

# **CERTIFICATION TEST REPORT**

**Report Number.** : S-4791427005-E2V1

**Applicant** : SAMSUNG ELECTRONICS CO., LTD.  
129 SAMSUNG-RO, YEONGTONG-GU, SUWON-SI,  
GYEONGGI-DO, 16677, KOREA

**Model** : SM- A165M/DS, SM-A165M

**FCC ID** : A3LSMA165M

**EUT Description** : GSM/WCDMA/LTE Phone + BT/BLE, DTS/UNII a/b/g/n/ac and NFC

**Test Standard(s)** : FCC CFR47 PART 22 SUBPART H  
FCC CFR47 PART 90 SUBPART S

**Date Of Issue:**

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Revision History

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|------|------------|---------------|-------------|
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## 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** SAMSUNG ELECTRONICS CO., LTD.

**EUT DESCRIPTION:** GSM/WCDMA/LTE Phone + BT/BLE, DTS/UNII a/b/g/n/ac and NFC.

**MODEL NUMBER:** SM-A165M/DS, SM-A165M

**SERIAL NUMBER:** R38X7005LDL, R38X7005L3W, R38X7005LBE (CONDUCTED);  
R38X7005L2R, R38X7005HNJ, R38X7005JLH (RADIATED);

**DATE TESTED:** 2024-08-12 - 2024-09-13;

| APPLICABLE STANDARDS |              |
|----------------------|--------------|
| STANDARD             | TEST RESULTS |
| FCC PART 22H, 90S    | Complies     |

UL KOREA LTD. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL KOREA LTD. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

**Note:** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL KOREA LTD. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL KOREA LTD. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by IAS, any agency of the Federal Government, or any agency of any government.

Approved & Released For  
UL KOREA LTD. By:



Seokhwan Hong  
Suwon Lab Engineer  
UL KOREA LTD.

Tested By:



Yeonhee Lim  
Suwon Lab Engineer  
UL KOREA LTD.

## 2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with following methods.

1. FCC CFR 47 Part 2.
2. FCC CFR 47 Part 22.
3. FCC 47 CFR Part 90.
4. ANSI TIA-603-E, 2016
5. ANSI C63.26, 2015
6. KDB 971168 D01 Power Meas License Digital Systems v03r01
7. KDB 971168 D02 Misc Rev Approv License Devices v02r02
8. KDB 412172 D01 Determining ERP and EIRP v01r01

## 3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea. Line conducted emissions are measured only at the 218 address. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

| 218 Maeyeong-ro                     |                                     |
|-------------------------------------|-------------------------------------|
| <input checked="" type="checkbox"/> | Chamber 1(3m semi-anechoic chamber) |
| <input checked="" type="checkbox"/> | Chamber 2(3m semi-anechoic chamber) |
| <input type="checkbox"/>            | Chamber 3(3m semi-anechoic chamber) |
| <input type="checkbox"/>            | Chamber 4(3m Full-anechoic chamber) |
| <input type="checkbox"/>            | Chamber 5(3m Full-anechoic chamber) |

UL KOREA LTD. is accredited by IAS, Laboratory Code TL-637. The full scope of accreditation can be viewed at <https://www.iasonline.org/wp-content/uploads/2017/05/TL-637-cert-New.pdf>.

## 4. CALIBRATION AND UNCERTAINTY

### 4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

### 4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

ERP = SG reading with EUT worst orientation (dBm) – cable loss(between the SG and substitution antenna) + Substitution Antenna Factor (dBd)

### 4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

| PARAMETER                             | UNCERTAINTY |
|---------------------------------------|-------------|
| Conducted Disturbance, 0.15 to 30 MHz | 2.79 dB     |
| Radiated Disturbance, 9 kHz to 30 MHz | 1.69 dB     |
| Radiated Disturbance, 30 MHz to 1 GHz | 4.07 dB     |
| Radiated Disturbance, 1 GHz to 18 GHz | 4.99 dB     |

Uncertainty figures are valid to a confidence level of 95%.

### 4.4. DECISION RULE

Decision rule for statement(s) of conformity is based on Clause 4.3.3 in IEC Guide 115:2023.

## 5. EQUIPMENT UNDER TEST

### 5.1. DESCRIPTION OF EUT

The EUT is a GSM/WCDMA/LTE Phone + BT/BLE, DTS/UNII a/b/g/n/ac and NFC.  
This test report addresses the WWAN operational mode.

| Representative model | Difference | Derivative model       |
|----------------------|------------|------------------------|
|                      |            | SM-A165M               |
| SM-A165M/DS          | Hardware   | SIM tray is single SIM |
|                      | Software   | Dual SIM not supported |

The model SM-A165M/DS was used for final testing and is representative of the test results in this report.

### 5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum average radiated ERP output powers as follows:

#### GSM

| FCC Part 22 |     |                       |            |              |                |              |          |
|-------------|-----|-----------------------|------------|--------------|----------------|--------------|----------|
| Band        | ANT | Frequency Range [MHz] | Modulation | Conducted    |                | Radiated     |          |
|             |     |                       |            | Avg [dBm]    | Avg [mW]       | Avg [dBm]    | Avg [mW] |
| GSM 850     | A   | 824.20 ~ 848.80       | GPRS       | <b>32.44</b> | <b>1753.88</b> | <b>29.46</b> | 883.08   |
|             |     |                       | EGPRS      | 26.69        | 466.66         | 24.56        | 285.76   |

#### WCDMA

| FCC Part 22 |     |                       |            |              |               |              |               |
|-------------|-----|-----------------------|------------|--------------|---------------|--------------|---------------|
| Band        | ANT | Frequency Range [MHz] | Modulation | Conducted    |               | Radiated     |               |
|             |     |                       |            | Avg [dBm]    | Avg [mW]      | Avg [dBm]    | Avg [mW]      |
| Band 5      | A   | 826.40 ~ 846.60       | Rel. 99    | <b>24.42</b> | <b>276.69</b> | <b>20.81</b> | <b>120.50</b> |
|             |     |                       | HSDPA      | 23.43        | 220.29        | 20.39        | 109.40        |

### LTE Band 26 (Part 90)

| FCC Part 90 |     |                       |                 |            |              |               |              |              |
|-------------|-----|-----------------------|-----------------|------------|--------------|---------------|--------------|--------------|
| Band        | ANT | Frequency Range [MHz] | BandWidth [MHz] | Modulation | Conducted    |               | Radiated     |              |
|             |     |                       |                 |            | Avg [dBm]    | Avg [mW]      | Avg [dBm]    | Avg [mW]     |
| Band 26     | A   | 821.50                | 15              | QPSK       | 23.72        | 235.50        | 18.33        | 68.08        |
|             |     |                       |                 | 16QAM      | 23.20        | 208.93        | 17.07        | 50.93        |
|             |     |                       |                 | 64QAM      | 22.13        | 163.31        |              |              |
|             |     | 819.00                | 10              | QPSK       | <b>23.88</b> | <b>244.34</b> | 18.64        | 73.11        |
|             |     |                       |                 | 16QAM      | 23.09        | 203.70        | 17.34        | 54.20        |
|             |     |                       |                 | 64QAM      | 22.19        | 165.58        |              |              |
|             |     | 816.50 ~ 821.50       | 5               | QPSK       | 23.82        | 240.99        | <b>18.85</b> | <b>76.74</b> |
|             |     |                       |                 | 16QAM      | 23.45        | 221.31        | 17.75        | 59.57        |
|             |     |                       |                 | 64QAM      | 22.36        | 172.19        |              |              |
|             |     | 815.50 ~ 822.50       | 3               | QPSK       | 23.40        | 218.78        | 18.66        | 73.45        |
|             |     |                       |                 | 16QAM      | 23.03        | 200.91        | 17.39        | 54.83        |
|             |     |                       |                 | 64QAM      | 21.95        | 156.68        |              |              |
|             |     | 814.70 ~ 823.30       | 1.4             | QPSK       | 23.66        | 232.27        | 18.57        | 71.94        |
|             |     |                       |                 | 16QAM      | 22.95        | 197.24        | 17.27        | 53.33        |
|             |     |                       |                 | 64QAM      | 22.07        | 161.06        |              |              |

### LTE Band 26 (Straddle)

| Straddle |     |                       |                 |            |              |               |              |              |
|----------|-----|-----------------------|-----------------|------------|--------------|---------------|--------------|--------------|
| Band     | ANT | Frequency Range [MHz] | BandWidth [MHz] | Modulation | Conducted    |               | Radiated     |              |
|          |     |                       |                 |            | Avg [dBm]    | Avg [mW]      | Avg [dBm]    | Avg [mW]     |
| Band 26  | A   | 824.00                | 15              | QPSK       | 23.71        | 234.96        | <b>19.06</b> | <b>80.54</b> |
|          |     |                       |                 | 16QAM      | 23.08        | 203.24        | 18.06        | 63.97        |
|          |     |                       |                 | 64QAM      | 21.74        | 149.28        |              |              |
|          |     |                       | 10              | QPSK       | 23.67        | 232.81        | 18.79        | 75.68        |
|          |     |                       |                 | 16QAM      | 22.77        | 189.23        | 17.78        | 59.98        |
|          |     |                       |                 | 64QAM      | 21.62        | 145.21        |              |              |
|          |     |                       | 5               | QPSK       | <b>23.73</b> | <b>236.05</b> | 19.05        | 80.35        |
|          |     |                       |                 | 16QAM      | 23.24        | 210.86        | 17.97        | 62.66        |
|          |     |                       |                 | 64QAM      | 22.04        | 159.96        |              |              |
|          |     |                       | 3               | QPSK       | 23.46        | 221.82        | 18.54        | 71.45        |
|          |     |                       |                 | 16QAM      | 22.31        | 170.22        | 17.48        | 55.98        |
|          |     |                       |                 | 64QAM      | 21.50        | 141.25        |              |              |
|          |     |                       | 1.4             | QPSK       | 23.62        | 230.14        | 18.40        | 69.18        |
|          |     |                       |                 | 16QAM      | 22.75        | 188.36        | 17.07        | 50.93        |
|          |     |                       |                 | 64QAM      | 21.85        | 153.11        |              |              |

### LTE Band 26 (Part 22)

| FCC Part 22 |     |                       |                 |            |              |               |              |               |
|-------------|-----|-----------------------|-----------------|------------|--------------|---------------|--------------|---------------|
| Band        | ANT | Frequency Range [MHz] | BandWidth [MHz] | Modulation | Conducted    |               | Radiated     |               |
|             |     |                       |                 |            | Avg [dBm]    | Avg [mW]      | Avg [dBm]    | Avg [mW]      |
| Band 26     | A   | 831.50 ~ 841.50       | 15              | QPSK       | <b>23.76</b> | <b>237.68</b> | 20.09        | 102.09        |
|             |     |                       |                 | 16QAM      | 23.21        | 209.41        | 19.26        | 84.33         |
|             |     |                       |                 | 64QAM      | 22.42        | 174.58        |              |               |
|             |     | 829.00 ~ 844.00       | 10              | QPSK       | 23.74        | 236.59        | 20.07        | 101.62        |
|             |     |                       |                 | 16QAM      | 23.49        | 223.36        | 19.01        | 79.62         |
|             |     |                       |                 | 64QAM      | 22.20        | 165.96        |              |               |
|             |     | 826.50 ~ 846.50       | 5               | QPSK       | 23.70        | 234.42        | <b>20.11</b> | <b>102.57</b> |
|             |     |                       |                 | 16QAM      | 23.49        | 223.36        | 18.78        | 75.51         |
|             |     |                       |                 | 64QAM      | 22.20        | 165.96        |              |               |
|             |     | 825.50 ~ 847.50       | 3               | QPSK       | 23.43        | 220.29        | 19.55        | 90.16         |
|             |     |                       |                 | 16QAM      | 23.11        | 204.64        | 18.49        | 70.63         |
|             |     |                       |                 | 64QAM      | 21.74        | 149.28        |              |               |
|             |     | 824.70 ~ 848.30       | 1.4             | QPSK       | 23.67        | 232.81        | 19.81        | 95.72         |
|             |     |                       |                 | 16QAM      | 23.07        | 202.77        | 18.78        | 75.51         |
|             |     |                       |                 | 64QAM      | 21.85        | 153.11        |              |               |

### 5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a internal antenna for the supported bands with a maximum peak gain as follow:

| Frequency (MHz)                                         | ANT | Peak Gain (dBd) |
|---------------------------------------------------------|-----|-----------------|
| GSM850 / WCDMA Band 5 / LTE Band 5, 26<br>814 - 849 MHz | A   | -1.80           |

## 5.4. WORST-CASE ORIENTATION

Following modes should be considered as worst-case scenario for all other measurements.

- **GSM GPRS/EGPRS**  
The worst-case scenario for all measurements is based on the average conducted output power measurement investigation results. Output power measurements were measured on GPRS and EGPRS modulations. It was found GPRS results were worst case.
- **UMTS REL 99/HSDPA**  
The worst-case scenario for all measurements is based on the average conducted output power measurement investigation results. Output power measurements were measured on REL 99 and HSDPA modulations. It was found REL 99 results were worst case.
- **LTE Band 26**  
The worst-case scenario for all measurements is based on the average conducted output power measurement investigation results. Output power measurements were measured on QPSK, 16QAM, 64QAM modulations. It was found QPSK and 16QAM results were worst case.

### **LTE Band 5**

LTE Band 5 (Frequency range: 824-849 MHz) is covered by LTE Band 26 (Frequency range: 814-849 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.

● Conducted Spurious Emission

| Highest conducted output power setting for each bands |     |                 |                 |         |           |
|-------------------------------------------------------|-----|-----------------|-----------------|---------|-----------|
| LTE Band                                              | ANT | Frequency (MHz) | Bandwidth (MHz) | RB size | RB offset |
| 26                                                    | A   | 819.00          | 10              | 1       | 25        |
|                                                       |     | 824.00          | 5               | 1       | 12        |
|                                                       |     | 831.50          | 15              | 1       | 37        |
|                                                       |     | 836.50          |                 | 1       | 37        |
|                                                       |     | 841.50          |                 | 1       | 37        |

● Radiated Spurious Emission

| Highest ERP setting for each bands |     |                 |                 |         |           |
|------------------------------------|-----|-----------------|-----------------|---------|-----------|
| LTE Band                           | ANT | Frequency (MHz) | Bandwidth (MHz) | RB size | RB offset |
| 26                                 | A   | 816.50          | 5               | 1       | 24        |
|                                    |     | 821.50          |                 | 1       | 12        |
|                                    |     | 824.00          | 15              | 1       | 37        |
|                                    |     | 826.50          | 5               | 1       | 12        |
|                                    |     | 831.50          |                 | 1       | 12        |
|                                    |     | 846.50          |                 | 1       | 12        |

The fundamental and radiated spurious emission were investigated in three orthogonal orientations X, Y and Z it was determined that below orientation was worst-case orientation for each band.

| Band     | ANT | ERP |   |   | RSE |   |   |
|----------|-----|-----|---|---|-----|---|---|
|          |     | X   | Y | Z | X   | Y | Z |
| GSM 850  | A   | -   | - | O | O   | - | - |
| WCDMA B5 | A   | -   | - | O | -   | - | O |
| LTE B26  | A   | -   | - | O | O   | - | - |

Note1 : For the radiated spurious testing, the EUT attached with travel adapter for the worst case condition. The EUT is continuously communicated with the call box during the tests.

## 5.5. DESCRIPTION OF TEST SETUP

### SUPPORT EQUIPMENT

| Support Equipment List |             |          |                |        |
|------------------------|-------------|----------|----------------|--------|
| Description            | Manufacture | Model    | Serial Number  | FCC ID |
| Charger                | SAMSUNG     | EP-TA800 | R37TC7A00JBDKA | N/A    |
| Data Cable             | SAMSUNG     | EP-DN980 | GH39-02115A    | N/A    |

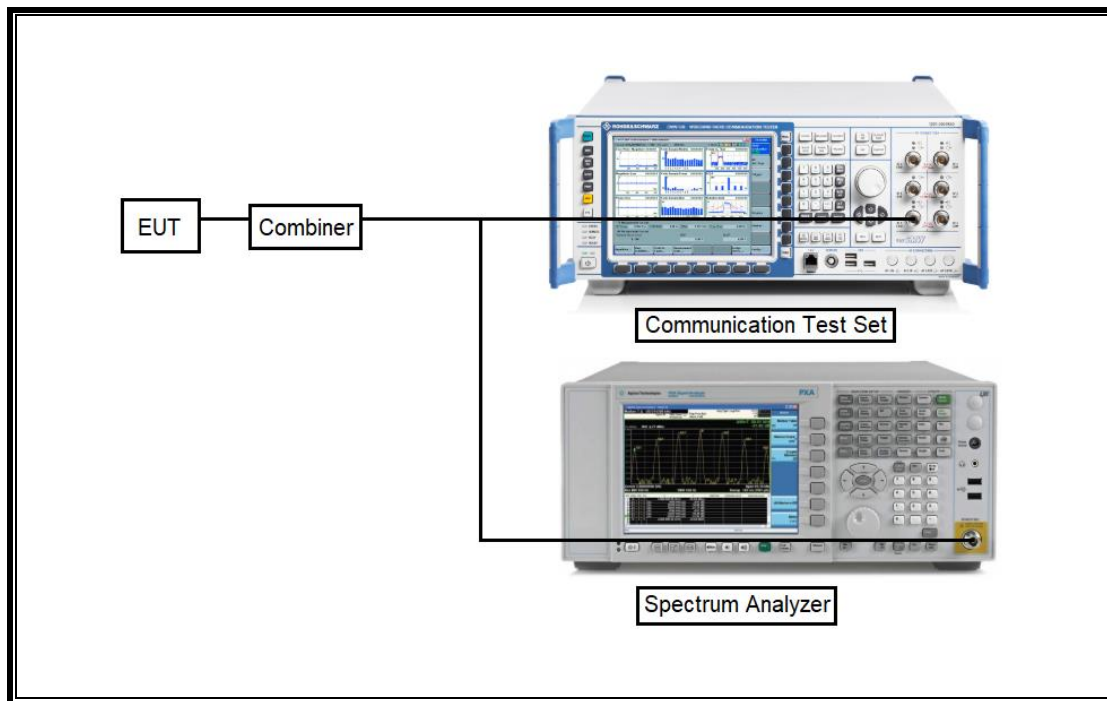
### I/O CABLE

| I/O Cable List |          |                      |                |            |                  |         |
|----------------|----------|----------------------|----------------|------------|------------------|---------|
| Cable No.      | Port     | # of identical ports | Connector Type | Cable Type | Cable Length (m) | Remarks |
| 1              | DC Power | 1                    | C Type         | Shielded   | 1.0 m            | N/A     |

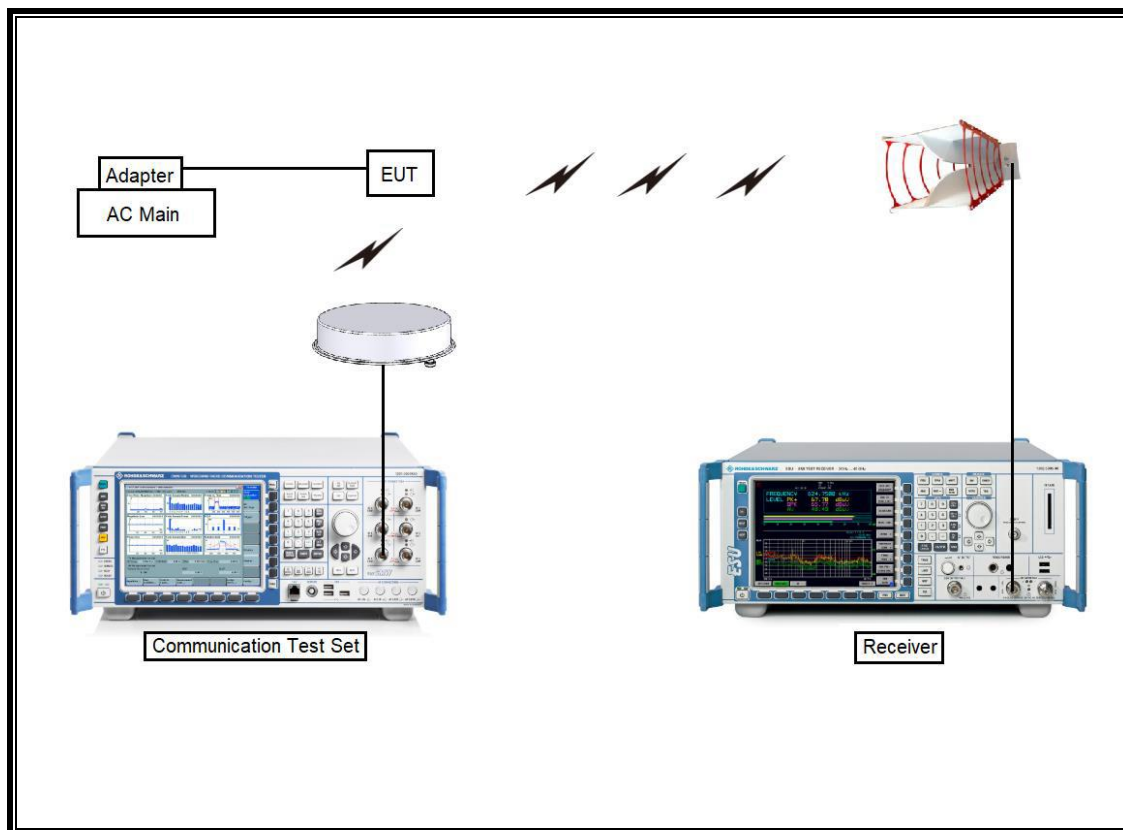
### TEST SETUP

The EUT is continuously communicated with the call box during the tests.

**SETUP DIAGRAM FOR TESTS (CONDUCTED TEST SETUP)**



**SETUP DIAGRAM FOR TESTS (RADIATED TEST SETUP)**



## 6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

| Test Equipment List                    |                       |                            |             |            |
|----------------------------------------|-----------------------|----------------------------|-------------|------------|
| Description                            | Manufacturer          | Model                      | S/N         | Cal Due    |
| Antenna, Tuned Dipole 400~1000 MHz     | ETS                   | 3121D DB-4                 | 00164753    | 2025-01-17 |
| Directional Antenna                    | Cobham                | FPA3-0.8-6.0R/1329         | 110367-0003 | N/A        |
| Directional Antenna                    | Cobham                | FPA3-0.8-6.0R/1329         | 80108-0004  | N/A        |
| Antenna, Horn, 40 GHz                  | ETS                   | 3116C                      | 00166155    | 2026-07-23 |
| Antenna, Horn, 40 GHz                  | ETS                   | 3116C                      | 00168645    | 2025-10-06 |
| Preamplifier                           | ETS                   | 3116C-PA                   | 00168841    | 2025-07-25 |
| Antenna, Bilog, 30MHz-1GHz             | SCHWARZBECK           | VULB 9163                  | 750         | 2026-07-30 |
| Antenna, Bilog, 30MHz-1GHz             | SCHWARZBECK           | VULB 9163                  | 845         | 2026-07-30 |
| Antenna, Bilog, 30MHz-1GHz             | SCHWARZBECK           | VULB 9163                  | 749         | 2026-08-12 |
| Antenna, Horn, 18 GHz                  | ETS                   | 3115                       | 00167211    | 2026-07-17 |
| Antenna, Horn, 18 GHz                  | ETS                   | 3115                       | 00161451    | 2026-07-17 |
| Antenna, Horn, 18 GHz                  | ETS                   | 3117                       | 00168724    | 2026-07-17 |
| Antenna, Horn, 18 GHz                  | ETS                   | 3117                       | 00168717    | 2026-07-17 |
| Communications Test Set                | R&S                   | CMW500                     | 169797      | 2025-07-23 |
| DC Power Supply                        | Agilent / HP          | E3640A                     | MY54226395  | 2025-07-24 |
| Preamplifier, 1000 MHz                 | Sonoma                | 310N                       | 341282      | 2025-07-22 |
| Preamplifier, 1000 MHz                 | Sonoma                | 310N                       | 370599      | 2025-07-22 |
| Preamplifier, 1000 MHz                 | Sonoma                | 310N                       | 351741      | 2025-07-22 |
| Preamplifier, 18 GHz                   | Miteq                 | AFS42-00101800-25-S-42     | 2029169     | 2025-07-23 |
| Preamplifier, 18 GHz                   | B&Z Technologies, LLC | BZR-01001800-231040-182020 | 28451       | 2025-07-22 |
| Preamplifier, 18 GHz                   | B&Z Technologies, LLC | BZR-01001800-231040-181515 | 23576       | 2025-07-25 |
| Spectrum Analyzer, 44 GHz              | Agilent / HP          | N9030A                     | MY54170614  | 2025-07-24 |
| Spectrum Analyzer, 44 GHz              | Agilent / HP          | N9030A                     | MY54490312  | 2025-01-03 |
| Spectrum Analyzer, 44 GHz              | KEYSIGHT              | N9030B                     | MY57143717  | 2025-07-23 |
| EMI Test Receive, 40 GHz               | R&S                   | ESU40                      | 100439      | 2025-07-23 |
| EMI Test Receive, 40 GHz               | R&S                   | ESU40                      | 100457      | 2025-07-22 |
| High Pass Filter 1.2GHz                | Micro-Tronics         | HPM50108-02                | G005        | 2025-07-23 |
| High Pass Filter 1.2GHz                | Micro-Tronics         | HPM50108-02                | G006        | 2025-07-23 |
| High Pass Filter 2.8GHz                | Micro-Tronics         | HPM50111-02                | 010         | 2025-07-23 |
| High Pass Filter 2.8GHz                | Micro-Tronics         | HPM50111-02                | 011         | 2025-07-23 |
| High Pass Filter 4GHz                  | Micro-Tronics         | HPM50118-02                | G001        | 2025-07-23 |
| High Pass Filter 4GHz                  | Micro-Tronics         | HPM50118-02                | G002        | 2025-07-23 |
| Attenuator                             | PASTERNAK             | PE7087-10                  | A009        | 2025-07-23 |
| Attenuator                             | PASTERNAK             | PE7087-10                  | A001        | 2025-07-23 |
| Attenuator                             | PASTERNAK             | PE7087-10                  | A008        | 2025-07-23 |
| Attenuator                             | PASTERNAK             | PE7004-10                  | 2           | 2025-07-23 |
| Attenuator                             | PASTERNAK             | PE7395-10                  | A011        | 2025-07-25 |
| Antenna, Loop, 9kHz-30MHz              | R&S                   | HFH2-Z2                    | 100418      | 2025-09-07 |
| Temperature Chamber                    | ESPEC                 | SH-642                     | 93001109    | 2025-07-23 |
| Power Splitter                         | MINI-CIRCUITS         | WA1534                     | UL003       | 2025-01-03 |
| Power Splitter                         | MINI-CIRCUITS         | WA1534                     | UL004       | 2025-01-03 |
| UXM5G Wireless Test Platform           | KEYSIGHT              | E7515B                     | MY57510655  | 2025-01-03 |
| UL Software                            |                       |                            |             |            |
| Description                            | Manufacturer          | Model                      | Version     |            |
| Antenna port test software             | UL                    | CLT                        | Ver 3.4     |            |
| Radiated software                      | UL                    | UL EMC                     | Ver 9.5     |            |
| Antenna port test software (5G NR FR1) | UL                    | UL iM                      | Ver 1.06    |            |

## 7. SUMMARY TABLE

| FCC Part Section       | Test Description                                     | Test Limit    | Test Condition | Test Results |
|------------------------|------------------------------------------------------|---------------|----------------|--------------|
| 2.1046                 | Conducted Output Power                               | N/A           | Conducted      | Pass         |
| 2.1049                 | Occupied Bandwidth (99%)                             | N/A           |                | Pass         |
| 22.917(a)              | Conducted Band Edge /<br>Conducted Spurious Emission | -13 dBm       |                | Pass         |
| 90.691                 | Emission Mask                                        | Section 8.4.1 |                | Pass         |
| 22.355<br>90.213       | Frequency Stability                                  | 2.5 ppm       |                | Pass         |
| 22.913(a)(5)           | Effective Radiated Power                             | 38.5 dBm      | Radiated       | Pass         |
| 90.635(b)              |                                                      | 50 dBm        |                |              |
| 22.917(a)<br>90.691(a) | Radiated Spurious Emission                           | -13 dBm       |                | Pass         |

## 8. CONDUCTED RESULTS

### 8.1. CONDUCTED OUTPUT POWER

#### Test Procedure

Per KDB 971168 D01 Power Meas License Digital Systems v03r01;

The transmitter output was connected to either CMW500 Test Set or E7515B Test set and configured to operate at maximum power.

#### RESULTS

See the following pages.

### 8.1.1. CONDUCTED AVERAGE OUTPUT POWER

#### GSM

| Mode            | Coding Scheme | Time Slots | Maximum Average Power (dBm) |           |               |           |
|-----------------|---------------|------------|-----------------------------|-----------|---------------|-----------|
|                 |               |            | Measured                    |           | Tune-up Limit |           |
|                 |               |            | Burst Pwr                   | Frame Pwr | Burst Pwr     | Frame Pwr |
| GSM<br>(Voice)  | CS1           | 1          | <b>32.44</b>                | 23.25     | 34.0          | 24.8      |
|                 |               |            | 32.40                       | 23.21     |               |           |
|                 |               |            | 32.32                       | 23.13     |               |           |
| GPRS<br>(GMSK)  | CS1           | 1          | <b>32.44</b>                | 23.25     | 34.0          | 24.8      |
|                 |               |            | 32.37                       | 23.18     |               |           |
|                 |               |            | 32.29                       | 23.10     |               |           |
|                 |               | 2          | 31.37                       | 25.19     | 32.5          | 26.3      |
|                 |               |            | 31.30                       | 25.12     |               |           |
|                 |               |            | 31.21                       | 25.03     |               |           |
|                 |               | 3          | 29.22                       | 24.80     | 30.5          | 26.1      |
|                 |               |            | 29.13                       | 24.71     |               |           |
|                 |               |            | 29.06                       | 24.64     |               |           |
|                 |               | 4          | 27.97                       | 24.80     | 29.5          | 26.3      |
|                 |               |            | 27.91                       | 24.74     |               |           |
|                 |               |            | 27.85                       | 24.68     |               |           |
| EGPRS<br>(8PSK) | MCS5          | 1          | 26.69                       | 17.50     | 28.0          | 18.8      |
|                 |               |            | 26.69                       | 17.50     |               |           |
|                 |               |            | 26.65                       | 17.46     |               |           |
|                 |               | 2          | 25.50                       | 19.32     | 26.5          | 20.3      |
|                 |               |            | 25.50                       | 19.32     |               |           |
|                 |               |            | 25.46                       | 19.28     |               |           |
|                 |               | 3          | 23.29                       | 18.87     | 24.5          | 20.1      |
|                 |               |            | 23.29                       | 18.87     |               |           |
|                 |               |            | 23.25                       | 18.83     |               |           |
|                 |               | 4          | 22.01                       | 18.84     | 23.5          | 20.3      |
|                 |               |            | 22.02                       | 18.85     |               |           |
|                 |               |            | 21.99                       | 18.82     |               |           |

**WCDMA B5**

| Mode       |                            | UL Ch No. | Freq.<br>(MHz) | Maximum Average Power (dBm) |     |               |
|------------|----------------------------|-----------|----------------|-----------------------------|-----|---------------|
|            |                            |           |                | Measured Pwr                | MPR | Tune-up Limit |
| Release 99 | Rel 99<br>(RMC, 12.2 kbps) | 4132      | 826.4          | <b>24.42</b>                | N/A | 25.5          |
|            |                            | 4183      | 836.6          | 24.39                       |     |               |
|            |                            | 4233      | 846.6          | 24.32                       |     |               |
| HSDPA      | Subtest 1                  | 4132      | 826.4          | 23.43                       | 1   | 24.5          |
|            |                            | 4183      | 836.6          | 23.42                       |     |               |
|            |                            | 4233      | 846.6          | 23.34                       |     |               |
|            | Subtest 2                  | 4132      | 826.4          | 23.41                       | 1   | 24.5          |
|            |                            | 4183      | 836.6          | 23.38                       |     |               |
|            |                            | 4233      | 846.6          | 23.29                       |     |               |
|            | Subtest 3                  | 4132      | 826.4          | 22.94                       | 1.5 | 24.0          |
|            |                            | 4183      | 836.6          | 22.94                       |     |               |
|            |                            | 4233      | 846.6          | 22.79                       |     |               |
|            | Subtest 4                  | 4132      | 826.4          | 22.91                       | 1.5 | 24.0          |
|            |                            | 4183      | 836.6          | 22.89                       |     |               |
|            |                            | 4233      | 846.6          | 22.80                       |     |               |
| HSUPA      | Subtest 1                  | 4132      | 826.4          | 21.23                       | 3   | 22.5          |
|            |                            | 4183      | 836.6          | 21.24                       |     |               |
|            |                            | 4233      | 846.6          | 21.17                       |     |               |
|            | Subtest 2                  | 4132      | 826.4          | 21.41                       | 3   | 22.5          |
|            |                            | 4183      | 836.6          | 21.36                       |     |               |
|            |                            | 4233      | 846.6          | 21.37                       |     |               |
|            | Subtest 3                  | 4132      | 826.4          | 22.55                       | 2   | 23.5          |
|            |                            | 4183      | 836.6          | 22.50                       |     |               |
|            |                            | 4233      | 846.6          | 22.48                       |     |               |
|            | Subtest 4                  | 4132      | 826.4          | 20.97                       | 3.5 | 22.0          |
|            |                            | 4183      | 836.6          | 21.02                       |     |               |
|            |                            | 4233      | 846.6          | 21.13                       |     |               |
|            | Subtest 5                  | 4132      | 826.4          | 22.67                       | 2   | 23.5          |
|            |                            | 4183      | 836.6          | 22.44                       |     |               |
|            |                            | 4233      | 846.6          | 22.51                       |     |               |
| DC-HSDPA   | Subtest 1                  | 4132      | 826.4          | 23.40                       | 1   | 24.5          |
|            |                            | 4183      | 836.6          | 23.36                       |     |               |
|            |                            | 4233      | 846.6          | 23.30                       |     |               |
|            | Subtest 2                  | 4132      | 826.4          | 23.41                       | 1   | 24.5          |
|            |                            | 4183      | 836.6          | 23.38                       |     |               |
|            |                            | 4233      | 846.6          | 23.32                       |     |               |
|            | Subtest 3                  | 4132      | 826.4          | 22.92                       | 1.5 | 24.0          |
|            |                            | 4183      | 836.6          | 22.90                       |     |               |
|            |                            | 4233      | 846.6          | 22.80                       |     |               |
|            | Subtest 4                  | 4132      | 826.4          | 22.90                       | 1.5 | 24.0          |
|            |                            | 4183      | 836.6          | 22.89                       |     |               |
|            |                            | 4233      | 846.6          | 22.78                       |     |               |

**LTE Band 26**

| BW<br>(MHz) | Mode  | RB Allocation | RB offset | Maximum Average Power (dBm) |            |            |            |            |            | MPR | Tune-up Limit |
|-------------|-------|---------------|-----------|-----------------------------|------------|------------|------------|------------|------------|-----|---------------|
|             |       |               |           | Measured Pwr (dBm)          |            |            |            |            |            |     |               |
|             |       |               |           | 26765                       |            | 26790      | 26865      | 26915      | 26965      |     |               |
|             |       |               |           | 821.50 MHz                  |            | 824.00 MHz | 831.50 MHz | 836.50 MHz | 841.50 MHz |     |               |
| 15 MHz      | QPSK  | 1             | 0         | 23.68                       |            | 23.54      | 23.72      | 23.49      | 23.59      | 0.0 | 25.5          |
|             |       | 1             | 37        | 23.72                       |            | 23.71      | 23.76      | 23.64      | 23.65      | 0.0 | 25.5          |
|             |       | 1             | 74        | 23.60                       |            | 23.48      | 23.63      | 23.51      | 23.65      | 0.0 | 25.5          |
|             |       | 36            | 0         | 22.70                       |            | 22.73      | 22.62      | 22.61      | 22.68      | 1.0 | 24.5          |
|             |       | 36            | 20        | 22.71                       |            | 22.78      | 22.74      | 22.67      | 22.70      | 1.0 | 24.5          |
|             |       | 36            | 39        | 22.70                       |            | 22.72      | 22.72      | 22.64      | 22.53      | 1.0 | 24.5          |
|             |       | 75            | 0         | 22.67                       |            | 22.67      | 22.66      | 22.65      | 22.75      | 1.0 | 24.5          |
|             | 16QAM | 1             | 0         | 23.20                       |            | 22.84      | 23.03      | 23.08      | 22.91      | 1.0 | 24.5          |
|             |       | 1             | 37        | 22.54                       |            | 23.08      | 22.77      | 23.21      | 22.76      | 1.0 | 24.5          |
|             |       | 1             | 74        | 22.82                       |            | 22.78      | 22.62      | 23.07      | 22.47      | 1.0 | 24.5          |
|             |       | 36            | 0         | 21.74                       |            | 21.67      | 21.62      | 21.64      | 21.74      | 2.0 | 23.5          |
|             |       | 36            | 20        | 21.81                       |            | 21.77      | 21.69      | 21.73      | 21.66      | 2.0 | 23.5          |
|             |       | 36            | 39        | 21.80                       |            | 21.70      | 21.65      | 21.67      | 21.66      | 2.0 | 23.5          |
|             |       | 75            | 0         | 21.72                       |            | 21.75      | 21.62      | 21.69      | 21.75      | 2.0 | 23.5          |
|             | 64QAM | 1             | 0         | 22.05                       |            | 21.49      | 21.89      | 22.27      | 21.75      | 2.0 | 23.5          |
|             |       | 1             | 37        | 22.13                       |            | 21.74      | 22.15      | 22.42      | 21.88      | 2.0 | 23.5          |
|             |       | 1             | 74        | 21.85                       |            | 21.42      | 21.65      | 22.28      | 21.85      | 2.0 | 23.5          |
|             |       | 36            | 0         | 20.71                       |            | 20.74      | 20.72      | 20.71      | 20.72      | 3.0 | 22.5          |
|             |       | 36            | 20        | 20.85                       |            | 20.88      | 20.76      | 20.74      | 20.64      | 3.0 | 22.5          |
|             |       | 36            | 39        | 20.81                       |            | 20.85      | 20.74      | 20.66      | 20.64      | 3.0 | 22.5          |
|             |       | 75            | 0         | 20.76                       |            | 20.80      | 20.65      | 20.73      | 20.65      | 3.0 | 22.5          |
| BW<br>(MHz) | Mode  | RB Allocation | RB offset | Measured Pwr (dBm)          |            |            |            |            |            | MPR | Tune-up Limit |
|             |       |               |           | 26740                       |            | 26790      | 26840      | 26865      | 26990      |     |               |
|             |       |               |           | 819.00 MHz                  |            | 824.00 MHz | 829.00 MHz | 831.50 MHz | 844.00 MHz |     |               |
| 10 MHz      | QPSK  | 1             | 0         | 23.71                       |            | 23.58      | 23.66      | 23.67      | 23.68      | 0.0 | 25.5          |
|             |       | 1             | 25        | 23.88                       |            | 23.67      | 23.60      | 23.74      | 23.69      | 0.0 | 25.5          |
|             |       | 1             | 49        | 23.67                       |            | 23.57      | 23.57      | 23.58      | 23.49      | 0.0 | 25.5          |
|             |       | 25            | 0         | 22.67                       |            | 22.62      | 22.58      | 22.66      | 22.63      | 1.0 | 24.5          |
|             |       | 25            | 12        | 22.71                       |            | 22.75      | 22.72      | 22.60      | 22.62      | 1.0 | 24.5          |
|             |       | 25            | 25        | 22.68                       |            | 22.65      | 22.61      | 22.60      | 22.59      | 1.0 | 24.5          |
|             |       | 50            | 0         | 22.72                       |            | 22.63      | 22.61      | 22.70      | 22.69      | 1.0 | 24.5          |
|             | 16QAM | 1             | 0         | 23.08                       |            | 22.66      | 23.24      | 23.06      | 22.70      | 1.0 | 24.5          |
|             |       | 1             | 25        | 23.09                       |            | 22.77      | 23.25      | 23.49      | 22.81      | 1.0 | 24.5          |
|             |       | 1             | 49        | 23.04                       |            | 22.70      | 23.13      | 23.04      | 22.61      | 1.0 | 24.5          |
|             |       | 25            | 0         | 21.78                       |            | 21.67      | 21.72      | 21.62      | 21.75      | 2.0 | 23.5          |
|             |       | 25            | 12        | 21.81                       |            | 21.79      | 21.72      | 21.67      | 21.68      | 2.0 | 23.5          |
|             |       | 25            | 25        | 21.84                       |            | 21.74      | 21.74      | 21.71      | 21.57      | 2.0 | 23.5          |
|             |       | 50            | 0         | 21.74                       |            | 21.68      | 21.68      | 21.63      | 21.68      | 2.0 | 23.5          |
|             | 64QAM | 1             | 0         | 21.67                       |            | 21.59      | 21.90      | 21.81      | 22.09      | 2.0 | 23.5          |
|             |       | 1             | 25        | 22.01                       |            | 21.62      | 21.85      | 22.20      | 22.02      | 2.0 | 23.5          |
|             |       | 1             | 49        | 22.19                       |            | 21.53      | 21.76      | 21.87      | 22.13      | 2.0 | 23.5          |
|             |       | 25            | 0         | 20.79                       |            | 20.78      | 20.74      | 20.65      | 20.70      | 3.0 | 22.5          |
|             |       | 25            | 12        | 20.85                       |            | 20.91      | 20.83      | 20.81      | 20.75      | 3.0 | 22.5          |
|             |       | 25            | 25        | 20.75                       |            | 20.84      | 20.78      | 20.74      | 20.68      | 3.0 | 22.5          |
|             |       | 50            | 0         | 20.78                       |            | 20.70      | 20.64      | 20.71      | 20.57      | 3.0 | 22.5          |
| BW<br>(MHz) | Mode  | RB Allocation | RB offset | Measured Pwr (dBm)          |            |            |            |            |            | MPR | Tune-up Limit |
|             |       |               |           | 26715                       | 26765      | 26790      | 26815      | 26865      | 27015      |     |               |
|             |       |               |           | 816.50 MHz                  | 821.50 MHz | 824.00 MHz | 826.50 MHz | 831.50 MHz | 846.50 MHz |     |               |
| 5 MHz       | QPSK  | 1             | 0         | 23.62                       | 23.64      | 23.56      | 23.56      | 23.54      | 23.47      | 0.0 | 25.5          |
|             |       | 1             | 12        | 23.73                       | 23.82      | 23.73      | 23.70      | 23.62      | 23.59      | 0.0 | 25.5          |
|             |       | 1             | 24        | 23.71                       | 23.66      | 23.54      | 23.54      | 23.54      | 23.53      | 0.0 | 25.5          |
|             |       | 12            | 0         | 22.65                       | 22.61      | 22.63      | 22.68      | 22.60      | 22.58      | 1.0 | 24.5          |
|             |       | 12            | 7         | 22.75                       | 22.73      | 22.74      | 22.69      | 22.64      | 22.73      | 1.0 | 24.5          |
|             |       | 12            | 13        | 22.68                       | 22.70      | 22.75      | 22.66      | 22.66      | 22.53      | 1.0 | 24.5          |
|             |       | 25            | 0         | 22.69                       | 22.72      | 22.66      | 22.71      | 22.62      | 22.61      | 1.0 | 24.5          |
|             | 16QAM | 1             | 0         | 22.69                       | 22.59      | 23.03      | 22.65      | 22.63      | 22.80      | 1.0 | 24.5          |
|             |       | 1             | 12        | 23.07                       | 22.76      | 23.24      | 22.74      | 22.84      | 23.49      | 1.0 | 24.5          |
|             |       | 1             | 24        | 23.45                       | 22.74      | 23.05      | 22.61      | 22.94      | 22.97      | 1.0 | 24.5          |
|             |       | 12            | 0         | 21.72                       | 21.69      | 21.87      | 21.59      | 21.65      | 21.65      | 2.0 | 23.5          |
|             |       | 12            | 7         | 21.87                       | 21.75      | 21.95      | 21.68      | 21.58      | 21.68      | 2.0 | 23.5          |
|             |       | 12            | 13        | 21.70                       | 21.72      | 21.92      | 21.62      | 21.63      | 21.55      | 2.0 | 23.5          |
|             |       | 25            | 0         | 21.71                       | 21.76      | 21.74      | 21.78      | 21.58      | 21.68      | 2.0 | 23.5          |
|             | 64QAM | 1             | 0         | 21.99                       | 21.80      | 21.85      | 22.11      | 21.61      | 21.76      | 2.0 | 23.5          |
|             |       | 1             | 12        | 22.36                       | 21.99      | 22.04      | 22.20      | 22.08      | 22.09      | 2.0 | 23.5          |
|             |       | 1             | 24        | 22.04                       | 21.90      | 21.90      | 22.09      | 21.72      | 21.54      | 2.0 | 23.5          |
|             |       | 12            | 0         | 20.65                       | 20.73      | 20.72      | 20.81      | 20.70      | 20.70      | 3.0 | 22.5          |
|             |       | 12            | 7         | 20.83                       | 20.75      | 20.81      | 20.80      | 20.85      | 20.86      | 3.0 | 22.5          |
|             |       | 12            | 13        | 20.84                       | 20.78      | 20.75      | 20.78      | 20.70      | 20.55      | 3.0 | 22.5          |
|             |       | 25            | 0         | 20.71                       | 20.68      | 20.77      | 20.78      | 20.77      | 20.66      | 3.0 | 22.5          |

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## 8.2. PEAK TO AVERAGE RATIO

### Test Procedure

Per KDB 971168 D01 Power Meas License Digital Systems v03r01;

The transmitter output was connected to CMW500 Test Set and configured to operate at maximum power. The PAR were measured on the Spectrum Analyzer.

### Test Spec

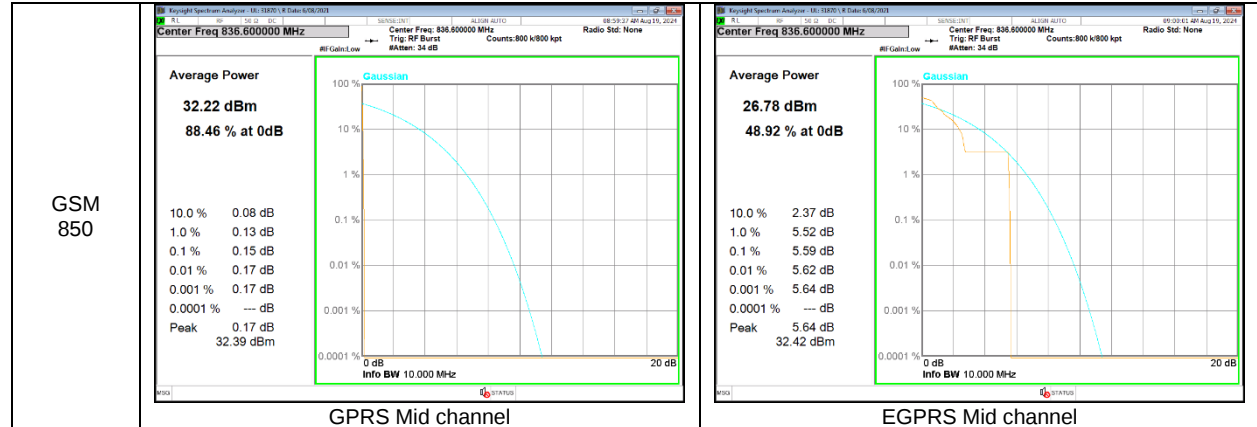
In addition, when the transmitter power is measured in terms of average value, the peak-to-average ratio of the power shall not exceed 13 dB.

### RESULTS

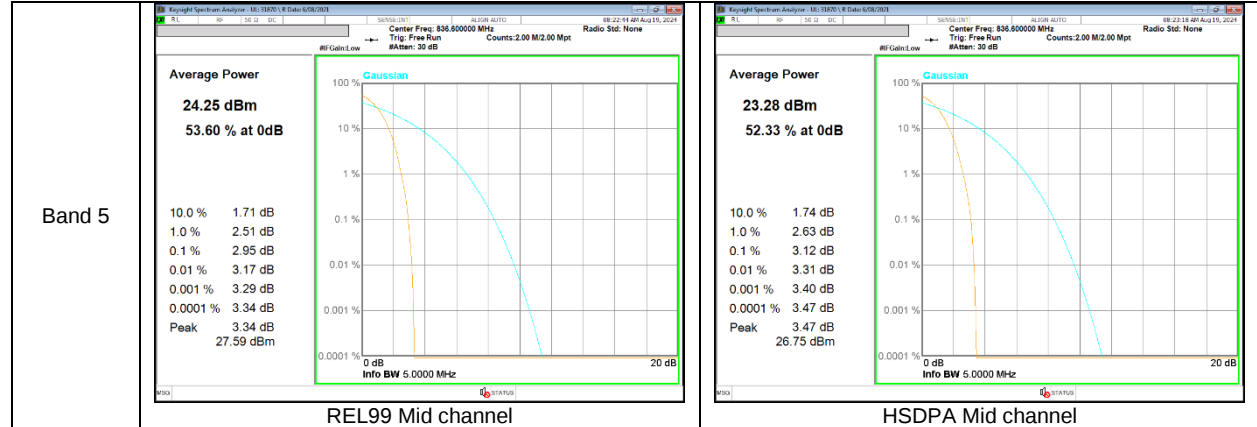
See the following pages.

## 8.2.1. CONDUCTED PEAK TO AVERAGE RESULT

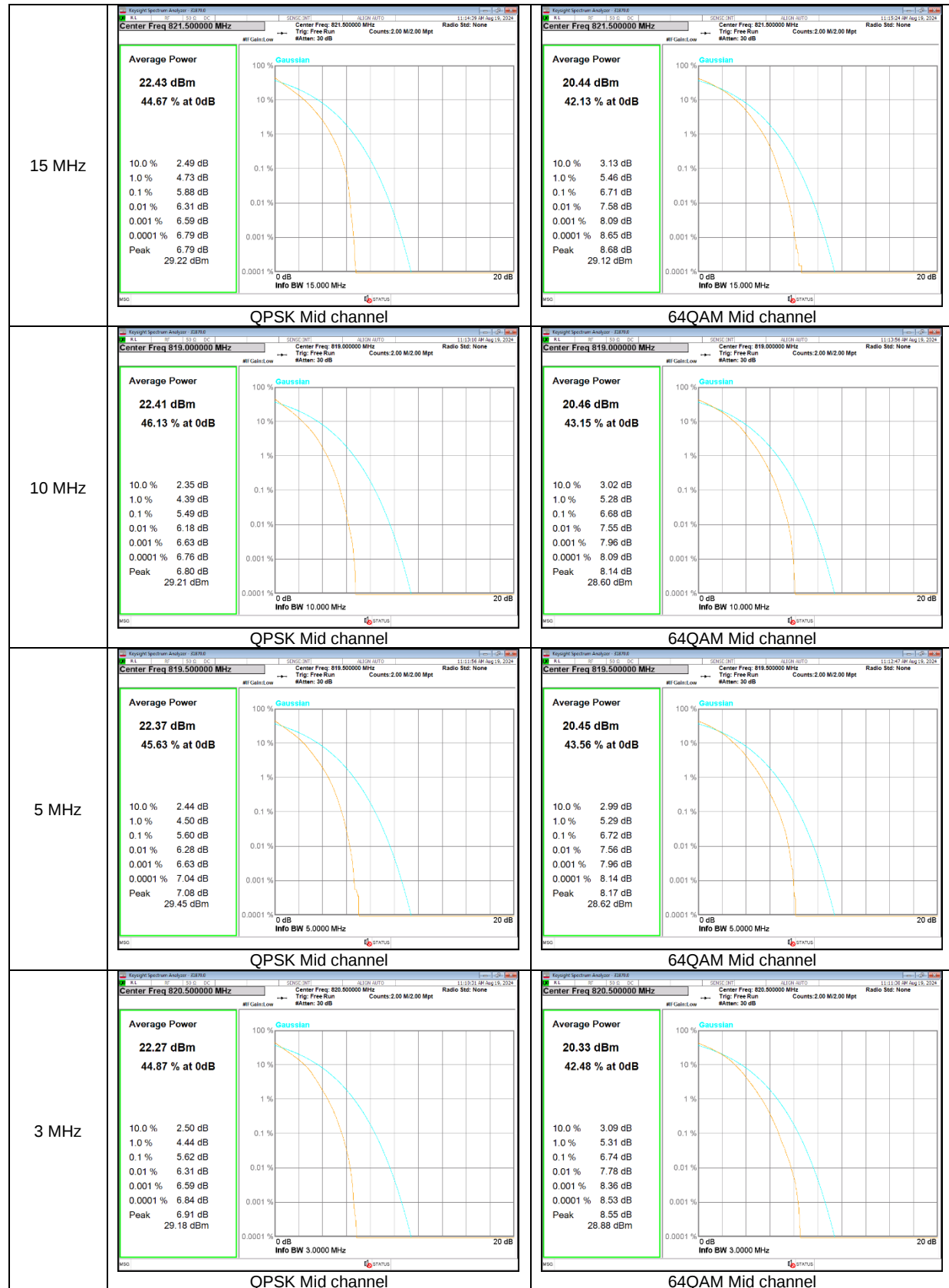
### GSM

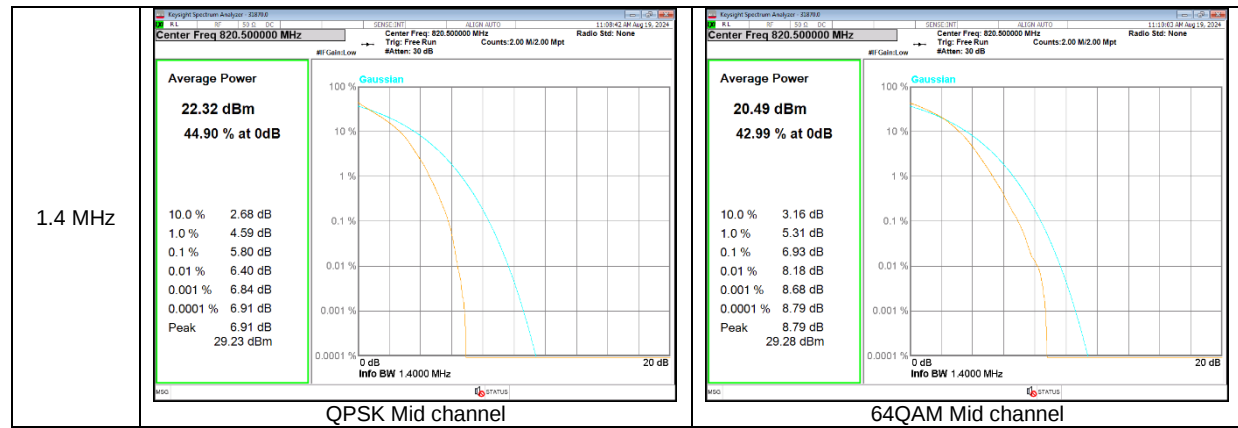


### WCDMA

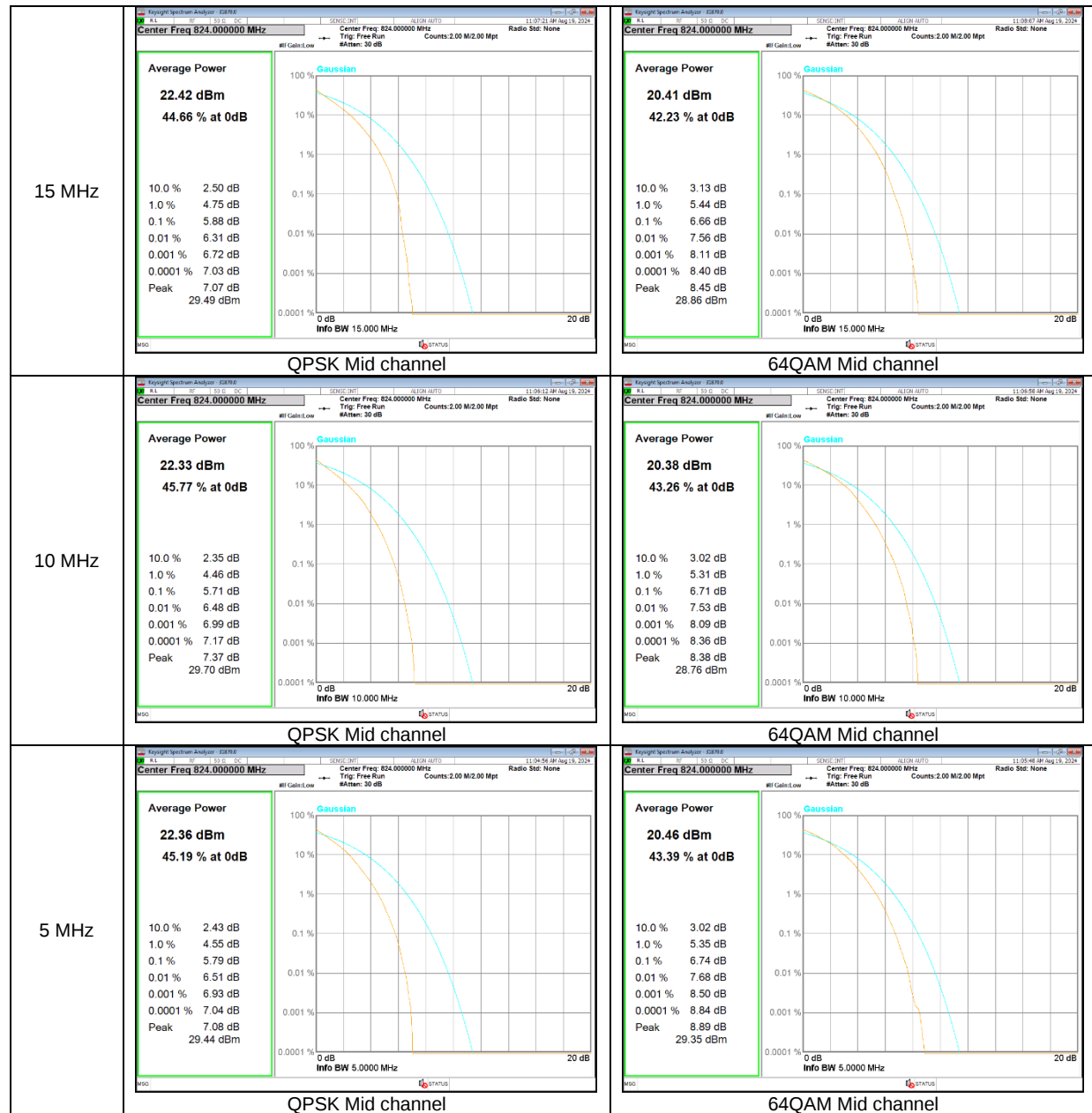


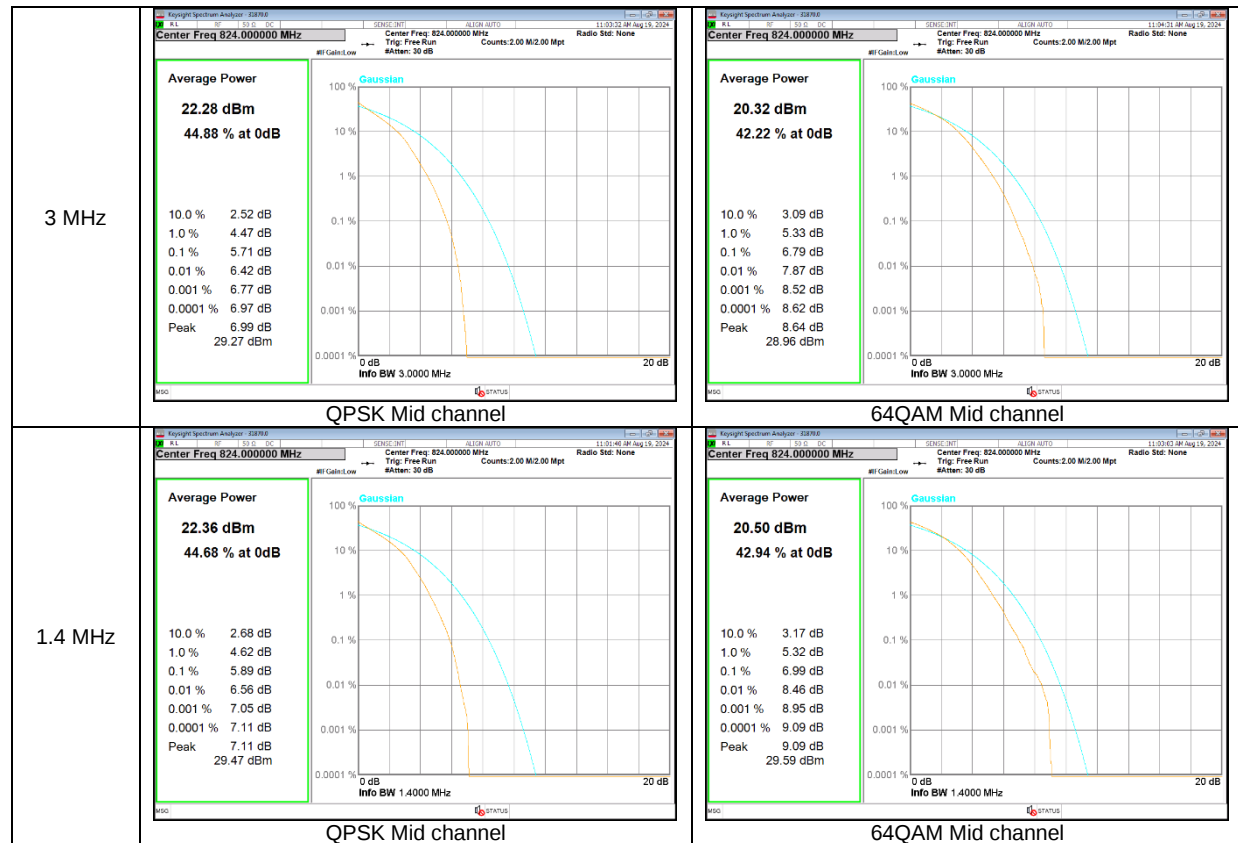
**LTE Band 26 (Part 90)**



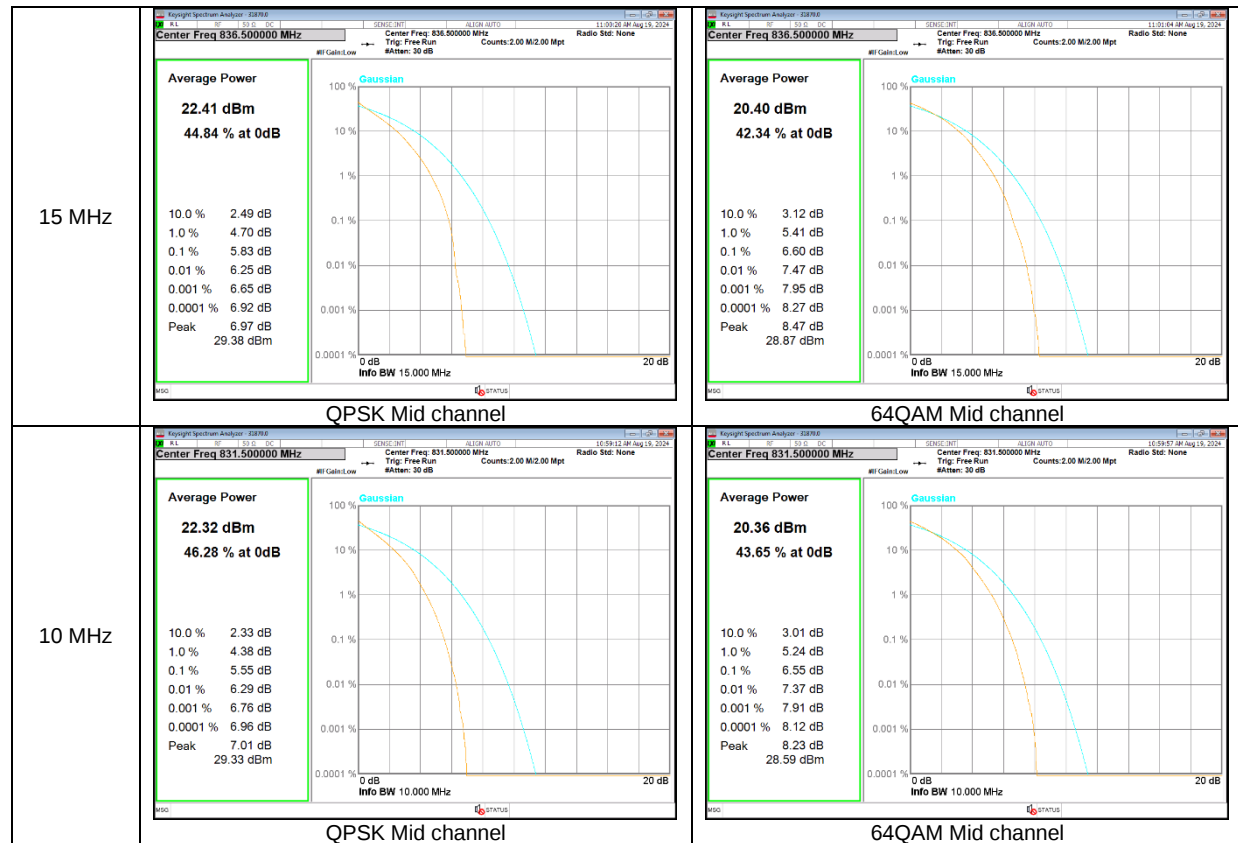


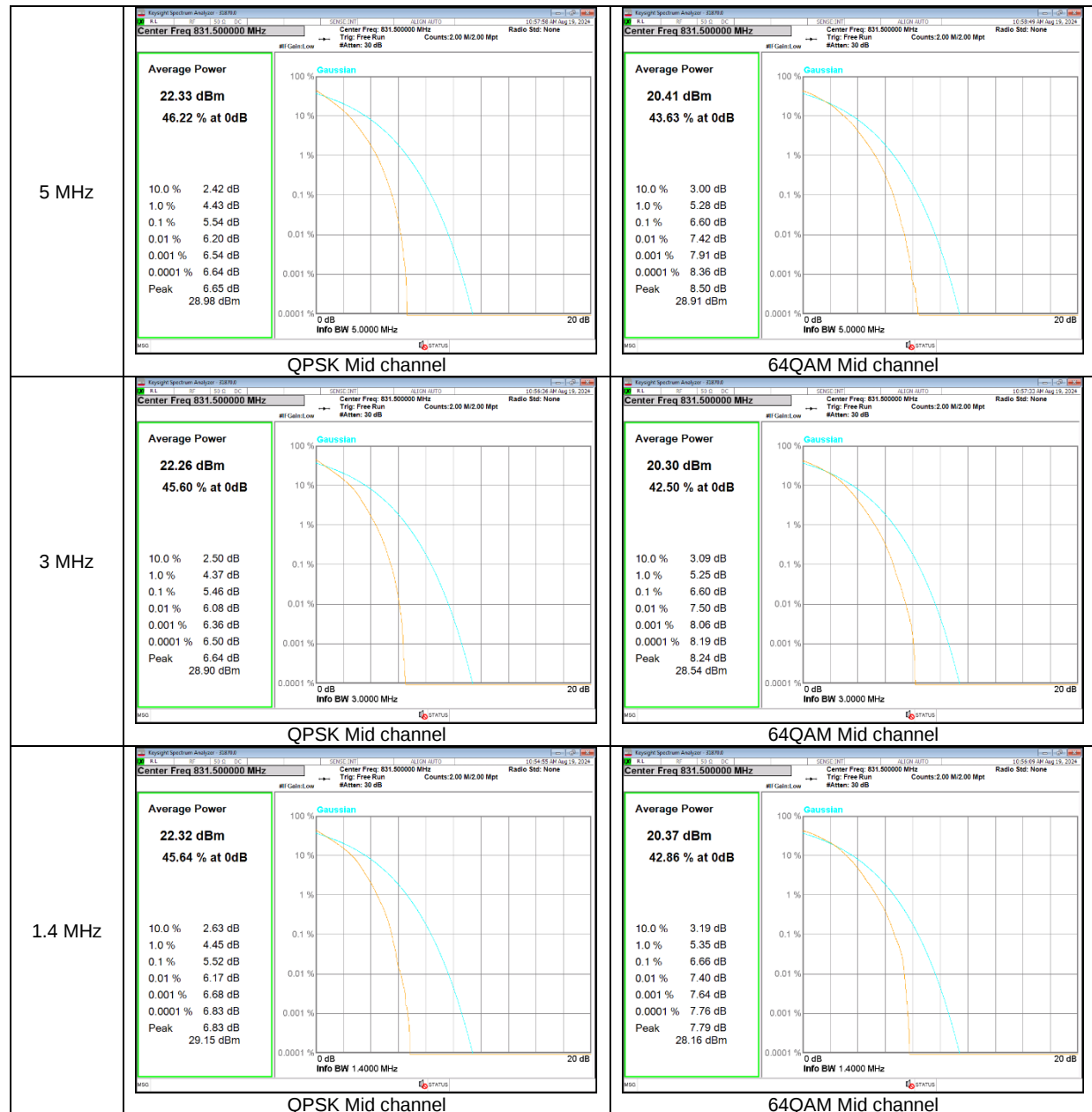
### LTE Band 26 (Straddle)





### LTE Band 26 (Part 22)





### **8.3. OCCUPIED BANDWIDTH**

#### **RULE PART(S)**

FCC: §2.1049

#### **LIMITS**

For reporting purposes only

#### **TEST PROCEDURE**

The transmitter output was connected to a calibrated coaxial cable and coupler, the other end of which was connected to a spectrum analyzer. The occupied bandwidth was measured with the spectrum analyzer at middle channel in each band. The -26dB bandwidth was also measured and recorded.

(KDB 971168 D01 Power Meas License Digital Systems v03r01)

#### **RESULTS**

See the following pages.

**- GSM**

| Band | Modulation | f [MHz] | 99% BW (kHz) | -26dB BW (kHz) |
|------|------------|---------|--------------|----------------|
| 850  | GPRS       | 836.60  | 244.49       | 318.0          |
|      | EGPRS      |         | 239.76       | 314.9          |

**- WCDMA**

| Band | Modulation | f [MHz] | 99% BW (MHz) | -26dB BW (MHz) |
|------|------------|---------|--------------|----------------|
| B5   | Rel.99     | 836.60  | 4.160        | 4.672          |
|      | HSDPA      |         | 4.161        | 4.654          |

**- LTE Band 26 (Part 90)**

| Band    | BW   | Modulation | f [MHz] | 99% BW (MHz) | -26dB BW (MHz) |
|---------|------|------------|---------|--------------|----------------|
| LTE B26 | 15M  | QPSK       | 819.00  | 13.406       | 14.320         |
|         |      | 16QAM      |         | 13.420       | 14.420         |
|         | 10M  | QPSK       | 819.00  | 8.943        | 9.500          |
|         |      | 16QAM      |         | 8.938        | 9.475          |
|         | 5M   | QPSK       | 819.50  | 4.480        | 4.858          |
|         |      | 16QAM      |         | 4.475        | 4.854          |
|         | 3M   | QPSK       | 820.50  | 2.679        | 2.960          |
|         |      | 16QAM      |         | 2.675        | 2.936          |
|         | 1.4M | QPSK       | 820.50  | 1.820        | 1.266          |
|         |      | 16QAM      |         | 1.088        | 1.272          |

**- LTE Band 26 (Straddle)**

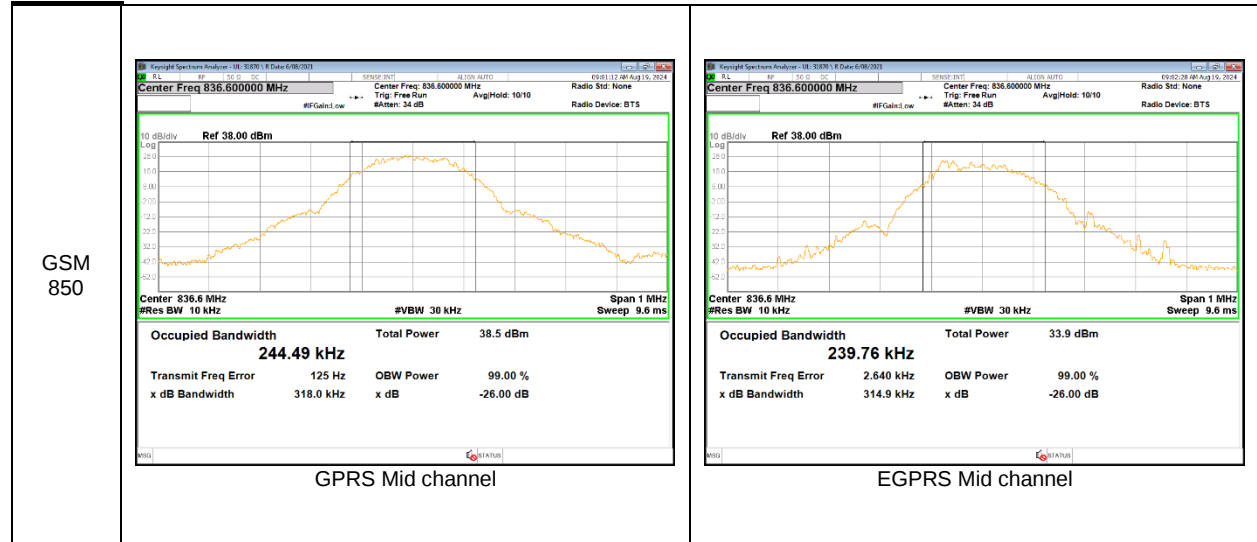
| Band    | BW   | Modulation | f [MHz] | 99% BW (MHz) | -26dB BW (MHz) |
|---------|------|------------|---------|--------------|----------------|
| LTE B26 | 15M  | QPSK       | 824.00  | 13.441       | 14.280         |
|         |      | 16QAM      |         | 13.373       | 14.320         |
|         | 10M  | QPSK       |         | 8.954        | 9.586          |
|         |      | 16QAM      |         | 8.947        | 9.568          |
|         | 5M   | QPSK       |         | 4.493        | 4.853          |
|         |      | 16QAM      |         | 4.483        | 4.802          |
|         | 3M   | QPSK       |         | 2.673        | 2.935          |
|         |      | 16QAM      |         | 2.683        | 2.936          |
|         | 1.4M | QPSK       |         | 1.093        | 1.273          |
|         |      | 16QAM      |         | 1.082        | 1.241          |

**- LTE Band 26 (Part 22)**

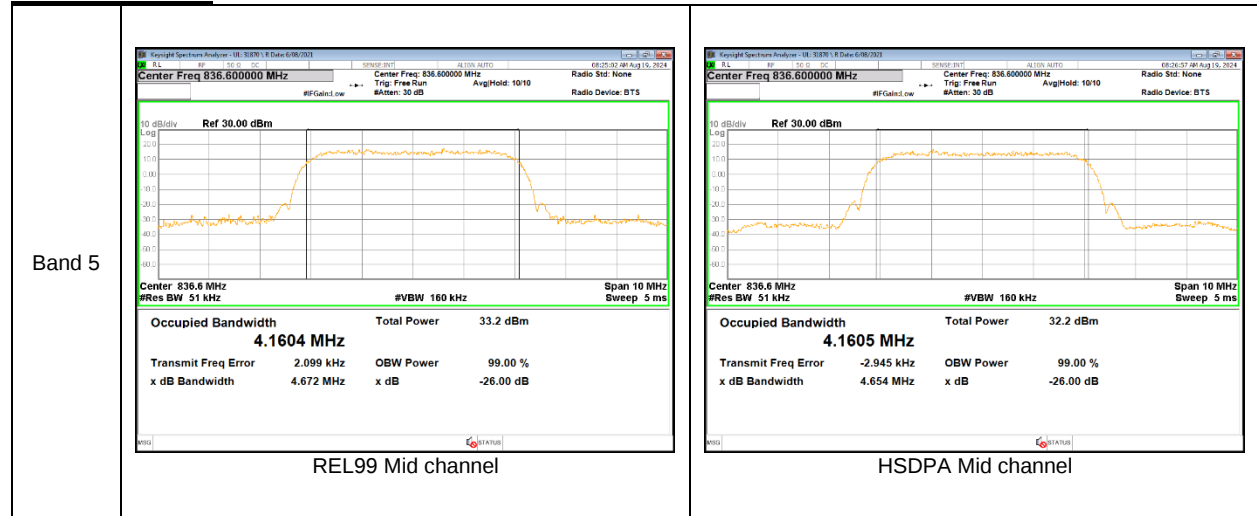
| Band    | BW   | Modulation | f [MHz] | 99% BW (MHz) | -26dB BW (MHz) |
|---------|------|------------|---------|--------------|----------------|
| LTE B26 | 15M  | QPSK       | 836.50  | 13.421       | 14.370         |
|         |      | 16QAM      |         | 13.413       | 14.250         |
|         | 10M  | QPSK       | 831.50  | 8.949        | 9.526          |
|         |      | 16QAM      |         | 8.944        | 9.642          |
|         | 5M   | QPSK       |         | 4.472        | 4.811          |
|         |      | 16QAM      |         | 4.479        | 4.837          |
|         | 3M   | QPSK       |         | 2.673        | 2.979          |
|         |      | 16QAM      |         | 2.677        | 2.940          |
|         | 1.4M | QPSK       |         | 1.091        | 1.279          |
|         |      | 16QAM      |         | 1.082        | 1.243          |

### 8.3.1. OCCUPIED BANDWIDTH RESULT

#### GSM 850

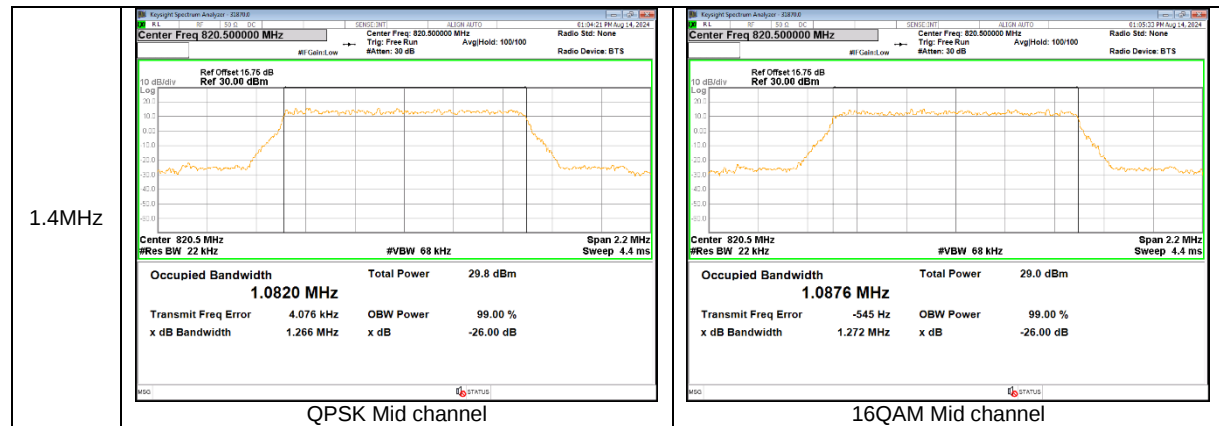


#### WCDMA Band 5



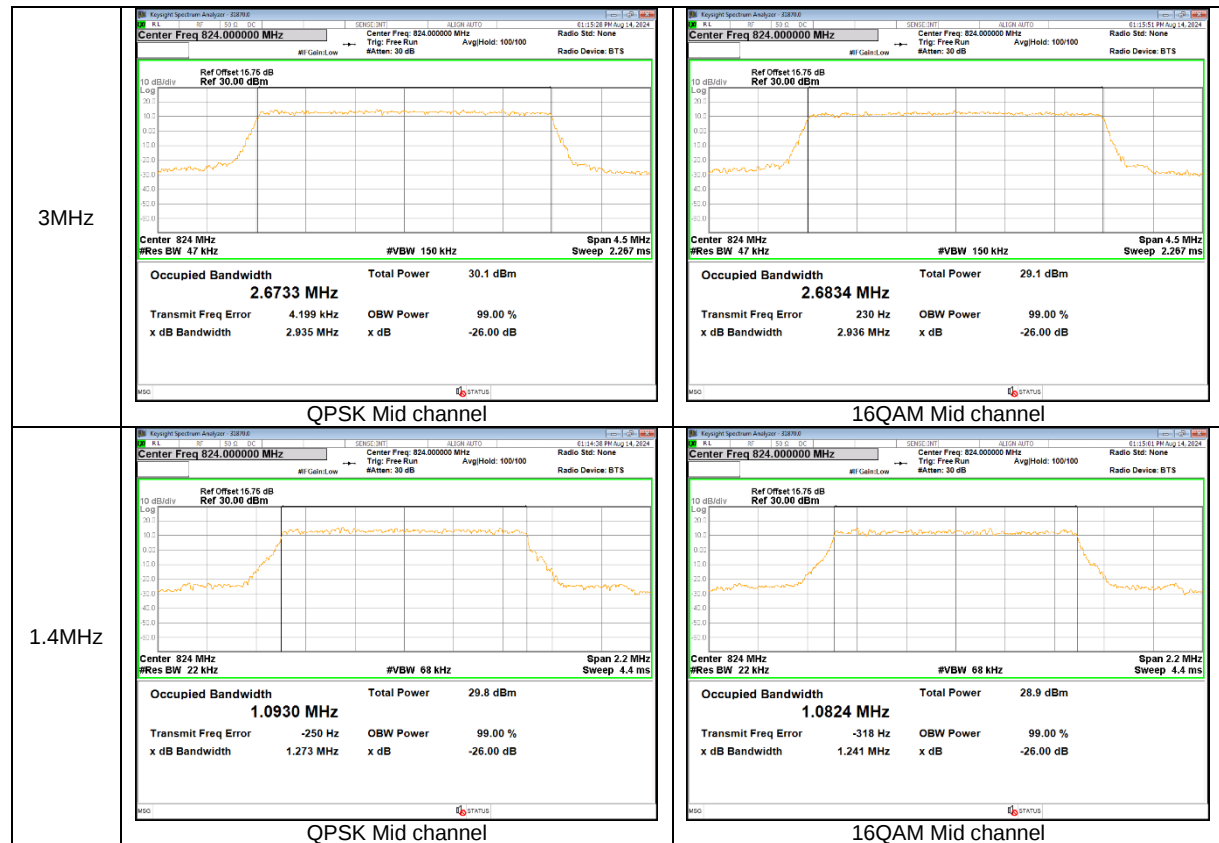
**LTE Band 26 (Part 90)**



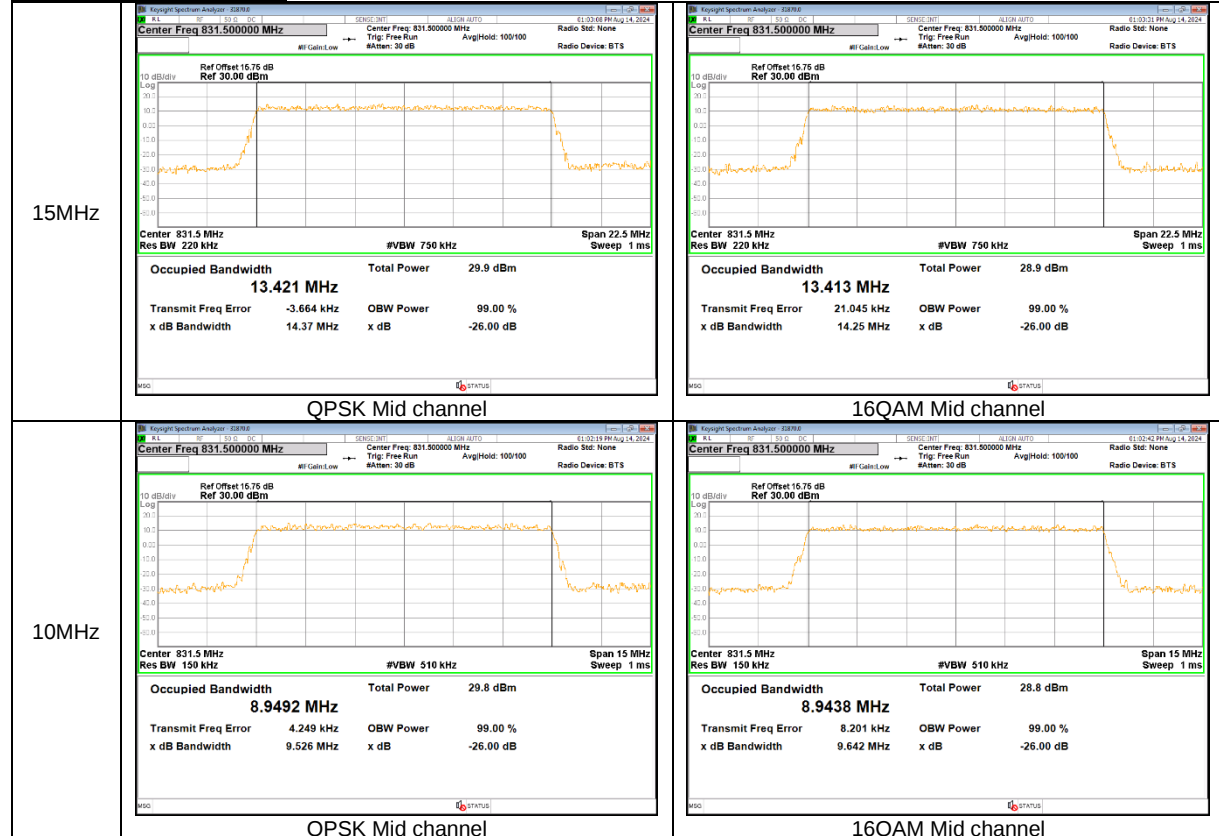


### LTE Band 26 (Straddle)





### LTE Band 26 (Part 22)





## 8.4. BAND EDGE EMISSIONS

### RULE PART(S)

FCC: §22.359, §22.917 and §90.691

### LIMITS

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB.

Part 90.691:

(a) Out-of-band emission requirement shall apply only to the “outer” channels included in an EA license and to spectrum adjacent to interior channels used by incumbent licensees. The emission limits are as follows:

(1) For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least  $116 \log_{10}(f/6.1)$  decibels or  $50 + 10 \log_{10}(P)$  decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.

(2) For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least  $43 + 10 \log_{10}(P)$  decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

## **TEST PROCEDURE**

Per KDB 971168 D01 Power Meas License Digital Systems v03r01

The transmitter output was connected to CMW500 Test Set and configured to operate at maximum power. The band edge emissions were measured at the required operating frequencies in each band on the Spectrum Analyzer.

### **GSM**

- a) Set the RBW = 1 - 5% of OBW(GSM850 – 8.2kHz)
- b) Set VBW  $\geq 3 \times$  RBW;
- c) Set span  $\geq 1.5$  times the OBW;
- d) Sweep time = 1S ;
- e) Detector = RMS;
- f) Ensure that the number of measurement points  $\geq 2 \times$  Span/RBW;
- g) Trace mode = Average(100);
- h) Add duty cycle correction factor (9dB)

### **WCDMA/LTE**

- a) Set the RBW = 1 - 1.5 % of OBW(Typically limited to a minimum RBW of 1% of the OBW)
- b) Set VBW  $\geq 3 \times$  RBW;
- c) Set span  $\geq 1.5$  times the OBW;
- d) Sweep time = Auto;
- e) Detector = RMS;
- f) Ensure that the number of measurement points  $\geq 2 \times$  Span/RBW;
- g) Trace mode = Average (100);

**NOTE1**

Note that the spurious emissions outside of the channel include narrowband signals. These signals are all below the -13dBm limits. Although the measurement bandwidth is less than the reference bandwidth of 1MHz no addtional correction is applied as ANSI C63.26 section 4.2.3 only requires the correction to be applied when the OBW of the emission being measured is wider than the measurement bandwidth (Where the OBW of the signal under measurement is less than the RBW of the measuring instrument, no bandwidth correction or integration will be required.) Plots for low and high channels show the level of the emission measured with the reduced bandwidth and the level of the same emission measured using the integration method over the 1MHz reference bandwidth are very close, indicating the emissions are narrowband.

**NOTE2**

For Band-Edge extended:

| CH BW (MHz) | RB Used (kHz) | CF for emissions more than 100kHz | CF for emissions more than 1MHz |
|-------------|---------------|-----------------------------------|---------------------------------|
| 1.4         | 15            | +8.2 dB                           | +18.2 dB                        |
| 3           | 30            | +5.2 dB                           | +15.2 dB                        |
| 5           | 51            | +2.9 dB                           | +12.9 dB                        |
| 10          | 100           | N/A                               | +10.0 dB                        |
| 15          | 150           | N/A                               | +8.2 dB                         |
| 20          | 200           | N/A                               | +7.0 dB                         |

For the band edge value measured in [RB Used], even if [CF for emissions reference bandwidth 100kHz/1MHz] is applied, it is below -13dBm.

**NOTE3**

Emission Mask: All 1RB Positions (Edge RB, Outer RB, Inner RB) and modulations (QPSK, 16QAM, 64QAM) were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

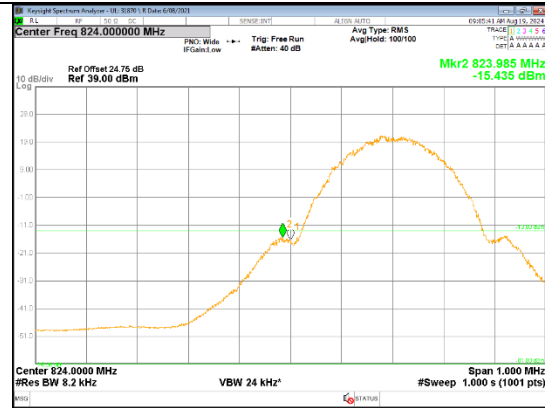
**RESULTS**

See the following pages.

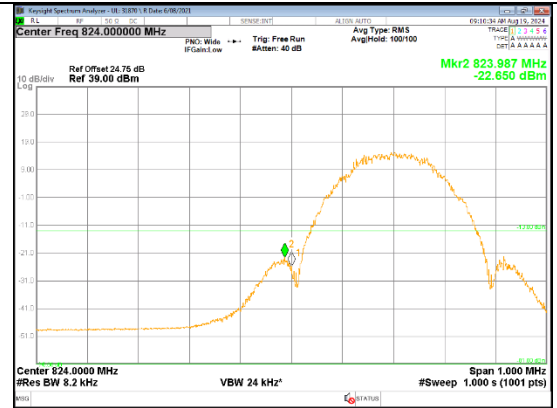
## 8.4.1. BAND EDGE RESULT

### GSM

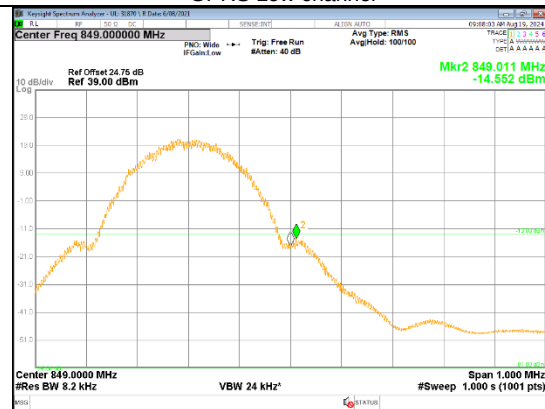
GSM  
850



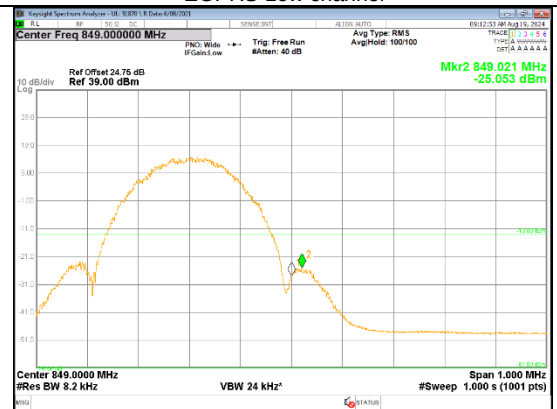
GPRS Low channel



EGPRS Low channel

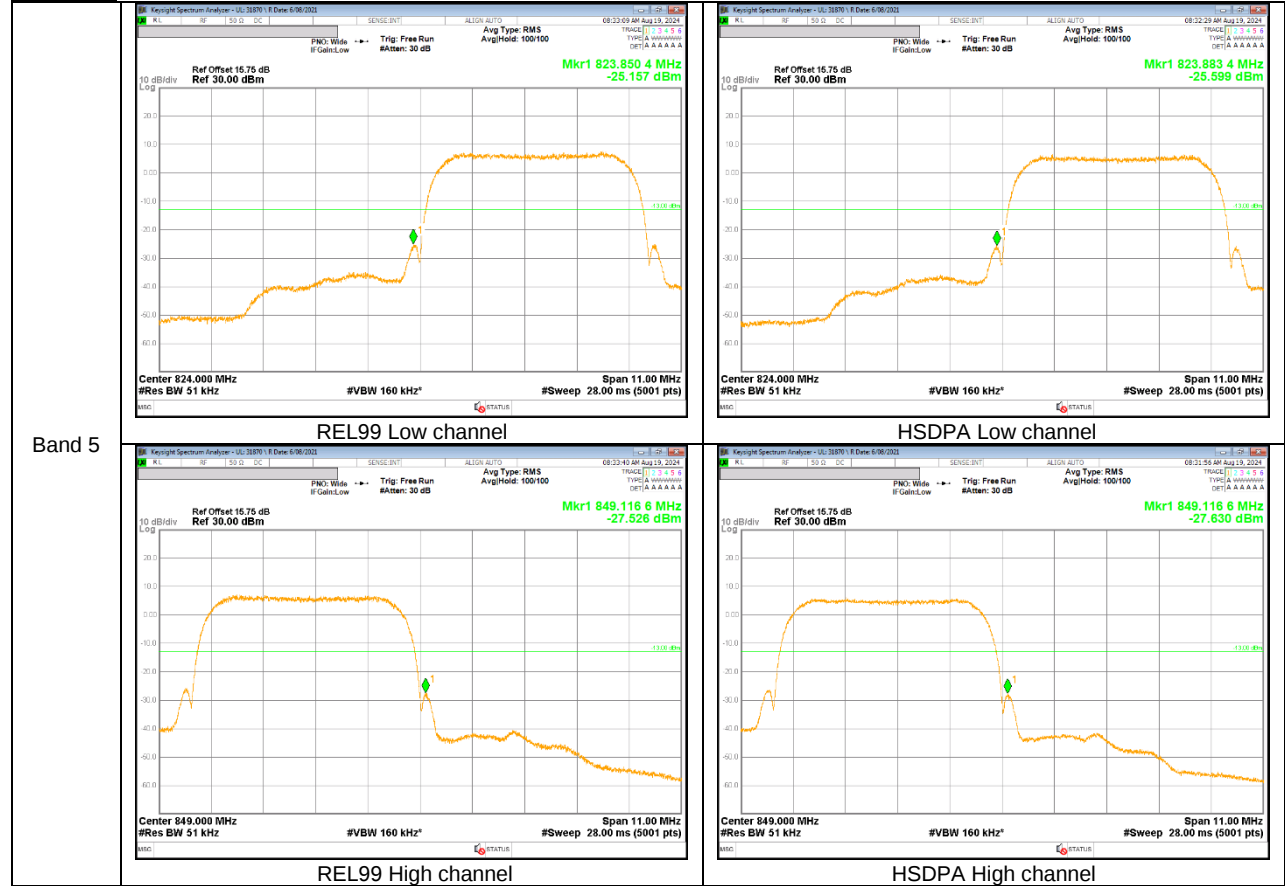


GPRS High channel



EGPRS High channel

WCDMA



LTE Band 26 (Part 22)

