

# Driver IC

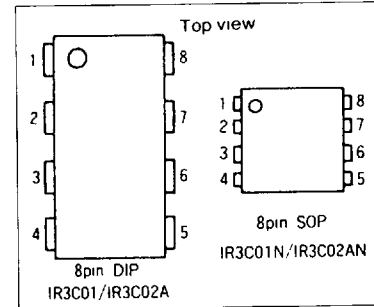
## Laser Diodes Driver IC

Sharp manufactures a series of driver ICs (IR3C01/R3C01/R3C01N, IR3C02A/IR2C02AN) for use as laser diode APC circuits. Using these ICs, the power output of the laser is easily adjusted by means of an external resistance. Specifications are as follows:

### IR3C01/IR3C01N, IR3C02A/IR3C02AN

#### Pin Assignment

Pin No.	IR3C01/IR3C01N		IR3C02A/IR3C02AN	
	symbol	Function	Symbol	Function
1	OUT	Out	OUT	Output
2	I <sub>M</sub>	Monitor input	GND	Ground
3	V <sub>AJ</sub>	Output Setting	I <sub>M</sub>	Monitor Input
4	V <sub>EE</sub>	(-) Power Supply	V <sub>EE</sub>	(-)Power Supply
5	V <sub>IN</sub>	Control Input (on/off)	V <sub>IN</sub>	Control Input (on/off)
6	GND	Ground	S <sub>O</sub>	Operating signal output
7	C <sub>p</sub>	Phase Compensation	C <sub>p</sub>	Phase Compensation
8	V <sub>CC</sub>	(+) Power Supply	V <sub>CC</sub>	(+) Power Supply



#### Absolute Maximum Ratings

(Ta=25°C)

Parameter	Symbol	Remarks	Ratings		Units
			IR3C01/IR3C01N	IR3C02A/IR3C02AN	
Supply Voltage	V <sub>CC</sub>		13	10	V
Supply Voltage	V <sub>EE</sub>		-20	-10	V
Output Current	I <sub>O</sub>	Pin ①	170	-170	mA
Control Input Voltage	V <sub>IN</sub>	Pin ⑤	-0.2 to 6	-0.2 to V <sub>CC</sub>	V
Power Dissipation	P <sub>C</sub>	Ta ≤ 25°C	450/330	550/500	mW
Derating ratio	—	Ta > 25°C	4.6/3.3	4.4	mW/°C
Operating Temperature	T <sub>opr</sub>		-20 to +85	-30 to +85	°C
Storage Temperature	T <sub>stg</sub>		-55 to +150	-55 to +150	°C
Output Current	I <sub>OS</sub>	Pin ⑥ with laser on	—	5	mA
Output Applied Voltage	V <sub>OS</sub>	Pin ⑥ with laser off	—	-0.2 - V <sub>CC</sub>	V

#### Electrical Characteristics

##### (a) IR3C01/IR3C01N

(V<sub>CC</sub>=-5V, V<sub>EE</sub>=-12V, Ta=25°C)

Parameter	Symbol	Condition	Rating			Units
			MIN	TYP	MAX	
Operating Supply Voltage	V <sub>CC</sub>	—	4.5	5.0	5.5	V
	V <sub>EE</sub>	—	-10.0	-12.0	-13.2	
Circuit Current	I <sub>CC</sub>	V <sub>IN</sub> =0V	—	2.8	4.5	mA
	I <sub>EE OFF</sub>	V <sub>IN</sub> =0V	—	-1.3	-2.1	
	I <sub>EE ON</sub>	V <sub>IN</sub> =5V	—	-2.8	-4.6	
Output Voltage	V <sub>OUT</sub>	I <sub>O</sub> =150mA	3.6	4.1	—	V
		I <sub>O</sub> =100mA	3.7	4.2	—	
		I <sub>O</sub> =20mA	3.8	4.3	—	
Control Input Voltage (H)	V <sub>INH</sub>	—	2.0	—	6	V
Control Input Voltage (L)	V <sub>INL</sub>	—	0	—	0.8	V
Control Input Current	I <sub>IN</sub>	V <sub>IN</sub> =5V	—	0.3	0.5	mA
Monitor Input pin Voltage	V <sub>M</sub>	—	—	-6.9	—	V
Output Adjustment Pin Voltage	V <sub>AJ</sub>	(V <sub>AJ</sub> -V <sub>EE</sub> )	3.5	3.9	4.3	V
Power Supply Ripple Reduction	ΔI <sub>O</sub> /ΔV <sub>CC</sub>	f=120Hz	—	4×10 <sup>-5</sup>	—	A/V
	ΔI <sub>O</sub> /ΔV <sub>EE</sub>	—	—	1×10 <sup>-6</sup>	—	

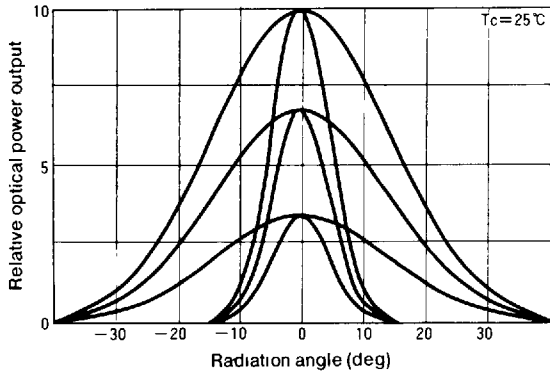
##### (b) IR3C02A/IR3C02AN

(V<sub>CC</sub>=5V, V<sub>EE</sub>=-5V, Ta=25°C)

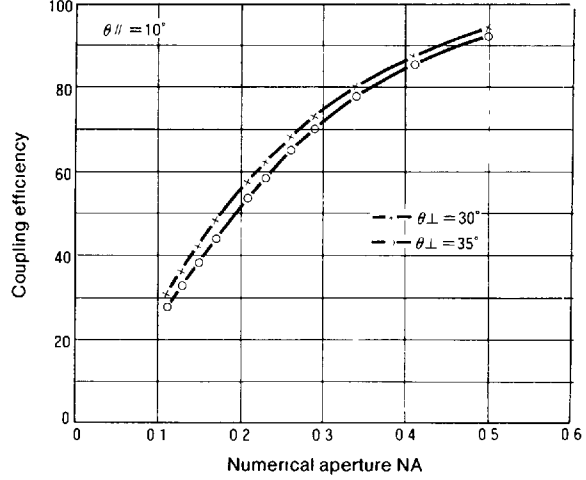
Parameter	Symbol	Condition	Rating			Units
			MIN	TYP	MAX	
Operating Supply Voltage	V <sub>CC</sub>	—	4.5	5.0	5.5	V
	V <sub>EE</sub>	—	-4.5	-5.0	-5.5	
Circuit Current	I <sub>CC ON</sub>	V <sub>IN</sub> =5V	—	2.8	5.0	mA
	I <sub>EE ON</sub>		—	-2.0	-5.0	
	I <sub>CC OFF</sub>	V <sub>IN</sub> =0V	—	4.1	7.5	
	I <sub>EE OFF</sub>		—	-2.1	-3.8	
Output Voltage	V <sub>OUT</sub>	I <sub>O</sub> =-150mA	3.7	4.1	—	V
		I <sub>O</sub> =-100mA	3.8	4.2	—	
		I <sub>O</sub> =-20mA	3.9	4.3	—	
Output Voltage	V <sub>OS1</sub>	I <sub>OS</sub> =0mA, V <sub>IN</sub> =0V	—	0.05	—	V
	V <sub>OS2</sub>	I <sub>OS</sub> =2mA	—	—	0.4	
Control	H	V <sub>IN</sub> H, V <sub>O</sub> V <sub>OS</sub> L→H	1.43	1.53	1.63	V
Input	L	V <sub>IN</sub> L, V <sub>O</sub> V <sub>OS</sub> H→L	1.23	1.33	1.43	V
Voltage	Hysteresis	V <sub>IN</sub> HY (V <sub>INH</sub> -V <sub>INL</sub> )	—	200	—	mW
Control Input Current	I <sub>IN</sub>	—	—	-0.3	—	μA
Monitor Input Pin Voltage	V	—	1.16	1.22	1.28	V
Monitor Input Pin Current	I	—	—	-0.3	-5	μA
Photo output power supply change	ΔI <sub>P</sub> /ΔV <sub>CC</sub>	V <sub>EE</sub> =-5V, V <sub>CC</sub> =5V±10%	—	0.02	—	% / V
	ΔI <sub>P</sub> /ΔV <sub>EE</sub>	V <sub>CC</sub> =-5V, V <sub>EE</sub> =-5V±10%	—	0.2	—	
Photo output changing width	ΔI <sub>P</sub> /I <sub>PO</sub>	Ta = -30 to +85°C	—	0.2	—	%

# Common Data

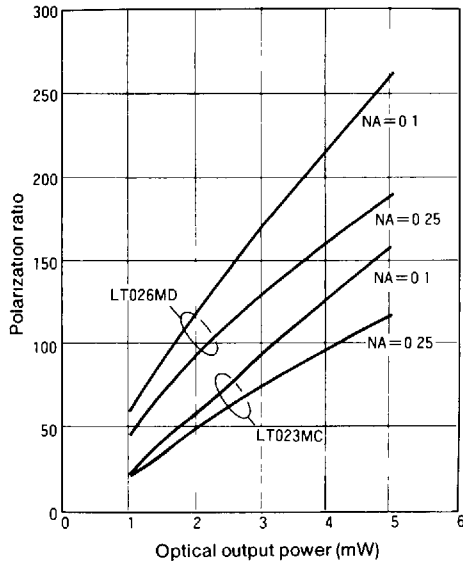
**Fig. 94-1 Optical Power Output Dependence of Far-Field Pattern**



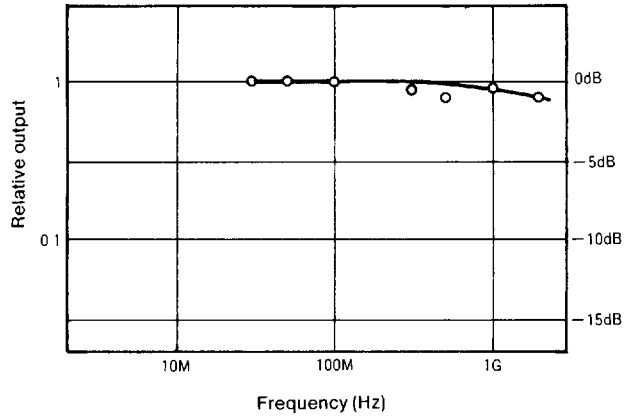
**Fig. 94-4 Coupling Efficiency**



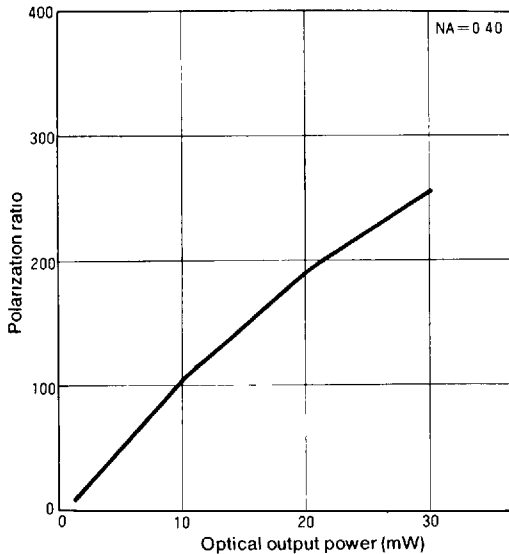
**Fig. 94-2 Polarization Ratio vs. Optical Power Output (LT026 series, LT023 series)**



**Fig. 94-5 Frequency Response**



**Fig. 94-3 Polarization Ratio vs. Optical Power Output (LT024 series, LT015 series)**



Note All data on this page is typical only, and is not intended as a specification. The shapes of these curves can be used as a general reference, but the actual characteristics will vary from device to device.

# Built-in PIN Photodiode Characteristics

Fig. 95-1 Photodiode Frequency Response Characteristic

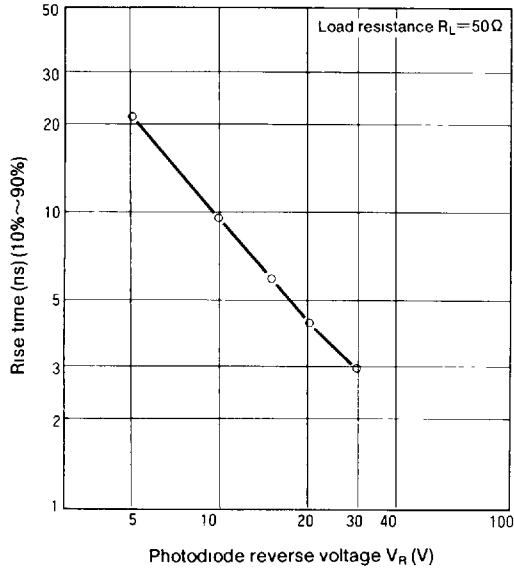
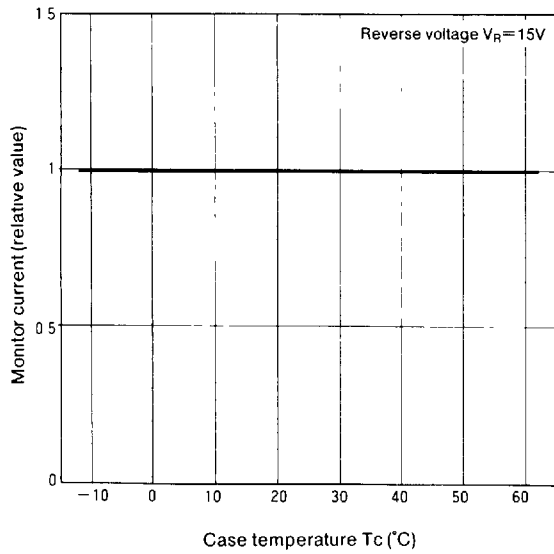


Fig. 95-2 Photodiode Temperature Characteristic



Note: All data on this page is typical only, and is not intended as a specification. The shapes of these curves can be used as a general reference, but the actual characteristics will vary from device to device.

# Outline Dimensions

Unit: mm

Fig. 98-1 Standard Type (C Type)

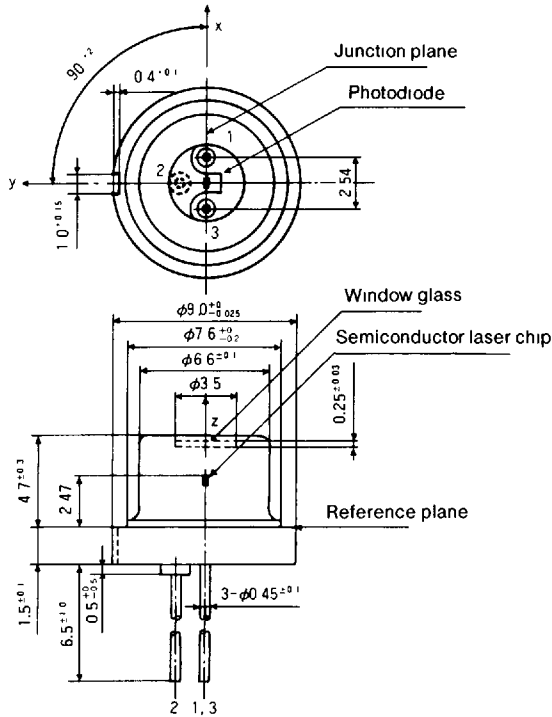


Fig. 98-2 Low-Cap Type (D Type)

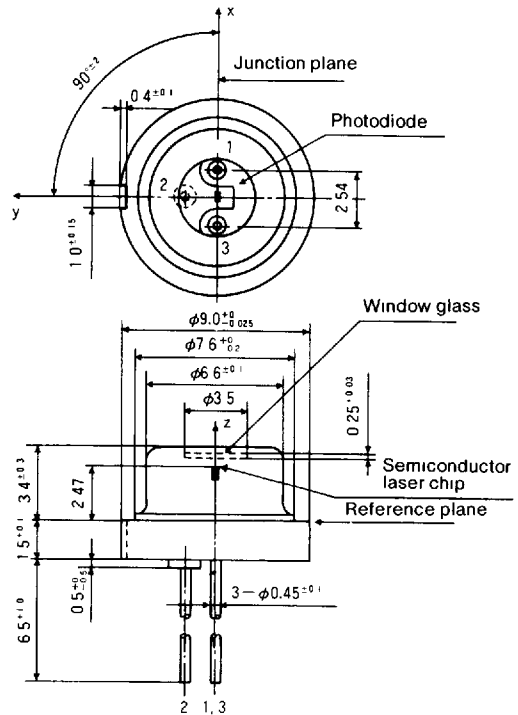


Fig. 98-3 Fin-Equipped Type (F Type)

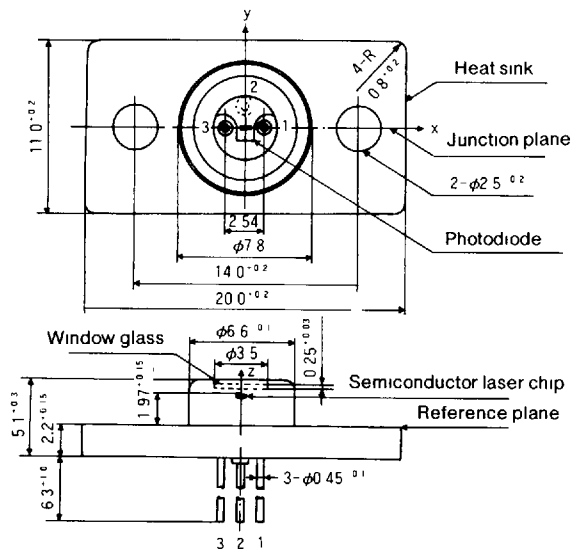
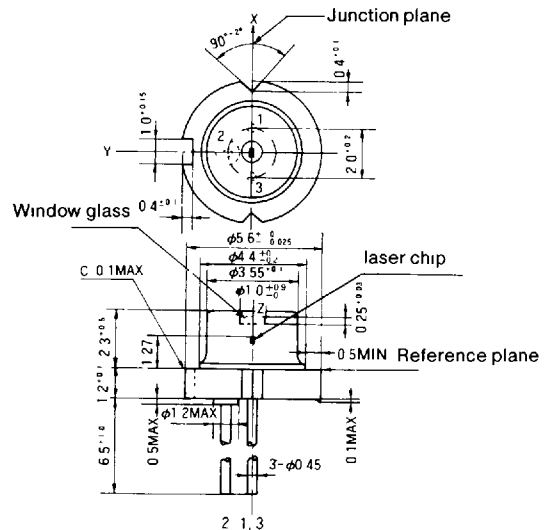


Fig. 98-4 Compact Package Type (S Type)



Terminal connections

