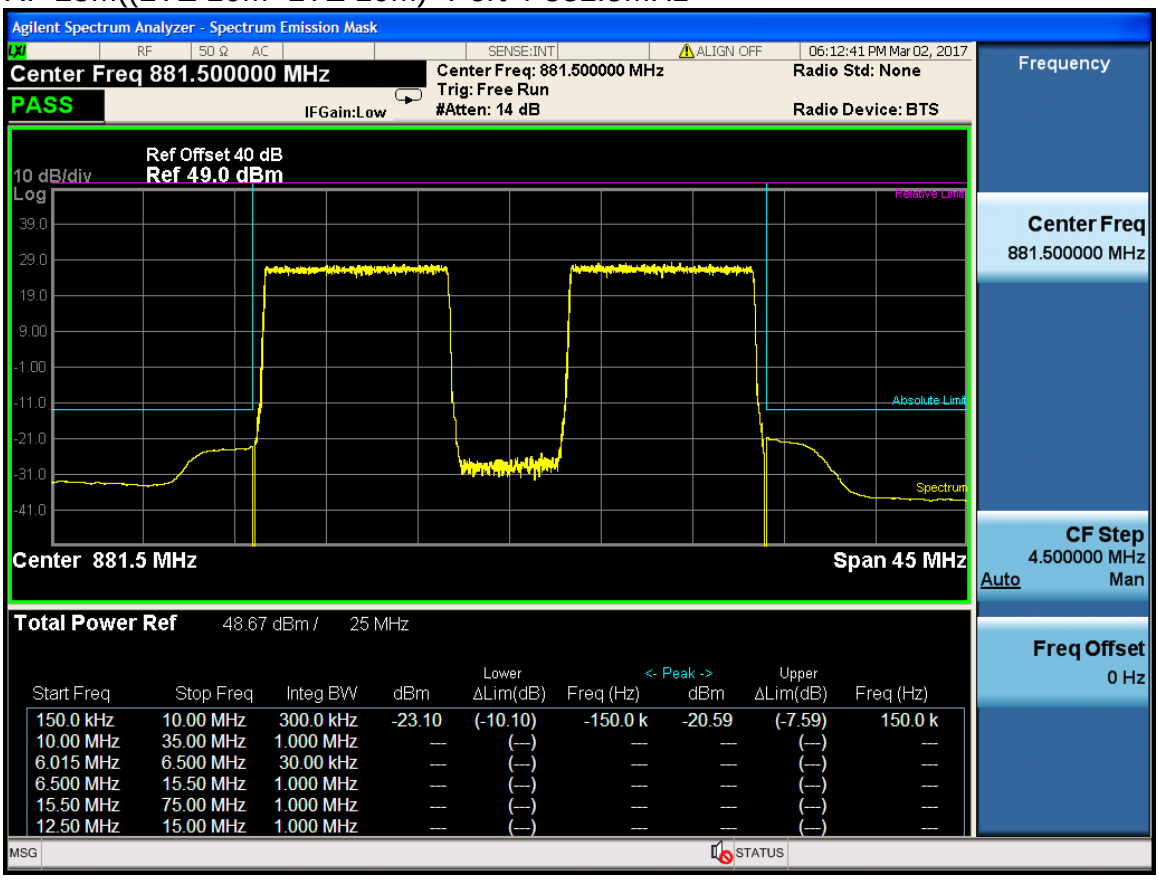
RF Bandwidth :IBW 25M(LTE 10M+LTE 10M)

Port	RF Center Freq. (MHz)	Max bandedge Emission (dBm)	Limit (dBm)
1	881.5	-20.04	-13
4	881.5	-20.59	-13

RF 25M(LTE 10M+LTE 10M) -Port 1-881.5MHz



RF 25M((LTE 10M+LTE 10M) -Port 4-881.5MHz



13 12 FREQUENCY STABILITY

13.1 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.

13.2 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
GZ-ESPEC	Temperature Chamber	EW0470	06113028	2016.09.12	2017.09.12
Agilent	MXA Series Spectrum Analyzer	N9030A	MY49431143	2016.09.12	2017.09.12
DTS	DTS 40dB Attenuator	DTS100-40-3-1	09112005	2015.04.17	2016.04.17

*__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 LTE

13.7 Test Data

13.7.1 Frequency Stability Versus Temperature

Frequency Stability vs Temperature（RF Bandwidth:25M(LTE 10M+10M) RF Frequency :881.5MHz								
Temperature (℃)	**Power Supplied (V_{DC})**	**Port**	**LTE Frequency**	**Frequency Measure Error**	**E-TM**	**Limit (ppm)**	**Limit (Hz)**	**Result**

				(Hz)				
-40	-48	1	874	0.456	TM2.0	0.05	44.7	PASS
				0.528	TM3.1	0.05	44.7	PASS
				0.352	TM3.2	0.05	44.7	PASS
				0.055	TM3.3	0.05	44.7	PASS
			889	0.428	TM2.0	0.05	44.7	PASS
				0.625	TM3.1	0.05	44.7	PASS
				0.136	TM3.2	0.05	44.7	PASS
				0.231	TM3.3	0.05	44.7	PASS
		4	874	0.256	TM2.0	0.05	44.7	PASS
				0.128	TM3.1	0.05	44.7	PASS
				0.478	TM3.2	0.05	44.7	PASS
				0.251	TM3.3	0.05	44.7	PASS
			889	0.227	TM2.0	0.05	44.7	PASS
				0.424	TM3.1	0.05	44.7	PASS
				0.155	TM3.2	0.05	44.7	PASS
				0.633	TM3.3	0.05	44.7	PASS
-30		1	874	0.226	TM2.0	0.05	44.7	PASS
				0.348	TM3.1	0.05	44.7	PASS
				0.365	TM3.2	0.05	44.7	PASS
				0.125	TM3.3	0.05	44.7	PASS
			889	0.125	TM2.0	0.05	44.7	PASS
				0.324	TM3.1	0.05	44.7	PASS
				0.128	TM3.2	0.05	44.7	PASS
				0.654	TM3.3	0.05	44.7	PASS
		4	874	0.196	TM2.0	0.05	44.7	PASS
				0.138	TM3.1	0.05	44.7	PASS
				0.338	TM3.2	0.05	44.7	PASS
				0.181	TM3.3	0.05	44.7	PASS
			889	0.127	TM2.0	0.05	44.7	PASS
				0.284	TM3.1	0.05	44.7	PASS
				0.115	TM3.2	0.05	44.7	PASS
				0.283	TM3.3	0.05	44.7	PASS
-20		1	874	0.325	TM2.0	0.05	44.7	PASS
				0.228	TM3.1	0.05	44.7	PASS
				0.689	TM3.2	0.05	44.7	PASS
				0.128	TM3.3	0.05	44.7	PASS
			889	0.548	TM2.0	0.05	44.7	PASS
				0.524	TM3.1	0.05	44.7	PASS
				0.133	TM3.2	0.05	44.7	PASS

				0.258	TM3.3	0.05	44.7	PASS
		4	874	0.398	TM2.0	0.05	44.7	PASS
				0.128	TM3.1	0.05	44.7	PASS
				0.438	TM3.2	0.05	44.7	PASS
				0.247	TM3.3	0.05	44.7	PASS
			889	0.327	TM2.0	0.05	44.7	PASS
				0.468	TM3.1	0.05	44.7	PASS
				0.245	TM3.2	0.05	44.7	PASS
				0.588	TM3.3	0.05	44.7	PASS
-10		1	874	0.421	TM2.0	0.05	44.7	PASS
				0.258	TM3.1	0.05	44.7	PASS
				0.078	TM3.2	0.05	44.7	PASS
				0.465	TM3.3	0.05	44.7	PASS
			889	0.474	TM2.0	0.05	44.7	PASS
				0.347	TM3.1	0.05	44.7	PASS
				0.256	TM3.2	0.05	44.7	PASS
				0.321	TM3.3	0.05	44.7	PASS
		4	874	0.354	TM2.0	0.05	44.7	PASS
				0.133	TM3.1	0.05	44.7	PASS
				0.248	TM3.2	0.05	44.7	PASS
				0.541	TM3.3	0.05	44.7	PASS
			889	0.235	TM2.0	0.05	44.7	PASS
				0.284	TM3.1	0.05	44.7	PASS
				0.147	TM3.2	0.05	44.7	PASS
				0.213	TM3.3	0.05	44.7	PASS
0		1	874	0.154	TM2.0	0.05	44.7	PASS
				0.429	TM3.1	0.05	44.7	PASS
				0.354	TM3.2	0.05	44.7	PASS
				0.145	TM3.3	0.05	44.7	PASS
			889	0.436	TM2.0	0.05	44.7	PASS
				0.524	TM3.1	0.05	44.7	PASS
				0.434	TM3.2	0.05	44.7	PASS
				0.235	TM3.3	0.05	44.7	PASS
		4	874	0.356	TM2.0	0.05	44.7	PASS
				0.354	TM3.1	0.05	44.7	PASS
				0.148	TM3.2	0.05	44.7	PASS
				0.236	TM3.3	0.05	44.7	PASS
			889	0.247	TM2.0	0.05	44.7	PASS
				0.624	TM3.1	0.05	44.7	PASS
				0.854	TM3.2	0.05	44.7	PASS
				0.743	TM3.3	0.05	44.7	PASS
10		1	874	0.456	TM2.0	0.05	44.7	PASS

				0.528	TM3.1	0.05	44.7	PASS
				0.352	TM3.2	0.05	44.7	PASS
				0.055	TM3.3	0.05	44.7	PASS
			889	0.428	TM2.0	0.05	44.7	PASS
				0.625	TM3.1	0.05	44.7	PASS
				0.136	TM3.2	0.05	44.7	PASS
				0.231	TM3.3	0.05	44.7	PASS
		4	874	0.256	TM2.0	0.05	44.7	PASS
				0.128	TM3.1	0.05	44.7	PASS
				0.478	TM3.2	0.05	44.7	PASS
				0.251	TM3.3	0.05	44.7	PASS
			889	0.347	TM2.0	0.05	44.7	PASS
				0.427	TM3.1	0.05	44.7	PASS
				0.225	TM3.2	0.05	44.7	PASS
				0.634	TM3.3	0.05	44.7	PASS
20		1	874	0.292	TM2.0	0.05	44.7	PASS
				0.128	TM3.1	0.05	44.7	PASS
				0.052	TM3.2	0.05	44.7	PASS
				0.335	TM3.3	0.05	44.7	PASS
			889	0.328	TM2.0	0.05	44.7	PASS
				0.025	TM3.1	0.05	44.7	PASS
				0.336	TM3.2	0.05	44.7	PASS
				0.226	TM3.3	0.05	44.7	PASS
		4	874	0.432	TM2.0	0.05	44.7	PASS
				0.137	TM3.1	0.05	44.7	PASS
				0.129	TM3.2	0.05	44.7	PASS
				0.106	TM3.3	0.05	44.7	PASS
			889	0.285	TM2.0	0.05	44.7	PASS
				0.067	TM3.1	0.05	44.7	PASS
				0.099	TM3.2	0.05	44.7	PASS
				0.134	TM3.3	0.05	44.7	PASS
30		1	874	0.211	TM2.0	0.05	44.7	PASS
				0.324	TM3.1	0.05	44.7	PASS
				0.152	TM3.2	0.05	44.7	PASS
				0.034	TM3.3	0.05	44.7	PASS
			889	0.029	TM2.0	0.05	44.7	PASS
				0.225	TM3.1	0.05	44.7	PASS
				0.136	TM3.2	0.05	44.7	PASS
				0.027	TM3.3	0.05	44.7	PASS
		4	874	0.232	TM2.0	0.05	44.7	PASS
				0.134	TM3.1	0.05	44.7	PASS
				0.219	TM3.2	0.05	44.7	PASS

				0.148	TM3.3	0.05	44.7	PASS
			889	0.085	TM2.0	0.05	44.7	PASS
				0.164	TM3.1	0.05	44.7	PASS
				0.284	TM3.2	0.05	44.7	PASS
				0.544	TM3.3	0.05	44.7	PASS
40		1	874	0.092	TM2.0	0.05	44.7	PASS
				0.224	TM3.1	0.05	44.7	PASS
				0.252	TM3.2	0.05	44.7	PASS
				0.036	TM3.3	0.05	44.7	PASS
			889	0.129	TM2.0	0.05	44.7	PASS
				0.125	TM3.1	0.05	44.7	PASS
				0.034	TM3.2	0.05	44.7	PASS
				0.222	TM3.3	0.05	44.7	PASS
		4	874	0.334	TM2.0	0.05	44.7	PASS
				0.237	TM3.1	0.05	44.7	PASS
				0.324	TM3.2	0.05	44.7	PASS
				0.114	TM3.3	0.05	44.7	PASS
			889	0.205	TM2.0	0.05	44.7	PASS
				0.167	TM3.1	0.05	44.7	PASS
				0.124	TM3.2	0.05	44.7	PASS
				0.357	TM3.3	0.05	44.7	PASS
50		1	874	0.125	TM2.0	0.05	44.7	PASS
				0.054	TM3.1	0.05	44.7	PASS
				0.152	TM3.2	0.05	44.7	PASS
				0.035	TM3.3	0.05	44.7	PASS
			889	0.124	TM2.0	0.05	44.7	PASS
				0.126	TM3.1	0.05	44.7	PASS
				0.134	TM3.2	0.05	44.7	PASS
				0.206	TM3.3	0.05	44.7	PASS
		4	874	0.132	TM2.0	0.05	44.7	PASS
				0.039	TM3.1	0.05	44.7	PASS
				0.125	TM3.2	0.05	44.7	PASS
				0.028	TM3.3	0.05	44.7	PASS
			889	0.184	TM2.0	0.05	44.7	PASS
				0.064	TM3.1	0.05	44.7	PASS
				0.358	TM3.2	0.05	44.7	PASS
				0.104	TM3.3	0.05	44.7	PASS
55		1	874	0.089	TM2.0	0.05	44.7	PASS
				0.058	TM3.1	0.05	44.7	PASS
				0.128	TM3.2	0.05	44.7	PASS
				0.134	TM3.3	0.05	44.7	PASS
			889	0.324	TM2.0	0.05	44.7	PASS

				0.185	TM3.1	0.05	44.7	PASS
				0.244	TM3.2	0.05	44.7	PASS
				0.216	TM3.3	0.05	44.7	PASS
		4	874	0.133	TM2.0	0.05	44.7	PASS
				0.134	TM3.1	0.05	44.7	PASS
				0.109	TM3.2	0.05	44.7	PASS
				0.204	TM3.3	0.05	44.7	PASS
			889	0.145	TM2.0	0.05	44.7	PASS
				0.168	TM3.1	0.05	44.7	PASS
				0.198	TM3.2	0.05	44.7	PASS
				0.336	TM3.3	0.05	44.7	PASS

13.7.2 Frequency Stability Versus Voltage

Frequency Stability vs Voltage（RF Bandwidth:25M(LTE 10M+10M) RF F1requency :881.5MHz								
Power Supplied (V_{DC})	**Temperature (℃)**	**Port**		**Frequency Measure Error (Hz)**	**E-TM**	**Limit (ppm)**	**Limit (Hz)**	**Result**
-37	20	1	874	0.094	TM2.0	0.05	44.7	PASS
				0.134	TM3.1	0.05	44.7	PASS
				0.152	TM3.2	0.05	44.7	PASS
				0.214	TM3.3	0.05	44.7	PASS
			889	0.015	TM2.0	0.05	44.7	PASS
				0.124	TM3.1	0.05	44.7	PASS
				0.246	TM3.2	0.05	44.7	PASS
				0.258	TM3.3	0.05	44.7	PASS
		4	874	0.438	TM2.0	0.05	44.7	PASS
				0.427	TM3.1	0.05	44.7	PASS
				0.259	TM3.2	0.05	44.7	PASS
				0.174	TM3.3	0.05	44.7	PASS
			889	0.365	TM2.0	0.05	44.7	PASS
				0.242	TM3.1	0.05	44.7	PASS
				0.253	TM3.2	0.05	44.7	PASS
				0.156	TM3.3	0.05	44.7	PASS
-42		1	874	0.191	TM2.0	0.05	44.7	PASS
				0.035	TM3.1	0.05	44.7	PASS
				0.168	TM3.2	0.05	44.7	PASS
				0.315	TM3.3	0.05	44.7	PASS
			889	0.215	TM2.0	0.05	44.7	PASS
				0.024	TM3.1	0.05	44.7	PASS

				0.259	TM3.2	0.05	44.7	PASS
				0.487	TM3.3	0.05	44.7	PASS
			874	0.248	TM2.0	0.05	44.7	PASS
				0.337	TM3.1	0.05	44.7	PASS
				0.459	TM3.2	0.05	44.7	PASS
		4		0.189	TM3.3	0.05	44.7	PASS
			889	0.245	TM2.0	0.05	44.7	PASS
				0.356	TM3.1	0.05	44.7	PASS
				0.053	TM3.2	0.05	44.7	PASS
				0.142	TM3.3	0.05	44.7	PASS
			874	0.292	TM2.0	0.05	44.7	PASS
				0.128	TM3.1	0.05	44.7	PASS
				0.052	TM3.2	0.05	44.7	PASS
		1		0.335	TM3.3	0.05	44.7	PASS
			889	0.328	TM2.0	0.05	44.7	PASS
				0.025	TM3.1	0.05	44.7	PASS
				0.336	TM3.2	0.05	44.7	PASS
-48				0.226	TM3.3	0.05	44.7	PASS
			874	0.432	TM2.0	0.05	44.7	PASS
				0.137	TM3.1	0.05	44.7	PASS
				0.129	TM3.2	0.05	44.7	PASS
		4		0.106	TM3.3	0.05	44.7	PASS
			889	0.285	TM2.0	0.05	44.7	PASS
				0.067	TM3.1	0.05	44.7	PASS
				0.099	TM3.2	0.05	44.7	PASS
				0.134	TM3.3	0.05	44.7	PASS
			874	0.089	TM2.0	0.05	44.7	PASS
				0.564	TM3.1	0.05	44.7	PASS
				0.136	TM3.2	0.05	44.7	PASS
		1		0.364	TM3.3	0.05	44.7	PASS
			889	0.425	TM2.0	0.05	44.7	PASS
				0.314	TM3.1	0.05	44.7	PASS
				0.086	TM3.2	0.05	44.7	PASS
-54				0.098	TM3.3	0.05	44.7	PASS
			874	0.538	TM2.0	0.05	44.7	PASS
				0.423	TM3.1	0.05	44.7	PASS
				0.149	TM3.2	0.05	44.7	PASS
		4		0.234	TM3.3	0.05	44.7	PASS
			889	0.215	TM2.0	0.05	44.7	PASS
				0.268	TM3.1	0.05	44.7	PASS
				0.123	TM3.2	0.05	44.7	PASS
				0.215	TM3.3	0.05	44.7	PASS

-60		1	874	0.125	TM2.0	0.05	44.7	PASS
				0.079	TM3.1	0.05	44.7	PASS
				0.622	TM3.2	0.05	44.7	PASS
				0.354	TM3.3	0.05	44.7	PASS
			889	0.155	TM2.0	0.05	44.7	PASS
				0.132	TM3.1	0.05	44.7	PASS
				0.211	TM3.2	0.05	44.7	PASS
				0.210	TM3.3	0.05	44.7	PASS
		4	874	0.435	TM2.0	0.05	44.7	PASS
				0.217	TM3.1	0.05	44.7	PASS
				0.159	TM3.2	0.05	44.7	PASS
				0.189	TM3.3	0.05	44.7	PASS
			889	0.206	TM2.0	0.05	44.7	PASS
				0.351	TM3.1	0.05	44.7	PASS
				0.351	TM3.2	0.05	44.7	PASS
				0.089	TM3.3	0.05	44.7	PASS

---End of Report---