



MOTOROLA

*Integrated Information Systems Group
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Exhibit 11 – RF Exposure Information

Card Acceptance Device (CAD⁺)

Low Power Transceiver Module

FCC ID: ABZMCAD200

Model Nos. T6480A (*and variants*)

11.0 RF Exposure Information

The Card Acceptance Device (CAD⁺) complies with human radiation emission requirements. These requirements are based on the Maximum Permissible Exposure (MPE) levels of ANSI/IEEE C95.1-1992 and 47 CFR 1.1310, Table 1 for an uncontrolled environment.

This low power modular transmitter is intended to be integrated into subsystem that would normally be used in a fixed location. This module, dependent on its integration, could arguably fit the definition of a portable device as defined in 47 CFR 2.1093(b) (i.e. "designed to be used so that the radiating structure of the device is within 20 cm of the body of the user", specifically the hand). However, it does not fit any of the equipment classification criteria for portable devices requiring SAR testing as defined in 47 CFR 2.1093(c). All other portable transmitting devices, including this low power modular transmitter, "are categorically excluded from routine environmental evaluation for RF exposure prior to equipment authorization or use" per 2.1093(c).

RF Energy Exposure Assessment Record

Product or Equipment Name: Card Acceptance Device (CAD+) Modular Transmitter Date: 31 Aug 2000

Program/Project Contact Person: Gilbert Roque Phone: (408) 383-4074

M/D: CA48

Location of Product/Equipment: Fixed locations

1. RF Emitting Product or Equipment Description

Manufacturer: Motorola Indala

Model: CAD + Serial Number: CLN7488A

Describe the product or equipment, the environment(s) where it is used, and information about operators and others who might be exposed to its emitted RF energy.

The transceiver module is a low power device intended to be integrated into subsystem terminals typically in fixed or permanent locations. This module can arguably fit the definition of a portable device as defined in 47 CFR 2.1093(b) (i.e. "designed to be used so that the radiating structure of the device is within 20 cm of the body of the user", specifically the hand). However, it does not fit any of the equipment classification criteria for portable devices requiring SAR testing as defined in 47 CFR 2.1093(c). All other portable transmitting devices "are categorically excluded from routine environmental evaluation for RF exposure prior to equipment authorization or use" per 2.1093(c) including this low power transceiver module.

Frequencies of Operation (MHz): 13.56 MHz

Maximum Output Power Level
(Watts): <7.2 mW EIRP

Modulation Characteristics: 10% ASK

If pulsed; Pulse duration: N/A Pulse repetition frequency (PRF): N/A

Duty cycle: 100%

Antenna description: 4 Loop antenna configurations, multiple-turns

Antenna gain: N/A

Failure Modes

Are there credible failure modes in the product or equipment (hardware, software) or operations (controls, procedures, human error) that could cause the average output power to increase above the normal operating level?

Yes _____ No ☒ If Yes, describe the failure mode, probability of occurrence of the failure, and the expected level of output power.

Figure 11-1 RF Energy Exposure Assessment Record (1 of 4)

2. Maximum Permissible Exposure (MPE) Levels

MPE Levels based on ANSI/IEEE C95.1-1992 and 47 CFR 1.1310, Table 1 requirements, unless otherwise specified.

	Frequency (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Plane Wave Equiv. Power Density (S) (mW/cm ²)	Specific Absorption Rate (SAR) (mW/g)
Uncontrolled Environment	<u>13.56</u>	<u>60.77</u>	<u>0.1615</u>	<u>N/A</u>	<u>N/A</u>
Induced Current (mA)	Both Feet	<u>90</u>	Each Foot	<u>N/A</u>	Frequency <u>13.56 MHz</u>
Contact Current (mA)	<u>45</u>	Frequency	<u>13.56 MHz</u>		

3. Measurement Results

Applicable Document: Radio Frequency (RF) Energy Exposure Test Procedure, Rev E.

Ferrite-Shield

104x67 mm Loop Antenna	Frequency (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Plane Wave Equiv. Power Density (S) (mW/cm ²)	Specific Absorption Rate (SAR) (mW/g)
Uncontrolled Environment	<u>13.56</u>	<u>< 10.0</u>	<u>0.027</u>	<u>N/A</u>	<u>N/A</u>
Induced Current (mA)	Both Feet	<u>0.38</u>	Each Foot	<u>0.25</u>	Frequency <u>13.56 MHz</u>
Contact Current (mA)	<u>4.2</u>	Frequency	<u>13.56 MHz</u>		

65 x 40 mm

Loop Antenna	Frequency (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Plane Wave Equiv. Power Density (S) (mW/cm ²)	Specific Absorption Rate (SAR) (mW/g)
Uncontrolled Environment	<u>13.56</u>	<u>< 10.0</u>	<u>< 0.027</u>	<u>N/A</u>	<u>N/A</u>
Induced Current (mA)	Both Feet	<u>2.27</u>	Each Foot	<u>0.82</u>	Frequency <u>13.56 MHz</u>
Contact Current (mA)	<u>1.7</u>	Frequency	<u>13.56 MHz</u>		

Figure 11-1 RF Energy Exposure Assessment Record (2 of 4)

50 x 25 mm w/ferrite

Loop Antenna	Frequency (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Plane Wave Equiv. Power Density (S) (mW/cm ²)	Specific Absorption Rate (SAR) (mW/g)
Uncontrolled Environment	13.56	< 10.0	< 0.027	N/A	N/A
Induced Current (mA)	Both Feet	0.76	Each Foot	0.35	Frequency 13.56 MHz
Contact Current (mA)	1.4	Frequency	13.56 MHz		

100 x 110mm

Loop Antenna	Frequency (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Plane Wave Equiv. Power Density (S) (mW/cm ²)	Specific Absorption Rate (SAR) (mW/g)
Uncontrolled Environment	13.56	< 10.0	0.037	N/A	N/A
Induced Current (mA)	Both Feet	1.75	Each Foot	0.77	Frequency 13.56 MHz
Contact Current (mA)	5.6	Frequency	13.56 MHz		

Is the Maximum Permissible Exposure Level for an uncontrolled environment exceeded?

Yes _____ No **X** If Yes, provide drawings to show the boundaries of the Restricted Access Area.

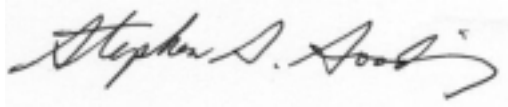
Is the Maximum Permissible Exposure Level for a controlled environment exceeded?

Yes _____ No **X** If Yes, define and implement necessary controls.

4. RF Energy Measurement Equipment

Manufacturer	Description	Model	Asset No.	Date of Last Cal.	Cal. Due Date
Narda	Probe, H-Field, 10MHz-300MHz	8731	G52449	06/22/00	06/30/01
Narda	Probe, E-Field, 300kHz-40GHz	8741	T57980	04/26/00	04/30/01
Narda	Electromagnetic Survey Meter	8719	G49076	03/07/00	03/31/01
Narda	Human Body Antenna	8858	N/A	N/A	N/A
Narda	Induced Current Meter	8850	G52446	02/02/00	02/28/01
Boonton	RMS Voltmeter	92EA	G52041	11/10/99	05/31/01

Figure 11-1 RF Energy Exposure Assessment Record (3 of 4)



Measurements made by: Steve Gooding

Date: 31 Aug 2000

5. Required Hazard Controls

Fully describe all hazard controls to be implemented. Provide drawings and other attachments, as necessary, to describe Restricted Access Areas.

None required for its present configuration and intended state of use.

6. Review & Approval

Gil Estrella
EMC Engineer

Date: _____

Dwayne Awerkamp
EMC Engineering Manager

Date: _____

Brent Marking
SSS RF Engineer

Date: _____