



High Speed CMOS Bus Interface 8-, 9-, and 10-Bit Latches

QS54/74FCT841T
QS54/74FCT843T
QS54/74FCT845T*

QS54/74FCT2841T
QS54/74FCT2843T*
QS54/74FCT2845T*

FEATURES/BENEFITS

- Pin and function compatible to the Am29841 /29843/29845 74FCT 841/843/845 and 74FCT841T/843T/845T
- CMOS power levels: <7.5 mW static
- Available in DIP, SOIC, QSOP, ZIP
- Undershoot Clamp diodes on all inputs
- TTL-compatible input and output levels
- Ground bounce controlled outputs
- Reduced output swing of 0-3.5V
- Military product compliant to MIL-STD-883

FCT-T 841T, 843T, 845T

- JEDEC-FCT spec compatible
- Fastest CMOS Logic family Available
- A, B, and C speed grades with 5.5 ns t_{PD} for C
- $I_{OL} = 48$ mA Com, 32 mA Mil

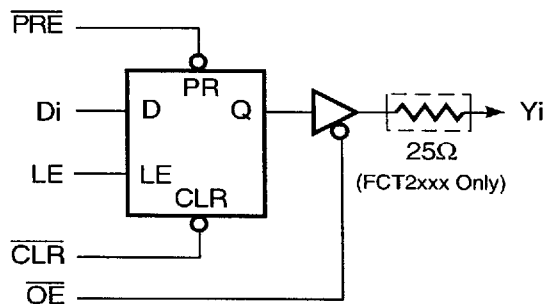
FCT-T 2841T, 2843T, 2845T

- Built-in 25Ω series resistor outputs reduce reflection and other system noise
- A, B, and C speed grades with 5.5 ns t_{PD} for C
- $I_{OL} = 12$ mA Com

DESCRIPTION

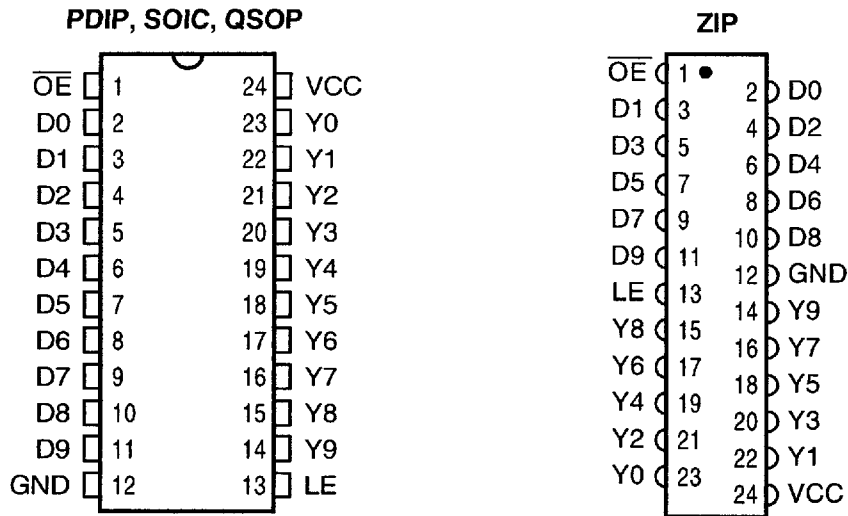
The QSFCT841T, 843T, and 845T are 10, 9, and 8-bit high-speed CMOS TTL-compatible buffered latches with three-state outputs that are ideal for driving high capacitance loads such as memory and address buses. The devices come in A, B, and C speed grades with 5.5 ns (Max.) t_{PLH}/t_{PLH} for the C grade. The 2841/3/5 devices are 25Ω resistor output versions useful for driving transmission lines and reducing system noise. The 284x eliminate the need for external series resistor in high speed systems and can replace the 84x series to reduce noise in an existing design. All inputs have clamp diodes for undershoot noise suppression. All output have ground bounce suppression see QSI Application Note AN-001), and outputs will not load an active bus when V_{CC} is removed from the device.

FUNCTIONAL BLOCK DIAGRAM

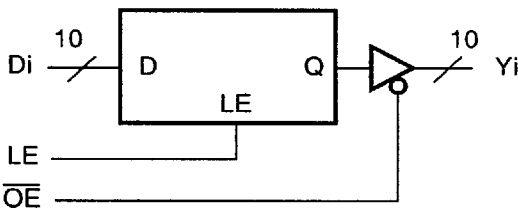


*Note: QS54/74FCT845T, 2843T, 2845T are not recommended for use in new designs

FCT841 PIN CONFIGURATIONS (All Pins Top View)



FCT841 LOGIC SYMBOL



PIN DESCRIPTION

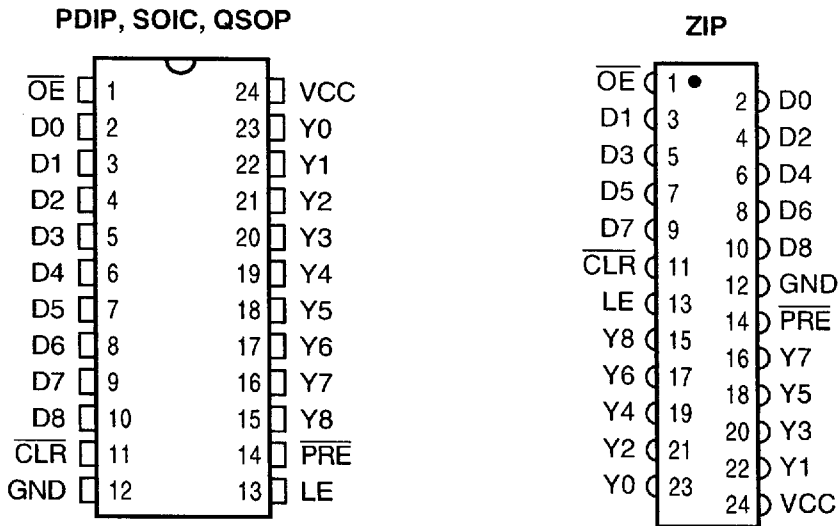
| Name | I/O | Description |
|------|-----|----------------------------|
| Di | I | Data Inputs |
| Yi | O | Data Outputs - Three State |
| LE | I | Latch Enable |
| OE | I | Output Enable |

FUNCTION TABLES

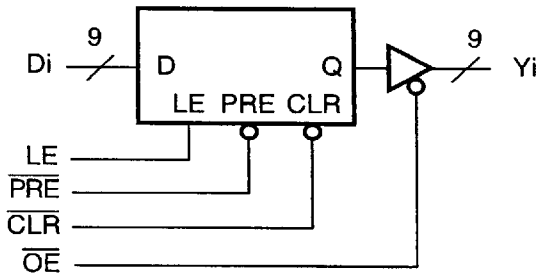
QSFCT841, 2841

| OE | Inputs | | Internal Qi | Outputs Yi | Function |
|----|--------|----|-------------|------------|----------------|
| | LE | Di | | | |
| H | X | X | X | Z | Hi-Z |
| L | X | X | H | H | Output Enabled |
| L | X | X | L | L | Output Enabled |
| X | H | H | H | X | Transparent |
| X | H | L | L | X | Transparent |
| X | L | X | NC | X | Latched |

FCT843 PIN CONFIGURATIONS (All Pins Top View)



FCT843 LOGIC SYMBOL



PIN DESCRIPTION

| Name | I/O | Description |
|------------------|-----|----------------------------|
| Di | I | Data Inputs |
| Yi | O | Data Outputs - Three State |
| \overline{OE} | I | Output Enable |
| LE | I | Latch Enable |
| \overline{PRE} | I | Preset |
| \overline{CLR} | I | Asynchronous Reset |

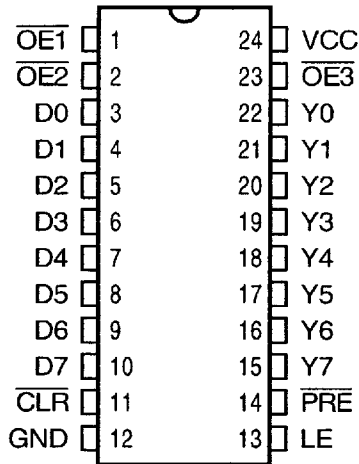
FUNCTION TABLE

QSFC843, 2843, 845, 2845

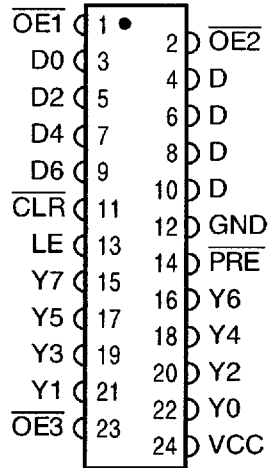
| Inputs | | | | | Internal | Outputs | Function |
|------------------|------------------|-----------------|----|----|----------|---------|----------------|
| \overline{CLR} | \overline{PRE} | \overline{OE} | LE | Di | Qi | Yi | |
| H | H | H | X | X | X | Z | Hi-Z |
| X | X | L | X | X | H | H | Output Enabled |
| X | X | L | X | X | L | L | Output Enabled |
| H | H | L | H | H | H | H | Transparent |
| H | H | L | H | L | L | L | Transparent |
| H | H | L | L | X | NC | NC | Latched |
| H | L | L | X | X | H | H | Preset |
| L | H | L | L | X | L | L | Clear |
| L | L | L | L | X | H | H | Preset |

FCT845 PIN CONFIGURATIONS (All Pins Top View)

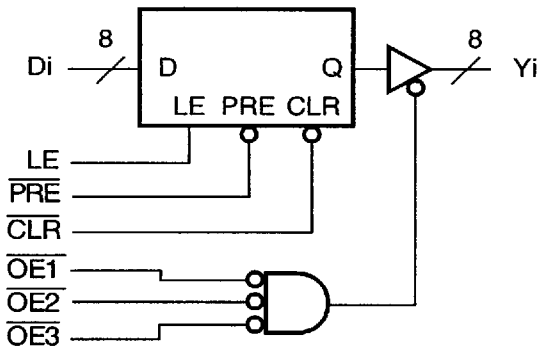
PDIP, SOIC, QSOP



ZIP



FCT845 LOGIC SYMBOL



PIN DESCRIPTION

| Name | I/O | Description |
|-------------------|-----|----------------------------|
| Di | I | Data Inputs |
| Yi | O | Data Outputs - Three State |
| $\overline{OE_i}$ | I | Output Enable |
| LE | I | Latch Enable |
| \overline{PRE} | I | Preset |
| \overline{CLR} | I | Asynchronous Reset |

ABSOLUTE MAXIMUM RATINGS

| | |
|---|----------------|
| Supply Voltage to Ground | -0.5V to +7.0V |
| DC Output Voltage V_{OUT} | -0.5V to +7.0V |
| DC Input Voltage V_{IN} | -0.5V to +7.0V |
| AC Input Voltage (for a pulse width ≤ 20 ns) | -3.0V |
| DC Input Diode Current with $V_{IN} < 0$ | -20 mA |
| DC Output Diode Current with $V_{OUT} < 0$ | -50 mA |
| DC Output Current Max. Sink Current/Pin | 120 mA |
| Maximum Power Dissipation | 0.5 watts |
| T_{STG} Storage Temperature | -65° to +150°C |

Note: Stresses greater than those listed under ABSOLUTE MAXIMUM RATINGS may cause permanent damage to QSI devices that result in functional or reliability type failures.

CAPACITANCE

$T_A = 25^\circ\text{C}$, $f = 1$ MHz, $V_{IN} = 0\text{V}$, $V_{OUT} = 0\text{V}$

| Pins | SOIC | QSOP | PDIP | ZIP | Unit |
|------------------|------|------|------|-----|------|
| 1-11, 13, 14, 23 | 4 | 4 | 5 | 7 | pF |
| 15-22 | 6 | 6 | 7 | 9 | pF |

Note: Capacitance is characterized but not tested.

POWER SUPPLY CHARACTERISTICS

| Symbol | Parameter | Test Conditions ⁽¹⁾ | Min | Max | Unit |
|-----------------|-------------------------------------|--|-----|------|--------|
| I_{CC} | Quiescent Power Supply Current | $V_{CC} = \text{Max.}$, $\text{freq} = 0$ $0\text{V} \leq V_{IN} \leq 0.2\text{V}$ or $V_{CC} - 0.2\text{V} \leq V_{IN} \leq V_{CC}$ | — | 1.5 | mA |
| ΔI_{CC} | Supply Current per Input @ TTL HIGH | $V_{CC} = \text{Max.}$, $V_{IN} = 3.4\text{V}$, $\text{freq} = 0$ ⁽²⁾ | — | 2.0 | mA |
| Q_{CCD} | Supply Current per Input per MHz | $V_{CC} = \text{Max.}$, Outputs open and enabled One bit toggling @ 50% duty cycle Other inputs at GND or V_{CC} ^(3,4) | — | 0.25 | mA/MHz |

Notes:

- For conditions shown as Min. or Max., use the appropriate values specified under DC specifications.
- Per TTL driven input ($V_{IN} = 3.4\text{V}$).
- For flip-flops, Q_{CCD} is measured by switching one of the data input pins so that the output changes every clock cycle. This is a measurement of device power consumption only and does not include power to drive load capacitance or tester capacitance. This parameter is guaranteed by design but not tested.
- I_C can be computed using the above parameters as explained in the Technical Overview section.

QSFCT841T, 843T, 845T, 2841T, 2843T, 2845T

DC ELECTRICAL CHARACTERISTICS OVER OPERATING RANGE

Commercial $T_A = 0^\circ\text{C}$ to 70°C , $V_{CC} = 5.0\text{V} \pm 5\%$

Military $T_A = -55^\circ\text{C}$ to 125°C , $V_{CC} = 5.0\text{V} \pm 10\%$

| Symbol | Parameter | Test Conditions | Min | Typ ⁽¹⁾ | Max | Unit |
|--------------------------|---|--|------------|--------------------|--------------|---------------|
| V_{IH} | Input HIGH Voltage | Logic HIGH for All Inputs | 2.0 | — | — | V |
| V_{IL} | Input LOW Voltage | Logic LOW for All Inputs | — | — | 0.8 | V |
| ΔV_T | Input Hysteresis | $V_{TLH} - V_{THL}$ for All Inputs | — | 0.2 | — | V |
| $ I_{IH} $ $ I_{IL} $ | Input Current Input HIGH or LOW | $V_{CC} = \text{Max.}, 0 \leq V_{IN} < V_{CC}$ | — | — | 5 | μA |
| $ I_{OZ} $ | Off-State Output Current (Hi-Z) | $V_{CC} = \text{Max.}, 0 \leq V_{IN} \leq V_{CC}$ | — | — | 5 | μA |
| I_{OS} | Short Circuit Current (FCTXXX) | $V_{CC} = \text{Max.}, V_{OUT} = \text{GND}^{(2,3)}$ | -60 | — | — | mA |
| I_{OR} | Current Drive (FCT2XXX - 25 Ω) | $V_{CC} = \text{Min.}, V_{OUT} = 2.0\text{V}^{(3)}$ | 50 | — | — | mA |
| V_{IC} | Input Clamp Voltage | $V_{CC} = \text{Min.}, I_{IN} = -18 \text{ mA}, T_A = 25^\circ\text{C}^{(3)}$ | — | -0.7 | -1.2 | V |
| V_{OH} | Output HIGH Voltage | $V_{CC} = \text{Min.}$ $I_{OH} = -12 \text{ mA (MIL)}$ $I_{OH} = -15 \text{ mA (COM)}$ | 2.4 2.4 | — — | — — | V |
| V_{OL} | Output LOW Voltage (FCTXXX) | $V_{CC} = \text{Min.}$ $I_{OL} = 32 \text{ mA (MIL)}$ $I_{OL} = 48 \text{ mA (COM)}$ | — — | — — | 0.50 0.50 | V |
| V_{OL} | Output LOW Voltage (FCT2XXX - 25 Ω) | $V_{CC} = \text{Min.}$ $I_{OL} = 12 \text{ mA (MIL)}$ $I_{OL} = 12 \text{ mA (COM)}$ | — — | — — | 0.50 0.50 | V |
| R_{OUT} | Output Resistance (FCT2XXX - 25 Ω) | $V_{CC} = \text{Min.}$ $I_{OL} = 12 \text{ mA (MIL)}$ $I_{OL} = 12 \text{ mA (COM)}$ | — 20 | 25 28 | — 40 | Ω |

Notes:

1. Typical values indicate $V_{CC} = 5.0\text{V}$ and $T_A = 25^\circ\text{C}$.
2. Not more than one output should be shorted and the duration is ≤ 1 second.
3. These parameters are guaranteed by design but not tested.

QSFACT841T, 843T, 845T, 2841T, 2843T, 2845T

SWITCHING CHARACTERISTICS OVER OPERATING RANGE

Commercial $T_A = 0^\circ\text{C}$ to 70°C , $V_{CC} = 5.0\text{V} \pm 5\%$

Military $T_A = -55^\circ\text{C}$ to 125°C , $V_{CC} = 5.0\text{V} \pm 10\%$

$C_{LOAD} = 50\text{ pF}$, $R_{LOAD} = 500\Omega$ unless otherwise noted.

| Symbol | Description | | 841A 843A 845A 2841A 2843A 2845A | | 841B 843B 845B 2841B 2843B 2845B | | 841C 843C 845C 2841C 2843C 2845C | | Unit |
|------------------|---|-----|---|-----|---|------|---|------|------|
| | | | Min | Max | Min | Max | Min | Max | |
| t _{PHL} | Data to Y Delay | COM | | 9.0 | | 6.5 | | 5.5 | ns |
| t _{PLH} | $\overline{OE} = \text{LOW}$, 841/3/5 | MIL | | 10 | | 7.5 | | 6.3 | |
| t _{PHL} | Data to Y Delay ^(2,3) | COM | | 13 | | 13 | | 13 | ns |
| t _{PLH} | $\overline{OE} = \text{LOW}$, 841/3/5 | MIL | | 15 | | 15 | | 15 | |
| t _{PHL} | Data to Y Delay | COM | | 9.5 | | 6.5 | | 5.5 | ns |
| t _{PLH} | $\overline{OE} = \text{LOW}$, 2841/3/5 | MIL | | 11 | | 7.5 | | 6.3 | |
| t _{PHL} | Data to Y Delay ^(2,3) | COM | | 20 | | 13 | | 13 | ns |
| t _{PLH} | $\overline{OE} = \text{LOW}$, 2841/3/5 | MIL | | 20 | | 15 | | 15 | |
| t _s | Data to LE Setup | COM | 2.5 | | 2.5 | | 2.5 | | ns |
| | | MIL | 2.5 | | 2.5 | | 2.5 | | |
| t _h | Data to LE Hold Time | COM | 2.5 | | 2.5 | | 2.5 | | ns |
| | | MIL | 3.0 | | 2.5 | | 2.5 | | |
| t _{LEY} | LE to Y Delay | COM | | 12 | | 8.0 | | 6.4 | ns |
| | | MIL | | 13 | | 10.5 | | 6.8 | |
| t _{LEY} | LE to Y Delay ^(2,3) | COM | | 16 | | 15.5 | | 15 | ns |
| | | MIL | | 20 | | 18 | | 16 | |
| t _{LEY} | LE to Y Delay | COM | | 12 | | 8 | | 8 | ns |
| | | MIL | | 13 | | 10.5 | | 10.5 | |
| t _{LEY} | LE to Y Delay ^(2,3) | COM | | 16 | | 15.5 | | 15 | ns |
| | | MIL | | 20 | | 18 | | 16 | |

Notes:

1. See Test Circuit and Waveforms.
2. This parameter is guaranteed by design but not tested.
3. $C_{LOAD} = 300\text{ pF}$.

QSFCT841T, 843T, 845T, 2841T, 2843T, 2845T

SWITCHING CHARACTERISTICS OVER OPERATING RANGE

Commercial T_A = 0°C to 70°C, V_{CC} = 5.0V ± 5%

Military T_A = -55°C to 125°C, V_{CC} = 5.0V ± 10%

C_{LOAD} = 50 pF, R_{LOAD} = 500Ω unless otherwise noted.

| Symbol | Description ⁽¹⁾ | | 841A 843A 845A 2841A 2843A 2845A | | 841B 843B 845B 2841B 2843B 2845B | | 841C 843C 845C 2841C 2843C 2845C | | Unit |
|----------------|---|-----|---|------|---|-----|---|-----|------|
| | | | Min | Max | Min | Max | Min | Max | |
| tsLEC | CLR to LE Setup | COM | 3 | | 2.5 | | 2.5 | | ns |
| | | MIL | 3 | | 2.5 | | 2.5 | | |
| tCLR tPRE | CLR, PRE to Y Delay, 843/5 | COM | | 12 | | 8 | | 7 | ns |
| | | MIL | | 14 | | 10 | | 9 | |
| tCLR tPRE | CLR, PRE to Y Delay, 2843/5 | COM | | 12 | | 8 | | 7 | ns |
| | | MIL | | 14 | | 10 | | 9 | |
| tCLRR tPRER | CLR, PRE ⁽²⁾ Recovery Time | COM | | 14 | | 8 | | 8 | ns |
| | | MIL | | 17 | | 10 | | 9 | |
| tleH | LE Pulse Width HIGH ⁽²⁾ | COM | 6 | | 4 | | 4 | | ns |
| | | MIL | 6 | | 4 | | 4 | | |
| tpREL | PRE, CLR ⁽²⁾ Pulse Width LOW | COM | 8 | | 4 | | 4 | | ns |
| | | MIL | 9 | | 4 | | 4 | | |
| tpZH tpZL | Output Enable Time OE to Yi, 841 | COM | | 11.5 | | 8 | | 6.5 | ns |
| | | MIL | | 13 | | 8.5 | | 8.5 | |
| tpZH tpZL | Output Enable Time ^(2,3) OE to Yi, 841 | COM | | 23 | | 14 | | 12 | ns |
| | | MIL | | 25 | | 15 | | 13 | |
| tpZH tpZL | Output Enable Time OE to Yi, 2841 | COM | | 11.5 | | 8 | | 6.5 | ns |
| | | MIL | | 13 | | 8.5 | | 8.5 | |
| tpZH tpZL | Output Enable Time ^(2,3) OE to Yi, 2841 | COM | | 23 | | 14 | | 12 | ns |
| | | MIL | | 25 | | 15 | | 13 | |
| tpHZ tPLZ | Output Disable Time ^(2,4) OE to Yi | COM | | 7 | | 6 | | 5.7 | ns |
| | | MIL | | 9 | | 6.5 | | 6 | |
| tpHZ tPLZ | Output Disable Time ⁽²⁾ OE to Yi | COM | | 8 | | 7 | | 6 | ns |
| | | MIL | | 10 | | 7.5 | | 6.3 | |

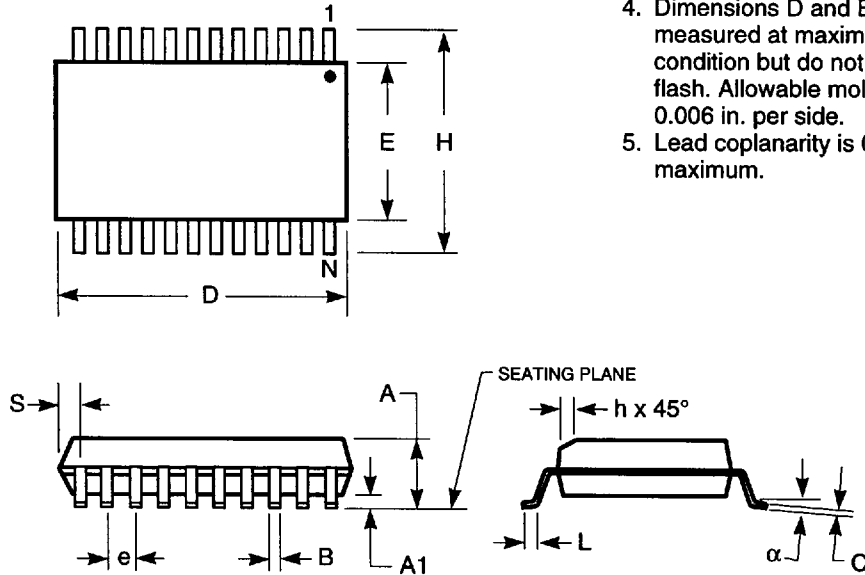
Notes:

1. See Test Circuit and Waveforms.
2. This parameter is guaranteed by design but not tested.
3. C_{LOAD} = 300 pF.
4. C_{LOAD} = 5 pF.

PACKAGING INFORMATION

150-MIL QSOP - Package Code Q

Quarter-Size Outline Package
Plastic Small Outline Gull-Wing



Notes:

1. Refer to applicable symbol list.
2. All dimensions are in inches.
3. N is the number of lead positions.
4. Dimensions D and E are to be measured at maximum material condition but do not include mold flash. Allowable mold flash is 0.006 in. per side.
5. Lead coplanarity is 0.004 in. maximum.

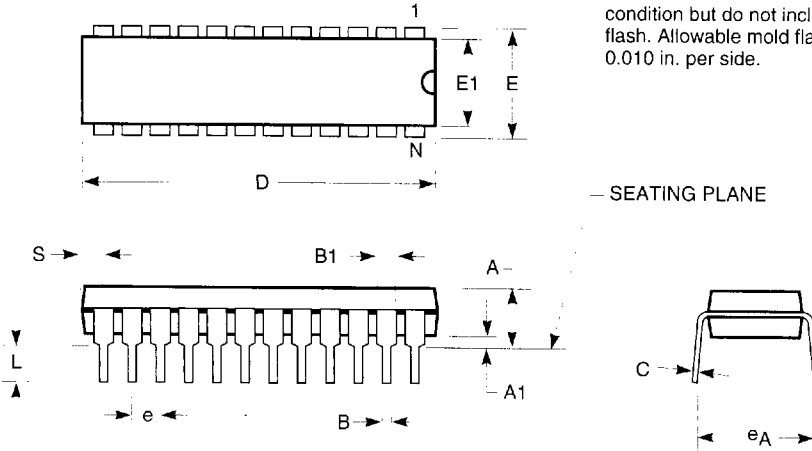
| JEDEC# | MO-137AB | | | MO-137AD | | | MO-137AE | | | MO-137AF | | |
|--------|-----------|-------|-------|-----------|-------|-------|-----------|-------|-------|-----------|-------|-------|
| DWG# | PSS-16A | | | PSS-20A | | | PSS-24A | | | PSS-28A | | |
| Symbol | Min | Nom | Max | Min | Nom | Max | Min | Nom | Max | Min | Nom | Max |
| A | 0.060 | 0.064 | 0.068 | 0.060 | 0.064 | 0.068 | 0.060 | 0.064 | 0.068 | 0.060 | 0.064 | 0.068 |
| A1 | 0.004 | 0.006 | 0.008 | 0.004 | 0.006 | 0.008 | 0.004 | 0.006 | 0.008 | 0.004 | 0.006 | 0.008 |
| B | 0.009 | 0.010 | 0.012 | 0.009 | 0.010 | 0.012 | 0.009 | 0.010 | 0.012 | 0.009 | 0.010 | 0.012 |
| C | 0.007 | 0.008 | 0.010 | 0.007 | 0.008 | 0.010 | 0.007 | 0.008 | 0.010 | 0.007 | 0.008 | 0.010 |
| D | 0.189 | 0.193 | 0.197 | 0.337 | 0.341 | 0.344 | 0.337 | 0.341 | 0.344 | 0.386 | 0.390 | 0.394 |
| E | 0.150 | 0.154 | 0.157 | 0.150 | 0.154 | 0.157 | 0.150 | 0.154 | 0.157 | 0.150 | 0.154 | 0.157 |
| e | 0.025 BSC | | | 0.025 BSC | | | 0.025 BSC | | | 0.025 BSC | | |
| H | 0.230 | 0.236 | 0.244 | 0.230 | 0.236 | 0.244 | 0.230 | 0.236 | 0.244 | 0.230 | 0.236 | 0.244 |
| h | 0.010 | 0.013 | 0.016 | 0.010 | 0.013 | 0.016 | 0.010 | 0.013 | 0.016 | 0.010 | 0.013 | 0.016 |
| L | 0.016 | 0.025 | 0.035 | 0.016 | 0.025 | 0.035 | 0.016 | 0.025 | 0.035 | 0.016 | 0.025 | 0.035 |
| N | 16 | | | 20 | | | 24 | | | 28 | | |
| α | 0° | 5° | 8° | 0° | 5° | 8° | 0° | 5° | 8° | 0° | 5° | 8° |
| S | 0.006 | 0.009 | 0.010 | 0.056 | 0.058 | 0.060 | 0.031 | 0.033 | 0.035 | 0.031 | 0.033 | 0.035 |

PACKAGING INFORMATION

300-MIL PDIP - Package Code P Plastic Dual In-line Package

Notes:

1. Refer to applicable symbol list.
2. All dimensions are in inches.
3. N is the number of lead positions.
4. Dimensions D and E are to be measured at maximum material condition but do not include mold flash. Allowable mold flash is 0.010 in. per side.



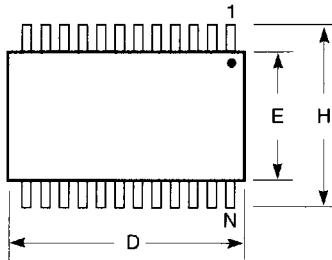
| JEDEC# | MS-001AC | | MS001AA | | MS-001AE | | N/A | | MS-001AF | | MO-095AH | |
|----------------|----------|-------|---------|-------|----------|-------|-------|-------|----------|-------|----------|-------|
| DWG# | PD14A | | PD16A | | PD20A | | PT22B | | PT24A | | PT28A | |
| Symbol | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max |
| A | 0.130 | 0.170 | 0.130 | 0.170 | 0.130 | 0.170 | 0.130 | 0.170 | 0.130 | 0.170 | 0.130 | 0.180 |
| A1 | 0.015 | 0.040 | 0.015 | 0.040 | 0.015 | 0.040 | 0.015 | 0.040 | 0.015 | 0.040 | 0.015 | 0.040 |
| B | 0.016 | 0.020 | 0.016 | 0.020 | 0.016 | 0.020 | 0.016 | 0.020 | 0.016 | 0.020 | 0.016 | 0.020 |
| B1 | 0.045 | 0.070 | 0.045 | 0.070 | 0.045 | 0.070 | 0.045 | 0.070 | 0.045 | 0.070 | 0.045 | 0.060 |
| C | 0.009 | 0.012 | 0.009 | 0.012 | 0.009 | 0.012 | 0.009 | 0.012 | 0.009 | 0.012 | 0.009 | 0.012 |
| D | 0.745 | 0.765 | 0.745 | 0.765 | 1.020 | 1.040 | 1.020 | 1.040 | 1.150 | 1.260 | 1.345 | 1.385 |
| E | 0.300 | 0.325 | 0.300 | 0.325 | 0.300 | 0.325 | 0.300 | 0.325 | 0.300 | 0.325 | 0.300 | 0.325 |
| E1 | 0.240 | 0.270 | 0.240 | 0.270 | 0.240 | 0.270 | 0.240 | 0.270 | 0.250 | 0.280 | 0.275 | 0.295 |
| e | 0.090 | 0.110 | 0.090 | 0.110 | 0.090 | 0.110 | 0.090 | 0.110 | 0.090 | 0.110 | 0.090 | 0.110 |
| ^e A | 0.310 | 0.380 | 0.310 | 0.380 | 0.310 | 0.380 | 0.310 | 0.380 | 0.310 | 0.380 | 0.310 | 0.380 |
| L | 0.120 | 0.140 | 0.120 | 0.140 | 0.120 | 0.140 | 0.120 | 0.140 | 0.120 | 0.140 | 0.120 | 0.140 |
| S | 0.070 | 0.080 | 0.020 | 0.035 | 0.060 | 0.070 | 0.010 | 0.020 | 0.025 | 0.080 | 0.020 | 0.040 |
| N | 14 | | 16 | | 20 | | 22 | | 24 | | 28 | |

7466803 0003416 711

PACKAGING INFORMATION

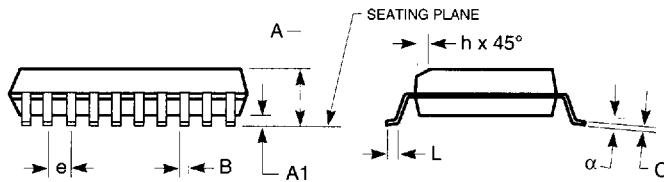
300-MIL SOIC - Package Code SO

Plastic Small Outline Gull-Wing



Notes:

1. Refer to applicable symbol list.
2. All dimensions are in inches.
3. N is the number of lead positions.
4. Dimensions D and E are to be measured at maximum material condition but do not include mold flash. Allowable mold flash is 0.006 in. per side.
5. Lead coplanarity is 0.004 in. maximum.



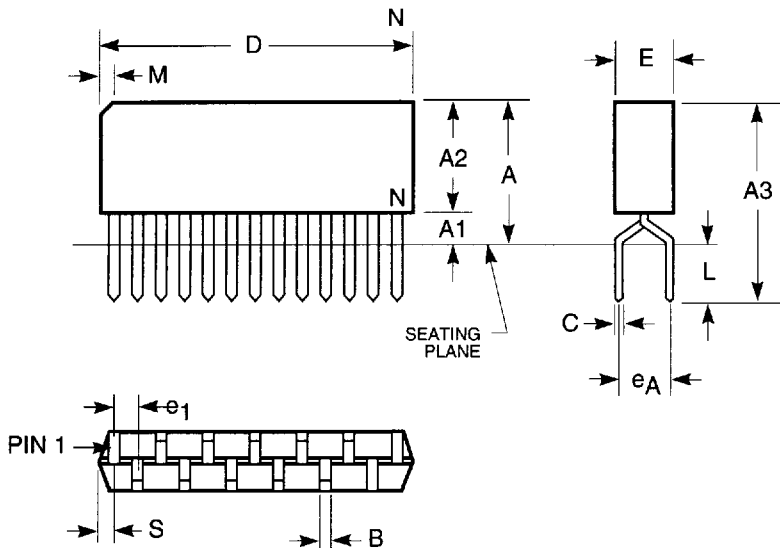
| JEDEC# | MS-013AA | | MS-013AC | | MS-013AD | | MS-013AE | |
|--------|----------|-------|----------|-------|----------|-------|----------|-------|
| DWG# | PS16A | | PS20A | | PS24A | | PS28A | |
| Symbol | Min | Max | Min | Max | Min | Max | Min | Max |
| A | 0.096 | 0.104 | 0.096 | 0.104 | 0.096 | 0.104 | 0.096 | 0.104 |
| A1 | 0.005 | 0.011 | 0.005 | 0.011 | 0.005 | 0.011 | 0.005 | 0.011 |
| B | 0.014 | 0.019 | 0.014 | 0.019 | 0.014 | 0.019 | 0.014 | 0.019 |
| C | 0.009 | 0.012 | 0.009 | 0.012 | 0.009 | 0.012 | 0.009 | 0.012 |
| D | 0.402 | 0.412 | 0.500 | 0.510 | 0.602 | 0.612 | 0.701 | 0.711 |
| E | 0.292 | 0.299 | 0.292 | 0.299 | 0.292 | 0.299 | 0.292 | 0.299 |
| e | 0.044 | 0.056 | 0.044 | 0.056 | 0.044 | 0.056 | 0.044 | 0.056 |
| H | 0.396 | 0.416 | 0.396 | 0.416 | 0.396 | 0.416 | 0.396 | 0.416 |
| h | 0.010 | 0.016 | 0.010 | 0.016 | 0.010 | 0.016 | 0.010 | 0.016 |
| L | 0.020 | 0.040 | 0.020 | 0.040 | 0.020 | 0.040 | 0.020 | 0.040 |
| N | 16 | | 20 | | 24 | | 28 | |
| α | 0° | 8° | 0° | 8° | 0° | 8° | 0° | 8° |

7466803 0003423 951

PACKAGING INFORMATION

300-MIL ZIP - Package Code Z

Zig-zag In-line Packages



| JEDEC# | MO-072AB | | MO-072AC | | MO-072AD | |
|--------|-----------|-------|-----------|-------|-----------|-------|
| DWG# | PZ20A | | PZ24A | | PZ28A | |
| Symbol | Min | Max | Min | Max | Min | Max |
| A | 0.350 | 0.400 | 0.350 | 0.400 | 0.350 | 0.400 |
| A1 | 0.030 | 0.070 | 0.030 | 0.070 | 0.032 | 0.055 |
| A2 | 0.280 | 0.340 | 0.320 | 0.350 | 0.335 | 0.345 |
| A3 | 0.450 | 0.550 | 0.450 | 0.550 | 0.460 | 0.550 |
| B | 0.015 | 0.024 | 0.015 | 0.024 | 0.015 | 0.024 |
| C | 0.008 | 0.012 | 0.008 | 0.012 | 0.008 | 0.012 |
| D | 1.008 | 1.030 | 1.200 | 1.250 | 1.409 | 1.424 |
| E | 0.100 | 0.120 | 0.100 | 0.120 | 0.110 | 0.120 |
| e1 | 0.050 BSC | | 0.050 BSC | | 0.050 BSC | |
| eA | 0.100 BSC | | 0.100 BSC | | 0.100 BSC | |
| L | 0.100 | 0.150 | 0.100 | 0.150 | 0.110 | 0.150 |
| M | 0.035 | 0.085 | 0.035 | 0.085 | 0.035 | 0.085 |
| N | 20 | | 24 | | 28 | |
| S | 0.018 | 0.032 | 0.018 | 0.032 | 0.025 | 0.038 |

Notes:

1. Refer to applicable symbol list.
2. All dimensions are in inches.
3. N is the number of lead positions.
4. Dimensions D and E are to be measured at maximum material condition but do not include mold flash. Allowable mold flash is 0.010 in. per side.

7466803 0003427 5T7