Rochester Electronics

Datasheet

Rochester Electronics Manufactured Components

Rochester branded components are manufactured using either die/wafers purchased from the original suppliers or Rochester wafers recreated from the original IP. All recreations are done with the approval of the OCM.

Parts are tested using original factory test programs or Rochester developed test solutions to guarantee product meets or exceed the OCM data sheet.

Quality Overview

- ISO-9001
- AS9120 certification
- Qualified Manufacturers List (QML) MIL-PRF-35835
    - Class Q Military
    - Class V Space Level
- Qualified Suppliers List of Distributors (QSLD)

- Rochester is a critical supplier to DLA and meets all industry and DLA standards.

Rochester Electronics, LLC is committed to supplying products that satisfy customer expectations for quality and are equal to those originally supplied by industry manufacturers.

The original manufacturer's datasheet accompanying this document reflects the performance and specifications of the Rochester manufactured version of this device. Rochester Electronics guarantees the performance of its semiconductor products to the original OEM specifications. 'Typical' values are for reference purposes only. Certain minimum or maximum ratings may be based on product characterization, design, simulation, or sample testing.

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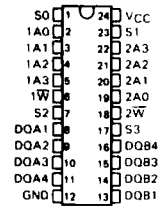
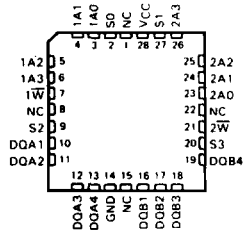
D2661, DECEMBER 1982 – REVISED OCTOBER 1991

- **3-State Buffer-Type Outputs Drive Bus Lines Directly**
- **Each Register File Has Individual Write Enable Controls and Address Lines**
- **Designed Specifically for Multibus Architecture and Overlapping File Operations**
- **Prioritized B Input Port Prevents Write Conflicts During Dual Input Mode**
- **Dependable Texas Instruments Quality and Reliability**

SN54ALS870 . . . JT PACKAGE
SN74ALS870 . . . DW OR NT PACKAGE
(TOP VIEW)



SN54ALS870 . . . FK PACKAGE
(TOP VIEW)



description

These devices features two 16-word by 4-bit register files. Each register file has individual write-enable controls and address lines. The 'ALS870 has two 4-bit data I/O ports (DQA1-DQA4 and DQB1-DQB4). The data I/O ports can output to Bus A and Bus B, receive input from Bus A and Bus B, receive input from Bus A and output to Bus B, or output to Bus A and receive input from Bus B. To prevent writing conflicts in the dual-input mode, the B input port takes priority. Two select lines, S0 and S1, control which port has access to which register. S2 determines whether the A ports are in the input or the output modes and S3 does likewise for the B ports. The address lines (1A0-1A3 or 2A0-2A3) are decoded by an internal 1-of-16 decoder to select which register word is to be accessed. All outputs are 3-state buffer-type outputs designed specifically to drive bus lines directly.

PRODUCTION DATA documents contain information current as of publication date. Products conform to specifications per the terms of Texas Instruments standard warranty. Production processing does not necessarily include testing of all parameters.

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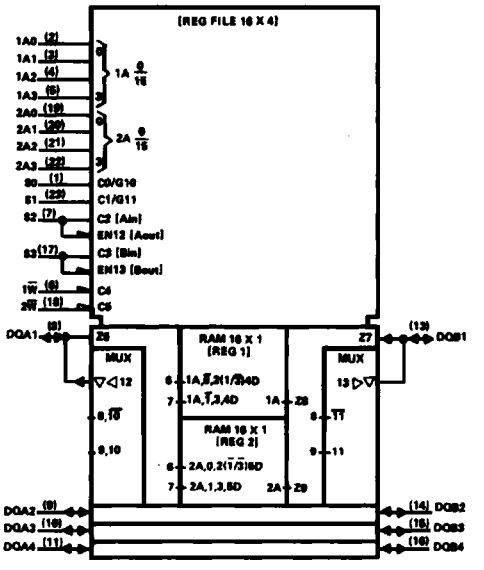
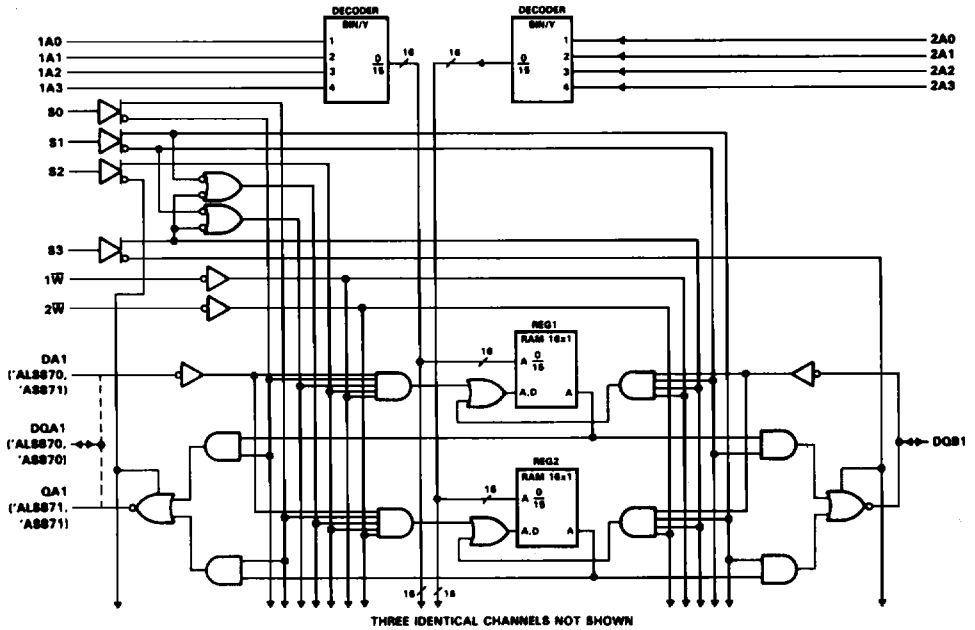
logic symbol†

'ALS870



† These symbols are in accordance with ANSI/IEEE Std 91-1984 and IEC Publications 617-12.
Pin numbers shown are for DW, JT, and NT packages.

logic diagram (positive logic)



FUNCTION TABLE

FILE SELECT			INPUT/OUTPUT		
S0	S1	FILE SEL	S2	S3	I/O SEL
L	L	1R TO A, 1R TO B	L	L	A OUT, B OUT
H	L	2R TO A, 1R TO B			
L	H	1R TO A, 2R TO B			
H	H	2R TO A, 2R TO B			
L	L	A TO 1R, 1R TO B	H	L	A IN, B OUT
H	L	A TO 2R, 1R TO B			
L	H	A TO 1R, 2R TO B			
H	H	A TO 2R, 2R TO B			
L	L	1R TO A, B TO 1R	L	H	A OUT, B IN
H	L	2R TO A, B TO 1R			
L	H	1R TO A, B TO 2R			
H	H	2R TO A, B TO 2R			
L	L	B TO 1R	H	H	A IN, B IN
H	L	A TO 2R, B TO 1R			
L	H	A TO 1R, B TO 2R			
H	H	B TO 2R			

absolute maximum ratings over operating free-air temperature range (unless otherwise noted)

Supply voltage, V_{CC} ..... 7 V
Input voltage: All inputs ..... 7 V
I/O ports ..... 5.5 V
Voltage applied to a disabled 3-state output ..... 5.5 V
Operating free-air temperature range: SN54ALS870 ..... −55 °C to 125 °C
SN74ALS870 ..... 0 °C to 70 °C
Storage temperature range ..... −65 °C to 150 °C

recommended operating conditions

			SN54ALS870			SN74ALS870			UNIT
			MIN	NOM	MAX	MIN	NOM	MAX	
V_{CC}	Supply voltage		4.5	5	5.5	4.5	5	5.5	V
V_{IH}	High-level input voltage		2			2			V
V_{IL}	Low-level input voltage				0.7			0.8	V
I_{OH}	High-level output current				−1			−2.6	mA
I_{OL}	Low-level output current				12			24	mA
t_w	Duration of write pulse		12			12			ns
t_{su}	Setup times	Address before write↓	5			5			ns
		Data before write↑	15			15			
		Select before write↓	12			12			
t_h	Hold times	Address after write↑	0			0			ns
		Data after write↑	0			0			
		Select after write↑	12			12			
T_A	Operating free-air temperature		−55		125	0		70	°C

electrical characteristics over recommended operating free-air temperature range (unless otherwise noted)

PARAMETER		TEST CONDITIONS		SN54ALS870			SN74ALS870			UNIT
				MIN	TYP†	MAX	MIN	TYP†	MAX	
V_{IK}		V_{CC} = 4.5 V,	I_I = −18 mA			−1.2			−1.2	V
V_{OH}		V_{CC} = 4.5 V to 5.5 V,	I_{OH} = −0.4 mA	V_{CC}−2			V_{CC}−2			V
		V_{CC} = 4.5 V,	I_{OH} = −1 mA	2.4	3.2					
		V_{CC} = 4.5 V,	I_{OH} = −2.6 mA				2.4	3.2		
V_{OL}		V_{CC} = 4.5 V,	I_{OL} = 12 mA		0.25	0.5				V
		V_{CC} = 4.5 V,	I_{OL} = 24 mA					0.35	0.5	
I_I	Control inputs	V_{CC} = 5.5 V,	V_I = 7 V			0.1			0.1	mA
	DQA and DQB ports	V_{CC} = 5.5 V,	V_I = 5.5 V			0.2			0.2	
I_{IH}	$1\overline{W}$ and $2\overline{W}$	V_{CC} = 5.5 V,	V_I = 2.7 V			20			20	µA
	Other control inputs					40			40	
	DQA and DQB ports‡					50			50	
I_{IL}	Control inputs	V_{CC} = 5.5 V,	V_I = 0.4 V			−0.2			−0.2	mA
	DQA and DQB ports‡					−0.2			−0.2	
I_O§		V_{CC} = 5.5 V,	V_O = 2.25 V	−30		−112	−30		−112	mA
I_{CC}		V_{CC} = 5.5 V			80	110		80	110	mA

switching characteristics (see Note 1)

PARAMETER	FROM (INTPUT)	TO (OUTPUT)	V_{CC} = 5 V, C_L = 50 pF, R1 = 500 Ω, R2 = 500 Ω, T_A = 25°C			V_{CC} = 4.5 V to 5.5 V, C_L = 50 pF, R1 = 500 Ω, R2 = 500 Ω, T_A = MIN to MAX				UNIT
			'ALS870			SN54ALS870		SN74ALS870		
			MIN	TYP†	MAX	MIN	MAX	MIN	MAX	
$t_{a(A)}$	Any A	Any DQ		10	18	3	24	3	19	ns
$t_{a(S)}$	S0	Any DQA		8	14	3	18	3	15	ns
	S1	Any DQB		8	14	3	18	3	15	
t_{dis}	S2	Any DQA		6	11	3	18	3	14	ns
	S3	Any DQB		6	11	3	18	3	14	
t_{en}	S2	Any DQA		7	14	3	20	3	17	ns
	S3	Any DQB		7	14	3	20	3	17	
t_{pd}	$\overline{W}$	Any DQ		12	20	5	26	5	23	ns
	DQA	DQB		13	22	5	29	5	26	
	DQB	DQA		13	22	5	29	5	26	

† All typical values are at V_{CC} = 5 V, T_A = 25°C.
‡ For I/O ports, the parameters I_{IH} and I_{IL} include the off-state output current.
§ The output conditions have been chosen to produce a current that closely approximates one-half of the true short-circuit current, I_{OS}.
NOTE 1: Load circuit and voltage waveforms are shown in Section 1.