Optically-Coupled Isolator

Optoelectronic Products

MCT2, MCT2E MCT26

General Description

The MCT2, MCT2E and MCT26 optical isolators are electrical and mechanical replacements for the Monsanto series. Optical intercoupling provides a high degree of ac and dc isolation. A capability for continuous operation of the input diode results in a frequency response extending to dc. Connection to the base is also provided for design flexibility.

Glassolated™
Electrically Equivalent to Monsanto Devices
Pin-for-Pin Equivalent to Monsanto Devices
Availability of Base Pin for Flexible Design

Absolute Maximum Ratings

Maximum Temperature and Humidity

Storage Temperature	−55°C to +150°C
Operating Temperature	−55°C to +100°C
Pin Temperature (Soldering, 5 s)	260°C
Total Package Power Dissipation at T_A = 25°C,	
LED plus Detector	250 mW
Derate Linearly from 25°C	3.3 mW/°C

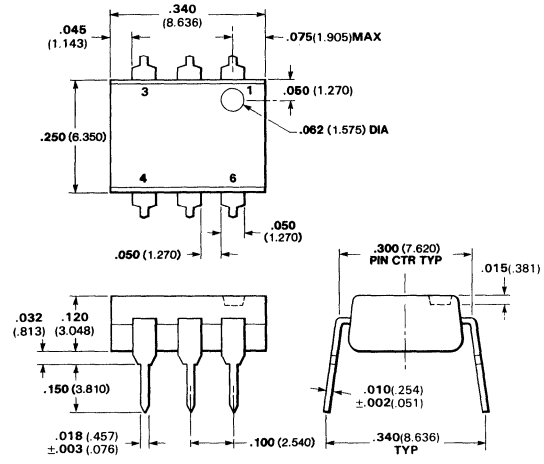
Input Diode

V_R	Reverse Voltage	3.0 V
I_F	Forward Current	60 mA
I_{pk}	Peak Forward Current, 1 μs pulse width, 330 pps	3.0 A
P_D	Power Dissipation at T_A = 25°C	200 mW
	Derate Linearly from 25°C	2.6 mW/°C

Output Transistor

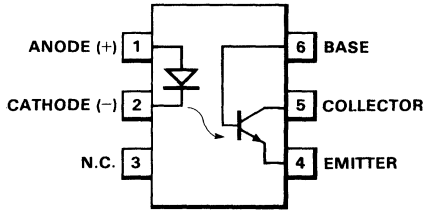
V_{CE}	Collector-to-Emitter Voltage	30 V
V_{CB}	Collector-to-Base Voltage	30 V
V_{EC}	Emitter-to-Collector Voltage	7.0 V
P_D	Power Dissipation at T_A = 25°C	200 mW
	Derate Linearly from 25°C	2.6 mW/°C

Package Outline



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

Connection Diagram
DIP (Top View)



Pin		
1	Anode (+)	Input Diode
2	Cathode (−)	
3	NC	
4	Emitter	Output npn Phototransistor
5	Collector	
6	Base	

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Typical Electrical Characteristics

MCT2, MCT2E MCT26

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
BV_R	Reverse Breakdown Voltage	3.0	5.5		V	$I_R = 10\ \mu A$

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

Symbol	Characteristic	Min	Typ	Max	Units	Test Conditions
V_{CEO}	Collector-to-Emitter Voltage					
	MCT2/MCT2E	30	65		V	$I_C = 1.0$ mA, $I_F = 0$
	MCT26	30	75		V	$I_C = 1.0$ mA, $I_F = 0$
V_{CBO}	Collector-to-Base Voltage					
	MCT2/MCT2E	70	165		V	$I_C = 100\ \mu A$
	MCT26	30	100		V	$I_C = 100\ \mu A$
V_{ECO}	Emitter-to-Collector Voltage					
	MCT2/MCT2E	7.0	14		V	$I_C = 100\ \mu A$
	MCT26	7.0	12		V	$I_C = 100\ \mu A$
I_{CEO}	Collector-to-Emitter Leakage Current					
	MCT2/MCT2E		5.0	50	nA	$V_{CE} = 10$ V, $I_F = 0$
	MCT26		5.0	100	nA	$V_{CE} = 5.0$ V, $I_F = 0$
I_{CBO}	Collector-to-Base Leakage Current					
	MCT2/MCT2E		0.1	20	nA	$V_{CB} = 10$ V, $I_F = 0$
	MCT26		1.0	100	nA	$V_{CB} = 5.0$ V, $I_F = 0$
h_{FE}	Forward Current Gain					
	MCT2/MCT2E	100	250			$V_{CE} = 5.0$ V, $I_C = 100\ \mu A$
	MCT26	100	150			$V_{CE} = 5.0$ V, $I_C = 100\ \mu A$
C_{ce}	Collector-to-Emitter Capacitance					
	MCT2/MCT2E, MCT26		8.0		pF	$V_{CE} = 0$
C_{cb}	Collector-to-Base Capacitance					
	MCT2/MCT2E		20		pF	$V_{CB} = 10$ V
C_{eb}	Emitter-to-Base Capacitance					
	MCT2/MCT2E		10		pF	$V_{BE} = 0$

Typical Electrical Characteristics (Cont'd)

MCT2, MCT2E MCT26

Electrical Characteristics—Coupled $T_A = 25°C$

Symbol	Characteristic	Min	Typ	Max	Units	Test Conditions
V_{IO}	Input-to-Output Voltage					
	MCT2	1500	2300		V_{dc}	f = 60 Hz
	MCT2E	2500			V_{dc}	
	MCT26	1500	2500		V_{dc}	
	MCT2, MCT26	800			V_{rms}	
$V_{CE(sat)}$	Collector-to-Emitter Saturation Voltage					
	MCT2, MCT2E		0.24	0.4	V	I_C = 2.0 mA, I_F = 16 mA
	MCT26		0.2	0.3	V	I_C = 250 μA, I_F = 20 mA
$I_C/I_F(CTR)$	Collector Current Transfer Ratio (Note 1)					
	MCT2, MCT2E	20	50		%	V_{CE} = 10 V, I_F = 10 mA
	MCT26	6	14		%	
R_{IO}	Input-to-Output Resistance					
	MCT2		10^{11}		Ω	V_{IO} = 500 V
	MCT2E		10^{11}	10^{12}	Ω	
C_{IO}	Input-to-Output Capacitance					
	MCT2, MCT2E		1.0		pF	f = 1.0 MHz
	MCT26		1.0	2.0	pF	
t_r, t_f	Collector Rise and Fall Times (Note 2)					
	MCT26		2.0		μs	I_C = 2.0 mA, V_{CE} = 10 V

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.