

## 74F573 Octal D-Type Latch with 3-STATE Outputs

### General Description

The 'F573 is a high speed octal latch with buffered common Latch Enable (LE) and buffered common Output Enable ( $\overline{OE}$ ) inputs.

This device is functionally identical to the 'F373 but has different pinouts.

- Useful as input or output port for microprocessors
- Functionally identical to 'F373
- 3-STATE outputs for bus interfacing
- Guaranteed 4000V minimum ESD protection

### Features

- Inputs and outputs on opposite sides of package allowing easy interface with microprocessors

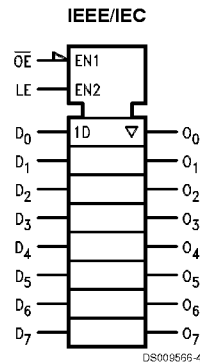
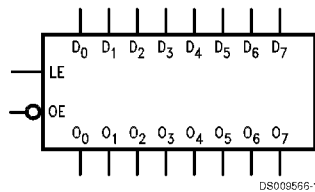
### Ordering Code:

Commercial	Military	Package Number	Package Description
74F573PC		N20A	20-Lead (0.300" Wide) Molded Dual-In-Line
	54F573DM (Note 2)	J20A	20-Lead Ceramic Dual-In-Line
74F573SC (Note 1)		M20B	20-Lead (0.300" Wide) Molded Small Outline, JEDEC
74F573SJ (Note 1)		M20D	20-Lead (0.300" Wide) Molded Small Outline, EIAJ
	54F573FM (Note 2)	W20A	20-Lead Cerpak
	54F573LM (Note 2)	E20A	20-Lead Ceramic Leadless Chip Carrier, Type C

**Note 1:** Devices also available in 13" reel. Use suffix = SCX and SJX.

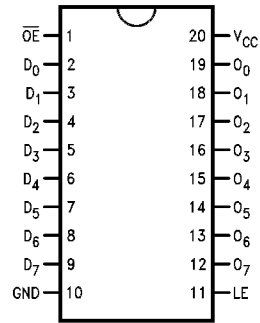
**Note 2:** Military grade device with environmental and burn-in processing. Use suffix = DMQB, FMQB and LMQB.

### Logic Symbols

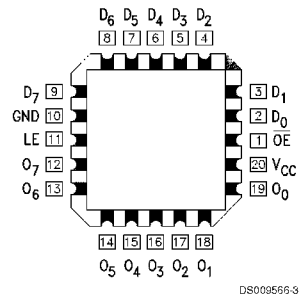


## Connection Diagrams

Pin Assignment for  
DIP, SOIC and Flatpak



Pin Assignment  
for LCC



## Unit Loading/Fan Out

Pin Names	Description	54F/74F	
		U.L. HIGH/LOW	Input $I_{IH}/I_{IL}$ Output $I_{OH}/I_{OL}$
D <sub>0</sub> -D <sub>7</sub>	Data Inputs	1.0/1.0	20 $\mu$ A/-0.6 mA
LE	Latch Enable Input (Active HIGH)	1.0/1.0	20 $\mu$ A/-0.6 mA
$\overline{OE}$	3-STATE Output Enable Input (Active LOW)	1.0/1.0	20 $\mu$ A/-0.6 mA
O <sub>0</sub> -O <sub>7</sub>	3-STATE Latch Outputs	150/40(33.3)	-3 mA/24 mA (20 mA)

## Functional Description

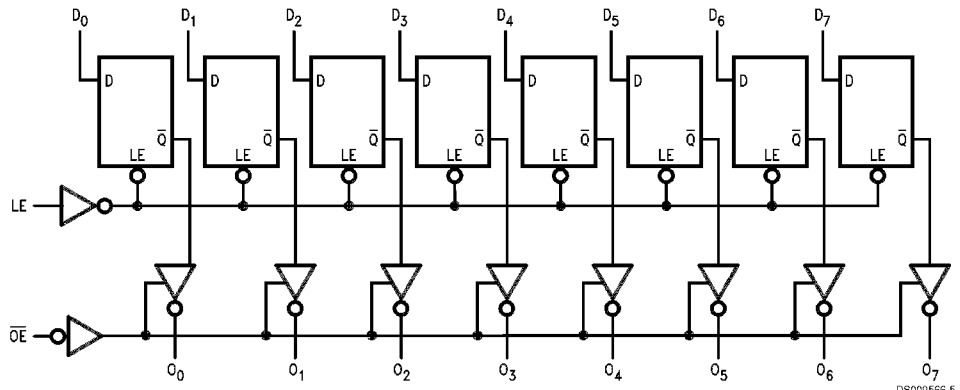
The 'F573 contains eight D-type latches with 3-state output buffers. When the Latch Enable (LE) input is HIGH, data on the D<sub>n</sub> inputs enters the latches. In this condition the latches are transparent, i.e., a latch output will change state each time its D input changes. When LE is LOW the latches store the information that was present on the D inputs a 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.

## Function Table

Inputs			Outputs
$\overline{OE}$	LE	D	O
L	H	H	H
L	H	L	L
L	L	X	O <sub>0</sub>
H	X	X	Z

H = HIGH Voltage Level  
L = LOW Voltage Level  
X = Immaterial  
O<sub>0</sub> = Value stored from previous clock cycle

## 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 (Note 3)

Storage Temperature	-65°C to +150°C
Ambient Temperature under Bias	-55°C to +125°C
Junction Temperature under Bias	-55°C to +175°C
Plastic	-55°C to +150°C
V <sub>CC</sub> Pin Potential to Ground Pin	-0.5V to +7.0V
Input Voltage (Note 4)	-0.5V to +7.0V
Input Current (Note 4)	-30 mA to +5.0 mA
Voltage Applied to Output in HIGH State (with V <sub>CC</sub> = 0V)	
Standard Output	-0.5V to V <sub>CC</sub>
3-STATE Output	-0.5V to +5.5V
Current Applied to Output in LOW State (Max)	twice the rated I <sub>OL</sub> (mA)

ESD Last Passing Voltage (Min)

4000V

## Recommended Operating Conditions

Free Air Ambient Temperature	
Military	-55°C to +125°C
Commercial	0°C to +70°C
Supply Voltage	
Military	+4.5V to +5.5V
Commercial	+4.5V to +5.5V

**Note 3:** Absolute maximum ratings are values beyond which the device may be damaged or have its useful life impaired. Functional operation under these conditions is not implied.

**Note 4:** Either voltage limit or current limit is sufficient to protect inputs.

## DC Electrical Characteristics

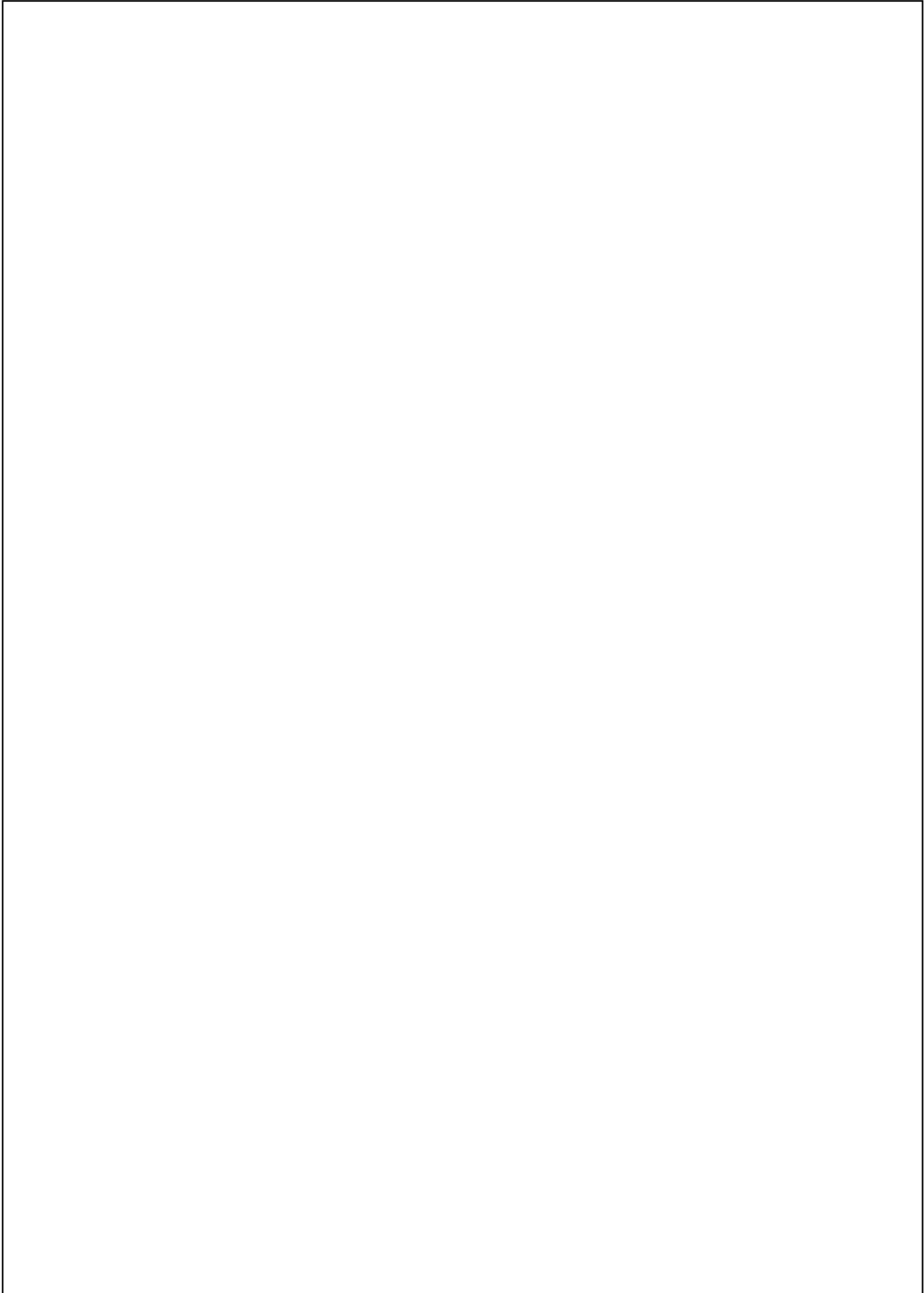
Symbol	Parameter	54F/74F			Units	V <sub>CC</sub>	Conditions
		Min	Typ	Max			
V <sub>IH</sub>	Input HIGH Voltage	2.0			V		Recognized as a HIGH Signal
V <sub>IL</sub>	Input LOW Voltage				V		Recognized as a LOW Signal
V <sub>CD</sub>	Input Clamp Diode Voltage				V	Min	I <sub>IN</sub> = -18 mA
V <sub>OH</sub>	Output HIGH Voltage	54F 10% V <sub>CC</sub>	2.5		V	Min	I <sub>OH</sub> = -1 mA
		54F 10% V <sub>CC</sub>	2.4				I <sub>OH</sub> = -3 mA
		74F 10% V <sub>CC</sub>	2.5				I <sub>OH</sub> = -1 mA
		74F 10% V <sub>CC</sub>	2.4				I <sub>OH</sub> = -3 mA
		74F 5% V <sub>CC</sub>	2.7				I <sub>OH</sub> = -1 mA
74F 5% V <sub>CC</sub>	2.7		I <sub>OH</sub> = -3 mA				
V <sub>OL</sub>	Output LOW Voltage	54F 10% V <sub>CC</sub>			V	Min	I <sub>OL</sub> = 20 mA
		74F 10% V <sub>CC</sub>					I <sub>OL</sub> = 24 mA
I <sub>IH</sub>	Input HIGH Current	54F	20.0		μA	Max	V <sub>IN</sub> = 2.7V
		74F	5.0				
I <sub>BVI</sub>	Input HIGH Breakdown Test	54F	100		μA	Max	V <sub>IN</sub> = 7.0V
		74F	7.0				
I <sub>CEX</sub>	Output HIGH Leakage Current	54F	250		μA	Max	V <sub>OUT</sub> = V <sub>CC</sub>
		74F	50				
V <sub>ID</sub>	Input Leakage Test	74F	4.75		V	0.0	I <sub>ID</sub> = 1.9 μA All Other Pins Grounded
I <sub>OD</sub>	Output Leakage Circuit Current	74F	3.75		μA	0.0	V <sub>IOD</sub> = 150 mV All Other Pins Grounded
I <sub>IL</sub>	Input LOW Current					Max	V <sub>IN</sub> = 0.5V
I <sub>OZH</sub>	Output Leakage Current					Max	V <sub>OUT</sub> = 2.7V
I <sub>OZL</sub>	Output Leakage Current					Max	V <sub>OUT</sub> = 0.5V
I <sub>OS</sub>	Output Short-Circuit Current	-60	-150		mA	Max	V <sub>OUT</sub> = 0V
I <sub>ZZ</sub>	Bus Drainage Test					0.0V	V <sub>OUT</sub> = 5.25V
I <sub>CCL</sub>	Power Supply Current	35		55	mA	Max	V <sub>O</sub> = LOW
I <sub>CCZ</sub>	Power Supply Current	35		55	mA	Max	V <sub>O</sub> = HIGH Z

## AC Electrical Characteristics

Symbol	Parameter	74F			54F		74F		Units
		T <sub>A</sub> = +25°C V <sub>CC</sub> = +5.0V C <sub>L</sub> = 50 pF			T <sub>A</sub> , V <sub>CC</sub> = Mil C <sub>L</sub> = 50 pF		T <sub>A</sub> , V <sub>CC</sub> = Com C <sub>L</sub> = 50 pF		
		Min	Typ	Max	Min	Max	Min	Max	
t <sub>PLH</sub>	Propagation Delay	3.0	5.3	7.0	3.0	9.0	3.0	8.0	ns
t <sub>PHL</sub>	D <sub>n</sub> to O <sub>n</sub>	2.0	3.7	6.0	2.0	7.0	2.0	6.5	
t <sub>PLH</sub>	Propagation Delay	5.0	9.0	11.0	5.0	13.5	5.0	12.0	ns
t <sub>PHL</sub>	LE to O <sub>n</sub>	3.0	5.2	7.0	3.0	7.5	3.0	7.0	
t <sub>PZH</sub>	Output Enable Time	2.0	5.0	8.0	2.0	10.0	2.0	9.0	ns
t <sub>PZL</sub>		2.0	5.6	8.5	2.0	10.0	2.0	9.5	
t <sub>PHZ</sub>	Output Disable Time	1.5	4.5	5.5	1.5	7.0	1.5	6.5	
t <sub>PLZ</sub>		1.5	3.8	5.5	1.5	5.5	1.5	5.5	

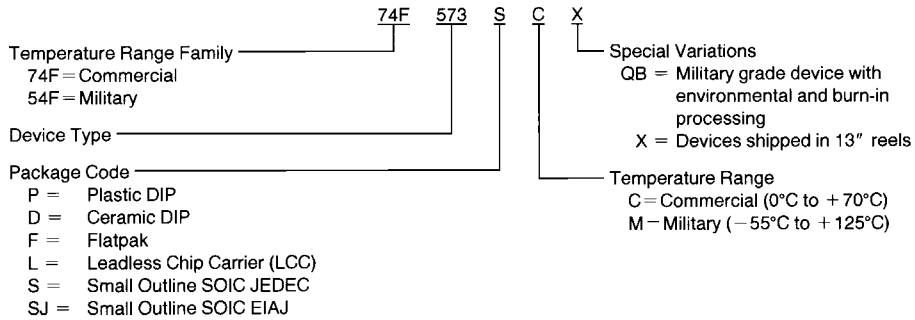
## AC Operating Requirements

Symbol	Parameter	74F		54F		74F		Units
		T <sub>A</sub> = +25°C V <sub>CC</sub> = +5.0V		T <sub>A</sub> , V <sub>CC</sub> = Mil		T <sub>A</sub> , V <sub>CC</sub> = Com		
		Min	Max	Min	Max	Min	Max	
t <sub>s</sub> (H)	Setup Time, HIGH or LOW	2.0		2.0		2.0		ns
t <sub>s</sub> (L)	D <sub>n</sub> to LE	2.0		2.0		2.0		
t <sub>h</sub> (H)	Hold Time, HIGH or LOW	3.0		3.0		3.0		ns
t <sub>h</sub> (L)	D <sub>n</sub> to LE	3.5		4.0		3.5		
t <sub>w</sub> (H)	LE Pulse Width, HIGH	4.0		4.0		4.0		ns



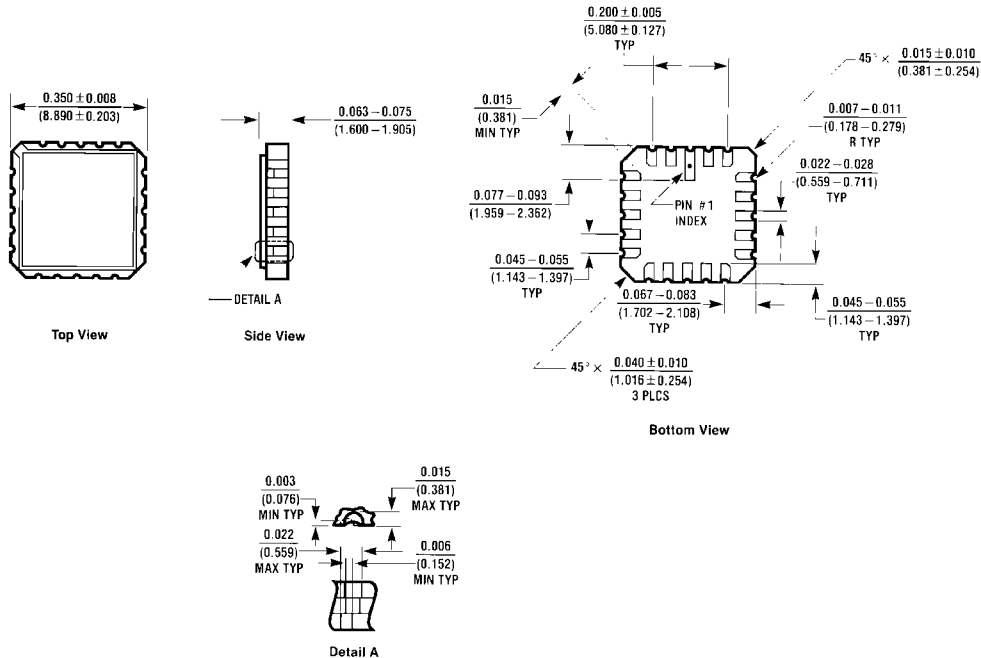
## Ordering Information

The device number is used to form part of a simplified purchasing code where the package type and temperature range are defined as follows:



DS009566-6

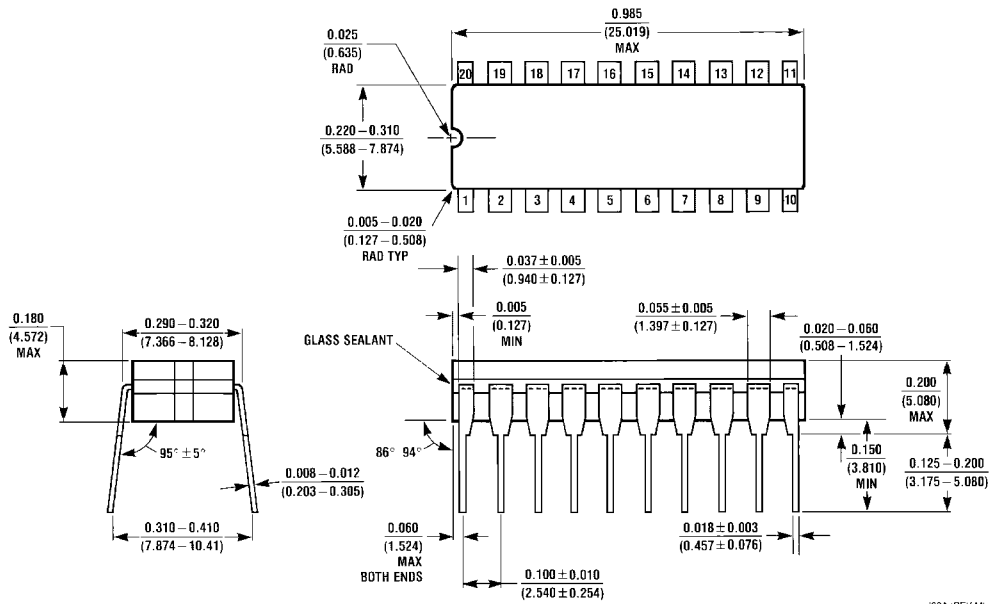
## Physical Dimensions inches (millimeters) unless otherwise noted



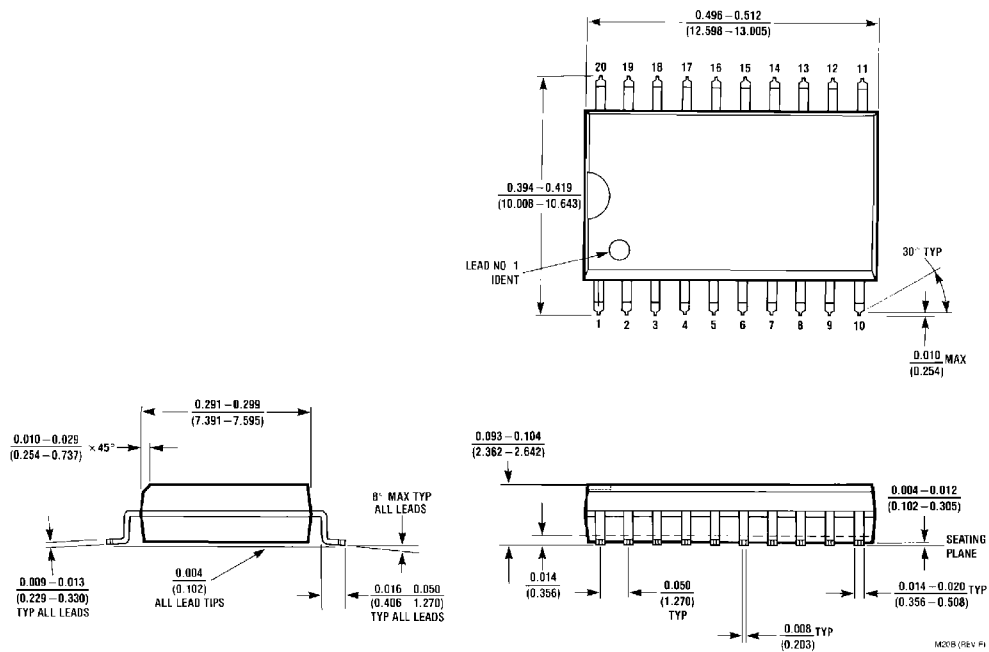
EQVA (REV. 01)

**20-Lead Ceramic Leadless Chip Carrier (L)  
Package Number E20A**

**Physical Dimensions** inches (millimeters) unless otherwise noted (Continued)



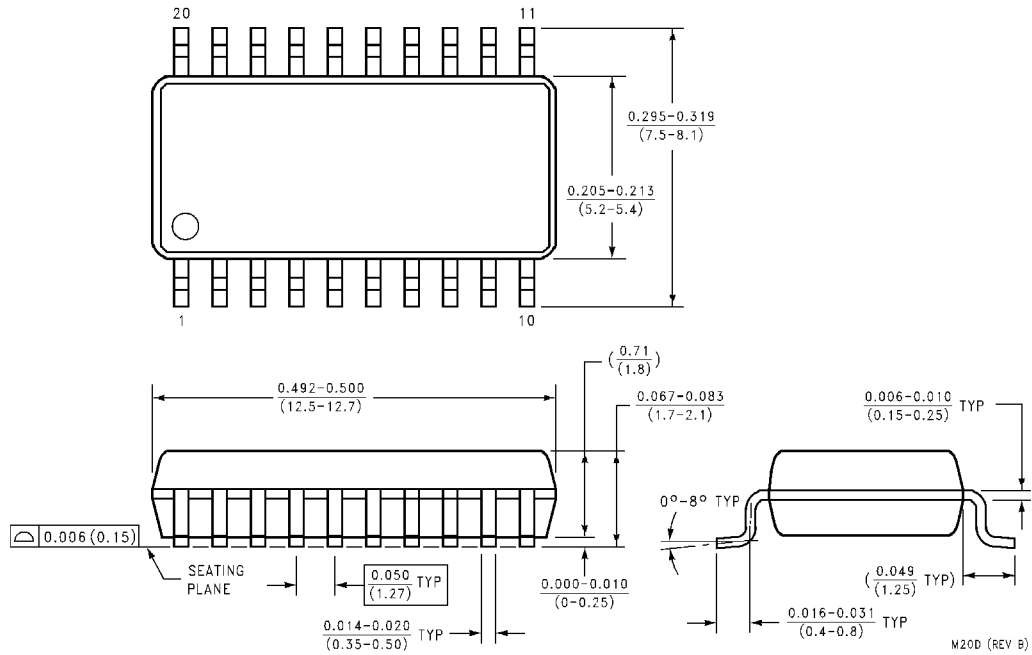
**20-Lead Ceramic Dual-In-Line Package (D)  
Package Number J20A**



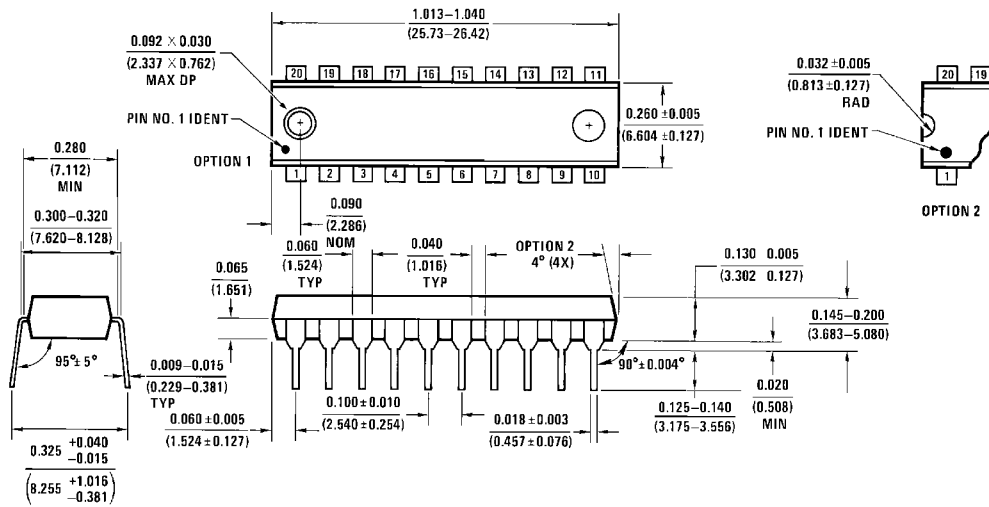
**20-Lead (0.300" Wide) Molded Small Outline Package, JEDEC (S)  
Package Number M20B**



**Physical Dimensions** inches (millimeters) unless otherwise noted (Continued)

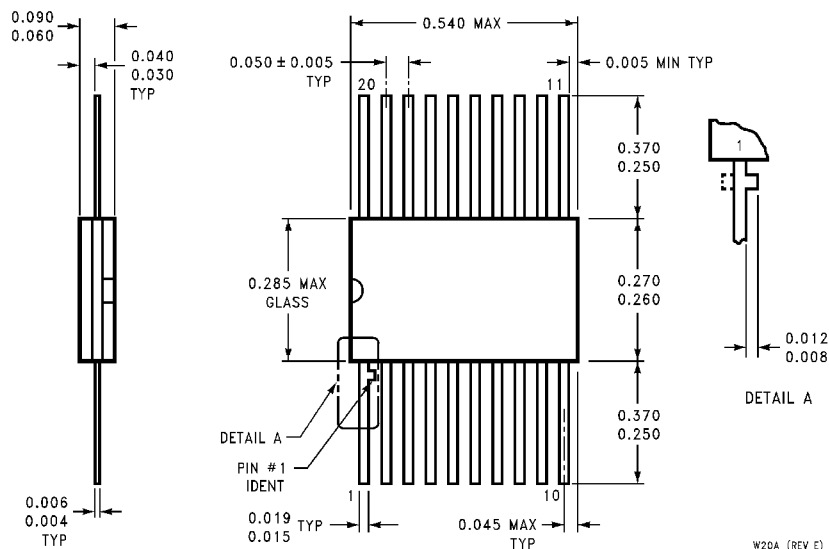


**20-Lead (0.300" Wide) Small Outline Package, EIAJ (SJ)  
Package Number M20D**



**20-Lead (0.300" Wide) Molded Dual-In-Line Package (P)  
Package Number N20A**

**Physical Dimensions** inches (millimeters) unless otherwise noted (Continued)



**20 Lead Ceramic Flatpak (F)  
Package Number W20A**

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