GlobalOptoisolator™

VDE | UL | CSA | SETI | SEMKO | DEMKO | NEMKO | BABT

MOC119

[CTR = 300% Min]

6-Pin DIP Optoisolator Darlington Output (No Base Connection)

The MOC119 device consists of a gallium arsenide infrared emitting diode optically coupled to a monolithic silicon photodarlington detector. The chip to Pin 6 connection has been eliminated for better performance when used in high noise environments.

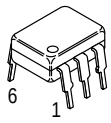
It is designed for use in applications requiring high improved noise immunity.

- Provides Higher Output Collector Current (I_C) with Lower Values of Input Drive Current (I_F)
- ***To order devices that are tested and marked per VDE 0884 requirements, the suffix "V" must be included at end of part number. VDE 0884 is a test option.***

Applications

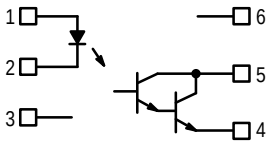
- Appliance, Measuring Instruments
- Interfacing and coupling systems of different potentials and impedances
- Monitor and Detection Circuits
- I/O Interfaces for Computers
- Solid State Relays
- Portable Electronics
- Programmable Controllers

STYLE 3 PLASTIC



STANDARD THRU HOLE
CASE 730A–04

SCHEMATIC



PIN 1. LED ANODE
2. LED CATHODE
3. N.C.
4. EMITTER
5. COLLECTOR
6. N.C.

MAXIMUM RATINGS (T_A = 25°C unless otherwise noted)

Rating	Symbol	Value	Unit
INPUT LED			
Reverse Voltage	V_R	3	Volts
Forward Current — Continuous	I_F	60	mA
LED Power Dissipation @ T_A = 25°C with Negligible Power in Output Detector Derate above 25°C	P_D	120 1.41	mW mW/°C
OUTPUT DETECTOR			
Collector–Emitter Voltage	V_{CEO}	30	Volts
Emitter–Collector Voltage	V_{ECO}	7	Volts
Detector Power Dissipation @ T_A = 25°C with Negligible Power in Input LED Derate above 25°C	P_D	150 1.76	mW mW/°C
TOTAL DEVICE			
Isolation Surge Voltage(1) (Peak ac Voltage, 60 Hz, 1 sec Duration)	V_{ISO}	7500	Vac(pk)
Total Device Power Dissipation @ T_A = 25°C Derate above 25°C	P_D	250 2.94	mW mW/°C
Ambient Operating Temperature Range(2)	T_A	–55 to +100	°C
Storage Temperature Range(2)	T_{stg}	–55 to +150	°C
Soldering Temperature (10 sec, 1/16″ from case)	T_L	260	°C

1. Isolation surge voltage is an internal device dielectric breakdown rating. For this test, Pins 1 and 2 are common, and Pins 4 and 5 are common.
2. Refer to Quality and Reliability Section in Opto Data Book for information on test conditions.

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ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)(1)

Characteristic	Symbol	Min	Typ(1)	Max	Unit
INPUT LED					
Reverse Leakage Current (V_R = 3 V)	I_R	—	0.05	100	μA
Forward Voltage (I_F = 10 mA)	V_F	—	1.15	1.5	Volts
Capacitance (V_R = 0 V, f = 1 MHz)	C	—	18	—	pF
PHOTOTRANSISTOR (T_A = 25°C and I_F = 0 unless otherwise noted)					
Collector–Emitter Dark Current (V_{CE} = 10 V)	I_{CEO}	—	—	100	nA
Collector–Emitter Breakdown Voltage (I_C = 100 μA)	$V_{(BR)CEO}$	30	—	—	Volts
Emitter–Collector Breakdown Voltage (I_E = 10 μA)	$V_{(BR)ECO}$	7	—	—	Volts
COUPLED (T_A = 25°C unless otherwise noted)					
Collector Output Current(3) (V_{CE} = 2 V, I_F = 10 mA)	I_C (CTR)(2)	30 (300)	45 (450)	—	mA (%)
Isolation Surge Voltage(4,5), 60 Hz ac Peak, 1 Second	V_{ISO}	7500	—	—	Vac(pk)
Isolation Resistance(4) (V = 500 V)	R_{ISO}	—	10^{11}	—	Ohms
Collector–Emitter Saturation Voltage(3) (I_C = 10 mA, I_F = 10 mA)	$V_{CE(sat)}$	—	—	1	Volt
Isolation Capacitance(4) (V = 0 V, f = 1 MHz)	C_{ISO}	—	0.2	—	pF
SWITCHING (Figures 4, 5)					
Turn–On Time	t_{on}	—	3.5	—	μs
Turn–Off Time	t_{off}	—	95	—	
Rise Time	t_r	—	1	—	
Fall Time	t_f	—	2	—	

(V_{CE} = 10 V, R_L = 100 Ω, I_F = 5 mA(6))

1. Always design to the specified minimum/maximum electrical limits (where applicable).
2. Current Transfer Ratio (CTR) = I_C/I_F x 100%.
3. Pulse Test: Pulse Width = 300 μs, Duty Cycle ≤ 2%.
4. For this test, LED Pins 1 and 2 are common and Phototransistor Pins 4 and 5 are common.
5. Isolation Surge Voltage, V_{ISO}, is an internal device dielectric breakdown rating.
6. For test circuit setup and waveforms, refer to Figure 9.

TYPICAL CHARACTERISTICS

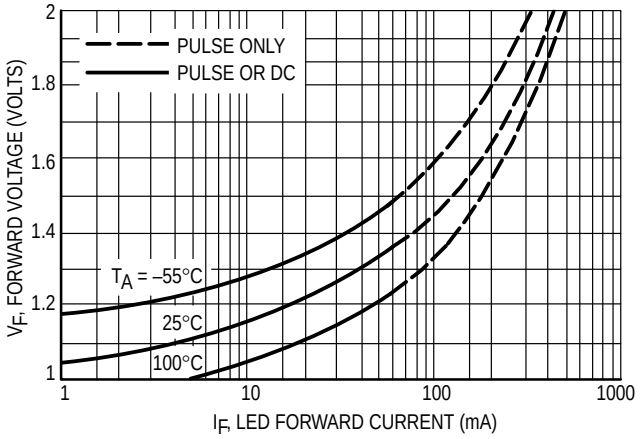


Figure 1. LED Forward Voltage versus Forward Current

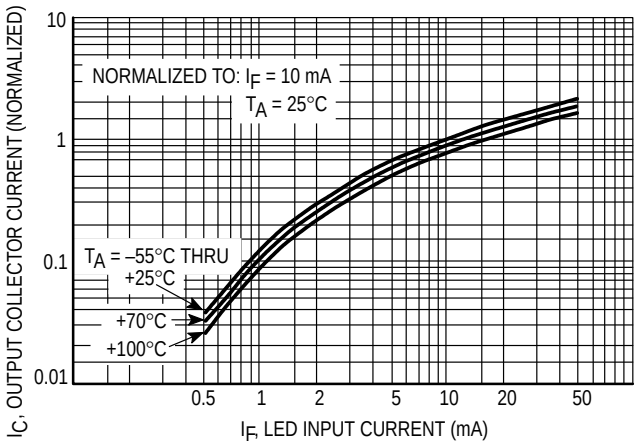


Figure 2. Output Current versus Input Current

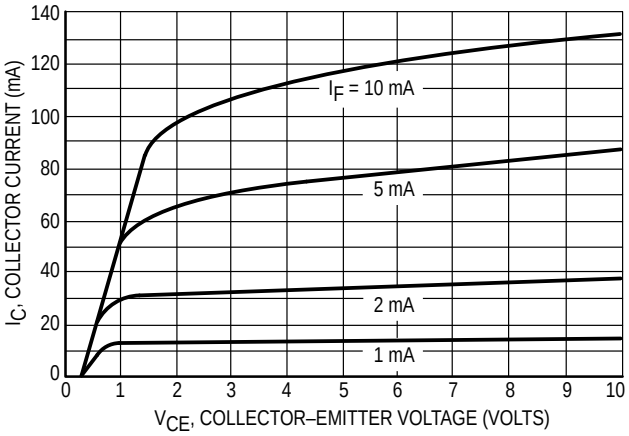


Figure 3. Collector Current versus Collector–Emitter Voltage

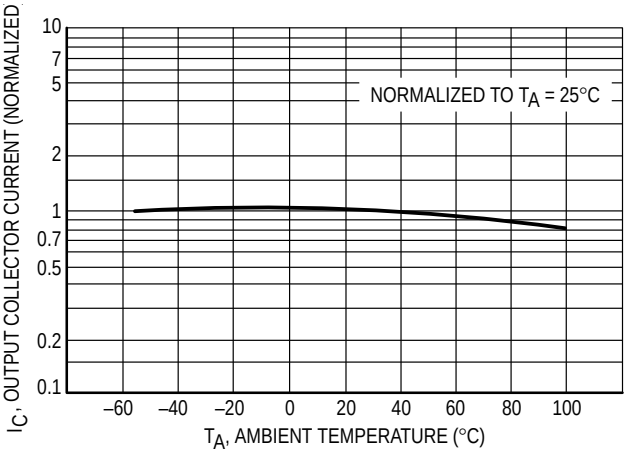


Figure 4. Output Current versus Ambient Temperature

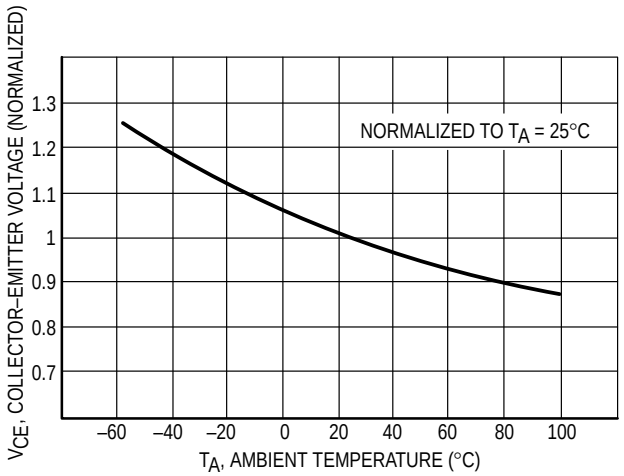


Figure 5. Collector–Emitter Voltage versus Ambient Temperature

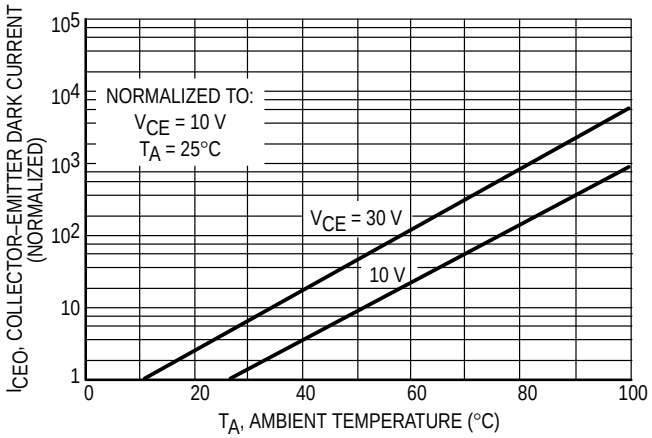


Figure 6. Collector–Emitter Dark Current versus Ambient Temperature

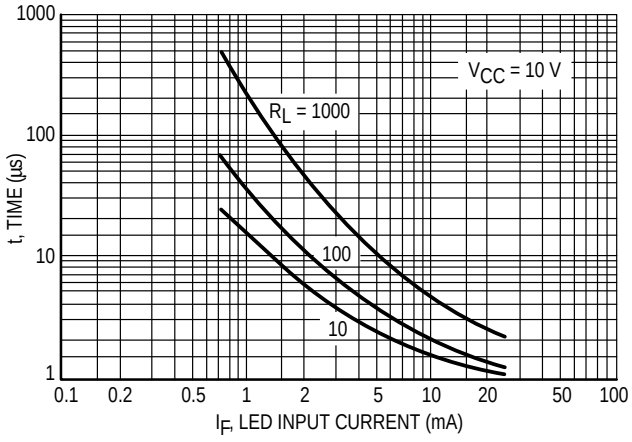


Figure 7. Turn–On Switching Times

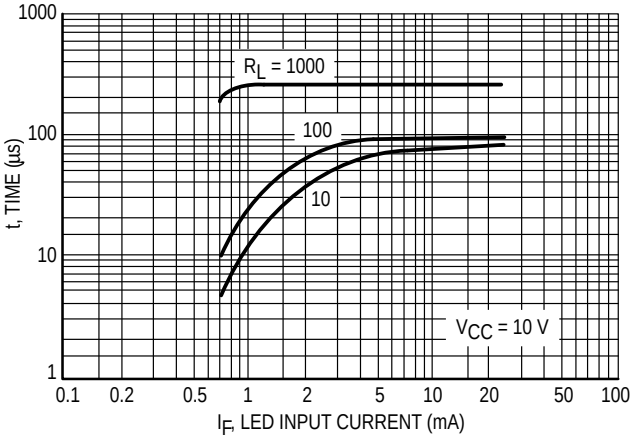


Figure 8. Turn–Off Switching Times

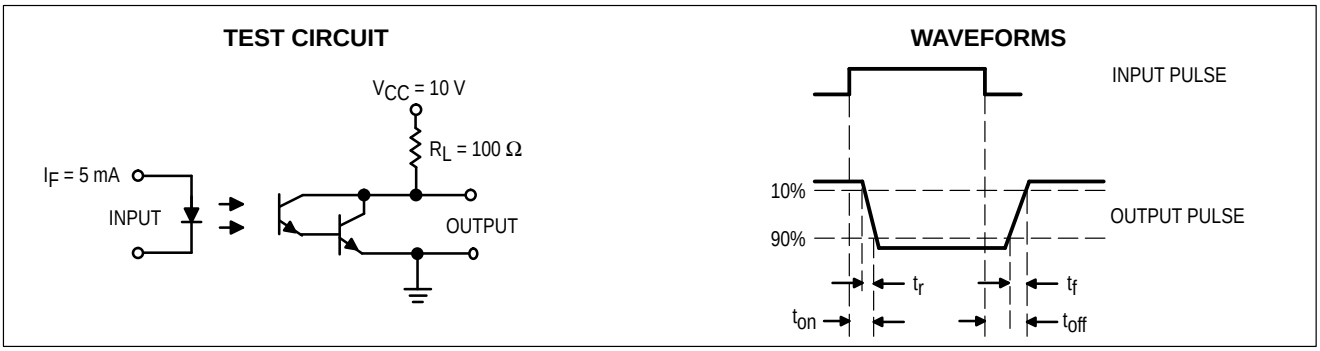
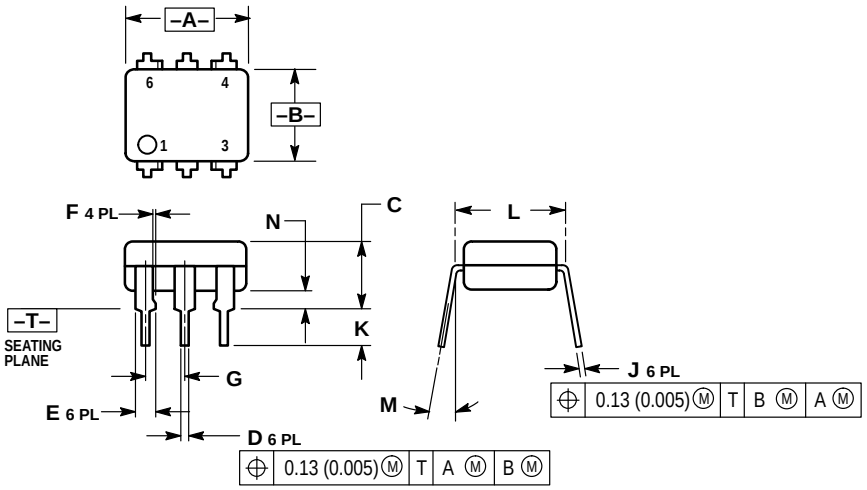


Figure 9. Switching Time Test Circuit and Waveforms

PACKAGE DIMENSIONS

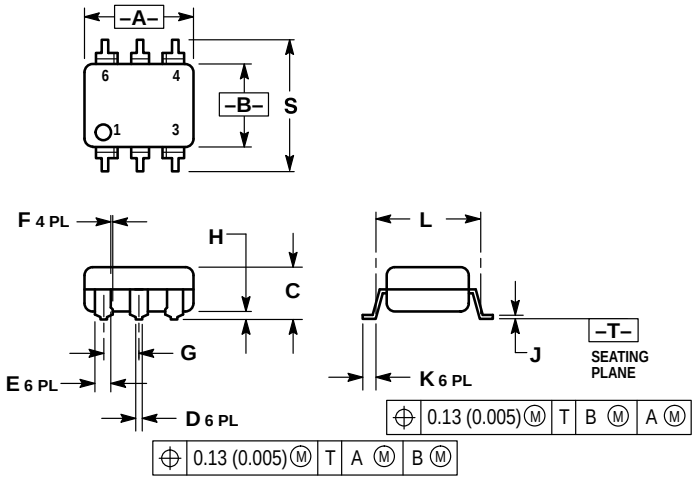


NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. DIMENSION L TO CENTER OF LEAD WHEN FORMED PARALLEL.

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	0.320	0.350	8.13	8.89
B	0.240	0.260	6.10	6.60
C	0.115	0.200	2.93	5.08
D	0.016	0.020	0.41	0.50
E	0.040	0.070	1.02	1.77
F	0.010	0.014	0.25	0.36
G	0.100 BSC		2.54 BSC	
J	0.008	0.012	0.21	0.30
K	0.100	0.150	2.54	3.81
L	0.300 BSC		7.62 BSC	
M	0 °	15 °	0 °	15 °
N	0.015	0.100	0.38	2.54

STYLE 3:
PIN 1. ANODE
2. CATHODE
3. NC
4. EMITTER
5. COLLECTOR
6. NC

CASE 730A–04
ISSUE G



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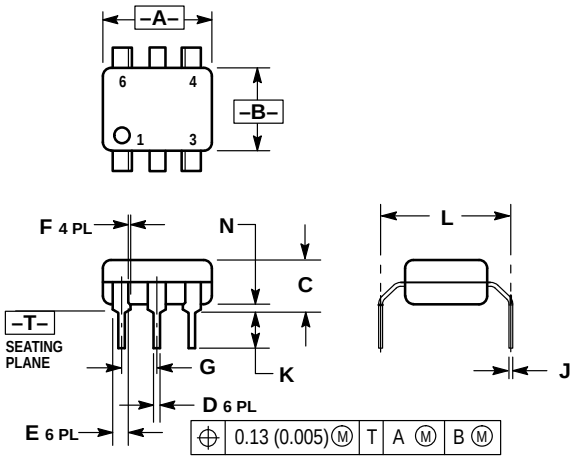
C	0.115	0.200	2.93	5.08
D	0.016	0.020	0.41	0.50
E	0.040	0.070	1.02	1.77
F	0.010	0.014	0.25	0.36
G	0.100 BSC		2.54 BSC	
H	0.020	0.025	0.51	0.63
J	0.008	0.012	0.20	0.30
K	0.006	0.035	0.16	0.88
L	0.320 BSC		8.13 BSC	
S	0.332	0.390	8.43	9.90

***Consult factory for leadform option availability**

CASE 730C–04
ISSUE D



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	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
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B	0.240	0.260	6.10	6.60
C	0.115	0.200	2.93	5.08
D	0.016	0.020	0.41	0.50
E	0.040	0.070	1.02	1.77
F	0.010	0.014	0.25	0.36
G	0.100 BSC		2.54 BSC	
J	0.008	0.012	0.21	0.30
K	0.100	0.150	2.54	3.81
L	0.400	0.425	10.16	10.80
N	0.015	0.040	0.38	1.02

***Consult factory for leadform option availability**

CASE 730D–05
ISSUE D

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