

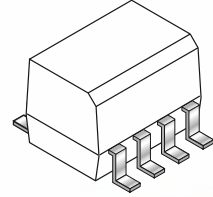
FAIRCHILD
SEMICONDUCTOR®

AC INPUT PHOTOTRANSISTOR SMALL OUTLINE SURFACE MOUNT OPTOCOUPLEDERS

MOC256-M

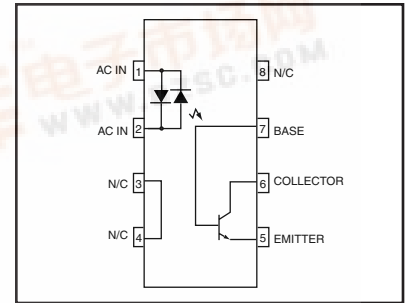
DESCRIPTION

The MOC256-M is an AC input phototransistor optocoupler. The device consists of two infra-red 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 ($T_A = 25^\circ\text{C}$ unless otherwise specified)						
Parameter	Test Conditions	Symbol	Min	Typ*	Max	Unit
EMITTER						
Input Forward Voltage	($I_F = \pm 10\text{ mA}$)	V_F	—	1.2	1.5	V
Input Capacitance	($V = 0\text{ V}$, $f = 1\text{ MHz}$)	C_J	—	20	—	pF
DETECTOR						
Collector-Emitter Dark Current	($V_{CE} = 10\text{ V}$, $T_A = 25^\circ\text{C}$)	I_{CE01}	—	1.0	100	nA
	($V_{CE} = 10\text{ V}$, $T_A = 100^\circ\text{C}$)	I_{CE02}	—	1.0	—	μA
Collector-Base Dark Current	($V_{CB} = 10\text{ V}$)	I_{CBO}	—	0.2	—	nA
Collector-Emitter Breakdown Voltage	($I_C = 10\text{ mA}$)	BV_{CEO}	30	100	—	nA
Collector-Base Breakdown Voltage	($I_C = 100\text{ }\mu\text{A}$)	BV_{CBO}	70	120	—	V
Emitter-Collector Breakdown Voltage	($I_E = 100\text{ }\mu\text{A}$)	BV_{ECO}	5	10	—	V
Collector-Emitter Capacitance	($f = 1.0\text{ MHz}$, $V_{CE} = 0$)	C_{CE}	—	7	—	pF
Collector-Base Capacitance	($f = 1.0\text{ MHz}$, $V_{CB} = 0$)	C_{CB}	—	20	—	pF
Emitter-Base Capacitance	($f = 1.0\text{ MHz}$, $V_{EB} = 0$)	C_{EB}	—	10	—	pF
COUPLED						
Current Transfer Ratio ⁽¹⁾	($I_F = \pm 10\text{ mA}$, $V_{CE} = 10\text{ V}$)	CTR	20	150	—	%
Output-Collector Current Symmetry	$\left(\frac{I_C @ I_F = +10\text{ mA}, V_{CE} = 10\text{ V}}{I_C @ I_F = -10\text{ mA}, V_{CE} = 10\text{ V}} \right)$	—	0.5	—	2.0	—
Collector-Emitter Saturation Voltage	($I_C = 0.5\text{ mA}$, $I_F = \pm 10\text{ mA}$)	$V_{CE(sat)}$	—	0.1	0.4	V
Isolation Surge Voltage ^(2,3)	($f = 60\text{ Hz AC Peak}$, $t = \text{min}$)	V_{ISO}	2500	—	—	Vac(rms)
Isolation Resistance ⁽³⁾	($V = 500\text{ V}$)	R_{ISO}	10^{11}	—	—	Ω
Isolation Capacitance ⁽³⁾	($V = 0\text{ V}$, $f = 1\text{ MHz}$)	C_{ISO}	—	0.2	—	pF

* Typical values at $T_A = 25^\circ\text{C}$

NOTE:

1. Current Transfer Ratio (CTR) = $I_C/I_F \times 100\%$.
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

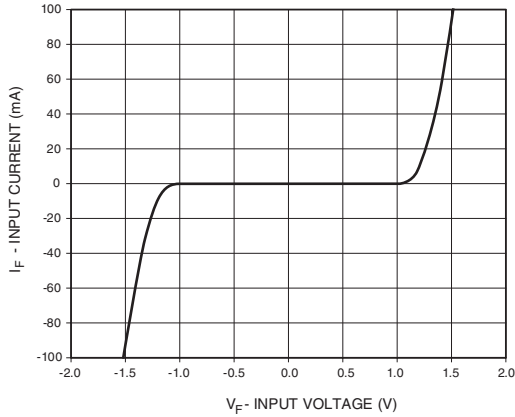


Fig. 2 Output Current vs. Input Current

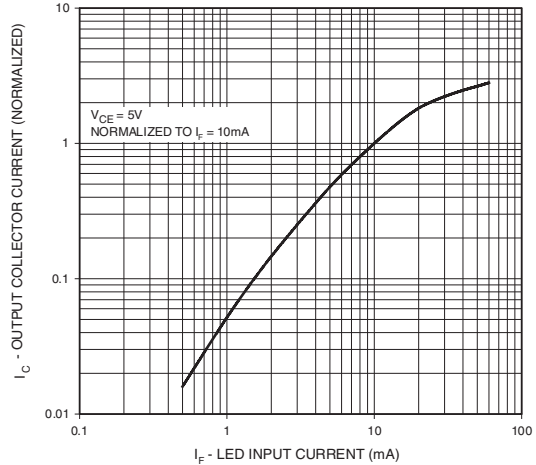


Fig. 3 Output Current vs. Ambient Temperature

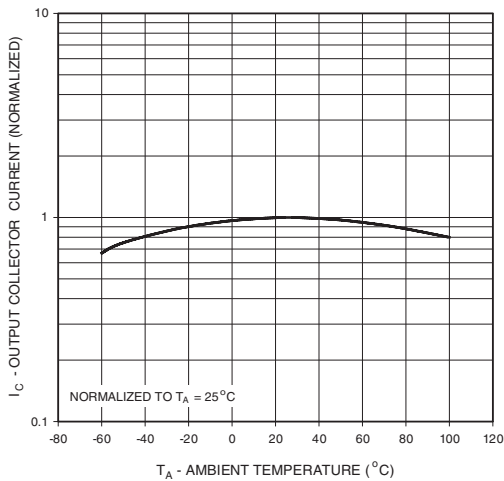


Fig. 4 Output Current vs. Collector - Emitter Voltage

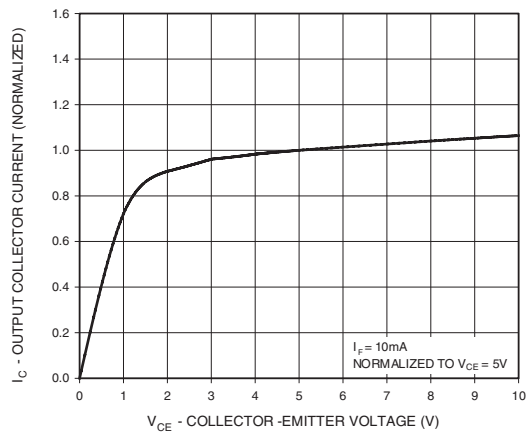
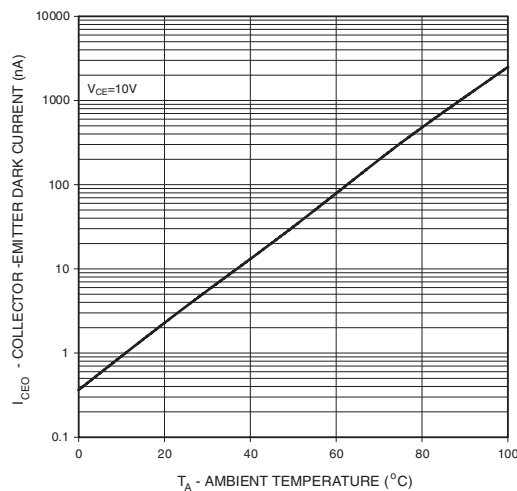
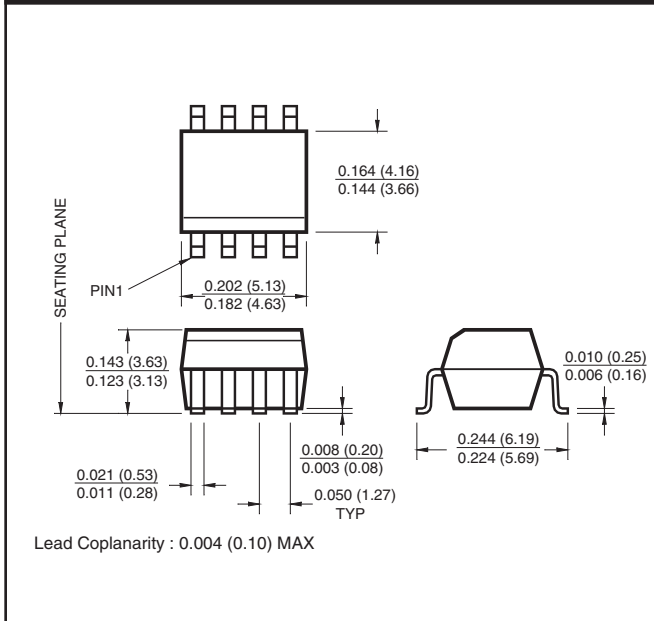


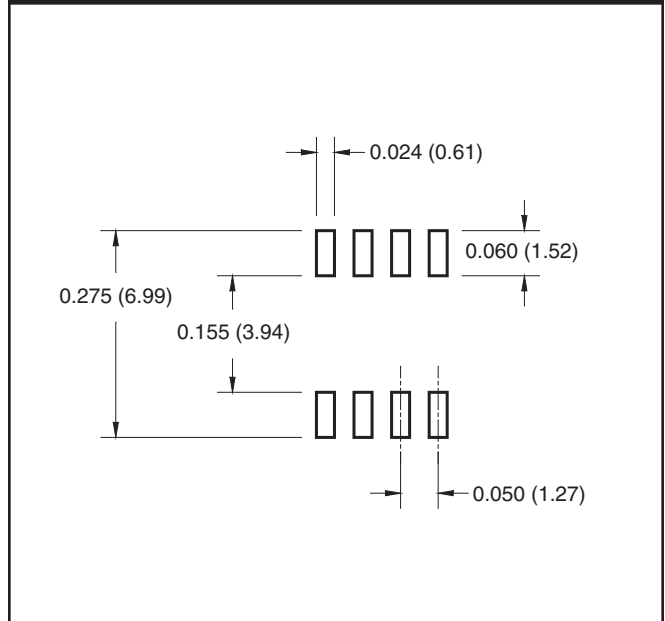
Fig. 5 Dark Current vs. Ambient Temperature



Package Dimensions (Surface Mount)



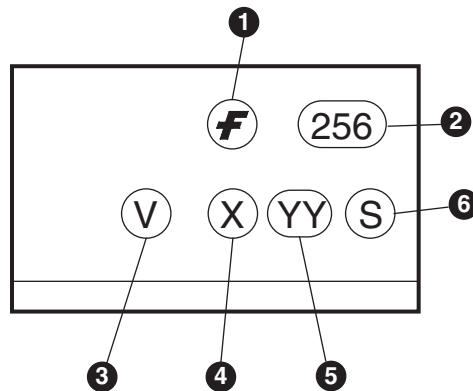
8-Pin Small Outline



ORDERING INFORMATION

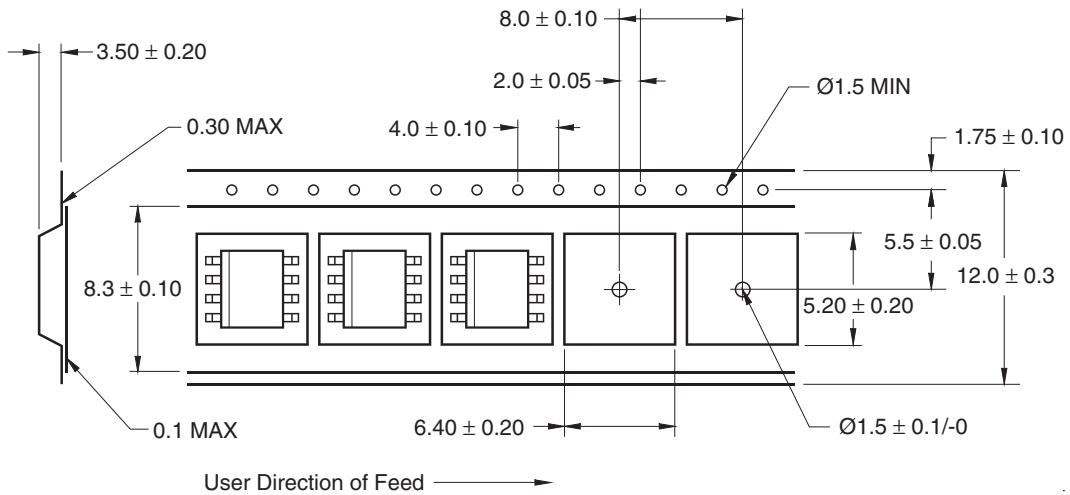
Option	Order Entry Identifier	Description
V	V	VDE 0884
R1	R1	Tape and reel (500 units per reel)
R1V	R1V	VDE 0884, Tape and reel (500 units per reel)
R2	R2	Tape and reel (2500 units per reel)
R2V	R2V	VDE 0884, Tape and reel (2500 units per reel)

MARKING INFORMATION

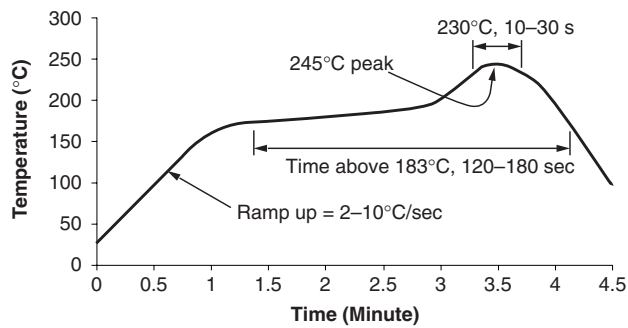


Definitions	
1	Fairchild logo
2	Device number
3	VDE mark (Note: Only appears on parts ordered with VDE option – See order entry table)
4	One digit year code, e.g., '3'
5	Two digit work week ranging from '01' to '53'
6	Assembly package code

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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MOC256-M

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