180V CRT Driver

calogic CORPORATION

CVA24150T

FEATURES

- Fall Time (C_{LOAD} = 10pf) 10ns
- RiseTime (C_{LOAD} = 10pf) 7ns
- Fall Time (C_{LOAD} = 20pf) 13ns
- RiseTime (C_{LOAD} = 20pf) 10ns
- Fall Time (C_{LOAD} = 30pf) 15ns
- RiseTime (C_{LOAD} = 30pf) 13ns
- Swing Voltage 100Vp-p
- Supply Voltage 180V

BENEFITS

- Low Power
- Smaller Package

APPLICATIONS

- High Definition Television
- Projection Television
- Arcades
- TV Monitors

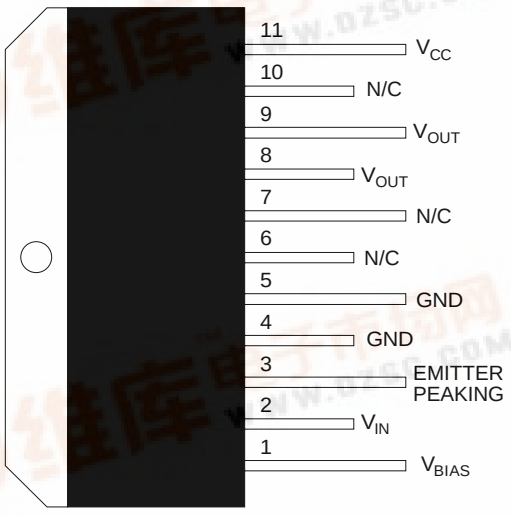
DESCRIPTION

The CVA24150T is a single channel, very high voltage amplifier, designed to drive a CRT. It is capable of delivering 65MHz at 100V_{P-P}. It features no cross-over distortion for excellent linearity. Emitter peaking option is available to adjust the high frequency response. CVA24150T features high gain to match existing pre-amplifier drive capability.

ORDERING INFORMATION

Part	Package	Temperature
CVA24150T	T11A	-20°C to +100°C

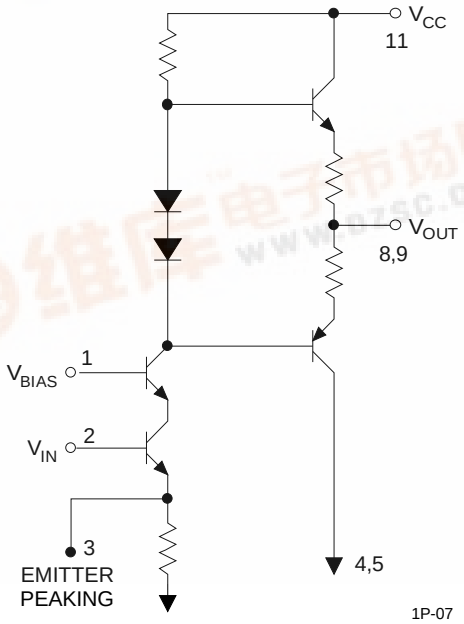
CONNECTION DIAGRAM



TOP VIEW
T11A PACKAGE

1P-06

SIMPLIFIED SCHEMATIC DIAGRAM



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ABSOLUTE MAXIMUM RATINGS

Supply Voltage 200V
Storage Temperature . . . . . -25°C to +100°C
Operating Temperature . . . . . -20°C to +100°C
Lead Temperature . . . . . +300°C

DC ELECTRICAL CHARACTERISTICS V_S = 180V, C_L = 10pF, $DC_{input\ bias}$ = 12V, V_{in} = 3.4V, V_{out} = 100_{p-p}, T_{case} = +25°C. See Figure 1.

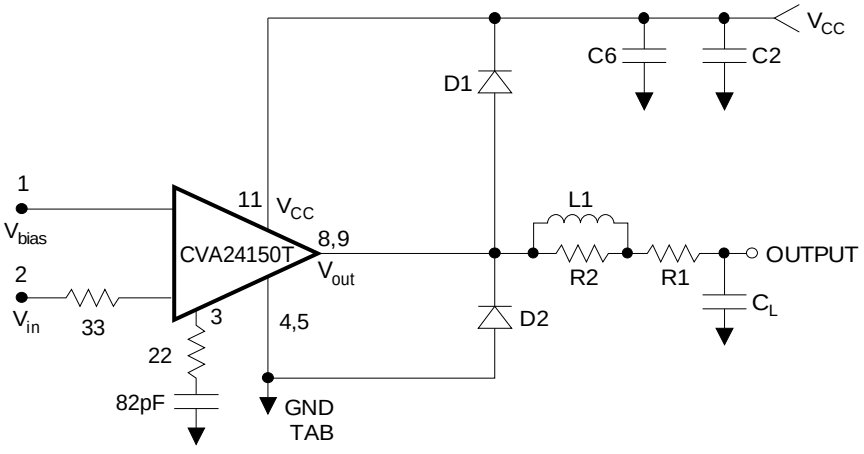
SYMBOL	CHARACTERISTICS	MIN	TYP	MAX	UNITS
I_{CC}	Supply Current @ 1MHz		35	40	mA
V_{outDC}	Output DC Level	65	70	75	V
A_V	Voltage Gain	24	26	28	V

AC ELECTRICAL CHARACTERISTICS V_S = 180V, C_L = 10pF, $DC_{input\ bias}$ = 12V, V_{in} = 3.4V, V_{out} = $100V_{p-p}$, T_{case} = +25°C. See Figure 1.

SYMBOL	CHARACTERISTICS	MIN	TYP	MAX	UNITS
t_r	Rise Time		10	12	ns
t_f	Fall Time		10	12	ns
BW	Bandwidth (Note 1)		70		MHz
Le	Linearity		2	5	%
OS	Overshoot		3	7	%

Note 1: -3dB at V_{P-P} = 100V

FIGURE 1. TEST CIRCUIT



C1 = 1.0µF
C2 = 1.0µF
C_L = 10pF (Including Parasitics)

R1 = 47Ω
R2 = 5.1KΩ

D1 = FDH400
D2 = FDH400
L1 = 560nH
Q1 = 2N5770

1Q-50

FIGURE 2. APPLICATION CIRCUIT

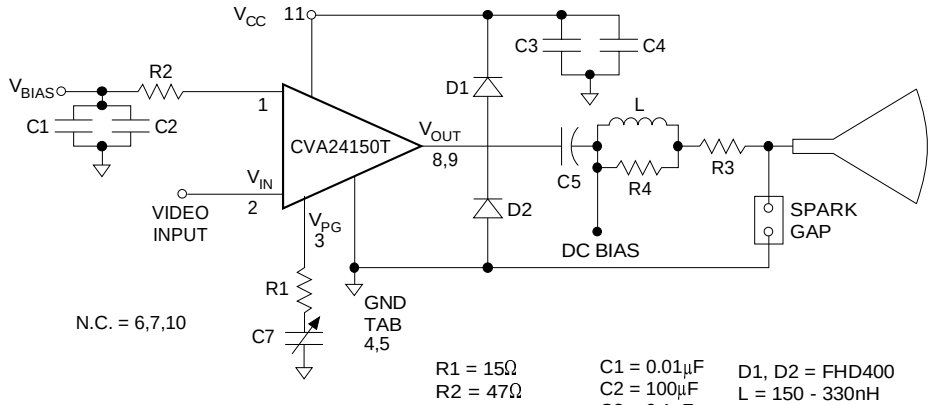
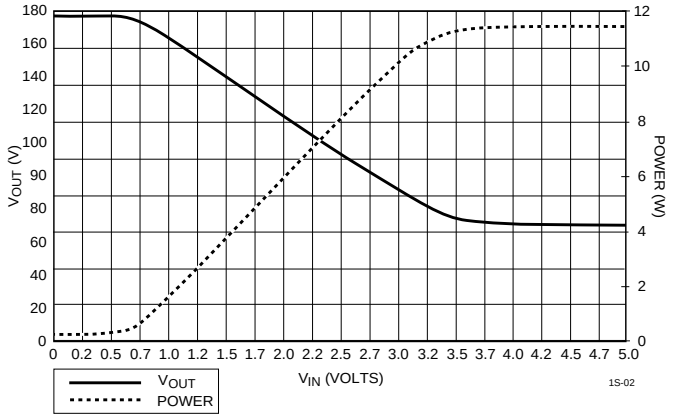


FIGURE 3. CVA24150T Transfer DC Characteristics



APPLICATION INFORMATION

The CVA24150T is a very high voltage amplifier. Using standard Cascode topology, it is designed primarily to meet the requirement of High Definition Television (HDTV), Projection Television, arcade displays, etc. CVA24150T can deliver $100V_{P-P}$ yet require only 180V supply voltage. CVA24150T frequency resplonse is excellent, can energize 20ns pixels at $100V_{P-P}$ into 10pf. At 40pf load, rise time is 18ns.

CVA24150T has very high gain (~34) to match any of the available pre-amplifiers. An emitter peaking option is also provided to adjust the high frequency response.

The product is housed in industry standard 11 lead TO-220 power package.

Thermal Considerations

The transfer characteristics of the amplifier are shown in *Figure 3.* Since this is a class A input stage, power supply current increases as the input signal increases and consequently power dissipation also increases.

The CVA24150T cannot be used without heat sinking. *Figure 3* shows the power dissipated in each channel over the operating voltage range of the device. Under white screen conditions, i.e.: 70V output, dissipation increases to 11W total. The CVA24150T case temperature must be maintained below $+100^oC$. If the maximum expected ambient temperature is $+50^oC$, then a heat sink is needed with thermal resistance equal to or less than:

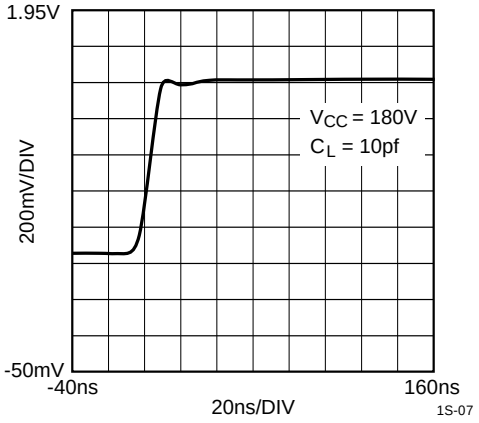
$$R_{th} = \frac{(100 - 50^oC)}{11W} = 4.5^oC/W$$

The CVA24150T maximum load is 600Ω to ground or V^+.

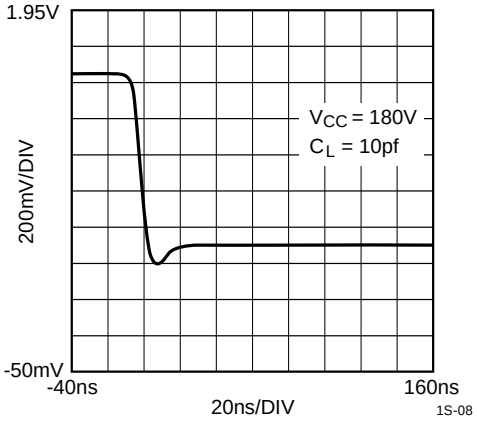
The output of CVA24150T is not short circuit proof. Any resistance to V^+ or Ground should be > 600Ω.

TYPICAL CHARACTERISTICS

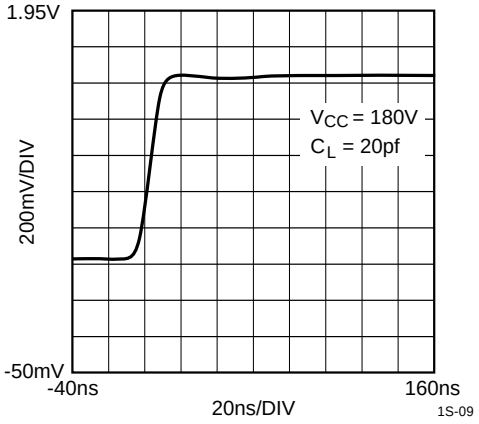
RISE TIME



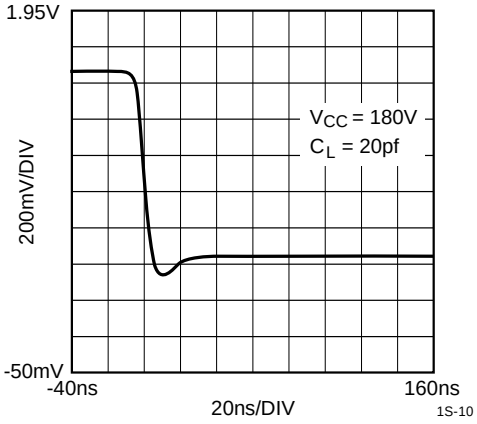
FALL TIME



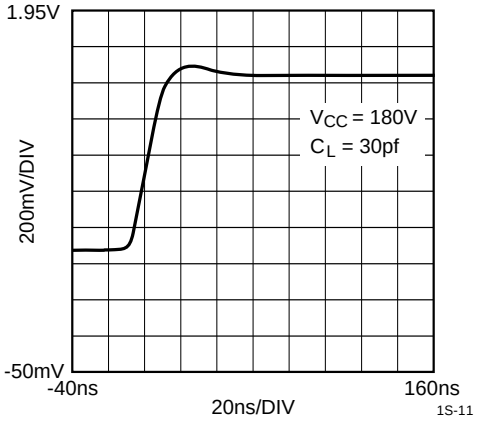
RISE TIME



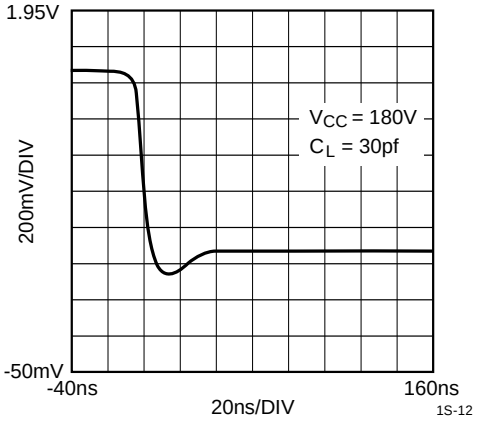
FALL TIME



RISE TIME

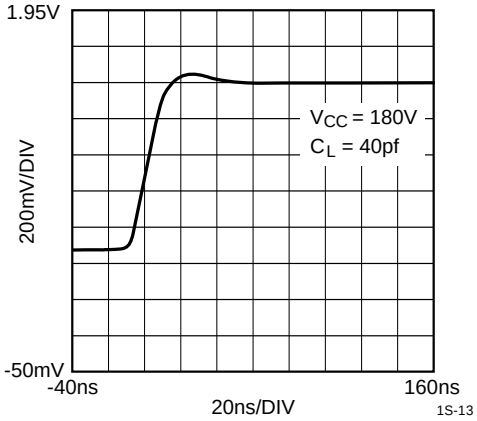


FALL TIME

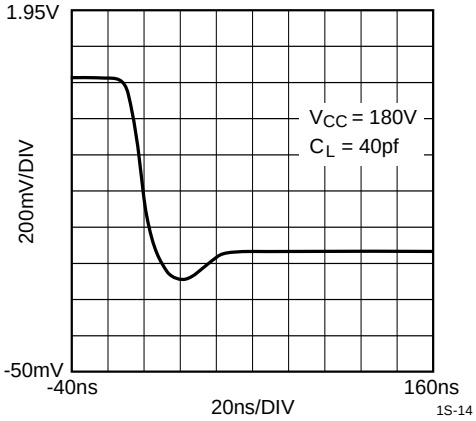


TYPICAL CHARACTERISTICS (continued)

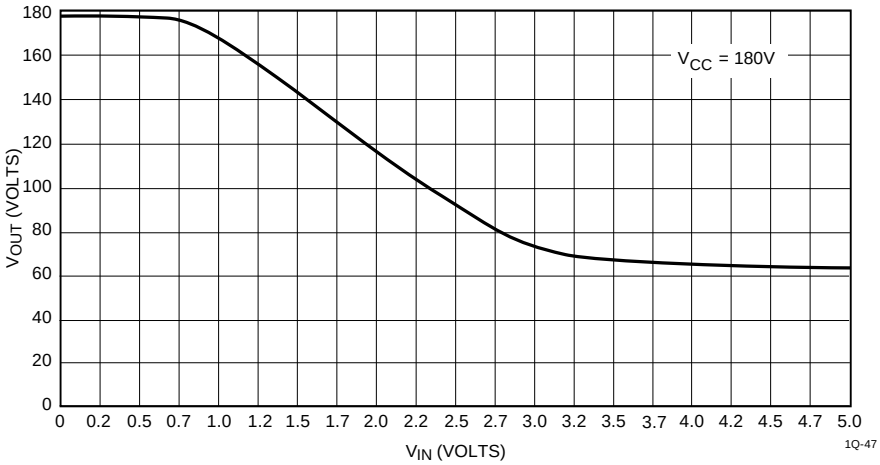
RISE TIME



FALL TIME



V_{OUT} vs V_{IN}



V_{OUT} vs FREQUENCY vs I_{CC}