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	○	○		

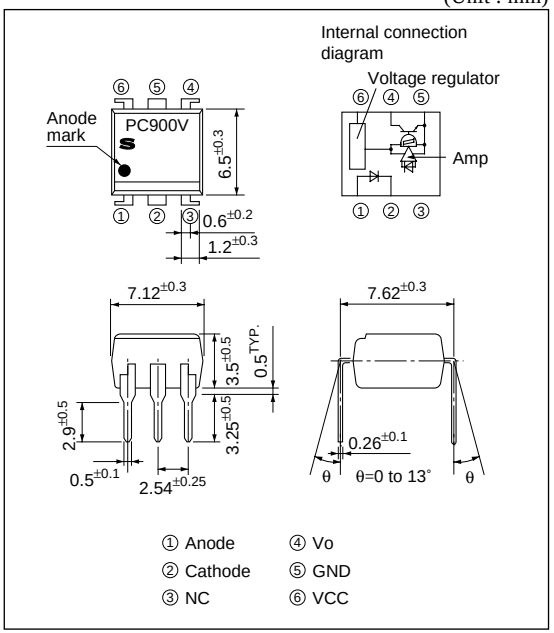
* Application Model No. PC900V

■ 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.

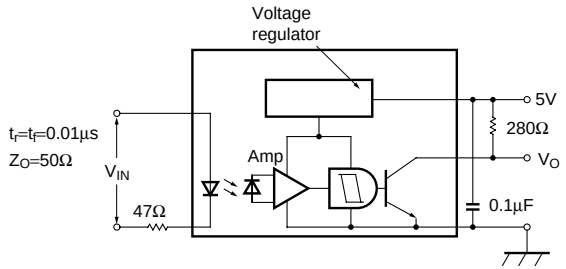
■ Electro-optical Characteristics

(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	Response time	"High→Low" propagation delay time	t_{PHL}	Ta=25˚C V_{CC}=5V, I_F=4mA R_L=280Ω	–	1	3	µs
		"Low→High" propagation delay time	t_{PLH}		–	2	6	
		Fall time	t_f		–	0.05	0.5	
		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



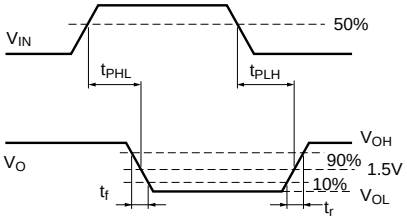


Fig.2 Forward Current vs. Ambient Temperature

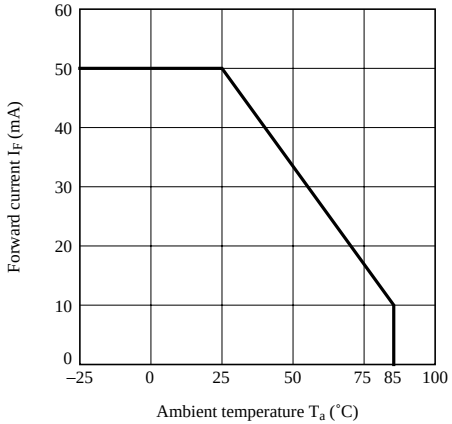


Fig.3 Power Dissipation vs. Ambient Temperature

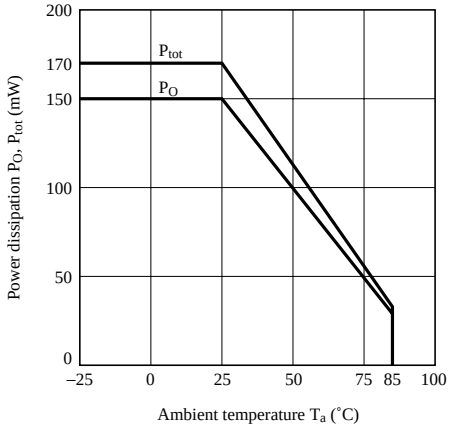


Fig.4 Forward Current vs. Forward Voltage

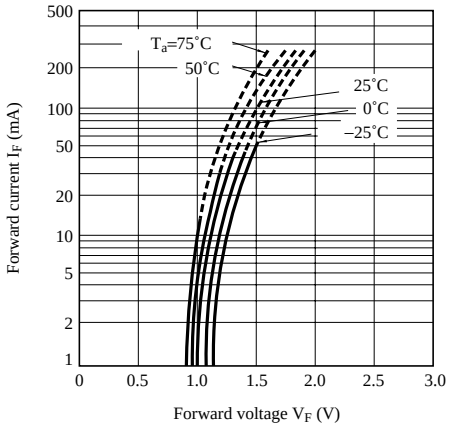


Fig.5 Relative Threshold Input Current vs. Supply Voltage

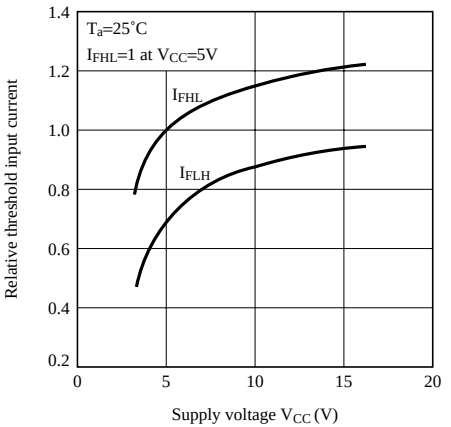


Fig.6 Relative Threshold Input Current vs. Ambient Temperature

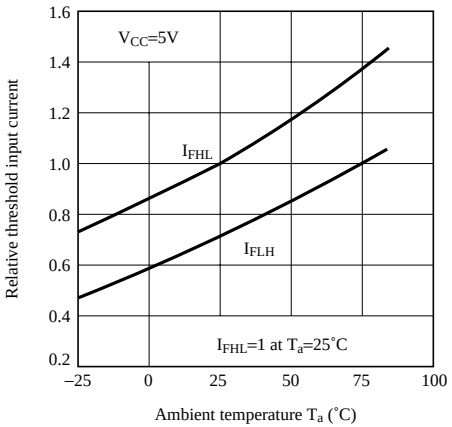


Fig.7 Low Level Output Voltage vs. Low Level Output Current

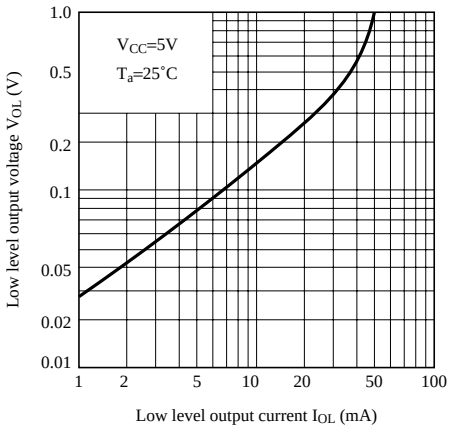


Fig.8 Low Level Output Voltage vs. Ambient Temperature

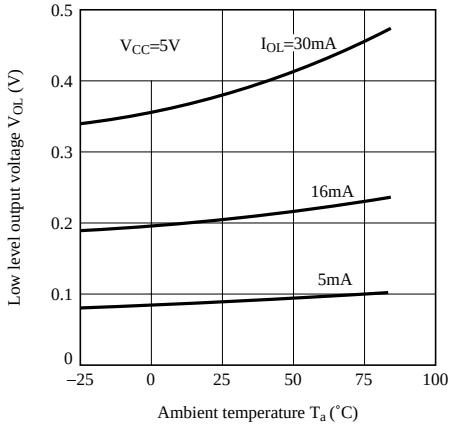


Fig.9 Supply Current vs. Supply Voltage

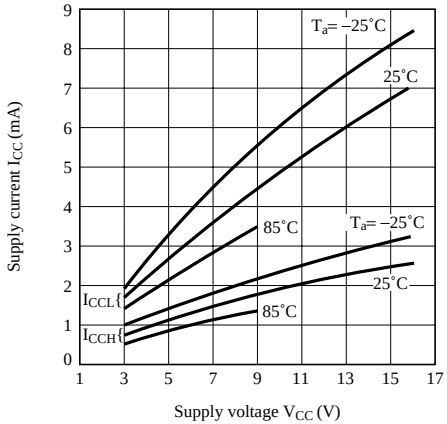


Fig.10 Propagation Delay Time vs. Forward Current

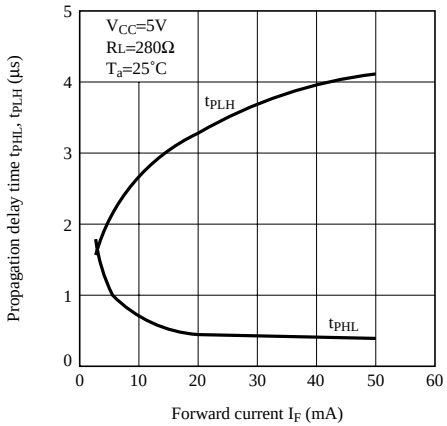
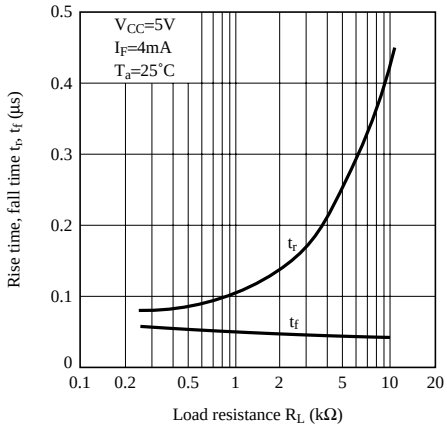


Fig.11 Rise Time, Fall Time vs. Load Resistance



■ 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

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  - 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:
  - Transportation control and safety equipment (i.e., aircraft, trains, automobiles, etc.)
  - Traffic signals
  - Gas leakage sensor breakers
  - Alarm equipment
  - Various safety devices, etc.

  (iii) SHARP devices shall not be used for or in connection with equipment that requires an extremely high level of reliability and safety such as:
  - 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	○	–		Taping

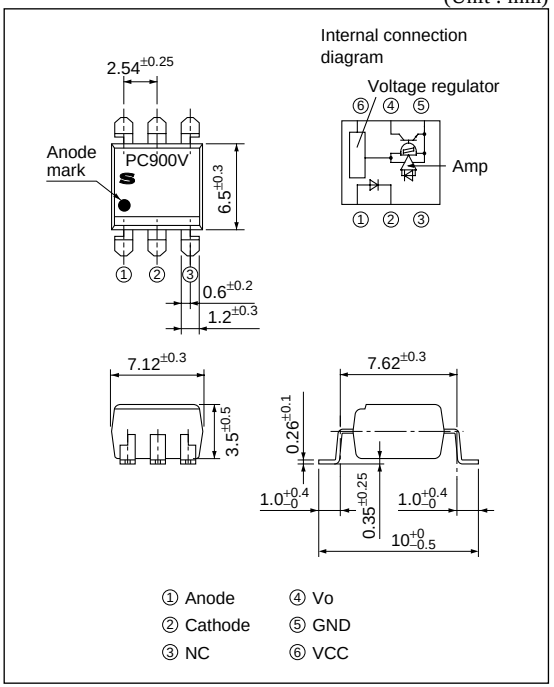
* Application Model No. PC900V

■ 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)



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■ Electro-optical Characteristics

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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
		"Low→High" propagation delay time	t_{PLH}		–	2	6	
		Fall time	t_f		–	0.05	0.5	
		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

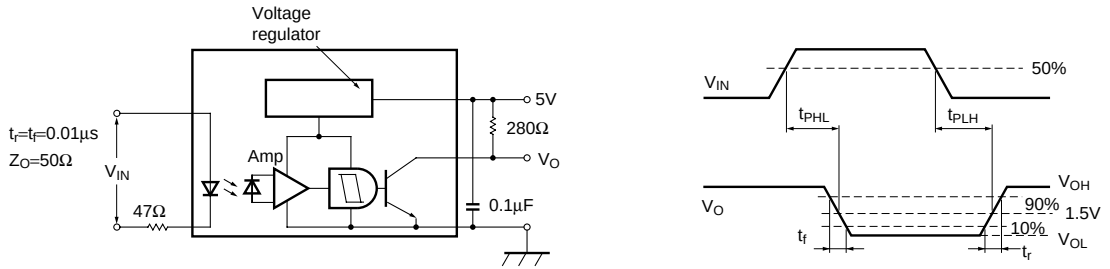


Fig.2 Forward Current vs. Ambient Temperature

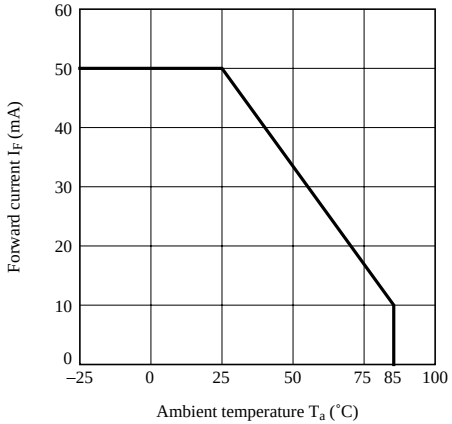


Fig.3 Power Dissipation vs. Ambient Temperature

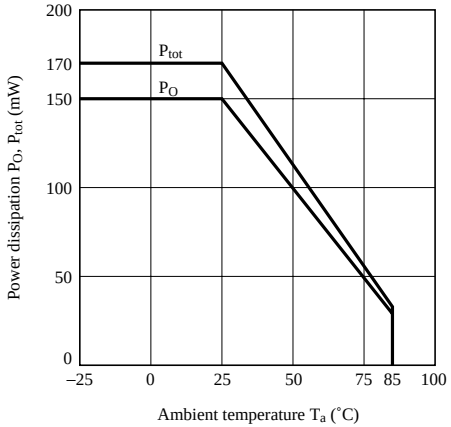


Fig.4 Forward Current vs. Forward Voltage

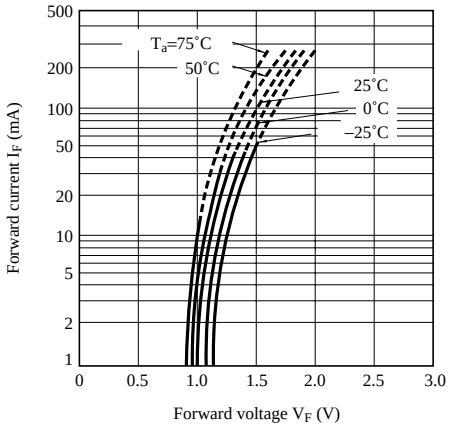


Fig.5 Relative Threshold Input Current vs. Supply Voltage

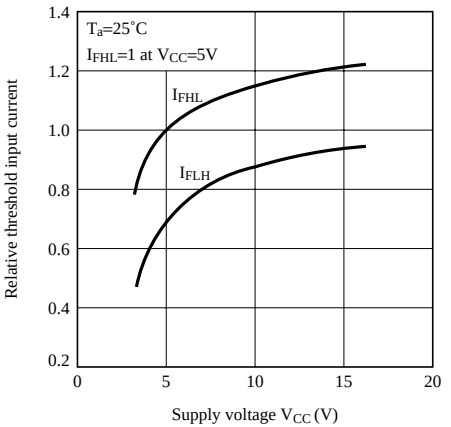


Fig.6 Relative Threshold Input Current vs. Ambient Temperature

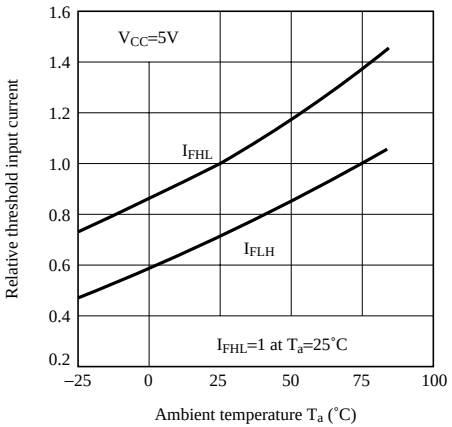


Fig.7 Low Level Output Voltage vs. Low Level Output Current

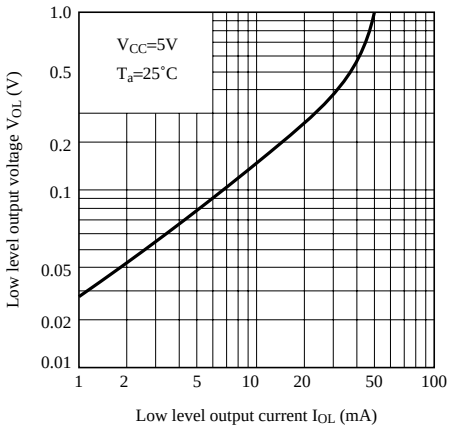


Fig.8 Low Level Output Voltage vs. Ambient Temperature

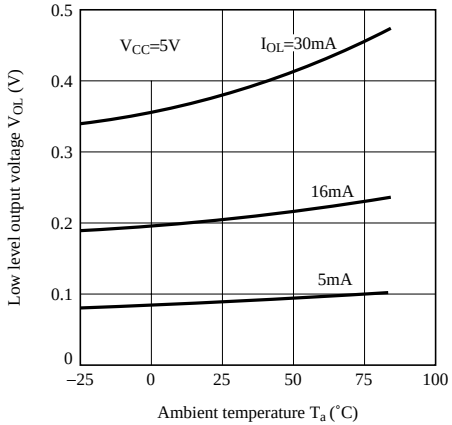


Fig.9 Supply Current vs. Supply Voltage

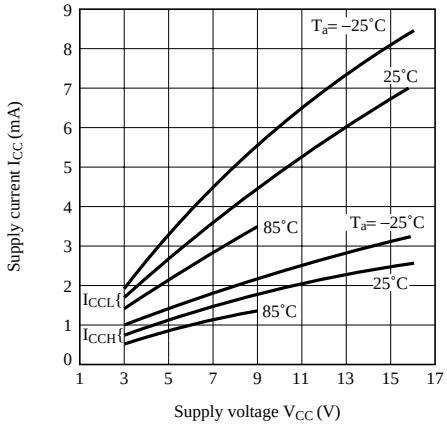


Fig.10 Propagation Delay Time vs. Forward Current

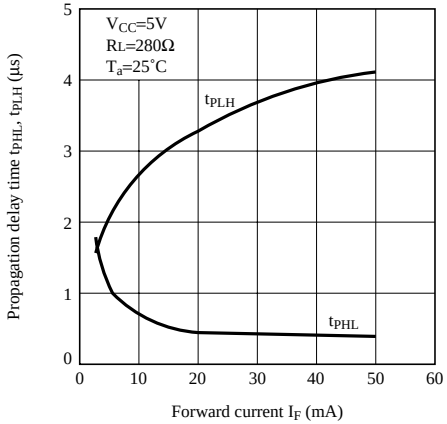
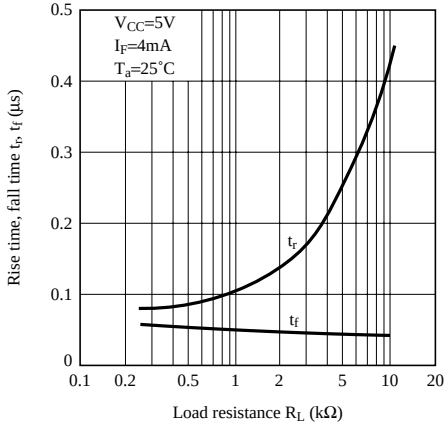


Fig.11 Rise Time, Fall Time vs. Load Resistance



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