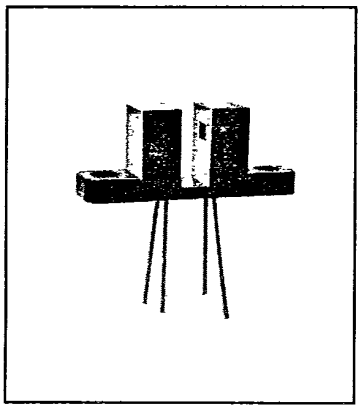
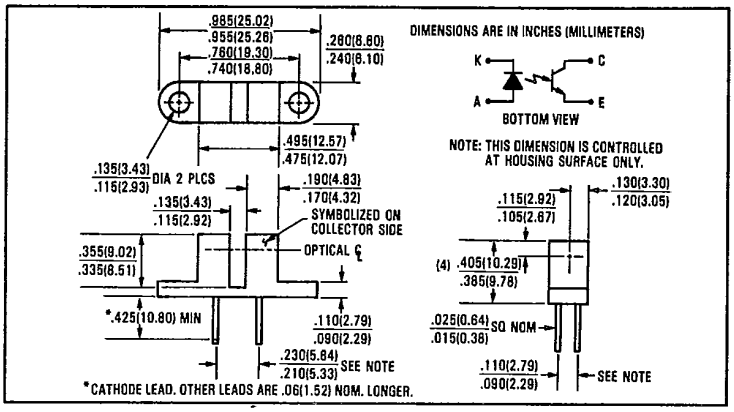
Optoelectronics Division
TRW Electronic Components Group

Product Bulletin 5323
January 1985

T-41-73

Slotted Optical Switches
Types OPB816, OPB817





Features
- Non-contact switching
- Low profile
- Fast switching speed

Description
The OPB816 and OPB817 each consist of an infrared emitting diode and an NPN silicon phototransistor mounted in a low cost black plastic housing on opposite sides of a 0.125" (3.18 mm) wide slot. Phototransistor switching takes place whenever an opaque object passes through the slot.

The OPB816 and OPB817 each utilize either an OP140 or OP240 LED combined with an OP550 family sensor.

Absolute Maximum Ratings (T_A = 25°C unless otherwise noted)
Storage and Operating Temperature Range ..... −40°C to +85°C
Lead Soldering Temperature [1/16 inch [1.6 mm] from case for 5 sec. with soldering iron) ..... 240°C(1)

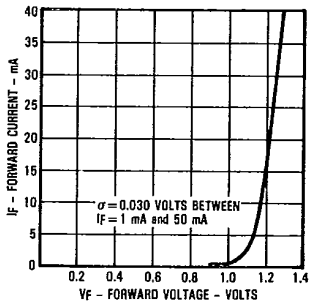
Input Diode
Reverse Voltage ..... 2.0 V
Continuous Forward Current ..... 50 mA
Peak Forward Current (1 μs pulse width, 300 pps) ..... 3.0 A
Power Dissipation ..... 100 mW(2)

Output Phototransistor
Collector-Emitter Voltage ..... 30 V
Emitter-Collector Voltage ..... 5.0 V
Power Dissipation ..... 100 mW(2)

Notes:
(1) RMA flux is recommended. Duration can be extended to 10 sec. max. when wave soldering.
(2) Derate linearly 1.33 mW/°C above 25°C.
(3) Methanol or isopropanol alcohols are recommended as cleaning agents.
(4) The OPB816/OPB817 is a low profile version of the OPB860 type. The OPB860 type is recommended when the extra height is not a factor.

Typical Performance Curves

Forward Current vs Forward Voltage Input Diode



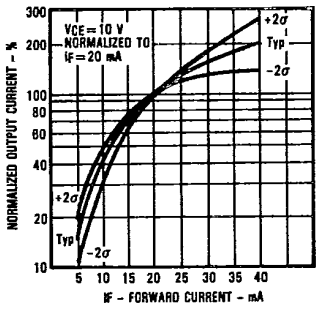
Types OPB816, OPB817

Electrical Characteristics (T_A = 25°C unless otherwise noted)

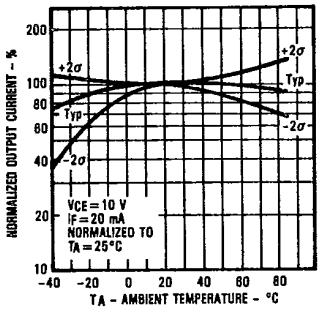
Symbol	Parameter		Min.	Max.	Units	Test Conditions
Input Diode						
V_F	Forward Voltage			1.70	V	I_F = 20 mA
I_R	Reverse Current			100	μA	V_R = 2.0 V
Output Phototransistor						
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage		30		V	I_C = 1.00 mA
$V_{(BR)ECO}$	Emitter-Collector Breakdown Voltage		5.0		V	I_E = 100 μA
I_{CEO}	Collector-Emitter Dark Current			100	nA	V_{CE} = 10.0 V, I_F = 0, E_e = 0
Coupled						
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage	OPB816		0.40	V	I_C = 250 μA, I_F = 20 mA
		OPB817		0.40	V	I_C = 250 μA, I_F = 10.0 mA
$I_{C(ON)}$	On-State Collector Current	OPB816	500		μA	V_{CE} = 10.0 V, I_F = 20 mA
		OPB817	1000		μA	V_{CE} = 10.0 V, I_F = 10.0 mA

Typical Performance Curves

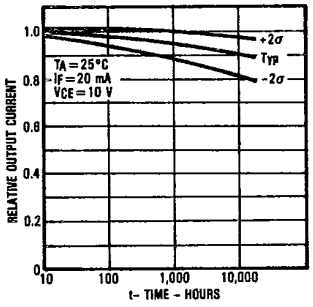
Normalized Output Current vs Forward Current



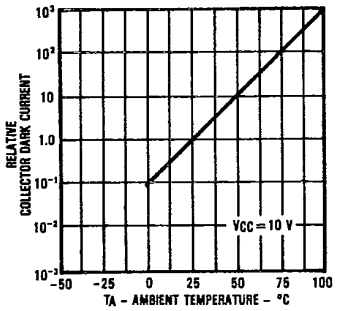
Normalized Output Current vs Ambient Temperature



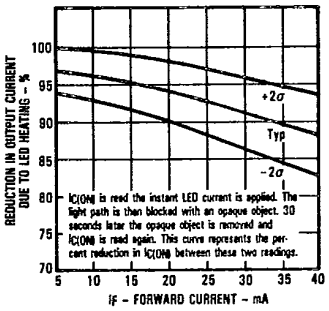
Relative Output Current vs Time



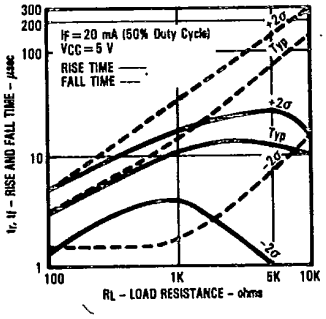
Relative Collector Dark Current vs Ambient Temperature



Reduction in Output Current Due to LED Heating vs Forward Current



Rise and Fall Time vs Load Resistance



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