Radiation Tolerant High-Speed 10MHz Hermetic Surface Mount Optocoupler

IBS500

Features

- Hermetic 6-pin LCC package
- 1500Vdc isolation voltage
- High Speed 10MHz
- Small package outline
- High reliability and rugged construction
- High reliability screening available
- Radiation tolerant
- Open collector output
- Low input LED current
- Operating temperature range -55℃ to +125℃

Applications

- Computer peripheral interface
- Motor control
- Actuation

Description

The IBS500 consists of a phototransistor optically coupled to an AlGaAs infrared-emitting diode in a leadless hermetic surface mount package.

Schematic Diagram

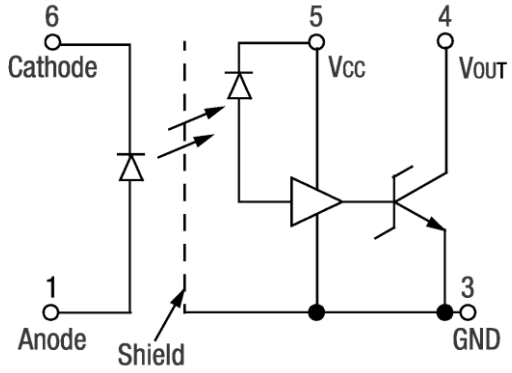


Figure 1. IBS500 Schematic Diagram

Package Dimensions in inches (mm)

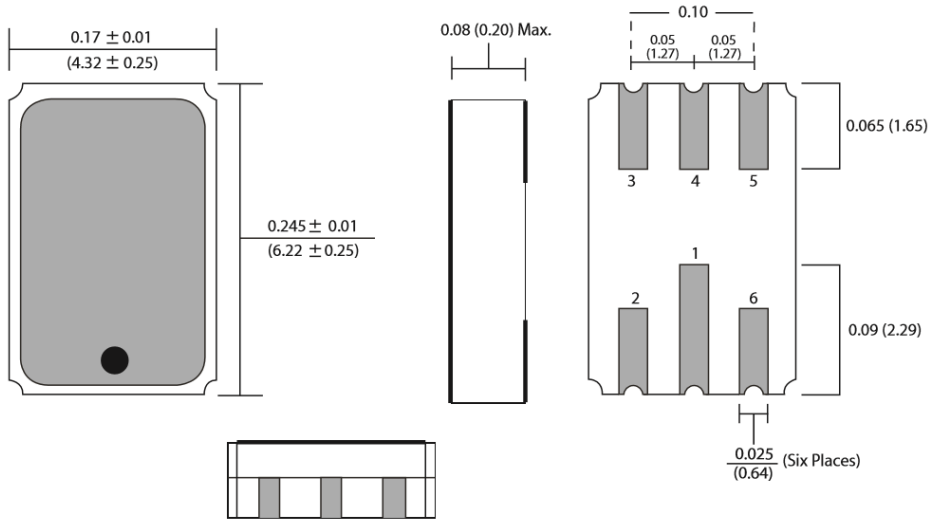


Figure 2. IBS500 Package Dimensions

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	36	mW	
I_F	Forward current	20	mA	
$I_{F(TRANS)}$	Peak transient current (≤1ms P.W.)	40	mA	
V_R	Reverse voltage	5	V	
Detector				
P_D	Detector power dissipation	40	mW	3
$I_{O(PEAK)}$	Peak Output Current	25	mA	
V_{CC}	Supply Voltage	7	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: 1.4 mW/°C above 100°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	-	1.8	2.5	V	
B_{VR}	Input Breakdown Reverse Voltage	I_R=10µA	3	-	-	V	

Detector Characteristics

Symbol	*Parameters*	*Test Conditions*	*Min*	*Typ*	*Max*	*Units*	*Notes*
V_{OL}	Logic Low Output Voltage	I_F=5mA,I_{OL}=10mA,V_{CC}=5.5V	-	0.4	0.6	V	2
I_{OH}	Logic High Output Current	I_F=250µA, V_{CC}=5.5V, V_O=5.5V	-	5	250	µA	2
I_{CCL}	Logic Low Supply Current	I_F=5mA, V_{CC}=5.5V, V_O=open	-	16	20	mA	2
I_{CCH}	Logic High Supply Current	I_F=0mA, V_{CC}=5.5V, V_O=open	-	11	16	mA	2

Transfer Characteristics

Symbol	*Parameters*	*Test Conditions*	*Min*	*Typ*	*Max*	*Units*	*Notes*
CM_H	Common Mode Transient Immunity High Output Level	V_{CM}= 50Vpeak, $V_{O(min)}$=2.0V, R_L= 510Ω, I_F=0mA, T_A=25°C	1,000	10,000	-	V/µs	2
CM_L	Common Mode Transient Immunity Low Output Level	V_{CM}= 50Vpeak, $V_{O(max)}$=0.8V, R_L= 510Ω, I_F=5mA, T_A=25°C	1,000	10,000	-	V/µs	2
I_{IO}	Input to Output Leakage Current	V_{IO}= 1500V_{DC} Relative Humidity ≤ 50% T_A=25°C	-	-	1	µA	3

Propagation Delay Time

Symbol	*Parameters*	*Test Conditions*	*Min*	*Typ*	*Max*	*Units*	*Notes*
t_{PHL}	Logic High to Low	I_F= 7.5mA, V_{CC}= 5V, R_L= 510Ω, T_A=25°C	-	60	140	ns	2
t_{PLH}	Logic Low to High		-	60	140		2

Notes

1. Performance guaranteed only under conditions listed in above tables.
2. A ceramic bypass capacitor (0.01µF to 0.1µF) between pins 3 and 5 is required to stabilize the operation of the amplifier.
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

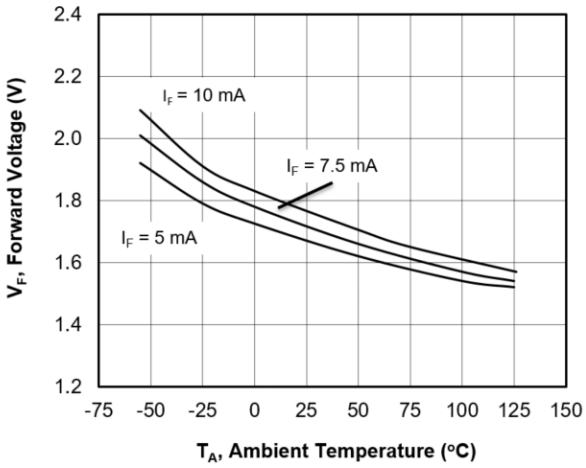


Figure 3. Forward Voltage vs Temperature

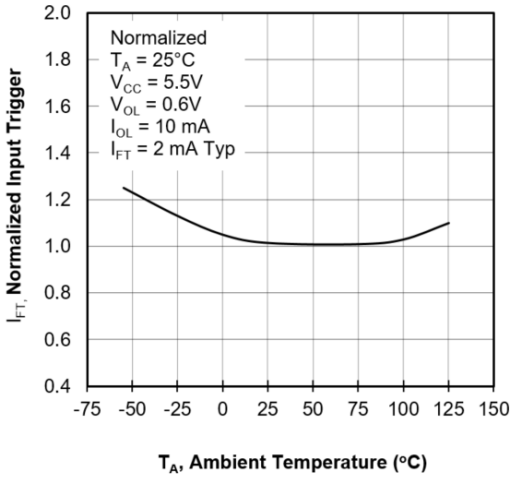


Figure 4. Trigger Current vs Temperature

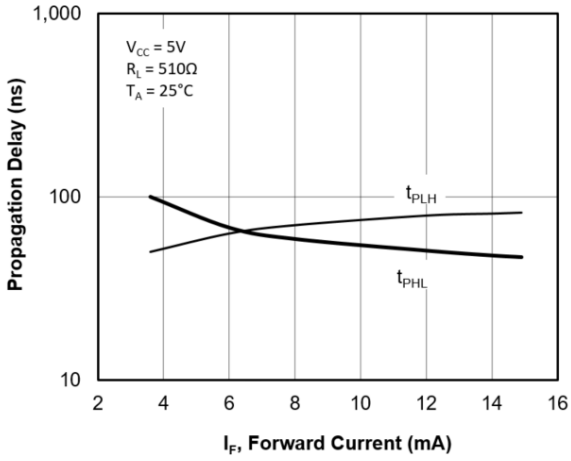


Figure 5. Propagation Delay vs Input Current

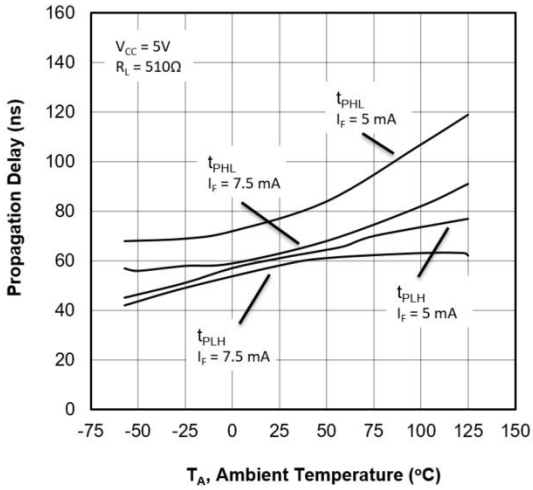
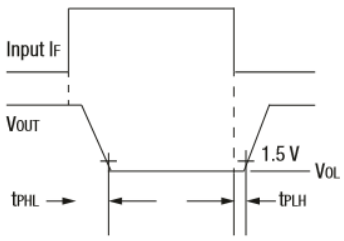


Figure 6. Propagation Delay vs Temperature



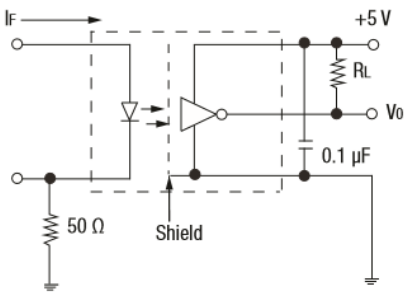


Figure 7. IBS500 Switching Test Circuit

Ordering Information

Manufacturing Part Number	*Part Description*
IBS500	Radiation Tolerant High-Speed 10MHz Hermetic 6-pin LCC Package

DISCLAIMER