



Is Now Part of



ON Semiconductor®

To learn more about ON Semiconductor, please visit our website at
www.onsemi.com

Please note: As part of the Fairchild Semiconductor integration, some of the Fairchild orderable part numbers will need to change in order to meet ON Semiconductor's system requirements. Since the ON Semiconductor product management systems do not have the ability to manage part nomenclature that utilizes an underscore (_), the underscore (_) in the Fairchild part numbers will be changed to a dash (-). This document may contain device numbers with an underscore (_). Please check the ON Semiconductor website to verify the updated device numbers. The most current and up-to-date ordering information can be found at www.onsemi.com. Please email any questions regarding the system integration to Fairchild_questions@onsemi.com.

ON Semiconductor and the ON Semiconductor logo are trademarks of Semiconductor Components Industries, LLC dba ON Semiconductor or its subsidiaries in the United States and/or other countries. ON Semiconductor owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of ON Semiconductor's product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marking.pdf. ON Semiconductor reserves the right to make changes without further notice to any products herein. ON Semiconductor makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does ON Semiconductor assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using ON Semiconductor products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by ON Semiconductor. "Typical" parameters which may be provided in ON Semiconductor data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. ON Semiconductor does not convey any license under its patent rights nor the rights of others. ON Semiconductor products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use ON Semiconductor products for any such unintended or unauthorized application, Buyer shall indemnify and hold ON Semiconductor and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that ON Semiconductor was negligent regarding the design or manufacture of the part. ON Semiconductor is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

74F240, 74F244

Octal Buffers/Line Drivers with 3-STATE Outputs

Features

- 3-STATE outputs drive bus lines or buffer memory address registers
- Outputs sink 64mA (48mA mil)
- 12mA source current
- Input clamp diodes limit high-speed termination effects

General Description

The 74F240 and 74F244 are octal buffers and line drivers designed to be employed as memory and address drivers, clock drivers and bus-oriented transmitters/receivers which provide improved PC and board density.

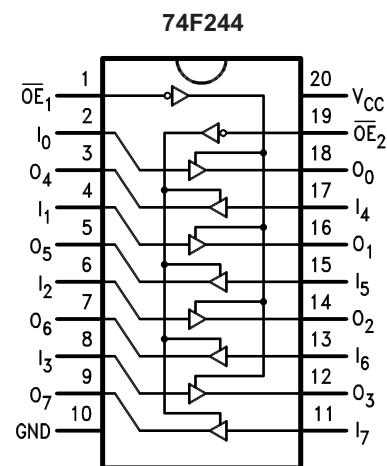
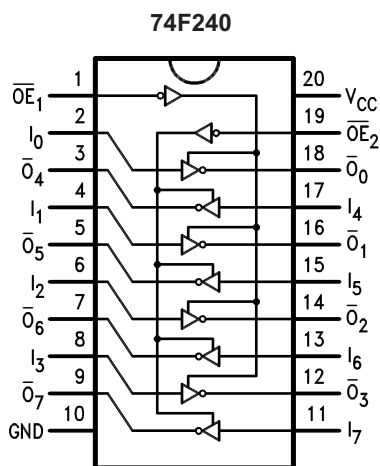
Ordering Information

Order Code	Package Number	Package Description
74F240SC ⁽¹⁾	M20B	20-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-013, 0.300" Wide
74F240SJ ⁽¹⁾	M20D	20-Lead Small Outline Package (SOP), EIAJ TYPE II, 5.3mm Wide
74F240PC	N20A	20-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300" Wide
74F244SC ⁽¹⁾	M20B	20-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-013, 0.300" Wide
74F244SJ ⁽¹⁾	M20D	20-Lead Small Outline Package (SOP), EIAJ TYPE II, 5.3mm Wide
74F244MSA ⁽¹⁾	MSA20	20-Lead Shrink Small Outline Package (SSOP), JEDEC MO-150, 5.3mm Wide
74F244PC	N20A	20-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300" Wide

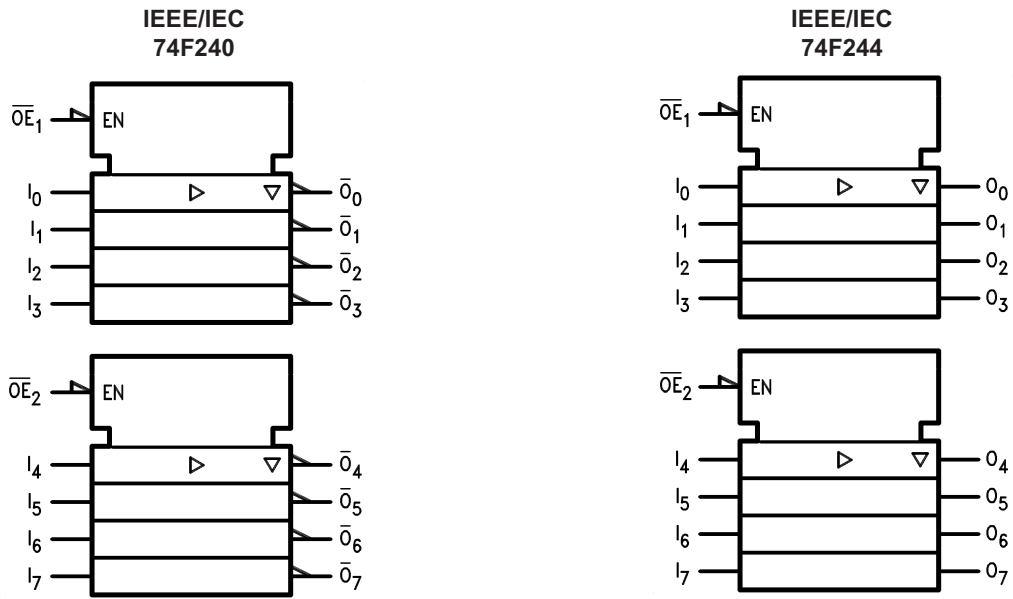
Note:

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

Connection Diagrams



Logic Symbols



Unit Loading/Fan Out

Pin Names	Description	U.L. HIGH/LOW	Input I_{IH} / I_{IL} , Output I_{OH} / I_{OL}
$\overline{OE}_1, \overline{OE}_2$	3-STATE Output Enable Input (Active LOW)	1.0 / 1.667	20 μ A / -1mA
OE_2	3-STATE Output Enable Input (Active HIGH)	1.0 / 1.667	20 μ A / -1mA
I_0 - I_7	Inputs (74F240)	1.0 / 1.667 ⁽²⁾	20 μ A / -1mA
I_0 - I_7	Inputs (74F244)	1.0 / 2.667 ⁽²⁾	20 μ A / -1.6mA
\overline{O}_0 - \overline{O}_7, O_0 - O_7	Outputs	600 / 106.6 (80)	-12mA / 64mA (48mA)

Note:

2. Worst-case 74F240 enabled; 74F244 disabled.

Truth Tables

74F240

\overline{OE}_1	D_{1n}	O_{1n}	\overline{OE}_2	D_{2n}	O_{2n}
H	X	Z	H	X	Z
L	H	L	L	H	L
L	L	H	L	L	H

74F244

\overline{OE}_1	D_{1n}	O_{1n}	\overline{OE}_2	D_{2n}	O_{2n}
H	X	Z	H	X	Z
L	H	H	L	H	H
L	L	L	L	L	L

H = HIGH Voltage Level

L = LOW Voltage Level

X = Immaterial

Z = High Impedance

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 ⁽³⁾	-0.5V to +7.0V
I_{IN}	Input Current ⁽³⁾	-30mA to +5.0mA
V_O	Voltage Applied to Output in HIGH State (with $V_{CC} = 0V$)	
	Standard Output	-0.5V to V_{CC}
	3-STATE Output	-0.5V to 5.5V
	Current Applied to Output in LOW State (Max.)	twice the rated I_{OL} (mA)
	ESD Last Passing Voltage (Min.)	4000V

Note:

3. 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	0°C to +70°C
V_{CC}	Supply Voltage	+4.5V to +5.5V

DC Electrical Characteristics

Symbol	Parameter	V_{CC}	Conditions	Min.	Typ.	Max.	Units
V_{IH}	Input HIGH Voltage		Recognized as a HIGH Signal	2.0			V
V_{IL}	Input LOW Voltage		Recognized as a LOW Signal			0.8	V
V_{CD}	Input Clamp Diode Voltage	Min.	$I_{IN} = -18\text{mA}$			-1.2	V
V_{OH}	Output HIGH Voltage	10% V_{CC}	Min. $I_{OH} = -3\text{mA}$	2.4			V
		10% V_{CC}		$I_{OH} = -15\text{mA}$	2.0		
		5% V_{CC}		$I_{OH} = -3\text{mA}$	2.7		
V_{OL}	Output LOW Voltage	10% V_{CC}	Min. $I_{OL} = 64\text{mA}$			0.55	V
I_{IH}	Input HIGH Current	Max.	$V_{IN} = 2.7\text{V}$			5.0	μA
I_{BVI}	Input HIGH Current Breakdown Test	Max.	$V_{IN} = 7.0\text{V}$			7.0	μA
I_{CEX}	Output HIGH Leakage Current	Max.	$V_{OUT} = V_{CC}$			50	μA
V_{ID}	Input Leakage Test	0.0	$I_{ID} = 1.9\mu\text{A}$	4.75			V
			All Other Pins Grounded				
I_{OD}	Output Leakage Circuit Current	0.0	$V_{IOD} = 150\text{mV}$			3.75	μA
			All Other Pins Grounded				
I_{IL}	Input LOW Current	Max.	$V_{IN} = 0.5\text{V}$ ($\overline{OE}_1, \overline{OE}_2, OE_2, D_n$ (74F240))			-1.0	mA
			$V_{IN} = 0.5\text{V}$ (D_n (74F244))			-1.6	
I_{OZH}	Output Leakage Current	Max.	$V_{OUT} = 2.7\text{V}$			50	μA
I_{OZL}	Output Leakage Current	Max.	$V_{OUT} = 0.5\text{V}$			-50	μA
I_{OS}	Output Short-Circuit Current	Max.	$V_{OUT} = 0\text{V}$	-100		-225	mA
I_{ZZ}	Bus Drainage Test	0.0V	$V_{OUT} = 5.25\text{V}$			500	μA
I_{CCH}	Power Supply Current (74F240)	Max.	$V_O = \text{HIGH}$		19	29	mA
I_{CCL}	Power Supply Current (74F240)	Max.	$V_O = \text{LOW}$		50	75	mA
I_{CCZ}	Power Supply Current (74F240)	Max.	$V_O = \text{HIGH Z}$		42	63	mA
I_{CCH}	Power Supply Current (74F244)	Max.	$V_O = \text{HIGH}$		40	60	mA
I_{CCL}	Power Supply Current (74F244)	Max.	$V_O = \text{LOW}$		60	90	mA
I_{CCZ}	Power Supply Current (74F244)	Max.	$V_O = \text{HIGH Z}$		60	90	mA

AC Electrical Characteristics

Symbol	Parameter	$T_A = +25^\circ\text{C}$, $V_{CC} = +5.0\text{V}$, $C_L = 50\text{pF}$			$T_A = -55^\circ\text{C to } +125^\circ\text{C}$, $V_{CC} = 5.0\text{V}$, $C_L = 50\text{pF}$		$T_A = 0^\circ\text{C to } +70^\circ\text{C}$, $V_{CC} = 5.0\text{V}$, $C_L = 50\text{pF}$		Units
		Min.	Typ.	Max.	Min.	Max.	Min.	Max.	
t_{PLH} , t_{PHL}	Propagation Delay Data to Output (74F240)	3.0	5.1	7.0	3.0	9.0	3.0	8.0	ns
		2.0	3.5	4.7	2.0	6.0	2.0	5.7	
t_{PZH} , t_{PZL}	Output Enable Time (74F240)	2.0	3.5	4.7	2.0	6.5	2.0	5.7	ns
		4.0	6.9	9.0	4.0	10.5	4.0	10.0	
t_{PHZ} , t_{PLZ}	Output Disable Time (74F240)	2.0	4.0	5.3	2.0	6.5	2.0	6.3	ns
		2.0	6.0	8.0	2.0	12.5	2.0	9.5	
t_{PLH} , t_{PHL}	Propagation Delay, Data to Output (74F244)	2.5	4.0	5.2	2.0	6.5	2.5	6.2	ns
		2.5	4.0	5.2	2.0	7.0	2.5	6.5	
t_{PZH} , t_{PZL}	Output Enable Time (74F244)	2.0	4.3	5.7	2.0	7.0	2.0	6.7	ns
		2.0	5.4	7.0	2.0	8.5	2.0	8.0	
t_{PHZ} , t_{PLZ}	Output Disable Time (74F244)	2.0	4.5	6.0	2.0	7.0	2.0	7.0	ns
		2.0	4.5	6.0	2.0	7.5	2.0	7.0	

Physical Dimensions

Dimensions are in inches (millimeters) unless otherwise noted.

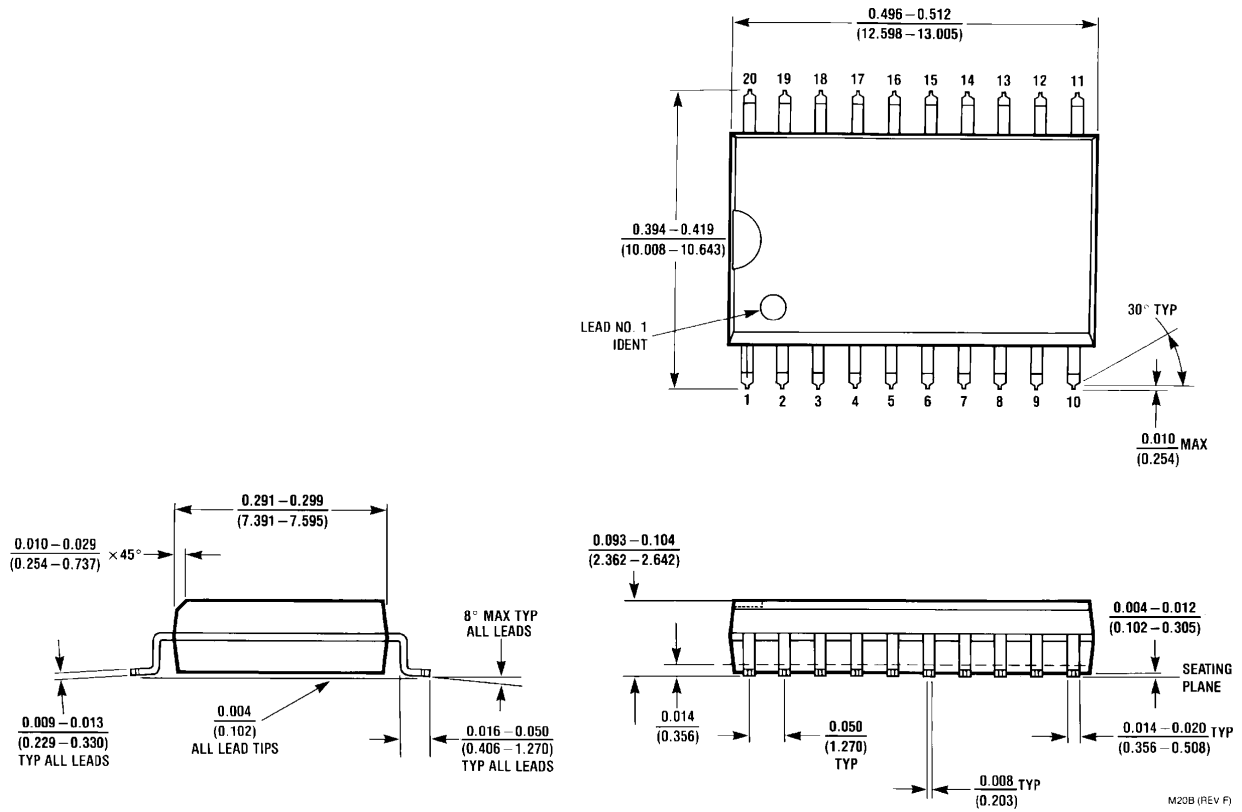
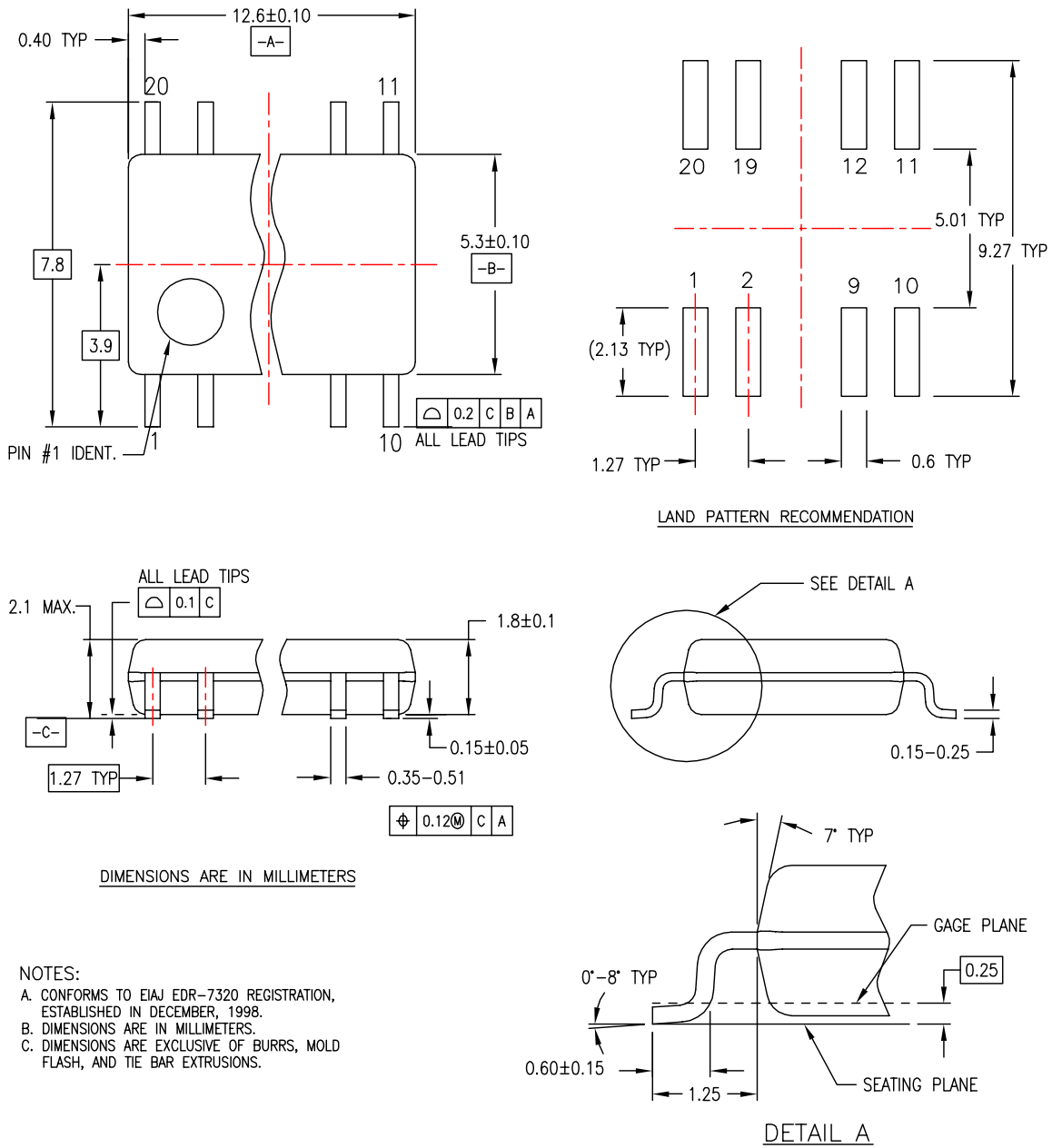


Figure 1. 20-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-013, 0.300" Wide Package Number M20B

Physical Dimensions (Continued)

Dimensions are in millimeters unless otherwise noted.

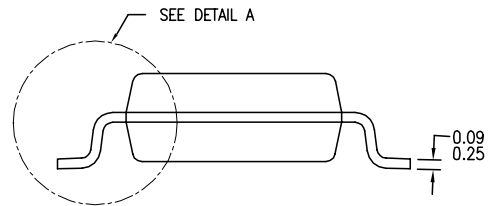
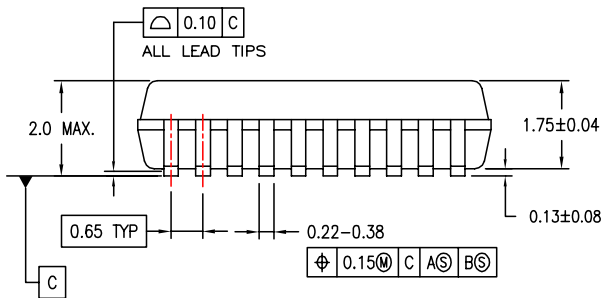
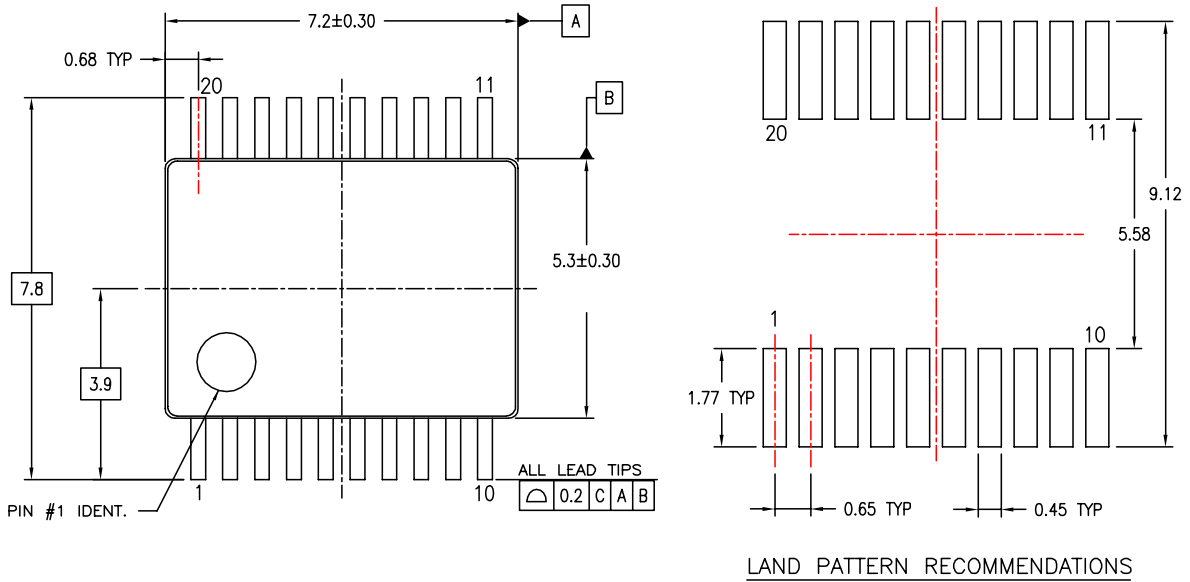


M20DREV C

Figure 2. 20-Lead Small Outline Package (SOP), EIAJ TYPE II, 5.3mm Wide Package Number M20D

Physical Dimensions (Continued)

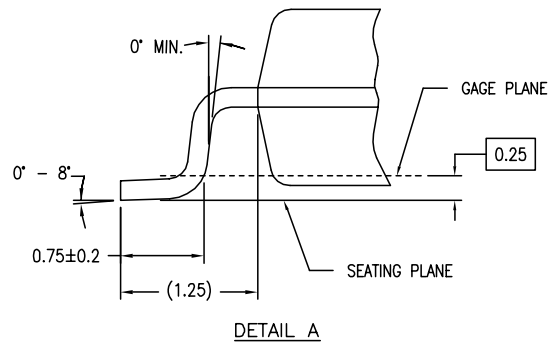
Dimensions are in millimeters unless otherwise noted.



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.



MSA20REV B

Figure 3. 20-Lead Shrink Small Outline Package (SSOP), JEDEC MO-150, 5.3mm Wide Package Number MSA20

Physical Dimensions (Continued)

Dimensions are in inches (millimeters) unless otherwise noted.

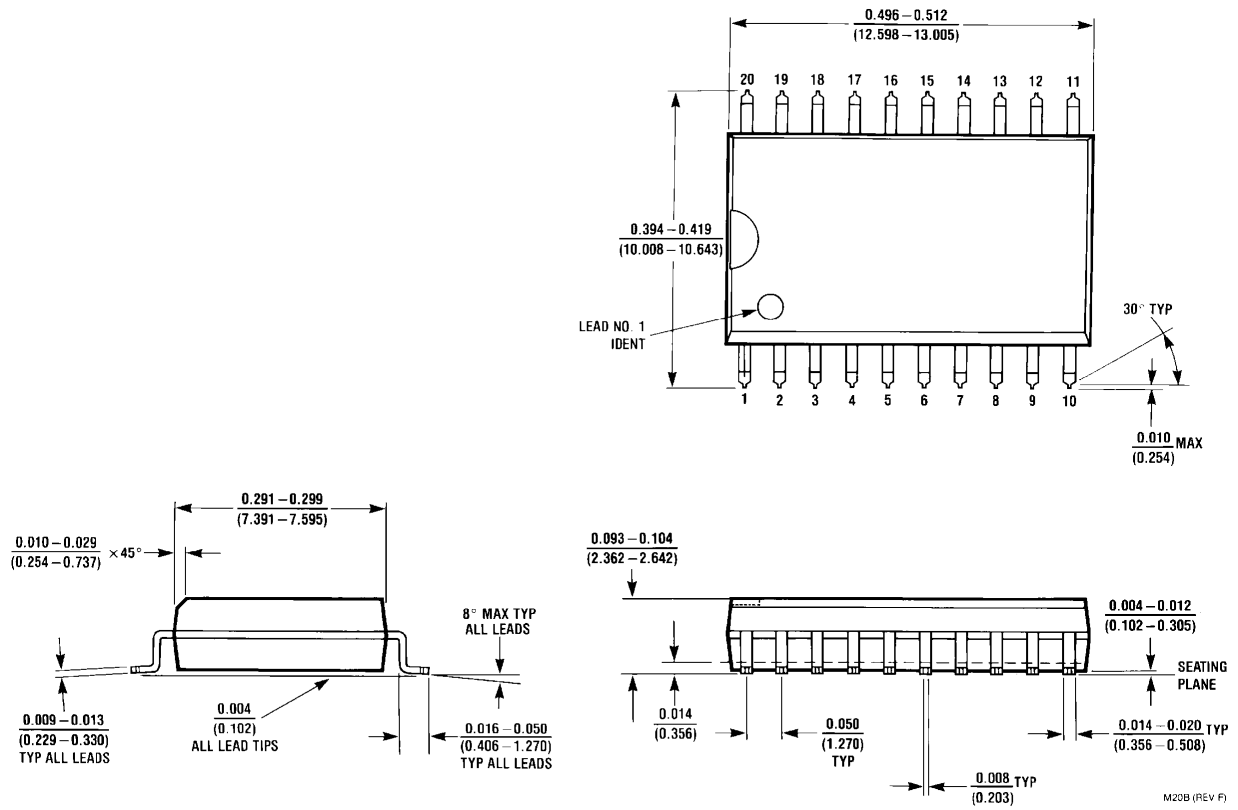



Figure 4. 20-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300" Wide Package Number N20A

M20B (REV F)



TRADEMARKS

The following are registered and unregistered trademarks Fairchild Semiconductor owns or is authorized to use and is not intended to be an exhaustive list of all such trademarks.

ACEx [®]	<i>i-Lo</i> [™]	Power-SPM [™]	TinyBoost [™]
Across the board. Around the world. [™]	ImpliedDisconnect [™]	PowerTrench [®]	TinyBuck [™]
ActiveArray [™]	IntelliMAX [™]	Programmable Active Droop [™]	TinyLogic [®]
Bottomless [™]	ISOPLANAR [™]	QFET [®]	TINYOPTO [™]
Build it Now [™]	MICROCOUPLER [™]	QS [™]	TinyPower [™]
CoolFET [™]	MicroPak [™]	QT Optoelectronics [™]	TinyWire [™]
CROSSVOLT [™]	MICROWIRE [™]	Quiet Series [™]	TruTranslation [™]
CTL [™]	Motion-SPM [™]	RapidConfigure [™]	μSerDes [™]
Current Transfer Logic [™]	MSX [™]	RapidConnect [™]	UHC [®]
DOME [™]	MSXPro [™]	ScalarPump [™]	UniFET [™]
E ² CMOS [™]	OCX [™]	SMART START [™]	VCX [™]
EcoSPARK [®]	OCXPro [™]	SPM [®]	Wire [™]
EnSigna [™]	OPTOLOGIC [®]	STEALTH [™]	
FACT Quiet Series [™]	OPTOPLANAR [®]	SuperFET [™]	
FACT [®]	PACMAN [™]	SuperSOT [™] -3	
FAST [®]	PDP-SPM [™]	SuperSOT [™] -6	
FASTr [™]	POP [™]	SuperSOT [™] -8	
FPS [™]	Power220 [®]	SyncFET [™]	
FRFET [®]	Power247 [®]	TCM [™]	
GlobalOptoisolator [™]	PowerEdge [™]	The Power Franchise [®]	
GTO [™]	PowerSaver [™]		
HiSeC [™]			

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 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. 126

ON Semiconductor and  are trademarks of Semiconductor Components Industries, LLC dba ON Semiconductor or its subsidiaries in the United States and/or other countries. ON Semiconductor owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of ON Semiconductor's product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marking.pdf. ON Semiconductor reserves the right to make changes without further notice to any products herein. ON Semiconductor makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does ON Semiconductor assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using ON Semiconductor products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by ON Semiconductor. "Typical" parameters which may be provided in ON Semiconductor data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. ON Semiconductor does not convey any license under its patent rights nor the rights of others. ON Semiconductor products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use ON Semiconductor products for any such unintended or unauthorized application, Buyer shall indemnify and hold ON Semiconductor and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that ON Semiconductor was negligent regarding the design or manufacture of the part. ON Semiconductor is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:

Literature Distribution Center for ON Semiconductor
19521 E. 32nd Pkwy, Aurora, Colorado 80011 USA
Phone: 303-675-2175 or 800-344-3860 Toll Free USA/Canada
Fax: 303-675-2176 or 800-344-3867 Toll Free USA/Canada
Email: orderlit@onsemi.com

N. American Technical Support: 800-282-9855 Toll Free
USA/Canada
Europe, Middle East and Africa Technical Support:
Phone: 421 33 790 2910
Japan Customer Focus Center
Phone: 81-3-5817-1050

ON Semiconductor Website: www.onsemi.com
Order Literature: <http://www.onsemi.com/orderlit>
For additional information, please contact your local
Sales Representative