



T-41-85

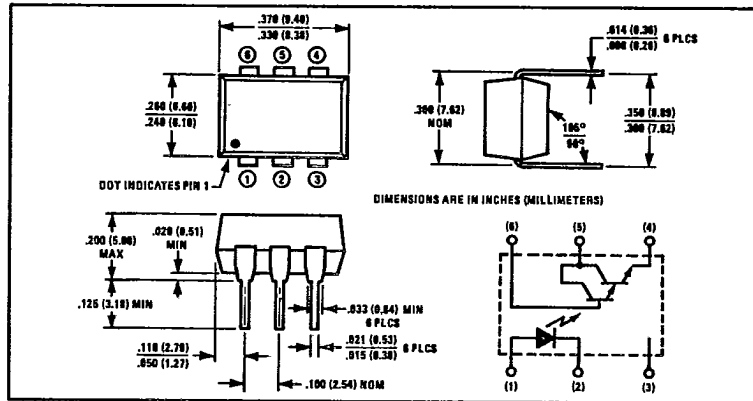
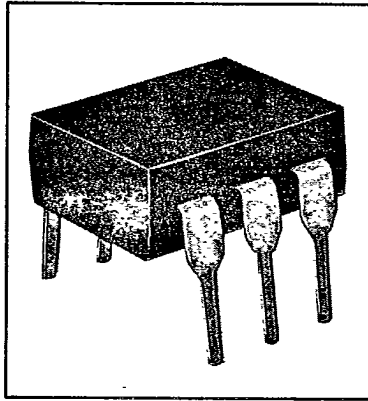
Optoelectronics Division  
TRW Electronic Components Group

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Product Bulletin 5242  
January 1985

# Optically Coupled Isolators

## Types 4N29, 4N30, 4N31, 4N32, 4N33



**Features**

- Photodarlington output
- High current transfer ratio
- 2500 or 1500 volt isolation ratings
- UL recognized File No. E58730

**Description**

The 4N29, 4N30, 4N31, 4N32, and 4N33 are JEDEC registered optically coupled isolators each consisting of a gallium arsenide infrared emitting diode and an NPN silicon photodarlington mounted in a standard plastic six pin dual-in-line package.

**Absolute Maximum Ratings** (T<sub>A</sub> = 25°C unless otherwise noted)

Input-to-Output Isolation Voltage — 4N30, 4N31, 4N33	± 1500 VDC <sup>(1)</sup>
4N29, 4N32	± 2500 VDC <sup>(1)</sup>
Storage Temperature Range	-55°C to +150°C
Operating Temperature Range	-55°C to +100°C
Lead Soldering Temperature (1/16 inch [1.6 mm] from case for 5 sec. with soldering iron <sup>(2)</sup> )	260°C

**Input Diode**

Forward DC Current	60 mA
Peak Forward Current (1 μs pulse width, 330 pps)	3.0 A
Reverse DC Voltage	3.0 V
Power Dissipation	100 mW <sup>(3)</sup>

**Output Photodarlington**

Collector-Emitter Voltage	30 V
Collector-Base Voltage	30 V
Emitter-Collector Voltage	5.0 V
Power Dissipation	160 mW <sup>(4)</sup>

**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.

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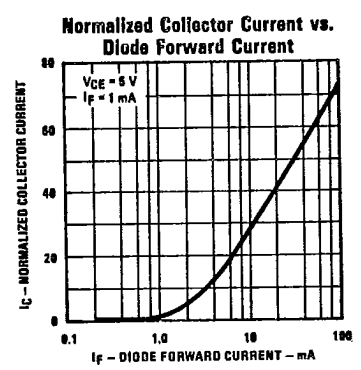
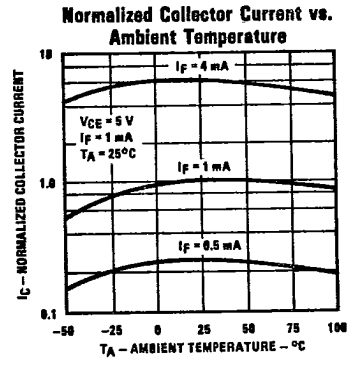
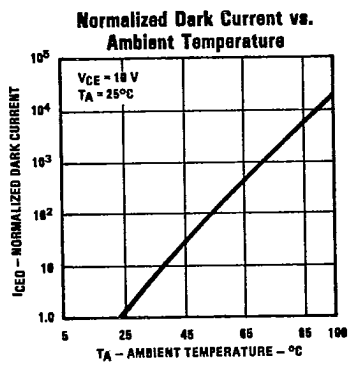
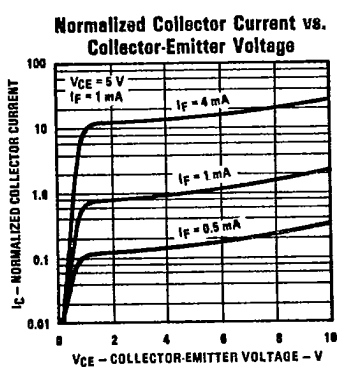
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Electrical Characteristics (TA = 25°C unless otherwise noted)

Symbol	Parameter	Min.	Max.	Units	Test Conditions
<b>Input Diode</b>					
V <sub>F</sub>	Forward Voltage		1.50	V	I <sub>F</sub> = 10.0 mA
I <sub>R</sub>	Reverse Current		100	μA	V <sub>R</sub> = 3.0 V
<b>Output Photodarlington</b>					
V <sub>BR(CEO)</sub>	Collector-Emitter Breakdown Voltage	30		V	I <sub>C</sub> = 100 μA
V <sub>BR(CBO)</sub>	Collector-Base Breakdown Voltage	30		V	I <sub>C</sub> = 100 μA
V <sub>BR(ECO)</sub>	Emitter-Collector Breakdown Voltage	5.0		V	I <sub>E</sub> = 100 μA
I <sub>CEO</sub>	Collector-Emitter Dark Current		100	nA	V <sub>CE</sub> = 10.0 V
<b>Coupled</b>					
I <sub>C</sub> /I <sub>F</sub>	DC Current Transfer Ratio	4N29, 4N30 4N31 4N32, 4N33	100 50 600	%	I <sub>F</sub> = 10.0 mA, V <sub>CE</sub> = 10.0 V
V <sub>CE(SAT)</sub>	Collector-Emitter Saturation Voltage	4N29, 4N30, 4N32, 4N33 4N31	1.00 1.20	V	I <sub>F</sub> = 8.0 mA, I <sub>C</sub> = 2.0 mA, I <sub>B</sub> = 0
t <sub>on</sub>	Turn-On Time	4N29, 4N30, 4N31	5.0	μs	V <sub>CC</sub> = 10.0 V, I <sub>C</sub> = 50 mA, I <sub>F</sub> = 200 mA
t <sub>off</sub>	Turn-Off Time	4N29, 4N30, 4N31 4N32, 4N33	40 100	μs	



Typical Performance Curves



TRW reserves the right to make changes at any time in order to improve design and to supply the best product possible. Plastic color may vary.  
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