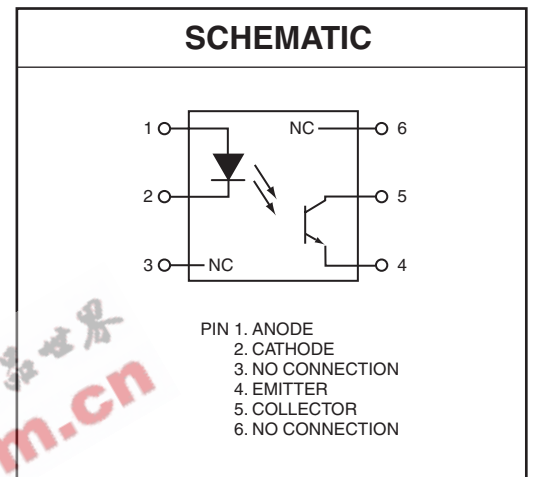
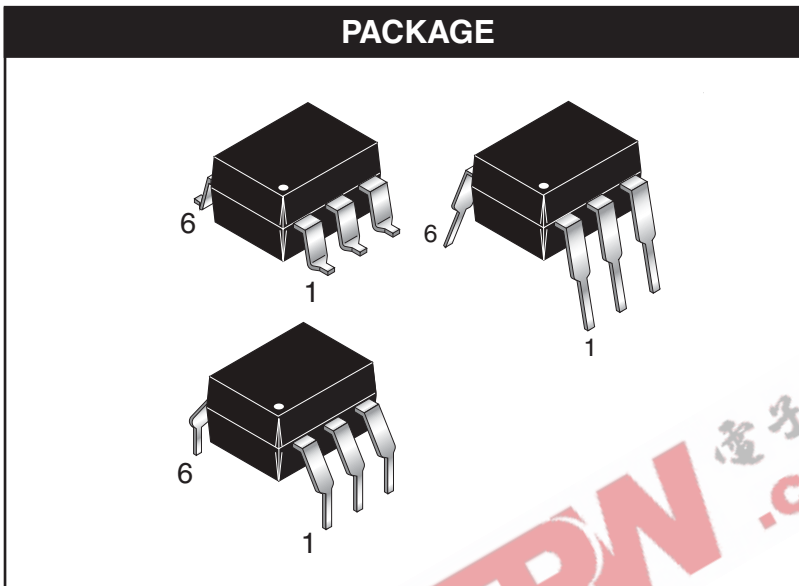


## 6-PIN DIP OPTOCOUPLEDERS FOR POWER SUPPLY APPLICATIONS (NO BASE CONNECTION)

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



### 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>

**ABSOLUTE MAXIMUM RATINGS** ( $T_A = 25^\circ\text{C}$  Unless otherwise specified)

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

**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>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	1.65	V
	$(I_F = 10 \text{ mA})$ MOC810X		1.0	1.18	1.5	
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		$V_{(BR) CEO}$				V
MOC8101/2/3/4/5	$(I_C = 1.0 \text{ mA})$		30	100	—	
MOC8106/7/8, CNY17F-1/2/3/4	$(I_C = 1.0 \text{ mA})$		70	100	—	
Emitter-Collector Breakdown Voltage	$(I_E = 100 \mu\text{A})$	$V_{(BR) ECO}$	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	
$(I_F = 10 \text{ mA}, V_{CE} = 5 \text{ V})$	CNY17F-1		40	—	80	
	CNY17F-2		63	—	125	
	CNY17F-3		100	—	200	
	CNY17F-4		160	—	320	
Collector-Emitter Saturation Voltage		$V_{CE(sat)}$				V
CNY17F-1/2/3/4	$(I_C = 2.5 \text{ mA}, I_F = 10 \text{ mA})$		—	—	0.4	
MOC8101/2/3/4/5/6/7/8	$(I_C = 500 \mu\text{A}, I_F = 5.0 \text{ mA})$					
Isolation Voltage	$(f = 60 \text{ Hz}, t = 1.0 \text{ min.})^{(4)}$	$V_{ISO}$	5300	—	—	Vac(rms)
Isolation Resistance	$(V_{I-O} = 500 \text{ V})^{(4)}$	$R_{ISO}$	$10^{11}$	—	—	$\Omega$
Isolation Capacitance	$(V_{I-O} = 0, f = 1.0 \text{ MHz})^{(4)}$	$C_{ISO}$	—	0.5	—	pF

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

## 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>

TRANSFER CHARACTERISTICS (T <sub>A</sub> = 25°C Unless otherwise specified)							
AC Characteristic	Test Conditions	Symbol	Min	Typ**	Max	Unit	
<b>NON-SATURATED SWITCHING TIME</b>							
Turn-on Time CNY17F-1/2/3/4 Only	(R <sub>L</sub> = 100 Ω, I <sub>C</sub> = 2 mA)	t <sub>on</sub>	—	2	10	μs	
Turn-off Time CNY17F-1/2/3/4 Only	(V <sub>CC</sub> = 10 V)	t <sub>off</sub>	—	3	10		
Turn-On Time	MOC8101-5 MOC8106-8 (I <sub>C</sub> = 2.0 mA, V <sub>CC</sub> = 10 V, R <sub>L</sub> = 100 Ω) <sup>(3)</sup>	t <sub>on</sub>	—	2	20	μs	
Turn-Off Time	MOC8101-5 MOC8106-8 (I <sub>C</sub> = 2.0 mA, V <sub>CC</sub> = 10 V, R <sub>L</sub> = 100 Ω) <sup>(3)</sup>	t <sub>off</sub>	—	3	20		
Rise Time	All Devices (I <sub>C</sub> = 2.0 mA, V <sub>CC</sub> = 10 V, R <sub>L</sub> = 100 Ω) <sup>(3)</sup>	t <sub>r</sub>	—	1	—	μs	
Fall Time	All Devices (I <sub>C</sub> = 2.0 mA, V <sub>CC</sub> = 10 V, R <sub>L</sub> = 100 Ω) <sup>(3)</sup>	t <sub>f</sub>	—	2	—		
<b>SATURATED SWITCHING TIMES</b>							
Turn-on Time	CNY17F-1 (I <sub>F</sub> = 20 mA, V <sub>CE</sub> = 0.4 V)	t <sub>on</sub>	—	—	5.5	μs	
	CNY17F-2 CNY17F-3 CNY17F-4 (I <sub>F</sub> = 10 mA, V <sub>CE</sub> = 0.4 V)		—	—	8.0		
Rise Time	CNY17F-1 (I <sub>F</sub> = 20 mA, V <sub>CE</sub> = 0.4 V)		t <sub>r</sub>	—	—		4.0
	CNY17F-2 CNY17F-3 CNY17F-4 (I <sub>F</sub> = 20 mA, V <sub>CE</sub> = 0.4 V)			—	—		—
Turn-off Time	CNY17F-1 (I <sub>F</sub> = 20 mA, V <sub>CE</sub> = 0.4 V)	t <sub>off</sub>		—	—	34	
	CNY17F-2 CNY17F-3 CNY17F-4 (I <sub>F</sub> = 10 mA, V <sub>CE</sub> = 0.4 V)		—	—	39		
Fall Time	CNY17F-1 (I <sub>F</sub> = 20 mA, V <sub>CE</sub> = 0.4 V)		t <sub>f</sub>	—	—	20	
	CNY17F-2 CNY17F-3 CNY17F-4 (I <sub>F</sub> = 10 mA, V <sub>CE</sub> = 0.4 V)	—		—	24		

\*\* All typicals at T<sub>A</sub> = 25°C

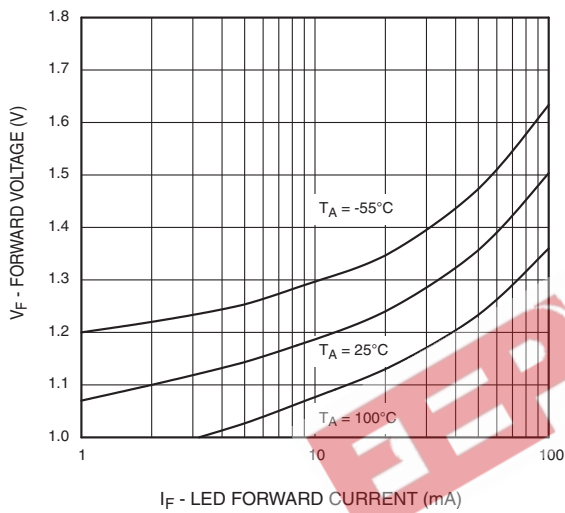
**NOTES:**

1. Always design to the specified minimum/maximum electrical limits (where applicable).
2. Current Transfer Ratio (CTR) = I<sub>C</sub>/I<sub>F</sub> x 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.

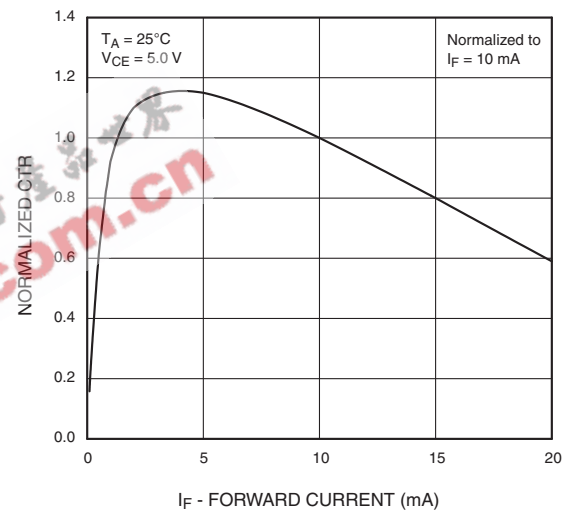
MOC8101	MOC8102	MOC8103	MOC8104
MOC8105	MOC8106	MOC8107	MOC8108
CNY17F-1	CNY17F-2	CNY17F-3	CNY17F-4

**TYPICAL PERFORMANCE CURVES**

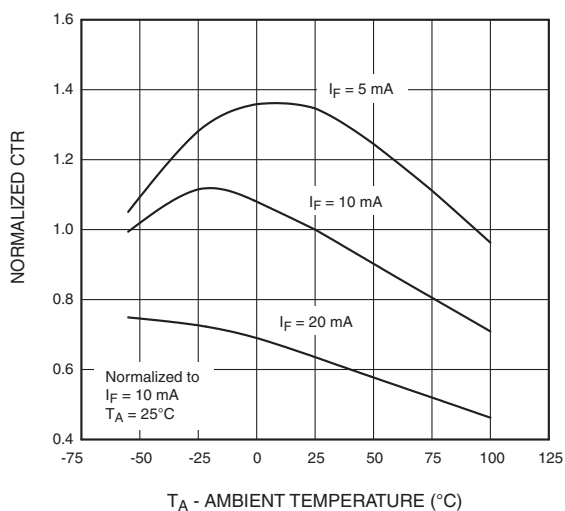
**Fig. 1 LED Forward Voltage vs. Forward Current**



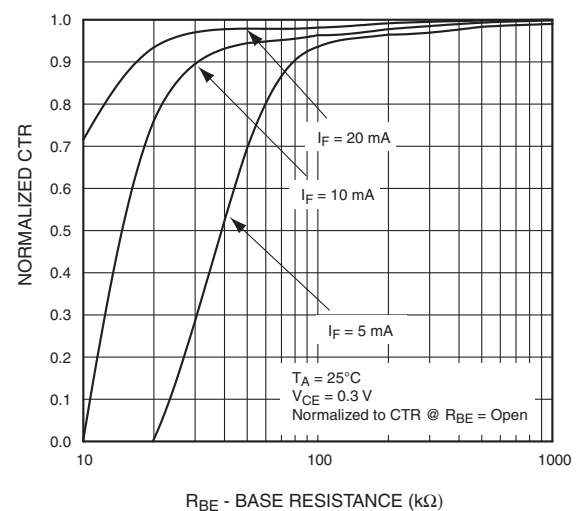
**Fig. 2 Normalized CTR vs. Forward Current**



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



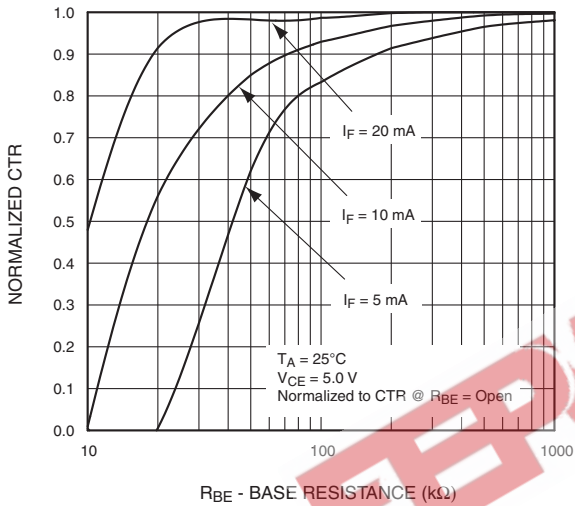
**Fig. 4 CTR vs. R<sub>BE</sub> (Saturated)**



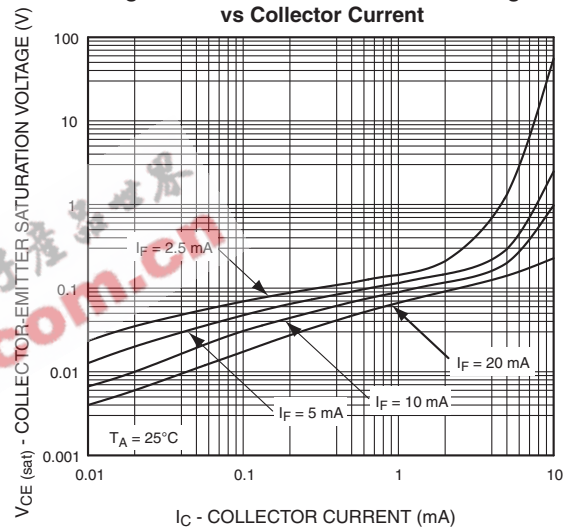
MOC8101	MOC8102	MOC8103	MOC8104
MOC8105	MOC8106	MOC8107	MOC8108
CNY17F-1	CNY17F-2	CNY17F-3	CNY17F-4

**TYPICAL PERFORMANCE CURVES (continued)**

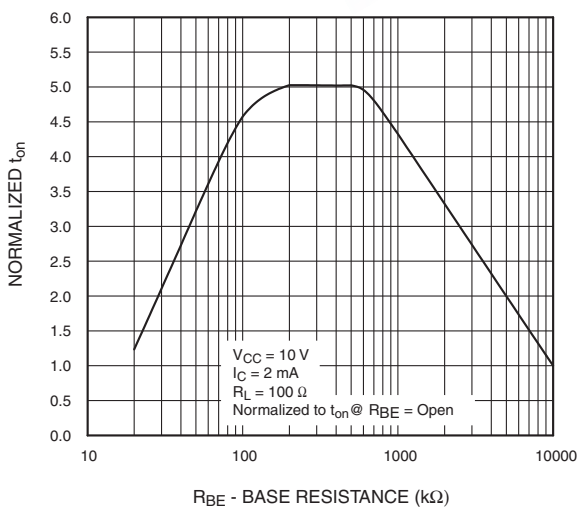
**Fig. 5 CTR vs. R<sub>BE</sub> (Unsaturated)**



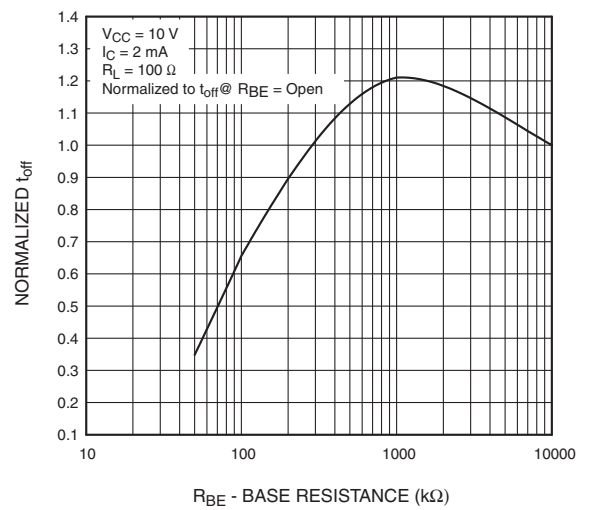
**Fig. 6 Collector-Emitter Saturation Voltage vs. Collector Current**



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



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

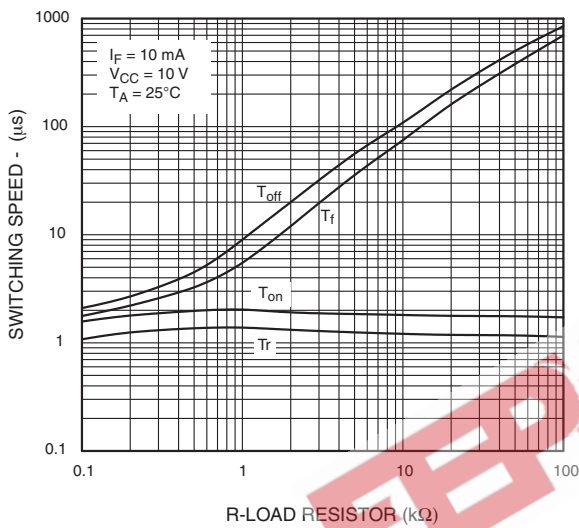


# 6-PIN DIP OPTOCOUPLEDERS FOR POWER SUPPLY APPLICATIONS (NO BASE CONNECTION)

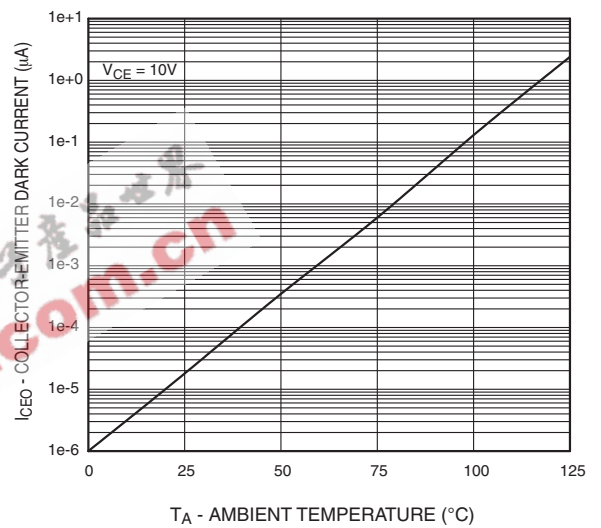
MOC8101	MOC8102	MOC8103	MOC8104
MOC8105	MOC8106	MOC8107	MOC8108
CNY17F-1	CNY17F-2	CNY17F-3	CNY17F-4

## TYPICAL PERFORMANCE CURVES (continued)

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



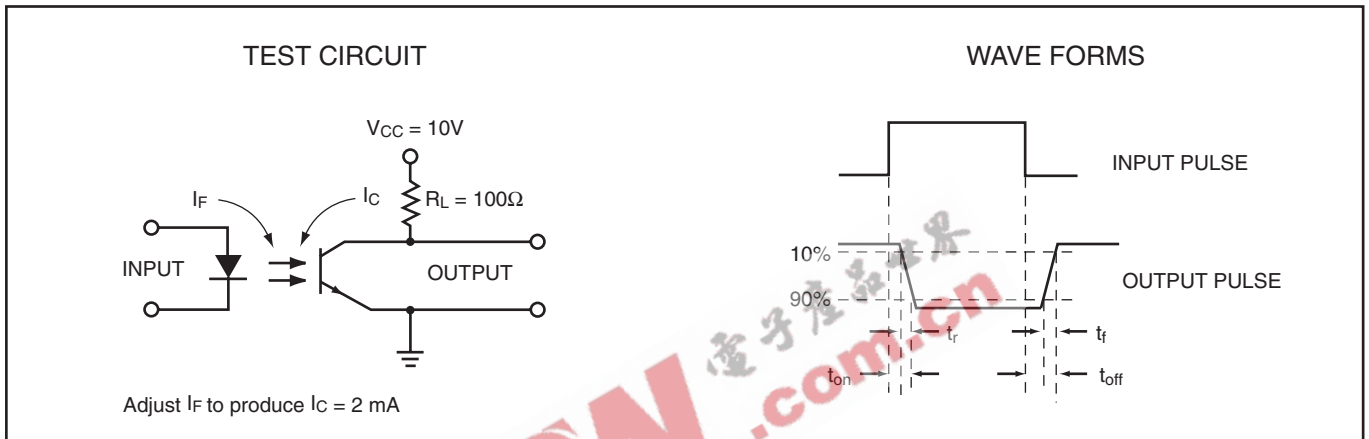
**Fig. 10 Dark current vs. Ambient Temperature.**



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

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

Figure 11. Switching Time Test Circuit and Waveforms





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

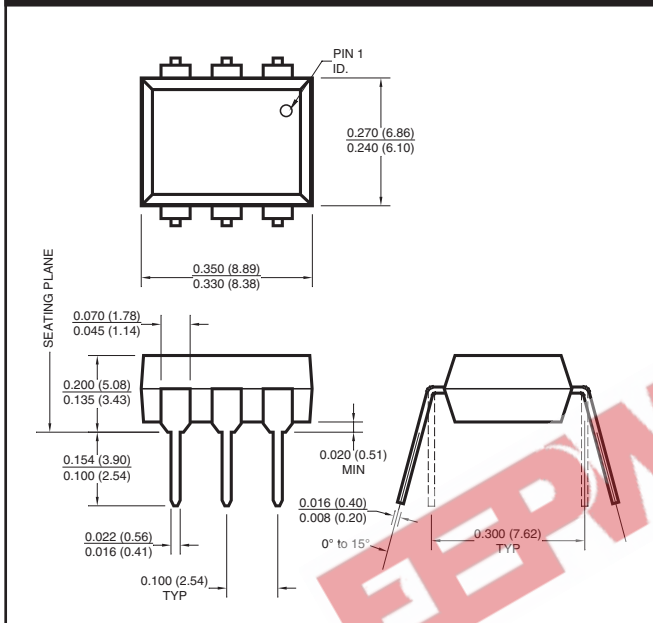
MOC8101  
MOC8105  
CNY17F-1

MOC8102  
MOC8106  
CNY17F-2

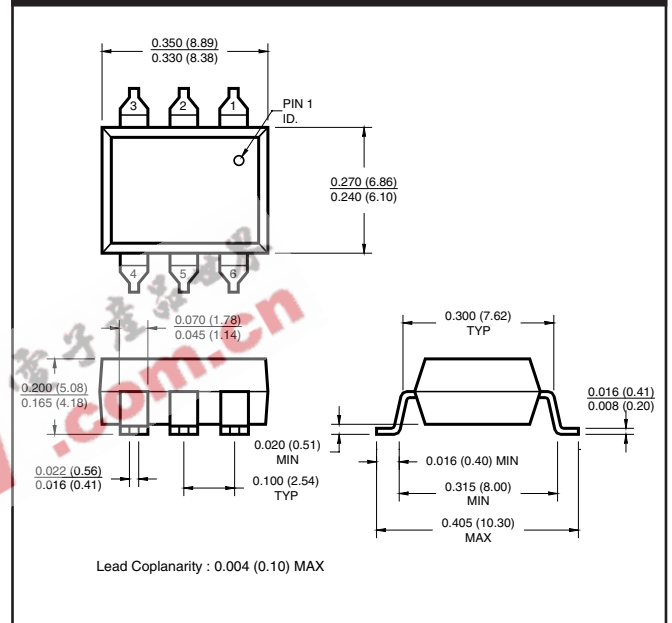
MOC8103  
MOC8107  
CNY17F-3

MOC8104  
MOC8108  
CNY17F-4

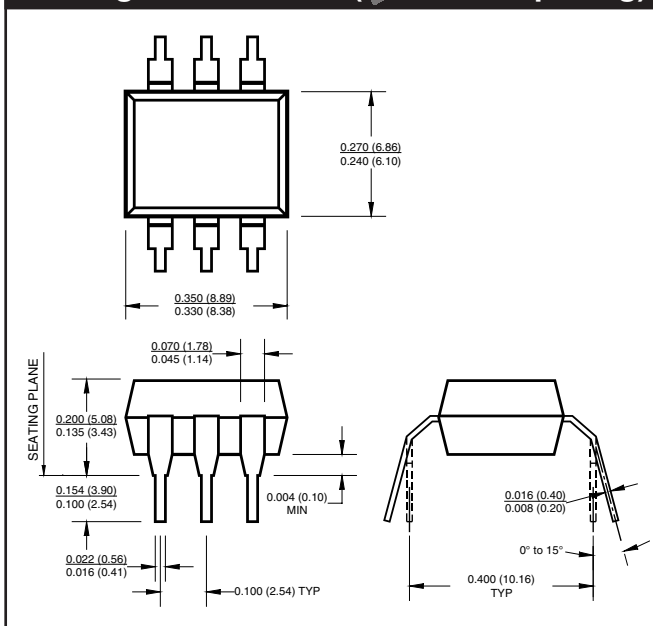
## Package Dimensions (Through Hole)



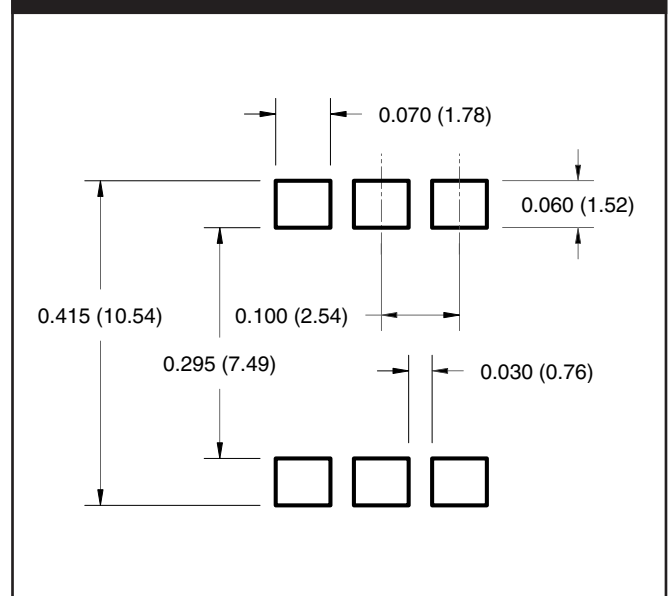
## Package Dimensions (Surface Mount)



## Package Dimensions (0.4" Lead Spacing)



## Recommended Pad Layout for Surface Mount Leadform



### NOTE

All dimensions are in inches (millimeters)

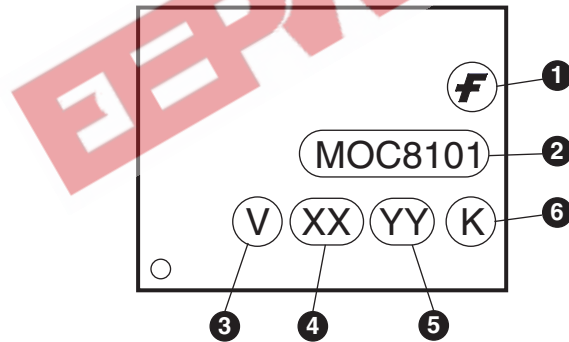
## 6-PIN DIP OPTOCOUPPLERS FOR POWER SUPPLY APPLICATIONS (NO BASE CONNECTION)

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

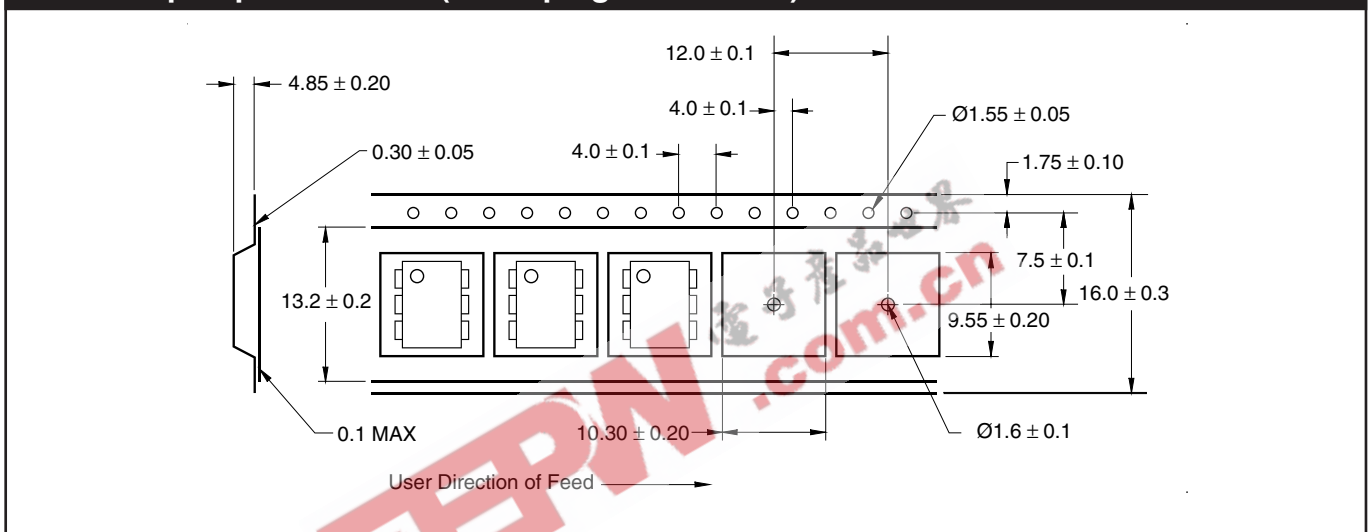


Definitions	
1	Fairchild logo
2	Device number
3	VDE mark (Note: Only appears on parts ordered with VDE option – See order entry table)
4	Two digit year code, e.g., '03'
5	Two digit work week ranging from '01' to '53'
6	Assembly package code

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

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

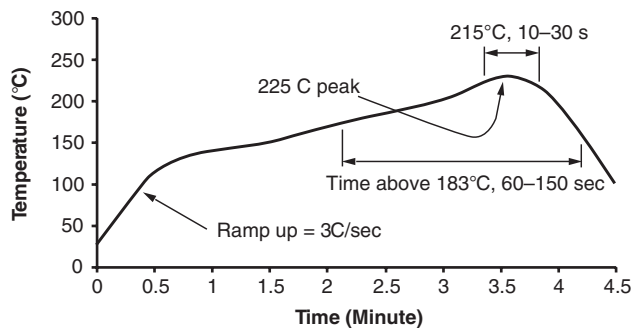
## Carrier Tape Specifications ("D" Taping Orientation)



### 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

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

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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.

