



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 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 $^\circ\text{C}$ rise in temperature over 25 $^\circ\text{C}$, the power is reduced by a factor of 1.55mW/ $^\circ\text{C}$	150	mW
Operating temperature	T_{opr}		-10 to +70	$^\circ\text{C}$
Storage temperature	T_{stg}		-40 to +125	$^\circ\text{C}$

■ Any and all SANYO Semiconductor Co.,Ltd. products described or contained herein are, with regard to "standard application", intended for the use as general electronics equipment (home appliances, AV equipment, communication device, office equipment, industrial equipment etc.). The products mentioned herein shall not be intended for use for any "special application" (medical equipment whose purpose is to sustain life, aerospace instrument, nuclear control device, burning appliances, transportation machine, traffic signal system, safety equipment etc.) that shall require extremely high level of reliability and can directly threaten human lives in case of failure or malfunction of the product or may cause harm to human bodies, nor shall they grant any guarantee thereof. If you should intend to use our products for applications outside the standard applications of our customer who is considering such use and/or outside the scope of our intended standard applications, please consult with us prior to the intended use. If there is no consultation or inquiry before the intended use, our customer shall be solely responsible for the use.

■ Specifications of any and all SANYO Semiconductor Co.,Ltd. products described or contained herein stipulate the performance, characteristics, and functions of the described products in the independent state, and are not guarantees of the performance, characteristics, and functions of the described products as mounted in the customer's products or equipment. To verify symptoms and states that cannot be evaluated in an independent device, the customer should always evaluate and test devices mounted in the customer's products or equipment.

LA9450CL

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

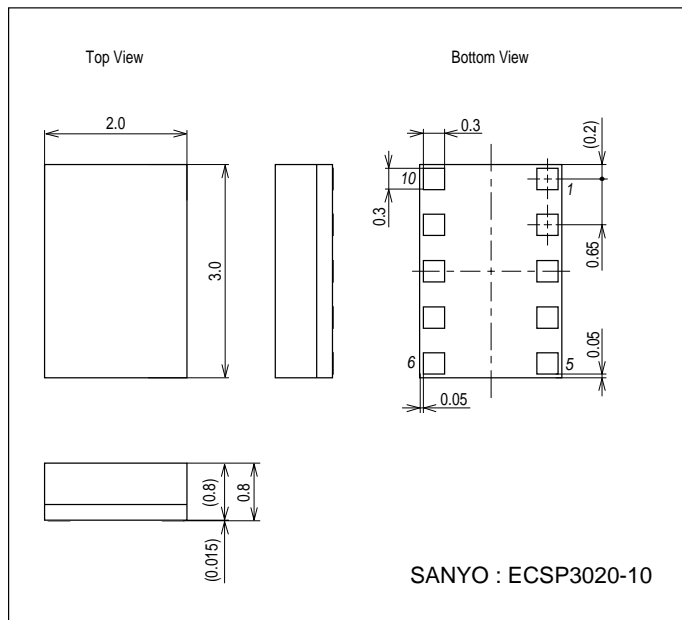
Parameter	Symbol	Conditions	Ratings			unit	
			min	typ	max		
Supply current 1 DC mode	I _{CC11}	I _{IN} =0μA, V _{cont} =V _{CC2}	V _{CC1}	300	500	1500	μA
	I _{CC12}	V _{SW} =0V, R _L =∞	V _{CC2}		0.1	5	μA
Supply current 2 Pulse mode	I _{CC21}	I _{IN} =0μA, V _{cont} =V _{CC2}	V _{CC1}	300	500	670	μA
	I _{CC22}	V _{SW} =V _{CC2}	V _{CC2}	70	110	150	μA
Supply current 3 Pulse mode	I _{CC31}	I _{IN} =500μA, V _{cont} =0V	V _{CC1}	300	530	710	μA
	I _{CC32}	V _{SW} =V _{CC2}	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

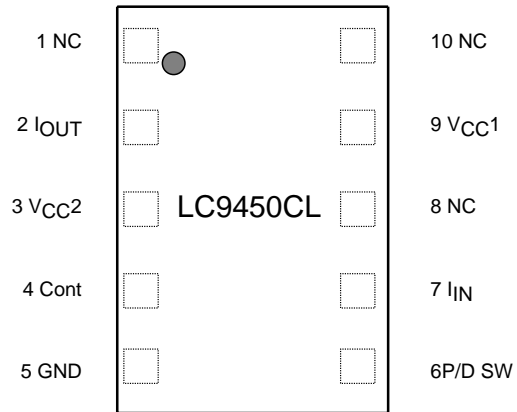
unit : mm (typ)

3291



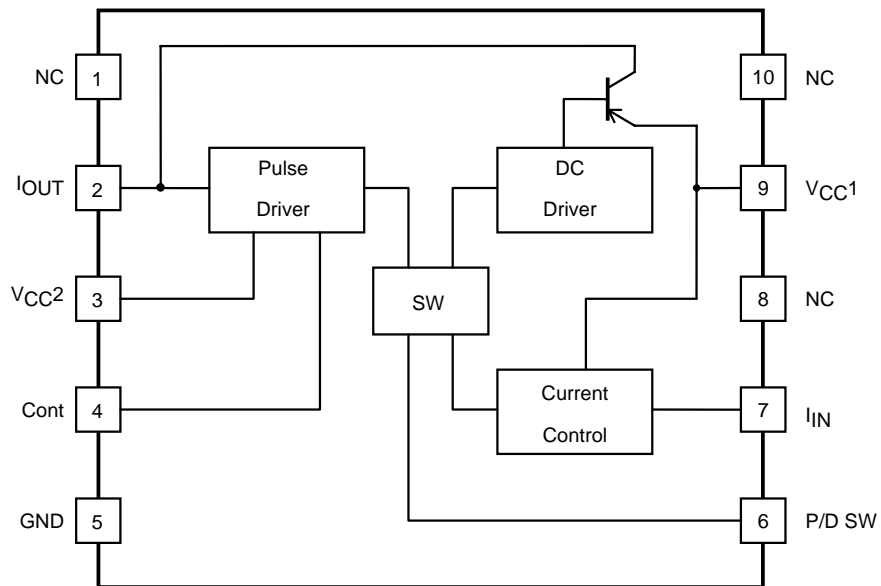
LA9450CL

Pin Assignment



Top view

Block Diagram

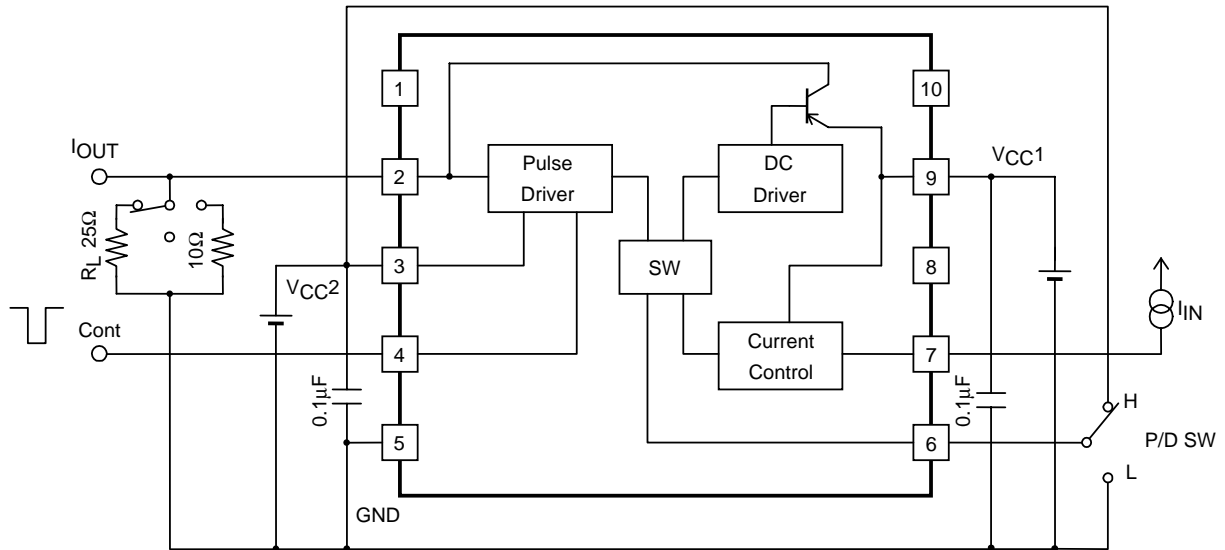


LA9450CL

Pin Functions

Pin No.	Pin Name	Pin Description	Equivalent Circuit
1	NC	NC	
2	I _{OUT}	This is a LD driver output terminal.	
3	V _{CC2}	This is a supply terminal for a pulse driver output. In DC luminescence mode, voltage which is bigger than V _{CC1} , and flowing are available.	
4	Cont	"Low" at pulse driver, and I _{OUT} output is ON.	
5	GND		
6	P/D SW	This is a switching terminal for DC/Pulse. (Low: DC, High: Pulse)	
7	I _{IN}	This is a controlled current input terminal. (Input resistance 330Ω)	
8	NC	NC	
9	V _{CC1}	This is a power supply terminal of a controlled circuit and driver output at DC luminescence. This can be connected to V _{CC2} to use as a common power supply.	
10	NC	NC	

Test Circuit



Power supplies of I_{OUT} drive current - Pulse mode: V_{CC2}
 DC mode: V_{CC1}

■ SANYO Semiconductor Co.,Ltd. assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all SANYO Semiconductor Co.,Ltd. products described or contained herein.

■ SANYO Semiconductor Co.,Ltd. strives to supply high-quality high-reliability products, however, any and all semiconductor products fail or malfunction with some probability. It is possible that these probabilistic failures or malfunction could give rise to accidents or events that could endanger human lives, trouble that could give rise to smoke or fire, or accidents that could cause damage to other property. When designing equipment, adopt safety measures so that these kinds of accidents or events cannot occur. Such measures include but are not limited to protective circuits and error prevention circuits for safe design, redundant design, and structural design.

■ In the event that any or all SANYO Semiconductor Co.,Ltd. products described or contained herein are controlled under any of applicable local export control laws and regulations, such products may require the export license from the authorities concerned in accordance with the above law.

■ No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording, or any information storage or retrieval system, or otherwise, without the prior written consent of SANYO Semiconductor Co.,Ltd.

■ Any and all information described or contained herein are subject to change without notice due to product/technology improvement, etc. When designing equipment, refer to the "Delivery Specification" for the SANYO Semiconductor Co.,Ltd. product that you intend to use.

■ Information (including circuit diagrams and circuit parameters) herein is for example only; it is not guaranteed for volume production.

■ Upon using the technical information or products described herein, neither warranty nor license shall be granted with regard to intellectual property rights or any other rights of SANYO Semiconductor Co.,Ltd. or any third party. SANYO Semiconductor Co.,Ltd. shall not be liable for any claim or suits with regard to a third party's intellectual property rights which has resulted from the use of the technical information and products mentioned above.

This catalog provides information as of April, 2007. Specifications and information herein are subject to change without notice.