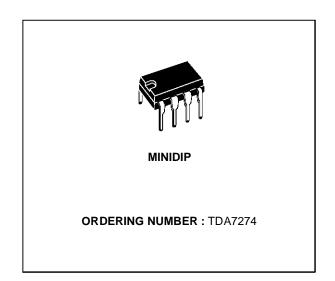


LOW-VOLTAGE DC MOTOR SPEED CONTROLLER

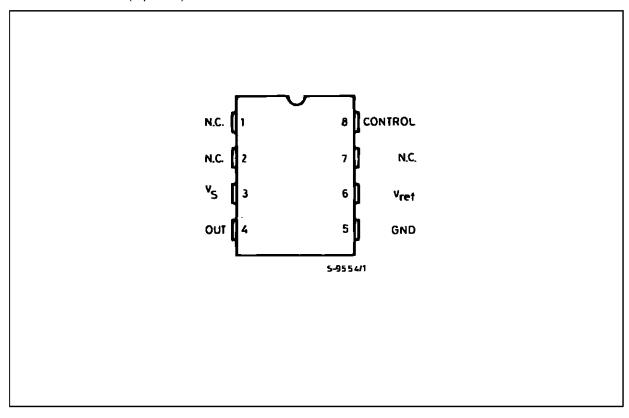
- WIDE OPERATING VOLTAGE RANGE (1.8 to 6 V)
- BUILT-IN LOW-VOLTAGE REFERENCE (0.2 V)
- LINEARITY IN SPEED ADJUSTMENT
- HIGH STABILITY VS. TEMPERATURE
- LOW NUMBER OF EXTERNAL PARTS

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 particulary suitable for low-voltage applications.

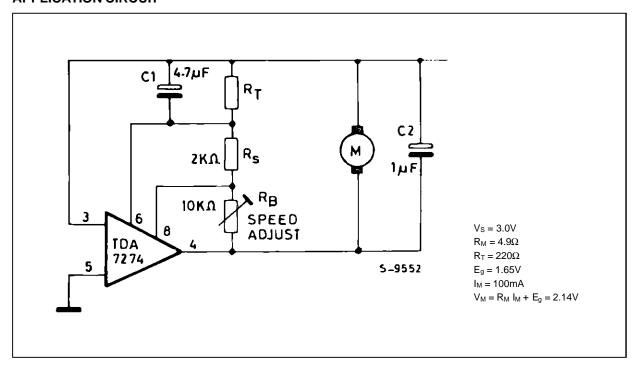


PIN CONNECTION (top view)

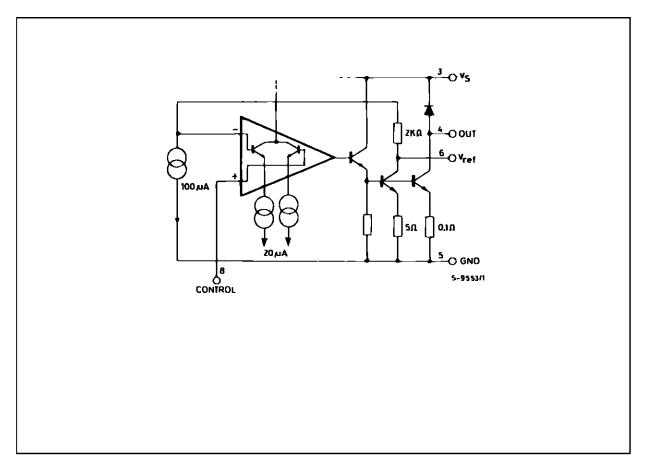


November 1988 1/10

APPLICATION CIRCUIT



SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
Vs	Supply Voltage	6	V
IM	Motor Current	700	mA
P _{tot}	Power Dissipation at T _{amb} = 25°C	1.25	w

THERMAL DATA

Symbol	Parameter	Value	Unit
R _{th j-amb}	Thermal Resistance Junction-ambient Max.	100	°C/W

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

Symbol	Parameter	Test Condition	Min.	Тур.	Max.	Unit
Vs	Supply Voltage Range		1.8		6	V
V _{ref}	Reference Voltage	I _M = 100mA	0.18	0.20	0.22	V
Iq	Quiescent Current			2.4	6.0	mA
I _d (Pin 6)	Quiescent Current			120		μА
К	Shunt Ratio	I _M = 100mA	45	50	55	_
V _{sat}	Residual Voltage	I _M = 100mA		0.13	0.3	V
$\frac{\Delta V_{ref}}{V_{ref}}/\Delta V_{S}$	Line Regulation	I _M = 100mA V _S = 1.8 to 6V		0.20		%/V
$\frac{\Delta K}{K}/\Delta V_S$	Voltage Characteristic of Shut Ratio	I _M = 100mA V _S = 1.8 to 6V		0.80		%/V
$\frac{\Delta V_{ref}}{V_{ref}}/\Delta I_{M}$	Load Regulation	I _M = 20 to 200mA		0.004		%/mA
$\frac{\Delta K}{K}/\Delta I_{M}$	Current Characteristic of Shut Ratio	I _M = 20 to 200mA		-0.03		%/mA
	Temperature Characteristic of Reference Voltage	I _M = 100mA Tamb = -20 to +60°C		0.04		%/°C
$\frac{\Delta K}{K}/\Delta T_{amb}$	Temperature Characteristic of Shut Ratio	I _M = 100mA Tamb = 20 to +60°C		0.02		%/°C

Figure 1 : Test Circuit.

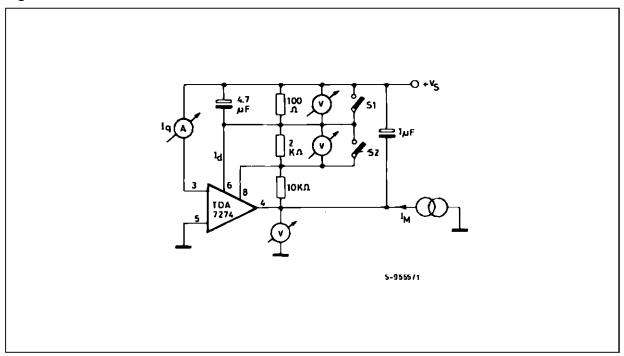


Figure 2 : Quiescent Current vs. Supply Voltage.

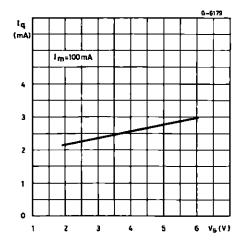


Figure 3: Reference Voltage vs. Supply Voltage.

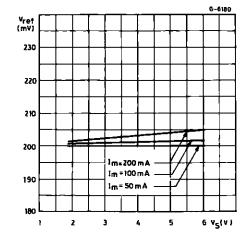


Figure 4: Shunt Ratio vs. Supply Voltage.

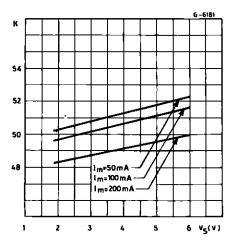


Figure 6: Shunt Ratio vs. Load Current.

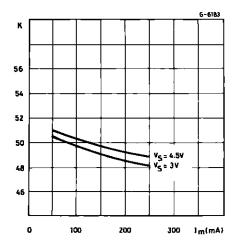


Figure 8: Saturation Voltage vs. Load Current.

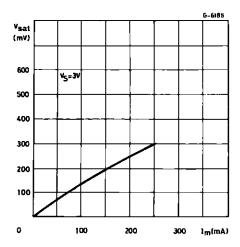


Figure 5: Reference Voltage vs. Load Current.

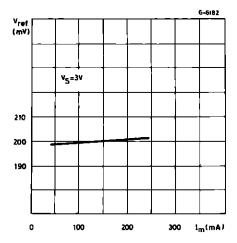


Figure 7: Minimum Supply Voltage (typical) vs. Load Current.

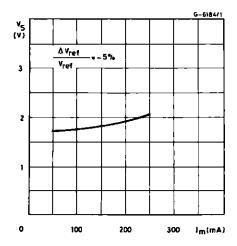


Figure 9: Quiescent Current vs. Ambient Temperature.

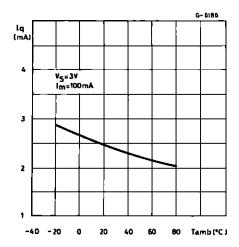


Figure 10: Reference Voltage vs. Ambient Temperature.

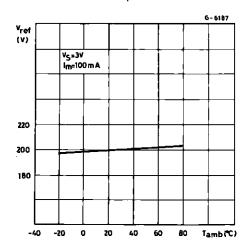


Figure 11: Application Circuit.

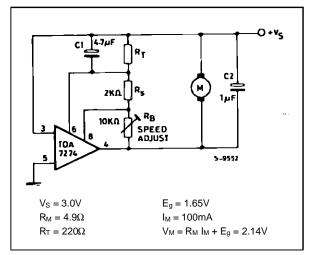


Figure 12: P. C. Board and Components layout of the Circuit of fig. 11 (1: 1 scale).

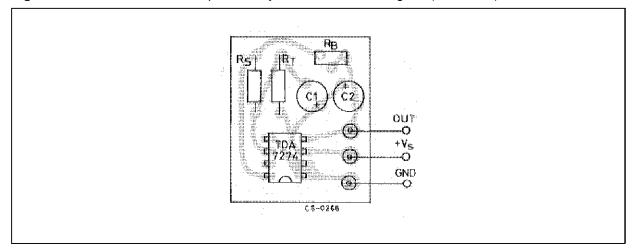


Figure 13: Speed Variations vs. Supply Voltage.

6-6188 (rpm)

10

10

10

10

10

2200

2100

2000

-5

-10

-15

-20

0

1 2 3 4 5 6 V₅(V)

Figure 14: Speed Variations vs. Motor Current.

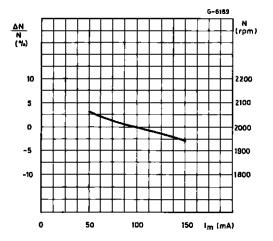
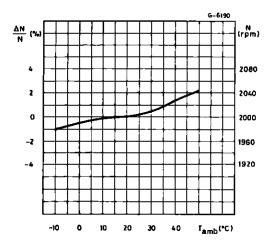
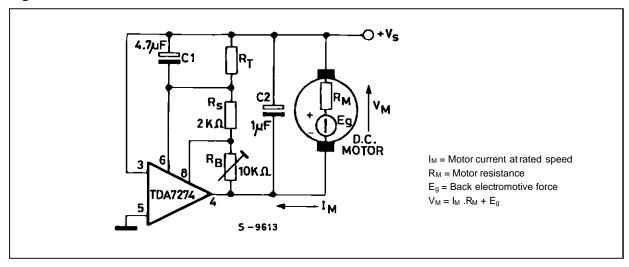


Figure 15: Speed Variations vs. Ambient Temperature.



APPLICATION INFORMATION

Figure 16.



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

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

 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 varing R_B .

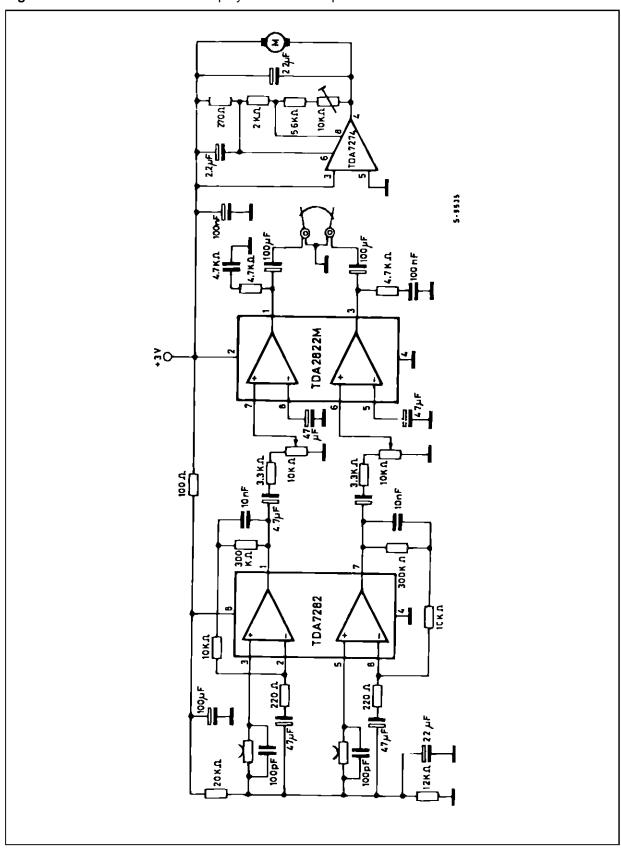
The value of R_T is calculated so that

$$R_{T \text{ (max.)}} < K_{\text{ (min.)}} \bullet R_{M \text{ (min.)}}$$

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

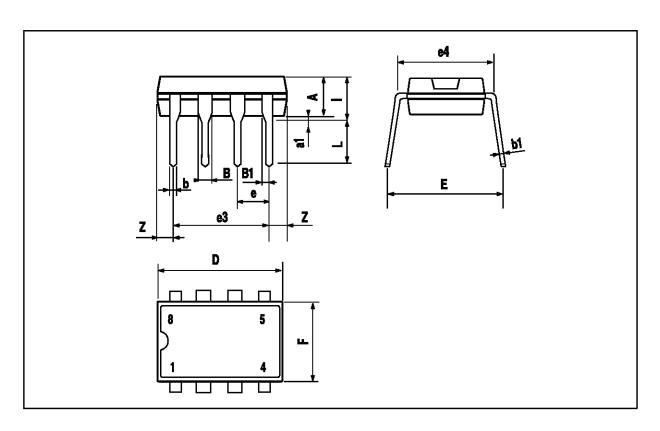
The values of C_1 (4.7 μF typ.) and C_2 (1 μF typ.) depend on the type of motor used. C_1 adjusts WOW and flutter of the system. C_2 suppresses motor spikes.

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



MINIDIP PACKAGE MECHANICAL DATA

DIM.		mm	inch			
Diwi.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
А		3.32			0.131	
a1	0.51			0.020		
В	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
Е	7.95		9.75	0.313		0.384
е		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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