

**LOW-VOLTAGE DC MOTOR SPEED CONTROLLER**

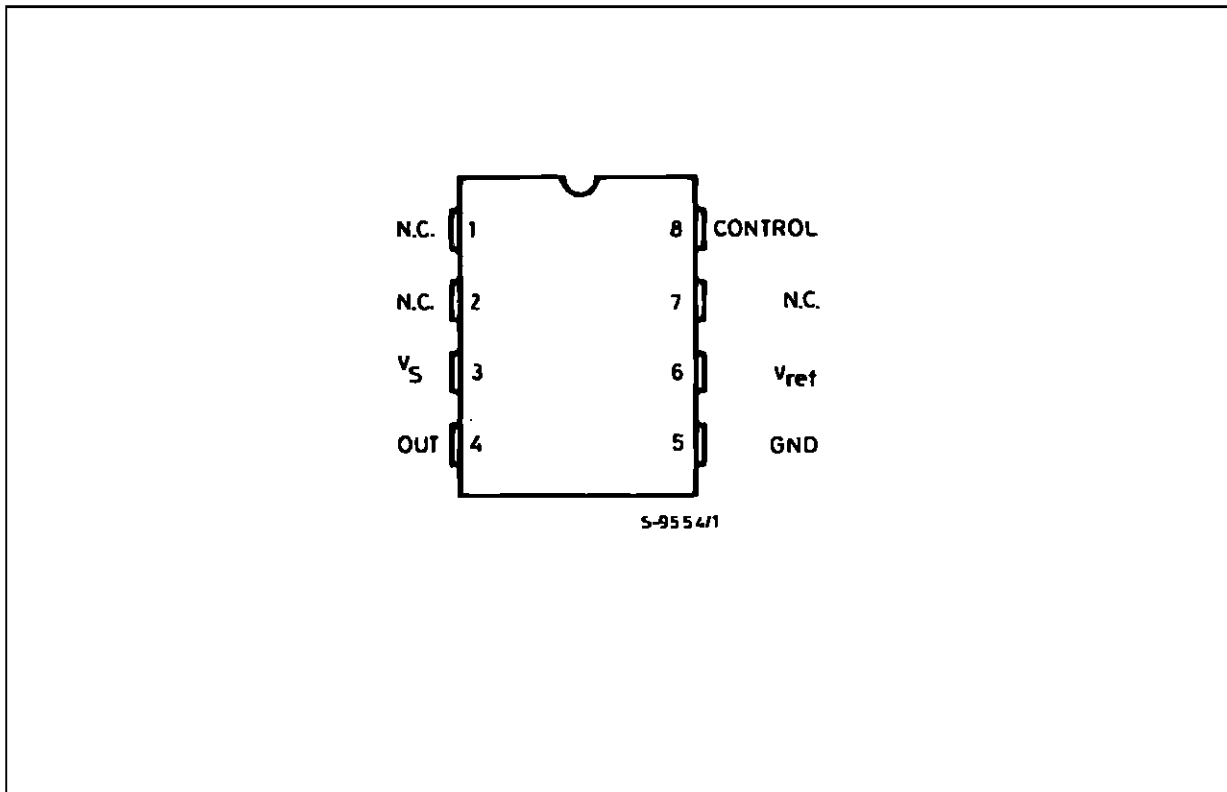
- WIDE OPERATING VOLTAGE RANGE (1.8 to 6 V)
- BUILT-IN LOW-VOLTAGE REFERENCE (0.2 V)
- LINEARITY IN SPEED ADJUSTMENT
- HIGH STABILITY VS. TEMPERATURE
- LOW NUMBER OF EXTERNAL PARTS



**DESCRIPTION**

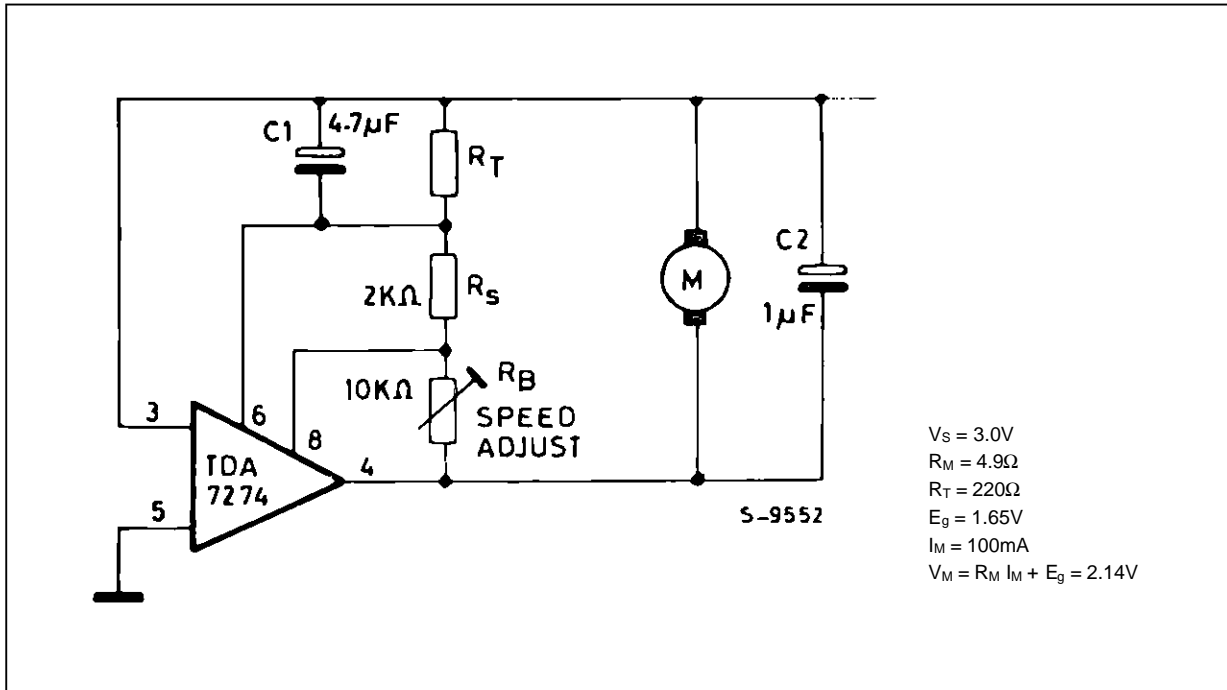
The TDA7274 is a monolithic integrated circuit DC motor speed controller intended for use in microcassettes, radio cassette players and other consumer equipment. It is particularly suitable for low-voltage applications.

**PIN CONNECTION (top view)**

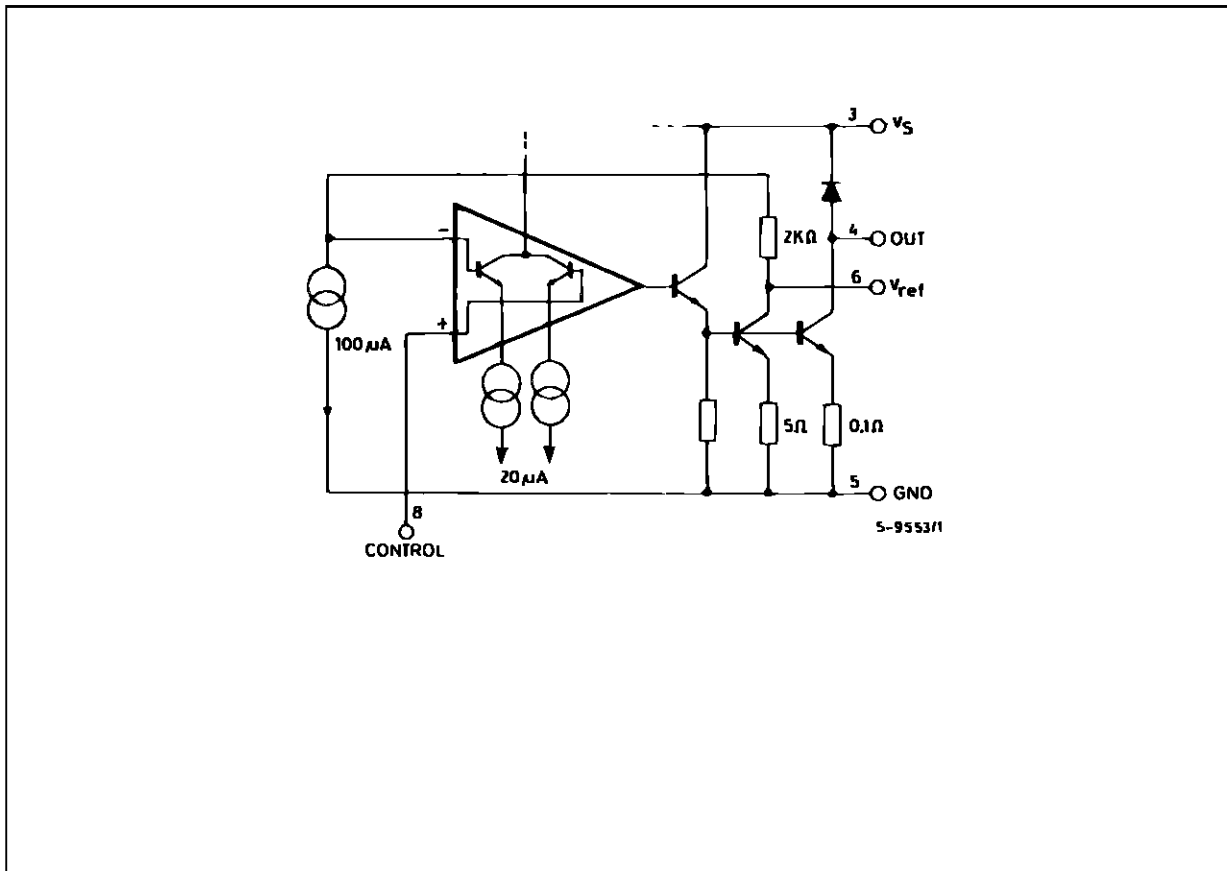


# TDA7274

## APPLICATION CIRCUIT



## SCHEMATIC DIAGRAM



**ABSOLUTE MAXIMUM RATINGS**

Symbol	Parameter	Value	Unit
$V_S$	Supply Voltage	6	V
$I_M$	Motor Current	700	mA
$P_{tot}$	Power Dissipation at $T_{amb} = 25^\circ\text{C}$	1.25	W

**THERMAL DATA**

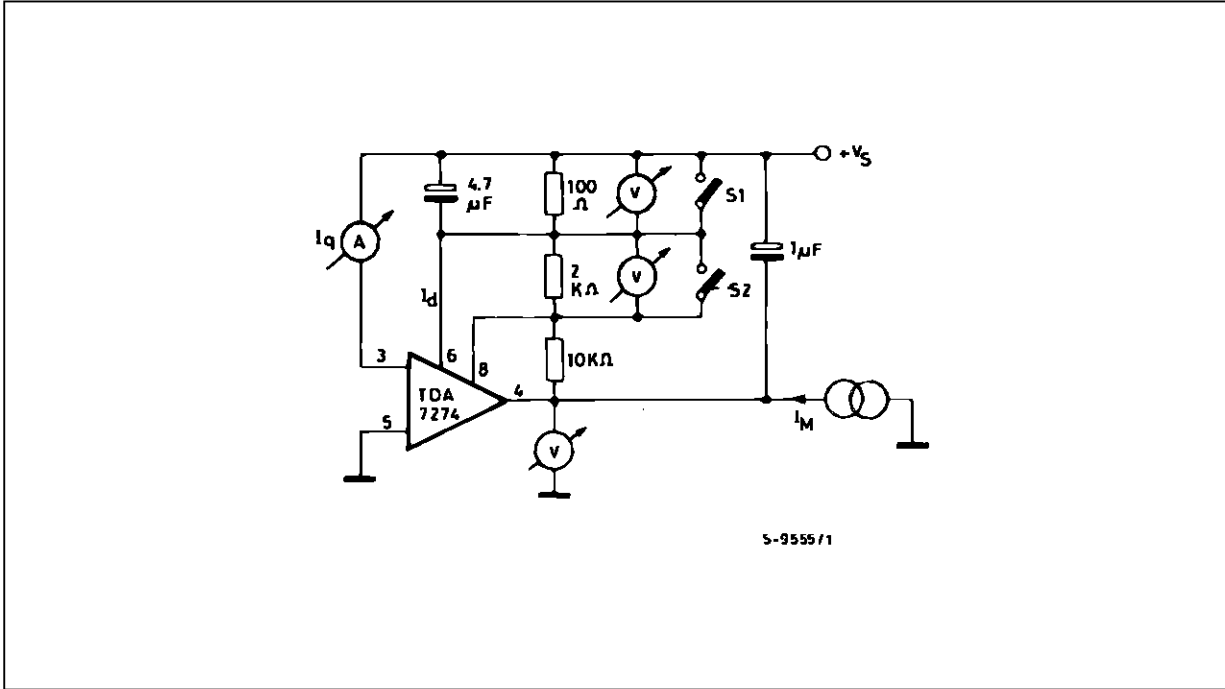
Symbol	Parameter	Value	Unit
$R_{th\ j-amb}$	Thermal Resistance Junction-ambient	Max. 100	$^\circ\text{C}/\text{W}$

**ELECTRICAL CHARACTERISTICS** (Refer to test circuit,  $V_S = 3\text{V}$ ,  $T_{amb} = 25^\circ\text{C}$  unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
$V_S$	Supply Voltage Range		1.8		6	V
$V_{ref}$	Reference Voltage	$I_M = 100\text{mA}$	0.18	0.20	0.22	V
$I_q$	Quiescent Current			2.4	6.0	mA
$I_d$ (Pin 6)	Quiescent Current			120		$\mu\text{A}$
K	Shunt Ratio	$I_M = 100\text{mA}$	45	50	55	–
$V_{sat}$	Residual Voltage	$I_M = 100\text{mA}$		0.13	0.3	V
$\frac{\Delta V_{ref}}{V_{ref}} / \Delta V_S$	Line Regulation	$I_M = 100\text{mA}$ $V_S = 1.8$ to $6\text{V}$		0.20		%/V
$\frac{\Delta K}{K} / \Delta V_S$	Voltage Characteristic of Shut Ratio	$I_M = 100\text{mA}$ $V_S = 1.8$ to $6\text{V}$		0.80		%/V
$\frac{\Delta V_{ref}}{V_{ref}} / \Delta I_M$	Load Regulation	$I_M = 20$ to $200\text{mA}$		0.004		%/mA
$\frac{\Delta K}{K} / \Delta I_M$	Current Characteristic of Shut Ratio	$I_M = 20$ to $200\text{mA}$		–0.03		%/mA
$\frac{\Delta V_{ref}}{V_{ref}} / \Delta T_{amb}$	Temperature Characteristic of Reference Voltage	$I_M = 100\text{mA}$ $T_{amb} = -20$ to $+60^\circ\text{C}$		0.04		%/ $^\circ\text{C}$
$\frac{\Delta K}{K} / \Delta T_{amb}$	Temperature Characteristic of Shut Ratio	$I_M = 100\text{mA}$ $T_{amb} = 20$ to $+60^\circ\text{C}$		0.02		%/ $^\circ\text{C}$

# TDA7274

Figure 1 : Test Circuit.



S-9555/11

Figure 2 : Quiescent Current vs. Supply Voltage.

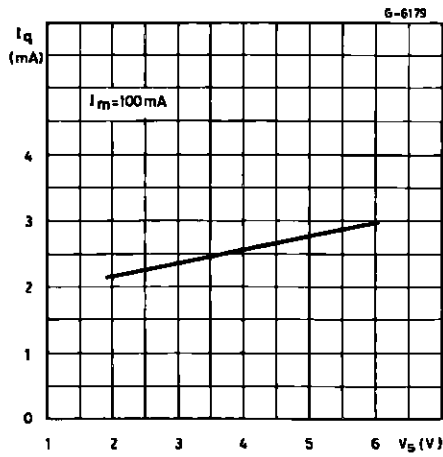


Figure 3 : Reference Voltage vs. Supply Voltage.

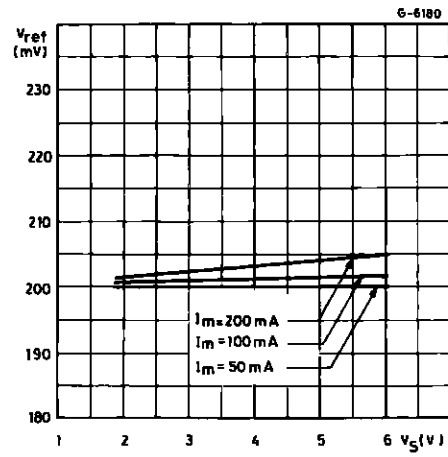


Figure 4 : Shunt Ratio vs. Supply Voltage.

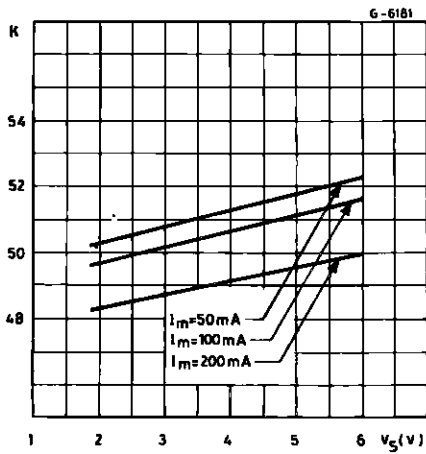


Figure 5 : Reference Voltage vs. Load Current.

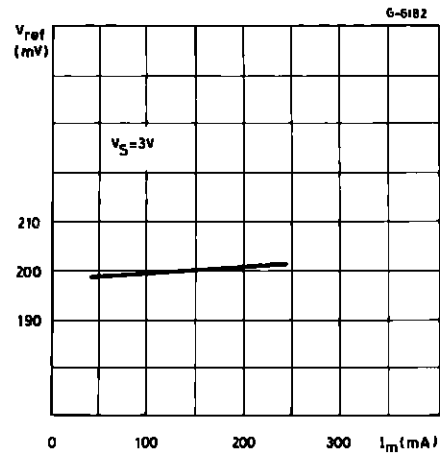


Figure 6 : Shunt Ratio vs. Load Current.

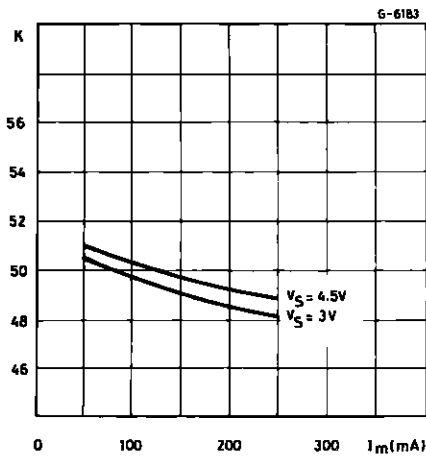


Figure 7 : Minimum Supply Voltage (typical) vs. Load Current.

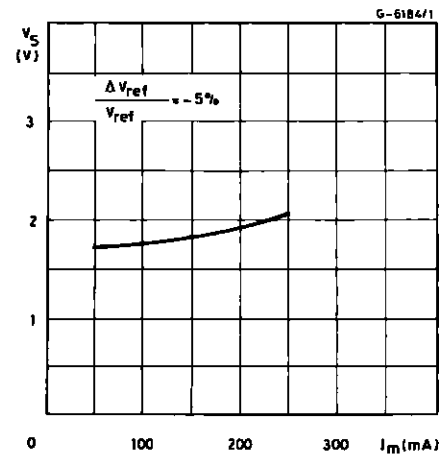


Figure 8 : Saturation Voltage vs. Load Current.

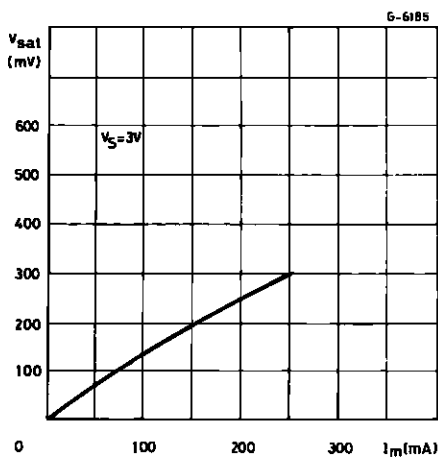


Figure 9 : Quiescent Current vs. Ambient Temperature.

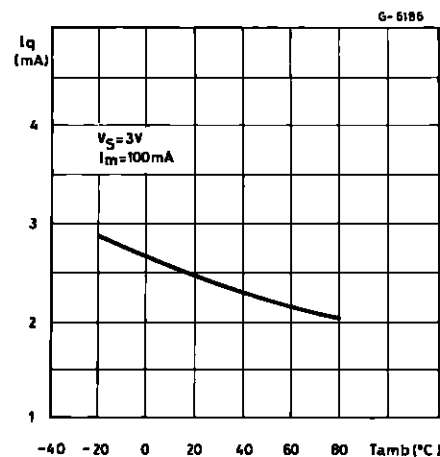


Figure 10 : Reference Voltage vs. Ambient Temperature.

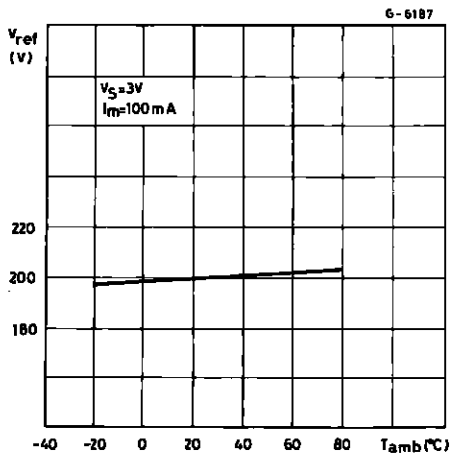


Figure 11 : Application Circuit.

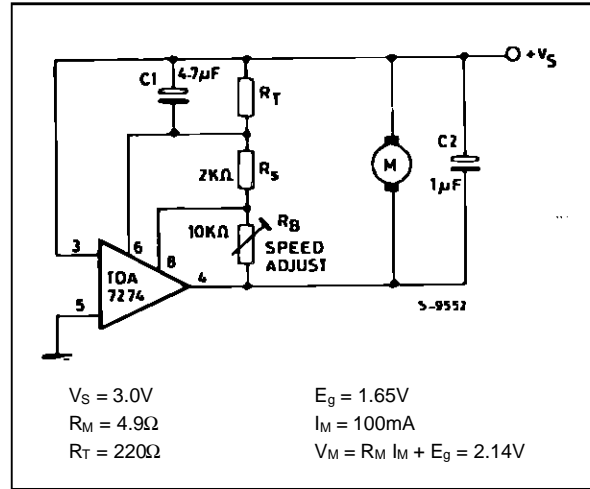


Figure 12 : P. C. Board and Components layout of the Circuit of fig. 11 (1 : 1 scale).

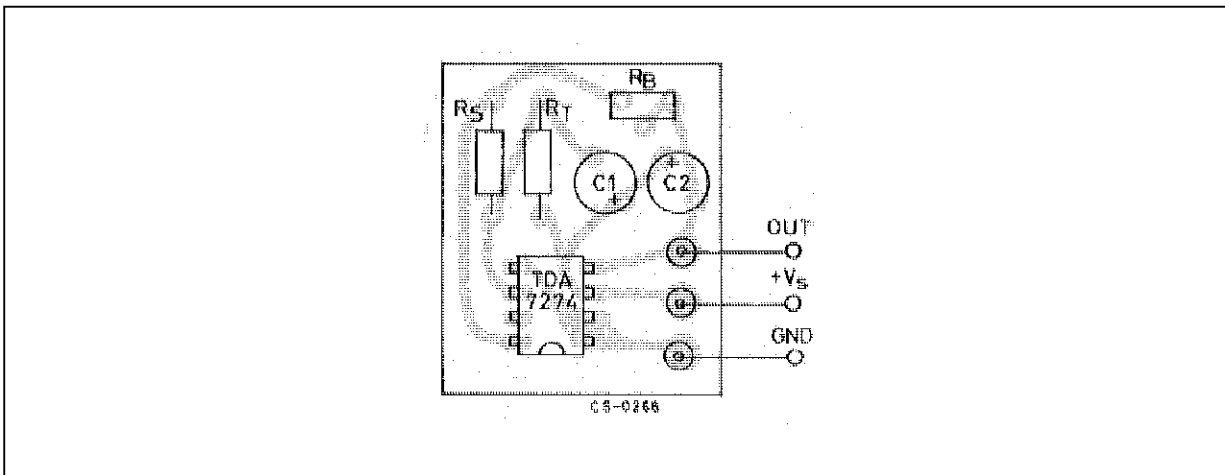


Figure 13 : Speed Variations vs. Supply Voltage.

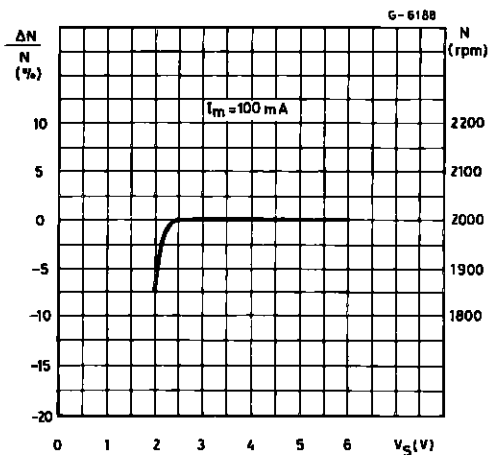
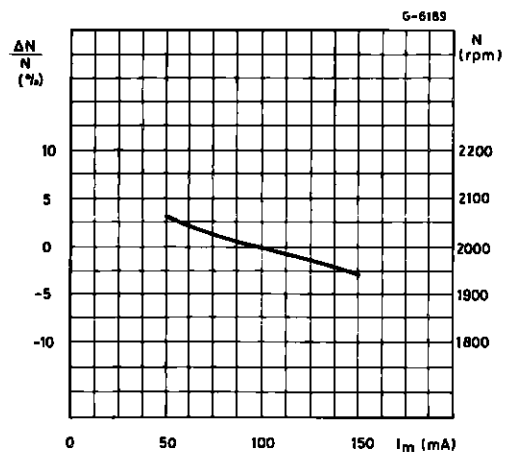
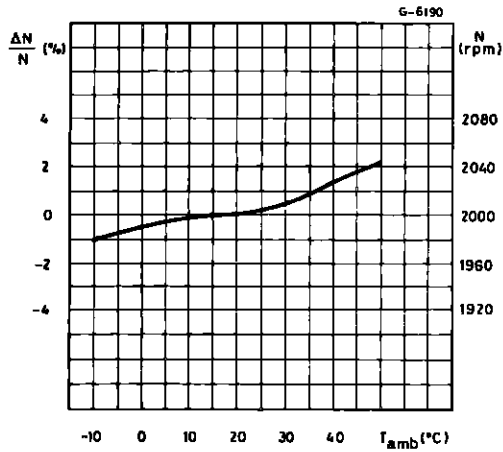


Figure 14 : Speed Variations vs. Motor Current.

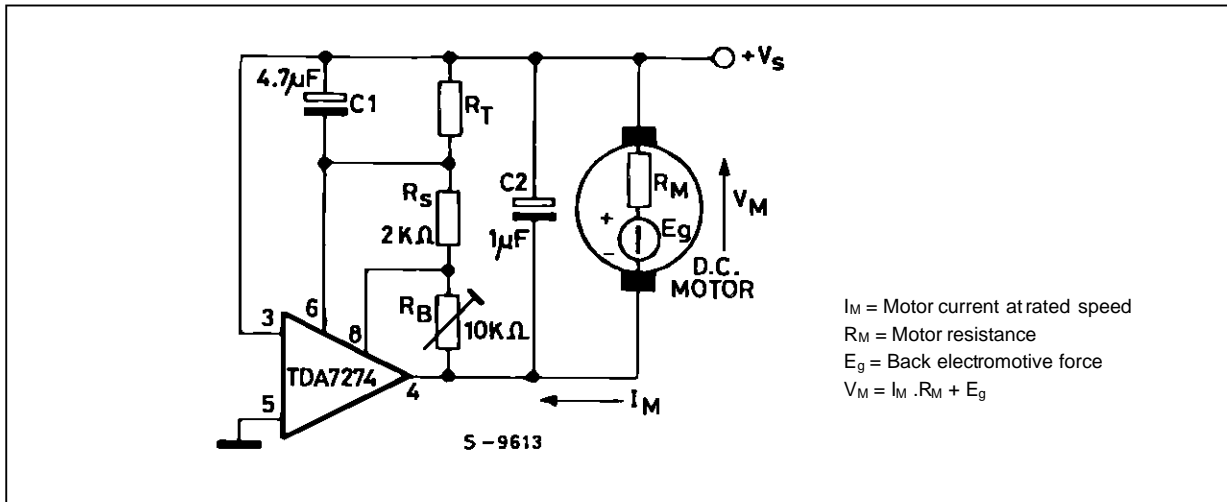


**Figure 15** : Speed Variations vs. Ambient Temperature.



**APPLICATION INFORMATION**

**Figure 16.**



$$E_g = R_T I_d + I_M \left( \frac{R_T}{K} - R_M \right) + V_{ref}$$

$$\left[ 1 + \frac{R_B}{R_s} + \frac{R_T}{R_s} \left( 1 + \frac{1}{K} \right) \right]$$

$R_s$  has to be adjusted so that the applied voltage  $V_M$  is suitable for a given motor, the speed is then linearly adjustable varying  $R_B$ .

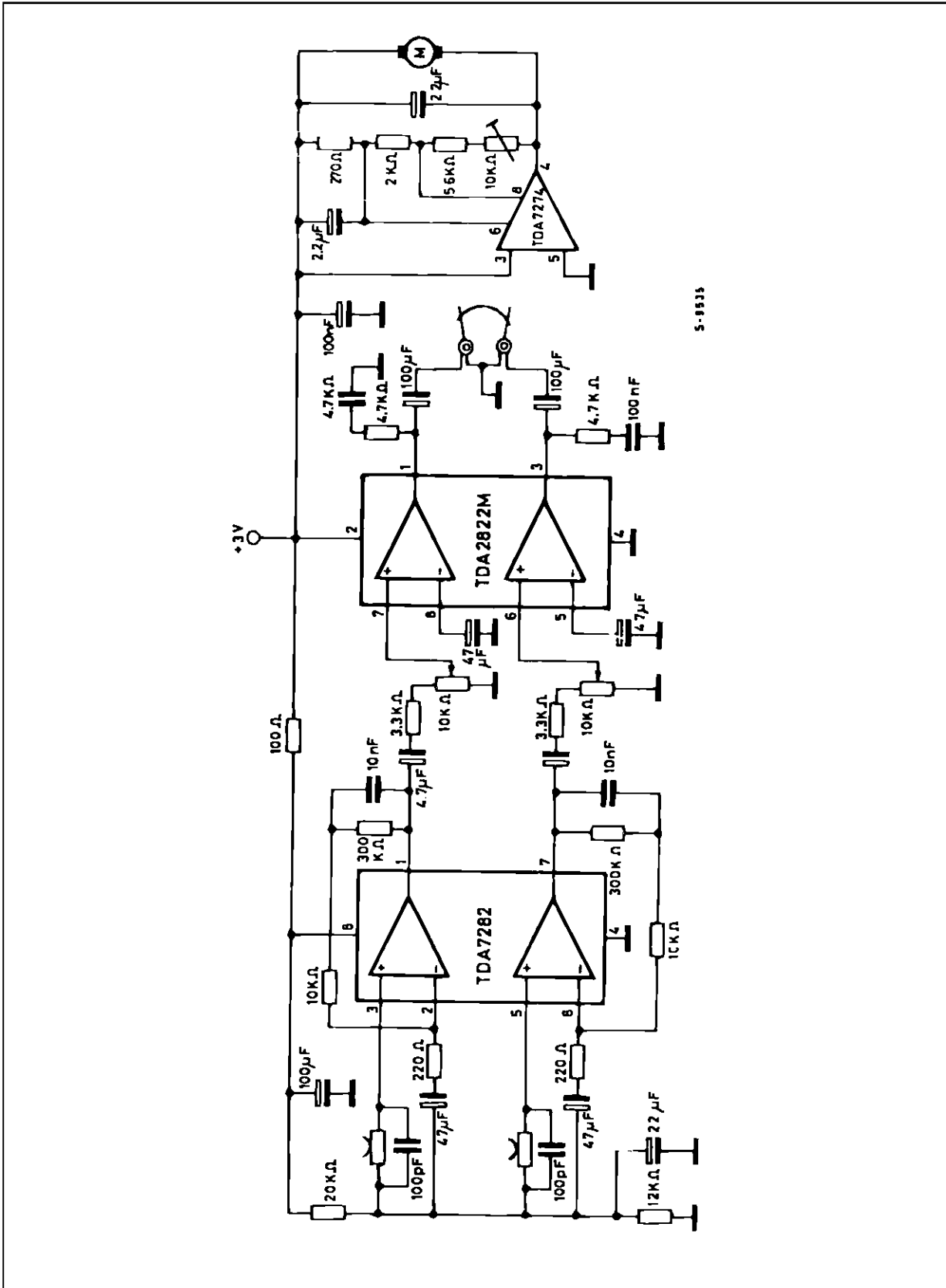
The value of  $R_T$  is calculated so that

$$R_{T(max)} < K(min.) \cdot R_{M(min.)}$$

If  $R_{T(max)} > K \cdot R_M$ , instability may occur.

The values of  $C_1$  (4.7  $\mu F$  typ.) and  $C_2$  (1  $\mu F$  typ.) depend on the type of motor used.  $C_1$  adjusts WOW and flutter of the system.  $C_2$  suppresses motor spikes.

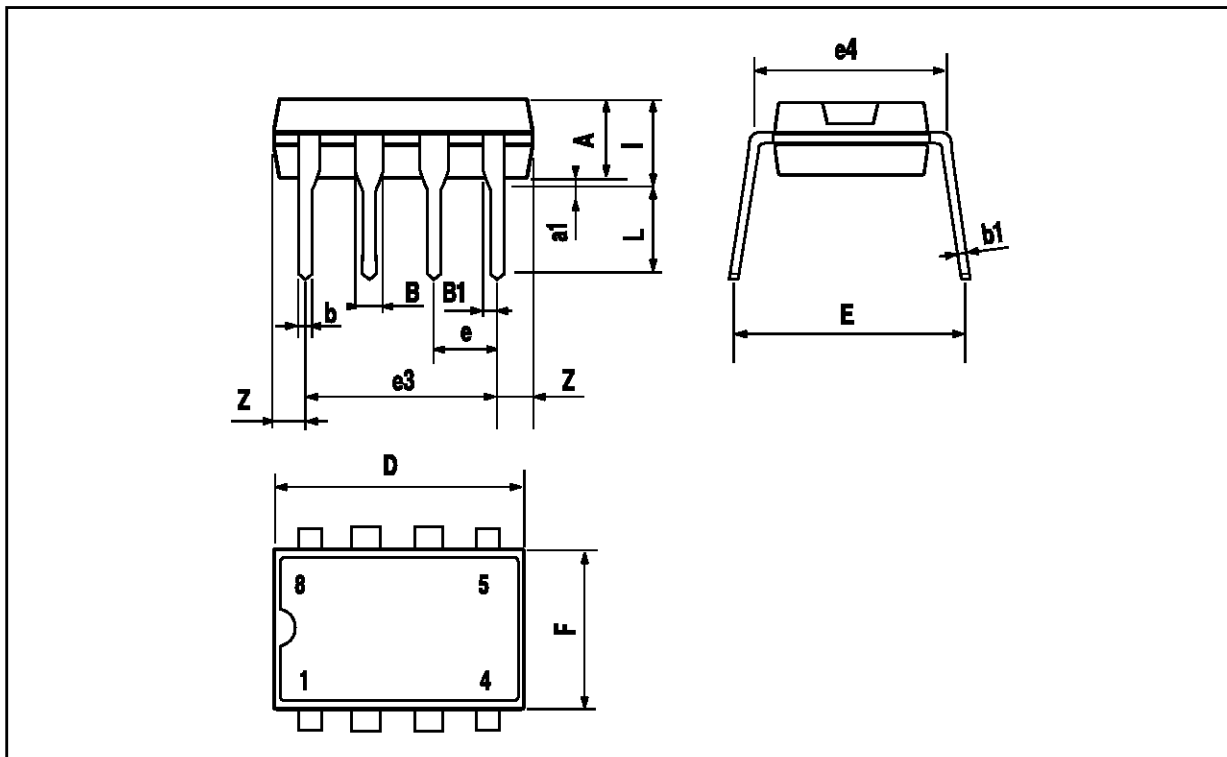
Figure 17 : 3V Stereo Cassette Miniplayer with Motor Speed Control.





## MINIDIP PACKAGE MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A		3.32			0.131	
a1	0.51			0.020		
B	1.15		1.65	0.045		0.065
b	0.356		0.55	0.014		0.022
b1	0.204		0.304	0.008		0.012
D			10.92			0.430
E	7.95		9.75	0.313		0.384
e		2.54			0.100	
e3		7.62			0.300	
e4		7.62			0.300	
F			6.6			0.260
I			5.08			0.200
L	3.18		3.81	0.125		0.150



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