

Optoelectronics Division
TRW Electronic Components Group

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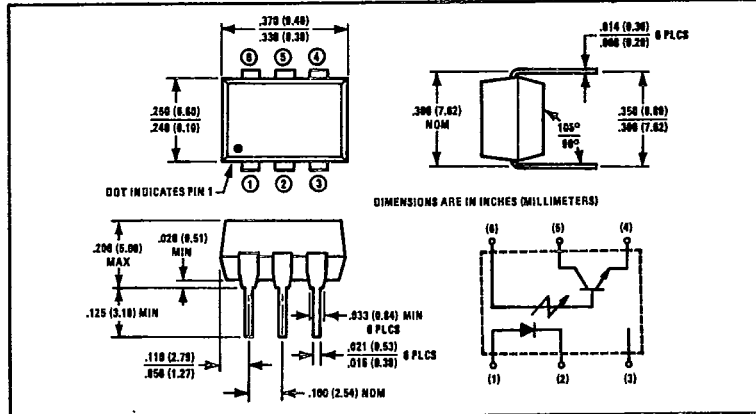
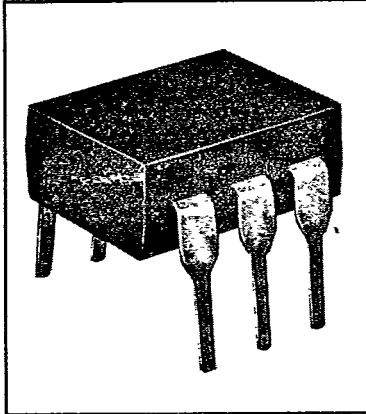


Product Bulletin 5196
January 1985

T-41-83

Optically Coupled Isolators

Types CNY17/1, CNY17/2, CNY17/3, CNY17/4



Features

- 4000 VDC isolation voltage
- Tightly controlled min-max CTR limits
- Low cost plastic package
- UL recognized, File No. E58730
- Fast switching speed

Description

The CNY17/1, CNY17/2, CNY17/3, and CNY17/4 are optically coupled isolators consisting of an infrared emitting diode coupled to an NPN silicon phototransistor and mounted in a standard six pin dual in-line package.

This series was originally numbered using Roman numerals, and may still appear on many prints and documents using the numbering system CNY17/I through CNY17/IV.

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

Input-to-Output Isolation Voltage	± 4000 VDC ⁽¹⁾
Operating Temperature Range	-55°C to +100°C
Storage Temperature Range	-55°C to +150°C
Lead Soldering Temperature (1/16 inch [1.6 mm] from case for 5 sec. with soldering iron)	260°C ⁽²⁾

Input Diode

Reverse DC Voltage	3.0 V
Peak Forward Current (1 μsec pulse width, 330 pps)	3.0 A
Continuous Forward Current	60 mA
Power Dissipation	100 mW ⁽³⁾

Output Sensor

Collector-Emitter Voltage	70 V
Emitter-Collector Voltage	7.0 V
Power Dissipation	150 mW ⁽⁴⁾

Notes:

- (1) Measured with input leads shorted together and output leads shorted together.
- (2) RMA flux is recommended. Duration can be extended to 10 sec. max. when flow soldering.
- (3) Derate linearly 1.33 mW/°C above 25°C.
- (4) Derate linearly 2.0 mW/°C above 25°C.

Types CNY17/1, CNY17/2, CNY17/3, CNY17/4

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

Symbol	Parameter	Min.	Max.	Units	Test Conditions	
Input Diode						
V _F	Forward Voltage		1.85	V	I _F = 60 mA	
I _R	Reverse Current		10.0	μA	V _R = 3.0 V	
Phototransistor						
V _{(BR)CEO}	Collector-Emitter Breakdown Voltage	70		V	I _C = 1.00 mA	
V _{(BR)CBO}	Collector-Base Breakdown Voltage	70		V	I _C = 100 μA	
V _{(BR)EBO}	Emitter-Base Breakdown Voltage	7.0		V	I _E = 100 μA	
I _{CEO}	Dark Current		50	nA	V _{CE} = 10.0 V	
			100	nA	V _{CE} = 10.0 V	
Coupled						
CTR	Current Transfer Ratio	CNY17/1	40	80	%	I _F = 10.0 mA, V _{CE} = 5.0 V, See Fig. 1, 2, 3
		CNY17/2	63	125	%	I _F = 10.0 mA, V _{CE} = 5.0 V
		CNY17/3	100	200	%	I _F = 10.0 mA, V _{CE} = 5.0 V
		CNY17/4	160	320	%	I _F = 10.0 mA, V _{CE} = 5.0 V
V _{CE(SAT)}	Saturation Voltage		0.40	V	I _F = 10.0 mA, I _C = 2.5 mA, See Fig. 1	
V _{ISO}	Isolation Voltage	4000		VDC	See Note 1	

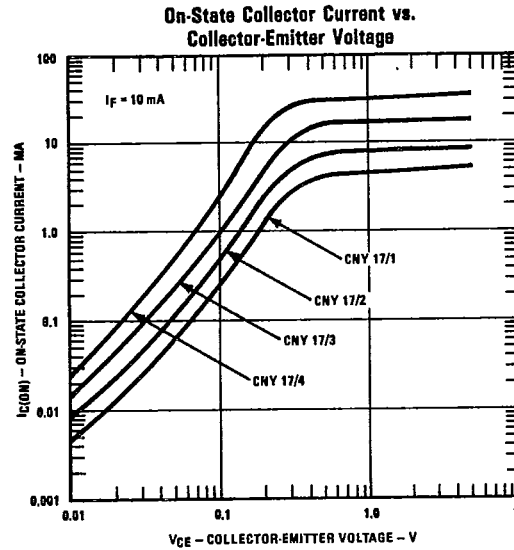
Thermal Behavior Data

R_{THJA} — Thermal resistance, junction to ambient air
 R_{THJX} — Thermal resistance, junction to some mounting surface
 τ_{TH} — Thermal time constant
 K — Thermal rating factor

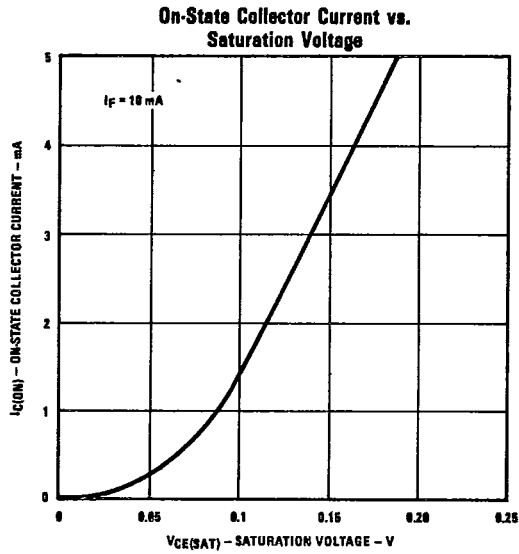
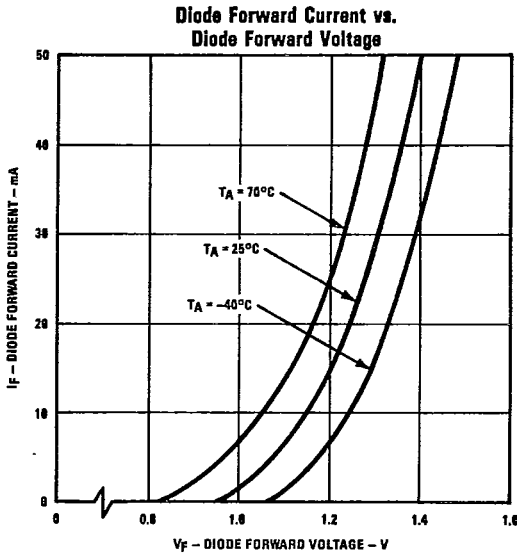
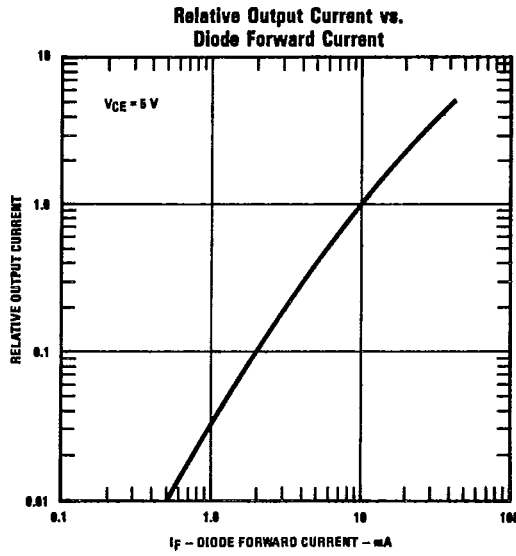
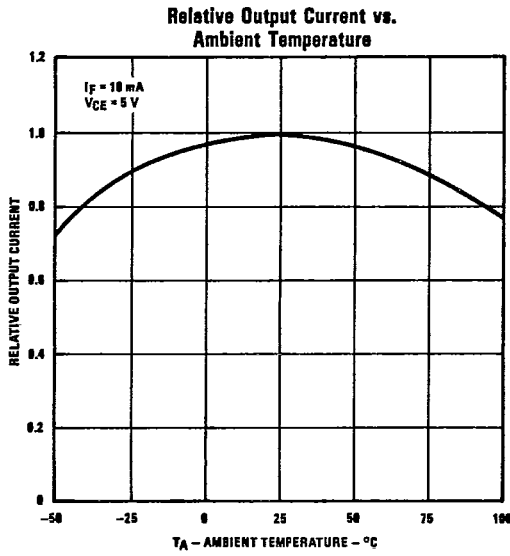
R _{THJA} or X °C/W	τ _{TH} 10 ⁻² sec	K	Condition
750	1.70	0.008	Free air
600	1.70	0.008	Mounted in standard DIP socket.
450	1.70	0.008	Mounted in 1/16" (1.6 mm) thick double sided PC board.

See Application Note 111 for information on proper soldering technique.

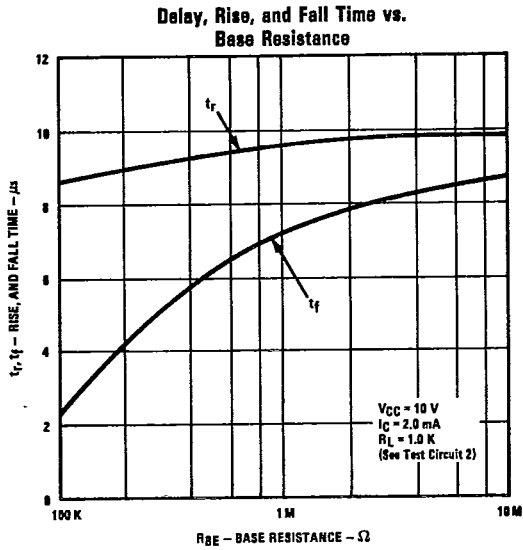
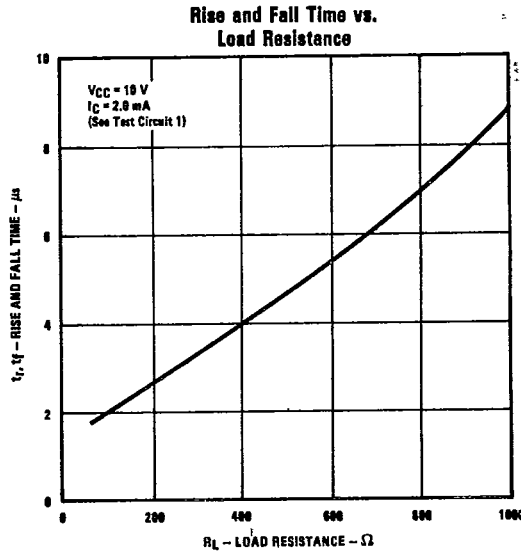
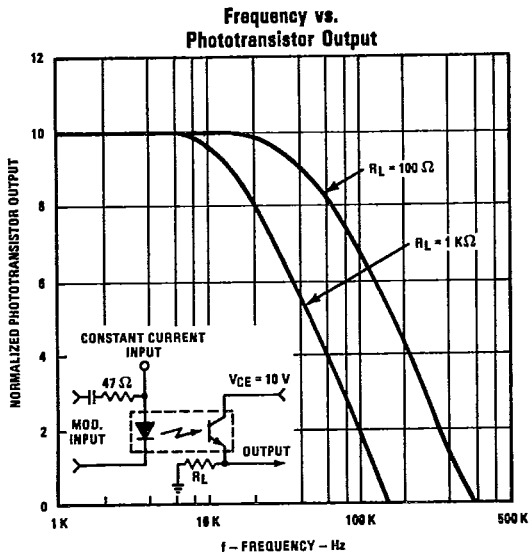
Typical Performance Curves



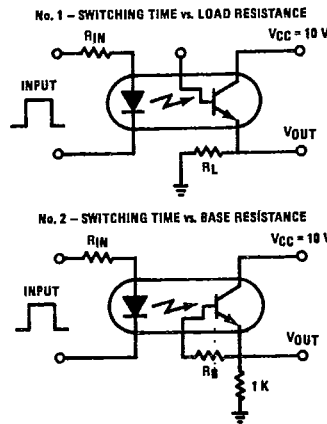
Typical Performance Curves



Typical Performance Curves



Switching Time Test Circuits



NOTE: Rise Time (t_r) is time required for collector current to increase from 10% to 90% of its final value. Fall Time (t_f) is time required for the collector current to decrease from 90% to 10% of its initial value. Delay Time (t_d) is the time from input pulse leading edge to point where collector current reaches 10% of its final value.