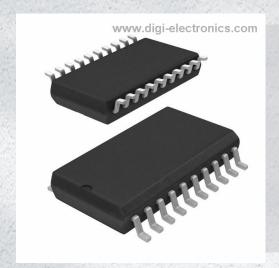


74ABT373CSCX Datasheet



https://www.DiGi-Electronics.com

DiGi Electronics Part Number 74ABT373CSCX-DG

Manufacturer onsemi

Manufacturer Product Number 74ABT373CSCX

Description IC D-TYPE TRANSP SGL 8:8 20SOIC

Detailed Description D-Type Transparent Latch 1 Channel 8:8 IC Tri-Stat

e 20-SOIC



Tel: +00 852-30501935

RFQ Email: Info@DiGi-Electronics.com

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Purchase and inquiry

Manufacturer Product Number:	Manufacturer:
74ABT373CSCX	onsemi
Series:	Product Status:
74ABT	Obsolete
Logic Type:	Circuit:
D-Type Transparent Latch	8:8
Output Type:	Voltage - Supply:
Tri-State	4.5V ~ 5.5V
Independent Circuits:	Delay Time - Propagation:
Independent Circuits: 1	Delay Time - Propagation: 2.7ns
Independent Circuits: 1 Current - Output High, Low:	
1	2.7ns
1 Current - Output High, Low:	2.7ns Operating Temperature:
1 Current - Output High, Low: 32mA, 64mA	2.7ns Operating Temperature: -40°C ~ 85°C
Current - Output High, Low: 32mA, 64mA Mounting Type:	2.7ns Operating Temperature: -40°C ~ 85°C Package / Case:

Environmental & Export classification

Moisture Sensitivity Level (MSL):	REACH Status:
1 (Unlimited)	REACH Unaffected
ECCN:	HTSUS:
EAR99	8542.39.0001



March 2007

74ABT373

Octal Transparent Latch with 3-STATE Outputs

Features

- 3-STATE outputs for bus interfacing
- Output sink capability of 64mA, source capability of 32mA
- Guaranteed output skew
- Guaranteed multiple output switching specifications
- Output switching specified for both 50pF and 250pF loads
- Guaranteed simultaneous switching, noise level and dynamic threshold performance
- Guaranteed latchup protection
- High-impedance, glitch-free bus loading during entire power up and power down
- Nondestructive, hot-insertion capability

General Description

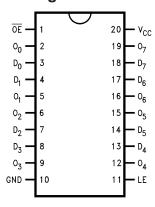
The ABT373 consists of eight latches with 3-STATE outputs for bus organized system applications. The flip-flops appear transparent to the data when Latch Enable (LE) is HIGH. When LE is LOW, the data that meets the setup times is latched. Data appears on the bus when the Output Enable (\overline{OE}) is LOW. When \overline{OE} is HIGH the bus output is in the high impedance state.

Ordering Information

Order Number	Package Number	Package Description
74ABT373CSC	M20B	20-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-013, 0.300" Wide
74ABT373CSJ	M20D	20-Lead Small Outline Package (SOP), EIAJ TYPE II, 5.3mm Wide
74ABT373CMSA	MSA20	20-Lead Shrink Small Outline Package (SSOP), JEDEC MO-150, 5.3mm Wide
74ABT373CMTC	MTC20	20-Lead Thin Shrink Small Outline Package (TSSOP), JEDEC MO-153, 4.4mm Wide

Device also available in Tape and Reel. Specify by appending suffix letter "X" to the ordering number. Pb-Free package per JEDEC J-STD-020B.

Connection Diagram



Pin Descriptions

Pin Names	Description
D ₀ –D ₇	Data Inputs
LE	Latch Enable Input (Active HIGH)
ŌĒ	Output Enable Input (Active LOW)
O ₀ -O ₇	3-STATE Latch Outputs

Functional Description

The ABT373 contains eight D-type latches with 3-STATE output buffers. When the Latch Enable (LE) input is HIGH, data on the D_n inputs enters the latches. In this condition the latches are transparent, i.e., a latch output will change state each time its D input changes. When LE is LOW, the latches store the information that was present on the D inputs at setup time preceding the HIGH-to-LOW transition of LE. The 3-STATE buffers are controlled by the Output Enable (\overline{OE}) input. When \overline{OE} is LOW, the buffers are in the bi-state mode. When \overline{OE} is HIGH the buffers are in the high impedance mode but this does not interfere with entering new data into the latches.

Truth Table

	Inputs	Output		
LE	OE D _n		O _n	
Н	L	Н	Н	
Н	L	L	L	
L	L	Х	O _n (no change)	
Х	Н	Х	Z	

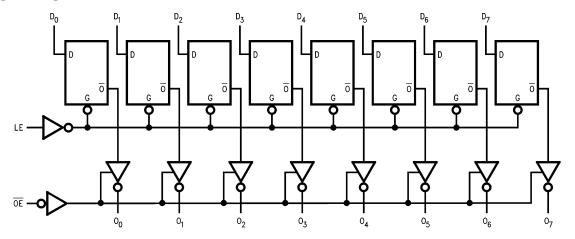
H = HIGH Voltage Level

L = LOW Voltage Level

X = Immaterial

Z = HIGH Impedance State

Logic Diagram



Please note that this diagram is provided only for the understanding of logic operations and should not be used to estimate propagation delays.

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
T _{STG}	Storage Temperature	−65°C to +150°C
T _A	Ambient Temperature Under Bias	–55°C to +125°C
T _J	Junction Temperature Under Bias	–55°C to +150°C
V _{CC}	V _{CC} Pin Potential to Ground Pin	-0.5V to +7.0V
V _{IN}	Input Voltage ⁽¹⁾	-0.5V to +7.0V
I _{IN}	Input Current ⁽¹⁾	-30mA to +5.0mA
Vo	Voltage Applied to Any Output	
	Disabled or Power-Off State	-0.5V to +5.5V
	HIGH State	–0.5V to V _{CC}
	Current Applied to Output in LOW State (Max.)	twice the rated I _{OL} (mA)
	DC Latchup Source Current Across Common Operating Range	
	OE Pin	–150mA
	Other Pins	–500mA
	Over Voltage Latchup (I/O)	10V

Note:

1. Either voltage limit or current limit is sufficient to protect inputs.

Recommended Operating Conditions

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	Rating
T _A	Free Air Ambient Temperature	–40°C to +85°C
V _{CC}	Supply Voltage	+4.5V to +5.5V
ΔV / Δt	Minimum Input Edge Rate	
	Data Input	50mV/ns
	Enable Input	20mV/ns

DC Electrical Characteristics

Symbol	Р	arameter	V _{CC}	Conditions	Min.	Тур.	Max.	Units
V _{IH}	Input HIGH	Voltage		Recognized HIGH Signal	2.0			V
V _{IL}	Input LOW	Voltage		Recognized LOW Signal			0.8	V
V _{CD}	Input Clam	o Diode Voltage	Min.	$I_{IN} = -18\text{mA}$			-1.2	V
V _{OH}	Output HIG	H Voltage	Min.	$I_{OH} = -3mA$	2.5			V
				$I_{OH} = -32mA$	2.0			
V _{OL}	Output LOV	V Voltage	Min.	I _{OL} = 64mA			0.55	V
I _{IH}	Input HIGH	Current	Max.	$V_{IN} = 2.7V^{(3)}$			1	μA
				$V_{IN} = V_{CC}$			1	
I _{BVI}	Input HIGH Breakdown		Max.	V _{IN} = 7.0V			7	μA
I _{IL}	Input LOW	Current	Max.	$V_{IN} = 0.5V^{(3)}$			-1	μA
				$V_{IN} = 0.0V$			-1	
V _{ID}	Input Leakage Test		0.0	I _{ID} = 1.9μA, All Other Pins Grounded	4.75			V
I _{OZH}	Output Lea	kage Current	0-5.5V	$V_{OUT} = 2.7V, \overline{OE} = 2.0V$			10	μA
I _{OZL}	Output Lea	kage Current	0-5.5V	$V_{OUT} = 0.5V, \overline{OE} = 2.0V$			-10	μA
Ios	Output Sho	rt-Circuit Current	Max.	$V_{OUT} = 0.0V$	-100		-275	mA
I _{CEX}	Output HIG	H Leakage Current	Max.	$V_{OUT} = V_{CC}$			50	μA
I _{ZZ}	Bus Draina	ge Test	0.0	V _{OUT} = 5.5V, All Others GND			100	μΑ
I _{CCH}	Power Supp	oly Current	Max.	All Outputs HIGH			50	μΑ
I _{CCL}	Power Supp	oly Current	Max.	All Outputs LOW			30	mA
I _{CCZ}	Power Supp	oly Current	Max.	$\overline{\text{OE}} = \text{V}_{\text{CC}}$, All Others at V_{CC} or Ground			50	μA
I _{CCT}	Additional	Outputs Enabled	Max.	$V_I = V_{CC} - 2.1V$			2.5	mA
	I _{CC} /Input	Outputs 3-STATE		Enable Input V _I = V _{CC} - 2.1V			2.5	mA
	Outputs 3-STATE			Data Input $V_I = V_{CC} - 2.1V$, All Others at V_{CC} or Ground			2.5	mA
I _{CCD}	Dynamic I _C	C No Load ⁽³⁾	Max.	Outputs OPEN, LE = V _{CC} , \overline{OE} = GND ⁽²⁾ , One-Bit Toggling, 50% Duty Cycle			0.12	mA/ MHz

Notes:

- 2. For 8-bit toggling, $I_{\mbox{\scriptsize CCD}} < 0.8 \mbox{\scriptsize mA/MHz}.$
- 3. Guaranteed, but not tested.

DC Electrical Characteristics

SOIC package.

	_ ,	.,	Conditions		_		
Symbol	Parameter	V _{CC}	$C_L = 50 pF, R_L = 500 \Omega$	Min.	Тур.	Max.	Units
V _{OLP}	Quiet Output Maximum Dynamic V _{OL}	5.0	$T_A = 25^{\circ}C^{(4)}$		0.4	0.8	V
V _{OLV}	Quiet Output Minimum Dynamic V _{OL}	5.0	$T_A = 25^{\circ}C^{(4)}$	-1.2	-0.8		V
V _{OHV}	Minimum HIGH Level Dynamic Output Voltage		$T_A = 25^{\circ}C^{(5)}$	2.5	3.0		V
V _{IHD}	Minimum HIGH Level Dynamic Input Voltage	5.0	$T_A = 25^{\circ}C^{(6)}$	2.0	1.7		V
V _{ILD}	Maximum LOW Level Dynamic Input Voltage	5.0	$T_A = 25^{\circ}C^{(6)}$		0.9	0.6	V

Notes:

- 4. Max number of outputs defined as (n). n − 1 data inputs are driven 0V to 3V. One output at Low. Guaranteed, but not tested.
- 5. Max number of outputs defined as (n). n 1 data inputs are driven 0V to 3V. One output HIGH. Guaranteed, but not tested.
- 6. Max number of data inputs (n) switching. n 1 inputs switching 0V to 3V. Input-under-test switching: 3V to threshold (V_{ILD}), 0V to threshold (V_{IHD}). Guaranteed, but not tested.

AC Electrical Characteristics

SOIC and SSOP package.

		T _A = +25°C, V _{CC} = +5.0V, C _L = 50pF		$V_{CC} = 4.5$	to +125°C, V to 5.5V, 50pF	T _A = -40°C V _{CC} = 4.5 C _L =			
Symbol	Parameter	Min.	Тур.	Max.	Min.	Max.	Min.	Max.	Units
t _{PLH}	Propagation Delay	1.9	2.7	4.5	1.0	6.8	1.9	4.5	ns
t _{PHL}	D _n to O _n	1.9	2.8	4.5	1.0	7.0	1.9	4.5	
t _{PLH}	Propagation Delay	2.0	3.1	5.0	1.0	7.7	2.0	5.0	ns
t _{PHL}	LE to O _n	2.0	3.0	5.0	1.5	7.7	2.0	5.0	
t _{PZH}	Output Enable Time	1.5	3.1	5.3	1.0	6.7	1.5	5.3	ns
t _{PZL}		1.5	3.1	5.3	1.5	7.2	1.5	5.3	
t _{PHZ}	Output Disable Time	2.0	3.6	5.4	1.7	8.0	2.0	5.4	ns
t _{PLZ}	1	2.0	3.4	5.4	1.0	7.0	2.0	5.4	

AC Operating Requirements

SOIC and SSOP packages.

		T _A = +25°C, V _{CC} = +5.0V, C _L = 50pF		$T_{A} = -55^{\circ}\text{C to } +125^{\circ}\text{C}, \\ V_{CC} = 4.5\text{V to } 5.5\text{V}, \\ C_{L} = 50\text{pF}, \\$		$T_A = -40$ °C to +85°C, $V_{CC} = 4.5$ V to 5.5V $C_L = 50$ pF			
Symbol	Parameter	Min.	Тур.	Max.	Min.	Max.	Min.	Max.	Units
f _{TOGGLE}	Max Toggle Frequency		100		100				MHz
t _S (H)	Setup Time, HIGH or	1.5			2.5		1.5		ns
t _S (L)	LOW, D _n to LE	1.5			2.5		1.5		
t _H (H)	Hold Time, HIGH or	1.0			2.5		1.0		ns
t _H (L)	LOW, D _n to LE	1.0			2.5		1.0		
t _W (H)	Pulse Width, LE HIGH	3.0			3.3		3.0		ns

Extended AC Electrical Characteristics

SOIC package.

		$T_A = -40$ °C to +85°C, $V_{CC} = 4.5$ V to 5.5V, $C_L = 50$ pF, 8 Outputs Switching ⁽⁷⁾		T _A = -40°C V _{CC} = 4.5 C _L = 2	C to +85°C, V to 5.5V, 50pF ⁽⁸⁾	T _A = -40°0 V _{CC} = 4.5 C _L = 2 8 Ou Switc		
Symbol	Parameter	Min.	Max.	Min.	Max.	Min.	Max.	Units
t _{PLH}	Propagation Delay,	1.5	5.2	2.0	6.8	2.0	9.0	ns
t _{PHL}	D _n to O _n	1.5	5.2	2.0	6.8	2.0	9.0	
t _{PLH}	Propagation Delay,	1.5	5.5	2.0	7.5	2.0	9.5	ns
t _{PHL}	LE to O _n	1.5	5.5	2.0	7.5	2.0	9.5	
t _{PZH}	Output Enable Time	1.5	6.2	2.0	8.0	2.0	10.5	ns
t _{PZL}		1.5	6.2	2.0	8.0	2.0	10.5	
t _{PHZ}	Output Disable Time	1.0	5.5	(1	(10) (10)		10)	ns
t _{PZL}		1.0	5.5					

Notes:

- 7. This specification is guaranteed but not tested. The limits apply to propagation delays for all paths described switching in phase (i.e., all LOW-to-HIGH, HIGH-to-LOW, etc.).
- 8. This specification is guaranteed but not tested. The limits represent propagation delay with 250pF load capacitors in place of the 50pF load capacitors in the standard AC load. This specification pertains to single output switching only.
- 9. This specification is guaranteed but not tested. The limits represent propagation delays for all paths described switching in phase (i.e., all LOW-to-HIGH, HIGH-to-LOW, etc.) with 250pF load capacitors in place of the 50pF load capacitors in the standard AC load.
- 10. The 3-STATE delay times are dominated by the RC network (500Ω , 250pF) on the output and has been excluded from the datasheet.

Skew

SOIC package.

		$T_A = -40$ °C to +85°C, $V_{CC} = 4.5V-5.5V$, $C_L = 50$ pF, 8 Outputs Switching ⁽¹¹⁾	$T_A = -40$ °C to +85°C, $V_{CC} = 4.5V-5.5V$, $C_L = 250$ pF, 8 Outputs Switching ⁽¹²⁾	
Symbol	Parameter	Max.	Max.	Units
t _{OSHL} ⁽¹³⁾	Pin to Pin Skew, HL Transitions	1.0	1.5	ns
t _{OSLH} ⁽¹³⁾	Pin to Pin Skew, LH Transitions	1.0	1.5	ns
t _{PS} ⁽¹⁵⁾	Duty Cycle, LH-HL Skew	1.4	3.5	ns
t _{OST} ⁽¹³⁾	Pin to Pin Skew, LH/HL Transitions	1.5	3.9	ns
t _{PV} ⁽¹⁴⁾	Device to Device Skew, LH/HL Transitions	2.0	4.0	ns

Notes:

- 11. This specification is guaranteed but not tested. The limits represent propagation delays with 250 pF load capacitors in place of the 50pF load capacitors in the standard AC load.
- 12. This specification is guaranteed but not tested. The limits apply to propagation delays for all paths described switching in phase (i.e., all LOW-to-HIGH, HIGH-to-LOW, etc.).
- 13. Skew is defined as the absolute value of the difference between the actual propagation delays for any two separate outputs of the same device. The specification applies to any outputs switching HIGH-to-LOW (t_{OSHL}), LOW-to-HIGH (t_{OSLH}), or any combination switching LOW-to-HIGH and/or HIGH-to-LOW (t_{OST}). This specification is guaranteed but not tested.
- 14. Propagation delay variation is for a given set of conditions (i.e., temperature and V_{CC}) from device to device. This specification is guaranteed but not tested.
- 15. This describes the difference between the delay of the LOW-to-HIGH and the HIGH-to-LOW transition on the same pin. It is measured across all the outputs (drivers) on the same chip, the worst (largest delta) number is the guaranteed specification. This specification is guaranteed but not tested.

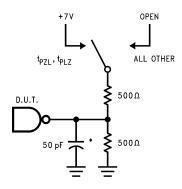
Capacitance

Symbol	Parameter	Conditions T _A = 25°C	Тур.	Units
C _{IN}	Input Capacitance	$V_{CC} = 0V$	5	pF
C _{OUT} ⁽¹⁶⁾	Output Capacitance	V _{CC} = 5.0V	9	pF

Note:

16. C_{OUT} is measured at frequency f = 1MHz, per MIL-STD-883, Method 3012.

AC Loading



*Includes jig and probe capacitance

Figure 1. Standard AC Test Load

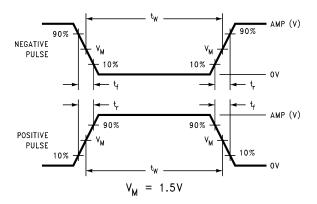


Figure 2. Test Input Signal Levels

Amplitude	Rep. Rate	t _w	t _r	t _f
3.0V	1MHz	500ns	2.5ns	2.5ns

Figure 3. Test Input Signal Requirements

AC Waveforms

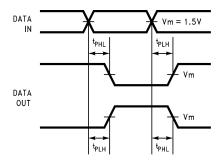


Figure 4. Propagation Delay Waveforms for Inverting and Non-Inverting Functions

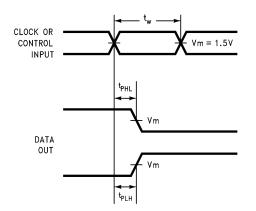


Figure 5. Propagation Delay, Pulse Width Waveforms

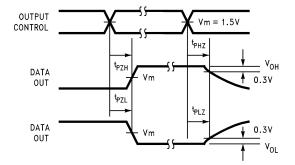


Figure 6. 3-STATE Output HIGH and LOW Enable and Disable Times

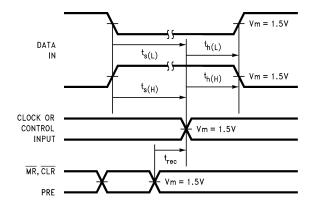
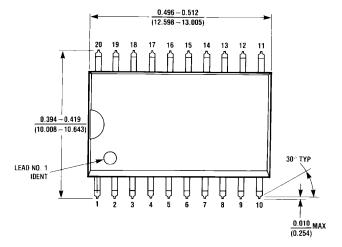
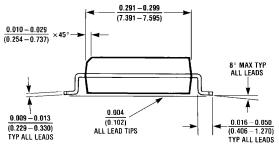


Figure 7. Setup Time, Hold Time and Recovery Time Waveforms

Physical Dimensions

Dimensions are in inches (millimeters) unless otherwise noted.





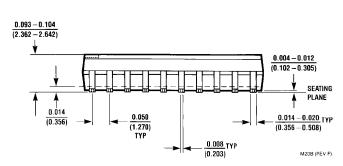
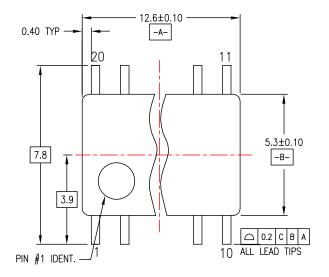
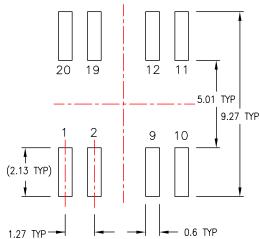


Figure 8. 20-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-013, 0.300" Wide Package Number M20B

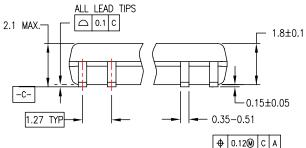
Physical Dimensions (Continued)

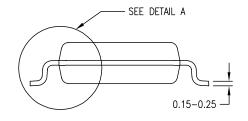
Dimensions are in millimeters unless otherwise noted.





LAND PATTERN RECOMMENDATION

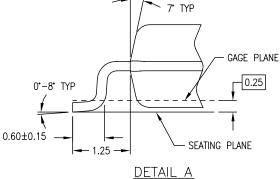




DIMENSIONS ARE IN MILLIMETERS

NOTES:

- A. CONFORMS TO EIAJ EDR-7320 REGISTRATION, ESTABLISHED IN DECEMBER, 1998.
 B. DIMENSIONS ARE IN MILLIMETERS.
 C. DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH, AND TIE BAR EXTRUSIONS.

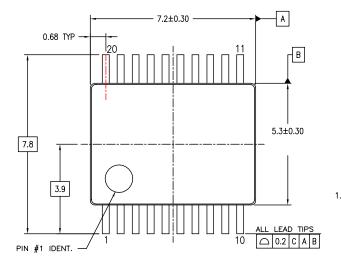


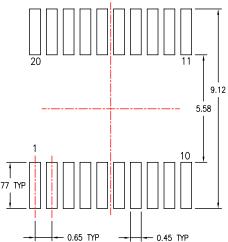
M20DREVC

Figure 9. 20-Lead Small Outline Package (SOP), EIAJ TYPE II, 5.3mm Wide Package Number M20D

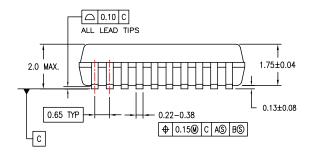
Physical Dimensions (Continued)

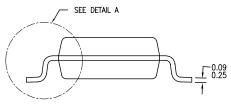
Dimensions are in millimeters unless otherwise noted.





LAND PATTERN RECOMMENDATIONS

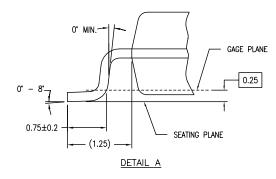




DIMENSIONS ARE IN MILLIMETERS

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.

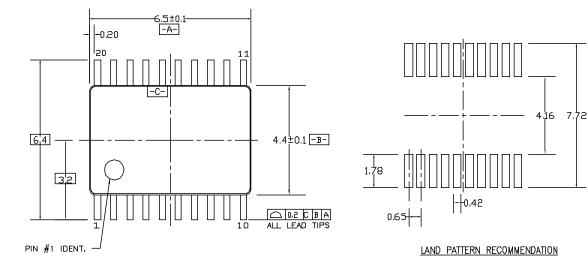


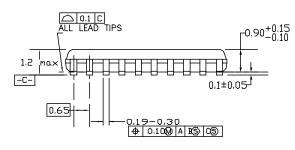
MSA20REVB

Figure 10. 20-Lead Shrink Small Outline Package (SSOP), JEDEC MO-150, 5.3mm Wide Package Number MSA20

Physical Dimensions (Continued)

Dimensions are in millimeters unless otherwise noted.



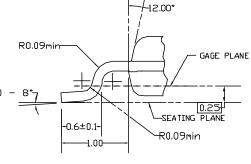




NOTES:

- A. CONFORMS TO JEDEC REGISTRATION MD-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.

SEE DETAIL A 0.09-0.20



DETAIL A

MTC20REVD1

Figure 11. 20-Lead Thin Shrink Small Outline Package (TSSOP), JEDEC MO-153, 4.4mm Wide Package Number MTC20





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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.	
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Rev. I24



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