

FAIRCHILD
SEMICONDUCTOR™

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100363 Low Power Dual 8-Input Multiplexer

General Description

The 100363 is a dual 8-input multiplexer. The Data Select (S_n) inputs determine which bit (A_n and B_n) will be presented at the outputs (Z_a and Z_b respectively). The same bit (0–7) will be selected for both the Z_a and Z_b output. All inputs have 50 k Ω pull-down resistors.

Features

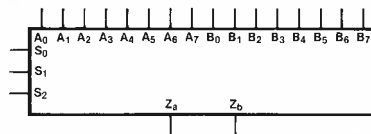
- 50% power reduction of the 100163
- 2000V ESD protection
- Pin/function compatible with 100163
- Voltage compensated operating range = $-4.2V$ to $-5.7V$
- Available to industrial grade temperature range

Ordering Code:

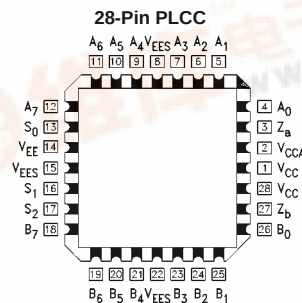
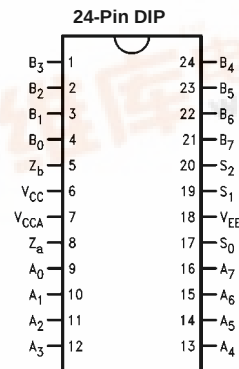
Order Number	Package Number	Package Description
100363PC	N24E	24-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-010, 0.400 Wide
100363QC	V28A	28-Lead Plastic Lead Chip Carrier (PLCC), JEDEC MO-047, 0.450 Square
100363QI	V28A	28-Lead Plastic Lead Chip Carrier (PLCC), JEDEC MO-047, 0.450 Square Industrial Temperature Range ($-40^{\circ}C$ to $+85^{\circ}C$)

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

Logic Symbol



Connection Diagrams



Pin Descriptions

Pin Names	Description
S_0 – S_2	Data Select Inputs
A_0 – A_7	A Data Inputs
B_0 – B_7	B Data Inputs
Z_a , Z_b	Data Outputs

100363 Low Power Dual 8-Input Multiplexer

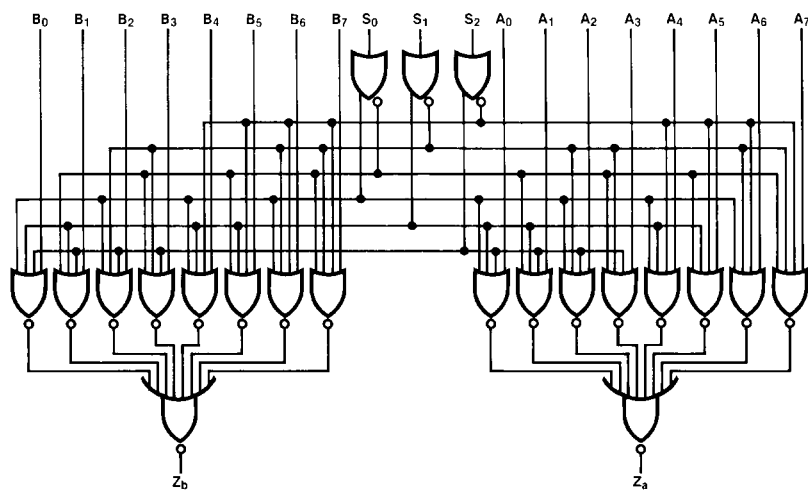


Truth Table

Inputs											Outputs
Select			Data								
S ₂	S ₁	S ₀	A ₇ B ₇	A ₆ B ₆	A ₅ B ₅	A ₄ B ₄	A ₃ B ₃	A ₂ B ₂	A ₁ B ₁	A ₀ B ₀	
L L	L L	L L								L H	L H
L L	L L	H H							L H		L H
L L	H H	L L						L H			L H
L L	H H	H H					L H				L H
H H	L L	L L				L H					L H
H H	L L	H H			L H						L H
H H	H H	L L		L H							L H
H H	H H	H H	L H								L H

H = HIGH Voltage Level
L = LOW Voltage Level
Blank = X = Don't Care

Logic Diagram



Absolute Maximum Ratings(Note 1)

Storage Temperature (T_{STG})	-65°C to +150°C
Maximum Junction Temperature (T_J)	+150°C
V_{EE} Pin Potential to Ground Pin	-7.0V to +0.5V
Input Voltage (DC)	V_{EE} to +0.5V
Output Current (DC Output HIGH)	-50 mA
ESD (Note 2)	≥2000V

Recommended Operating Conditions

Case Temperature (T_C)	
Commercial	0°C to +85°C
Industrial	-40°C to +85°C
Supply Voltage (V_{EE})	-5.7V to -4.2V

Note 1: The "Absolute Maximum Ratings" are those values beyond which the safety of the device cannot be guaranteed. The device should not be operated at these limits. The parametric values defined in the Electrical Characteristics tables are not guaranteed at the absolute maximum rating. The "Recommended Operating Conditions" table will define the conditions for actual device operation.

Note 2: ESD testing conforms to MIL-STD-883, Method 3015.

Commercial Version**DC Electrical Characteristics** (Note 3)

$V_{EE} = -4.2V$ to $-5.7V$, $V_{CC} = V_{CCA} = GND$, $T_C = 0^\circ C$ to $+85^\circ C$

Symbol	Parameter	Min	Typ	Max	Units	Conditions	
V_{OH}	Output HIGH Voltage	-1025	-955	-870	mV	$V_{IN} = V_{IH}$ (Max)	Loading with
V_{OL}	Output LOW Voltage	-1830	-1705	-1620	mV	or V_{IL} (Min)	50Ω to -2.0V
V_{OHC}	Output HIGH Voltage	-1035			mV	$V_{IN} = V_{IH}$ (Min)	Loading with
V_{OLC}	Output LOW Voltage			-1610	mV	or V_{IL} (Max)	50Ω to -2.0V
V_{IH}	Input HIGH Voltage	-1165		-870	mV	Guaranteed HIGH Signal for All Inputs	
V_{IL}	Input LOW Voltage	-1830		-1475	mV	Guaranteed LOW Signal for All Inputs	
I_{IL}	Input LOW Current	0.50			μA	$V_{IN} = V_{IL}$ (Min)	
I_{IH}	Input HIGH Current			265 340	μA	$V_{IN} = V_{IH}$ (Max)	
		S_n					
		A_n, B_n					
I_{EE}	Power Supply Current	-80		-40	mA	Inputs OPEN	

Note 3: The specified limits represent the "worst case" value for the parameter. Since these values normally occur at the temperature extremes, additional noise immunity and guardbanding can be achieved by decreasing the allowable system operating ranges. Conditions for testing shown in the tables are chosen to guarantee operation under "worst case" conditions.

DIP AC Electrical Characteristics

$V_{EE} = -4.2V$ to $-5.7V$, $V_{CC} = V_{CCA} = GND$

Symbol	Parameter	$T_C = 0^\circ C$		$T_C = +25^\circ C$		$T_C = +85^\circ C$		Units	Conditions
		Min	Max	Min	Max	Min	Max		
t_{PLH}	Propagation Delay	0.70	1.65	0.80	1.70	0.80	1.80	ns	Figures 1, 2
t_{PHL}	A_0-A_7, B_0-B_7 to Output								
t_{PLH}	Propagation Delay	1.30	2.60	1.40	2.70	1.40	2.70	ns	
t_{PHL}	S_0-S_2 to Output								
t_{TLH}	Transition Time	0.45	1.30	0.45	1.30	0.45	1.30	ns	
t_{THL}	20% to 80%, 80% to 20%								

PLCC AC Electrical Characteristics

$V_{EE} = -4.2V$ to $-5.7V$, $V_{CC} = V_{CCA} = GND$

Symbol	Parameter	$T_C = 0^\circ C$		$T_C = +25^\circ C$		$T_C = +85^\circ C$		Units	Conditions
		Min	Max	Min	Max	Min	Max		
t_{PLH}	Propagation Delay	0.70	1.65	0.80	1.70	0.80	1.80	ns	Figures 1, 2
t_{PHL}	A_0-A_7, B_0-B_7 to Output								
t_{PLH}	Propagation Delay	1.30	2.60	1.40	2.70	1.40	2.70	ns	
t_{PHL}	S_0-S_2 to Output								
t_{TLH}	Transition Time	0.45	1.30	0.45	1.30	0.45	1.30	ns	
t_{THL}	20% to 80%, 80% to 20%								

Industrial Version

DC Electrical Characteristics (Note 4)

$V_{EE} = -4.2V$ to $-5.7V$, $V_{CC} = V_{CCA} = GND$, $T_C = -40^\circ C$ to $+85^\circ C$

Symbol	Parameter	$T_C = -40^\circ C$		$T_C = 0^\circ C$ to $+85^\circ C$		Units	Conditions	
		Min	Max	Min	Max			
V_{OH}	Output HIGH Voltage	-1085	-870	-1025	-870	mV	$V_{IN} = V_{IH} (max)$	Loading with
V_{OL}	Output LOW Voltage	-1830	-1575	-1830	-1620	mV	or $V_{IL} (min)$	50Ω to $-2.0V$
V_{OHC}	Output HIGH Voltage	-1095		-1035		mV	$V_{IN} = V_{IH} (min)$	Loading with
V_{OLC}	Output LOW Voltage		-1565		-1610	mV	or $V_{IL} (max)$	50Ω to $-2.0V$
V_{IH}	Input HIGH Voltage	-1170	-870	-1165	-870	mV	Guaranteed HIGH Signal for All Inputs	
V_{IL}	Input LOW Voltage	-1830	-1480	-1830	-1475	mV	Guaranteed LOW Signal for All Inputs	
I_{IL}	Input LOW Current	0.50		0.50		μA	$V_{IN} = V_{IL} (min)$	
I_{IH}	Input HIGH Current							
	S_n		265		265	μA	$V_{IN} = V_{IH} (Max)$	
	A_n, B_n		380		340			
I_{EE}	Power Supply Current	-80	-35	-80	-40	mA	Inputs OPEN	

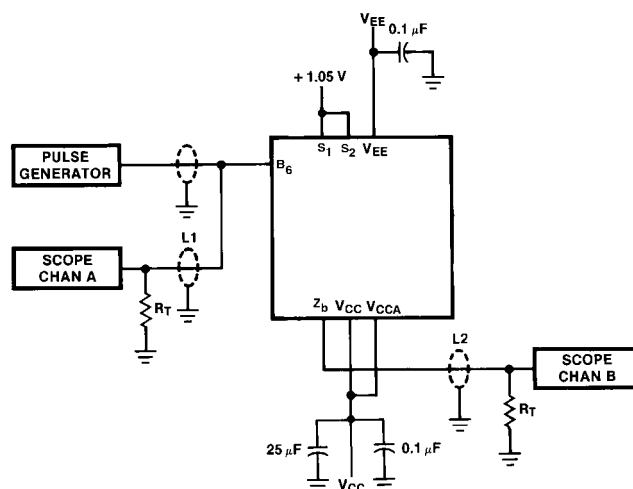
Note 4: The specified limits represent the "worst case" value for the parameter. Since these values normally occur at the temperature extremes, additional noise immunity and guardbanding can be achieved by decreasing the allowable system operating ranges. Conditions for testing shown in the tables are chosen to guarantee operation under "worst case" conditions.

AC Electrical Characteristics

$V_{EE} = -4.2V$ to $-5.7V$, $V_{CC} = V_{CCA} = GND$

Symbol	Parameter	$T_C = -40^\circ C$		$T_C = +25^\circ C$		$T_C = +85^\circ C$		Units	Conditions
		Min	Max	Min	Max	Min	Max		
t_{PLH}	Propagation Delay								
t_{PHL}	A_0-A_7, B_0-B_7 to Output	0.60	1.65	0.80	1.70	0.80	1.80	ns	Figures 1, 2
t_{PLH}	Propagation Delay								
t_{PHL}	S_0-S_2 to Output	1.20	2.60	1.40	2.70	1.40	2.70	ns	
t_{TLH}	Transition Time								
t_{THL}	20% to 80%, 80% to 20%	0.30	1.90	0.45	1.30	0.45	1.30	ns	

Test Circuitry



Notes:

$V_{CC}, V_{CCA} = +2V, V_{EE} = -2.5V$

L1 and L2 = equal length 50Ω impedance lines

$R_T = 50\Omega$ terminator internal to scope

Decoupling 0.1 μF from GND to V_{CC} and V_{EE}

All unused outputs are loaded with 50Ω to GND

C_L = Fixture and stray capacitance ≤ 3 pF

FIGURE 1. AC Test Circuit

Switching Waveforms

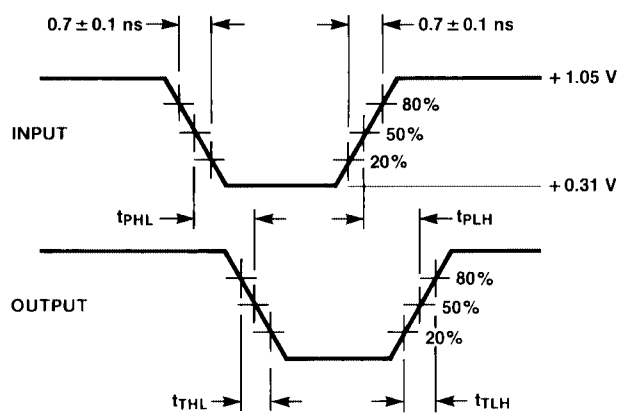
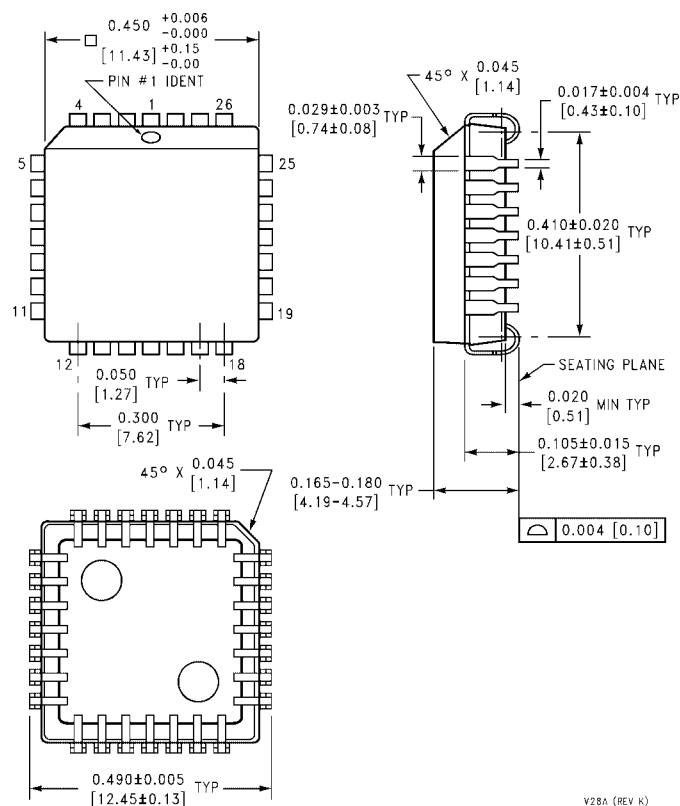


FIGURE 2. Propagation Delay and Transition Times



**24-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-010, 0.400 Wide
Package Number N24E**

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



V28A (REV K)

**28-Lead Plastic Lead Chip Carrier (PLCC), JEDEC MO-047, 0.450 Square
Package Number V28A**

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