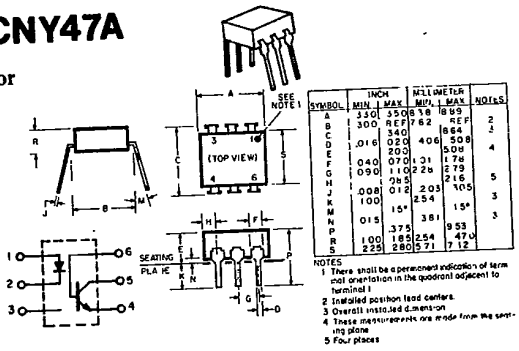
# Photon Coupled Isolator CNY47, CNY47A

**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.




| SYMBOL | INCH MIN. | INCH MAX | MILLIMETER MIN. | MILLIMETER MAX | NOTES |
|---|---|---|---|---|---|
| A | .330 | .350 | 8.38 | 8.89 | |
| B | .300 | REF | 7.62 | REF | 2 |
| C | | .340 | | 8.64 | 2 |
| D | .016 | .020 | .406 | .508 | 4 |
| E | | .200 | | 5.08 | 4 |
| F | .040 | .070 | 1.01 | 1.78 | |
| G | .090 | .110 | 2.29 | 2.79 | 5 |
| H | | .085 | | 2.16 | |
| J | .008 | .012 | .203 | .305 | 3 |
| K | 100 | | 2.54 | | 3 |
| M | | 15° | | 15° | |
| N | .015 | | .381 | | 3 |
| P | | .375 | | 9.53 | |
| R | .100 | .185 | 2.54 | 4.70 | |
| S | .225 | .280 | 5.71 | 7.12 | |

NOTES
1 There shall be a permanent indication of term mal orientation in the quadrant adjacent to terminal 1
2 Installed position lead centers.
3 Overall installed dimension
4 These measurements are made from the seating plane
5 Four places

## 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 |
| $V_{CEO}$ | 30 | volts |
| $V_{CBO}$ | 50 | volts |
| $V_{EBO}$ | 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). |
| 2828$V_{(peak)}$ 2000$V_{(RMS)}$ |
| Steady-State Isolation Voltage (Input to Output). |
| 1695$V_{(peak)}$ 1200$V_{(RMS)}$ |

## individual electrical characteristics (25°C)

| INFRARED EMITTING DIODE | TYP. | MAX. | UNITS |
|---|---|---|---|
| Forward Voltage ($I_F$ = 10 mA) | 1.1 | 1.5 | volts |
| Reverse Current ($V_R$ = 3 V) | — | 100 | microamps |
| Capacitance (V = 0, f = 1 MHz) | 50 | — | picofarads |

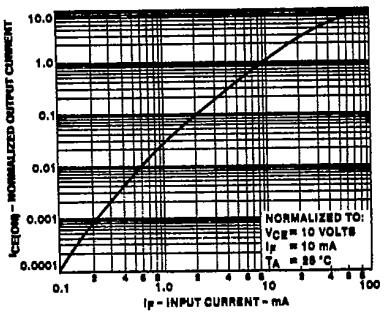
| PHOTO-TRANSISTOR | MIN. | TYP. | MAX. | UNITS |
|---|---|---|---|---|
| Breakdown Voltage—$V_{(BR)CEO}$ ($I_C$ = 10mA, $I_F$ = 0) | 30 | — | — | volts |
| Breakdown Voltage—$V_{(BR)CBO}$ ($I_C$ = 100μA, $I_F$ = 0) | 50 | — | — | volts |
| Breakdown Voltage—$V_{(BR)EBO}$ ($I_E$ = 100μA, $I_F$ = 0) | 4 | — | — | volts |
| Collector Dark Current—$I_{CEO}$ ($V_{CE}$ = 10V, $I_F$ = 0) | — | 5 | 100 | nanoamps |
| Collector Dark Current—$I_{CBO}$ ($V_{CB}$ = 10V, $I_F$ = 0) | — | — | 20 | nanoamps |
| Capacitance ($V_{CE}$ = 10V, F = 1 MHz) | — | 2 | — | picofarads |

## coupled electrical characteristics (25°C)

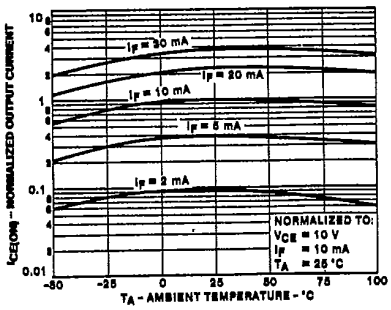
| | | MIN. | TYP. | MAX. | UNITS |
|---|---|---|---|---|---|
| DC Current Transfer Ratio ($I_F$ = 10mA, $V_{CE}$ = .4V) | CNY47 | 20 | — | 60 | % |
| | CNY47A | 40 | — | — | % |
| Saturation Voltage — Collector to Emitter ($I_F$ = 10mA, $I_C$ = 2mA) | CNY47 | — | 0.1 | 0.4 | volts |
| ($I_F$ = 10mA, $I_C$ = 4mA) | CNY47A | | | 0.4 | volts |
| Isolation Resistance ($V_{IO}$ = 500$V_{DC}$) | | 100 | — | | gigaohms |
| Input to Output Capacitance ($V_{IO}$ = 0, f = 1 MHz) | | — | — | 2 | picofarads |
| Switching Speeds: | | | | | |
| Rise/Fall Time ($V_{CE}$ = 10V, $I_{CE}$ = 2mA, $R_L$ = 100Ω) | | — | 2 | — | microseconds |
| Rise/Fall Time ($V_{CB}$ = 10V, $I_{CB}$ = 50μA, $R_L$ = 100Ω) | | — | 300 | — | nanoseconds |

VDE Approved to 0883/6.80 0110b Certificate # 35025

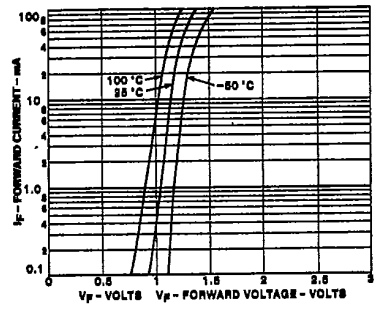
## TYPICAL CHARACTERISTICS



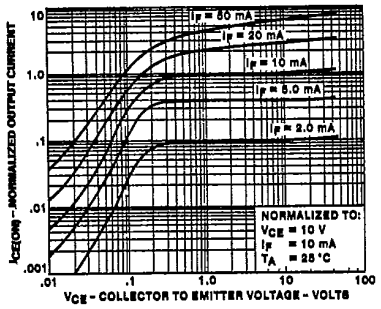

1. OUTPUT CURRENT VS INPUT CURRENT



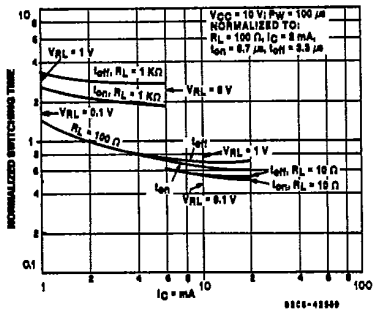

2. OUTPUT CURRENT VS TEMPERATURE



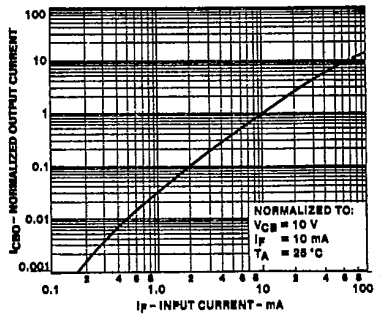

3. INPUT CHARACTERISTICS




4. OUTPUT CHARACTERISTICS




5. SWITCHING SPEED VS COLLECTOR CURRENT (NOT SATURATED)




6. OUTPUT CURRENT ($I_{CEO}$) VS INPUT CURRENT

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