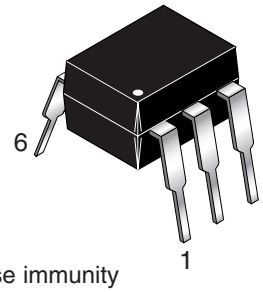
FAIRCHILD
SEMICONDUCTOR™

PHOTODARLINGTON OPTOCOUPLERS (NO BASE CONNECTION)

MOC119

DESCRIPTION

The MOC119 device has a gallium arsenide infrared emitting diode coupled to a silicon darlington phototransistor.

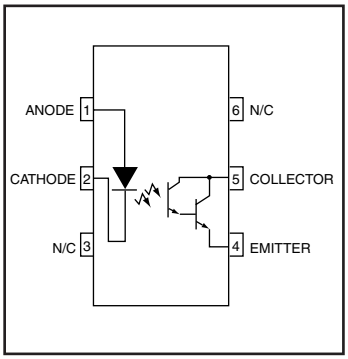


FEATURES

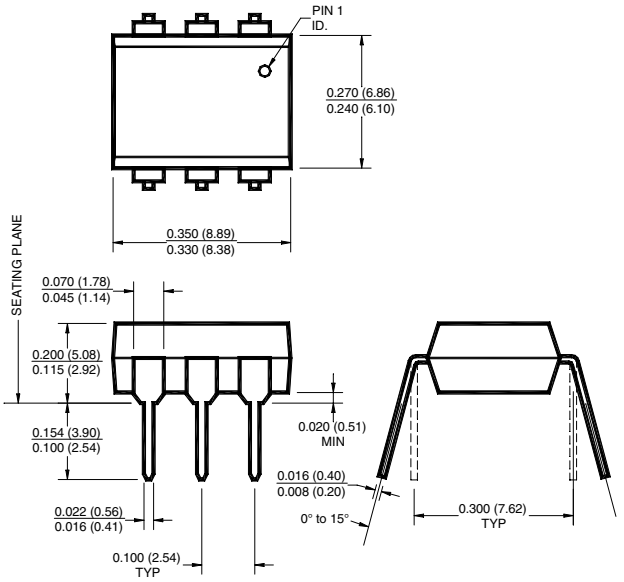
- High current transfer ratio of 300%
- No base connection for improved noise immunity
- Underwriters Laboratory (UL) recognized File# E90700

APPLICATIONS

- Appliances, measuring instruments
- I/O interface for computers
- Programmable controllers
- Portable electronics
- Interfacing and coupling systems of different potentials and impedance
- Solid state relays



PACKAGE DIMENSIONS



NOTE
All dimensions are in inches (millimeters)

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C Unless otherwise specified.)

Parameter	Symbol	Value	Units
TOTAL DEVICE Storage Temperature	T_{STG}	-55 to +150	°C
Operating Temperature	T_{OPR}	-55 to +100	°C
Lead Solder Temperature	T_{SOL}	260 for 10 sec	°C
Total Device Power Dissipation @ T_A = 25°C	P_D	250	mW
Derate above 25°C		2.94	mW/°C
Input-Output Isolation Voltage	V_{ISO}	5300	Vac(rms)
EMITTER DC/Average Forward Input Current	I_F	60	mA
Reverse Input Voltage	V_R	3	V
LED Power Dissipation @ T_A = 25°C	P_D	120	mW
Derate above 25°C		1.41	mW/°C
DETECTOR Collector-Emitter Voltage	V_{CEO}	30	V
Emitter-Collector Voltage	V_{ECO}	7	V
Detector Power Dissipation @ T_A = 25°C	P_D	150	mW
Derate above 25°C		1.76	mW/°C
Continuous Collector Current	I_C	150	mA

ELECTRICAL CHARACTERISTICS (T_A = 25°C Unless otherwise specified.)

INDIVIDUAL COMPONENT CHARACTERISTICS

Parameter	Test Conditions	Symbol	Min	Typ**	Max	Unit
EMITTER						
Input Forward Voltage	(I_F = 10 mA)	V_F		1.15	1.5	V
Input Capacitance	(V_R = 0, f = 1 MHz)	C_{IN}		18		pF
Reverse Leakage Current	(V_R = 3.0 V)	I_R		0.05	100	µA
DETECTOR						
Collector-Emitter Breakdown Voltage	(I_C = 100 µA)	BV_{CEO}	30			V
Emitter-Collector Breakdown Voltage	(I_E = 10 µA)	BV_{ECO}	7			V
Collector-Emitter Dark Current	(V_{CE} = 10 V)	I_{CEO}			100	nA

TRANSFER CHARACTERISTICS

DC Characteristic	Test Conditions	Symbol	Min	Typ**	Max	Units
Current Transfer Ratio,	(I_F = 10 mA, V_{CE} = 2 V)	CTR	30 (300)	45 (450)		mA (%)

TRANSFER CHARACTERISTICS

Characteristic	Test Conditions	Symbol	Min	Typ**	Max	Units
SWITCHING TIMES						
Turn-on Time	(V_{CE} = 10 V, R_L = 100Ω, I_F = 5 mA)	t_{on}		3.5		µs
Turn-off Time		t_{off}		95		µs

ISOLATION CHARACTERISTICS

Characteristic	Test Conditions	Symbol	Min	Typ**	Max	Units
Input-Output Isolation Voltage	(I_{I-O} ≤ 1 µA, 1 min.)	V_{ISO}	7500			Vac(pk)
	(I_{I-O} ≤ 1 µA, 1 min.)		5300			Vac(rms)
Isolation Resistance	(V_{I-O} = 500 VDC)	R_{ISO}		10^{11}		Ω
Isolation Capacitance	(V = 0 V, f = 1 MHz)	C_{ISO}		0.2		pf
Collector - Emitter Saturation Voltage	(I_C = 10 mA, I_F = 10 mA)	$V_{CE\ (SAT)}$			1	V

Note
** Typical values at T_A = 25°C

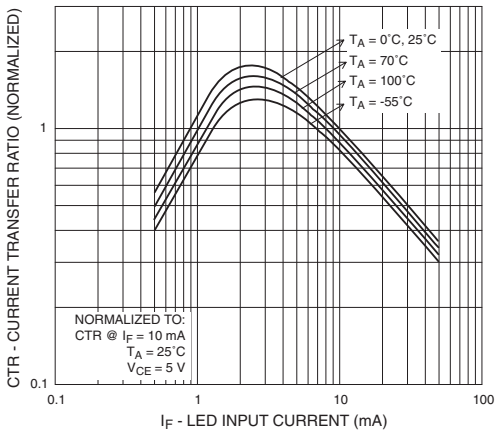


Fig. 1 Output Current vs. Input Current

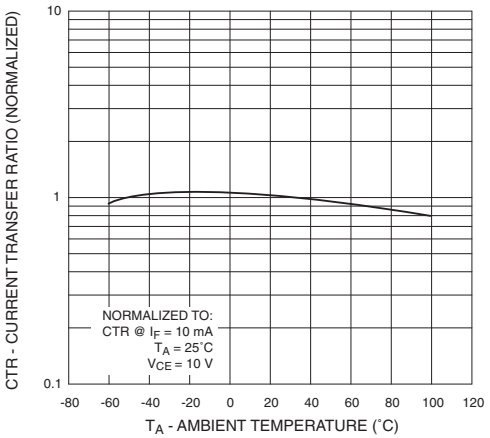


Fig. 2 Current Transfer Ratio vs. Ambient Temperature

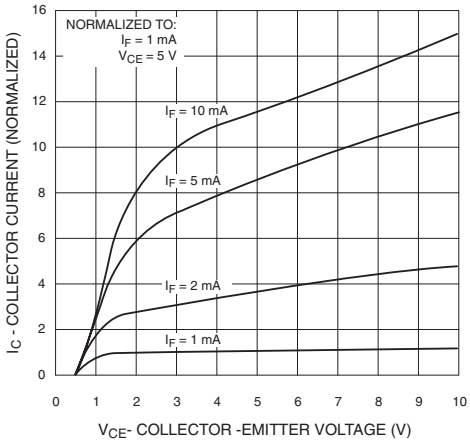


Fig. 3 Collector Current vs. Collector-Emitter Voltage

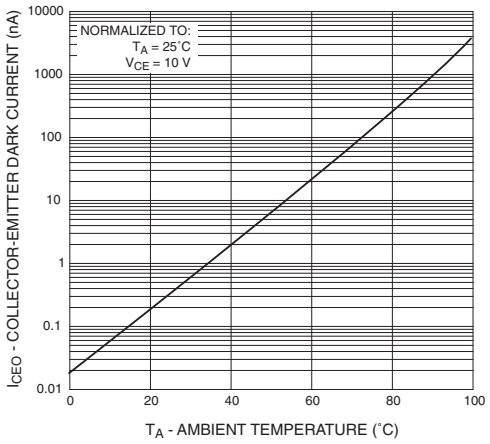


Fig. 4 Dark Current vs. Ambient Temperature

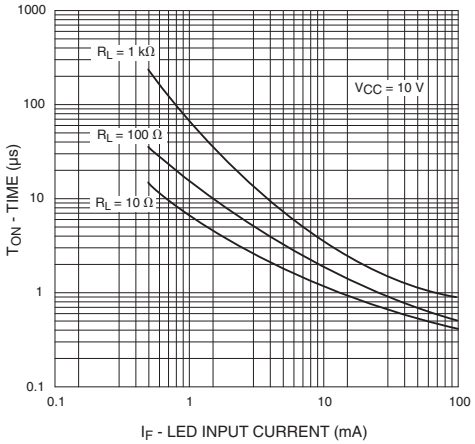


Fig. 5 Turn-On Time vs. Input Current

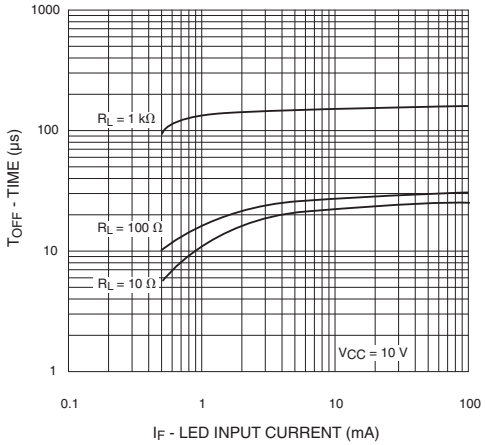
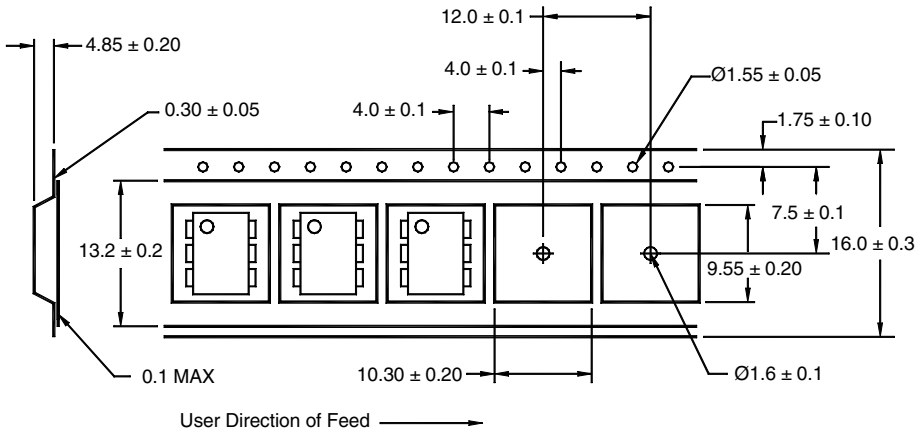


Fig. 6 Turn-Off Time vs. Input Current

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 & Reel

QT Carrier Tape Specifications (“D” Taping Orientation)



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