

## 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.NEO consists of two pairs of a phototransistor optically coupled to an AlGaAs infrared-emitting diode in a leadless hermetic surface mount package, specifically screened and qualified for NewSpace, near earth orbit, and low earth orbit (LEO) applications.

## Schematic Diagram

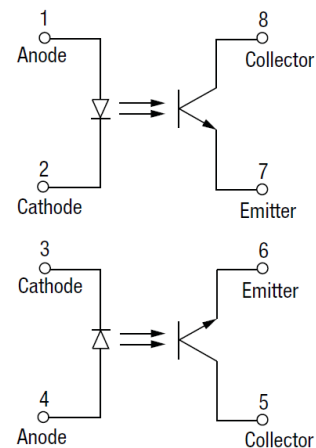


Figure 1. IBS2249.NEO Schematic Diagram

## Package Dimensions in inches

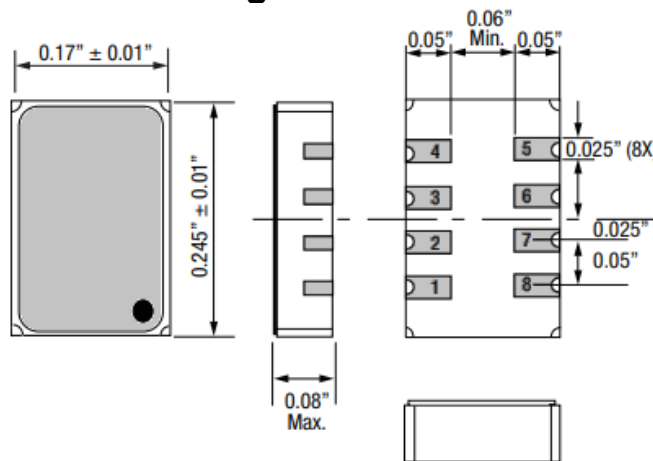


Figure 2. IBS2249.NEO Package Dimensions

**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 1uA.

### Typical Characteristic Curves

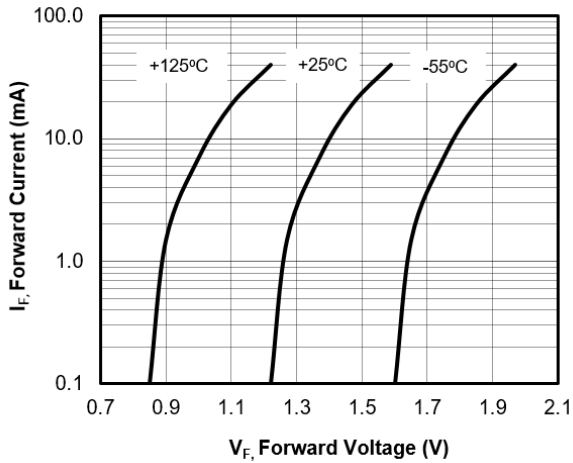


Figure 3. Forward Current vs Forward Voltage

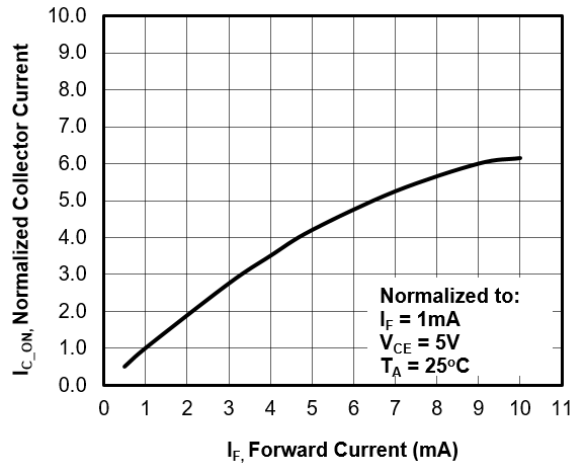


Figure 4. Collector Current vs Forward Current

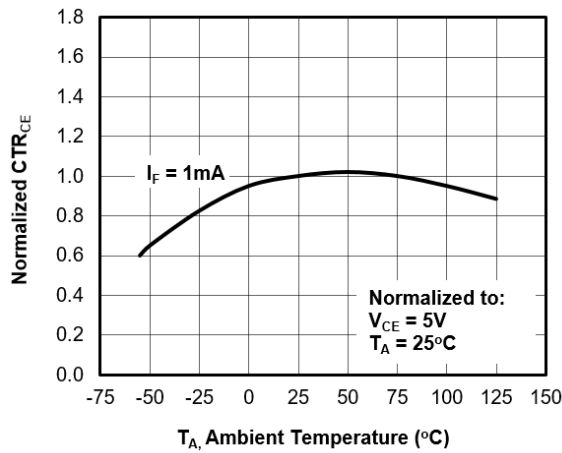


Figure 5. Normalized CTR<sub>CE</sub> vs Temperature

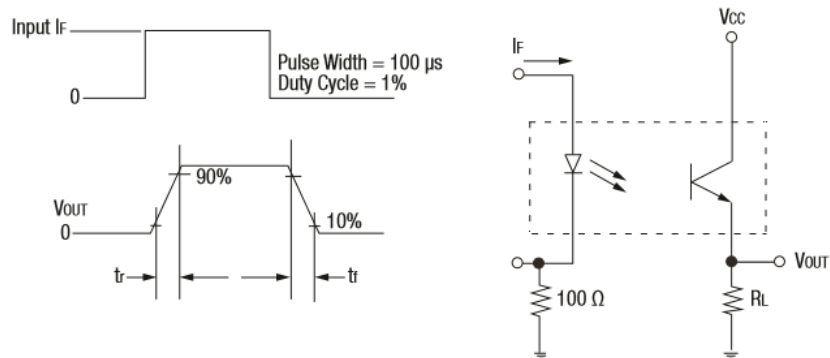


Figure 6. IBS2249.NEO Switching Test Circuit

## Ordering Information

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

## Screening Information $T_A = 25^\circ\text{C}$ (unless otherwise specified) (Note 1)

<i>Screening Test</i>	<i>Test Condition Description</i>	<i>Notes</i>
Constant Acceleration	100% per MIL-STD-750 Method 2006	
Gross leak	100% per MIL-STD-750 Method 1071, Condition C	
Fine leak	100% per MIL-STD-750 Method 1071, Condition H	
Electrical test at $T_A = 25^\circ\text{C}$	100%	2, 5
Electrical test at $T_A = -55^\circ\text{C}$	Sample size based on lot size	3, 6
Electrical test at $T_A = 125^\circ\text{C}$	Sample size based on lot size	3, 6
Steady State Op Life	Per MIL STD-750 Method 1026. Sample size based on lot size	3
Radiation tolerance	Typical wafer lot data	4

### Notes

- Performance guaranteed only under conditions listed in above tables
- Testing at  $25^\circ\text{C}$  guarantees full temperature operating range
- Small Lot sample size = 12 units. Large Lot sample size = 22 units
- Data provided upon request
- 100% Test at  $T_A = 25^\circ\text{C}$ . No R&R data
- R&R data provided on samples tested at  $T_A = 25^\circ\text{C}$ ,  $-55^\circ\text{C}$ ,  $125^\circ\text{C}$

## Revision History

<i>Date</i>	<i>Revision Description</i>
August 2019	Initial Release
January 2020	Screening Info Added
March 2021	Note 4, Page 3

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