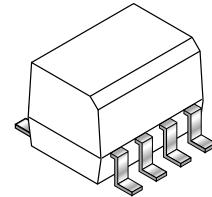


**MOC256-M**

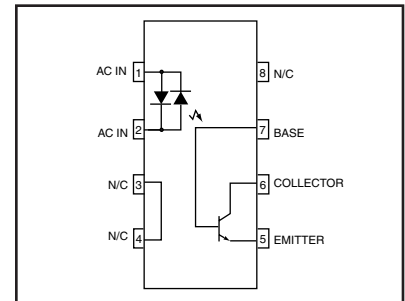
**DESCRIPTION**

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



<b>ABSOLUTE MAXIMUM RATINGS</b> ( $T_A = 25^\circ\text{C}$ Unless otherwise specified)			
Rating	Symbol	Value	Unit
<b>EMITTER</b>			
Forward Current - Continuous	$I_F$	60	mA
Forward Current - Peak (PW = 100 $\mu\text{s}$ , 120 pps)	$I_F$ (pk)	1.0	A
LED Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	90 0.8	mW mW/ $^\circ\text{C}$
<b>DETECTOR</b>			
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 @ $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	150 1.76	mW mW/ $^\circ\text{C}$
<b>TOTAL DEVICE</b>			
Input-Output Isolation Voltage (f = 60 Hz, t = 1 min.)	$V_{ISO}$	2500	Vac(rms)
Total Device Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	250 2.94	mW mW/ $^\circ\text{C}$
Ambient Operating Temperature Range	$T_A$	-40 to +100	$^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	-40 to +150	$^\circ\text{C}$

**MOC256-M**

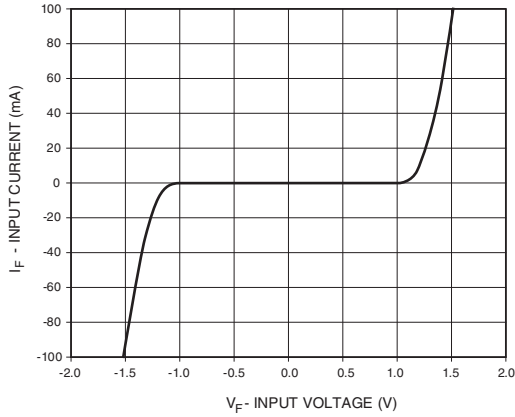
<b>ELECTRICAL CHARACTERISTICS</b> ( $T_A = 25^\circ\text{C}$ unless otherwise specified)						
Parameter	Test Conditions	Symbol	Min	Typ*	Max	Unit
<b>EMITTER</b>						
Input Forward Voltage	( $I_F = \pm 10\text{ mA}$ )	$V_F$	—	1.2	1.5	V
Input Capacitance	( $V = 0\text{ V}, f = 1\text{ MHz}$ )	$C_J$	—	20	—	pF
<b>DETECTOR</b>						
Collector-Emitter Dark Current	( $V_{CE} = 10\text{ V}, T_A = 25^\circ\text{C}$ )	$I_{CEO1}$	—	1.0	100	nA
	( $V_{CE} = 10\text{ V}, T_A = 100^\circ\text{C}$ )	$I_{CEO2}$	—	1.0	—	$\mu\text{A}$
Collector-Base Dark Current	( $V_{CB} = 10\text{ V}$ )	$I_{CBO}$	—	0.2	—	V
Collector-Emitter Breakdown Voltage	( $I_C = 10\text{ mA}$ )	$BV_{CEO}$	30	100	—	nA
Collector-Base Breakdown Voltage	( $I_C = 100\ \mu\text{A}$ )	$BV_{CBO}$	70	120	—	V
Emitter-Collector Breakdown Voltage	( $I_E = 100\ \mu\text{A}$ )	$BV_{ECO}$	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
<b>COUPLED</b>						
Current Transfer Ratio <sup>(1)</sup>	( $I_F = \pm 10\text{ mA}, V_{CE} = 10\text{ V}$ )	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 <sup>(2,3)</sup>	( $f = 60\text{ Hz AC Peak}, t = \text{min}$ )	$V_{ISO}$	2500	—	—	Vac(rms)
Isolation Resistance <sup>(3)</sup>	( $V = 500\text{ V}$ )	$R_{ISO}$	$10^{11}$	—	—	$\Omega$
Isolation Capacitance <sup>(3)</sup>	( $V = 0\text{ V}, f = 1\text{ MHz}$ )	$C_{ISO}$	—	0.2	—	pF

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

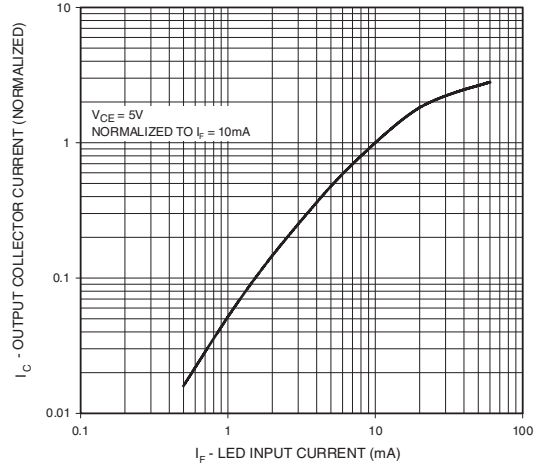
**NOTE:**

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.

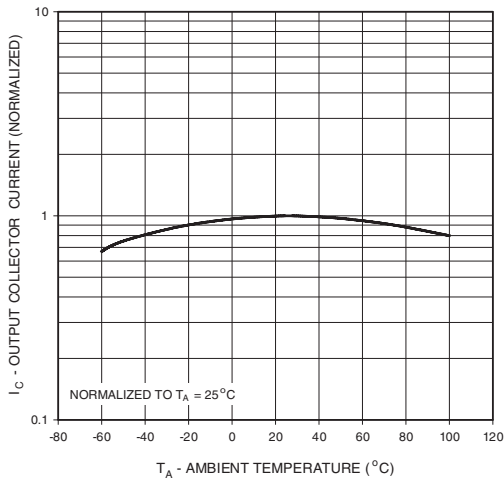
**Fig. 1 Input Voltage vs. Input Current**



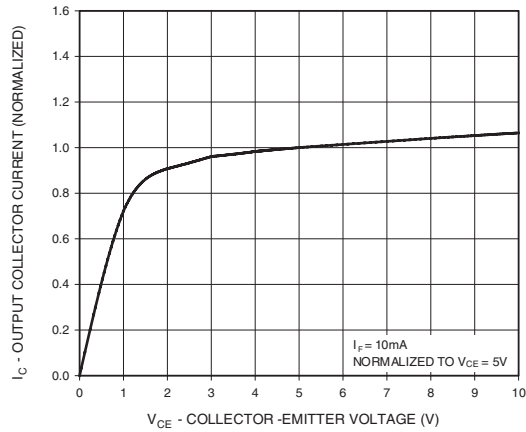
**Fig. 2 Output Current vs. Input Current**



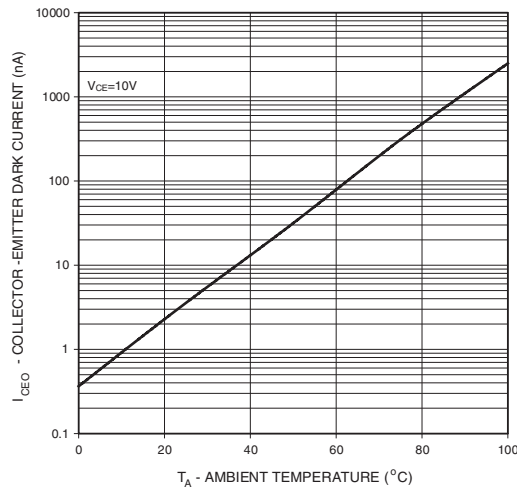
**Fig. 3 Output Current vs. Ambient Temperature**



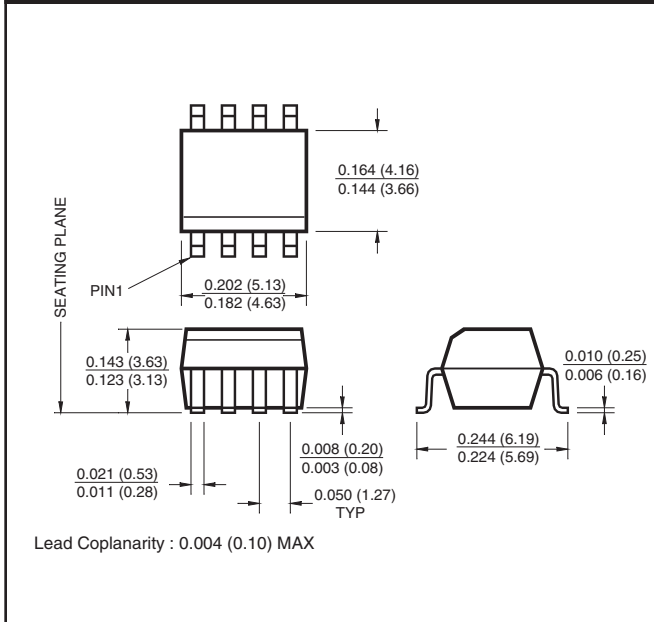
**Fig. 4 Output Current vs. Collector - Emitter Voltage**



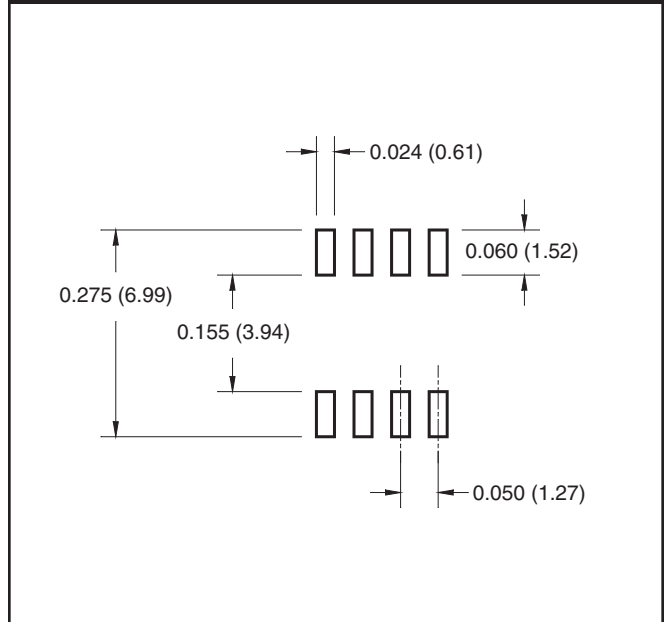
**Fig. 5 Dark Current vs. Ambient Temperature**



**Package Dimensions (Surface Mount)**



**8-Pin Small Outline**

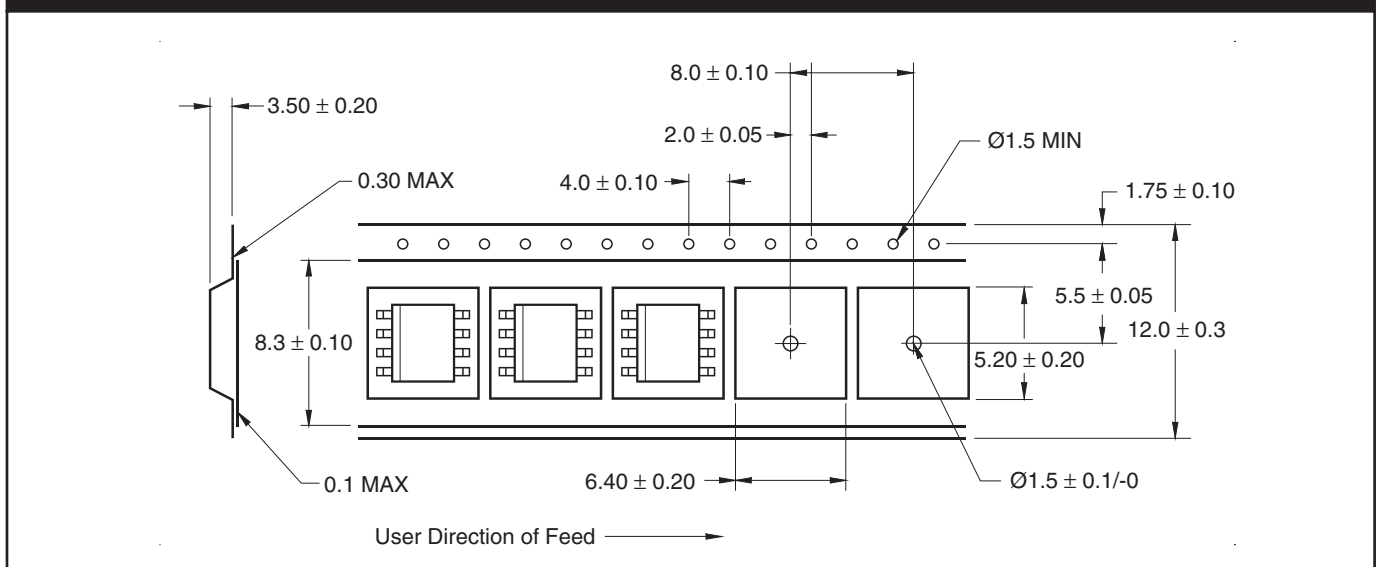


**MOC256-M**

**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)

**Carrier Tape Specifications**



**DISCLAIMER**

FAIRCHILD SEMICONDUCTOR RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION OR DESIGN. FAIRCHILD DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN; NEITHER DOES IT CONVEY ANY LICENSE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS.

**LIFE SUPPORT POLICY**

FAIRCHILD'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF THE PRESIDENT OF FAIRCHILD SEMICONDUCTOR CORPORATION. As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury of the user.
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.