

SLLS353H-JUNE 1999-REVISED SEPTEMBER 2008

3-V TO 5.5-V MULTICHANNEL RS-232 COMPATIBLE LINE DRIVER/RECEIVER

FEATURES

- Operates With 3-V to 5.5-V V_{CC} Supply
- Always-Active Noninverting Receiver Output (ROUT2B)
- Low Standby Current ... 1 μA Typ
- External Capacitors . . . 4 × 0.1 μF
- Accepts 5-V Logic Input With 3.3-V Supply
- Inter-Operable With SN65C3238, SN75C3238
- Supports Operation From 250 kbit/s to 1 Mbit/s
- RS-232 Bus-Pin ESD Protection Exceeds ±15 kV Using Human-Body Model (HBM)
- Latch-Up Performance Exceeds 100 mA Per JESD 78, Class II

APPLICATIONS

- Battery-Powered Systems
- PDAs
- Notebooks
- Laptops
- Palmtop PCs
- Hand-Held Equipment

DESCRIPTION/ORDERING INFORMATION

The SN65C3243 and SN75C3243 consist of three line drivers, five line receivers, and a dual charge-pump circuit with \pm 15-kV ESD protection pin to pin (serial-port connection pins, including GND). This device provides the electrical interface between an asynchronous communication controller and the serial-port connector. The charge pump and four small external capacitors allow operation from a single 3-V to 5.5-V supply. In addition, this device includes an always-active noninverting output (ROUT2B), which allows applications using the ring indicator to transmit data while the device is powered down. The device operates at data signaling rates up to 1 Mbit/s and an increased slew-rate range of 24 V/µs to 150 V/µs.

Flexible control options for power management are available when the serial port is inactive. The auto-powerdown feature functions when FORCEON is low and FORCEOFF is high. During this mode of operation, if the device does not sense a valid RS-232 signal, the driver outputs are disabled. If FORCEOFF is set low, both drivers and receivers (except ROUT2B) are shut off, and the supply current is reduced to 1 μ A. Disconnecting the serial port or turning off the peripheral drivers causes the auto-powerdown condition to occur.

Auto-powerdown can be disabled when FORCEON and FORCEOFF are high and should be done when driving a serial mouse. With auto-powerdown enabled, the device is activated automatically when a valid signal is applied to any receiver input. The INVALID output is used to notify the user if an RS-232 signal is present at any receiver input. INVALID is high (valid data) if any receiver input voltage is greater than 2.7 V or less than -2.7 V or has been between -0.3 V and 0.3 V for less than 30 μ s. INVALID is low (invalid data) if all receiver input voltages are between -0.3 V and 0.3 V for more than 30 μ s. Refer to Figure 5 for receiver input levels.



Please be aware that an important notice concerning availability, standard warranty, and use in critical applications of Texas Instruments semiconductor products and disclaimers thereto appears at the end of this data sheet.

| , , | DB, DW, OR PW PACKAGE (TOP VIEW) C2+ 1 28 C1+ C2- 2 27 V+ V- 3 26 V _{CC} RIN1 4 25 GND RIN2 5 24 C1- RIN3 6 23 FORCEON RIN4 7 22 FORCEOFF RIN5 8 21 INVALID DOUT1 9 20 ROUT2B DOUT2 10 19 ROUT1 DOUT3 11 18 ROUT2 DIN3 12 17 ROUT3 DIN2 13 16 ROUT4 DIN1 14 15 ROUT5 | | | |
|--------|--|-----------|-------------------|--|
| | | _ • • •) | | |
| C2+[| 1 | 28 |]C1+ | |
| C2-[| 2 | 27 |] V+ | |
| V-[| 3 | 26 |] V _{CC} | |
| RIN1 | 4 | 25 |] GND | |
| RIN2 | 5 | 24 |] C1– | |
| RIN3 | 6 | 23 |] FORCEON | |
| RIN4 | 7 | 22 | FORCEOFF | |
| RIN5 | 8 | 21 |] INVALID | |
| DOUT1[| 9 | 20 |] ROUT2B | |
| DOUT2 | 10 | 19 |] ROUT1 | |
| DOUT3[| 11 | 18 |] ROUT2 | |
| DIN3 | 12 | 17 |] ROUT3 | |
| DIN2 | 13 | 16 | ROUT4 | |
| DIN1 | 14 | 15 |] ROUT5 | |
| I | | | I | |

| T _A | PA | CKAGE ⁽¹⁾⁽²⁾ | ORDERABLE PART NUMBER | TOP-SIDE MARKING | | | |
|----------------|------------|-------------------------|-----------------------|--|--|--|--|
| | SOIC – DW | Tube of 20 | SN75C3243DW | 7502242 | | | |
| | 50IC - DW | Reel of 1000 | SN75C3243DWR | TOP-SIDE MARKING 75C3243 75C3243 CA3243 65C3243 65C3243 CB3243 | | | |
| 0°C to 70°C | SSOP – DB | Reel of 2000 | SN75C3243DBR | 75C3243 | | | |
| | | Tube of 50 | SN75C3243PW | 040040 | | | |
| | TSSOP – PW | Reel of 2000 | SN75C3243PWR | - CA3243 | | | |
| | SOIC – DW | Tube of 20 | SN65C3243DW | 6502242 | | | |
| | 50IC - DW | Reel of 1000 | SN65C3243DWR | 0503243 | | | |
| –40°C to 85°C | SSOP – DB | Reel of 2000 | SN65C3243DBR | 65C3243 | | | |
| | TSSOP – PW | Tube of 50 | SN65C3243PW | CD2242 | | | |
| | 1330P - PW | Reel of 2000 | SN65C3243PWR | 003243 | | | |

ORDERING INFORMATION

(1) Package drawings, thermal data, symbolization are available at www.ti.com/sc/packaging.

(2) For the most current package and ordering information, see the Package Option Addendum at the end of this document, or see the TI website at www.ti.com.

FUNCTION TABLES

EACH DRIVER⁽¹⁾

| | INPUTS | | | OUTPUT | |
|-----|---------|----------|---------------------------|--------|---|
| DIN | FORCEON | FORCEOFF | VALID RIN RS-232 LEVEL | DOUT | DRIVER STATUS |
| Х | Х | L | Х | Z | Powered off |
| L | Н | Н | Х | Н | Normal approximation with outpany advantage dischlord |
| Н | Н | Н | Х | L | Normal operation with auto-powerdown disabled |
| L | L | Н | Yes | Н | Normal apprection with outp powerdown apphled |
| Н | L | Н | Yes | L | Normal operation with auto-powerdown enabled |
| L | L | Н | No | Z | Powered off by auto-powerdown feature |
| Н | L | Н | No | Z | Fowered on by auto-powerdown realtire |

(1) H = high level, L = low level, X = irrelevant, Z = high impedance

EACH RECEIVER⁽¹⁾

| | INP | UTS | | Ουτι | PUTS | | |
|------|--------------------|----------|------------------------------|--------|-------|-------------------|-----------------------|
| RIN2 | RIN1, RIN3–RIN5 | FORCEOFF | VALID RIN RS-232 LEVEL | ROUT2B | ROUT2 | ROUT1, ROUT3–5 | RECEIVER STATUS |
| L | Х | L | Х | L | Z | Z | Powered off while |
| н | х | L | х | н | Z | Z | ROUT2B is active |
| L | L | Н | YES | L | Н | Н | |
| L | Н | Н | YES | L | L | L | Normal operation with |
| н | L | Н | YES | н | Н | н | auto-powerdown |
| н | н | Н | YES | н | L | L | disabled/enabled |
| Open | Open | Н | YES | L | Н | н | |

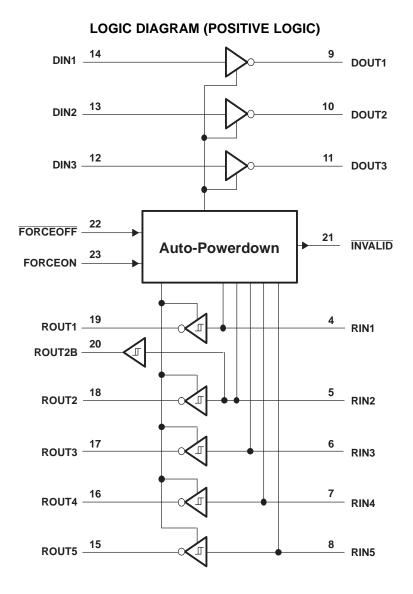
(1) H = high level, L = low level, X = irrelevant, Z = high impedance (off), Open = input disconnected or connected driver off

www.ti.com



Texas

INSTRUMENTS





ABSOLUTE MAXIMUM RATINGS⁽¹⁾

over operating free-air temperature range (unless otherwise noted)

| | | | MIN | MAX | UNIT | |
|------------------------|---|----------------------------|-------|------|------|--|
| V _{CC} | Supply voltage range ⁽²⁾ | | -0.3 | 6 | V | |
| V+ | Positive-output supply voltage range ⁽²⁾ | | -0.3 | 7 | V | |
| V– | Negative-output supply voltage range ⁽²⁾ | | 0.3 | -7 | V | |
| V+ - V- | Supply voltage difference ⁽²⁾ | | | 13 | V | |
| V _I Input v | Input voltogo rongo | Driver (FORCEOFF, FORCEON) | -0.3 | 6 | V | |
| | Input voltage range | Receiver | -25 | 25 | | |
| Vo | Output voltage range | Driver | -13.2 | 13.2 | V | |
| | | DB package | | 62 | 2 | |
| θ_{JA} | Package thermal impedance ⁽³⁾⁽⁴⁾ | DW package | | 46 | °C/W | |
| | | PW package | | 62 | | |
| TJ | Operating virtual junction temperature | | | 150 | °C | |
| T _{stg} | Storage temperature range | | -65 | 150 | °C | |

Stresses beyond those listed under "absolute maximum ratings" may cause permanent damage to the device. These are stress ratings (1) only, and functional operation of the device at these or any other conditions beyond those indicated under "recommended operating conditions" is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

All voltages are with respect to network GND. (2)

(3)Maximum power dissipation is a function of T_J(max), θ_{JA}, and T_A. The maximum allowable power dissipation at any allowable ambient temperature is $P_D = (T_J(max) - T_A)/\theta_{JA}$. Operating at the absolute maximum T_J of 150°C can affect reliability.

The package thermal impedance is calculated in accordance with JESD 51-7. (4)

RECOMMENDED OPERATING CONDITIONS⁽¹⁾

see Figure 6

| | | | | MIN | NOM | MAX | UNIT |
|-----------------|--|------------------------|------------------|-----|-----|-----|------|
| | Supply voltage | | $V_{CC} = 3.3 V$ | 3 | 3.3 | 3.6 | V |
| | Supply voltage Driver and control high-level input voltage Driver and control low-level input voltage DIN, FORCEOFF, FORCEON Driver and control low-level input voltage DIN, FORCEOFF, FORCEON | $V_{CC} = 5 V$ | 4.5 | 5 | 5.5 | v | |
| V | Driver and control high-level input voltage | | $V_{CC} = 3.3 V$ | 2 | | | V |
| VIH | | | $V_{CC} = 5 V$ | 2.4 | | | v |
| V_{IL} | Driver and control low-level input voltage | DIN, FORCEOFF, FORCEON | | | | 0.8 | V |
| VI | Driver and control input voltage | DIN, FORCEOFF, FORCEON | | 0 | | 5.5 | V |
| VI | Receiver input voltage | | | -25 | | 25 | V |
| т | Operating free air temperature | | SN65C3243 | -40 | | 85 | °C |
| T _A | | | SN75C3243 | 0 | | 70 | C |

(1) Test conditions are C1–C4 = 0.1 μ F at V_{CC} = 3.3 V ± 0.3 V; C1 = 0.047 μ F, C2–C4 = 0.33 μ F at V_{CC} = 5 V ± 0.5 V.

ELECTRICAL CHARACTERISTICS⁽¹⁾

over recommended ranges of supply voltage and operating free-air temperature (unless otherwise noted) (see Figure 6)

| | PARAME | TER | TEST CONDITIONS | MIN | TYP ⁽²⁾ | MAX | UNIT |
|-----------------|-------------------------|--|---|-----|--------------------|-----|------|
| I _I | Input leakage current | FORCEOFF, FORCEON | | | ±0.01 | ±1 | μA |
| | Auto-powerdown disabled | No load, FORCEOFF and FORCEON = V_{CC} | | 0.3 | 1 | mA | |
| | | Powered off | No load, $\overline{\text{FORCEOFF}} = \text{GND}$ | | 1 | 10 | |
| I _{CC} | Supply current | Auto-powerdown enabled | No load, $\overline{\text{FORCEOFF}} = V_{CC}$, FORCEON = GND, All RIN are open or grounded, All DIN are grounded | | 1 | 10 | μΑ |

Test conditions are C1–C4 = 0.1 μ F at V_{CC} = 3.3 V ± 0.3 V; C1 = 0.047 μ F, C2–C4 = 0.33 μ F at V_{CC} = 5 V ± 0.5 V. All typical values are at V_{CC} = 3.3 V or V_{CC} = 5 V, and T_A = 25°C. (1)

(2)



www.ti.com

DRIVER SECTION

Electrical Characteristics⁽¹⁾

over recommended ranges of supply voltage and operating free-air temperature (unless otherwise noted) (see Figure 6)

| | PARAMETER | TEST CONDITIONS | MIN | TYP ⁽²⁾ | MAX | UNIT |
|------------------|--|---|-----|--------------------|-----|------|
| V _{OH} | High-level output voltage | All DOUT at $R_L = 3 \text{ k}\Omega$ to GND | 5 | 5.4 | | V |
| V _{OL} | Low-level output voltage | All DOUT at $R_L = 3 \text{ k}\Omega$ to GND | -5 | -5.4 | | V |
| Vo | Output voltage (mouse driveability) | DIN1 = DIN2 = GND, DIN3 = V_{CC} , 3-k Ω to GND at DOUT3, DOUT1 = DOUT2 = 2.5 mA | ±5 | | | V |
| I _{IH} | High-level input current | V _I = V _{CC} | | ±0.01 | ±1 | μΑ |
| IIL | Low-level input current | V _I = GND | | ±0.01 | ±1 | μΑ |
| | Short-circuit output | $V_{CC} = 3.6 \text{ V}, \qquad V_{O} = 0 \text{ V}$ | | ±35 | ±60 | |
| I _{OS} | current ⁽³⁾ | $V_{CC} = 5.5 \text{ V}, \qquad V_O = 0 \text{ V}$ | | ±35 | ±90 | mA |
| r _o | Output resistance | V_{CC} , V+, and V- = 0 V, $V_{O} = \pm 2 V$ | 300 | 10M | | Ω |
| | | $\overline{\text{FORCEOFF}} = \text{GND}$ | | | ±25 | ۵ |
| l _{off} | Output leakage current | FORCEOFF = GND $V_0 = \pm 10 \text{ V}, V_{CC} = 4.5 \text{ V to } 5.5 \text{ V}$ | | | ±25 | μA |

(1) Test conditions are C1–C4 = 0.1 μ F at V_{CC} = 3.3 V ± 0.3 V; C1 = 0.047 μ F, C2–C4 = 0.33 μ F at V_{CC} = 5 V ± 0.5 V. (2) All typical values are at V_{CC} = 3.3 V or V_{CC} = 5 V, and T_A = 25°C.

(3)Short-circuit durations should be controlled to prevent exceeding the device absolute power dissipation ratings, and not more than one output should be shorted at a time.

Switching Characteristics⁽¹⁾

over recommended ranges of supply voltage and operating free-air temperature (unless otherwise noted) (see Figure 6)

| | PARAMETER | | TEST CONDITIONS | | MIN | TYP ⁽²⁾ | MAX | UNIT |
|--------------------|---|---|--------------------------------------|-------------------------|------|--------------------|-----|--------|
| Maximum data rata | | C _L = 1000 pF | | 250 | | | | |
| | Maximum data rate (see Figure 1) | R _L = 3 kΩ, One DOUT switching | C _L = 250 pF, | V_{CC} = 3 V to 4.5 V | 1000 | | | kbit/s |
| (see rigure r) | one boot switching | C _L = 1000 pF, | V_{CC} = 4.5 V to 5.5 V | 1000 | | | | |
| t _{sk(p)} | Pulse skew ⁽³⁾ | C_{L} = 150 pF to 2500 pF, | $R_L = 3 k\Omega$ to 7 k Ω , | See Figure 2 | | 25 | | ns |
| SR(tr) | Slew rate, transition region (see Figure 1) | $C_{L} = 150 \text{ pF to } 1000 \text{ pF},$ | $R_L = 3 \ k\Omega$ to 7 $k\Omega$, | V _{CC} = 3.3 V | 18 | | 150 | V/µs |

(1) Test conditions are C1–C4 = 0.1 μ F at V_{CC} = 3.3 V ± 0.3 V; C1 = 0.047 μ F, C2–C4 = 0.33 μ F at V_{CC} = 5 V ± 0.5 V. (2) All typical values are at V_{CC} = 3.3 V or V_{CC} = 5 V, and T_A = 25°C. (3) Pulse skew is defined as |t_{PLH} - t_{PHL}| of each channel of the same device.



www.ti.com

RECEIVER SECTION

Electrical Characteristics⁽¹⁾

over recommended ranges of supply voltage and operating free-air temperature (unless otherwise noted) (see Figure 6)

| | PARAMETER | TEST CONDITIONS | MIN | TYP ⁽²⁾ | MAX | UNIT |
|------------------|---|-------------------------------|----------------|-----------------------|-----|------|
| V _{OH} | High-level output voltage | I _{OH} = -1 mA | $V_{CC} - 0.6$ | V _{CC} – 0.1 | | V |
| V _{OL} | Low-level output voltage | I _{OL} = 1.6 mA | | | 0.4 | V |
| V _{IT+} | Positive-going input threshold voltage | $V_{CC} = 3.3 V$ | | 1.6 | 2.4 | V |
| | Positive-going input theshold voltage | $V_{CC} = 5 V$ | | 1.9 | 2.4 | v |
| V | | $V_{CC} = 3.3 V$ | 0.6 | 1.1 | | V |
| V _{IT} | Negative-going input threshold voltage | $V_{CC} = 5 V$ | 0.8 | 1.4 | | v |
| V _{hys} | Input hysteresis (V _{IT+} – V _{IT-}) | | | 0.5 | | V |
| I _{off} | Output leakage current (except ROUT2B) | FORCEOFF = 0 V | | ±0.05 | ±10 | μA |
| r _i | Input resistance | $V_1 = \pm 3 V$ to $\pm 25 V$ | 3 | 5 | 7 | kΩ |

Test conditions are C1–C4 = 0.1 μ F at V_{CC} = 3.3 V ± 0.3 V; C1 = 0.047 μ F, C2–C4 = 0.33 μ F at V_{CC} = 5 V ± 0.5 V. All typical values are at V_{CC} = 3.3 V or V_{CC} = 5 V, and T_A = 25°C. (1)

(2)

Switching Characteristics⁽¹⁾

over recommended ranges of supply voltage and operating free-air temperature (unless otherwise noted)

| | PARAMETER | TEST CONDITIONS | TYP ⁽²⁾ | UNIT |
|--------------------|---|---|--------------------|------|
| t _{PLH} | Propagation delay time, low- to high-level output | $C_L = 150 \text{ pF}$, See Figure 3 | 150 | ns |
| t _{PHL} | Propagation delay time, high- to low-level output | C _L = 150 pF, See Figure 3 | 150 | ns |
| t _{en} | Output enable time | C_L = 150 pF, R_L = 3 k Ω , See Figure 4 | 200 | ns |
| t _{dis} | Output disable time | C_L = 150 pF, R_L = 3 k Ω , See Figure 4 | 200 | ns |
| t _{sk(p)} | Pulse skew ⁽³⁾ | See Figure 3 | 50 | ns |

Test conditions are C1–C4 = 0.1 μ F at V_{CC} = 3.3 V ± 0.3 V; C1 = 0.047 μ F, C2–C4 = 0.33 μ F at V_{CC} = 5 V ± 0.5 V. All typical values are at V_{CC} = 3.3 V or V_{CC} = 5 V, and T_A = 25°C. Pulse skew is defined as |t_{PLH} - t_{PHL}| of each channel of the same device. (1)

(2)

(3)



www.ti.com

AUTO-POWERDOWN SECTION

Electrical Characteristics

over recommended ranges of supply voltage and operating free-air temperature (unless otherwise noted) (see Figure 5)

| | PARAMETER | TEST CONDITIONS | MIN | MAX | UNIT |
|-------------------------|---|--|-----------------------|-----|------|
| V _{T+(valid)} | Receiver input threshold for INVALID high-level output voltage | FORCEON = GND, $\overline{\text{FORCEOFF}} = V_{CC}$ | | 2.7 | V |
| V _{T-(valid)} | Receiver input threshold for INVALID high-level output voltage | FORCEON = GND, $\overline{\text{FORCEOFF}} = V_{CC}$ | -2.7 | | V |
| V _{T(invalid)} | Receiver input threshold for INVALID low-level output voltage | FORCEON = GND, $\overline{\text{FORCEOFF}} = V_{CC}$ | -0.3 | 0.3 | V |
| V _{OH} | INVALID high-level output voltage | $I_{OH} = -1 \text{ mA}$, FORCEON = GND, FORCEOFF = V _{CC} | V _{CC} – 0.6 | | V |
| V _{OL} | INVALID low-level output voltage | $I_{OL} = 1.6 \text{ mA}$, FORCEON = GND, FORCEOFF = V _{CC} | | 0.4 | V |

Switching Characteristics

over recommended ranges of supply voltage and operating free-air temperature (unless otherwise noted) (see Figure 5)

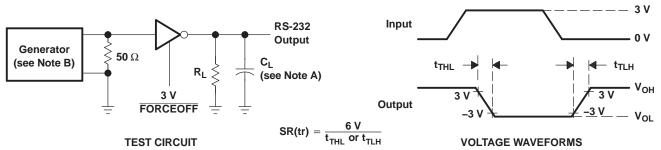
| | PARAMETER | TYP ⁽¹⁾ | UNIT |
|----------------------|---|--------------------|------|
| t _{valid} | Propagation delay time, low- to high-level output | 1 | μs |
| t _{invalid} | Propagation delay time, high- to low-level output | 30 | μs |
| t _{en} | Supply enable time | 100 | μs |

(1) All typical values are at V_{CC} = 3.3 V or V_{CC} = 5 V, and T_A = 25 ^{\circ}C.



SLLS353H-JUNE 1999-REVISED SEPTEMBER 2008

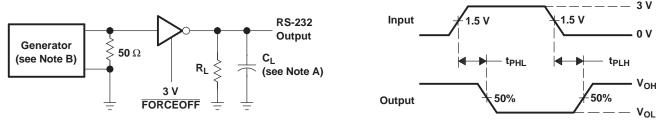




NOTES: A. C_L includes probe and jig capacitance.

B. The pulse generator has the following characteristics: PRR = 1 Mbit/s, $Z_0 = 50 \Omega$, 50% duty cycle, $t_r \le 10$ ns, $t_f \le 10$ ns.

Figure 1. Driver Slew Rate



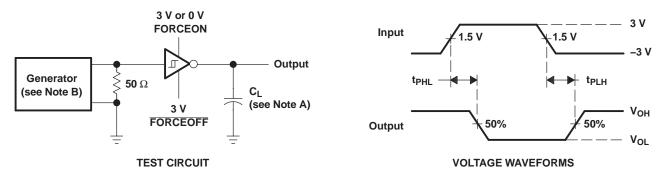
TEST CIRCUIT



NOTES: A. C_L includes probe and jig capacitance.

B. The pulse generator has the following characteristics: PRR = 1 Mbit/s, $Z_0 = 50 \Omega$, 50% duty cycle, $t_r \le 10$ ns. $t_f \le 10$ ns.

Figure 2. Driver Pulse Skew

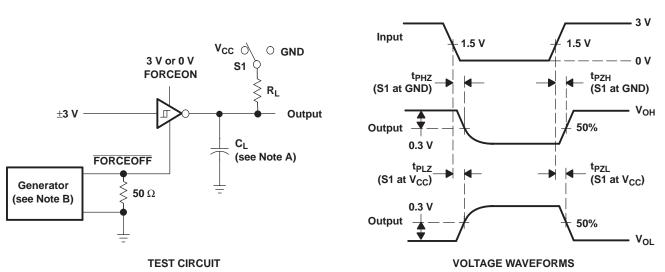


NOTES: A. C_L includes probe and jig capacitance. B. The pulse generator has the following characteristics: $Z_0 = 50 \ \Omega$, 50% duty cycle, $t_r \le 10 \text{ ns}$, $t_f \le 10 \text{ ns}$.

Figure 3. Receiver Propagation Delay Times



SLLS353H-JUNE 1999-REVISED SEPTEMBER 2008



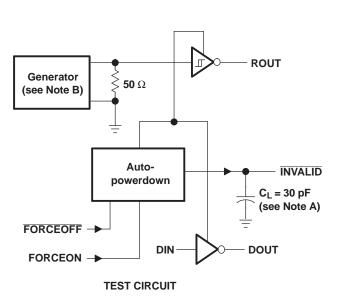
PARAMETER MEASUREMENT INFORMATION (continued)

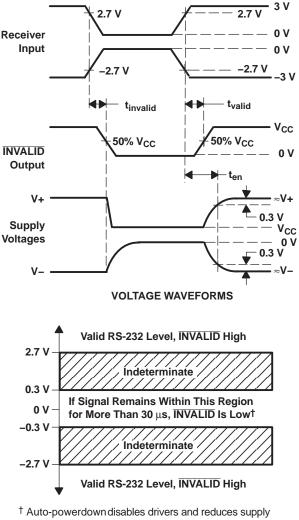
- NOTES: A. C_L includes probe and jig capacitance.
 - B. The pulse generator has the following characteristics: $Z_0 = 50 \ \Omega$, 50% duty cycle, $t_r \le 10 \text{ ns}$, $t_f \le 10 \text{ ns}$.
 - C. t_{PLZ} and t_{PHZ} are the same as t_{dis} .
 - D. t_{PZL} and t_{PZH} are the same as t_{en} .

Figure 4. Receiver Enable and Disable Times

www.ti.com







current to 1 μA.

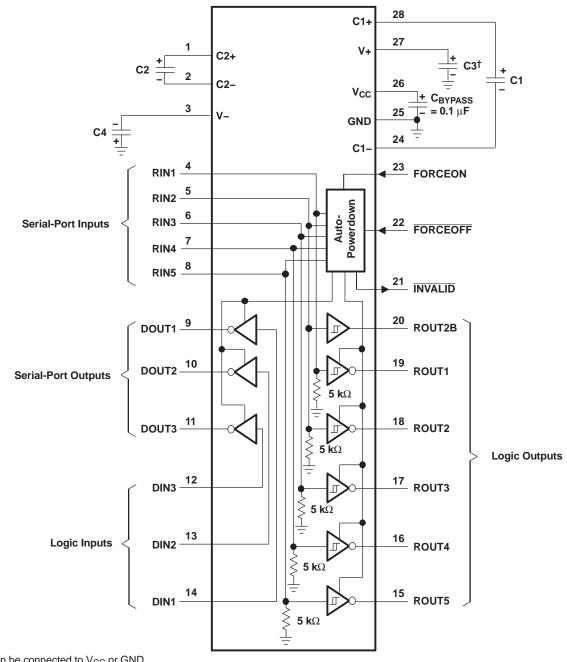
- NOTES: A. C_L includes probe and jig capacitance.
 - B. The pulse generator has the following characteristics: PRR = 5 kbit/s, Z_0 = 50 Ω , 50% duty cycle, $t_r \le 10$ ns, $t_f \le 10$ ns.

Figure 5. INVALID Propagation Delay Times and Supply Enabling Time

Texas

INSTRUMENTS

SLLS353H-JUNE 1999-REVISED SEPTEMBER 2008



PARAMETER MEASUREMENT INFORMATION (continued)

[†] C3 can be connected to V_{CC} or GND.

NOTE A: Resistor values shown are nominal.

| VCC VS CAFACITOR VALUES | | | | | | | |
|--|------------------------------|------------------------------|--|--|--|--|--|
| V _{CC} | C1 | C2, C3, and C4 | | | | | |
| $\begin{array}{c} \textbf{3.3 V} \pm \textbf{0.3 V} \\ \textbf{5 V} \pm \textbf{0.5 V} \\ \textbf{3 V to 5.5 V} \end{array}$ | 0.1 μF 0.047 μF 0.1 μF | 0.1 μF 0.33 μF 0.47 μF | | | | | |

| V _{CC} vs | CAPACITOR | VALUES |
|--------------------|-----------|--------|
|--------------------|-----------|--------|

| Figure 6. | Typical (| Operating | Circuit and | Capacitor | Values |
|-----------|-----------|-----------|-------------|-----------|--------|
|-----------|-----------|-----------|-------------|-----------|--------|

16-Apr-2009

PACKAGING INFORMATION

| Orderable Device | Status ⁽¹⁾ | Package Type | Package Drawing | Pins | Package Qty | e Eco Plan ⁽²⁾ | Lead/Ball Finish | MSL Peak Temp ⁽³⁾ |
|------------------|-----------------------|-----------------|--------------------|------|----------------|---------------------------|------------------|------------------------------|
| SN65C3243DBR | ACTIVE | SSOP | DB | 28 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN65C3243DBRE4 | ACTIVE | SSOP | DB | 28 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN65C3243DBRG4 | ACTIVE | SSOP | DB | 28 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN65C3243DW | ACTIVE | SOIC | DW | 28 | 20 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN65C3243DWE4 | ACTIVE | SOIC | DW | 28 | 20 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN65C3243DWG4 | ACTIVE | SOIC | DW | 28 | 20 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN65C3243DWR | ACTIVE | SOIC | DW | 28 | 1000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN65C3243DWRE4 | ACTIVE | SOIC | DW | 28 | 1000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN65C3243DWRG4 | ACTIVE | SOIC | DW | 28 | 1000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN65C3243PW | ACTIVE | TSSOP | PW | 28 | 50 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN65C3243PWE4 | ACTIVE | TSSOP | PW | 28 | 50 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN65C3243PWG4 | ACTIVE | TSSOP | PW | 28 | 50 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN65C3243PWR | ACTIVE | TSSOP | PW | 28 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN65C3243PWRE4 | ACTIVE | TSSOP | PW | 28 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN65C3243PWRG4 | ACTIVE | TSSOP | PW | 28 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN75C3243DBR | ACTIVE | SSOP | DB | 28 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN75C3243DBRE4 | ACTIVE | SSOP | DB | 28 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN75C3243DBRG4 | ACTIVE | SSOP | DB | 28 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN75C3243DW | ACTIVE | SOIC | DW | 28 | 20 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN75C3243DWE4 | ACTIVE | SOIC | DW | 28 | 20 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN75C3243DWG4 | ACTIVE | SOIC | DW | 28 | 20 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN75C3243DWR | ACTIVE | SOIC | DW | 28 | 1000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN75C3243DWRE4 | ACTIVE | SOIC | DW | 28 | 1000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN75C3243DWRG4 | ACTIVE | SOIC | DW | 28 | 1000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN75C3243PW | ACTIVE | TSSOP | PW | 28 | 50 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |

RUMENTS

| Orderable Device | Status ⁽¹⁾ | Package Type | Package Drawing | Pins | Package Qty | e Eco Plan ⁽²⁾ | Lead/Ball Finish | MSL Peak Temp ⁽³⁾ |
|------------------|-----------------------|-----------------|--------------------|------|----------------|---------------------------|------------------|------------------------------|
| SN75C3243PWE4 | ACTIVE | TSSOP | PW | 28 | 50 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN75C3243PWG4 | ACTIVE | TSSOP | PW | 28 | 50 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN75C3243PWR | ACTIVE | TSSOP | PW | 28 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN75C3243PWRE4 | ACTIVE | TSSOP | PW | 28 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN75C3243PWRG4 | ACTIVE | TSSOP | PW | 28 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIN |

⁽¹⁾ The marketing status values are defined as follows:

ACTIVE: Product device recommended for new designs.

LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.

NRND: Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.

PREVIEW: Device has been announced but is not in production. Samples may or may not be available.

OBSOLETE: TI has discontinued the production of the device.

⁽²⁾ Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS), Pb-Free (RoHS Exempt), or Green (RoHS & no Sb/Br) - please check http://www.ti.com/productcontent for the latest availability information and additional product content details.

TBD: The Pb-Free/Green conversion plan has not been defined.

Pb-Free (RoHS): TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.

Pb-Free (RoHS Exempt): This component has a RoHS exemption for either 1) lead-based flip-chip solder bumps used between the die and package, or 2) lead-based die adhesive used between the die and leadframe. The component is otherwise considered Pb-Free (RoHS compatible) as defined above.

Green (RoHS & no Sb/Br): TI defines "Green" to mean Pb-Free (RoHS compatible), and free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material)

⁽³⁾ MSL, Peak Temp. -- The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

Important Information and Disclaimer:The information provided on this page represents TI's knowledge and belief as of the date that it is provided. TI bases its knowledge and belief on information provided by third parties, and makes no representation or warranty as to the accuracy of such information. Efforts are underway to better integrate information from third parties. TI has taken and continues to take reasonable steps to provide representative and accurate information but may not have conducted destructive testing or chemical analysis on incoming materials and chemicals. TI and TI suppliers consider certain information to be proprietary, and thus CAS numbers and other limited information may not be available for release.

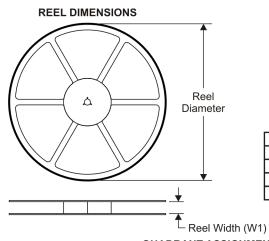
In no event shall TI's liability arising out of such information exceed the total purchase price of the TI part(s) at issue in this document sold by TI to Customer on an annual basis.

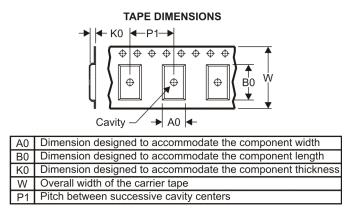
PACKAGE MATERIALS INFORMATION

www.ti.com

Texas Instruments

TAPE AND REEL INFORMATION





QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE



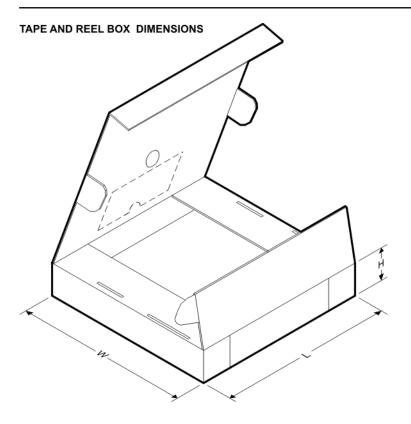
| *All dimensions are nominal | | | | | | | | | | | | |
|-----------------------------|-----------------|--------------------|----|------|--------------------------|--------------------------|------------|------------|------------|------------|-----------|------------------|
| Device | Package Type | Package Drawing | | SPQ | Reel Diameter (mm) | Reel Width W1 (mm) | A0 (mm) | B0 (mm) | K0 (mm) | P1 (mm) | W (mm) | Pin1 Quadrant |
| SN65C3243DBR | SSOP | DB | 28 | 2000 | 330.0 | 16.4 | 8.2 | 10.5 | 2.5 | 12.0 | 16.0 | Q1 |
| SN65C3243DWR | SOIC | DW | 28 | 1000 | 330.0 | 32.4 | 11.35 | 18.67 | 3.1 | 16.0 | 32.0 | Q1 |
| SN65C3243PWR | TSSOP | PW | 28 | 2000 | 330.0 | 16.4 | 7.1 | 10.4 | 1.6 | 12.0 | 16.0 | Q1 |
| SN75C3243DBR | SSOP | DB | 28 | 2000 | 330.0 | 16.4 | 8.2 | 10.5 | 2.5 | 12.0 | 16.0 | Q1 |
| SN75C3243DWR | SOIC | DW | 28 | 1000 | 330.0 | 32.4 | 11.35 | 18.67 | 3.1 | 16.0 | 32.0 | Q1 |
| SN75C3243PWR | TSSOP | PW | 28 | 2000 | 330.0 | 16.4 | 7.1 | 10.4 | 1.6 | 12.0 | 16.0 | Q1 |

TEXAS INSTRUMENTS

www.ti.com

PACKAGE MATERIALS INFORMATION

8-Jul-2011



*All dimensions are nominal

| Device | Package Type | Package Drawing | Pins | SPQ | Length (mm) | Width (mm) | Height (mm) |
|--------------|--------------|-----------------|------|------|-------------|------------|-------------|
| SN65C3243DBR | SSOP | DB | 28 | 2000 | 346.0 | 346.0 | 33.0 |
| SN65C3243DWR | SOIC | DW | 28 | 1000 | 346.0 | 346.0 | 49.0 |
| SN65C3243PWR | TSSOP | PW | 28 | 2000 | 346.0 | 346.0 | 33.0 |
| SN75C3243DBR | SSOP | DB | 28 | 2000 | 346.0 | 346.0 | 33.0 |
| SN75C3243DWR | SOIC | DW | 28 | 1000 | 346.0 | 346.0 | 49.0 |
| SN75C3243PWR | TSSOP | PW | 28 | 2000 | 346.0 | 346.0 | 33.0 |

DW (R-PDSO-G28)

PLASTIC SMALL OUTLINE



NOTES:

A. All linear dimensions are in inches (millimeters). Dimensioning and tolerancing per ASME Y14.5M-1994.

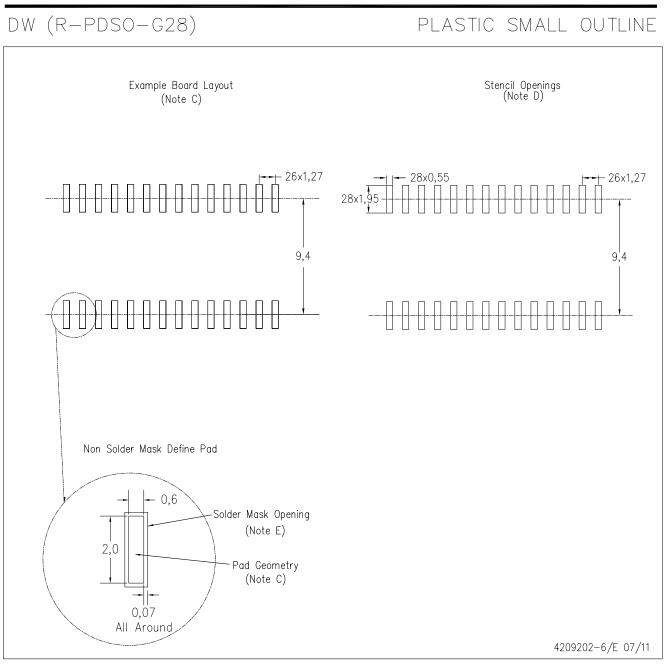
B. This drawing is subject to change without notice.

C. Body dimensions do not include mold flash or protrusion not to exceed 0.006 (0,15).

D. Falls within JEDEC MS-013 variation AE.



LAND PATTERN DATA



NOTES:

A. All linear dimensions are in millimeters.

- B. This drawing is subject to change without notice.
- C. Refer to IPC7351 for alternate board design.
- D. Laser cutting apertures with trapezoidal walls and also rounding corners will offer better paste release. Customers should contact their board assembly site for stencil design recommendations. Refer to IPC-7525
- E. Customers should contact their board fabrication site for solder mask tolerances between and around signal pads.



PW (R-PDSO-G28)

PLASTIC SMALL OUTLINE



NOTES:

A. All linear dimensions are in millimeters. Dimensioning and tolerancing per ASME Y14.5M-1994.
B. This drawing is subject to change without notice.

Body length does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0,15 each side.

Body width does not include interlead flash. Interlead flash shall not exceed 0,25 each side.

E. Falls within JEDEC MO-153



MECHANICAL DATA

MSSO002E - JANUARY 1995 - REVISED DECEMBER 2001

DB (R-PDSO-G**)

PLASTIC SMALL-OUTLINE

28 PINS SHOWN



NOTES: A. All linear dimensions are in millimeters.

- B. This drawing is subject to change without notice.
- C. Body dimensions do not include mold flash or protrusion not to exceed 0,15.
- D. Falls within JEDEC MO-150



IMPORTANT NOTICE

Texas Instruments Incorporated and its subsidiaries (TI) reserve the right to make corrections, modifications, enhancements, improvements, and other changes to its products and services at any time and to discontinue any product or service without notice. Customers should obtain the latest relevant information before placing orders and should verify that such information is current and complete. All products are sold subject to TI's terms and conditions of sale supplied at the time of order acknowledgment.

TI warrants performance of its hardware products to the specifications applicable at the time of sale in accordance with TI's standard warranty. Testing and other quality control techniques are used to the extent TI deems necessary to support this warranty. Except where mandated by government requirements, testing of all parameters of each product is not necessarily performed.

TI assumes no liability for applications assistance or customer product design. Customers are responsible for their products and applications using TI components. To minimize the risks associated with customer products and applications, customers should provide adequate design and operating safeguards.

TI does not warrant or represent that any license, either express or implied, is granted under any TI patent right, copyright, mask work right, or other TI intellectual property right relating to any combination, machine, or process in which TI products or services are used. Information published by TI regarding third-party products or services does not constitute a license from TI to use such products or services or a warranty or endorsement thereof. Use of such information may require a license from a third party under the patents or other intellectual property of the third party, or a license from TI under the patents or other intellectual property of TI.

Reproduction of TI information in TI data books or data sheets is permissible only if reproduction is without alteration and is accompanied by all associated warranties, conditions, limitations, and notices. Reproduction of this information with alteration is an unfair and deceptive business practice. TI is not responsible or liable for such altered documentation. Information of third parties may be subject to additional restrictions.

Resale of TI products or services with statements different from or beyond the parameters stated by TI for that product or service voids all express and any implied warranties for the associated TI product or service and is an unfair and deceptive business practice. TI is not responsible or liable for any such statements.

TI products are not authorized for use in safety-critical applications (such as life support) where a failure of the TI product would reasonably be expected to cause severe personal injury or death, unless officers of the parties have executed an agreement specifically governing such use. Buyers represent that they have all necessary expertise in the safety and regulatory ramifications of their applications, and acknowledge and agree that they are solely responsible for all legal, regulatory and safety-related requirements concerning their products and any use of TI products in such safety-critical applications, notwithstanding any applications-related information or support that may be provided by TI. Further, Buyers must fully indemnify TI and its representatives against any damages arising out of the use of TI products in such safety-critical applications.

TI products are neither designed nor intended for use in military/aerospace applications or environments unless the TI products are specifically designated by TI as military-grade or "enhanced plastic." Only products designated by TI as military-grade meet military specifications. Buyers acknowledge and agree that any such use of TI products which TI has not designated as military-grade is solely at the Buyer's risk, and that they are solely responsible for compliance with all legal and regulatory requirements in connection with such use.

TI products are neither designed nor intended for use in automotive applications or environments unless the specific TI products are designated by TI as compliant with ISO/TS 16949 requirements. Buyers acknowledge and agree that, if they use any non-designated products in automotive applications, TI will not be responsible for any failure to meet such requirements.

Following are URLs where you can obtain information on other Texas Instruments products and application solutions:

| Products | | Applications | |
|------------------------|---------------------------------|-------------------------------|-----------------------------------|
| Audio | www.ti.com/audio | Automotive and Transportation | www.ti.com/automotive |
| Amplifiers | amplifier.ti.com | Communications and Telecom | www.ti.com/communications |
| Data Converters | dataconverter.ti.com | Computers and Peripherals | www.ti.com/computers |
| DLP® Products | www.dlp.com | Consumer Electronics | www.ti.com/consumer-apps |
| DSP | dsp.ti.com | Energy and Lighting | www.ti.com/energy |
| Clocks and Timers | www.ti.com/clocks | Industrial | www.ti.com/industrial |
| Interface | interface.ti.com | Medical | www.ti.com/medical |
| Logic | logic.ti.com | Security | www.ti.com/security |
| Power Mgmt | power.ti.com | Space, Avionics and Defense | www.ti.com/space-avionics-defense |
| Microcontrollers | microcontroller.ti.com | Video and Imaging | www.ti.com/video |
| RFID | www.ti-rfid.com | | |
| OMAP Mobile Processors | www.ti.com/omap | | |
| Wireless Connectivity | www.ti.com/wirelessconnectivity | | |
| | TI 505 0 | | |

TI E2E Community Home Page

e2e.ti.com

Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265 Copyright © 2012, Texas Instruments Incorporated