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.

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.

C. L. Payne III (Para. 1.1)
Facility Manager
Coalville Facility.
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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 Section 15.203 / 15.247	RSS-Gen Section 8.1.3	---	Pass
AC Power Line Conducted Emissions	FCC Part 15, Subpart C Section 15.207	RSS-Gen Section 8.8	ANSI C63.10 (2013) Section 6.2	Pass
Minimum 20dB Bandwidth	FCC Part 15, Subpart C Section 15.247 (a,1,i)	RSS-247 Issue 2 Feb 2017 Section 5.1	ANSI C63.10 (2013) Section 7.8.7	Pass
Conducted Peak Output Power	FCC Part 15, Subpart C Section 15.247 (b,2)	RSS-247 Issue 2 Feb 2017 Section 5.4	ANSI C63.10 (2013) Section 7.8.5	Pass
Conducted Spurious Emissions and Band Edge	FCC Part 15, Subpart C Section 15.247 (d)	RSS-247 Issue 2 Feb 2017 Section 5.5	ANSI C63.10 (2013) Section 7.8.6	Pass
Radiated Spurious Emissions and Band Edge	FCC Part 15, Subpart C Section 15.209 / 15.205	RSS-247 Issue 2 Feb 2017 Section 5.5	ANSI C63.10 (2013) 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

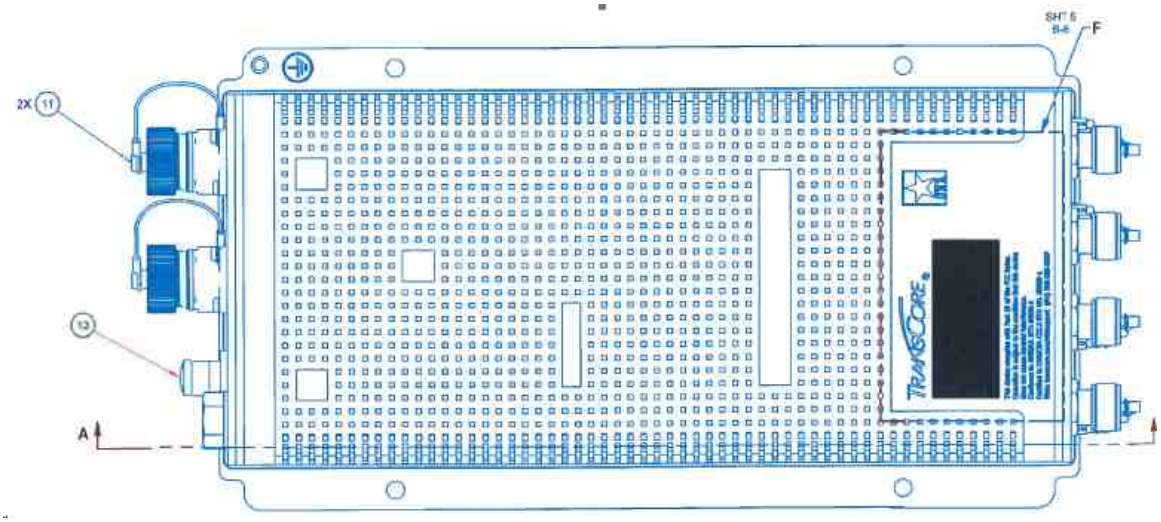
2.1033 (b) (1) Application for Certification

Name of Applicant:		Transcore 8600 Jefferson Street, NE Albuquerque, NM 87113
FRN Number:		0006083745
Applicant is: Vendor Licensee Prospective Licensee Other	X	Transcore
Name of Manufacturer :		Transcore 8600 Jefferson Street, NE 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) 0.787 W (epc) 0.783 W (IAG) 0.798 W (SeGo)
Antenna (Maximum Gain):		6.0 dBi (Maximum combined antenna gain and required 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

15.203 Antenna Requirement

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.

15.207 Conducted Emissions (General Provisions)

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 (dBµV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

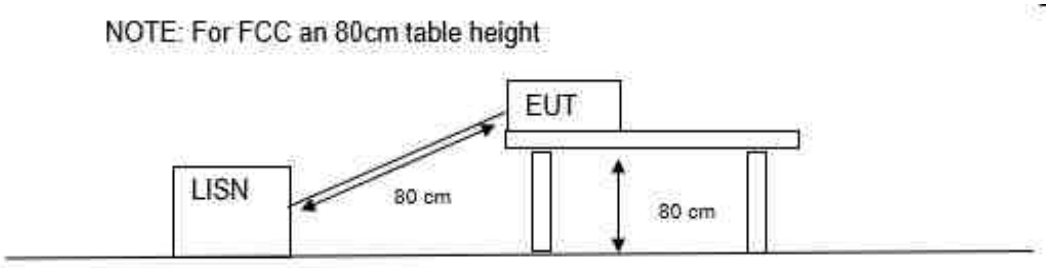
*Decreases with the logarithm of the frequency.

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.

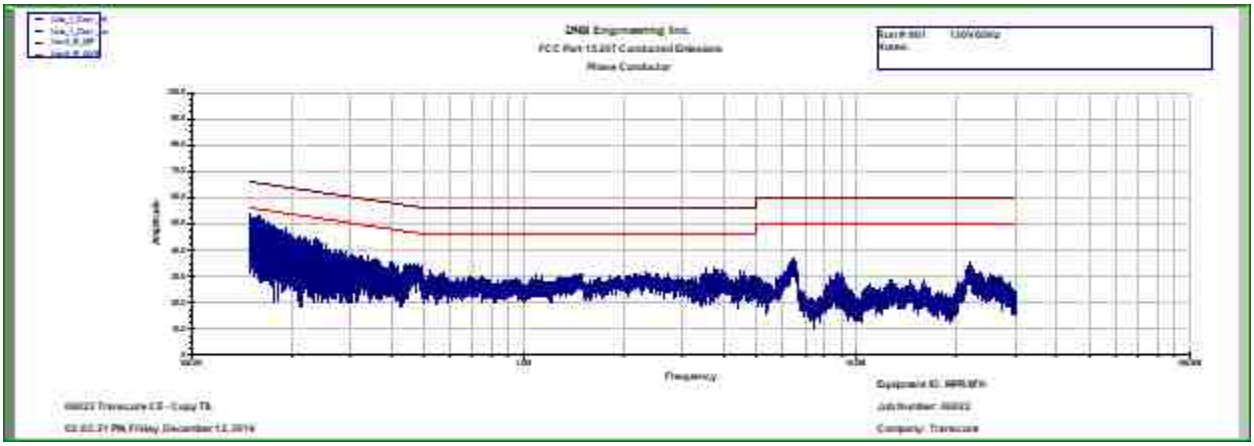
Example of Typical Calculation

Rohde and Schwarz reading @ 10 MHz	49.0	dBµV
LISN Factor	+7.5	dB
Cable Loss	+2.0	dB
Total Factors	9.5	dB
Voltage dBµV at LISN =	58.5	dBµv

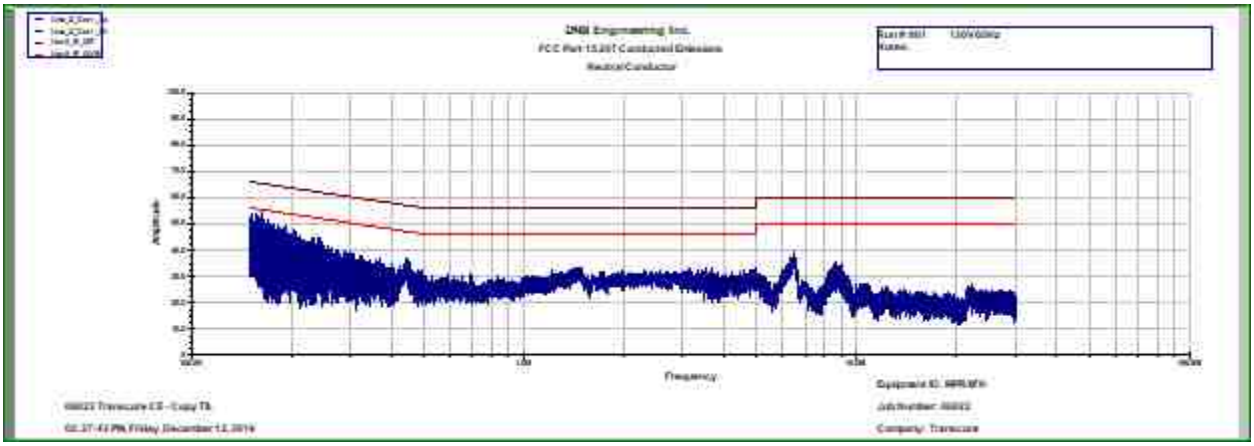
SETUP DIAGRAM



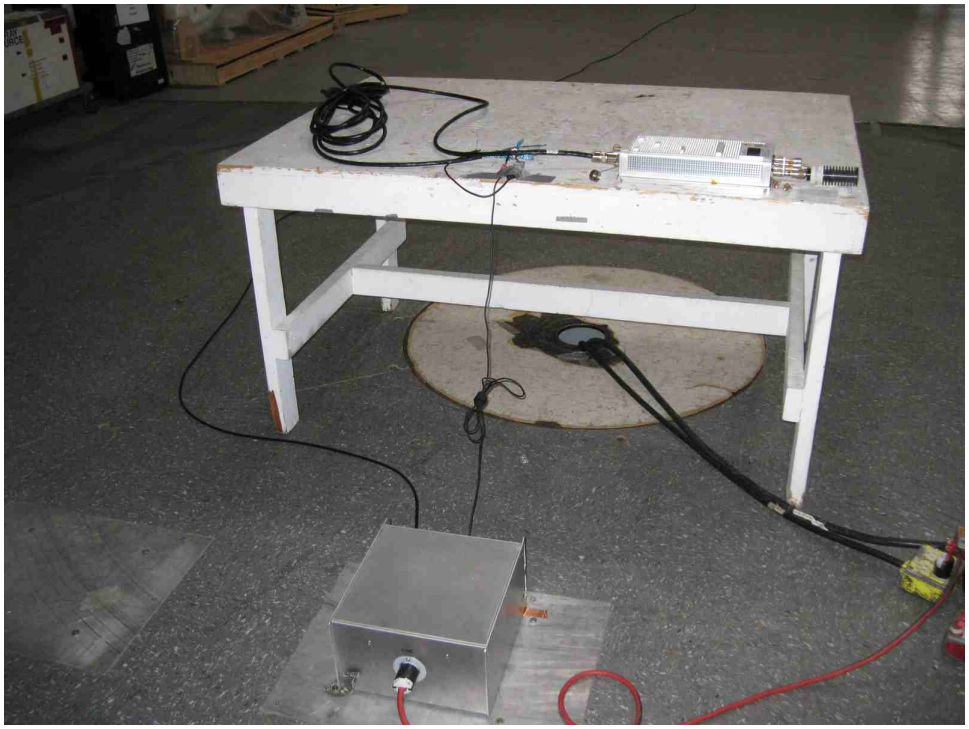
CONDUCTED EMISSIONS - PHASE LEAD												
Freq. (MHz)	Meas'd (dBuV)	Atten. Factors (dB)	Amp Factors (dB)	LISN Factors (dB)	Cable Factors (dB)	Total Factors (dB)	Total (dBuV)	Limit (dBuV)	Delta (dB)	Limit Type AVE,QP	Line L1 L2 L3 L4	Meas. Type AVE, QP, Peak
0.151	43.83	9.4		0.1	0.1	9.7	53.51	56.0	-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. (MHz)	Meas'd (dBuV)	Atten. Factors (dB)	Amp Factors (dB)	LISN Factors (dB)	Cable Factors (dB)	Total Factors (dB)	Total (dBuV)	Limit (dBuV)	Delta (dB)	Limit Type AVE,QP	Line L1 L2 L3 L4	Meas. Type AVE, 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 Coalville, UT 84017 (435) 336-4433 FAX (435) 336-4436	**Conducted Emissions** (General)	
DNB Job Number:	06022	Date: 13 Dec 2019	Specification [X] 15.207 [X] ANSI C63.10-2013
Customer:	Transcore		
Model Number:	MPRXFH		
Description:	Multiprotocol Reader Extreme- Frequency Hopper		
Test Set Up - Conducted Emissions			



15.209 Radiated Emissions (General Provisions)

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.

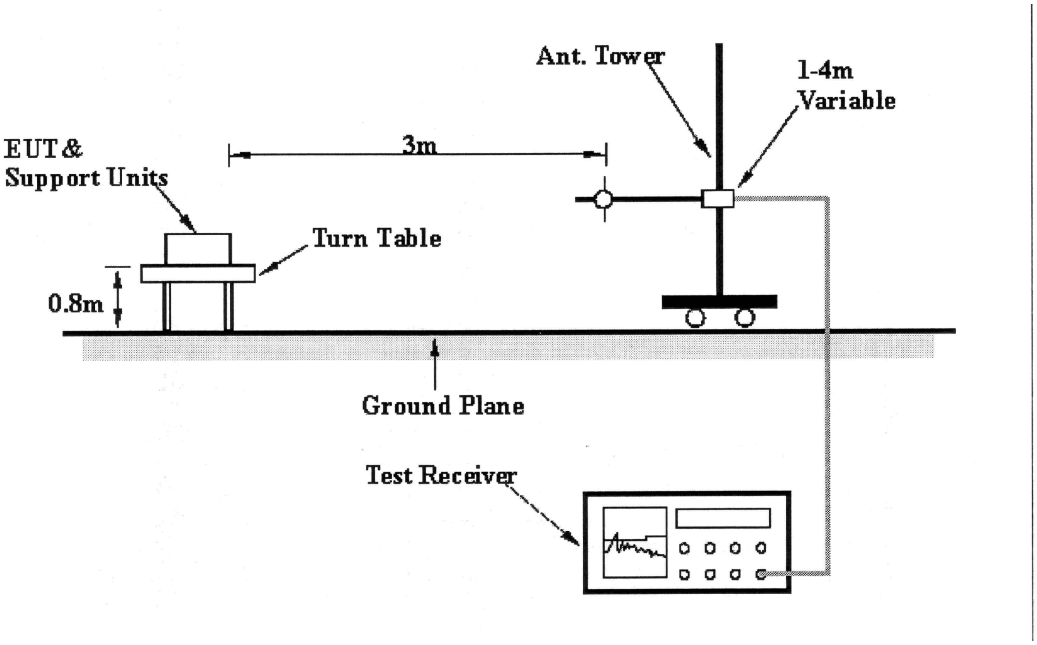
Sufficient precautions shall be taken to ensure that reflections from extraneous objects adjacent to the site do not degrade the measurement results, in particular:

- 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)	$20*(Log_{10}(2400/F(kHz))$	300
0.490 - 1.705	24000/F(kHz)	$20*(Log_{10}(24000/F(kHz))$	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 Coalville, UT 84017 (435) 336-4433 FAX (435) 336-4436	**Radiated Emissions** (General)	
DNB Job Number:	06022	Date: 3 Sep 2019	Specification [X] 15.209 [X] ANSI C63.10-2013
Customer:	Transcore		
Model Number:	MPRXFH		
Description:	Multiprotocol Reader Extreme- Frequency Hopper		
	Test Set Up		



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

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

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

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Radiated Emissions (General)

DNB Job Number:	06022	Date: 3 Sep 2019	Specification
Customer:	Transcore		[X] 15.209
Model Number:	MPRXFH		[X] ANSI C63.10-2013
Description:	Multiprotocol Reader Extreme- Frequency Hopper		

EUT is in conformance with FCC 15.209	X	YES		NO	Signed	*Y Staples*

X - Axis (Worst case)

FREQ (Mhz)	S/A Reading	Correction Factors (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

15.247 Spurious Radiated Emissions

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 ≥ 1 GHz, 100 kHz for f < 1 GHz
VBW = ≥ RBW
Sweep = auto
Detector function = peak
Trace = max hold

Follow the guidelines in ANSI C63.10-2013with 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.

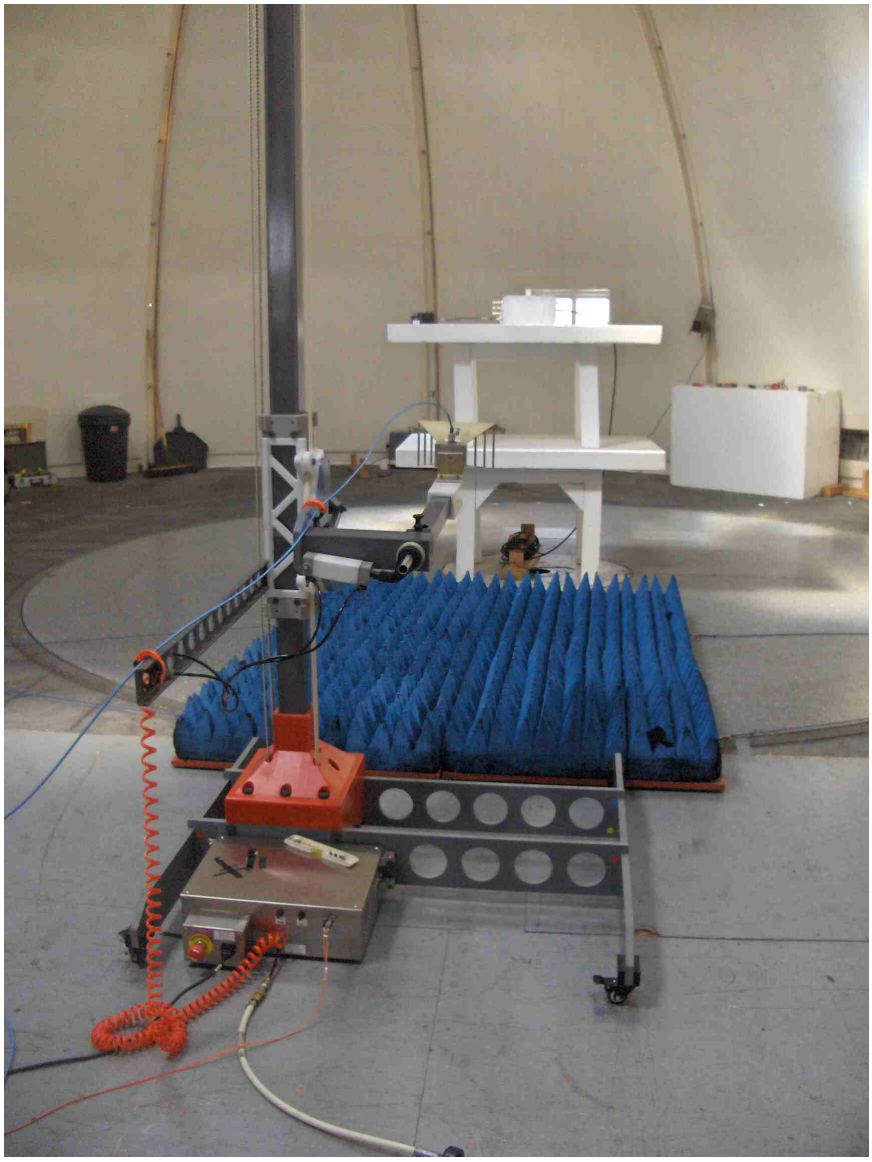
If the emission on which a radiated measurement must be made is located at the edge of the authorized band of operation, then the alternative “marker-delta” method, listed at the end of this document, may be employed.

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



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Radiated Emissions (Spurious)

DNB Job Number:	06022	Date: 2 Oct 2019	Specification
Customer:	Transcore		[X] 15.247 (c) [X] ANSI C63.10-2013
Model Number:	MPRXFH		
Description:	Multiprotocol Reader Extreme- Frequency Hopper		

Low Channel - X Axis

FREQ (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

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Radiated Emissions (Spurious)

DNB Job Number:	06022	Date: 2 Oct 2019	Specification
Customer:	Transcore		[X] 15.247 (c) [X] ANSI C63.10-2013
Model Number:	MPRXFH		
Description:	Multiprotocol Reader Extreme- Frequency Hopper		

Low Channel - Y Axis

FREQ (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

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Radiated Emissions (Spurious)

DNB Job Number:	06022	Date: 2 Oct 2019	Specification
Customer:	Transcore		[X] 15.247 (c) [X] ANSI C63.10-2013
Model Number:	MPRXFH		
Description:	Multiprotocol Reader Extreme- Frequency Hopper		

Low Channel - Z Axis

FREQ (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

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Radiated Emissions (Spurious)

DNB Job Number:	06022	Date: 2 Oct 2019	Specification
Customer:	Transcore		[X] 15.247 (c) [X] ANSI C63.10-2013
Model Number:	MPRXFH		
Description:	Multiprotocol Reader Extreme- Frequency Hopper		

Middle Channel - X axis

FREQ (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

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Radiated Emissions (Spurious)

DNB Job Number:	06022	Date: 2 Oct 2019	Specification
Customer:	Transcore		[X] 15.247 (c) [X] ANSI C63.10-2013
Model Number:	MPRXFH		
Description:	Multiprotocol Reader Extreme- Frequency Hopper		

Middle Channel - Y axis

FREQ (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

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Radiated Emissions (Spurious)

DNB Job Number:	06022	Date: 2 Oct 2019	Specification
Customer:	Transcore		[X] 15.247 (c) [X] ANSI C63.10-2013
Model Number:	MPRXFH		
Description:	Multiprotocol Reader Extreme- Frequency Hopper		

Middle Channel - Z axis

FREQ (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

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Radiated Emissions (Spurious)

DNB Job Number:	06022	Date: 2 Oct 2019	Specification
Customer:	Transcore		[X] 15.247 (c) [X] ANSI C63.10-2013
Model Number:	MPRXFH		
Description:	Multiprotocol Reader Extreme- Frequency Hopper		

High Channel - X axis

FREQ (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

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Radiated Emissions (Spurious)

DNB Job Number:	06022	Date: 2 Oct 2019	Specification
Customer:	Transcore		[X] 15.247 (c) [X] ANSI C63.10-2013
Model Number:	MPRXFH		
Description:	Multiprotocol Reader Extreme- Frequency Hopper		

High Channel - Y axis

FREQ (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

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Radiated Emissions (Spurious)

DNB Job Number:	06022	Date: 2 Oct 2019	Specification
Customer:	Transcore		[X] 15.247 (c) [X] ANSI C63.10-2013
Model Number:	MPRXFH		
Description:	Multiprotocol Reader Extreme- Frequency Hopper		

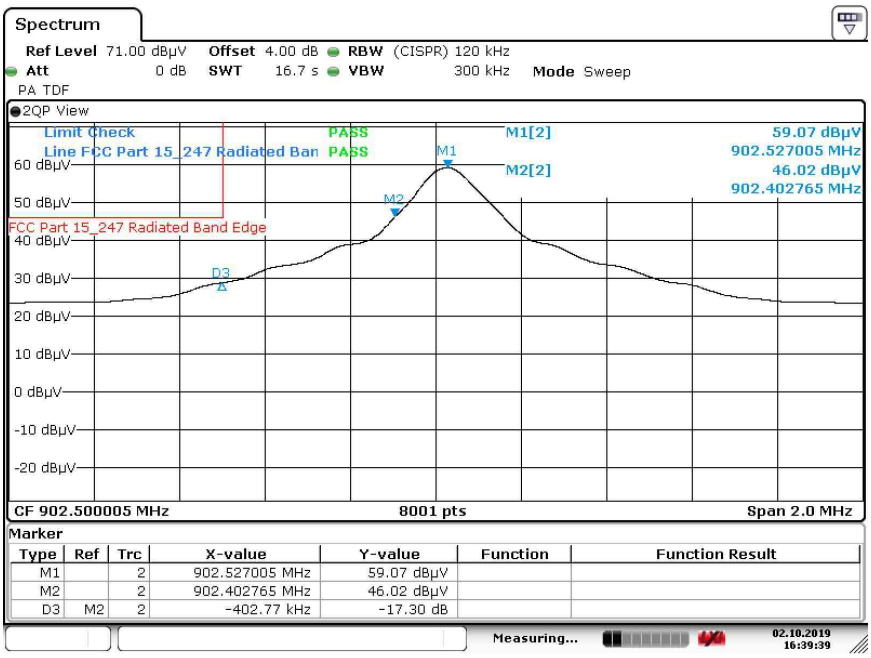
High Channel - Z axis

FREQ (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 Coalville, UT 84017 (435) 336-4433 FAX (435) 336-4436	**Radiated Emissions** (Bandedge)

DNB Job Number:	06022	Date: 2 Oct 2019	Specification
Customer:	Transcore		[X] 15.247 (c) [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

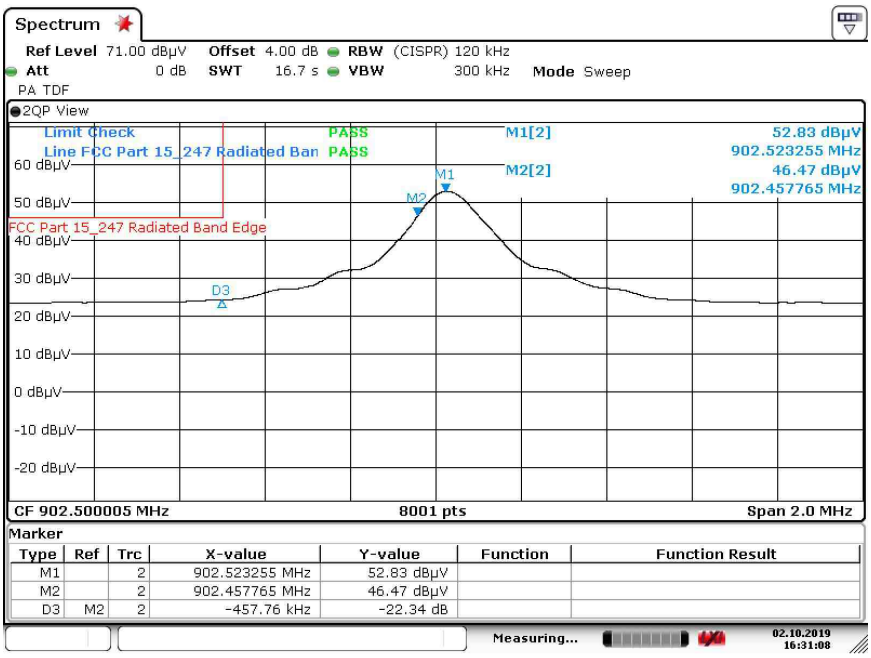


Date: 2.OCT.2019 16:39:39

	1100 E Chalk Creek Road Coalville, UT 84017 (435) 336-4433 FAX (435) 336-4436	**Radiated Emissions** (Bandedge)

DNB Job Number:	06022	Date: 2 Oct 2019	Specification
Customer:	Transcore		[X] 15.247 (c) [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

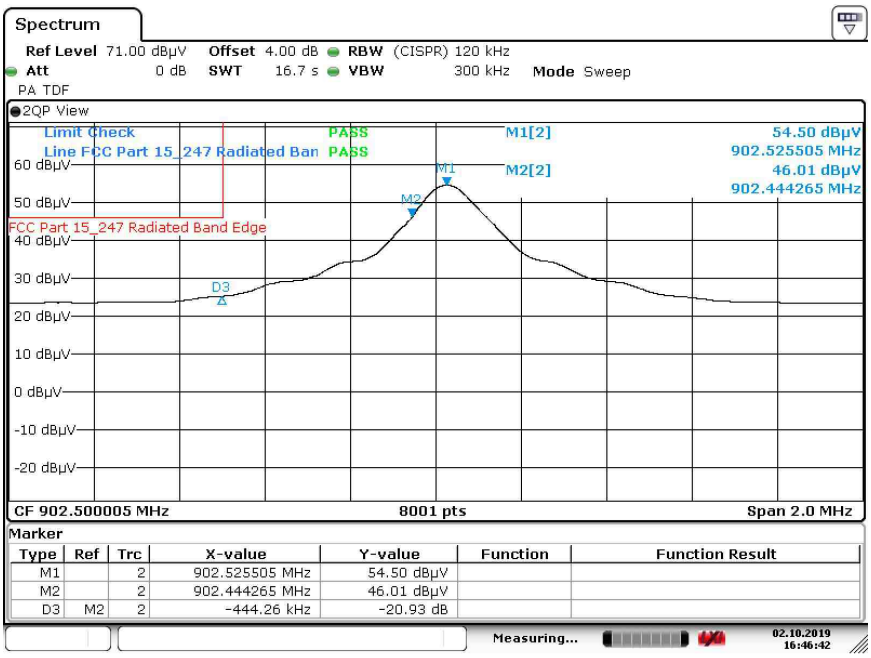


Date: 2.OCT.2019 16:31:09

	1100 E Chalk Creek Road Coalville, UT 84017 (435) 336-4433 FAX (435) 336-4436	**Radiated Emissions** (Bandedge)

DNB Job Number:	06022	Date: 2 Oct 2019	Specification
Customer:	Transcore		[X] 15.247 (c) [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

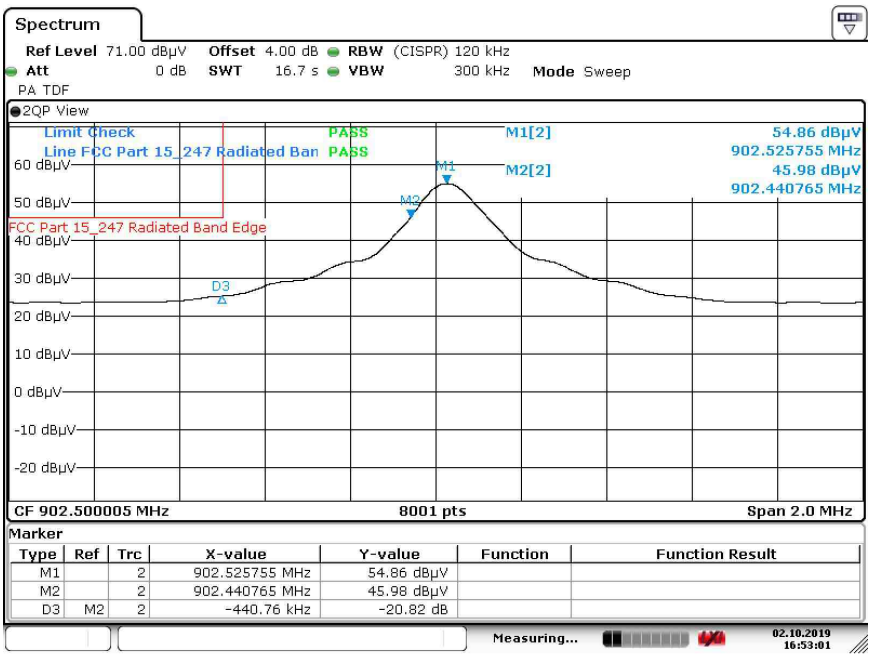


Date: 2.OCT.2019 16:46:42

	1100 E Chalk Creek Road Coalville, UT 84017 (435) 336-4433 FAX (435) 336-4436	**Radiated Emissions** (Bandedge)

DNB Job Number:	06022	Date: 2 Oct 2019	Specification
Customer:	Transcore		[X] 15.247 (c) [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

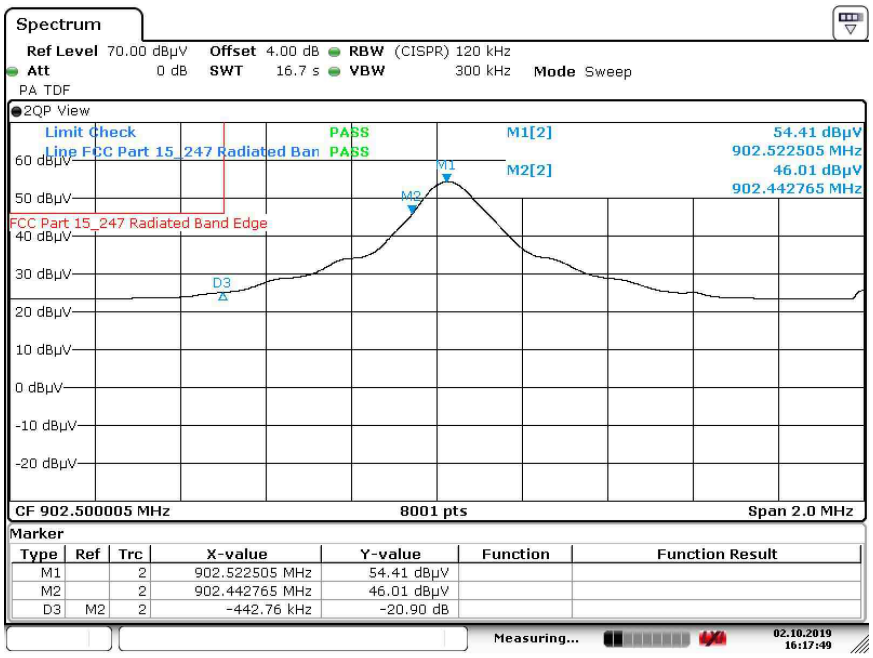


Date: 2.OCT.2019 16:53:01

	1100 E Chalk Creek Road Coalville, UT 84017 (435) 336-4433 FAX (435) 336-4436	**Radiated Emissions** (Bandedge)

DNB Job Number:	06022	Date: 2 Oct 2019	Specification
Customer:	Transcore		[X] 15.247 (c) [X] ANSI C63.10-2013
Model Number:	MPRXFH		
Description:	Multiprotocol Reader Extreme- Frequency Hopper		

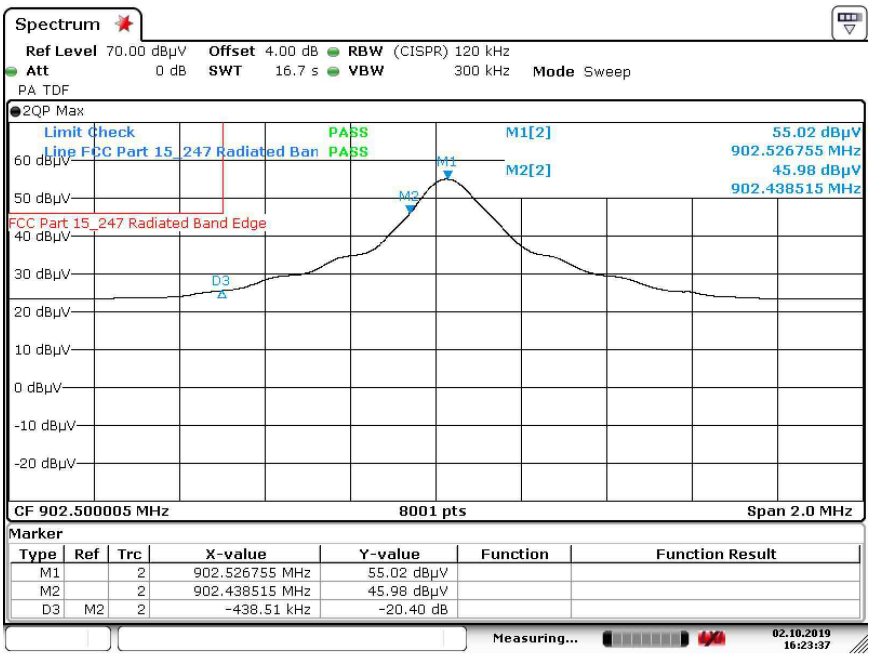
Radiated Corrected Band Edge
Lower Edge / Z-Axis
Receive Antenna - Horizontal



	1100 E Chalk Creek Road Coalville, UT 84017 (435) 336-4433 FAX (435) 336-4436	**Radiated Emissions** (Bandedge)

DNB Job Number:	06022	Date: 2 Oct 2019	Specification
Customer:	Transcore		[X] 15.247 (c) [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

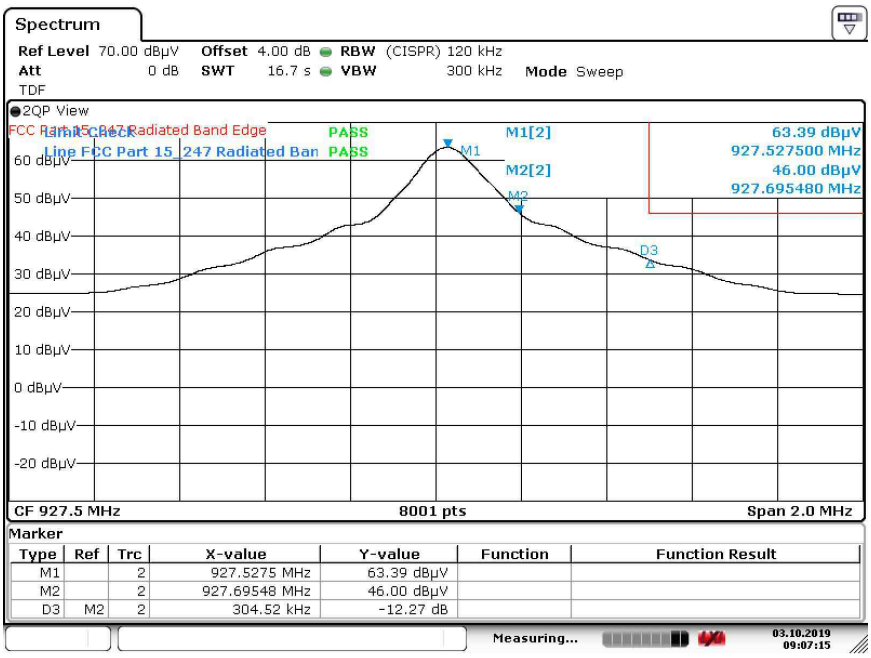


Date: 2.OCT.2019 16:23:37

	1100 E Chalk Creek Road Coalville, UT 84017 (435) 336-4433 FAX (435) 336-4436	**Radiated Emissions** (Bandedge)

DNB Job Number:	06022	Date: 3 Oct 2019	Specification
Customer:	Transcore		[X] 15.247 (c) [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

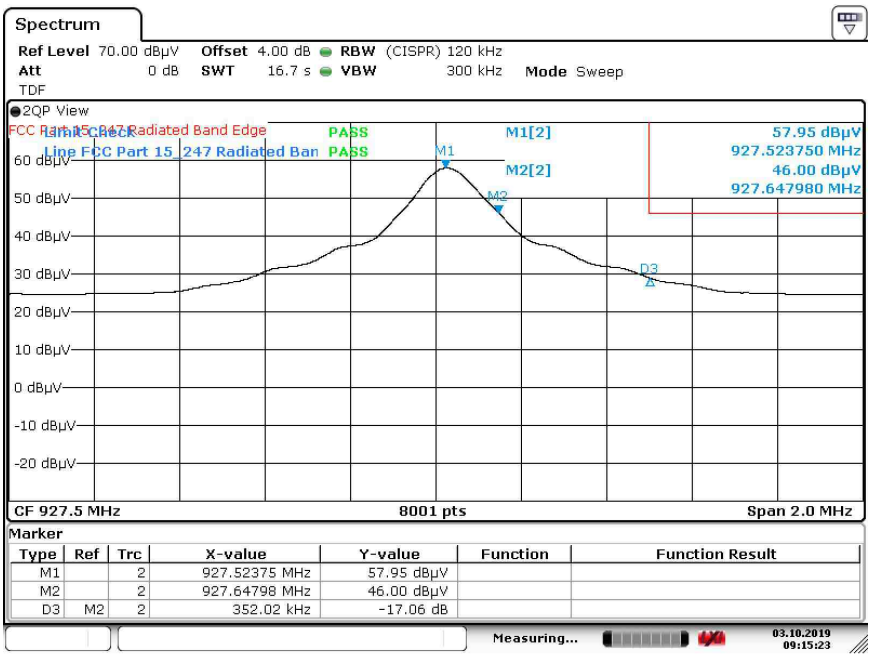


Date: 3.OCT.2019 09:07:15

	1100 E Chalk Creek Road Coalville, UT 84017 (435) 336-4433 FAX (435) 336-4436	**Radiated Emissions** (Bandedge)

DNB Job Number:	06022	Date: 3 Oct 2019	Specification
Customer:	Transcore		[X] 15.247 (c) [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

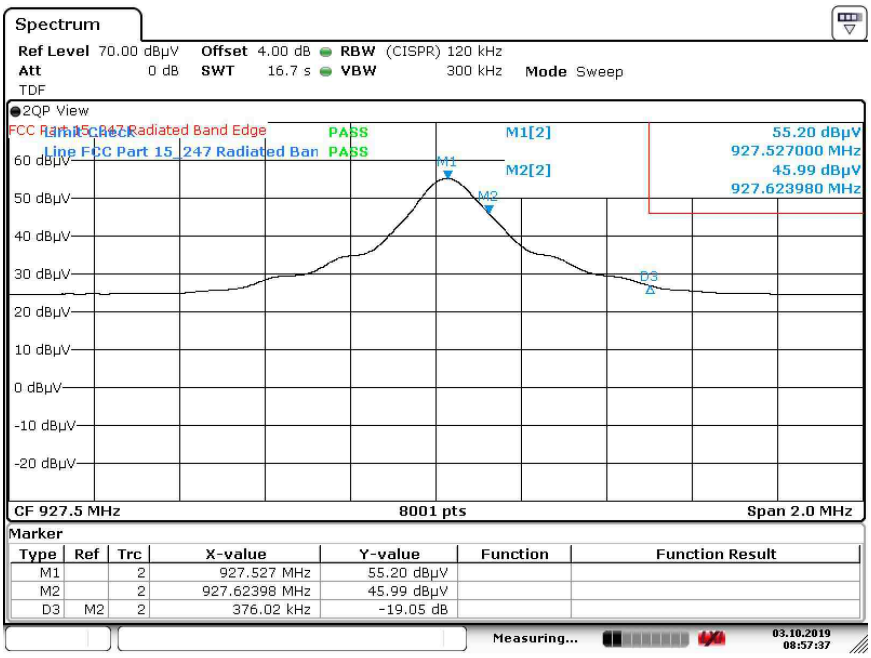


Date: 3.OCT.2019 09:15:23

	1100 E Chalk Creek Road Coalville, UT 84017 (435) 336-4433 FAX (435) 336-4436	**Radiated Emissions** (Bandedge)

DNB Job Number:	06022	Date: 3 Oct 2019	Specification
Customer:	Transcore		[X] 15.247 (c) [X] ANSI C63.10-2013
Model Number:	MPRXFH		
Description:	Multiprotocol Reader Extreme- Frequency Hopper		

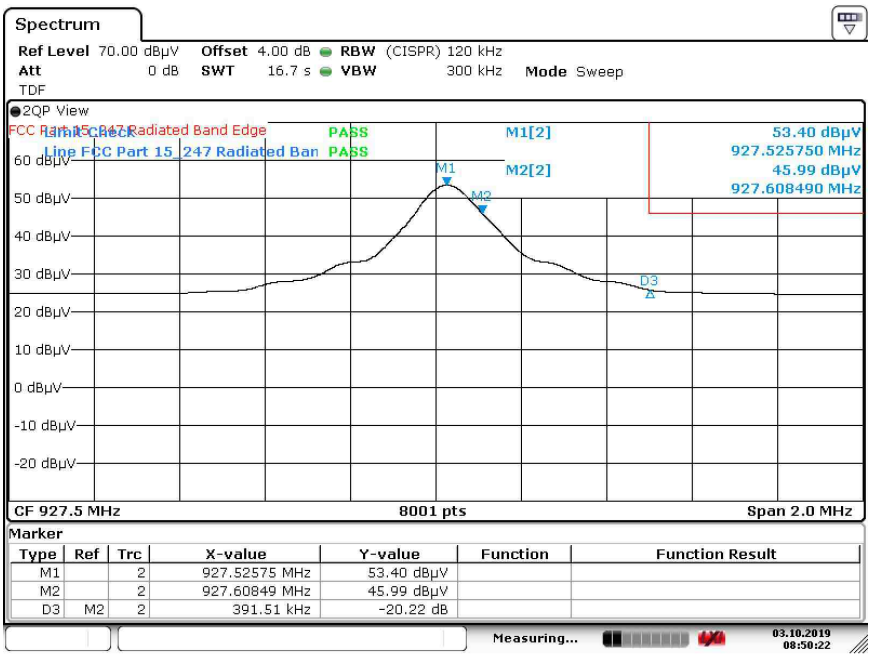
Radiated Corrected Band Edge
Upper Edge / Y-Axis
Receive Antenna - Horizontal



	1100 E Chalk Creek Road Coalville, UT 84017 (435) 336-4433 FAX (435) 336-4436	**Radiated Emissions** (Bandedge)

DNB Job Number:	06022	Date: 3 Oct 2019	Specification
Customer:	Transcore		[X] 15.247 (c) [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

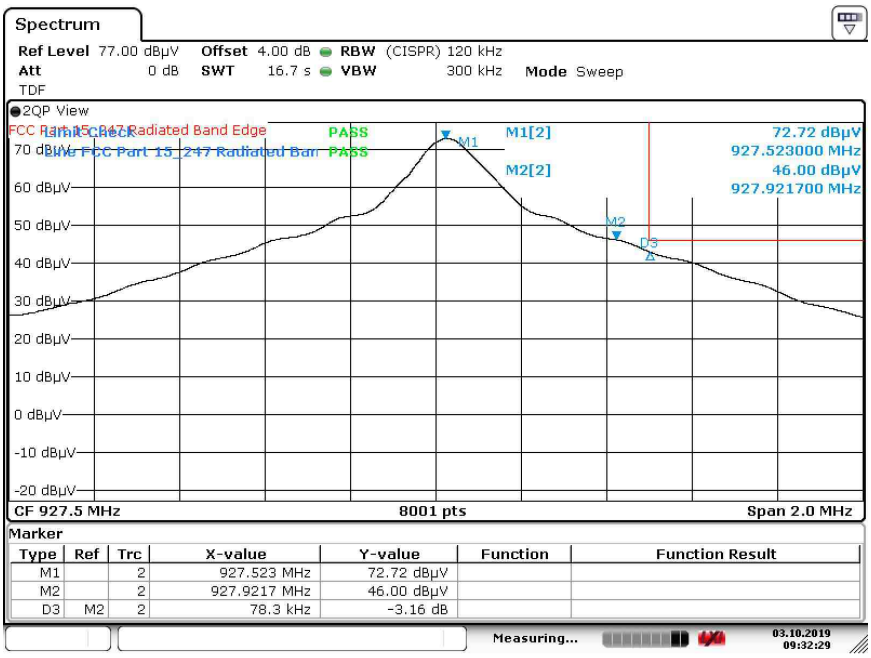


Date: 3.OCT.2019 08:50:22

	1100 E Chalk Creek Road Coalville, UT 84017 (435) 336-4433 FAX (435) 336-4436	**Radiated Emissions** (Bandedge)

DNB Job Number:	06022	Date: 3 Oct 2019	Specification
Customer:	Transcore		[X] 15.247 (c) [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

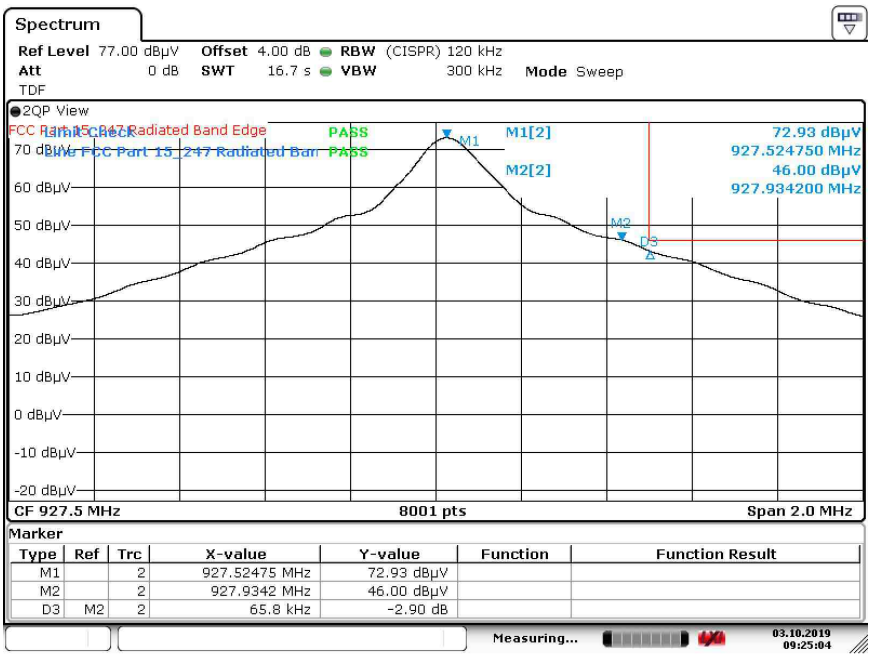


Date: 3.OCT.2019 09:32:29

	1100 E Chalk Creek Road Coalville, UT 84017 (435) 336-4433 FAX (435) 336-4436	**Radiated Emissions** (Bandedge)

DNB Job Number:	06022	Date: 3 Oct 2019	Specification
Customer:	Transcore		[X] 15.247 (c) [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.

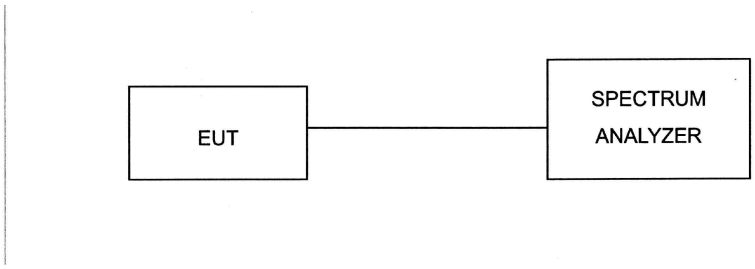
Reference ANSI C63.10-2013 for measurement procedure.

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).

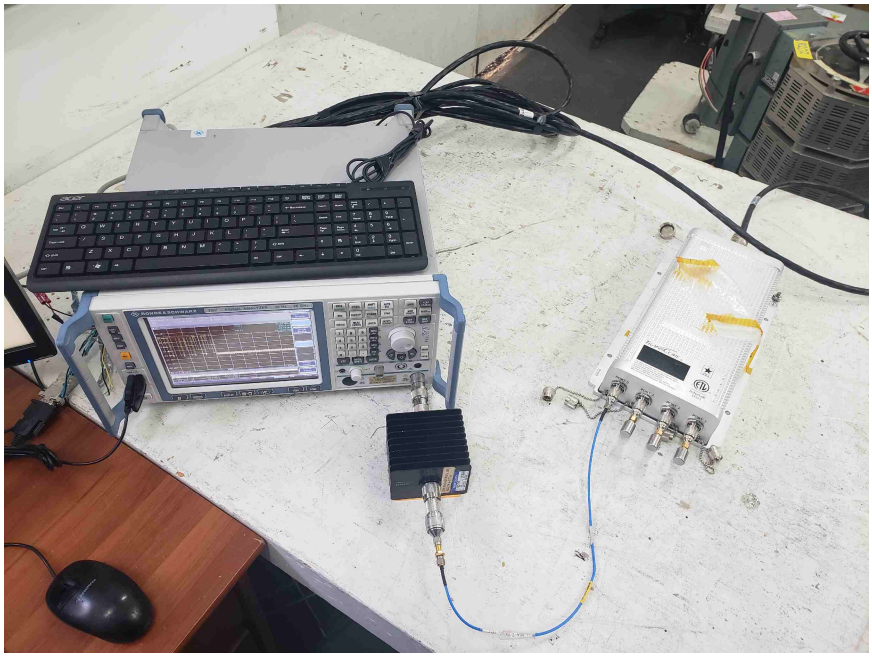
EUT operating conditions:

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 Coalville, UT 84017 (435) 336-4433 FAX (435) 336-4436	**Measurement Test Set Up**	
DNB Job Number:	06022	Date: 7 Mar 2018	**Conformance Standard** FCC Part 15
Customer:	Transcore		
Model Number:	MPRXFH		
Description:	Multiprotocol Reader Extreme- Frequency Hopper		**Clause** 15.247
Antenna Conducted Measurement Set Up			

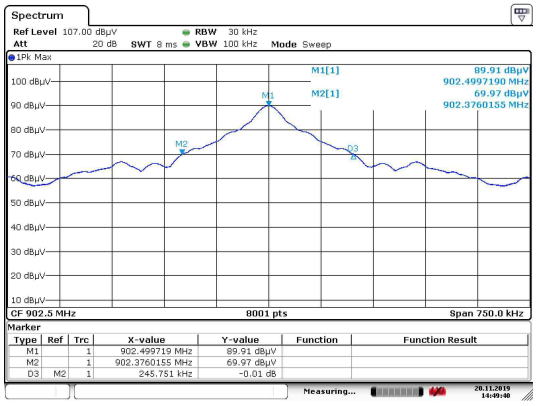


	1100 E Chalk Creek Road Coalville, UT 84017 (435) 336-4433 FAX (435) 336-4436	**20 dB Single Channel Bandwidth**	
DNB Job Number:	06022	Date: 18 Nov 2019	**Conformance Standard** FCC Part 15
Customer:	Transcore		
Model Number:	MPRXFH		
Description:	Multiprotocol Reader Extreme- Frequency Hopper		**Clause** 15.247(a,1,i)

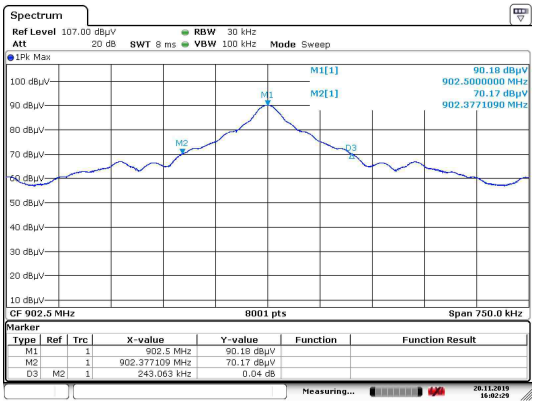
Environmental Conditions		
Ambient Temperature	Relative Humidity	Barometric Pressure
20 °C	24 %	101.1 kPa

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	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



Date: 20.NOV.2019 14:49:40



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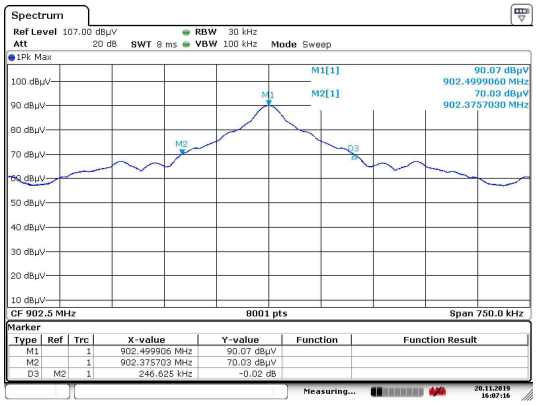

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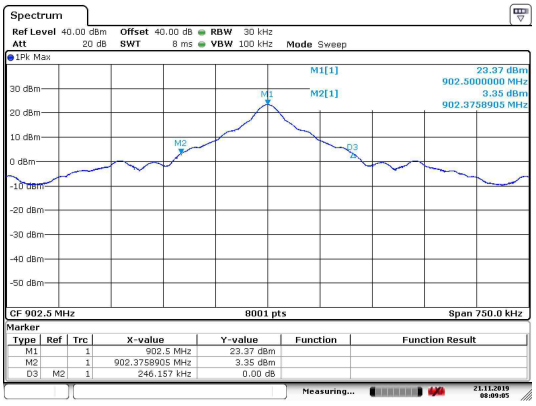


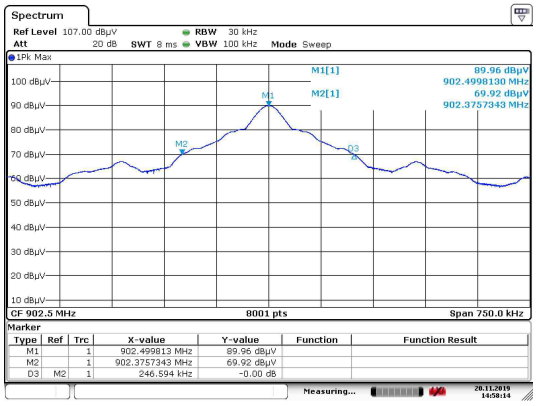
Date: 21.NOV.2019 08:09:05

	1100 E Chalk Creek Road Coalville, UT 84017 (435) 336-4433 FAX (435) 336-4436	**20 dB Single Channel Bandwidth**	
DNB Job Number:	06022	Date: 18 Nov 2019	**Conformance Standard** FCC Part 15
Customer:	Transcore		
Model Number:	MPRXFH		
Description:	Multiprotocol Reader Extreme- Frequency Hopper		**Clause** 15.247(a,1,i)

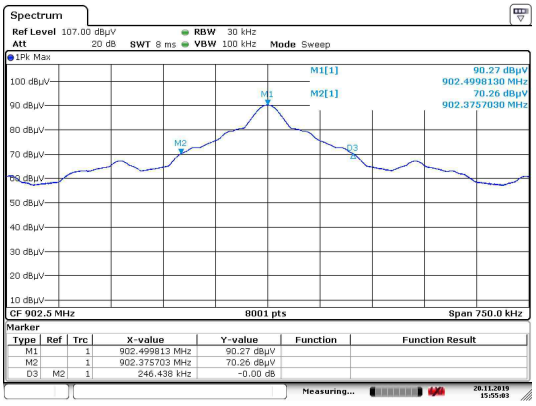
Environmental Conditions		
Ambient Temperature	Relative Humidity	Barometric Pressure
20 °C	24 %	101.1 kPa

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



Date: 20.NOV.2019 14:58:14



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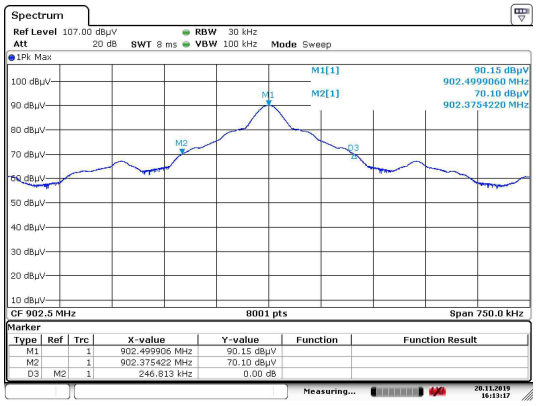

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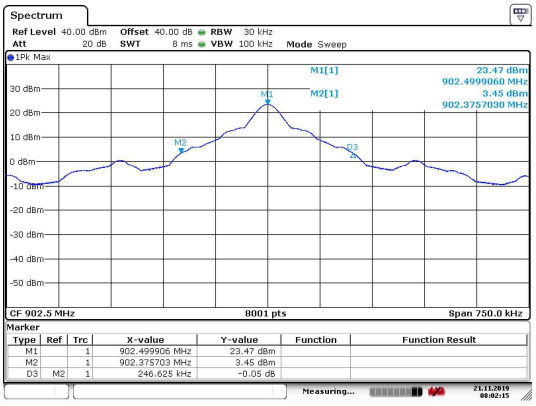


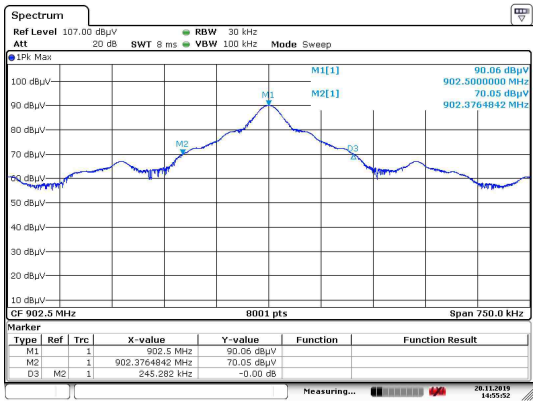
Date: 21.NOV.2019 08:02:15

	1100 E Chalk Creek Road Coalville, UT 84017 (435) 336-4433 FAX (435) 336-4436	**20 dB Single Channel Bandwidth**	
DNB Job Number:	06022	Date: 18 Nov 2019	**Conformance Standard** FCC Part 15
Customer:	Transcore		
Model Number:	MPRXFH		
Description:	Multiprotocol Reader Extreme- Frequency Hopper		**Clause** 15.247(a,1,i)

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



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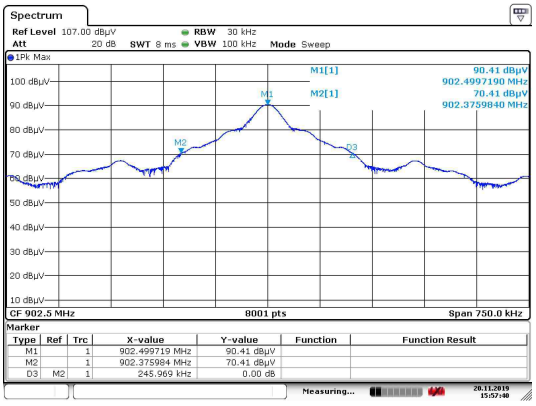

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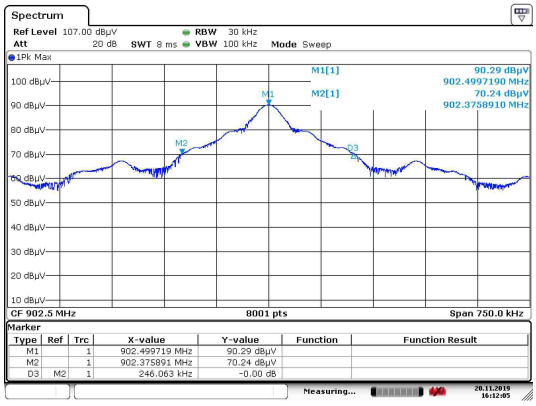

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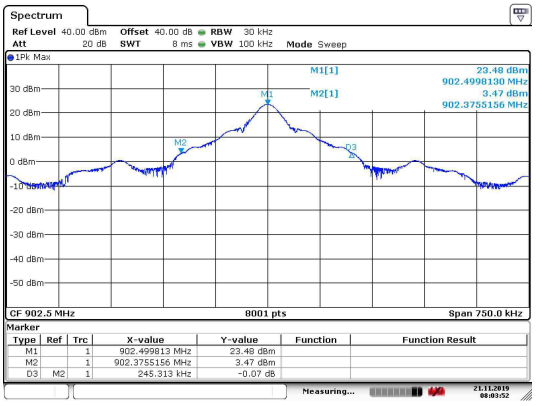


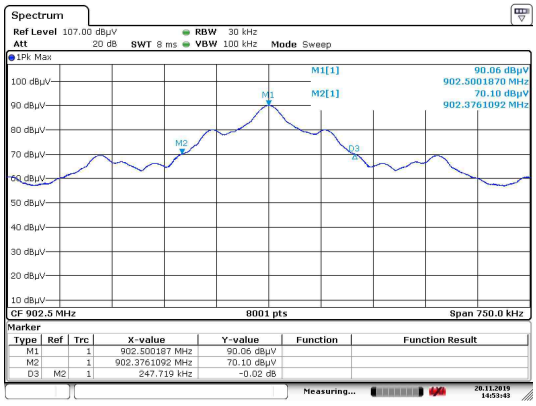
Date: 21.NOV.2019 08:03:52

	1100 E Chalk Creek Road Coalville, UT 84017 (435) 336-4433 FAX (435) 336-4436	**20 dB Single Channel Bandwidth**	
DNB Job Number:	06022	Date: 18 Nov 2019	**Conformance Standard** FCC Part 15
Customer:	Transcore		
Model Number:	MPRXFH		
Description:	Multiprotocol Reader Extreme- Frequency Hopper		**Clause** 15.247(a,1,i)

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



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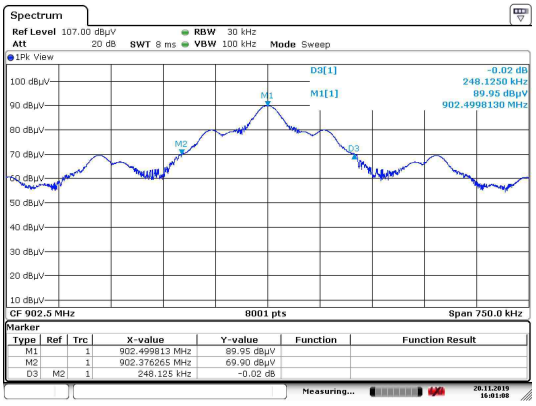

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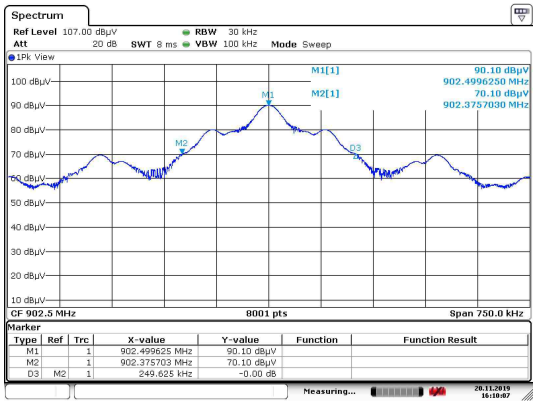

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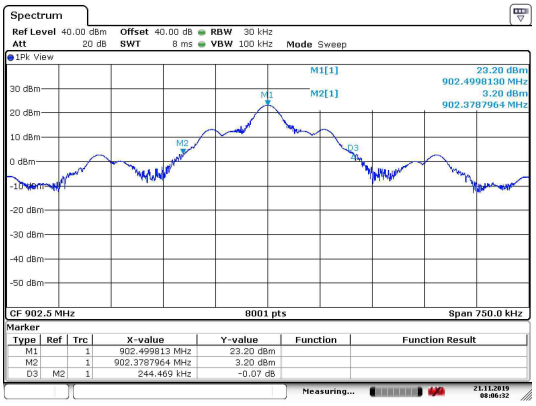

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