

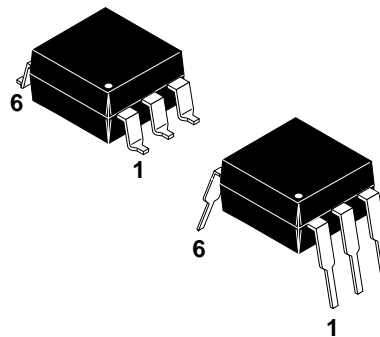
DESCRIPTION

The CNW82, CNW83, CNW84 and CNW85 optocouplers consist of a GaAs infrared emitting diode which is optically coupled to an NPN phototransistor.

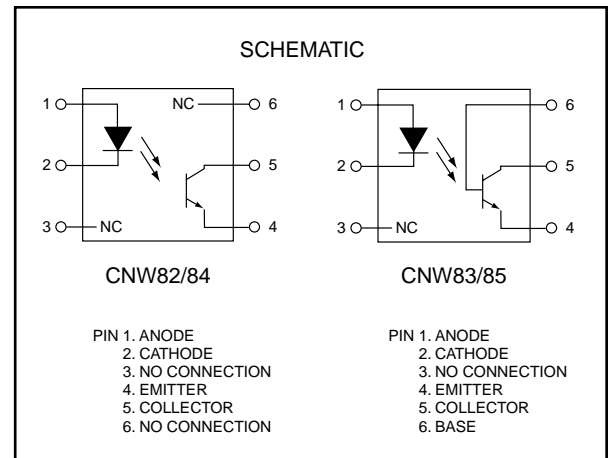
The CNW82 and CNW84 do not have the base pin connected for improved noise immunity.

FEATURES

- Wide body DIL encapsulation, with a pin distance of 10.16 mm.
- Minimum creepage distance 10 mm.
- High current transfer ratio and Low Saturation Voltage, making the device suitable for use with TTL integrated circuits.
- High degree of AC and DC insulation (5900 V (RMS) and 8340 V (DC)).
- Minimum 2 mm isolation thickness between emitter and detector. (CNW84/85 only).
- An external clearance of 9.6 mm minimum and an external creepage distance of 10 mm minimum.
- Collector-Emitter Breakdown Voltage: 50 V (CNW82/83 only).
- Collector-Emitter Breakdown Voltage: 80 V (CNW84/85 only).
- UL recognized (File # E90700)



CNW82
CNW83
CNW84
CNW85



ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Value	Units
EMITTER			
Forward Current - Continuous	I_F	100	mA
Forward Current - Peak (PW = 100µs, 120pps)	$I_F(pk)$	3	A
Reverse Voltage	V_R	5	V
Total Power Dissipation @ $T_A = 25^\circ\text{C}$	P_D	200	mW
Derate above 25°C		2.0	mW/°C
DETECTOR			
Collector Current-Continuous	I_C	100	mA
Emitter-Collector Voltage	V_{ECO}	7	V
Collector-Emitter Voltage	V_{CEO}	50	V
(CNW82/CNW83)		80	
Collector-Base Voltage	V_{CBO}	70	V
(CNW83)		120	
Total Power Dissipation @ $T_A = 25^\circ\text{C}$	P_D	200	mW
Derate above 25°C		2.0	mW/°C
TOTAL DEVICE			
Storage Temperature Range	T_{stg}	-55 to 150	°C
Ambient Operating Temperature Range	T_A	-40 to 100	°C
Lead Soldering Temperature (1/16" from case, 10 sec. duration)	T_L	260	°C

CNW82, CNW83, CNW84, CNW85

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ Unless otherwise specified)						
Parameter	Test Conditions	Symbol	Min	Typ	Max	Unit
EMITTER						
Input Forward Voltage	($I_F = 10\text{ mA}$)	V_F	—	1.20	1.50	V
Reverse Leakage Current	($V_R = 5.0\text{ V}$)	I_R	—	—	10	μA
DETECTOR						
Collector-Emitter Breakdown Voltage	($I_C = 1.0\text{ mA}$)	BV_{CEO}	50	100	—	V
Emitter-Collector Breakdown Voltage	($I_E = 0.1\text{ mA}$)	BV_{ECO}	7	10	—	V
Collector-Base Breakdown Voltage	($I_C = 0.1\text{ mA}$)	BV_{CBO}	70	100	—	V
Collector-Emitter Dark Current	($V_{CE} = 10\text{ V}, I_F = 0$)	I_{CEO}	—	1	50	nA
Collector-Base Cut-off Current	($V_{CB} = 10\text{ V}, I_F = 0$)	I_{CBO}	—	—	20	nA
COUPLED						
Collector-Emitter Saturation Voltage	($I_C = 4\text{ mA}, I_F = 10\text{ mA}$)	$V_{CE(sat)}$	—	0.15	0.4	V
Isolation Voltage	(DC Value) (t = 1.0 min.) ⁽¹⁾ (RMS Value) (t = 1.0 min.) ⁽¹⁾	V_{ISO}	8.34	—	—	kV
Isolation Resistance	($V_{I-O} = 500\text{ V}$)	R_{ISO}	1	10	—	$T\Omega$
Isolation Capacitance	($V_{I-O} = 0, f = 1.0\text{ MHz}$)	C_{ISO}	—	0.4	1	pF
Current Transfer Ratio	($I_F = 10\text{ mA}, V_{CE} = 0.4\text{ V}$) ($I_F = 10\text{ mA}, V_{CE} = 5\text{ V}$)	CTR	0.4	0.8	—	%
Capacitance	($V_{CB} = 10\text{ V}, f = 1\text{ MHz}$)	C_{CB}	—	4.5	—	pF
Turn-on Time	($I_C = 2\text{ mA}, V_{CC} = 5\text{ V}, R_L = 100\ \Omega$) ($I_C = 2\text{ mA}, V_{CC} = 5\text{ V}, R_L = 1\text{ k}\Omega$)	T_{ON}	—	3	—	μs
Turn-off Time	($I_C = 2\text{ mA}, V_{CC} = 5\text{ V}, R_L = 100\ \Omega$) ($I_C = 2\text{ mA}, V_{CC} = 5\text{ V}, R_L = 1\text{ k}\Omega$)	T_{OFF}	—	3	—	μs

NOTE:

1. Every product is tested with pins 1, 2 and 3 shorted together, and pins 4, 5 and 6 shorted together.

CNW82, CNW83, CNW84, CNW85

Fig. 1 Forward Current vs. Forward Voltage

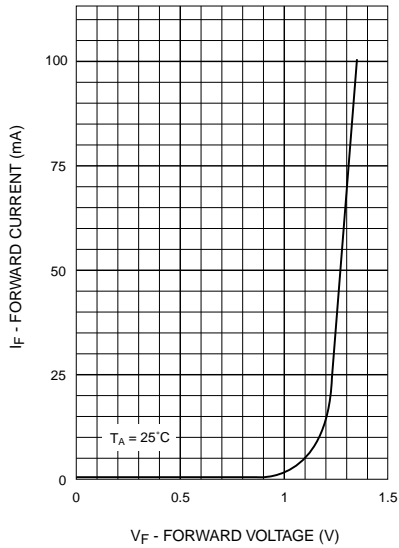


Fig. 2 Collector Current vs. Forward Current (for CNW84 and CNW85)

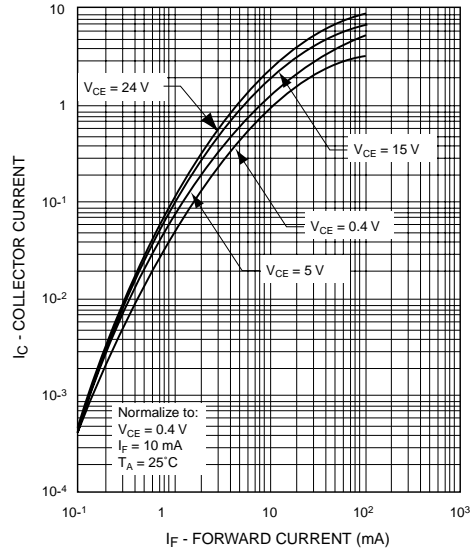


Fig. 3 Collector Current vs. Forward Current (for CNW82 and CNW83)

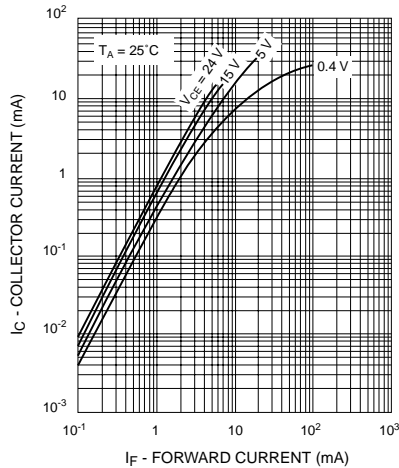


Fig. 4 Collector Current vs. Collector-Emitter Voltage

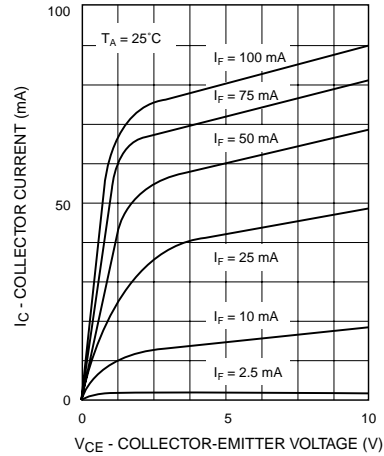


Fig. 5 Collector Current vs. Ambient Temperature (for CNW82 and CNW83)

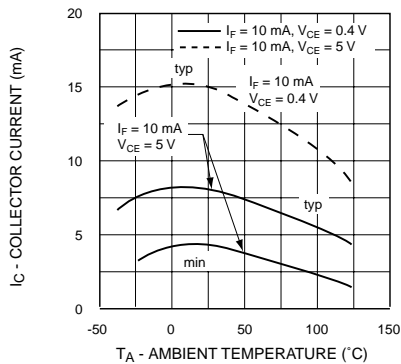
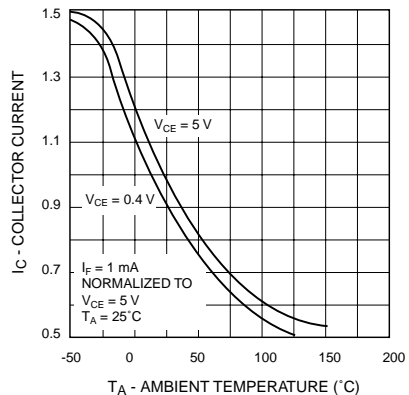


Fig. 6 Collector Current vs. Ambient Temperature (for CNW84 and CNW85)



CNW82, CNW83, CNW84, CNW85

**Fig. 7 Collector Current vs. Ambient Temperature
(for CNW84 and CNW85)**

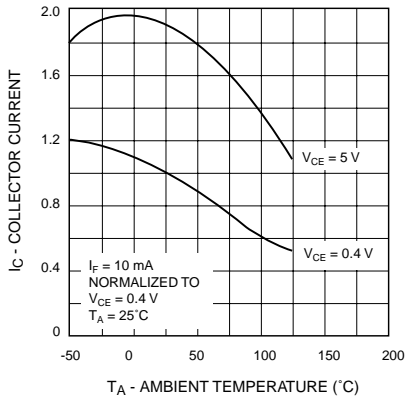


Fig. 8 Collector-Emitter Dark Current vs. Junction Temperature

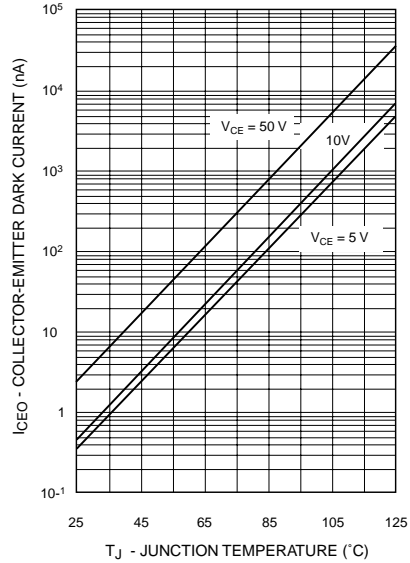


Fig. 9 Collector-Emitter Saturation Voltage vs. Collector Current

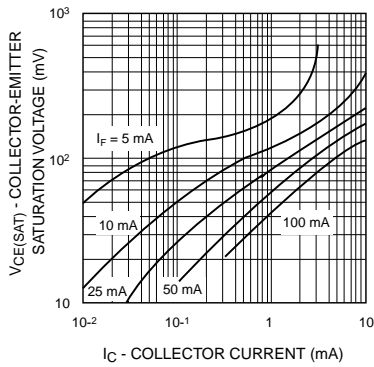
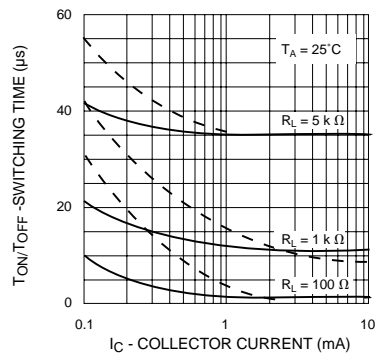
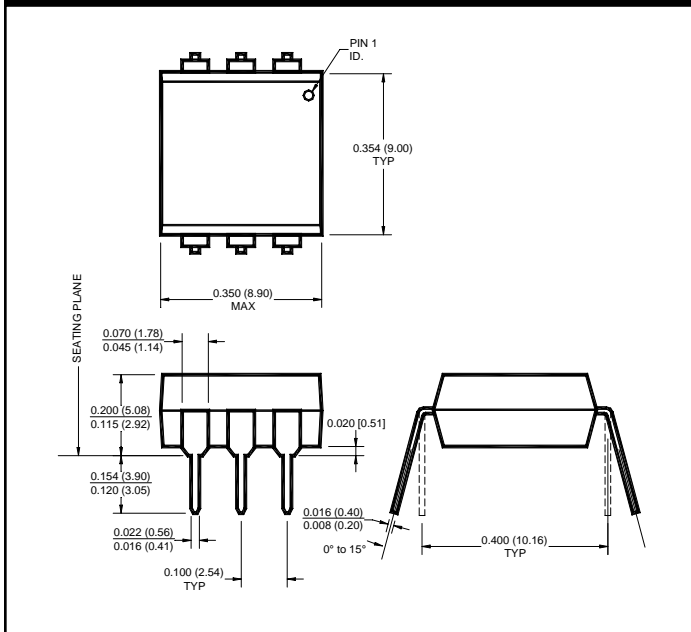


Fig. 10 Rise and Fall Time vs. Collector Current

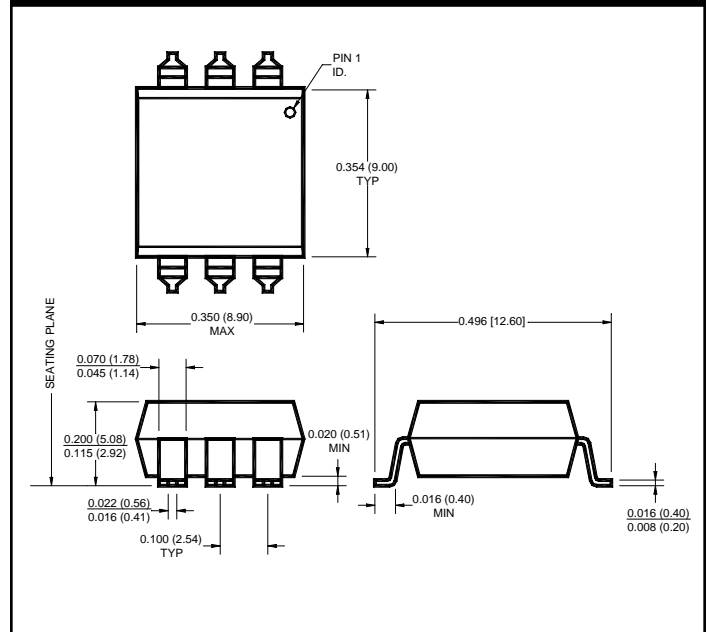


CNW82, CNW83, CNW84, CNW85

Package Dimensions (Through Hole)



Package Dimensions (Surface Mount)



NOTE

All dimensions are in inches (millimeters)

DISCLAIMER

FAIRCHILD SEMICONDUCTOR RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION OR DESIGN. FAIRCHILD DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN; NEITHER DOES IT CONVEY ANY LICENSE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS.

LIFE SUPPORT POLICY

FAIRCHILD'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF THE PRESIDENT OF FAIRCHILD SEMICONDUCTOR CORPORATION. As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury of the user.
2. A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.