

*Preliminary*

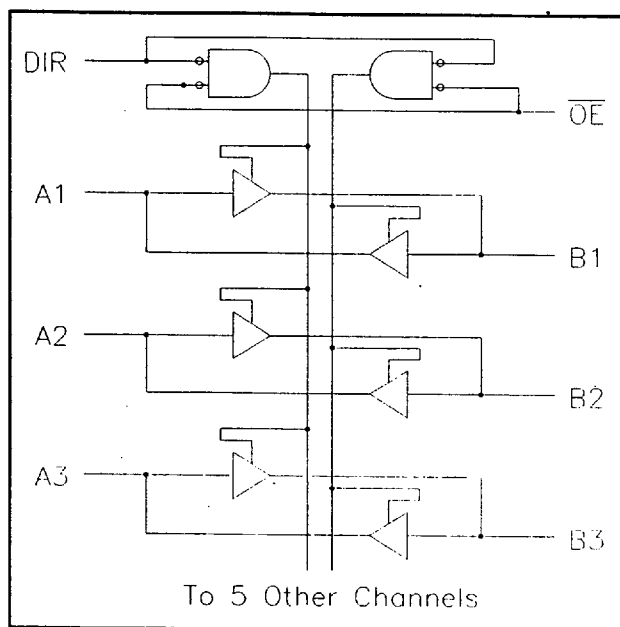
# Radiation Hardened 54LVT245RP

ABT Octal Bus Transceivers  
with 3-State Outputs

*For Space  
Applications*

SEI's 54LVT245RP (RP for RAD-PAK<sup>®</sup>) octal transceiver micro-circuit features a minimum 100 kilorad (Si) total dose tolerance. Using SEI's radiation hardened RAD-PAK<sup>®</sup> packaging technology, the 54LVT245RP is fully

equivalent to the commercial 54LVT245 from industry standard. The 54LVT245RP is ideal for high speed applications which require low power consumption. It is an octal bus transceiver which is designed specifically for low voltage (3.3V)  $V_{CC}$  operation, but with the capability to provide a TTL interface to a 5V system environment. It is designed for asynchronous communication between data buses. The device transmits data from the A bus to the B bus or from the B bus to the A bus depending upon the logic level at the direction control (DIR) input. The output enable ( $\overline{OE}$ ) input can be used to disable the device so the buses are effectively isolated. An active bus-hold circuitry is provided to hold unused or floating data inputs at a valid logic level. The 54LVT245RP has a total dose survivability of 100 krad (Si) and is available in Class S packaging and screening.



54LVT245RP Logic Diagram (Positive Logic)



SPACE  
ELECTRONICS  
INCORPORATED

Tel: (619) 452-4167 Fax: (619) 452-5499  
INTERNET: 102005.1635@COMPUSERVE.COM

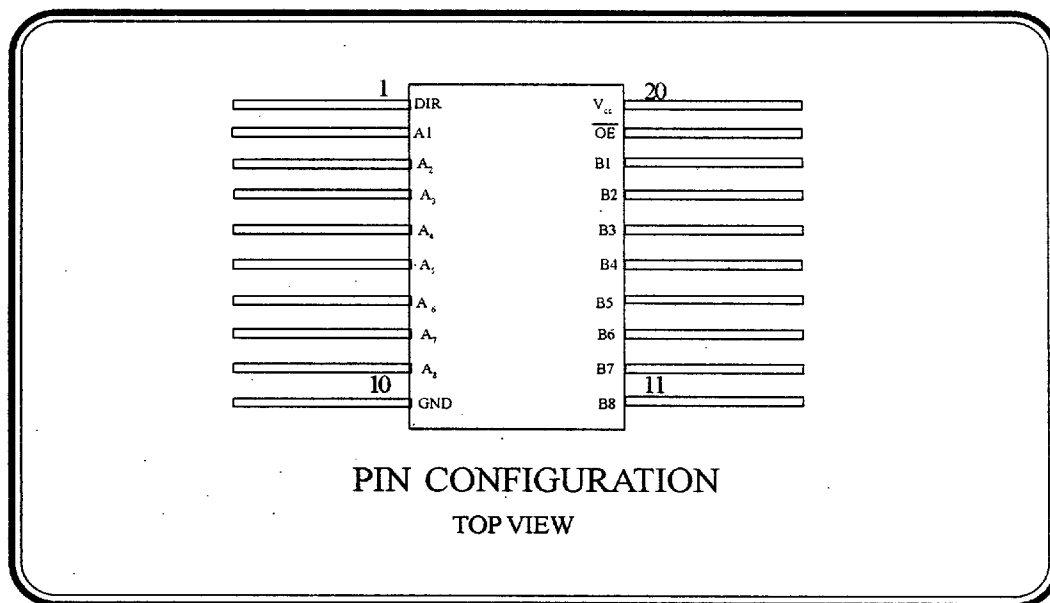
■ 9011241 0000449 966 ■ 447

SEI 54LVT245RP RADHARD BUS TRANSCEIVERS

# Radiation Hardened

## 54LVT245RP

Advanced BiCMOS Technology  
Octal Bus Transceiver with 3-State Outputs



### Features:

- 3.3V ABT Octal Bus Transceiver with 3-state Outputs
- Pin Compatible with Industry Standard 54LVT244
- RAD-PAK® Radiation Hardened Against Natural Space Radiation
- Total Dose Hardness >100 krad (Si)
- Single Event Effect
  - No Latchup, >119MeV/mg/cm<sup>2</sup>
- Package:
  - 20 Pin RAD-PAK® flat pack
  - 20 Pin RAD-PAK® DIP
- Operating Temperature Range:
  - 55 °C to 125°C
- JEDEC Approved Byte Wide Pinout
- Supports Mixed-Mode Signal Operation
  - 5V Input and Output Voltages with 3.3V Vcc
- Supports Unregulated Battery Operation Down to 2.7V.
- Typical V<sub>OLP</sub> (Output Ground Bounce) < 0.8V at V<sub>CC</sub>=3.3V, T<sub>A</sub>=25°C
- Latch-Up Performance Exceeds 500mA Per JEDEC Standard JESD-17
- Supports Live Insertion
- Bus-Hold Data Inputs Eliminate the Need for External Pullup Resistors

Specifications and design are subject to change without notice.



August 1996

*For Further Information Contact:*

**Space Electronics Inc.**

4031 Sorrento Valley Blvd., San Diego, CA 92121  
(619) 452-4167 Fax (619) 452-5499  
INTERNET: 102005.1635@COMPUSERVE.COM

**54LVT245RP ABSOLUTE MAXIMUM RATINGS**

PARAMETER	SYMBOL	MIN	MAX	UNITS
Supply Voltage Range	$V_{CC}$	-0.5	4.6	V
Input Voltage Range	$V_I$	-0.5	7	V
Voltage Range Applied to Any Output in the High State or Power-off State	$V_O$	-0.5	7	V
Current into any Output in the Low State	$I_O$		96	mA
Current into any Output in the High State	$I_O$		48	mA
Input Clamp Current	$I_{IK}$		-50	mA
Output Clamp Current	$I_{OK}$		-50	mA
Storage Temperature Range		-65	150	°C

**54LVT245RP RECOMMENDED OPERATING CONDITIONS**

PARAMETER	SYMBOL	MIN	MAX	UNITS
Supply Voltage	$V_{CC}$	2.7	3.6	V
High-level Input Voltage	$V_{HI}$	2		V
Low-level Input Voltage	$V_{LI}$		0.8	V
Input Voltage	$V_I$		5.5	V
High-level Output Current	$I_{OH}$		-24	mA
Low-level Output Current	$I_{OL}$		48	mA
Input Transition Rise or Fall Rate			10	ns/V
Operating Free-air Temperature	$T_A$	-55	125	°C



**SPACE ELECTRONICS INC.**

■ 9011241 0000451 514 ■

449

4031 SORRENTO VALLEY BLVD.  
 SAN DIEGO, CA 92121  
 PHONE: (619) 452-4167  
 FAX: (619) 452-5499  
 INTERNET: 102005.1635@COMPUSERVE.COM

4LVT245RP DC ELECTRICAL CHARACTERISTICS

PARAMETER	SYMBOL	MIN	TYP'	MAX	UNITS
$V_{CC}=2.7V, I_I=-18mA$	$V_{IK}$			-1.2	V
$V_{CC}=\text{MIN to MAX}, I_{OH}=-100\mu A$ $V_{CC}=2.7V, I_{OH}=-8mA$ $V_{CC}=3V, I_{OH}=-24mA$	$V_{OH}$	$V_{CC}-0.2$ 2.4 2			V
$V_{CC}=2.7V$ $I_{OL}=100\mu A$ $I_{OL}=24mA$ $V_{CC}=3V$ $I_{OL}=16mA$ $I_{OL}=32mA$ $I_{OL}=48mA$	$V_{OL}$			0.2 0.5  0.4 0.5 0.55	V
$V_{CC}=3.6V, V_I=V_{CC}$ or GND $V_{CC}=0$ or MAX, $V_I=5.5V$ $V_{CC}=3.6V$ $V_I=5.5V$ $V_I=V_{CC}$ $V_I=0$	$I_I$			$\pm 1$ 10  100 1 -10	$\mu A$
$V_{CC}=3V$ $V_I=0.8V$ $V_I=2V$	$I_{I(\text{hold})}$	75 -75			$\mu A$
$V_{CC}=3.6V, V_O=3V$	$I_{OZH}$			1	$\mu A$
$V_{CC}=3.6V, V_O=0.5V$	$I_{OZL}$			-1	$\mu A$
Outputs High Outputs Low Outputs Disabled $V_{CC}=3.6V, I_O=0,$ $V_I=V_{CC}$ or GND	$I_{CC}$		0.13 8.8 0.13	0.39 14 0.39	mA
$V_{CC}=3V$ to 3.6V One input at $V_{CC}-0.6V$ ; Other Inputs at $V_{CC}$ or GND				0.3	mA
$V_I=3V$ or 0	$C_i$		4		pF
$V_O=3V$ or 0	$C_o$		10		pF

Note:

1. All typical values are at  $V_{CC}=3.3V, T_A=25^\circ C$



**SPACE ELECTRONICS INC.**

450

9011241 0000452 450

4031 SORRENTO VALLEY BLVD.  
SAN DIEGO, CA 92121  
PHONE: (619) 452-4167  
FAX: (619) 452-5499  
INTERNET: 102005.1635@COMPUSERVE.COM

**54LVT245RP SWITCHING CHARACTERISTICS**

PARAMETER	MIN <sup>2</sup>	MAX <sup>2</sup>	MIN <sup>3</sup>	MAX <sup>3</sup>	UNITS
t <sub>PLH</sub>	0.5	4.4		5.2	ns
t <sub>PHL</sub>	0.5	4.2		4.8	ns
t <sub>PZH</sub>	0.8	5.9		7.3	ns
t <sub>PZH</sub>	1	5.9		7.2	ns
t <sub>PZL</sub>	1.5	6.5		7.2	ns
t <sub>PZL</sub>	1.5	6.1		6.5	ns

Notes:

- 2. V<sub>CC</sub>=3.3V±0.3V
- 3. V<sub>CC</sub>=2.7V

**54LVT245RP Package Ordering Guide**

Package Style	Case Outline	1/	Description
F	F-20		20 Pin Flat Package
Q	Q-44		44 Pin Quad Flat Package

Note:

- 1/ For outline information, see Appendix A (Package Information - Outline Dimension)

**54LVT245RP PINOUT**

PIN	SIGNAL	PIN	SIGNAL
1	DIR	11	B8
2	A1	12	B7
3	A2	13	B6
4	A3	14	B5
5	A4	15	B4
6	A5	16	B3
7	A6	17	B2
8	A7	18	B1
9	A8	19	OE\
10	GND	20	Vcc



**SPACE ELECTRONICS INC.**

451

■ 9011241 0000453 397 ■

4031 SORRENTO VALLEY BLVD.  
 SAN DIEGO, CA 92121  
 PHONE: (619) 452-4167  
 FAX: (619) 452-5499  
 INTERNET: 102005.1635@COMPUSERVE.COM