

## Features

- Hermetic 8-pin LCC package
- Dual channels of IBS049 / IBS249
- 1500Vdc isolation voltage
- High CTR
- Small package outline
- High reliability and rugged construction
- High reliability screening available
- Radiation tolerant
- DC input with transistor output
- Operating temperature range -55°C to +125°C

## Applications

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

## Description

The IBS2249 consists of two pairs of a phototransistor optically coupled to an AlGaAs infrared-emitting diode in a leadless hermetic surface mount package.

## Schematic Diagram

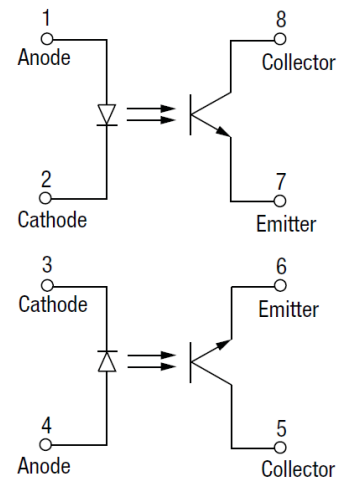


Figure 1. IBS2249 Schematic Diagram

## Package Dimensions in inches

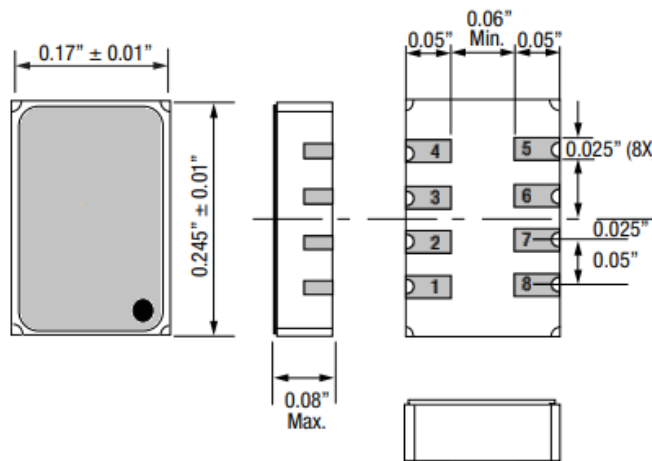


Figure 2. IBS2249 Package Dimensions

**Absolute Maximum Rating at 25°C** (Note 1)

<b>Symbol</b>	<b>Parameters</b>	<b>Ratings</b>	<b>Units</b>	<b>Notes</b>
V <sub>DC</sub>	Isolation voltage	-1500 to +1500	V	2
V <sub>DC</sub>	Channel to channel isolation voltage	-500 to +500	V	3
T <sub>OPR</sub>	Operating temperature	-55 to +125	°C	
T <sub>STG</sub>	Storage temperature	-65 to +150	°C	
T <sub>SOL</sub>	Soldering temperature (10 seconds maximum)	240	°C	
<b>Emitter</b>				
P <sub>D</sub>	Emitter power dissipation	70	mW	
I <sub>F</sub>	Forward current	40	mA	4
I <sub>F(TRANS)</sub>	Peak transient current (≤1μs P.W., 300pps)	1	A	
V <sub>R</sub>	Reverse voltage	2	V	
<b>Detector</b>				
P <sub>D</sub>	Detector power dissipation	300	mW	5
V <sub>CE</sub>	Collector-Emitter Voltage	65	V	
I <sub>CC</sub>	Continuous Collector Current	50	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, 2, 3 and 4 shorted together, and output pins 5, 6, 7 and 8 shorted together. T<sub>A</sub> = 25°C and duration = 1sec.
3. Measured between input pins 1, 2, 7 and 8 shorted together, and output pins 3, 4, 5 and 6 shorted together. T<sub>A</sub> = 25°C and duration = 1sec.
4. Linear derating factor: 0.67 mA/°C above 65°C
5. 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**  $T_A = 25^\circ\text{C}$  (unless otherwise specified) (Note 1)

**Emitter Characteristics**

Symbol	Parameters	Test Conditions	Min	Max	Units	Notes
$V_F$	Forward Voltage	$I_F=10\text{mA}$ , $T_A = -55^\circ\text{C}$	1.4	2.0	V	
		$I_F=10\text{mA}$	1.2	1.8	V	
		$I_F=10\text{mA}$ , $T_A = 125^\circ\text{C}$	1.1	1.7	V	
$I_R$	Reverse Current	$V_R = 2\text{V}$	-	100	$\mu\text{A}$	

**Detector Characteristics**

Symbol	Parameters	Test Conditions	Min	Max	Units	Notes
$BV_{CEO}$	Collector-Emitter Breakdown Voltage	$I_{CE}=1\text{mA}$	65	-	V	
$BV_{ECO}$	Emitter-Collector Breakdown Voltage	$I_{EC}=100\mu\text{A}$	5	-	V	
$I_{C\_ON}$	Collector Current, On-state	$V_{CE}=5\text{V}$ , $I_F=1\text{mA}$	2.0	12.0	mA	2, 4
		$V_{CE}=5\text{V}$ , $I_F=2\text{mA}$ , $T_A = -55^\circ\text{C}$	2.8	-	mA	2
		$V_{CE}=5\text{V}$ , $I_F=2\text{mA}$ , $T_A = 125^\circ\text{C}$	2.0	-	mA	2
$I_{CE\_OFF}$	Collector-Emitter Dark Current, Off-state	$V_{CE}=20\text{V}$	-	100	nA	
		$V_{CE}=20\text{V}$ , $T_A = 125^\circ\text{C}$	-	100	$\mu\text{A}$	

**Transfer Characteristics**

Symbol	Parameters	Test Conditions	Min	Max	Units	Notes
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage	$I_F=2\text{mA}$ , $I_C=2\text{mA}$	-	0.3	V	
$R_{IO}$	Isolation Resistance	$V_{IO}=\pm 1000\text{V}_{DC}$	$10^{11}$	-	$\Omega$	3
$C_{IO}$	Isolation Capacitance	$f=1\text{MHz}$ , $V_{IO}=0\text{V}_{DC}$	-	5	pF	3

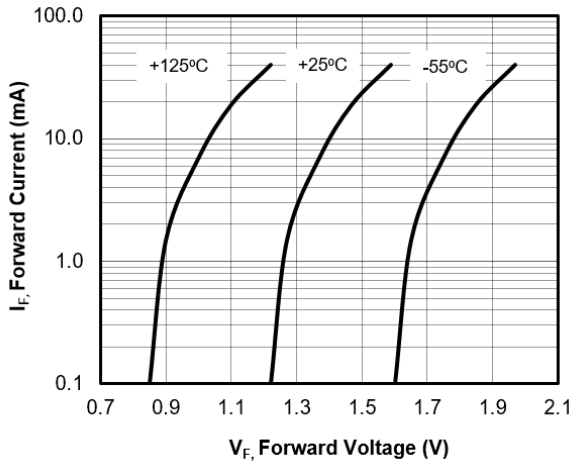
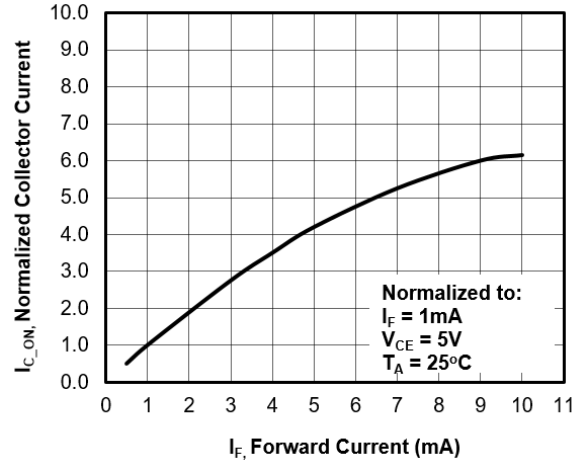
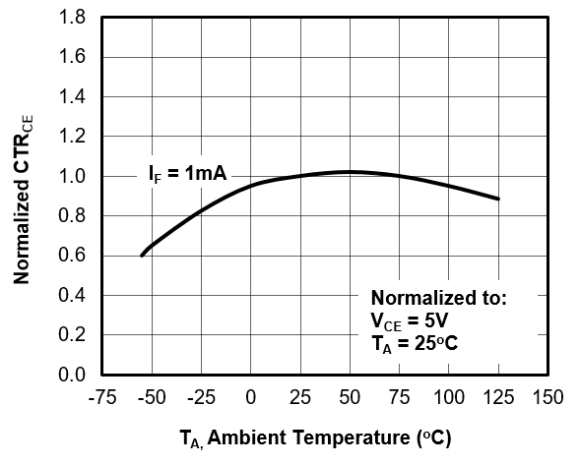
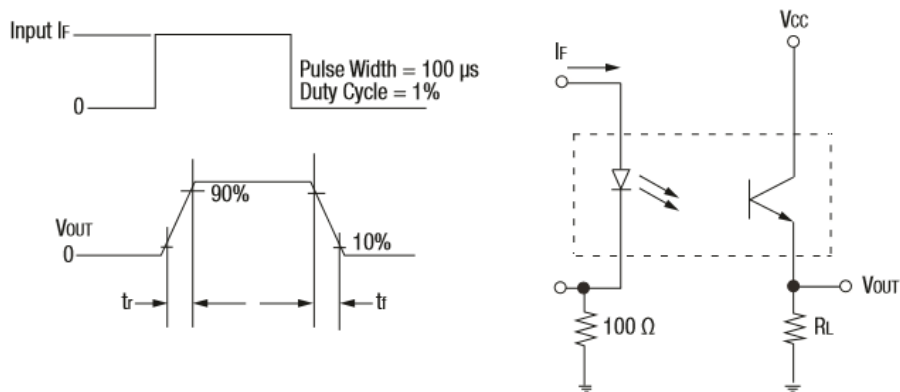
**Switching Characteristics**

Symbol	Parameters	Test Conditions	Min	Max	Units	Notes
$t_r$	Rise Time	$I_F=5\text{mA}$ , $V_{CC}=10\text{V}$ , $R_L=100\Omega$	-	25	$\mu\text{s}$	
$t_f$	Fall Time		-	25		

**Notes**

- Performance guaranteed only under conditions listed in above tables.
- Testing at  $25^\circ\text{C}$  guarantees full temperature operating range.
- Measured between input pins 1, 2, 3 and 4 shorted together, and output pins 5, 6, 7 and 8 shorted together.  $T_A = 25^\circ\text{C}$  and duration = 1sec.
- CTR Crosstalk tested @  $I_F=10\text{mA}$ ,  $V_{ce} = 5\text{V}$ , max 1 $\mu\text{A}$ .

### Typical Characteristic Curves


**Figure 3. Forward Current vs Forward Voltage**

**Figure 4. Collector Current vs Forward Current**

**Figure 5. Normalized CTR<sub>CE</sub> vs Temperature**

**Figure 6. IBS2249 Switching Test Circuit**



Dual Channel,  
Radiation Tolerant Phototransistor  
Hermetic Surface Mount Optocoupler

**IBS2249**

### Ordering Information

<i>Manufacturing Part Number</i>	<i>Part Description</i>
IBS2249	Dual Channel, Radiation Tolerant Phototransistor Hermetic 8-pin LCC Package

### Revision History

<i>Date</i>	<i>Revision Description</i>
July 2019	Initial Release
January 2020	Notes update
March 2021	Note 4, Page 3

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