

## Product Datasheet - Technical Specifications



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# ***Specifications***

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## Analog Input Specifications

Table 27 lists the specifications for the A/D subsystem on the DT9810 module.

**Table 27: A/D Subsystem Specifications**

Feature	DT9810 Specifications
Number of analog input channels	8 single-ended
Number of gains	–
Resolution	10-bit
Data encoding	binary
System accuracy, to % of FSR (gain = 1) (Averaged over 50 readings)	0.1%
Range	0 to 2.44 V
Nonlinearity	0.1%
Differential nonlinearity	$\pm 1/2$ LSB
Inherent quantizing error	1 LSB
Drift Zero: Gain:	$\pm 20$ $\mu$ V $\pm 50$ ppm
Differential linearity:	monotonic
Input impedance <sup>a</sup> Off channel: On channel:	10 M $\Omega$ , 10 pf 10 M $\Omega$ , 100 pf
Input bias current	$\pm 10$ nA
Maximum input voltage (without damage) Power on: Power off:	$\pm 35$ V $\pm 20$ V
A/D conversion time	40 $\mu$ s
Channel acquisition time ( $\pm 1/2$ LSB)	40 $\mu$ s
Sample-and-hold Aperture uncertainty: Aperture delay:	2 ns 200 ns
Throughput	25 kHz
ESD protection (per spec) Arc: Contact:	8 kV 4 kV
Reference	2.44 V
Monotonicity	Yes
Input FIFO	–

a. Very high input impedance minimizes any source error.

## Digital I/O Specifications

Table 28 lists the specifications for the digital input (DIN) and digital output (DOUT) subsystems on the DT9810, DT9817, and DT9817-H modules.

**Table 28: DIN/DOUT Subsystem Specifications**

Feature	DT9810	DT9817	DT9817-H
Number of digital I/O lines	20	28	28
Number of ports	2, 8-bit & 1, 4-bit	3, 8-bit & 1, 4-bit	3, 8-bit & 1, 4-bit
Input termination	No	No	No
Logic family	TTL	TTL	TTL
Logic sense	Positive true	Positive true	Positive true
Inputs Input type: Input logic load: High input voltage: Low input voltage: Low input current:	Level sensitive 1 TTL Load 2.4V min 0.8 V max -0.4 mA max	Level sensitive 1 TTL Load 2.4 V min 0.8 V max -0.4 mA max	Level sensitive 1 TTL Load 2.4 V min 0.8 V max -0.4 mA max
Outputs High output: Low output: High output current (source), typical: Low output current (sink), typical:	2.8 V min 0.6 V max 4.5 mA 10 mA	2.8 V min 0.6 V max 4.5 mA 10 mA	2.8 V min 0.6 V max 15 mA 64 mA
Software I/O selectable	Yes	Yes	Yes
ESD protection (per spec) Arc: Contact:	8 kV 4 kV	8 kV 4 kV	8 kV 4 kV

Table 29 lists the specifications for the digital input (DIN) and digital output (DOUT) subsystems on the DT9817-R module.

**Table 29: DT9817-R DIN/DOUT Subsystem Specifications**

Feature	DT9817-R
Number of digital I/O lines	16 (8 In, 8 Out)
Number of ports	2, 8-bit (1 In, 1 Out)
Inputs Input type: High input voltage: Low input voltage: High input current: Low input current: Termination	AC or DC $\pm 3$ to 32 V $< \pm 1.5$ V 2.2 k $\Omega$ resistor to 1.2 V 2.2 k $\Omega$ resistor to 1.2 V Series 2.2 k $\Omega$
Outputs Output type: Output driver: High output: Low output: Breakdown voltage: Contact impedance:	Solid-state Relay CMOS $\pm 30$ V 0.4 V @ 400 mA $\pm 60$ V 1 $\Omega$
Isolation voltage To computer ground: Input within pairs 0&1, 2&3, etc. Input across pairs Output channel to channel	500 V 250 V ( $\pm 125$ V) 500 V ( $\pm 250$ V) 500 V
Software I/O selectable	Yes
ESD protection (per spec) Arc: Contact:	8 kV 4 kV

## Counter/Timer Specifications

Table 30 lists the specifications for the C/T subsystem on the DT9810, DT9817, DT9817-H, and DT9817-R modules.

**Table 30: C/T Subsystem Specifications**

Feature	Specifications
Number of counter/timers	1
Counter/timer modes	Event counting, frequency measurement, edge-to-edge measurement, rate generation
Resolution	32-bit
Minimum pulse width: (minimum amount of time it takes a C/T to recognize an input pulse)	200 $\mu$ s (DT9817-R) 200 ns (other modules)
Logic family	TTL
Inputs Input logic load: High input voltage: Low input voltage: Low input current:	Level sensitive 1 TTL Load 2.4 V min 0.8 V max -0.4 mA max
Outputs High output DT9817-R: Other modules: Low output DT9817-R: Other modules:	3.0 V min @ 0.1 mA Source 2.8 V min @ 2 mA Source 0.4 V max @ 2 mA Sink 0.6 V max @ 12 mA Sink
Isolation voltage (DT9817-R)	500 V to computer ground
ESD protection (per spec) Arc: Contact:	8 kV 4 kV
Internal clock frequency DT9817-R: Other modules:	4 Hz to 2.5 kHz 4 Hz to 12 MHz
External clock divider DT9817-R: Other modules:	9600 to 130050 2 to 130050

## Power, Physical, and Environmental Specifications

Table 31 lists the power, physical, and environmental specifications for the DT9810, DT9817, DT9817-H, and DT9817-R modules.

**Table 31: Power, Physical, and Environmental Specifications**

Feature	DT9810, DT9817, DT9817-H, and DT9817-R
Power +5 V Enumeration: Operation:	< 100 mA < 100 mA (DT9810, DT9817, and DT9817-R) < 150 mA (DT9817-H)
Physical Dimensions (board):  Dimensions (box with screw terminals and feet):  Weight (board):  Weight (box with screw terminals and feet):	100 mm (L) x 100 mm (W) x 15.5 mm (H)  107.7 mm (L) x 100 mm (W) x 33.5 mm (H)  60.3 g  133.4 g
Environmental Operating temperature range: Storage temperature range: Relative humidity: Altitude:	0 to 45° C –40 to 85° C to 95% non-condensing 10,000 feet

## Regulatory Specifications

Table 32 lists the regulatory specifications for the DT9810, DT9817, DT9817-H, and DT9817-R modules.

**Table 32: Regulatory Specifications**

Feature	Specifications
Emissions (EMI)	FCC Part 15, EN55022:1994 + A1:1995 + A2:1997 VCCI, AS/NZS 3548 Class A
Immunity	EN61000-6-1:2001
RoHS (EU Directive 2002/95/EG)	Compliant (as of July 1st, 2006)