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Jameco Part Number 978236

MCT6, MCT61, MCT62 Dual Phototransistor Optocouplers

Features

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

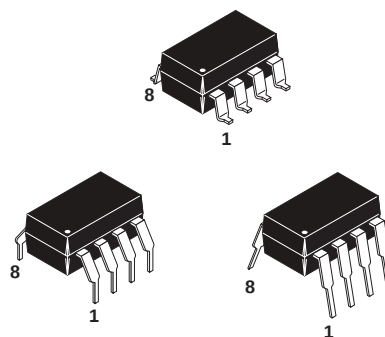
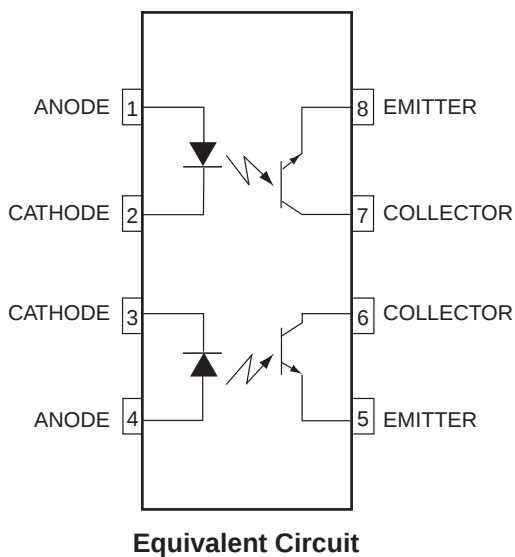
Applications

- 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

Description

The MCT6X Optocouplers have 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.

Schematic



Absolute Maximum Ratings

Rating	Symbol	Value	Unit
EMITTER (Each channel)			
Forward Current – Continuous	I_F	60	mA
Forward Current – Peak (PW = 1 μ s, 300pps)	$I_F(pk)$	3	A
Reverse Voltage	V_R	3.0	V
LED Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C (Total Input)	P_D	100 1.3	mW mW/ $^\circ\text{C}$
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 2.0	mW mW/ $^\circ\text{C}$
TOTAL DEVICE			
Storage Temperature	T_{STG}	-55 to +150	$^\circ\text{C}$
Operating Temperature	T_{OPR}	-55 to +100	$^\circ\text{C}$
Lead Solder Temperature (wave solder)	T_{SOL}	250 for 10 sec	$^\circ\text{C}$
Total Device Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	400 5.33	mW mW/ $^\circ\text{C}$

Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Test Conditions	Symbol	Min.	Typ.*	Max.	Units
INDIVIDUAL COMPONENT CHARACTERISTICS						
Emitter						
Input Forward Voltage	$I_F = 20\text{mA}$	V_F		1.2	1.5	V
Reverse Voltage	$I_R = 10\mu\text{A}$	V_R	3.0	25		V
Reverse Current	$V_R = 5\text{V}$	I_R		0.001	10	μA
Junction Capacitance	$V_F = 0\text{V}$, $f = 1\text{MHz}$	C_J		50		pF
Detector						
Collector-Emitter Breakdown Voltage	$I_C = 1.0\text{mA}$, $I_F = 0$	BV_{CEO}	30	85		V
Emitter-Collector Breakdown Voltage	$I_E = 100\mu\text{A}$, $I_F = 0$	BV_{ECO}	6	13		V
Collector-Emitter Dark Current	$V_{CE} = 10\text{V}$, $I_F = 0$	I_{CEO}		5	100	nA
Capacitance	$V_{CE} = 0\text{V}$, $f = 1\text{MHz}$	C_{CE}		8		pF

AC Characteristic	Test Conditions	Symbol	Min	Typ*	Max	Units
TRANSFER CHARACTERISTICS						
Switching Characteristics						
Non-Saturated Turn-on Time	$R_L = 100\Omega$, $I_C = 2\text{mA}$, $V_{CC} = 10\text{V}$	t_{on}		2.4		μs
Non-Saturated Turn-off Time		t_{off}		2.4		μs

All typicals at $T_A = 25^\circ\text{C}$

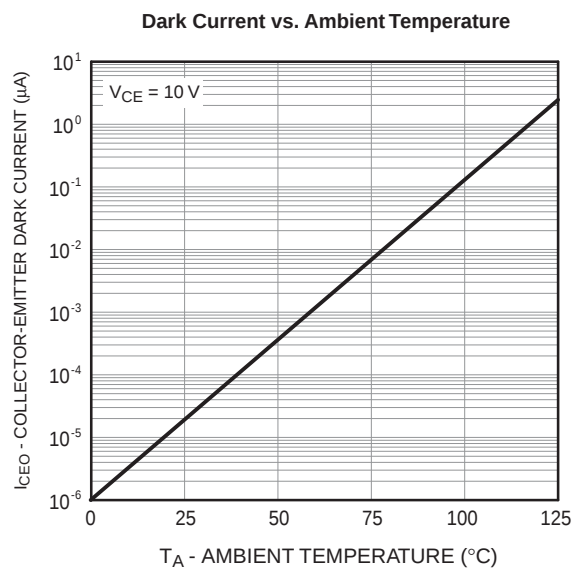
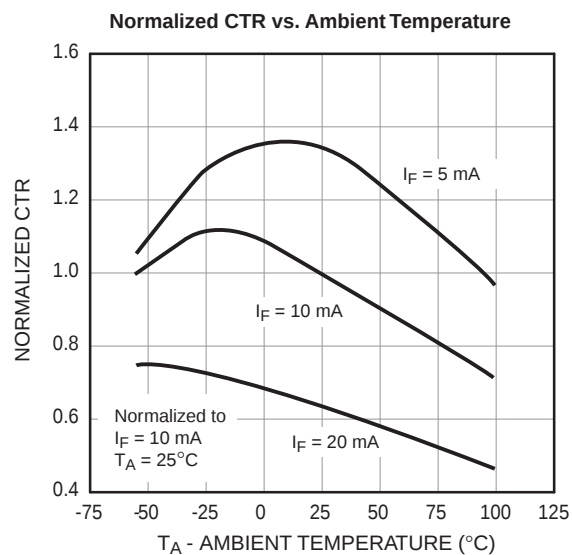
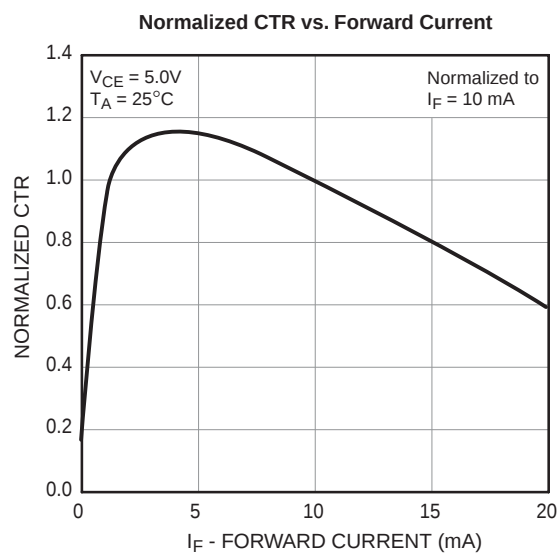
Electrical Characteristics ($T_A = 25^\circ\text{C}$) (Continued)

DC Characteristic	Test Conditions	Symbol	Min	Typ*	Max	Units
TRANSFER CHARACTERISTICS						
Current Transfer Ratio, Collector-Emitter						
MCT6	$I_F = 10\text{mA}$, $V_{CE} = 10\text{V}$	CTR	20			%
MCT61	$I_F = 5\text{mA}$, $V_{CE} = 5\text{V}$		50			
MCT62			100			
Saturation Voltage	$I_F = 16\text{mA}$, $I_C = 2\text{mA}$	$V_{CE(sat)}$		0.15	0.40	V

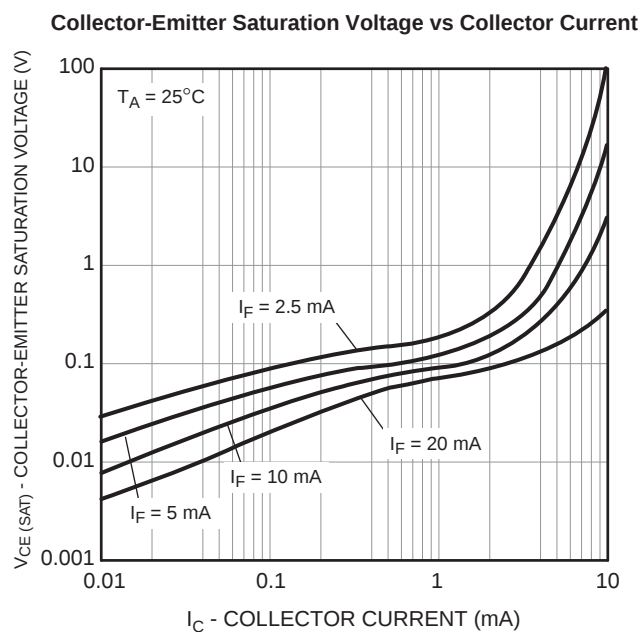
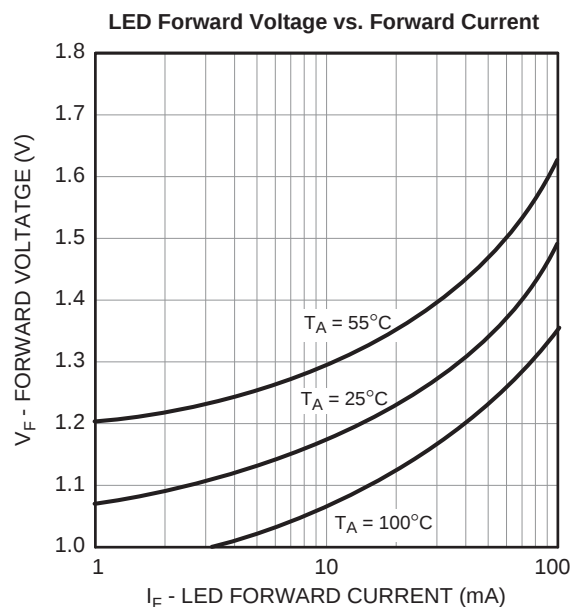
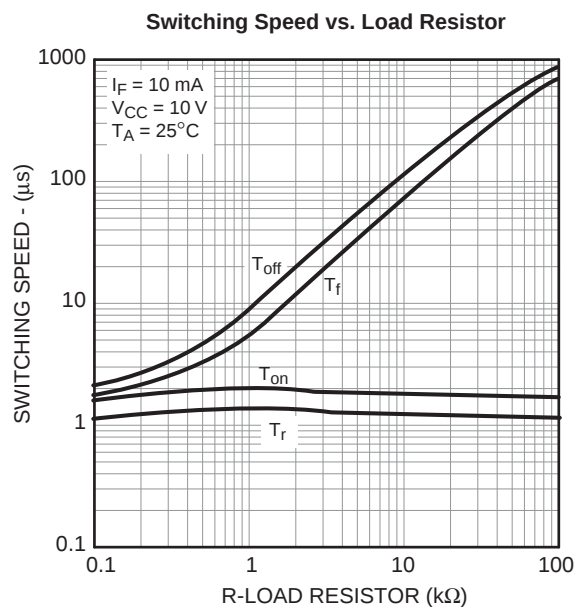
Characteristic	Test Conditions	Symbol	Min	Typ*	Max	Units
ISOLATION CHARACTERISTICS						
Input-Output Isolation Voltage	$I_{I-O} \leq 1\mu\text{A}$, $t = 1\text{min.}$	V_{ISO}	5300			Vac(rms)
Isolation Resistance	$V_{I-O} = 500\text{VDC}$	R_{ISO}	10^{11}			Ω
Input-Output Isolation Voltage	$f = 1\text{MHz}$	C_{ISO}		0.5		pF

* All typicals at $T_A = 25^\circ\text{C}$

Typical Performance Curves

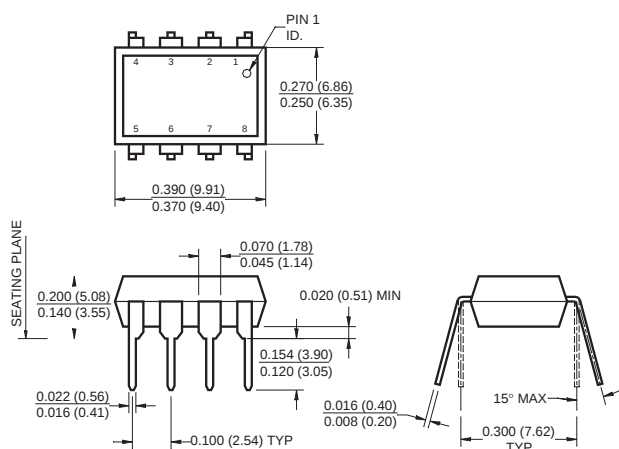


Typical Performance Curves (Continued)

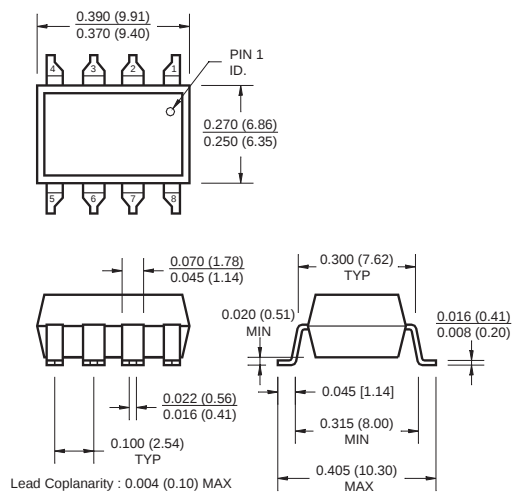


Package Dimensions

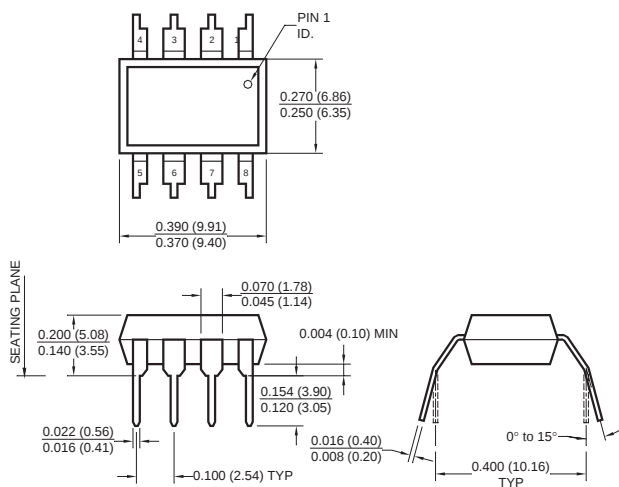
Through Hole



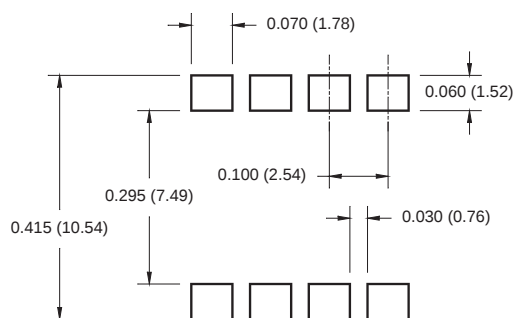
Surface Mount



0.4" Lead Spacing



Recommend Pad Layout for Surface Mount Leadform



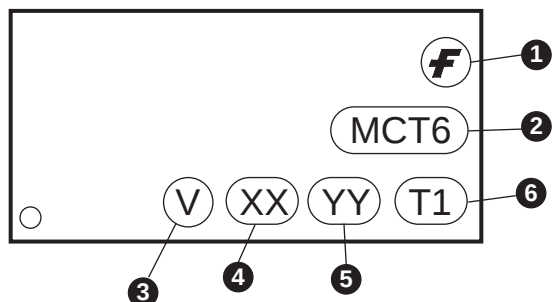
Note:

All dimensions are in inches (millimeters)

Ordering Information

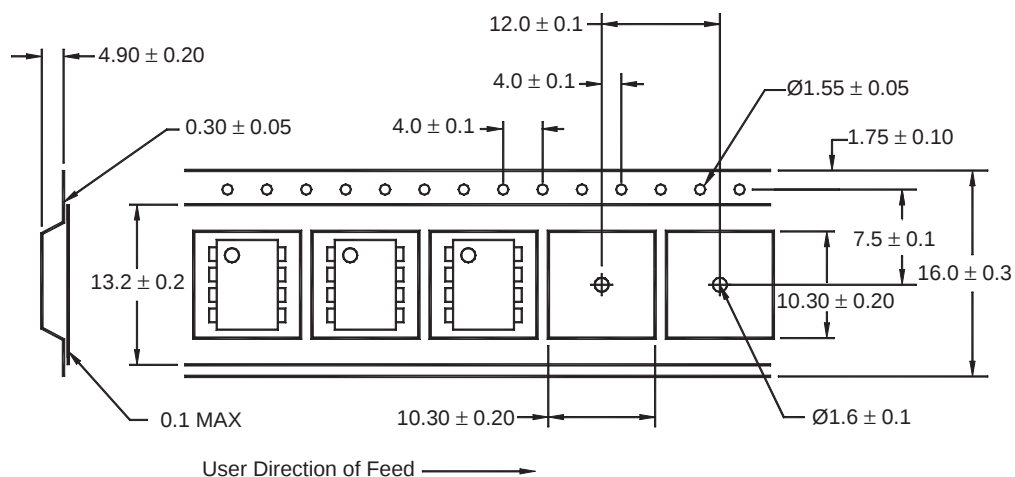
Option	Order Entry Identifier	Description
S	.S	Surface Mount Lead Bend
SD	.SD	Surface Mount; Tape and Reel
W	.W	0.4" Lead Spacing

Marking Information



Definitions	
1	Fairchild logo
2	Device number
3	VDE mark (Note: Only appears on parts ordered with VDE option – See order entry table)
4	Two digit year code, e.g., '03'
5	Two digit work week ranging from '01' to '53'
6	Assembly package code

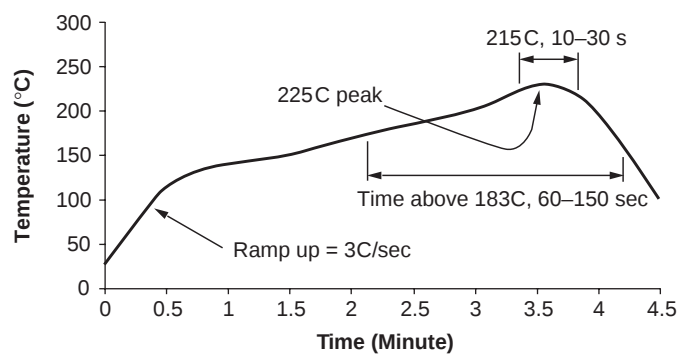
Carrier Tape Specifications



Note:

All dimensions are in inches (millimeters)

Reflow Profile



- Peak reflow temperature: 225°C (package surface temperature)
- Time of temperature higher than 183°C for 60–150 seconds
- One time soldering reflow is recommended

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CoolFET TM	GlobalOptoisolator TM	MicroPak TM	QT Optoelectronics TM	TinyLogic [®]
CROSSVOLT TM	GTO TM	MICROWIRE TM	Quiet Series TM	TINYOPTO TM
DO TM	HiSeC TM	MSX TM	RapidConfigure TM	TruTranslation TM
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PRODUCT STATUS DEFINITIONS

Definition of Terms

Datasheet Identification	Product Status	Definition
Advance Information	Formative or In Design	This datasheet contains the design specifications for product development. Specifications may change in any manner without notice.
Preliminary	First Production	This datasheet contains preliminary data, and supplementary data will be published at a later date. Fairchild Semiconductor reserves the right to make changes at any time without notice in order to improve design.
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