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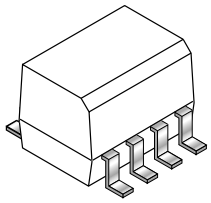
FAIRCHILD
SEMICONDUCTOR®

AC INPUT PHOTOTRANSISTOR SMALL OUTLINE SURFACE MOUNT OPTOCOUPLERS

MOC256-M

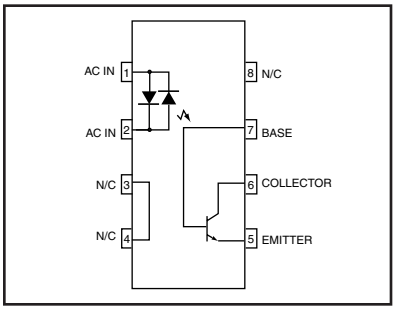
DESCRIPTION



The MOC256-M is an AC input phototransistor optocoupler. The device consists of two infrared emitters connected in anti-parallel and coupled to a silicon NPN phototransistor detector. It is designed for applications requiring the detection or monitoring of AC signals. The device is constructed with a standard SOIC-8 footprint.

FEATURES

- UL Recognized File (#E90700, Volume 2)
- VDE recognized (File #136616)
  - Ordering option V (i.e. MOC256V-M)
- Industry Standard SOIC-8 Surface Mountable Package, with 0.050" lead spacing
- Available in Tape and Reel Option
- Bidirectional AC Input (Protection Against Reversed DC Bias)
- Guaranteed CTR Symmetry of 2:1 Maximum
- High Input-Output Isolation of 2500 Vac (rms) Guaranteed



ABSOLUTE MAXIMUM RATINGS (T_A = 25°C Unless otherwise specified)

Rating	Symbol	Value	Unit
EMITTER			
Forward Current - Continuous	I_F	60	mA
Forward Current - Peak (PW = 100 µs, 120 pps)	I_F (pk)	1.0	A
LED Power Dissipation @ T_A = 25°C Derate above 25°C	P_D	90 0.8	mW mW/°C
DETECTOR			
Collector-Emitter Voltage	V_{CEO}	30	V
Emitter-Base Voltage	V_{ECO}	7.0	V
Collector Current-Continuous	I_C	150	mA
Detector Power Dissipation @ T_A = 25°C Derate above 25°C	P_D	150 1.76	mW mW/°C
TOTAL DEVICE			
Input-Output Isolation Voltage (f = 60 Hz, t = 1 min.)	V_{ISO}	2500	Vac(rms)
Total Device Power Dissipation @ T_A = 25°C Derate above 25°C	P_D	250 2.94	mW mW/°C
Ambient Operating Temperature Range	T_A	-40 to +100	°C
Storage Temperature Range	T_{stg}	-40 to +150	°C

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise specified)

Parameter	Test Conditions	Symbol	Min	Typ*	Max	Unit
EMITTER						
Input Forward Voltage	(I_F = ±10 mA)	V_F	—	1.2	1.5	V
Input Capacitance	(V = 0 V, f = 1 MHz)	C_J	—	20	—	pF
DETECTOR						
Collector-Emitter Dark Current	(V_{CE} = 10 V, T_A = 25°C)	I_{CEO1}	—	1.0	100	nA
	(V_{CE} = 10 V, T_A = 100°C)	I_{CEO2}	—	1.0	—	µA
Collector-Base Dark Current	(V_{CB} = 10V)	I_{CBO}	—	0.2	—	nA
Collector-Emitter Breakdown Voltage	(I_C = 10 mA)	BV_{CEO}	30	100	—	nA
Collector-Base Breakdown Voltage	(I_C = 100 µA)	BV_{CBO}	70	120	—	V
Emitter-Collector Breakdown Voltage	(I_E = 100 µA)	BV_{ECO}	5	10	—	V
Collector-Emitter Capacitance	(f = 1.0 MHz, V_{CE} = 0)	C_{CE}	—	7	—	pF
Collector-Base Capacitance	(f = 1.0 MHz, V_{CB} = 0)	C_{CB}	—	20	—	pF
Emitter-Base Capacitance	(f = 1.0 MHz, V_{EB} = 0)	C_{EB}	—	10	—	pF
COUPLED						
Current Transfer Ratio(1)	(I_F = ±10 mA, V_{CE} = 10 V)	CTR	20	150	—	%
Output-Collector Current Symmetry	$\left(\frac{(I_C \text{ @ } I_F = +10 \text{ mA}, V_{CE} = 10V)}{(I_C \text{ @ } I_F = -10 \text{ mA}, V_{CE} = 10V)}\right)$	—	0.5		2.0	—
Collector-Emitter Saturation Voltage	(I_C = 0.5 mA, I_F = ±10 mA)	$V_{CE\ (sat)}$	—	0.1	0.4	V
Isolation Surge Voltage(2,3)	(f = 60 Hz AC Peak, t = min)	V_{ISO}	2500	—	—	Vac(rms)
Isolation Resistance(3)	(V = 500 V)	R_{ISO}	10^{11}	—	—	Ω
Isolation Capacitance(3)	(V = 0 V, f = 1 MHz)	C_{ISO}	—	0.2	—	pF

* Typical values at T_A = 25°C

NOTE:

1. Current Transfer Ratio (CTR) = I_C/I_F x 100%.
2. Isolation Surge Voltage, V_{ISO}, is an internal device dielectric breakdown rating.
3. For this test, Pins 1 and 2 are common and Pins 5, 6 and 7 are common.

Fig. 1 Input Voltage vs. Input Current

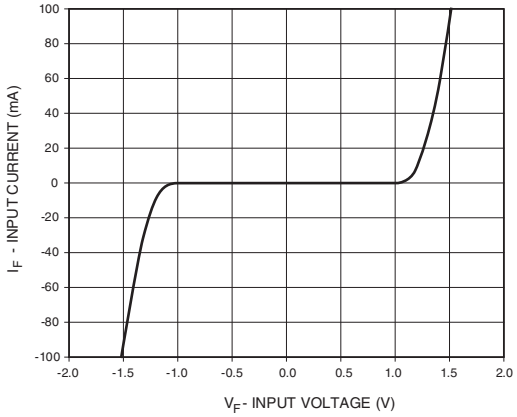


Fig. 2 Output Curent vs. Input Current

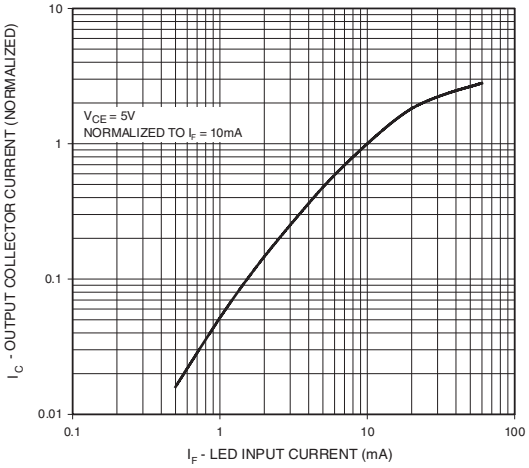


Fig. 3 Output Current vs. Ambient Temperature

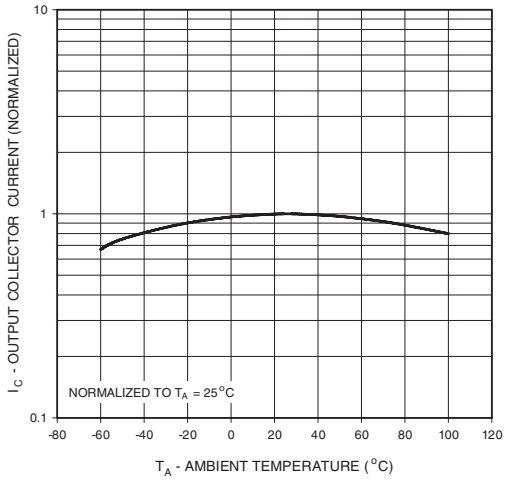


Fig. 4 Output Current vs. Collector - Emitter Voltage

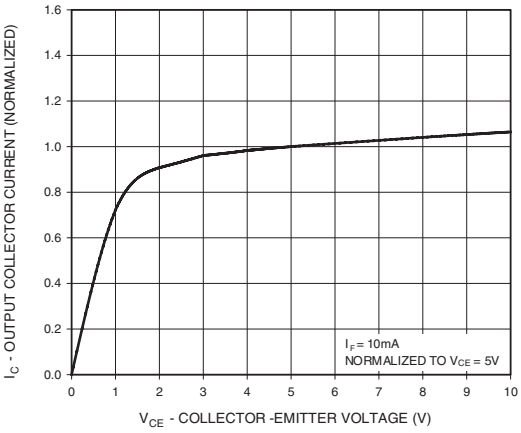
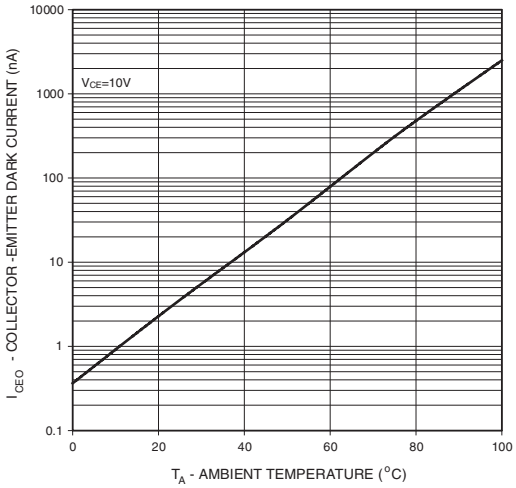


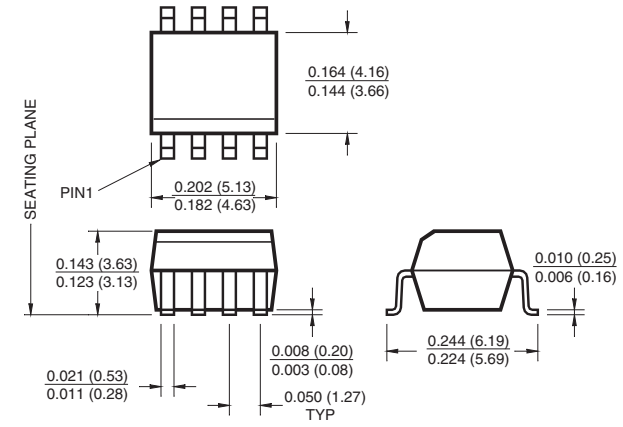
Fig. 5 Dark Current vs. Ambient Temperature



AC INPUT PHOTOTRANSISTOR SMALL OUTLINE SURFACE MOUNT OPTOCOUPLERS

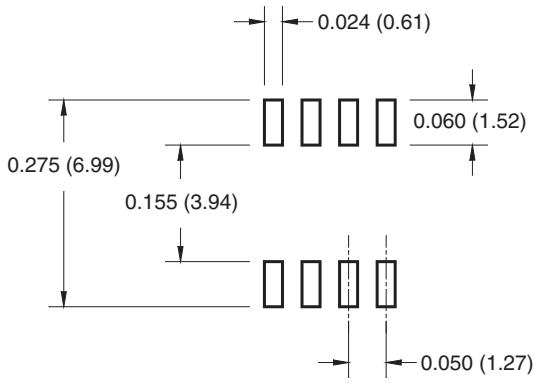
MOC256-M

Package Dimensions (Surface Mount)



Lead Coplanarity : 0.004 (0.10) MAX

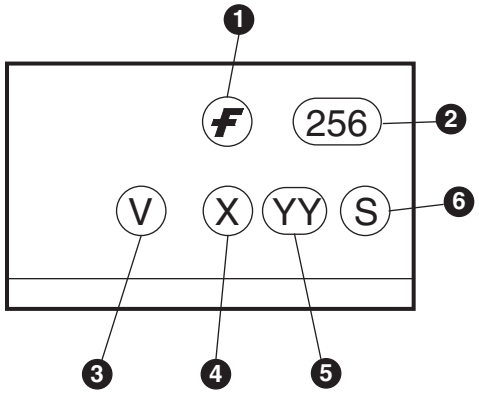
8-Pin Small Outline



ORDERING INFORMATION

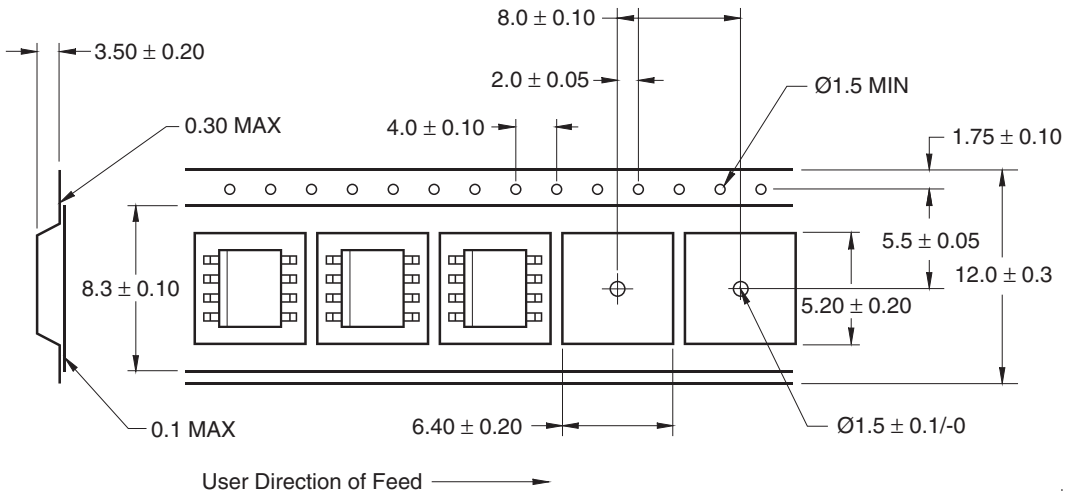
Option	Order Entry Identifier	Description
V	V	VDE 0884
R1	R1	Tape and reel (500 units per reel)
R1V	R1V	VDE 0884, Tape and reel (500 units per reel)
R2	R2	Tape and reel (2500 units per reel)
R2V	R2V	VDE 0884, Tape and reel (2500 units per reel)

MARKING INFORMATION

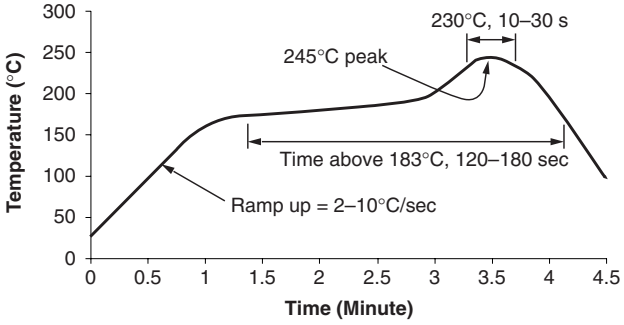


Definitions	
1	Fairchild logo
2	Device number
3	VDE mark (Note: Only appears on parts ordered with VDE option – See order entry table)
4	One digit year code, e.g., ‘3’
5	Two digit work week ranging from ‘01’ to ‘53’
6	Assembly package code

Carrier Tape Specifications



Reflow Profile



- Peak reflow temperature: 245°C (package surface temperature)
- Time of temperature higher than 183°C for 120–180 seconds
- One time soldering reflow is recommended

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2. A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.