

MCT9001

DESCRIPTION

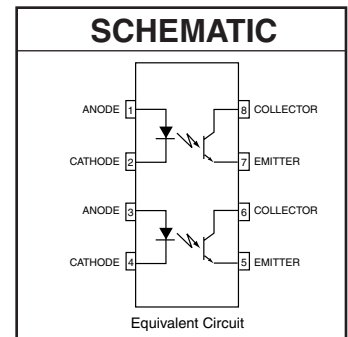
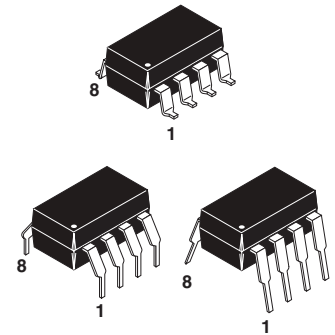
The MCT9001 Optocoupler has two channels for density applications. For four channel applications, two-packages fit into a standard 16-pin DIP socket. Each channel is an NPN silicon planar phototransistor optically coupled to a gallium arsenide infrared emitting diode.

FEATURES

- Two isolated channels per package
- Two packages fit into a 16 lead DIP socket
- Underwriters Laboratory (U.L.) recognized File E90700

APPLICATIONS

- AC Line/Digital Logic - isolate high voltage transients
- Digital Logic/Digital Logic - Eliminate spurious grounds
- Digital Logic/AC Triac Control - isolate high voltage transients
- Twisted pair line receiver - Eliminate ground loop feedthrough
- Telephone/Telegraph line receiver - isolate high voltage transients
- High Frequency Power Supply Feedback Control - Maintain floating grounds and transients
- Relay contact monitor - isolate floating grounds and transients
- Power supply monitor - Isolate transients



ABSOLUTE MAXIMUM RATINGS			
Rating	Symbol	Value	Unit
EMITTER (Each channel)			
Forward Current - Continuous	I_F	60	mA
Forward Current - Peak (PW = 1μs, 300pps)	$I_F(pk)$	3	A
Reverse Voltage	V_R	5.0	V
LED Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C (Total Input)	P_D	100 1.1	mW mW/°C
DETECTOR (Each channel)			
Collector Current - Continuous	I_C	30	mA
Detector Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	150 1.67	mW mW/°C
TOTAL DEVICE			
Storage Temperature	T_{STG}	-55 to +150	°C
Operating Temperature	T_{OPR}	-55 to +100	°C
Lead Solder Temperature	T_{SOL}	250 for 10 sec	°C
Total Device Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	400 4.83	mW mW/°C

MCT9001

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

INDIVIDUAL COMPONENT CHARACTERISTICS

Parameter	Test Conditions	Symbol	Min	Typ**	Max	Unit
EMITTER						
Input Forward Voltage	($I_F = 10\text{ mA}$)	V_F		1.0	1.3	V
Reverse Current	($V_R = 5\text{ V}$)	I_R			10	μA
Junction Capacitance	($V_F = 0\text{ V}$, $f = 1\text{ MHz}$)	C_J		50		pF
DETECTOR						
Collector-Emitter Breakdown Voltage	($I_C = 0.5\text{ mA}$, $I_F = 0$)	BV_{CEO}	55			V
Emitter-Collector Breakdown Voltage	($I_E = 100\text{ }\mu\text{A}$, $I_F = 0$)	BV_{ECO}	7			V
Collector-Emitter Dark Current	($V_{CE} = 24\text{ V}$, $I_F = 0$)	I_{CEO}		5	100	nA
	($V_{CE} = 24\text{ V}$, $T_A = 85^\circ\text{C}$)				50	μA
Capacitance	($V_{CE} = 0\text{ V}$, $f = 1\text{ MHz}$)	C_{CE}		8		pF

TRANSFER CHARACTERISTICS

AC Characteristic	Test Conditions	Symbol	Min	Typ**	Max	Units
SWITCHING TIMES						
Non-Saturated	(R _L = 100 Ω , I _C = 2 mA, V _{CC} = 10 V)					μs
Turn-on Time		t_{on}		3		
Turn-off Time		t_{off}		3		
Rise Time		t_r		2.4		
Fall Time		t_f		2.4		
Saturated	(I _F = 16 mA, R _L = 1.9 k Ω , V _{CE} = 5 V)					
Turn-on Time		t_{on}		2.4		
Turn-off Time		t_{off}		25.0		

TRANSFER CHARACTERISTICS

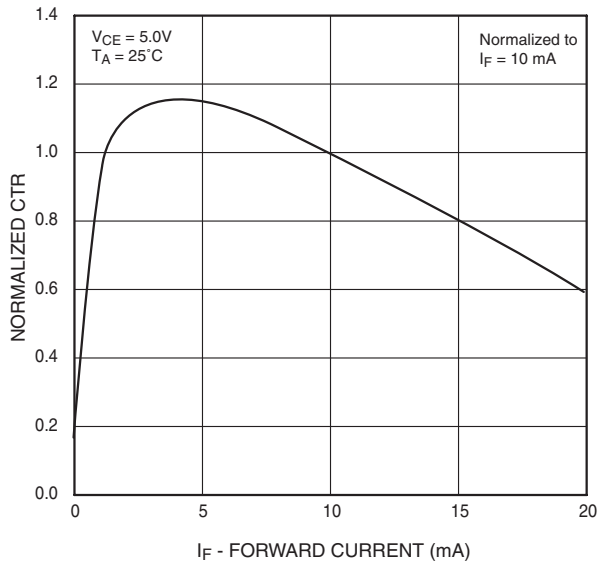
DC Characteristic	Test Conditions	Symbol	Min	Typ**	Max	Units
Current Transfer Ratio, Collector-Emitter	(I _F = 5 mA, V _{CE} = 5 V)	CTR	50		600	%
	(I _F = 8 mA, V _{CE} = 0.4 V)	CTR _(sat)	30			
Saturation Voltage	(I _F = 8 mA, I _C = 2.4 mA)	V _{CE(sat)}			0.40	V

ISOLATION CHARACTERISTICS

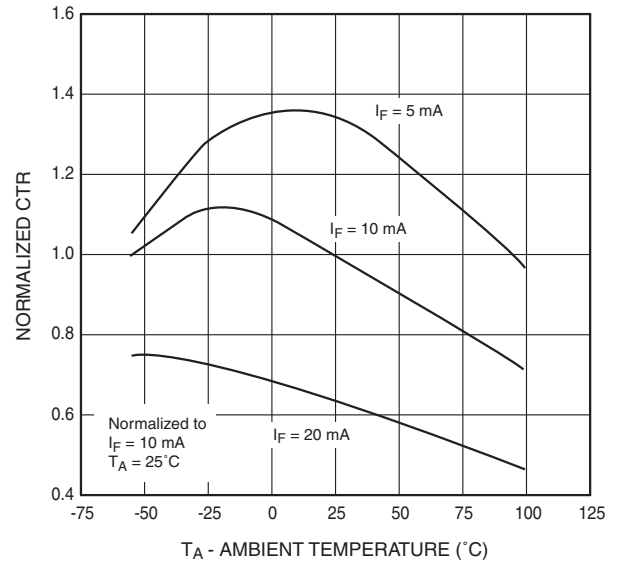
Characteristic	Test Conditions	Symbol	Min	Typ**	Max	Units
Input-Output Isolation Voltage	(I _{I-O} \leq 1 μA , t = 1 min.)	V _{ISO}	5300			Vac(rms)
Isolation Resistance	(V _{I-O} = 500 VDC)	R _{ISO}	10 ¹¹			Ω
Isolation Capacitance	(f = 1 MHz)	C _{ISO}		0.5		pf

** All typicals at TA = 25°C

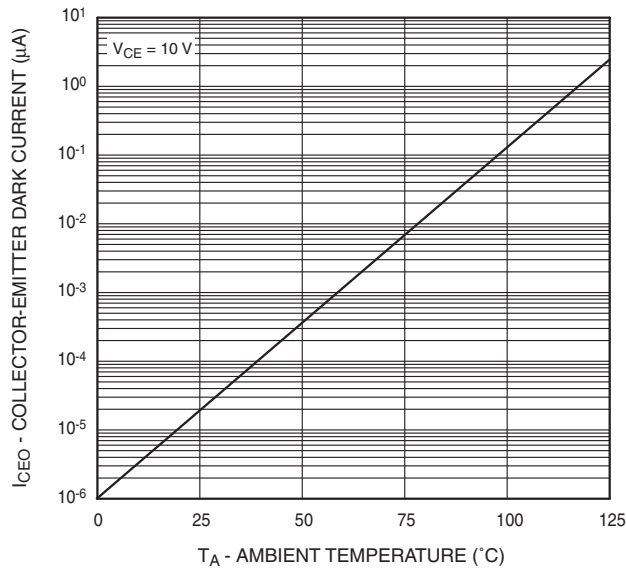
Normalized CTR vs. Forward Current



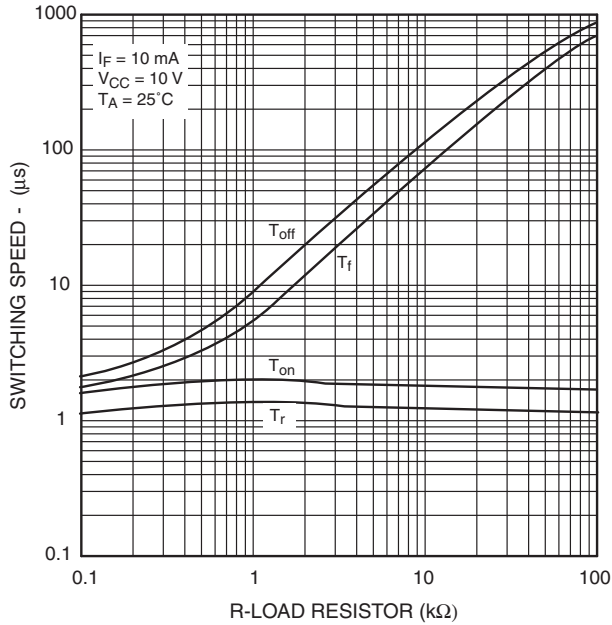
Normalized CTR vs. Ambient Temperature



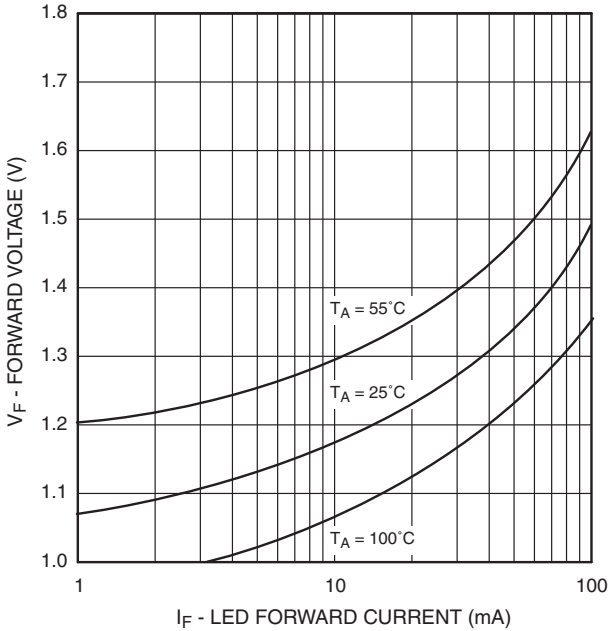
Dark Current vs. Ambient Temperature



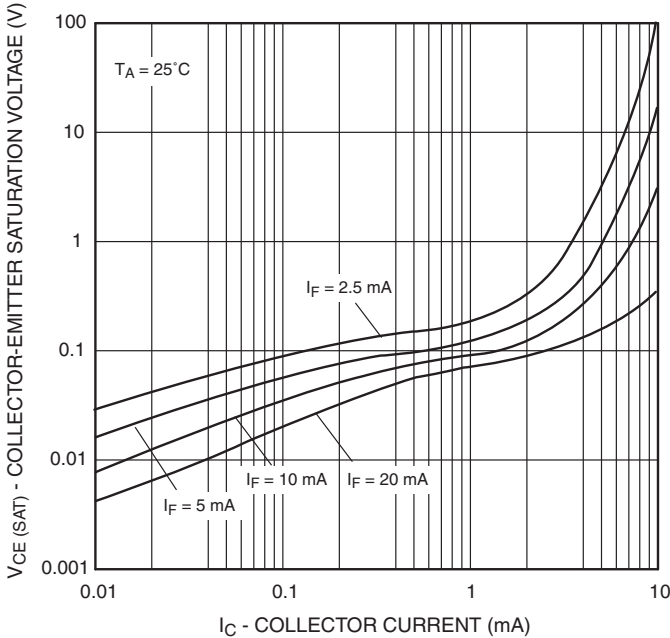
Switching Speed vs. Load Resistor



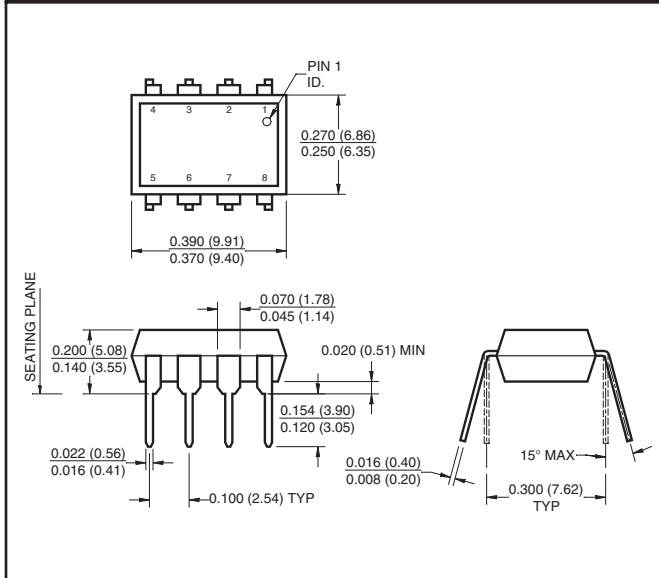
LED Forward Voltage vs. Forward Current



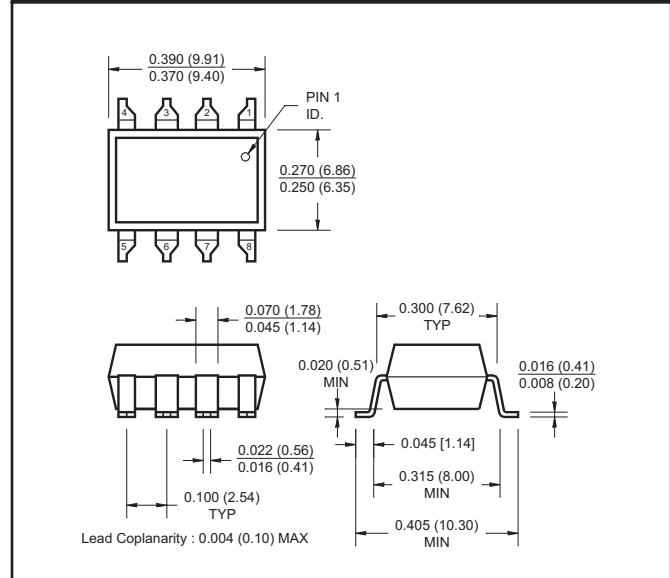
Collector-Emitter Saturation Voltage vs Collector Current



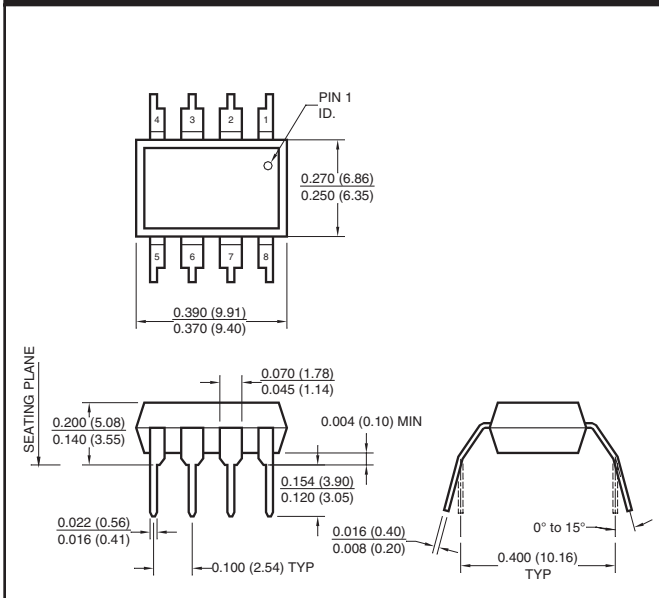
Package Dimensions (Through Hole)



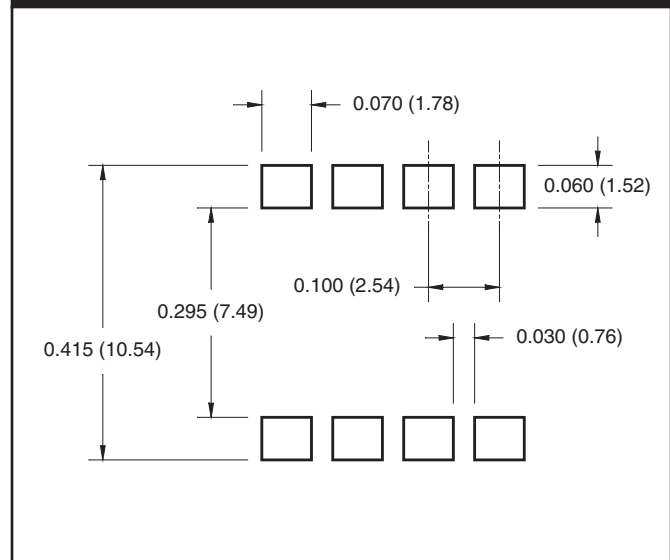
Package Dimensions (Surface Mount)



Package Dimensions (0.4" Lead Spacing)



**Recommended Pad Layout for
Surface Mount Leadform**



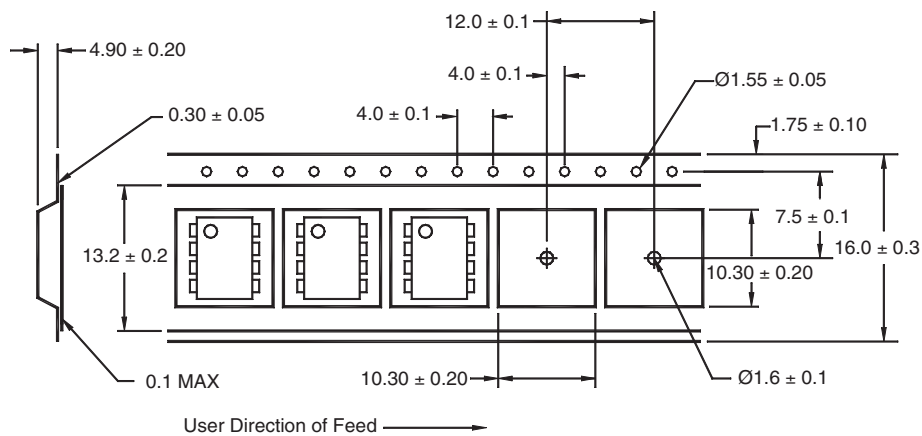
NOTE

All dimensions are in inches (millimeters)

ORDERING INFORMATION

Option	Order Entry Identifier	Description
S	.S	Surface Mount Lead Bend
SD	.SD	Surface Mount; Tape and reel
W	.W	0.4" Lead Spacing

Carrier Tape Specifications



NOTE

All dimensions are in inches (millimeters)

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