

29F52•29F53 8-Bit Registered Transceiver

General Description

The 29F52 and 29F53 are 8-bit registered transceivers. Two 8-bit back to back registers store data flowing in both directions between two bidirectional buses. Separate clock, clock enable and 3-STATE output enable signals are provided for each register. The A₀–A₇ output pins are guaranteed to sink 24 mA (20 mA mil.) while the B₀–B₇ output pins are designed for 64 mA.

The 29F53 is an inverting option of the 29F52. Both transceivers are AMD Am2952/2953 functional equivalents.

Features

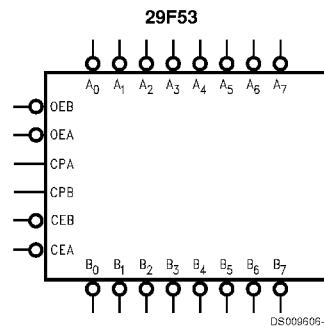
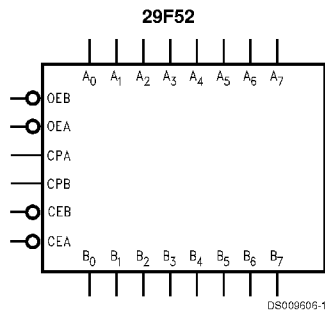
- 8-bit registered transceivers
- Separate clock, clock enable and 3-STATE output enable provided for each register
- AMD Am2952/2953 functional equivalents
- Both inverting and non-inverting options available
- 24-Pin slimline package

Ordering Code:

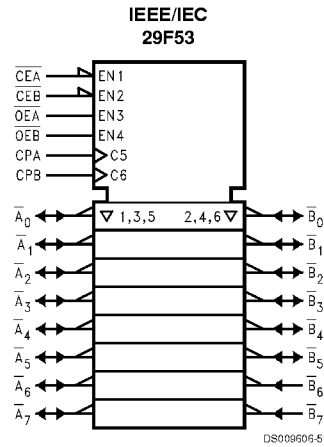
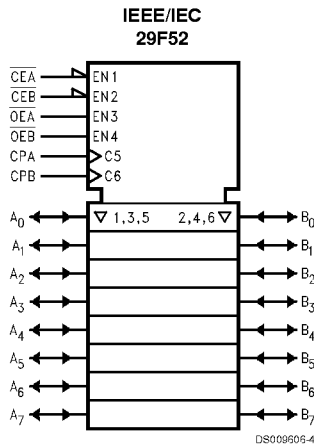
Commercial	Package Number	Package Description
29F52SPC	N24C	24-Lead (0.300" Wide) Molded Dual-In-Line
29F52SC (Note 1)	M24B	24-Lead (0.300" Wide) Molded Small Outline, JEDEC
29F53SPC	N24C	24-Lead (0.300" Wide) Molded Dual-In-Line

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

Logic Symbols

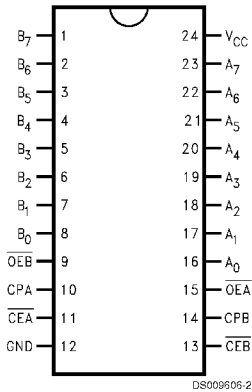


Logic Symbols (Continued)

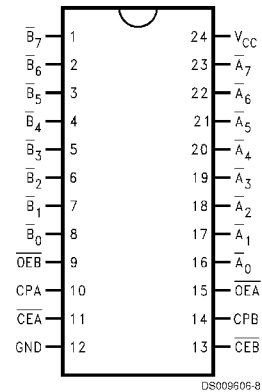


Connection Diagrams

**Pin Assignment
for DIP and SOIC
29F52**



**Pin Assignment
for DIP
29F53**



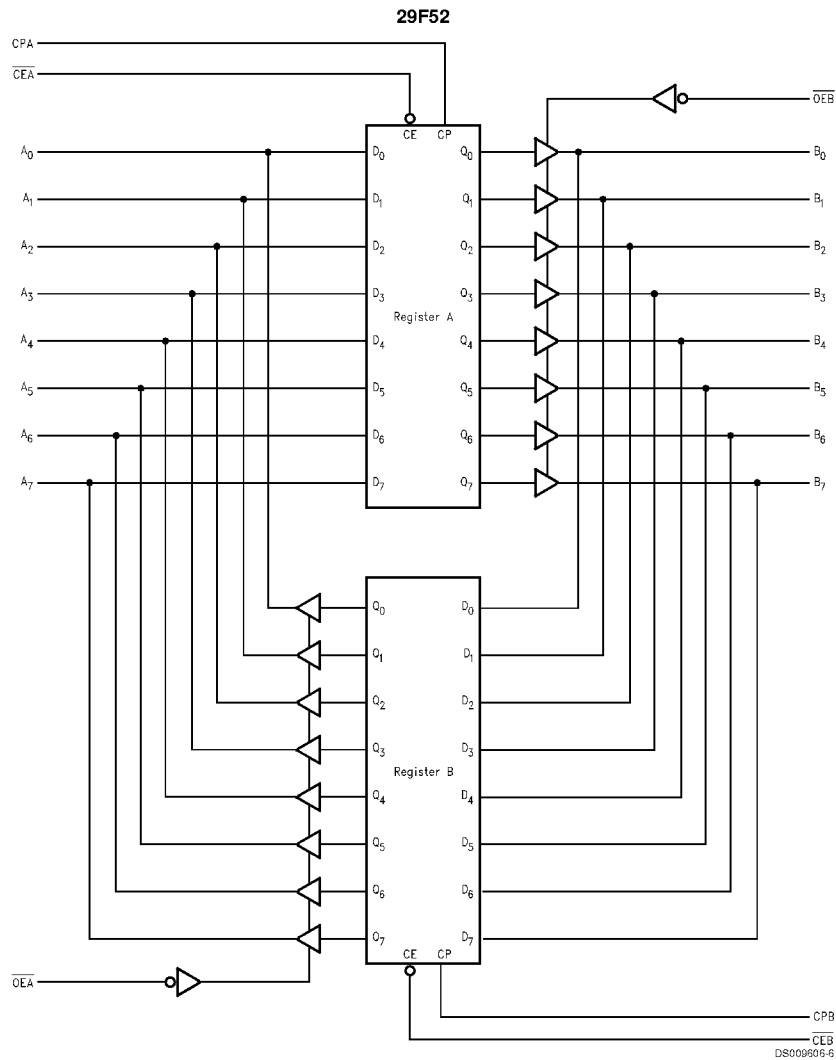
Unit Loading/Fan Out

Pin Names	Description	54F/74F	
		U.L. HIGH/LOW	Input I_{IH}/I_{IL} Output I_{OH}/I_{OL}
A_0-A_7	A-Register Inputs/ B-Register 3-STATE Outputs	3.5/1.083 150/40 (33.3)	70 μ A/0.65 mA -3 mA/24 mA (20 mA)
B_0-B_7	B Register Inputs/ A-Register 3-STATE Outputs	3.5/1.083 600/106.6 (80)	70 μ A/0.65 mA -12 mA/64 mA (48 mA)
\overline{OEA}	Output Enable A-Register	1.0/1.0	20 μ A/-0.6 mA
CPA	A-Register Clock	1.0/1.0	20 μ A/-0.6 mA
\overline{CEA}	A-Register Clock Enable	1.0/1.0	20 μ A/-0.6 mA
\overline{OEB}	Output Enable B-Register	1.0/1.0	20 μ A/-0.6 mA

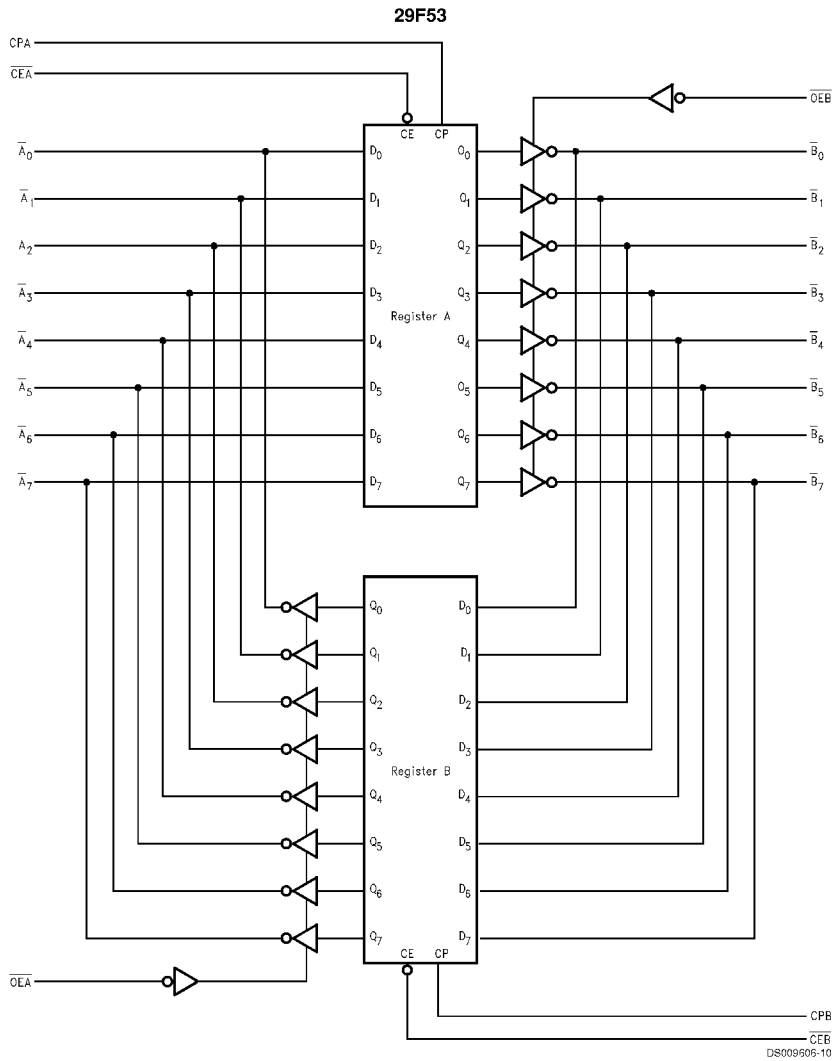
Unit Loading/Fan Out (Continued)

Pin Names	Description	54F/74F	
		U.L. HIGH/LOW	Input I_{IH}/I_{IL} Output I_{OH}/I_{OL}
CPB	B-Register Clock	1.0/1.0	20 μ A/-0.6 mA
\overline{CEB}	B-Register Clock Enable	1.0/1.0	20 μ A/-0.6 mA

Block Diagrams



Block Diagrams (Continued)



DS009505-10

Output Control

OE	Internal Q	Y-Output		Function
		29F52	29F53	
H	X	Z	Z	Disable Outputs
L	L	L	H	Enable Outputs
L	H	H	L	

H = HIGH Voltage Level
 L = LOW Voltage Level
 X = Immaterial
 Z = HIGH Impedance
 N = LOW-to-HIGH Transition
 NC = No Change

Register Function Table (Applies to A or B Register)

Inputs			Internal Q	Function
D	CP	CE		
X	X	H	NC	Hold Data
L	N	L	L	Load Data
H	N	L	H	

Absolute Maximum Ratings (Note 2)

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 3)	-0.5V to +7.0V
Input Current (Note 3)	-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 2: 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 3: 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						0.8	Recognized as a LOW Signal		
V _{CD}	Input Clamp Diode Voltage				V	Min	-1.2	I _{IN} = -18 mA (Non I/O Pins)		
V _{OH}	Output HIGH Voltage	54F 10% V _{CC}	2.5		V	Min		I _{OH} = -1 mA (A _n)		
		54F 10% V _{CC}	2.4				I _{OH} = -3 mA (A _n , B _n)			
		54F 10% V _{CC}	2.0				I _{OH} = -12 mA (B _n)			
		74F 10% V _{CC}	2.5				I _{OH} = -1 mA (A _n)			
		74F 10% V _{CC}	2.4				I _{OH} = -3 mA (A _n , B _n)			
		74F 10% V _{CC}	2.0				I _{OH} = -15 mA (B _n)			
		74F 5% V _{CC}	2.7				I _{OH} = -1 mA (A _n)			
V _{OL}	Output LOW Voltage	54F 10% V _{CC}	0.5		V	Min		I _{OL} = 20 mA (A _n)		
		54F 10% V _{CC}	0.55				I _{OL} = 48 mA (B _n)			
		74F 10% V _{CC}	0.5				I _{OL} = 24 mA (A _n)			
		74F 10% V _{CC}	0.55				I _{OL} = 64 mA (B _n)			
I _{IH}	Input HIGH Current						20	μA	Max	V _{IN} = 2.7V (Non-I/O Pins)
I _{BVI}	Input HIGH Current Breakdown Test						100	μA	Max	V _{IN} = 7.0V (Non-I/O Pins)
I _{BVIT}	Input HIGH Current Breakdown Test (I/O)						1.0	mA	Max	V _{IN} = 5.5V (A _n , B _n)
I _{IL}	Input LOW Current						-0.6	mA	Max	V _{IN} = 0.5V (Non-I/O Pins)
I _{IH} + I _{OZH}	Output Leakage Current						70	μA	Max	V _{OUT} = 2.7V (A _n , B _n)
I _{IL} + I _{OZL}	Output Leakage Current						-650	μA	Max	V _{OUT} = 0.5V (A _n , B _n)
I _{OS}	Output Short-Circuit Current			-60	mA	Max		V _{OUT} = 0V (A _n)		
				-100			V _{OUT} = 0V (B _n)			
I _{CEX}	Output HIGH Leakage Current						250	μA	Max	V _{OUT} = V _{CC} (A _n , B _n)
I _{ZZ}	Bus Drainage Test						500	μA	0.0V	V _{OUT} = 5.25V (A _n , B _n)
I _{CCH}	Power Supply Current	130		190	mA	Max		V _O = HIGH		
I _{CCL}	Power Supply Current			190	mA	Max		V _O = LOW		
I _{CCZ}	Power Supply Current			190	mA	Max		V _O = HIGH Z		

AC Electrical Characteristics

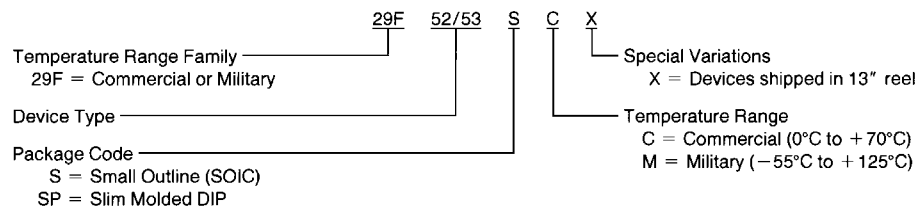
Symbol	Parameter	74F			54F		74F		Units
		$T_A = +25^\circ\text{C}$ $V_{CC} = +5.0\text{V}$ $C_L = 50\text{ pF}$			$T_A, V_{CC} = \text{Mil}$ $C_L = 50\text{ pF}$		$T_A, V_{CC} = \text{Com}$ $C_L = 50\text{ pF}$		
		Min	Typ	Max	Min	Max	Min	Max	
t_{PLH}	Propagation Delay	3.0	5.5	7.5			2.5	8.5	ns
t_{PHL}	CPA or CPB to A_n or B_n	4.0	7.0	9.0			3.5	10.0	
t_{PZH}	Output Enable Time	2.5	5.5	7.5			2.0	8.5	ns
t_{PZL}	$\overline{\text{OE}}\text{A}$ or $\overline{\text{OE}}\text{B}$ to A_n or B_n	3.5	7.0	9.5			3.0	10.5	
t_{PHZ}	Output Disable Time	2.5	6.5	9.0			2.0	10.0	ns
t_{PLZ}	$\overline{\text{OE}}\text{A}$ or $\overline{\text{OE}}\text{B}$ to A_n or B_n	2.5	5.5	7.5			2.0	8.5	

AC Operating Requirements

Symbol	Parameter	74F		54F		74F		Units
		$T_A = +25^\circ\text{C}$ $V_{CC} = +5.0\text{V}$		$T_A, V_{CC} = \text{Mil}$		$T_A, V_{CC} = \text{Com}$		
		Min	Max	Min	Max	Min	Max	
$t_s(\text{H})$	Setup Time, HIGH or LOW	4.0				4.5		ns
$t_s(\text{L})$	A_n or B_n to CPA or CPB	4.0				4.5		
$t_h(\text{H})$	Hold Time, HIGH or LOW	2.0				2.5		ns
$t_h(\text{L})$	A_n or B_n to CPA or CPB	2.0				2.5		
$t_s(\text{H})$	Setup Time, HIGH or LOW	1.0				1.5		ns
$t_s(\text{L})$	$\overline{\text{CE}}\text{A}$ or $\overline{\text{CE}}\text{B}$ to CPA or CPB	4.0				4.5		
$t_h(\text{H})$	Hold Time, HIGH or LOW	2.0				2.5		ns
$t_h(\text{L})$	$\overline{\text{CE}}\text{A}$ or $\overline{\text{CE}}\text{B}$ to CPA or CPB	2.0				2.5		
$t_w(\text{H})$	Pulse Width, HIGH or LOW	3.0				3.5		ns
$t_w(\text{L})$	CPA or CPB	3.0				3.5		

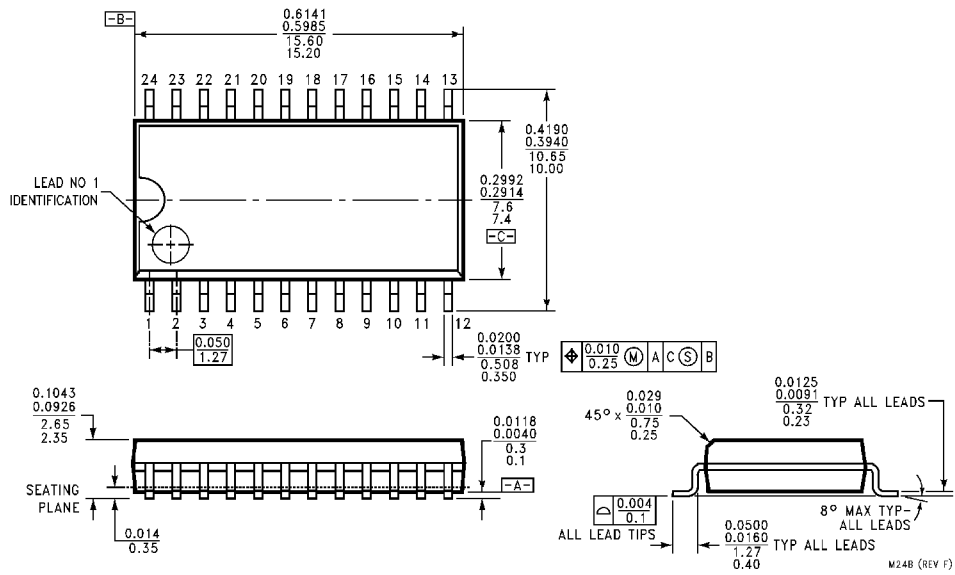
Ordering Information

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

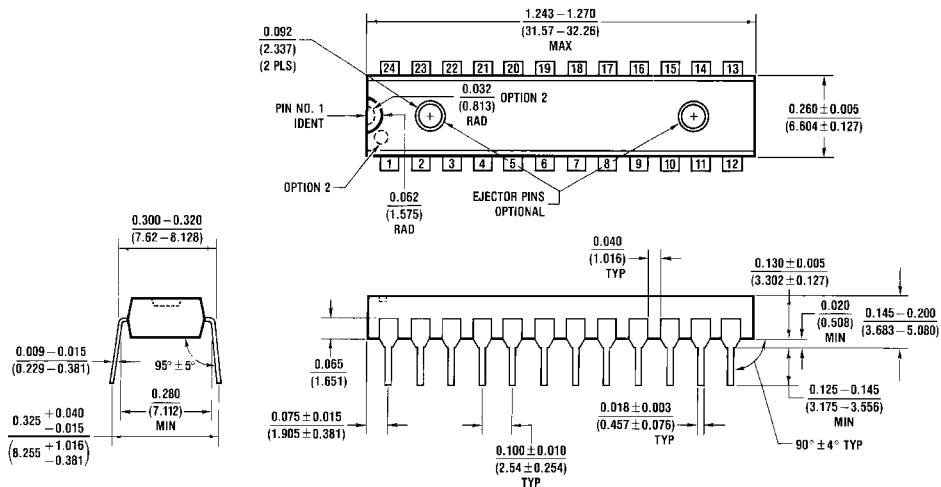


DS009606-11

Physical Dimensions inches (millimeters) unless otherwise noted



**24-Lead (0.300" Wide) Molded Small Outline Package, JEDEC (S)
Package Number M24B**



**24-Lead (0.300" Wide) Molded Dual-In-Line Package (SP)
Package Number N24C**

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