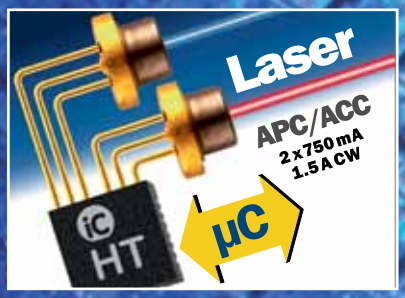
iC-HT

DUAL CW LASER DIODE DRIVER FOR UP TO 1.5A



iC-HT is suitable for CW laser driver applications with one or two laser diodes of up to 1.5 A or 2 x 750 mA. The IC requires only very few external components: a low cost microcontroller and the laser diode(s). The driver is completely controllable and monitorable with a microcontroller via SPI or I2C.

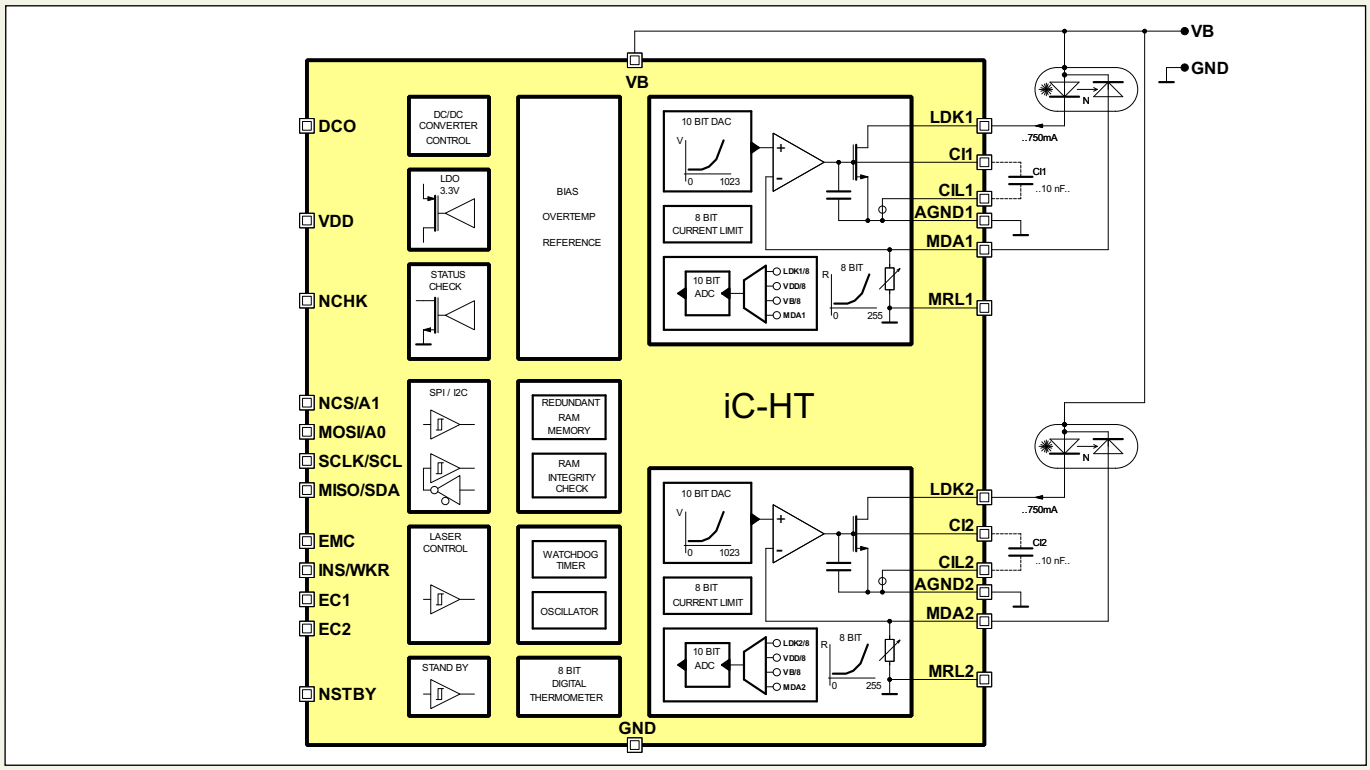
Laser regulation can be APC (Automatic Power Control) or ACC (Automatic Current Control), or the connected microcontroller takes over parameter control digitally.

Applications

- Laser diode modules
- CW laser diode driver
- Embedded laser diode controller
- Safety-oriented laser controller

Features

- Up to 750 mA per channel, up to 1500 mA merged
- 2.8 V to 8 V power supply
- Operation with or without microcontroller
- Individual enable input per channel
- Control loop accuracy better than 1 %
- Internal programmable logarithmic monitor resistor
- Operating point setup with 10 bit logarithmic resolution
- Current or light-power control (ACC or APC) per channel
- Analog level monitoring by A/D converter (per channel)
- Serial programming interface (SPI or I2C compliant)
- Configuration content verification and validation
- Programmable laser overcurrent shutdown
- Optimized for N-type laser diodes
- Low-drop linear regulator output for 3.3 V (10 mA)
- Low power standby mode
- On-chip temperature sensing
- Operating temperature range of -40 °C to 85 °C



iC-Haus

Am Kuemmerling 18 • D-55294 Bodenheim, Germany
Tel. +49 61 35/92 92-300 • Fax +49 61 35/92 92-192 • http://www.ichaus.com

iC-HT

DUAL CW LASER DIODE DRIVER FOR UP TO 1.5A

iC-HT provides a high-precision logarithmic configurable resistor for laser diode power or current control over a wide bandwidth of operation. The driver covers a wide dynamic power range and is flexible to be used with typical CW laser diodes, including blue and green laser diodes.

A 10-bit logarithmic D/A converter sets the internal laser regulator voltage reference. A 10-bit linear A/D converter permits the monitoring of all relevant system voltages. Besides, the driver temperature is measured with an on-chip sensor.

For safe operation iC-HT provides safety-relevant system and channel-wise laser diode power-off events. The permissible laser diode operating current is channel-wise configurable. The system checks overcurrents, overvoltages, overtemperature, timer watchdog and the power down of VB and VDD.

Pin Functions

No.	Name	Function
1, 2	LDK1	Channel 1 Laser Diode Cathode
3	AGND1	Channel 1 Analog Ground
4	CI1	Channel 1 Capacitor
5	CIL1	Channel 1 Capacitor low
6	MDA1	Channel 1 Monitor Diode Anode
7	MRL1	Channel 1 Monitor Resistor Low
8	EMC	Microcontroller Operation Enable Input (pin configuration is selected when low)
9	SCLK/SCL	SPI Clock / I2C Clock
10	MISO/SDA	SPI Master In Slave OUT / I2C Data line
11	MOSI/A0	SPI Master Out Slave In / I2C AD0
12	NCS/A1	Not Chip Select / I2C AD1
13	EC1	Channel 1 Enable Input
14	EC2	Channel 2 Enable Input
15	MRL2	Channel 2 Monitor Resistor Low
16	MDA2	Channel 2 Monitor Diode Anode
17	CIL2	Channel 2 Capacitor low
18	CI2	Channel 2 Capacitor
19	AGND2	Channel 2 Analog Ground
20, 21	LDK2	Channel 2 Laser Diode Cathode
22	GND	Ground
23	DCO	Digital Current Output
24	INS/WKR	I2C not SPI / WK Reference
25	VDD	+3.3 V Supply Output
26	VB	+2.8 V to +8 V Power Supply
27	NCHK	Check Output (low active)
28	NSTBY	Standby Input (low active)
TP		Thermal Pad (GND)

Key Specifications

General	
Supply Voltage	2.8 V to 8 V
Laser Driver Output Current	up to 750 mA each channel up to 1500 mA with channels paired
Standby Current Consumption	< 10 µA

Laser Driver	
Permissible Voltage at LDKx	-0.3 V to +8 V
Permissible CW Current LDKx	750 mA max.
Saturation Voltage at LDKx	0.7 V max., at I(LDKx) = 750 mA

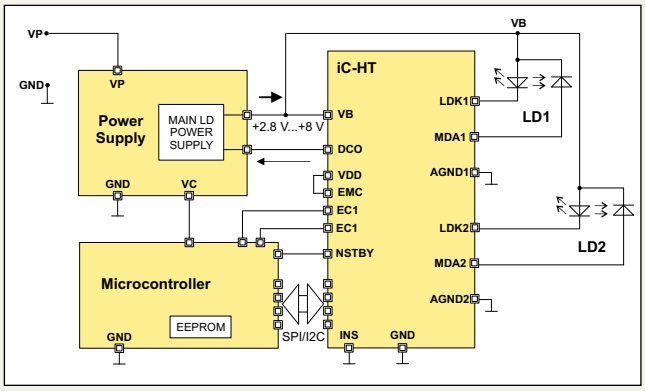
Programmable Resistor	
Minimum Resistor Value	typ. 100 Ω
Maximum Resistor Value	typ. 500 kΩ
Resistor Increments	typ. 3.3 % per step

Safety Features
Individual Channel enable Inputs ECx, Overtemperature detection, VB and VDD Undervoltage detection, Power-On Detection, Watchdog Timer, RAM Integrity Check, Configuration Timeout, Safe mode detection (on pins EMC and INS)

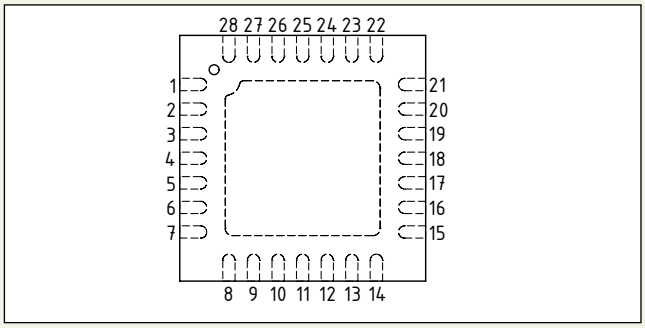
Pin Configuration Operation (EMC = lo)	
INS/WKR = LO (M-Type LD)	Reference voltage 0.25 V
INS/WKR = HI (N-Type LD)	Reference voltage 0.5 V

I/O Interface	
SPI Interface I²C Interface	clock rate 10 MHz max. clock rate 400 kHz max.

Application Example



Pin Configuration QFN28 5x5 mm²



iC-Haus
Am Kuemmerling 18 • D-55294 Bodenheim, Germany
Tel. +49 61 35/92 92-300 • Fax +49 61 35/92 92-192 • http://www.ichaus.com