

VACUUM FLUORESCENT DISPLAY DRIVER

SA/NE594

DESCRIPTION

The SA/NE594 is a display driver interface for vacuum fluorescent displays. The device is comprised of 8 drivers and a bias network and is capable of driving the digits and/or segments of most vacuum fluorescent displays.

The inputs are designed to be compatible with TTL, DTL, NMOS, PMOS or CMOS output circuitry.

There is an active pull-down circuit on each output so that display ghosting is minimized and no external components are required for most fluorescent display applications.

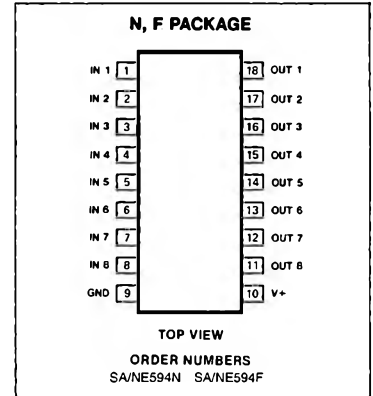
FEATURES

- Digit and/or segment drivers
- Active output pull-down circuitry
- High output breakdown voltage
- Low supply voltage
- Input compatible with all logic outputs

APPLICATIONS

- Digital clocks
- Dashboard displays
- Panel displays

PIN CONFIGURATION



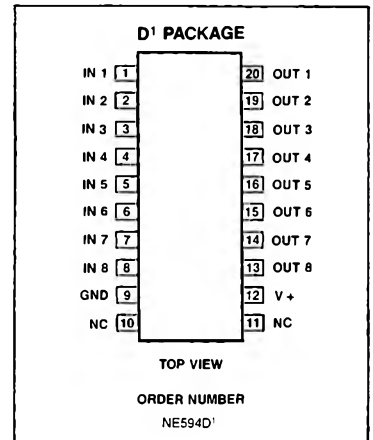
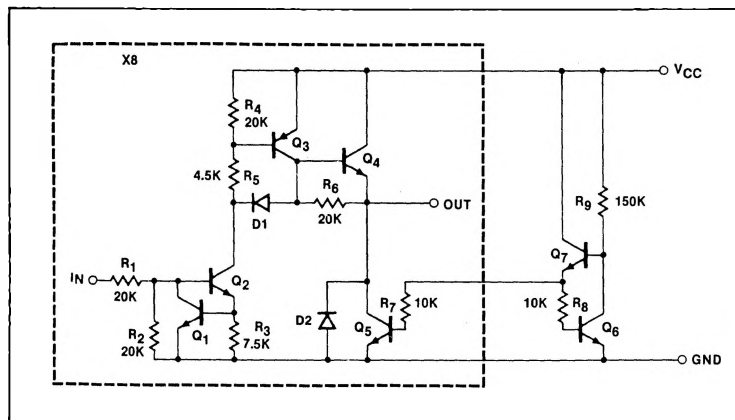
ABSOLUTE MAXIMUM RATINGS (at 25°C unless otherwise noted)

PARAMETER	RATING	UNIT
V _{CC}	Supply voltage	45
V _{OUT}	Output voltage	V _{CC}
V _{IN}	Input voltage	-0.3, +20
I _{OUT}	Output current	
	Each output	50
	All outputs	200
P _d	Power dissipation*	800
	(at 25°C)	
T _A	Operating temperature range	
	NE	0 to 70
	SA	-40 to +85
T _{STG}	Storage temperature range	+65 to +150
T _J	Maximum junction temperature	-165
T _{SOLD}	Lead soldering temperature	300
	(10 seconds)	

NOTE

- *Derate N (Plastic) Package above 38°C at 7.14 mW/°C.
Derate F (Ceramic) Package above 75°C at 10.8 mW/°C.

EQUIVALENT SCHEMATIC



NOTES:

1. SOL - Released in Large SO package only.
2. SOL and non-standard pinout.
3. SO and non-standard pinouts.

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DC ELECTRICAL CHARACTERISTICS $V_{CC} = +4.75$ to $+40V$, T_A (NE) = 0 to $70^\circ C$, T_A (SA) = -40 to $+85^\circ C$ unless otherwise stated.

PARAMETER		TEST CONDITIONS		LIMITS			UNIT
				Min	Typ	Max	
V _{CC}	Supply voltage range			4.75	35	40	V
I _{CCH}	Supply current (all outputs high)	V _{CC} = 40V	V _{IN} = 3.5V		3	6	mA
I _{CCL}	Supply current (all outputs low)	V _{CC} = 40V	V _{IN} = 0.4V		0.4	1	mA
V _{IN}	Input voltage range			0		15	V
V _{IH}	Input voltage to ensure logic '1'			2.6			V
V _{IL}	Input voltage to ensure logic '0'					0.8	V
I _{IH}	Input current to ensure logic '1'			100			μA
I _{IL}	Input current to ensure logic '0'					10	μA
I _{IN}	Input current	V _{IN} = 2.6V			60	130	μA
		V _{IN} = 5.0V			180	330	μA
		V _{IN} = 15.0V			.68	1.3	mA
V _{OH}	Output high voltage	V _{IN} = 3.5V	T _A = 25°C	V _{CC} -1.5	V _{CC} -1.1		V
		I _{OUT} = -25mA	Over Temp.	V _{CC} -2	V _{CC} -1.3		V
		V _{OUT} with respect to V _{CC}					
V _{OH}	Output high, <i>no load</i> voltage	V _{IN} = 3.5V I _{OUT} = 0, T _A =25°C V _{OUT} with respect to V _{CC}		V _{CC} -1	V _{CC} -0.8		V
V _{OFF}	Output 'OFF' voltage level	V _{IN} = 0.8V I _{OUT} = 0			10	200	mV
I _{OH}	Available output current	V _{CC} = 35V V _{OUT} = 30V T _A = 25°C		-35			mA
I _{OUT}	Output pulldown current	V _{CC} = V _{OUT} = 35V Inputs open		100	200	400	μA
I _{CEX}	Output leakage current	T _A = 25°C V _{CC} = 40V,			-1 -1		μA
		V _{IN} = 0.4V V _{OUT} = 0V					

AC ELECTRICAL CHARACTERISTICS¹ $V_{CC} = 35V$, $T_A = 25^\circ C$

PARAMETER	TEST CONDITIONS	NE/SA594			UNIT
		Min	Typ	Max	
t_{pDLH}	Propagation delay - low to high output transition.	50% V_{IN} to 50% V_{OUT}	1	5	μS
t_{pDHL}	Propagation delay - high to low output transition.		3	10	μS
t_R	Output rise time	10% V_{OUT} to 90% V_{OUT} 90% V_{OUT} to 10% V_{OUT}	0.5	3	μS
t_F	Output fall time		1.5	5	μS

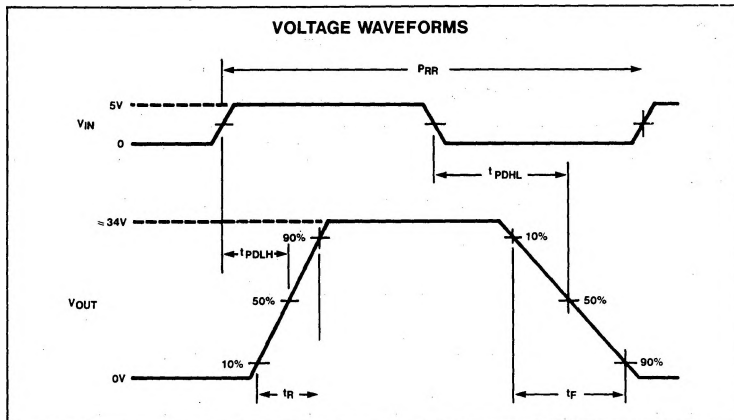
NOTE

1. See figure 1

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SWITCHING TIMES OF DRIVERS



TEST CIRCUIT

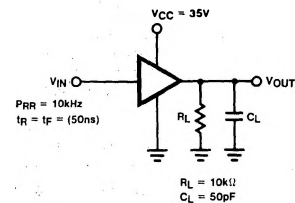
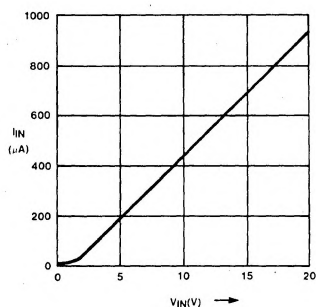
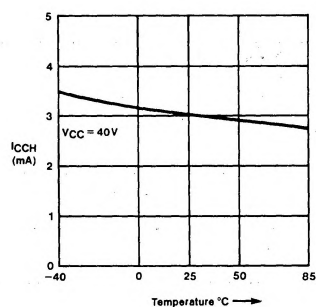
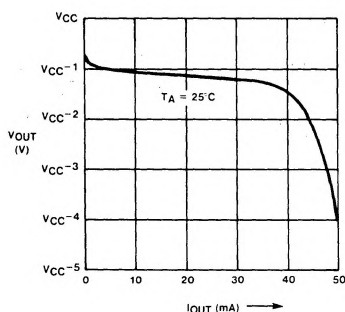
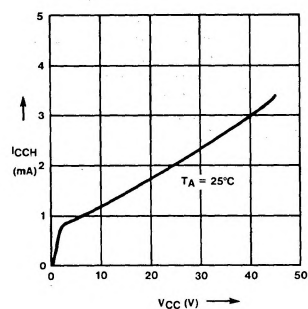
INCLUDES PROBE AND
FIXTURE CAPACITANCE

Figure 1

TYPICAL PERFORMANCE CHARACTERISTICS

 I_{IN} VS V_{IN}  I_{CCH} VS TEMPERATURE

OUTPUT VOLTAGE VS OUTPUT CURRENT

 I_{CC} VS V_{CC} (ALL INPUTS HIGH)

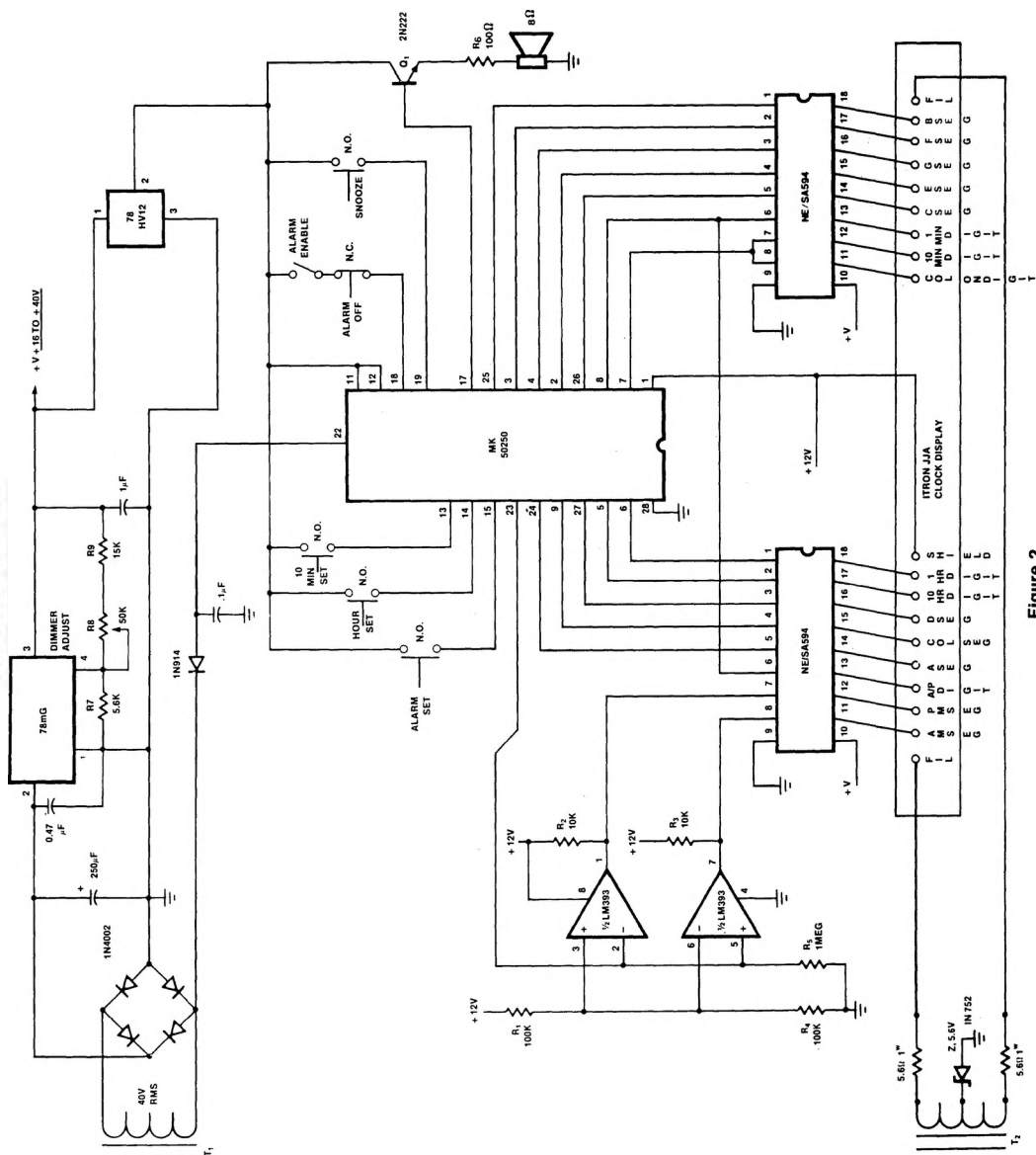


Figure 2