

**66181** 30kV HIGH VOLTAGE ISOLATOR WITH BUFFERED OUTPUT



**Features:**

- 10 Mhz bandwidth typical
- 30kVdc isolation test voltage
- TTL compatible input and output
- High common mode rejection
- Rugged ceramic package

**Applications:**

- Military and Space
- Voltage Level Shifting
- Grid Current Modulator
- Switching between power supplies
- Medical systems

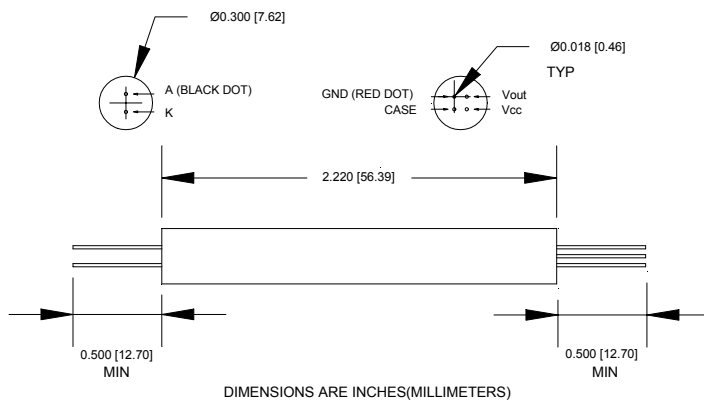
**DESCRIPTION**

The **66181** high voltage isolator consisting of a LED optically coupled to a high speed, high gain inverting detector gate. Output is TTL capable with switching propagation delays of 55ns typical, hermetically sealed in TO-46 packages and mounted in a highly reliability, hermetically sealed ceramic package. Available in commercial (0° to +70°C), extended temperature range (-40° to +85°) and full Military temperature range (-55° to +125°C). **Contact the factory for special custom or multi-channel requirements!**

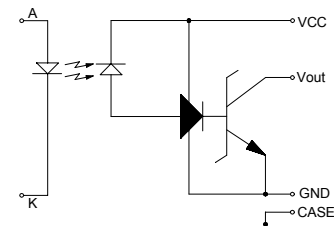
**ABSOLUTE MAXIMUM RATINGS**

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 <sub>CC</sub> .....	7V(1 minute maximum)
Output Current - I <sub>O</sub> .....	25mA
Output Power Dissipation .....	40mW
Output Voltage - V <sub>O</sub> .....	7V
Total Power Dissipation .....	350mW

**Package Dimensions**



**Schematic Diagram**



NOTE:  
A.01 TO 0.1 μF BYPASS CAPACITOR MUST BE CONNECTED BETWEEN V<sub>CC</sub> AND GROUND.  
ENCAPSULATION IN A SUITABLE EPOXY IS REQUIRED TO MEET 30KV ISOLATION VOLTAGE

**ELECTRICAL CHARACTERISTICS**T<sub>a</sub> = 25°C unless otherwise specified.

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	TEST CONDITIONS	NOTE
High Level Output Current	I <sub>OH</sub>		5	250	μA	V <sub>CC</sub> = 5.5V, V <sub>O</sub> = 5.5V, I <sub>F</sub> = 20μA	
Low Level Output Voltage	V <sub>OL</sub>		0.35	0.6	V	V <sub>CC</sub> = 5.5V, I <sub>F</sub> = 10mA I <sub>OL</sub> (Sinking) = 10mA	
High Level Supply Current	I <sub>CCH</sub>		9	20	mA	V <sub>CC</sub> = 5.5V, I <sub>F</sub> = 0	
Low Level Supply Current	I <sub>CCL</sub>		13	30	mA	V <sub>CC</sub> = 5.5V, I <sub>F</sub> = 20mA	
Input Forward Voltage	V <sub>F</sub>		1.5	1.75	V	I <sub>F</sub> = 15mA	
Input Reverse Breakdown Voltage	BV <sub>R</sub>	5			V	I <sub>R</sub> = 10μA	
Input-Output Insulation Leakage Current	I <sub>I-O</sub>			10.0	μA	V <sub>I-O</sub> = 30kVdc, Relative Humidity = 45% T <sub>a</sub> = 25°C, t = 5 sec	
Propagation Delay Time To High Output Level	t <sub>PLH</sub>		65	150	ns	R <sub>L</sub> = 510Ω, C <sub>L</sub> = 15Pf, I <sub>F</sub> = 13mA	9
Propagation Delay Time To Low Output Level	t <sub>PHL</sub>		55	150	ns	R <sub>L</sub> = 510Ω, C <sub>L</sub> = 15Pf, I <sub>F</sub> = 13mA	9

**TYPICAL CHARACTERISTICS**T<sub>A</sub> = 25°C, V<sub>CC</sub> = 5V

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	TEST CONDITIONS	NOTE
Input Diode Temperature Coefficient	$\frac{\Delta V_F}{\Delta T_A}$		-1.9		mV/°C	I <sub>F</sub> = 20mA	1
Resistance (Input-Output)	R <sub>I-O</sub>		10 <sup>12</sup>		Ω	V <sub>I-O</sub> = 500V	3
Input-Input Insulation Leakage Current	I <sub>I-I</sub>		0.5		nA	Relative Humidity = 45% V <sub>I-I</sub> = 500V, t = 5s	4
Resistance (Input-Input)	R <sub>I-I</sub>		10 <sup>12</sup>		Ω	V <sub>I-I</sub> = 500V	4
Common Mode Transient Immunity at High Output Level	CM <sub>H</sub>	1000	10000		V/μs	V <sub>CM</sub> = 10V (peak), V <sub>O</sub> (min) = 2V, R <sub>L</sub> = 510Ω, I <sub>F</sub> = 0mA	7
Common Mode Transient Immunity at Low Output Level	CM <sub>L</sub>	1000	10000		V/μs	V <sub>CM</sub> = 10V (peak), V <sub>O</sub> (max) = 0.8V, R <sub>L</sub> = 510Ω, I <sub>F</sub> = 10mA	8

**NOTES:**

- Each channel
- 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<sub>plh</sub> 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<sub>phl</sub> 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<sub>H</sub> is the max. tolerable common mode transient to assure that the output will remain in a high logic state (i.e. V<sub>O</sub> > 2.0V).
- CM<sub>L</sub> is the max. tolerable common mode transient to assure that the output will remain in a low logic state (i.e. V<sub>O</sub> < 0.8V).
- It is essential that a bypass capacitor (.01 to 0.1μF ceramic) be connected from pin 1 to pin 4.

**RECOMMENDED OPERATING CONDITIONS:**

PARAMETER	SYMBOL	MIN	MAX	UNITS
Input Current, Low Level Each Channel	I <sub>FL</sub>	0	250	μA
Input Current, High Level Each Channel	I <sub>FH</sub>	12.5	20	Ma
Supply Voltage	V <sub>C</sub>	4.5	5.5	V
Fan Out (TTL Load) Each Channel	N		6	
Operating Temperature	T <sub>A</sub>	-55	125	°C

**SELECTION GUIDE**

PART #	PART DESCRIPTION
66181-001	Inverted output, military operating range (-55° to +125°C)
66181-101	Inverted output, full mil-temp (-55° to +125°C) with 100% device screening (on discrete components)
66181-011	Inverted output, commercial version Isolator (0° to 70°C)