

6-Pin DIP Optoisolator Darlington Output

The MOC8080 device consists of a gallium arsenide infrared emitting diode optically coupled to a monolithic silicon photodarlington detector. They are designed for use in applications requiring high gain at specified input currents.

- High Output Collector Current (I_C)
- Low, Stable Leakage Current at Elevated Temperature
- **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

- Appliances, Measuring Instruments
- General Purpose Switching Circuits
- Programmable Controllers
- Portable Electronics
- Interfacing and coupling systems of different potentials and impedances
- Solid State Relays

MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Rating	Symbol	Value	Unit
INPUT LED			
Reverse Voltage	V_R	6	Volts
Forward Current — Continuous	I_F	60	mA
LED Power Dissipation @ $T_A = 25^\circ\text{C}$ with Negligible Power in Output Detector Derate above 25°C	P_D	120	mW
		1.41	mW/ $^\circ\text{C}$

OUTPUT DETECTOR

Collector–Emitter Voltage	V_{CEO}	55	Volts
Emitter–Collector Voltage	V_{ECO}	5	Volts
Collector–Base Voltage	V_{CBO}	55	Volts
Collector Current — Continuous	I_C	150	mA
Detector Power Dissipation @ $T_A = 25^\circ\text{C}$ with Negligible Power in Input LED Derate above 25°C	P_D	150	mW
		1.76	mW/ $^\circ\text{C}$

TOTAL DEVICE

Isolation Surge Voltage ⁽¹⁾ (Peak ac Voltage, 60 Hz, 1 sec Duration)	V_{ISO}	7500	Vac(pk)
Total Device Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	250 2.94	mW mW/ $^\circ\text{C}$
Ambient Operating Temperature Range ⁽²⁾	T_A	-55 to +100	$^\circ\text{C}$
Storage Temperature Range ⁽²⁾	T_{stg}	-55 to +150	$^\circ\text{C}$
Soldering Temperature (10 sec, 1/16" from case)	T_L	260	$^\circ\text{C}$

1. Isolation surge voltage is an internal device dielectric breakdown rating. For this test, Pins 1 and 2 are common, and Pins 4, 5 and 6 are common.
2. Refer to Quality and Reliability Section in Opto Data Book for information on test conditions.

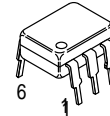
Preferred devices are Motorola recommended choices for future use and best overall value. GlobalOptoisolator is a trademark of Motorola, Inc.

MOC8080

[CTR = 500% Min]

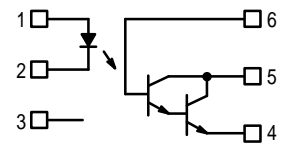
Motorola Preferred Device

STYLE 1 PLASTIC



STANDARD THRU HOLE
CASE 730A-04

SCHEMATIC



- PIN 1. LED ANODE
- LED CATHODE
- N.C.
- EMITTER
- COLLECTOR
- BASE

MOC8080

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)⁽¹⁾

Characteristic	Symbol	Min	Typ ⁽¹⁾	Max	Unit	
INPUT LED						
Forward Voltage ($I_F = 10\text{ mA}$)	V_F	$T_A = 25^\circ\text{C}$	0.8	1.15	1.5	V
		$T_A = -55^\circ\text{C}$	0.9	1.3	1.7	
		$T_A = 100^\circ\text{C}$	0.7	1.05	1.4	
Reverse Leakage Current ($V_R = 3\text{ V}$)	I_R	—	—	100	μA	
Capacitance ($V = 0\text{ V}$, $f = 1\text{ MHz}$)	C	—	18	—	pF	

OUTPUT DETECTOR

Collector–Emitter Dark Current ($V_{CE} = 10\text{ V}$)	$T_A = 25^\circ\text{C}$ $T_A = 100^\circ\text{C}$	I_{CEO}	—	5	100	nA
			—	5	100	μA
Collector–Base Dark Current ($V_{CB} = 10\text{ V}$)	$T_A = 25^\circ\text{C}$ $T_A = 100^\circ\text{C}$	I_{CBO}	—	1	20	nA
			—	100	—	
Collector–Emitter Breakdown Voltage ($I_C = 1\text{ mA}$)		$V_{(BR)CEO}$	55	80	—	V
Collector–Base Breakdown Voltage ($I_C = 100\text{ }\mu\text{A}$)		$V_{(BR)CBO}$	55	100	—	V
Emitter–Collector Breakdown Voltage ($I_E = 100\text{ }\mu\text{A}$)		$V_{(BR)ECO}$	5	7	—	V
DC Current Gain ($I_C = 5\text{ mA}$, $V_{CE} = 5\text{ V}$) (Typical)		h_{FE}	—	16 k	—	—
Collector–Emitter Capacitance ($f = 1\text{ MHz}$, $V_{CE} = 5\text{ V}$)		C_{CE}	—	3.9	—	pF
Collector–Base Capacitance ($f = 1\text{ MHz}$, $V_{CB} = 5\text{ V}$)		C_{CB}	—	6.3	—	pF
Emitter–Base Capacitance ($f = 1\text{ MHz}$, $V_{EB} = 5\text{ V}$)		C_{EB}	—	3.8	—	pF

COUPLED

Output Collector Current ($I_F = 10\text{ mA}$, $V_{CE} = 5\text{ V}$)	I_C (CTR) ⁽²⁾	50 (500)	117 (1117)	—	mA (%)	
Collector–Emitter Saturation Voltage ($I_C = 1\text{ mA}$, $I_F = 1\text{ mA}$)	$V_{CE(sat)}$	—	0.6	1	V	
Turn-On Time	$V_{CC} = 10\text{ V}$, $R_L = 100\text{ }\Omega$, $I_F = 5\text{ mA}$ ⁽³⁾	t_{on}	—	3.5	—	μs
Turn-Off Time		t_{off}	—	95	—	
Rise Time		t_r	—	1	—	
Fall Time		t_f	—	2	—	
Isolation Voltage ($f = 60\text{ Hz}$, $t = 1\text{ sec}$) ⁽⁴⁾	V_{ISO}	7500	—	—	Vac(pk)	
Isolation Resistance ($V = 500\text{ V}$) ⁽⁴⁾	R_{ISO}	10^{11}	—	—	Ω	
Isolation Capacitance ($V = 0\text{ V}$, $f = 1\text{ MHz}$) ⁽⁴⁾	C_{ISO}	—	0.2	2	pF	

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, 5 and 6 are common.

TYPICAL CHARACTERISTICS

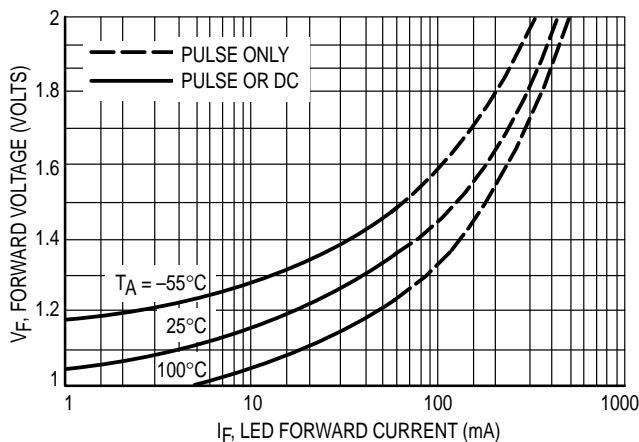


Figure 1. LED Forward Voltage versus Forward Current

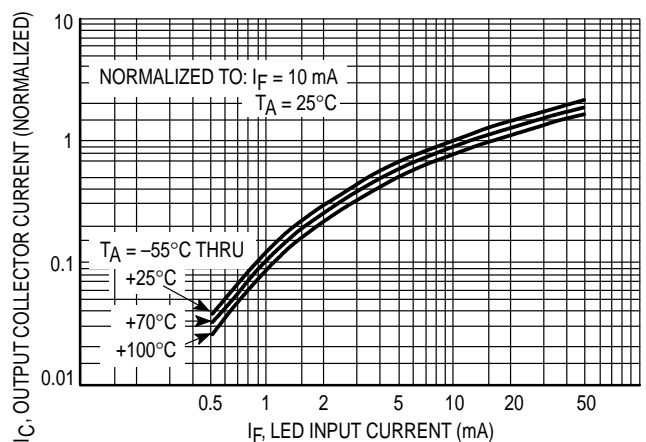


Figure 2. Output Current versus Input Current

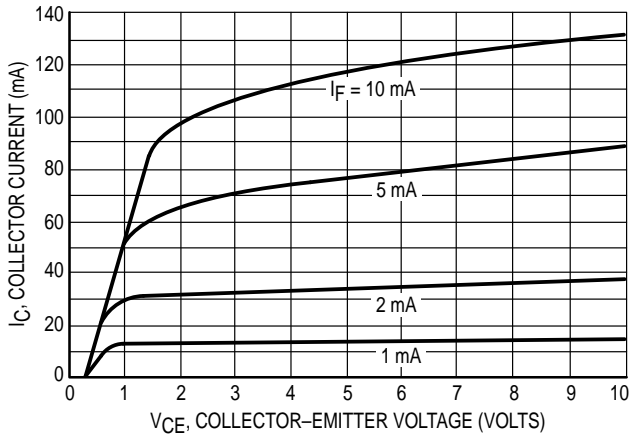


Figure 3. Collector Current versus Collector-Emitter Voltage

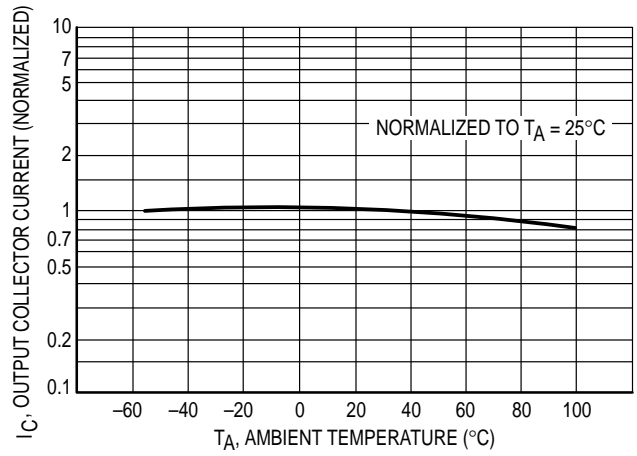


Figure 4. Output Current versus Ambient Temperature

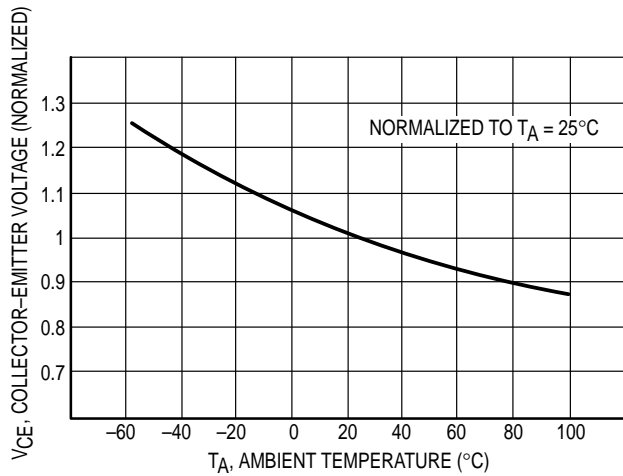


Figure 5. Collector-Emitter Voltage versus Ambient Temperature

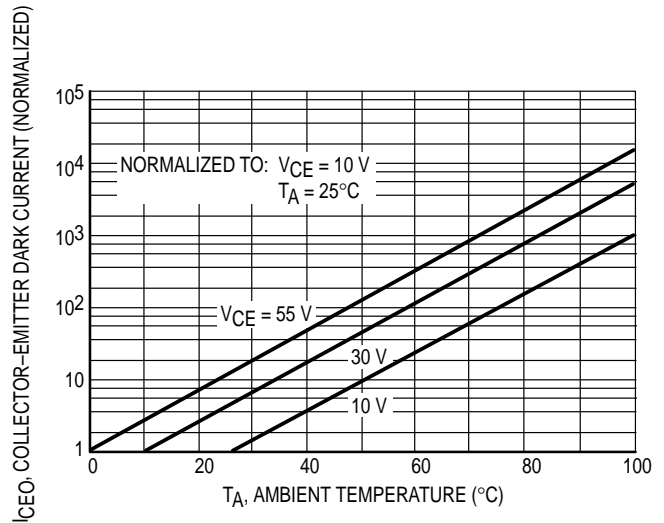


Figure 6. Collector-Emitter Dark Current versus Ambient Temperature

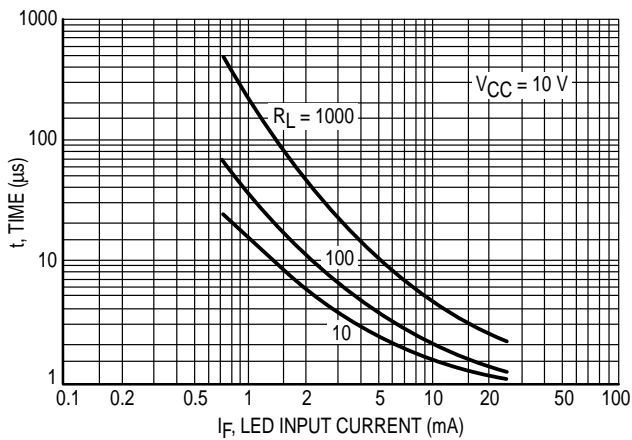


Figure 7. Turn-On Switching Times (Typical Values)

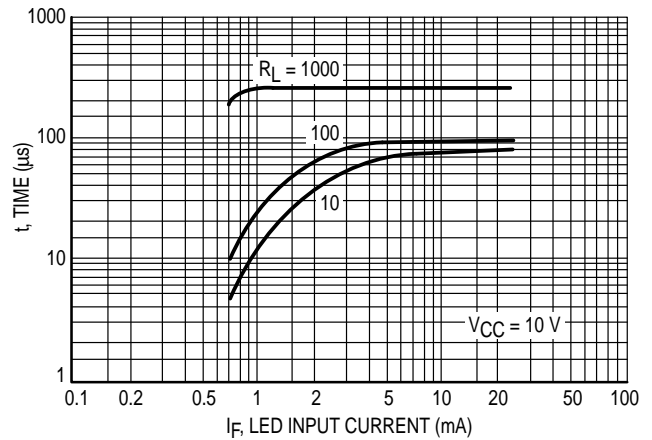


Figure 8. Turn-Off Switching Times (Typical Values)

MOC8080

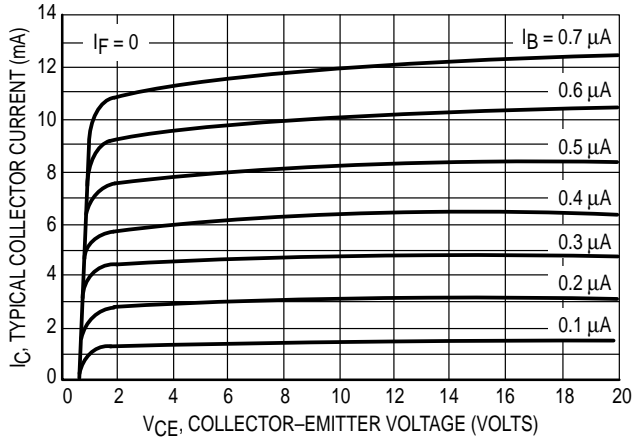


Figure 9. DC Current Gain (Detector Only)

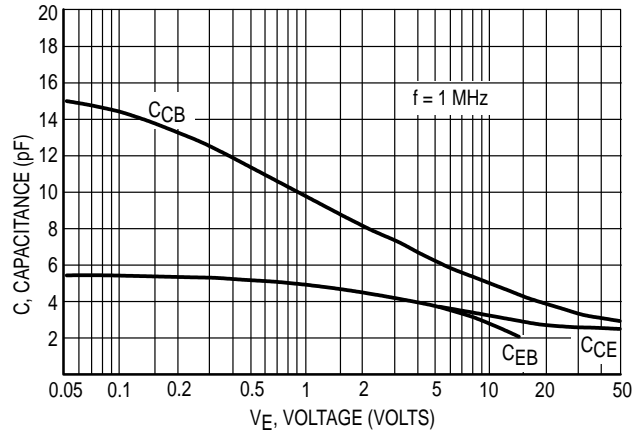


Figure 10. Detector Capacitances versus Voltage

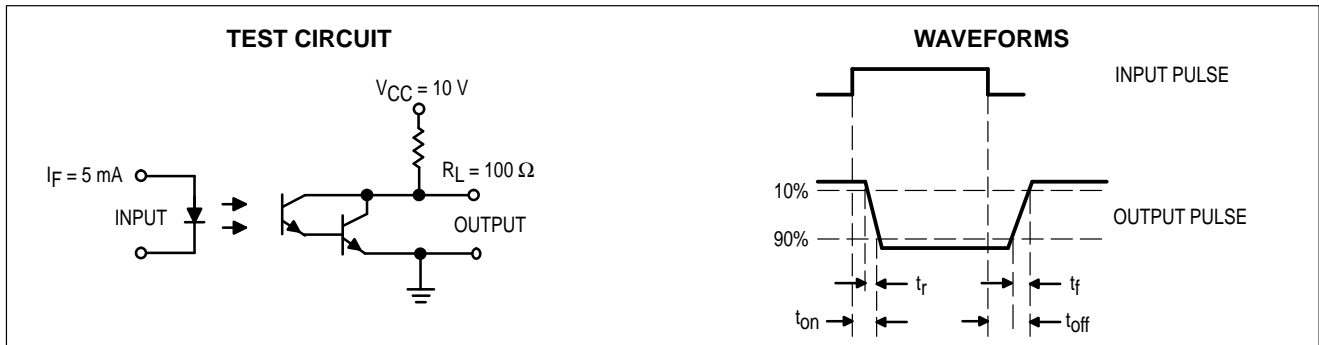
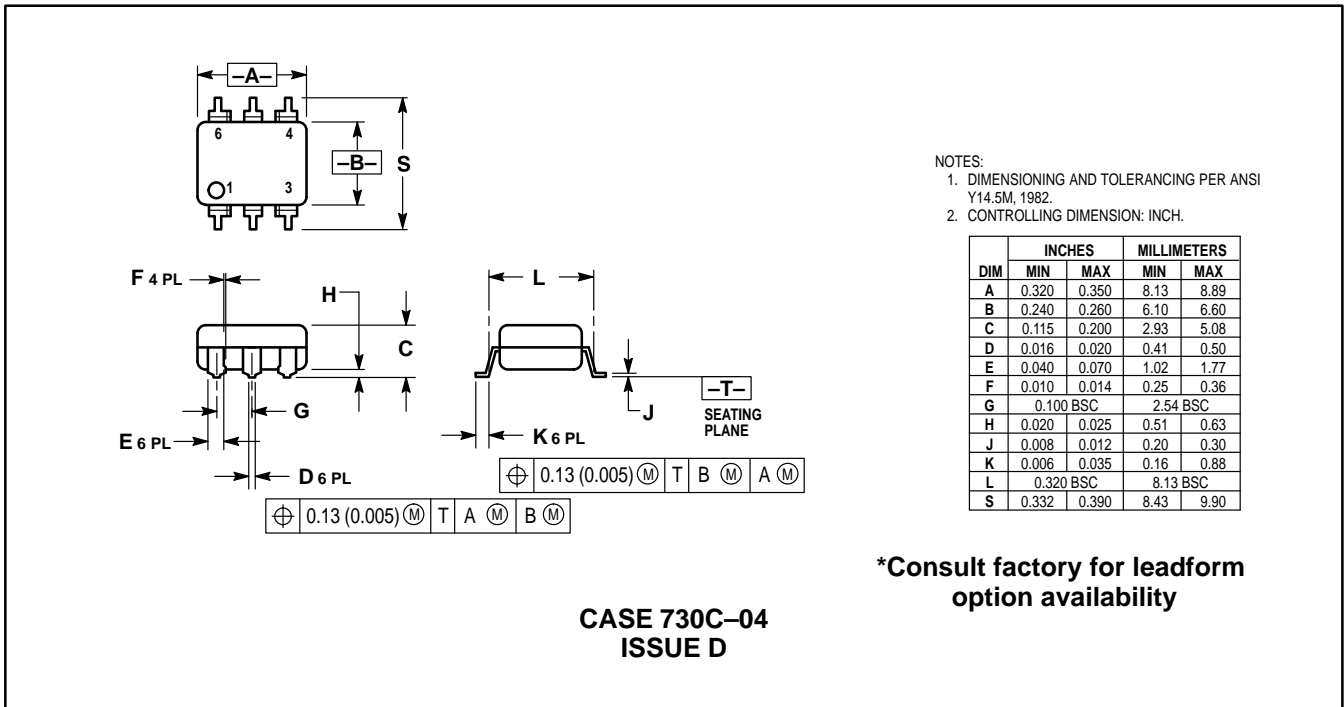
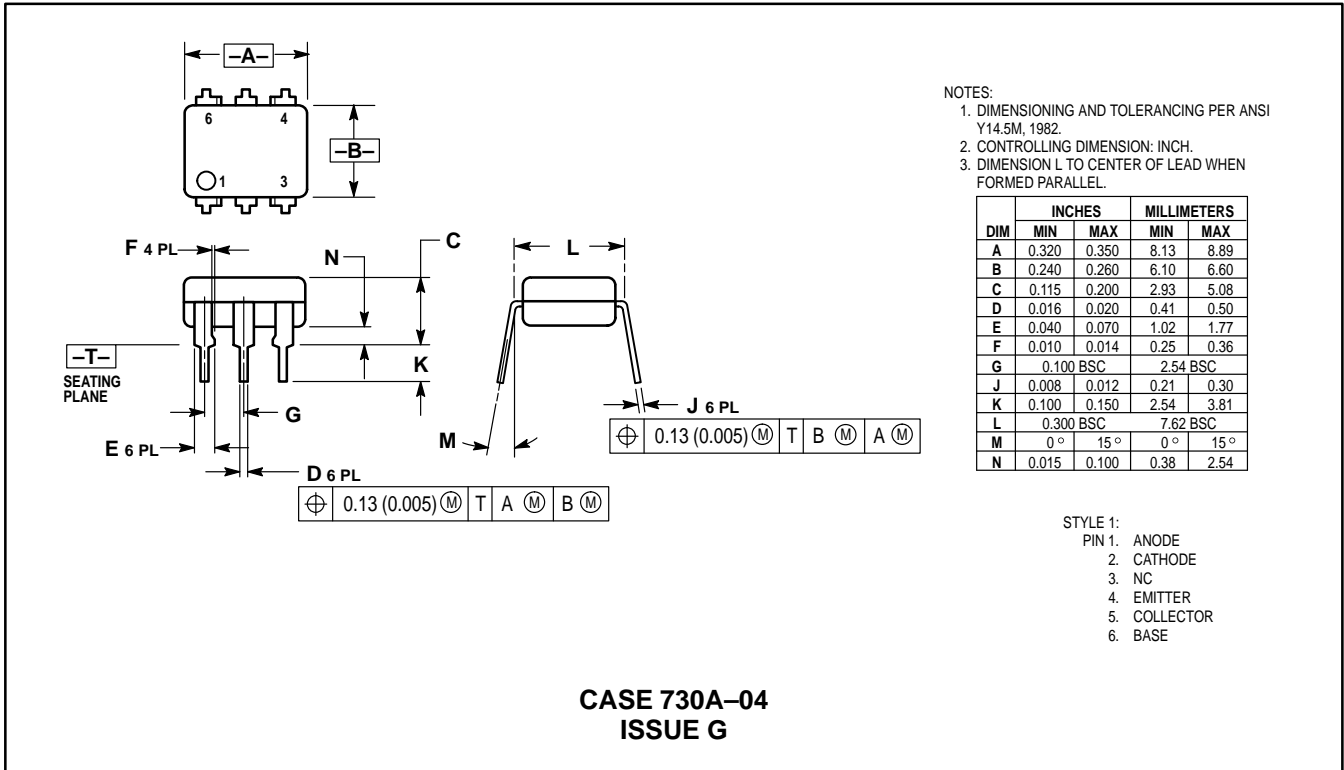
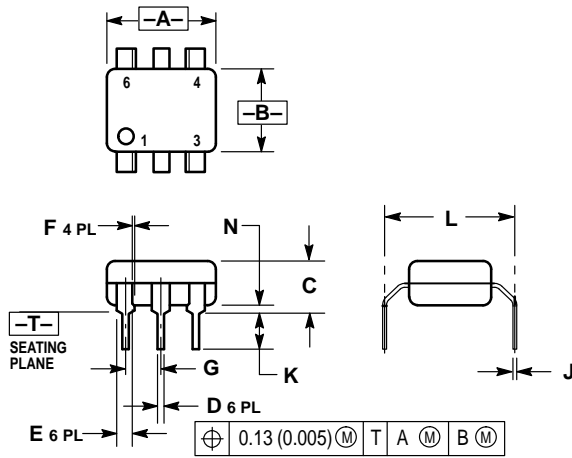


Figure 11. Switching Time Test Circuit and Waveforms

PACKAGE DIMENSIONS



MOC8080



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

DIM	INCHES		MILLIMETERS	
	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	0.400	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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