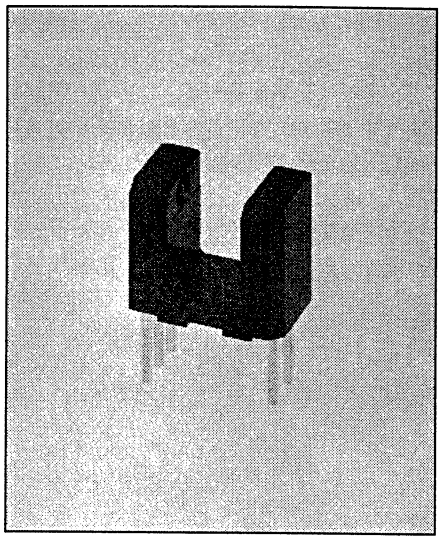
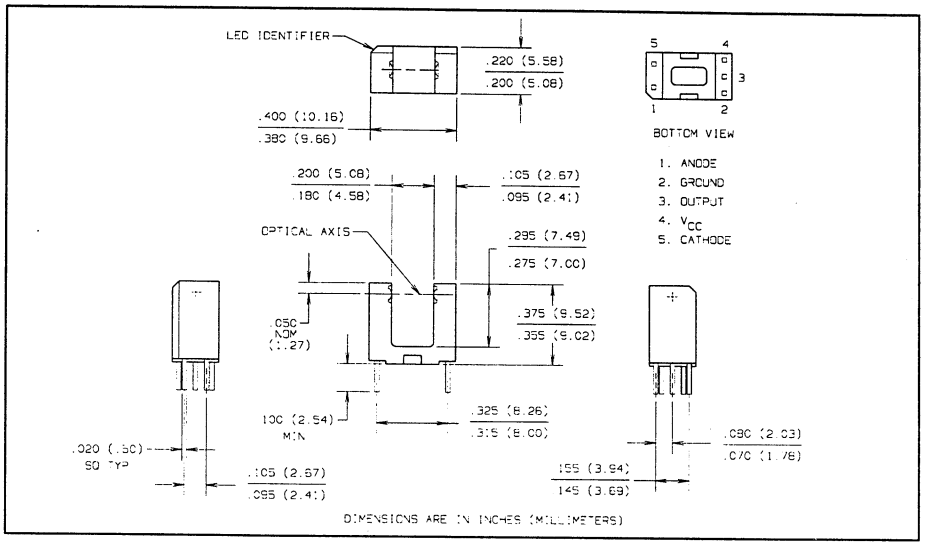
Photologic® Slotted Optical Switch
Types OPB625, OPB626, OPB627, OPB628





Features

- Non-contact switching
- Printed circuit board mounting
- 0.320" (8.13 mm) Lead centers
- 0.190" (4.83 mm) Gap
- Enhanced signal to noise ratio
- Four output options

Description

The OPB625 series slotted optical switches consist of an infrared emitting diode and a monolithic integrated circuit which incorporates a photodiode, a linear amplifier and a Schmitt trigger on a single silicon chip.

The device features TTL/LSTTL compatible logic level output. Open collector output versions can drive up to 10 TTL loads over a voltage range from 4.5V to 16V.

Absolute Maximum Ratings (T_A = 25° C unless otherwise noted)

Storage Temperature Range	-40° C to +100°C
Operating Temperature Range	-40° C to +100° C
Lead Soldering Temperature [1/16 inch (1.6 mm) from case for 5 sec. with soldering iron]	240° C(1)

Input Diode

Forward DC Current	50 mA
Peak Forward Current (1µs pulse width, 300 pps)	3.0 A
Reverse DC Voltage	3.0 V
Power Dissipation	100 mW(2)

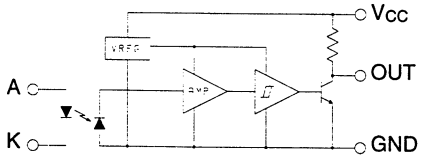
Output Photologic®

Supply Voltage, V_{CC}	18 V
Duration of Output Short To V_{CC}	1.00 sec
Voltage at Output	30 V
Low Level Output Current (sinking)	16 mA
Power Dissipation	240 mW(3)

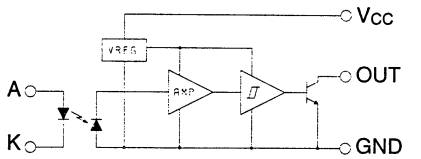
Notes:
(1) RMA flux is recommended. Duration can be extended to 10 sec. max. when flow soldering.
(2) Derate linearly 1.33 mW/° C above 25° C.
(3) Derate linearly 2.50 mW/° C above 30° C.

Schematics

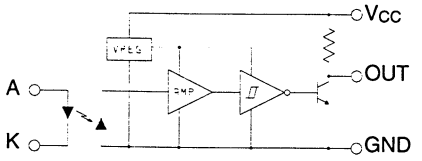
OPB625...Buffer/10K PU



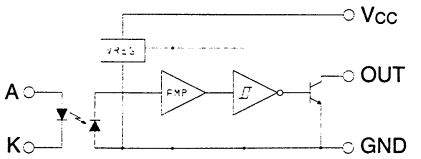
OPB626...Buffer/OC



OPB627...Inverter/10K PU



OPB628...Inverter/OC



Types OPB625, OPB626, OPB627, OPB628

Electrical Characteristics (T_A = 25° C, V_{CC} = 4.5 V to 16 V unless otherwise noted)

SYMBOL	PARAMETER		MIN	TYP	MAX	UNITS	TEST CONDITIONS
Input Diode							
V_F	Forward Voltage				1.6	V	I_F = 10 mA
I_R	Reverse Current				100	µA	V_R = 3.0 V
Output Photologic® Sensor							
V_{CC}	Operating D.C. Supply Voltage		4.5		16.0	V	
$I_F(+)$	LED Positive-Going Threshold Current		0.1	0.6	3.0	mA	
$I_F(+)/I_F(-)$	Hysteresis Ratio		1.05	1.20	1.60		
I_{CCH}	High Level Supply Current:						
	Buffer, 10K Pull-up	OPB625		5.0	12.0	mA	I_F = 5 mA, No Load On Output
	Buffer, Open-Collector	OPB626					
	Inverter, 10K Pull-up	OPB627		4.0	12.0	mA	I_F = 0 mA(4), No Load On Output
	Inverter, Open-Collector	OPB628					
I_{CCL}	Low Level Supply Current:						
	Buffer, 10K Pull-up	OPB625		5.5	12.0	mA	I_F = 0 mA(4), No Load On Output
	Buffer, Open-Collector	OPB626		4.0	12.0		
	Inverter, 10K Pull-up	OPB627		6.5	12.0	mA	I_F = 5 mA, No Load On Output
	Inverter, Open-Collector	OPB628		5.0	12.0		
V_{OH}	High Level Output Voltage:						
	Buffer, 10K Pull-up	OPB625	(V_{CC}-1.5)			V	I_F = 5 mA, I_{OH} = 100 µA
	Inverter, 10K Pull-up	OPB627	(V_{CC}-1.5)			V	I_F = 0 mA(4), I_{OH} = 100 µA
I_{OH}	High Level Output Current:						
	Buffer, Open-Collector	OPB626			100	µA	I_F = 5 mA, V_{OH} = 30 V
	Inverter, Open-Collector	OPB628			100	µA	I_F = 0 mA(4), V_{OH} = 30 V
V_{OL}	Low Level Output Voltage:						
	Buffer, 10K Pull-up	OPB625			0.4	V	I_F = 0 mA(4), I_{OL} = 16 mA
	Buffer, Open-Collector	OPB626					
	Inverter, 10K Pull-up	OPB627			0.4	V	I_F = 5 mA, I_{OL} = 16 mA
	Inverter, Open-Collector	OPB628					
t_r, t_f	Output Rise Time, Output Fall Time			30		ns	I_F = 0 or 5 mA, f = 10 kHz, DC = 50%, R_L = 300 Ω
t_{PLH}	Propagation Delay, Low-High						
	Buffer, 10K Pull-up	OPB625		0.6		µs	
	Buffer, Open-Collector	OPB626					
	Inverter, 10K Pull-up	OPB627		3.0		µs	
	Inverter, Open-Collector	OPB628					
t_{PHL}	Propagation Delay, High-Low						
	Buffer, 10K Pull-up	OPB625		3.0		µs	
	Buffer, Open-Collector	OPB626					
	Inverter, 10K Pull-up	OPB627		0.6		µs	
	Inverter, Open-Collector	OPB628					
Data Rate	Data Rate			100		KHz	I_F = 0 or 5 mA, DC = 50%, R_L = 300 Ω

(4) Normal application would be with light source blocked, simulated by I_F = 0 mA.

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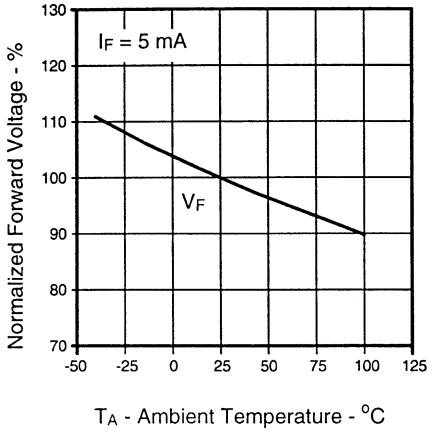
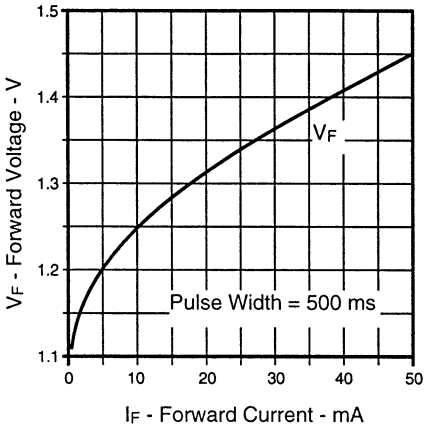
Typical Performance Curves

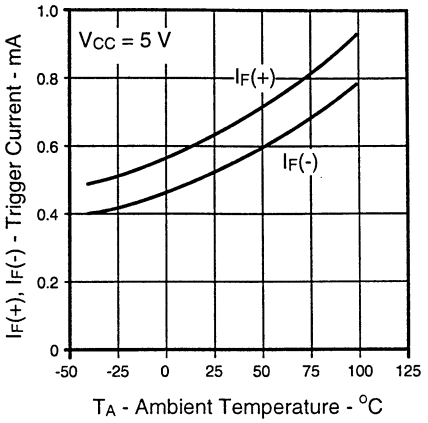
Normalized Forward Voltage vs Ambient Temperature



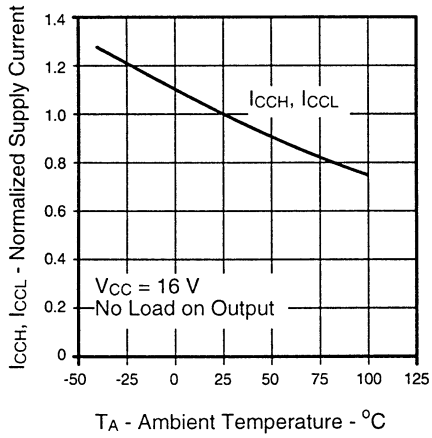
Forward Voltage vs Forward Current Input Diode



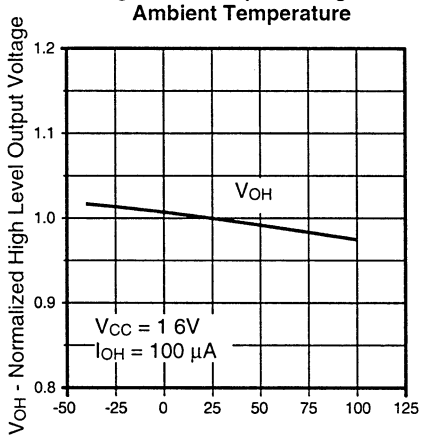
Trigger Current vs Ambient Temperature



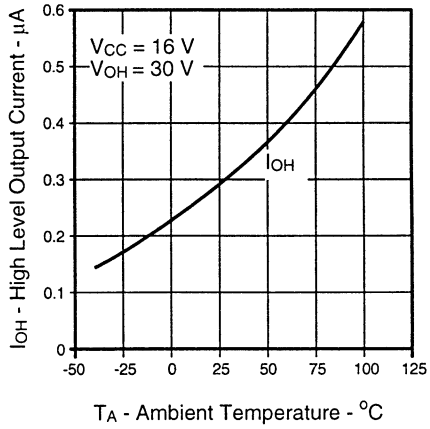
Normalized Supply Current vs Ambient Temperature



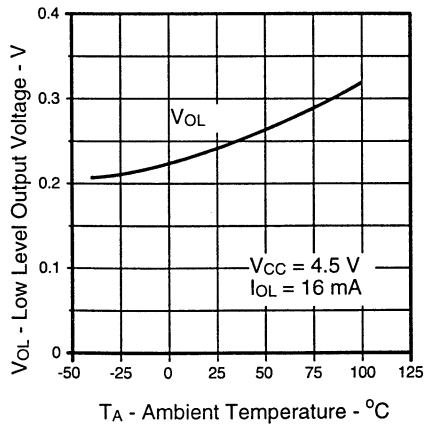
OPB625, OPB627 Normalized High Level Output Voltage vs Ambient Temperature



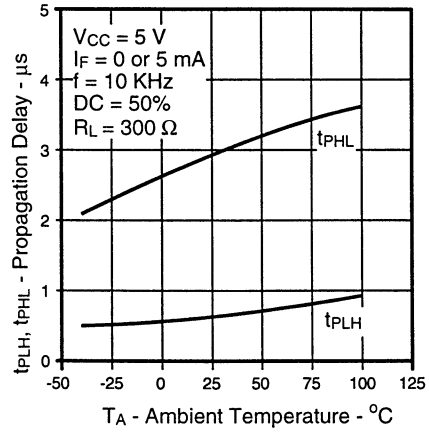
OPB626, OPB628 High Level Output Current vs Ambient Temperature



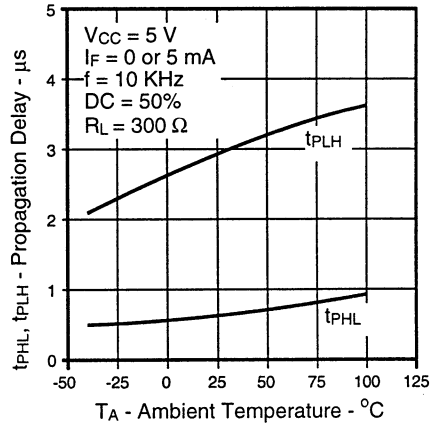
Low Level Output Voltage vs Ambient Temperature



OPB625, OPB626 Propagation Delay vs Ambient Temperature

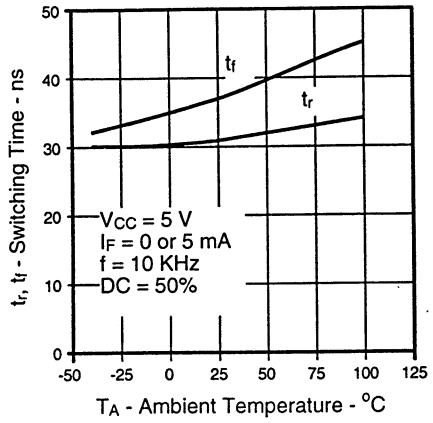


OPB627, OPB628 Propagation Delay vs Ambient Temperature

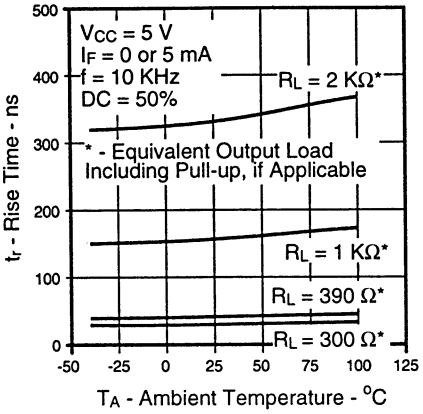


Typical Performance Curves

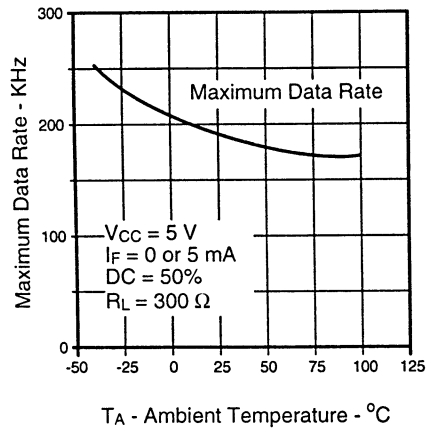
Rise Time and Fall Time vs Ambient Temperature



Rise Time vs Output Load vs Ambient Temperature



Maximum Data Rate vs Ambient Temperature



Typical Thermal Derating Curve