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GP1A91LR/GP1A91LC

Subminiature OPIC Photointerrupter

■ Features

1. Compact package (3.7 × 2.6 × 3.1mm)
2. Can be directly connected to C-MOS logic and microcomputer
3. Low voltage operation, low dissipation current
(Operating supply voltage : 1.4 to 7.0V
OFF-state consumption current : MAX. 0.5mA)
4. Gap width 1.2mm, slit width 0.23mm
5. General purpose

■ Applications

1. Cameras
2. CD-ROM drives

■ Absolute Maximum Ratings (Ta=25°C)

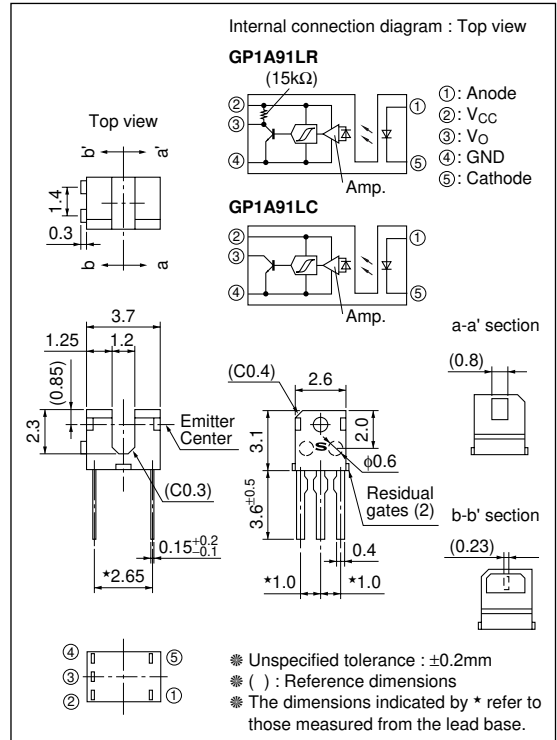
	Parameter	Symbol	Rating	Unit
Input	Forward current	I _F	50	mA
	Reverse voltage	V _R	6	V
	Power dissipation	P	75	mW
Output	Supply voltage	V _{CC}	7.0	V
	Low level Output current	I _O	2.0	mA
	Power dissipation	P _O	80	mW
	Operating temperature	T _{opr}	-25 to +85	°C
	Storage temperature	T _{stg}	-40 to +100	°C
	*1 Soldering temperature	T _{sol}	260	°C

*1 The derating factors of absolute maximum ratings due to ambient temperature are shown in Fig.3, 4, 5

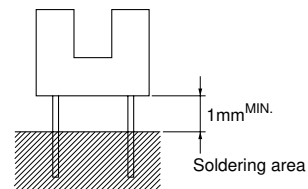
*2 For 5s or less

■ Outline Dimensions

(Unit : mm)



**"OPIC" (Optical IC) is a trademark of the SHARP Corporation. An OPIC consists of a light-detecting element and signal-processing circuit integrated onto a single chip.



■ Electro-optical Characteristics

(Ta=25°C)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit	
Input	Forward voltage	$I_f=5\text{mA}$	-	1.15	1.25	V	
	Reverse current	$V_R=3\text{V}$	-	-	10	μA	
Output	Operating supply voltage	-	1.4	-	7.0	V	
	Low level output voltage	$V_{CC}=3\text{V}, I_{OL}=1\text{mA}, I_f=5\text{mA}$	-	0.1	0.4	V	
	High level output voltage	$V_{CC}=3\text{V}, I_f=0\text{mA}$	2.9	-	-	V	
	Low level supply current	$V_{CC}=3\text{V}, I_f=5\text{mA}$	-	0.7	1.2	mA	
	High level supply current	$V_{CC}=3\text{V}, I_f=0\text{mA}$	-	0.3	0.5	mA	
Transfer characteristics	^{*3} "High→Low" threshold input current	$V_{CC}=3\text{V}$	-	1.2	3.5	mA	
	^{*4} Hysteresis	$V_{CC}=3\text{V}$	0.55	0.8	0.95	-	
	Response time	"Low→High" propagation delay time	$V_{CC}=3\text{V}$ $I_f=5\text{mA}$ $R_L=3\text{k}\Omega$ (GP1A91LR) $R_L=2.4\text{k}\Omega$ (GP1A91LC)	-	10	30	μs
		"High→Low" propagation delay time		-	3	15	
		Rise time		-	0.6	3.0	
		Fall time		-	0.2	1.0	

*3 I_{FHL} represents forward current when output goes from High to Low.

*4 Hysteresis stands for I_{FLH}/I_{FHL} .

GP1A91LC-- R_L (15k Ω) is applied to $V_{CC}-V_o$ (Condition during measuring response time : $R_L=2.4\text{k}\Omega$)

Fig.1 Test Circuit for Response Time

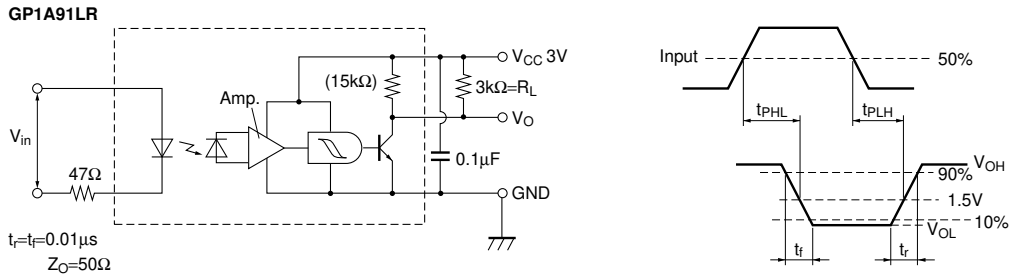


Fig.2 Test Circuit for Response Time

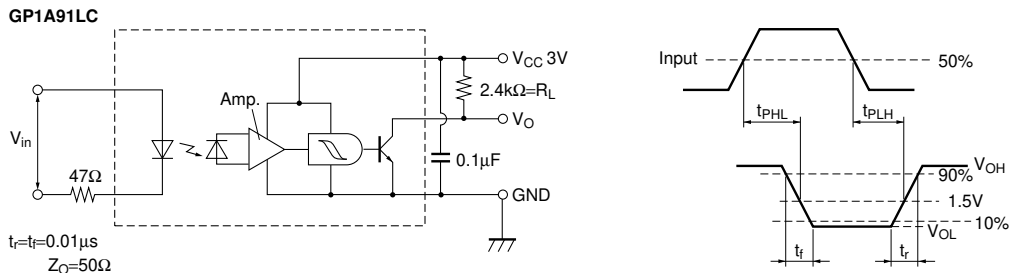


Fig.3 Forward Current vs. Ambient Temperature

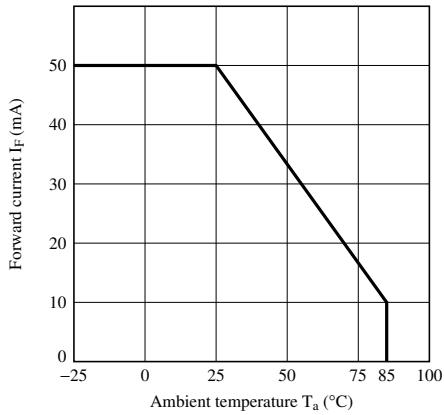


Fig.4 Output Current vs. Ambient Temperature

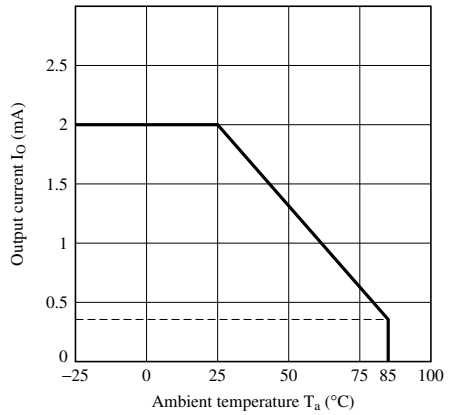


Fig.5 Output Power Dissipation vs. Ambient Temperature

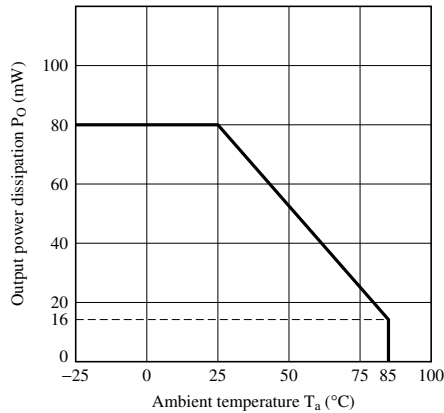


Fig.6 Forward Current vs. Forward Voltage

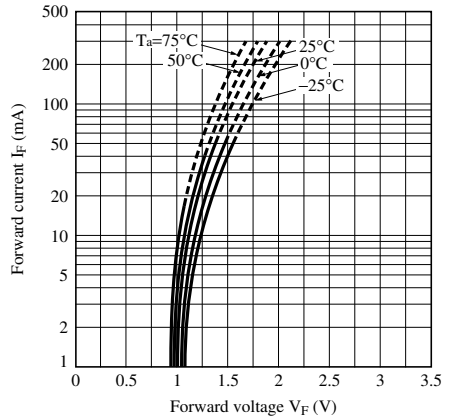


Fig.7 Relative Threshold Input Current vs. Supply Voltage

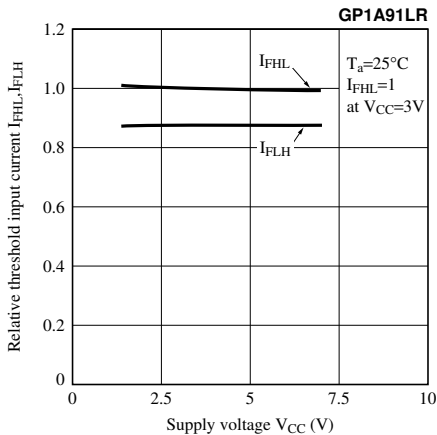


Fig.8 Relative Threshold Input Current vs. Supply Voltage

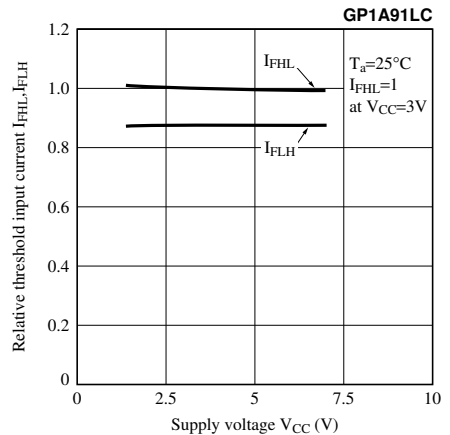


Fig.9 Relative Threshold Input Current vs. Ambient Temperature

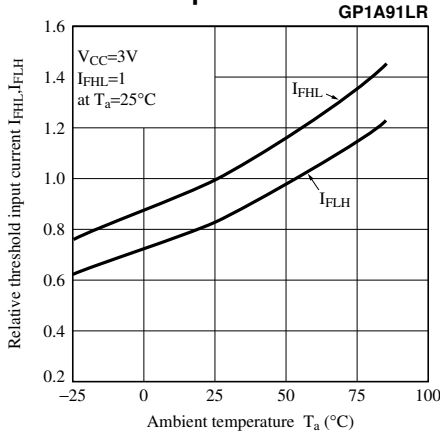


Fig.10 Relative Threshold Input Current vs. Ambient Temperature

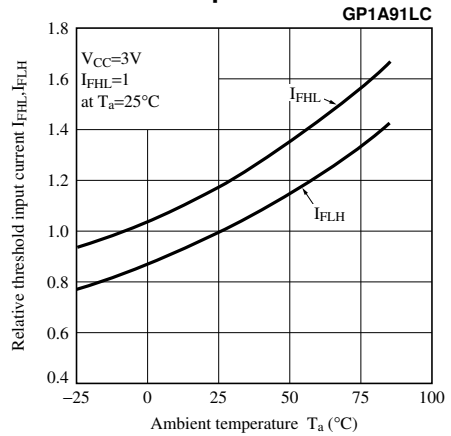


Fig.11 Low Level, High Level Supply Current vs. Supply Voltage (1)

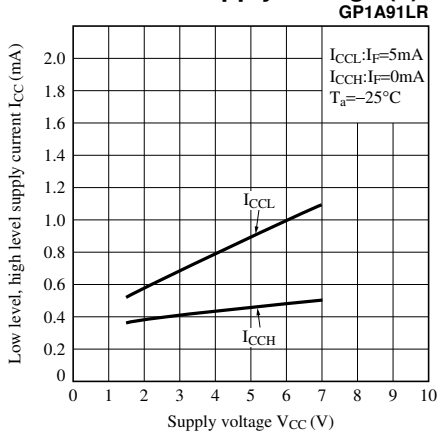


Fig.12 Low Level, High Level Supply Current vs. Supply Voltage (1)

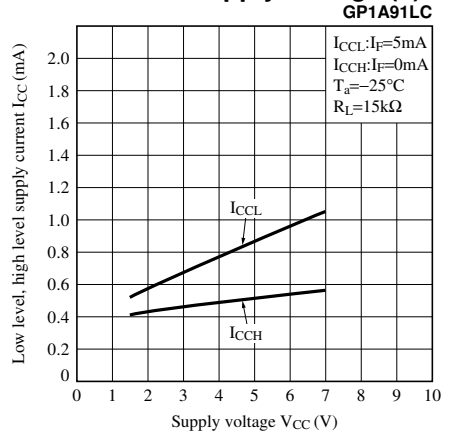


Fig.13 Low Level, High Level Supply Current vs. Supply Voltage (2)

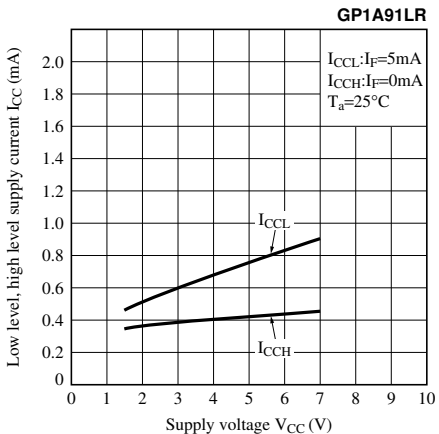


Fig.14 Low Level, High Level Supply Current vs. Supply Voltage (2)

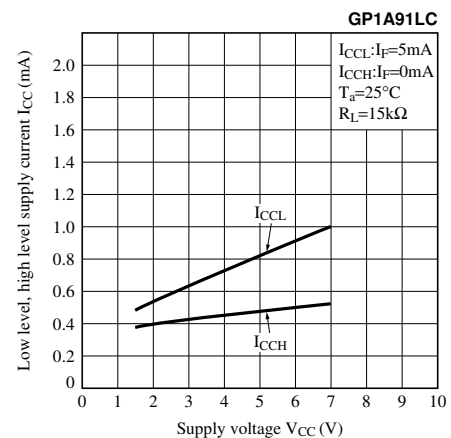


Fig.15 Low Level, High Level Supply Current vs. Supply Voltage (3)

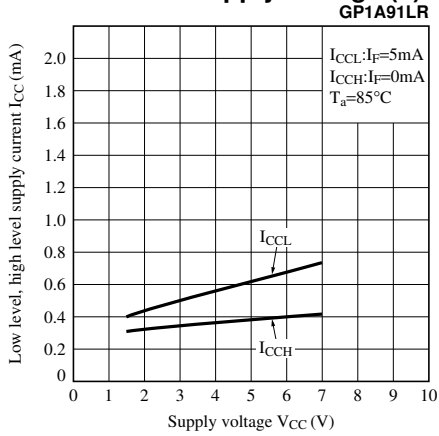


Fig.16 Low Level, High Level Supply Current vs. Supply Voltage (3)

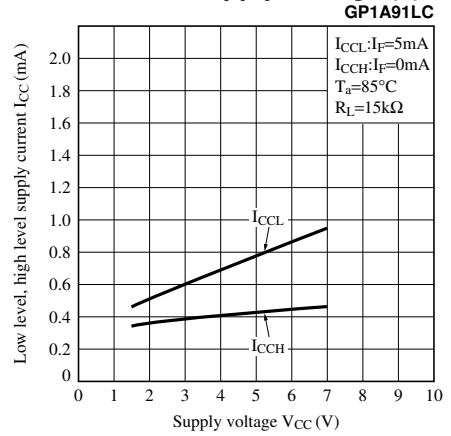


Fig.17 Low Level Output Voltage vs. Low Level Output Current

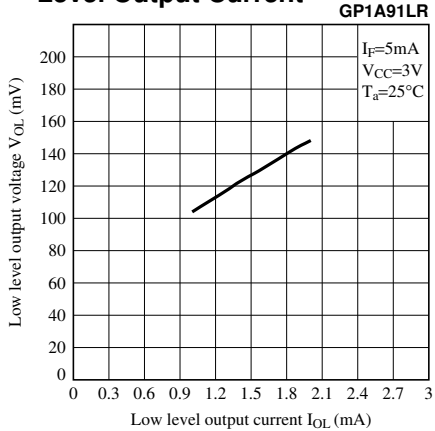


Fig.18 Low Level Output Voltage vs. Low Level Output Current

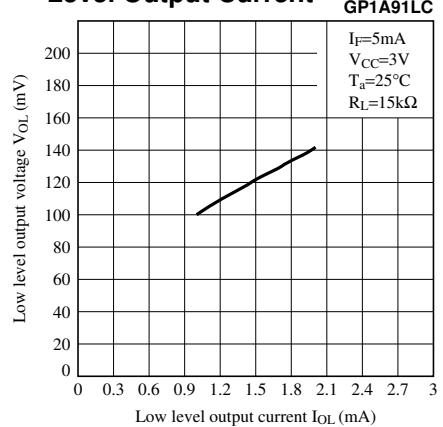


Fig.19 Low Level Output Voltage vs. Ambient Temperature

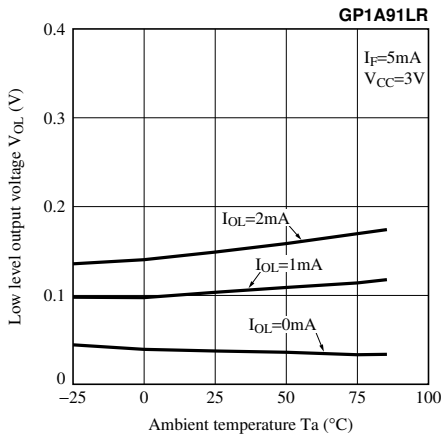


Fig.20 Low Level Output Voltage vs. Ambient Temperature

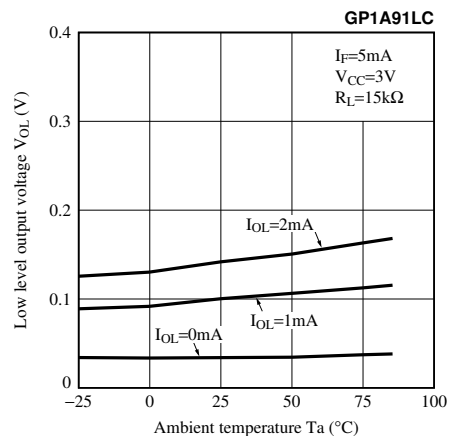


Fig.21 Rise Time, Fall Time vs. Load Resistance

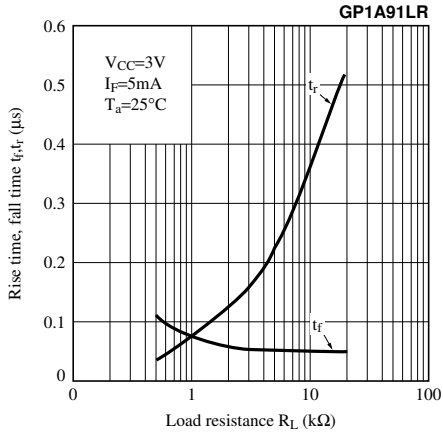


Fig.22 Rise Time, Fall Time vs. Load Resistance

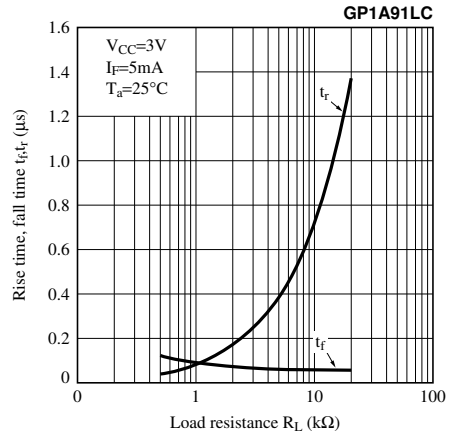


Fig.23 Propagation Delay Time vs. Forward Current

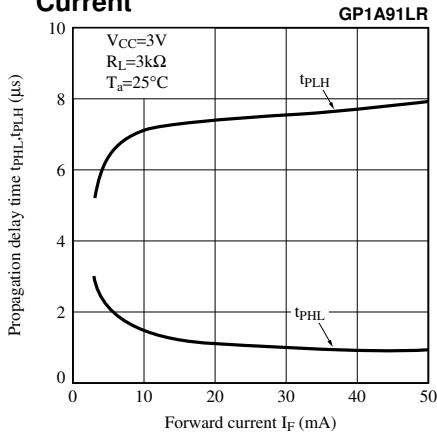


Fig.24 Propagation Delay Time vs. Forward Current

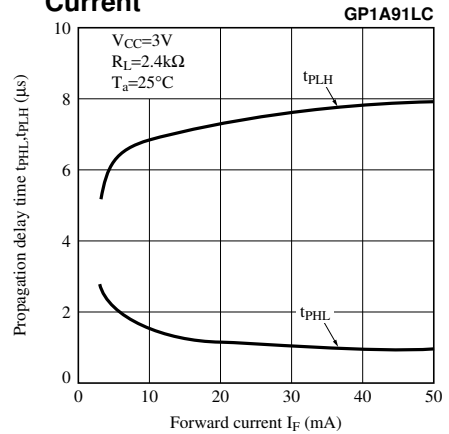


Fig.25 Low, High Level Output vs. Shield Distance (1) (Typical Value)

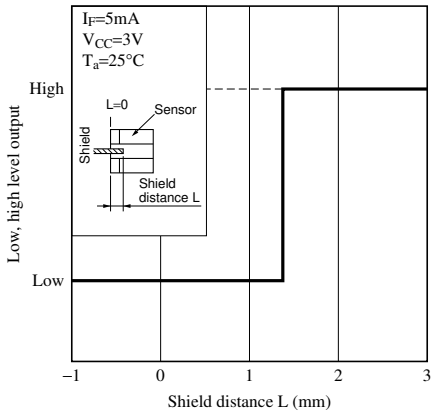
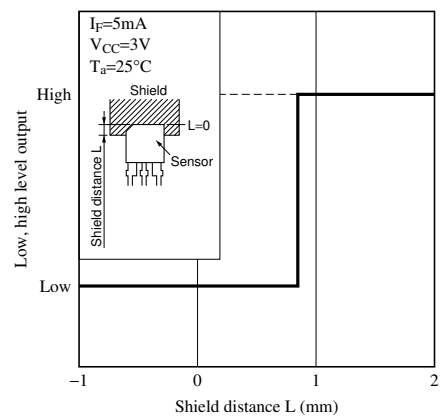


Fig.26 Low, High Level Output vs. Shield Distance (2) (Typical Value)



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