



T-45-17-00

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DM74ALS689 8-Bit Comparator

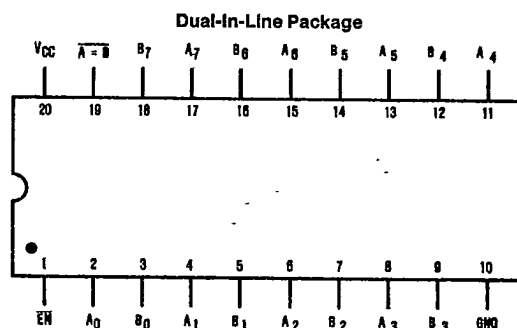
General Description

This comparator performs an "equal to" comparison of two eight-bit words with provision for expansion or external enabling. The matching of the two 8-bit inputs plus a logic LOW on the $\overline{EN}$ input produces the output $A = B$. The ALS689 has an open collector output for wire AND cascading.

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 TTL counterpart
- Improved output transient handling capability

Connection Diagram



Order Number DM74ALS689WM or DM74ALS689N
See NS Package Number M20B or N20A

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Function Table

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

H = High Level, L = Low Level, X = Don't Care

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Absolute Maximum Ratings**T-45-17**

Supply Voltage	7V
Input Voltage	7V
Off State Output Voltage	7V
Operating Free Air Temperature Range DM74ALS	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

Note: 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" table are not guaranteed at the absolute maximum ratings. The "Recommended Operating Conditions" table will define the conditions for actual device operation.

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
V_{OH}	High Level Output Voltage			5.5	V
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	$V_{CC} = 4.5V$, $I_I = -18\text{ mA}$			-1.5	V
I_{OH}	High Level Output Current	$V_{CC} = 5.5V$, $V_{OH} = 5.5V$			0.1	mA
V_{OL}	Low Level Output Voltage	$V_{CC} = 4.5V$, $I_{OL} = 12\text{ mA}$		0.25	0.4	V
		$I_{OL} = 24\text{ mA}$		0.35	0.5	V
I_I	Max High Input Current	$V_{CC} = 5.5V$, $V_{IH} = 7V$			0.1	mA
I_{IH}	High Level Input Current	$V_{CC} = 5.5V$, $V_{IH} = 2.7V$			20	μA
I_{IL}	Low Level Input Current	$V_{CC} = 5.5V$, $V_{IL} = 0.4V$			-0.1	mA
I_{CC}	Supply Current	$V_{CC} = 5.5V$ (Note 1)		12	19	mA

Note 1: I_{CC} is measured with $\overline{EN}$ grounded, A and B inputs at 4.5V.

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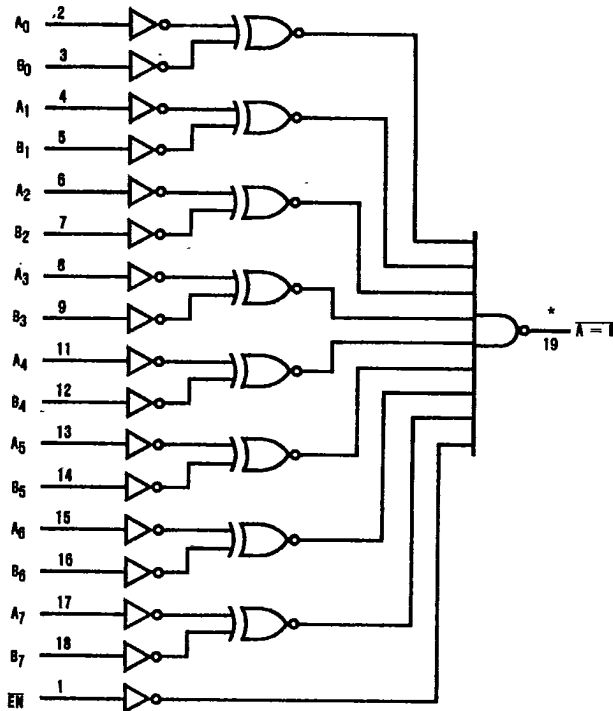
Switching Characteristics

over recommended operating free air temperature range (Note 1)

Symbol	Parameter	Conditions	From (Input)	To (Output)	Min	Max	Units
t_{PLH}	Propagation Delay Time Low to High Level Output	$V_{CC} = 4.5V \text{ to } 5.5V$ $C_L = 50 \text{ pF}$ $R_L = 680\Omega$	A or B Data	$\overline{A} = \overline{B}$	10	25	ns
t_{PHL}	Propagation Delay Time High to Low Level Output		A or B Data	$\overline{A} = \overline{B}$	5	23	ns
t_{PLH}	Propagation Delay Time Low to High Level Output		EN	$\overline{A} = \overline{B}$	8	25	ns
t_{PHL}	Propagation Delay Time High to Low Level Output		EN	$\overline{A} = \overline{B}$	8	25	ns

Note 1: See Section 1 for test waveforms and output load.

Logic Diagram



*Output is open collector

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