

**TEST REPORT  
FCC Part 27**

Report Reference No.....: HK2205182093-13E

FCC ID.....: 2AU4T-T8

Compiled by  
( position+printedname+signature)....: File administrators Gary QianSupervised by  
(position+printedname+signature)....: Technique principal Eden HuApproved by  
(position+printedname+signature)....: Manager Jason Zhou

Date of issue.....: Jun. 14, 2022

Testing Laboratory Name .....: Shenzhen HUAKE Testing Technology Co., Ltd.

Address.....: 1-2/F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park,  
Heping, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

Applicant's name.....: Shanghai TUGE Data Technologies Co., Ltd.

Address .....: Room 316, Lane 302, Lane 838, Shuyuan Town, Pudong New Area,  
Shanghai, China

Test specification .....

Standard .....: FCC CFR Title 47 Part 2, Part 27

TRF Originator.....: Shenzhen HUAKE Testing Technology Co., Ltd.

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Test item description .....: 4G Global Pocket WiFi

Trade Mark .....: N/A

Manufacturer.....: Shanghai Stoneoim Intelligent Technology Co., Ltd

Model/Type reference.....: T8

Series Models .....: N/A

Modulation Type .....: QPSK, 16QAM

Rating .....: DC 5V from Type-C or DC 3.8V from battery

Hardware version .....: V2.0

Software version.....: V2.0

Result.....: **PASS**

**TEST REPORT**

|                          |                         |               |
|--------------------------|-------------------------|---------------|
| <b>Test Report No. :</b> | <b>HK2205182093-13E</b> | Jun. 14, 2022 |
|                          |                         | Date of issue |

Equipment under Test : 4G Global Pocket WiFi

Model /Type : T8

Series Models : N/A

**Applicant** : **Shanghai TUGE Data Technologies Co., Ltd.**

Address : Room 316, Lane 302, Lane 838, Shuyuan Town, Pudong  
New Area, Shanghai, China

**Manufacturer** : **Shanghai Stoneoim Intelligent Technology Co.,Ltd**

Address : Floors 11, building 7, Innovation and Intelligence Center,  
No.410, Yunzhen Road, Songjiang District, Shanghai,  
China

|                     |             |
|---------------------|-------------|
| <b>Test Result:</b> | <b>PASS</b> |
|---------------------|-------------|

The test report merely corresponds to the test sample.  
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

**\*\* Modified History \*\***

| Revision     | Description                 | Issued Data   | Remark     |
|--------------|-----------------------------|---------------|------------|
| Revision 1.0 | Initial Test Report Release | Jun. 14, 2022 | Jason Zhou |
|              |                             |               |            |
|              |                             |               |            |



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## **1 TEST STANDARDS**

The tests were performed according to following standards:

[FCC Part 2](#): FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS

[FCC Part 27](#): MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES

[ANSI/TIA-603-E-2016](#): Land Mobile FM or PM Communications Equipment Measurement and Performance Standards.

[ANSI C63.26-2015](#): IEEE/ANSI Standard for Compliance Testing of Transmitters Used in Licensed Radio Services

[FCC KDB 971168 D01 v03r01](#): Power Meas License Digital Systems



## 2 SUMMARY

### 2.1 General Remarks

|                                |   |               |
|--------------------------------|---|---------------|
| Date of receipt of test sample | : | May. 09, 2022 |
|                                |   |               |
| Testing commenced on           | : | May. 09, 2022 |
|                                |   |               |
| Testing concluded on           | : | Jun. 14, 2022 |

### 2.2 Product Description

The Shanghai TUGE Data Technologies Co., Ltd.'s Model:T8 or the "EUT" as referred to in this report; more general information as follows, for more details, refer to the user's manual of the EUT.

|                          |                                           |
|--------------------------|-------------------------------------------|
| Name of EUT              | 4G Global Pocket WiFi                     |
| Model/Type reference:    | T8                                        |
| Series Models:           | N/A                                       |
| Power supply:            | DC 5V from Type-C or DC 3.8V from battery |
| Modulation Type          | QPSK, 16QAM                               |
| Antenna Type             | Internal Antenna                          |
| Antenna Gain             | 1dBi                                      |
| Operation Frequency Band | LTE Band 41                               |
| Operation frequency      | LTE Band 41:2496-2690MHz                  |
| LTE Release              | R8                                        |
| Extreme temp. Tolerance  | -30°C to +50°C                            |
| Extreme vol. Limits      | 4.5VDC to 5.5VDC (nominal: 5.0VDC)        |

Note: EUT used the same communication chip, test data as same as report HK2205182092-12E

### 2.3 Equipment under Test

#### Power supply system utilised

|                      |   |                                                                   |                                 |
|----------------------|---|-------------------------------------------------------------------|---------------------------------|
| Power supply voltage | : | <input type="radio"/> 120V/ 60 Hz                                 | <input type="radio"/> 115V/60Hz |
|                      |   | <input type="radio"/> 12 V DC                                     | <input type="radio"/> 24 V DC   |
|                      |   | <input checked="" type="radio"/> Other (specified in blank below) |                                 |

DC 5V from Type-C or DC 3.8V from battery



## 2.4 Normal Accessory setting

Fully charged battery was used during the test.

## 2.5 EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

- - supplied by the manufacturer
- - supplied by the lab

|               |                |   |
|---------------|----------------|---|
| ○ Power Cable | Length (m) :   | / |
|               | Shield :       | / |
|               | Detachable :   | / |
| ○ Multimeter  | Manufacturer : | / |
|               | Model No. :    | / |

## 2.6 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended filing to comply with FCC Part 27, Rules.

## 2.7 Modifications

No modifications were implemented to meet testing criteria.

## 2.8 General Test Conditions/Configurations

### 2.9.1 Test Environment

| Environment Parameter | Selected Values During Tests |         |
|-----------------------|------------------------------|---------|
| Relative Humidity     | Ambient                      |         |
| Temperature           | TN                           | Ambient |
| Voltage               | VL                           | 4.5V    |
|                       | VN                           | 5.0V    |
|                       | VH                           | 5.5V    |

NOTE: VL=lower extreme test voltage VN=nominal voltage  
VH=upper extreme test voltage TN=normal temperature



### 3 TEST ENVIRONMENT

#### 3.1 Information of The Test Laboratory

Shenzhen HUAKE Testing Technology Co., Ltd.  
Add.: 1-2/F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping,  
Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

Testing Laboratory Authorization:

A2LA Accreditation Code is 4781.01.  
FCC Designation Number is CN1229.  
Canada IC CAB identifier is CN0045.  
CNAS Registration Number is L9589.

#### 3.2 Test Description

| Test Item                               | FCCRuleNo.                 | Verdict |
|-----------------------------------------|----------------------------|---------|
| Effective(Isotropic)RadiatedOutputPower | Part 2.1046<br>27.50(h)(2) | Pass    |
| Peak-AverageRatio                       | Part 2.1046                | Pass    |
| ModulationCharacteristics               | §2.1047                    | N/A     |
| Bandwidth                               | Part 2.1049                | Pass    |
| BandEdgesCompliance                     | Part 2.1051<br>27.53(m)    | Pass    |
| SpuriousEmissionatAntennaTerminals      | Part 2.1051<br>27.53(m)    | Pass    |
| Field Strengthof Spurious<br>Radiation  | Part 2.1053<br>27.53(m)    | Pass    |
| Frequency Stability                     | Part 2.1055<br>27.54       | Pass    |

NOTE 1:For the verdict,the“N/A”denotes“not applicable”,the“N/T”denotes “nottested”.

Remark:

1. The measurement uncertainty is not included in the test result.





### 3.3 Equipments Used during the Test

| Test Equipment                  | Manufacturer | Model No.            | Serial No. | Calibration Date | Calibration Due Date |
|---------------------------------|--------------|----------------------|------------|------------------|----------------------|
| LISN                            | R&S          | ENV216               | HKE-059    | 2022/02/18       | 2023/02/17           |
| LISN                            | R&S          | ENV216               | HKE-002    | 2022/02/18       | 2023/02/17           |
| Receiver                        | R&S          | ESCI 7               | HKE-010    | 2022/02/18       | 2023/02/17           |
| Spectrum analyzer               | R&S          | FSP40                | HKE-025    | 2022/02/18       | 2023/02/17           |
| Spectrum analyzer               | Agilent      | N9020A               | HKE-048    | 2022/02/18       | 2023/02/17           |
| RF automatic control unit       | Tonscend     | JS0806-1             | HKE-060    | 2022/02/18       | 2023/02/17           |
| Loop antenna                    | Schwarzbeck  | FMZB 1519 B          | HKE-014    | 2022/02/18       | 2023/02/17           |
| Bilog Broadband Antenna         | Schwarzbeck  | VULB9163             | HKE-012    | 2022/02/18       | 2023/02/17           |
| Horn antenna                    | Schwarzbeck  | 9120D                | HKE-013    | 2022/02/18       | 2023/02/17           |
| High gain antenna               | Schwarzbeck  | LB-180400KF          | HKE-054    | 2022/02/18       | 2023/02/17           |
| Preamplifier                    | EMCI         | EMC051845SE          | HKE-015    | 2022/02/18       | 2023/02/17           |
| Preamplifier                    | Agilent      | 83051A               | HKE-016    | 2022/02/18       | 2023/02/17           |
| Preamplifier                    | Schwarzbeck  | BBV 9743             | HKE-006    | 2022/02/18       | 2023/02/17           |
| Temperature and humidity meter  | Boyang       | HTC-1                | HKE-075    | 2022/02/18       | 2023/02/17           |
| High-low temperature chamber    | Guangke      | HT-80L               | HKE-118    | 2022/02/18       | 2023/02/17           |
| High pass filter unit           | Tonscend     | JS0806-F             | HKE-055    | 2022/02/18       | 2023/02/17           |
| RF Cable(below1GHz)             | Times        | 9kHz-1GHz            | HKE-117    | 2022/02/18       | 2023/02/17           |
| RF Cable(above 1GHz)            | Times        | 1-40G                | HKE-034    | 2022/02/18       | 2023/02/17           |
| Power meter                     | Agilent      | E4419B               | HKE-085    | 2022/02/18       | 2023/02/17           |
| Power Sensor                    | Agilent      | E9300A               | HKE-086    | 2022/02/18       | 2023/02/17           |
| Conducted test software         | Tonscend     | TS+ Rev 2.5.0.0      | HKE-081    | N/A              | N/A                  |
| Radiated test software          | Tonscend     | TS+ Rev 2.5.0.0      | HKE-082    | N/A              | N/A                  |
| RF test software                | Tonscend     | JS1120-B Version 2.6 | HKE-083    | N/A              | N/A                  |
| RF test software                | Tonscend     | JS1120-4             | HKE-113    | N/A              | N/A                  |
| RF test software                | Tonscend     | JS1120-3             | HKE-114    | N/A              | N/A                  |
| RF test software                | Tonscend     | JS1120-1             | HKE-115    | N/A              | N/A                  |
| Wireless Communication Test Set | R&S          | CMW500               | HKE-026    | 2022/02/18       | 2023/02/17           |
| Wireless Communication Test Set | R&S          | CMU200               | HKE-029    | 2022/02/18       | 2023/02/17           |



## 4 TEST CONDITIONS AND RESULTS

### 4.1 Output Power

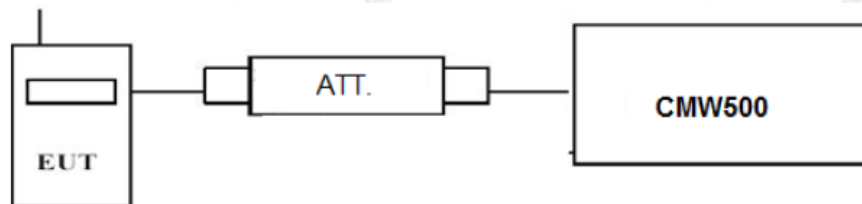
#### 4.1.1 Conducted Output Power

##### TEST APPLICABLE

Part 27.50(h)(2), during the process of testing, the EUT was controlled via R&S Digital Radio Communication tester (CMW500) to ensure max power transmission and proper modulation. This result contains output power measurements for the EUT. In all cases, output power is within the specified limits.

##### TEST CONFIGURATION

Conducted Power Measurement:



##### TEST PROCEDURE

###### Conducted Power Measurement:

- Place the EUT on a bench and set it in transmitting mode.
- Connect a low loss RF cable from the antenna port to a CMW500 by an Att.
- EUT Communicate with CMW500 then selects a channel for testing.
- Add a correction factor to the display CMW500, and then test.

##### TEST RESULTS

Remark:

- We measured all RB Configuration refer 3GPP TS136 521 for each Channel Bandwidth of LTE Band 41;

| LTE Band 41          |                 |                |                           |       |
|----------------------|-----------------|----------------|---------------------------|-------|
| TX Channel Bandwidth | Frequency (MHz) | RB Size/Offset | Burst Average Power [dBm] |       |
|                      |                 |                | QPSK                      | 16QAM |
| 5 MHz                | 2498.5          | 1 RB low       | 21.34                     | 20.92 |
|                      |                 | 1 RB mid       | 21.25                     | 20.91 |
|                      |                 | 1 RB high      | 21.36                     | 20.91 |
|                      |                 | 50% RB low     | 20.31                     | 19.35 |
|                      |                 | 50% RB mid     | 20.34                     | 19.33 |
|                      |                 | 50% RB high    | 20.28                     | 19.39 |
|                      |                 | 100% RB        | 20.27                     | 19.43 |
|                      | 2593.0          | 1 RB low       | 21.46                     | 20.81 |
|                      |                 | 1 RB mid       | 21.40                     | 20.79 |
|                      |                 | 1 RB high      | 21.39                     | 21.49 |
|                      |                 | 50% RB low     | 20.58                     | 19.59 |
|                      |                 | 50% RB mid     | 20.53                     | 19.57 |
|                      |                 | 50% RB high    | 20.49                     | 19.60 |
|                      |                 | 100% RB        | 20.47                     | 19.83 |
|                      | 2687.5          | 1 RB low       | 21.56                     | 21.41 |
|                      |                 | 1 RB mid       | 21.65                     | 21.13 |
|                      |                 | 1 RB high      | 21.48                     | 21.62 |
|                      |                 | 50% RB low     | 20.55                     | 19.60 |
|                      |                 | 50% RB mid     | 20.49                     | 19.72 |
|                      |                 | 50% RB high    | 20.64                     | 19.80 |
|                      |                 | 100% RB        | 20.46                     | 19.67 |



|        |        |             |       |       |
|--------|--------|-------------|-------|-------|
| 10 MHz | 2501.0 | 1 RB low    | 21.71 | 20.77 |
|        |        | 1 RB mid    | 21.68 | 20.86 |
|        |        | 1 RB high   | 21.77 | 20.88 |
|        |        | 50% RB low  | 20.65 | 19.75 |
|        |        | 50% RB mid  | 20.67 | 19.79 |
|        |        | 50% RB high | 20.67 | 19.79 |
|        |        | 100% RB     | 20.82 | 19.81 |
|        | 2593.0 | 1 RB low    | 22.23 | 21.58 |
|        |        | 1 RB mid    | 22.20 | 21.50 |
|        |        | 1 RB high   | 22.32 | 21.76 |
|        |        | 50% RB low  | 20.93 | 20.24 |
|        |        | 50% RB mid  | 21.18 | 20.38 |
|        |        | 50% RB high | 21.14 | 20.37 |
|        |        | 100% RB     | 21.20 | 20.24 |
|        | 2685.0 | 1 RB low    | 22.42 | 21.59 |
|        |        | 1 RB mid    | 22.52 | 21.91 |
|        |        | 1 RB high   | 22.47 | 21.98 |
|        |        | 50% RB low  | 21.26 | 20.37 |
|        |        | 50% RB mid  | 21.32 | 20.39 |
|        |        | 50% RB high | 21.38 | 20.39 |
|        |        | 100% RB     | 21.28 | 20.77 |
| 15 MHz | 2503.5 | 1 RB low    | 21.19 | 19.36 |
|        |        | 1 RB mid    | 21.07 | 19.26 |
|        |        | 1 RB high   | 21.01 | 19.22 |
|        |        | 50% RB low  | 21.15 | 19.16 |
|        |        | 50% RB mid  | 21.14 | 19.15 |
|        |        | 50% RB high | 21.12 | 19.14 |
|        |        | 100% RB     | 21.08 | 19.10 |
|        | 2593.0 | 1 RB low    | 21.87 | 21.70 |
|        |        | 1 RB mid    | 21.72 | 21.80 |
|        |        | 1 RB high   | 21.36 | 21.53 |
|        |        | 50% RB low  | 21.11 | 20.22 |
|        |        | 50% RB mid  | 21.16 | 20.24 |
|        |        | 50% RB high | 21.17 | 20.24 |
|        |        | 100% RB     | 21.08 | 20.33 |
|        | 2682.5 | 1 RB low    | 21.44 | 21.40 |
|        |        | 1 RB mid    | 21.72 | 21.77 |
|        |        | 1 RB high   | 21.86 | 21.93 |
|        |        | 50% RB low  | 21.25 | 20.55 |
|        |        | 50% RB mid  | 21.25 | 20.54 |
|        |        | 50% RB high | 21.19 | 20.54 |
|        |        | 100% RB     | 21.07 | 20.50 |
| 20 MHz | 2506.0 | 1 RB low    | 22.19 | 19.18 |
|        |        | 1 RB mid    | 21.98 | 19.01 |
|        |        | 1 RB high   | 22.80 | 19.85 |
|        |        | 50% RB low  | 21.92 | 18.96 |
|        |        | 50% RB mid  | 21.93 | 18.96 |
|        |        | 50% RB high | 21.93 | 18.96 |
|        |        | 100% RB     | 21.10 | 19.11 |
|        | 2593.0 | 1 RB low    | 21.87 | 21.64 |
|        |        | 1 RB mid    | 21.70 | 21.66 |
|        |        | 1 RB high   | 21.83 | 21.80 |
|        |        | 50% RB low  | 21.20 | 20.42 |
|        |        | 50% RB mid  | 21.12 | 20.44 |
|        |        | 50% RB high | 21.13 | 20.45 |
|        |        | 100% RB     | 21.16 | 20.29 |

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TEL : +86-755 2302 9901 FAX : +86-755 2302 9901 E-mail : [service@cer-mark.com](mailto:service@cer-mark.com)

Add: 1-2F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China



|  |        |             |       |       |
|--|--------|-------------|-------|-------|
|  | 2680.0 | 1 RB low    | 21.29 | 21.10 |
|  |        | 1 RB mid    | 21.55 | 21.48 |
|  |        | 1 RB high   | 22.42 | 22.14 |
|  |        | 50% RB low  | 21.29 | 20.59 |
|  |        | 50% RB mid  | 21.29 | 20.69 |
|  |        | 50% RB high | 21.29 | 20.59 |
|  |        | 100% RB     | 21.32 | 20.61 |





### 4.1.2. Radiated Output Power

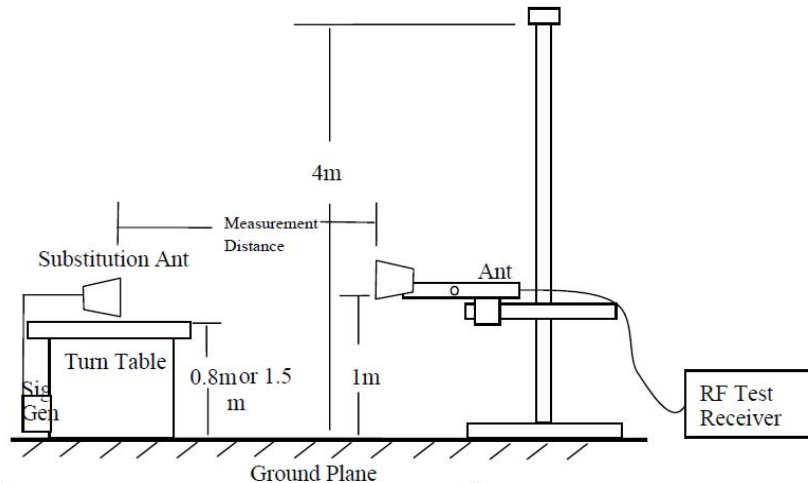
#### LIMIT

This is the test for the maximum radiated power from the EUT.

#### TEST CONFIGURATION

RadiatedPowerMeasurement:

remark : 0.8m for below 1GHz, 1.5m for above 1GHz



#### TEST PROCEDURE

The EUT was setup according to EIA/TIA 603D

- The EUT shall be placed at the specified height on a support, and in the position closest to normal use as declared by provider.
- The test antenna shall be oriented initially for vertical polarization and shall be chosen to correspond to the frequency of the transmitter.
- The output of the test antenna shall be connected to the measuring receiver.
- The transmitter shall be switched on and the measuring receiver shall be tuned to the frequency of the transmitter under test.
- The test antenna shall be raised and lowered through the specified range of height until a maximum signal level is detected by the measuring receiver.
- The transmitter shall then be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
- The test antenna shall be raised and lowered again through the specified range of height until a maximum signal level is detected by the measuring receiver.
- The maximum signal level detected by the measuring receiver shall be noted.
- The transmitter shall be replaced by a substitution antenna.
- The substitution antenna shall be orientated for vertical polarization and the length of the substitution antenna shall be adjusted to correspond to the frequency of the transmitter.
- The substitution antenna shall be connected to a calibrated signal generator.
- If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
- The test antenna shall be raised and lowered through the specified range of height to ensure that the maximum signal is received.
- The input signal to the substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuator setting of the measuring receiver.
- The measurement shall be repeated with the test antenna and the substitution antenna orientated for horizontal polarization.
- The measure of the effective radiated power is the larger of the two levels recorded at the input to the substitution antenna, corrected for gain of the substitution antenna if necessary.
- Test site anechoic chamber refer to ANSI C63.4.

**TEST RESULTS****Radiated Measurement:**

Remark:

1. We measured all RB Configuration refer 3GPP TS136 521 for each Channel Bandwidth of LTE Band 41; recorded worst case for each Channel Bandwidth of LTE Band 41.
2.  $EIRP = P_s(dBm) - P_{cl}(dB) + G_a(dBi)$
3. We measured both Horizontal and Vertical direction, recorded worst case direction.

**LTE Band 41 Channel Bandwidth 5MHz QPSK 1RB#0**

| Frequency (MHz) | $P_s$ (dBm) | $P_{cl}$ (dB) | $G_a$ Antenna Gain(dB) | Burst Average EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|-----------------|-------------|---------------|------------------------|--------------------------|-------------|-------------|--------------|
| 2498.5          | 12.08       | 3.41          | 15.12                  | 23.79                    | 33.01       | 9.22        | V            |
| 2593.0          | 12.56       | 3.49          | 15.12                  | 24.19                    | 33.01       | 8.82        | V            |
| 2687.5          | 11.33       | 3.55          | 15.12                  | 22.9                     | 33.01       | 10.11       | V            |

**LTE Band 41 Channel Bandwidth 10MHz QPSK 1RB#0**

| Frequency (MHz) | $P_s$ (dBm) | $P_{cl}$ (dB) | $G_a$ Antenna Gain(dB) | Burst Average EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|-----------------|-------------|---------------|------------------------|--------------------------|-------------|-------------|--------------|
| 2501.0          | 12.57       | 3.41          | 15.12                  | 24.28                    | 33.01       | 8.73        | V            |
| 2593.0          | 12.24       | 3.49          | 15.12                  | 23.87                    | 33.01       | 9.14        | V            |
| 2685.0          | 11.46       | 3.55          | 15.12                  | 23.03                    | 33.01       | 9.98        | V            |

**LTE Band 41 Channel Bandwidth 15MHz QPSK 1RB#0**

| Frequency (MHz) | $P_s$ (dBm) | $P_{cl}$ (dB) | $G_a$ Antenna Gain(dB) | Burst Average EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|-----------------|-------------|---------------|------------------------|--------------------------|-------------|-------------|--------------|
| 2503.5          | 12.4        | 3.41          | 15.12                  | 24.11                    | 33.01       | 8.9         | V            |
| 2593.0          | 12.69       | 3.49          | 15.12                  | 24.32                    | 33.01       | 8.69        | V            |
| 2682.5          | 11.51       | 3.55          | 15.12                  | 23.08                    | 33.01       | 9.93        | V            |

**LTE Band 41 Channel Bandwidth 20MHz QPSK 1RB#0**

| Frequency (MHz) | $P_s$ (dBm) | $P_{cl}$ (dB) | $G_a$ Antenna Gain(dB) | Burst Average EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|-----------------|-------------|---------------|------------------------|--------------------------|-------------|-------------|--------------|
| 2506.0          | 12.46       | 3.41          | 15.12                  | 24.17                    | 33.01       | 8.84        | V            |
| 2593.0          | 12.62       | 3.49          | 15.12                  | 24.25                    | 33.01       | 8.76        | V            |
| 2680.0          | 10.91       | 3.55          | 15.12                  | 22.48                    | 33.01       | 10.53       | V            |

*LTE Band 41\_Channel Bandwidth 5MHz\_16QAM\_1RB#0*

| Frequency (MHz) | P <sub>s</sub> (dBm) | P <sub>cl</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | Burst Average EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|-----------------|----------------------|----------------------|---------------------------------|--------------------------|-------------|-------------|--------------|
| 2498.5          | 11.97                | 3.41                 | 15.12                           | 23.68                    | 33.01       | 9.33        | V            |
| 2593.0          | 13.18                | 3.49                 | 15.12                           | 24.81                    | 33.01       | 8.2         | V            |
| 2687.5          | 11.02                | 3.55                 | 15.12                           | 22.59                    | 33.01       | 10.42       | V            |

*LTE Band 41\_Channel Bandwidth 10MHz\_16QAM\_1RB#0*

| Frequency (MHz) | P <sub>s</sub> (dBm) | P <sub>cl</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | Burst Average EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|-----------------|----------------------|----------------------|---------------------------------|--------------------------|-------------|-------------|--------------|
| 2501.0          | 11.82                | 3.41                 | 15.12                           | 23.53                    | 33.01       | 9.48        | V            |
| 2593.0          | 12.74                | 3.49                 | 15.12                           | 24.37                    | 33.01       | 8.64        | V            |
| 2685.0          | 11.03                | 3.55                 | 15.12                           | 22.6                     | 33.01       | 10.41       | V            |

*LTE Band 41\_Channel Bandwidth 15MHz\_16QAM\_1RB#0*

| Frequency (MHz) | P <sub>s</sub> (dBm) | P <sub>cl</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | Burst Average EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|-----------------|----------------------|----------------------|---------------------------------|--------------------------|-------------|-------------|--------------|
| 2503.5          | 12.46                | 3.41                 | 15.12                           | 24.17                    | 33.01       | 8.84        | V            |
| 2593.0          | 12.84                | 3.49                 | 15.12                           | 24.47                    | 33.01       | 8.54        | V            |
| 2682.5          | 11.39                | 3.55                 | 15.12                           | 22.96                    | 33.01       | 10.05       | V            |

*LTE Band 41\_Channel Bandwidth 20MHz\_16QAM\_1RB#0*

| Frequency (MHz) | P <sub>s</sub> (dBm) | P <sub>cl</sub> (dB) | G <sub>a</sub> Antenna Gain(dB) | Burst Average EIRP (dBm) | Limit (dBm) | Margin (dB) | Polarization |
|-----------------|----------------------|----------------------|---------------------------------|--------------------------|-------------|-------------|--------------|
| 2506.0          | 11.85                | 3.41                 | 15.12                           | 23.56                    | 33.01       | 9.45        | V            |
| 2593.0          | 12.53                | 3.49                 | 15.12                           | 24.16                    | 33.01       | 8.85        | V            |
| 2680.0          | 11.43                | 3.55                 | 15.12                           | 23                       | 33.01       | 10.01       | V            |

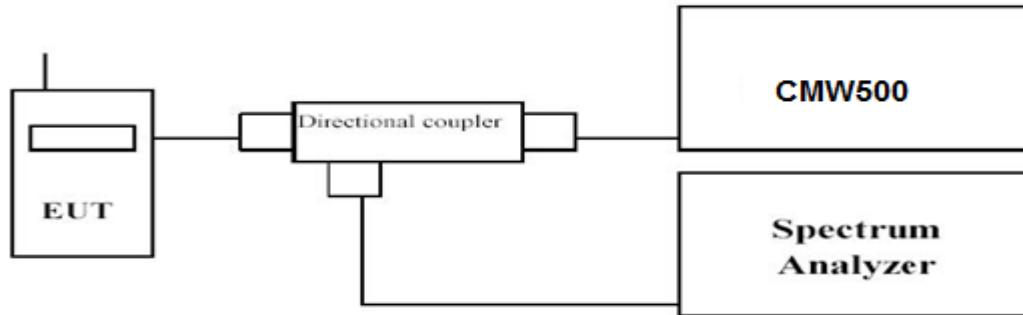


## 4.2 Peak-to-Average Ratio (PAR)

### LIMIT

The Peak-to-Average Ratio (PAR) of the transmission may not exceed 13 dB.

### TEST CONFIGURATION



### TEST PROCEDURE

1. Refer to instrument's analyzer instruction manual for details on how to use the power statistics/CCDF function;
2. Set resolution/measurement bandwidth  $\geq$  signal's occupied bandwidth;
3. Set the number of counts to a value that stabilizes the measured CCDF curve;
4. Set the measurement interval as follows:
  - 1). for continuous transmissions, set to 1 ms,
  - 2). for burst transmissions, employ an external trigger that is synchronized with the EUT burst timing sequence, or use the internal burst trigger with a trigger level that allows the burst to stabilize and set the measurement interval to a time that is less than or equal to the burst duration.
5. Record the maximum PAPR level associated with a probability of 0.1%.

### TEST RESULTS

Remark:

1. We measured all RB Configuration refer 3GPP TS136 521 for each Channel Bandwidth of LTE Band 41; recorded worst case for each Channel Bandwidth of LTE Band 41.

| TX Channel Bandwidth | Frequency (MHz) | RB Size/Offset | LTE Band 41 |       |
|----------------------|-----------------|----------------|-------------|-------|
|                      |                 |                | PAPR(dB)    |       |
|                      |                 |                | QPSK        | 16QAM |
| 5 MHz                | 2498.5          | 1RB#0          | 4.71        | 6.76  |
|                      | 2593.0          |                | 4.96        | 4.21  |
|                      | 2687.5          |                | 5.45        | 5.30  |
| 10 MHz               | 2501.0          | 1RB#0          | 5.79        | 6.05  |
|                      | 2593.0          |                | 4.73        | 5.25  |
|                      | 2685.0          |                | 4.40        | 5.15  |
| 15 MHz               | 2503.5          | 1RB#0          | 6.29        | 6.50  |
|                      | 2593.0          |                | 4.50        | 5.33  |
|                      | 2682.5          |                | 4.77        | 5.30  |
| 20 MHz               | 2506.0          | 1RB#0          | 5.66        | 5.66  |
|                      | 2593.0          |                | 4.46        | 4.73  |
|                      | 2680.0          |                | 4.74        | 4.95  |





## LTE Band 41-5MHz Channel BandwidthPAPR

QPSK

16QAM

## Low Channel



1RB#0



1RB#0

## Middle Channel



1RB#0



1RB#0

## High Channel



1RB#0



1RB#0



## LTE Band 41-10MHz Channel Bandwidth PAPR

QPSK

16QAM

## Low Channel

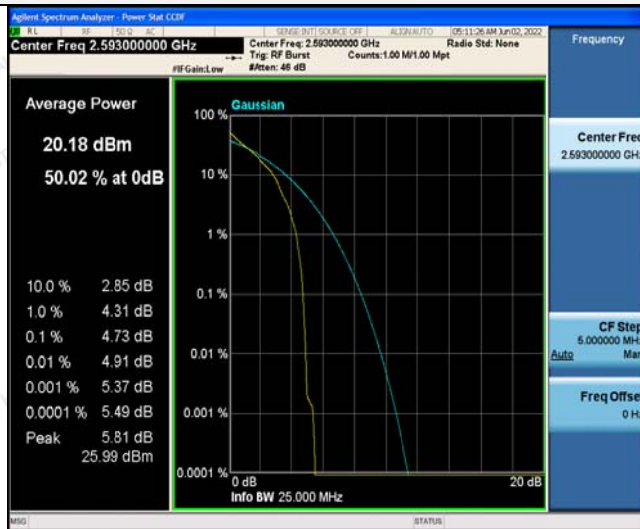


1RB#0



1RB#0

## Middle Channel



1RB#0



1RB#0

## High Channel



1RB#0



1RB#0





## LTE Band 41– 15 MHz Channel BandwidthPAPR

QPSK

16QAM

### Low Channel



1RB#0



1RB#0

### Middle Channel



1RB#0



1RB#0

### High Channel



1RB#0



1RB#0



## LTE Band 41-20MHz Channel BandwidthPAPR

QPSK

16QAM

## Low Channel



1RB#0



1RB#0

## Middle Channel



1RB#0



1RB#0

## High Channel



1RB#0



1RB#0



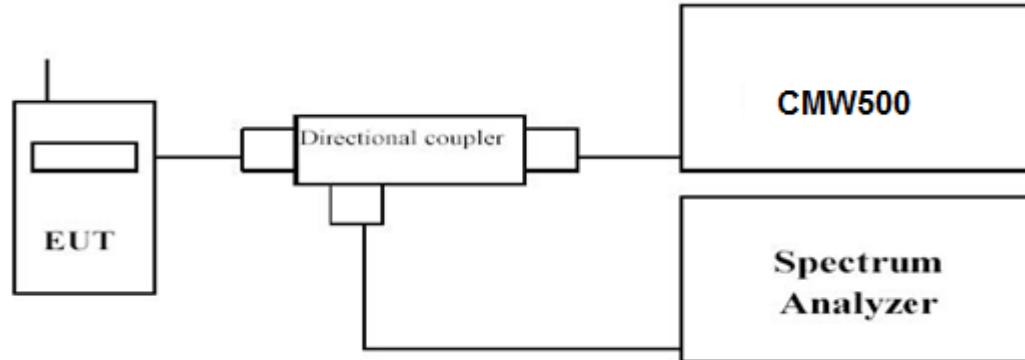


### 4.3 Occupied Bandwidth and Emission Bandwidth

#### LIMIT

N/A

#### TEST CONFIGURATION



#### TEST PROCEDURE

The transmitter output was connected to a calibrated coaxial cable and coupler, the other end of which was connected to a spectrum analyzer. The occupied bandwidth was measured with the spectrum analyzer at low, middle and high channel in each band. The -26dBc Emission bandwidth was also measured and recorded. Set RBW was set to about 1% of emission BW, VBW  $\geq 3$  times RBW.

-26dBc display line was placed on the screen (or 99% bandwidth), the occupied bandwidth is the delta frequency between the two points where the display line intersects the signal trace.

#### TEST RESULTS

Remark:

1. We were tested all RB Configuration refer 3GPP TS136 521 for each Channel Bandwidth of LTE Band 41; recorded worst case for each Channel Bandwidth of LTE Band 41.

| LTE Band 41          |                |                 |                              |        |                                 |       |
|----------------------|----------------|-----------------|------------------------------|--------|---------------------------------|-------|
| TX Channel Bandwidth | RB Size/Offset | Frequency (MHz) | 99% Occupied bandwidth (MHz) |        | -26dBc Emission bandwidth (MHz) |       |
|                      |                |                 | QPSK                         | 16QAM  | QPSK                            | 16QAM |
| 5 MHz                | 25RB#0         | 2498.5          | 4.5129                       | 4.5115 | 5.250                           | 5.159 |
|                      |                | 2593.0          | 4.5071                       | 4.4993 | 5.224                           | 5.185 |
|                      |                | 2687.5          | 4.5183                       | 4.4983 | 5.224                           | 5.133 |
| 10 MHz               | 50RB#0         | 2501.0          | 9.0159                       | 8.9947 | 10.60                           | 9.879 |
|                      |                | 2593.0          | 8.9886                       | 8.9908 | 10.38                           | 9.924 |
|                      |                | 2685.0          | 9.0131                       | 8.9894 | 10.67                           | 9.929 |
| 15 MHz               | 75RB#0         | 2503.5          | 13.493                       | 13.482 | 15.26                           | 14.85 |
|                      |                | 2593.0          | 13.513                       | 13.468 | 16.65                           | 14.88 |
|                      |                | 2682.5          | 13.522                       | 13.485 | 15.44                           | 15.11 |
| 20 MHz               | 100RB#0        | 2506.0          | 18.022                       | 17.969 | 19.69                           | 19.68 |
|                      |                | 2593.0          | 17.988                       | 17.951 | 19.62                           | 19.77 |
|                      |                | 2680.0          | 17.982                       | 17.986 | 19.68                           | 19.65 |

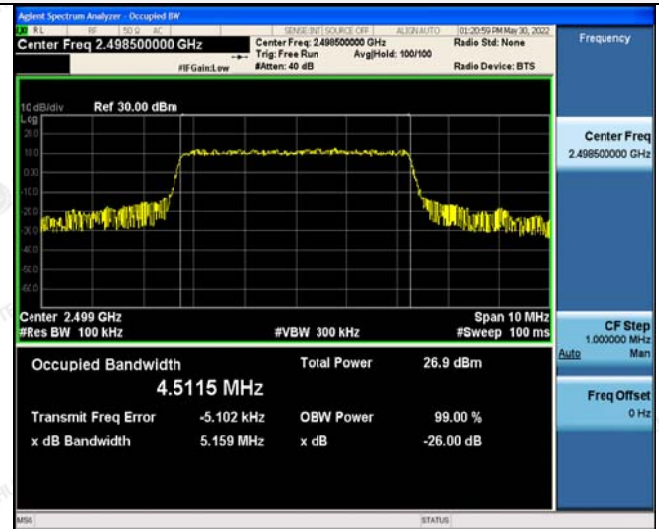
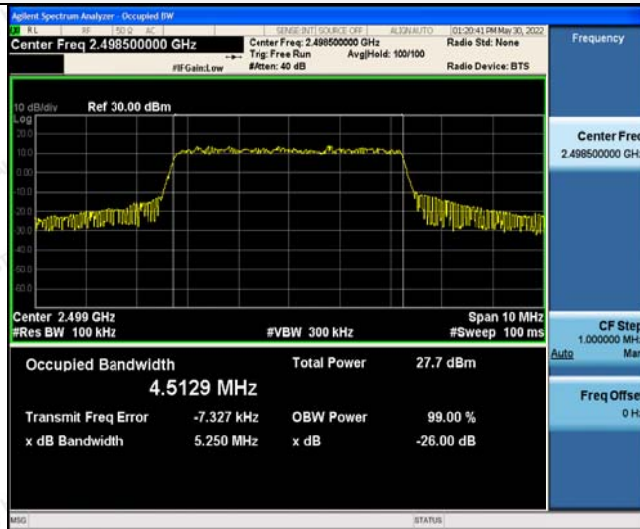


## LTE Band 41-5MHz Channel Bandwidth Occupied Bandwidth and Emission Bandwidth

QPSK

16QAM

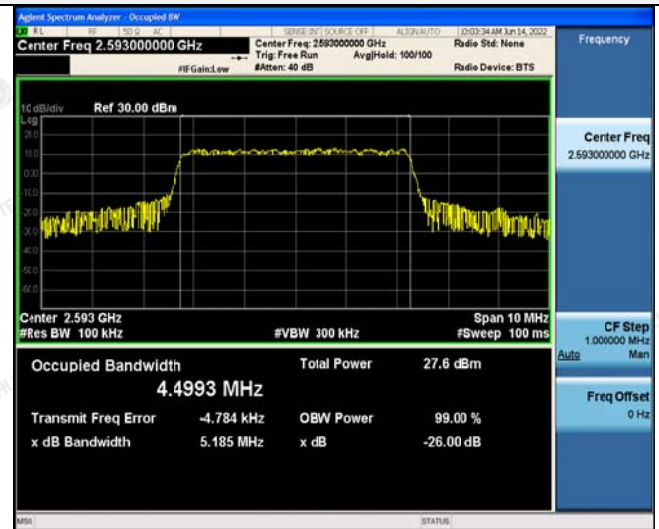
## Low Channel



25RB#0

25RB#0

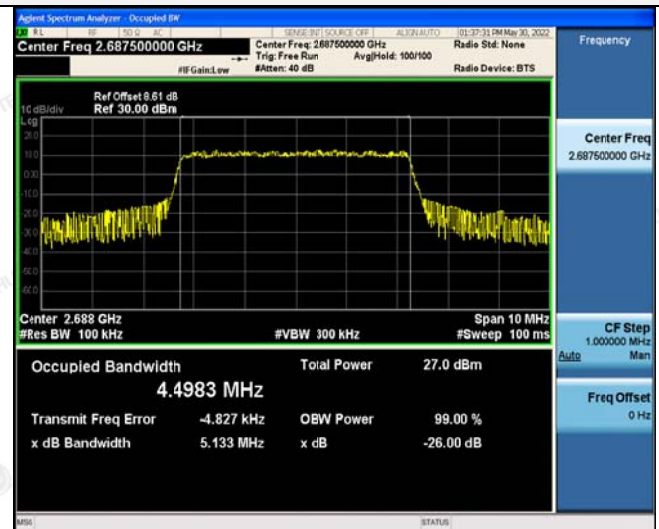
## Middle Channel



25RB#0

25RB#0

## High Channel



25RB#0

25RB#0

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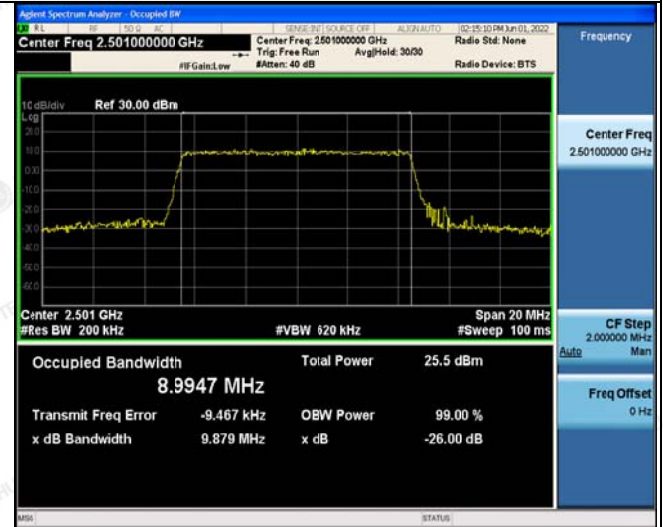


## LTE Band 41-10MHz Channel Bandwidth Occupied Bandwidth and Emission Bandwidth

QPSK

16QAM

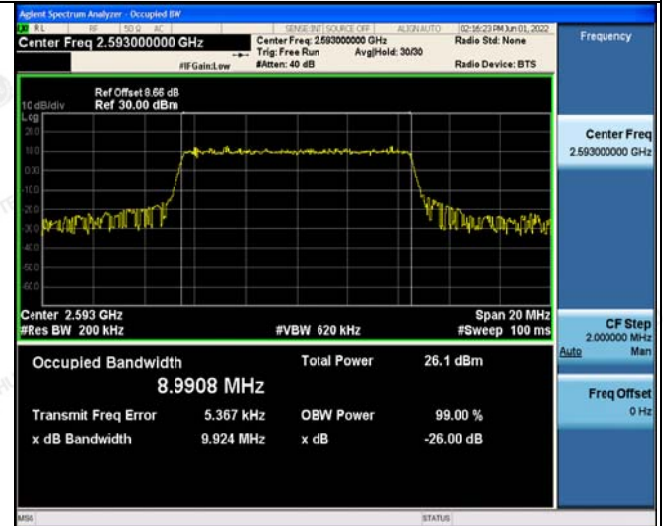
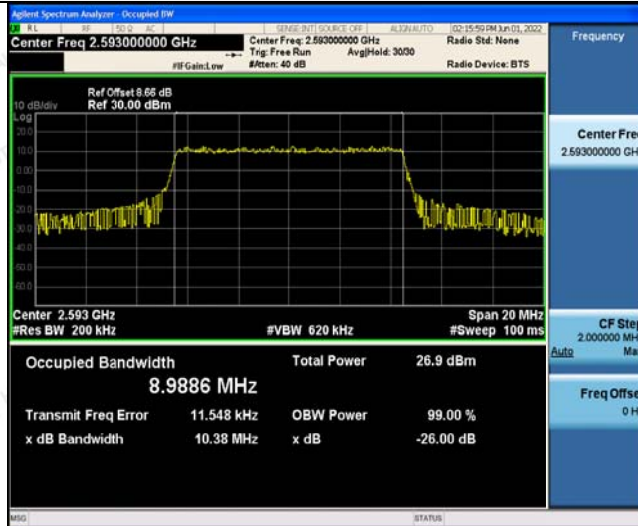
## Low Channel



50RB#0

50RB#0

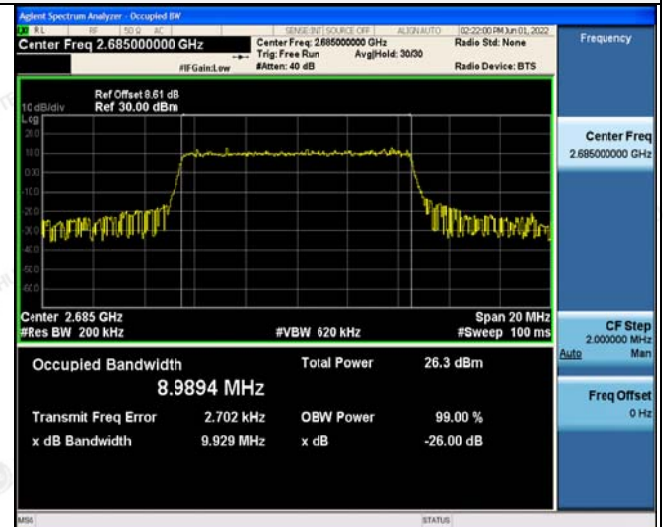
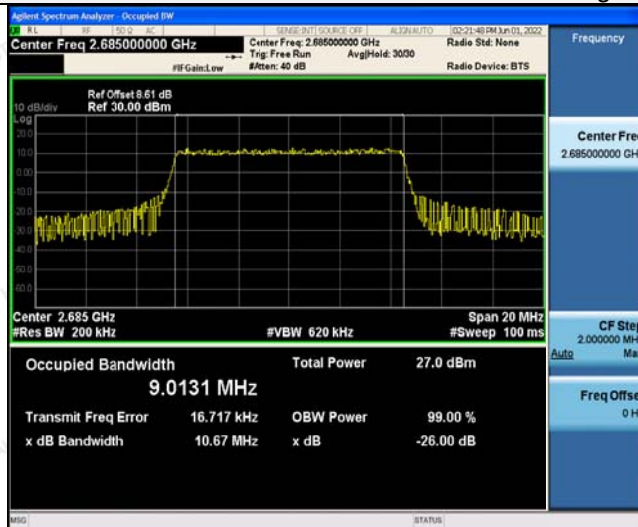
## Middle Channel



50RB#0

50RB#0

## High Channel



50RB#0

50RB#0

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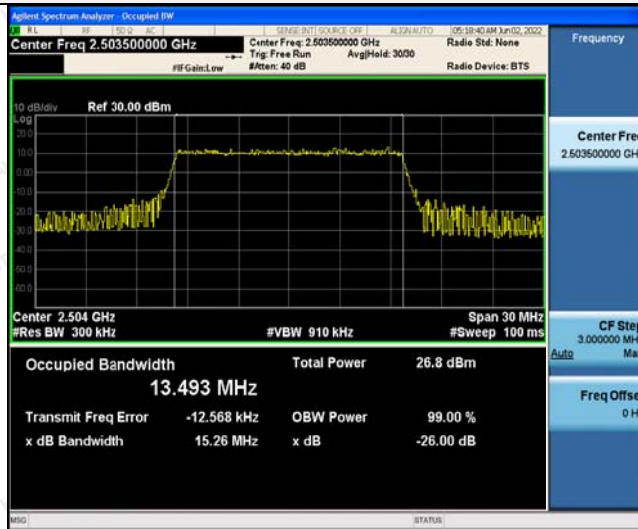


## LTE Band 41-15MHz Channel Bandwidth Occupied Bandwidth and Emission Bandwidth

QPSK

16QAM

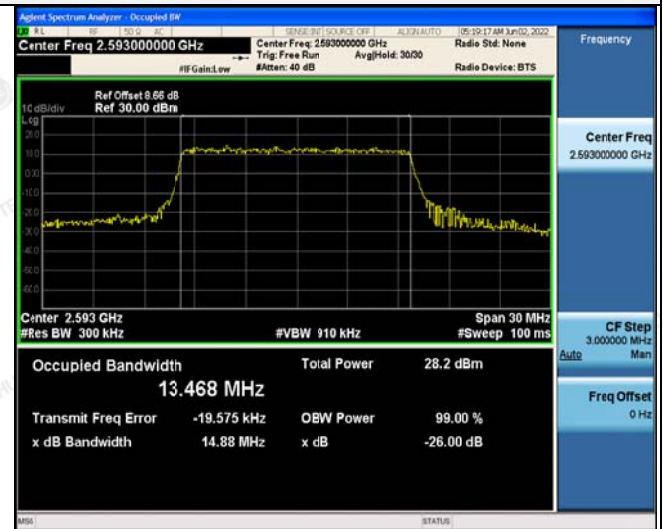
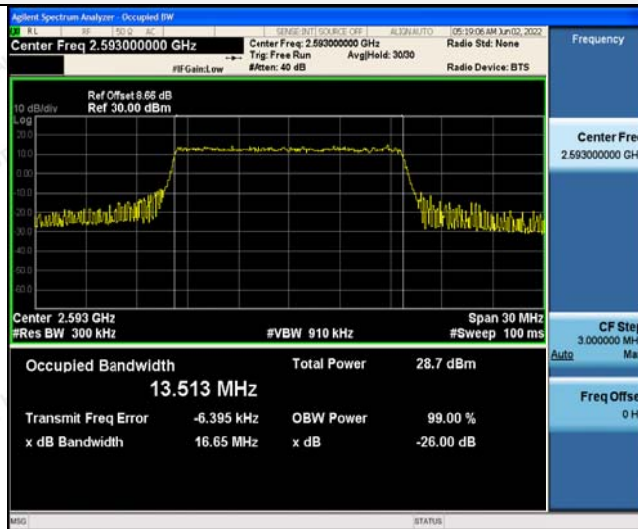
## Low Channel



75RB#0

75RB#0

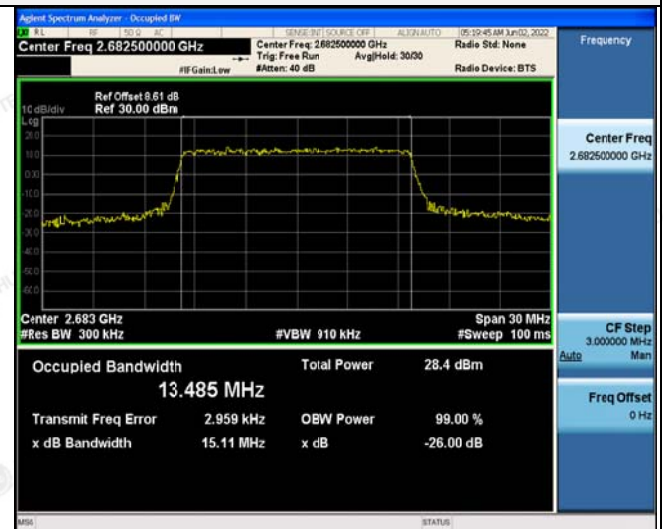
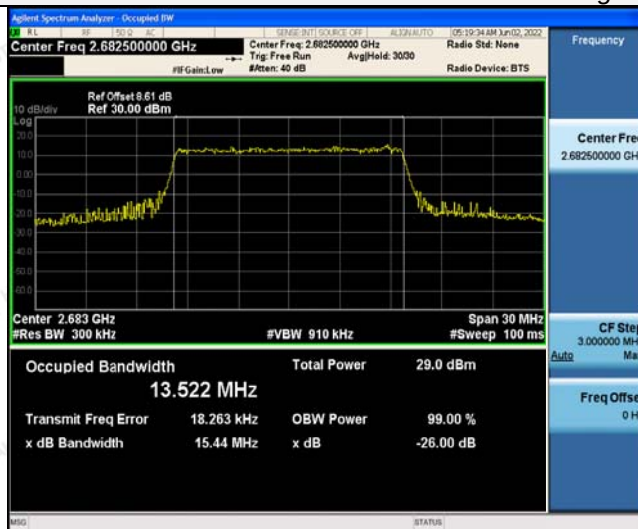
## Middle Channel



75RB#0

75RB#0

## High Channel



75RB#0

75RB#0

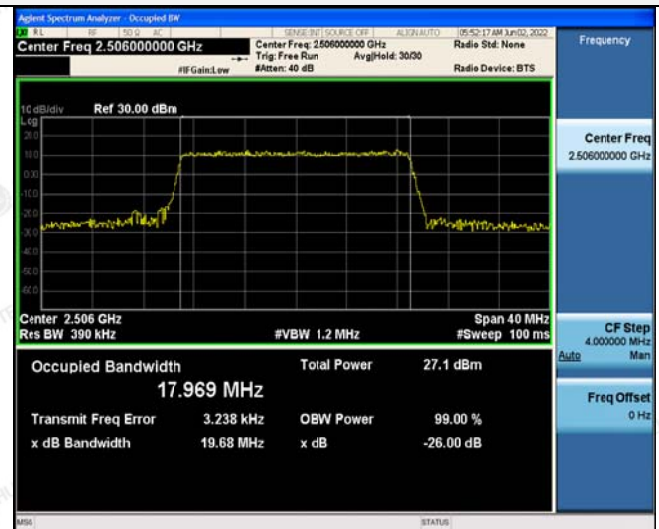
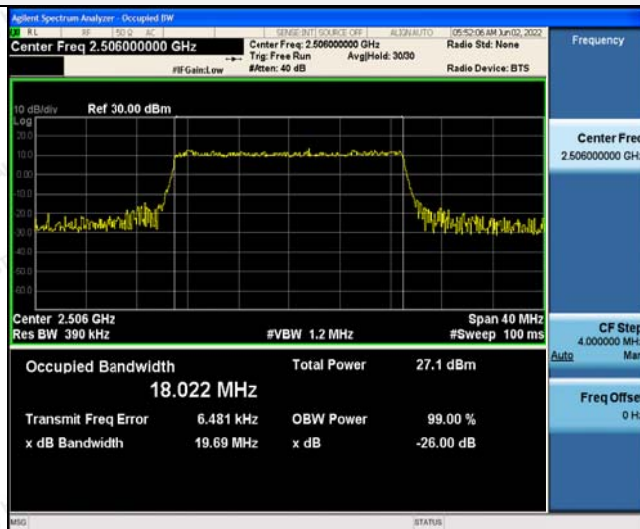


## LTE Band 41-20MHz Channel Bandwidth Occupied Bandwidth and Emission Bandwidth

QPSK

16QAM

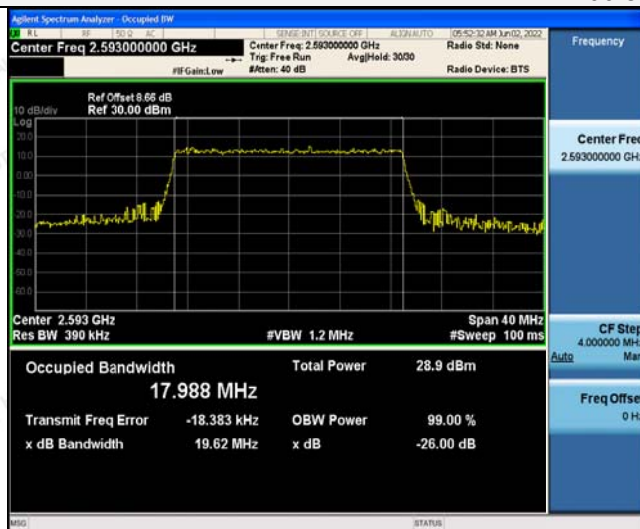
## Low Channel



100RB#0

100RB#0

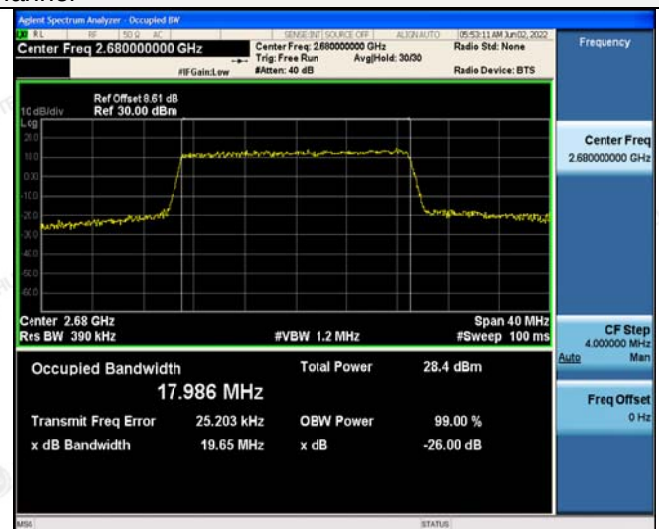
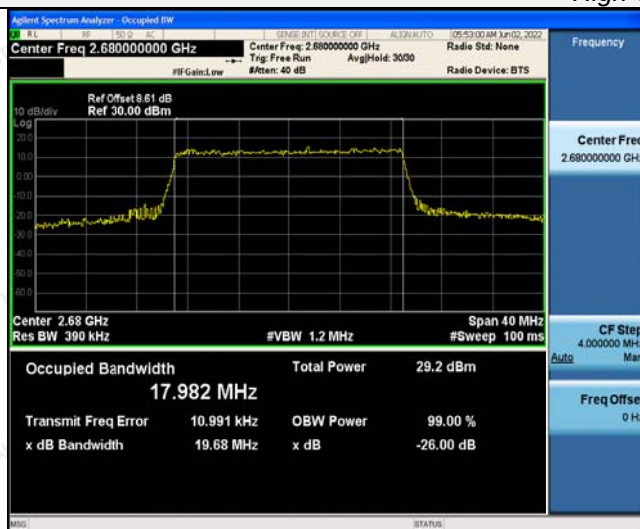
## Middle Channel



100RB#0

100RB#0

## High Channel



100RB#0

100RB#0

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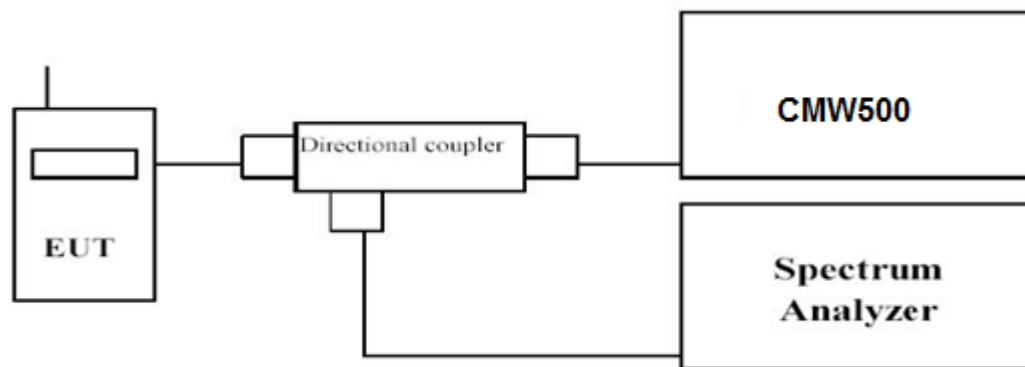


## 4.4 Band Edge compliance

### LIMIT

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  $40 + 10 \log P$  dB ( $-10$  dBm,  $100$  nW) on all frequencies between the channel edge and  $5$  MHz from the channel edge,  $43 + 10 \log P$  dB ( $-13$  dBm,  $50$  nW) on all frequencies between  $5$  MHz and  $X$  MHz from the channel edge, and  $55 + 10 \log P$  dB ( $-25$  dBm,  $3$  nW) on all frequencies more than  $20$  MHz from the channel edge, where  $X$  MHz is the greater of  $6$  MHz or the actual emission bandwidth ( $26$  dB).

### TEST CONFIGURATION



### TEST PROCEDURE

1. The transmitter output port was connected to base station.
2. The RF output of EUT was connected to the power meter by RF cable and attenuator, the path loss was compensated to the results for each measurement.
3. Set EUT at maximum power through base station.
4. Select lowest and highest channels for each band and different modulation.
5. Measure Band edge using RMS (Average) detector by spectrum
6. Set RBW =  $100$  kHz, VBW= $300$  kHz, Span= $50$  MHz Peak Detector.

### TEST RESULTS

#### Remark:

1. We tested all RB Configuration refer 3GPP TS136 521 for each Channel Bandwidth of LTE Band 41; recorded worst case for each Channel Bandwidth of LTE Band 41.



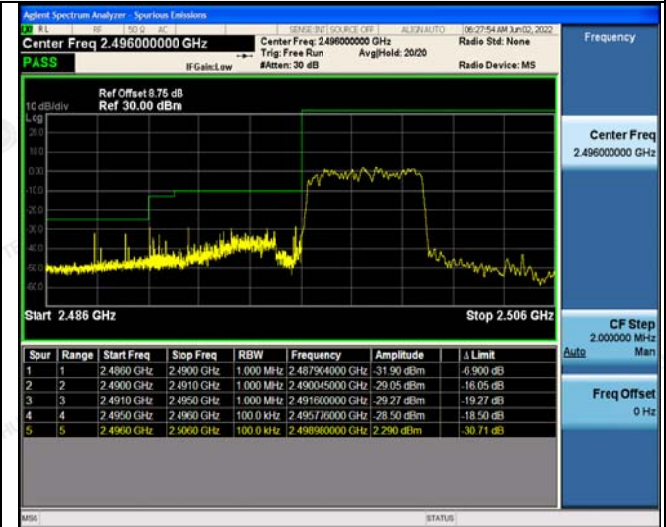
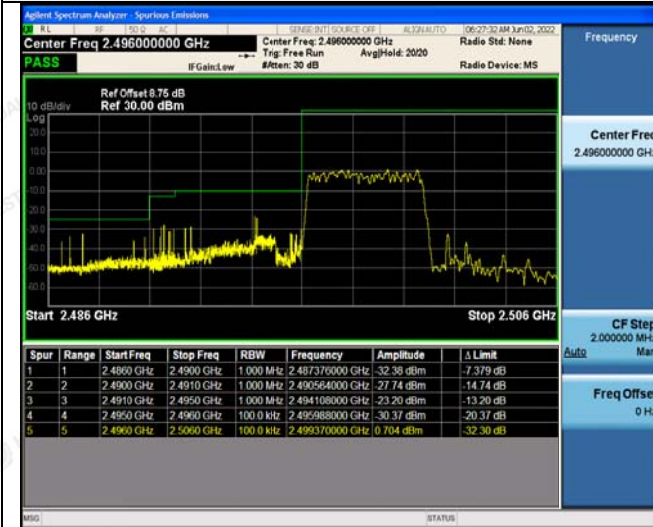


## LTE Band 41-5MHz Channel Bandwidth Band Edge Compliance

QPSK

16QAM

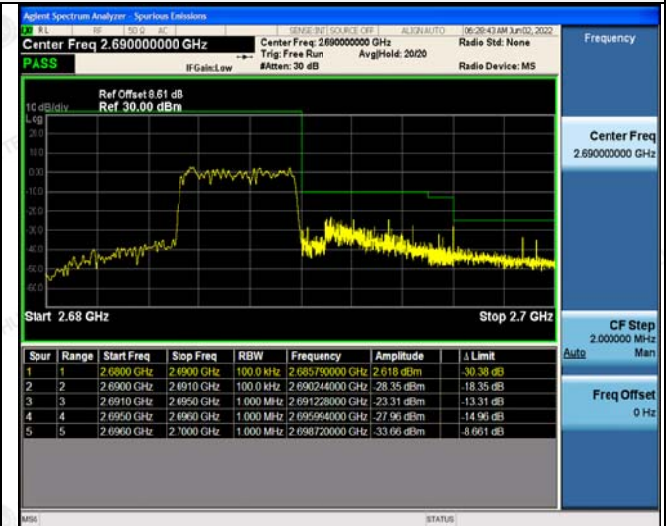
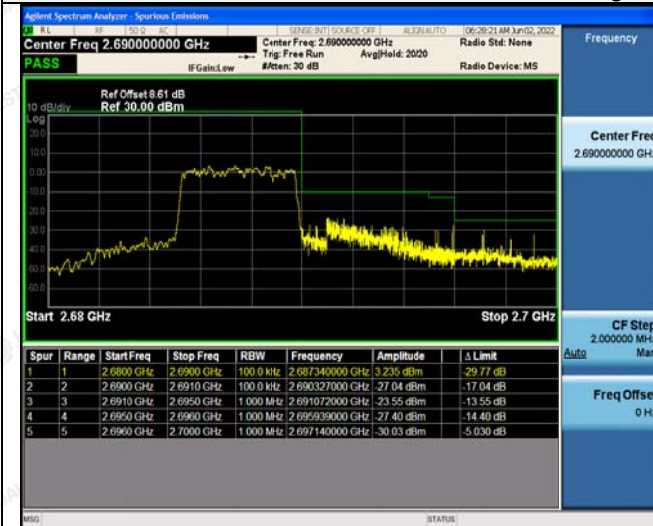
## Low Channel



25RB#0

25RB#0

## High Channel



25RB#0

25RB#0

