



## Electro-optical Characteristics

(Unless otherwise specified, Ta = 0 to 70°C)

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit			
Input	Forward voltage	V <sub>F</sub>	Ta = 25°C, I <sub>F</sub> = 10mA	-	1.6	1.9	V			
	Reverse current	I <sub>R</sub>	Ta = 25°C, V <sub>R</sub> = 5V	-	-	10	μA			
	Terminal capacitance	C <sub>t</sub>	Ta = 25°C, V = 0, f = 1MHz	-	60	150	pF			
Output	High level output current	I <sub>OH</sub>	V <sub>CC</sub> = V <sub>O</sub> = 5.5V, V <sub>E</sub> = 2.0V, I <sub>F</sub> = 250 μA	-	2	250	μA			
	Low level output voltage	V <sub>OL</sub>	V <sub>CC</sub> = 5.5V, V <sub>E</sub> = 2.0V, I <sub>F</sub> = 5mA, I <sub>OL</sub> = 13mA	-	0.4	0.6	V			
	High level enable current	I <sub>EH</sub>	V <sub>CC</sub> = 5.5V, V <sub>E</sub> = 2.0V	-	- 0.8	- 1.8	mA			
	Low level enable current	I <sub>EL</sub>	V <sub>CC</sub> = 5.5V, V <sub>E</sub> = 0.5V	-	- 1.2	- 2.0	mA			
	High level supply current	I <sub>CCH</sub>	V <sub>CC</sub> = 5.5V, I <sub>F</sub> = 0, V <sub>E</sub> = 0.5V	-	7	15	mA			
	Low level supply current	I <sub>CCL</sub>	V <sub>CC</sub> = 5.5V, I <sub>F</sub> = 10mA, V <sub>E</sub> = 0.5V	-	13	18	mA			
	Transfer characteristics	“High→Low” threshold input current	I <sub>FHL</sub>	V <sub>CC</sub> = 5V, V <sub>E</sub> = 2.0V V <sub>O</sub> = 0.8V, R <sub>L</sub> = 350Ω	-	2.5	5	mA		
Isolation resistance		R <sub>iso</sub>	Ta = 25°C, DC500V, 40 to 60% RH	5 x 10 <sup>10</sup>	10 <sup>10</sup>	-	Ω			
Floating capacitance		C <sub>f</sub>	Ta = 25°C, V = 0, f = 1MHz	-	0.6	5	pF			
Response time		“High→Low” propagation delay time	t <sub>PHL</sub>	Ta = 25°C, V <sub>CC</sub> = 5V R <sub>L</sub> = 350Ω, C <sub>L</sub> = 15pF I <sub>F</sub> = 7.5mA	Fig. 1	-	50	120	ns	
		“Low→High” propagation delay time	t <sub>PLH</sub>			-	50	120	ns	
		Rise time, Fall time	t <sub>r</sub> , t <sub>f</sub>			-	30	60	ns	
		“High→Low” enable propagation delay time	t <sub>EH</sub>	Ta = 25°C, V <sub>CC</sub> = 5V R <sub>L</sub> = 350Ω, C <sub>L</sub> = 15pF I <sub>F</sub> = 7.5mA, V <sub>EH</sub> = 3V V <sub>EL</sub> = 0.5V		Fig. 2	-	15	50	ns
		“Low→High” enable propagation delay time	t <sub>ELH</sub>				-	65	100	ns
CMR		Instantaneous common mode rejection voltage “Output: High level”	CM <sub>H</sub>	Ta = 25°C, V <sub>CC</sub> = 5V, V <sub>CM</sub> = 10V <sub>(peak)</sub> R <sub>L</sub> = 350Ω, I <sub>F</sub> = 0, V <sub>O(MIN)</sub> = 2V	Fig. 3	100	500	-	V/μs	
		Instantaneous common mode rejection voltage “Output: Low level”	CM <sub>L</sub>	Ta = 25°C, V <sub>CC</sub> = 5V, V <sub>CM</sub> = 10V <sub>(peak)</sub> R <sub>L</sub> = 350Ω, I <sub>F</sub> = 5mA, V <sub>O(MAX)</sub> = 0.8V		Fig. 3	- 100	- 500	-	V/μs

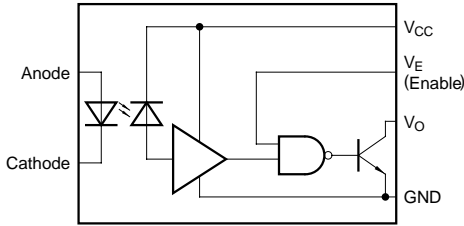
All typical values : at Ta = 25°C, V<sub>CC</sub> = 5V

## Recommended Operating Conditions

Parameter	Symbol	MIN.	MAX.	Unit
Low level input current	I <sub>FL</sub>	0	250	μA
High level input current	I <sub>FH</sub>	7	15	mA
High level enable voltage	V <sub>EH</sub>	2.0	V <sub>CC</sub>	V
Low level enable voltage	V <sub>EL</sub>	0	0.8	V
Supply voltage	V <sub>CC</sub>	4.5	5.5	V
Fanout (TTL load)	N	-	8	-
Operating temperature	T <sub>opr</sub>	0	70	°C

- When the enable input is in high level state, external pull-up resistor is unnecessary.
- Connect a by-pass ceramic capacitor (0.01 to 0.1μF) between V<sub>CC</sub> and GND at the position within 1cm from pin.

Circuit Block Diagram



Truth Table

Input	Enable	Output
H	H	L
L	H	H
H	L	H
L	L	H

L : Logic (0)  
H : Logic (1)

Fig. 1 Test Circuit for  $t_{PHL}$ ,  $t_{PLH}$ ,  $t_r$  and  $t_f$

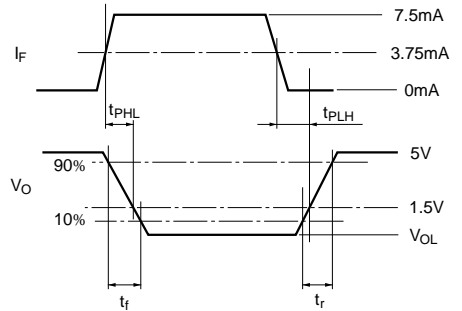
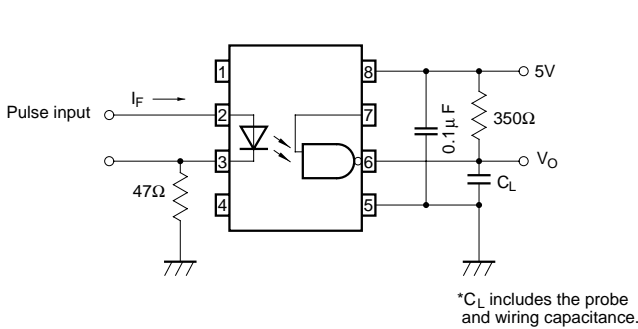


Fig. 2 Test Circuit for  $t_{EHL}$  and  $t_{ELH}$

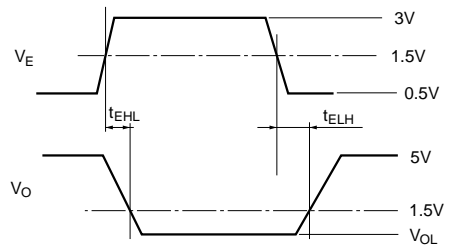
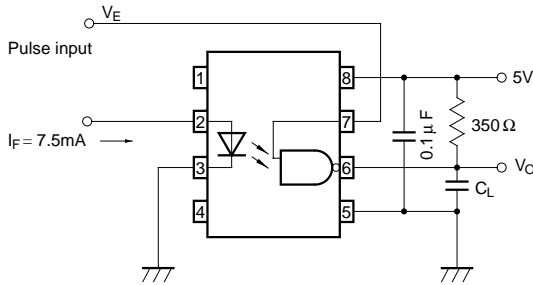
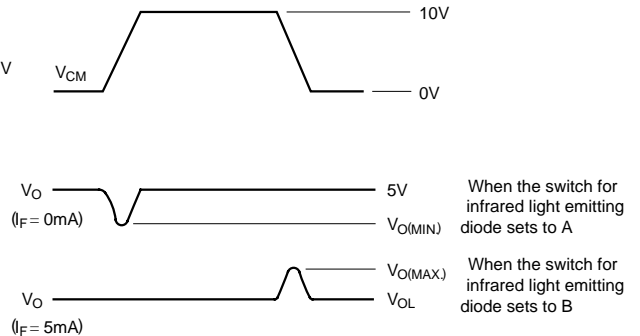
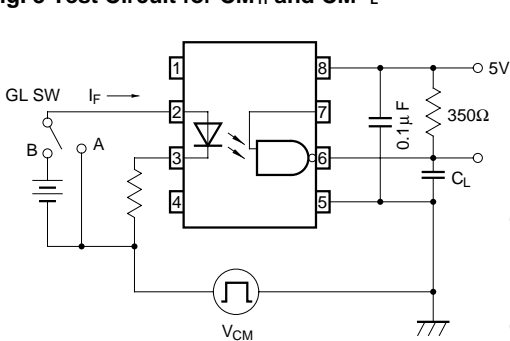
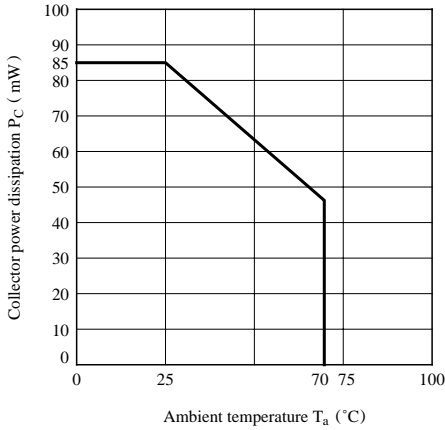


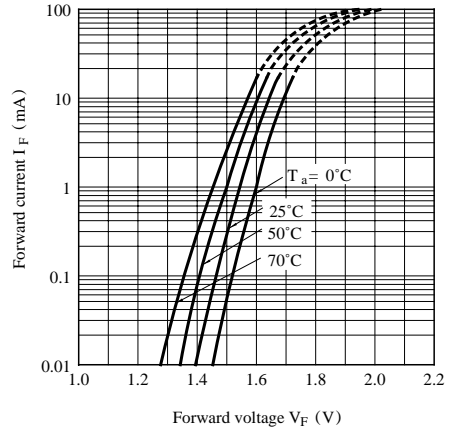
Fig. 3 Test Circuit for  $CM_H$  and  $CM_L$



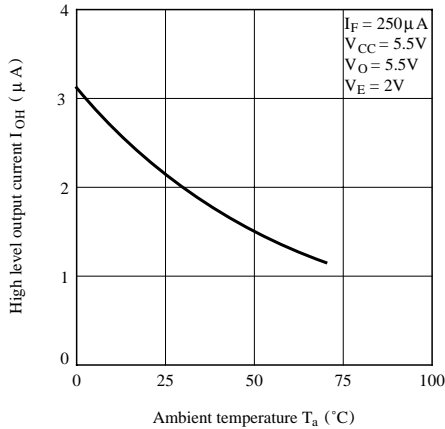
**Fig. 4 Collector Power Dissipation vs. Ambient Temperature**



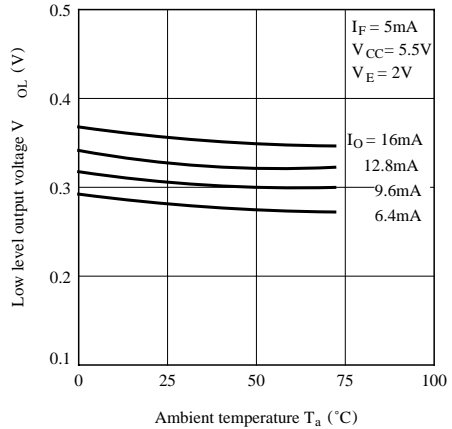
**Fig. 5 Forward Current vs. Forward Voltage**



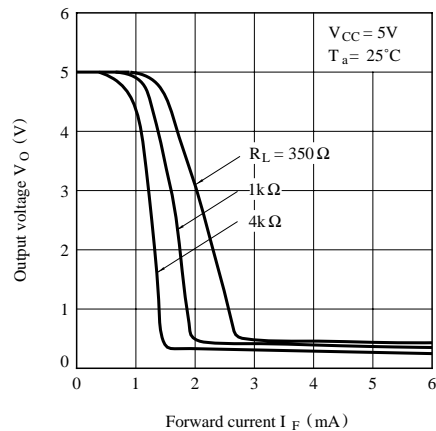
**Fig. 6 High Level Output Current vs. Ambient Temperature**



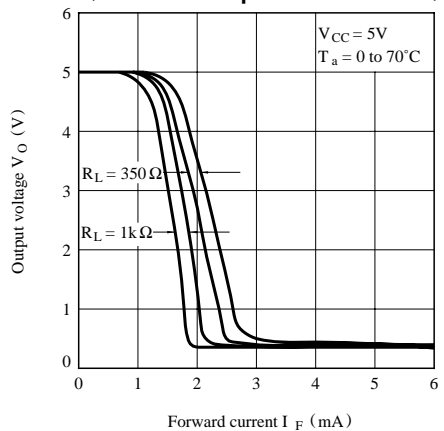
**Fig. 7 Low Level Output Voltage vs. Ambient Temperature**



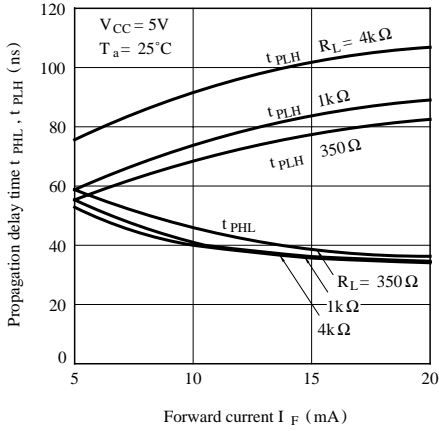
**Fig. 8-a Output Voltage vs. Forward Current**



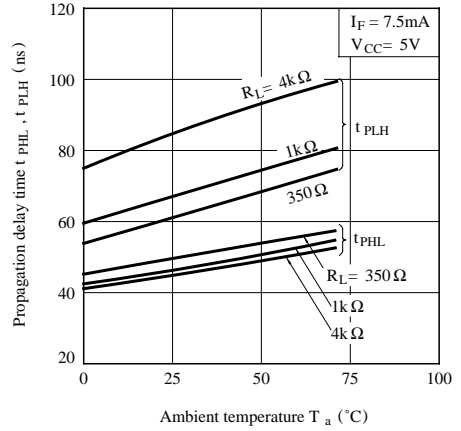
**Fig. 8-b Output Voltage vs. Forward Current (Ambient Temp. Characteristics)**



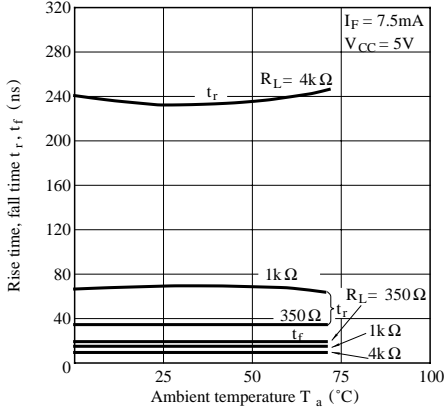
**Fig. 9 Propagation Delay Time vs. Forward Current**



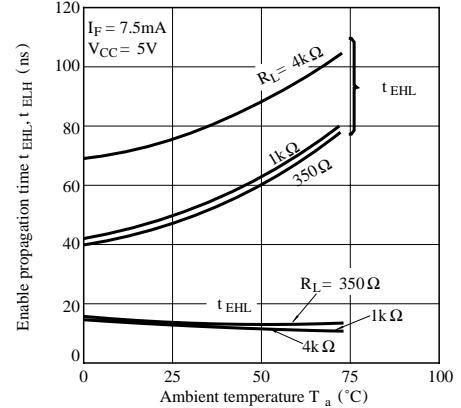
**Fig.10 Propagation Delay Time vs. Ambient Temperature**



**Fig.11 Rise Time, Fall Time vs. Ambient Temperature**



**Fig.12 Enable Propagation Time vs. Ambient Temperature**



**■ Precautions for Use**

- (1) Handle this product the same as with other integrated circuits against static electricity.
- (2) As for other general cautions, refer to the chapter “Precautions for Use”