Agilent 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 µs and minimum CTR is 40% at input current of 10 mA.

Ordering Information

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

CNY17-3-XXXE

- E — Lead Free
- XXX — Option Number

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

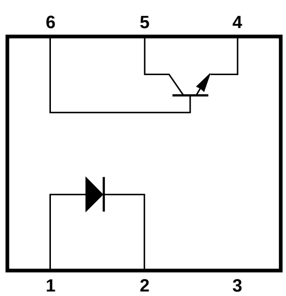
- High collector-emitter voltage (V_{CEO} = 70 V)
- High input-output isolation voltage (V_{iso} = 5000 Vrms)
- Current Transfer Ratio (CTR: min. 40% at I_F = 10 mA, V_{CE} = 5 V)
- Response time (t_r: typ., 5 µs at V_{CC} = 10 V, I_C = 2 mA, R_L = 100 Ω)
- Dual-in-line package
- UL approved
- CSA approved
- IEC/EN/DIN EN 60747-5-2 approved
- Options available:
  - Leads with 0.4" (10.16 mm) spacing (W00)
  - Leads bends 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

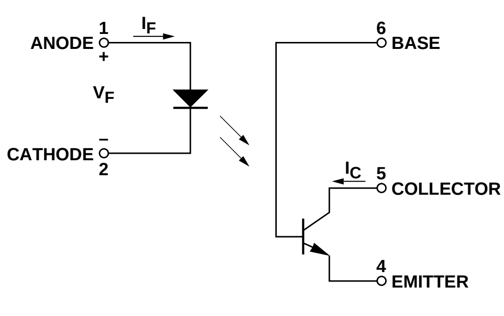
Functional Diagram

PIN NO. AND INTERNAL CONNECTION DIAGRAM



1. ANODE
2. CATHODE
3. NC
4. EMITTER
5. COLLECTOR
6. BASE

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.

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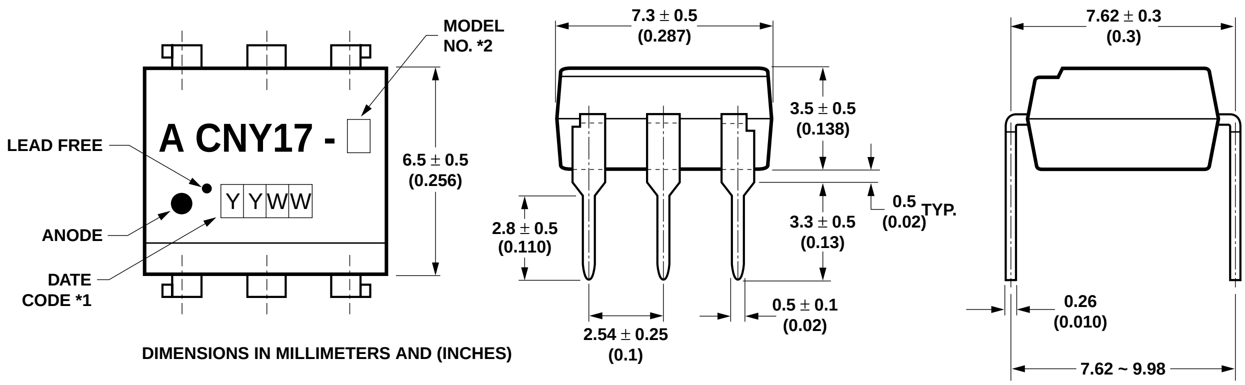
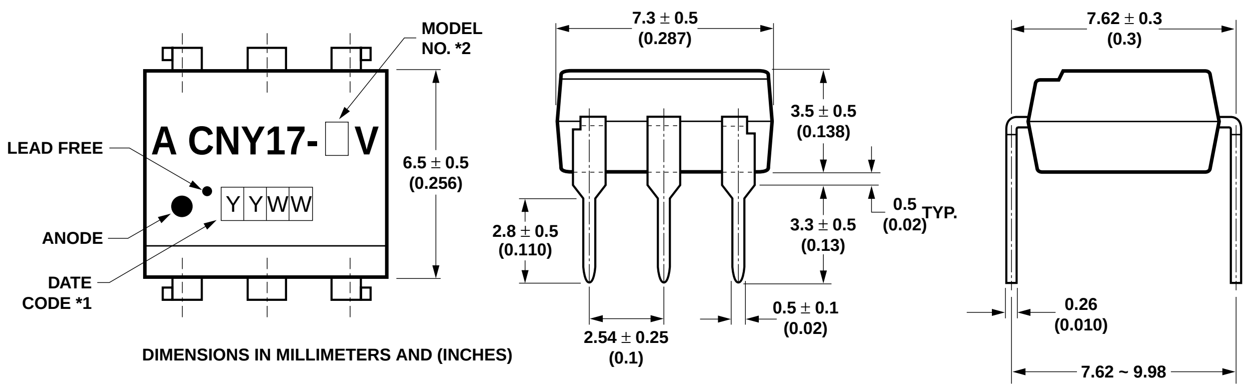
Package Outline Drawings

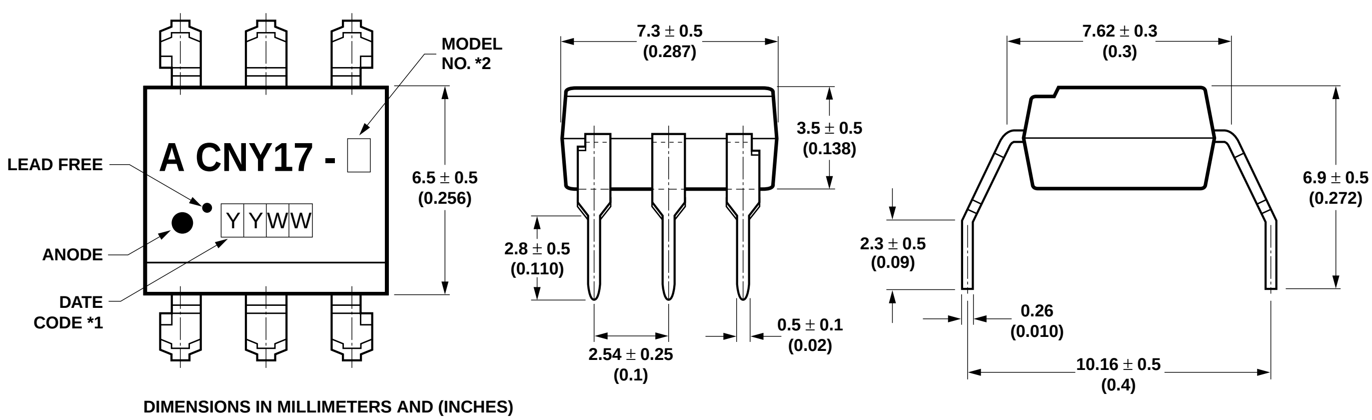
CNY17-X-000E



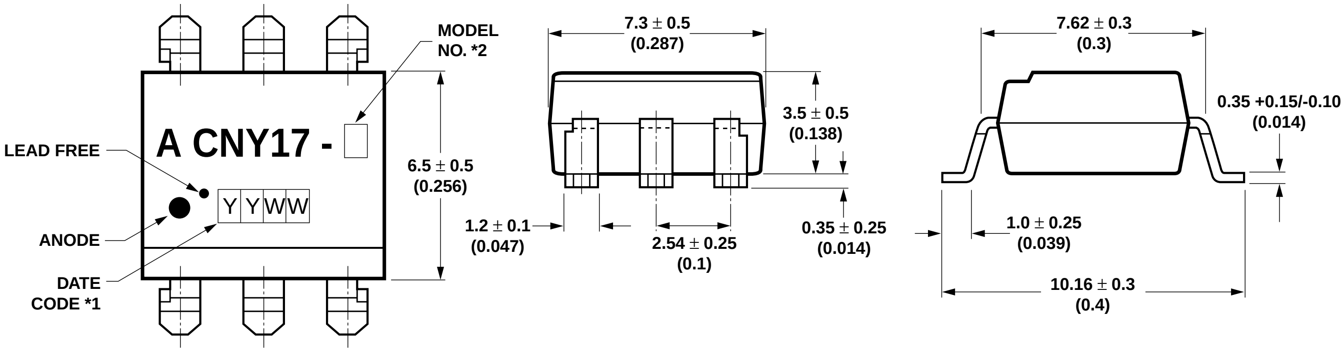
CNY17-X-060E



CNY17-X-W00E



CNY17-X-300E

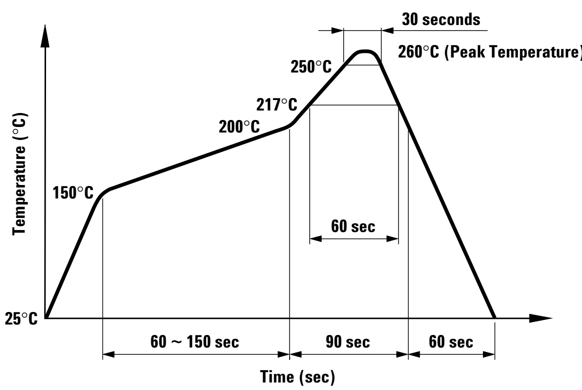


DIMENSIONS IN MILLIMETERS AND (INCHES)

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	CTR	40	–	80	%	V_{CE} = 5 V
	CNY17-2		63	–	125		
	CNY17-3		100	–	200		
	CNY17-4		160	–	320		
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}	1×10^{11}	–	–	Ω	DC 500 V 40 ~ 60% R.H.
Floating Capacitance		C_f	–	–	2	pF	V = 0, f = 1 MHz

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

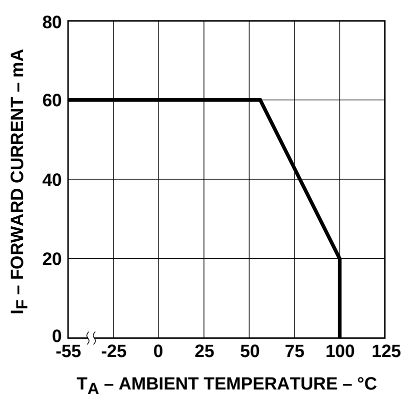


Figure 1. Forward current vs. temperature.

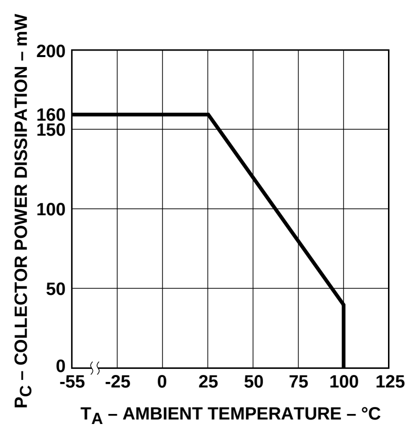


Figure 2. Collector power dissipation vs. temperature.

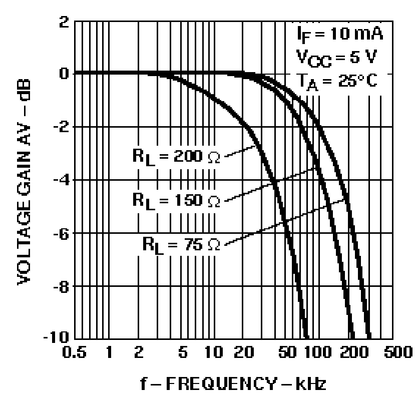


Figure 3. Frequency response.

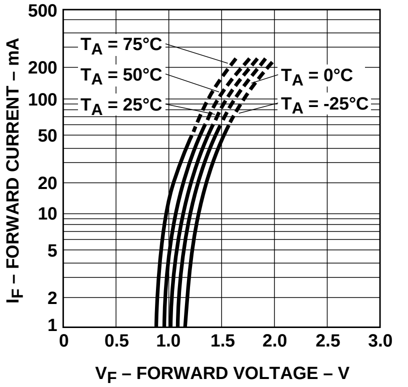


Figure 4. Forward current vs. forward voltage.

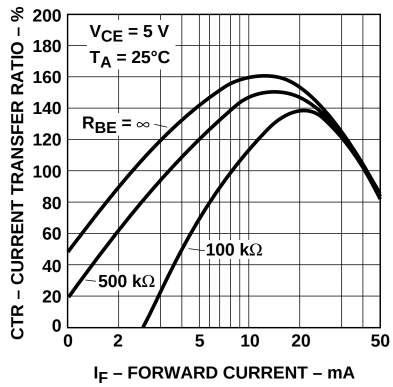


Figure 5. Current transfer ratio vs. forward current.

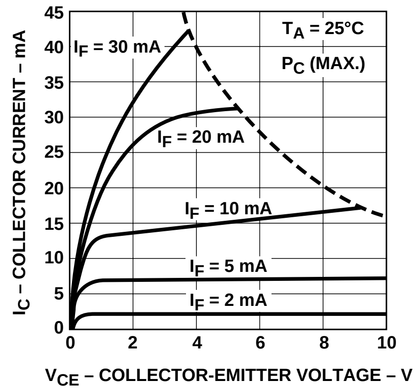


Figure 6. Collector current vs. collector-emitter voltage.

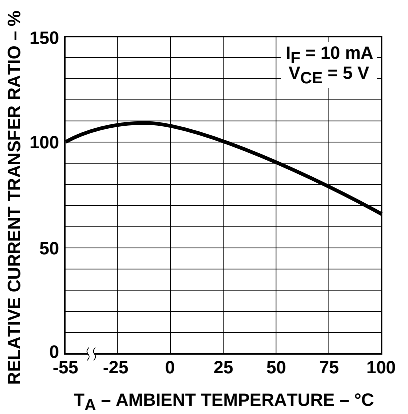


Figure 7. Relative current transfer ratio vs. temperature.

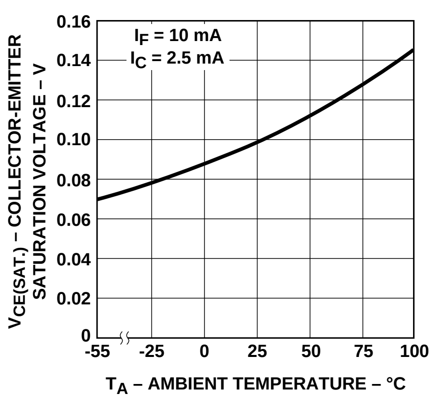


Figure 8. Collector-emitter saturation voltage vs. temperature.

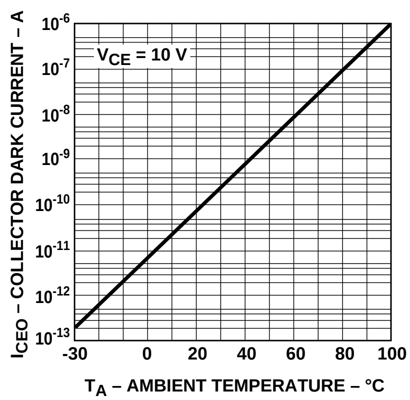


Figure 9. Collector dark current vs. temperature.

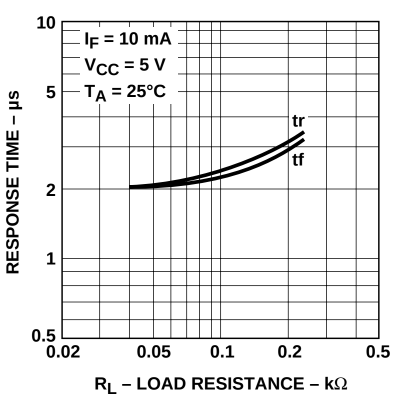


Figure 10. Response time vs. load resistance.

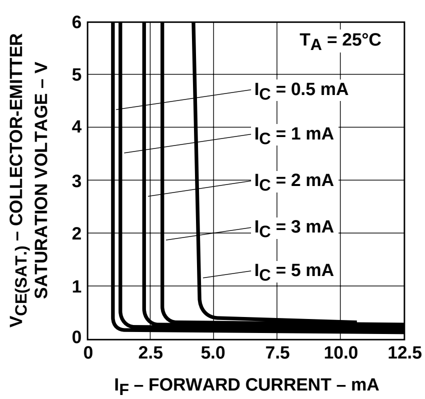
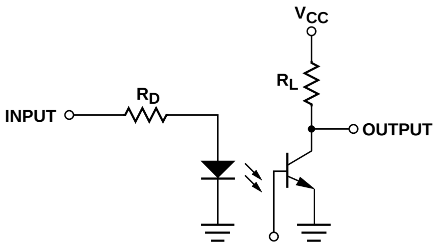
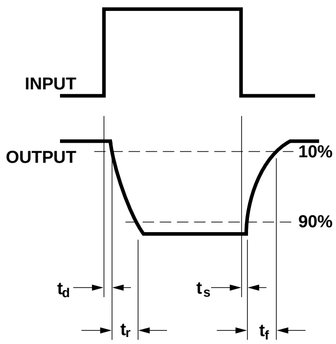


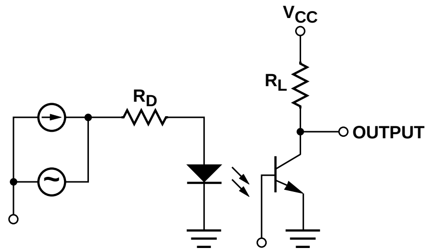
Figure 11. Collector-emitter saturation voltage vs. forward current.

Test Circuit for Response Time





Test Circuit for Frequency Response



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Data subject to change.

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