

DESCRIPTION

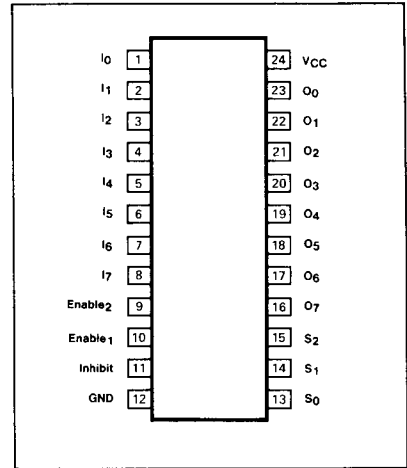
The 8243 8-Bit Position Scaler is an MSI array of approximately 70 gate complexity. The primary function of the 8243 is to scale (or shift) data bit positions by a selection of a 3-bit binary selector code.

The most significant bit input (I_7) may be shifted 8 positions to the least significant bit output (O_0). At zero shift, or scale select, all eight input data bits are transferred and inverted to their respective outputs, (I_0 to O_0 , I_1 to O_1 , I_2 to O_2 , etc.) At a shift, or scale select, of one, each input bit (I_n) will shift to the next lower output bit (O_{n-1}). See truth table for other shift codes.

The 8243's advantages over shift registers are the speed of operation and lower complexity of external logic required to effect a scale function. The speed of the 8243 Scaler is a function of gate propagation delays—the speed equivalent shift registers is the time for clock periods plus the propagation delay to effect a scale function.

The 8243 is provided with open collector outputs to provide expansion to larger scaling functions. Data input logic zero loading is reduced to less than $-100\mu A$ when the unit is disabled.

PIN CONFIGURATION



ORDERING CODE (See Section 9 for further Package and Ordering Information)

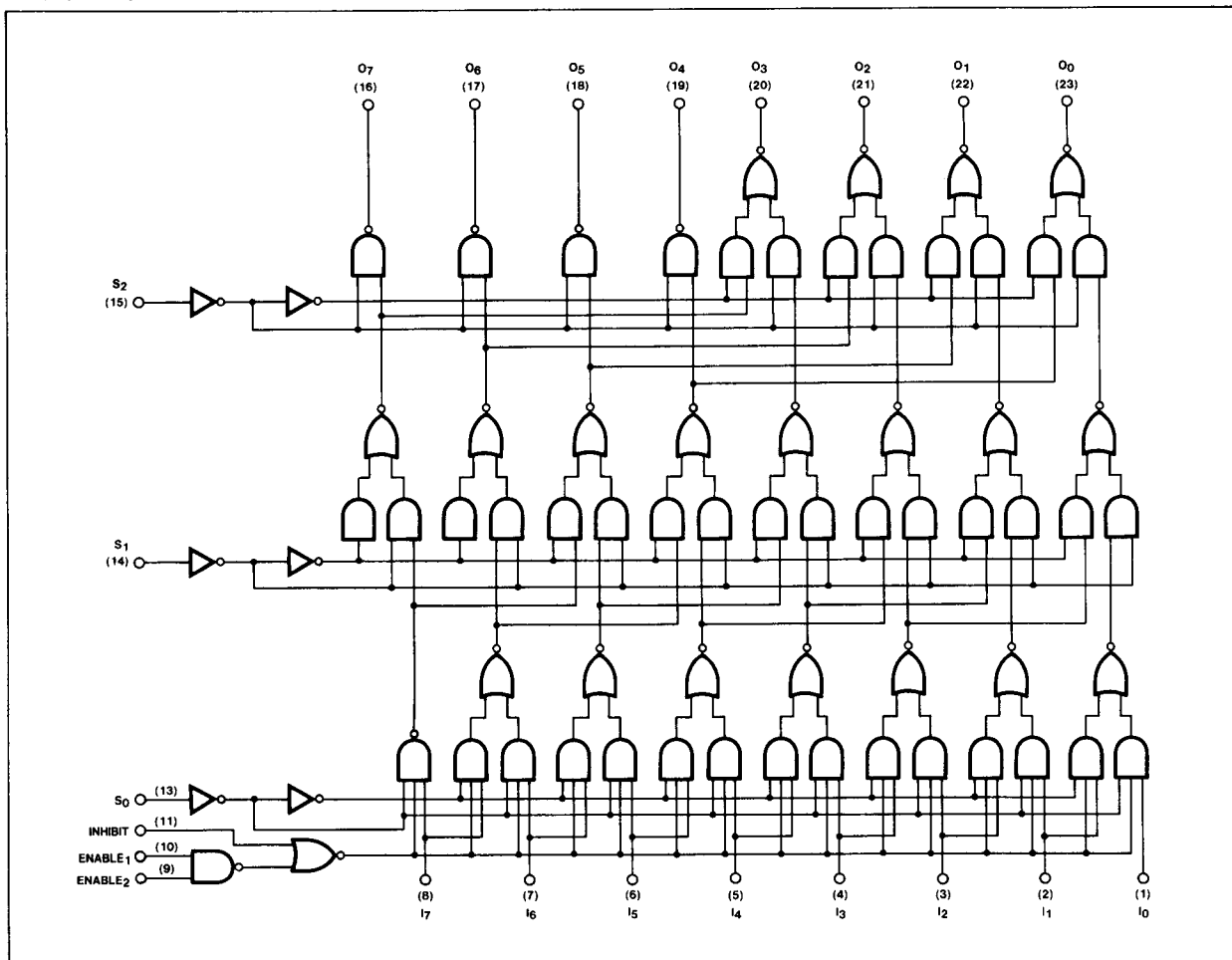
PACKAGES	COMMERCIAL RANGES	MILITARY RANGES
	$V_{CC}=5V \pm 5\%$; $T_A=0^\circ C$ to $+75^\circ C$	$V_{CC}=5V \pm 5\%$; $T_A=-55^\circ C$ to $+125^\circ C$
Plastic DIP	N8243N	
Ceramic DIP	N8243F	S8243F
Flatpak		S8243Q

DC CHARACTERISTICS OVER OPERATING TEMPERATURE RANGE

PARAMETER	TEST CONDITIONS	8243		UNIT
		Min	Max	
I_{OH} Output HIGH current	$V_{CC} = 4.75V, V_{OUT} = 5.25V$		150	μA
V_{OL} Output LOW voltage	$V_{CC} = 4.75V, I_{OL} = 12.8mA$		0.4	V
I_{IL} Input LOW current Data in (Disabled) Data in (Enabled)	$V_{CC} = 5.25V, V_{IN} = 0.4V$ $V_E = 0.8V$		-100 -1.6	μA mA
I_{IH} Input HIGH current Data in Select, Inhibit, Enable 1 & 2	$V_{CC} = 5.25V, V_{IN} = 4.5V$		80 40	μA μA
V_{BD} Voltage breakdown	$V_{CC} = 5.0V, I_N = 10mA$	5.5		V
I_{CC} Supply Current	$V_{CC} = 5.25V,$		75.2	mA



LOGIC DIAGRAM



TRUTH TABLE

INHIBIT	ENABLE 1 & 2	INPUTS			OUTPUTS							
		S ₀	S ₁	S ₂	O ₀	O ₁	O ₂	O ₃	O ₄	O ₅	O ₆	O ₇
L	H	L	L	L	\bar{I}_0	\bar{I}_1	\bar{I}_2	\bar{I}_3	\bar{I}_4	\bar{I}_5	\bar{I}_6	\bar{I}_7
L	H	H	L	L	\bar{I}_1	\bar{I}_2	\bar{I}_3	\bar{I}_4	\bar{I}_5	\bar{I}_6	\bar{I}_7	H
L	H	L	H	L	\bar{I}_2	\bar{I}_3	\bar{I}_4	\bar{I}_5	\bar{I}_6	\bar{I}_7	H	H
L	H	H	H	L	\bar{I}_3	\bar{I}_4	\bar{I}_5	\bar{I}_6	\bar{I}_7	H	H	H
L	H	L	L	H	\bar{I}_4	\bar{I}_5	\bar{I}_6	\bar{I}_7	H	H	H	H
L	H	H	L	H	\bar{I}_5	\bar{I}_6	\bar{I}_7	H	H	H	H	H
L	H	L	H	H	\bar{I}_6	\bar{I}_7	H	H	H	H	H	H
L	H	H	H	H	\bar{I}_7	H	H	H	H	H	H	H
H	X	X	X	X	H	H	H	H	H	H	H	H
X	L	X	X	X	H	H	H	H	H	H	H	H

X indicates either logic H or logic L may be present.

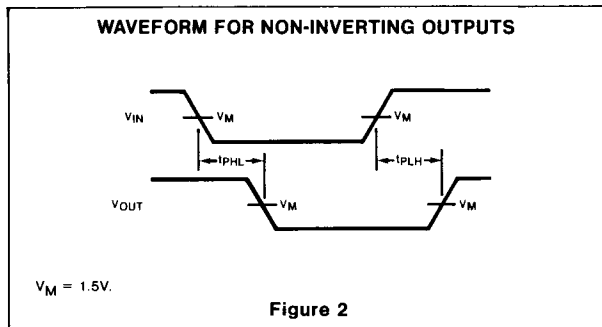
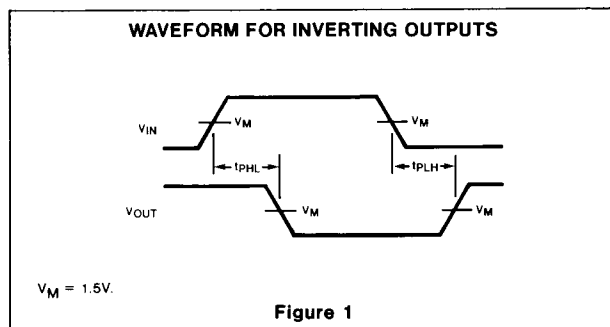
H = HIGH voltage level

L = LOW voltage level

AC CHARACTERISTICS: $T_A = 25^\circ\text{C}$ (See Section 4 for Waveforms and Conditions)

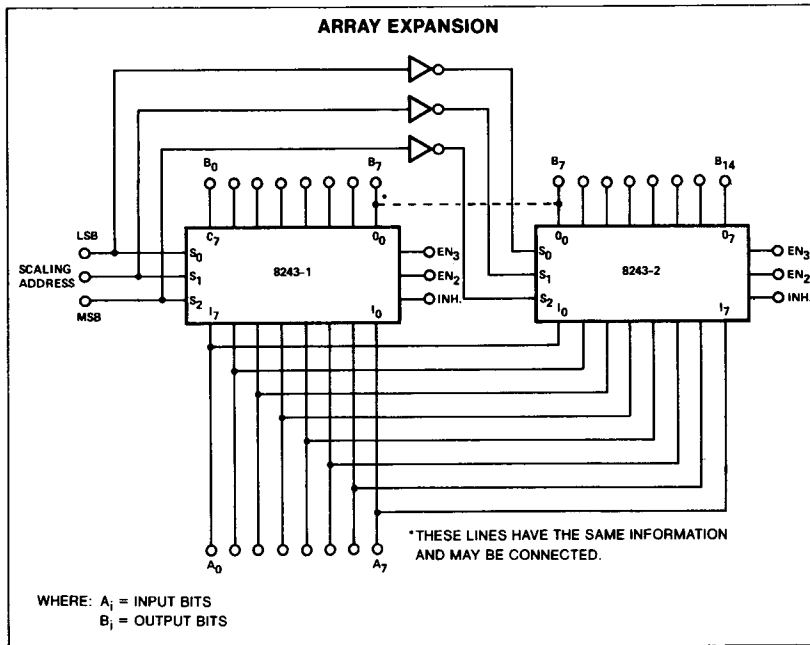
PARAMETER	TEST CONDITIONS	8243		UNITS
		$C_L = 24\text{pF}$ $R_1 = 480\Omega$ $R_2 = 500\Omega$		
		Min	Max	
t_{PLH} t_{PHL} Propagation delay Data to output	Waveform 1		32	ns
t_{PLH} t_{PHL} Propagation delay Select to output	Waveforms 1 & 2		40	ns
t_{PLH} t_{PHL} Propagation delay Inhibit to output	Waveform 2		35	ns
t_{PLH} t_{PHL} Propagation delay Enable to output	Waveform 1		45	ns

AC WAVEFORMS



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TYPICAL APPLICATIONS



TRUTH TABLE FOR ARRAY EXPANSION

SCALE ADDRESS			8243-1								8243-2							
MSB	LSB		B_0	B_1	B_2	B_3	B_4	B_5	B_6	B_7	B_7	B_8	B_9	B_{10}	B_{11}	B_{12}	B_{13}	B_{14}
L	L	L	\bar{A}_0	\bar{A}_1	\bar{A}_2	\bar{A}_3	\bar{A}_4	\bar{A}_5	\bar{A}_6	\bar{A}_7	\bar{A}_7	H	H	H	H	H	H	H
L	L	H	H	\bar{A}_0	\bar{A}_1	\bar{A}_2	\bar{A}_3	\bar{A}_4	\bar{A}_5	\bar{A}_6	\bar{A}_6	\bar{A}_7	H	H	H	H	H	H
L	H	L	H	H	\bar{A}_0	\bar{A}_1	\bar{A}_2	\bar{A}_3	\bar{A}_4	\bar{A}_5	\bar{A}_5	\bar{A}_6	\bar{A}_7	H	H	H	H	H
L	H	H	H	H	\bar{A}_0	\bar{A}_1	\bar{A}_2	\bar{A}_3	\bar{A}_4	\bar{A}_4	\bar{A}_4	\bar{A}_5	\bar{A}_6	\bar{A}_7	H	H	H	H
H	L	L	H	H	H	\bar{A}_0	\bar{A}_1	\bar{A}_2	\bar{A}_3	\bar{A}_3	\bar{A}_3	\bar{A}_4	\bar{A}_5	\bar{A}_6	\bar{A}_7	H	H	H
H	L	H	H	H	H	\bar{A}_0	\bar{A}_1	\bar{A}_2	\bar{A}_2	\bar{A}_2	\bar{A}_2	\bar{A}_3	\bar{A}_4	\bar{A}_5	\bar{A}_6	\bar{A}_7	H	H
H	H	L	H	H	H	H	H	H	\bar{A}_0	\bar{A}_1	\bar{A}_1	\bar{A}_2	\bar{A}_3	\bar{A}_4	\bar{A}_5	\bar{A}_6	\bar{A}_7	H
H	H	H	H	H	H	H	H	H	H	\bar{A}_0	\bar{A}_0	\bar{A}_1	\bar{A}_2	\bar{A}_3	\bar{A}_4	\bar{A}_5	\bar{A}_6	\bar{A}_7