Miniature High-Speed Schmitt Trigger Hybrid Surface Mount Optocoupler

IBI600

Features

- Hybrid 6-pin package
- 1500Vdc isolation voltage
- CMR transient immunity >1000V/us
- Small package outline
- High reliability and rugged construction
- High reliability screening available
- DC input with on/off threshold hysteresis output
- Fast switching times: tr, tf = 10ns typical
- Operating temperature range -55℃ to +125℃

Applications

- Switch mode power supplies
- Computer peripheral interface
- Motor control
- Ground signal isolation

Description

The IBI600 consists of an integrated high-speed detector optically coupled to an AlGaAs infrared-emitting diode in a leadless hybrid surface mount package.

Schematic Diagram

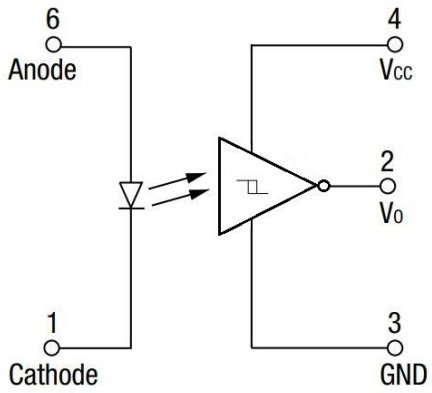

Figure 1. IBI600 Schematic Diagram

Package Dimensions in inches (mm)

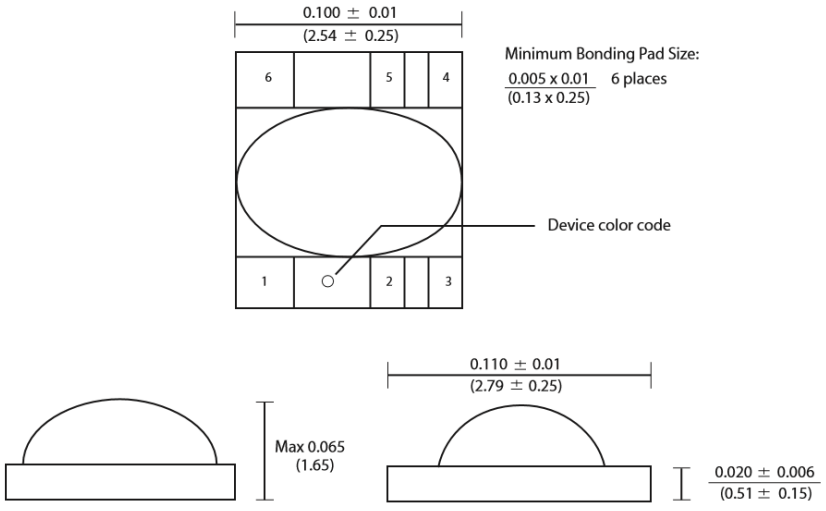

Figure 2. IBI600 Package Dimensions

Absolute Maximum Rating at 25°C (Note 1)

Symbol	*Parameters*	*Ratings*	*Units*	*Notes*
V_{DC}	Isolation voltage	-1500 to +1500	V	2
T_{OPR}	Operating temperature	-55 to +125	°C	
T_{STG}	Storage temperature	-65 to +150	°C	
T_{SOL}	Soldering temperature (10 seconds maximum)	240	°C	
P_D	Total power dissipation	250	mW	3
Emitter				
I_{DD}	Average input current	20	mA	
V_R	Reverse voltage	5	V	
P_D	Power Dissipation	36	mW	3
Detector				
V_{CC}	Supply voltage	18	V	
V_{OUT}	Output voltage	18	V	
I_{OUT}	Peak output current	40	mA	

Notes

1. When using this product, please observe the absolute maximum ratings. Only one parameter may be set at the limit to ensure no damage to the device. Exceeding any of the limits listed here may damage the device.
2. Measured between input pins 1 and 6 shorted together, and output pins 2, 3, 4, and 5 shorted together. T_A = 25°C and duration = 1sec.
3. Linear derating factor: 3.0 mW/°C above 25°C

ESD Precaution

Please be advised that normal static precautions should be taken in the handling and assembly of this device to prevent damage or degradation which may be induced by electrostatic discharge (ESD).

Electrical Characteristics *T_A = -55℃ to +125℃ (unless otherwise specified)* (Note 1)

Emitter Characteristics

Symbol	*Parameters*	*Test Conditions*	*Min*	*Typ*	*Max*	*Units*	*Notes*
V_F	Forward Voltage	I_F=10mA	-	1.6	2.4	V	
I_R	Reverse Current	V_R = 3V	-	-	10	µA	

Detector Characteristics

Symbol	*Parameters*	*Test Conditions*	*Min*	*Typ*	*Max*	*Units*	*Notes*
$I_{F(ON)}$	Threshold Current, ON	V_{CC}= 15V, R_L= 680Ω	-	-	10	mA	
$I_{F(OFF)}$ / $I_{F(ON)}$	Hysteresis Ratio	V_{CC}= 15V, R_L= 680Ω	-	0.8	-	-	
V_{OL}	Low Level Output Voltage	V_{CC}= 15V, R_L= 680Ω, I_F= 5mA	5	-	-	V	
I_{OH}	High Level Output Current	V_{CC}= V_O=15V, I_F= 0mA			250	µA	
I_{CCH}	High Level Supply Current	V_{CC}=15V, I_F= 0mA	-	9	15	mA	
I_{CCL}	Low Level Supply Current	V_{CC}=15V, I_F= 10mA	-	9	15	mA	

Common Mode Transient Immunity

Symbol	*Parameters*	*Test Conditions*	*Min*	*Typ*	*Max*	*Units*	*Notes*
CM_H	Logic High	V_{CM}= 300V peak, R_L= 680Ω, I_F=0mA, V_{CC}= 15V, T_A=25°C	1000	>10,000	-	V/µs	
CM_L	Logic Low	V_{CM}= 300V peak, R_L= 680Ω, I_F=5mA, V_{CC}= 15V, T_A=25°C	1000	>10,000	-	V/µs	
I_{I_O}	Output Leakage Current	V_{I_O}= 1500V_{DC}, R_H≤50%, T_A=25°C	-	-	1.0	µA	2

Switching Characteristics

Symbol	*Parameters*	*Test Conditions*	*Min*	*Typ*	*Max*	*Units*	*Notes*
t_{PHL}	Logic High to Low	I_F= 5mA, V_{CC}= 15V, R_L= 680Ω, T_A=25°C	-	-	300	ns	3
t_{PLH}	Logic Low to High		-	-	300		3
t_r	Rise Time		-	10	-		
t_f	Fall Time		-	10	-		

Notes

1. Performance guaranteed only under conditions listed in above tables.
2. Measured between input pins 1 and 6 shorted together, and output pins 2, 3, 4, and 5 shorted together. T_A = 25°C and duration = 1sec.
3. A ceramic bypass capacitor (0.01µF to 0.1µF) between pins 3 and 5 is required to stabilize the operation of the amplifier.

Typical Characteristic Curves

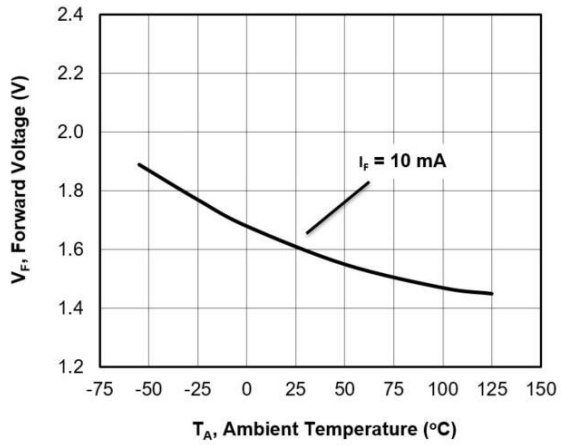

Figure 3. Forward Voltage vs Temperature

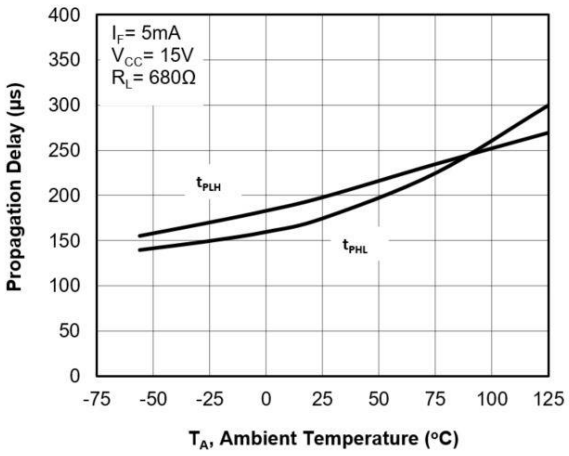

Figure 4. Propagation Delay vs Temperature

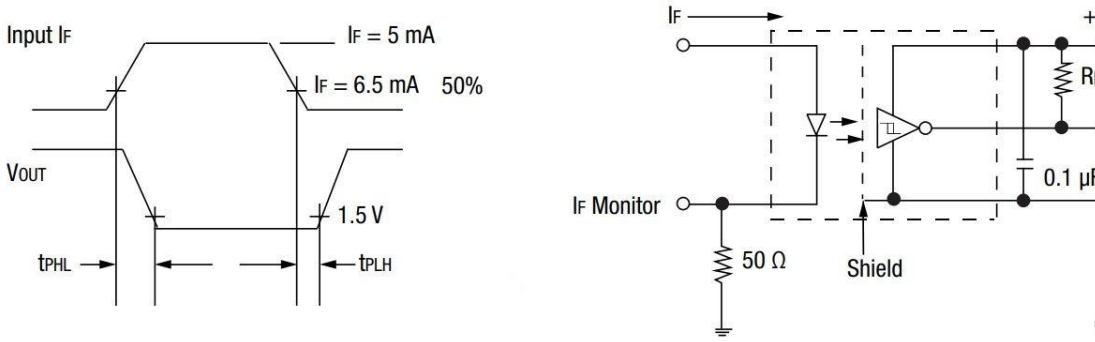

Figure 5. IBI600 Switching Test Circuit

Ordering Information

Manufacturing Part Number	*Part Description*
IBI600	Miniature High-Speed Schmitt Trigger 6-pin Hybrid Package

DISCLAIMER