

GN8062

GaAs IC

For semiconductor laser drive

■ Features

- High-speed switching
- High output
- Pulse current and DC bias current can be controlled.

■ Absolute Maximum Ratings (Ta = 25°C)

Parameter	Symbol	Rating	Unit
Power supply voltage	V _{DD}	6	V
	V _{SS}	− 6	V
Pin voltage	V _{IN}	− 0.5 to V _{DD} −1.5	V
	V _{IP} ^{* 5}	1.5 to V _{DD}	V
	V _{OUT} ^{* 1}	V _{DD}	V
Power current	I _{DD} ^{* 4}	50	mA
	I _{SS}	40	mA
Output current	I _{OUT}	145	mA
Allowable power dissipation	P _D ^{* 2}	700	mW
Channel temperature	T _{ch}	150	°C
Storage temperature	T _{stg}	− 55 to +150	°C
Operating ambient temperature	T _{opr} ^{* 3}	−10 to +75	°C

* 1 Do not apply the voltage higher than the set V_{DD}.

* 2 Guaranteed value of the unit at Ta= 25°C.

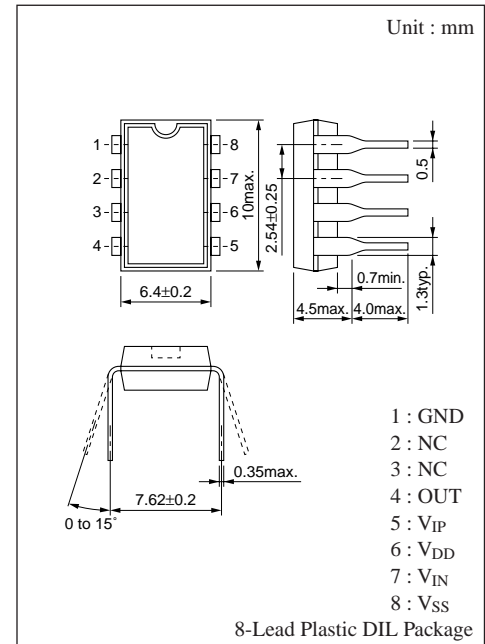
* 3 Range in which the IC circuit function operates and not the guaranteed range of electric characteristics.

* 4 I_{DD} is a current when the pulse output current is zero.

* 5 Voltage when the constant current source has been connected.

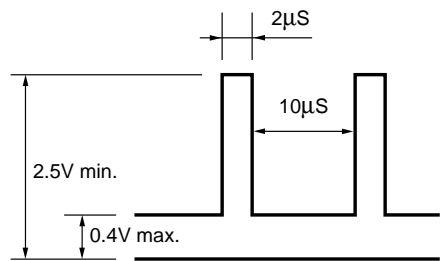
■ Electrical Characteristics (Ta = 25°C)

Parameter	Symbol	Test circuit	Condition	Min	Typ	Max	Unit
Pulse output current	I _{pmax.}	1	V _{DD} = 5V, V _{SS} = −5V, V _{IN} = 2V, I _p =120mA, R _L =10Ω	100	120		mA
	I _{pmin.}	1	V _{DD} = 5V, V _{SS} = −5V, V _{IN} = 0.4V, I _p =120mA, R _L =10Ω		1	5	mA
Supply current	I _{DD} ^{* 1}	2	V _{DD} = 5V, V _{SS} = − 5V, V _{IN} = 0.4V		35	50	mA
	I _{SS}	2	I _p = 0, R _L =10Ω		25	40	mA
Input voltage	V _{IH}			2.5			V
	V _{IL}					0.4	V
Rise time	t _r ^{* 2}	3	V _{DD} = 5V, V _{SS} = − 5V, I _p =100mA			7	ns
Fall time	t _f ^{* 2}	3	R _L =10Ω			5	ns



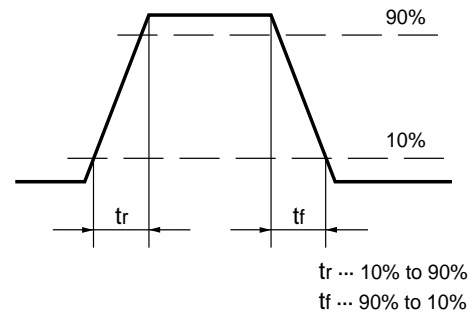
- * 1 The current value to be supplied from the 5V power supply is a total sum of this value plus the pulse output current and bias output current.
- * 2 Waveform of input and output signals

Input signal

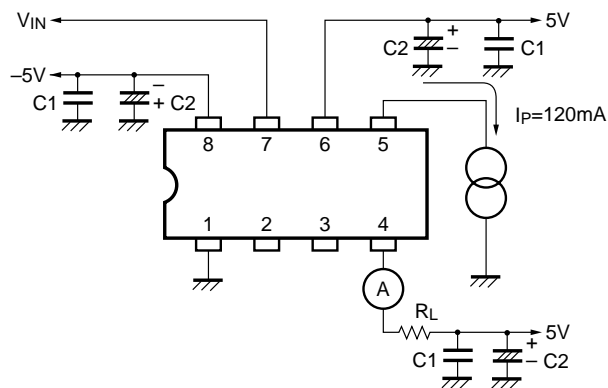


* The rise/fall time of the input signal is 2ns (10 to 90%)

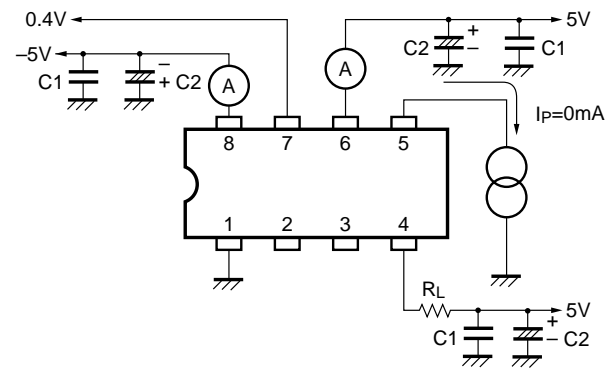
Output waveform



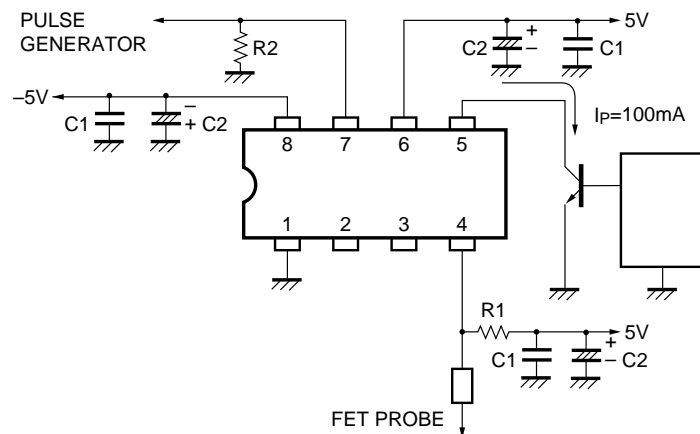
Test circuit 1



Test circuit 2

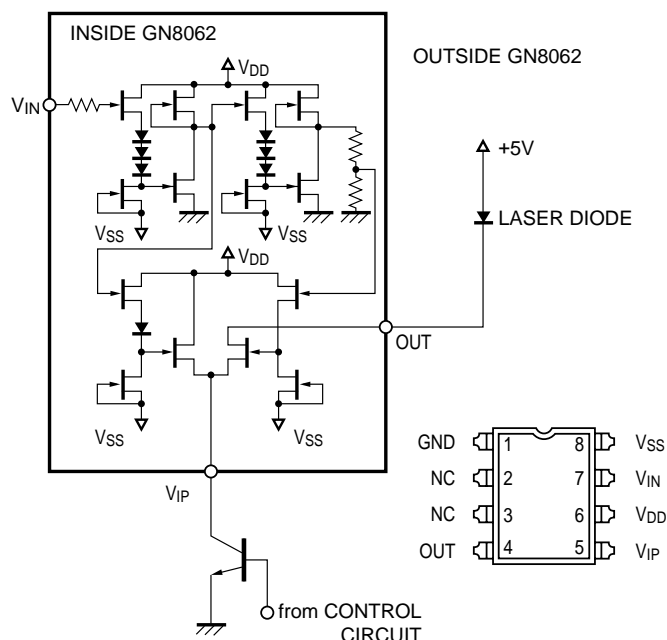


Test circuit 3



$C_1 : 0.1\mu\text{F}$
 $C_2 : 3.3\mu\text{F}$
 $R_1 : 10\Omega$
 $R_2 : 50\Omega$

■ Block Diagram



■ Caution for Handling

- 1) The recommended V_{IN} voltage is 2.5 to 3V for [H] and 0 to 0.4V for [L].
- 2) Do not apply V_{IN} while the power supply is OFF.
- 3) For the current source to be connected to the V_{IP} pin, use a Si bipolar transistor as shown in the circuit diagram.

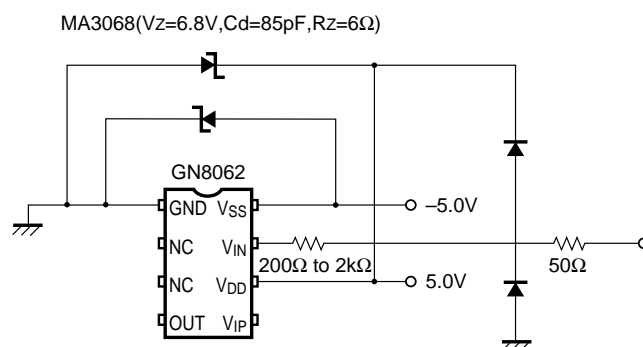
(Example: 2SD874)

To connect a resistor to the emitter or collector, use a resistor of a few ohm. The use of higher resistor may cause large change in the voltage at the V_{IP} pin, and may make the output waveform distortion. (See the pulse output current control example).

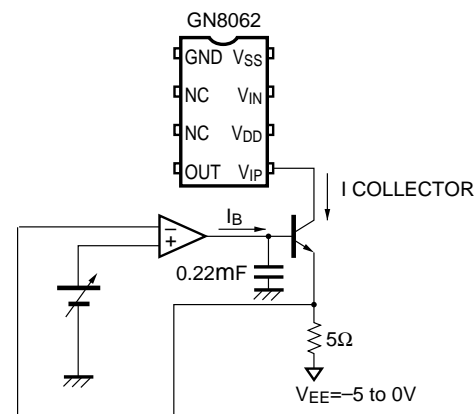
To use another current control circuit, set so that the V_{IP} pin voltage becomes around 2V.

- 4) When mounting, minimize the connection distance between the semiconductor laser and IC, and use the chip parts (C, R) of less parasitic effects.
- 5) Attention to damage by the power surge (see the example connection of the pin protection circuit).
During handling, take care to ground the human body and solder iron tip.
- 6) When the power supply is turned ON and OFF, set the current value of the current source connected to the V_{IP} pin to zero. This is important to prevent the large current flow through the semiconductor laser during power ON/OFF.
When the power supply is ON, be sure to turn ON V_{DD} , after V_{SS} is completely equal to $-5V$. When the power supply is OFF, be sure to turn OFF V_{SS} , after V_{DD} is completely 0V.

- 7) Pay attention to release the heat.



Connection example of pin protection circuit



Example of pulse output current control circuit