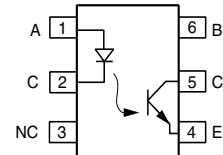
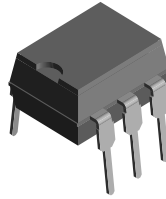


## Optocoupler, Phototransistor Output, No Base Connection

### Features

- No Base Terminal Connection for Improved Common Mode Interface Immunity
- Long Term Stability
- Industry Standard Dual-in-Line Package
- Lead-free component
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC



1179009

### Agency Approvals

- UL1577, File No. E52744 System Code H or J, Double Protection
- BSI IEC60950 IEC60065
- DIN EN 60747-5-2 (VDE0884)  
DIN EN 60747-5-5 pending  
Available with Option 1
- CSA 93751

### Description

The MOC8111/ MOC8112 is an optocoupler consisting of a Gallium Arsenide infrared emitting diode optically coupled to a silicon planar phototransistor detector in a plastic plug-in DIP 6 pin package.

The coupling device is suitable for signal transmission between two electrically separated circuits. The potential difference between the circuits to be coupled should not exceed the maximum permissible reference voltages.

In contrast to the IL1, the base terminal is not connected, resulting in substantially improved common-mode interference immunity.

### Order Information

Part	Remarks
MOC8111	CTR > 20 %, DIP-6
MOC8112	CTR > 50 %, DIP-6
MOC8111-X006	CTR > 20 %, DIP-6 400 mil (option 6)
MOC8111-X007	CTR > 20 %, SMD-6 (option 7)
MOC8112-X006	CTR > 50 %, DIP-6 400 mil (option 6)
MOC8112-X007	CTR > 50 %, SMD-6 (option 7)
MOC8112-X009	CTR > 50 %, SMD-6 (option 9)

For additional information on the available options refer to Option Information.

### Absolute Maximum Ratings

$T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified

Stresses in excess of the absolute Maximum Ratings can cause permanent damage to the device. Functional operation of the device is not implied at these or any other conditions in excess of those given in the operational sections of this document. Exposure to absolute Maximum Rating for extended periods of the time can adversely affect reliability.

### Input

Parameter	Test condition	Symbol	Value	Unit
DC Forward current		$I_F$	60	mA
Reverse voltage		$V_R$	6.0	V
Surge forward current	$t \leq 10\text{ }\mu\text{s}$	$I_{FSM}$	2.5	A
Total power dissipation		$P_{diss}$	100	mW

### Output

Parameter	Test condition	Symbol	Value	Unit
Emitter-collector breakdown voltage		$BV_{ECO}$	30	V
Collector current		$I_C$	50	mA
	$t \leq 10 \mu\text{s}$	$I_C$	150	mA
Total power dissipation		$P_{diss}$	150	mW

### Coupler

Parameter	Test condition	Symbol	Value	Unit
Isolation test voltage between emitter and detector refer to Standard Climate 23/50 DIN 50014		$V_{ISO}$	5300	$V_{RMS}$
Creepage			$\geq 7$	mm
Clearance			$\geq 7$	mm
Isolation thickness between emitter and detector			$\geq 4$	mm
Comparative tracking index per DIN IEC 112/VDE 0303, part 1			175	
Isolation resistance	$V_{IO} = 500 \text{ V}, T_{amb} = 25 \text{ }^\circ\text{C}$	$R_{IO}$	$10^{12}$	$\Omega$
	$V_{IO} = 500 \text{ V}, T_{amb} = 100 \text{ }^\circ\text{C}$	$R_{IO}$	$10^{11}$	$\Omega$
Storage temperature range		$T_{stg}$	- 55 to + 150	$^\circ\text{C}$
Ambient temperature range		$T_{amb}$	- 55 to + 150	$^\circ\text{C}$
Soldering temperature	max. 10 s, dip soldering distance to seating plane $\geq 1.5 \text{ mm}$	$T_{sld}$	260	$^\circ\text{C}$

### Electrical Characteristics

$T_{amb} = 25 \text{ }^\circ\text{C}$ , unless otherwise specified

Minimum and maximum values are testing requirements. Typical values are characteristics of the device and are the result of engineering evaluation. Typical values are for information only and are not part of the testing requirements.

### Input

Parameter	Test condition	Symbol	Min	Typ.	Max	Unit
Forward voltage	$I_F = 10 \text{ mA}$	$V_F$		1.15	1.5	V
Reverse leakage current	$V_R = 6.0 \text{ V}$	$I_R$		0.05	10	$\mu\text{A}$
Junction capacitance	$V = 0 \text{ V}, f = 1.0 \text{ MHz}$	$C_j$		25		pF

### Output

Parameter	Test condition	Symbol	Min	Typ.	Max	Unit
Collector-emitter breakdown voltage	$I_C = 1.0 \mu\text{A}$	$BV_{CEO}$	30			V
Collector-emitter leakage current	$V_{CE} = 10 \text{ V}$	$I_{CEO}$		1.0	50	nA
Emitter-collector breakdown voltage	$I_E = 10 \mu\text{A}$	$BV_{ECO}$	7.0			V
Collector-emitter capacitance	$V_{CE} = 0 \text{ V}, f = 1.0 \text{ MHz}$	$C_{CE}$		7.0		pF

## Coupler

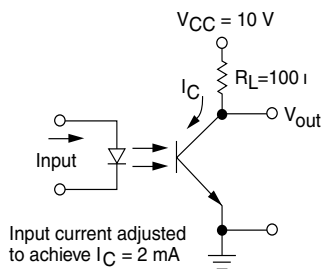
Parameter	Test condition	Symbol	Min	Typ.	Max	Unit
Collector saturation voltage	$I_C = 500 \mu\text{A}$ , $I_F = 10 \text{ mA}$	$V_{CEsat}$		0.15	0.4	V

## Current Transfer Ratio

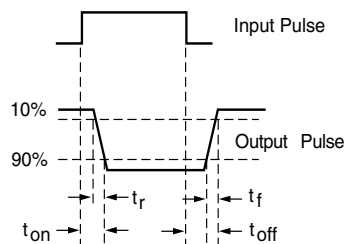
Parameter	Test condition	Part	Symbol	Min	Typ.	Max	Unit
Current Transfer Ratio	$I_F = 10 \text{ mA}$ , $V_{CE} = 10 \text{ V}$	MOC8111	CTR	20			%
		MOC8112	CTR	50			%

## Switching Characteristics

Parameter	Test condition	Symbol	Min	Typ.	Max	Unit
Turn on time	$V_{CC} = 10 \text{ V}$ , $R_L = 100 \Omega$ $I_C = 2.0 \text{ mA}$ , see figure 1	$t_{on}$		7.5	20	$\mu\text{s}$
Turn off time	$V_{CC} = 10 \text{ V}$ , $R_L = 100 \Omega$ $I_C = 2.0 \text{ mA}$ , see figure 1	$t_{off}$		5.7	20	$\mu\text{s}$



Test Circuit



Waveforms

imoc8111\_01

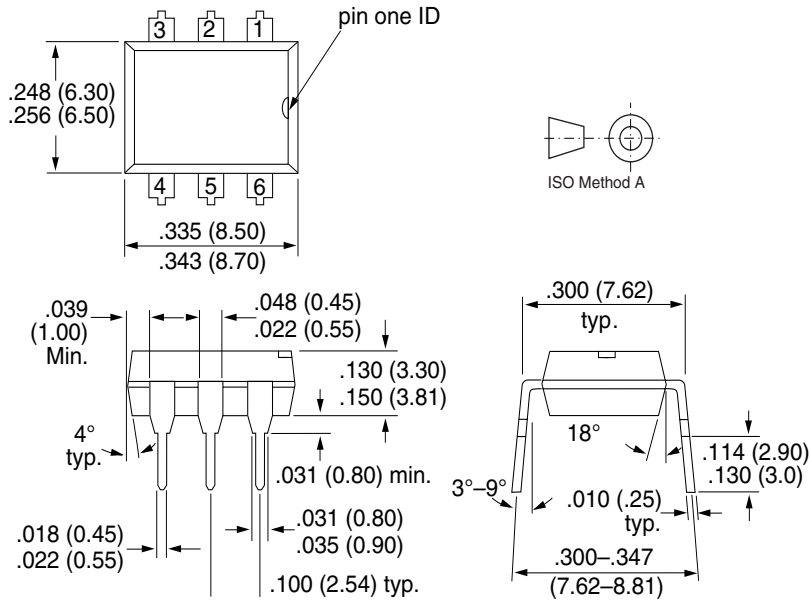
Figure 1. Switching Times

# MOC8111/ MOC8112



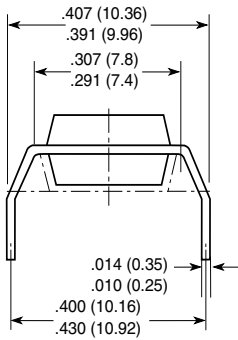
Vishay Semiconductors

## Package Dimensions in Inches (mm)

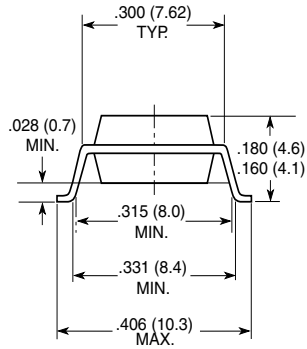


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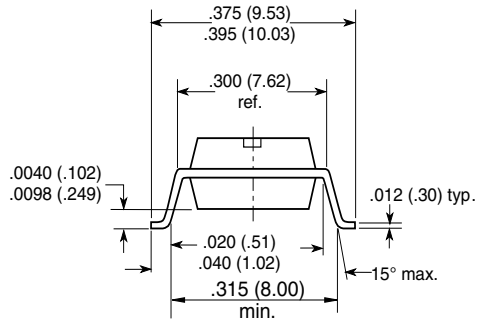
Option 6



Option 7



Option 9



18450



## Ozone Depleting Substances Policy Statement

It is the policy of Vishay Semiconductor GmbH to

1. Meet all present and future national and international statutory requirements.
2. Regularly and continuously improve the performance of our products, processes, distribution and operating systems with respect to their impact on the health and safety of our employees and the public, as well as their impact on the environment.

It is particular concern to control or eliminate releases of those substances into the atmosphere which are known as ozone depleting substances (ODSs).

The Montreal Protocol (1987) and its London Amendments (1990) intend to severely restrict the use of ODSs and forbid their use within the next ten years. Various national and international initiatives are pressing for an earlier ban on these substances.

Vishay Semiconductor GmbH has been able to use its policy of continuous improvements to eliminate the use of ODSs listed in the following documents.

1. Annex A, B and list of transitional substances of the Montreal Protocol and the London Amendments respectively
2. Class I and II ozone depleting substances in the Clean Air Act Amendments of 1990 by the Environmental Protection Agency (EPA) in the USA
3. Council Decision 88/540/EEC and 91/690/EEC Annex A, B and C (transitional substances) respectively.

Vishay Semiconductor GmbH can certify that our semiconductors are not manufactured with ozone depleting substances and do not contain such substances.

We reserve the right to make changes to improve technical design and may do so without further notice.

Parameters can vary in different applications. All operating parameters must be validated for each customer application by the customer. Should the buyer use Vishay Semiconductors products for any unintended or unauthorized application, the buyer shall indemnify Vishay Semiconductors against all claims, costs, damages, and expenses, arising out of, directly or indirectly, any claim of personal damage, injury or death associated with such unintended or unauthorized use.

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