



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<sup>1,2</sup>**

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 <sup>2</sup>	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**

*T-52-11*

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		$\mu A$	Capacitive load
$I_{SINK}$	Output current	66	100		$\mu A$	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		$\mu s$	$V_{DD} = 10V, V_{NN} = GND$
$\Delta t_{ON}$	Variation in $t_{ON}$ , any 2 channels		5		%	$V_{DD} = 10V, V_{NN} = GND$
$t_{OFF}$	Turn off time, any channel		3		$\mu s$	$V_{DD} = 10V, V_{NN} = GND$
$\Delta t_{OFF}$	Variation in $t_{OFF}$ , any 2 channels		5		%	$V_{DD} = 10V, V_{NN} = GND$

**Recommended Operating Conditions**

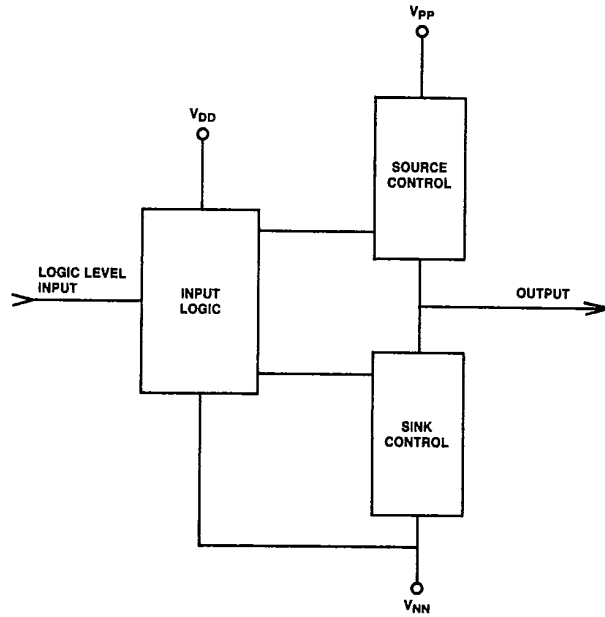
Symbol	Parameter	Min	Typ	Max	Units
$V_{DD}$	Logic supply voltage	4.75		15	V
$V_{PP}$	Positive high voltage supply	$V_{NN} + 12$		275	V
$V_{NN}$	Negative supply	-15		0	V
$V_{IH}$	High-level input voltage	$V_{DD} - 1.2$		$V_{DD}$	V
$V_{IL}$	Low-level input voltage	0		$V_{DD} - 4.2$	V
$T_A$	Operating free-air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

**Function Table**

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

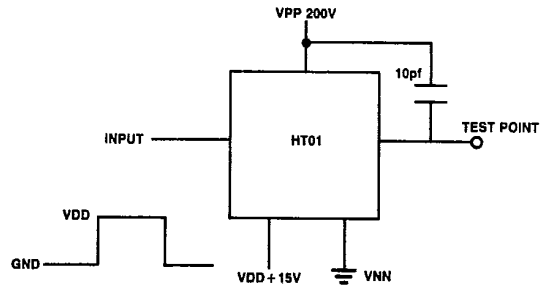
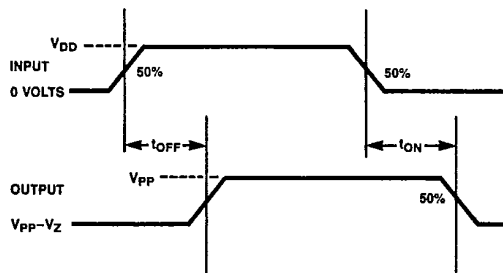
Functional Block Diagram

T-52-11



(One of eight channels within the HT01)

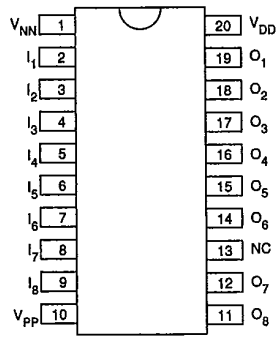
Switching Waveforms and Test Circuit



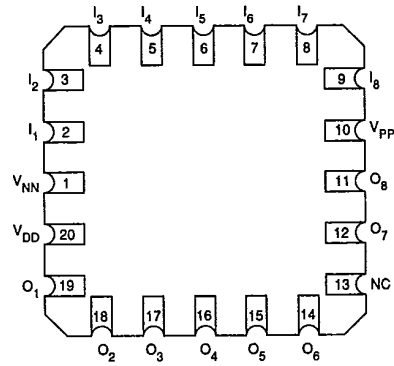
(One of eight channels within the HT01)

Pin Configuration

T-52-11



top view  
20-pin DIP/SOW-20



bottom view  
20-pin LCC



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