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10161 Decoder

1-of-8 Decoder with 3 Enable Inputs (Active-LOW Outputs)

FEATURES

- Typical propagation delay: 4.0ns
- Typical supply current ($-I_{EE}$): 61mA

DESCRIPTION

The 10161 accepts three binary weighted inputs (A_0 , A_1 , A_2) and, when enabled, provides eight mutually-exclusive Active-LOW outputs (Q_0 - Q_7). The device features two Active-LOW enable inputs. All unused inputs can be left open due to integrated pull-down resistors which avoid the need for a supply voltage.

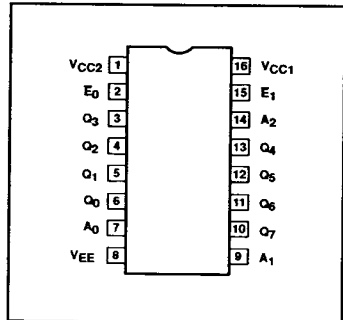
ORDERING INFORMATION

DESCRIPTION	ORDER CODE
16-Pin Plastic DIP	10161N
16-Pin Ceramic DIP	10161F

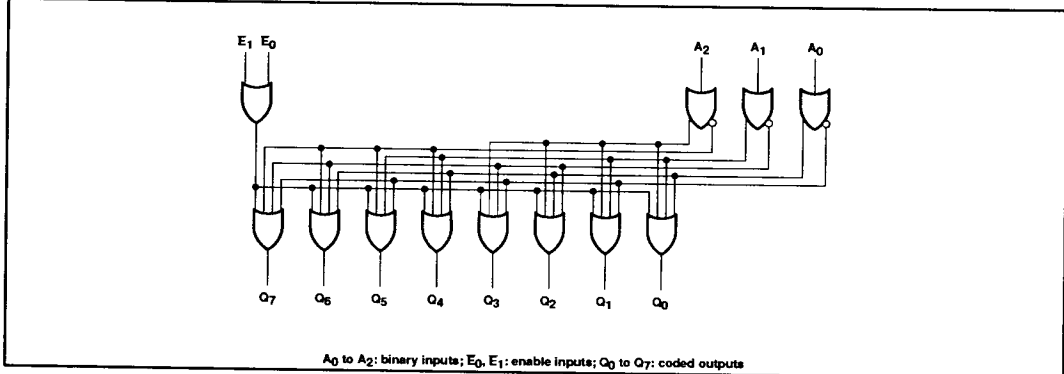
PIN DESCRIPTION

PINS	DESCRIPTION
A_0 - A_2	Address Inputs
E_0 , E_1	Enabled Inputs (Active-LOW)
Q_0 - Q_7	Data Outputs

PIN CONFIGURATION



LOGIC DIAGRAM



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FUNCTION TABLE

[illegible]

H = High Voltage Level

L = Low Voltage Level

X = Don't Care

ABSOLUTE MAXIMUM RATINGS

SYMBOL	PARAMETER		LIMITS	UNIT
V _{EE}	Supply voltage		-8.0	V
V _{IN}	Input voltage (V _{IN} should never be more negative than V _{EE})		0 to V _{EE}	V
I _O	Output source current (continuous)		-50	mA
T _S	Storage temperature range		-55 to +150	°C
T _J	Maximum junction temperature	Ceramic Package	+165	°C
		Plastic Package	+150	°C

NOTE:

Operation beyond the limits set forth in this table may impair the useful life of the device. Unless otherwise noted, these limits are specified over the operating ambient temperature range.

DC OPERATING CONDITIONS

SYMBOL	PARAMETER	TEST CONDITIONS	LIMITS			UNIT
			MIN.	NOM.	MAX.	
V _{CC1} , V _{CC2}	Circuit ground		0	0	0	V
V _{EE}	Supply voltage (negative)			-5.2		V
V _{IH}	High level input voltage	T _A = -30°C			-890	mV
		T _A = +25°C			-810	mV
		T _A = +85°C			-700	mV
V _{IHT}	High level input threshold voltage	T _A = -30°C	-1205			mV
		T _A = +25°C	-1105			mV
		T _A = +85°C	-1035			mV
V _{ILT}	Low level input threshold voltage	T _A = -30°C			-1500	mV
		T _A = +25°C			-1475	mV
		T _A = +85°C			-1440	mV
V _{IL}	Low level input voltage	T _A = -30°C	-1890			mV
		T _A = +25°C	-1850			mV
		T _A = +85°C	-1825			mV
T _A	Operating ambient temperature range		-30	+25	+85	°C

NOTE:

When operating at other than the specified V_{EE} voltage ($-5.2V$), the DC and AC Electrical Characteristics will vary slightly from specified values.

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DC ELECTRICAL CHARACTERISTICS $V_{CC1} = V_{CC2} = \text{ground}$, $V_{EE} = -5.2V \pm 0.010V$, $T_A = -30^\circ\text{C}$ to $+85^\circ\text{C}$ output loading 50Ω to $-2.0V \pm 0.010V$ unless otherwise specified^{1,3}

SYMBOL	PARAMETER	TEST CONDITIONS ²		LIMITS			UNIT
				MIN.	TYP.	MAX.	
V_{OH}	High level output voltage	$T_A = -30^\circ\text{C}$	Apply V_{IHMAX} to E_0 input,	-1060		-890	mV
		$T_A = +25^\circ\text{C}$	with V_{ILMIN} applied	-960		-810	mV
		$T_A = +85^\circ\text{C}$	to all other inputs.	-890		-700	mV
V_{OHT}	High level output threshold voltage	$T_A = -30^\circ\text{C}$	Apply V_{IHT} to E_0 input,	-1080			mV
		$T_A = +25^\circ\text{C}$	with V_{ILMIN} applied	-980			mV
		$T_A = +85^\circ\text{C}$	to all other inputs.	-910			mV
V_{OLT}	Low level output threshold voltage	$T_A = -30^\circ\text{C}$	Using V_{IHMAX} and V_{ILMIN} , apply a functional			-1655	mV
		$T_A = +25^\circ\text{C}$	pattern as indicated in the Function Table, substituting V_{IHT} for V_{IHMAX} and V_{ILT} for			-1630	mV
		$T_A = +85^\circ\text{C}$	V_{ILMIN} on one input at a time and measure V_{OLT} on the respective output.			-1595	mV
V_{OL}	Low level output voltage	$T_A = -30^\circ\text{C}$	Using V_{IHMAX} and V_{ILMIN} , apply a functional	-1890		-1675	mV
		$T_A = +25^\circ\text{C}$	pattern as indicated in the Function Table,	-1850		-1650	mV
		$T_A = +85^\circ\text{C}$	and measure V_{OL} on the respective output.	-1825		-1615	mV
I_{IH}	High level input current	$T_A = -30^\circ\text{C}$	Apply V_{IHMAX} to each input under			350	μA
		$T_A = +25^\circ\text{C}$	test, one at a time, with V_{ILMIN}			220	μA
		$T_A = +85^\circ\text{C}$	applied to all other inputs.			220	μA
I_{IL}	Low level input current	$T_A = -30^\circ\text{C}$	Apply V_{ILMIN} to each input under	0.5			μA
		$T_A = +25^\circ\text{C}$	test, one at a time, with V_{IHMAX}	0.5			μA
		$T_A = +85^\circ\text{C}$	applied to all other inputs.	0.3			μA
$-I_{EE}$	V_{EE} supply current	$T_A = -30^\circ\text{C}$	Apply V_{IHMAX} to pins			84	mA
		$T_A = +25^\circ\text{C}$	2, 7, 9, 14, 15 and		61	76	mA
		$T_A = +85^\circ\text{C}$	V_{ILMIN} to all other inputs.			84	mA
$\frac{\Delta V_{OH}}{\Delta V_{EE}}$	High level output voltage compensation	$T_A = +25^\circ\text{C}$			0.016		V/V
$\frac{\Delta V_{OL}}{\Delta V_{EE}}$	Low level output voltage compensation				0.250		V/V
$\frac{\Delta V_{BB}}{\Delta V_{EE}}$	Reference bias voltage compensation				0.148		V/V

NOTES:

- The specified limits represent the worst case values for the parameter. Since these worst case values normally occur at the supply voltage and temperature extremes, additional noise immunity can be achieved by decreasing the allowable operating condition ranges.
- Conditions for testing shown in the tables are not necessarily worst case. For worst case testing guidelines, refer to DC Testing, Chapter 1, Section 3.
- The specified limits shown in the DC Electrical Characteristics table can be met only after thermal equilibrium has been established. Thermal equilibrium is established by applying power for at least 2 minutes, while maintaining transverse airflow of 2.5 meters/sec (500 linear feet/min) over the device, mounted either in a test socket or on a printed circuit board. Test voltage values are given in the DC Operating Conditions table.

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AC ELECTRICAL CHARACTERISTICS $V_{CC1} = V_{CC2} = \text{ground}$, $V_{EE} = -5.2V \pm 0.010V$

SYMBOL	PARAMETER	TEST CONDITIONS	LIMITS							UNIT
			T _A = -30°C		T _A = +25°C			T _A = +85°C		
			MIN.	MAX.	MIN.	TYP.	MAX.	MIN.	MAX.	
t _{PLH} t _{PHL}	Propagation delay E _n , A _n to Q _n	Waveform 1	1.50 1.50	6.20 6.20	1.50 1.50	4.00 4.00	6.00 6.00	1.50 1.50	6.40 6.40	ns ns
t _{TLH} t _{THL}	Transition time 20% to 80%, 80% to 20%		1.00 1.00	3.30 3.30	1.10 1.10	2.00 2.00	3.30 3.30	1.10 1.10	3.50 3.50	ns ns

NOTE:

For AC test setup information, see AC Testing, Chapter 2, Section 3.

AC WAVEFORMS

