66013	**DUAL CHANNEL, HERMETICALLY SEALED, HIGH-SPEED 6N134 OPTOCOUPLER**	**OPTOELECTRONIC PRODUCTS DIVISION**

06/20/2011

Features:

- 5 MHz bandwidth typical
- 1500 Vdc isolation test voltage
- TTL compatible input and output
- 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

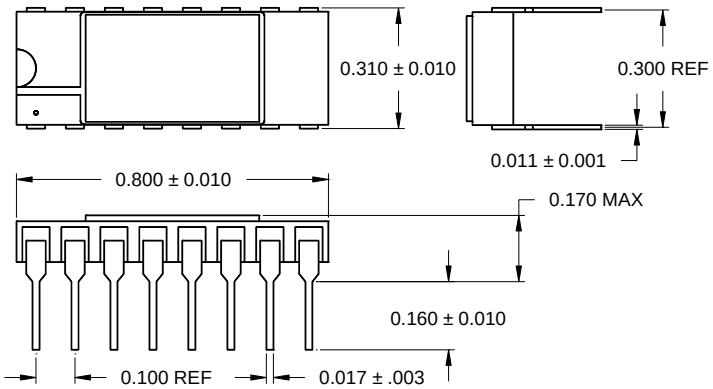
DESCRIPTION

The ***66013*** dual channel optocoupler consists of two LED's optically coupled to two high speed, high gain inverting detector gates. Maximum isolation can be achieved while providing TTL outputs capable of switching with propagation delays of 55ns typical. The 66013 is a 16 pin dual-in-line, hermetically sealed package and is available in standard and MIL-PRF-38534 screened versions or tested to customer specifications.

ABSOLUTE MAXIMUM RATINGS

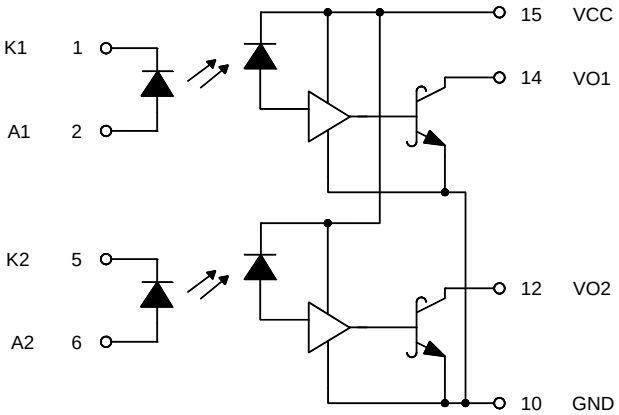
Peak Forward Input Current (each channel) ..... 40 mA (1ms duration)
Average Forward Input Current (each channel) ..... 20 mA
Input Power Dissipation (each channel) ..... 35 mW
Reverse Input Voltage (each channel) ..... 5 V
Supply Voltage ..... 7 V(1 minute maximum)
Output Current - I_O (each channel) ..... 25 mA
Output Power Dissipation (each channel) ..... 40 mW
Output Voltage - V_O (each channel) ..... 7 V
Total Power Dissipation ..... 400 mW
Operating Free-Air Temperature Range ..... -55℃ to +125℃
Storage Temperature ..... -65℃ to +150℃
Solder Temperature (10 seconds, 1/16" from case) ..... 260℃

Package Dimensions



ALL DIMENSIONS ARE IN INCHES.

Schematic Diagram



ELECTRICAL CHARACTERISTICS

T_a=-55℃ TO T_a= 25℃ 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 V, V_O = 5.5 V, I_F = 250 µA	1
Low Level Output Voltage	V_{OL}		0.35	0.6	V	V_{CC} = 5.5 V, I_F = 10 mA I_{OL}(Sinking) = 10 mA	1, 8
High Level Supply Current (Both Channels)	I_{CCH}		18	28	mA	V_{CC} = 5.5 V, I_F = 0	
Low Level Supply Current (Both Channels)	I_{CCL}		26	36	mA	V_{CC} = 5.5 V, I_F = 20 mA	
Input Forward Voltage	V_F		1.5	1.75	V	I_F = 20 mA	1
Input Reverse Breakdown Voltage	BV_R	5			V	I_R = 10 µA	
Input-Output Insulation Leakage Current	$I_{I—O}$			1.0	µA	$V_{I—0}$ = 1500 Vdc, Relative Humidity = 45% t_a = 25°C, t = 5 s	2
Propagation Delay Time To High Output Level	t_{PLH}		45	135	ns	R_L = 510 Ω, C_L = 50 pF I_f = 13 mA, T_a = 25°C	4
Propagation Delay Time To Low Output Level	t_{PHL}		55	115	ns	R_L = 510 Ω, C_L = 50 pF I_f = 13 mA, T_a = 25°C	5
Output Rise Time	t_R			90	ns	R_L = 510 Ω, C_L = 50 pF I_F = 13 mA, T_a = 25°C	
Output Fall Time	t_F			40	ns	R_L = 510 Ω, C_L = 50 pF I_f = 13 mA, T_a = 25°C	

TYPICAL CHARACTERISTICS

T_A = 25°C, V_{CC} = 5 V EACH CHANNEL

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	TEST CONDITIONS	NOTE
Input Capacitance	C_{IN}		60		pF	V_F = 0, f = MHz	1
Input Diode Temperature Coefficient	$\Delta V_F/\Delta T_A$		-1.9		mV/°C	I_F = 20 mA	1
Resistance (Input-Output)	R_{I-0}		10^{12}		Ω	$V_{I—O}$ = 500 V	2
Capacitance (Input-Output)	C_{I-O}		1.7		pF	f = 1 MHz	2
Input-Input Insulation Leakage Current	I_{I-I}		0.5		nA	Relative Humidity = 45% V_{I-I} = 500 V, t = 5 s	3
Resistance (Input-Input)	R_{I-I}		10^{12}		Ω	V_{I-I} = 500 V	3
Capacitance (Input-Input)	C_{I-I}		0.80		pF	f = 1 MHz	3
Output Rise-Fall Time (10-90%)	t_r, t_f		35	90	ns	R_L = 510 Ω, C_L = 50 pF I_F = 13 mA	1
Common Mode Transient Immunity at High Output Level	CM_H	1000	10000		V/µs	V_{CM} = 10 V (peak), V_O (min) = 2V, R_L = 510 Ω, I_F = 0 mA	6
Common Mode Transient Immunity at Low Output Level	CM_L	1000	10000		V/µs	V_{CM} = 10 V (peak), V_O (max) = 0.8 V, R_L = 510 Ω, I_F = 10 mA	7

NOTES:

1. Each channel
2. Measured between pins 1 through 8 shorted together and pins 9 through 16 shorted together.
3. Measured between pins 1 and 2 shorted together, and pins 5 and 6 shorted together.
4. The t_{plh} propagation delay is measured from the 6.5 mA point on the trailing edge of the input pulse to the 1.5 V point on the trailing edge of the output pulse.
5. The t_{phl} propagation delay is measured from the 6.5 mA point on the leading edge of the input pulse to the 1.5 V point on the leading edge of the output pulse.
6. 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 V).
7. 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 V).
8. It is essential that a bypass capacitor (0.01 to 0.1 µF ceramic) be connected from pin 10 to pin 15.

RECOMMENDED OPERATING CONDITIONS:

PARAMETER	SYMBOL	MIN	MAX	UNITS
Input Current, Low Level Each Channel	I_{FL}	0	250	µA
Input Current, High Level Each Channel	I_{FH}	12.5	20	mA
Supply Voltage	V_C	4.5	5.5	V

SELECTION GUIDE

PART NUMBER	PART DESCRIPTION
66013-002	Screened to Class H
66013-003	Commercial (0° to 70°C)
66013-300	Screened to Class K