**4N32X3,-2,-1**
**4N32-3,-2,-1**

# LOW INPUT CURRENT PHOTODARLINGTON OPTICALLY COUPLED ISOLATORS

## APPROVALS

- UL recognised, File No. E91231

## 'X' SPECIFICATION APPROVALS

- VDE 0884 in 2 available lead form : -
  - STD
  - G form

  VDE 0884 in SMD approval pending
- EN60950 approved by SETI, reg. no. 157786-18

## DESCRIPTION

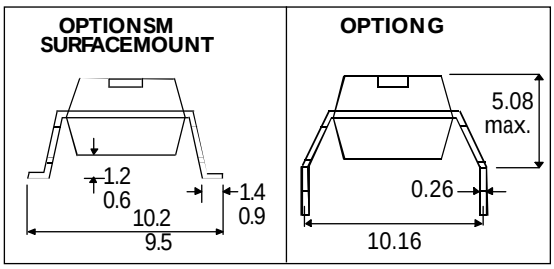
The 4N32-3,-2,-1 series of optically coupled isolators consist of an infrared light emitting diode and NPN silicon photodarlington in a space efficient dual in line plastic package.

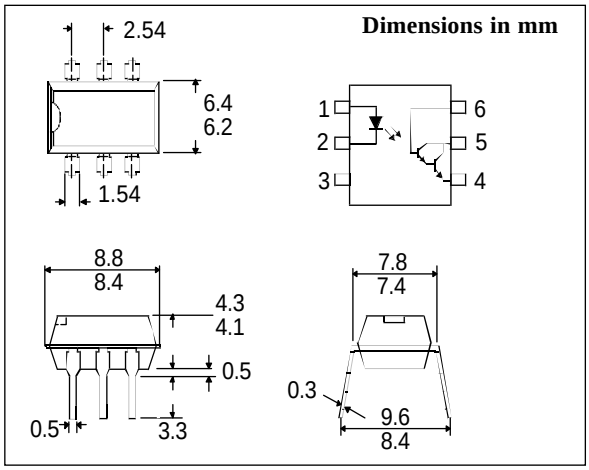
## FEATURES

- Options :-
  10mm lead spread - add G after part no.
  Surface mount - add SM after part no.
  Tape&reel - add SMT&R after part no.
- Low input current 0.25mA $I_F$
- High CurrentTransfer Ratio (200% min)
- High Isolation Voltage ($5.3kV_{RMS}$,$7.5kV_{PK}$)
- High $BV_{CEO}$ (55V min)
- 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 | 10V |
| Power Dissipation | 105mW |

## OUTPUT TRANSISTOR

| | |
|---|---|
| Collector-emitter Voltage $BV_{CEO}$ | 55V |
| Emitter-collector Voltage $BV_{ECO}$ | 6V |
| Power Dissipation | 150mW |

## POWER DISSIPATION

| | |
|---|---|
| Total Power Dissipation | 250mW |
| (derate linearly 3.3mW/°C above 25°C) | |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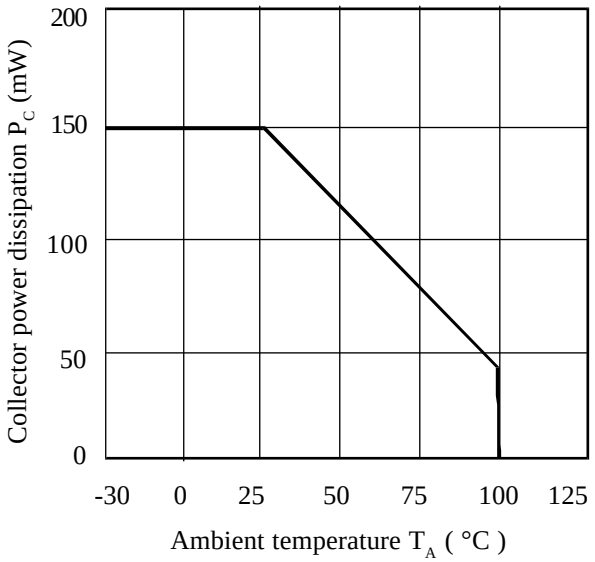
**ELECTRICAL CHARACTERISTICS ( $T_A$ = 25°C Unless otherwise noted )**

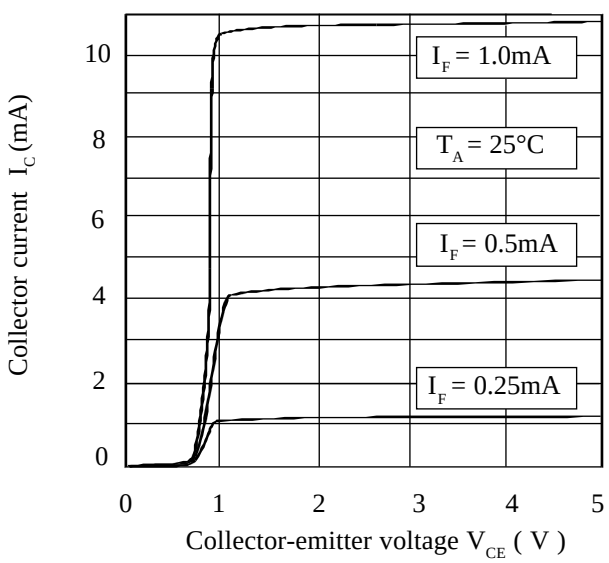
| PARAMETER | | MIN | TYP | MAX | UNITS | TEST CONDITION |
|---|---|---|---|---|---|---|
| Input | Forward Voltage ($V_F$) | | 1.2 | 1.4 | V | $I_F$ = 20mA |
| | Reverse Voltage ($V_R$) | 10 | | | V | $I_R$ = 10µA |
| | Reverse Current ($I_R$) | | | 10 | µA | $V_R$ = 10V |
| Output | Collector-emitter Breakdown ($BV_{CEO}$) | 55 | | | V | $I_C$ = 1mA (note 2) |
| | Collector-base Breakdown ($BV_{CBO}$) | 55 | | | V | $I_C$ = 100µA |
| | Emitter-collector Breakdown ($BV_{ECO}$) | 6 | | | V | $I_E$ = 100µA |
| | Collector-emitter Dark Current ($I_{CEO}$) | | | 100 | nA | $V_{CE}$ = 10V |
| Coupled | Current Transfer Ratio (CTR) (Note 2) | | | | | |
| | 4N32-3 | 200 | | | % | 0.25mA $I_F$, 1.0V $V_{CE}$ |
| | | 400 | | | % | 0.5mA $I_F$, 1.0V $V_{CE}$ |
| | | 800 | | | % | 1.0mA $I_F$, 1.0V $V_{CE.}$ |
| | 4N32-2 | 400 | | | % | 0.5mA $I_F$, 1.0V $V_{CE}$ |
| | | 800 | | | % | 1.0mA $I_F$, 1.0V $V_{CE.}$ |
| | 4N32-1 | 800 | | | % | 1.0mA $I_F$, 1.0V $V_{CE.}$ |
| | Collector-emitter Saturation Voltage -3 | | | 1.0 | V | 0.25mA $I_F$, 0.5mA $I_C$ |
| | -2 | | | 1.0 | V | 0.5mA $I_F$, 2mA $I_C$ |
| | -1 | | | 1.0 | V | 1.0mA $I_F$, 8mA $I_C$ |
| | Input to Output Isolation Voltage $V_{ISO}$ | 5300 | | | $V_{RMS}$ | (note 1) |
| | | 7500 | | | $V_{PK}$ | (note 1) |
| | Input-output Isolation Resistance $R_{ISO}$ | $5x10^{10}$ | | | Ω | $V_{IO}$ = 500V (note 1) |
| | Output Rise Time tr | | 60 | 300 | µs | $V_{CE}$ = 2V , |
| | Output Fall Time tf | | 53 | 250 | µs | $I_C$ = 10mA, $R_L$= 100Ω |

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.

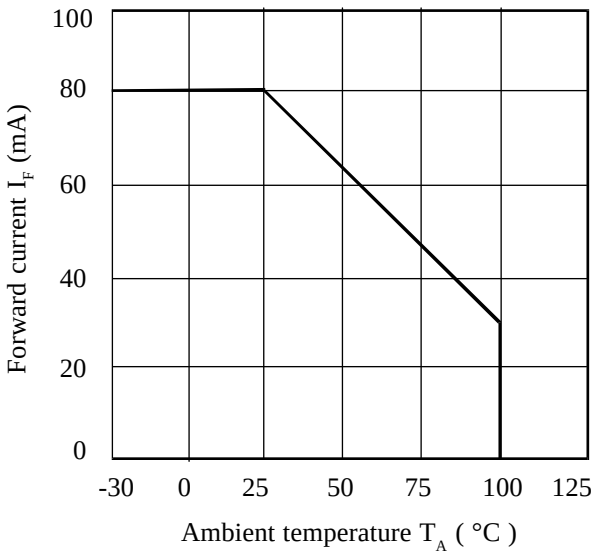
**Collector Power Dissipation vs. Ambient Temperature**



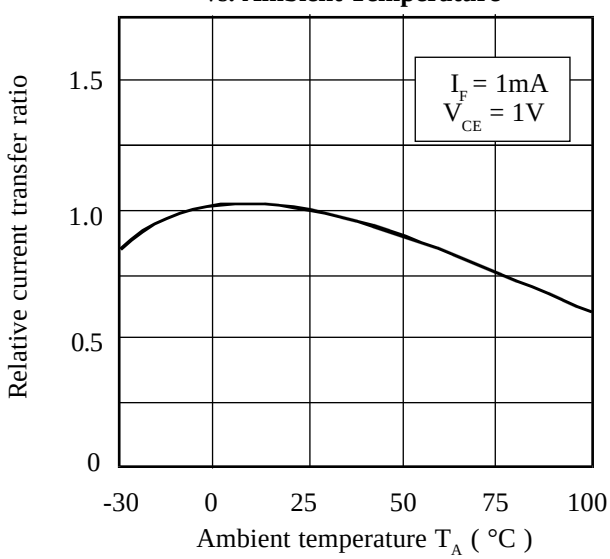

**Collector Current vs. Collector-emitter Voltage**



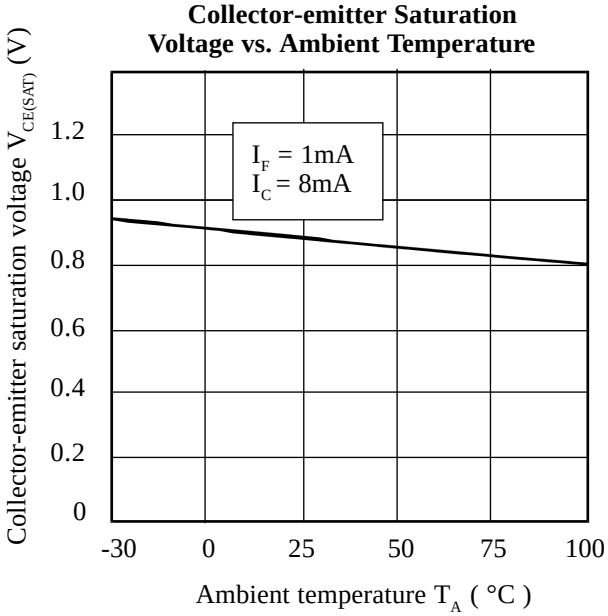

**Forward Current vs. Ambient Temperature**




**Relative Current Transfer Ratio vs. Ambient Temperature**




**Collector-emitter Saturation Voltage vs. Ambient Temperature**




**Current Transfer Ratio vs. Forward Current**