

VERTICAL DRIVER

GENERAL DESCRIPTION

The TDA4301 is an integrated circuit which acts as an inverting buffer between the pulse pattern generator SAD1019 (LOCMOS technology) and the NXA1011 to NXA1041 frame-transfer sensors. The circuit consists of four drivers either for all vertical transfer clocks for image part (1A to 4A), or all vertical transfer clocks for storage part (1B to 4B) electrodes, and one driver for a transfer gate (TG) electrode.

QUICK REFERENCE DATA

| parameter | conditions | symbol | min. | typ. | max. | unit |
|-------------------------------------|-----------------------------|--------------------|------|-------|------|------|
| Supply voltages | | | | | | |
| pin 13 | | V ₁₃₋₁₆ | 4.5 | 5.0 | 5.5 | V |
| pin 1 | | V ₁₋₁₆ | 11.0 | 11.25 | 11.5 | V |
| Supply current | V ₁₃₋₁₆ = 5 V | I ₁₃ | — | 14 | — | mA |
| Operating current | V ₁₋₁₆ = 11.25 V | I ₁ | — | 9.25 | — | mA |
| Storage temperature range | | T _{stg} | -25 | — | +150 | °C |
| Operating ambient temperature range | | T _{amb} | -20 | — | +70 | °C |

PACKAGE OUTLINE

16-lead DIL; plastic (SOT38).

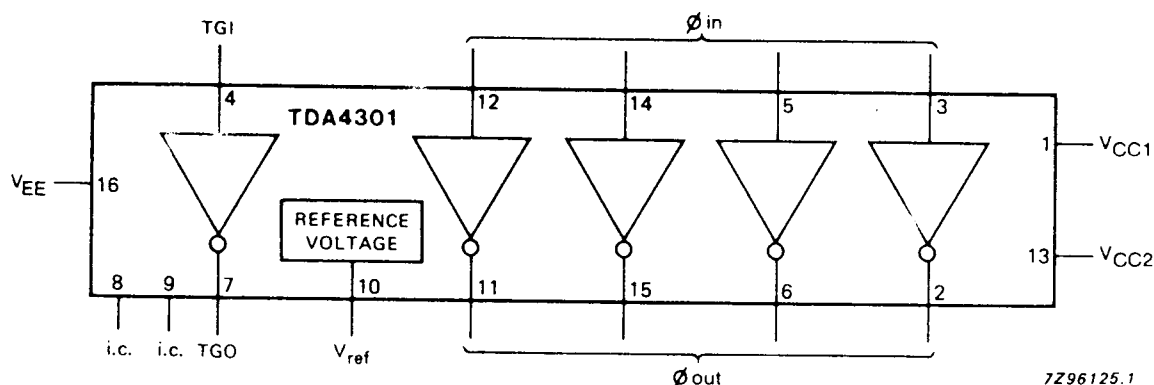


Fig.1 Block diagram.

RATINGS

Limiting values in accordance with the Absolute Maximum System (IEC 134)

| parameter | conditions | symbol | min. | max. | unit |
|-------------------------------------|------------|------------------|------|------|------|
| Supply voltages | | | | | |
| pin 1 | | V _{CC1} | — | 12 | V |
| pin 13 | | V _{CC2} | — | 12 | V |
| DC output current | t < 1 s | | | | |
| pins 2, 6, 11 and 13 | | I _O | — | 250 | mA |
| pin 7 | | I _{TGO} | — | 10 | mA |
| Total power dissipation | | P _{tot} | — | 550 | mW |
| Operating ambient temperature range | | T _{amb} | -20 | +70 | °C |
| Storage temperature range | | T _{stg} | -25 | +150 | °C |

DC CHARACTERISTICS

| parameter | symbol | min. | typ. | max. | unit |
|----------------------------|------------------|-------|-------|-------|------|
| Supply voltage (pin 13) | V _{CC2} | 4.5 | 5.0 | 5.5 | V |
| Supply voltage (pin 1) | V _{CC1} | 11.20 | 11.25 | 11.30 | V |
| Reference voltage (pin 10) | V _{ref} | 3.60 | 3.75 | 3.90 | V |
| Supply current (pin 13) | I _{CC2} | — | 14.0 | — | mA |
| Operating current (pin 1) | I _{CC1} | — | 9.25 | — | mA |

AC CHARACTERISTICS

$V_{CC1} = V_{1-16} = 11.25 \text{ V}$; $V_{CC2} = V_{13-16} = 5.0 \text{ V}$; $T_{amb} = 25 \text{ }^\circ\text{C}$ unless otherwise specified

| parameter | conditions | symbol | min. | typ. | max. | unit |
|--|-------------------------|-----------------|------|------|------|---------------|
| Inputs (pins 3, 4, 5, 12 and 14) | | | | | | |
| Input voltage range | | V_ϕ | 0 | — | 5 | V |
| Input threshold voltage | | $V_{\phi TH}$ | 0.9 | 1.1 | 1.3 | V |
| Input current | $V_\phi = 5 \text{ V}$ | I_ϕ | — | 10 | 30 | μA |
| Outputs (pins 2, 6, 11 and 15) | | | | | | |
| Output voltage swing (peak-to-peak value) | $C_L = 2000 \text{ pF}$ | $V_{\phi(p-p)}$ | — | 10 | — | V |
| Timing | see Fig.2 | | | | | |
| Negative slope delay | | t_{d1} | — | — | 100 | ns |
| Negative slope (fall time) | | t_{d5} | 50 | 70 | 90 | ns |
| Positive slope delay | | t_{d3} | — | — | 100 | ns |
| Positive slope (rise time) | | t_{d6} | 30 | 50 | 70 | ns |
| Output (pin 7) | | | | | | |
| Output voltage swing (peak-to-peak value) | $C_L = 68 \text{ pF}$ | $V_{TGO(p-p)}$ | — | 10 | — | V |
| Timing | see Fig.2 | | | | | |
| Negative slope delay | | t_{d1} | — | — | 100 | ns |
| Negative slope (fall time) | | t_{d5} | 70 | 100 | 120 | ns |
| Positive slope delay | | t_{d3} | — | — | 100 | ns |
| Positive slope (rise time) | | t_{d6} | 50 | 70 | 90 | ns |

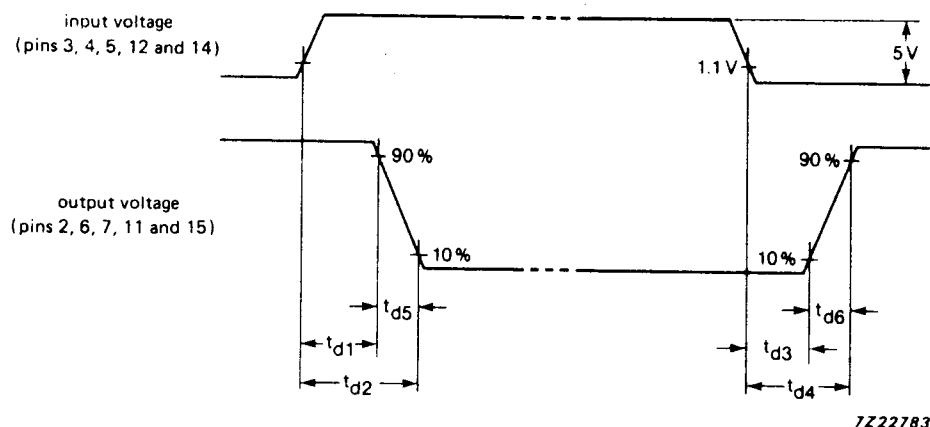


Fig.2 Timing diagram.

Load output (ϕ out) $C_L = 2000 \text{ pF}$; load output (TGO) $C_L = 68 \text{ pF}$. At the specified load only one switching may be done at a time.

APPLICATION INFORMATION

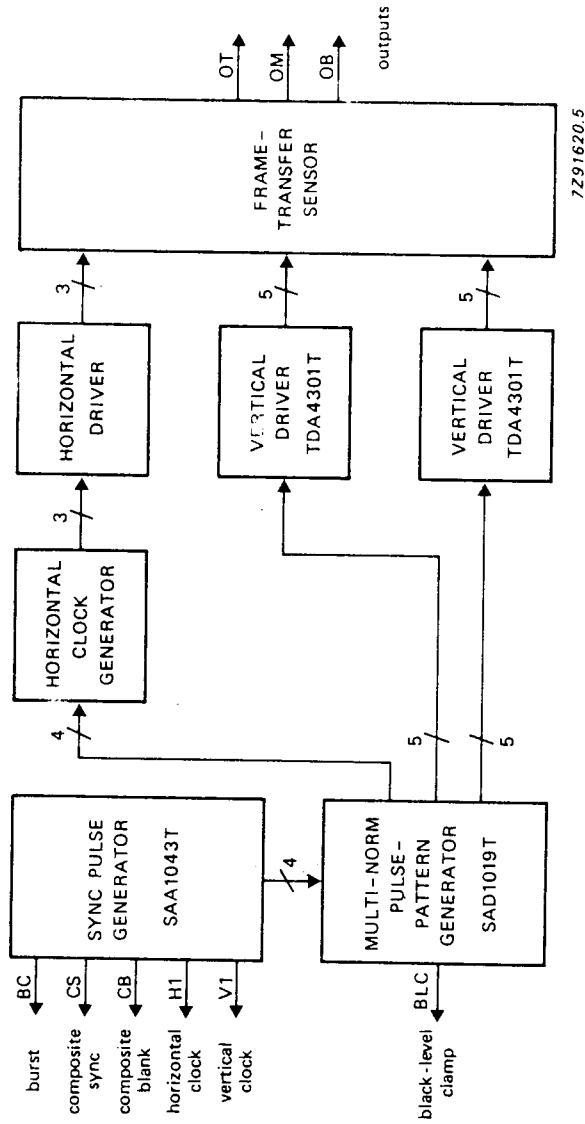


Fig.3 Control circuitry for driving the NXA1011 to NXA1041 frame-transfer sensors.