DM8884A high voltage cathode decoder/driver (for driving Panaplex II™ and Sperry displays)

general description

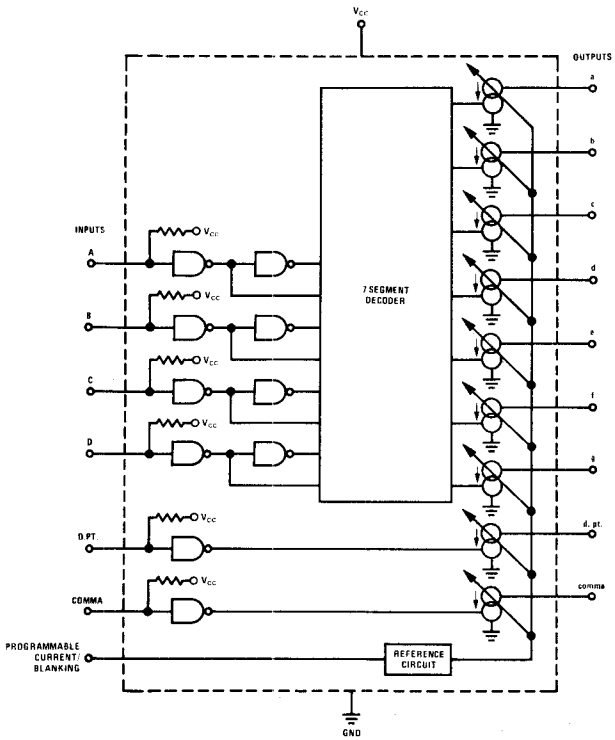
The DM8884A is designed to decode four lines of BCD input and drive seven-segment digits of gas-filled readout displays. Two separate inputs are provided for driving the decimal point and comma cathodes.

All outputs consist of switchable and programmable current sinks which provide constant current to the tube cathodes, even with high tube anode supply tolerance. Output currents may be varied over the 0.2 to 1.2 mA range for multiplex operation. The output current is adjusted by connecting an external program resistor (R_P) from V_{CC} to the program input in accordance with the programming curve.

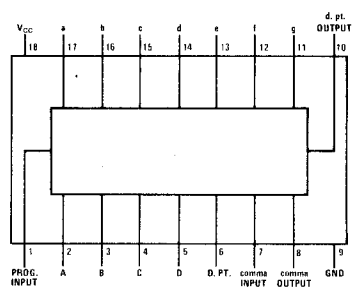
features

- Usable with AC or DC input coupling
- Current sink outputs
- High output breakdown voltage
- Low input load current
- Intended for multiplex operation.
- Input pullups increase noise immunity

logic and connection diagrams



Dual-In-Line Package



TOP VIEW

Order Number DM8884AN
See Package 25

absolute maximum ratings

V_{CC}	7V
Input Voltage (Note 1)	V_{CC}
Segment Output Voltage	80V
Power Dissipation (Note 2)	600 mW
Transient Segment Output Current (Note 3)	50 mA
Operating Temperature Range	0°C to +70°C
Storage Temperature Range	−65°C to +150°C

electrical characteristics ($0°C \leq T_A \leq 70°C$ – Unless otherwise noted), $V_{CC} = 5V \pm 5\%$.

PARAMETER	CONDITIONS	MIN	MAX	UNITS
Logic "1" Input Voltage	V_{CC} = 4.75V	2.0		V
Logic "0" Input Voltage	V_{CC} = 4.75V		1.0	V
Logic "1" Input Current	V_{CC} = 5.25V, V_{IN} = 2.4V		15	μA
Positive Input Clamp Voltage	V_{CC} = 4.75, I_{IN} = 1 mA	5.0		V
Logic "0" Input Current	V_{CC} = 5.25V, V_{IN} = 0.4V		−250	μA
Power Supply Current	V_{CC} = 5.25V, R_P = 2.8k, All Inputs = 5V		40	mA
Negative Input Clamp Voltage	V_{CC} = 5V, I_{IN} = −12 mA, T_A = 25°C		−1.5	V
Segment Outputs:				
All Outputs ON Current Ratio	All Outputs = 50V, Output b Current = Ref.	0.9	1.1	
Output b ON Current	V_{CC} = 5V, V_{OUT} b = 50V,			
	T_A = 25°C, R_P = 18.1k	0.18	0.22	mA
	R_P = 7.03k	0.45	0.55	mA
	R_P = 3.40k	0.90	1.10	mA
	R_P = 2.80k	1.08	1.32	mA
Output Leakage Current	V_{OUT} = 75V		5	μA
Output Breakdown Voltage	I_{OUT} = 250 μA	80		V
Propagation Delay:				
Any Input to Segment Output	V_{CC} = 5V, T_A = 25°C		10	μs

Note 1: This limit can be higher for a current limiting voltage source.

Note 2: The maximum junction temperature is 140°C. For operation at elevated temperatures, the device must be derated based on a thermal resistance of 140°C/W θ_{JA}.

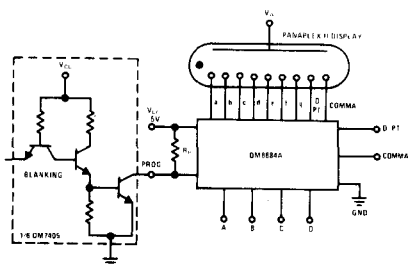
Note 3: In all applications transient segment output current must be limited to 50 mA. This may be accomplished in DC applications by connecting a 2.2k resistor from the anode-supply filter capacitor to the display anode, or by current limiting the anode driver in multiplex applications.

truth table

FUNCTION	D PT	COMMA	D	C	B	A	a	b	c	d	e	f	g	DISPLAY
0	1	1	0	0	0	0	0	0	0	0	0	0	1	
1	1	1	0	0	0	1	1	0	0	1	1	1	1	
2	1	1	0	0	1	0	0	0	1	0	0	1	0	
3	1	1	0	0	1	1	0	0	0	0	1	1	0	
4	1	1	0	1	0	0	1	0	0	1	1	0	0	
5	1	1	0	1	0	1	0	1	0	0	1	0	0	
6	1	1	0	1	1	0	0	1	0	0	0	0	0	
7	1	1	0	1	1	1	0	0	0	1	1	1	1	
8	1	1	1	0	0	0	0	0	0	0	0	0	0	
9	1	1	1	0	0	1	0	0	0	0	1	0	0	
10	1	1	1	0	1	0	1	1	0	0	0	1	0	
11	1	1	1	0	1	1	1	1	0	0	1	1	0	
12	1	1	1	1	0	0	0	0	1	1	1	0	0	
13	1	1	1	1	0	1	0	1	1	0	0	0	0	
14	1	1	1	1	1	0	1	1	1	1	1	1	0	
15	1	1	1	1	1	1	1	1	1	1	1	1	1	
*D PT	0	1	X	X	X	X	X	X	X	X	X	X	X	•
*Comma	0	0	X	X	X	X	X	X	X	X	X	X	X	,

*Decimal point and comma can be displayed with or without any numeral.

typical application



typical performance characteristics (see DM7880 data sheet)