



## MEASUREMENT REPORT

### C2PC

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**FCC ID** : HD5-CK67X1N  
**APPLICANT** : Honeywell International Inc  
**Application Type** : Certification  
**Product** : Mobile Computer  
**Model No.** : CK67X1N  
**Brand Name** : Honeywell  
**FCC Classification** : PCS Licensed Transmitter worn on body (PCT)  
**FCC Rule Part(s)** : Part2, Part96  
**Test Procedure(s)** : ANSI C63.26 2015  
**Received Date** : August 5, 2024  
**Test Date** : January 6, 2025~ January 14, 2025

**Tested By** : *Wen Lee*  
( Wen Lee )  
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( Paddy Chen )  
**Approved By** : *Chenz Ker*  
( Chenz Ker )



The test results only relate to the tested sample.

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.26-2015. Test results reported herein relate only to the item(s) tested.

The test report shall not be reproduced except in full without the written approval of MRT Technology (Taiwan) Co., Ltd.

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## Revision History

| Report No.    | Version | Description     | Issue Date | Note |
|---------------|---------|-----------------|------------|------|
| 2501TW0104-U1 | 1.0     | Original Report | 2025-01-24 |      |

Note:

1. This time, added LTE band 42: 3550~3600MHz and the LTE Band 42 Power Class 3 function is enabled, so the FCC C2PC is executed, original report Grant Date: 02/28/2025, FCC ID: HD5-CK67X1N.
2. Based on original report number: 2408TW0104-U13, for disabling power Class 2 for LTE B42, verify Transmitter Output Power & Transmitter unwanted emissions.

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## General Information

|                                 |                                                                            |
|---------------------------------|----------------------------------------------------------------------------|
| <b>Applicant</b>                | Honeywell International Inc                                                |
| <b>Applicant Address</b>        | 9680 Old Bailes Rd. Fort Mill, SC 29707 United States                      |
| <b>Manufacturer</b>             | Honeywell International Inc                                                |
| <b>Manufacturer Address</b>     | 9680 Old Bailes Rd. Fort Mill, SC 29707 United States                      |
| <b>Test Site</b>                | MRT Technology (Taiwan) Co., Ltd                                           |
| <b>Test Site Address</b>        | No. 38, Fuxing Second Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C) |
| <b>MRT FCC Registration No.</b> | 291082                                                                     |

## Test Facility / Accreditations

1. MRT facility is a FCC registered (Reg. No. 291082) test facility with the site description report on file and is designated by the FCC as an Accredited Test Firm.
2. MRT facility is an IC registered (MRT Reg. No. 21723) test laboratory with the site description on file at Industry Canada.
3. MRT Lab is accredited to ISO 17025 by the Taiwan Accreditation Foundation (TAF Cert. No. 3261) in EMC, Telecommunications and Radio testing for FCC (Designation Number: TW3261), Industry Canada, EU and TELEC Rules.

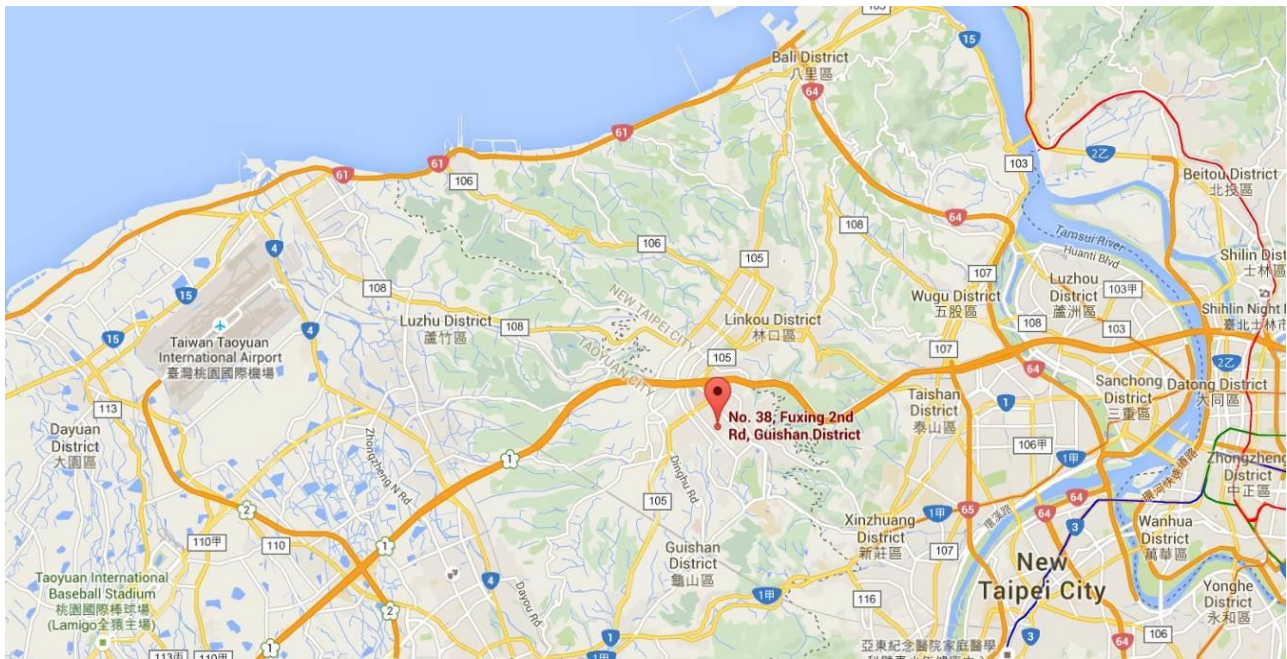
# 1. INTRODUCTION

## 1.1. Scope

Measurement and determination of electromagnetic emissions (EMC) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission and the Industry Canada Certification and Engineering Bureau.

## 1.2. MRT Test Location

The map below shows the location of the MRT LABORATORY, its proximity to the Taoyuan City. These measurement tests were conducted at the MRT Technology (Taiwan) Co., Ltd. Facility located at No.38, Fuxing 2nd Rd., Guishan Dist., Taoyuan City 33377, Taiwan (R.O.C).



### 1.3. Product Information

|                                                                                                                                                          |                                                                                                                         |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|
| Product Name                                                                                                                                             | Mobile Computer                                                                                                         |
| Model No.                                                                                                                                                | CK67X1N                                                                                                                 |
| Brand Name                                                                                                                                               | Honeywell                                                                                                               |
| Wi-Fi Specification                                                                                                                                      | 802.11a/b/g/n/ac/ax                                                                                                     |
| Bluetooth Specification                                                                                                                                  | Main BT/BLE : V5.3 dual mode + 2 <sup>nd</sup> BLE: V5.3 Single mode                                                    |
| NFC Specification                                                                                                                                        | 13.56MHz                                                                                                                |
| WWAN Specification                                                                                                                                       | 4G-LTE: Band 2,4,5,7,12,13,14,17,25,26,30,38,41,42,43,48,66,71<br>5G-NR: n 2,5,7,12,13,14,25,26,30,38,41,48,66,71,77,78 |
| CA Intra-Band                                                                                                                                            | 5B; 7C; 38C; 41C; 66B; 66C                                                                                              |
| EUT Identification No.:                                                                                                                                  | #24295D8051, #24295D80CF (Conducted)<br>#24295D8059 (Radiated)                                                          |
| Operating Temperature Range                                                                                                                              | -20~50 °C                                                                                                               |
| Supply Voltage Rating                                                                                                                                    | DC 3.6V                                                                                                                 |
| Accessory                                                                                                                                                |                                                                                                                         |
| Battery                                                                                                                                                  | Brand: Honeywell<br>MODEL:CK65-BTSC<br>Rating: 3.6Vdc, 7000mAh, 25.2Wh                                                  |
| Remark:<br>The information of EUT was provided by the manufacturer, and the accuracy of the information shall be the responsibility of the manufacturer. |                                                                                                                         |

Note:

- For other features of this EUT, test report will be issued separately.
- This product has 3 scanners, 5 keypads, can refer as below:

|                |               |         |               |                            |                   |
|----------------|---------------|---------|---------------|----------------------------|-------------------|
| <b>Scanner</b> | S0703         | S0803FR | S0803         | --                         | --                |
| <b>Keypad</b>  | Alpha Numeric | Numeric | Large Numeric | 53keys<br>Alpha<br>Numeric | 42keys<br>Numeric |

- This report selected S0803FR with Alpha Numeric as the main test.

## 1.4. Radio Specification under Testing

| E-UTRA Specification        |                                         |
|-----------------------------|-----------------------------------------|
| TDD TX & RX Frequency Range | LTE Band 42 (Part 27): 3450 ~ 3550 MHz; |
| Support Bandwidth           | LTE Band 42: 5MHz, 10MHz, 15MHz, 20MHz  |
| Type of Modulation          | UL up to 256QAM, DL up to 256QAM        |

| 3.5G Support Band | Part27<br>(3450-3550MHz) |
|-------------------|--------------------------|
| LTE Band 42       | PC3                      |

Note: the LTE Band 42 Power Class 3 function is enabled, and disabling power Class 2 for LTE B42, so verification Transmitter Output Power & Transmitter unwanted emissions.

## 1.5. Description of Available Antennas

| Antenna Type                                                                             |                       |    | LDS                 |      |       |       |
|------------------------------------------------------------------------------------------|-----------------------|----|---------------------|------|-------|-------|
| Technology                                                                               | Frequency Range (MHz) |    | Max Peak Gain (dBi) |      |       |       |
|                                                                                          | TX                    | RX | ANT3                | ANT4 | ANT5  | ANT6  |
| LTE Band 42                                                                              | 3450 ~ 3550           |    | --                  | --   | -1.50 | -1.51 |
| Note                                                                                     |                       |    |                     |      |       |       |
| 1: All antenna information (Antenna type and Peak Gain) is provided by the manufacturer. |                       |    |                     |      |       |       |
| 2: The typical antennas used to calculate the ERP (EIRP).                                |                       |    |                     |      |       |       |
| 3. Ant3 support SRS functions and its signal is switched from Ant5.                      |                       |    |                     |      |       |       |
| 4. Ant4 support SRS functions and its signal is switched from Ant6.                      |                       |    |                     |      |       |       |
| 5. Ant6 support TX functions for UHB (3300MHz-3800MHz).                                  |                       |    |                     |      |       |       |

## 1.6. Test Methodology

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ANSI C63.26:2015
- FCC CFR 47 Part 2, Part 27, Part 96
- FCC KDB 971168 D01 v03r01: Power Meas License Digital Systems
- FCC KDB 971168 D02 v02r02: Misc Rev Approv License Devices
- FCC KDB 412172 D01 v01r01: Determining ERP and EIRP

## 2. DESCRIPTION OF TEST

### 2.1. Summary

| FCC Part Section(s)           | Test Description                           | Test Condition | Test Result |
|-------------------------------|--------------------------------------------|----------------|-------------|
| 2.1049                        | Occupied Bandwidth                         | Conducted      | N/A         |
| 2.1055, 27.54                 | Frequency Stability                        |                | N/A         |
| 2.1046, 27.50 (k) (3) (j) (3) | Transmitter Output Power                   |                | Pass        |
| 27.50 (k) (4) (j) (4)         | Peak to Average Ratio                      |                | N/A         |
| 2.1051, 27.53(i) (n)          | Transmitter unwanted emissions (band-edge) |                | Pass        |
| 2.1051, 27.53(i) (n)          | Transmitter unwanted emissions (spurious)  |                |             |
| 2.1053, 27.53(i) (n)          | Transmitter Spurious Emissions             | Radiated       | N/A         |

**Notes:** The analyzer plots shown in this section were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables and attenuators used as part of the system to connect the EUT to the analyzer at all frequencies of interest.

- 1) All supported modulation types were evaluated. The worst-case emission of modulation was selected. Therefore, the Frequency Stability, Transmitter unwanted emissions (band-edge), Transmitter unwanted emissions (spurious), Radiated Spurious Emissions were presented worst-case in the test report.
- 2) For radiated emission tests, every axis (X, Y, Z) was also verified. The test results shown in the following sections represent the worst-case emissions.

| LTE Test Items           | Bandwidth  | Modulation     | RB Combination | Test Channel    |
|--------------------------|------------|----------------|----------------|-----------------|
| Occupied Bandwidth       | All BW     | All Modulation | Full           | Low/Middle/High |
| Frequency Stability      | Maximum BW | QPSK           | Full           | Middle          |
| Transmitter Output Power | All BW     | All Modulation | 1RB/Half/Full  | Low/Middle/High |
| Peak to Average Ratio    | Maximum BW | All Modulation | Full           | Middle          |
| Band Edge                | All BW     | QPSK           | 1RB/Half/Full  | Low/High        |
| Conducted Emissions      | All BW     | All Modulation | 1RB            | Low/Middle/High |
| Radiated Emissions       | Minimum BW | QPSK           | 1RB            | Low/Middle/High |

Note:

1. All modes of operation and data rates were investigated. The test results shown in the above part represent the worst case emissions.
2. All antenna port conducted emissions testing was performed on a test bench with the antenna port of the EUT connected to the spectrum analyzer through calibrated cables, attenuators, and couplers.

| NR Test Items            | Bandwidth  | Modulation                                | RB Combination                                          | Test Channel    |
|--------------------------|------------|-------------------------------------------|---------------------------------------------------------|-----------------|
| Occupied Bandwidth       | All BW     | All DFT Modulation                        | Outer full RB                                           | Low/Middle/High |
| Frequency Stability      | Maximum BW | DFT_BPSK                                  | Outer full RB                                           | Middle          |
| Transmitter Output Power | All BW     | All DFT Modulation and CP_QPSK Modulation | Edge_1RB<br>Inner_1RB<br>Inner Full RB<br>Outer full RB | Low/Middle/High |
| Peak to Average Ratio    | Maximum BW | All DFT Modulation                        | Outer full RB                                           | Middle          |
| Band Edge                | All BW     | DFT_BPSK                                  | Edge_1RB<br>Outer full RB                               | Low/High        |
| Conducted Emissions      | All BW     | All DFT Modulation                        | Inner_1RB                                               | Low/Middle/High |
| Radiated Emissions       | Minimum BW | DFT_BPSK                                  | Inner_1RB                                               | Low/Middle/High |

Note:

1. All modes of operation and data rates were investigated. The test results shown in the above part represent the worst case emissions.
2. All antenna port conducted emissions testing was performed on a test bench with the antenna port of the EUT connected to the spectrum analyzer through calibrated cables, attenuators, and couplers.

## 2.2. Occupied Bandwidth

### According to FCC Part 2.1049

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured.

## 2.3. Frequency Stability / Temperature Variation

### According to FCC Part 2.1055, 27.54

Frequency stability testing is performed in accordance with the guidelines of ANSI/TIA-603-E-2016. The frequency stability of the transmitter is measured by:

- a.) Temperature: The temperature is varied from -30°C to +50°C in 10°C increments using an environmental chamber.
- b.) Primary Supply Voltage: The primary supply voltage is varied from 85% to 115% of the nominal value for non hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

Specification – For Part 22, the frequency stability of the transmitter shall be maintained within  $\pm 0.00025\%$  ( $\pm 2.5$  ppm) of the center frequency.

Time Period and Procedure:

1. The carrier frequency of the transmitter is measured at room temperature (20°C to provide a reference).
2. The equipment is turned on in a “standby” condition for fifteen minutes before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.
3. Frequency measurements are made at 10°C intervals ranging from -30°C to +50°C. A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.

## 2.4. Conducted Output Power Measurement

### According to FCC Part 2.1046, 27.50

According to KDB 412172 D01 Section 1.2 Power Approach

$EIRP = PT + GT - LC = ERP + 2.15 \text{ dB}$ ,  $ERP = EIRP - 2.15 \text{ dB}$

PT = transmitter output power in dBm

GT = gain of the transmitting antenna in dBi

LC = signal attenuation in the connecting cable between the transmitter and antenna in dB.

| Technology  | EIRP Power Limit |
|-------------|------------------|
| LTE Band 42 | 1W (30dBm)       |

## 2.5. Peak-Average Ratio

### According to FCC Part 27.50

A peak to average ratio measurement is performed at the conducted port of the EUT. The spectrum analyzers Complementary Cumulative Distribution Function (CCDF) measurement profile is used to determine the largest deviation between the average and the peak power of the EUT in a given bandwidth. The CCDF curve shows how much time the peak waveform spends at or above a given average power level. The percent of time the signal spends at or above the level defines the probability for that particular power level.

The peak-to-average power ratio (PAPR) of the transmitter output power must not exceed 13 dB. The PAPR measurements should be made using either an instrument with complementary cumulative distribution function (CCDF) capabilities to determine that PAPR will not exceed 13 dB for more than 0.1 percent of the time or other Commission approved procedure. The measurement must be performed using a signal corresponding to the highest PAPR expected during periods of continuous transmission.

## **2.6. Spurious and Harmonic Emissions at Antenna Terminal**

### **According to FCC Part 2.1051, 27.53**

#### **For 27.53(n)(2)**

For mobile operations in the 3450-3550 MHz band, the conducted power of any emission outside the licensee's authorized bandwidth shall not exceed  $-13$  dBm/MHz. Compliance with this paragraph (n)(2) is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed, but limited to a maximum of 200 kHz. In the bands between 1 and 5 MHz removed from the licensee's frequency block, the minimum resolution bandwidth for the measurement shall be 500 kHz. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

#### **For 27.53(i)(2)**

For mobile operations in the 3700-3980 MHz band, the conducted power of any emission outside the licensee's authorized bandwidth shall not exceed  $-13$  dBm/MHz. Compliance with this paragraph (i)(2) is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, the minimum resolution bandwidth for the measurement shall be either one percent of the emission bandwidth of the fundamental emission of the transmitter or 350 kHz. In the bands between 1 and 5 MHz removed from the licensee's frequency block, the minimum resolution bandwidth for the measurement shall be 500 kHz. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

## 2.7. Conducted and Radiated Spurious Emissions

### **According to FCC Part 2.1051, 2.1053, 27.53**

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th harmonic.

### **For 27.53(n)(2)**

For mobile operations in the 3450-3550 MHz band, the conducted power of any emission outside the licensee's authorized bandwidth shall not exceed –13 dBm/MHz.

### **For 27.53(i)(2)**

For mobile operations in the 3700-3980 MHz band, the conducted power of any emission outside the licensee's authorized bandwidth shall not exceed –13 dBm/MHz.

### 3. TEST EQUIPMENT CALIBRATION DATE

#### Radiated Emissions

| Instrument               | Manufacturer                | Type No.              | Asset No.   | Cali. Interval | Cali. Due Date |
|--------------------------|-----------------------------|-----------------------|-------------|----------------|----------------|
| Active Loop Antenna      | Schwarzbeck                 | FMZB 1519B            | MRTTWA00002 | 1 year         | 2025/5/7       |
| Broadband TRILOG Antenna | SCHWARZBECK                 | VULB 9162             | MRTTWA00086 | 1 year         | 2025/11/5      |
| Broadband Hornantenna    | RFSPIN                      | DRH18-E               | MRTTWA00087 | 1 year         | 2025/5/20      |
| Broadband Preamplifier   | EMC Instruments corporation | EMC118A45SE           | MRTTWA00088 | 1 year         | 2025/5/14      |
| Breitband Hornantenna    | Schwarzbeck                 | BBHA 9170             | MRTTWA00004 | 1 year         | 2025/3/26      |
| Broadband Amplifier      | Schwarzbeck                 | BBV 9721              | MRTTWA00006 | 1 year         | 2025/3/21      |
| EMI Test Receiver        | R&S                         | ESR3                  | MRTTWA00009 | 1 year         | 2025/3/5       |
| Signal Analyzer          | R&S                         | FSVA3044              | MRTTWA00092 | 1 year         | 2025/6/20      |
| Cable                    | HUBERSUHNER                 | SF106                 | MRTTWE00010 | 1 year         | 2025/6/14      |
| Cable                    | Rosnol                      | K1K50-UP0264-K1K50-4M | MRTTWE00012 | 1 year         | 2025/6/14      |

#### Conducted Test Equipment

| Instrument                          | Manufacturer | Type No. | Asset No.   | Cali. Interval | Cali. Due Date |
|-------------------------------------|--------------|----------|-------------|----------------|----------------|
| EXA Signal Analyzer                 | KEYSIGHT     | N9010A   | MRTTWA00012 | 1 year         | 2025/9/24      |
| EXA Signal Analyzer                 | KEYSIGHT     | N9010B   | MRTTWA00074 | 1 year         | 2025/8/12      |
| USB Wideband Power Sensor           | KEYSIGHT     | U2021XA  | MRTTWA00015 | 1 year         | 2025/3/12      |
| Wideband Radio Communication Taster | R&S          | CMW 500  | MRTTWA00084 | 1 year         | 2025/10/23     |
| UXM 5G Wireless Test Platform       | KEYSIGHT     | E7515B   | MRTTWA00089 | 1 year         | 2025/5/30      |

#### Test Software

| Software | Version   | Function          |
|----------|-----------|-------------------|
| e3       | 9.160520a | EMI Test Software |

## 4. Decision Rules and Measurement Uncertainty

### 4.1. Decision Rules

The Decision Rule is based on Simple Acceptance in accordance with ISO Guide 98-4: 2012 Clause 8.2.

(Measurement uncertainty is not taken into account when stating conformity with a specified requirement.)

### 4.2. Measurement Uncertainty

Where relevant, the following test uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k = 2$ .

|                                                                                                                                                                                                                     |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Radiated Spurious Emission</b>                                                                                                                                                                                   |
| Measuring Uncertainty for a Level of Confidence of 95% ( $U=2Uc(y)$ ):<br>9kHz~30MHz: $\pm 3.92\text{dB}$<br>30MHz~1GHz: $\pm 4.25\text{dB}$<br>1GHz~18GHz: $\pm 4.40\text{dB}$<br>18GHz~40GHz: $\pm 4.45\text{dB}$ |
| <b>Frequency Error</b>                                                                                                                                                                                              |
| Measuring Uncertainty for a Level of Confidence of 95% ( $U=2Uc(y)$ ): $\pm 78.4\text{Hz}$                                                                                                                          |
| <b>Conducted Power</b>                                                                                                                                                                                              |
| Measuring Uncertainty for a Level of Confidence of 95% ( $U=2Uc(y)$ ): $\pm 0.84\text{dB}$                                                                                                                          |
| <b>Conducted Spurious Emission</b>                                                                                                                                                                                  |
| Measuring Uncertainty for a Level of Confidence of 95% ( $U=2Uc(y)$ ): $\pm 2.65\text{ dB}$                                                                                                                         |
| <b>Occupied Bandwidth</b>                                                                                                                                                                                           |
| Measuring Uncertainty for a Level of Confidence of 95% ( $U=2Uc(y)$ ): $\pm 3.3\%$                                                                                                                                  |
| <b>Temp. / Humidity</b>                                                                                                                                                                                             |
| Measuring Uncertainty for a Level of Confidence of 95% ( $U=2Uc(y)$ ): $\pm 0.82^\circ\text{C}/ \pm 3\%$                                                                                                            |
| <b>DC Voltage</b>                                                                                                                                                                                                   |
| Measuring Uncertainty for a Level of Confidence of 95% ( $U=2Uc(y)$ ): $\pm 0.3\%$                                                                                                                                  |

Note:

Determining compliance is based on the test results met the regulation limits or requirements declared by clients, and the test results don't take into account the value of measurement uncertainty.

## 5. TEST RESULT

### 5.1. Summary

#### Maximum Conducted Power and ERP/EIRP Power

Average power measurements were performed only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor. The power meter implemented triggering and gating capabilities which were set up such that power measurements were recorded only during the ON time of the transmitter.

The relevant equation for determining the maximum ERP or EIRP from the measured RF output power is given in Equation (1) as follows

$$\text{ERP or EIRP} = P_{\text{Meas}} + G_T$$

where

ERP or EIRP effective radiated power or equivalent isotropically radiated power, respectively. (expressed in the same units as  $P_{\text{Meas}}$ , e.g., dBm or dBW)

$P_{\text{Meas}}$  measured transmitter output power or PSD, in dBm or dBW

$G_T$  gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP)

$$\text{ERP} = \text{EIRP} - 2.15$$

| LTE Band |            | Band42                     | Antenna Gain (dBi)       |                  | -1.51          |
|----------|------------|----------------------------|--------------------------|------------------|----------------|
| BW       | Modulation | Conducted Peak Power (dBm) | Conducted Peak Power (W) | Maximum EIRP (W) | EIRP Limit (W) |
| 5MHz     | QPSK       | 24.39                      | 0.275                    | 0.194            | 1              |
|          | 16QAM      | 23.58                      | 0.228                    | 0.161            | 1              |
|          | 64QAM      | 22.11                      | 0.163                    | 0.115            | 1              |
|          | 256QAM     | 19.77                      | 0.095                    | 0.067            | 1              |
| 10MHz    | QPSK       | 24.21                      | 0.264                    | 0.186            | 1              |
|          | 16QAM      | 23.48                      | 0.223                    | 0.157            | 1              |
|          | 64QAM      | 22.27                      | 0.169                    | 0.119            | 1              |
|          | 256QAM     | 19.71                      | 0.094                    | 0.066            | 1              |
| 15MHz    | QPSK       | 24.05                      | 0.254                    | 0.179            | 1              |
|          | 16QAM      | 23.18                      | 0.208                    | 0.147            | 1              |
|          | 64QAM      | 22.16                      | 0.164                    | 0.116            | 1              |
|          | 256QAM     | 19.34                      | 0.086                    | 0.061            | 1              |
| 20MHz    | QPSK       | 24.15                      | 0.260                    | 0.184            | 1              |
|          | 16QAM      | 23.18                      | 0.208                    | 0.147            | 1              |
|          | 64QAM      | 22.17                      | 0.165                    | 0.116            | 1              |
|          | 256QAM     | 19.19                      | 0.083                    | 0.059            | 1              |

## 5.2. Occupied Bandwidth

### 5.2.1 Test Limit

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured.

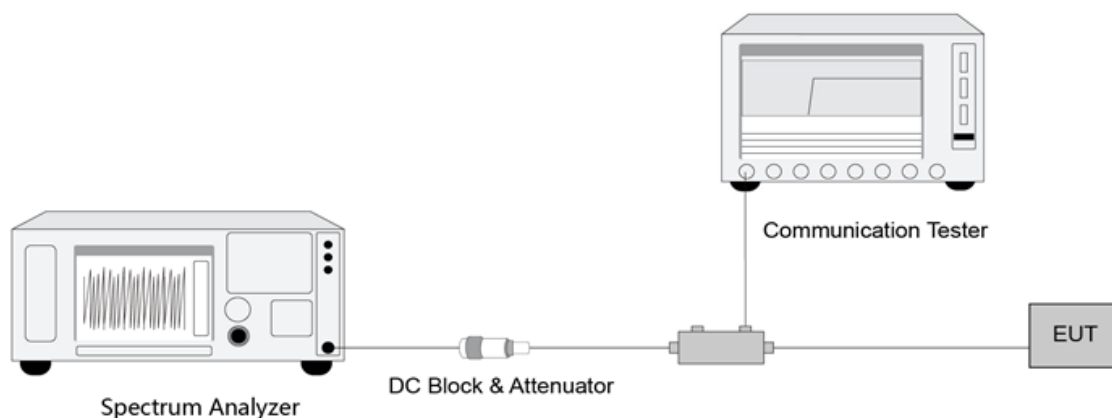
### 5.2.2 Test Procedure used

ANSI C63.26-2015 - Section 5.4.4

### 5.2.3 Test Setting

1. Set center frequency to the nominal EUT channel center frequency
2. RBW = The nominal RBW shall be in the range of 1% to 5% of the anticipated OBW
3. VBW  $\geq 3 \times$  RBW
4. Detector = Peak
5. Trace mode = max hold
6. Sweep = auto couple
7. Allow the trace to stabilize
8. Use the 99% power bandwidth function of the instrument and report the measured bandwidth.

### 5.2.4 Test Setup



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### 5.2.5 Test Result

Refer to Appendix A.1

## 5.3. Frequency Stability Under Temperature & Voltage Variations

### 5.3.1 Test Limit

The frequency stability shall be measured by variation of ambient temperature and variation of primary supply voltage to ensure that the fundamental emission stays within the authorized frequency block. The frequency stability of the transmitter shall be maintained within  $\pm 0.00025\%$  ( $\pm 2.5\text{ppm}$ ) of the center frequency.

### 5.3.2 Test Procedure

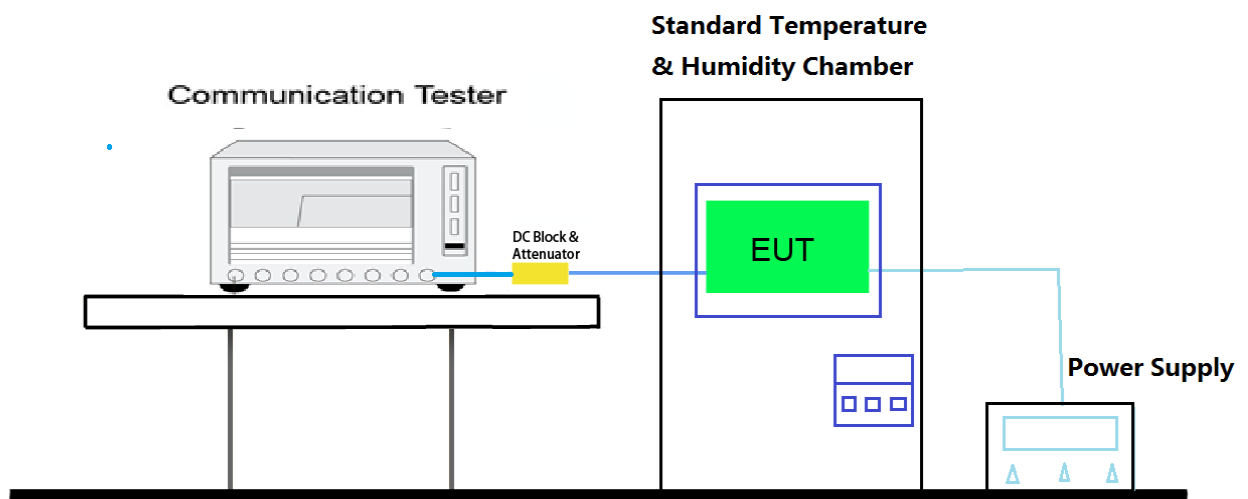
ANSI C63.26-2015 - Section 5.6

### 5.3.3 Frequency Stability Under Voltage Variations

Set chamber temperature to  $20^{\circ}\text{C}$ . Use a variable AC power supply / DC power source to power the EUT and set the voltage to rated voltage. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency.

Reduce the input voltage to specify extreme voltage variation ( $\pm 15\%$ ) and endpoint, record the maximum

### 5.3.4 Test Setup



### 5.3.5 Test Result

Refer to Appendix A.2

## 5.4. Transmitter Output Power Measurement

### 5.4.1 Test Limit

| Technology  | EIRP Power Limit |
|-------------|------------------|
| LTE Band 42 | 1W (30dBm)       |

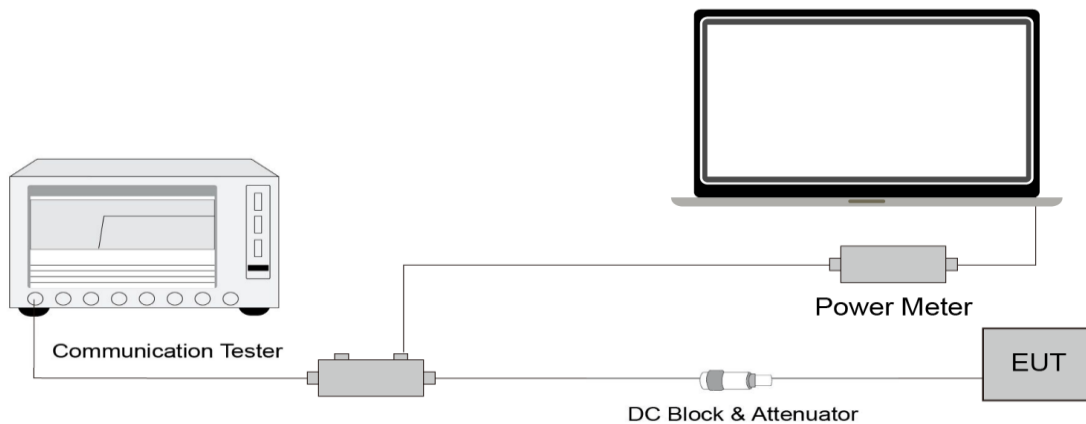
### 5.4.2 Test Procedure

ANSI C63.26-2015 - Section 5.2.4.2

### 5.4.3 Test Setting

Average power measurements were performed only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor. The power meter implemented triggering and gating capabilities which were set up such that power measurements were recorded only during the ON time of the transmitter.

### 5.4.4 Test Setup



### 5.4.5 Test Result

Refer to Appendix A.3

## 5.5. Peak-Average Ratio

### 5.5.1 Test Limit

The peak-to-average power ratio (PAPR) of the transmitter output power must not exceed 13 dB.

The PAPR measurements should be made using either an instrument with complementary cumulative distribution function (CCDF) capabilities to determine that PAPR will not exceed 13 dB for more than 0.1 percent of the time or other Commission approved procedure.

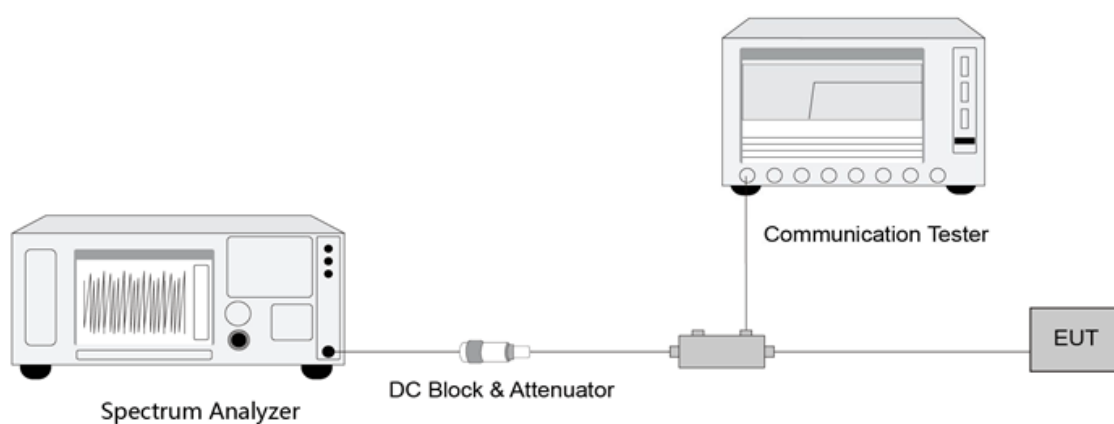
### 5.5.2 Test Procedure

ANSI C63.26-2015 - Section 5.2.3.4 (CCDF).

### 5.5.3 Test Setting

1. Set the 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 PARR level associated with a probability of 0.1%

### 5.5.4 Test Setup



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### 5.5.5 Test Result

Refer to Appendix A.4

## **5.6. Transmitter unwanted emissions (band-edge) Measurement**

### **5.6.1 Test Limit**

#### **For 27.53(n)(2)**

For mobile operations in the 3450-3550 MHz band, the conducted power of any emission outside the licensee's authorized bandwidth shall not exceed  $-13$  dBm/MHz. Compliance with this paragraph (n)(2) is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed, but limited to a maximum of 200 kHz. In the bands between 1 and 5 MHz removed from the licensee's frequency block, the minimum resolution bandwidth for the measurement shall be 500 kHz.

#### **For 27.53(i)(2)**

For mobile operations in the 3700-3980 MHz band, the conducted power of any emission outside the licensee's authorized bandwidth shall not exceed  $-13$  dBm/MHz. Compliance with this paragraph (l)(2) is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, the minimum resolution bandwidth for the measurement shall be either one percent of the emission bandwidth of the fundamental emission of the transmitter or 350 kHz. In the bands between 1 and 5 MHz removed from the licensee's frequency block, the minimum resolution bandwidth for the measurement shall be 500 kHz.

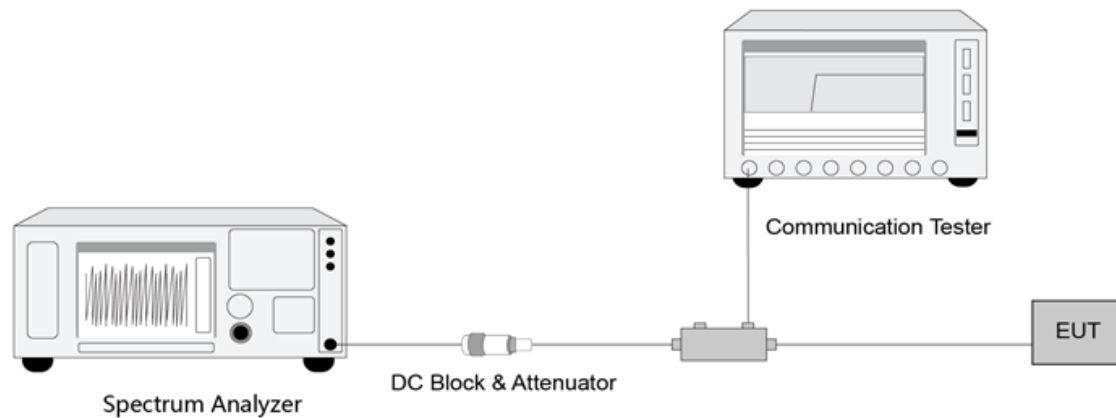
### **5.6.2 Test Procedure**

ANSI C63.26-2015 - Section 5.7.

### **5.6.3 Test Setting**

In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 100 kHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

#### 5.6.4 Test Setup



#### 5.6.4 Test Result

Refer to Appendix A.5

## **5.7. Transmitter unwanted emissions (spurious) Measurement**

### **5.7.1 Test Limit**

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th harmonic.

On any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least  $43 + 10 \log(P)$  dB. The emission limit equal to -13dBm.

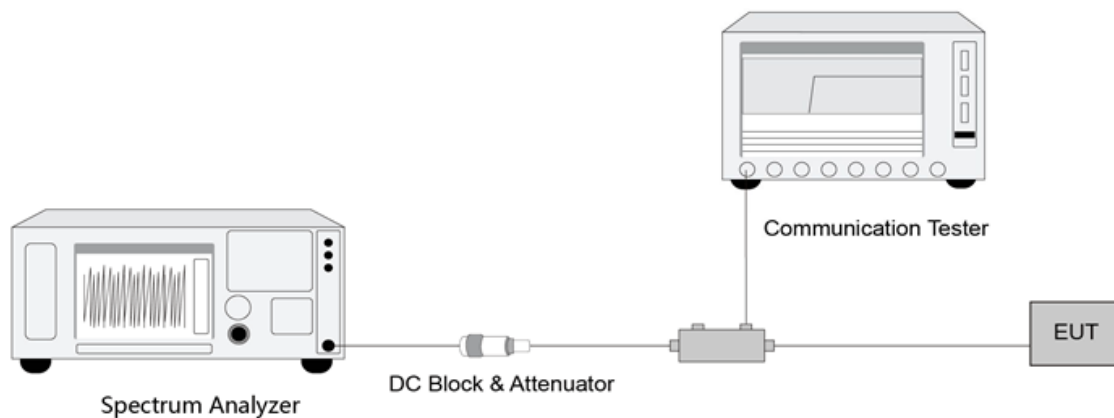
### **5.7.2 Test Procedure**

ANSI C63.26-2015 - Section 5.7

### 5.7.3 Test Setting

1. Set the analyzer frequency to low, Mid or high channel.
2. RBW = specified resolution bandwidth of 100 kHz is at or below 1GHz and 1MHz is above 1GHz
3. VBW  $\geq 3 \times$  RBW
4. Sweep time = auto
5. Detector = power averaging (rms)
6. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th harmonic.
7. Use the peak marker function to determine the maximum amplitude level.

### 5.7.4 Test Setup



### 5.7.5 Test Result

Refer to Appendix A.6

## 5.8. Radiated Spurious Emissions Measurement

### 5.8.1 Test Limit

On any frequency outside a licensee's frequency block, the power of any emission shall be attenuated below the transmitter power (P) by at least  $43 + 10 \log(P)$  dB. The emission limit equal to -13dBm.

### For For 96.41(e)(2)

The conducted power of emissions below 3540 MHz or above 3710 MHz shall not exceed -25 dBm/MHz, and the conducted power of emissions below 3530 MHz or above 3720 MHz shall not exceed -40dBm/MHz.

### 5.8.2 Test Procedure

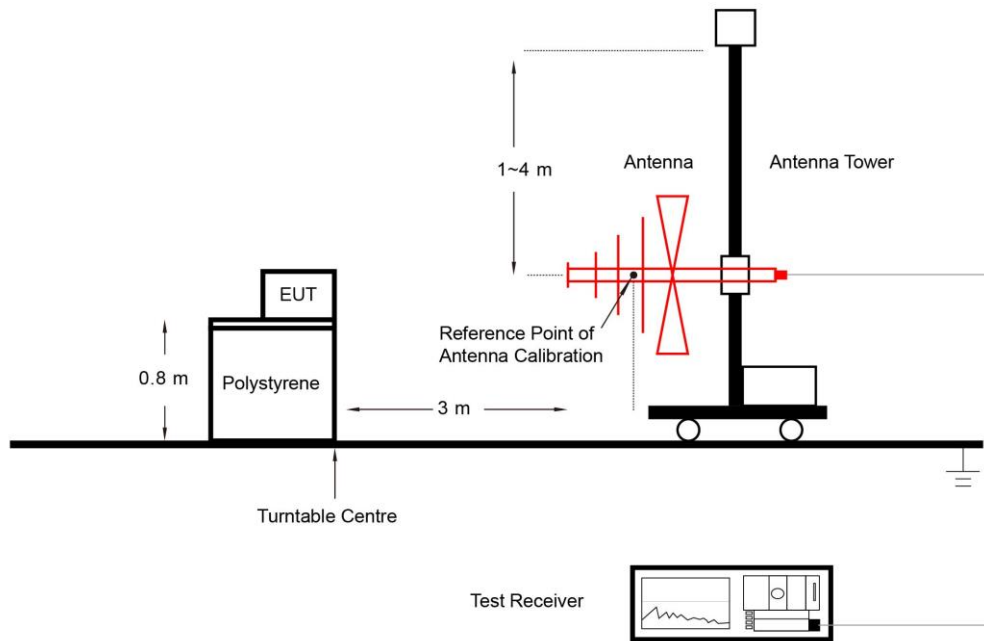
ANSI C63.26-2015 - Section 5.7

### 5.8.3 Test Setting

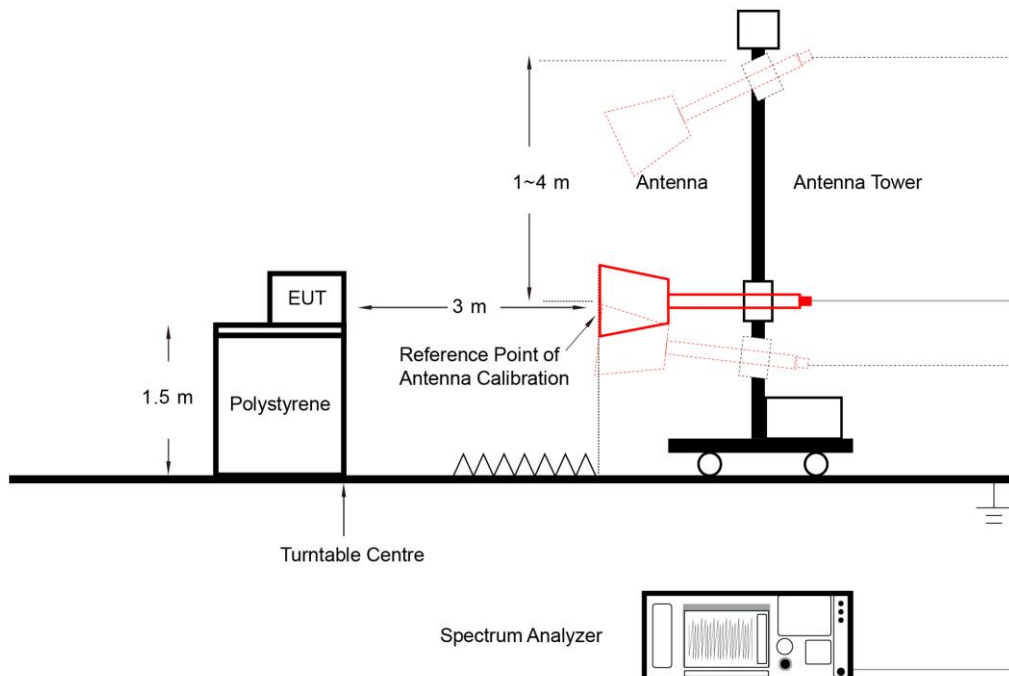
1. RBW = 120kHz or 1MHz
2. VBW  $\geq 3 \times$  RBW
3. Sweep time  $\geq 10 \times$  (number of points in sweep)  $\times$  (transmission symbol period)
4. Detector = CISPR quasi-peak / average detector (Below 1 GHz, compliance with the limits shall be demonstrated using a CISPR quasi-peak detector and the related measurement bandwidth. Above 1 GHz, compliance with the limits shall be demonstrated using a linear average detector with a minimum resolution bandwidth of 1 MHz.)
5. The trace was allowed to stabilize

### 5.8.4 Test Setup

Below 1GHz Test Setup:



Above 1GHz Test Setup:



### 5.8.5 Test Result

Refer to Appendix A.7.

## **Appendix A : TEST RESULT DATA**

### **A1. Occupied Bandwidth Test Result**

#### **A1.1 LTE B42**

Please refer to the original report Grant Date: 02/28/2025, FCC ID: HD5-CK67X1N.

## **A2. Frequency Stability Test Result**

### **A2.1 LTE Band 42**

Please refer to the original report Grant Date: 02/28/2025, FCC ID: HD5-CK67X1N.

### A3. Transmitter Output Power Test Result

#### A3.1 LTE B42 PC3 (3.45G~3.55G)

| LTE Band42 |           |        | Maximum Conducted Output Power (Channel / Frequency (MHz)) |       |        |       |       |       |        |       |        |       |       |       |
|------------|-----------|--------|------------------------------------------------------------|-------|--------|-------|-------|-------|--------|-------|--------|-------|-------|-------|
| Modulation | Bandwidth |        | 5MHz                                                       |       |        | 10MHz |       |       | 15MHz  |       |        | 20MHz |       |       |
|            | RB        | RB     | 42115                                                      | 42590 | 43065  | 42140 | 42590 | 43040 | 42165  | 42590 | 43015  | 42190 | 42590 | 42990 |
|            | No.       | Offset | 3452.5                                                     | 3500  | 3547.5 | 3455  | 3500  | 3545  | 3457.5 | 3500  | 3542.5 | 3460  | 3500  | 3540  |
| QPSK       | 1         | #0     | 24.39                                                      | 23.54 | 24.03  | 24.21 | 23.94 | 23.96 | 23.59  | 23.62 | 24.05  | 24.15 | 23.53 | 23.60 |
|            | 1         | #Mid   | 24.27                                                      | 24.13 | 24.39  | 24.15 | 24.11 | 23.87 | 23.81  | 23.72 | 23.74  | 23.80 | 23.56 | 23.75 |
|            | 1         | #High  | 24.27                                                      | 24.16 | 24.34  | 24.04 | 24.01 | 24.12 | 23.84  | 23.90 | 23.50  | 24.09 | 23.61 | 23.47 |
|            | 50%       | #0     | 23.06                                                      | 22.69 | 23.03  | 23.03 | 22.89 | 22.74 | 22.78  | 22.54 | 22.61  | 23.00 | 22.41 | 22.76 |
|            | 50%       | #Mid   | 23.15                                                      | 22.98 | 22.89  | 23.04 | 22.92 | 23.12 | 22.90  | 22.68 | 22.68  | 22.76 | 22.52 | 22.68 |
|            | 50%       | #High  | 23.09                                                      | 22.88 | 23.11  | 22.97 | 22.74 | 23.16 | 22.80  | 22.55 | 22.88  | 22.69 | 22.70 | 22.79 |
|            | 100%      | #0     | 23.32                                                      | 22.85 | 22.99  | 23.25 | 22.83 | 23.02 | 23.01  | 22.48 | 22.70  | 22.69 | 22.67 | 22.82 |
| 16QAM      | 1         | #0     | 23.44                                                      | 22.65 | 22.98  | 22.99 | 22.83 | 22.94 | 22.14  | 22.58 | 23.18  | 22.67 | 22.60 | 22.36 |
|            | 1         | #Mid   | 23.58                                                      | 22.83 | 23.18  | 23.48 | 22.47 | 22.79 | 22.88  | 22.48 | 22.94  | 23.18 | 22.57 | 22.36 |
|            | 1         | #High  | 23.58                                                      | 23.03 | 22.80  | 22.75 | 22.50 | 22.64 | 22.84  | 22.68 | 23.14  | 22.88 | 22.76 | 22.34 |
|            | 50%       | #0     | 22.32                                                      | 21.72 | 21.91  | 22.00 | 21.85 | 21.77 | 21.75  | 21.57 | 21.73  | 21.80 | 21.43 | 21.76 |
|            | 50%       | #Mid   | 22.29                                                      | 21.74 | 21.76  | 22.19 | 21.93 | 22.02 | 21.86  | 21.72 | 21.84  | 22.00 | 21.77 | 21.90 |
|            | 50%       | #High  | 22.03                                                      | 21.91 | 22.17  | 22.02 | 21.83 | 22.07 | 21.86  | 21.71 | 21.61  | 21.74 | 21.63 | 21.75 |
|            | 100%      | #0     | 22.06                                                      | 21.90 | 21.78  | 22.03 | 21.78 | 22.09 | 22.05  | 21.60 | 21.72  | 21.67 | 21.36 | 21.80 |
| 64QAM      | 1         | #0     | 21.83                                                      | 21.20 | 21.96  | 22.01 | 21.26 | 21.52 | 22.00  | 21.60 | 21.66  | 21.58 | 21.77 | 21.46 |
|            | 1         | #Mid   | 21.88                                                      | 21.64 | 22.11  | 22.03 | 21.43 | 21.32 | 21.89  | 21.65 | 21.27  | 22.17 | 21.40 | 21.93 |
|            | 1         | #High  | 22.11                                                      | 21.65 | 22.03  | 22.27 | 22.19 | 21.82 | 22.16  | 21.38 | 21.13  | 21.64 | 21.54 | 21.90 |
|            | 50%       | #0     | 21.13                                                      | 21.13 | 21.09  | 21.22 | 21.01 | 20.73 | 20.90  | 20.68 | 20.68  | 20.74 | 20.45 | 20.67 |
|            | 50%       | #Mid   | 21.07                                                      | 20.81 | 20.99  | 21.06 | 20.89 | 21.05 | 21.00  | 20.47 | 20.65  | 20.70 | 20.63 | 20.86 |
|            | 50%       | #High  | 21.07                                                      | 20.57 | 20.97  | 20.96 | 20.82 | 20.83 | 21.02  | 20.48 | 20.66  | 20.67 | 20.41 | 20.81 |
|            | 100%      | #0     | 21.10                                                      | 20.75 | 21.09  | 21.15 | 20.58 | 20.81 | 20.71  | 20.79 | 20.64  | 20.71 | 20.76 | 20.60 |
| 256QAM     | 1         | #0     | 18.94                                                      | 19.23 | 19.37  | 18.95 | 18.59 | 19.12 | 19.20  | 18.65 | 18.71  | 18.94 | 18.86 | 18.78 |
|            | 1         | #Mid   | 19.77                                                      | 19.17 | 19.29  | 19.13 | 19.17 | 18.93 | 19.34  | 18.41 | 18.84  | 19.05 | 18.43 | 18.67 |
|            | 1         | #High  | 18.99                                                      | 18.36 | 19.26  | 19.71 | 18.63 | 18.99 | 18.20  | 19.02 | 18.66  | 19.19 | 18.70 | 18.57 |
|            | 50%       | #0     | 19.29                                                      | 18.71 | 19.01  | 19.17 | 18.98 | 19.06 | 19.08  | 18.53 | 18.80  | 18.92 | 18.67 | 18.84 |
|            | 50%       | #Mid   | 19.14                                                      | 18.87 | 19.26  | 19.23 | 18.83 | 19.03 | 19.00  | 18.64 | 18.88  | 18.99 | 18.77 | 18.76 |
|            | 50%       | #High  | 19.22                                                      | 18.95 | 19.15  | 19.17 | 18.85 | 18.98 | 18.97  | 18.70 | 18.86  | 19.05 | 18.77 | 18.74 |
|            | 100%      | #0     | 19.33                                                      | 19.03 | 18.93  | 19.07 | 18.80 | 18.98 | 18.98  | 18.70 | 18.87  | 18.99 | 18.68 | 18.89 |

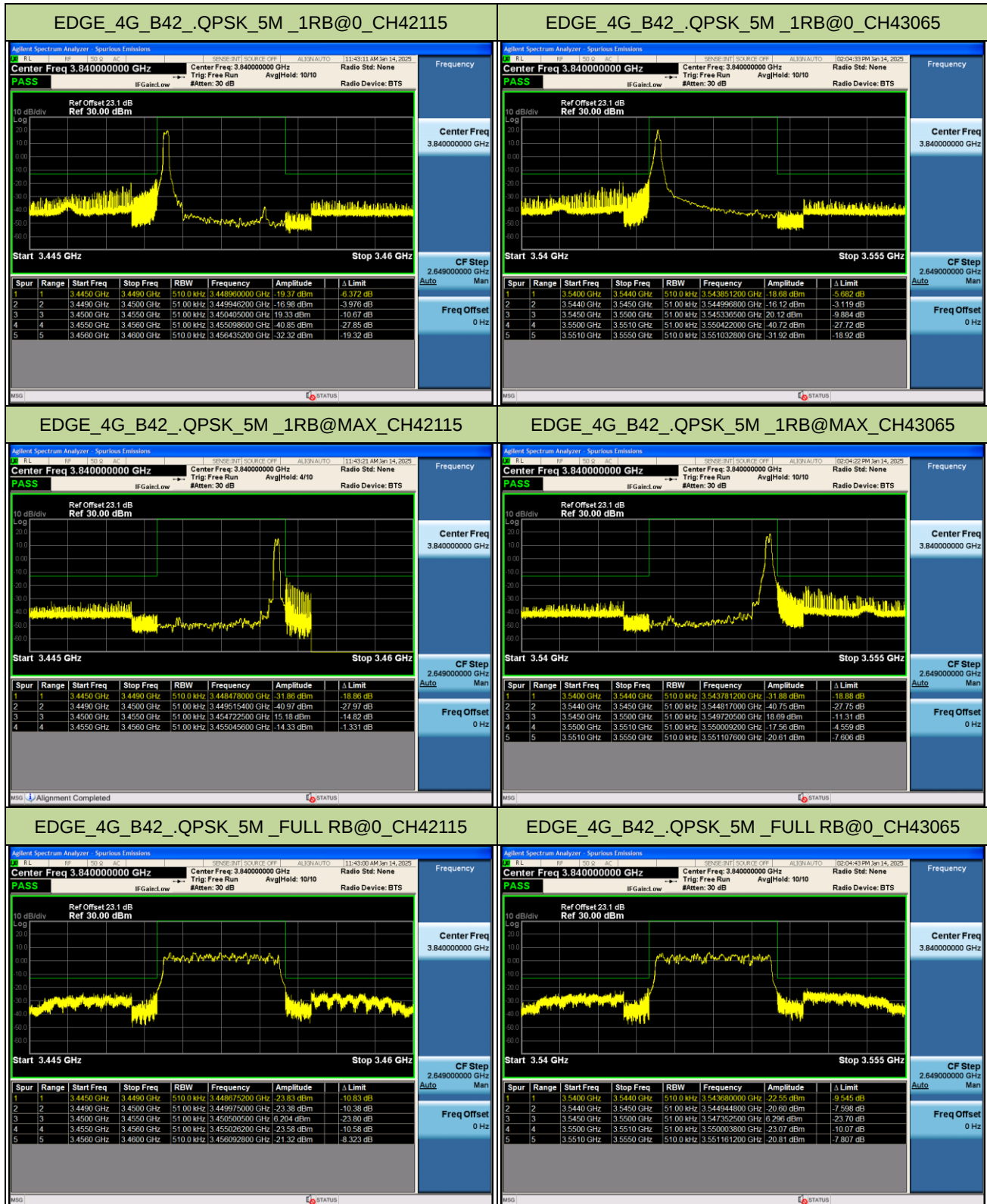
## **A4. Peak to Average Radio Test Result**

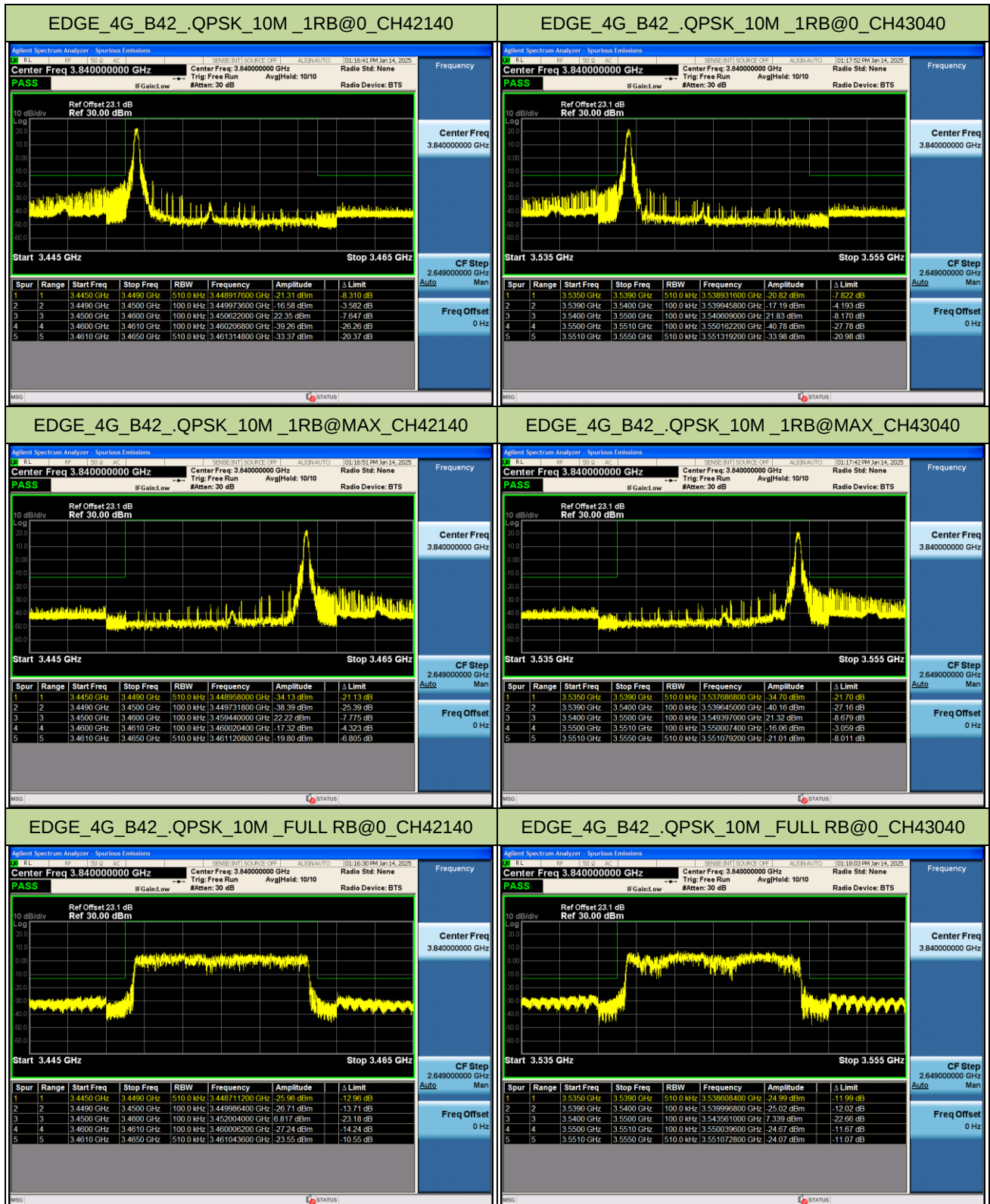
### **A4.1 LTE Band42**

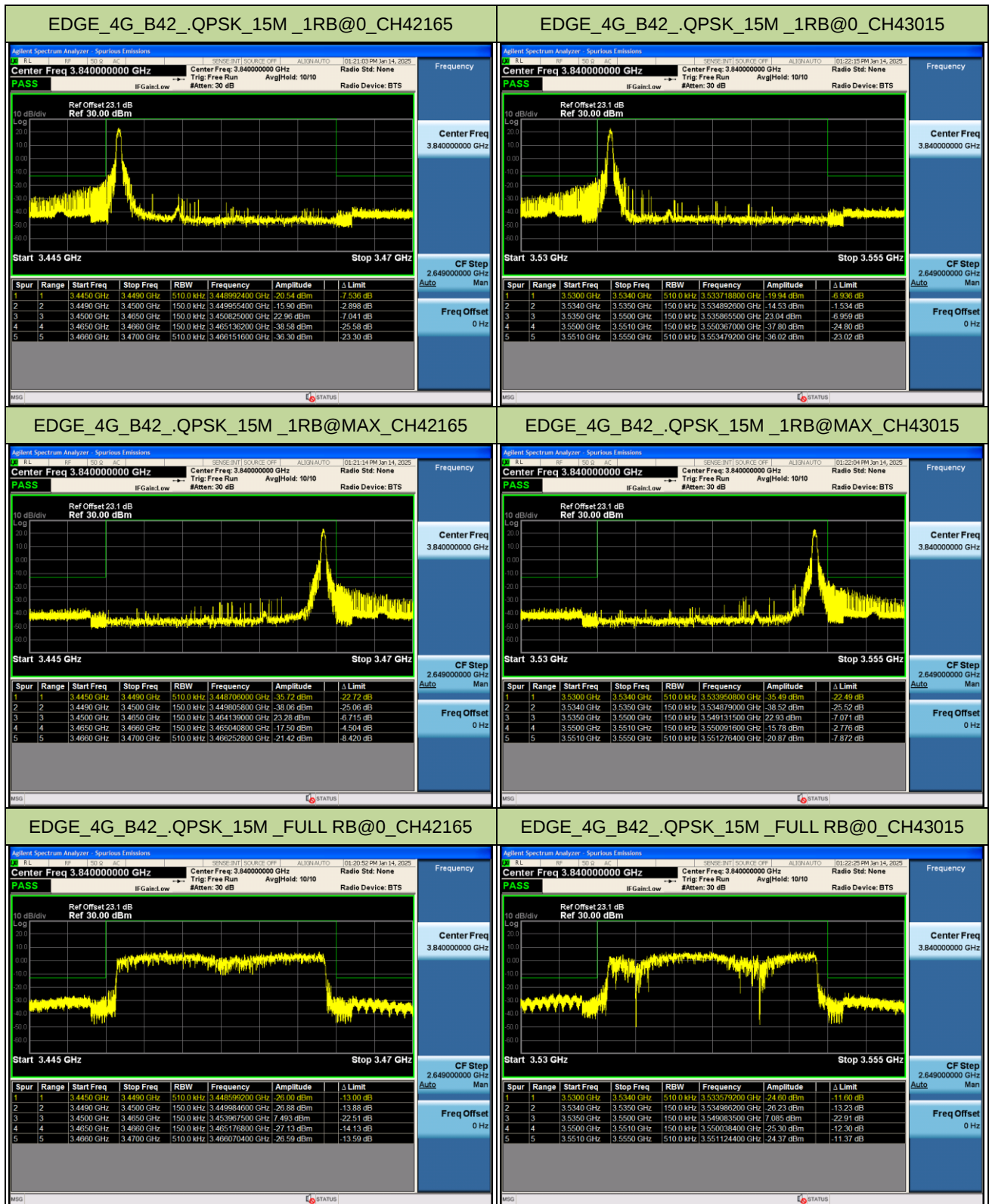
Please refer to the original report Grant Date: 02/28/2025, FCC ID: HD5-CK67X1N.

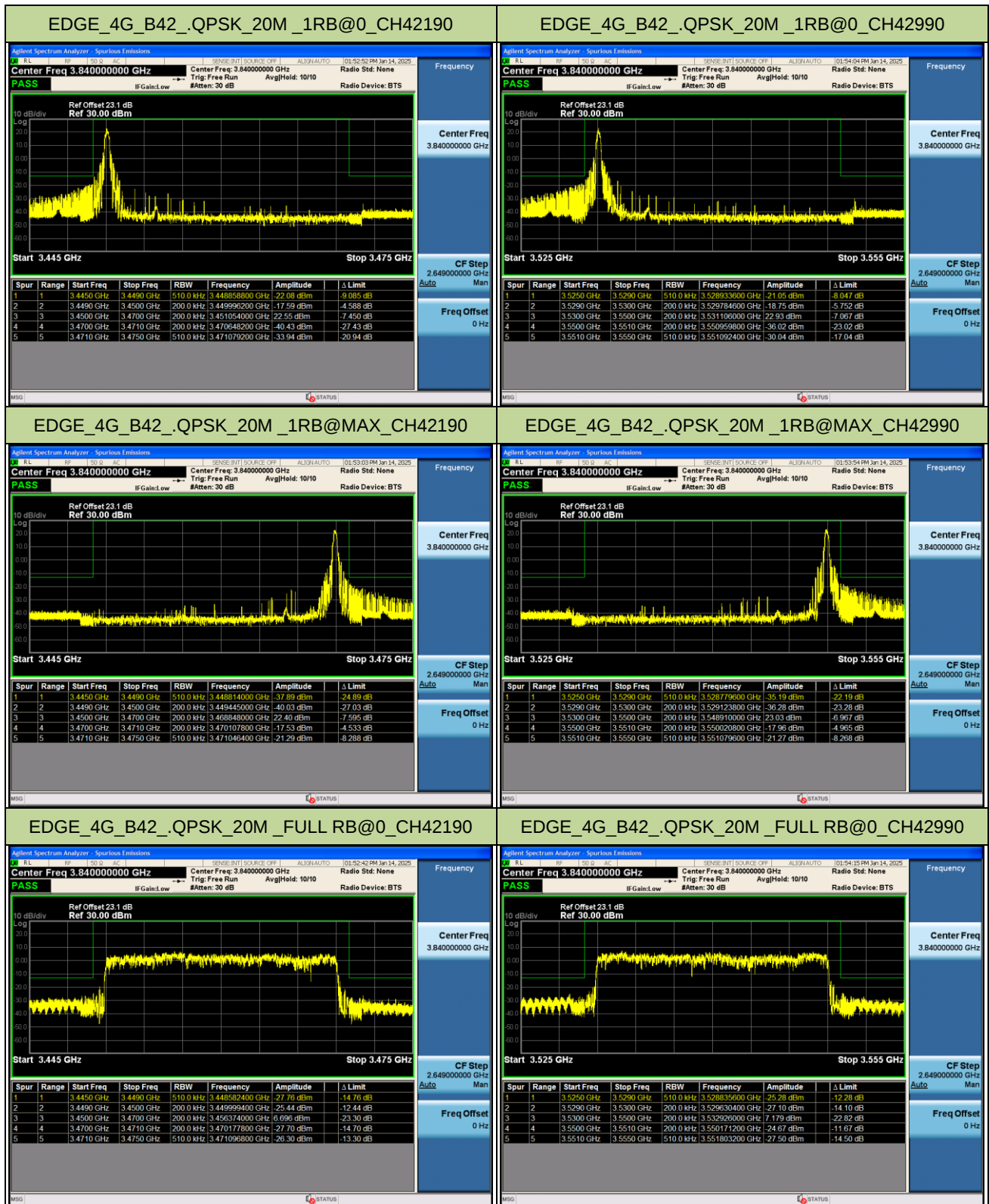
## A5. Transmitter unwanted emissions (band-edge) Test Result

### A5.1 LTE B42 PC3 (3.45G~3.55G)









## A6. Transmitter unwanted emissions (spurious) Test Result

### A6.1 LTE B42 PC3 (3.45G~3.55G)

