

DESCRIPTION

The CNY17F series consists of a Gallium Arsenide IRED coupled with an NPN phototransistor

FEATURES

- High isolation voltage 5300 VAC RMS-1 minute, 7500 VAC PEAK-1 minute
- High BV_{CEO} minimum 70 volts
- Maximum switching time in saturation specified
- Underwriters Laboratory (UL) recognized file #E90700

APPLICATIONS

- Power supply regulators
- Digital logic inputs
- Microprocessor inputs
- Appliance sensor systems
- Industrial controls

CNY17F-1

(CTR = 40%-80%)

CNY17F-2

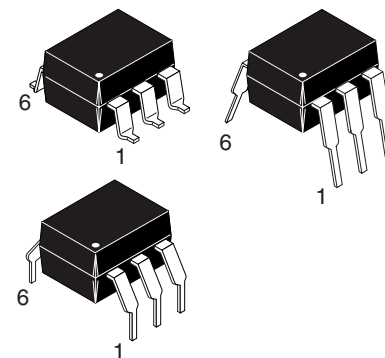
(CTR = 63%-125%)

CNY17F-3

(CTR = 100%-200%)

CNY17F-4

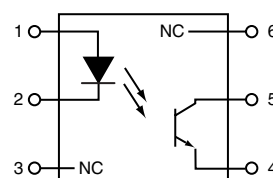
(CTR = 160%-320%)



ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ Unless otherwise specified)

Rating	Symbol	Value	Unit
EMITTER			
Forward Current - Continuous	I_F	90	mA
Forward Current - Peak (PW = 1 μ s, 300pps)	$I_F(\text{pk})$	3.0	A
Reverse Voltage	V_R	6	Volts
LED Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	135 1.8	mW mW/ $^\circ\text{C}$
DETECTOR			
Detector Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	200 2.67	mW mW/ $^\circ\text{C}$
TOTAL DEVICE			
Total Device Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	260 3.5	mW mW/ $^\circ\text{C}$
Ambient Operating Temperature Range	T_A	-55 to +100	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-55 to +150	$^\circ\text{C}$
Lead Soldering Temperature (1/16" from case, 10 sec. duration)	T_L	260	$^\circ\text{C}$

SCHEMATIC



- PIN 1. ANODE
2. CATHODE
3. NO CONNECTION
4. EMITTER
5. COLLECTOR
6. NO CONNECTION

NOTE

1. Input-Output Isolation Voltage, VISO, is an internal device dielectric breakdown rating.

ELECTRICAL CHARACTERISTICS (T_A = 25°C Unless otherwise specified.)

INDIVIDUAL COMPONENT CHARACTERISTICS

Parameter	Test Conditions	Symbol	Min	Typ**	Max	Unit
EMITTER						
Input Forward Voltage	(I _F = 60 mA)	V _F		1.35	1.65	V
Forward Voltage Temp. Coefficient		$\frac{\Delta V_F}{\Delta T_A}$		-1.8		mV/°C
Reverse Voltage	(I _R = 10 µA)	V _R	6.0	15		V
Junction Capacitance	(V _F = 0 V, f = 1 MHz)	C _J		50		pF
	(V _F = 1 V, f = 1 MHz)			65		
Reverse Leakage Current	(V _R = 3.0 V)	I _R		.35	10	µA
DETECTOR						
Collector-Emitter Breakdown Voltage	(I _C = 1.0 mA, I _F = 0)	BV _{CEO}	70	100		V
Emitter-Collector Breakdown Voltage	(I _E = 100 µA, I _F = 0)	BV _{ECO}	7	10		V
Collector-Emitter Dark Current	(V _{CE} = 10 V, I _F = 0)	I _{CEO}		5	50	nA
Capacitance	(V _{CE} = 0 V, f = 1 MHz)	C _{CE}		8		pF

TRANSFER CHARACTERISTICS

AC Characteristic	Test Conditions	Symbol	Min	Typ**	Max	Units
NON-SATURATED SWITCHING TIMES						
Turn-on Time	(R _L = 100 Ω, I _C = 2 mA, V _{CC} = 10 V) (Fig. 7)	t _{on}		6.0	10	μs
Turn-off Time		t _{off}		5.5	10	μs
SATURATED SWITCHING TIMES						
Turn-on Time CNY17F-1	(I _F = 20 mA, V _{CE} = 0.4 V)	t _{on}		3.0	5.5	μs
CNY17F-2						
CNY17F-3	(I _F = 10 mA, V _{CE} = 0.4 V)			4.2	8.0	
CNY17F-4						
Rise Time CNY17F-1	(I _F = 20 mA, V _{CE} = 0.4 V)	t _r		2.0	4.0	μs
CNY17F-2						
CNY17F-3	(I _F = 10 mA, V _{CE} = 0.4 V)			3.0	6.0	
CNY17F-4						
Turn-off Time CNY17F-1	(I _F = 20 mA, V _{CE} = 0.4 V)	t _{off}		18	34	μs
CNY17F-2						
CNY17F-3	(I _F = 10 mA, V _{CE} = 0.4 V)			23	39	
CNY17F-4						
Fall Time CNY17F-1	(I _F = 20 mA, V _{CE} = 0.4 V)	t _f		11	20	μs
CNY17F-2						
CNY17F-3	(I _F = 10 mA, V _{CE} = 0.4 V)			14	24	
CNY17F-4						

** All typicals at T_A = 25°C

TRANSFER CHARACTERISTICS

DC Characteristic	Test Conditions	Symbol	Min	Typ**	Max	Units
Current Transfer Ratio, Collector-Emitter	$(I_F = 10 \text{ mA}, V_{CE} = 5 \text{ V})$	CTR	40		80	%
CNY17F-1			63		125	
CNY17F-2			100		200	
CNY17F-3			160		320	
CNY17F-4						
Saturation Voltage	$(I_F = 10 \text{ mA}, I_C = 2.5 \text{ mA})$	$V_{CE(sat)}$		0.15	0.40	V

ISOLATION CHARACTERISTICS

Characteristic	Test Conditions	Symbol	Min	Typ**	Max	Units
Input-Output Isolation Voltage	$(I_{I-O} \leq 1 \mu\text{A}, 1 \text{ min.})$	V_{ISO}	5300 7500			$V_{ac(rms)}$ $V_{ac(pk)}$
Isolation Resistance	$(V_{I-O} = 500 \text{ VDC})$	R_{ISO}	10^{11}			Ω
Isolation Capacitance	$(f = 1 \text{ MHz})$	C_{ISO}		0.5		pf

** All typicals at $T_A = 25^\circ\text{C}$

TYPICAL CHARACTERISTICS

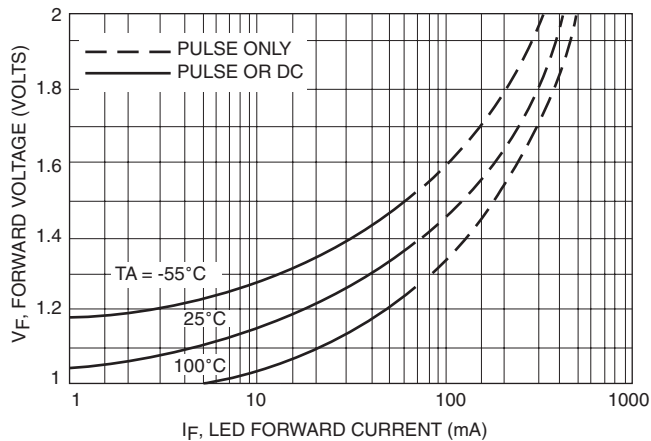


Figure 1. LED Forward Voltage versus Forward Current

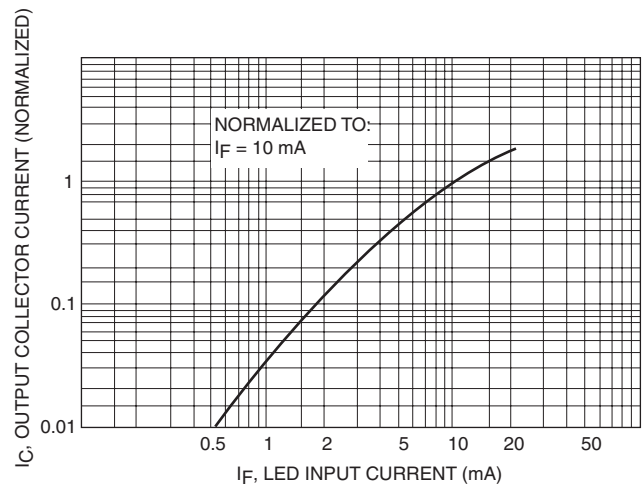


Figure 2. Output Current versus Input Current

Figure 3. Output Current vs. Ambient Temperature

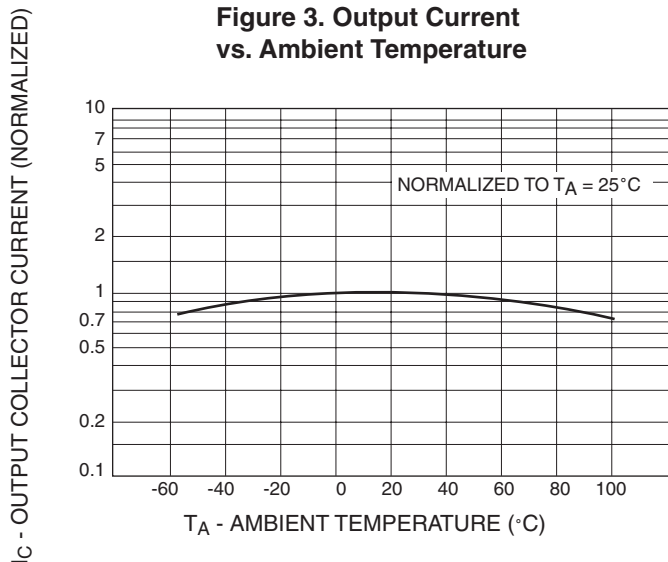


Fig. 4 Collector Current vs. Collector-Emitter Saturation Voltage

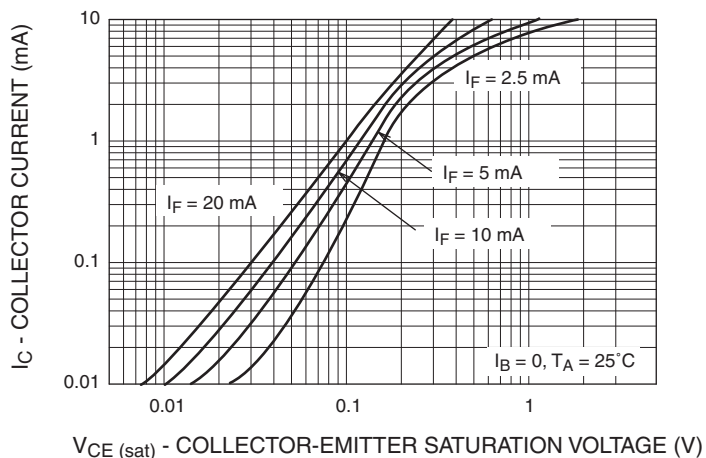


Figure 5. Dark Current vs. Ambient Temperature

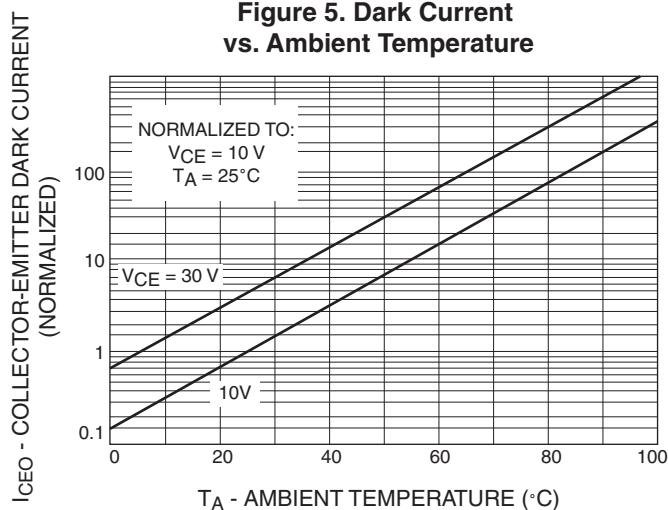
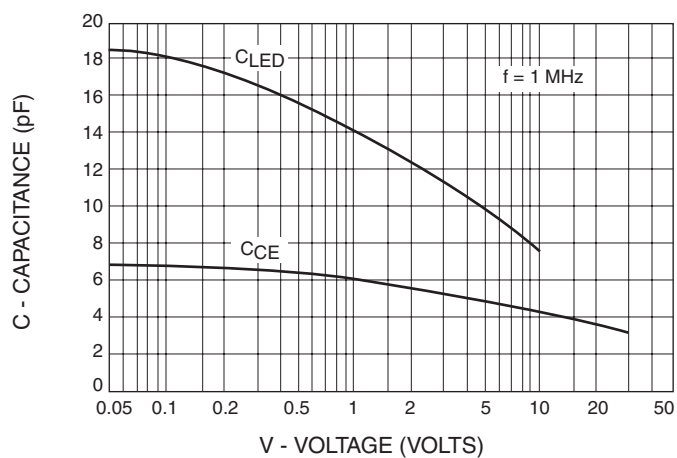
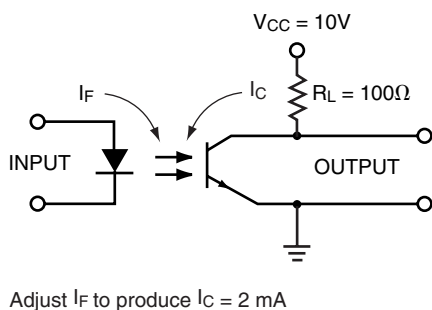


Figure 6. Capacitance versus Voltage



TEST CIRCUIT



WAVE FORMS

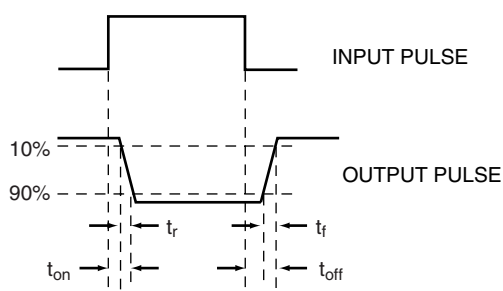
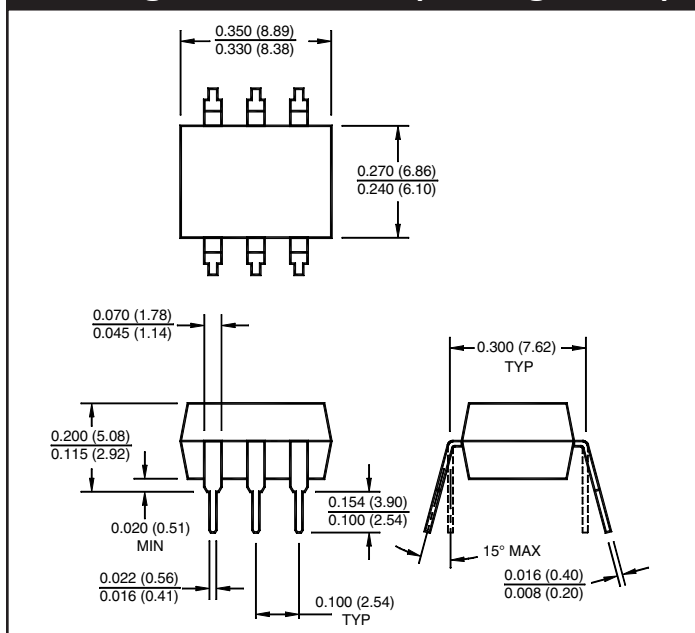
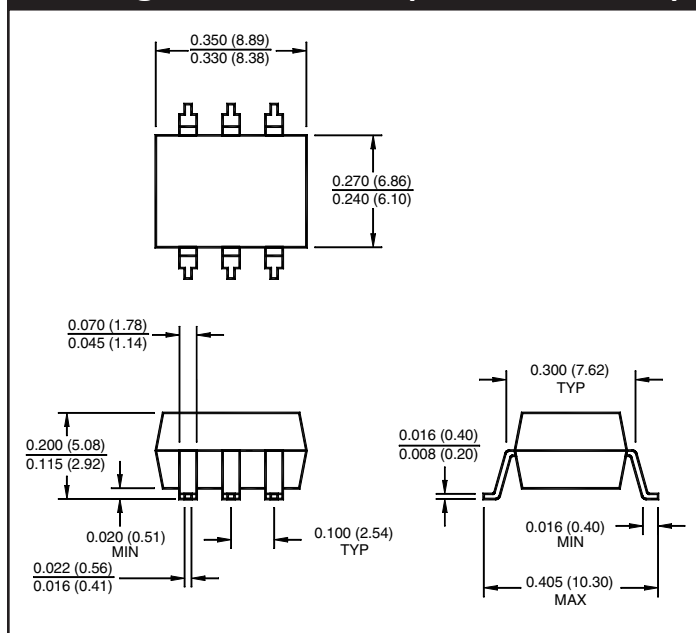


Figure 7. Switching Time Test Circuit and Waveforms

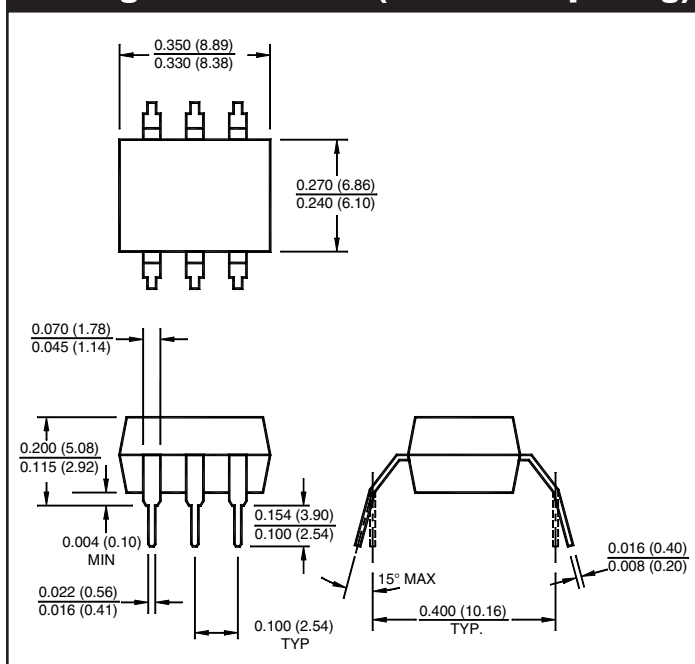
Package Dimensions (Through Hole)



Package Dimensions (Surface Mount)



Package Dimensions (0.4"Lead Spacing)



NOTE

All dimensions are in inches (millimeters)

Call QT Optoelectronics for more information or the phone number of your nearest distributor.

United States 800-533-6786 • France 33 [0] 1.45.18.78.78 • Germany 49 [0] 89/96.30.51 • United Kingdom 44 [0] 1296 394499 • Asia/Pacific 603-7352417