

**Application for Certification  
For a Transmitter.**

TRANSCORE  
Amtech Technology Center  
8600 Jefferson Street, NE  
Albuquerque, NM 87113

Multiprotocol Reader Extreme- Frequency Hopper

M/N: MPRXFH

FCC ID: FIHMPRXFHV1  
IC: 1584A-MPRXFHV1  
HVIN: MPRXFH

REPORT # UT06022A-004

This report was prepared in accordance with the requirements of the FCC Rules and Regulations Part 2, Subpart J, 2.1033, Part 15.247, RSS-247 Issue 2, and other applicable sections of the rules as indicated herein.

Prepared By:

DNB Engineering, Inc.  
1100 E Chalk Creek Road  
Coalville, UT 84017

20 Nov 2019

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Paragraph numbers in this report follow the application section numbers found in the FEDERAL COMMUNICATIONS COMMISSION Rules and Regulations, Part 2, Subpart J for Certification of electronic equipment.

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## 1.0 ADMINISTRATIVE DATA

### 1.1 Certifications and Qualifications

I certify that DNB Engineering, Inc conducted the tests performed in order to obtain the technical data presented in this application. Also, based on the results of the enclosed data, I have concluded that the equipment tested meets or exceeds the requirements of the Rules and Regulations governing this application.

### 1.2 Measurement Repeatability Information

The test data presented in this report has been acquired using the guidelines set forth in FCC Part 2.1031 through 2.1057, Part 15. The test results presented in this document are valid only for the equipment identified herein under the test conditions described. Repeatability of these test results will only be achieved with identical measurement conditions. These conditions include: The same test distance, EUT Height, Measurement Site Characteristics, and the same EUT System Components. The system must have the same Interconnecting Cables arranged in identical placement to that in the test set-up, with the system and/or EUT functioning in the identical mode of operation (i.e. software and so on) as on the date of the test. Any deviation from the test conditions and the environment on the date of the test may result in measurement repeatability difficulties.

All changes made to the EUT during the course of testing as identified in this test report must be incorporated into the EUT or identical models to ensure compliance with the FCC regulations.



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### 1.3 Test Equipment List

| TEST EQUIPMENT LIST - RADIATED EMISSIONS |                          |         |            |             |
|------------------------------------------|--------------------------|---------|------------|-------------|
| Description                              | Manufacturer/MN          | Asset # | Serial #   | Cal Due     |
| Amplifier                                | HP/8447D                 | U-065   | 2727A06180 | 6 May 2012  |
| BiconiLog Antenna                        | ETS/3142E                | U-255   | 7          | 3 Sep 2021  |
| DRG Horn Antenna                         | AH Systems/SAS-571       | U-071   | 417        | 11 Jul 2020 |
| Spectrum Analyzer                        | R&S/FSV30                | U-248   | 101367     | 17 Aug 2020 |
| TILE Software                            | ETS- Lindgern/ 3.4.11.13 | U-317   | 8112006    | 07 Mar 2020 |

| TEST EQUIPMENT LIST - ANTENNA CONDUCTED |                 |         |          |             |
|-----------------------------------------|-----------------|---------|----------|-------------|
| Description                             | Manufacturer/MN | Asset # | Serial # | Cal Due     |
| Spectrum Analyzer                       | R&S/FSV30       | U-248   | 101367   | 17 Aug 2020 |

| TEST EQUIPMENT LIST - CONDUCTED EMISSIONS |                 |         |           |             |
|-------------------------------------------|-----------------|---------|-----------|-------------|
| Description                               | Manufacturer/MN | Asset # | Serial #  | Cal Due     |
| Spectrum Analyzer                         | R&S/FSV30       | U-248   | 101367    | 17 Aug 2020 |
| LISN                                      | Fisher          | U-286   | 2020      | 16 May 2020 |
| TILE Software                             | ETS Lindgren    | U-317   | Aug112006 | 08 Mar 2020 |

| SUPPORT EQUIPMENT LIST |                                                                  |
|------------------------|------------------------------------------------------------------|
| Description            | Comments                                                         |
| Interconnect Cable     | 3 meter cable used to connect into the Host port to supply power |
| AC Power Supply        | Ac to DC power supply connected to Interconnect cable            |

Note: Only one sample was tested and all data was taken from it.

#### 1.4 Test Summary Cross Reference

| Test Item                                        | FCC Requirement                                   | IC Requirement                             | Test Method                         | Result |
|--------------------------------------------------|---------------------------------------------------|--------------------------------------------|-------------------------------------|--------|
| Antenna Requirement                              | FCC Part 15, Subpart C<br>Section 15.203 / 15.247 | RSS-Gen<br>Section 8.1.3                   | ---                                 | Pass   |
| AC Power Line<br>Conducted Emissions             | FCC Part 15, Subpart C<br>Section 15.207          | RSS-Gen<br>Section 8.8                     | ANSI C63.10 (2013)<br>Section 6.2   | Pass   |
| Minimum 20dB<br>Bandwidth                        | FCC Part 15, Subpart C<br>Section 15.247 (a,1,i)  | RSS-247 Issue 2<br>Feb 2017<br>Section 5.1 | ANSI C63.10 (2013)<br>Section 7.8.7 | Pass   |
| Conducted Peak<br>Output Power                   | FCC Part 15, Subpart C<br>Section 15.247 (b,2)    | RSS-247 Issue 2<br>Feb 2017<br>Section 5.4 | ANSI C63.10 (2013)<br>Section 7.8.5 | Pass   |
| Conducted Spurious<br>Emissions and<br>Band Edge | FCC Part 15, Subpart C<br>Section 15.247 (d)      | RSS-247 Issue 2<br>Feb 2017<br>Section 5.5 | ANSI C63.10 (2013)<br>Section 7.8.6 | Pass   |
| Radiated Spurious<br>Emissions and<br>Band Edge  | FCC Part 15, Subpart C<br>Section 15.209 / 15.205 | RSS-247 Issue 2<br>Feb 2017<br>Section 5.5 | ANSI C63.10 (2013)<br>Section 7.8.6 | Pass   |

Preliminary scans were performed to determine worst case modulation, packet length, and data rates. Only worst case data has been recorded within the body of the test report.

#### 1.5 Measurement Uncertainty

| Measurement Type                                                  | Uncertainty |
|-------------------------------------------------------------------|-------------|
| OATS - Radiated Emissions - Vertical Biconical (30-300MHz)        | ± 4.17 dB   |
| OATS - Radiated Emissions - Horizontal Biconical (30-300MHz)      | ± 4.22 dB   |
| OATS - Radiated Emissions - Vertical Log Periodic (300-100MHz)    | ± 4.92 dB   |
| OATS - Radiated Emissions - Horizontal Log Periodic (300-1000MHz) | ± 4.79 dB   |
| OATS - Radiated Emissions - Vertical DRG Horn (> 1GHz)            | ± 5.74 dB   |
| OATS - Radiated Emissions - Horizontal DRG Horn (>1GHz)           | ± 5.80 dB   |
| Antenna Conducted Measurements                                    | ± 1.96 dB   |
| Power Line Conducted Emissions                                    | ± 3.48 dB   |

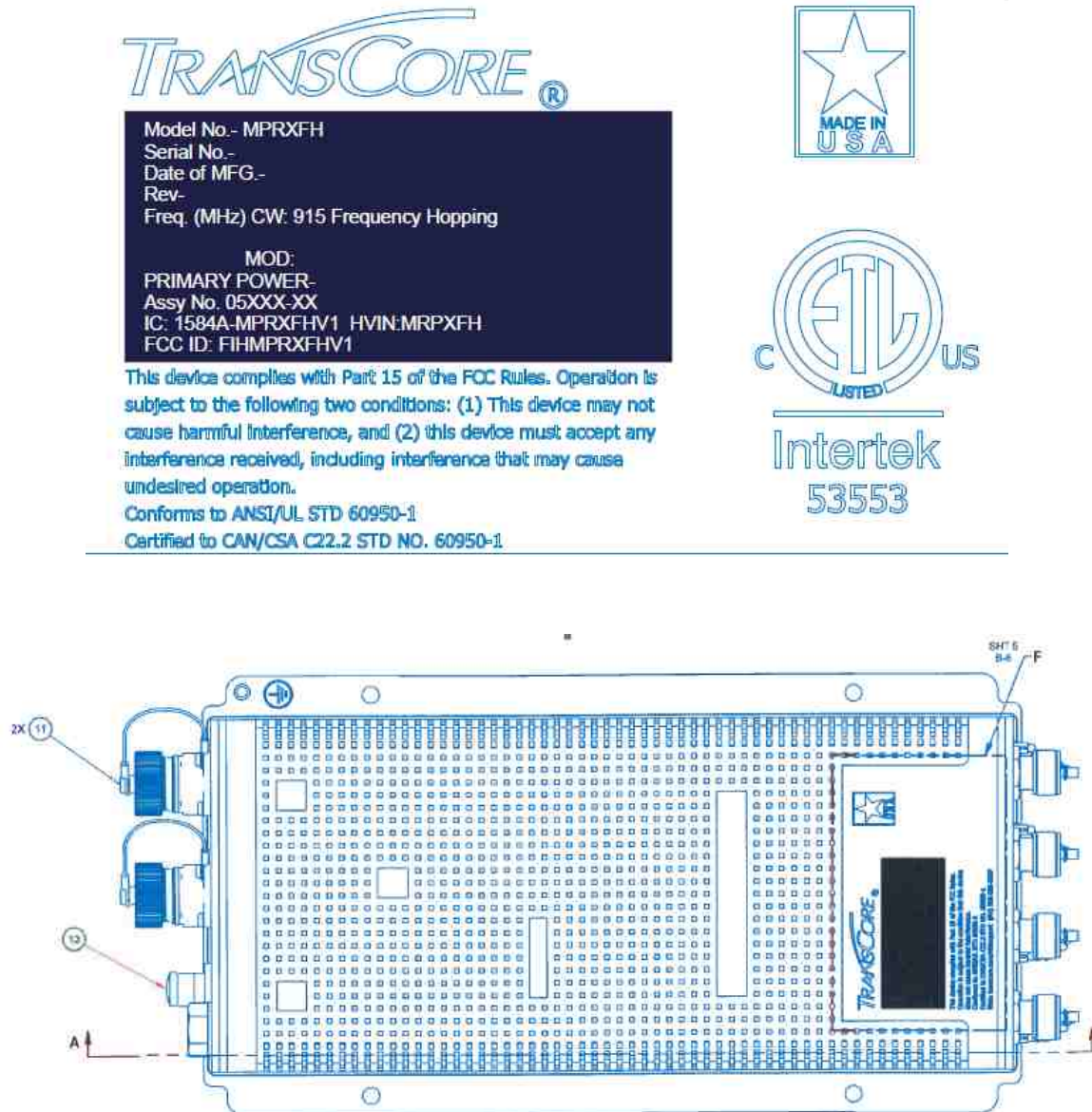
## 2.1033 (b) (1) Application for Certification

|                                  |                                                                                                              |
|----------------------------------|--------------------------------------------------------------------------------------------------------------|
| Name of Applicant:               | Transcore<br>8600 Jefferson Street, NE<br>Albuquerque, NM 87113                                              |
| FRN Number:                      | 0006083745                                                                                                   |
| Applicant is:                    | X Transcore                                                                                                  |
| Vendor                           |                                                                                                              |
| Licensee                         |                                                                                                              |
| Prospective Licensee             |                                                                                                              |
| Other                            |                                                                                                              |
| Name of Manufacturer :           | Transcore<br>8600 Jefferson Street, NE<br>Albuquerque, NM 87113                                              |
| Description:                     | Multiprotocol Reader Extreme-Frequency Hopper                                                                |
| Part Number:                     | MPRXFH                                                                                                       |
| Anticipated Production Quantity: | Multiple Units                                                                                               |
| Authorized Frequency Band:       | 902.500 - 927.500 MHz                                                                                        |
| Rated Power:                     | 0.802 W (eGo)<br>0.787 W (epc)<br>0.783 W (IAG)<br>0.798 W (SeGo)                                            |
| Antenna (Maximum Gain):          | 6.0 dBi<br>(Maximum combined antenna gain and required<br>attenuation (cable loss and external attenuation)) |

2.1033 (b) (2) FCC Identifier

Model Number: MPRXFH  
FCC ID: FIH MPRXFHV1  
IC: 1584A-MPRXFHV1

Figure 1 - Label and placement



## 2.1033 (b) (3) Installation and Operating Instructions

Supplied separately.

## 2.1033 (b) (4) Brief Description of Circuit Function

TransCore's Multiprotocol Reader Extreme Frequency Hopper (MPRX-FH) is a radio frequency identification (RFID) reader designed for harsh environment applications. It is intended for use by authorized TransCore dealers, professional installers, and service personnel. The MPRX-FH must be installed by a professional installer. Once installed, configured, and verified by testing, the end user cannot change the configuration (transmit power, etc) of the MPRX-FH. If changes are required, the end user must contact their authorized TransCore dealer, professional installer, and/or service personnel for additional service. The MPRX-FH has several antenna types/gains (*refer to installation guide for details*), uses 4 types of Frequency Hopping modes (eGo, SeGo, epc and IAG), it has four available output ports and cannot transmit simultaneously either in FHSS mode or all multiple ports.

## 2.1033 (b) (5) Block Diagram

Supplied separately for confidentiality.

## 2.1033 (b) (6) Report of Measurements

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217, §15.219, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

Pass - Antenna gain is equal to or less than 6dBi

Pass - The end user can not use a different antenna other than the specific type and gain as specified by the manufacturer.

Test Procedure: As specified in ANSI C63.10-2013 Clause 6.2

EUT has an indirect connection to the AC Mains through the Host Port connector on pins 11 and 12. A AC Wall mount power supply was provided by the manufacturer which simulated worst case conditions. Conducted emissions were made in accordance with ANSI C63.10-2013 Clause 6.2.

| Frequency of emission (MHz) | Conducted limit (dB $\mu$ V) |           |
|-----------------------------|------------------------------|-----------|
|                             | Quasi-peak                   | Average   |
| 0.15-0.5                    | 66 to 56*                    | 56 to 46* |
| 0.5-5                       | 56                           | 46        |
| 5-30                        | 60                           | 50        |

\*Decreases with the logarithm of the frequency.

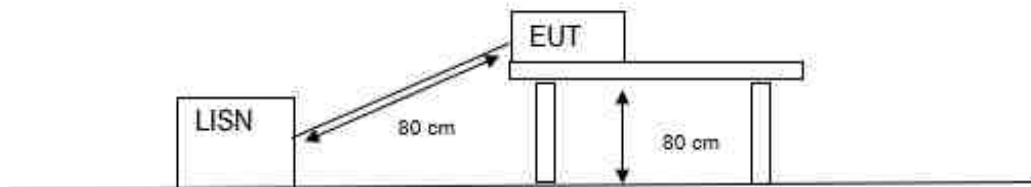
The spectrum analyzer is setup to store the peak emissions over the range stated in the applicable standard. Cables are then adjusted to maximize emissions. The peak spectrum analyzer trace and limits are plotted onto graph paper. A receiver (with CISPR quasi peak and average capability) is used to identify the highest frequencies with respect to the limit. Ambient signals are noted on the graph along with emissions from the EUT. The highest levels are listed in the Conducted Emissions Summary Test Data. If the Peak readings are below the Average limits only the Peak have been recorded.

### Example of Typical Calculation

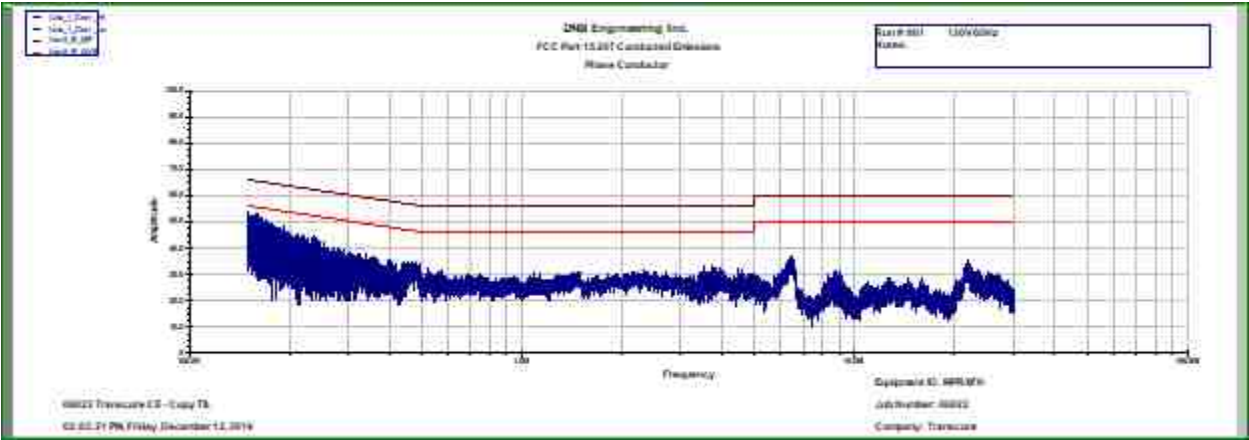
|                                    |      |            |
|------------------------------------|------|------------|
| Rohde and Schwarz reading @ 10 MHz | 49.0 | dB $\mu$ V |
| LISN Factor                        | +7.5 | dB         |
| Cable Loss                         | +2.0 | dB         |
| Total Factors                      | 9.5  | dB         |
| Voltage dB $\mu$ V at LISN =       | 58.5 | dB $\mu$ v |

### SETUP DIAGRAM

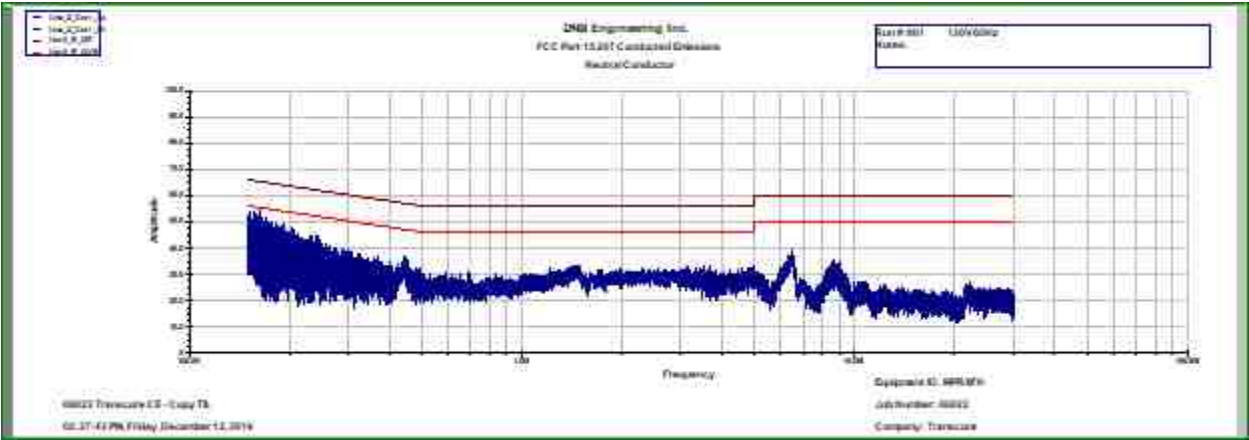
NOTE: For FCC an 80cm table height



| CONDUCTED EMISSIONS - PHASE LEAD |                  |                           |                        |                         |                          |                          |                 |                 |               |                         |                     |                                |
|----------------------------------|------------------|---------------------------|------------------------|-------------------------|--------------------------|--------------------------|-----------------|-----------------|---------------|-------------------------|---------------------|--------------------------------|
| Freq.<br>(MHz)                   | Meas'd<br>(dBuV) | Atten.<br>Factors<br>(dB) | Amp<br>Factors<br>(dB) | LISN<br>Factors<br>(dB) | Cable<br>Factors<br>(dB) | Total<br>Factors<br>(dB) | Total<br>(dBuV) | Limit<br>(dBuV) | Delta<br>(dB) | Limit<br>Type<br>AVE,QP | Line<br>L1 L2 L3 L4 | Meas.<br>Type AVE,<br>QP, Peak |
| 0.151                            | 43.83            | 9.4                       |                        | 0.1                     | 0.1                      | 9.7                      | 53.51           | 56.0            | -2.49         | AVE                     | L1                  | Peak                           |
| 0.154                            | 42.27            | 9.4                       |                        | 0.1                     | 0.1                      | 9.7                      | 51.95           | 56.0            | -4.05         | AVE                     | L1                  | Peak                           |
| 0.156                            | 42.61            | 9.4                       |                        | 0.1                     | 0.1                      | 9.7                      | 52.29           | 56.0            | -3.71         | AVE                     | L1                  | Peak                           |
| 0.159                            | 43.24            | 9.4                       |                        | 0.1                     | 0.1                      | 9.7                      | 52.92           | 56.0            | -3.08         | AVE                     | L1                  | Peak                           |
| 0.162                            | 42.86            | 9.4                       |                        | 0.1                     | 0.1                      | 9.7                      | 52.53           | 56.0            | -3.47         | AVE                     | L1                  | Peak                           |
| 0.164                            | 41.81            | 9.4                       |                        | 0.1                     | 0.1                      | 9.7                      | 51.48           | 56.0            | -4.52         | AVE                     | L1                  | Peak                           |



| CONDUCTED EMISSIONS - NEUTRAL LEAD |                  |                           |                        |                         |                          |                          |                 |                 |               |                         |                     |                                |
|------------------------------------|------------------|---------------------------|------------------------|-------------------------|--------------------------|--------------------------|-----------------|-----------------|---------------|-------------------------|---------------------|--------------------------------|
| Freq.<br>(MHz)                     | Meas'd<br>(dBuV) | Atten.<br>Factors<br>(dB) | Amp<br>Factors<br>(dB) | LISN<br>Factors<br>(dB) | Cable<br>Factors<br>(dB) | Total<br>Factors<br>(dB) | Total<br>(dBuV) | Limit<br>(dBuV) | Delta<br>(dB) | Limit<br>Type<br>AVE,QP | Line<br>L1 L2 L3 L4 | Meas.<br>Type AVE,<br>QP, Peak |
| 0.151                              | 42.14            | 9.4                       |                        | 0.1                     | 0.1                      | 9.7                      | 51.82           | 56.0            | -4.18         | AVE                     | L2                  | Peak                           |
| 0.153                              | 43.54            | 9.4                       |                        | 0.1                     | 0.1                      | 9.7                      | 53.22           | 56.0            | -2.78         | AVE                     | L2                  | Peak                           |
| 0.157                              | 43.81            | 9.4                       |                        | 0.1                     | 0.1                      | 9.7                      | 53.49           | 56.0            | -2.51         | AVE                     | L2                  | Peak                           |
| 0.159                              | 42.74            | 9.4                       |                        | 0.1                     | 0.1                      | 9.7                      | 52.42           | 56.0            | -3.58         | AVE                     | L2                  | Peak                           |
| 0.164                              | 44.31            | 9.4                       |                        | 0.1                     | 0.1                      | 9.7                      | 53.98           | 56.0            | -2.02         | AVE                     | L2                  | Peak                           |
| 0.171                              | 41.60            | 9.4                       |                        | 0.1                     | 0.1                      | 9.7                      | 51.27           | 55.0            | -3.73         | AVE                     | L2                  | Peak                           |



|                                   |                                                                                        |                                      |             |                                                     |
|-----------------------------------|----------------------------------------------------------------------------------------|--------------------------------------|-------------|-----------------------------------------------------|
|                                   | 1100 E Chalk Creek Road<br>Coalville, UT 84017<br>(435) 336-4433<br>FAX (435) 336-4436 | <b>Conducted Emissions</b> (General) |             |                                                     |
| DNB Job Number:                   | 06022                                                                                  | Date:                                | 13 Dec 2019 | Specification<br>[X] 15.207<br>[X] ANSI C63.10-2013 |
| Customer:                         | Transcore                                                                              |                                      |             |                                                     |
| Model Number:                     | MPRXFH                                                                                 |                                      |             |                                                     |
| Description:                      | Multiprotocol Reader Extreme- Frequency Hopper                                         |                                      |             |                                                     |
| Test Set Up - Conducted Emissions |                                                                                        |                                      |             |                                                     |



Test Procedure: ANSI C63.10-2013

The EUT was measured on an open area test site (OATS).

A measuring distance of at least 3 m shall be used for measurements at frequencies up to 1 GHz. For frequencies above 1 GHz, any suitable measuring distance may be used. The equipment size (excluding the antenna) shall be less than 20 % of the measuring distance.

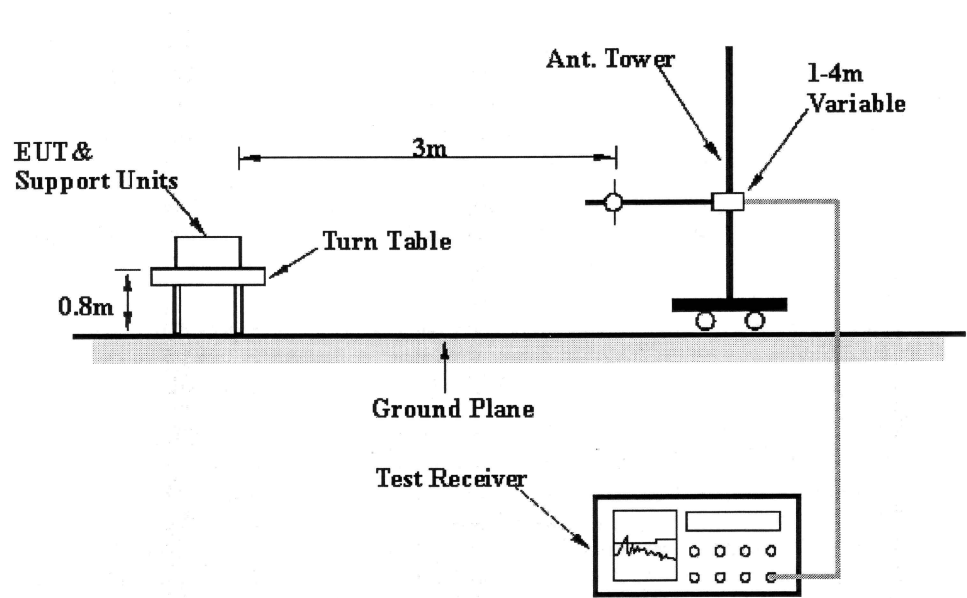
Sufficient precautions shall be taken to ensure that reflections from extraneous objects adjacent to the site do not degrade the measurement results, in particular:

- no extraneous conducting objects having any dimension in excess of a quarter wavelength of the highest frequency tested shall be in the immediate vicinity of the site;
- all cables shall be as short as possible; as much of the cables as possible shall be on the ground plane or preferably below; and the low impedance cables shall be screened.
- EUT was positioned in three orthogonal axis - only the worst case data (X-Axis) has been recorded
- EUT antenna port was terminated into 50 ohm load.
- All modes of FHSS (eGo, SeGo, IAG, and epc) were evaluated, the worst case modulation for radiated emissions was SeGo and was used for all testing. Data within the test report reflects the worst case emissions.

The EUT shall be placed upon a non-conductive table (wooden for below 1GHz and styrene above 1GHz) 0.80 meters above the ground plane for frequencies from 30 to 1000MHz and 1.5 meters above the ground plane above 1 GHz and shall be placed in the “worst case” transmitting mode. The EUT shall be rotated 360 degrees to find the azimuth maxima. The receive antenna shall then be raised and lowered between 1 to 4 meters to find the maximum signal emanating from the EUT. This signal strength is then recorded on the data sheets.

| Frequency (MHz) | Field Strength (uV/m) | Field Strength (dBuV/m)                     | Measurement Distance (meters) |
|-----------------|-----------------------|---------------------------------------------|-------------------------------|
| .0009 - 0.490   | 2400/F(kHz)           | $20*(\text{Log}_{10}(2400/F(\text{kHz})))$  | 300                           |
| 0.490 - 1.705   | 24000/F(kHz)          | $20*(\text{Log}_{10}(24000/F(\text{kHz})))$ | 30                            |
| 1.705 - 30.0    | 30                    | 29.5                                        | 30                            |
| 30 - 88         | 100                   | 40.0                                        | 3                             |
| 88 - 216        | 150                   | 43.5                                        | 3                             |
| 216 - 960       | 200                   | 46.0                                        | 3                             |
| Above 960       | 500                   | 54.0                                        | 3                             |

|                 |                                                                                        |                                                     |            |
|-----------------|----------------------------------------------------------------------------------------|-----------------------------------------------------|------------|
|                 | 1100 E Chalk Creek Road<br>Coalville, UT 84017<br>(435) 336-4433<br>FAX (435) 336-4436 | <b>Radiated Emissions</b> (General)                 |            |
| DNB Job Number: | 06022                                                                                  | Date:                                               | 3 Sep 2019 |
| Customer:       | Transcore                                                                              | Specification<br>[X] 15.209<br>[X] ANSI C63.10-2013 |            |
| Model Number:   | MPRXFH                                                                                 |                                                     |            |
| Description:    | Multiprotocol Reader Extreme- Frequency Hopper                                         |                                                     |            |
|                 | Test Set Up                                                                            |                                                     |            |



|                                       |                                                                                        |                                     |            |                                                         |
|---------------------------------------|----------------------------------------------------------------------------------------|-------------------------------------|------------|---------------------------------------------------------|
|                                       | 1100 E Chalk Creek Road<br>Coalville, UT 84017<br>(435) 336-4433<br>FAX (435) 336-4436 | <b>Radiated Emissions</b> (General) |            |                                                         |
| DNB Job Number:                       | 06022                                                                                  | Date:                               | 3 Sep 2019 | Specification<br><br>[X] 15.209<br>[X] ANSI C63.10-2013 |
| Customer:                             | Transcore                                                                              |                                     |            |                                                         |
| Model Number:                         | MPRXFH                                                                                 |                                     |            |                                                         |
| Description:                          | Multiprotocol Reader Extreme- Frequency Hopper                                         |                                     |            |                                                         |
| Test Set Up - Horizontal - 30-1000MHz |                                                                                        |                                     |            |                                                         |



|                 |                                                                                        |                                     |            |                                                         |
|-----------------|----------------------------------------------------------------------------------------|-------------------------------------|------------|---------------------------------------------------------|
|                 | 1100 E Chalk Creek Road<br>Coalville, UT 84017<br>(435) 336-4433<br>FAX (435) 336-4436 | <b>Radiated Emissions</b> (General) |            |                                                         |
| DNB Job Number: | 06022                                                                                  | Date:                               | 3 Sep 2019 | Specification<br><br>[X] 15.209<br>[X] ANSI C63.10-2013 |
| Customer:       | Transcore                                                                              |                                     |            |                                                         |
| Model Number:   | MPRXFH                                                                                 |                                     |            |                                                         |
| Description:    | Multiprotocol Reader Extreme- Frequency Hopper                                         |                                     |            |                                                         |
| X-Axis          |                                                                                        |                                     |            |                                                         |



|                 |                                                                                        |                                     |                                                         |
|-----------------|----------------------------------------------------------------------------------------|-------------------------------------|---------------------------------------------------------|
|                 | 1100 E Chalk Creek Road<br>Coalville, UT 84017<br>(435) 336-4433<br>FAX (435) 336-4436 | <b>Radiated Emissions</b> (General) |                                                         |
| DNB Job Number: | 06022                                                                                  | Date: 3 Sep 2019                    | Specification<br><br>[X] 15.209<br>[X] ANSI C63.10-2013 |
| Customer:       | Transcore                                                                              |                                     |                                                         |
| Model Number:   | MPRXFH                                                                                 |                                     |                                                         |
| Description:    | Multiprotocol Reader Extreme- Frequency Hopper                                         |                                     |                                                         |
| Y-Axis          |                                                                                        |                                     |                                                         |



|                 |                                                                                        |                                     |            |                                                     |
|-----------------|----------------------------------------------------------------------------------------|-------------------------------------|------------|-----------------------------------------------------|
|                 | 1100 E Chalk Creek Road<br>Coalville, UT 84017<br>(435) 336-4433<br>FAX (435) 336-4436 | <b>Radiated Emissions</b> (General) |            |                                                     |
| DNB Job Number: | 06022                                                                                  | Date:                               | 3 Sep 2019 | Specification<br>[X] 15.209<br>[X] ANSI C63.10-2013 |
| Customer:       | Transcore                                                                              |                                     |            |                                                     |
| Model Number:   | MPRXFH                                                                                 |                                     |            |                                                     |
| Description:    | Multiprotocol Reader Extreme- Frequency Hopper                                         |                                     |            |                                                     |
| Z-Axis          |                                                                                        |                                     |            |                                                     |



|                                       |                | 1100 E Chalk Creek Road<br>Coalville, UT 84017<br>(435) 336-4433<br>FAX (435) 336-4436 |      |       | <b>Radiated Emissions</b> (General)   |                              |                             |                                 |                                                     |      |      |  |
|---------------------------------------|----------------|----------------------------------------------------------------------------------------|------|-------|---------------------------------------|------------------------------|-----------------------------|---------------------------------|-----------------------------------------------------|------|------|--|
| DNB Job Number:                       |                | 06022                                                                                  |      |       | Date:                                 |                              | 3 Sep 2019                  |                                 | Specification<br>[X] 15.209<br>[X] ANSI C63.10-2013 |      |      |  |
| Customer:                             |                | Transcore                                                                              |      |       |                                       |                              |                             |                                 |                                                     |      |      |  |
| Model Number:                         |                | MPRXFH                                                                                 |      |       |                                       |                              |                             |                                 |                                                     |      |      |  |
| Description:                          |                | Multiprotocol Reader Extreme- Frequency Hopper                                         |      |       |                                       |                              |                             |                                 |                                                     |      |      |  |
| EUT is in conformance with FCC 15.209 |                |                                                                                        |      |       | <input checked="" type="checkbox"/> X | <input type="checkbox"/> YES | <input type="checkbox"/> NO | <input type="checkbox"/> Signed | Y Staples                                           |      |      |  |
| X - Axis (Worst case)                 |                |                                                                                        |      |       |                                       |                              |                             |                                 |                                                     |      |      |  |
| FREQ<br>(Mhz)                         | S/A<br>Reading | Correction Factors<br>(dB)                                                             |      |       | dBuV/m                                |                              |                             | Positions                       |                                                     |      |      |  |
|                                       |                | Ant                                                                                    | Cbl  | Amp   | Corr                                  | Lim                          | Delta                       | Typ                             | Tbl                                                 | Pl   | Hgt  |  |
| 30.699                                | 33.52          | 19.51                                                                                  | 1.03 | 26.60 | 27.46                                 | 40.00                        | -12.55                      | QP                              | 226                                                 | Vert | 1.00 |  |
| 31.113                                | 32.01          | 19.28                                                                                  | 1.04 | 26.60 | 25.73                                 | 40.00                        | -14.28                      | QP                              | 227                                                 | Vert | 1.00 |  |
| 37.790                                | 35.42          | 15.59                                                                                  | 1.20 | 26.54 | 25.67                                 | 40.00                        | -14.34                      | QP                              | 236                                                 | Vert | 1.00 |  |
| 56.863                                | 39.90          | 10.63                                                                                  | 1.17 | 26.50 | 25.20                                 | 40.00                        | -14.81                      | QP                              | 163                                                 | Vert | 1.00 |  |
| 38.029                                | 34.80          | 15.46                                                                                  | 1.20 | 26.54 | 24.92                                 | 40.00                        | -15.08                      | QP                              | 236                                                 | Vert | 1.00 |  |
| 67.651                                | 38.30          | 11.06                                                                                  | 1.28 | 26.50 | 24.14                                 | 40.00                        | -15.87                      | QP                              | 22                                                  | Horz | 2.79 |  |
| 340.023                               | 33.59          | 18.94                                                                                  | 3.40 | 26.08 | 29.85                                 | 46.00                        | -16.16                      | QP                              | 0                                                   | Horz | 1.00 |  |
| 58.156                                | 36.27          | 10.62                                                                                  | 1.18 | 26.50 | 21.57                                 | 40.00                        | -18.44                      | QP                              | 161                                                 | Vert | 1.00 |  |

This test is required for any spurious emission or modulation product that falls in a Restricted Band, as defined in Section 15.205. It must be performed with the highest gain of each type of antenna proposed for use with the EUT. Use the following spectrum analyzer settings:

Span = wide enough to fully capture the emission being measured  
RBW = 1 MHz for  $f \geq 1$  GHz, 100 kHz for  $f < 1$  GHz  
VBW =  $\geq$  RBW  
Sweep = auto  
Detector function = peak  
Trace = max hold

Follow the guidelines in ANSI C63.10-2013 with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization, etc. A pre-amp and a high pass filter are required for this test, in order to provide the measuring system with sufficient sensitivity. Allow the trace to stabilize. The peak reading of the emission, after being corrected by the antenna factor, cable loss, pre-amp gain, etc., is the peak field strength, which must comply with the limit specified in Section 15.35(b). Submit this data.

Now repeat the measurement using the average detector of the spectrum analyzer. Submit this data.

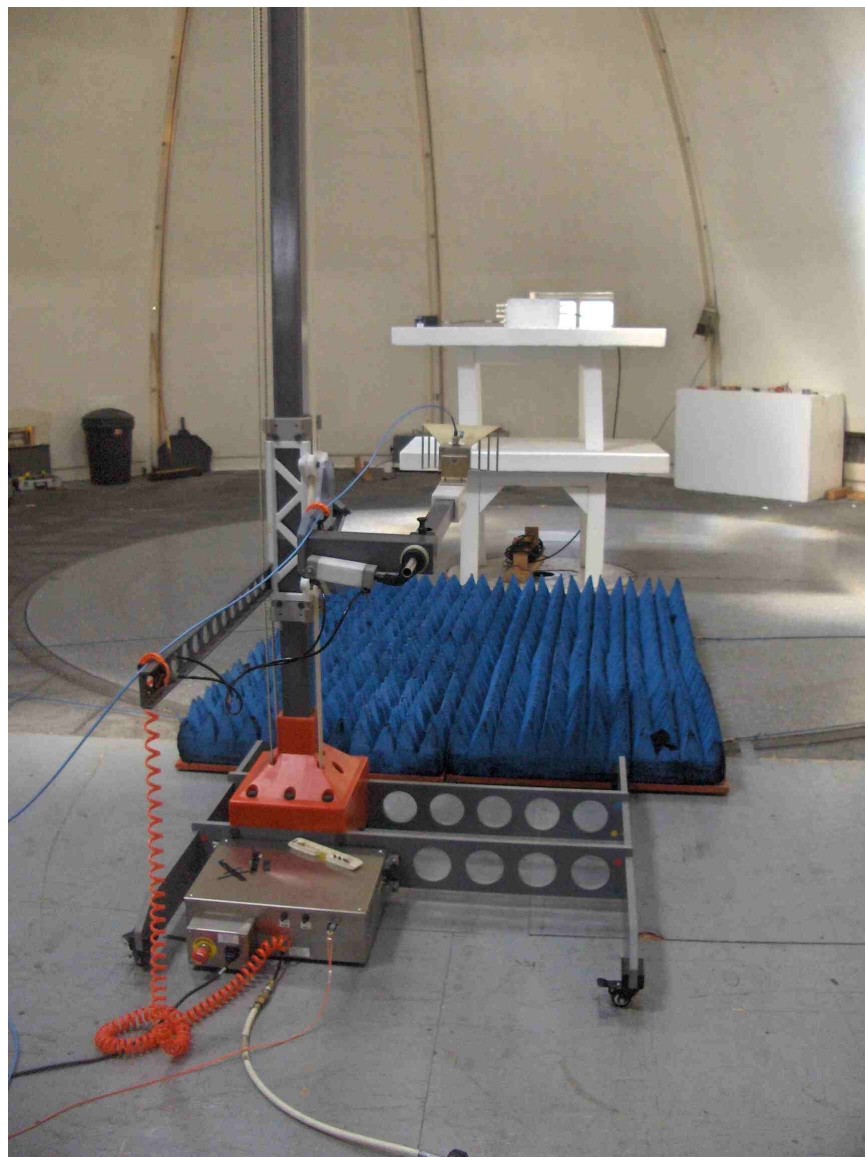
If the emission on which a radiated measurement must be made is located at the edge of the authorized band of operation, then the alternative “marker-delta” method, listed at the end of this document, may be employed.

Note 1: Limit listed is the general limit as specified in 15.209 in order to show compliance with the restricted bands of operation as well as the out of band limit in 15.247. No other identifiable signals were observed in the restricted bands as specified in 15.205.

Note 2: Highest frequency investigated was the tenth harmonic of the fundamental.

Note 3: This device was evaluated with all modulation protocols active and at Low, Mid, High Channels, and X, Y, Z axis.

|                                |                                                                                        |                                      |            |                                                             |
|--------------------------------|----------------------------------------------------------------------------------------|--------------------------------------|------------|-------------------------------------------------------------|
|                                | 1100 E Chalk Creek Road<br>Coalville, UT 84017<br>(435) 336-4433<br>FAX (435) 336-4436 | <b>Radiated Emissions</b> (Spurious) |            |                                                             |
| DNB Job Number:                | 06022                                                                                  | Date:                                | 2 Oct 2019 | Specification<br><br>[X] 15.247 (c)<br>[X] ANSI C63.10-2013 |
| Customer:                      | Transcore                                                                              |                                      |            |                                                             |
| Model Number:                  | MPRXFH                                                                                 |                                      |            |                                                             |
| Description:                   | Multiprotocol Reader Extreme- Frequency Hopper                                         |                                      |            |                                                             |
| Test Set Up - (Vertical - DRG) |                                                                                        |                                      |            |                                                             |



|                      |       | 1100 E Chalk Creek Road<br>Coalville, UT 84017<br>(435) 336-4433<br>FAX (435) 336-4436 |      |      | <b>Radiated Emissions</b> (Spurious) |      |            |      |                                                             |          |
|----------------------|-------|----------------------------------------------------------------------------------------|------|------|--------------------------------------|------|------------|------|-------------------------------------------------------------|----------|
| DNB Job Number:      |       | 06022                                                                                  |      |      | Date:                                |      | 2 Oct 2019 |      | Specification<br><br>[X] 15.247 (c)<br>[X] ANSI C63.10-2013 |          |
| Customer:            |       | Transcore                                                                              |      |      |                                      |      |            |      |                                                             |          |
| Model Number:        |       | MPRXFH                                                                                 |      |      |                                      |      |            |      |                                                             |          |
| Description:         |       | Multiprotocol Reader Extreme- Frequency Hopper                                         |      |      |                                      |      |            |      |                                                             |          |
| Low Channel - X Axis |       |                                                                                        |      |      |                                      |      |            |      |                                                             |          |
| FREQ<br>(Mhz)        | Meter | Correction Factors (dB)                                                                |      |      | dBuV/m                               |      |            | Type |                                                             | Polarity |
|                      |       | Ant                                                                                    | Cbl  | Amp  | Corr                                 | Lim  | Delta      | Lim  | Rdng                                                        |          |
| 1805.000             | 29.8  | 27.1                                                                                   | 4.3  | 26.3 | 34.84                                | 54.0 | -19.16     | AVE  | PK                                                          | Horz     |
| 2707.500             | 30.0  | 30.1                                                                                   | 5.3  | 26.3 | 39.04                                | 54.0 | -14.96     | AVE  | PK                                                          | Horz     |
| 3610.000             | 30.9  | 30.9                                                                                   | 6.0  | 26.1 | 41.68                                | 54.0 | -12.32     | AVE  | PK                                                          | Horz     |
| 4512.500             | 31.0  | 32.0                                                                                   | 6.8  | 25.9 | 43.97                                | 54.0 | -10.03     | AVE  | PK                                                          | Horz     |
| 5415.000             | 31.5  | 34.7                                                                                   | 7.5  | 25.7 | 48.04                                | 54.0 | -5.96      | AVE  | PK                                                          | Horz     |
| 6317.500             | 33.9  | 35.9                                                                                   | 8.1  | 25.7 | 52.25                                | 54.0 | -1.75      | AVE  | PK                                                          | Horz     |
| 7220.000             | 26.1  | 37.0                                                                                   | 8.8  | 25.5 | 46.33                                | 54.0 | -7.67      | AVE  | PK                                                          | Horz     |
| 8122.500             | 25.9  | 37.4                                                                                   | 9.4  | 25.3 | 47.45                                | 54.0 | -6.55      | AVE  | PK                                                          | Horz     |
| 9025.000             | 25.3  | 37.5                                                                                   | 10.0 | 25.0 | 47.77                                | 54.0 | -6.23      | AVE  | PK                                                          | Horz     |
| 1805.000             | 28.6  | 27.1                                                                                   | 4.3  | 26.3 | 33.69                                | 54.0 | -20.31     | AVE  | PK                                                          | Vert     |
| 2707.500             | 29.0  | 30.1                                                                                   | 5.3  | 26.3 | 38.06                                | 54.0 | -15.94     | AVE  | PK                                                          | Vert     |
| 3610.000             | 29.5  | 30.9                                                                                   | 6.0  | 26.1 | 40.23                                | 54.0 | -13.77     | AVE  | PK                                                          | Vert     |
| 4512.500             | 29.1  | 32.0                                                                                   | 6.8  | 25.9 | 42.00                                | 54.0 | -12.00     | AVE  | PK                                                          | Vert     |
| 5415.000             | 31.2  | 34.7                                                                                   | 7.5  | 25.7 | 47.68                                | 54.0 | -6.32      | AVE  | PK                                                          | Vert     |
| 6317.500             | 32.3  | 35.9                                                                                   | 8.1  | 25.7 | 50.61                                | 54.0 | -3.39      | AVE  | PK                                                          | Vert     |
| 7220.000             | 24.6  | 37.0                                                                                   | 8.8  | 25.5 | 44.79                                | 54.0 | -9.21      | AVE  | PK                                                          | Vert     |
| 8122.500             | 25.5  | 37.4                                                                                   | 9.4  | 25.3 | 47.04                                | 54.0 | -6.96      | AVE  | PK                                                          | Vert     |
| 9025.000             | 24.0  | 37.5                                                                                   | 10.0 | 25.0 | 46.44                                | 54.0 | -7.56      | AVE  | PK                                                          | Vert     |

|                      |       | 1100 E Chalk Creek Road<br>Coalville, UT 84017<br>(435) 336-4433<br>FAX (435) 336-4436 |      |      | <b>Radiated Emissions</b> (Spurious) |      |            |      |                                                             |          |
|----------------------|-------|----------------------------------------------------------------------------------------|------|------|--------------------------------------|------|------------|------|-------------------------------------------------------------|----------|
| DNB Job Number:      |       | 06022                                                                                  |      |      | Date:                                |      | 2 Oct 2019 |      | Specification<br><br>[X] 15.247 (c)<br>[X] ANSI C63.10-2013 |          |
| Customer:            |       | Transcore                                                                              |      |      |                                      |      |            |      |                                                             |          |
| Model Number:        |       | MPRXFH                                                                                 |      |      |                                      |      |            |      |                                                             |          |
| Description:         |       | Multiprotocol Reader Extreme- Frequency Hopper                                         |      |      |                                      |      |            |      |                                                             |          |
| Low Channel - Y Axis |       |                                                                                        |      |      |                                      |      |            |      |                                                             |          |
| FREQ<br>(Mhz)        | Meter | Correction Factors (dB)                                                                |      |      | dBuV/m                               |      |            | Type |                                                             | Polarity |
|                      |       | Ant                                                                                    | Cbl  | Amp  | Corr                                 | Lim  | Delta      | Lim  | Rdng                                                        |          |
| 1805.000             | 28.6  | 27.1                                                                                   | 4.3  | 26.3 | 33.68                                | 54.0 | -20.32     | AVE  | PK                                                          | Horz     |
| 2707.500             | 29.6  | 30.1                                                                                   | 5.3  | 26.3 | 38.72                                | 54.0 | -15.28     | AVE  | PK                                                          | Horz     |
| 3610.000             | 30.2  | 30.9                                                                                   | 6.0  | 26.1 | 40.95                                | 54.0 | -13.05     | AVE  | PK                                                          | Horz     |
| 4512.500             | 31.2  | 32.0                                                                                   | 6.8  | 25.9 | 44.14                                | 54.0 | -9.86      | AVE  | PK                                                          | Horz     |
| 5415.000             | 31.6  | 34.7                                                                                   | 7.5  | 25.7 | 48.07                                | 54.0 | -5.93      | AVE  | PK                                                          | Horz     |
| 6317.500             | 33.4  | 35.9                                                                                   | 8.1  | 25.7 | 51.75                                | 54.0 | -2.25      | AVE  | PK                                                          | Horz     |
| 7220.000             | 25.3  | 37.0                                                                                   | 8.8  | 25.5 | 45.49                                | 54.0 | -8.51      | AVE  | PK                                                          | Horz     |
| 8122.500             | 24.8  | 37.4                                                                                   | 9.4  | 25.3 | 46.28                                | 54.0 | -7.72      | AVE  | PK                                                          | Horz     |
| 9025.000             | 25.4  | 37.5                                                                                   | 10.0 | 25.0 | 47.89                                | 54.0 | -6.11      | AVE  | PK                                                          | Horz     |
| 1805.000             | 28.9  | 27.1                                                                                   | 4.3  | 26.3 | 33.96                                | 54.0 | -20.04     | AVE  | PK                                                          | Vert     |
| 2707.500             | 29.6  | 30.1                                                                                   | 5.3  | 26.3 | 38.65                                | 54.0 | -15.35     | AVE  | PK                                                          | Vert     |
| 3610.000             | 31.5  | 30.9                                                                                   | 6.0  | 26.1 | 42.27                                | 54.0 | -11.73     | AVE  | PK                                                          | Vert     |
| 4512.500             | 32.3  | 32.0                                                                                   | 6.8  | 25.9 | 45.27                                | 54.0 | -8.73      | AVE  | PK                                                          | Vert     |
| 5415.000             | 32.2  | 34.7                                                                                   | 7.5  | 25.7 | 48.70                                | 54.0 | -5.30      | AVE  | PK                                                          | Vert     |
| 6317.500             | 32.8  | 35.9                                                                                   | 8.1  | 25.7 | 51.15                                | 54.0 | -2.85      | AVE  | PK                                                          | Vert     |
| 7220.000             | 25.9  | 37.0                                                                                   | 8.8  | 25.5 | 46.11                                | 54.0 | -7.89      | AVE  | PK                                                          | Vert     |
| 8122.500             | 24.7  | 37.4                                                                                   | 9.4  | 25.3 | 46.26                                | 54.0 | -7.74      | AVE  | PK                                                          | Vert     |
| 9025.000             | 25.0  | 37.5                                                                                   | 10.0 | 25.0 | 47.42                                | 54.0 | -6.58      | AVE  | PK                                                          | Vert     |

|                      |       | 1100 E Chalk Creek Road<br>Coalville, UT 84017<br>(435) 336-4433<br>FAX (435) 336-4436 |      |      | <b>Radiated Emissions</b> (Spurious) |      |            |      |                                                             |          |
|----------------------|-------|----------------------------------------------------------------------------------------|------|------|--------------------------------------|------|------------|------|-------------------------------------------------------------|----------|
| DNB Job Number:      |       | 06022                                                                                  |      |      | Date:                                |      | 2 Oct 2019 |      | Specification<br><br>[X] 15.247 (c)<br>[X] ANSI C63.10-2013 |          |
| Customer:            |       | Transcore                                                                              |      |      |                                      |      |            |      |                                                             |          |
| Model Number:        |       | MPRXFH                                                                                 |      |      |                                      |      |            |      |                                                             |          |
| Description:         |       | Multiprotocol Reader Extreme- Frequency Hopper                                         |      |      |                                      |      |            |      |                                                             |          |
| Low Channel - Z Axis |       |                                                                                        |      |      |                                      |      |            |      |                                                             |          |
| FREQ<br>(Mhz)        | Meter | Correction Factors (dB)                                                                |      |      | dBuV/m                               |      |            | Type |                                                             | Polarity |
|                      |       | Ant                                                                                    | Cbl  | Amp  | Corr                                 | Lim  | Delta      | Lim  | Rdng                                                        |          |
| 1805.000             | 29.5  | 27.1                                                                                   | 4.3  | 26.3 | 34.59                                | 54.0 | -19.41     | AVE  | PK                                                          | Horz     |
| 2707.500             | 28.9  | 30.1                                                                                   | 5.3  | 26.3 | 37.96                                | 54.0 | -16.04     | AVE  | PK                                                          | Horz     |
| 3610.000             | 30.0  | 30.9                                                                                   | 6.0  | 26.1 | 40.76                                | 54.0 | -13.24     | AVE  | PK                                                          | Horz     |
| 4512.500             | 31.7  | 32.0                                                                                   | 6.8  | 25.9 | 44.59                                | 54.0 | -9.41      | AVE  | PK                                                          | Horz     |
| 5415.000             | 31.7  | 34.7                                                                                   | 7.5  | 25.7 | 48.16                                | 54.0 | -5.84      | AVE  | PK                                                          | Horz     |
| 6317.500             | 32.8  | 35.9                                                                                   | 8.1  | 25.7 | 51.16                                | 54.0 | -2.84      | AVE  | PK                                                          | Horz     |
| 7220.000             | 25.7  | 37.0                                                                                   | 8.8  | 25.5 | 45.88                                | 54.0 | -8.12      | AVE  | PK                                                          | Horz     |
| 8122.500             | 25.8  | 37.4                                                                                   | 9.4  | 25.3 | 47.35                                | 54.0 | -6.65      | AVE  | PK                                                          | Horz     |
| 9025.000             | 25.1  | 37.5                                                                                   | 10.0 | 25.0 | 47.57                                | 54.0 | -6.43      | AVE  | PK                                                          | Horz     |
| 1805.000             | 30.2  | 27.1                                                                                   | 4.3  | 26.3 | 35.29                                | 54.0 | -18.71     | AVE  | PK                                                          | Vert     |
| 2707.500             | 29.4  | 30.1                                                                                   | 5.3  | 26.3 | 38.43                                | 54.0 | -15.57     | AVE  | PK                                                          | Vert     |
| 3610.000             | 30.8  | 30.9                                                                                   | 6.0  | 26.1 | 41.49                                | 54.0 | -12.51     | AVE  | PK                                                          | Vert     |
| 4512.500             | 31.0  | 32.0                                                                                   | 6.8  | 25.9 | 43.94                                | 54.0 | -10.06     | AVE  | PK                                                          | Vert     |
| 5415.000             | 31.3  | 34.7                                                                                   | 7.5  | 25.7 | 47.81                                | 54.0 | -6.19      | AVE  | PK                                                          | Vert     |
| 6317.500             | 33.6  | 35.9                                                                                   | 8.1  | 25.7 | 51.95                                | 54.0 | -2.05      | AVE  | PK                                                          | Vert     |
| 7220.000             | 25.7  | 37.0                                                                                   | 8.8  | 25.5 | 45.89                                | 54.0 | -8.11      | AVE  | PK                                                          | Vert     |
| 8122.500             | 25.6  | 37.4                                                                                   | 9.4  | 25.3 | 47.16                                | 54.0 | -6.84      | AVE  | PK                                                          | Vert     |
| 9025.000             | 25.3  | 37.5                                                                                   | 10.0 | 25.0 | 47.80                                | 54.0 | -6.20      | AVE  | PK                                                          | Vert     |

|                         |       | 1100 E Chalk Creek Road<br>Coalville, UT 84017<br>(435) 336-4433<br>FAX (435) 336-4436 |      |      | <b>Radiated Emissions</b> (Spurious) |      |            |      |                                                             |          |
|-------------------------|-------|----------------------------------------------------------------------------------------|------|------|--------------------------------------|------|------------|------|-------------------------------------------------------------|----------|
| DNB Job Number:         |       | 06022                                                                                  |      |      | Date:                                |      | 2 Oct 2019 |      | Specification<br><br>[X] 15.247 (c)<br>[X] ANSI C63.10-2013 |          |
| Customer:               |       | Transcore                                                                              |      |      |                                      |      |            |      |                                                             |          |
| Model Number:           |       | MPRXFH                                                                                 |      |      |                                      |      |            |      |                                                             |          |
| Description:            |       | Multiprotocol Reader Extreme- Frequency Hopper                                         |      |      |                                      |      |            |      |                                                             |          |
| Middle Channel - X axis |       |                                                                                        |      |      |                                      |      |            |      |                                                             |          |
| FREQ<br>(Mhz)           | Meter | Correction Factors (dB)                                                                |      |      | dBuV/m                               |      |            | Type |                                                             | Polarity |
|                         |       | Ant                                                                                    | Cbl  | Amp  | Corr                                 | Lim  | Delta      | Lim  | Rdng                                                        |          |
| 1831.500                | 29.1  | 27.3                                                                                   | 4.3  | 26.3 | 34.34                                | 54.0 | -19.66     | AVE  | PK                                                          | Horz     |
| 2747.250                | 29.4  | 30.1                                                                                   | 5.4  | 26.3 | 38.62                                | 54.0 | -15.38     | AVE  | PK                                                          | Horz     |
| 3662.976                | 30.2  | 31.1                                                                                   | 6.0  | 26.1 | 41.14                                | 54.0 | -12.86     | AVE  | PK                                                          | Horz     |
| 4578.750                | 29.7  | 32.3                                                                                   | 6.8  | 25.9 | 42.99                                | 54.0 | -11.01     | AVE  | PK                                                          | Horz     |
| 5494.500                | 31.1  | 34.9                                                                                   | 7.5  | 25.7 | 47.81                                | 54.0 | -6.19      | AVE  | PK                                                          | Horz     |
| 6410.250                | 31.2  | 36.0                                                                                   | 8.2  | 25.7 | 49.71                                | 54.0 | -4.29      | AVE  | PK                                                          | Horz     |
| 7326.000                | 24.7  | 37.1                                                                                   | 8.8  | 25.5 | 45.07                                | 54.0 | -8.93      | AVE  | PK                                                          | Horz     |
| 8241.750                | 24.4  | 37.4                                                                                   | 9.5  | 25.3 | 45.95                                | 54.0 | -8.05      | AVE  | PK                                                          | Horz     |
| 9157.500                | 24.3  | 37.6                                                                                   | 10.1 | 25.0 | 47.06                                | 54.0 | -6.94      | AVE  | PK                                                          | Horz     |
| 1831.500                | 33.0  | 27.3                                                                                   | 4.3  | 26.3 | 38.30                                | 54.0 | -15.70     | AVE  | PK                                                          | Vert     |
| 2747.250                | 29.1  | 30.1                                                                                   | 5.4  | 26.3 | 38.32                                | 54.0 | -15.68     | AVE  | PK                                                          | Vert     |
| 3662.976                | 29.2  | 31.1                                                                                   | 6.0  | 26.1 | 40.17                                | 54.0 | -13.83     | AVE  | PK                                                          | Vert     |
| 4578.750                | 30.6  | 32.3                                                                                   | 6.8  | 25.9 | 43.82                                | 54.0 | -10.18     | AVE  | PK                                                          | Vert     |
| 5494.500                | 30.8  | 34.9                                                                                   | 7.5  | 25.7 | 47.52                                | 54.0 | -6.48      | AVE  | PK                                                          | Vert     |
| 6410.250                | 33.1  | 36.0                                                                                   | 8.2  | 25.7 | 51.61                                | 54.0 | -2.39      | AVE  | PK                                                          | Vert     |
| 7326.000                | 25.6  | 37.1                                                                                   | 8.8  | 25.5 | 45.95                                | 54.0 | -8.05      | AVE  | PK                                                          | Vert     |
| 8241.750                | 23.9  | 37.4                                                                                   | 9.5  | 25.3 | 45.52                                | 54.0 | -8.48      | AVE  | PK                                                          | Vert     |
| 9157.500                | 24.6  | 37.6                                                                                   | 10.1 | 25.0 | 47.35                                | 54.0 | -6.65      | AVE  | PK                                                          | Vert     |

|                         |       | 1100 E Chalk Creek Road<br>Coalville, UT 84017<br>(435) 336-4433<br>FAX (435) 336-4436 |      |      | <b>Radiated Emissions</b> (Spurious) |      |            |      |                                                             |          |
|-------------------------|-------|----------------------------------------------------------------------------------------|------|------|--------------------------------------|------|------------|------|-------------------------------------------------------------|----------|
| DNB Job Number:         |       | 06022                                                                                  |      |      | Date:                                |      | 2 Oct 2019 |      | Specification<br><br>[X] 15.247 (c)<br>[X] ANSI C63.10-2013 |          |
| Customer:               |       | Transcore                                                                              |      |      |                                      |      |            |      |                                                             |          |
| Model Number:           |       | MPRXFH                                                                                 |      |      |                                      |      |            |      |                                                             |          |
| Description:            |       | Multiprotocol Reader Extreme- Frequency Hopper                                         |      |      |                                      |      |            |      |                                                             |          |
| Middle Channel - Y axis |       |                                                                                        |      |      |                                      |      |            |      |                                                             |          |
| FREQ<br>(Mhz)           | Meter | Correction Factors (dB)                                                                |      |      | dBuV/m                               |      |            | Type |                                                             | Polarity |
|                         |       | Ant                                                                                    | Cbl  | Amp  | Corr                                 | Lim  | Delta      | Lim  | Rdng                                                        |          |
| 1831.500                | 29.2  | 27.3                                                                                   | 4.3  | 26.3 | 34.48                                | 54.0 | -19.52     | AVE  | PK                                                          | Horz     |
| 2747.250                | 29.1  | 30.1                                                                                   | 5.4  | 26.3 | 38.30                                | 54.0 | -15.70     | AVE  | PK                                                          | Horz     |
| 3662.976                | 29.5  | 31.1                                                                                   | 6.0  | 26.1 | 40.46                                | 54.0 | -13.54     | AVE  | PK                                                          | Horz     |
| 4578.750                | 30.2  | 32.3                                                                                   | 6.8  | 25.9 | 43.40                                | 54.0 | -10.60     | AVE  | PK                                                          | Horz     |
| 5494.500                | 31.4  | 34.9                                                                                   | 7.5  | 25.7 | 48.16                                | 54.0 | -5.84      | AVE  | PK                                                          | Horz     |
| 6410.250                | 32.1  | 36.0                                                                                   | 8.2  | 25.7 | 50.61                                | 54.0 | -3.39      | AVE  | PK                                                          | Horz     |
| 7326.000                | 24.5  | 37.1                                                                                   | 8.8  | 25.5 | 44.91                                | 54.0 | -9.09      | AVE  | PK                                                          | Horz     |
| 8241.750                | 24.7  | 37.4                                                                                   | 9.5  | 25.3 | 46.34                                | 54.0 | -7.66      | AVE  | PK                                                          | Horz     |
| 9157.500                | 24.5  | 37.6                                                                                   | 10.1 | 25.0 | 47.20                                | 54.0 | -6.80      | AVE  | PK                                                          | Horz     |
| 1831.500                | 30.4  | 27.3                                                                                   | 4.3  | 26.3 | 35.72                                | 54.0 | -18.28     | AVE  | PK                                                          | Vert     |
| 2747.250                | 28.5  | 30.1                                                                                   | 5.4  | 26.3 | 37.68                                | 54.0 | -16.32     | AVE  | PK                                                          | Vert     |
| 3662.976                | 30.8  | 31.1                                                                                   | 6.0  | 26.1 | 41.78                                | 54.0 | -12.22     | AVE  | PK                                                          | Vert     |
| 4578.750                | 30.4  | 32.3                                                                                   | 6.8  | 25.9 | 43.66                                | 54.0 | -10.34     | AVE  | PK                                                          | Vert     |
| 5494.500                | 31.0  | 34.9                                                                                   | 7.5  | 25.7 | 47.70                                | 54.0 | -6.30      | AVE  | PK                                                          | Vert     |
| 6410.250                | 33.1  | 36.0                                                                                   | 8.2  | 25.7 | 51.63                                | 54.0 | -2.37      | AVE  | PK                                                          | Vert     |
| 7326.000                | 25.0  | 37.1                                                                                   | 8.8  | 25.5 | 45.34                                | 54.0 | -8.66      | AVE  | PK                                                          | Vert     |
| 8241.750                | 25.0  | 37.4                                                                                   | 9.5  | 25.3 | 46.56                                | 54.0 | -7.44      | AVE  | PK                                                          | Vert     |
| 9157.500                | 23.8  | 37.6                                                                                   | 10.1 | 25.0 | 46.55                                | 54.0 | -7.45      | AVE  | PK                                                          | Vert     |

|                         |       | 1100 E Chalk Creek Road<br>Coalville, UT 84017<br>(435) 336-4433<br>FAX (435) 336-4436 |      |      | <b>Radiated Emissions</b> (Spurious) |      |            |      |                                                             |          |
|-------------------------|-------|----------------------------------------------------------------------------------------|------|------|--------------------------------------|------|------------|------|-------------------------------------------------------------|----------|
| DNB Job Number:         |       | 06022                                                                                  |      |      | Date:                                |      | 2 Oct 2019 |      | Specification<br><br>[X] 15.247 (c)<br>[X] ANSI C63.10-2013 |          |
| Customer:               |       | Transcore                                                                              |      |      |                                      |      |            |      |                                                             |          |
| Model Number:           |       | MPRXFH                                                                                 |      |      |                                      |      |            |      |                                                             |          |
| Description:            |       | Multiprotocol Reader Extreme- Frequency Hopper                                         |      |      |                                      |      |            |      |                                                             |          |
| Middle Channel - Z axis |       |                                                                                        |      |      |                                      |      |            |      |                                                             |          |
| FREQ<br>(Mhz)           | Meter | Correction Factors (dB)                                                                |      |      | dBuV/m                               |      |            | Type |                                                             | Polarity |
|                         |       | Ant                                                                                    | Cbl  | Amp  | Corr                                 | Lim  | Delta      | Lim  | Rdng                                                        |          |
| 1831.500                | 30.7  | 27.3                                                                                   | 4.3  | 26.3 | 36.02                                | 54.0 | -17.98     | AVE  | PK                                                          | Horz     |
| 2747.250                | 29.2  | 30.1                                                                                   | 5.4  | 26.3 | 38.40                                | 54.0 | -15.60     | AVE  | PK                                                          | Horz     |
| 3662.976                | 30.2  | 31.1                                                                                   | 6.0  | 26.1 | 41.17                                | 54.0 | -12.83     | AVE  | PK                                                          | Horz     |
| 4578.750                | 29.9  | 32.3                                                                                   | 6.8  | 25.9 | 43.17                                | 54.0 | -10.83     | AVE  | PK                                                          | Horz     |
| 5494.500                | 32.0  | 34.9                                                                                   | 7.5  | 25.7 | 48.75                                | 54.0 | -5.25      | AVE  | PK                                                          | Horz     |
| 6410.250                | 33.7  | 36.0                                                                                   | 8.2  | 25.7 | 52.20                                | 54.0 | -1.80      | AVE  | PK                                                          | Horz     |
| 7326.000                | 25.2  | 37.1                                                                                   | 8.8  | 25.5 | 45.55                                | 54.0 | -8.45      | AVE  | PK                                                          | Horz     |
| 8241.750                | 25.5  | 37.4                                                                                   | 9.5  | 25.3 | 47.06                                | 54.0 | -6.94      | AVE  | PK                                                          | Horz     |
| 9157.500                | 25.3  | 37.6                                                                                   | 10.1 | 25.0 | 48.01                                | 54.0 | -5.99      | AVE  | PK                                                          | Horz     |
| 1831.500                | 29.8  | 27.3                                                                                   | 4.3  | 26.3 | 35.09                                | 54.0 | -18.91     | AVE  | PK                                                          | Vert     |
| 2747.250                | 29.2  | 30.1                                                                                   | 5.4  | 26.3 | 38.37                                | 54.0 | -15.63     | AVE  | PK                                                          | Vert     |
| 3662.976                | 29.7  | 31.1                                                                                   | 6.0  | 26.1 | 40.68                                | 54.0 | -13.32     | AVE  | PK                                                          | Vert     |
| 4578.750                | 30.8  | 32.3                                                                                   | 6.8  | 25.9 | 44.02                                | 54.0 | -9.98      | AVE  | PK                                                          | Vert     |
| 5494.500                | 31.9  | 34.9                                                                                   | 7.5  | 25.7 | 48.63                                | 54.0 | -5.37      | AVE  | PK                                                          | Vert     |
| 6410.250                | 33.6  | 36.0                                                                                   | 8.2  | 25.7 | 52.13                                | 54.0 | -1.87      | AVE  | PK                                                          | Vert     |
| 7326.000                | 25.2  | 37.1                                                                                   | 8.8  | 25.5 | 45.59                                | 54.0 | -8.41      | AVE  | PK                                                          | Vert     |
| 8241.750                | 25.7  | 37.4                                                                                   | 9.5  | 25.3 | 47.31                                | 54.0 | -6.69      | AVE  | PK                                                          | Vert     |
| 9157.500                | 25.6  | 37.6                                                                                   | 10.1 | 25.0 | 48.33                                | 54.0 | -5.67      | AVE  | PK                                                          | Vert     |

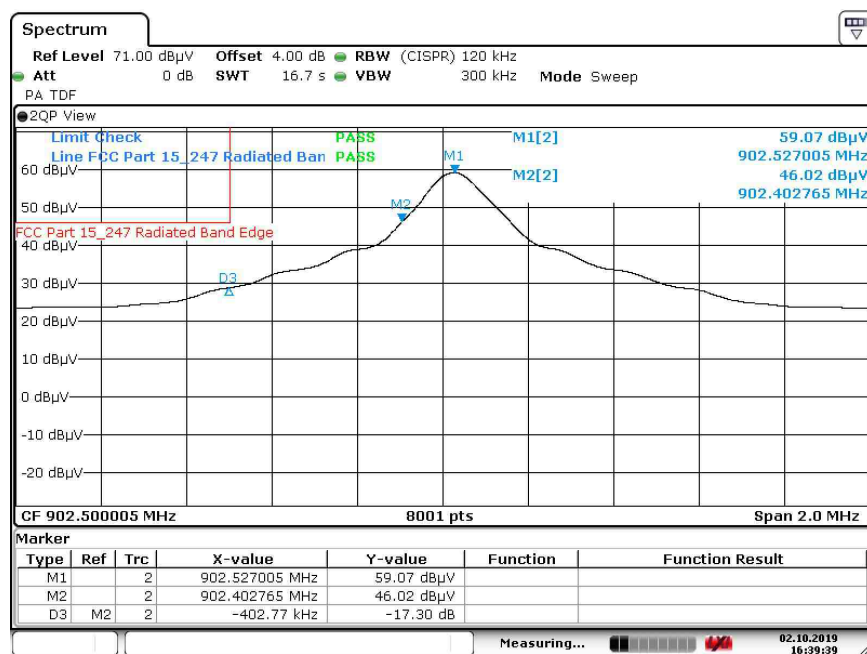
|                       |       | 1100 E Chalk Creek Road<br>Coalville, UT 84017<br>(435) 336-4433<br>FAX (435) 336-4436 |      |      | <b>Radiated Emissions</b> (Spurious) |      |            |      |                                                             |          |
|-----------------------|-------|----------------------------------------------------------------------------------------|------|------|--------------------------------------|------|------------|------|-------------------------------------------------------------|----------|
| DNB Job Number:       |       | 06022                                                                                  |      |      | Date:                                |      | 2 Oct 2019 |      | Specification<br><br>[X] 15.247 (c)<br>[X] ANSI C63.10-2013 |          |
| Customer:             |       | Transcore                                                                              |      |      |                                      |      |            |      |                                                             |          |
| Model Number:         |       | MPRXFH                                                                                 |      |      |                                      |      |            |      |                                                             |          |
| Description:          |       | Multiprotocol Reader Extreme- Frequency Hopper                                         |      |      |                                      |      |            |      |                                                             |          |
| High Channel - X axis |       |                                                                                        |      |      |                                      |      |            |      |                                                             |          |
| FREQ<br>(Mhz)         | Meter | Correction Factors (dB)                                                                |      |      | dBuV/m                               |      |            | Type |                                                             | Polarity |
|                       |       | Ant                                                                                    | Cbl  | Amp  | Corr                                 | Lim  | Delta      | Lim  | Rdng                                                        |          |
| 1855.000              | 28.7  | 27.5                                                                                   | 4.4  | 26.4 | 34.17                                | 54.0 | -19.83     | AVE  | PK                                                          | Horz     |
| 2782.500              | 29.3  | 30.2                                                                                   | 5.4  | 26.3 | 38.62                                | 54.0 | -15.38     | AVE  | PK                                                          | Horz     |
| 3710.000              | 29.8  | 31.2                                                                                   | 6.1  | 26.1 | 41.03                                | 54.0 | -12.97     | AVE  | PK                                                          | Horz     |
| 4637.500              | 31.3  | 32.5                                                                                   | 6.9  | 25.8 | 44.82                                | 54.0 | -9.18      | AVE  | PK                                                          | Horz     |
| 5565.000              | 32.4  | 35.0                                                                                   | 7.6  | 25.7 | 49.32                                | 54.0 | -4.68      | AVE  | PK                                                          | Horz     |
| 6492.500              | 33.5  | 36.1                                                                                   | 8.2  | 25.7 | 52.14                                | 54.0 | -1.86      | AVE  | PK                                                          | Horz     |
| 7420.000              | 26.1  | 37.1                                                                                   | 8.9  | 25.5 | 46.63                                | 54.0 | -7.37      | AVE  | PK                                                          | Horz     |
| 8347.500              | 24.8  | 37.3                                                                                   | 9.6  | 25.2 | 46.45                                | 54.0 | -7.55      | AVE  | PK                                                          | Horz     |
| 9275.000              | 25.2  | 37.7                                                                                   | 10.2 | 25.0 | 48.14                                | 54.0 | -5.86      | AVE  | PK                                                          | Horz     |
| 1855.000              | 29.2  | 27.5                                                                                   | 4.4  | 26.4 | 34.73                                | 54.0 | -19.27     | AVE  | PK                                                          | Vert     |
| 2782.500              | 29.7  | 30.2                                                                                   | 5.4  | 26.3 | 39.00                                | 54.0 | -15.00     | AVE  | PK                                                          | Vert     |
| 3710.000              | 29.7  | 31.2                                                                                   | 6.1  | 26.1 | 40.94                                | 54.0 | -13.06     | AVE  | PK                                                          | Vert     |
| 4637.500              | 31.0  | 32.5                                                                                   | 6.9  | 25.8 | 44.57                                | 54.0 | -9.43      | AVE  | PK                                                          | Vert     |
| 5565.000              | 32.9  | 35.0                                                                                   | 7.6  | 25.7 | 49.80                                | 54.0 | -4.20      | AVE  | PK                                                          | Vert     |
| 6492.500              | 33.9  | 36.1                                                                                   | 8.2  | 25.7 | 52.55                                | 54.0 | -1.45      | AVE  | PK                                                          | Vert     |
| 7420.000              | 26.0  | 37.1                                                                                   | 8.9  | 25.5 | 46.52                                | 54.0 | -7.48      | AVE  | PK                                                          | Vert     |
| 8347.500              | 24.8  | 37.3                                                                                   | 9.6  | 25.2 | 46.44                                | 54.0 | -7.56      | AVE  | PK                                                          | Vert     |
| 9275.000              | 25.6  | 37.7                                                                                   | 10.2 | 25.0 | 48.56                                | 54.0 | -5.44      | AVE  | PK                                                          | Vert     |

|                       |       | 1100 E Chalk Creek Road<br>Coalville, UT 84017<br>(435) 336-4433<br>FAX (435) 336-4436 |      |      | <b>Radiated Emissions</b> (Spurious) |      |            |      |                                                             |          |
|-----------------------|-------|----------------------------------------------------------------------------------------|------|------|--------------------------------------|------|------------|------|-------------------------------------------------------------|----------|
| DNB Job Number:       |       | 06022                                                                                  |      |      | Date:                                |      | 2 Oct 2019 |      | Specification<br><br>[X] 15.247 (c)<br>[X] ANSI C63.10-2013 |          |
| Customer:             |       | Transcore                                                                              |      |      |                                      |      |            |      |                                                             |          |
| Model Number:         |       | MPRXFH                                                                                 |      |      |                                      |      |            |      |                                                             |          |
| Description:          |       | Multiprotocol Reader Extreme- Frequency Hopper                                         |      |      |                                      |      |            |      |                                                             |          |
| High Channel - Y axis |       |                                                                                        |      |      |                                      |      |            |      |                                                             |          |
| FREQ<br>(Mhz)         | Meter | Correction Factors (dB)                                                                |      |      | dBuV/m                               |      |            | Type |                                                             | Polarity |
|                       |       | Ant                                                                                    | Cbl  | Amp  | Corr                                 | Lim  | Delta      | Lim  | Rdng                                                        |          |
| 1855.000              | 29.3  | 27.5                                                                                   | 4.4  | 26.4 | 34.83                                | 54.0 | -19.17     | AVE  | PK                                                          | Horz     |
| 2782.500              | 29.8  | 30.2                                                                                   | 5.4  | 26.3 | 39.11                                | 54.0 | -14.89     | AVE  | PK                                                          | Horz     |
| 3710.000              | 30.5  | 31.2                                                                                   | 6.1  | 26.1 | 41.70                                | 54.0 | -12.30     | AVE  | PK                                                          | Horz     |
| 4637.500              | 30.1  | 32.5                                                                                   | 6.9  | 25.8 | 43.61                                | 54.0 | -10.39     | AVE  | PK                                                          | Horz     |
| 5565.000              | 32.5  | 35.0                                                                                   | 7.6  | 25.7 | 49.39                                | 54.0 | -4.61      | AVE  | PK                                                          | Horz     |
| 6492.500              | 33.9  | 36.1                                                                                   | 8.2  | 25.7 | 52.56                                | 54.0 | -1.44      | AVE  | PK                                                          | Horz     |
| 7420.000              | 25.5  | 37.1                                                                                   | 8.9  | 25.5 | 46.03                                | 54.0 | -7.97      | AVE  | PK                                                          | Horz     |
| 8347.500              | 25.2  | 37.3                                                                                   | 9.6  | 25.2 | 46.85                                | 54.0 | -7.15      | AVE  | PK                                                          | Horz     |
| 9275.000              | 24.8  | 37.7                                                                                   | 10.2 | 25.0 | 47.71                                | 54.0 | -6.29      | AVE  | PK                                                          | Horz     |
| 1855.000              | 30.4  | 27.5                                                                                   | 4.4  | 26.4 | 35.92                                | 54.0 | -18.08     | AVE  | PK                                                          | Vert     |
| 2782.500              | 29.4  | 30.2                                                                                   | 5.4  | 26.3 | 38.70                                | 54.0 | -15.30     | AVE  | PK                                                          | Vert     |
| 3710.000              | 29.4  | 31.2                                                                                   | 6.1  | 26.1 | 40.60                                | 54.0 | -13.40     | AVE  | PK                                                          | Vert     |
| 4637.500              | 31.2  | 32.5                                                                                   | 6.9  | 25.8 | 44.71                                | 54.0 | -9.29      | AVE  | PK                                                          | Vert     |
| 5565.000              | 32.5  | 35.0                                                                                   | 7.6  | 25.7 | 49.37                                | 54.0 | -4.63      | AVE  | PK                                                          | Vert     |
| 6492.500              | 34.0  | 36.1                                                                                   | 8.2  | 25.7 | 52.61                                | 54.0 | -1.39      | AVE  | PK                                                          | Vert     |
| 7420.000              | 26.8  | 37.1                                                                                   | 8.9  | 25.5 | 47.28                                | 54.0 | -6.72      | AVE  | PK                                                          | Vert     |
| 8347.500              | 25.3  | 37.3                                                                                   | 9.6  | 25.2 | 46.95                                | 54.0 | -7.05      | AVE  | PK                                                          | Vert     |
| 9275.000              | 26.1  | 37.7                                                                                   | 10.2 | 25.0 | 49.07                                | 54.0 | -4.93      | AVE  | PK                                                          | Vert     |

|                              |       | 1100 E Chalk Creek Road<br>Coalville, UT 84017<br>(435) 336-4433<br>FAX (435) 336-4436 |      |      | <b>Radiated Emissions</b> (Spurious) |      |            |      |                                                             |          |
|------------------------------|-------|----------------------------------------------------------------------------------------|------|------|--------------------------------------|------|------------|------|-------------------------------------------------------------|----------|
| DNB Job Number:              |       | 06022                                                                                  |      |      | Date:                                |      | 2 Oct 2019 |      | Specification<br><br>[X] 15.247 (c)<br>[X] ANSI C63.10-2013 |          |
| Customer:                    |       | Transcore                                                                              |      |      |                                      |      |            |      |                                                             |          |
| Model Number:                |       | MPRXFH                                                                                 |      |      |                                      |      |            |      |                                                             |          |
| Description:                 |       | Multiprotocol Reader Extreme- Frequency Hopper                                         |      |      |                                      |      |            |      |                                                             |          |
| <b>High Channel - Z axis</b> |       |                                                                                        |      |      |                                      |      |            |      |                                                             |          |
| FREQ<br>(Mhz)                | Meter | Correction Factors (dB)                                                                |      |      | dBuV/m                               |      |            | Type |                                                             | Polarity |
|                              |       | Ant                                                                                    | Cbl  | Amp  | Corr                                 | Lim  | Delta      | Lim  | Rdng                                                        |          |
| 1855.000                     | 30.4  | 27.5                                                                                   | 4.4  | 26.4 | 35.87                                | 54.0 | -18.13     | AVE  | PK                                                          | Horz     |
| 2782.500                     | 29.2  | 30.2                                                                                   | 5.4  | 26.3 | 38.47                                | 54.0 | -15.53     | AVE  | PK                                                          | Horz     |
| 3710.000                     | 30.5  | 31.2                                                                                   | 6.1  | 26.1 | 41.68                                | 54.0 | -12.32     | AVE  | PK                                                          | Horz     |
| 4637.500                     | 31.0  | 32.5                                                                                   | 6.9  | 25.8 | 44.54                                | 54.0 | -9.46      | AVE  | PK                                                          | Horz     |
| 5565.000                     | 32.7  | 35.0                                                                                   | 7.6  | 25.7 | 49.61                                | 54.0 | -4.39      | AVE  | PK                                                          | Horz     |
| 6492.500                     | 34.3  | 36.1                                                                                   | 8.2  | 25.7 | 52.94                                | 54.0 | -1.06      | AVE  | PK                                                          | Horz     |
| 7420.000                     | 27.5  | 37.1                                                                                   | 8.9  | 25.5 | 48.04                                | 54.0 | -5.96      | AVE  | PK                                                          | Horz     |
| 8347.500                     | 24.7  | 37.3                                                                                   | 9.6  | 25.2 | 46.40                                | 54.0 | -7.60      | AVE  | PK                                                          | Horz     |
| 9275.000                     | 24.8  | 37.7                                                                                   | 10.2 | 25.0 | 47.74                                | 54.0 | -6.26      | AVE  | PK                                                          | Horz     |
| 1855.000                     | 30.1  | 27.5                                                                                   | 4.4  | 26.4 | 35.59                                | 54.0 | -18.41     | AVE  | PK                                                          | Vert     |
| 2782.500                     | 30.3  | 30.2                                                                                   | 5.4  | 26.3 | 39.63                                | 54.0 | -14.37     | AVE  | PK                                                          | Vert     |
| 3710.000                     | 30.9  | 31.2                                                                                   | 6.1  | 26.1 | 42.13                                | 54.0 | -11.87     | AVE  | PK                                                          | Vert     |
| 4637.500                     | 30.1  | 32.5                                                                                   | 6.9  | 25.8 | 43.63                                | 54.0 | -10.37     | AVE  | PK                                                          | Vert     |
| 5565.000                     | 33.0  | 35.0                                                                                   | 7.6  | 25.7 | 49.85                                | 54.0 | -4.15      | AVE  | PK                                                          | Vert     |
| 6492.500                     | 33.8  | 36.1                                                                                   | 8.2  | 25.7 | 52.46                                | 54.0 | -1.54      | AVE  | PK                                                          | Vert     |
| 7420.000                     | 25.4  | 37.1                                                                                   | 8.9  | 25.5 | 45.92                                | 54.0 | -8.08      | AVE  | PK                                                          | Vert     |
| 8347.500                     | 25.8  | 37.3                                                                                   | 9.6  | 25.2 | 47.47                                | 54.0 | -6.53      | AVE  | PK                                                          | Vert     |
| 9275.000                     | 25.1  | 37.7                                                                                   | 10.2 | 25.0 | 48.05                                | 54.0 | -5.95      | AVE  | PK                                                          | Vert     |

|                 |                                                                                        |                                                         |            |
|-----------------|----------------------------------------------------------------------------------------|---------------------------------------------------------|------------|
|                 | 1100 E Chalk Creek Road<br>Coalville, UT 84017<br>(435) 336-4433<br>FAX (435) 336-4436 | <b>Radiated Emissions</b> (Bandedge)                    |            |
| DNB Job Number: | 06022                                                                                  | Date:                                                   | 2 Oct 2019 |
| Customer:       | Transcore                                                                              | Specification<br>[X] 15.247 (c)<br>[X] ANSI C63.10-2013 |            |
| Model Number:   | MPRXFH                                                                                 |                                                         |            |
| Description:    | Multiprotocol Reader Extreme- Frequency Hopper                                         |                                                         |            |

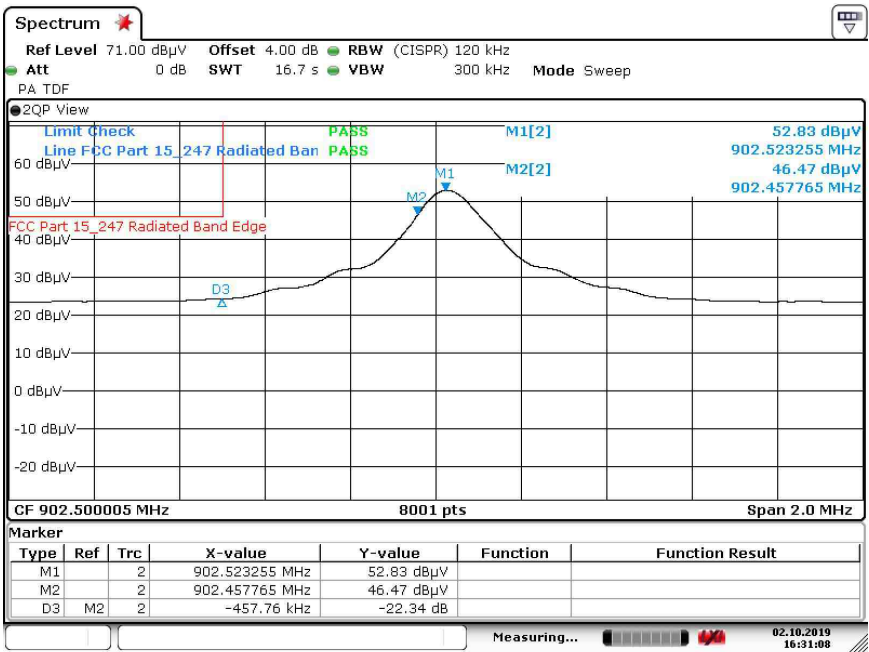
Radiated Corrected Band Edge  
Lower Edge / X-Axis  
Receive Antenna - Horizontal



Date: 2.OCT.2019 16:39:39

|                 |                                                                                        |                                                         |            |
|-----------------|----------------------------------------------------------------------------------------|---------------------------------------------------------|------------|
|                 | 1100 E Chalk Creek Road<br>Coalville, UT 84017<br>(435) 336-4433<br>FAX (435) 336-4436 | <b>Radiated Emissions</b> (Bandedge)                    |            |
| DNB Job Number: | 06022                                                                                  | Date:                                                   | 2 Oct 2019 |
| Customer:       | Transcore                                                                              | Specification<br>[X] 15.247 (c)<br>[X] ANSI C63.10-2013 |            |
| Model Number:   | MPRXFH                                                                                 |                                                         |            |
| Description:    | Multiprotocol Reader Extreme- Frequency Hopper                                         |                                                         |            |

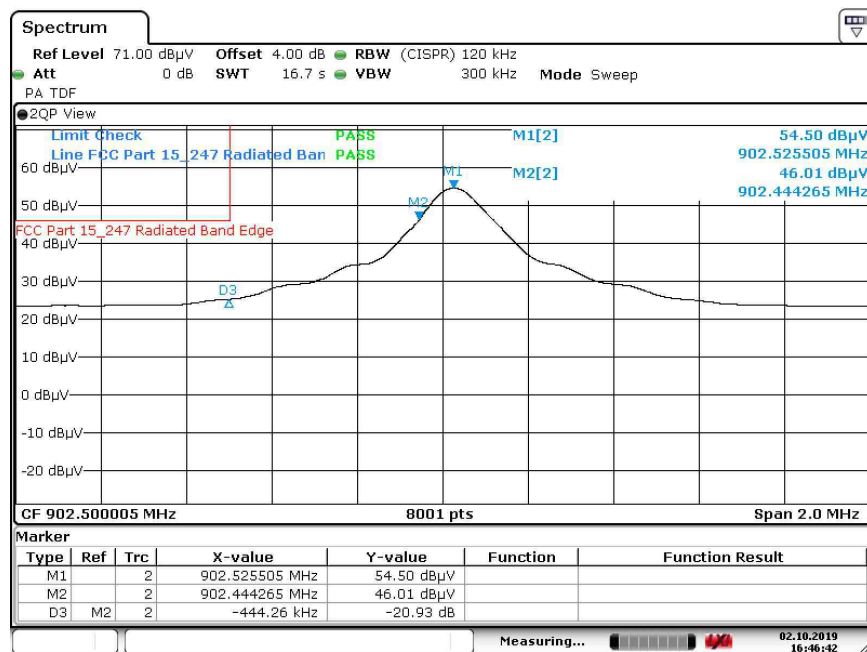
Radiated Corrected Band Edge  
Lower Edge / X-Axis  
Receive Antenna - Vertical



Date: 2.OCT.2019 16:31:09

|                 |                                                                                        |                                                         |            |
|-----------------|----------------------------------------------------------------------------------------|---------------------------------------------------------|------------|
|                 | 1100 E Chalk Creek Road<br>Coalville, UT 84017<br>(435) 336-4433<br>FAX (435) 336-4436 | <b>Radiated Emissions</b> (Bandedge)                    |            |
| DNB Job Number: | 06022                                                                                  | Date:                                                   | 2 Oct 2019 |
| Customer:       | Transcore                                                                              | Specification<br>[X] 15.247 (c)<br>[X] ANSI C63.10-2013 |            |
| Model Number:   | MPRXFH                                                                                 |                                                         |            |
| Description:    | Multiprotocol Reader Extreme- Frequency Hopper                                         |                                                         |            |

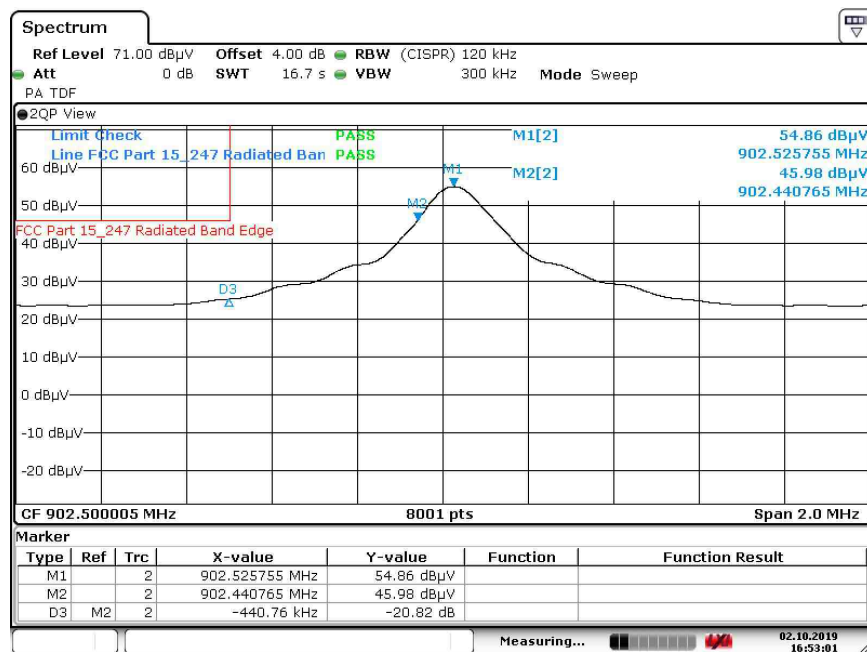
Radiated Corrected Band Edge  
Lower Edge / Y-Axis  
Receive Antenna - Horizontal



Date: 2.OCT.2019 16:46:42

|                 |                                                                                        |                                                         |            |
|-----------------|----------------------------------------------------------------------------------------|---------------------------------------------------------|------------|
|                 | 1100 E Chalk Creek Road<br>Coalville, UT 84017<br>(435) 336-4433<br>FAX (435) 336-4436 | <b>Radiated Emissions</b> (Bandedge)                    |            |
| DNB Job Number: | 06022                                                                                  | Date:                                                   | 2 Oct 2019 |
| Customer:       | Transcore                                                                              | Specification<br>[X] 15.247 (c)<br>[X] ANSI C63.10-2013 |            |
| Model Number:   | MPRXFH                                                                                 |                                                         |            |
| Description:    | Multiprotocol Reader Extreme- Frequency Hopper                                         |                                                         |            |

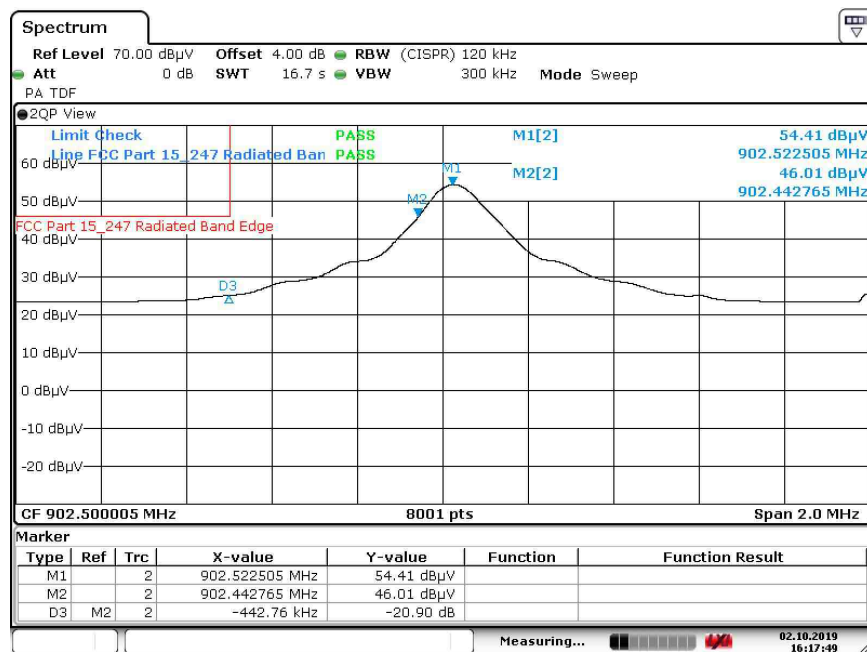
Radiated Corrected Band Edge  
Lower Edge / Y-Axis  
Receive Antenna - Vertical



Date: 2.OCT.2019 16:53:01

|                 |                                                                                        |                                                         |            |
|-----------------|----------------------------------------------------------------------------------------|---------------------------------------------------------|------------|
|                 | 1100 E Chalk Creek Road<br>Coalville, UT 84017<br>(435) 336-4433<br>FAX (435) 336-4436 | <b>Radiated Emissions</b> (Bandedge)                    |            |
| DNB Job Number: | 06022                                                                                  | Date:                                                   | 2 Oct 2019 |
| Customer:       | Transcore                                                                              | Specification<br>[X] 15.247 (c)<br>[X] ANSI C63.10-2013 |            |
| Model Number:   | MPRXFH                                                                                 |                                                         |            |
| Description:    | Multiprotocol Reader Extreme- Frequency Hopper                                         |                                                         |            |

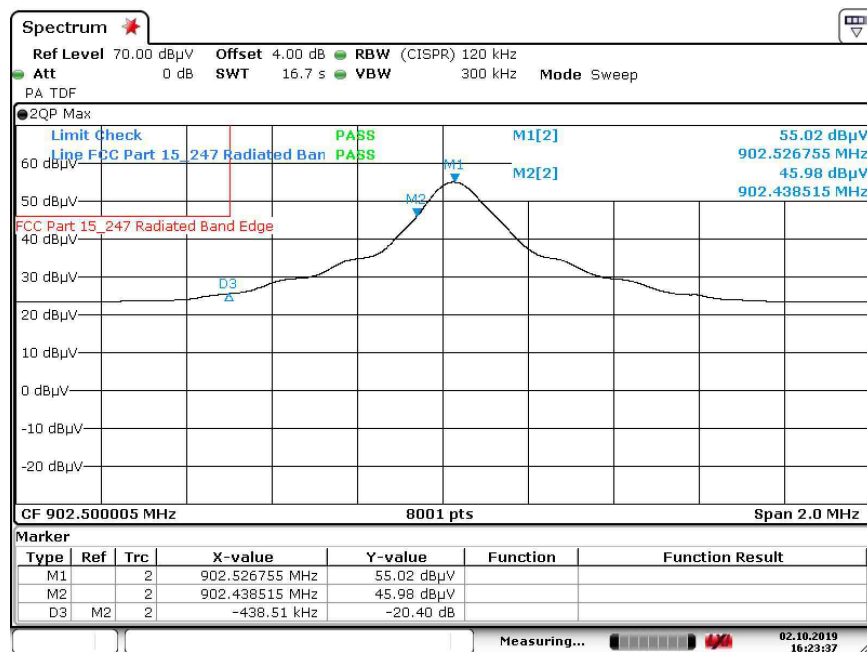
Radiated Corrected Band Edge  
Lower Edge / Z-Axis  
Receive Antenna - Horizontal



Date: 2.OCT.2019 16:17:49

|                 |                                                                                        |                                                         |            |
|-----------------|----------------------------------------------------------------------------------------|---------------------------------------------------------|------------|
|                 | 1100 E Chalk Creek Road<br>Coalville, UT 84017<br>(435) 336-4433<br>FAX (435) 336-4436 | <b>Radiated Emissions</b> (Bandedge)                    |            |
| DNB Job Number: | 06022                                                                                  | Date:                                                   | 2 Oct 2019 |
| Customer:       | Transcore                                                                              | Specification<br>[X] 15.247 (c)<br>[X] ANSI C63.10-2013 |            |
| Model Number:   | MPRXFH                                                                                 |                                                         |            |
| Description:    | Multiprotocol Reader Extreme- Frequency Hopper                                         |                                                         |            |

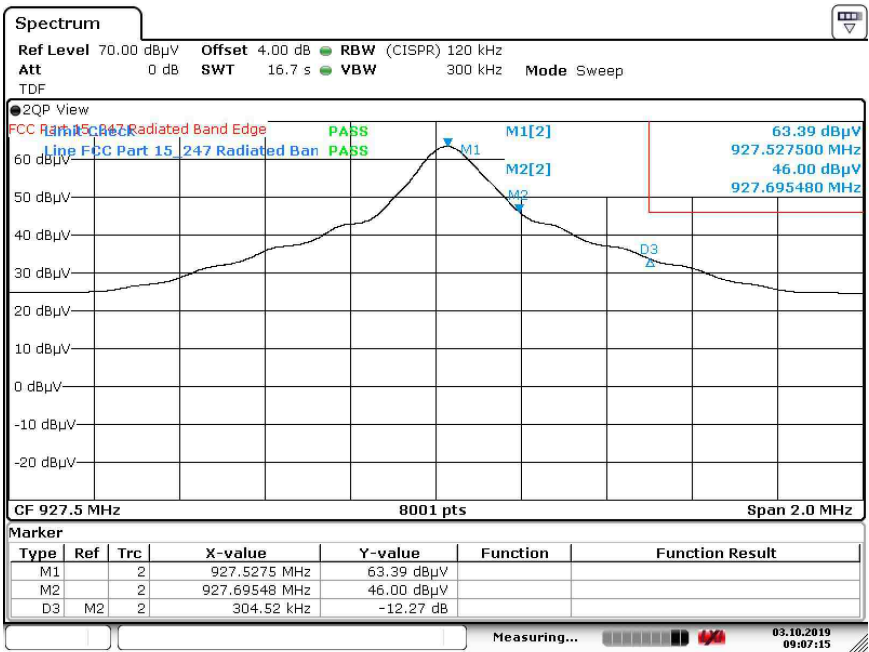
Radiated Corrected Band Edge  
Lower Edge / Z-Axis  
Receive Antenna - Vertical



Date: 2.OCT.2019 16:23:37

|                 |                                                                                        |                                                         |            |
|-----------------|----------------------------------------------------------------------------------------|---------------------------------------------------------|------------|
|                 | 1100 E Chalk Creek Road<br>Coalville, UT 84017<br>(435) 336-4433<br>FAX (435) 336-4436 | <b>Radiated Emissions</b> (Bandedge)                    |            |
| DNB Job Number: | 06022                                                                                  | Date:                                                   | 3 Oct 2019 |
| Customer:       | Transcore                                                                              | Specification<br>[X] 15.247 (c)<br>[X] ANSI C63.10-2013 |            |
| Model Number:   | MPRXFH                                                                                 |                                                         |            |
| Description:    | Multiprotocol Reader Extreme- Frequency Hopper                                         |                                                         |            |

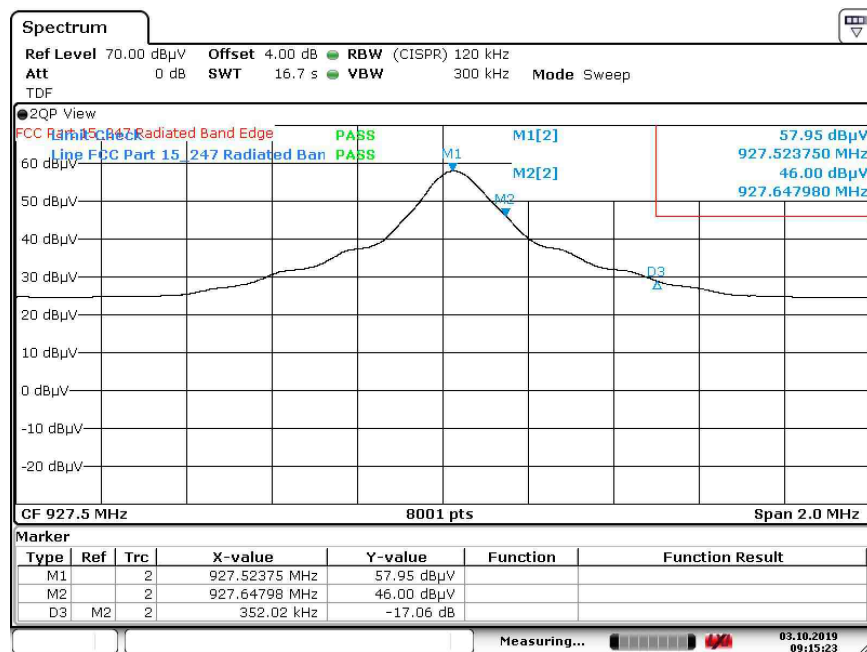
Radiated Corrected Band Edge  
 Upper Edge / X-Axis  
 Receive Antenna - Horizontal



Date: 3.OCT.2019 09:07:15

|                 |                                                                                        |                                                         |            |
|-----------------|----------------------------------------------------------------------------------------|---------------------------------------------------------|------------|
|                 | 1100 E Chalk Creek Road<br>Coalville, UT 84017<br>(435) 336-4433<br>FAX (435) 336-4436 | <b>Radiated Emissions</b> (Bandedge)                    |            |
| DNB Job Number: | 06022                                                                                  | Date:                                                   | 3 Oct 2019 |
| Customer:       | Transcore                                                                              | Specification<br>[X] 15.247 (c)<br>[X] ANSI C63.10-2013 |            |
| Model Number:   | MPRXFH                                                                                 |                                                         |            |
| Description:    | Multiprotocol Reader Extreme- Frequency Hopper                                         |                                                         |            |

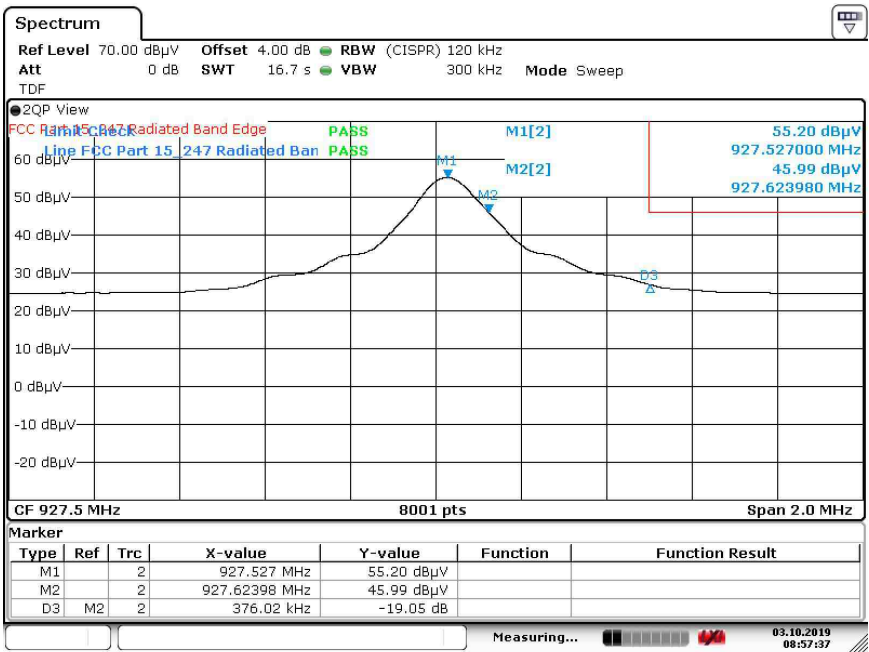
Radiated Corrected Band Edge  
Upper Edge / X-Axis  
Receive Antenna - Vertical



Date: 3.OCT.2019 09:15:23

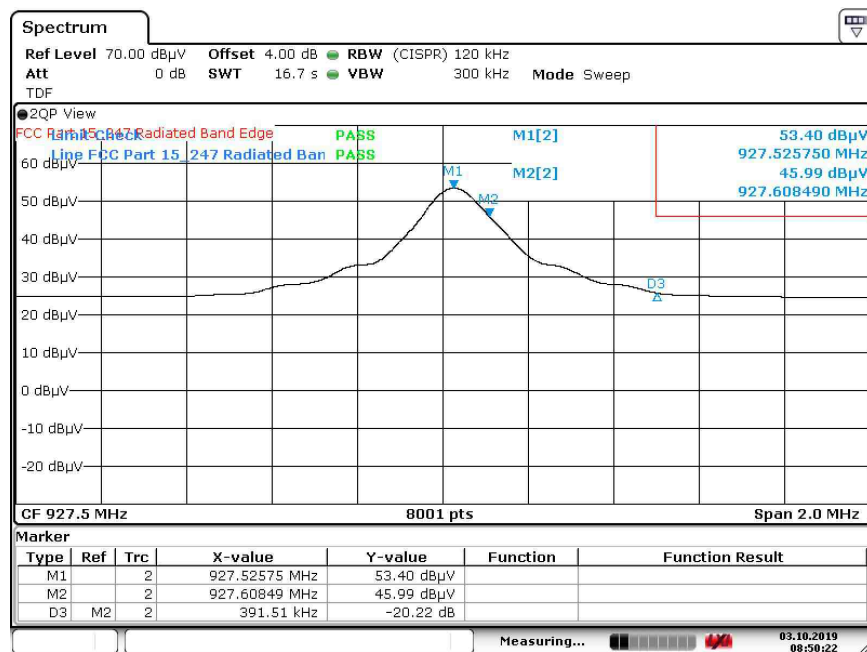
|                 |                                                                                        |                                                         |            |
|-----------------|----------------------------------------------------------------------------------------|---------------------------------------------------------|------------|
|                 | 1100 E Chalk Creek Road<br>Coalville, UT 84017<br>(435) 336-4433<br>FAX (435) 336-4436 | <b>Radiated Emissions</b> (Bandedge)                    |            |
| DNB Job Number: | 06022                                                                                  | Date:                                                   | 3 Oct 2019 |
| Customer:       | Transcore                                                                              | Specification<br>[X] 15.247 (c)<br>[X] ANSI C63.10-2013 |            |
| Model Number:   | MPRXFH                                                                                 |                                                         |            |
| Description:    | Multiprotocol Reader Extreme- Frequency Hopper                                         |                                                         |            |

Radiated Corrected Band Edge  
 Upper Edge / Y-Axis  
 Receive Antenna - Horizontal



|                 |                                                                                        |                                                         |            |
|-----------------|----------------------------------------------------------------------------------------|---------------------------------------------------------|------------|
|                 | 1100 E Chalk Creek Road<br>Coalville, UT 84017<br>(435) 336-4433<br>FAX (435) 336-4436 | <b>Radiated Emissions</b> (Bandedge)                    |            |
| DNB Job Number: | 06022                                                                                  | Date:                                                   | 3 Oct 2019 |
| Customer:       | Transcore                                                                              | Specification<br>[X] 15.247 (c)<br>[X] ANSI C63.10-2013 |            |
| Model Number:   | MPRXFH                                                                                 |                                                         |            |
| Description:    | Multiprotocol Reader Extreme- Frequency Hopper                                         |                                                         |            |

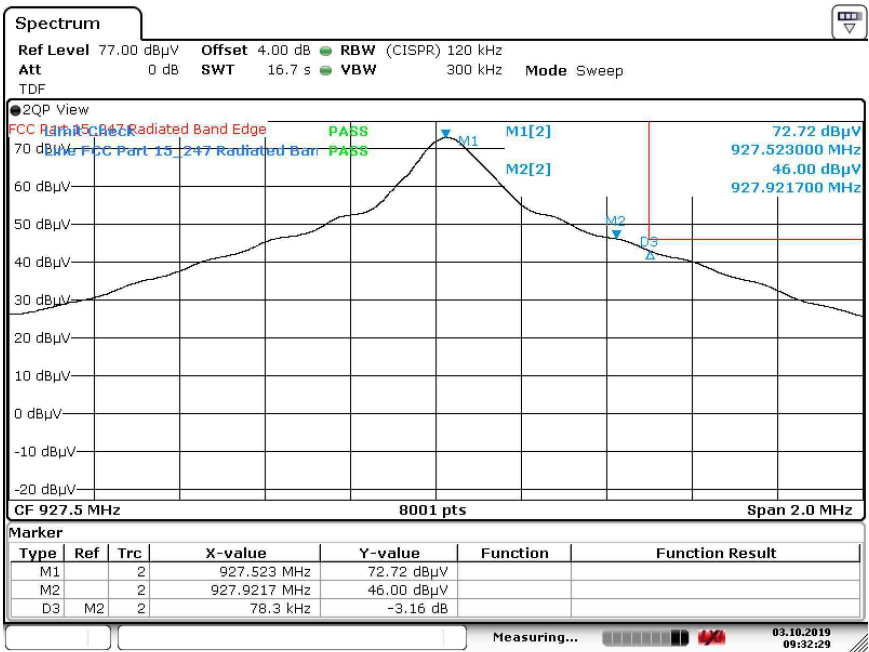
Radiated Corrected Band Edge  
Upper Edge / Y-Axis  
Receive Antenna - Vertical



Date: 3.OCT.2019 08:50:22

|                 |                                                                                        |                                                         |            |
|-----------------|----------------------------------------------------------------------------------------|---------------------------------------------------------|------------|
|                 | 1100 E Chalk Creek Road<br>Coalville, UT 84017<br>(435) 336-4433<br>FAX (435) 336-4436 | <b>Radiated Emissions</b> (Bandedge)                    |            |
| DNB Job Number: | 06022                                                                                  | Date:                                                   | 3 Oct 2019 |
| Customer:       | Transcore                                                                              | Specification<br>[X] 15.247 (c)<br>[X] ANSI C63.10-2013 |            |
| Model Number:   | MPRXFH                                                                                 |                                                         |            |
| Description:    | Multiprotocol Reader Extreme- Frequency Hopper                                         |                                                         |            |

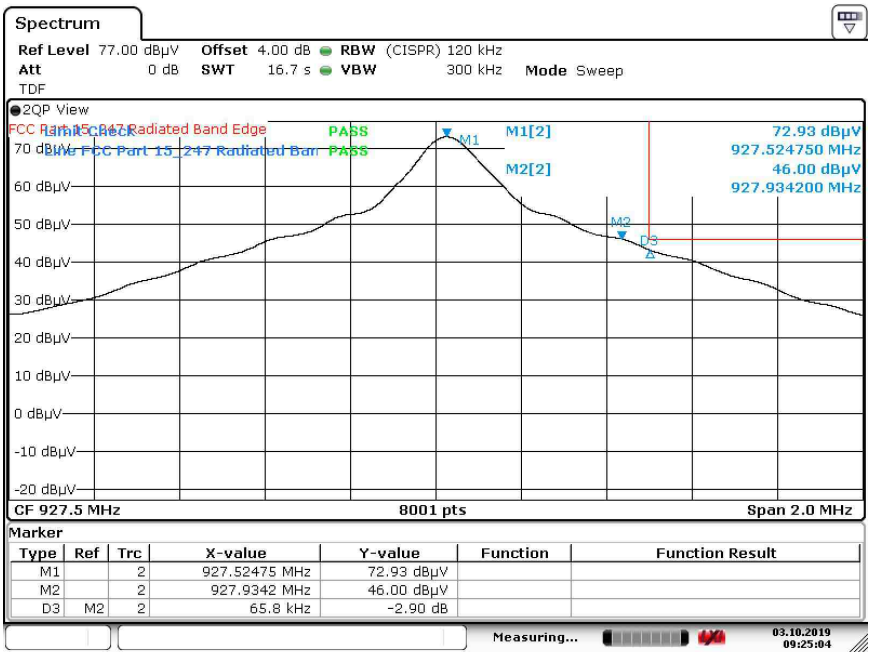
Radiated Corrected Band Edge  
 Upper Edge / Z-Axis  
 Receive Antenna - Horizontal



Date: 3.OCT.2019 09:32:29

|                 |                                                                                        |                                                         |            |
|-----------------|----------------------------------------------------------------------------------------|---------------------------------------------------------|------------|
|                 | 1100 E Chalk Creek Road<br>Coalville, UT 84017<br>(435) 336-4433<br>FAX (435) 336-4436 | <b>Radiated Emissions</b> (Bandedge)                    |            |
| DNB Job Number: | 06022                                                                                  | Date:                                                   | 3 Oct 2019 |
| Customer:       | Transcore                                                                              | Specification<br>[X] 15.247 (c)<br>[X] ANSI C63.10-2013 |            |
| Model Number:   | MPRXFH                                                                                 |                                                         |            |
| Description:    | Multiprotocol Reader Extreme- Frequency Hopper                                         |                                                         |            |

Radiated Corrected Band Edge  
Upper Edge / Z-Axis  
Receive Antenna - Vertical



Date: 3.OCT.2019 09:25:04

## 15.247 (a,1,i) 20 dB Bandwidth

### Occupied Bandwidth - Relative Measurement Procedure -20 dB Bandwidth

The occupied bandwidth is measured as the width of the spectral envelope of the modulated signal, at an amplitude level reduced from a reference value by a specified ratio (or in decibels, a specified number of dB down from the reference value). Typical ratios, expressed in dB, are -6 dB, -20 dB, and -26 dB, corresponding to 6 dB BW, 20 dB BW, and 26 dB BW, respectively. In this subclause, the ratio is designated by “-xx dB.” The reference value is either the level of the unmodulated carrier or the highest level of the spectral envelope of the modulated signal, as stated by the applicable requirement. Some requirements might specify a specific maximum or minimum value for the “-xx dB” bandwidth; other requirements might specify that the “-xx dB” bandwidth be entirely contained within the authorized or designated frequency band.

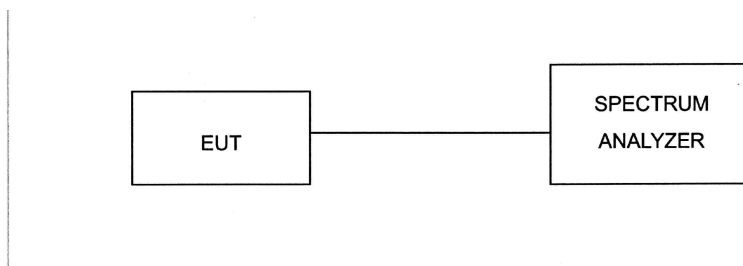
Reference ANSI C63.10-2013 for measurement procedure.

The EUT should be transmitting at its maximum data rate. Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. Use the marker-delta function to measure 20 dB down one side of the emission. Reset the marker-delta function, and move the marker to the other side of the emission, until it is (as close as possible to) even with the reference marker level. The marker-delta reading at this point is the 20 or 6 dB bandwidth of the emission. If this value varies with different modes of operation (e.g., data rate, modulation format, etc.), repeat this test for each variation. The limit is specified in one of the subparagraphs of this Section. Submit this plot(s).

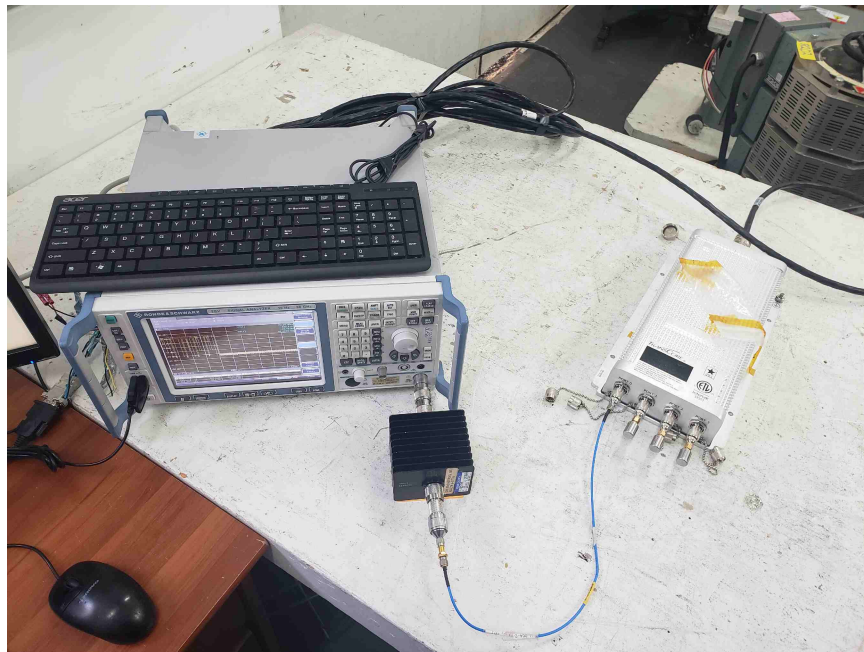
EUT operating conditions:

The software provided by the client to enable the EUT to transmit continuously.

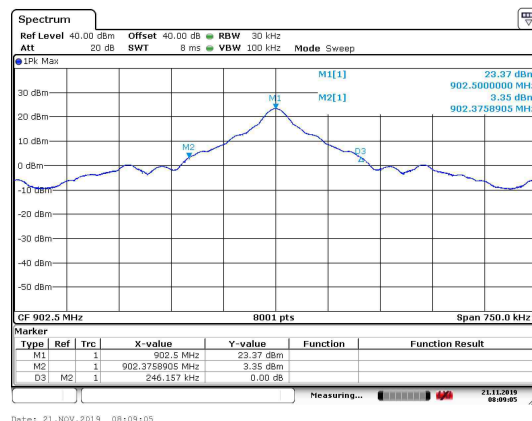
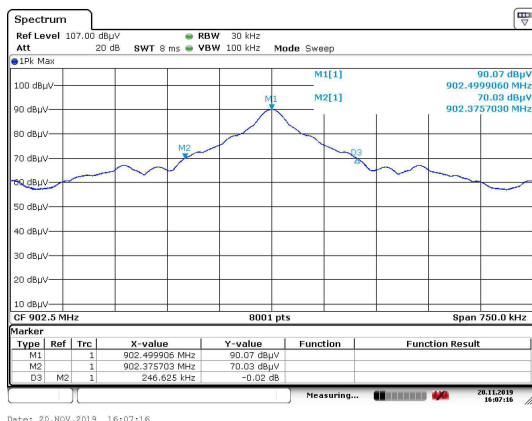
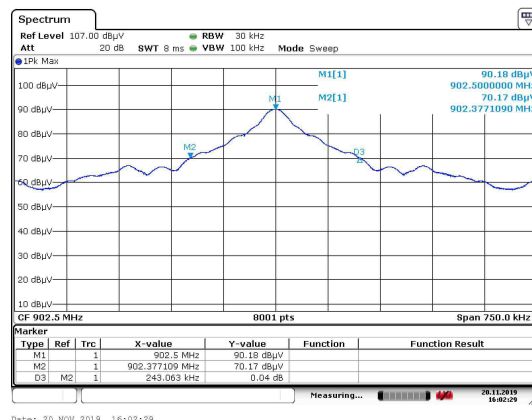
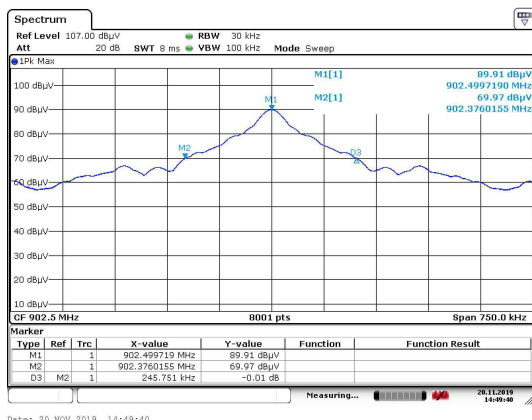
Test Set Up: (Note following set up was used for all antenna conducted measurements)



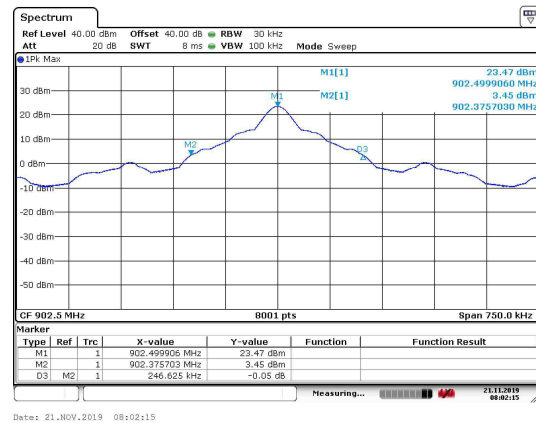
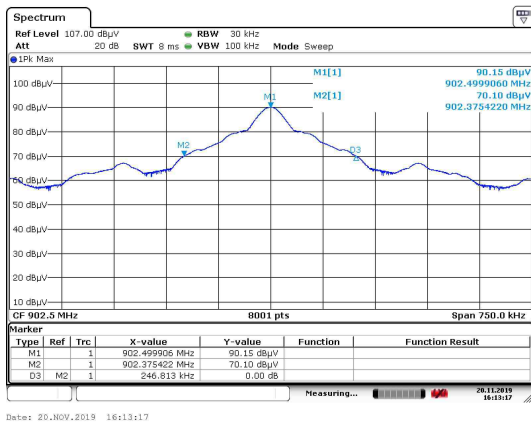
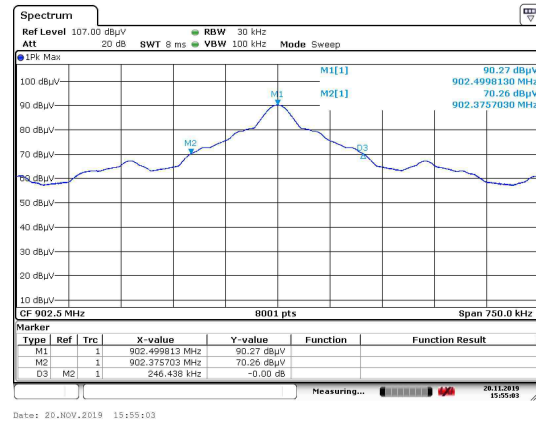
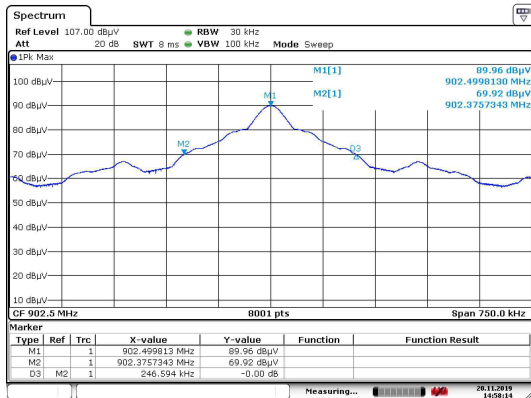
|                                      |                                                                                        |                                |                                                |
|--------------------------------------|----------------------------------------------------------------------------------------|--------------------------------|------------------------------------------------|
|                                      | 1100 E Chalk Creek Road<br>Coalville, UT 84017<br>(435) 336-4433<br>FAX (435) 336-4436 | <b>Measurement Test Set Up</b> |                                                |
| DNB Job Number:                      | 06022                                                                                  | Date: 7 Mar 2018               | <b>Conformance Standard</b><br><br>FCC Part 15 |
| Customer:                            | Transcore                                                                              |                                |                                                |
| Model Number:                        | MPRXFH                                                                                 |                                |                                                |
| Description:                         | Multiprotocol Reader Extreme- Frequency Hopper                                         |                                | <b>Clause</b><br>15.247                        |
|                                      |                                                                                        |                                |                                                |
| Antenna Conducted Measurement Set Up |                                                                                        |                                |                                                |



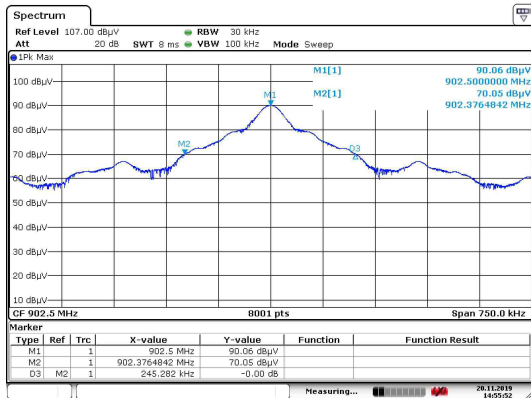
|                                                                                                                                                     |         |                                                                                        |                |                                       |             |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|---------|----------------------------------------------------------------------------------------|----------------|---------------------------------------|-------------|
|                                                                                                                                                     |         | 1100 E Chalk Creek Road<br>Coalville, UT 84017<br>(435) 336-4433<br>FAX (435) 336-4436 |                | <b>20 dB Single Channel Bandwidth</b> |             |
| DNB Job Number:                                                                                                                                     |         | 06022                                                                                  |                | Date:                                 | 18 Nov 2019 |
| Customer:                                                                                                                                           |         | Transcore                                                                              |                |                                       |             |
| Model Number:                                                                                                                                       |         | MPRXFH                                                                                 |                |                                       |             |
| Description:                                                                                                                                        |         | Multiprotocol Reader Extreme- Frequency Hopper                                         |                |                                       |             |
|                                                                                                                                                     |         |                                                                                        |                |                                       |             |
| <b>Conformance Standard</b>                                                                                                                         |         |                                                                                        |                |                                       |             |
| FCC Part 15                                                                                                                                         |         |                                                                                        |                |                                       |             |
| <b>Clause</b><br>15.247(a,1,i)                                                                                                                      |         |                                                                                        |                |                                       |             |
| <b>Environmental Conditions</b>                                                                                                                     |         |                                                                                        |                |                                       |             |
| Ambient Temperature                                                                                                                                 |         | Relative Humidity                                                                      |                | Barometric Pressure                   |             |
| 20 °C                                                                                                                                               |         | 24 %                                                                                   |                | 101.1 kPa                             |             |
| EUT performed within the requirements of the applicable standard <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <i>J Payne</i> |         |                                                                                        |                |                                       |             |
| Port                                                                                                                                                | Channel | Modulation                                                                             | Chl Freq (MHz) | 20dB BW (kHz)                         | Pass/Fail   |
| 0                                                                                                                                                   | Low     | ego                                                                                    | 902.500        | 245.751                               | Pass        |
| 1                                                                                                                                                   | Low     | ego                                                                                    | 902.500        | 243.063                               | Pass        |
| 2                                                                                                                                                   | Low     | ego                                                                                    | 902.500        | 246.625                               | Pass        |
| 3                                                                                                                                                   | Low     | ego                                                                                    | 902.500        | 246.157                               | Pass        |



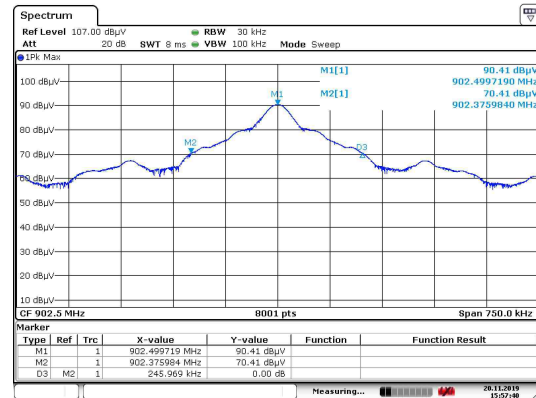
|                                                                                         |                                                |                                                                                        |                |                                                                           |           |  |
|-----------------------------------------------------------------------------------------|------------------------------------------------|----------------------------------------------------------------------------------------|----------------|---------------------------------------------------------------------------|-----------|--|
|                                                                                         |                                                | 1100 E Chalk Creek Road<br>Coalville, UT 84017<br>(435) 336-4433<br>FAX (435) 336-4436 |                | 20 dB Single Channel Bandwidth                                            |           |  |
| DNB Job Number:                                                                         | 06022                                          | Date:                                                                                  | 18 Nov 2019    | Conformance<br>Standard<br><br>FCC Part 15<br><br>Clause<br>15.247(a,1,i) |           |  |
| Customer:                                                                               | Transcore                                      |                                                                                        |                |                                                                           |           |  |
| Model Number:                                                                           | MPRXFH                                         |                                                                                        |                |                                                                           |           |  |
| Description:                                                                            | Multiprotocol Reader Extreme- Frequency Hopper |                                                                                        |                |                                                                           |           |  |
| Environmental Conditions                                                                |                                                |                                                                                        |                |                                                                           |           |  |
| Ambient Temperature                                                                     |                                                | Relative Humidity                                                                      |                | Barometric Pressure                                                       |           |  |
| 20 °C                                                                                   |                                                | 24 %                                                                                   |                | 101.1 kPa                                                                 |           |  |
| EUT performed within the requirements of the applicable standard [X] Yes [ ] No J Payne |                                                |                                                                                        |                |                                                                           |           |  |
| Port                                                                                    | Channel                                        | Modulation                                                                             | Chl Freq (MHz) | 20dB BW (kHz)                                                             | Pass/Fail |  |
| 0                                                                                       | Low                                            | epc                                                                                    | 902.500        | 246.594                                                                   | Pass      |  |
| 1                                                                                       | Low                                            | epc                                                                                    | 902.500        | 246.438                                                                   | Pass      |  |
| 2                                                                                       | Low                                            | epc                                                                                    | 902.500        | 246.813                                                                   | Pass      |  |
| 3                                                                                       | Low                                            | epc                                                                                    | 902.500        | 246.625                                                                   | Pass      |  |



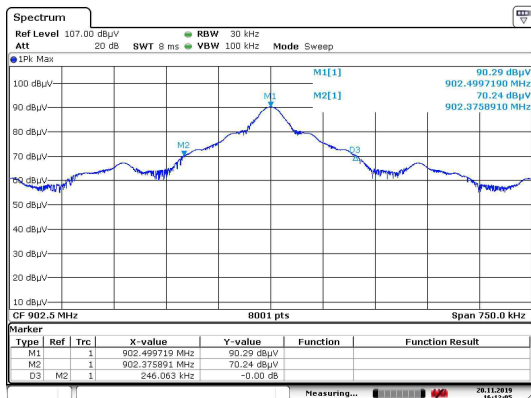
|                                                                                         |                                                |                                                                                        |                |                                                                           |           |
|-----------------------------------------------------------------------------------------|------------------------------------------------|----------------------------------------------------------------------------------------|----------------|---------------------------------------------------------------------------|-----------|
|                                                                                         |                                                | 1100 E Chalk Creek Road<br>Coalville, UT 84017<br>(435) 336-4433<br>FAX (435) 336-4436 |                | 20 dB Single Channel Bandwidth                                            |           |
| DNB Job Number:                                                                         | 06022                                          | Date:                                                                                  | 18 Nov 2019    | Conformance<br>Standard<br><br>FCC Part 15<br><br>Clause<br>15.247(a,1,i) |           |
| Customer:                                                                               | Transcore                                      |                                                                                        |                |                                                                           |           |
| Model Number:                                                                           | MPRXFH                                         |                                                                                        |                |                                                                           |           |
| Description:                                                                            | Multiprotocol Reader Extreme- Frequency Hopper |                                                                                        |                |                                                                           |           |
| Environmental Conditions                                                                |                                                |                                                                                        |                |                                                                           |           |
| Ambient Temperature                                                                     |                                                | Relative Humidity                                                                      |                | Barometric Pressure                                                       |           |
| 20 °C                                                                                   |                                                | 24 %                                                                                   |                | 101.1 kPa                                                                 |           |
| EUT performed within the requirements of the applicable standard [X] Yes [ ] No J Payne |                                                |                                                                                        |                |                                                                           |           |
| Port                                                                                    | Channel                                        | Modulation                                                                             | Chl Freq (MHz) | 20dB BW (kHz)                                                             | Pass/Fail |
| 0                                                                                       | Low                                            | iag                                                                                    | 902.500        | 245.282                                                                   | Pass      |
| 1                                                                                       | Low                                            | iag                                                                                    | 902.500        | 245.969                                                                   | Pass      |
| 2                                                                                       | Low                                            | iag                                                                                    | 902.500        | 246.063                                                                   | Pass      |
| 3                                                                                       | Low                                            | iag                                                                                    | 902.500        | 245.313                                                                   | Pass      |



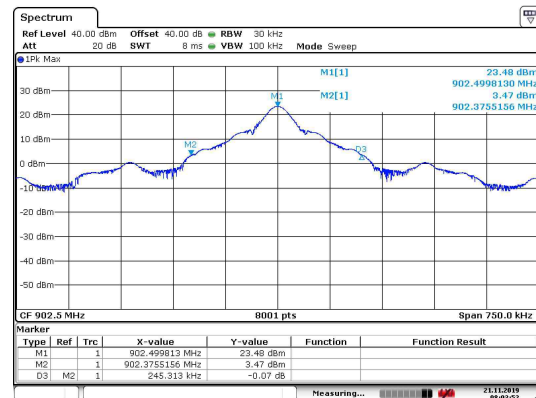
Date: 20.NOV.2019 14:55:52



Date: 20.NOV.2019 15:57:40



Date: 20.NOV.2019 16:12:05



Date: 21.NOV.2019 08:03:52

|                                                                                         |                                                |                                                                                        |                |                                                                           |           |  |
|-----------------------------------------------------------------------------------------|------------------------------------------------|----------------------------------------------------------------------------------------|----------------|---------------------------------------------------------------------------|-----------|--|
|                                                                                         |                                                | 1100 E Chalk Creek Road<br>Coalville, UT 84017<br>(435) 336-4433<br>FAX (435) 336-4436 |                | 20 dB Single Channel Bandwidth                                            |           |  |
| DNB Job Number:                                                                         | 06022                                          | Date:                                                                                  | 18 Nov 2019    | Conformance<br>Standard<br><br>FCC Part 15<br><br>Clause<br>15.247(a,1,i) |           |  |
| Customer:                                                                               | Transcore                                      |                                                                                        |                |                                                                           |           |  |
| Model Number:                                                                           | MPRXFH                                         |                                                                                        |                |                                                                           |           |  |
| Description:                                                                            | Multiprotocol Reader Extreme- Frequency Hopper |                                                                                        |                |                                                                           |           |  |
| Environmental Conditions                                                                |                                                |                                                                                        |                |                                                                           |           |  |
| Ambient Temperature                                                                     |                                                | Relative Humidity                                                                      |                | Barometric Pressure                                                       |           |  |
| 20 °C                                                                                   |                                                | 24 %                                                                                   |                | 101.1 kPa                                                                 |           |  |
| EUT performed within the requirements of the applicable standard [X] Yes [ ] No J Payne |                                                |                                                                                        |                |                                                                           |           |  |
| Port                                                                                    | Channel                                        | Modulation                                                                             | Chl Freq (MHz) | 20dB BW (kHz)                                                             | Pass/Fail |  |
| 0                                                                                       | Low                                            | Sego                                                                                   | 902.500        | 247.719                                                                   | Pass      |  |
| 1                                                                                       | Low                                            | Sego                                                                                   | 902.500        | 248.125                                                                   | Pass      |  |
| 2                                                                                       | Low                                            | Sego                                                                                   | 902.500        | 249.625                                                                   | Pass      |  |
| 3                                                                                       | Low                                            | Sego                                                                                   | 902.500        | 244.469                                                                   | Pass      |  |

