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ECL Products	

10188
Hex Buffer

Hex Buffer with Enable (Non-Inverting)

FEATURES

- **Typical propagation delay: 2.0ns**
- **Typical supply current ($-I_{EE}$): 33mA**

DESCRIPTION

The 10188 includes six buffers offering individual inputs and outputs and a common Enable input, driving all outputs Low. Each input is connected to V_{EE} via a pull-down resistor resulting in high input impedance and eliminating the need for connecting unused inputs Low.

Due to open emitter outputs the 10188 features OR capability with high fan-out for driving 50Ω lines.

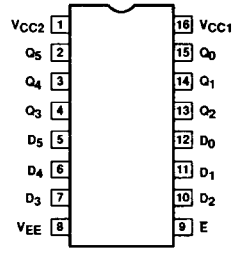
ORDERING INFORMATION

DESCRIPTION	ORDER CODE
16–Pin Plastic DIP	10188N
16–Pin Ceramic DIP	10188F
16–Pin SO	10188D

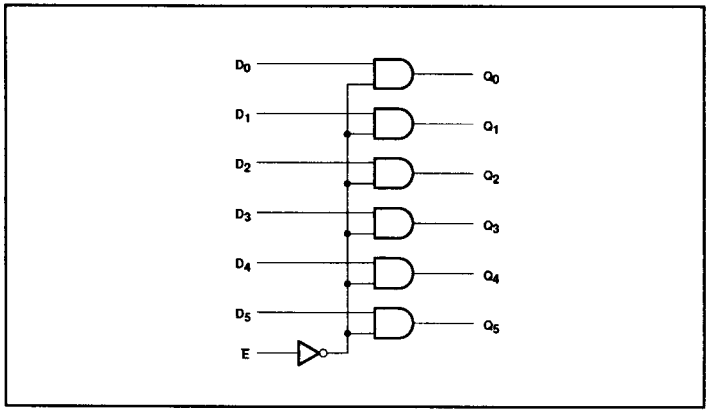
PIN DESCRIPTION

PINS	DESCRIPTION
$D_0 - D_5$	Data Inputs
$\overline{E}$	Common Enable Input
$Q_0 - Q_5$	Data Outputs

PIN CONFIGURATION



LOGIC DIAGRAM



FUNCTION TABLE

INPUTS		OUTPUT
$\overline{E}$	D_n	Q_n
L	L	L
L	H	H
H	X	L

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.

DC ELECTRICAL CHARACTERISTICS

$V_{CC1} = V_{CC2}$ = ground, $V_{EE} = -5.2V \pm 0.010V$, $T_A = -30°C$ to $+85°C$ output loading 50Ω to $-2.0V \pm 0.010V$ unless otherwise specified[1,3]

SYMBOL	PARAMETER		TEST CONDITIONS[2]		LIMITS MIN.	LIMITS TYP.	LIMITS MAX.	UNIT
V_{OH}	High level output voltage		$T_A = -30°C$	Apply V_{ILMIN} to $\overline{E}$ input	−1060		−890	mV
			$T_A = +25°C$	with V_{IHMAX} applied to	−960		−810	mV
			$T_A = +85°C$	all other inputs.	−890		−700	mV
V_{OHT}	High level output threshold voltage		$T_A = -30°C$	Apply V_{ILT} to $\overline{E}$ input	−1080			mV
			$T_A = +25°C$	with V_{IHMAX} applied to	−980			mV
			$T_A = +85°C$	all other inputs.	−910			mV
V_{OLT}	Low level output threshold voltage		$T_A = -30°C$	Apply V_{IHT} to $\overline{E}$ input			−1655	mV
			$T_A = +25°C$	with V_{IHMAX} applied to			−1630	mV
			$T_A = +85°C$	all other inputs.			−1595	mV
V_{OL}	Low level output voltage		$T_A = -30°C$	Apply V_{ILMIN} to all inputs.	−1890		−1675	mV
			$T_A = +25°C$		−1850		−1650	mV
			$T_A = +85°C$		−1825		−1615	mV
I_{IH}	High level input current	Other inputs	$T_A = -30°C$	Apply V_{IHMAX} to each input under			425	µA
			$T_A = +25°C$	test, one at a time, with V_{ILMIN}			265	µA
			$T_A = +85°C$	applied to all other inputs.			265	µA
		$\overline{E}$ input	$T_A = -30°C$	Apply V_{IHMAX} to $\overline{E}$ input			460	µA
			$T_A = +25°C$	with V_{ILMIN} applied to			290	µA
			$T_A = +85°C$	all other inputs.			290	µA
I_{IL}	Low level input current		$T_A = -30°C$	Apply V_{ILMIN} to each input under	0.5			µA
			$T_A = +25°C$	test, one at a time, with V_{IHMAX}	0.5			µA
			$T_A = +85°C$	applied to all other inputs.	0.3			µA
$-I_{EE}$	V_{EE} supply current		$T_A = -30°C$				46	mA
			$T_A = +25°C$			33	42	mA
			$T_A = +85°C$				46	mA
$\frac{\Delta V_{OH}}{\Delta V_{EE}}$	High level output voltage compensation		$T_A = +25°C$			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:

1. 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.
2. 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.
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.

Hex Buffer

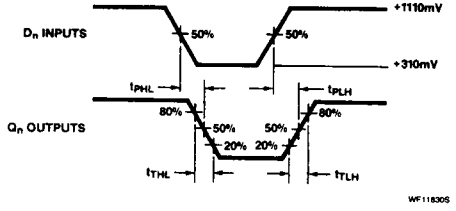
10188

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

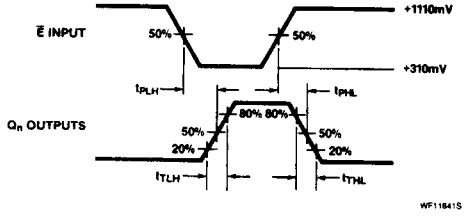
SYMBOL	PARAMETER	TEST CONDITIONS	LIMITS							UNIT
			$T_A = -30°C$		$T_A = +25°C$			$T_A = +85°C$		
			Min	Max	Min	Typ	Max	Min	Max	
t_{PLH} t_{PHL}	Propagation delay D_n to Q_n	Waveform 1	1.00 1.00	3.30 3.30	1.00 1.00	2.00 2.00	2.90 2.90	1.00 1.00	3.30 3.30	ns
t_{PLH} t_{PHL}	Propagation delay $\overline{E}$ to Q_n		1.10 1.10	3.90 3.90	1.10 1.10	2.50 2.50	3.50 3.50	1.10 1.10	3.90 3.90	ns
t_{TLH} t_{THL}	Transition time 20% to 80%, 80% to 20%		1.10 1.10	3.70 3.70	1.10 1.10	2.00 2.00	3.30 3.30	1.10 1.10	3.70 3.70	ns ns

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

AC WAVEFORMS



Waveform 1. Propagation Delay and Transition Times for Data to Output



Waveform 2. Propagation Delay and Transition Times for Enable to Output