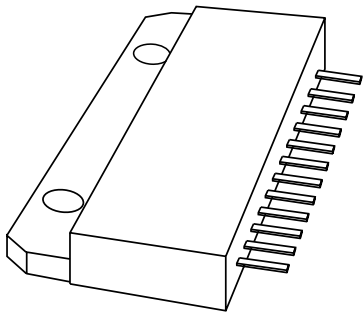


DATA SHEET



CR6928A

Triple video driver hybrid amplifier

Product specification
Supersedes data of 1998 May 07
File under Discrete Semiconductors, SC05

1998 Jul 03

Triple video driver hybrid amplifier

CR6928A

FEATURES

- Transition times (10 to 90%) with 45 V (p-p) swing and $C_L = 10$ pF:
 - rise time (typ.) 2.5 ns
 - fall time (typ.) 2.1 ns
- Low power consumption: 11 W with 25 MHz square wave
- Minimum small signal bandwidth: 140 MHz at 1 V (p-p) or 120 MHz at 40 V (p-p)
- Very fast slew rate: 16000 V/ μ s
- Internal smearing compensation
- Excellent grey-scale linearity
- Unconditional stability
- Gold metallization ensures excellent reliability.

APPLICATIONS

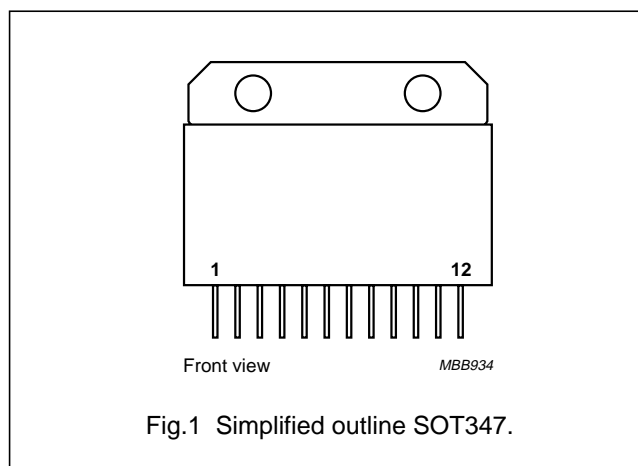
- Cathode-ray tube (CRT) drivers in high-resolution colour monitors.

DESCRIPTION

Hybrid amplifier module comprising three video amplifiers in a SOT347 package.

PINNING

| PIN | DESCRIPTION |
|----------|--------------------------|
| 1, 5, 9 | supply voltage (V_S) |
| 2 | input 1 |
| 3, 7, 11 | ground |
| 4 | output 1 |
| 6 | input 2 |
| 8 | output 2 |
| 10 | input 3 |
| 12 | output 3 |



LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

| SYMBOL | PARAMETER | MIN. | MAX. | UNIT |
|-----------|-------------------------------------|------|------|--------------|
| V_S | supply voltage (DC) | – | 110 | V |
| T_{mb} | operating mounting base temperature | –20 | +110 | $^{\circ}$ C |
| T_{stg} | storage temperature | –40 | +125 | $^{\circ}$ C |

RECOMMENDED OPERATING CONDITIONS

| SYMBOL | PARAMETER | MIN. | MAX. | UNIT |
|-----------|-------------------------------------|------|------|--------------|
| V_S | supply voltage (DC) | – | 90 | V |
| T_{mb} | operating mounting base temperature | –20 | +100 | $^{\circ}$ C |
| T_{stg} | storage temperature | –40 | +125 | $^{\circ}$ C |

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CHARACTERISTICS

$V_S = 85\text{ V}$; $T_{mb} = 25\text{ }^\circ\text{C}$; $C_L = 10\text{ pF}$; output swing = 45 V (p-p) with 42.5 V DC offset (see Fig.3); unless otherwise specified.

| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|----------------------|--|------------------------------------|------|------|------|------|
| Per amplifier | | | | | | |
| I_S | supply current | open input and open output | 105 | 120 | 135 | mA |
| P_{tot} | total power dissipation | 25 MHz square wave | – | 12 | 12.5 | W |
| t_r | rise time transient response | 10 to 90%; note 1 | – | 2.5 | 3.1 | ns |
| t_f | fall time transient response | 10 to 90%; note 1 | – | 2.1 | 2.5 | ns |
| BW | small signal bandwidth | between –3 dB points; note 2 | 140 | 150 | – | MHz |
| V_{tilt} | low frequency tilt voltage | 10 kHz square wave | – | 1.3 | 1.5 | V |
| V_{os} | overshoot voltage (rise and fall time) | adjustable by C1 and C2; see Fig.3 | – | 3 | 10 | % |
| NLN | non-linearity | $V_O = 15\text{ to }75\text{ V}$ | – | 2 | 5 | % |
| A_V | DC voltage gain | 50 Ω source; note 3 | 11.2 | 12.4 | 13.6 | V/V |
| V_G | insertion gain | 50 Ω source; note 4 | 160 | 180 | 200 | V/V |

Notes

1. Input signal is a 100 kHz square wave of 3.7 V (p-p) with 400 mV DC offset (50 Ω source), without R_{level} .
2. Sinewave output signal: 1 V (p-p).
3. Measured V_O/V_I at input test circuit.
4. Measured V_O/V_I at input module.

APPLICATION NOTES

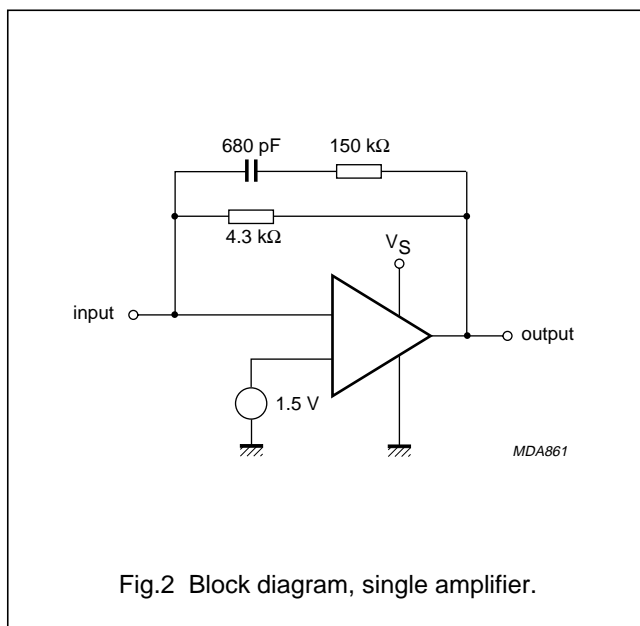
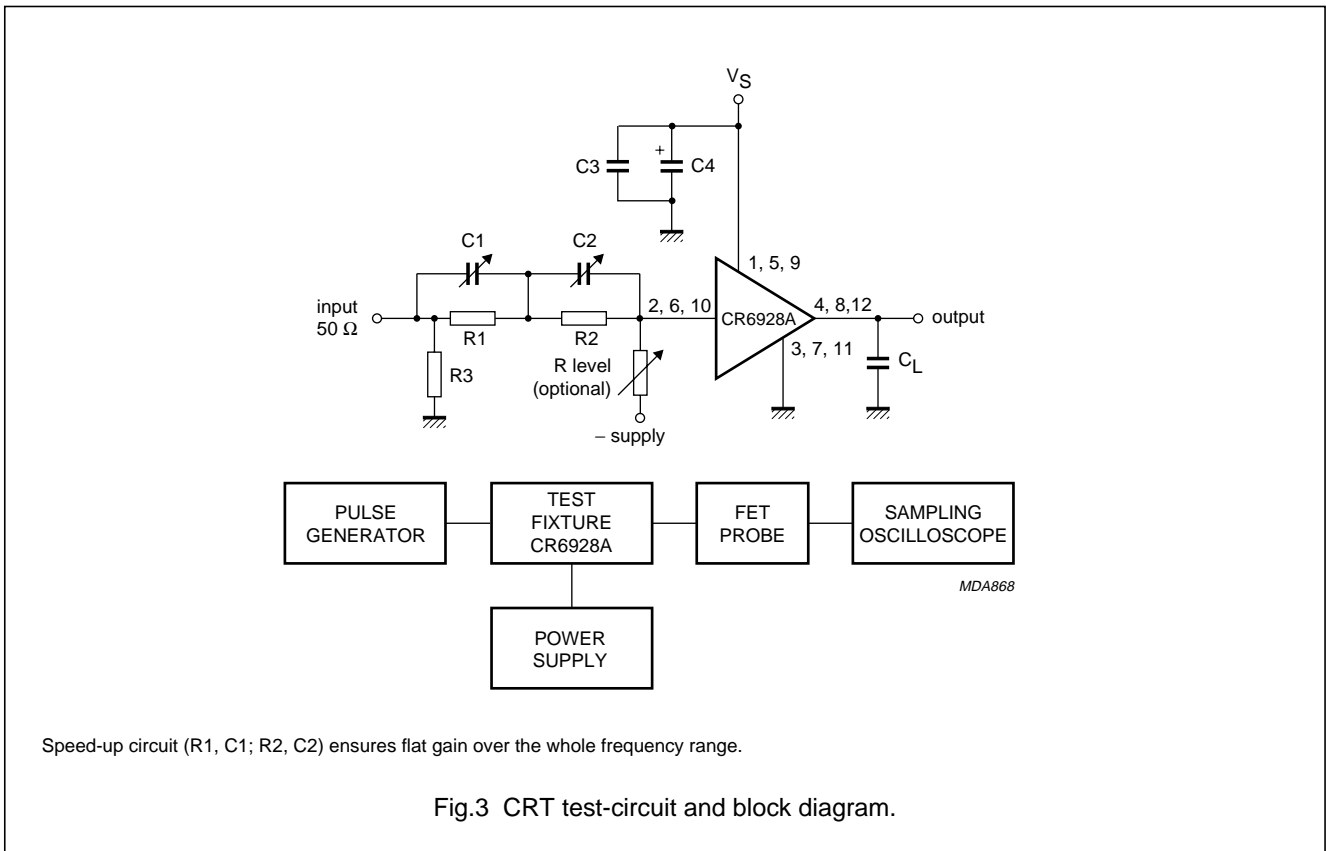


Fig.2 Block diagram, single amplifier.

Triple video driver hybrid amplifier

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Components used in test-circuit (see Fig.3)

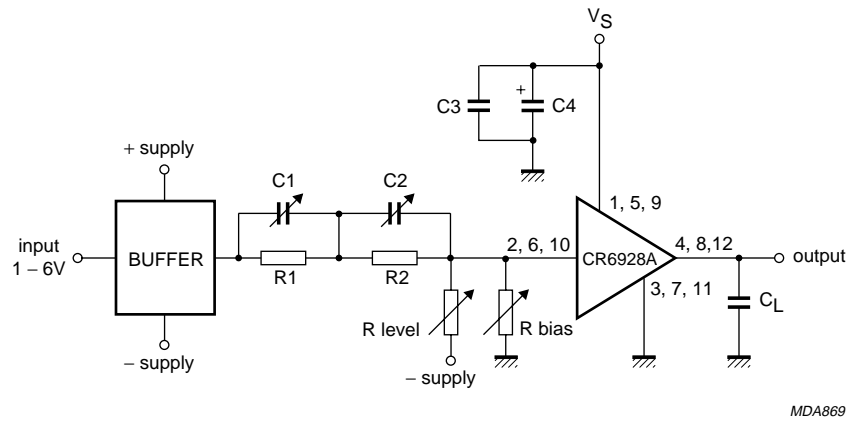
| COMPONENT | DESCRIPTION | VALUE |
|-----------|------------------------|---------------------------|
| C1 | variable capacitor | 10 to 160 pF (typ. 50 pF) |
| C2 | variable capacitor | 10 to 160 pF (typ. 82 pF) |
| C3 | chip capacitor | 10 nF |
| C4 | electrolytic capacitor | 4.7 μF; 160 V |
| R1 | resistor | 275 Ω |
| R2 | resistor | 62 Ω |
| R3 | resistor | 50 Ω |

Test equipment used in test-circuit (see Fig.3)

| EQUIPMENT | TYPE DESCRIPTION |
|-----------------------|--|
| Pulse generator | Le Croy; model 9210 with unit 9211 |
| | Philips; model PM5785B (125 MHz) with internal DC offset |
| Power supply | Philips; model PE1542, 80 V |
| FET probe | Philips; model PM8943, attenuation 100 : 1 |
| Sampling oscilloscope | Tektronix; model 11801B, sampling head SD26 |

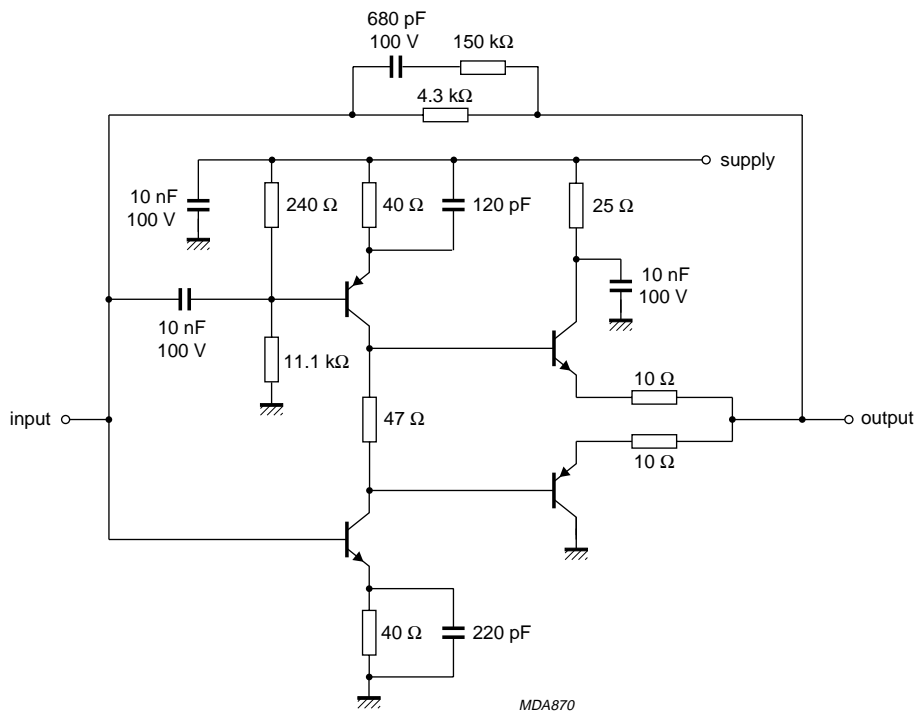
Triple video driver hybrid amplifier

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R_{level} and R_{bias} are intended to achieve the required output level and to optimize the frequency smearing performance.
 R_{level} has to be adjusted to the required output level (approximately 2 k Ω at $V_S = -12$ V).
 R_{bias} has to be tuned for the best high frequency smearing performance (200 MHz burst).

Fig.4 Application test-circuit.



Supply voltages are internally connected.

Fig.5 Internal circuit, single amplifier.

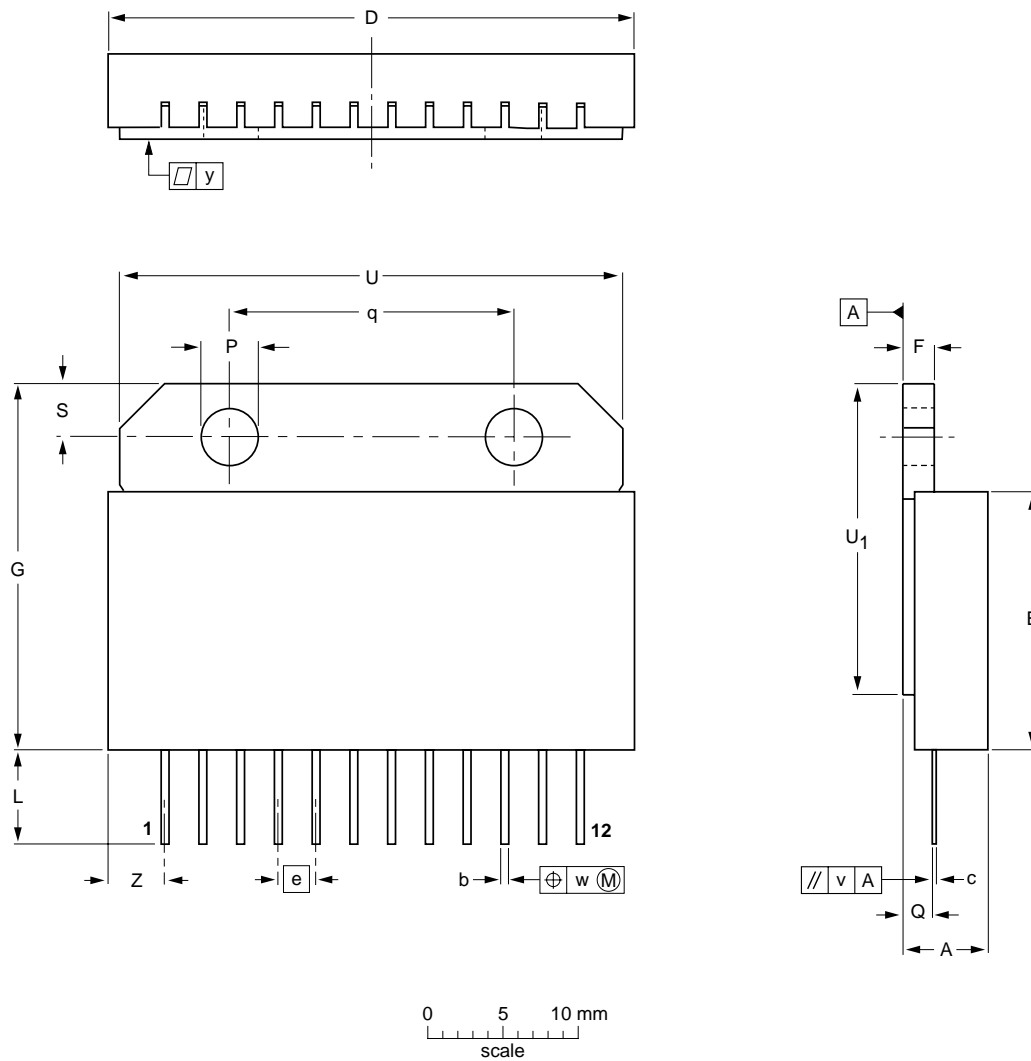
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PACKAGE OUTLINE

Ceramic single-ended flat package; heatsink mounted; 2 mounting holes;
12 in-line tin (Sn) plated leads

SOT347



DIMENSIONS (mm are the original dimensions)

| UNIT | A | b | c | D | E | e | F | G | L min. | P | Q | q | S | U | U ₁ | v | w | y | Z max. |
|------|------------|--------------|------|--------------|--------------|------|-----|--------------|-----------|--------------|-----|----|------------|--------------|----------------|-----|------|-----|-----------|
| mm | 6.0 5.6 | 0.51 0.38 | 0.25 | 36.2 35.8 | 18.2 17.8 | 2.54 | 2.0 | 25.5 24.5 | 6 | 4.15 3.85 | 1.8 | 19 | 3.5 3.4 | 34.4 34.0 | 22.2 21.8 | 0.3 | 0.25 | 0.1 | 4.1 |

| OUTLINE VERSION | REFERENCES | | | | EUROPEAN PROJECTION | ISSUE DATE |
|--------------------|------------|-------|------|--|------------------------|------------|
| | IEC | JEDEC | EIAJ | | | |
| SOT347 | | | | | | 97-06-28 |

Triple video driver hybrid amplifier

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DEFINITIONS

| | |
|---|---|
| Data sheet status | |
| Objective specification | This data sheet contains target or goal specifications for product development. |
| Preliminary specification | This data sheet contains preliminary data; supplementary data may be published later. |
| Product specification | This data sheet contains final product specifications. |
| Limiting values | |
| Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability. | |
| Application information | |
| Where application information is given, it is advisory and does not form part of the specification. | |

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