



HT01

8-Channel Logic To High-Voltage Level Translator

T-52-11

Ordering Information

Part Number/Package				
20 Lead CERDIP	20 Lead Plastic DIP	20 Terminal Ceramic LCC	Plastic SOW-20*	Die in wafer pack
HT0130D	HT0130P	HT0130LC	HT0130WG	HT0130X

*Same as SO-20 0.300 mil wide body.

Features

- Operating voltage up to 300V
- 5V to 15V logic input capability
- Output swings below GND if required
- Drives high-voltage P-Channel MOS from logic level signal
- Surface mount packaging available
- No "floating logic" required
- 8 independent channels

Applications

- ATE systems
- Printers/plotters
- P-Channel MOSFET control

Absolute Maximum Ratings^{1,2}

Supply voltage, V_{DD}	$V_{NN} - 0.3V$ to +16V
Supply Voltage, V_{PP}	$V_{NN} - 0.3V$ to + 300V
Supply Voltage, V_{NN}	-16V to 0.3V
Logic inputs levels	V_{IN} $V_{NN} - 0.3V$ to $V_{DD} + 0.3V$
	V_{OUTPUT} $V_{PP} + 0.3V$ max
I_{OUT} — DC per Channel	30mA
Continuous total power dissipation ²	700mW
Operating temperature range	0°C to 70°C
Storage temperature range	-65°C to + 150°C

Note 1: All voltages are referenced to chip ground.

Note 2: For operation above 25°C ambient derate linearly to 85°C at 8mW/°C.

General Description

The Supertex HT01 8-channel Level Translator is designed to implement the necessary level translation between logic level signals and voltage swings required to drive high-voltage P-Channel MOSFET transistors. This device is intended to provide gate drive signals to devices such as the Supertex AP01 P-Channel MOSFET Array in applications requiring active pull-up to a high-voltage (V_{PP}) line of up to 300 volts. Logic input can be from 5 volts to 15 volts and is referenced to the logic supply (V_{DD}).

When an input is switched to 4.2 volts below the V_{DD} supply, the corresponding output will typically switch from V_{PP} to $V_{PP} - 14$ volts. If the V_{PP} supply remains above 12 volts, the negative supply (V_{NN}) would be connected to system ground (GND). If variations of the V_{PP} supply level require the P-Channel MOSFET gate drive to swing below GND in order to turn on, connect the V_{NN} pin to a negative supply of up to -15 volts. The logic inputs can remain between V_{DD} and system ground (GND) and still provide correct operation.

In an OFF condition, the HT01 is a low power device. In an ON condition, each channel will dissipate power determined by the V_{PP} and V_{NN} voltage. Internal power dissipation must be considered when the application requires that more than one channel be active at one time, especially at higher V_{PP} voltage values.

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Electrical Characteristics (over recommended operating conditions unless noted)

DC Characteristics

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Symbol	Parameter	Min	Typ	Max	Units	Conditions
I_{DD}	V_{DD} Supply Current			0.001	mA	All OFF
			0.6	3.50	mA	1 ch ON, no load
I_{PP}	V_{PP} Supply Current			0.001	mA	All OFF
			0.4	1.0	mA	1 ch ON, no load
I_{NN}	V_{NN} Supply Current			0.001	mA	All OFF
			1.0	4.50	mA	1 ch ON, no load
I_{SOURCE}	Output current	135	200		μA	Capacitive load
I_{SINK}	Output current	66	100		μA	Capacitive load
V_{ON}	Output voltage	$V_{PP} - 17$		$V_{PP} - 10$	V	$V_{DD} = 4.75V$
		$V_{PP} - 17$		$V_{PP} - 12.5$	V	$V_{DD} = 15V$
V_{OFF}	Output voltage	$V_{PP} - 0.5$			V	
V_Z	Zener voltage	11	14	17	V	Output to V_{PP}

AC Characteristics

Symbol	Parameter	Min	Typ	Max	Units	Conditions
t_{ON}	Turn on time, any channel		5		μs	$V_{DD} = 10V, V_{NN} = GND$
Δt_{ON}	Variation in t_{ON} , any 2 channels		5		%	$V_{DD} = 10V, V_{NN} = GND$
t_{OFF}	Turn off time, any channel		3		μs	$V_{DD} = 10V, V_{NN} = GND$
Δt_{OFF}	Variation in t_{OFF} , any 2 channels		5		%	$V_{DD} = 10V, V_{NN} = GND$

Recommended Operating Conditions

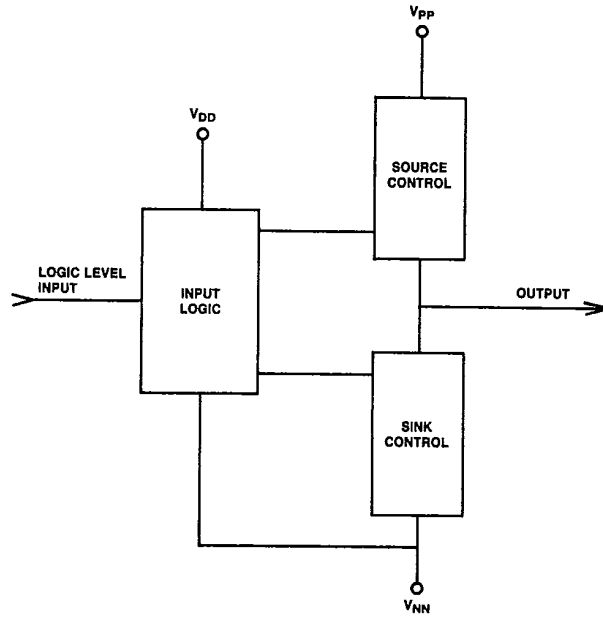
Symbol	Parameter	Min	Typ	Max	Units
V_{DD}	Logic supply voltage	4.75		15	V
V_{PP}	Positive high voltage supply	$V_{NN} + 12$		275	V
V_{NN}	Negative supply	-15		0	V
V_{IH}	High-level input voltage	$V_{DD} - 1.2$		V_{DD}	V
V_{IL}	Low-level input voltage	0		$V_{DD} - 4.2$	V
T_A	Operating free-air temperature	0		+70	$^{\circ}C$

Function Table

Input Condition	Output Stage
High level	V_{PP}
Low level	$V_{PP} - V_Z$

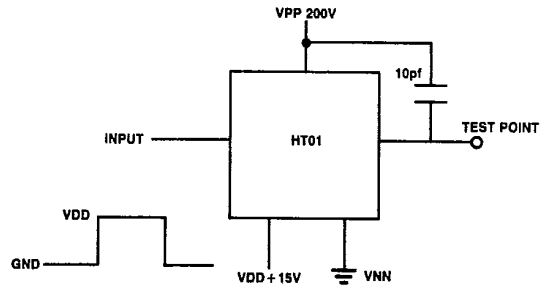
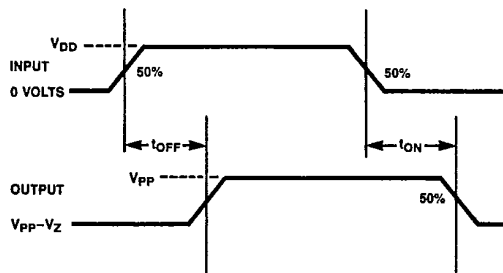
Functional Block Diagram

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(One of eight channels within the HT01)

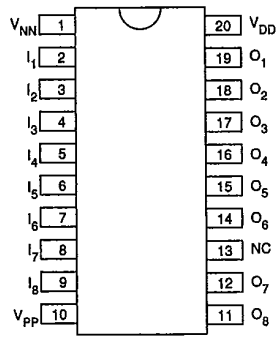
Switching Waveforms and Test Circuit



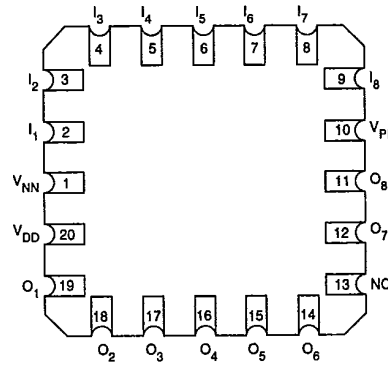
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Pin Configuration

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top view
20-pin DIP/SOW-20



bottom view
20-pin LCC