

# CNY30, CNY34 Optoisolator

## GaAs Infrared Emitting Diode and Light Activated SCR

The CNY30 and CNY34 consist of a gallium arsenide, infrared emitting diode coupled with a light activated silicon controlled rectifier in a dual-in-line package. These devices are also available in surface-mount packaging.

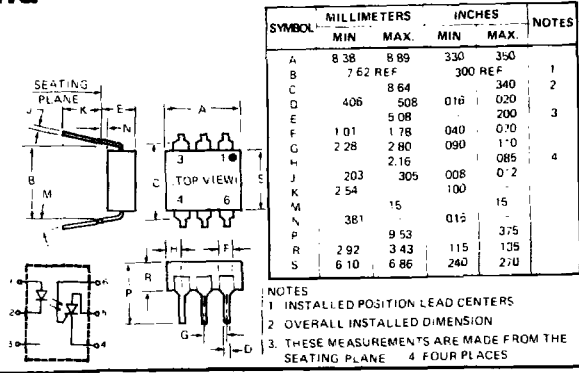
**absolute maximum ratings: (25°C)**

INFRARED EMITTING DIODE		
Power Dissipation (-55°C to 50°C)	*100	milliwatts
Forward Current (Continuous) (-55°C to 50°C)	60	milliamps
Forward Current (Peak) (-55°C to 50°C) (100 μs 1% duty cycle)	1	ampere
Reverse Voltage (-55°C to 50°C)	6	volts

\*Derate 2.0mW/°C above 50°C.

PHOTO-SCR		
Off-State and Reverse Voltage (-55°C to 100°C)	CNY30 200 CNY34 400	volts
Peak Reverse Gate Voltage (-55°C to 50°C)	6	volts
Direct On-State Current (-55°C to 50°C)	300	milliamps
Surge (non-rep) On-State Current (-55°C to 50°C)	10	amps
Peak Gate Current (-55°C to 50°C)	10	milliamps
Output Power Dissipation (-55°C to 50°C)**	400	milliwatts

\*\*Derate 8mW/°C above 50°C.



TOTAL DEVICE	
Storage Temperature Range	-55°C to 150°C
Operating Temperature Range	-55°C to 100°C
Normal Temperature Range (No Derating)	-55°C to 80°C
Soldering Temperature (10 seconds)	260°C
Total Device Dissipation (-55°C to 50°C)	450 milliwatts
Linear Derating Factor (above 50°C)	9.0mW/°C
Surge Isolation Voltage (Input to Output)	3535V(peak) 2500V(RMS)
Steady-State Isolation Voltage (Input to Output)	3180V(peak) 2250(RMS)

### individual electrical characteristics (25°C) (unless otherwise specified)

INFRAREMITTINGDIODE	TYP.	MAX.	UNITS
Forward Voltage $V_F$ ( $I_F = 10mA$ )	1.1	1.5	volts
Reverse Current $I_R$ ( $V_R = 3V$ )	-	10	microamps
Capacitance $C_j$ ( $V = 0, f = 1 MHz$ )	50	-	picofarads

PHOTO-SCR	MIN.	MAX.	UNITS
Peak Off-State Voltage - $V_{DM}$ ( $R_{GK} = 10K\Omega, T_A = 100^\circ C$ )	CNY30 200 CNY34 400	-	volts
Peak Reverse Voltage - $V_{RM}$ ( $T_A = 100^\circ C$ )	CNY30 200 CNY34 400	-	volts
On-State Voltage - $V_T$ ( $I_T = 300mA$ )		1.3	volts
Off-State Current - $I_D$ ( $V_D = 200V, T_A = 100^\circ C, I_F = 0, R_{GK} = 10K$ )	CNY30	50	microamps
Off-State Current - $I_D$ ( $V_D = 400V, T_A = 100^\circ C, I_F = 0, R_{GK} = 10K$ )	CNY34	150	microamps
Reverse Current - $I_R$ ( $V_R = 200V, T_A = 100^\circ C, I_F = 0$ )	CNY30	50	microamps
Reverse Current - $I_R$ ( $V_R = 400V, T_A = 100^\circ C, I_F = 0$ )	CNY34	150	microamps

### coupled electrical characteristics (25°C)

	MIN.	MAX.	UNITS
Input Current to Trigger	-	20	milliamps
Isolation Resistance	100	-	gigaohms
Turn-On Time - $V_{AK} = 50V, I_F = 30mA, R_{GK} = 10K\Omega, R_L = 200\Omega$	-	50	microseconds
Coupled dv/dt, Input to Output (See Figure 13)	500	-	volts microsec.
Input to Output Capacitance ( $V_{IO} = 0, f = 1 MHz$ )	-	2	picofarads

VDE Approved to 0883:6.80 0110b Certificate # 35025

TYPICAL CHARACTERISTICS

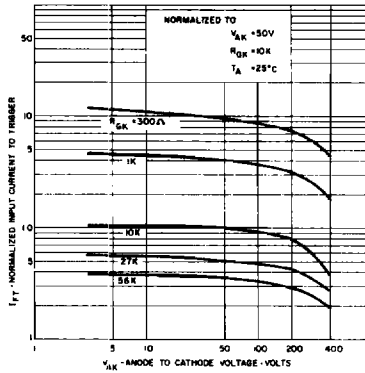


FIGURE 1. INPUT CURRENT TO TRIGGER VS. ANODE-CATHODE VOLTAGE

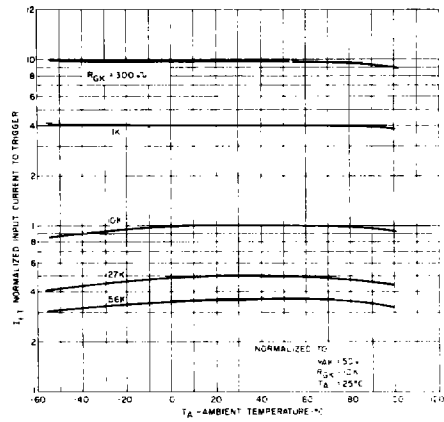


FIGURE 2. INPUT CURRENT TO TRIGGER VS. TEMPERATURE

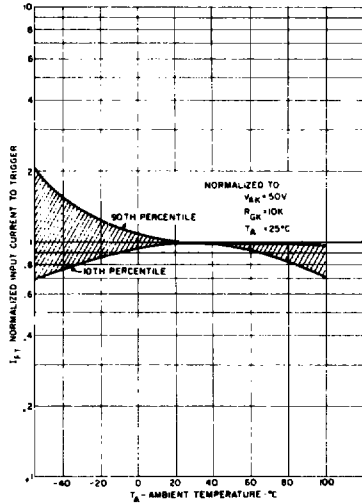


FIGURE 3. INPUT CURRENT TO TRIGGER DISTRIBUTION VS. TEMPERATURE

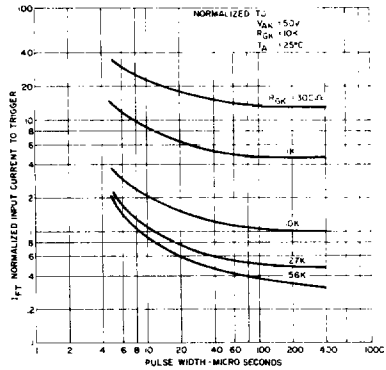


FIGURE 4. INPUT CURRENT TO TRIGGER VS. PULSE WIDTH

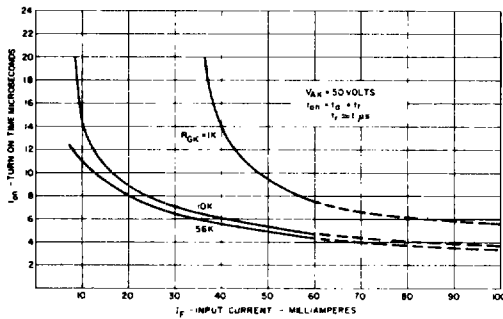


FIGURE 5. TURN-ON TIME VS. INPUT CURRENT

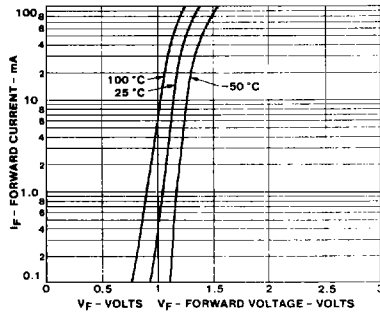


FIGURE 6. INPUT CHARACTERISTICS I<sub>F</sub> VS. V<sub>F</sub>

CNY30, CNY34

TYPICAL CHARACTERISTICS OF OUTPUT (SCR)

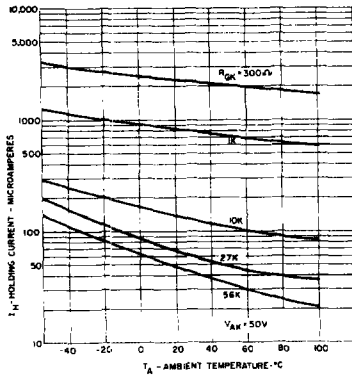


FIGURE 7. HOLDING CURRENT VS. TEMPERATURE

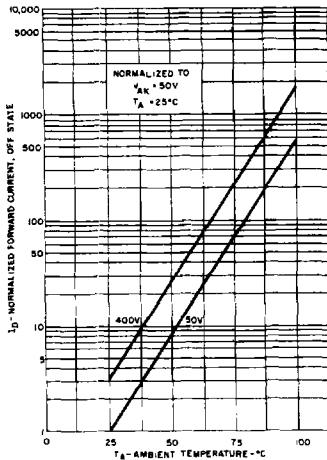


FIGURE 9. OFF-STATE FORWARD CURRENT VS. TEMPERATURE

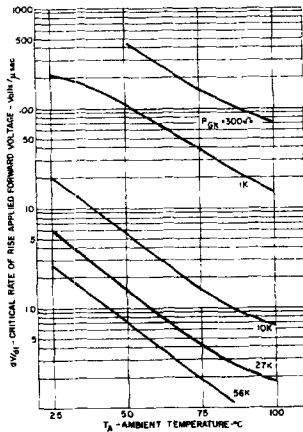


FIGURE 11.  $dv/dt$  VS. TEMPERATURE

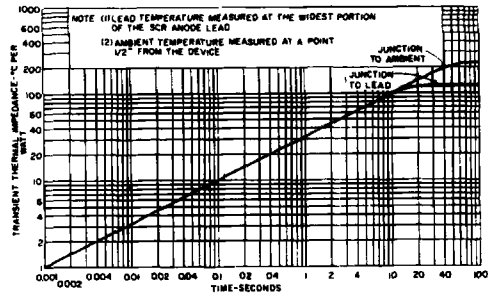


FIGURE 8. MAXIMUM TRANSIENT THERMAL IMPEDANCE

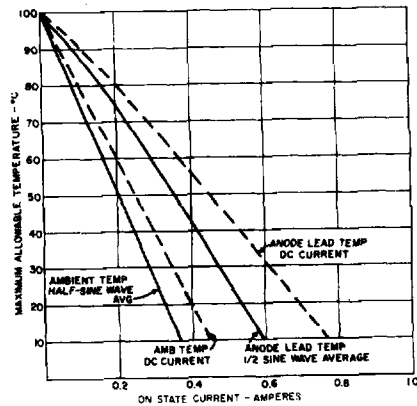


FIGURE 10. ON-STATE CURRENT VS. MAXIMUM ALLOWABLE TEMPERATURE

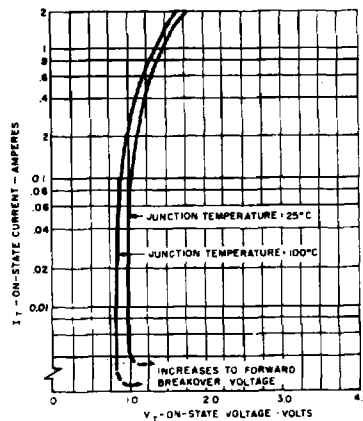
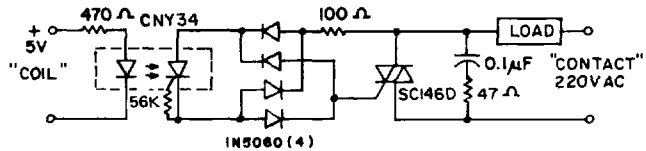


FIGURE 12. ON-STATE CHARACTERISTICS

TYPICAL APPLICATIONS

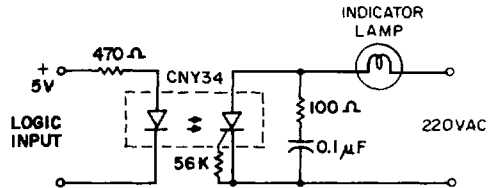
10A, T<sup>2</sup>L COMPATIBLE, SOLID STATE RELAY

Use of the CNY34 for high sensitivity, 2500V isolation capability, provides this highly reliable solid state relay design. This design is compatible with 74, 74S and 74H series T<sup>2</sup>L logic systems inputs and 220V AC loads up to 10A.



25W LOGIC INDICATOR LAMP DRIVER

The high surge capability and non-reactive input characteristics of the device allow it to directly couple, without buffers, T<sup>2</sup>L and DTL logic to indicator and alarm devices, without danger of introducing noise and logic glitches.



400V SYMMETRICAL TRANSISTOR COUPLER

Use of the high voltage PNP portion of the CNY34 provides a 400V transistor capable of conducting positive and negative signals with current transfer ratios of over 1%. This function is useful in remote instrumentation, high voltage power supplies and test equipment. Care should be taken not to exceed the CNY34 400 mW power dissipation rating when used at high voltages.

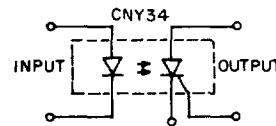


FIGURE 13  
COUPLED  $dv/dt$  - TEST CIRCUIT

$V_p = 800$  Volts  
 $t_p = .010$  Seconds  
 $f = 25$  Hertz  
 $T_A = 25^\circ$  C

