

TDA1006A

MOTOR REGULATOR WITH AUTOMATIC
TAPE-END INDICATOR

The TDA1006A is for use in car radio tape-decks

The circuit incorporates the following functions:

- capstan motor speed control;
- an electronic motor stop in conjunction with hysteresis slip-coupling or commutator pulses;
- an automatic switch from playback to radio at tape-end;
- playback indication with lamp;
- tape-end indication with intermittent light.

QUICK REFERENCE DATA

Supply voltage range	V _p	6 to 22 V
Ambient temperature	T _{amb}	typ. 25 °C
Supply voltage	V _p	typ. 14 V
Motor regulator		
Current consumption (R _{3,4} = 7,5 kΩ)		
radio	I ₄	typ. 9 mA
playback (I ₁ = 0)	I ₄	typ. 12 mA
playback	I ₄	typ. 52 mA
tape-end	I ₄	typ. 32 mA
Operating motor current	I ₃	typ. 200 mA
Supply voltage rejection	ΔV ₃₋₂ /ΔV ₄₋₂	typ. 1 mV/V
Automatic stop circuit		
Input current	I ₁₄	> 25 μA
Input voltage at commutator	V ₁₁₋₂	-6 to +6 V



PACKAGE OUTLINE

16-lead DIL; plastic power (SOT-38BE-2).

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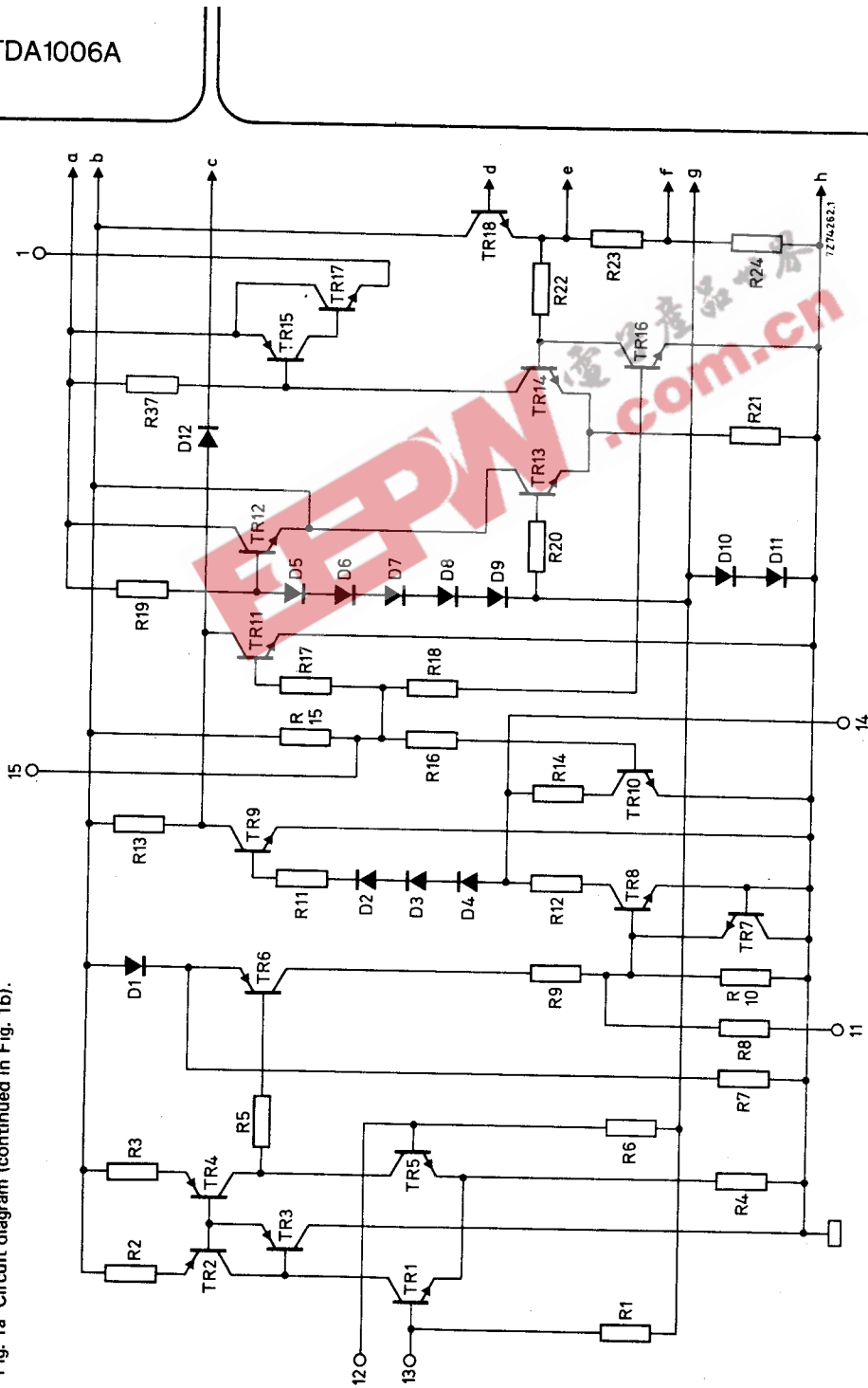


Fig. 1a Circuit diagram (continued in Fig. 1b).



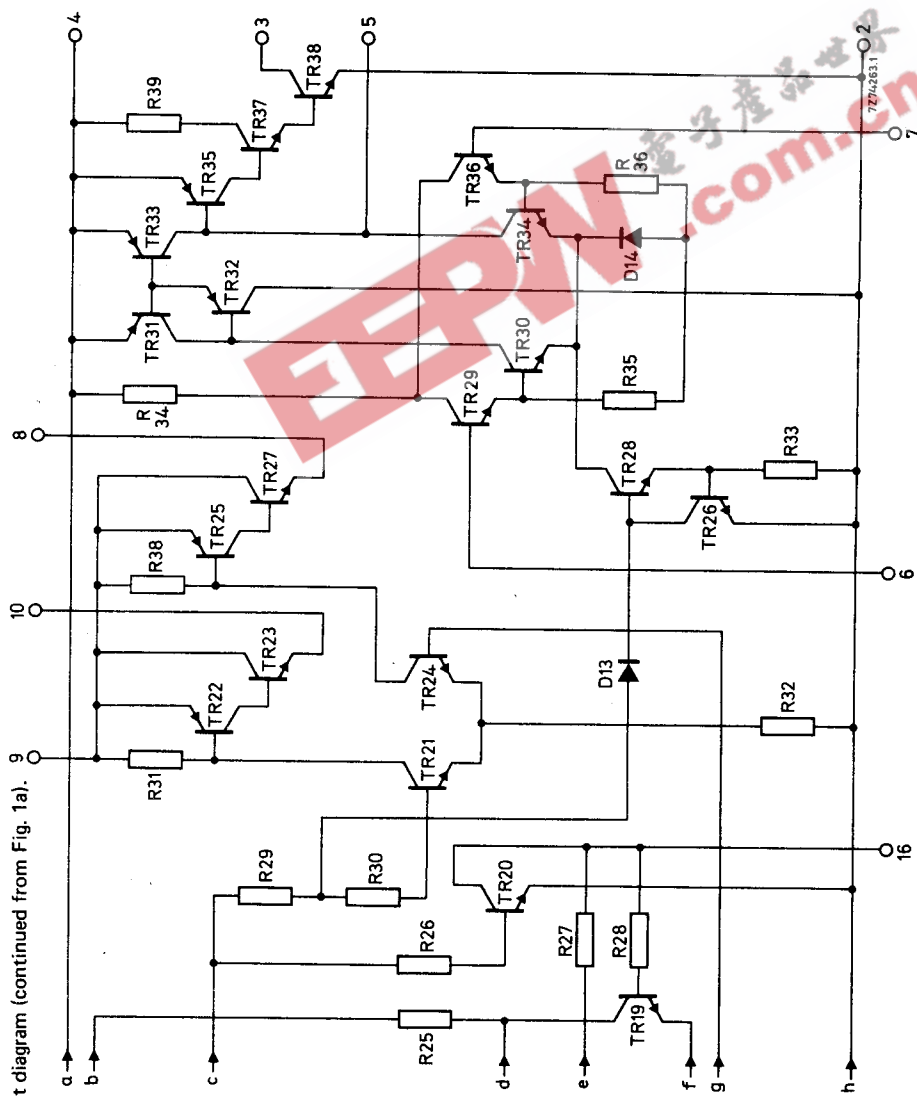


Fig. 1b Circuit diagram (continued from Fig. 1a).

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RATINGS

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

Supply voltage

pin 4
pin 9

V₄₋₂ max. 24 V
V₉₋₂ max. 24 V
V₄₋₂ ≥ V₉₋₂

Output current

pin 1 (d.c. value)
(peak value)

-I₁ max. 40 mA
-I_{1M} max. 100 mA

pin 3 (d.c. value)
(non-repetitive peak value)

I₃ max. 250 mA
I_{3SM} max. 600 mA

pin 8 (d.c. value)
(peak value)

-I₈ max. 45 mA
-I_{8M} max. 80 mA

pin 10 (d.c. value)
(peak value)

-I₁₀ max. 20 mA
-I_{10M} max. 20 mA

Storage temperature

T_{stg} -65 to +150 °C

Operating ambient temperature

see power derating curve Fig. 2

T_{amb} -25 to +150 °C

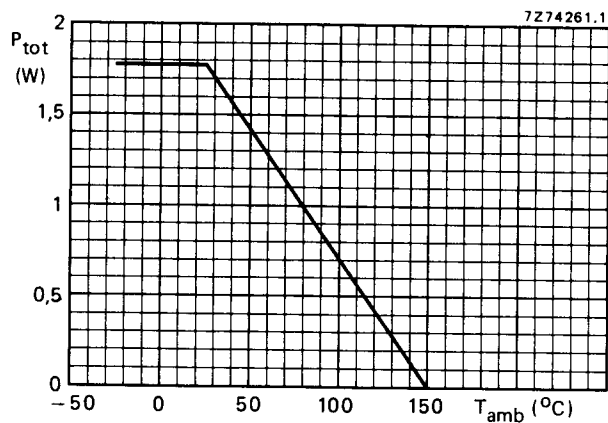


Fig. 2 Power derating curve; derating factor: 14,3 mW/°C.



CHARACTERISTICS

$V_P = 14\text{ V}$; $T_{\text{amb}} = 25\text{ }^\circ\text{C}$ unless otherwise specified (see test circuit Fig. 3).

Supply voltage range (pins 4 and 9)

V_P 6 to 22 V
 $V_{4-2} \geq V_{9-2}$

Motor regulator

Current consumption ($R_{3-4} = 7,5\text{ k}\Omega$)
 radio

I_4 typ. 9 mA

playback ($I_1 = 0$)

I_4 typ. 12 mA
 9,5 to 17 mA

playback

I_4 typ. 52 mA

tape-end

I_4 typ. 32 mA

Input offset voltage at $I_3 = 3\text{ mA}$

$|V_{7-6}|$ typ. 2 mV
 < 8 mV

Input voltage range (common mode)

$V_{6-2}; V_{7-2}$ 2,4 to $V_P - 0,2\text{ V}$

Input bias current

$I_6; I_7$ typ. 80 nA
 < 700 nA

Input sensitivity (for $\Delta I_3 = 100\text{ mA}$)

ΔV_{7-6} < 13 mV

Operating voltage of TR38 at $I_{3SM} = 600\text{ mA}$

V_{3-2} typ. 900 mV
 < 1800 mV

Supply voltage rejection

$\Delta V_{3-2} / \Delta V_{4-2}$ typ. 1 mV/V

Operating motor current

I_3 typ. 200 mA
 < 250 mA

Automatic motor 'stop' circuit

Input current

$I_{14} > 25\text{ }\mu\text{A}$

Voltage when TR20 is not conducting
 (pin 16; peak-to-peak value)

$V_{16-2(p-p)}$ 0,9 to 1,4 V

Voltage when TR20 is conducting (pin 16)

$V_{16-2} < 250\text{ mV}$

Input voltage at commutator (pin 11)

$V_{11-2} -6\text{ to }+6\text{ V}$

Stop signal amplifier

Differential input voltage

V_{12-13} typ. 3,5 mV
 2,6 to 4,4 mV

Voltage without input signal

V_{11-2} 85 to 170 mV

Input voltage (r.m.s. value)

$V_{12-13(rms)} > 10\text{ mV}$



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CHARACTERISTICS (continued)

Radio and preamplifier supply

Radio supply current (d.c.)

$-I_8 \leq 45 \text{ mA}$

Saturation voltage at $-I_{8M} = 80 \text{ mA}$

$V_{8-9} \leq 1,35 \text{ V}$

Preamplifier supply current (d.c.)

$-I_{10} \leq 20 \text{ mA}$

Saturation voltage at $-I_{10} = 20 \text{ mA}$

$V_{10-9} \leq 1,2 \text{ V}$

Lamp driver

Output current (d.c.)

$-I_1 \leq 40 \text{ mA}$

Saturation voltage at $-I_{1M} = 100 \text{ mA}$

$V_{4-1} \leq 1,85 \text{ V}$

D.C. voltage level

$V_{15-2} \text{ 0,75 to 1,2 V}$



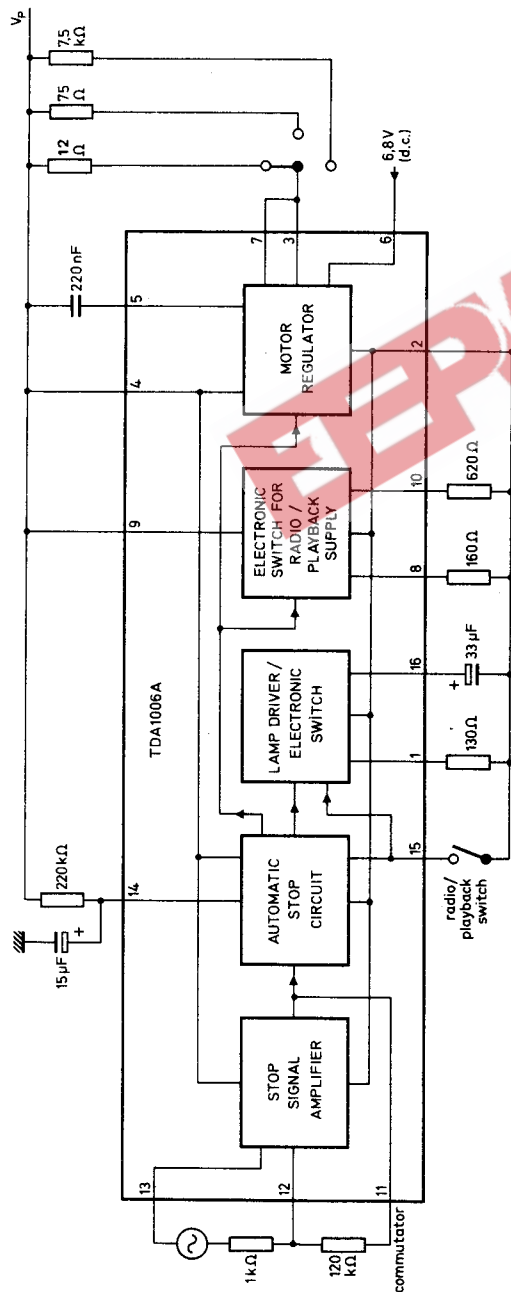


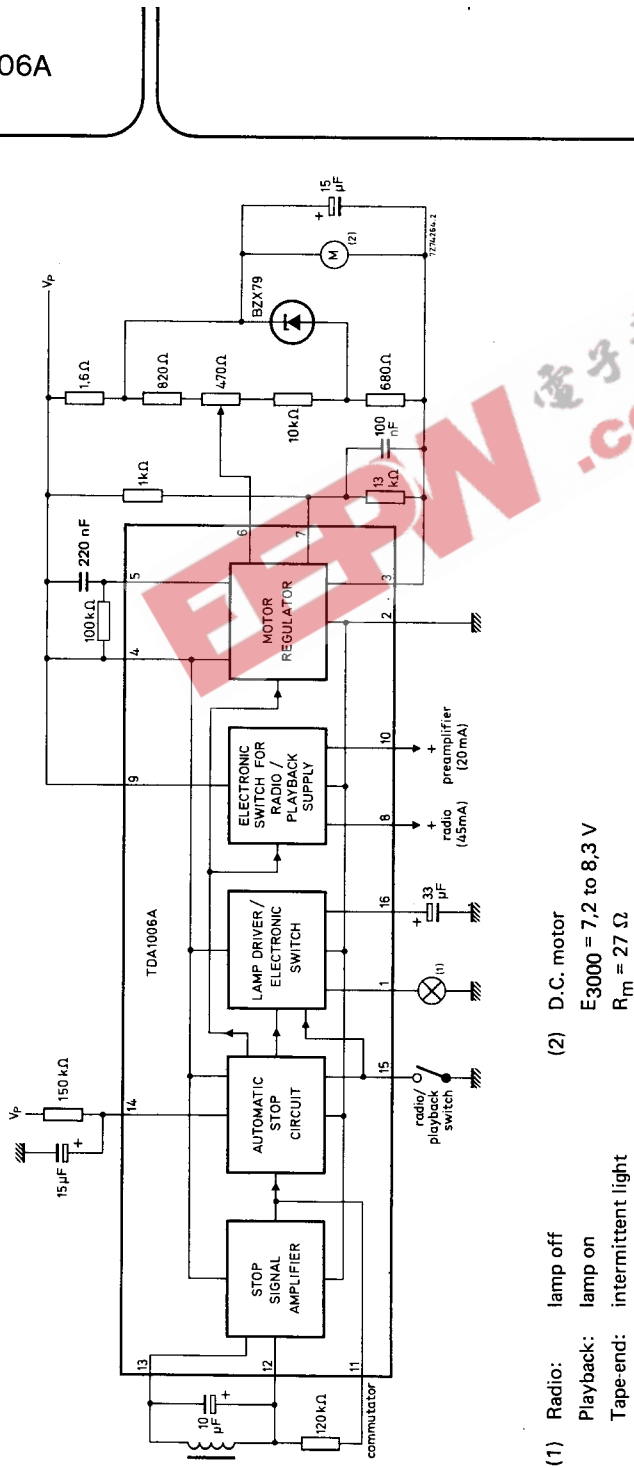
Fig. 3 Test circuit.

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APPLICATION INFORMATION



- (1) Radio: lamp off
- Playback: lamp on
- Tape-end: intermittent light
- (2) D.C. motor
- E3000 = 7,2 to 8,3 V
- R_m = 27 Ω

Fig. 4 Application circuit diagram.

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