

## AM25LS2521

### *Eight-Bit Equal-to Comparator*

The AM25LS2521 is an 8-bit “equal to” comparator comparable of comparing two 8-bit words for “equal to” with provision for expansion or external enabling. The matching of the two 8-bit inputs plus a logic LOW on the  $\bar{E}_{IN}$  produces an active LOW on the output  $\bar{E}_{OUT}$ .

#### **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 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 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.*

# Am25LS2521

Eight-Bit Equal-to Comparator

## DISTINCTIVE CHARACTERISTICS

- 8-bit byte oriented equal comparator
- Cascadable using  $\bar{E}_{IN}$
- High-speed, Low-Power Schottky technology
- $t_{pd} A \cdot B$  to  $\bar{E}_{OUT}$  in 9ns
- Standard 20-pin package

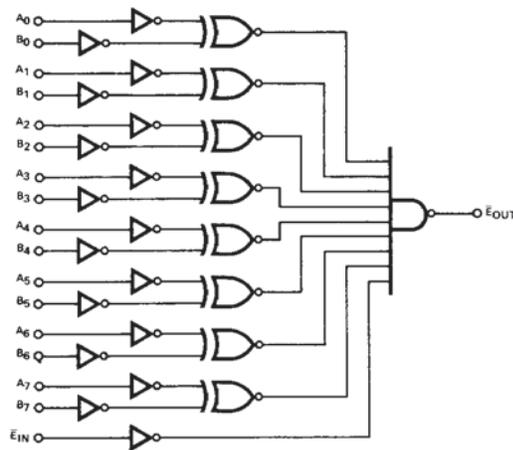
## GENERAL DESCRIPTION

The Am25LS2521 is an 8-bit "equal to" comparator capable of comparing two 8-bit words for "equal to" with provision for expansion or external enabling. The matching of the two 8-bit inputs plus a logic LOW on the  $\bar{E}_{IN}$  produces an active LOW on the output  $\bar{E}_{OUT}$ .

The logic expression for the device can be expressed as:  
 $\bar{E}_{OUT} = (\bar{A}_0 \odot \bar{B}_0) (A_1 \odot B_1) (A_2 \odot B_2) (A_3 \odot B_3) (A_4 \odot B_4)$

$(\bar{A}_5 \odot \bar{B}_5) Y(A_6 \odot B_6) (A_7 \odot B_7) \bar{E}_{IN}$ . It is obvious that the expression is valid where  $A_0 - A_7$  and  $B_0 - B_7$  are expressed as either assertions or negations. This is also true for pair of terms i.e.  $A_0$  can be compared with  $B_0$  at the same time  $\bar{A}_1$  is compared with  $\bar{B}_1$ . It is only essential that the polarity of the paired terms be maintained.

## BLOCK DIAGRAM

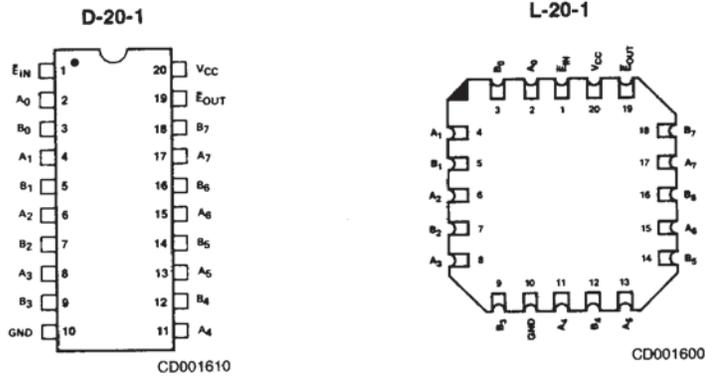


BD001390

## RELATED PRODUCTS

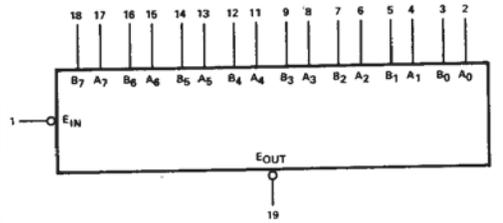
Part No.	Description
Am29806	Chip Select Decoder
Am29809	9-Bit Comparator

**CONNECTION DIAGRAM  
Top View**



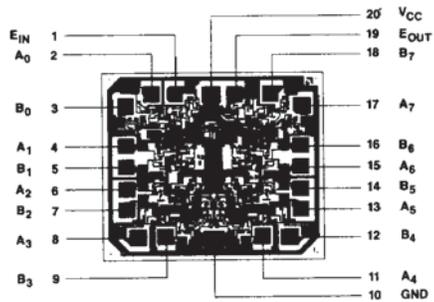
Note: Pin 1 is marked for orientation

**LOGIC SYMBOL**



LS000530

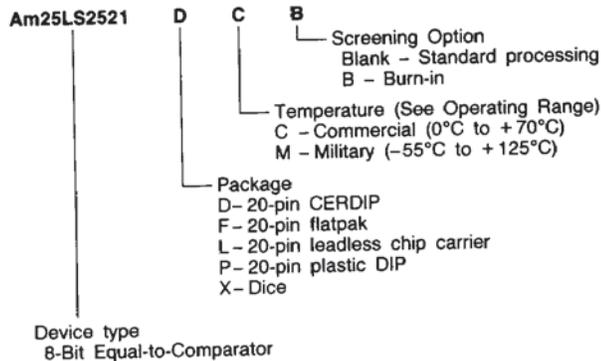
**METALLIZATION AND PAD LAYOUT**



DIE SIZE 0.068" x 0.058"

**ORDERING INFORMATION**

AMD products are available in several packages and operating ranges. The order number is formed by a combination of the following: Device number, speed option (if applicable), package type, operating range and screening option (if desired).



Valid Combinations	
Am25LS2521	PC
	DC, DM
	FM
	LC, LM
	XC, XM

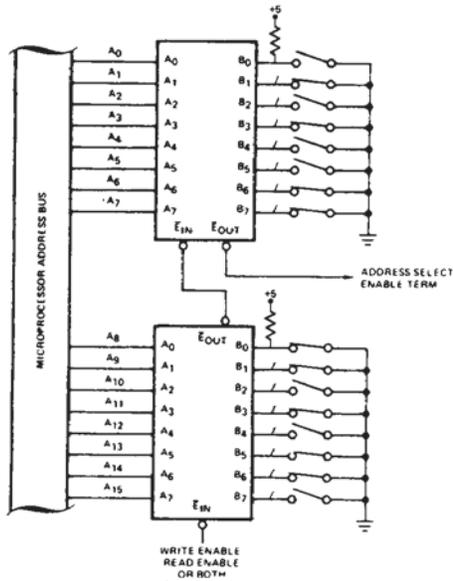
**Valid Combinations**

Consult the AMD sales office in your area to determine if a device is currently available in the combination you wish.

## PIN DESCRIPTION

Pin No.	Name	I/O	Description
	A <sub>0</sub> -A <sub>7</sub>	I	A input to comparator.
	B <sub>0</sub> -B <sub>7</sub>	I	B input to comparator.
1	$\overline{E}_{IN}$	I	Enable active LOW.
19	$\overline{E}_{OUT}$	O	EQUAL output active LOW.

## APPLICATION



MAX,  $\overline{E}_{ENABLE}$  (HIGH-to-LOW) DELAY  
OVER 16-BITS  
(Commercial Range)

$t_{PHL}$	A <sub>i</sub> or B <sub>i</sub> to $\overline{E}_{OUT}$	19ns
$t_{PHL}$	$\overline{E}_{IN}$ to $\overline{E}_{OUT}$	12.5ns
Total		31.5ns

AF000651

Note: This part does not have internal pull up resistors. In this application external pull ups should be added to the 16 ports.

**MICROPROCESSOR ENABLE CONTROLLED,  
SELECTABLE, ADDRESS DECODER**

**ABSOLUTE MAXIMUM RATINGS**

Storage Temperature .....	-65°C to +150°C
(Ambient) Temperature Under Bias .....	-55°C to +125°C
Supply Voltage to Ground Potential Continuous .....	-0.5V to +7.0V
DC Voltage Applied to Outputs For High Output State .....	-0.5V to +V <sub>CC</sub> max
DC Input Voltage .....	-0.5V to +7.0V
DC Output Current, Into Outputs .....	30mA
DC Input Current .....	-30mA to +5.0mA

Stresses above those listed under ABSOLUTE MAXIMUM RATINGS may cause permanent device failure. Functionality at or above these limits is not implied. Exposure to absolute maximum ratings for extended periods may affect device reliability.

**OPERATING RANGES**

Commercial (C) Devices	
Temperature .....	0°C to +70°C
Supply Voltage .....	+4.75V to +5.25V
Military (M) Devices	
Temperature .....	-55°C to +125°C
Supply Voltage .....	+4.5V to +5.5V

Operating ranges define those limits over which the functionality of the device is guaranteed.

**DC CHARACTERISTICS** over operating range unless otherwise specified

Parameters	Description	Test Conditions (Note 2)	Min	Typ (Note 1)	Max	Units
V <sub>OH</sub>	Output HIGH Voltage	V <sub>CC</sub> = MIN V <sub>IN</sub> = V <sub>IH</sub> or V <sub>IL</sub> I <sub>OH</sub> = -440μA	MIL	2.5		Volts
			COM'L	2.7		
V <sub>OL</sub>	Output LOW Voltage	V <sub>CC</sub> = MIN V <sub>IN</sub> = V <sub>IH</sub> or V <sub>IL</sub>	I <sub>OL</sub> = 4.0 mA		0.4	Volts
			I <sub>OL</sub> = 8.0mA		0.45	
			I <sub>OL</sub> = 12mA		0.5	
V <sub>IH</sub>	Input HIGH Level	Guaranteed input logical HIGH voltage for all inputs	2.0			Volts
V <sub>IL</sub>	Input LOW Level	Guaranteed input logical LOW voltage for all inputs.	MIL		0.7	Volts
			COM'L		0.8	
V <sub>I</sub>	Input Clamp Voltage	V <sub>CC</sub> = MIN, I <sub>IN</sub> = -18mA			-1.5	Volts
I <sub>IL</sub>	Input LOW Current	V <sub>CC</sub> = MAX, V <sub>IN</sub> = 0.4V	A <sub>i</sub> , B <sub>i</sub>		-0.36	mA
			E		-0.72	
I <sub>IH</sub>	Input HIGH Current	V <sub>CC</sub> = MAX, V <sub>IN</sub> = 2.7V	A <sub>i</sub> , B <sub>i</sub>		20	μA
			E		40	
I <sub>I</sub>	Input HIGH Current	V <sub>CC</sub> = MAX, V <sub>IN</sub> = 7.0V	A <sub>i</sub> , B <sub>i</sub>		0.1	mA
			E		0.2	
I <sub>SC</sub>	Output Short Circuit Current (Note 3)	V <sub>CC</sub> = MAX	-15		-85	mA
I <sub>CC</sub>	Power Supply Current (Note 4)	V <sub>CC</sub> = MAX		27	40	mA

- Notes: 1. Typical limits are at V<sub>CC</sub> = 5.0V, 25°C ambient and maximum loading.  
 2. For conditions shown as MIN or MAX, use the appropriate value specified under Operating Ranges for the applicable device type.  
 3. Not more than one output should be shorted at a time. Duration of the short circuit test should not exceed one second.  
 4. E = GND, all other inputs and outputs open.

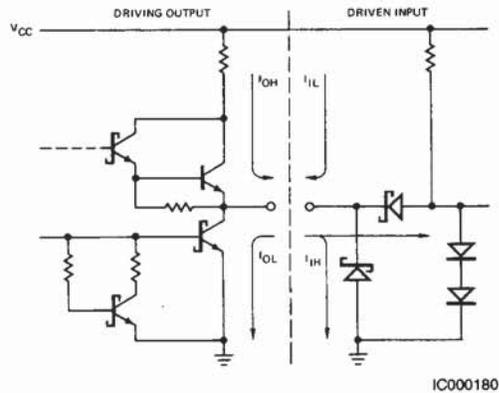
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SWITCHING CHARACTERISTICS (T <sub>A</sub> = +25°C, V <sub>CC</sub> = 5.0V)						
Parameters	Description	Test Conditions	Min	Typ	Max	Units
t <sub>PLH</sub>	A <sub>i</sub> or B <sub>i</sub> to <u>Equal</u>	C <sub>L</sub> = 15pF R <sub>L</sub> = 2.0kΩ		9	15	ns
t <sub>PHL</sub>				9	15	
t <sub>PLH</sub>	E to <u>Equal</u>			5	7	ns
t <sub>PHL</sub>				6	8	

SWITCHING CHARACTERISTICS over operating range unless otherwise specified*							
Parameters	Description	Test Conditions	COMMERCIAL		MILITARY		Units
			Am25LS2521		Am25LS2521		
			Min	Max	Min	Max	
t <sub>PLH</sub>	A <sub>i</sub> or B <sub>i</sub> to	C <sub>L</sub> = 50pF R <sub>L</sub> = 2.0kΩ		20		22	ns
t <sub>PHL</sub>	<u>Equal</u> Output			19		21	
t <sub>PLH</sub>	E to <u>Equal</u> Output			10.5		12	ns
t <sub>PHL</sub>				12.5		15	

\*AC performance over the operating temperature range is guaranteed by testing defined in Group A, Subgroup 9.

**Am25LS2521  
LOW-POWER SCHOTTKY INPUT/OUTPUT  
CURRENT INTERFACE CONDITIONS**



Note: Actual current flow direction shown.