Specifications

PMD-1608

Specifications

Typical for 25°C unless otherwise specified.

Analog input section

Parameter	Conditions	Specification
A/D converter type		16 bit successive approximation type
Number of channels		8 single-ended
Input Configuration		Individual A/D per channel
Sampling method		Simultaneous
Absolute maximum input voltage	CHx IN to GND	±18V max
Input Impedance		100 MOhm, min
Input ranges	Software selectable	±10V,±5V,±2V,±1V,
Simultaneous sampling uncertainty	Any channel to any channel	TBD ns max
Sampling rate		0.1 to 50kS/s, software programmable
Pacer clock stability		50 ppm
Throughput	Software paced	500 S/s all channels
	Continuous scan	= (100kS/s) / (# of channels), max of 50kS/s for any channel
	Burst scan to FIFO	= (400kS/s) / (# of channels), max of 50kS/s for any channel
Resolution		16 bits
No missing codes		15 bits
CAL output	User calibration source	0.625V, 1.25V, 2.5V,5.0V, software selectable
CAL output accuracy (Note 1)		±0.5% typ, ±1.0% max
CAL current		±5mA max
Trigger Source	Software selectable	External Digital: TRIG_IN

Note 1: Actual values used for calibration are measured and stored in eeprom.

Table 1 – Calibrated Absolute Accuracy

Range	Accuracy (mV)
±10V	5.66
±5V	2.98
±2V	1.31
±1V	0.68

Table 2 –Accuracy Components - All values are (±)

Range	% of Reading	Gain Error at FS (mV)	Offset (mV)	Nonlinearity (mV)
±10V	0.02	2.00	1.22	2.44
±5V	0.02	1.00	0.76	1.22
±2V	0.02	0.40	0.43	0.48
±1V	0.02	0.20	0.24	0.24

Table3 below summarizes the noise performance for the PMD-1616LS. Noise distribution is determined by gathering 50K samples with inputs tied to ground at the user connector. Samples are gathered at the maximum specified sampling rate of 50kS/s.

Table 3 –Noise Performance

Range	Typical Counts	LSBrms
±10V	TBD	TBD
±5V	TBD	TBD
±2V	TBD	TBD
±1V	TBD	TBD

Digital input/output

Digital type	CMOS
Number of I/O	8 (DIO0 through DIO7)
Configuration	Independently configured for input or output
Pull up/pull-down configuration	All pins pulled up to Vs via 47K resistors (default). Positions available for pull down to ground. Hardware selectable via zero ohm resistors as a factory option.
Input high voltage	2.0V min, 5.5V absolute max
Input low voltage	0.8V max, –0.5V absolute min
Output high voltage (IOH = -2.5mA)	3.0V min
Output low voltage (IOL = 2.5mA)	0.4V max

External trigger

Parameter	Conditions	Specification
Trigger Source (Note 2)	External Digital	TRIG_IN
Trigger mode	Software selectable	Edge Sensitive: user configurable for CMOS compatible rising or falling edge.
Trigger latency (Note 3)	No other activity on PMD-1608LS while waiting for trigger	1µs max
Trigger pulse width		1µs min
Input high voltage		3.0V min, 15.0V absolute max
Input low voltage		0.8V max
Input leakage current		±1.0µA

Note 2: TRIG_IN is protected with a 1.5KOhm series resistor.

Note 3: Trigger latency assumes that no other activity is going on within the PMD-1608LS. This includes digital I/O and counter updates, memory read operations, etc.

Counter section

Counter type	Event counter
Number of Channels	1
Input source	CTR screw terminal
Resolution	32 bits
Schmidt Trigger Hysteresis	20mV to 100mV
Input Leakage Current	±1µA
Maximum input frequency	1 MHz
High pulse width	500ns min
Low pulse width	500ns min
Input low voltage	0V min, 1.0V max
Input high voltage	4.0V min, 15.0V max

Memory

Data FIFO	65,536 bytes: 32,768 samples		
EEPROM	1,024 bytes		
EEPROM Configuration	**Address Range**	**Access**	**Description**
	0x000-0x1FF	Read/Write	512 bytes cal data
	0x200-0x2FF	Read/Write	256 bytes user area
	0x300-0x3FF	Read/Write	256 bytes reserved

Microcontroller

Type	High performance 8-bit RISC microcontroller
Program Memory	16,384 words
Data Memory	2,048 bytes

Power

Parameter	Conditions	Specification
Supply current (Note 4)		90mA
+5V USB power available (Note 5)	Connected to self-powered hub	4.5V min, 5.25V max
	Connected to bus-powered hub	4.1V min, 5.25V max
Output Current (Note 6)	Connected to self-powered hub	410mA
	Connected to bus-powered hub	10mA

Note 4: This is the total current requirement for the PMD-1208LS which includes up to 5mA for the status LED.

Note 5: Self-powered refers to USB hubs and hosts with a power supply. Bus-powered refers to USB hubs and hosts without their own power supply.

Note 6: This refers to the total amount of current that can be sourced from the USB +5V and digital outputs.

General

Parameter	Conditions	Specification
Device type		USB 2.0 (full-speed)
Device compatibility		USB 1.1, USB 2.0

Environmental

Operating Temperature Range	-40 to 85 °C
Storage Temperature Range	-40 to 85 °C
Humidity	0 to 90% non-condensing

Mechanical

Dimensions	79mm(L) x 82mm(W) x 25mm(H)
USB Cable Length	3 meters max
User Connection Length	3 meters max

Main connector and pin out

Connector type	Screw Terminal
Wire gauge range	16 AWG to 30 AWG

Pin	Signal Name	Pin	Signal Name
1	CH0 IN	21	DIO0
2	AGND	22	GND
3	CH1 IN	23	DIO1
4	AGND	24	GND
5	CH2 IN	25	DIO2
6	AGND	26	GND
7	CH3 IN	27	DIO3
8	AGND	28	GND
9	CH4 IN	29	DIO4
10	AGND	30	GND
11	CH5 IN	31	DIO5
12	AGND	32	GND
13	CH6 IN	33	DIO6
14	AGND	34	GND
15	CH7 IN	35	DIO7
16	AGND	36	SYNC
17	CAL	37	CTR
18	AGND	38	TRIG_IN
19	AGND	39	PC +5V
20	AGND	40	GND

Single-Ended Analog Input Mode

Pin	Signal Name	Pin	Signal Name
1	+5V PC BUS POWER	20	CTR 3 OUT
2	CTR 1 OUT	21	CTR 1 CLOCK IN
3	DIG OUT 3	22	DIG OUT 2
4	DIG OUT 1	23	DIG OUT 0
5	DIG IN 3	24	DIG IN 2 / CTR1 GATE
6	DIG IN 1	25	DIG IN 0 / EXT TRIG / EXT PACER / EXT GATE
7	DIG GND	26	SS&H OUT
8	NC	27	NC
9	NC	28	AGND
10	NC	29	AGND
11	CH15 HIGH	30	CH7 HIGH
12	CH14 HIGH	31	CH6 HIGH
13	CH13 HIGH	32	CH5 HIGH
14	CH12 HIGH	33	CH4 HIGH
15	CH11 HIGH	34	CH3 HIGH
16	CH10 HIGH	35	CH2 HIGH
17	CH9 HIGH	36	CH1 HIGH
18	CH8 HIGH	37	CHO HIGH
19	AGND		

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