

CNY17-x

Phototransistor Optocoupler

High Collector-Emitter Voltage Type



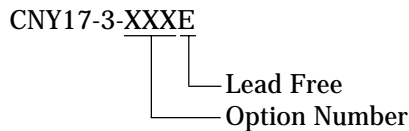
Data Sheet

Description

The CNY17 contains a light emitting diode optically coupled to a photo-transistor. It is packaged in a 6-pin DIP package and available in wide-lead spacing option and lead bend SMD option. Collector-emitter voltage is above 70 V. Response time, t_r , is typically 5 μ s and minimum CTR is 40% at input current of 10 mA.

Ordering Information

Specify part number followed by Option Number (if desired).



- 000 = No Options
- 060 = IEC/EN/DIN EN 60747-5-2 Option
- W00 = 0.4" Lead Spacing Option
- 300 = Lead Bend SMD Option
- 500 = Tape and Reel Packaging Option

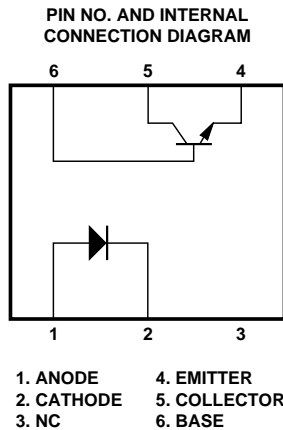
Features

- High collector-emitter voltage ($V_{CE0} = 70$ V)
- High input-output isolation voltage ($V_{iso} = 5000$ Vrms)
- Current Transfer Ratio (CTR: min. 40% at $I_F = 10$ mA, $V_{CE} = 5$ V)
- Response time (t_r : typ., 5 μ s at $V_{CC} = 10$ V, $I_C = 2$ mA, $R_L = 100$ Ω)
- Dual-in-line package
- UL approved
- CSA approved
- IEC/EN/DIN EN 60747-5-2 approved
- Options available:
 - Leads with 0.4" (10.16 mm) spacing (W00)
 - Leads bend for surface mounting (300)
 - Tape and reel for SMD (500)
 - IEC/EN/DIN EN 60747-5-2 approvals (060)

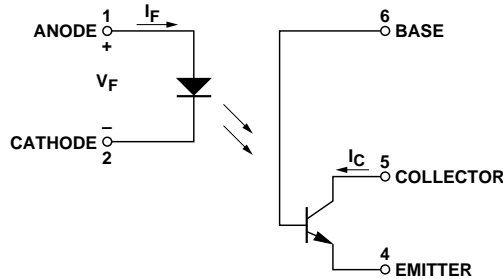
Applications

- System appliances, measuring instruments
- Signal transmission between circuits of different potentials and impedances
- Feedback circuit in power supply

Functional Diagram

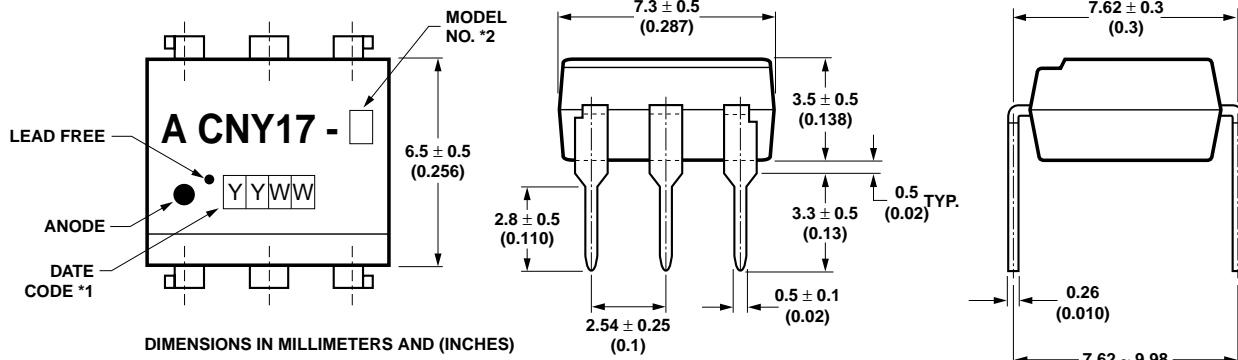


Schematic

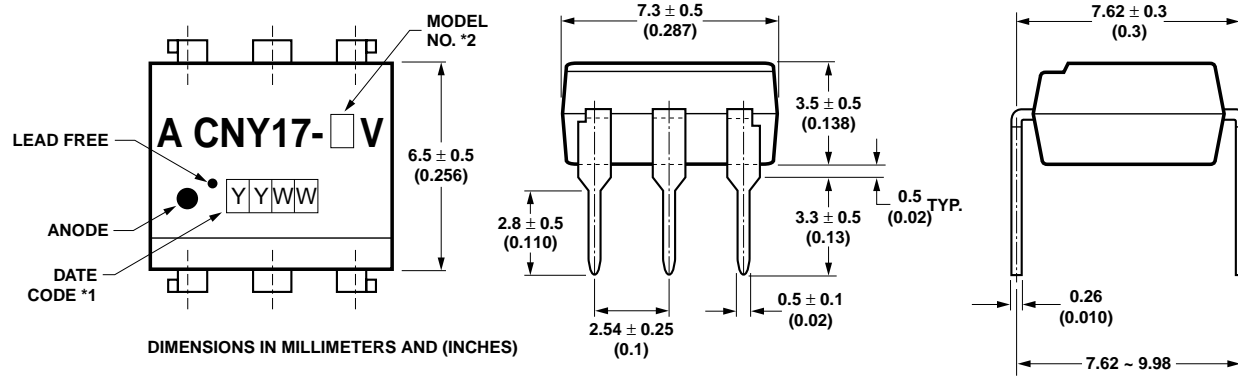


CAUTION: It is advised that normal static precautions be taken in handling and assembly of this component to prevent damage and/or degradation which may be induced by ESD.

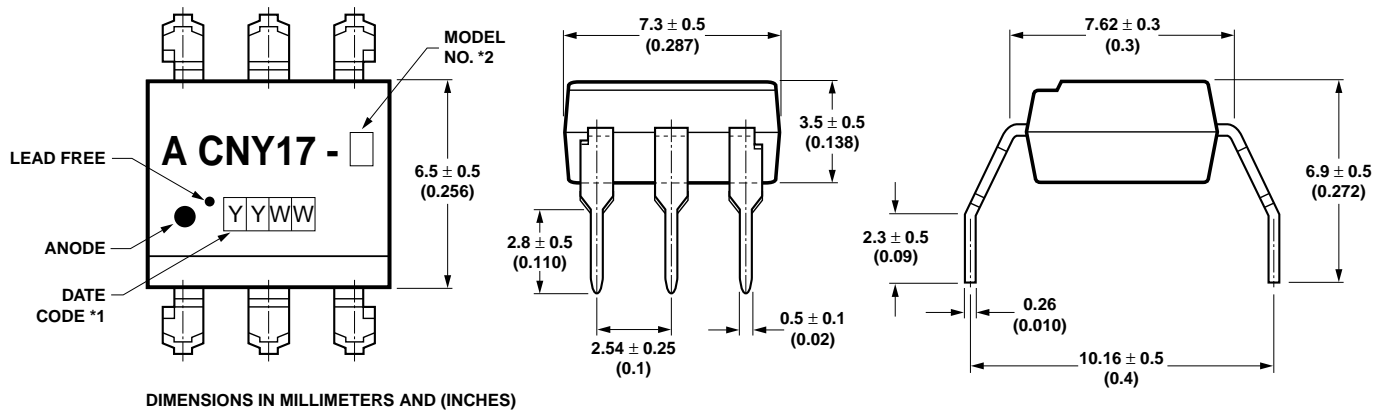
Package Outline Drawings
CNY17-X-000E



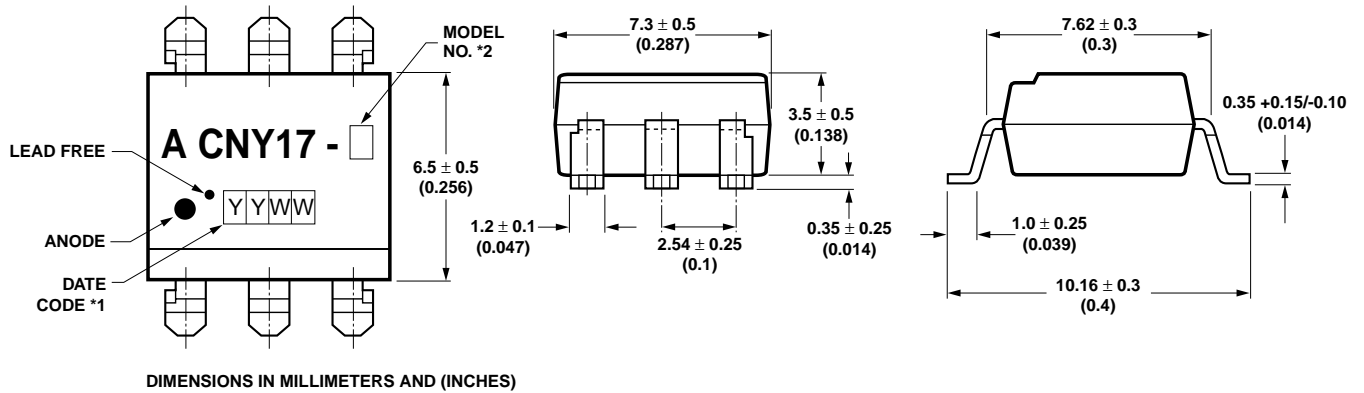
CNY17-X-060E



CNY17-X-W00E

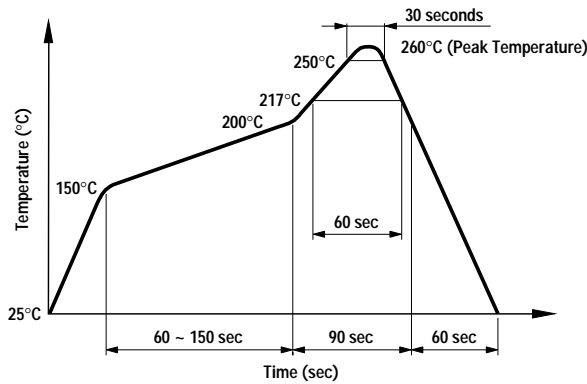


CNY17-X-300E



Solder Reflow Temperature Profile

- 1) One-time soldering reflow is recommended within the condition of temperature and time profile shown at right.
- 2) When using another soldering method such as infrared ray lamp, the temperature may rise partially in the mold of the device. Keep the temperature on the package of the device within the condition of (1) above.



Absolute Maximum Ratings

| | |
|---|-----------------|
| Storage Temperature, T_S | -55°C to +150°C |
| Operating Temperature, T_A | -55°C to +100°C |
| Lead Solder Temperature, max. (1.6 mm below seating plane) | 260°C for 10 s |
| Average Forward Current, I_F | 60 mA |
| Reverse Input Voltage, V_R | 6 V |
| Input Power Dissipation, P_I | 100 mW |
| Collector Current, I_C | 150 mA |
| Collector-Emitter Voltage, V_{CEO} | 70 V |
| Emitter-Collector Voltage, V_{ECO} | 6 V |
| Collector-Base Voltage, V_{CBO} | 70 V |
| Collector Power Dissipation | 150 mW |
| Total Power Dissipation | 250 mW |
| Isolation Voltage, V_{ISO} (AC for 1 minute, R.H. = 40 ~ 60%) | 5000 Vrms |

Electrical Specifications (T_A = 25°C)

| Parameter | Symbol | Min. | Typ. | Max. | Units | Test Conditions |
|--------------------------------------|--|----------------------|------------------------|------------------|-------------------------|---|
| Forward Voltage | V _F | - | 1.4 | 1.7 | V | I _F = 60 mA |
| Reverse Current | I _R | - | - | 10 | μA | V _R = 6 V |
| Terminal Capacitance | C _t | - | - | 100 | pF | V = 0, f = 1 MHz |
| Collector Dark Current | I _{CEO} | - | - | 50 | nA | V _{CE} = 10 V |
| Collector-Emitter Breakdown Voltage | BV _{CEO} | 70 | - | - | V | I _C = 0.1 mA, I _F = 0 |
| Emitter-Collector Breakdown Voltage | BV _{ECO} | 6 | - | - | V | I _E = 10 μA, I _F = 0 |
| Collector-Base Breakdown Voltage | BV _{CBO} | 70 | - | - | V | I _C = 0.1 mA, I _F = 0 |
| Collector Current | I _C | 4 | - | 32 | mA | I _F = 10 mA |
| *Current Transfer Ratio | CNY17-1 CNY17-2 CNY17-3 CNY17-4 | CTR | 40 63 100 160 | - - - - | 80 125 200 320 | % V _{CE} = 5 V |
| Collector-Emitter Saturation Voltage | V _{CE(sat)} | - | - | 0.3 | V | I _F = 10 mA, I _C = 2.5 mA |
| Response Time (Rise) | t _r | - | 5 | 10 | μs | V _{CE} = 5 V, I _C = 10 mA |
| Response Time (Fall) | t _f | - | 5 | 10 | μs | R _L = 100 Ω |
| Isolation Resistance | R _{iso} | 1 x 10 ¹¹ | - | - | Ω | DC 500 V 40 ~ 60% R.H. |
| Floating Capacitance | C _f | - | - | 2 | pF | V = 0, f = 1 MHz |

$$* CTR = \frac{I_C}{I_F} \times 100\%$$

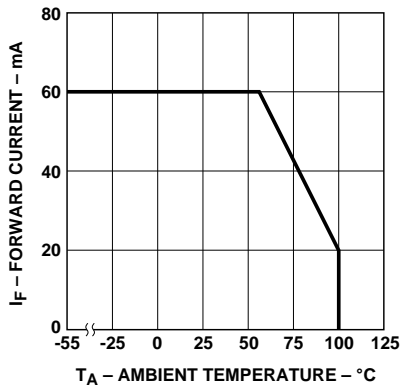


Figure 1. Forward current vs. temperature.

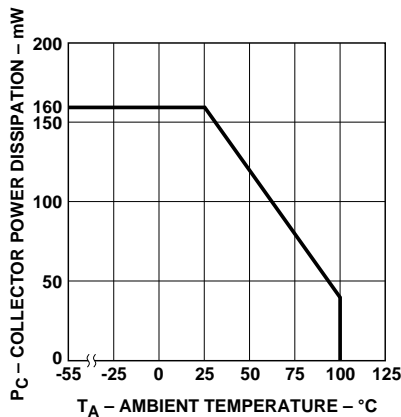


Figure 2. Collector power dissipation vs. temperature.

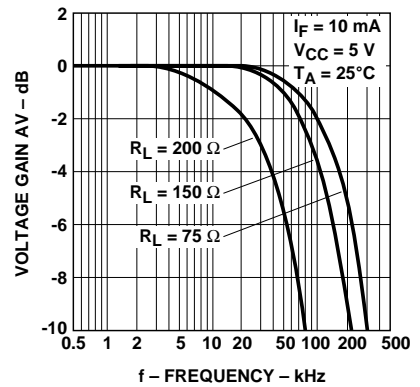


Figure 3. Frequency response.

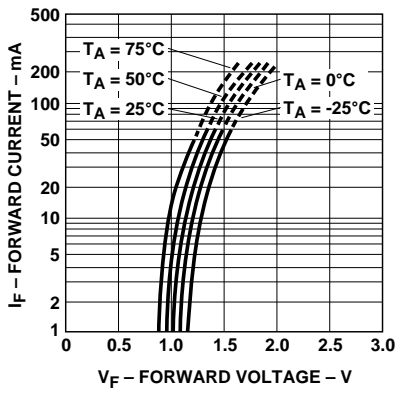


Figure 4. Forward current vs. forward voltage.

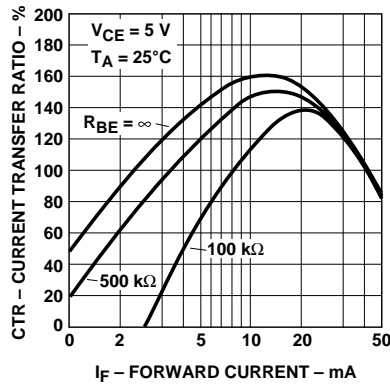


Figure 5. Current transfer ratio vs. forward current.

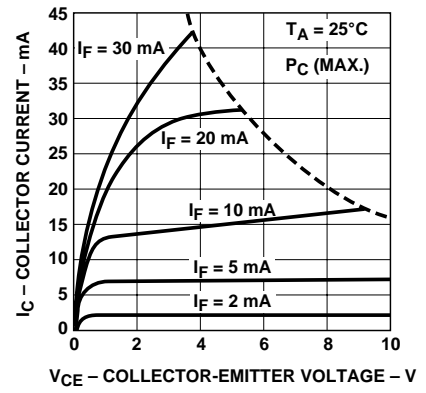


Figure 6. Collector current vs. collector-emitter voltage.

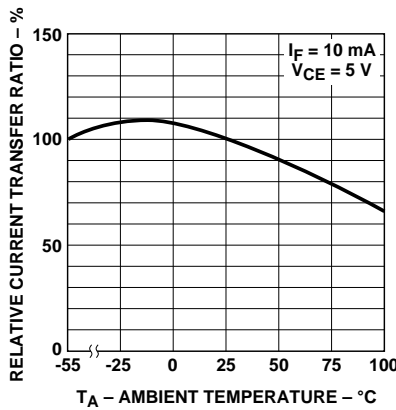


Figure 7. Relative current transfer ratio vs. temperature.

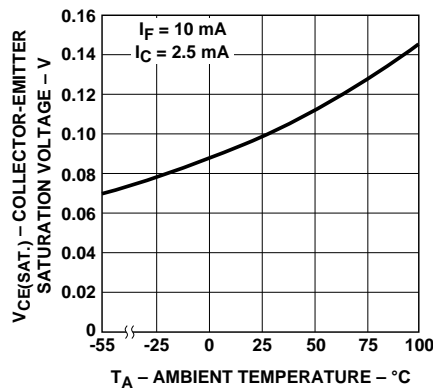


Figure 8. Collector-emitter saturation voltage vs. temperature.

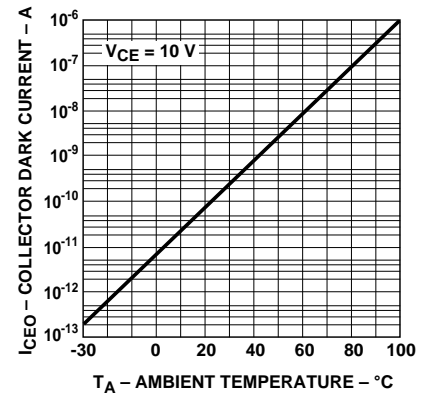


Figure 9. Collector dark current vs. temperature.

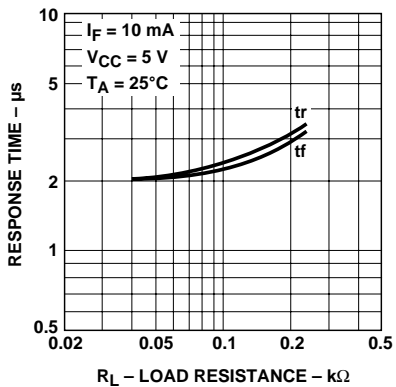


Figure 10. Response time vs. load resistance.

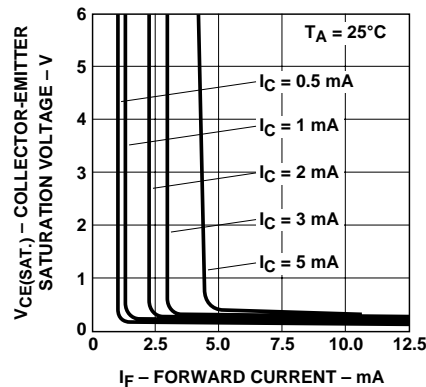
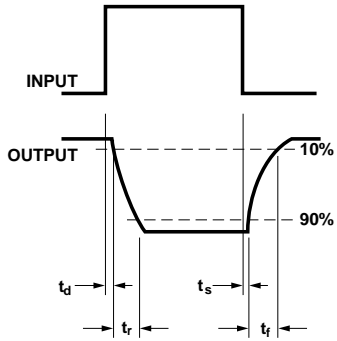
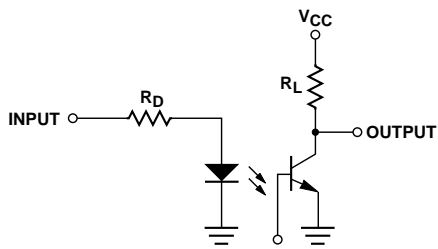
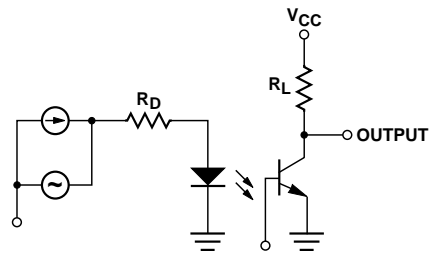


Figure 11. Collector-emitter saturation voltage vs. forward current.

Test Circuit for Response Time



Test Circuit for Frequency Response



For product information and a complete list of distributors, please go to our website: www.avagotech.com

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