Specifications and Compliance

This chapter describes the HCA Expansion Card specifications and compliance certifications.

Electrical Specifications

Table 3-1 lists LVTTL signal levels.

Table 3-1 LVTTL Signal Levels

Parameter	Test Condition	Min	Nom	Max	Units
V_{OH}	$I_{OH} \leq 7.0$ mA	2.4		3.3	Volts
V_{OL}	$I_{OL} \leq 8.0$ mA	0.0		0.4	Volts
V_{IH}		2.0		5.5	Volts
V_{IL}		-0.5		0.8	Volts
I_{IH}				4.0	mAmps
I_{IL}				2.5	mAmps

Table 3-2 lists I2C signal levels.

Table 3-2 12C Signal Levels

Parameter	Test Condition	Min	Nom	Max	Units
V_{OH}	$I_{OH} \leq 7.0$ mA	2.4		3.3	Volts
V_{OL}	$I_{OL} \leq 8.0$ mA	0.0		0.4	Volts
V_{IH}		2.0		5.5	Volts
V_{IL}		-0.5		0.8	Volts
I_{IH}				4.0	mAmps
I_{IL}				2.5	mAmps

Table 3-3 lists InfiniBand signal levels.

Table 3-3 InfiniBand Signal Levels

Parameter	Test Condition	Min	Nom	Max	Units
TX diff. Peak to Peak	Vdd = 2.5V	0.9		1.6	Volts
RX diff. Input Peak to Peak	Vdd = 2.5V	0.2		2.2	Volts

Physical and Environmental Specifications

Table 3-4 lists temperature and cooling conditions.

Table 3-4 Temperature and Cooling

Condition	Range
Operating temperature	5 to 67 degrees Celsius, local ambient temperature
System Non-operating	-40 to 90 degrees Celsius
Operating altitude	0 to 10,000 ft
Non-operating altitude	0 to 50,000 ft

Table 3-5 lists temperature and cooling conditions.

Table 3-5 Humidity

Condition	Range
Operating Humidity	8% to 80% non-condensing
Operating Gradient	Maximum per 60 min: 10%
Non-Operating Humidity	5% to 80%, non-condensing

Safety

The HCA Expansion Card meets the following safety agency standards:

- USA: UL 60950.
- Canada: CAN60950
- Europe: IEC60950, EN60950, EN60825-1 and EN60825-2

Electromagnetic Compatibility

The HCA Expansion Card meets the following EMC "Class A" standards, when installed in and operated within a closed chassis:

- USA: CFR 47 Part 15, Subpart B
- Canada: ICES-003 Issue 2
- Europe: EN 61000-3-2 (Harmonics), EN 61000-3-3 (Flicker), EN 55022 1998, EN 55024 1994
- Japan: VCCI-V3/97.04