

Data Sheet

#### July 1999 File Number 4611.1

### Radiation Hardened Octal Non-Inverting Bidirectional Bus Transceiver

interci

Intersil's Satellite Applications Flow<sup>TM</sup> (SAF) devices are fully tested and guaranteed to 100kRAD Total Dose. These QML Class T devices are processed to a standard flow intended to meet the cost and shorter lead-time needs of large volume satellite manufacturers, while maintaining a high level of reliability.

The Intersil ACTS245T is a Radiation Hardened Octal Non-Inverting Bidirectional Bus Transceiver intended for two-way asynchronous communication between data busses.

## Specifications

Specifications for Rad Hard QML devices are controlled by the Defense Supply Center in Columbus (DSCC). The SMD numbers listed below must be used when ordering.

Detailed Electrical Specifications for the ACTS245T are contained in SMD 5962-96719. A "hot-link" is provided from our website for downloading.

www.intersil.com/spacedefense/newsafclasst.asp

Intersil's Quality Management Plan (QM Plan), listing all Class T screening operations, is also available on our website.

www.intersil.com/quality/manuals.asp

#### **Ordering Information**

ORDERING NUMBER	PART NUMBER	TEMP. RANGE ( <sup>o</sup> C)
5962R9671901TRC	ACTS245DTR	-55 to 125
5962R9671901TXC	ACTS245KTR	-55 to 125

NOTE: Minimum order quantity for -T is 150 units through distribution, or 450 units direct.

#### Features

- QML Class T, Per MIL-PRF-38535
- Radiation Performance
  - Gamma Dose ( $\gamma$ ) 1 x 10<sup>5</sup> RAD(Si)
  - Latch-Up Free Under Any Conditions
  - Single Event Upset (SEU) Immunity: <1 x 10<sup>-10</sup> Errors/Bit/Day (Typ)
  - SEU LET Threshold .....>100 MEV-cm<sup>2</sup>/mg
- 1.25 Micron Radiation Hardened SOS CMOS
- Significant Power Reduction Compared to ALSTTL Logic
- DC Operating Voltage Range..... 4.5V to 5.5V
- Input Logic Levels
  - V<sub>IL</sub> = 0.8V Max
  - $V_{IH} = V_{CC/2}$  Min
- Fast Propagation Delay ..... 18ns (Max), 12ns (Typ)

#### Pinouts

ACTS	2451	<b>T (SBDIP)</b> , TOP VIEW		2-T20
DIR A0 A1 A2 A3 A4 A5 A6 A7 GND	12345678910		20 19 18 17 16 15 14 13 12 11	V <sub>CC</sub> OE B0 B1 B2 B3 B4 B5 B6 B7

#### ACTS245T (FLATPACK), CDFP4-F20 TOP VIEW



# Functional Diagram



TRUTH TABLE				
INPUTS				
ŌĒ	DIR	OPERATION		
L	L	B Data to A Bus		
L	н	A Data to B Bus		
Н	Х	Isolation		

NOTE:

H = High Voltage Level, L = Low Voltage Level, X = Immaterial.

## **Die Characteristics**

#### DIE DIMENSIONS:

(2440μm x 2970μm x 533μm ±51μm) 96 x 117 x 21mils ±2mil

#### **METALLIZATION:**

Type: Al Si Cu Thickness: 10.0kÅ ±2kÅ

#### SUBSTRATE POTENTIAL:

Unbiased (Silicon on Sapphire) Bond Pad #20 (V<sub>CC</sub>) First Bond Pad #20 (V<sub>CC</sub>) Uses Two Bond Wires Bond Pad #10 (GND) Uses Two Bond Wires

## Metallization Mask Layout

#### BACKSIDE FINISH:

Sapphire

#### PASSIVATION:

Type: Silox (S<sub>i</sub>O<sub>2</sub>) Thickness: 8.0kÅ ±1.0kÅ

WORST CASE CURRENT DENSITY:

< 2.0e5 A/cm<sup>2</sup>

#### TRANSISTOR COUNT:

420

#### PROCESS:

CMOS SOS



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