

4N29X, 4N30X, 4N31X, 4N32X, 4N33X  
4N29, 4N30, 4N31, 4N32, 4N33



**OPTICALLY COUPLED ISOLATOR  
PHOTODARLINGTON OUTPUT**

**'X' SPECIFICATION APPROVALS**

- VDE 0884 in 3 available lead form :-  
- STD  
- G form  
- SMD approved to CECC 0080

**DESCRIPTION**

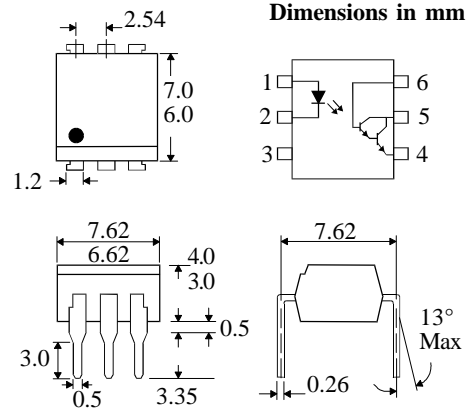
The 4N29, 4N30, 4N31, 4N32, 4N33 series of optically coupled isolators consist of an infrared light emitting diode and NPN silicon photodarlington in a space efficient dual in line plastic package.

**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<sub>RMS</sub>, 7.5kV<sub>PK</sub>)
- 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**

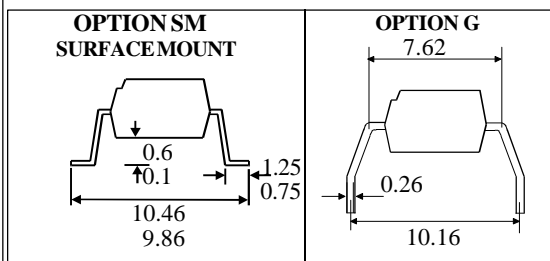
Forward Current	80mA
Reverse Voltage	5V
Power Dissipation	105mW

**OUTPUT TRANSISTOR**

Collector-emitter Voltage BV <sub>CEO</sub>	30V
Collector-base Voltage BV <sub>CBO</sub>	50V
Emitter-collector Voltage BV <sub>ECO</sub>	5V
Power Dissipation	150mW

**POWER DISSIPATION**

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



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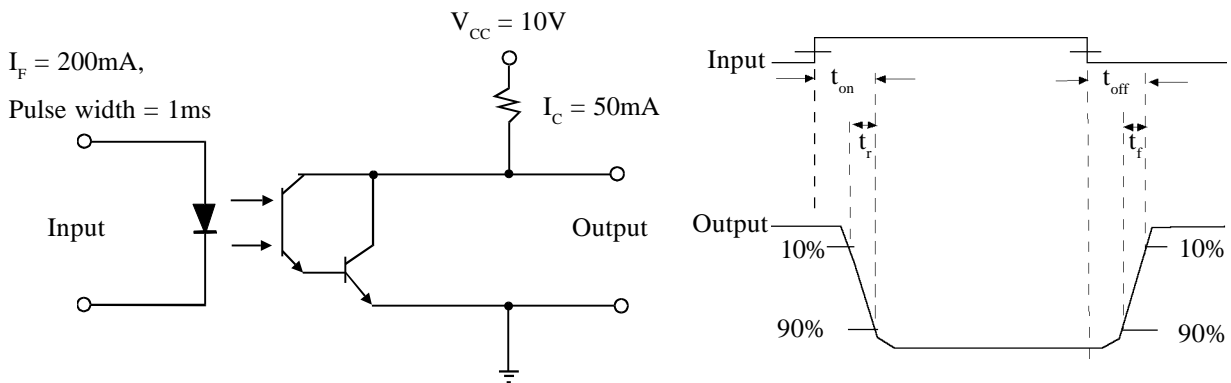
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**ELECTRICAL CHARACTERISTICS (  $T_A = 25^\circ\text{C}$  Unless otherwise noted )**

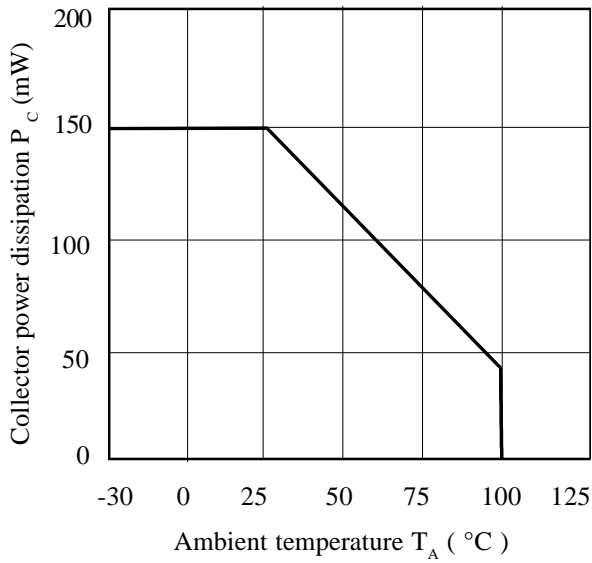
PARAMETER		MIN	TYP	MAX	UNITS	TEST CONDITION	
Input	Forward Voltage ( $V_F$ )		1.2	1.5	V	$I_F = 50\text{mA}$ $I_R = 10\mu\text{A}$ $V_R = 3\text{V}$	
	Reverse Voltage ( $V_R$ )	3			V		
	Reverse Current ( $I_R$ )			10	$\mu\text{A}$		
Output	Collector-emitter Breakdown ( $BV_{CEO}$ )	30			V	$I_C = 1\text{mA}$ (note 2) $I_C = 100\mu\text{A}$ $I_E = 100\mu\text{A}$ $V_{CE} = 10\text{V}$	
	Collector-base Breakdown ( $BV_{CBO}$ )	50			V		
	Emitter-collector Breakdown ( $BV_{ECO}$ )	5			V		
	Collector-emitter Dark Current ( $I_{CEO}$ )			100	nA		
Coupled	Collector Output Current ( $I_C$ ) (Note 2)					$10\text{mA } I_F, 10\text{V } V_{CE}$ $10\text{mA } I_F, 10\text{V } V_{CE}$ $10\text{mA } I_F, 10\text{V } V_{CE}$	
	4N32, 4N33	50			mA		
	4N29, 4N30	10			mA		
	4N31	5			mA		
	Collector-emitter Saturation Voltage $V_{CE(SAT)}$						$8\text{mA } I_F, 2\text{mA } I_C$ $8\text{mA } I_F, 2\text{mA } I_C$
	4N29, 4N30, 4N32, 4N33			1.0	V		
	4N31			1.2	V		
	Input to Output Isolation Voltage $V_{ISO}$	5300					$V_{RMS}$
		7500					$V_{PK}$
	Input-output Isolation Resistance $R_{ISO}$	$5 \times 10^{10}$					$\Omega$
Output Turn on Time      ton			5	$\mu\text{s}$	$V_{CC} = 10\text{V}, I_C = 50\text{mA},$ $I_F = 200\text{mA},$ Pulse Width = 1ms fig.1		
Output Turn off Time							
4N32, 4N33      toff			100	$\mu\text{s}$			
4N29, 4N30, 4N31			40	$\mu\text{s}$			

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.

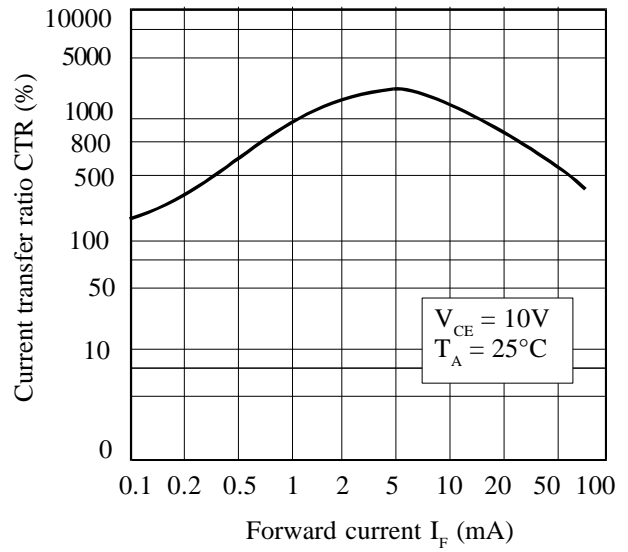
**FIGURE 1**



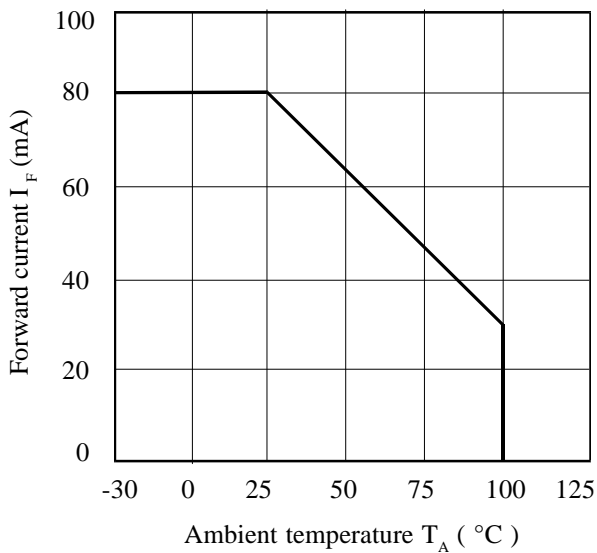
**Collector Power Dissipation vs. Ambient Temperature**



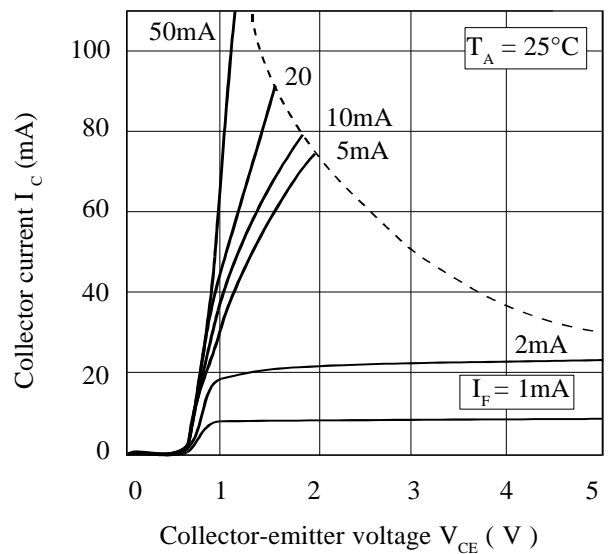
**Current Transfer Ratio vs. Forward Current**



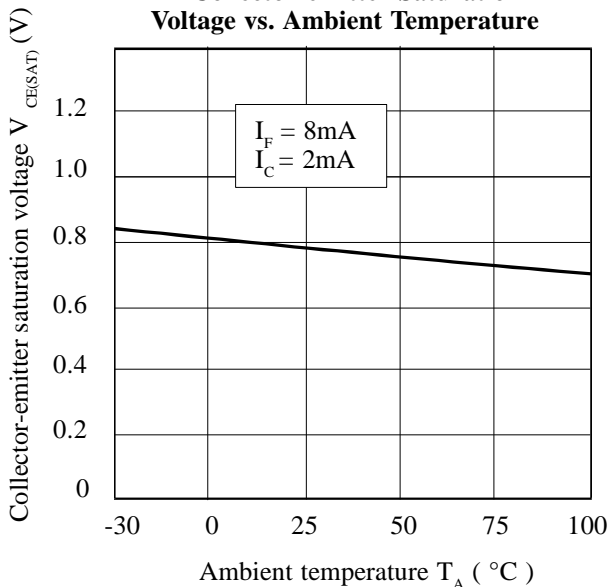
**Forward Current vs. Ambient Temperature**



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



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



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

