

## MOC8111 PHOTOTRANSISTOR NO BASE CONNECTION OPTOCOUPLER

### FEATURES

- **Current Transfer Ratio 20% Min.**
- **No Base Terminal Connection for Improved Common Mode Interface Immunity**
- **Field-Effect Stable by TRIOS (TRansparent IOn Shield)**
- **Long Term Stability**
- **Industry Standard Dual-in-Line Package**
- **Underwriters Lab File #E52744**
-  **VDE 0884 Available with Option 1**

### DESCRIPTION

The MOC8111 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 is not allowed to exceed the maximum permissible reference voltages.

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

### Maximum Ratings ( $T_A=25^\circ\text{C}$ )

#### Emitter

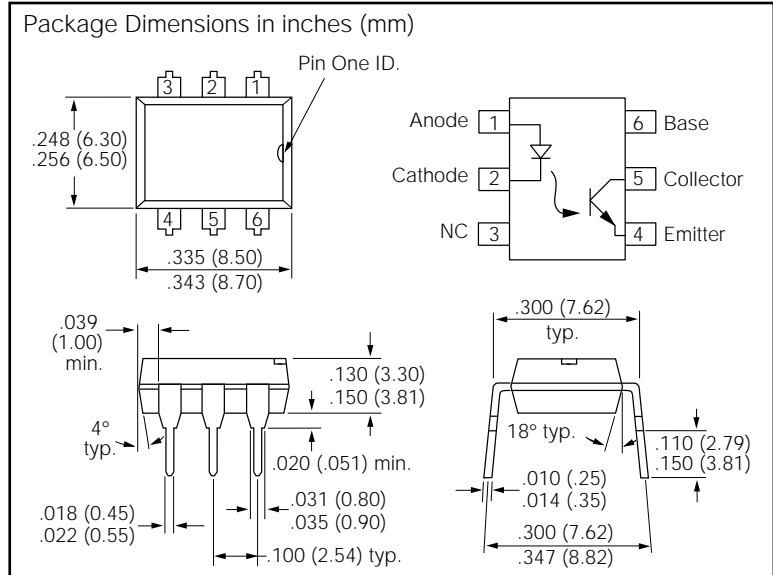
Reverse Voltage ..... 6 V  
 DC Forward Current ..... 60 mA  
 Surge Forward Current ( $t \leq 10 \mu\text{s}$ ) ..... 2.5 A  
 Total Power Dissipation ..... 100 mW

#### Detector

Collector-Emitter Breakdown Voltage ..... 30 V  
 Collector Current ..... 50 mA  
 Collector Current ( $t \leq 1 \text{ ms}$ ) ..... 150 mA  
 Total Power Dissipation ..... 150 mW

#### Package

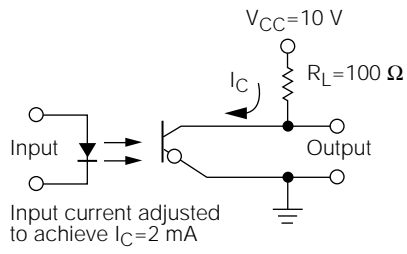
Isolation Test Voltage between  
 Emitter and Detector, Refer to  
 Standard Climate 23/50  
 DIN 50014 ..... 5300 V AC<sub>RMS</sub>  
 Creepage .....  $\geq 7 \text{ mm}$   
 Clearance .....  $\geq 7 \text{ mm}$   
 Isolation Thickness between  
 Emitter and Detector .....  $\geq 0.4 \text{ mm}$   
 Comparative Tracking Index  
 per DIN IEC 112/VDE 0303, part 1 ..... 175  
 Isolation Resistance  
 $V_{IO}=500 \text{ V}, T_A=25^\circ\text{C}$  .....  $10^{12} \Omega$   
 $V_{IO}=500 \text{ V}, T_A=100^\circ\text{C}$  .....  $10^{11} \Omega$   
 Storage Temperature Range .....  $-55^\circ\text{C}$  to  $+150^\circ\text{C}$   
 Ambient Temperature Range .....  $-55^\circ\text{C}$  to  $+100^\circ\text{C}$   
 Soldering Temperature (max. 10 s,  
 dip soldering distance to  
 seating plane  $\geq 1.5 \text{ mm}$ ) .....  $260^\circ\text{C}$



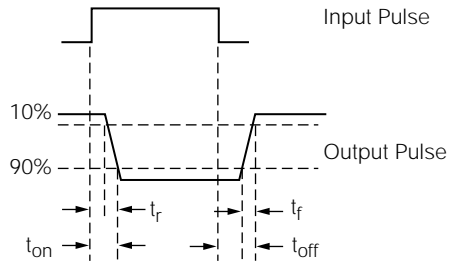
### Electrical Characteristics ( $T_A=25^\circ\text{C}$ )

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
<b>Emitter</b>						
Forward Voltage	$V_F$		1.15	1.5	V	$I_F=10 \text{ mA}$
Reverse Leakage Current	$I_R$		0.05	10	$\mu\text{A}$	$V_R=6 \text{ V}$
Capacitance	$C_J$		25		pF	$V=0, f=1 \text{ MHz}$
<b>Detector</b>						
Collector-Emitter Breakdown Voltage	$BV_{CEO}$	30			V	$I_C=1 \mu\text{A}$
Collector-Emitter Leakage Current	$I_{CEO}$		1	50	nA	$V_{CE}=10 \text{ V}$
Emitter-Collector Breakdown Voltage	$V_{ECO}$	7			V	$I_E=10 \mu\text{A}$
Collector-Emitter Capacitance	$C_{CE}$		7		pF	$V_{CE}=0 \text{ V}, f=1 \text{ MHz}$
<b>Package</b>						
Collector Saturation Voltage	$V_{CESAT}$		0.15	0.4	V	$I_C=500 \mu\text{A}$ $I_F=10 \text{ mA}$
Output Collector Current	$I_C$	2	5		mA	$I_F=10 \text{ mA}$ $V_{CE}=10 \text{ V}$
Turn On Time	$T_{ON}$		7.5	20	$\mu\text{s}$	$V_{CC}=10 \text{ V}$ $R_L=100 \Omega$
Turn Off Time	$T_{OFF}$		5.7	20	$\mu\text{s}$	$I_C=2 \text{ mA}$ , see Figure 1

**Figure 1. Switching times**



**Test Circuit**



**Waveforms**