



AN6651 LINEAR INTEGRATED CIRCUIT

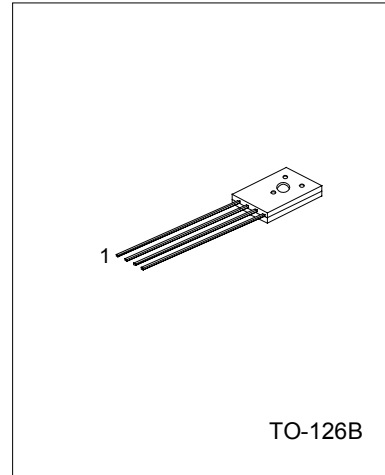
MOTOR SPEED CONTROL CIRCUIT

DESCRIPTION

The AN6651 is a monolithic integrated circuit designed for the rotating control of a compact DC motor which is used for a tape recorder, recorder player etc.

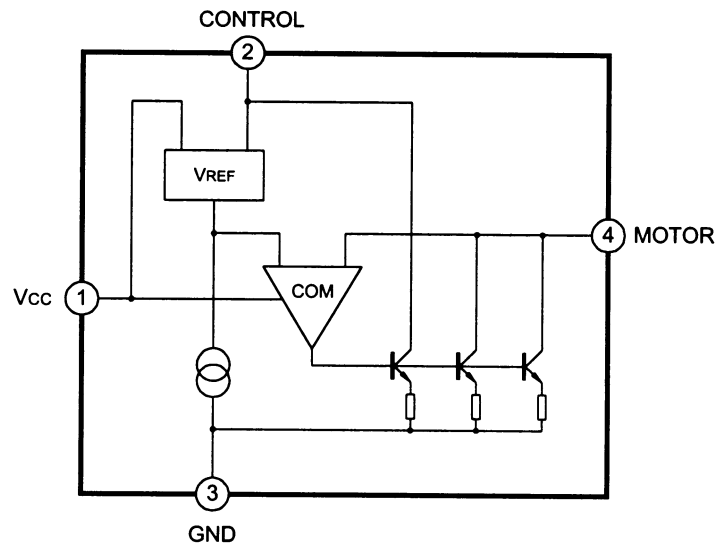
FEATURES

- *Wide operating supply voltage: $V_{cc}=3.5V \sim 14.4V$
- *Small four-lead plastic packer for compact motor.
- *Few external components
- *Stable low reference voltage (1.0V, typical)
- *Wide motor speed setting
- *Reverse voltage protection circuit built-in



1: Vcc 2: CONTROL 3: GND 4: MOTOR

BLOCK DIAGRAM



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ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

PARAMETER	SYMBOL	VALUE	UNIT
Supply Voltage	V _{CC}	14.4	V
Supply Current (note 1)	I _{CC}	2000	mA
Power Dissipation (Ta=25°C) (note 2)	P _D	1300	mW
Operating Temperature	T _{OPR}	-20 to +75	°C
Storage Temperature	T _{STG}	-40 to +150	°C
Terminal Voltage	V _{n-3} (n=1,2,4)	-0.5 to +14.4	V
Terminal Current	I ₁	150	mA
Terminal Current	I ₂	100	mA
Terminal Current (note 1)	I ₃	-2000 (MIN.)	mA
Terminal Current (note 1)	I ₄	1750	mA

Note 1: t ≤ 5 sec

Note 2: Ta=25°C, with a 10 x 10 mm bakelite PCB (3.5μm Cu leaf)

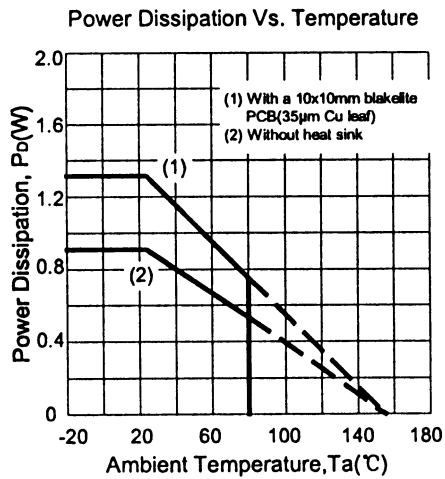
ELECTRICAL CHARACTERISTICS (Ta=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Reference Voltage	V _{ref}	V _{CC} =6V, Ra=1kΩ	0.85	1.00	1.15	V
Base Current	I _{bias}	V _{CC} =6V		0.8	1.8	mA
Current Proportional Constant	K	V _{CC} =6V, ΔI ₄ =40mA	35	40	45	
Saturation Voltage	V _{SAT}	V _{CC} =4.2V, Ra=5.0Ω		1.15	2.0	V
Voltage Characteristics 1	$\frac{\Delta V_{REF}}{V_{REF}} / \Delta V_{CC}$	V _{CC} =3.5V~14V Ra=1kΩ		-0.1		%/V
Voltage Characteristics 2	$\frac{\Delta K}{K} / \Delta V_{CC}$	V _{CC} =3.5V~14V ΔI ₄ =40mA		0.2		%/V
Current Characteristics 1	$\frac{\Delta V_{REF}}{V_{REF}} / \Delta I_4$	I ₄ =50mA~200mA		-0.02		%/mA
Current Characteristics 2	$\frac{\Delta K}{K} / \Delta I_4$	I ₄ =50mA~200mA		-0.01		%/mA
Temperature Characteristics 1	$\frac{\Delta V_{REF}}{V_{REF}} / \Delta T_a$	Ta=-20~+75°C V _{CC} =6V Ra=1kΩ		0.01		%/°C

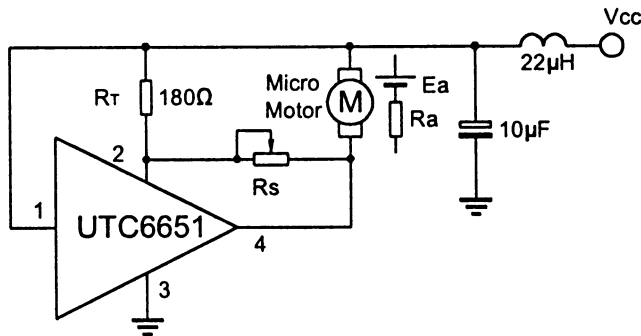
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PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Temperature Characteristics 2	$\frac{\Delta K}{K}$ ΔT_a	$T_a = -20 \sim +75^\circ\text{C}$ $\Delta I_4 = 40\text{mA}$		0.01		%/ $^\circ\text{C}$

CHARACTERISTICS CURVE



APPLICATION CIRCUIT



Motor Constant:

K_a -- Electromotive force constant=1.1mV/rpm

R_a -- Internal Resistor=5Ω

K_T =Torque Constant=100g.cm/A