

Temperature Controller and Laser Diode Driver AD5005



GENERAL DESCRIPTION

The AD5005 is a high precision laser diode and temperature controller series coming in several models to work with all low power laser diodes. Based on its low noise current driver and high efficient temperature controller, it best fits your applications with high performance.

The laser current driver feeds high stable current with noise below $75\mu\text{A}$ and incorporates all essential protection strategies to laser diode. The driver offers excellent current stability in constant current mode or power stability in constant power mode. Furthermore, it supports external modulation of sinewave with small signal 3dB bandwidth from DC to 500KHz

The temperature controller is built based on reliable and precise circuitry. It is ideal for high performance applications like wavelength locking. By the help of adjustable Proportional Gain(P) and Integrator Time Constant(I), it achieves temperature stability better than 0.005°C . Any type of temperature sensors are compatible with AD5005.

AD5005 supports local and remote operation. By a USB2.0 interface, users can operate it via PC conveniently.

Features and Benefits

- Current/Temperature Controlling Combination
- USB2.0 remote interface
- Operating in constant power or constant current modes
- Current noise $<75\mu\text{A}$
- Current Stability $<50\text{ppm}$ (Constant Current Mode)
- Power Stability $<0.02\%$ (Constant Power Mode)
- Analog modulation capability up to 500 KHz
- Temperature controlling power up to 50W
- Temperature Stability $<0.005^{\circ}\text{C}$
- Compatible with thermistor, IC, RTD sensors

Temperature Controller and Laser Diode Driver
AD5005 Specification

General Specification

Input Voltage	220V AC 45~65Hz
Power requirements (max)	<50 W
Output Current (TEC/LD) (max)	±5A / 500mA
Operating Temperature	10 to 40 °C
Storage Temperature	0 to 60 °C
Temperature Stability °C	<0.005 °C (short term); <0.008 °C (long term)
Temperature Control Ranges	-45 °C ~ +145 °C (AD590); -55 °C ~ +114 °C (NTC)
Current/Power Stability	<50ppm / <0.02%
Sensor	NTC /PT/AD590/LM335
User Interface	DB9 analog and USB
Software	With software for PC control
19-inch standard rack kits were supported	

ELECTRICAL AND OPERATING SPECIFICATIONS

Laser Diode Driver		Temperature Controller	
Output Current	500 mA max	Output Current	±5 A max
Operating Temperature	10 to +40 °C		
Storage Temperature	0 to +60 °C		
Constant Current Control		Temperature Control	
Constant Current	0 ~ 500 mA	Stability ¹	<0.005 °C (short term)
Stability	<50 ppm		<0.008 °C (long term)
Noise and Ripple (rms) ²	< 75µA µA	P (Proportional Gain)	~ 20 A/V
Current Limit Range	0 ~ 500 mA	I (Integrator Time Constant)	0.53 ~ 4.5 Sec
Constant Power Control	Current Limit Range	PI Control	Manual
Photodiode Range	15~2500 µA	Compliance Voltage	±3.4 V @ 2A
Power Stability	< 0.02%	Sensors	
Modulation	Resistive Sensor Type		
Depth of Modulation (100 KHz Sinewave)	99%		
Constant Current Bandwidth ³	500 KHz	Sensor Bias Current Range	2µA ~ 1 mA
Input Impedance	5 kΩ	Input Impedance	1 MΩ
Constant Power Bandwidth	Depends on PD	IC Sensor Types	AD590, LM335, Thermistors, RTDs
Mod Input Safe Range	0 ~ 2V	Mod Input Safe Range	0 ~ 3.3V

1. OFF ambient, 10 k Ω thermistor @ 25°C
2. I_{LD} = 100 mA
3. Sinewave input signal

For laser diode type:

