



# FCC RF TEST REPORT

Report Number : **RP20170313032\_\_02** 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 : **80**

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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.

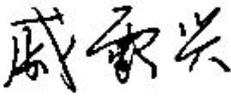
The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 373926. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

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**Prepared By**  
RF Test Engineer

2017-03-12  
**Date**

**Qi Luxing**  
**Name**

  
**Signature**

**Reviewed By**  
Laboratory Manager

2017-03-12  
**Date**

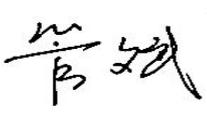
**Wu Shuzhong**  
**Name**

  
**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: Remote Radio Unit**

**MANUFACTURERS MODEL/SERIAL NUMBER: ZXSDR R8872A S1900(GUL)**

**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 x 352 mm x 137 mm (HxWxD)

Input voltage: -37V~-60V

Frequency range: UL:1850MHz~1910MHz; DL: 1930MHz~1990 MHz

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 MISCELLANEOUS WIRELESS COMMUNICATIONS 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.

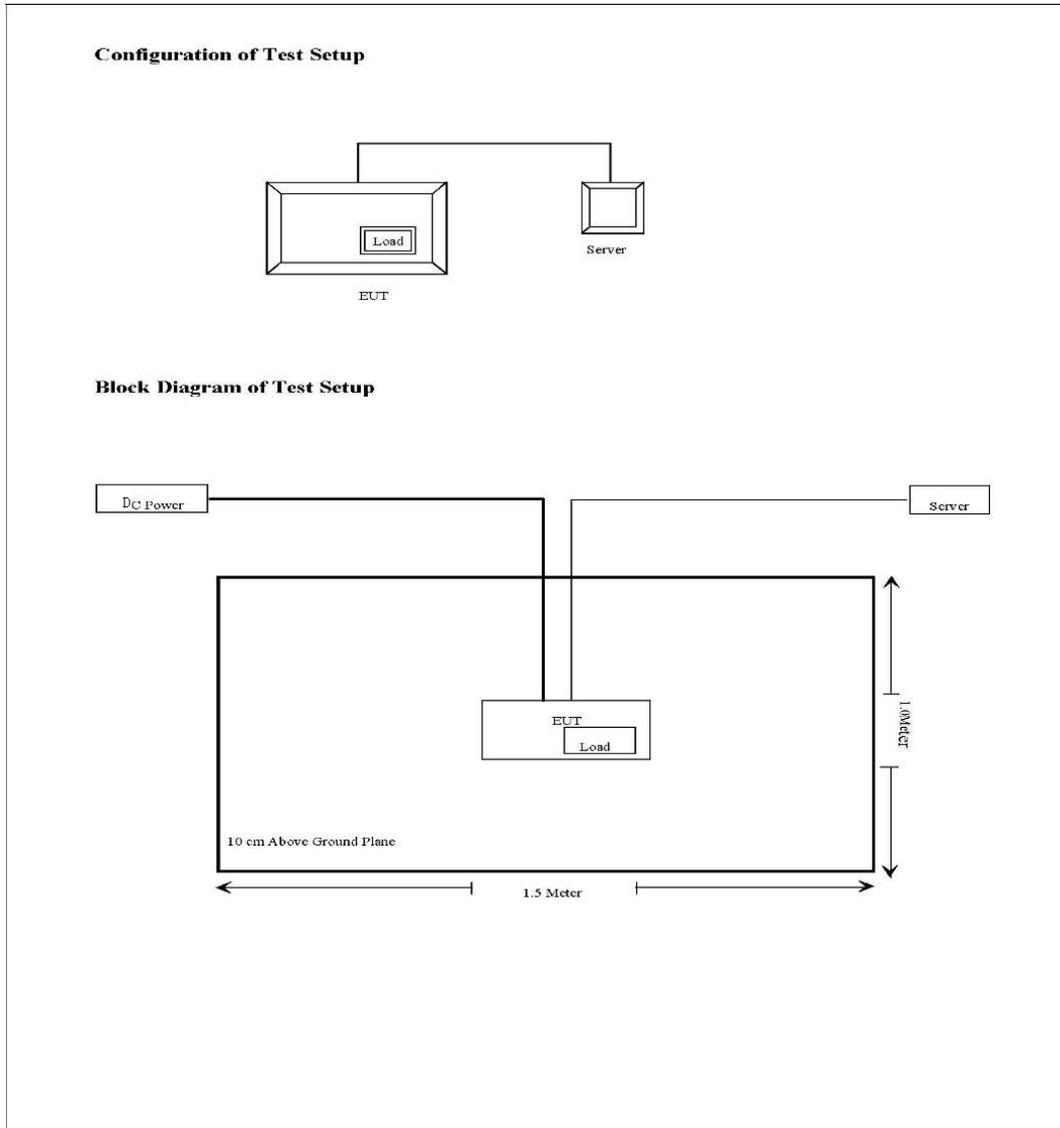


fig 2. Test configuration

**6 TRANSMITTER OUTPUT POWER**

**6.1 Applicable Standard: FCC §2.1046, §24.232**

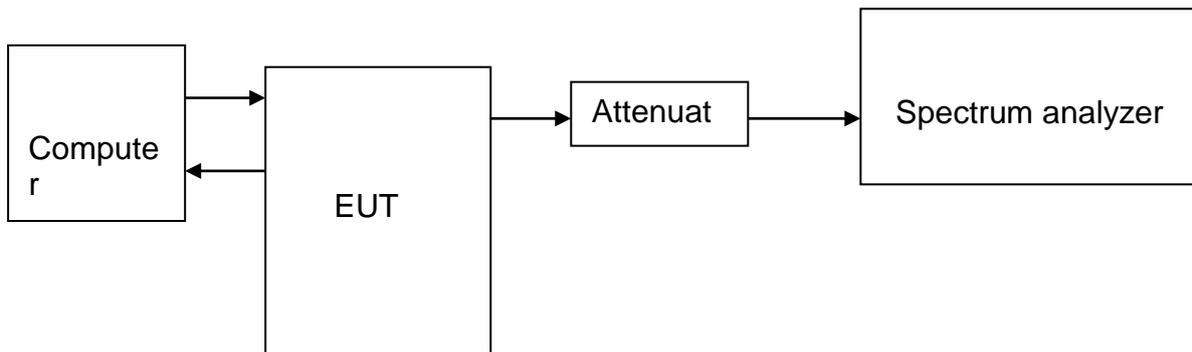
According to FCC §2.1046 & 24.232, the EIRP (equivalent isotropically radiated power) must not exceed 1640Watts.

**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 40dB, Cable Loss is about 2.5dB

**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+UMTS+GSM**

**6.7 Test Data:**

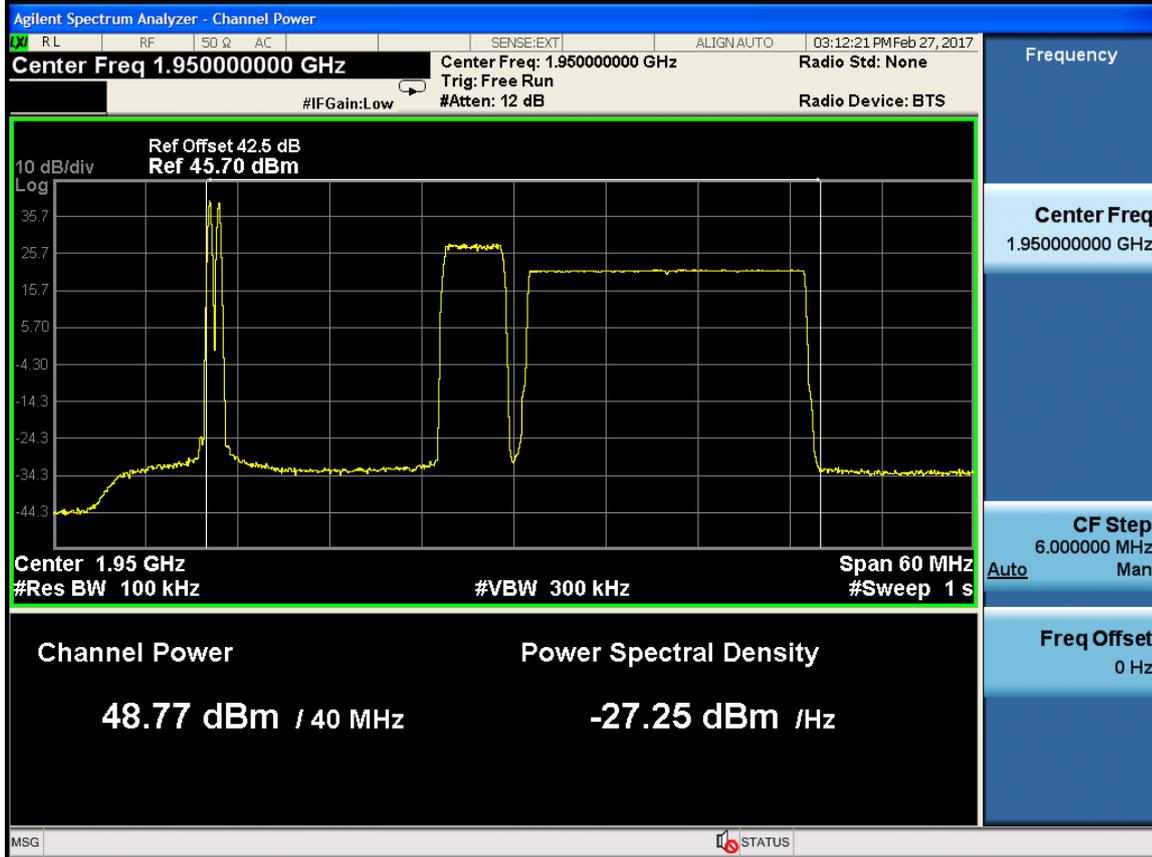
RF Bandwidth :IBW 40M(LTE+UMTS+GSM)

Port	Center Freq. (MHz)	Max output Power in dBm	Antenna gain dBi	Cable Loss dB	equivalent isotropically radiated power dBm Of single antenna	Total Power in W Of single antenna



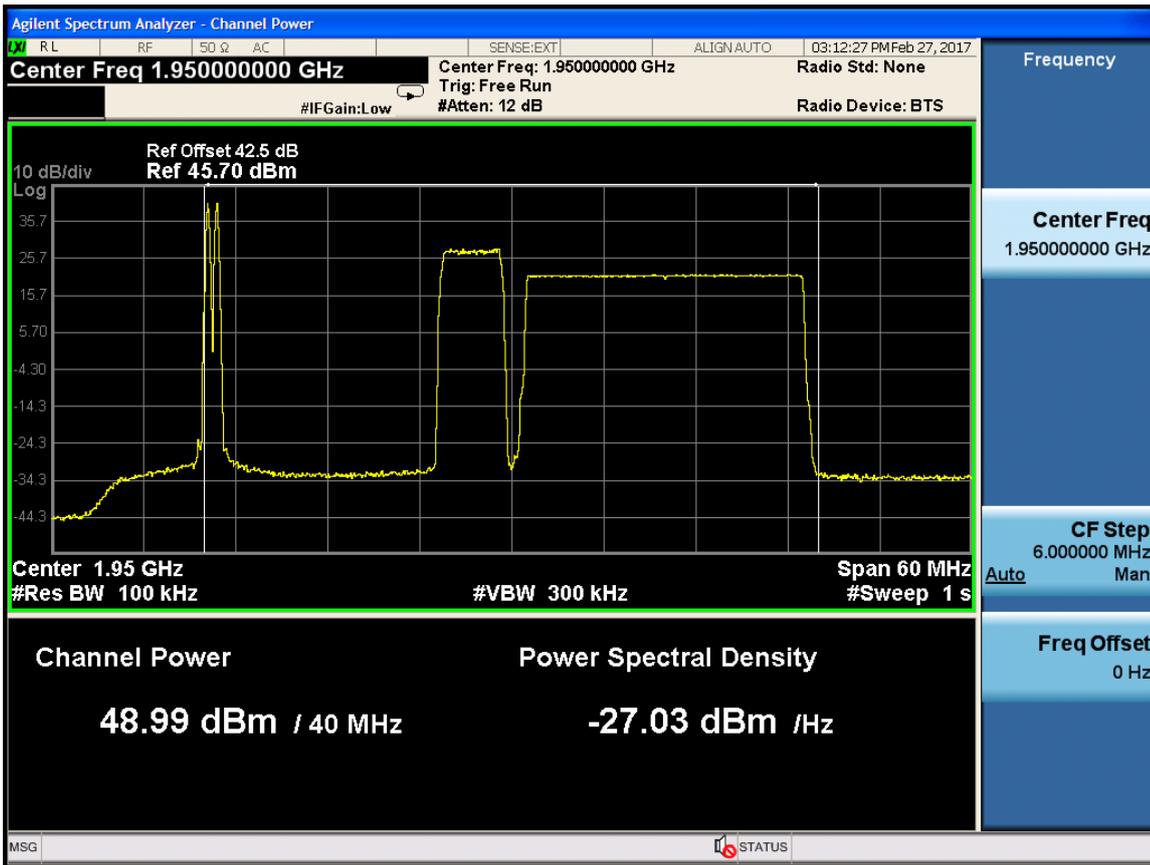
1	1950	48.77	15	4.5	59.27	845.3
	1960	48.95	15	4.5	59.45	881.0
	1970	48.97	15	4.5	59.47	885.1
4	1950	48.99	15	4.5	59.49	889.2
	1960	49.06	15	4.5	59.56	903.6
	1970	49.07	15	4.5	59.57	905.7

### Port 1 -1950MHz

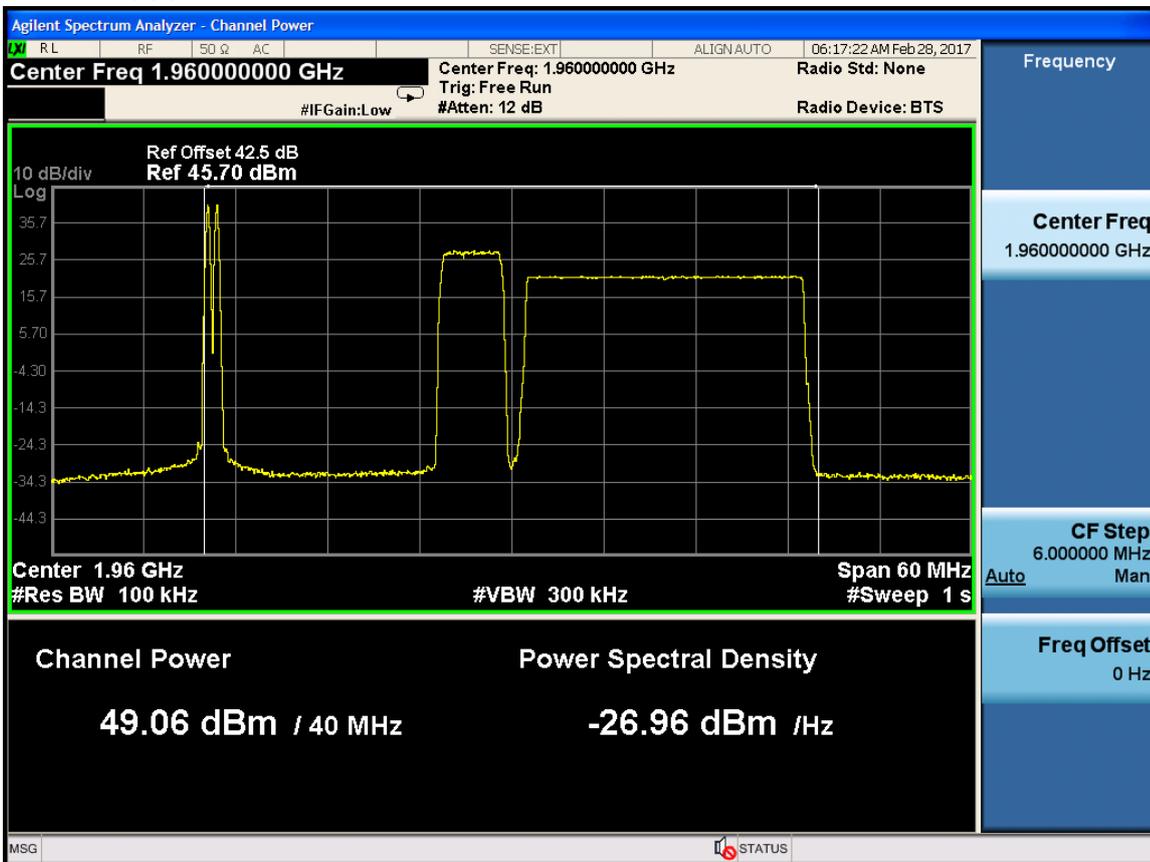


### Port 1 -1960MHz

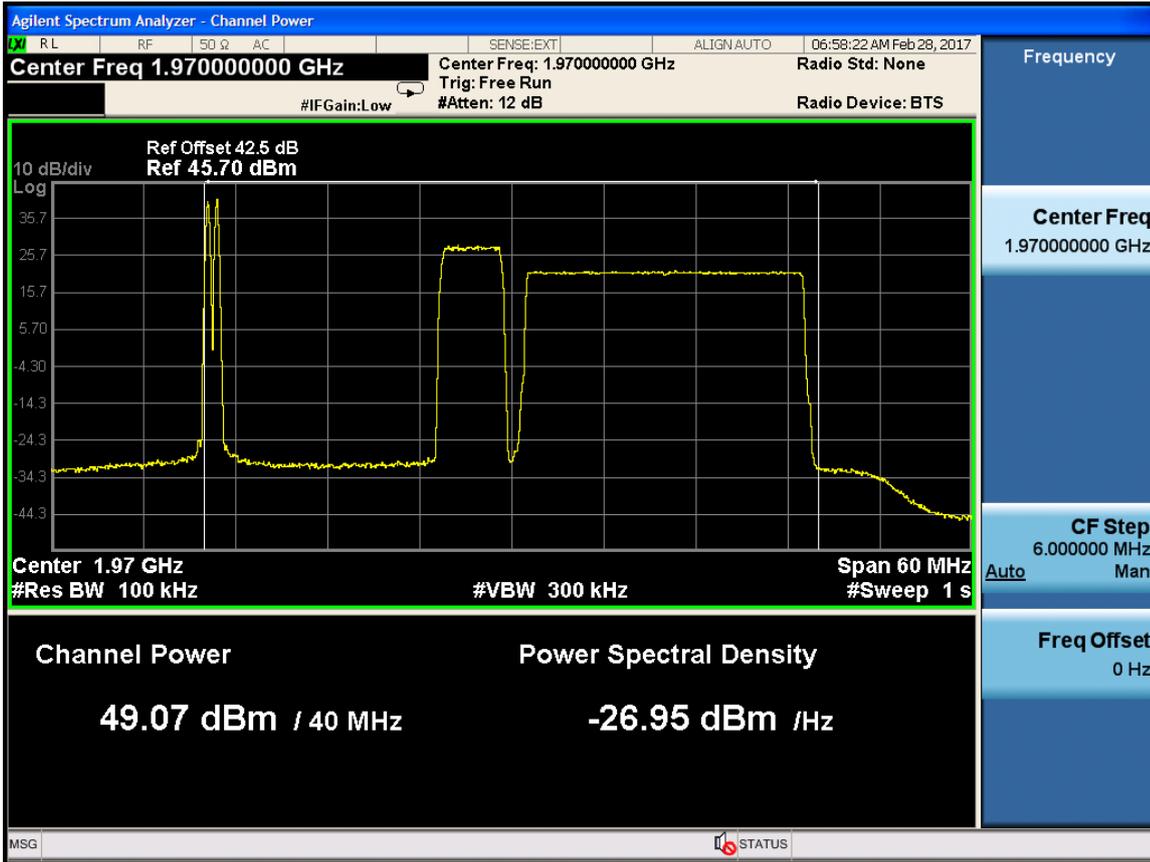




Port 4 -1960MHz



Port 4 -1970MHz





## 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 <sup>2</sup> )	Averaging Time  E  <sup>2</sup> ,  H  <sup>2</sup> or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f <sup>2</sup> )*	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

$$S = \text{EIRP} / 4\pi R^2$$

Where: S = power density

R = distance to the center of radiation of the antenna= [EIRP /4πS]1/2

According to §24.232, the equivalent isotropically radiated power (EIRP) of base transmitters and cellular repeaters must not exceed 1640 Watts.

Frequency 1990MHz is between 1500MHz and 100,000MHz, and the Maximum S=1mW/cm<sup>2</sup>

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	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**

GUL digital mode is used by EUT.

**8.4 Test Data Environmental Conditions**

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

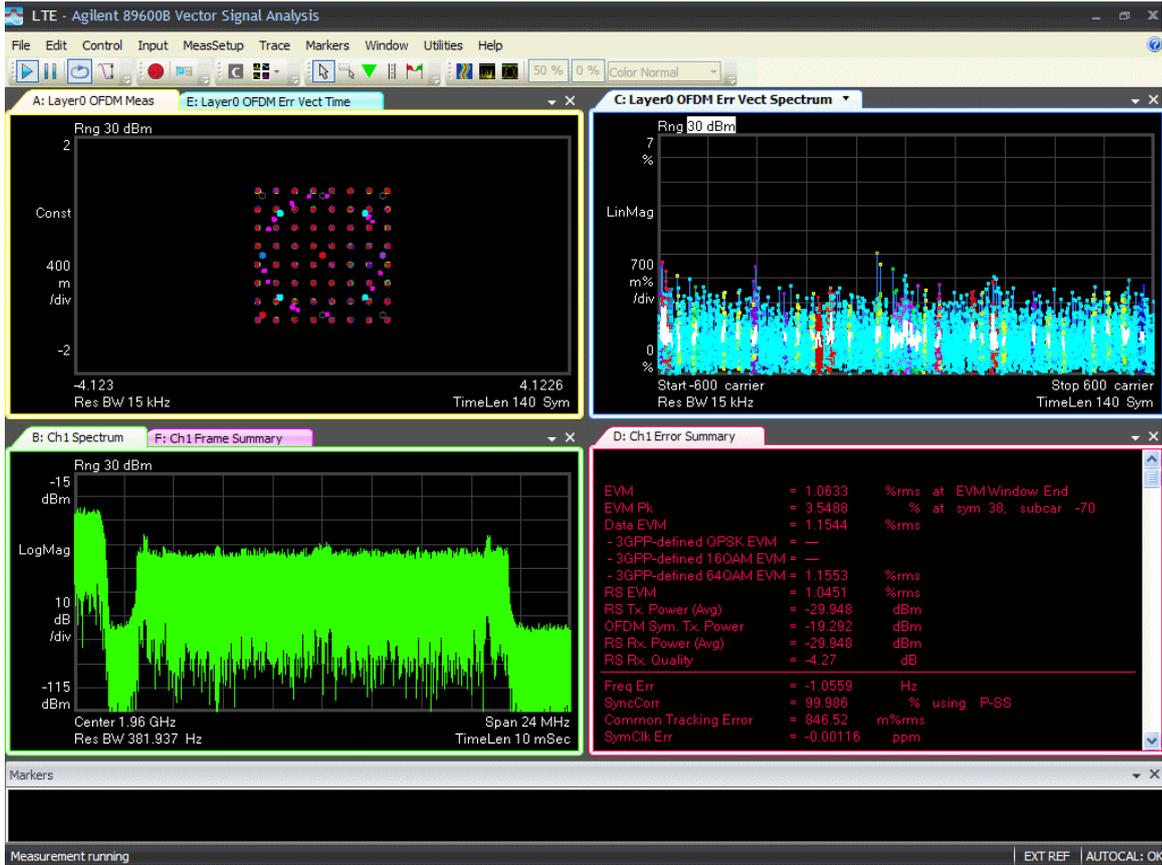
**8.5 Test Result: Pass****8.6 Test Mode: Transmitting LTE+UMTS+GSM****8.7 Test Data (LTE)**

RF Bandwidth :IBW 40M(GUL-LTE 20M)

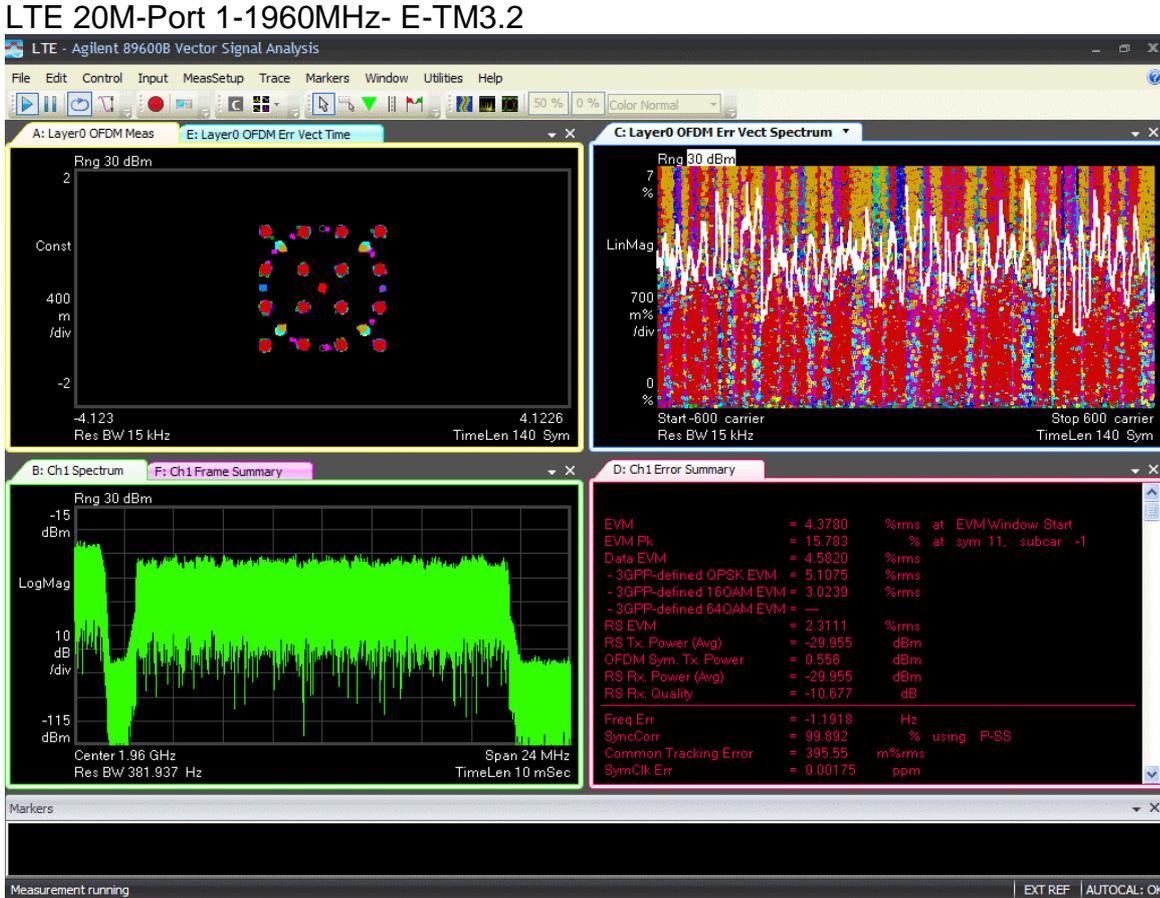
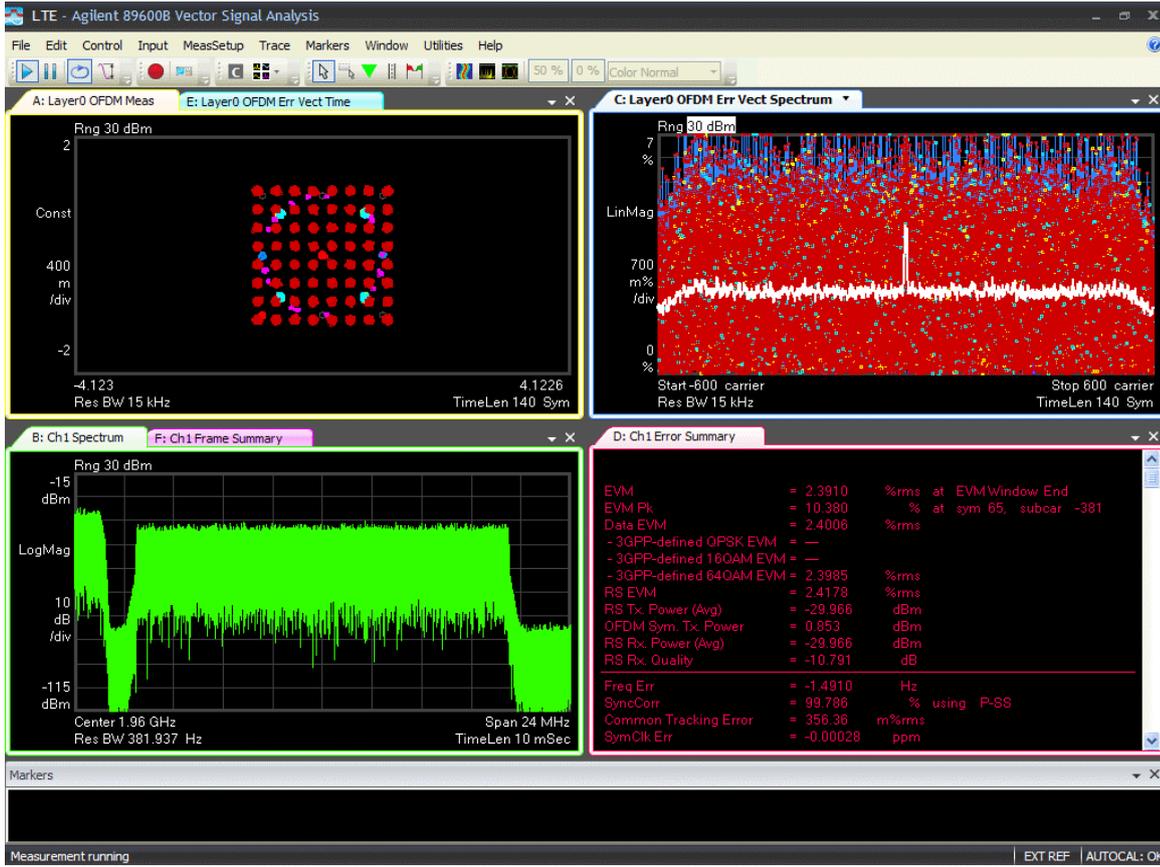
Port	RF Center Freq. (MHz)	LTE Center Freq. (MHz)	Test mode	EVM%
1	1950	1960	E-TM2	1.1553
			E-TM3.1	2.3985
			E-TM 3.2	3.0239
			E-TM 3.3	3.9379
	1960	1970	E-TM2	1.2201
			E-TM3.1	2.4308
			E-TM 3.2	3.0926
			E-TM 3.3	4.1406
	1970	1980	E-TM2	1.1687
			E-TM3.1	2.4150
			E-TM 3.2	3.0559
			E-TM 3.3	4.0927
4	1950	1960	E-TM2	1.1539
			E-TM3.1	2.3464
			E-TM 3.2	3.0561
			E-TM 3.3	3.9072
	1960	1970	E-TM2	1.1517

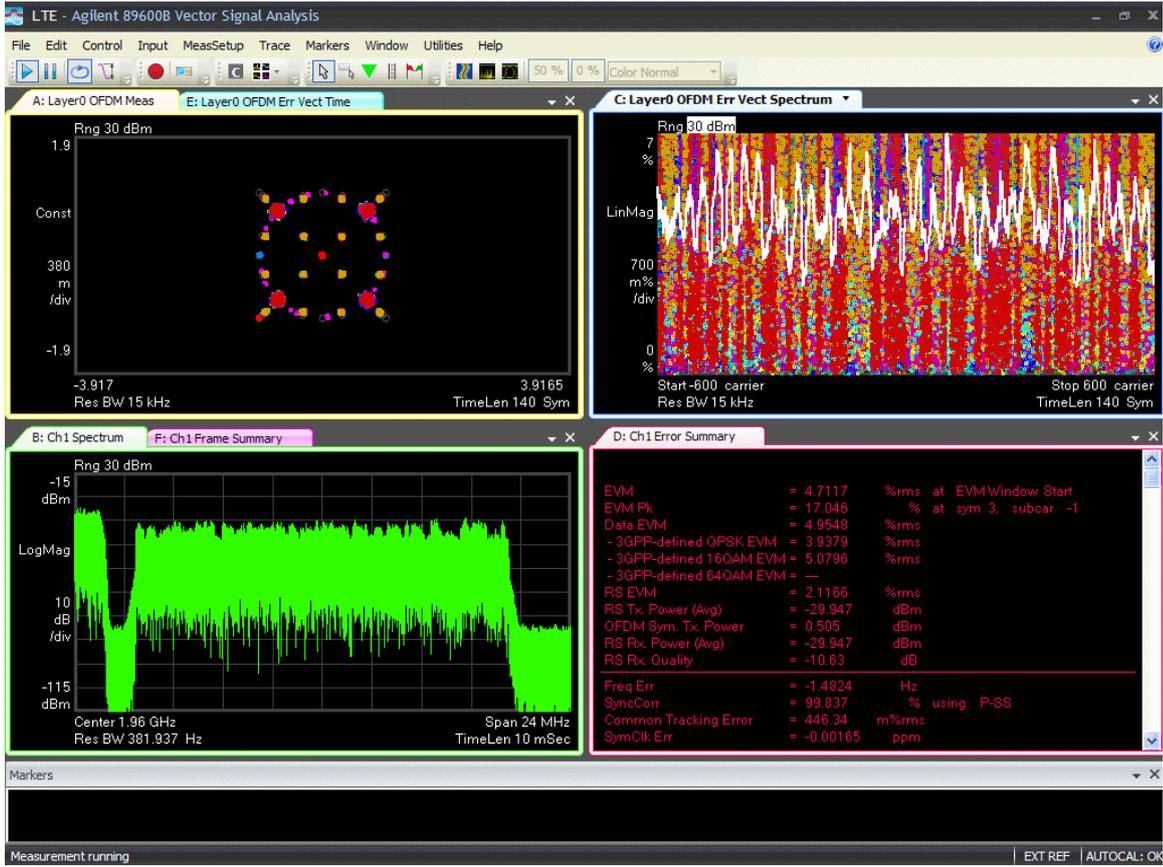
			E-TM3.1	2.4067
			E-TM 3.2	3.0061
			E-TM 3.3	4.0505
	1970	1980	E-TM2	1.1611
			E-TM3.1	2.4125
			E-TM 3.2	3.0593
			E-TM 3.3	4.1161

RF 1950M:  
LTE 20M-Port 1-1960MHz-E-TM2

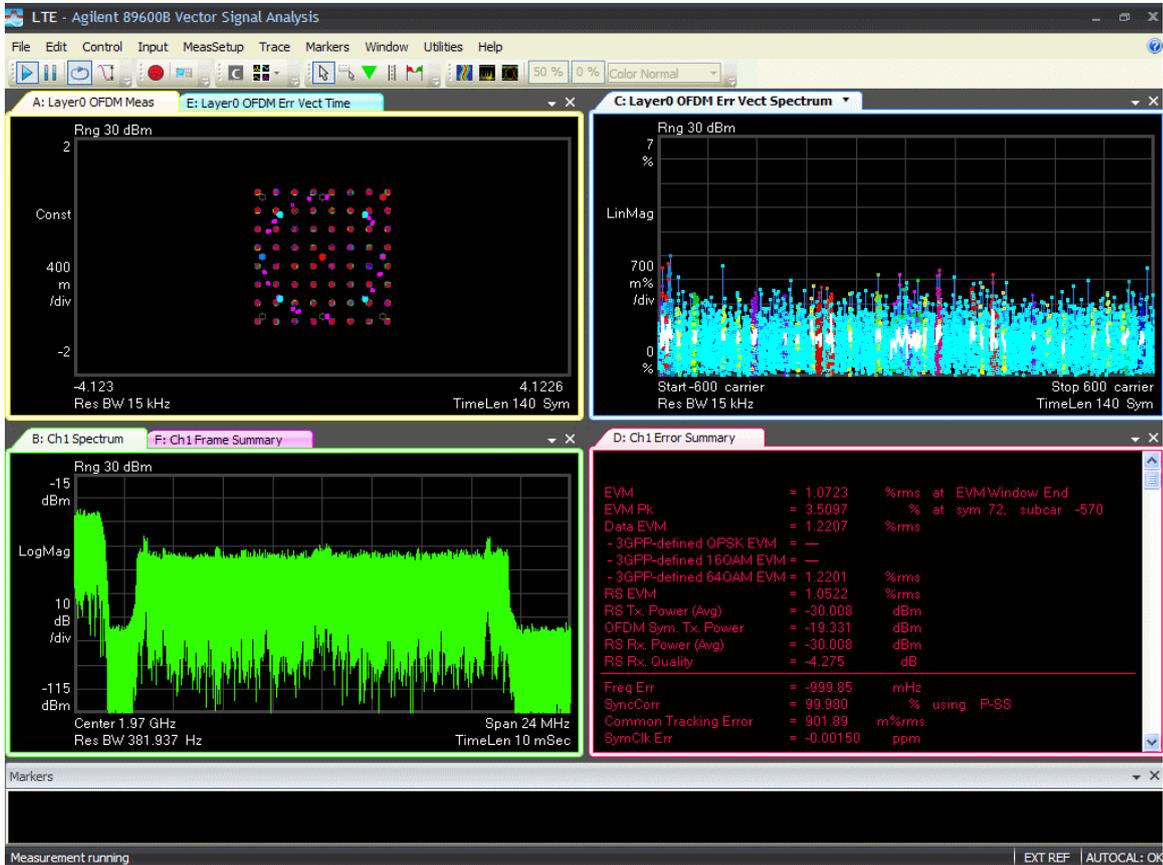


LTE 20M--Port 1-1960MHz-E-TM3.1

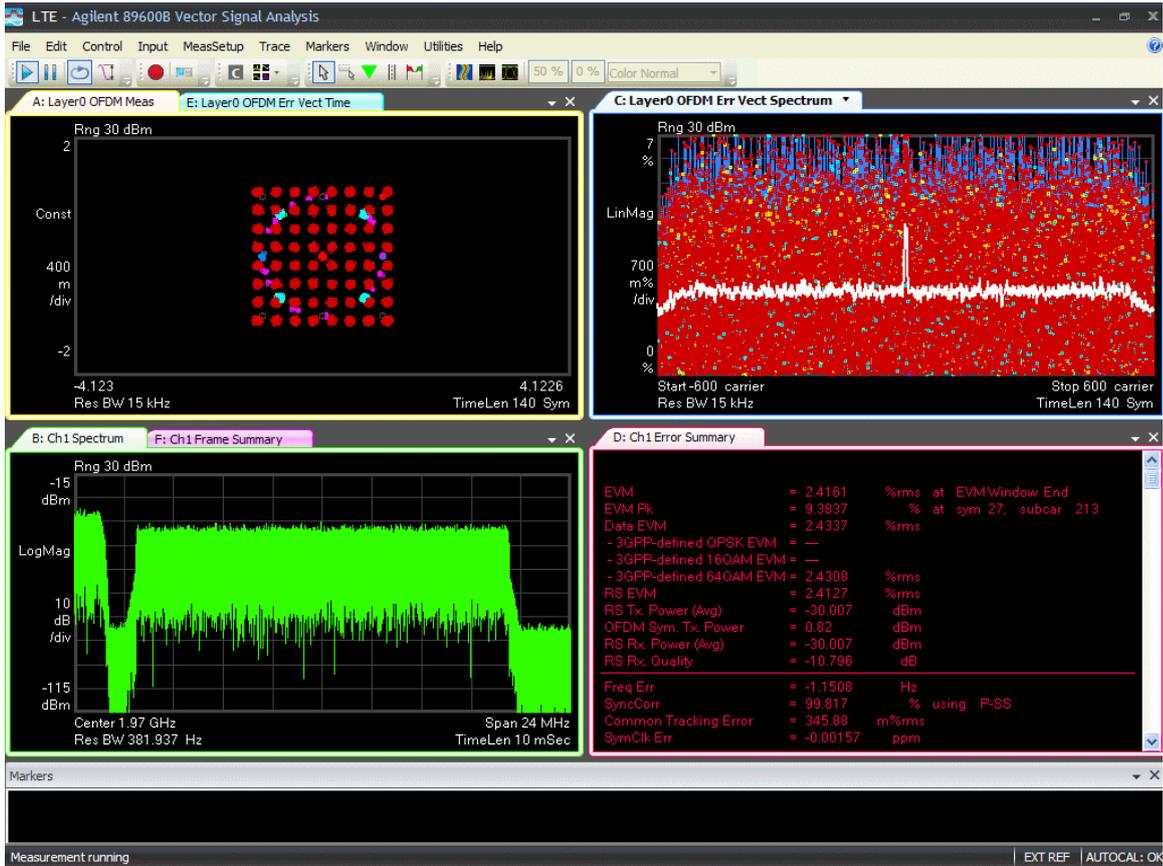




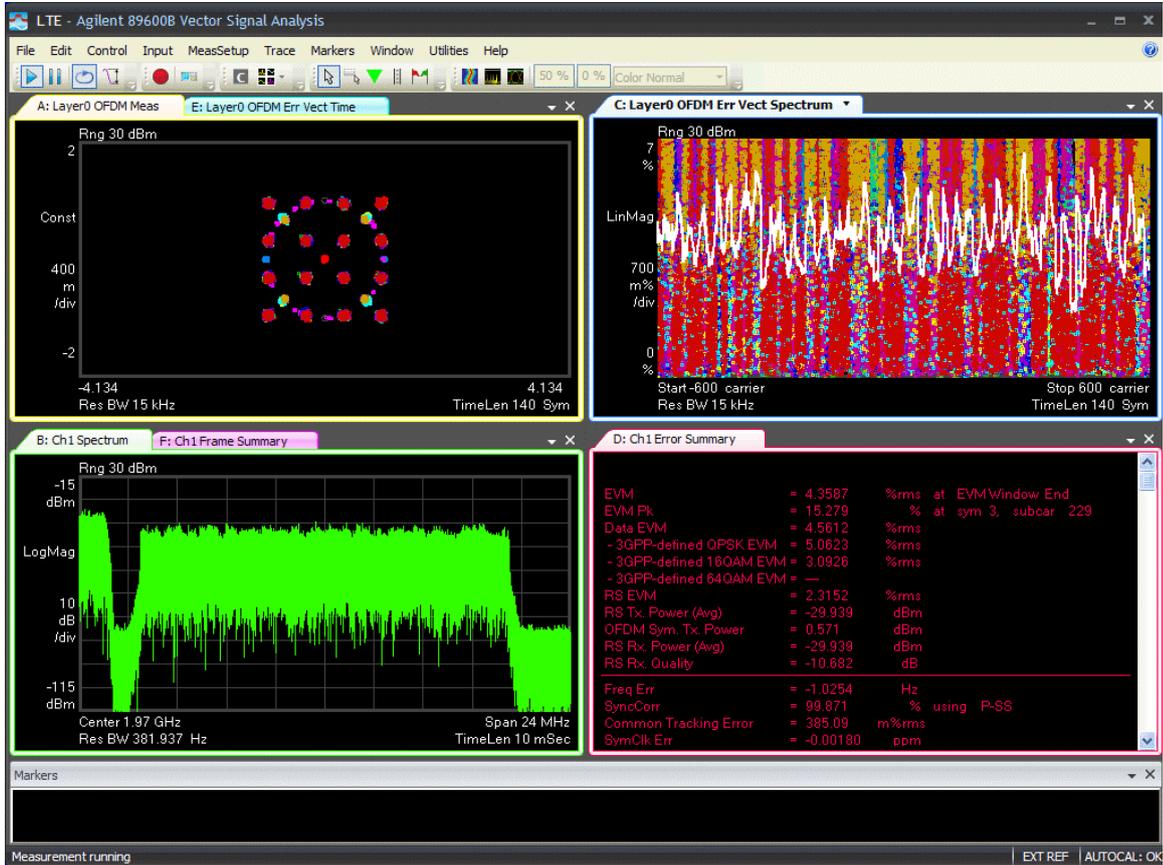
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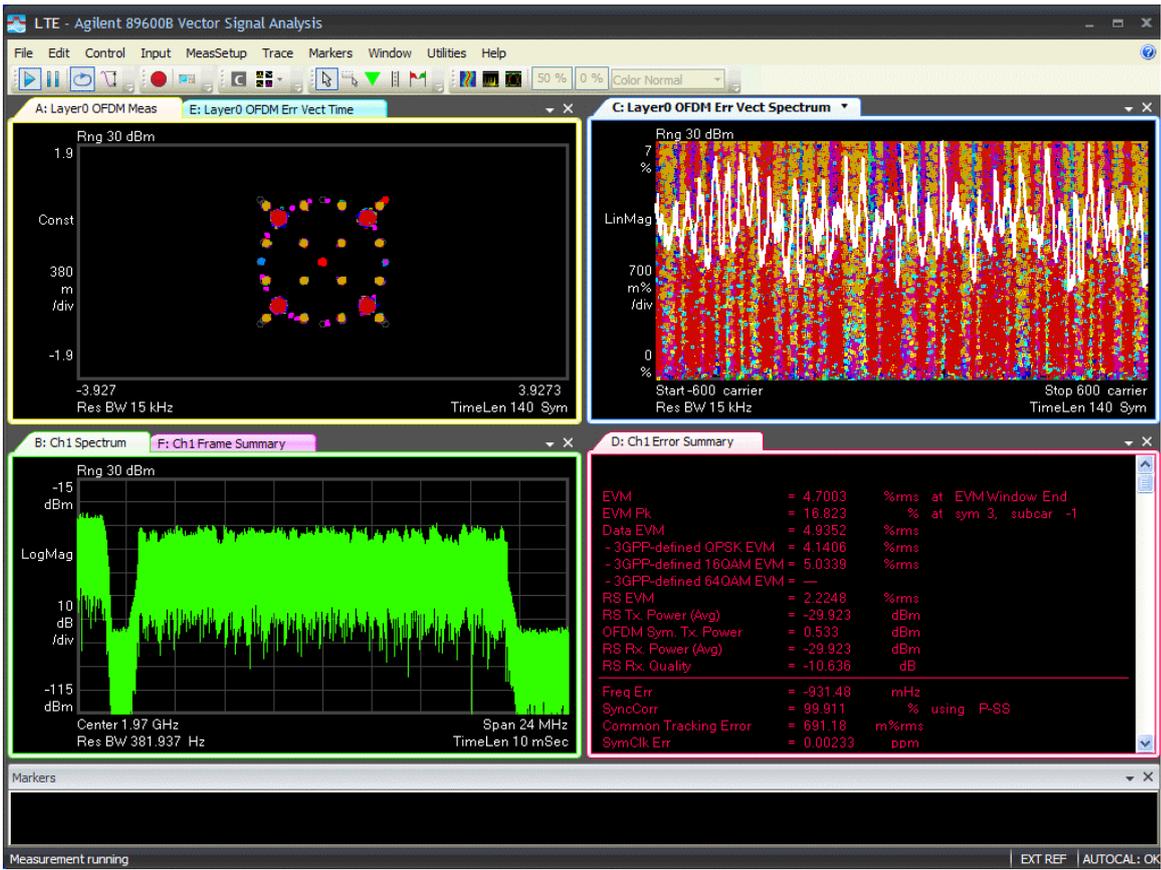
### LTE 20M-Port 1-1970MHz- E-TM3.1



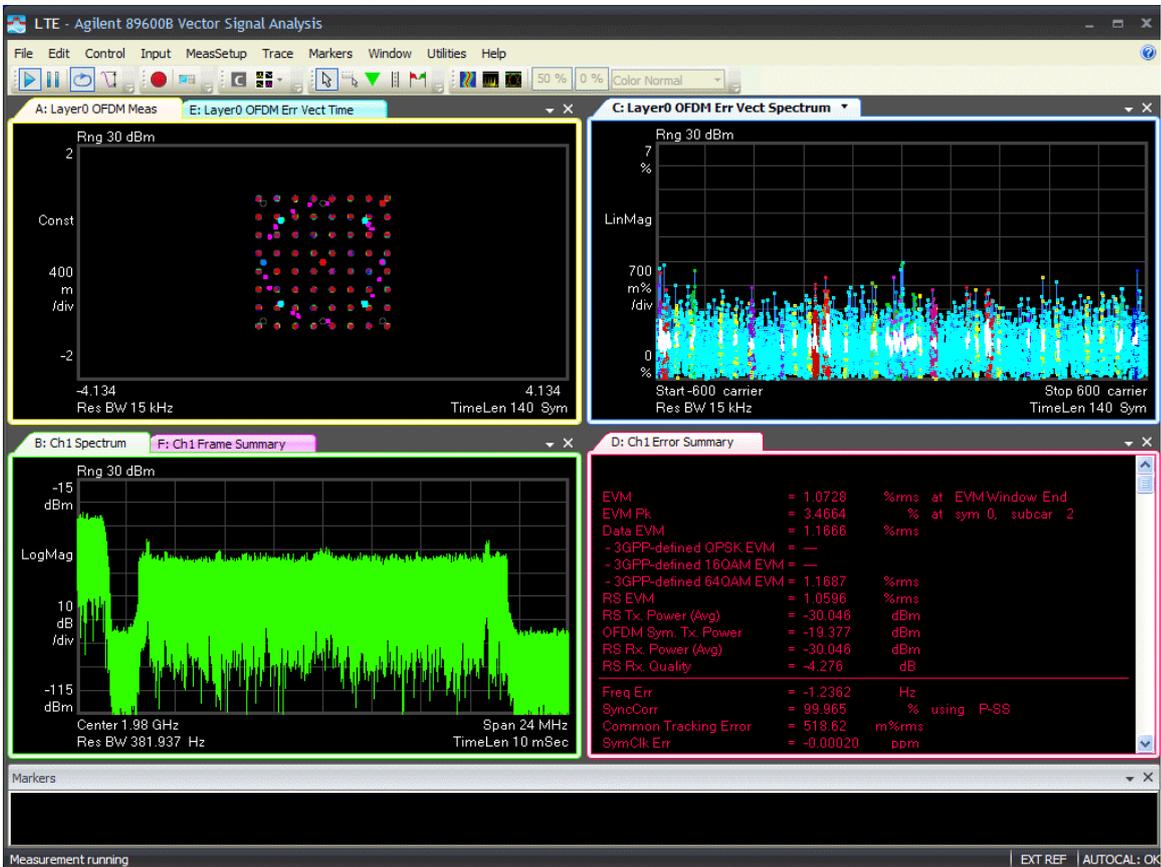
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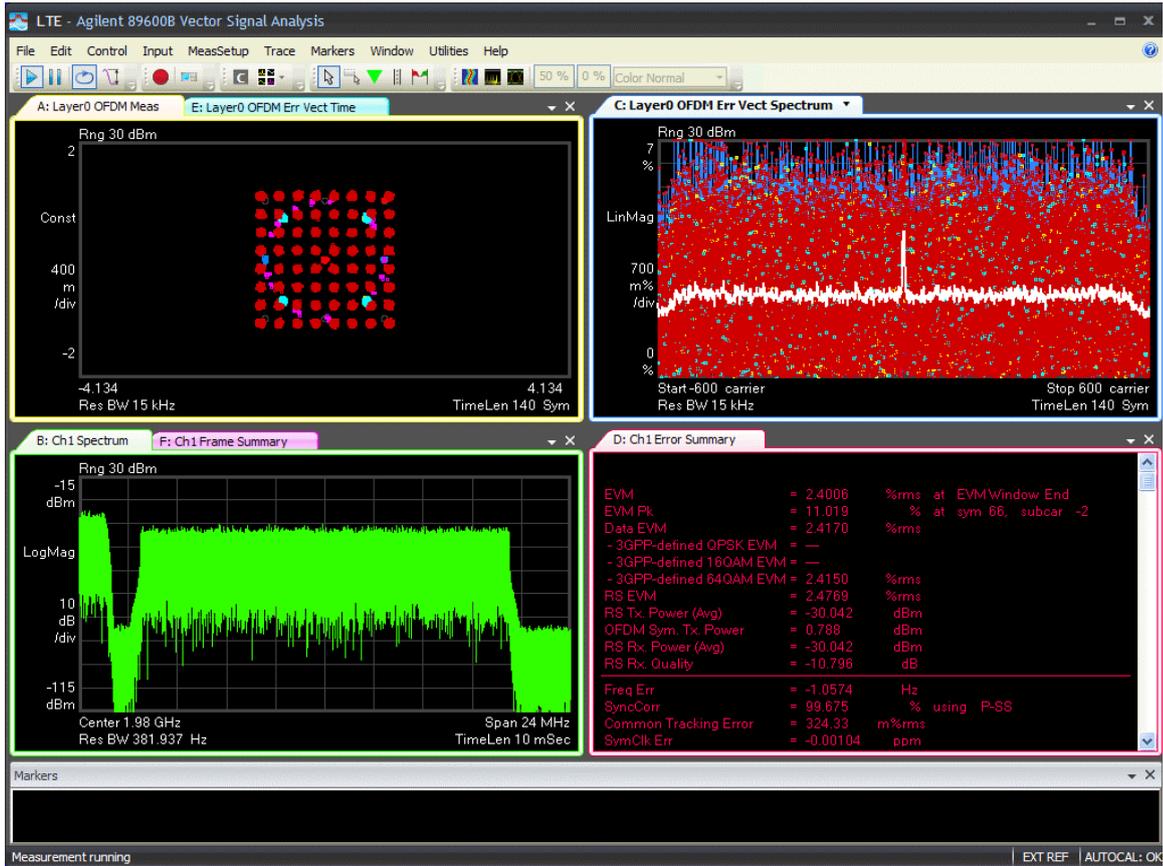
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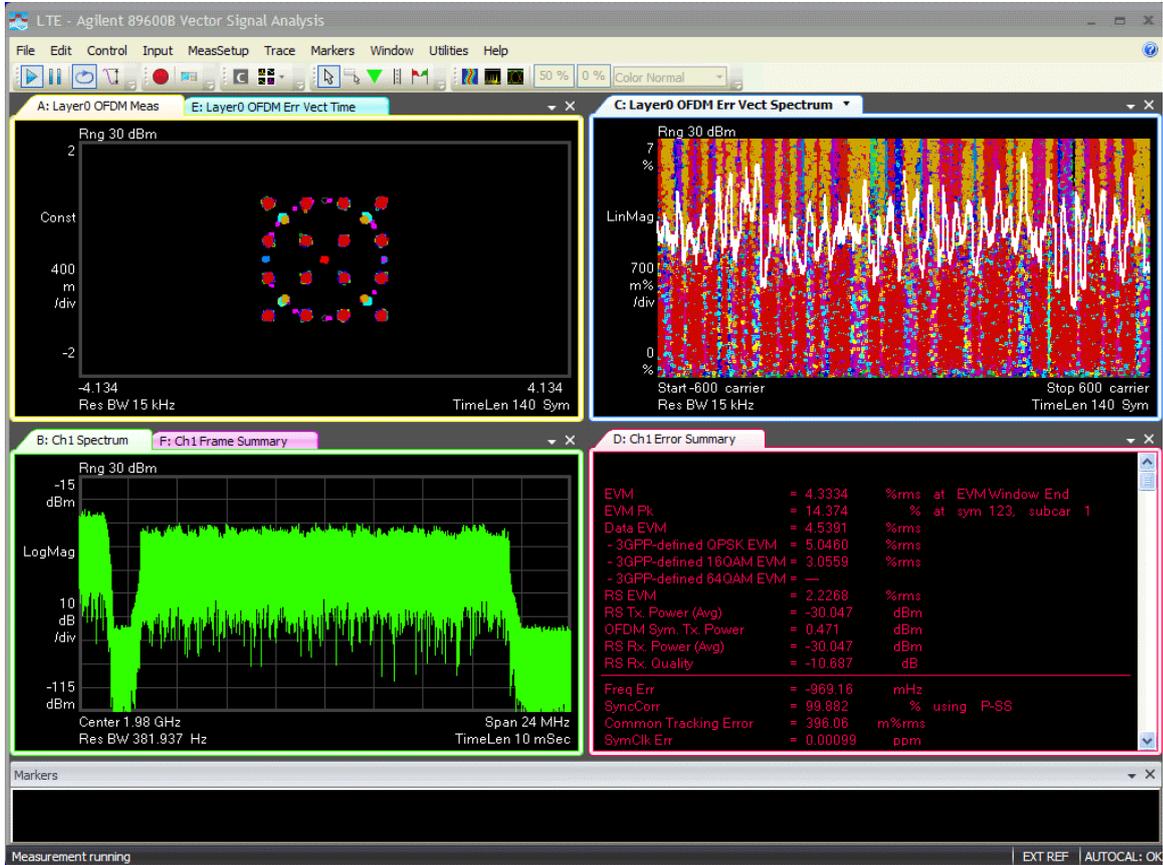
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LTE 20M-Port 1-1980MHz- E-TM2**



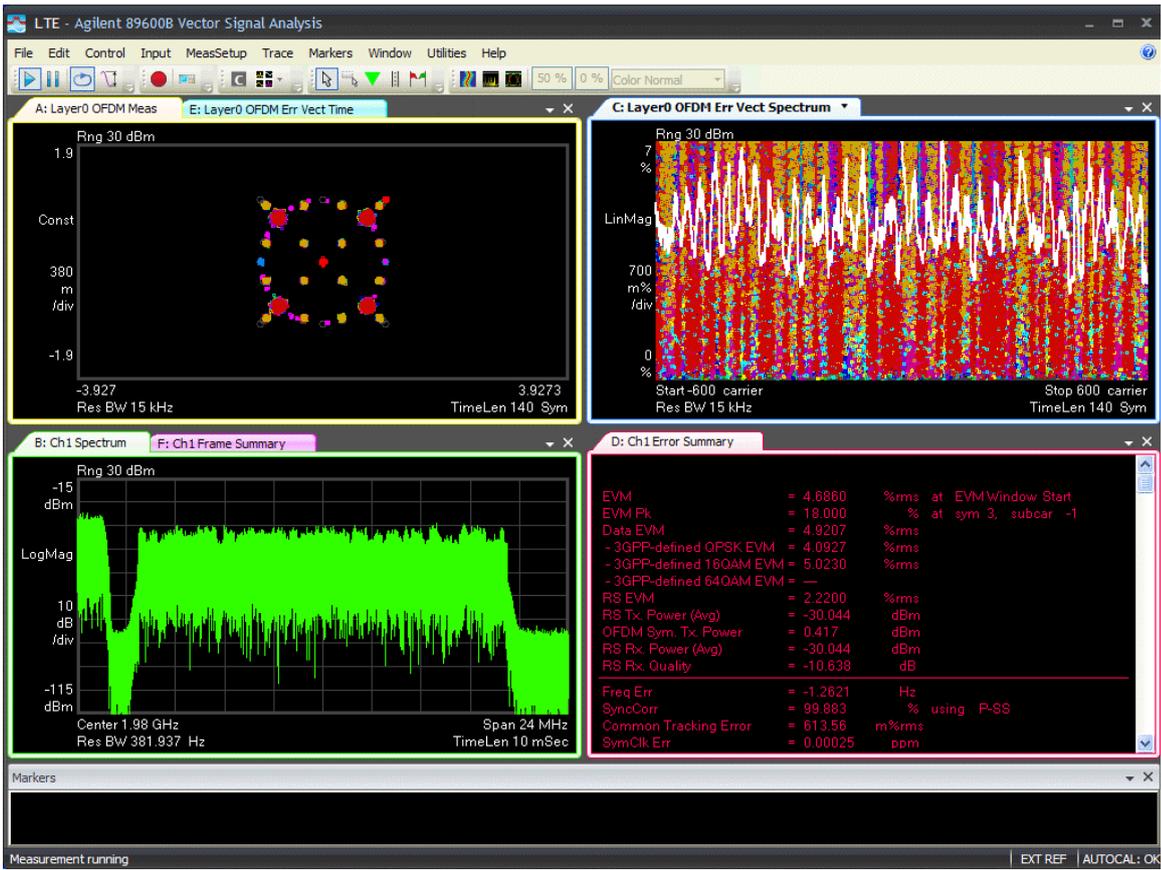
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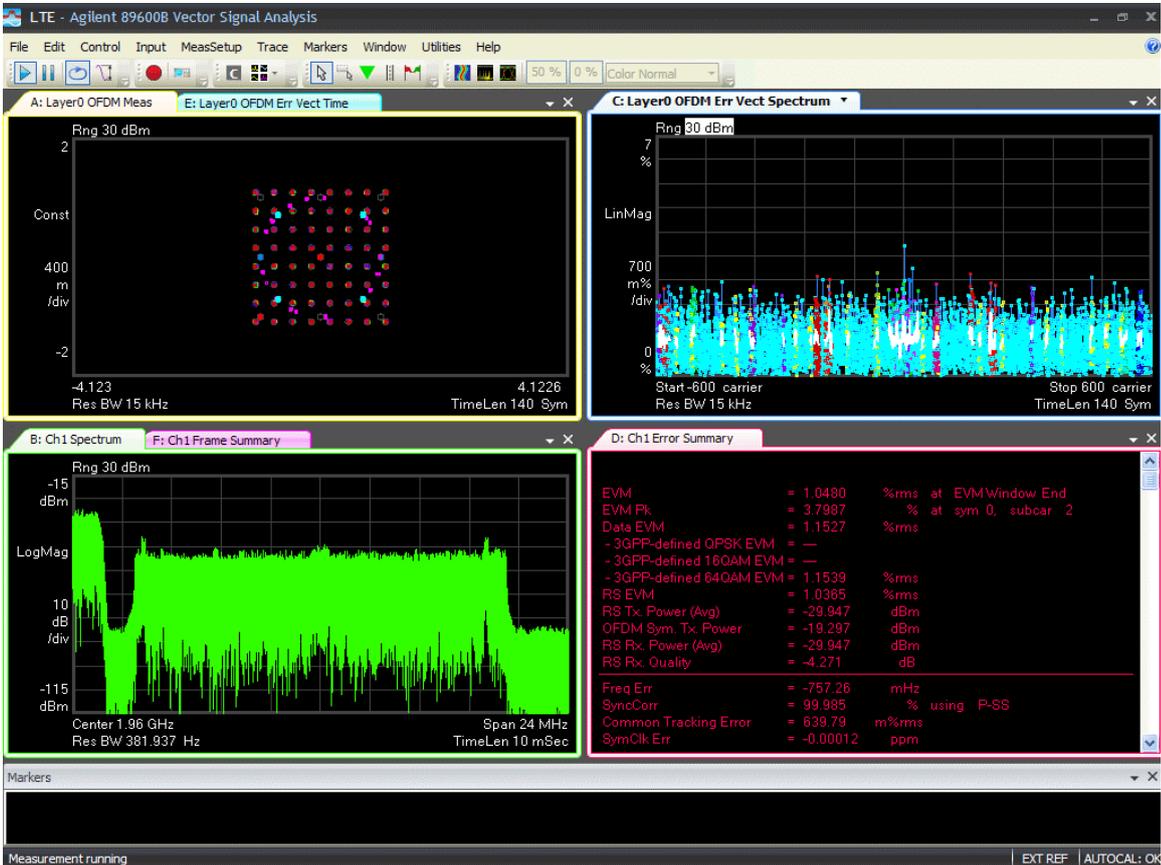
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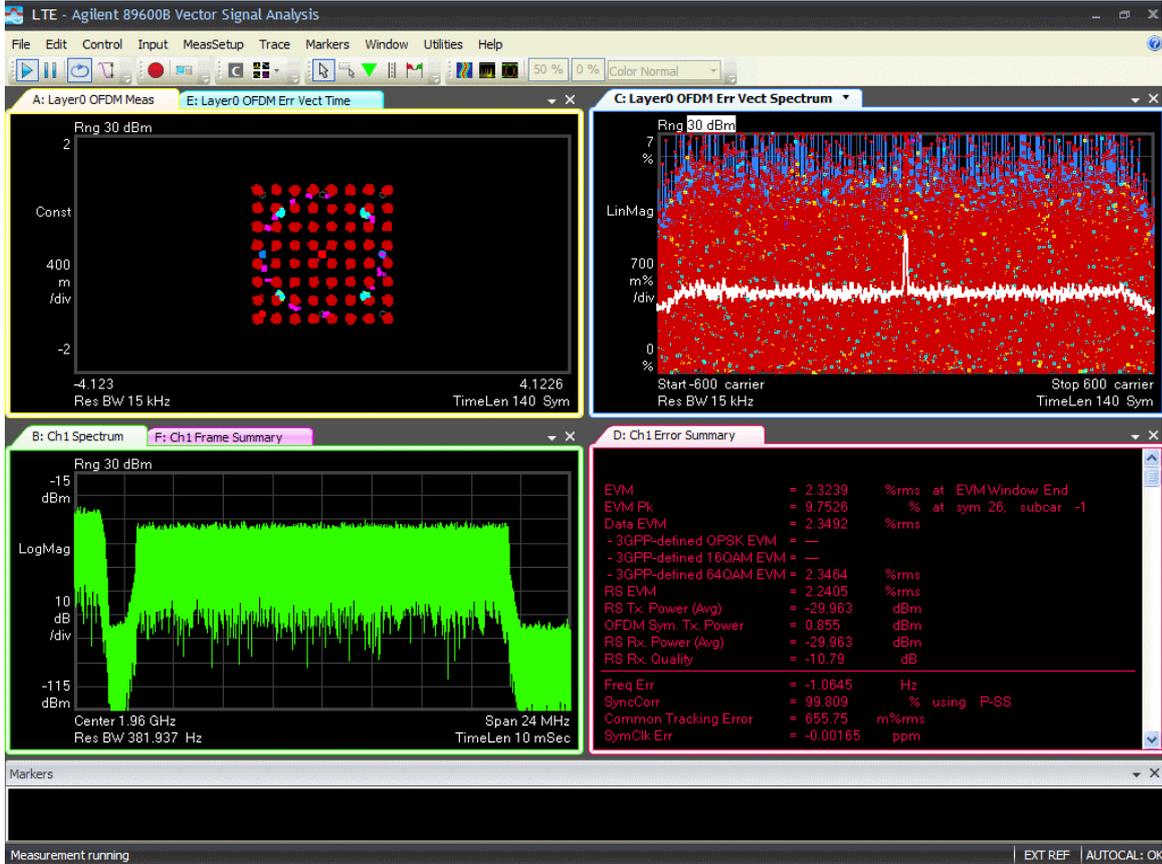
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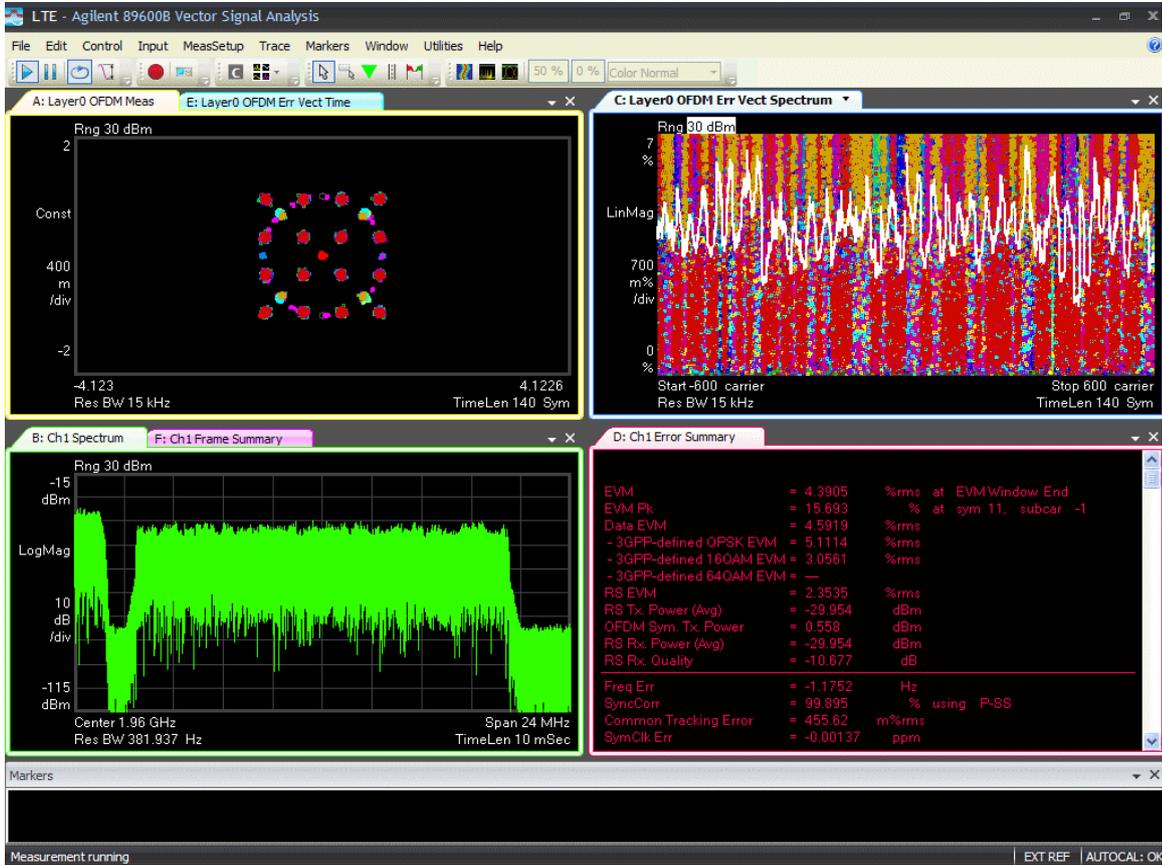
**RF 1950M:  
LTE 20M-Port 4-1960MHz- E-TM2**



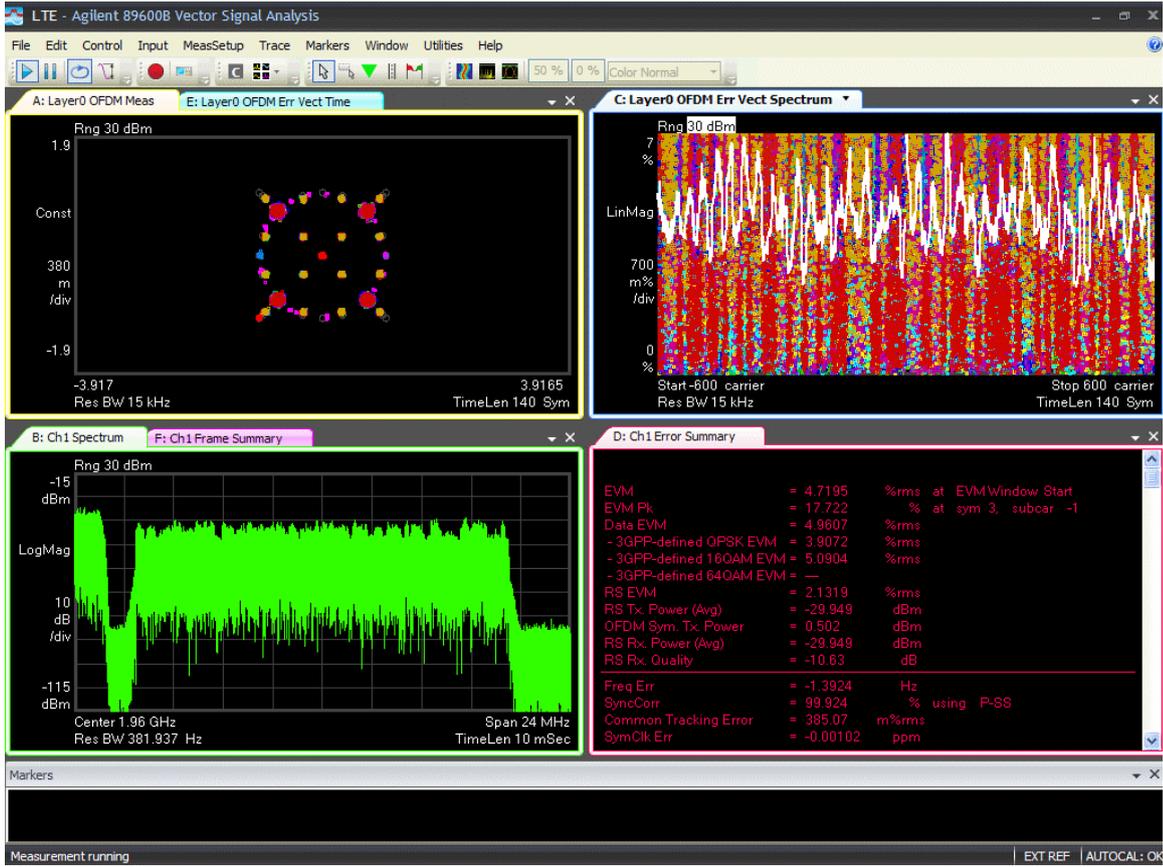
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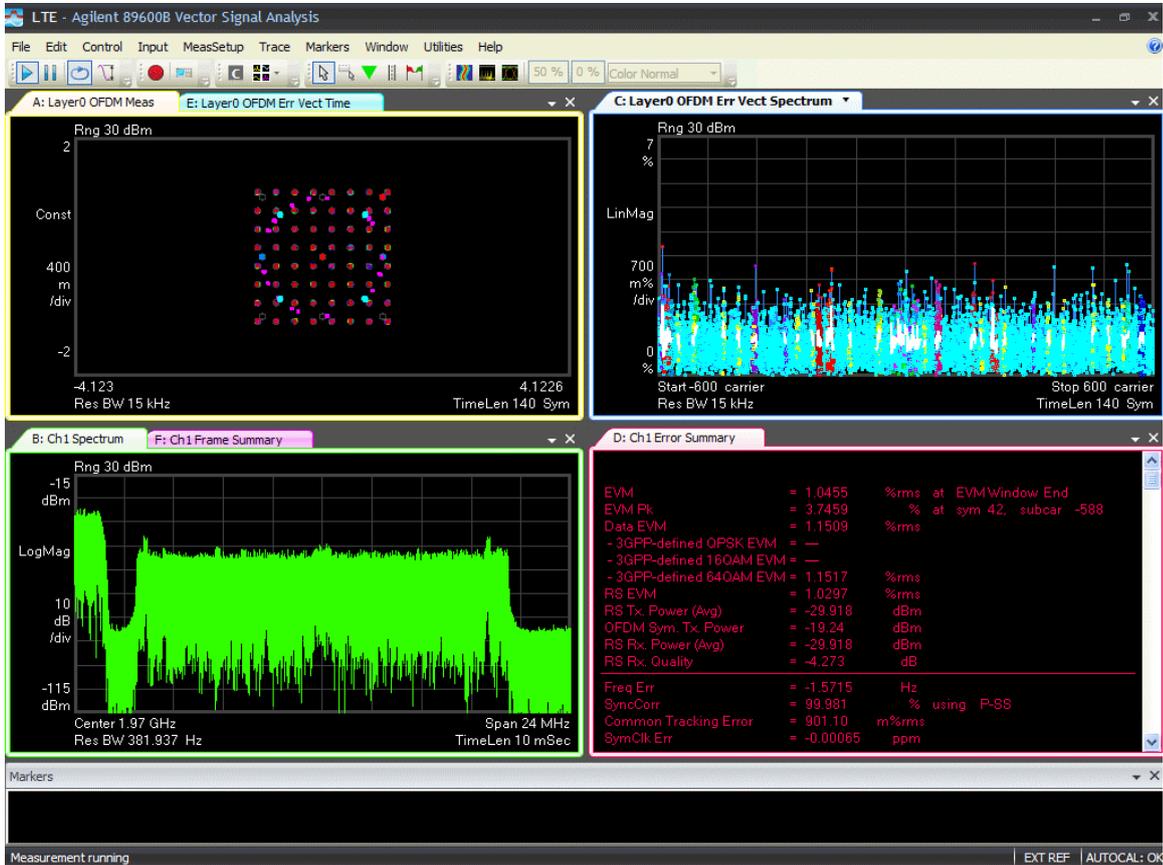
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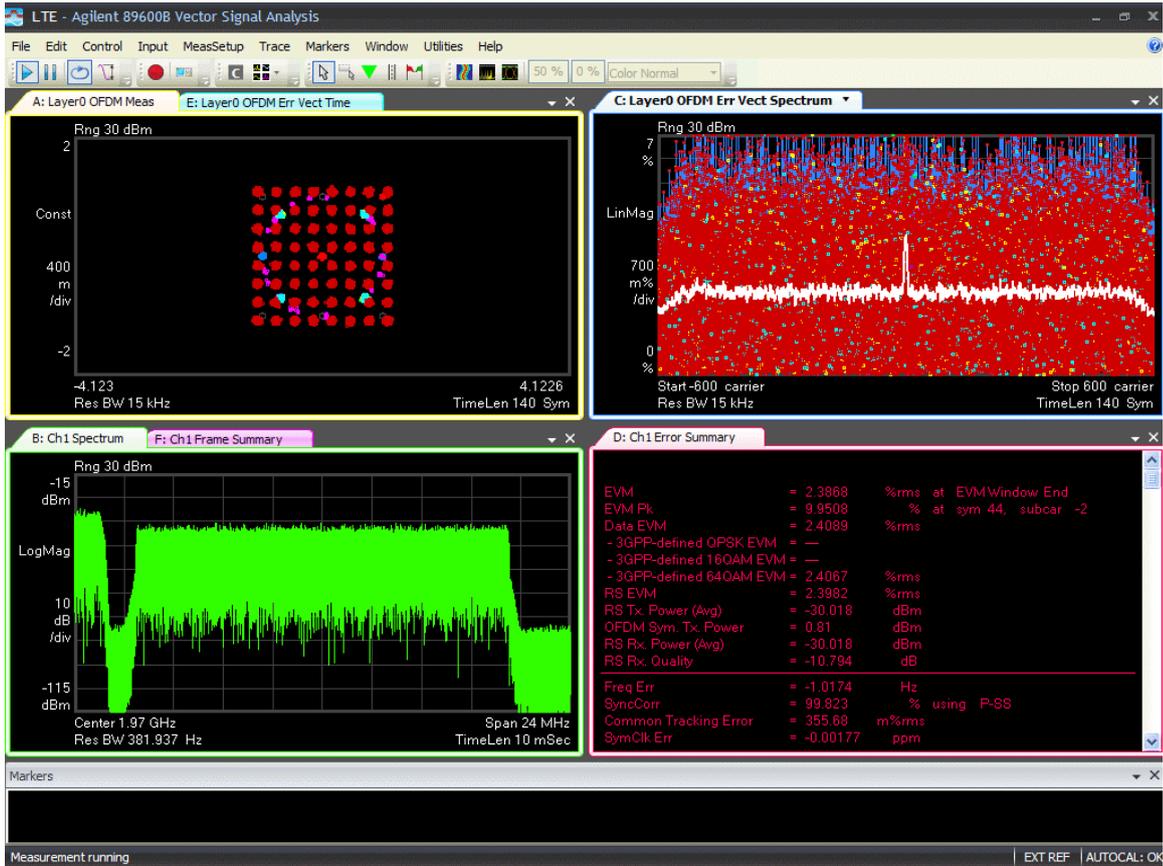
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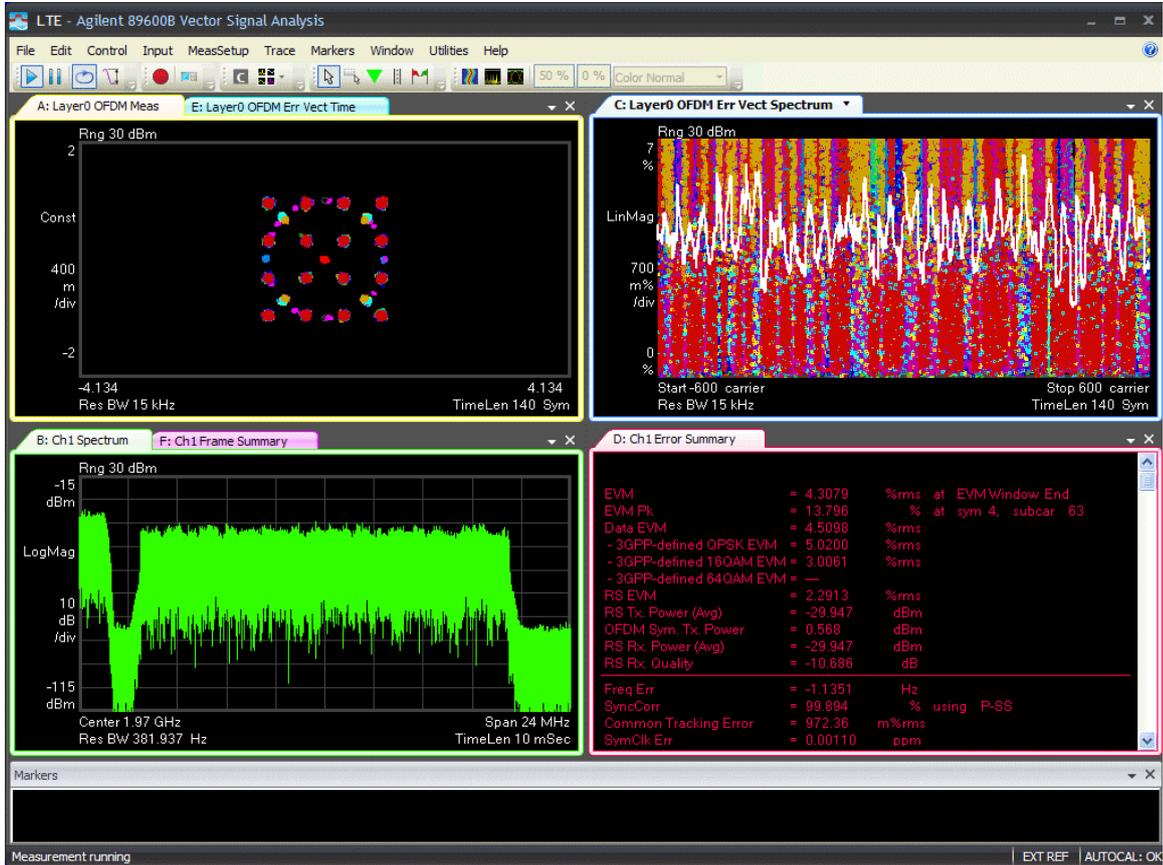
**RF 1960M:  
 LTE 20M-Port 4-1970MHz- E-TM2**



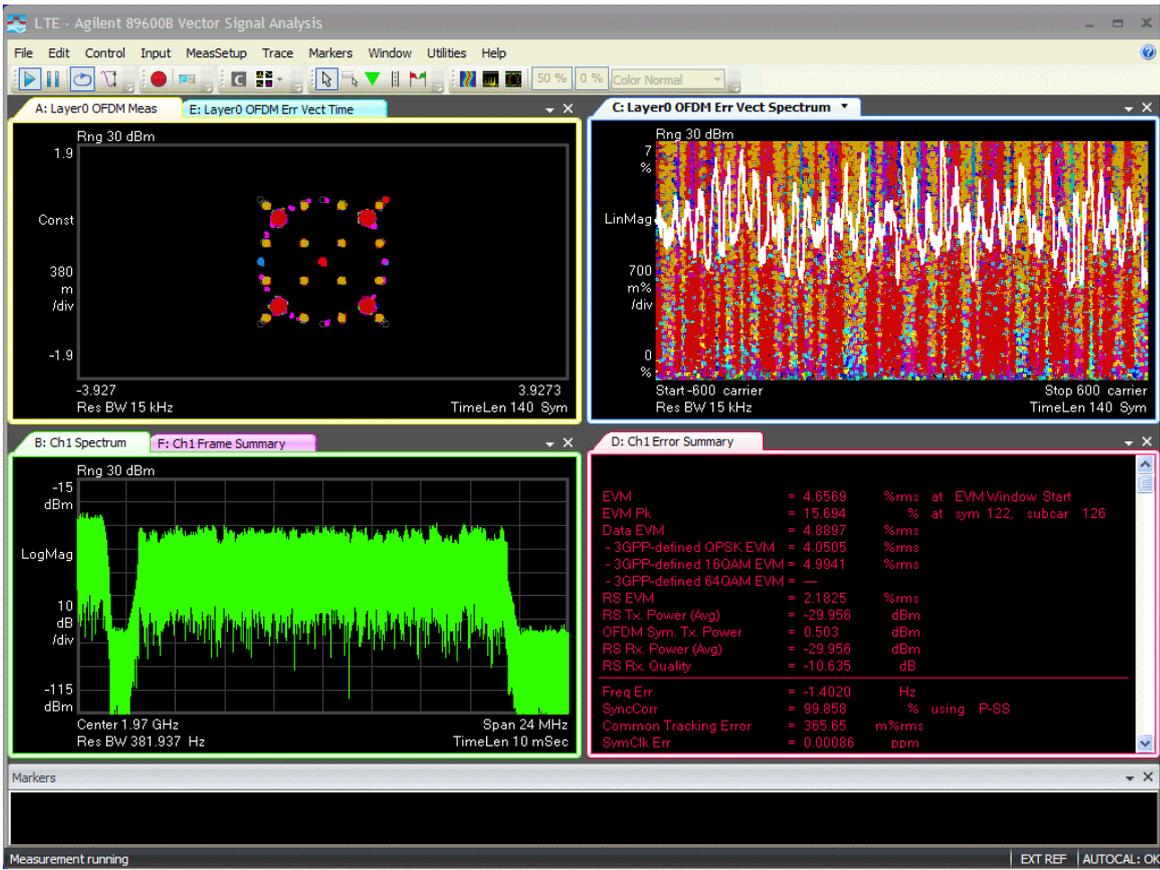
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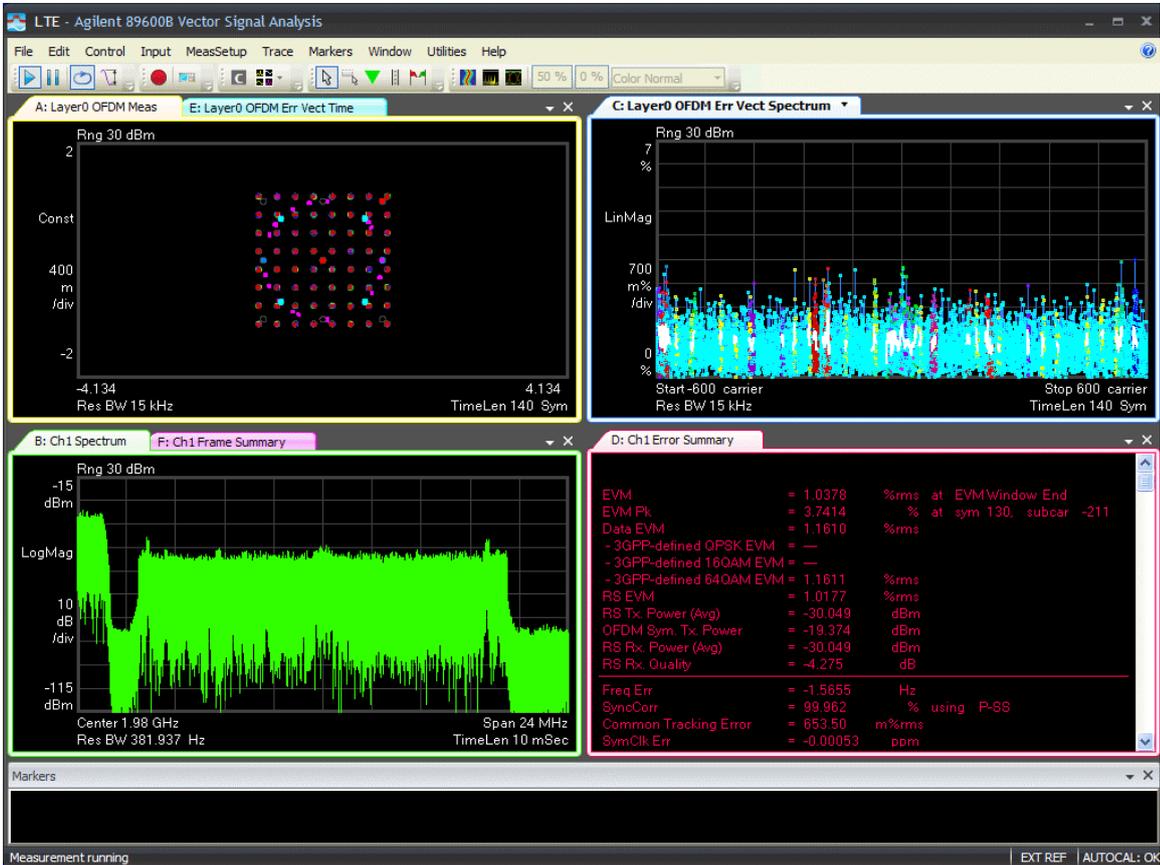
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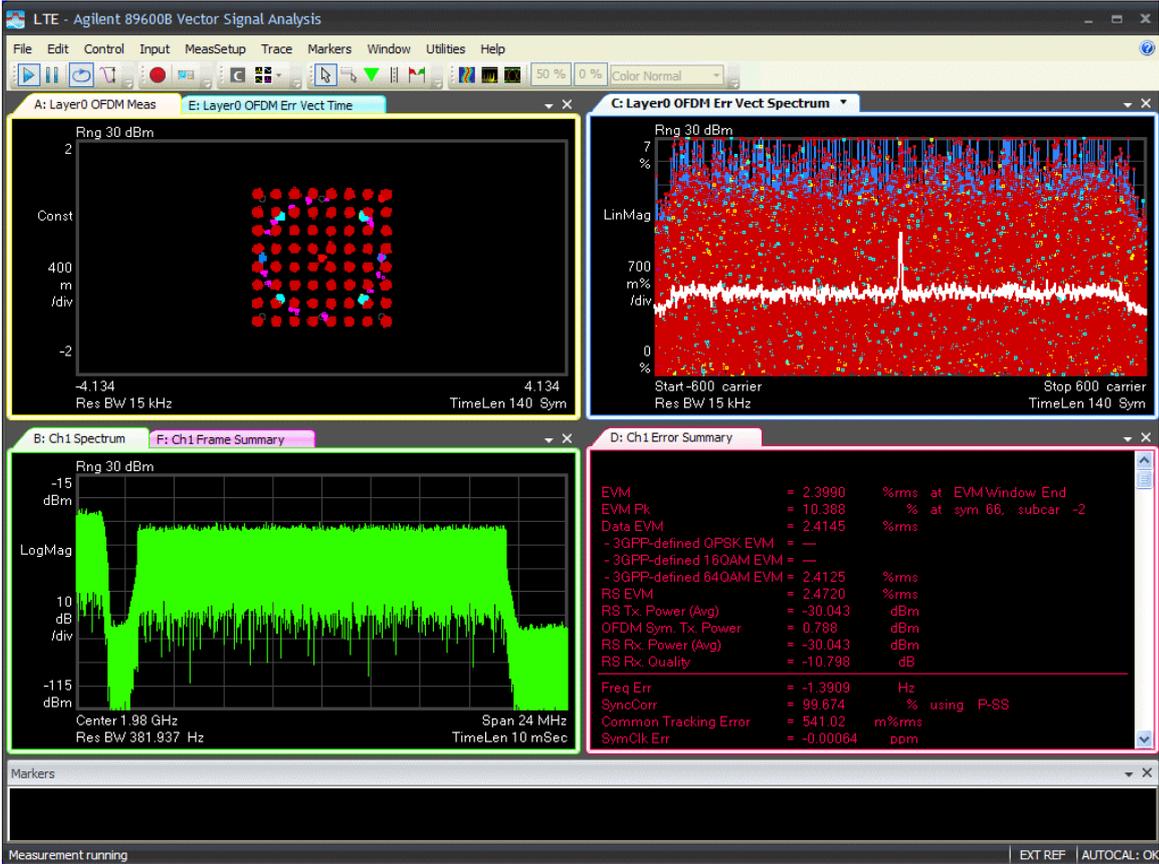
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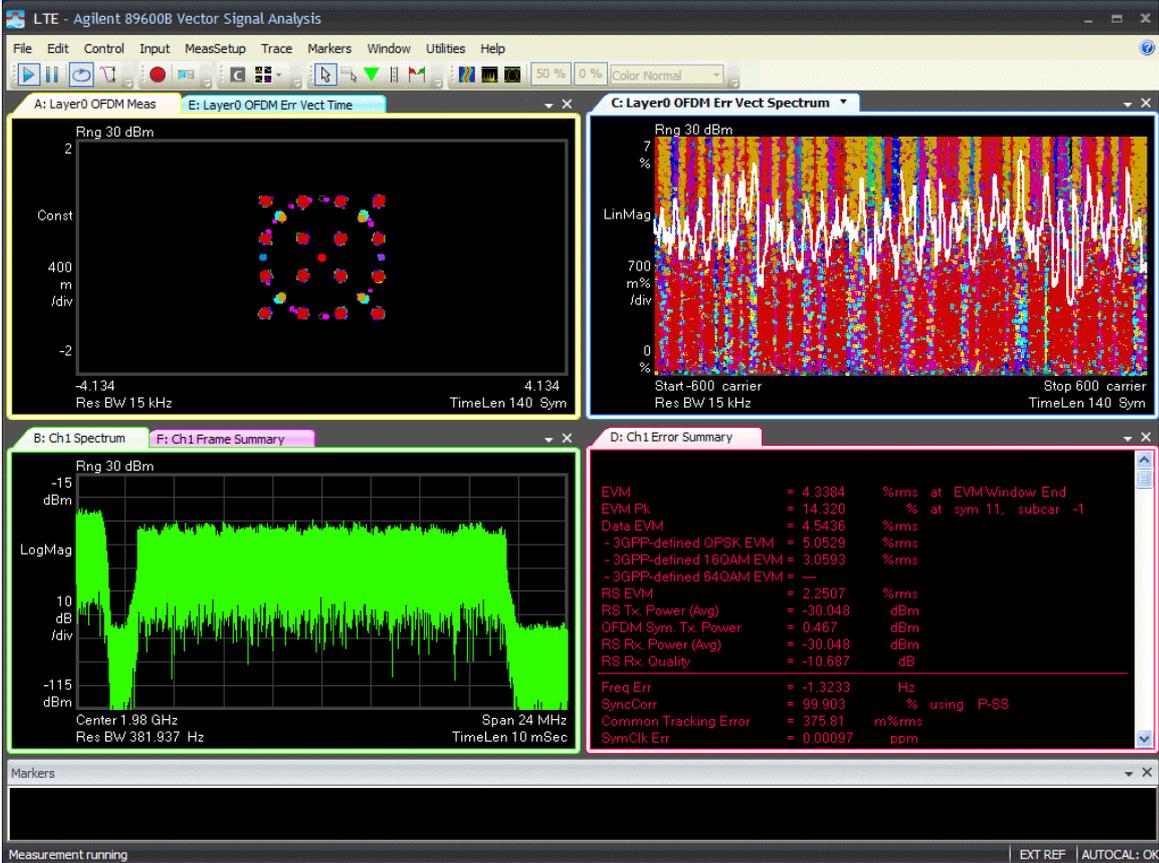
**RF 1970M:**  
**LTE 20M-Port 4-1980MHz- E-TM2**



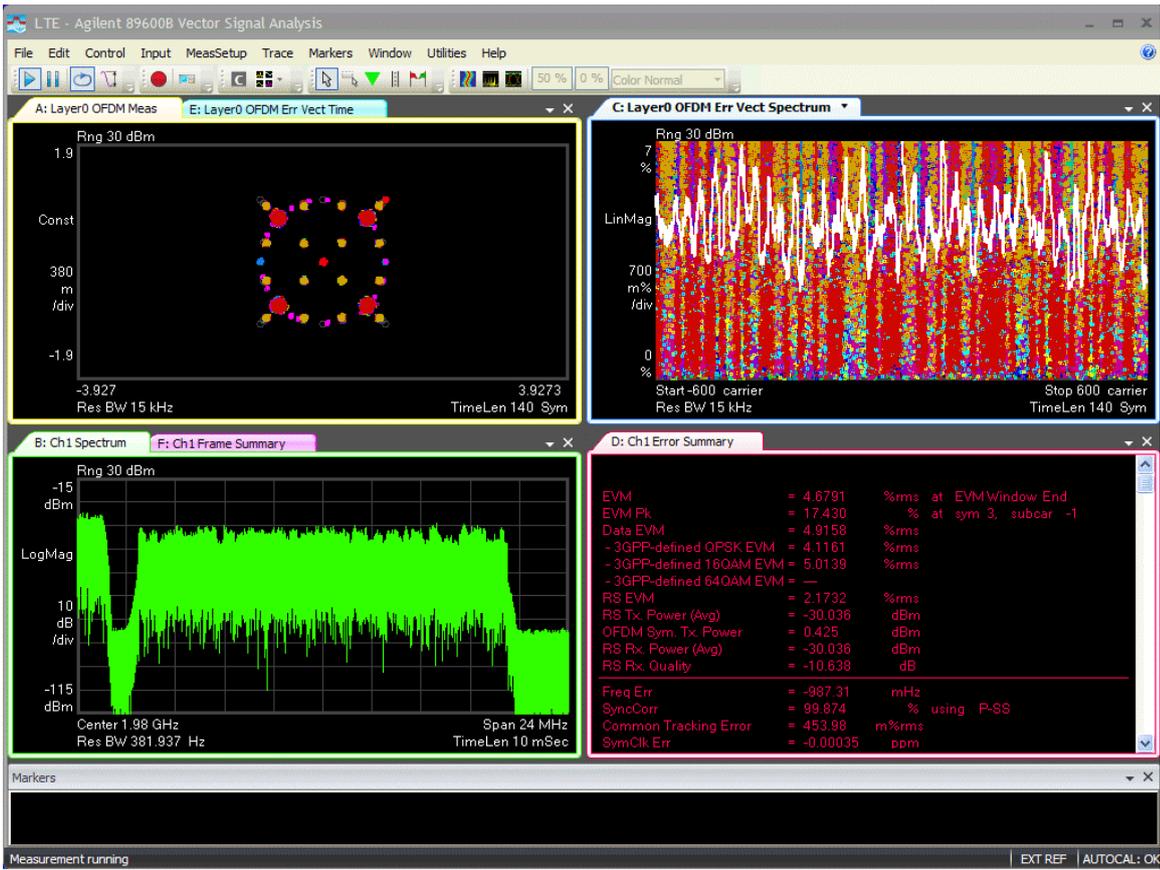
### LTE 20M-Port 4-1980MHz- E-TM3.1



### LTE 20M-Port 4-1980MHz- E-TM3.2

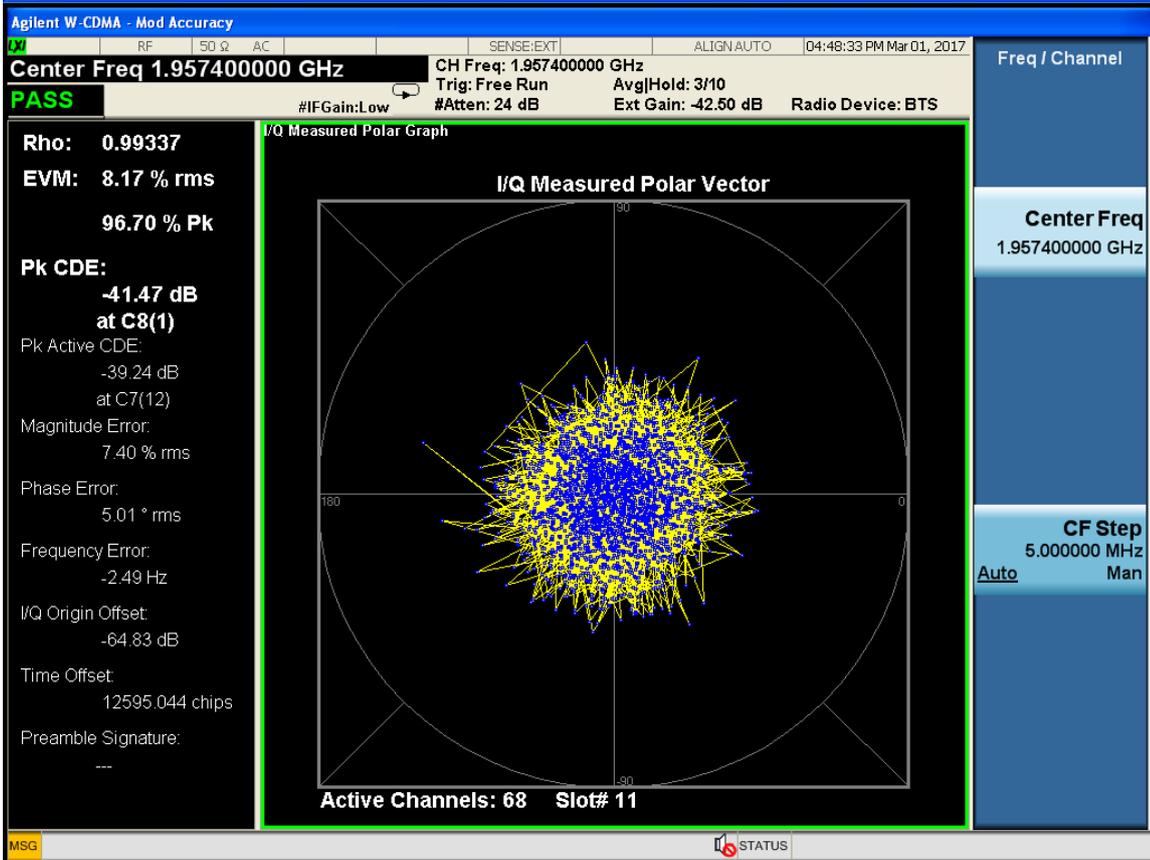
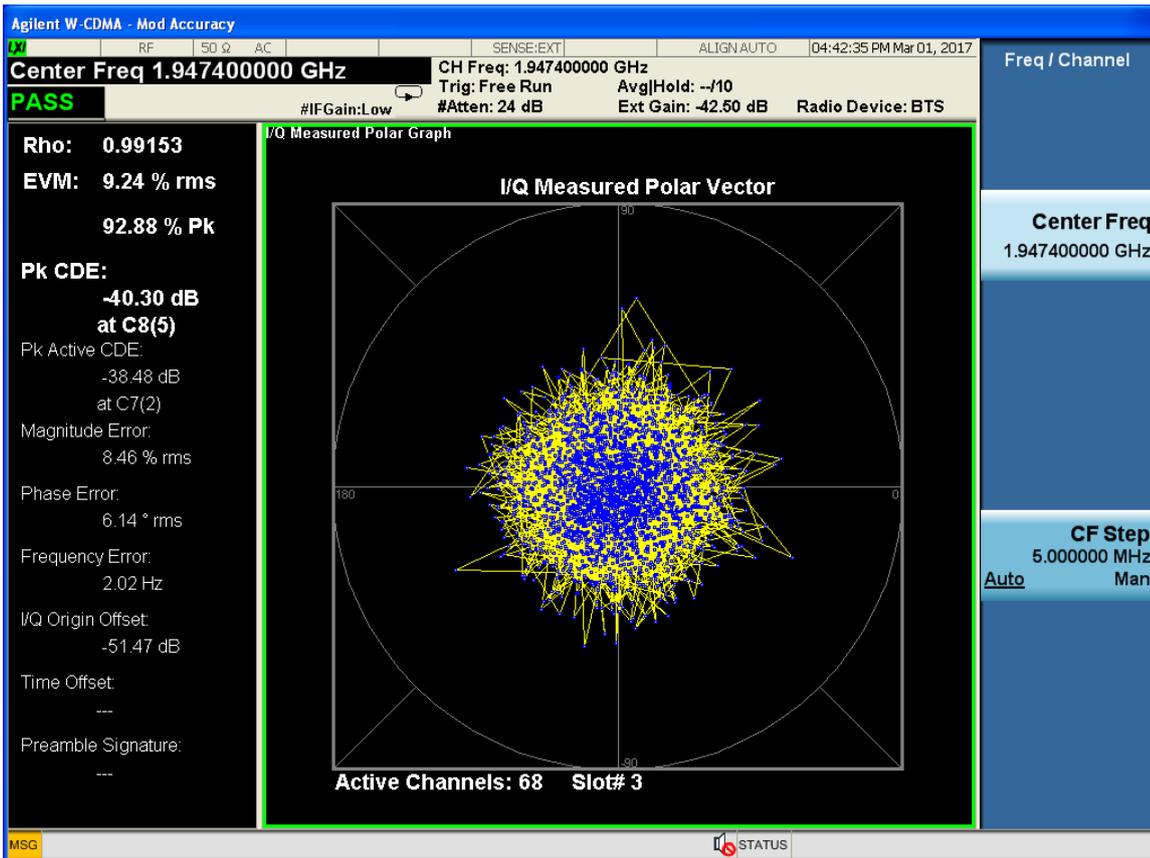


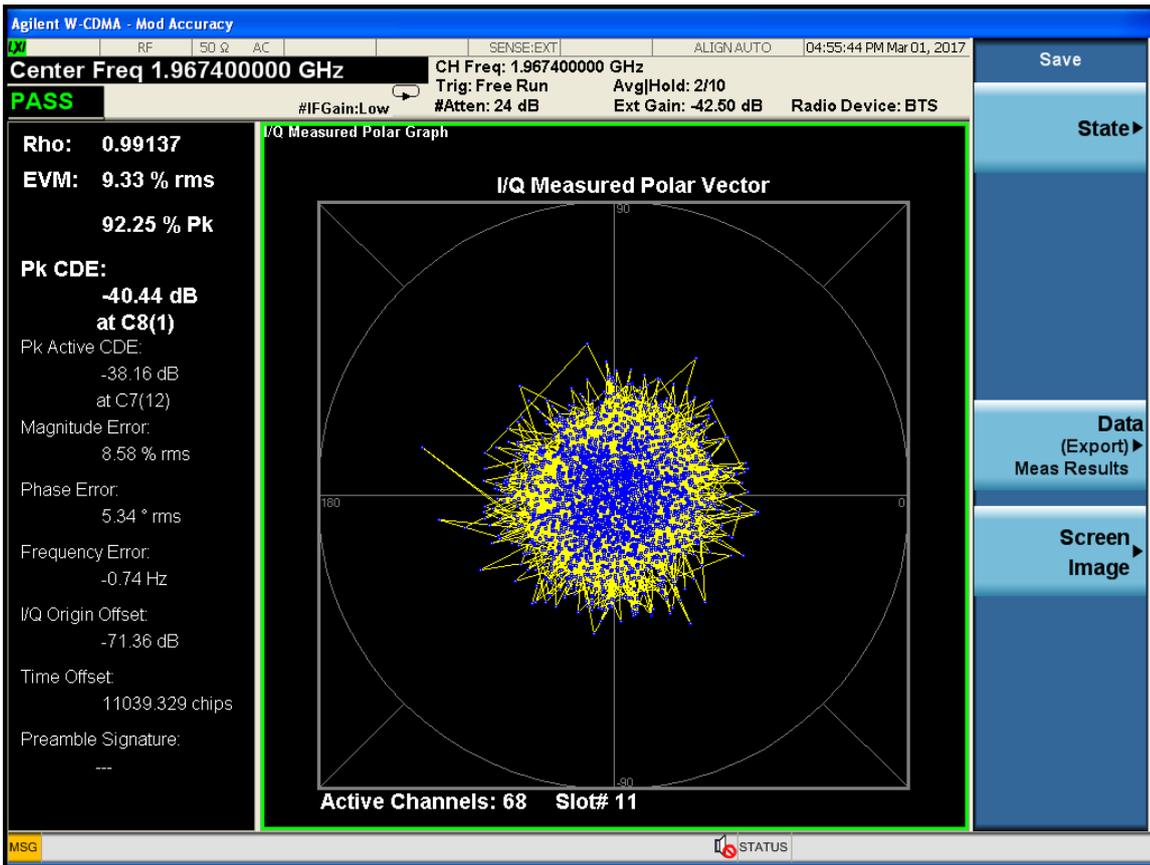
### LTE 20M-Port 4-1980MHz- E-TM3.3



**8.8 Test Data (UMTS) :**

Frequency (MHz)	EVM%
1947.4	9.24
1957.4	8.17
1967.4	9.33

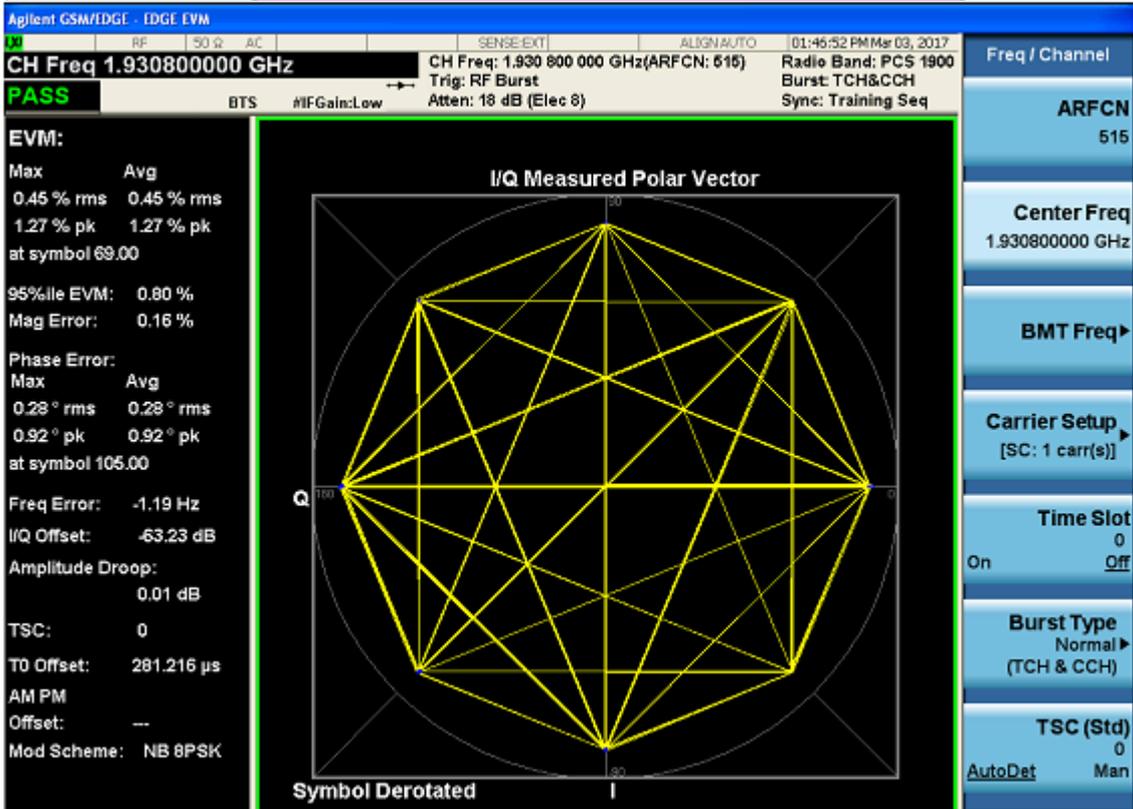
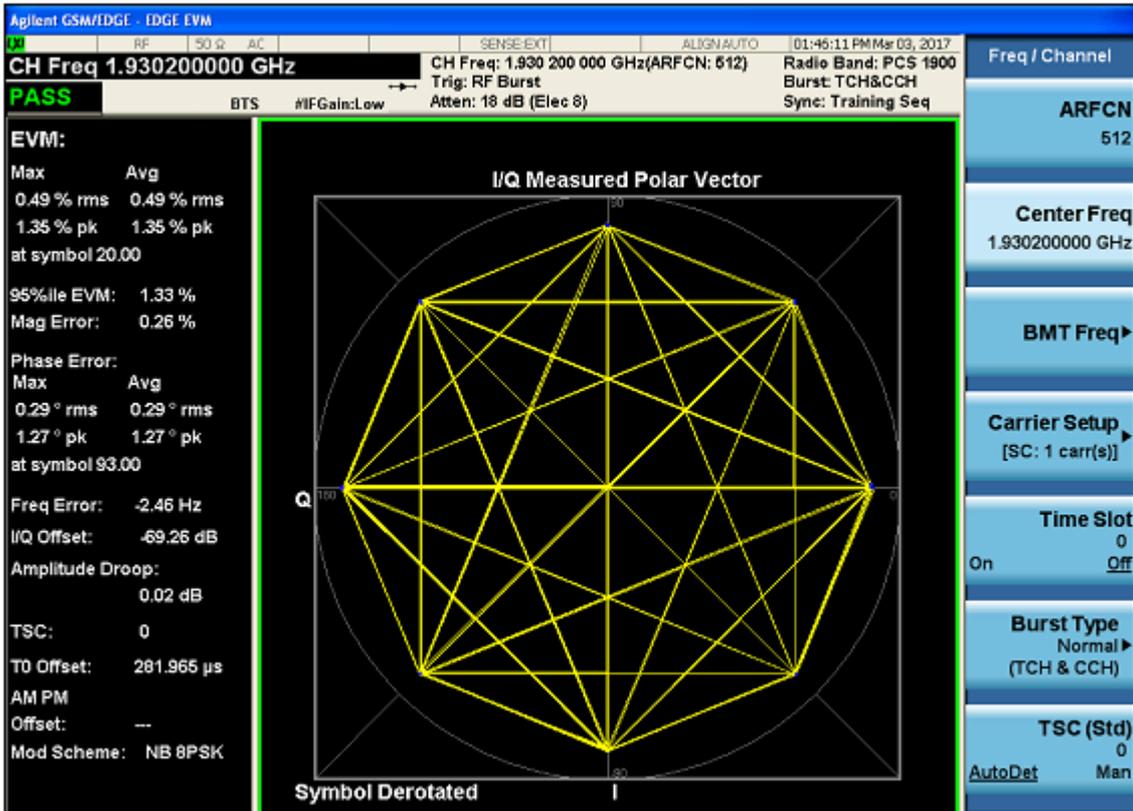




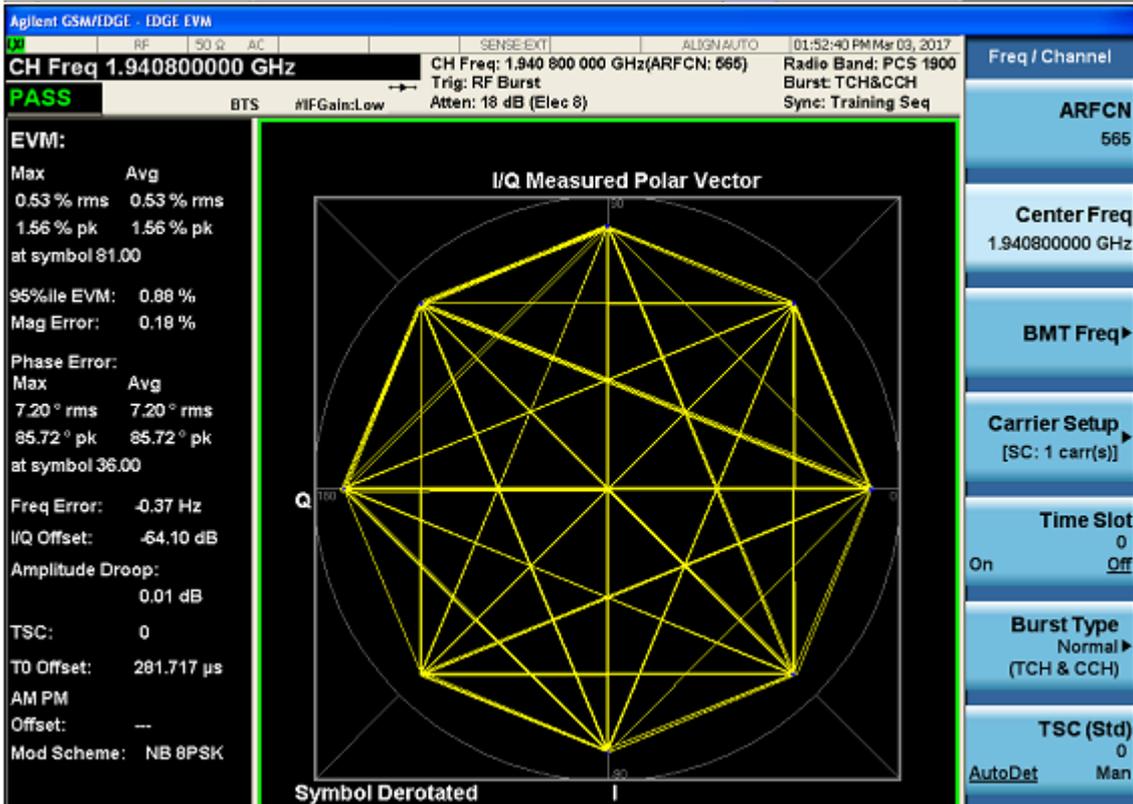
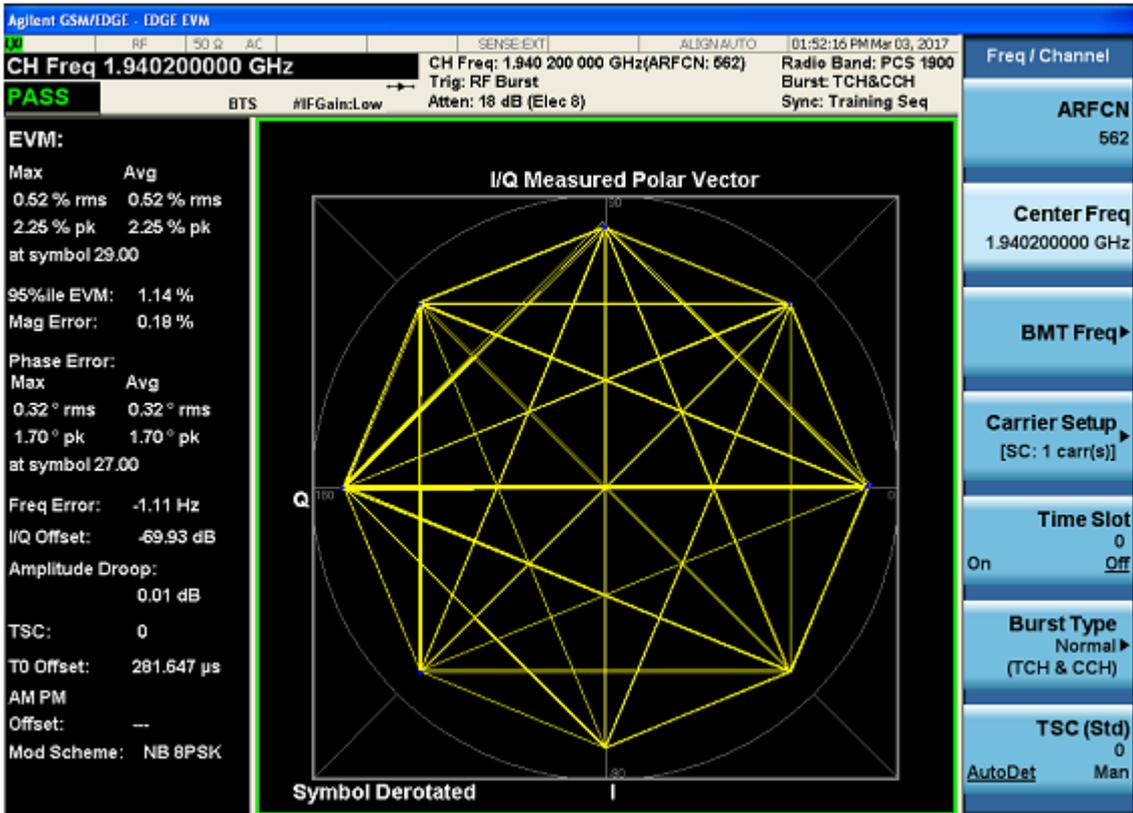
**8.9 Test Data (GSM) :**

Port	Frequency (MHz)	Test mode	EVM%	
1	B	8PSK	1930.2	0.49
			1930.8	0.45
	M	8PSK	1940.2	0.52
			1940.8	0.53
	T	8PSK	1950.2	0.50
			1950.8	0.46
4	B	8PSK	1930.2	0.52
			1930.8	0.49
	M	8PSK	1940.2	0.44
			1940.8	0.44
	T	8PSK	1950.2	0.49
			1950.8	0.48

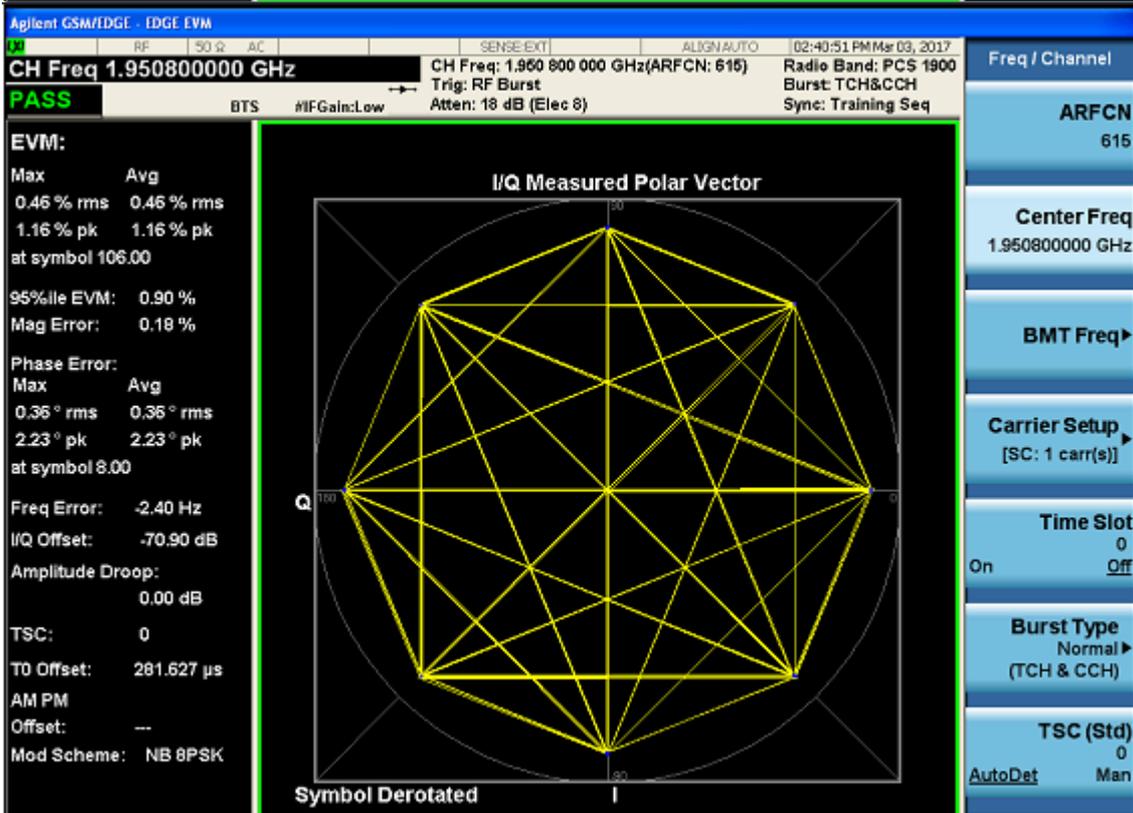
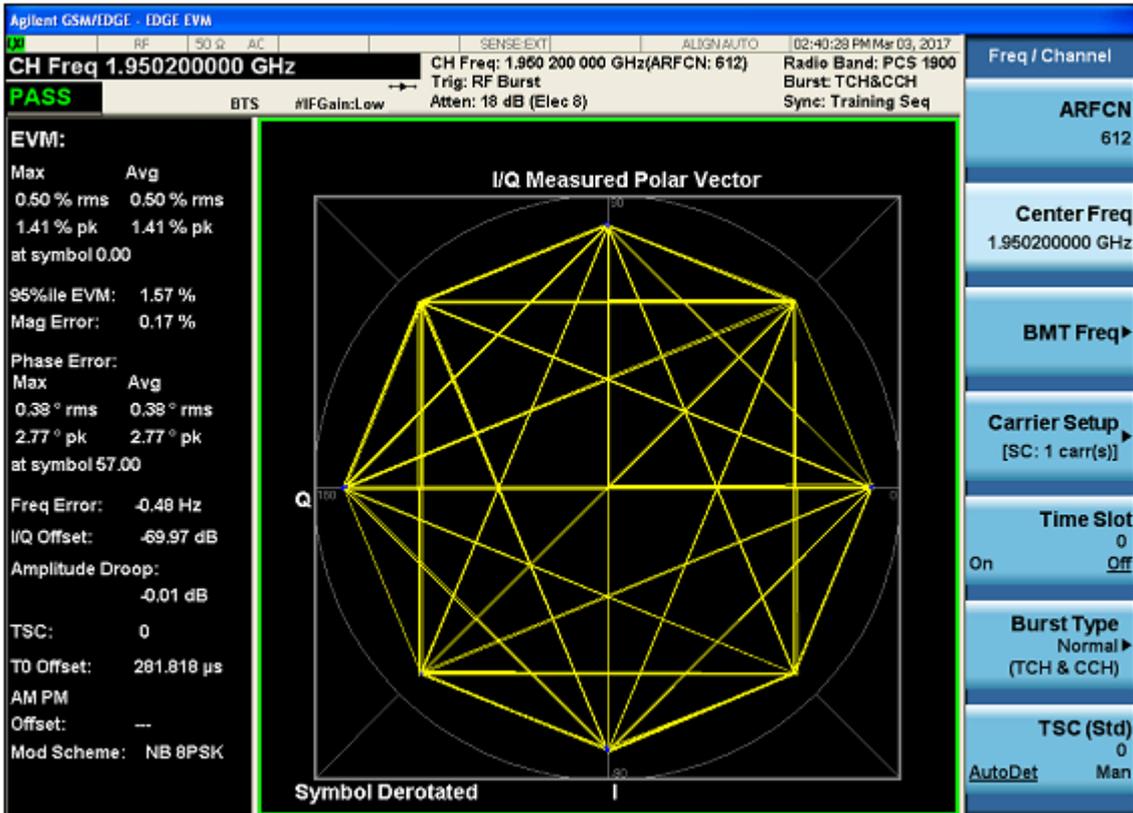
Port 1  
 B:1930.2M 1930.8M



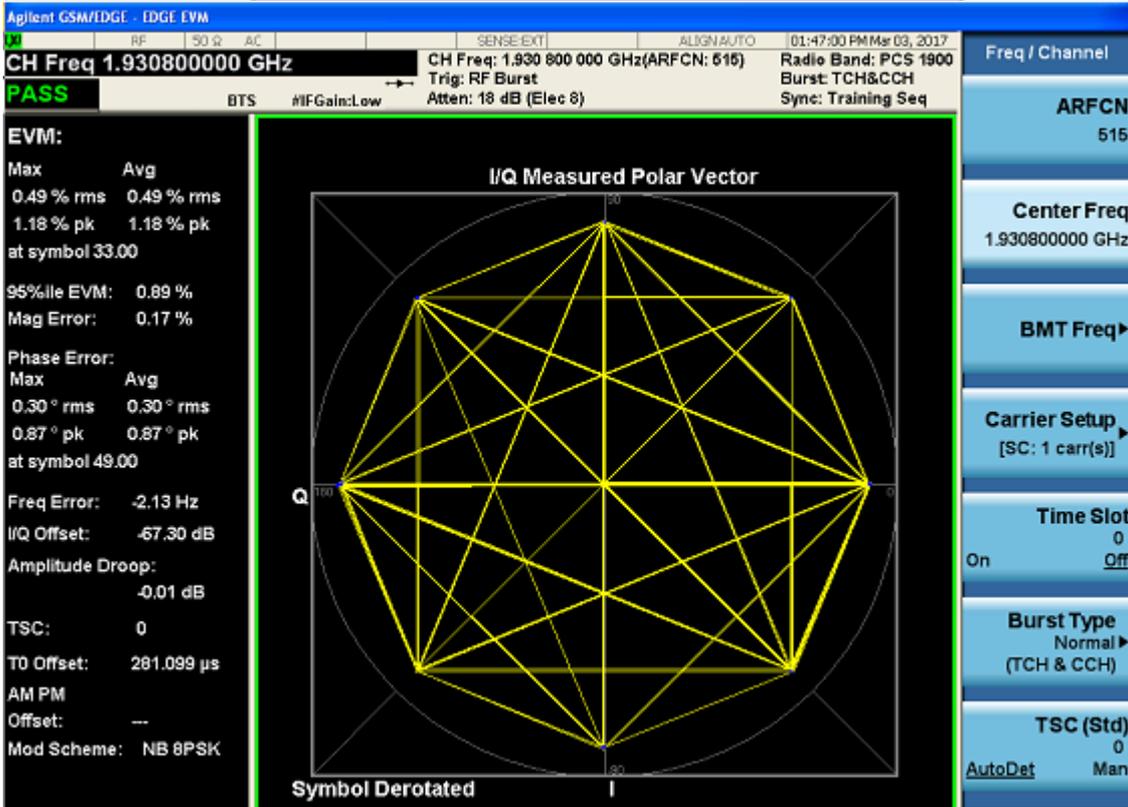
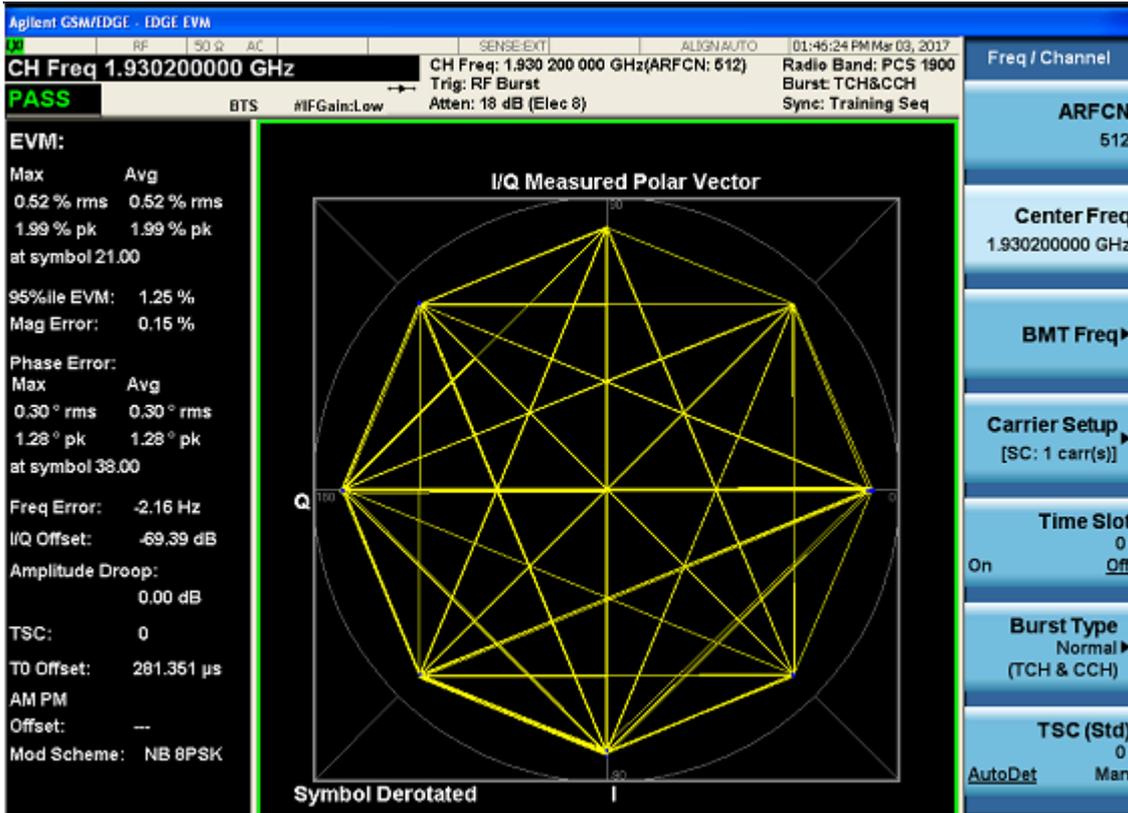
M:1940.2M 1940.8M



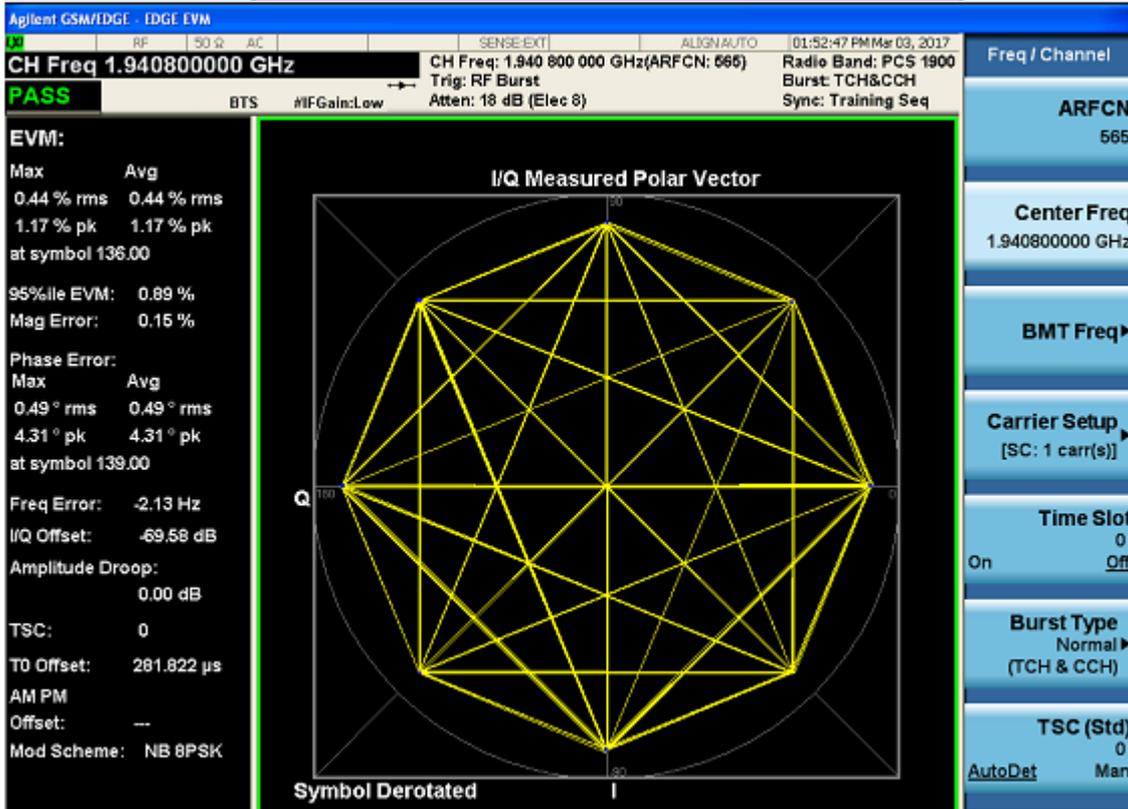
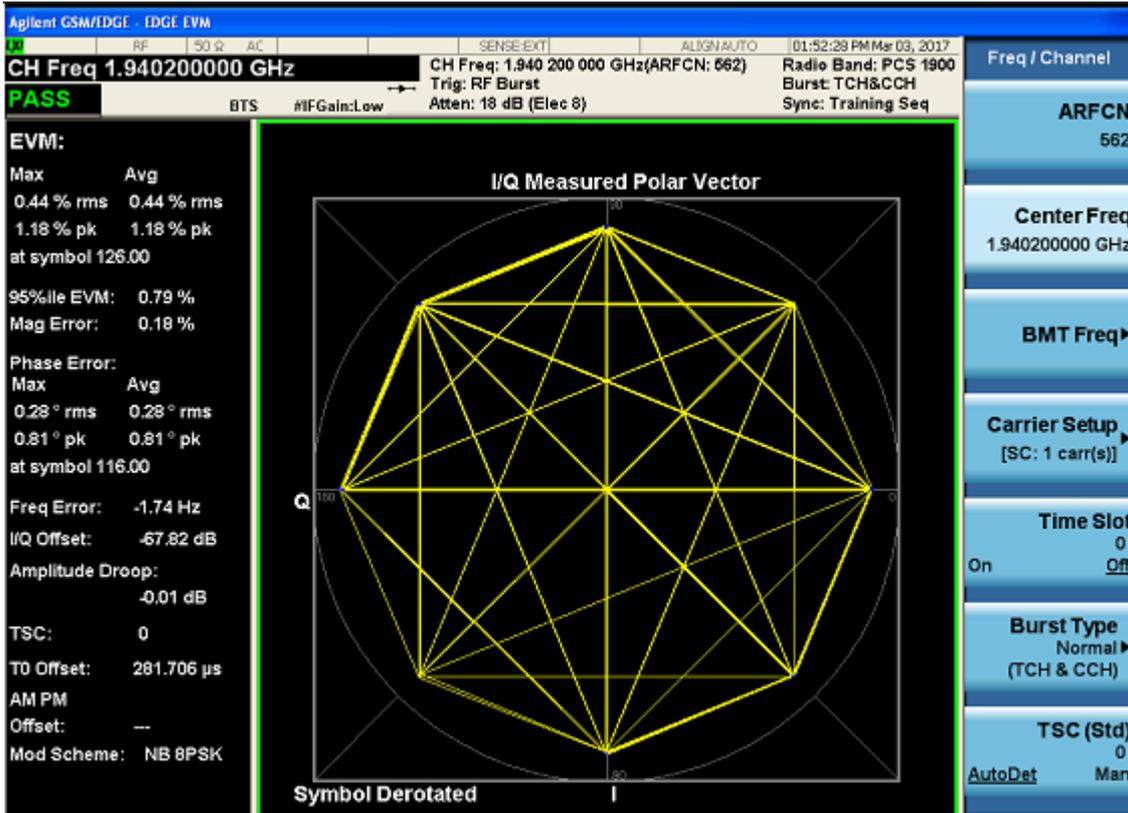
T:1950.2M 1950.8M



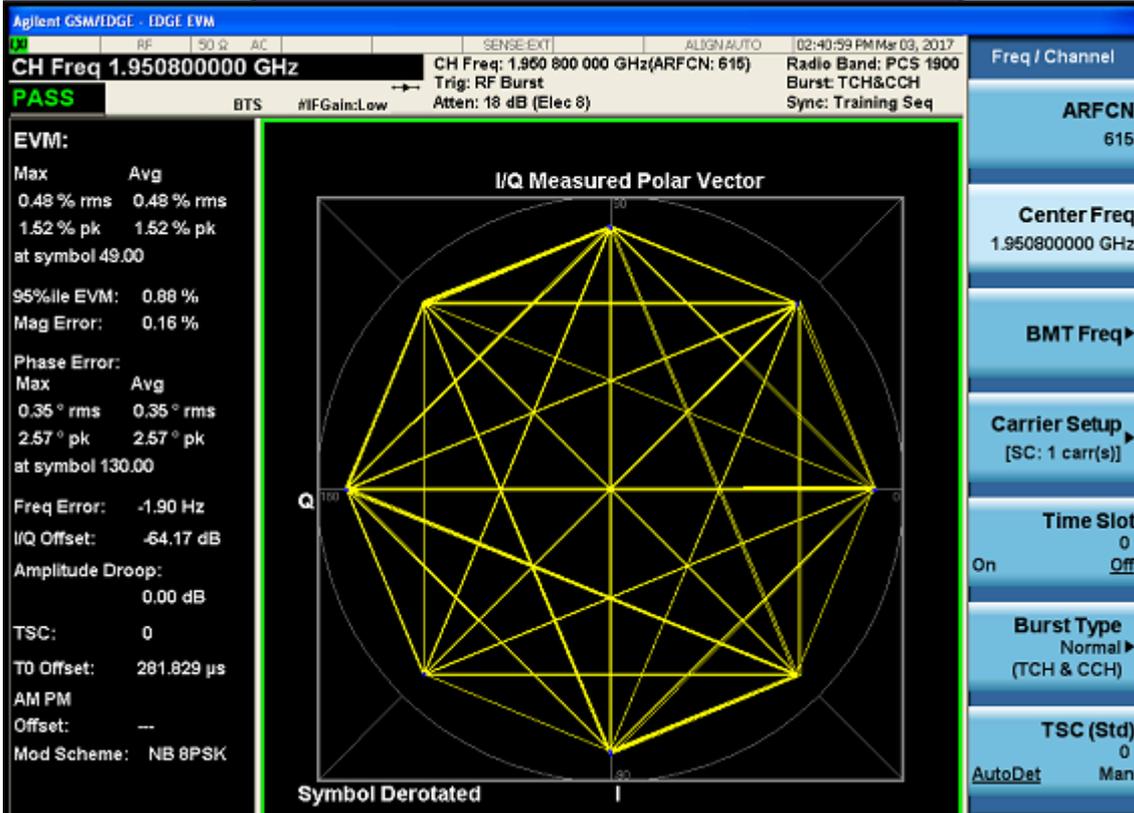
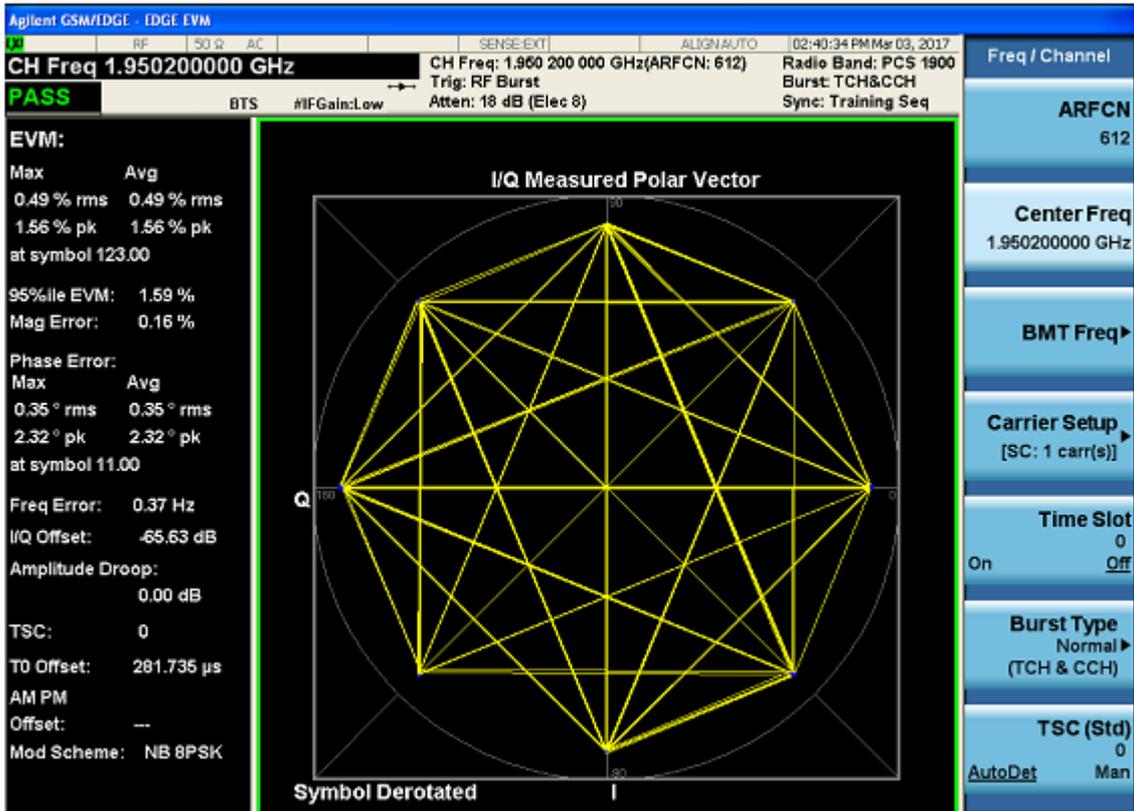
Port 4  
B:1930.2M 1930.8M



M:1940.2M 1940.8M



T:1950.2M 1950.8M



**9 SPURIOUS RADIATED EMISSIONS**

**9.1 Applicable Standard: FCC CFR 47 §2.1053**

**9.2 Test Equipment List and Details**

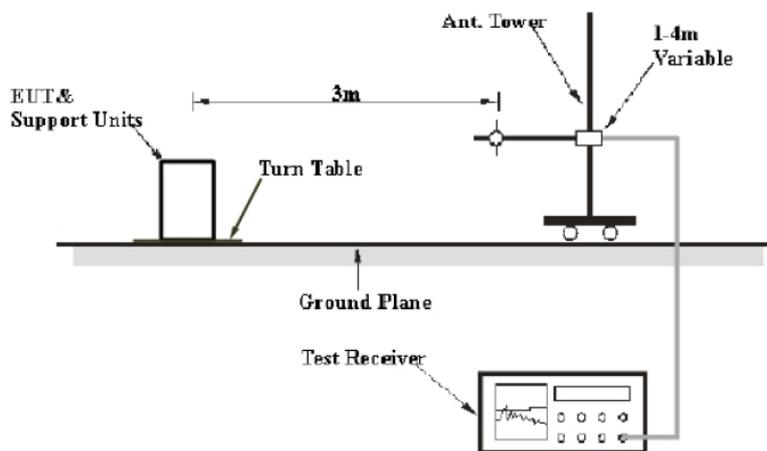
Manufacturer	9.2.1.1.1 Equipment	Model	Serial Number	Last Cal.	Cal. Interval
Albatross	Anechoic Chamber	3m Site	A00017354	2016-11-18	1 year
R&S	EMI Test Receiver	ESI26	100058	2016-8-1	1 year
R&S	Log periodic Antenna	SWB-VUBA9163	9163-282	2016-12-7	1 year
R&S	Double-Ridged Waveguide Horn Antenna	HF906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

**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 lg (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 scanning, set at 1MHz for 1GHz to 20GHz scanning.

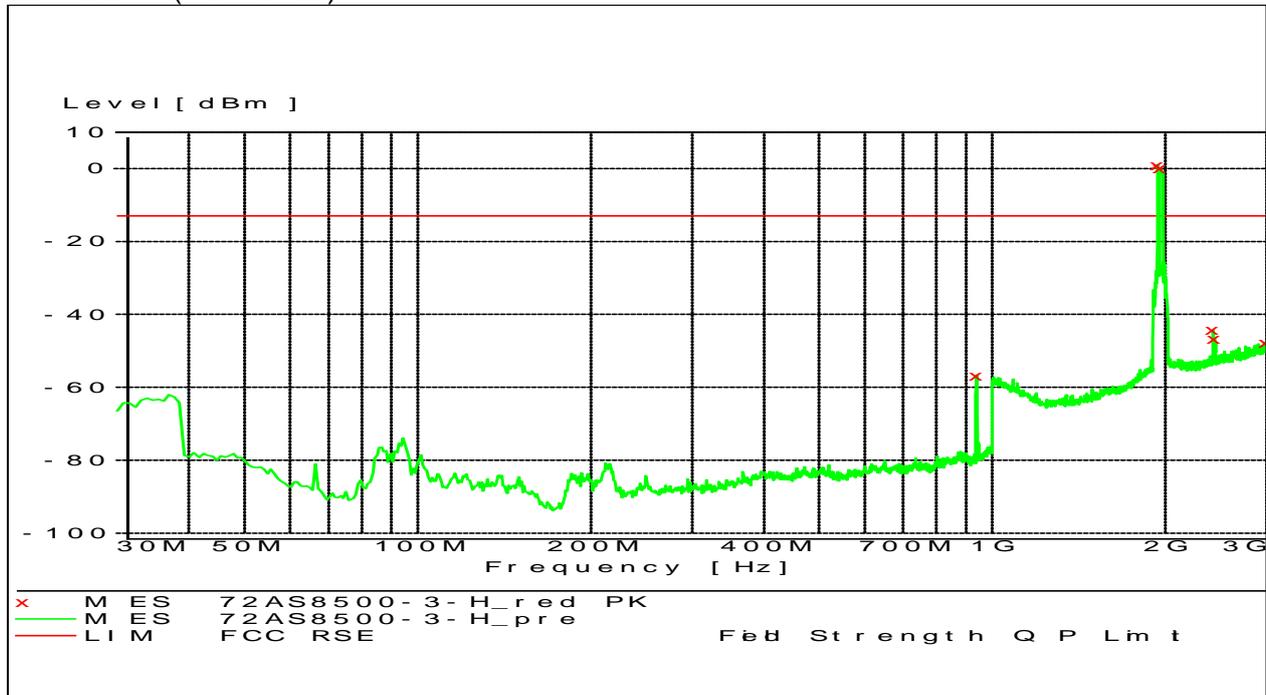
**9.4 Test Results Summary: PASS**

**9.5 Environmental Conditions**

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

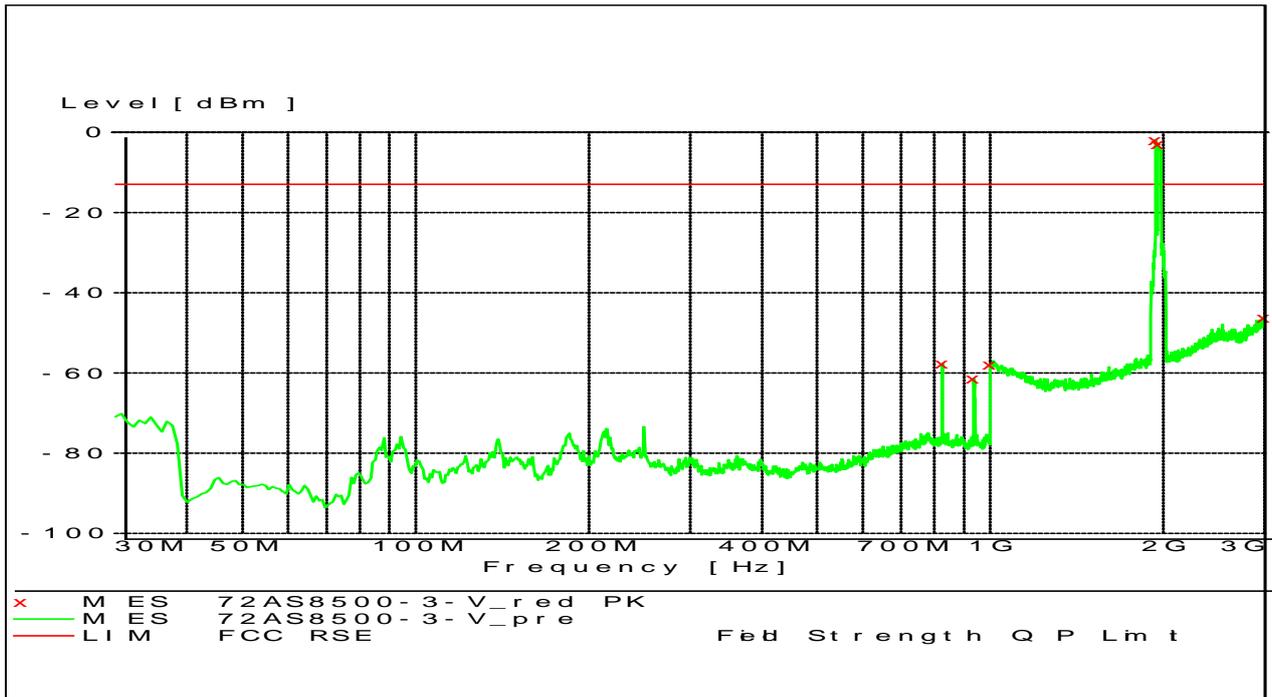
**9.6 Test data**

**30M-3GHz (Horizontal)**



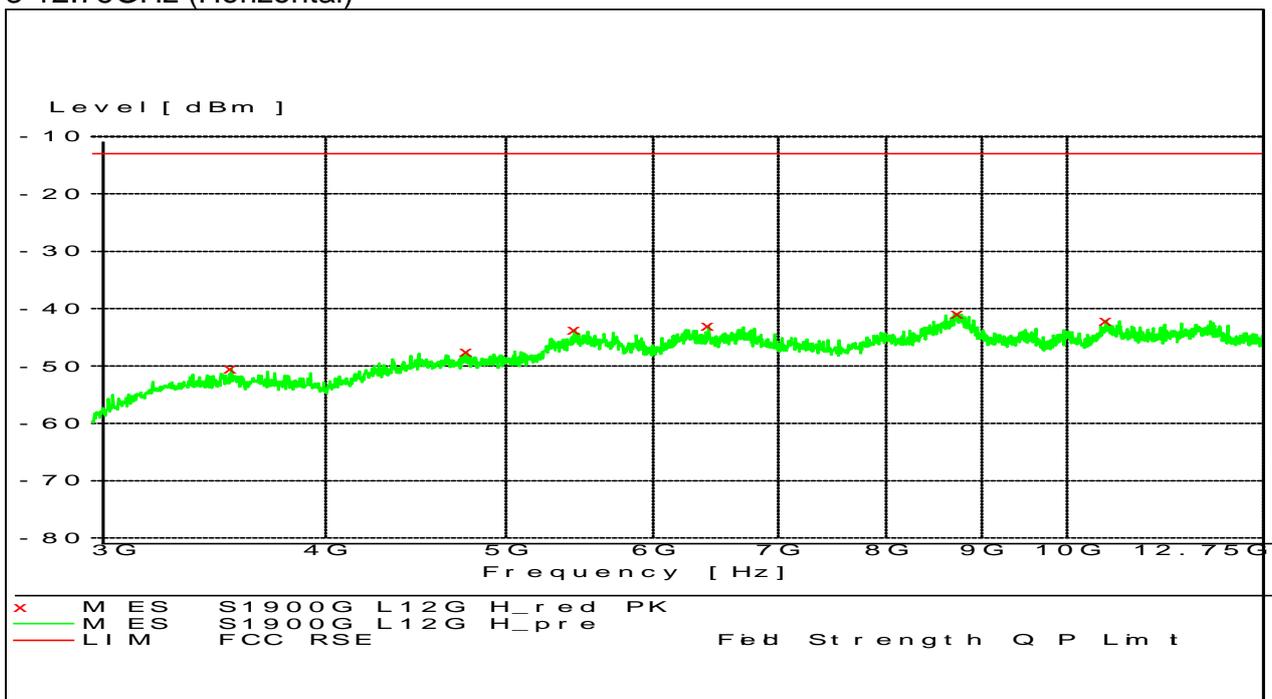
Frequency (MHz)	Level ( dBm )	Azimuth (deg)	Height (cm)	Polarisation	Transd (dB)	Limit (dBm)	Margin (dB)
940.248	-56.65	133.7	200	HOR	-122.2	-13	43.7
2420.8	-44.26	155.6	200	HOR	-102.7	-13	31.3
2436.8	-46.5	155.6	200	HOR	-102.9	-13	33.5
2988.8	-47.65	266.1	100	HOR	-98.7	-13	34.6

**30M-3GHz (Vertical)**



Frequency (MHz)	Level ( dBm )	Azimuth (deg)	Height (cm)	Polarisation	Transd (dB)	Limit (dBm)	Margin (dB)
825.4	-57.71	0.1	200	VER	-119.3	-13	44.7
935.592	-61.32	154.9	100	VER	-120.1	-13	48.3
1000	-57.88	125.4	100	VER	-108.9	-13	44.9
2995.2	-46.1	140.1	100	VER	-96.9	-13	33.1

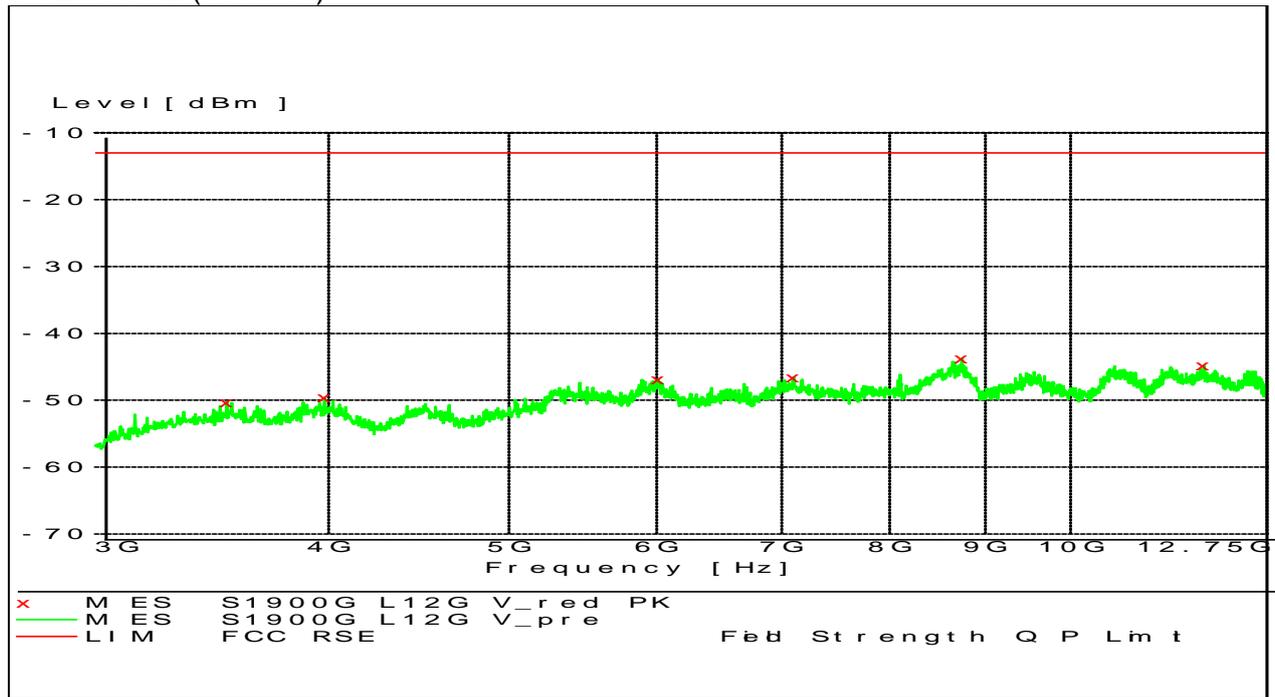
### 3-12.75GHz (Horizontal)





Frequency (MHz)	Level ( dBm )	Azimuth (deg)	Height (cm)	Polarisation	Transd (dB)	Limit (dBm)	Margin (dB)
3563.2	-50.55	160.3	200	HOR	-89.4	-13	37.5
4766.4	-47.54	35.5	200	HOR	-84.5	-13	34.5
5441.6	-43.75	263.5	200	HOR	-80.1	-13	30.7
6424	-43.05	90.8	200	HOR	-78.1	-13	30
8743.4	-40.82	323	200	HOR	-72.4	-13	27.8
10500.6	-42.01	283.5	200	HOR	-73	-13	29

3-12.75GHz (Vertical)



Frequency (MHz)	Level ( dBm )	Azimuth (deg)	Height (cm)	Polarisation	Transd (dB)	Limit (dBm)	Margin (dB)
3528	-50.26	226.3	100	VER	-89.5	-13	37.3
3982.4	-49.64	282	100	VER	-87.4	-13	36.6
6011.2	-46.83	267.8	100	VER	-81.5	-13	33.8
7105.8	-46.53	9.8	100	VER	-80.5	-13	33.5
8748	-43.74	267.8	100	VER	-76.5	-13	30.7
11793.2	-44.78	32.4	100	VER	-75.9	-13	31.8

**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.

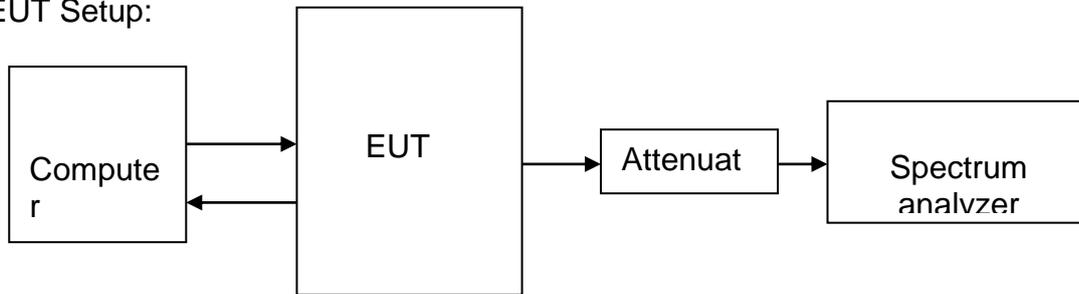
**10.2 Test Equipment List and Details**

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Agilent	MXA Series Spectrum Analyzer	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)=40dB, Cable Loss (dB)=2.5dB.

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**

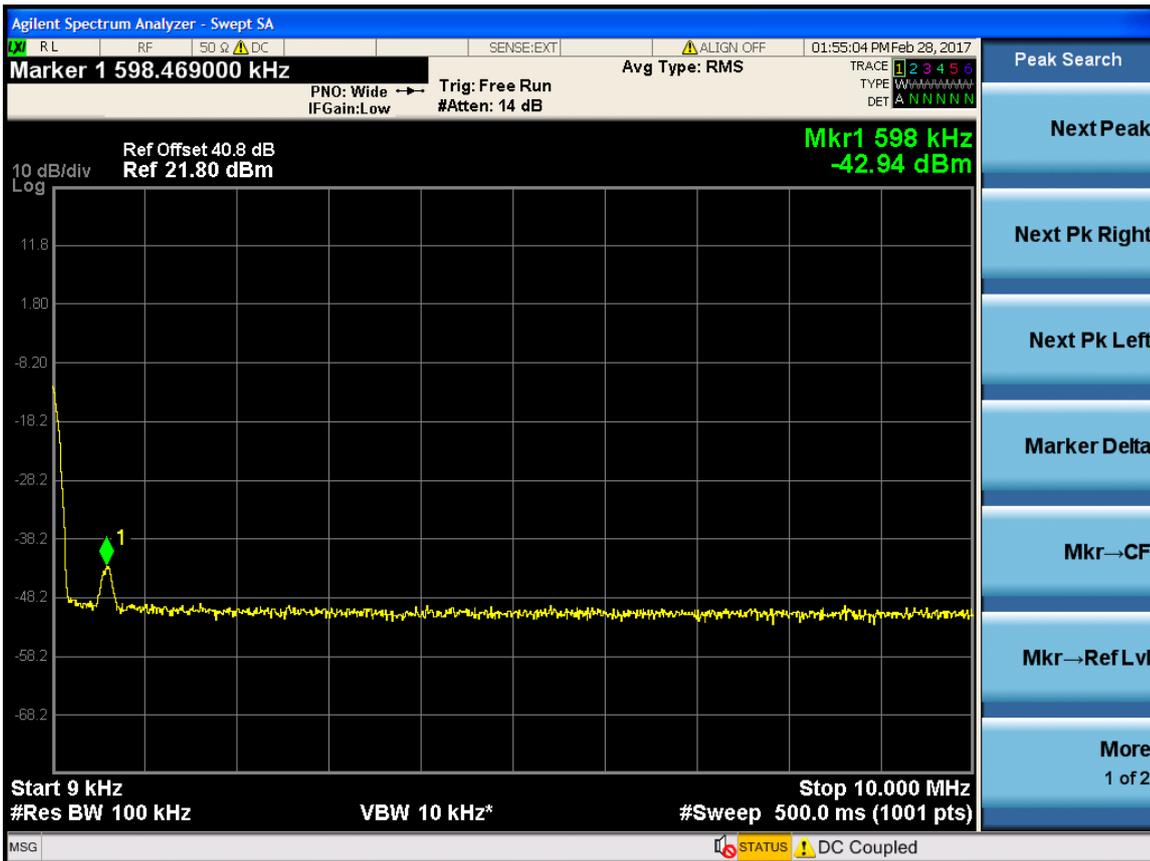
Temperature:	20 °C
Relative Humidity:	53 %
ATM Pressure:	1009 mbar

**10.5 Test Result: Pass**

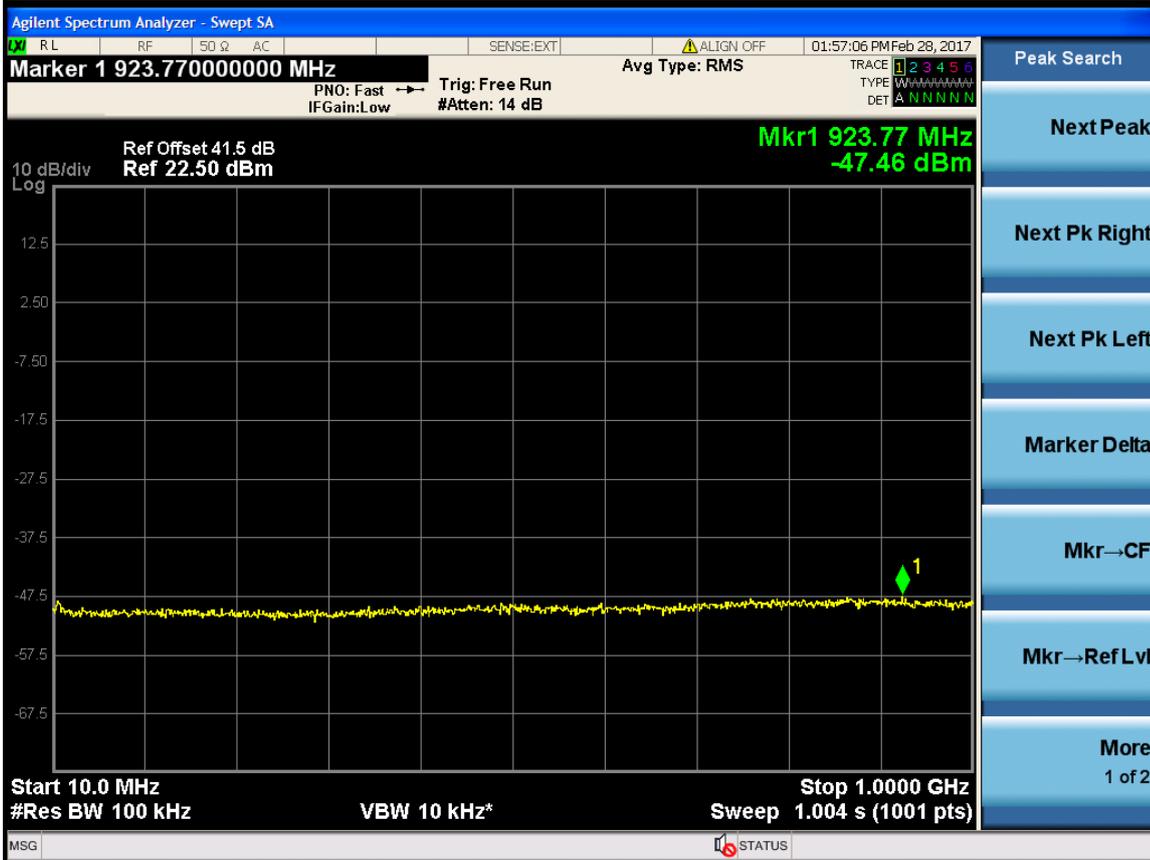
**10.6 Test Mode: Transmitting LTE+UMTS+GSM**

**10.7 Test Data:**

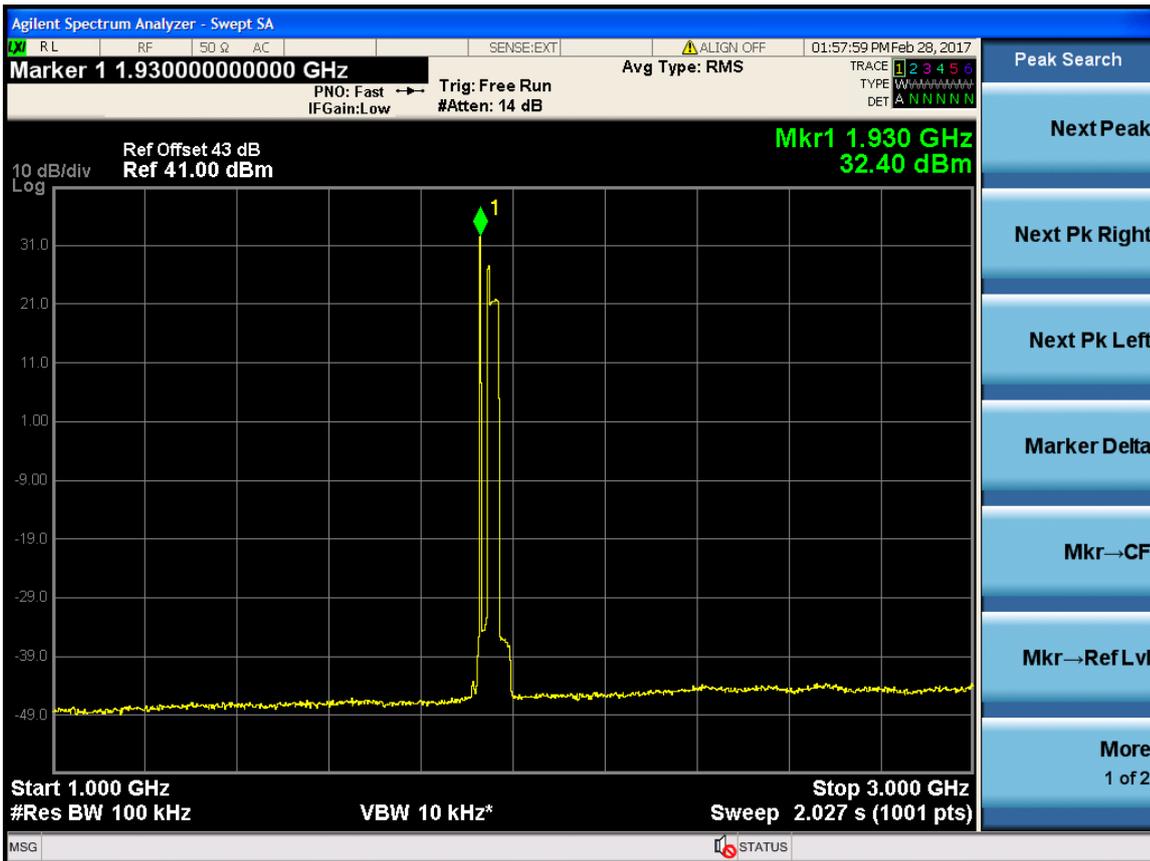
RF 40M (GUL):  
RF 40M (GUL) -Port 1 -1950MHz



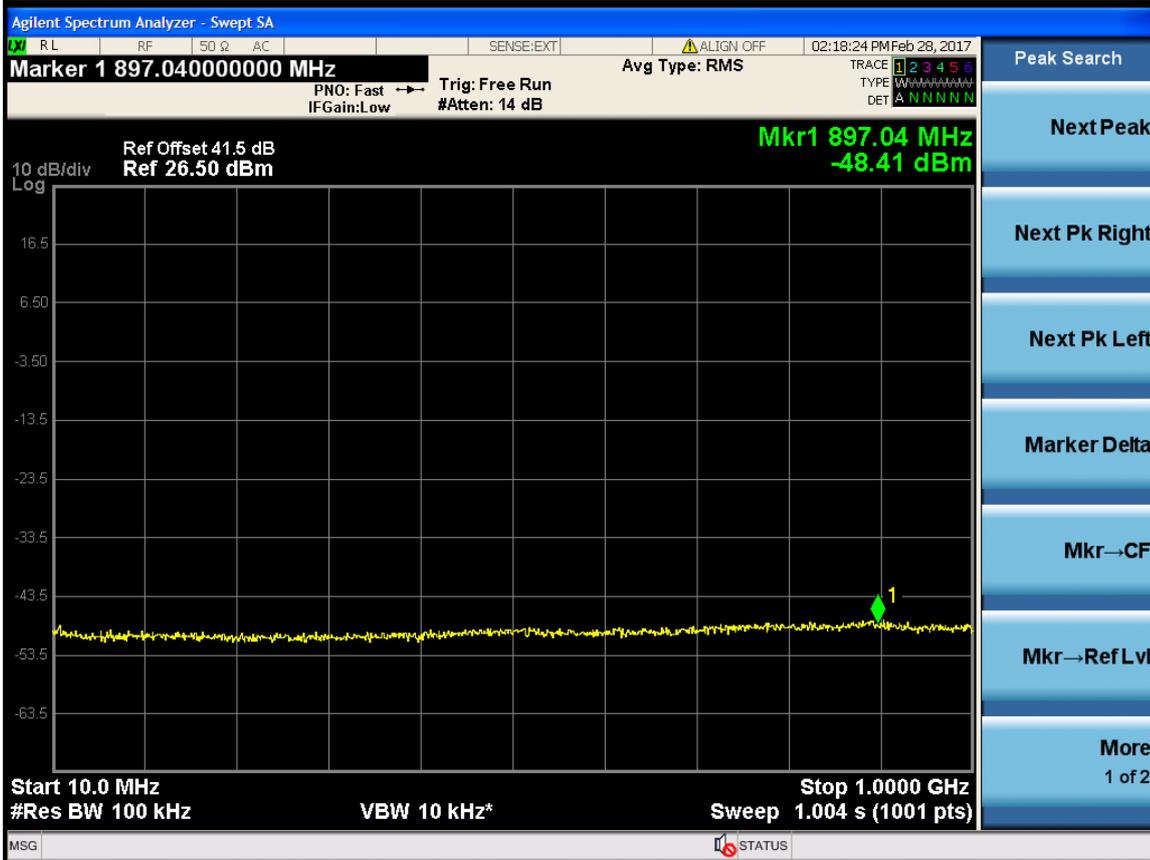
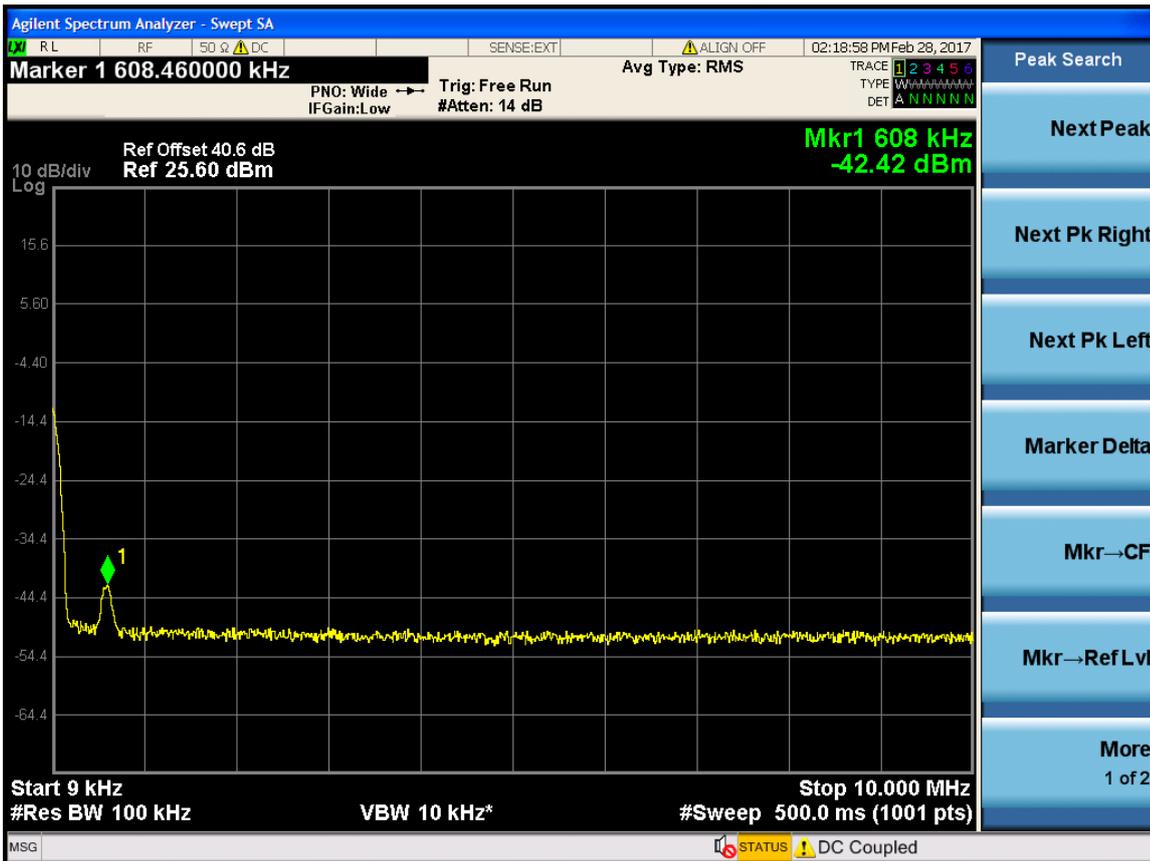
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- Next Peak
- Next Pk Right
- Next Pk Left
- Marker Delta
- Mkr→CF
- Mkr→Ref Lvl
- More  
1 of 2

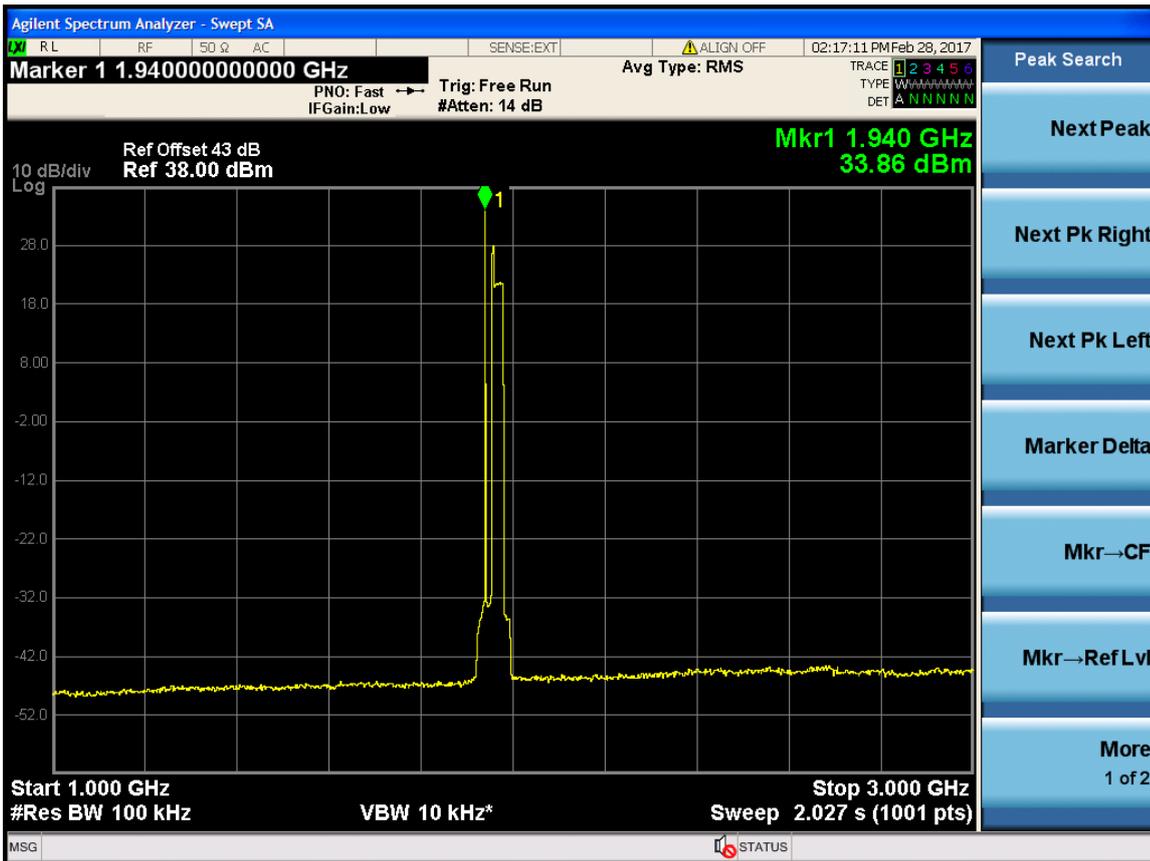


- Peak Search
- Next Peak
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- Marker Delta
- Mkr→CF
- Mkr→Ref Lvl
- More  
1 of 2

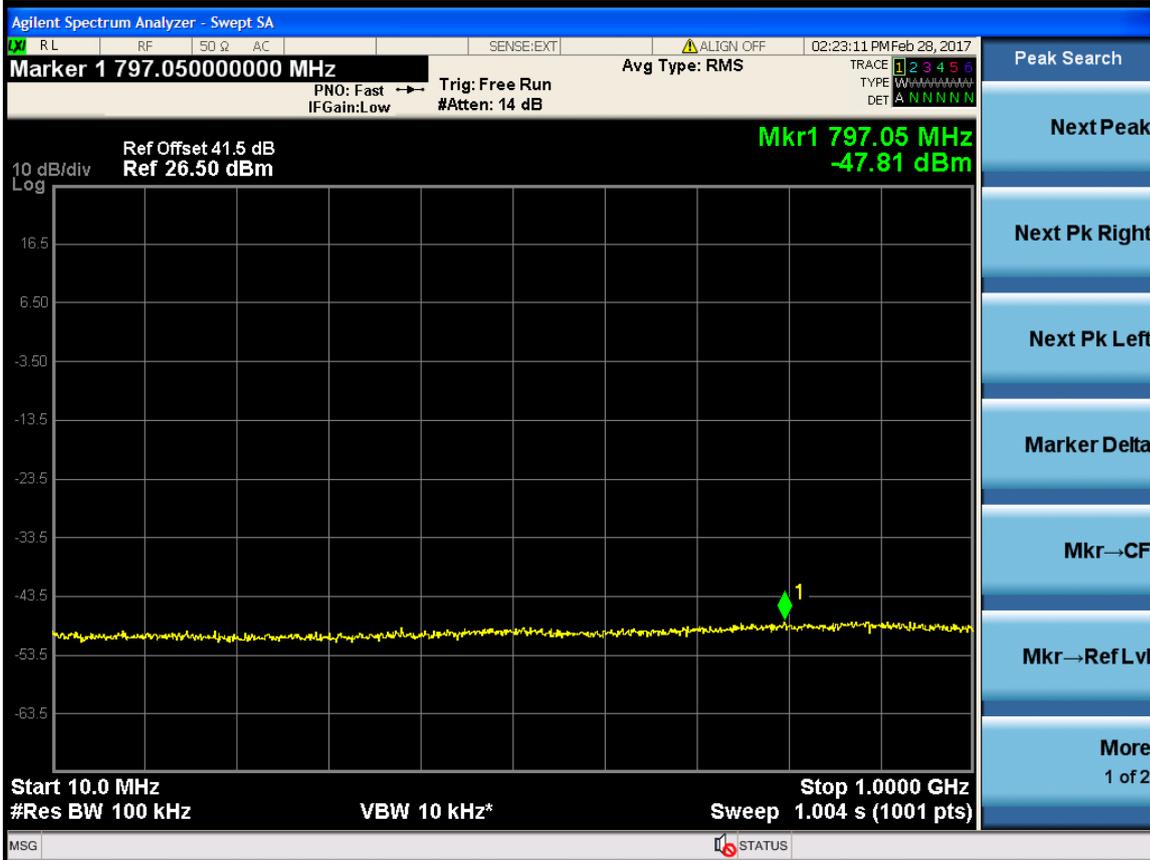
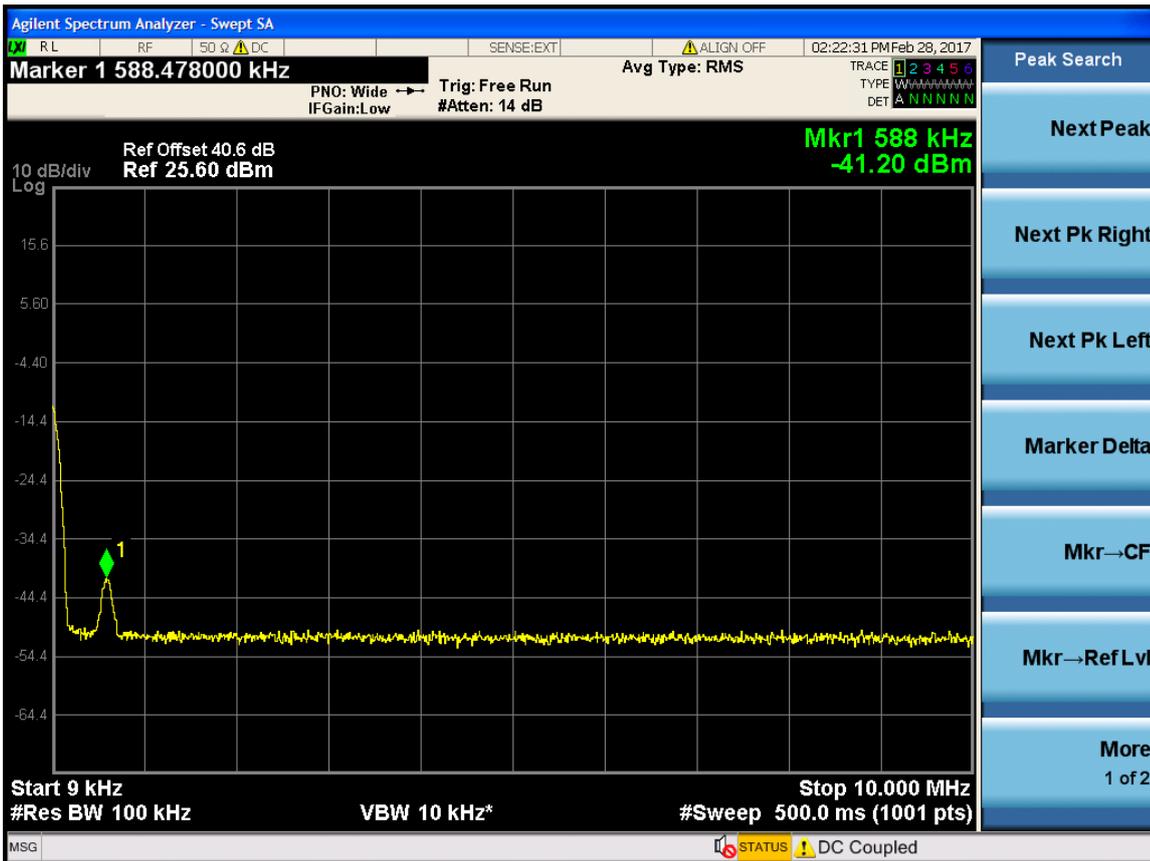


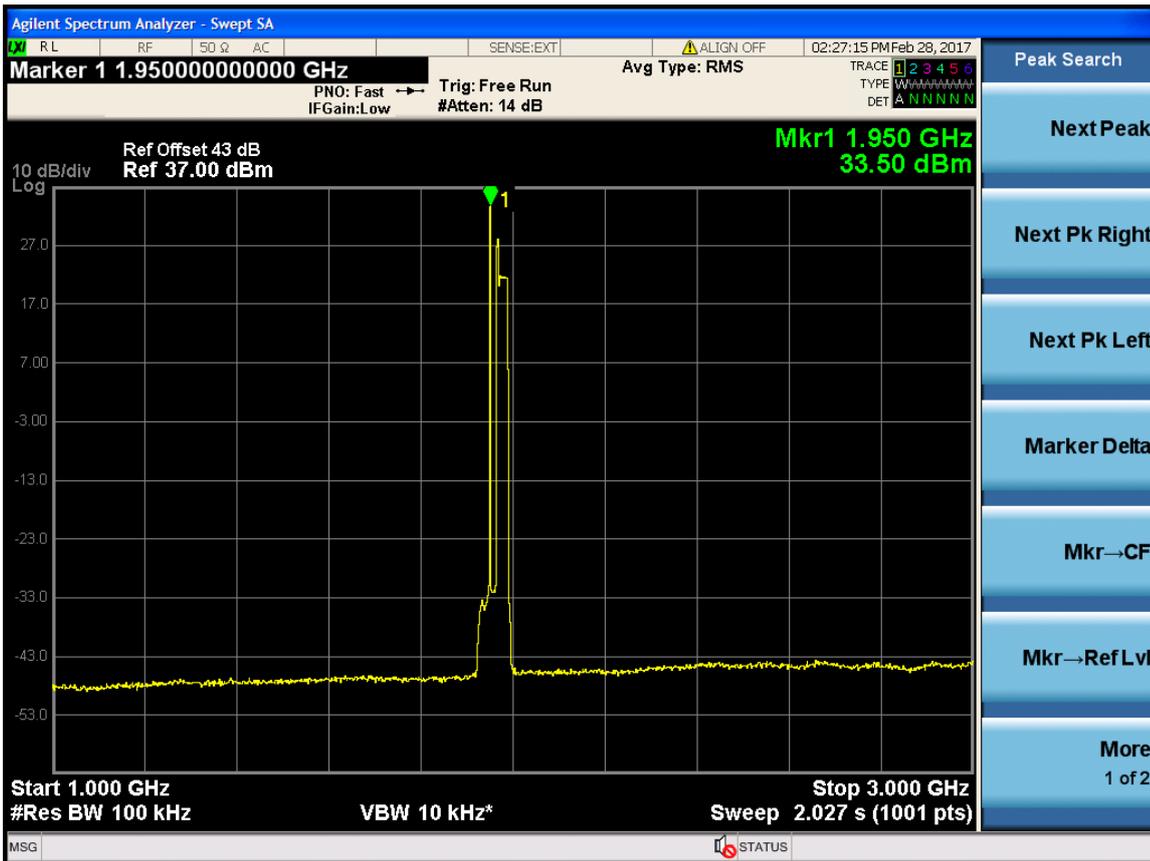
RF 40M (GUL) -Port 1 -1960MHz



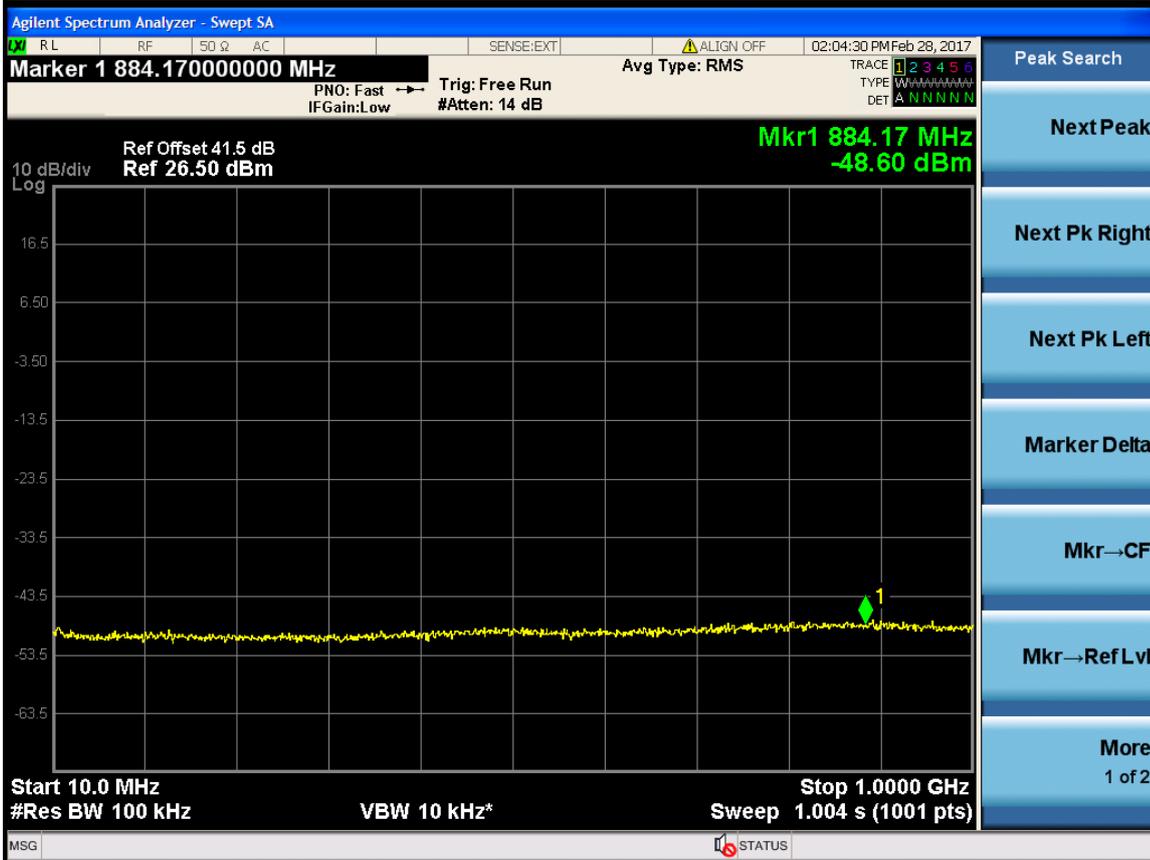
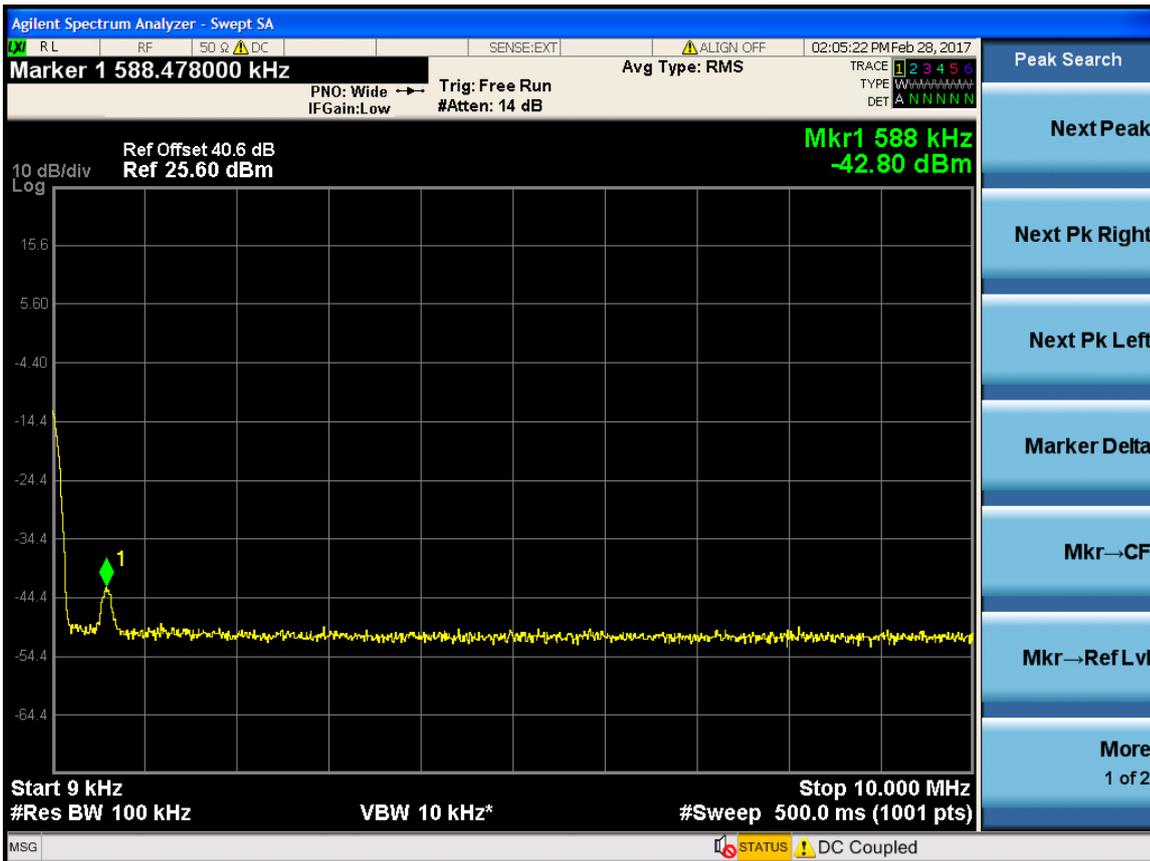


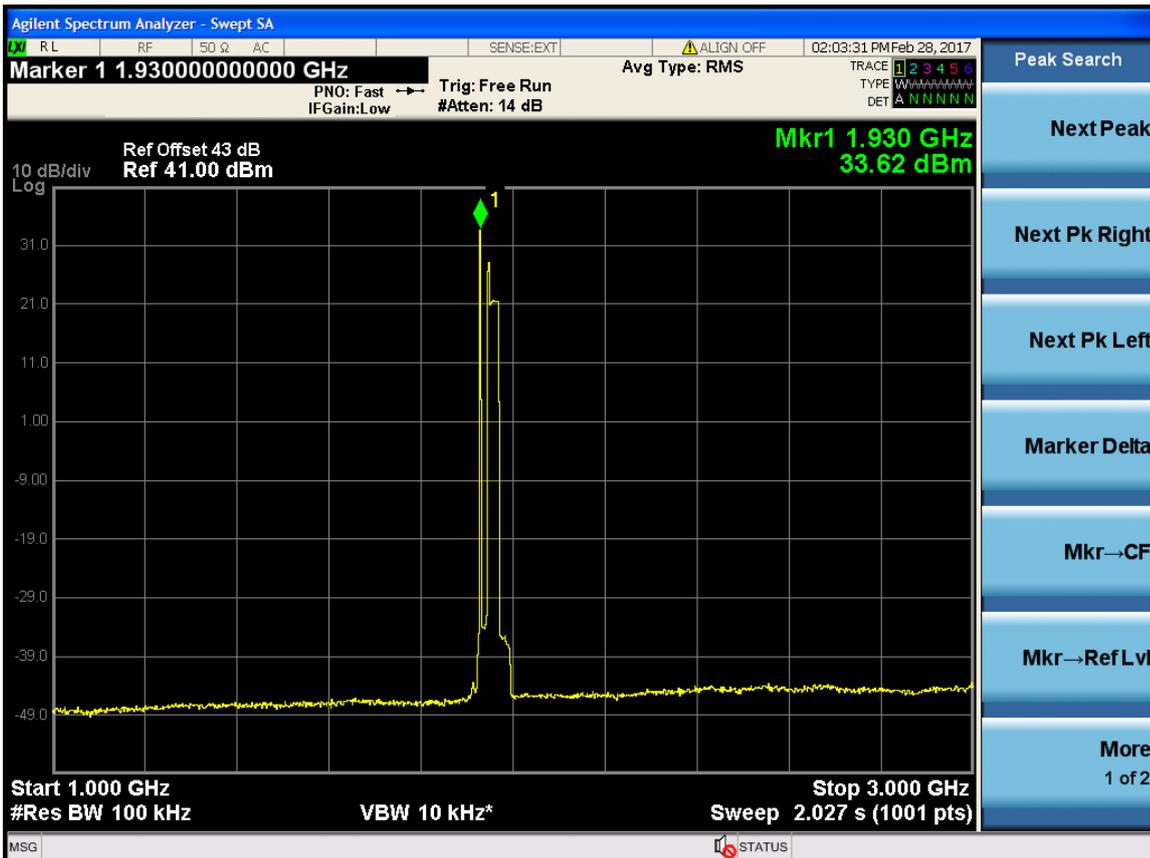
RF 40M (GUL) -Port 1 -1970MHz





RF 40M (GUL) -Port 4 -1950MHz



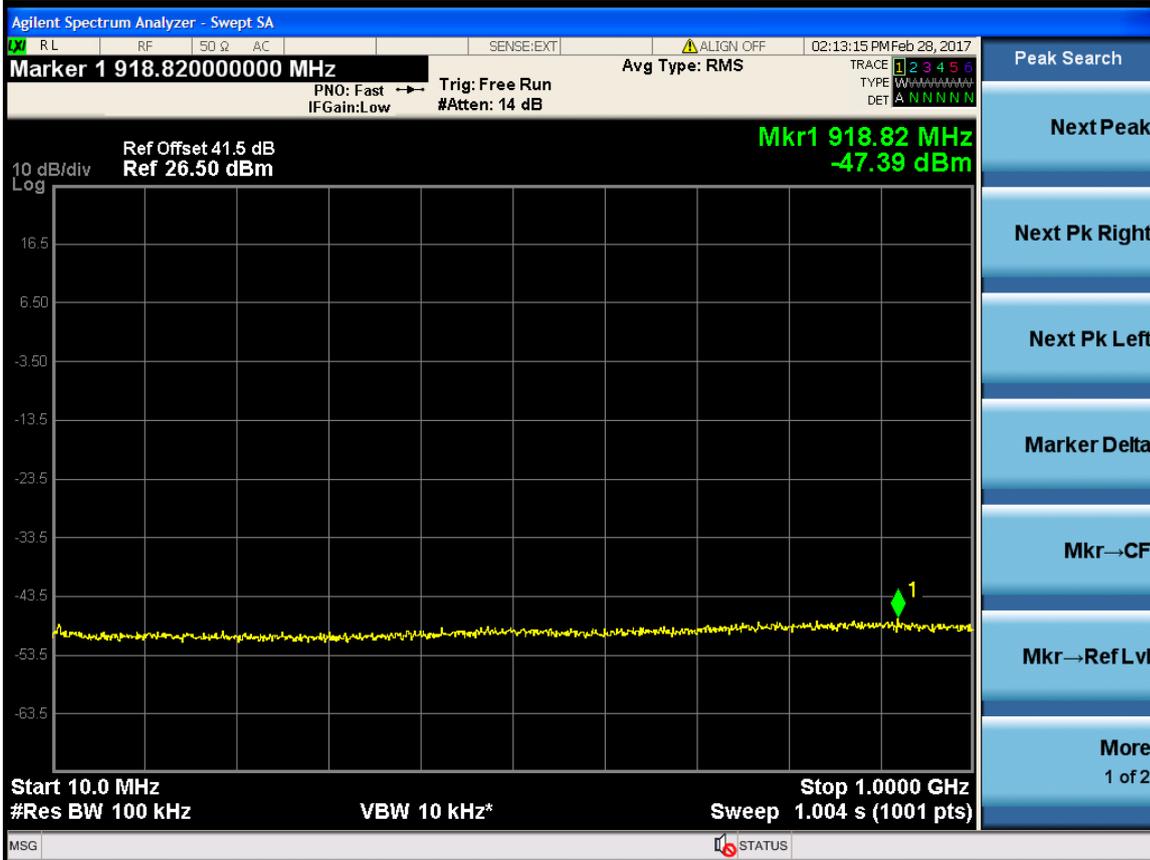
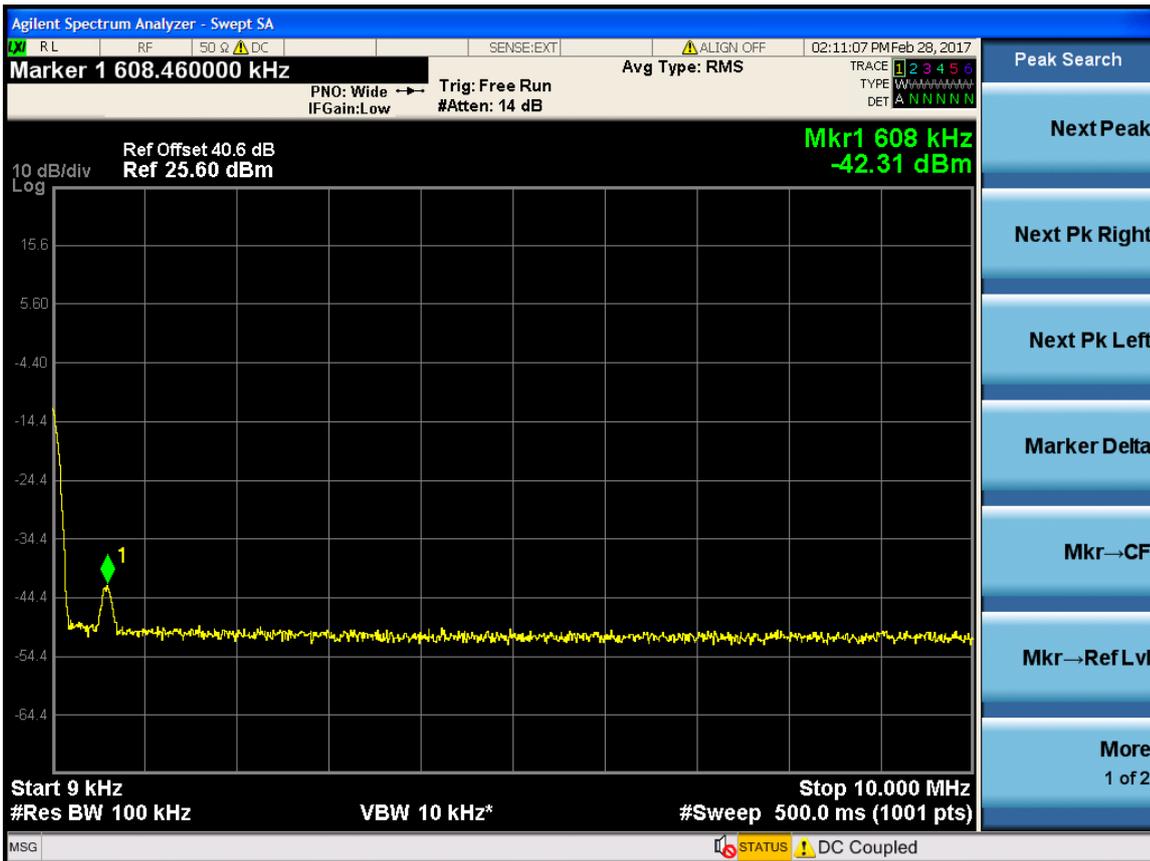


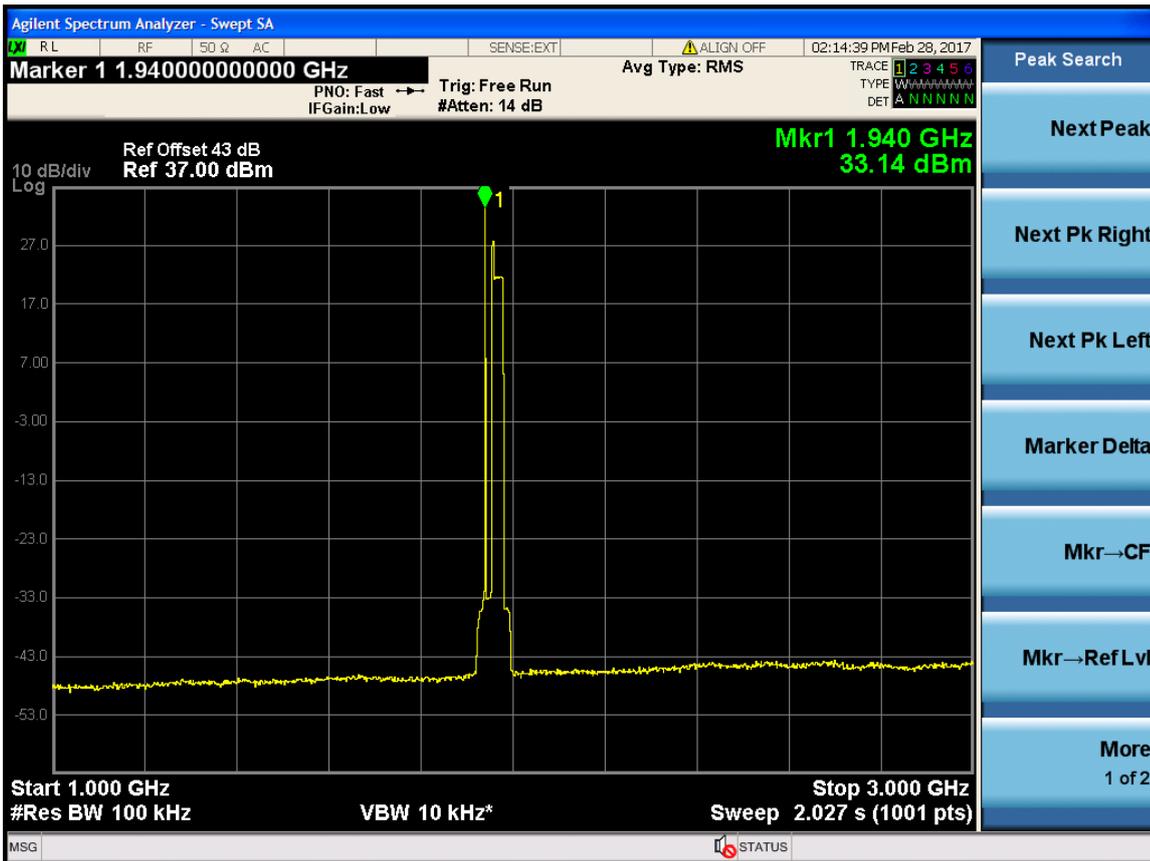
- Peak Search
- Next Peak
- Next Pk Right
- Next Pk Left
- Marker Delta
- Mkr→CF
- Mkr→Ref Lvl
- More 1 of 2



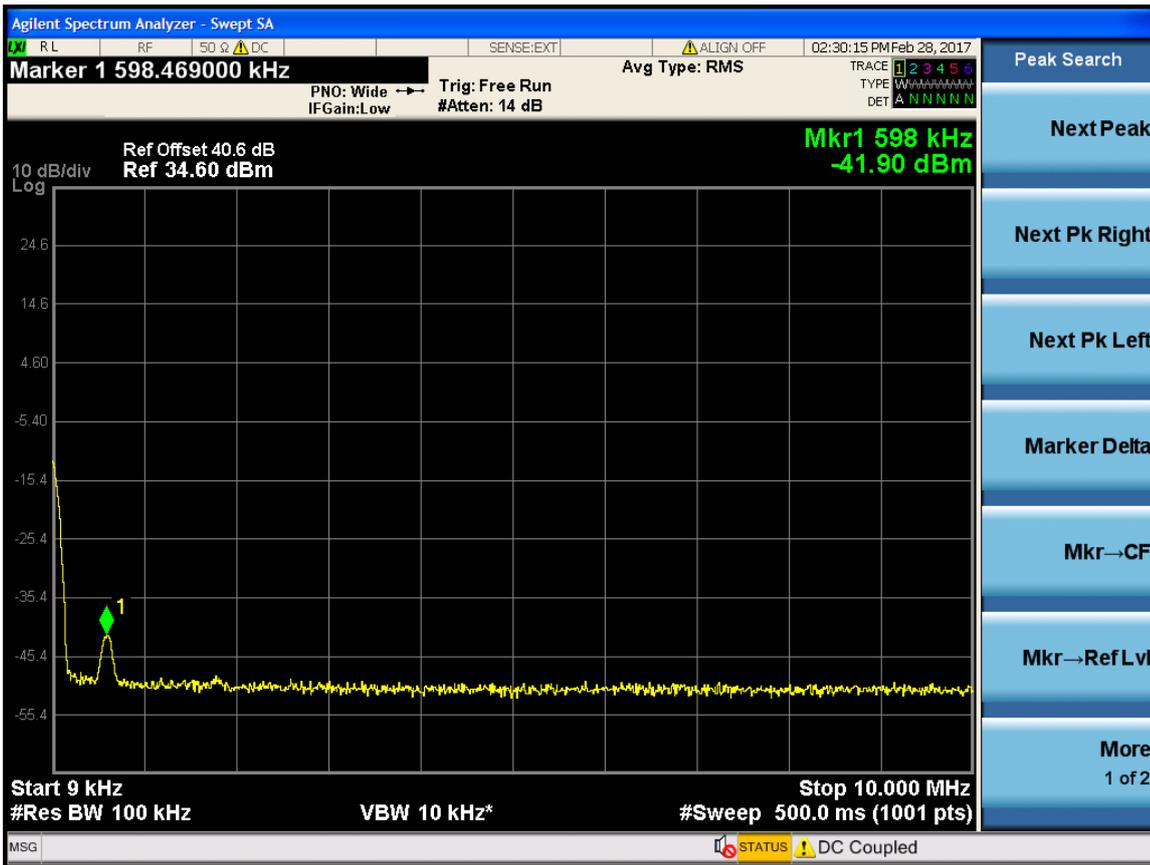
- Peak Search
- Next Peak
- Next Pk Right
- Next Pk Left
- Marker Delta
- Mkr→CF
- Mkr→Ref Lvl
- More 1 of 2

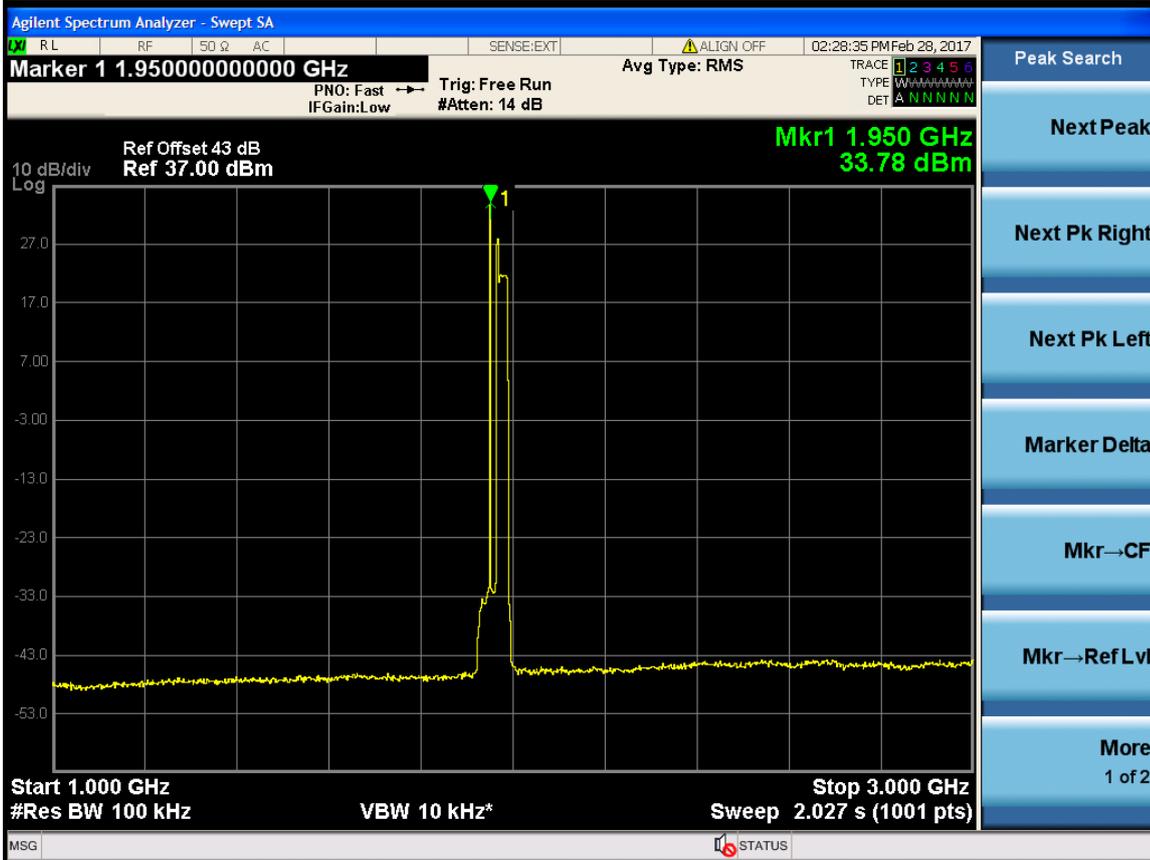
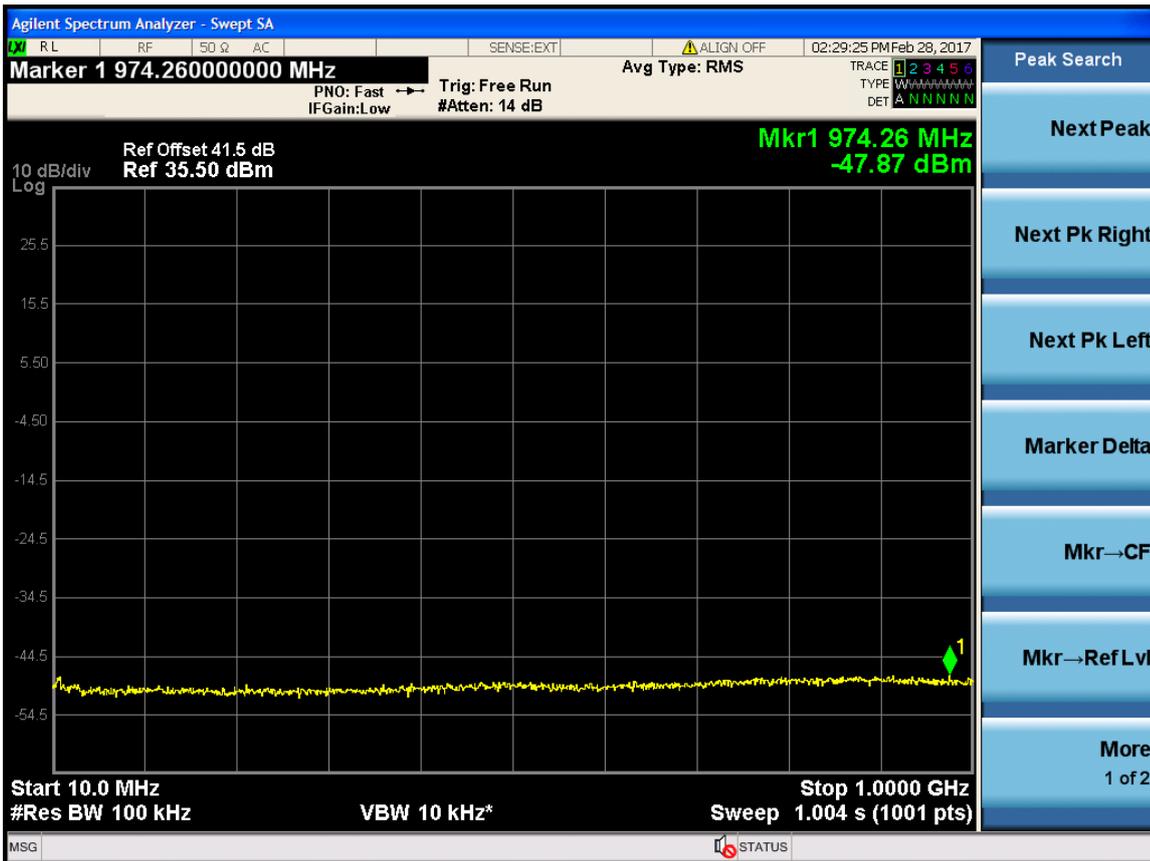
RF 40M (GUL) -Port 4 -1960MHz





RF 40M (GUL) -Port 4 -1970MHz









## 11 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

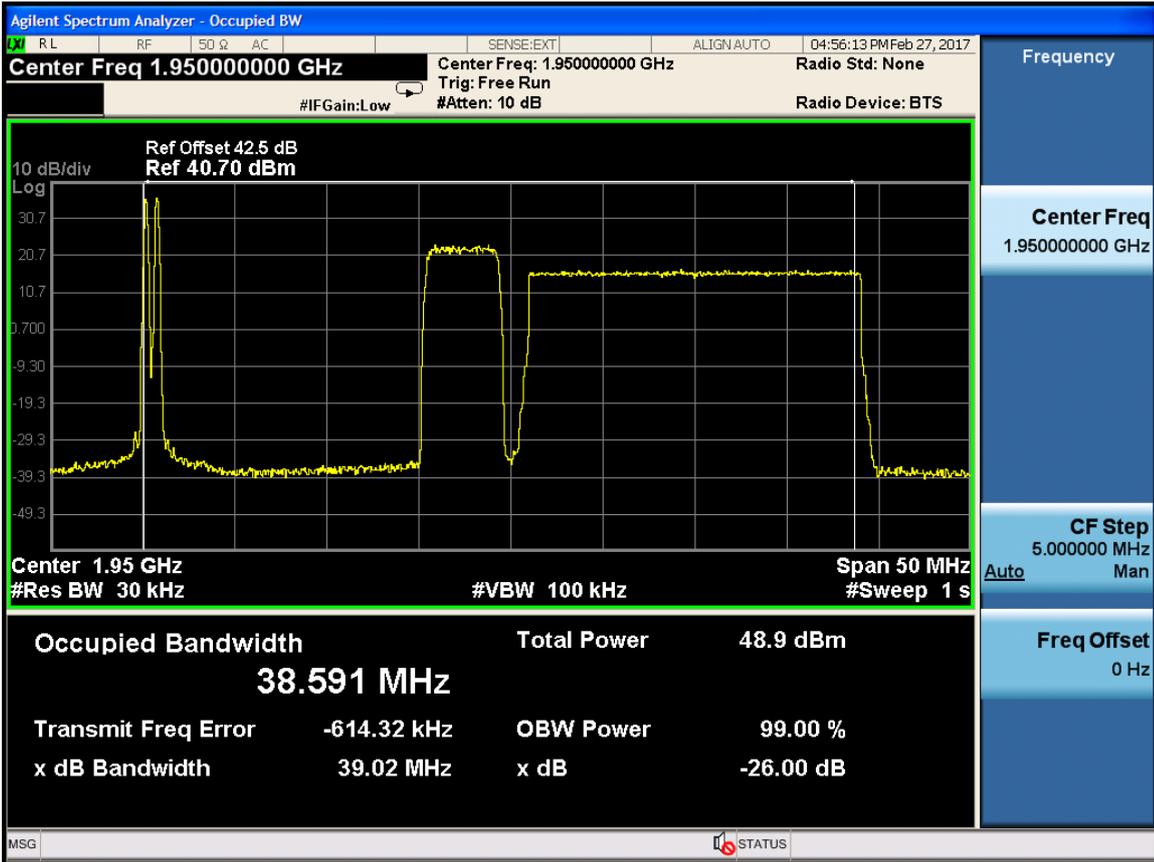
### 11.6 Test Mode: Transmitting LTE+UMTS+GSM

### 11.7 Test Data

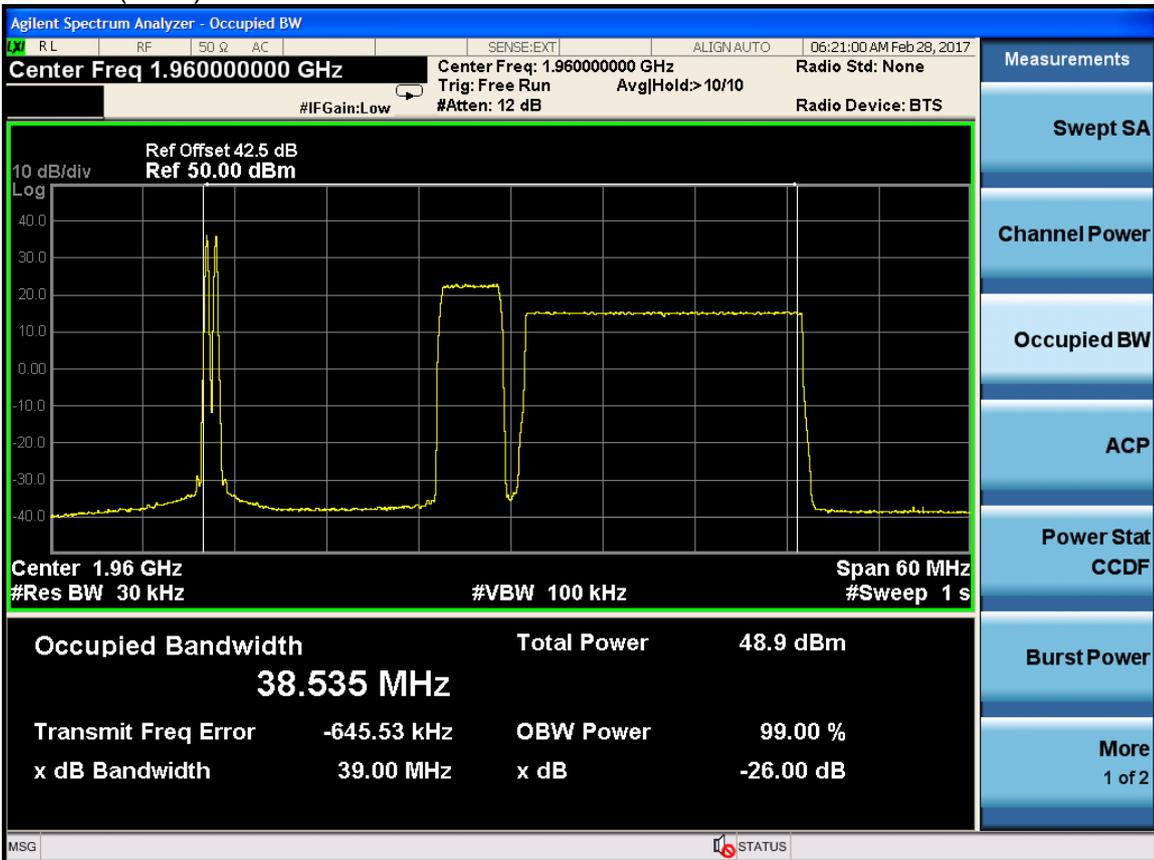
RF Bandwidth :IBW 40M(LTE +UMTS+GSM)

Port	RF Center Freq. (MHz)	99% Power Bandwidth (MHz)	Limit (MHz)
1	1950	38.591	40M
	1960	38.535	40M
	1970	38.587	40M
4	1950	38.580	40M
	1960	38.583	40M
	1970	38.578	40M

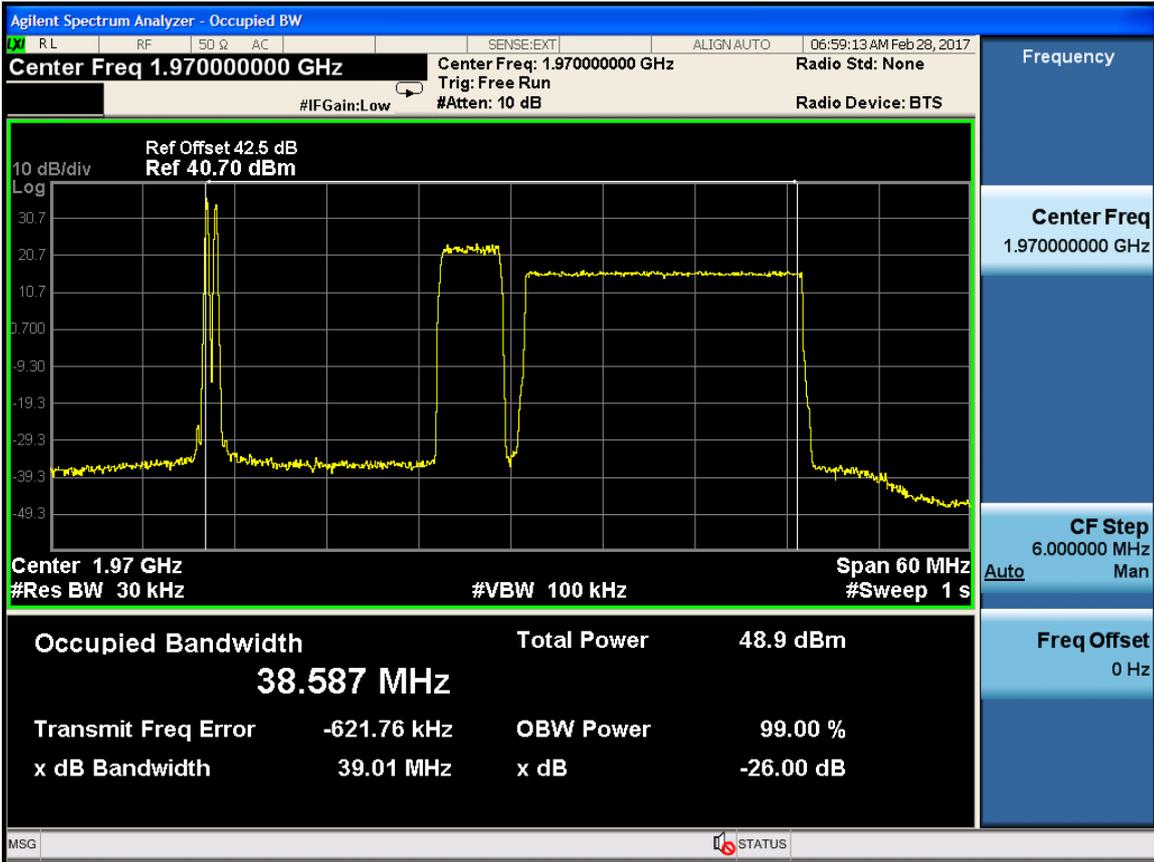
RF 40M(GUL) -Port 1-1950MHz



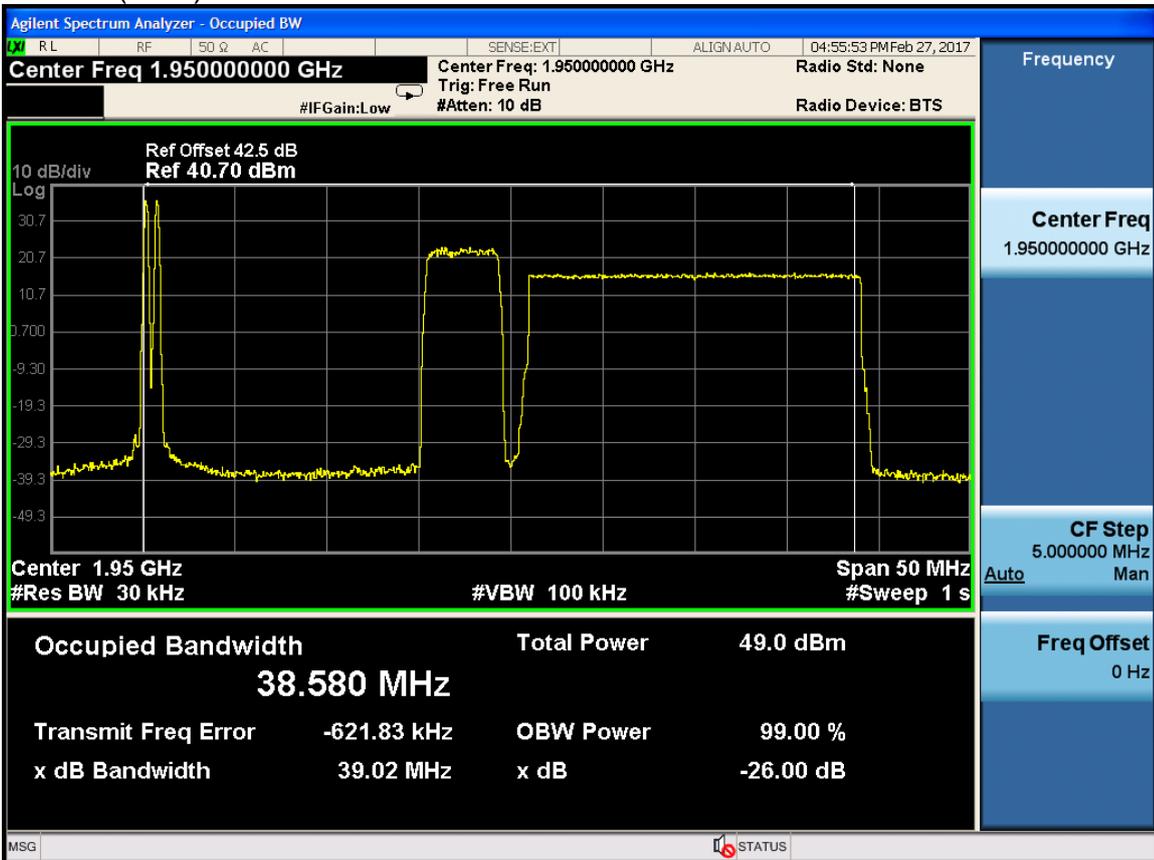
RF 40M(GUL) -Port 1-1960MHz



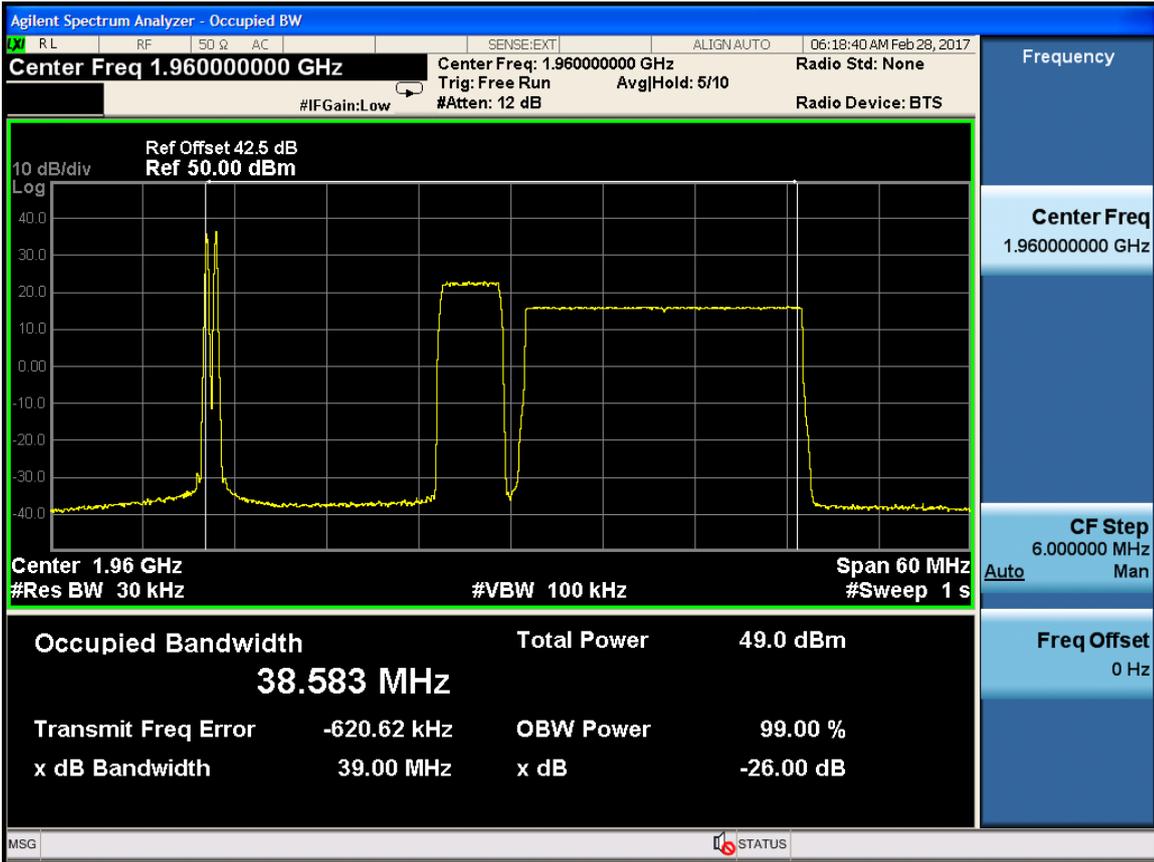
RF 40M(GUL) -Port 1-1970MHz



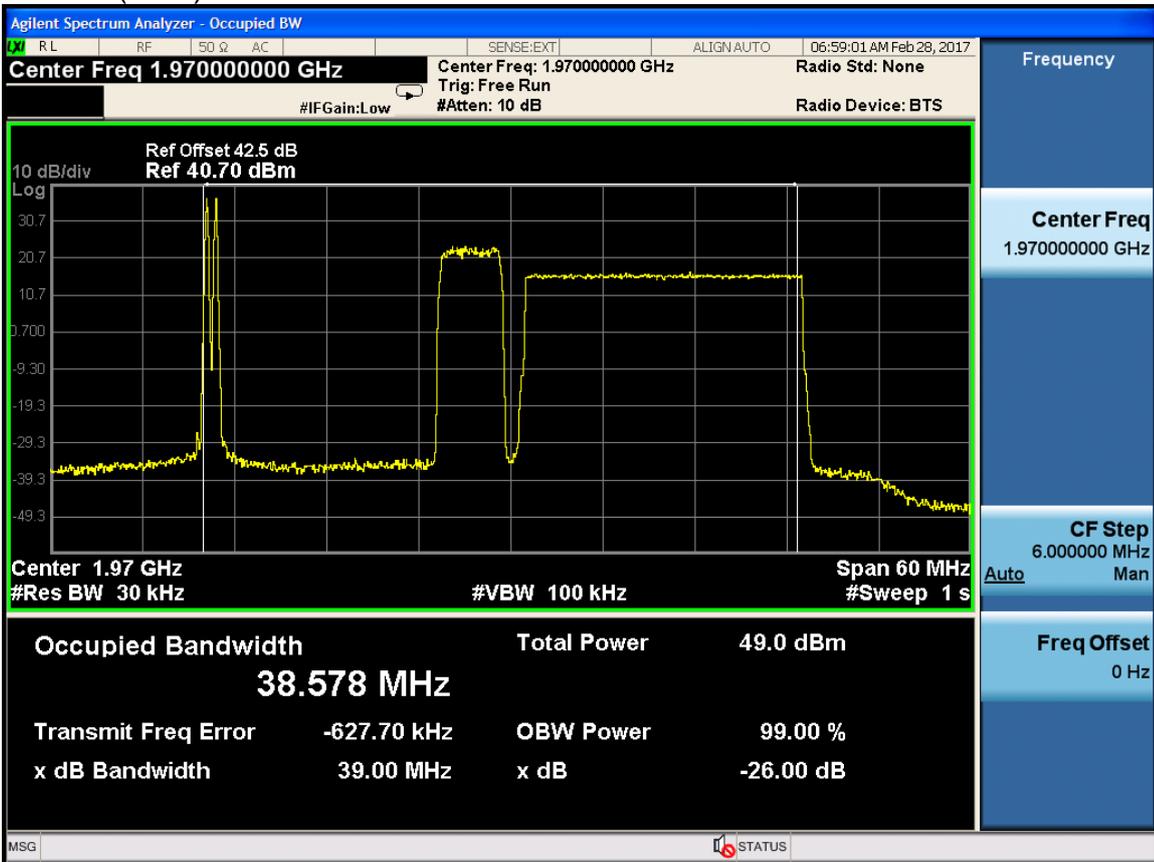
RF 40M(GUL) -Port 4-1950MHz



RF 40M(GUL) -Port 4-1960MHz



RF 40M(GUL) -Port 4-1970MHz





## 12 BAND EDGES

### 12.1 Applicable Standard: FCC §2.1051, §24.238

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  $< P - (43 + 10 \log(P)) = -13 \text{ dBm}$ .

### 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

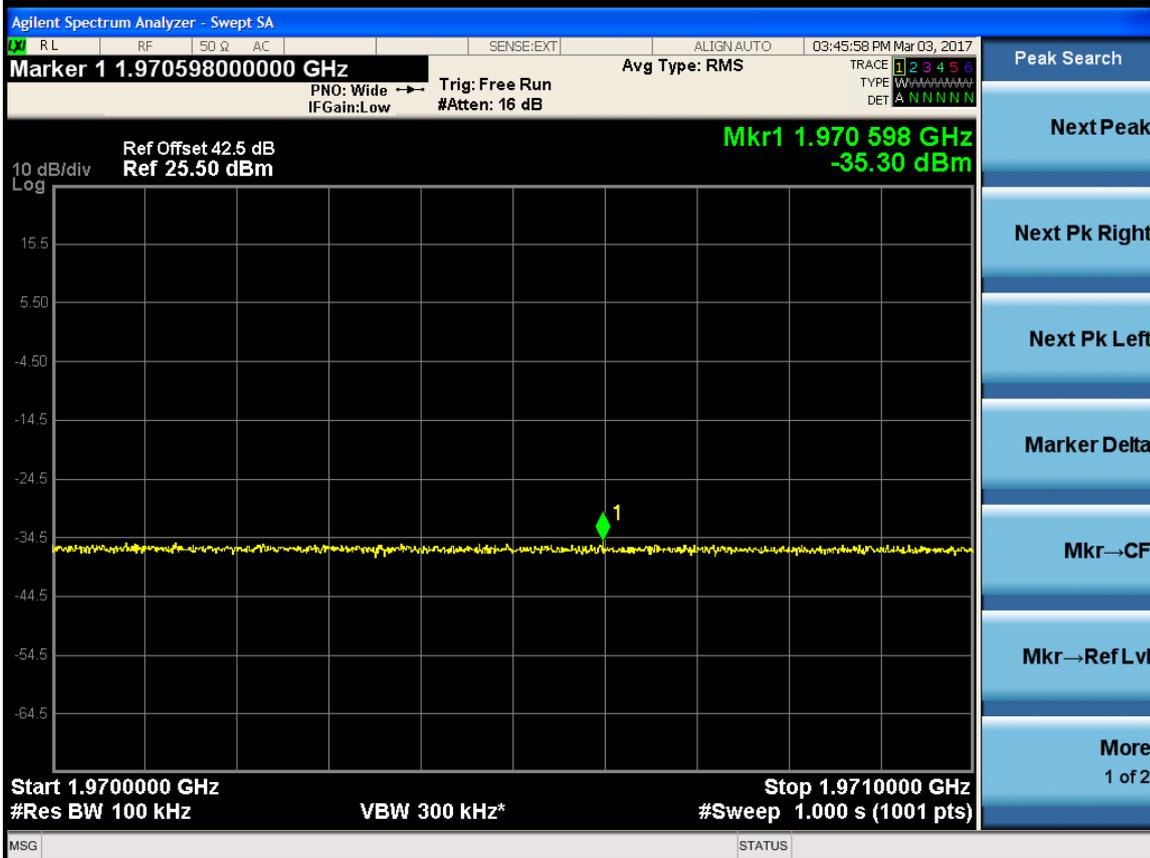
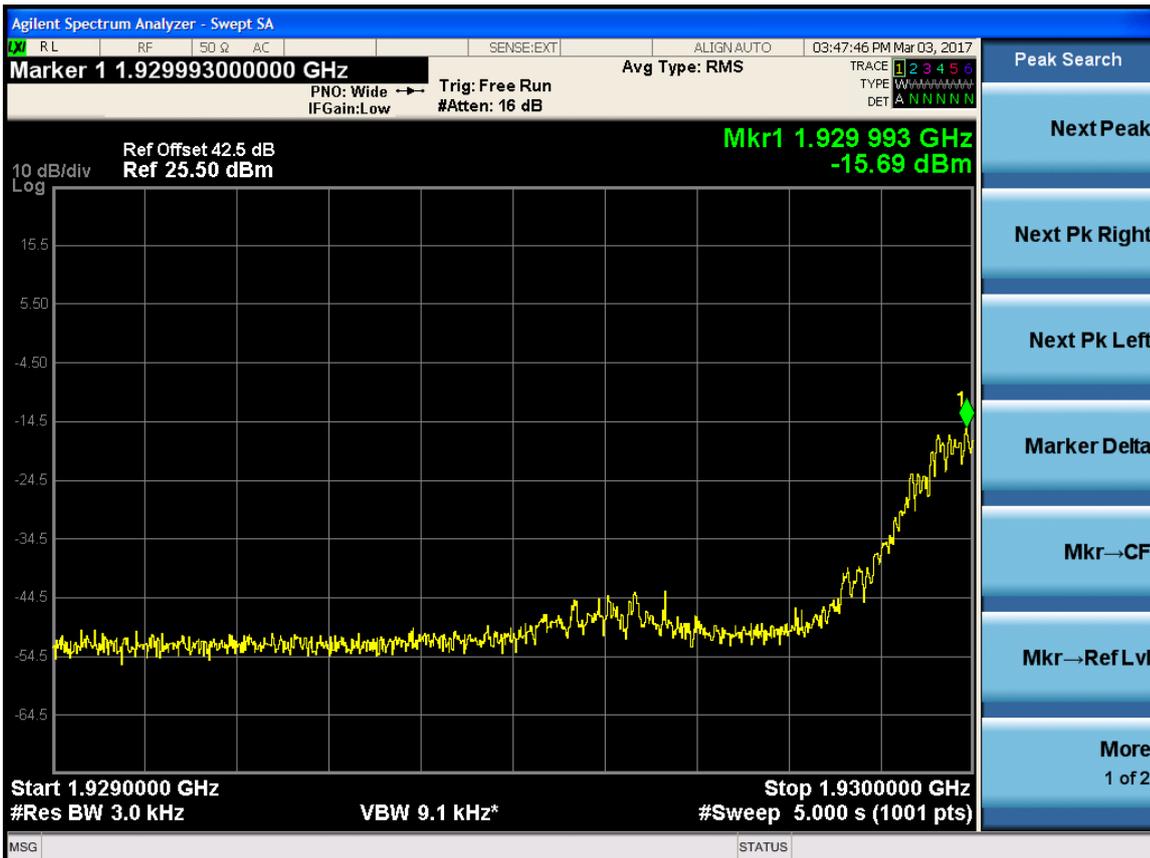
### 12.6 Test Mode: Transmitting LTE+UMTS+GSM

### 12.7 Test Data

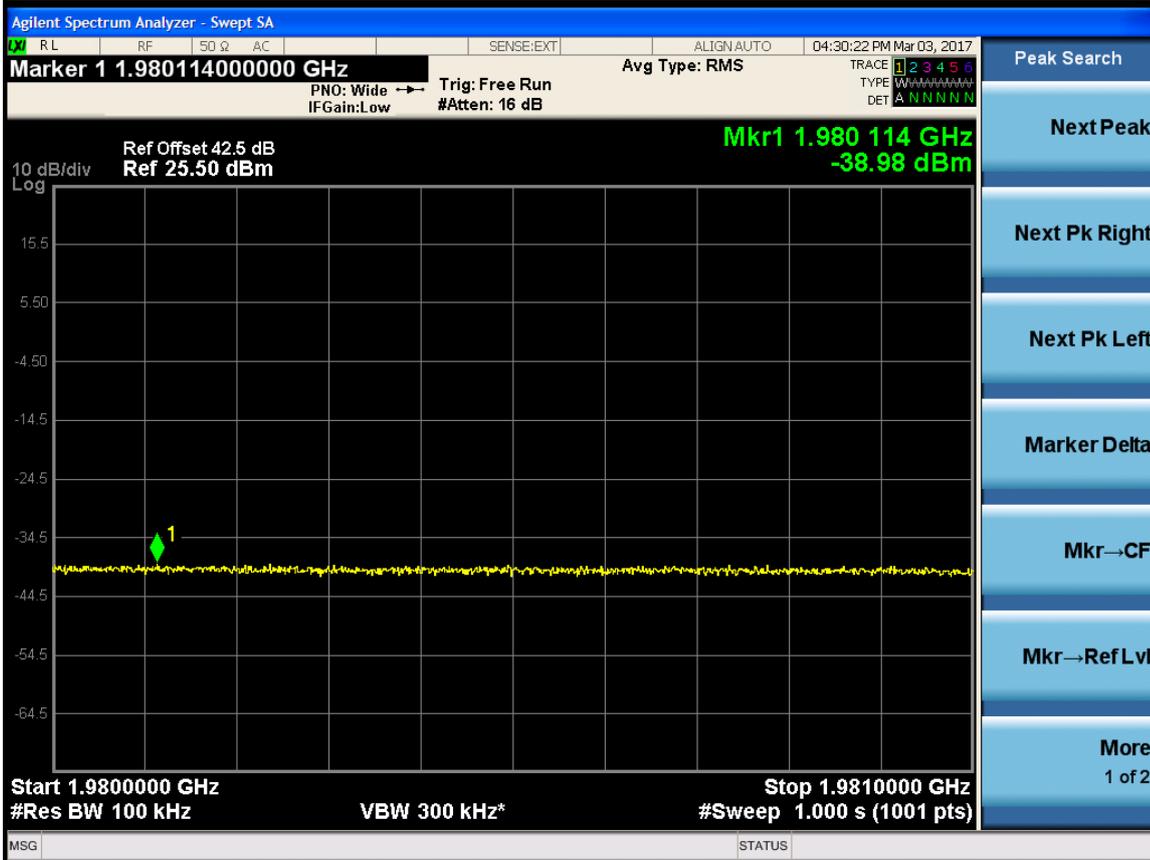
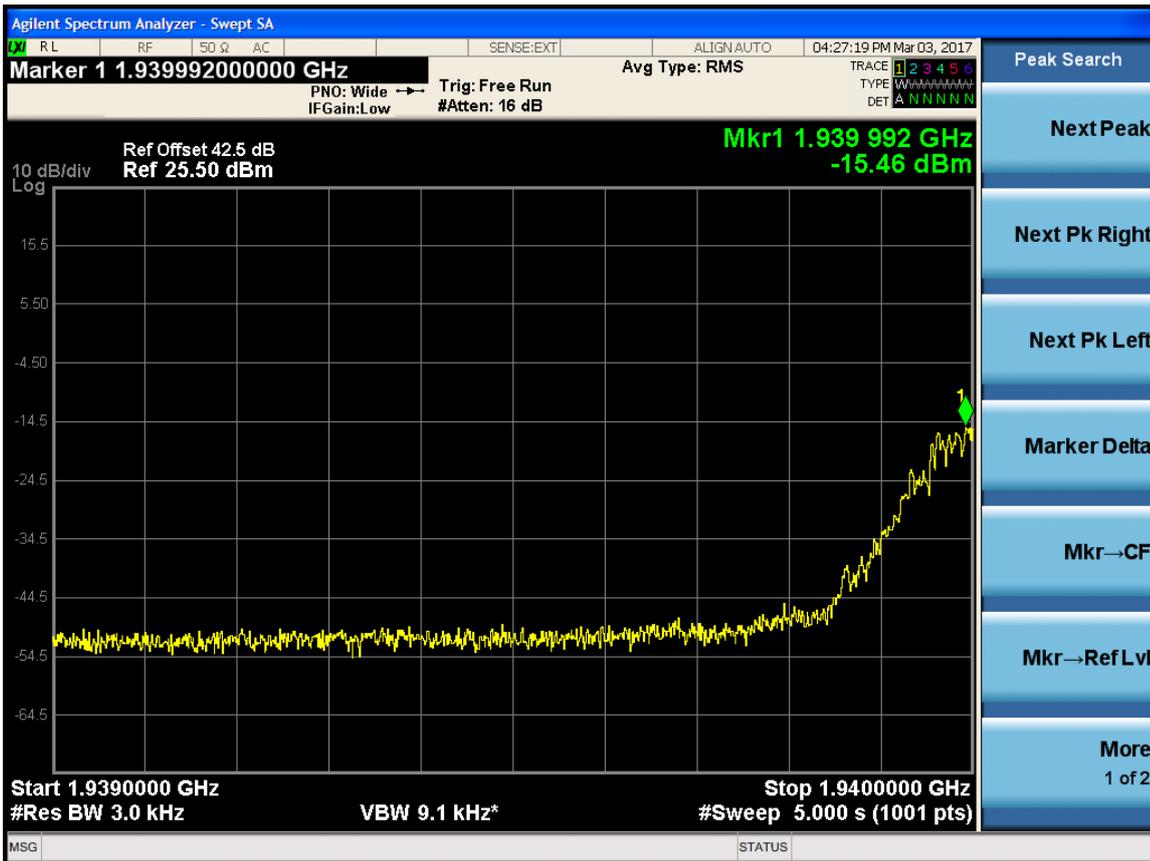
RF Bandwidth :IBW 40M(LTE +UMTS+GSM)

Port	RF Center Freq. (MHz)	Max bandedge Emission (dBm)	Limit (dBm)
1	1950	-15.69	-13
	1960	-15.46	-13
	1970	-15.32	-13
4	1950	-15.65	-13
	1960	-15.53	-13
	1970	-15.54	-13

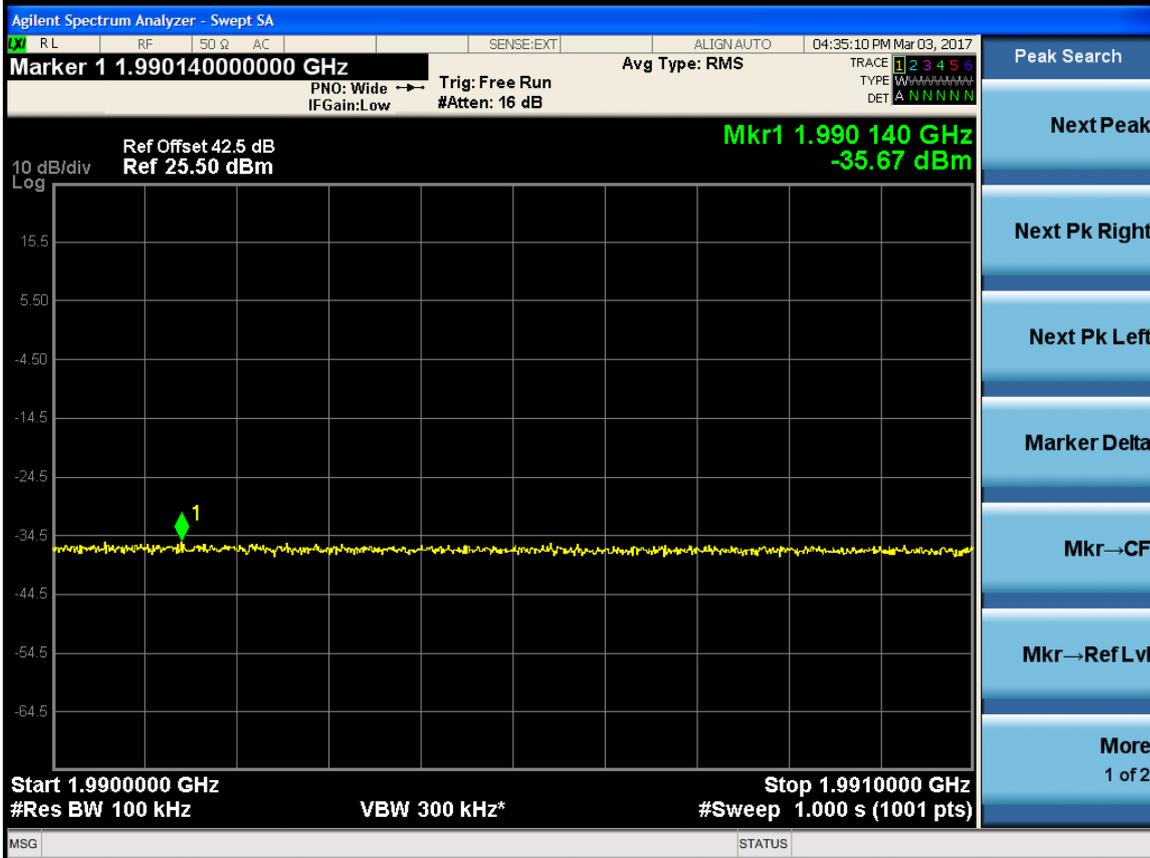
RF 40M(GUL) -Port 1-1950MHz



RF 40M(GUL) -Port 1-1960MHz

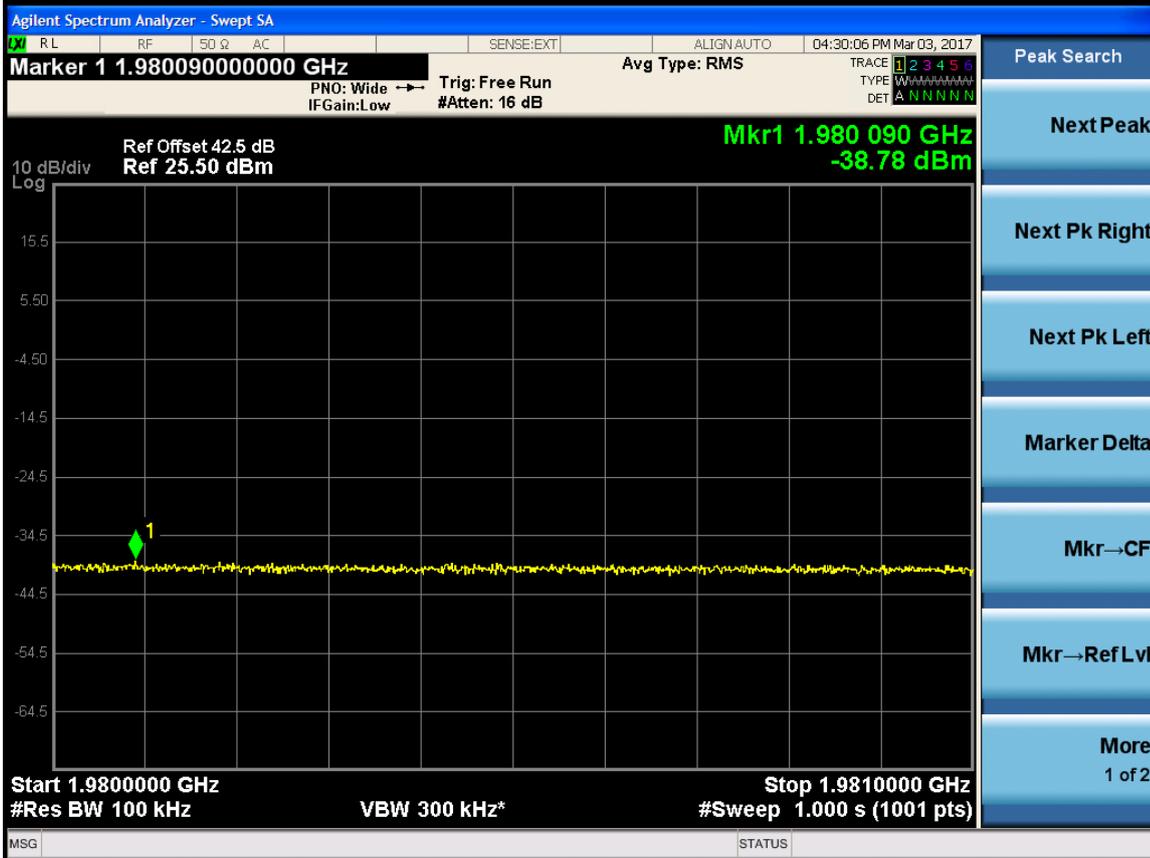


RF 40M(GUL) -Port 1-1970MHz

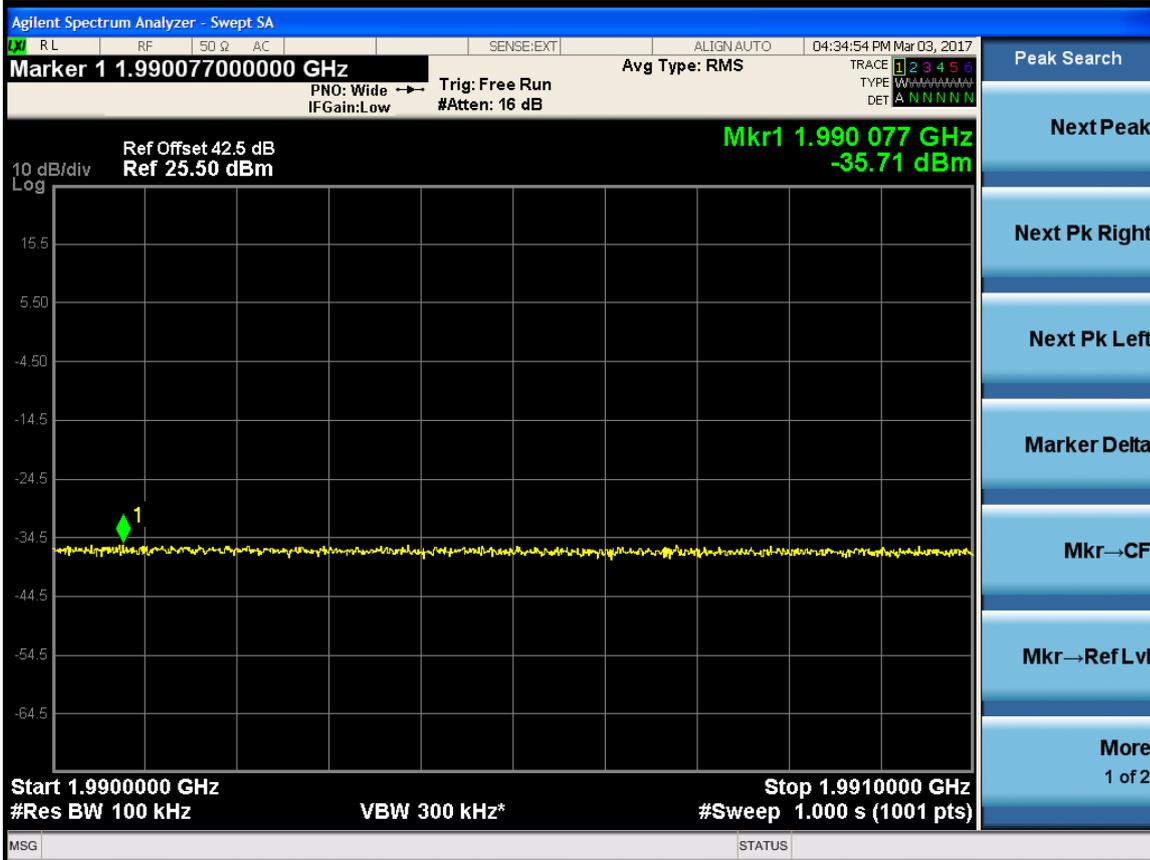


RF 40M(GUL) -Port 4-1950MHz





RF 40M(GUL) -Port 4-1970MHz





### 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
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+UMTS+GSM

#### 13.7 Test Data (LTE)

##### 13.7.1 Frequency Stability Versus Temperature

**Frequency Stability vs Temperature (RF Bandwidth:40M(LTE+UMTS+GSM) RF Frequency :1950MHz)**



Temperature (°C)	Power Supplied (V <sub>DC</sub> )	Port	LTE Frequency (MHz)	Frequency Measure Error (Hz)	E-TM	Limit (ppm)	Limit (Hz)	Result
-40	-48	1	1960	1.107	TM2.0	0.05	99.5	PASS
				1.183	TM3.1	0.05	99.5	PASS
				1.088	TM3.2	0.05	99.5	PASS
				1.265	TM3.3	0.05	99.5	PASS
		4	1960	1.534	TM2.0	0.05	99.5	PASS
				1.289	TM3.1	0.05	99.5	PASS
				1.275	TM3.2	0.05	99.5	PASS
				1.614	TM3.3	0.05	99.5	PASS
-30	-48	1	1960	1.153	TM2.0	0.05	99.5	PASS
				1.411	TM3.1	0.05	99.5	PASS
				1.014	TM3.2	0.05	99.5	PASS
				1.070	TM3.3	0.05	99.5	PASS
		4	1960	1.150	TM2.0	0.05	99.5	PASS
				1.488	TM3.1	0.05	99.5	PASS
				1.396	TM3.2	0.05	99.5	PASS
				1.383	TM3.3	0.05	99.5	PASS
-20	-48	1	1960	1.172	TM2.0	0.05	99.5	PASS
				1.162	TM3.1	0.05	99.5	PASS
				1.234	TM3.2	0.05	99.5	PASS
				1.357	TM3.3	0.05	99.5	PASS
		4	1960	1.318	TM2.0	0.05	99.5	PASS
				1.376	TM3.1	0.05	99.5	PASS
				1.077	TM3.2	0.05	99.5	PASS
				1.312	TM3.3	0.05	99.5	PASS
-10	-48	1	1960	1.162	TM2.0	0.05	99.5	PASS
				1.164	TM3.1	0.05	99.5	PASS
				1.143	TM3.2	0.05	99.5	PASS
				1.163	TM3.3	0.05	99.5	PASS
		4	1960	1.468	TM2.0	0.05	99.5	PASS
				1.476	TM3.1	0.05	99.5	PASS
				1.079	TM3.2	0.05	99.5	PASS
				1.081	TM3.3	0.05	99.5	PASS
0	-48	1	1960	1.137	TM2.0	0.05	99.5	PASS
				1.441	TM3.1	0.05	99.5	PASS
				1.225	TM3.2	0.05	99.5	PASS
				1.107	TM3.3	0.05	99.5	PASS
		4	1960	1.058	TM2.0	0.05	99.5	PASS
				1.358	TM3.1	0.05	99.5	PASS



10	1	1960	1.271	TM3.2	0.05	99.5	PASS
			1.229	TM3.3	0.05	99.5	PASS
			1.376	TM2.0	0.05	99.5	PASS
			1.239	TM3.1	0.05	99.5	PASS
			1.165	TM3.2	0.05	99.5	PASS
			1.212	TM3.3	0.05	99.5	PASS
20	4	1960	1.151	TM2.0	0.05	99.5	PASS
			1.020	TM3.1	0.05	99.5	PASS
			1.414	TM3.2	0.05	99.5	PASS
			1.333	TM3.3	0.05	99.5	PASS
30	1	1960	1.222	TM2.0	0.05	99.5	PASS
			1.308	TM3.1	0.05	99.5	PASS
			1.435	TM3.2	0.05	99.5	PASS
			1.403	TM3.3	0.05	99.5	PASS
	4	1960	1.042	TM2.0	0.05	99.5	PASS
			1.382	TM3.1	0.05	99.5	PASS
1.004			TM3.2	0.05	99.5	PASS	
1.366			TM3.3	0.05	99.5	PASS	
40	1	1960	1.293	TM2.0	0.05	99.5	PASS
			1.023	TM3.1	0.05	99.5	PASS
			1.254	TM3.2	0.05	99.5	PASS
			1.191	TM3.3	0.05	99.5	PASS
	4	1960	1.268	TM2.0	0.05	99.5	PASS
			1.064	TM3.1	0.05	99.5	PASS
1.396			TM3.2	0.05	99.5	PASS	
1.438			TM3.3	0.05	99.5	PASS	
50	1	1960	1.409	TM2.0	0.05	99.5	PASS
			1.400	TM3.1	0.05	99.5	PASS
			1.500	TM3.2	0.05	99.5	PASS
			1.103	TM3.3	0.05	99.5	PASS
	4	1960	1.229	TM2.0	0.05	99.5	PASS
			1.143	TM3.1	0.05	99.5	PASS
1.012			TM3.2	0.05	99.5	PASS	
1.370			TM3.3	0.05	99.5	PASS	
50	1	1960	1.239	TM2.0	0.05	99.5	PASS
			1.467	TM3.1	0.05	99.5	PASS
			1.280	TM3.2	0.05	99.5	PASS
			1.118	TM3.3	0.05	99.5	PASS
	4	1960	1.181	TM2.0	0.05	99.5	PASS
			1.255	TM3.1	0.05	99.5	PASS
1.330			TM3.2	0.05	99.5	PASS	
1.310			TM3.3	0.05	99.5	PASS	



55	1	1960	1.235	TM2.0	0.05	99.5	PASS
			1.409	TM3.1	0.05	99.5	PASS
			1.332	TM3.2	0.05	99.5	PASS
			1.144	TM3.3	0.05	99.5	PASS
	4	1960	1.382	TM2.0	0.05	99.5	PASS
			1.059	TM3.1	0.05	99.5	PASS
			1.118	TM3.2	0.05	99.5	PASS
			1.008	TM3.3	0.05	99.5	PASS

Frequency Stability vs Temperature (RF Bandwidth:40M(LTE+UMTS+GSM) RF Frequency :1960MHz)								
Temperature (°C)	Power Supplied (V <sub>DC</sub> )	Port	LTE Frequency (MHz)	Frequency Measure Error (Hz)	E-TM	Limit (ppm)	Limit (Hz)	Result
-40	-48	1	1970	1.310	TM2.0	0.05	99.5	PASS
				1.500	TM3.1	0.05	99.5	PASS
				1.410	TM3.2	0.05	99.5	PASS
				1.230	TM3.3	0.05	99.5	PASS
		4	1970	1.450	TM2.0	0.05	99.5	PASS
				1.036	TM3.1	0.05	99.5	PASS
				1.057	TM3.2	0.05	99.5	PASS
				1.045	TM3.3	0.05	99.5	PASS
-30	-48	1	1970	1.452	TM2.0	0.05	99.5	PASS
				1.485	TM3.1	0.05	99.5	PASS
				1.196	TM3.2	0.05	99.5	PASS
				1.182	TM3.3	0.05	99.5	PASS
		4	1970	1.176	TM2.0	0.05	99.5	PASS
				1.077	TM3.1	0.05	99.5	PASS
				1.450	TM3.2	0.05	99.5	PASS
				1.382	TM3.3	0.05	99.5	PASS
-20	-48	1	1970	1.037	TM2.0	0.05	99.5	PASS
				1.065	TM3.1	0.05	99.5	PASS
				1.152	TM3.2	0.05	99.5	PASS
				1.249	TM3.3	0.05	99.5	PASS
		4	1970	1.253	TM2.0	0.05	99.5	PASS
				1.019	TM3.1	0.05	99.5	PASS
				1.022	TM3.2	0.05	99.5	PASS
				1.460	TM3.3	0.05	99.5	PASS
-10	-48	1	1970	1.101	TM2.0	0.05	99.5	PASS
				1.292	TM3.1	0.05	99.5	PASS
				1.194	TM3.2	0.05	99.5	PASS



		4	1970	1.037	TM3.3	0.05	99.5	PASS
				1.306	TM2.0	0.05	99.5	PASS
				1.163	TM3.1	0.05	99.5	PASS
				1.285	TM3.2	0.05	99.5	PASS
				1.388	TM3.3	0.05	99.5	PASS
0		1	1970	1.417	TM2.0	0.05	99.5	PASS
				1.288	TM3.1	0.05	99.5	PASS
				1.298	TM3.2	0.05	99.5	PASS
				1.272	TM3.3	0.05	99.5	PASS
		4	1970	1.097	TM2.0	0.05	99.5	PASS
				1.310	TM3.1	0.05	99.5	PASS
				1.441	TM3.2	0.05	99.5	PASS
				1.143	TM3.3	0.05	99.5	PASS
10		1	1970	1.351	TM2.0	0.05	99.5	PASS
				1.304	TM3.1	0.05	99.5	PASS
				1.350	TM3.2	0.05	99.5	PASS
				1.101	TM3.3	0.05	99.5	PASS
		4	1970	1.379	TM2.0	0.05	99.5	PASS
				1.052	TM3.1	0.05	99.5	PASS
				1.425	TM3.2	0.05	99.5	PASS
				1.154	TM3.3	0.05	99.5	PASS
20		1	1970	1.322	TM2.0	0.05	99.5	PASS
				1.055	TM3.1	0.05	99.5	PASS
				1.173	TM3.2	0.05	99.5	PASS
				1.313	TM3.3	0.05	99.5	PASS
		4	1970	1.185	TM2.0	0.05	99.5	PASS
				1.163	TM3.1	0.05	99.5	PASS
				1.240	TM3.2	0.05	99.5	PASS
				1.494	TM3.3	0.05	99.5	PASS
30		1	1970	1.207	TM2.0	0.05	99.5	PASS
				1.360	TM3.1	0.05	99.5	PASS
				1.050	TM3.2	0.05	99.5	PASS
				1.254	TM3.3	0.05	99.5	PASS
		4	1970	1.041	TM2.0	0.05	99.5	PASS
				1.053	TM3.1	0.05	99.5	PASS
				1.459	TM3.2	0.05	99.5	PASS
				1.375	TM3.3	0.05	99.5	PASS
40		1	1970	1.097	TM2.0	0.05	99.5	PASS
				1.036	TM3.1	0.05	99.5	PASS
				1.450	TM3.2	0.05	99.5	PASS
				1.415	TM3.3	0.05	99.5	PASS
		4	1970	1.365	TM2.0	0.05	99.5	PASS





-20	1	1980	1.213	TM2.0	0.05	99.5	PASS
			1.261	TM3.1	0.05	99.5	PASS
			1.365	TM3.2	0.05	99.5	PASS
			1.383	TM3.3	0.05	99.5	PASS
	4	1980	1.271	TM2.0	0.05	99.5	PASS
			1.151	TM3.1	0.05	99.5	PASS
			1.162	TM3.2	0.05	99.5	PASS
			1.451	TM3.3	0.05	99.5	PASS
-10	1	1980	1.283	TM2.0	0.05	99.5	PASS
			1.303	TM3.1	0.05	99.5	PASS
			1.118	TM3.2	0.05	99.5	PASS
			1.008	TM3.3	0.05	99.5	PASS
	4	1980	1.404	TM2.0	0.05	99.5	PASS
			1.006	TM3.1	0.05	99.5	PASS
			1.264	TM3.2	0.05	99.5	PASS
			1.070	TM3.3	0.05	99.5	PASS
0	1	1980	1.256	TM2.0	0.05	99.5	PASS
			1.014	TM3.1	0.05	99.5	PASS
			1.251	TM3.2	0.05	99.5	PASS
			1.037	TM3.3	0.05	99.5	PASS
	4	1980	1.493	TM2.0	0.05	99.5	PASS
			1.331	TM3.1	0.05	99.5	PASS
			1.278	TM3.2	0.05	99.5	PASS
			1.232	TM3.3	0.05	99.5	PASS
10	1	1980	1.437	TM2.0	0.05	99.5	PASS
			1.153	TM3.1	0.05	99.5	PASS
			1.238	TM3.2	0.05	99.5	PASS
			1.276	TM3.3	0.05	99.5	PASS
	4	1980	1.046	TM2.0	0.05	99.5	PASS
			1.093	TM3.1	0.05	99.5	PASS
			1.229	TM3.2	0.05	99.5	PASS
			1.473	TM3.3	0.05	99.5	PASS
20	1	1980	1.108	TM2.0	0.05	99.5	PASS
			1.009	TM3.1	0.05	99.5	PASS
			1.328	TM3.2	0.05	99.5	PASS
			1.077	TM3.3	0.05	99.5	PASS
	4	1980	1.389	TM2.0	0.05	99.5	PASS
			1.455	TM3.1	0.05	99.5	PASS
			1.454	TM3.2	0.05	99.5	PASS
			1.311	TM3.3	0.05	99.5	PASS
30	1	1980	1.301	TM2.0	0.05	99.5	PASS
			1.459	TM3.1	0.05	99.5	PASS



		4	1980	1.375	TM3.2	0.05	99.5	PASS
				1.144	TM3.3	0.05	99.5	PASS
				1.460	TM2.0	0.05	99.5	PASS
				1.082	TM3.1	0.05	99.5	PASS
				1.081	TM3.2	0.05	99.5	PASS
				1.011	TM3.3	0.05	99.5	PASS
40		1	1980	1.235	TM2.0	0.05	99.5	PASS
				1.041	TM3.1	0.05	99.5	PASS
				1.351	TM3.2	0.05	99.5	PASS
				1.214	TM3.3	0.05	99.5	PASS
		4	1980	1.061	TM2.0	0.05	99.5	PASS
				1.500	TM3.1	0.05	99.5	PASS
				1.388	TM3.2	0.05	99.5	PASS
				1.291	TM3.3	0.05	99.5	PASS
50		1	1980	1.399	TM2.0	0.05	99.5	PASS
				1.324	TM3.1	0.05	99.5	PASS
				1.463	TM3.2	0.05	99.5	PASS
				1.136	TM3.3	0.05	99.5	PASS
		4	1980	1.263	TM2.0	0.05	99.5	PASS
				1.384	TM3.1	0.05	99.5	PASS
				1.457	TM3.2	0.05	99.5	PASS
				1.034	TM3.3	0.05	99.5	PASS
55		1	1980	1.254	TM2.0	0.05	99.5	PASS
				1.158	TM3.1	0.05	99.5	PASS
				1.408	TM3.2	0.05	99.5	PASS
				1.299	TM3.3	0.05	99.5	PASS
		4	1980	1.360	TM2.0	0.05	99.5	PASS
				1.371	TM3.1	0.05	99.5	PASS
				1.289	TM3.2	0.05	99.5	PASS
				1.123	TM3.3	0.05	99.5	PASS

**13.7.2 Frequency Stability Versus Voltage**

Frequency Stability vs Voltage (RF Bandwidth:40M(LTE+UMTS+GSM) RF Frequency :1950MHz)								
Power Supplied (V <sub>DC</sub> )	Temperature (°C)	Port	LTE Frequency(MHz)	Frequency Measure Error (Hz)	E-TM	Limit (ppm)	Limit (Hz)	Result
-37	20	1	1960	1.352	TM2.0	0.05	99.5	PASS
				1.046	TM3.1	0.05	99.5	PASS



		4	1960	1.133	TM3.2	0.05	99.5	PASS
				1.231	TM3.3	0.05	99.5	PASS
				1.183	TM2.0	0.05	99.5	PASS
				1.406	TM3.1	0.05	99.5	PASS
				1.352	TM3.2	0.05	99.5	PASS
				1.171	TM3.3	0.05	99.5	PASS
-42	1	1960	1.090	TM2.0	0.05	99.5	PASS	
			1.424	TM3.1	0.05	99.5	PASS	
			1.408	TM3.2	0.05	99.5	PASS	
			1.364	TM3.3	0.05	99.5	PASS	
	4	1960	1.080	TM2.0	0.05	99.5	PASS	
			1.043	TM3.1	0.05	99.5	PASS	
1.313			TM3.2	0.05	99.5	PASS		
-48	1	1960	1.128	TM3.3	0.05	99.5	PASS	
			1.203	TM2.0	0.05	99.5	PASS	
			1.219	TM3.1	0.05	99.5	PASS	
			1.007	TM3.2	0.05	99.5	PASS	
	4	1960	1.440	TM3.3	0.05	99.5	PASS	
			1.343	TM2.0	0.05	99.5	PASS	
1.238			TM3.1	0.05	99.5	PASS		
-54	1	1960	1.083	TM3.2	0.05	99.5	PASS	
			1.378	TM3.3	0.05	99.5	PASS	
			1.423	TM2.0	0.05	99.5	PASS	
			1.209	TM3.1	0.05	99.5	PASS	
	4	1960	1.459	TM3.2	0.05	99.5	PASS	
			1.204	TM3.3	0.05	99.5	PASS	
1.465			TM2.0	0.05	99.5	PASS		
-60	1	1960	1.114	TM3.1	0.05	99.5	PASS	
			1.062	TM3.2	0.05	99.5	PASS	
			1.017	TM3.3	0.05	99.5	PASS	
			1.075	TM2.0	0.05	99.5	PASS	
	4	1960	1.389	TM3.1	0.05	99.5	PASS	
			1.005	TM3.2	0.05	99.5	PASS	
1.081			TM3.3	0.05	99.5	PASS		
				1.227	TM2.0	0.05	99.5	PASS
				1.393	TM3.1	0.05	99.5	PASS
				1.495	TM3.2	0.05	99.5	PASS
				1.080	TM3.3	0.05	99.5	PASS

**Frequency Stability vs Voltage (RF Bandwidth:40M(LTE+UMTS+GSM) RF  
Frequency :1960MHz)**



Power Supplied (V <sub>DC</sub> )	Temperature (°C)	Port	LTE Frequency (MHz)	Frequency Measure Error (Hz)	E-TM	Limit (ppm)	Limit (Hz)	Result
-37	20	1	1970	1.029	TM2.0	0.05	99.5	PASS
				1.236	TM3.1	0.05	99.5	PASS
				1.347	TM3.2	0.05	99.5	PASS
				1.065	TM3.3	0.05	99.5	PASS
		4	1970	1.019	TM2.0	0.05	99.5	PASS
				1.358	TM3.1	0.05	99.5	PASS
				1.298	TM3.2	0.05	99.5	PASS
				1.323	TM3.3	0.05	99.5	PASS
-42	20	1	1970	1.199	TM2.0	0.05	99.5	PASS
				1.049	TM3.1	0.05	99.5	PASS
				1.171	TM3.2	0.05	99.5	PASS
				1.497	TM3.3	0.05	99.5	PASS
		4	1970	1.023	TM2.0	0.05	99.5	PASS
				1.235	TM3.1	0.05	99.5	PASS
				1.357	TM3.2	0.05	99.5	PASS
				1.317	TM3.3	0.05	99.5	PASS
-48	20	1	1970	1.163	TM2.0	0.05	99.5	PASS
				1.044	TM3.1	0.05	99.5	PASS
				1.282	TM3.2	0.05	99.5	PASS
				1.387	TM3.3	0.05	99.5	PASS
		4	1970	1.442	TM2.0	0.05	99.5	PASS
				1.082	TM3.1	0.05	99.5	PASS
				1.172	TM3.2	0.05	99.5	PASS
				1.404	TM3.3	0.05	99.5	PASS
-54	20	1	1970	1.286	TM2.0	0.05	99.5	PASS
				1.341	TM3.1	0.05	99.5	PASS
				1.132	TM3.2	0.05	99.5	PASS
				1.259	TM3.3	0.05	99.5	PASS
		4	1970	1.014	TM2.0	0.05	99.5	PASS
				1.065	TM3.1	0.05	99.5	PASS
				1.306	TM3.2	0.05	99.5	PASS
				1.411	TM3.3	0.05	99.5	PASS
-60	20	1	1970	1.380	TM2.0	0.05	99.5	PASS
				1.086	TM3.1	0.05	99.5	PASS
				1.269	TM3.2	0.05	99.5	PASS
				1.062	TM3.3	0.05	99.5	PASS
		4	1970	1.457	TM2.0	0.05	99.5	PASS



				1.318	TM3.1	0.05	99.5	PASS
				1.196	TM3.2	0.05	99.5	PASS
				1.181	TM3.3	0.05	99.5	PASS

**Frequency Stability vs Voltage (RF Bandwidth:40M(LTE+UMTS+GSM) RF  
Frequency :1970MHz)**

Power Supplied (V <sub>DC</sub> )	Temperature (°C)	Port	LTE Frequency(MHz)	Frequency Measure Error (Hz)	E-TM	Limit (ppm)	Limit (Hz)	Result	
-37	20	1	1980	1.360	TM2.0	0.05	99.5	PASS	
				1.259	TM3.1	0.05	99.5	PASS	
				1.189	TM3.2	0.05	99.5	PASS	
				1.167	TM3.3	0.05	99.5	PASS	
		4	1980	1.298	TM2.0	0.05	99.5	PASS	
				1.069	TM3.1	0.05	99.5	PASS	
				1.152	TM3.2	0.05	99.5	PASS	
-42		1	1980	1.117	TM3.3	0.05	99.5	PASS	
				1.025	TM2.0	0.05	99.5	PASS	
				1.253	TM3.2	0.05	99.5	PASS	
				1.180	TM3.3	0.05	99.5	PASS	
			4	1980	1.188	TM2.0	0.05	99.5	PASS
					1.500	TM3.1	0.05	99.5	PASS
					1.248	TM3.2	0.05	99.5	PASS
-48	1	1980	1.057	TM3.3	0.05	99.5	PASS		
			1.462	TM2.0	0.05	99.5	PASS		
			1.435	TM3.1	0.05	99.5	PASS		
			1.147	TM3.2	0.05	99.5	PASS		
		4	1980	1.156	TM3.3	0.05	99.5	PASS	
				1.032	TM2.0	0.05	99.5	PASS	
				1.003	TM3.1	0.05	99.5	PASS	
-54	1	1980	1.162	TM3.2	0.05	99.5	PASS		
			1.493	TM2.0	0.05	99.5	PASS		
			1.330	TM3.1	0.05	99.5	PASS		
			1.178	TM3.2	0.05	99.5	PASS		
		4	1980	1.176	TM3.3	0.05	99.5	PASS	
				1.282	TM2.0	0.05	99.5	PASS	
				1.171	TM3.1	0.05	99.5	PASS	



-60	1	1980	1.452	TM3.2	0.05	99.5	PASS
			1.271	TM3.3	0.05	99.5	PASS
			1.126	TM2.0	0.05	99.5	PASS
			1.364	TM3.1	0.05	99.5	PASS
			1.415	TM3.2	0.05	99.5	PASS
			1.420	TM3.3	0.05	99.5	PASS
	4	1980	1.066	TM2.0	0.05	99.5	PASS
			1.053	TM3.1	0.05	99.5	PASS
			1.255	TM3.2	0.05	99.5	PASS
			1.096	TM3.3	0.05	99.5	PASS

**13.8 Test Data (UMTS)**

**13.8.1 Frequency Stability Versus Temperature**

Frequency Stability vs. Temperature					
Temperature °C	Power Supplied VDC	Frequency Measure Error Hz	Limit (ppm)	Limit (Hz)	Result
<b>B(1947.4MHz)</b>					
-40	-48	-3.8	0.05	97.37	PASS
-30	-48	-2.5	0.05	97.37	PASS
-20	-48	-4.6	0.05	97.37	PASS
-10	-48	3.2	0.05	97.37	PASS
0	-48	2.2	0.05	97.37	PASS
10	-48	-3.6	0.05	97.37	PASS
20	-48	3.4	0.05	97.37	PASS
30	-48	-4.5	0.05	97.37	PASS
40	-48	-3.6	0.05	97.37	PASS
50	-48	3.3	0.05	97.37	PASS
55	-48	-3.2	0.05	97.37	PASS
<b>M(1957.4MHz)</b>					
-40	-48	3.5	0.05	97.87	PASS
-30	-48	-2.8	0.05	97.87	PASS
-20	-48	-4.4	0.05	97.87	PASS
-10	-48	3.8	0.05	97.87	PASS
0	-48	-3.6	0.05	97.87	PASS
10	-48	2.8	0.05	97.87	PASS
20	-48	-4.8	0.05	97.87	PASS
30	-48	-3.9	0.05	97.87	PASS
40	-48	-4.7	0.05	97.87	PASS
50	-48	3.7	0.05	97.87	PASS
55	-48	5.1	0.05	97.87	PASS
<b>T (1967.4MHz)</b>					



-40	-48	-4.9	0.05	98.37	PASS
-30	-48	3.6	0.05	98.37	PASS
-20	-48	4.8	0.05	98.37	PASS
-10	-48	-5.5	0.05	98.37	PASS
0	-48	2.8	0.05	98.37	PASS
10	-48	3.5	0.05	98.37	PASS
20	-48	-5.3	0.05	98.37	PASS
30	-48	-3.9	0.05	98.37	PASS
40	-48	3.5	0.05	98.37	PASS
50	-48	-4.2	0.05	98.37	PASS
55	-48	-5.6	0.05	98.37	PASS

### 13.8.2 Frequency Stability Versus Voltage

Frequency Stability vs. Voltage					
Voltage Vdc	Temperature	Frequency Measure Error Hz	Limit ( ppm)	Limit ( Hz)	Result
<b>B(1947.4M)</b>					
-37	20	-5.5	0.05	97.37	
-42	20	-3.6	0.05	97.37	PASS
-48	20	-4.2	0.05	97.37	PASS
-54	20	3.8	0.05	97.37	PASS
-60	20	3.6	0.05	97.37	PASS
<b>M(1957.4M)</b>					
-37	20	-4.8	0.05	97.87	PASS
-42	20	-4.5	0.05	97.87	PASS
-48	20	-5.2	0.05	97.87	PASS
-54	20	4.2	0.05	97.87	PASS
-60	20	-3.5	0.05	97.87	PASS
<b>T(1967.4M)</b>					
-37	20	-4.2	0.05	98.37	PASS
-42	20	3.7	0.05	98.37	PASS
-48	20	-4.9	0.05	98.37	PASS
-54	20	-4.3	0.05	98.37	PASS
-60	20	5.6	0.05	98.37	PASS

### 13.9 Test Data (GSM)

#### 13.9.1 Frequency Stability Versus Temperature

Frequency Stability vs. Temperature					
Temperature °C	Power Supplied VDC	Frequency Measure Error Hz	Limit ( ppm)	Limit ( Hz)	Result
<b>B(1930.2MHz)</b>					
-40	-48	-0.39	0.05	96.51	PASS



-30	-48	1.07	0.05	96.51	PASS
-20	-48	-0.26	0.05	96.51	PASS
-10	-48	-0.54	0.05	96.51	PASS
0	-48	-0.21	0.05	96.51	PASS
10	-48	0.88	0.05	96.51	PASS
20	-48	0.75	0.05	96.51	PASS
30	-48	0.68	0.05	96.51	PASS
40	-48	-0.46	0.05	96.51	PASS
50	-48	-1.15	0.05	96.51	PASS
55	-48	-0.86	0.05	96.51	PASS
<b>M(1940.2MHz)</b>					
-40	-48	0.78	0.05	97.01	PASS
-30	-48	0.96	0.05	97.01	PASS
-20	-48	-0.59	0.05	97.01	PASS
-10	-48	0.15	0.05	97.01	PASS
0	-48	-1.12	0.05	97.01	PASS
10	-48	1.88	0.05	97.01	PASS
20	-48	0.68	0.05	97.01	PASS
30	-48	-1.55	0.05	97.01	PASS
40	-48	-0.36	0.05	97.01	PASS
50	-48	2.16	0.05	97.01	PASS
55	-48	2.23	0.05	97.01	PASS
<b>T (1950.2MHz)</b>					
-40	-48	0.99	0.05	97.51	PASS
-30	-48	0.87	0.05	97.51	PASS
-20	-48	-0.58	0.05	97.51	PASS
-10	-48	-0.45	0.05	97.51	PASS
0	-48	1.48	0.05	97.51	PASS
10	-48	-1.11	0.05	97.51	PASS
20	-48	-0.13	0.05	97.51	PASS
30	-48	0.77	0.05	97.51	PASS
40	-48	-0.47	0.05	97.51	PASS
50	-48	0.94	0.05	97.51	PASS
55	-48	0.92	0.05	97.51	PASS

**13.9.2 Frequency Stability Versus Voltage**

<b>Frequency Stability vs. Voltage</b>					
<b>Voltage Vdc</b>	<b>Temperature</b>	<b>Frequency Measure Error Hz</b>	<b>Limit ( ppm)</b>	<b>Limit ( Hz)</b>	<b>Result</b>
<b>B(1930.2M)</b>					
-37	20	0.76	0.05	96.51	PASS
-42	20	0.84	0.05	96.51	PASS



-48	20	-1.21	0.05	96.51	PASS
-54	20	1.76	0.05	96.51	PASS
-60	20	-0.58	0.05	96.51	PASS
<b>M(1940.2M)</b>					
-37	20	-1.69	0.05	97.01	PASS
-42	20	-1.15	0.05	97.01	PASS
-48	20	1.86	0.05	97.01	PASS
-54	20	0.88	0.05	97.01	PASS
-60	20	0.95	0.05	97.01	PASS
<b>T(1950.2M)</b>					
-37	20	0.75	0.05	97.51	PASS
-42	20	1.52	0.05	97.51	PASS
-48	20	-0.79	0.05	97.51	PASS
-54	20	-0.61	0.05	97.51	PASS
-60	20	1.04	0.05	97.51	PASS

---End of Report---