



Canada

# EMC Test Report for DOT 2274 B25B66 (KRY 901 468/1) and DOT 2284 B25B66 (KRY 901 468/2)

**Tested to: FCC Part 15 Subpart B / ICES 003**

**FCC Part 24** (Section 24.238(a))

**FCC Part 27** (Section - 27.53(h))

**RSS-Gen** (Section 7.0)

**RSS-133** (Section 6.5)

**RSS-139** (Section 6.6)

**RSS-170** (Section 5.4)

## Test Result summary

| FCC/ICES/<br>RSS Section | Description                           | Specification/Method                | Pass<br>or<br>Fail | Results<br>in<br>section |
|--------------------------|---------------------------------------|-------------------------------------|--------------------|--------------------------|
| 15.109 / 6.2             | Radiated Emissions (RE)               | FCC Part 15 / ICES 003 / ANSI C63.4 | Pass               | 3.2                      |
| 7.0                      | Receiver Emissions Limits             | RSS-Gen / ANSI C63.4                | Pass               | 3.2                      |
| 15.107 / 6.1             | Conducted Emissions (CE) for AC Power | FCC Part 15 / ICES 003 / ANSI C63.4 | Not applicable     |                          |
| 27.53(h)                 | Transmitter Spurious Emissions (RE)   | FCC Part 27 / ANSI C63.26           | Pass               | 3.2                      |
| 24.238(a)                | Out of band Emissions (RE)            | FCC Part 24 / ANSI C63.26           | Pass               | 3.2                      |
| RSS-133 / 6.5            | Transmitter unwanted Emissions        | RSS-133 / ANSI C63.26               | Pass               | 3.2                      |
| RSS-139 / 6.6            | Transmitter unwanted Emissions        | RSS-139 / ANSI C63.26               | Pass               | 3.2                      |
| RSS-170 / 5.4            | Transmitter unwanted Emissions        | RSS-170 / ANSI C63.26               | Pass               | 3.2                      |

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## Table of contents

|                                                                                       |           |
|---------------------------------------------------------------------------------------|-----------|
| <b>About this document.....</b>                                                       | <b>2</b>  |
| <b>1. Executive summary.....</b>                                                      | <b>8</b>  |
| 1.1 Compliance summary .....                                                          | 9         |
| <b>2. Details of the equipment under test.....</b>                                    | <b>11</b> |
| 2.1 Assessed hardware .....                                                           | 11        |
| 2.2 Product overview .....                                                            | 11        |
| 2.3 Clocks, oscillators, or switching frequencies.....                                | 13        |
| 2.4 Product port definition and EUT cable information .....                           | 13        |
| 2.5 Configurations of the EUT.....                                                    | 14        |
| 2.5.1 Radiated Emissions Single RAT / Single Carrier Configurations (WCDMA) .....     | 15        |
| 2.5.2 Radiated Emissions Single RAT / Single Carrier Configurations (LTE) .....       | 16        |
| 2.5.3 Radiated Emissions Single RAT / Single Carrier Configurations (NR).....         | 17        |
| 2.5.4 Radiated Emissions Single RAT / Multi Carriers Configurations (WCDMA) .....     | 18        |
| 2.5.5 Radiated Emissions Multi RAT/Carrier Configuration (LTE+WCDMA & LTE+NR).....    | 19        |
| 2.6 Modifications of the EUT during testing.....                                      | 20        |
| 2.7 Inventory of the EUT and support equipments.....                                  | 20        |
| <b>3. Detailed test results of Emissions.....</b>                                     | <b>21</b> |
| 3.1 Measurement instrumentation.....                                                  | 21        |
| 3.2 Radiated Emissions, E-field (RE).....                                             | 22        |
| 3.2.1 Test specification and limits .....                                             | 22        |
| 3.2.2 Test procedure.....                                                             | 23        |
| 3.2.3 Calculation of the compliance margin .....                                      | 24        |
| 3.2.4 Measurement uncertainties .....                                                 | 25        |
| 3.2.5 Test results of RE (Single RAT/Single carrier, WCDMA - Bottom channel).....     | 26        |
| 3.2.6 Test results of RE (Single RAT/Single carrier, WCDMA - Middle channel) .....    | 31        |
| 3.2.7 Test results of RE (Single RAT/Single carrier, WCDMA - Top channel) .....       | 36        |
| 3.2.8 Test results of RE (Single RAT/Single carrier, LTE 5MHz - Middle channel) ..... | 41        |
| 3.2.9 Test results of RE (Single RAT/Single carrier, NR 5 MHz - Middle channel) ..... | 46        |
| 3.2.10 Test results of RE (Single RAT/Multi carrier, WCDMA - Middle channel) .....    | 51        |
| 3.2.11 Test results of RE (Multi RAT/Carrier, MR1, LTE+WCDMA & LTE+NR - Mid channel)  | 56        |
| 3.2.12 Radiated Emissions test setup pictures .....                                   | 61        |
| 3.2.13 Test equipment.....                                                            | 64        |
| 3.2.14 Test conclusion .....                                                          | 64        |
| <b>4. References .....</b>                                                            | <b>65</b> |
| 4.1 Appendix A: Abbreviations .....                                                   | 66        |

## List of figures

|                                                                                 |    |
|---------------------------------------------------------------------------------|----|
| Figure 1: The EUT with External antenna (DOT 2284) .....                        | 11 |
| Figure 2: Test configuration for Emission tests .....                           | 14 |
| Figure 3: Tested carrier detail – Single RAT /Single carrier (WCDMA).....       | 15 |
| Figure 4: Tested carrier detail – Single RAT / Single carrier (LTE) .....       | 16 |
| Figure 5: Tested carrier detail – Single RAT / Single carrier (NR).....         | 17 |
| Figure 6: Tested carrier detail – Single RAT / Multi carrier (WCDMA) .....      | 18 |
| Figure 7: Tested carrier detail – MultiCarrier / Multi RAT Configuration .....  | 19 |
| Figure 8: Setup of Radiated Emissions .....                                     | 24 |
| Figure 9: Plot of RE at 3 m – 30 to1000 MHz (WCDMA – Bot channel) .....         | 27 |
| Figure 10: Plot of RE at 3m from 1 to 10GHz (WCDMA – Bot channel) .....         | 28 |
| Figure 11: Plot of RE at 3m from 10 to 18 GHz (WCDMA – Bot channel) .....       | 29 |
| Figure 12: Plot of RE at 1m from 18 to 26.5 GHz (WCDMA – Bot channel) .....     | 30 |
| Figure 13: Plot of RE at 3 m – 30 to1000 MHz (WCDMA – Mid channel) .....        | 32 |
| Figure 14: Plot of RE at 3m from 1 to 10GHz (WCDMA – Mid channel) .....         | 33 |
| Figure 15: Plot of RE at 3m from 10 to 18 GHz (WCDMA – Mid channel) .....       | 34 |
| Figure 16: Plot of RE at 1m from 18 to 26.5 GHz (WCDMA – Mid channel) .....     | 35 |
| Figure 17: Plot of RE at 3 m – 30 to1000 MHz (WCDMA – Top channel) .....        | 37 |
| Figure 18: Plot of RE at 3m from 1 to 10GHz (WCDMA – Top channel) .....         | 38 |
| Figure 19: Plot of RE at 3m from 10 to 18 GHz (WCDMA – Top channel) .....       | 39 |
| Figure 20: Plot of RE at 1m from 18 to 26.5 GHz (WCDMA – Top channel) .....     | 40 |
| Figure 21: Plot of RE at 3 m – 30 to1000 MHz (LTE 5M – Mid channel) .....       | 42 |
| Figure 22: Plot of RE at 3m from 1 to 10GHz (LTE 5M – Mid channel) .....        | 43 |
| Figure 23: Plot of RE at 3m from 10 to 18 GHz (LTE 5M – Mid channel) .....      | 44 |
| Figure 24: Plot of RE at 1m from 18 to 26.5 GHz (LTE 5M – Mid channel) .....    | 45 |
| Figure 25: Plot of RE at 3 m – 30 to1000 MHz (NR 5MHz – Mid channel) .....      | 47 |
| Figure 26: Plot of RE at 3m from 1 to 10GHz (NR 5MHz – Mid channel) .....       | 48 |
| Figure 27: Plot of RE at 3m from 10 to 18 GHz (NR 5MHz – Mid channel) .....     | 49 |
| Figure 28: Plot of RE at 1m from 18 to 26.5 GHz (NR 5MHz – Mid channel) .....   | 50 |
| Figure 29: Plot of RE at 3 m – 30 to1000 MHz (MC1, WCDMA - Mid channel).....    | 52 |
| Figure 30: Plot of RE at 3m from 1 to 10GHz (MC1, WCDMA - Mid channel).....     | 53 |
| Figure 31: Plot of RE at 3m from 10 to 18 GHz (MC1, WCDMA - Mid channel).....   | 54 |
| Figure 32: Plot of RE at 1m from 18 to 26.5 GHz (MC1, WCDMA - Mid channel)..... | 55 |
| Figure 33: Plot of RE at 1m from 26.5 to 40 GHz (MC1, WCDMA - Mid channel)..... | 55 |
| Figure 34: Plot of RE at 3 m – 30 to1000 MHz (MR1 - Mid channel) .....          | 57 |
| Figure 35: Plot of RE at 3m from 1 to 10GHz (MR1 - Mid channel) .....           | 58 |
| Figure 36: Plot of RE at 3m from 10 to 18 GHz (MR1 - Mid channel) .....         | 59 |

|                                                                           |    |
|---------------------------------------------------------------------------|----|
| Figure 37: Plot of RE at 1m from 18 to 26.5 GHz (MR1 - Mid channel) ..... | 60 |
| Figure 38: EUT Setup for RE tests (Closeup) .....                         | 61 |
| Figure 39: EUT Setup for RE tests at 30 MHz to 1 GHz .....                | 62 |
| Figure 40: EUT Setup for RE tests for above 1 GHz .....                   | 63 |

## List of tables

|                                                                                             |    |
|---------------------------------------------------------------------------------------------|----|
| Table 1: Summary of test results for the USA; FCC Part 15 subpart B .....                   | 9  |
| Table 2: Summary of test results for the USA; FCC Part 24, Section 24.238 (a) .....         | 9  |
| Table 3: Summary of test results for the USA; FCC Part 27 subpart C .....                   | 9  |
| Table 4: Summary of test results for Canada; ICES-003.....                                  | 9  |
| Table 5: Summary of test results for RSS-Gen, Section 7.0.....                              | 10 |
| Table 6: Summary of test results for Canada, RSS-133 .....                                  | 10 |
| Table 7: Summary of test results for Canada, RSS-139 .....                                  | 10 |
| Table 8: Summary of test results for Canada, RSS-170 .....                                  | 10 |
| Table 9: Assessed hardware.....                                                             | 11 |
| Table 10: Product specifications – Tested DOT 2284 .....                                    | 12 |
| Table 11: EUT fundamental frequencies .....                                                 | 13 |
| Table 12: System port definition.....                                                       | 13 |
| Table 13: Inventory of the EUT (RE & CE tests).....                                         | 20 |
| Table 14: RE test requirements .....                                                        | 22 |
| Table 15: RE limits at 10 m for Class B of FCC Part 15, ICES 003 & RSS-Gen.....             | 22 |
| Table 16: Tx unwanted Emissions limits for FCC Part 24, Part 27, RSS-133 & RSS-139.....     | 22 |
| Table 17: Tx unwanted Emission limits for RSS-170 .....                                     | 23 |
| Table 18: RE test results from 30 to 1000 MHz for FCC Part 15 (WCDMA – Bot channel).....    | 27 |
| Table 19: RE test results from 30 to 1000 MHz for FCC Part 24/27 (WCDMA – Bot channel)..... | 27 |
| Table 20: RE test results from 1 to 10 GHz for FCC Part 15 (WCDMA – Bot channel) .....      | 28 |
| Table 21: RE test results from 1 to 10 GHz for Part 24/27 (WCDMA – Bot channel).....        | 28 |
| Table 22: RE test results from 10 to 18 GHz for FCC Part 15 (WCDMA – Bot channel) .....     | 29 |
| Table 23: RE test results from 10 to 18 GHz for Part 24/27 (WCDMA – Bot channel).....       | 29 |
| Table 24: RE test results from 30 to 1000 MHz for FCC Part 15 (WCDMA – Mid channel).....    | 32 |
| Table 25: RE test results from 30 to 1000 MHz for FCC Part 24/27 (WCDMA – Mid channel)..... | 32 |
| Table 26: RE test results from 1 to 10 GHz for FCC Part 15 (WCDMA – Mid channel).....       | 33 |
| Table 27: RE test results from 1 to 10 GHz for Part 24/27 (WCDMA – Mid channel).....        | 33 |
| Table 28: RE test results from 10 to 18 GHz for FCC Part 15 (WCDMA – Mid channel).....      | 34 |
| Table 29: RE test results from 10 to 18 GHz for Part 24/27 (WCDMA – Mid channel).....       | 34 |
| Table 30: RE test results from 30 to 1000 MHz for FCC Part 15 (WCDMA – Top channel) .....   | 37 |

|                                                                                                |    |
|------------------------------------------------------------------------------------------------|----|
| Table 31: RE test results from 30 to 1000 MHz for FCC Part 24/27 (WCDMA – Top channel) .....   | 37 |
| Table 32: RE test results from 1 to 10 GHz for FCC Part 15 (WCDMA – Top channel) .....         | 38 |
| Table 33: RE test results from 1 to 10 GHz for Part 24/27 (WCDMA – Top channel) .....          | 38 |
| Table 34: RE test results from 10 to 18 GHz for FCC Part 15 (WCDMA – Top channel) .....        | 39 |
| Table 35: RE test results from 10 to 18 GHz for Part 24/27 (WCDMA – Top channel) .....         | 39 |
| Table 36: RE test results from 30 to 1000 MHz for FCC Part 15 (LTE 5M – Mid channel) .....     | 42 |
| Table 37: RE test results from 30 to 1000 MHz for FCC Part 24/27 (LTE 5M – Mid channel) .....  | 42 |
| Table 38: RE test results from 1 to 10 GHz for FCC Part 15 (LTE 5M – Mid channel) .....        | 43 |
| Table 39: RE test results from 1 to 10 GHz for Part 24/27 (LTE 5M – Mid channel) .....         | 43 |
| Table 40: RE test results from 10 to 18 GHz for FCC Part 15 (LTE 5M – Mid channel) .....       | 44 |
| Table 41: RE test results from 10 to 18 GHz for Part 24/27 (LTE 5M – Mid channel) .....        | 44 |
| Table 42: RE test results from 30 to 1000 MHz for FCC Part 15 (NR 5MHz – Mid channel) .....    | 47 |
| Table 43: RE test results from 30 to 1000 MHz for FCC Part 24/27 (NR 5MHz – Mid channel) ..... | 47 |
| Table 44: RE test results from 1 to 10 GHz for FCC Part 15 (NR 5MHz – Mid channel) .....       | 48 |
| Table 45: RE test results from 1 to 10 GHz for Part 24/27 (NR 5MHz – Mid channel) .....        | 48 |
| Table 46: RE test results from 10 to 18 GHz for FCC Part 15 (NR 5MHz – Mid channel) .....      | 49 |
| Table 47: RE test results from 10 to 18 GHz for Part 24/27 (NR 5MHz – Mid channel) .....       | 49 |
| Table 48: RE test results from 30 to 1000 MHz for FCC Part 15 (MC1, WCDMA - Mid channel) ..... | 52 |
| Table 49: RE test results from 30 to 1000 MHz for FCC Part 24/27 (MC1, WCDMA - Mid channel) .. | 52 |
| Table 50: RE test results from 1 to 10 GHz for FCC Part 15 (MC1, WCDMA - Mid channel) .....    | 53 |
| Table 51: RE test results from 1 to 10 GHz for Part 24/27 (MC1, WCDMA - Mid channel) .....     | 53 |
| Table 52: RE test results from 10 to 18 GHz for FCC Part 15 (MC1, WCDMA - Mid channel) .....   | 54 |
| Table 53: RE test results from 10 to 18 GHz for Part 24/27 (MC1, WCDMA - Mid channel) .....    | 54 |
| Table 54: RE test results from 30 to 1000 MHz for FCC Part 15 (MR1 - Mid channel) .....        | 57 |
| Table 55: RE test results from 30 to 1000 MHz for FCC Part 24/27 (MR1 - Mid channel) .....     | 57 |
| Table 56: RE test results from 1 to 10 GHz for FCC Part 15 (MR1 - Mid channel) .....           | 58 |
| Table 57: RE test results from 1 to 10 GHz for Part 24/27 (MR1 - Mid channel) .....            | 58 |
| Table 58: RE test results from 10 to 18 GHz for FCC Part 15 (MR1 - Mid channel) .....          | 59 |
| Table 59: RE test results from 10 to 18 GHz for Part 24/27 (MR1 - Mid channel) .....           | 59 |
| Table 60: Test equipment used for RE .....                                                     | 64 |



# 1. Executive summary

This document reports the Electromagnetic Compatibility (EMC) testing performed on the product called DOT 2274 B25B66 (KRY 901 468/1) and DOT 2284 B25B66 (KRY 901 468/2) for Ericsson Canada per project number 7169008619. The objective of the test activities is to evaluate compliance of the product to following EMC regulatory standards.

The DOT 2274 B25B66 (KRY 901 468/1) and DOT 2284 B25B66 (KRY 901 468/2) is verified to comply with the Emissions requirements of these standards:

- FCC Part 15 Subpart B [5] (Class B)
- FCC Part 24 [7] (Emissions Limitations for broadband PCS equipment, Section 24.238(a))
- FCC Part 27 [8] (Digital Base Stations, Section - 27.53(h))
- ICES 003 [9] (Class B)
- RSS-Gen [13] (Receiver emissions Limits, Section 7.0)
- RSS-133 [10] (Transmitter unwanted Emissions, Section 6.5)
- RSS-139 [11] (Transmitter unwanted Emissions, Section 6.6)
- RSS-170 [12] (Transmitter unwanted Emissions, Section 5.4)

Information about the test result summary and, the equipment under test (EUT) is in the sections:

- [Compliance summary](#)
- [Details of the equipment under test](#)
- [Detailed test results of Emissions](#)



## 1.1 Compliance summary

The test results in this report apply only to the tested components that are identified in the section [Assessed hardware](#).

The following table summarizes the EMC test results for the test cases performed on the DOT 2274 B25B66 (KRY 901 468/1) and DOT 2284 B25B66 (KRY 901 468/2)

**Table 1: Summary of test results for the USA; FCC Part 15 subpart B**

| FCC Section | Description                           | Specification/Method   | Pass or Fail                         | Results in section |
|-------------|---------------------------------------|------------------------|--------------------------------------|--------------------|
| 15.109      | Radiated Emissions (RE)               | FCC Part 15/ANSI C63.4 | Pass                                 | 3.2                |
| 15.107      | Conducted Emissions (CE) for AC Power | FCC Part 15/ANSI C63.4 | Not applicable<br>EUT is POE powered |                    |

**Table 2: Summary of test results for the USA; FCC Part 24, Section 24.238 (a)**

| FCC Section | Description                                                               | Specification/Method     | Pass or Fail | Results in section |
|-------------|---------------------------------------------------------------------------|--------------------------|--------------|--------------------|
| 24.238 (a)  | Emissions Limitations for Broadband PCS equipment – Out of band emissions | FCC Part 24/ ANSI C63.26 | Pass         | 3.2                |

**Table 3: Summary of test results for the USA; FCC Part 27 subpart C**

| FCC Section | Description         | Specification/Method     | Pass or Fail | Results in section |
|-------------|---------------------|--------------------------|--------------|--------------------|
| 27.53(h)    | AWS emission limits | FCC Part 27/ ANSI C63.26 | Pass         | 3.2                |

**Table 4: Summary of test results for Canada; ICES-003**

| ICES Section | Description                           | Specification/Method | Pass or Fail                         | Results in section |
|--------------|---------------------------------------|----------------------|--------------------------------------|--------------------|
| 6.2          | Radiated Emissions (RE)               | ICES 003/ANSI C63.4  | Pass                                 | 3.2                |
| 6.1          | Conducted Emissions (CE) for AC Power | ICES 003/ANSI C63.4  | Not applicable<br>EUT is POE powered |                    |



**Table 5: Summary of test results for RSS-Gen, Section 7.0**

| RSS-Gen Section | Description                           | Specification/Method                                           | Pass or Fail                         | Results in section |
|-----------------|---------------------------------------|----------------------------------------------------------------|--------------------------------------|--------------------|
| 7.3             | Receiver Radiated Emissions           | RSS-Gen / ANSI C63.4                                           | Pass                                 | 3.2                |
| 7.2             | Conducted Emissions (CE) for AC Power | RSS-Gen / ANSI C63.4                                           | Not applicable<br>EUT is POE powered |                    |
| 7.4             | Receiver Conducted Emissions          | See antenna port conducted emissions in applicable test report |                                      |                    |

**Table 6: Summary of test results for Canada, RSS-133**

| RSS-133 Section | Description                    | Specification/Method  | Pass or Fail | Results in section |
|-----------------|--------------------------------|-----------------------|--------------|--------------------|
| 6.5             | Transmitter unwanted Emissions | RSS-133 / ANSI C63.26 | Pass         | 3.2                |

**Table 7: Summary of test results for Canada, RSS-139**

| RSS-139 Section | Description                    | Specification/Method  | Pass or Fail | Results in section |
|-----------------|--------------------------------|-----------------------|--------------|--------------------|
| 6.6             | Transmitter unwanted Emissions | RSS-139 / ANSI C63.26 | Pass         | 3.2                |

**Table 8: Summary of test results for Canada, RSS-170**

| RSS-170 Section | Description                    | Specification/Method  | Pass or Fail | Results in section |
|-----------------|--------------------------------|-----------------------|--------------|--------------------|
| 5.4             | Transmitter unwanted Emissions | RSS-170 / ANSI C63.26 | Pass         | 3.2                |

## 2. Details of the equipment under test

This section describes the equipment under test (EUT).

### 2.1 Assessed hardware

The following table indicates the hardware components that were assessed during this test program.

**Table 9: Assessed hardware**

| Hardware component <sup>1</sup>                                                                                                                                                                                            | Part number   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| DOT 2274 B25B66 - Equipped with 4 internal antennas                                                                                                                                                                        | KRY 901 468/1 |
| DOT 2284 B25B66 - Equipped with 4 external antenna ports                                                                                                                                                                   | KRY 901 468/2 |
| <b>Table Notes</b>                                                                                                                                                                                                         |               |
| 1. The 2 units above use the same pcb and hardware. The only difference between the units is the presence of the internal/external antennas. Therefore all EMC tests were done only on the external antenna ports variant. |               |

### 2.2 Product overview

The product trade name is DOT 2274 B25B66 (KRY 901 468/1) and DOT 2284 B25B66 (KRY 901 468/2). The DOT 2274 & DOT 2284 products are indoor wireless telecommunication products. They transmit and receives the cellular signals for 4G and 5G wireless systems; and operates from POE (56 VDC). This DOTs come in 2 variants as mention above in [Table 9: Assessed hardware](#).

**Figure 1: The EUT with External antenna (DOT 2284)**



The 2 units above use the same pcb and hardware. The only difference between the units is the presence of the internal/external antennas. Therefore all EMC tests were done only on the external antenna port variant.



**Table 10: Product specifications – Tested DOT 2284**

| Product Detail                     |                                        |
|------------------------------------|----------------------------------------|
| Product                            | DOT 2284 B25B66                        |
| Revision:                          | R1A                                    |
| P/N:                               | KRY 901 468/2                          |
| Nominal Voltage:                   | POE, 56Vdc                             |
| Operating Temperature:             | +5°C to +40°C                          |
| Bands                              | B25, B66                               |
| Antennas (external)                | 4T4R                                   |
| Output Power per band              | 200mW (23dBm)                          |
| IBW                                | B25: 65MHz, B66: 70MHz                 |
| Nominal O/P per FDD Antenna Port:  | Single Carrier: 1 x 200mW (23dBm)      |
|                                    | Multi-Carrier: 2 x 100mW (19.98dBm)    |
|                                    | Multi-Carrier: 3 x 66.7mW (18.25dBm)   |
|                                    | Multi-Carrier: 4 x 50mW ( 16.97dBm)    |
| IBW limitation:                    | Contiguous operations only             |
| RAT support                        | B25: NR + LTE + NB IoT IB/GB, SC MC    |
|                                    | B25: WCDMA + LTE + NB IoT IB/GB, SC MC |
|                                    | B66: NR + LTE + NB IoT IB/GB SC, MC    |
|                                    | B66: WCDMA + LTE + NB IoT IB/GB, SC MC |
| supported LTE/NR BW:               | 5, 10, 15, 20MHz                       |
| Max No of carriers per Band:       | 6 (SP1)                                |
| Max no of NR per port              | 2                                      |
| Max no of GSM per port             | na                                     |
| Modulations, LTE                   | QPSK, 16QAM, 64QAM, 256QAM             |
| Modulations, GSM                   | na                                     |
| NB IoT IB per LTE host             | 1                                      |
| NB IoT GB per LTE host (min 10MHz) | 1                                      |
| NB IoT SA per port                 | na                                     |
| NR FDD FR1                         | Yes                                    |
| IRU models supported               | 8848, 1648, 1649                       |
| Mounting                           | ceiling or wall                        |
| Dimensions: (H x W)                | 83mm x 210mm                           |
| Weight;                            | < 1.6kg                                |

The configurations of the tested DOT 2284 B25B66 (KRY 901 468/2) are shown in the section [Configurations of the EUT](#).

## 2.3 Clocks, oscillators, or switching frequencies

The maximum clock frequency used to determine the Radiated Emissions (RE) frequency range to test is 2.197 GHz.

Table 11 lists all the clock sources (for example, discrete crystals, VCXOs, and DC/DC converter switching frequencies) used in the EUT.

**Table 11: EUT fundamental frequencies**

| Fundamental frequencies (MHz)                     |
|---------------------------------------------------|
| 0.5, 3.84, 25.0, 50.0, 52.0, 125.0, 153.6, 156.25 |

## 2.4 Product port definition and EUT cable information

Table 12 identifies all the cables and ports on the EUT. The Environment of the cables is indoor.

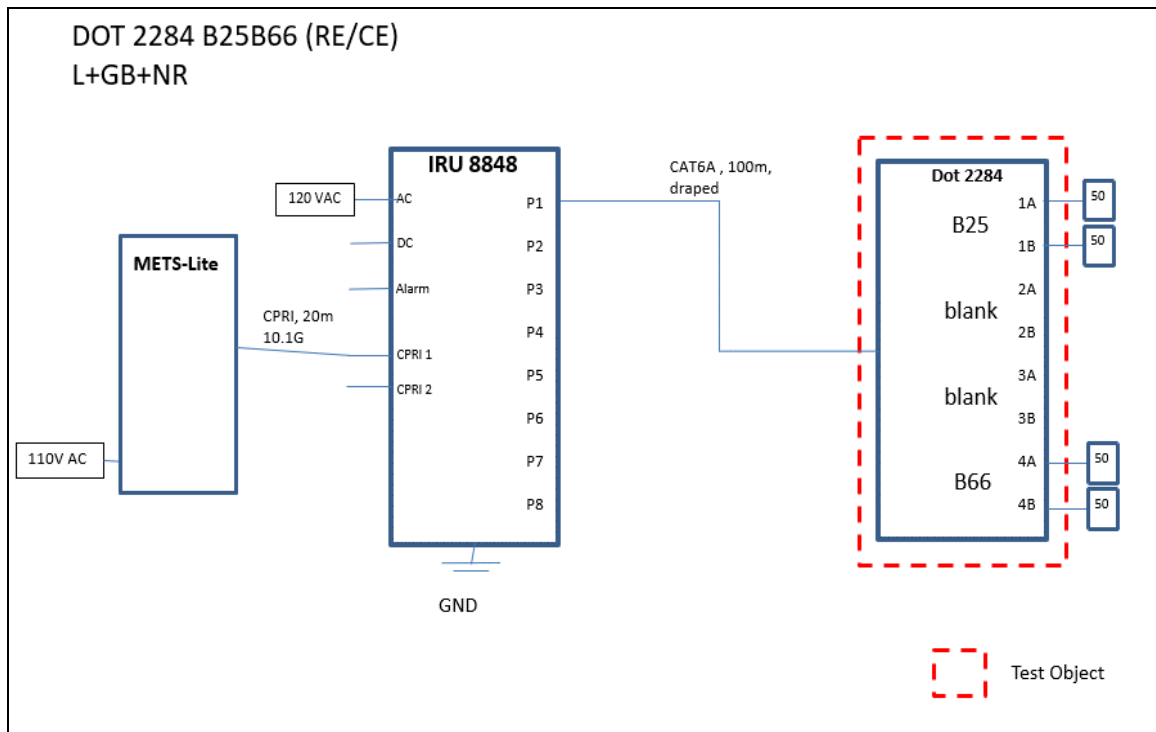
**Table 12: System port definition**

| Port Name      | Port Description  | Port Type | Interface Detail | Plug-Cable Type |
|----------------|-------------------|-----------|------------------|-----------------|
| digRDI         | Digital RDI       | Telecom   | ethernet         | RJ-45, CAT6A    |
| 1A, 1B         | RF to antenna B25 | Antenna   | RF               | SMA, Coax >3m   |
| 4A, 4B         | RF to antenna B66 | Antenna   | RF               | SMA, Coax >3m   |
| 2A, 2B, 3A, 3B | blank             | na        | na               | na              |

## 2.5 Configurations of the EUT

Figure 2 shows the configuration of the EUT for Emissions test.

**Figure 2: Test configuration for Emission tests**



Following RAT/carrier configurations were tested during this Radiated Emissions evaluations.

- Radiated Emissions Single RAT / Single Carrier Configurations (WCDMA)
- Radiated Emissions Single RAT / Single Carrier Configurations (LTE)
- Radiated Emissions Single RAT / Single Carrier Configurations (NR)
- Radiated Emissions Single RAT / Multi Carriers Configurations (WCDMA)
- Radiated Emissions Multi RAT/Carrier Configuration (LTE+WCDMA & LTE+NR)

## 2.5.1 Radiated Emissions Single RAT / Single Carrier Configurations (WCDMA)

Figure 3: Tested carrier detail – Single RAT /Single carrier (WCDMA)

| Single RAT/Single Carrier - WCDMA setups for Emissions   |                         |                   |                         |
|----------------------------------------------------------|-------------------------|-------------------|-------------------------|
| B25 PORT (1A,1B)                                         |                         | B66 Port (4A, 4B) |                         |
| WCDMA                                                    |                         | LTE               |                         |
| SR WCDMA Config <b>SC M</b> Carrier setups for Emissions |                         |                   |                         |
| Carrier:                                                 | Middle channel          | Carrier:          | Middle channel          |
| 1                                                        | B25: W, 5MHz, 1962.6MHz | 1                 | B66: L, 5MHz, 2155MHz   |
| SR WCDMA Config <b>SC B</b> Carrier setups for Emissions |                         |                   |                         |
| Carrier:                                                 | Bottom channel          | Carrier:          | Bottom channel          |
| 1                                                        | B25: W, 5MHz, 1932.4MHz | 1                 | B66: L, 5MHz, 2112.5MHz |
| SR WCDMA Config <b>SC T</b> Carrier setups for Emissions |                         |                   |                         |
| Carrier:                                                 | Top channel             | Carrier:          | Top channel             |
| 1                                                        | B25: W, 5MHz, 1992.6MHz | 1                 | B66: L, 5MHz, 2197.5MHz |

**Note:** All configurations were tested.



## 2.5.2 Radiated Emissions Single RAT / Single Carrier Configurations (LTE)

Figure 4: Tested carrier detail – Single RAT / Single carrier (LTE)

| Single RAT/Single Carrier - LTE setups for Emissions |                                  |                   |                                  |
|------------------------------------------------------|----------------------------------|-------------------|----------------------------------|
| B25 PORT (1A,1B)                                     |                                  | B66 Port (4A, 4B) |                                  |
| SR LTE Config SC1 Carrier setups for Emissions       |                                  |                   |                                  |
| Carrier:                                             | Middle channel                   | Carrier:          | Middle channel                   |
| 1                                                    | B25: L, 5MHz, 1962.5MHz          | 1                 | B66: L, 5MHz, 2155MHz            |
| SR LTE Config SC2 Carrier setups for Emissions       |                                  |                   |                                  |
| Carrier:                                             | Middle channel                   | Carrier:          | Middle channel                   |
| 1                                                    | B25: L, 10MHz, 1962.5MHz         | 1                 | B66: L, 10MHz, 2155MHz           |
| 2                                                    | B25: NBIoT GB, 800KHz, 1957.9MHz | 2                 | B66: NBIoT GB, 800KHz, 2150.4MHz |
| SR LTE Config SC3 Carrier setups for Emissions       |                                  |                   |                                  |
| Carrier:                                             | Middle channel                   | Carrier:          | Middle channel                   |
| 1                                                    | B25: L, 15MHz, 1962.5MHz         | 1                 | B66: L, 15MHz, 2155MHz           |
| 2                                                    | B25: NBIoT GB, 800KHz, 1955.4MHz | 2                 | B66: NBIoT GB, 800KHz, 2147.9MHz |
| SR LTE Config SC4 Carrier setups for Emissions       |                                  |                   |                                  |
| Carrier:                                             | Middle channel                   | Carrier:          | Middle channel                   |
| 1                                                    | B25: L, 20MHz, 1962.5MHz         | 1                 | B66: L, 20MHz, 2155MHz           |
| 2                                                    | B25: NBIoT GB, 800KHz, 1952.9MHz | 2                 | B66: NBIoT GB, 800KHz, 2145.4MHz |

**Note:** Radiated Emissions measurements were compared between above 4 LTE carrier setups. **SC1** was found to have higher emissions than **SC2**, **SC3** and **SC4**. All plots with single LTE carrier in this report are therefore measured using **SC1** Middle channel carrier setup.

## 2.5.3 Radiated Emissions Single RAT / Single Carrier Configurations (NR)

Figure 5: Tested carrier detail – Single RAT / Single carrier (NR)

| Single RAT/Single Carrier - NR setups for Emissions  |                           |                   |                         |
|------------------------------------------------------|---------------------------|-------------------|-------------------------|
| B25 PORT (1A,1B)                                     |                           | B66 Port (4A, 4B) |                         |
| SR NR Config <b>SC1</b> Carrier setups for Emissions |                           |                   |                         |
| Carrier:                                             | Middle channel            | Carrier:          | Middle channel          |
| 1                                                    | B25: NR, 5MHz, 1962.5MHz  | 1                 | B66: NR, 5MHz, 2155MHz  |
| SR NR Config <b>SC2</b> Carrier setups for Emissions |                           |                   |                         |
| Carrier:                                             | Middle channel            | Carrier:          | Middle channel          |
| 1                                                    | B25: NR, 10MHz, 1962.5MHz | 1                 | B66: NR, 10MHz, 2155MHz |
| SR NR Config <b>SC3</b> Carrier setups for Emissions |                           |                   |                         |
| Carrier:                                             | Middle channel            | Carrier:          | Middle channel          |
| 1                                                    | B25: NR, 15MHz, 1962.5MHz | 1                 | B66: NR, 15MHz, 2155MHz |
| SR NR Config <b>SC4</b> Carrier setups for Emissions |                           |                   |                         |
| Carrier:                                             | Middle channel            | Carrier:          | Middle channel          |
| 1                                                    | B25: NR, 20MHz, 1962.5MHz | 1                 | B66: NR, 20MHz, 2155MHz |

**Note:** Radiated Emissions measurements were compared between above 4 NR carrier setups. **SC1** was found to have higher emissions than **SC2**, **SC3** and **SC4**. All plots with single NR carrier in this report are therefore measured using **SC1** Middle channel carrier setup.

## 2.5.4 Radiated Emissions Single RAT / Multi Carriers Configurations (WCDMA)

Figure 6: Tested carrier detail – Single RAT / Multi carrier (WCDMA)

| Single RAT / Multi Carrier - WCDMA setups for Emissions |                         |                   |                       |
|---------------------------------------------------------|-------------------------|-------------------|-----------------------|
| B25 PORT (1A,1B)                                        |                         | B66 Port (4A, 4B) |                       |
| WCDMA                                                   |                         | LTE               |                       |
| SR WCDMA Config MC1 Carrier setups for Emissions        |                         |                   |                       |
| Carrier:                                                | Middle channel          | Carrier:          | Middle channel        |
| 1                                                       | B25: W, 5MHz, 1960MHz   | 1                 | B66: L, 5MHz, 2155MHz |
| 2                                                       | B25: W, 5MHz, 1965MHz   |                   |                       |
| SR WCDMA Config MC2 Carrier setups for Emissions        |                         |                   |                       |
| Carrier:                                                | Middle channel          | Carrier:          | Middle channel        |
| 1                                                       | B25: W, 5MHz, 1957.6MHz | 1                 | B66: L, 5MHz, 2155MHz |
| 2                                                       | B25: W, 5MHz, 1962.6MHz |                   |                       |
| 3                                                       | B25: W, 5MHz, 1967.6MHz |                   |                       |
| SR WCDMA Config MC3 Carrier setups for Emissions        |                         |                   |                       |
| Carrier:                                                | Middle channel          | Carrier:          | Middle channel        |
| 1                                                       | B25: W, 5MHz, 1950MHz   | 1                 | B66: L, 5MHz, 2155MHz |
| 2                                                       | B25: W, 5MHz, 1955MHz   |                   |                       |
| 3                                                       | B25: W, 5MHz, 1960MHz   |                   |                       |
| 4                                                       | B25: W, 5MHz, 1965MHz   |                   |                       |
| 5                                                       | B25: W, 5MHz, 1970MHz   |                   |                       |
| 6                                                       | B25: W, 5MHz, 1975MHz   |                   |                       |

**Note:** Radiated Emissions measurements were compared between MC1, MC2 and MC3. MC1 was found to have higher emissions. All plots with Single RAT/Multi carrier in this report are therefore measured using MC1 carrier setups.

## 2.5.5 Radiated Emissions Multi RAT/Carrier Configuration (LTE+WCDMA & LTE+NR)

Figure 7: Tested carrier detail – MultiCarrier / Multi RAT Configuration

| Single RAT / Multi Carrier - WCDMA setups for Emissions |                        |                   |                          |
|---------------------------------------------------------|------------------------|-------------------|--------------------------|
| B25 PORT (1A,1B)                                        |                        | B66 Port (4A, 4B) |                          |
| LTE+WCDMA & LTE+NR                                      |                        | LTE+NR            |                          |
| MR Config MR1 Carrier setups for Emissions              |                        |                   |                          |
| Carrier:                                                | Middle channel         | Carrier:          | Middle channel           |
| 1                                                       | B25: L, 5MHz, 1960MHz  | 1                 | B66: L, 5MHz, 2152.5MHz  |
| 2                                                       | B25: W, 5MHz, 1965MHz  | 2                 | B66: NR, 5MHz, 2157.5MHz |
| MR Config MR2 Carrier setups for Emissions              |                        |                   |                          |
| Carrier:                                                | Middle channel         | Carrier:          | Middle channel           |
| 1                                                       | B25: L, 5MHz, 1950MHz  | 1                 | B66: L, 5MHz, 2150MHz    |
| 2                                                       | B25: L, 5MHz, 1955MHz  | 2                 | B66: L, 5MHz, 2155MHz    |
| 3                                                       | B25: W, 5MHz, 1960MHz  | 3                 | B66: NR, 5MHz, 2160MHz   |
| 4                                                       | B25: W, 5MHz, 1965MHz  |                   |                          |
| 5                                                       | B25: W, 5MHz, 1970MHz  |                   |                          |
| 6                                                       | B25: W, 5MHz, 1975MHz  |                   |                          |
| MR Config MR3 Carrier setups for Emissions              |                        |                   |                          |
| Carrier:                                                | Middle channel         | Carrier:          | Middle channel           |
| 1                                                       | B25: L, 5MHz, 1960MHz  | 1                 | B66: L, 5MHz, 2145MHz    |
| 2                                                       | B25: NR, 5MHz, 1965MHz | 2                 | B66: L, 5MHz, 2150MHz    |
|                                                         |                        | 3                 | B66: L, 5MHz, 2155MHz    |
|                                                         |                        | 4                 | B66: NR, 5MHz, 2160MHz   |
|                                                         |                        | 5                 | B66: NR, 5MHz, 2165MHz   |
| MR Config MR4 Carrier setups for Emissions              |                        |                   |                          |
| Carrier:                                                | Middle channel         | Carrier:          | Middle channel           |
| 1                                                       | B25: L, 5MHz, 1950MHz  | 1                 | B66: L, 5MHz, 2142.5MHz  |
| 2                                                       | B25: L, 5MHz, 1955MHz  | 2                 | B66: L, 5MHz, 2147.5MHz  |
| 3                                                       | B25: L, 5MHz, 1960MHz  | 3                 | B66: L, 5MHz, 2152.5MHz  |
| 4                                                       | B25: L, 5MHz, 1965MHz  | 4                 | B66: L, 5MHz, 2157.5MHz  |
| 5                                                       | B25: NR, 5MHz, 1970MHz | 5                 | B66: NR, 5MHz, 2162.5MHz |
| 6                                                       | B25: NR, 5MHz, 1975MHz | 6                 | B66: NR, 5MHz, 2167.5MHz |

**Note:** Radiated Emissions measurements were compared between **MR1**, **MR2**, **MR3** and **MR4**. **MR1** was found to have higher emissions than **MR2**, **MR3** and **MR4**. All plots with Multi RAT/Multi carrier in this report are therefore measured using **MR1** Middle channel carrier configuration.

## 2.6 Modifications of the EUT during testing

The EUT was not modified prior to or during testing.

## 2.7 Inventory of the EUT and support equipments

The following tables identifies the inventory of the EUT.

**Table 13: Inventory of the EUT (RE & CE tests)**

| Equipment Role                                 | Product Name                      | Product Number | Release | Product Serial# |
|------------------------------------------------|-----------------------------------|----------------|---------|-----------------|
| EUT                                            | DOT 2284 B25B66                   | KRY 901 468/2  | R1A     | TD3W005257      |
|                                                |                                   |                |         |                 |
| SUPPORT                                        | IRU 8848                          | KRC 161 889/1  | R1D     | TD3F064191      |
| Optical Fiber                                  | CPRI, LC, SM, 20m                 | na             | na      | na              |
| Cable                                          | RDI cable: 100m Cat6A, F/UTP, M-M |                |         |                 |
| TEST SET                                       | METS-Lite, CT-10, DU-SIM          | LPC 102 487/1  | R1C     |                 |
| <b>Software info</b>                           |                                   |                |         |                 |
| IRU load: iru2plus_app-CXP9013268_25-R84EF.xlf |                                   |                |         |                 |

---

## 3. Detailed test results of Emissions

Emissions from systems manifest themselves in two forms: conducted emissions on cables and radiated emissions from the entire system (i.e. electronic modules, hardware, and cables). Regulatory standards restrict these different forms of emissions generated by the system.

The temperature and humidity in the test facilities are controlled. The temperature is maintained between 20 °C and 25 °C, with a relative humidity between 30 % and 60 %. Levels are recorded and any exceptions are included in the detailed test results sections of this report.

### 3.1 Measurement instrumentation

The measurement instrumentation conforms to the relevant standards in this report: ANSI C63.2, CISPR 16, CISPR 22, and CISPR 32. Calibration of the measurement instrumentation is maintained in accordance with the supplier's recommendations, or as necessary to ensure its accuracy.

## 3.2 Radiated Emissions, E-field (RE)

This test verifies that the EUT does not produce excess amounts of E-field Radiated Emissions (RE) that could interfere with licensed radiators.

### 3.2.1 Test specification and limits

The testing requirements are as follows.

**Table 14: RE test requirements**

| Requirement                     | Method                              | Country of application |
|---------------------------------|-------------------------------------|------------------------|
| FCC Part 15, Subpart B          | FCC Part 15 / ANSI C63.4            | USA                    |
| FCC Part 24 (Section 24.238(a)) | ANSI C63.26                         | USA                    |
| FCC Part 27 (Section 27.53(h))  | ANSI C63.26                         | USA                    |
| ICES 003                        | FCC Part 15 / ICES 003 / ANSI C63.4 | Canada                 |
| RSS-Gen (Section 7.3)           | FCC Part 15 / ICES 003 / ANSI C63.4 | Canada                 |
| RSS-133 (Section 6.5)           | ANSI C63.26                         | Canada                 |
| RSS- 139 (Section 6.6)          | ANSI C63.26                         | Canada                 |
| RSS- 170 (Section 5.4 - 1 & 2)  | ANSI C63.26                         | Canada                 |

The limits of the RE tests are as follows.

**Table 15: RE limits at 10 m for Class B of FCC Part 15, ICES 003 & RSS-Gen**

| Frequency range (MHz) | FCC Part 15 & ICES 003 (dB $\mu$ V/m) | Detector   |
|-----------------------|---------------------------------------|------------|
| 30 to 88              | 29.5                                  | Quasi-Peak |
| 88 to 216             | 33.0                                  | Quasi-Peak |
| 216 to 960            | 35.5                                  | Quasi-Peak |
| 960 to 1000           | 43.5                                  | Quasi-Peak |
| 1000 to 40000         | 43.5 <sup>1</sup>                     | Average    |

**Table 16: Tx unwanted Emissions limits for FCC Part 24, Part 27, RSS-133 & RSS-139**

| Frequency range (MHz) | EIRP Limit (dBm) | Calculated EIRP Limit in dB $\mu$ V/m |
|-----------------------|------------------|---------------------------------------|
| 30 - 40000            | -13              | 82.2                                  |



**Table 17: Tx unwanted Emission limits for RSS-170**

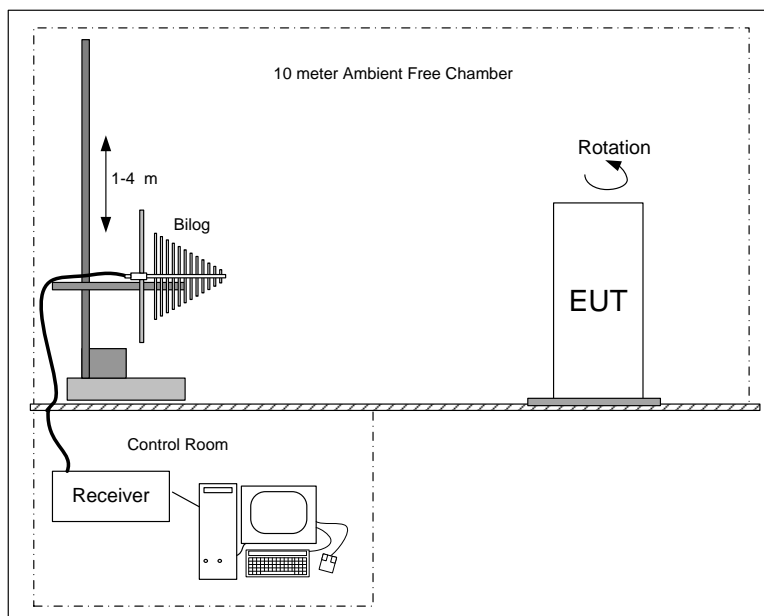
| Frequency range (MHz) | EIRP Limit (dBm) | Calculated EIRP Limit in dB $\mu$ V/m |
|-----------------------|------------------|---------------------------------------|
| 30 - 40000            | -13              | 82.2                                  |
| 2200 – 2290           | -100.6 dBW/4 kHz | 48.6                                  |

### 3.2.2 Test procedure

Verifications of the test equipment and AFC were performed before the installation of the EUT in accordance with the quality assurance procedures documented in the EMC test procedures document. The test was performed according to the relevant procedures listed in [Table 14](#).

- The EUT was placed on the turntable inside the AFC (configured for normal operation). The system and its cables were separated from the ground plane by an insulating support 10 mm in height.
- For tests between 30 MHz and 1 GHz the receive antenna (BiLog®) was placed 3 m away from the EUT. An initial scan was performed to find emissions/frequencies requiring detailed measurement. The pre-scan was performed by rotating the system 360 degrees while recording all emissions (frequency and amplitude). This procedure was repeated for antenna heights of 1 to 4 m, as well as both polarizations of the receiving antenna.
- For tests above 1 GHz the receive antenna (horn) was placed 3 m away from the EUT. Absorbing cones were placed on the floor between the antenna and the EUT. An initial scan was performed to find emissions/frequencies requiring detailed measurement. The pre-scan was performed by rotating the system 360 degrees while recording all emissions (frequency and amplitude). This procedure was repeated for antenna heights of 1 to 4 m, as well as both polarizations of the receiving antenna.
- For tests between 18 and 40 GHz the receive horn antenna was placed at a 1 m distance from the EUT with the absorbing cones placed on the floor. An initial scan was performed to find emissions/frequencies requiring detail measurement. The pre-scan was performed on all sides of the EUT, using both polarization of the receive antenna to find any system emissions.
- For all above frequency ranges, the pre-scan peak data was compared to the limits. Peaks with less than 6 dB of margin were maximized using the proper detector: the EUT was rotated in azimuth over 360 degrees to identify the direction of maximum emission, antenna height was then varied from 1 to 4 m to obtain maximum emission level.

**Figure 8: Setup of Radiated Emissions**



### 3.2.3 Calculation of the compliance margin

The following example shows the way in which the compliance margin is calculated in the “RE Test Results” tables.

The rows in these tables are defined as follows.

Meter Reading (dB $\mu$ V) = Voltage measured using the spectrum analyzer with the proper detector

Correction (dB) = Cumulative gain or loss of pre-amplifier and cables used in the measurement path (dB) + Antenna Factor (dB)

Level (dB $\mu$ V/m) = Corrected value or field strength, that is, the parameter of interest that is compared to the limit

Margin (dB) = Level with respect to the appropriate limit (a negative Margin indicates that the Level is below the limit and that the measurement is a Pass)

The values in the Level row are calculated as follows: Level = Meter Reading + Correction (dB)

The values in the Margin row are calculated as follows: Margin = Level - Limit

---

### 3.2.4 Measurement uncertainties

The expanded measurement instrumentation uncertainty with a 95 % level of confidence, calculated according to the method described in CISPR 16 is:

- $\pm 3.8$  dB between 30 MHz and 1 GHz
- $\pm 4.7$  dB between 1 GHz and 10 GHz
- $\pm 4.8$  dB between 10 GHz and 18 GHz
- $\pm 4.6$  dB between 18 GHz and 26.5 GHz
- $\pm 4.8$  dB between 26.5 GHz and 40 GHz



---

### 3.2.5 Test results of RE (Single RAT/Single carrier, WCDMA - Bottom channel)

Test location: 10-meter Ambient Free Chamber (AFC)

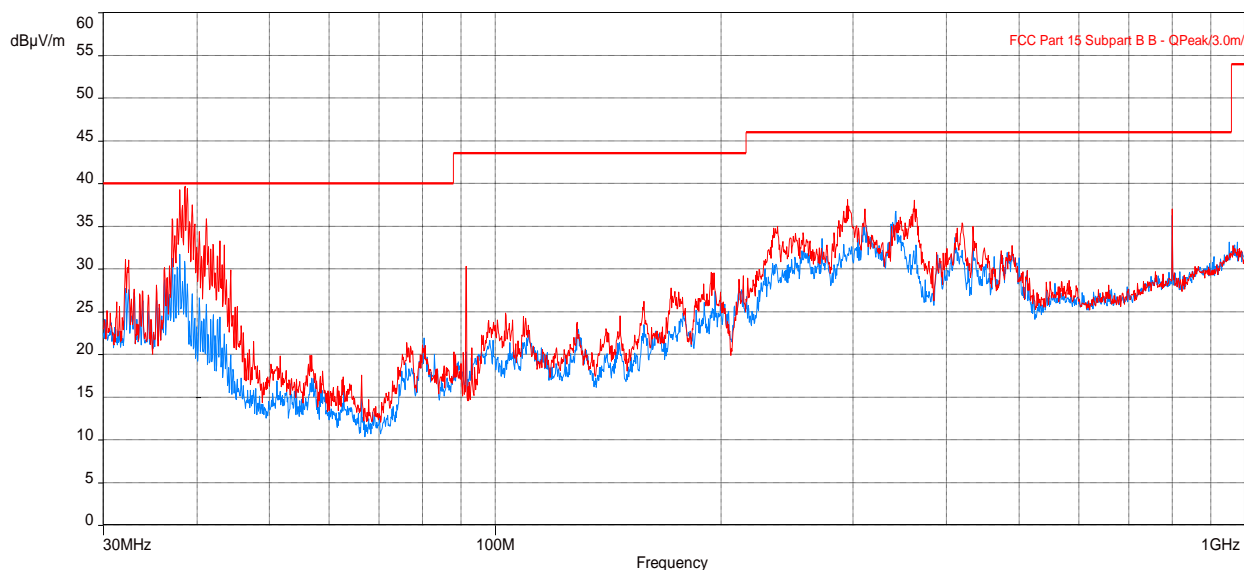
Date tested: 15 - 22 October 2020

Tested by: Krupal Patel

Test configurations are identified in the section [Configurations of the EUT](#).

For the following test results that have supporting data tables, negative margin values indicate a pass.

**Figure 9: Plot of RE at 3 m – 30 to 1000 MHz (WCDMA – Bot channel)**



**Table 18: RE test results from 30 to 1000 MHz for FCC Part 15 (WCDMA – Bot channel)**

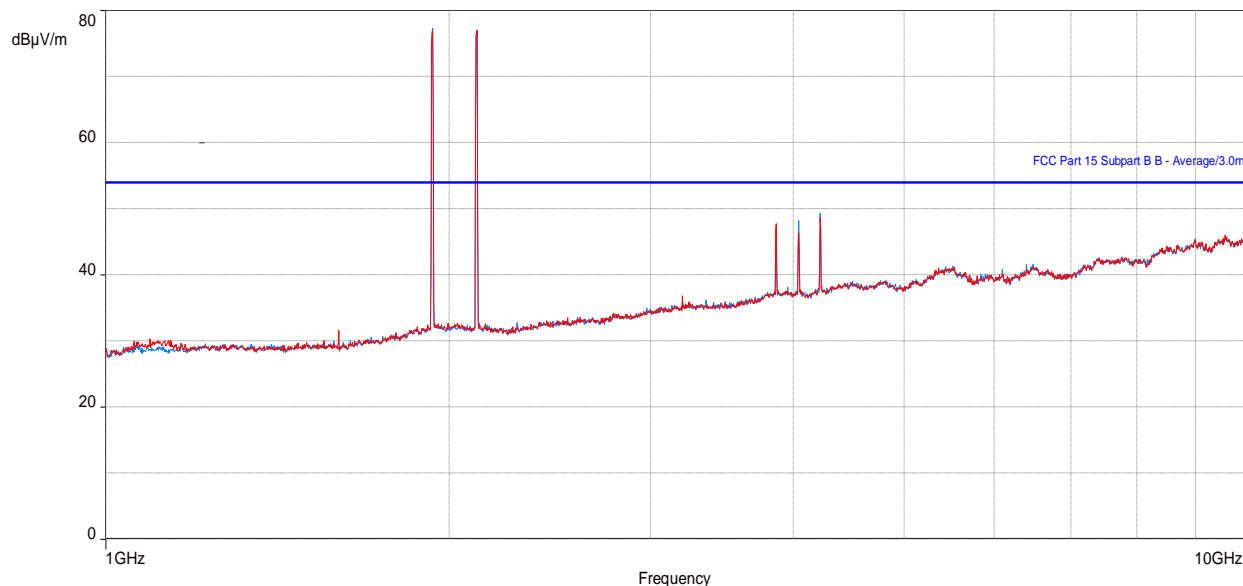
| Frequency (MHz) | Level Quasi Peak (dBμV/m) | Limit Quasi-peak (dBμV/m) | Margin to FCC part 15 Class B (dB) | Height (m) | Azimuth (deg) | Polarization | Correction (dB) |
|-----------------|---------------------------|---------------------------|------------------------------------|------------|---------------|--------------|-----------------|
| 37.98573077     | 34.69                     | 40.00                     | -5.31                              | 2.63       | 5.00          | Horizontal   | -6.30           |
| 38.56480736     | 38.30                     | 40.00                     | -1.70                              | 1.05       | 112.50        | Vertical     | -6.64           |
| 38.85516633     | 37.75                     | 40.00                     | -2.25                              | 1.05       | 62.50         | Vertical     | -6.81           |
| 799.9946121     | 36.58                     | 46.02                     | -9.44                              | 2.86       | 247.25        | Horizontal   | 4.29            |

**Table 19: RE test results from 30 to 1000 MHz for FCC Part 24/27 (WCDMA – Bot channel)**

| Frequency (MHz) | Level (dBμV/m) | EIRP Limit (dBμV/m) | Margin to (dB) | Height (m) | Azimuth (deg) | Polarization | Correction (dB) |
|-----------------|----------------|---------------------|----------------|------------|---------------|--------------|-----------------|
| 37.98573077     | 34.69          | 82.2                | -47.51         | 2.63       | 5.00          | Horizontal   | -6.30           |
| 38.56480736     | 38.30          | 82.2                | -43.9          | 1.05       | 112.50        | Vertical     | -6.64           |
| 38.85516633     | 37.75          | 82.2                | -44.45         | 1.05       | 62.50         | Vertical     | -6.81           |
| 799.9946121     | 36.58          | 82.2                | -45.62         | 2.86       | 247.25        | Horizontal   | 4.29            |

**Note:** In the table/Plot above, no emissions exceed the Part 24/Part 27 radiated spurious emissions limit when converted to dBuV/m. For final spurious emissions measurements to FCC Part 24/Part 27, see antenna port conducted emissions in applicable test report.

**Figure 10: Plot of RE at 3m from 1 to 10GHz (WCDMA – Bot channel)**



**Note:** Peaks above the limit are leakage of the EUT's fundamentals from the 50-ohm terminations.

**Table 20: RE test results from 1 to 10 GHz for FCC Part 15 (WCDMA – Bot channel)**

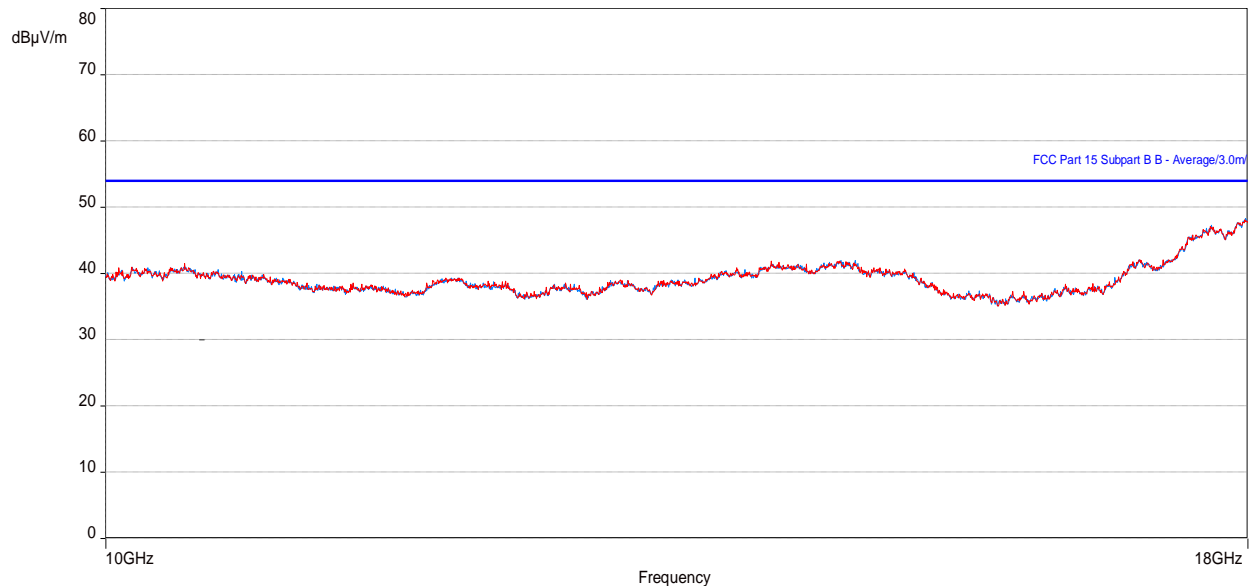
| Frequency (MHz) | Level Average (dBμV/m) | Limit Average (dBμV/m) | Margin to FCC part 15 Class B (dB) | Height (m) | Azimuth (degrees) | Polarization | Correction (dB) |
|-----------------|------------------------|------------------------|------------------------------------|------------|-------------------|--------------|-----------------|
| 3864.873077     | 46.49                  | 53.96                  | -7.47                              | 2.35       | 254.25            | Vertical     | 2.49            |
| 4045.125        | 46.42                  | 53.96                  | -7.54                              | 3.48       | 127.00            | Horizontal   | 2.65            |
| 4224.685577     | 46.82                  | 53.96                  | -7.14                              | 1.04       | 156.00            | Vertical     | 2.56            |

**Table 21: RE test results from 1 to 10 GHz for Part 24/27 (WCDMA – Bot channel)**

| Frequency (MHz) | Level (dBμV/m) | EIRP Limit (dBμV/m) | Margin to (dB) | Height (m) | Azimuth (degrees) | Polarization | Correction (dB) |
|-----------------|----------------|---------------------|----------------|------------|-------------------|--------------|-----------------|
| 3864.873077     | 46.49          | 82.2                | -35.71         | 2.35       | 254.25            | Vertical     | 2.49            |
| 4045.125        | 46.42          | 82.2                | -35.78         | 3.48       | 127.00            | Horizontal   | 2.65            |
| 4224.685577     | 46.82          | 82.2                | -35.38         | 1.04       | 156.00            | Vertical     | 2.56            |

**Note:** In the table/Plot above, no emissions exceed the Part 24/Part 27 radiated spurious emissions limit when converted to dBuV/m, except for the fundamentals. For final spurious emissions measurements to FCC Part 24/Part 27, see antenna port conducted emissions in applicable test report.

**Figure 11: Plot of RE at 3m from 10 to 18 GHz (WCDMA – Bot channel)**



**Table 22: RE test results from 10 to 18 GHz for FCC Part 15 (WCDMA – Bot channel)**

| Frequency (MHz) | Level Average (dBμV/m) | Limit Average (dBμV/m) | Margin to FCC part 15 Class B (dB) | Height (m) | Azimuth (degrees) | Polarization | Correction (dB) |
|-----------------|------------------------|------------------------|------------------------------------|------------|-------------------|--------------|-----------------|
| 14587.79808     | 38.16                  | 53.96                  | -15.80                             | 1.00       | 0.00              | Vertical     | 11.09           |
| 14710.09935     | 38.53                  | 53.96                  | -15.43                             | 4.00       | 17.00             | Horizontal   | 10.31           |
| 17903.49903     | 45.02                  | 53.96                  | -8.94                              | 4.00       | 2.75              | Horizontal   | 19.19           |
| 17908.98687     | 44.70                  | 53.96                  | -9.26                              | 1.00       | 16.50             | Vertical     | 19.29           |

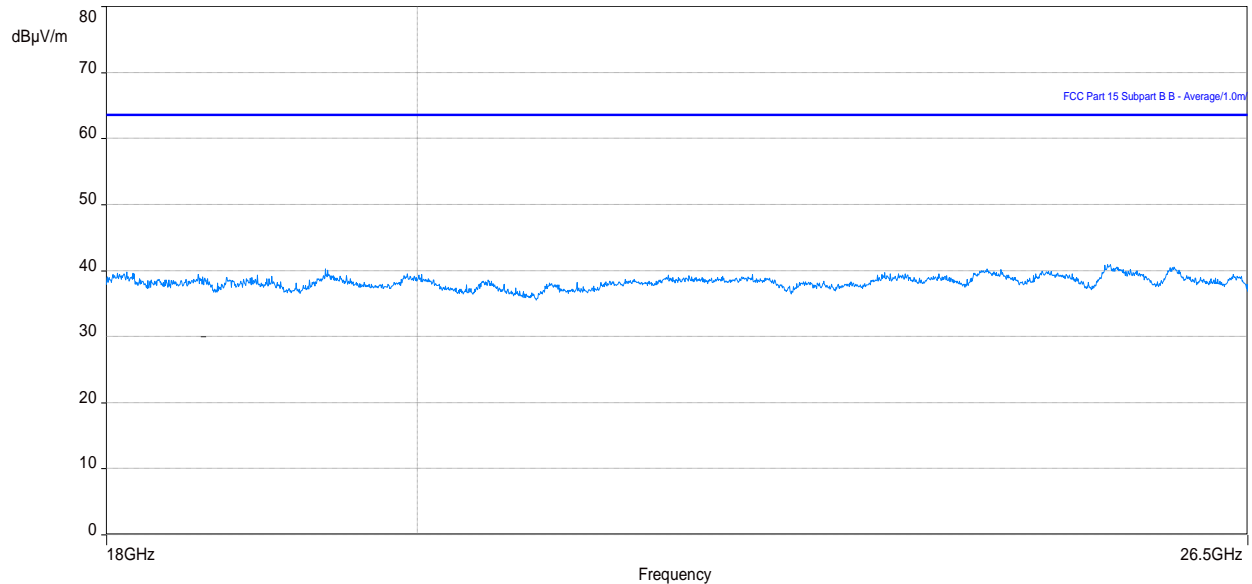
**Table 23: RE test results from 10 to 18 GHz for Part 24/27 (WCDMA – Bot channel)**

| Frequency (MHz) | Level (dBμV/m) | EIRP Limit (dBμV/m) | Margin to (dB) | Height (m) | Azimuth (degrees) | Polarization | Correction (dB) |
|-----------------|----------------|---------------------|----------------|------------|-------------------|--------------|-----------------|
| 14587.79808     | 38.16          | 82.2                | -44.04         | 1.00       | 0.00              | Vertical     | 11.09           |
| 14710.09935     | 38.53          | 82.2                | -43.67         | 4.00       | 17.00             | Horizontal   | 10.31           |
| 17903.49903     | 45.02          | 82.2                | -37.18         | 4.00       | 2.75              | Horizontal   | 19.19           |
| 17908.98687     | 44.70          | 82.2                | -37.5          | 1.00       | 16.50             | Vertical     | 19.29           |

**Note:** In the table/Plot above, no emissions exceed the Part 24/Part 27 radiated spurious emissions limit when converted to dBuV/m. For final spurious emissions measurements to FCC Part 24/Part 27, see antenna port conducted emissions in applicable test report.



**Figure 12: Plot of RE at 1m from 18 to 26.5 GHz (WCDMA – Bot channel)**



**Note 1:** In the plot above No Emissions exceeds the FCC Part 15/ICES 003 limit.

**Note 2:** In the plot above, no emissions exceed the Part 24/27 radiated spurious emissions limit when converted to dBuV/m. For final spurious emissions measurements to FCC Part 24/27, see antenna port conducted emissions in applicable test report.



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### 3.2.6 Test results of RE (Single RAT/Single carrier, WCDMA - Middle channel)

Test location: 10-meter Ambient Free Chamber (AFC)

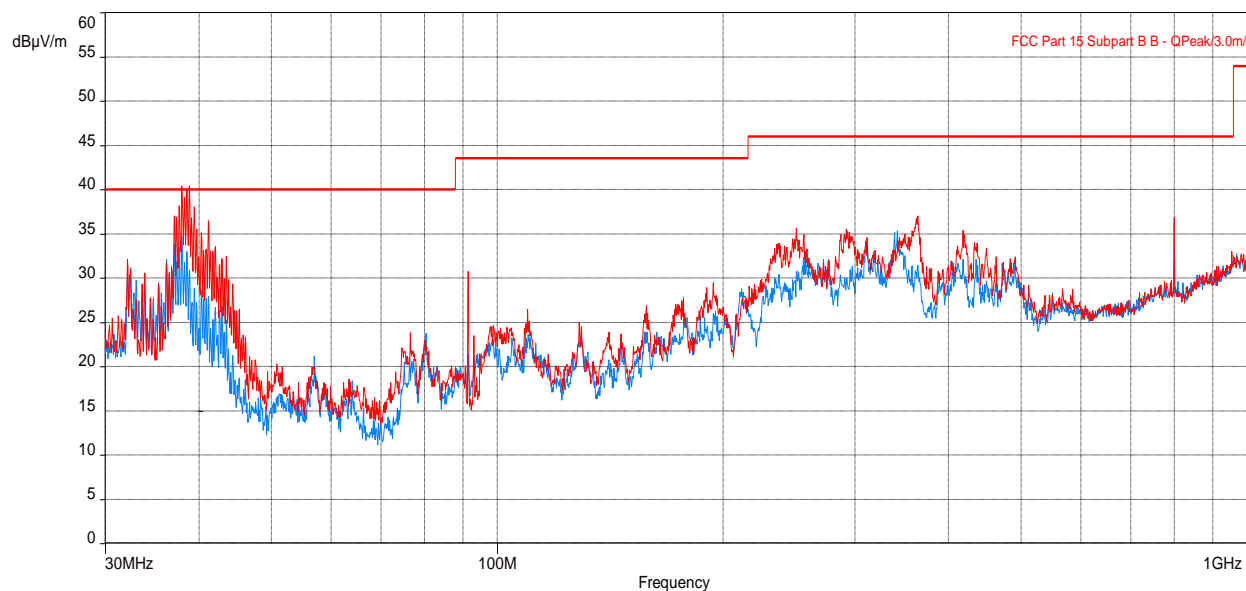
Date tested: 15 - 22 October 2020

Tested by: Krupal Patel

Test configurations are identified in the section [Configurations of the EUT](#).

For the following test results that have supporting data tables, negative margin values indicate a pass.

**Figure 13: Plot of RE at 3 m – 30 to 1000 MHz (WCDMA – Mid channel)**



**Table 24: RE test results from 30 to 1000 MHz for FCC Part 15 (WCDMA – Mid channel)**

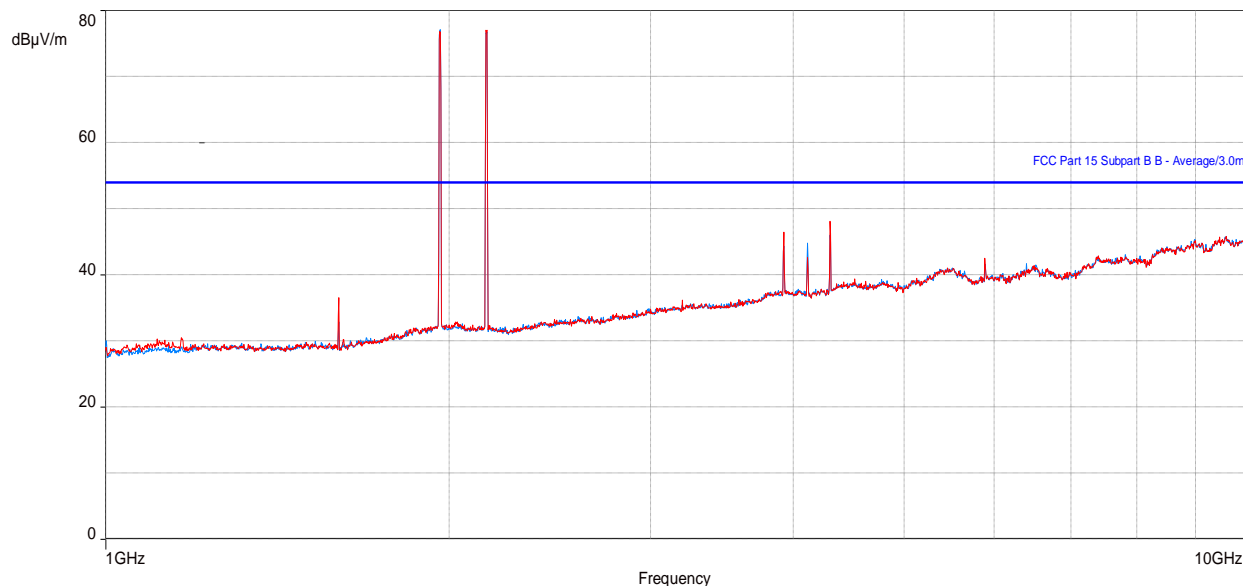
| Frequency (MHz) | Level Quasi Peak (dBμV/m) | Limit Quasi-peak (dBμV/m) | Margin to FCC part 15 Class B (dB) | Height (m) | Azimuth (deg) | Polarization | Correction (dB) |
|-----------------|---------------------------|---------------------------|------------------------------------|------------|---------------|--------------|-----------------|
| 37.98733333     | 36.84                     | 40.00                     | -3.16                              | 1.00       | 11.75         | Vertical     | -6.30           |
| 38.57446154     | 33.26                     | 40.00                     | -6.74                              | 1.00       | 4.75          | Vertical     | -6.64           |
| 38.8630189      | 34.20                     | 40.00                     | -5.80                              | 1.00       | 55.25         | Vertical     | -6.82           |
| 799.9944518     | 36.31                     | 46.02                     | -9.71                              | 2.96       | 326.50        | Vertical     | 4.29            |

**Table 25: RE test results from 30 to 1000 MHz for FCC Part 24/27 (WCDMA – Mid channel)**

| Frequency (MHz) | Level (dBμV/m) | EIRP Limit (dBμV/m) | Margin to (dB) | Height (m) | Azimuth (deg) | Polarization | Correction (dB) |
|-----------------|----------------|---------------------|----------------|------------|---------------|--------------|-----------------|
| 37.98733333     | 36.84          | 82.2                | -45.36         | 1.00       | 11.75         | Vertical     | -6.30           |
| 38.57446154     | 33.26          | 82.2                | -48.94         | 1.00       | 4.75          | Vertical     | -6.64           |
| 38.8630189      | 34.20          | 82.2                | -48.00         | 1.00       | 55.25         | Vertical     | -6.82           |
| 799.9944518     | 36.31          | 82.2                | -45.89         | 2.96       | 326.50        | Vertical     | 4.29            |

**Note:** In the table/Plot above, no emissions exceed the Part 24/Part 27 radiated spurious emissions limit when converted to dBuV/m. For final spurious emissions measurements to FCC Part 24/Part 27, see antenna port conducted emissions in applicable test report.

**Figure 14: Plot of RE at 3m from 1 to 10GHz (WCDMA – Mid channel)**



**Note:** Peaks above the limit are leakage of the EUT's fundamentals from the 50-ohm terminations.

**Table 26: RE test results from 1 to 10 GHz for FCC Part 15 (WCDMA – Mid channel)**

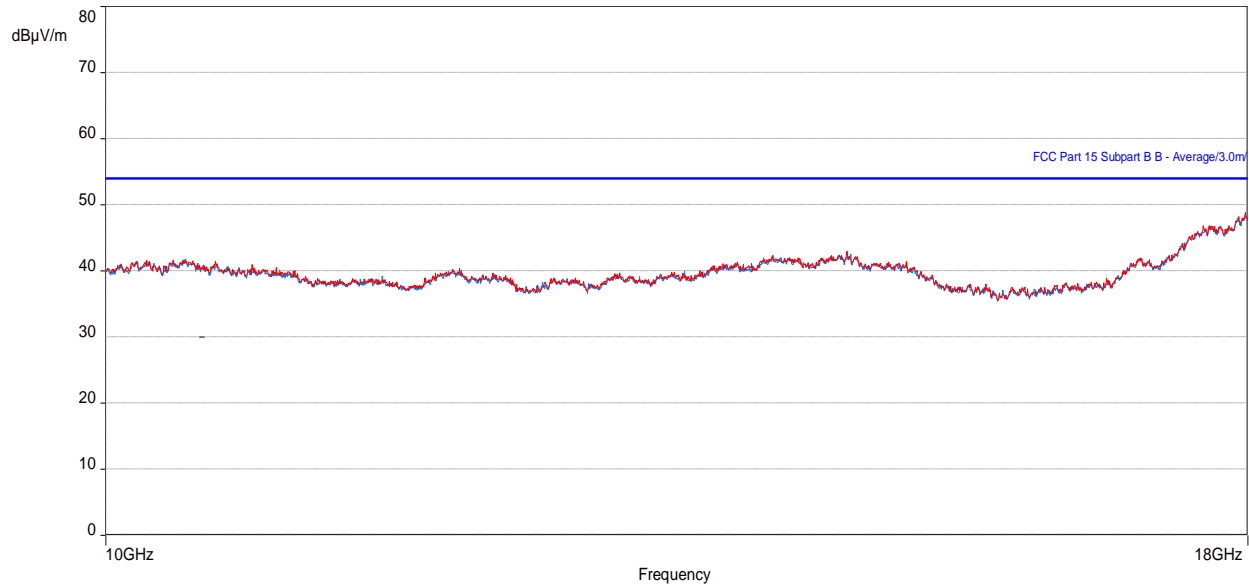
| Frequency (MHz) | Level Average (dBμV/m) | Limit Average (dBμV/m) | Margin to FCC part 15 Class B (dB) | Height (m) | Azimuth (degrees) | Polarization | Correction (dB) |
|-----------------|------------------------|------------------------|------------------------------------|------------|-------------------|--------------|-----------------|
| 3925.816346     | 43.68                  | 53.96                  | -10.28                             | 2.28       | 247.00            | Vertical     | 2.46            |
| 4309.95609      | 43.60                  | 53.96                  | -10.36                             | 1.00       | 141.75            | Horizontal   | 2.75            |
| 4310.43141      | 45.94                  | 53.96                  | -8.02                              | 1.18       | 155.00            | Vertical     | 2.75            |

**Table 27: RE test results from 1 to 10 GHz for Part 24/27 (WCDMA – Mid channel)**

| Frequency (MHz) | Level (dBμV/m) | EIRP Limit (dBμV/m) | Margin to (dB) | Height (m) | Azimuth (degrees) | Polarization | Correction (dB) |
|-----------------|----------------|---------------------|----------------|------------|-------------------|--------------|-----------------|
| 3925.816346     | 43.68          | 82.2                | -38.52         | 2.28       | 247.00            | Vertical     | 2.46            |
| 4309.95609      | 43.60          | 82.2                | -38.60         | 1.00       | 141.75            | Horizontal   | 2.75            |
| 4310.43141      | 45.94          | 82.2                | -36.26         | 1.18       | 155.00            | Vertical     | 2.75            |

**Note:** In the table/Plot above, no emissions exceed the Part 24/Part 27 radiated spurious emissions limit when converted to dBuV/m, except for the fundamentals. For final spurious emissions measurements to FCC Part 24/Part 27, see antenna port conducted emissions in applicable test report.

**Figure 15: Plot of RE at 3m from 10 to 18 GHz (WCDMA – Mid channel)**



**Table 28: RE test results from 10 to 18 GHz for FCC Part 15 (WCDMA – Mid channel)**

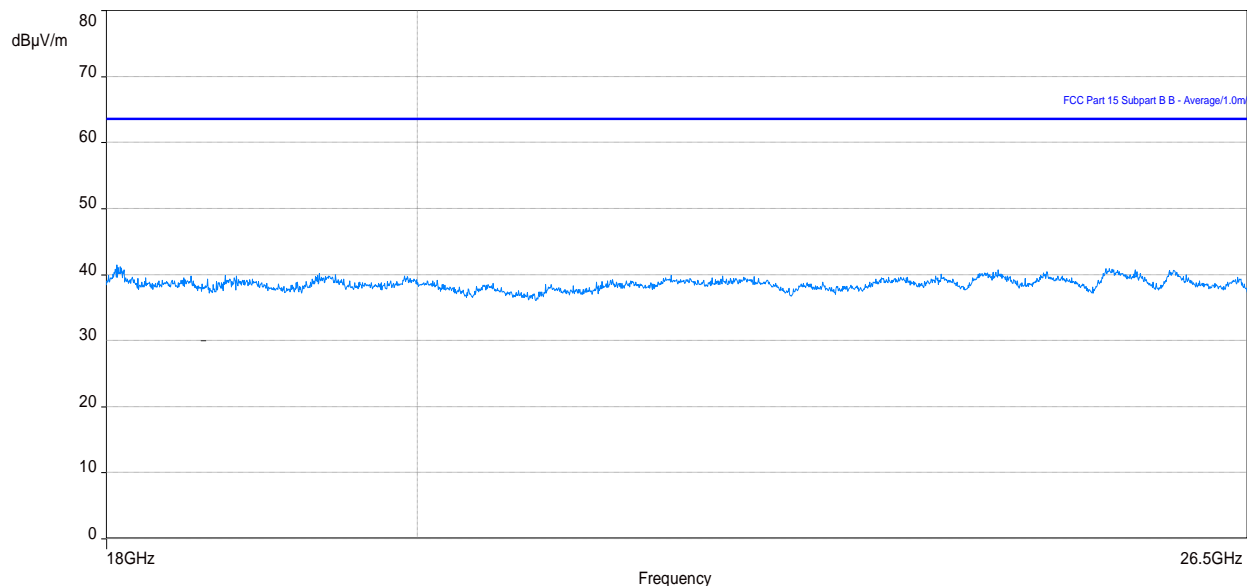
| Frequency (MHz) | Level Average (dBμV/m) | Limit Average (dBμV/m) | Margin to FCC part 15 Class B (dB) | Height (m) | Azimuth (degrees) | Polarization | Correction (dB) |
|-----------------|------------------------|------------------------|------------------------------------|------------|-------------------|--------------|-----------------|
| 14645.43396     | 39.27                  | 53.96                  | -14.69                             | 4.00       | 17.25             | Vertical     | 10.80           |
| 14674.3205      | 38.71                  | 53.96                  | -15.25                             | 4.00       | 2.50              | Horizontal   | 10.63           |
| 17912.62437     | 45.29                  | 53.96                  | -8.67                              | 4.00       | 247.00            | Horizontal   | 19.36           |
| 17917.17277     | 45.48                  | 53.96                  | -8.48                              | 4.00       | 24.25             | Vertical     | 19.45           |

**Table 29: RE test results from 10 to 18 GHz for Part 24/27 (WCDMA – Mid channel)**

| Frequency (MHz) | Level (dBμV/m) | EIRP Limit (dBμV/m) | Margin to (dB) | Height (m) | Azimuth (degrees) | Polarization | Correction (dB) |
|-----------------|----------------|---------------------|----------------|------------|-------------------|--------------|-----------------|
| 14645.43396     | 39.27          | 82.2                | -42.93         | 4.00       | 17.25             | Vertical     | 10.80           |
| 14674.3205      | 38.71          | 82.2                | -43.49         | 4.00       | 2.50              | Horizontal   | 10.63           |
| 17912.62437     | 45.29          | 82.2                | -36.91         | 4.00       | 247.00            | Horizontal   | 19.36           |
| 17917.17277     | 45.48          | 82.2                | -36.72         | 4.00       | 24.25             | Vertical     | 19.45           |

**Note:** In the table/Plot above, no emissions exceed the Part 24/Part 27 radiated spurious emissions limit when converted to dBuV/m. For final spurious emissions measurements to FCC Part 24/Part 27, see antenna port conducted emissions in applicable test report.

**Figure 16: Plot of RE at 1m from 18 to 26.5 GHz (WCDMA – Mid channel)**



**Note 1:** In the plot above No Emissions exceeds the FCC Part 15/ICES 003 limit.

**Note 2:** In the plot above, no emissions exceed the Part 24/27 radiated spurious emissions limit when converted to dBuV/m. For final spurious emissions measurements to FCC Part 24/27, see antenna port conducted emissions in applicable test report.



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### 3.2.7 Test results of RE (Single RAT/Single carrier, WCDMA - Top channel)

Test location: 10-meter Ambient Free Chamber (AFC)

Date tested: 15 - 22 October 2020

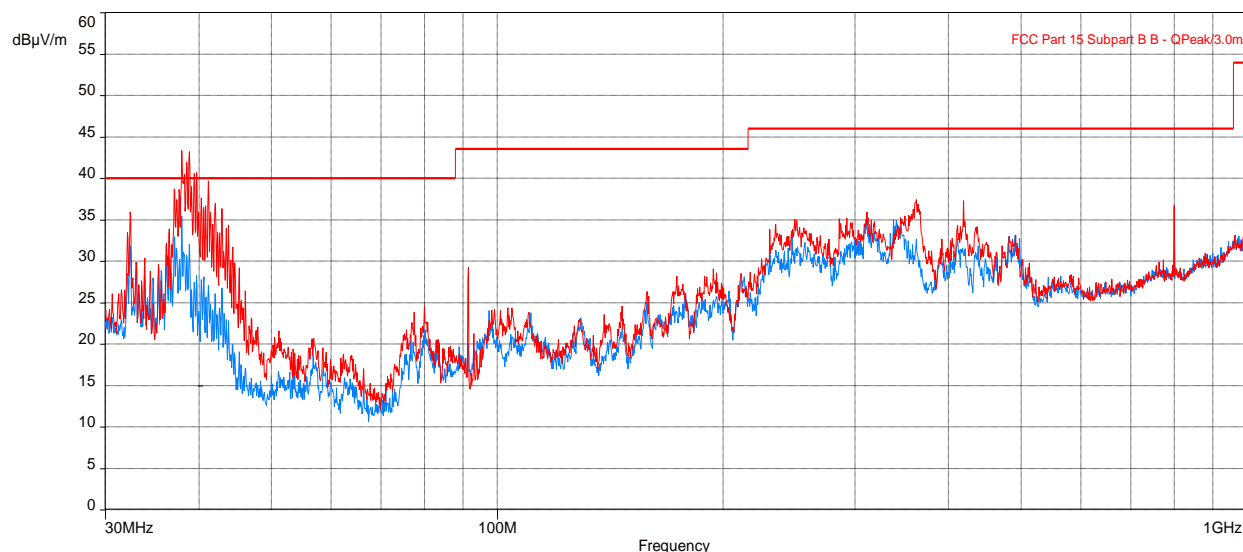
Tested by: Krupal Patel

Test configurations are identified in the section [Configurations of the EUT](#).

For the following test results that have supporting data tables, negative margin values indicate a pass.



**Figure 17: Plot of RE at 3 m – 30 to 1000 MHz (WCDMA – Top channel)**



**Table 30: RE test results from 30 to 1000 MHz for FCC Part 15 (WCDMA – Top channel)**

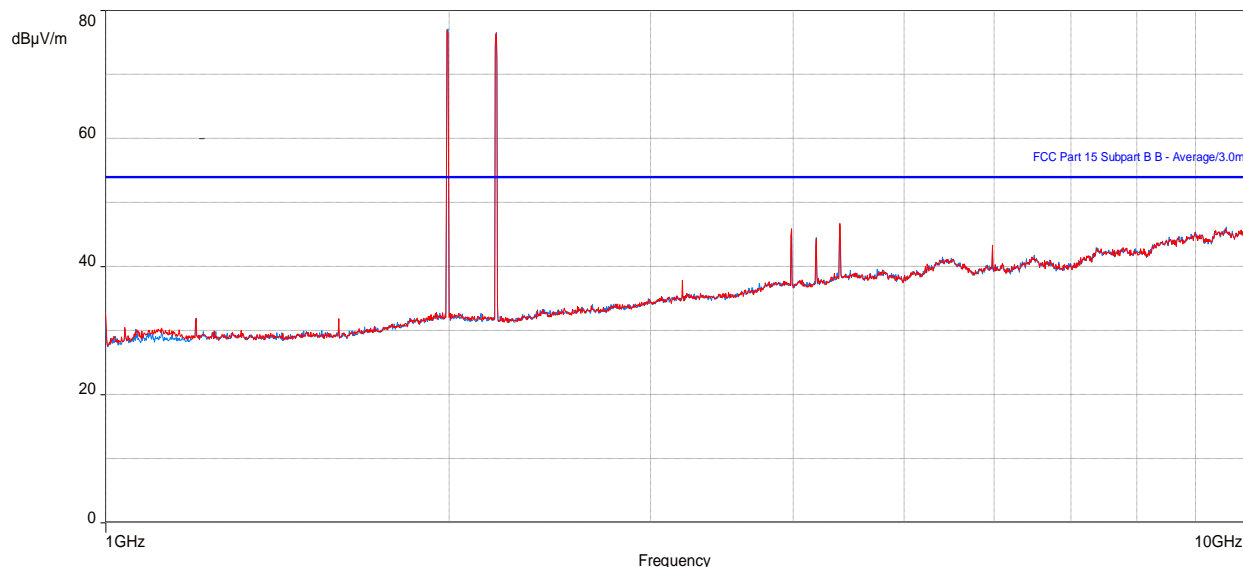
| Frequency (MHz) | Level Quasi Peak (dBµV/m) | Limit Quasi-peak (dBµV/m) | Margin to FCC part 15 Class B (dB) | Height (m) | Azimuth (deg) | Polarization | Correction (dB) |
|-----------------|---------------------------|---------------------------|------------------------------------|------------|---------------|--------------|-----------------|
| 37.97851923     | 33.32                     | 40.00                     | -6.68                              | 2.71       | 5.00          | Horizontal   | -6.30           |
| 37.97771795     | 39.70                     | 40.00                     | -0.30                              | 1.00       | 11.75         | Vertical     | -6.30           |
| 38.5646859      | 33.65                     | 40.00                     | -6.35                              | 1.00       | 11.75         | Vertical     | -6.64           |
| 38.85504487     | 38.61                     | 40.00                     | -1.39                              | 1.00       | 62.25         | Vertical     | -6.81           |
| 39.73076923     | 35.29                     | 40.00                     | -4.71                              | 1.05       | 33.50         | Vertical     | -7.33           |

**Table 31: RE test results from 30 to 1000 MHz for FCC Part 24/27 (WCDMA – Top channel)**

| Frequency (MHz) | Level (dBµV/m) | EIRP Limit (dBµV/m) | Margin to (dB) | Height (m) | Azimuth (deg) | Polarization | Correction (dB) |
|-----------------|----------------|---------------------|----------------|------------|---------------|--------------|-----------------|
| 37.97851923     | 33.32          | 82.2                | -48.88         | 2.71       | 5.00          | Horizontal   | -6.30           |
| 37.97771795     | 39.70          | 82.2                | -42.5          | 1.00       | 11.75         | Vertical     | -6.30           |
| 38.5646859      | 33.65          | 82.2                | -48.55         | 1.00       | 11.75         | Vertical     | -6.64           |
| 38.85504487     | 38.61          | 82.2                | -43.59         | 1.00       | 62.25         | Vertical     | -6.81           |
| 39.73076923     | 35.29          | 82.2                | -46.91         | 1.05       | 33.50         | Vertical     | -7.33           |

**Note:** In the table/Plot above, no emissions exceed the Part 24/Part 27 radiated spurious emissions limit when converted to dBuV/m. For final spurious emissions measurements to FCC Part 24/Part 27, see antenna port conducted emissions in applicable test report.

**Figure 18: Plot of RE at 3m from 1 to 10GHz (WCDMA – Top channel)**



**Note:** Peaks above the limit are leakage of the EUT's fundamentals from the 50-ohm terminations.

**Table 32: RE test results from 1 to 10 GHz for FCC Part 15 (WCDMA – Top channel)**

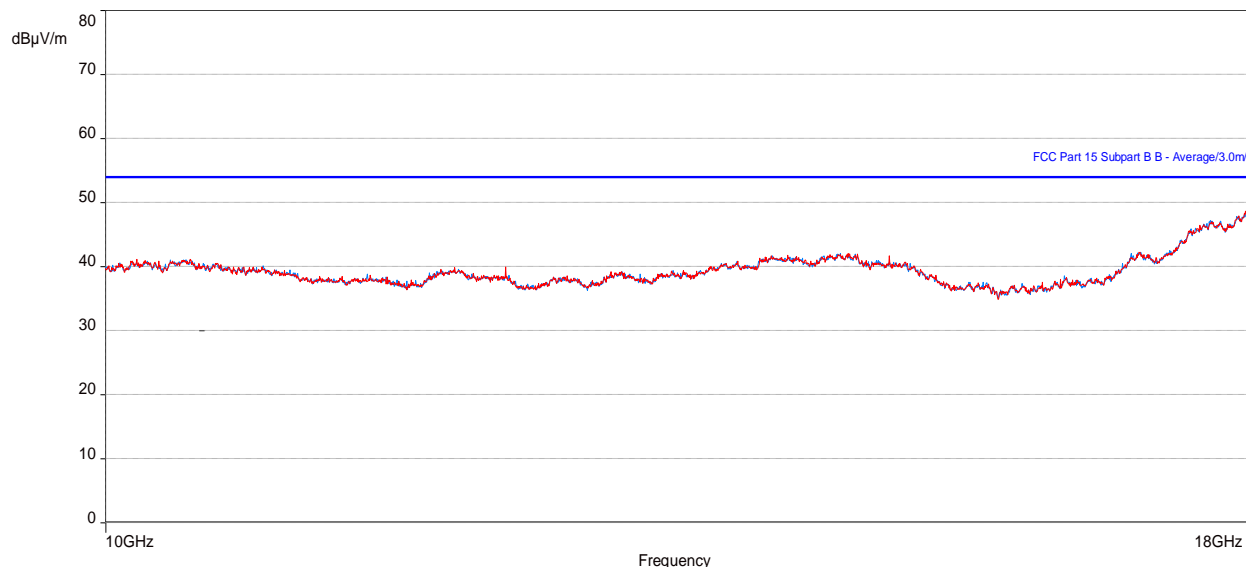
| Frequency (MHz) | Level Average (dBμV/m) | Limit Average (dBμV/m) | Margin to FCC part 15 Class B (dB) | Height (m) | Azimuth (degrees) | Polarization | Correction (dB) |
|-----------------|------------------------|------------------------|------------------------------------|------------|-------------------|--------------|-----------------|
| 3985.357692     | 44.65                  | 53.96                  | -9.31                              | 2.07       | 247.50            | Vertical     | 2.54            |
| 4394.817949     | 44.04                  | 53.96                  | -9.92                              | 1.00       | 155.00            | Vertical     | 3.18            |
| 9577.078846     | 42.52                  | 53.96                  | -11.44                             | 1.00       | 242.50            | Horizontal   | 14.34           |

**Table 33: RE test results from 1 to 10 GHz for Part 24/27 (WCDMA – Top channel)**

| Frequency (MHz) | Level (dBμV/m) | EIRP Limit (dBμV/m) | Margin to (dB) | Height (m) | Azimuth (degrees) | Polarization | Correction (dB) |
|-----------------|----------------|---------------------|----------------|------------|-------------------|--------------|-----------------|
| 3985.357692     | 44.65          | 82.2                | -37.55         | 2.07       | 247.50            | Vertical     | 2.54            |
| 4394.817949     | 44.04          | 82.2                | -38.16         | 1.00       | 155.00            | Vertical     | 3.18            |
| 9577.078846     | 42.52          | 82.2                | -39.68         | 1.00       | 242.50            | Horizontal   | 14.34           |

**Note:** In the table/Plot above, no emissions exceed the Part 24/Part 27 radiated spurious emissions limit when converted to dBuV/m, except for the fundamentals. For final spurious emissions measurements to FCC Part 24/Part 27, see antenna port conducted emissions in applicable test report.

**Figure 19: Plot of RE at 3m from 10 to 18 GHz (WCDMA – Top channel)**



**Table 34: RE test results from 10 to 18 GHz for FCC Part 15 (WCDMA – Top channel)**

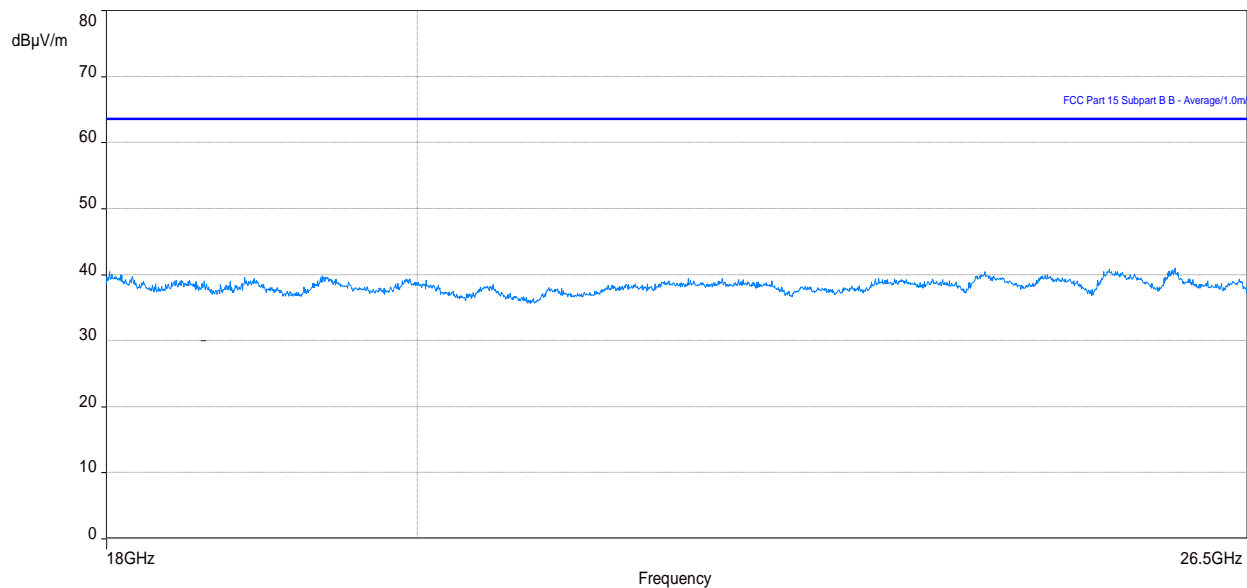
| Frequency (MHz) | Level Average (dBμV/m) | Limit Average (dBμV/m) | Margin to FCC part 15 Class B (dB) | Height (m) | Azimuth (degrees) | Polarization | Correction (dB) |
|-----------------|------------------------|------------------------|------------------------------------|------------|-------------------|--------------|-----------------|
| 14575.80929     | 38.31                  | 53.96                  | -15.65                             | 1.00       | 321.50            | Horizontal   | 11.09           |
| 14654.27883     | 38.19                  | 53.96                  | -15.77                             | 1.00       | 271.00            | Vertical     | 10.75           |
| 17901.24969     | 44.92                  | 53.96                  | -9.04                              | 3.99       | -2.00             | Horizontal   | 19.15           |
| 17919.09967     | 44.96                  | 53.96                  | -9.00                              | 4.00       | 356.50            | Vertical     | 19.49           |

**Table 35: RE test results from 10 to 18 GHz for Part 24/27 (WCDMA – Top channel)**

| Frequency (MHz) | Level (dBμV/m) | EIRP Limit (dBμV/m) | Margin to (dB) | Height (m) | Azimuth (degrees) | Polarization | Correction (dB) |
|-----------------|----------------|---------------------|----------------|------------|-------------------|--------------|-----------------|
| 14575.80929     | 38.31          | 82.2                | -43.89         | 1.00       | 321.50            | Horizontal   | 11.09           |
| 14654.27883     | 38.19          | 82.2                | -44.01         | 1.00       | 271.00            | Vertical     | 10.75           |
| 17901.24969     | 44.92          | 82.2                | -37.28         | 3.99       | -2.00             | Horizontal   | 19.15           |
| 17919.09967     | 44.96          | 82.2                | -37.24         | 4.00       | 356.50            | Vertical     | 19.49           |

**Note:** In the table/Plot above, no emissions exceed the Part 24/Part 27 radiated spurious emissions limit when converted to dBuV/m. For final spurious emissions measurements to FCC Part 24/Part 27, see antenna port conducted emissions in applicable test report.

**Figure 20: Plot of RE at 1m from 18 to 26.5 GHz (WCDMA – Top channel)**



**Note 1:** In the plot above No Emissions exceeds the FCC Part 15/ICES 003 limit.

**Note 2:** In the plot above, no emissions exceed the Part 24/27 radiated spurious emissions limit when converted to dBuV/m. For final spurious emissions measurements to FCC Part 24/27, see antenna port conducted emissions in applicable test report.



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### 3.2.8 Test results of RE (Single RAT/Single carrier, LTE 5MHz - Middle channel)

Test location: 10-meter Ambient Free Chamber (AFC)

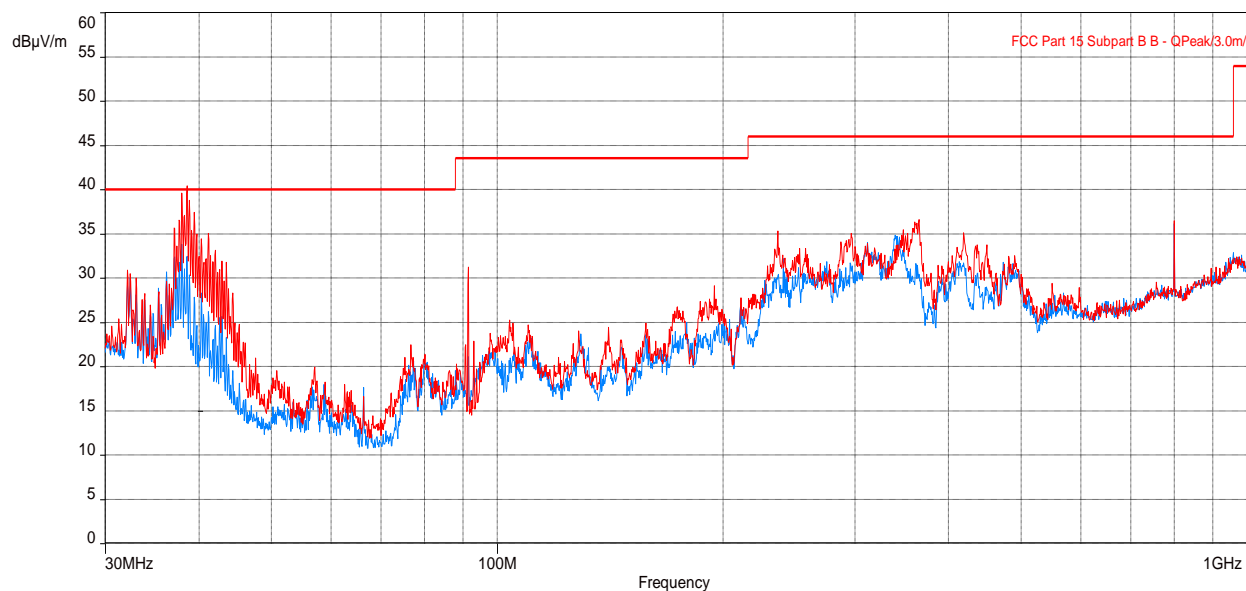
Date tested: 15 - 22 October 2020

Tested by: Krupal Patel

Test configurations are identified in the section [Configurations of the EUT](#).

For the following test results that have supporting data tables, negative margin values indicate a pass.

**Figure 21: Plot of RE at 3 m – 30 to 1000 MHz (LTE 5M – Mid channel)**



**Table 36: RE test results from 30 to 1000 MHz for FCC Part 15 (LTE 5M – Mid channel)**

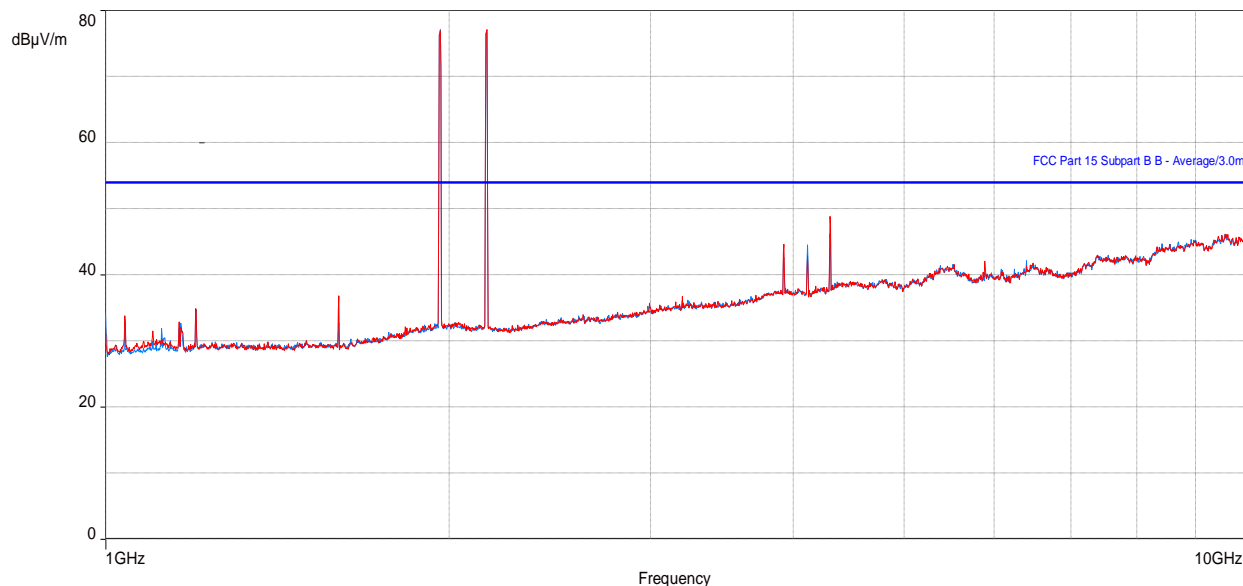
| Frequency (MHz) | Level Quasi Peak (dBμV/m) | Limit Quasi-peak (dBμV/m) | Margin to FCC part 15 Class B (dB) | Height (m) | Azimuth (deg) | Polarization | Correction (dB) |
|-----------------|---------------------------|---------------------------|------------------------------------|------------|---------------|--------------|-----------------|
| 37.98921762     | 36.91                     | 40.00                     | -3.09                              | 1.00       | 41.00         | Vertical     | -6.30           |
| 38.57522403     | 38.54                     | 40.00                     | -1.46                              | 1.00       | 62.25         | Vertical     | -6.64           |
| 38.86365992     | 35.96                     | 40.00                     | -4.04                              | 1.04       | 69.75         | Vertical     | -6.82           |
| 799.9946121     | 36.41                     | 46.02                     | -9.61                              | 2.96       | 326.50        | Vertical     | 4.29            |

**Table 37: RE test results from 30 to 1000 MHz for FCC Part 24/27 (LTE 5M – Mid channel)**

| Frequency (MHz) | Level (dBμV/m) | EIRP Limit (dBμV/m) | Margin to (dB) | Height (m) | Azimuth (deg) | Polarization | Correction (dB) |
|-----------------|----------------|---------------------|----------------|------------|---------------|--------------|-----------------|
| 37.98921762     | 36.91          | 82.2                | -45.29         | 1.00       | 41.00         | Vertical     | -6.30           |
| 38.57522403     | 38.54          | 82.2                | -43.66         | 1.00       | 62.25         | Vertical     | -6.64           |
| 38.86365992     | 35.96          | 82.2                | -46.24         | 1.04       | 69.75         | Vertical     | -6.82           |
| 799.9946121     | 36.41          | 82.2                | -45.79         | 2.96       | 326.50        | Vertical     | 4.29            |

**Note:** In the table/Plot above, no emissions exceed the Part 24/Part 27 radiated spurious emissions limit when converted to dBuV/m. For final spurious emissions measurements to FCC Part 24/Part 27, see antenna port conducted emissions in applicable test report.

**Figure 22: Plot of RE at 3m from 1 to 10GHz (LTE 5M – Mid channel)**



**Note:** Peaks above the limit are leakage of the EUT's fundamentals from the 50-ohm terminations.

**Table 38: RE test results from 1 to 10 GHz for FCC Part 15 (LTE 5M – Mid channel)**

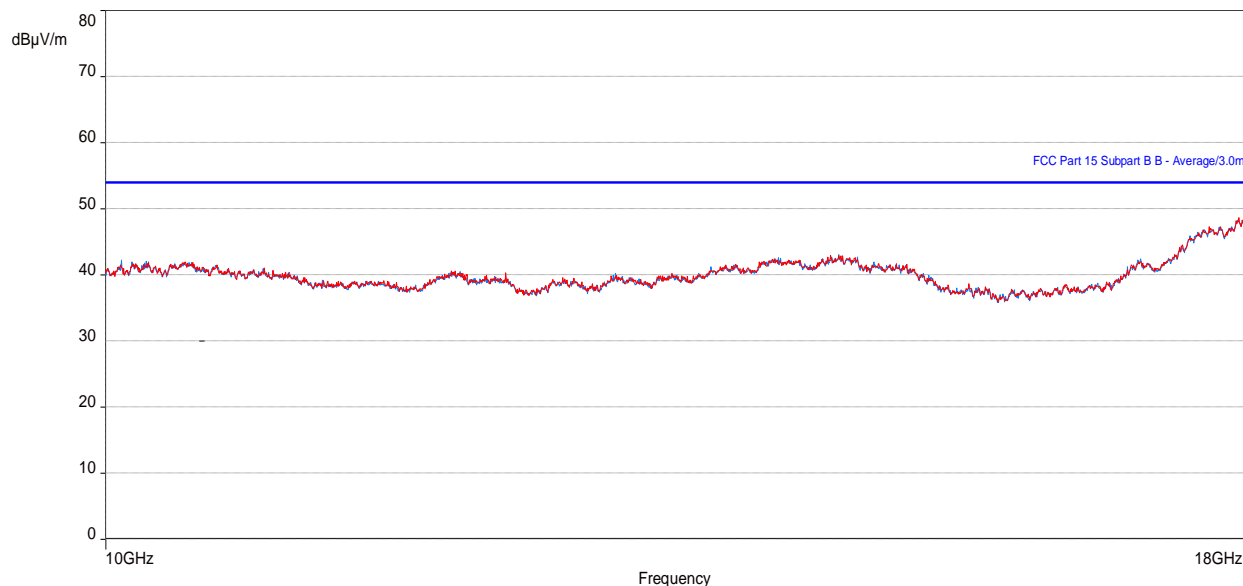
| Frequency (MHz) | Level Average (dBμV/m) | Limit Average (dBμV/m) | Margin to FCC part 15 Class B (dB) | Height (m) | Azimuth (degrees) | Polarization | Correction (dB) |
|-----------------|------------------------|------------------------|------------------------------------|------------|-------------------|--------------|-----------------|
| 3925.258333     | 43.12                  | 53.96                  | -10.84                             | 1.80       | 261.50            | Vertical     | 2.46            |
| 4309.923718     | 45.30                  | 53.96                  | -8.66                              | 1.80       | 147.75            | Vertical     | 2.75            |
| 9561.910256     | 42.88                  | 53.96                  | -11.08                             | 2.21       | -0.25             | Vertical     | 14.08           |

**Table 39: RE test results from 1 to 10 GHz for Part 24/27 (LTE 5M – Mid channel)**

| Frequency (MHz) | Level (dBμV/m) | EIRP Limit (dBμV/m) | Margin to (dB) | Height (m) | Azimuth (degrees) | Polarization | Correction (dB) |
|-----------------|----------------|---------------------|----------------|------------|-------------------|--------------|-----------------|
| 3925.258333     | 43.12          | 82.2                | -39.08         | 1.80       | 261.50            | Vertical     | 2.46            |
| 4309.923718     | 45.30          | 82.2                | -36.9          | 1.80       | 147.75            | Vertical     | 2.75            |
| 9561.910256     | 42.88          | 82.2                | -39.32         | 2.21       | -0.25             | Vertical     | 14.08           |

**Note:** In the table/Plot above, no emissions exceed the Part 24/Part 27 radiated spurious emissions limit when converted to dBuV/m, except for the fundamentals. For final spurious emissions measurements to FCC Part 24/Part 27, see antenna port conducted emissions in applicable test report.

**Figure 23: Plot of RE at 3m from 10 to 18 GHz (LTE 5M – Mid channel)**



**Table 40: RE test results from 10 to 18 GHz for FCC Part 15 (LTE 5M – Mid channel)**

| Frequency (MHz) | Level Average (dBμV/m) | Limit Average (dBμV/m) | Margin to FCC part 15 Class B (dB) | Height (m) | Azimuth (degrees) | Polarization | Correction (dB) |
|-----------------|------------------------|------------------------|------------------------------------|------------|-------------------|--------------|-----------------|
| 14521.96636     | 38.80                  | 53.96                  | -15.16                             | 4.00       | 360.00            | Vertical     | 11.09           |
| 14586.22692     | 39.28                  | 53.96                  | -14.68                             | 3.93       | -0.25             | Horizontal   | 11.09           |
| 17907.86378     | 45.37                  | 53.96                  | -8.59                              | 4.00       | 362.00            | Horizontal   | 19.27           |
| 17916.9875      | 45.62                  | 53.96                  | -8.34                              | 4.00       | 17.75             | Vertical     | 19.44           |

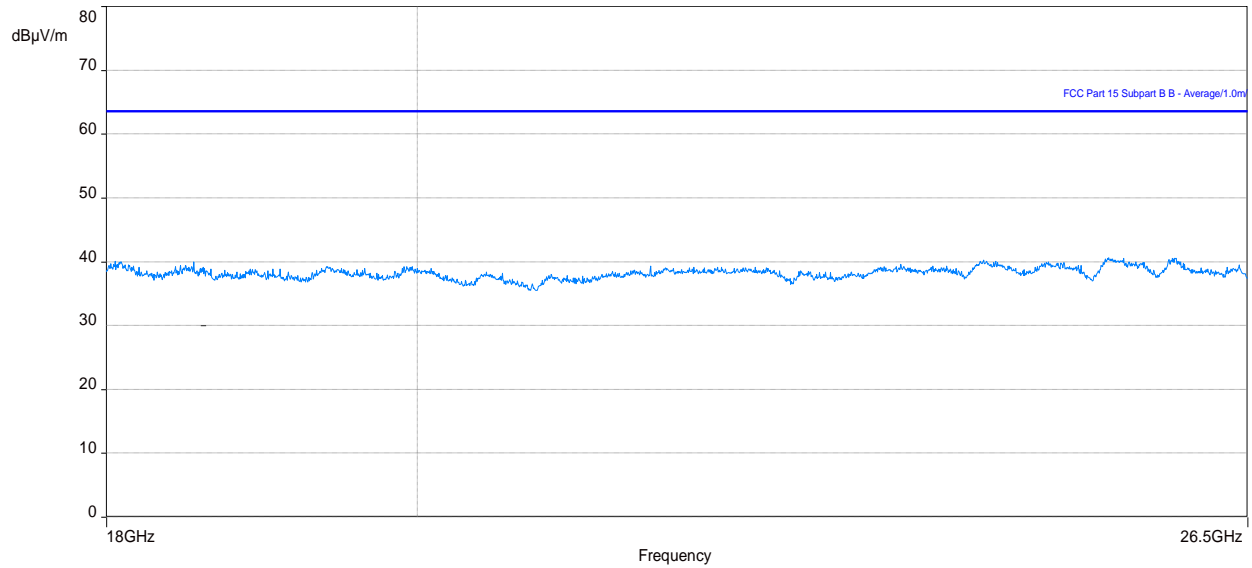
**Table 41: RE test results from 10 to 18 GHz for Part 24/27 (LTE 5M – Mid channel)**

| Frequency (MHz) | Level (dBμV/m) | EIRP Limit (dBμV/m) | Margin to (dB) | Height (m) | Azimuth (degrees) | Polarization | Correction (dB) |
|-----------------|----------------|---------------------|----------------|------------|-------------------|--------------|-----------------|
| 14521.96636     | 38.80          | 82.2                | -43.4          | 4.00       | 360.00            | Vertical     | 11.09           |
| 14586.22692     | 39.28          | 82.2                | -42.92         | 3.93       | -0.25             | Horizontal   | 11.09           |
| 17907.86378     | 45.37          | 82.2                | -36.83         | 4.00       | 362.00            | Horizontal   | 19.27           |
| 17916.9875      | 45.62          | 82.2                | -36.58         | 4.00       | 17.75             | Vertical     | 19.44           |

**Note:** In the table/Plot above, no emissions exceed the Part 24/Part 27 radiated spurious emissions limit when converted to dBuV/m. For final spurious emissions measurements to FCC Part 24/Part 27, see antenna port conducted emissions in applicable test report.



**Figure 24: Plot of RE at 1m from 18 to 26.5 GHz (LTE 5M – Mid channel)**



**Note 1:** In the plot above No Emissions exceeds the FCC Part 15/ICES 003 limit.

**Note 2:** In the plot above, no emissions exceed the Part 24/27 radiated spurious emissions limit when converted to dBuV/m. For final spurious emissions measurements to FCC Part 24/27, see antenna port conducted emissions in applicable test report.



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### 3.2.9 Test results of RE (Single RAT/Single carrier, NR 5 MHz - Middle channel)

Test location: 10-meter Ambient Free Chamber (AFC)

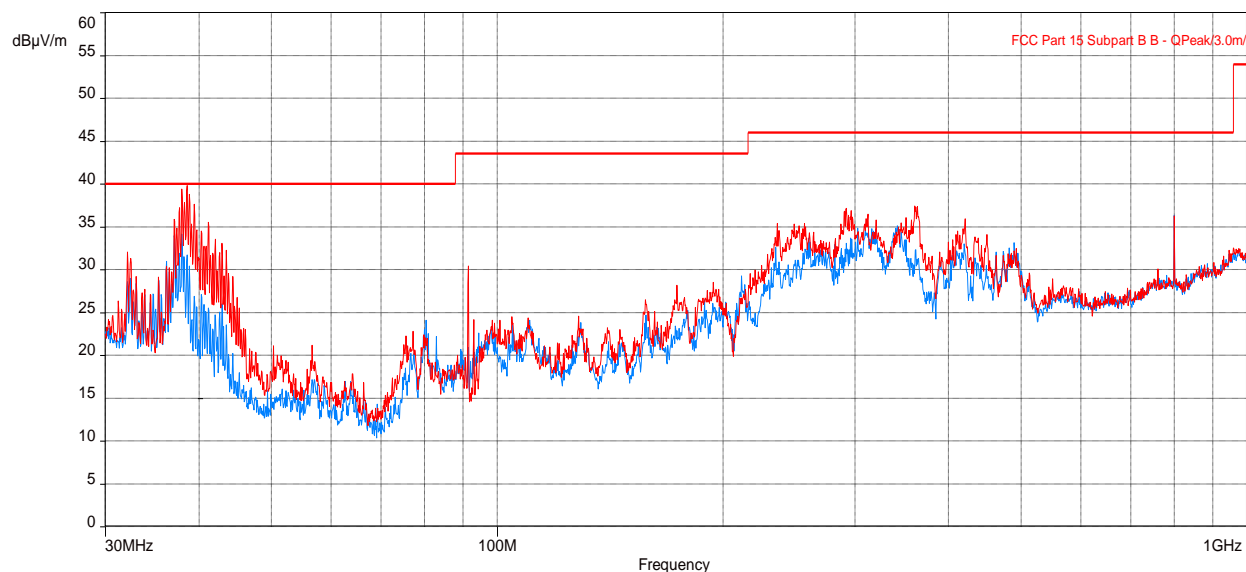
Date tested: 15 - 22 October 2020

Tested by: Krupal Patel

Test configurations are identified in the section [Configurations of the EUT](#).

For the following test results that have supporting data tables, negative margin values indicate a pass.

**Figure 25: Plot of RE at 3 m – 30 to 1000 MHz (NR 5MHz – Mid channel)**



**Table 42: RE test results from 30 to 1000 MHz for FCC Part 15 (NR 5MHz – Mid channel)**

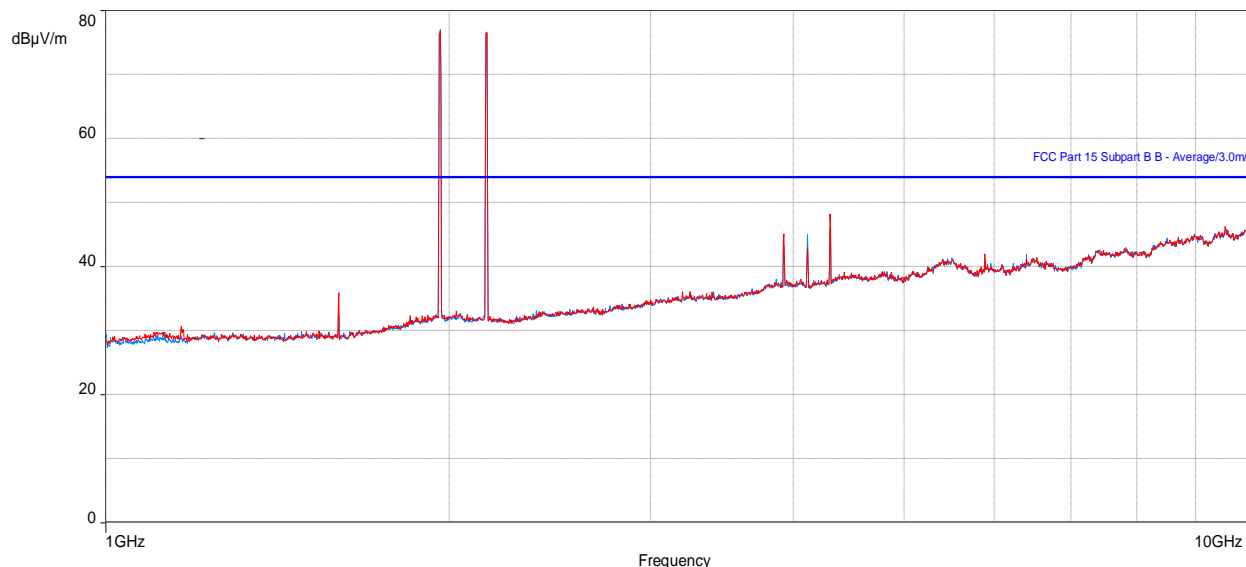
| Frequency (MHz) | Level Quasi Peak (dBμV/m) | Limit Quasi-peak (dBμV/m) | Margin to FCC part 15 Class B (dB) | Height (m) | Azimuth (deg) | Polarization | Correction (dB) |
|-----------------|---------------------------|---------------------------|------------------------------------|------------|---------------|--------------|-----------------|
| 37.9888971      | 37.25                     | 40.00                     | -2.75                              | 1.00       | 183.75        | Vertical     | -6.30           |
| 38.56865351     | 34.79                     | 40.00                     | -5.21                              | 1.11       | 61.50         | Vertical     | -6.64           |
| 39.45223044     | 31.29                     | 40.00                     | -8.71                              | 1.00       | 104.75        | Vertical     | -7.16           |
| 799.9946538     | 36.35                     | 46.02                     | -9.67                              | 2.92       | 333.50        | Vertical     | 4.29            |

**Table 43: RE test results from 30 to 1000 MHz for FCC Part 24/27 (NR 5MHz – Mid channel)**

| Frequency (MHz) | Level (dBμV/m) | EIRP Limit (dBμV/m) | Margin to (dB) | Height (m) | Azimuth (deg) | Polarization | Correction (dB) |
|-----------------|----------------|---------------------|----------------|------------|---------------|--------------|-----------------|
| 37.9888971      | 37.25          | 82.2                | -44.95         | 1.00       | 183.75        | Vertical     | -6.30           |
| 38.56865351     | 34.79          | 82.2                | -47.41         | 1.11       | 61.50         | Vertical     | -6.64           |
| 39.45223044     | 31.29          | 82.2                | -50.91         | 1.00       | 104.75        | Vertical     | -7.16           |
| 799.9946538     | 36.35          | 82.2                | -45.85         | 2.92       | 333.50        | Vertical     | 4.29            |

**Note:** In the table/Plot above, no emissions exceed the Part 24/Part 27 radiated spurious emissions limit when converted to dBuV/m. For final spurious emissions measurements to FCC Part 24/Part 27, see antenna port conducted emissions in applicable test report.

**Figure 26: Plot of RE at 3m from 1 to 10GHz (NR 5MHz – Mid channel)**



**Note:** Peaks above the limit are leakage of the EUT's fundamentals from the 50-ohm terminations.

**Table 44: RE test results from 1 to 10 GHz for FCC Part 15 (NR 5MHz – Mid channel)**

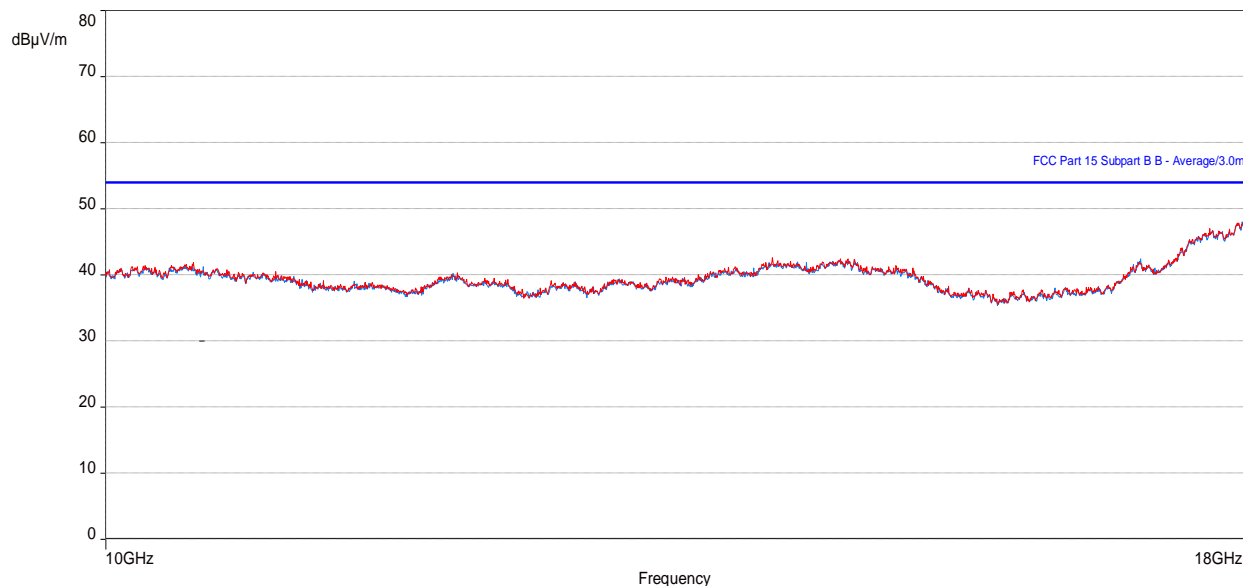
| Frequency (MHz) | Level Average (dBμV/m) | Limit Average (dBμV/m) | Margin to FCC part 15 Class B (dB) | Height (m) | Azimuth (degrees) | Polarization | Correction (dB) |
|-----------------|------------------------|------------------------|------------------------------------|------------|-------------------|--------------|-----------------|
| 4117.476282     | 42.77                  | 53.96                  | -11.19                             | 1.94       | 5.00              | Horizontal   | 2.36            |
| 4309.054808     | 45.50                  | 53.96                  | -8.46                              | 1.11       | 155.00            | Vertical     | 2.74            |
| 9576.199359     | 42.68                  | 53.96                  | -11.28                             | 4.00       | 17.00             | Horizontal   | 14.32           |

**Table 45: RE test results from 1 to 10 GHz for Part 24/27 (NR 5MHz – Mid channel)**

| Frequency (MHz) | Level (dBμV/m) | EIRP Limit (dBμV/m) | Margin to (dB) | Height (m) | Azimuth (degrees) | Polarization | Correction (dB) |
|-----------------|----------------|---------------------|----------------|------------|-------------------|--------------|-----------------|
| 4117.476282     | 42.77          | 82.2                | -39.43         | 1.94       | 5.00              | Horizontal   | 2.36            |
| 4309.054808     | 45.50          | 82.2                | -36.70         | 1.11       | 155.00            | Vertical     | 2.74            |
| 9576.199359     | 42.68          | 82.2                | -39.52         | 4.00       | 17.00             | Horizontal   | 14.32           |

**Note:** In the table/Plot above, no emissions exceed the Part 24/Part 27 radiated spurious emissions limit when converted to dBuV/m, except for the fundamentals. For final spurious emissions measurements to FCC Part 24/Part 27, see antenna port conducted emissions in applicable test report.

**Figure 27: Plot of RE at 3m from 10 to 18 GHz (NR 5MHz – Mid channel)**



**Table 46: RE test results from 10 to 18 GHz for FCC Part 15 (NR 5MHz – Mid channel)**

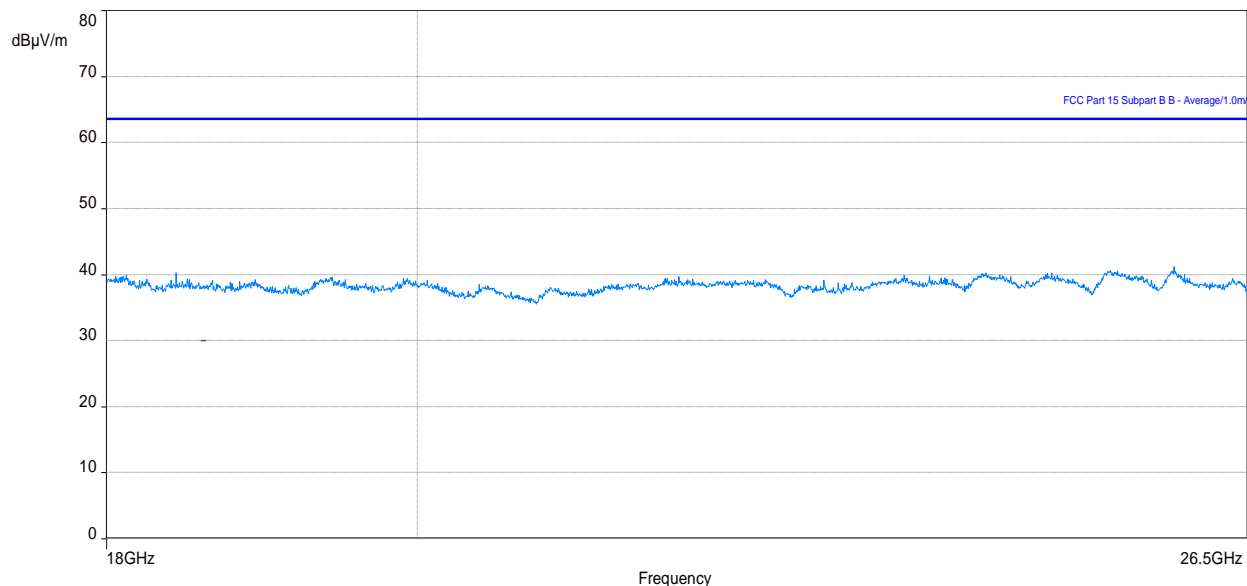
| Frequency (MHz) | Level Average (dBμV/m) | Limit Average (dBμV/m) | Margin to FCC part 15 Class B (dB) | Height (m) | Azimuth (degrees) | Polarization | Correction (dB) |
|-----------------|------------------------|------------------------|------------------------------------|------------|-------------------|--------------|-----------------|
| 14591.05417     | 38.94                  | 53.96                  | -15.02                             | 3.89       | 335.75            | Horizontal   | 11.09           |
| 14653.02373     | 39.04                  | 53.96                  | -14.92                             | 3.96       | 350.50            | Vertical     | 10.76           |
| 17898.61572     | 44.95                  | 53.96                  | -9.01                              | 4.00       | 31.25             | Horizontal   | 19.08           |
| 17919.71056     | 45.35                  | 53.96                  | -8.61                              | 4.00       | 38.25             | Vertical     | 19.50           |

**Table 47: RE test results from 10 to 18 GHz for Part 24/27 (NR 5MHz – Mid channel)**

| Frequency (MHz) | Level (dBμV/m) | EIRP Limit (dBμV/m) | Margin to (dB) | Height (m) | Azimuth (degrees) | Polarization | Correction (dB) |
|-----------------|----------------|---------------------|----------------|------------|-------------------|--------------|-----------------|
| 14591.05417     | 38.94          | 82.2                | -43.26         | 3.89       | 335.75            | Horizontal   | 11.09           |
| 14653.02373     | 39.04          | 82.2                | -43.16         | 3.96       | 350.50            | Vertical     | 10.76           |
| 17898.61572     | 44.95          | 82.2                | -37.25         | 4.00       | 31.25             | Horizontal   | 19.08           |
| 17919.71056     | 45.35          | 82.2                | -36.85         | 4.00       | 38.25             | Vertical     | 19.50           |

**Note:** In the table/Plot above, no emissions exceed the Part 24/Part 27 radiated spurious emissions limit when converted to dBuV/m. For final spurious emissions measurements to FCC Part 24/Part 27, see antenna port conducted emissions in applicable test report.

**Figure 28: Plot of RE at 1m from 18 to 26.5 GHz (NR 5MHz – Mid channel)**



**Note 1:** In the plot above No Emissions exceeds the FCC Part 15/ICES 003 limit.

**Note 2:** In the plot above, no emissions exceed the Part 24/27 radiated spurious emissions limit when converted to dBuV/m. For final spurious emissions measurements to FCC Part 24/27, see antenna port conducted emissions in applicable test report.



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### 3.2.10 Test results of RE (Single RAT/Multi carrier, WCDMA - Middle channel)

Test location: 10-meter Ambient Free Chamber (AFC)

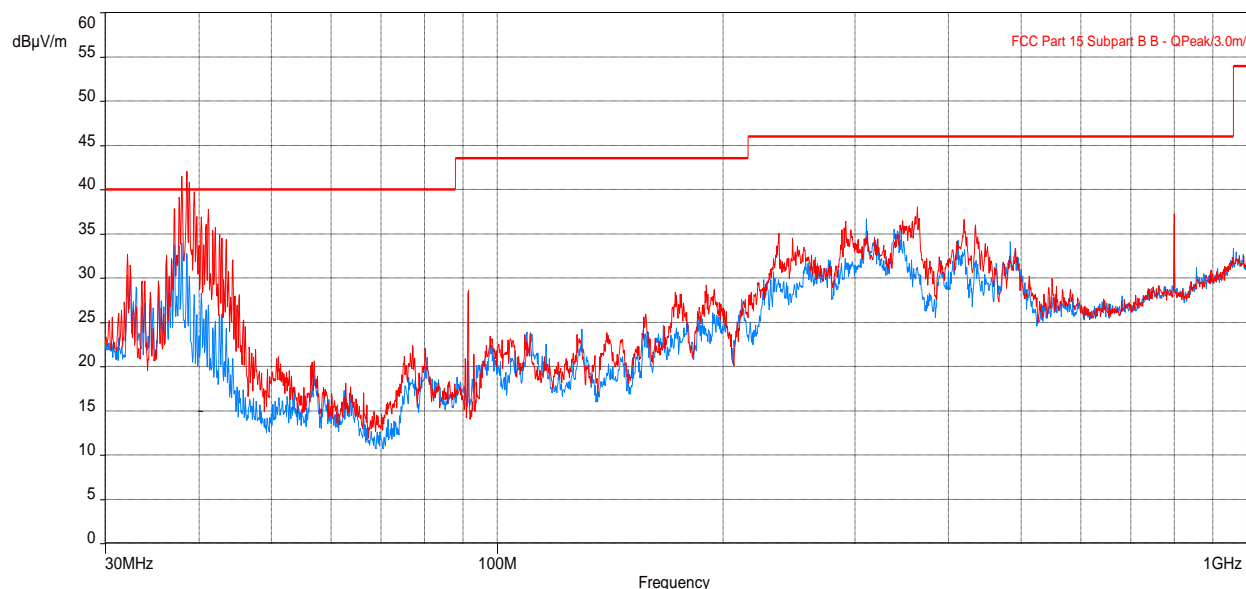
Date tested: 15 - 22 October 2020

Tested by: Krupal Patel

Test configurations are identified in the section [Configurations of the EUT](#).

For the following test results that have supporting data tables, negative margin values indicate a pass.

**Figure 29: Plot of RE at 3 m – 30 to 1000 MHz (MC1, WCDMA - Mid channel)**



**Table 48: RE test results from 30 to 1000 MHz for FCC Part 15 (MC1, WCDMA - Mid channel)**

| Frequency (MHz) | Level Quasi Peak (dBμV/m) | Limit Quasi-peak (dBμV/m) | Margin to FCC part 15 Class B (dB) | Height (m) | Azimuth (deg) | Polarization | Correction (dB) |
|-----------------|---------------------------|---------------------------|------------------------------------|------------|---------------|--------------|-----------------|
| 37.98316667     | 32.53                     | 40.00                     | -7.47                              | 1.00       | 69.25         | Vertical     | -6.30           |
| 38.56436538     | 34.21                     | 40.00                     | -5.79                              | 1.04       | 25.25         | Vertical     | -6.64           |
| 39.43560256     | 32.64                     | 40.00                     | -7.36                              | 1.04       | 4.00          | Vertical     | -7.15           |
| 799.9946121     | 36.42                     | 46.02                     | -9.60                              | 2.92       | 333.50        | Vertical     | 4.29            |

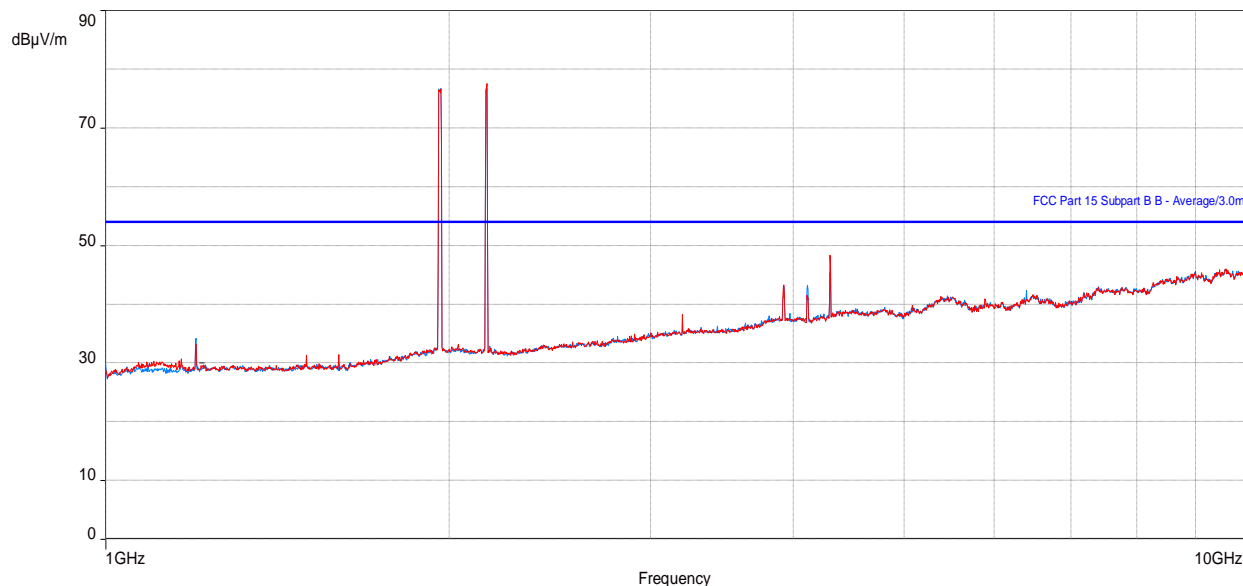
**Table 49: RE test results from 30 to 1000 MHz for FCC Part 24/27 (MC1, WCDMA - Mid channel)**

| Frequency (MHz) | Level (dBμV/m) | EIRP Limit (dBμV/m) | Margin to (dB) | Height (m) | Azimuth (deg) | Polarization | Correction (dB) |
|-----------------|----------------|---------------------|----------------|------------|---------------|--------------|-----------------|
| 37.98316667     | 32.53          | 82.2                | -49.67         | 1.00       | 69.25         | Vertical     | -6.30           |
| 38.56436538     | 34.21          | 82.2                | -47.99         | 1.04       | 25.25         | Vertical     | -6.64           |
| 39.43560256     | 32.64          | 82.2                | -49.56         | 1.04       | 4.00          | Vertical     | -7.15           |
| 799.9946121     | 36.42          | 82.2                | -45.78         | 2.92       | 333.50        | Vertical     | 4.29            |

**Note:** In the table/Plot above, no emissions exceed the Part 24/Part 27 radiated spurious emissions limit when converted to dBuV/m. For final spurious emissions measurements to FCC Part 24/Part 27, see antenna port conducted emissions in applicable test report.



**Figure 30: Plot of RE at 3m from 1 to 10GHz (MC1, WCDMA - Mid channel)**



**Note:** Peaks above the limit are leakage of the EUT's fundamentals from the 50-ohm terminations.

**Table 50: RE test results from 1 to 10 GHz for FCC Part 15 (MC1, WCDMA - Mid channel)**

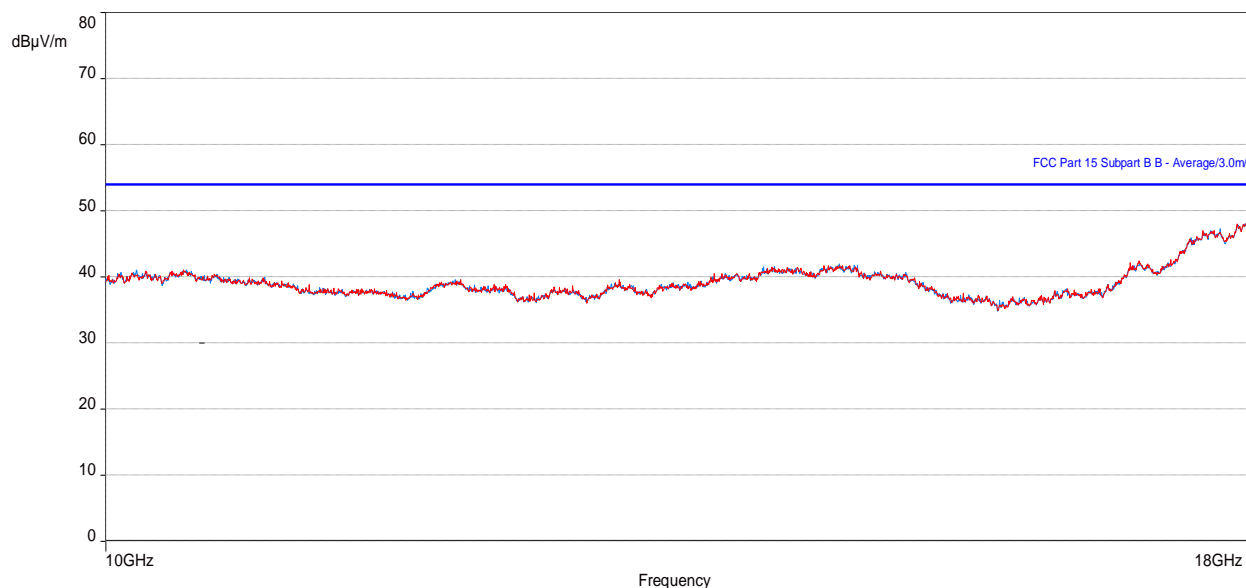
| Frequency (MHz) | Level Average (dBμV/m) | Limit Average (dBμV/m) | Margin to FCC part 15 Class B (dB) | Height (m) | Azimuth (degrees) | Polarization | Correction (dB) |
|-----------------|------------------------|------------------------|------------------------------------|------------|-------------------|--------------|-----------------|
| 4116.648718     | 42.43                  | 53.96                  | -11.53                             | 1.39       | 47.75             | Horizontal   | 2.36            |
| 4309.684936     | 46.39                  | 53.96                  | -7.57                              | 1.11       | 155.00            | Vertical     | 2.75            |
| 9559.930449     | 43.01                  | 53.96                  | -10.95                             | 3.82       | 334.75            | Vertical     | 14.04           |

**Table 51: RE test results from 1 to 10 GHz for Part 24/27 (MC1, WCDMA - Mid channel)**

| Frequency (MHz) | Level (dBμV/m) | EIRP Limit (dBμV/m) | Margin to (dB) | Height (m) | Azimuth (degrees) | Polarization | Correction (dB) |
|-----------------|----------------|---------------------|----------------|------------|-------------------|--------------|-----------------|
| 4116.648718     | 42.43          | 82.2                | -39.77         | 1.39       | 47.75             | Horizontal   | 2.36            |
| 4309.684936     | 46.39          | 82.2                | -35.81         | 1.11       | 155.00            | Vertical     | 2.75            |
| 9559.930449     | 43.01          | 82.2                | -39.19         | 3.82       | 334.75            | Vertical     | 14.04           |

**Note:** In the table/Plot above, no emissions exceed the Part 24/Part 27 radiated spurious emissions limit when converted to dBuV/m, except for the fundamentals. For final spurious emissions measurements to FCC Part 24/Part 27, see antenna port conducted emissions in applicable test report.

**Figure 31: Plot of RE at 3m from 10 to 18 GHz (MC1, WCDMA - Mid channel)**



**Table 52: RE test results from 10 to 18 GHz for FCC Part 15 (MC1, WCDMA - Mid channel)**

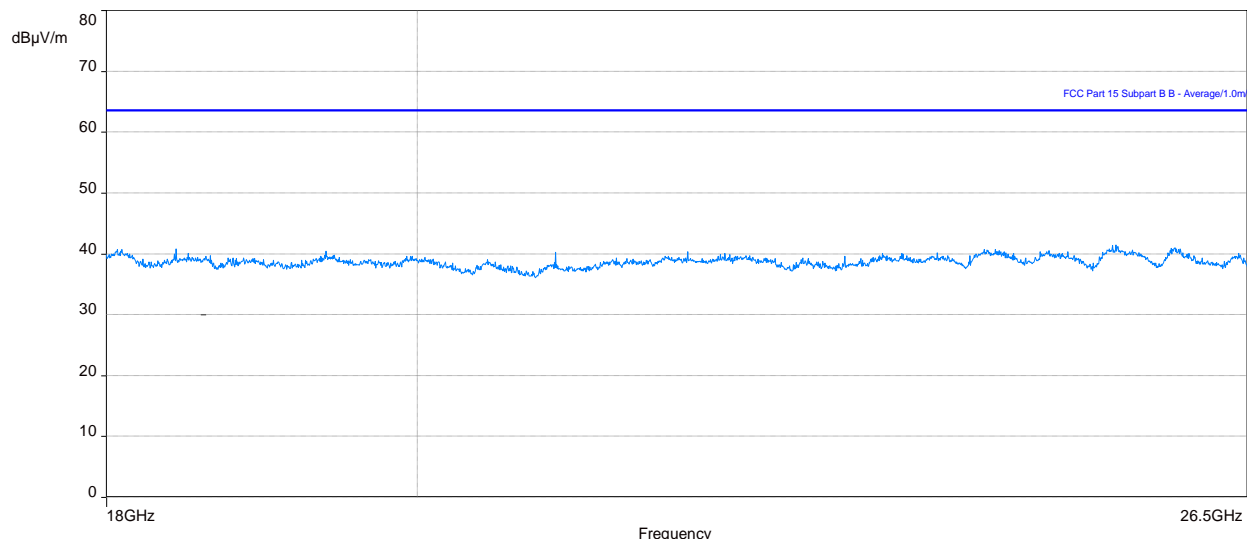
| Frequency (MHz) | Level Average (dBμV/m) | Limit Average (dBμV/m) | Margin to FCC part 15 Class B (dB) | Height (m) | Azimuth (degrees) | Polarization | Correction (dB) |
|-----------------|------------------------|------------------------|------------------------------------|------------|-------------------|--------------|-----------------|
| 14474.5436      | 37.80                  | 53.96                  | -16.16                             | 3.86       | 31.25             | Vertical     | 10.77           |
| 14588.00641     | 38.36                  | 53.96                  | -15.60                             | 1.00       | 16.75             | Horizontal   | 11.09           |
| 17905.43814     | 44.66                  | 53.96                  | -9.30                              | 1.00       | 31.25             | Vertical     | 19.22           |
| 17911.53431     | 45.09                  | 53.96                  | -8.87                              | 4.00       | 350.00            | Horizontal   | 19.34           |

**Table 53: RE test results from 10 to 18 GHz for Part 24/27 (MC1, WCDMA - Mid channel)**

| Frequency (MHz) | Level (dBμV/m) | EIRP Limit (dBμV/m) | Margin to (dB) | Height (m) | Azimuth (degrees) | Polarization | Correction (dB) |
|-----------------|----------------|---------------------|----------------|------------|-------------------|--------------|-----------------|
| 14474.5436      | 37.80          | 82.2                | -44.40         | 3.86       | 31.25             | Vertical     | 10.77           |
| 14588.00641     | 38.36          | 82.2                | -43.84         | 1.00       | 16.75             | Horizontal   | 11.09           |
| 17905.43814     | 44.66          | 82.2                | -37.54         | 1.00       | 31.25             | Vertical     | 19.22           |
| 17911.53431     | 45.09          | 82.2                | -37.11         | 4.00       | 350.00            | Horizontal   | 19.34           |

**Note:** In the table/Plot above, no emissions exceed the Part 24/Part 27 radiated spurious emissions limit when converted to dBuV/m. For final spurious emissions measurements to FCC Part 24/Part 27, see antenna port conducted emissions in applicable test report.

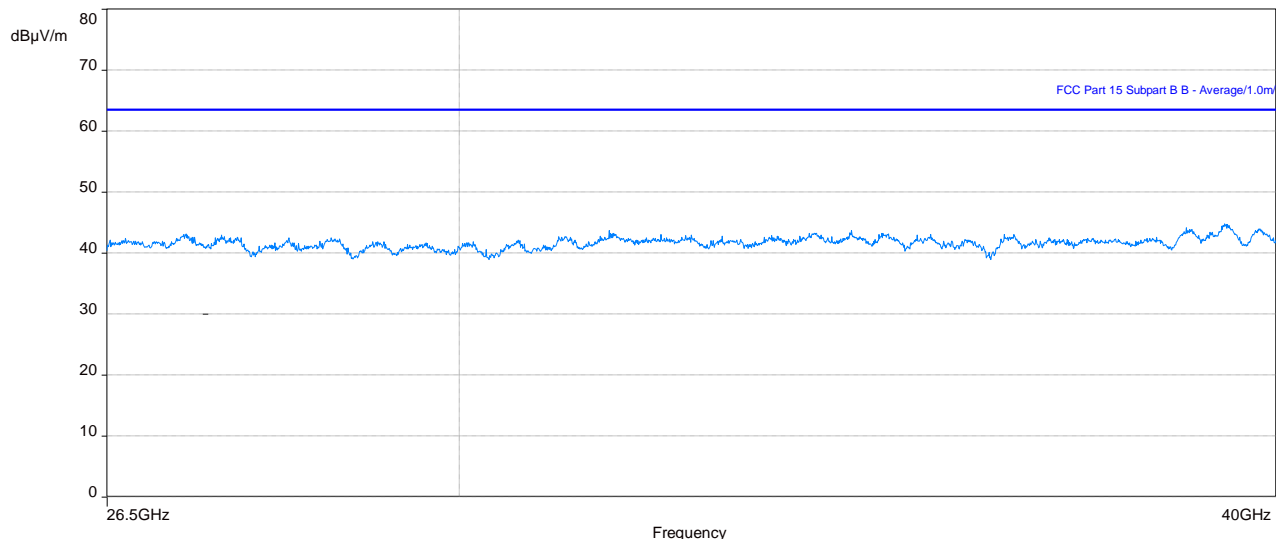
**Figure 32: Plot of RE at 1m from 18 to 26.5 GHz (MC1, WCDMA - Mid channel)**



**Note 1:** In the plot above No Emissions exceeds the FCC Part 15/ICES 003 limit.

**Note 2:** In the plot above, no emissions exceed the Part 24/27 radiated spurious emissions limit when converted to dBuV/m. For final spurious emissions measurements to FCC Part 24/27, see antenna port conducted emissions in applicable test report.

**Figure 33: Plot of RE at 1m from 26.5 to 40 GHz (MC1, WCDMA - Mid channel)**



**Note 1:** In the plot above No Emissions exceeds the FCC Part 15/ICES 003 limit.

**Note 2:** In the plot above, no emissions exceed the Part 24/27 radiated spurious emissions limit when converted to dBuV/m. For final spurious emissions measurements to FCC Part 24/27, see antenna port conducted emissions in applicable test report.



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### 3.2.11 Test results of RE (Multi RAT/Carrier, MR1, LTE+WCDMA & LTE+NR - Mid channel)

Test location: 10-meter Ambient Free Chamber (AFC)

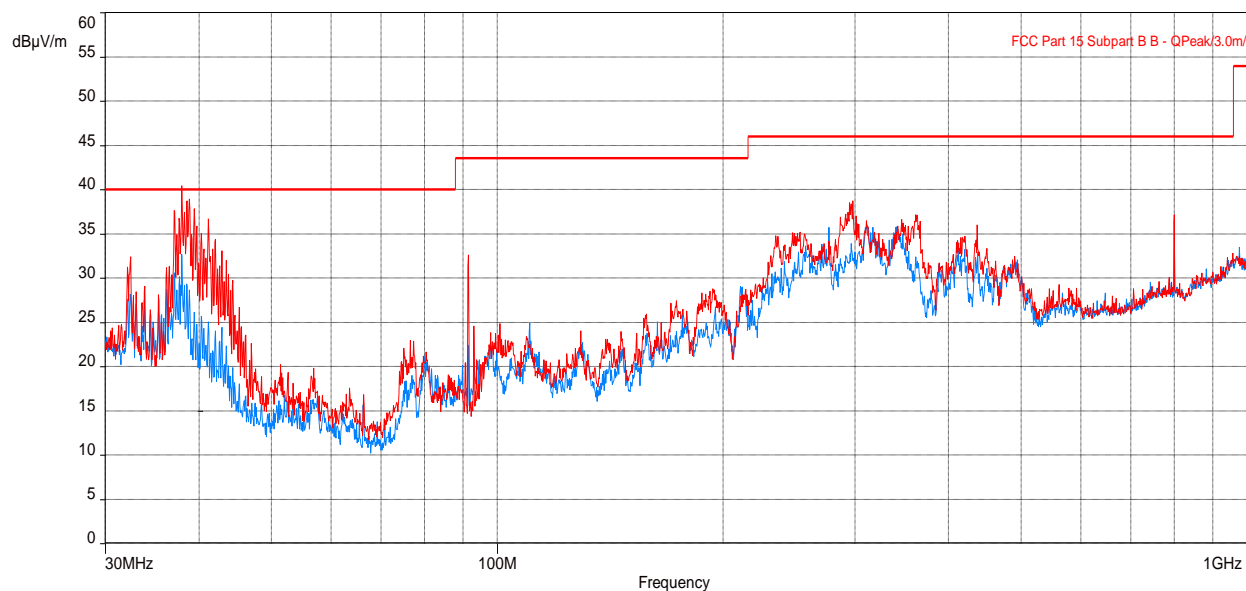
Date tested: 15 - 22 October 2020

Tested by: Krupal Patel

Test configurations are identified in the section [Configurations of the EUT](#).

For the following test results that have supporting data tables, negative margin values indicate a pass.

**Figure 34: Plot of RE at 3 m – 30 to 1000 MHz (MR1 - Mid channel)**



**Table 54: RE test results from 30 to 1000 MHz for FCC Part 15 (MR1 - Mid channel)**

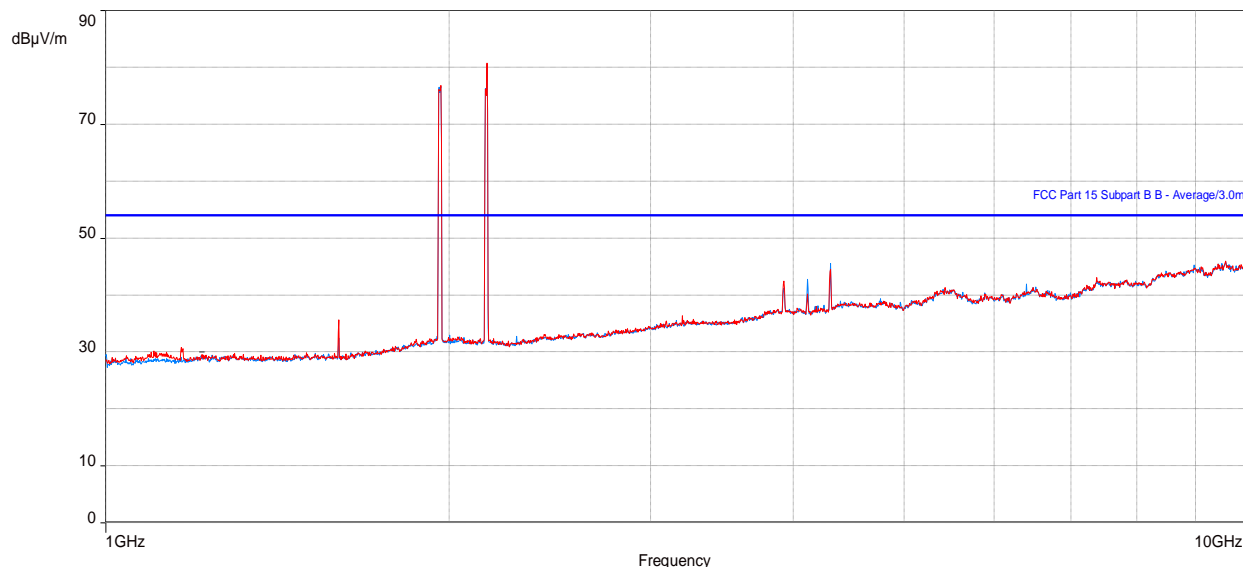
| Frequency (MHz) | Level Quasi Peak (dBμV/m) | Limit Quasi-peak (dBμV/m) | Margin to FCC part 15 Class B (dB) | Height (m) | Azimuth (deg) | Polarization | Correction (dB) |
|-----------------|---------------------------|---------------------------|------------------------------------|------------|---------------|--------------|-----------------|
| 37.98072403     | 36.46                     | 40.00                     | -3.54                              | 1.00       | 70.25         | Vertical     | -6.30           |
| 38.56288428     | 36.49                     | 40.00                     | -3.51                              | 1.00       | 62.75         | Vertical     | -6.64           |
| 296.7362597     | 33.91                     | 46.02                     | -12.11                             | 2.88       | 0.00          | Vertical     | -5.52           |
| 799.9944936     | 36.60                     | 46.02                     | -9.42                              | 2.87       | 247.00        | Horizontal   | 4.29            |

**Table 55: RE test results from 30 to 1000 MHz for FCC Part 24/27 (MR1 - Mid channel)**

| Frequency (MHz) | Level (dBμV/m) | EIRP Limit (dBμV/m) | Margin to (dB) | Height (m) | Azimuth (deg) | Polarization | Correction (dB) |
|-----------------|----------------|---------------------|----------------|------------|---------------|--------------|-----------------|
| 37.98072403     | 36.46          | 82.2                | -45.74         | 1.00       | 70.25         | Vertical     | -6.30           |
| 38.56288428     | 36.49          | 82.2                | -45.71         | 1.00       | 62.75         | Vertical     | -6.64           |
| 296.7362597     | 33.91          | 82.2                | -48.29         | 2.88       | 0.00          | Vertical     | -5.52           |
| 799.9944936     | 36.60          | 82.2                | -45.60         | 2.87       | 247.00        | Horizontal   | 4.29            |

**Note:** In the table/Plot above, no emissions exceed the Part 24/Part 27 radiated spurious emissions limit when converted to dBuV/m. For final spurious emissions measurements to FCC Part 24/Part 27, see antenna port conducted emissions in applicable test report.

**Figure 35: Plot of RE at 3m from 1 to 10GHz (MR1 - Mid channel)**



**Note:** Peaks above the limit are leakage of the EUT's fundamentals from the 50-ohm terminations.

**Table 56: RE test results from 1 to 10 GHz for FCC Part 15 (MR1 - Mid channel)**

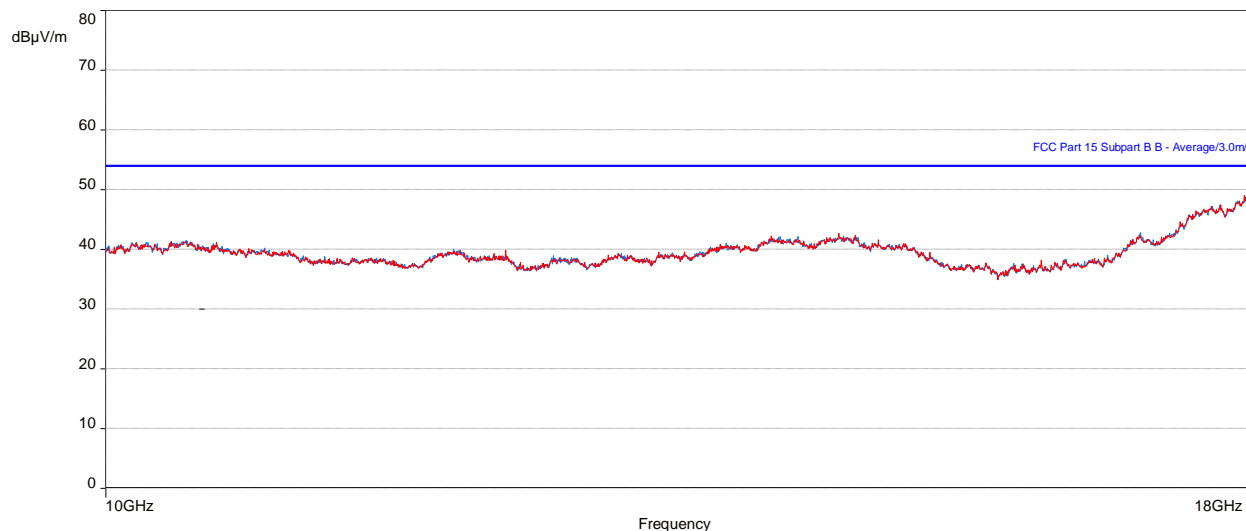
| Frequency (MHz) | Level Average (dBμV/m) | Limit Average (dBμV/m) | Margin to FCC part 15 Class B (dB) | Height (m) | Azimuth (degrees) | Polarization | Correction (dB) |
|-----------------|------------------------|------------------------|------------------------------------|------------|-------------------|--------------|-----------------|
| 4116.653205     | 41.10                  | 53.96                  | -12.86                             | 1.87       | 41.00             | Horizontal   | 2.36            |
| 4314.969551     | 44.39                  | 53.96                  | -9.57                              | 1.18       | 156.25            | Vertical     | 2.76            |
| 9565.251603     | 42.57                  | 53.96                  | -11.39                             | 1.52       | -2.00             | Vertical     | 14.13           |

**Table 57: RE test results from 1 to 10 GHz for Part 24/27 (MR1 - Mid channel)**

| Frequency (MHz) | Level (dBμV/m) | EIRP Limit (dBμV/m) | Margin to (dB) | Height (m) | Azimuth (degrees) | Polarization | Correction (dB) |
|-----------------|----------------|---------------------|----------------|------------|-------------------|--------------|-----------------|
| 4116.653205     | 41.10          | 82.2                | -41.10         | 1.87       | 41.00             | Horizontal   | 2.36            |
| 4314.969551     | 44.39          | 82.2                | -37.81         | 1.18       | 156.25            | Vertical     | 2.76            |
| 9565.251603     | 42.57          | 82.2                | -39.63         | 1.52       | -2.00             | Vertical     | 14.13           |

**Note:** In the table/Plot above, no emissions exceed the Part 24/Part 27 radiated spurious emissions limit when converted to dBuV/m, except for the fundamentals. For final spurious emissions measurements to FCC Part 24/Part 27, see antenna port conducted emissions in applicable test report.

**Figure 36: Plot of RE at 3m from 10 to 18 GHz (MR1 - Mid channel)**



**Table 58: RE test results from 10 to 18 GHz for FCC Part 15 (MR1 - Mid channel)**

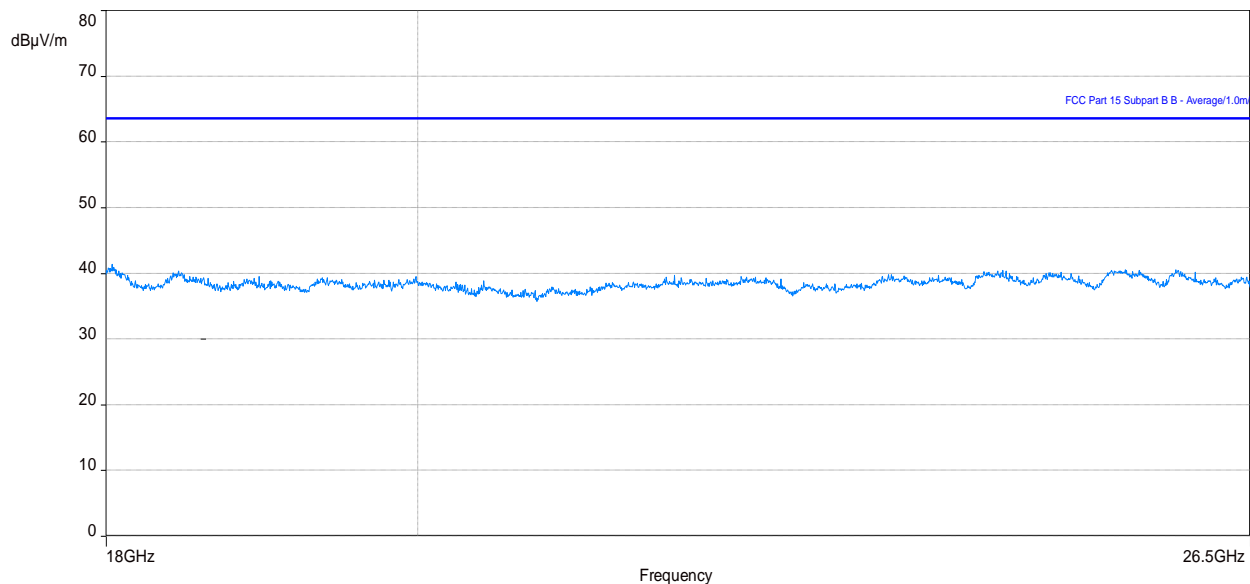
| Frequency (MHz) | Level Average (dBμV/m) | Limit Average (dBμV/m) | Margin to FCC part 15 Class B (dB) | Height (m) | Azimuth (degrees) | Polarization | Correction (dB) |
|-----------------|------------------------|------------------------|------------------------------------|------------|-------------------|--------------|-----------------|
| 14150.42885     | 37.93                  | 53.96                  | -16.03                             | 1.00       | -2.00             | Horizontal   | 9.77            |
| 14583.59678     | 38.44                  | 53.96                  | -15.52                             | 1.53       | 349.25            | Vertical     | 11.09           |
| 17908.91859     | 45.16                  | 53.96                  | -8.80                              | 4.00       | 298.75            | Horizontal   | 19.29           |
| 17968.97468     | 45.08                  | 53.96                  | -8.88                              | 1.00       | 298.75            | Vertical     | 20.53           |

**Table 59: RE test results from 10 to 18 GHz for Part 24/27 (MR1 - Mid channel)**

| Frequency (MHz) | Level (dBμV/m) | EIRP Limit (dBμV/m) | Margin to (dB) | Height (m) | Azimuth (degrees) | Polarization | Correction (dB) |
|-----------------|----------------|---------------------|----------------|------------|-------------------|--------------|-----------------|
| 14150.42885     | 37.93          | 82.2                | -44.27         | 1.00       | -2.00             | Horizontal   | 9.77            |
| 14583.59678     | 38.44          | 82.2                | -43.76         | 1.53       | 349.25            | Vertical     | 11.09           |
| 17908.91859     | 45.16          | 82.2                | -37.04         | 4.00       | 298.75            | Horizontal   | 19.29           |
| 17968.97468     | 45.08          | 82.2                | -37.12         | 1.00       | 298.75            | Vertical     | 20.53           |

**Note:** In the table/Plot above, no emissions exceed the Part 24/Part 27 radiated spurious emissions limit when converted to dBuV/m. For final spurious emissions measurements to FCC Part 24/Part 27, see antenna port conducted emissions in applicable test report.

**Figure 37: Plot of RE at 1m from 18 to 26.5 GHz (MR1 - Mid channel)**



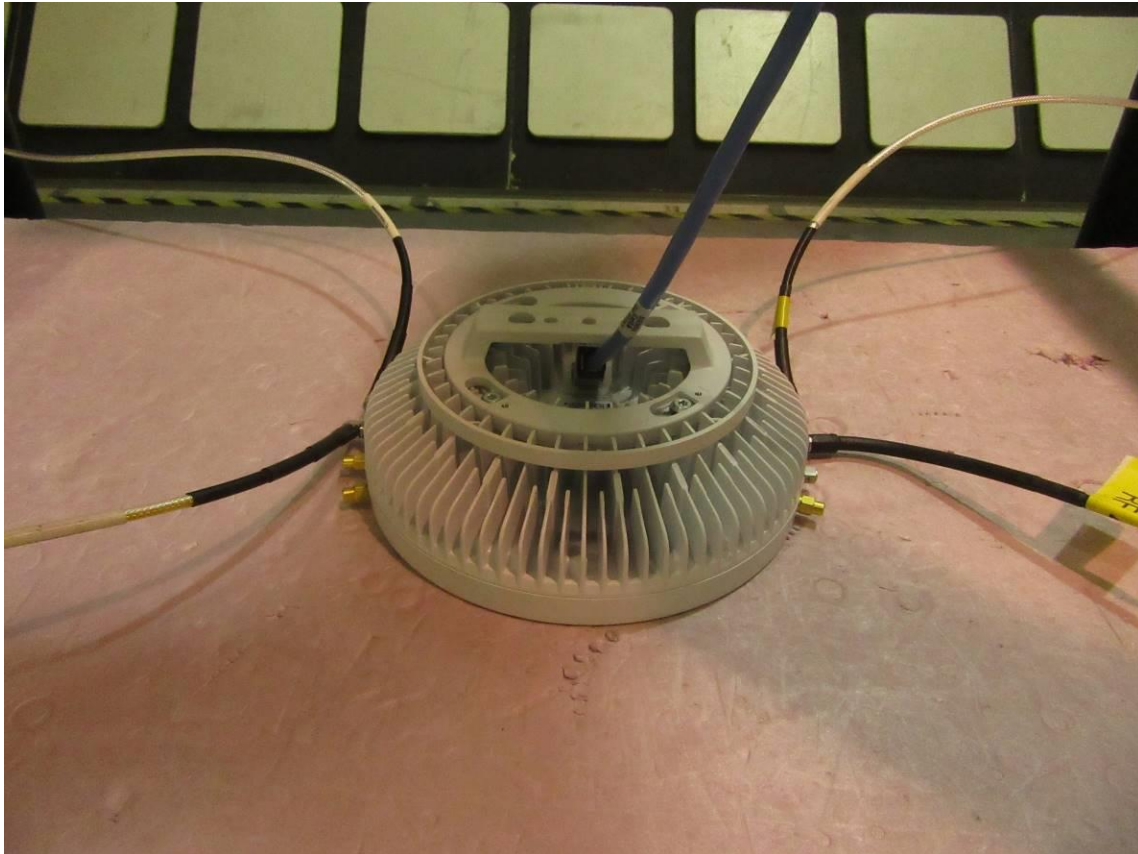
**Note 1:** In the plot above No Emissions exceeds the FCC Part 15/ICES 003 limit.

**Note 2:** In the plot above, no emissions exceed the Part 24/27 radiated spurious emissions limit when converted to dBuV/m. For final spurious emissions measurements to FCC Part 24/27, see antenna port conducted emissions in applicable test report.



### 3.2.12 Radiated Emissions test setup pictures

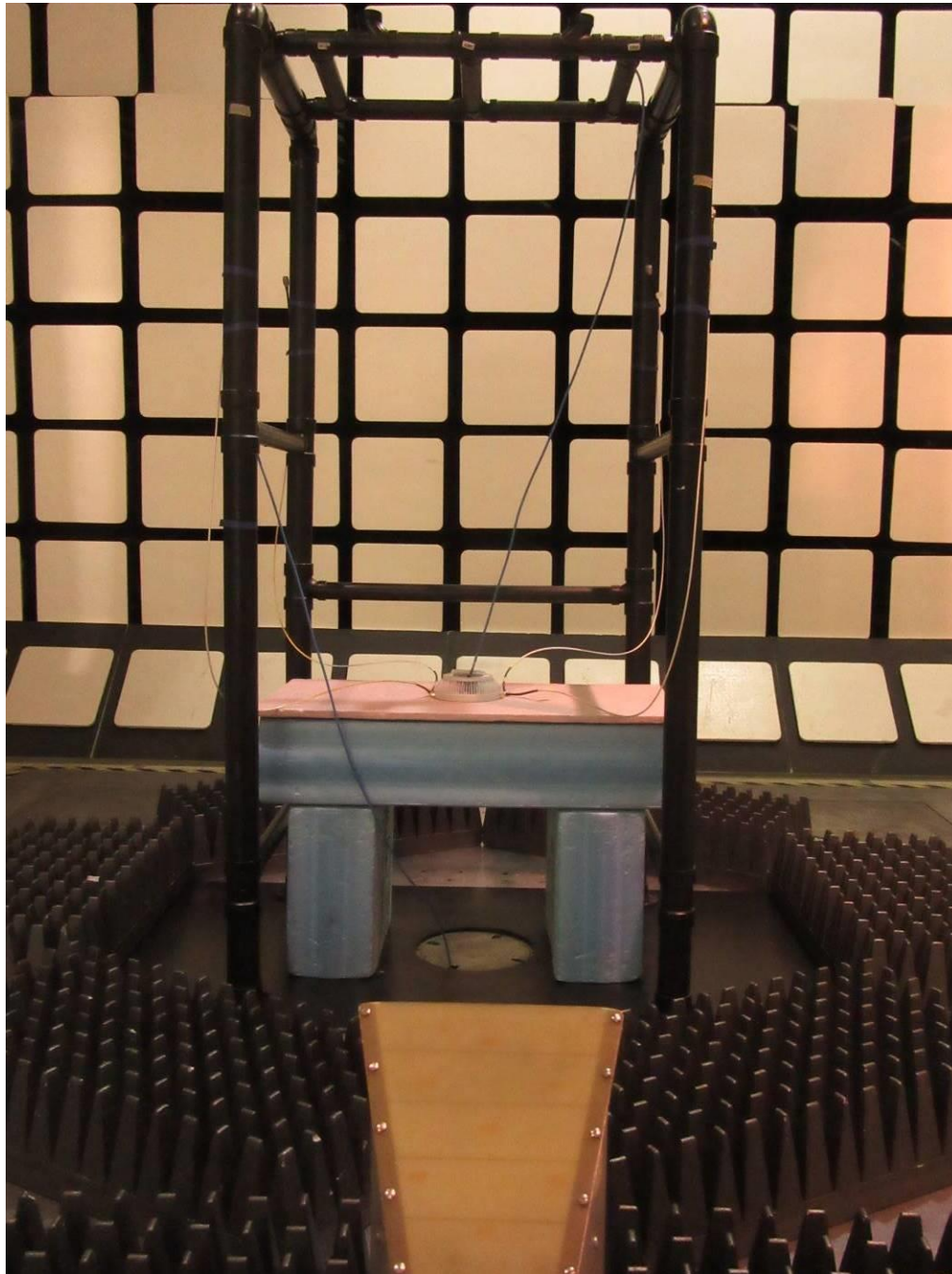
**Figure 38: EUT Setup for RE tests (Closeup)**



**Figure 39: EUT Setup for RE tests at 30 MHz to 1 GHz**



**Figure 40: EUT Setup for RE tests for above 1 GHz**



### 3.2.13 Test equipment

The equipment used for E-field RE testing was as follows.

**Table 60: Test equipment used for RE**

| Description                  | Make                    | Model number           | Asset ID  | Calibr. date | Calibr. due  |
|------------------------------|-------------------------|------------------------|-----------|--------------|--------------|
| EMC Automation Software      | Nexio V3.18             | BAT-EMC                | F0163649  | Not required |              |
| Bilog Antenna                | Teseq                   | 6111D                  | SSG013955 | 2019-12-03   | 2020-12-03   |
| Double Ridged Horn Antenna   | Emco                    | 3115                   | SSG012508 | 2020-05-11   | 2021-05-11   |
| Horn Antenna (18 - 26.5 GHz) | Emco                    | 3160-09                | SSG012292 | 2019-08-26   | 2021-08-26   |
| Horn Antenna (26.5 - 40 GHz) | Emco                    | 3160-10                | SSG012294 | 2019-08-26   | 2021-08-26   |
| EMI Receiver                 | Rohde & Schwarz         | ESU26                  | SSG013729 | 2020-03-19   | 2021-03-19   |
| EMI Receiver                 | Rohde & Schwarz         | ESU40                  | SSG013672 | 2019-10-08   | 2021-01-08   |
| Coaxial Cable                | Huber & Suhner          | 106A                   | SSG013841 | 2020-01-06   | 2021-01-06   |
| Coaxial Cable                | Huber & Suhner          | 106A                   | SSG012711 | 2020-01-06   | 2021-01-06   |
| Coaxial Cable                | Huber & Suhner          | 104PEA                 | SSG012041 | 2020-01-06   | 2021-01-06   |
| Coaxial Cable                | Huber & Suhner          | ST18/Nm/Nm/36          | SSG012785 | 2020-01-06   | 2021-01-06   |
| Coaxial Cable                | Micro-Coax              | UFA 210B-1-1500-504504 | SSG012376 | 2020-01-02   | 2021-01-02   |
| Coaxial Cable                | Huber & Suhner          | 101 PEA, Sucoflex      | SSG012290 | 2018-11-13   | 2020-11-13   |
| RF Amplifier                 | Hewlett Packard         | 8447D                  | SSG013045 | 2020-01-08   | 2021-01-08   |
| Pre-Amplifier                | BNR                     | LNA                    | SSG012360 | 2019-09-26   | 2020-12-26   |
| Power Supply                 | Hewlett Packard         | 6216A                  | SSG013063 | not required | not required |
| Power Supply                 | Lambda                  | LPD-421A-FM            | SSG013085 | not required | not required |
| RF Filter: High Pass         | Microwave Circuits inc. | H3G02G1                | SSG012728 | 2020-01-06   | 2021-01-06   |
| Attenuator                   | Narda                   | N/A                    | SSG013687 | 2020-01-06   | 2021-01-06   |
| Attenuator                   | Narda                   | 768-10                 | SSG012714 | 2019-01-04   | 2021-01-05   |

### 3.2.14 Test conclusion

The DOT 2274 B25B66 (KRY 901 468/1) and DOT 2284 B25B66 (KRY 901 468/2) has passed the E-field Radiated Emission (RE) tests with respect to the standards/sections listed in section [Executive summary](#).



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## 4. References

The documents, regulations, and standards that are referenced throughout this test report are listed alphabetically as follows.

1. ANSI C63.2-2009, American National Standards Institute for Electromagnetic Noise and Field Strength Instrumentation, 10 Hz to 40 GHz – Specifications.
2. ANSI C63.4-2014, American National Standards Institute for Methods of Measurement of Radio-Noise Emission from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.
3. CISPR 16 Publications (all parts and sections), Specification for Radio Disturbance and Immunity Measuring Apparatus and Methods - Part 1: Radio Disturbance and Immunity Measuring Apparatus.
4. CISPR 22 (2008, +IS 1, + IS 2, + IS 3: 2012), Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement.
5. FCC Rules for Radio Frequency Devices, Title 47 of the Code of Federal Regulations, Part 2, U.S. Federal Communications Commission.
6. FCC Rules for Radio Frequency Devices, Title 47 of the Code of Federal Regulations, Part 15 Radio Frequency Devices, U.S. Federal Communications Commission.
7. FCC Rules for Radio Frequency Devices, Title 47 of the Code of Federal Regulations, Part 24 – PERSONAL COMMUNICATIONS SERVICES, U.S. Federal Communications Commission.
8. FCC Rules for Radio Frequency Devices, Title 47 of the Code of Federal Regulations, Part 27 Miscellaneous Wireless Communications Services, U.S. Federal Communications Commission.
9. ICES-003 Issue 6 (2016), Spectrum Management and Telecommunications, Interference-Causing Equipment Standard: Information Technology Equipment (ITE) – Limits and methods of measurement.
10. Radio Standards Specification RSS-133, issue 6 (January 2018), 2 GHz Personal Communication Services, Ministry of Industry, Government of Canada.
11. Radio Standards Specification RSS-139, issue 3 (July 2015), Advanced Wireless Services (AWS) Equipment Operating in the Bands 1710 - 1780 MHz and 2110-2180 MHz. Ministry of Industry, Government of Canada.
12. Radio Standards Specification RSS-170, issue 3 (July 2015), Mobile Earth Stations (MESs) and Ancillary Terrestrial Component (ATC) Equipment Operating in the Mobile-Satellite Service (MSS) Bands. Ministry of Industry, Government of Canada.
13. RSS-Gen – General Requirements for Compliance of Radio Apparatus, Issue 5 (March 2019); Ministry of Industry, Government of Canada.

## 4.1 Appendix A: Abbreviations

The abbreviations of terms used in this document are as follows.

| Term   | Definition                                                                                                                    |
|--------|-------------------------------------------------------------------------------------------------------------------------------|
| A      | 6 dB Coaxial Attenuator (Conducted Immunity)                                                                                  |
| AAN    | Asymmetric Artificial Network (ISN)                                                                                           |
| AE     | Auxiliary equipment                                                                                                           |
| AFC    | Ambient Free Chamber                                                                                                          |
| ANSI   | American National Standards Institute                                                                                         |
| AVG    | Average detector                                                                                                              |
| BiLog  | Biconical Log-Periodic Hybrid antenna (a registered trademark of Schaffner-Chase EMC Limited, 1993)                           |
| CDN    | Coupling-decoupling Network                                                                                                   |
| CE     | Conducted Emissions                                                                                                           |
| CISPR  | Comité International Spécial Perturbation Radioélectrique (International Special Committee on Radio Interference)             |
| CSA    | Canadian Standards Association                                                                                                |
| DN/P   | Decoupling / Protection Network                                                                                               |
| EMC    | Electromagnetic Compatibility                                                                                                 |
| EMI    | Electromagnetic Interference                                                                                                  |
| ETSI   | European Telecommunications Standards Institute                                                                               |
| EUT    | equipment under test                                                                                                          |
| GND    | Ground                                                                                                                        |
| HCP    | Horizontal Coupling Plane                                                                                                     |
| HME    | Harmonics Measurement Equipment                                                                                               |
| HV     | High Voltage                                                                                                                  |
| HVP    | High Voltage Probe                                                                                                            |
| h/w    | hardware                                                                                                                      |
| IC     | Industry Canada                                                                                                               |
| ICES   | Canadian Specification: ICES-003, Issue 3, "Spectrum Management: Interference-causing equipment standard (Digital Apparatus)" |
| IEC    | International Electro Technical Association                                                                                   |
| ISN    | Impedance Stabilization Network                                                                                               |
| LISN   | Line Impedance Stabilization Network                                                                                          |
| ms     | millisecond, unless otherwise specified                                                                                       |
| NA, na | not applicable                                                                                                                |



| Term | Definition                                                      |
|------|-----------------------------------------------------------------|
| PA   | Broadband Power Amplifier                                       |
| PK   | Peak Detector                                                   |
| PS   | Power Supply                                                    |
| QP   | Quasi-peak Detector                                             |
| QPA  | Quasi-peak Adapter (for the Spectrum Analyzer)                  |
| R    | 100-ohm Injection Resistor (Conducted Immunity)                 |
| RBW  | Resolution Bandwidth                                            |
| RE   | Radiated Emissions                                              |
| RF   | Radio-Frequency                                                 |
| RI   | Radiated Immunity                                               |
| RMS  | Root-mean-square                                                |
| s/w  | software                                                        |
| SA   | Spectrum Analyzer, the CISPR 16, ANSI C63.2 Compliant EMI meter |
| STP  | Shielded Twisted Pair                                           |
| T    | 50-ohm Coaxial Termination (Conducted Emissions / Immunity)     |
| TL   | Transient Limiter                                               |
| UFA  | Uniform field Area                                              |
| VBW  | Video Bandwidth                                                 |



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**End of Document**