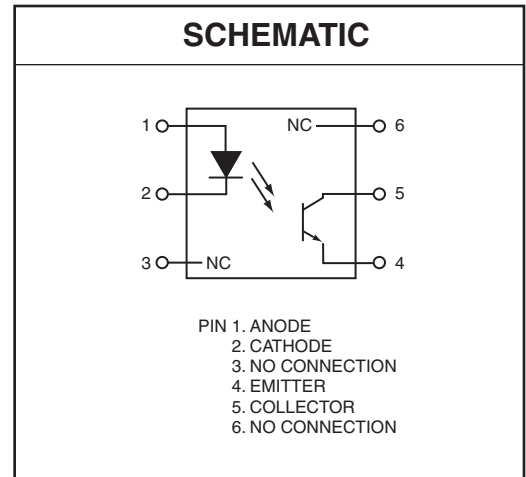
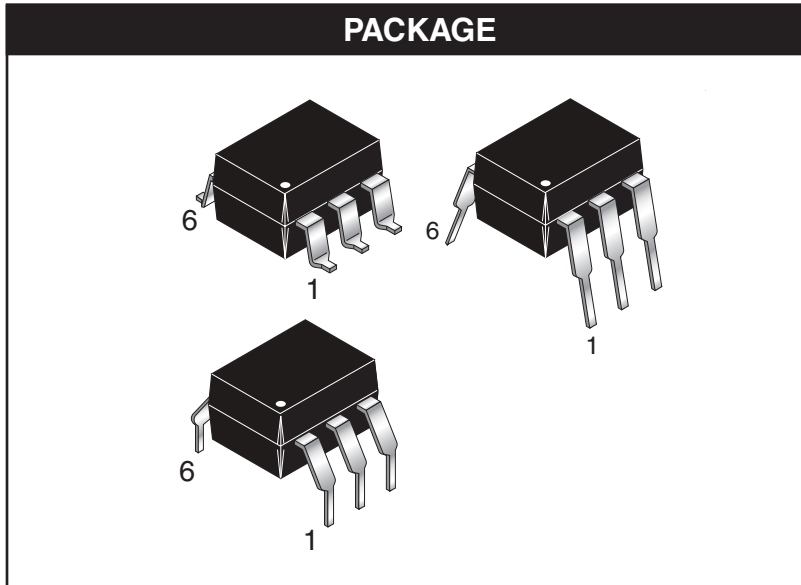


<b>MOC8101</b>	<b>MOC8102</b>	<b>MOC8103</b>	<b>MOC8104</b>
<b>MOC8105</b>	<b>MOC8106</b>	<b>MOC8107</b>	<b>MOC8108</b>
<b>CNY17F-1</b>	<b>CNY17F-2</b>	<b>CNY17F-3</b>	<b>CNY17F-4</b>



## FEATURES

The MOC810X and CNY17F-X devices consist of a gallium arsenide LED optically coupled to a silicon phototransistor in a dual-in-line package.

- Closely Matched Current Transfer Ratio (CTR) Minimizes Unit-to-Unit Variation
- Narrow (CTR) Windows that Translate to a Narrow and Predictable Open Loop Gain Window
- Very Low Coupled Capacitance along with No Chip to Pin 6 Base Connection for Minimum Noise Susceptibility
- **To order devices that are tested and marked per VDE 0884 requirements, the suffix ".300" must be included at the end of part number. e.g. MOC8101.300 VDE 0884 is a test option.**

## APPLICATIONS

- Switchmode Power Supplies (Feedback Control)
- AC Line/Digital Logic Isolation
- Interfacing and coupling systems of different potentials and impedances

**6-PIN DIP OPTOCOUPLEDERS FOR  
POWER SUPPLY APPLICATIONS  
(NO BASE CONNECTION)**

<b>MOC8101</b>	<b>MOC8102</b>	<b>MOC8103</b>	<b>MOC8104</b>
<b>MOC8105</b>	<b>MOC8106</b>	<b>MOC8107</b>	<b>MOC8108</b>
<b>CNY17F-1</b>	<b>CNY17F-2</b>	<b>CNY17F-3</b>	<b>CNY17F-4</b>

<b>ABSOLUTE MAXIMUM RATINGS</b> ( $T_A = 25^\circ\text{C}$ Unless otherwise specified)			
<b>Parameter</b>	<b>Symbol</b>	<b>Value</b>	<b>Unit</b>
<b>INPUT LED</b>			
Forward Current - Continuous	$I_F$	100	mA
Forward Current - Peak (PW = 1 $\mu$ s, 300pps)	$I_F(\text{pk})$	1	A
Reverse Voltage	$V_R$	6	Volts
LED Power Dissipation @ $T_A = 25^\circ\text{C}$	$P_D$	150	mW
Derate above 25 $^\circ\text{C}$		2.0	mW/ $^\circ\text{C}$
<b>OUTPUT TRANSISTOR</b>			
Collector-Emitter Voltage	$V_{\text{CEO}}$	70	Volts
MOC8106/7/8, CNY17F-1/2/3/4		30	
MOC8101/2/3/4/5			
Emitter-Collector Voltage	$V_{\text{ECO}}$	7	Volts
Detector Power Dissipation @ $T_A = 25^\circ\text{C}$	$P_D$	150	mW
Derate above 25 $^\circ\text{C}$		2.0	mW/ $^\circ\text{C}$
<b>TOTAL DEVICE</b>			
Input-Output Isolation Voltage (f = 60 Hz, t = 1 min.)	$V_{\text{ISO}}$	5300	Vac(rms)
Total Device Power Dissipation @ $T_A = 25^\circ\text{C}$	$P_D$	250	mW
Derate above 25 $^\circ\text{C}$		3.3	mW/ $^\circ\text{C}$
Ambient Operating Temperature Range	$T_{\text{OPR}}$	-55 to +100	$^\circ\text{C}$
Storage Temperature Range	$T_{\text{STG}}$	-55 to +150	$^\circ\text{C}$
Lead Soldering Temperature (1/16" from case, 10 sec. duration)	$T_{\text{SOL}}$	260	$^\circ\text{C}$

<b>MOC8101</b>	<b>MOC8102</b>	<b>MOC8103</b>	<b>MOC8104</b>
<b>MOC8105</b>	<b>MOC8106</b>	<b>MOC8107</b>	<b>MOC8108</b>
<b>CNY17F-1</b>	<b>CNY17F-2</b>	<b>CNY17F-3</b>	<b>CNY17F-4</b>

<b>ELECTRICAL CHARACTERISTICS</b> ( $T_A = 25^\circ\text{C}$ Unless otherwise specified) <sup>(1)</sup>						
Characteristic	Symbol	Min	Typ**	Max	Unit	
<b>INPUT LED</b>						
Forward Voltage	( $I_F = 60\text{ mA}$ )	CNY17F-X	$V_F$	—	1.40	V
	( $I_F = 10\text{ mA}$ )	MOC810X		1.0	1.18	
Reverse Leakage Current ( $V_R = 5.0\text{ V}$ )		$I_R$	—	0.001	10	$\mu\text{A}$
Capacitance		$C$	—	18	—	pF
<b>OUTPUT TRANSISTOR</b>						
Collector-Emitter Dark Current	( $V_{CE} = 10\text{ V}, T_A = 25^\circ\text{C}$ )	$I_{CEO1}$	—	1.0	50	nA
	( $V_{CE} = 10\text{ V}, T_A = 100^\circ\text{C}$ )	$I_{CEO2}$	—	1.0	—	$\mu\text{A}$
Collector-Emitter Breakdown Voltage	MOC8101/2/3/4/5	( $I_C = 1.0\text{ mA}$ )	$V_{(BR)CEO}$	30	100	V
	MOC8106/7/8, CNY17F-1/2/3/4	( $I_C = 1.0\text{ mA}$ )		70	100	
Emitter-Collector Breakdown Voltage	( $I_E = 100\text{ }\mu\text{A}$ )	$V_{(BR)ECO}$	7.0	10	—	V
Collector-Emitter Capacitance	( $f = 1.0\text{ MHz}, V_{CE} = 0$ )	$C_{CE}$	—	8	—	pF
<b>COUPLED</b>						
Output Collector Current ( $I_F = 10\text{ mA}, V_{CE} = 10\text{ V}$ )	MOC8101	(CTR) <sup>(2)</sup>	50	—	80	%
	MOC8102		73	—	117	
	MOC8103		108	—	173	
	MOC8104		160	—	256	
	MOC8105		65	—	133	
	MOC8106		50	—	150	
	MOC8107		100	—	300	
	MOC8108		250	—	600	
(I <sub>F</sub> = 10 mA, V <sub>CE</sub> = 5 V)	CNY17F-1	40	—	80		
	CNY17F-2	63	—	125		
	CNY17F-3	100	—	200		
	CNY17F-4	160	—	320		
Collector-Emitter Saturation Voltage		$V_{CE(sat)}$	—	—	0.4	V
CNY17F-1/2/3/4	( $I_C = 2.5\text{ mA}, I_F = 10\text{ mA}$ )					
	MOC8101/2/3/4/5/6/7/8	( $I_C = 500\text{ }\mu\text{A}, I_F = 5.0\text{ mA}$ )				
Isolation Voltage	( $f = 60\text{ Hz}, t = 1.0\text{ min.}$ ) <sup>(4)</sup>	$V_{ISO}$	5300	—	—	Vac(rms)
Isolation Resistance	( $V_{I-O} = 500\text{ V}$ ) <sup>(4)</sup>	$R_{ISO}$	$10^{11}$	—	—	$\Omega$
Isolation Capacitance	( $V_{I-O} = 0, f = 1.0\text{ MHz}$ ) <sup>(4)</sup>	$C_{ISO}$	—	0.5	—	pF

\*\* All typicals at  $T_A = 25^\circ\text{C}$

<b>MOC8101</b>	<b>MOC8102</b>	<b>MOC8103</b>	<b>MOC8104</b>
<b>MOC8105</b>	<b>MOC8106</b>	<b>MOC8107</b>	<b>MOC8108</b>
<b>CNY17F-1</b>	<b>CNY17F-2</b>	<b>CNY17F-3</b>	<b>CNY17F-4</b>

<b>TRANSFER CHARACTERISTICS</b> ( $T_A = 25^\circ\text{C}$ Unless otherwise specified)						
<b>AC Characteristic</b>	<b>Test Conditions</b>	<b>Symbol</b>	<b>Min</b>	<b>Typ**</b>	<b>Max</b>	<b>Unit</b>
<b>NON-SATURATED SWITCHING TIME</b>						
Turn-on Time CNY17F-1/2/3/4 Only	( $R_L = 100 \Omega$ , $I_C = 2 \text{ mA}$ )	$t_{on}$	—	2	10	$\mu\text{s}$
Turn-off Time CNY17F-1/2/3/4 Only	( $V_{CC} = 10 \text{ V}$ )	$t_{off}$	—	3	10	
Turn-On Time	MOC8101-5 MOC8106-8 ( $I_C = 2.0 \text{ mA}$ , $V_{CC} = 10 \text{ V}$ , $R_L = 100 \Omega$ ) <sup>(3)</sup>	$t_{on}$	—	2	20	$\mu\text{s}$
					—	
Turn-Off Time	MOC8101-5 MOC8106-8 ( $I_C = 2.0 \text{ mA}$ , $V_{CC} = 10 \text{ V}$ , $R_L = 100 \Omega$ ) <sup>(3)</sup>	$t_{off}$	—	3	20	
					—	
Rise Time	All Devices ( $I_C = 2.0 \text{ mA}$ , $V_{CC} = 10 \text{ V}$ , $R_L = 100 \Omega$ ) <sup>(3)</sup>	$t_r$	—	1	—	$\mu\text{s}$
All Devices						
Fall Time	All Devices ( $I_C = 2.0 \text{ mA}$ , $V_{CC} = 10 \text{ V}$ , $R_L = 100 \Omega$ ) <sup>(3)</sup>	$t_f$	—	2	—	$\mu\text{s}$
All Devices						
<b>SATURATED SWITCHING TIMES</b>						
Turn-on Time	CNY17F-1 ( $I_F = 20 \text{ mA}$ , $V_{CE} = 0.4 \text{ V}$ )	$t_{on}$	—	—	5.5	$\mu\text{s}$
CNY17F-2 CNY17F-3 CNY17F-4					( $I_F = 10 \text{ mA}$ , $V_{CE} = 0.4 \text{ V}$ )	
Rise Time	CNY17F-1 ( $I_F = 20 \text{ mA}$ , $V_{CE} = 0.4 \text{ V}$ )	$t_r$	—	—	4.0	$\mu\text{s}$
CNY17F-2 CNY17F-3 CNY17F-4					( $I_F = 20 \text{ mA}$ , $V_{CE} = 0.4 \text{ V}$ )	
Turn-off Time	CNY17F-1 ( $I_F = 20 \text{ mA}$ , $V_{CE} = 0.4 \text{ V}$ )	$t_{off}$	—	—	34	$\mu\text{s}$
CNY17F-2 CNY17F-3 CNY17F-4					( $I_F = 10 \text{ mA}$ , $V_{CE} = 0.4 \text{ V}$ )	
Fall Time	CNY17F-1 ( $I_F = 20 \text{ mA}$ , $V_{CE} = 0.4 \text{ V}$ )	$t_f$	—	—	20	$\mu\text{s}$
CNY17F-2 CNY17F-3 CNY17F-4					( $I_F = 10 \text{ mA}$ , $V_{CE} = 0.4 \text{ V}$ )	

\*\* All typicals at  $T_A = 25^\circ\text{C}$

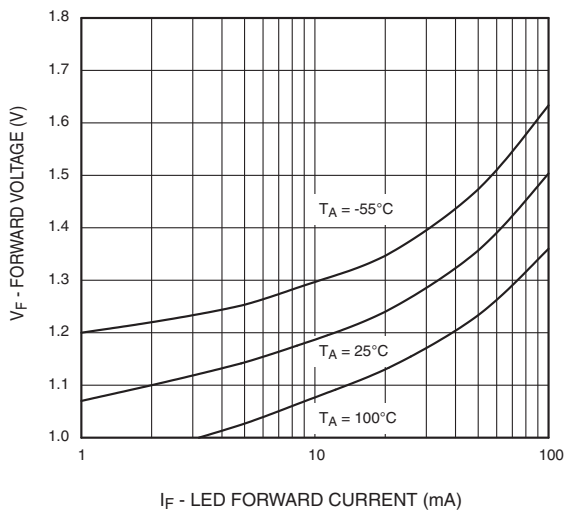
**NOTES:**

1. Always design to the specified minimum/maximum electrical limits (where applicable).
2. Current Transfer Ratio (CTR) =  $I_C/I_F \times 100\%$ .
3. For test circuit setup and waveforms, refer to Figure 11.
4. For this test, Pins 1 and 2 are common, and Pins 4 and 5 are common.

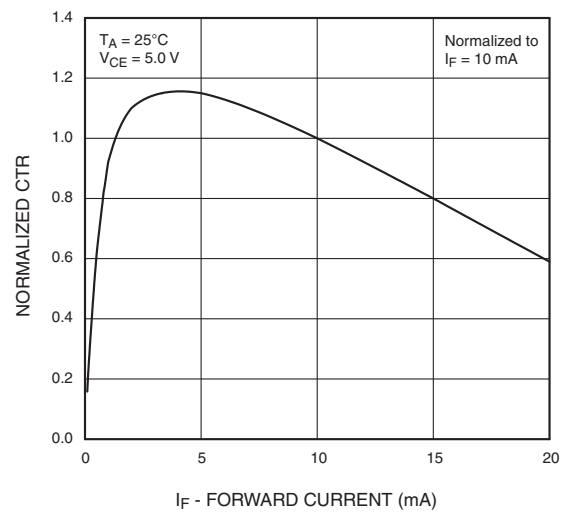
<b>MOC8101</b>	<b>MOC8102</b>	<b>MOC8103</b>	<b>MOC8104</b>
<b>MOC8105</b>	<b>MOC8106</b>	<b>MOC8107</b>	<b>MOC8108</b>
<b>CNY17F-1</b>	<b>CNY17F-2</b>	<b>CNY17F-3</b>	<b>CNY17F-4</b>

**TYPICAL PERFORMANCE CURVES**

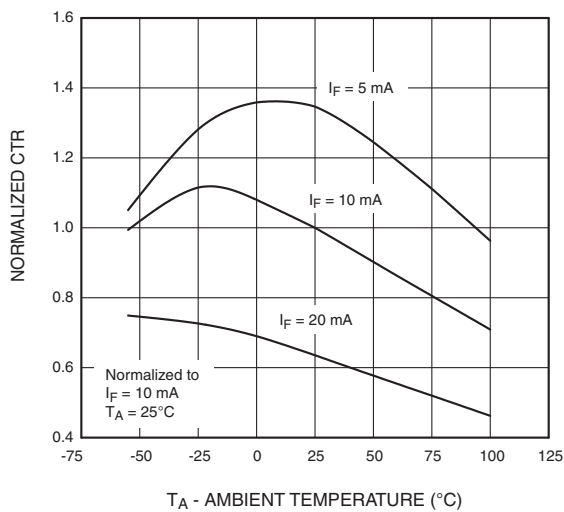
**Fig. 1 LED Forward Voltage vs. Forward Current**



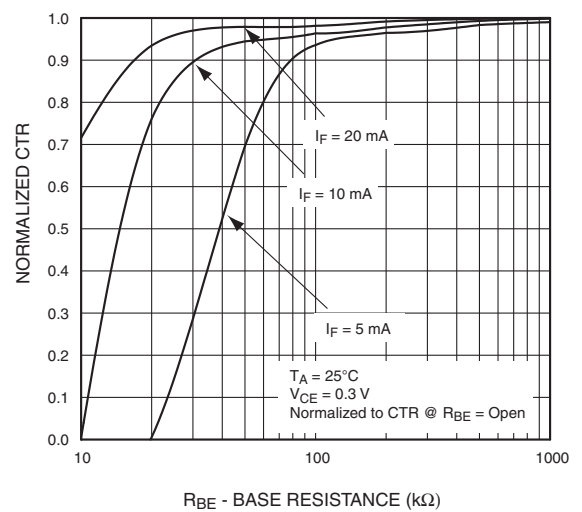
**Fig. 2 Normalized CTR vs. Forward Current**



**Fig. 3 Normalized CTR vs. Ambient Temperature**



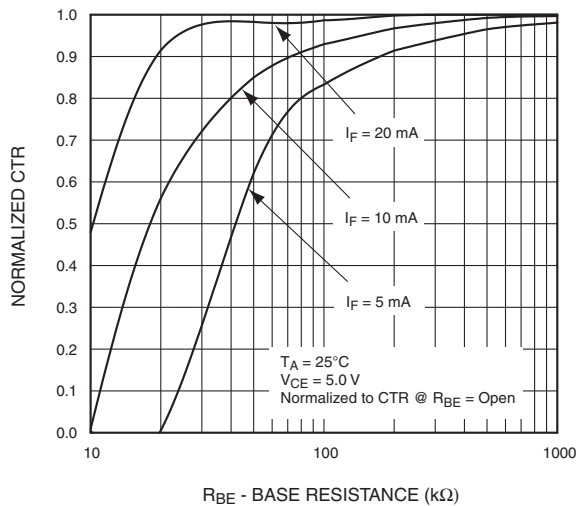
**Fig. 4 CTR vs. R<sub>BE</sub> (Saturated)**



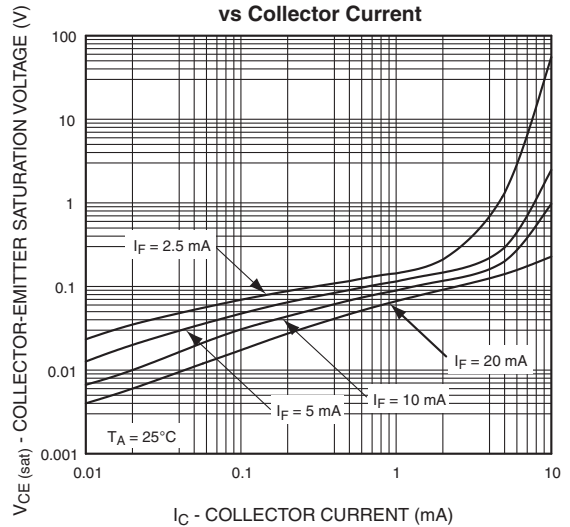
<b>MOC8101</b>	<b>MOC8102</b>	<b>MOC8103</b>	<b>MOC8104</b>
<b>MOC8105</b>	<b>MOC8106</b>	<b>MOC8107</b>	<b>MOC8108</b>
<b>CNY17F-1</b>	<b>CNY17F-2</b>	<b>CNY17F-3</b>	<b>CNY17F-4</b>

**TYPICAL PERFORMANCE CURVES (continued)**

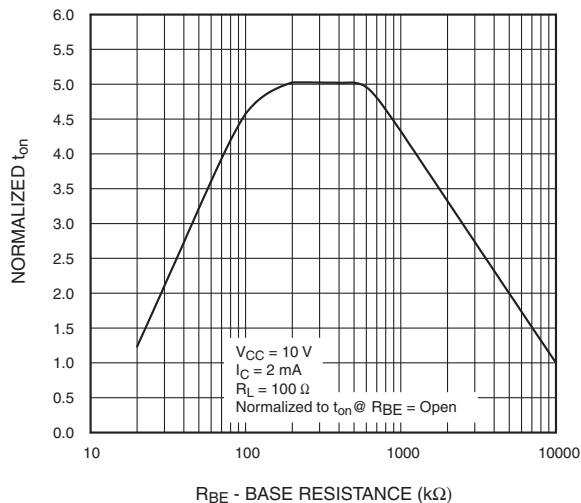
**Fig. 5 CTR vs. R<sub>BE</sub> (Unsaturated)**



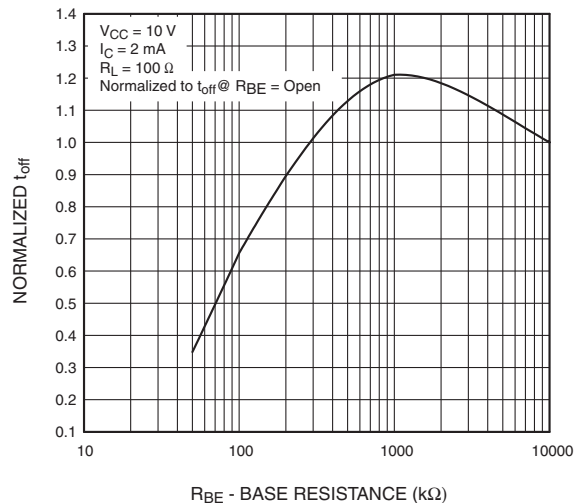
**Fig. 6 Collector Emitter Saturation Voltage vs Collector Current**



**Fig. 7 Normalized t<sub>on</sub> vs. R<sub>BE</sub>**



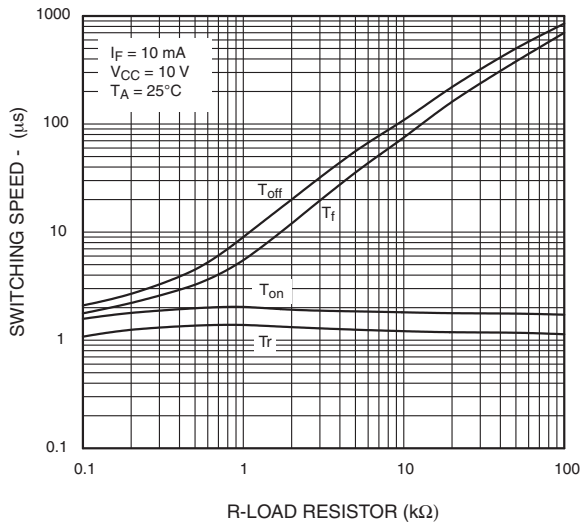
**Fig. 8 Normalized t<sub>off</sub> vs. R<sub>BE</sub>**



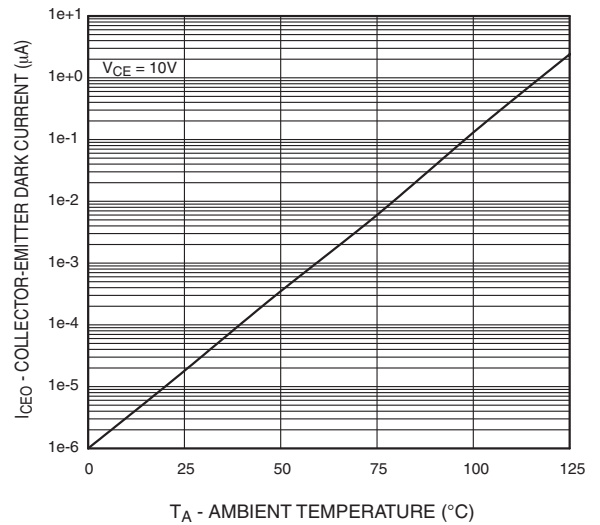
<b>MOC8101</b>	<b>MOC8102</b>	<b>MOC8103</b>	<b>MOC8104</b>
<b>MOC8105</b>	<b>MOC8106</b>	<b>MOC8107</b>	<b>MOC8108</b>
<b>CNY17F-1</b>	<b>CNY17F-2</b>	<b>CNY17F-3</b>	<b>CNY17F-4</b>

**TYPICAL PERFORMANCE CURVES** (continued)

**Fig. 9 Switching Speed vs. Load Resistor**

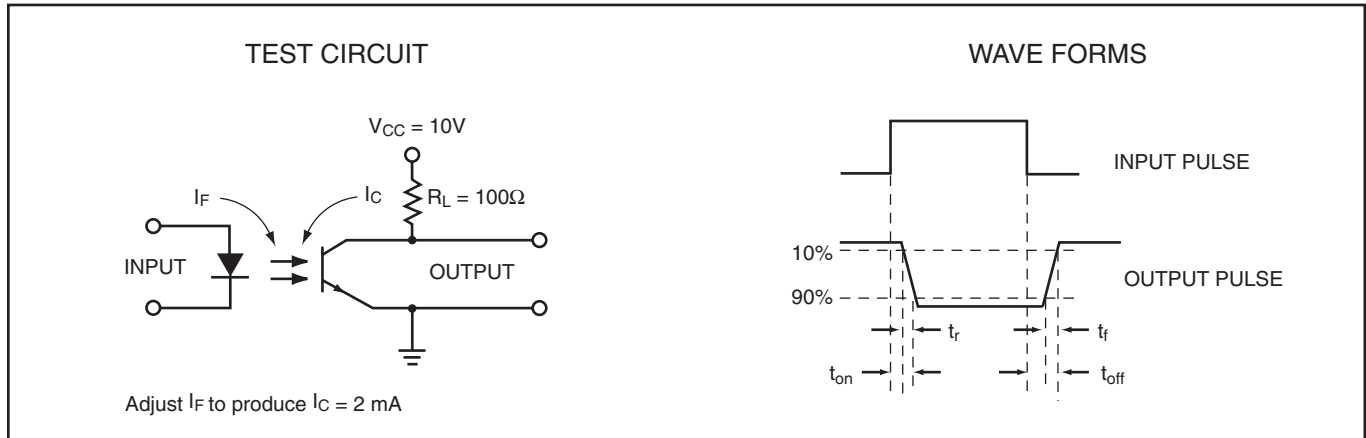


**Fig. 10 Dark current vs. Ambient Temperature.**



<b>MOC8101</b>	<b>MOC8102</b>	<b>MOC8103</b>	<b>MOC8104</b>
<b>MOC8105</b>	<b>MOC8106</b>	<b>MOC8107</b>	<b>MOC8108</b>
<b>CNY17F-1</b>	<b>CNY17F-2</b>	<b>CNY17F-3</b>	<b>CNY17F-4</b>

Figure 11. Switching Time Test Circuit and Waveforms





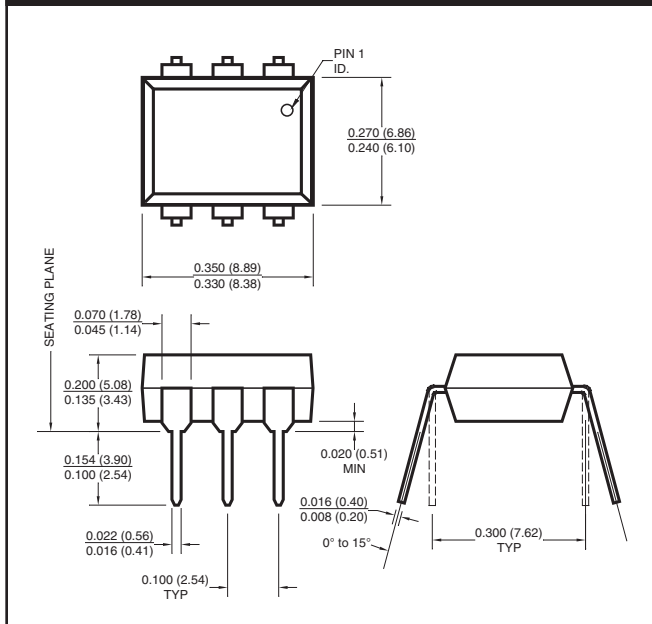
**MOC8101  
MOC8105  
CNY17F-1**

**MOC8102  
MOC8106  
CNY17F-2**

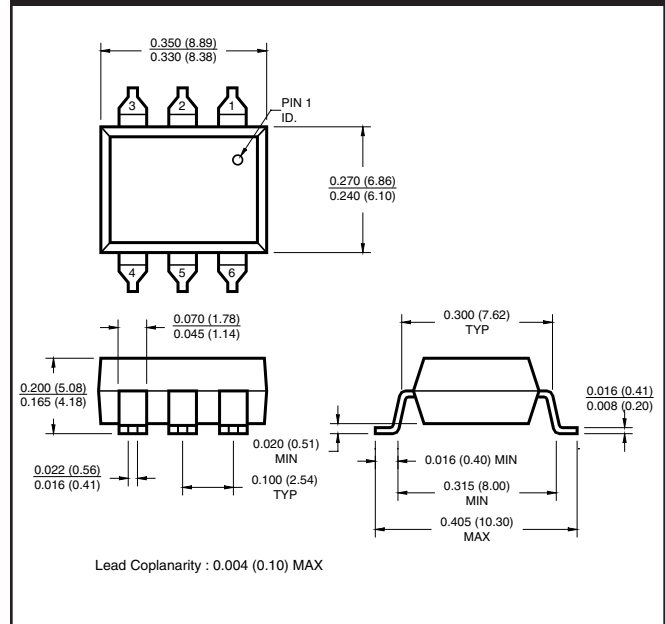
**MOC8103  
MOC8107  
CNY17F-3**

**MOC8104  
MOC8108  
CNY17F-4**

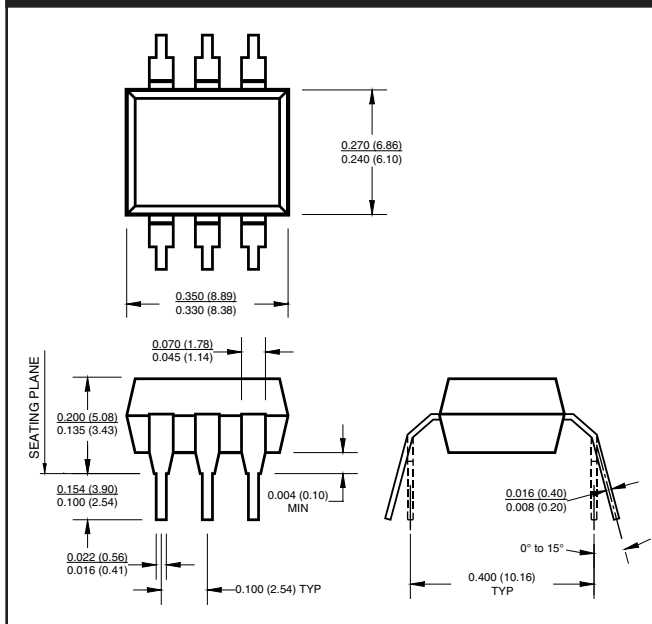
**Package Dimensions (Through Hole)**



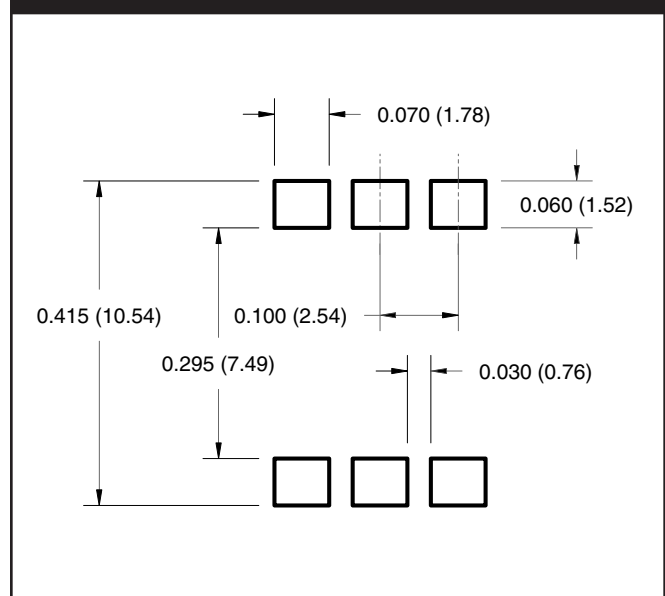
**Package Dimensions (Surface Mount)**



**Package Dimensions (0.4" Lead Spacing)**



**Recommended Pad Layout for  
Surface Mount Leadform**



**NOTE**  
All dimensions are in inches (millimeters)

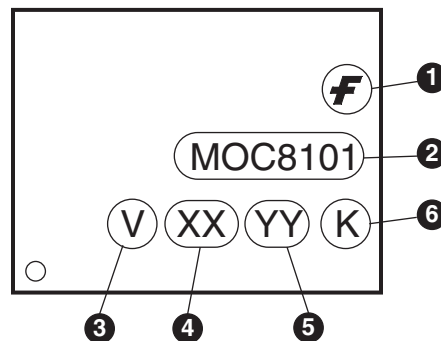
# 6-PIN DIP OPTOCOUPPLERS FOR POWER SUPPLY APPLICATIONS (NO BASE CONNECTION)

MOC8101	MOC8102	MOC8103	MOC8104
MOC8105	MOC8106	MOC8107	MOC8108
CNY17F-1	CNY17F-2	CNY17F-3	CNY17F-4

## ORDERING INFORMATION

Option	Order Entry Identifier	Description
S	.S	Surface Mount Lead Bend
SD	.SD	Surface Mount; Tape and Reel
W	.W	0.4" Lead Spacing
300	.300	VDE 0884
300W	.300W	VDE 0884, 0.4" Lead Spacing
3S	.3S	VDE 0884, Surface Mount
3SD	.3SD	VDE 0884, Surface Mount, Tape and Reel

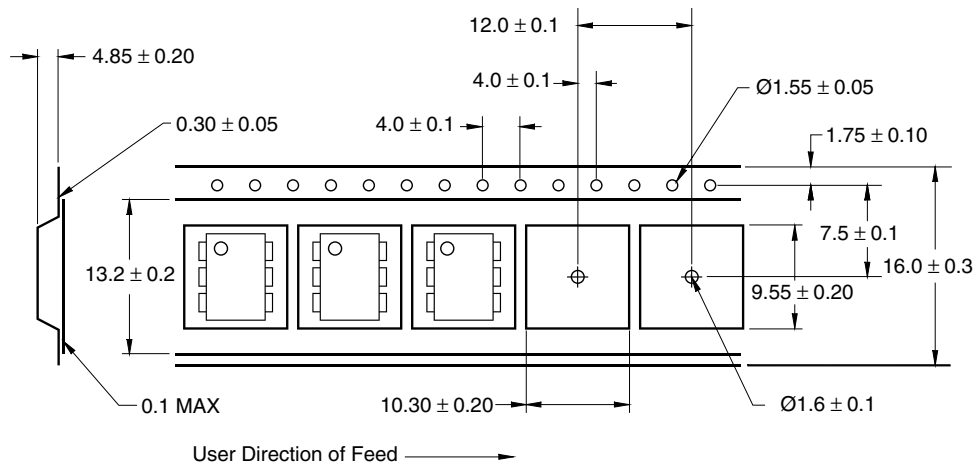
## MARKING INFORMATION



Definitions	
1	Fairchild logo
2	Device number
3	VDE mark (Note: Only appears on parts ordered with VDE option – See order entry table)
4	Two digit year code, e.g., '03'
5	Two digit work week ranging from '01' to '53'
6	Assembly package code

MOC8101	MOC8102	MOC8103	MOC8104
MOC8105	MOC8106	MOC8107	MOC8108
CNY17F-1	CNY17F-2	CNY17F-3	CNY17F-4

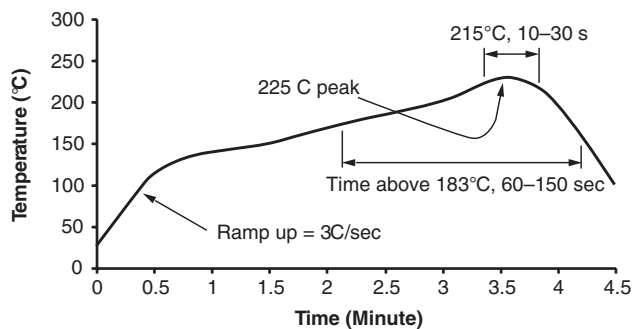
**Carrier Tape Specifications ("D" Taping Orientation)**



**NOTE**

All dimensions are in inches (millimeters)

**Reflow Profile (Black Package, No Suffix)**



- Peak reflow temperature: 225°C (package surface temperature)
- Time of temperature higher than 183°C for 60–150 seconds
- One time soldering reflow is recommended

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<b>MOC8101</b>	<b>MOC8102</b>	<b>MOC8103</b>	<b>MOC8104</b>
<b>MOC8105</b>	<b>MOC8106</b>	<b>MOC8107</b>	<b>MOC8108</b>
<b>CNY17F-1</b>	<b>CNY17F-2</b>	<b>CNY17F-3</b>	<b>CNY17F-4</b>

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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.