

Annex A – Test Report for TA-1095 (Dual SIM)

FCC Test Report

(PART 27)

Report No.: RF180626C10D-2

FCC ID: 2AJOTTA-1095

Test Model: TA-1095

Received Date: Jun. 26, 2018

Test Date: Jul. 02, 2018 ~ Jul. 26, 2018

Issued Date: Aug. 01, 2018

Applicant: HMD Global Oy

Address: Karaportti 2, 02610 Espoo, Finland

Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch

Lab Address: No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan
(R.O.C)

Test Location (1): No. 19, Hwa Ya 2nd Rd, Wen Hwa Vil, Kwei Shan Dist., Taoyuan City
33383, Taiwan (R.O.C)

Test Location (2): No.215, Sec. 3, Beixin Rd., Xindian Dist., New Taipei City 231, Taiwan,
R.O.C

**FCC Registration /
Designation Number:** 427177 / TW0011



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Release Control Record

| Issue No. | Description | Date Issued |
|----------------|------------------|---------------|
| RF180626C10D-2 | Original Release | Aug. 01, 2018 |

1 Certificate of Conformity

Product: Smart Phone

Brand: NOKIA

Test Model: TA-1095


Sample Status: Engineering Sample

Applicant: HMD Global Oy

Test Date: Jul. 02, 2018 ~ Jul. 26, 2018

Standards: FCC Part 27, Subpart C, M

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's RF characteristics under the conditions specified in this report.

Prepared by : , **Date:** Aug. 01, 2018
Ivonne Wu / Supervisor

Approved by : , **Date:** Aug. 01, 2018
Dylan Chiou / Project Engineer

2 Summary of Test Results

| Applied Standard: FCC Part 27 & Part 2 | | | |
|--|-------------------------------------|--------|---|
| FCC Clause | Test Item | Result | Remarks |
| 2.1046 27.50(h) | Equivalent Isotropic Radiated Power | Pass | Meet the requirement of limit. |
| 2.1047 | Modulation Characteristics | Pass | Meet the requirement. |
| 2.1055 27.54 | Frequency Stability | Pass | Meet the requirement of limit. |
| 2.1049 | Occupied Bandwidth | Pass | Meet the requirement of limit. |
| -- | Peak to Average Ratio | Pass | Meet the requirement of limit. |
| 2.1051 27.53(l) | Out-of-Band Emissions Measurements | Pass | Meet the requirement of limit. |
| 2.1051 27.53(m) | Conducted Spurious Emissions | Pass | Meet the requirement of limit. |
| 2.1053 27.53(m) | Radiated Spurious Emissions | Pass | Meet the requirement of limit. Minimum passing margin is -9.84 dB at 10140.00 MHz. |

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

| Measurement | Frequency | Expanded Uncertainty (k=2) (±) |
|--------------------------------|--------------------|--------------------------------|
| Radiated Emissions up to 1 GHz | 30 MHz ~ 200 MHz | 2.0153 dB |
| | 200 MHz ~ 1000 MHz | 2.0224 dB |
| Radiated Emissions above 1 GHz | 1 GHz ~ 18 GHz | 1.0121 dB |
| | 18 GHz ~ 40 GHz | 1.1508 dB |

2.2 Test Site and Instruments

| Description & Manufacturer | Model No. | Serial No. | Date of Calibration | Due Date of Calibration |
|--|------------------|---|---------------------|-------------------------|
| Test Receiver Agilent Technologies | N9010A | MY52220314 | Nov. 24, 2017 | Nov. 23, 2018 |
| Spectrum Analyzer ROHDE & SCHWARZ | FSU43 | 101261 | Jan. 11, 2018 | Jan. 10, 2019 |
| Double Ridge Guide Horn Antenna EMCO | 3115 | 5619 | Nov. 30, 2017 | Nov. 29, 2018 |
| BILOG Antenna SCHWARZBECK | VULB 9168 | 9168-153 | Dec. 06, 2017 | Dec. 05, 2018 |
| HORN Antenna Schwarzbeck | BBHA 9120D | 9120D-969 | Dec. 12, 2017 | Dec. 11, 2018 |
| Fixed Attenuator Woken | 00801A1GGAM02Y | NA | May 17, 2018 | May 16, 2019 |
| MXG Vector signal generator Agilent | N5182B | MY53050430 | Oct. 24, 2017 | Oct. 23, 2018 |
| Preamplifier Agilent | 310N | 187226 | Jun. 19, 2018 | Jun. 18, 2019 |
| Preamplifier Agilent | 83017A | MY39501357 | Jun. 19, 2018 | Jun. 18, 2019 |
| RF signal cable ETS-LINDGREN | 5D-FB | Cable-CH1-01(RF C-SMS-100-SMS- 120+RFC-SMS-1 00-SMS-400) | Jun. 19, 2018 | Jun. 18, 2019 |
| RF signal cable ETS-LINDGREN | 8D-FB | Cable-CH1-02(RF C-SMS-100-SMS- 24) | Jun. 19, 2018 | Jun. 18, 2019 |
| Boresight Antenna Fixture | FBA-01 | FBA-SIP01 | NA | NA |
| Software BV ADT | E3 8.130425b | NA | NA | NA |
| Antenna Tower MF | NA | NA | NA | NA |
| Turn Table MF | NA | NA | NA | NA |
| Antenna Tower & Turn Table Controller MF | MF-7802 | NA | NA | NA |
| Radio Communication Analyzer Anritsu | MT8820C | 6201010284 | Dec. 28, 2017 | Dec. 27, 2018 |
| Temperature & Humidity Chamber | GTH-120-40-CP-AR | MAA1306-019 | Sep. 08, 2017 | Sep. 07, 2018 |
| DC Power Supply Topward | 33010D | 807748 | Oct. 25, 2016 | Oct. 24, 2018 |
| Digital Multimeter Fluke | 87-III | 70360742 | Jun. 29, 2018 | Jun. 28, 2019 |

- Note:
1. The calibration interval of the above test instruments is 12 / 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
 2. The test was performed in HsinTien Chamber 1.
 3. The horn antenna and preamplifier (model: 83017A) are used only for the measurement of emission frequency above 1 GHz if tested.
 4. The IC Site Registration No. is IC7450I-1.

3 General Information

3.1 General Description of EUT

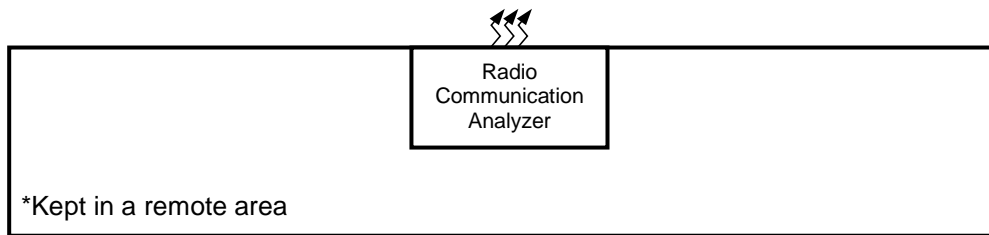
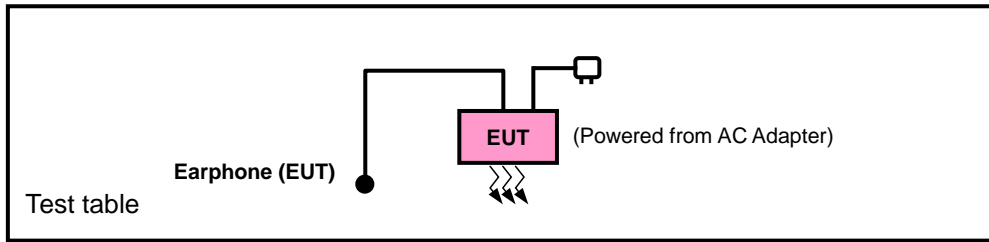
| | | |
|----------------------------|---|---------------------|
| Product | Smart Phone | |
| Brand | NOKIA | |
| Test Model | TA-1095 | |
| Status of EUT | Engineering Sample | |
| Power Supply Rating | 5.0 Vdc or 9 Vdc or 12 Vdc (adapter) 5.0 Vdc (host equipment) 3.85 Vdc (Li-ion battery) | |
| Modulation Type | QPSK, 16QAM | |
| Frequency Range | LTE Band 7 (Channel Bandwidth: 5 MHz) | 2502.5 ~ 2567.5 MHz |
| | LTE Band 7 (Channel Bandwidth: 10 MHz) | 2505 ~ 2565 MHz |
| | LTE Band 7 (Channel Bandwidth: 15 MHz) | 2507.5 ~ 2562.5 MHz |
| | LTE Band 7 (Channel Bandwidth: 20 MHz) | 2510 ~ 2560 MHz |
| | LTE Band 38 (Channel Bandwidth: 5 MHz) | 2572.5 ~ 2617.5 MHz |
| | LTE Band 38 (Channel Bandwidth: 10 MHz) | 2575.0 ~ 2615.0 MHz |
| | LTE Band 38 (Channel Bandwidth: 15 MHz) | 2577.5 ~ 2612.5 MHz |
| | LTE Band 38 (Channel Bandwidth: 20 MHz) | 2580.0 ~ 2610.0 MHz |
| Max. EIRP Power | LTE Band 7 (Channel Bandwidth: 5 MHz) | 179.76 mW |
| | LTE Band 7 (Channel Bandwidth: 10 MHz) | 180.18 mW |
| | LTE Band 7 (Channel Bandwidth: 15 MHz) | 181.43 mW |
| | LTE Band 7 (Channel Bandwidth: 20 MHz) | 183.10 mW |
| | LTE Band 38 (Channel Bandwidth: 5 MHz) | 198.98 mW |
| | LTE Band 38 (Channel Bandwidth: 10 MHz) | 200.96 mW |
| | LTE Band 38 (Channel Bandwidth: 15 MHz) | 202.21 mW |
| | LTE Band 38 (Channel Bandwidth: 20 MHz) | 203.70 mW |
| Emission Designator | LTE Band 7 (Channel Bandwidth: 5 MHz) | 4M50W7D |
| | LTE Band 7 (Channel Bandwidth: 10 MHz) | 8M97W7D |
| | LTE Band 7 (Channel Bandwidth: 15 MHz) | 13M5G7D |
| | LTE Band 7 (Channel Bandwidth: 20 MHz) | 17M9W7D |
| | LTE Band 38 (Channel Bandwidth: 5 MHz) | 4M49W7D |
| | LTE Band 38 (Channel Bandwidth: 10 MHz) | 8M97W7D |
| | LTE Band 38 (Channel Bandwidth: 15 MHz) | 13M5G7D |
| | LTE Band 38 (Channel Bandwidth: 20 MHz) | 17M9G7D |
| Antenna Type | LTE Band 7: PIFA Antenna with -0.04 dBi gain LTE Band 38: PIFA Antenna with -0.26 dBi gain | |
| Accessory Device | Refer to Note as below | |
| Data Cable Supplied | Refer to Note as below | |

Note:

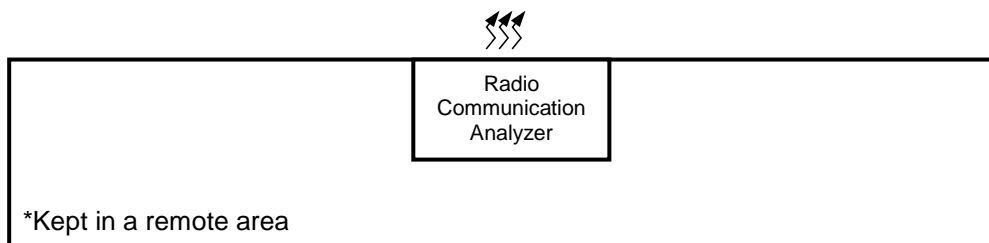
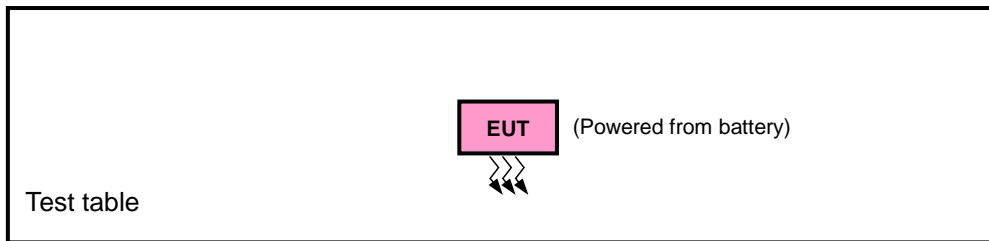
1. This report is issued as a duplicate report to BV CPS report no.: RF180626C09-3. The difference compared with original report is WWAN supported band. Therefore, only EIRP and radiated spurious emission tests were re-tested.
2. There're 2 configurations for the EUT listed as below.
Main Sample: EUT + Battery 1
2nd Sample: EUT + Battery 2
✧ Only the worst test data was presented in the report.
3. The EUT's accessories list refers to Ext. Pho.
4. The above EUT information is declared by manufacturer and for more detailed features description, please refers to the manufacturer's specifications or user's manual.

3.2 Configuration of System under Test

<Radiated Emission Test>



<E.I.R.P. Test>



3.2.1 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units.

3.3 Test Mode Applicability and Tested Channel Detail

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis, and antenna ports.

The worst case was found when positioned as the table below. Following channel(s) was (were) selected for the final test as listed below:

| EUT Configure Mode | Description |
|--------------------|------------------------|
| A | Main Sample |
| B | 2 nd Sample |

| SIM | Band | EIRP | Radiated Emission |
|-----|-------------|---------|-------------------|
| 1 | LTE Band 7 | Z-plane | Z-axis |
| | LTE Band 38 | X-plane | Y-axis |

LTE Band 7

| EUT Configure Mode | Test Item | Available Channel | Tested Channel | Channel Bandwidth | Modulation | Mode |
|--------------------|----------------------------|-------------------|---------------------|--------------------|-------------|----------------------|
| A | EIRP | 20775 to 21425 | 20775, 21100, 21425 | 5 MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| | | 20800 to 21400 | 20800, 21100, 21400 | 10 MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| | | 20825 to 21375 | 20825, 21100, 21375 | 15 MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| | | 20850 to 21350 | 20850, 21100 21350 | 20 MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| B | | 20850 to 21350 | 20850, 21100 21350 | 20 MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| A | Modulation Characteristics | 20850 to 21350 | 21100 | 5 MHz | QPSK, 16QAM | 25 RB / 0 RB Offset |
| A | Frequency Stability | 20775 to 21425 | 20775, 21425 | 5 MHz | QPSK | 1 RB / 0 RB Offset |
| | | 20800 to 21400 | 20800, 21400 | 10 MHz | QPSK | 1 RB / 0 RB Offset |
| | | 20825 to 21375 | 20825, 21375 | 15 MHz | QPSK | 1 RB / 0 RB Offset |
| | | 20850 to 21350 | 20850, 21350 | 20 MHz | QPSK | 1 RB / 0 RB Offset |
| A | Occupied Bandwidth | 20775 to 21425 | 20775, 21100, 21425 | 5 MHz | QPSK, 16QAM | 25 RB / 0 RB Offset |
| | | 20800 to 21400 | 20800, 21100, 21400 | 10 MHz | QPSK, 16QAM | 50 RB / 0 RB Offset |
| | | 20825 to 21375 | 20825, 21100, 21375 | 15 MHz | QPSK, 16QAM | 75 RB / 0 RB Offset |
| | | 20850 to 21350 | 20850, 21100 21350 | 20 MHz | QPSK, 16QAM | 100 RB / 0 RB Offset |
| A | Peak to Average Ratio | 20775 to 21425 | 20775, 21100, 21425 | 5 MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| | | 20800 to 21400 | 20800, 21100, 21400 | 10 MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| | | 20825 to 21375 | 20825, 21100, 21375 | 15 MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| | | 20850 to 21350 | 20850, 21100 21350 | 20 MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| A | Out-of-Band Emissions | 20775 to 21425 | 20775, 21425 | 5 MHz | QPSK, 16QAM | 25 RB / 0 RB Offset |
| | | 20800 to 21400 | 20800, 21400 | 10 MHz | QPSK, 16QAM | 50 RB / 0 RB Offset |
| | | 20825 to 21375 | 20825, 21375 | 15 MHz | QPSK, 16QAM | 75 RB / 0 RB Offset |
| | | 20850 to 21350 | 20850, 21350 | 20 MHz | QPSK, 16QAM | 100 RB / 0 RB Offset |
| A | Conducted Emission | 20775 to 21425 | 20775, 21100, 21425 | 5 MHz | QPSK | 1 RB / 0 RB Offset |
| | | 20800 to 21400 | 20800, 21100, 21400 | 10 MHz | QPSK | 1 RB / 0 RB Offset |
| | | 20825 to 21375 | 20825, 21100, 21375 | 15 MHz | QPSK | 1 RB / 0 RB Offset |
| | | 20850 to 21350 | 20850, 21100 21350 | 20 MHz | QPSK | 1 RB / 0 RB Offset |
| A | Radiated Emission | 20775 to 21425 | 20775, 21100, 21425 | 5 MHz | QPSK | 1 RB / 0 RB Offset |
| | | 20850 to 21350 | 20850, 21100 21350 | 20 MHz | QPSK | 1 RB / 0 RB Offset |
| | | B | 20850 to 21350 | 20850, 21100 21350 | 20 MHz | QPSK |

Note: This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation.

LTE Band 38

| EUT Configure Mode | Test Item | Available Channel | Tested Channel | Channel Bandwidth | Modulation | Mode |
|--------------------|----------------------------|-------------------|---------------------|-------------------|-------------|----------------------|
| A | EIRP | 37775 to 38225 | 37775, 38000, 38225 | 5 MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| | | 37800 to 38200 | 37800, 38000, 38200 | 10 MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| | | 37825 to 38175 | 37825, 38000, 38175 | 15 MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| | | 37850 to 38150 | 37850, 38000, 38150 | 20 MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| A | Modulation Characteristics | 37850 to 38150 | 38000 | 5 MHz | QPSK, 16QAM | 25 RB / 0 RB Offset |
| A | Frequency Stability | 37775 to 38225 | 37775, 38225 | 5 MHz | QPSK | 1 RB / 0 RB Offset |
| | | 37800 to 38200 | 37800, 38200 | 10 MHz | QPSK | 1 RB / 0 RB Offset |
| | | 37825 to 38175 | 37825, 38175 | 15 MHz | QPSK | 1 RB / 0 RB Offset |
| | | 37850 to 38150 | 37850, 38150 | 20 MHz | QPSK | 1 RB / 0 RB Offset |
| A | Occupied Bandwidth | 37775 to 38225 | 37775, 38000, 38225 | 5 MHz | QPSK, 16QAM | 25 RB / 0 RB Offset |
| | | 37800 to 38200 | 37800, 38000, 38200 | 10 MHz | QPSK, 16QAM | 50 RB / 0 RB Offset |
| | | 37825 to 38175 | 37825, 38000, 38175 | 15 MHz | QPSK, 16QAM | 75 RB / 0 RB Offset |
| | | 37850 to 38150 | 37850, 38000, 38150 | 20 MHz | QPSK, 16QAM | 100 RB / 0 RB Offset |
| A | Peak to Average Ratio | 37775 to 38225 | 37775, 38000, 38225 | 5 MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| | | 37800 to 38200 | 37800, 38000, 38200 | 10 MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| | | 37825 to 38175 | 37825, 38000, 38175 | 15 MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| | | 37850 to 38150 | 37850, 38000, 38150 | 20 MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| A | Out-of-Band Emissions | 37775 to 38225 | 37775, 38225 | 5 MHz | QPSK, 16QAM | 25 RB / 0 RB Offset |
| | | 37800 to 38200 | 37800, 38200 | 10 MHz | QPSK, 16QAM | 50 RB / 0 RB Offset |
| | | 37825 to 38175 | 37825, 38175 | 15 MHz | QPSK, 16QAM | 75 RB / 0 RB Offset |
| | | 37850 to 38150 | 37850, 38150 | 20 MHz | QPSK, 16QAM | 100 RB / 0 RB Offset |
| A | Conducted Emission | 37775 to 38225 | 37775, 38000, 38225 | 5 MHz | QPSK | 1 RB / 0 RB Offset |
| | | 37800 to 38200 | 37800, 38000, 38200 | 10 MHz | QPSK | 1 RB / 0 RB Offset |
| | | 37825 to 38175 | 37825, 38000, 38175 | 15 MHz | QPSK | 1 RB / 0 RB Offset |
| | | 37850 to 38150 | 37850, 38000, 38150 | 20 MHz | QPSK | 1 RB / 0 RB Offset |
| A | Radiated Emission | 37775 to 38225 | 37775, 38000, 38225 | 5 MHz | QPSK | 1 RB / 0 RB Offset |
| | | 37850 to 38150 | 37850, 38000, 38150 | 20 MHz | QPSK | 1 RB / 0 RB Offset |

Note: This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation.

Test Condition:

| Test Item | Environmental Conditions | Input Power | Tested By |
|----------------------------|--------------------------|----------------|------------------------|
| EIRP | 25 deg. C, 65 % RH | 3.85 Vdc | Karl Lee |
| Modulation Characteristics | 25 deg. C, 65 % RH | 3.85 Vdc | Wayne Lin |
| Frequency Stability | 25 deg. C, 65 % RH | 3.85 Vdc | Wayne Lin |
| Occupied Bandwidth | 25 deg. C, 65 % RH | 3.85 Vdc | Wayne Lin |
| Out-of-Band Emissions | 25 deg. C, 65 % RH | 3.85 Vdc | Wayne Lin |
| Peak to Average Ratio | 25 deg. C, 65 % RH | 3.85 Vdc | Wayne Lin |
| Conducted Emission | 25 deg. C, 65 % RH | 3.85 Vdc | Wayne Lin |
| Radiated Emission | 25 deg. C, 65 % RH | 120 Vac, 60 Hz | Karl Lee / Harry Hsueh |

3.4 EUT Operating Conditions

The EUT makes a call to the communication simulator. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency

3.5 General Description of Applied Standards

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC 47 CFR Part 2

FCC 47 CFR Part 27

KDB 971168 D01 Power Meas License Digital Systems v03r01

ANSI/TIA/EIA-603-E 2016

ANSI 63.26-2015

Note: All test items have been performed and recorded as per the above standards.

4 Test Types and Results

4.1 Output Power Measurement

4.1.1 Limits of Output Power Measurement

The radiated peak output power shall be according to the specific rule Part 27.50(h)(2) that “User stations are limited to 2 watts” and 27.50(i) specific that “Peak transmit power must be measure over any interval of continuous transmission using instrumentation calibration in terms of rms-equivalent voltage.”

4.1.2 Test Procedures

EIRP Measurement:

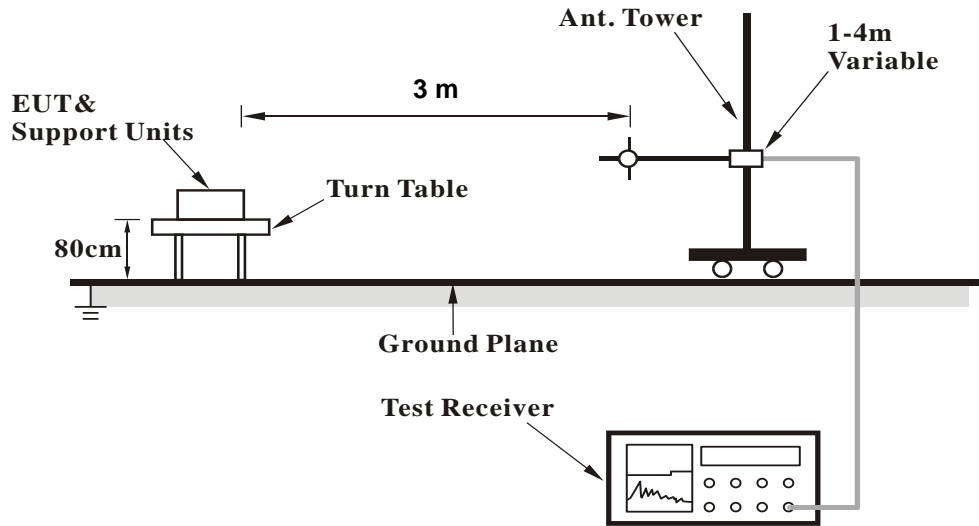
- a. All measurements were done at low, middle and high operational frequency range. RBW and VBW is 10 MHz for LTE mode.
- b. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8 m (below or equal 1 GHz) and/or 1.5 m (above 1 GHz) height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1 m to 4 m to find the maximum polar radiated power. The “Read Value” is the spectrum reading the maximum power value.
- c. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a tx cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to “Read Value“ of step b. Record the power level of S.G.
- d. $EIRP = \text{Output power level of S.G} - \text{TX cable loss} + \text{Antenna gain of substitution horn}.$

Conducted Power Measurement:

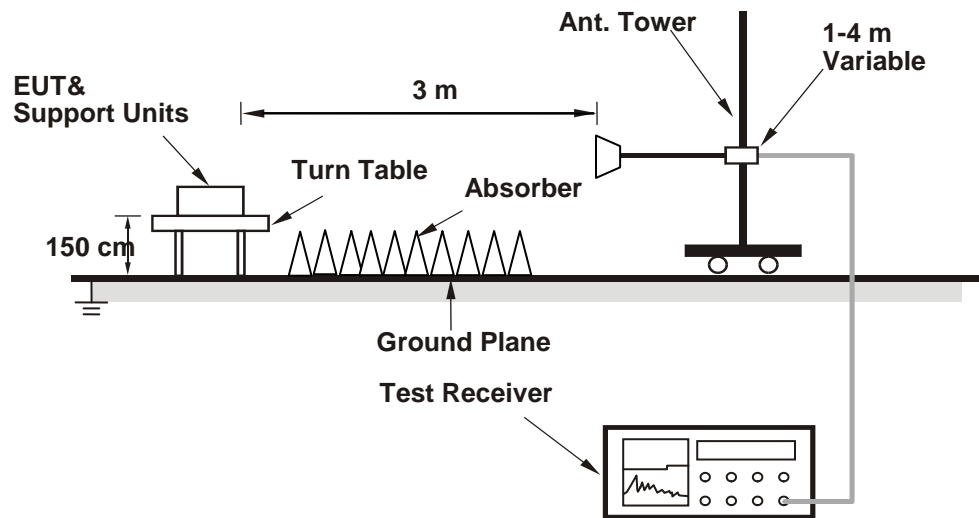
- a. The EUT was set up for the maximum power with LTE link data modulation and link up with simulator.
- b. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

4.1.3 Test Setup

EIRP / ERP Measurement:
<Radiated Emission below or equal 1 GHz>

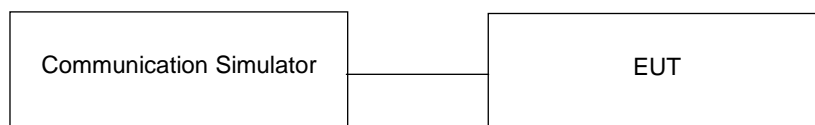


<Radiated Emission above 1 GHz>



For the actual test configuration, please refer to the attached file (Test Setup Photo).

Conducted Power Measurement:



4.1.4 Test Results

Conducted Output Power (dBm)

| LTE Band 7 | | | | | | | | | | | | | | | |
|------------|-----------|-------------------------|-----------|--------|--------|-------------------------|---------------|-----|-----------|---------|-----------|-------|-------|-------|---------------|
| BW | MCS Index | RB Size | RB Offset | Low | Mid | High | 3GPP MPR (dB) | BW | MCS Index | RB Size | RB Offset | Low | Mid | High | 3GPP MPR (dB) |
| | | | | 20850 | 21100 | 21350 | | | | | | 20825 | 21100 | 21375 | |
| | | Channel Frequency (MHz) | 2510.0 | 2535.0 | 2560.0 | Channel Frequency (MHz) | 2507.5 | | | 2535.0 | 2562.5 | | | | |
| 20M | QPSK | 1 | 0 | 22.54 | 22.58 | 22.41 | 0 | 15M | QPSK | 1 | 0 | 22.42 | 22.46 | 22.29 | 0 |
| | | 1 | 50 | 22.47 | 22.51 | 22.34 | 0 | | | 1 | 37 | 22.35 | 22.39 | 22.22 | 0 |
| | | 1 | 99 | 22.45 | 22.49 | 22.32 | 0 | | | 1 | 74 | 22.33 | 22.37 | 22.20 | 0 |
| | | 50 | 0 | 21.62 | 21.66 | 21.49 | 1 | | | 36 | 0 | 21.50 | 21.54 | 21.37 | 1 |
| | | 50 | 25 | 21.61 | 21.65 | 21.48 | 1 | | | 36 | 19 | 21.49 | 21.53 | 21.36 | 1 |
| | | 50 | 50 | 21.59 | 21.63 | 21.46 | 1 | | | 36 | 39 | 21.47 | 21.51 | 21.34 | 1 |
| | 16QAM | 100 | 0 | 21.60 | 21.64 | 21.47 | 1 | | 75 | 0 | 21.48 | 21.52 | 21.35 | 1 | |
| | | 1 | 0 | 21.48 | 21.52 | 21.35 | 1 | | 1 | 0 | 21.36 | 21.40 | 21.23 | 1 | |
| | | 1 | 50 | 21.41 | 21.45 | 21.28 | 1 | | 1 | 37 | 21.29 | 21.33 | 21.16 | 1 | |
| | | 1 | 99 | 21.39 | 21.43 | 21.26 | 1 | | 1 | 74 | 21.27 | 21.31 | 21.14 | 1 | |
| | | 50 | 0 | 20.56 | 20.60 | 20.43 | 2 | | 36 | 0 | 20.44 | 20.48 | 20.31 | 2 | |
| | | 50 | 25 | 20.55 | 20.59 | 20.42 | 2 | | 36 | 19 | 20.43 | 20.47 | 20.30 | 2 | |
| | | 50 | 50 | 20.53 | 20.57 | 20.40 | 2 | | 36 | 39 | 20.41 | 20.45 | 20.28 | 2 | |
| | | 100 | 0 | 20.54 | 20.58 | 20.41 | 2 | | 75 | 0 | 20.42 | 20.46 | 20.29 | 2 | |

| LTE Band 7 | | | | | | | | | | | | | | | |
|------------|-----------|-------------------------|-----------|--------|--------|-------------------------|---------------|----|-----------|---------|-----------|-------|-------|-------|---------------|
| BW | MCS Index | RB Size | RB Offset | Low | Mid | High | 3GPP MPR (dB) | BW | MCS Index | RB Size | RB Offset | Low | Mid | High | 3GPP MPR (dB) |
| | | | | 20800 | 21100 | 21400 | | | | | | 20775 | 21100 | 21425 | |
| | | Channel Frequency (MHz) | 2505.0 | 2535.0 | 2565.0 | Channel Frequency (MHz) | 2502.5 | | | 2535.0 | 2567.5 | | | | |
| 10M | QPSK | 1 | 0 | 22.33 | 22.37 | 22.20 | 0 | 5M | QPSK | 1 | 0 | 22.19 | 22.23 | 22.06 | 0 |
| | | 1 | 24 | 22.26 | 22.30 | 22.13 | 0 | | | 1 | 12 | 22.12 | 22.16 | 21.99 | 0 |
| | | 1 | 49 | 22.24 | 22.28 | 22.11 | 0 | | | 1 | 24 | 22.10 | 22.14 | 21.97 | 0 |
| | | 25 | 0 | 21.41 | 21.45 | 21.28 | 1 | | | 12 | 0 | 21.27 | 21.31 | 21.14 | 1 |
| | | 25 | 12 | 21.40 | 21.44 | 21.27 | 1 | | | 12 | 6 | 21.26 | 21.30 | 21.13 | 1 |
| | | 25 | 25 | 21.38 | 21.42 | 21.25 | 1 | | | 12 | 13 | 21.24 | 21.28 | 21.11 | 1 |
| | 16QAM | 50 | 0 | 21.39 | 21.43 | 21.26 | 1 | | 25 | 0 | 21.25 | 21.29 | 21.12 | 1 | |
| | | 1 | 0 | 21.27 | 21.31 | 21.14 | 1 | | 1 | 0 | 21.13 | 21.17 | 21.00 | 1 | |
| | | 1 | 24 | 21.20 | 21.24 | 21.07 | 1 | | 1 | 12 | 21.06 | 21.10 | 20.93 | 1 | |
| | | 1 | 49 | 21.18 | 21.22 | 21.05 | 1 | | 1 | 24 | 21.04 | 21.08 | 20.91 | 1 | |
| | | 25 | 0 | 20.35 | 20.39 | 20.22 | 2 | | 12 | 0 | 20.21 | 20.25 | 20.08 | 2 | |
| | | 25 | 12 | 20.34 | 20.38 | 20.21 | 2 | | 12 | 6 | 20.20 | 20.24 | 20.07 | 2 | |
| | | 25 | 25 | 20.32 | 20.36 | 20.19 | 2 | | 12 | 13 | 20.18 | 20.22 | 20.05 | 2 | |
| | | 50 | 0 | 20.33 | 20.37 | 20.20 | 2 | | 25 | 0 | 20.19 | 20.23 | 20.06 | 2 | |

| LTE Band 38 | | | | | | | | | | | | | | | |
|-------------|-----------|---------|-----------|-------------------------|--------|--------|---------------|-----|-----------|---------|-----------|--------|--------|--------|---------------|
| BW | MCS Index | RB Size | RB Offset | Low | Mid | High | 3GPP MPR (dB) | BW | MCS Index | RB Size | RB Offset | Low | Mid | High | 3GPP MPR (dB) |
| | | | | 37850 | 38000 | 38150 | | | | | | 37825 | 38000 | 38175 | |
| | | | | Channel Frequency (MHz) | 2580.0 | 2595.0 | | | | | | 2610.0 | 2577.5 | 2595.0 | |
| 20M | QPSK | 1 | 0 | 23.21 | 23.19 | 23.09 | 0 | 15M | QPSK | 1 | 0 | 23.08 | 23.06 | 22.96 | 0 |
| | | 1 | 50 | 23.18 | 23.16 | 23.06 | 0 | | | 1 | 37 | 23.05 | 23.03 | 22.93 | 0 |
| | | 1 | 99 | 23.14 | 23.12 | 23.02 | 0 | | | 1 | 74 | 23.01 | 22.99 | 22.89 | 0 |
| | | 50 | 0 | 22.20 | 22.18 | 22.08 | 1 | | | 36 | 0 | 22.07 | 22.05 | 21.95 | 1 |
| | | 50 | 25 | 22.17 | 22.15 | 22.05 | 1 | | | 36 | 19 | 22.04 | 22.02 | 21.92 | 1 |
| | | 50 | 50 | 22.15 | 22.13 | 22.03 | 1 | | | 36 | 39 | 22.02 | 22.00 | 21.90 | 1 |
| | | 100 | 0 | 22.13 | 22.11 | 22.01 | 1 | | | 75 | 0 | 22.00 | 21.98 | 21.88 | 1 |
| | 16QAM | 1 | 0 | 22.19 | 22.17 | 22.07 | 1 | | 16QAM | 1 | 0 | 22.06 | 22.04 | 21.94 | 1 |
| | | 1 | 50 | 22.16 | 22.14 | 22.04 | 1 | | | 1 | 37 | 22.03 | 22.01 | 21.91 | 1 |
| | | 1 | 99 | 22.12 | 22.10 | 22.00 | 1 | | | 1 | 74 | 21.99 | 21.97 | 21.87 | 1 |
| | | 50 | 0 | 21.18 | 21.16 | 21.06 | 2 | | | 36 | 0 | 21.05 | 21.03 | 20.93 | 2 |
| | | 50 | 25 | 21.15 | 21.13 | 21.03 | 2 | | | 36 | 19 | 21.02 | 21.00 | 20.90 | 2 |
| | | 50 | 50 | 21.13 | 21.11 | 21.01 | 2 | | | 36 | 39 | 21.00 | 20.98 | 20.88 | 2 |
| | | 100 | 0 | 21.11 | 21.09 | 20.99 | 2 | | | 75 | 0 | 20.98 | 20.96 | 20.86 | 2 |
| BW | MCS Index | RB Size | RB Offset | Low | Mid | High | 3GPP MPR (dB) | BW | MCS Index | RB Size | RB Offset | Low | Mid | High | 3GPP MPR (dB) |
| | | | | 37800 | 38000 | 38200 | | | | | | 37775 | 38000 | 38225 | |
| | | | | Channel Frequency (MHz) | 2575.0 | 2595.0 | | | | | | 2615.0 | 2572.5 | 2595.0 | |
| 10M | QPSK | 1 | 0 | 23.00 | 22.98 | 22.88 | 0 | 5M | QPSK | 1 | 0 | 22.88 | 22.86 | 22.76 | 0 |
| | | 1 | 24 | 22.97 | 22.95 | 22.85 | 0 | | | 1 | 12 | 22.85 | 22.83 | 22.73 | 0 |
| | | 1 | 49 | 22.93 | 22.91 | 22.81 | 0 | | | 1 | 24 | 22.81 | 22.79 | 22.69 | 0 |
| | | 25 | 0 | 21.99 | 21.97 | 21.87 | 1 | | | 12 | 0 | 21.87 | 21.85 | 21.75 | 1 |
| | | 25 | 12 | 21.96 | 21.94 | 21.84 | 1 | | | 12 | 6 | 21.84 | 21.82 | 21.72 | 1 |
| | | 25 | 25 | 21.94 | 21.92 | 21.82 | 1 | | | 12 | 13 | 21.82 | 21.80 | 21.70 | 1 |
| | | 50 | 0 | 21.92 | 21.90 | 21.80 | 1 | | | 25 | 0 | 21.80 | 21.78 | 21.68 | 1 |
| | 16QAM | 1 | 0 | 21.98 | 21.96 | 21.86 | 1 | | 16QAM | 1 | 0 | 21.86 | 21.84 | 21.74 | 1 |
| | | 1 | 24 | 21.95 | 21.93 | 21.83 | 1 | | | 1 | 12 | 21.83 | 21.81 | 21.71 | 1 |
| | | 1 | 49 | 21.91 | 21.89 | 21.79 | 1 | | | 1 | 24 | 21.79 | 21.77 | 21.67 | 1 |
| | | 25 | 0 | 20.97 | 20.95 | 20.85 | 2 | | | 12 | 0 | 20.85 | 20.83 | 20.73 | 2 |
| | | 25 | 12 | 20.94 | 20.92 | 20.82 | 2 | | | 12 | 6 | 20.82 | 20.80 | 20.70 | 2 |
| | | 25 | 25 | 20.92 | 20.90 | 20.80 | 2 | | | 12 | 13 | 20.80 | 20.78 | 20.68 | 2 |
| | | 50 | 0 | 20.90 | 20.88 | 20.78 | 2 | | | 25 | 0 | 20.78 | 20.76 | 20.66 | 2 |

**EIRP Power (dBm)
Mode A**

| LTE Band 7 | | | | | | | |
|----------------------------------|---------|-----------------|---------------|------------------------|------------|-----------|--------------------|
| Channel Bandwidth: 5 MHz / QPSK | | | | | | | |
| Plane | Channel | Frequency (MHz) | Reading (dBm) | Correction Factor (dB) | EIRP (dBm) | EIRP (mW) | Polarization (H/V) |
| Z | 20775 | 2502.5 | -21.75 | 44.24 | 22.49 | 177.34 | H |
| | 21100 | 2535.0 | -21.65 | 44.20 | 22.55 | 179.76 | |
| | 21425 | 2567.5 | -22.30 | 44.80 | 22.50 | 177.87 | |
| | 20775 | 2502.5 | -27.70 | 44.19 | 16.49 | 44.58 | V |
| | 21100 | 2535.0 | -27.58 | 44.09 | 16.51 | 44.75 | |
| | 21425 | 2567.5 | -28.02 | 44.50 | 16.48 | 44.45 | |
| Channel Bandwidth: 5 MHz / 16QAM | | | | | | | |
| Z | 20775 | 2502.5 | -22.77 | 44.24 | 21.47 | 140.22 | H |
| | 21100 | 2535.0 | -22.68 | 44.20 | 21.52 | 141.81 | |
| | 21425 | 2567.5 | -23.31 | 44.80 | 21.49 | 140.96 | |
| | 20775 | 2502.5 | -28.72 | 44.19 | 15.47 | 35.25 | V |
| | 21100 | 2535.0 | -28.60 | 44.09 | 15.49 | 35.38 | |
| | 21425 | 2567.5 | -29.03 | 44.50 | 15.47 | 35.23 | |

Note: EIRP (dBm) = Reading (dBm) + Correction Factor (dB)

| LTE Band 7 | | | | | | | |
|-----------------------------------|---------|-----------------|---------------|------------------------|------------|-----------|--------------------|
| Channel Bandwidth: 10 MHz / QPSK | | | | | | | |
| Plane | Channel | Frequency (MHz) | Reading (dBm) | Correction Factor (dB) | EIRP (dBm) | EIRP (mW) | Polarization (H/V) |
| Z | 20800 | 2505.0 | -21.86 | 44.34 | 22.48 | 177.05 | H |
| | 21100 | 2535.0 | -21.64 | 44.20 | 22.56 | 180.18 | |
| | 21400 | 2565.0 | -22.25 | 44.72 | 22.47 | 176.73 | |
| | 20800 | 2505.0 | -27.73 | 44.23 | 16.50 | 44.63 | V |
| | 21100 | 2535.0 | -27.56 | 44.09 | 16.53 | 44.96 | |
| | 21400 | 2565.0 | -27.94 | 44.41 | 16.47 | 44.32 | |
| Channel Bandwidth: 10 MHz / 16QAM | | | | | | | |
| Z | 20800 | 2505.0 | -22.85 | 44.34 | 21.49 | 140.96 | H |
| | 21100 | 2535.0 | -22.63 | 44.20 | 21.57 | 143.45 | |
| | 21400 | 2565.0 | -23.24 | 44.72 | 21.48 | 140.70 | |
| | 20800 | 2505.0 | -28.74 | 44.23 | 15.49 | 35.37 | V |
| | 21100 | 2535.0 | -28.57 | 44.09 | 15.52 | 35.63 | |
| | 21400 | 2565.0 | -28.96 | 44.41 | 15.45 | 35.04 | |

Note: EIRP (dBm) = Reading (dBm) + Correction Factor (dB)

| LTE Band 7 | | | | | | | |
|-----------------------------------|---------|-----------------|---------------|------------------------|------------|-----------|--------------------|
| Channel Bandwidth: 15 MHz / QPSK | | | | | | | |
| Plane | Channel | Frequency (MHz) | Reading (dBm) | Correction Factor (dB) | EIRP (dBm) | EIRP (mW) | Polarization (H/V) |
| Z | 20825 | 2507.5 | -21.80 | 44.32 | 22.52 | 178.57 | H |
| | 21100 | 2535.0 | -21.61 | 44.20 | 22.59 | 181.43 | |
| | 21375 | 2562.5 | -22.35 | 44.85 | 22.50 | 177.75 | |
| | 20825 | 2507.5 | -27.43 | 43.99 | 16.56 | 45.31 | V |
| | 21100 | 2535.0 | -27.52 | 44.09 | 16.57 | 45.37 | |
| | 21375 | 2562.5 | -27.98 | 44.51 | 16.53 | 44.98 | |
| Channel Bandwidth: 15 MHz / 16QAM | | | | | | | |
| Z | 20825 | 2507.5 | -22.81 | 44.32 | 21.51 | 141.51 | H |
| | 21100 | 2535.0 | -22.62 | 44.20 | 21.58 | 143.78 | |
| | 21375 | 2562.5 | -23.38 | 44.85 | 21.47 | 140.22 | |
| | 20825 | 2507.5 | -28.46 | 43.99 | 15.53 | 35.74 | V |
| | 21100 | 2535.0 | -28.51 | 44.09 | 15.58 | 36.12 | |
| | 21375 | 2562.5 | -29.02 | 44.51 | 15.49 | 35.40 | |

Note: EIRP (dBm) = Reading (dBm) + Correction Factor (dB)

| LTE Band 7 | | | | | | | |
|-----------------------------------|---------|-----------------|---------------|------------------------|------------|-----------|--------------------|
| Channel Bandwidth: 20 MHz / QPSK | | | | | | | |
| Plane | Channel | Frequency (MHz) | Reading (dBm) | Correction Factor (dB) | EIRP (dBm) | EIRP (mW) | Polarization (H/V) |
| Z | 20850.0 | 2510.0 | -21.61 | 44.16 | 22.55 | 179.89 | H |
| | 21100.0 | 2535.0 | -21.57 | 44.20 | 22.63 | 183.10 | |
| | 21350.0 | 2560.0 | -22.27 | 44.81 | 22.54 | 179.35 | |
| | 20850.0 | 2510.0 | -28.21 | 44.78 | 16.57 | 45.39 | V |
| | 21100.0 | 2535.0 | -27.49 | 44.09 | 16.60 | 45.69 | |
| | 21350.0 | 2560.0 | -28.17 | 44.72 | 16.55 | 45.19 | |
| Channel Bandwidth: 20 MHz / 16QAM | | | | | | | |
| Z | 20850.0 | 2510.0 | -22.61 | 44.16 | 21.55 | 142.89 | H |
| | 21100.0 | 2535.0 | -22.55 | 44.20 | 21.65 | 146.12 | |
| | 21350.0 | 2560.0 | -23.28 | 44.81 | 21.53 | 142.13 | |
| | 20850.0 | 2510.0 | -29.22 | 44.78 | 15.56 | 35.97 | V |
| | 21100.0 | 2535.0 | -28.50 | 44.09 | 15.59 | 36.21 | |
| | 21350.0 | 2560.0 | -29.17 | 44.72 | 15.55 | 35.89 | |

Note: EIRP (dBm) = Reading (dBm) + Correction Factor (dB)

| LTE Band 38 | | | | | | | |
|----------------------------------|---------|-----------------|---------------|------------------------|------------|-----------|--------------------|
| Channel Bandwidth: 5 MHz / QPSK | | | | | | | |
| Plane | Channel | Frequency (MHz) | Reading (dBm) | Correction Factor (dB) | EIRP (dBm) | EIRP (mW) | Polarization (H/V) |
| X | 37775 | 2572.5 | -21.25 | 44.24 | 22.99 | 198.98 | H |
| | 38000 | 2595.0 | -21.23 | 44.20 | 22.97 | 198.02 | |
| | 38225 | 2617.5 | -21.88 | 44.80 | 22.92 | 195.93 | |
| | 37775 | 2572.5 | -23.21 | 44.19 | 20.98 | 125.34 | V |
| | 38000 | 2595.0 | -23.16 | 44.09 | 20.93 | 123.82 | |
| | 38225 | 2617.5 | -23.60 | 44.50 | 20.90 | 123.00 | |
| Channel Bandwidth: 5 MHz / 16QAM | | | | | | | |
| X | 37775 | 2572.5 | -22.27 | 44.24 | 21.97 | 157.33 | H |
| | 38000 | 2595.0 | -22.26 | 44.20 | 21.94 | 156.21 | |
| | 38225 | 2617.5 | -22.91 | 44.80 | 21.89 | 154.56 | |
| | 37775 | 2572.5 | -25.22 | 44.19 | 18.97 | 78.90 | V |
| | 38000 | 2595.0 | -24.17 | 44.09 | 19.92 | 98.13 | |
| | 38225 | 2617.5 | -24.61 | 44.50 | 19.89 | 97.48 | |

Note: EIRP (dBm) = Reading (dBm) + Correction Factor (dB)

| LTE Band 38 | | | | | | | |
|-----------------------------------|---------|-----------------|---------------|------------------------|------------|-----------|--------------------|
| Channel Bandwidth: 10 MHz / QPSK | | | | | | | |
| Plane | Channel | Frequency (MHz) | Reading (dBm) | Correction Factor (dB) | EIRP (dBm) | EIRP (mW) | Polarization (H/V) |
| X | 37800 | 2575.0 | -21.31 | 44.34 | 23.03 | 200.96 | H |
| | 38000 | 2595.0 | -21.23 | 44.20 | 22.97 | 198.02 | |
| | 38200 | 2615.0 | -21.80 | 44.72 | 22.92 | 196.02 | |
| | 37800 | 2575.0 | -23.23 | 44.23 | 21.00 | 125.78 | V |
| | 38000 | 2595.0 | -23.14 | 44.09 | 20.95 | 124.39 | |
| | 38200 | 2615.0 | -23.49 | 44.41 | 20.92 | 123.48 | |
| Channel Bandwidth: 10 MHz / 16QAM | | | | | | | |
| X | 37800 | 2575.0 | -22.32 | 44.34 | 22.02 | 159.26 | H |
| | 38000 | 2595.0 | -22.23 | 44.20 | 21.97 | 157.29 | |
| | 38200 | 2615.0 | -22.78 | 44.72 | 21.94 | 156.42 | |
| | 37800 | 2575.0 | -24.24 | 44.23 | 19.99 | 99.68 | V |
| | 38000 | 2595.0 | -24.15 | 44.09 | 19.94 | 98.58 | |
| | 38200 | 2615.0 | -24.49 | 44.41 | 19.92 | 98.08 | |

Note: EIRP (dBm) = Reading (dBm) + Correction Factor (dB)

| LTE Band 38 | | | | | | | |
|-----------------------------------|---------|-----------------|---------------|------------------------|------------|-----------|--------------------|
| Channel Bandwidth: 15 MHz / QPSK | | | | | | | |
| Plane | Channel | Frequency (MHz) | Reading (dBm) | Correction Factor (dB) | EIRP (dBm) | EIRP (mW) | Polarization (H/V) |
| X | 37825 | 2577.5 | -21.26 | 44.32 | 23.06 | 202.21 | H |
| | 38000 | 2595.0 | -21.17 | 44.20 | 23.03 | 200.77 | |
| | 38175 | 2612.5 | -21.89 | 44.85 | 22.96 | 197.61 | |
| | 37825 | 2577.5 | -22.92 | 43.99 | 21.07 | 128.00 | V |
| | 38000 | 2595.0 | -23.10 | 44.09 | 20.99 | 125.55 | |
| | 38175 | 2612.5 | -23.55 | 44.51 | 20.96 | 124.74 | |
| Channel Bandwidth: 15 MHz / 16QAM | | | | | | | |
| X | 37825 | 2577.5 | -22.27 | 44.32 | 22.05 | 160.25 | H |
| | 38000 | 2595.0 | -22.20 | 44.20 | 22.00 | 158.38 | |
| | 38175 | 2612.5 | -22.89 | 44.85 | 21.96 | 156.96 | |
| | 37825 | 2577.5 | -23.93 | 43.99 | 20.06 | 101.44 | V |
| | 38000 | 2595.0 | -24.09 | 44.09 | 20.00 | 99.95 | |
| | 38175 | 2612.5 | -24.56 | 44.51 | 19.95 | 98.86 | |

Note: EIRP (dBm) = Reading (dBm) + Correction Factor (dB)

| LTE Band 38 | | | | | | | |
|-----------------------------------|---------|-----------------|---------------|------------------------|------------|-----------|--------------------|
| Channel Bandwidth: 20 MHz / QPSK | | | | | | | |
| Plane | Channel | Frequency (MHz) | Reading (dBm) | Correction Factor (dB) | EIRP (dBm) | EIRP (mW) | Polarization (H/V) |
| X | 37850 | 2580.0 | -21.07 | 44.16 | 23.09 | 203.70 | H |
| | 38000 | 2595.0 | -21.16 | 44.20 | 23.04 | 201.23 | |
| | 38150 | 2610.0 | -21.78 | 44.81 | 23.03 | 200.77 | |
| | 37850 | 2580.0 | -23.71 | 44.78 | 21.07 | 127.94 | V |
| | 38000 | 2595.0 | -23.06 | 44.09 | 21.03 | 126.71 | |
| | 38150 | 2610.0 | -23.73 | 44.72 | 21.00 | 125.75 | |
| Channel Bandwidth: 20 MHz / 16QAM | | | | | | | |
| X | 37850 | 2580.0 | -22.08 | 44.16 | 22.08 | 161.44 | H |
| | 38000 | 2595.0 | -22.16 | 44.20 | 22.04 | 159.85 | |
| | 38150 | 2610.0 | -22.81 | 44.81 | 22.00 | 158.38 | |
| | 37850 | 2580.0 | -24.70 | 44.78 | 20.08 | 101.86 | V |
| | 38000 | 2595.0 | -24.06 | 44.09 | 20.03 | 100.65 | |
| | 38150 | 2610.0 | -24.73 | 44.72 | 19.99 | 99.77 | |

Note: EIRP (dBm) = Reading (dBm) + Correction Factor (dB)

Mode B

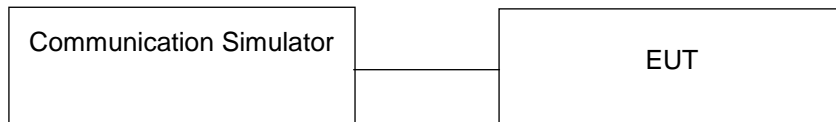
| LTE Band 7 | | | | | | | |
|-----------------------------------|---------|-----------------|---------------|------------------------|------------|-----------|--------------------|
| Channel Bandwidth: 20 MHz / QPSK | | | | | | | |
| Plane | Channel | Frequency (MHz) | Reading (dBm) | Correction Factor (dB) | EIRP (dBm) | EIRP (mW) | Polarization (H/V) |
| Z | 20850.0 | 2510.0 | -22.62 | 44.16 | 21.54 | 142.56 | H |
| | 21100.0 | 2535.0 | -22.58 | 44.20 | 21.62 | 145.11 | |
| | 21350.0 | 2560.0 | -23.27 | 44.81 | 21.54 | 142.46 | |
| | 20850.0 | 2510.0 | -29.22 | 44.78 | 15.56 | 35.97 | V |
| | 21100.0 | 2535.0 | -28.50 | 44.09 | 15.59 | 36.21 | |
| | 21350.0 | 2560.0 | -29.18 | 44.72 | 15.54 | 35.81 | |
| Channel Bandwidth: 20 MHz / 16QAM | | | | | | | |
| Z | 20850.0 | 2510.0 | -23.61 | 44.16 | 20.55 | 113.50 | H |
| | 21100.0 | 2535.0 | -23.56 | 44.20 | 20.64 | 115.80 | |
| | 21350.0 | 2560.0 | -24.29 | 44.81 | 20.52 | 112.64 | |
| | 20850.0 | 2510.0 | -30.23 | 44.78 | 14.55 | 28.51 | V |
| | 21100.0 | 2535.0 | -29.51 | 44.09 | 14.58 | 28.69 | |
| | 21350.0 | 2560.0 | -30.18 | 44.72 | 14.54 | 28.44 | |

4.2 Modulation Characteristics Measurement

4.2.1 Limits of Modulation Characteristics

N/A

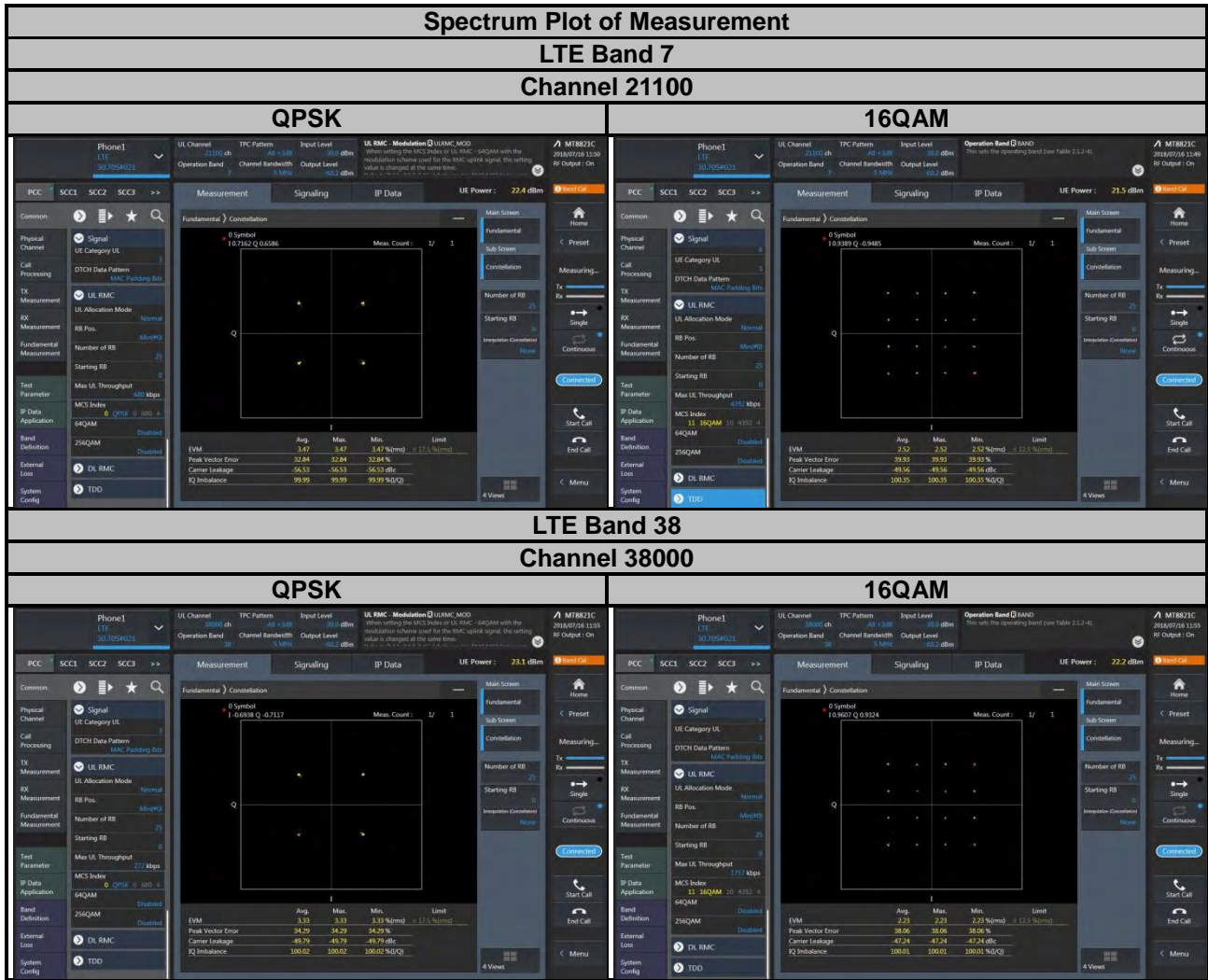
4.2.2 Test Setup



4.2.3 Test Procedure

Connect the EUT to Communication Simulator via the antenna connector. The frequency band is set as EUT supported Modulation and Channels, the EUT output is matched with 50 ohm load, the waveform quality and constellation of the EUT was tested.

4.2.4 Test Results



4.3 Frequency Stability Measurement

4.3.1 Limits of Frequency Stability Measurement

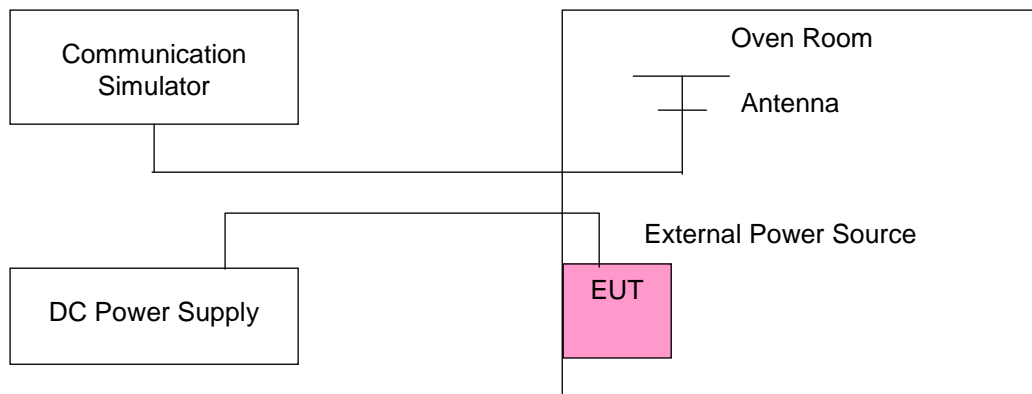
According to the FCC part 2.1055 shall be tested the frequency stability. The rule is defined that "The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block." The test extreme voltage is according to the 2.1055(d)(1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment and the extreme temperature rule is comply with specification of EUT $-30^{\circ}\text{C} \sim 50^{\circ}\text{C}$.

4.3.2 Test Procedure

- Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.
- EUT is connected the external power supply to control the DC input power. The test voltage range is from minimum to maximum working voltage. Each step shall be record the frequency error rate.
- The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the $\pm 0.5^{\circ}\text{C}$ during the measurement testing. The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.

NOTE: The frequency error was recorded frequency error from the communication simulator.

4.3.3 Test Setup



4.3.4 Test Results

Frequency Error vs. Voltage

| Voltage (Volts) | LTE Band 7 | | | | Limit (ppm) |
|-----------------|--------------------------|-----------------------|-----------------|-----------------------|-------------|
| | Channel Bandwidth: 5 MHz | | | | |
| | Low Channel | | High Channel | | |
| | Frequency (MHz) | Frequency Error (ppm) | Frequency (MHz) | Frequency Error (ppm) | |
| 3.85 | 2502.500002 | 0.0008 | 2567.500003 | 0.0010 | 2.5 |
| 3.27 | 2502.500001 | 0.0005 | 2567.500001 | 0.0005 | 2.5 |
| 4.42 | 2502.500002 | 0.0008 | 2567.500002 | 0.0007 | 2.5 |

Note: The applicant defined the normal working voltage of the battery is from 3.27 Vdc to 4.42 Vdc.

Frequency Error vs. Temperature

| Temp. (°C) | LTE Band 7 | | | | Limit (ppm) |
|------------|--------------------------|-----------------------|-----------------|-----------------------|-------------|
| | Channel Bandwidth: 5 MHz | | | | |
| | Low Channel | | High Channel | | |
| | Frequency (MHz) | Frequency Error (ppm) | Frequency (MHz) | Frequency Error (ppm) | |
| -30 | 2502.500003 | 0.0011 | 2567.500002 | 0.0006 | 2.5 |
| -20 | 2502.500002 | 0.0007 | 2567.500003 | 0.0011 | 2.5 |
| -10 | 2502.500004 | 0.0014 | 2567.500002 | 0.0009 | 2.5 |
| 0 | 2502.500003 | 0.0010 | 2567.500001 | 0.0004 | 2.5 |
| 10 | 2502.500002 | 0.0008 | 2567.500002 | 0.0007 | 2.5 |
| 20 | 2502.499999 | -0.0005 | 2567.499996 | -0.0015 | 2.5 |
| 30 | 2502.499998 | -0.0010 | 2567.499999 | -0.0005 | 2.5 |
| 40 | 2502.499998 | -0.0007 | 2567.499999 | -0.0004 | 2.5 |
| 50 | 2502.499997 | -0.0012 | 2567.499998 | -0.0007 | 2.5 |
| 55 | 2502.499997 | -0.0013 | 2567.499997 | -0.0013 | 2.5 |

Frequency Error vs. Voltage

| Voltage (Volts) | LTE Band 7 | | | | Limit (ppm) |
|-----------------|---------------------------|-----------------------|-----------------|-----------------------|-------------|
| | Channel Bandwidth: 10 MHz | | | | |
| | Low Channel | | High Channel | | |
| | Frequency (MHz) | Frequency Error (ppm) | Frequency (MHz) | Frequency Error (ppm) | |
| 3.85 | 2505.000002 | 0.0008 | 2565.000003 | 0.0012 | 2.5 |
| 3.27 | 2505.000002 | 0.0009 | 2565.000001 | 0.0005 | 2.5 |
| 4.42 | 2505.000002 | 0.0008 | 2565.000001 | 0.0005 | 2.5 |

Note: The applicant defined the normal working voltage of the battery is from 3.27 Vdc to 4.42 Vdc.

Frequency Error vs. Temperature

| Temp. (°C) | LTE Band 7 | | | | Limit (ppm) |
|------------|---------------------------|-----------------------|-----------------|-----------------------|-------------|
| | Channel Bandwidth: 10 MHz | | | | |
| | Low Channel | | High Channel | | |
| | Frequency (MHz) | Frequency Error (ppm) | Frequency (MHz) | Frequency Error (ppm) | |
| -30 | 2505.000004 | 0.0014 | 2565.000002 | 0.0006 | 2.5 |
| -20 | 2505.000002 | 0.0008 | 2565.000001 | 0.0004 | 2.5 |
| -10 | 2505.000004 | 0.0015 | 2565.000004 | 0.0015 | 2.5 |
| 0 | 2505.000001 | 0.0004 | 2565.000001 | 0.0005 | 2.5 |
| 10 | 2505.000002 | 0.0007 | 2565.000004 | 0.0015 | 2.5 |
| 20 | 2504.999996 | -0.0015 | 2564.999998 | -0.0007 | 2.5 |
| 30 | 2504.999997 | -0.0010 | 2564.999999 | -0.0004 | 2.5 |
| 40 | 2504.999997 | -0.0010 | 2564.999997 | -0.0013 | 2.5 |
| 50 | 2504.999996 | -0.0016 | 2564.999998 | -0.0008 | 2.5 |
| 55 | 2504.999997 | -0.0013 | 2564.999998 | -0.0008 | 2.5 |

Frequency Error vs. Voltage

| Voltage (Volts) | LTE Band 7 | | | | Limit (ppm) |
|-----------------|---------------------------|-----------------------|-----------------|-----------------------|-------------|
| | Channel Bandwidth: 15 MHz | | | | |
| | Low Channel | | High Channel | | |
| | Frequency (MHz) | Frequency Error (ppm) | Frequency (MHz) | Frequency Error (ppm) | |
| 3.85 | 2507.500004 | 0.0015 | 2562.500002 | 0.0006 | 2.5 |
| 3.27 | 2507.500001 | 0.0004 | 2562.500002 | 0.0009 | 2.5 |
| 4.42 | 2507.500002 | 0.0008 | 2562.500001 | 0.0005 | 2.5 |

Note: The applicant defined the normal working voltage of the battery is from 3.27 Vdc to 4.42 Vdc.

Frequency Error vs. Temperature

| Temp. (°C) | LTE Band 7 | | | | Limit (ppm) |
|------------|---------------------------|-----------------------|-----------------|-----------------------|-------------|
| | Channel Bandwidth: 15 MHz | | | | |
| | Low Channel | | High Channel | | |
| | Frequency (MHz) | Frequency Error (ppm) | Frequency (MHz) | Frequency Error (ppm) | |
| -30 | 2507.500002 | 0.0008 | 2562.500003 | 0.0011 | 2.5 |
| -20 | 2507.500003 | 0.0012 | 2562.500003 | 0.0013 | 2.5 |
| -10 | 2507.500003 | 0.0010 | 2562.500003 | 0.0012 | 2.5 |
| 0 | 2507.500002 | 0.0007 | 2562.500003 | 0.0011 | 2.5 |
| 10 | 2507.500002 | 0.0009 | 2562.500002 | 0.0007 | 2.5 |
| 20 | 2507.499997 | -0.0011 | 2562.499998 | -0.0006 | 2.5 |
| 30 | 2507.499996 | -0.0016 | 2562.499999 | -0.0005 | 2.5 |
| 40 | 2507.499997 | -0.0013 | 2562.499996 | -0.0016 | 2.5 |
| 50 | 2507.499999 | -0.0006 | 2562.499997 | -0.0012 | 2.5 |
| 55 | 2507.499996 | -0.0014 | 2562.499998 | -0.0007 | 2.5 |

Frequency Error vs. Voltage

| Voltage (Volts) | LTE Band 7 | | | | Limit (ppm) |
|-----------------|---------------------------|-----------------------|-----------------|-----------------------|-------------|
| | Channel Bandwidth: 20 MHz | | | | |
| | Low Channel | | High Channel | | |
| | Frequency (MHz) | Frequency Error (ppm) | Frequency (MHz) | Frequency Error (ppm) | |
| 3.85 | 2510.000003 | 0.0012 | 2560.000003 | 0.0010 | 2.5 |
| 3.27 | 2510.000003 | 0.0012 | 2560.000001 | 0.0004 | 2.5 |
| 4.42 | 2510.000004 | 0.0015 | 2560.000002 | 0.0007 | 2.5 |

Note: The applicant defined the normal working voltage of the battery is from 3.27 Vdc to 4.42 Vdc.

Frequency Error vs. Temperature

| Temp. (°C) | LTE Band 7 | | | | Limit (ppm) |
|------------|---------------------------|-----------------------|-----------------|-----------------------|-------------|
| | Channel Bandwidth: 20 MHz | | | | |
| | Low Channel | | High Channel | | |
| | Frequency (MHz) | Frequency Error (ppm) | Frequency (MHz) | Frequency Error (ppm) | |
| -30 | 2510.000001 | 0.0005 | 2560.000001 | 0.0005 | 2.5 |
| -20 | 2510.000002 | 0.0009 | 2560.000001 | 0.0004 | 2.5 |
| -10 | 2510.000003 | 0.0013 | 2560.000003 | 0.0012 | 2.5 |
| 0 | 2510.000003 | 0.0012 | 2560.000003 | 0.0010 | 2.5 |
| 10 | 2510.000002 | 0.0007 | 2560.000001 | 0.0005 | 2.5 |
| 20 | 2509.999999 | -0.0004 | 2559.999997 | -0.0010 | 2.5 |
| 30 | 2509.999997 | -0.0014 | 2559.999996 | -0.0015 | 2.5 |
| 40 | 2509.999997 | -0.0011 | 2559.999999 | -0.0005 | 2.5 |
| 50 | 2509.999997 | -0.0014 | 2559.999998 | -0.0010 | 2.5 |
| 55 | 2509.999998 | -0.0006 | 2559.999996 | -0.0016 | 2.5 |

Frequency Error vs. Voltage

| Voltage (Volts) | LTE Band 38 | | | | Limit (ppm) |
|-----------------|--------------------------|-----------------------|-----------------|-----------------------|-------------|
| | Channel Bandwidth: 5 MHz | | | | |
| | Low Channel | | High Channel | | |
| | Frequency (MHz) | Frequency Error (ppm) | Frequency (MHz) | Frequency Error (ppm) | |
| 3.85 | 2572.500004 | 0.0014 | 2617.500002 | 0.0008 | 2.5 |
| 3.27 | 2572.500004 | 0.0014 | 2617.500003 | 0.0011 | 2.5 |
| 4.42 | 2572.500003 | 0.0012 | 2617.500002 | 0.0008 | 2.5 |

Note: The applicant defined the normal working voltage of the battery is from 3.27 Vdc to 4.42 Vdc.

Frequency Error vs. Temperature

| Temp. (°C) | LTE Band 38 | | | | Limit (ppm) |
|------------|--------------------------|-----------------------|-----------------|-----------------------|-------------|
| | Channel Bandwidth: 5 MHz | | | | |
| | Low Channel | | High Channel | | |
| | Frequency (MHz) | Frequency Error (ppm) | Frequency (MHz) | Frequency Error (ppm) | |
| -30 | 2572.500001 | 0.0005 | 2617.500002 | 0.0006 | 2.5 |
| -20 | 2572.500001 | 0.0005 | 2617.500001 | 0.0005 | 2.5 |
| -10 | 2572.500004 | 0.0014 | 2617.500002 | 0.0006 | 2.5 |
| 0 | 2572.500004 | 0.0015 | 2617.500004 | 0.0015 | 2.5 |
| 10 | 2572.500002 | 0.0008 | 2617.500004 | 0.0014 | 2.5 |
| 20 | 2572.499996 | -0.0014 | 2617.499998 | -0.0008 | 2.5 |
| 30 | 2572.499997 | -0.0012 | 2617.499998 | -0.0006 | 2.5 |
| 40 | 2572.499997 | -0.0012 | 2617.499997 | -0.0010 | 2.5 |
| 50 | 2572.499997 | -0.0012 | 2617.499997 | -0.0013 | 2.5 |
| 55 | 2572.499999 | -0.0005 | 2617.499998 | -0.0009 | 2.5 |

Frequency Error vs. Voltage

| Voltage (Volts) | LTE Band 38 | | | | Limit (ppm) |
|-----------------|---------------------------|-----------------------|-----------------|-----------------------|-------------|
| | Channel Bandwidth: 10 MHz | | | | |
| | Low Channel | | High Channel | | |
| | Frequency (MHz) | Frequency Error (ppm) | Frequency (MHz) | Frequency Error (ppm) | |
| 3.85 | 2575.000001 | 0.0005 | 2615.000002 | 0.0008 | 2.5 |
| 3.27 | 2575.000002 | 0.0009 | 2615.000002 | 0.0009 | 2.5 |
| 4.42 | 2575.000003 | 0.0012 | 2615.000003 | 0.0011 | 2.5 |

Note: The applicant defined the normal working voltage of the battery is from 3.27 Vdc to 4.42 Vdc.

Frequency Error vs. Temperature

| Temp. (°C) | LTE Band 38 | | | | Limit (ppm) |
|------------|---------------------------|-----------------------|-----------------|-----------------------|-------------|
| | Channel Bandwidth: 10 MHz | | | | |
| | Low Channel | | High Channel | | |
| | Frequency (MHz) | Frequency Error (ppm) | Frequency (MHz) | Frequency Error (ppm) | |
| -30 | 2575.000002 | 0.0007 | 2615.000003 | 0.0012 | 2.5 |
| -20 | 2575.000002 | 0.0008 | 2615.000003 | 0.0010 | 2.5 |
| -10 | 2575.000002 | 0.0007 | 2615.000004 | 0.0014 | 2.5 |
| 0 | 2575.000003 | 0.0013 | 2615.000004 | 0.0014 | 2.5 |
| 10 | 2575.000002 | 0.0007 | 2615.000002 | 0.0007 | 2.5 |
| 20 | 2574.999999 | -0.0005 | 2614.999997 | -0.0013 | 2.5 |
| 30 | 2574.999997 | -0.0013 | 2614.999997 | -0.0013 | 2.5 |
| 40 | 2574.999998 | -0.0010 | 2614.999997 | -0.0010 | 2.5 |
| 50 | 2574.999999 | -0.0005 | 2614.999997 | -0.0012 | 2.5 |
| 55 | 2574.999997 | -0.0010 | 2614.999999 | -0.0005 | 2.5 |

Frequency Error vs. Voltage

| Voltage (Volts) | LTE Band 38 | | | | Limit (ppm) |
|-----------------|---------------------------|-----------------------|-----------------|-----------------------|-------------|
| | Channel Bandwidth: 15 MHz | | | | |
| | Low Channel | | High Channel | | |
| | Frequency (MHz) | Frequency Error (ppm) | Frequency (MHz) | Frequency Error (ppm) | |
| 3.85 | 2577.500003 | 0.0011 | 2612.500003 | 0.0010 | 2.5 |
| 3.27 | 2577.500004 | 0.0015 | 2612.500003 | 0.0011 | 2.5 |
| 4.42 | 2577.500001 | 0.0005 | 2612.500002 | 0.0009 | 2.5 |

Note: The applicant defined the normal working voltage of the battery is from 3.27 Vdc to 4.42 Vdc.

Frequency Error vs. Temperature

| Temp. (°C) | LTE Band 38 | | | | Limit (ppm) |
|------------|---------------------------|-----------------------|-----------------|-----------------------|-------------|
| | Channel Bandwidth: 15 MHz | | | | |
| | Low Channel | | High Channel | | |
| | Frequency (MHz) | Frequency Error (ppm) | Frequency (MHz) | Frequency Error (ppm) | |
| -30 | 2577.500004 | 0.0014 | 2612.500001 | 0.0005 | 2.5 |
| -20 | 2577.500001 | 0.0004 | 2612.500004 | 0.0014 | 2.5 |
| -10 | 2577.500004 | 0.0014 | 2612.500004 | 0.0015 | 2.5 |
| 0 | 2577.500002 | 0.0007 | 2612.500003 | 0.0012 | 2.5 |
| 10 | 2577.500003 | 0.0013 | 2612.500004 | 0.0014 | 2.5 |
| 20 | 2577.499997 | -0.0011 | 2612.499997 | -0.0013 | 2.5 |
| 30 | 2577.499998 | -0.0008 | 2612.499998 | -0.0009 | 2.5 |
| 40 | 2577.499999 | -0.0005 | 2612.499998 | -0.0007 | 2.5 |
| 50 | 2577.499997 | -0.0013 | 2612.499998 | -0.0010 | 2.5 |
| 55 | 2577.499997 | -0.0013 | 2612.499998 | -0.0006 | 2.5 |

Frequency Error vs. Voltage

| Voltage (Volts) | LTE Band 38 | | | | Limit (ppm) |
|-----------------|---------------------------|-----------------------|-----------------|-----------------------|-------------|
| | Channel Bandwidth: 20 MHz | | | | |
| | Low Channel | | High Channel | | |
| | Frequency (MHz) | Frequency Error (ppm) | Frequency (MHz) | Frequency Error (ppm) | |
| 3.85 | 2580.000004 | 0.0015 | 2610.000003 | 0.0011 | 2.5 |
| 3.27 | 2580.000003 | 0.0011 | 2610.000002 | 0.0007 | 2.5 |
| 4.42 | 2580.000003 | 0.0010 | 2610.000003 | 0.0011 | 2.5 |

Note: The applicant defined the normal working voltage of the battery is from 3.27 Vdc to 4.42 Vdc.

Frequency Error vs. Temperature

| Temp. (°C) | LTE Band 38 | | | | Limit (ppm) |
|------------|---------------------------|-----------------------|-----------------|-----------------------|-------------|
| | Channel Bandwidth: 20 MHz | | | | |
| | Low Channel | | High Channel | | |
| | Frequency (MHz) | Frequency Error (ppm) | Frequency (MHz) | Frequency Error (ppm) | |
| -30 | 2580.000001 | 0.0004 | 2610.000003 | 0.0013 | 2.5 |
| -20 | 2580.000003 | 0.0012 | 2610.000002 | 0.0008 | 2.5 |
| -10 | 2580.000002 | 0.0009 | 2610.000004 | 0.0014 | 2.5 |
| 0 | 2580.000002 | 0.0008 | 2610.000002 | 0.0009 | 2.5 |
| 10 | 2580.000002 | 0.0007 | 2610.000004 | 0.0015 | 2.5 |
| 20 | 2579.999998 | -0.0006 | 2609.999996 | -0.0014 | 2.5 |
| 30 | 2579.999996 | -0.0016 | 2609.999997 | -0.0011 | 2.5 |
| 40 | 2579.999998 | -0.0008 | 2609.999998 | -0.0007 | 2.5 |
| 50 | 2579.999999 | -0.0005 | 2609.999997 | -0.0010 | 2.5 |
| 55 | 2579.999997 | -0.0011 | 2609.999996 | -0.0014 | 2.5 |

4.4 Occupied Bandwidth Measurement

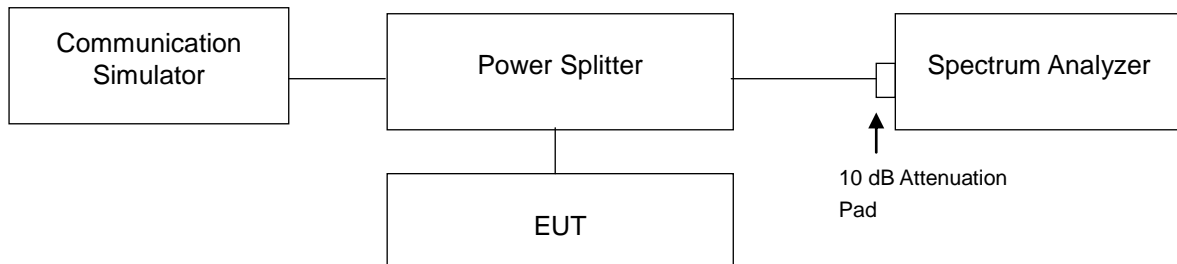
4.4.1 Limits of Occupied Bandwidth Measurement

The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 % of the total mean power of a given emission.

4.4.2 Test Procedure

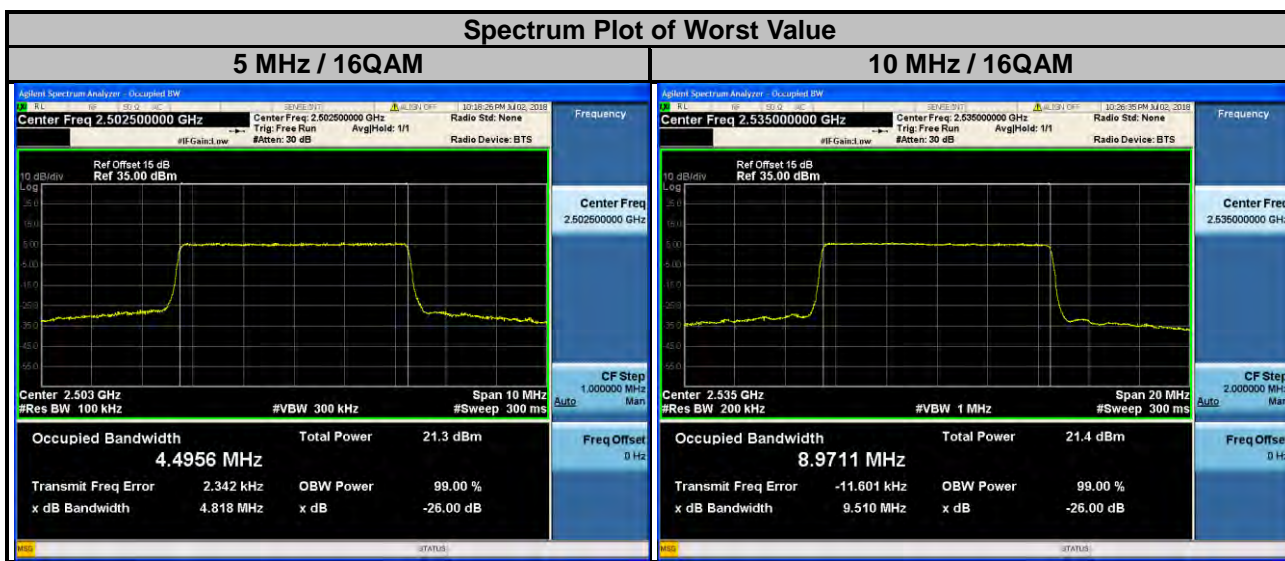
- The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
- Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth.

4.4.3 Test Setup



4.4.4 Test Results

| LTE Band 7 | | | | | | | |
|--------------------------|-----------------|-------------------------------|--------|---------------------------|-----------------|-------------------------------|--------|
| Channel Bandwidth: 5 MHz | | | | Channel Bandwidth: 10 MHz | | | |
| Channel | Frequency (MHz) | 99 % Occupied Bandwidth (MHz) | | Channel | Frequency (MHz) | 99 % Occupied Bandwidth (MHz) | |
| | | QPSK | 16QAM | | | QPSK | 16QAM |
| 20775 | 2502.5 | 4.4923 | 4.4956 | 20800 | 2505.0 | 8.9616 | 8.9689 |
| 21100 | 2535.0 | 4.4939 | 4.4944 | 21100 | 2535.0 | 8.9669 | 8.9711 |
| 21425 | 2567.5 | 4.4926 | 4.4933 | 21400 | 2565.0 | 8.9628 | 8.9650 |



LTE Band 7

| Channel Bandwidth: 15 MHz | | | | Channel Bandwidth: 20 MHz | | | |
|---------------------------|-----------------|-------------------------------|--------|---------------------------|-----------------|-------------------------------|--------|
| Channel | Frequency (MHz) | 99 % Occupied Bandwidth (MHz) | | Channel | Frequency (MHz) | 99 % Occupied Bandwidth (MHz) | |
| | | QPSK | 16QAM | | | QPSK | 16QAM |
| 20825 | 2507.5 | 13.443 | 13.438 | 20850 | 2510.0 | 17.908 | 17.919 |
| 21100 | 2535.0 | 13.450 | 13.439 | 21100 | 2535.0 | 17.914 | 17.949 |
| 21375 | 2562.5 | 13.447 | 13.438 | 21350 | 2560.0 | 17.900 | 17.918 |

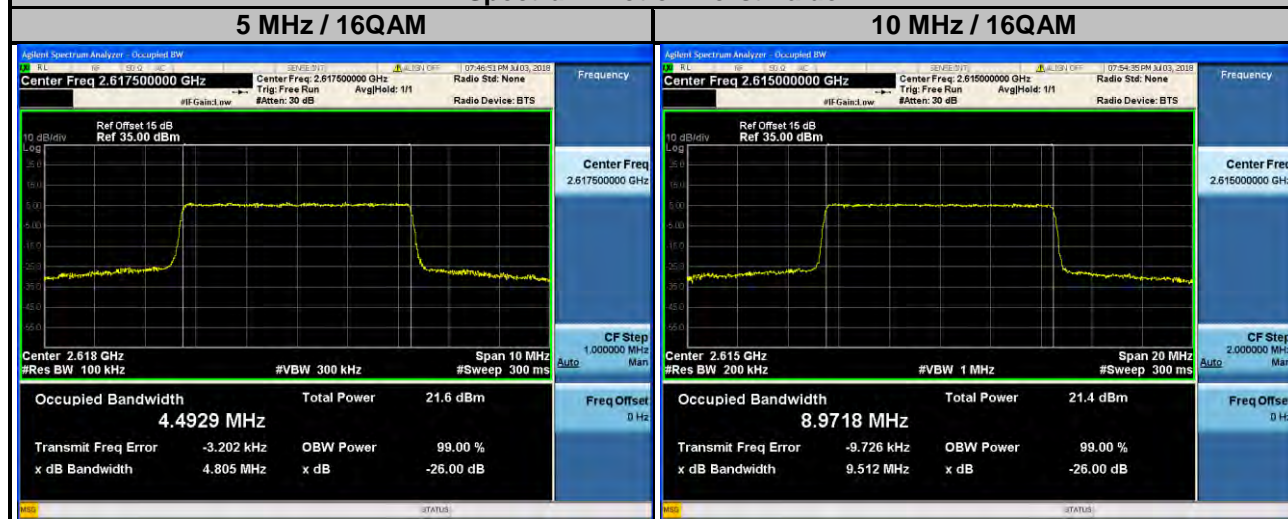
Spectrum Plot of Worst Value



LTE Band 38

| Channel Bandwidth: 5 MHz | | | | Channel Bandwidth: 10 MHz | | | |
|--------------------------|-----------------|-------------------------------|--------|---------------------------|-----------------|-------------------------------|--------|
| Channel | Frequency (MHz) | 99 % Occupied Bandwidth (MHz) | | Channel | Frequency (MHz) | 99 % Occupied Bandwidth (MHz) | |
| | | QPSK | 16QAM | | | QPSK | 16QAM |
| 37775 | 2572.5 | 4.4902 | 4.4859 | 37800 | 2575.0 | 8.9522 | 8.9640 |
| 38000 | 2595.0 | 4.4911 | 4.4879 | 38000 | 2595.0 | 8.9555 | 8.9591 |
| 38225 | 2617.5 | 4.4926 | 4.4929 | 38200 | 2615.0 | 8.9607 | 8.9718 |

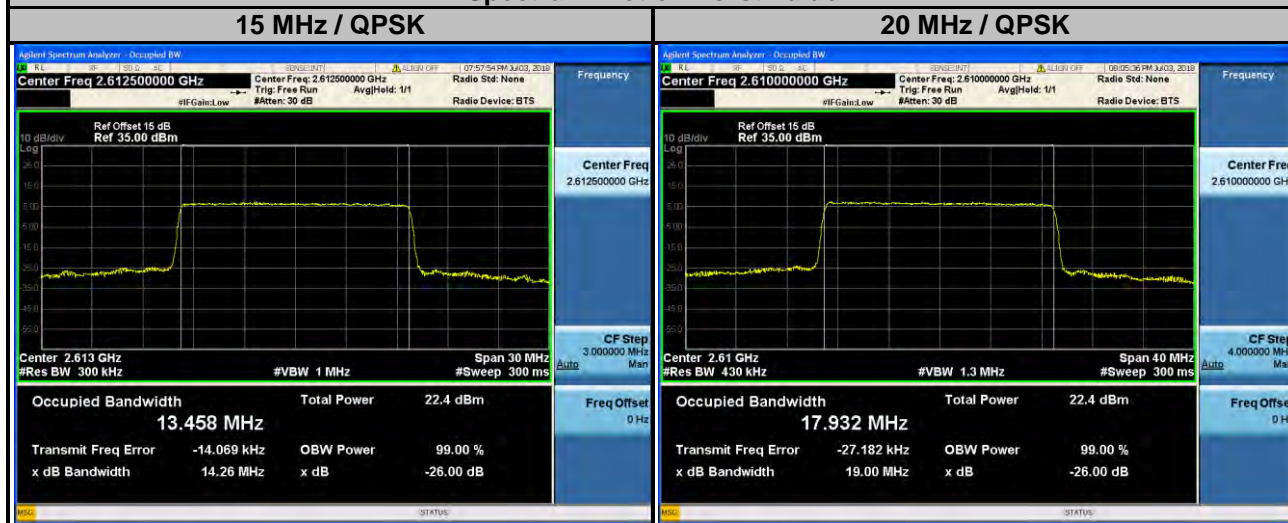
Spectrum Plot of Worst Value



LTE Band 38

| Channel Bandwidth: 15 MHz | | | | Channel Bandwidth: 20 MHz | | | |
|---------------------------|-----------------|-------------------------------|--------|---------------------------|-----------------|-------------------------------|--------|
| Channel | Frequency (MHz) | 99 % Occupied Bandwidth (MHz) | | Channel | Frequency (MHz) | 99 % Occupied Bandwidth (MHz) | |
| | | QPSK | 16QAM | | | QPSK | 16QAM |
| 37825 | 2577.5 | 13.433 | 13.426 | 37850 | 2580.0 | 17.883 | 17.878 |
| 38000 | 2595.0 | 13.439 | 13.429 | 38000 | 2595.0 | 17.894 | 17.890 |
| 38175 | 2612.5 | 13.458 | 13.450 | 38150 | 2610.0 | 17.932 | 17.924 |

Spectrum Plot of Worst Value

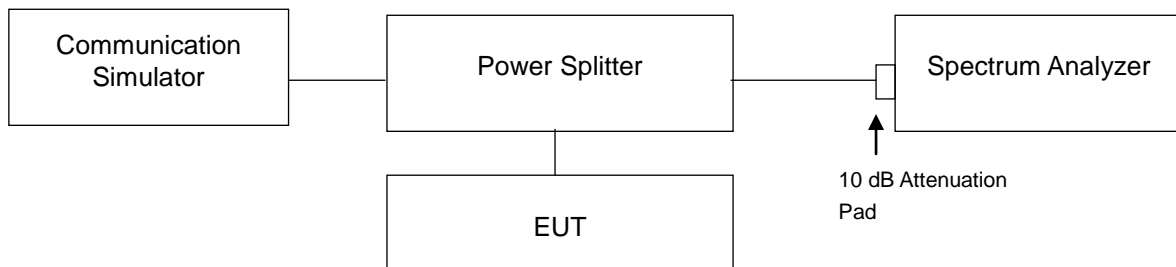


4.5 Out-of-Band Emissions Measurement

4.5.1 Limits of Out-of-Band Emissions Measurement

According to FCC 27.53(l)(4) specified that power of any emission outside of the channel edge must be attenuated below the transmitting power (P) by a factor shall be not less than $40 + 10 \log (P)$ dB on all frequencies between the channel edge and 5 megahertz from the channel edge, $43 + 10 \log (P)$ dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and $55 + 10 \log (P)$ dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth. In addition, the attenuation factor shall not be less that $43 + 10 \log (P)$ dB on all frequencies between 2490.5 MHz and 2496 MHz and $55 + 10 \log (P)$ dB at or below 2490.5 MHz. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least two percent may be employed, except when the 1 megahertz band is 2495-2496 MHz, in which case a resolution bandwidth of at least one percent may be employed.

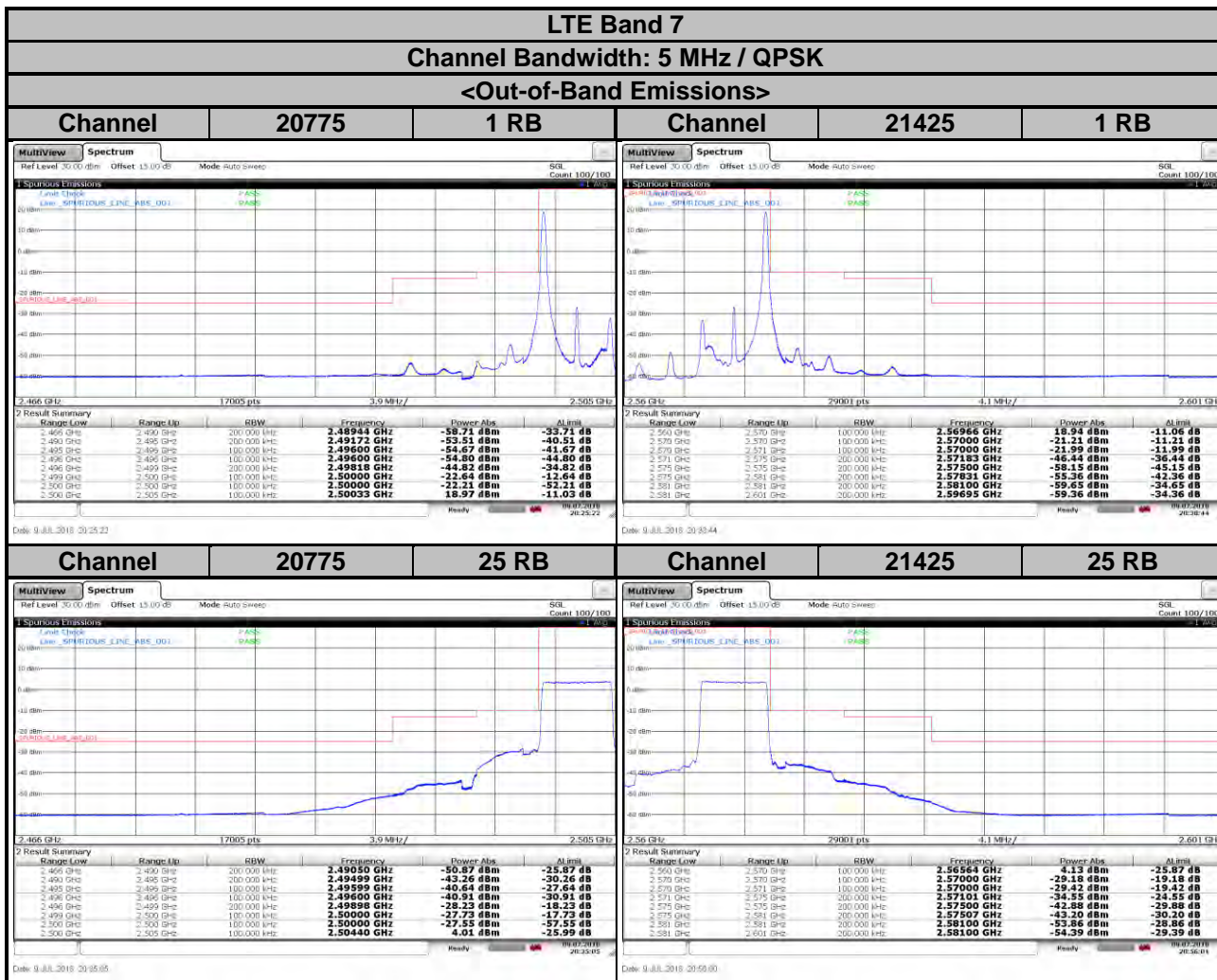
4.5.2 Test Setup



4.5.3 Test Procedures

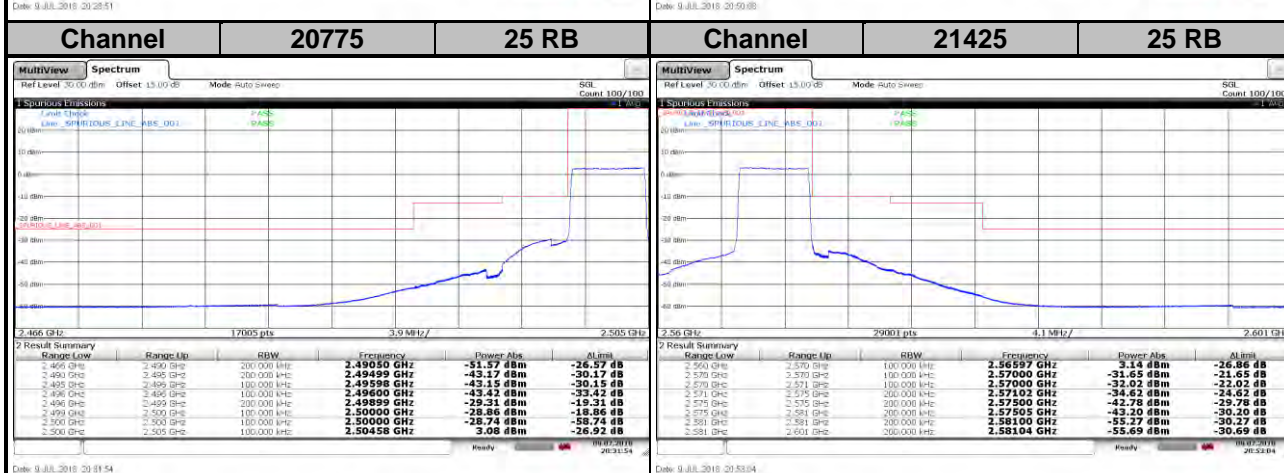
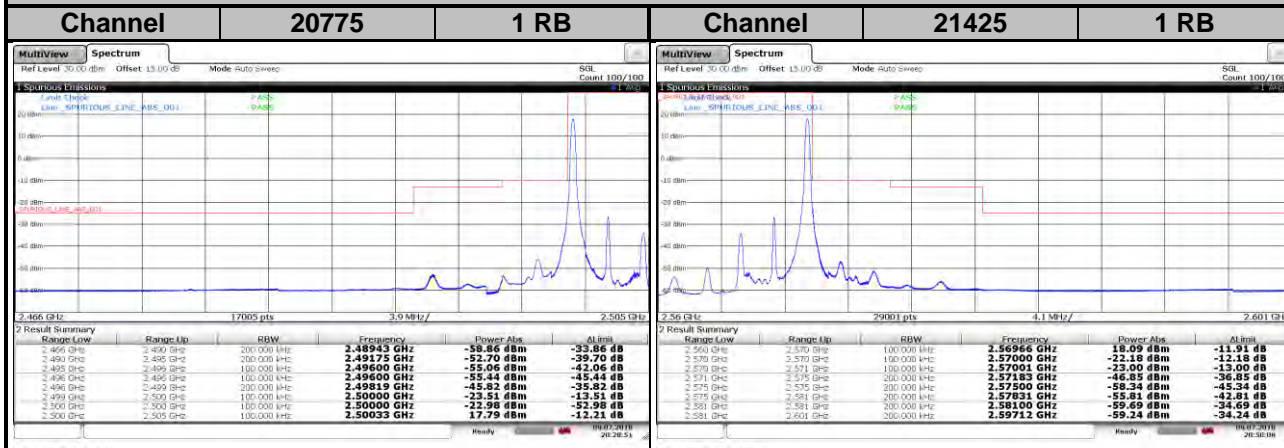
- The EUT was set up for the maximum peak power with LTE link data modulation. The power was measured with R&S Spectrum Analyzer. All measurements were done at 2 channels (low and high operational frequency range).
- The out-of-band emissions measurement used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
- Record the max. trace plot into the test report.

4.5.4 Test Results



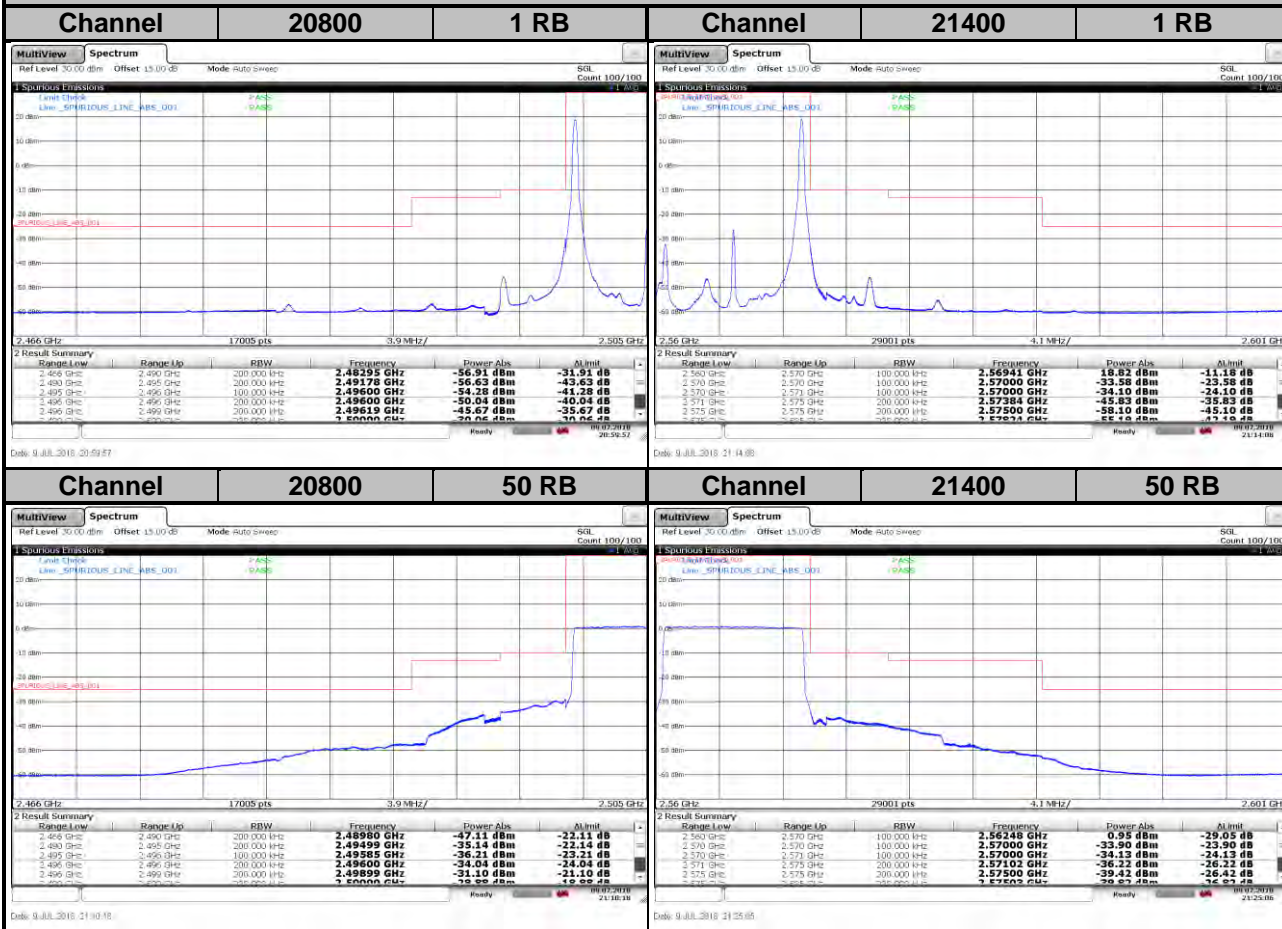
LTE Band 7
Channel Bandwidth: 5 MHz / 16QAM

<Out-of-Band Emissions>



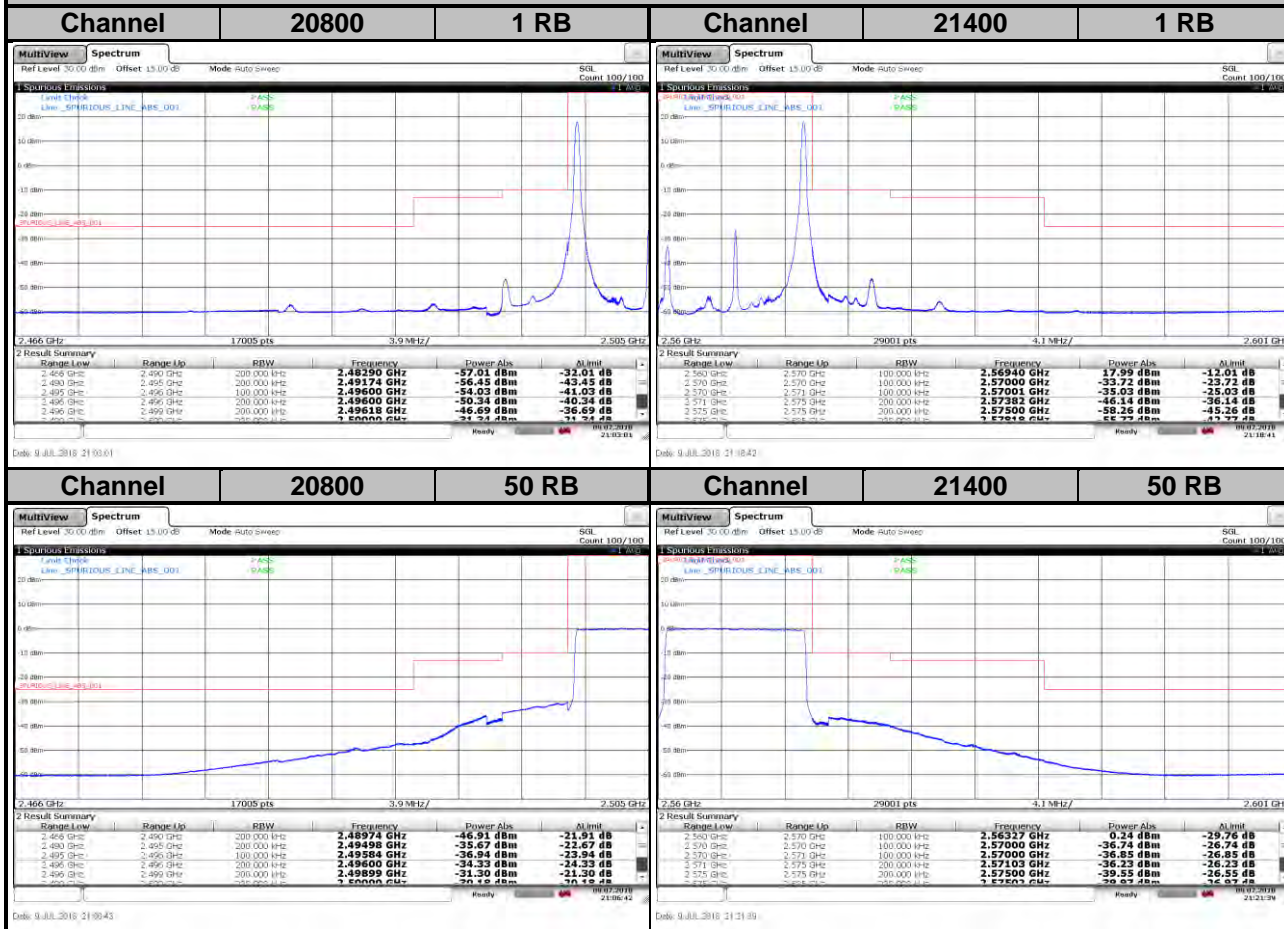
LTE Band 7
Channel Bandwidth: 10 MHz / QPSK

<Out-of-Band Emissions>



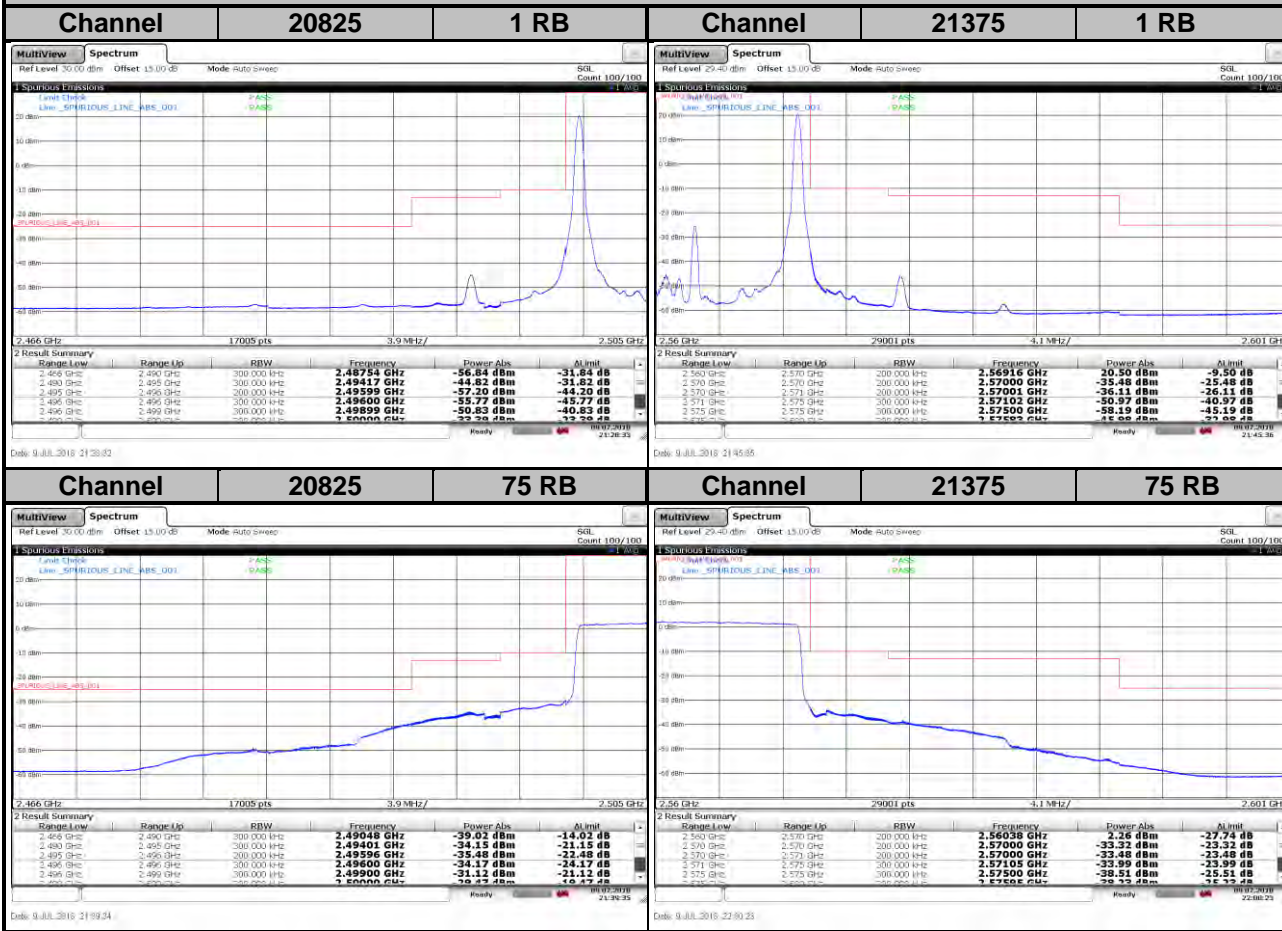
LTE Band 7
Channel Bandwidth: 10 MHz / 16QAM

<Out-of-Band Emissions>

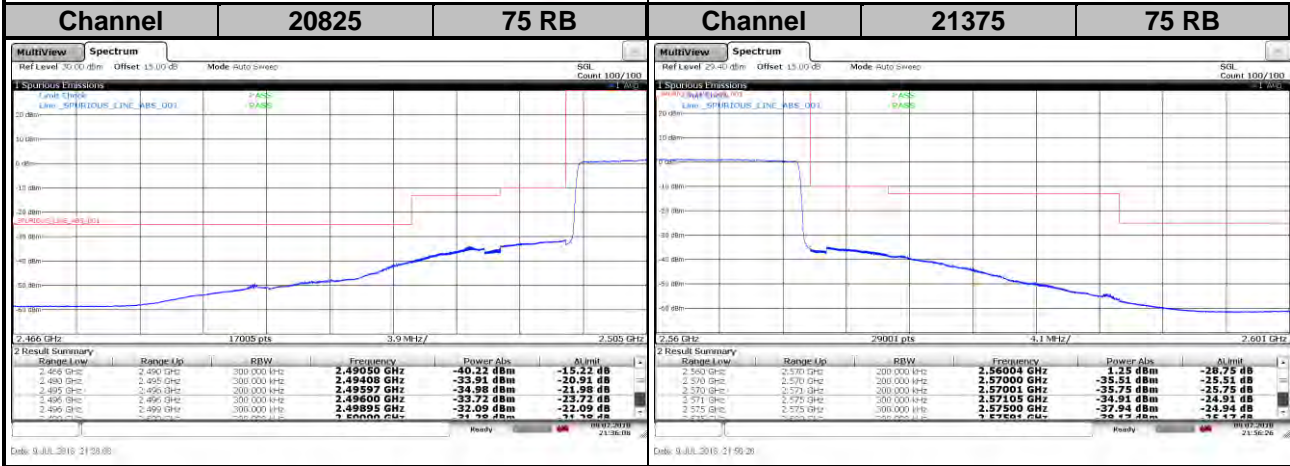
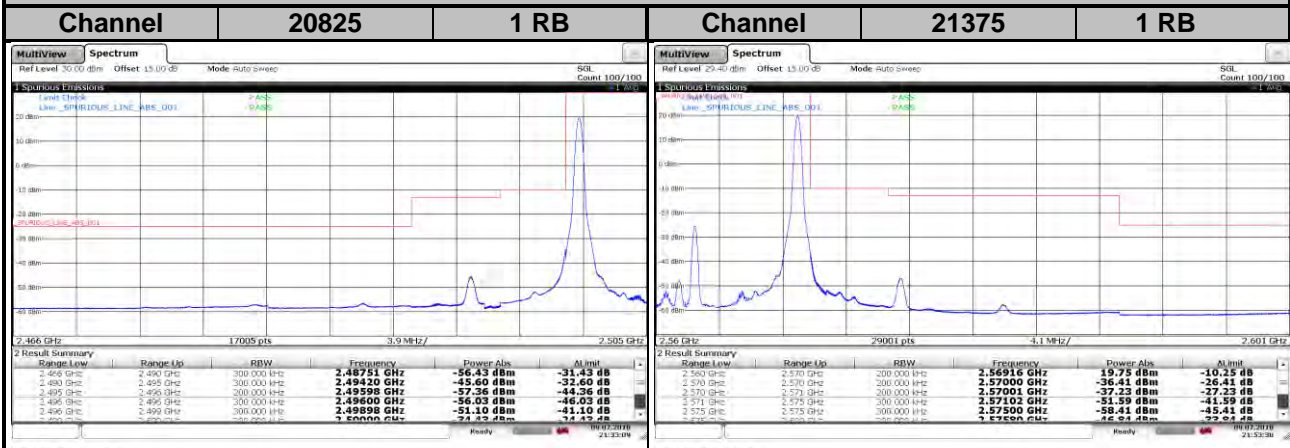


LTE Band 7
Channel Bandwidth: 15 MHz / QPSK

<Out-of-Band Emissions>

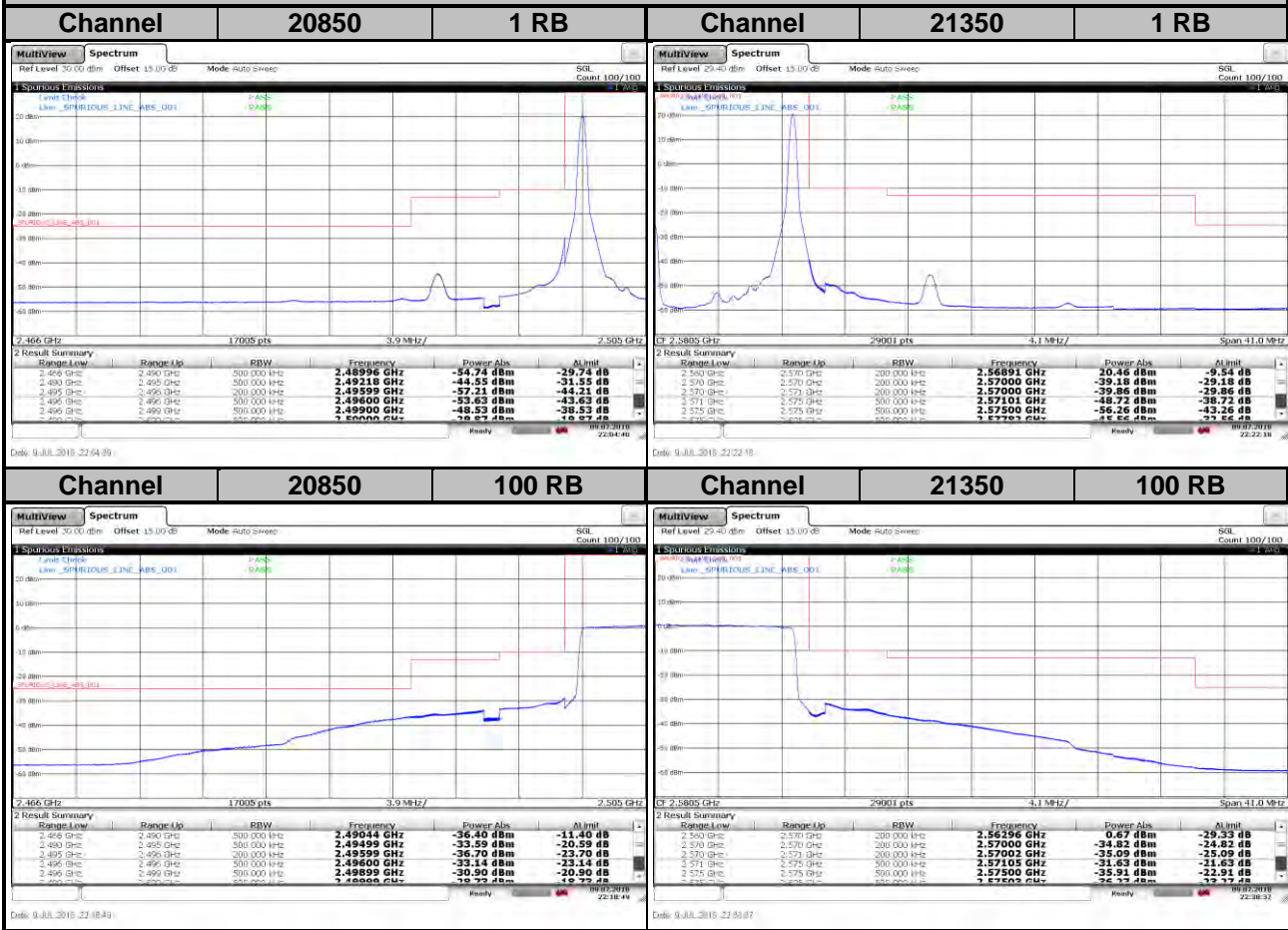


LTE Band 7
Channel Bandwidth: 15 MHz / 16QAM
<Out-of-Band Emissions>



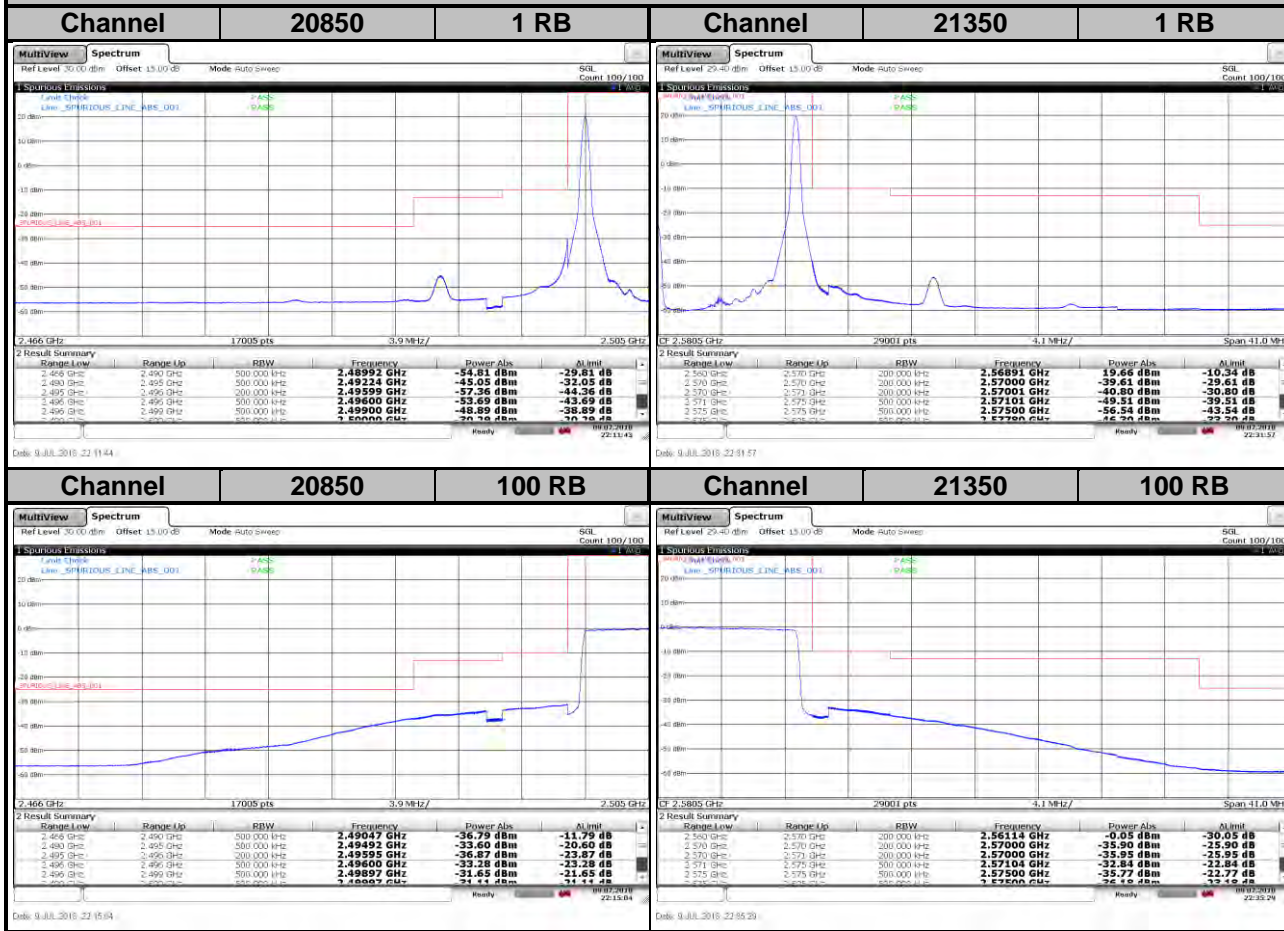
LTE Band 7
Channel Bandwidth: 20 MHz / QPSK

<Out-of-Band Emissions>

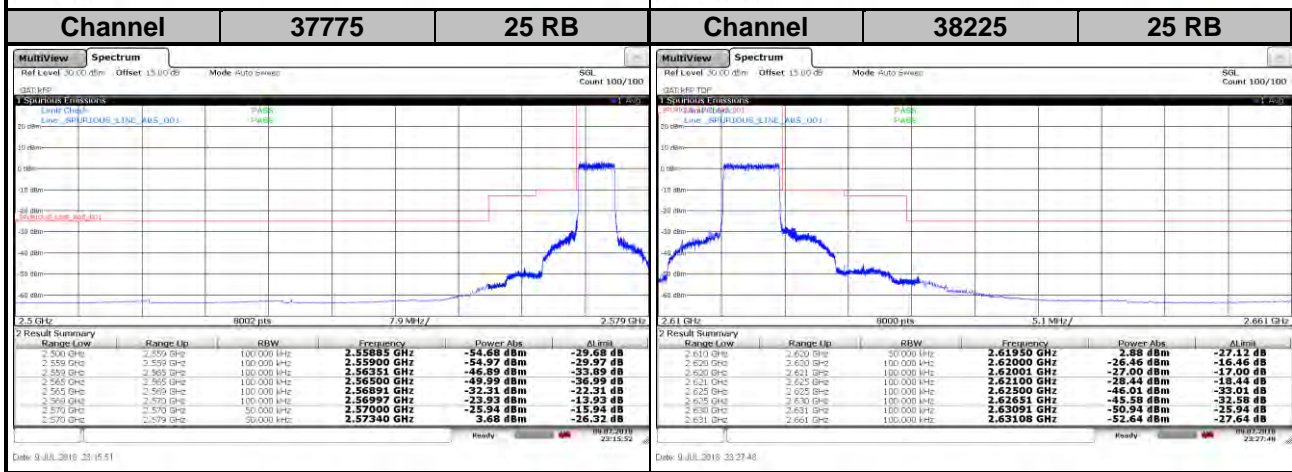
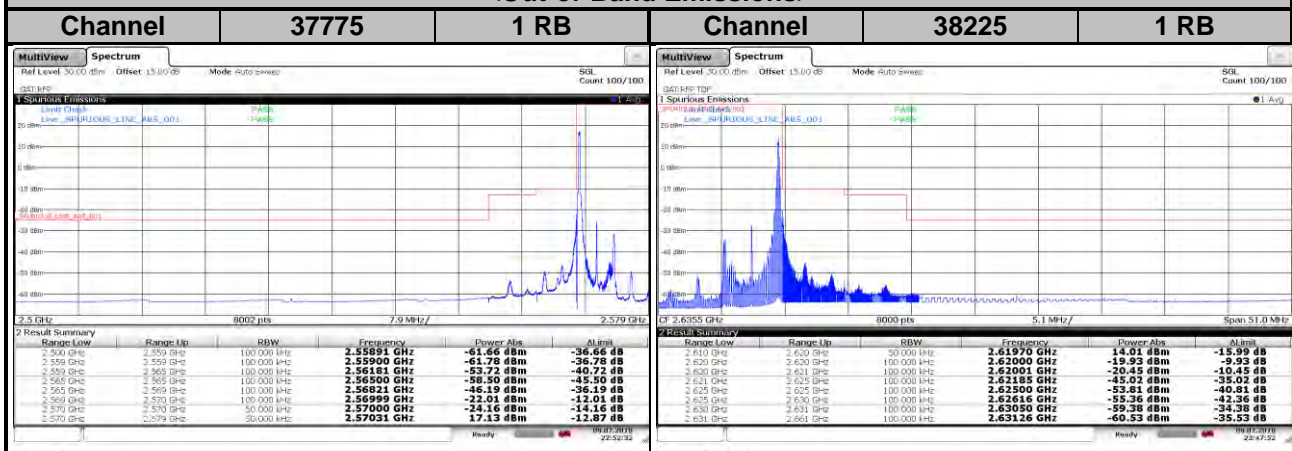


LTE Band 7
Channel Bandwidth: 20 MHz / 16QAM

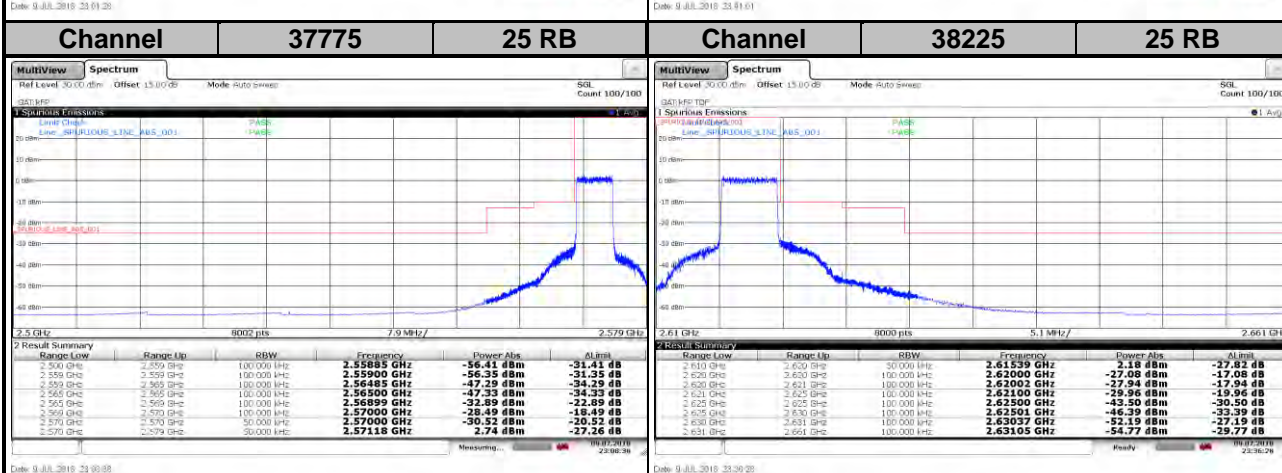
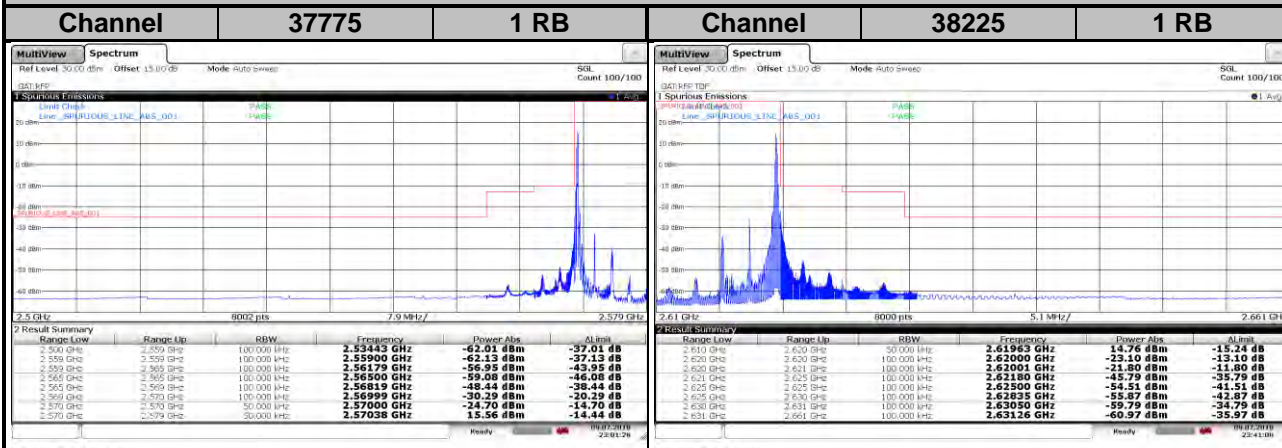
<Out-of-Band Emissions>

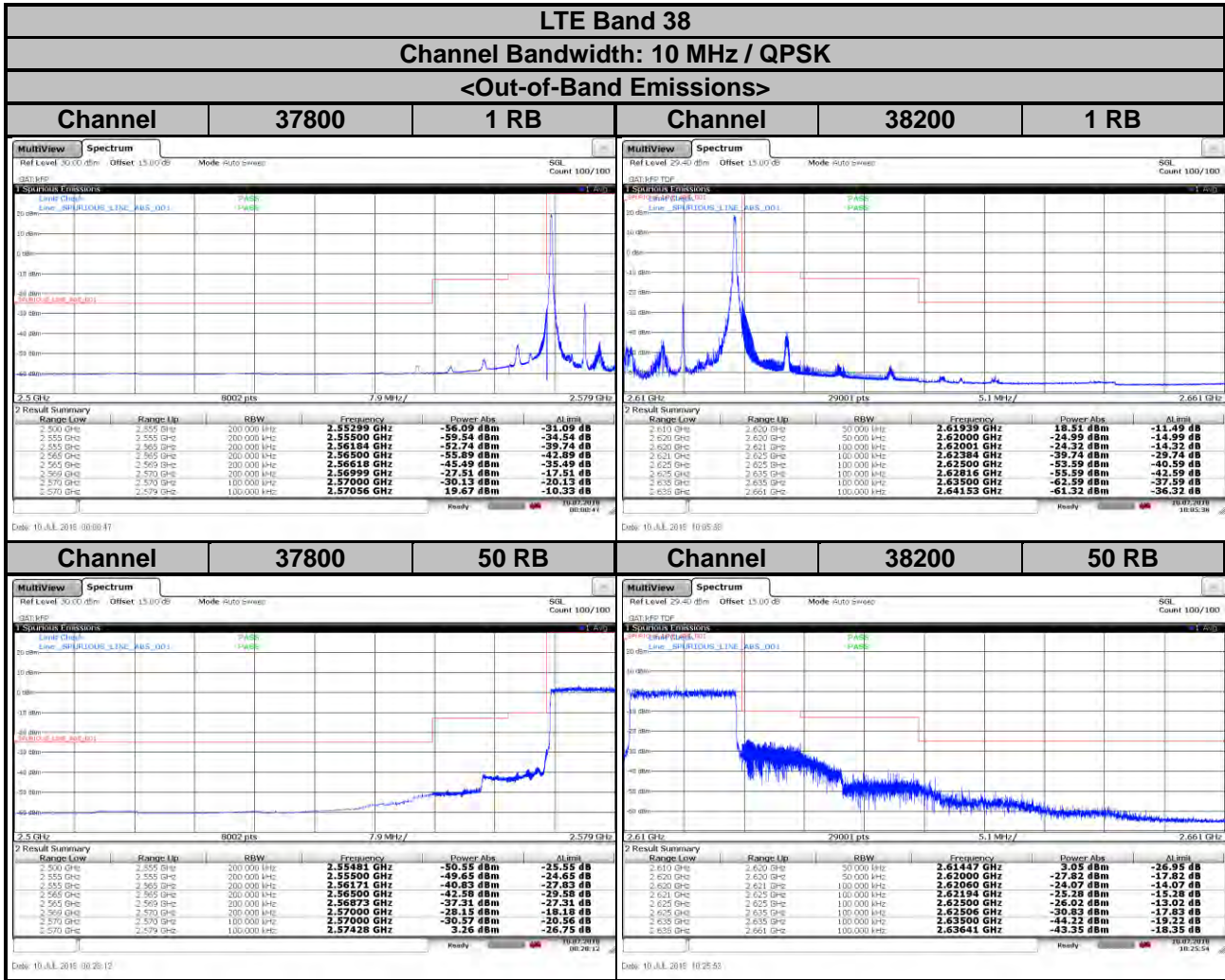


LTE Band 38
Channel Bandwidth: 5 MHz / QPSK
<Out-of-Band Emissions>

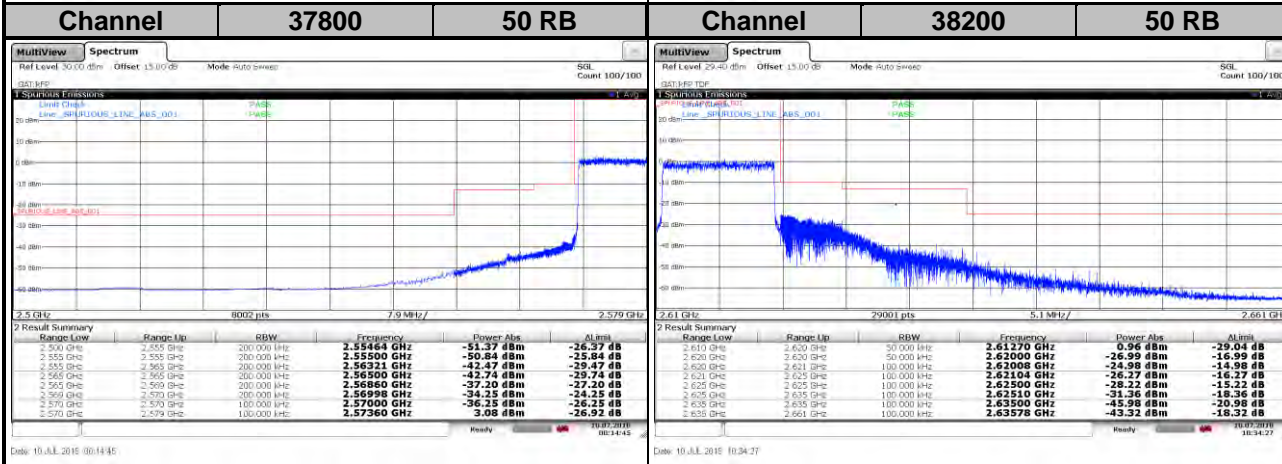
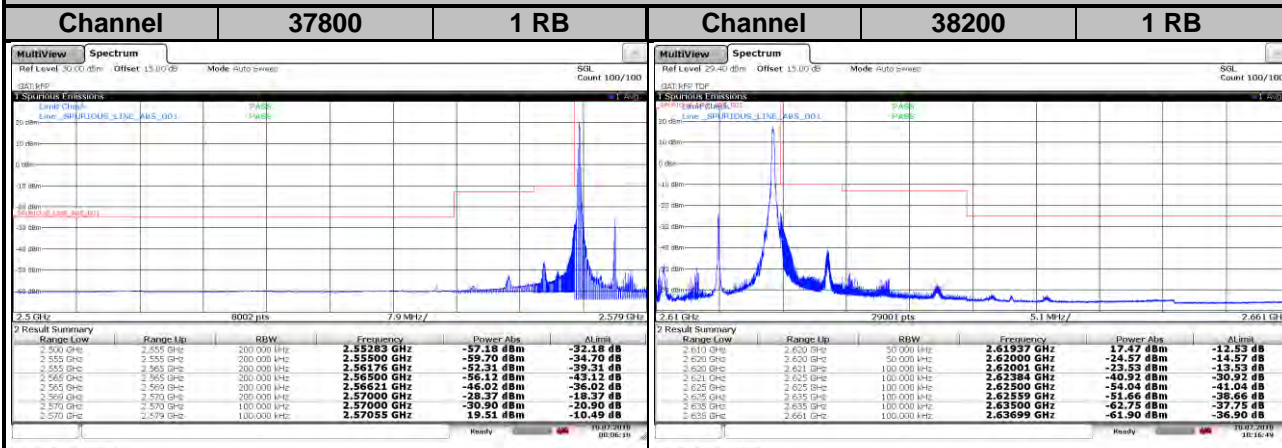


LTE Band 38
Channel Bandwidth: 5 MHz / 16QAM
<Out-of-Band Emissions>

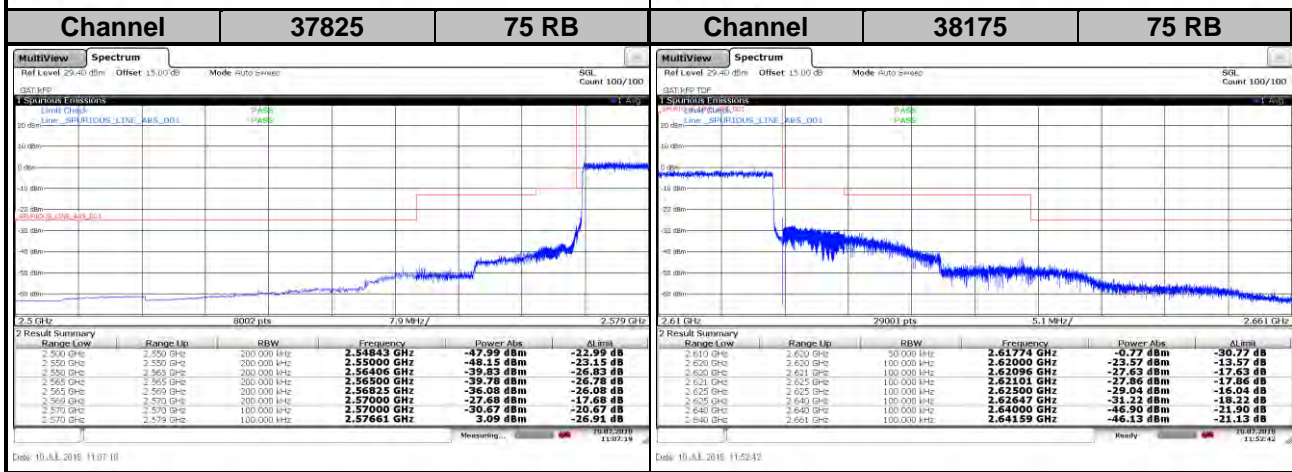
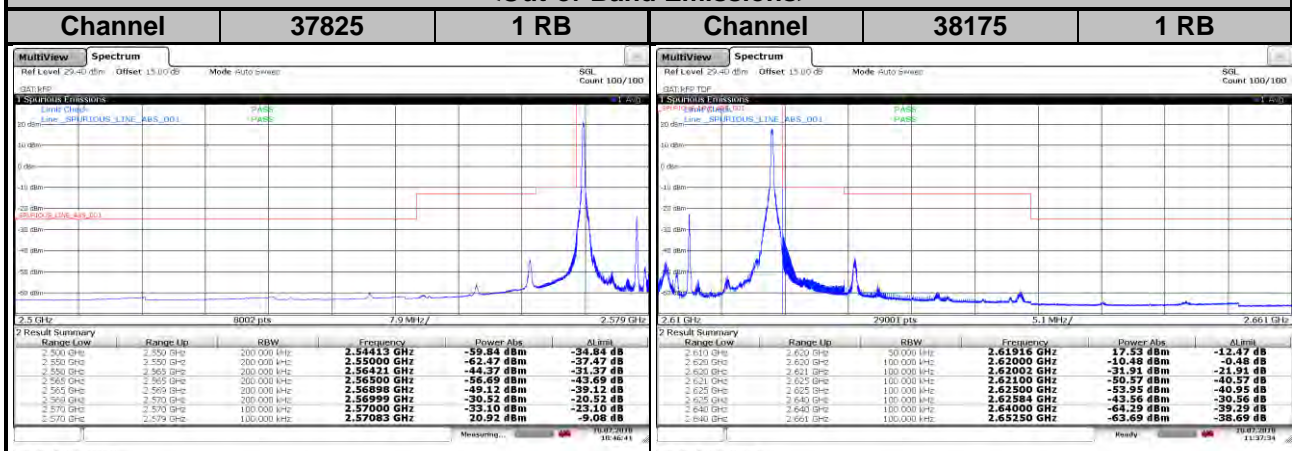




LTE Band 38
Channel Bandwidth: 10 MHz / 16QAM
<Out-of-Band Emissions>

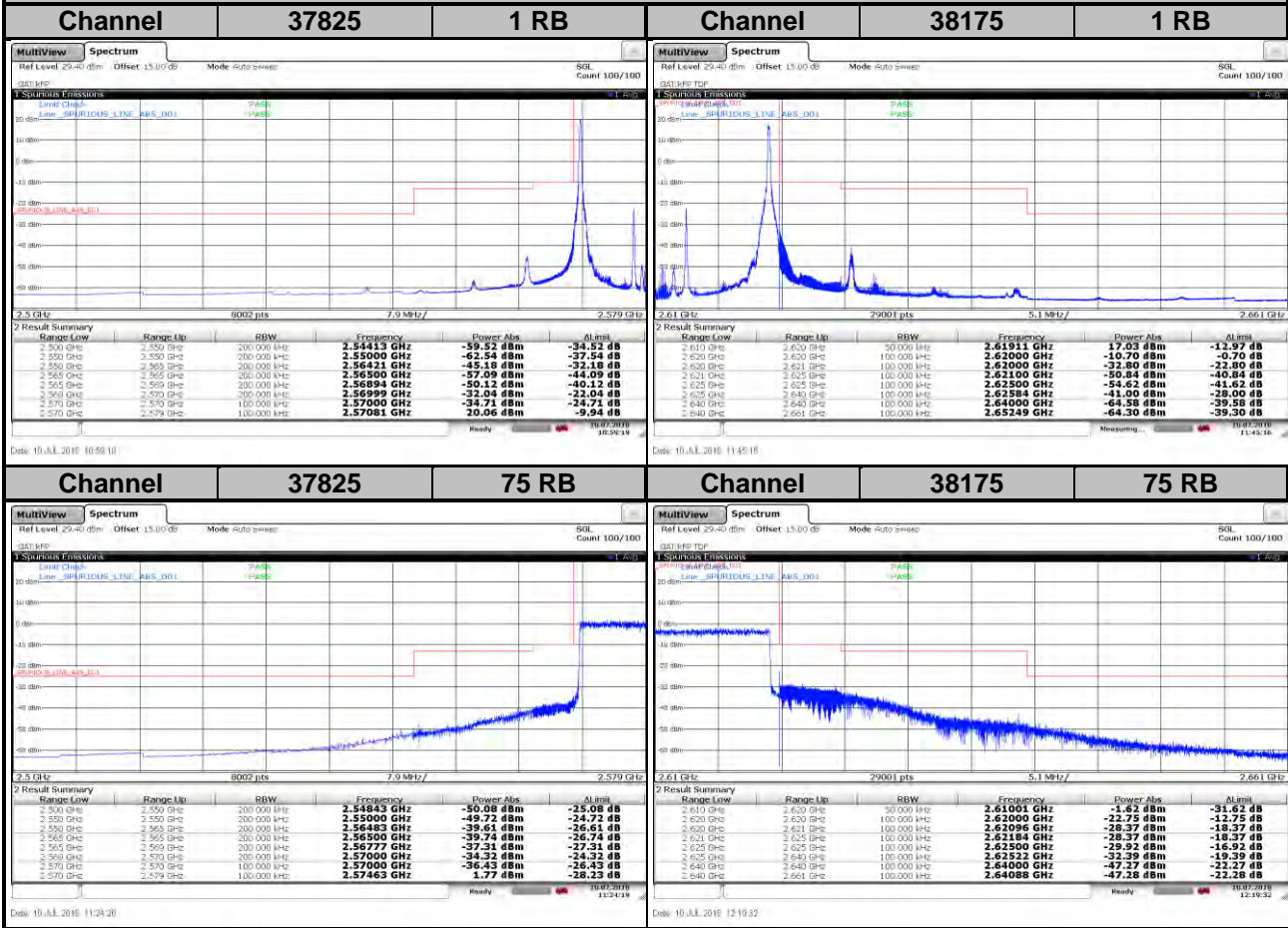


LTE Band 38
Channel Bandwidth: 15 MHz / QPSK
<Out-of-Band Emissions>



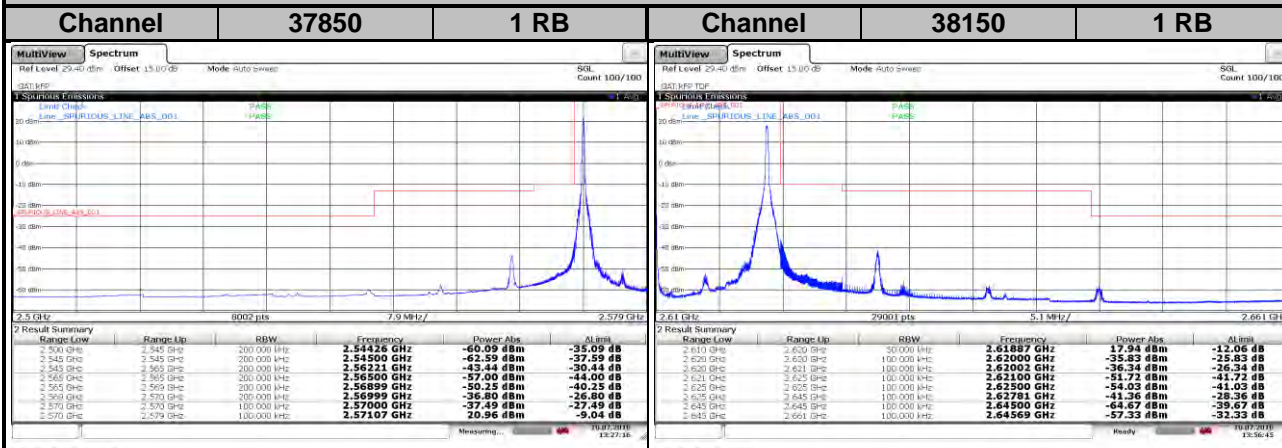
LTE Band 38
Channel Bandwidth: 15 MHz / 16QAM

<Out-of-Band Emissions>

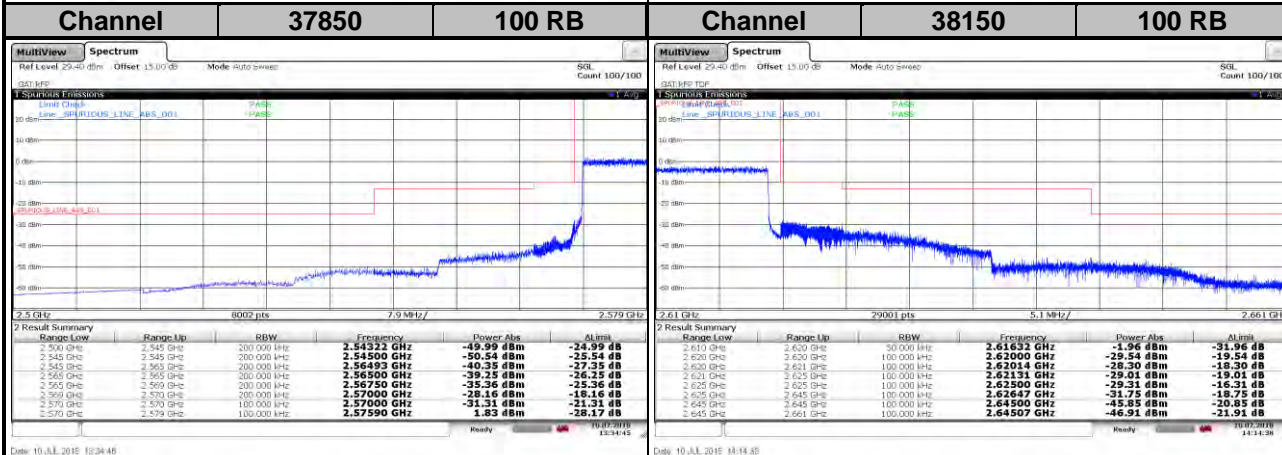


LTE Band 38
Channel Bandwidth: 20 MHz / QPSK

<Out-of-Band Emissions>



Date: 10.JUL.2016 13:27:16 Date: 10.JUL.2016 13:56:45

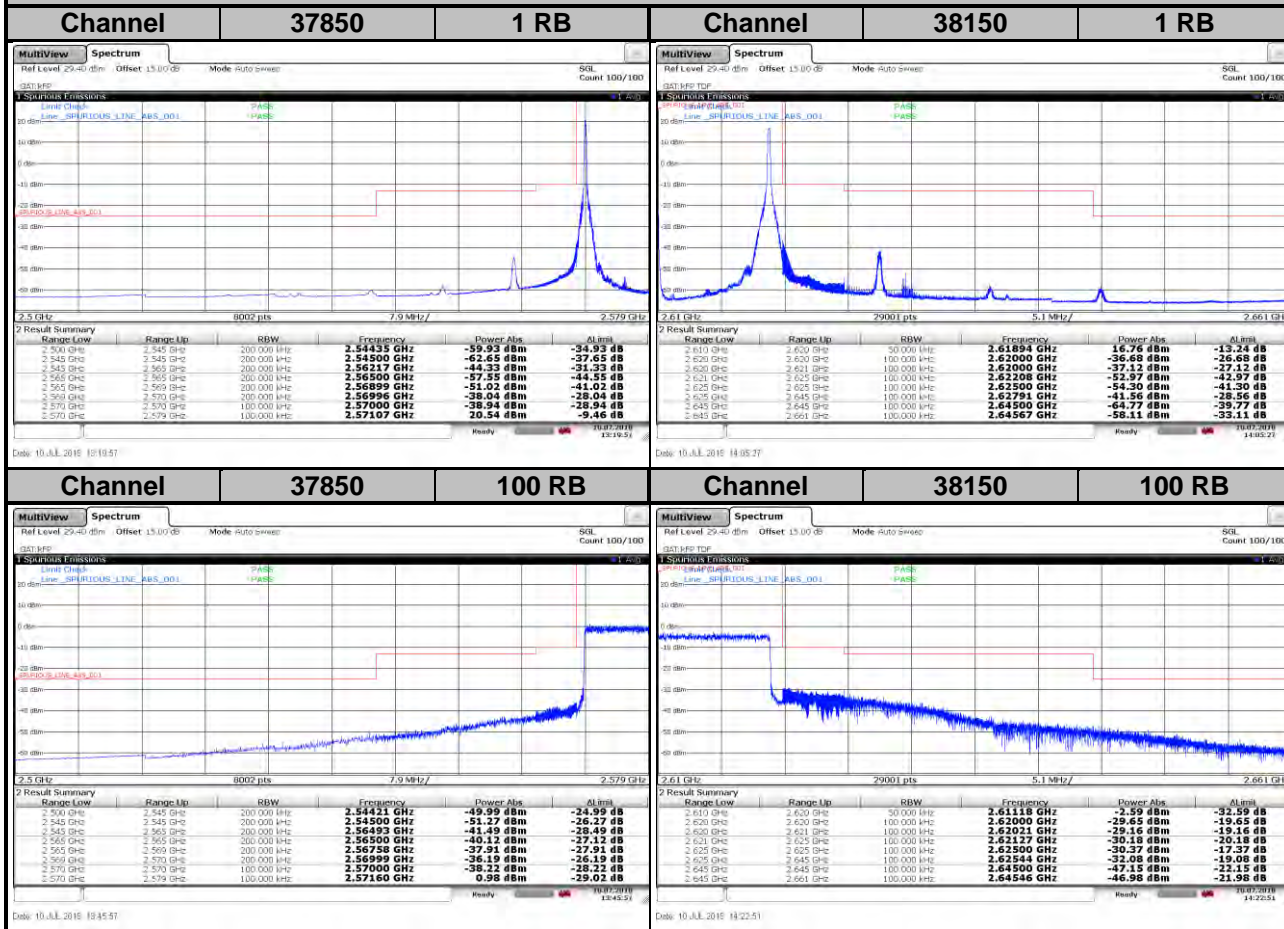


Date: 10.JUL.2016 13:34:48 Date: 10.JUL.2016 13:14:55

LTE Band 38

Channel Bandwidth: 20 MHz / 16QAM

<Out-of-Band Emissions>

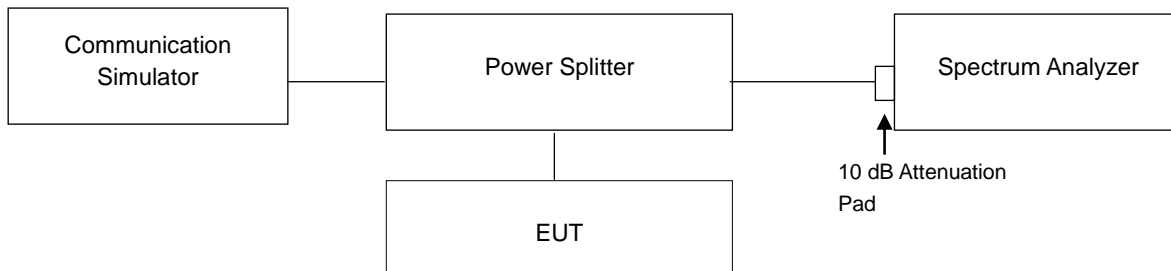


4.6 Peak to Average Ratio

4.6.1 Limits of Peak to Average Ratio Measurement

In measuring transmissions in this band using an average power technique, the peak to-average ratio (PAR) of the transmission may not exceed 13 dB.

4.6.2 Test Setup

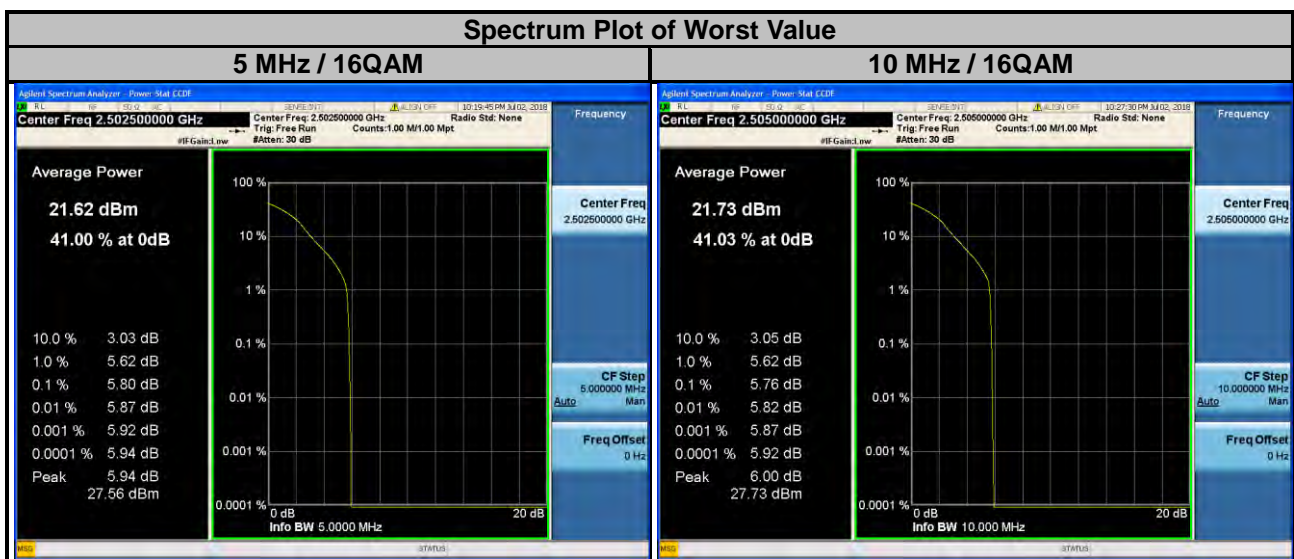


4.6.3 Test Procedures

1. Set resolution/measurement bandwidth \geq signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Record the maximum PAPR level associated with a probability of 0.1 %.

4.6.4 Test Results

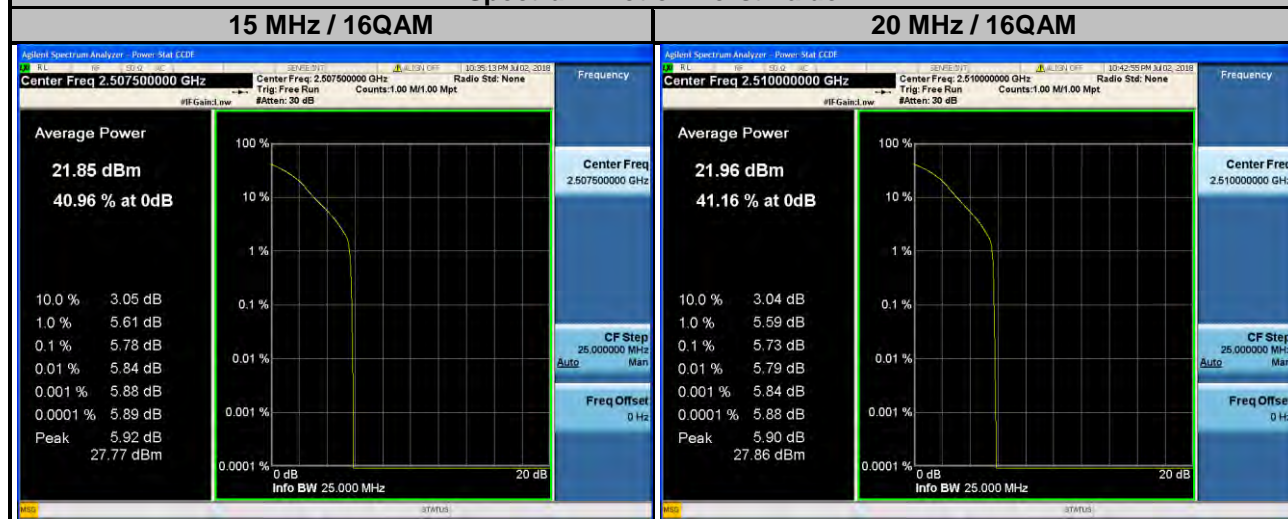
| LTE Band 7 | | | | | | | |
|--------------------------|-----------------|----------------------------|-------|---------------------------|-----------------|----------------------------|-------|
| Channel Bandwidth: 5 MHz | | | | Channel Bandwidth: 10 MHz | | | |
| Channel | Frequency (MHz) | Peak to Average Ratio (dB) | | Channel | Frequency (MHz) | Peak to Average Ratio (dB) | |
| | | QPSK | 16QAM | | | QPSK | 16QAM |
| 20775 | 2502.5 | 4.04 | 5.80 | 20800 | 2505.0 | 4.00 | 5.76 |
| 21100 | 2535.0 | 3.80 | 5.58 | 21100 | 2535.0 | 3.59 | 5.37 |
| 21425 | 2567.5 | 3.73 | 5.44 | 21400 | 2565.0 | 3.66 | 5.34 |



LTE Band 7

| Channel Bandwidth: 15 MHz | | | | Channel Bandwidth: 20 MHz | | | |
|---------------------------|-----------------|----------------------------|-------|---------------------------|-----------------|----------------------------|-------|
| Channel | Frequency (MHz) | Peak to Average Ratio (dB) | | Channel | Frequency (MHz) | Peak to Average Ratio (dB) | |
| | | QPSK | 16QAM | | | QPSK | 16QAM |
| 20825 | 2507.5 | 3.98 | 5.78 | 20850 | 2510.0 | 3.96 | 5.73 |
| 21100 | 2535.0 | 3.56 | 5.22 | 21100 | 2535.0 | 3.49 | 5.24 |
| 21375 | 2562.5 | 3.80 | 5.59 | 21350 | 2560.0 | 3.92 | 5.64 |

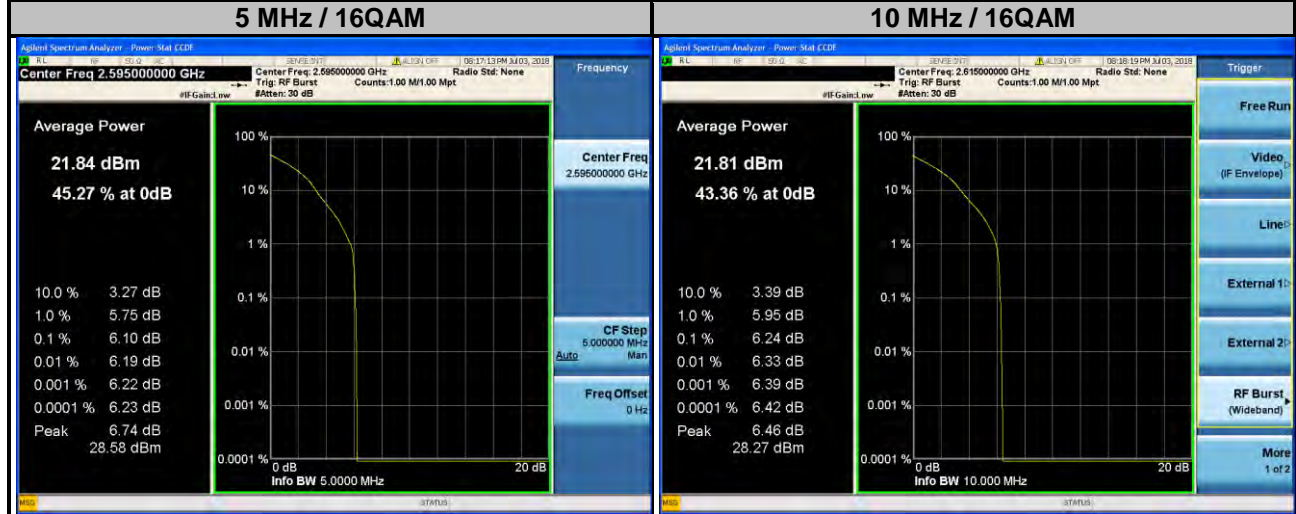
Spectrum Plot of Worst Value



LTE Band 38

| Channel Bandwidth: 5 MHz | | | | Channel Bandwidth: 10 MHz | | | |
|--------------------------|-----------------|----------------------------|-------|---------------------------|-----------------|----------------------------|-------|
| Channel | Frequency (MHz) | Peak to Average Ratio (dB) | | Channel | Frequency (MHz) | Peak to Average Ratio (dB) | |
| | | QPSK | 16QAM | | | QPSK | 16QAM |
| 37775 | 2572.5 | 3.78 | 5.23 | 37800 | 2575.0 | 4.41 | 5.59 |
| 38000 | 2595.0 | 3.97 | 6.10 | 38000 | 2595.0 | 4.77 | 5.92 |
| 38225 | 2617.5 | 4.44 | 5.98 | 38200 | 2615.0 | 5.06 | 6.24 |

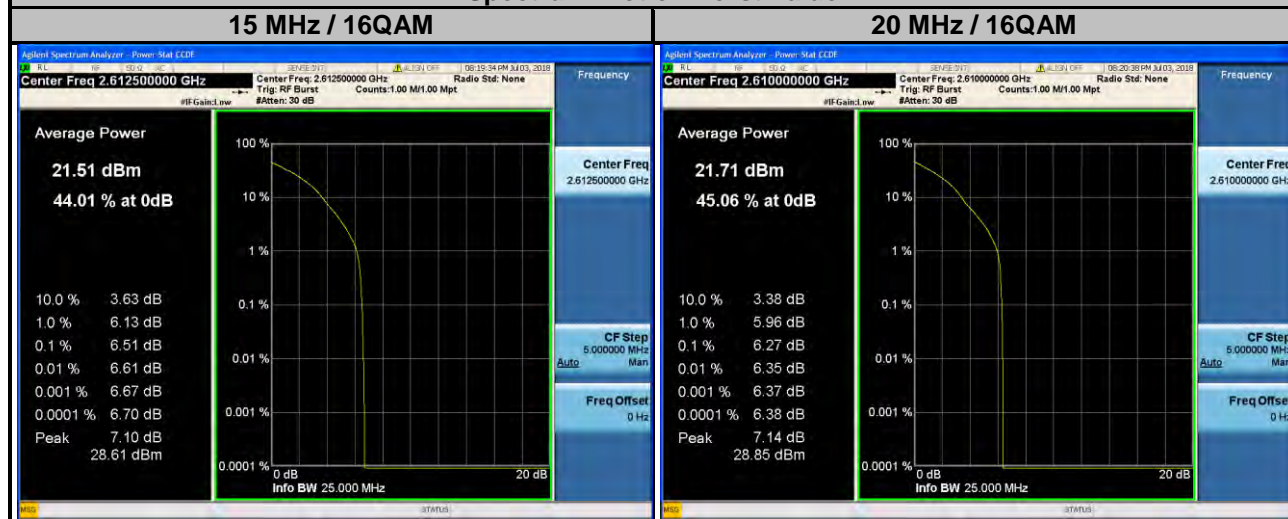
Spectrum Plot of Worst Value



LTE Band 38

| Channel Bandwidth: 15 MHz | | | | Channel Bandwidth: 20 MHz | | | |
|---------------------------|-----------------|----------------------------|-------|---------------------------|-----------------|----------------------------|-------|
| Channel | Frequency (MHz) | Peak to Average Ratio (dB) | | Channel | Frequency (MHz) | Peak to Average Ratio (dB) | |
| | | QPSK | 16QAM | | | QPSK | 16QAM |
| 37825 | 2577.5 | 3.42 | 4.68 | 37850 | 2580.0 | 3.48 | 5.92 |
| 38000 | 2595.0 | 3.58 | 6.10 | 38000 | 2595.0 | 3.53 | 6.13 |
| 38175 | 2612.5 | 4.56 | 6.51 | 38150 | 2610.0 | 4.14 | 6.27 |

Spectrum Plot of Worst Value

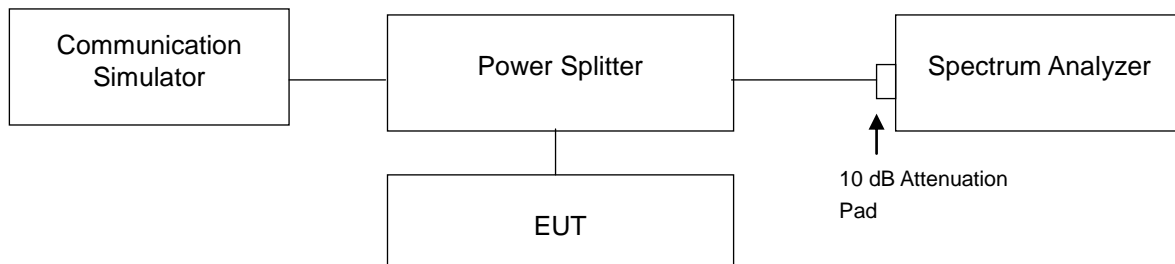


4.7 Conducted Spurious Emissions

4.7.1 Limits of Conducted Spurious Emissions Measurement

The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least $55 + 10 \log_{10}(P)$ dB. The limit of emission is equal to -25 dBm.

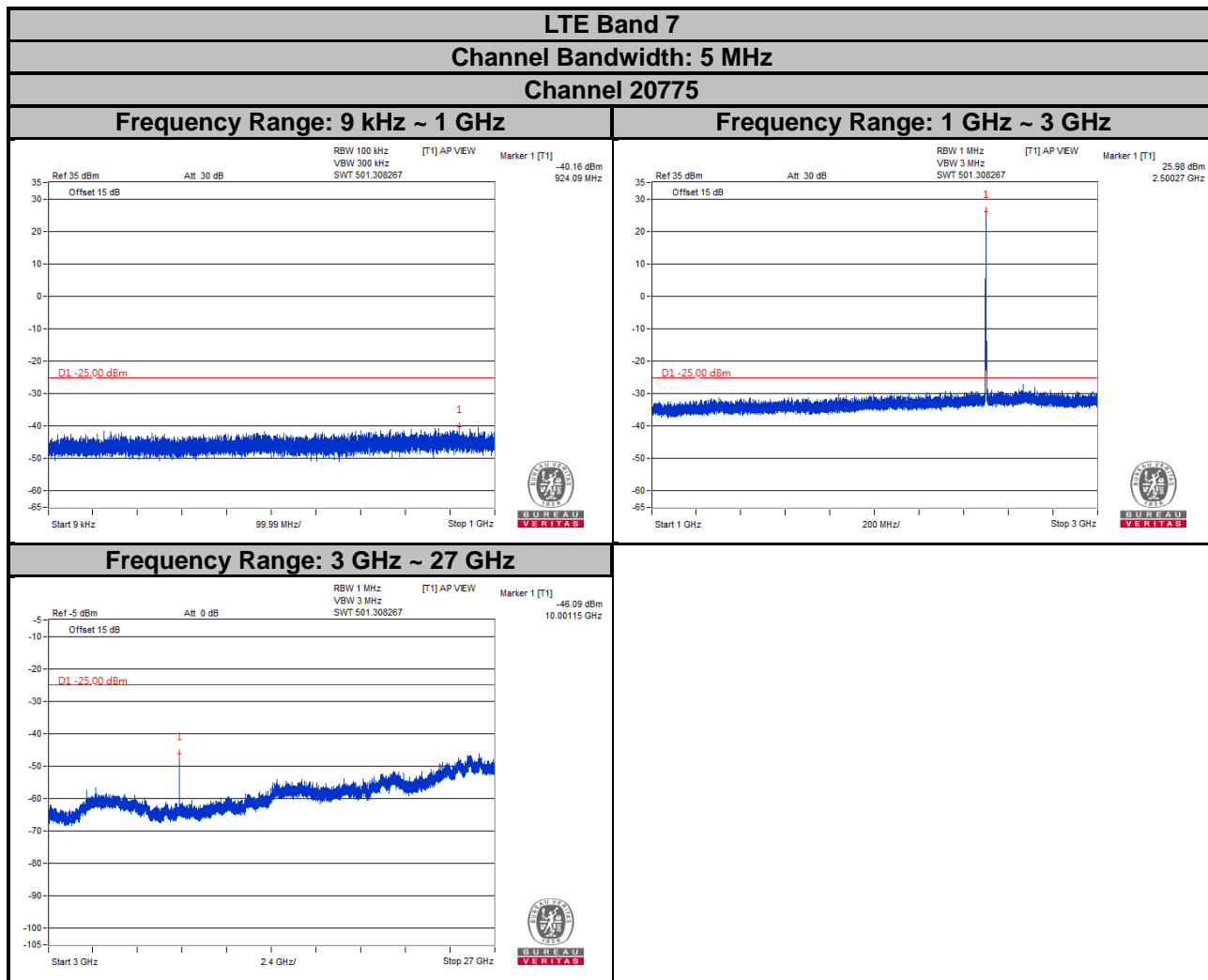
4.7.2 Test Setup



4.7.3 Test Procedure

- The EUT makes a phone call to the communication simulator. All measurements were done at low, middle and high operational frequency range.
- Measuring frequency range from 9 kHz to 1 GHz, 10 dB attenuation pad is connected with spectrum. RBW = 100 kHz and VBW = 300 kHz are used for conducted emission measurement.
- Measuring frequency range from 1 GHz to 27 GHz, 10 dB attenuation pad is connected with spectrum. RBW = 1 MHz and VBW = 3 MHz are used for conducted emission measurement.

4.7.4 Test Results

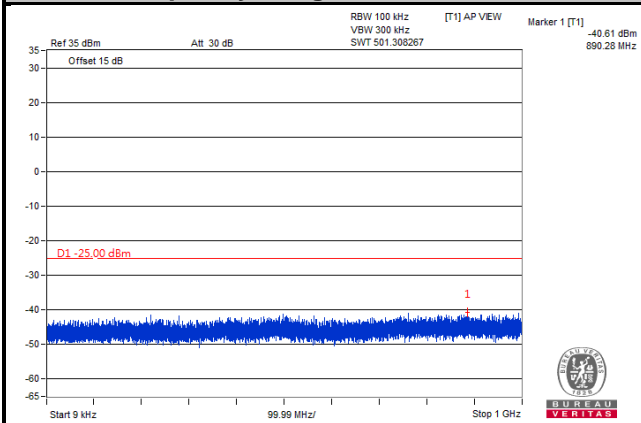


LTE Band 7

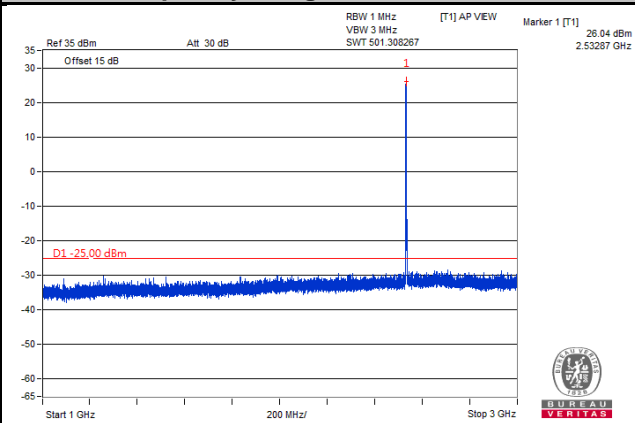
Channel Bandwidth: 5 MHz

Channel 21100

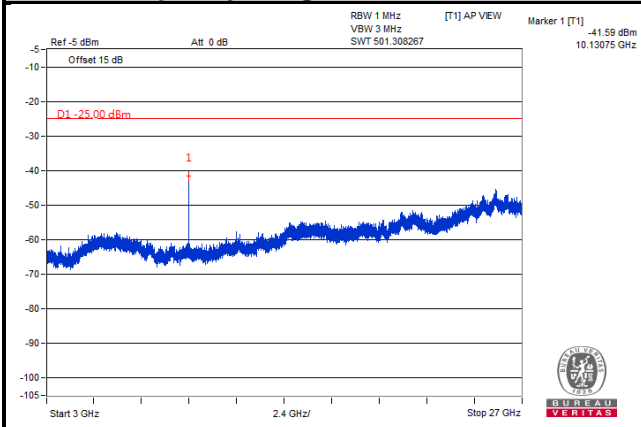
Frequency Range: 9 kHz ~ 1 GHz



Frequency Range: 1 GHz ~ 3 GHz



Frequency Range: 3 GHz ~ 27 GHz

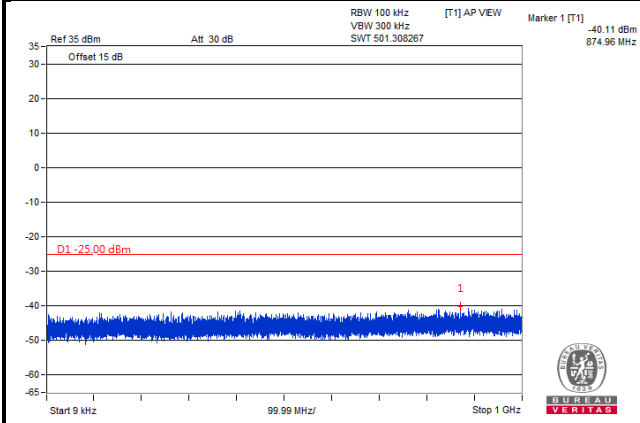


LTE Band 7

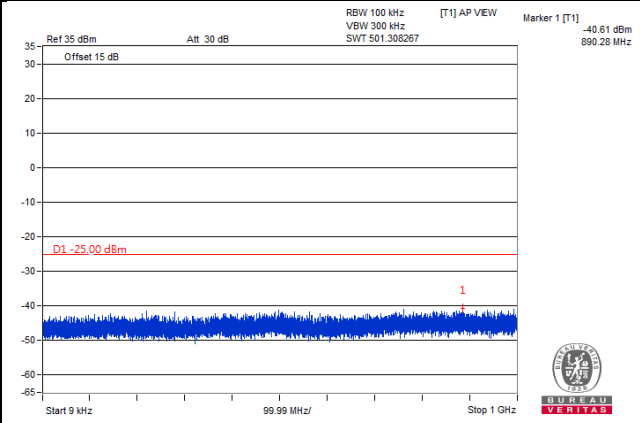
Channel Bandwidth: 5 MHz

Channel 21425

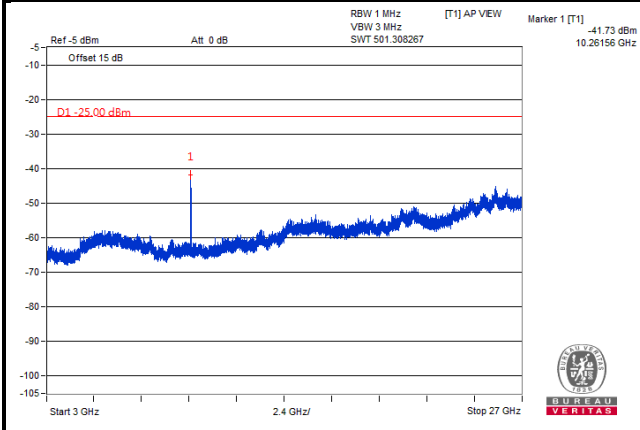
Frequency Range: 9 kHz ~ 1 GHz



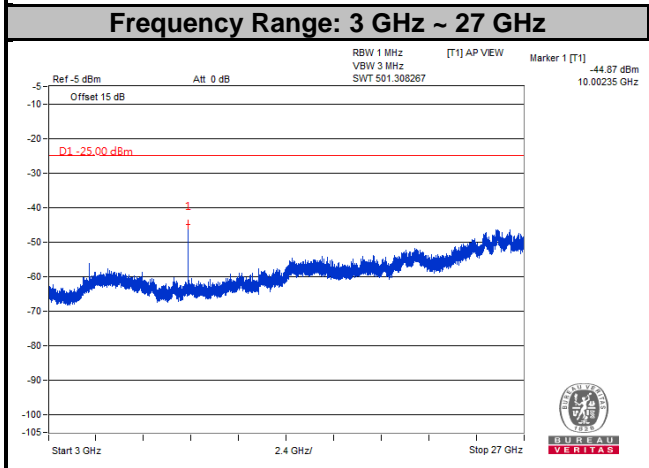
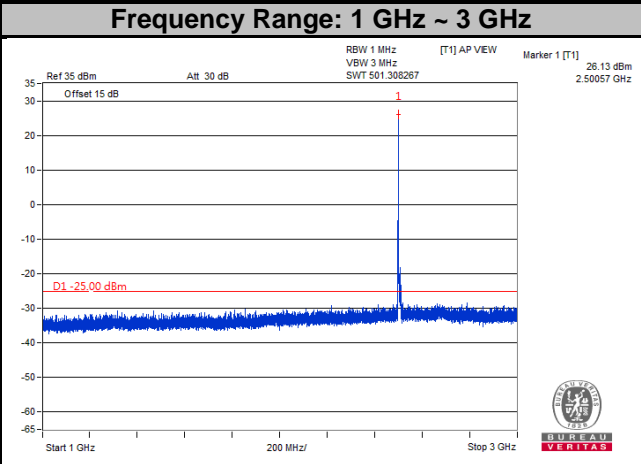
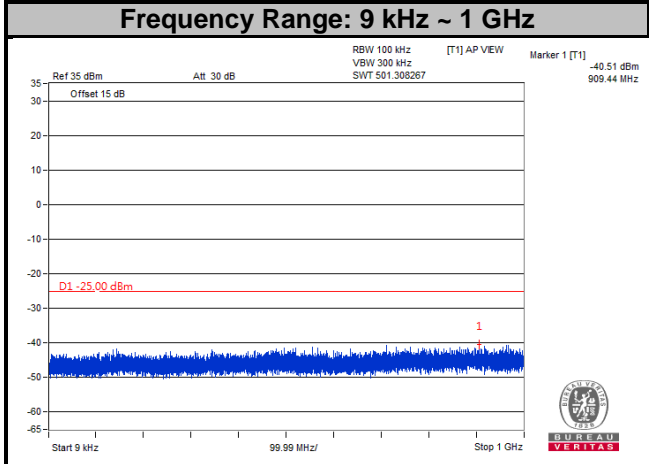
Frequency Range: 1 GHz ~ 3 GHz



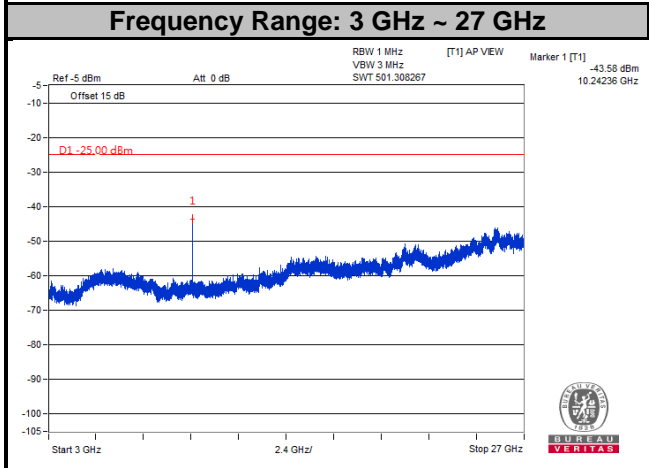
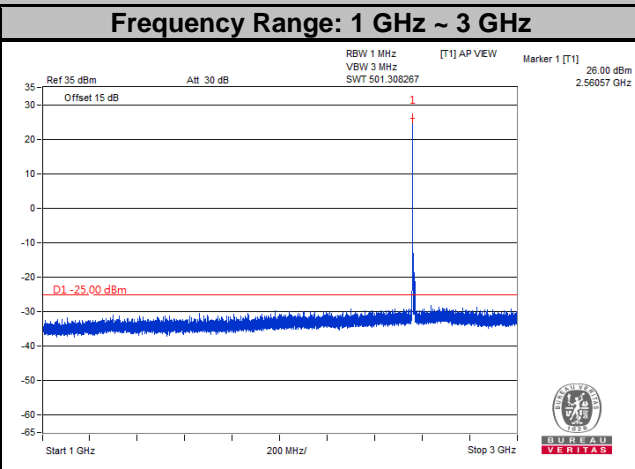
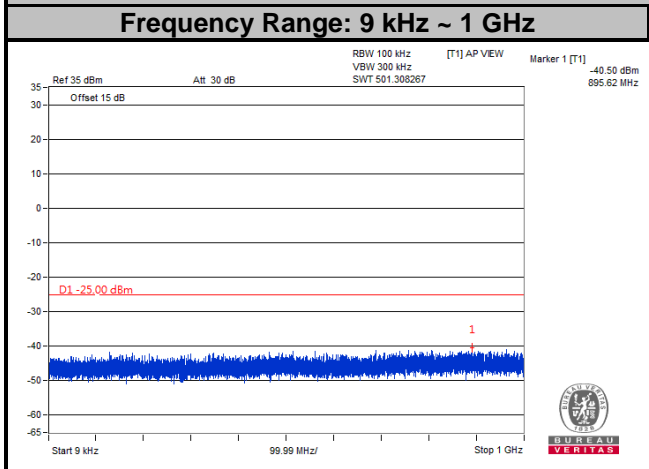
Frequency Range: 3 GHz ~ 27 GHz



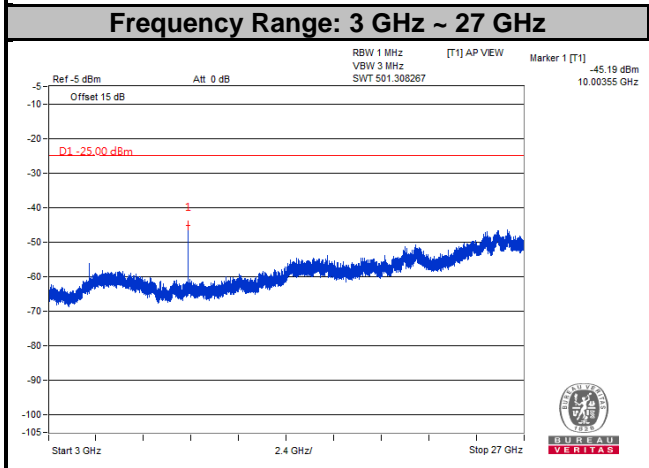
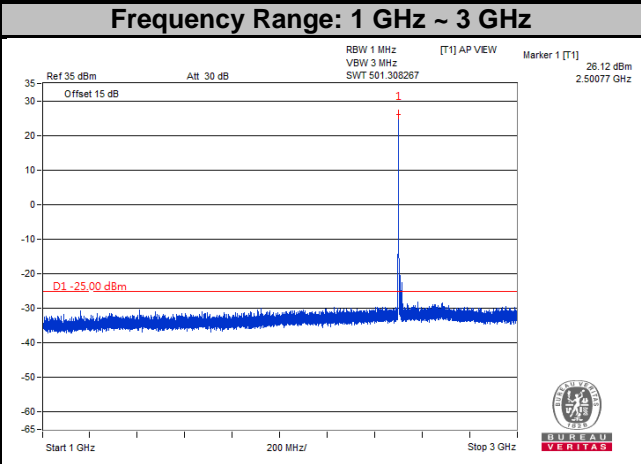
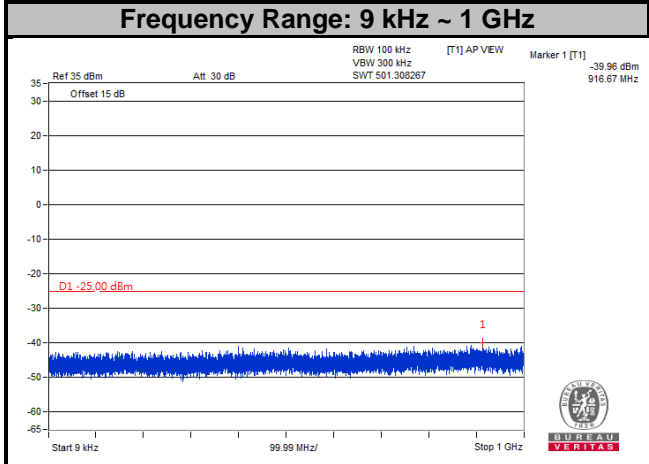
LTE Band 7
Channel Bandwidth: 10 MHz
Channel 20800



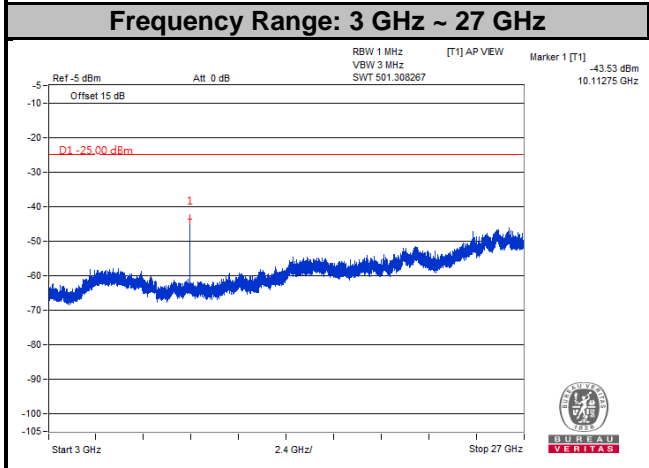
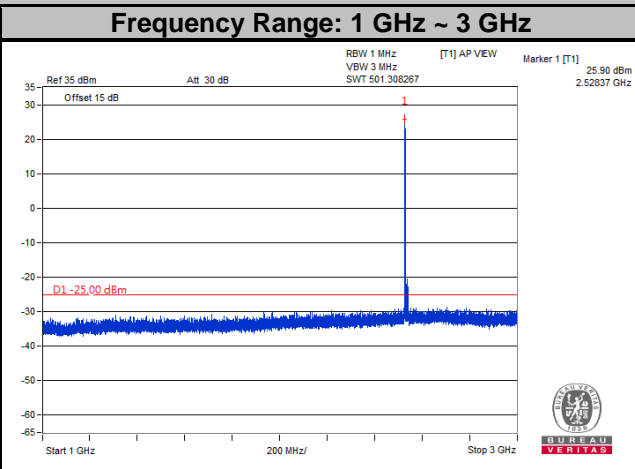
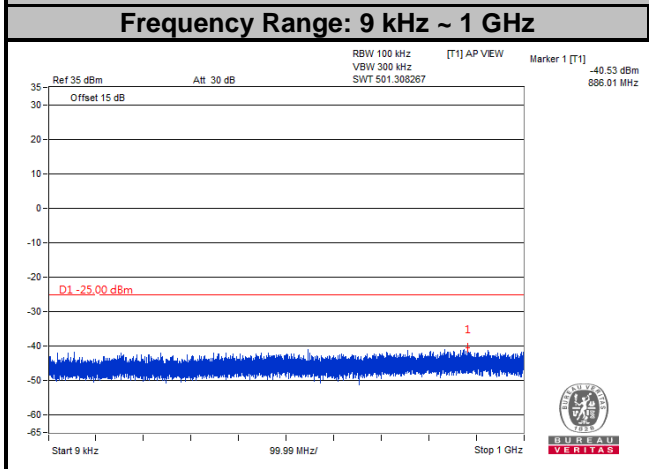
LTE Band 7
Channel Bandwidth: 10 MHz
Channel 21400



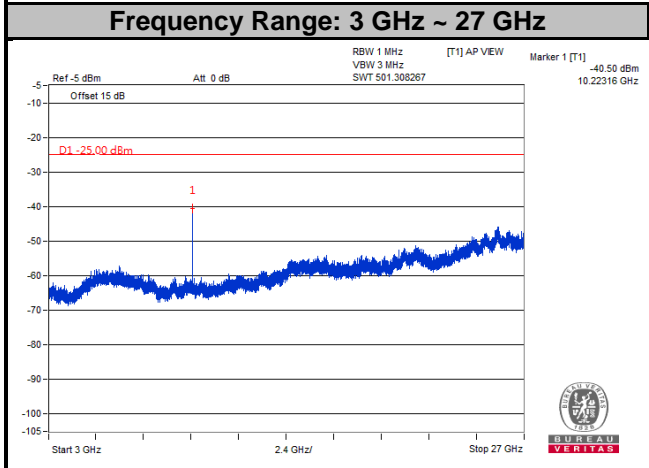
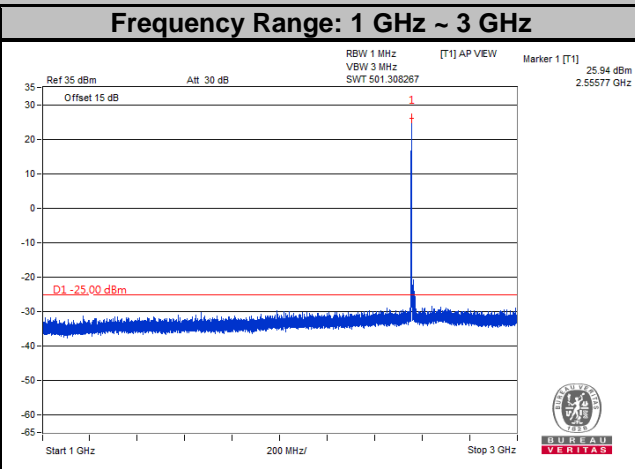
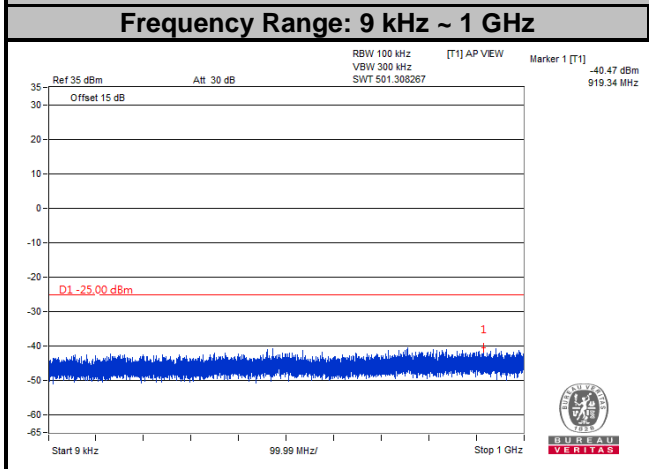
LTE Band 7
Channel Bandwidth: 15 MHz
Channel 20825



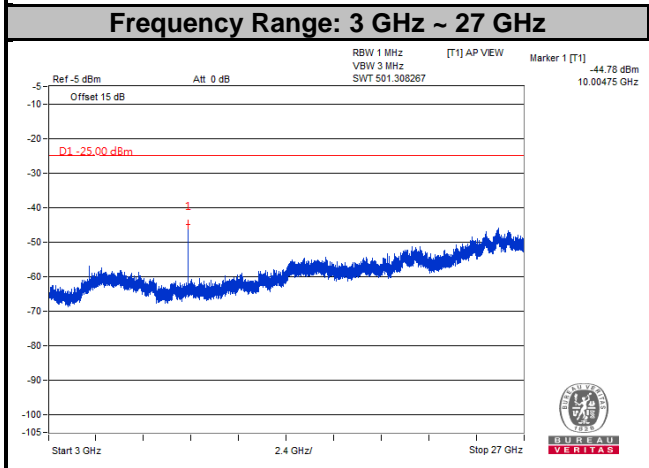
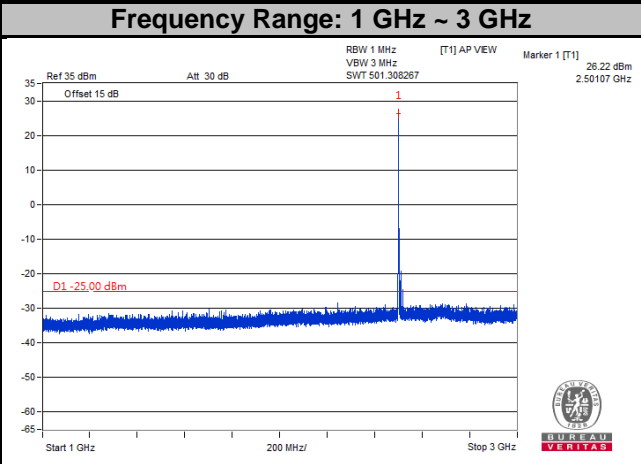
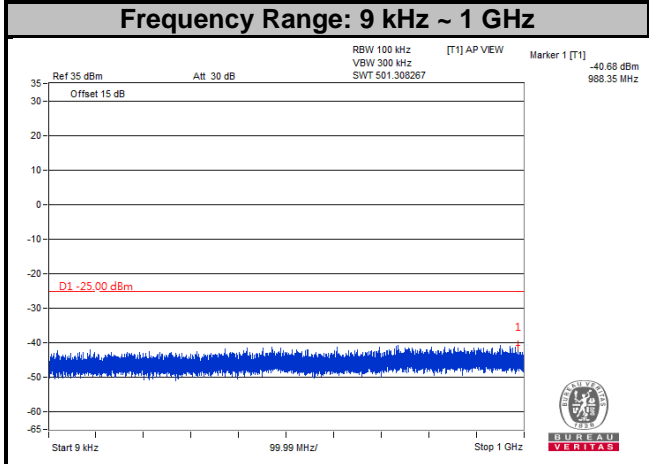
LTE Band 7
Channel Bandwidth: 15 MHz
Channel 21100



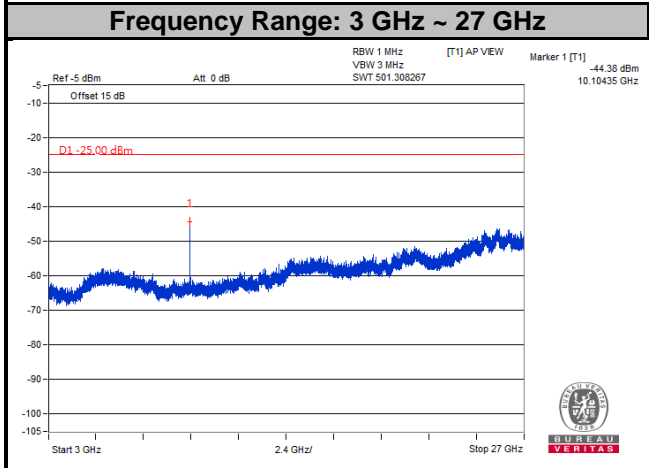
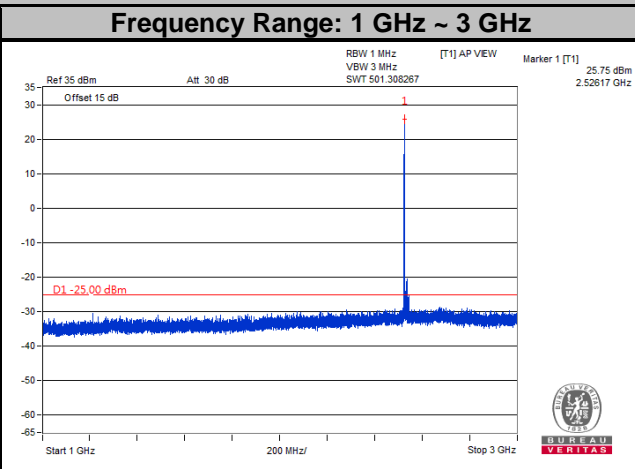
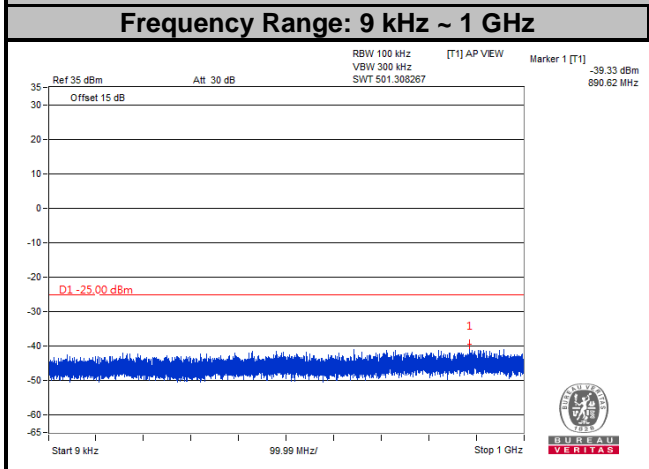
LTE Band 7
Channel Bandwidth: 15 MHz
Channel 21375



LTE Band 7
Channel Bandwidth: 20 MHz
Channel 20850



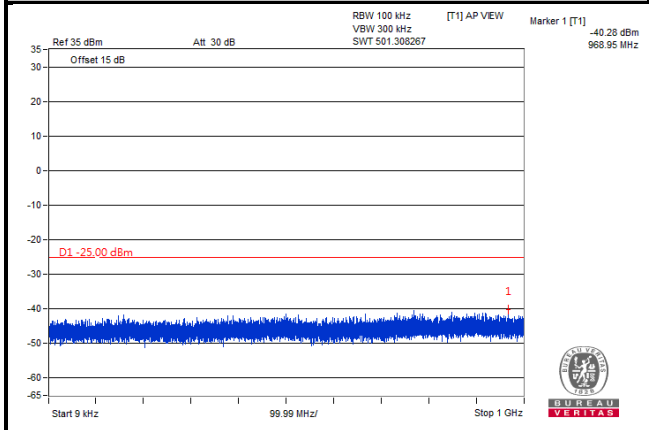
LTE Band 7
Channel Bandwidth: 20 MHz
Channel 21100



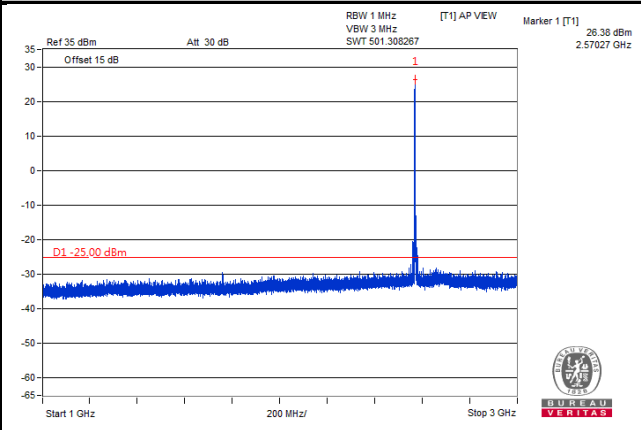
LTE Band 38
Channel Bandwidth: 5 MHz

Channel 37775

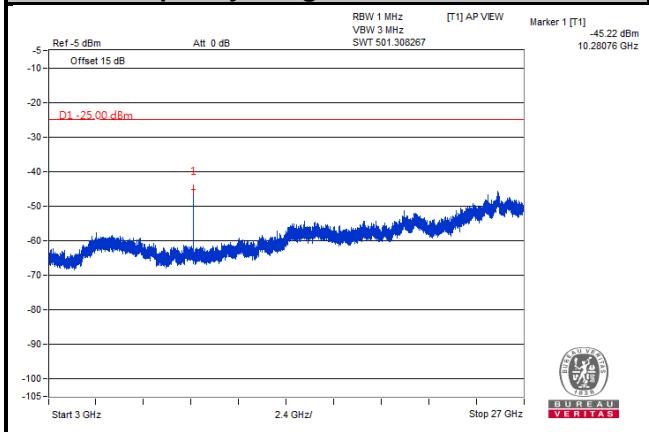
Frequency Range: 9 kHz ~ 1 GHz

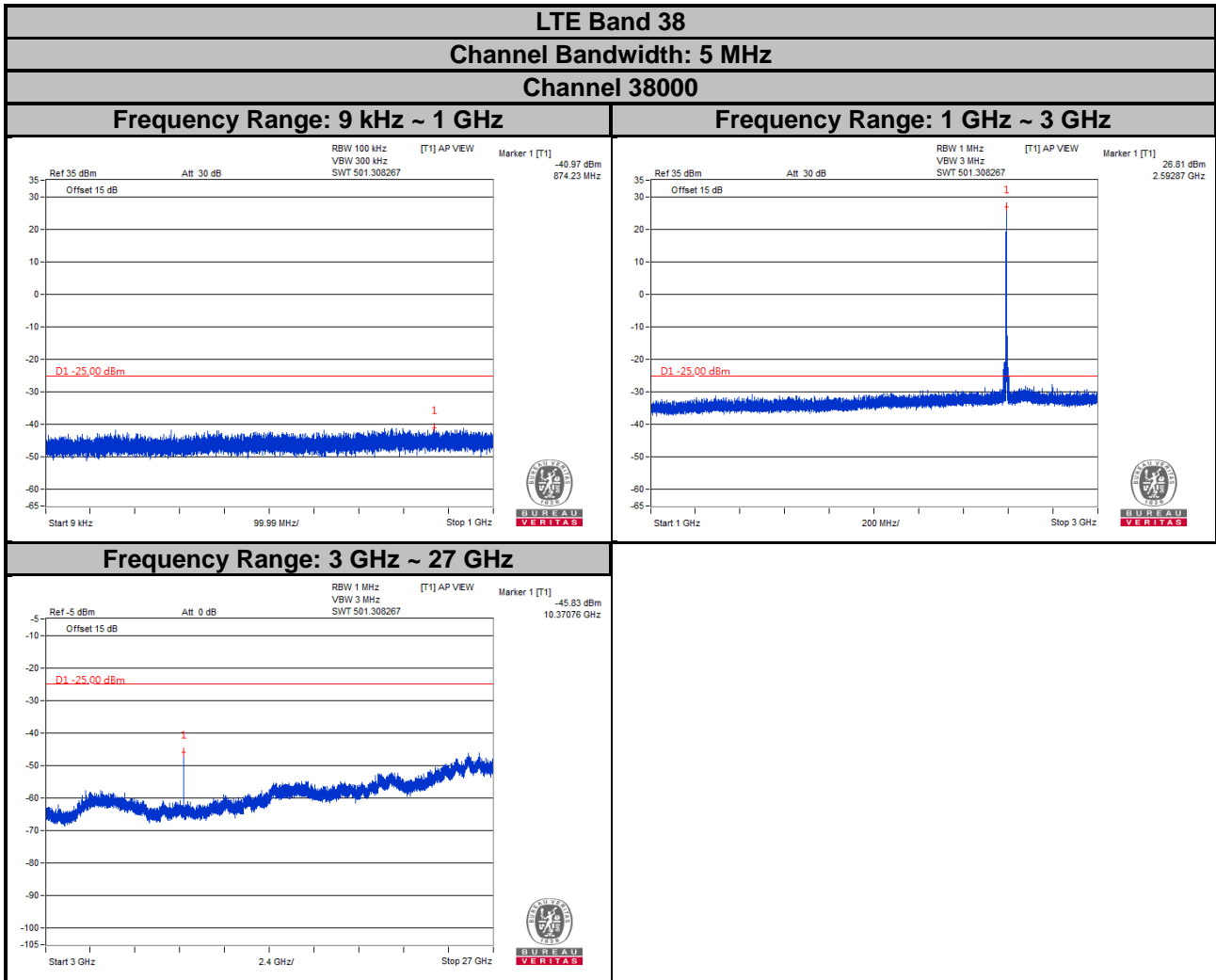


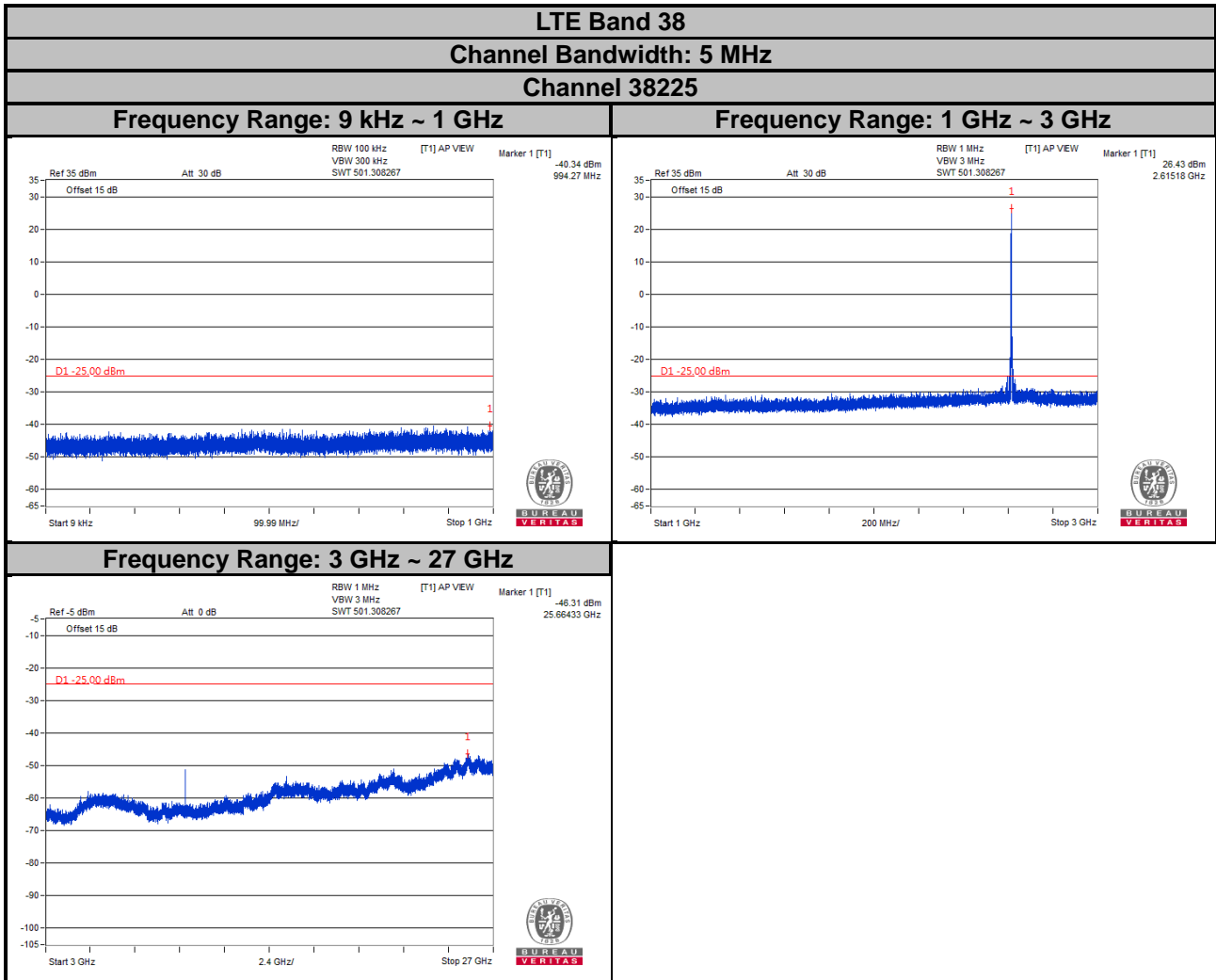
Frequency Range: 1 GHz ~ 3 GHz



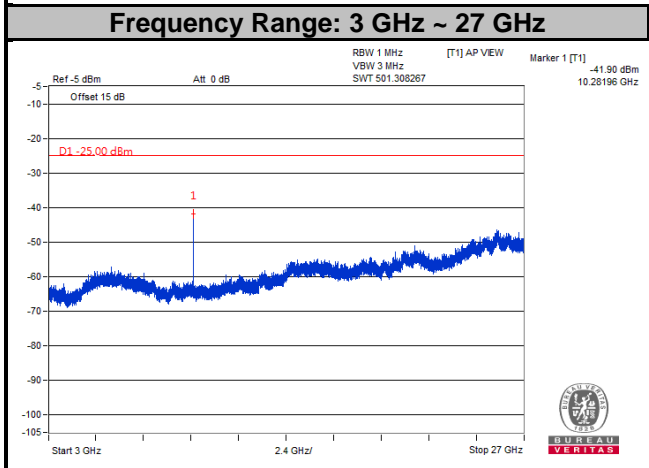
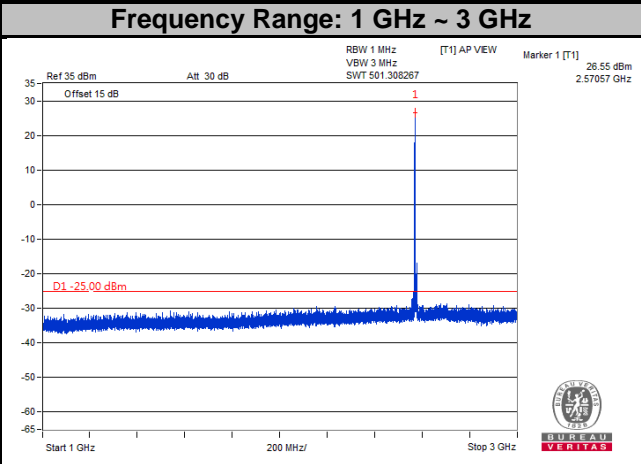
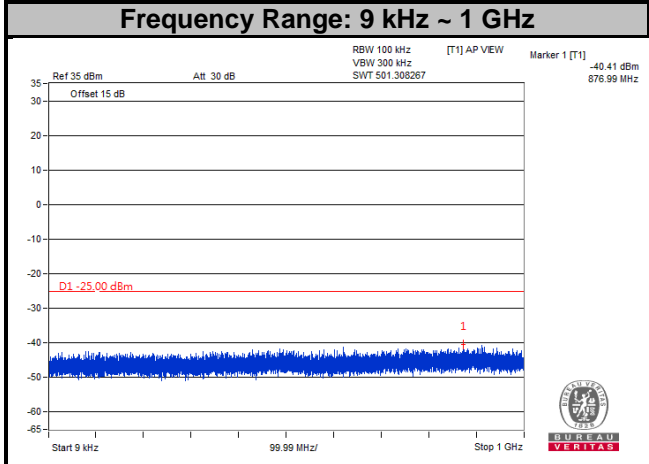
Frequency Range: 3 GHz ~ 27 GHz



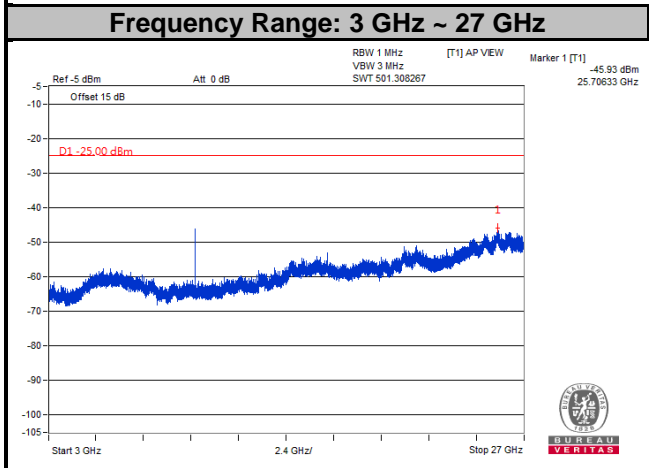
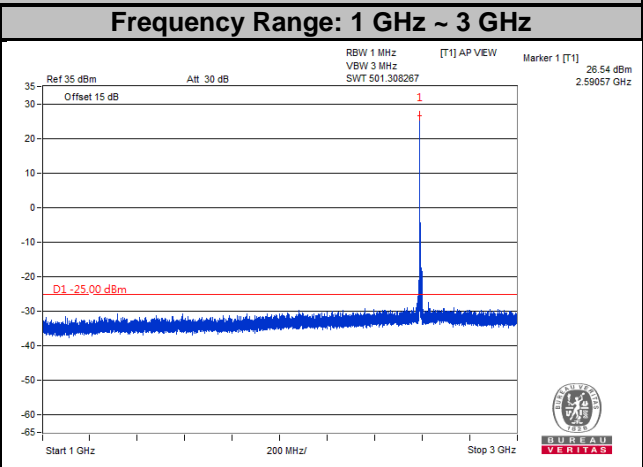
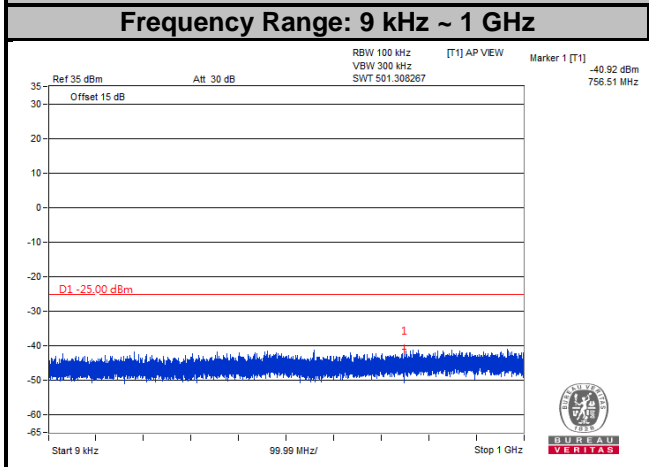




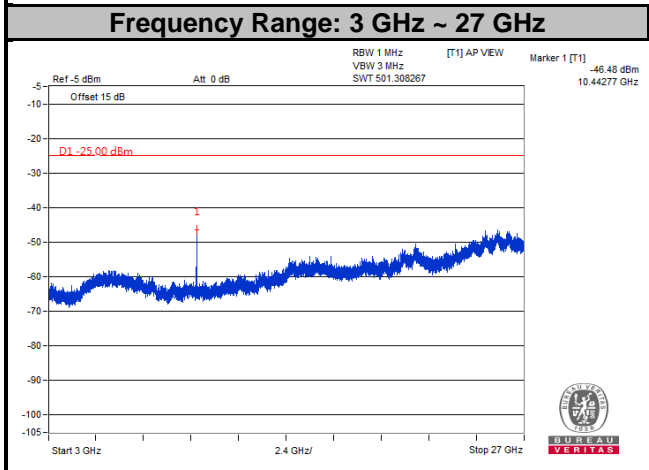
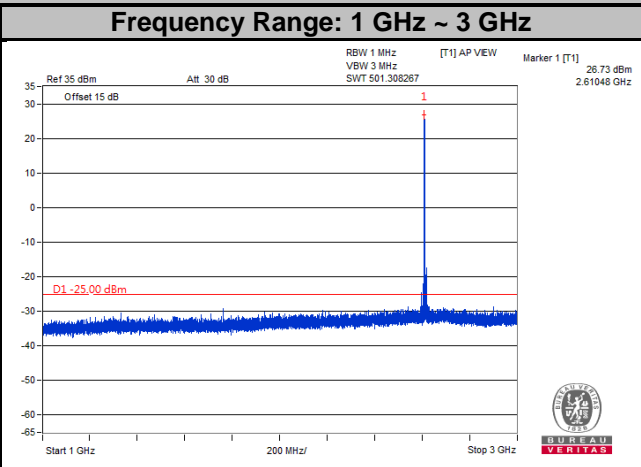
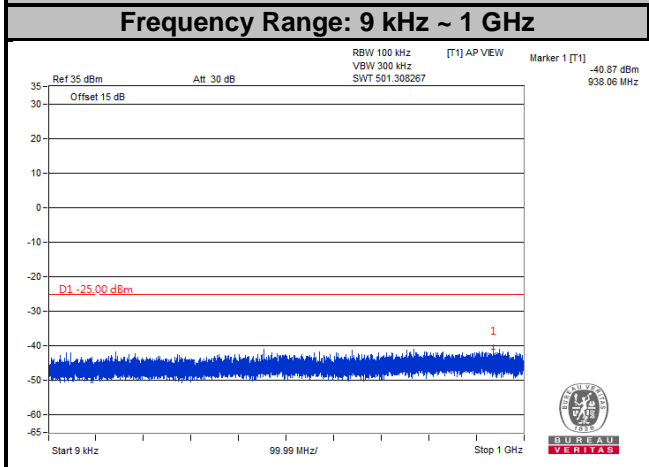
LTE Band 38
Channel Bandwidth: 10 MHz
Channel 37800



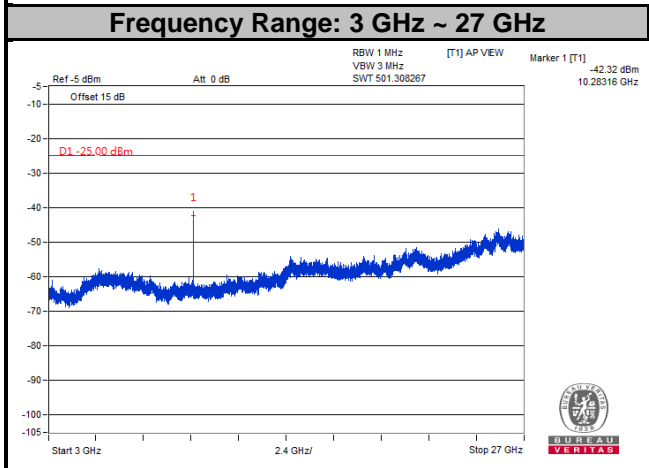
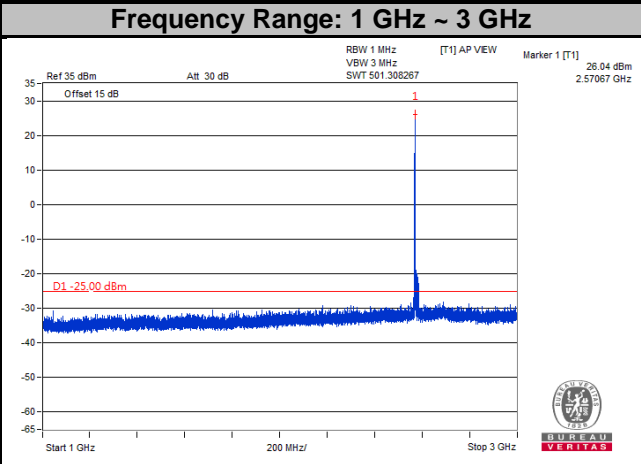
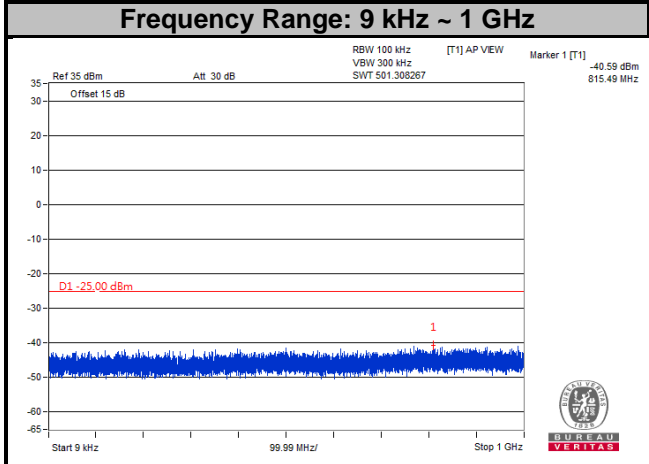
LTE Band 38
Channel Bandwidth: 10 MHz
Channel 38000

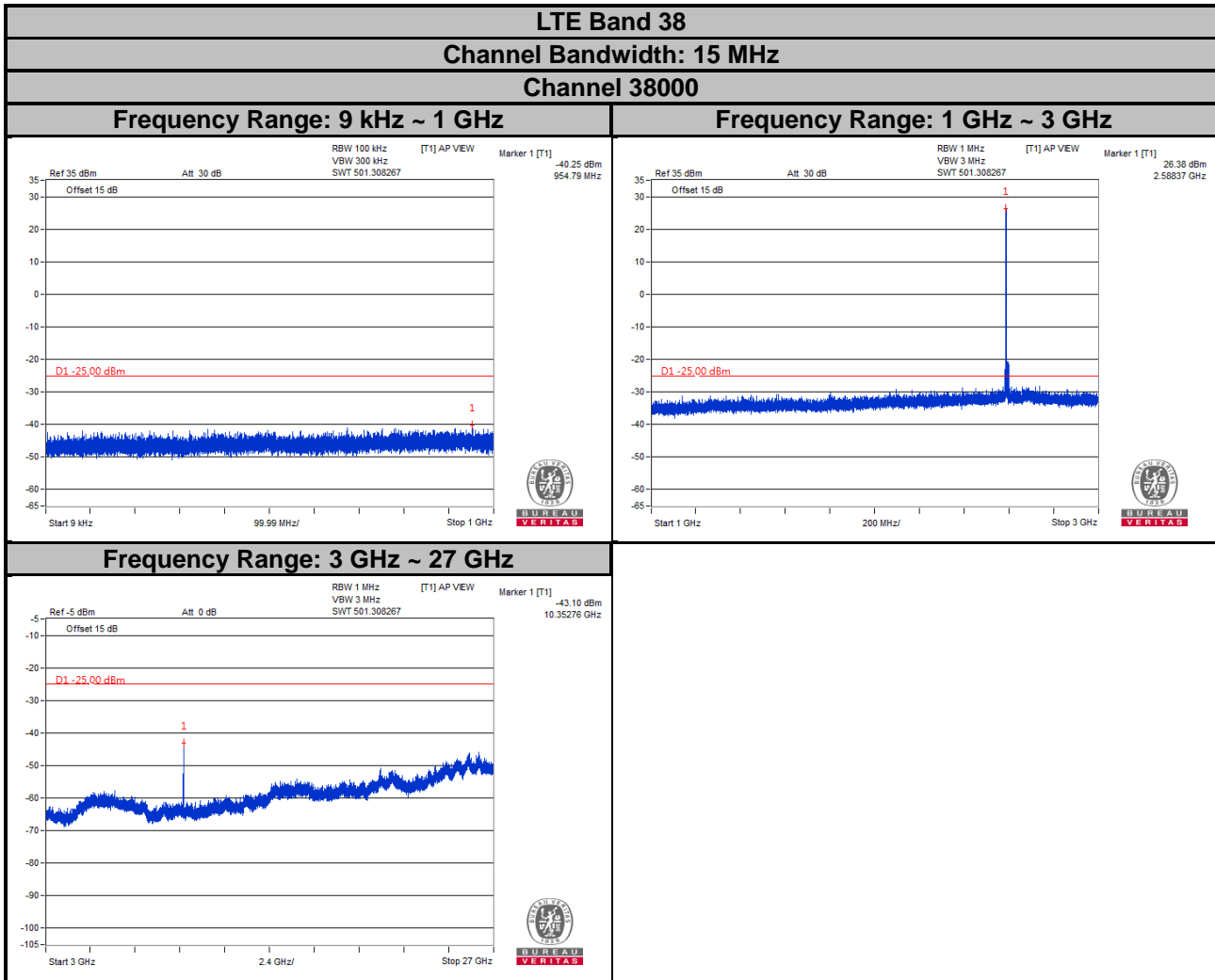


LTE Band 38
Channel Bandwidth: 10 MHz
Channel 38200

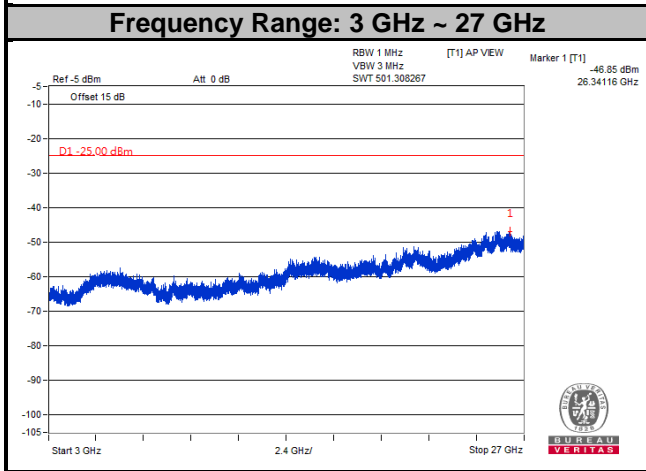
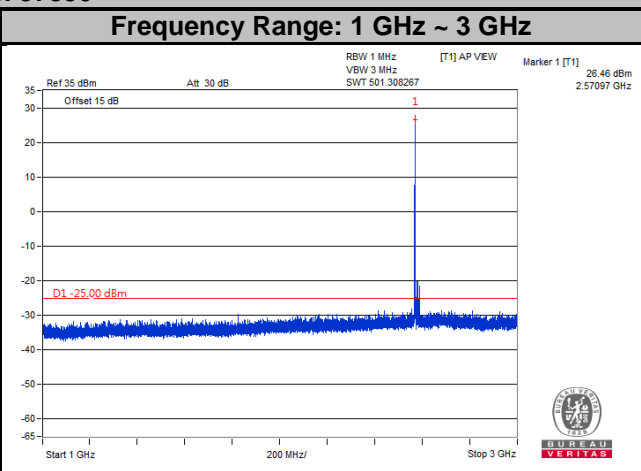
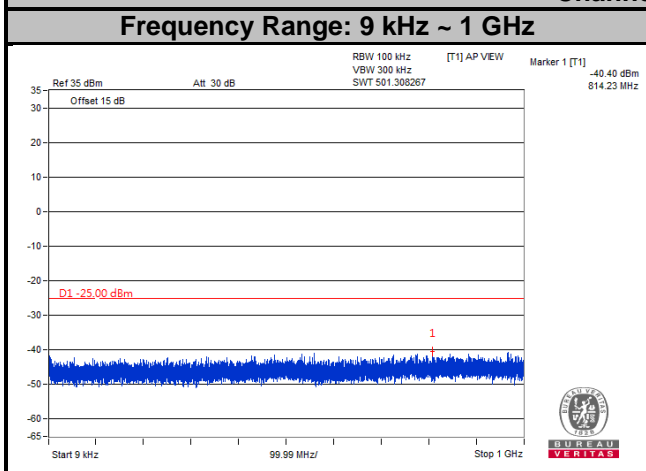


LTE Band 38
Channel Bandwidth: 15 MHz
Channel 37825

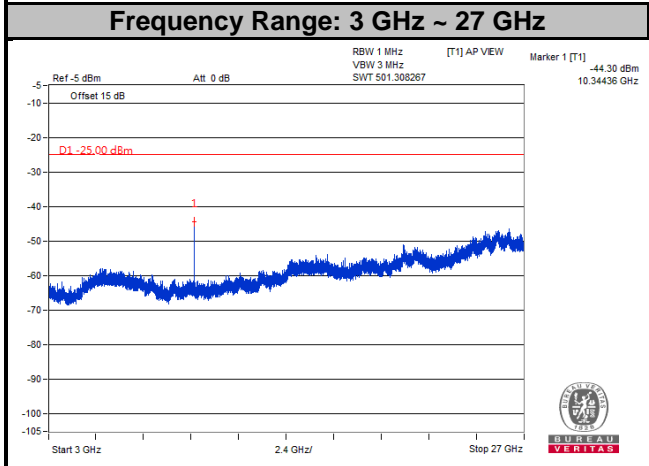
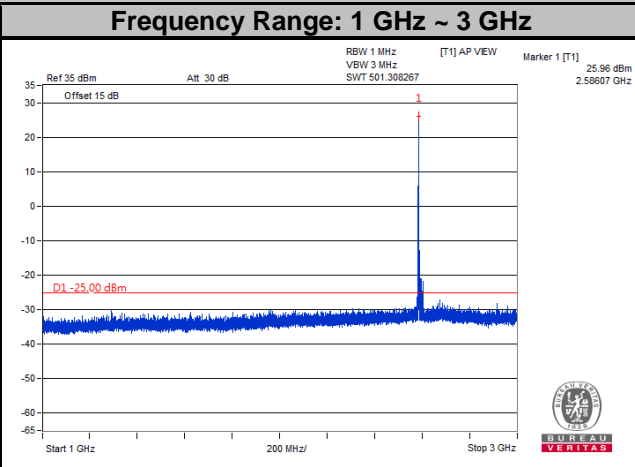
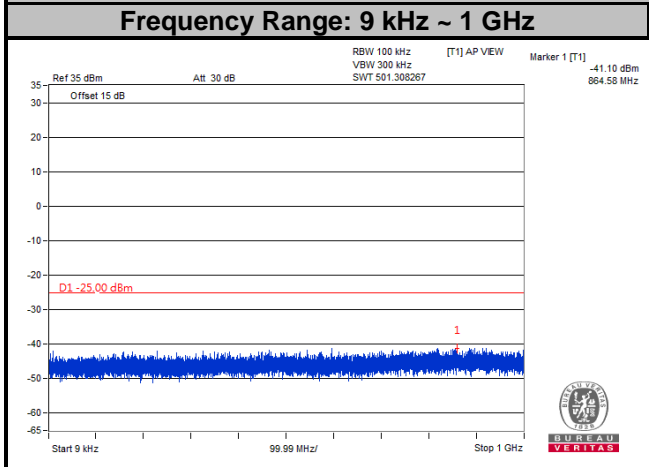




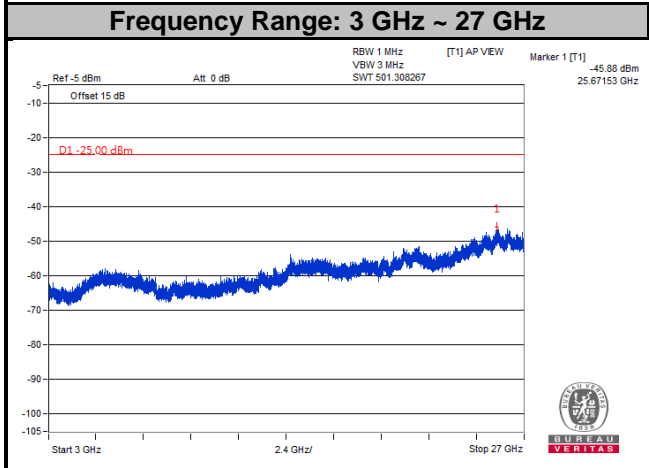
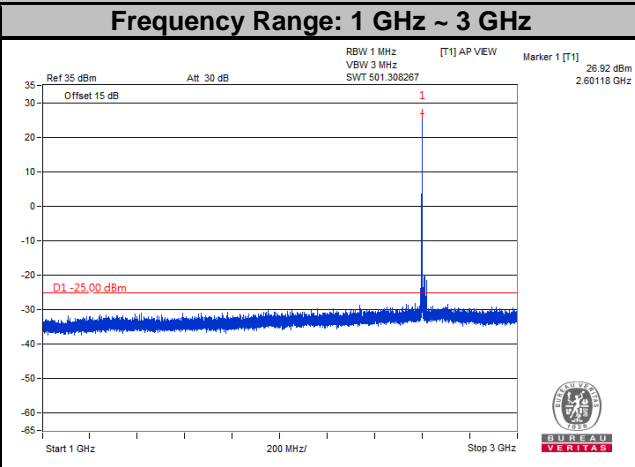
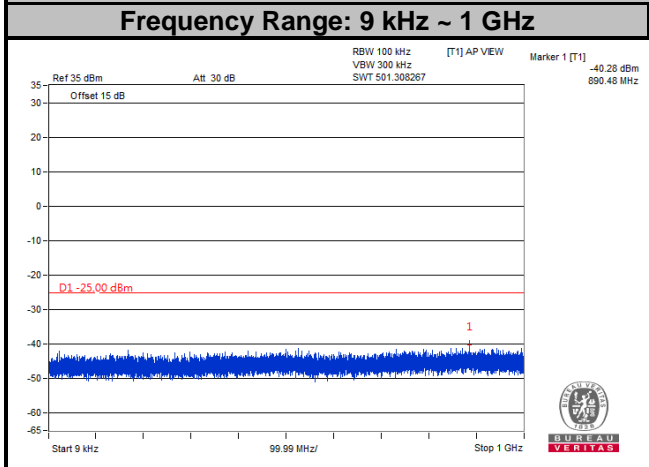
LTE Band 38
Channel Bandwidth: 20 MHz
Channel 37850



LTE Band 38
Channel Bandwidth: 20 MHz
Channel 38000



LTE Band 38
Channel Bandwidth: 20 MHz
Channel 38150



4.8 Radiated Emission Measurement

4.8.1 Limits of Radiated Emission Measurement

The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least $55 + 10 \log_{10}(P)$ dB. The limit of emission is equal to -25 dBm.

4.8.2 Test Procedure

- a. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8 m (below or equal 1 GHz) and/or 1.5 m (above 1 GHz) height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1 m to 4 m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.
- b. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to "Read Value" of step a. Record the power level of S.G.
- c. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.
- d. E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.R.P power - 2.15 dB.

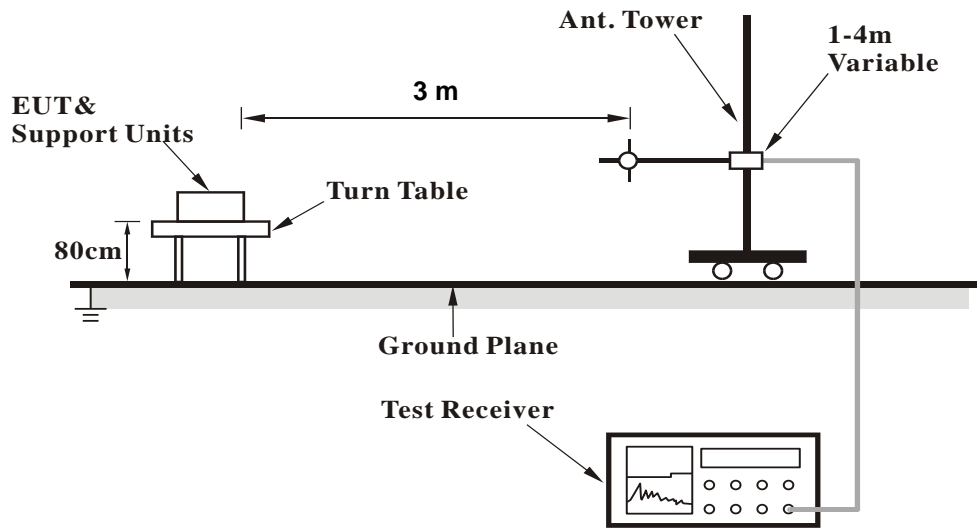
NOTE: The resolution bandwidth of spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz.

4.8.3 Deviation from Test Standard

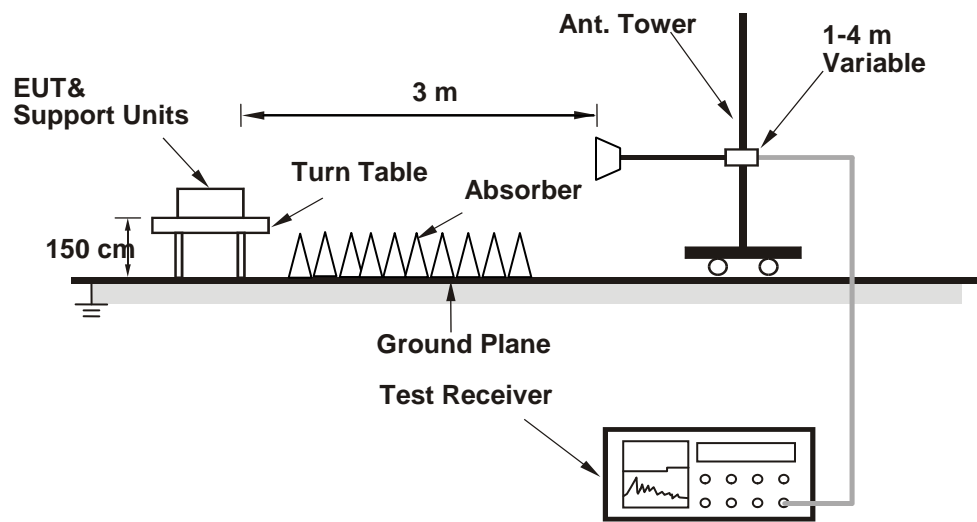
No deviation.

4.8.4 Test Setup

<Radiated Emission below or equal 1 GHz>



<Radiated Emission above 1 GHz>



For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.8.5 Test Results

Mode A

LTE Band 7

Channel Bandwidth: 5 MHz / QPSK

Low Channel

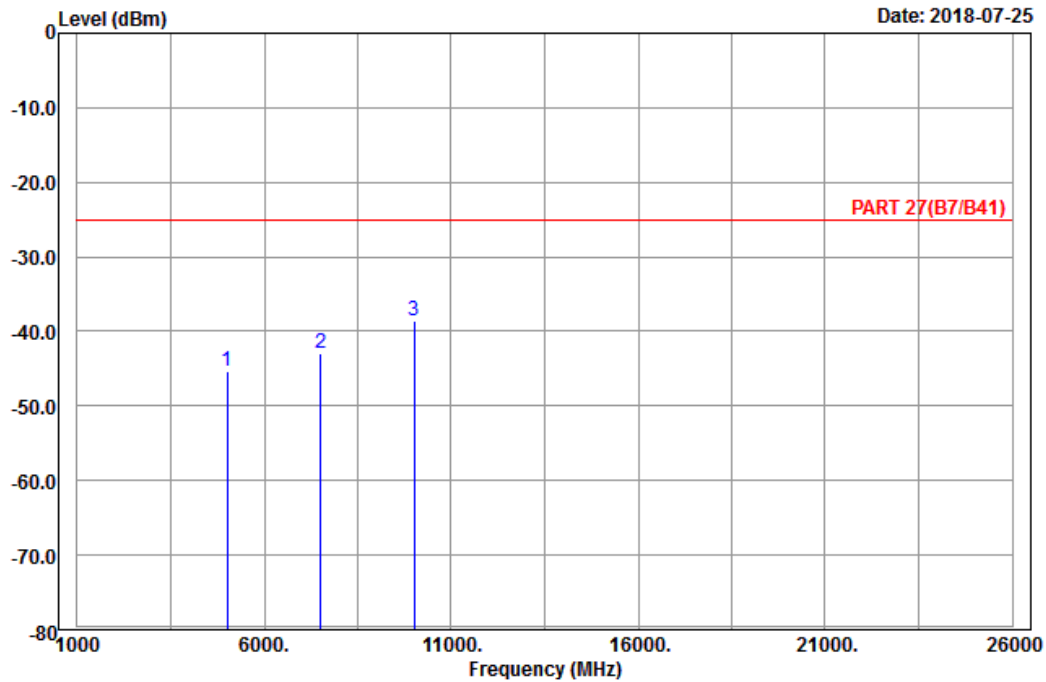


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 9

Date: 2018-07-25



Site : 966 chamber 1
 Condition: PART 27(B7/B41) Horizontal
 Remark : LTE_Band 7_Link_CH20775
 Tested by: Karl Lee

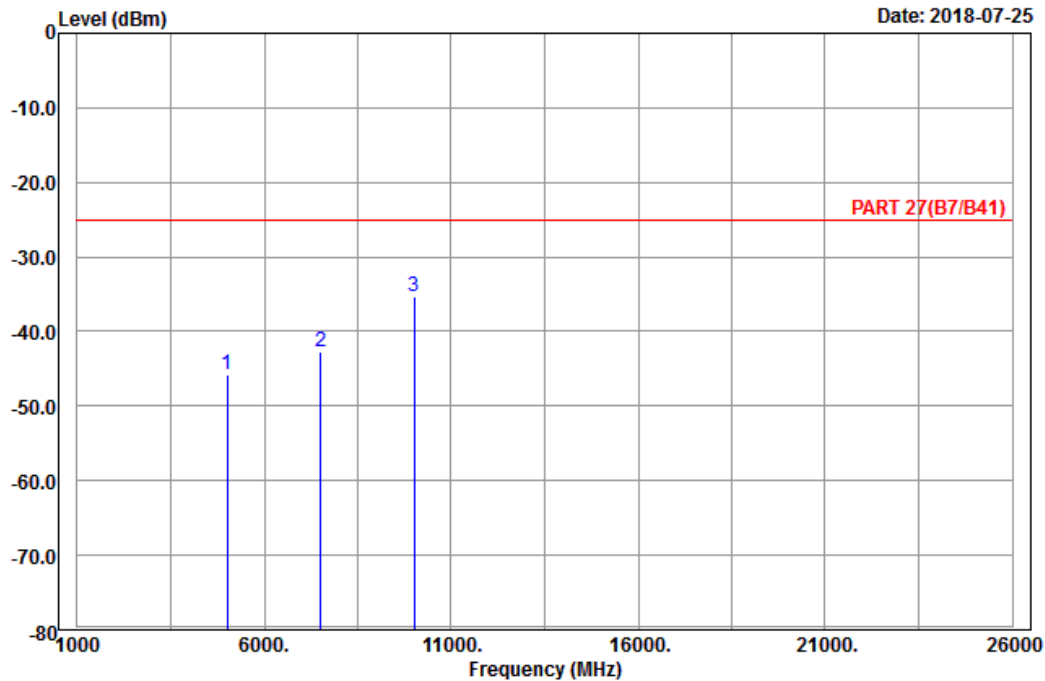
| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|------|----------|--------|------------|------------|------------|--------|--------|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 | 5005.00 | -45.24 | -64.82 | -25.00 | -20.24 | 19.58 | Peak |
| 2 | 7507.50 | -43.04 | -65.72 | -25.00 | -18.04 | 22.68 | Peak |
| 3 pp | 10010.00 | -38.51 | -64.76 | -25.00 | -13.51 | 26.25 | Peak |



A D T

Data: 10

Date: 2018-07-25



Site : 966 chamber 1
 Condition: PART 27(B7/B41) Vertical
 Remark : LTE_Band 7_Link_CH20775
 Tested by: Karl Lee

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|------|----------|--------|------------|------------|------------|--------|--------|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 | 5005.00 | -45.68 | -65.26 | -25.00 | -20.68 | 19.58 | Peak |
| 2 | 7507.50 | -42.72 | -65.40 | -25.00 | -17.72 | 22.68 | Peak |
| 3 pp | 10010.00 | -35.28 | -61.53 | -25.00 | -10.28 | 26.25 | Peak |

Middle Channel

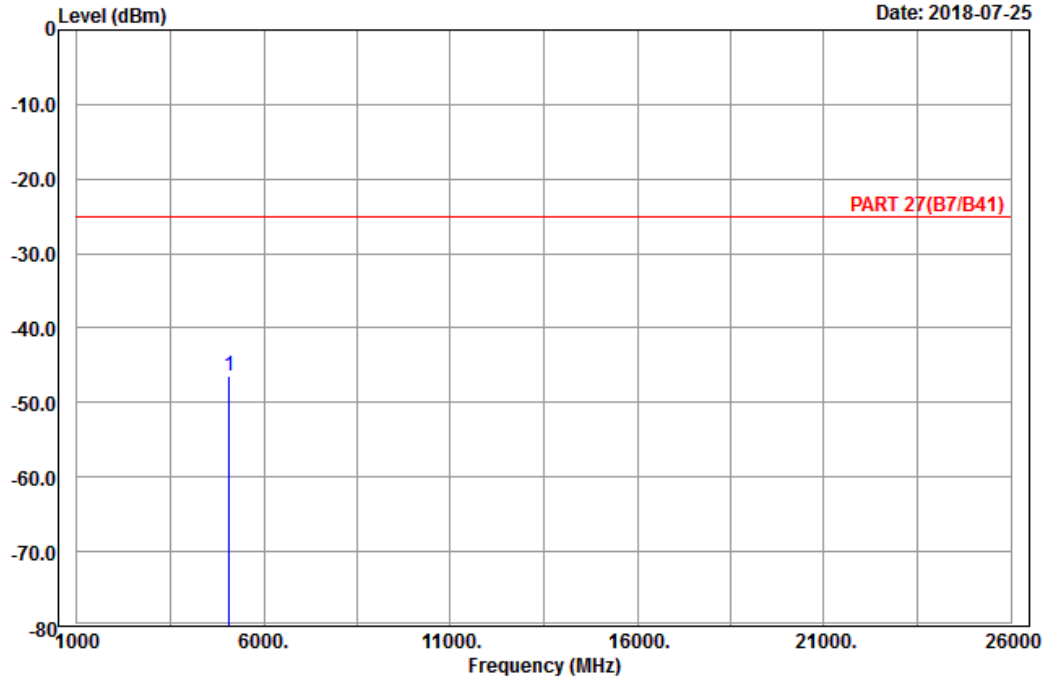


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 9

Date: 2018-07-25



Site : 966 chamber 1
 Condition: PART 27(B7/B41) Horizontal
 Remark : LTE_Band 7_Link_CH21100
 Tested by: Harry Hsueh

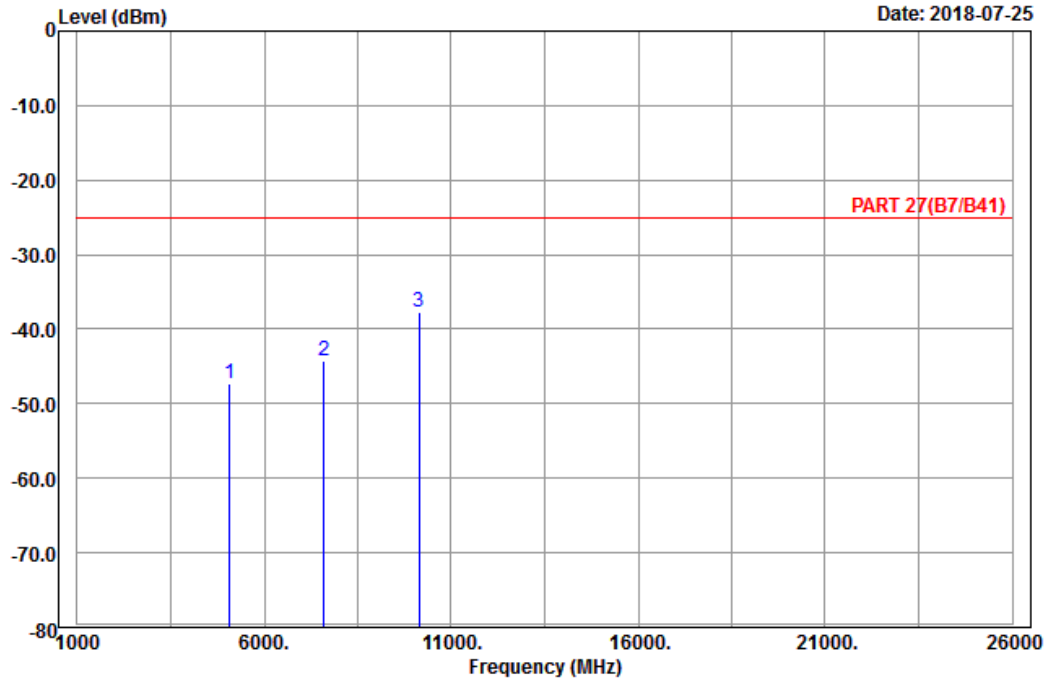
| Freq | Level | Read Level | Limit | Over | Factor | Remark |
|--------------|--------|------------|--------|--------|--------|--------|
| MHz | dBm | dBm | dBm | dB | dB | |
| 1 pp 5070.00 | -46.41 | -65.80 | -25.00 | -21.41 | 19.39 | Peak |



A D T

Data: 10

Date: 2018-07-25



Site : 966 chamber 1
 Condition: PART 27(B7/B41) Vertical
 Remark : LTE_Band 7_Link_CH21100
 Tested by: Harry Hsueh

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|------|----------|--------|------------|------------|------------|--------|--------|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 | 5070.00 | -47.40 | -66.79 | -25.00 | -22.40 | 19.39 | Peak |
| 2 | 7605.00 | -44.33 | -67.32 | -25.00 | -19.33 | 22.99 | Peak |
| 3 pp | 10140.00 | -37.79 | -64.21 | -25.00 | -12.79 | 26.42 | Peak |

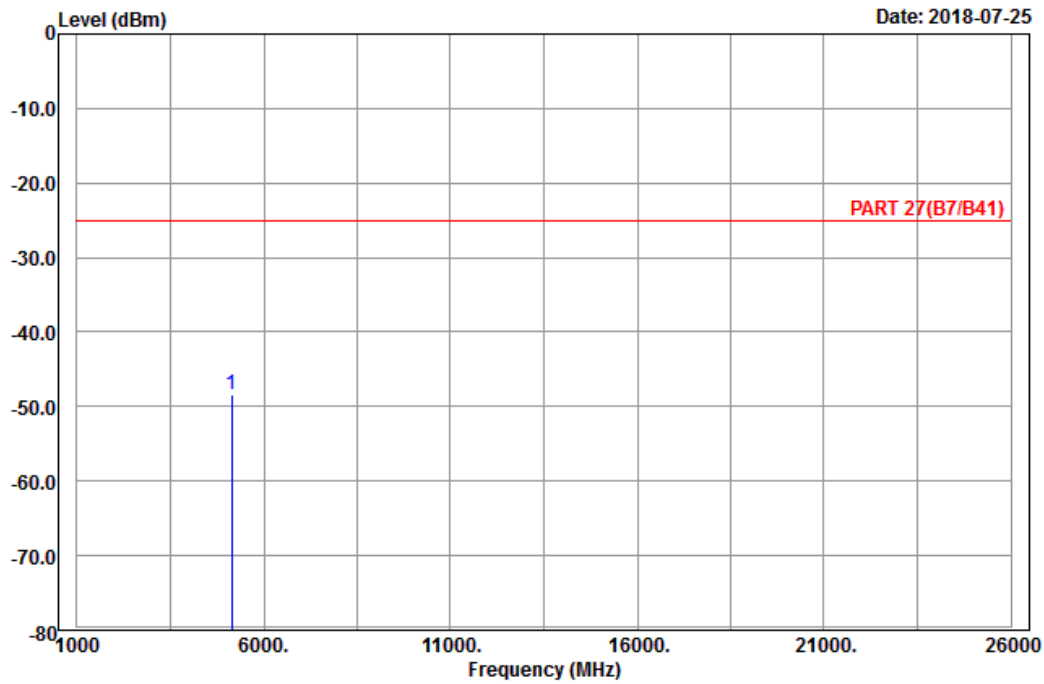
High Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 9



Site : 966 chamber 1
 Condition: PART 27(B7/B41) Horizontal
 Remark : LTE_Band 7_Link_CH21425
 Tested by: Karl Lee

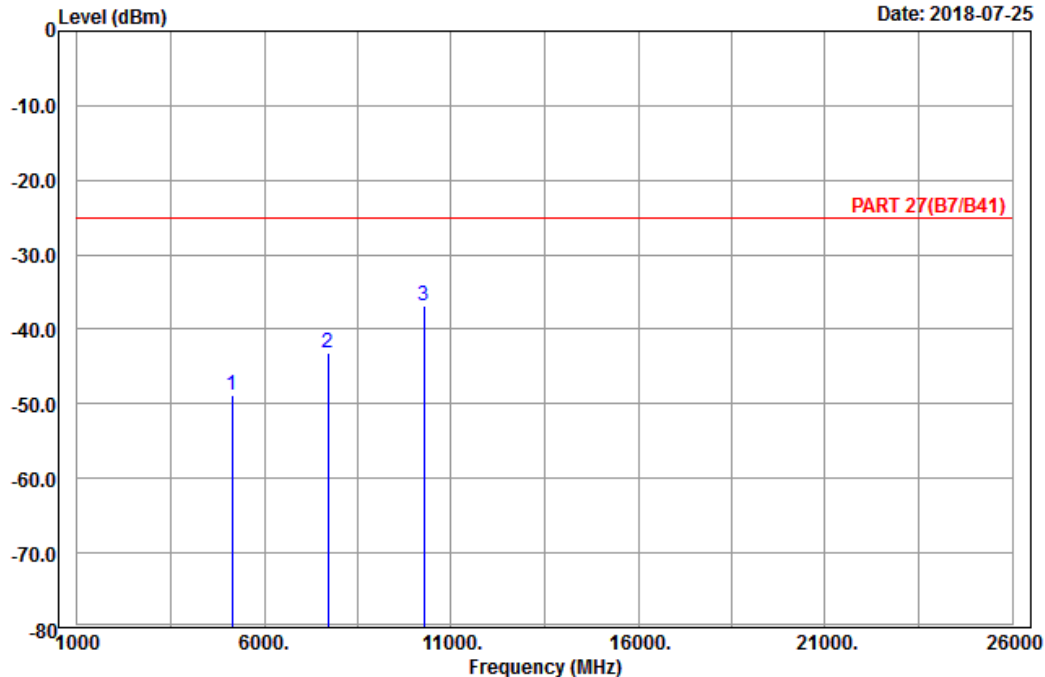
| | Read | Limit | Over | | | |
|--------------|--------|--------|--------|--------|--------|--------|
| Freq | Level | Level | Line | Limit | Factor | Remark |
| MHz | dBm | dBm | dBm | dB | dB | |
| 1 pp 5135.00 | -48.47 | -68.28 | -25.00 | -23.47 | 19.81 | Peak |



A D T

Data: 10

Date: 2018-07-25



Site : 966 chamber 1
 Condition: PART 27(B7/B41) Vertical
 Remark : LTE_Band 7_Link_CH21425
 Tested by: Karl Lee

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|------|----------|--------|------------|------------|------------|--------|--------|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 | 5135.00 | -48.88 | -68.69 | -25.00 | -23.88 | 19.81 | Peak |
| 2 | 7702.50 | -43.21 | -66.37 | -25.00 | -18.21 | 23.16 | Peak |
| 3 pp | 10270.00 | -36.86 | -63.45 | -25.00 | -11.86 | 26.59 | Peak |

Channel Bandwidth: 20 MHz / QPSK
Low Channel

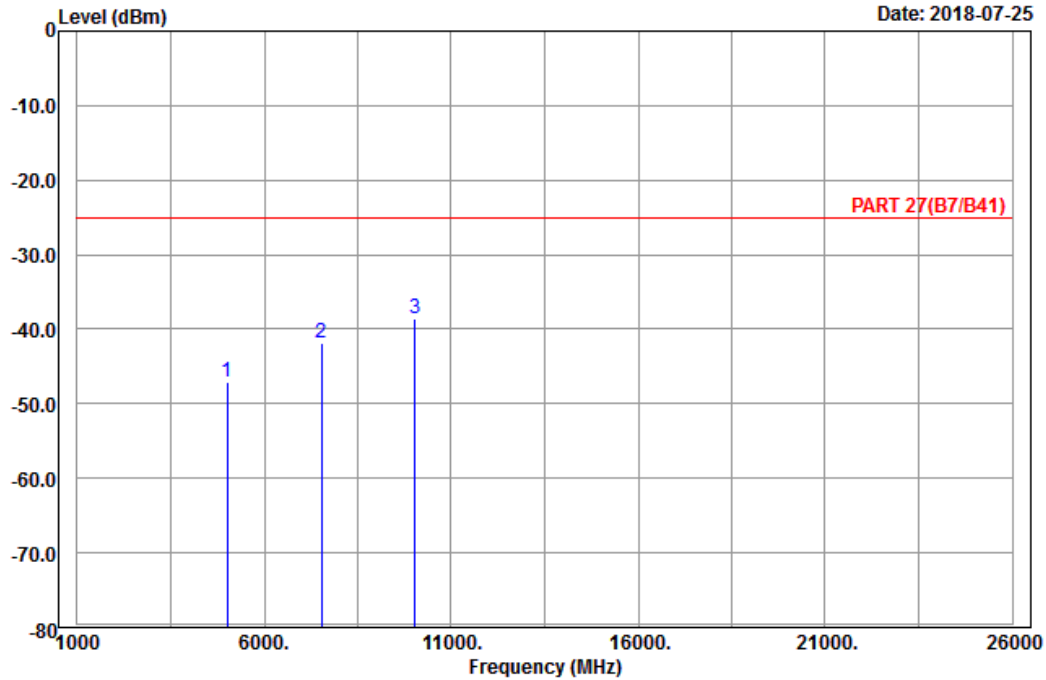


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 9

Date: 2018-07-25



Site : 966 chamber 1
Condition: PART 27(B7/B41) Horizontal
Remark : LTE_Band 7_Link_CH20850
Tested by: Harry Hsueh

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|---|-------------|--------|------------|------------|------------|--------|--------|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 | 5020.00 | -47.06 | -66.14 | -25.00 | -22.06 | 19.08 | Peak |
| 2 | 7530.00 | -41.90 | -64.75 | -25.00 | -16.90 | 22.85 | Peak |
| 3 | pp 10040.00 | -38.58 | -64.85 | -25.00 | -13.58 | 26.27 | Peak |

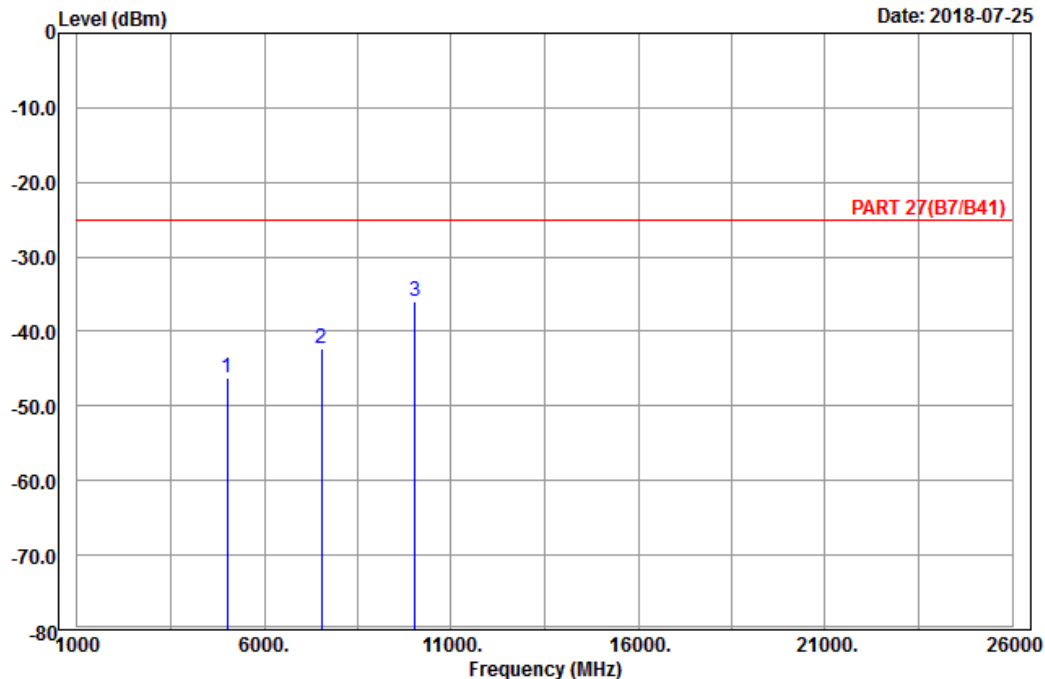


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 10

Date: 2018-07-25



Site : 966 chamber 1
 Condition: PART 27(B7/B41) Vertical
 Remark : LTE_Band 7_Link_CH20850
 Tested by: Harry Hsueh

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|------|----------|--------|------------|------------|------------|--------|--------|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 | 5020.00 | -46.11 | -65.19 | -25.00 | -21.11 | 19.08 | Peak |
| 2 | 7530.00 | -42.25 | -65.10 | -25.00 | -17.25 | 22.85 | Peak |
| 3 pp | 10040.00 | -35.95 | -62.22 | -25.00 | -10.95 | 26.27 | Peak |

Middle Channel

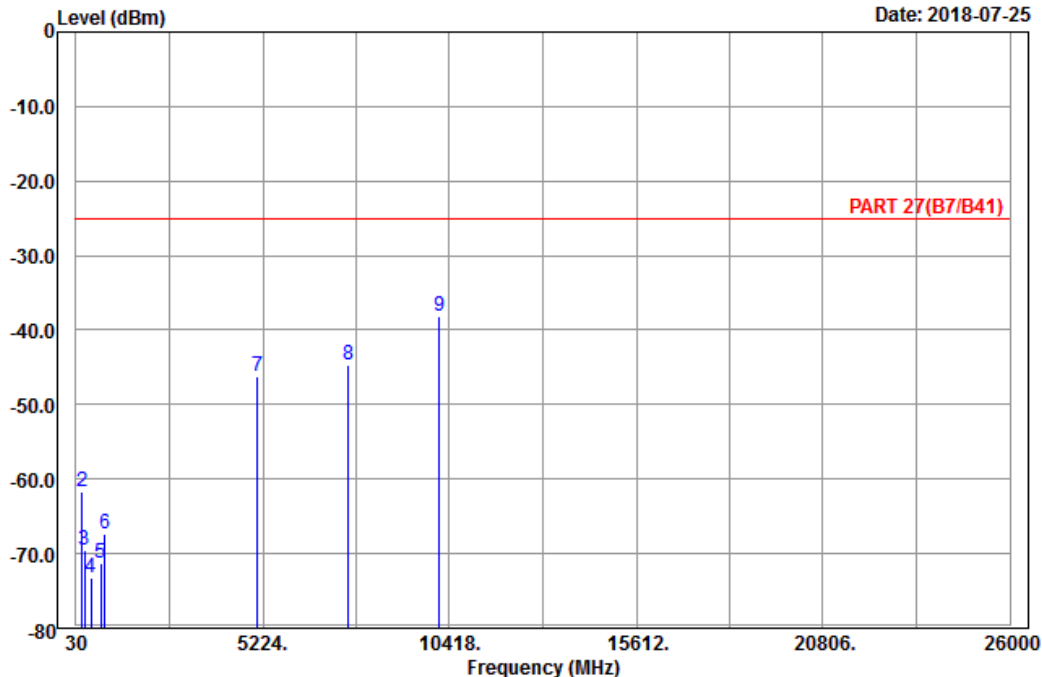


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 13

Date: 2018-07-25



Site : 966 chamber 1
 Condition: PART 27(B7/B41) Horizontal
 Remark : LTE_Band 7_Link_CH21100
 Tested by: Harry Hsueh

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|---|-------------|--------|------------|------------|------------|--------|--------|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 | 81.84 | -84.09 | -72.43 | -25.00 | -59.09 | -11.66 | Peak |
| 2 | 198.48 | -61.77 | -55.63 | -25.00 | -36.77 | -6.14 | Peak |
| 3 | 278.40 | -69.61 | -63.85 | -25.00 | -44.61 | -5.76 | Peak |
| 4 | 439.30 | -73.27 | -69.66 | -25.00 | -48.27 | -3.61 | Peak |
| 5 | 728.40 | -71.37 | -70.46 | -25.00 | -46.37 | -0.91 | Peak |
| 6 | 841.80 | -67.41 | -68.95 | -25.00 | -42.41 | 1.54 | Peak |
| 7 | 5070.00 | -46.14 | -65.53 | -25.00 | -21.14 | 19.39 | Peak |
| 8 | 7605.00 | -44.62 | -67.61 | -25.00 | -19.62 | 22.99 | Peak |
| 9 | pp 10140.00 | -38.10 | -64.52 | -25.00 | -13.10 | 26.42 | Peak |

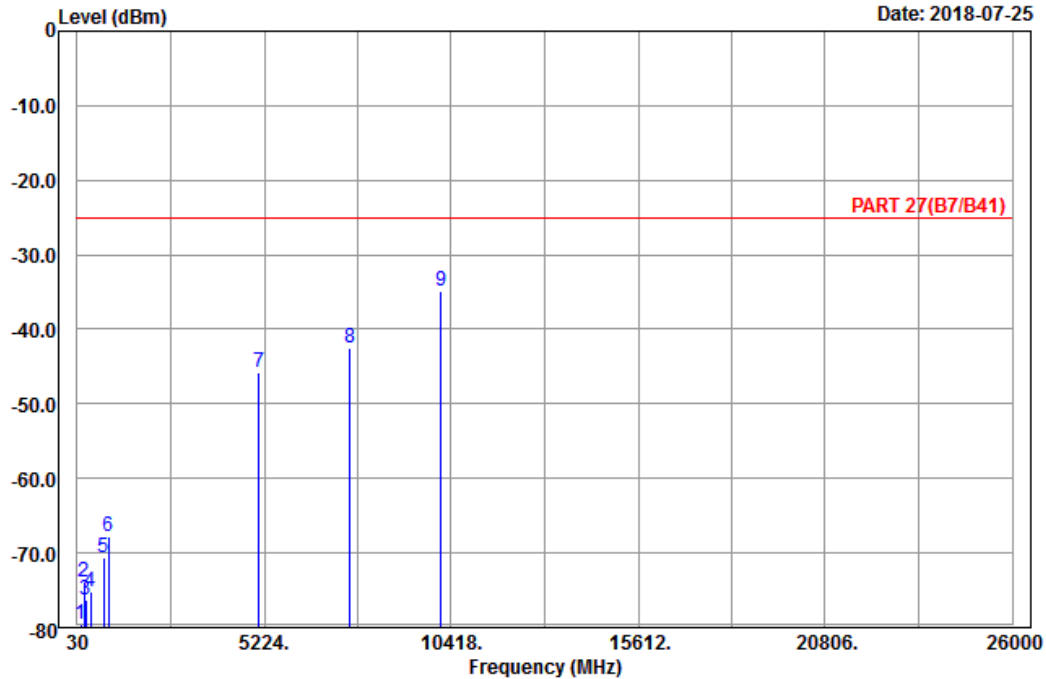


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 14

Date: 2018-07-25



Site : 966 chamber 1
 Condition: PART 27(B7/B41) Vertical
 Remark : LTE_Band 7_Link_CH21100
 Tested by: Harry Hsueh

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|------|----------|--------|------------|------------|------------|--------|--------|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 | 130.98 | -79.65 | -72.00 | -25.00 | -54.65 | -7.65 | Peak |
| 2 | 221.16 | -73.83 | -67.93 | -25.00 | -48.83 | -5.90 | Peak |
| 3 | 275.70 | -76.24 | -70.50 | -25.00 | -51.24 | -5.74 | Peak |
| 4 | 413.40 | -75.21 | -72.17 | -25.00 | -50.21 | -3.04 | Peak |
| 5 | 771.80 | -70.65 | -70.81 | -25.00 | -45.65 | 0.16 | Peak |
| 6 | 909.70 | -67.86 | -71.18 | -25.00 | -42.86 | 3.32 | Peak |
| 7 | 5070.00 | -45.73 | -65.12 | -25.00 | -20.73 | 19.39 | Peak |
| 8 | 7605.00 | -42.45 | -65.44 | -25.00 | -17.45 | 22.99 | Peak |
| 9 pp | 10140.00 | -34.84 | -61.26 | -25.00 | -9.84 | 26.42 | Peak |

High Channel

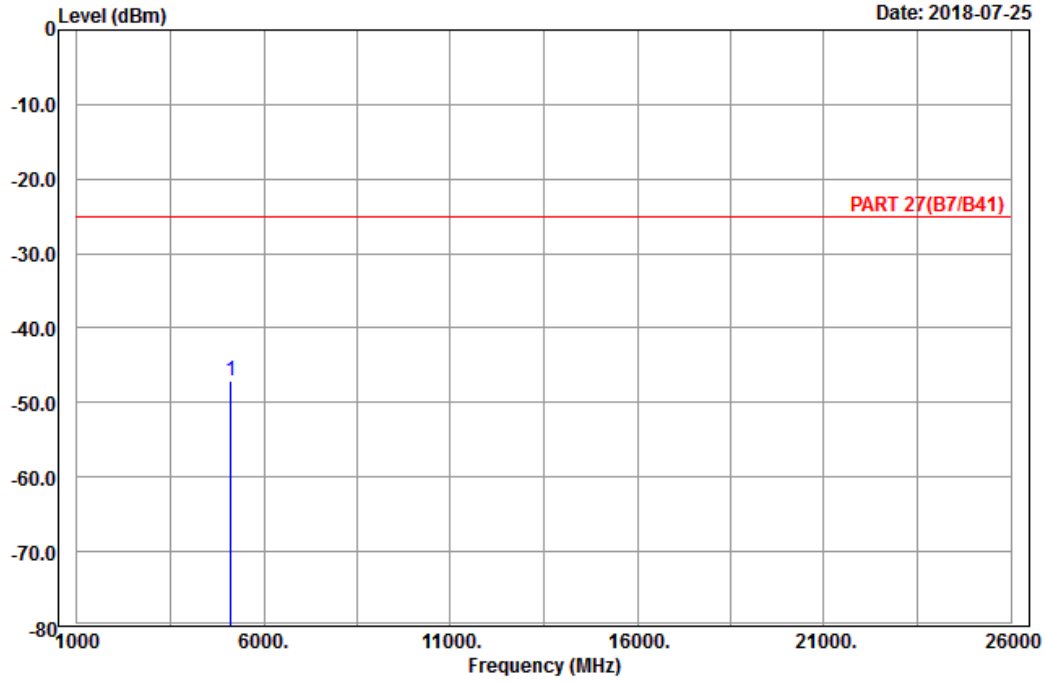


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 9

Date: 2018-07-25



Site : 966 chamber 1
 Condition: PART 27(B7/B41) Horizontal
 Remark : LTE_Band 7_Link_CH21350
 Tested by: Karl Lee

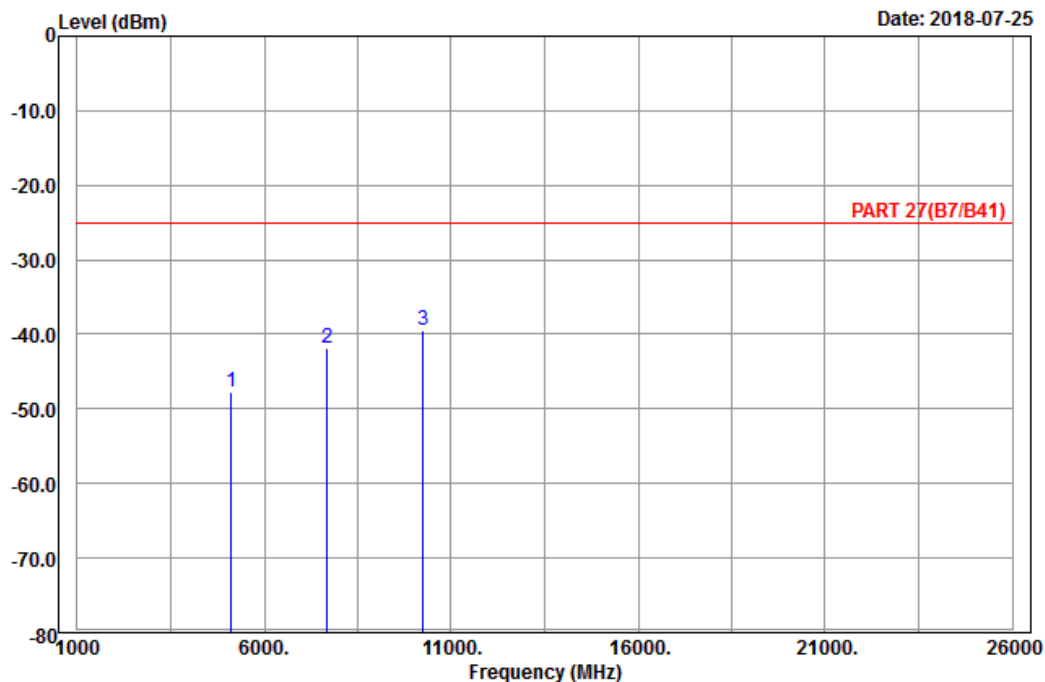
| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|---|------------|--------|------------|------------|------------|--------|--------|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 | pp 5120.00 | -47.07 | -66.78 | -25.00 | -22.07 | 19.71 | Peak |



A D T

Data: 10

Date: 2018-07-25



Site : 966 chamber 1
 Condition: PART 27(B7/B41) Vertical
 Remark : LTE_Band 7_Link_CH21350
 Tested by: Karl Lee

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|------|----------|--------|------------|------------|------------|--------|--------|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 | 5120.00 | -47.75 | -67.46 | -25.00 | -22.75 | 19.71 | Peak |
| 2 | 7680.00 | -41.89 | -65.01 | -25.00 | -16.89 | 23.12 | Peak |
| 3 pp | 10240.00 | -39.42 | -65.96 | -25.00 | -14.42 | 26.54 | Peak |

LTE Band 38
 Channel Bandwidth: 5 MHz / QPSK
 Low Channel

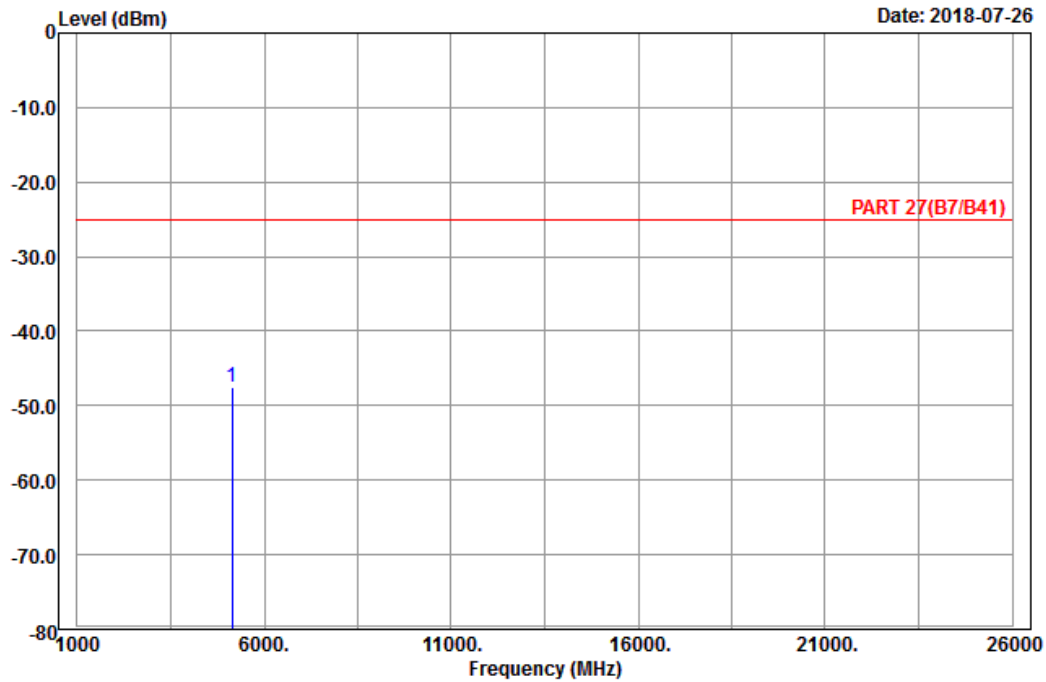


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 9

Date: 2018-07-26



Site : 966 chamber 1
 Condition: PART 27(B7/B41) Horizontal
 Remark : LTE_Band 38_Link_CH37775
 Tested by: Karl Lee

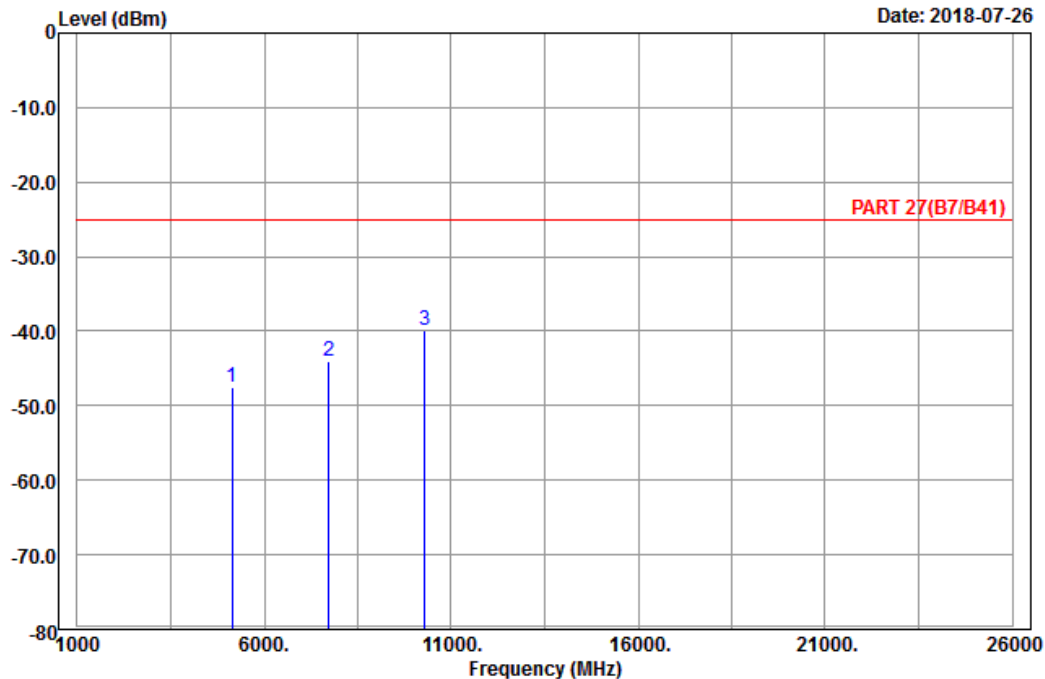
| | Read | Limit | Over | | | |
|--------------|--------|--------|--------|--------|--------|--------|
| Freq | Level | Level | Line | Limit | Factor | Remark |
| MHz | dBm | dBm | dBm | dB | dB | |
| 1 pp 5145.00 | -47.51 | -67.32 | -25.00 | -22.51 | 19.81 | Peak |



A D T

Data: 10

Date: 2018-07-26



Site : 966 chamber 1
 Condition: PART 27(B7/B41) Vertical
 Remark : LTE_Band 38_Link_CH37775
 Tested by: Karl Lee

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|------|----------|--------|------------|------------|------------|--------|--------|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 | 5145.00 | -47.62 | -67.43 | -25.00 | -22.62 | 19.81 | Peak |
| 2 | 7717.50 | -44.08 | -67.27 | -25.00 | -19.08 | 23.19 | Peak |
| 3 pp | 10290.00 | -39.79 | -66.41 | -25.00 | -14.79 | 26.62 | Peak |

Middle Channel

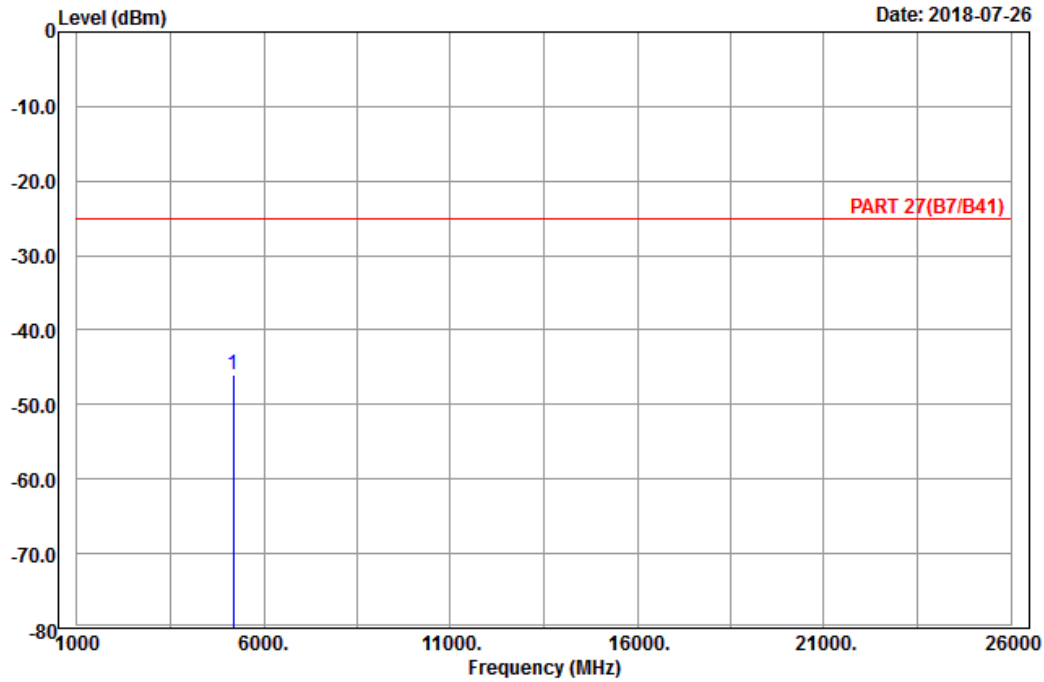


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 9

Date: 2018-07-26



Site : 966 chamber 1
 Condition: PART 27(B7/B41) Horizontal
 Remark : LTE_Band 38_Link_CH38000
 Tested by: Karl Lee

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|------|---------|--------|------------|------------|------------|--------|--------|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 pp | 5190.00 | -45.90 | -66.02 | -25.00 | -20.90 | 20.12 | Peak |

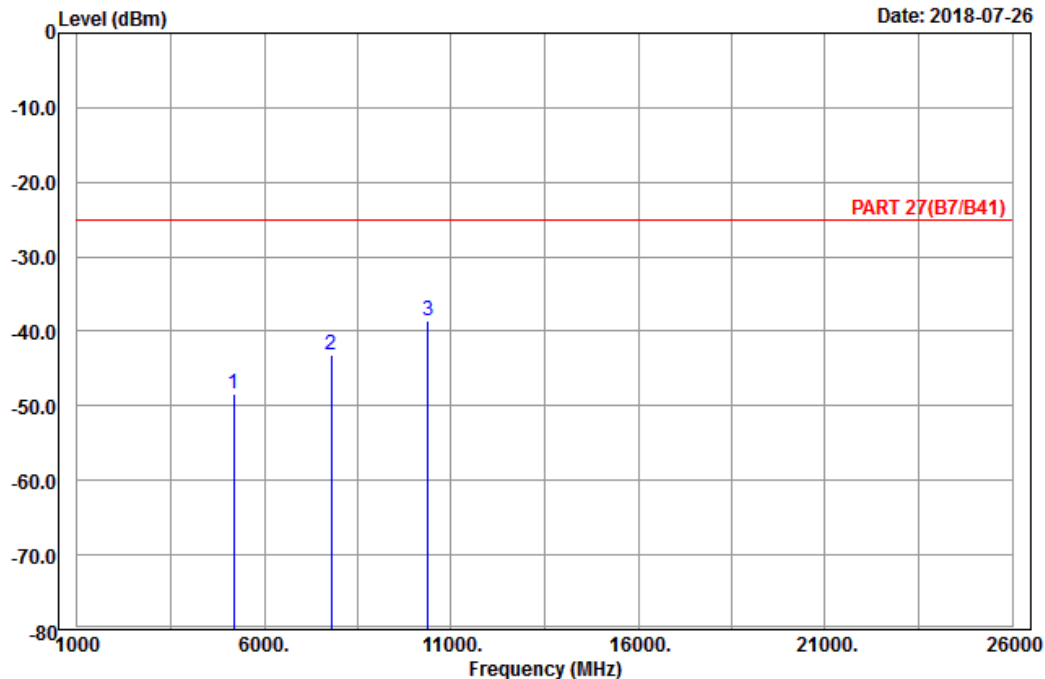


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 10

Date: 2018-07-26



Site : 966 chamber 1
 Condition: PART 27(B7/B41) Vertical
 Remark : LTE_Band 38_Link_CH38000
 Tested by: Karl Lee

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|------|----------|--------|------------|------------|------------|--------|--------|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 | 5190.00 | -48.40 | -68.52 | -25.00 | -23.40 | 20.12 | Peak |
| 2 | 7785.00 | -43.26 | -66.59 | -25.00 | -18.26 | 23.33 | Peak |
| 3 pp | 10380.00 | -38.50 | -65.24 | -25.00 | -13.50 | 26.74 | Peak |

High Channel

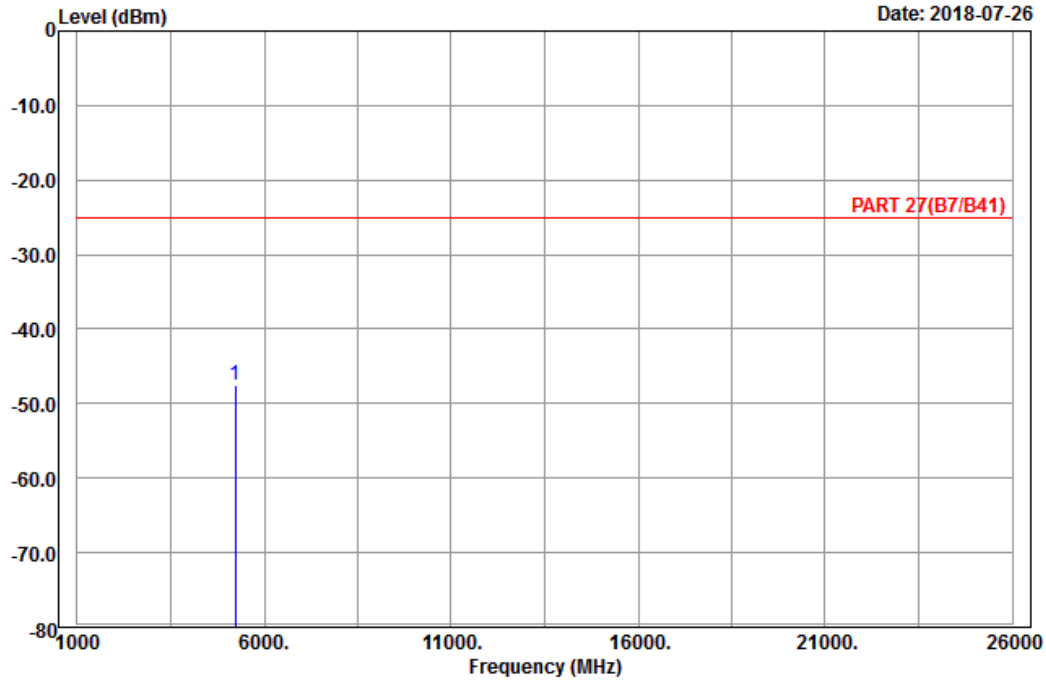


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 9

Date: 2018-07-26



Site : 966 chamber 1
 Condition: PART 27(B7/B41) Horizontal
 Remark : LTE_Band 38_Link_CH38225
 Tested by: Karl Lee

| Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|--------------|--------|------------|------------|------------|--------|--------|
| MHz | dBm | dBm | dBm | dB | dB | |
| 1 pp 5235.00 | -47.41 | -67.57 | -25.00 | -22.41 | 20.16 | Peak |

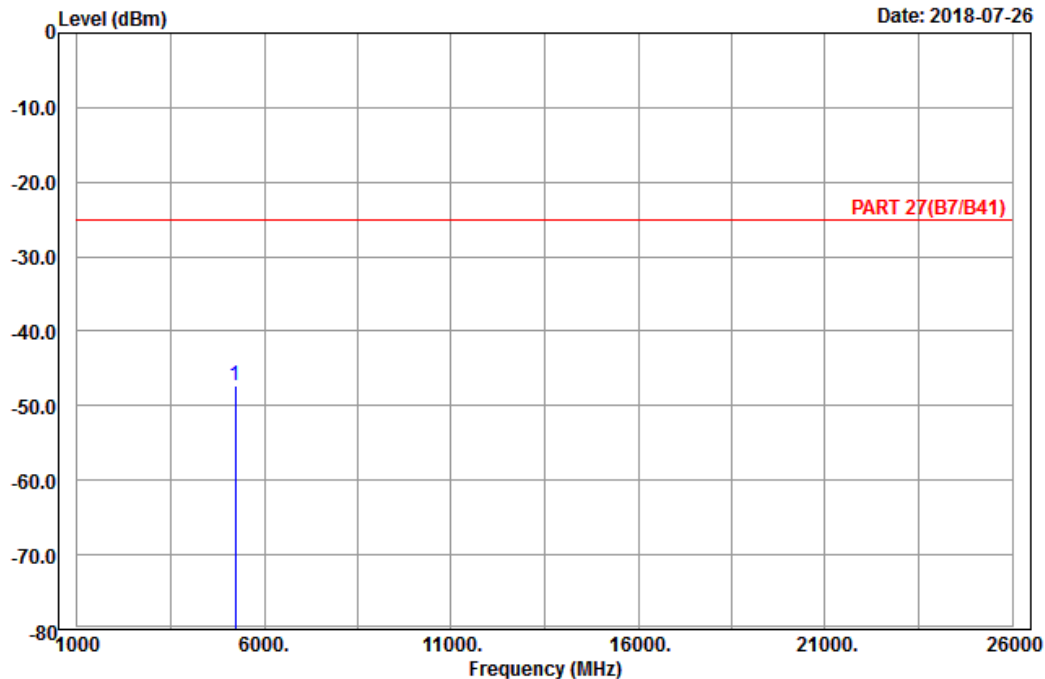


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 10

Date: 2018-07-26



Site : 966 chamber 1
 Condition: PART 27(B7/B41) Vertical
 Remark : LTE_Band 38_Link_CH38225
 Tested by: Karl Lee

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|---|---------|--------|------------|------------|------------|--------|--------|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 | 5235.00 | -47.21 | -67.37 | -25.00 | -22.21 | 20.16 | Peak |

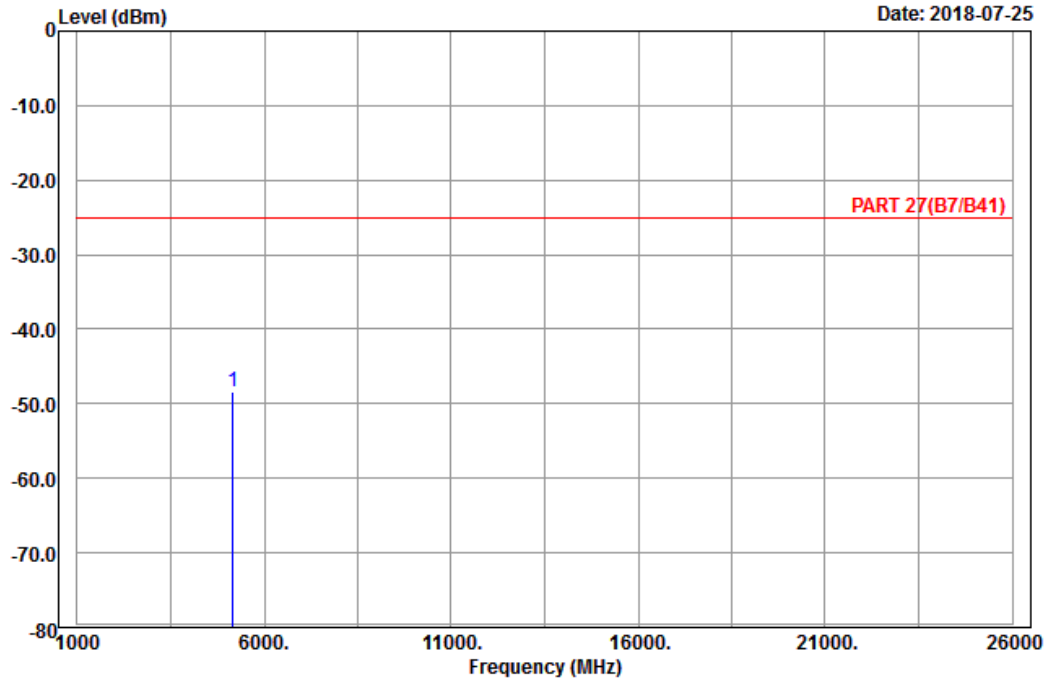
Channel Bandwidth: 20 MHz / QPSK
Low Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 9



Site : 966 chamber 1
Condition: PART 27(B7/B41) Horizontal
Remark : LTE_Band 38_Link_CH37850
Tested by: Karl Lee

| | Read | Limit | Over | | | |
|--------------|--------|--------|--------|--------|--------|--------|
| Freq | Level | Level | Line | Limit | Factor | Remark |
| MHz | dBm | dBm | dBm | dB | dB | |
| 1 pp 5160.00 | -48.34 | -68.26 | -25.00 | -23.34 | 19.92 | Peak |

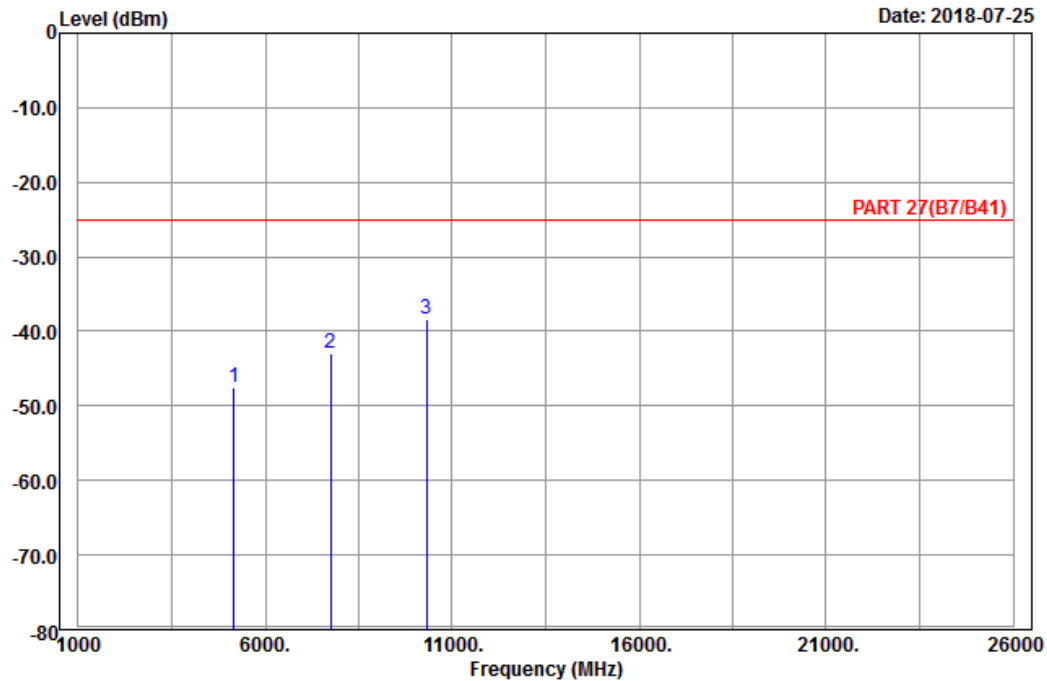


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 10

Date: 2018-07-25



Site : 966 chamber 1
 Condition: PART 27(B7/B41) Vertical
 Remark : LTE_Band 38_Link_CH37850
 Tested by: Karl Lee

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|------|----------|--------|------------|------------|------------|--------|--------|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 | 5160.00 | -47.52 | -67.44 | -25.00 | -22.52 | 19.92 | Peak |
| 2 | 7740.00 | -42.98 | -66.21 | -25.00 | -17.98 | 23.23 | Peak |
| 3 pp | 10320.00 | -38.27 | -64.94 | -25.00 | -13.27 | 26.67 | Peak |

Middle Channel

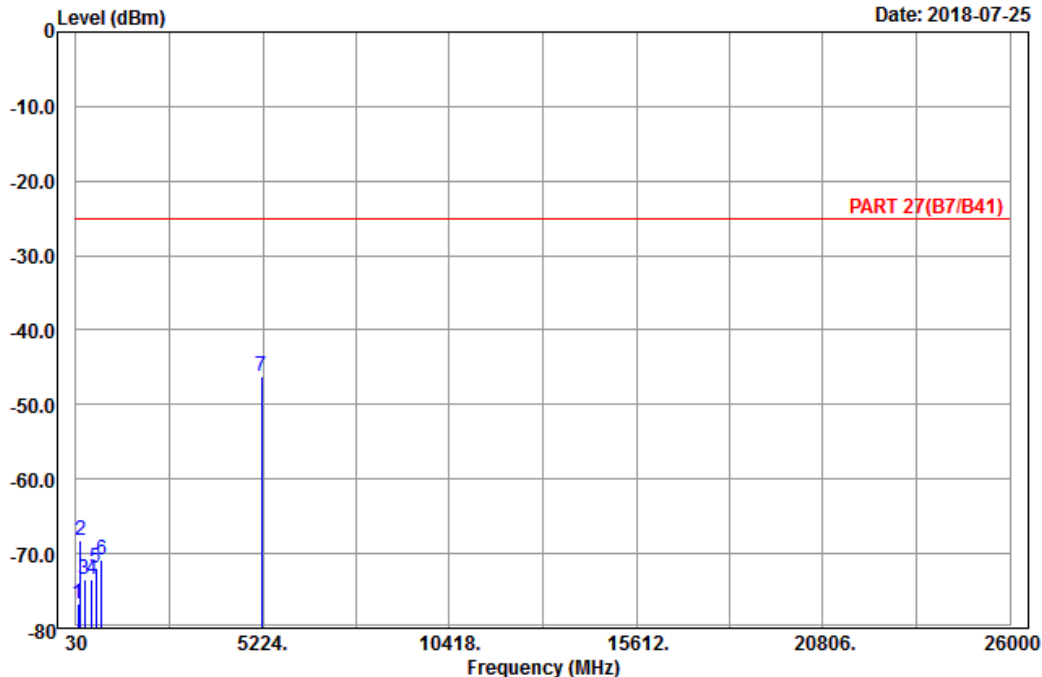


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 13

Date: 2018-07-25



Site : 966 chamber 1
 Condition: PART 27(B7/B41) Horizontal
 Remark : LTE_Band 38_Link_CH38000
 Tested by: Karl Lee

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|------|---------|--------|------------|------------|------------|--------|--------|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 | 92.64 | -76.79 | -66.28 | -25.00 | -51.79 | -10.51 | Peak |
| 2 | 163.11 | -68.24 | -60.86 | -25.00 | -43.24 | -7.38 | Peak |
| 3 | 274.89 | -73.45 | -67.72 | -25.00 | -48.45 | -5.73 | Peak |
| 4 | 462.40 | -73.46 | -69.25 | -25.00 | -48.46 | -4.21 | Peak |
| 5 | 581.40 | -71.89 | -71.51 | -25.00 | -46.89 | -0.38 | Peak |
| 6 | 745.20 | -70.93 | -69.71 | -25.00 | -45.93 | -1.22 | Peak |
| 7 pp | 5190.00 | -46.23 | -66.35 | -25.00 | -21.23 | 20.12 | Peak |

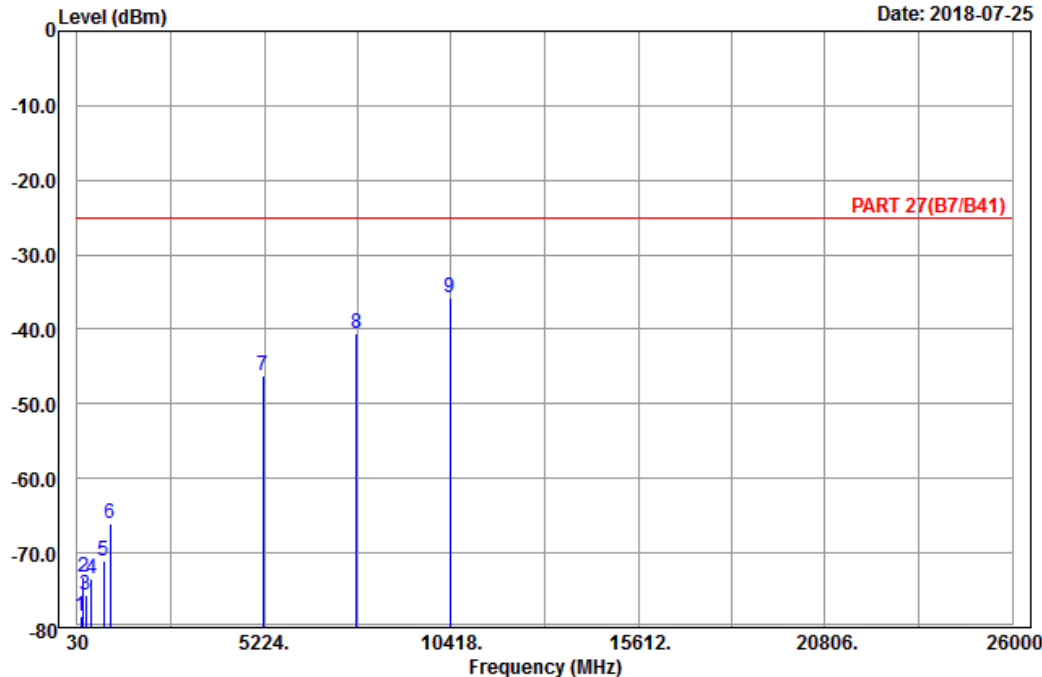


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 14

Date: 2018-07-25



Site : 966 chamber 1
 Condition: PART 27(B7/B41) Vertical
 Remark : LTE_Band 38_Link_CH38000
 Tested by: Karl Lee

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|---|-------------|--------|------------|------------|------------|--------|--------|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 | 129.90 | -78.54 | -70.89 | -25.00 | -53.54 | -7.65 | Peak |
| 2 | 199.83 | -73.17 | -66.99 | -25.00 | -48.17 | -6.18 | Peak |
| 3 | 276.51 | -75.68 | -69.93 | -25.00 | -50.68 | -5.75 | Peak |
| 4 | 432.30 | -73.40 | -69.94 | -25.00 | -48.40 | -3.46 | Peak |
| 5 | 758.50 | -71.00 | -70.26 | -25.00 | -46.00 | -0.74 | Peak |
| 6 | 934.90 | -66.12 | -70.57 | -25.00 | -41.12 | 4.45 | Peak |
| 7 | 5190.00 | -46.24 | -66.36 | -25.00 | -21.24 | 20.12 | Peak |
| 8 | 7785.00 | -40.55 | -63.88 | -25.00 | -15.55 | 23.33 | Peak |
| 9 | pp 10390.00 | -35.82 | -62.58 | -25.00 | -10.82 | 26.76 | Peak |

High Channel

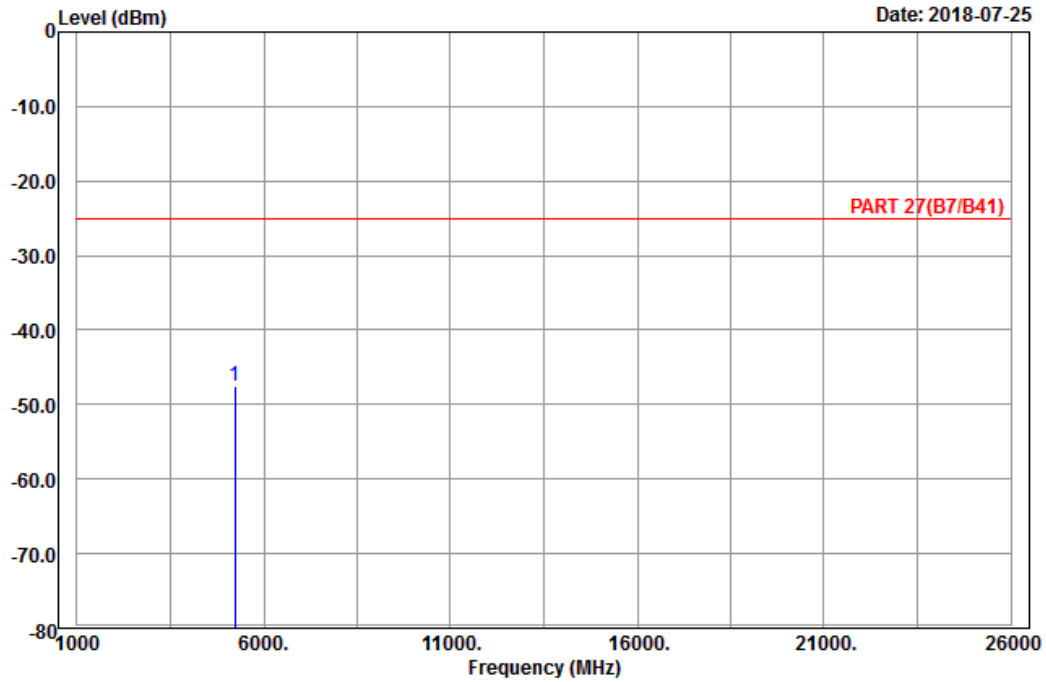


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 9

Date: 2018-07-25



Site : 966 chamber 1
 Condition: PART 27(B7/B41) Horizontal
 Remark : LTE_Band 38_Link_CH38150
 Tested by: Karl Lee

| | Read | Limit | Over | | | |
|--------------|--------|--------|--------|--------|--------|--------|
| Freq | Level | Level | Line | Limit | Factor | Remark |
| MHz | dBm | dBm | dBm | dB | dB | |
| 1 pp 5220.00 | -47.56 | -67.70 | -25.00 | -22.56 | 20.14 | Peak |

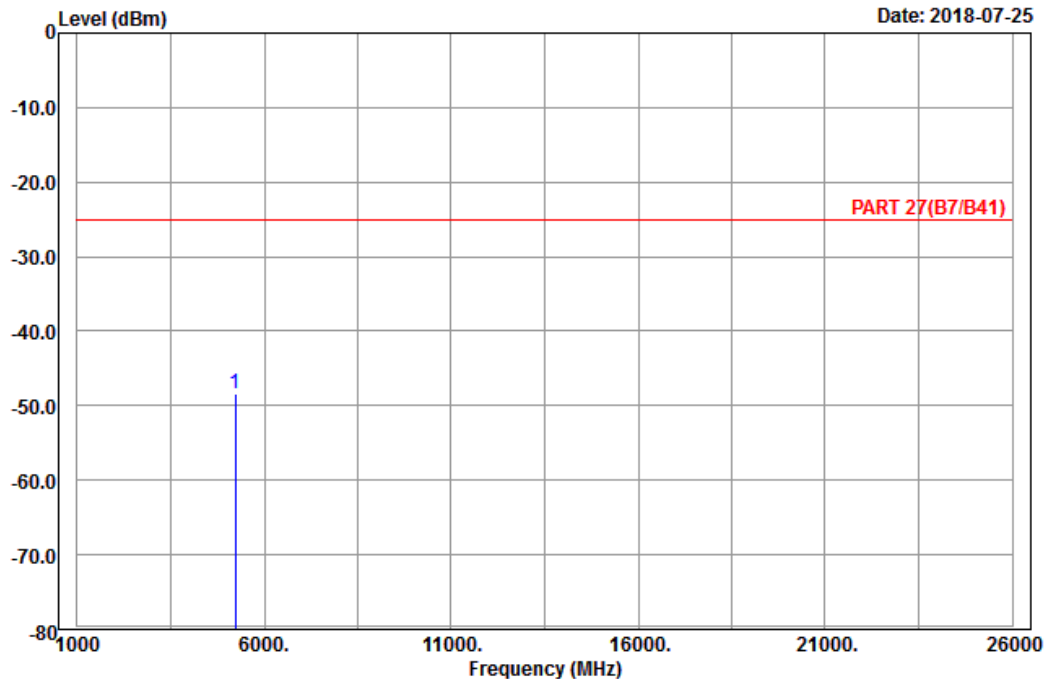


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 10

Date: 2018-07-25



Site : 966 chamber 1
 Condition: PART 27(B7/B41) Vertical
 Remark : LTE_Band 38_Link_CH38150
 Tested by: Karl Lee

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|---|------------|--------|------------|------------|------------|--------|--------|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 | pp 5220.00 | -48.34 | -68.48 | -25.00 | -23.34 | 20.14 | Peak |

Mode B
 LTE Band 7
 Channel Bandwidth: 20 MHz / QPSK
 Low Channel

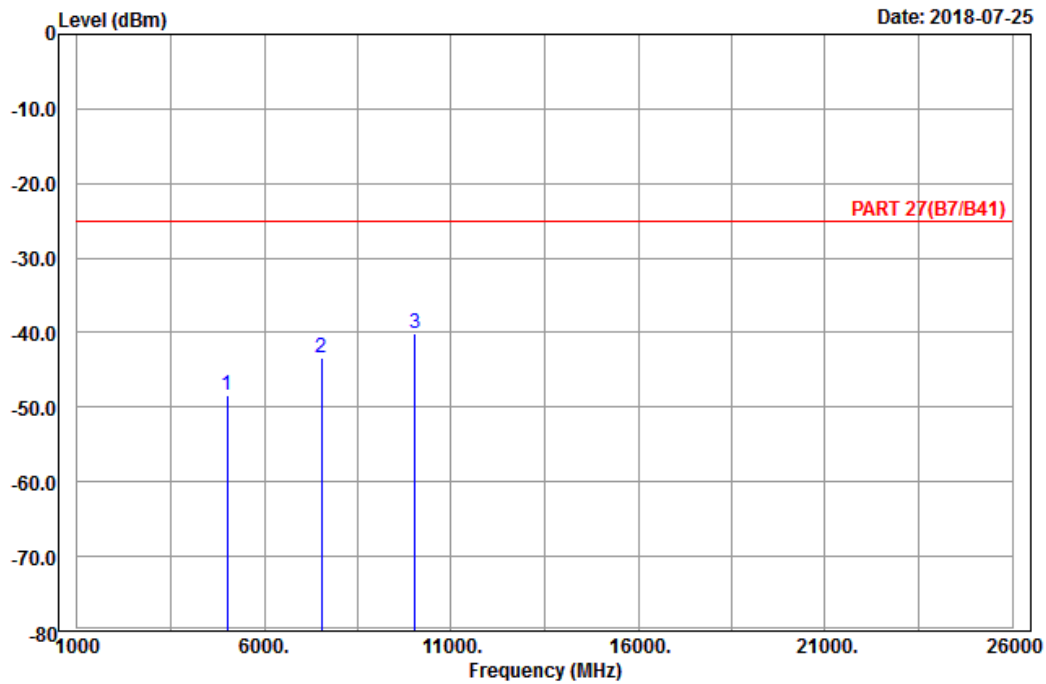


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 9

Date: 2018-07-25



Site : 966 chamber 1
 Condition: PART 27(B7/B41) Horizontal
 Remark : LTE_Band 7_Link_CH20850
 Tested by: Harry Hsueh

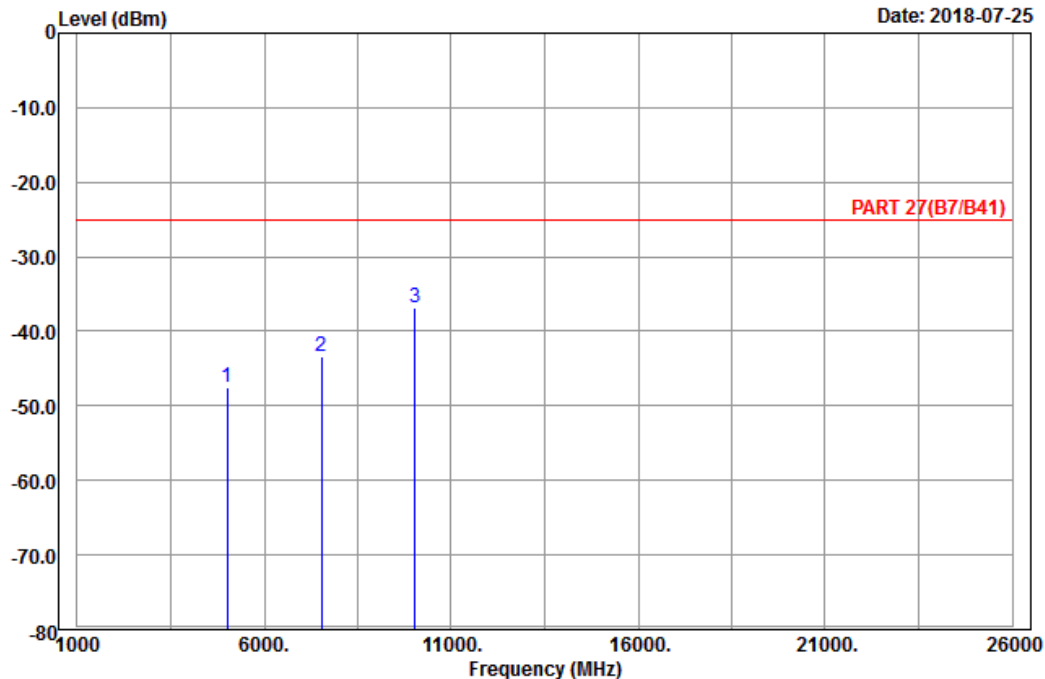
| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|------|----------|--------|------------|------------|------------|--------|--------|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 | 5020.00 | -48.36 | -67.44 | -25.00 | -23.36 | 19.08 | Peak |
| 2 | 7530.00 | -43.36 | -66.21 | -25.00 | -18.36 | 22.85 | Peak |
| 3 pp | 10040.00 | -40.14 | -66.41 | -25.00 | -15.14 | 26.27 | Peak |



A D T

Data: 10

Date: 2018-07-25



Site : 966 chamber 1
 Condition: PART 27(B7/B41) Vertical
 Remark : LTE_Band 7_Link_CH20850
 Tested by: Harry Hsueh

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|------|----------|--------|------------|------------|------------|--------|--------|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 | 5020.00 | -47.50 | -66.58 | -25.00 | -22.50 | 19.08 | Peak |
| 2 | 7530.00 | -43.39 | -66.24 | -25.00 | -18.39 | 22.85 | Peak |
| 3 pp | 10040.00 | -36.88 | -63.15 | -25.00 | -11.88 | 26.27 | Peak |

Middle Channel

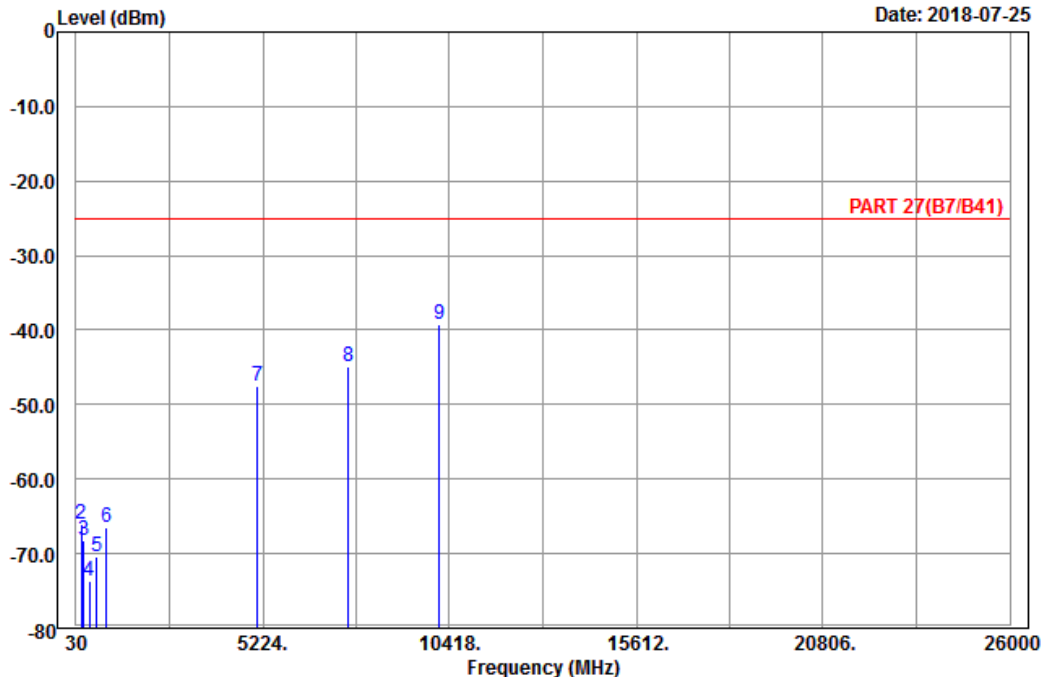


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 13

Date: 2018-07-25



Site : 966 chamber 1
 Condition: PART 27(B7/B41) Horizontal
 Remark : LTE_Band 7_Link_CH21100
 Tested by: Harry Hsueh

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|---|-------------|--------|------------|------------|------------|--------|--------|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 | 58.89 | -86.43 | -72.37 | -25.00 | -61.43 | -14.06 | Peak |
| 2 | 180.12 | -65.97 | -60.39 | -25.00 | -40.97 | -5.58 | Peak |
| 3 | 243.03 | -68.16 | -62.56 | -25.00 | -43.16 | -5.60 | Peak |
| 4 | 393.10 | -73.60 | -70.50 | -25.00 | -48.60 | -3.10 | Peak |
| 5 | 610.80 | -70.45 | -70.76 | -25.00 | -45.45 | 0.31 | Peak |
| 6 | 885.20 | -66.40 | -68.87 | -25.00 | -41.40 | 2.47 | Peak |
| 7 | 5070.00 | -47.58 | -66.97 | -25.00 | -22.58 | 19.39 | Peak |
| 8 | 7605.00 | -45.00 | -67.99 | -25.00 | -20.00 | 22.99 | Peak |
| 9 | pp 10140.00 | -39.25 | -65.67 | -25.00 | -14.25 | 26.42 | Peak |

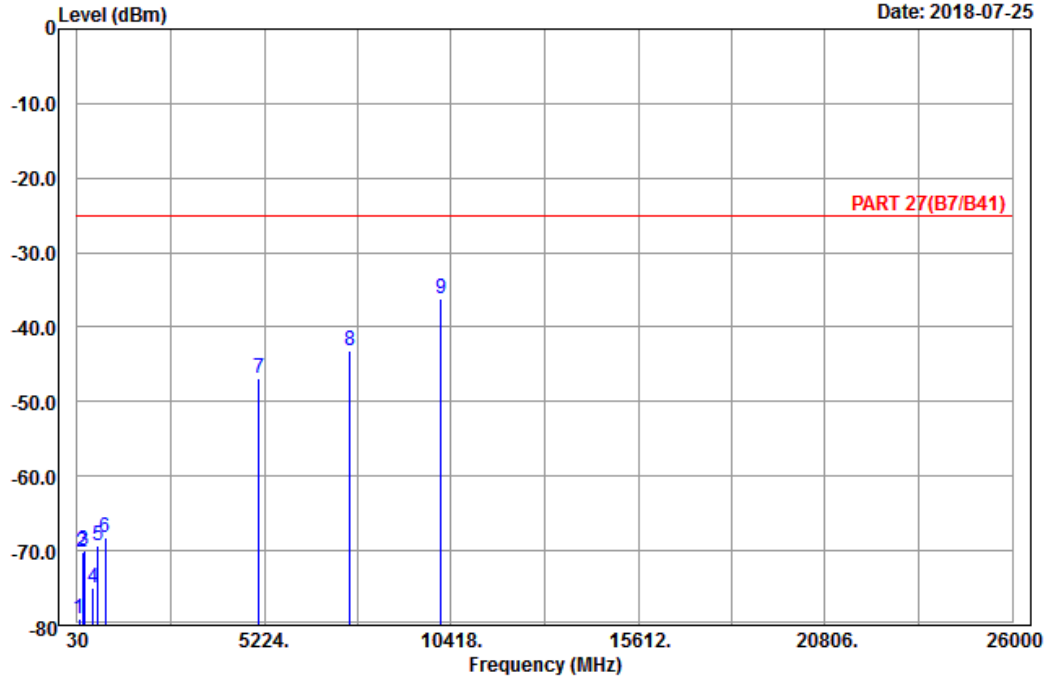


Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 14

Date: 2018-07-25



Site : 966 chamber 1
 Condition: PART 27(B7/B41) Vertical
 Remark : LTE_Band 7_Link_CH21100
 Tested by: Harry Hsueh

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|------|----------|--------|------------|------------|------------|--------|--------|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 | 92.10 | -79.11 | -68.55 | -25.00 | -54.11 | -10.56 | Peak |
| 2 | 187.68 | -70.10 | -64.40 | -25.00 | -45.10 | -5.70 | Peak |
| 3 | 220.08 | -70.00 | -64.09 | -25.00 | -45.00 | -5.91 | Peak |
| 4 | 477.80 | -75.08 | -70.43 | -25.00 | -50.08 | -4.65 | Peak |
| 5 | 607.30 | -69.22 | -69.57 | -25.00 | -44.22 | 0.35 | Peak |
| 6 | 803.30 | -68.16 | -70.14 | -25.00 | -43.16 | 1.98 | Peak |
| 7 | 5070.00 | -46.87 | -66.26 | -25.00 | -21.87 | 19.39 | Peak |
| 8 | 7605.00 | -43.25 | -66.24 | -25.00 | -18.25 | 22.99 | Peak |
| 9 pp | 10140.00 | -36.25 | -62.67 | -25.00 | -11.25 | 26.42 | Peak |

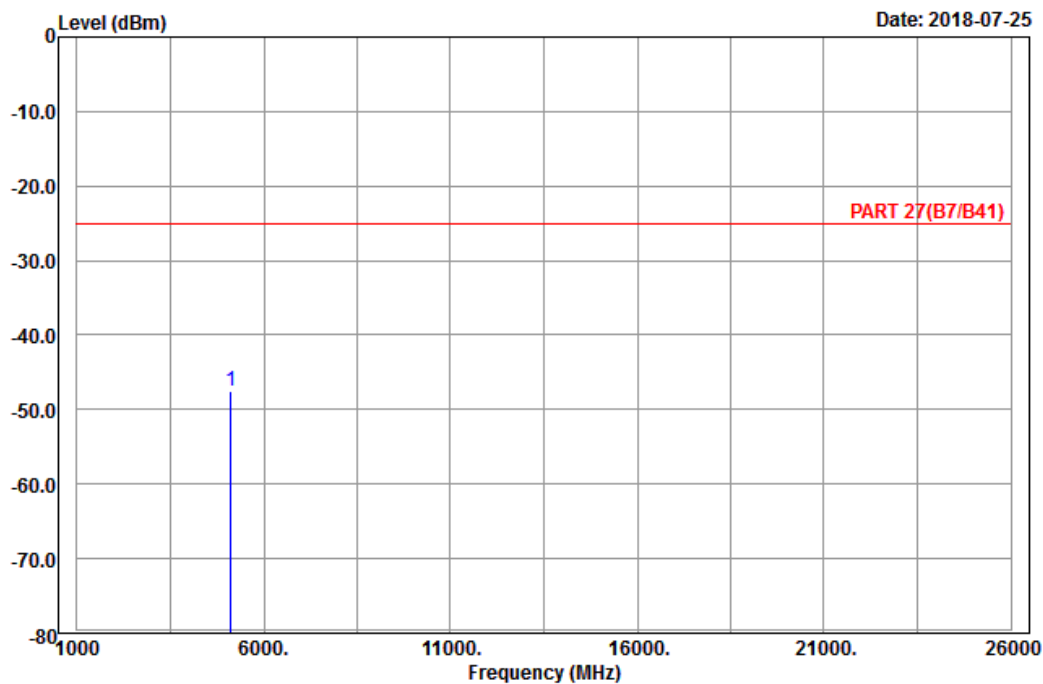
High Channel



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 9



Site : 966 chamber 1
 Condition: PART 27(B7/B41) Horizontal
 Remark : LTE_Band 7_Link_CH21350
 Tested by: Karl Lee

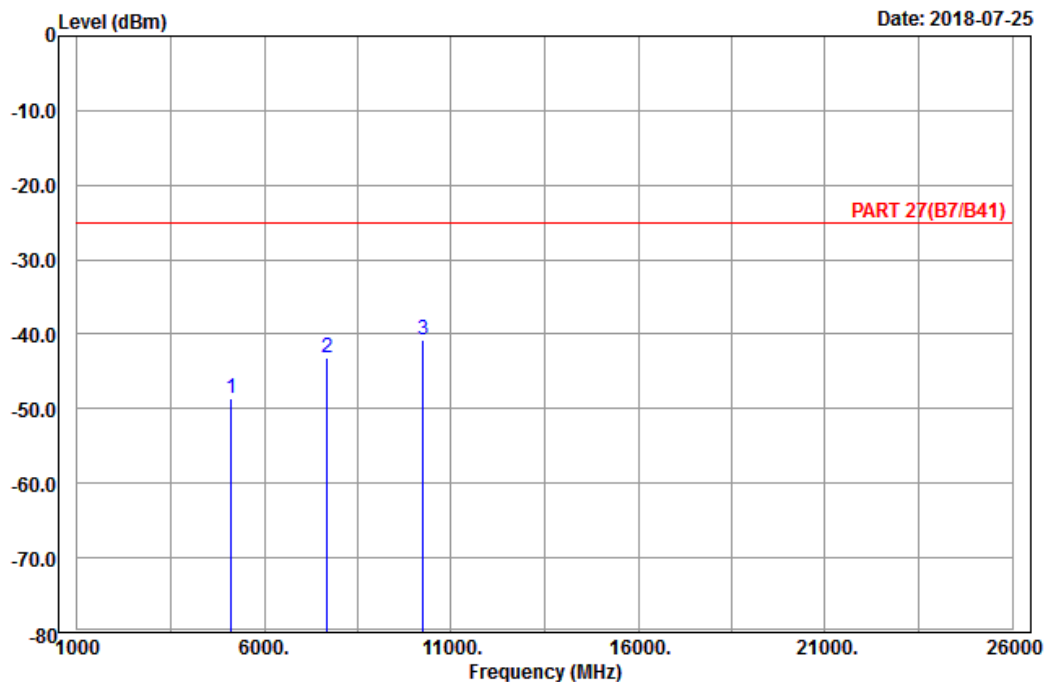
| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|---|------------|--------|------------|------------|------------|--------|--------|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 | pp 5120.00 | -47.44 | -67.15 | -25.00 | -22.44 | 19.71 | Peak |



Bureau Veritas Consumer Products Services Ltd., Taoyuan Branch

A D T

Data: 10



Site : 966 chamber 1
 Condition: PART 27(B7/B41) Vertical
 Remark : LTE_Band 7_Link_CH21350
 Tested by: Karl Lee

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark |
|------|----------|--------|------------|------------|------------|--------|--------|
| | MHz | dBm | dBm | dBm | dB | dB | |
| 1 | 5120.00 | -48.62 | -68.33 | -25.00 | -23.62 | 19.71 | Peak |
| 2 | 7680.00 | -43.10 | -66.22 | -25.00 | -18.10 | 23.12 | Peak |
| 3 pp | 10240.00 | -40.74 | -67.28 | -25.00 | -15.74 | 26.54 | Peak |

5 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo).

Appendix – Information on the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are FCC recognized accredited test firms and accredited according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

Linko EMC/RF Lab

Tel: 886-2-26052180

Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab

Tel: 886-3-6668565

Fax: 886-3-6668323

Hwa Ya EMC/RF/Safety

Tel: 886-3-3183232

Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com

Web Site: www.bureauveritas-adt.com

The address and road map of all our labs can be found in our web site also.

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