

GN8061

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)

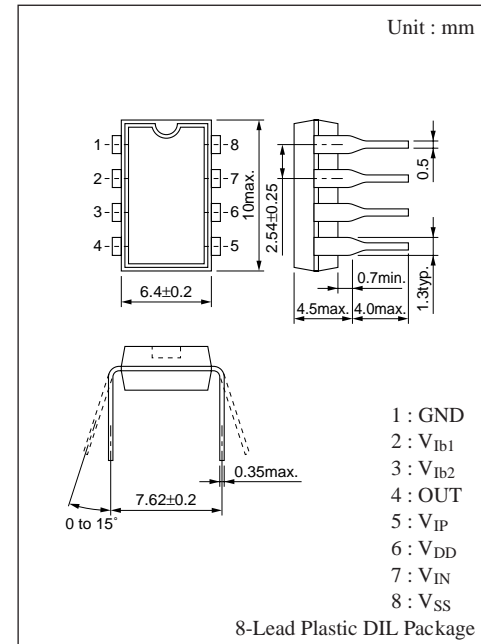
Parameter	Symbol	Rating	Unit
Power supply voltage	V _{DD}	6	V
	V _{SS}	− 6	V
Pin voltage	V _{Ib1} ^{*1}	6	V
	V _{Ib2}	0.5	V
	V _{IN}	− 0.5 to V _{DD} − 1.5	V
	V _{IP} ^{*5}	1.5 to 6	V
	V _{OUT} ^{*1}	6	V
Power current	I _{DD} ^{*4}	55	mA
	I _{SS}	40	mA
Output current	I _{OUT}	225	mA
Allowable power dissipation	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 for the unit in the natural atmosphere.
 * 3 IC circuit functioning range. Note however that the electrical characteristics shown at Ta= 25°C is not guaranteed.
 * 4 I_{DD} is a current when the pulse output current and bias output current are zero.
 * 5 Voltage when the constant current source has been connected.

■ Electrical Characteristics (Ta = 25°C)

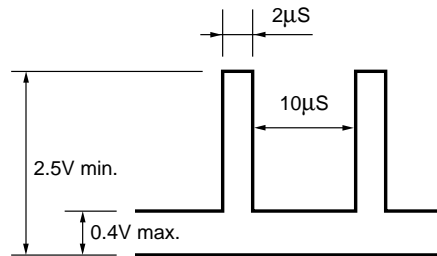
Parameter	Symbol	Test circuit	Condition	Min	Typ	Max	Unit
Pulse output current	I _{pmax.}	1	V _{IN} = 2.0V, V _{Ib2} = − 5V	100	120		mA
	I _{pmin.}	1	V _{IN} = 0.4V, V _{Ib2} = − 5V		1	5	mA
Bias output current	I _{bmax.}	2	I _P = 0, V _{Ib1} = 5V, V _{Ib2} = 0	80	100		mA
	I _{bmin. 1}	2	I _P = 0, V _{Ib1} = 0, V _{Ib2} = 0		1	5	mA
	I _{bmin. 2}	2	I _P = 0, V _{Ib1} = 5V, V _{Ib2} = − 5V		0.05	0.1	mA
Supply current	I _{DD} ^{*1}	2	V _{Ib1} = 5V, V _{Ib2} = − 5V, V _{IN} = 0.4V		35	55	mA
	I _{SS}	2	I _P = 0		25	40	mA
Input voltage	V _{IH}			2.5			V
	V _{IL}					0.4	V
Rise time	t _r ^{*2}	3	V _{Ib1} = 0, V _{Ib2} = − 5V, I _P =100mA			7	ns
Fall time	t _f ^{*2}	3				5	ns

Note : Following condition is applied unless otherwise specified: V_{DD}= 5V, V_{SS}= − 5V, V_{Ib1}= 0V, V_{Ib2}= 0V
 Set the supply current of constant current source to I_P=120mA and load resistance to R_L=10Ω



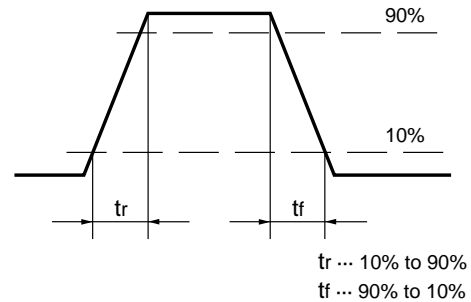
- * 1 The current value to be supplied from the 5V power supply is a total sum of this value plus the pulse output current and bias output current.
- * 2 Waveform of input and output signals

Input signal

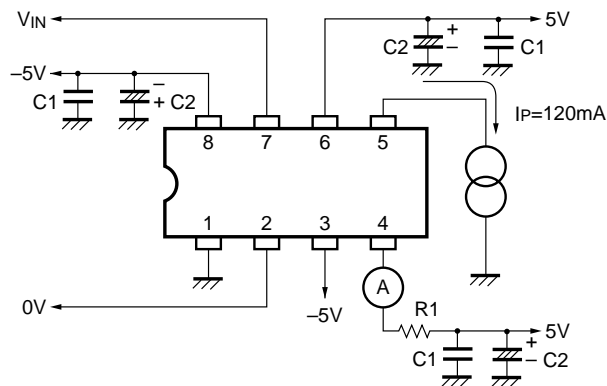


* The rise/fall time of the input signal is 2ns (10 to 90%)

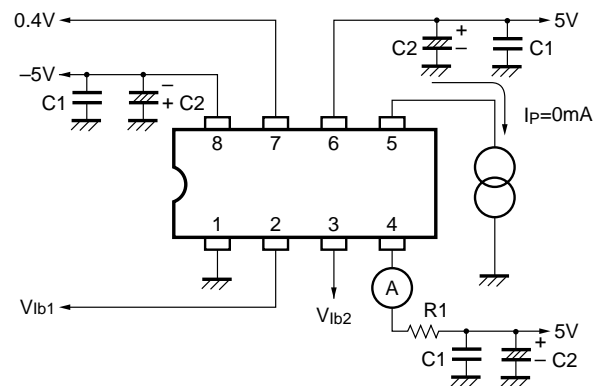
Output waveform



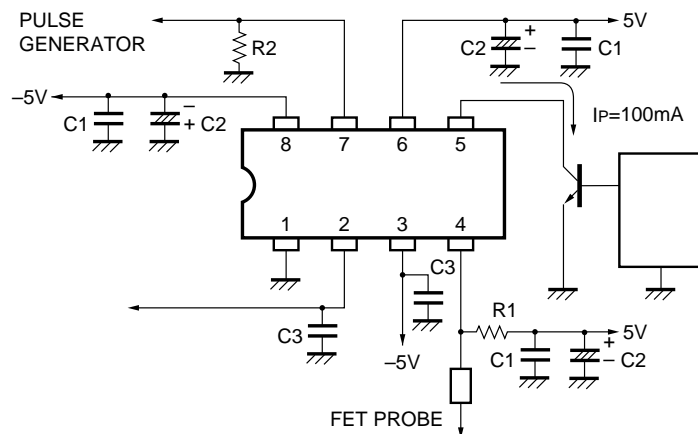
Test circuit 1



Test circuit 2

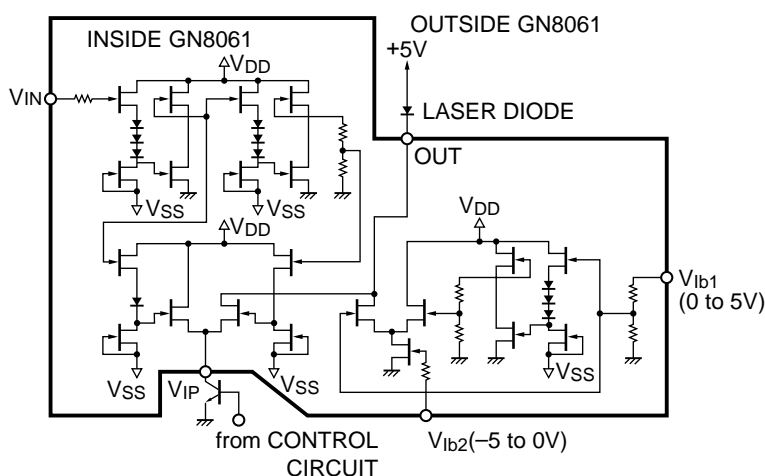


Test circuit 3



C_1 : 0.1μF
 C_2 : 3.3μF
 C_3 : 2200pF
 R_1 : 10Ω
 R_2 : 50Ω

■ Block Diagram



■ Caution for Handling

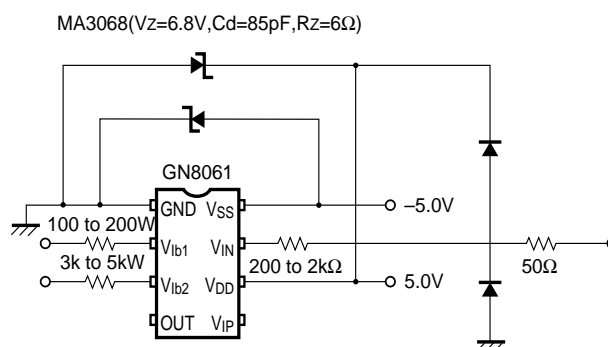
- 1) The recommended V_{IN} voltage is 2.5 to 3V for [H] and 0 to 0.4V for [L].
- 2) Do not apply V_{IN} while the power supply is OFF.
- 3) For the current source to be connected to the V_{IP} pin, use a Si bipolar transistor as shown in the circuit diagram.

(Example: 2SD874)

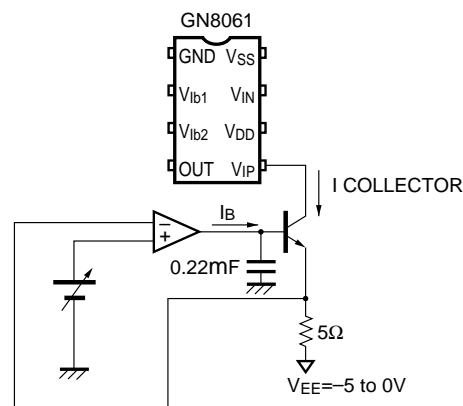
To connect a resistor to the emitter or collector, use a resistor of a few ohm. The use of higher resistor may cause large change in the voltage at the V_{IP} pin, and may make the output waveform distortion. (See the pulse output current control example).

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

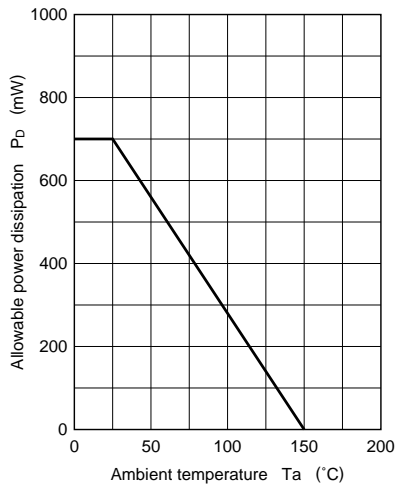
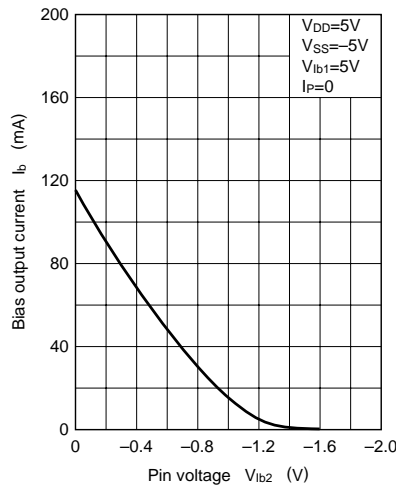
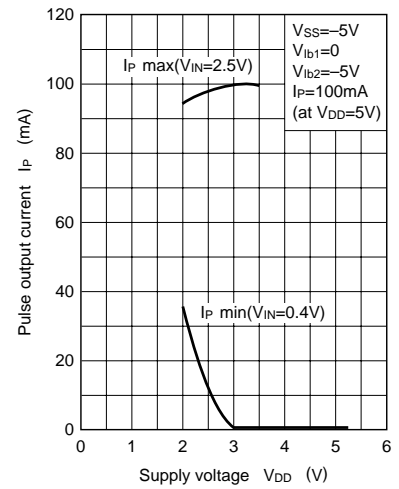
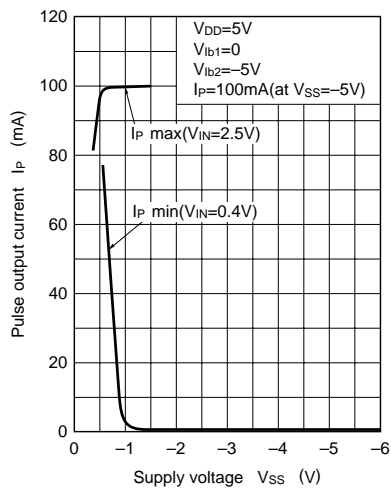
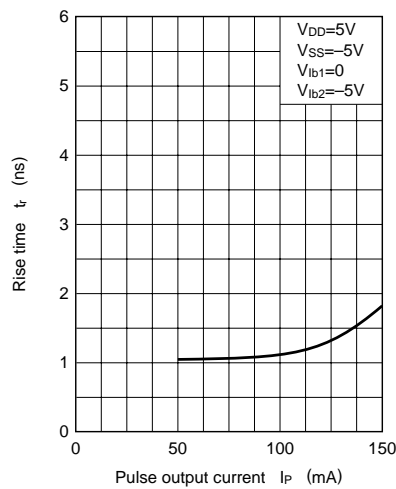
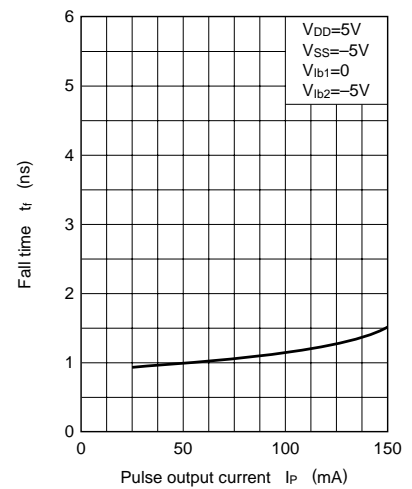
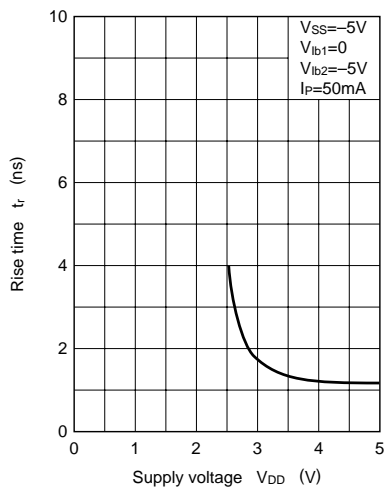
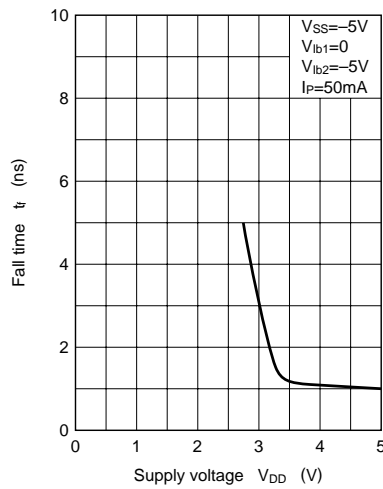
- 4) When mounting, minimize the connection distance between the semiconductor laser and IC, and use the chip parts (C, R) of less parasitic effects.
- 5) Attention to damage by the power surge (see the example connection of the pin protection circuit). During handling, take care to ground the human body and solder iron tip.
- 6) The current value of the current source connected to the V_{IP} pin should be zero to protect the semiconductor laser when the power supply is turned ON and OFF. When the power supply is ON, make V_{SS} to rise earlier than V_{DD} . When the power supply is OFF, make V_{DD} to fall earlier than V_{SS} . When $V_{DD} = 5V$, $V_{SS} = 0$ even transitional, the current of about 30mA flows through the semiconductor laser.
- 7) Pay attention to release the heat.



Connection example of pin protection circuit



Example of pulse output current control circuit

$P_D - T_a$  $I_b - V_{Ib2}$  $I_P - V_{DD}$  $I_P - V_{SS}$  $t_r - I_P$  $t_f - I_P$  $t_r - V_{DD}$  $t_f - V_{DD}$  $t_r - V_{SS}$ 