

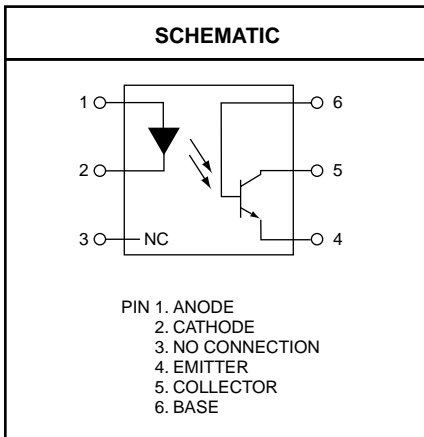
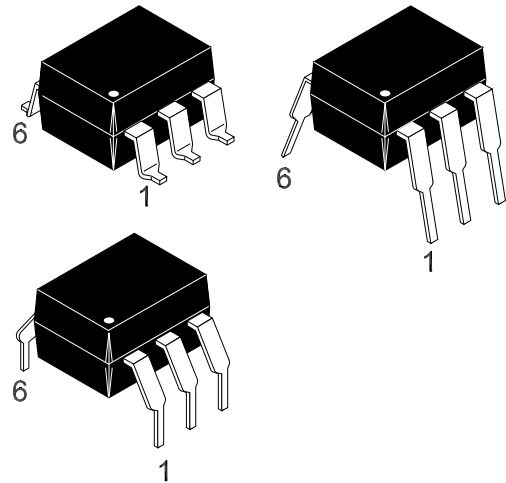
**MOC8204**

**DESCRIPTION**

The MOC8204 device consists of a gallium arsenide infrared emitting diode optically coupled to a high voltage, silicon, phototransistor detector in a standard 6-pin DIP package. It is designed for high voltage applications and is particularly useful in copy machines and solid state relays.

**APPLICATIONS**

- Copy Machines
- Interfacing and coupling systems of different potentials and impedances
- Monitor and Detection Circuits
- Solid State Relays



Parameter	Symbol	Value	Units
<b>TOTAL DEVICE</b>			
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
Input-Output Isolation Voltage Peak ac Voltage, 60 Hz, 1 Second Duration <sup>(1)</sup>	$V_{ISO}$	7500	Vac(pk)
Total Device Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	$P_D$	250 2.94	mW
<b>EMITTER</b>			
DC/Average Forward Input Current	$I_F$	60	mA
Forward Current - Peak (Pulse Width = 1µs, 330 pps)	$I_F(pk)$	1.2	A
LED Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	$P_D$	120 1.41	mW mW/°C
<b>DETECTOR</b>			
Collector-Emitter Voltage	$V_{CEO}$	400	V
Collector-Base Voltage	$V_{CBO}$	400	V
Emitter-Collector Voltage	$V_{ECO}$	7	V
Detector Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	$P_D$	150 1.76	mW mW/°C

**MOC8204**
**ELECTRICAL CHARACTERISTICS** ( $T_A = 25^\circ\text{C}$  Unless otherwise specified.)

**INDIVIDUAL COMPONENT CHARACTERISTICS**

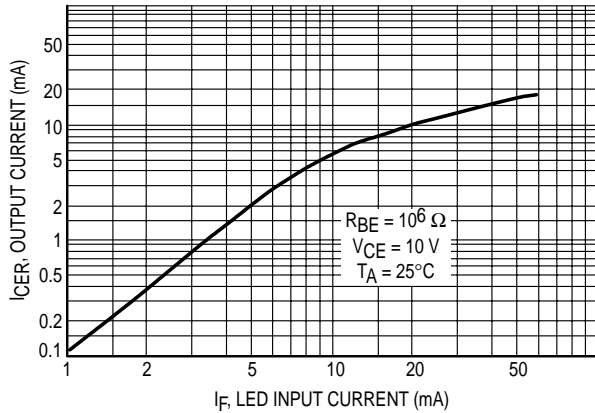
Parameter	Test Conditions	Symbol	Min	Typ <sup>(1)</sup>	Max	Unit
<b>EMITTER</b>						
Input Forward Voltage	( $I_F = 10\text{ mA}$ )	$V_F$	—	1.2	15	V
Reverse Leakage Current	( $V_R = 6.0\text{ V}$ )	$I_R$	—	—	10	$\mu\text{A}$
Capacitance	( $V = 0, f = 1\text{ MHz}$ )	$C_J$	—	18	—	pF
<b>DETECTOR</b>						
Collector-Emitter Breakdown Voltage ( $I_C = 1.0\text{ mA}, R_{BE} = 1\text{ M}\Omega$ )		$BV_{CEO}$	400	—	—	V
Collector-Base Breakdown Voltage ( $I_C = 100\text{ }\mu\text{A}$ )		$BV_{CBO}$	400	—	—	V
Emitter-Base Breakdown Voltage ( $I_E = 100\text{ }\mu\text{A}$ )		$BV_{EBO}$	7	—	—	V
Collector-Emitter Dark Current		$I_{CEO}$	—	—	100	nA
$T_A = 25^\circ\text{C}$	( $R_{BE} = 1\text{ M}\Omega, V_{CE} = 300\text{ V}$ )				250	$\mu\text{A}$
$T_A = 100^\circ\text{C}$						

**ISOLATION CHARACTERISTICS**

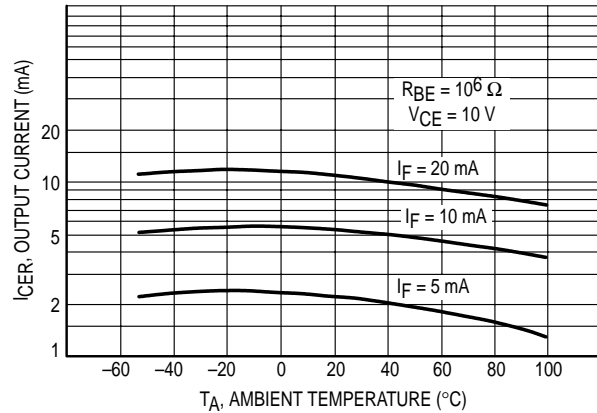
Characteristic	Test Conditions	Symbol	Min	Typ <sup>(1)</sup>	Max	Units
Output Collector Current	( $V_{CE} = 10\text{ V}, I_F = 10\text{ mA}, R_{BE} = 1\text{ M}\Omega$ )	$I_C$ (CTR) <sup>(2)</sup>	2 (20)	—	—	mA(%)
Collector-Emitter Saturation Voltage ( $I_C = 0.5\text{ mA}, I_F = 10\text{ mA}, R_{BE} = 1\text{ M}\Omega$ )		$V_{SAT}$	—	—	0.4	V
Input-Output Isolation Voltage <sup>(3)</sup>	(I <sub>I-O</sub> ≤ 1 $\mu\text{A}$ , Time = 1min)	$V_{ISO}$	5300	—	—	$V_{AC(RMS)}$
			7300	—	—	$V_{AC(PEAK)}$
Isolation Resistance <sup>(3)</sup>		$R_{ISO}$	—	$10^{11}$	—	$\Omega$
Isolation Capacitance <sup>(1)</sup>		$C_{ISO}$	—	0.2	—	pf
Turn-On Time	(V <sub>CC</sub> = 10 V, I <sub>C</sub> = 2 mA, R <sub>L</sub> = 100 $\Omega$ )	$t_{ON}$	—	5	—	$\mu\text{s}$
Turn-Off Time		$t_{OFF}$	—	5	—	

**Notes**

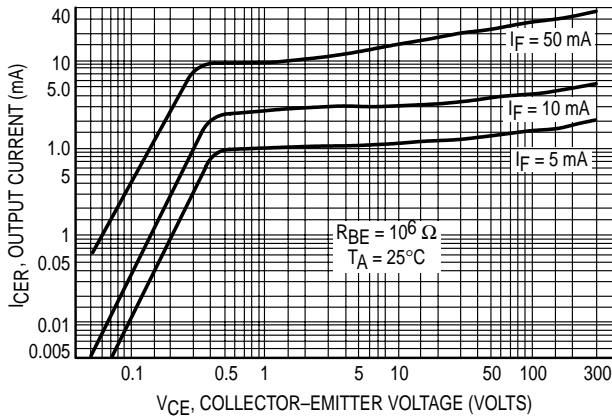
1. Always design to the specified minimum/maximum electrical limits (where applicable).
2. Current Transfer Ratio (CTR) =  $I_C / I_F \times 100\%$ .
3. For this test LED pins 1 and 2 are common and phototransistor Pins 4,5 and 6 are common.



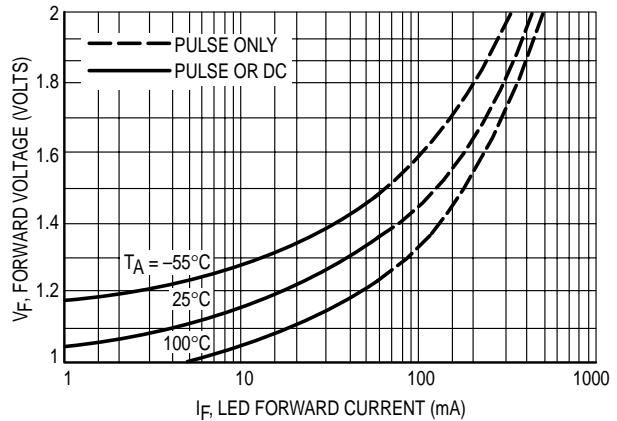
**Figure 1. Output Current versus LED Input Current**



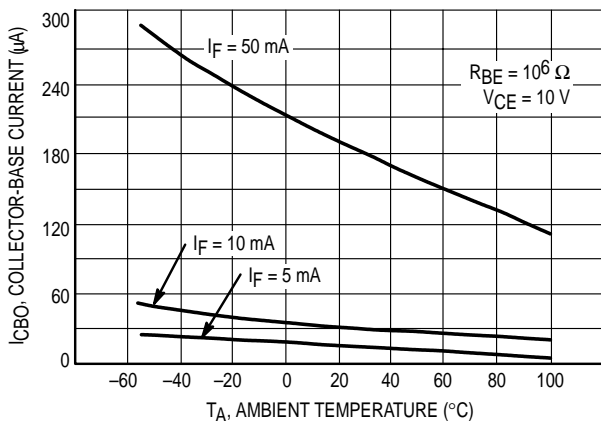
**Figure 2. Output Current versus Temperature**



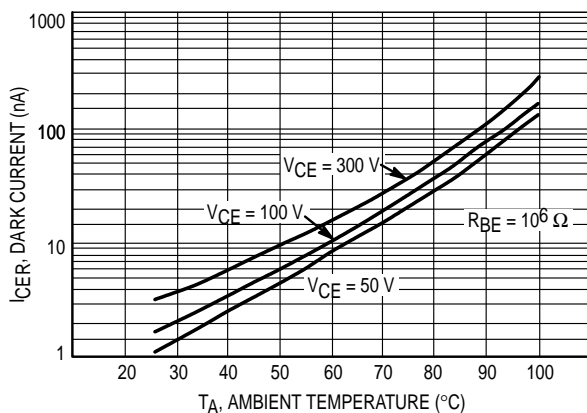
**Figure 3. Output Characteristics**



**Figure 4. Forward Characteristics**



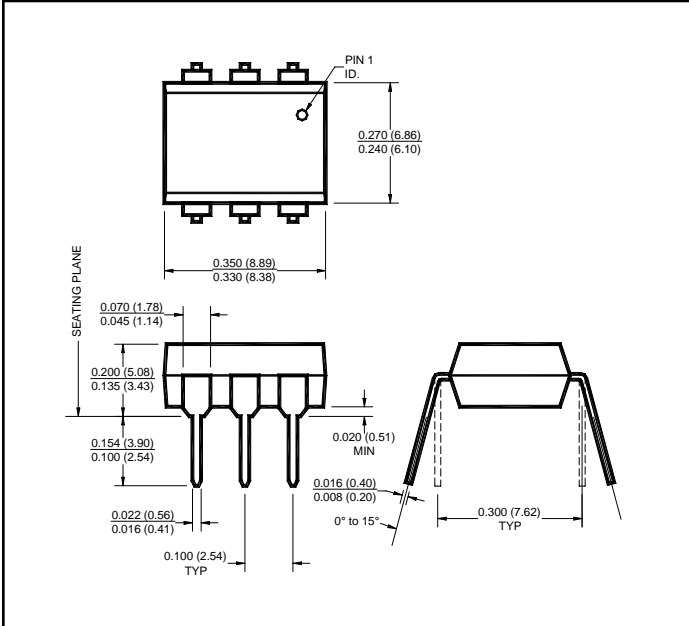
**Figure 5. Collector-Base Current versus Temperature**



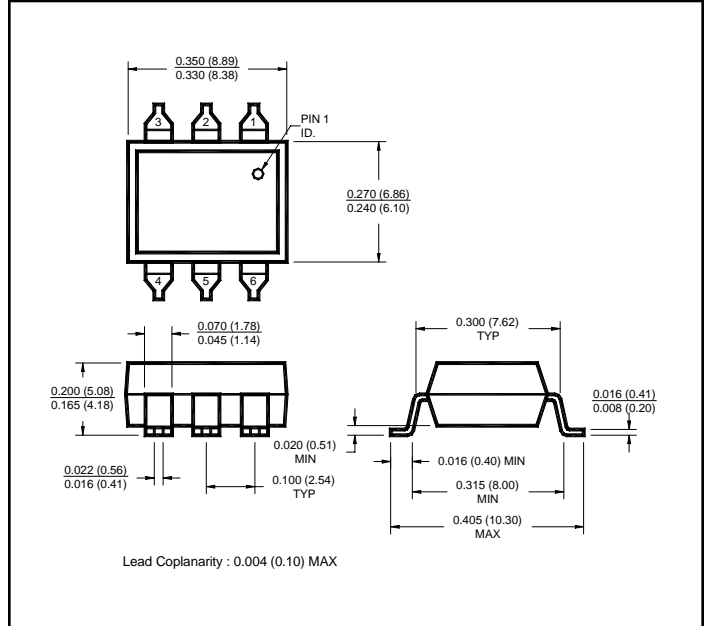
**Figure 6. Dark Current versus Temperature**

**MOC8204**

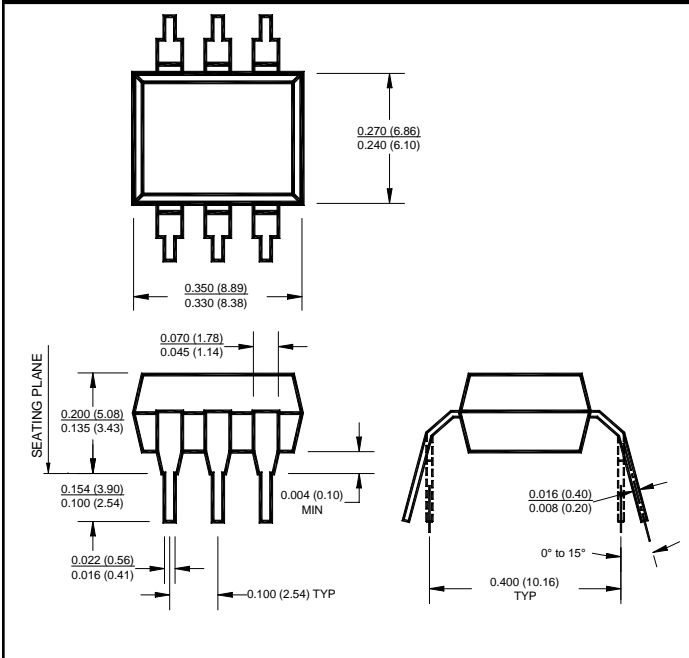
**Package Dimensions (Through Hole)**



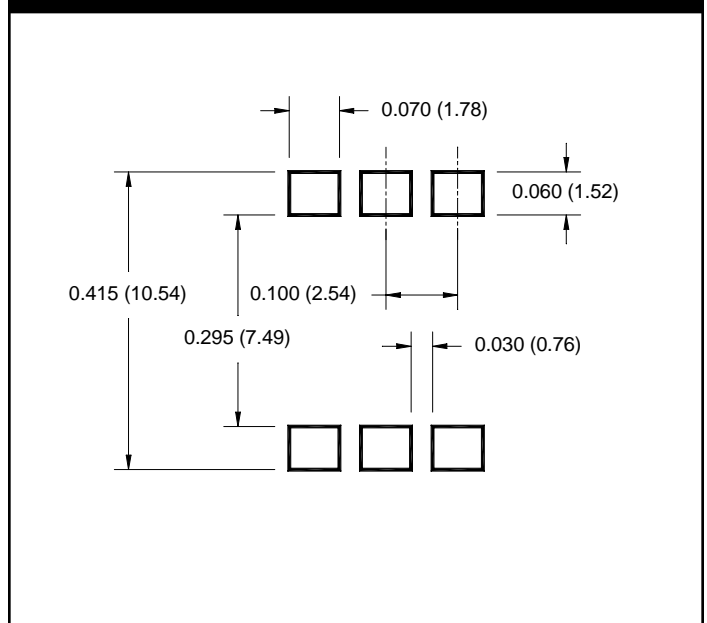
**Package Dimensions (Surface Mount)**



**Package Dimensions (0.4" Lead Spacing)**



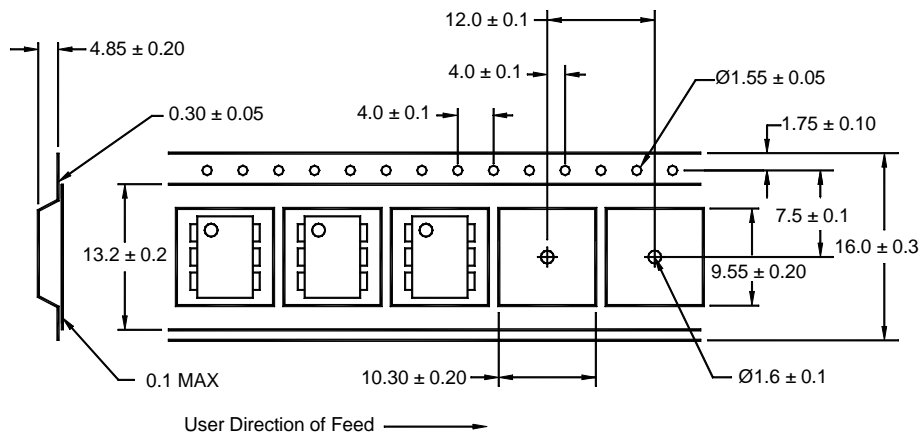
**Recommended Pad Layout for  
Surface Mount Leadform**



**ORDERING INFORMATION**

Option	Order Entry Identifier	Description
R2	.R2	Opto Plus Reliability Conditioning
S	.S	Surface Mount Lead Bend
SD	.SD	Surface Mount; Tape and reel
SDL	.SDL	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**



## **DISCLAIMER**

FAIRCHILD SEMICONDUCTOR RESERVES THE THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION OR DESIGN. FAIRCHILD DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN; NEITHER DOES IT CONVEY ANY LICENSE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS.

## **LIFE SUPPORT POLICY**

FAIRCHILD'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF THE PRESIDENT OF FAIRCHILD SEMICONDUCTOR CORPORATION. As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and (c) whose failure to perform when properly used in accordance with instructions for use provided in labeling, can be reasonably expected to result in a significant injury of the user.
2. A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.