

## 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
<b>Motor regulator</b>			
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
playback	$I_4$	typ.	52 mA
tape-end	$I_4$	typ.	32 mA
Operating motor current	$I_3$	typ.	200 mA
Supply voltage rejection	$\Delta V_{3-2}/\Delta V_{4-2}$	typ.	1 mV/V
<b>Automatic stop circuit</b>			
Input current	$I_{14}$	>	25 $\mu$ A
Input voltage at commutator	$V_{11-2}$	-6 to +6 V	



### PACKAGE OUTLINE

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

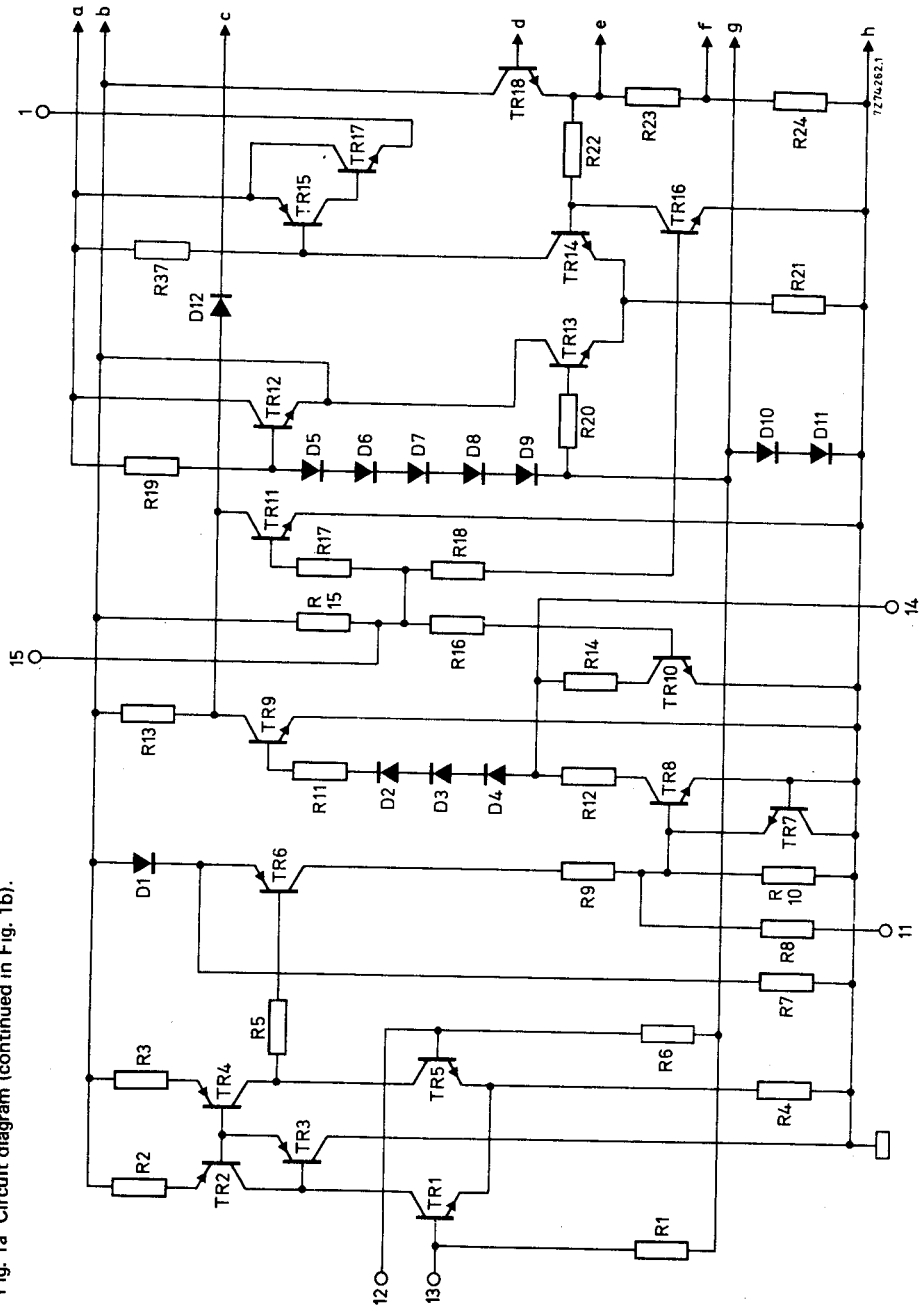


Fig. 1a Circuit diagram (continued in Fig. 1b).



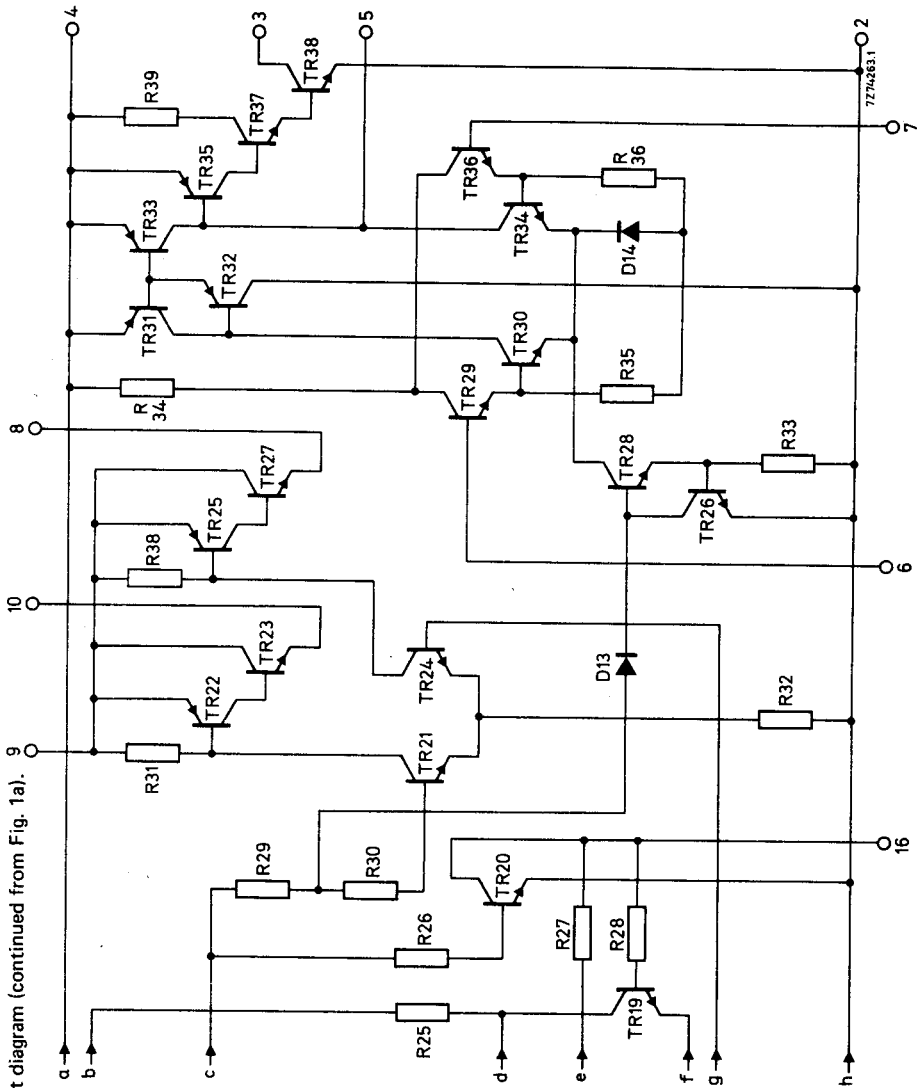


Fig. 1b Circuit diagram (continued from Fig. 1a).

## RATINGS

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

## Supply voltage

pin 4	$V_{4-2}$	max.	24 V
pin 9	$V_{9-2}$	max.	24 V
	$V_{4-2}$	$\geq$	$V_{9-2}$

## Output current

pin 1 (d.c. value)	$-I_1$	max.	40 mA
(peak value)	$-I_{1M}$	max.	100 mA
pin 3 (d.c. value)	$I_3$	max.	250 mA
(non-repetitive peak value)	$I_{3SM}$	max.	600 mA
pin 8 (d.c. value)	$-I_8$	max.	45 mA
(peak value)	$-I_{8M}$	max.	80 mA
pin 10 (d.c. value)	$-I_{10}$	max.	20 mA
(peak value)	$-I_{10M}$	max.	20 mA

## Storage temperature

 $T_{stg}$  -65 to +150 °C

## Operating ambient temperature

see power derating curve Fig. 2

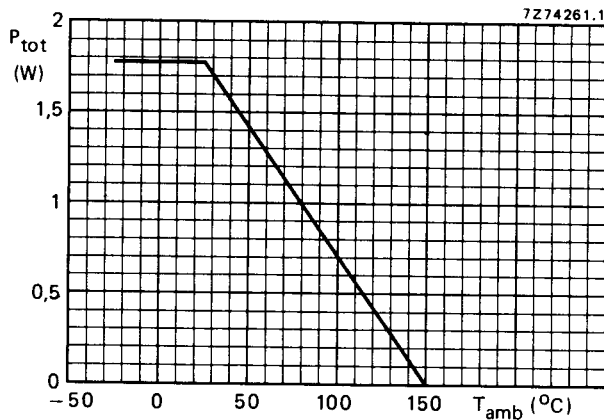
 $T_{amb}$  -25 to +150 °C

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



**CHARACTERISTICS**

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

Supply voltage range (pins 4 and 9)	$V_P$ $V_{4-2}$	$\geq$	6 to 22 V $V_{9-2}$
<b>Motor regulator</b>			
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 $\Delta I_3 = 100 \text{ mA}$ )	$\Delta V_{7-6}$	<	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
<b>Automatic motor 'stop' circuit</b>			
Input current	$I_{14}$	>	25 $\mu\text{A}$
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 mV
Input voltage at commutator (pin 11)	$V_{11-2}$		-6 to +6 V
<b>Stop signal amplifier</b>			
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 mV



## CHARACTERISTICS (continued)

**Radio and preamplifier supply**

Radio supply current (d.c.)	$-I_8$	$\leq$	45 mA
Saturation voltage at $-I_{8M} = 80$ mA	$V_{8-9}$	$\leq$	1,35 V
Preamplifier supply current (d.c.)	$-I_{10}$	$\leq$	20 mA
Saturation voltage at $-I_{10} = 20$ mA	$V_{10-9}$	$\leq$	1,2 V

**Lamp driver**

Output current (d.c.)	$-I_1$	$\leq$	40 mA
Saturation voltage at $-I_{1M} = 100$ mA	$V_{4-1}$	$\leq$	1,85 V
D.C. voltage level	$V_{15-2}$		0,75 to 1,2 V



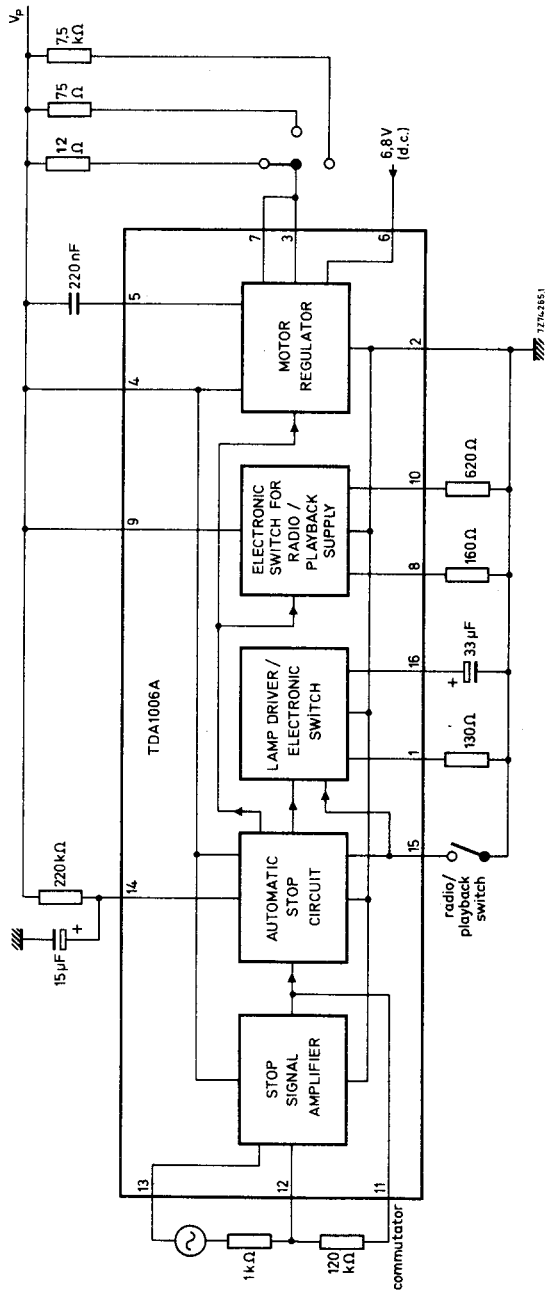
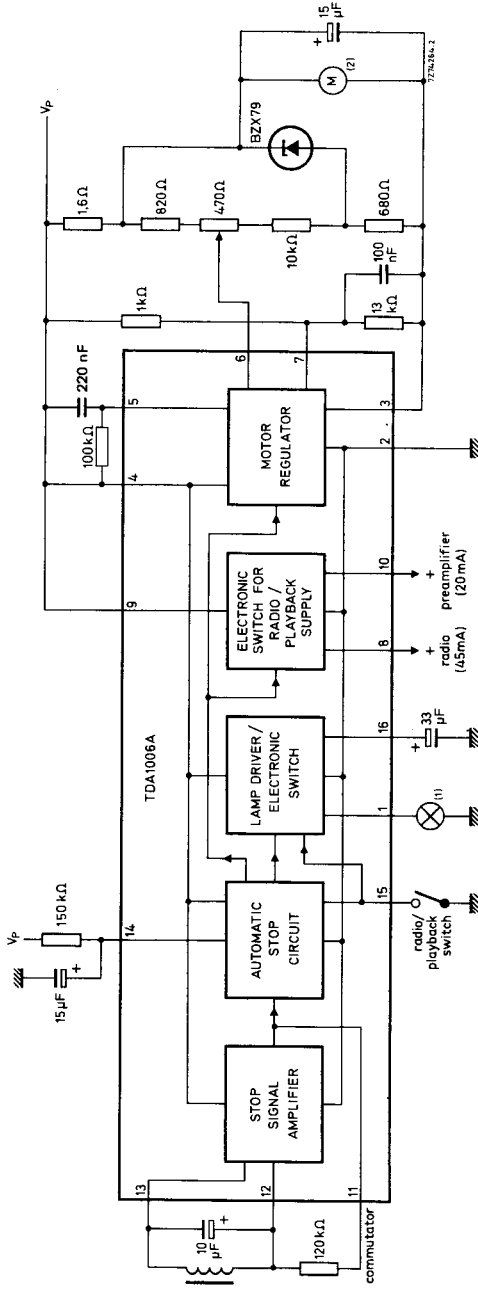


Fig. 3 Test circuit.





APPLICATION INFORMATION



- (1) Radio: lamp off
- Playback: lamp on
- Tape-end: intermittent light
- (2) D.C. motor
- $E_{3000} = 7.2 \text{ to } 8.3 \text{ V}$
- $R_m = 27 \Omega$

Fig. 4 Application circuit diagram.