Rochester Electronics

Datasheet

PART NUMBER

74ALS29809

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 re-creations are done with the approval of the Original Component Manufacturer. (OCM)

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

Quality Overview

- ISO-9001
- AS9120 certification
- Qualified Manufacturers List (QML) MIL-PRF-38535
    - 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 OCM specifications. 'Typical' values are for reference purposes only. Certain minimum or maximum ratings may be based on product characterization, design, simulation, or sample testing.

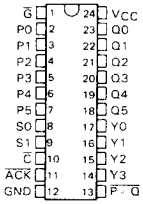
- **'ALS29806 is a 6-Bit Identity Comparator Controlling a 2- to 4-Bit Decoder**
- **'ALS29809 is a 9-Bit Identity Comparator**
- **Low Power Dissipation . . . 50 mW Typical**
- **'ALS29806 and 'ALS29809 are Functionally Equivalent to AM29806 and AM29809**
- **Internal Pull-Up Resistor on Q Inputs**
- **Package Options Include Both Plastic and Ceramic Chip Carriers in Addition to Plastic and Ceramic DIPs**
- **Dependable Texas Instruments Quality and Reliability**

description

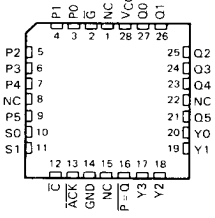
The 'ALS29806 and 'ALS29809 are 6-bit and 9-bit comparators, respectively. The 'ALS29806 and 'ALS29809 compare two data words applied to the P and Q inputs. When the two words are identical, the $\overline{P=Q}$ output goes low. Both devices feature an open-collector acknowledge ($\overline{ACK}$) output that goes low when $\overline{P=Q}$ and the controlling input ($\overline{C}$) are low. The 'ALS29806 features a 2- to 4-bit decoder whose selected output goes low when the $\overline{P=Q}$ output is low. The 'ALS29806 and 'ALS29809 can be cascaded by tying the $\overline{P=Q}$ output to the enable $\overline{G}$ of the next device. If the $\overline{G}$ input is high, all the outputs will be inactive (high).

The SN54ALS29806 and SN54ALS29809 are characterized for operation over the full military temperature range of −55°C to 125°C. The SN74ALS29806 and SN74ALS29809 are characterized for operation from 0°C to 70°C.

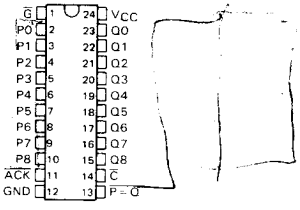
SN54ALS29806 . . . JT PACKAGE
SN74ALS29806 . . . DW OR NT PACKAGE
(TOP VIEW)



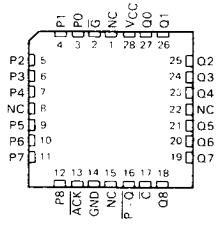
SN54ALS29806 . . . FK PACKAGE
SN74ALS29806 . . . FN PACKAGE
(TOP VIEW)



SN54ALS29809 . . . JT PACKAGE
SN74ALS29809 . . . DW OR NT PACKAGE
(TOP VIEW)



SN54ALS29809 . . . FK PACKAGE
SN74ALS29809 . . . FN PACKAGE
(TOP VIEW)



NC—No internal connection

FUNCTION TABLE
FOR $\overline{P=Q}$ AND $\overline{ACK}$ OUTPUTS

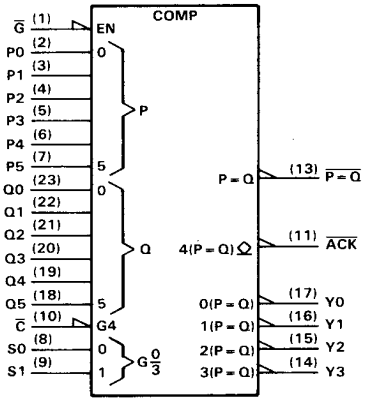
INPUTS			OUTPUTS	
$\overline{G}$	P,Q	$\overline{C}$	$\overline{P=Q}$	$\overline{ACK}$
H	X	X	H	H
X	P≠Q	X	H	H
L	P≠Q	L	L	L
L	P=Q	H	L	H

FUNCTION TABLE
FOR DECODER OUTPUTS

INPUTS				OUTPUTS			
$\overline{G}$	P,Q	S1	S0	Y3	Y2	Y1	Y0
H	X	X	X	H	H	H	H
X	P≠Q	X	X	H	H	H	H
L	P=Q	L	L	H	H	H	L
L	P=Q	L	H	H	H	L	H
L	P=Q	H	L	H	L	H	H
L	P=Q	H	H	L	H	H	H

logic symbol†

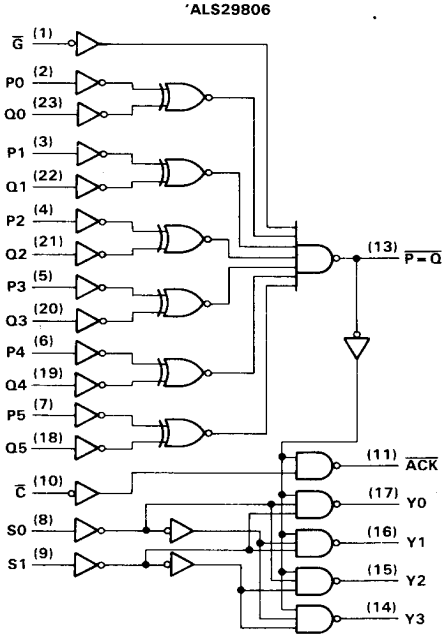
'ALS29806



†This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.
Pin numbers shown are for DW, JT and NT packages.

logic diagram (positive logic)

'ALS29806



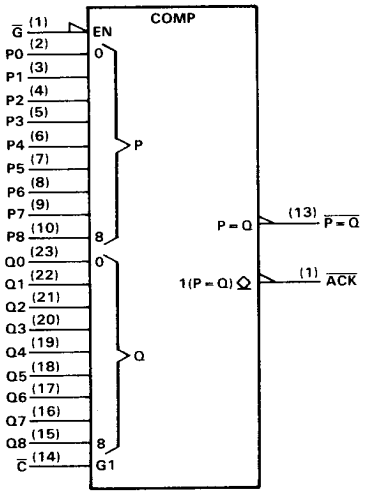
TEXAS INSTRUMENTS
POST OFFICE BOX 655012 • DALLAS, TEXAS 75265

FUNCTION TABLE

INPUTS			OUTPUTS	
$\overline{G}$	P,Q	$\overline{C}$	$\overline{P=Q}$	$\overline{ACK}$
H	X	X	H	H
X	$P \neq Q$	X	H	H
L	P=Q	L	L	L
L	P=Q	H	L	H

logic symbol†

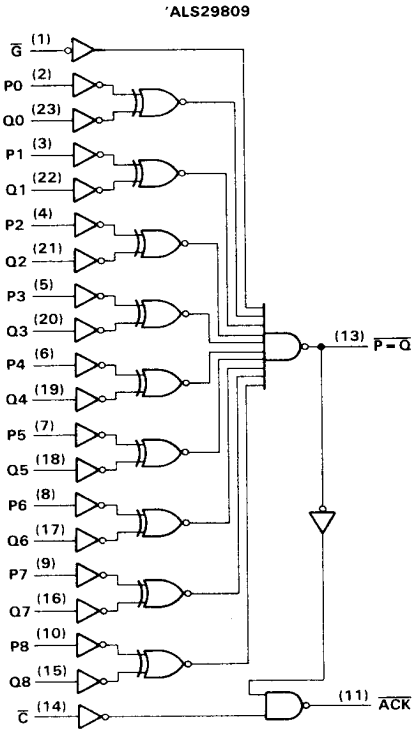
'ALS29809



†This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.
Pin numbers shown are for DW, JT and NT packages.

logic diagram (positive logic)

'ALS29809



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

Supply voltage, V_{CC} . . . . . 7 V
Input voltage, V_I . . . . . 5.5 V
Operating free-air temperature range: SN54' . . . . . −55°C to 125°C
SN74' . . . . . 0°C to 70°C
Storage temperature range . . . . . −65°C to 150°C

recommended operating conditions

			SN54ALS29806 SN54ALS29809			SN74ALS29806 SN74ALS29809			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
V_{OH}	High-level output voltage	$\overline{ACK}$			5.5			5.5	V
I_{OH}	High-level output current	$\overline{P=Q}$, Y			−3			−3	mA
I_{OL}	Low-level output current	$\overline{ACK}$			32			32	mA
		$\overline{P=Q}$, Y			12			24	
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		SN54ALS29806 SN54ALS29809			SN74ALS29806 SN74ALS29809			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}−2.2			V_{CC}−2			V
		V_{CC} = 4.5 V,	I_{OH} = −3 mA	2.4	3.2		2.4	3.2		
I_{OH}	$\overline{ACK}$	V_{CC} = 5.5 V,	V_{OH} = 5.5 V			0.1			0.1	mA
V_{OL}	$\overline{P=Q}$, Y	V_{CC} = 4.5 V,	I_{OL} = 12 mA		0.25	0.4		0.25	0.4	V
		V_{CC} = 4.5 V,	I_{OL} = 24 mA					0.32	0.5	
	$\overline{ACK}$	V_{CC} = 4.5 V,	I_{OL} = 32 mA		0.34	0.5		0.34	0.5	
I_I		V_{CC} = 5.5 V,	V_I = 5.5 V			0.1			0.1	mA
I_{IH}	Q‡	V_{CC} = 5.5 V,	V_I = 2.4 V			−250			−250	μA
	All other					20			20	
I_{IL}	Q‡	V_{CC} = 5.5 V,	V_I = 0.5 V			−2			−1	mA
	All other					−0.6			−0.6	
I_{OS}§		V_{CC} = 5.5 V,	V_O = 0 V	−60		−150	−60		−150	mA
I_{CC}	'ALS29806	V_{CC} = 5.5 V,	See Note 1		14	22		14	22	mA
	'ALS29809				10	20		10	20	

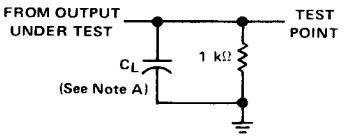
† All typical values are at V_{CC} = 5 V, T_A = 25°C.
‡ All Q inputs have internal pull-up resistors of 27 kΩ nominal.
§ Not more than one output should be shorted at a time, and the duration of the short circuit should not exceed one second.
NOTE 1: I_{CC} is measured with $\overline{G}$ grounded and P and Q at 4.5 V.

TEXAS INSTRUMENTS
POST OFFICE BOX 655012 • DALLAS, TEXAS 75265

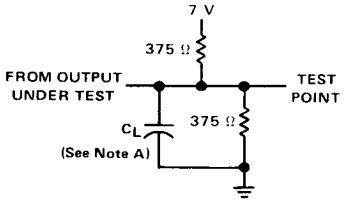
switching characteristics

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V_{CC} = 5 V, C_L = 50 pF, R_L = (see Figure 1), T_A = 25°C			V_{CC} = 4.5 V to 5.5 V, C_L = 50 pF, R_L = (see Figure 1), T_A = MIN to MAX				UNIT
			'ALS29806 'ALS29809			SN54ALS29806 SN54ALS29809		SN74ALS29806 SN74ALS29809		
			MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t_{PLH}	P or Q	$\overline{P=Q}$		8	11	3	15	3	13	ns
t_{PHL}				7	10	2	13	2	11	
t_{PLH}	P or Q	Y		9	11	3	17	3	13	ns
t_{PHL}				9	12	5	17	5	14	
t_{PLH}	$\overline{G}$	$\overline{P=Q}$		9	12	3	15	3	14	ns
t_{PHL}				7	10	2	14	2	12	
t_{PLH}	$\overline{G}$	Y		8	11	3	17	3	15	ns
t_{PHL}				10	13	5	19	5	16	
t_{PLH}	S0 or S1	Y		6	10	2	15	2	13	ns
t_{PHL}				8	11	2	15	2	13	
t_{PLH}	P or Q	$\overline{ACK}$		11	14	5	22	5	17	ns
t_{PHL}				10	13	4	18	4	16	
t_{PLH}	$\overline{G}$	$\overline{ACK}$		10	14	5	22	5	17	ns
t_{PHL}				10	14	4	19	4	17	
t_{PLH}	$\overline{C}$	$\overline{ACK}$		8	11	3	21	3	18	ns
t_{PHL}				7	11	3	17	3	15	

PARAMETER MEASUREMENT INFORMATION

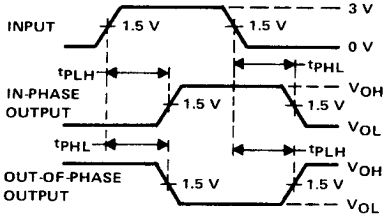


LOAD CIRCUIT FOR
$\overline{P=Q}$ AND Y OUTPUTS



LOAD CIRCUIT FOR
$\overline{ACK}$ OUTPUT

NOTE A: C_L includes probe and jig capacitance.



VOLTAGE WAVEFORMS
PROPAGATION DELAY TIMES

FIGURE 1

TEXAS INSTRUMENTS
POST OFFICE BOX 655012 • DALLAS, TEXAS 75265

TYPICAL APPLICATION

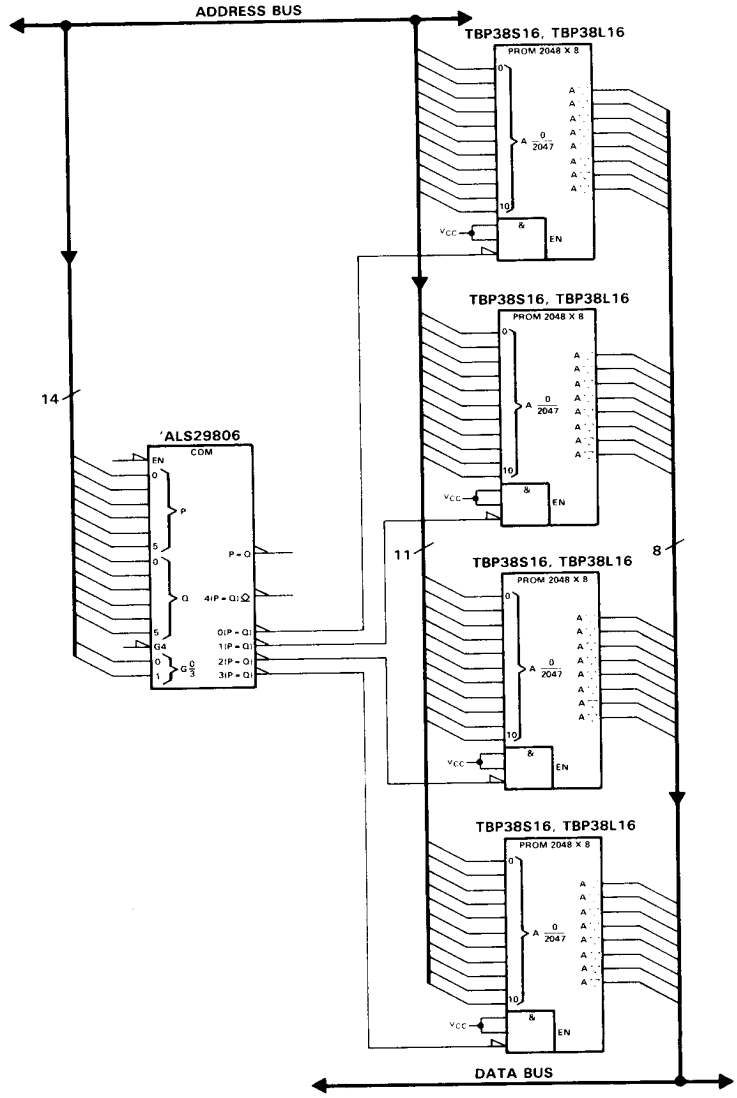


FIGURE 2. MEMORY BANK DECODER