4N39X, 4N40X
4N39, 4N40

PHOTON COUPLED ISOLATOR Ga As INFRARED EMITTING DIODE & LIGHT ACTIVATED SCR

APPROVALS

- UL recognised, File No. E91231

'X' SPECIFICATION APPROVALS

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

DESCRIPTION

The 4N39, 4N40 are optically coupled isolators consisting of infrared light emitting diode and a light activated silicon controlled rectifier in a standard 6pin dual in line plastic package.

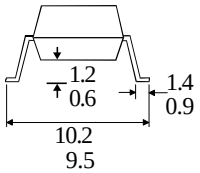
FEATURES

- 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 Isolation Voltage ($5.3kV_{RMS}$, $7.5kV_{PK}$)
- High Surge Anode Current (5.0 A)
- High Blocking Voltage (200V*[1], 400V*[1])
- Low Turn on Current (5mA typical)
- All electrical parameters 100% tested
- Custom electrical selections available

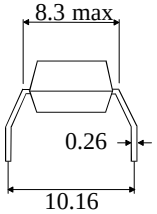
APPLICATIONS

- 10A, T²L compatible, Solid State Relay
- 25W Logic Indicator Lamp Driver
- 400V Symmetrical transistor coupler

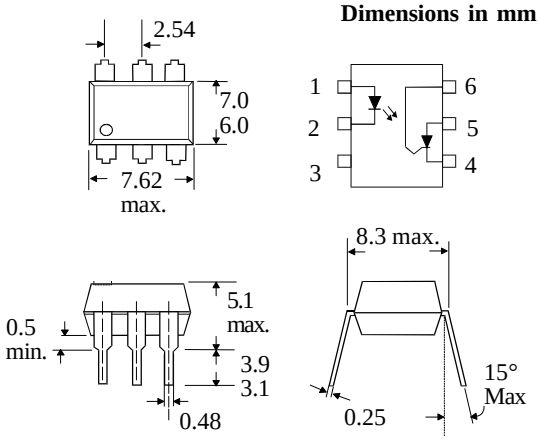
OPTION SM
SURFACE MOUNT



OPTION G



Dimensions in mm



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
Forward Current (Peak) (1µs pulse, 300pps)	3A
Reverse Voltage	6V
Power Dissipation	100mW

DETECTOR

Peak Forward Voltage	
4N39	200V*[1]
4N40	400V*[1]
Peak Reverse Gate Voltage	6V
RMS On-state Current	300mA
Peak On-state Current (100µs, 1% duty cycle)	10A
Surge Current (10ms)	5A
Power Dissipation	300mW

*1 IMPORTANT : A resistor must be connected between gate and cathode (pins 4 & 6) to prevent false firing (R_{GK} < 56kΩ)

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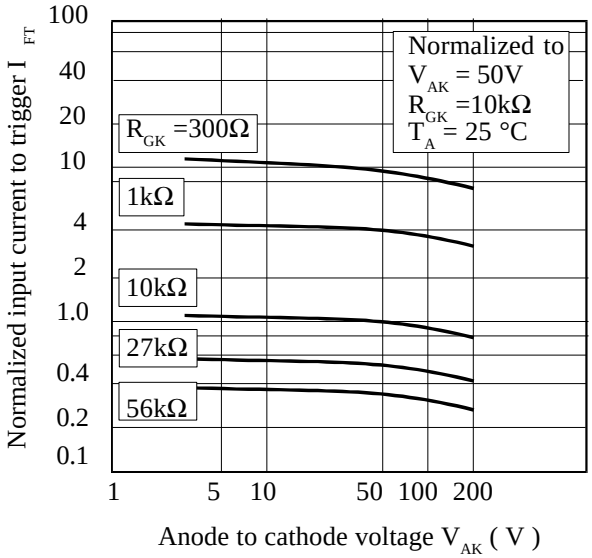
ELECTRICAL CHARACTERISTICS (T_A= 25°C Unless otherwise noted)

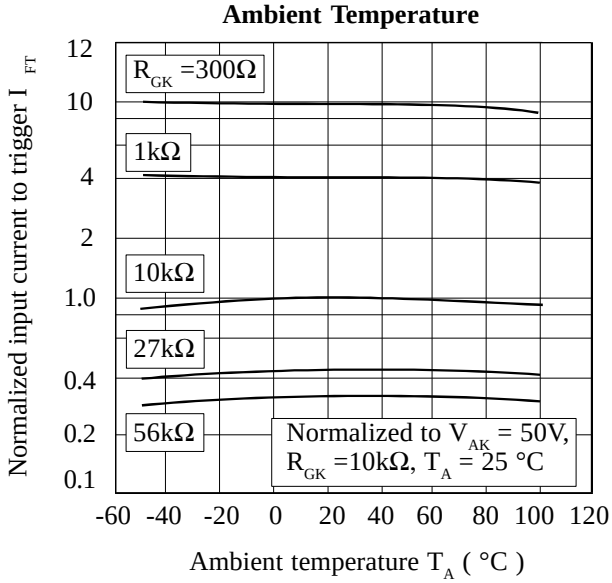
PARAMETER		MIN	TYP	MAX	UNITS	TEST CONDITION
Input	Forward Voltage (V_F)		1.2	1.5	V	I_F = 10mA
	Reverse Voltage (V_R)	3			V	I_R = 10µA
Output (note 2)	Peak Off-state Voltage (V_{DM})					
	4N39	200			V	R_{GK}=10kΩ, I_D= 50µA, T_A= 100°C
	4N40	400			V	R_{GK}=10kΩ,I_D=150µA, T_A=100°C
	Peak Reverse Voltage (V_{RM})					
	4N39	200			V	R_{GK}=10kΩ, I_D= 50µA, T_A=100°C
	4N40	400			V	R_{GK}=10kΩ,I_D=150µA, T_A=100°C
	On-state Voltage (V_{TM})		1.1	1.3	V	I_{TM} = 300mA
	Off-state Current (I_{DM})					
	4N39			50	µA	R_{GK}=10kΩ, I_F= 0, V_{DM}=200V, T_A=100°C
	4N40			150	µA	R_{GK}=10kΩ, I_F= 0, V_{DM}=400V, T_A=100°C
	Reverse Current (I_R)					
	4N39			50	µA	R_{GK}=10kΩ, I_F= 0, V_{DM}=200V, T_A=100°C
	4N40			150	µA	R_{GK}=10kΩ, I_F= 0, V_{DM}=400V, T_A=100°C
	Holding Current (I_H)			1	mA	R_{GK}=27kΩ, V_{FX}=50V
Coupled	Input Current to Trigger (I_{FT}) (note 2)					
				30	mA	V_{AK} =50V, R_{GK}=10kΩ
				14	mA	V_{AK}=100V, R_{GK}=27kΩ
	Turn on Time (t_{on})			50	µs	R_{GK}=10kΩ, I_F=30mA, V_{AK}=50V, R_L=200Ω
	Coupled dv/dt, Input to Output (dv/dt)	500			V/µs	
	Input to Output Isolation Voltage V_{ISO}	5300			V_{RMS}	See note 1
		7500			V_{PK}	See note 1
	Input-output Isolation Resistance R_{ISO}	10^{11}			Ω	V_{IO} = 500V (note 1)
	Input-output Capacitance Cf			2	pF	V = 0, f =1MHz

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.

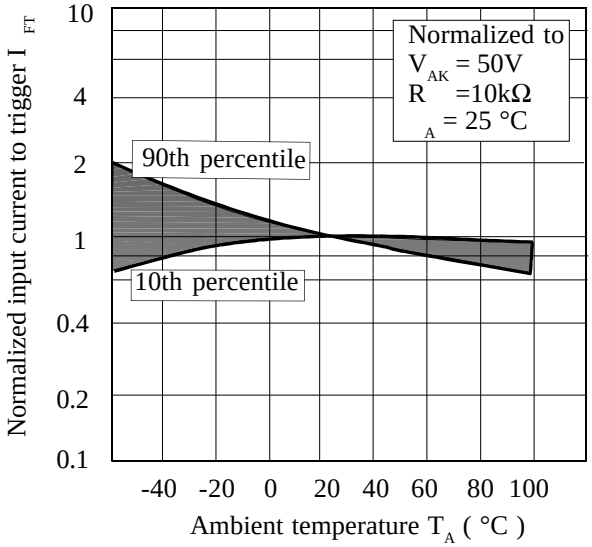
Input Current to Trigger vs. Anode to Cathode Voltage



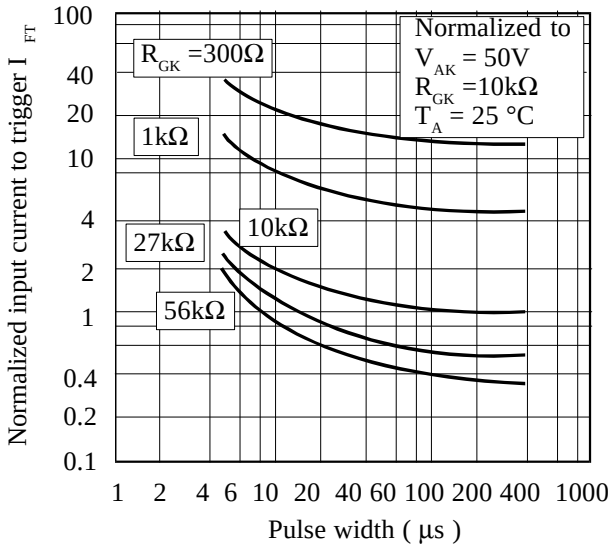
Input Current to Trigger vs. Ambient Temperature



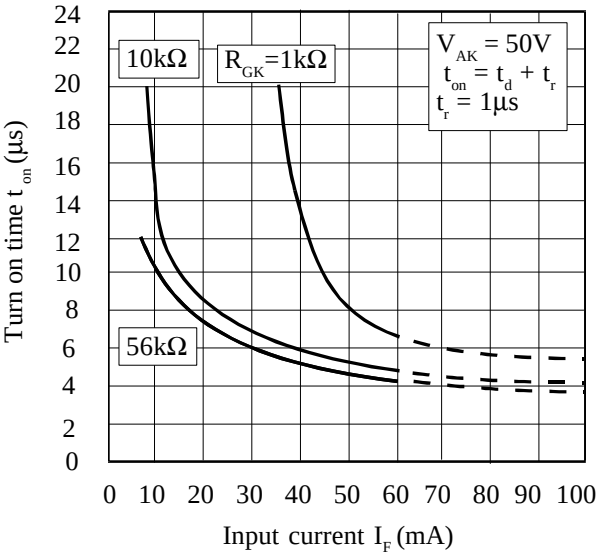
Input Current to Trigger Distribution vs. Ambient Temperature



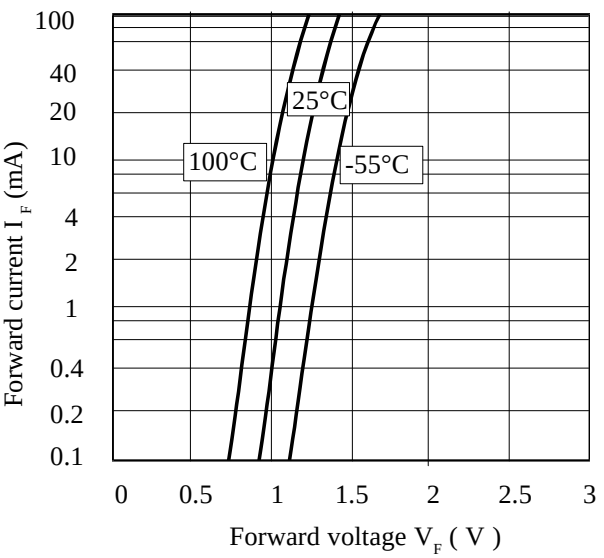
Input Current to Trigger vs. Pulse Width



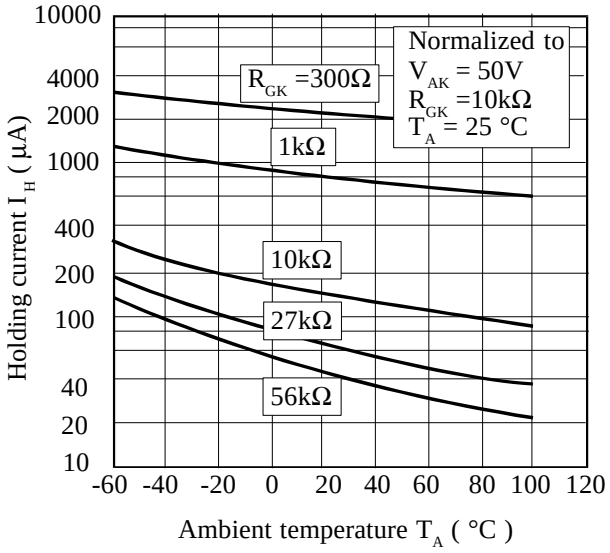
Turn on Time vs. Input Current



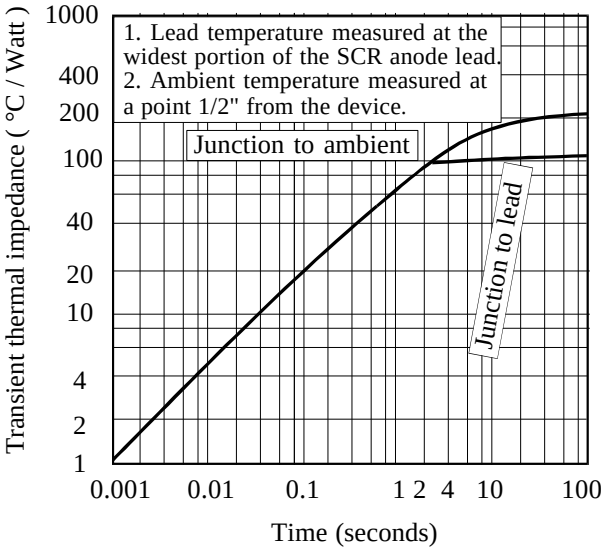
Input Characteristics I_F vs. V_F



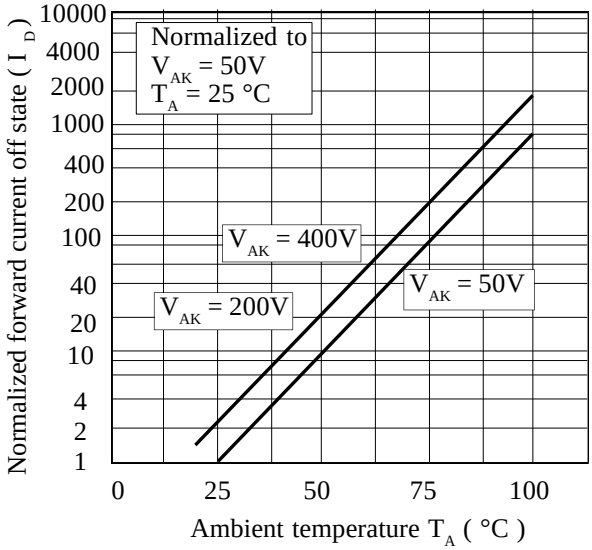
Holding Current vs. Ambient Temperature



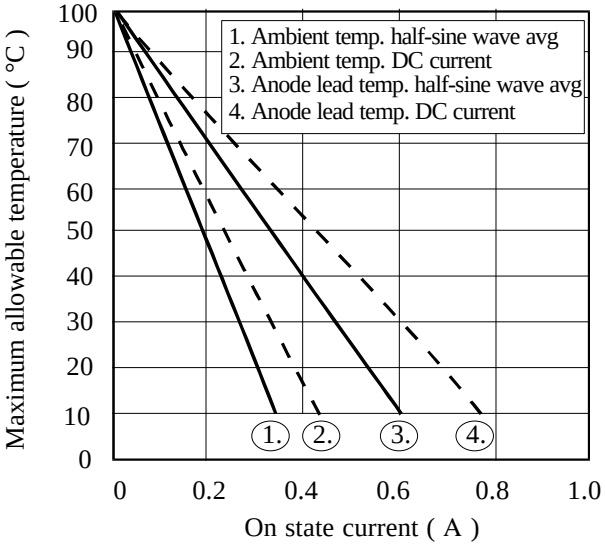
Maximum Transient Thermal Impedence



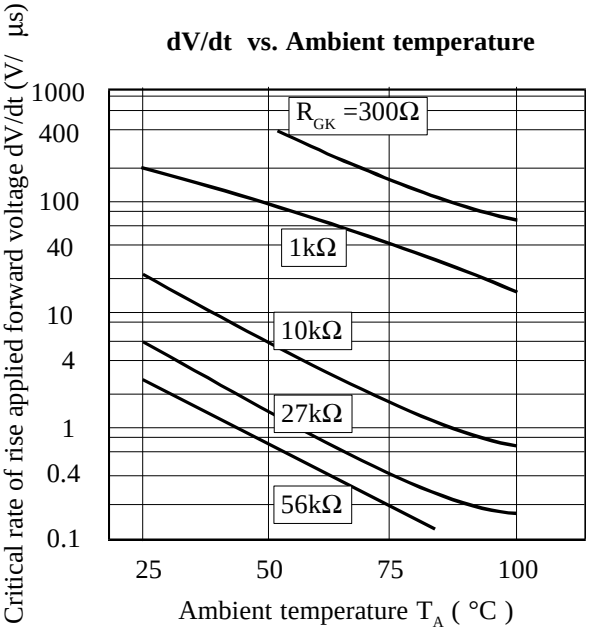
Off State Forward Current vs. Ambient Temperature



On State Current vs. Maximum Allowable Temperature



dV/dt vs. Ambient temperature



On State Characteristics