

4N29, 4N30, 4N31, 4N32, 4N33



**OPTICALLY COUPLED ISOLATOR
PHOTODARLINGTON OUTPUT**

APPROVALS

- UL recognised, File No. E91231

DESCRIPTION

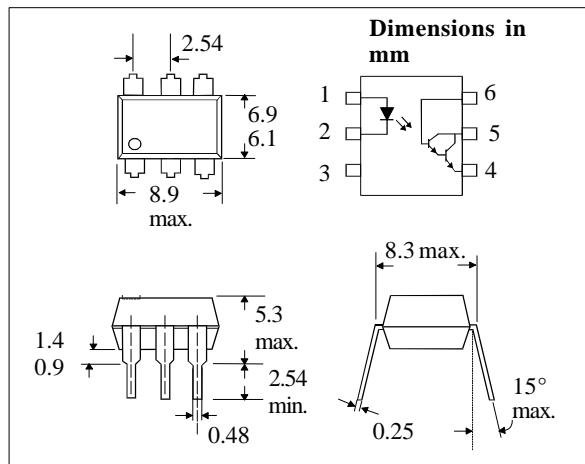
The 4N29, 4N30, 4N31, 4N32, 4N33 series of optically coupled isolators consist of an infrared light emitting diode and NPN silicon photodarlington in a space efficient dual in line plastic package.

FEATURES

- Options :-
10mm lead spread - add G after part no.
Surface mount - add SM after part no.
Tape&reel - add SMT&R after part no.
- High Current Transfer Ratio
- High Isolation Voltage (5.3kV_{RMS}, 7.5kV_{PK})
- All electrical parameters 100% tested
- Custom electrical selections available

APPLICATIONS

- Computer terminals
- Industrial systems controllers
- Measuring instruments
- Signal transmission between systems of different potentials and impedances



**ABSOLUTE MAXIMUM RATINGS
(25°C unless otherwise specified)**

Storage Temperature _____ -55°C to + 150°C
 Operating Temperature _____ -55°C to + 100°C
 Lead Soldering Temperature
 (1/16 inch (1.6mm) from case for 10 secs) 260°C

INPUT DIODE

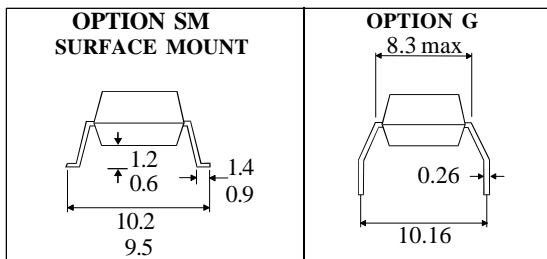
Forward Current _____ 80mA
 Reverse Voltage _____ 5V
 Power Dissipation _____ 100mW

OUTPUT TRANSISTOR

Collector-emitter Voltage BV_{CEO} _____ 30V
 Collector-base Voltage BV_{CBO} _____ 50V
 Emitter-collector Voltage BV_{ECO} _____ 5V
 Power Dissipation _____ 150mW

POWER DISSIPATION

Total Power Dissipation _____ 250mW
 (derate linearly 3.3mW/°C above 25°C)



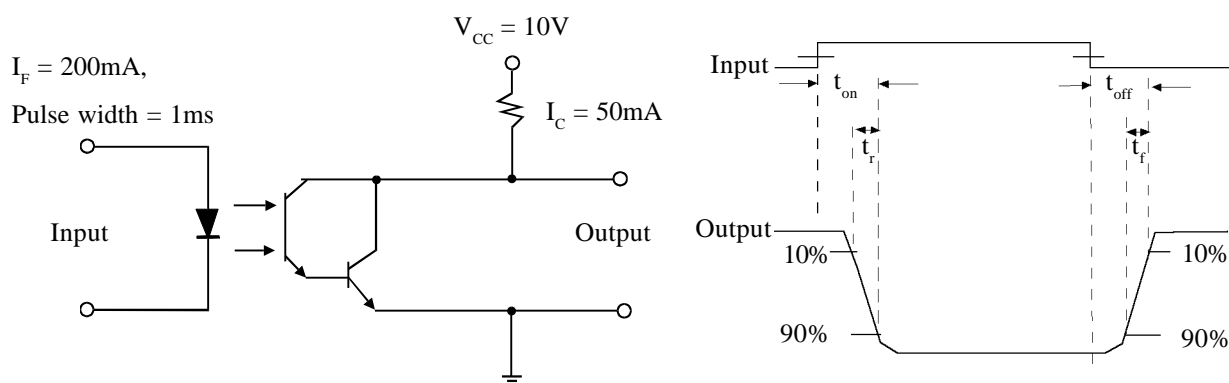
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ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ Unless otherwise noted)

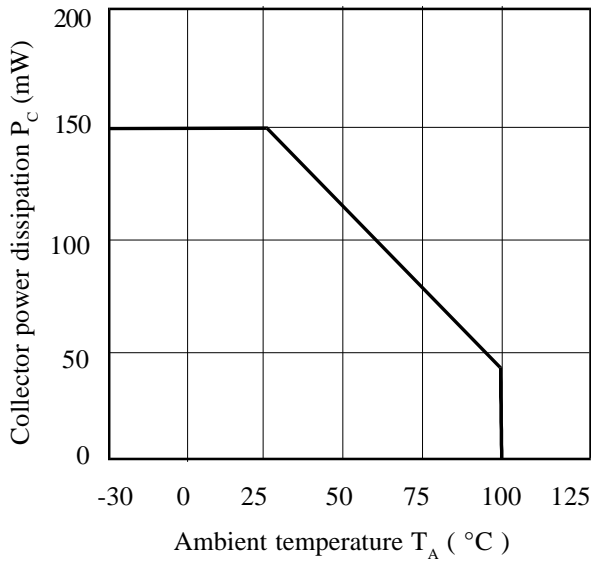
| PARAMETER | | MIN | TYP | MAX | UNITS | TEST CONDITION |
|----------------------|--|--------------------|-----|-----|---------------|--|
| Input | Forward Voltage (V_F) | | 1.2 | 1.5 | V | $I_F = 50\text{mA}$ |
| | Reverse Current (I_R) | | | 10 | μA | $V_R = 6\text{V}$ |
| Output | Collector-emitter Breakdown (BV_{CEO}) | 30 | | | V | $I_C = 1\text{mA}$ (note 2) |
| | Collector-base Breakdown (BV_{CBO}) | 50 | | | V | $I_C = 100\mu\text{A}$ |
| | Emitter-collector Breakdown (BV_{ECO}) | 5 | | | V | $I_E = 100\mu\text{A}$ |
| | Collector-emitter Dark Current (I_{CEO}) | | | 100 | nA | $V_{CE} = 10\text{V}$ |
| Coupled | Collector Output Current (I_C) (Note 2) | | | | | |
| | 4N32, 4N33 | 50 | | | mA | $10\text{mA } I_F, 10\text{V } V_{CE}$ |
| | 4N29, 4N30 | 10 | | | mA | $10\text{mA } I_F, 10\text{V } V_{CE}$ |
| | 4N31 | 5 | | | mA | $10\text{mA } I_F, 10\text{V } V_{CE}$ |
| | Collector-emitter Saturation Voltage $V_{CE(SAT)}$ | | | | | |
| | 4N29, 4N30, 4N32, 4N33 | | | 1.0 | V | $8\text{mA } I_F, 2\text{mA } I_C$ |
| | 4N31 | | | 1.2 | V | $8\text{mA } I_F, 2\text{mA } I_C$ |
| | Input to Output Isolation Voltage V_{ISO} | 5300 | | | V_{RMS} | (note 1) |
| | | 7500 | | | V_{PK} | (note 1) |
| | Input-output Isolation Resistance R_{ISO} | 5×10^{10} | | | Ω | $V_{IO} = 500\text{V}$ (note 1) |
| Output Turn on Time | ton | | | 5 | μs | $V_{CC} = 10\text{V}, I_C = 50\text{mA},$ $I_F = 200\text{mA},$ Pulse Width = 1ms fig.1 |
| Output Turn off Time | toff | | | 100 | μs | |
| | 4N32, 4N33 | | | 40 | μs | |
| | 4N29, 4N30, 4N31 | | | | | |

- Note 1 Measured with input leads shorted together and output leads shorted together.
 Note 2 Special Selections are available on request. Please consult the factory.

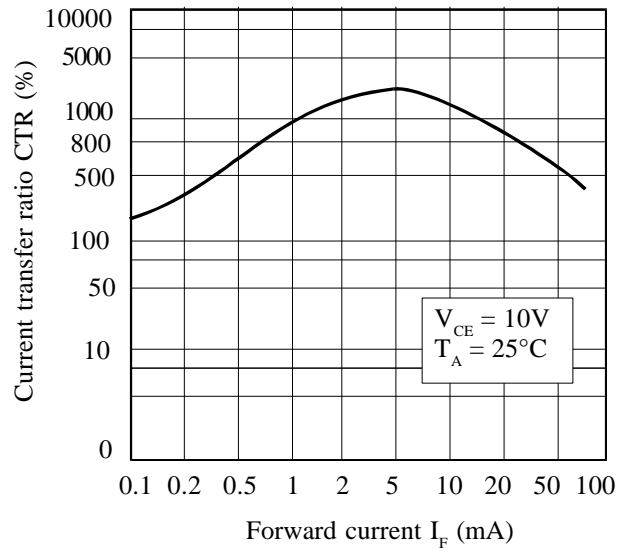
FIGURE 1



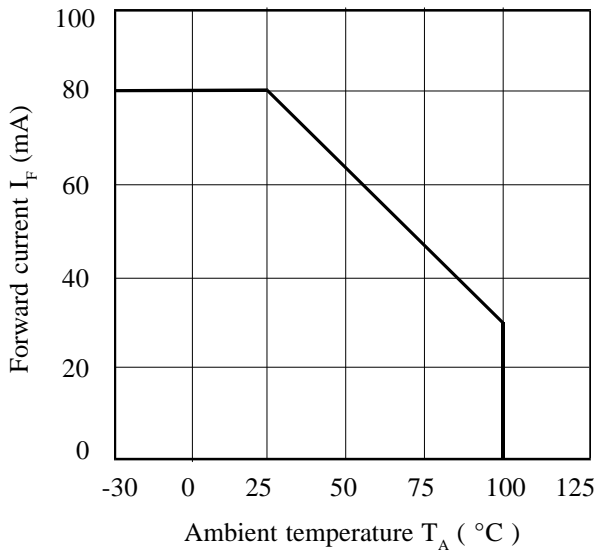
Collector Power Dissipation vs. Ambient Temperature



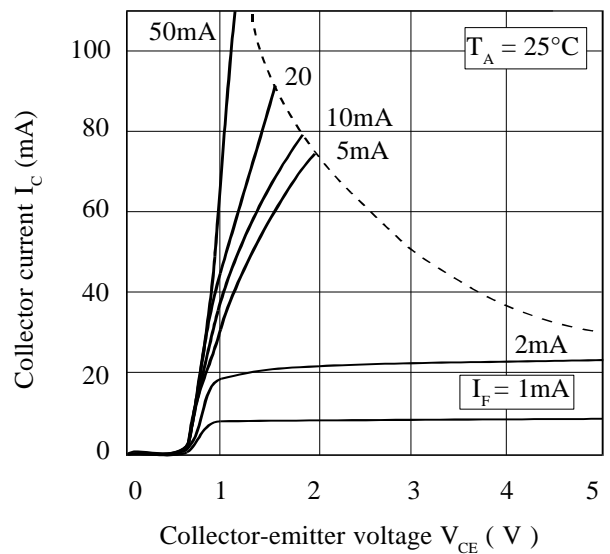
Current Transfer Ratio vs. Forward Current



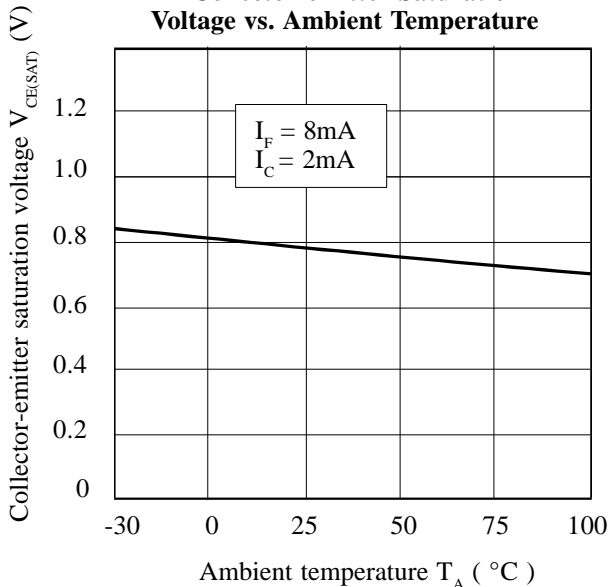
Forward Current vs. Ambient Temperature



Collector Current vs. Collector-emitter Voltage



Collector-emitter Saturation Voltage vs. Ambient Temperature



Relative Current Transfer Ratio vs. Ambient Temperature

