GlobalOptoisolator™

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

# MOC8020
[CTR = 500% Min]
# MOC8021
[CTR = 1000% Min]

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

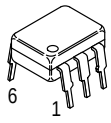
The MOC8020 and MOC8021 devices consist of a gallium arsenide infrared emitting diode optically coupled to a monolithic silicon photodarlington detector. The chip to Pin 6 base connection has been eliminated to improve the device's output performance in higher noise environments.

- No Base Connection for Improved Noise Immunity
- Higher Sensitivity to Low Input Drive Current
- ***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

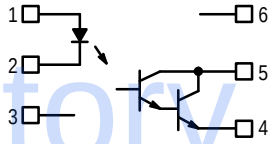
- Appliances, Measuring Instruments
- I/O Interfaces for Computers
- Programmable Controllers
- Portable Electronics
- Interfacing and coupling systems of different potentials and impedances
- Solid State Relays
- Circuits Exposed to High Noise Environments

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}	50	Volts
Collector Current Continuous	IC	150	mA
Emitter–Collector Voltage	V_{ECO}	5	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	10	μA
Forward Voltage (I_F = 10 mA)		V_F	—	1.15	2	Volts
Capacitance (V = 0 V, f = 1 MHz)		C	—	18	—	pF
PHOTODARLINGTON (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 Base Breakdown Voltage (I_C = 1 mA)		$V_{(BR)CEO}$	50	—	—	Volts
Emitter–Collector Breakdown Voltage (I_E = 100 μA)		$V_{(BR)ECO}$	5	—	—	Volts
COUPLED (T_A = 25°C unless otherwise noted)						
Collector Output Current (V_{CE} = 5 V, I_F = 10 mA)	MOC8020 MOC8021	I_C (CTR)[2]	50 (500) 100 (1000)	— —	— —	mA (%)
Isolation Surge Voltage[3,4], 60 Hz Peak ac, 1 Second		V_{ISO}	7500	—	—	Vac(pk)
Isolation Resistance[3] (V = 500 V)		R_{ISO}	—	10^{11}	—	Ohms
Isolation Capacitance[3] (V = 0, f = 1 MHz)		C_{ISO}	—	0.2	—	pF
SWITCHING						
Turn–On Time	V_{CC} = 10 V, R_L = 100 Ω, I_F = 5 mA[5]	t_{on}	—	3.5	—	μs
Turn–Off Time		t_{off}	—	95	—	
Rise Time		t_r	—	1	—	
Fall Time		t_f	—	2	—	

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 this test, LED Pins 1 and 2 are common and Phototransistor Pins 4 and 5 are common.
4. Isolation Surge Voltage, V_{ISO}, is an internal device dielectric breakdown rating.
5. For test circuit setup and waveforms, refer to Figure 9.

TYPICAL CHARACTERISTICS

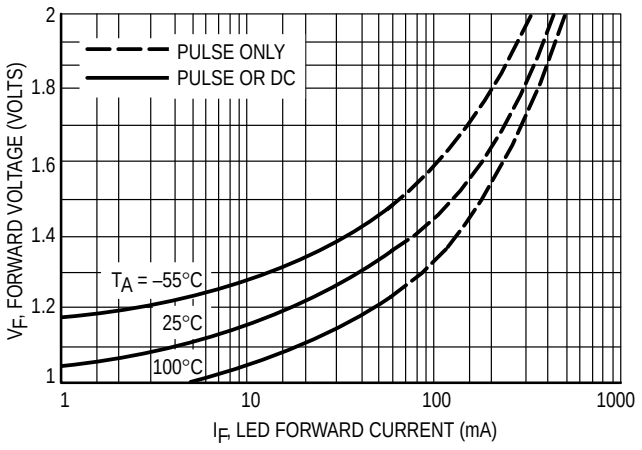


Figure 1. LED Forward Voltage versus Forward Current

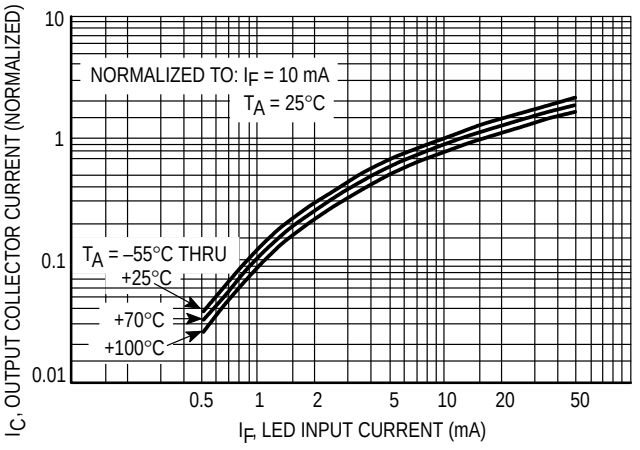


Figure 2. Output Current versus Input Current

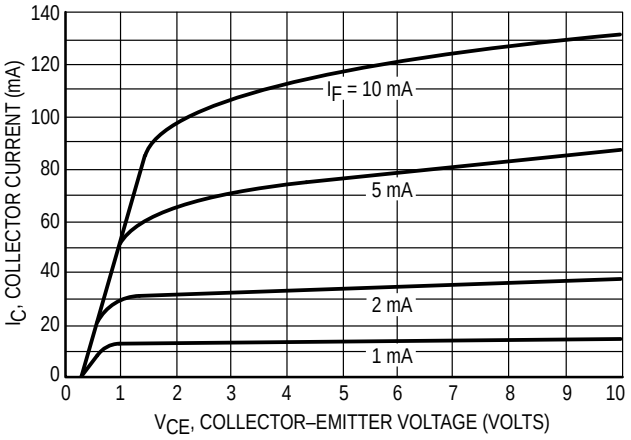


Figure 3. Collector Current versus Collector–Emitter Voltage

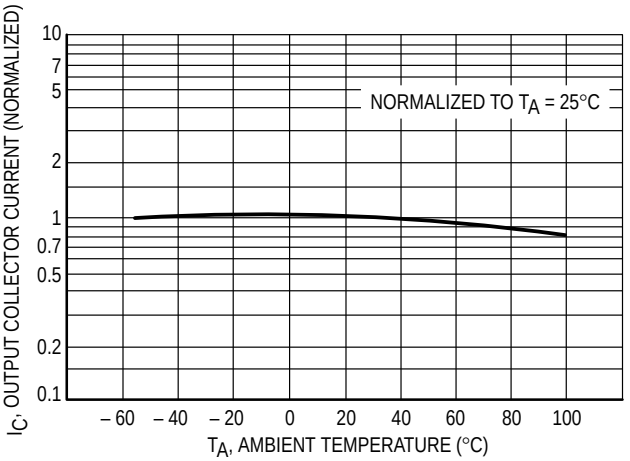


Figure 4. Output Current versus Ambient Temperature

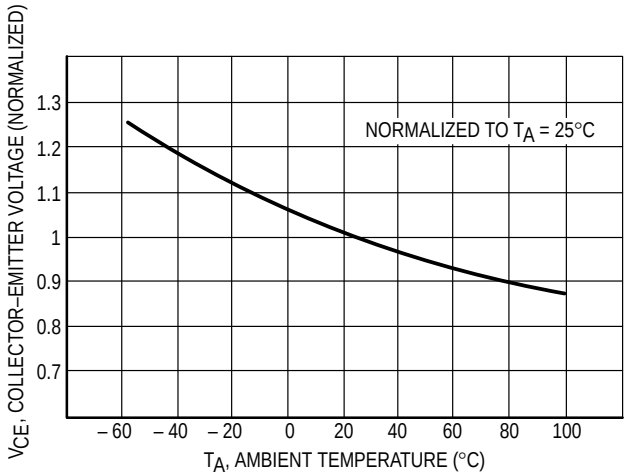


Figure 5. Collector–Emitter Voltage versus Ambient Temperature

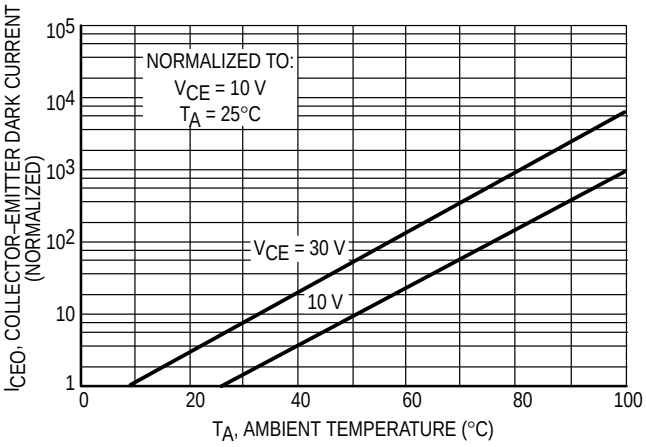


Figure 6. Collector–Emitter Dark Current versus Ambient Temperature

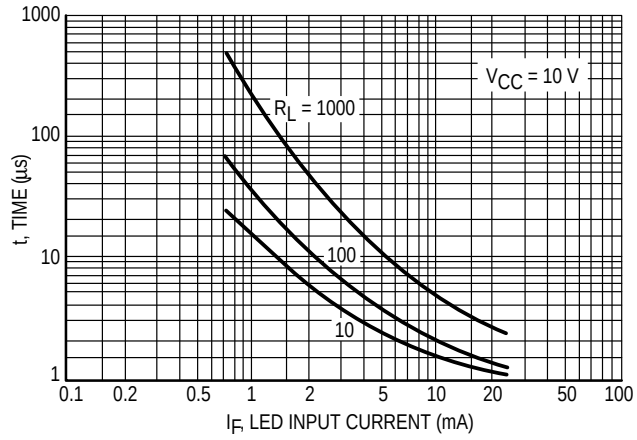


Figure 7. Turn–On Switching Times (Typical Value)

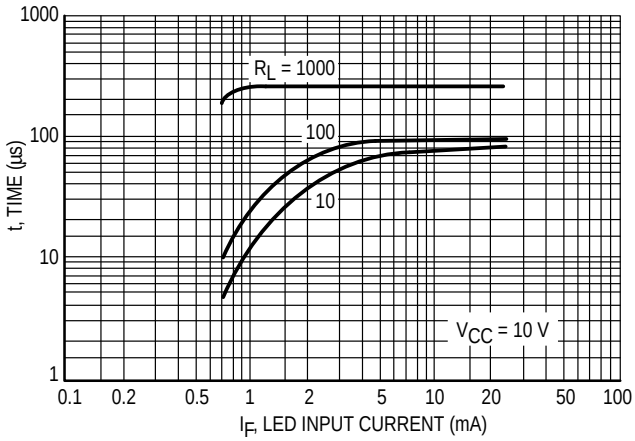


Figure 8. Turn–Off Switching Times (Typical Value)

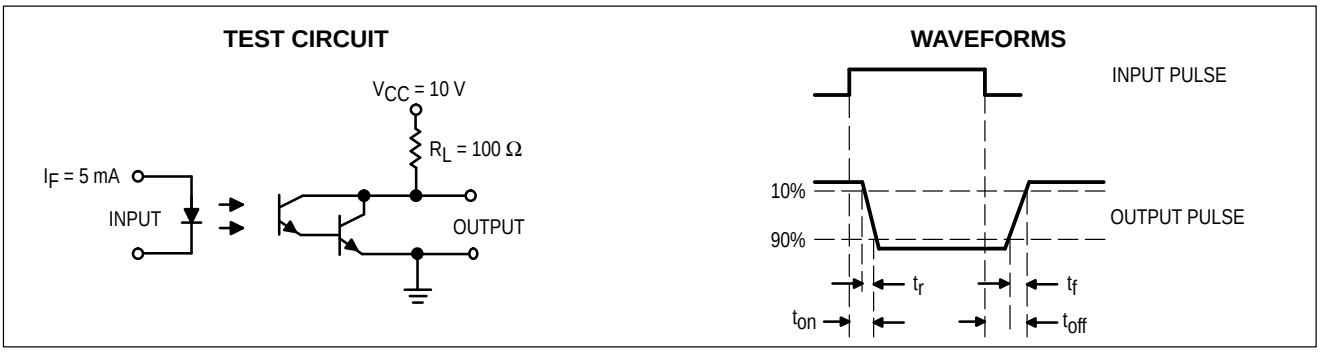
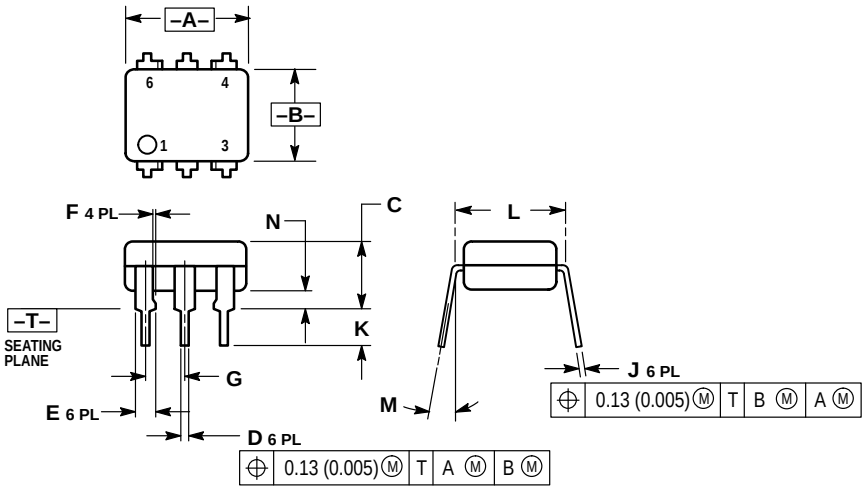


Figure 9. Switching Time Test Circuit and Waveforms

PACKAGE DIMENSIONS

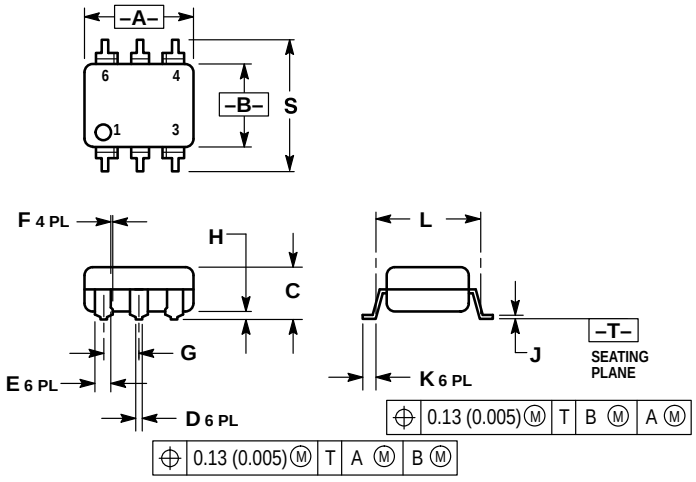


NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. DIMENSION L TO CENTER OF LEAD WHEN FORMED PARALLEL.

	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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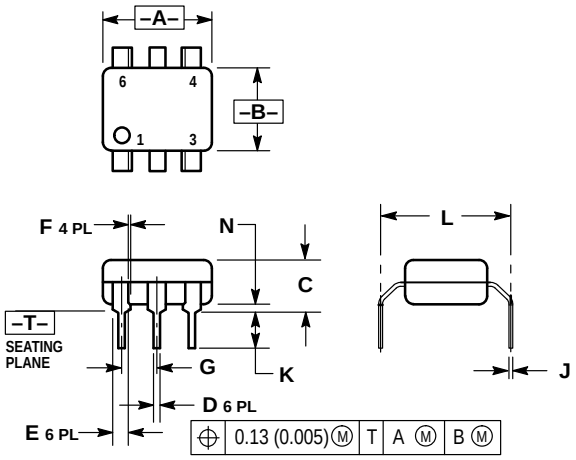
	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	0.320	0.350	8.13	8.89
B	0.240	0.260	6.10	6.60
C	0.115	0.200	2.93	5.08
D	0.016	0.020	0.41	0.50
E	0.040	0.070	1.02	1.77
F	0.010	0.014	0.25	0.36
G	0.100 BSC		2.54 BSC	
H	0.020	0.025	0.51	0.63
J	0.008	0.012	0.20	0.30
K	0.006	0.035	0.16	0.88
L	0.320 BSC		8.13 BSC	
S	0.332	0.390	8.43	9.90

***Consult factory for leadform option availability**

CASE 730C–04
ISSUE D



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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	0.400	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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