

FEATURES

- **High Current Transfer Ratio**
MOC8101, 50-80%
MOC8102, 73-117%
MOC8103, 108-173%
MOC8104, 160-256%
MOC8105, 65-133%
- **High Isolation Voltage, 5300 V_{RMS}**
- **No Base Terminal Connection for Improved Common Mode Interface Immunity**
- **Field-Effect Stable by TRIOS***
- **Long Term Stability**
- **Industry Standard Dual-in-Line Package**
- **Underwriters Lab File #E52744**
- **VDE 0884 Available with Option 1**

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

Emitter

Reverse Voltage	6.0 V
Continuous Forward Current	60 mA
Surge Forward Current ($t \leq 10 \mu\text{s}$)	2.5 A
Derate Linearly from 25°C	1.33 mW/ $^\circ\text{C}$
Power Dissipation	100 mW

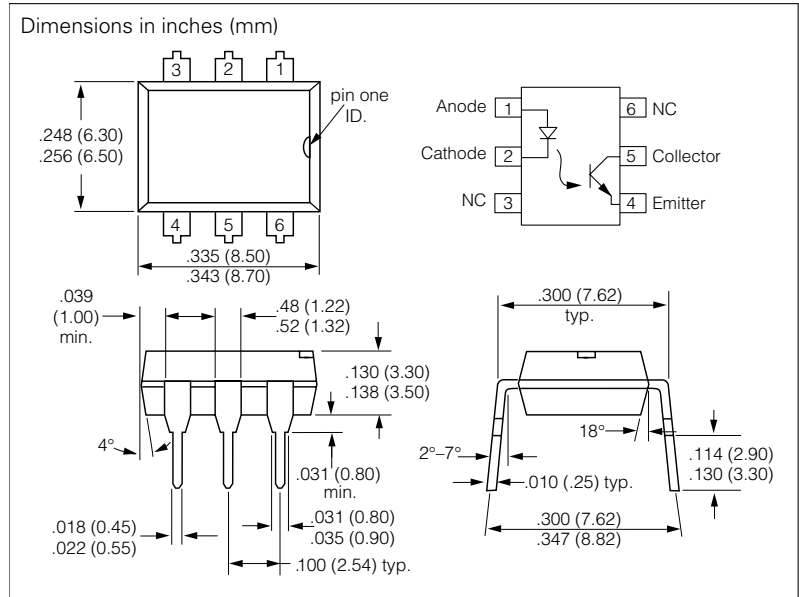
Detector

Collector-Emitter Breakdown Voltage	30 V
Emitter-Collector Breakdown Voltage	7.0 V
Collector Current	50 mA
Collector Current ($t \leq 1.0 \text{ ms}$)	100 mA
Derate Linearly from 25°C	2.00 mW/ $^\circ\text{C}$
Power Dissipation	150 mW

Package

Isolation Test Voltage ($t=1.0 \text{ sec}$)	5300 V _{RMS}
Creepage	$\geq 7.0 \text{ mm}$
Clearance	$\geq 7.0 \text{ mm}$
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 ($V_{IO}=500 \text{ V}$)	$\geq 10^{12} \Omega$
Derate Linearly from 25°C	3.33 mW/ $^\circ\text{C}$
Total Power Dissipation	250 mW
Storage Temperature Range	$-55 \text{ to } +150^\circ\text{C}$
Ambient Temperature Range	$-55 \text{ to } +100^\circ\text{C}$
Junction Temperature	100°C
Soldering Temperature (max. 10 s, dip soldering; distance to seating plane $\geq 1.5 \text{ mm}$)	260°C

***TRIOS**—**TR**ansparent **IO**n **S**hield



DESCRIPTION

The MOC810X 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 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.

The base terminal of the MOC810X is not connected, resulting in a substantially improved common-mode interference immunity.

Characteristics, ($T_A=25^\circ\text{C}$) unless otherwise specified

Parameter	Sym.	Min.	Typ.	Max.	Unit	Condition
Emitter						
Forward Voltage	V_F	—	1.25	1.5	V	$I_F=10 \text{ mA}$
Breakdown Voltage	V_{BR}	6.0	—	—	V	$I_R=10 \mu\text{A}$
Reverse Current	I_R	—	0.01	10	μA	$V_R=6.0 \text{ V}$
Capacitance	C_O	—	25	—	pF	$V_R=0 \text{ V}$, $f=1.0 \text{ MHz}$
Thermal Resistance	R_{thJA}	—	750	—	K/W	—
Detector						
Capacitance	C_{CE}	—	5.2	—	pF	$V_{CE}=5.0 \text{ V}$, $f=1.0 \text{ MHz}$
Collector-Emitter Dark Current	I_{CEO1}	—	1.0	50	nA	$V_{CE}=10 \text{ V}$, $T_A=25^\circ\text{C}$
	I_{CEO2}	—	1.0	—	μA	$V_{CE}=10 \text{ V}$, $T_A=100^\circ\text{C}$
Collector-Emitter Breakdown Voltage	V_{CEO}	30	—	—	—	$I_C=1.0 \text{ mA}$
Emitter-Collector Breakdown Voltage	V_{ECO}	7.0	—	—	V	$I_E=100 \mu\text{A}$
Thermal Resistance	R_{thJA}	—	500	—	K/W	—

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

Parameter	Sym.	Min.	Typ.	Max.	Unit	Condition
Package						
Saturation Voltage, Collector-Emitter	V_{CEsat}	—	0.25	0.4	V	$I_F=5.0\text{ mA}$, $I_C=500\text{ }\mu\text{A}$
Coupling Capacitance	C_C	—	0.6	—	pF	
Current Transfer Ratio	CTR	—	—	—	%	$V_{CE}=10\text{ V}$, $I_F=10\text{ mA}$
MOC8101		50		80		
MOC8102		73		117		
MOC8103		108		173		
MOC8104		160		256		
MOC8105		65		133		
Turn-on Time	t_{ON}	—	3.0	—	μs	$I_C=2.0\text{ mA}$, $V_{CC}=10\text{ V}$, $R_L=100\text{ }\Omega$
Turn-off Time	t_{OFF}	—	2.3	—		
Rise Time	t_r	—	2.0	—		
Fall Time	t_f	—	2.0	—		
Cut off Frequency	f_{CO}	—	250	—	kHz	

Figure 1. Switching Time Test Circuit and Waveforms

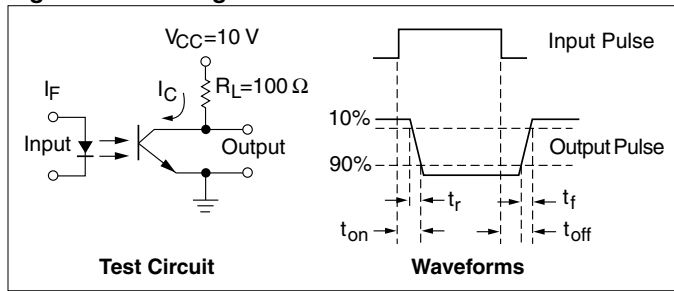


Figure 2. Forward Voltage vs. Forward Current

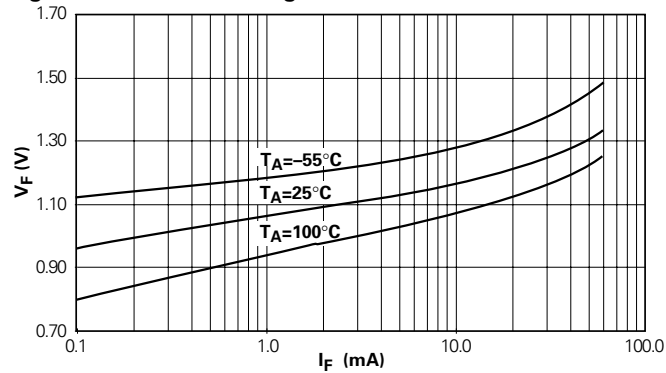


Figure 3. Collector Current vs. LED Forward Current (Normalized to $I_F=10\text{ mA}$)

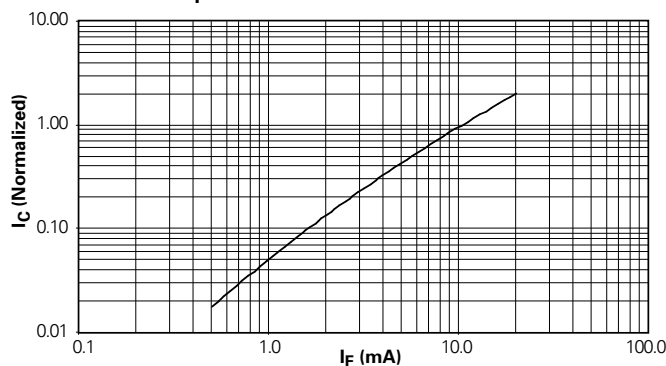


Figure 4. Collector Current vs. Collector-Emitter Voltage

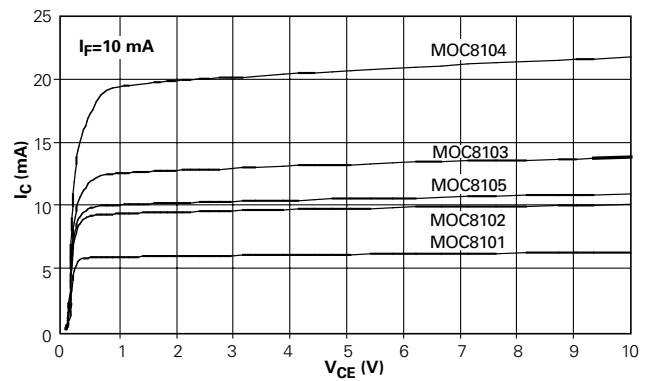


Figure 5. Collector Current vs. Ambient Temperature

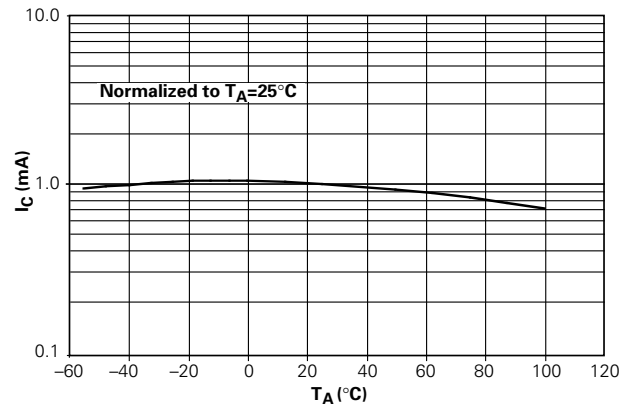


Figure 6. Collector-Emitter Dark Current vs. Ambient Temperature

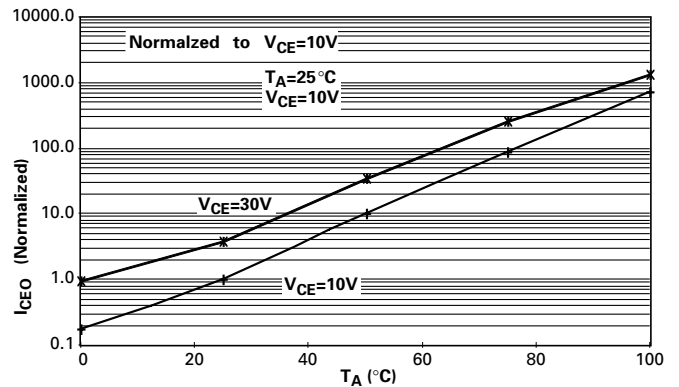


Figure 7. Capacitance vs. Voltage

