

74F521 8-Bit Identity Comparator

General Description

The 74F521 is an expandable 8-bit comparator. It compares two words of up to eight bits each and provides a LOW output when the two words match bit for bit. The expansion input $\bar{I}_{A=B}$ also serves as an active LOW enable input.

Features

- Compares two 8-bit words in 6.5 ns typ
- Expandable to any word length
- 20-pin package

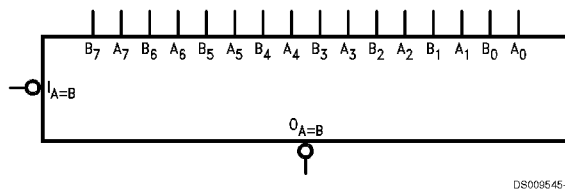
Ordering Code:

Commercial	Military	Package Number	Package Description
74F521PC		N20A	20-Lead (0.300" Wide) Molded Dual-In-Line
	54F521DM (Note 2)	J20A	20-Lead Ceramic Dual-In-Line
74F521SC (Note 1)		M20B	20-Lead (0.300" Wide) Molded Small Outline, JEDEC
74F521SJ (Note 1)		M20D	20-Lead (0.300" Wide) Molded Small Outline, EIAJ
74F521MSA (Note 1)		MSA20	20-Lead Molded Shrink Small Outline, EIAJ type II

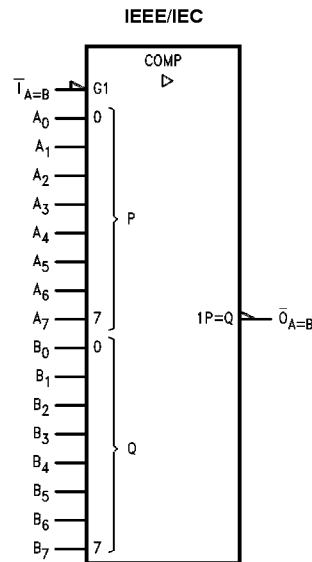
Note 1: Devices also available in 13" reel. Use suffix = SCX, SJX and MSAX.

Note 2: Military grade device with environmental and burn-in processing. Use suffix = DMOB.

Logic Symbols



DS009545-1



DS009545-4

Unit Loading/Fan Out

Pin Names	Description	54F/74F	
		U.L. HIGH/LOW	Input I_{IH}/I_{IL} Output I_{OH}/I_{OL}
A_0 – A_7	Word A Inputs	1.0/1.0	20 μ A/–0.6 mA
B_0 – B_7	Word B Inputs	1.0/1.0	20 μ A/–0.6 mA
$\bar{I}_{A=B}$	Expansion or Enable Input (Active LOW)	1.0/1.0	20 μ A/–0.6 mA
$\bar{O}_{A=B}$	Identity Output (Active LOW)	50/33.3	–1 mA/20 mA

Truth Table

Inputs		Output
$\bar{I}_{A=B}$	A, B	$\bar{O}_{A=B}$
L	A = B (Note 3)	L
L	A \neq B	H
H	A = B (Note 3)	H
H	A \neq B	H

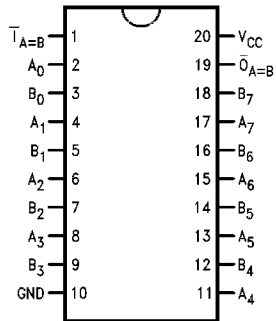
H = HIGH Voltage Level

L = LOW Voltage Level

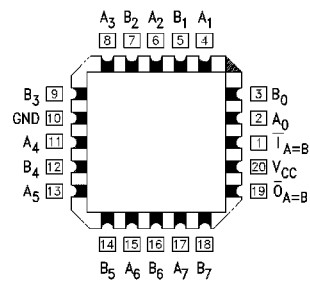
Note 3: $A_0 = B_0$, $A_1 = B_1$, $A_2 = B_2$, etc.

Connection Diagrams

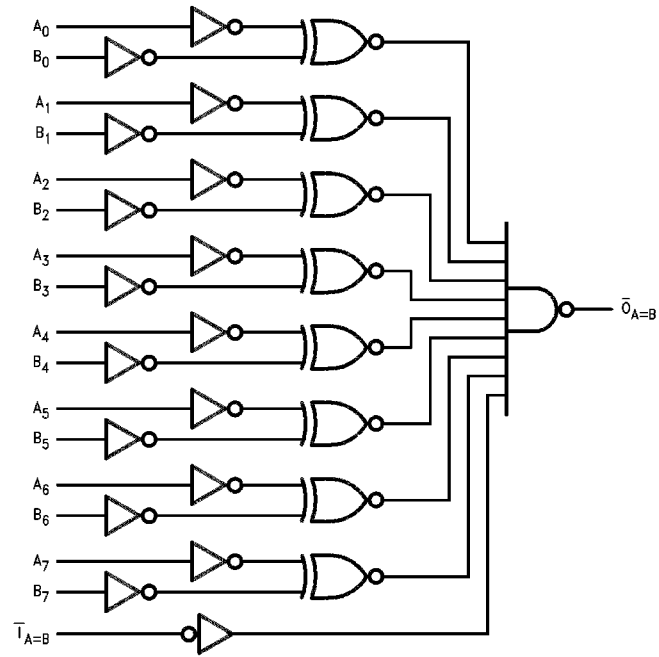
Pin Assignment for DIP,
SOIC, SSOP and Flatpak



Pin Assignment
for LCC



Logic Diagram



DS009545-5

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 4)

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 _{CC} Pin Potential to Ground Pin	-0.5V to +7.0V
Input Voltage (Note 5)	-0.5V to +7.0V
Input Current (Note 5)	-30 mA to +5.0 mA
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)

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 4: 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 5: Either voltage limit or current limit is sufficient to protect inputs.

DC Electrical Characteristics

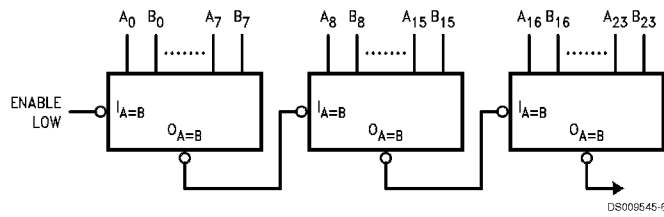
Symbol	Parameter	54F/74F			Units	V _{CC}	Conditions
		Min	Typ	Max			
V _{IH}	Input HIGH Voltage	2.0			V		Recognized as a HIGH Signal
V _{IL}	Input LOW Voltage				V		Recognized as a LOW Signal
V _{CD}	Input Clamp Diode Voltage				V	Min	I _{IN} = -18 mA
V _{OH}	Output HIGH Voltage	54F 10% V _{CC}	2.5		V	Min	I _{OH} = -1 mA
		74F 10% V _{CC}	2.5				I _{OH} = -1 mA
		74F 5% V _{CC}	2.7				I _{OH} = -1 mA
V _{OL}	Output LOW Voltage	54F 10% V _{CC}			V	Min	I _{OL} = 20 mA
		74F 10% V _{CC}					I _{OL} = 20 mA
I _{IH}	Input HIGH Current	54F	20.0		μA	Max	V _{IN} = 2.7V
		74F	5.0				
I _{BVI}	Input HIGH Breakdown Test Current	54F	100		μA	Max	V _{IN} = 7.0V
		74F	7.0				
I _{CEX}	Output HIGH Leakage Current	54F	250		μA	Max	V _{OUT} = V _{CC}
		74F	50				
V _{ID}	Input Leakage Test	74F	4.75		V	0.0	I _{ID} = 1.9 μA All Other Pins Grounded
I _{OD}	Output Leakage Circuit Current	74F	3.75		μA	0.0	V _{IOD} = 150 mV All Other Pins Grounded
I _{IL}	Input LOW Current				mA	Max	V _{IN} = 0.5V
I _{OS}	Output Short-Circuit Current	-60			mA	Max	V _{OUT} = 0V
I _{CCH}	Power Supply Current	21			mA	Max	V _O = HIGH

AC Electrical Characteristics

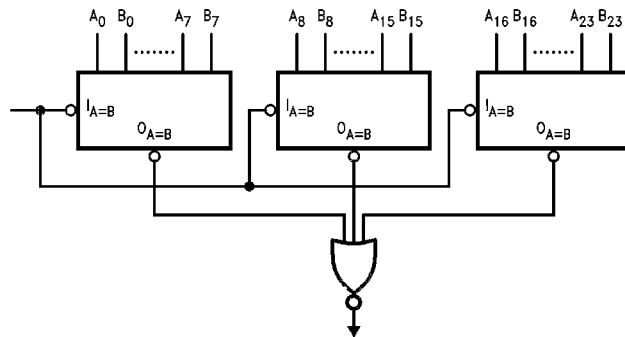
Symbol	Parameter	74F			54F		74F		Units
		$T_A = +25^\circ\text{C}$ $V_{CC} = +5.0\text{V}$ $C_L = 50\text{ pF}$			$T_A, V_{CC} = \text{MIL}$ $C_L = 50\text{ pF}$		$T_A, V_{CC} = \text{Com}$ $C_L = 50\text{ pF}$		
		Min	Typ	Max	Min	Max	Min	Max	
t_{PLH}	Propagation Delay	3.0	7.0	10.0	3.0	14.0	3.0	11.0	ns
t_{PHL}	A_n or B_n to $\overline{O}_{A=B}$	4.5	7.0	10.0	4.0	15.0	4.0	11.0	
t_{PLH}	Propagation Delay	3.0	5.0	6.5	3.0	8.5	3.0	7.5	ns
t_{PHL}	$\overline{I}_{A=B}$ to $\overline{O}_{A=B}$	3.5	6.5	9.0	3.5	13.5	3.5	10.0	

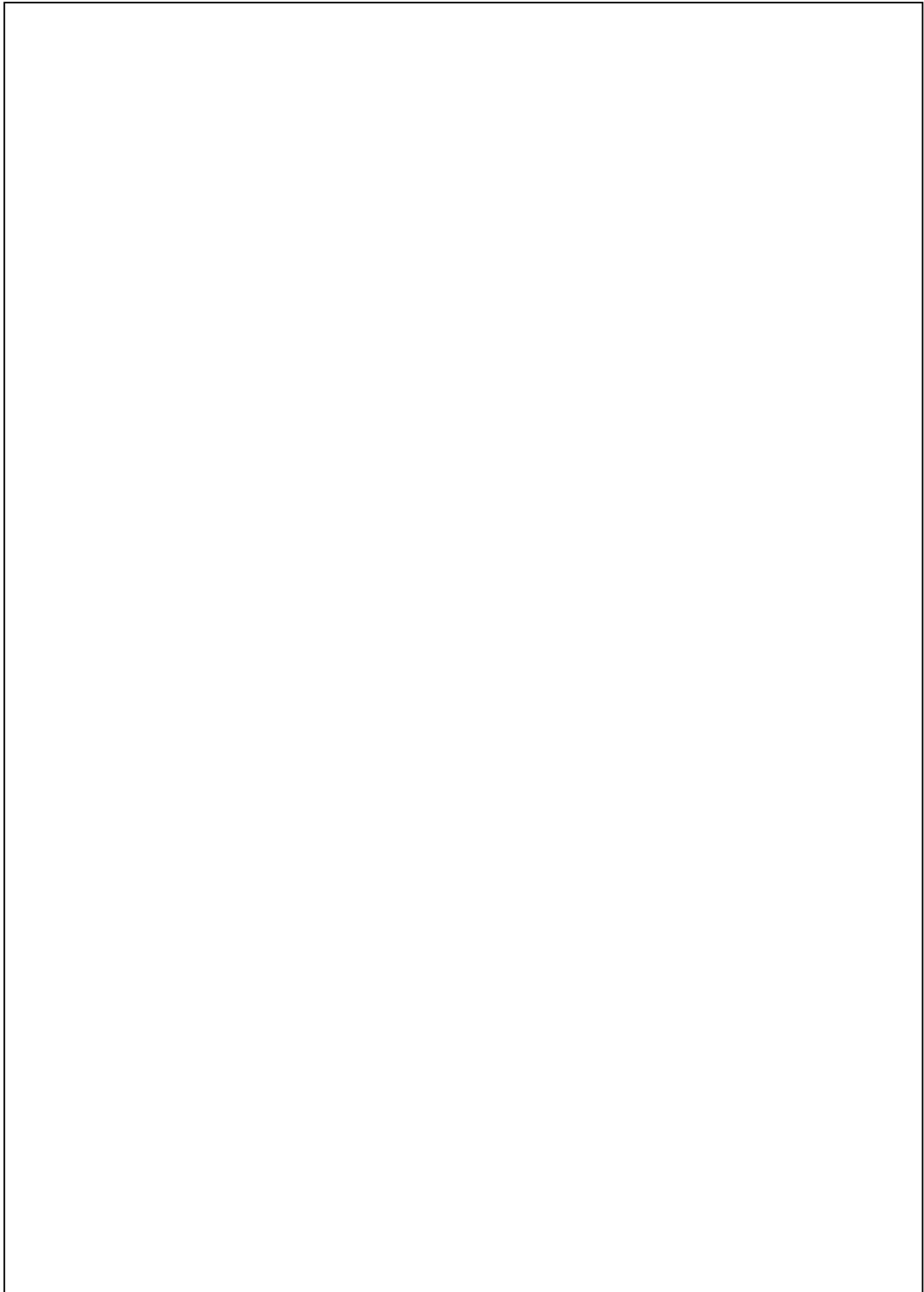
Applications

Ripple Expansion

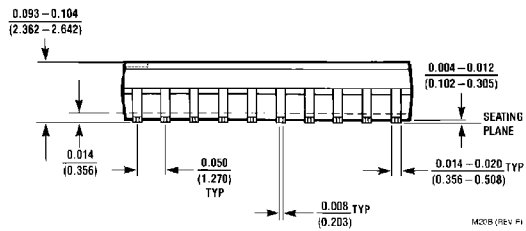
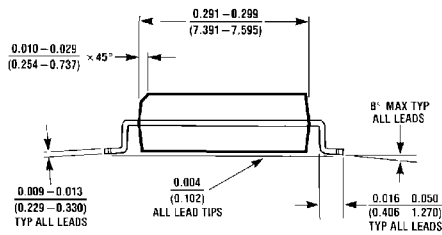
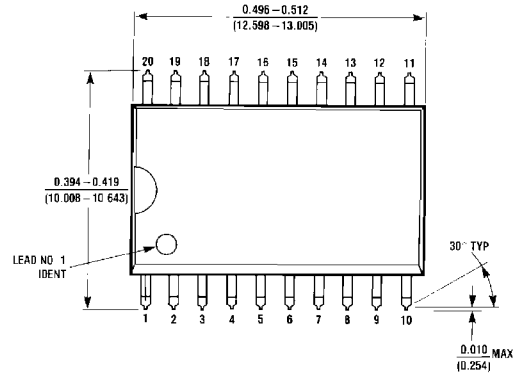


Parallel Expansion

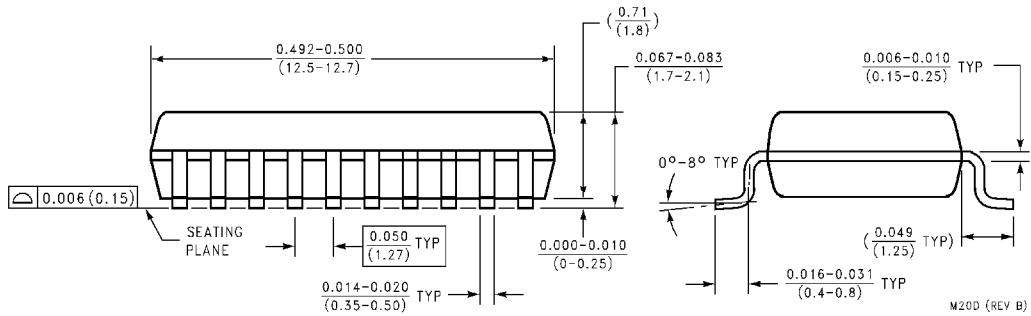
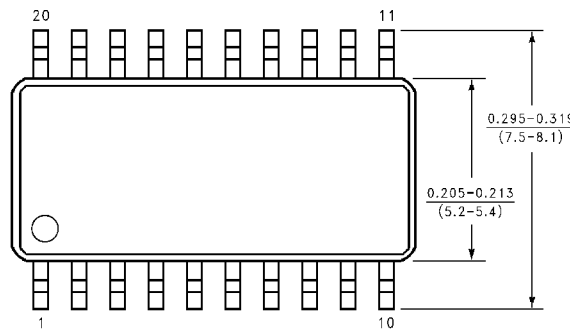




Physical Dimensions inches (millimeters) unless otherwise noted (Continued)

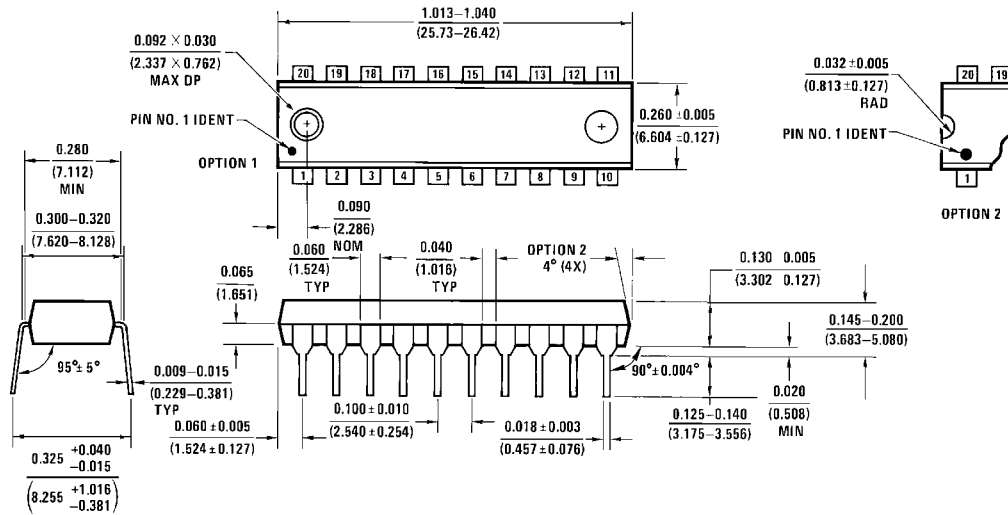


20-Lead (0.300" Wide) Molded Small Outline Package, JEDEC (S)
Package Number M20B

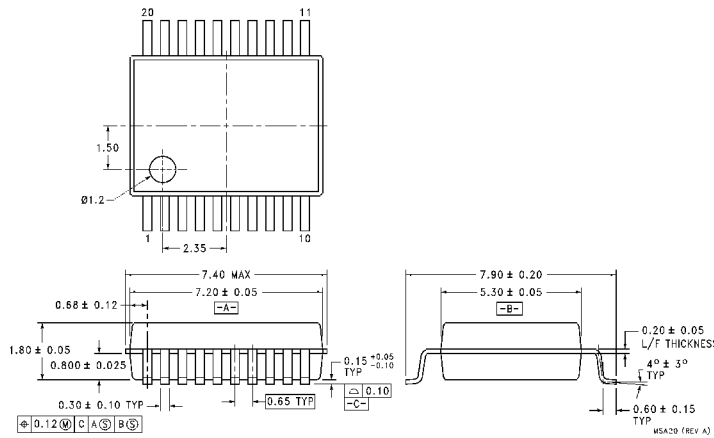


20-Lead (0.300" Wide) Molded Small Outline Package, EIAJ (SJ)
Package Number M20D

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

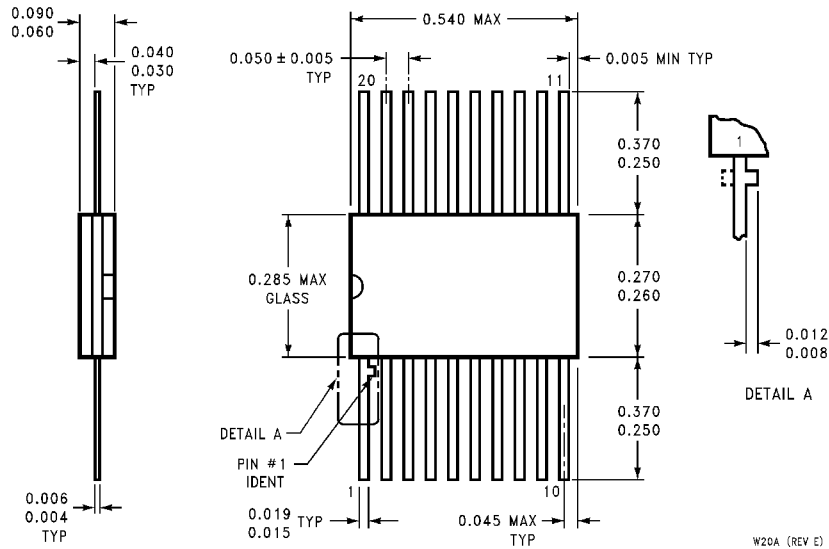


**20-Lead (0.300" Wide) Molded Dual-In-Line Package (P)
Package Number N20A**



**20-Lead (0.300" Wide) Molded Shrink Outline Package, EIAJ, Type II (MSA)
Package Number MSA20**

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



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

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 THE PRESIDENT OF FAIRCHILD SEMICONDUCTOR CORPORATION. As used herein:

1. 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 to the user.
2. 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.

Fairchild Semiconductor Corporation
Americas
Customer Response Center
Tel: 1-888-522-5372

Fairchild Semiconductor Europe
Fax: +49 (0) 1 80-530 85 86
Email: europe.support@nsc.com
Deutsch Tel: +49 (0) 8 141-35-0
English Tel: +44 (0) 1 793-85-68-56
Italy Tel: +39 (0) 2 57 5631

Fairchild Semiconductor Hong Kong Ltd.
13th Floor, Straight Block,
Ocean Centre, 5 Canton Rd.
Tsimshatsui, Kowloon
Hong Kong
Tel: +852 2737-7200
Fax: +852 2314-0061

National Semiconductor Japan Ltd.
Tel: 81-3-5620-6175
Fax: 81-3-5620-6179

www.fairchildsemi.com