GlobalOptoisolator™

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

6-Pin DIP Optoisolators for Power Supply Applications (No Base Connection)

MOC8101
[CTR = 50–80%]

MOC8102
[CTR = 73–117%]

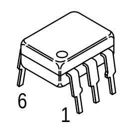
MOC8103
[CTR = 108–173%]

MOC8104
[CTR = 160–256%]

MOC8105*
[CTR = 65–133%]

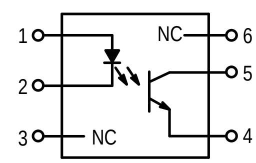
***Motorola Preferred Device**

STYLE 3 PLASTIC



STANDARD THRU HOLE
CASE 730A–04

SCHEMATIC



PIN 1. ANODE
2. CATHODE
3. NO CONNECTION
4. EMITTER
5. COLLECTOR
6. NO CONNECTION

The MOC8101, MOC8102, MOC8103, MOC8104 and MOC8105 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 "V" must be included at end of part number. 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

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

Rating	Symbol	Value	Unit
INPUT LED			
Forward Current — Continuous	I_F	60	mA
Forward Current — Peak (PW = 100 µs, 120 pps)	I_F(pk)	1	A
Reverse Voltage	V_R	6	Volts
LED Power Dissipation @ T_A = 25°C Derate above 25°C	P_D	120 1.41	mW mW/°C
OUTPUT TRANSISTOR			
Collector–Emitter Voltage	V_{CEO}	30	Volts
Emitter–Collector Voltage	V_{ECO}	7	Volts
Collector Current — Continuous	I_C	150	mA
Detector Power Dissipation @ T_A = 25°C Derate above 25°C	P_D	150 1.76	mW mW/°C
TOTAL DEVICE			
Input–Output Isolation Voltage(1) (f = 60 Hz, t = 1 sec.)	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
Lead Soldering Temperature (1/16″ from case, 10 sec. duration)	T_L	260	°C

1. Input–Output Isolation Voltage, V_{ISO}, 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.

Preferred devices are Motorola recommended choices for future use and best overall value.

REV 1

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

Characteristic	Symbol	Min	Typ(1)	Max	Unit
INPUT LED					
Forward Voltage (I_F = 10 mA)	V_F	1.0	1.15	1.5	V
Reverse Leakage Current (V_R = 5.0 V)	I_R	—	0.05	10	µA
Capacitance	C	—	18	—	pF
OUTPUT TRANSISTOR					
Collector–Emitter Dark Current (V_{CE} = 10 V, T_A = 25°C)	I_{CEO1}	—	1.0	50	nA
(V_{CE} = 10 V, T_A = 100°C)	I_{CEO2}	—	1.0	—	µA
Collector–Emitter Breakdown Voltage (I_C = 1.0 mA)	$V_{(BR)CEO}$	30	45	—	V
Emitter–Collector Breakdown Voltage (I_E = 100 µA)	$V_{(BR)ECO}$	7.0	7.8	—	V
Collector–Emitter Capacitance (f = 1.0 MHz, V_{CE} = 0)	C_{CE}	—	7.0	—	pF
COUPLED					
Output Collector Current (I_F = 10 mA, V_{CE} = 10 V) MOC8101	I_C (CTR)(2)	5.0 (50)	6.5 (65)	8.0 (80)	mA (%)
MOC8102		7.3 (73)	9.0 (90)	11.7 (117)	
MOC8103		10.8 (108)	14 (140)	17.3 (173)	
MOC8104		16 (160)	20 (200)	25.6 (256)	
MOC8105		6.5 (65)	10 (100)	13.3 (133)	
Collector–Emitter Saturation Voltage (I_C = 500 µA, I_F = 5.0 mA)	$V_{CE(sat)}$	—	0.15	0.4	V
Turn–On Time (I_C = 2.0 mA, V_{CC} = 10 V, R_L = 100 Ω)(3)	t_{on}	—	7.5	20	µs
Turn–Off Time (I_C = 2.0 mA, V_{CC} = 10 V, R_L = 100 Ω)(3)	t_{off}	—	5.7	20	µs
Rise Time (I_C = 2.0 mA, V_{CC} = 10 V, R_L = 100 Ω)(3)	t_r	—	3.2	—	µs
Fall Time (I_C = 2.0 mA, V_{CC} = 10 V, R_L = 100 Ω)(3)	t_f	—	4.7	—	µs
Isolation Voltage (f = 60 Hz, t = 1.0 sec.)(4)	V_{ISO}	7500	—	—	Vac(pk)
Isolation Resistance ($V_{I–O}$ = 500 V)(4)	R_{ISO}	10^{11}	—	—	Ω
Isolation Capacitance ($V_{I–O}$ = 0, f = 1.0 MHz)(4)	C_{ISO}	—	0.2	—	pF

1. Always design to the specified minimum/maximum electrical limits (where applicable).
2. Current Transfer Ratio (CTR) = I_C/I_F x 100%.
3. For test circuit setup and waveforms, refer to Figure 7.
4. For this test, Pins 1 and 2 are common, and Pins 4 and 5 are common.

TYPICAL CHARACTERISTICS

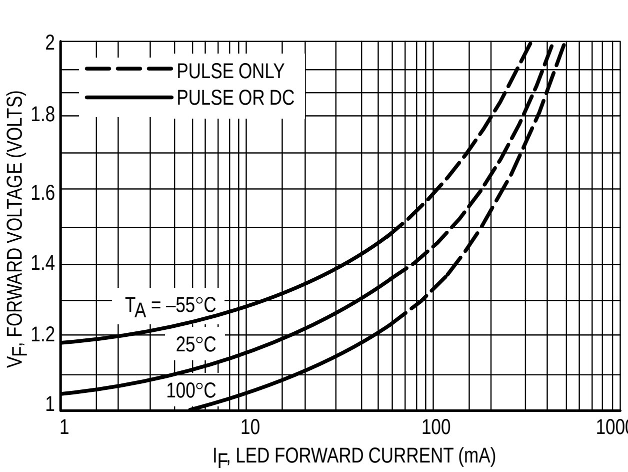


Figure 1. LED Forward Voltage versus Forward Current

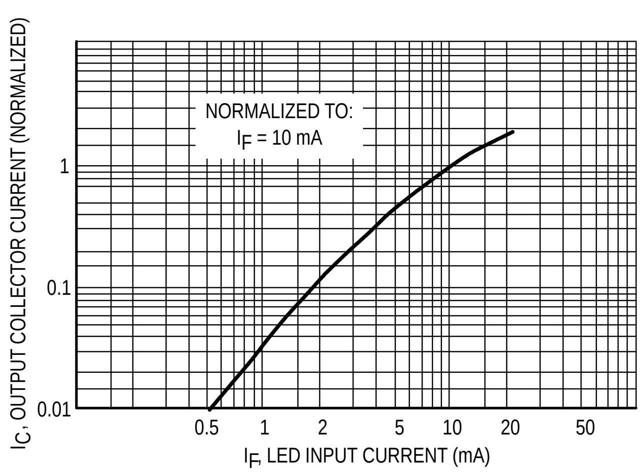


Figure 2. Output Current versus Input Current

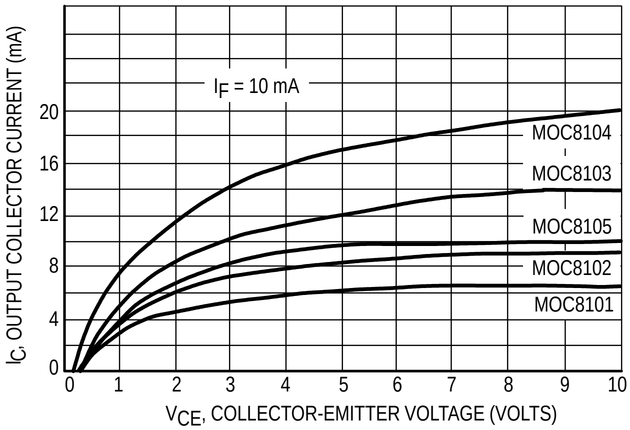


Figure 3. Collector Current versus Collector–Emitter Voltage

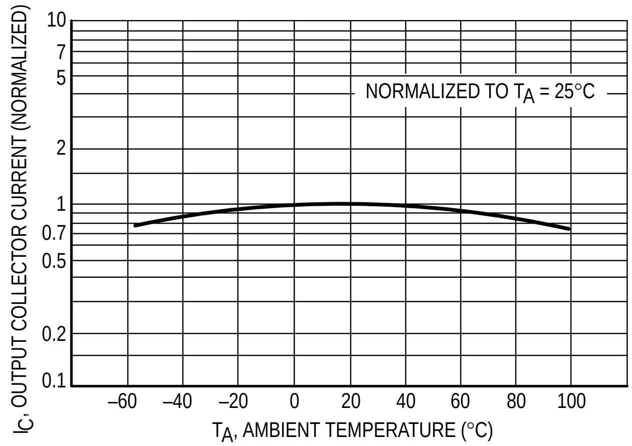


Figure 4. Output Current versus Ambient Temperature

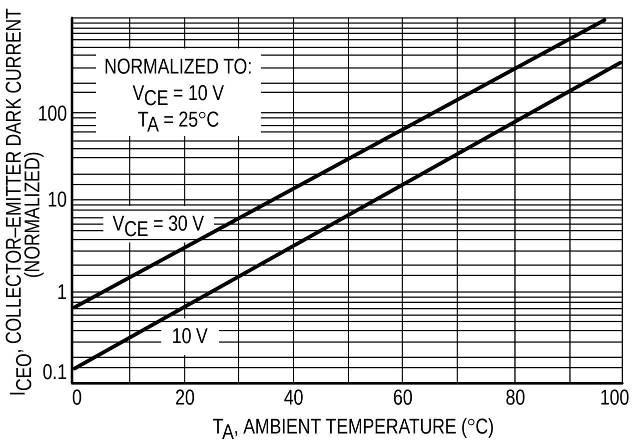


Figure 5. Dark Current versus Ambient Temperature

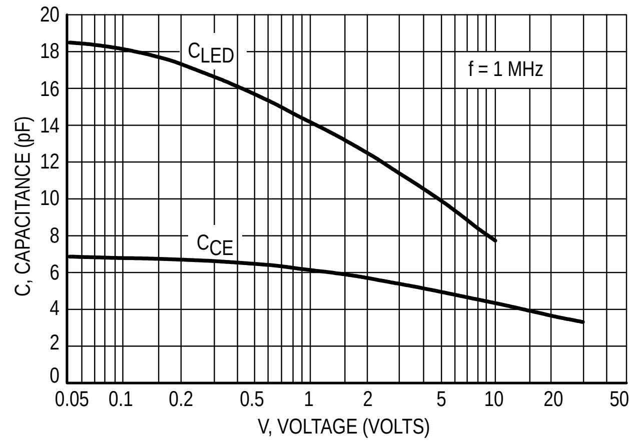


Figure 6. Capacitance versus Voltage

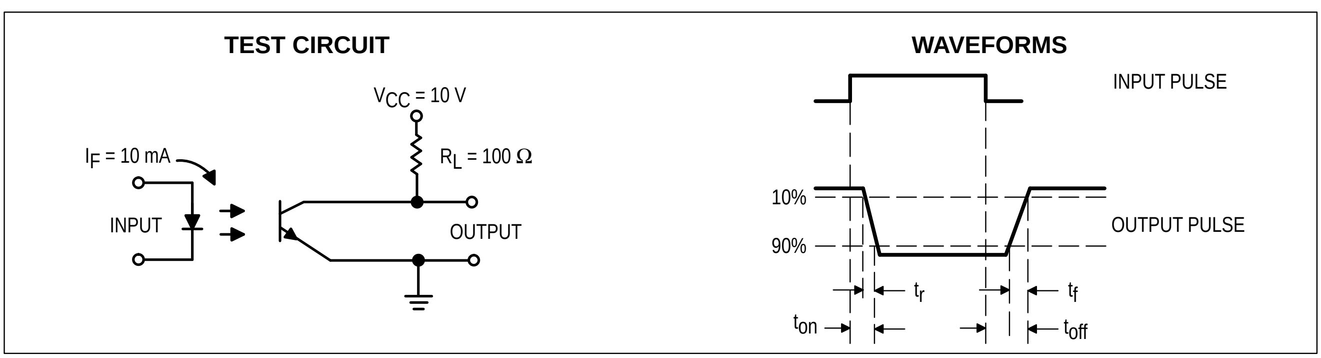
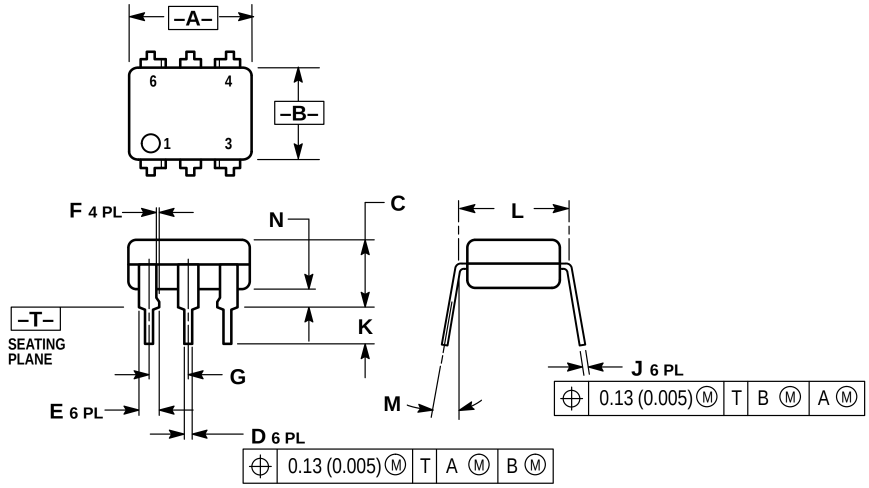


Figure 7. Switching Time Test Circuit and Waveforms

PACKAGE DIMENSIONS

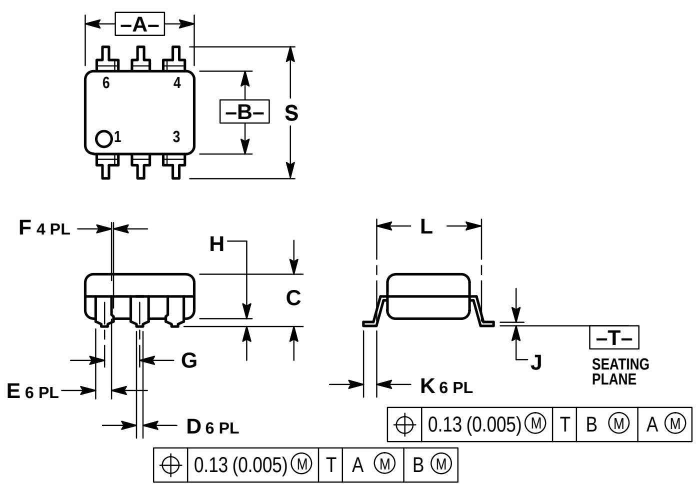


NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. DIMENSION L TO CENTER OF LEAD WHEN FORMED PARALLEL.

	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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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

CASE 730C–04
ISSUE D

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