

# Photon Coupled Isolator CNY47, CNY47A

Ga As Infrared Emitting Diode & NPN Silicon Photo-Transistor

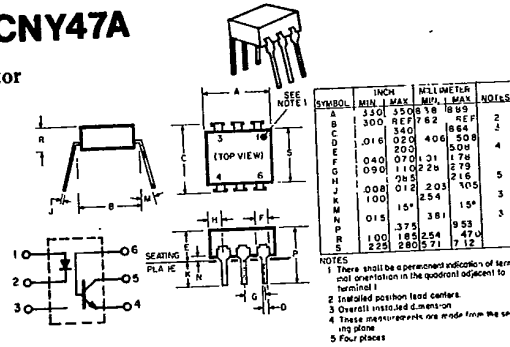
The GE Solid State CNY47 and CNY47A are gallium arsenide infrared emitting diodes coupled with a silicon photo-transistor in a dual-in-line package. These devices are also available in Surface-Mount packaging.

absolute maximum ratings: (25°C)

INFRARED EMITTING DIODE		
Power Dissipation	*100	milliwatts
Forward Current (Continuous)	30	milliamps
Forward Current (Peak) (Pulse width 1 μs 300 pps)	3	ampere
Reverse Voltage	3	volts
*Derate 1.33mW/°C above 25°C ambient		

PHOTO-TRANSISTOR		
Power Dissipation	**150	milliwatts
V <sub>CEO</sub>	30	volts
V <sub>CBO</sub>	50	volts
V <sub>EBO</sub>	4	volts
Collector Current (Continuous)	30	milliamps
**Derate 2.0mW/°C above 25°C ambient		

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)	2828V <sub>(peak)</sub>	2000V <sub>(RMS)</sub>
Steady-State Isolation Voltage (Input to Output)	1695V <sub>(peak)</sub>	1200V <sub>(RMS)</sub>



## Individual electrical characteristics (25°C)

INFRARED EMITTING DIODE	TYP.	MAX.	UNITS
Forward Voltage (I <sub>F</sub> = 10 mA)	1.1	1.5	volts
Reverse Current (V <sub>R</sub> = 3 V)	—	100	microamps
Capacitance (V = 0, f = 1 MHz)	50	—	picofarads

PHOTO-TRANSISTOR	MIN.	TYP.	MAX.	UNITS
Breakdown Voltage—V <sub>(BR)CEO</sub> (I <sub>C</sub> = 10mA, I <sub>F</sub> = 0)	30	—	—	volts
Breakdown Voltage—V <sub>(BR)CBO</sub> (I <sub>C</sub> = 100μA, I <sub>F</sub> = 0)	50	—	—	volts
Breakdown Voltage—V <sub>(BR)EBO</sub> (I <sub>E</sub> = 100μA, I <sub>F</sub> = 0)	4	—	—	volts
Collector Dark Current—I <sub>CEO</sub> (V <sub>CE</sub> = 10V, I <sub>F</sub> = 0)	—	5	100	nanoamps
Collector Dark Current—I <sub>CBO</sub> (V <sub>CB</sub> = 10V, I <sub>F</sub> = 0)	—	—	20	nanoamps
Capacitance (V <sub>CE</sub> = 10V, F = 1 MHz)	—	2	—	picofarads

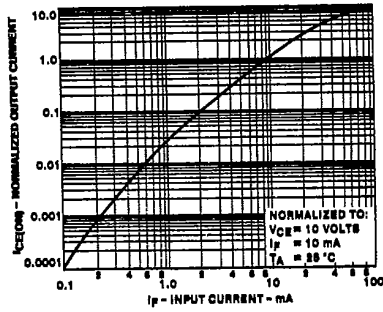
## coupled electrical characteristics (25°C)

	MIN.	TYP.	MAX.	UNITS
DC Current Transfer Ratio (I <sub>F</sub> = 10mA, V <sub>CE</sub> = .4V)	20	—	60	%
	40	—	—	%
Saturation Voltage — Collector to Emitter (I <sub>F</sub> = 10mA, I <sub>C</sub> = 2mA)	—	0.1	0.4	volts
(I <sub>F</sub> = 10mA, I <sub>C</sub> = 4mA)	—	—	0.4	volts
Isolation Resistance (V <sub>IO</sub> = 500V <sub>DC</sub> )	100	—	2	gigohms
Input to Output Capacitance (V <sub>IO</sub> = 0, f = 1 MHz)	—	—	—	picofarads
Switching Speeds:	—	2	—	microseconds
Rise/Fall Time (V <sub>CE</sub> = 10V, I <sub>CE</sub> = 2mA, R <sub>L</sub> = 100Ω)	—	300	—	nanoseconds
Rise/Fall Time (V <sub>CB</sub> = 10V, I <sub>CB</sub> = 50μA, R <sub>L</sub> = 100Ω)	—	—	—	nanoseconds

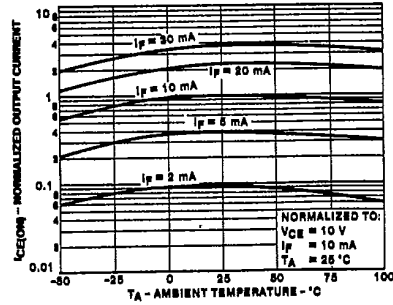
VDE Approved to 0883/6.80 0110b Certificate # 35025

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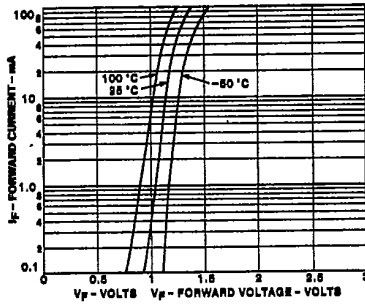
TYPICAL CHARACTERISTICS



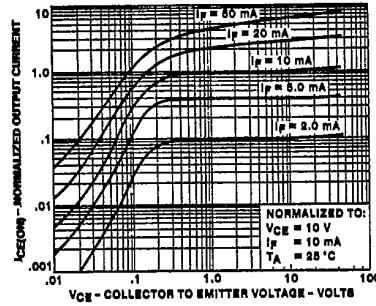
1. OUTPUT CURRENT VS INPUT CURRENT



2. OUTPUT CURRENT VS TEMPERATURE

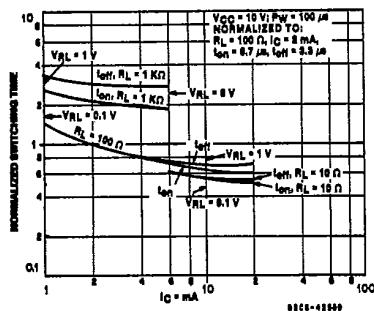


3. INPUT CHARACTERISTICS

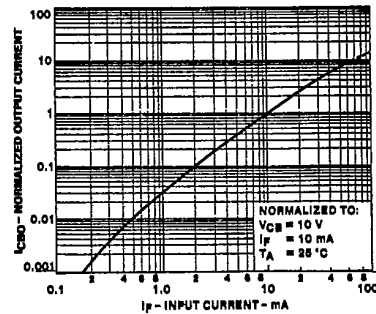


4. OUTPUT CHARACTERISTICS

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5. SWITCHING SPEED VS COLLECTOR CURRENT (NOT SATURATED)



6. OUTPUT CURRENT (I\_CEO) VS INPUT CURRENT