

CNW11AV-1

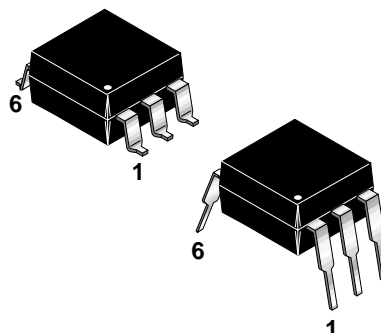
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DESCRIPTION

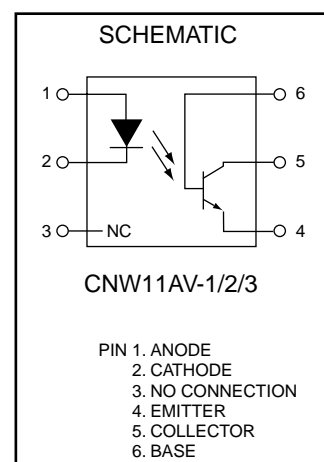
The CNW11AV series are high voltage optocouplers in a wide body dual-in-line package (DIP).

Each optocoupler consists of a GaAs infrared emitter optically coupled to a silicon npn phototransistor with the base connected.



FEATURES

- Minimum 2 mm isolation thickness between emitter and receiver
- A wide body encapsulation with a pin distance of 10.16 mm
- An external clearance of 9.6 mm minimum and an external creepage of 10 mm minimum
- 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 (4000 V (RMS) and 5656 V (DC))
- Collector-emitter breakdown Voltage: 70 V
- Low isolation capacitance of 0.5 pF maximum
- UL recognized (File # E90700)
- VDE recognized (File # 76876)
- Ordering option '300' (e.g. CNW11AV-1.300)



ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Value	Units
TOTAL DEVICE			
Storage Temperature Range	T _{STG}	-55 to 150	°C
Ambient Operating Temperature Range	T _{OPR}	-40 to 100	°C
Lead Soldering Temperature	T _{SOL}	260 for 10 sec	°C
Junction Temperature	T _J	125	°C
EMITTER			
Forward Current - Continuous	I _F	100	mA
Forward Current - Peak (t _{on} = 10µs, δ = 0.01)	I _{F(pk)}	3	A
Reverse Voltage	V _R	6	V
Total Power Dissipation @ T _A = 25°C Derate Linearly From 25°C	P _D	200	mW
		2.0	mW/°C
DETECTOR			
Collector Current-Continuous	I _C	100	mA
Emitter-Collector Voltage	V _{ECO}	7	V
Collector-Emitter Voltage	V _{CEO}	70	V
Collector-Base Voltage	V _{CBO}	70	V
Total Power Dissipation @ T _A = 25°C Derate Linearly From 25°C	P _D	200	mW
		2.0	mW/°C

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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	0.8	1.15	1.50	V
	$I_F = 10\text{ mA}, T_A = -55^\circ\text{C}$		0.9	—	1.70	
	$I_F = 10\text{ mA}, T_A = 100^\circ\text{C}$		0.7	—	1.40	
Reverse Leakage Current	$V_R = 6.0\text{ V}$	I_R	—	—	10	μA
Input Capacitance	$V_I = 0, f = 1\text{ MHz}$	C_J	—	25	100	pF
DETECTOR						
Collector-Emitter Breakdown Voltage	$I_C = 1.0\text{ mA}$	BV_{CEO}	70	—	—	V
Collector-Base Breakdown Voltage	$I_C = 0.1\text{ mA}$	BV_{CBO}	70	—	—	V
Emitter-Collector Breakdown Voltage	$I_E = 0.1\text{ mA}$	BV_{ECO}	7	—	—	V
Emitter-Base Breakdown Voltage	$I_E = 0.1\text{ mA}$	BV_{EBO}	7	—	—	V
Collector-Emitter Dark Current	$V_{CE} = 10\text{ V}, I_F = 0, T_A = 25^\circ\text{C}$	I_{CEO}	—	0.5	50	nA
	$V_{CE} = 10\text{ V}, I_F = 0, T_A = 70^\circ\text{C}$		—	—	10	μA
Collector-Base Cut-off Current	$I_F = 0, V_{CB} = 10\text{ V}$	I_{CBO}	—	—	20	nA

ISOLATION CHARACTERISTICS

Characteristic	Test Conditions	Symbol	Min	Typ	Max	Units
Input-Output Isolation Voltage	DC Value, Time = 1 min.	V_{ISO}	5,656			V
	RMS Value, Time = 1 min.		4,000			
Isolation Resistance	$V_{I-O} = \pm 500\text{ VDC}$	R_{ISO}	1	10		$T\Omega$
Isolation Capacitance	$V = 0\text{ V}, f = 1\text{ MHz}$	C_{ISO}		0.3	0.5	pF
Output Capacitance	$V_{CB} = 10\text{ V}, f = 1\text{ MHz}$	C_O		4.5		pF

TRANSFER CHARACTERISTICS ($T_A = 25^\circ\text{C}$ Unless otherwise specified.)

DC Characteristics	Test Conditions	Symbol	Device	Min	Typ	Max	Units
Output/Input Current Transfer Ratio	$I_F = 10\text{ mA}, V_{CE} = 10\text{ V}$	CTR	CNW11AV-1	100		300	%
			CNW11AV-2	50			
			CNW11AV-3	20			
Collector-Emitter Saturation Voltage	$I_F = 20\text{ mA}, I_C = 2\text{ mA}$	$V_{CE(SAT)}$	All		0.1	0.4	V
Common Mode Rejection Ratio	$I_C = 2\text{ mA}, V_{CC} = 5\text{ V}, f = 10\text{ kHz}, R = 1\text{ k}\Omega$	CMRR	All		-60		dB
AC Characteristics	Test Conditions	Symbol	Device	Min	Typ	Max	Units
Saturated Switching Times							
Turn-On Time (fig. 2 & 3)	$I_C = 2\text{ mA}, V_{CC} = 10\text{ V}, R_L = 100\Omega$	t_{on}	All		3	15	μs
Turn-Off Time (fig. 2 & 3)		t_{off}	All		2.5	15	μs

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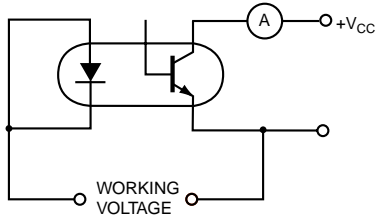


Fig. 1 Test Circuit

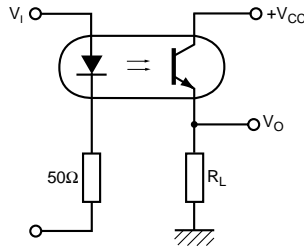


Fig. 2 Switching Circuit

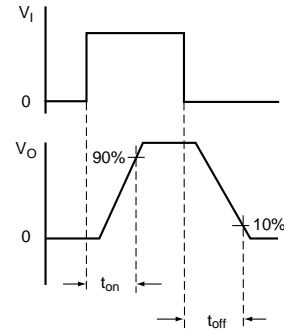


Fig. 3 Waveforms

Fig. 4 LED Forward Voltage vs. Forward Current

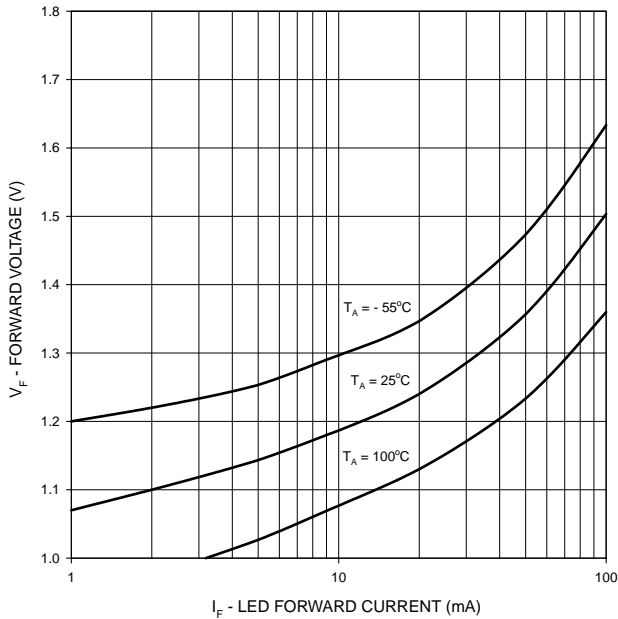


Fig. 5 Normalized CTR vs. Forward Current

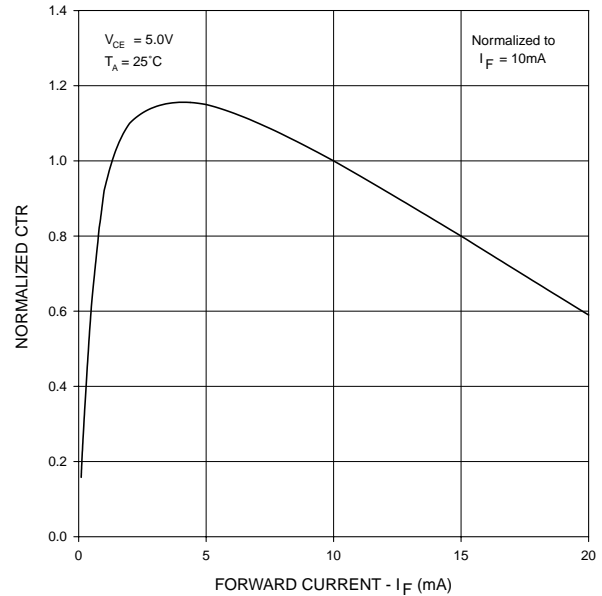


Fig. 6 Normalized CTR vs. Temperature

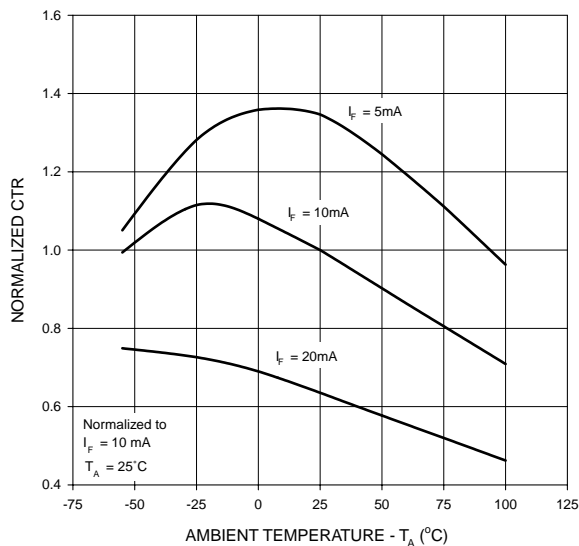
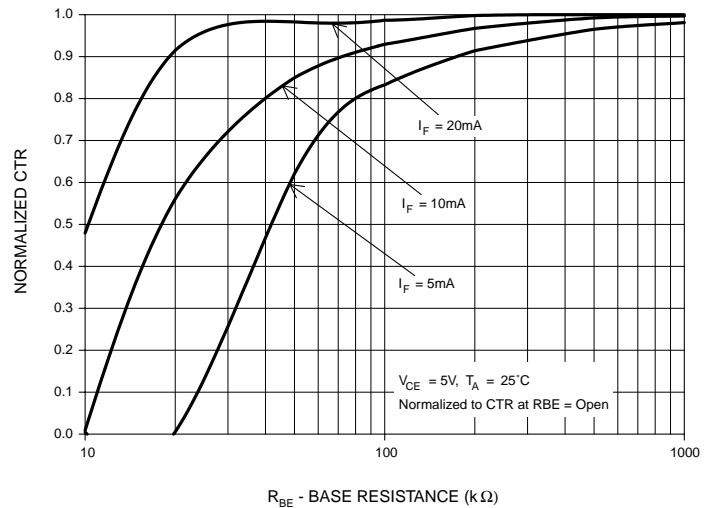


Fig. 7 CTR vs. R_{BE} (Unsaturated)



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Fig. 8 CTR vs. R_{BE} (Saturated)

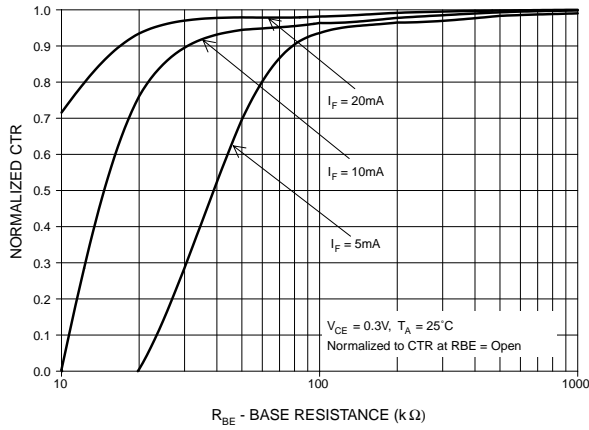


Fig. 9 Normalized t_{on} vs. R_{BE}

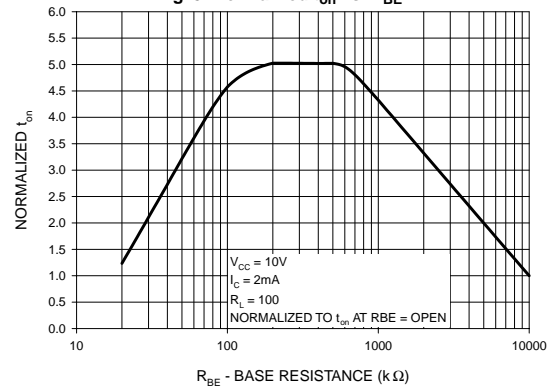


Fig. 10 Normalized t_{off} vs. R_{BE}

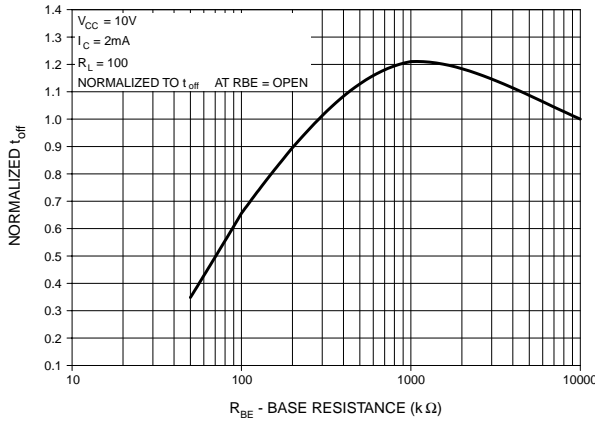


Fig. 11 Switching Speed vs. Load Resistor

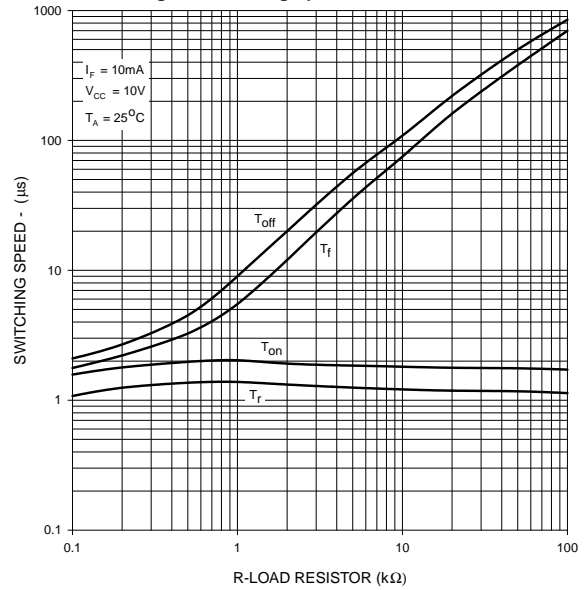


Fig. 12 Collector-Emitter Saturation Voltage vs Collector Current

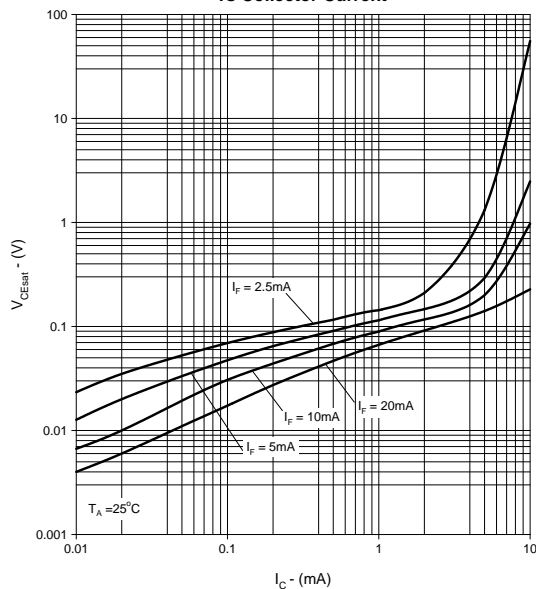
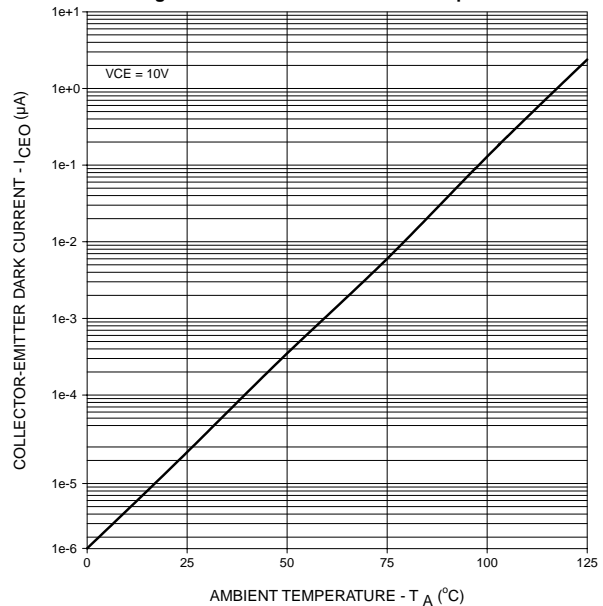
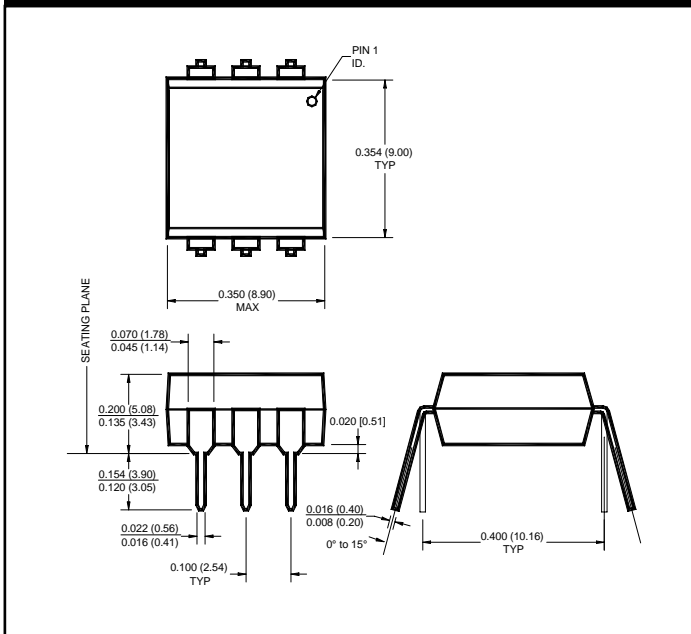


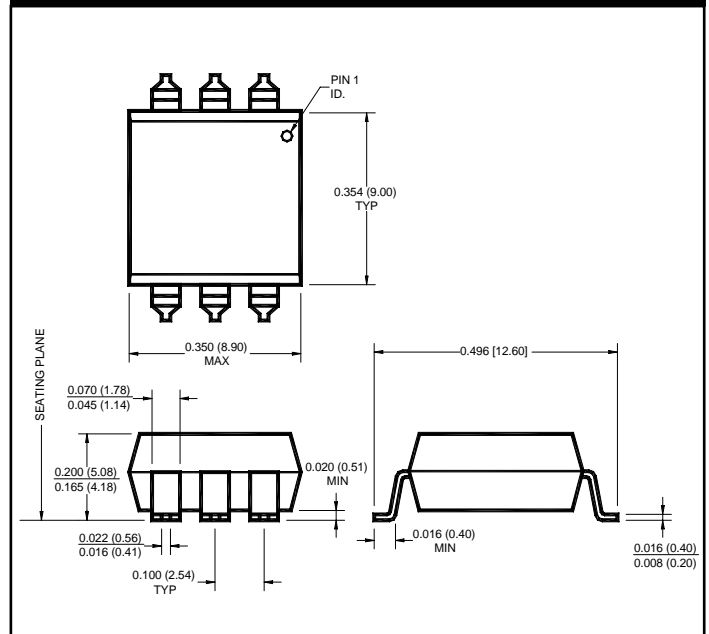
Fig. 13 Dark Current vs. Ambient Temperature



Package Dimensions (Through Hole)



Package Dimensions (Surface Mount)



NOTE

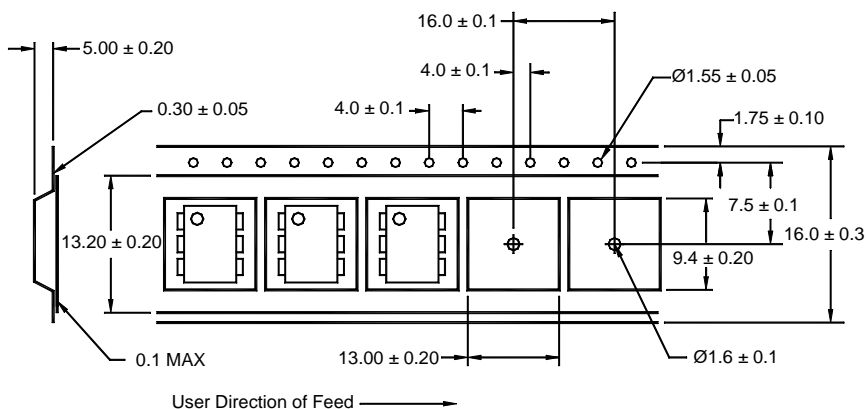
All dimensions are in inches (millimeters)

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ORDERING INFORMATION

Option	Order Entry Identifier	Description
S	.S	Surface Mount Lead Bend
SD	.SD	Surface Mount; Tape and reel
300	.300	VDE 0884

Carrier Tape Specifications ("D" Taping Orientation)



NOTE

All dimensions are in inches (millimeters)

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