PC900V0NSZX/ PC900V0YSZX

Digital Output Type OPIC Photocoupler

■ Features

1. Normal OFF operation, open collector output
2. TTL and LSTTL compatible output
3. Operating supply voltage V_{CC}:3 to 15V
4. Isolation voltage (Viso (rms):5kV)
5. Recognized by UL, file No.E64380
   Approved by TÜV (VDE0884) (**PC900V0YSZX**)
6. 6-pin DIP package

■ Applications

1. Programmable controllers
2. PC peripherals
3. Electronic musical instruments

■ Model Line-up

Model No.	* Safty Standard Approval		Package	Packing
	UL	TÜV (VDE0884)		
PC900V0NSZX	○	−	DIP	Sleeve
PC900V0YSZX	○	○	DIP	Sleeve

* Application Model No. PC900V

■ Absolute Maximum Ratings

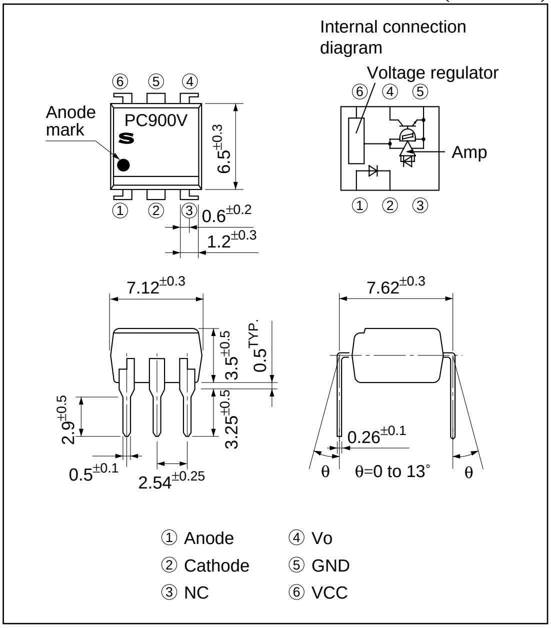
(Ta=25°C)

Parameter		Symbol	Rating	Unit
Input	Forward current	I_F	50	mA
	*1 Peak forward current	I_{FM}	1	A
	Reverse voltage	V_R	6	V
	Power dissipation	P	70	mW
Output	Supply voltage	V_{CC}	16	V
	High level output voltage	V_{OH}	16	V
	Low level output current	I_{OL}	50	mA
	Power dissipation	P_O	150	mW
Total power dissipation		P_{tot}	170	mW
*2 Isolation voltage		$V_{iso\ (rms)}$	5	kV
Operating temperature		T_{opr}	−25 to +85	°C
Storage temperature		T_{stg}	−40 to +125	°C
*3 Soldering temperature		T_{sol}	260	°C

*1 Pulse width≤100μs, Duty ratio=0.001
*2 40 to 60%RH, AC for 1 min
*3 For 10 s

■ 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=0 to 70°C unless spesified)

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Input	Forward voltage	V_F	I_F=4mA	–	1.1	1.4	V
			I_F=0.3mA	0.7	1.0	–	
	Reverse current	I_R	Ta=25˚C, V_R=3V	–	–	10	µA
	Terminal capacitance	C_t	Ta=25˚C, V=0, f=1kHz	–	30	250	pF
Output	Operating supply voltage	V_{CC}		3	–	15	V
	Low level output voltage	V_{OL}	I_{OL}=16mA, V_{CC}=5V, I_F=4mA	–	0.2	0.4	V
	High level output current	I_{OH}	V_O=V_{CC}=15V, I_F=250µA	–	–	100	µA
	Low level supply current	I_{CCL}	V_{CC}=5.5V, I_F=0	–	2.5	5.0	mA
	High level supply current	I_{CCH}	V_{CC}=5V, I_F=0	–	1.0	5.0	mA
	*4 "High→Low" threshold input current	I_{FHL}	Ta=25˚C, V_{CC}=5V, R_L=280Ω	–	1.1	2.0	mA
			V_{CC}=5V, R_L=280Ω	–	–	4.0	
	*5 "Low→High" threshold input current	I_{FLH}	Ta=25˚C, V_{CC}=5V, R_L=280Ω	0.4	0.8	–	mA
			V_{CC}=5V, R_L=280Ω	0.3	–	–	
	*6 Hysteresis	I_{FLH}/I_{FHL}	V_{CC}=5V, R_L=280Ω	0.5	0.7	0.9	−
	Isolation resistance	R_{ISO}	Ta=25˚C, DC=500V, 40 to 60%RH	5×10^{10}	10^{11}	–	Ω
Transfer characteristics	*7 Response time: "High→Low" propagation delay time	t_{PHL}	Ta=25˚C, V_{CC}=5V, I_F=4mA, R_L=280Ω	−	1	3	µs
	*7 Response time: "Low→High" propagation delay time	t_{PLH}		−	2	6	
	*7 Response time: Fall time	t_f		–	0.05	0.5	
	*7 Response time: Rise time	t_r		–	0.1	0.5	

*4 I_{FHL} represents forward current when output goes from high to low.
*5 I_{FLH} represents forward current when output goes from low to high.
*6 Hysteresis stands for I_{FLH}/I_{FHL}.
*7 Test circuit for response time is shown below.

Fig.1 Test Circuit for Response Time

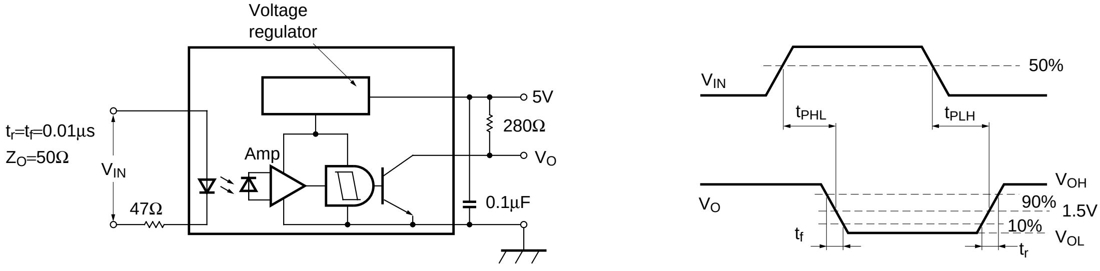


Fig.2 Forward Current vs. Ambient Temperature

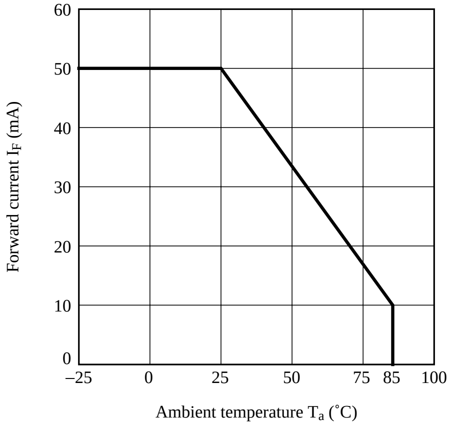


Fig.3 Power Dissipation vs. Ambient Temperature

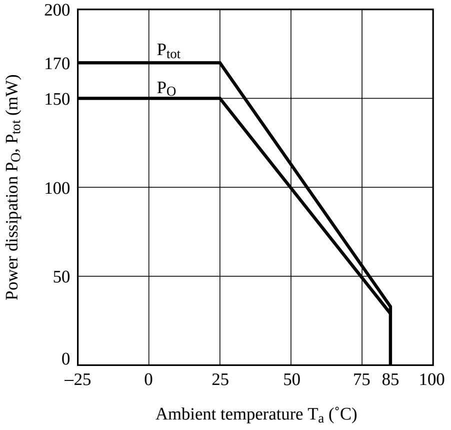


Fig.4 Forward Current vs. Forward Voltage

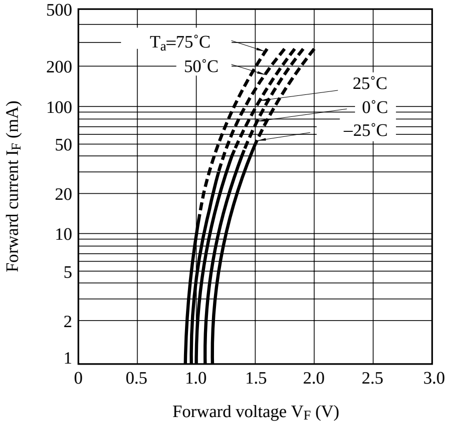


Fig.5 Relative Threshold Input Current vs. Supply Voltage

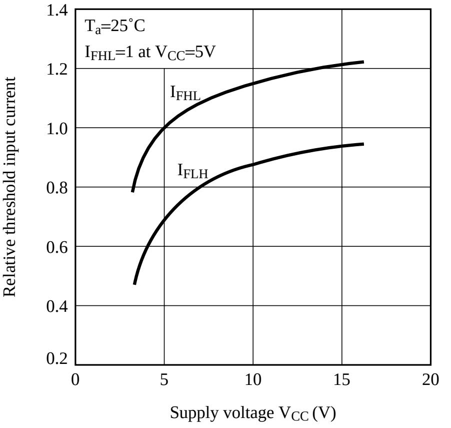


Fig.6 Relative Threshold Input Current vs. Ambient Temperature

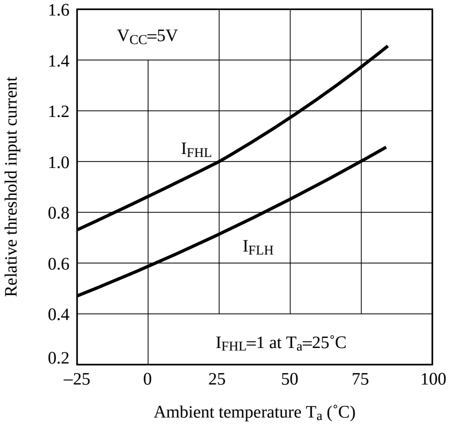


Fig.7 Low Level Output Voltage vs. Low Level Output Current

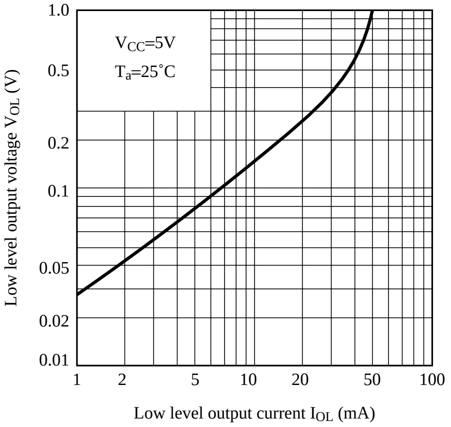


Fig.8 Low Level Output Voltage vs. Ambient Temperature

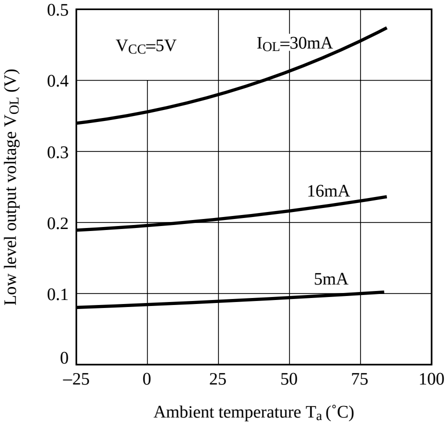


Fig.9 Supply Current vs. Supply Voltage

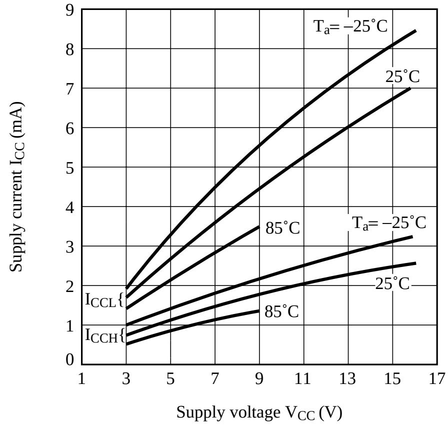


Fig.10 Propagation Delay Time vs. Forward Current

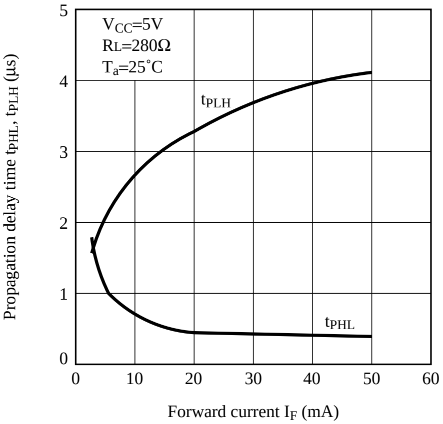
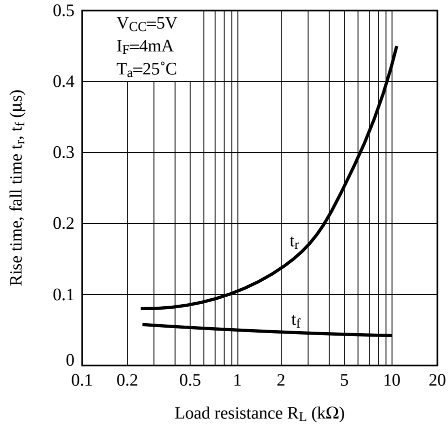


Fig.11 Rise Time, Fall Time vs. Load Resistance



■ Precautions for Use

1. It is recommended that a by-pass capacitor of more than 0.01µF is added between V_{CC} and GND near the device in order to stabilize power supply line.
2. Handle this product the same as with other integrated circuits against static electricity.

NOTICE

- The circuit application examples in this publication are provided to explain representative applications of SHARP devices and are not intended to guarantee any circuit design or license any intellectual property rights. SHARP takes no responsibility for any problems related to any intellectual property right of a third party resulting from the use of SHARP's devices.
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  (i) The devices in this publication are designed for use in general electronic equipment designs such as:
  - Personal computers
  - Office automation equipment
  - Telecommunication equipment [terminal]
  - Test and measurement equipment
  - Industrial control
  - Audio visual equipment
  - Consumer electronics

  (ii) Measures such as fail-safe function and redundant design should be taken to ensure reliability and safety when SHARP devices are used for or in connection with equipment that requires higher reliability such as:
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  - Traffic signals
  - Gas leakage sensor breakers
  - Alarm equipment
  - Various safety devices, etc.

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  - Space applications
  - Telecommunication equipment [trunk lines]
  - Nuclear power control equipment
  - Medical and other life support equipment (e.g., scuba).
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-
- Contact and consult with a SHARP representative if there are any questions about the contents of this publication.

PC900V0NIZX/ PC900V0NIPX

Digital Output Type OPIC Photocoupler

■ Features

1. Normal OFF operation, open collector output
2. TTL and LSTTL compatible output
3. Operating supply voltage V_{CC}:3 to 15V
4. Isolation voltage (Viso (rms):5kV)
5. Recognized by UL, file No.E64380
6. 6-pin DIP package (Lead forming type)

■ Applications

1. Programmable controllers
2. PC peripherals
3. Electronic musical instruments

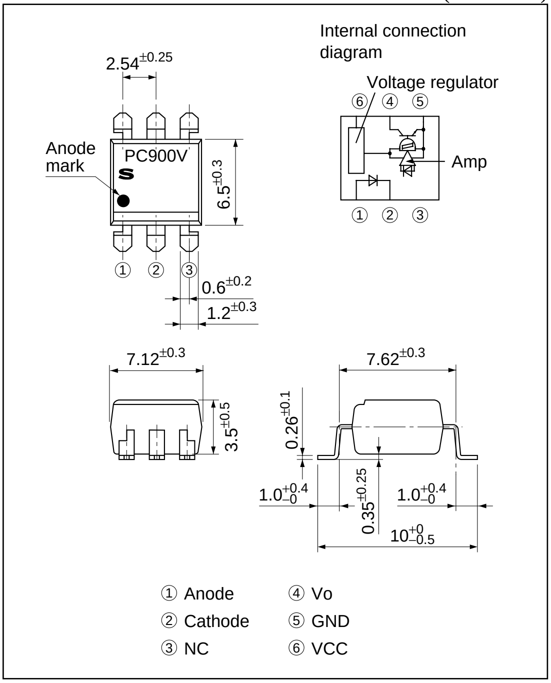
■ Model Line-up

Model No.	* Safty Standard Approval		Package	Packing
	UL	TÜV (VDE0884)		
PC900V0NIZX	○	–	Surface Mount	Sleeve
PC900V0NIPX	○	–	Surface Mount	Taping

* Application Model No. PC900V

■ Outline Dimensions

(Unit : mm)



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■ Absolute Maximum Ratings

(Ta=25°C)

Parameter		Symbol	Rating	Unit
Input	Forward current	I_F	50	mA
	*1 Peak forward current	I_{FM}	1	A
	Reverse voltage	V_R	6	V
	Power dissipation	P	70	mW
Output	Supply voltage	V_{CC}	16	V
	High level output voltage	V_{OH}	16	V
	Low level output current	I_{OL}	50	mA
	Power dissipation	P_O	150	mW
Total power dissipation		P_{tot}	170	mW
*2 Isolation voltage		$V_{iso\,(rms)}$	5	kV
Operating temperature		T_{opr}	–25 to +85	°C
Storage temperature		T_{stg}	–40 to +125	°C
*3 Soldering temperature		T_{sol}	260	°C

*1 Pulse width≤100μs, Duty ratio=0.001
*2 40 to 60%RH, AC for 1 min
*3 For 10 s

■ Electro-optical Characteristics

(Ta=0 to 70°C unless spesified)

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Input	Forward voltage	V_F	I_F=4mA	–	1.1	1.4	V
			I_F=0.3mA	0.7	1.0	–	
	Reverse current	I_R	Ta=25˚C, V_R=3V	–	–	10	μA
	Terminal capacitance	C_t	Ta=25˚C, V=0, f=1kHz	–	30	250	pF
Output	Operating supply voltage	V_{CC}		3	–	15	V
	Low level output voltage	V_{OL}	I_{OL}=16mA, V_{CC}=5V, I_F=4mA	–	0.2	0.4	V
	High level output current	I_{OH}	V_O=V_{CC}=15V, I_F=250μA	–	–	100	μA
	Low level supply current	I_{CCL}	V_{CC}=5.5V, I_F=0	–	2.5	5.0	mA
	High level supply current	I_{CCH}	V_{CC}=5V, I_F=0	–	1.0	5.0	mA
	*4 "High→Low" threshold input current	I_{FHL}	Ta=25˚C, V_{CC}=5V, R_L=280Ω	–	1.1	2.0	mA
			V_{CC}=5V, R_L=280Ω	–	–	4.0	
	*5 "Low→High" threshold input current	I_{FLH}	Ta=25˚C, V_{CC}=5V, R_L=280Ω	0.4	0.8	–	mA
			V_{CC}=5V, R_L=280Ω	0.3	–	–	
	*6 Hysteresis	I_{FLH}/I_{FHL}	V_{CC}=5V, R_L=280Ω	0.5	0.7	0.9	−
	Isolation resistance	R_{ISO}	Ta=25˚C, DC=500V, 40 to 60%RH	5×10^{10}	10^{11}	–	Ω
Transfer charac-teristics	*7 Response time: "High→Low" propagation delay time	t_{PHL}	Ta=25˚C, V_{CC}=5V, I_F=4mA, R_L=280Ω	−	1	3	μs
	*7 Response time: "Low→High" propagation delay time	t_{PLH}		−	2	6	
	*7 Response time: Fall time	t_f		–	0.05	0.5	
	*7 Response time: Rise time	t_r		–	0.1	0.5	

*4 I_{FHL} represents forward current when output goes from high to low.
*5 I_{FLH} represents forward current when output goes from low to high.
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*7 Test circuit for response time is shown below.

Fig.1 Test Circuit for Response Time

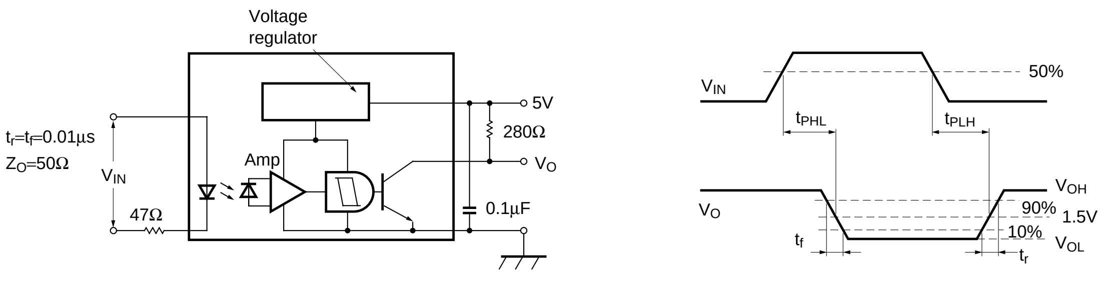


Fig.2 Forward Current vs. Ambient Temperature

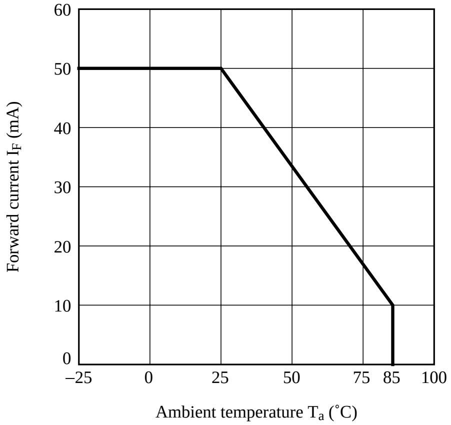


Fig.3 Power Dissipation vs. Ambient Temperature

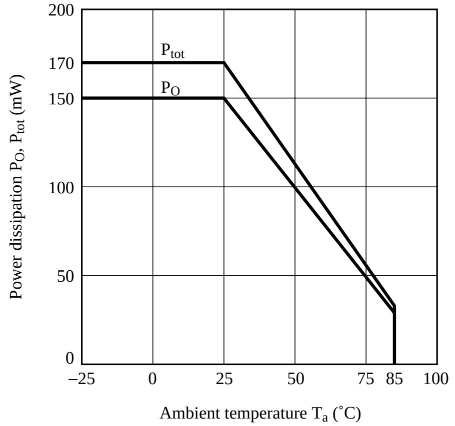


Fig.4 Forward Current vs. Forward Voltage

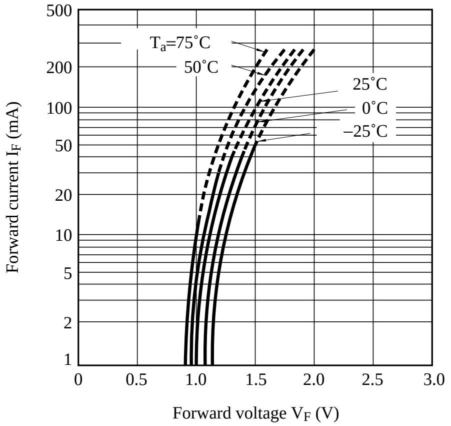


Fig.5 Relative Threshold Input Current vs. Supply Voltage

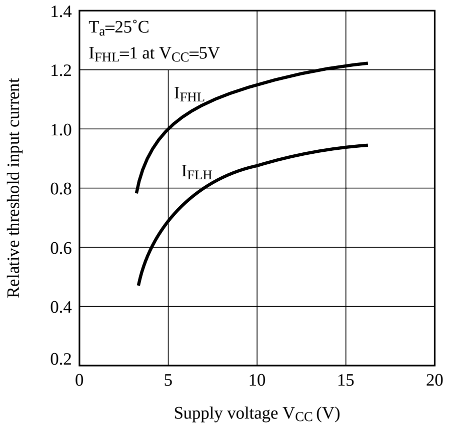


Fig.6 Relative Threshold Input Current vs. Ambient Temperature

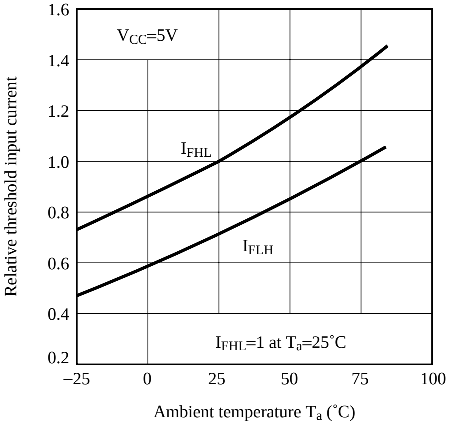


Fig.7 Low Level Output Voltage vs. Low Level Output Current

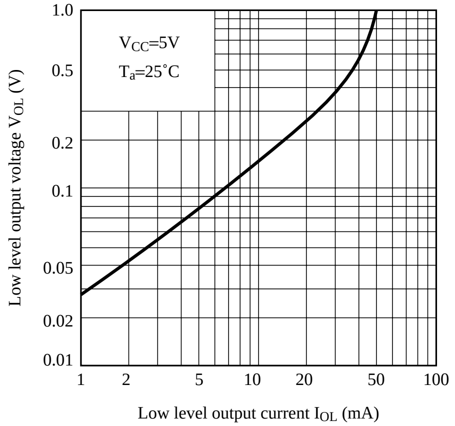


Fig.8 Low Level Output Voltage vs. Ambient Temperature

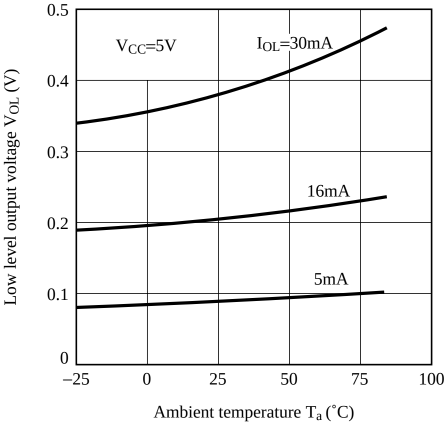


Fig.9 Supply Current vs. Supply Voltage

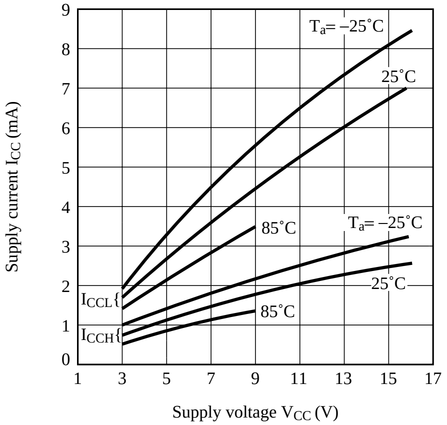


Fig.10 Propagation Delay Time vs. Forward Current

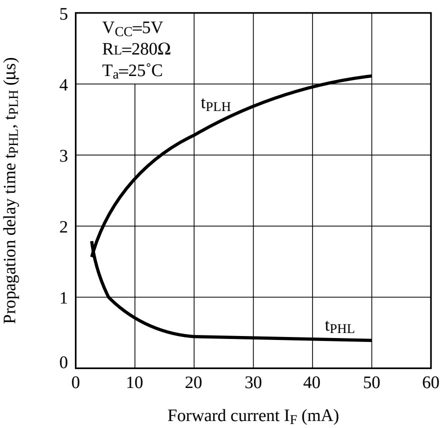
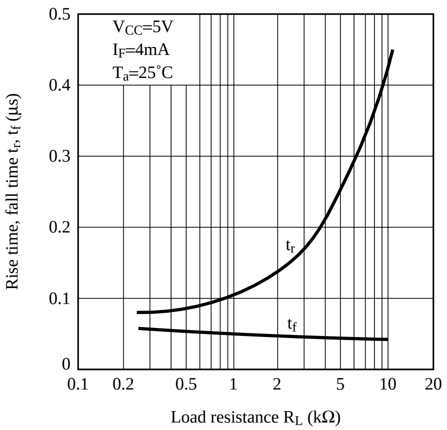


Fig.11 Rise Time, Fall Time vs. Load Resistance



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1. It is recommended that a by-pass capacitor of more than 0.01μF is added between V_{CC} and GND near the device in order to stabilize power supply line.
2. Handle this product the same as with other integrated circuits against static electricity.