

2.5V CW LASER DIODE DRIVER

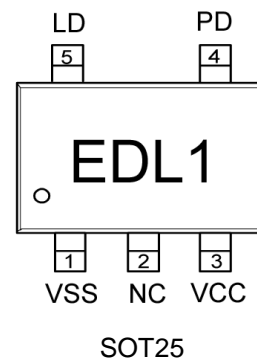
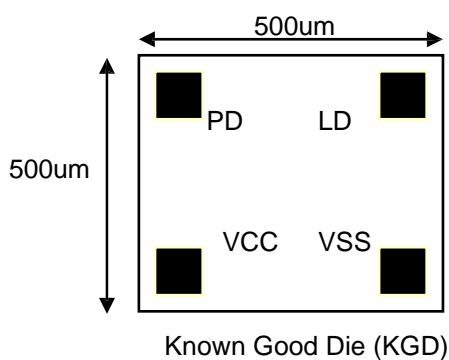
FEATURES

- z CW operation up to 60mA from 2.5..6V supply voltage
- z Rapid soft start after power-on
- z Simple power adjustment via the external resistor
- z Control loop accuracy better than 3% with changes in temperature, supply voltage and load current
- z Permanent shutdown with excessive temperature and overcurrent (i.e. if the laser diode is damaged or the feedback current path fails)
- z Wide monitor current range from 10µA to 0.5mA
- z No external capacitor is required on output

APPLICATIONS

- z Industrial Laser Diode Module
- z LD Pointers
- z Laser Leveling
- z Bar Code Reader
- z Laser Measuring Equipment

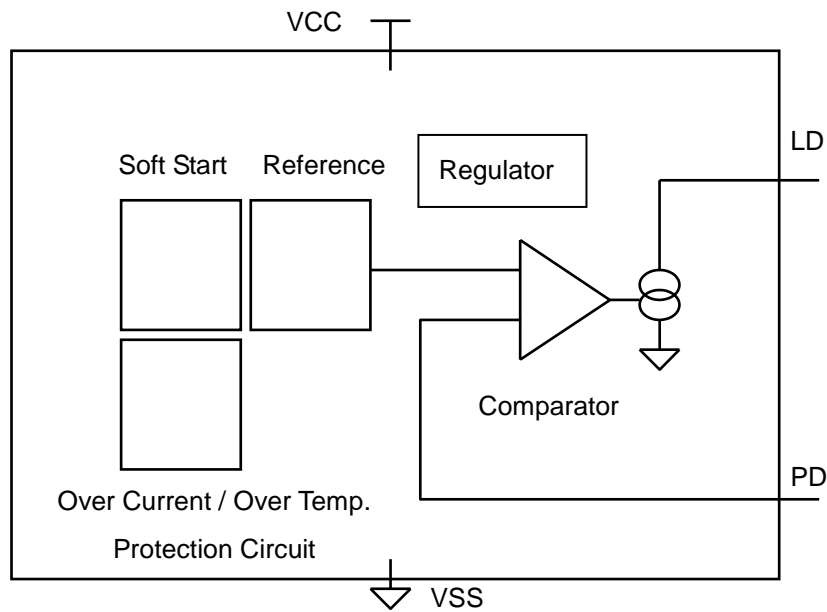
PACKAGES



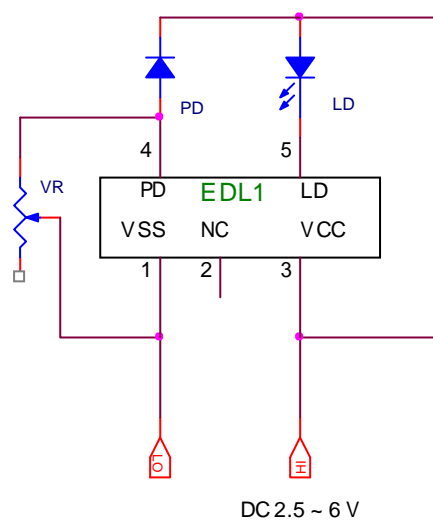
SOT 25 PIN CONFIGURATION

No.	Name	Function
1	VSS	Ground
2	NC	No Connection
3	PD	APC Setup, Monitor Input, PD Anode
4	LD	Driver Output (LD Cathode)
5	VCC	+2.5 .. +6V Supply Voltage

BLOCK DIAGRAM



APPLICATION CONNECTION



DESCRIPTION

The ED-LDDWK device is a driver for laser diodes in continuous wave operation which requires only few external components. The broad power supply range of 2.5V to 6V and the integrated reverse battery protection allow for battery operation with a minimum of two cells.

The driver includes integrated circuitry protecting against destruction by ESD, excessive temperature and over current and a soft start which regulates the power and protects the laser diode when the power supply is switched on. The driver also filters the laser diode power supply for transients.

The power supply is regulated and adapted for the laser diode used by an external resistor at PD. The monitor current acts as a reference and is regulated independent of the influence of temperature and supply voltage (range: 10 μ A to 0.5mA). There is no external capacitor required.

In the event of failure, such as over current in the laser path with a lack of feedback, for example, a quick power lockout is activated. The shutdown continues 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.

ABSOLUTE MAXIMUM RATINGS

Beyond these values damage may occur; device operation is not guaranteed.

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
VCC	Voltage at VCC		-0.3		7	V
I(VCC)	Current in VCC		-500		100	mA
I(LD)	Current in LD				80	mA
I(PD)	Current in PD				6	mA
VR	Reverse Voltage				-4	V
VD	ESD Susceptibility at all pins	MIL-STD-883, Method 3015, HBM 100pF discharged through 1.5kS			1	kV
Tj	Operating Junction Temperature		-40		150	$^{\circ}$ C
Ts	Storage Temperature Range		-40		150	$^{\circ}$ C

THERMAL DATA

Operating Conditions: VCC= 2.5..6V

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Ta	Operating Ambient Temperature Range		-20		80	°C
Rthja	Thermal Resistance Chip / Ambient	SOT25 package, soldered on PCB, no additional cooling areas			140	K/W

All voltages are referenced to ground unless otherwise noted.

All currents into the device pins are positive; all currents out of the device pins are negative.

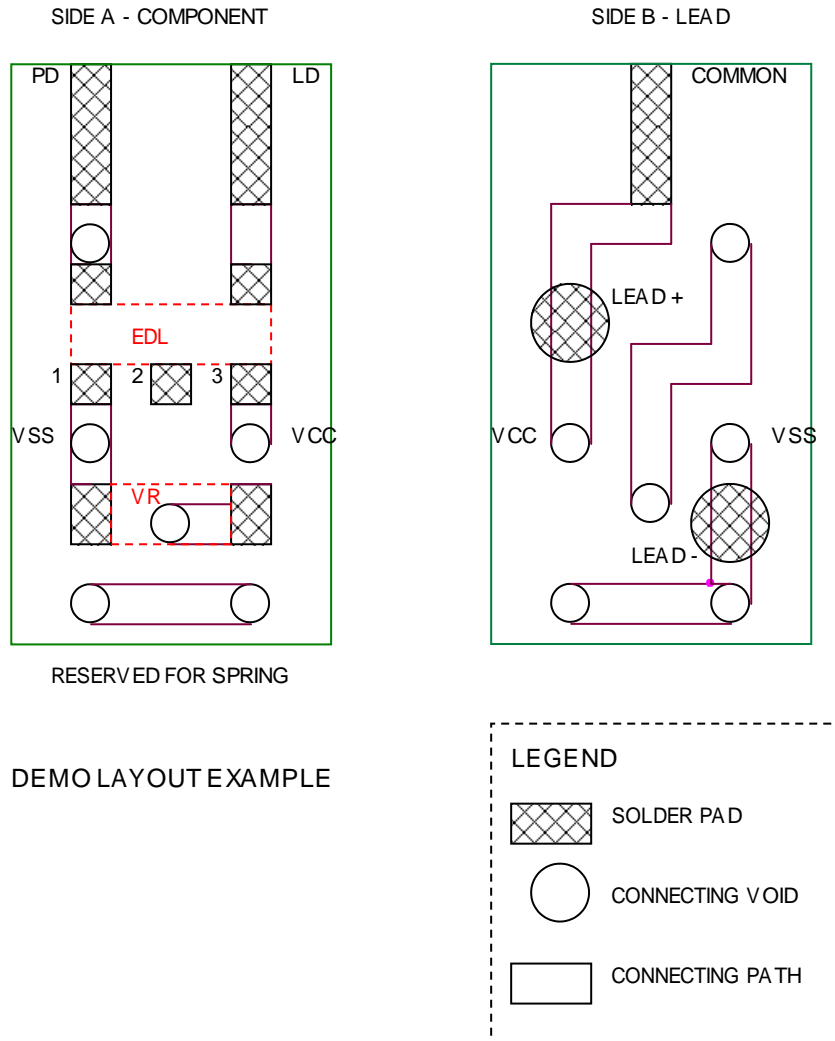
ELECTRICAL CHARACTERISTICS

Operating Conditions: VCC= 2.5..6V, VR= 2KΩ..100KΩ, Ta= -20..80°C unless otherwise noted

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
VCC	Permissible Supply Voltage		2.5		6	V
I(LD)	Permissible Laser Diode Current	power control range	5	35	60	mA
I(PD)	Permissible Photo Diode Current	power control range	10		500	μA
ton()	Turn-on Delay	VCC: 0V→5V to 95% I(LD); I(LD)= 60mA			70	μs
APCerr	Control Error	VR= 10kΩ, Ta= 0..50°C VR= 10kΩ, Ta= -20..80°C			5 10	% %
Ioff(LD)	Laser Diode Shutdown Current		65	70	80	mA
Rout	Power Adjustment Resistor	power control range	1.2		60	KΩ
I(VCC)	Supply Current in VCC	power control range			13	mA
V(PD)	Voltage on PD	power control range	0.5	0.6	0.7	V

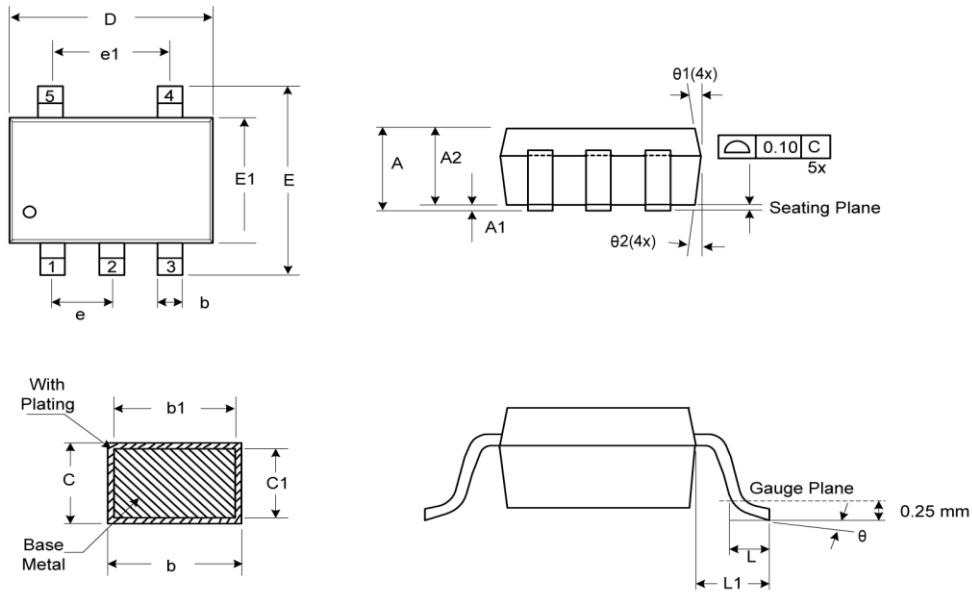
LASER MODULE LAYOUT EXAMPLE

The following is a reference PCB layout design, which accommodates most of existing PCB for laser diode module. Trace must be modified to reduce EM wave emission, and component dimension should be altered.



DEMO LAYOUT EXAMPLE

SOT25 Package Drawing



Symbol	Dimensions In Millimeters			Dimensions In Inches		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	1.05	1.20	1.35	0.041	0.047	0.053
A1	0.05	0.10	0.15	0.002	0.004	0.006
A2	1.00	1.10	1.20	0.039	0.043	0.047
b	0.25	-	0.55	0.010	-	0.022
b1	0.25	0.40	0.45	0.010	0.016	0.018
c	0.08	-	0.20	0.003	-	0.008
c1	0.08	0.11	0.15	0.003	0.004	0.006
D	2.70	2.85	3.00	0.106	0.112	0.118
E	2.60	2.80	3.00	0.102	0.110	0.118
E1	1.50	1.60	1.70	0.059	0.063	0.067
L	0.35	0.45	0.55	0.014	0.018	0.022
L1	0.60 Ref.			0.024 Ref.		
e	0.95 Bsc.			0.037 Bsc.		
e1	1.90 Bsc.			0.075 Bsc.		
θ	0°	5°	10°	0°	5°	10°
$\theta1$	3°	5°	7°	3°	5°	7°
$\theta2$	6°	8°	10°	6°	8°	10°