

Photon Coupled Isolator CNY33

Ga As Infrared Emitting Diode & NPN Silicon High Voltage Photo-Transistor

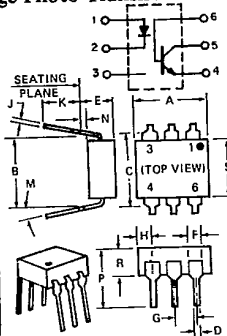
The GE Solid State CNY33 is a gallium arsenide, infrared emitting diode coupled with silicon high voltage phototransistors in a dual-in-line package. This device is also available in Surface-Mount packaging.

absolute maximum ratings: (25°C)

INFRARED EMITTING DIODE		
Power Dissipation	*100	milliwatts
Forward Current (Continuous)	60	milliamps
Forward Current (Peak) (Pulse width 1 μ sec 300 pps)	3	ampere
Reverse Voltage	6	volts
*Derate 1.33mW/°C above 25°C ambient.		

PHOTO-TRANSISTOR		
Power Dissipation	**300	milliwatts
V _{CEO}	300	volts
V _{CBO}	300	volts
V _{EBO}	7	volts
Collector Current (Continuous)	100	milliamps
**Derate 4.0mW/°C above 25°C ambient.		

SYMBOL	MILLIMETERS		INCHES		NOTES
	MIN.	MAX.	MIN.	MAX.	
A	8.38	8.89	330	350	1
B	7.62 REF	—	300 REF	—	2
C	—	8.64	—	340	2
D	406	508	016	020	3
E	—	5.08	—	070	3
F	1.01	1.78	040	110	4
G	2.28	2.80	090	110	4
H	—	2.16	—	085	4
J	203	305	008	012	4
K	254	—	100	—	4
M	—	15	—	15	4
N	381	—	015	—	4
P	—	9.53	—	375	4
R	292	343	115	135	4
S	6.10	6.86	240	270	4



NOTES
1 INSTALLED POSITION LEAD CENTERS
2 OVERALL INSTALLED DIMENSION.
3 THESE MEASUREMENTS ARE MADE FROM THE SEATING PLANE.
4 FOUR PLACES

TOTAL DEVICE

Storage Temperature -55 to 150°C
Operating Temperature -55 to 100°C
Lead Soldering Time (at 260°C) 10 seconds.
Surge Isolation Voltage (Input to Output).
3535V_(peak) 2500V_(RMS)
Steady-State Isolation Voltage (Input to Output).
3180V_(peak) 2250V_(RMS)

individual electrical characteristics (25°C)

INFRARED EMITTING DIODE	TYP.	MAX.	UNITS	PHOTO-TRANSISTOR	MIN.	MAX.	UNITS
Forward Voltage (I _F = 10mA)	1.1	1.5	volts	Breakdown Voltage - V _{(BR)CEO} (I _C = 1mA; I _F = 0)	300	—	volts
Reverse Current (V _R = 6V)	—	10	microamps	Breakdown Voltage - V _{(BR)CBO} (I _C = 100 μ A; I _F = 0)	300	—	volts
Capacitance (V = 0, f = 1 MHz)	50	—	picoFarads	Breakdown Voltage - V _{(BR)EBO} (I _E = 100 μ A; I _F = 0)	7	—	volts
				Collector Dark Current - I _{CEO} (V _{CE} = 200V; I _F = 0; T _A = 25°C)	—	100	nanoamps
				(V _{CE} = 200V; I _F = 0; T _A = 100°C)	—	250	microamps

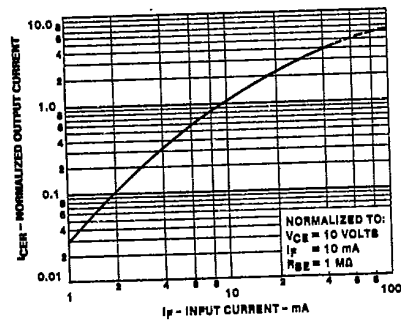
coupled electrical characteristics (25°C)

	MIN.	TYP.	MAX.	UNITS
DC Current Transfer Ratio (I _F = 10mA, V _{CE} = 10V)	20	—	—	%
Saturation Voltage - Collector to Emitter (I _F = 10mA, I _C = 0.5mA)	—	0.1	0.4	volts
Isolation Resistance (V _{IO} = 500V _{DC})	100	—	—	gigaohms
Input to Output Capacitance (V _{IO} = 0, f = 1MHz)	—	—	2	picoFarads
Switching Speeds: Turn-On Time - (V _{CE} = 10V, I _{CE} = 2mA, R _L = 100 Ω)	—	5	—	microseconds
Turn-Off Time - (V _{CE} = 10V, I _{CE} = 2mA, R _L = 100 Ω)	—	5	—	microseconds

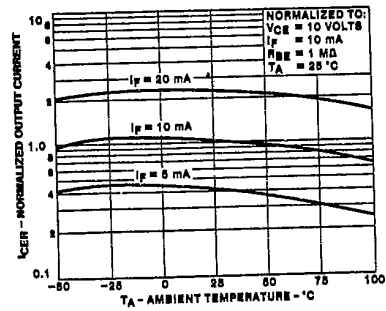
VDE Approved to 0883/6.80 0110b Certificate # 35025

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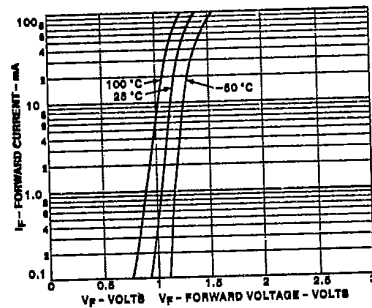
TYPICAL CHARACTERISTICS



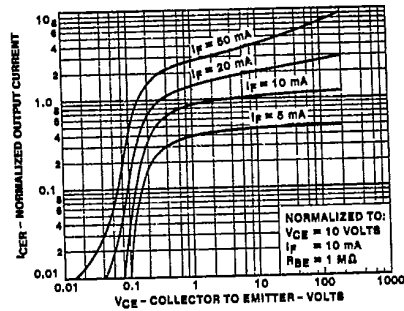
1. OUTPUT CURRENT VS INPUT CURRENT



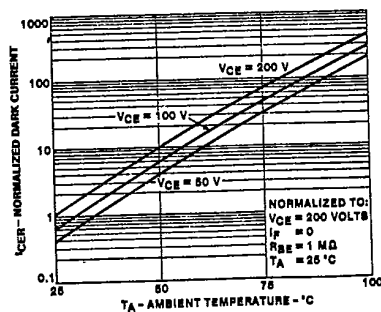
2. OUTPUT CURRENT VS. TEMPERATURE



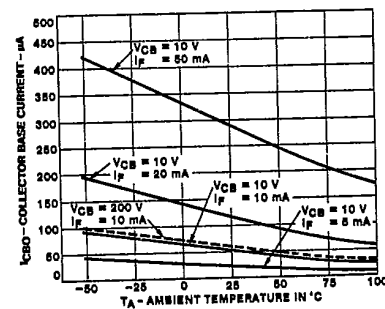
3. INPUT CHARACTERISTICS



4. OUTPUT CHARACTERISTICS



5. NORMALIZED DARK CURRENT VS. TEMPERATURE



6. COLLECTOR BASE CURRENT VS. TEMPERATURE

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AC Input Photon Coupled Isolator CNY35

Ga As Infrared Emitting Diodes & NPN Silicon Photo-Transistor

The GE Solid State CNY35 consists of two gallium arsenide, infrared emitting diodes connected in inverse parallel and coupled with a silicon phototransistor in a dual-in-line package. This device is also available in Surface-Mount packaging.

FEATURES:

- AC or polarity insensitive inputs
- Fast switching speeds
- Built-in reverse polarity input protection
- High isolation voltage
- High isolation resistance
- I/O compatible with integrated circuits

absolute maximum ratings: (25°C) (unless otherwise specified)

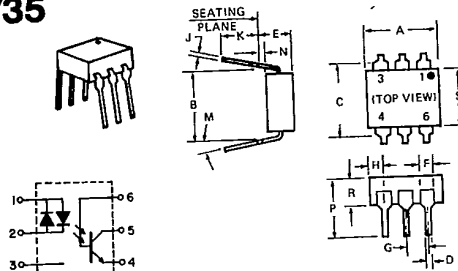
INFRARED EMITTING DIODE			
Power Dissipation — $T_A = 25^\circ\text{C}$	*100	milliwatts	
Power Dissipation — $T_A = 25^\circ\text{C}$	*100	milliwatts	
(T _C indicates collector lead temperature 1/32" from case)			
Input Current (RMS)	60	milliamps	
Input Current (Peak)	±1	ampere	
(Pulse width 1 μs, 300 pps)			
*Derate 1.33 mW/°C above 25°C			

PHOTO-TRANSISTOR			
Power Dissipation — $T_A = 25^\circ\text{C}$	**300	milliwatts	
Power Dissipation — $T_A = 25^\circ\text{C}$	***500	milliwatts	
(T _C indicates collector lead temperature 1/32" from case)			
V _{CEO}	30	volts	
V _{CBO}	70	volts	
V _{EBO}	5	volts	
Collector Current Continuous)	100	milliamps	
**Derate 4.0 mW/°C above 25°C			
***Derate 6.7 mW/°C above 25°C			

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

INFRARED EMITTING DIODE	MAX.	UNITS
Input Voltage — V _F (I _F = ±10mA)	1.8	volts
Capacitance (V = 0, f = 1 MHz)	100	picofarads

PHOTO-TRANSISTOR	MIN.	MAX.	UNITS
Breakdown Voltage — V _{(BR)CEO} (I _C = 10mA, I _F = 0)	30	—	volts
Breakdown Voltage — V _{(BR)CBO} (I _C = 100μA, I _F = 0)	70	—	volts
Breakdown Voltage — V _{(BR)EBO} (I _E = 100μA, I _F = 0)	5	—	volts
Collector Dark Current — I _{CEO} (V _{CE} = 10V, I _F = 0)	—	200	nanoamps



SYMBOL	MILLIMETERS		INCHES		NOTES
	MIN.	MAX.	MIN.	MAX.	
A	8.38	8.89	330	350	1
B	7.62	REF.	300	REF.	1
C	—	8.64	—	340	2
D	.406	.508	.016	.020	2
E	—	5.08	—	.200	3
F	1.01	1.78	.040	.070	3
G	2.28	2.80	.090	.110	3
H	—	2.16	—	.085	4
J	2.03	.305	.008	.012	4
K	2.54	—	—	.100	4
M	—	.15	—	.15	4
N	.381	—	.015	—	4
P	—	9.53	—	.375	4
R	2.92	3.43	.115	.135	4
S	6.10	6.86	.240	.270	4

NOTES

1. INSTALLED POSITION LEAD CENTERS.
2. OVERALL INSTALLED DIMENSION.
3. THESE MEASUREMENTS ARE MADE FROM THE SEATING PLANE.
4. FOUR PLACES.

TOTAL DEVICE

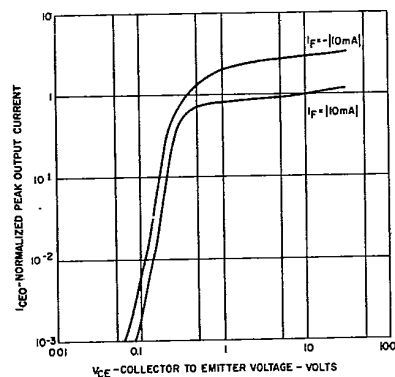
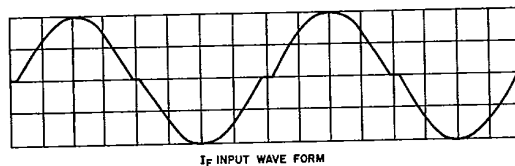
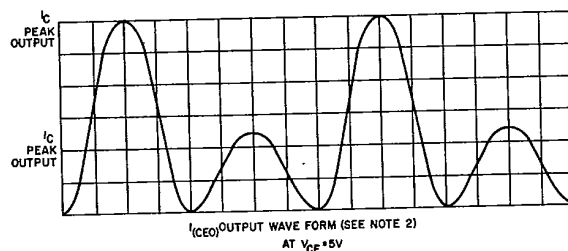
Storage Temperature -55 to 150°C
 Operating Temperature -55 to 100°C
 Lead Soldering Time (at 260°C) 10 seconds
 Surge Isolation Voltage (Input to Output)
 1500V_(peak) 1060V_(RMS)
 Steady-State Isolation Voltage (Input to Output)
 950V_(peak) 660V_(RMS)

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coupled electrical characteristics (25°C) (unless otherwise specified)

	MIN.	MAX.	UNITS
Current Transfer Ratio ($V_{CE} = 10V$, $I_F = \pm 10mA$)	10	—	percent
Saturation Voltage — Collector to Emitter ($I_{CEO} = 0.5 mA$, $I_F = \pm 10mA$)	—	0.4	volts
Isolation Resistance $V_{IO} = 500V$ (note 1)	100	—	gigaohms

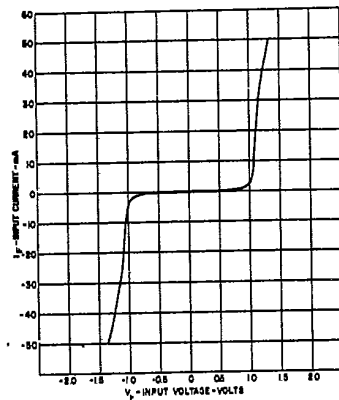
Note 1: Tests of input to output isolation current resistance, and capacitance are performed with the input terminals (diode) shorted together and the output terminals (transistor) shorted together.



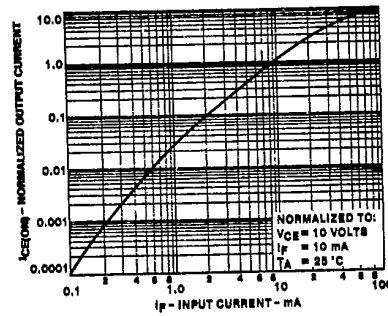
Note 2: These waveforms and curves are exaggerated in amplitude differences to indicate the outputs corresponding to the positive and negative input polarities will not be identical. Typical differences in amplitude is 10% to 20%.

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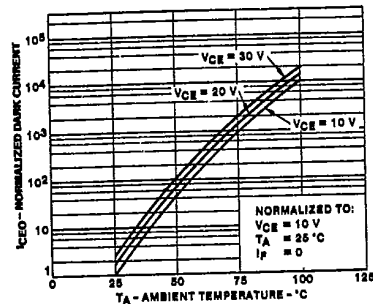
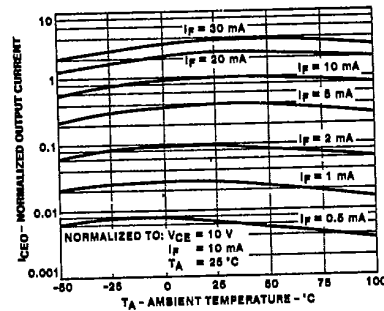
TYPICAL CHARACTERISTICS



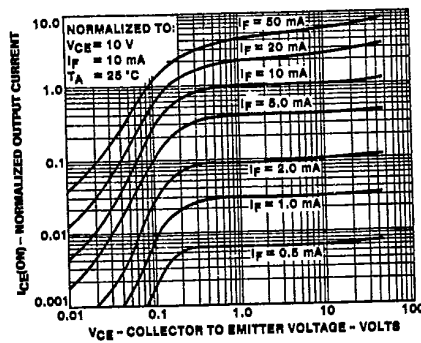
1. INPUT CHARACTERISTICS



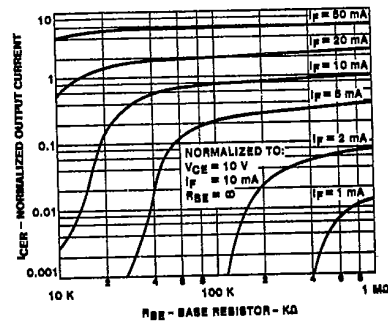
2. OUTPUT CURRENT VS INPUT CURRENT

3. DARK I_{CEO} CURRENT VS TEMPERATURE

4. OUTPUT CURRENT VS TEMPERATURE



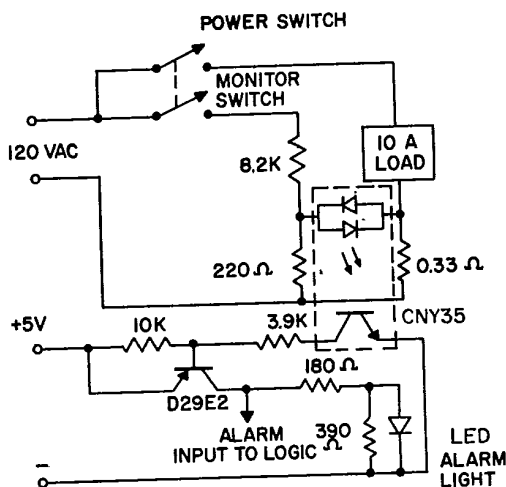
5. OUTPUT CHARACTERISTICS

6. OUTPUT CURRENT VS BASE
EMITTER RESISTANCE

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TYPICAL APPLICATIONS

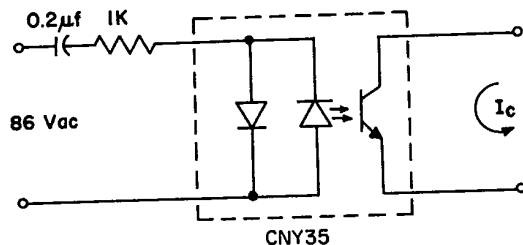
LOAD MONITOR AND ALARM



In many computer controlled systems where AC power is controlled, load dropout due to filament burnout, fusing, etc. or the opposite situation - load power when uncalled for due to switch failure can cause serious systems or safety problems. This circuit provides a simple AC power monitor which lights an alarm lamp and provides a "1" input to the computer control in either of these situations while maintaining complete electrical isolation between the logic and the power system.

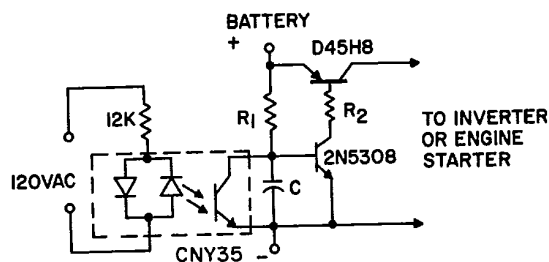
Note that for other than resistive loads, phase angle correction of the monitoring voltage divider is required.

RING DETECTOR



In many telecommunications applications it is desirable to detect the presence of a ring signal in a system without any direct electrical contact with the system. When the 86 Vac ring signal is applied, the output transistor of the CNY35 is turned on indicating the presence of a ring signal in the isolated telecommunications system.

UPS SOLID STATE TURN-ON SWITCH



Interruption of the 120 VAC power line turns off the CNY35, allowing C to charge and turn on the 2N5308-D45H8 combination which activates the auxiliary power supply. This system features low standby drain, isolation to prevent ground loop problems and the capability of ignoring a fixed number of "dropped cycles" by choice of the value of C.

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