



# SANYO Semiconductors DATA SHEET

## 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 $\mu$ 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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# LA9450CL

## Operating Condition at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Recommend supply voltage	V <sub>CC1</sub>		2.4	V
	V <sub>CC2</sub>		2.8	V
Operating supply voltage range	V <sub>CC1</sub> opg		2.0 to 3.5	V
	V <sub>CC2</sub> opg		2.6 to 3.5	V

## Electrical Characteristics at Ta = 25°C, V<sub>CC1</sub> = 2.4V, V<sub>CC2</sub> = 2.8V, R<sub>L</sub> = 25Ω

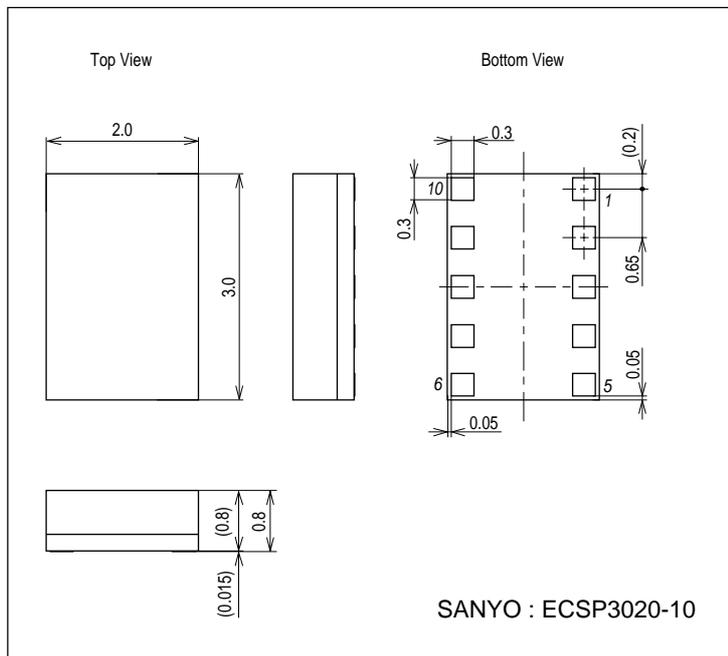
Parameter	Symbol	Conditions	Ratings			unit	
			min	typ	max		
Supply current 1 DC mode	I <sub>CC11</sub>	I <sub>IN</sub> =0μA, V <sub>cont</sub> =V <sub>CC2</sub> V <sub>SW</sub> =0V, R <sub>L</sub> =∞	V <sub>CC1</sub>	300	500	1500	μA
	I <sub>CC12</sub>		V <sub>CC2</sub>		0.1	5	μA
Supply current 2 Pulse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

\* Design target value and no measurement is performed.

## Package Dimensions

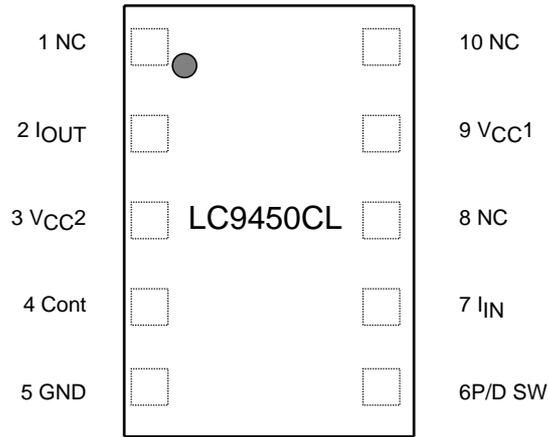
unit : mm (typ)

3291



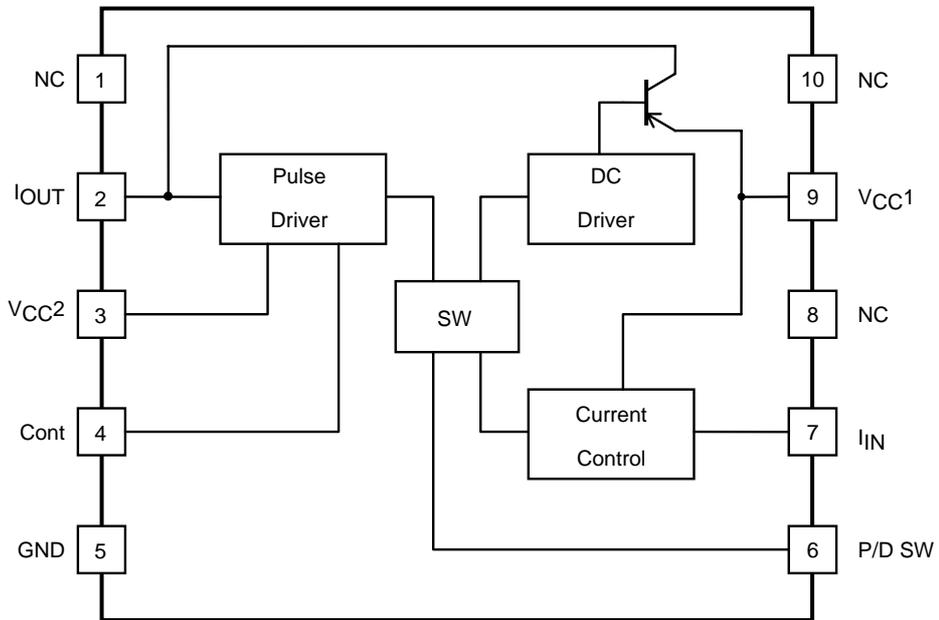
# LA9450CL

## Pin Assignment



Top view

## Block Diagram

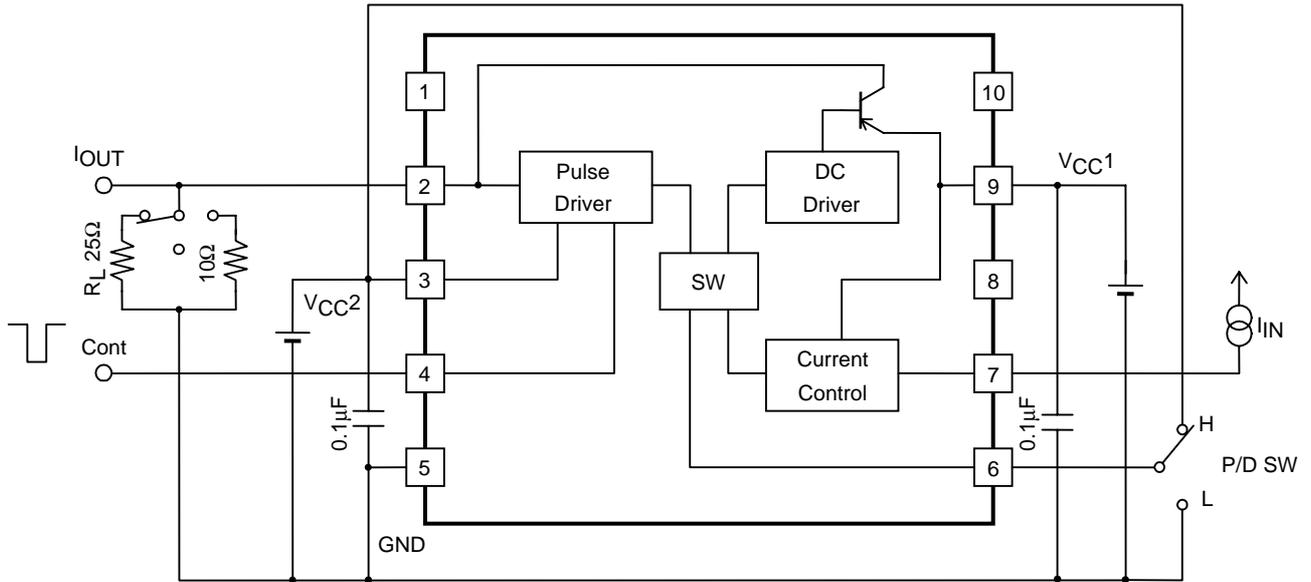


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## Pin Functions

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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