

66169

**GULL WING HERMETICALLY SEALED,
SINGLE CHANNEL OPTOCOUPLER
(Electrically Similar To 6N134)**

Mii
OPTOELECTRONIC PRODUCTS
DIVISION

Rev 1 7/24/01

Features:

- High Speed
- 1500 Vdc isolation test voltage
- 5 MHz bandwidth
- High radiation immunity
- Faraday shield to provide high Common mode rejection

Applications:

- Military and Space
- High reliability systems
- Voltage Level Shifting
- Isolated Receiver Input
- Communication systems
- Medical systems

DESCRIPTION

The **66169** single channel optocoupler consists of an LED optically coupled to a high speed, high gain inverting detector gate. Maximum isolation can be achieved while providing TTL output capable of switching with a propagation delay of 55ns typical. The 66169 is a 10 pin gull wing hermetically sealed package and is available in standard and screened versions or tested to customer specifications.

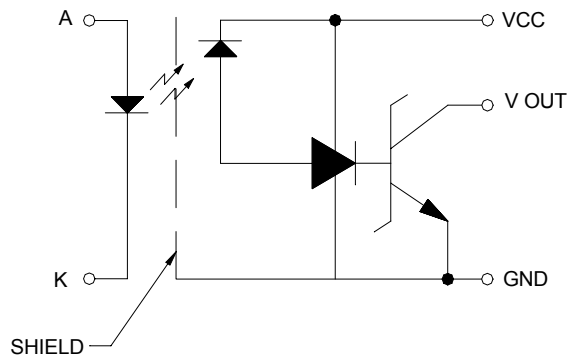
ABSOLUTE MAXIMUM RATINGS

Storage Temperature.....	-65°C to +150°C
Operating Free-Air Temperature Range	-55°C to +125°C
Lead Solder Temperature.....	260°C for 10s (1.6mm below seating plane)
Peak Forward Input Current	40mA (1ms duration)
Average Forward Input Current	20mA
Input Power Dissipation	35mW
Reverse Input Voltage	5V
Supply voltage-V _{CC}	7V(1 minute maximum)
Output Current-I _O	25mA
Output Power Dissipation	40mW
Output Voltage – V _O	7V
Total Power Dissipation	350mW

Package Dimensions

Schematic Diagram

CONTACT FACTORY
FOR PACKAGE
AND PIN OUT
INFORMATION



ELECTRICAL CHARACTERISTICS $T_A = -55^{\circ}\text{C}$ to 125°C unless otherwise specified.

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	TEST CONDITIONS	NOTE
High Level Output Current	I_{OH}		5	250	μA	$V_{CC} = 5.5\text{V}$, $V_O = 5.5\text{V}$, $I_F = 250\mu\text{A}$	
Low Level Output Voltage	V_{OL}		0.35	0.6	V	$V_{CC} = 5.5\text{V}$, $I_F = 10\text{mA}$ I_{OL} (Sinking) = 10mA	8
High Level Supply Current	I_{CCH}		9	14	mA	$V_{CC} = 5.5\text{V}$, $I_F = 0$	
Low Level Supply Current	I_{CCL}		13	18	mA	$V_{CC} = 5.5\text{V}$, $I_F = 20\text{mA}$	
Input Forward Voltage	V_F		1.5	1.75	v	$I_F = 20\text{mA}$	
Input Reverse Breakdown Voltage	BV_R	5			v	$I_R = 10\mu\text{A}$	
Input-Output Insulation Leakage Current	I_{I-O}			1.0	μA	$V_{I-O} = 1500\text{Vdc}$, Relative Humidity = 45% $T_A = 25^{\circ}\text{C}$, $t = 5\text{s}$	3
Propagation Delay Time To High Output Level	t_{PLH}		65	100	ns	$V_{CC} = 5.5\text{V}$, $R_L = 510\Omega$, $C_L = 15\text{pF}$, $I_F = 13\text{mA}$, $T_A = 25^{\circ}\text{C}$	4
Propagation Delay Time To Low Output Level	t_{PHL}		55	100	ns	$V_{CC} = 5.5\text{V}$, $R_L = 510\Omega$, $C = 15\text{p}$, $I_F = 13\text{mA}$, $T_A = 25^{\circ}\text{C}$	5

TYPICAL CHARACTERISTICS AT $T_A = 25^{\circ}\text{C}$, $V_{CC} = 5\text{V}$ Each Channel

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	TEST CONDITIONS	NOTE
Input Capacitance	C_{IN}		60		pF	$V_F = 0$, $f = \text{MHz}$	
Input Diode Temperature Coefficient	$\frac{\Delta V_F}{\Delta T_A}$		-1.9		$\text{mV}/^{\circ}\text{C}$	$I_F = 20\text{mA}$	
Resistance (Input-Output)	R_{I-O}		10^{12}		Ω	$V_{I-O} = 500\text{V}$	2
Capacitance (Input-Output)	C_{I-O}		1.7		pF	$f = 1\text{MHz}$	2
Input-Input Insulation Leakage Current	I_{I-I}		0.5		nA	Relative Humidity = 45% $V_{I-I} = 500\text{V}$, $t = 5\text{s}$	3
Output Rise-Fall Time (10-90%)	t_r , t_f		35		ns	$R_L = 510\Omega$, $C_L = 15\text{pF}$ $I_F = 13\text{mA}$	
Common Mode Transient immunity at High Output Level	CM_H	1000	10000		$\text{V}/\mu\text{s}$	$V_{CM} = 10\text{V}$ (peak), V_O (min) = 2V, $R_L = 510\Omega$, $I_F = 0\text{mA}$	6
Common Mode Transient Immunity at Low Output Level	CM_L	1000	10000		$\text{V}/\mu\text{s}$	$V_{CM} = 10\text{V}$ (peak), V_O (max) = 0.8V, $R_L = 510\Omega$, $I_F = 10\text{mA}$	7

NOTES:

- Measured between pins 1 through 8 shorted together and pins 9 through 16 shorted together.
- Measured between pins 9 and 10 or 11 and 12 shorted together, and pins 9 through 16 shorted together.
- Measured between pins 9 and 10 shorted together, and pins 11 and 12 shorted together.
- The t_{pin} propagation delay is measured from the 6.5mA point on the trailing edge of the input pulse to the 1.5V point on the trailing edge of the output pulse.
- The t_{phl} propagation delay is measured from the 6.5mA point on the leading edge of the input pulse to the 1.5V point on the leading edge of the output pulse.
- CM_H is the max. tolerable common mode transient to assure that the output will remain in a high logic state (i.e. $V_O > 2.0\text{V}$).
- CM_L is the max. tolerable common mode transient to assure that the output will remain in a low logic state (i.e. $V_O < 0.8\text{V}$).
- It is essential that a bypass capacitor (.01 to 0.1 μF ceramic) be connected from pin 1 to pin 4.

RECOMMENDED OPERATING CONDITIONS:

PARAMETER	SYMBOL	MIN	MAX	UNITS
Input Current, Low Level	I_{FL}	0	250	μA
Input Current, High Level	I_{FH}	12.5	20	mA
Supply Voltage	V_C	4.5	5.5	V
Fan Out (TTL Load)	N		6	
Operating Temperature	T_A	-55	125	$^{\circ}\text{C}$

SELECTION GUIDE

PART NUMBER	PART DESCRIPTION
66169-000	Single Channel optocoupler, full mil-temp (-55° to $+125^{\circ}\text{C}$) with 100% device screening
66169-002	Single Channel optocoupler, military operating range (-55° to $+125^{\circ}\text{C}$)
66169-003	Single Channel optocoupler, commercial (0° to 70°C)
66169-004	Single Channel optocoupler, extended temperature range (-40° to $+85^{\circ}\text{C}$)