

**LOW-VOLTAGE DC MOTOR SPEED CONTROLLER**

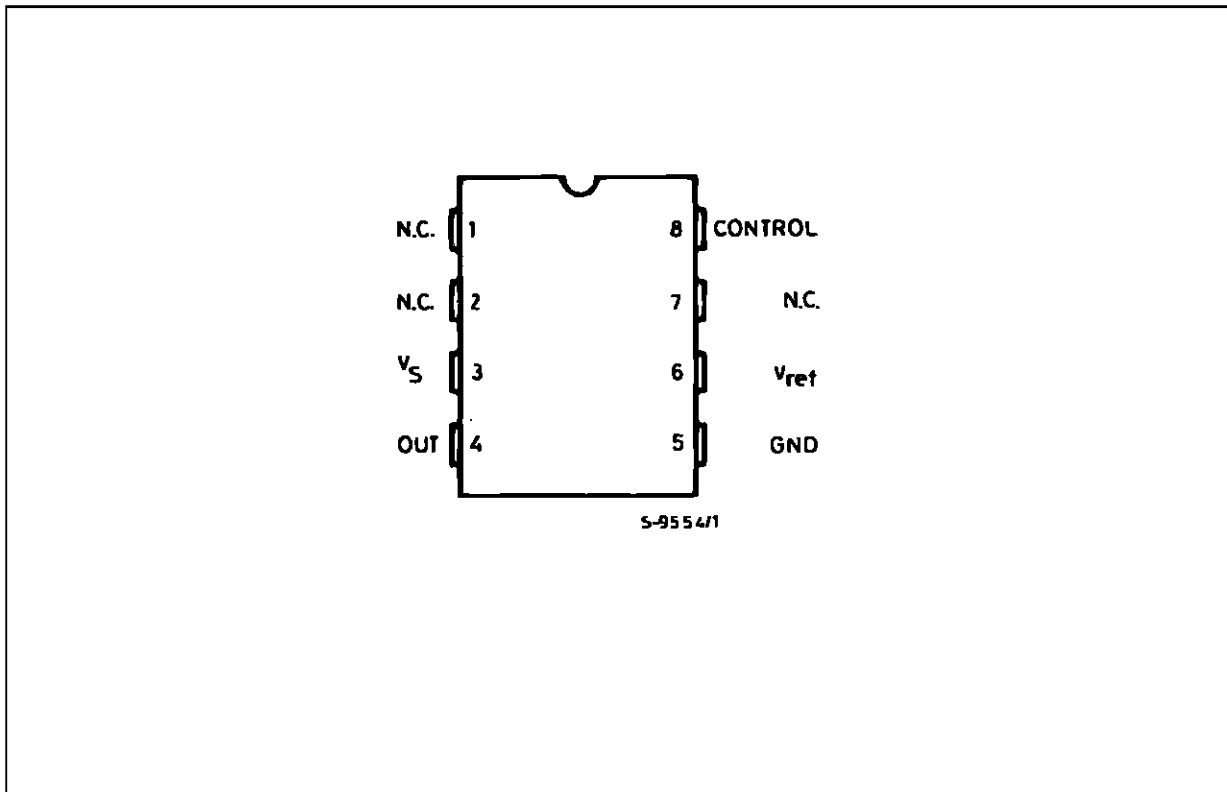
- WIDE OPERATING VOLTAGE RANGE (1.8 to 6 V)
- BUILT-IN LOW-VOLTAGE REFERENCE (0.2 V)
- LINEARITY IN SPEED ADJUSTMENT
- HIGH STABILITY VS. TEMPERATURE
- LOW NUMBER OF EXTERNAL PARTS

**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.

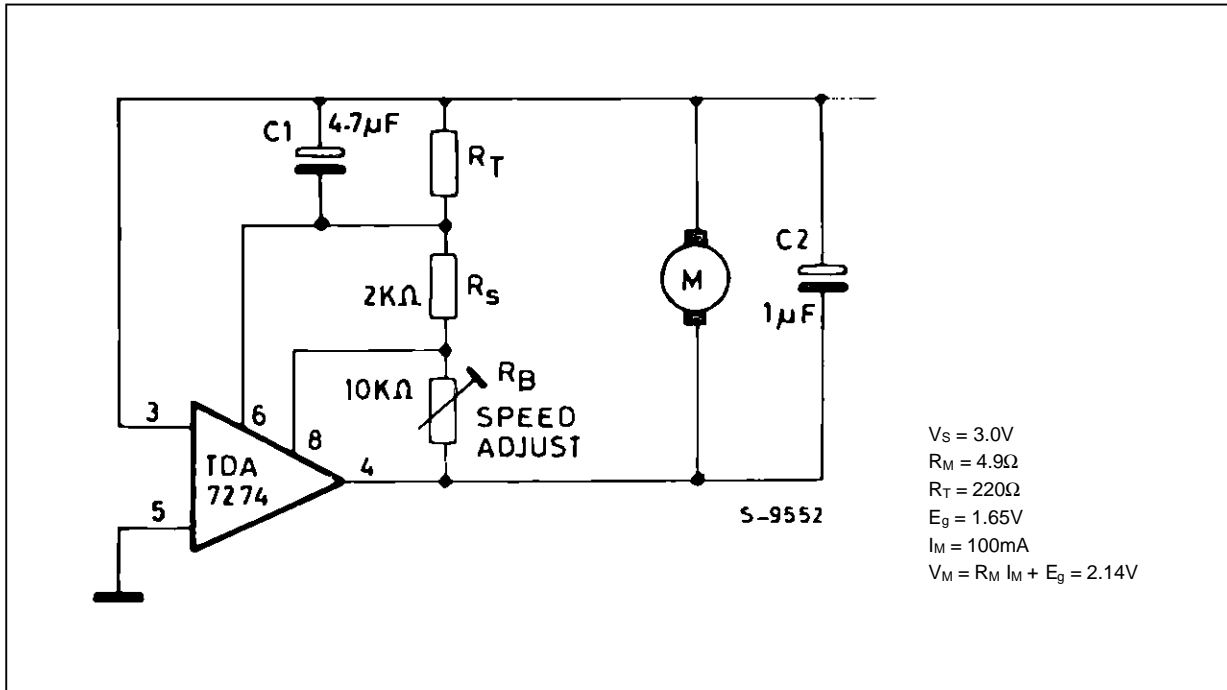


**PIN CONNECTION (top view)**

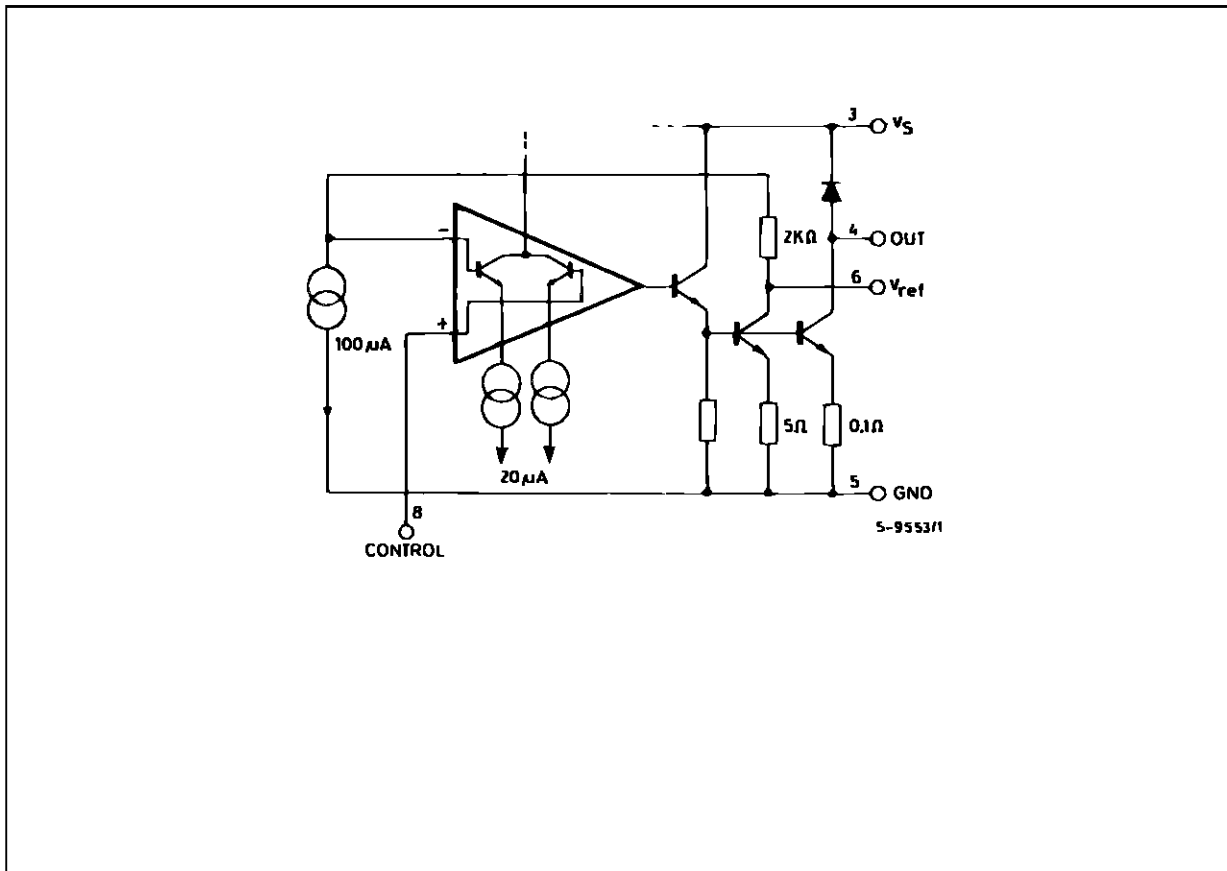


# TDA7274

## 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**

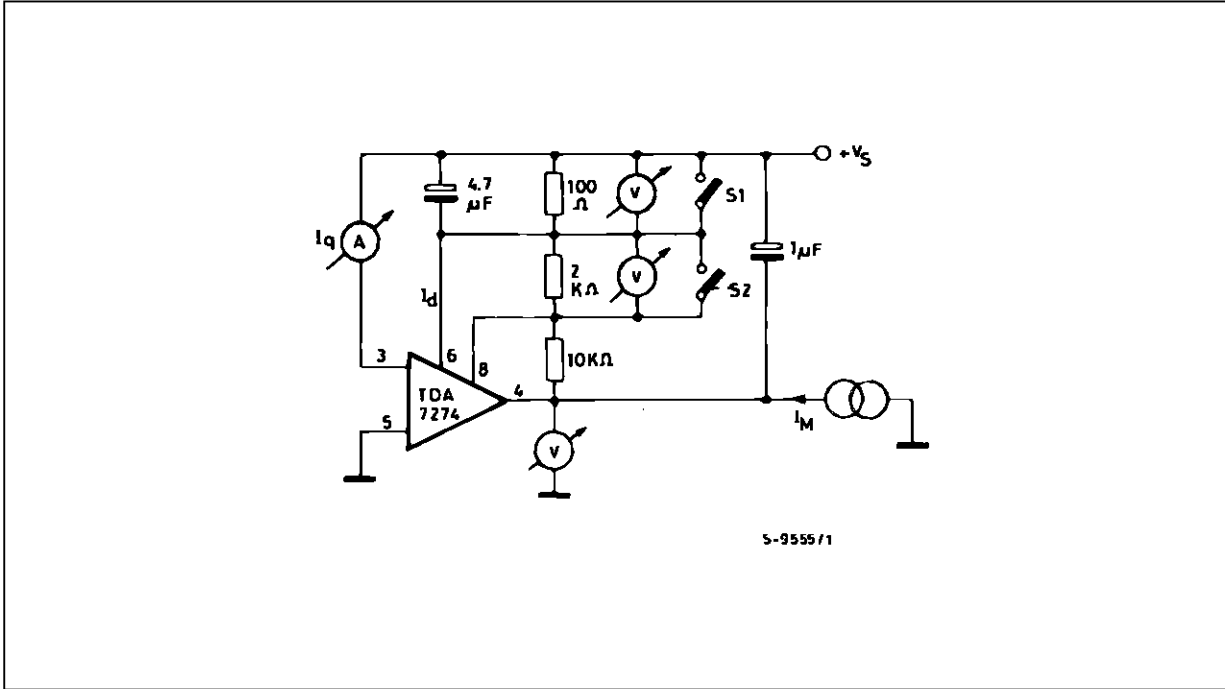
Symbol	Parameter	Value	Unit
$R_{th\ j-amb}$	Thermal Resistance Junction-ambient	Max. 100	$^\circ\text{C}/\text{W}$

**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-9555/1

Figure 2 : Quiescent Current vs. Supply Voltage.

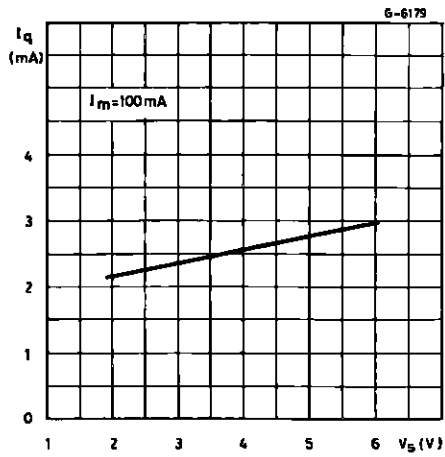


Figure 3 : Reference Voltage vs. Supply Voltage.

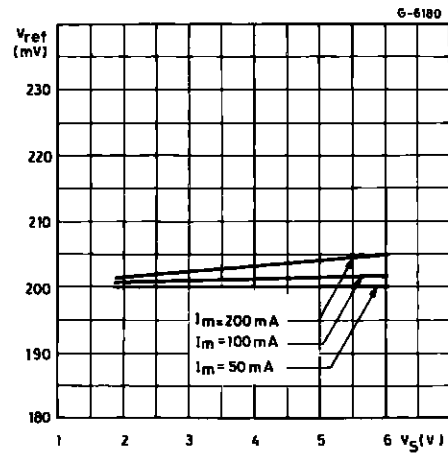


Figure 4 : Shunt Ratio vs. Supply Voltage.

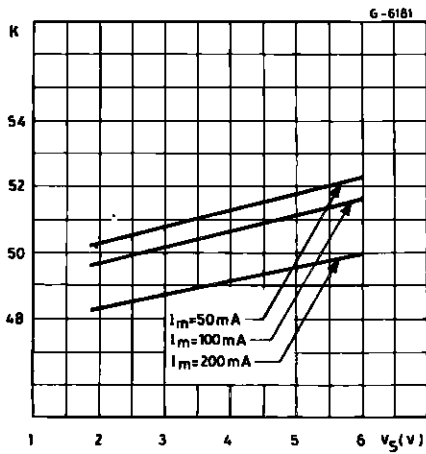


Figure 5 : Reference Voltage vs. Load Current.

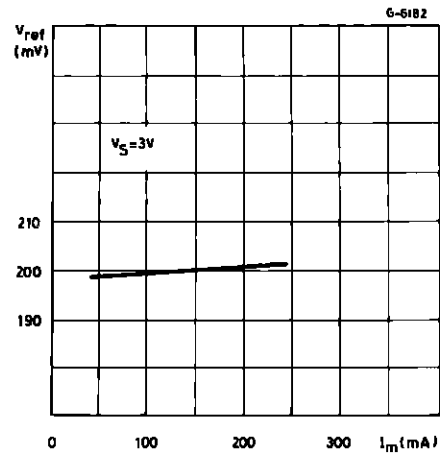


Figure 6 : Shunt Ratio vs. Load Current.

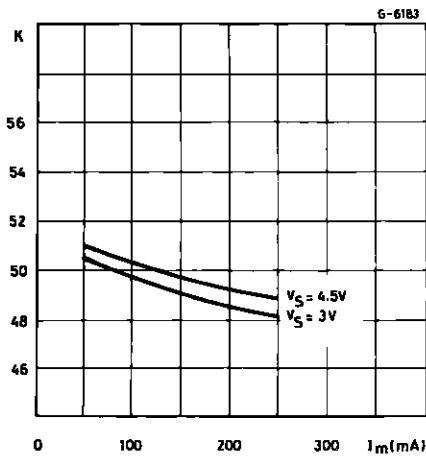


Figure 7 : Minimum Supply Voltage (typical) vs. Load Current.

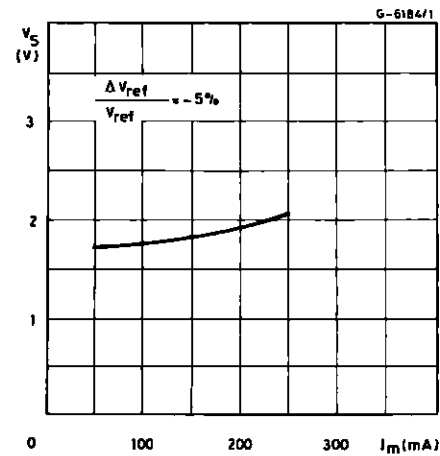


Figure 8 : Saturation Voltage vs. Load Current.

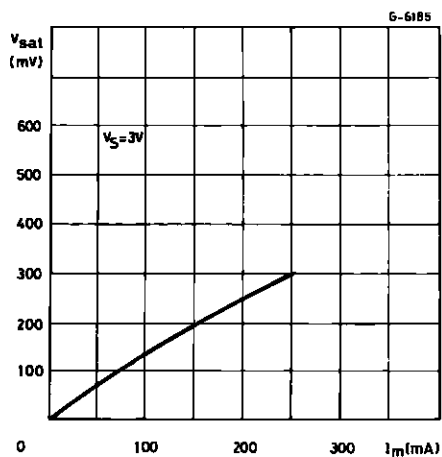


Figure 9 : Quiescent Current vs. Ambient Temperature.

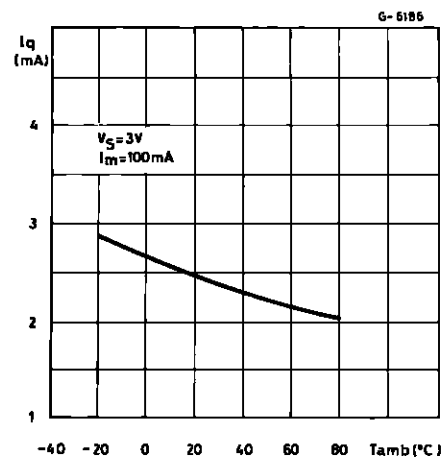


Figure 10 : Reference Voltage vs. Ambient Temperature.

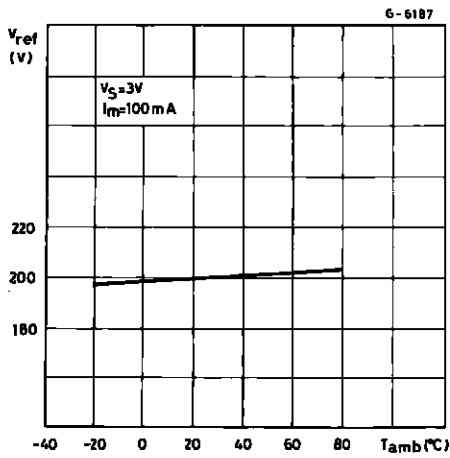


Figure 11 : Application Circuit.

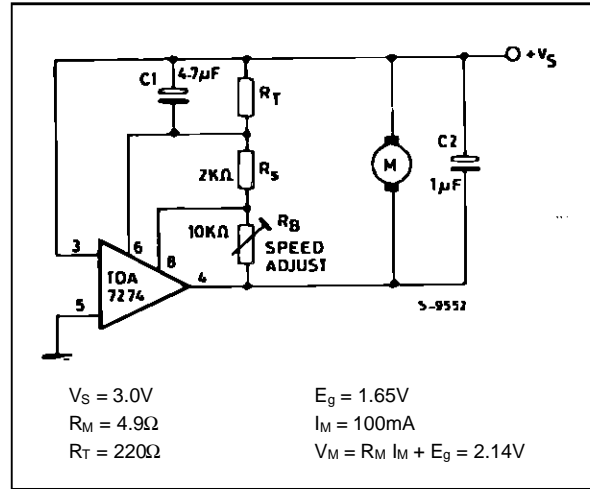


Figure 12 : P. C. Board and Components layout of the Circuit of fig. 11 (1 : 1 scale).

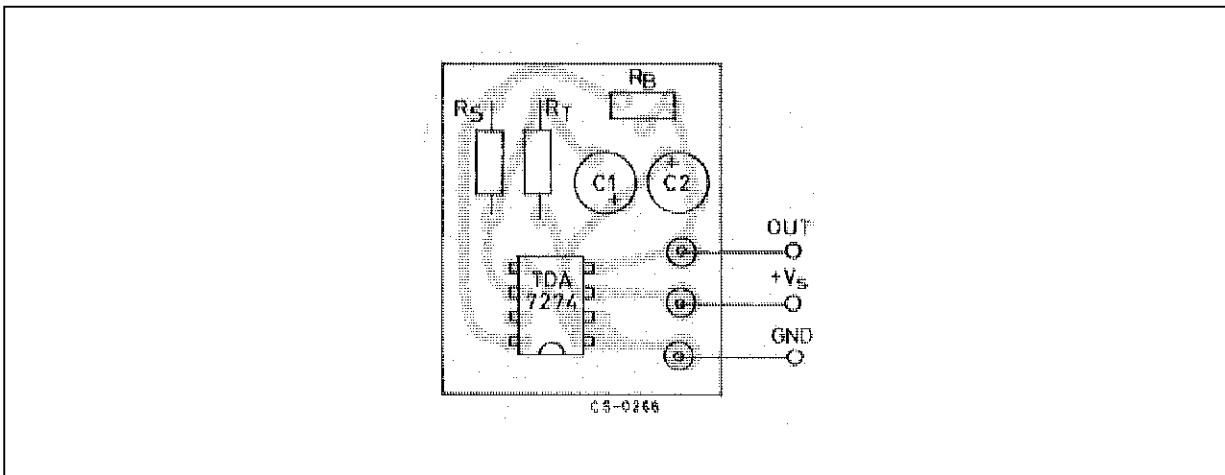


Figure 13 : Speed Variations vs. Supply Voltage.

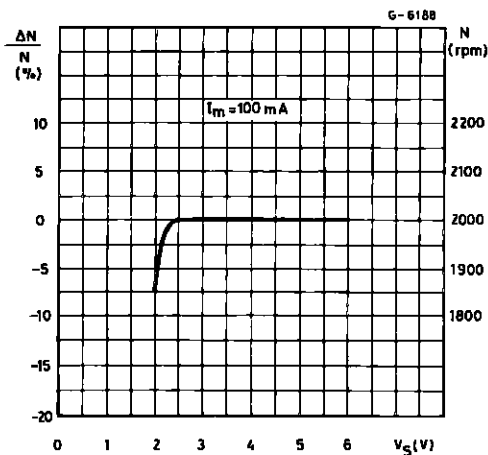
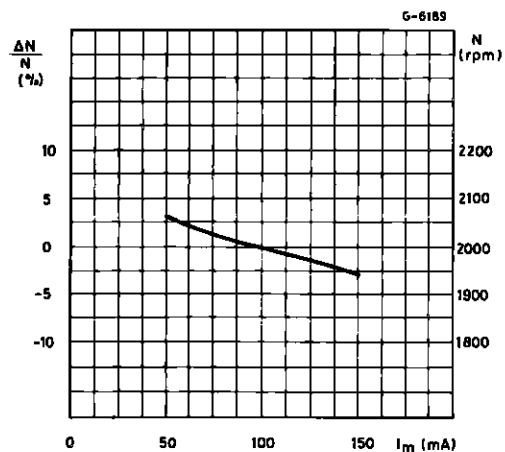
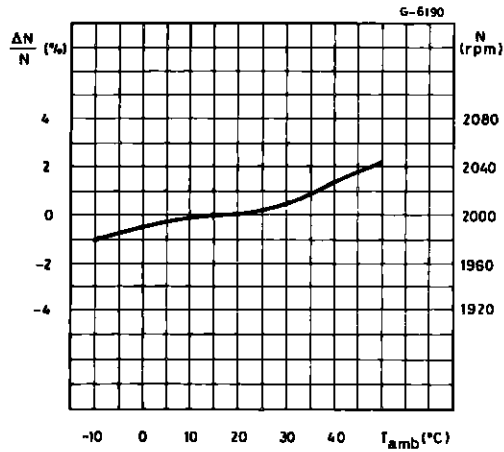


Figure 14 : Speed Variations vs. Motor Current.

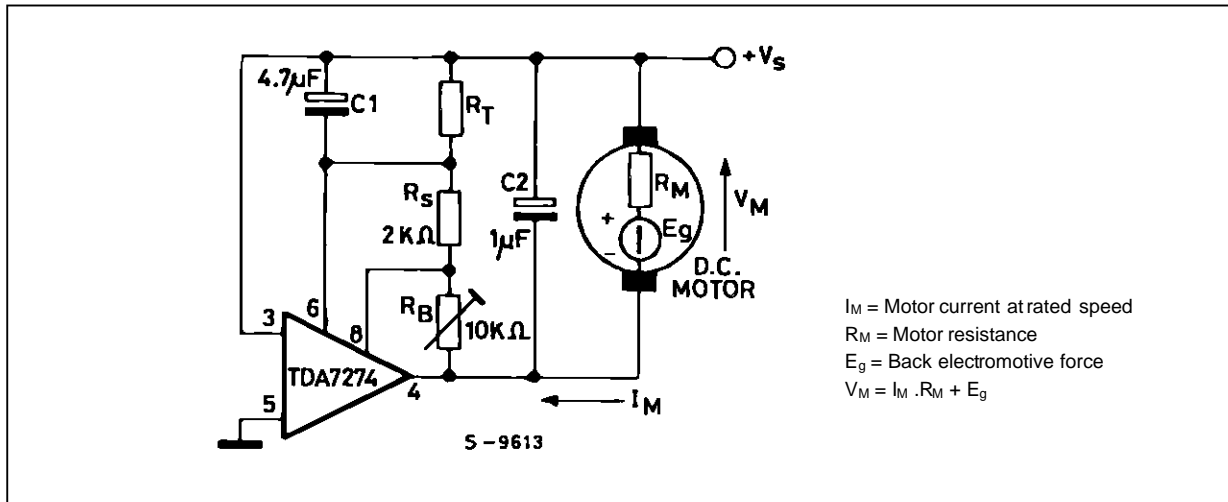


**Figure 15** : Speed Variations vs. Ambient Temperature.



**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.

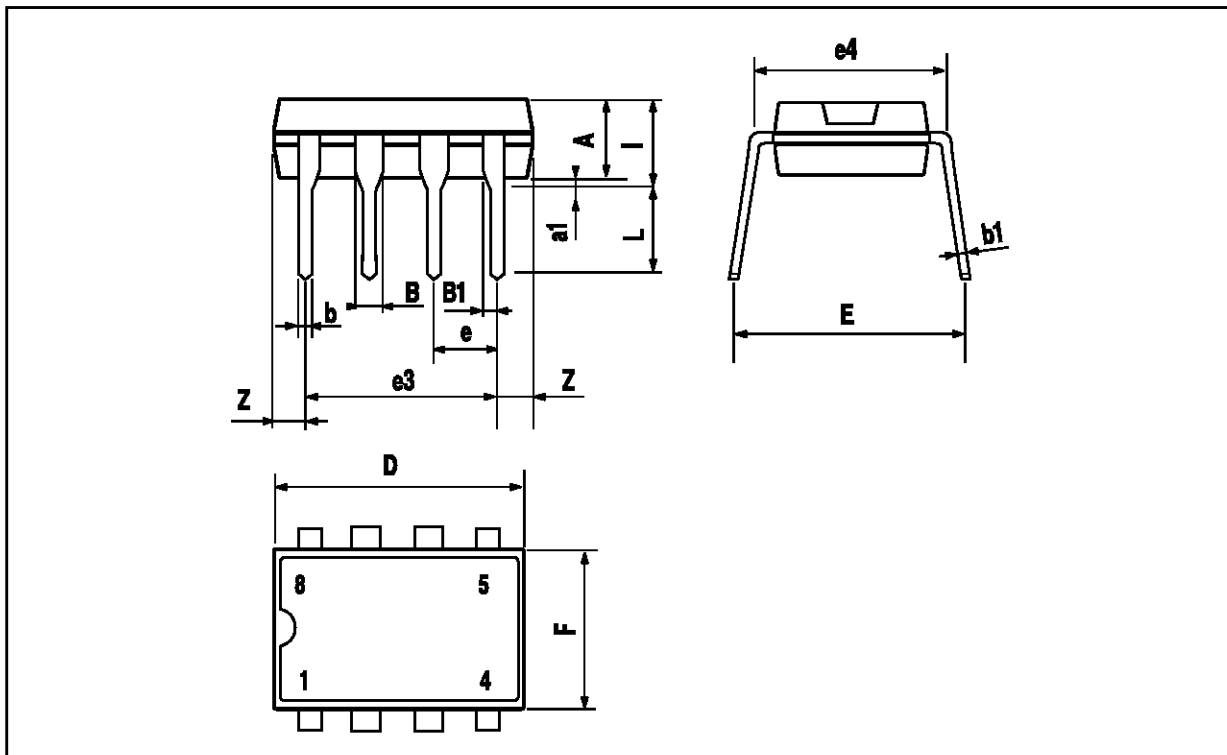
The values of  $C_1$  (4.7  $\mu F$  typ.) and  $C_2$  (1  $\mu F$  typ.) depend on the type of motor used.  $C_1$  adjusts motor spikes.  $C_2$  suppresses motor spikes.





## 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



Information furnished is believed to be accurate and reliable. However, SGS-THOMSON Microelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of SGS-THOMSON Microelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. SGS-THOMSON Microelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of SGS-THOMSON Microelectronics.

© 1994 SGS-THOMSON Microelectronics - All Rights Reserved

SGS-THOMSON Microelectronics GROUP OF COMPANIES

Australia - Brazil - France - Germany - Hong Kong - Italy - Japan - Korea - Malaysia - Malta - Morocco - The Netherlands - Singapore - Spain - Sweden - Switzerland - Taiwan - Thailand - United Kingdom - U.S.A.