

# Specifications

**PCI-DDA08/12**



**MEASUREMENT  
COMPUTING™**

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# Specifications

Typical for 25 °C unless otherwise specified.

Specifications in *italic text* are guaranteed by design.

## Power consumption

Table 1. Power consumption specifications

|                |                          |
|----------------|--------------------------|
| +5 V operating | 1.6 A typical, 2.6 A max |
| +12 V          | 24 mA typical, 48 mA max |
| -12 V          | 16 mA typical, 25 mA max |

## Analog output

Table 2. Analog output specifications

|                                                   |                                                                                                                                                                                                                                                 |
|---------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| D/A converter type                                | AD7837B                                                                                                                                                                                                                                         |
| Resolution                                        | 12-bits                                                                                                                                                                                                                                         |
| Number of channels                                | 8                                                                                                                                                                                                                                               |
| Output ranges                                     | $\pm 10$ V, $\pm 5$ V, $\pm 2.5$ V, 0 to 10 V, 0 to 5 V, 0 to 2.5 V.<br>Each channel independently programmable.                                                                                                                                |
| Data transfer                                     | Programmed I/O                                                                                                                                                                                                                                  |
| Offset error (calibrated)                         | $\pm(300 \mu\text{V} + \frac{1}{4} \text{LSB})$                                                                                                                                                                                                 |
| Gain error (calibrated)                           | $\pm(300 \mu\text{V} + \frac{1}{4} \text{LSB})$                                                                                                                                                                                                 |
| Differential nonlinearity                         | $\pm 1$ LSB max                                                                                                                                                                                                                                 |
| Integral nonlinearity                             | $\pm 1$ LSB max                                                                                                                                                                                                                                 |
| Monotonicity                                      | 12-bits                                                                                                                                                                                                                                         |
| D/A gain drift                                    | $\pm 2$ ppm/°C                                                                                                                                                                                                                                  |
| D/A offset drift                                  | $\pm 5 \mu\text{V}/^\circ\text{C}$                                                                                                                                                                                                              |
| Throughput                                        | PC dependent                                                                                                                                                                                                                                    |
| Settling time (20V step to $\pm \frac{1}{2}$ LSB) | 6 $\mu\text{s}$ typ, 10 $\mu\text{s}$ max                                                                                                                                                                                                       |
| Slew rate                                         | 5 V/ $\mu\text{s}$                                                                                                                                                                                                                              |
| Current drive                                     | $\pm 5$ mA                                                                                                                                                                                                                                      |
| Output short-circuit duration                     | 25 mA indefinite                                                                                                                                                                                                                                |
| Output coupling                                   | DC                                                                                                                                                                                                                                              |
| Output impedance                                  | 0.1 Ohms max                                                                                                                                                                                                                                    |
| Miscellaneous                                     | <ul style="list-style-type: none"><li>▪ Double buffered output latches</li><li>▪ Update DACs individually or simultaneously (software selectable)</li><li>▪ Power up and reset, all DAC's cleared to 0 volts, <math>\pm 210</math> mV</li></ul> |

## Digital input / output

Table 3. Digital I/O specifications

|                               |                                                                     |
|-------------------------------|---------------------------------------------------------------------|
| Digital type (main connector) | 82C55 mode 0 emulation                                              |
|                               | Output: 74S244                                                      |
|                               | Input: 74LS373                                                      |
| Configuration                 | 4 banks of 8, 4 banks of 4, programmable by bank as input or output |
| Number of channels            | 48 I/O                                                              |
| Output high                   | 2.4 volts min @ -15 mA                                              |
| Output low                    | 0.5 volts max @ 64 mA                                               |
| Input high                    | 2.0 volts min, 7 volts absolute max                                 |
| Input low                     | 0.8 volts max, -0.5 volts absolute min                              |
| Power-up / reset state        | Input mode (high impedance)                                         |

## Environmental

Table 4. Environmental specifications

|                             |                         |
|-----------------------------|-------------------------|
| Operating temperature range | 0 to 70 °C              |
| Storage temperature range   | -40 to 100 °C           |
| Humidity                    | 0 to 90% non-condensing |

## Main connector and pin out

Table 5. Board connectors, cables, accessory equipment

|                                                       |                                                       |
|-------------------------------------------------------|-------------------------------------------------------|
| Connector type                                        | 100-pin, high density connector                       |
| Compatible cables                                     | C100FF-x unshielded ribbon cable (x = length in feet) |
| Compatible accessory products with the C100FF-x cable | CIO-TERM100<br>CIO-MINI50 (two required)              |

Table 6. I/O connector pin out

| Pin | Signal Name    | Pin | Signal Name       |
|-----|----------------|-----|-------------------|
| 1   | Vout 0         | 51  | SECONDPORTA Bit 7 |
| 2   | Analog Ground  | 52  | SECONDPORTA Bit 6 |
| 3   | Vout 1         | 53  | SECONDPORTA Bit 5 |
| 4   | Analog Ground  | 54  | SECONDPORTA Bit 4 |
| 5   | Vout 2         | 55  | SECONDPORTA Bit 3 |
| 6   | Analog Ground  | 56  | SECONDPORTA Bit 2 |
| 7   | Vout 3         | 57  | SECONDPORTA Bit 1 |
| 8   | Analog Ground  | 58  | SECONDPORTA Bit 0 |
| 9   | Vout 4         | 59  | SECONDPORTB Bit 7 |
| 10  | Analog Ground  | 60  | SECONDPORTB Bit 6 |
| 11  | Vout 5         | 61  | SECONDPORTB Bit 5 |
| 12  | Analog Ground  | 62  | SECONDPORTB Bit 4 |
| 13  | Vout 6         | 63  | SECONDPORTB Bit 3 |
| 14  | Analog Ground  | 64  | SECONDPORTB Bit 2 |
| 15  | Vout 7         | 65  | SECONDPORTB Bit 1 |
| 16  | Analog Ground  | 66  | SECONDPORTB Bit 0 |
| 17  | NC             | 67  | SECONDPORTC Bit 7 |
| 18  | NC             | 68  | SECONDPORTC Bit 6 |
| 19  | NC             | 69  | SECONDPORTC Bit 5 |
| 20  | NC             | 70  | SECONDPORTC Bit 4 |
| 21  | NC             | 71  | SECONDPORTC Bit 3 |
| 22  | NC             | 72  | SECONDPORTC Bit 2 |
| 23  | NC             | 73  | SECONDPORTC Bit 1 |
| 24  | NC             | 74  | SECONDPORTC Bit 0 |
| 25  | NC             | 75  | FIRSTPORTA Bit 7  |
| 26  | NC             | 76  | FIRSTPORTA Bit 6  |
| 27  | NC             | 77  | FIRSTPORTA Bit 5  |
| 28  | NC             | 78  | FIRSTPORTA Bit 4  |
| 29  | NC             | 79  | FIRSTPORTA Bit 3  |
| 30  | NC             | 80  | FIRSTPORTA Bit 2  |
| 31  | NC             | 81  | FIRSTPORTA Bit 1  |
| 32  | NC             | 82  | FIRSTPORTA Bit 0  |
| 33  | NC             | 83  | FIRSTPORTB Bit 7  |
| 34  | NC             | 84  | FIRSTPORTB Bit 6  |
| 35  | NC             | 85  | FIRSTPORTB Bit 5  |
| 36  | NC             | 86  | FIRSTPORTB Bit 4  |
| 37  | NC             | 87  | FIRSTPORTB Bit 3  |
| 38  | NC             | 88  | FIRSTPORTB Bit 2  |
| 39  | NC             | 89  | FIRSTPORTB Bit 1  |
| 40  | NC             | 90  | FIRSTPORTB Bit 0  |
| 41  | NC             | 91  | FIRSTPORTC Bit 7  |
| 42  | NC             | 92  | FIRSTPORTC Bit 6  |
| 43  | NC             | 93  | FIRSTPORTC Bit 5  |
| 44  | NC             | 94  | FIRSTPORTC Bit 4  |
| 45  | NC             | 95  | FIRSTPORTC Bit 3  |
| 46  | NC             | 96  | FIRSTPORTC Bit 2  |
| 47  | NC             | 97  | FIRSTPORTC Bit 1  |
| 48  | NC             | 98  | FIRSTPORTC Bit 0  |
| 49  | NC             | 99  | +5V               |
| 50  | Digital Ground | 100 | Digital Ground    |

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