

# 74LCX245

## Low Voltage Bidirectional Transceiver with 5V Tolerant Inputs and Outputs

### Features

- 5V tolerant inputs and outputs
- 2.3V to 3.6V  $V_{CC}$  specifications provided
- 7.0ns  $t_{PD}$  max. ( $V_{CC} = 3.3V$ ), 10 $\mu$ A  $I_{CC}$  max.
- Power down high impedance inputs and outputs
- Supports live insertion/withdrawal<sup>(1)</sup>
- $\pm 24mA$  output drive ( $V_{CC} = 3.0V$ )
- Implements proprietary noise/EMI reduction circuitry
- Latch-up performance exceeds 500mA
- ESD performance:
  - Human body model > 2000V
  - Machine model > 200V
- Leadless DQFN package

### Note:

1. To ensure the high-impedance state during power up or down,  $\overline{OE}$  should be tied to  $V_{CC}$  through a pull-up resistor: the minimum value of the resistor is determined by the current-sourcing capability of the driver.

### General Description

The LCX245 contains eight non-inverting bidirectional buffers with 3-STATE outputs and is intended for bus oriented applications. The device is designed for low voltage (2.5V and 3.3V)  $V_{CC}$  applications with capability of interfacing to a 5V signal environment. The  $T/\overline{R}$  input determines the direction of data flow through the device. The  $\overline{OE}$  input disables both the A and B ports by placing them in a high impedance state.

The LCX245 is fabricated with an advanced CMOS technology to achieve high speed operation while maintaining CMOS low power dissipation.

### Ordering Information

| Order Number               | Package Number | Package Description   |
|----------------------------|----------------|---|
| 74LCX245WM                 | M20B           | 20-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-013, 0.300" Wide                  |
| 74LCX245SJ                 | M20D           | 20-Lead Small Outline Package (SOP), EIAJ TYPE II, 5.3mm Wide                               |
| 74LCX245BQX <sup>(2)</sup> | MLP20B         | 20-Terminal Depopulated Quad Very-Thin Flat Pack No Leads (DQFN), JEDEC MO-241, 2.5 x 4.5mm |
| 74LCX245MSA                | MSA20          | 20-Lead Shrink Small Outline Package (SSOP), JEDEC MO-150, 5.3mm Wide                       |
| 74LCX245MTC                | MTC20          | 20-Lead Thin Shrink Small Outline Package (TSSOP), JEDEC MO-153, 4.4mm Wide                 |

### Note:

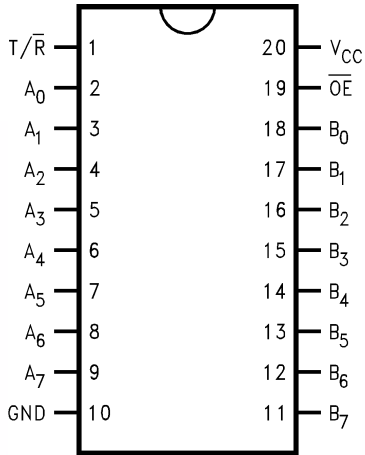
2. DQFN package available in Tape and Reel only.

Device also available in Tape and Reel. Specify by appending suffix letter "X" to the ordering number.

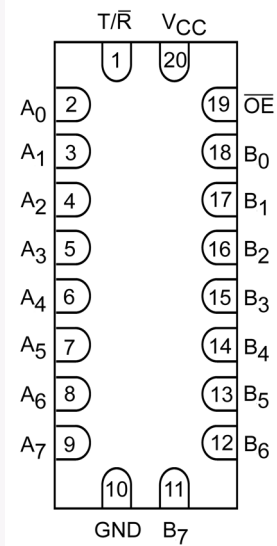
 All packages are lead free per JEDEC: J-STD-020B standard.

## Connection Diagrams

Pin Assignments for SOIC, SOP, SSOP, and TSSOP



Pin Assignment for DQFN

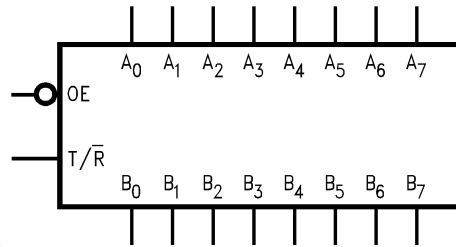


(Top Through View)

## Pin Description

| Pin Names        | Description                      |
|------------------|----------------------------------|
| $\overline{OE}$  | Output Enable Input              |
| $T/\overline{R}$ | Transmit/Receive Input           |
| $A_0-A_7$        | Side A Inputs or 3-STATE Outputs |
| $B_0-B_7$        | Side B Inputs or 3-STATE Outputs |

## Logic Symbol



## Truth Table

| Inputs |                  | Outputs   |
|--------|------------------|---|
| OE     | $T/\overline{R}$ |   |
| L      | L                | Bus $B_0 - B_7$ Data to Bus $A_0 - A_7$               |
| L      | H                | Bus $A_0 - A_7$ Data to Bus $B_0 - B_7$               |
| H      | X                | HIGH Z State on $A_0 - A_7, B_0 - B_7$ <sup>(3)</sup> |

H = HIGH Voltage Level

L = LOW Voltage Level

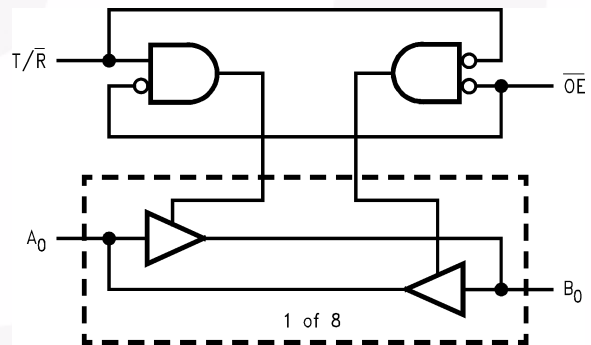
X = Immaterial

Z = High Impedance

### Note:

3. Unused bus terminals during HIGH Z State must be held HIGH or LOW.

## Logic Diagram



## Absolute Maximum Ratings

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only.

| Symbol    | Parameter                                  | Rating                   |
|-----------|--|--------------------------|
| $V_{CC}$  | Supply Voltage                             | -0.5V to +7.0V           |
| $V_I$     | DC Input Voltage                           | -0.5V to +7.0V           |
| $V_O$     | DC Output Voltage<br>Output in 3-STATE     | -0.5V to +7.0V           |
|           | Output in HIGH or LOW State <sup>(4)</sup> | -0.5V to $V_{CC} + 0.5V$ |
| $I_{IK}$  | DC Input Diode Current, $V_I < GND$        | -50mA                    |
| $I_{OK}$  | DC Output Diode Current<br>$V_O < GND$     | -50mA                    |
|           | $V_O > V_{CC}$                             | +50mA                    |
| $I_O$     | DC Output Source/Sink Current              | $\pm 50mA$               |
| $I_{CC}$  | DC Supply Current per Supply Pin           | $\pm 100mA$              |
| $I_{GND}$ | DC Ground Current per Ground Pin           | $\pm 100mA$              |
| $T_{STG}$ | Storage Temperature                        | -65°C to +150°C          |

### Note:

4.  $I_O$  Absolute Maximum Rating must be observed.

## Recommended Operating Conditions<sup>(5)</sup>

The Recommended Operating Conditions table defines the conditions for actual device operation. Recommended operating conditions are specified to ensure optimal performance to the datasheet specifications. Fairchild does not recommend exceeding them or designing to absolute maximum ratings.

| Symbol                | Parameter   | Min. | Max.     | Units |
|-----------------------|---|------|----------|-------|
| $V_{CC}$              | Supply Voltage<br>Operating                             | 2.0  | 3.6      | V     |
|                       | Data Retention  | 1.5  | 3.6      |       |
| $V_I$                 | Input Voltage   | 0    | 5.5      | V     |
| $V_O$                 | Output Voltage<br>3-STATE                               | 0    | 5.5      | V     |
|                       | HIGH or LOW State                                       | 0    | $V_{CC}$ |       |
| $I_{OH} / I_{OL}$     | Output Current<br>$V_{CC} = 3.0V-3.6V$                  |      | $\pm 24$ | mA    |
|                       | $V_{CC} = 2.7V-3.0V$                                    |      | $\pm 12$ |       |
|                       | $V_{CC} = 2.3V-2.7V$                                    |      | $\pm 8$  |       |
| $T_A$                 | Free-Air Operating Temperature                          | -40  | 85       | °C    |
| $\Delta t / \Delta V$ | Input Edge Rate, $V_{IN} = 0.8V-2.0V$ , $V_{CC} = 3.0V$ | 0    | 10       | ns/V  |

### Note:

5. Unused inputs must be held HIGH or LOW. They may not float.

## DC Electrical Characteristics

| Symbol           | Parameter                             | V <sub>CC</sub> (V) | Conditions  | T <sub>A</sub> = -40°C to +85°C |      | Units |
|------------------|---------------------------------------|---------------------|---|---------------------------------|------|-------|
|                  |                                       |                     |   | Min.                            | Max. |       |
| V <sub>IH</sub>  | HIGH Level Input Voltage              | 2.3–2.7             |   | 1.7                             |      | V     |
|                  |                                       | 2.7–3.6             |   | 2.0                             |      |       |
| V <sub>IL</sub>  | LOW Level Input Voltage               | 2.3–2.7             |   |                                 | 0.7  | V     |
|                  |                                       | 2.7–3.6             |   |                                 | 0.8  |       |
| V <sub>OH</sub>  | HIGH Level Output Voltage             | 2.3–3.6             | I <sub>OH</sub> = -100μA  | V <sub>CC</sub> - 0.2           |      | V     |
|                  |                                       | 2.3                 | I <sub>OH</sub> = -8mA  | 1.8                             |      |       |
|                  |                                       | 2.7                 | I <sub>OH</sub> = -12mA   | 2.2                             |      |       |
|                  |                                       | 3.0                 | I <sub>OH</sub> = -18mA   | 2.4                             |      |       |
|                  |                                       |                     | I <sub>OH</sub> = -24mA   | 2.2                             |      |       |
| V <sub>OL</sub>  | LOW Level Output Voltage              | 2.3–3.6             | I <sub>OL</sub> = 100μA   |                                 | 0.2  | V     |
|                  |                                       | 2.3                 | I <sub>OL</sub> = 8mA   |                                 | 0.6  |       |
|                  |                                       | 2.7                 | I <sub>OL</sub> = 12mA  |                                 | 0.4  |       |
|                  |                                       | 3.0                 | I <sub>OL</sub> = 16mA  |                                 | 0.4  |       |
|                  |                                       |                     | I <sub>OL</sub> = 24mA  |                                 | 0.55 |       |
| I <sub>I</sub>   | Input Leakage Current                 | 2.3–3.6             | 0 ≤ V <sub>I</sub> ≤ 5.5V   |                                 | ±5.0 | μA    |
| I <sub>OZ</sub>  | 3-STATE Output Leakage                | 2.3–3.6             | 0 ≤ V <sub>O</sub> ≤ 5.5V,<br>V <sub>I</sub> = V <sub>IH</sub> or V <sub>IL</sub> |                                 | ±5.0 | μA    |
| I <sub>OFF</sub> | Power-Off Leakage Current             | 0                   | V <sub>I</sub> or V <sub>O</sub> = 5.5V   |                                 | 10   | μA    |
| I <sub>CC</sub>  | Quiescent Supply Current              | 2.3–3.6             | V <sub>I</sub> = V <sub>CC</sub> or GND   |                                 | 10   | μA    |
|                  |                                       |                     | 3.6V ≤ V <sub>I</sub> , V <sub>O</sub> ≤ 5.5V <sup>(6)</sup>                      |                                 | ±10  |       |
| ΔI <sub>CC</sub> | Increase in I <sub>CC</sub> per Input | 2.3–3.6             | V <sub>IH</sub> = V <sub>CC</sub> - 0.6V  |                                 | 500  | μA    |

## Note:

6. Outputs disabled or 3-STATE only.

## AC Electrical Characteristics

| Symbol                                | Parameter  | T <sub>A</sub> = -40°C to +85°C, R <sub>L</sub> = 500Ω  |      |  |      |   |      | Units |
|---------------------------------------|--|---|------|--|------|---|------|-------|
|                                       |  | V <sub>CC</sub> = 3.3V ± 0.3V,<br>C <sub>L</sub> = 50pF |      | V <sub>CC</sub> = 2.7V,<br>C <sub>L</sub> = 50pF |      | V <sub>CC</sub> = 2.5V ± 0.2V,<br>C <sub>L</sub> = 30pF |      |       |
|                                       |  | Min.  | Max. | Min.   | Max. | Min.  | Max. |       |
| t <sub>PHL</sub> , t <sub>PLH</sub>   | Propagation Delay,<br>A <sub>n</sub> to B <sub>n</sub> or B <sub>n</sub> to A <sub>n</sub> | 1.5   | 7.0  | 1.5  | 8.0  | 1.5   | 8.4  | ns    |
| t <sub>PZL</sub> , t <sub>PZH</sub>   | Output Enable Time   | 1.5   | 8.5  | 1.5  | 9.5  | 1.5   | 10.5 | ns    |
| t <sub>PLZ</sub> , t <sub>PHZ</sub>   | Output Disable Time  | 1.5   | 7.5  | 1.5  | 8.5  | 1.5   | 9.0  | ns    |
| t <sub>OSHL</sub> , t <sub>OSLH</sub> | Output to Output Skew <sup>(7)</sup>   |   | 1.0  |  |      |   |      | ns    |

## Note:

7. Skew is defined as the absolute value of the difference between the actual propagation delay for any two separate outputs of the same device. The specification applies to any outputs switching in the same direction, either HIGH-to-LOW (t<sub>OSHL</sub>) or LOW-to-HIGH (t<sub>OSLH</sub>).

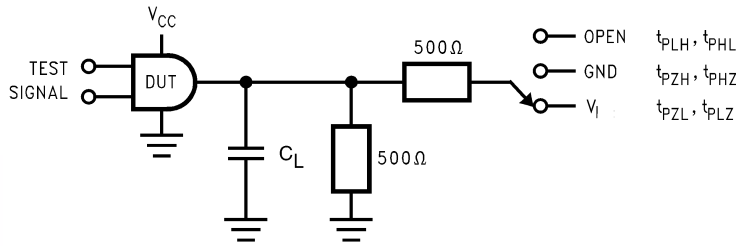
**Dynamic Switching Characteristics**

| Symbol           | Parameter                                   | V <sub>CC</sub> (V) | Conditions  | T <sub>A</sub> = 25°C |      |
|------------------|---|---------------------|---|-----------------------|------|
|                  |   |                     |   | Typical               | Unit |
| V <sub>OLP</sub> | Quiet Output Dynamic Peak V <sub>OL</sub>   | 3.3                 | C <sub>L</sub> = 50pF, V <sub>IH</sub> = 3.3V, V <sub>IL</sub> = 0V | 0.8                   | V    |
|                  |   | 2.5                 | C <sub>L</sub> = 30pF, V <sub>IH</sub> = 2.5V, V <sub>IL</sub> = 0V | 0.6                   |      |
| V <sub>OLV</sub> | Quiet Output Dynamic Valley V <sub>OL</sub> | 3.3                 | C <sub>L</sub> = 50pF, V <sub>IH</sub> = 3.3V, V <sub>IL</sub> = 0V | -0.8                  | V    |
|                  |   | 2.5                 | C <sub>L</sub> = 30pF, V <sub>IH</sub> = 2.5V, V <sub>IL</sub> = 0V | -0.6                  |      |

**Capacitance**

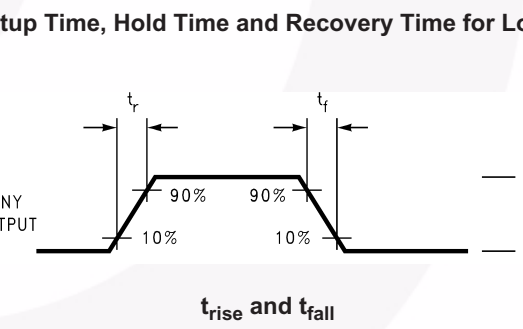
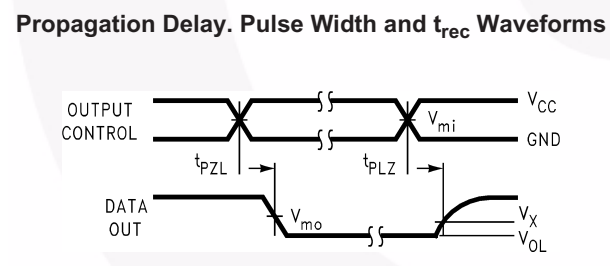
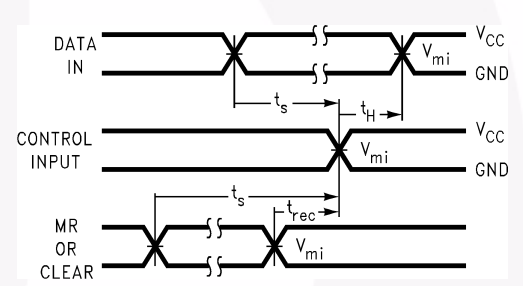
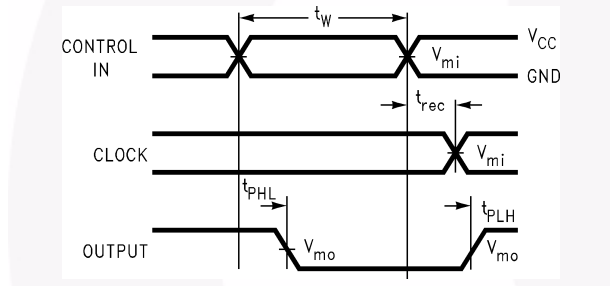
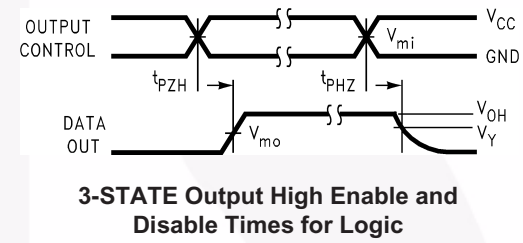
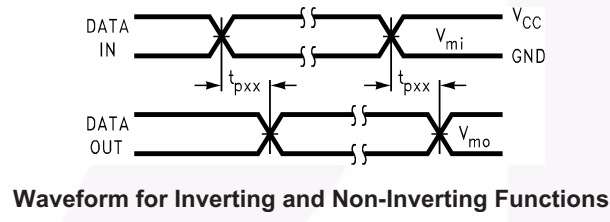
| Symbol           | Parameter                     | Conditions   | Typical | Units |
|------------------|-------------------------------|--|---------|-------|
| C <sub>IN</sub>  | Input Capacitance             | V <sub>CC</sub> = Open, V <sub>I</sub> = 0V or V <sub>CC</sub>             | 7.0     | pF    |
| C <sub>OUT</sub> | Output Capacitance            | V <sub>CC</sub> = 3.3V, V <sub>I</sub> = 0V or V <sub>CC</sub>             | 8.0     | pF    |
| C <sub>PD</sub>  | Power Dissipation Capacitance | V <sub>CC</sub> = 3.3V, V <sub>I</sub> = 0V or V <sub>CC</sub> , f = 10MHz | 25.0    | pF    |

### AC Loading and Waveforms (Generic for LCX Family)



| Test               | Switch  |
|--------------------|---|
| $t_{PLH}, t_{PHL}$ | Open  |
| $t_{PZL}, t_{PLZ}$ | 6V at $V_{CC} = 3.3 \pm 0.3V$<br>$V_{CC} \times 2$ at $V_{CC} = 2.5 \pm 0.2V$ |
| $t_{PZH}, t_{PHZ}$ | GND   |

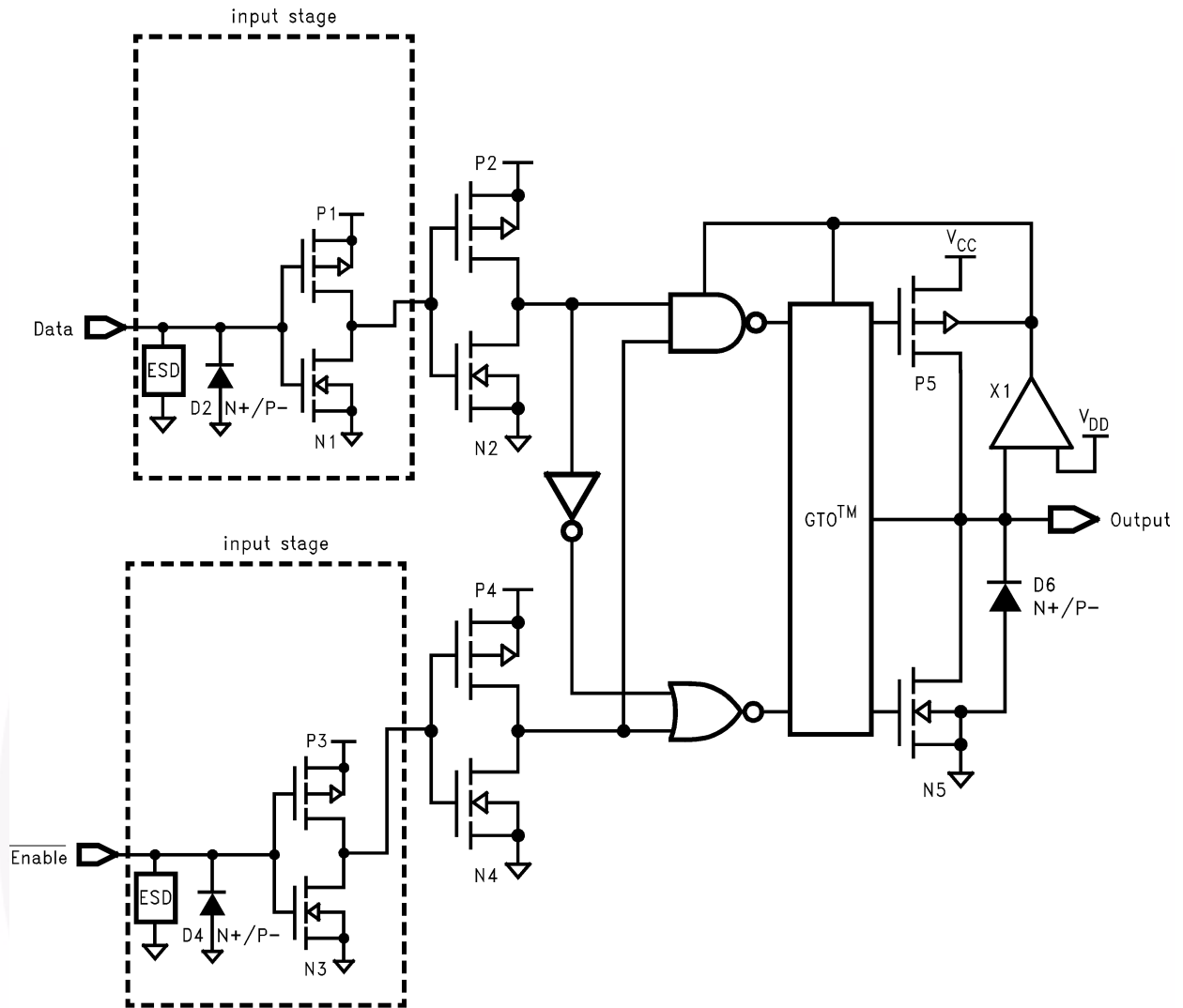
Figure 1. AC Test Circuit ( $C_L$  includes probe and jig capacitance)



| Symbol   | $V_{CC}$        |                 |                  |
|----------|-----------------|-----------------|------------------|
|          | $3.3V \pm 0.3V$ | 2.7V            | $2.5V \pm 0.2V$  |
| $V_{mi}$ | 1.5V            | 1.5V            | $V_{CC}/2$       |
| $V_{mo}$ | 1.5V            | 1.5V            | $V_{CC}/2$       |
| $V_x$    | $V_{OL} + 0.3V$ | $V_{OL} + 0.3V$ | $V_{OL} + 0.15V$ |
| $V_y$    | $V_{OH} - 0.3V$ | $V_{OH} - 0.3V$ | $V_{OH} - 0.15V$ |

Figure 2. Waveforms (Input Characteristics;  $f = 1MHz, t_r = t_f = 3ns$ )

**Schematic Diagram** (Generic for LCX Family)

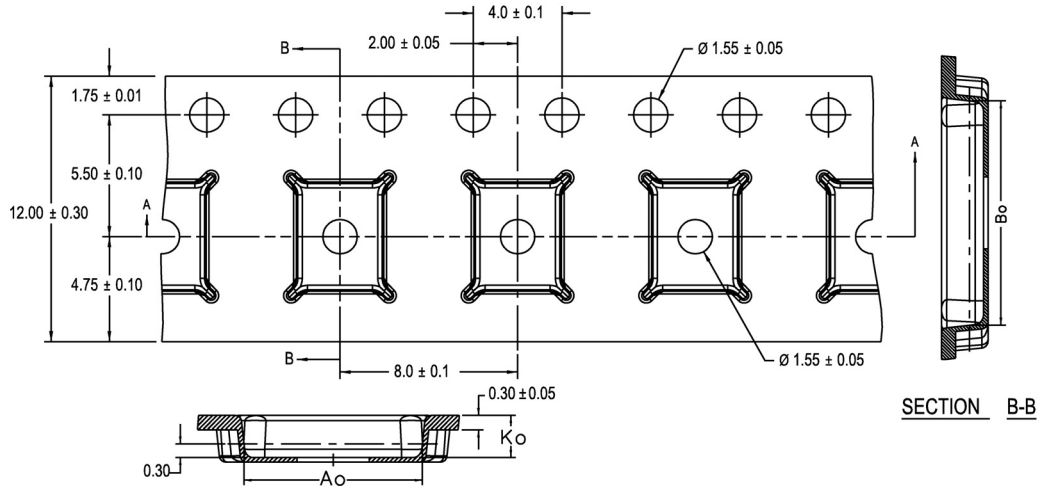


## Tape and Reel Specification

### Tape Format for DQFN

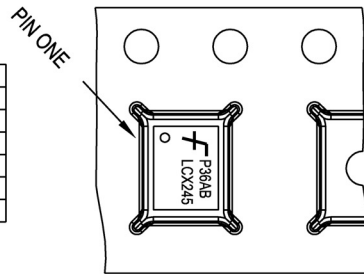
| Package Designator | Tape Section       | Number of Cavities | Cavity Status | Cover Tape Status |
|--------------------|--------------------|--------------------|---------------|-------------------|
| BQX                | Leader (Start End) | 125 (typ.)         | Empty         | Sealed            |
|                    | Carrier            | 3000               | Filled        | Sealed            |
|                    | Trailer (Hub End)  | 75 (typ.)          | Empty         | Sealed            |

### Tape Dimension inches (millimeters)

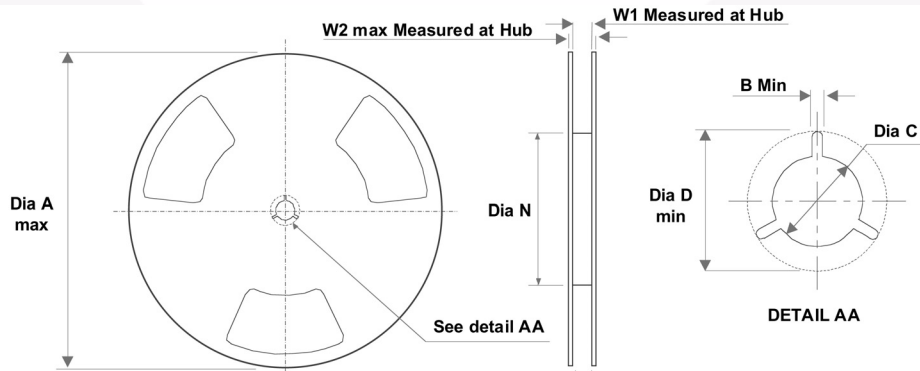


| PKG. SIZE | DIM. A <sub>o</sub> | DIM. B <sub>o</sub> | DIM. K <sub>o</sub> |
|-----------|---------------------|---------------------|---------------------|
| 3.0 X 3.0 | 3.3±0.1             | 3.3±0.1             | 0.9±0.1             |
| 3.5 X 4.5 | 3.8±0.1             | 4.8±0.1             | 0.9±0.1             |
| 2.5 X 4.5 | 2.8±0.1             | 4.8±0.1             | 0.9±0.1             |
| 2.5 X 3.5 | 2.8±0.1             | 3.8±0.1             | 0.9±0.1             |
| 2.5 X 3.0 | 2.8±0.1             | 3.3±0.1             | 0.9±0.1             |

DIMENSIONS ARE IN MILLIMETERS



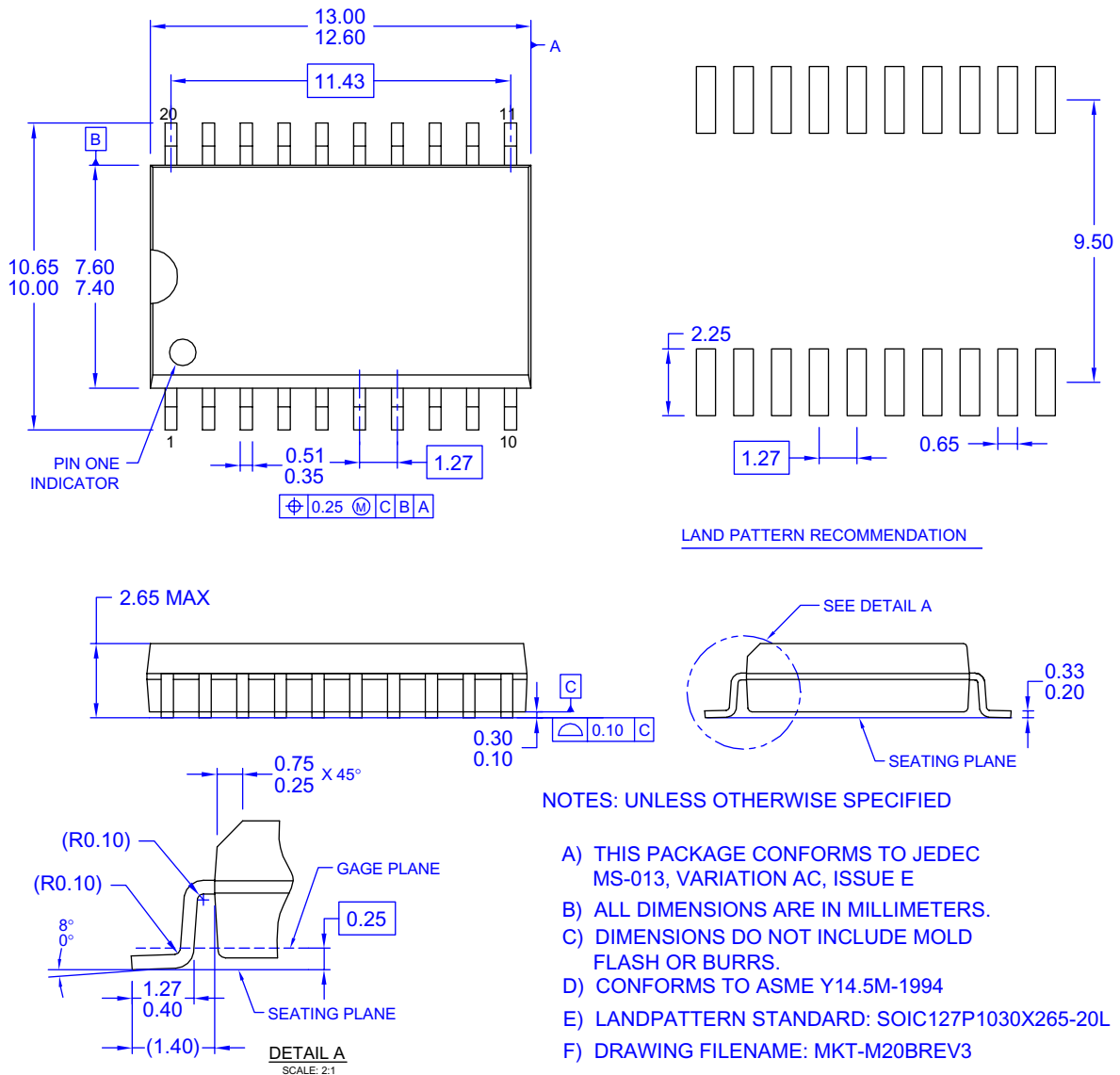
### Reel Dimensions inches (millimeters)



| Tape Size | A            | B            | C             | D             | N             | W1           | W2           |
|-----------|--------------|--------------|---------------|---------------|---------------|--------------|--------------|
| 12mm      | 13.0 (330.0) | 0.059 (1.50) | 0.512 (13.00) | 0.795 (20.20) | 2.165 (55.00) | 0.488 (12.4) | 0.724 (18.4) |



### Physical Dimensions



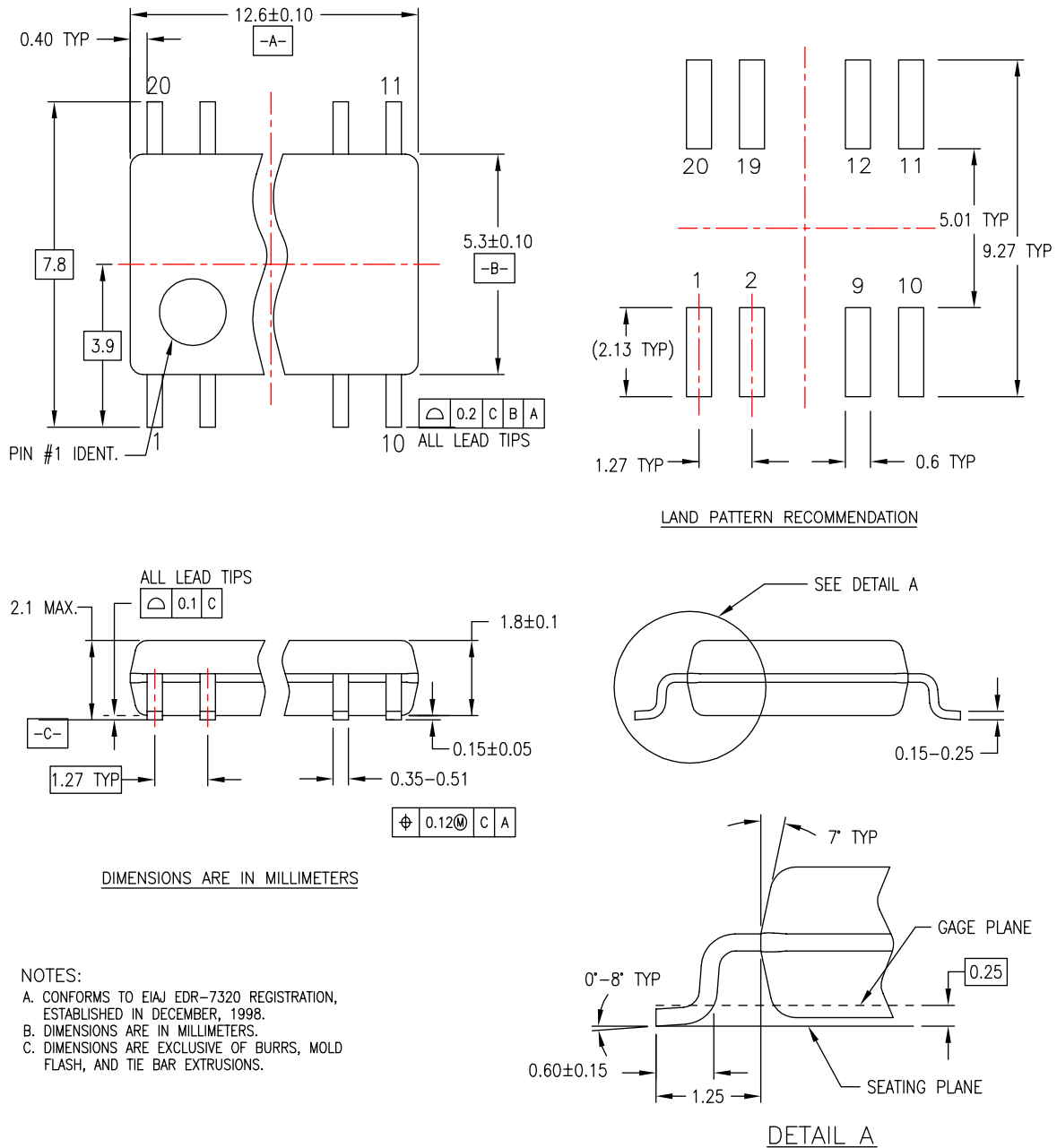
**Figure 3. 20-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-013, 0.300" Wide**

Package drawings are provided as a service to customers considering Fairchild components. Drawings may change in any manner without notice. Please note the revision and/or date on the drawing and contact a Fairchild Semiconductor representative to verify or obtain the most recent revision. Package specifications do not expand the terms of Fairchild's worldwide terms and conditions, specifically the warranty therein, which covers Fairchild products.

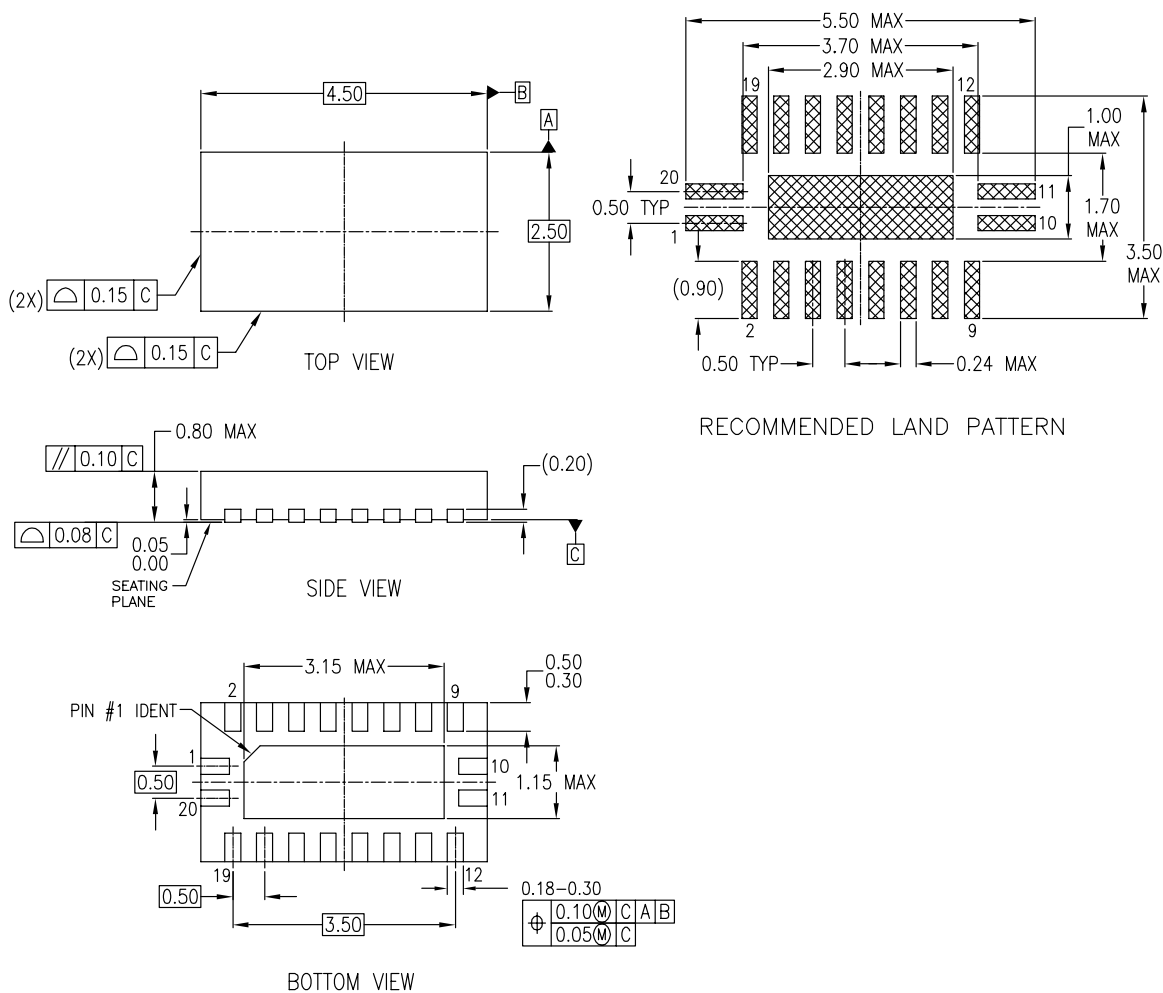
Always visit Fairchild Semiconductor's online packaging area for the most recent package drawings:

<http://www.fairchildsemi.com/packaging/>

**Physical Dimensions (Continued)**



Physical Dimensions (Continued)



NOTES:

- A. CONFORMS TO JEDEC REGISTRATION MO-241, VARIATION AC
- B. DIMENSIONS ARE IN MILLIMETERS.
- C. DIMENSIONS AND TOLERANCES PER ASME Y14.5M, 1994

MLP20BrevA

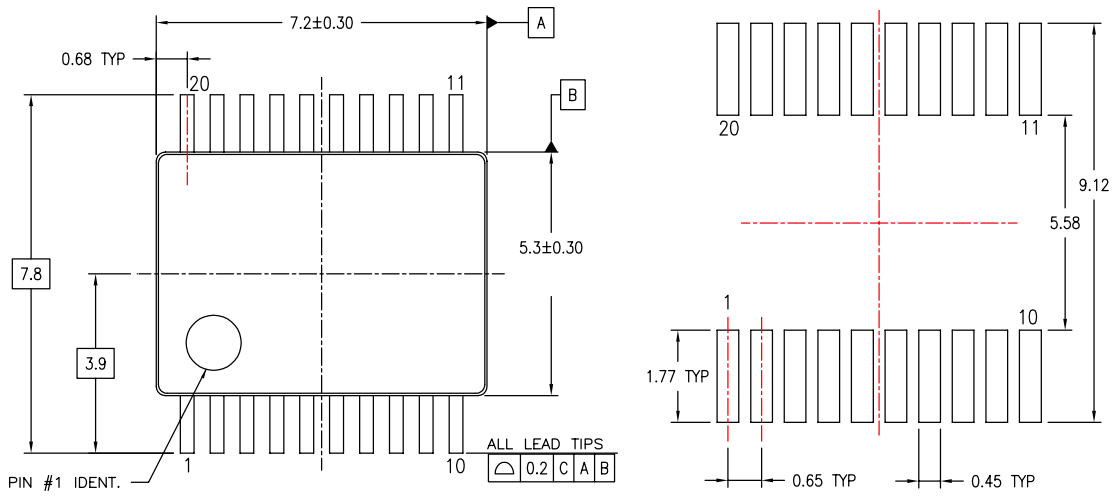
Figure 5. 20-Terminal Depopulated Quad Very-Thin Flat Pack No Leads (DQFN), JEDEC MO-241, 2.5 x 4.5mm

Package drawings are provided as a service to customers considering Fairchild components. Drawings may change in any manner without notice. Please note the revision and/or date on the drawing and contact a Fairchild Semiconductor representative to verify or obtain the most recent revision. Package specifications do not expand the terms of Fairchild's worldwide terms and conditions, specifically the warranty therein, which covers Fairchild products.

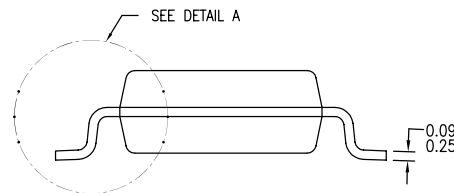
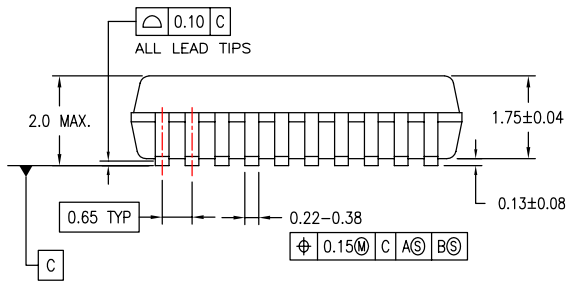
Always visit Fairchild Semiconductor's online packaging area for the most recent package drawings:

<http://www.fairchildsemi.com/packaging/>

**Physical Dimensions (Continued)**



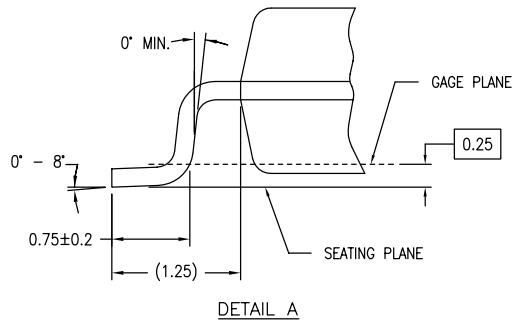
**LAND PATTERN RECOMMENDATIONS**



DIMENSIONS ARE IN MILLIMETERS

**NOTES:**

- A. CONFORMS TO JEDEC REGISTRATION MO-150, VARIATION AE, DATE 1/94.
- B. DIMENSIONS ARE IN MILLIMETERS.
- C. DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH, AND TIE BAR EXTRUSIONS.
- D. DIMENSIONS AND TOLERANCES PER ASME Y14.5M - 1994.



MSA20REVB

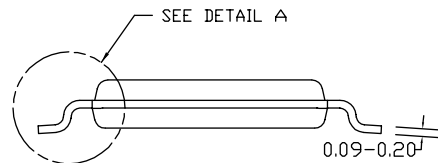
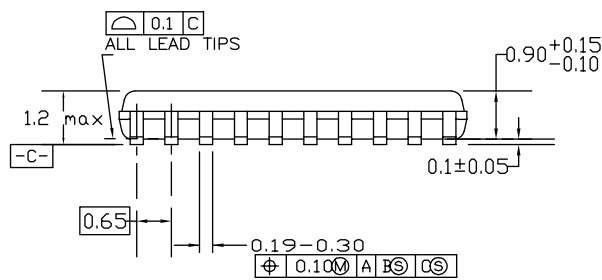
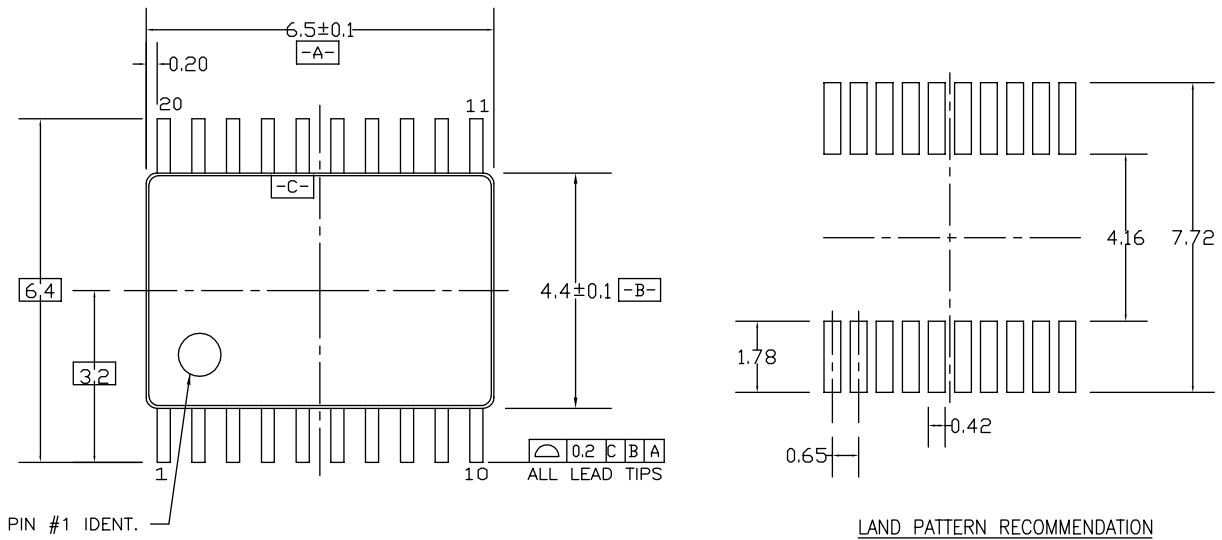
**Figure 6. 20-Lead Shrink Small Outline Package (SSOP), JEDEC MO-150, 5.3mm Wide**

Package drawings are provided as a service to customers considering Fairchild components. Drawings may change in any manner without notice. Please note the revision and/or date on the drawing and contact a Fairchild Semiconductor representative to verify or obtain the most recent revision. Package specifications do not expand the terms of Fairchild's worldwide terms and conditions, specifically the warranty therein, which covers Fairchild products.

Always visit Fairchild Semiconductor's online packaging area for the most recent package drawings:

<http://www.fairchildsemi.com/packaging/>

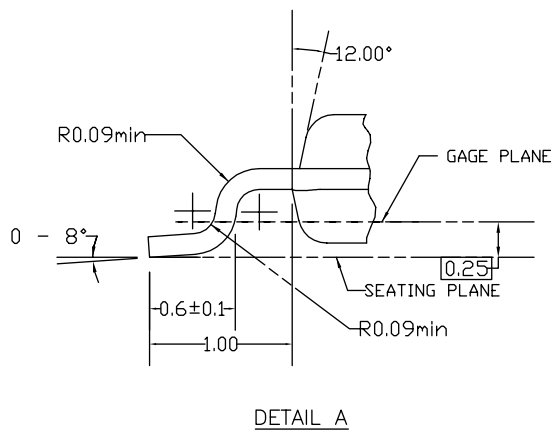
Physical Dimensions (Continued)



DIMENSIONS ARE IN MILLIMETERS

NOTES:

- A. CONFORMS TO JEDEC REGISTRATION MO-153, VARIATION AC, REF NOTE 6, DATE 7/93.
- B. DIMENSIONS ARE IN MILLIMETERS.
- C. DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLDS FLASH, AND TIE BAR EXTRUSIONS.
- D. DIMENSIONS AND TOLERANCES PER ANSI Y14.5M, 1982.



MTC20REV D1

Figure 8. 20-Lead Thin Shrink Small Outline Package (TSSOP), JEDEC MO-153, 4.4mm Wide

Package drawings are provided as a service to customers considering Fairchild components. Drawings may change in any manner without notice. Please note the revision and/or date on the drawing and contact a Fairchild Semiconductor representative to verify or obtain the most recent revision. Package specifications do not expand the terms of Fairchild's worldwide terms and conditions, specifically the warranty therein, which covers Fairchild products.



Always visit Fairchild Semiconductor's online packaging area for the most recent package drawings:

<http://www.fairchildsemi.com/packaging/>



**TRADEMARKS**

The following includes registered and unregistered trademarks and service marks, owned by Fairchild Semiconductor and/or its global subsidiaries, and is not intended to be an exhaustive list of all such trademarks.

- |   |  |  |                                  |
|---|--|--|----------------------------------|
| ACEx <sup>®</sup>   | FPS <sup>™</sup>                             | PDP-SPM <sup>™</sup>                   | SupreMOS <sup>™</sup>            |
| Build it Now <sup>™</sup>   | FRFET <sup>®</sup>                           | Power220 <sup>®</sup>                  | SyncFET <sup>™</sup>             |
| CorePLUS <sup>™</sup>   | Global Power Resource <sup>SM</sup>          | POWEREDGE <sup>®</sup>                 | SYSTEM <sup>®</sup>              |
| CROSSVOLT <sup>™</sup>  | Green FPS <sup>™</sup>                       | Power-SPM <sup>™</sup>                 | GENERAL <sup>®</sup>             |
| CTL <sup>™</sup>  | Green FPS <sup>™</sup> e-Series <sup>™</sup> | PowerTrench <sup>®</sup>               | The Power Franchise <sup>®</sup> |
| Current Transfer Logic <sup>™</sup>   | GTO <sup>™</sup>                             | Programmable Active Droop <sup>™</sup> | power <sup>®</sup>               |
| EcoSPARK <sup>®</sup>   | i-Lo <sup>™</sup>                            | QFET <sup>®</sup>                      | the franchise                    |
| EZSWITCH <sup>™</sup> *   | IntelliMAX <sup>™</sup>                      | QS <sup>™</sup>                        | TinyBoost <sup>™</sup>           |
|  ™ | ISOPLANAR <sup>™</sup>                       | QT Optoelectronics <sup>™</sup>        | TinyBuck <sup>™</sup>            |
|  ™ | MegaBuck <sup>™</sup>                        | Quiet Series <sup>™</sup>              | TinyLogic <sup>®</sup>           |
| Fairchild <sup>®</sup>  | MICROCOUPLER <sup>™</sup>                    | RapidConfigure <sup>™</sup>            | TINYOPTO <sup>™</sup>            |
| Fairchild Semiconductor <sup>®</sup>  | MicroFET <sup>™</sup>                        | SMART START <sup>™</sup>               | TinyPower <sup>™</sup>           |
| FACT Quiet Series <sup>™</sup>  | MicroPak <sup>™</sup>                        | SPM <sup>®</sup>                       | TinyPWM <sup>™</sup>             |
| FACT <sup>®</sup>   | MillerDrive <sup>™</sup>                     | STEALTH <sup>™</sup>                   | TinyWire <sup>™</sup>            |
| FAST <sup>®</sup>   | Motion-SPM <sup>™</sup>                      | SuperFET <sup>™</sup>                  | μSerDes <sup>™</sup>             |
| FastvCore <sup>™</sup>  | OPTOLOGIC <sup>®</sup>                       | SuperSOT <sup>™</sup> 3                | UHC <sup>®</sup>                 |
| FlashWriter <sup>®</sup> *  | OPTOPLANAR <sup>®</sup>                      | SuperSOT <sup>™</sup> 6                | Ultra FRFET <sup>™</sup>         |
|   |  | SuperSOT <sup>™</sup> 8                | UniFET <sup>™</sup>              |
|   |  |  | VCX <sup>™</sup>                 |

\* EZSWITCH<sup>™</sup> and FlashWriter<sup>®</sup> are trademarks of System General Corporation, used under license by Fairchild Semiconductor.

**DISCLAIMER**

FAIRCHILD SEMICONDUCTOR RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION, OR DESIGN. FAIRCHILD DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN; NEITHER DOES IT CONVEY ANY LICENSE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS. THESE SPECIFICATIONS DO NOT EXPAND THE TERMS OF FAIRCHILD'S WORLDWIDE TERMS AND CONDITIONS, SPECIFICALLY THE WARRANTY THEREIN, WHICH COVERS THESE PRODUCTS.

**LIFE SUPPORT POLICY**

FAIRCHILD'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF FAIRCHILD SEMICONDUCTOR CORPORATION.

As used herein:

- Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body or (b) support or sustain life, and (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury of the user.
- A critical component in any component of a life support, device, or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

**PRODUCT STATUS DEFINITIONS**

**Definition of Terms**

| Datasheet Identification | Product Status         | Definition   |
|--------------------------|------------------------|--|
| Advance Information      | Formative or In Design | This datasheet contains the design specifications for product development. Specifications may change in any manner without notice.   |
| Preliminary              | First Production       | This datasheet contains preliminary data; supplementary data will be published at a later date. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve design. |
| No Identification Needed | Full Production        | This datasheet contains final specifications. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve the design.   |
| Obsolete                 | Not In Production      | This datasheet contains specifications on a product that has been discontinued by Fairchild Semiconductor. The datasheet is printed for reference information only.                                      |

Rev. I33