Triple CRT Driver

Preliminary Product Information

CVA1405T

FEATURES

- **Rise/Fall Time (at the Cathode) 9.0ns**
- **Swing . . . . . 65V_{P-P}**
- **Supply Voltage 100V**
- **Pin to Pin Compatible to CVA2404T**

APPLICATIONS

- **CRT driver for up to 64kHz monitors with resolution up to 1024 x 768**

DESCRIPTION

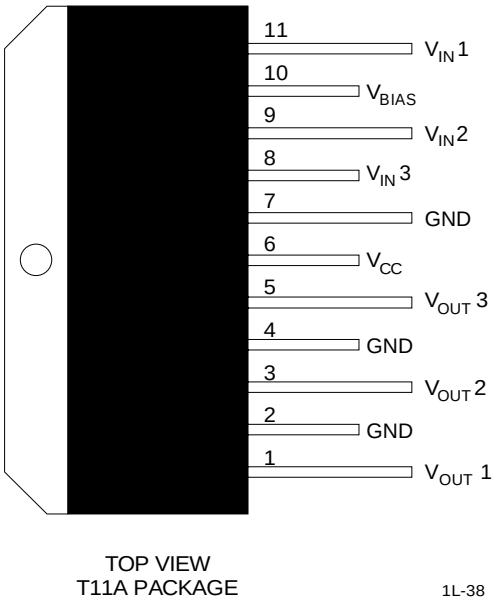
The CVA1405T contains three wideband amplifiers, designed specifically to drive a CRT. The device can drive monitors with resolutions up to 1024 x 768 (non-interlaced).

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

ORDERING INFORMATION

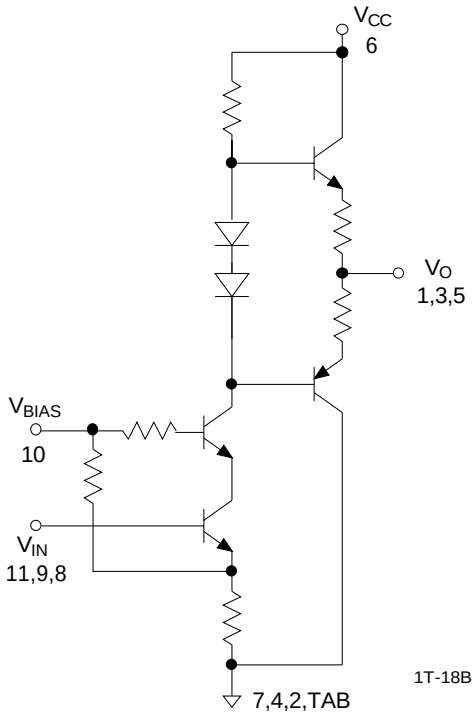
Part	Package	Temperature
CVA1405T	T11A	-20°C to +100°C

CONNECTION DIAGRAM



TOP VIEW
T11A PACKAGE

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1T-18B

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ABSOLUTE MAXIMUM RATINGS

Supply Voltage 100V
Storage Temperature . . . . . -25°C to +125°C
Operating Temperature . . . . . -20°C to +100°C
Lead Temperature . . . . . +300°C

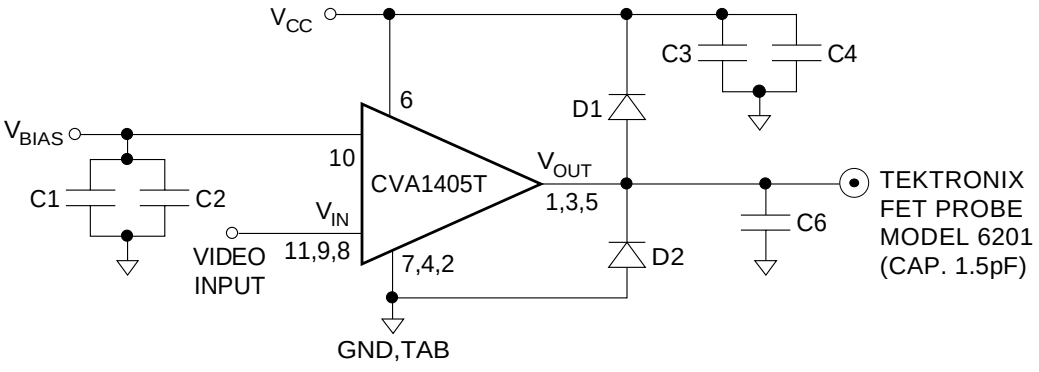
DC ELECTRICAL CHARACTERISTICS V_S = 80V, $DC_{INPUT\ BIAS}$ = 12V, V_{IN} = 2.5V, T_{CASE} = +25°C. See Figure 1.

SYMBOL	CHARACTERISTICS	MIN	TYP	MAX	UNITS
I_{cc}	Supply Current @ 1MHz		15	18	mA
$V_{OUT\ DC}$	Output DC Level	50	54	58	V
A_v	Voltage Gain	13	15	17	V
	Gain Matching		0.2		dB

AC ELECTRICAL CHARACTERISTICS (at the cathode) V_S = 80V, C_L = 8pF, $DC_{INPUT\ BIAS}$ = 12V, V_{IN} = 2.4V, V_{OUT} = $50V_{p-p}$. T_{CASE} = +25°C. See Figure 1.

SYMBOL	CHARACTERISTICS	MIN	TYP	MAX	UNITS
T_r	Rise Time		9	11	ns
T_f	Fall Time		9	11	ns
L_e	Linearity		5		%
OS	Overshoot/Undershoot		3		%

FIGURE 1. TEST CIRCUIT



C1 = 0.01µF
C2 = 100µF
C3 = 0.1µF
C4 = 100µF
C6 = 8pF
D1, D2 = FHD400

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FIGURE 2.

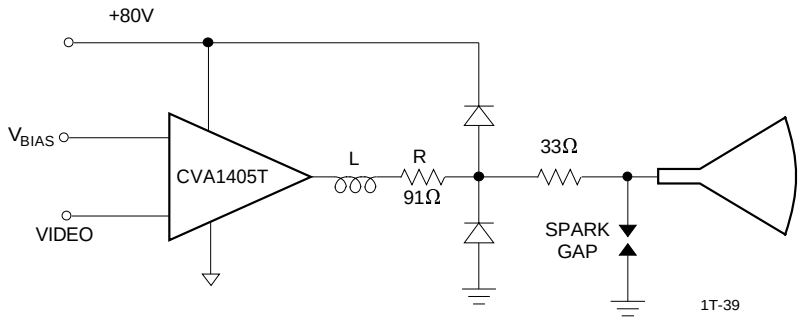
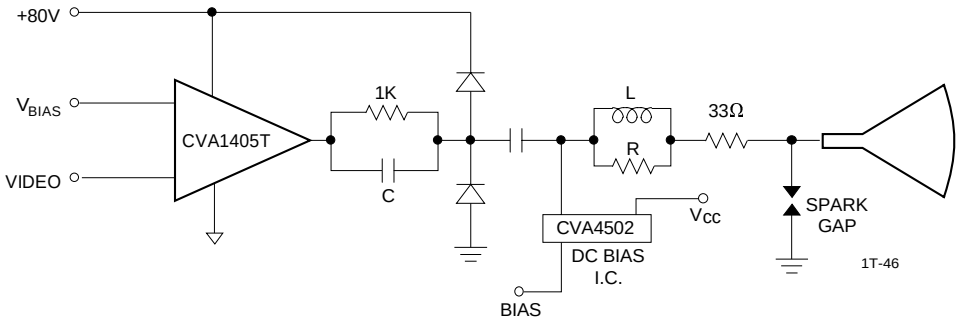


FIGURE 3.



APPLICATION INFORMATION

The CVA1405T is a high voltage triple CRT driver suitiable to drive 69kHz, 1024 x 768 CRT displays. It features a high impedance input to match any pre-amplifier. The CVA1405T has a true class AB output stage that results in excellent gray scale linearity and consistent EMI performance.

As with any high speed amplifier used in CRT display applications, specific precaution should be taken to get the required performance. Power supply should be by pass as close to the device pin as possible. Use 0.01µf very near to the device and a large capacitor of 10µf or more (preferable 100µf) near the device. A 0.1µf and 10µf should be connected near the V_{bias} pin (#10). Arc protection is very essential. Fast diodes together with the spark gap will achieve sufficient protection. However, in certain applications depends on the tubes a high value of resistor is required to reduce the current into the CVA1405T during arcing. This will result in less than desireable performance some of which can be restored by using a peaking inductor at the output pin, *Figure 2*. Another way to achieve this is by using a RC network at the output of the device and use a peaking inductor at the tube, *Figure 3*.

The rise and fall time of the CVA1405T may suffer due to stray capacitances associated with the PC Board and other components. It can be improved by carefully designing the PC Board where the output stage and input stage ground path are seperated. Calogic will assist customers in the layout of the PC Board that will result in quick EMI passage and better performance. The output peaking should be used only to restore the performance loss due to stray capacitances. Over peaking will cause excessive ringing that will have better results but poor EMI. The DC restore circuit is also important when considering the high frequency performance. Using CVA4502, DC Bias IC, better results can be obtained and high frequency performance can be maximixed.

THERMAL CONSIDERATIONS

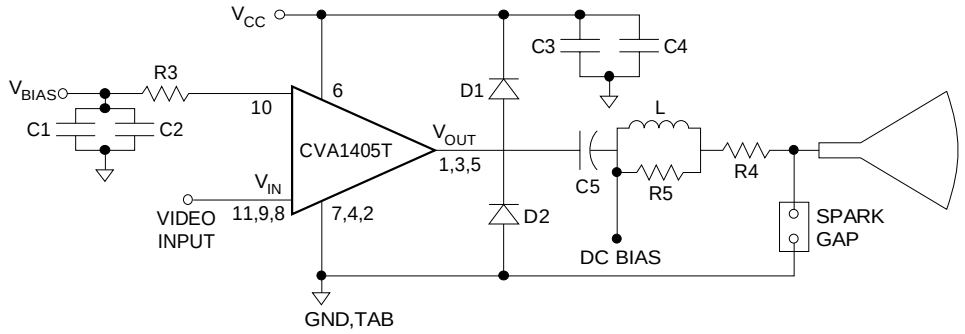
Power supply current increases as the input signal increases and consequently power dissipation also increases.

The CVA1405T cannot be used without heat sinking. The calculations below shows the power dissipated in each channel over the operating voltage range of the device. Under white screen conditions, i.e.: 25V output, dissipation increases to 8.1W total. The CVA1405T case temperature must be maintained below +100^{o}C. If the maximum expected ambient temperature is +50^{o}C, then a heat sink is needed with thermal resistance equal to or less than:

$$R_{th} = \frac{(100 - 50^{o}C)}{8.1W} = 6.2^{o}C/W$$

The output of CVA2405T is not short circuit proof.

FIGURE 4. APPLICATION CIRCUIT



R3 = 47Ω
R4 = 47(1/2W)Ω
R7 = 33Ω
R8 = 39Ω
R10 = 680Ω

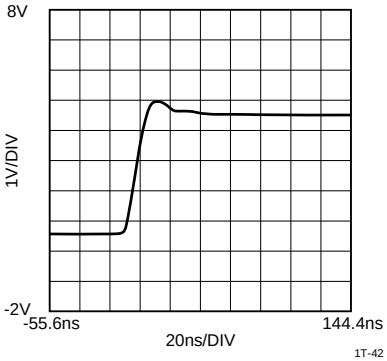
C1 = 0.01µF
C2 = 100µF
C3 = 0.1µF
C4 = 100µF
C5 = 2.2µF

D1, D2 = FHD400
L = 330 - 390nH

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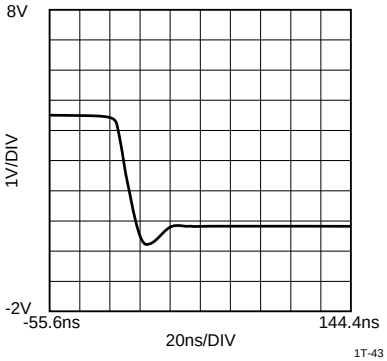
TYPICAL CHARACTERISTICS

RISE TIME



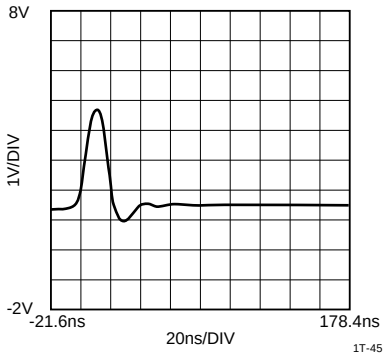
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FALL TIME



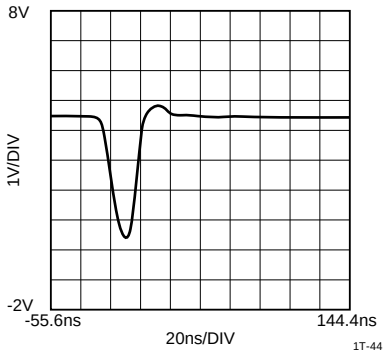
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CROSS HATCH WHITE BACKGROUND



1T-45

CROSS HATCH BLACK BACKGROUND



1T-44

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