calogic
CORPORATION

# Low Cost Triple CRT Driver

## CVA2422TL

### FEATURES

- **Bandwidth . . . . . 90MHz**
- **Rise/Fall Time. . . . . 5.0ns**
- **Swing . . . . . 70V$_{P-P}$**
- **Supply Voltage . . . . . 90V**

### APPLICATIONS

- **CRT driver for up to 82kHz monitors with resolution up to 1280 x 1024.**

### DESCRIPTION

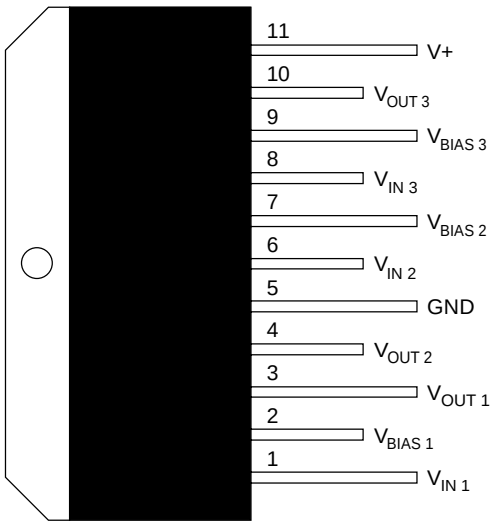
The CVA2422TL contains three cascode video driver amplifiers without a common emitter. This device is designed for ease of use, adjustable gain, controlled EMI, OSD, and external peaking.

The part is housed in the industry standard 11-lead TO-220 molded power package. The heat sink is floating and may be grounded for ease of manufacturing and RFI shielding.

### ORDERING INFORMATION

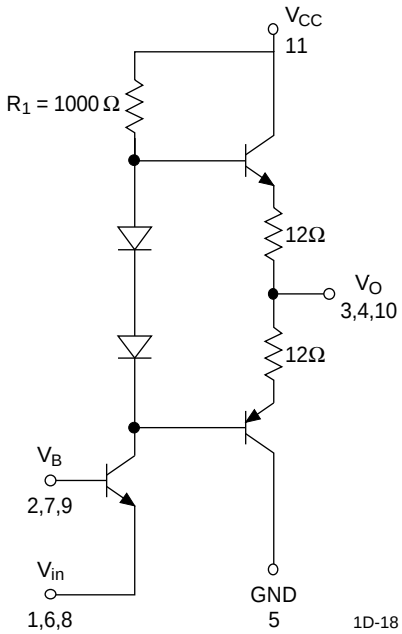
| Part | Package | Temperature |
|---|---|---|
| CVA2422TL | T11A | -20°C to +90°C |

### CONNECTION DIAGRAM




TOP VIEW
T11A PACKAGE

1C-46




1D-18

**CALOGIC CORPORATION**, 237 Whitney Place, Fremont, California 94539, Telephone: 510-656-2900, FAX: 510-651-3025

**ABSOLUTE MAXIMUM RATINGS**

Supply Voltage . . . . . 95V
Power Dissipation . . . . . 16W
Storage Temperature . . . . . -25°C to +100°C
Operating Temperature . . . . . -20°C to +90°C
Lead Temperature . . . . . +300°C

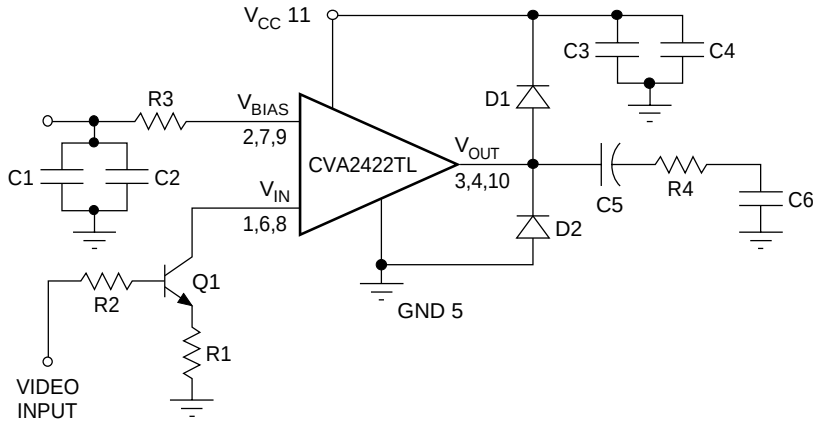
**DC ELECTRICAL CHARACTERISTICS** $V_S$ = 80V, $C_L$ = 8pF, $DC_{INPUT\ BIAS}$ = 12V, $V_{IN}$ = 3.4V, $V_{OUT}$ = 50$V_{p-p}$. $T_{CASE}$ = +25°C. See Figure 1.

| SYMBOL | CHARACTERISTICS | MIN | TYP | MAX | UNITS |
|---|---|---|---|---|---|
| $I_{cc}$ | Supply Current @ 1MHz | | 34 | 40 | mA |
| $I_{cc}$ | Supply Current @ 50MHz | | 58 | | mA |
| $V_{OUT\ DC}$ | Output DC Level | 40 | 45 | 50 | V |
| $A_v$ | Voltage Gain | 12 | 15 | 17 | V |
| | Gain Matching | | 0.2 | | dB |

**AC ELECTRICAL CHARACTERISTICS** $V_S$ = 80V, $C_L$ = 8pF, $DC_{INPUT\ BIAS}$ = 12V, $V_{IN}$ = 3.4V, $V_{OUT}$ = 50$V_{p-p}$. $T_{CASE}$ = +25°C. See Figure 1.

| SYMBOL | CHARACTERISTICS | MIN | TYP | MAX | UNITS |
|---|---|---|---|---|---|
| $T_r$ | Rise Time | | 5 | 6 | ns |
| $T_f$ | Fall Time | | 5 | 6 | ns |
| BW | Bandwidth | | 90 | | MHz |
| $L_e$ | Linearity | | 6 | | % |
| OS | Overshoot | | 6 | | % |

**FIGURE 1. TEST CIRCUIT**




C1 = 0.01 µF
C2 = 100 µF
C3 = 0.1 µF
C4 = 100 µF
C5 = 2.2 µF
C6 = 8pF (INCLUDING PARASITIC)
R1 = 62
R2 = 120
R3 = 180
R4 = 47
Q1 = 2N3904
D1, D2 = FHD400

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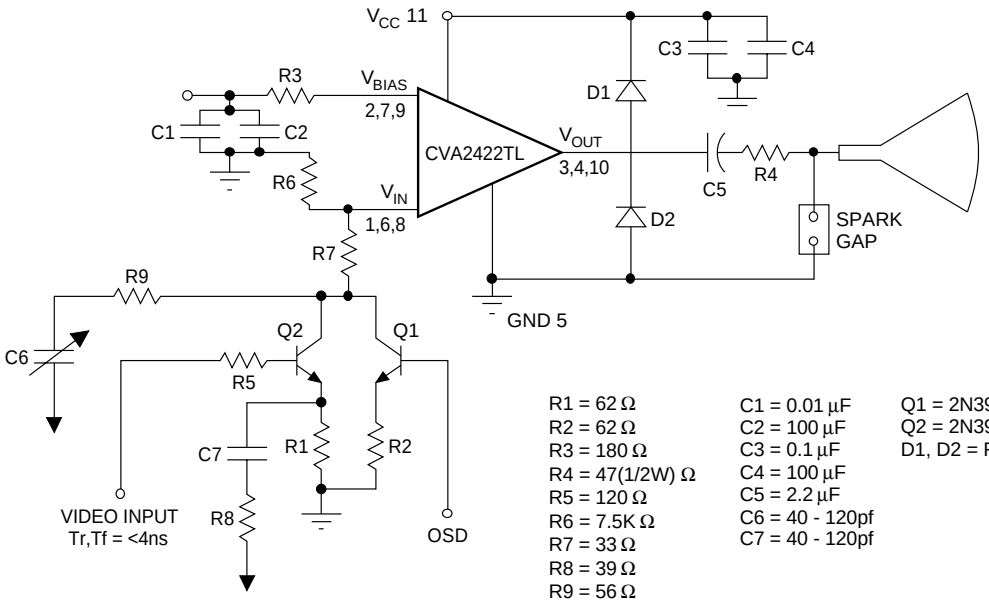
**FIGURE 2. APPLICATION CIRCUIT**




R1 = 62 Ω
R2 = 62 Ω
R3 = 180 Ω
R4 = 47(1/2W) Ω
R5 = 120 Ω
R6 = 7.5K Ω
R7 = 33 Ω
R8 = 39 Ω
R9 = 56 Ω

C1 = 0.01 µF
C2 = 100 µF
C3 = 0.1 µF
C4 = 100 µF
C5 = 2.2 µF
C6 = 40 - 120pf
C7 = 40 - 120pf

Q1 = 2N3904
Q2 = 2N3904
D1, D2 = FHD400

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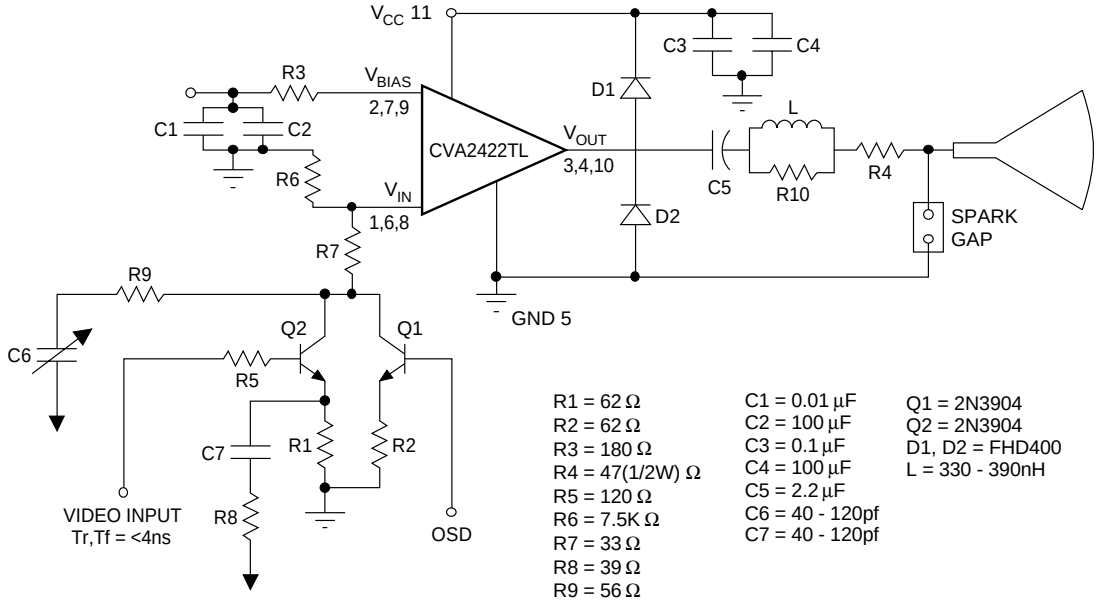
**FIGURE 3. APPLICATION CIRCUIT**




R1 = 62 Ω
R2 = 62 Ω
R3 = 180 Ω
R4 = 47(1/2W) Ω
R5 = 120 Ω
R6 = 7.5K Ω
R7 = 33 Ω
R8 = 39 Ω
R9 = 56 Ω
R10 = 680 Ω

C1 = 0.01 µF
C2 = 100 µF
C3 = 0.1 µF
C4 = 100 µF
C5 = 2.2 µF
C6 = 40 - 120pf
C7 = 40 - 120pf

Q1 = 2N3904
Q2 = 2N3904
D1, D2 = FHD400
L = 330 - 390nH

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## APPLICATION INFORMATION

The CVA2422TL is a high voltage triple CRT driver suitable for VGA, Super VGA, IBM® 8514, 1280 x 1024 and 1024 x 768 non-interlaced display applications. The CVA2422TL features 80V operation. The part is housed in the industry standard 11 lead TO-220 molded power package. The heat sink is floating and may be grounded for ease of manufacturing and RFI shielding.

### Thermal Considerations

The transfer characteristics of the amplifier are shown in *Figure 4.* Since this is a class A input stage, power supply current increases as the input signal increases and consequently power dissipation also increases.

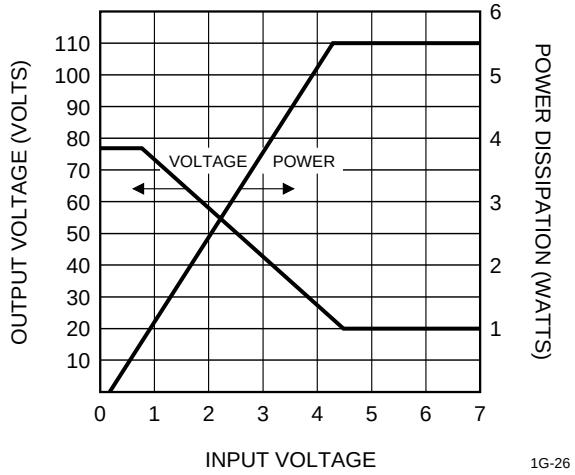
The CVA2422TL cannot be used without heat sinking. *Figure 2* shows the power dissipated in each channel over the operating voltage range of the device. Under white screen conditions, i.e.: 20V output, dissipation increases to 16W total. The CVA2422TL case temperature must be maintained below +90°C. If the maximum expected ambient temperature is +50°C, then a heat sink is needed with thermal resistance equal to or less than:

$$R_{th} = \frac{(90 - 50^{o}C)}{16W} = 2.5^{o}C/W$$

The CVA2422TL maximum load is 600Ω to ground or $V^+$.

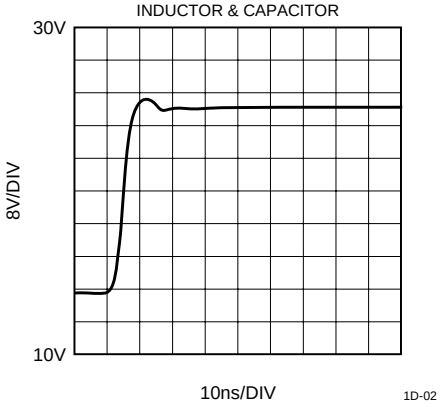
The output of CVA2422TL is not short circuit proof. Any resistance to $V^+$ or Ground should be > 600Ω.

**FIGURE 4. CVA2422TL DC Characteristics**

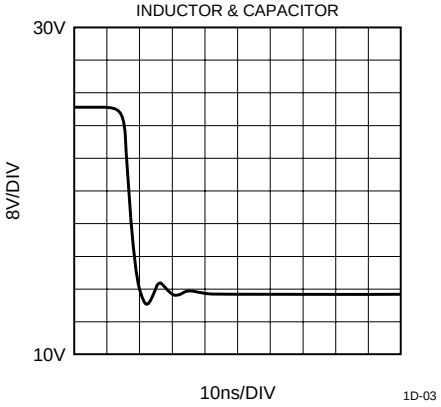


## TYPICAL CHARACTERISTICS

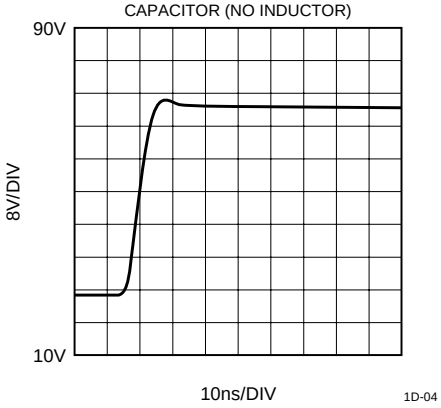
**RISE TIME**
WITH PEAKING
INDUCTOR & CAPACITOR



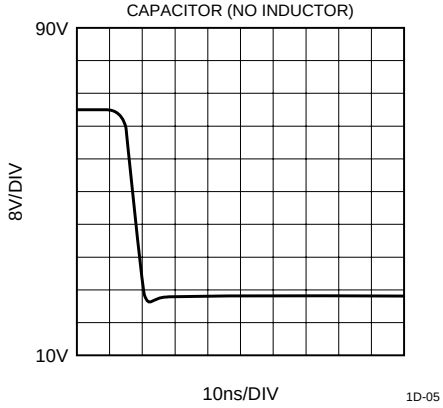

**FALL TIME**
WITH PEAKING
INDUCTOR & CAPACITOR



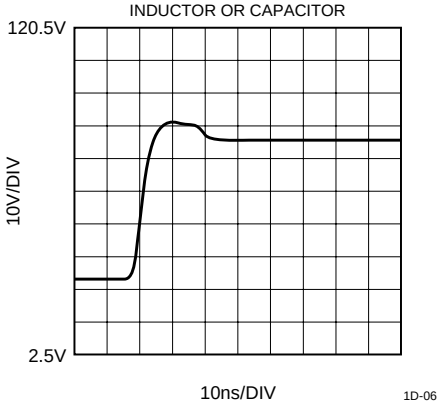

**RISE TIME**
WITH PEAKING
CAPACITOR (NO INDUCTOR)



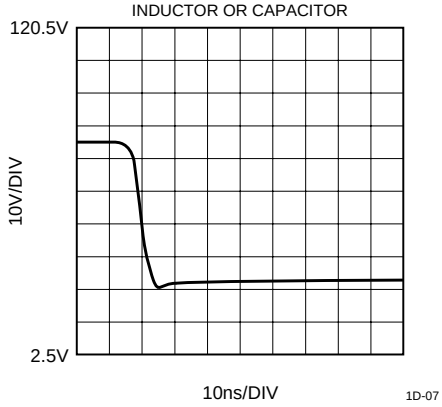

**FALL TIME**
WITH PEAKING
CAPACITOR (NO INDUCTOR)




**RISE TIME**
NO PEAKING
INDUCTOR OR CAPACITOR




**FALL TIME**
NO PEAKING
INDUCTOR OR CAPACITOR



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