

NE/SA594 Vacuum Fluorescent Display Driver

Product Specification

Linear Products

DESCRIPTION

The NE/SA594 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

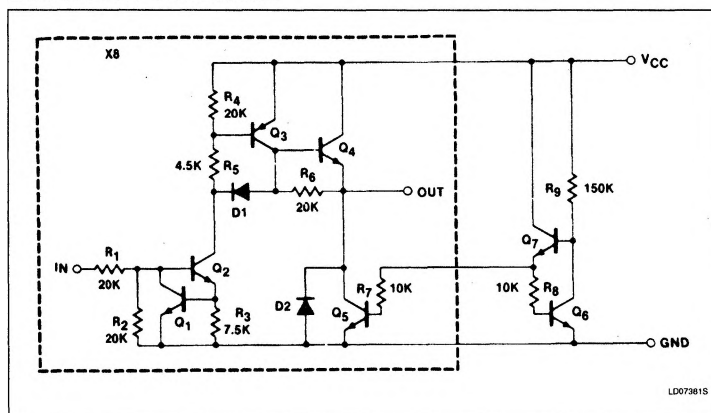
APPLICATIONS

- Digital clocks
- Dashboard displays
- Panel displays

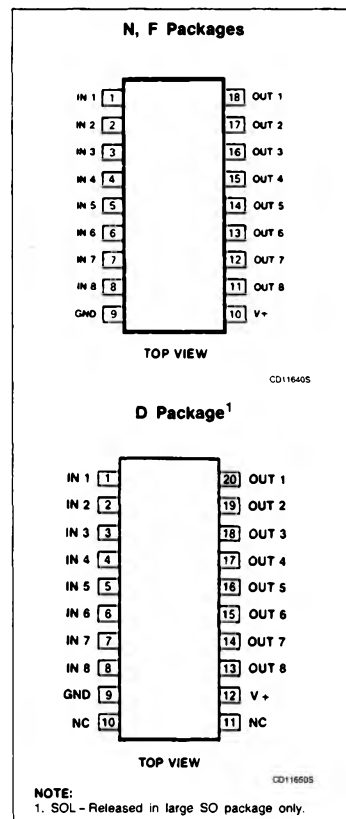
ORDERING INFORMATION

DESCRIPTION	TEMPERATURE RANGE	ORDER CODE
18-Pin Plastic DIP	0 to +70°C	NE594N
18-Pin Ceramic DIP	0 to +70°C	NE594F
20-Pin Plastic SO	0 to +70°C	NE594D
18-Pin Plastic DIP	-40°C to +85°C	SA594N
18-Pin Ceramic DIP	-40°C to +85°C	SA594F

EQUIVALENT SCHEMATIC



PIN CONFIGURATIONS



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

SYMBOL	PARAMETER	RATING	UNIT
V _{CC}	Supply voltage	45	V
V _{OUT}	Output voltage	V _{CC}	
V _{IN}	Input voltage	-0.3, +20	V
I _{OUT}	Output current	50	mA
	Each output All outputs	200	mA
P _D	Maximum power dissipation, T _A = 25°C (still-air) ¹		
	F package	1500	mW
	N package	1690	mW
	D package	1390	mW
T _A	Operating ambient temperature range		
	NE594 SA594	0 to 70 -40 to +85	°C °C
T _{STG}	Storage temperature range	+65 to +150	°C
T _J	Maximum junction temperature	-150	°C
T _{SOLD}	Lead soldering temperature (10sec max)	300	°C

NOTE:

1. Derate above 25°C, at the following rates:

F package at 12.0mW/°C

N package at 13.5mW/°C

D package at 11.1mW/°C

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

SYMBOL	PARAMETER	TEST CONDITIONS	LIMITS			UNIT
			Min	Typ	Max	
V_{CC}	Supply voltage range		4.75	35	40	V
I_{CCH} I_{CCL}	Supply current (all outputs high) Supply current (all outputs low)	$V_{CC} = 40V$, $V_{IN} = 3.5V$ $V_{CC} = 40V$, $V_{IN} = 0.4V$		3 0.4	6 1	mA mA
V_{IN} V_{IH} V_{IL}	Input voltage range Input voltage to ensure logic '1' Input voltage to ensure logic '0'		0 2.6		15 0.8	V V V
I_{IH} I_{IL} I_{IN}	Input current to ensure logic '1' Input current to ensure logic '0' Input current	$V_{IN} = 2.6V$ $V_{IN} = 5.0V$ $V_{IN} = 15.0V$	100	60 180 .68	10 130 330 1.3	μA μA μA mA
V_{OH}	Output high voltage	$V_{IN} = 3.5V$ $I_{OUT} = -25mA$ V_{OUT} with respect to V_{CC}	$T_A = 25^\circ C$ Over temp.	$V_{CC} - 1.5$ $V_{CC} - 2$	$V_{CC} - 1.1$ $V_{CC} - 1.3$	V V
V_{OH}	Output high, no load voltage	$V_{IN} = 3.5V$, $I_{OUT} = 0$, $T_A = 25^\circ C$, 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	$V_{CC} = 35V$, $V_{IN} = 3.5V$, $V_{OUT} = 30V$, $T_A = 25^\circ C$	-35			mA
I_{OUT}	Output pulldown current	$V_{CC} = V_{OUT} = 35V$, Inputs open	100	200	400	μA
I_{CEX}	Output leakage current	$T_A = 25^\circ C$, $V_{IN} = 0.4V$ $V_{CC} = 40V$, $V_{OUT} = 0V$		-1 -1		μA

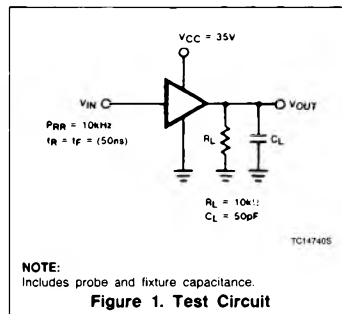
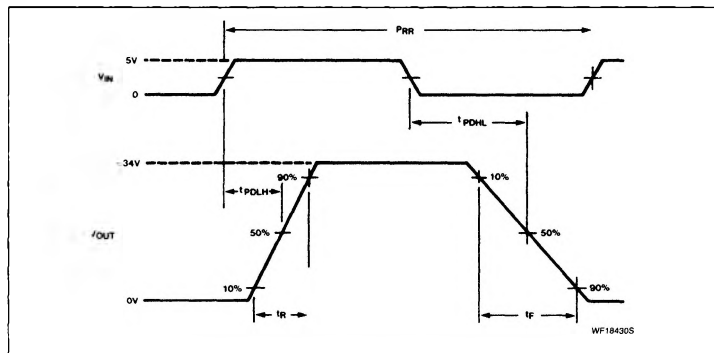
AC ELECTRICAL CHARACTERISTICS $V_{CC} = 35V$, $T_A = 25^\circ C$.

SYMBOL	PARAMETER	TEST CONDITIONS	LIMITS			UNIT
			Min	Typ	Max	
t_{PLH}	Propagation delay — low-to-high output transition	50% V_{IN} to 50% V_{OUT}		1	5	μs
t_{PHL}	Propagation delay — high-to-low output transition	50% V_{IN} to 50% V_{OUT}		3	10	μs
t_R t_F	Output rise time Output fall time	10% V_{OUT} to 90% V_{OUT} 90% V_{OUT} to 10% V_{OUT}		0.5 1.5	3 5	μs μs

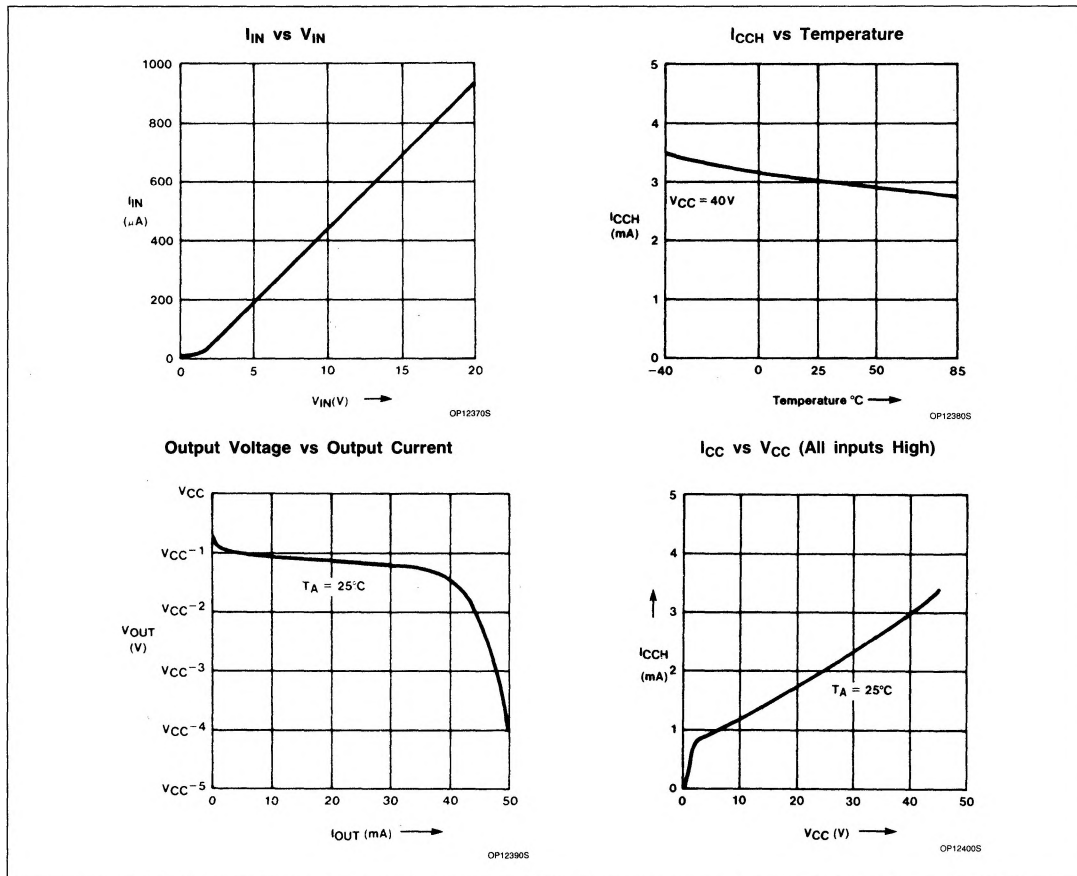
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SWITCHING TIMES OF DRIVERS



TYPICAL PERFORMANCE CHARACTERISTICS



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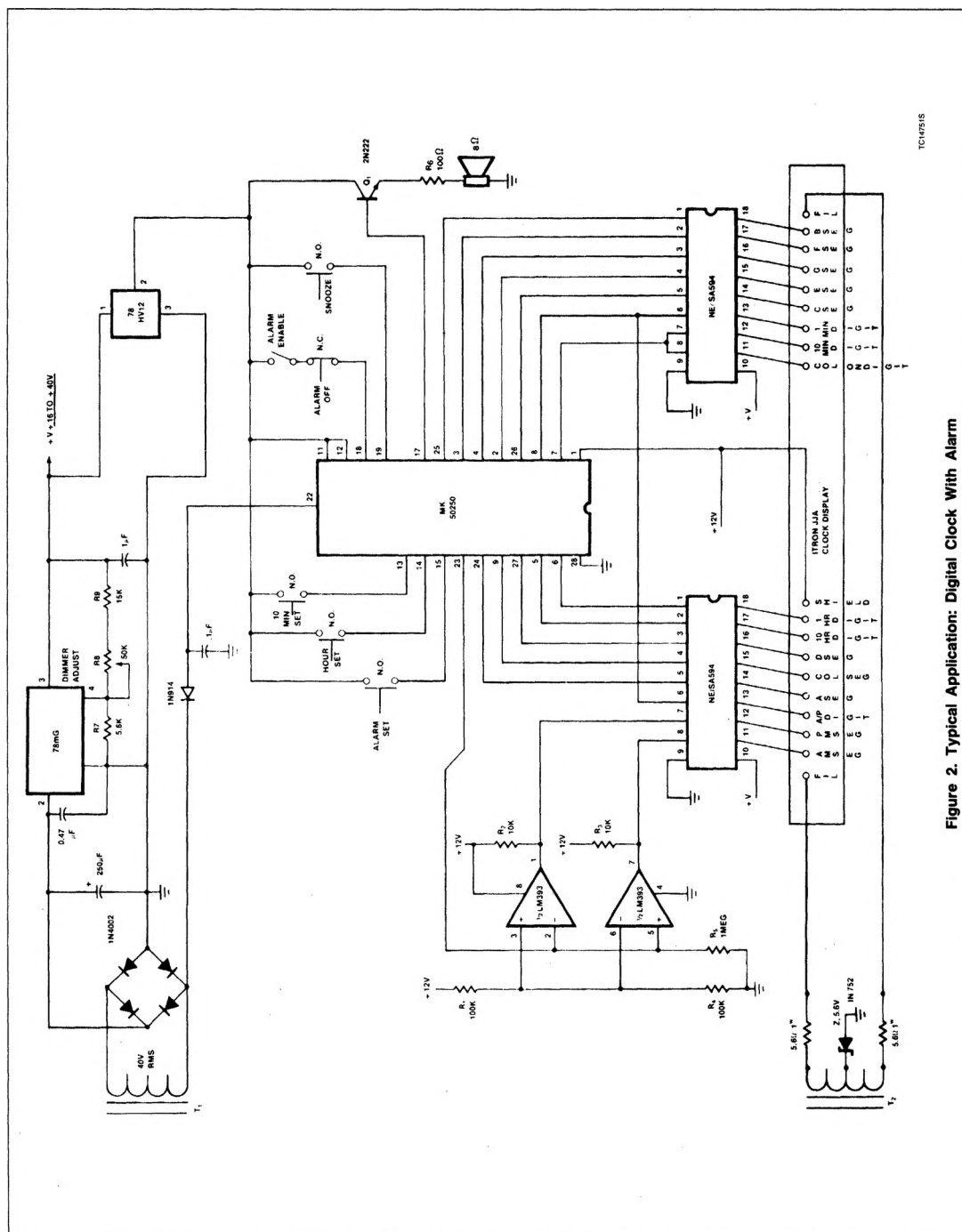


Figure 2. Typical Application: Digital Clock With Alarm