Miniature Phototransistor Hybrid Surface Mount Optocoupler

IBI100

Features

- Hybrid 6-pin package
- 1500Vdc isolation voltage
- High CTR
- Small package outline
- High reliability and rugged construction
- High reliability screening available
- DC input with transistor output
- Operating temperature range -55℃ to +125℃

Applications

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

Description

The IBI100 consists of a phototransistor optically coupled to an AlGaAs infrared-emitting diode in a leadless hybrid surface mount package.

Schematic Diagram

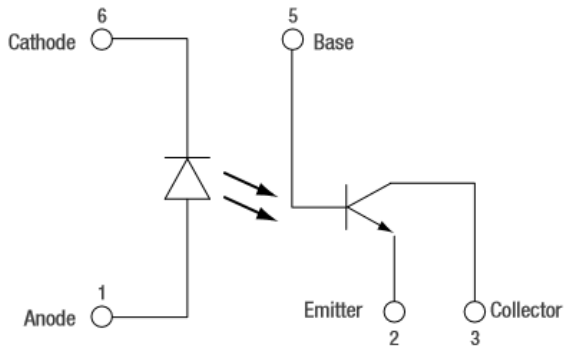

Figure 1. IBI100 Schematic Diagram

Package Dimensions in inches (mm)

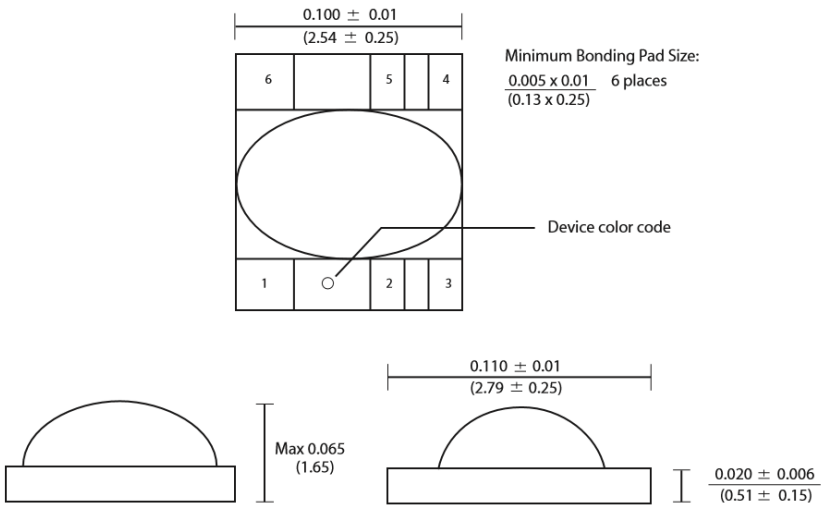

Figure 2. IBI100 Package Dimensions

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	
Emitter				
P_D	Emitter power dissipation	70	mW	
I_F	Forward current	40	mA	
$I_{F(TRANS)}$	Peak transient current (≤1ms P.W.)	60	mA	
V_R	Reverse voltage	3	V	
Detector				
P_D	Detector power dissipation	300	mW	3
V_{CE}	Collector-Emitter Voltage	35	V	
V_{EC}	Emitter-Collector Voltage	7	V	
V_{CB}	Collector-Base Voltage	70	V	

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	0.9	1.3	1.7	V	
I_R	Reverse Current	V_R = 3V	-	-	100	µA	

Detector Characteristics

Symbol	*Parameters*	*Test Conditions*	*Min*	*Typ*	*Max*	*Units*	*Notes*
BV_{CEO}	Collector-Emitter Breakdown Voltage	I_{CE}= 100µA	30	-	-	V	
BV_{CBO}	Collector-Base Breakdown Voltage	I_{CB}= 10µA	70	-	-	V	
BV_{ECO}	Emitter-Collector Breakdown Voltage	I_{EC}= 100µA	5	-	-	V	
I_{CEO}	Leakage Current (Collector to Emitter)	V_{CE}= 20V, I_F=10mA, T_A=25°C	-	-	100	nA	
		V_{CE}= 20V, I_F=10mA,T_A=100°C	-	-	100	µA	

Transfer Characteristics

Symbol	*Parameters*	*Test Conditions*	*Min*	*Typ*	*Max*	*Units*	*Notes*
CTR	Current Transfer Ratio	V_{CE}= 5V, I_F=1mA, T_A=25°C	100	200	-	%	2
		V_{CE}= 5V, I_F=10mA, T_A=25°C	100	200	-	%	2
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage	I_F= 10mA, I_C= 2mA	-	0.15	0.3	V	
I_{IO}	Input to Output Leakage Current	V_{IO}= 1500V_{DC} Relative Humidity ≤ 50% T_A=25°C	-	-	1	µA	3

Switching Characteristics

Symbol	*Parameters*	*Test Conditions*	*Min*	*Typ*	*Max*	*Units*	*Notes*
t_{ON}	Turn-on Time	I_C= 2mA, V_{CC}= 10V,	-	5	15	µs	
t_{OFF}	Turn-off Time	R_L= 100Ω, T_A=25°C	-	5	15		

Notes

1. Performance guaranteed only under conditions listed in above tables.
2. CTR is the ratio of the output collector current I_{C_ON} to the forward LED current I_F multiplied by 100%
3. 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.

Typical Characteristic Curves

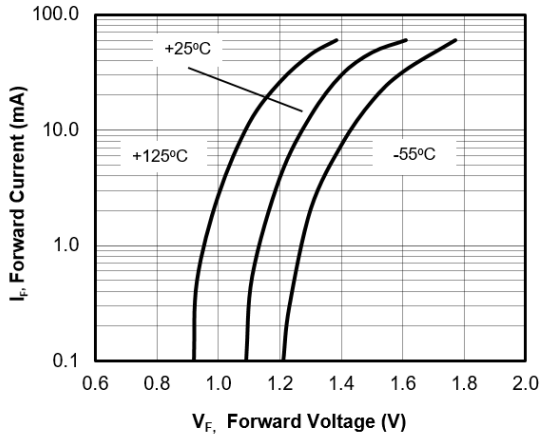

Figure 3. Forward Current vs Forward Voltage

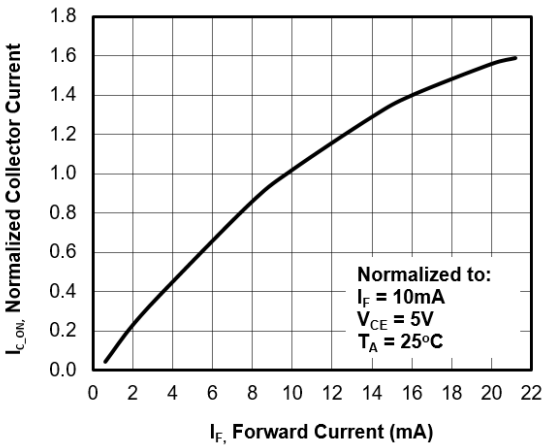

Figure 4. Collector Current vs Forward Current

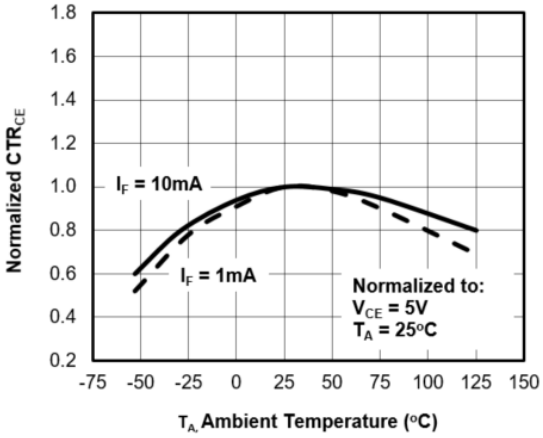

Figure 5. Normalized CTR_{CE} vs Temperature

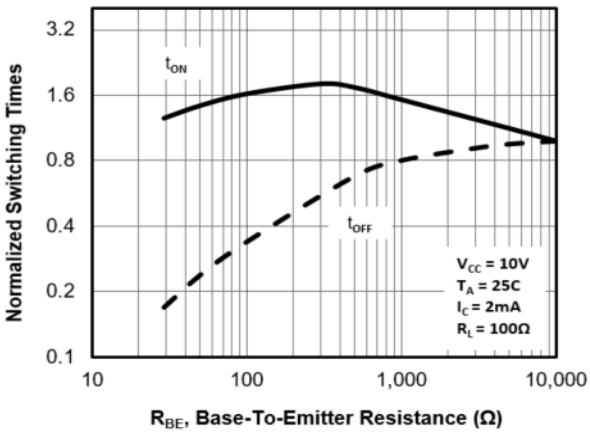

Figure 6. Switching Times vs R_{BE}

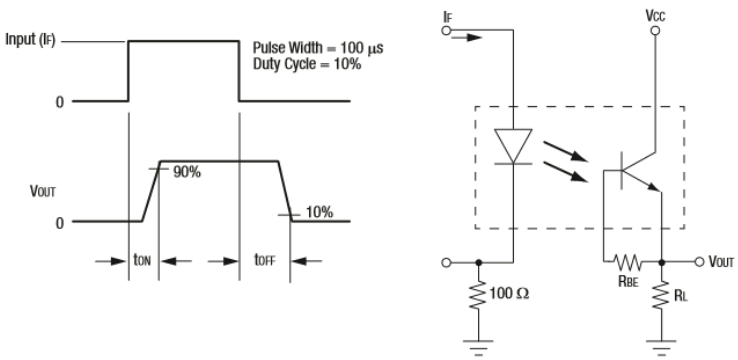

Figure 7. IBI100 Switching Test Circuit

Ordering Information

Manufacturing Part Number	*Part Description*
IBI100	Miniature Phototransistor 6-pin Hybrid Package

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