# PCM-7140 1A Pulsed Current Source — Datasheet





# **Precision Pulse Control**

The PCM-7140 is a compact pulsed current source designed to drive laser diodes, bars, arrays, or any low-impedance load. The key specifications are output current from 0.1 A to 1 A, rise and fall times below 1  $\mu$ s at 1 A, pulse widths from 1  $\mu$ s to 100% duty cycle, pulse repetition rates from single shot to 100 KHz, and forward voltage from 0 V to 60 V.

#### **System Operation**

The PCM-7140 output current may be set with an internal potentiometer or an external analog voltage. The pulse width and frequency is controlled with an external trigger source.

The system requires two DC power supplies for operation: 12 VDC for housekeeping and a high voltage power supply with voltage  $\leq$  10 VDC above the laser diode's forward voltage.

# Input / Output Cable

The laser or load is connected to the PCM-7140 with a 100 cm length of 18 AWG twisted pair cable (included). This same cable has the DC input connection from the high voltage power supply.

# **Liquid Cooling**

The PCM-7140 module is liquid cooled with a liquid temperature of 11 °C to 22 °C with a flow rate of 6 liters per minute. The connection type is 3/8" tubing.

# **Ordering Information**

PCM-7140

PCM-7140 Pulser DC Input / Output Cable Load Board Control Board Control Signal Cable



1000 mA, 300 µs pulse width





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# **Pulse Amplitude**

Output current range Setpoint accuracy Current overshoot

Current rise/fall time

# Trigger (J3-Pin 6)

Frequency range 100% Duty Cycle Input voltage levels

5 V, output on

1.0 A \* High Voltage = VForward + 5 V

0.1 A to 1.0 A

≤ 100 kHz

0 V, output off

±1 % of full-scale current

≤ 5 µs : 0.1 A to 0.499 A

≤ 2 µs : 0.500 A to 1.0 A

≤ 1 % : 0.100 A to 0.499 A ≤ 5 % : 0.500 A to 1.0 A

Termination impedance Trigger pulse width Delay (external to output) 50 Ω 1 µs to 100% duty cycle  $\leq 1 \mu s$  (typical)

#### Current Setpoint Control (J3-Pin 4)

Input voltage levels

Termination impedance

Response time on change

5 V or open: internal potentiometer control 0 V: external control 9,000 Ω ≤ 0.5 µs

# Analog Current Setpoint (J3-Pin 5)

Input voltage levels

0 V to 2.048 V 0.000 V: 0 A output 2.000 V: 1.0 A output

>19 kO

≤ 0.5 µs

Termination impedance Response time on change

Current monitor termination

Current monitorconnector

# **Current Monitor (J2)**

Current monitor

0 V to 0.200 V 1.0 A output current: 0.165 V (typical) 50 O SMB

# Control Signal Connector (J3)

Connector

Molex #70553-0110 Pin 1: 12 V DC Pin 2: Return Pin 3: Return Pin 4: Current setpoint control Pin 5: Analog current setpoint

Pin 6: Trigger

# Liquid Cooling

Input Temperature Flow Rate Connection

#### 11 °C to 22 °C 6 liters/minute 3/8" tubing, McMaster-Carr # 9336T2

# 12 V Power Specifications (J3-Pin 1)

Voltage requirements Current requirements 12 V DC ± 5% 0.100 A

#### DC Input / Output Connector (J1) TE AMP Connector 1-770974-0

Connector Output + Output -

DC Input + DC Return

Pins 1, 2, 3, 4 Pins 9, 10, 11, 12

Pins 13, 14, 15, 16 Pins 5, 6, 7, 8

### **DC Input Power Specifications**

High voltage range 0 V DC to 75 V DC (Max) (load +10 V) Current requirements 1.2 A

**Output Current** 0 A to 1.0 A 0 A to 1.0 A

High Voltage requirements Forward voltage + 10 V DC ± 5%\*1 100% Duty Cycle VForward +5 V DC

<sup>\*1</sup> Operation of instrument outside of this voltage can cause permanent damage to the instrument and/or load. Do not exceed 75 V DC.

### General

Size (HxWxD) Weight

8.3 cm x 11.0 cm x 13.75 cm 0.635 kg

Mounting screw size 6-32 Mounting hole placement Operating temperature Cooling

See Manual 10°C to 40°C Liquid cooled

#### Notes

Warranty: One year parts and labor on defects in materials and workmanship.

The PCM-7140 current source meets or exceeds these specifications.

All specifications are measured with 100 cm of 18 AWG twisted pair wire connecting the PCM-7140 to a low impedance/inductance load (HPL-2400-2.653).

Specifications subject to change without notice.

# Control Board



# Load Board



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Safe Operating Area Graphs

— Pulse Width 10 μs

– Pulse Width 50 μs

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----- Pulse Width 100 μs

Pulse Width 150 μs Pulse Width 200 μs

------ Pulse Width 250 μs

----- Pulse Width 300 μs