



**Report of Measurements
FCC Part 15, Subpart C, Section 15.209**

On

**Train Guard Mass Transit Zub On-Board Equipment
50 kHz Control Circuit and 850 kHz Data Transmitting Circuit with Vehicle Coupling Coil (VCC)
FCC ID: 2A8HRS25441-M3-A3**

Customer Name: Siemens Mobility

Customer P.O.: 4510076816

Date of Report Rev.: October 31, 2023

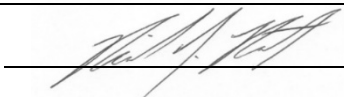
Test Report No: R-3578P-2, Rev. B

Test Start Date: July 28, 2022

Test Finish Date: July 29, 2022

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Certification and Signatures We certify that this report is a true representation of the results obtained from the tests of the equipment stated. We further certify that the measurements shown in this report were made in accordance with the procedures indicated and vouch for the qualifications of all Retlif Testing Laboratories personnel taking them.

 Richard J. Reitz Director of Engineering iNARTE Electromagnetic Compatibility Engineer EMC-050739-E	 Scott Wentworth Branch Manager
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Non-Warranty Provision

The testing services have been performed, findings obtained and reports prepared in accordance with generally accepted laboratory principles and practices. This warranty is in lieu of all others, either expressed or implied.

Non-Endorsement

This test report contains only findings and results arrived at after employing the specific test procedures and standards listed herein. It is not intended to constitute a recommendation, endorsement or certification of the product or material tested. This test report must not be used by the client to claim product endorsement by ANAB or any agency of the U.S. Government.



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Technical Information

Report Number:	R-3578P-2, Rev. B
Applicant:	Siemens Mobility, Inc.
Address:	162 East Bridge Street
	Suite 200
	Homestead, PA 15120
FRN:	0032806093
Test Sample:	Train Guard Mass Transit Zub System Equipment
Model Number:	S25441-M3-A3-01.H
Frequency Range of Operation:	50 kHz and 850 kHz
Equipment Class:	DCD – Part 15 Low Power Transmitter below 1705 kHz
Equipment Use:	Mobile
Power Requirements:	DC Voltage derived from Host Train Car
Transmission	50 kHz: Control Circuit
Protocols/Modulation	850 kHz: Data Transmitting Circuit (Binary Coded FSK 50 kBd)

Test Specifications:

FCC Rules and Regulations Part 15, Subpart C, Section 15.209

Test Procedures:

ANSI C63.4: 2014

ANSI C63.10: 2013

Test Facility:

Retlif Testing Laboratories

3131 Detwiler Road

Harleysville, PA 19438

FCC Registered Designation Number: US2321

Tests Performed

The test method that was performed to demonstrate compliance with the FCC Rules is shown below:

FCC Rule Section	Test Method	EUT Component / Operating Frequency	Test Result
15.209	ANSI C63.10, 6.4 Radiated Emissions from Unlicensed Wireless Devices Below 30 MHz	50 kHz Standalone	Pass
		50 kHz with TCC	Pass
15.209	ANSI C63.10, 6.4 Radiated Emissions from Unlicensed Wireless Devices Below 30 MHz	850 kHz with IMU	Pass



All test methods listed above are included in Retlif Testing Laboratories ANSI National Accreditation Board (ANAB), ISO/IEC 17025 Scope of Accreditation, Certificate Number: L2320.02.

General Test Information

Part 15.31 Measurement Standards

- Testing was performed using the procedures specified in ANSI C63.10-2013 in accordance with 15.31(a)(3).
- Testing was performed with the transmitter continuously transmitting at the selected frequency in accordance with 15.31(c).
- Field strength measurements were made on an Open Area Test Site in accordance with 15.31(d).
- Field strength measurements were made at a distance closer than specified in the regulations. The results were extrapolated to the specified test distance by using the square of an inverse linear distance extrapolation factor (40 dB/decade).

Sample Calculation:

- Extrapolation Factor (dB) = $40 \text{ Log } (D_{\text{Meas}} / D_{\text{Spec}})$

Where:

- D_{Meas} = Distance at which measurements were performed (10 Meters)
- D_{Spec} = Distance at which the limit is specified (300 Meters)

- Extrapolation Factor (dB) = $40 \text{ Log } (10 / 300)$
= $40 \text{ Log } (0.033)$
= $40 * -1.488$
= - 59.08

- The Device under test was positioned and adjusted to maximize the level of emissions in accordance with 15.31(g).
- The test sample operates at two (2) discrete frequencies under Part 15. All testing outlined herein was performed with the device under test operating at each of these frequencies.

Part 15.33 Frequency range of radiated measurements

- The radio frequency spectrum was investigated from 9 kHz to the 10th harmonic of the highest fundamental frequency as specified in 15.33(a)(1).

Part 15.35 Measurement detector function and bandwidths

- On frequencies below or equal to 1000 MHz, measurements were made utilizing either a peak or quasi-peak detector and associated bandwidths with the exception of measurements in the frequency bands of 9 to 90 kHz and 110 to 490 kHz in which an average detector was utilized.

Requirements and Test Results

Requirement: 15.209 Radiated Emissions Limits; General Requirements

(a) Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz) Field strength (microvolts/meter) Measurement distance (meters)

0.009-0.490	$2400/F(\text{kHz})$	300
0.490-1.705	$24000/F(\text{kHz})$	30
1.705-30.0	30	30
30-88	100 **	3
88-216	150 **	3
216-960	200 **	3
Above 960	500	3

Limit Calculation:

- 50 kHz

$$\text{Limit (uV/m)} = 2400 / 50 = 48.0 \text{ uV/m}$$

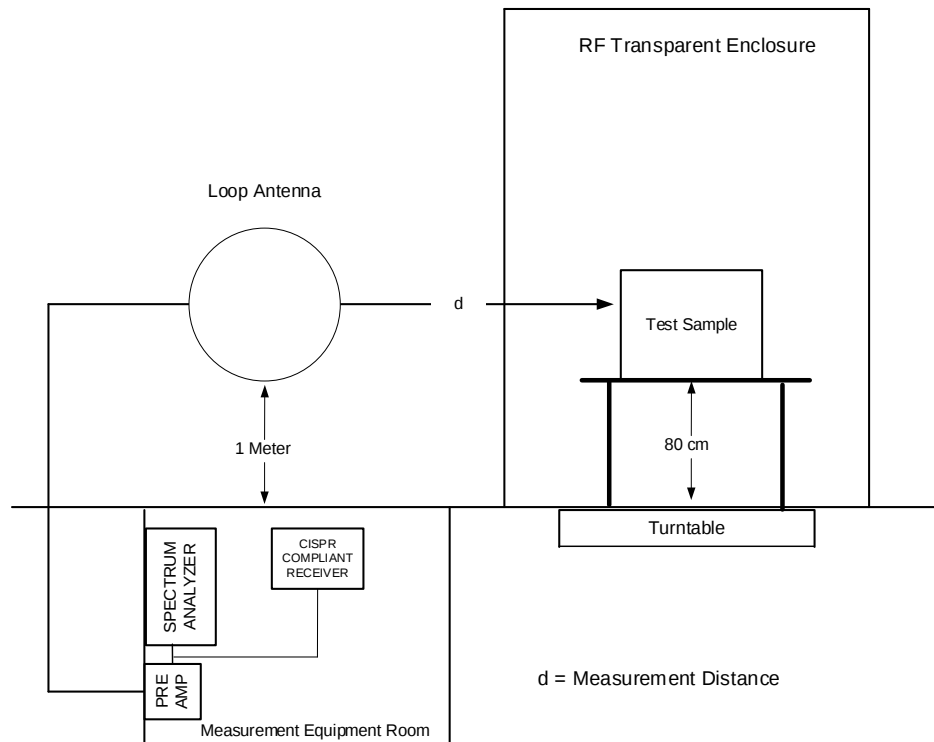
- 850 kHz

$$\text{Limit (uV/m)} = 2400 / 850 = 28.2 \text{ uV/m}$$

- **Results:**

The emissions observed from the EUT do not exceed the specified limits when measured in the specified detector function.

General Radiated Emissions, 9 kHz to 30 MHz



EQUIPMENT LIST

50 kHz:

EN	Manufacturer	Model No.	Description	Serial No.	Due Date
3207	ETS / EMCO	6502	ANTENNA, ACTIVE LOOP, 9 kHz - 30 MHz	1033	5/31/2023
8079	ROHDE &	ESH3	RECEIVER, EMI, 9 kHz - 30 MHz	861742/012	6/30/2023
8300	RETLIF	RPA	OPEN AREA TEST SITE, ATTENUATION, 3/10 Meter OATS	N/A	5/31/2024
8300B	UNKNOWN	10 METER CABLE	CABLE, COAXIAL, 3/10 Meter Site	N/A	8/31/2022
8644	AGILENT / HP	85662A	ANALYZER, SPECTRUM, 100 Hz - 22 GHz	2848A18175	9/30/2022
8644A	AGILENT / HP	8566B	ANALYZER, SPECTRUM, 100 Hz - 22.5 GHz	2937A06124	9/30/2022
8662	DIGI-SENSE	20250-30	HYGROMETER, 0 - 50 deg. c, 10 - 90 % RH	151210305	10/31/2022

850 kHz:

EN	Manufacturer	Model No.	Description	Serial No.	Due Date
3207	ETS / EMCO	6502	ANTENNA, ACTIVE LOOP, 9 kHz - 30 MHz	1033	5/31/2023
5272	ROHDE &	ESPC	RECEIVER, EMI, 150 kHz - 1 GHz	843820/023	3/31/2023
8300	RETLIF	RPA	OPEN AREA TEST SITE, ATTENUATION, 3/10 Meter OATS	N/A	5/31/2024
8300C	UNKNOWN	3 METER CABLE	CABLE, COAXIAL, 3/10 METER	N/A	2/28/2023
8644	AGILENT / HP	85662A	ANALYZER, SPECTRUM, 100 Hz - 22 GHz	2848A18175	9/30/2023
8644A	AGILENT / HP	8566B	ANALYZER, SPECTRUM, 100 Hz - 22.5 GHz	2937A06124	9/30/2023
8668	DIGI-SENSE	20250-31	HYGROMETER, 0 - 50 deg. c, 10 - 90 % RH	140908984	10/31/2023

On Board Equipment – 50 kHz Standalone

EMISSIONS TEST DATA SHEET	
Method:	FCC Part 15.209(a)
Job Number/Customer:	R-3578P-2 / Siemens Mobility
Test Sample:	Train Guard Mass Transit Zub On-Board Equipment
Model Number:	S25441-M3-A3-01.H (VCC); S25451-C401-B242 (Card File)
Serial Number:	6101125087-001 (VCC); A2V00002744893 (Card File)
Operating Mode:	Vehicle Coupling Coil Transmitting at 50 kHz, without Track Coupling Coil
Technician:	M. Nowak
Date(s):	7/28/22
Temperature:	25.5 °C
Relative Humidity:	47%
Detector:	Peak
Test Distance:	10m
Notes: The frequency range was scanned from 9 kHz to 500kHz The emissions observed from the EUT do not exceed the limits specified. *Noise floor measurement, minimum sensitivity of measurement system.	

Frequency	Antenna Pol / Height	EUT Orientation	Peak Meter Reading @ 10 M	Correction Factor	Distance Correction	Corrected Reading @ 300m (30m above 0.490 MHz)	Converted Reading	Limit @ 300m (30m above 0.490 MHz)
MHz	(Parallel/Perpendicular/Horizontal)	Degrees	dBuV	dB	dB	dBuV/m	uV/m	uV/m
0.009								2666.7
0.050	Parallel	256.4	79.4	12.5	-59.08	32.82	43.75	480.0
0.050	Perpendicular	171.5	76.9	12.5	-59.08	30.32	32.81	480.0
0.050	Horizontal	282.3	61.4	12.5	-59.08	14.82	5.51	480.0
*0.100	Parallel	180.0	35.1	11.9	-59.08	-12.08	0.25	24.0
*0.100	Perpendicular	180.0	35.1	11.9	-59.08	-12.08	0.25	24.0
*0.100	Horizontal	180.0	35.1	11.9	-59.08	-12.08	0.25	24.0
*0.150	Parallel	180.0	29.2	11.7	-59.08	-18.18	0.12	160.0
*0.150	Perpendicular	180.0	29.2	11.7	-59.08	-18.18	0.12	160.0
*0.150	Horizontal	180.0	29.2	11.7	-59.08	-18.18	0.12	160.0
*0.200	Parallel	180.0	29.8	11.7	-59.08	-17.58	0.13	120.0
*0.200	Perpendicular	180.0	29.8	11.7	-59.08	-17.58	0.13	120.0
*0.200	Horizontal	180.0	29.8	11.7	-59.08	-17.58	0.13	120.0
*0.250	Parallel	180.0	25.3	11.7	-59.08	-22.08	0.08	96.0
*0.250	Perpendicular	180.0	25.3	11.7	-59.08	-22.08	0.08	96.0
*0.250	Horizontal	180.0	25.3	11.7	-59.08	-22.08	0.08	96.0
*0.300	Parallel	180.0	24.1	11.7	-59.08	-23.28	0.07	80.0
*0.300	Perpendicular	180.0	24.1	11.7	-59.08	-23.28	0.07	80.0
*0.300	Horizontal	180.0	24.1	11.7	-59.08	-23.28	0.07	80.0

Frequency	Antenna Pol / Height	EUT Orientation	Peak Meter Reading @ 10 M	Correction Factor	Distance Correction	Corrected Reading @ 300m (30m above 0.490 MHz)	Converted Reading	Limit @ 300m (30m above 0.490 MHz)
MHz	(Parallel/Perpendi cular/Horizontal)	Degrees	dBuV	dB	dB	dBuV/m	uV/m	uV/m
*0.350	Parallel	180.0	21.9	11.7	-59.08	-25.48	0.05	68.6
*0.350	Perpendicular	180.0	21.9	11.7	-59.08	-25.48	0.05	68.6
*0.350	Horizontal	180.0	21.9	11.7	-59.08	-25.48	0.05	68.6
*0.400	Parallel	180.0	22.4	11.7	-59.08	-24.98	0.06	60.0
*0.400	Perpendicular	180.0	22.4	11.7	-59.08	-24.98	0.06	60.0
*0.400	Horizontal	180.0	22.4	11.7	-59.08	-24.98	0.06	60.0
*0.450	Parallel	180.0	20.2	11.7	-59.08	-27.18	0.04	53.3
*0.450	Perpendicular	180.0	20.2	11.7	-59.08	-27.18	0.04	53.3
*0.450	Horizontal	180.0	20.2	11.7	-59.08	-27.18	0.04	53.3
0.490								49.0
0.490								48.98
*0.500	Parallel	180.0	20.2	11.7	-19.08	12.82	4.38	48.0
*0.500	Perpendicular	180.0	20.2	11.7	-19.08	12.82	4.38	48.0
*0.500	Horizontal	180.0	20.2	11.7	-19.08	12.82	4.38	48.0
0.500								48.0

EMISSIONS TEST DATA SHEET

Method:	FCC Part 15.209(a)
Job Number/Customer:	R-3578P-2 / Siemens Mobility
Test Sample:	Train Guard Mass Transit Zub On-Board Equipment
Model Number:	S25441-M3-A3-01.H (VCC); S25451-C401-B242 (Card File)
Serial Number:	6101125087-001 (VCC); A2V00002744893 (Card File)
Operating Mode:	Vehicle Coupling Coil Transmitting at 50 kHz, without Track Coupling Coil
Technician:	M. Nowak
Date(s):	7/28/22
Temperature:	25.5 °C
Relative Humidity:	47%
Detector:	Average
Test Distance:	10m

Notes: The frequency range was scanned from 9 kHz to 500kHz

The emissions observed from the EUT do not exceed the limits specified.

*Noise floor measurement, minimum sensitivity of measurement system.

Frequency	Antenna Pol / Height	EUT Orientation	Avg Meter Reading @ 10 M	Correction Factor	Distance Correction	Corrected Reading @ 300m (30m above 0.490 MHz)	Converted Reading	Limit @ 300m (30m above 0.490 MHz)
MHz	(Parallel/Perpendi- cular/Horizontal)	Degrees	dBuV	dB	dB	dBuV/m	uV/m	uV/m
0.009								266.67
0.050	Parallel	259.6	76.7	12.5	-59.08	30.12	32.06	48.0
0.050	Perpendicular	171.5	71.9	12.5	-59.08	25.32	18.45	48.0
0.050	Horizontal	271.8	55.2	12.5	-59.08	8.62	2.70	48.0
*0.100	Parallel	180.0	21.5	11.9	-59.08	-25.68	0.05	N/A
*0.100	Perpendicular	180.0	21.5	11.9	-59.08	-25.68	0.05	N/A
*0.100	Horizontal	180.0	21.5	11.9	-59.08	-25.68	0.05	N/A
*0.150	Parallel	180.0	19.0	11.7	-59.08	-28.38	0.04	16.0
*0.150	Perpendicular	180.0	19.0	11.7	-59.08	-28.38	0.04	16.0
*0.150	Horizontal	180.0	19.0	11.7	-59.08	-28.38	0.04	16.0
*0.200	Parallel	180.0	18.7	11.7	-59.08	-28.68	0.04	12.0
*0.200	Perpendicular	180.0	18.7	11.7	-59.08	-28.68	0.04	12.0
*0.200	Horizontal	180.0	18.7	11.7	-59.08	-28.68	0.04	12.0
*0.250	Parallel	180.0	14.0	11.7	-59.08	-33.38	0.02	9.6
*0.250	Perpendicular	180.0	14.0	11.7	-59.08	-33.38	0.02	9.6
*0.250	Horizontal	180.0	14.0	11.7	-59.08	-33.38	0.02	9.6
*0.300	Parallel	180.0	12.7	11.7	-59.08	-34.68	0.02	8.0
*0.300	Perpendicular	180.0	12.7	11.7	-59.08	-34.68	0.02	8.0
*0.300	Horizontal	180.0	12.7	11.7	-59.08	-34.68	0.02	8.0
*0.350	Parallel	180.0	11.6	11.7	-59.08	-35.78	0.02	6.86
*0.350	Perpendicular	180.0	11.6	11.7	-59.08	-35.78	0.02	6.86
*0.350	Horizontal	180.0	11.6	11.7	-59.08	-35.78	0.02	6.86

Frequency	Antenna Pol / Height	EUT Orientation	Avg Meter Reading @ 10 M	Correction Factor	Distance Correction	Corrected Reading @ 300m (30m above 0.490 MHz)	Converted Reading	Limit @ 300m (30m above 0.490 MHz)
MHz	(Parallel/Perpendicular/Horizontal)	Degrees	dBuV	dB	dB	dBuV/m	uV/m	uV/m
*0.400	Parallel	180.0	10.6	11.7	-59.08	-36.78	0.01	6.0
*0.400	Perpendicular	180.0	10.6	11.7	-59.08	-36.78	0.01	6.0
*0.400	Horizontal	180.0	10.6	11.7	-59.08	-36.78	0.01	6.0
*0.450	Parallel	180.0	10.1	11.7	-59.08	-37.28	0.01	5.33
*0.450	Perpendicular	180.0	10.1	11.7	-59.08	-37.28	0.01	5.33
*0.450	Horizontal	180.0	10.1	11.7	-59.08	-37.28	0.01	5.33
0.490								4.90
0.490								48.98
*0.500	Parallel	180.0	8.8	11.7	-19.08	1.42	1.18	N/A
*0.500	Perpendicular	180.0	8.8	11.7	-19.08	1.42	1.18	N/A
*0.500	Horizontal	180.0	8.8	11.7	-19.08	1.42	1.18	N/A
0.500								48.0

On Board Equipment – 50 kHz with TCC

EMISSIONS TEST DATA SHEET	
Method:	FCC Part 15.209(a)
Job Number/Customer:	R-3578P-2 / Siemens Mobility
Test Sample:	Train Guard Mass Transit Zub On-Board Equipment
Model Number:	S25441-M3-A3-01.H (VCC); S25451-C401-B242 (Card File); S25442-M1-A1-15.K (TCC)
Serial Number:	6101125087-001 (VCC); A2V00002744893 (Card File); 6101020657-007 (TCC)
Operating Mode:	Vehicle Coupling Coil Transmitting at 50 kHz, with Track Coupling Coil
Technician:	M. Nowak
Date(s):	7/29/22
Temperature:	25.5 °C
Relative Humidity:	47%
Detector:	Peak
Test Distance:	10m
Notes: The frequency range was scanned from 9 kHz to 500 kHz The emissions observed from the EUT do not exceed the limits specified. *Noise floor measurement, minimum sensitivity of measurement system.	

Frequency	Antenna Pol / Height	EUT Orientation	Peak Meter Reading @ 10 M	Correction Factor	Distance Correction	Corrected Reading @ 300m (30m above 0.490 MHz)	Converted Reading	Limit @ 300m (30m above 0.490 MHz)
MHz	(Parallel/Perpendicular/Horizontal)	Degrees	dBuV	dB	dB	dBuV/m	uV/m	uV/m
0.009								2666.7
0.050	Parallel	258.8	77.1	12.5	-59.08	30.52	33.57	480.0
0.050	Perpendicular	182.8	72.7	12.5	-59.08	30.32	20.23	480.0
0.050	Horizontal	282.3	54.2	12.5	-59.08	7.62	2.40	480.0
*0.100	Parallel	180.0	32.8	11.9	-59.08	-14.38	0.19	24.0
*0.100	Perpendicular	180.0	32.8	11.9	-59.08	-14.38	0.19	24.0
*0.100	Horizontal	180.0	32.8	11.9	-59.08	-14.38	0.19	24.0
*0.150	Parallel	180.0	29.2	11.7	-59.08	-18.18	0.12	160.0
*0.150	Perpendicular	180.0	29.2	11.7	-59.08	-18.18	0.12	160.0
*0.150	Horizontal	180.0	29.2	11.7	-59.08	-18.18	0.12	160.0
*0.200	Parallel	180.0	29.8	11.7	-59.08	-17.58	0.13	120.0
*0.200	Perpendicular	180.0	29.8	11.7	-59.08	-17.58	0.13	120.0
*0.200	Horizontal	180.0	29.8	11.7	-59.08	-17.58	0.13	120.0
*0.250	Parallel	180.0	25.3	11.7	-59.08	-22.08	0.08	96.0
*0.250	Perpendicular	180.0	25.3	11.7	-59.08	-22.08	0.08	96.0
*0.250	Horizontal	180.0	25.3	11.7	-59.08	-22.08	0.08	96.0
*0.300	Parallel	180.0	24.1	11.7	-59.08	-23.28	0.07	80.0
*0.300	Perpendicular	180.0	24.1	11.7	-59.08	-23.28	0.07	80.0
*0.300	Horizontal	180.0	24.1	11.7	-59.08	-23.28	0.07	80.0
*0.350	Parallel	180.0	21.9	11.7	-59.08	-25.48	0.05	68.6
*0.350	Perpendicular	180.0	21.9	11.7	-59.08	-25.48	0.05	68.6
*0.350	Horizontal	180.0	21.9	11.7	-59.08	-25.48	0.05	68.6

Frequency	Antenna Pol / Height	EUT Orientation	Peak Meter Reading @ 10 M	Correction Factor	Distance Correction	Corrected Reading @ 300m (30m above 0.490 MHz)	Converted Reading	Limit @ 300m (30m above 0.490 MHz)
MHz	(Parallel/Perpendicular/Horizontal)	Degrees	dBuV	dB	dB	dBuV/m	uV/m	uV/m
I								I
*0.400	Parallel	180.0	22.4	11.7	-59.08	-24.98	0.06	60.0
*0.400	Perpendicular	180.0	22.4	11.7	-59.08	-24.98	0.06	60.0
*0.400	Horizontal	180.0	22.4	11.7	-59.08	-24.98	0.06	60.0
I								I
*0.450	Parallel	180.0	20.2	11.7	-59.08	-27.18	0.04	53.3
*0.450	Perpendicular	180.0	20.2	11.7	-59.08	-27.18	0.04	53.3
*0.450	Horizontal	180.0	20.2	11.7	-59.08	-27.18	0.04	53.3
I								I
0.490								49.0
0.490								48.98
I								I
*0.500	Parallel	180.0	20.2	11.7	-19.08	12.82	4.38	48.0
*0.500	Perpendicular	180.0	20.2	11.7	-19.08	12.82	4.38	48.0
*0.500	Horizontal	180.0	20.2	11.7	-19.08	12.82	4.38	48.0
I								I
0.500								48.0

EMISSIONS TEST DATA SHEET	
Method:	FCC Part 15.209(a)
Job Number/Customer:	R-3578P-2 / Siemens Mobility
Test Sample:	Train Guard Mass Transit Zub On-Board Equipment
Model Number:	S25441-M3-A3-01.H (VCC); S25451-C401-B242 (Card File); S25442-M1-A1-15.K (TCC)
Serial Number:	6101125087-001 (VCC); A2V00002744893 (Card File); 6101020657-007 (TCC)
Operating Mode:	Vehicle Coupling Coil Transmitting at 50 kHz, with Track Coupling Coil
Technician:	M. Nowak
Date(s):	7/29/22
Temperature:	25.5 °C
Relative Humidity:	47%
Detector:	Average
Test Distance:	10m
Notes: The frequency range was scanned from 9kHz to 500kHz The emissions observed from the EUT do not exceed the limits specified. *Noise floor measurement, minimum sensitivity of measurement system.	

Frequency	Antenna Pol / Height	EUT Orientation	Avg Meter Reading @ 10 M	Correction Factor	Distance Correction	Corrected Reading @ 300m (30m above 0.490 MHz)	Converted Reading	Limit @ 300m (30m above 0.490 MHz)
MHz	(Parallel/Perpendicular/Horizontal)	Degrees	dBuV	dB	dB	dBuV/m	uV/m	uV/m
0.009								266.67
0.050	Parallel	259.6	76.0	12.5	-59.08	29.42	29.58	48.0
0.050	Perpendicular	182.8	71.8	12.5	-59.08	25.22	18.24	48.0
0.050	Horizontal	271.8	52.4	12.5	-59.08	5.88	1.97	48.0
*0.100	Parallel	180.0	21.5	11.9	-59.08	-25.68	0.05	N/A
*0.100	Perpendicular	180.0	21.5	11.9	-59.08	-25.68	0.05	N/A
*0.100	Horizontal	180.0	21.5	11.9	-59.08	-25.68	0.05	N/A
*0.150	Parallel	180.0	19.0	11.7	-59.08	-28.38	0.04	16.0
*0.150	Perpendicular	180.0	19.0	11.7	-59.08	-28.38	0.04	16.0
*0.150	Horizontal	180.0	19.0	11.7	-59.08	-28.38	0.04	16.0
*0.200	Parallel	180.0	18.7	11.7	-59.08	-28.68	0.04	12.0
*0.200	Perpendicular	180.0	18.7	11.7	-59.08	-28.68	0.04	12.0
*0.200	Horizontal	180.0	18.7	11.7	-59.08	-28.68	0.04	12.0
*0.250	Parallel	180.0	14.0	11.7	-59.08	-33.38	0.02	9.6
*0.250	Perpendicular	180.0	14.0	11.7	-59.08	-33.38	0.02	9.6
*0.250	Horizontal	180.0	14.0	11.7	-59.08	-33.38	0.02	9.6
*0.300	Parallel	180.0	12.7	11.7	-59.08	-34.68	0.02	8.0
*0.300	Perpendicular	180.0	12.7	11.7	-59.08	-34.68	0.02	8.0
*0.300	Horizontal	180.0	12.7	11.7	-59.08	-34.68	0.02	8.0
*0.350	Parallel	180.0	11.6	11.7	-59.08	-35.78	0.02	6.86
*0.350	Perpendicular	180.0	11.6	11.7	-59.08	-35.78	0.02	6.86
*0.350	Horizontal	180.0	11.6	11.7	-59.08	-35.78	0.02	6.86

Frequency	Antenna Pol / Height	EUT Orientation	Avg Meter Reading @ 10 M	Correction Factor	Distance Correction	Corrected Reading @ 300m (30m above 0.490 MHz)	Converted Reading	Limit @ 300m (30m above 0.490 MHz)
MHz	(Parallel/Perpendicular/Horizontal)	Degrees	dBuV	dB	dB	dBuV/m	uV/m	uV/m
*0.400	Parallel	180.0	10.6	11.7	-59.08	-36.78	0.01	6.0
*0.400	Perpendicular	180.0	10.6	11.7	-59.08	-36.78	0.01	6.0
*0.400	Horizontal	180.0	10.6	11.7	-59.08	-36.78	0.01	6.0
*0.450	Parallel	180.0	10.1	11.7	-59.08	-37.28	0.01	5.33
*0.450	Perpendicular	180.0	10.1	11.7	-59.08	-37.28	0.01	5.33
*0.450	Horizontal	180.0	10.1	11.7	-59.08	-37.28	0.01	5.33
0.490								4.90
0.490								48.98
*0.500	Parallel	180.0	8.8	11.7	-19.08	1.42	1.18	N/A
*0.500	Perpendicular	180.0	8.8	11.7	-19.08	1.42	1.18	N/A
*0.500	Horizontal	180.0	8.8	11.7	-19.08	1.42	1.18	N/A
0.500								48.0

On Board Equipment – VCC Operating at 850 kHz, with IMU Antenna

EMISSIONS TEST DATA SHEET	
Method:	FCC Part 15.209(a)
Job Number/Customer:	R-3578P-7 / Siemens Mobility
Test Sample:	IMU 100 Test Device
Model Number:	S25441-M3-A3-01.H (VCC); S25451-C401-B242 (Card File); S25447-H8-A2 (IMU 100); S25447-H80-A2-02 (Antenna)
Serial Number:	6101125087-001 (VCC); A2V00002744893 (Card File); 0225 (IMU 100)
Operating Mode:	VCC Transmitter Operating at 850 kHz, with IMU Antenna in Place
Technician:	M. Nowak
Date(s):	11/7/22 – 11/8/22
Temperature:	23.9 °C
Relative Humidity:	40%
Detector:	Peak
Test Distance:	3m
Notes: The frequency range was scanned from 9kHz to 8.5 MHz The emissions observed from the EUT do not exceed the limits specified. *Noise floor measurement, minimum sensitivity of measurement system. The limit shown for below 0.490 MHz is for a measurement distance of 300m.	

Frequency	Antenna Pol / Height	EUT Orientation	Peak Meter Reading @ 3 M	Correction Factor	Distance Correction	Corrected Reading @ 30 M	Converted Reading	Limit @ 30m
MHz	(Parallel/Perpendicular/Horizontal)	Degrees	dBuV	dB	dB	dBuV/m	uV/m	uV/m
0.009								266.67
0.490								4.90
0.490								48.98
0.850	Parallel	187.1	56.8	11.7	-40.00	28.5	26.61	28.2
0.850	Perpendicular	183.6	57.0	11.7	-40.00	28.7	27.23	28.2
0.850	Horizontal	111.9	48.3	11.7	-40.00	20.0	10.00	28.2
1.700	Parallel	249.6	41.8	11.7	-40.00	13.5	4.74	14.12
1.700	Perpendicular	181.0	37.2	11.7	-40.00	8.9	2.79	14.12
1.700	Horizontal	121.5	33.3	11.7	-40.00	5.0	1.78	14.12
1.705								14.08
1.705								30
2.550	Parallel	121.8	28.4	11.8	-40.00	0.2	1.03	30
2.550	Perpendicular	173.8	25.4	11.8	-40.00	-2.8	0.73	30
2.550	Horizontal	104.5	22.2	11.8	-40.00	-6.0	0.51	30
3.400	Parallel	253.0	31.8	11.8	-40.00	3.6	1.52	30
3.400	Perpendicular	173.4	38.2	11.8	-40.00	10.0	3.17	30
3.400	Horizontal	228.2	22.3	11.8	-40.00	-5.9	0.51	30
4.250	Parallel	102.4	25.5	11.8	-40.00	-2.7	0.74	30
4.250	Perpendicular	44.8	32.0	11.8	-40.00	3.8	1.55	30
4.250	Horizontal	112.3	19.8	11.8	-40.00	-8.4	0.39	30

Frequency	Antenna Pol / Height	EUT Orientation	Peak Meter Reading @ 3 M	Correction Factor	Distance Correction	Corrected Reading @ 30 M	Converted Reading	Limit @ 30m
MHz	(Parallel/Perpendicular/Horizontal)	Degrees	dBuV	dB	dB	dBuV/m	uV/m	uV/m
5.100	Parallel	234.4	22.6	11.9	-40.00	-5.5	0.54	30
5.100	Perpendicular	185.7	30.9	11.9	-40.00	2.8	1.39	30
5.100	Horizontal	191.0	17.5	11.9	-40.00	-10.6	0.30	30
I								
5.950	Parallel	115.3	24.6	11.9	-40.00	-3.5	0.67	30
5.950	Perpendicular	95.7	26.3	11.9	-40.00	-1.8	0.82	30
*5.950	Horizontal	180.0	17.3	11.9	-40.00	-10.8	0.29	30
I								
6.800	Parallel	199.1	26.6	11.9	-40.00	-1.5	0.85	30
6.800	Perpendicular	215.0	17.7	11.9	-40.00	-10.4	0.31	30
*6.800	Horizontal	180.0	15.8	11.9	-40.00	-12.3	0.25	30
I								
7.650	Parallel	42.2	18.8	11.9	-40.00	-9.3	0.35	30
7.650	Perpendicular	153.2	17.7	11.9	-40.00	-10.4	0.31	30
*7.650	Horizontal	180.0	13.9	11.9	-40.00	-14.2	0.20	30
I								
8.500	Parallel	95.6	13.9	11.9	-40.00	-14.2	0.2	30
8.500	Perpendicular	180.0	13.5	11.9	-40.00	-14.6	0.19	30
*8.500	Horizontal	180.0	12.5	11.9	-40.00	-15.6	0.17	30
I								
8.50								30

EMISSIONS TEST DATA SHEET

Method:	FCC Part 15.209(a)
Job Number/Customer:	R-3578P-7 / Siemens Mobility
Test Sample:	IMU 100 Test Device
Model Number:	S25441-M3-A3-01.H (VCC); S25451-C401-B242 (Card File); S25447-H8-A2 (IMU 100); S25447-H80-A2-02 (Antenna)
Serial Number:	6101125087-001 (VCC); A2V00002744893 (Card File); 0225 (IMU 100)
Operating Mode:	VCC Transmitter Operating at 850 kHz, with IMU Antenna in Place
Technician:	M. Nowak
Date(s):	11/7/22 – 11/8/22
Temperature:	23.9 °C
Relative Humidity:	40%
Detector:	Average
Test Distance:	3m
Notes: The frequency range was scanned from 9kHz to 8.5 MHz The emissions observed from the EUT do not exceed the limits specified. *Noise floor measurement, minimum sensitivity of measurement system. The limit shown for below 0.490 MHz is for a measurement distance of 300m.	

Frequency	Antenna Pol / Height	EUT Orientation	Avg. Meter Reading @ 3 M	Correction Factor	Distance Correction	Corrected Reading @ 30 M	Converted Reading	Limit @ 30m
MHz	(Parallel/Perpendicular/Horizontal)	Degrees	dBuV	dB	dB	dBuV/m	uV/m	uV/m
0.009								266.67
0.490								4.90
0.490								48.98
0.850	Parallel	187.1	42.6	11.7	-40.00	14.3	5.19	N/A
0.850	Perpendicular	183.6	45.8	11.7	-40.00	17.5	7.50	N/A
0.850	Horizontal	111.9	34.5	11.7	-40.00	6.2	2.05	N/A
1.700	Parallel	249.6	30.0	11.7	-40.00	1.7	1.22	N/A
1.700	Perpendicular	181.0	26.5	11.7	-40.00	-1.8	0.82	N/A
1.700	Horizontal	121.5	20.8	11.7	-40.00	-7.5	0.43	N/A
1.705								14.08
1.705								30
2.550	Parallel	121.8	17.5	11.8	-40.00	-10.7	0.3	N/A
2.550	Perpendicular	173.8	11.9	11.8	-40.00	-16.3	0.16	N/A
2.550	Horizontal	104.5	10.4	11.8	-40.00	-17.8	0.13	N/A
3.400	Parallel	253.0	11.7	11.8	-40.00	-16.5	0.15	N/A
3.400	Perpendicular	173.4	17.0	11.8	-40.00	-11.2	0.28	N/A
3.400	Horizontal	228.2	10.0	11.8	-40.00	-18.2	0.13	N/A
4.250	Parallel	102.4	13.5	11.8	-40.00	-14.7	0.19	N/A
4.250	Perpendicular	44.8	13.8	11.8	-40.00	-14.4	0.20	N/A
4.250	Horizontal	112.3	8.0	11.8	-40.00	-20.2	0.10	N/A
5.100	Parallel	234.4	7.1	11.9	-40.00	-21.0	0.09	N/A
5.100	Perpendicular	108.5	9.3	11.9	-40.00	-18.8	0.12	N/A

Frequency	Antenna Pol / Height	EUT Orientation	Avg. Meter Reading @ 3 M	Correction Factor	Distance Correction	Corrected Reading @ 30 M	Converted Reading	Limit @ 30m
MHz	(Parallel/Perpendicular/Horizontal)	Degrees	dBuV	dB	dB	dBuV/m	uV/m	uV/m
5.100	Horizontal	191.0	6.5	11.9	-40.00	-21.6	0.09	N/A
I								
5.950	Parallel	115.3	5.2	11.9	-40.00	-22.9	0.08	N/A
5.950	Perpendicular	95.7	7.8	11.9	-40.00	-20.3	0.10	N/A
*5.950	Horizontal	180.0	4.5	11.9	-40.00	-23.6	0.07	N/A
I								
6.800	Parallel	199.1	11.0	11.9	-40.00	-17.1	0.14	N/A
6.800	Perpendicular	215.0	6.4	11.9	-40.00	-21.7	0.09	N/A
*6.800	Horizontal	180.0	6.0	11.9	-40.00	-22.1	0.08	N/A
I								
7.650	Parallel	42.2	5.6	11.9	-40.00	-22.5	0.08	N/A
7.650	Perpendicular	153.2	5.5	11.9	-40.00	-22.6	0.08	N/A
*7.650	Horizontal	180.0	2.5	11.9	-40.00	-25.6	0.06	N/A
I								
8.500	Parallel	95.6	2.8	11.9	-40.00	-25.3	0.06	N/A
8.500	Perpendicular	193.1	2.1	11.9	-40.00	-26.0	0.06	N/A
*8.500	Horizontal	180.0	0.1	11.9	-40.00	-28.0	0.04	N/A
I								
8.50								30