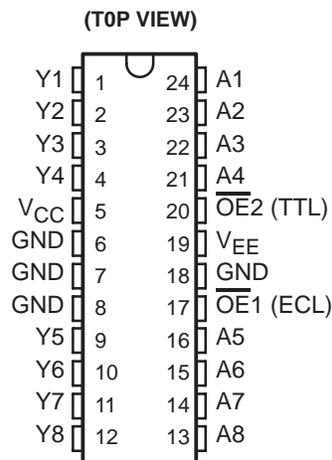


SN100KT5540 OCTAL ECL-TO-TTL TRANSLATOR WITH 3-STATE OUTPUTS

SDZS005 – DECEMBER 1989

- 100K Compatible
- Inverting Outputs
- ECL and TTL Control Inputs
- Flow-Through Architecture Optimizes PCB Layout
- Center Pin V_{CC} , V_{EE} , and GND Configurations Minimize High-Speed Switching Noise
- Package Options Include “Small Outline” Packages and Standard Plastic 300-mil DIPs

R NT PACKAGE



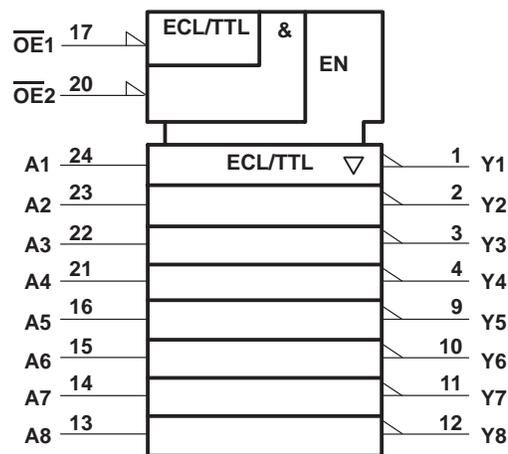
description

This octal ECL-to-TTL translator is designed to provide a efficient translation between a 100K ECL signal environment and a TTL signal environment. This device is designed specifically to improve the performance and density of ECL-to-TTL CPU/bus-oriented functions such as memory-address drivers, clock drivers, and bus-oriented receivers and transmitters.

Two output pins, $\overline{OE}1$ and $\overline{OE}2$, are provided. These control inputs are ANDed together with $\overline{OE}1$ being ECL compatible and $\overline{OE}2$ being TTL compatible. This offers the choice of controlling the outputs of the device from either a TTL or ECL signal environment.

The SN100KT5540 is characterized for operation from 0°C to 85°C.

logic symbol†



† This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.

FUNCTION TABLE

OUTPUT ENABLE		DATA INPUT A	OUTPUT TTL
OE1	OE2		Y
X	H	X	Z
H	X	X	Z
L	L	L	H
L	L	H	L

SN100KT5540
OCTAL ECL-TO-TTL TRANSLATOR
WITH 3-STATE OUTPUTS

SDZS005 – DECEMBER 1989

recommended operating conditions

		MIN	NOM	MAX	UNIT
V _{CC}	TTL supply voltage	4.5	5	5.5	V
V _{EE}	ECL supply voltage	-4.2	-4.5	-4.8	V
V _{IH}	TTL high-level input voltage	2			V
V _{IL}	TTL low-level input voltage			0.8	V
V _{IH}	ECL high-level input voltage [†]	-1150		-840	mV
V _{IL}	ECL low-level input voltage [†]	-1810		-1490	mV
I _{IK}	TTL input clamp current			-18	mA
I _{OH}	High-level output current			-15	mA
I _{OL}	Low-level output current			48	mA
T _A	Operating free-air temperature	0		85	°C

[†] The algebraic convention, in which the least positive (most negative) value is designated minimum, is used in this data sheet for logic levels only.

electrical characteristics over recommended operating free-air temperature range (unless otherwise noted)

PARAMETER		TEST CONDITIONS			MIN	TYP [‡]	MAX	UNIT
V _{IK}	OE2 only	V _{CC} = 4.5 V, V _{EE} = -4.2 V, I _I = -18 mA					-1.2	V
V _{OH}		V _{CC} = 4.5 V, V _{EE} = -4.5 V ± 0.3 V, I _{OH} = -3 mA	2.4	3.3				V
		V _{CC} = 4.5 V, V _{EE} = -4.5 V ± 0.3 V, I _{OH} = -15 mA	2	3.1				
V _{OL}		V _{CC} = 4.5 V, V _{EE} = -4.5 V ± 0.3 V, I _{OL} = 48 mA			0.38	0.55		V
I _I	OE2 only	V _{CC} = 5.5 V, V _{EE} = -4.8 V, V _I = 7 V					0.1	mA
I _{IH}	OE2 only	V _{CC} = 5.5 V, V _{EE} = -4.8 V, V _I = 2.7 V					20	μA
I _{IL}	OE2 only	V _{CC} = 5.5 V, V _{EE} = -4.8 V, V _I = 0.5 V					-0.5	mA
I _{IH}	Data inputs and OE1	V _{CC} = 5.5 V, V _{EE} = -4.8 V, V _{IH} = -840 mV					350	μA
I _{IL}	Data inputs and OE1	V _{CC} = 5.5 V, V _{EE} = -4.8 V, V _{IL} = -1810 mV	0.50					μA
I _{OZH}		V _{CC} = 5.5 V, V _{EE} = -4.8 V, V _O = 2.7 V					50	μA
I _{OZL}		V _{CC} = 5.5 V, V _{EE} = -4.8 V, V _O = 0.5 V					-50	μA
I _{OS} [§]		V _{CC} = 5.5 V, V _{EE} = -4.8 V, V _O = 0 V	-100				-225	mA
I _{CCH}		V _{CC} = 5.5 V, V _{EE} = -4.8 V		67	97			mA
I _{CCL}		V _{CC} = 5.5 V, V _{EE} = -4.8 V		84	120			mA
I _{CCZ}		V _{CC} = 5.5 V, V _{EE} = -4.8 V		81	116			mA
I _{EE}		V _{CC} = 5.5 V, V _{EE} = -4.8 V		-22	-33			mA
C _i		V _{CC} = 5 V, V _{EE} = 4.5 V		5				pF
C _o		V _{CC} = 5 V, V _{EE} = 4.5 V		7				pF

[‡] All typical values are at V_{CC} = 5 V, V_{EE} = -4.5 V, T_A = 25°C.

[§] Not more than one output should be tested at a time, and the duration of the test should not exceed 10 ms.



SN100KT5540
OCTAL ECL-TO-TTL TRANSLATOR
WITH 3-STATE OUTPUTS

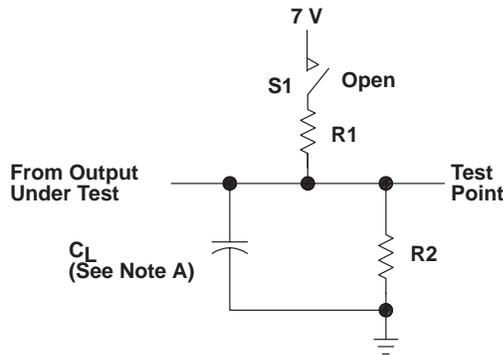
SDZS005 - DECEMBER 1989

switching characteristics over recommended ranges of supply voltage and operating free-air temperature (see Figure 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	C _L = 50 pF, R ₁ = 500 Ω, R ₂ = 500 Ω			UNIT
			MIN	TYP†	MAX	
t _{PLH}	A	Y	1.6	3.9	6.4	ns
t _{PHL}			1.6	4.2	6.4	
t _{PZH}	$\overline{OE1}$	Y	2.4	4.5	6.9	ns
t _{PZL}			3.5	5.9	8.7	
t _{PHZ}	$\overline{OE1}$	Y	2.8	5.2	8.1	ns
t _{PLZ}			2.2	4.6	8	
t _{PZH}	$\overline{OE2}$	Y	1.4	3.3	6.1	ns
t _{PZL}			2.5	4.7	7.9	
t _{PHZ}	$\overline{OE2}$	Y	1.6	4.1	6.5	ns
t _{PLZ}			0.7	3.3	6.4	

† All typical values are at V_{CC} = 5 V, V_{EE} = -4.5 V, T_A = 25°C.

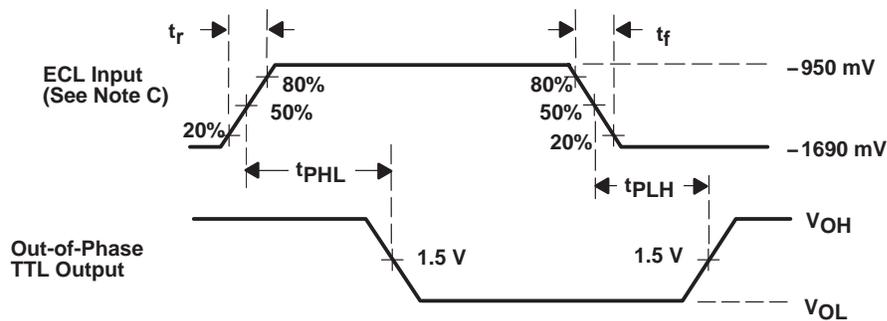
PARAMETER MEASUREMENT INFORMATION



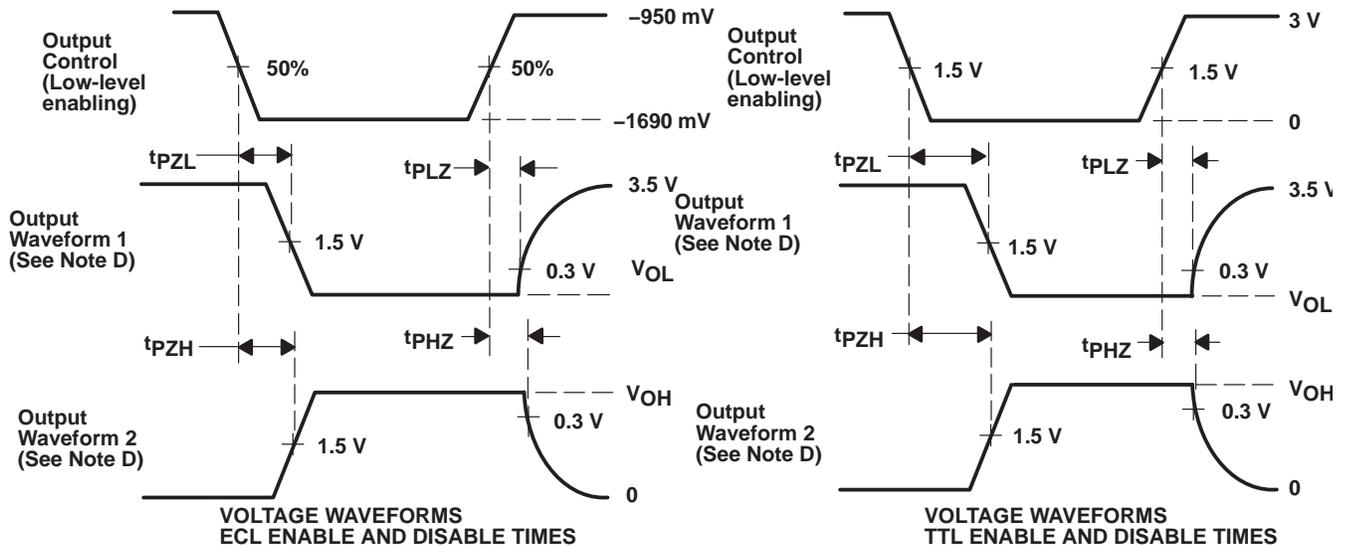
SWITCH POSITION TABLE

TEST	S1
t_{PLH}	Open
t_{PHL}	Open
t_{PZH}	Open
t_{PZL}	Closed
t_{PHZ}	Open
t_{PLZ}	Closed

LOAD CIRCUIT



ECL INPUT PROPAGATION DELAY TIMES



- NOTES: A. C_L includes probe and jig capacitance.
 B. For TTL inputs, input pulses are supplied by generators having the following characteristics: $PRR \leq 10$ MHz, $Z_0 = 50 \Omega$, $t_r \leq 2.5$ ns, $t_f \leq 2.5$ ns.
 C. For ECL inputs, input pulses are supplied by generators having the following characteristics: $PRR \leq 10$ MHz, $Z_0 = 50 \Omega$, $t_r \leq 0.7$ ns, $t_f \leq 0.7$ ns.
 D. Waveform 1 is for an output with internal conditions such that the output is low except when disabled by the output control. Waveform 2 is for an output with internal conditions such that the output is high except when disabled by the output control.
 E. The outputs are measured one at a time with one transition per measurement.

SN100KT5540
OCTAL ECL-TO-TTL TRANSLATOR
WITH 3-STATE OUTPUTS

SDZS005 - DECEMBER 1989

FIGURE 1. LOAD CIRCUIT AND VOLTAGE WAVEFORMS

IMPORTANT NOTICE

Texas Instruments Incorporated and its subsidiaries (TI) reserve the right to make corrections, modifications, enhancements, improvements, and other changes to its products and services at any time and to discontinue any product or service without notice. Customers should obtain the latest relevant information before placing orders and should verify that such information is current and complete. All products are sold subject to TI's terms and conditions of sale supplied at the time of order acknowledgment.

TI warrants performance of its hardware products to the specifications applicable at the time of sale in accordance with TI's standard warranty. Testing and other quality control techniques are used to the extent TI deems necessary to support this warranty. Except where mandated by government requirements, testing of all parameters of each product is not necessarily performed.

TI assumes no liability for applications assistance or customer product design. Customers are responsible for their products and applications using TI components. To minimize the risks associated with customer products and applications, customers should provide adequate design and operating safeguards.

TI does not warrant or represent that any license, either express or implied, is granted under any TI patent right, copyright, mask work right, or other TI intellectual property right relating to any combination, machine, or process in which TI products or services are used. Information published by TI regarding third-party products or services does not constitute a license from TI to use such products or services or a warranty or endorsement thereof. Use of such information may require a license from a third party under the patents or other intellectual property of the third party, or a license from TI under the patents or other intellectual property of TI.

Reproduction of TI information in TI data books or data sheets is permissible only if reproduction is without alteration and is accompanied by all associated warranties, conditions, limitations, and notices. Reproduction of this information with alteration is an unfair and deceptive business practice. TI is not responsible or liable for such altered documentation. Information of third parties may be subject to additional restrictions.

Resale of TI products or services with statements different from or beyond the parameters stated by TI for that product or service voids all express and any implied warranties for the associated TI product or service and is an unfair and deceptive business practice. TI is not responsible or liable for any such statements.

TI products are not authorized for use in safety-critical applications (such as life support) where a failure of the TI product would reasonably be expected to cause severe personal injury or death, unless officers of the parties have executed an agreement specifically governing such use. Buyers represent that they have all necessary expertise in the safety and regulatory ramifications of their applications, and acknowledge and agree that they are solely responsible for all legal, regulatory and safety-related requirements concerning their products and any use of TI products in such safety-critical applications, notwithstanding any applications-related information or support that may be provided by TI. Further, Buyers must fully indemnify TI and its representatives against any damages arising out of the use of TI products in such safety-critical applications.

TI products are neither designed nor intended for use in military/aerospace applications or environments unless the TI products are specifically designated by TI as military-grade or "enhanced plastic." Only products designated by TI as military-grade meet military specifications. Buyers acknowledge and agree that any such use of TI products which TI has not designated as military-grade is solely at the Buyer's risk, and that they are solely responsible for compliance with all legal and regulatory requirements in connection with such use.

TI products are neither designed nor intended for use in automotive applications or environments unless the specific TI products are designated by TI as compliant with ISO/TS 16949 requirements. Buyers acknowledge and agree that, if they use any non-designated products in automotive applications, TI will not be responsible for any failure to meet such requirements.

Following are URLs where you can obtain information on other Texas Instruments products and application solutions:

Products

Amplifiers	amplifier.ti.com
Data Converters	dataconverter.ti.com
DSP	dsp.ti.com
Clocks and Timers	www.ti.com/clocks
Interface	interface.ti.com
Logic	logic.ti.com
Power Mgmt	power.ti.com
Microcontrollers	microcontroller.ti.com
RFID	www.ti-rfid.com
RF/IF and ZigBee® Solutions	www.ti.com/lprf

Applications

Audio	www.ti.com/audio
Automotive	www.ti.com/automotive
Broadband	www.ti.com/broadband
Digital Control	www.ti.com/digitalcontrol
Medical	www.ti.com/medical
Military	www.ti.com/military
Optical Networking	www.ti.com/opticalnetwork
Security	www.ti.com/security
Telephony	www.ti.com/telephony
Video & Imaging	www.ti.com/video
Wireless	www.ti.com/wireless

Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265
Copyright © 2008, Texas Instruments Incorporated