

SEVEN SEGMENT DECODER/TRANSISTOR DRIVER

8T05

DIGITAL 8000 SERIES TTL/MSI

DESCRIPTION

The 8T05 consists of the necessary logic to decode a 4-Bit BCD code to seven segment (0 through 9) readout as well as some selected signs and letters.

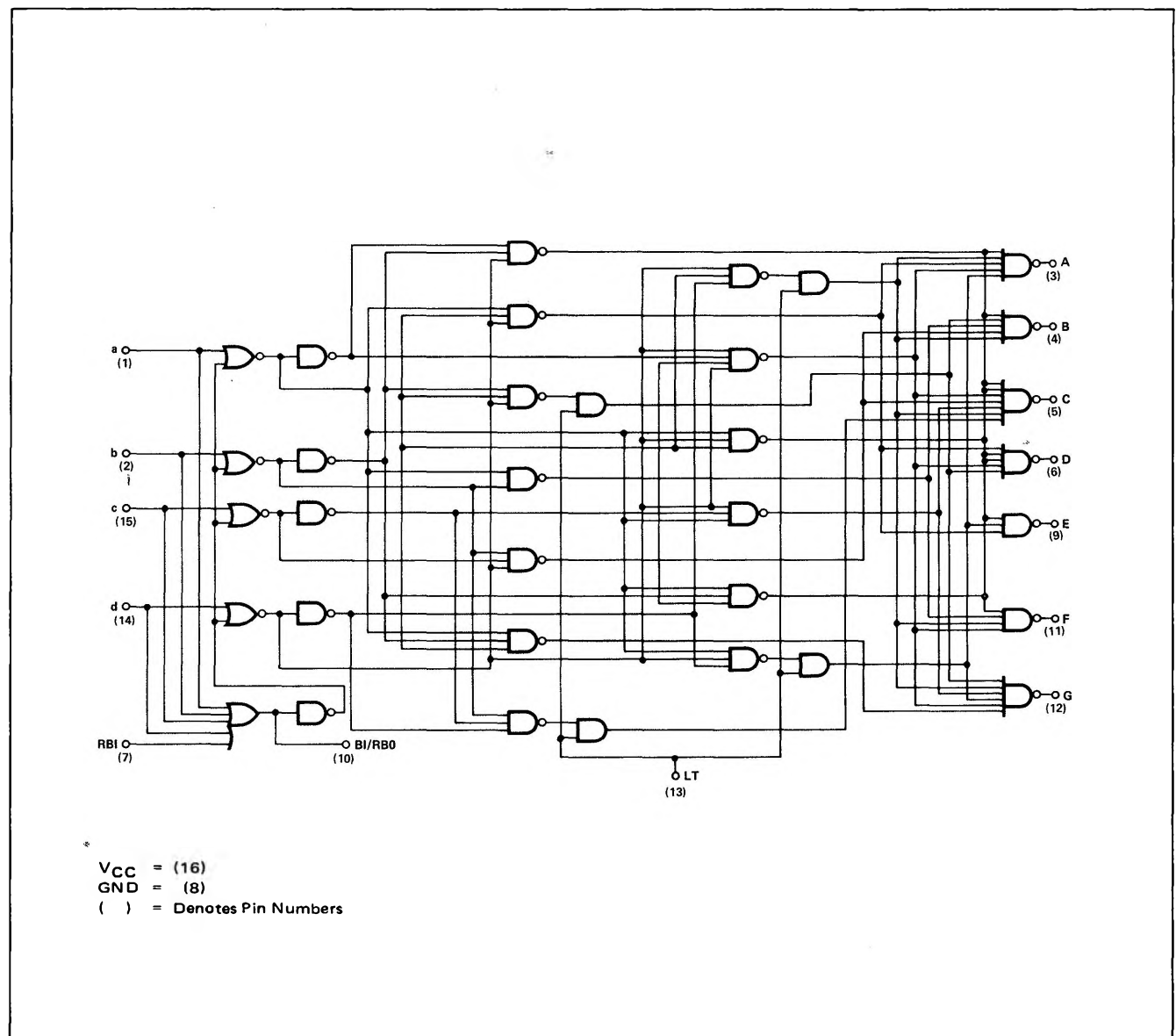
A Ripple Blanking input is provided to implement suppression of leading and/or trailing zeros. The suppression of all numerically insignificant zeros provides an easily read display.

Incorporated in the Ripple Blanking output (BI/RBO) is the facility to ground all the outputs. Blanking of the outputs allows for intensity modulation.

A Lamp Test input is provided which, when grounded forces all segment outputs high. This allows the viewer to check the validity of the display presentation by testing the integrity of the lamps.

The 8T05 has resistor pullups on the outputs to provide source current sufficient to drive interfacing elements. This allows the unit to drive high voltage transistors for neon displays. The 8T05 can also be used to drive common cathode LED displays at moderate light intensity levels.

LOGIC DIAGRAM



ELECTRICAL CHARACTERISTICS (Over Recommended Operating Temperature And Voltage)

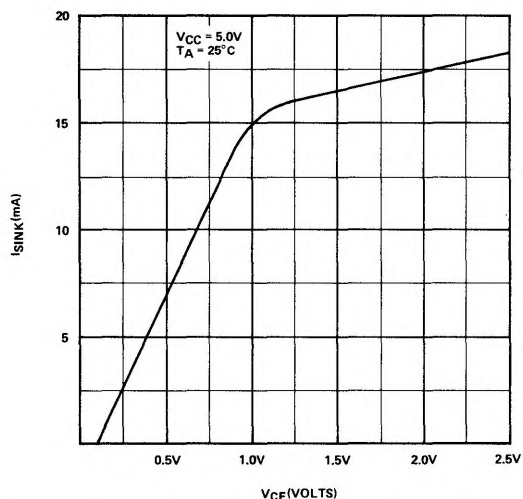
CHARACTERISTICS	LIMITS				LT	TEST CONDITIONS			OUTPUTS	NOTES
	MIN	TYP	MAX	UNITS		RBI	RBO BI	DRIVEN INPUTS		
A-G "1" Output Voltage	3.9			V	0.4V				-500 μ A	7, 9
A-G Output Source Current	-2.3			mA	0.4V				1.0V	
A-G "0" Output Voltage			0.3	V	4.5V	0.4V	0.4V		+500 μ A	8, 9
RBO "1" Output Voltage	3.1			V			-160 μ A			7, 9
RBO "0" Output Voltage			0.4	V		0.8V	4.8mA	0.8V		8, 9
"1" Input Current										
RBI			40	μ A		4.5V				
LT			160	μ A	4.5V					
All other Inputs			80	μ A		4.5V	4.5V	4.5V		
"0" Input Current										
RBI	-1		-1.2	mA		0.4V				
BI	-1		-2.2	mA			0.4V			
LT	-1		-1.0	mA	0.4V					
All Other Inputs	-1		-1.6	mA				0.4V		
Input Voltage Rating	5.5			V				10mA		10
Power/Current Consumption:										
"S" Temperature Range			394/75	mW/mA						12
"N" Temperature Range			110/85	mW/mA						12

NOTES:

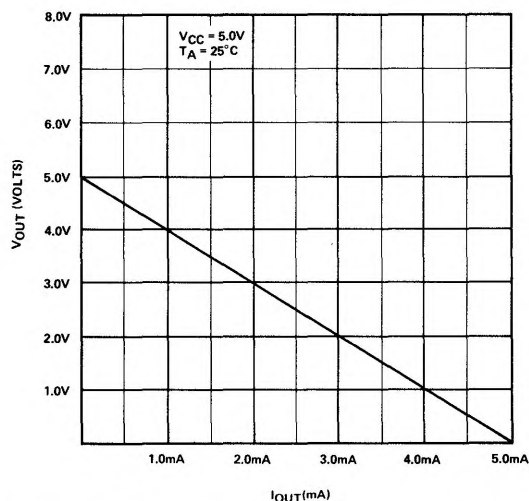
- All voltage measurements are referenced to the ground terminal. Terminals not specifically referenced are left electrically open.
- All measurements are taken with ground pin tied to zero volts.
- Positive current is defined as into the terminal referenced.
- Positive NAND Logic Definition:
"UP" Level = "1", "DOWN" Level = "0".
- Precautionary measures should be taken to ensure current limiting in accordance with Absolute Maximum Ratings should the isolation diodes become forward biased.
- Measurements apply to each element independently.
- Output source current is supplied through a resistor to ground.
- Output sink current is supplied through a resistor to V_{CC} .
- See truth table: "1" Threshold = 2.0V for a,b,c,d.
"0" Threshold = 0.8V for a,b,c,d.
- This test guarantees operation free of input latch-up over the specified operating supply voltage range.
- Manufacturer reserves the right to make design and process changes and improvements.
- $V_{CC} = 5.25V$.

TYPICAL CHARACTERISTIC CURVES

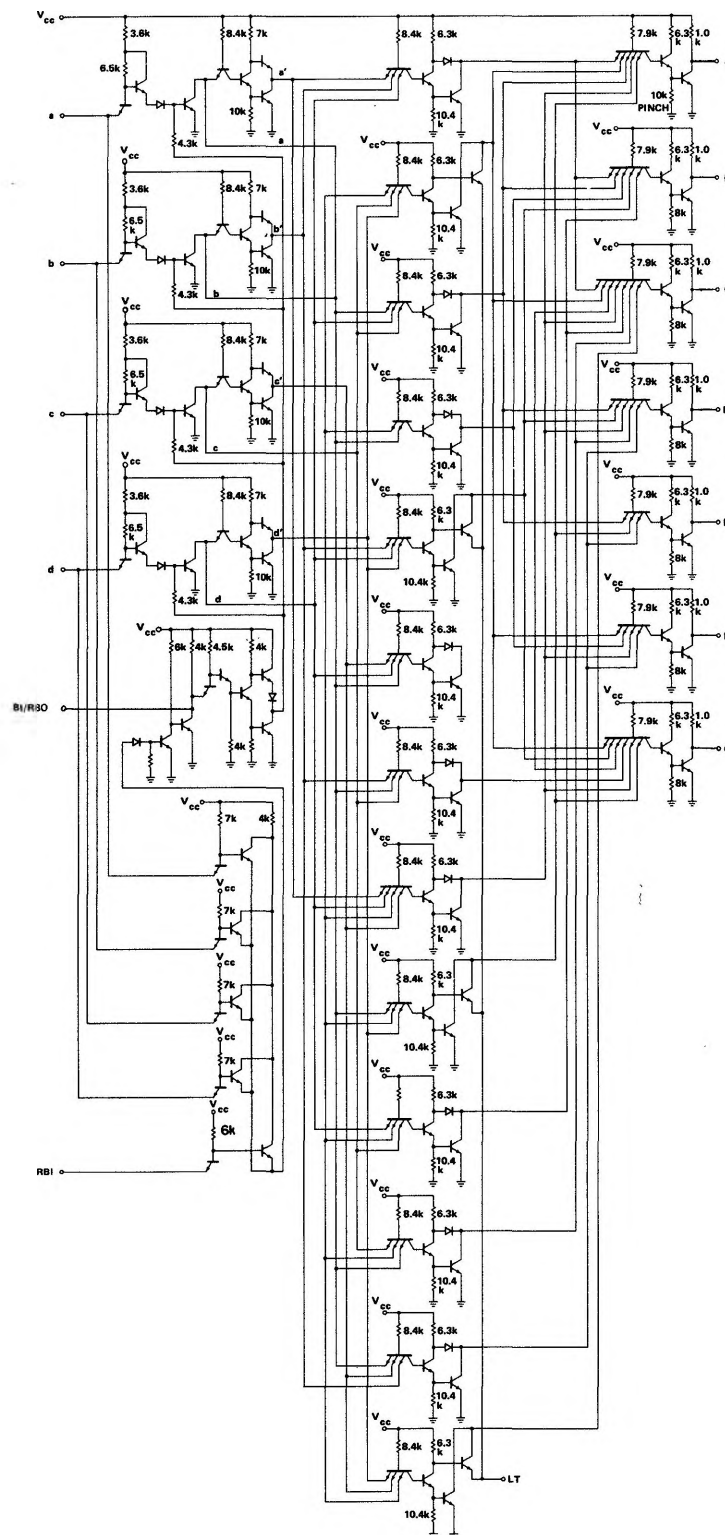
**TYPICAL CURRENT SINK
CAPABILITY VERSUS $V_{CE}(SAT)$
(OUTPUTS A-G)**



**TYPICAL OUTPUT CURRENT
VERSUS OUTPUT VOLTAGE
(OUTPUTS A-G)**



SCHEMATIC DIAGRAM



TRUTH TABLE

INPUTS						BI/RBO	OUTPUTS								
INPUT CODE				LAMP TEST	RBI		OUTPUT STATE								DISPLAY CHARACTER
d	c	b	a	LT			Note	A	B	C	D	E	F	G	
X	X	X	X	0	X	X	1	1	1	1	1	1	1	1	0
X	X	X	X	1	X	0	0	0	0	0	0	0	0	0	BLK
0	0	0	0	1	0	(Note 1 & 2) 0	0	0	0	0	0	0	0	0	BLK
0	0	0	0	1	1	(Note 2) 1	1	1	1	1	1	1	0	0	0
0	0	0	1	1	X	1	0	1	1	0	0	0	0	0	1
0	0	1	0	1	X	1	1	1	0	1	1	0	1	2	2
0	0	1	1	1	X	1	1	1	1	1	0	0	1	3	3
0	1	0	0	1	X	1	0	1	1	0	0	1	1	4	4
0	1	0	1	1	X	1	1	0	1	1	0	1	1	5	5
0	1	1	0	1	X	1	0	0	1	1	1	1	1	6	6
0	1	1	1	1	X	1	1	1	1	0	0	0	0	7	7
1	0	0	0	1	X	1	1	1	1	1	1	1	1	8	8
1	0	0	1	1	X	1	1	1	1	1	0	0	1	9	9
1	0	1	0	1	X	1	0	0	0	0	0	0	1	-	-
1	0	1	1	1	X	1	0	0	0	0	0	0	0	BLK	BLK
1	1	0	0	1	X	1	1	1	1	0	1	1	1	A	A
1	1	0	1	1	X	1	0	0	1	0	0	0	0	1.	1.
1	1	1	0	1	X	1	0	0	0	1	1	1	0	L	L
1	1	1	1	1	X	1	0	0	0	0	0	0	0	BLK	BLK

*COMMA

X = Don't care, either "1" or "0".

BI/RBO is an internally wired OR output.

NOTE:

1. BI/RBO used as input.
2. BI/RBO should not be forced high when a, b, c, d, RBI terminals are low, or damage may occur to the unit.

