DESCRIPTION

The DM8880 is a High Voltage Seven-Segment Decoder/Driver designed to decode BCD and drive gas filled seven-segment display tubes.

Decoding is performed by a 16x7 read only memory. Thus, for applications desiring other fonts, or applications not using standard BCD inputs, the ROM contents can be altered via metal mask change to produce any seven-segment combination for any 16 binary input combinations.

The output of the ROM is used to drive high voltage constant current sink generators. The current sinks will withstand 80V output min. The current sinks are ratioed to the B output current as required for even illumination of the segments. Output currents may be varied over a 0.2 to 1.5 mA range through use of the external current programming input.

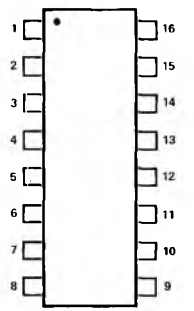
Blanking input provides unconditional blanking of any output display, while the ripple blanking pins allow simple leading or trailing zero blanking.

FEATURES

- CURRENT SOURCE OUTPUTS
- ADJUSTABLE OUTPUT CURRENT – 0.2 TO 1.5 mA
- HIGH OUTPUT BREAKDOWN VOLTAGE – 110V TYP
- SUITABLE FOR MULTIPLEX OPERATION
- BLANKING AND RIPPLE BLANKING PROVISIONS
- LOW FAN-IN AND LOW POWER

PIN CONFIGURATION

B PACKAGE

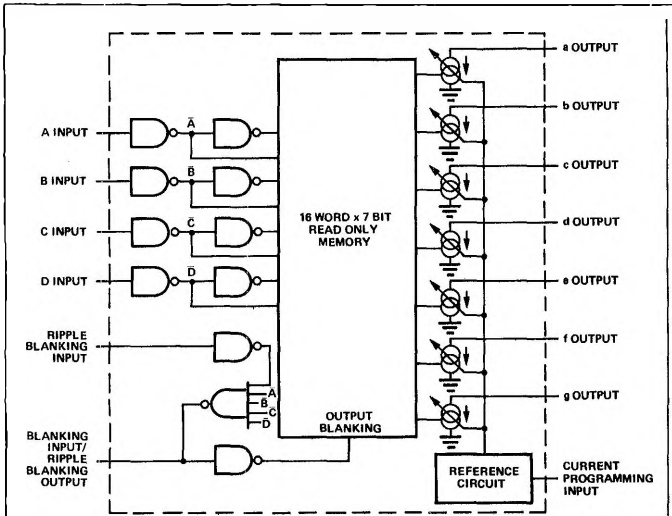


1. B Input
2. C Input
3. Program
4. BI/RBO
5. RBI
6. D Input
7. A Input
8. GND

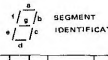
16. V_{CC}
15. f Output
14. g Output
13. a Output
12. b Output
11. c Output
10. d Output
9. e Output

ORDER PART
DM8880N-16

LOGIC AND CONNECTION DIAGRAMS



TRUTH TABLE



DECIMAL OR FUNCTION	RBI	D	C	B	A	BI/RBO	a	b	c	d	e	f	g	DISPLAY
0	1	0	0	0	0	1	0	0	0	0	0	0	1	
1	X	0	0	0	1	1	1	0	0	1	1	1	1	
2	X	0	0	1	0	1	0	0	1	0	0	1	0	
3	X	0	0	1	1	1	0	0	0	0	1	1	0	
4	X	0	1	0	0	1	1	0	0	1	1	0	0	
5	X	0	1	0	1	1	0	1	0	0	1	0	0	
6	X	0	1	1	0	1	0	1	0	0	0	0	0	
7	X	0	1	1	1	1	0	0	0	1	1	1	1	
8	X	1	0	0	0	1	0	0	0	0	0	0	0	
9	X	1	0	0	1	1	0	0	0	0	1	0	0	
10	X	1	0	1	0	1	0	0	1	0	0	0	0	
11	X	1	0	1	1	1	1	1	0	0	0	0	0	
12	X	1	1	0	0	1	0	1	1	1	0	0	0	
13	X	1	1	0	1	1	1	0	1	0	0	1	0	
14	X	1	1	1	0	1	0	1	1	1	0	0	0	
15	X	1	1	1	1	1	0	1	1	1	0	1	0	
BI	X	X	X	X	X	0	1	1	1	1	1	1	1	
RBI	0	0	0	0	0	0	1	1	1	1	1	1	1	

ABSOLUTE MAXIMUM RATINGS

V_{CC}	7V	Power Dissipation (Note 1)	600mW
Input Voltage (Except B1)	6V	Operating Temperature Range	0°C to 70°C
Input Voltage (B1)	V_{CC}	Storage Temperature Range	-65°C to 150°C
Segment Output Voltage	80V	Lead Temperature (Soldering, 10 sec)	300°C

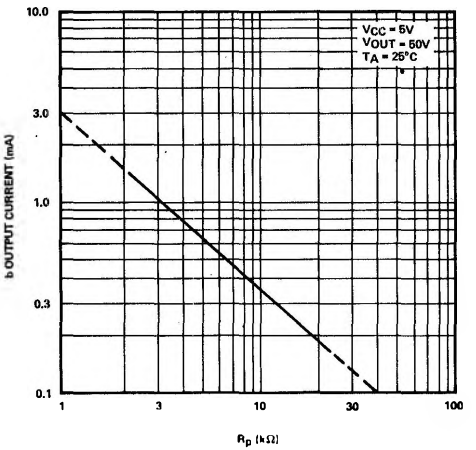
ELECTRICAL CHARACTERISTICS (Note 1)

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
Logic "1" Input Voltage	V_{CC} = 4.75V	2.0			V
Logic "0" Input Voltage	V_{CC} = 4.75V			0.8	V
Logic "1" Output Voltage (RBO)	V_{CC} = 4.75V, I_{OUT} = -200μA	2.4	3.7		V
Logic "0" Output Voltage (RBO)	V_{CC} = 4.75V, I_{OUT} = 8mA		0.13	0.4	V
Logic "1" Input Current (Except B1)	V_{CC} = 5.25V, V_{IN} = 2.4V		2	15	μA
	V_{CC} = 5.25V, V_{IN} = 5.5V		4	400	μA
Logic "0" Input Current (Except B1)	V_{CC} = 5.25V, V_{IN} = 0.4V		-300	-600	μA
Logic "0" Input Current (B1)	V_{CC} = 5.25V, V_{IN} = 0.4V		-1.2	-2.0	mA
Power Supply Current	V_{CC} = 5.25V, All Inputs = 0V, R_P = 2.2k		27	43	mA
Input Diode Clamp Voltage	V_{CC} = 5V, I_{IN} = -12mA, T_A = 25°C		-0.9	-1.5	V
Segment Outputs:					
Outputs a, f, g On Current Ratio	All Outputs = 50V, Output b Curr. = Ref.	0.88	0.93	0.98	
Output c On Current Ratio	All Outputs = 50 V, Output b Curr. = Ref.	1.19	1.25	1.31	
Output d On Current Ratio	All Outputs = 50V, Output b Curr. = Ref.	0.95	1.00	1.05	
Output e On Current Ratio	All Outputs = 50V, Output b Curr. = Ref.	1.04	1.10	1.16	
Output b On Current	V_{CC} = 5V, V_{OUT} b = 50V, T_A = 25°C, R_P = 18.1k	0.18	0.20	0.22	mA
	V_{CC} = 5V, V_{OUT} b = 50V, T_A = 25°C, R_P = 7.03k	0.45	0.50	0.55	mA
	V_{CC} = 5V, V_{OUT} b = 50V, T_A = 25°C, R_P = 3.40k	0.90	1.00	1.10	mA
	V_{CC} = 5V, V_{OUT} b = 50V, T_A = 25°C, R_P = 2.20k	1.45	1.50	1.65	mA
Output Saturation Voltage	V_{CC} = 4.75V, I_{OUT} = 2mA, R_P = 1k ±5%		0.8	2.5	V
Output Leakage Current	V_{OUT} = 75V, BI = 0V		.003	3	μA
Output Breakdown Voltage	I_{OUT} = 250μA, BI = 0V	80	110		V
Propagation Delays:					
BCD Input to Segment Output	V_{CC} = 5V, T_A = 25°C		0.4	10	μs
BI to Segment Output	V_{CC} = 5V, T_A = 25°C		0.4	10	μs
RBI to Segment Output	V_{CC} = 5V, T_A = 25°C		0.7	10	μs
RBI to RBO	V_{CC} = 5V, T_A = 25°C		0.4	10	μs

Note 1: Min/max limits apply across the guaranteed operating temperature range of 0°C to 70°C unless otherwise specified. Typicals are for V_{CC} = 5V, T_A = 25°C. Positive current is defined as current into the referenced pin.

TYPICAL APPLICATION

OUTPUT CURRENT PROGRAMMING



ON CURRENTS vs. TEMPERATURE