iC-WKM

15 V M-TYPE CW LASER DIODE DRIVER

iC-WKM is a driver for laser diodes in continuous wave operation with laser currents of up to 350 mA which requires only four external components. The wide power supply range of up to 15 V permits the operation of blue laser diodes. The driver is optimised for M-type laser diodes and allows use with operation from a single supply and the connection of the laser diode case (common cathode) to ground.

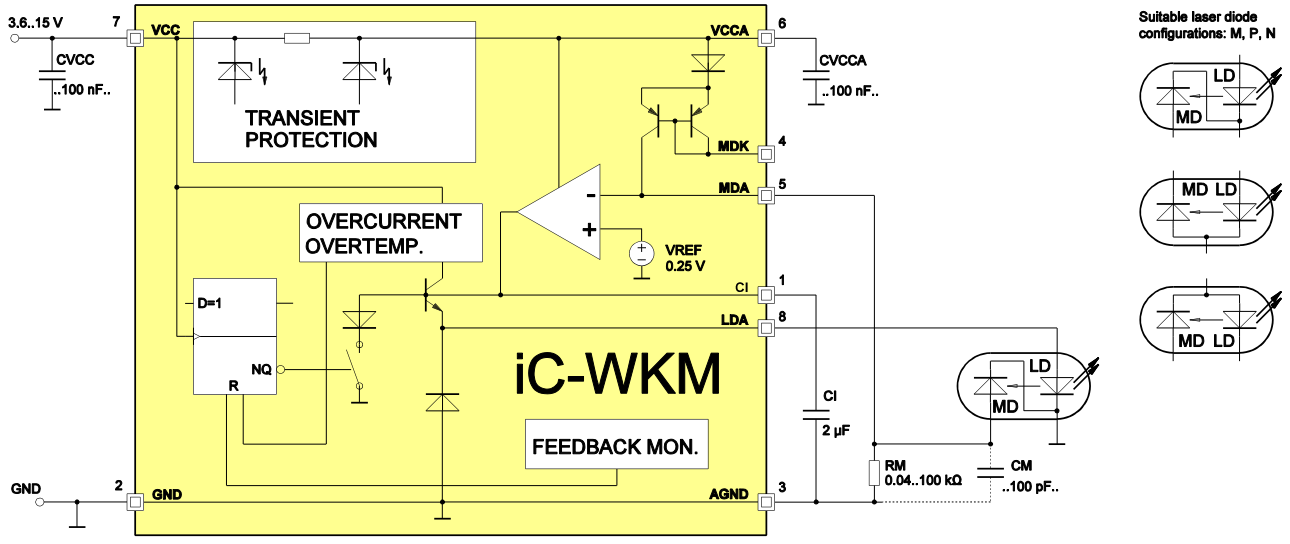
The iC includes integrated circuitry protecting against destruction by ESD, excessive temperature and overcurrent plus a soft start of the regulator to protect the laser diode when the power supply is switched on. The iC also filters the laser diode power supply for transients.

Applications

– Blue laser diodes
– Laser diode modules
– Laser diode pointers
– Leveling lasers
– Barcode readers

Features

– Optimised for M-type laser diodes (single supply, case grounded)
– CW operation up to 350 mA from a single supply of 3.6 to 15 V
– Rapid soft start after power-on
– Simple power adjustment via an external resistor
– Control loop accuracy better than 3 % with changes in temperature, supply voltage and load current
– Integrated reverse polarity protection for the iC and laser diode
– Strong suppression of transients with small external capacitors; integrated flyback path
– Permanent shutdown with excessive temperature and overcurrent (i.e. if the laser diode is damaged or the feedback current path fails)
– Two feedback inputs permit all current laser diode types to be used (M/P/N configurations)
– Modulation via the feedback inputs possible
– Wide monitor current range from 2.5 µA to 6.25 mA



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The regulator is adapted to the laser diode by an external resistor at MDA. The monitor current acts as a reference and is regulated independent of the influence of temperature and supply voltage (range: 2.5 µA to 6.25 mA). The capacitor at CI determines the control time constants and start-up time.

A second monitor input, pin MDK, allows the driver to be used for P-type laser diode configurations; alternatively, it can be used as an analog modulation input (DC to a few kHz).

In the event of failure, such as overcurrent in the laser path with a lack of feedback, for example, a quick power lockout is activated. The shutdown persists until power is reapplied, permitting a restart. The strain on power packs and batteries is relieved and the laser class is retained even in the event of a disturbance.

iC-WKM offers additional protection by means of spike detection at pin MDA. Should spikes or oscillation occur at pin MDA the power lockout is activated after a certain timeout.

Key Specifications

General		
Supply Voltage Range		3.6 to 15 V
Laser Drive Current		10 to 350 mA
Turn-on Delay	CI = 3.3 µF	600 µs max.

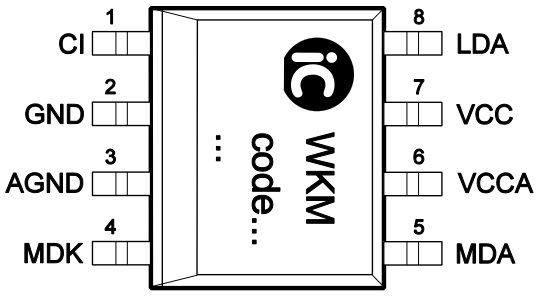
Control Circuit		
Control Error	RM = 10 kΩ, Tj = 0..80 °C RM = 10 kΩ, Tj = -40..125 °C	0.5 % 2 %
Supply Voltage Suppression		±0.2 %/V
Load Balancing Error		±0.01 %/mA
Reference Voltage at MDA		typ. 250 mV

Laser Driver		
Saturation Voltage at LDA (referenced to VCC)	I(LDA) = -40 mA I(LDA) = -350 mA	1 V max. 1.5 V max.
Overcurrent Threshold in LDA		360 to 700 mA
Overcurrent Reset Delay	CI = 1 µF	600 µs max.

Pin Functions

No.	Name	Function
1	CI	Capacitor for Power Control
2	GND	Ground
3	AGND	Reference Ground for CI, RM
4	MDK	Monitor Input 2 (MD Cathode, modulation)
5	MDA	APC Setup, Monitor Input 1 (MD Anode)
6	VCCA	Driver Supply
7	VCC	+3.6 to 15 V Supply Voltage
8	LDA	Driver Output (LD Anode)

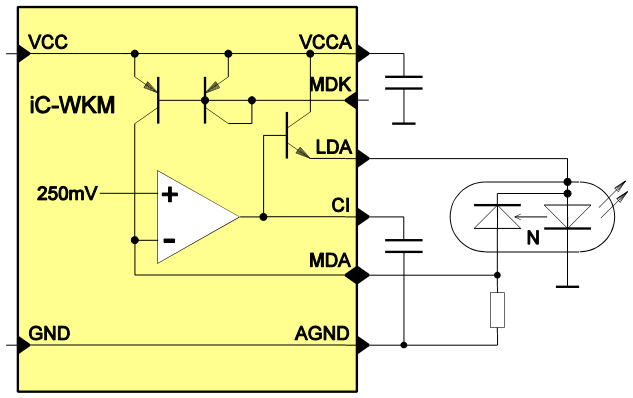
Pin Configuration SO8Ntp



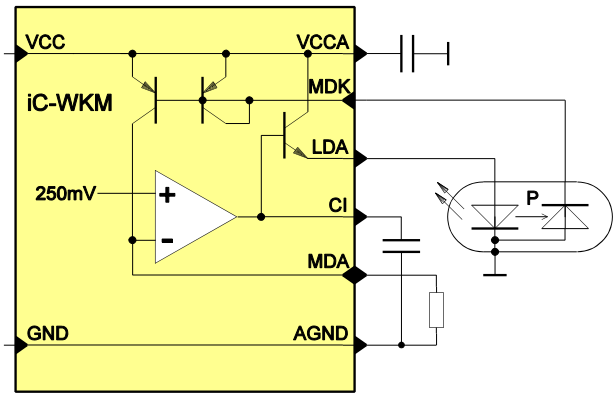
Low R_{th} package (typ. 30 K/W)

Alternative Laser Diode Configurations

N-type laser diode



P-type laser diode



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