



LA9450CL — Bi-CMOS IC For Laser Diode Pulse Driver IC

Overview

The LA9450CL is a pulse driver IC for laser diode that enables low voltage operation.

Features

- Two-power voltage design for low power consumption. Two-mode switching function of DC (supplied from V_{CC1} : 2.4V) and pulse luminescence (supplied from V_{CC2} : 2.8V).
- Low voltage (V_{CC1} =2.0V min, V_{CC2} =2.6V min) and low current consumption (I_{CC1} =500 μ A) design.
- Low saturation PNP driver is used for DC mode for the low V_{CEsat} .
- Small package ECSP3020-10 (size 3 \times 2mm, pin pitch 0.65mm)

Function

- Laser driver
- Two-mode switching functions of DC and pulse luminescence

Specifications

Maximum Ratings at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	$V_{CC\ max}$		4.5	V
Allowable power dissipation	$P_d\ max$	For every 1°C rise in temperature over 25°C, the power is reduced by a factor of 1.55mW/°C	150	mW
Operating temperature	T_{opr}		-10 to +70	°C
Storage temperature	T_{stg}		-40 to +125	°C

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Operating Condition at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Recommend supply voltage	V _{CC1}		2.4	V
	V _{CC2}		2.8	V
Operating supply voltage range	V _{CC1} opg		2.0 to 3.5	V
	V _{CC2} opg		2.6 to 3.5	V

Electrical Characteristics at Ta = 25°C, V_{CC1} = 2.4V, V_{CC2} = 2.8V, R_L = 25Ω

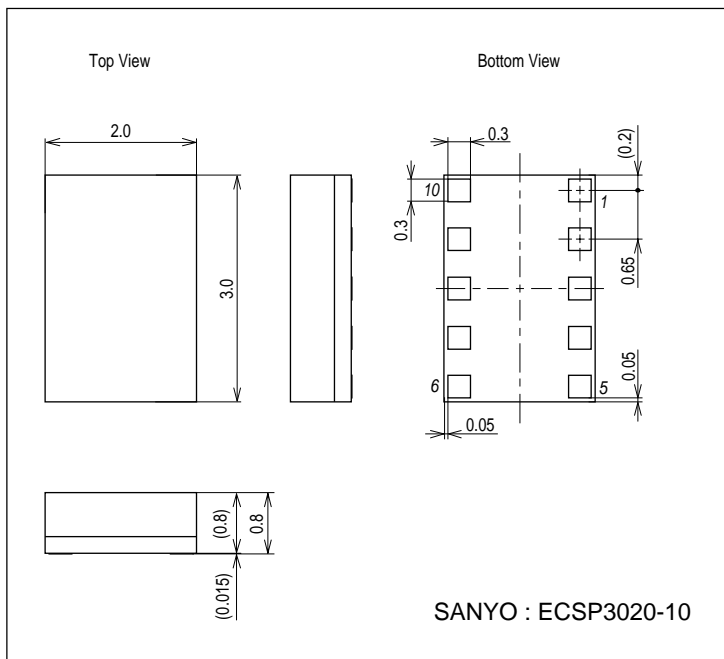
Parameter	Symbol	Conditions	Ratings			unit	
			min	typ	max		
Supply current 1 DC mode	I _{CC11}	I _{IN} =0μA, V _{cont} =V _{CC2} V _{SW} =0V, R _L =∞	V _{CC1}	300	500	1500	μA
	I _{CC12}		V _{CC2}		0.1	5	μA
Supply current 2 Pulse mode	I _{CC21}	I _{IN} =0μA, V _{cont} =V _{CC2} V _{SW} =V _{CC2}	V _{CC1}	300	500	670	μA
	I _{CC22}		V _{CC2}	70	110	150	μA
Supply current 3 Pulse mode	I _{CC31}	I _{IN} =500μA, V _{cont} =0V V _{SW} =V _{CC2}	V _{CC1}	300	530	710	μA
	I _{CC32}		V _{CC2}	68	80	93	mA
Output current	I _{OUT}	I _{IN} =500μA, V _{cont} =0V	65	75	85	mA	
Current gain	I _{gain}	I _{IN} =500μA, V _{cont} =0V	130	150	170		
Maximum output current Pulse	I _{OUT} maxP	I _{IN} =1200μA, V _{cont} =0V, R _L =10Ω	140	165	210	mA	
Maximum output current DC	I _{OUT} maxD	I _{IN} =1200μA, V _{cont} =0V, R _L =10Ω	150	175	210	mA	
Maximum output voltage Pulse	V _{OUT} maxP	I _{IN} =1000μA, V _{cont} =0V, V _{SW} =V _{CC2}	2.4	2.58		V	
Maximum output voltage DC	V _{OUT} maxD	I _{IN} =1000μA, V _{cont} =0V, V _{SW} =0V	2.15	2.24		V	
Cont high level	V _{cont} H		V _{CC2} /2		V _{CC2} +0.2	V	
Cont low level	V _{cont} L		-0.2		0.4	V	
SW High level	V _{SW} H		V _{CC1} -0.7		V _{CC2} +0.2	V	
SW Low level	V _{SW} L		-0.2		0.15	V	
I _{IN} Input resistance	R _{IN}		270	330	390	Ω	
* Rising edge time	t _r	R _L =10Ω, I _{OUT} peak=40mA, 10→90%		2.9	4.1	ns	
* Falling edge time	t _f	R _L =10Ω, I _{OUT} peak=40mA, 90→10%		6.1	8.6	ns	
*Cont falling edge delay time	T _{ondelay}	I _{OUT} peak=55mA, cont 50%→Output 50%		6.8	8.9	ns	
*Cont falling edge delay time	T _{ofdelay}	I _{OUT} peak=55mA, cont 50%→Output 50%		10.8	14.1	ns	

* Design target value and no measurement is performed.

Package Dimensions

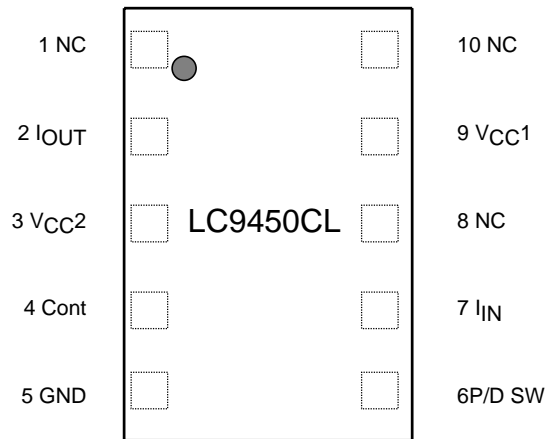
unit : mm (typ)

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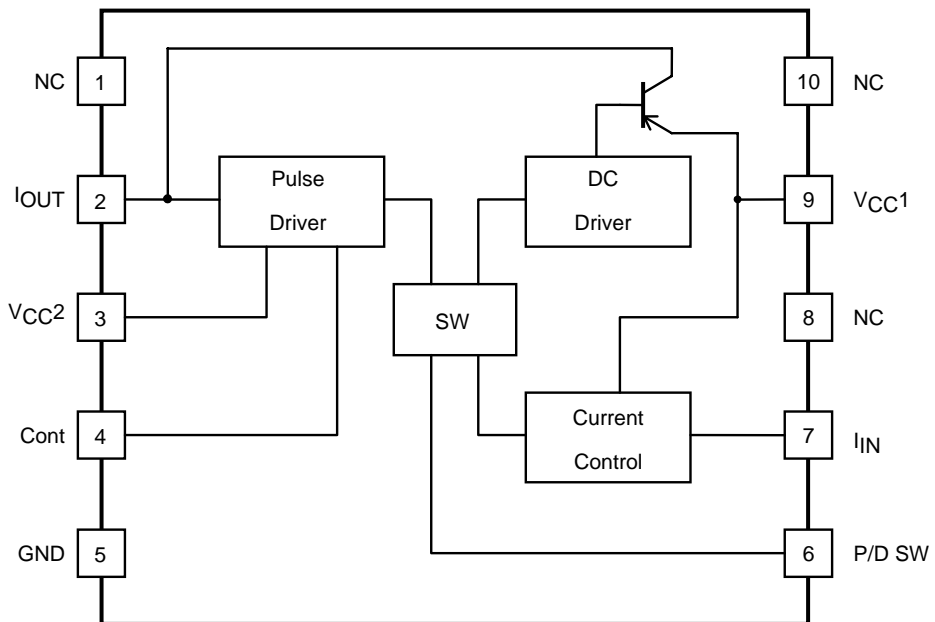
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Pin Assignment



Top view

Block Diagram

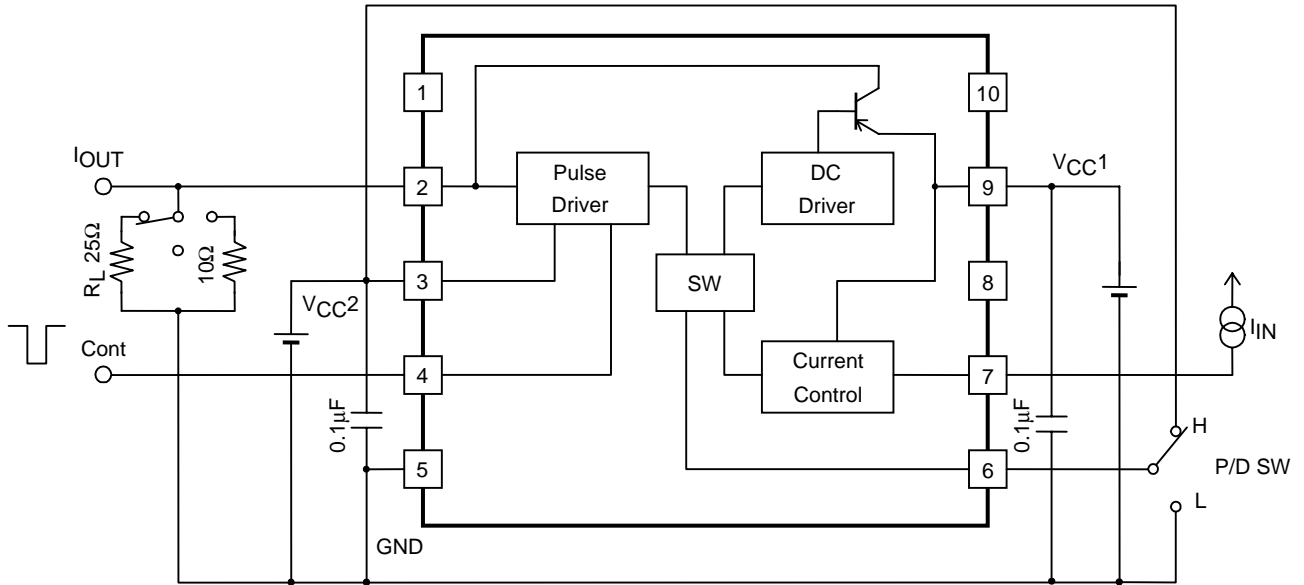


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Pin Functions

Pin No.	Pin Name	Pin Description	Equivalent Circuit
1	NC	NC	
2	IOUT	This is a LD driver output terminal.	
3	VCC2	This is a supply terminal for a pulse driver output. In DC luminescence mode, voltage which is bigger than VCC1, and flowing are available.	
4	Cont	"Low" at pulse driver, and IOUT output is ON.	
5	GND		
6	P/D SW	This is a switching terminal for DC/Pulse. (Low: DC, High: Pulse)	
7	IIN	This is a controlled current input terminal. (Input resistance 330Ω)	
8	NC	NC	
9	VCC1	This is a power supply terminal of a controlled circuit and driver output at DC luminescence. This can be connected to VCC2 to use as a common power supply.	
10	NC	NC	

Test Circuit



Power supplies of IOUT drive current - Pulse mode: VCC2
 DC mode: VCC1

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