

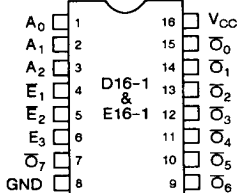
FEATURES:

- Equivalent to ALS speeds and output drive over full temperature and voltage supply extremes
- 11ns typical address to output delay
- $I_{OL} = 14\text{mA}$ over full military temperature range
- CMOS power levels ($5\mu\text{W}$ typ. static)
- Both CMOS and TTL output compatible
- Substantially lower input current levels than ALS ($5\mu\text{A}$ max.)
- 1-of-8 decoder with enables
- JEDEC standard pinout for DIP and LCC
- Military product compliant to MIL-STD-883, Class B

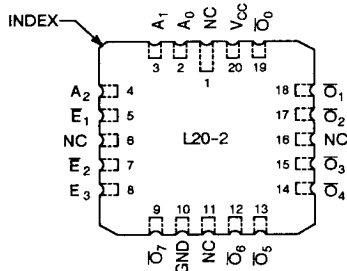
DESCRIPTION:

The IDT54AHCT138 are 1-of-8 decoders built using advanced CEMOS™, a dual metal CMOS technology. The IDT54AHCT138 accepts three binary weighted inputs (A_0, A_1, A_2) and, when enabled, provides eight mutually exclusive active LOW outputs ($\bar{O}_0 - \bar{O}_7$). The IDT54AHCT138 features three enable inputs, two active LOW (\bar{E}_1, \bar{E}_2) and one active HIGH (E_3). All outputs will be HIGH unless \bar{E}_1 and \bar{E}_2 are LOW and E_3 is HIGH. This multiple enable function allows easy parallel expansion of the device to a 1-of-32 (5 lines to 32 lines) decoder with just four IDT54AHCT138 devices and one inverter.

PIN CONFIGURATIONS

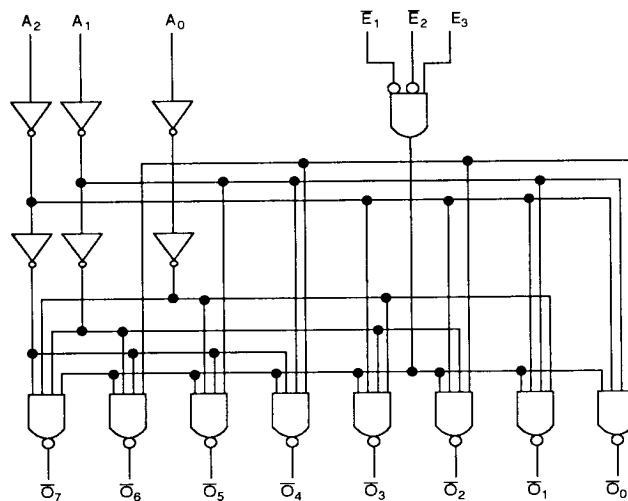


DIP/CERPACK
TOP VIEW



LCC
TOP VIEW

FUNCTIONAL BLOCK DIAGRAM



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MILITARY TEMPERATURE RANGE

DECEMBER 1987

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10-198

DSC-4038/-

ABSOLUTE MAXIMUM RATINGS ⁽¹⁾

SYMBOL	RATING	VALUE	UNIT
V _{TERM}	Terminal Voltage with Respect to GND	-0.5 to +7.0	V
T _A	Operating Temperature	-55 to +125	°C
T _{BIAS}	Temperature Under Bias	-65 to +135	°C
T _{STG}	Storage Temperature	-65 to +150	°C
P _T	Power Dissipation	0.5	W
I _{OUT}	DC Output Current	120	mA

NOTE:

1. Stresses greater than those listed under ABSOLUTE MAXIMUM RATINGS may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect reliability.

CAPACITANCE (T_A = +25°C, f = 1.0MHz)

SYMBOL	PARAMETER ⁽¹⁾	CONDITIONS	TYP.	MAX.	UNIT
C _{IN}	Input Capacitance	V _{IN} = 0V	6	10	pF
C _{OUT}	Output Capacitance	V _{OUT} = 0V	8	12	pF

NOTE:

1. This parameter is measured at characterization but not tested.

DC ELECTRICAL CHARACTERISTICS OVER OPERATING RANGE

Following Conditions Apply Unless Otherwise Specified:

T_A = -55°C to +125°C

V_{CC} = 5.0V ± 10%

V_{LC} = 0.2V

V_{HC} = V_{CC} - 0.2V

SYMBOL	PARAMETER	TEST CONDITIONS ⁽¹⁾	MIN.	TYP. ⁽²⁾	MAX.	UNIT
V _{IH}	Input HIGH Level	Guaranteed Logic High Level	2.0	—	—	V
V _{IL}	Input LOW Level	Guaranteed Logic Low Level	—	—	0.8	V
I _{IH}	Input HIGH Current	V _{CC} = Max., V _{IN} = V _{CC}	—	—	5.0	μA
I _{IL}	Input LOW Current	V _{CC} = Max., V _{IN} = GND	—	—	-5.0	μA
I _{SC}	Short Circuit Current	V _{CC} = Max. ⁽³⁾	-60	-100	—	mA
V _{OH}	Output HIGH Voltage	V _{CC} = 3V, V _{IN} = V _{LC} or V _{HC} , I _{OH} = -32μA	V _{HC}	V _{CC}	—	mA
		V _{CC} = Min.	I _{OH} = -150μA	V _{HC}	V _{CC}	V
		V _{IN} = V _{IH} or V _{IL}	I _{OH} = -1.0mA	2.4	4.3	
V _{OL}	Output LOW Voltage	V _{CC} = 3V, V _{IN} = V _{LC} or V _{HC} , I _{OL} = 300μA	—	GND	V _{LC}	V
		V _{CC} = Min.	I _{OL} = 300μA	—	GND	
		V _{IN} = V _{IH} or V _{IL}	I _{OL} = 14mA	—	—	

NOTES:

1. For conditions shown as max. or min., use appropriate value specified under Electrical Characteristics for the applicable device type.
2. Typical values are at V_{CC} = 5.0V, +25°C ambient and maximum loading.
3. Not more than one output should be shorted at one time. Duration of the short circuit test should not exceed one second.

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