

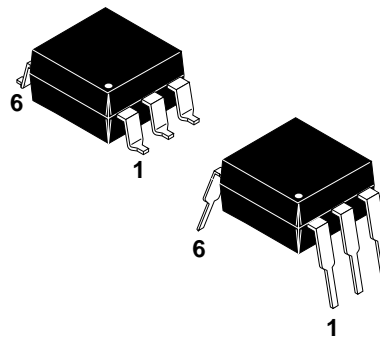
## DESCRIPTION

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

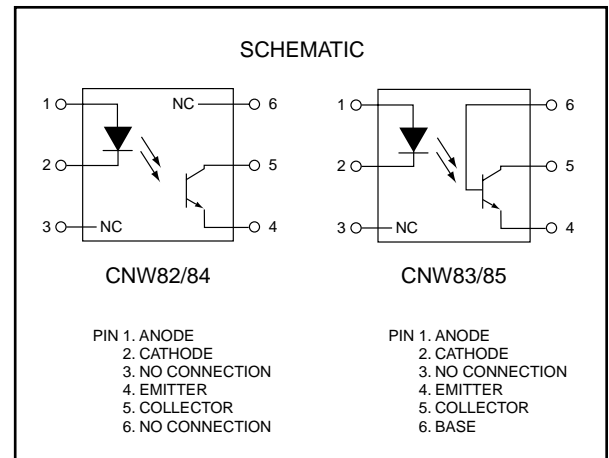
The CNW82 and CNW84 do not have the base pin connected for improved noise immunity.

## 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
<b>EMITTER</b>			
Forward Current - Continuous	$I_F$	100	mA
Forward Current - Peak (PW = 100 $\mu$ s, 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 $^\circ\text{C}$		2.0	mW/ $^\circ\text{C}$
<b>DETECTOR</b>			
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	
(CNW85)			
Total Power Dissipation @ $T_A = 25^\circ\text{C}$	$P_D$	200	mW
Derate above 25 $^\circ\text{C}$		2.0	mW/ $^\circ\text{C}$
<b>TOTAL DEVICE</b>			
Storage Temperature Range	$T_{stg}$	-55 to 150	$^\circ\text{C}$
Ambient Operating Temperature Range	$T_A$	-40 to 100	$^\circ\text{C}$
Lead Soldering Temperature (1/16" from case, 10 sec. duration)	$T_L$	260	$^\circ\text{C}$

## CNW82, CNW83, CNW84, CNW85

ELECTRICAL CHARACTERISTICS (T <sub>A</sub> = 25°C Unless otherwise specified)						
Parameter	Test Conditions	Symbol	Min	Typ	Max	Unit
<b>EMITTER</b>						
Input Forward Voltage	(I <sub>F</sub> = 10 mA)	V <sub>F</sub>	—	1.20	1.50	V
Reverse Leakage Current	(V <sub>R</sub> = 5.0 V)	I <sub>R</sub>	—	—	10	μA
<b>DETECTOR</b>						
Collector-Emitter Breakdown Voltage	(CNW82/83) (I <sub>C</sub> = 1.0 mA)	BV <sub>CEO</sub>	50	100	—	V
	(CNW84/85)		80	100	—	
Emitter-Collector Breakdown Voltage	(I <sub>E</sub> = 0.1 mA)	BV <sub>ECO</sub>	7	10	—	V
Collector-Base Breakdown Voltage	(CNW83) (I <sub>C</sub> = 0.1 mA)	BV <sub>CBO</sub>	70	100	—	V
	(CNW85)		120	140	—	
Collector-Emitter Dark Current	(T <sub>A</sub> = 25°C) (T <sub>A</sub> = 70°C) (V <sub>CE</sub> = 10 V, I <sub>F</sub> = 0)	I <sub>CEO</sub>	—	1	50	nA
			—	0.1	10	μA
Collector-Base Cut-off Current	(CNW83/85) (V <sub>CB</sub> = 10 V, I <sub>F</sub> = 0)	I <sub>CBO</sub>	—	—	20	nA
<b>COUPLED</b>						
Collector-Emitter Saturation Voltage	(I <sub>C</sub> = 4 mA, I <sub>F</sub> = 10 mA)	V <sub>CE(sat)</sub>	—	0.15	0.4	V
Isolation Voltage	(DC Value) (t = 1.0 min.) <sup>(1)</sup> (RMS Value) (t = 1.0 min.) <sup>(1)</sup>	V <sub>ISO</sub>	8.34	—	—	kV
			5.9	—	—	
Isolation Resistance	(V <sub>I-O</sub> = 500 V)	R <sub>ISO</sub>	1	10	—	TΩ
Isolation Capacitance	(V <sub>I-O</sub> = 0, f = 1.0 MHz)	C <sub>ISO</sub>	—	0.4	1	pF
Current Transfer Ratio	(CNW82/83) (I <sub>F</sub> = 10 mA, V <sub>CE</sub> = 0.4 V) (CNW84/85) (I <sub>F</sub> = 10 mA, V <sub>CE</sub> = 5 V)	CTR	0.4	0.8	—	%
			0.63	1.5	3.2	
Capacitance	(CNW83/85) (V <sub>CB</sub> = 10 V, f = 1 MHz)	C <sub>CB</sub>	—	4.5	—	pF
Turn-on Time	(I <sub>C</sub> = 2 mA, V <sub>CC</sub> = 5 V, R <sub>L</sub> = 100 Ω) (I <sub>C</sub> = 2 mA, V <sub>CC</sub> = 5 V, R <sub>L</sub> = 1 kΩ)	T <sub>ON</sub>	—	3	—	μs
			—	12	—	
Turn-off Time	(I <sub>C</sub> = 2 mA, V <sub>CC</sub> = 5 V, R <sub>L</sub> = 100 Ω) (I <sub>C</sub> = 2 mA, V <sub>CC</sub> = 5 V, R <sub>L</sub> = 1 kΩ)	T <sub>OFF</sub>	—	3	—	μs
			—	12	—	

**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

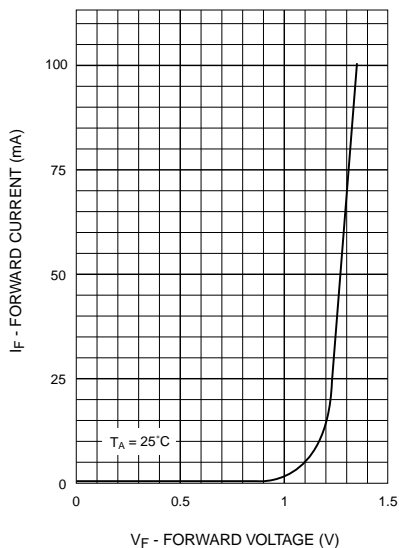


Fig. 2 Collector Current vs. Forward Current (for CNW84 and CNW85)

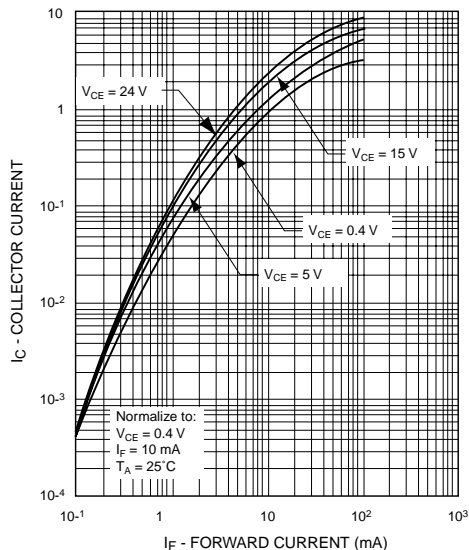


Fig. 3 Collector Current vs. Forward Current (for CNW82 and CNW83)

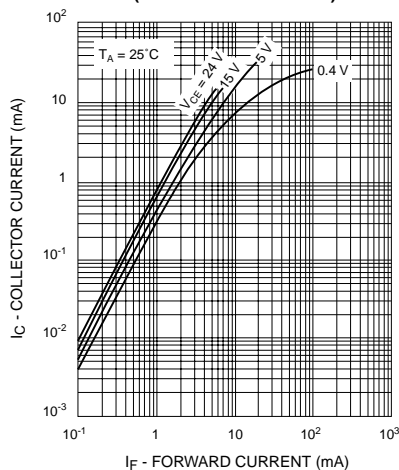


Fig. 4 Collector Current vs. Collector-Emitter Voltage

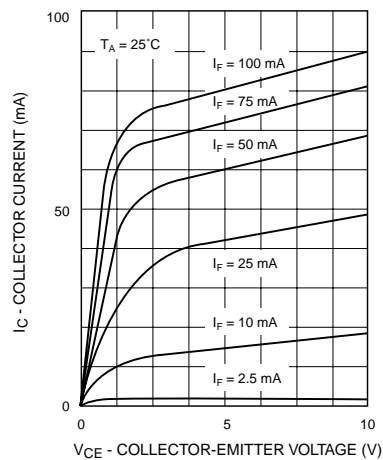


Fig. 5 Collector Current vs. Ambient Temperature (for CNW82 and CNW83)

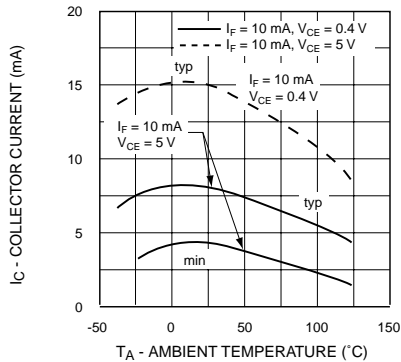
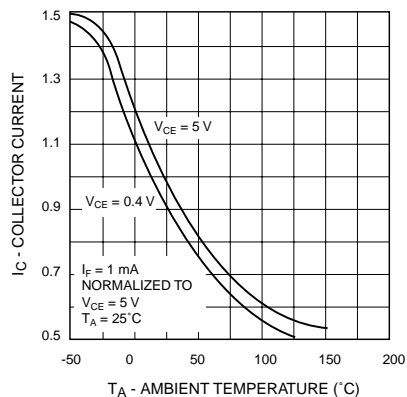
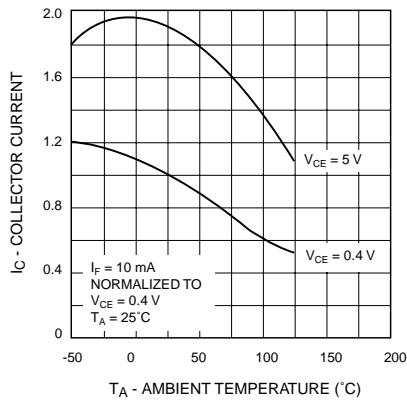


Fig. 6 Collector Current vs. Ambient Temperature (for CNW84 and CNW85)

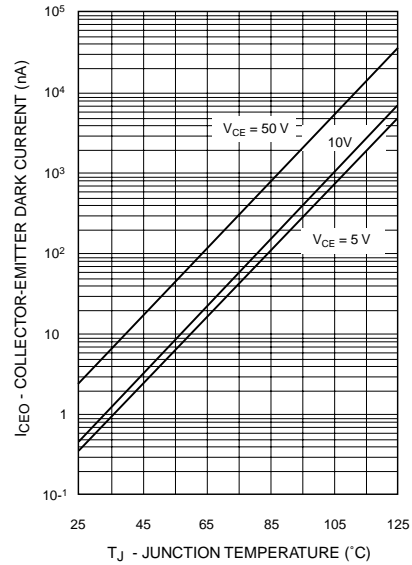


## CNW82, CNW83, CNW84, CNW85

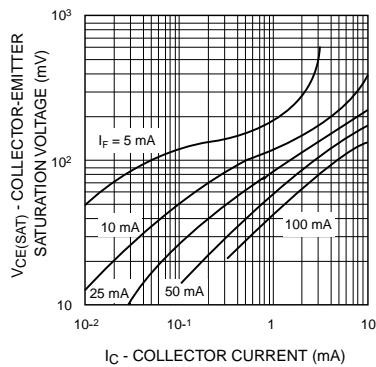
**Fig. 7 Collector Current vs. Ambient Temperature (for CNW84 and CNW85)**



**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**

