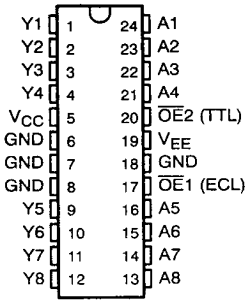
- **100K Compatible**
- **Inverting Outputs**
- **ECL and TTL Control Inputs**
- **Flow-Through Architecture Optimizes PCB Layout**
- **Center Pin V_{CC}, V_{EE}, and GND Configurations Minimize High-Speed Switching Noise**
- **Package Options Include "Small Outline" Packages and Standard Plastic 300-mil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

DW OR NT PACKAGE
(TOP VIEW)



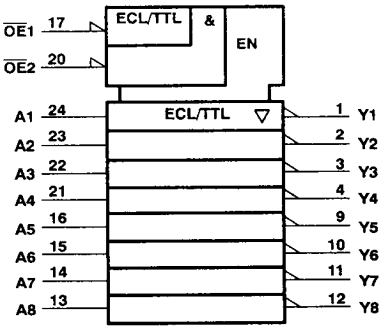
description

This octal ECL-to-TTL translator is designed to provide 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-enable 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†

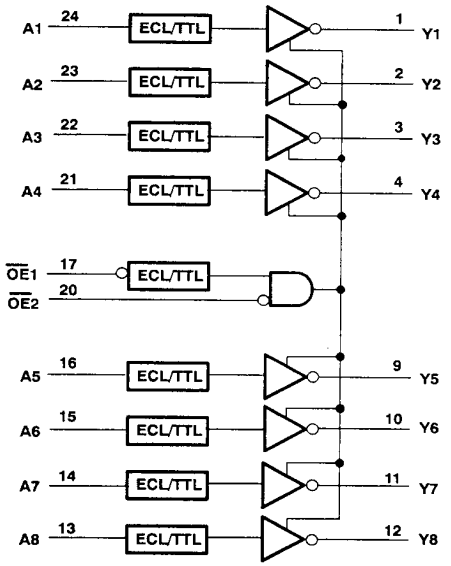


† This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.

FUNCTION TABLE

OUTPUT ENABLE		DATA INPUT	OUTPUT TTL
$\overline{OE}1$	$\overline{OE}2$	A	Y
X	H	X	Z
H	X	X	Z
L	L	L	H
L	L	H	L

logic diagram (positive logic)



absolute maximum ratings over operating free-air temperature range (unless otherwise noted)†

Supply voltage range, V_{CC}	−0.5 V to 7 V
Supply voltage range, V_{EE}	−8 V to 0 V
Input voltage range: TTL (see Note 1)	−1.2 V to 7 V
ECL	V_{EE} to 0 V
Voltage applied to any output in the high state	−0.5 V to V_{CC}
Voltage applied to any output in the disabled or power-off state	−0.5 V to 5.5 V
Input current range (TTL)	−30 mA to 5 mA
Current into any output in the low state	96 mA
Operating free-air temperature range	0°C to 85°C
Storage temperature range	−65°C to 150°C

† Stresses beyond those listed under "absolute maximum ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under "recommended operating conditions" is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

NOTE 1: The TTL input voltage ratings may be exceeded provided the input current ratings are observed.

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}	$\overline{OE}2$ 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	$\overline{OE}2$ only	V_{CC} = 5.5 V,	V_{EE} = −4.8 V,	V_I = 7 V			0.1	mA
I_{IH}	$\overline{OE}2$ only	V_{CC} = 5.5 V,	V_{EE} = −4.8 V,	V_I = 2.7 V			20	μA
I_{IL}	$\overline{OE}2$ only	V_{CC} = 5.5 V,	V_{EE} = −4.8 V,	V_I = 0.5 V			−0.5	mA
I_{IH}	Data inputs and $\overline{OE}1$	V_{CC} = 5.5 V,	V_{EE} = −4.8 V,	V_{IH} = −840 mV			350	μA
I_{IL}	Data inputs and $\overline{OE}1$	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.

switching characteristics over recommended ranges of supply voltage and operating free-air temperature (see Note 2)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	C_L = 50 pF, R1 = 500 Ω, R2 = 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}	$\overline{OE}1$	Y	2.4	4.5	6.9	ns
t_{PZL}			3.5	5.9	8.7	
t_{PHZ}	$\overline{OE}1$	Y	2.8	5.2	8.1	ns
t_{PLZ}			2.2	4.6	8	
t_{PZH}	$\overline{OE}2$	Y	1.4	3.3	6.1	ns
t_{PZL}			2.5	4.7	7.9	
t_{PHZ}	$\overline{OE}2$	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.
NOTE 2: Load circuit and voltage waveforms are shown in Section 1.