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[Fairchild Semiconductor](#)
[DM74ALS521N](#)

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September 1986
Revised April 2000

DM74ALS520 • DM74ALS521 8-Bit Comparator

General Description

These comparators perform an "equal to" comparison of two 8-bit words with provision for expansion or external enabling. The $\overline{\text{EN}}$ matching of the two 8-bit input plus a logic LOW on the $\overline{\text{EN}}$ input produces the output $\overline{\text{A}} = \overline{\text{B}}$ on the DM74ALS520 and DM74ALS521. The DM74ALS520 and DM74ALS521 have totem pole outputs for wire AND cascading. Additionally, the DM74ALS520 is provided with B input pull up termination resistors for analog or switch data.

Features

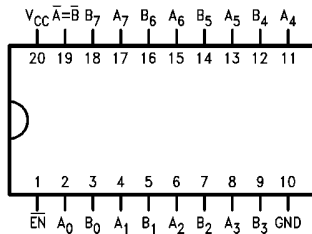
- Switching specifications at 50 pF
- Switching specifications guaranteed over full temperature and V_{CC} range
- Advanced oxide-isolated, ion-implanted Schottky TTL process
- Functionally and pin for pin compatible with LS family counterpart
- Improved output transient handling capability

Ordering Code:

Ordering Code	Package Number	Package Description
DM74ALS520WM	M20B	20-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-013, 0.300 Wide
DM74ALS520N	N20A	20-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300 Wide
DM74ALS521WM	M20B	20-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-013, 0.300 Wide
SM74ALS521N	N20A	20-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300 Wide

Devices also available in Tape and Reel. Specify by appending the suffix letter "X" to the ordering code.

Connection Diagram



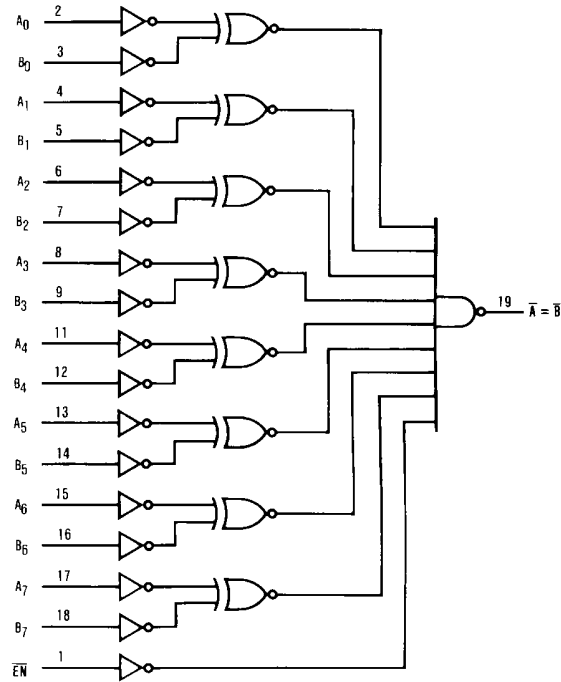
Function Table

Inputs		Output
$\overline{\text{EN}}$	Data	$\overline{\text{A}} = \overline{\text{B}}$
L	A = B	L
L	A ≠ B	H
H	X	H

H = HIGH Logic Level
L = LOW Logic Level
X = Don't Care

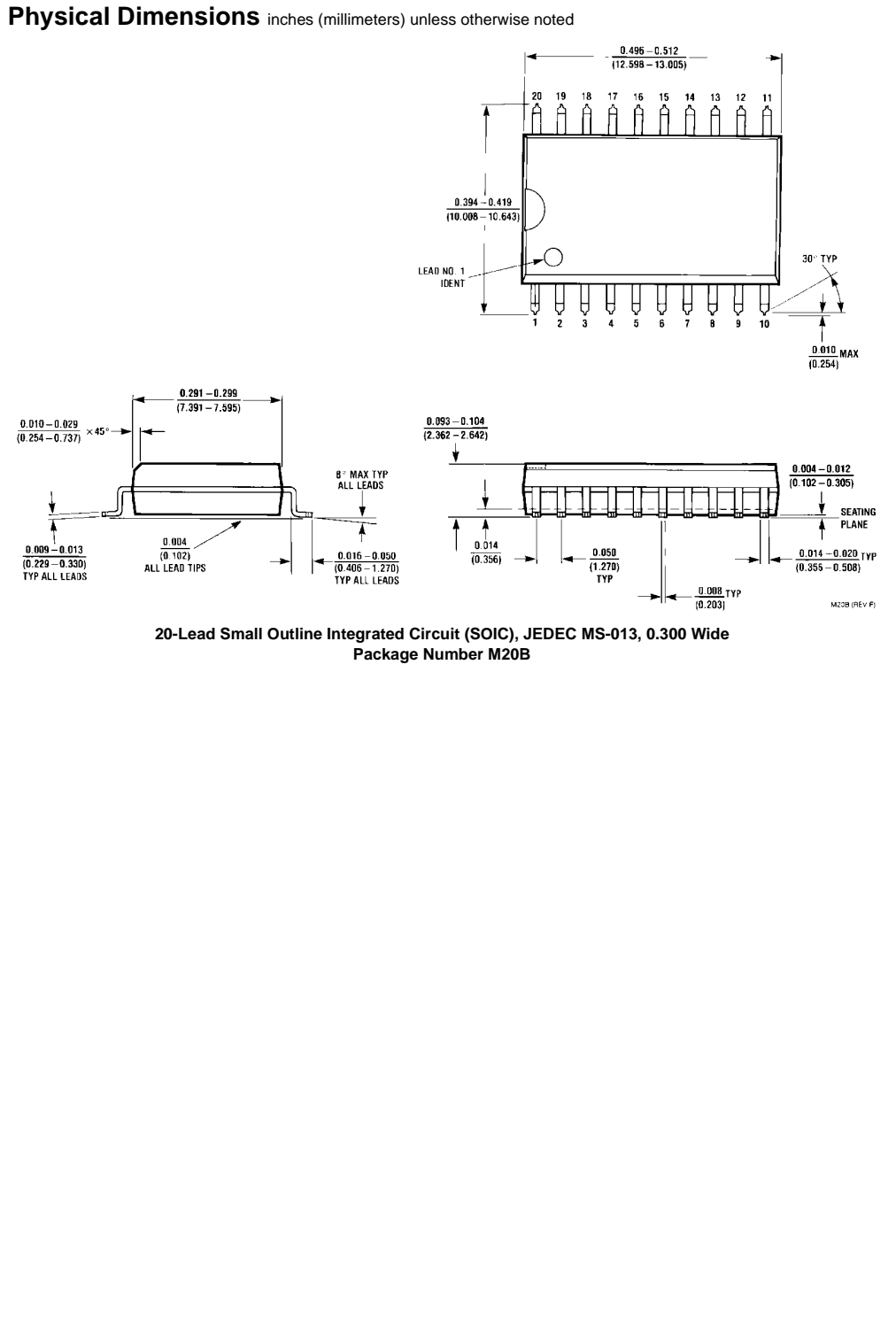
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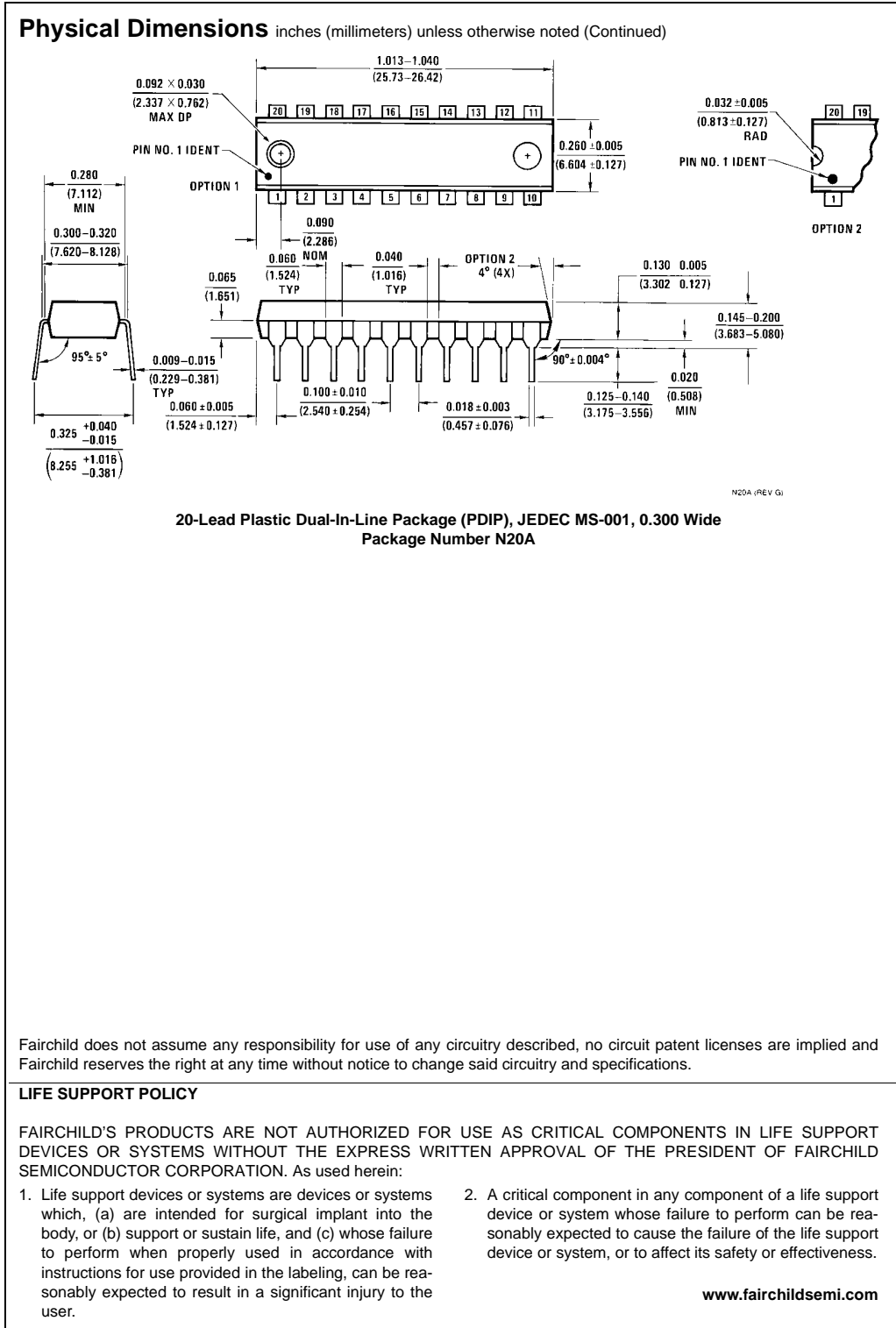
Logic Diagram



Absolute Maximum Ratings (Note 1)								
Supply Voltage						7V		
Input Voltage						7V		
Operating Free Air Temperature Range						0°C to +70°C		
Storage Temperature Range						-65°C to +150°C		
Typical θ_{JA}								
N Package						62.0°C/W		
M Package						82.0°C/W		
<p>Note 1: The "Absolute Maximum Ratings" are those values beyond which the safety of the device cannot be guaranteed. The device should not be operated at these limits. The parametric values defined in the Electrical Characteristics tables are not guaranteed at the absolute maximum ratings. The "Recommended Operating Conditions" table will define the conditions for actual device operation.</p>								
Recommended Operating Conditions								
Symbol	Parameter	Min	Nom	Max	Units			
V_{CC}	Supply Voltage	4.5	5	5.5	V			
V_{IH}	HIGH Level Input Voltage	2			V			
V_{IL}	LOW Level Input Voltage			0.8	V			
I_{OH}	HIGH Level Output Current			-2.6	mA			
I_{OL}	LOW Level Output Current			24	mA			
T_A	Free Air Operating Temperature	0		70	°C			
Electrical Characteristics								
over recommended operating free air temperature range. All typical values are measured at $V_{CC} = 5V$, $T_A = 25^\circ C$.								
Symbol	Parameter	Conditions		Min	Typ	Max	Units	
V_{IK}	Input Clamp Voltage	$V_{CC} = 4.5V$, $I_I = -18 mA$				-1.5	V	
V_{OH}	HIGH Level Output Voltage	$V_{CC} = 4.5V$ to $5.5V$		$V_{CC} - 2$			V	
		$I_{OH} = -400 \mu A$						
		$V_{CC} = 4.5V$ $I_{OH} = Max$			2.4	3.2	V	
V_{OL}	LOW Level Output Voltage	$V_{CC} = 4.5V$	$I_{OL} = 24 mA$		0.35	0.5	V	
I_I	Max HIGH Input Current	$V_{CC} = 5.5V$				0.1	mA	
		$V_{IH} = 5.5V$ B Input DM74ALS520 $V_{IH} = 7V$, All Others						
I_{IH}	HIGH Level Input Current	$V_{CC} = 5.5V$, $V_{IH} = 2.7V$				20	μA	
		All Others						
I_{IL}	Low Level Input Current	$V_{CC} = 5.5V$, $V_{IL} = 0.4V$				-0.6	mA	
		All Others						
I_O	Output Drive Current	$V_{CC} = 5.5V$		$V_O = 2.25V$		-30	-112	mA
I_{CC}	Supply Current	$V_{CC} = 5.5V$ (Note 2)			12	19	mA	
<p>Note 2: I_{CC} is measured with EN grounded, A and B inputs at 4.5V and outputs OPEN.</p>								
Switching Characteristics								
over recommended operating free air temperature range								
Symbol	Parameter	Conditions		From Input	To Output	Min	Max	Units
t_{PLH}	Propagation Delay Time LOW-to-HIGH Level Output	$V_{CC} = 4.5V$ to $5.5V$ $C_L = 50 pF$		A or B Data	$\bar{A} = \bar{B}$	3	12	ns
		$R_L = 500\Omega$						
t_{PHL}	Propagation Delay Time HIGH-to-LOW Level Output	$V_{CC} = 4.5V$ to $5.5V$ $C_L = 50 pF$		A or B Data	$\bar{A} = \bar{B}$	5	20	ns
		$R_L = 500\Omega$						
t_{PLH}	Propagation Delay Time LOW-to-HIGH Level Output	$V_{CC} = 4.5V$ to $5.5V$ $C_L = 50 pF$		\bar{EN}	$\bar{A} = \bar{B}$	2	12	ns
		$R_L = 500\Omega$						
t_{PHL}	Propagation Delay Time HIGH-to-LOW Level Output	$V_{CC} = 4.5V$ to $5.5V$ $C_L = 50 pF$		\bar{EN}	$\bar{A} = \bar{B}$	5	22	ns
		$R_L = 500\Omega$						

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2. A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

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