

4N38X, 4N38AX
4N38, 4N38A



**OPTICALLY COUPLED
ISOLATOR
PHOTOTRANSISTOR OUTPUT**

APPROVALS

- UL recognised, File No. E91231
- 'X' SPECIFICATION APPROVALS
- VDE 0884 in 3 available lead forms : -
- STD
- G form
- SMD approved to CECC 00802
- Certified to EN60950 by the following Test Bodies :-
Nemko - Certificate No. P96101299
Fimko - Registration No. 190469-01..22
Semko - Reference No. 9620076 01
Demko - Reference No. 305567

DESCRIPTION

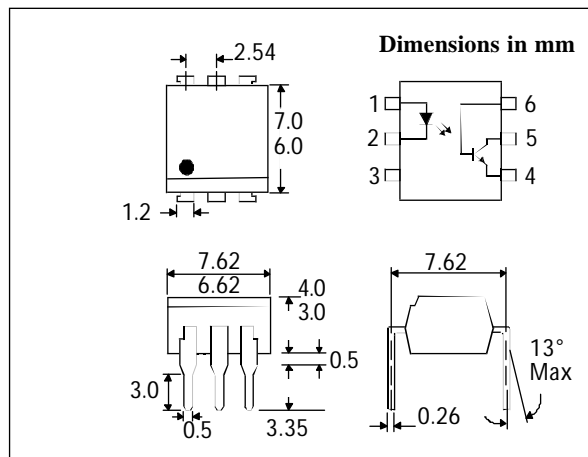
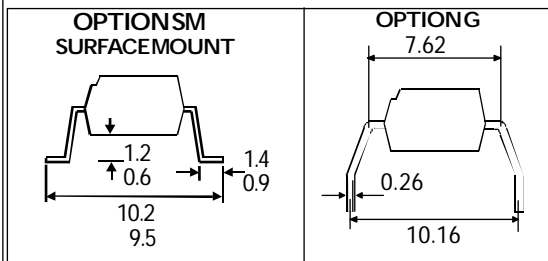
The 4N38, 4N38A series of optically coupled isolators consist of infrared light emitting diode and NPN silicon photo transistor in a standard 6 pin dual in line plastic package.

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 BV_{CEO} (80V min)
- High Isolation Voltage ($5.3kV_{RMS}, 7.5kV_{PK}$)
- All electrical parameters 100% tested
- Custom electrical selections available

APPLICATIONS

- DC motor controllers
- 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	_____	60mA
Reverse Voltage	_____	6V
Power Dissipation	_____	105mW

OUTPUT TRANSISTOR

Collector-emitter Voltage BV_{CEO}	_____	80V
Collector-base Voltage BV_{CBO}	_____	80V
Emitter-collector Voltage BV_{ECO}	_____	6V
Power Dissipation	_____	160mW

POWER DISSIPATION

Total Power Dissipation	_____	200mW
(derate linearly 2.67mW/°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	$I_F = 10\text{mA}$ $I_R = 10\mu\text{A}$ $V_R = 6\text{V}$
	Reverse Voltage (V_R)	6			V	
	Reverse Current (I_R)			10	μA	
Output	Collector-emitter Breakdown (BV_{CEO}) (note 2)	80			V	$I_C = 1\text{mA}$
	Collector-base Breakdown (BV_{CBO})	80			V	$I_C = 100\mu\text{A}$
	Emitter-collector Breakdown (BV_{ECO})	6			V	$I_E = 100\mu\text{A}$
	Collector-emitter Dark Current (I_{CEO})			50	nA	$V_{CE} = 60\text{V}$
	Collector-base Dark Current (I_{CBO})			20	nA	$V_{CE} = 60\text{V}$
Coupled	Current Transfer Ratio (CTR)	20			%	$10\text{mA } I_F, 10\text{V } V_{CE}$
	Collector-emitter Saturation Voltage $V_{CE(SAT)}$			1.0	V	$20\text{mA } I_F, 4\text{mA } I_C$
	Input to Output Isolation Voltage V_{ISO}	5300 7500			V_{RMS} V_{PK}	See note 1 See note 1
	Input-output Isolation Resistance R_{ISO}	5×10^{10}			Ω	$V_{IO} = 500\text{V}$ (note 1)
	Turn-on Time t_{on} Turn-off Time t_{off}		5 5		μs μs	$V_{CC} = 10\text{V}$, $I_C = 2\text{mA}$, $R_L = 100\Omega$ (FIG 1)

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.

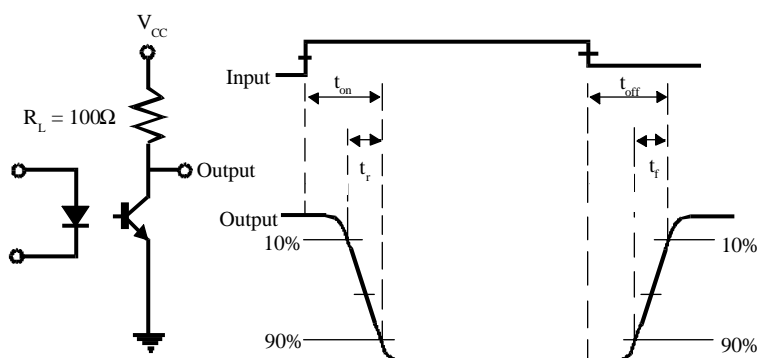
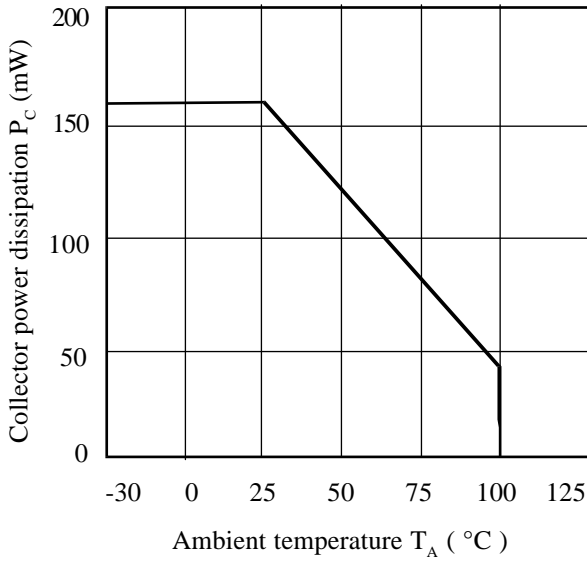
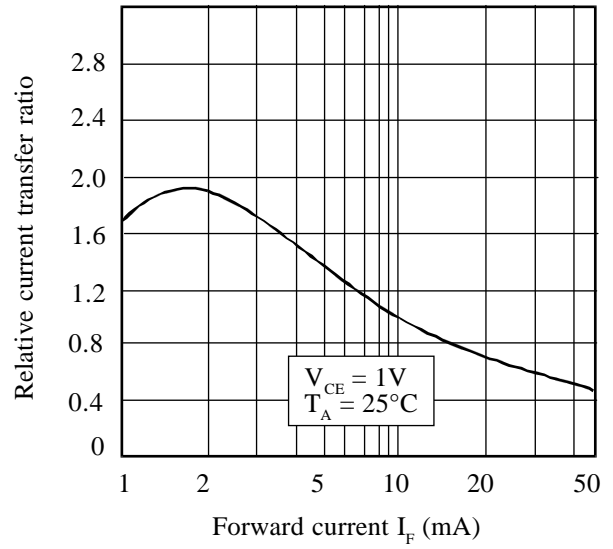


FIG 1

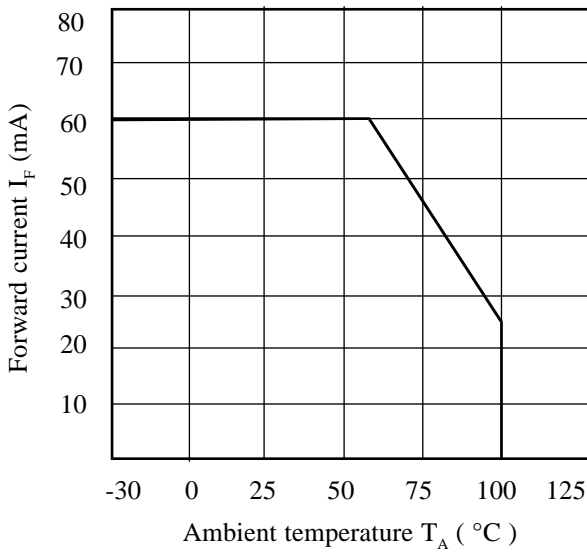
Collector Power Dissipation vs. Ambient Temperature



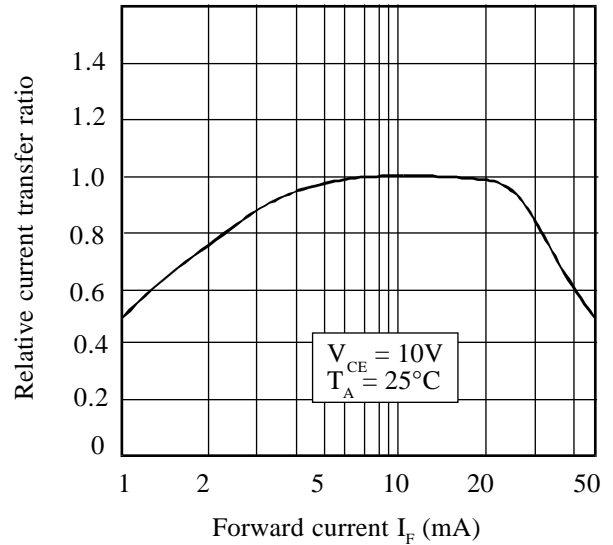
Relative Current Transfer Ratio vs. Forward Current



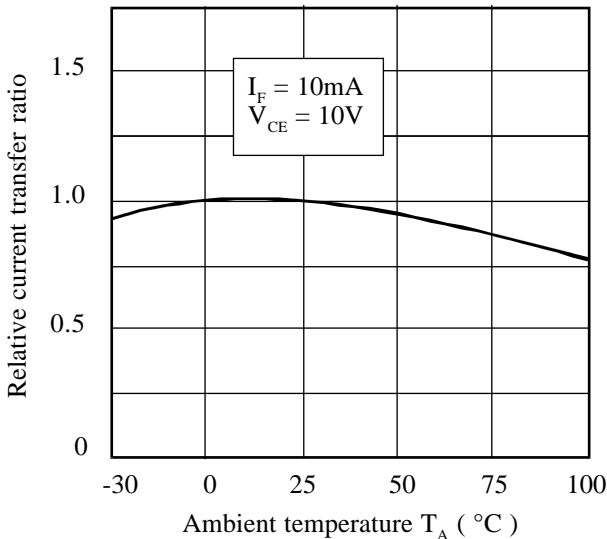
Forward Current vs. Ambient Temperature



Relative Current Transfer Ratio vs. Forward Current



Relative Current Transfer Ratio vs. Ambient Temperature



Collector-emitter Saturation Voltage vs. Ambient Temperature

