



Test Report - FCC Part 1.1310/ MPE

Applicant: Minova Technology GmbH

Approved for Release By:

Signature: Bruno Clavier

Name & Title: Bruno Clavier, General Manager

Date of Signature 10/19/2023

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Industrial Inspection & Analysis
13146 NW 86th Drive, Suite 400, Alachua, Florida 32615
(352) 472-5500 / testing@industrial-ia.com

1. Applicant Information

Applicant: Minova Technology GmbH
Address: Auf dem Wall 29
Rottweil, BW, Germany

2. Location of Testing

2.1 Test Laboratory

Timco Engineering Inc. is a subsidiary of Industrial Inspection & Analysis, Inc. ("IIA"). Testing was performed at IIA's permanent laboratory located at 13146 NW 86th Drive, Suite 400, Alachua, Florida 32615.

FCC test firm # 578780
FCC Designation # US1070
FCC site registration is under A2LA certificate # 0955.01
ISED Canada test site registration # 2056A
EU Notified Body # 1177
For all designations see A2LA scope # 0955.01

2.2 Testing was performed, reviewed by

Dates of Testing: 9/22/2023

Signature: _____



Sr. EMC Engineer
EMC-003838-NE



Name & Title: _____

Tim Royer, EMC Engineer

Date of Signature _____

10/19/2023

Signature: _____



Name & Title: _____

Terri Allen, Project Specialist

Date of Signature _____

10/19/2023

3. Test Sample(s) (EUT/DUT)

The test sample was received: 9/22/2023

3.1 Description of the EUT

A description as well as unambiguous identification of the EUT(s) tested. Where more than one sample is required for technical reasons (such as the use of connected units for the purpose of conducted output power testing where the product units will have integral antennas), each specific test shall identify which unit was tested.

Identification	
FCC ID:	2BC4ZMCR08M-1100
Brief Description	RFID Reader
Model(s) #	MCR08M-1100

Technical Characteristics	
Technology	13.56 MHz Card Reader
Number of Channels	1
Antenna Connector	PCB Trace
Voltage Rating (AC or Batt.)	12vDC

Results Summary	
Fundamental	26.86 dBuV/m at 13.56 MHz
Occupied Bandwidth	48.08 kHz
Type of Modulation	ASK
Emission Classification	48KA1D
Transmitter Spurious (worst case) at 3 meters	40.67 dBµV/m at 13.61 MHz (Measured with a Peak detector)
Frequency Tolerance %, Hz, ppm	0.16 kHz

Antenna Characteristics			
Antenna	Frequency Range	Mode / BW	Antenna Gain
1	n/a	n/a	0 dBi

- Note: Information such as antenna gain, firmware/software numbers are provided by manufacturer and cannot be validated by the test lab.

4. Test methods & Applicable Regulatory Limits

4.1 Test methods/Standards/Guidance:

The following guidance FCC KDB 447498 D01 General RF Exposure Guidance v06 was used for RF exposure evaluation as per FCC Part 1.1310 and FCC Part 2.1091 and part 2.1093. Full test results are available in this report.

4.1.1 FCC Limits for Maximum Permissible Exposure (MPE)

Frequency Range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging Time (minutes)
A Limits for Occupational/Controlled Exposure				
0.3-3.0	614	1.63	*(100)	≤6
3.0-30	1842/f	4.89/f	*(900/f ²)	<6
30-300	61.4	0.163	1.0	<6
300-1,500			f/300	<6
1,500-100,000			5	<6
B Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	<30
1.34-30	824/f	2.19/f	*(180/f ²)	<30
30-300	27.5	0.073	0.2	<30
300-1,500			f/1500	<30
1,500-100,000			1.0	<30

4.2 Equations

POWER DENSITY

$$E(V/m) = \text{SQRT} (30 * P * G) / d$$

$$Pd(W/m^2) = E^2 / 377$$

$$S = \text{EIRP} / (4 * \text{Pi} * D^2v)$$

Where:

S = Power density, in mW/cm²

EIRP = Equivalent Isotropic Radiated Power, in mW

D = Separation distance in cm

Power density is converted from units of mW/cm² to units of W/m² by multiplying by 10.

DISTANCE

$$D = \text{SQRT} (\text{EIRP} / (4 * \text{Pi} * S))$$

Where:

D = Separation distance in cm

EIRP = Equivalent Isotropic Radiated Power, in mW

S = Power density in mW/cm²

SOURCE-BASED DUTY CYCLE (When applicable (for example, multi-slot mobile phone applications) A duty cycle factor may be applied.)

$$\text{Source-based time-average EIRP} = (DC / 100) * \text{EIRP}$$

Where:

DC = Duty Cycle in % as applicable.

EIRP = Equivalent Isotropic radiated Power, in mW

5. RF Exposure Results

MPE

Frequency Band	Evaluation Distance (cm)	Max Power + Tolerance (dBm)	Antenna Gain (dBi)	Duty Cycle (%)	EIRP (W)	Power Density	Limit for Uncontrolled Exposure	Limit for Controlled Exposure	Distance Required to meet Uncontrolled Exposure Limit (cm)
13.56-13.56 MHz	20	-70.49	0.00	100%	0.00	0 mW/cm ²	0.98 mW/cm ²	4.89 mW/cm ²	20.00

RESULT: Pass at DISTANCE 20.00 cm

6. History of Test Report Changes

Test Report #	Revision #	Description	Date of Issue
TR_10202_FCC 1.1310/ MPE_	1	Initial release	10/19/2023



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END OF TEST REPORT
