Dual Optically-Coupled Isolator

MCT6, MCT66

Optoelectronic Products

General Description
The MCT6 and MCT66 comprise two distinct optoisolators with transistor output, in a single 8-pin dual in-line package. Each channel consists of a GaAs emitter optically coupled to a phototransistor.

High Current Transfer Ratio
1500 V Minimum Isolation Input-to-Output
10^{11} Ω Isolation Resistance
Low Coupling Capacitance—Typically 1.0 pF
I/O Compatible with Integrated Circuits
Two Packages Fit Into a Standard 16-Pin DIP Socket

Absolute Maximum Ratings

Maximum Temperature

Storage Temperature	−55°C to +150°C
Operating Temperature	−55°C to +100°C
Pin Temperature (Soldering, 5 s)	250°C
Total Package Power Dissipation at T_A = 25°C	400 mW
Derate Linearly from 25°C	5.33 mW/°C

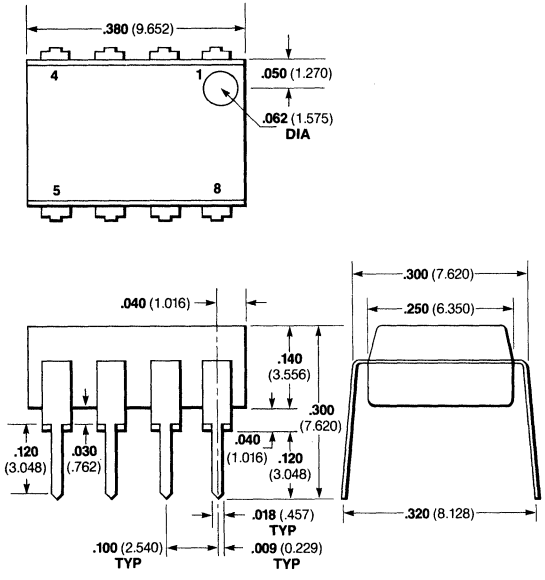
Input Diode (Each Channel)

V_R	Reverse Voltage	3.0 V
I_F	Forward Current	60 mA
I_{pk}	Peak Forward Current at 1 μs pulse, 300 pps	3.0 A
P_D	Power Dissipation at T_A = 25°C	100 mW
	Derate Linearly from 50°C	2.0 mW/°C

Output Transistor (Each Channel)

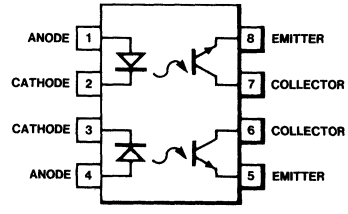
V_{CE}	Collector-to-Emitter Voltage	30 V
V_{EC}	Emitter-to-Collector Voltage	6.0 V
P_D	Power Dissipation at T_A = 25°C	150 mW
	Derate Linearly from 25°C	2.0 mW/°C
I_C	Collector Current	30 mA

Package Outline



Notes
All dimensions in inches **bold** and millimeters (parentheses)
Tolerance unless specified = ±.015 (±.381)
Package weight is 0.4 gram

Connection Diagram
DIP (Top View)



Pin		
1	Anode	
2	Cathode	Channel #1
3	Cathode	
4	Anode	Channel #2
5	Emitter	
6	Collector	Channel #2
7	Collector	
8	Emitter	Channel #1

Typical Electrical Characteristics

MCT6, MCT66

Electrical Characteristics—Input Diode $T_A = 25°C$

Symbol	Characteristic	Min	Typ	Max	Units	Test Conditions
V_F	Forward Voltage		1.25	1.5	V	$I_F = 20$ mA
V_R	Reverse Voltage	3.0	5.5		V	$I_R = 10\ \mu A$
C_J	Junction Capacitance		50		pF	$V_F = 0$ V
I_R	Reverse Current		0.01	10	μA	$V_R = 3.0$ V

Electrical Characteristics—Output Transistor $T_A = 25°C$

Symbol	Characteristic	Min	Typ	Max	Units	Test Conditions
V_{CEO}	Collector-to-Emitter Voltage	30	85		V	$I_C = 1.0$ mA, $I_F = 0$
V_{ECO}	Emitter-to-Collector Voltage	6.0	13		V	$I_C = 100\ \mu A$
I_{CEO}	Collector-to-Emitter Leakage Current		5.0	100	nA	$V_{CE} = 10$ V, $I_F = 0$
C_{CE}	Collector-to-Emitter Capacitance		8.0		pF	$V_{CE} = 0$

Electrical Characteristics—Coupled $T_A = 25°C$

Symbol	Characteristic	Min	Typ	Max	Units	Test Conditions
V_{IO}	Input-to-Output Voltage	1500	2500		V	
$V_{CE(sat)}$	Collector-to-Emitter Saturation Voltage					
	MCT6		0.20	0.4	V	$I_C = 2.0$ mA, $I_F = 16$ mA
	MCT66		0.20	0.4	V	$I_C = 2.0$ mA, $I_F = 40$ mA
I_C/I_F(CTR)	Collector Current Transfer Ratio (Note 1)					
	MCT6	20	50		%	$V_{CE} = 10$ V, $I_F = 10$ mA
	MCT66	6	15		%	$V_{CE} = 10$ V, $I_F = 10$ mA
R_{IO}	Input-to-Output Resistance	10^{11}	10^{12}		Ω	$V_{IO} = 500$ V
C_{IO}	Input-to-Output Capacitance		0.5		pF	$f = 1.0$ MHz
$t_r\ t_f$	Collector Rise and Fall Times (Note 2)		2.0		μs	$I_C = 2.0$ mA, $V_{CE} = 10$ V, $R_L = 100\ \Omega$
B_W	Bandwidth		150		kHz	$I_C = 2.0$ mA, $V_{CC} = 10$ V, $R_L = 100\ \Omega$
$BV_{C\text{-}C}$	Breakdown Voltage Channel-to-Channel		1500		V	
$C_{C\text{-}C}$	Capacitance Channel-to-Channel		0.4		pF	$f = 1.0$ MHz

Notes
1. Collector current transfer ratio is defined as the ratio of the collector current to the forward bias input current.
2. Rise time is defined as the time for the collector current to rise from 10% to 90% of peak value. Fall time is defined as the time required for the current to decrease from 90% to 10% of peak value.

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