## Am25LS2521

Eight-Bit Equal-to Comparator

#### DISTINCTIVE CHARACTERISTICS

- · 8-bit byte oriented equal comparator
- · Cascadable using EIN
- High-speed, Low-Power Schottky technology
- tpd A · B to EOUT in 9ns
- Standard 20-pin package

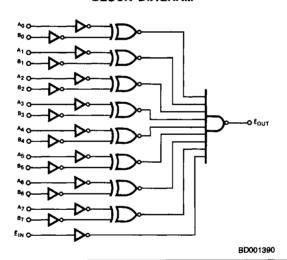
#### **GENERAL DESCRIPTION**

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 EIN produces an active LOW on the output EOIT.

The logic expression for the device can be expressed as:  $E_{OUT} = (A_0 \odot B_0) (A_1 \odot B_1) (A_2 \odot B_2) (A_3 \odot B_3) (A_4 \odot B_4)$ 

 $(A_5 \odot B_5)$  Y( $A_5 \odot B_6$ ) ( $A_7 \odot B_7$ ) E<sub>IN</sub>. 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  $\overline{A}_1$  is compared with  $\overline{B}_1$ . It is only essential that the polarity of the paired terms be maintained.

#### **BLOCK DIAGRAM**

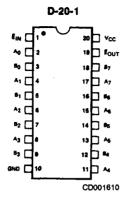


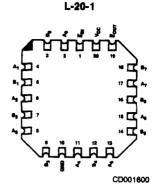
#### **RELATED PRODUCTS**

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

03619B

## CONNECTION DIAGRAM Top View

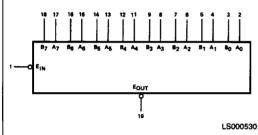


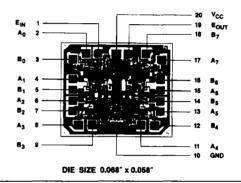


Note: Pin 1 is marked for orientation

#### LOGIC SYMBOL

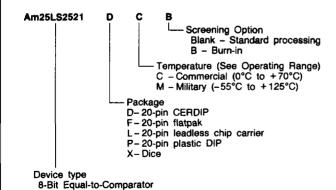
#### **METALLIZATION AND PAD LAYOUT**





#### **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			

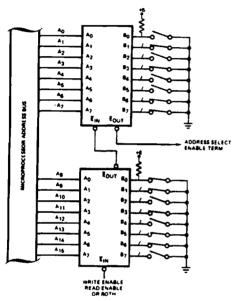
#### Valid Combinations

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	1/0	Description
	A <sub>0</sub> -A <sub>7</sub>	ı	A input to comparator.
-	B <sub>0</sub> -B <sub>7</sub>	I	B input to comparator.
1	EIN	I	Enable active LOW.
19	EOUT	0	EQUAL output active LOW.

#### **APPLICATION**



#### MAX, ENABLE (HIGH-to-LOW) DELAY OVER 16-BITS (Commercial Range)

<sup>†</sup> PHL	t <sub>PHL</sub> A <sub>i</sub> or B <sub>i</sub> to E <sub>OUT</sub>		
tPHL EOUT		12.5ns	
T	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 Temperature65°C to +150°C (Ambient) Temperature Under Bias55°C to +125°C
Supply Voltage to Ground Potential
Continuous0.5V to +7.0V
DC Voltage Applied to Outputs For
High Output State0.5V to +VCC max
DC Input Voltage0.5V to +7.0V
DC Output Current, Into Outputs
DC Input Current30mA 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	r which the function-
ality 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>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	
VOH	Output HIGH Voltage			COM'L	2.7				
			IOL = 4.0				0.4		
VOL	Output LOW Voltage	V <sub>CC</sub> = MIN V <sub>IN</sub> = V <sub>IH</sub> or V <sub>IL</sub>	IOL = 8.0n	nA	T		0.45	Volts	
		AIM - AIH OL AIL	I <sub>OL</sub> = 12m	ıA			0.5		
ViH	Input HIGH Level	Guaranteed input log voltage for all inputs	Guaranteed input logical HIGH voltage for all inputs					Volts	
		Guaranteed input logical LOW		MIL			0.7	Volts	
VIL	Input LOW Level			COM'L			0.8		
V <sub>I</sub>	Input Clamp Voltage	V <sub>CC</sub> = MIN, I <sub>IN</sub> = -18mA					- 1.5	Volts	
			A <sub>i</sub> , B <sub>i</sub>				-0.36		
IIL.	Input LOW Current	V <sub>CC</sub> = MAX, V <sub>IN</sub> = 0.	MAX, V <sub>IN</sub> = 0.4V			-0.72	mA		
				A <sub>i</sub> , B <sub>i</sub>			20		
ήн	input HIGH Current	V <sub>CC</sub> = MAX, V <sub>IN</sub> = 2	.7 <b>V</b>	E			40	μΑ	
		V <sub>CC</sub> = MAX, V <sub>IN</sub> = 7.0V		A <sub>i</sub> , B <sub>i</sub>			0.1	mA	
h	Input HIGH Current			Ē			0.2		
Isc	Output Short Circuit Current (Note 3)	V <sub>CC</sub> = MAX			-15		-85	mA	
lcc	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.

### SWITCHING CHARACTERISTICS ( $T_A = +25^{\circ}C$ , $V_{CC} = 5.0V$ )

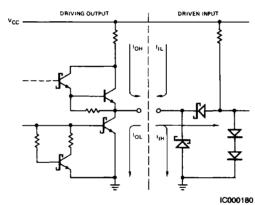
Parameters	Description	Test Conditions	Min	Тур	Max	Units
tp⊔H				9	15	
tpHL	A <sub>i</sub> or B <sub>i</sub> to Equal	Ç <sub>L</sub> = 15pF		9	15	ns
¹PLH		$R_L = 2.0k\Omega$		5	7	-
tou	E to Equal	l F		6	8	ns

#### SWITCHING CHARACTERISTICS over operating range unless otherwise specified\*

			COMM	ERCIAL	MILI		
			Am25	LS2521	Am25l	.S2521	
Parameters	Description	Test Conditions	Min	Max	Min	Max	Units
t <sub>PLH</sub>	A <sub>i</sub> or B <sub>i</sub> to			20		22	
<sup>t</sup> PHL	Equal Output	C <sub>L</sub> = 50pF		19		21	ns
tpLH		R <sub>L</sub> = 2.0kΩ		10.5		12	
tpHL	E to Equal Output			12.5		15	ns

<sup>\*</sup>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.