



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
0X0004B945**

Description:

Radar Characteristics Validation

In compliance with:

SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA

Date of Issue: January 13, 2025

Owner of EUT:

**Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201**

Attention of:

**Engineering Department
Phone: (480) 443-7000**

Test Facility	
Test Laboratory	Keystone Compliance, LLC
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	
Title	EMC Test Engineer
Signature	



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX0004B945**

Date of Issue: January 13, 2025

This speed measuring device has been tested and verified to be functioning in accordance with the manufacture's specifications.

The frequency measurements performed and reported within this report demonstrate that the SmartMicro UMRR-11 T44 radar system has an accuracy of less than or equal to 1 mph up to 100 mph and 1% accuracy thereafter up to 199 mph maximum.

FSK Frequency Set 1					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBμV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	126.51	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX00049049**

Description:

Radar Characteristics Validation

In compliance with:

SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA

Date of Issue: January 13, 2025

Owner of EUT:

**Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201**

Attention of:

**Engineering Department
Phone: (480) 443-7000**

Test Facility	
Test Laboratory	Keystone Compliance, LLC
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	
Title	EMC Test Engineer
Signature	



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX00049049**

Date of Issue: January 13, 2025

This speed measuring device has been tested and verified to be functioning in accordance with the manufacture’s specifications.

The frequency measurements performed and reported within this report demonstrate that the SmartMicro UMRR-11 T44 radar system has an accuracy of less than or equal to 1 mph up to 100 mph and 1% accuracy thereafter up to 199 mph maximum.

FSK Frequency Set 1					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBμV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	83.3	125.31	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
0X0004B953**

**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 13, 2025

**Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201**

**Attention of: Engineering Department
Phone: (480) 443-7000**

Test Facility	
Test Laboratory	Keystone Compliance, LLC
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	
Title	EMC Test Engineer
Signature	



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX0004B953**

Date of Issue: January 13, 2025

This speed measuring device has been tested and verified to be functioning in accordance with the manufacture's specifications.

The frequency measurements performed and reported within this report demonstrate that the SmartMicro UMRR-11 T44 radar system has an accuracy of less than or equal to 1 mph up to 100 mph and 1% accuracy thereafter up to 199 mph maximum.

FSK Frequency Set 1					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBμV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	125.07	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
0X0004B162**

Description:

Radar Characteristics Validation

In compliance with:

SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA

Date of Issue: January 31, 2025

Owner of EUT:

**Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201**

Attention of:

**Engineering Department
Phone: (480) 443-7000**

Test Facility	
Test Laboratory	Applus+ Keystone
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX0004B162**

Date of Issue: January 31, 2025

This speed measuring device has been tested and verified to be functioning in accordance with the manufacture’s specifications.

The frequency measurements performed and reported within this report demonstrate that the SmartMicro UMRR-11 T44 radar system has an accuracy of less than or equal to 1 mph up to 100 mph and 1% accuracy thereafter up to 199 mph maximum.

FSK Frequency Set 1					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBμV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	83.3	124.69	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX0004899F**

Description:

Radar Characteristics Validation

In compliance with:

SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA

Date of Issue: January 31, 2025

Owner of EUT:

**Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201**

Attention of:

**Engineering Department
Phone: (480) 443-7000**

Test Facility	
Test Laboratory	Applus+ Keystone
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX0004899F**

Date of Issue: January 31, 2025

This speed measuring device has been tested and verified to be functioning in accordance with the manufacture’s specifications.

The frequency measurements performed and reported within this report demonstrate that the SmartMicro UMRR-11 T44 radar system has an accuracy of less than or equal to 1 mph up to 100 mph and 1% accuracy thereafter up to 199 mph maximum.

FSK Frequency Set 1					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBμV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	126.29	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

Radar Sensor Calibration Verification Test Report

Model: UMRR-11 T44

**Part Number / Serial Number:
OX000489F8**

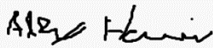
**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 13, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Keystone Compliance, LLC
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	
Title	EMC Test Engineer
Signature	

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Report No.: 2403-267EA

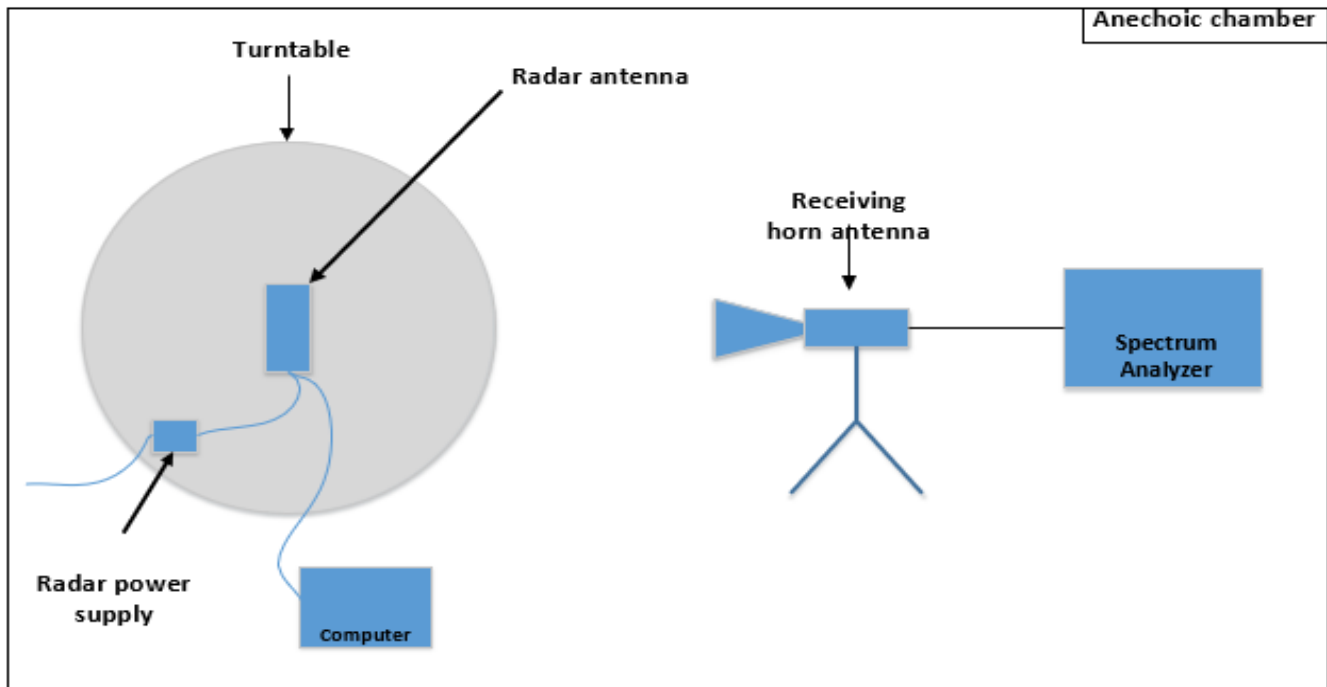
Revision: N/C

Revision	Date	Description	Revised By
N/C	#####	Initial Release	0

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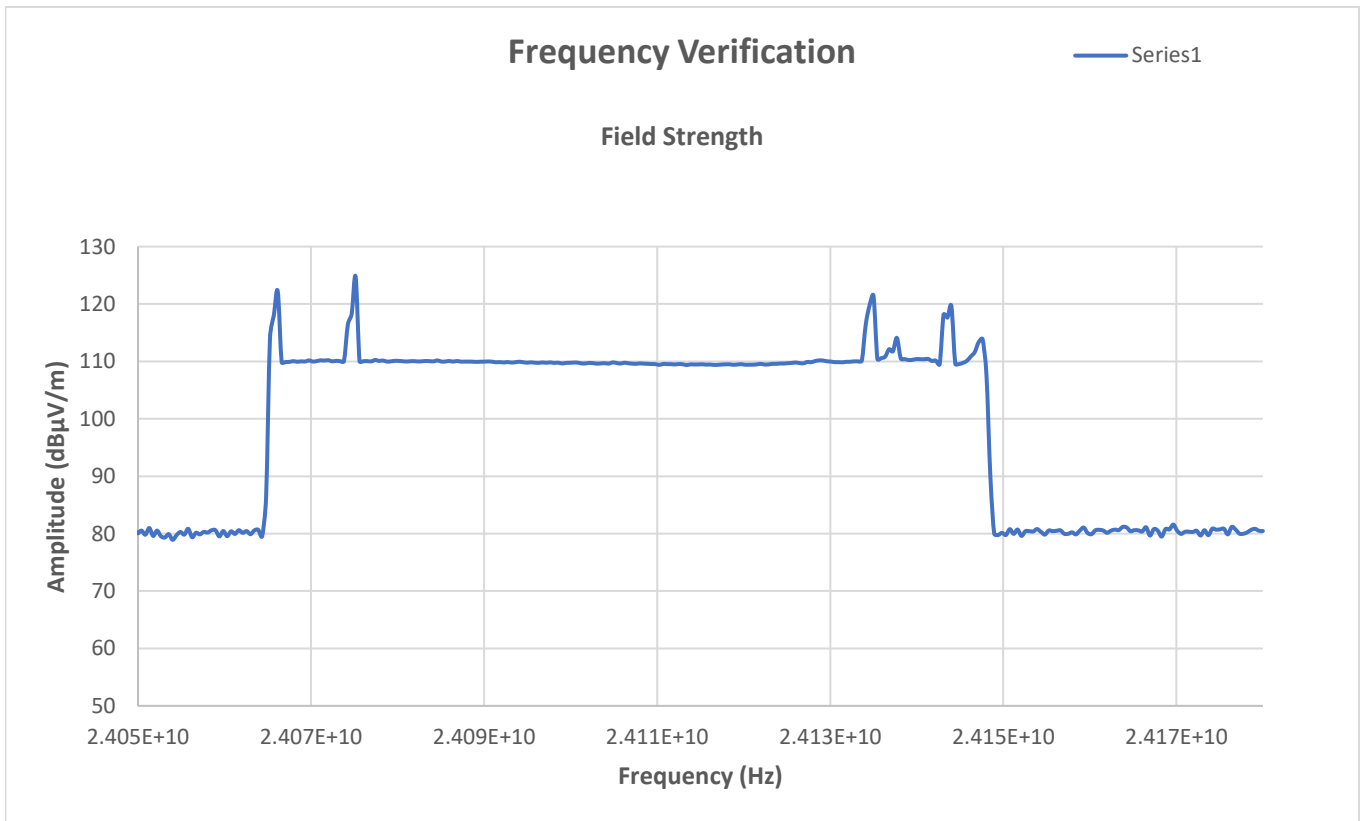
Test Setup Diagram



Test Equipment Utilized

Description	Manufacturer	Model #	Serial #	Asset #	Cal. Due Date
EMC Analyzer	Agilent	E7405	US40240238	EB046	2/12/2025
DRG Horn Antenna	ETS Lindgren	3116	00026390	EE017	5/21/2026
Pre-Amplifier	Keystone Compliance	PA-1	0002	EG003	6/30/2026
Turntable Controller	EMCO	1061.2.013	9401-1717	EI009	UWCE

Frequency Measurements:



Frequency Verification					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBµV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	124.75	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX000489F8**

**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 13, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Keystone Compliance, LLC
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	
Title	EMC Test Engineer
Signature	



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX000489F8**

Date of Issue: January 13, 2025

This speed measuring device has been tested and verified to be functioning in accordance with the manufacture’s specifications.

The frequency measurements performed and reported within this report demonstrate that the SmartMicro UMRR-11 T44 radar system has an accuracy of less than or equal to 1 mph up to 100 mph and 1% accuracy thereafter up to 199 mph maximum.

FSK Frequency Set 1					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBμV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	124.75	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Test Report**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX0004901C**

**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 13, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Keystone Compliance, LLC
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	
Title	EMC Test Engineer
Signature	

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Report No.: 2403-267EA

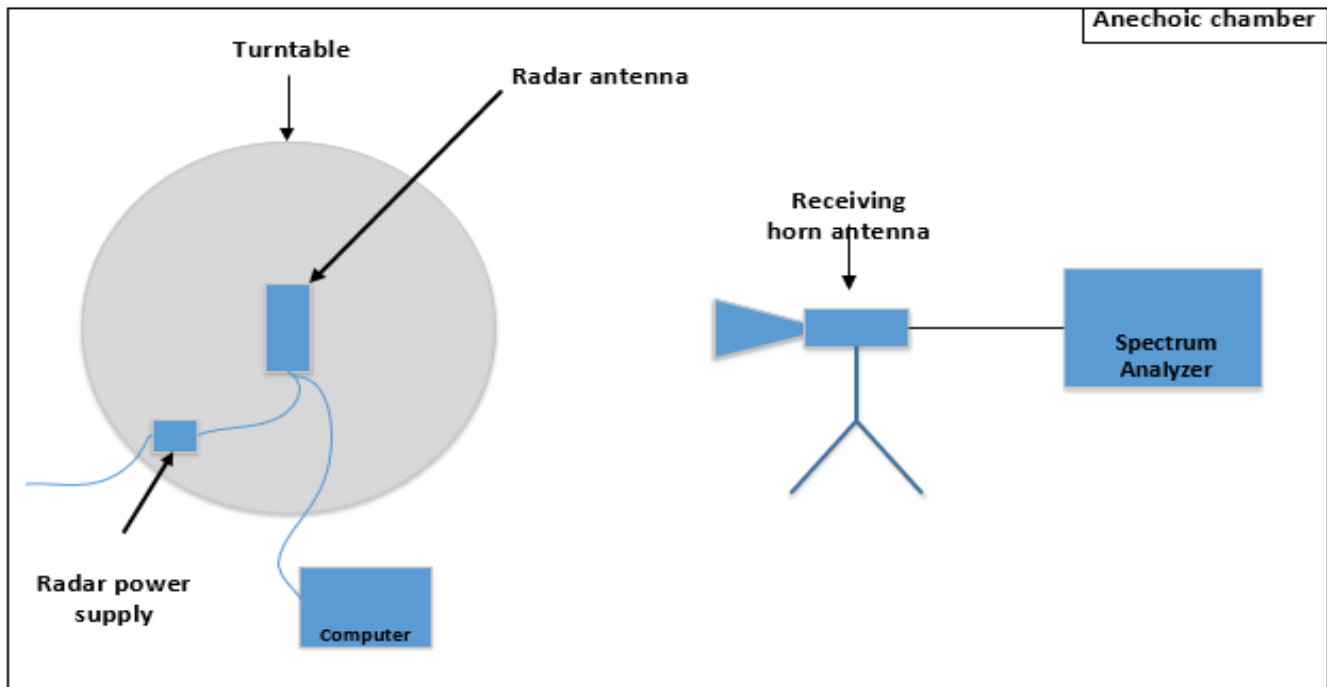
Revision: N/C

Revision	Date	Description	Revised By
N/C	#####	Initial Release	0

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Test Equipment Utilized.....	4
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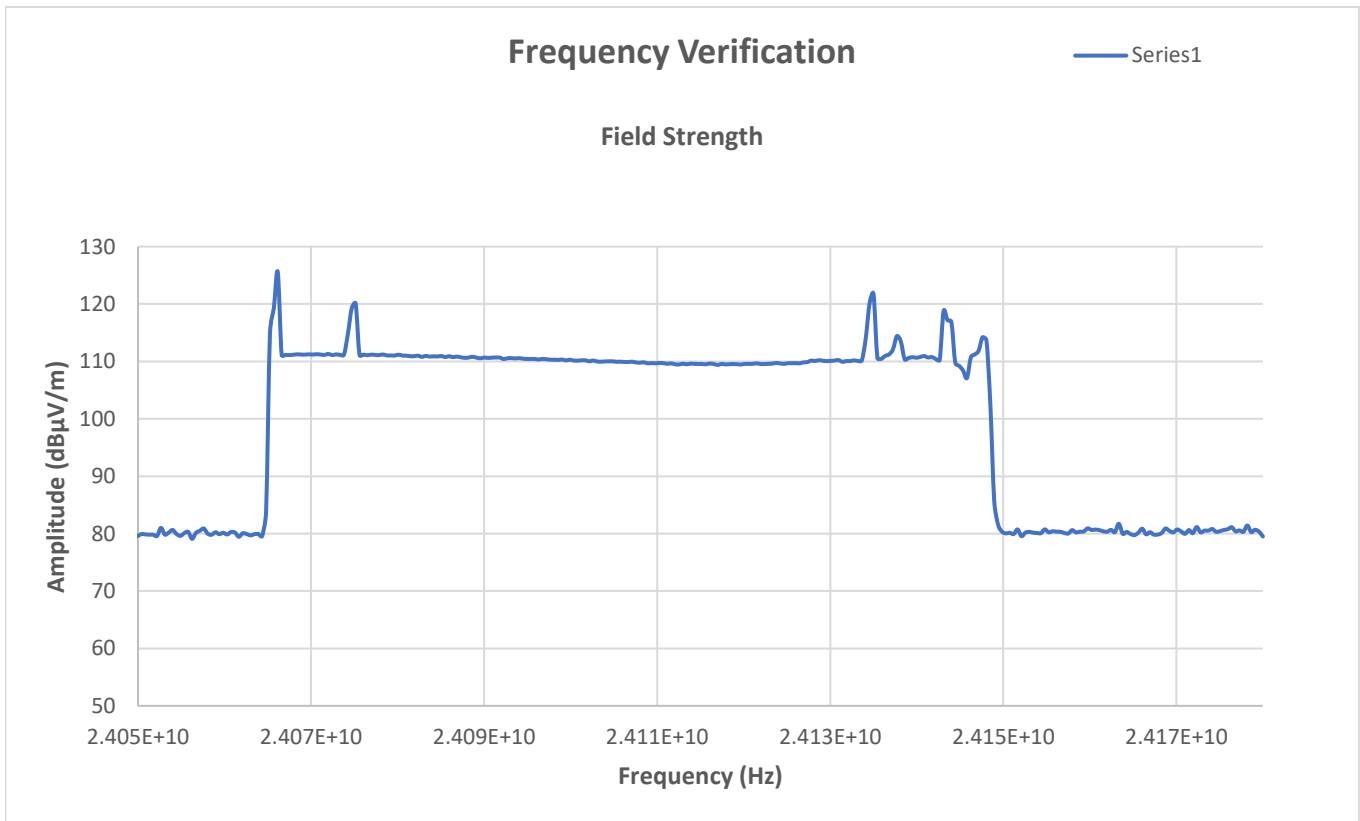
Test Setup Diagram



Test Equipment Utilized

Description	Manufacturer	Model #	Serial #	Asset #	Cal. Due Date
EMC Analyzer	Agilent	E7405	US40240238	EB046	2/12/2025
DRG Horn Antenna	ETS Lindgren	3116	00026390	EE017	5/21/2026
Pre-Amplifier	Keystone Compliance	PA-1	0002	EG003	6/30/2026
Turntable Controller	EMCO	1061.2.013	9401-1717	EI009	UWCE

Frequency Measurements:



Frequency Verification					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBµV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	83.3	125.54	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

Radar Sensor Calibration Verification Certificate of Calibration

Model: UMRR-11 T44

Part Number / Serial Number:
OX0004901C

Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA

Date of Issue: January 13, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Keystone Compliance, LLC
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	
Title	EMC Test Engineer
Signature	



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX0004901C**

Date of Issue: January 13, 2025

This speed measuring device has been tested and verified to be functioning in accordance with the manufacture’s specifications.

The frequency measurements performed and reported within this report demonstrate that the SmartMicro UMRR-11 T44 radar system has an accuracy of less than or equal to 1 mph up to 100 mph and 1% accuracy thereafter up to 199 mph maximum.

FSK Frequency Set 1					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBµV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	83.3	125.54	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Test Report**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX0004B946**

**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 13, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Keystone Compliance, LLC
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	
Title	EMC Test Engineer
Signature	

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Report No.: 2403-267EA

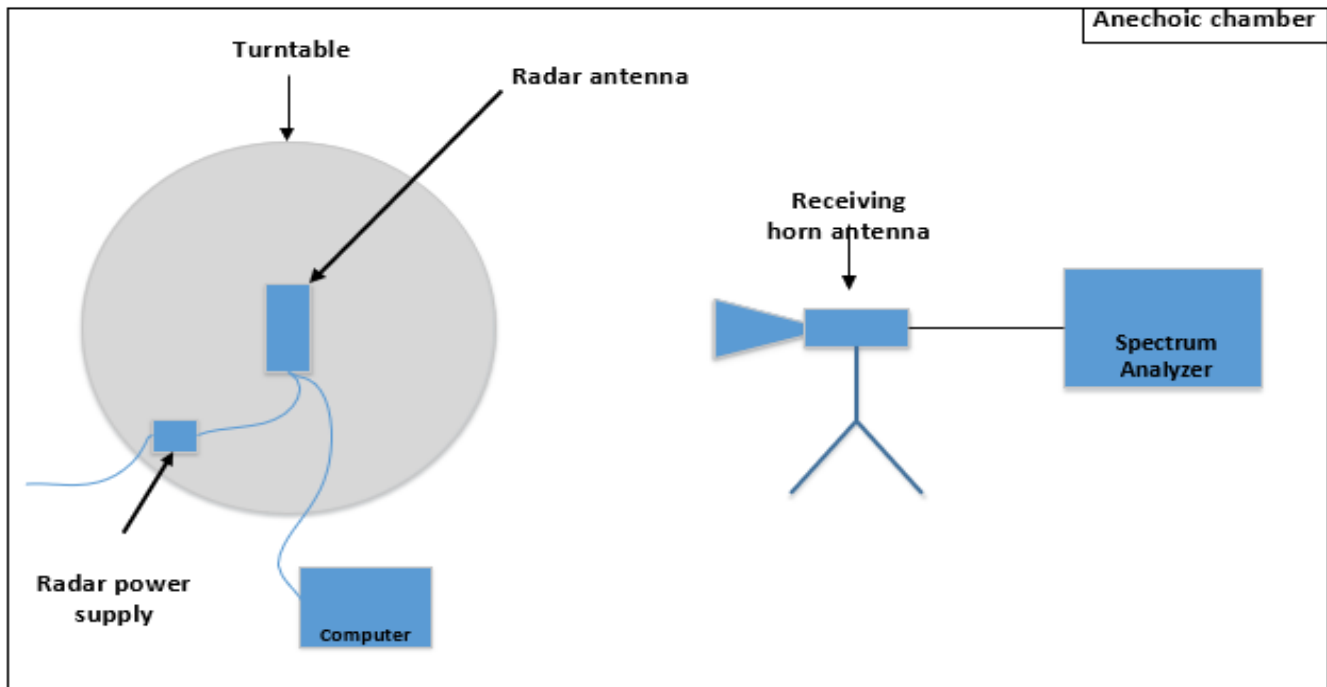
Revision: N/C

Revision	Date	Description	Revised By
N/C	#####	Initial Release	0

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Test Setup Diagram.....	4
Test Equipment Utilized.....	4
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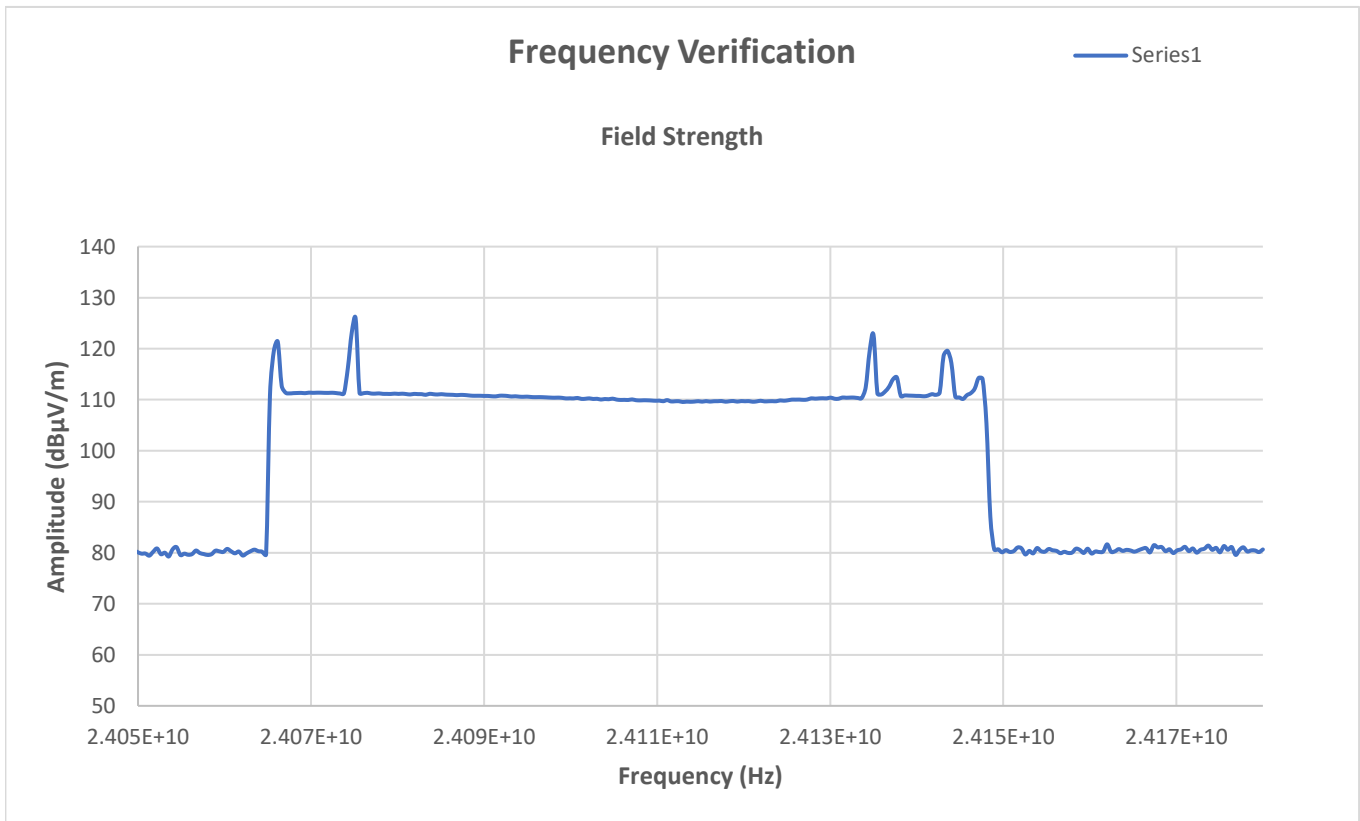
Test Setup Diagram



Test Equipment Utilized

Description	Manufacturer	Model #	Serial #	Asset #	Cal. Due Date
EMC Analyzer	Agilent	E7405	US40240238	EB046	2/12/2025
DRG Horn Antenna	ETS Lindgren	3116	00026390	EE017	5/21/2026
Pre-Amplifier	Keystone Compliance	PA-1	0002	EG003	6/30/2026
Turntable Controller	EMCO	1061.2.013	9401-1717	EI009	UWCE

Frequency Measurements:



Frequency Verification					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBµV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	125.90	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

Radar Sensor Calibration Verification Certificate of Calibration

Model: UMRR-11 T44

**Part Number / Serial Number:
0X0004B946**

**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 13, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Keystone Compliance, LLC
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	
Title	EMC Test Engineer
Signature	



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX0004B946**

Date of Issue: January 13, 2025

This speed measuring device has been tested and verified to be functioning in accordance with the manufacture's specifications.

The frequency measurements performed and reported within this report demonstrate that the SmartMicro UMRR-11 T44 radar system has an accuracy of less than or equal to 1 mph up to 100 mph and 1% accuracy thereafter up to 199 mph maximum.

FSK Frequency Set 1					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBμV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	125.90	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
0X0004899A**

**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 31, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Applus+ Keystone
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX0004899A**

Date of Issue: January 31, 2025

This speed measuring device has been tested and verified to be functioning in accordance with the manufacture’s specifications.

The frequency measurements performed and reported within this report demonstrate that the SmartMicro UMRR-11 T44 radar system has an accuracy of less than or equal to 1 mph up to 100 mph and 1% accuracy thereafter up to 199 mph maximum.

FSK Frequency Set 1					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBμV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	83.3	124.48	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
0X0004B033**

Description:

Radar Characteristics Validation

In compliance with:

SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA

Date of Issue: January 31, 2025

Owner of EUT:

**Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201**

Attention of:

**Engineering Department
Phone: (480) 443-7000**

Test Facility	
Test Laboratory	Applus+ Keystone
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX0004B033**

Date of Issue: January 31, 2025

This speed measuring device has been tested and verified to be functioning in accordance with the manufacture’s specifications.

The frequency measurements performed and reported within this report demonstrate that the SmartMicro UMRR-11 T44 radar system has an accuracy of less than or equal to 1 mph up to 100 mph and 1% accuracy thereafter up to 199 mph maximum.

FSK Frequency Set 1					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBμV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	83.3	126.59	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX000489F3**

**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 13, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Keystone Compliance, LLC
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	
Title	EMC Test Engineer
Signature	



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX000489F3**

Date of Issue: January 13, 2025

This speed measuring device has been tested and verified to be functioning in accordance with the manufacture's specifications.

The frequency measurements performed and reported within this report demonstrate that the SmartMicro UMRR-11 T44 radar system has an accuracy of less than or equal to 1 mph up to 100 mph and 1% accuracy thereafter up to 199 mph maximum.

FSK Frequency Set 1					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBμV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	122.37	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX000489F7**

**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 13, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Keystone Compliance, LLC
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	
Title	EMC Test Engineer
Signature	



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX000489F7**

Date of Issue: January 13, 2025

This speed measuring device has been tested and verified to be functioning in accordance with the manufacture’s specifications.

The frequency measurements performed and reported within this report demonstrate that the SmartMicro UMRR-11 T44 radar system has an accuracy of less than or equal to 1 mph up to 100 mph and 1% accuracy thereafter up to 199 mph maximum.

FSK Frequency Set 1					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBμV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	122.42	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Test Report**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX0004899B**

**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 31, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Applus + Keystone
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

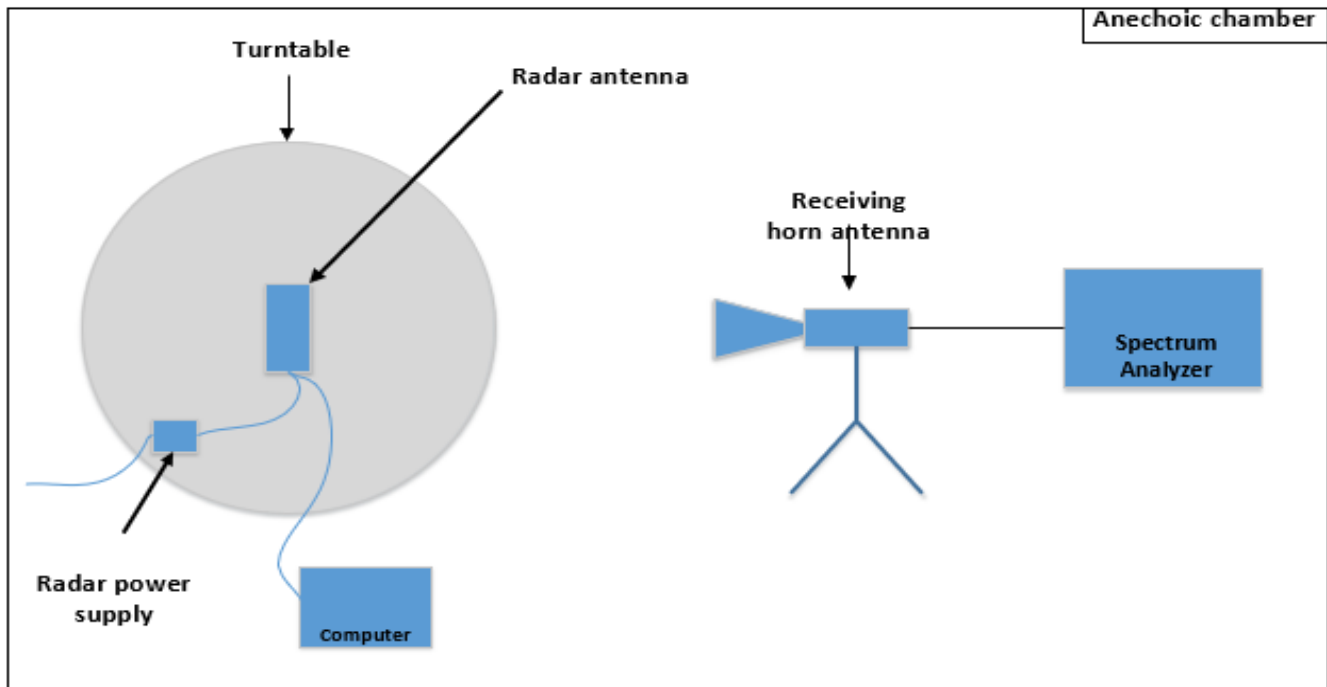
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Revision	Date	Description	Revised By
N/C	#####	Initial Release	Mathew Santiago

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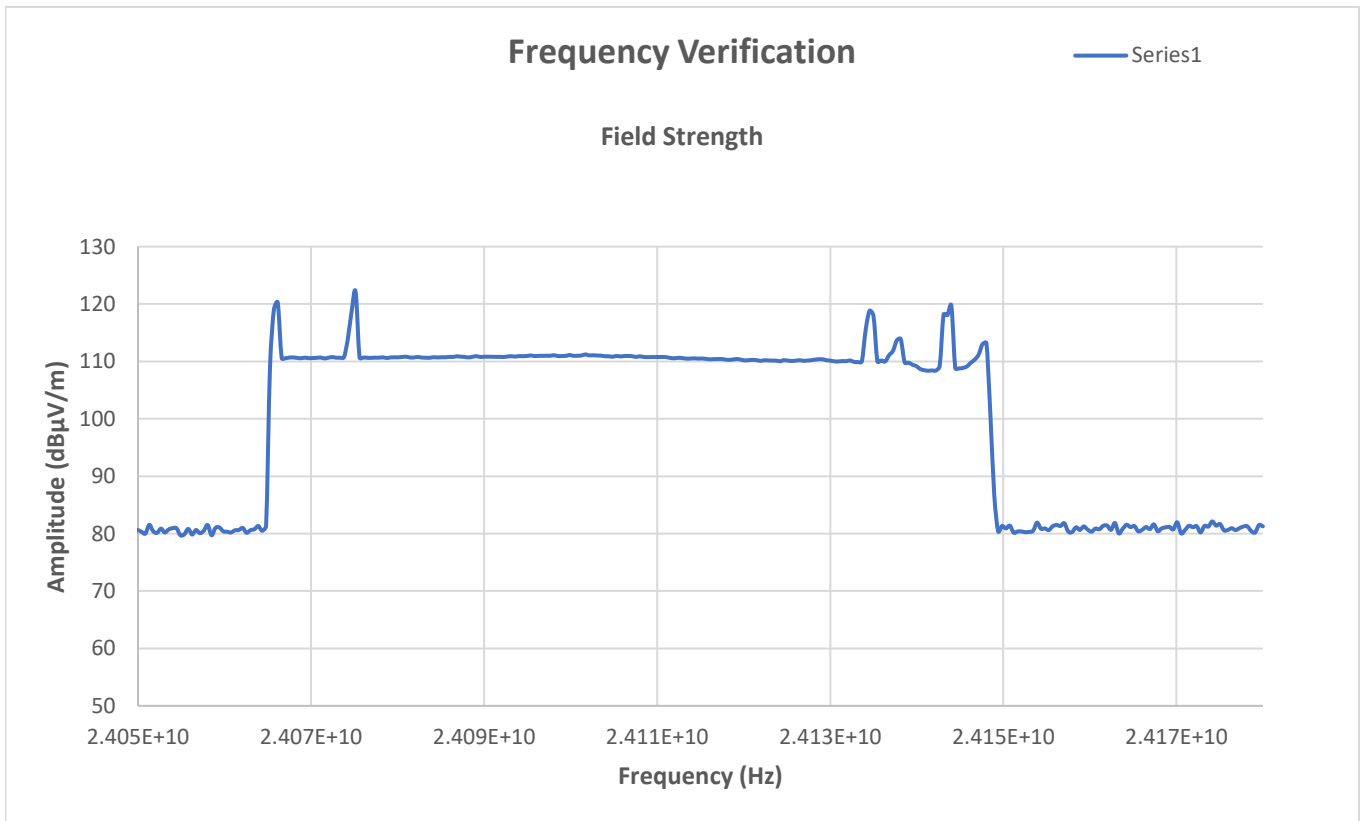
Test Setup Diagram



Test Equipment Utilized

Description	Manufacturer	Model #	Serial #	Asset #	Cal. Due Date
EMC Analyzer	Agilent	E7405	US40240238	EB046	1/29/2026
DRG Horn Antenna	ETS Lindgren	3116	00026390	EE017	5/21/2026
Pre-Amplifier	Keystone Compliance	PA-1	0002	EG003	6/30/2026
Turntable Controller	EMCO	1061.2.013	9401-1717	EI009	UWCE

Frequency Measurements:



Frequency Verification					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBµV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	83.3	122.08	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
0X0004899B**

**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 31, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Applus+ Keystone
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX0004899B**

Date of Issue: January 31, 2025

This speed measuring device has been tested and verified to be functioning in accordance with the manufacture’s specifications.

The frequency measurements performed and reported within this report demonstrate that the SmartMicro UMRR-11 T44 radar system has an accuracy of less than or equal to 1 mph up to 100 mph and 1% accuracy thereafter up to 199 mph maximum.

FSK Frequency Set 1					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBμV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	83.3	122.08	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Test Report**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX00048996**

**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 31, 2025

**Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201**

**Attention of: Engineering Department
Phone: (480) 443-7000**

Test Facility	
Test Laboratory	Applus + Keystone
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

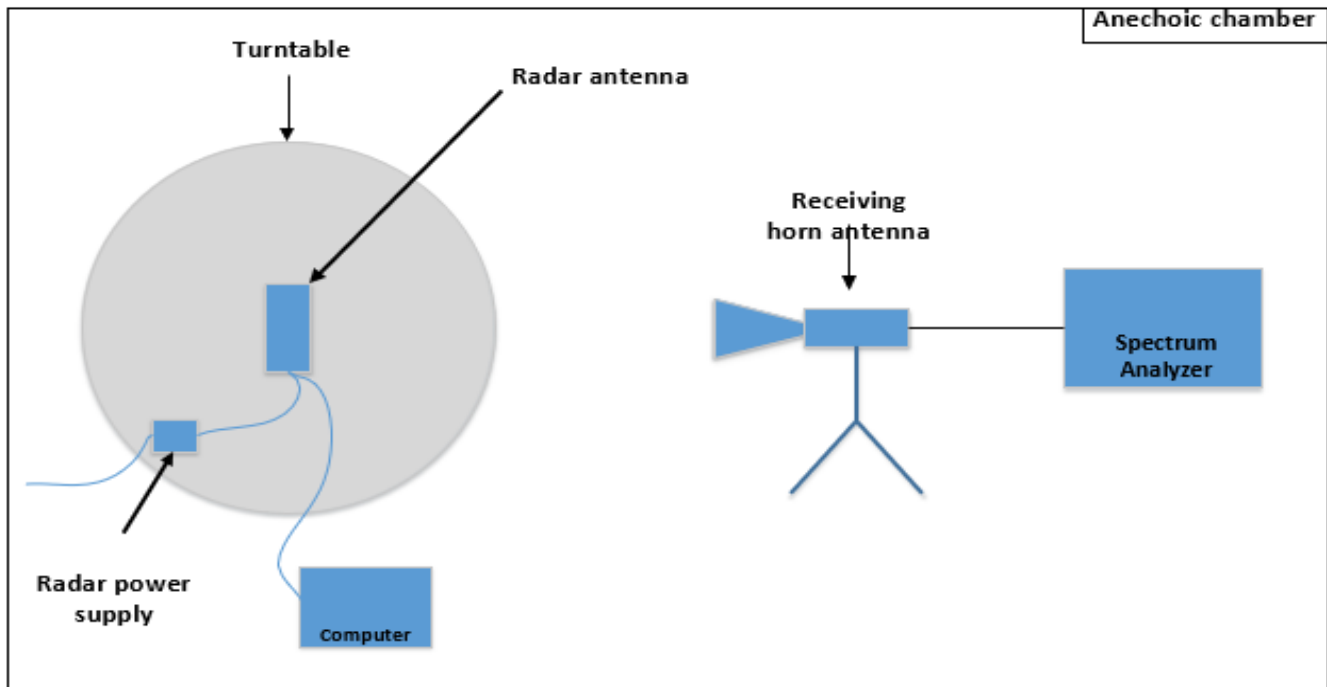
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Revision	Date	Description	Revised By
N/C	#####	Initial Release	Mathew Santiago

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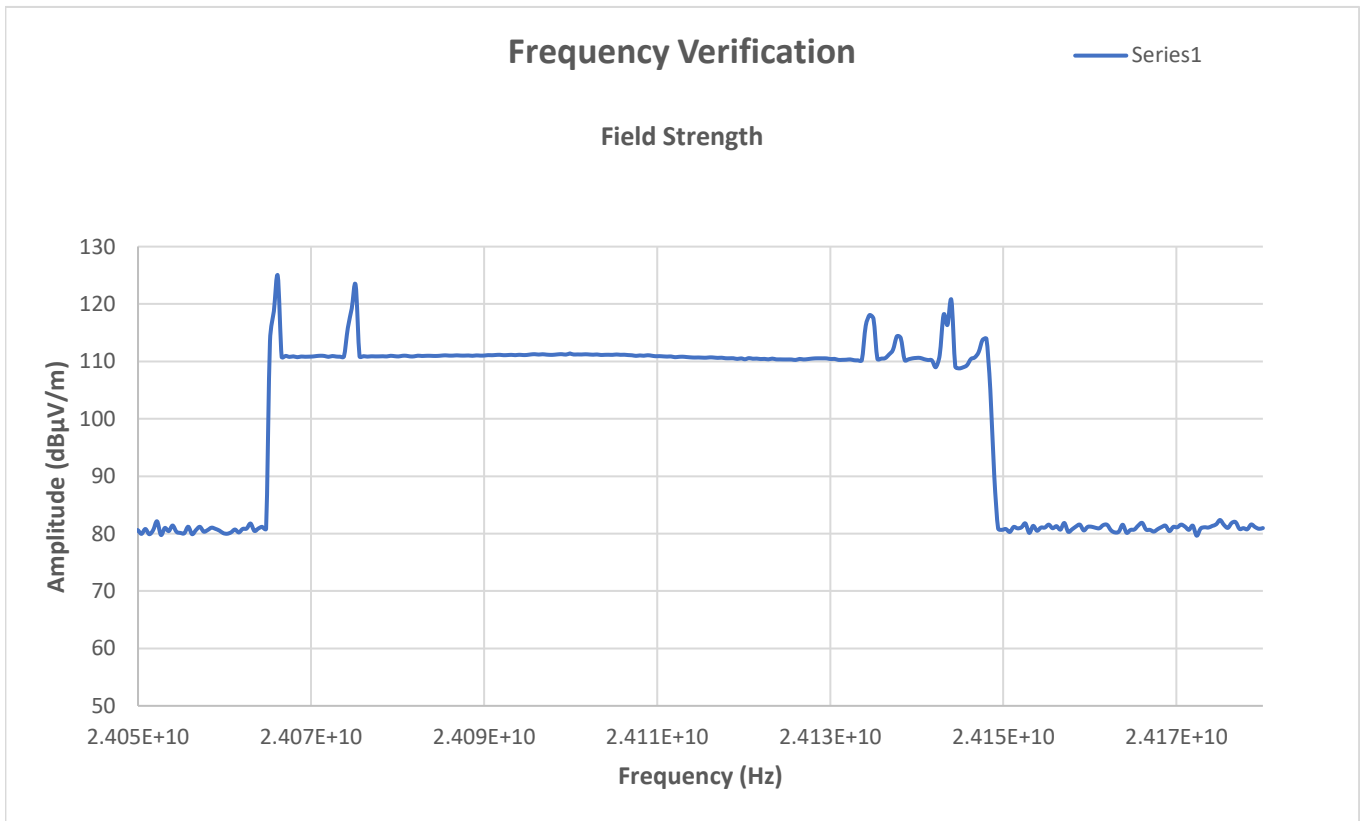
Test Setup Diagram



Test Equipment Utilized

Description	Manufacturer	Model #	Serial #	Asset #	Cal. Due Date
EMC Analyzer	Agilent	E7405	US40240238	EB046	1/29/2026
DRG Horn Antenna	ETS Lindgren	3116	00026390	EE017	5/21/2026
Pre-Amplifier	Keystone Compliance	PA-1	0002	EG003	6/30/2026
Turntable Controller	EMCO	1061.2.013	9401-1717	EI009	UWCE

Frequency Measurements:



Frequency Verification					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBµV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	83.3	124.88	84.7 +/- 4.8	PASS

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX00048996**

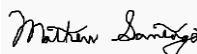
**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 31, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Applus+ Keystone
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX00048996**

Date of Issue: January 31, 2025

This speed measuring device has been tested and verified to be functioning in accordance with the manufacture’s specifications.

The frequency measurements performed and reported within this report demonstrate that the SmartMicro UMRR-11 T44 radar system has an accuracy of less than or equal to 1 mph up to 100 mph and 1% accuracy thereafter up to 199 mph maximum.

FSK Frequency Set 1					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBμV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	83.3	124.88	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX000446B0**

Description:

Radar Characteristics Validation

In compliance with:

SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA

Date of Issue: September 2, 2025

Owner of EUT:

**Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201**

Attention of:

**Engineering Department
Phone: (480) 443-7000**

Test Facility	
Test Laboratory	Applus+ Keystone
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX000446B0**

Date of Issue: September 2, 2025

This speed measuring device has been tested and verified to be functioning in accordance with the manufacture’s specifications.

The frequency measurements performed and reported within this report demonstrate that the SmartMicro UMRR-11 T44 radar system has an accuracy of less than or equal to 1 mph up to 100 mph and 1% accuracy thereafter up to 199 mph maximum.

FSK Frequency Set 1					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBμV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	83.3	124.52	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Test Report**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX000489A0**

**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 31, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Applus + Keystone
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

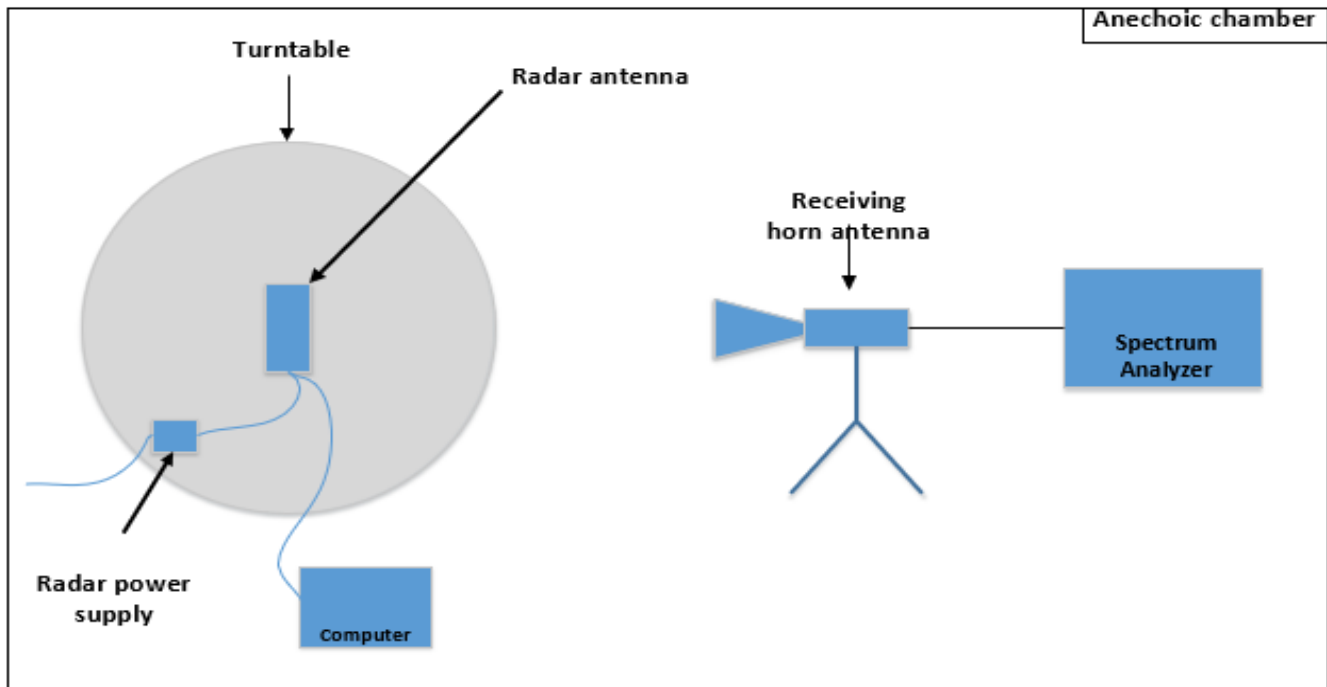
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Revision	Date	Description	Revised By
N/C	#####	Initial Release	Mathew Santiago

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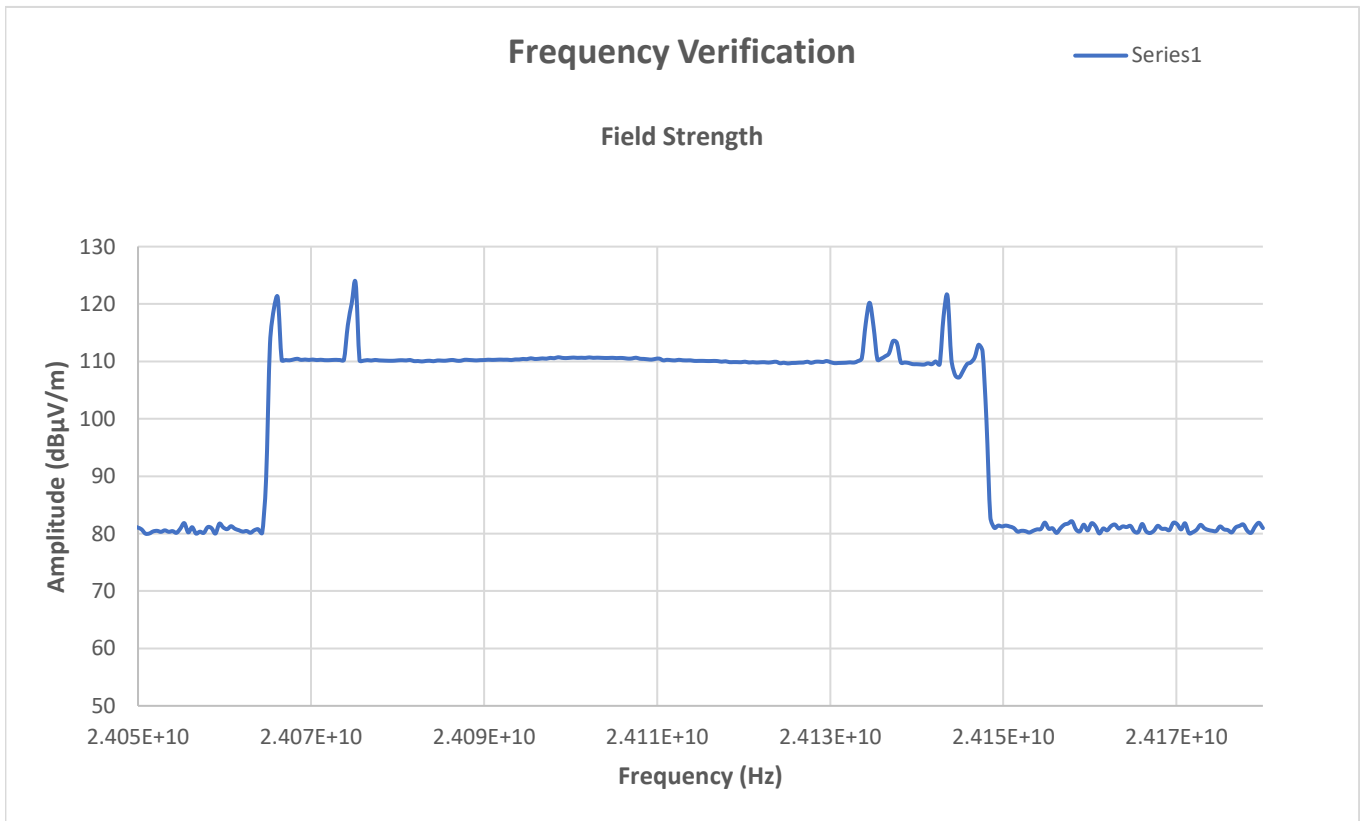
Test Setup Diagram



Test Equipment Utilized

Description	Manufacturer	Model #	Serial #	Asset #	Cal. Due Date
EMC Analyzer	Agilent	E7405	US40240238	EB046	1/29/2026
DRG Horn Antenna	ETS Lindgren	3116	00026390	EE017	5/21/2026
Pre-Amplifier	Keystone Compliance	PA-1	0002	EG003	6/30/2026
Turntable Controller	EMCO	1061.2.013	9401-1717	EI009	UWCE

Frequency Measurements:



Frequency Verification					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBµV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.106	82.4	123.65	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
0X000489A0**

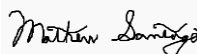
**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 31, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Applus+ Keystone
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX000489A0**

Date of Issue: January 31, 2025

This speed measuring device has been tested and verified to be functioning in accordance with the manufacture’s specifications.

The frequency measurements performed and reported within this report demonstrate that the SmartMicro UMRR-11 T44 radar system has an accuracy of less than or equal to 1 mph up to 100 mph and 1% accuracy thereafter up to 199 mph maximum.

FSK Frequency Set 1					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBμV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.106	82.4	123.65	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
0X0004901B**

**Description:
Radar Characteristics Validation
In compliance with:**

SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA

Date of Issue: January 13, 2025

Owner of EUT:
**Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201**

Attention of:
**Engineering Department
Phone: (480) 443-7000**

Test Facility	
Test Laboratory	Keystone Compliance, LLC
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	
Title	EMC Test Engineer
Signature	



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX0004901B**

Date of Issue: January 13, 2025

This speed measuring device has been tested and verified to be functioning in accordance with the manufacture’s specifications.

The frequency measurements performed and reported within this report demonstrate that the SmartMicro UMRR-11 T44 radar system has an accuracy of less than or equal to 1 mph up to 100 mph and 1% accuracy thereafter up to 199 mph maximum.

FSK Frequency Set 1					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBμV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	125.65	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Test Report**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX000489A2**

**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 31, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Applus + Keystone
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

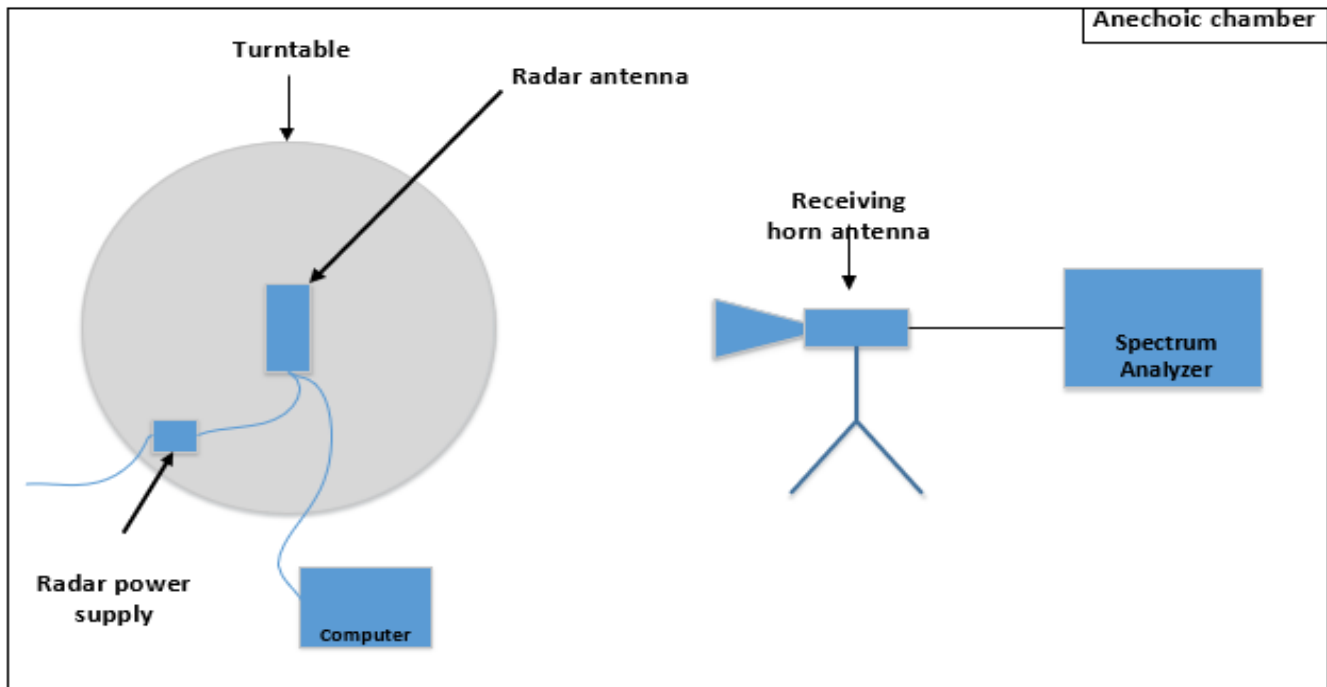
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Revision	Date	Description	Revised By
N/C	#####	Initial Release	Mathew Santiago

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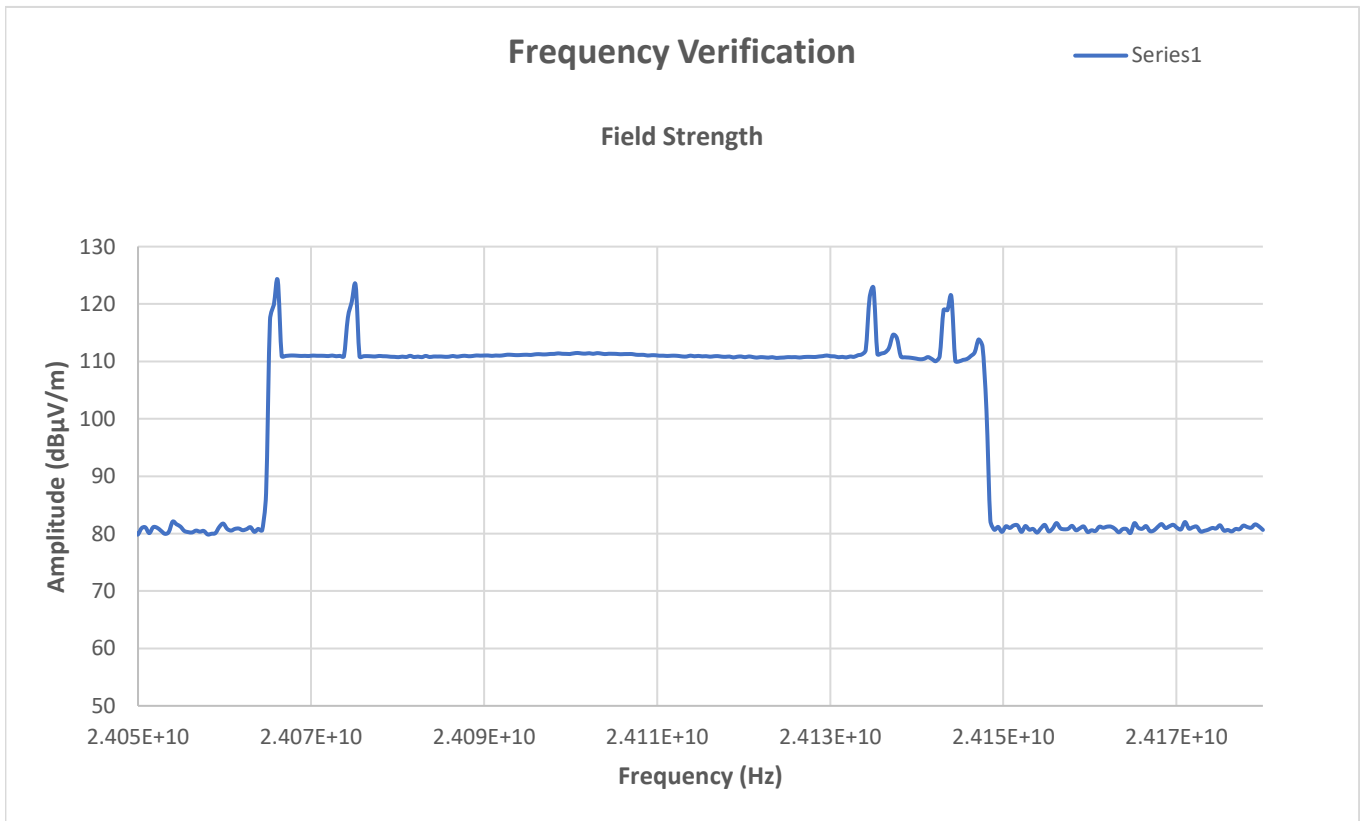
Test Setup Diagram



Test Equipment Utilized

Description	Manufacturer	Model #	Serial #	Asset #	Cal. Due Date
EMC Analyzer	Agilent	E7405	US40240238	EB046	1/29/2026
DRG Horn Antenna	ETS Lindgren	3116	00026390	EE017	5/21/2026
Pre-Amplifier	Keystone Compliance	PA-1	0002	EG003	6/30/2026
Turntable Controller	EMCO	1061.2.013	9401-1717	EI009	UWCE

Frequency Measurements:



Frequency Verification					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBµV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	124.08	84.7 +/- 4.8	PASS

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
0X000489A2**

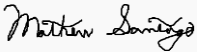
**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 31, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Applus+ Keystone
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX000489A2**

Date of Issue: January 31, 2025

This speed measuring device has been tested and verified to be functioning in accordance with the manufacture’s specifications.

The frequency measurements performed and reported within this report demonstrate that the SmartMicro UMRR-11 T44 radar system has an accuracy of less than or equal to 1 mph up to 100 mph and 1% accuracy thereafter up to 199 mph maximum.

FSK Frequency Set 1					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBμV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	124.08	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Test Report**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX000489A1**

**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 31, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Applus + Keystone
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

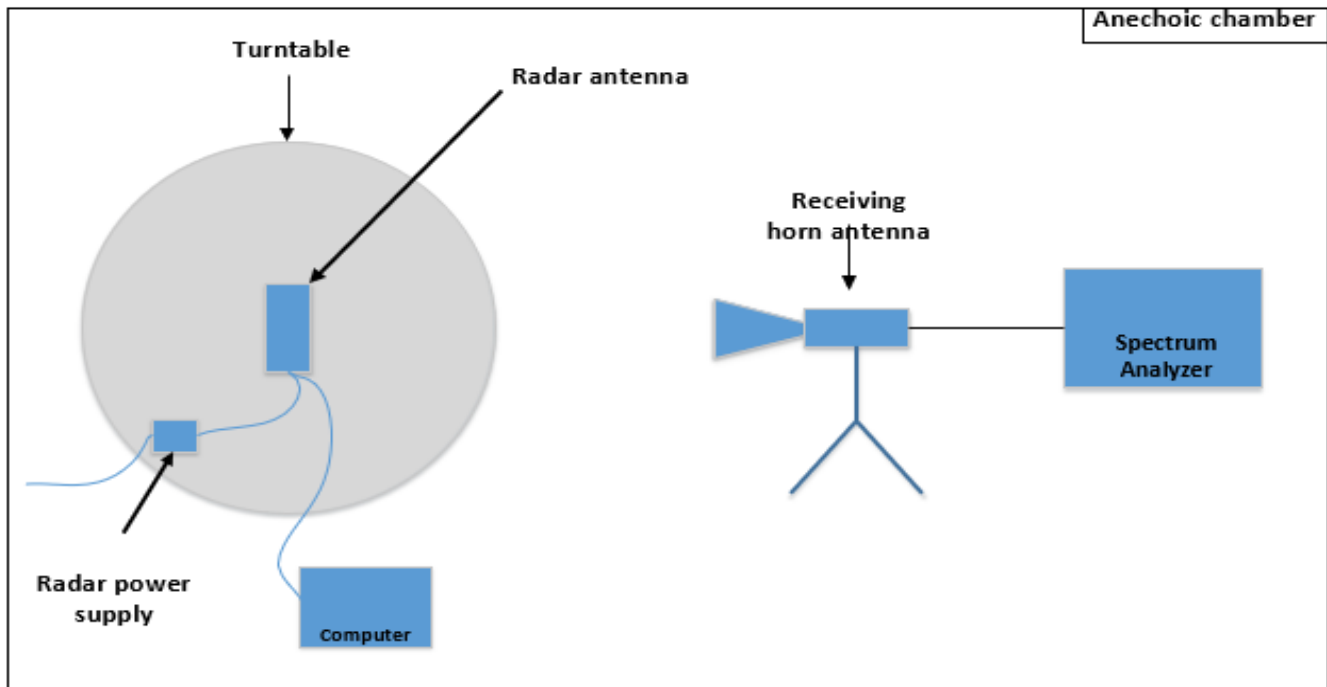
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Revision	Date	Description	Revised By
N/C	#####	Initial Release	Mathew Santiago

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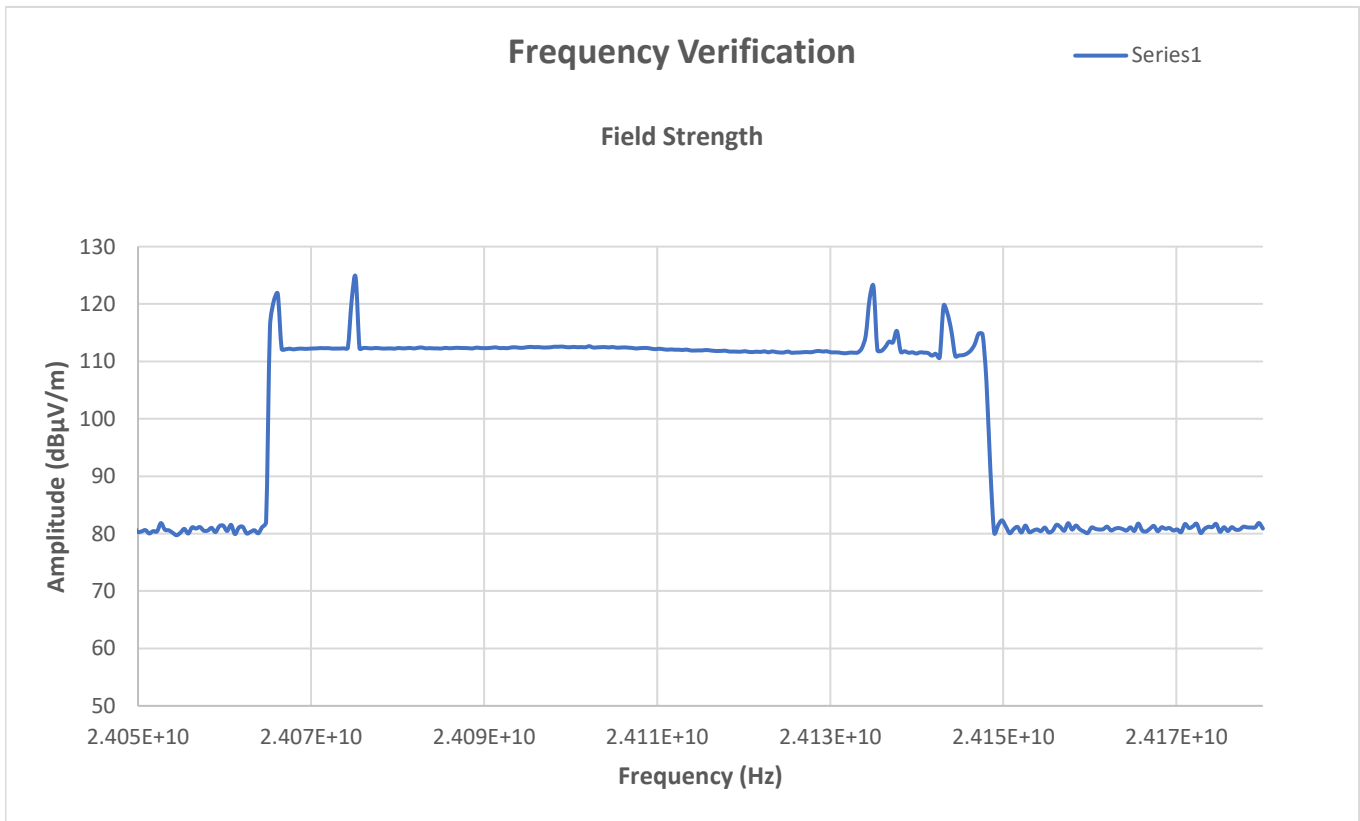
Test Setup Diagram



Test Equipment Utilized

Description	Manufacturer	Model #	Serial #	Asset #	Cal. Due Date
EMC Analyzer	Agilent	E7405	US40240238	EB046	1/29/2026
DRG Horn Antenna	ETS Lindgren	3116	00026390	EE017	5/21/2026
Pre-Amplifier	Keystone Compliance	PA-1	0002	EG003	6/30/2026
Turntable Controller	EMCO	1061.2.013	9401-1717	EI009	UWCE

Frequency Measurements:



Frequency Verification					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBµV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	124.65	84.7 +/- 4.8	PASS

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
0X000489A1**

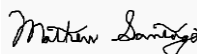
**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 31, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Applus+ Keystone
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX000489A1**

Date of Issue: January 31, 2025

This speed measuring device has been tested and verified to be functioning in accordance with the manufacture’s specifications.

The frequency measurements performed and reported within this report demonstrate that the SmartMicro UMRR-11 T44 radar system has an accuracy of less than or equal to 1 mph up to 100 mph and 1% accuracy thereafter up to 199 mph maximum.

FSK Frequency Set 1					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBμV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	124.65	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Test Report**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX0004899C**

**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 31, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Applus + Keystone
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

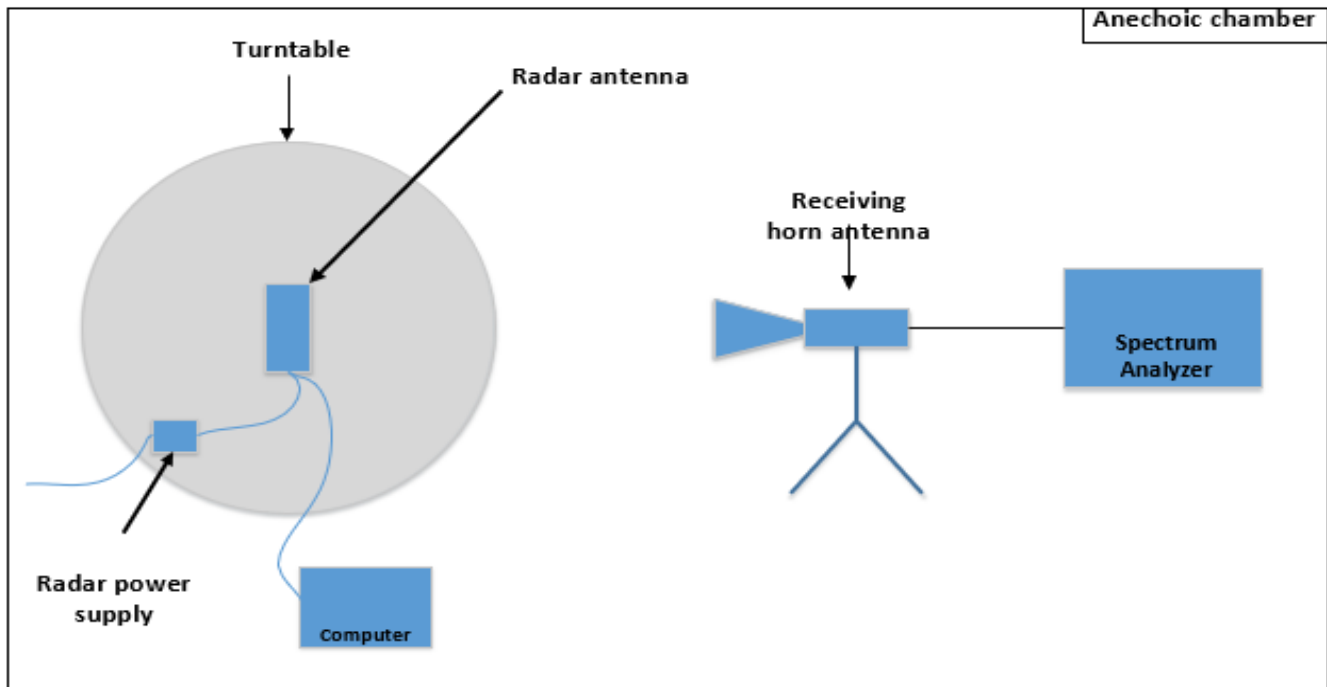
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Revision	Date	Description	Revised By
N/C	#####	Initial Release	Mathew Santiago

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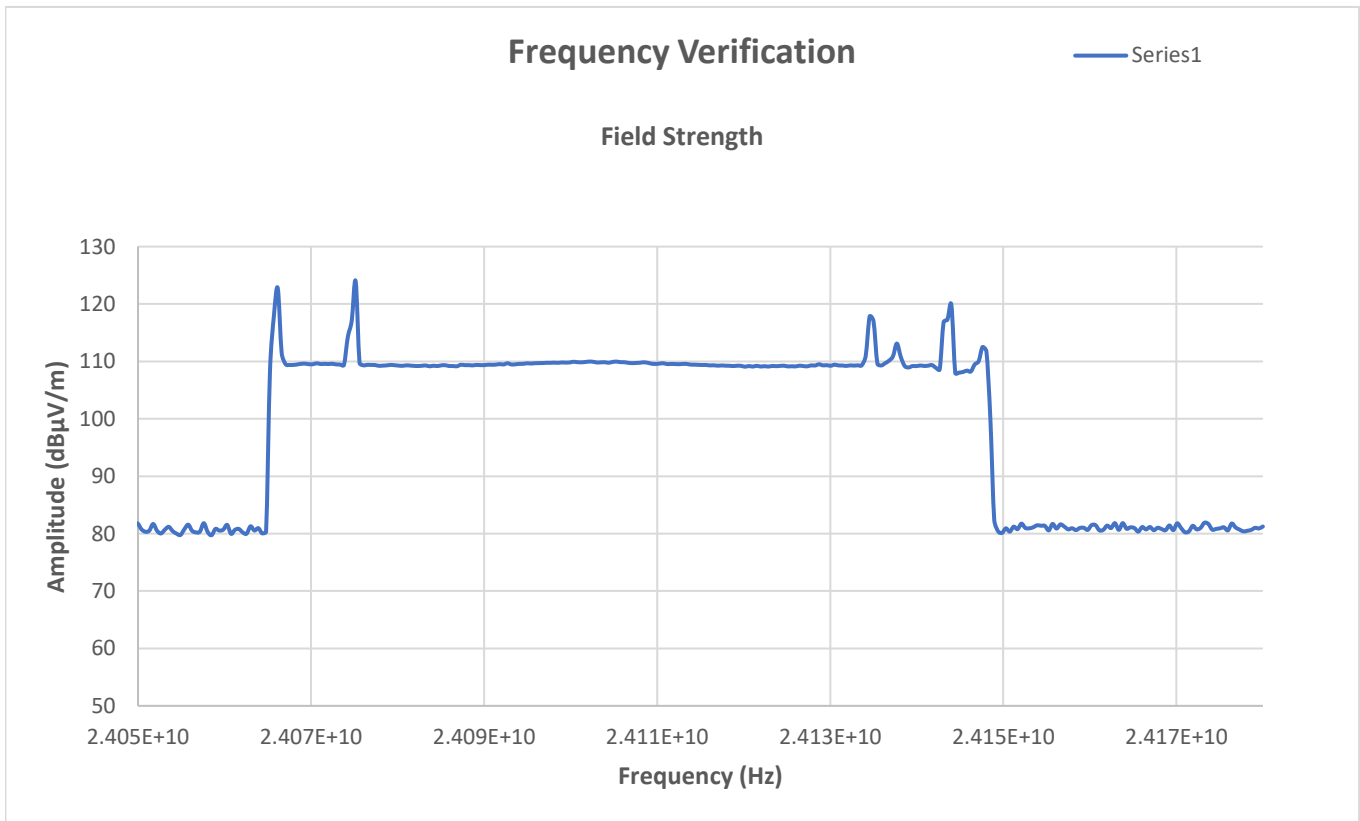
Test Setup Diagram



Test Equipment Utilized

Description	Manufacturer	Model #	Serial #	Asset #	Cal. Due Date
EMC Analyzer	Agilent	E7405	US40240238	EB046	1/29/2026
DRG Horn Antenna	ETS Lindgren	3116	00026390	EE017	5/21/2026
Pre-Amplifier	Keystone Compliance	PA-1	0002	EG003	6/30/2026
Turntable Controller	EMCO	1061.2.013	9401-1717	EI009	UWCE

Frequency Measurements:



Frequency Verification					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBµV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	83.3	123.98	84.7 +/- 4.8	PASS

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX0004899C**

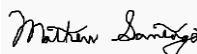
**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 31, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Applus+ Keystone
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX0004899C**

Date of Issue: January 31, 2025

This speed measuring device has been tested and verified to be functioning in accordance with the manufacture's specifications.

The frequency measurements performed and reported within this report demonstrate that the SmartMicro UMRR-11 T44 radar system has an accuracy of less than or equal to 1 mph up to 100 mph and 1% accuracy thereafter up to 199 mph maximum.

FSK Frequency Set 1					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBμV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	83.3	123.98	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Test Report**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX0004899E**

**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 31, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Applus + Keystone
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

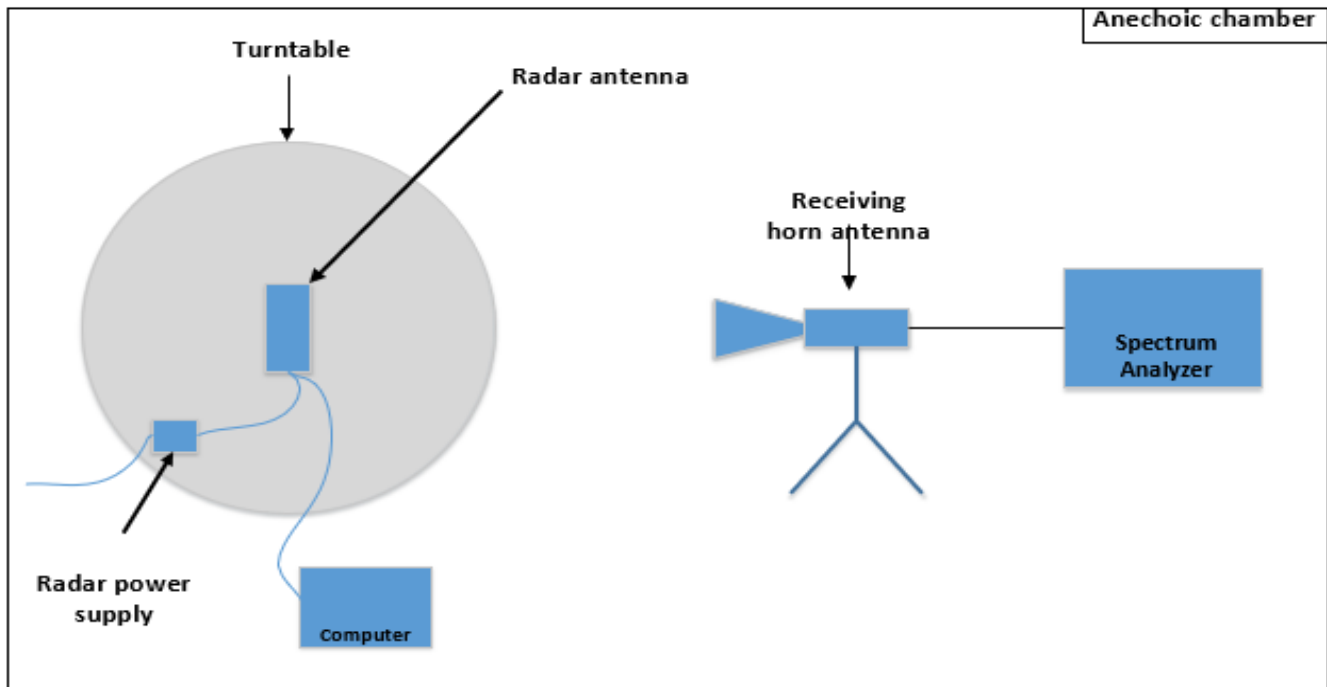
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Revision	Date	Description	Revised By
N/C	#####	Initial Release	Mathew Santiago

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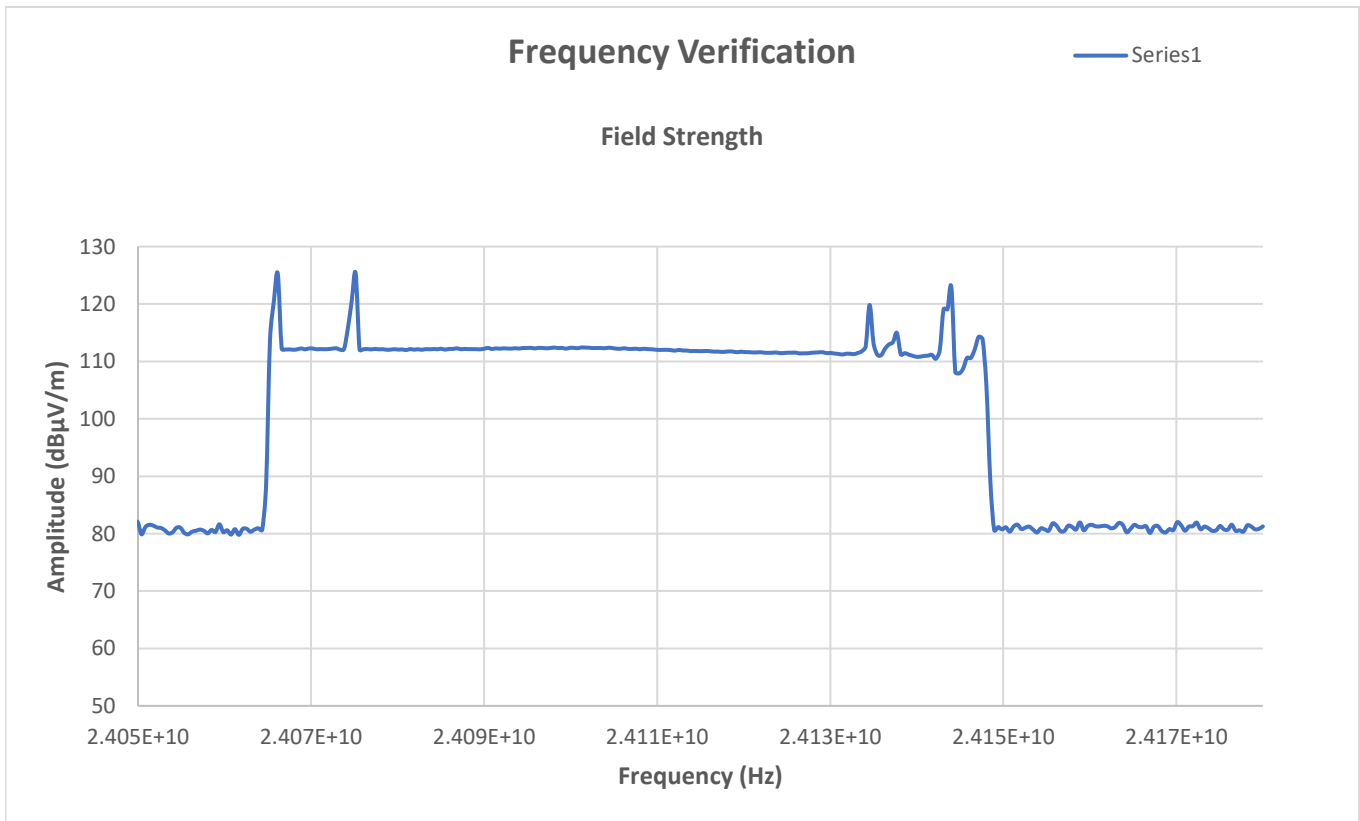
Test Setup Diagram



Test Equipment Utilized

Description	Manufacturer	Model #	Serial #	Asset #	Cal. Due Date
EMC Analyzer	Agilent	E7405	US40240238	EB046	1/29/2026
DRG Horn Antenna	ETS Lindgren	3116	00026390	EE017	5/21/2026
Pre-Amplifier	Keystone Compliance	PA-1	0002	EG003	6/30/2026
Turntable Controller	EMCO	1061.2.013	9401-1717	EI009	UWCE

Frequency Measurements:



Frequency Verification					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBµV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	125.37	84.7 +/- 4.8	PASS

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX0004899E**

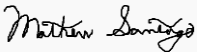
**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 31, 2025

Owner of EUT: **Verra Mobility**
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: **Engineering Department**
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Applus+ Keystone
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX0004899E**

Date of Issue: January 31, 2025

This speed measuring device has been tested and verified to be functioning in accordance with the manufacture’s specifications.

The frequency measurements performed and reported within this report demonstrate that the SmartMicro UMRR-11 T44 radar system has an accuracy of less than or equal to 1 mph up to 100 mph and 1% accuracy thereafter up to 199 mph maximum.

FSK Frequency Set 1					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBμV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	125.37	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Test Report**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX000489A3**

**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 31, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Applus + Keystone
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

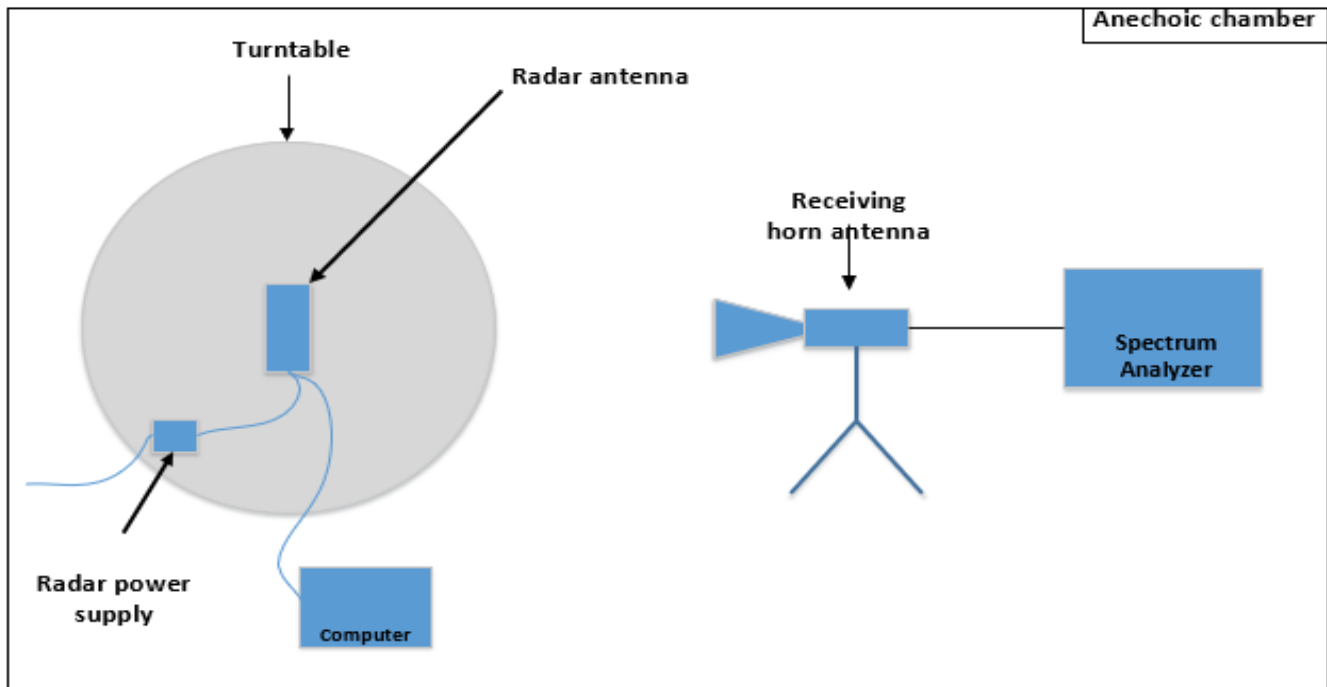
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Revision	Date	Description	Revised By
N/C	#####	Initial Release	Mathew Santiago

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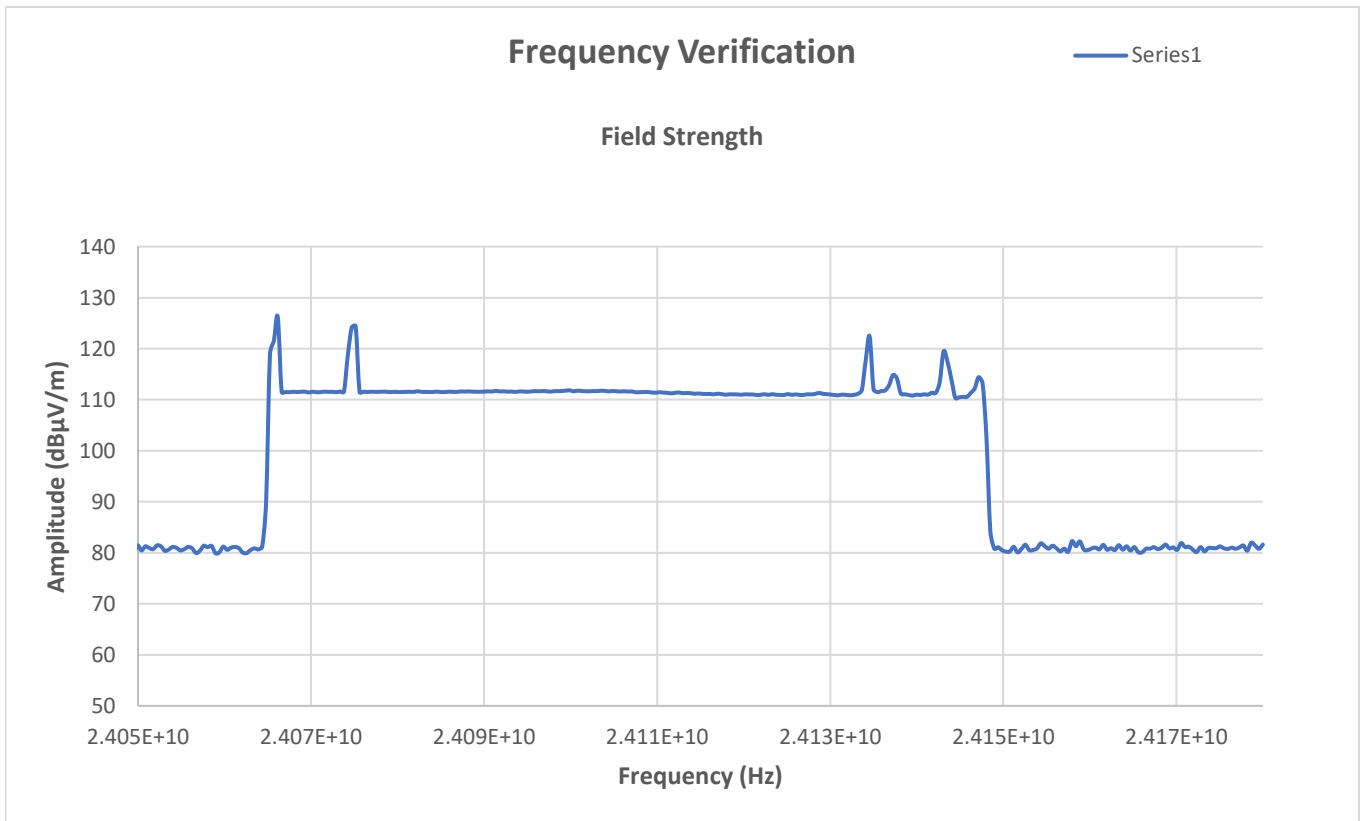
Test Setup Diagram



Test Equipment Utilized

Description	Manufacturer	Model #	Serial #	Asset #	Cal. Due Date
EMC Analyzer	Agilent	E7405	US40240238	EB046	1/29/2026
DRG Horn Antenna	ETS Lindgren	3116	00026390	EE017	5/21/2026
Pre-Amplifier	Keystone Compliance	PA-1	0002	EG003	6/30/2026
Turntable Controller	EMCO	1061.2.013	9401-1717	EI009	UWCE

Frequency Measurements:



Frequency Verification					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBµV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	126.20	84.7 +/- 4.8	PASS

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
0X000489A3**


**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 31, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
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Attention of: Engineering Department
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Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX000489A3**

Date of Issue: January 31, 2025

This speed measuring device has been tested and verified to be functioning in accordance with the manufacture’s specifications.

The frequency measurements performed and reported within this report demonstrate that the SmartMicro UMRR-11 T44 radar system has an accuracy of less than or equal to 1 mph up to 100 mph and 1% accuracy thereafter up to 199 mph maximum.

FSK Frequency Set 1					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBμV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	126.20	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

Radar Sensor Calibration Verification Test Report

Model: UMRR-11 T44

Part Number / Serial Number:
OX000489A4

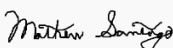
Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA

Date of Issue: January 31, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
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Address	131 North Columbus Innerbelt
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Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

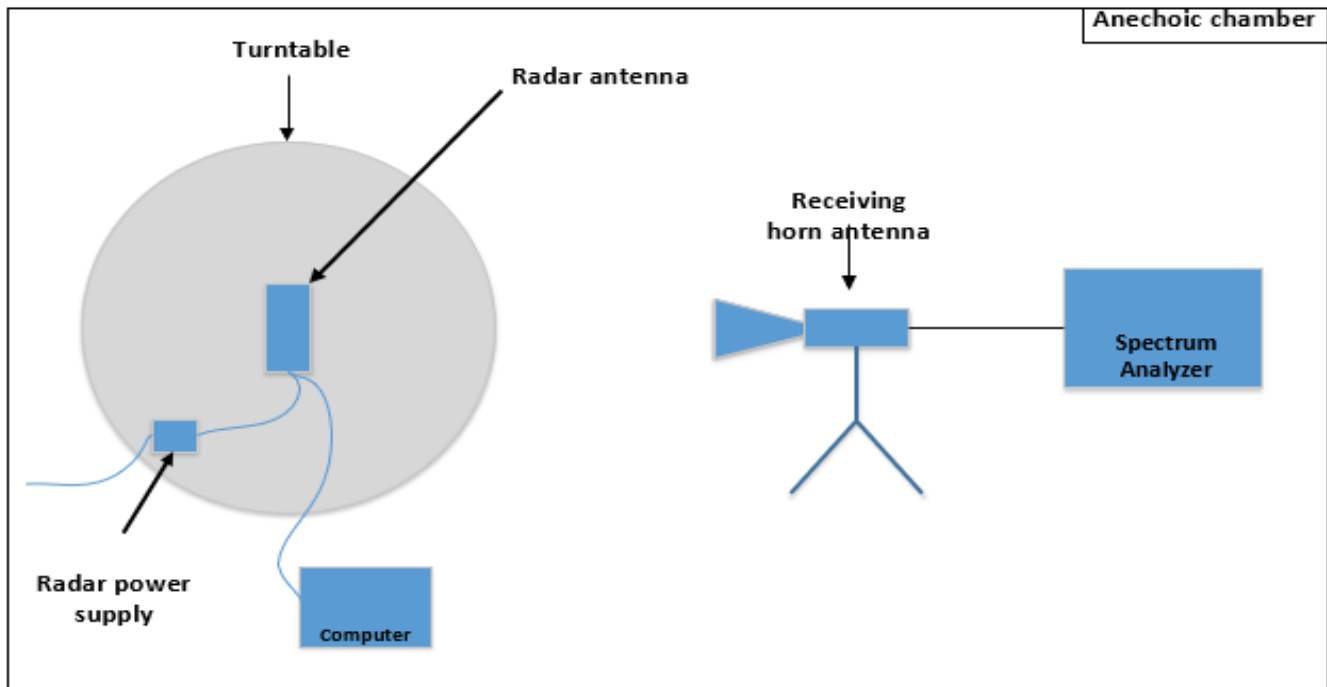
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Revision	Date	Description	Revised By
N/C	#####	Initial Release	Mathew Santiago

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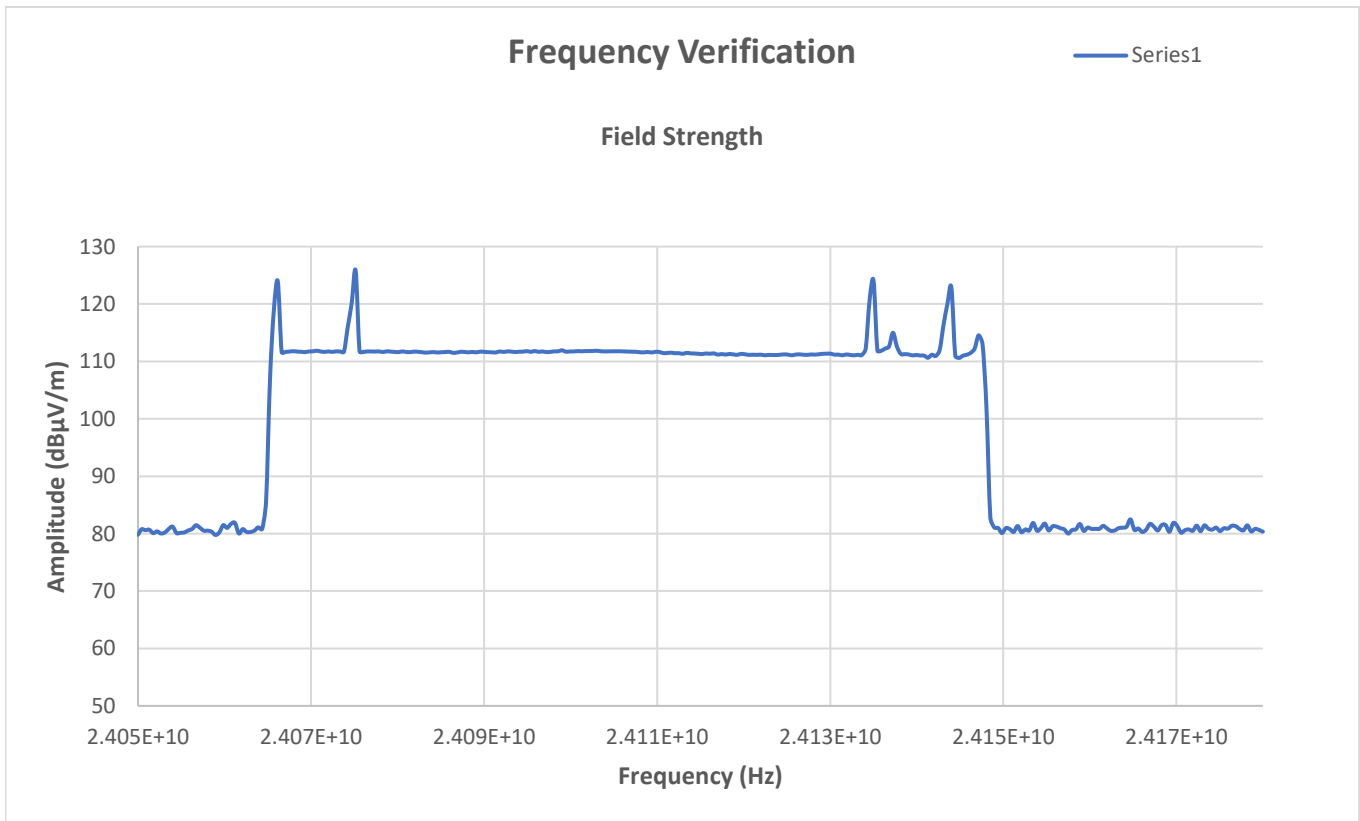
Test Setup Diagram



Test Equipment Utilized

Description	Manufacturer	Model #	Serial #	Asset #	Cal. Due Date
EMC Analyzer	Agilent	E7405	US40240238	EB046	1/29/2026
DRG Horn Antenna	ETS Lindgren	3116	00026390	EE017	5/21/2026
Pre-Amplifier	Keystone Compliance	PA-1	0002	EG003	6/30/2026
Turntable Controller	EMCO	1061.2.013	9401-1717	EI009	UWCE

Frequency Measurements:



Frequency Verification					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBµV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	125.82	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
0X000489A4**

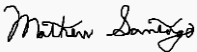
**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 31, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

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Address	131 North Columbus Innerbelt
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Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

Part Number / Serial Number:

OX000489A4

Date of Issue: January 31, 2025

This speed measuring device has been tested and verified to be functioning in accordance with the manufacture's specifications.

The frequency measurements performed and reported within this report demonstrate that the SmartMicro UMRR-11 T44 radar system has an accuracy of less than or equal to 1 mph up to 100 mph and 1% accuracy thereafter up to 199 mph maximum.

FSK Frequency Set 1					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dB μ V)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	125.82	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Test Report**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX00048999**

**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 31, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Applus + Keystone
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

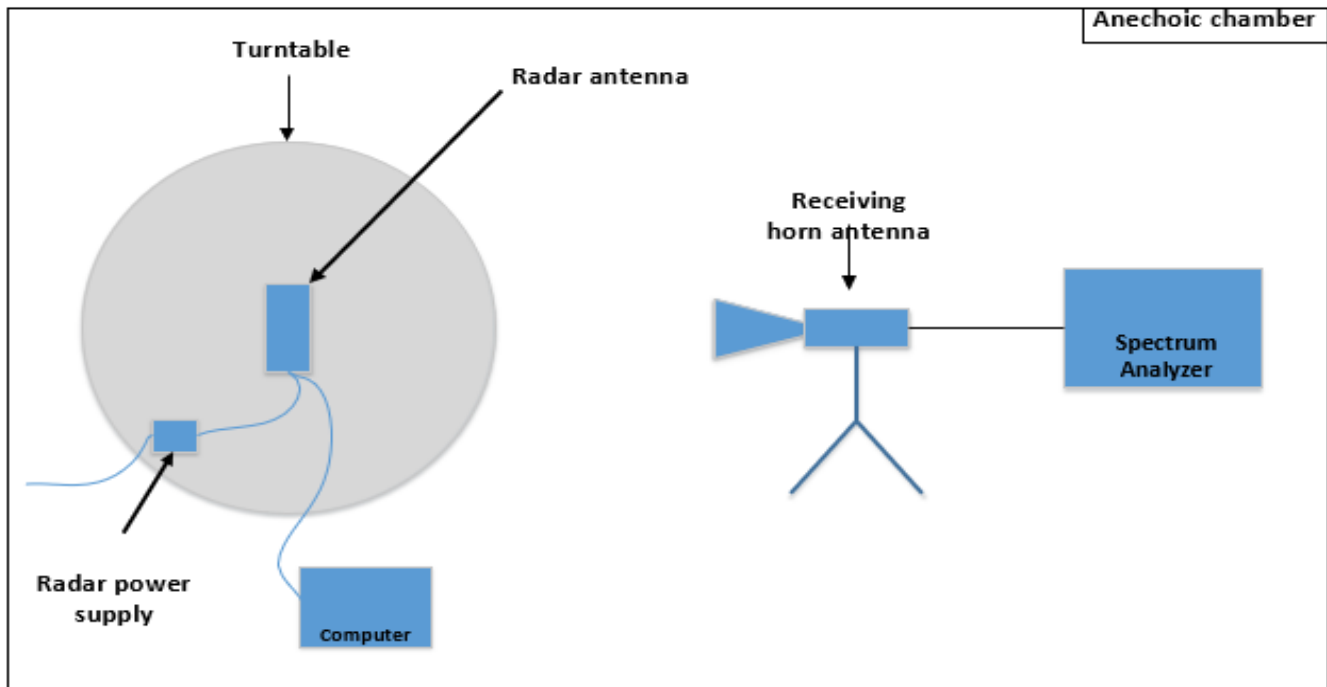
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Revision	Date	Description	Revised By
N/C	#####	Initial Release	Mathew Santiago

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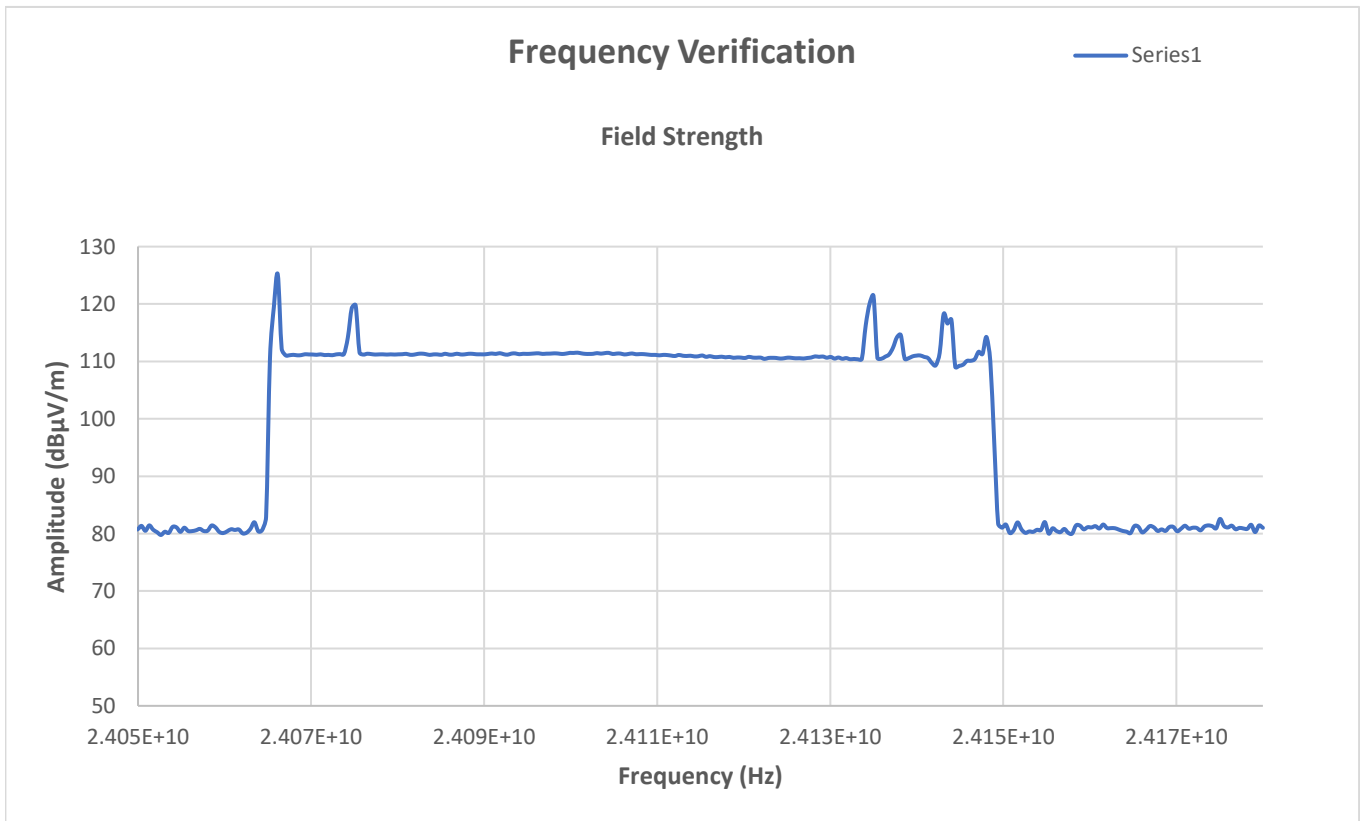
Test Setup Diagram



Test Equipment Utilized

Description	Manufacturer	Model #	Serial #	Asset #	Cal. Due Date
EMC Analyzer	Agilent	E7405	US40240238	EB046	1/29/2026
DRG Horn Antenna	ETS Lindgren	3116	00026390	EE017	5/21/2026
Pre-Amplifier	Keystone Compliance	PA-1	0002	EG003	6/30/2026
Turntable Controller	EMCO	1061.2.013	9401-1717	EI009	UWCE

Frequency Measurements:



Frequency Verification					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBµV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	83.3	125.15	84.7 +/- 4.8	PASS

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX00048999**

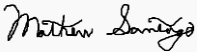
**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 31, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Applus+ Keystone
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX00048999**

Date of Issue: January 31, 2025

This speed measuring device has been tested and verified to be functioning in accordance with the manufacture’s specifications.

The frequency measurements performed and reported within this report demonstrate that the SmartMicro UMRR-11 T44 radar system has an accuracy of less than or equal to 1 mph up to 100 mph and 1% accuracy thereafter up to 199 mph maximum.

FSK Frequency Set 1					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBμV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	83.3	125.15	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Test Report**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX00048998**

**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 31, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Applus + Keystone
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

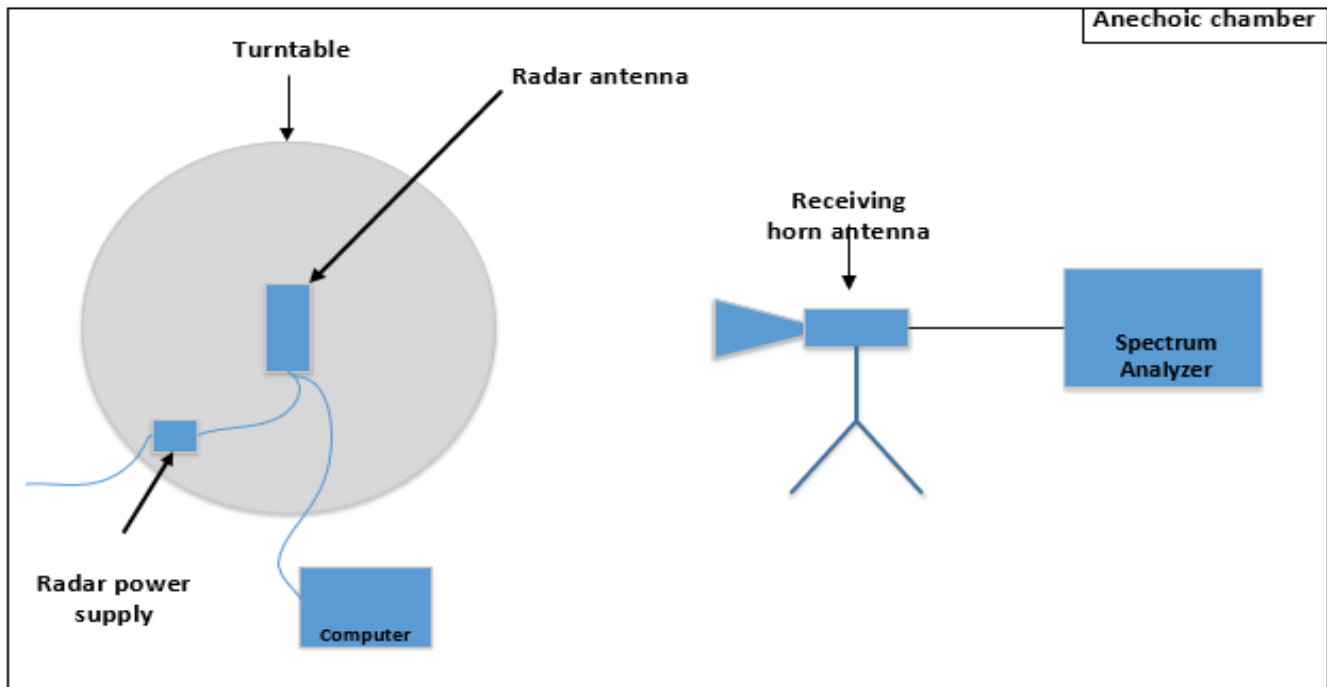
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Revision	Date	Description	Revised By
N/C	#####	Initial Release	Mathew Santiago

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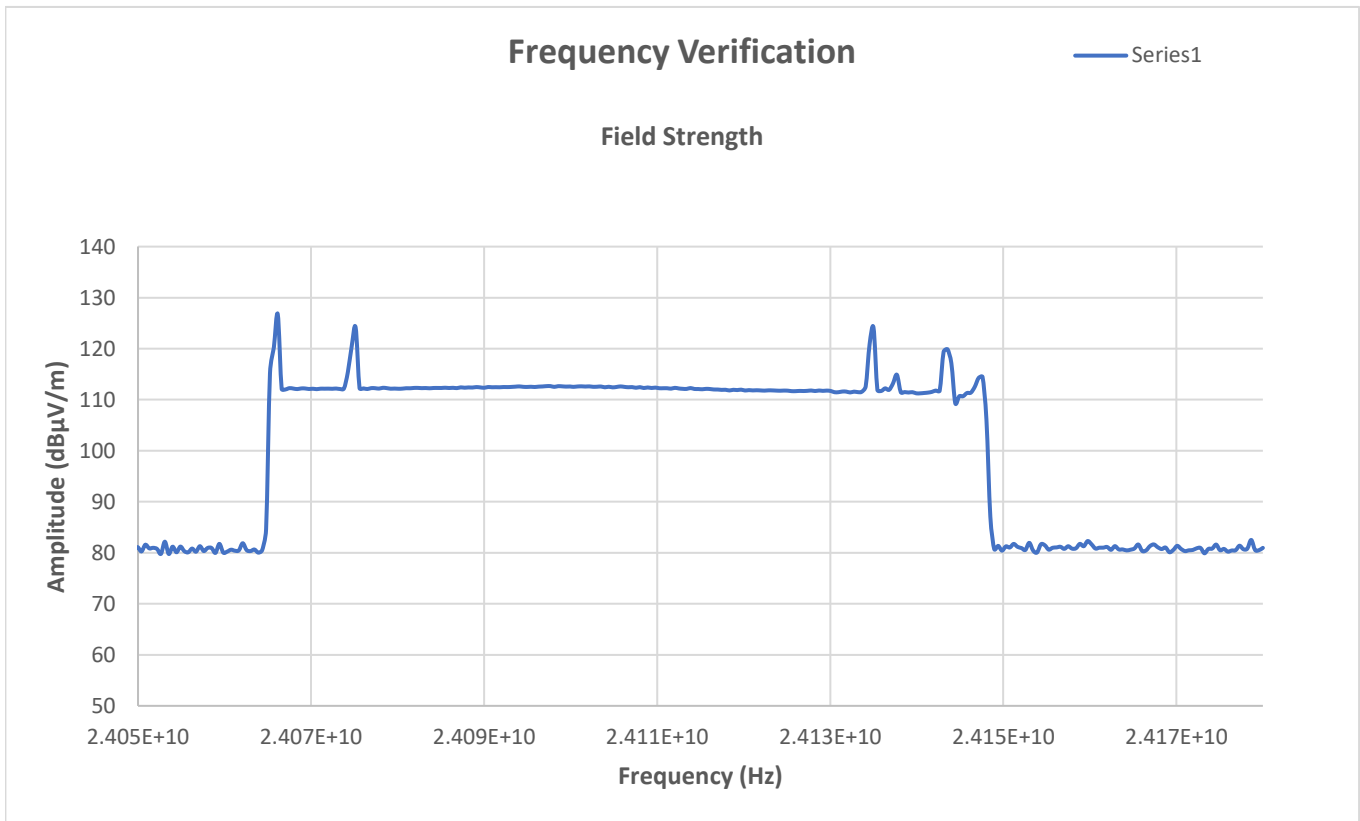
Test Setup Diagram



Test Equipment Utilized

Description	Manufacturer	Model #	Serial #	Asset #	Cal. Due Date
EMC Analyzer	Agilent	E7405	US40240238	EB046	1/29/2026
DRG Horn Antenna	ETS Lindgren	3116	00026390	EE017	5/21/2026
Pre-Amplifier	Keystone Compliance	PA-1	0002	EG003	6/30/2026
Turntable Controller	EMCO	1061.2.013	9401-1717	EI009	UWCE

Frequency Measurements:



Frequency Verification					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBµV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	126.72	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX00048998**

**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 31, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
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Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
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Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX00048998**

Date of Issue: January 31, 2025

This speed measuring device has been tested and verified to be functioning in accordance with the manufacture's specifications.

The frequency measurements performed and reported within this report demonstrate that the SmartMicro UMRR-11 T44 radar system has an accuracy of less than or equal to 1 mph up to 100 mph and 1% accuracy thereafter up to 199 mph maximum.

FSK Frequency Set 1					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBμV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	126.72	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Test Report**

Model: UMRR-11 T44

**Part Number / Serial Number:
0X0004899D**

**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 31, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Applus + Keystone
Address	131 North Columbus Innerbelt
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Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

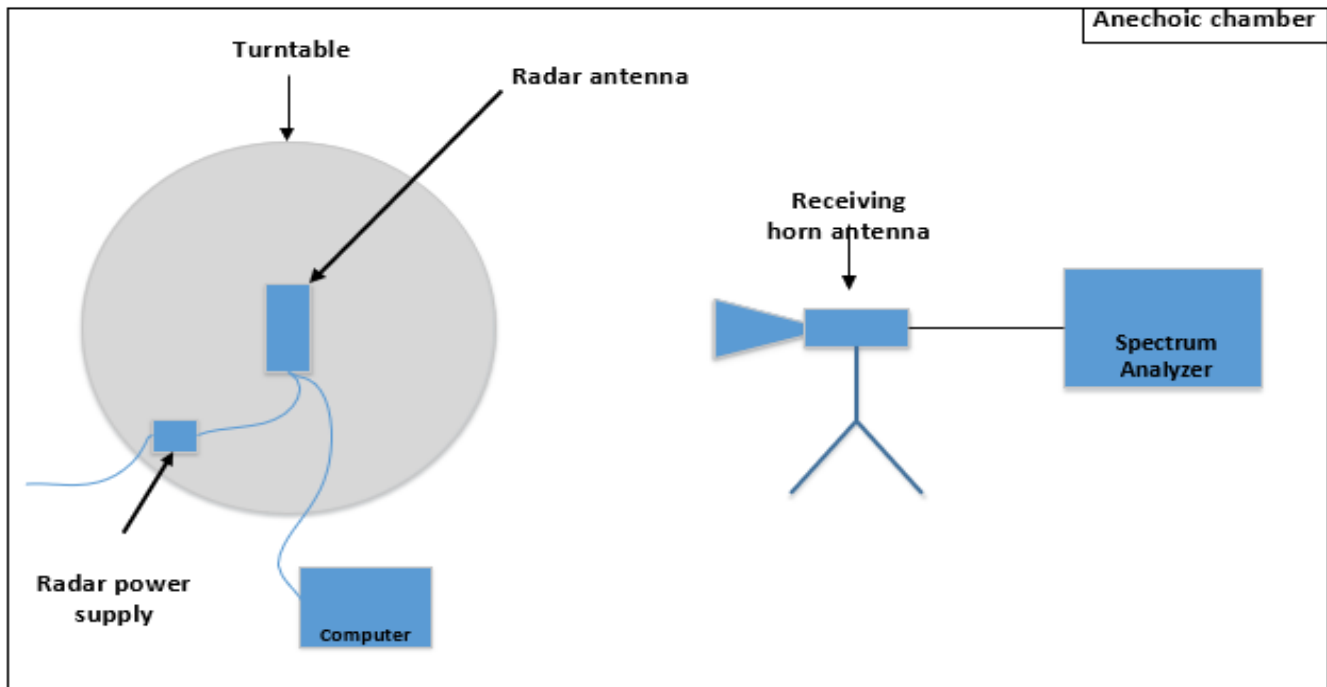
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Revision	Date	Description	Revised By
N/C	#####	Initial Release	Mathew Santiago

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Test Equipment Utilized.....	4
Frequency Characteristics Test Results.....	5

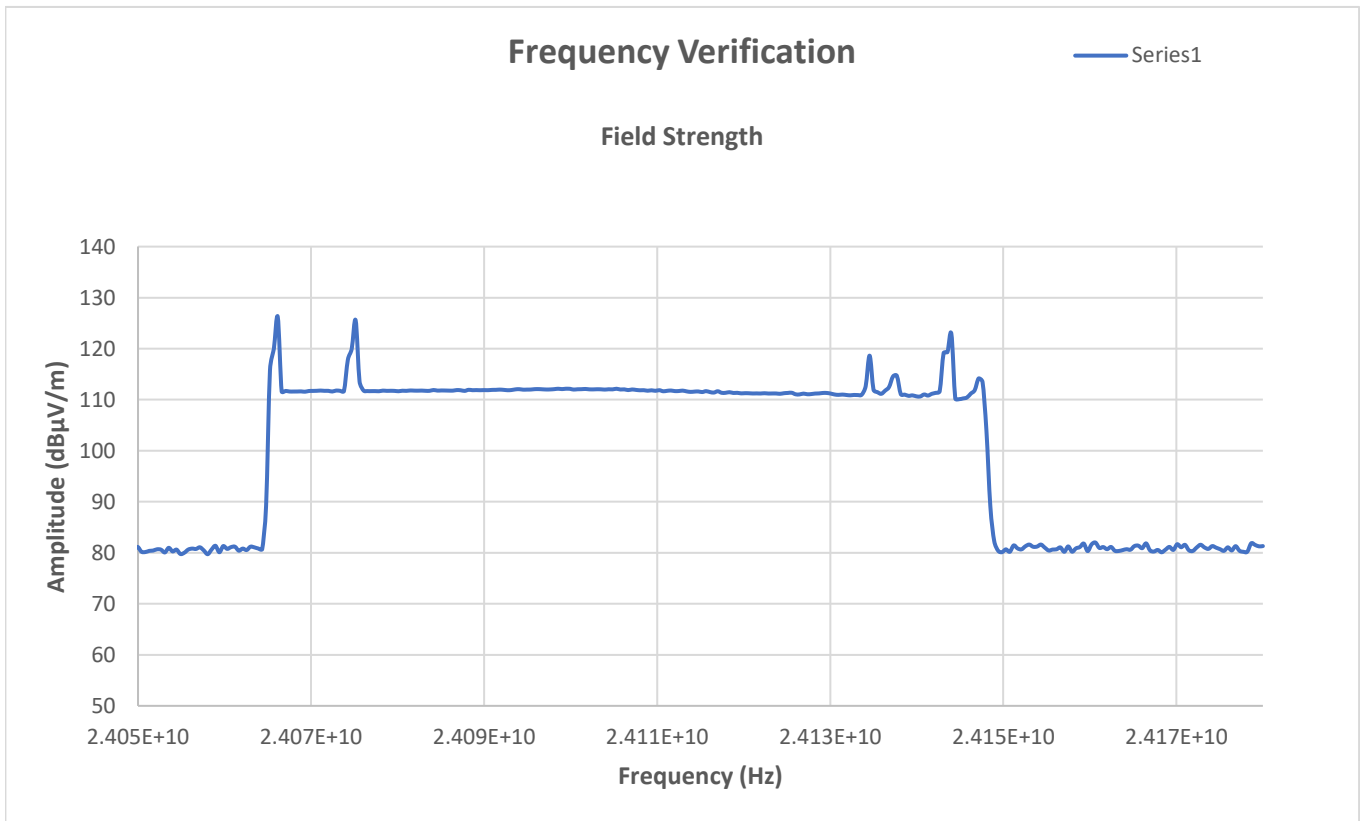
Test Setup Diagram



Test Equipment Utilized

Description	Manufacturer	Model #	Serial #	Asset #	Cal. Due Date
EMC Analyzer	Agilent	E7405	US40240238	EB046	1/29/2026
DRG Horn Antenna	ETS Lindgren	3116	00026390	EE017	5/21/2026
Pre-Amplifier	Keystone Compliance	PA-1	0002	EG003	6/30/2026
Turntable Controller	EMCO	1061.2.013	9401-1717	EI009	UWCE

Frequency Measurements:



Frequency Verification					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBµV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	126.19	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
0X0004899D**

**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 31, 2025

Owner of EUT: Verra Mobility
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Phone: (480) 443-7000

Test Facility	
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City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX0004899D**

Date of Issue: January 31, 2025

This speed measuring device has been tested and verified to be functioning in accordance with the manufacture’s specifications.

The frequency measurements performed and reported within this report demonstrate that the SmartMicro UMRR-11 T44 radar system has an accuracy of less than or equal to 1 mph up to 100 mph and 1% accuracy thereafter up to 199 mph maximum.

FSK Frequency Set 1					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBμV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	126.19	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Test Report**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX00048A1F**

**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 31, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Applus + Keystone
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

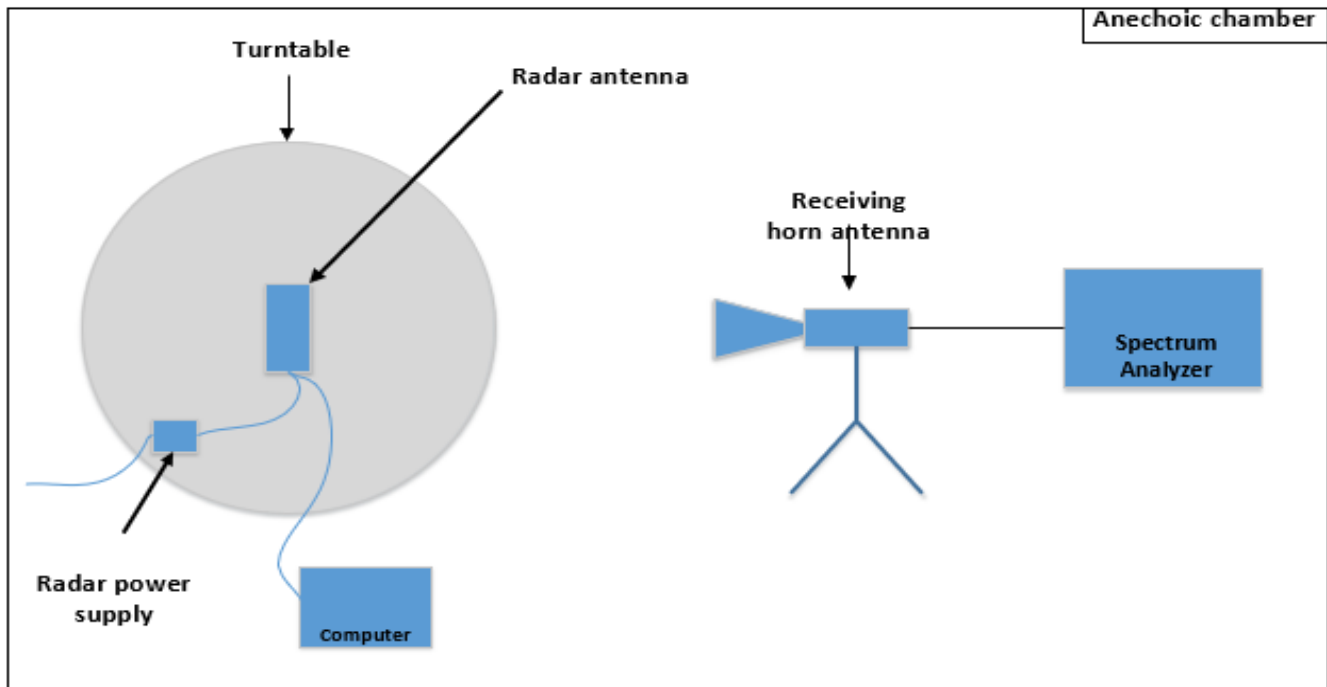
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Revision	Date	Description	Revised By
N/C	#####	Initial Release	Mathew Santiago

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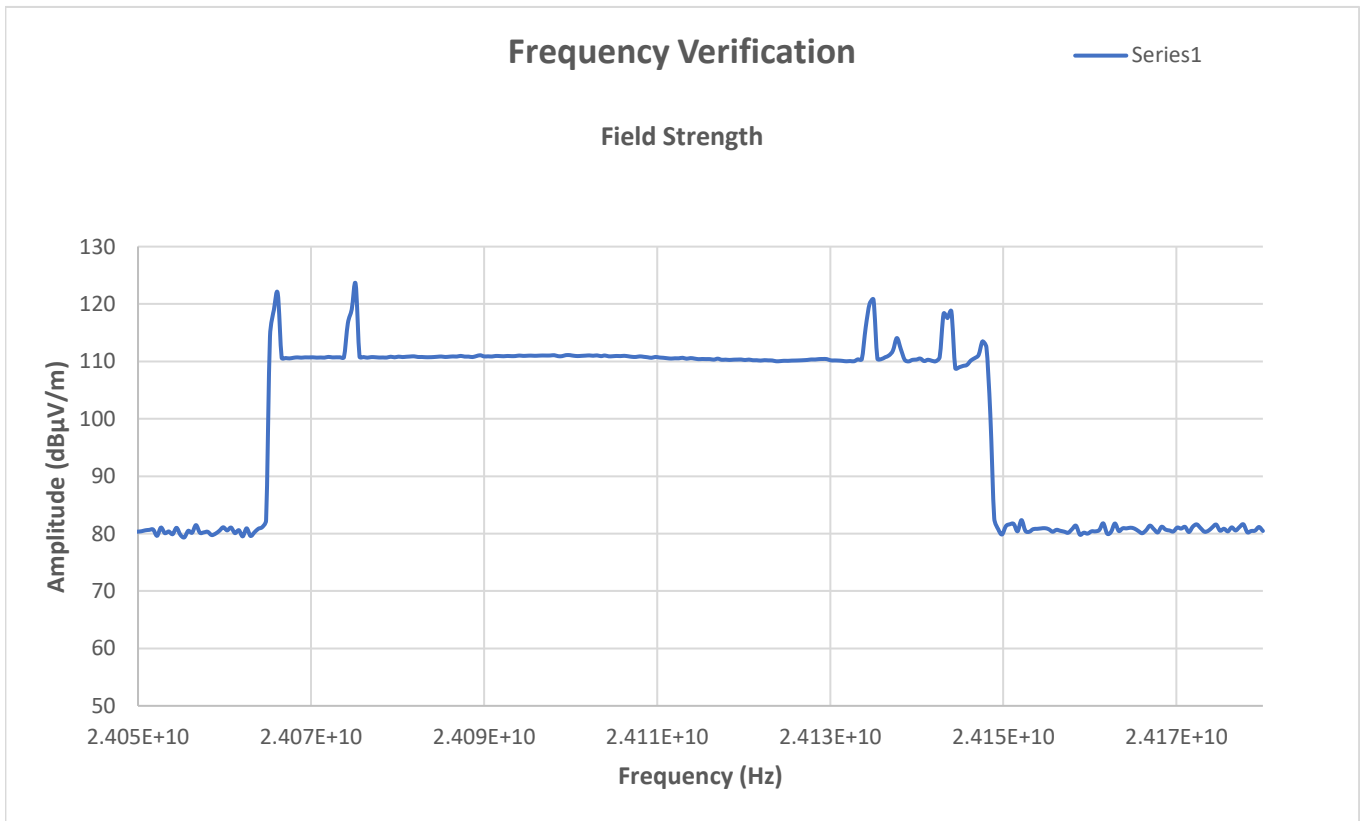
Test Setup Diagram



Test Equipment Utilized

Description	Manufacturer	Model #	Serial #	Asset #	Cal. Due Date
EMC Analyzer	Agilent	E7405	US40240238	EB046	1/29/2026
DRG Horn Antenna	ETS Lindgren	3116	00026390	EE017	5/21/2026
Pre-Amplifier	Keystone Compliance	PA-1	0002	EG003	6/30/2026
Turntable Controller	EMCO	1061.2.013	9401-1717	EI009	UWCE

Frequency Measurements:



Frequency Verification					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBµV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	83.3	123.49	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX00048A1F**

**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 31, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Applus+ Keystone
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX00048A1F**

Date of Issue: January 31, 2025

This speed measuring device has been tested and verified to be functioning in accordance with the manufacture's specifications.

The frequency measurements performed and reported within this report demonstrate that the SmartMicro UMRR-11 T44 radar system has an accuracy of less than or equal to 1 mph up to 100 mph and 1% accuracy thereafter up to 199 mph maximum.

FSK Frequency Set 1					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBμV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	83.3	123.49	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Test Report**

Model: UMRR-11 T44

**Part Number / Serial Number:
0X00048A1D**

**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 31, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Applus + Keystone
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

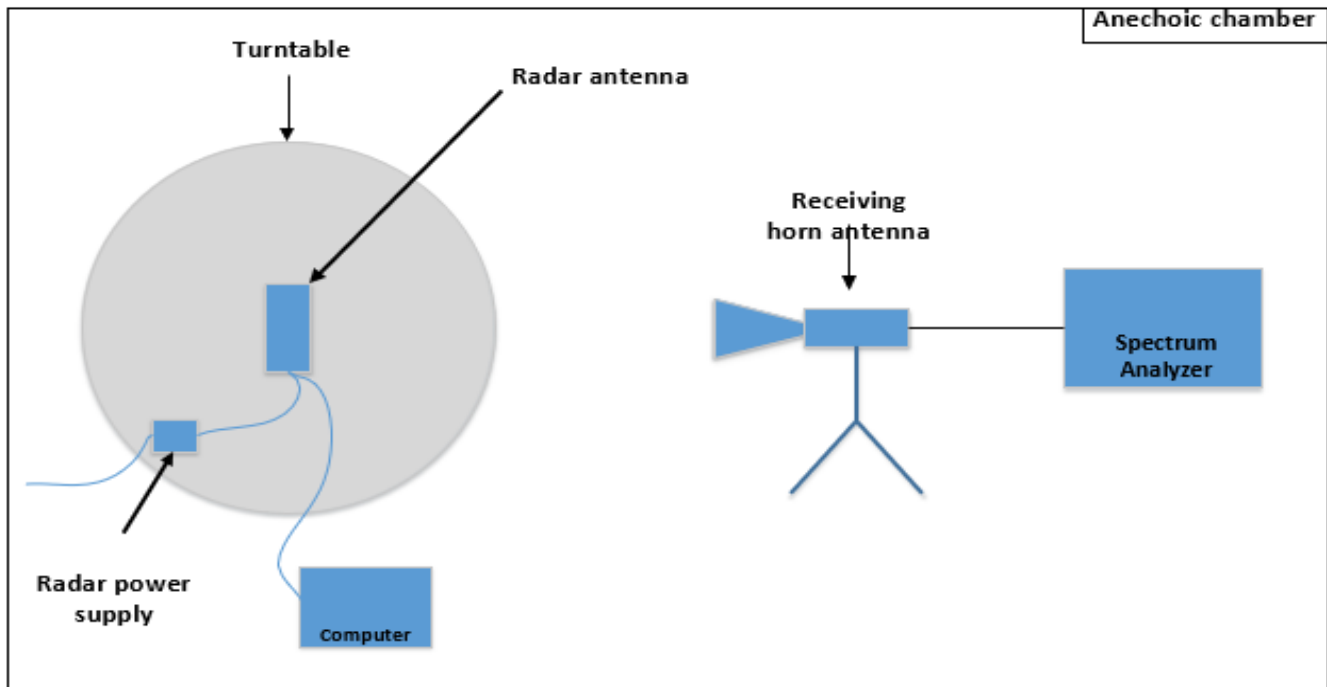
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Revision	Date	Description	Revised By
N/C	#####	Initial Release	Mathew Santiago

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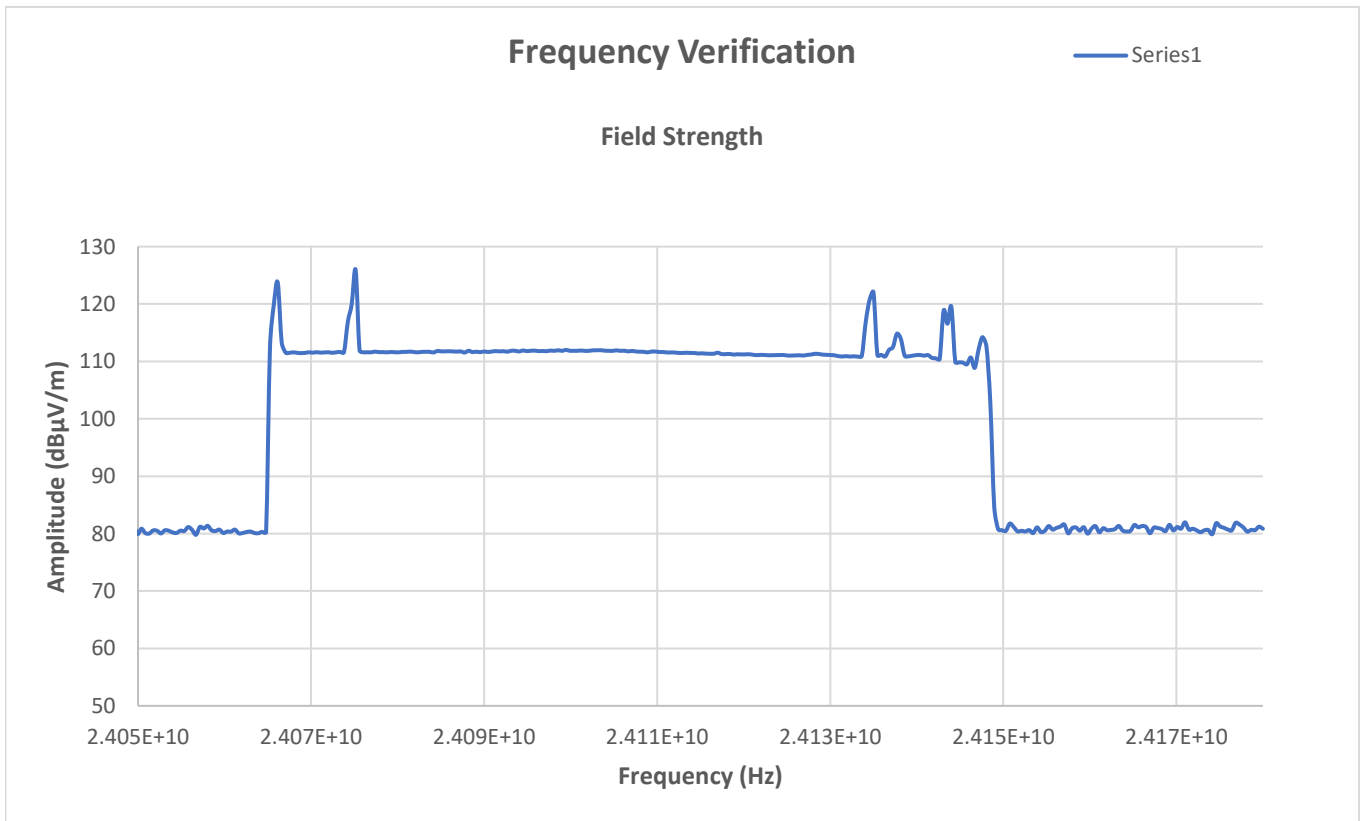
Test Setup Diagram



Test Equipment Utilized

Description	Manufacturer	Model #	Serial #	Asset #	Cal. Due Date
EMC Analyzer	Agilent	E7405	US40240238	EB046	1/29/2026
DRG Horn Antenna	ETS Lindgren	3116	00026390	EE017	5/21/2026
Pre-Amplifier	Keystone Compliance	PA-1	0002	EG003	6/30/2026
Turntable Controller	EMCO	1061.2.013	9401-1717	EI009	UWCE

Frequency Measurements:



Frequency Verification					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBµV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	83.3	125.91	84.7 +/- 4.8	PASS

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
0X00048A1D**

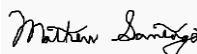
**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 31, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Applus+ Keystone
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

Part Number / Serial Number:

0X00048A1D

Date of Issue: January 31, 2025

This speed measuring device has been tested and verified to be functioning in accordance with the manufacture's specifications.

The frequency measurements performed and reported within this report demonstrate that the SmartMicro UMRR-11 T44 radar system has an accuracy of less than or equal to 1 mph up to 100 mph and 1% accuracy thereafter up to 199 mph maximum.

FSK Frequency Set 1					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBμV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	83.3	125.91	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
0X0004B94C**

Description:

Radar Characteristics Validation

In compliance with:

SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA

Date of Issue: January 13, 2025

Owner of EUT:

**Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201**

Attention of:

**Engineering Department
Phone: (480) 443-7000**

Test Facility	
Test Laboratory	Keystone Compliance, LLC
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	
Title	EMC Test Engineer
Signature	



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX0004B94C**

Date of Issue: January 13, 2025

This speed measuring device has been tested and verified to be functioning in accordance with the manufacture's specifications.

The frequency measurements performed and reported within this report demonstrate that the SmartMicro UMRR-11 T44 radar system has an accuracy of less than or equal to 1 mph up to 100 mph and 1% accuracy thereafter up to 199 mph maximum.

FSK Frequency Set 1					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBμV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	124.32	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
0X0004B94B**

**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 13, 2025

**Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201**

**Attention of: Engineering Department
Phone: (480) 443-7000**

Test Facility	
Test Laboratory	Keystone Compliance, LLC
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	
Title	EMC Test Engineer
Signature	



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX0004B94B**

Date of Issue: January 13, 2025

This speed measuring device has been tested and verified to be functioning in accordance with the manufacture’s specifications.

The frequency measurements performed and reported within this report demonstrate that the SmartMicro UMRR-11 T44 radar system has an accuracy of less than or equal to 1 mph up to 100 mph and 1% accuracy thereafter up to 199 mph maximum.

FSK Frequency Set 1					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBμV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	125.22	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Test Report**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX00048E6B**

**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 31, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Applus + Keystone
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

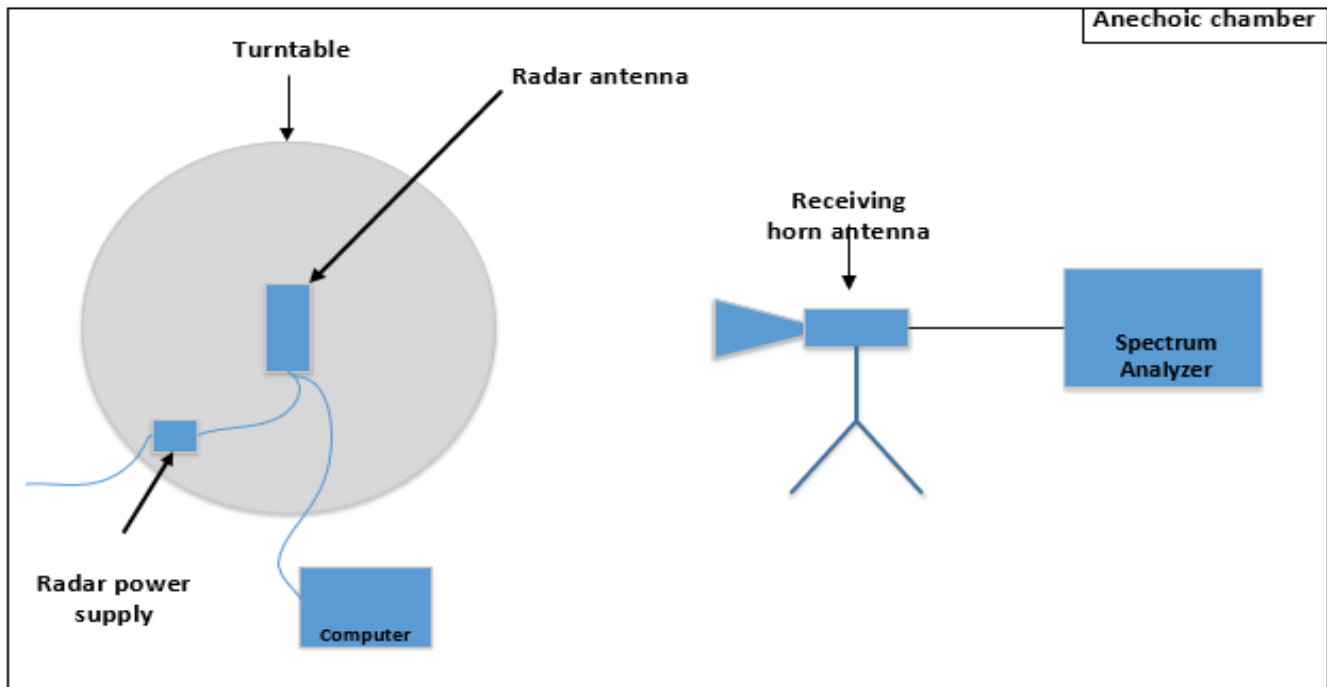
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Revision	Date	Description	Revised By
N/C	#####	Initial Release	Mathew Santiago

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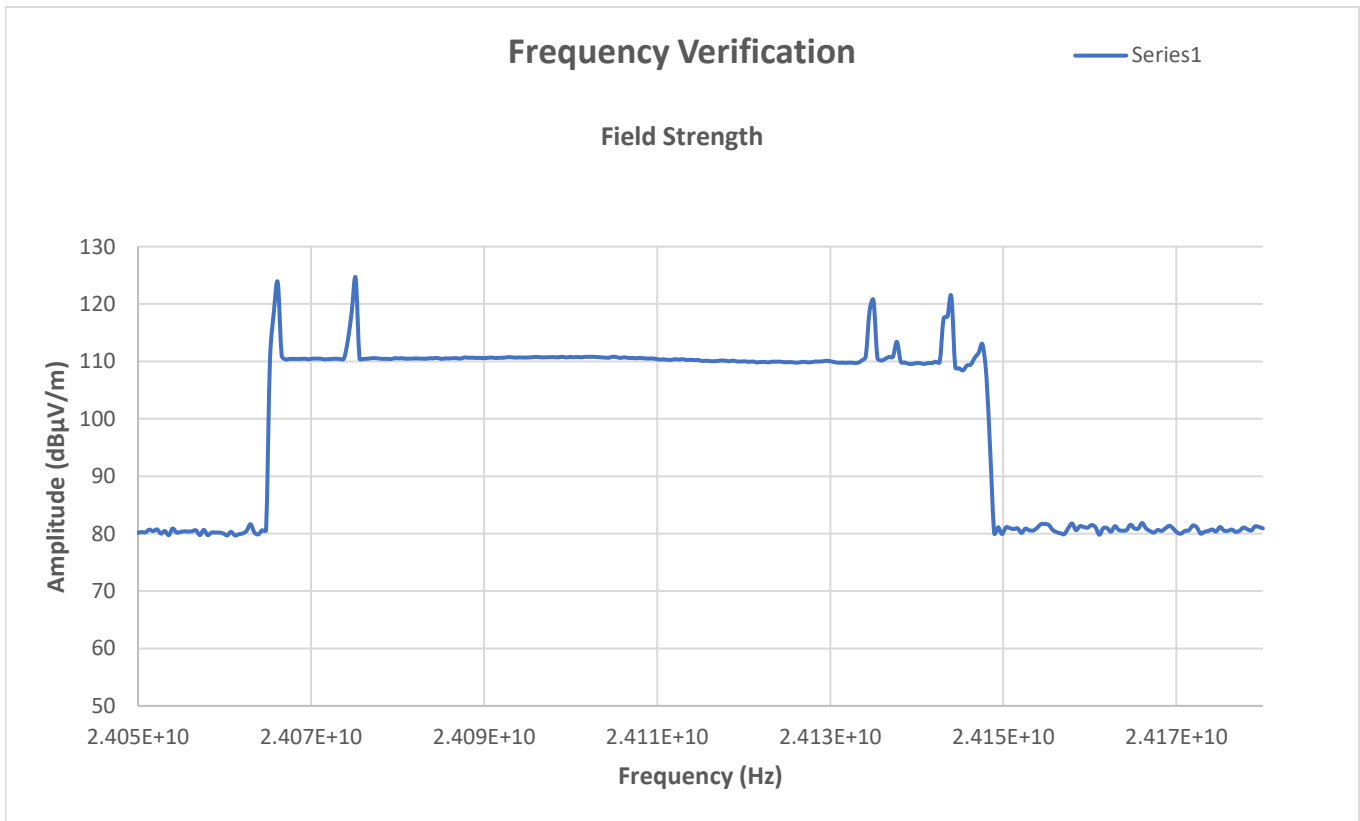
Test Setup Diagram



Test Equipment Utilized

Description	Manufacturer	Model #	Serial #	Asset #	Cal. Due Date
EMC Analyzer	Agilent	E7405	US40240238	EB046	1/29/2026
DRG Horn Antenna	ETS Lindgren	3116	00026390	EE017	5/21/2026
Pre-Amplifier	Keystone Compliance	PA-1	0002	EG003	6/30/2026
Turntable Controller	EMCO	1061.2.013	9401-1717	EI009	UWCE

Frequency Measurements:



Frequency Verification					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBµV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	124.52	84.7 +/- 4.8	PASS

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX00048E6B**

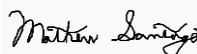
**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 31, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Applus+ Keystone
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX00048E6B**

Date of Issue: January 31, 2025

This speed measuring device has been tested and verified to be functioning in accordance with the manufacture’s specifications.

The frequency measurements performed and reported within this report demonstrate that the SmartMicro UMRR-11 T44 radar system has an accuracy of less than or equal to 1 mph up to 100 mph and 1% accuracy thereafter up to 199 mph maximum.

FSK Frequency Set 1					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBμV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	124.52	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Test Report**

Model: UMRR-11 T44

**Part Number / Serial Number:
0X000461A7**

**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 31, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Applus + Keystone
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

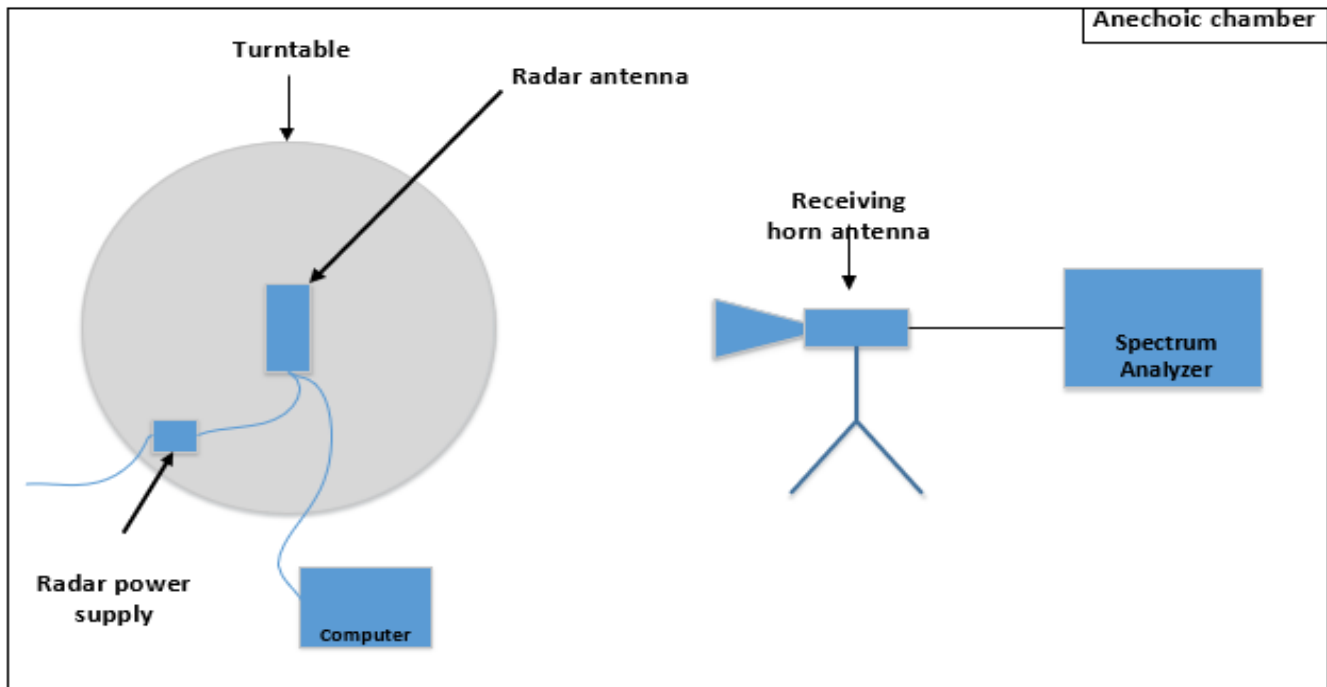
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Revision	Date	Description	Revised By
N/C	#####	Initial Release	Mathew Santiago

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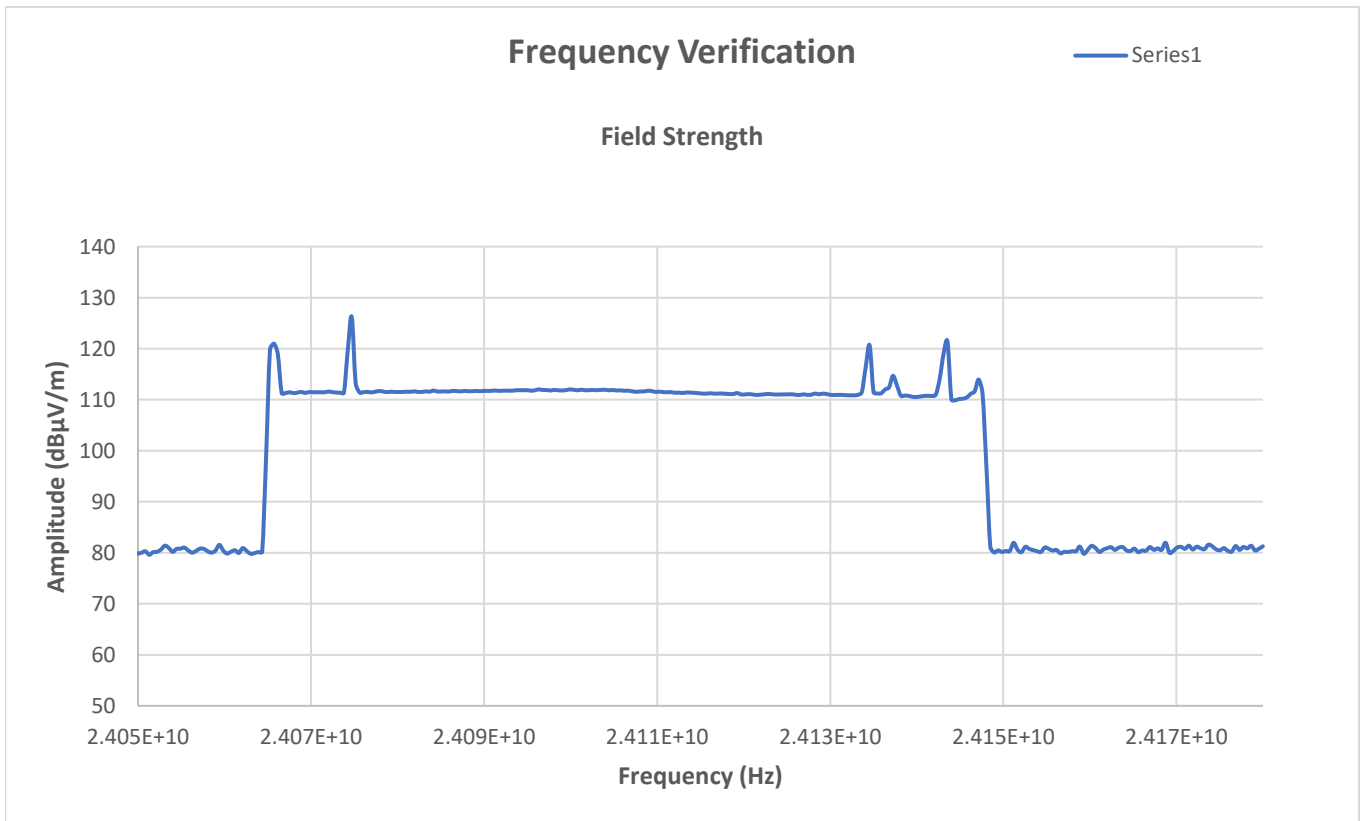
Test Setup Diagram



Test Equipment Utilized

Description	Manufacturer	Model #	Serial #	Asset #	Cal. Due Date
EMC Analyzer	Agilent	E7405	US40240238	EB046	1/29/2026
DRG Horn Antenna	ETS Lindgren	3116	00026390	EE017	5/21/2026
Pre-Amplifier	Keystone Compliance	PA-1	0002	EG003	6/30/2026
Turntable Controller	EMCO	1061.2.013	9401-1717	EI009	UWCE

Frequency Measurements:



Frequency Verification					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBµV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.106	82.4	126.20	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
0X000461A7**

**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 31, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Applus+ Keystone
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

Part Number / Serial Number:

OX000461A7

Date of Issue: January 31, 2025

This speed measuring device has been tested and verified to be functioning in accordance with the manufacture's specifications.

The frequency measurements performed and reported within this report demonstrate that the SmartMicro UMRR-11 T44 radar system has an accuracy of less than or equal to 1 mph up to 100 mph and 1% accuracy thereafter up to 199 mph maximum.

FSK Frequency Set 1					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBμV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.106	82.4	126.20	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Test Report**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX000489ED**

**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 31, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Applus + Keystone
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

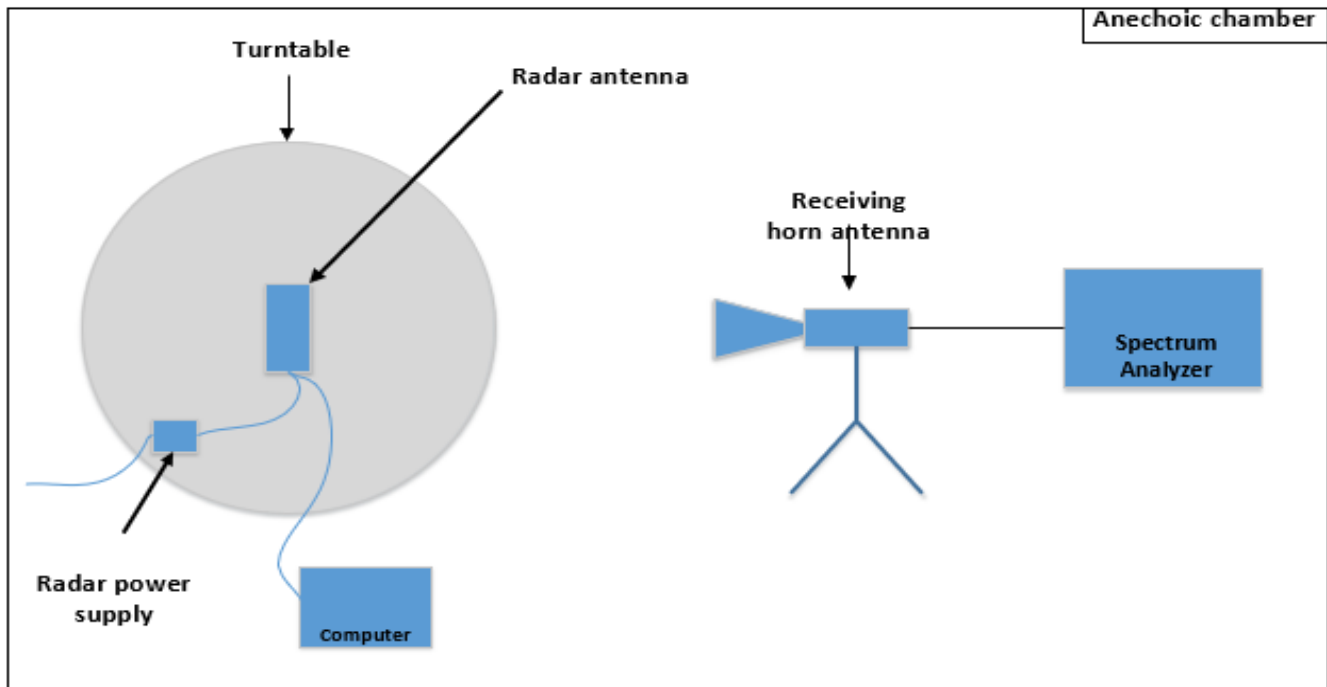
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Revision	Date	Description	Revised By
N/C	#####	Initial Release	Mathew Santiago

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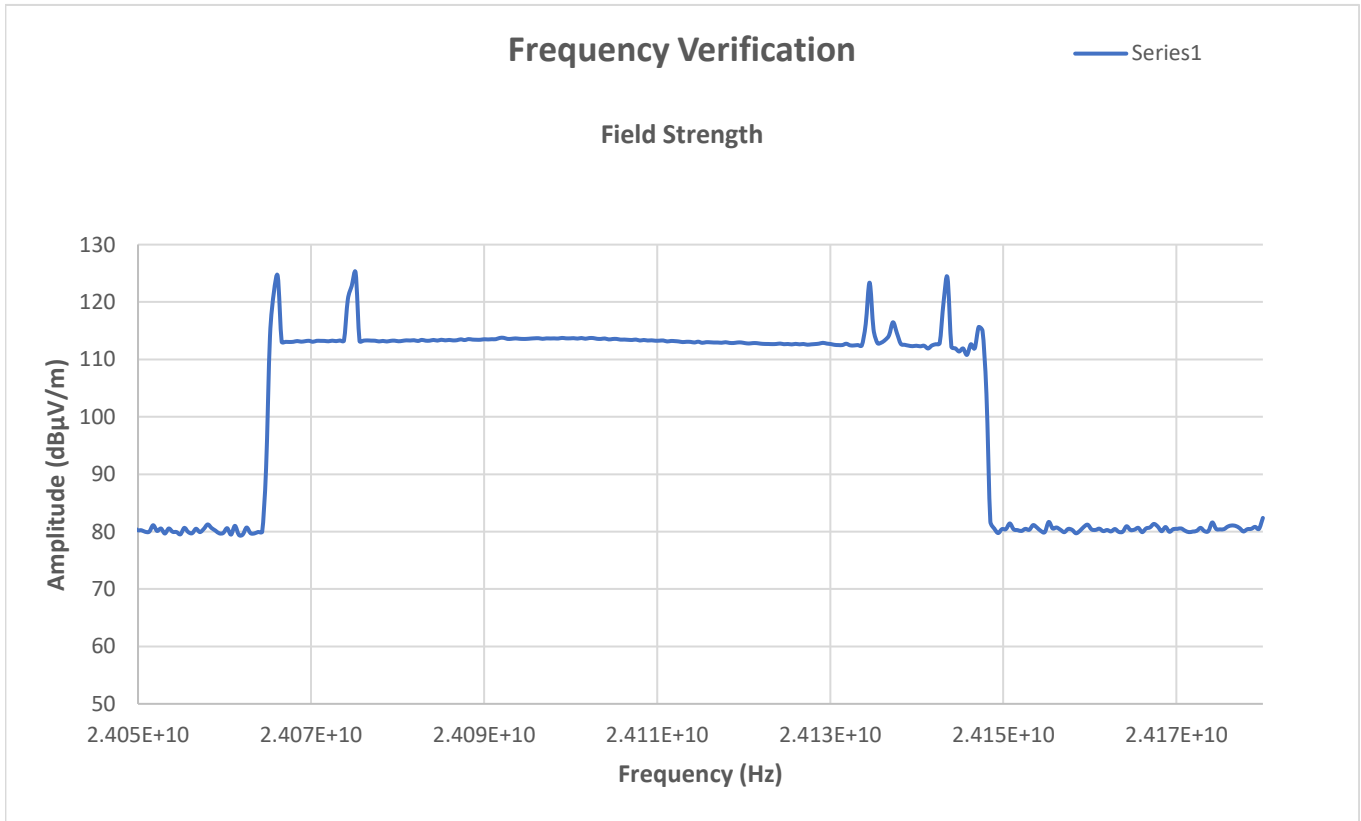
Test Setup Diagram



Test Equipment Utilized

Description	Manufacturer	Model #	Serial #	Asset #	Cal. Due Date
EMC Analyzer	Agilent	E7405	US40240238	EB046	1/29/2026
DRG Horn Antenna	ETS Lindgren	3116	00026390	EE017	5/21/2026
Pre-Amplifier	Keystone Compliance	PA-1	0002	EG003	6/30/2026
Turntable Controller	EMCO	1061.2.013	9401-1717	EI009	UWCE

Frequency Measurements:



Frequency Verification					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBµV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	125.09	84.7 +/- 4.8	PASS

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
0X000489ED**

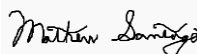
**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 31, 2025

Owner of EUT: **Verra Mobility**
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: **Engineering Department**
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Applus+ Keystone
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

Part Number / Serial Number:

OX000489ED

Date of Issue: January 31, 2025

This speed measuring device has been tested and verified to be functioning in accordance with the manufacture’s specifications.

The frequency measurements performed and reported within this report demonstrate that the SmartMicro UMRR-11 T44 radar system has an accuracy of less than or equal to 1 mph up to 100 mph and 1% accuracy thereafter up to 199 mph maximum.

FSK Frequency Set 1					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBμV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	125.09	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Test Report**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX0004884C**

**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 30, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Applus + Keystone
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

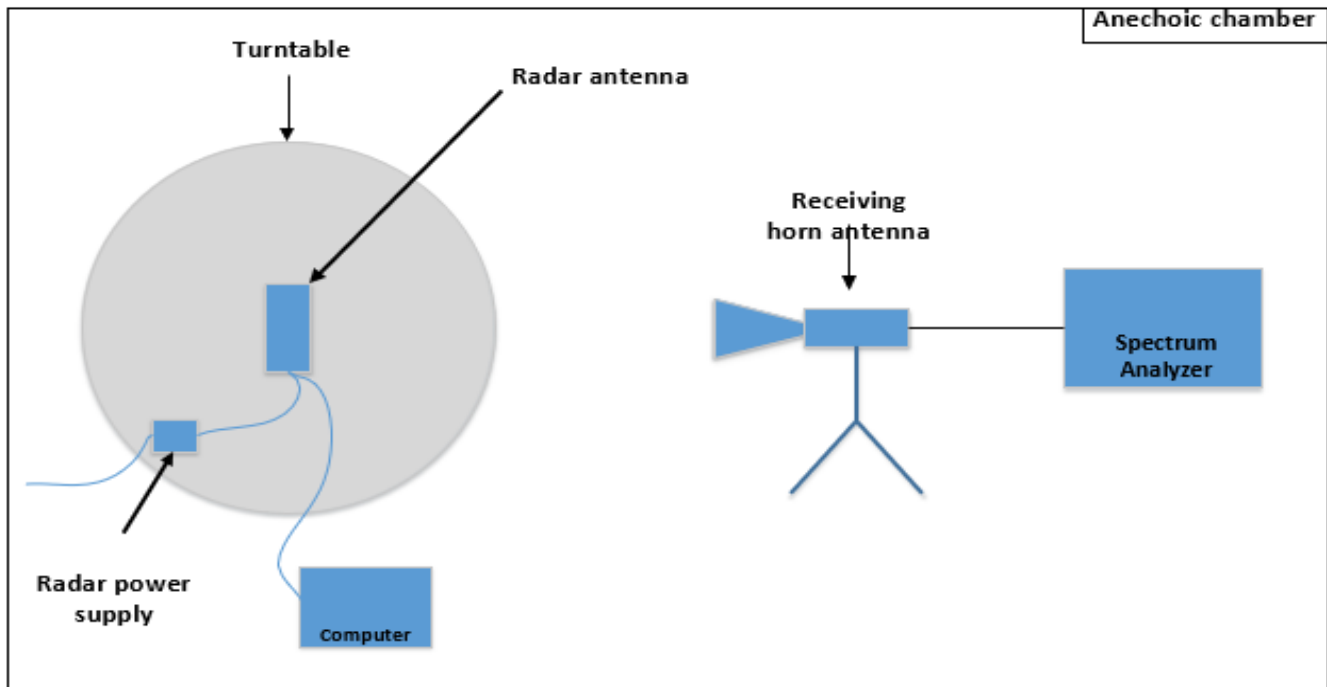
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Revision	Date	Description	Revised By
N/C	#####	Initial Release	Mathew Santiago

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Test Equipment Utilized.....	4
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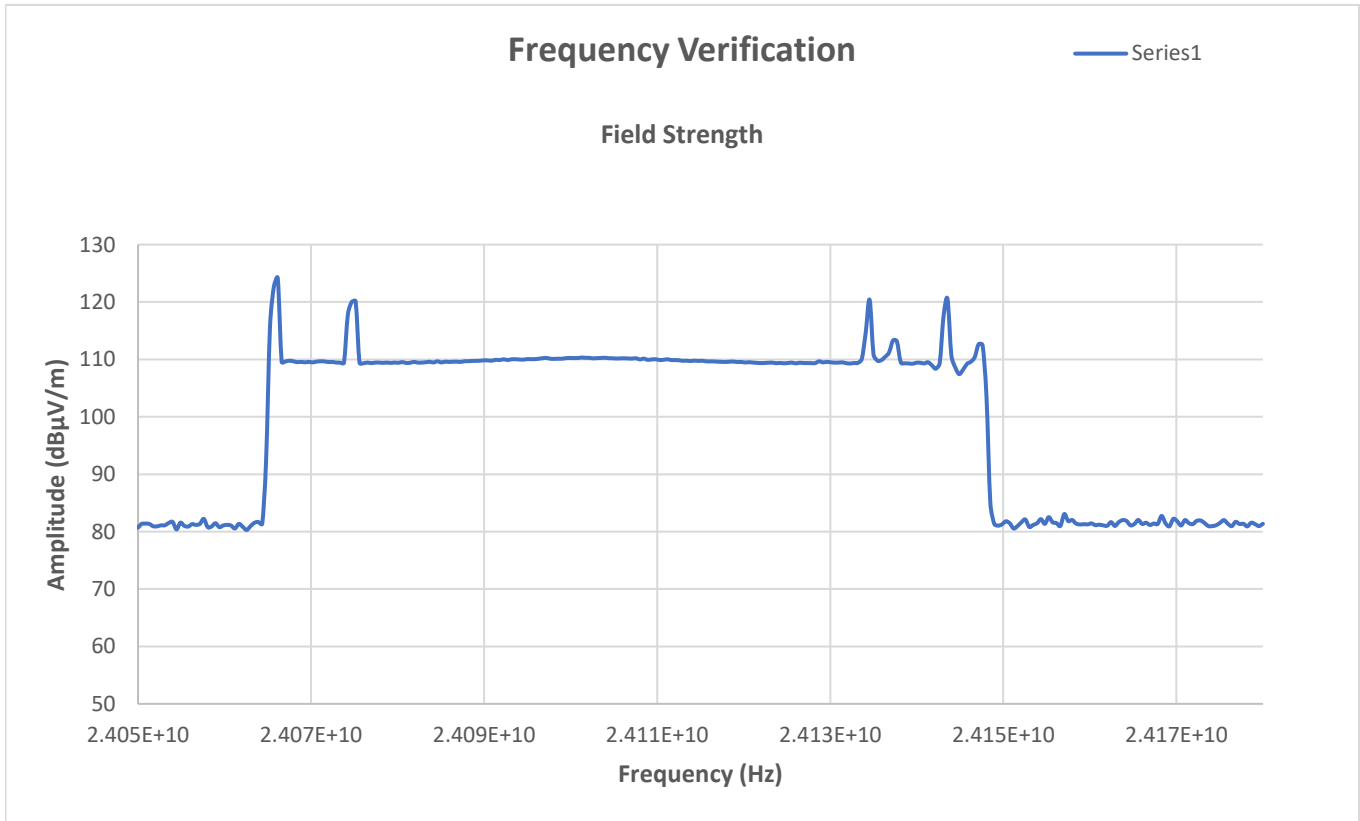
Test Setup Diagram



Test Equipment Utilized

Description	Manufacturer	Model #	Serial #	Asset #	Cal. Due Date
EMC Analyzer	Agilent	E7405	US40240238	EB046	1/29/2026
DRG Horn Antenna	ETS Lindgren	3116	00026390	EE017	5/21/2026
Pre-Amplifier	Keystone Compliance	PA-1	0002	EG003	6/30/2026
Turntable Controller	EMCO	1061.2.013	9401-1717	EI009	UWCE

Frequency Measurements:



Frequency Verification					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBµV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	124.13	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX0004884C**

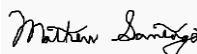
**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 30, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Applus+ Keystone
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX0004884C**

Date of Issue: January 30, 2025

This speed measuring device has been tested and verified to be functioning in accordance with the manufacture’s specifications.

The frequency measurements performed and reported within this report demonstrate that the SmartMicro UMRR-11 T44 radar system has an accuracy of less than or equal to 1 mph up to 100 mph and 1% accuracy thereafter up to 199 mph maximum.

FSK Frequency Set 1					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBμV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	124.13	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Test Report**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX00048850**

**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 30, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Applus + Keystone
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

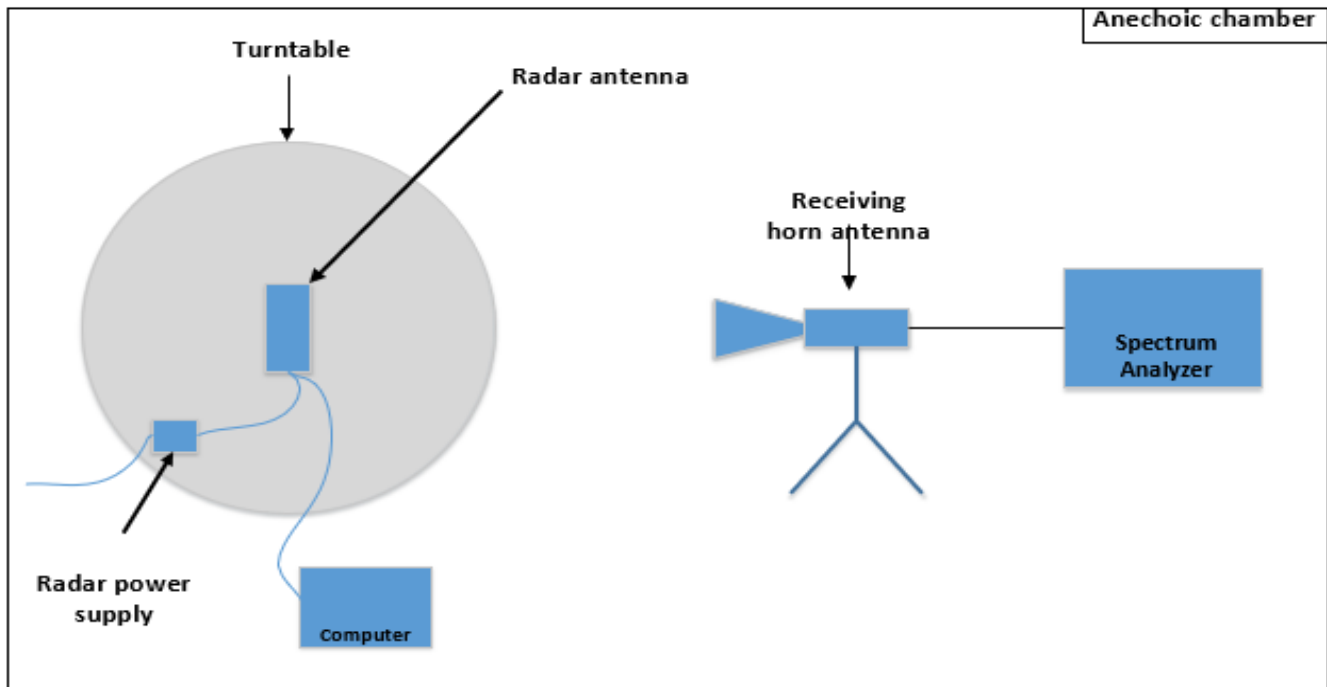
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Revision	Date	Description	Revised By
N/C	#####	Initial Release	Mathew Santiago

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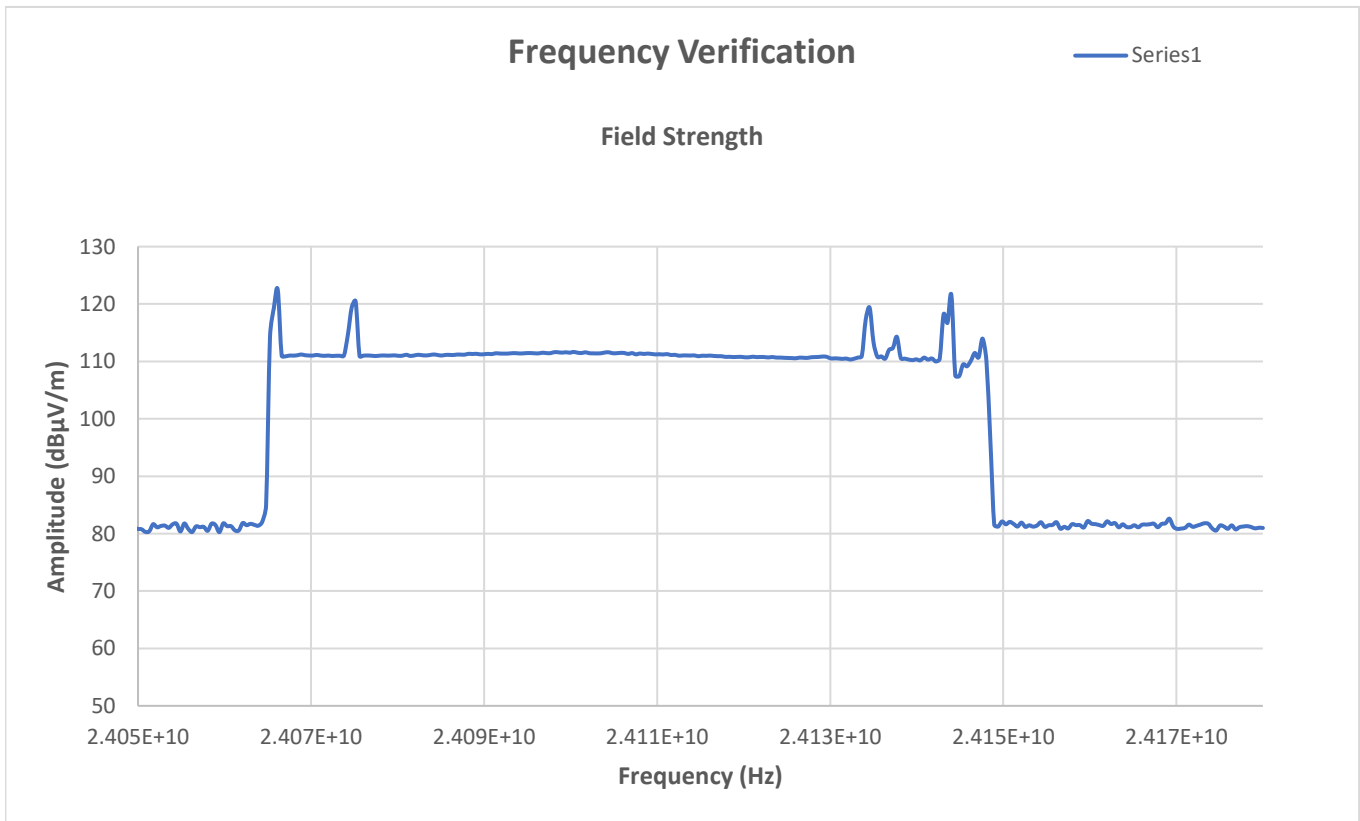
Test Setup Diagram



Test Equipment Utilized

Description	Manufacturer	Model #	Serial #	Asset #	Cal. Due Date
EMC Analyzer	Agilent	E7405	US40240238	EB046	1/29/2026
DRG Horn Antenna	ETS Lindgren	3116	00026390	EE017	5/21/2026
Pre-Amplifier	Keystone Compliance	PA-1	0002	EG003	6/30/2026
Turntable Controller	EMCO	1061.2.013	9401-1717	EI009	UWCE

Frequency Measurements:



Frequency Verification					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBµV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	122.46	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX00048850**

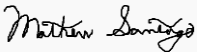
**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 30, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

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Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX00048850**

Date of Issue: January 30, 2025

This speed measuring device has been tested and verified to be functioning in accordance with the manufacture’s specifications.

The frequency measurements performed and reported within this report demonstrate that the SmartMicro UMRR-11 T44 radar system has an accuracy of less than or equal to 1 mph up to 100 mph and 1% accuracy thereafter up to 199 mph maximum.

FSK Frequency Set 1					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBμV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	122.46	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Test Report**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX00048853**

**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 30, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Applus + Keystone
Address	131 North Columbus Innerbelt
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Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

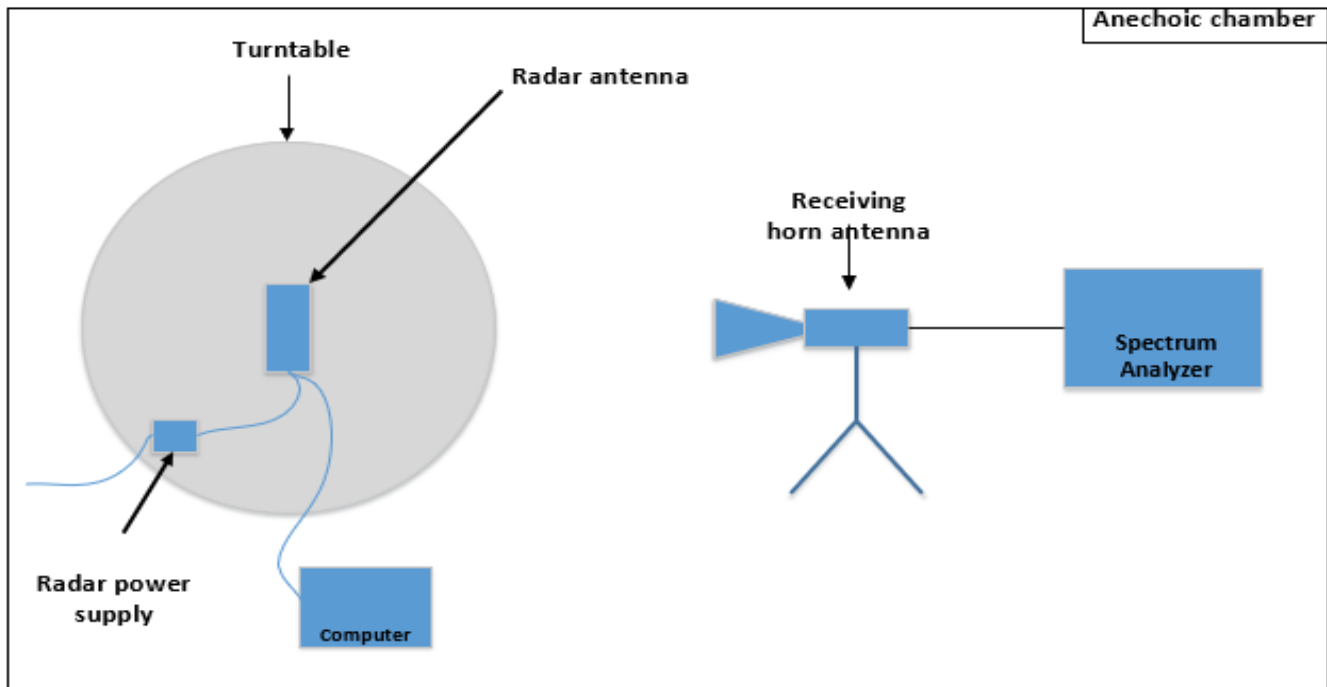
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Revision	Date	Description	Revised By
N/C	#####	Initial Release	Mathew Santiago

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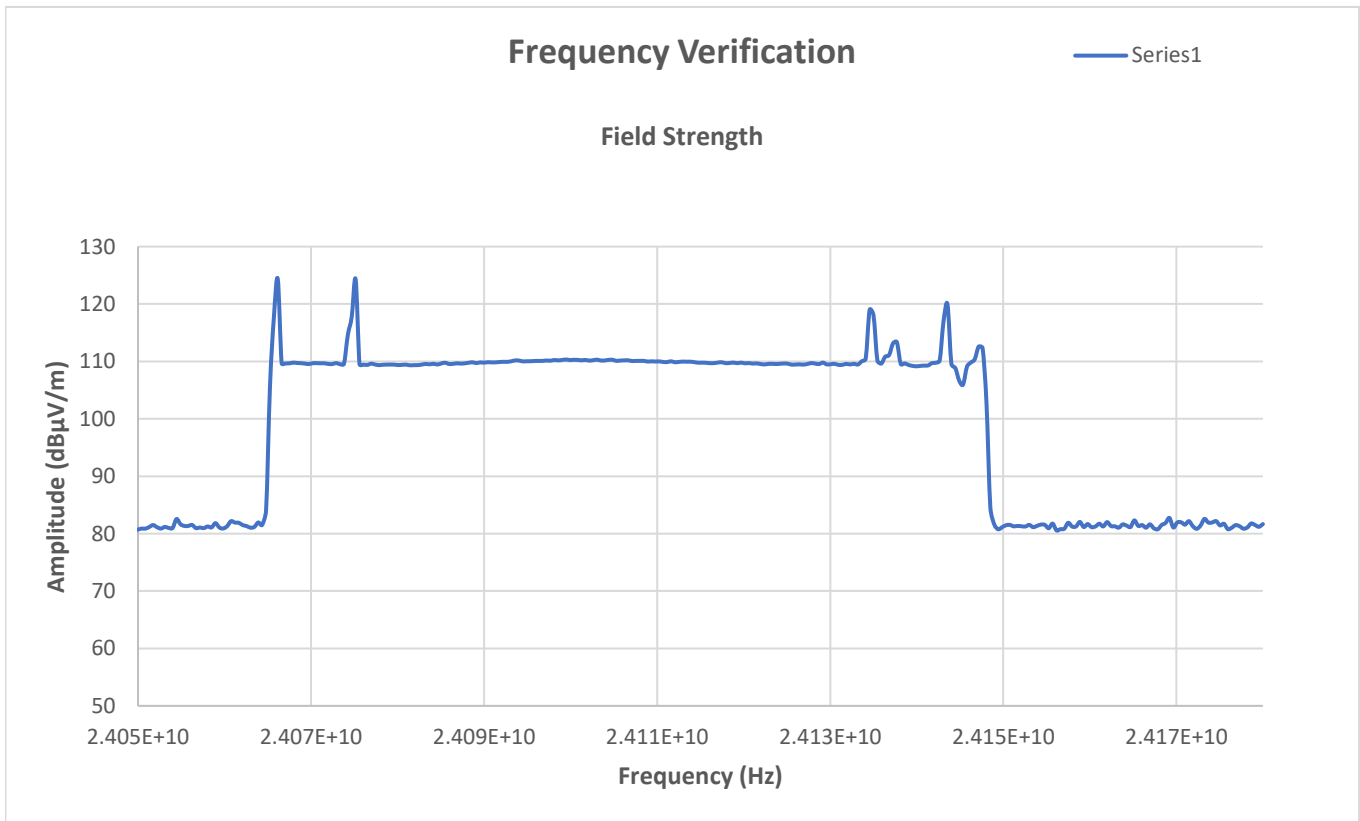
Test Setup Diagram



Test Equipment Utilized

Description	Manufacturer	Model #	Serial #	Asset #	Cal. Due Date
EMC Analyzer	Agilent	E7405	US40240238	EB046	1/29/2026
DRG Horn Antenna	ETS Lindgren	3116	00026390	EE017	5/21/2026
Pre-Amplifier	Keystone Compliance	PA-1	0002	EG003	6/30/2026
Turntable Controller	EMCO	1061.2.013	9401-1717	EI009	UWCE

Frequency Measurements:



Frequency Verification					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBµV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	124.35	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX00048853**


**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 30, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Applus+ Keystone
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Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX00048853**

Date of Issue: January 30, 2025

This speed measuring device has been tested and verified to be functioning in accordance with the manufacture’s specifications.

The frequency measurements performed and reported within this report demonstrate that the SmartMicro UMRR-11 T44 radar system has an accuracy of less than or equal to 1 mph up to 100 mph and 1% accuracy thereafter up to 199 mph maximum.

FSK Frequency Set 1					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBμV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	124.35	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Test Report**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX000488E4**

**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 30, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Applus + Keystone
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

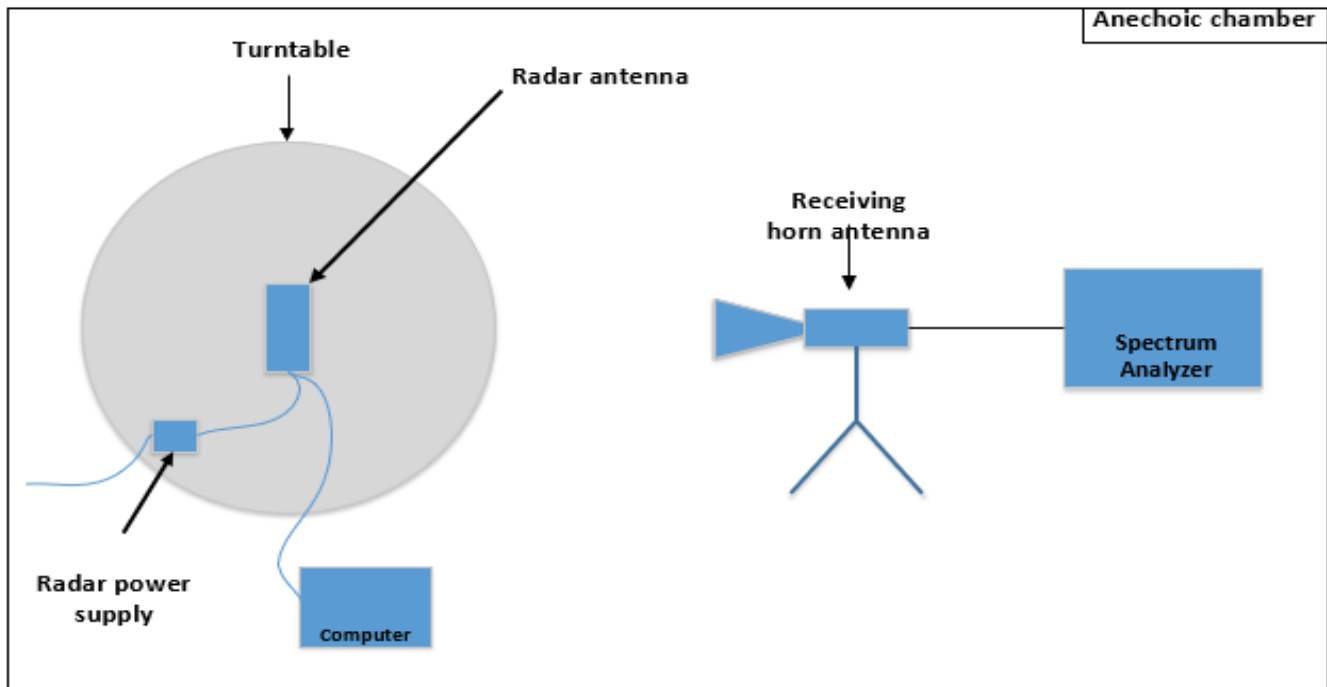
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Revision	Date	Description	Revised By
N/C	#####	Initial Release	Mathew Santiago

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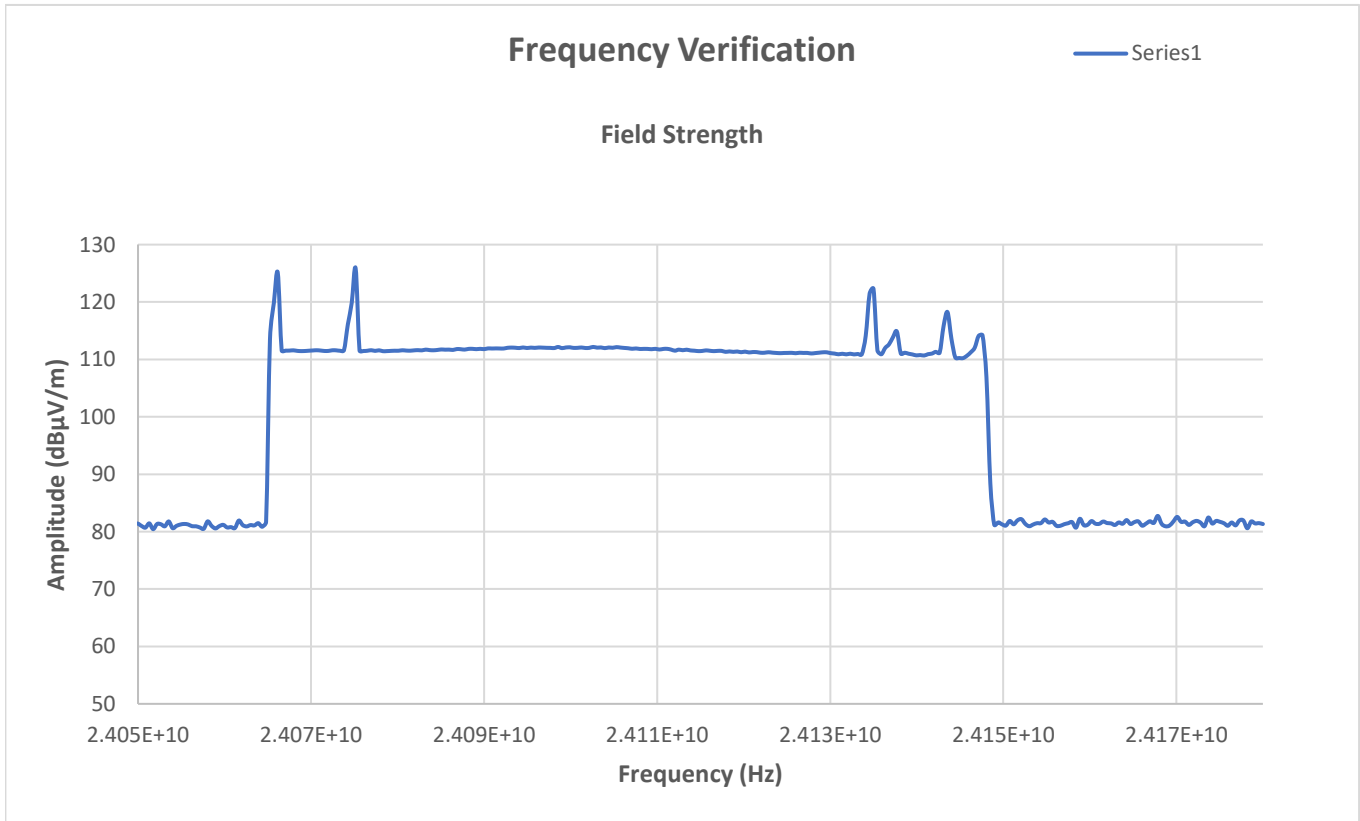
Test Setup Diagram



Test Equipment Utilized

Description	Manufacturer	Model #	Serial #	Asset #	Cal. Due Date
EMC Analyzer	Agilent	E7405	US40240238	EB046	1/29/2026
DRG Horn Antenna	ETS Lindgren	3116	00026390	EE017	5/21/2026
Pre-Amplifier	Keystone Compliance	PA-1	0002	EG003	6/30/2026
Turntable Controller	EMCO	1061.2.013	9401-1717	EI009	UWCE

Frequency Measurements:



Frequency Verification					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBµV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	125.85	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX000488E4**

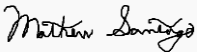
**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 30, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

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Address	131 North Columbus Innerbelt
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Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX000488E4**

Date of Issue: January 30, 2025

This speed measuring device has been tested and verified to be functioning in accordance with the manufacture’s specifications.

The frequency measurements performed and reported within this report demonstrate that the SmartMicro UMRR-11 T44 radar system has an accuracy of less than or equal to 1 mph up to 100 mph and 1% accuracy thereafter up to 199 mph maximum.

FSK Frequency Set 1					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBμV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	125.85	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Test Report**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX00048947**

**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 31, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Applus + Keystone
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

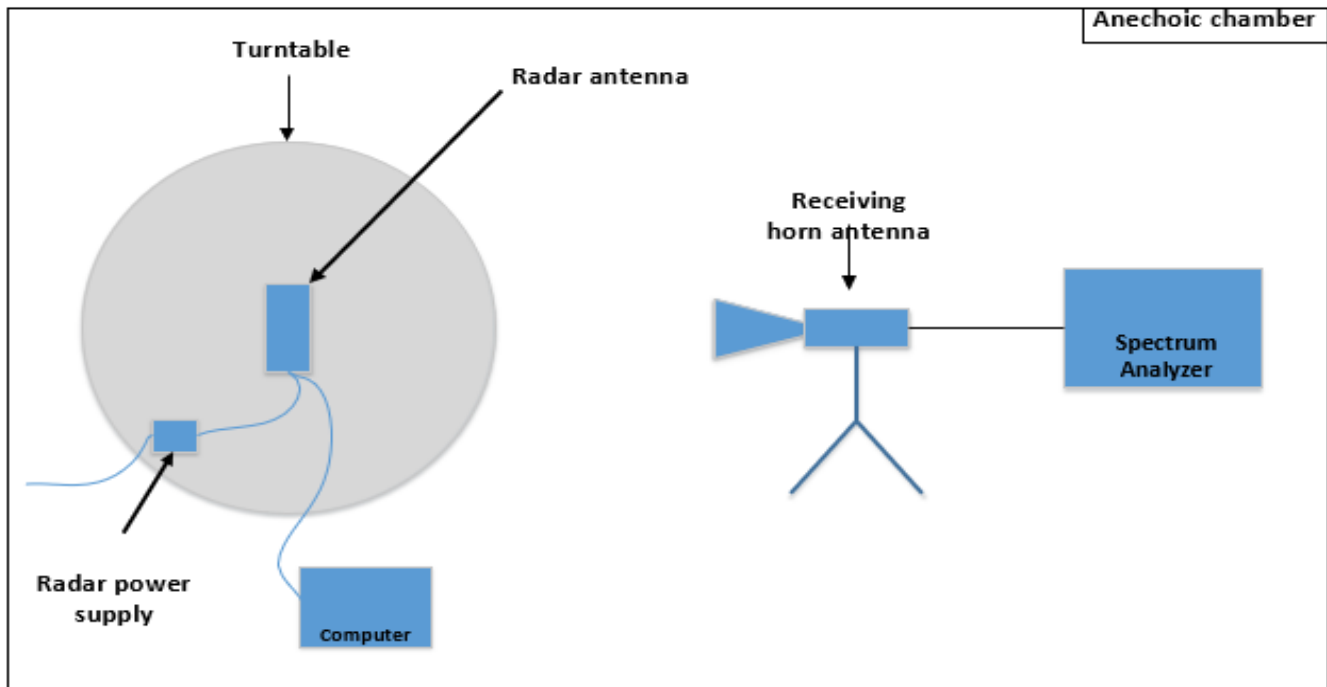
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Revision	Date	Description	Revised By
N/C	#####	Initial Release	Mathew Santiago

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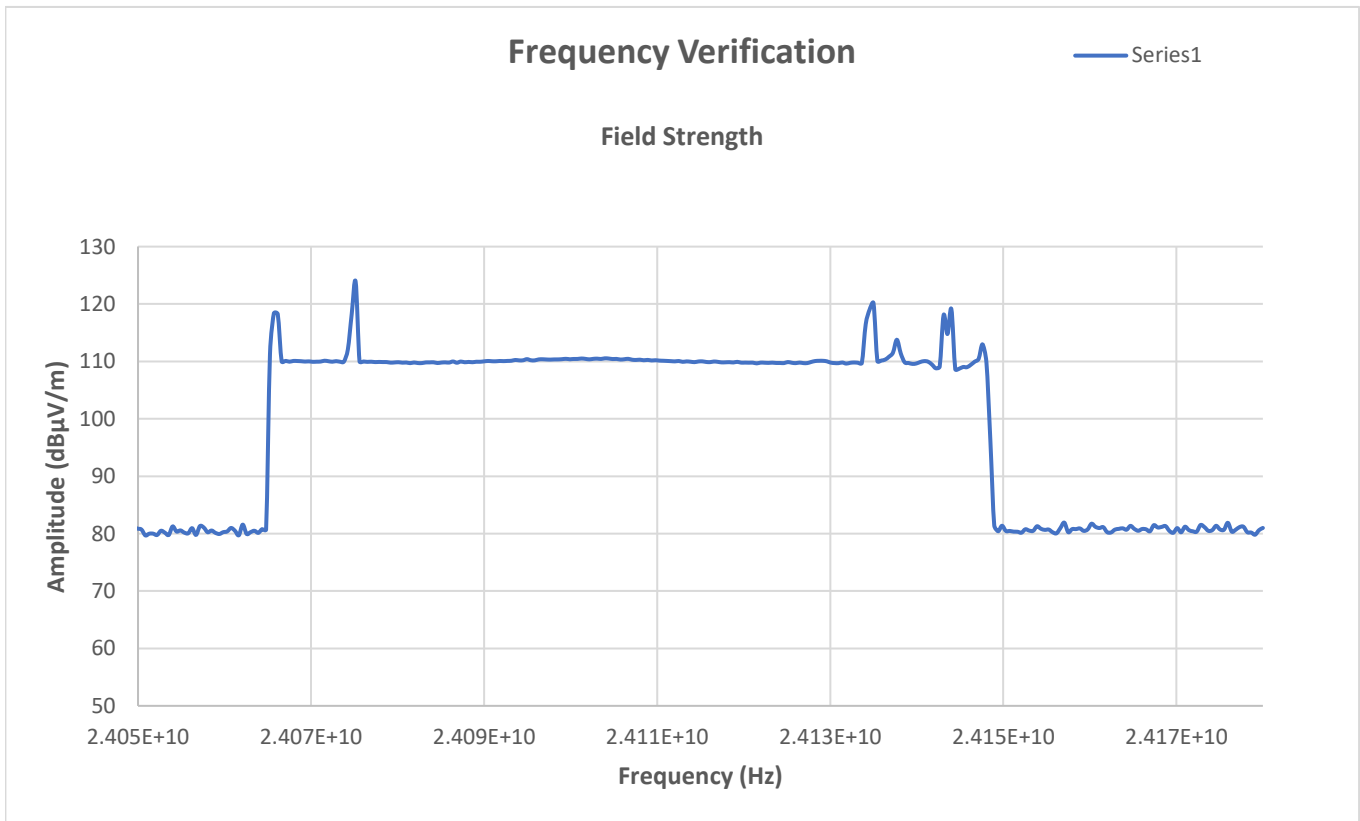
Test Setup Diagram



Test Equipment Utilized

Description	Manufacturer	Model #	Serial #	Asset #	Cal. Due Date
EMC Analyzer	Agilent	E7405	US40240238	EB046	1/29/2026
DRG Horn Antenna	ETS Lindgren	3116	00026390	EE017	5/21/2026
Pre-Amplifier	Keystone Compliance	PA-1	0002	EG003	6/30/2026
Turntable Controller	EMCO	1061.2.013	9401-1717	EI009	UWCE

Frequency Measurements:



Frequency Verification					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBµV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	123.89	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
0X00048947**

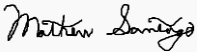
**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 31, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Applus+ Keystone
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

Part Number / Serial Number:

0X00048947

Date of Issue: January 31, 2025

This speed measuring device has been tested and verified to be functioning in accordance with the manufacture's specifications.

The frequency measurements performed and reported within this report demonstrate that the SmartMicro UMRR-11 T44 radar system has an accuracy of less than or equal to 1 mph up to 100 mph and 1% accuracy thereafter up to 199 mph maximum.

FSK Frequency Set 1					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBμV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	123.89	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Test Report**

Model: UMRR-11 T44

**Part Number / Serial Number:
0X00048E6F**

**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 30, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Applus + Keystone
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

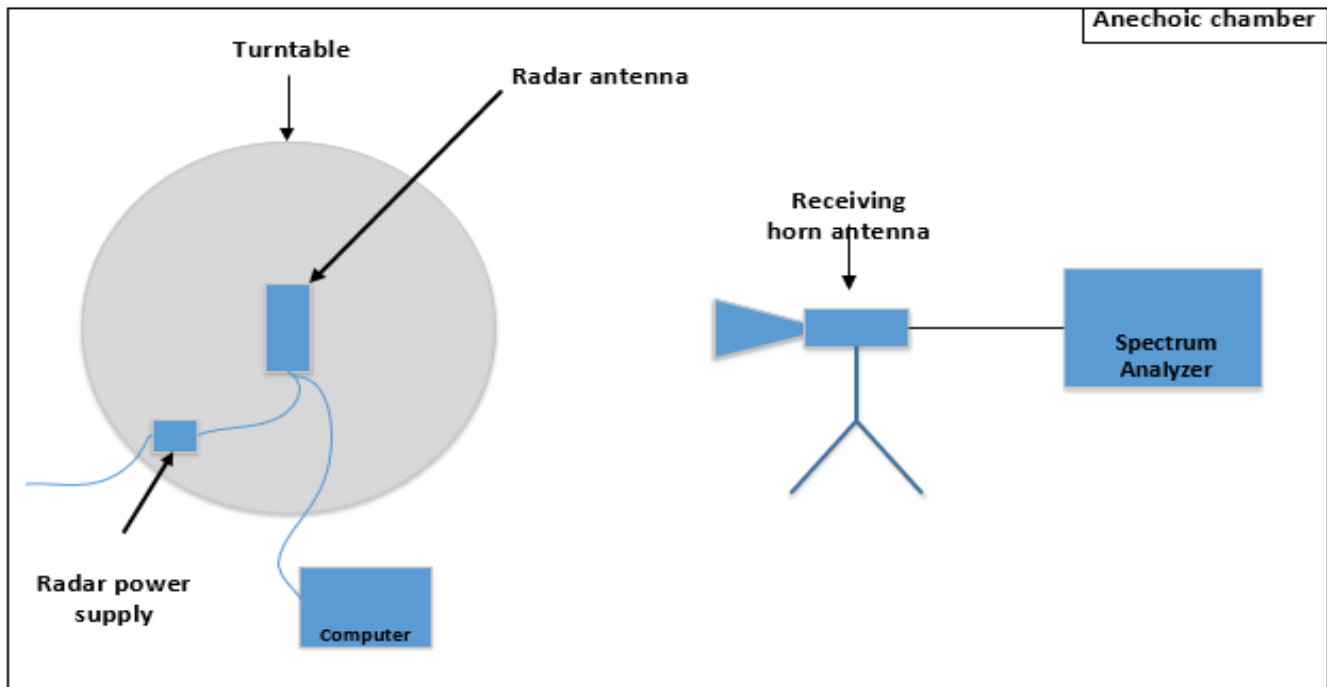
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Revision	Date	Description	Revised By
N/C	#####	Initial Release	Mathew Santiago

Contents

Test Setup Diagram.....	4
Test Equipment Utilized.....	4
Frequency Characteristics Test Results.....	5

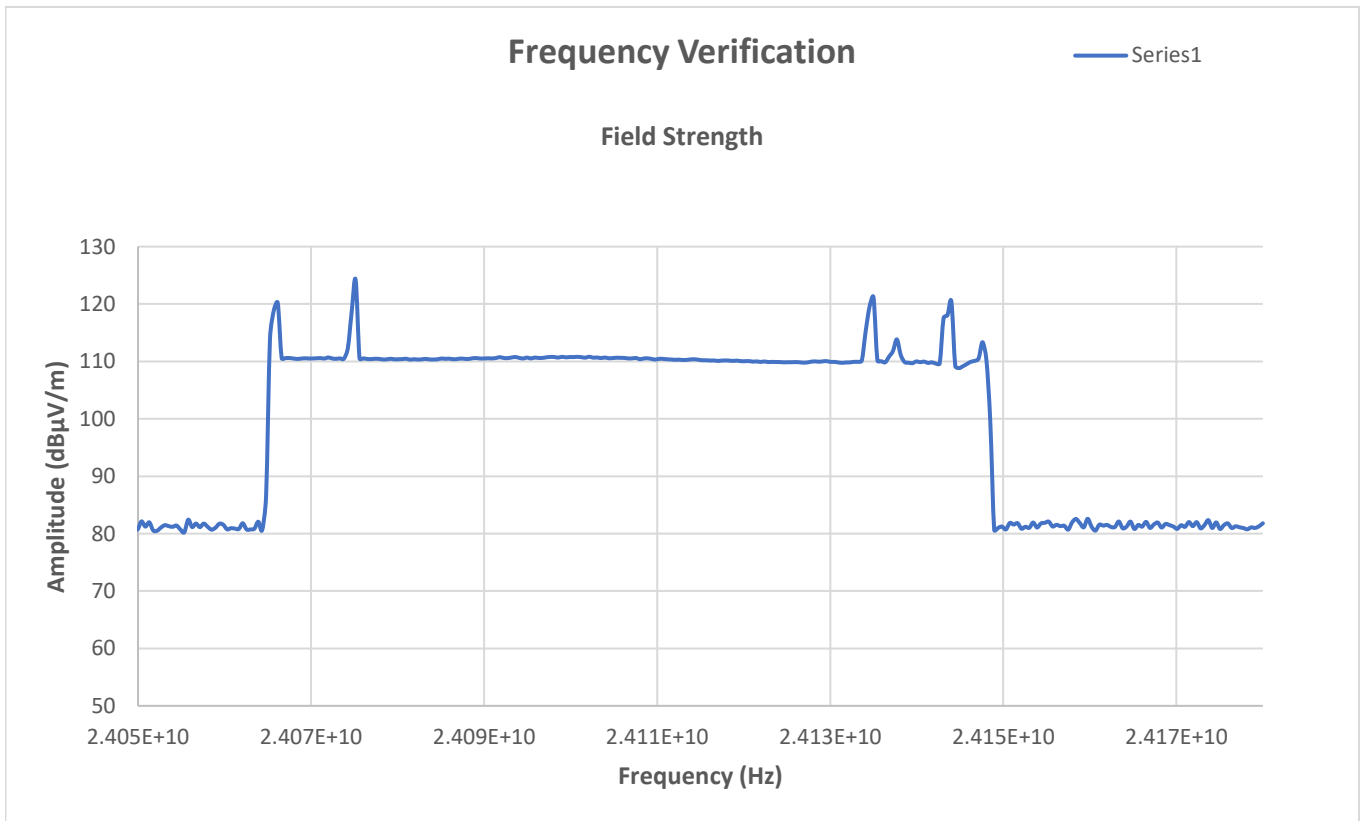
Test Setup Diagram



Test Equipment Utilized

Description	Manufacturer	Model #	Serial #	Asset #	Cal. Due Date
EMC Analyzer	Agilent	E7405	US40240238	EB046	1/29/2026
DRG Horn Antenna	ETS Lindgren	3116	00026390	EE017	5/21/2026
Pre-Amplifier	Keystone Compliance	PA-1	0002	EG003	6/30/2026
Turntable Controller	EMCO	1061.2.013	9401-1717	EI009	UWCE

Frequency Measurements:



Frequency Verification					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBµV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	124.21	84.7 +/- 4.8	PASS

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX00048E6F**

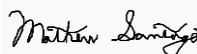
**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 30, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

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Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

Part Number / Serial Number:

OX00048E6F

Date of Issue: January 30, 2025

This speed measuring device has been tested and verified to be functioning in accordance with the manufacture’s specifications.

The frequency measurements performed and reported within this report demonstrate that the SmartMicro UMRR-11 T44 radar system has an accuracy of less than or equal to 1 mph up to 100 mph and 1% accuracy thereafter up to 199 mph maximum.

FSK Frequency Set 1					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBμV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	124.21	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Test Report**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX00048E6A**

**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 30, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
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Address	131 North Columbus Innerbelt
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Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

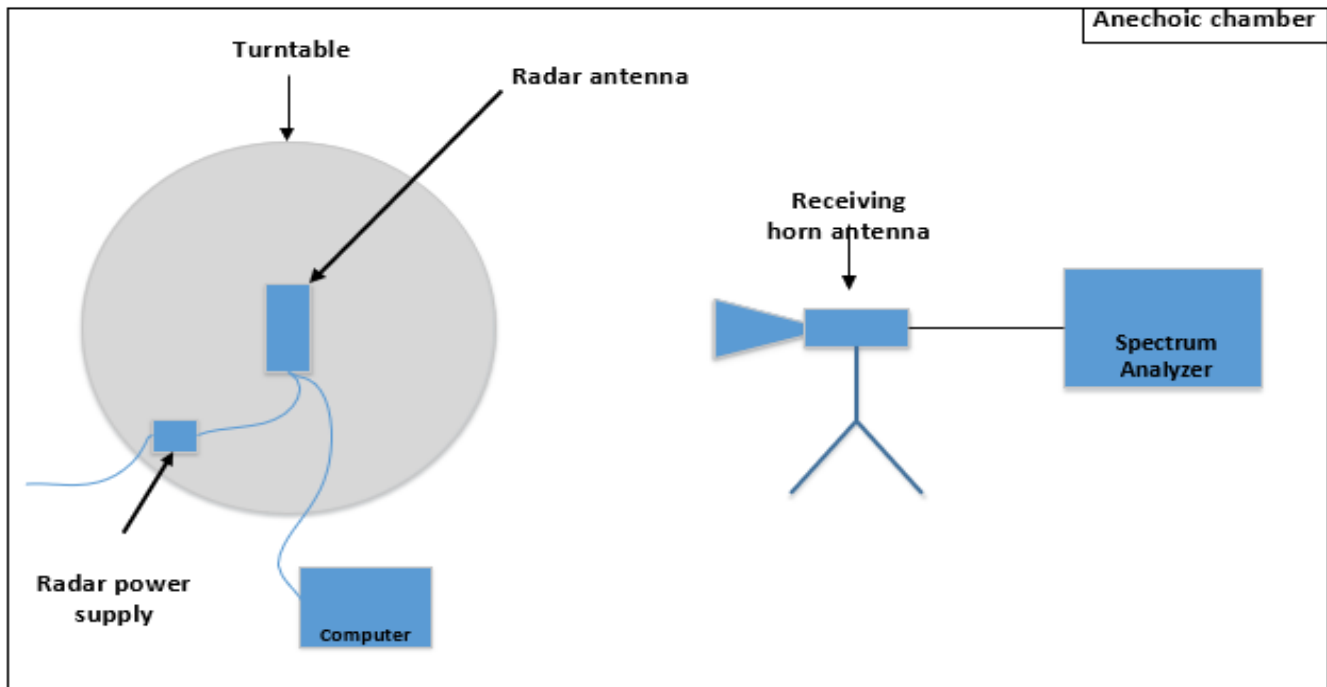
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Revision	Date	Description	Revised By
N/C	#####	Initial Release	Mathew Santiago

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Test Equipment Utilized.....	4
Frequency Characteristics Test Results.....	5

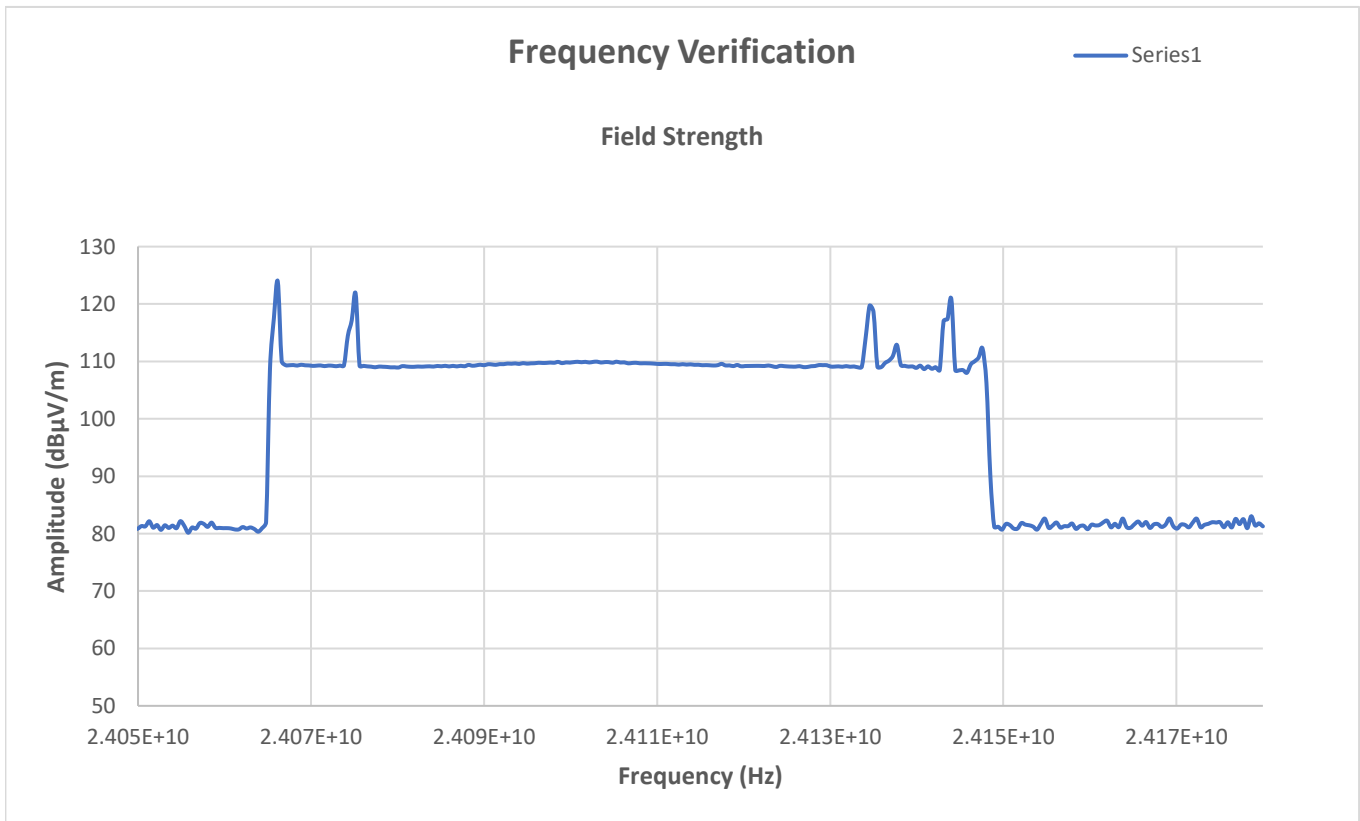
Test Setup Diagram



Test Equipment Utilized

Description	Manufacturer	Model #	Serial #	Asset #	Cal. Due Date
EMC Analyzer	Agilent	E7405	US40240238	EB046	1/29/2026
DRG Horn Antenna	ETS Lindgren	3116	00026390	EE017	5/21/2026
Pre-Amplifier	Keystone Compliance	PA-1	0002	EG003	6/30/2026
Turntable Controller	EMCO	1061.2.013	9401-1717	EI009	UWCE

Frequency Measurements:



Frequency Verification					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBµV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	123.92	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
0X00048E6A**

**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 30, 2025

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City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX00048E6A**

Date of Issue: January 30, 2025

This speed measuring device has been tested and verified to be functioning in accordance with the manufacture's specifications.

The frequency measurements performed and reported within this report demonstrate that the SmartMicro UMRR-11 T44 radar system has an accuracy of less than or equal to 1 mph up to 100 mph and 1% accuracy thereafter up to 199 mph maximum.

FSK Frequency Set 1					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBμV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	123.92	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Test Report**

Model: UMRR-11 T44

**Part Number / Serial Number:
0X0004889D**

**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 30, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Applus + Keystone
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

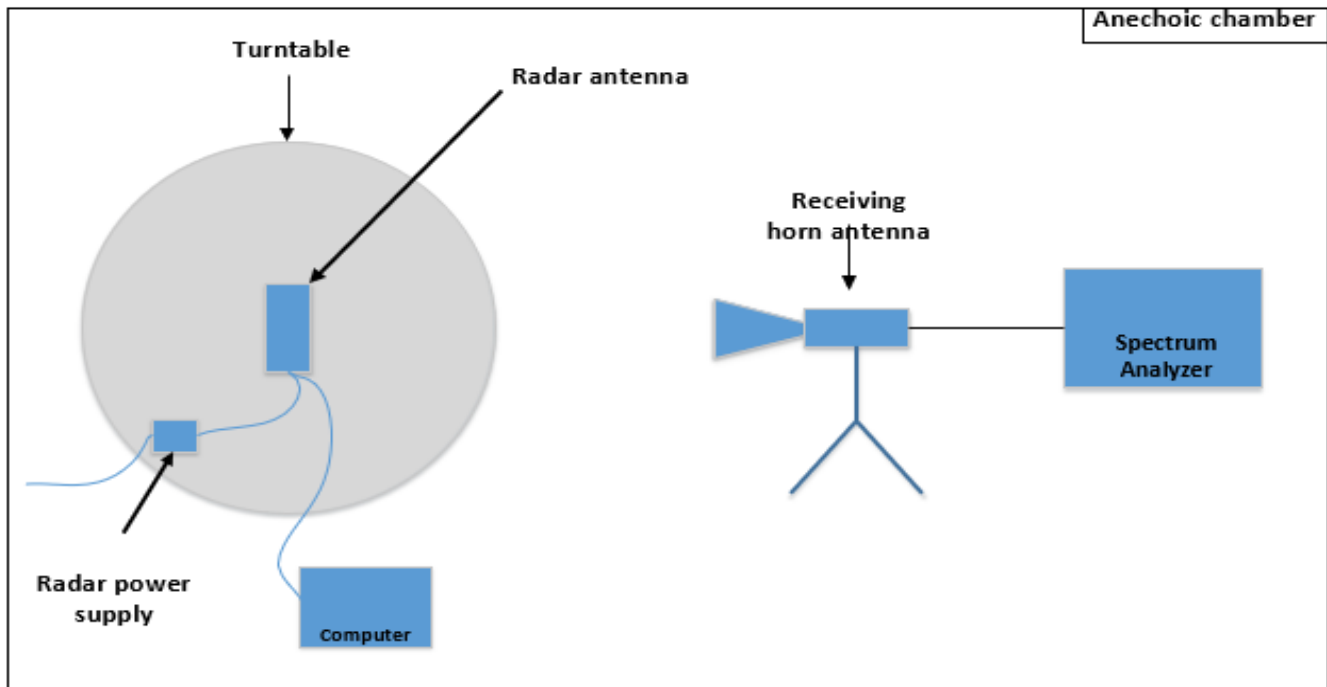
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Revision	Date	Description	Revised By
N/C	#####	Initial Release	Mathew Santiago

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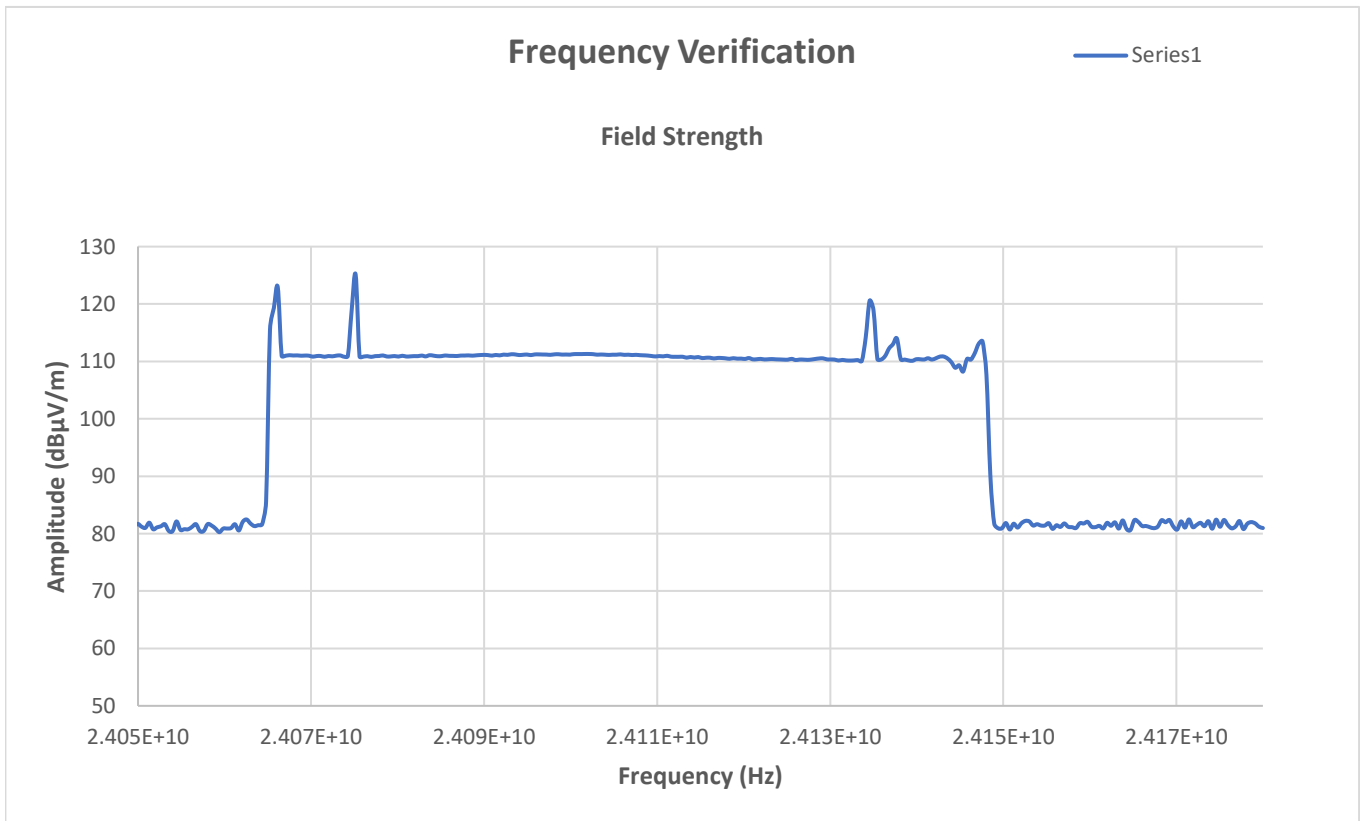
Test Setup Diagram



Test Equipment Utilized

Description	Manufacturer	Model #	Serial #	Asset #	Cal. Due Date
EMC Analyzer	Agilent	E7405	US40240238	EB046	1/29/2026
DRG Horn Antenna	ETS Lindgren	3116	00026390	EE017	5/21/2026
Pre-Amplifier	Keystone Compliance	PA-1	0002	EG003	6/30/2026
Turntable Controller	EMCO	1061.2.013	9401-1717	EI009	UWCE

Frequency Measurements:



Frequency Verification					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBµV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	125.12	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
0X0004889D**


**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 30, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Applus+ Keystone
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX0004889D**

Date of Issue: January 30, 2025

This speed measuring device has been tested and verified to be functioning in accordance with the manufacture’s specifications.

The frequency measurements performed and reported within this report demonstrate that the SmartMicro UMRR-11 T44 radar system has an accuracy of less than or equal to 1 mph up to 100 mph and 1% accuracy thereafter up to 199 mph maximum.

FSK Frequency Set 1					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBμV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	125.12	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Test Report**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX00048E65**

**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 30, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Applus + Keystone
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

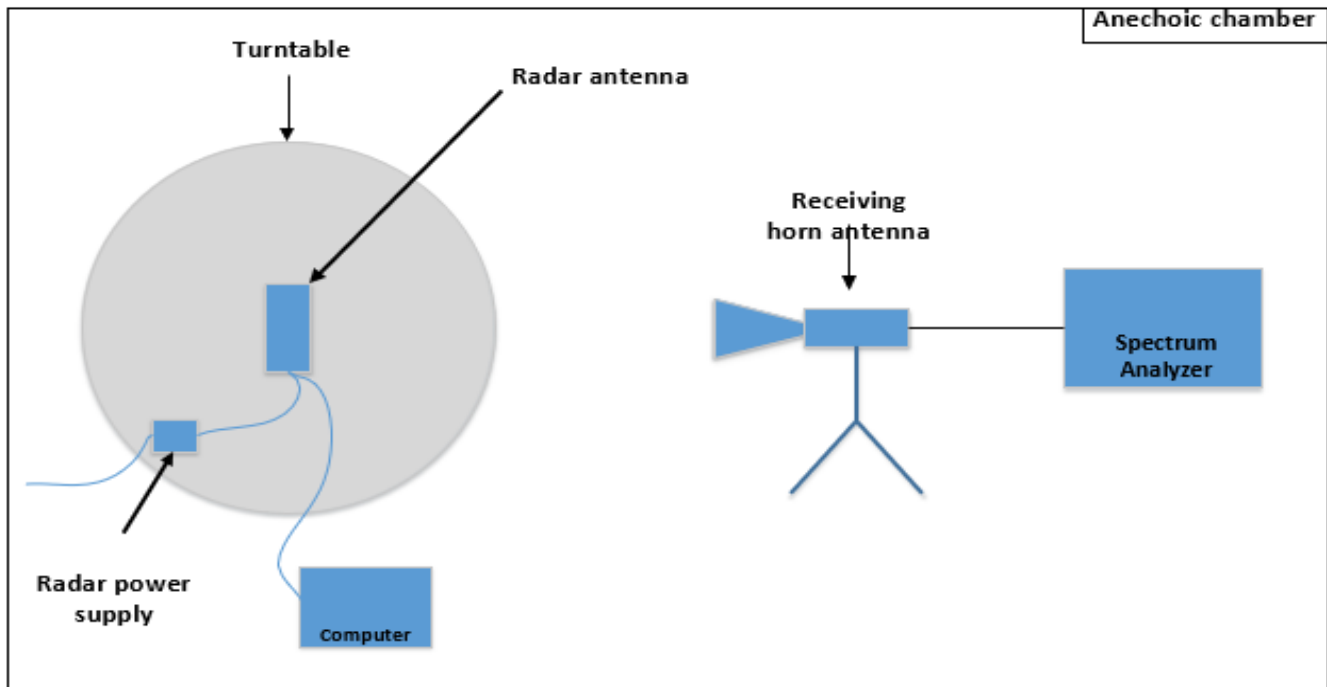
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Revision	Date	Description	Revised By
N/C	#####	Initial Release	Mathew Santiago

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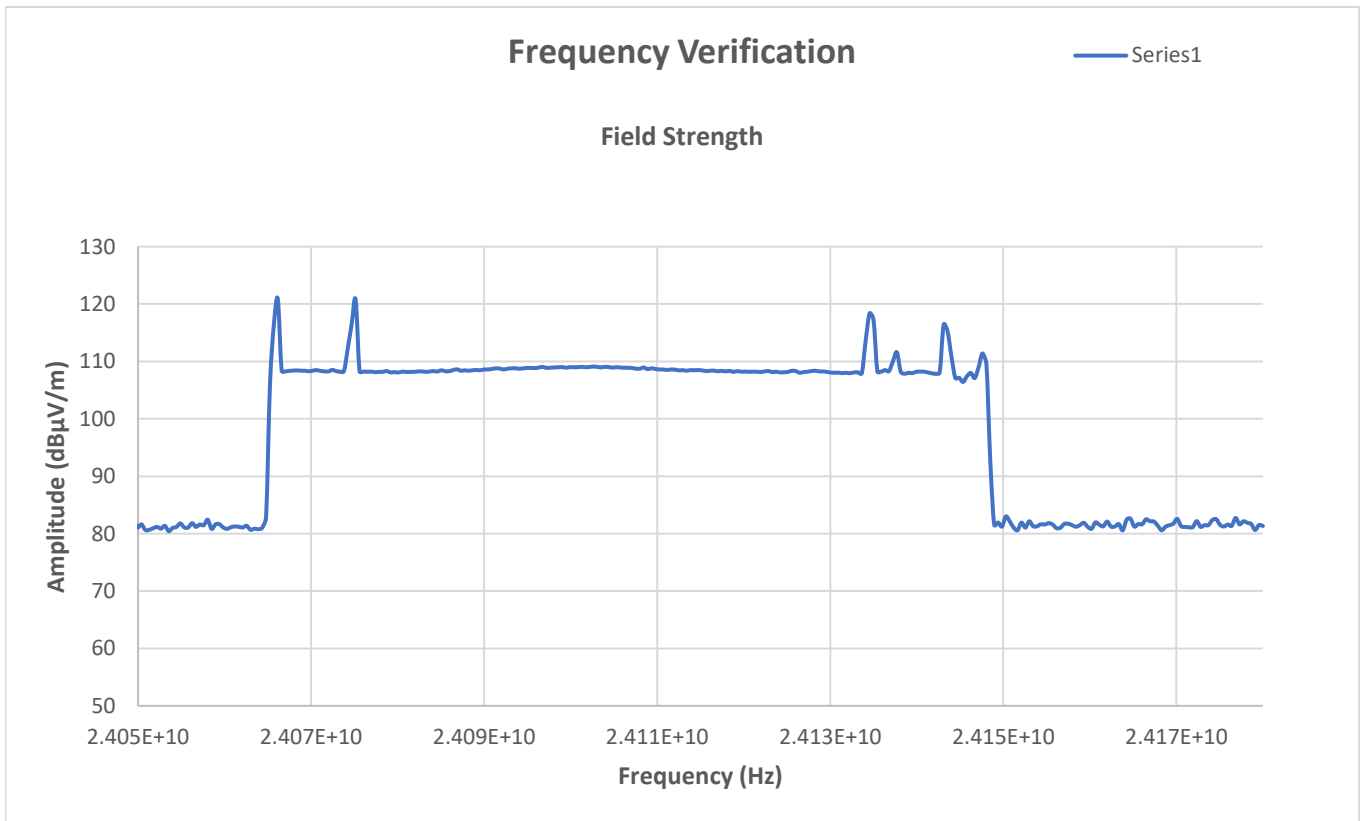
Test Setup Diagram



Test Equipment Utilized

Description	Manufacturer	Model #	Serial #	Asset #	Cal. Due Date
EMC Analyzer	Agilent	E7405	US40240238	EB046	1/29/2026
DRG Horn Antenna	ETS Lindgren	3116	00026390	EE017	5/21/2026
Pre-Amplifier	Keystone Compliance	PA-1	0002	EG003	6/30/2026
Turntable Controller	EMCO	1061.2.013	9401-1717	EI009	UWCE

Frequency Measurements:



Frequency Verification					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBµV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	120.90	84.7 +/- 4.8	PASS

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX00048E65**

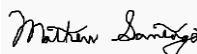
**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 30, 2025

Owner of EUT: **Verra Mobility**
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: **Engineering Department**
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Applus+ Keystone
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX00048E65**

Date of Issue: January 30, 2025

This speed measuring device has been tested and verified to be functioning in accordance with the manufacture’s specifications.

The frequency measurements performed and reported within this report demonstrate that the SmartMicro UMRR-11 T44 radar system has an accuracy of less than or equal to 1 mph up to 100 mph and 1% accuracy thereafter up to 199 mph maximum.

FSK Frequency Set 1					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBμV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	120.90	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Test Report**

Model: UMRR-11 T44

**Part Number / Serial Number:
0X00048875**

**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 30, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Applus + Keystone
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

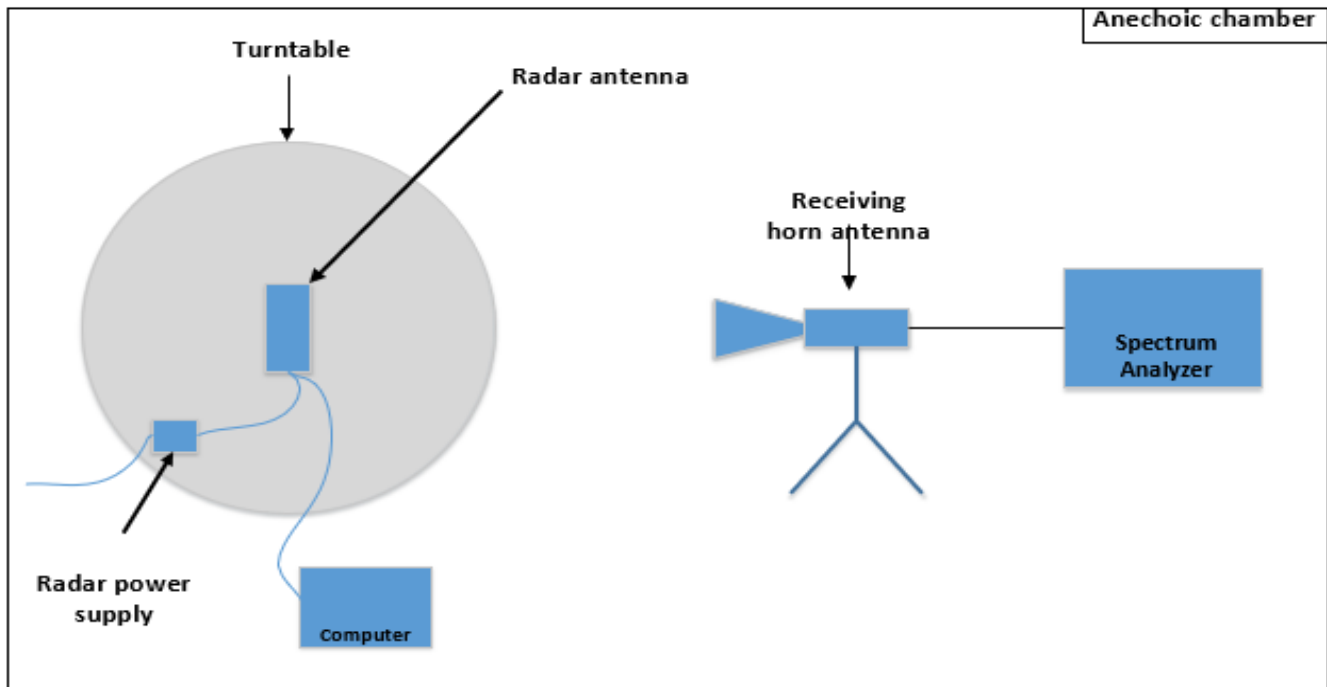
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Revision	Date	Description	Revised By
N/C	#####	Initial Release	Mathew Santiago

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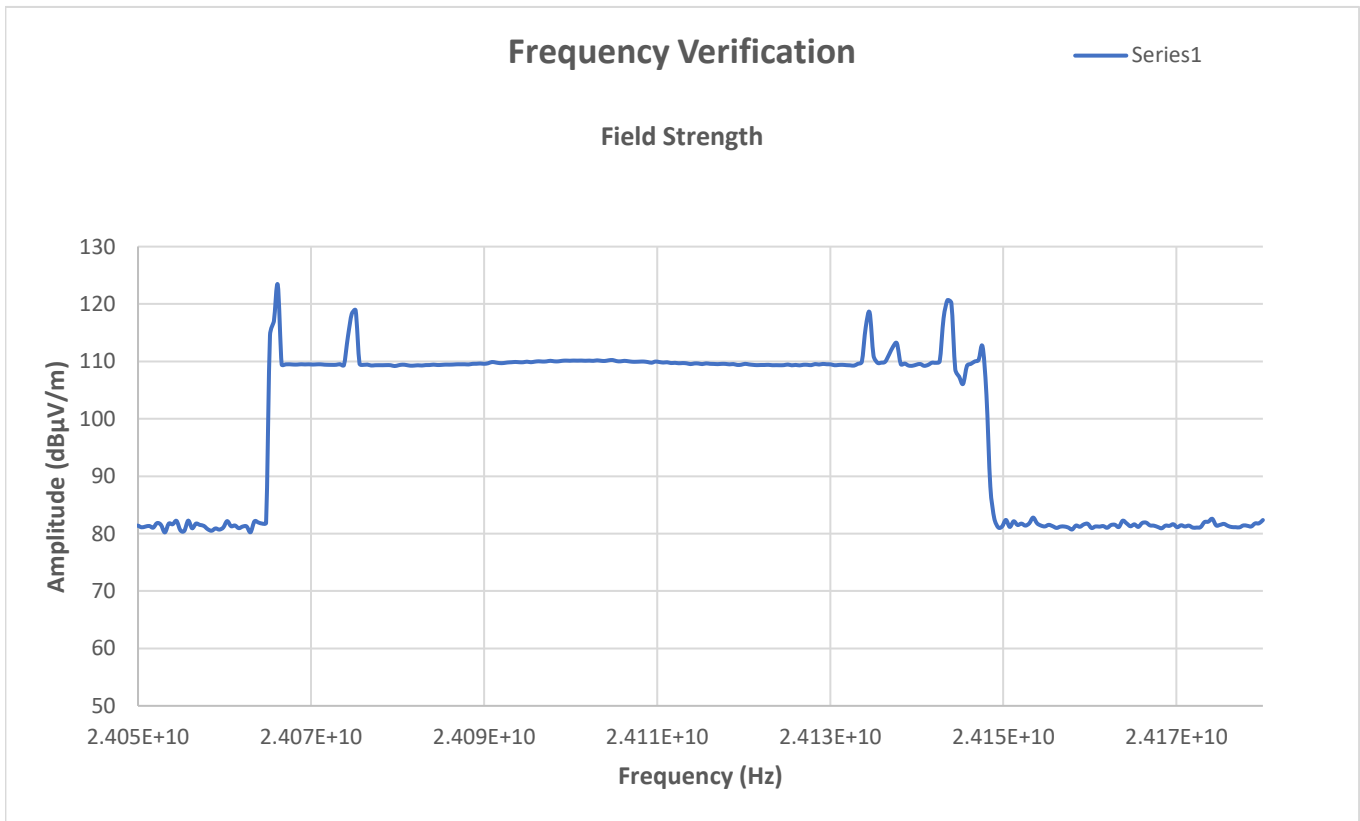
Test Setup Diagram



Test Equipment Utilized

Description	Manufacturer	Model #	Serial #	Asset #	Cal. Due Date
EMC Analyzer	Agilent	E7405	US40240238	EB046	1/29/2026
DRG Horn Antenna	ETS Lindgren	3116	00026390	EE017	5/21/2026
Pre-Amplifier	Keystone Compliance	PA-1	0002	EG003	6/30/2026
Turntable Controller	EMCO	1061.2.013	9401-1717	EI009	UWCE

Frequency Measurements:



Frequency Verification					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBµV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	123.32	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
0X00048875**

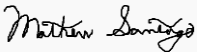
**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 30, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
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Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX00048875**

Date of Issue: January 30, 2025

This speed measuring device has been tested and verified to be functioning in accordance with the manufacture's specifications.

The frequency measurements performed and reported within this report demonstrate that the SmartMicro UMRR-11 T44 radar system has an accuracy of less than or equal to 1 mph up to 100 mph and 1% accuracy thereafter up to 199 mph maximum.

FSK Frequency Set 1					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBμV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	123.32	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Test Report**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX00048967**

**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 31, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Applus + Keystone
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

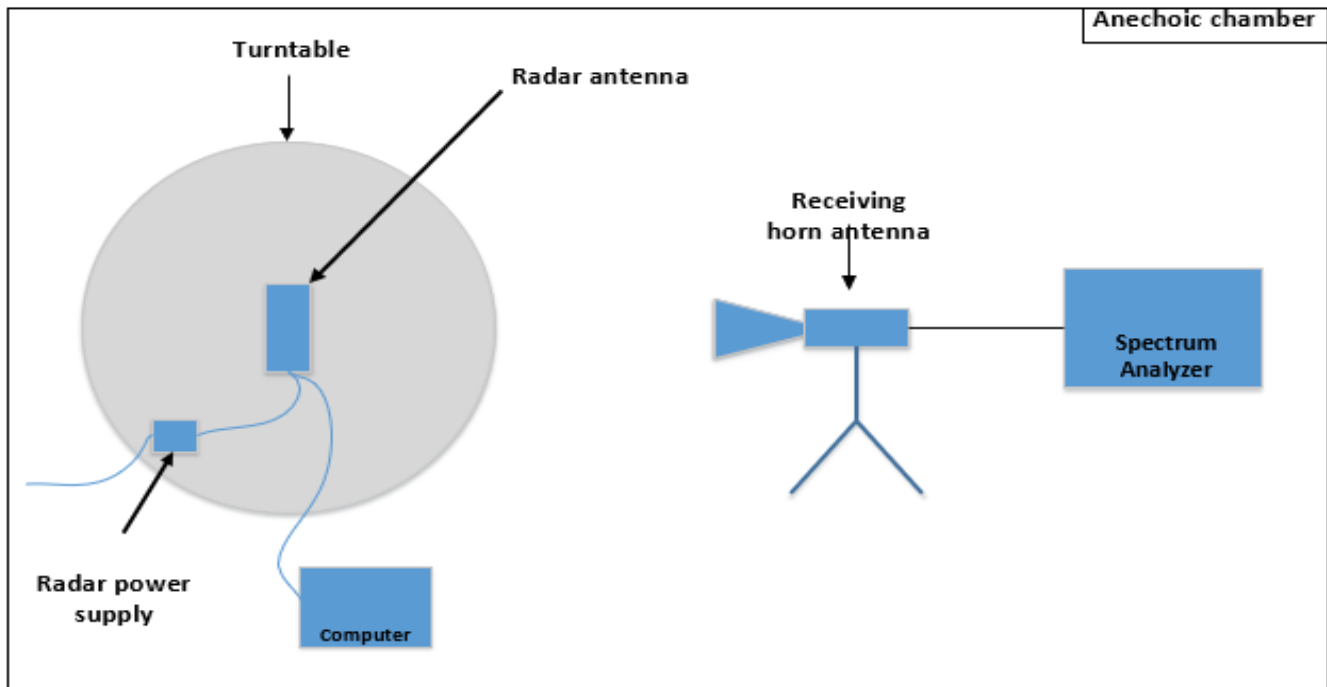
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Revision	Date	Description	Revised By
N/C	#####	Initial Release	Mathew Santiago

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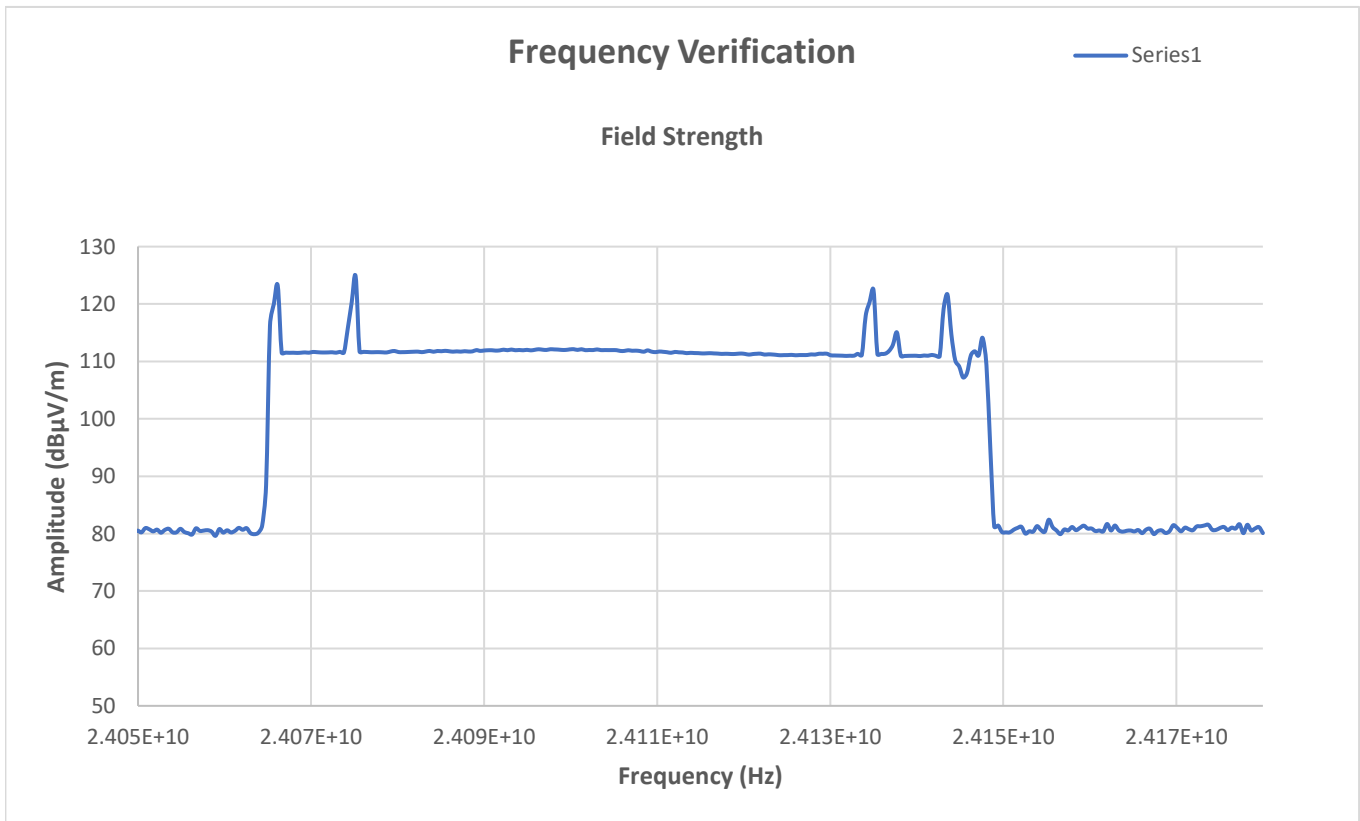
Test Setup Diagram



Test Equipment Utilized

Description	Manufacturer	Model #	Serial #	Asset #	Cal. Due Date
EMC Analyzer	Agilent	E7405	US40240238	EB046	1/29/2026
DRG Horn Antenna	ETS Lindgren	3116	00026390	EE017	5/21/2026
Pre-Amplifier	Keystone Compliance	PA-1	0002	EG003	6/30/2026
Turntable Controller	EMCO	1061.2.013	9401-1717	EI009	UWCE

Frequency Measurements:



Frequency Verification					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBµV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	124.81	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
0X00048967**

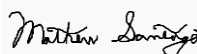
**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 31, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Applus+ Keystone
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX00048967**

Date of Issue: January 31, 2025

This speed measuring device has been tested and verified to be functioning in accordance with the manufacture’s specifications.

The frequency measurements performed and reported within this report demonstrate that the SmartMicro UMRR-11 T44 radar system has an accuracy of less than or equal to 1 mph up to 100 mph and 1% accuracy thereafter up to 199 mph maximum.

FSK Frequency Set 1					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBμV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	124.81	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Test Report**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX000487B4**

**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 31, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Applus + Keystone
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

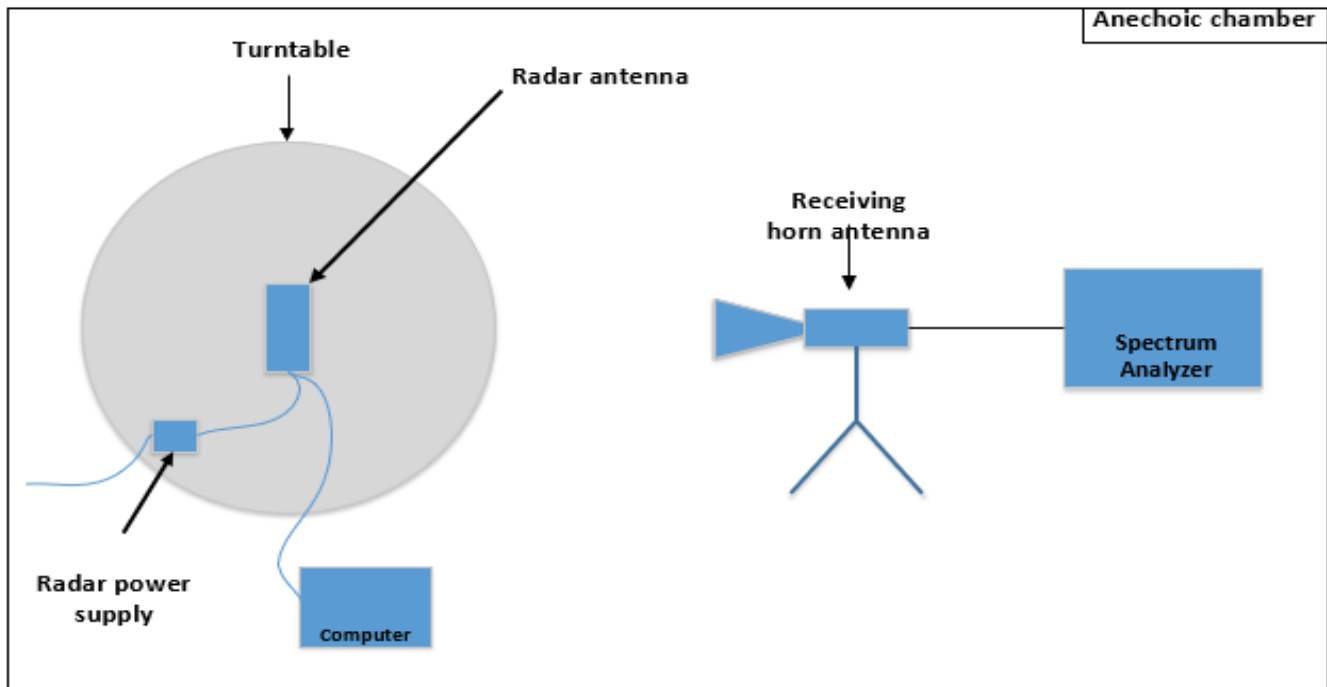
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Revision	Date	Description	Revised By
N/C	#####	Initial Release	Mathew Santiago

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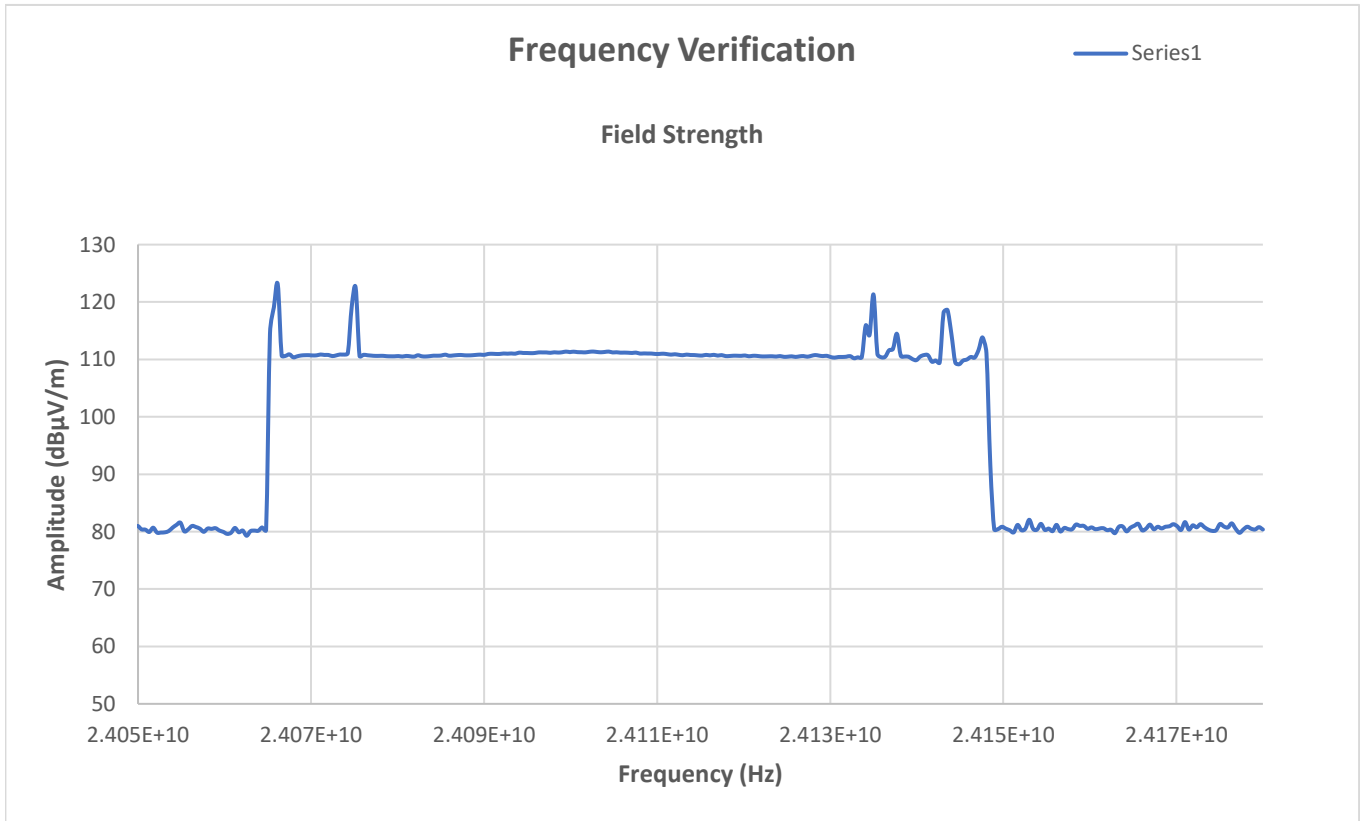
Test Setup Diagram



Test Equipment Utilized

Description	Manufacturer	Model #	Serial #	Asset #	Cal. Due Date
EMC Analyzer	Agilent	E7405	US40240238	EB046	1/29/2026
DRG Horn Antenna	ETS Lindgren	3116	00026390	EE017	5/21/2026
Pre-Amplifier	Keystone Compliance	PA-1	0002	EG003	6/30/2026
Turntable Controller	EMCO	1061.2.013	9401-1717	EI009	UWCE

Frequency Measurements:



Frequency Verification					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBµV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	123.08	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
0X000487B4**

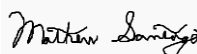
**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 31, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Applus+ Keystone
Address	131 North Columbus Innerbelt
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Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX000487B4**

Date of Issue: January 31, 2025

This speed measuring device has been tested and verified to be functioning in accordance with the manufacture’s specifications.

The frequency measurements performed and reported within this report demonstrate that the SmartMicro UMRR-11 T44 radar system has an accuracy of less than or equal to 1 mph up to 100 mph and 1% accuracy thereafter up to 199 mph maximum.

FSK Frequency Set 1					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBμV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	123.08	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Test Report**

Model: UMRR-11 T44

**Part Number / Serial Number:
0X000486D1**

**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 31, 2025

**Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201**

**Attention of: Engineering Department
Phone: (480) 443-7000**

Test Facility	
Test Laboratory	Applus + Keystone
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

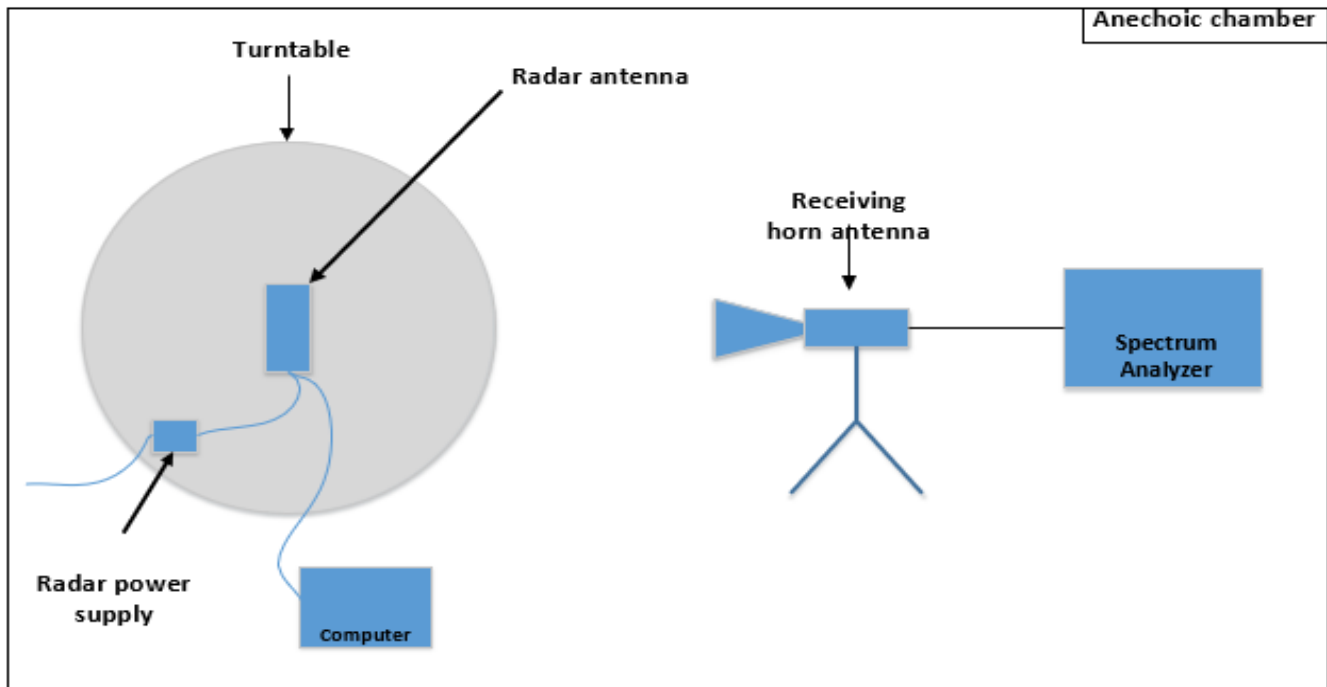
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Revision	Date	Description	Revised By
N/C	#####	Initial Release	Mathew Santiago

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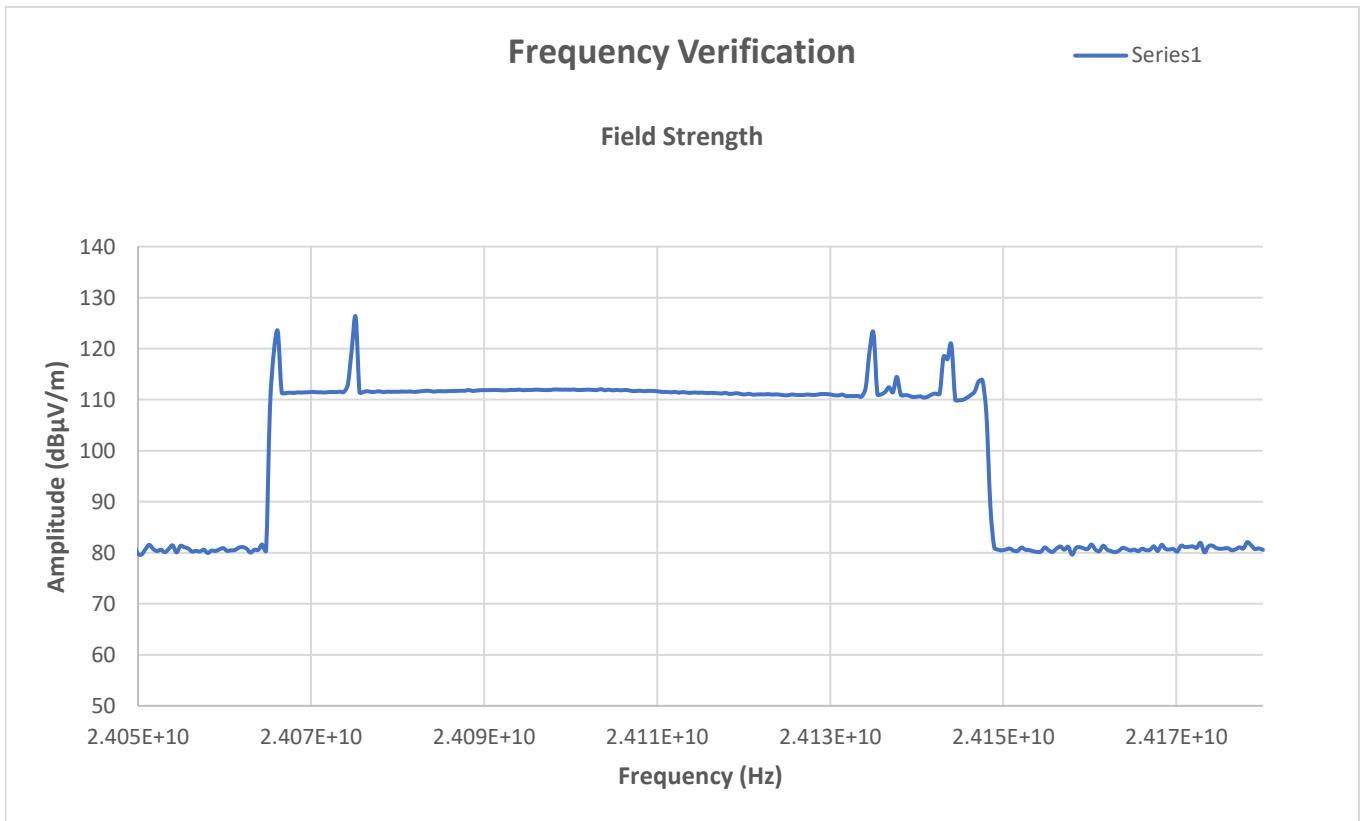
Test Setup Diagram



Test Equipment Utilized

Description	Manufacturer	Model #	Serial #	Asset #	Cal. Due Date
EMC Analyzer	Agilent	E7405	US40240238	EB046	1/29/2026
DRG Horn Antenna	ETS Lindgren	3116	00026390	EE017	5/21/2026
Pre-Amplifier	Keystone Compliance	PA-1	0002	EG003	6/30/2026
Turntable Controller	EMCO	1061.2.013	9401-1717	EI009	UWCE

Frequency Measurements:



Frequency Verification					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBµV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	126.20	84.7 +/- 4.8	PASS

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
0X000486D1**

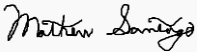
**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 31, 2025

Owner of EUT: **Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201**

Attention of: **Engineering Department
Phone: (480) 443-7000**

Test Facility	
Test Laboratory	Applus+ Keystone
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX000486D1**

Date of Issue: January 31, 2025

This speed measuring device has been tested and verified to be functioning in accordance with the manufacture’s specifications.

The frequency measurements performed and reported within this report demonstrate that the SmartMicro UMRR-11 T44 radar system has an accuracy of less than or equal to 1 mph up to 100 mph and 1% accuracy thereafter up to 199 mph maximum.

FSK Frequency Set 1					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBμV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	126.20	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Test Report**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX00048768**

**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 31, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Applus + Keystone
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

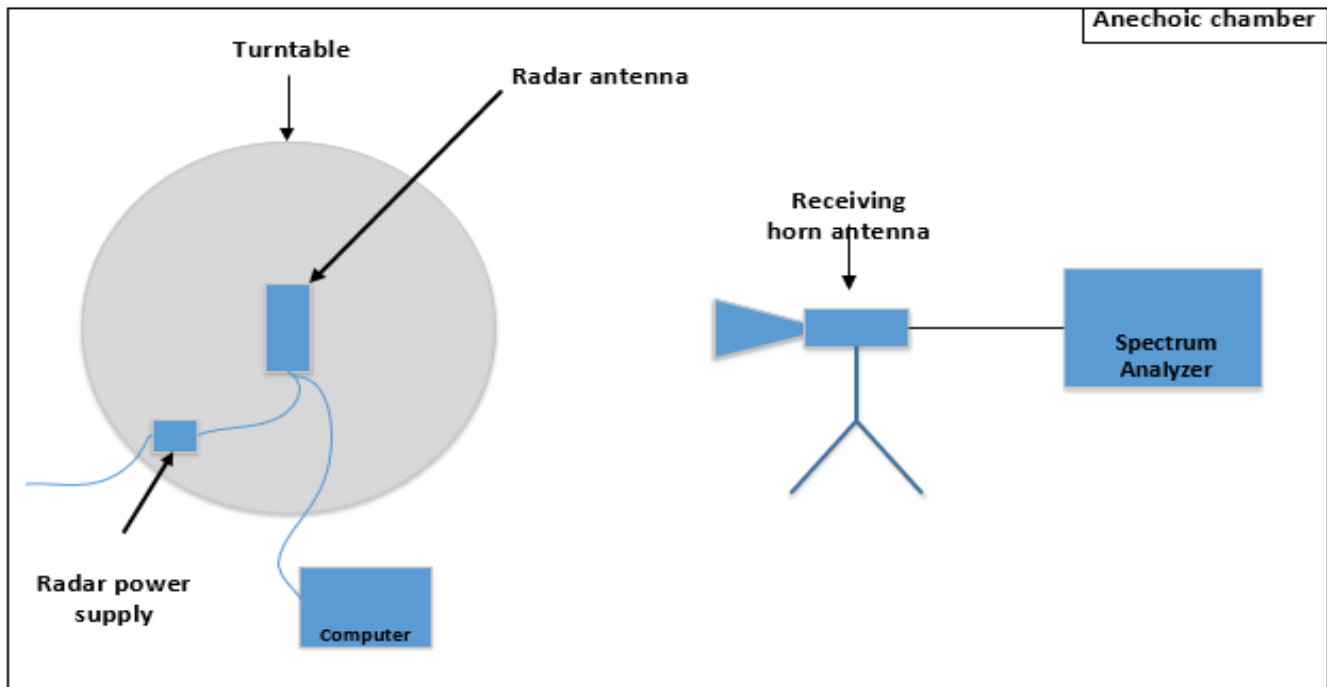
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Revision	Date	Description	Revised By
N/C	#####	Initial Release	Mathew Santiago

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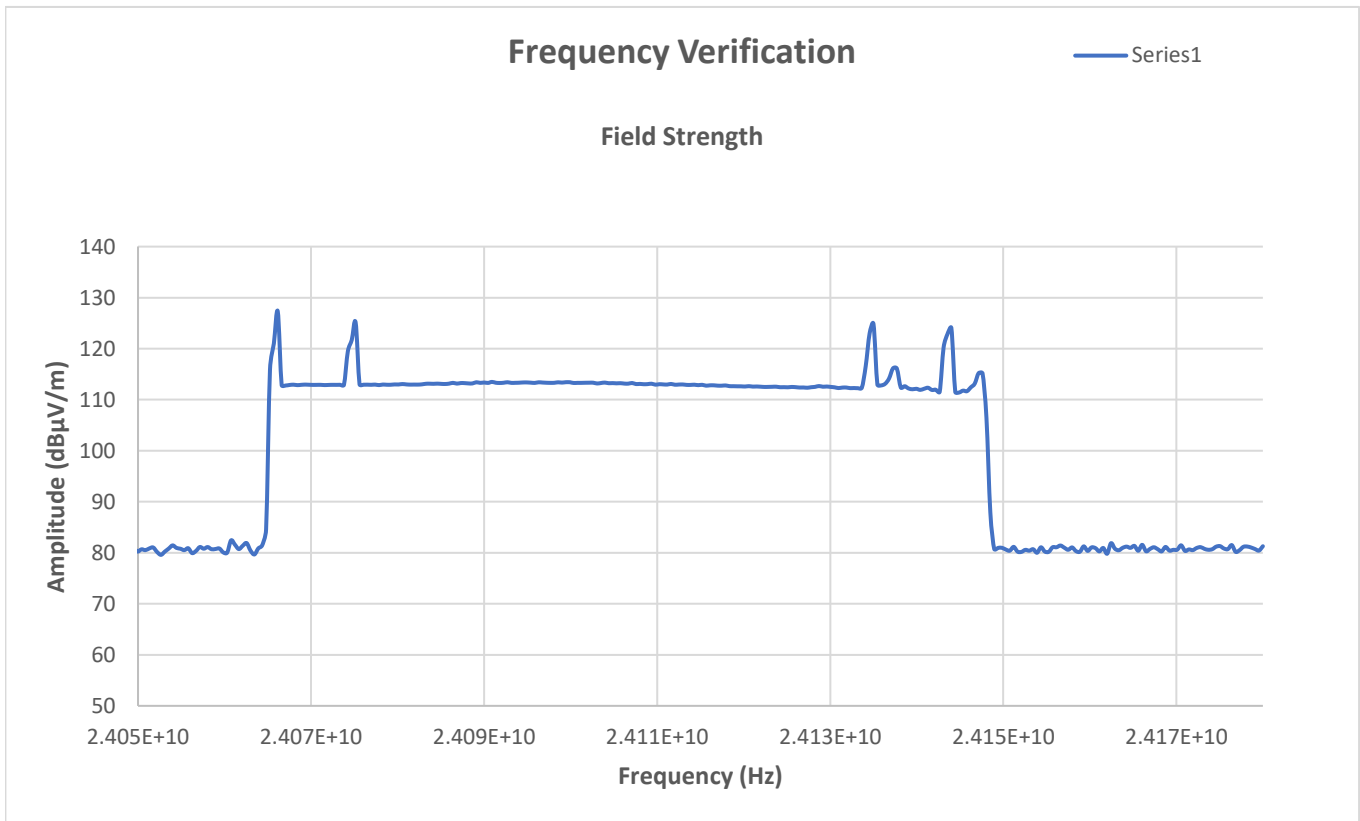
Test Setup Diagram



Test Equipment Utilized

Description	Manufacturer	Model #	Serial #	Asset #	Cal. Due Date
EMC Analyzer	Agilent	E7405	US40240238	EB046	1/29/2026
DRG Horn Antenna	ETS Lindgren	3116	00026390	EE017	5/21/2026
Pre-Amplifier	Keystone Compliance	PA-1	0002	EG003	6/30/2026
Turntable Controller	EMCO	1061.2.013	9401-1717	EI009	UWCE

Frequency Measurements:



Frequency Verification					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBµV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	127.28	84.7 +/- 4.8	PASS

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX00048768**

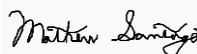
**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 31, 2025

Owner of EUT: Verra Mobility
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Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX00048768**

Date of Issue: January 31, 2025

This speed measuring device has been tested and verified to be functioning in accordance with the manufacture’s specifications.

The frequency measurements performed and reported within this report demonstrate that the SmartMicro UMRR-11 T44 radar system has an accuracy of less than or equal to 1 mph up to 100 mph and 1% accuracy thereafter up to 199 mph maximum.

FSK Frequency Set 1					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBμV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	127.28	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Test Report**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX00048F68**

**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 31, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
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Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

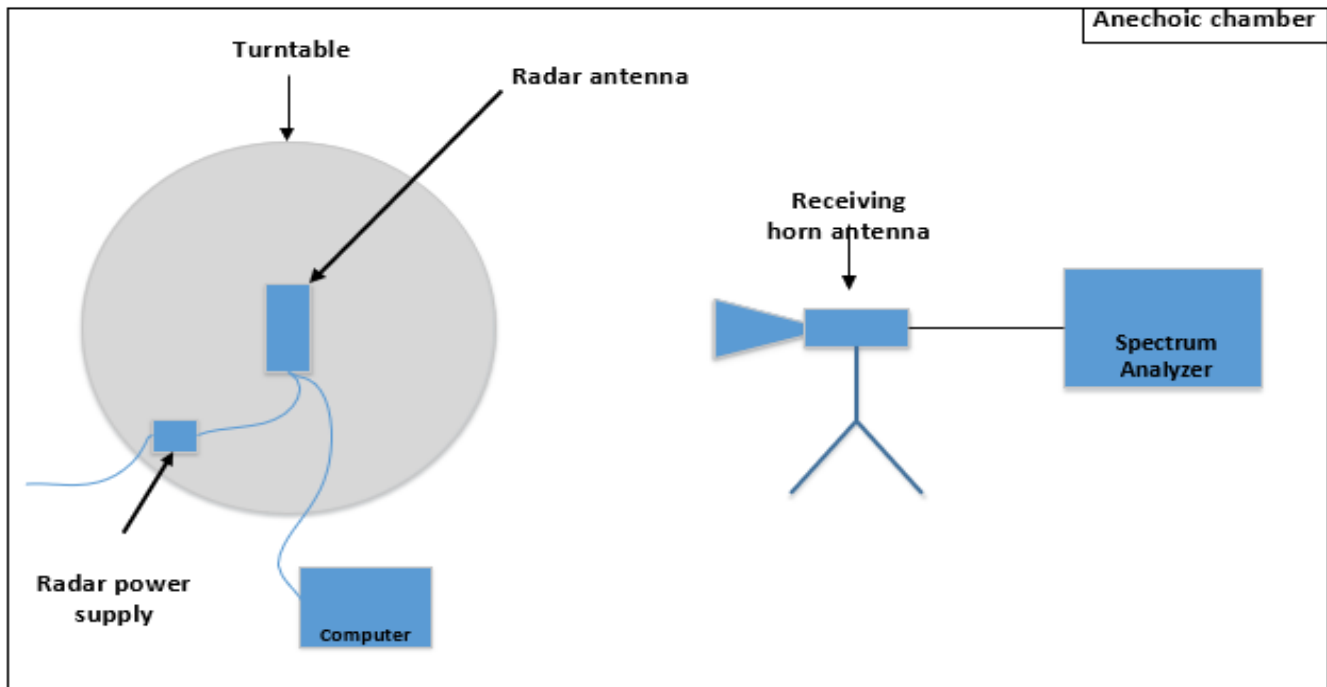
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Revision	Date	Description	Revised By
N/C	#####	Initial Release	Mathew Santiago

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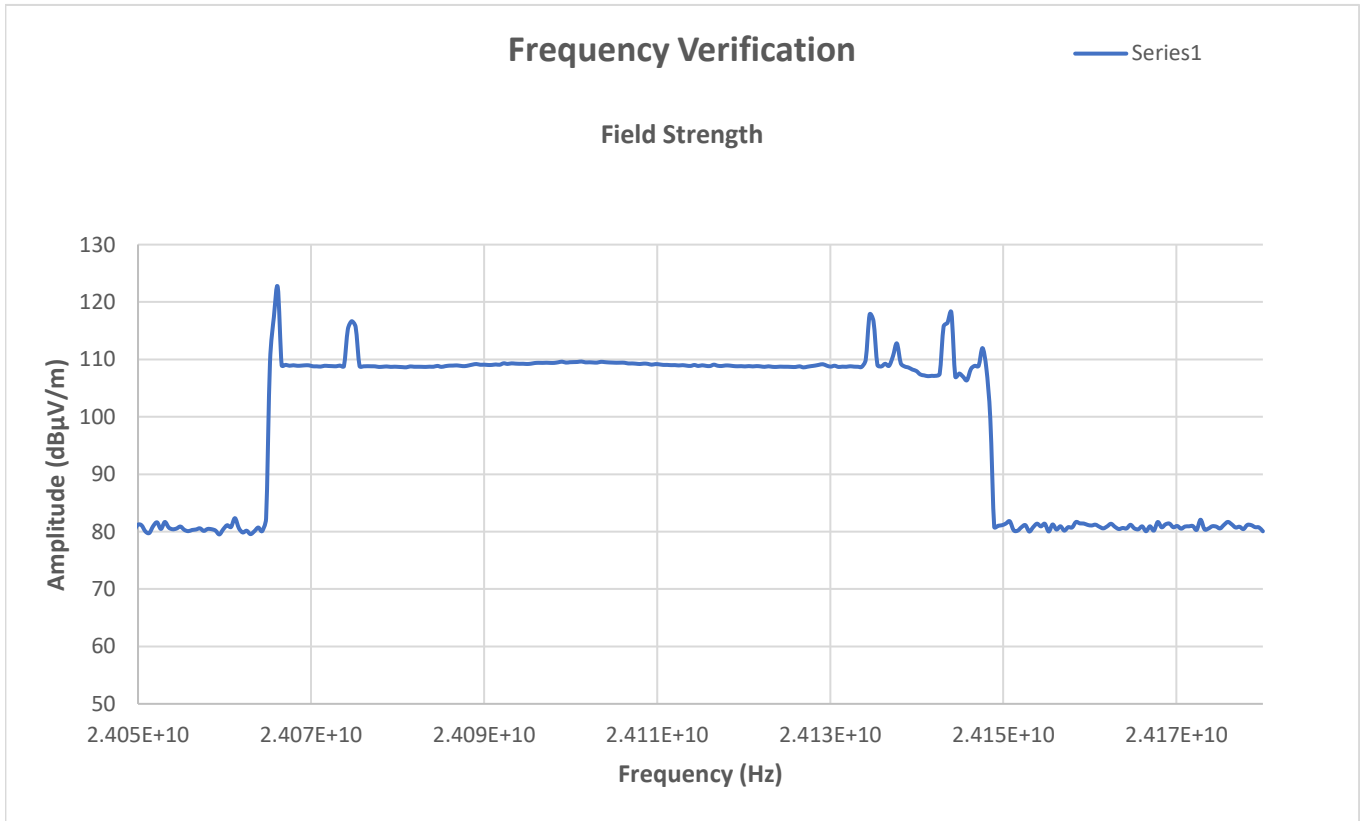
Test Setup Diagram



Test Equipment Utilized

Description	Manufacturer	Model #	Serial #	Asset #	Cal. Due Date
EMC Analyzer	Agilent	E7405	US40240238	EB046	1/29/2026
DRG Horn Antenna	ETS Lindgren	3116	00026390	EE017	5/21/2026
Pre-Amplifier	Keystone Compliance	PA-1	0002	EG003	6/30/2026
Turntable Controller	EMCO	1061.2.013	9401-1717	EI009	UWCE

Frequency Measurements:



Frequency Verification					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBµV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	122.55	84.7 +/- 4.8	PASS

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX00048F68**

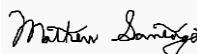
**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 31, 2025

Owner of EUT: Verra Mobility
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Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX00048F68**

Date of Issue: January 31, 2025

This speed measuring device has been tested and verified to be functioning in accordance with the manufacture’s specifications.

The frequency measurements performed and reported within this report demonstrate that the SmartMicro UMRR-11 T44 radar system has an accuracy of less than or equal to 1 mph up to 100 mph and 1% accuracy thereafter up to 199 mph maximum.

FSK Frequency Set 1					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBμV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	122.55	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Test Report**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX00048F6C**

**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 31, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Applus + Keystone
Address	131 North Columbus Innerbelt
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Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

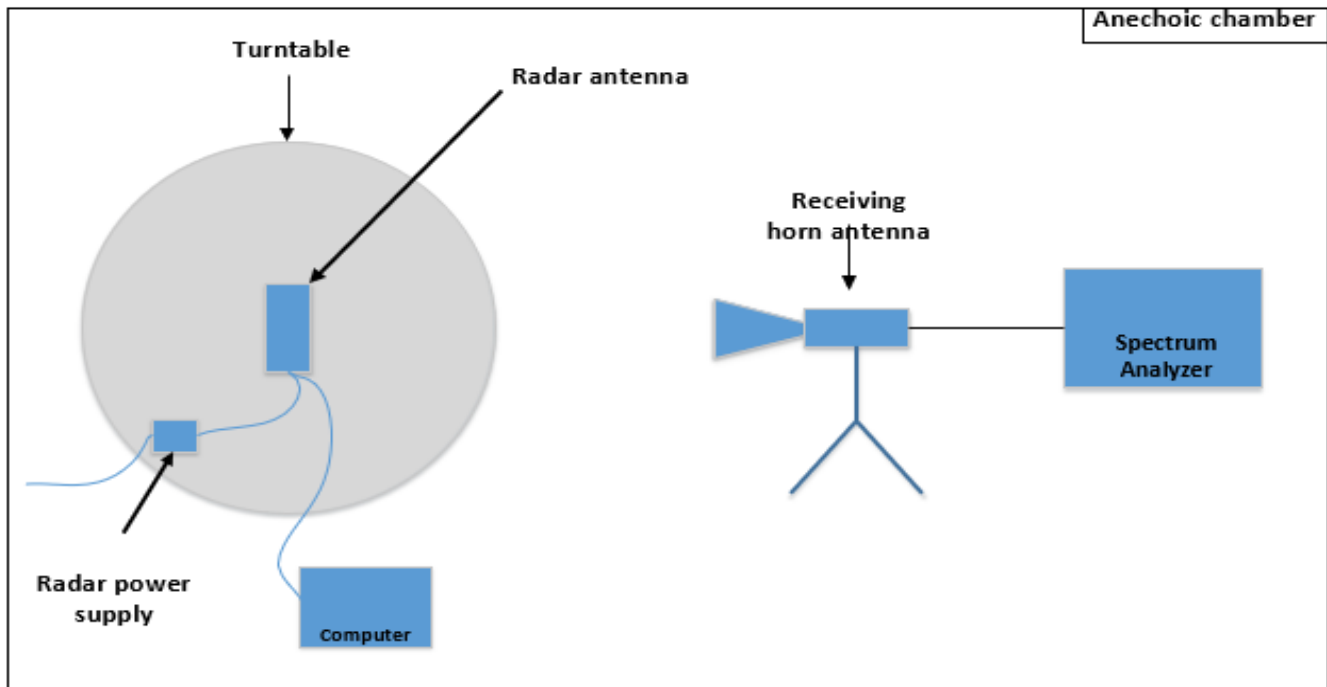
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Revision	Date	Description	Revised By
N/C	#####	Initial Release	Mathew Santiago

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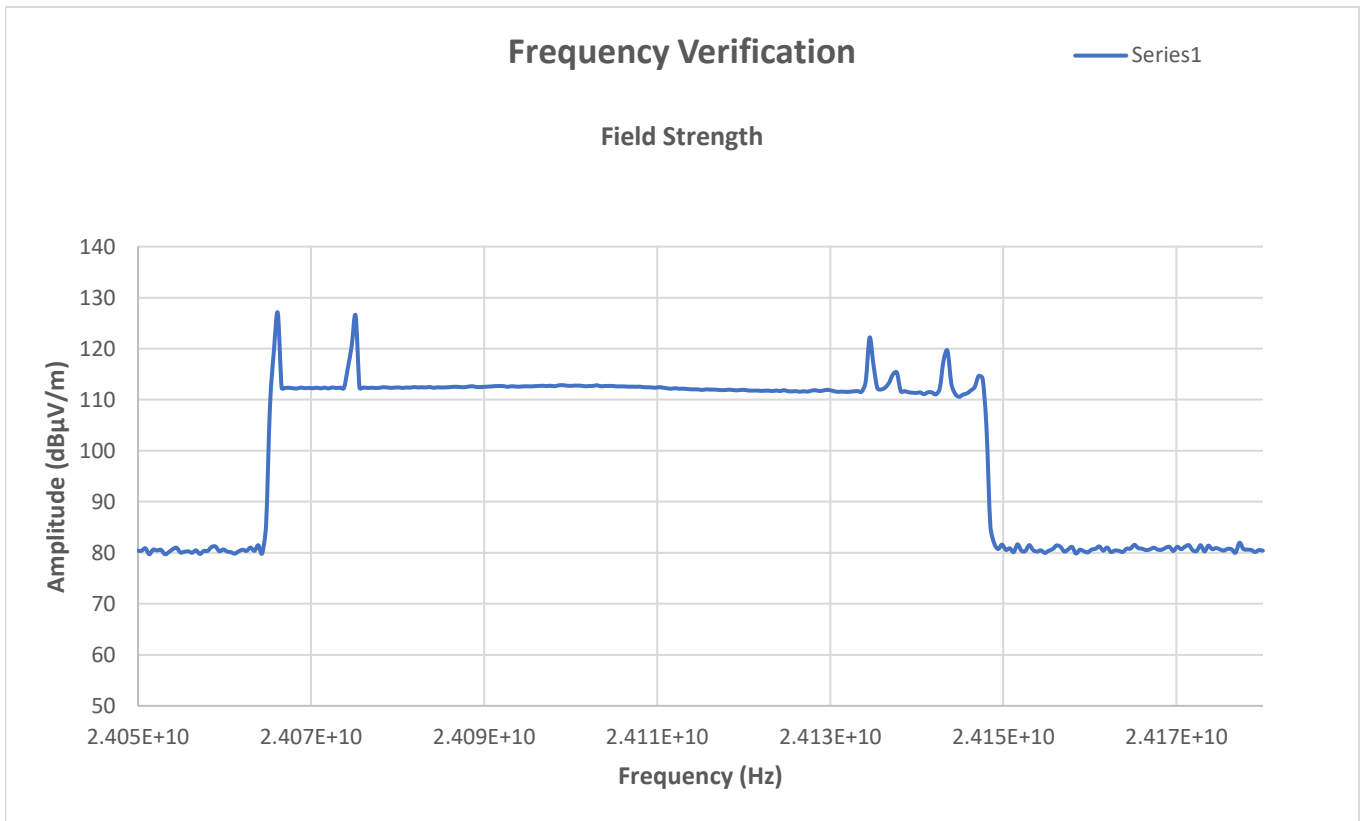
Test Setup Diagram



Test Equipment Utilized

Description	Manufacturer	Model #	Serial #	Asset #	Cal. Due Date
EMC Analyzer	Agilent	E7405	US40240238	EB046	1/29/2026
DRG Horn Antenna	ETS Lindgren	3116	00026390	EE017	5/21/2026
Pre-Amplifier	Keystone Compliance	PA-1	0002	EG003	6/30/2026
Turntable Controller	EMCO	1061.2.013	9401-1717	EI009	UWCE

Frequency Measurements:



Frequency Verification					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBµV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	126.99	84.7 +/- 4.8	PASS

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX00048F6C**

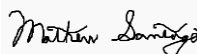
**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 31, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
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Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX00048F6C**

Date of Issue: January 31, 2025

This speed measuring device has been tested and verified to be functioning in accordance with the manufacture’s specifications.

The frequency measurements performed and reported within this report demonstrate that the SmartMicro UMRR-11 T44 radar system has an accuracy of less than or equal to 1 mph up to 100 mph and 1% accuracy thereafter up to 199 mph maximum.

FSK Frequency Set 1					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBμV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	126.99	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Test Report**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX00048878**

**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 31, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Applus + Keystone
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

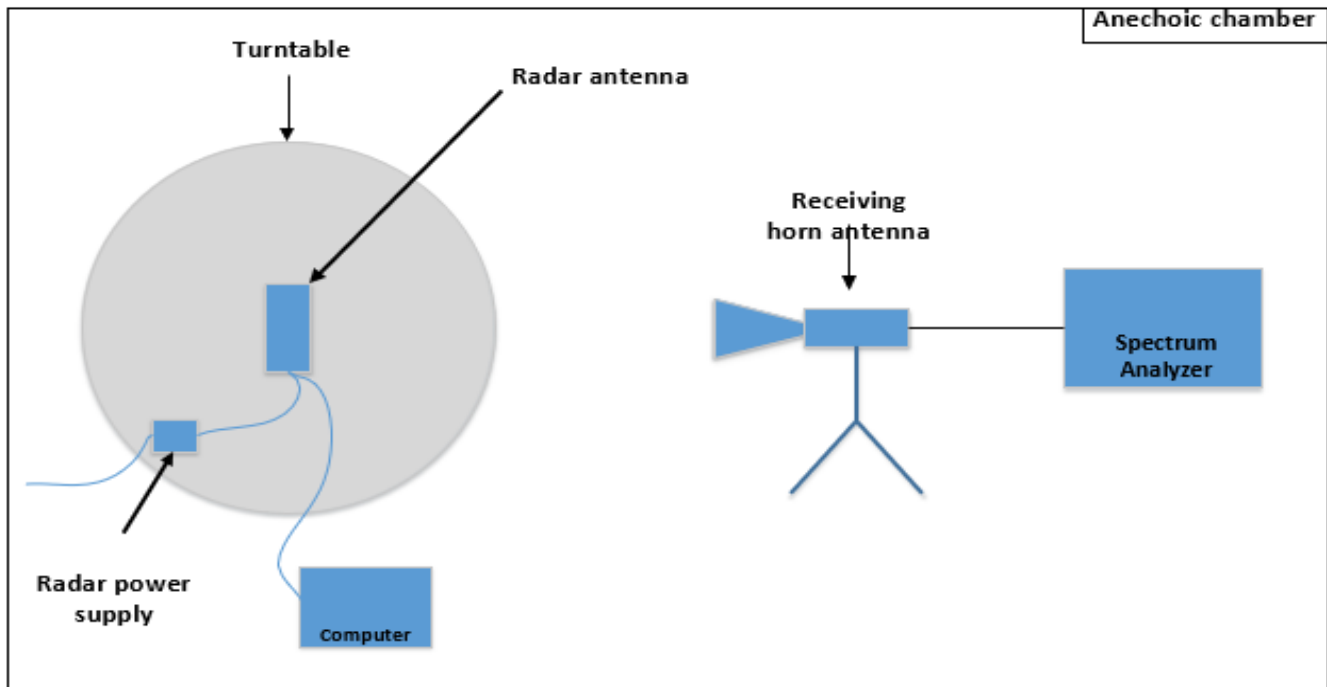
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Revision	Date	Description	Revised By
N/C	#####	Initial Release	Mathew Santiago

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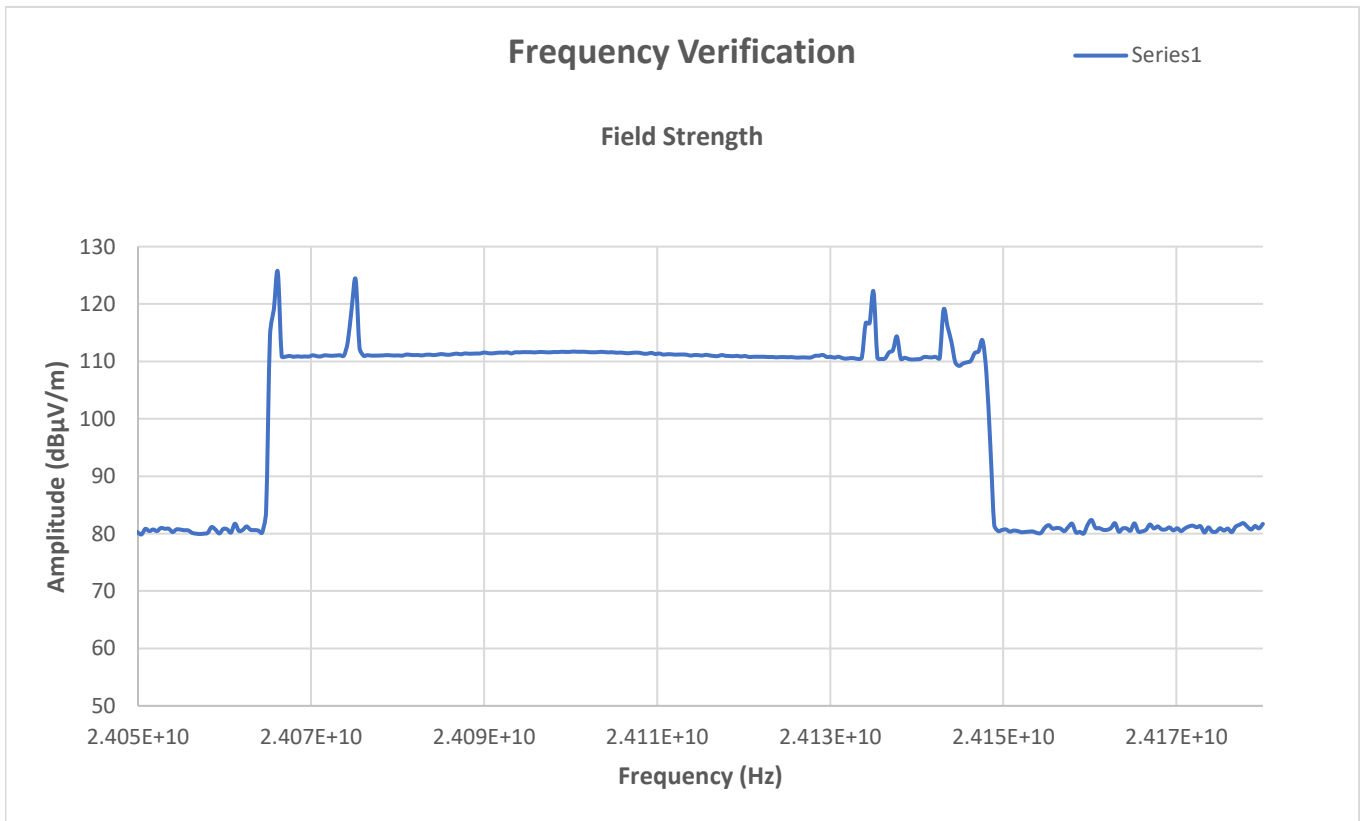
Test Setup Diagram



Test Equipment Utilized

Description	Manufacturer	Model #	Serial #	Asset #	Cal. Due Date
EMC Analyzer	Agilent	E7405	US40240238	EB046	1/29/2026
DRG Horn Antenna	ETS Lindgren	3116	00026390	EE017	5/21/2026
Pre-Amplifier	Keystone Compliance	PA-1	0002	EG003	6/30/2026
Turntable Controller	EMCO	1061.2.013	9401-1717	EI009	UWCE

Frequency Measurements:



Frequency Verification					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBµV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	125.60	84.7 +/- 4.8	PASS

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
0X00048878**

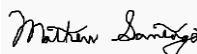
**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 31, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Applus+ Keystone
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX00048878**

Date of Issue: January 31, 2025

This speed measuring device has been tested and verified to be functioning in accordance with the manufacture’s specifications.

The frequency measurements performed and reported within this report demonstrate that the SmartMicro UMRR-11 T44 radar system has an accuracy of less than or equal to 1 mph up to 100 mph and 1% accuracy thereafter up to 199 mph maximum.

FSK Frequency Set 1					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBμV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	125.60	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Test Report**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX0004B035**

**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 31, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Applus + Keystone
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

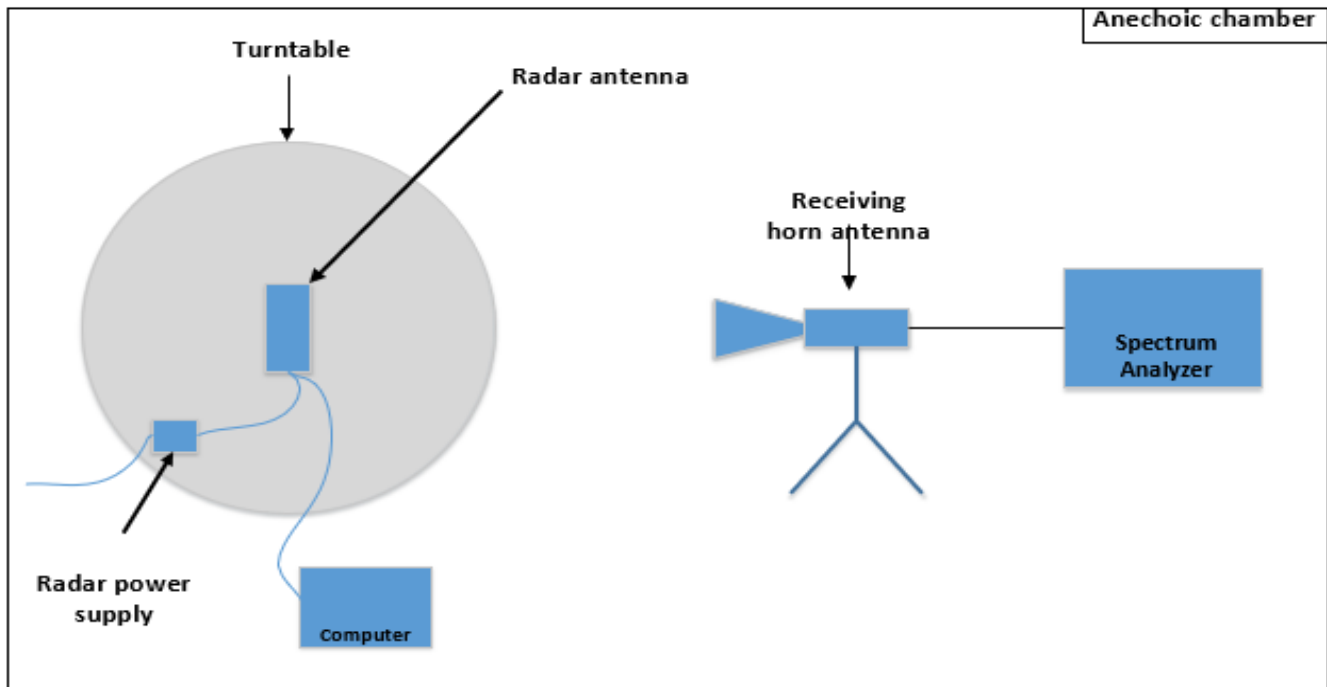
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Revision	Date	Description	Revised By
N/C	#####	Initial Release	Mathew Santiago

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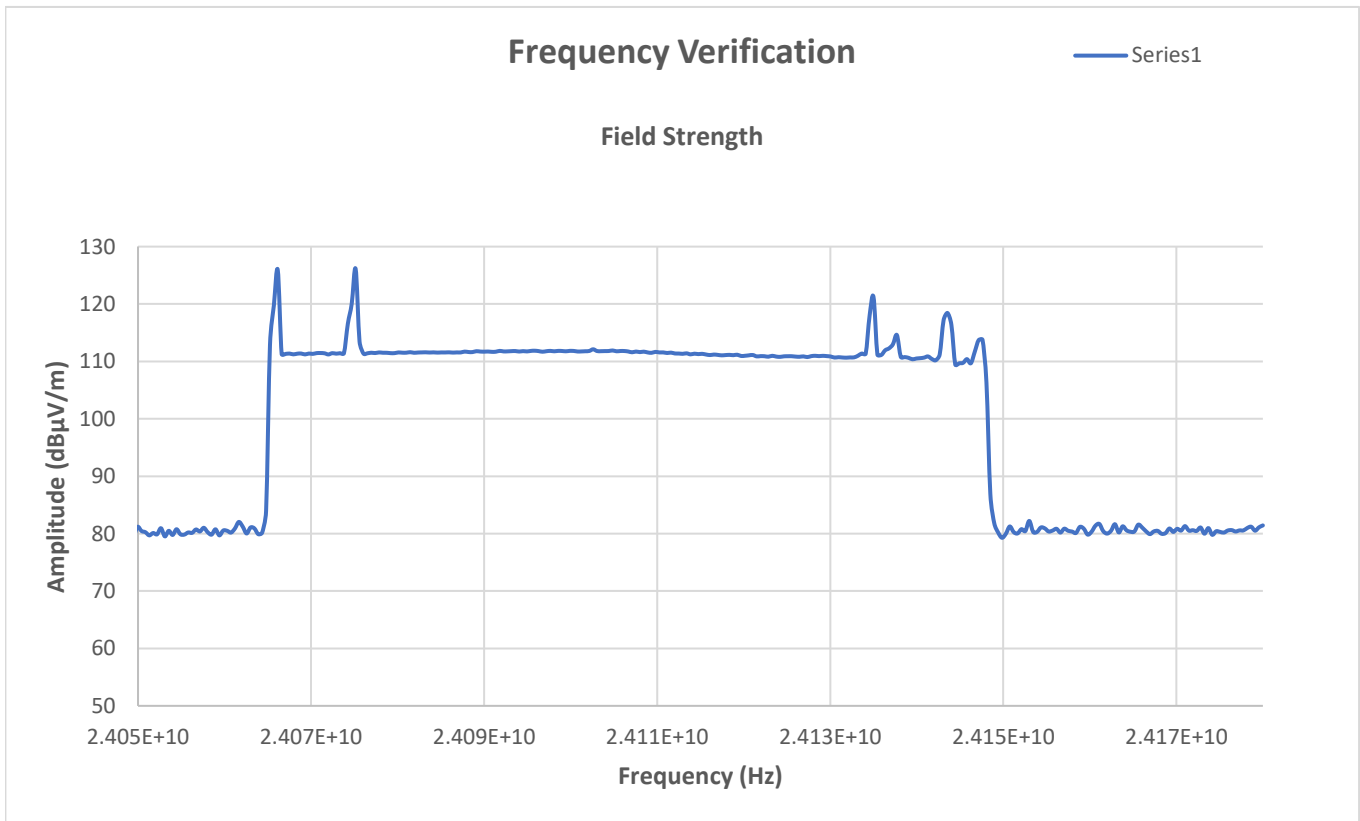
Test Setup Diagram



Test Equipment Utilized

Description	Manufacturer	Model #	Serial #	Asset #	Cal. Due Date
EMC Analyzer	Agilent	E7405	US40240238	EB046	1/29/2026
DRG Horn Antenna	ETS Lindgren	3116	00026390	EE017	5/21/2026
Pre-Amplifier	Keystone Compliance	PA-1	0002	EG003	6/30/2026
Turntable Controller	EMCO	1061.2.013	9401-1717	EI009	UWCE

Frequency Measurements:



Frequency Verification					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBµV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	126.11	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
0X0004B035**

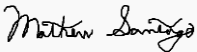
**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 31, 2025

Owner of EUT: Verra Mobility
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Mesa, AZ 85201

Attention of: Engineering Department
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Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX0004B035**

Date of Issue: January 31, 2025

This speed measuring device has been tested and verified to be functioning in accordance with the manufacture’s specifications.

The frequency measurements performed and reported within this report demonstrate that the SmartMicro UMRR-11 T44 radar system has an accuracy of less than or equal to 1 mph up to 100 mph and 1% accuracy thereafter up to 199 mph maximum.

FSK Frequency Set 1					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBμV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	126.11	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Test Report**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX0004B037**

**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 31, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Applus + Keystone
Address	131 North Columbus Innerbelt
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Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
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Signature	

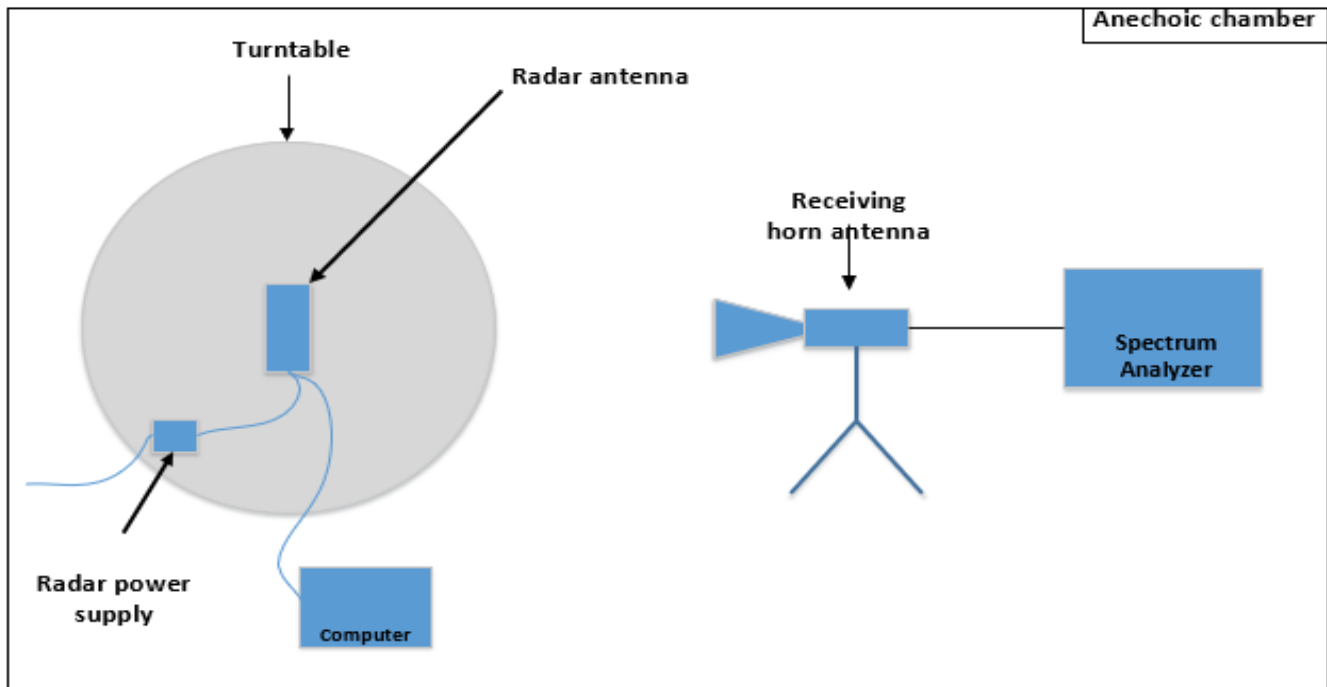
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Revision	Date	Description	Revised By
N/C	#####	Initial Release	Mathew Santiago

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Test Equipment Utilized.....	4
Frequency Characteristics Test Results.....	5

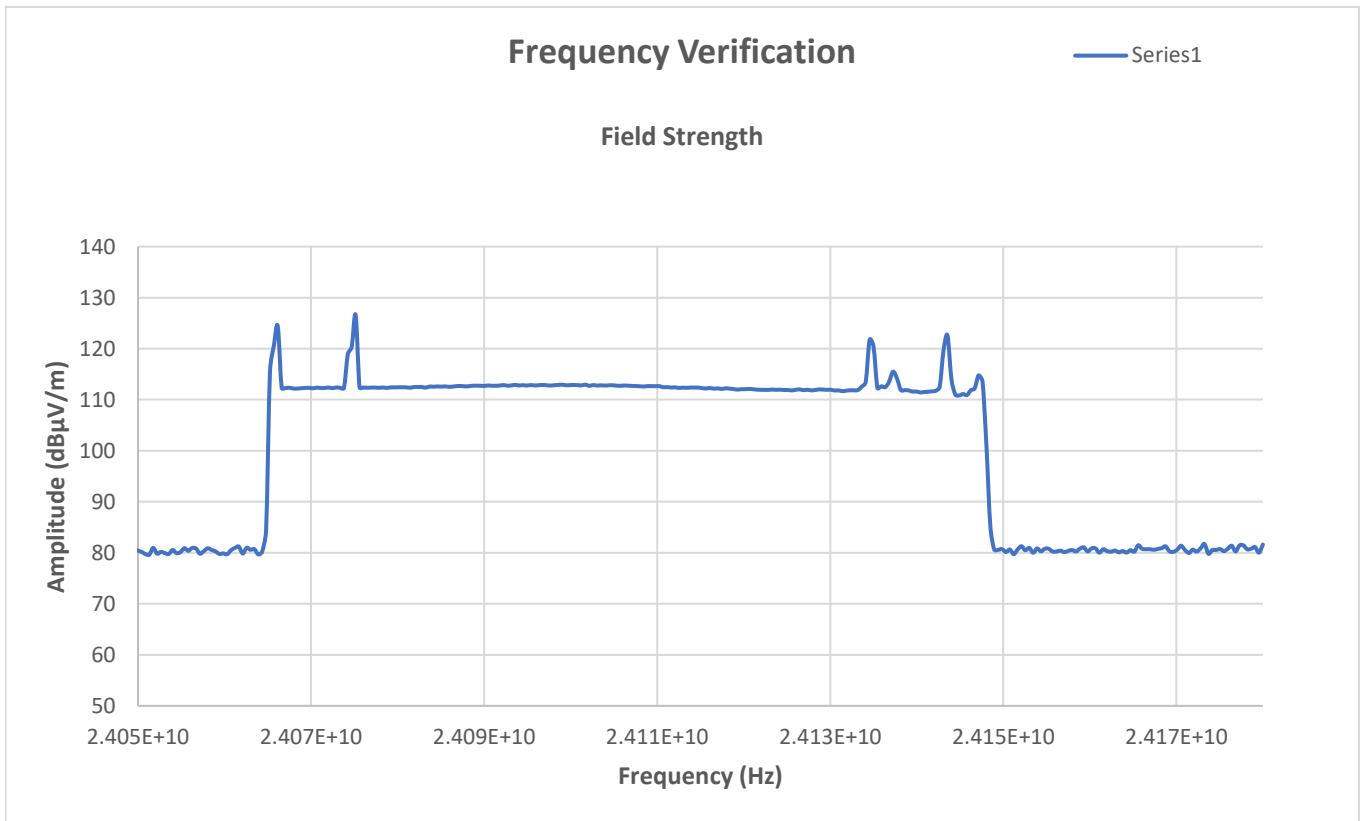
Test Setup Diagram



Test Equipment Utilized

Description	Manufacturer	Model #	Serial #	Asset #	Cal. Due Date
EMC Analyzer	Agilent	E7405	US40240238	EB046	1/29/2026
DRG Horn Antenna	ETS Lindgren	3116	00026390	EE017	5/21/2026
Pre-Amplifier	Keystone Compliance	PA-1	0002	EG003	6/30/2026
Turntable Controller	EMCO	1061.2.013	9401-1717	EI009	UWCE

Frequency Measurements:



Frequency Verification					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBµV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	126.59	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
0X0004B037**


**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 31, 2025

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Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

Part Number / Serial Number:

OX0004B037

Date of Issue: January 31, 2025

This speed measuring device has been tested and verified to be functioning in accordance with the manufacture’s specifications.

The frequency measurements performed and reported within this report demonstrate that the SmartMicro UMRR-11 T44 radar system has an accuracy of less than or equal to 1 mph up to 100 mph and 1% accuracy thereafter up to 199 mph maximum.

FSK Frequency Set 1					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBμV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	126.59	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Test Report**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX00048F67**

**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 31, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

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Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

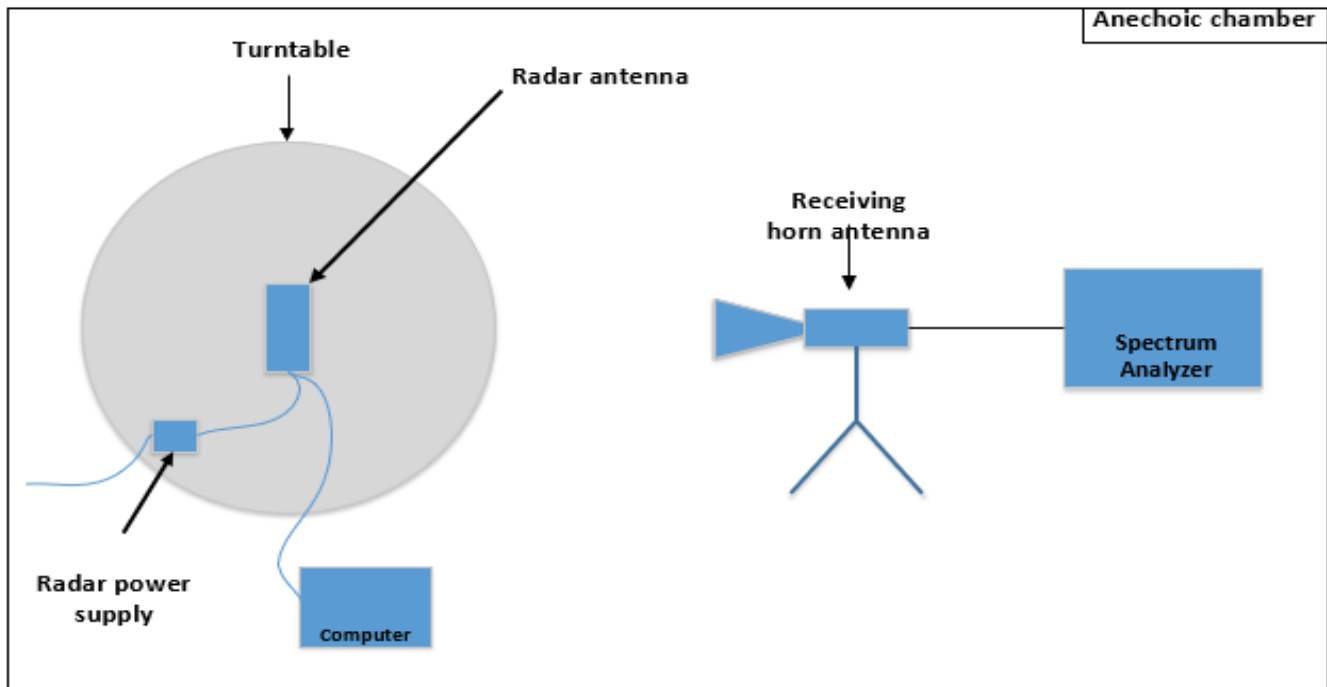
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Revision	Date	Description	Revised By
N/C	#####	Initial Release	Mathew Santiago

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Test Equipment Utilized.....	4
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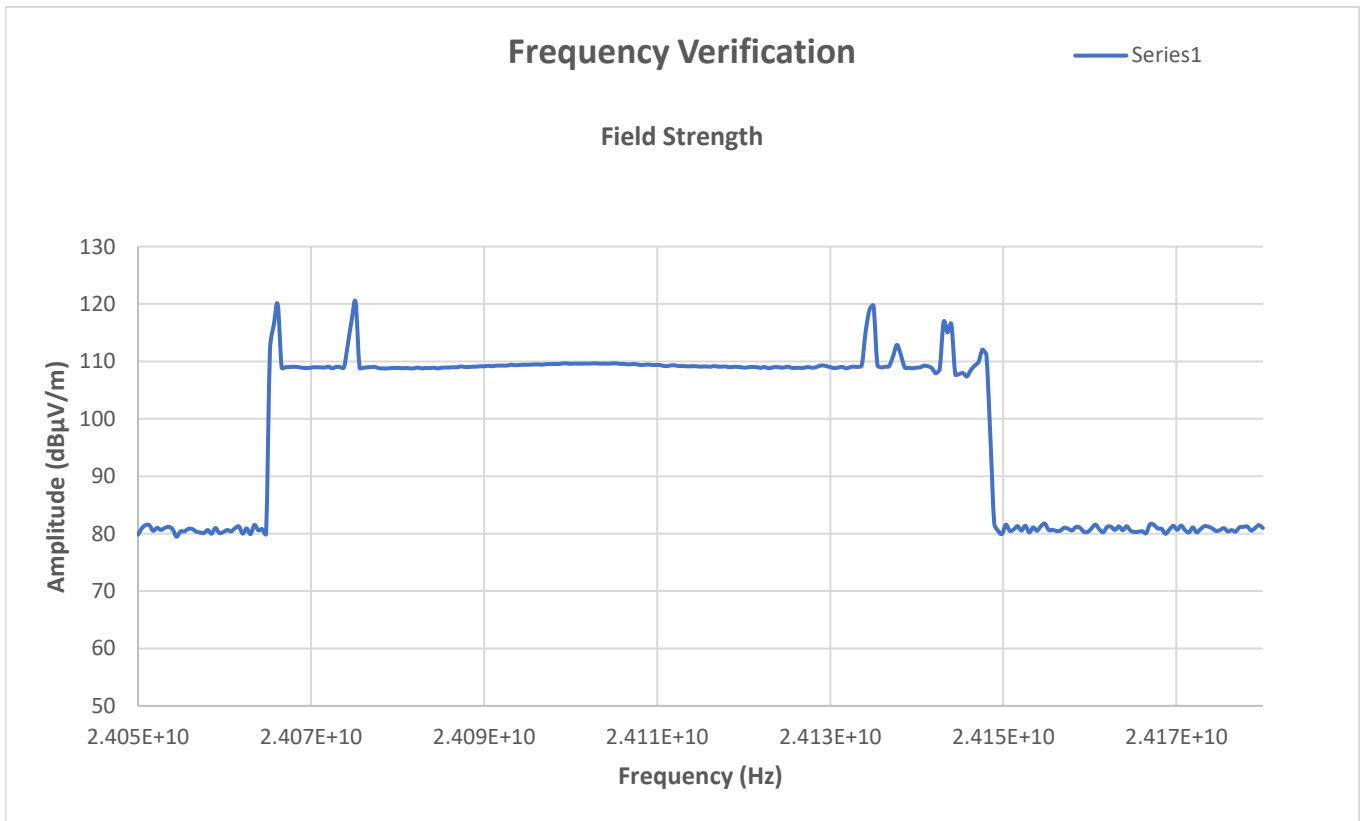
Test Setup Diagram



Test Equipment Utilized

Description	Manufacturer	Model #	Serial #	Asset #	Cal. Due Date
EMC Analyzer	Agilent	E7405	US40240238	EB046	1/29/2026
DRG Horn Antenna	ETS Lindgren	3116	00026390	EE017	5/21/2026
Pre-Amplifier	Keystone Compliance	PA-1	0002	EG003	6/30/2026
Turntable Controller	EMCO	1061.2.013	9401-1717	EI009	UWCE

Frequency Measurements:



Frequency Verification					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBµV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	120.27	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX00048F67**


**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 31, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Applus+ Keystone
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX00048F67**

Date of Issue: January 31, 2025

This speed measuring device has been tested and verified to be functioning in accordance with the manufacture's specifications.

The frequency measurements performed and reported within this report demonstrate that the SmartMicro UMRR-11 T44 radar system has an accuracy of less than or equal to 1 mph up to 100 mph and 1% accuracy thereafter up to 199 mph maximum.

FSK Frequency Set 1					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBμV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	120.27	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Test Report**

Model: UMRR-11 T44

**Part Number / Serial Number:
0X00048F6F**

**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 31, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Applus + Keystone
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

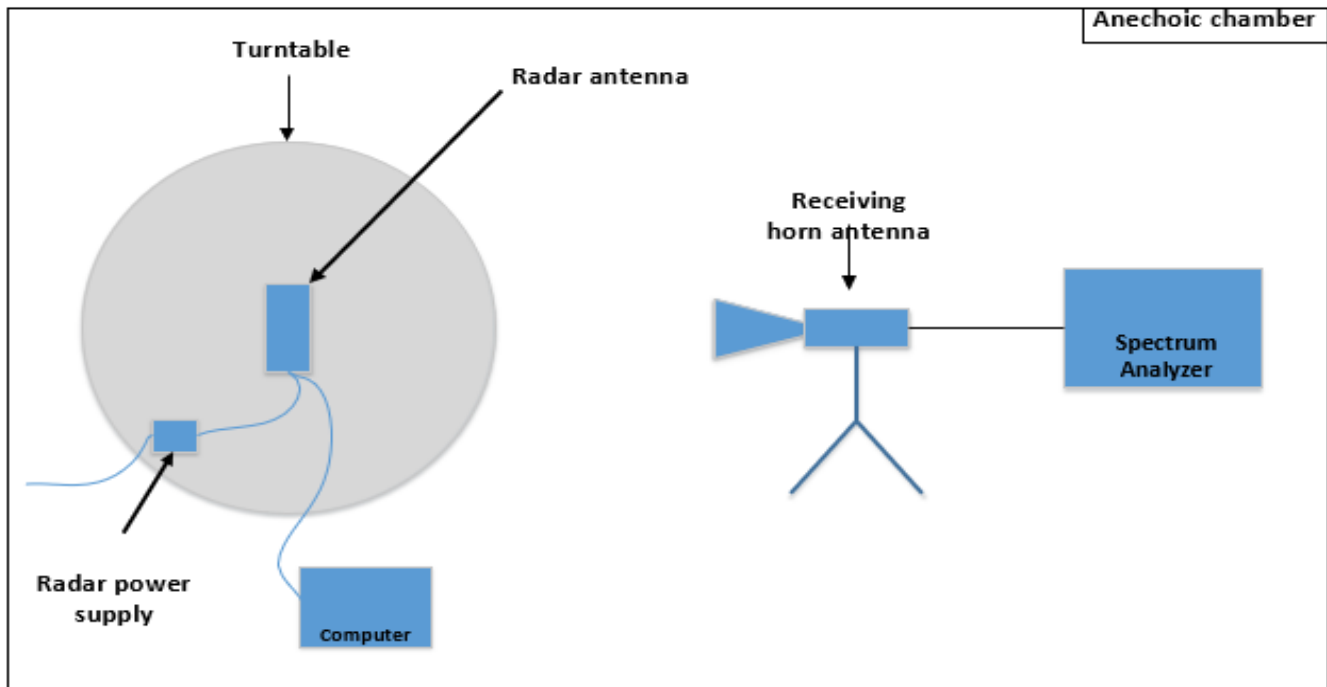
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Revision	Date	Description	Revised By
N/C	#####	Initial Release	Mathew Santiago

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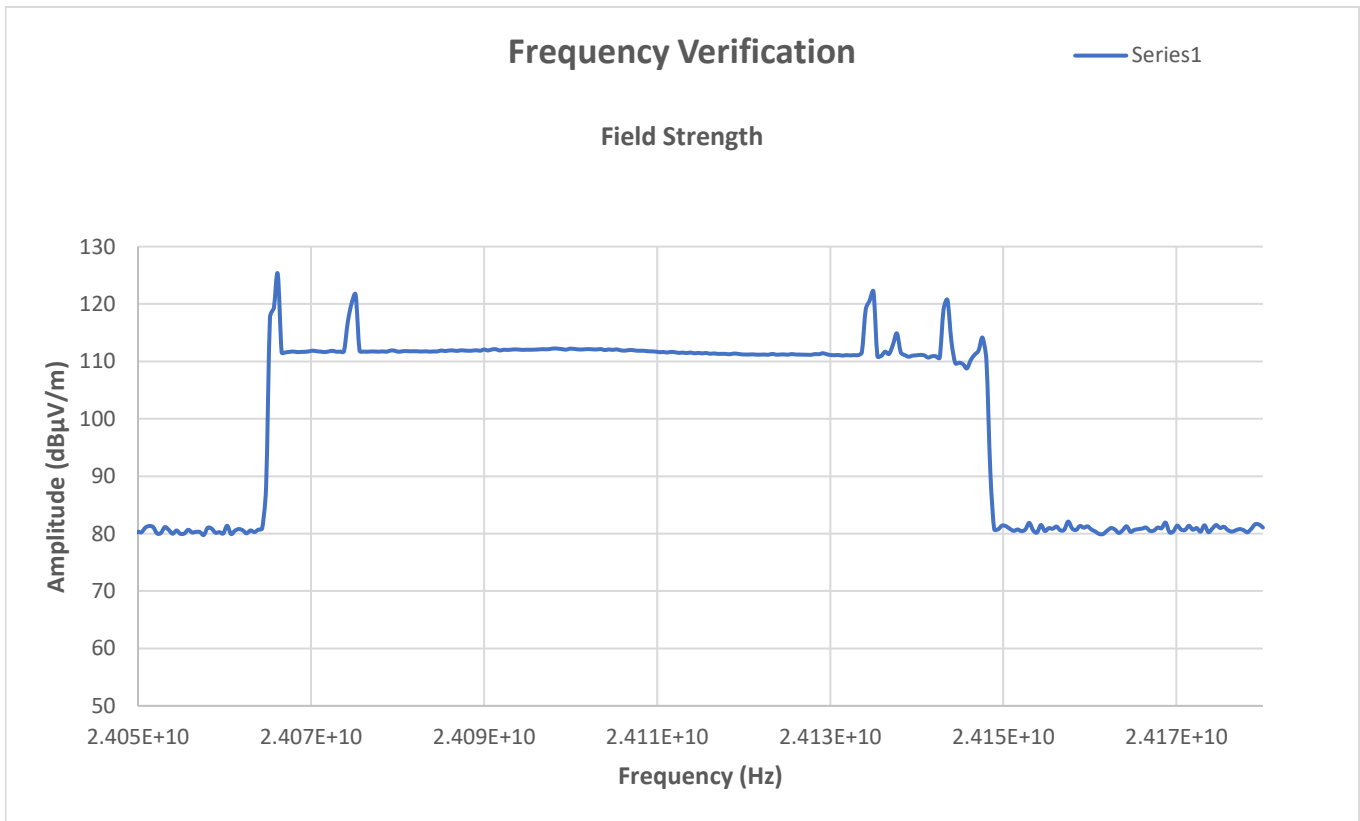
Test Setup Diagram



Test Equipment Utilized

Description	Manufacturer	Model #	Serial #	Asset #	Cal. Due Date
EMC Analyzer	Agilent	E7405	US40240238	EB046	1/29/2026
DRG Horn Antenna	ETS Lindgren	3116	00026390	EE017	5/21/2026
Pre-Amplifier	Keystone Compliance	PA-1	0002	EG003	6/30/2026
Turntable Controller	EMCO	1061.2.013	9401-1717	EI009	UWCE

Frequency Measurements:



Frequency Verification					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBµV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	125.22	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
0X00048F6F**

**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 31, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Applus+ Keystone
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX00048F6F**

Date of Issue: January 31, 2025

This speed measuring device has been tested and verified to be functioning in accordance with the manufacture's specifications.

The frequency measurements performed and reported within this report demonstrate that the SmartMicro UMRR-11 T44 radar system has an accuracy of less than or equal to 1 mph up to 100 mph and 1% accuracy thereafter up to 199 mph maximum.

FSK Frequency Set 1					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBμV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	125.22	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Test Report**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX0004B991**

**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 31, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Applus + Keystone
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

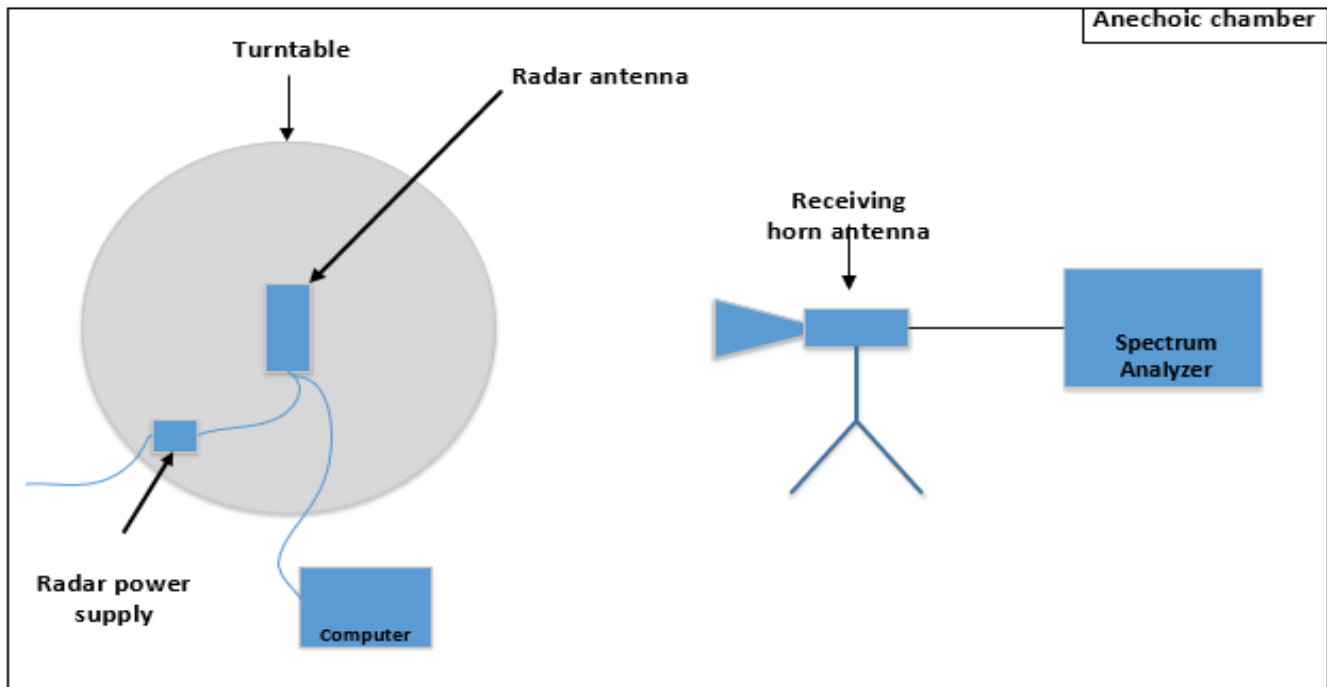
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Revision	Date	Description	Revised By
N/C	#####	Initial Release	Mathew Santiago

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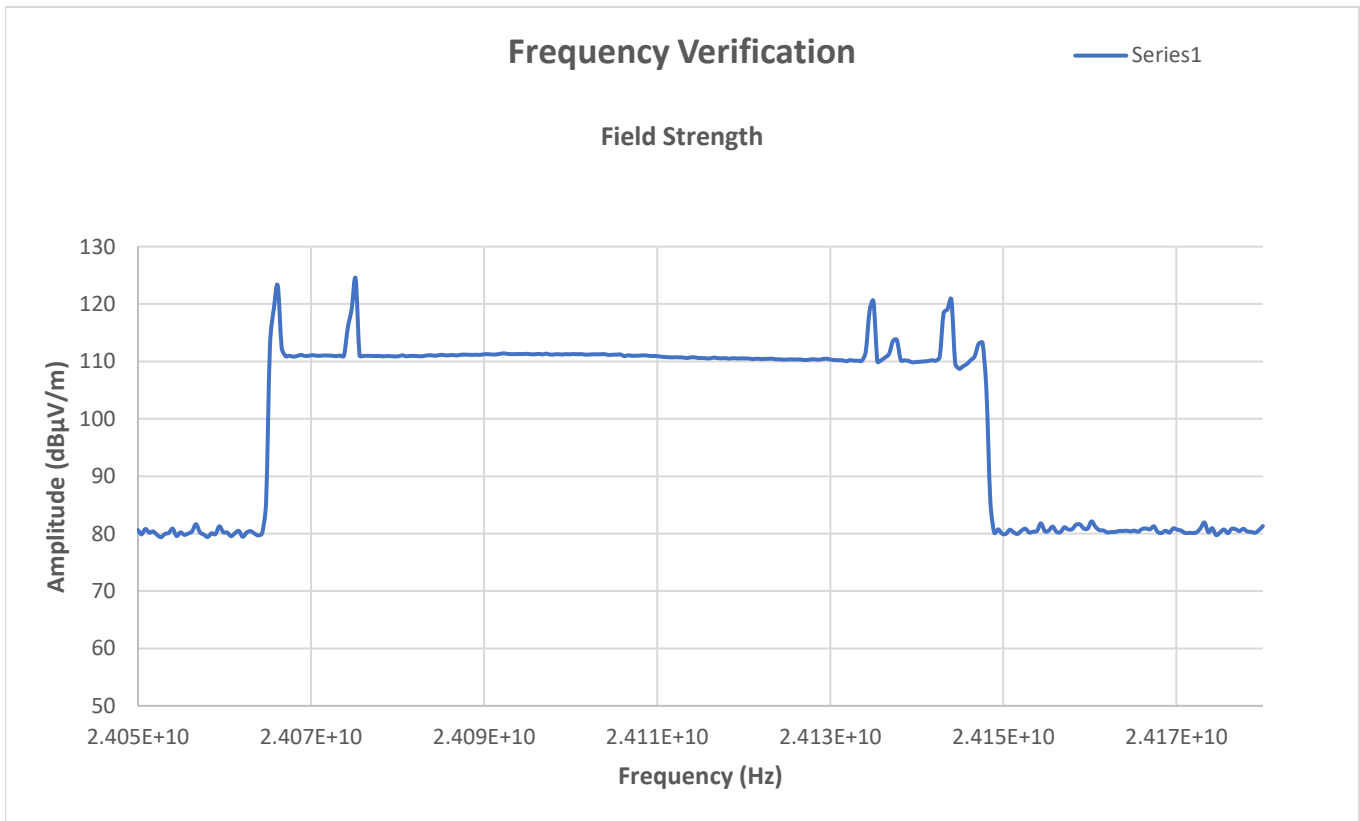
Test Setup Diagram



Test Equipment Utilized

Description	Manufacturer	Model #	Serial #	Asset #	Cal. Due Date
EMC Analyzer	Agilent	E7405	US40240238	EB046	1/29/2026
DRG Horn Antenna	ETS Lindgren	3116	00026390	EE017	5/21/2026
Pre-Amplifier	Keystone Compliance	PA-1	0002	EG003	6/30/2026
Turntable Controller	EMCO	1061.2.013	9401-1717	EI009	UWCE

Frequency Measurements:



Frequency Verification					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBµV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	124.40	84.7 +/- 4.8	PASS

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
0X0004B991**

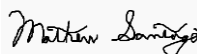
**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 31, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Applus+ Keystone
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX0004B991**

Date of Issue: January 31, 2025

This speed measuring device has been tested and verified to be functioning in accordance with the manufacture’s specifications.

The frequency measurements performed and reported within this report demonstrate that the SmartMicro UMRR-11 T44 radar system has an accuracy of less than or equal to 1 mph up to 100 mph and 1% accuracy thereafter up to 199 mph maximum.

FSK Frequency Set 1					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBµV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	124.40	84.7 +/- 4.8	PASS



Report No.: 2403-267EA

Revision: N/C

**Radar Sensor Calibration Verification
Test Report**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX00048F69**

**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 31, 2025

Owner of EUT: Verra Mobility
1150 N. Alma School Rd
Mesa, AZ 85201

Attention of: Engineering Department
Phone: (480) 443-7000

Test Facility	
Test Laboratory	Applus + Keystone
Address	131 North Columbus Innerbelt
City, State, Zip Code	New Castle, PA 16101
Email	questions@keystonecompliance.com
Web Site	www.keystonecompliance.com

Test Personnel	
Name	Mathew Santiago
Title	EMC Test Engineer
Signature	

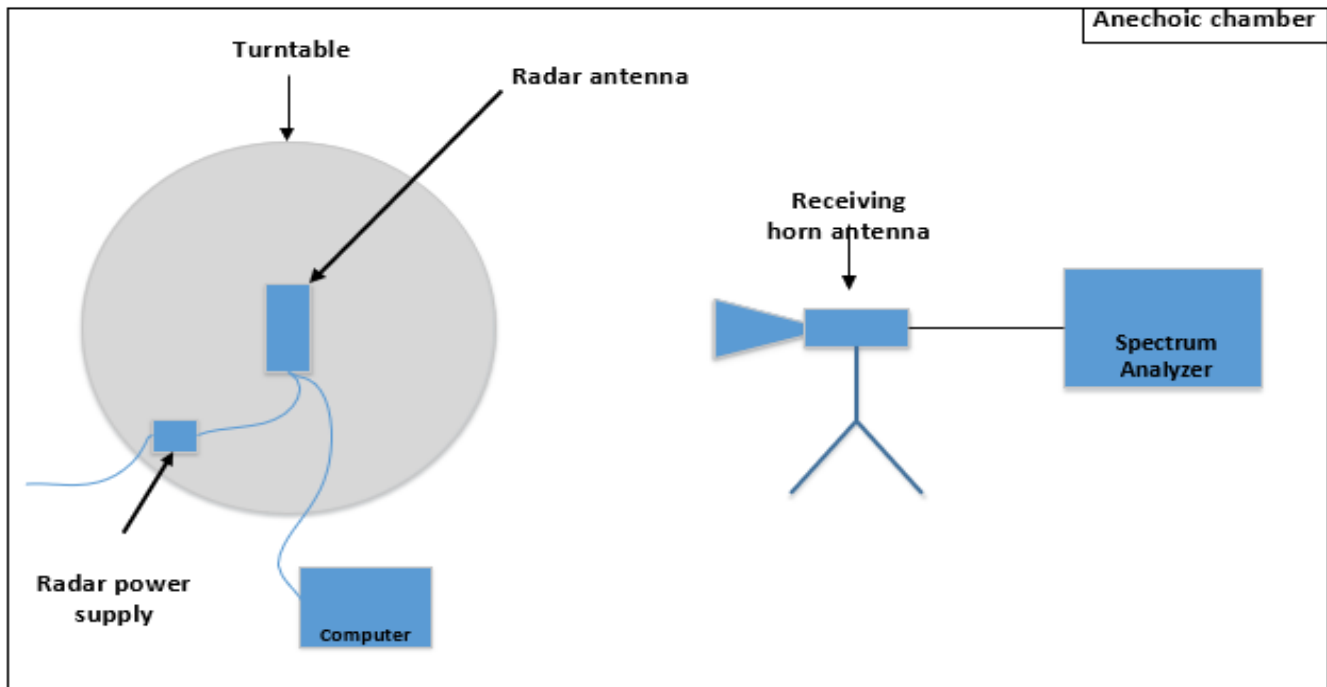
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Revision	Date	Description	Revised By
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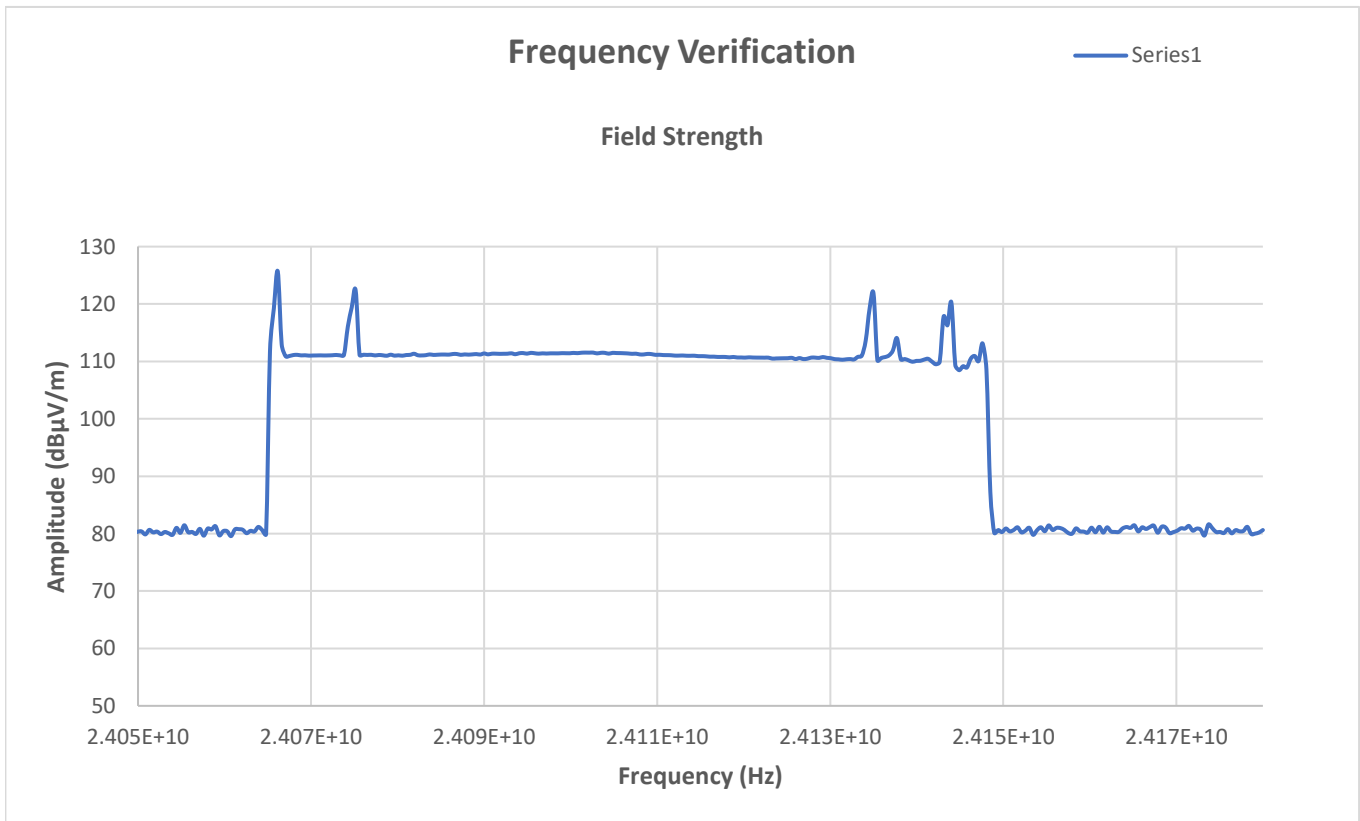
Test Setup Diagram



Test Equipment Utilized

Description	Manufacturer	Model #	Serial #	Asset #	Cal. Due Date
EMC Analyzer	Agilent	E7405	US40240238	EB046	1/29/2026
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Frequency Measurements:



Frequency Verification					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBµV)	Bandwidth Limit (MHz)	Results
24.075-24.175	24.107	82.8	125.67	84.7 +/- 4.8	PASS

**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX00048F69**

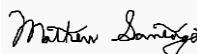
**Description:
Radar Characteristics Validation
In compliance with:
SMS UMRR-11 T44 / UMRR-12 T48 RADAR QUALIFICATION USING SPECRA**

Date of Issue: January 31, 2025

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**Radar Sensor Calibration Verification
Certificate of Calibration**

Model: UMRR-11 T44

**Part Number / Serial Number:
OX00048F69**

Date of Issue: January 31, 2025

This speed measuring device has been tested and verified to be functioning in accordance with the manufacture’s specifications.

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FSK Frequency Set 1					
Nominal Frequency Range (GHz)	Measured Center Frequency (GHz)	Measured Frequency Bandwidth @ 20dB (MHz)	Amplitude (dBμV)	Bandwidth Limit (MHz)	Results
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