



# AN6652

## LINEAR INTEGRATED CIRCUIT

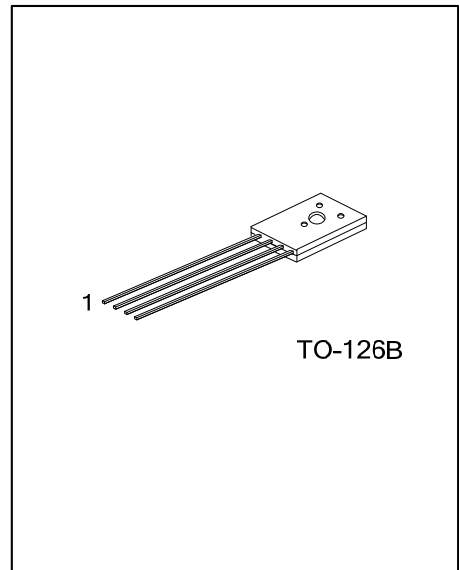
### MOTOR CONTROL CIRCUIT

#### DESCRIPTION

The UTC **AN6652** is an IC designed for the rotating speed control of a compact DC motor, which is used for a tape recorder, record player, etc.

#### FEATURES

- \*Small four-lead plastic package for compact motor. Fewer external parts.
- \*Stable low reference voltage (1.25V typ.), wide motor speed setting
- \*Highly stable operation over a wide range of supply voltage and torque supply voltage,  $V_{cc}=6V\sim 20V$
- \*Reverse voltage protection circuit is built-in.

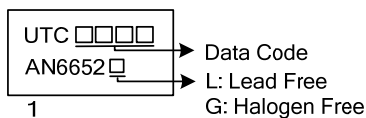


#### ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
AN6652L-T6B-K	AN6652G-T6B-K	TO-126B	Bulk
AN6652L-T6B-K	AN6652G-T6B-K	TO-126B	Bulk

<p>AN6652L-T6B-K</p> <p>(1) Packing Type (2) Package Type (3) Green Package</p>	<p>(1) K: Bulk (2) T6B: TO-126B (3) L: Lead Free, G: Halogen Free and Lead Free</p>
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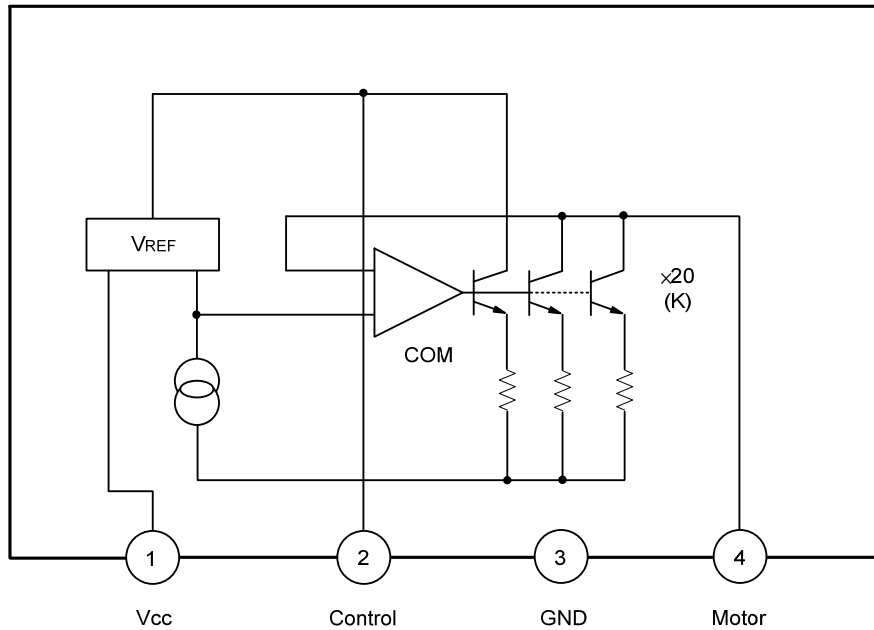
#### MARKING



## ■ PIN DESCRIPTIONS

PIN NO.	PIN NAME	PIN FUNCTION
1	V <sub>CC</sub>	Supply Voltage
2	CONTROL	Control signal input
3	GND	GND
4	MOTOR	Connected to the motor.

## ■ BLOCK DIAGRAM



■ **ABSOLUTE MAXIMUM RATINGS** ( $T_A = 25^\circ\text{C}$ , unless otherwise specified)

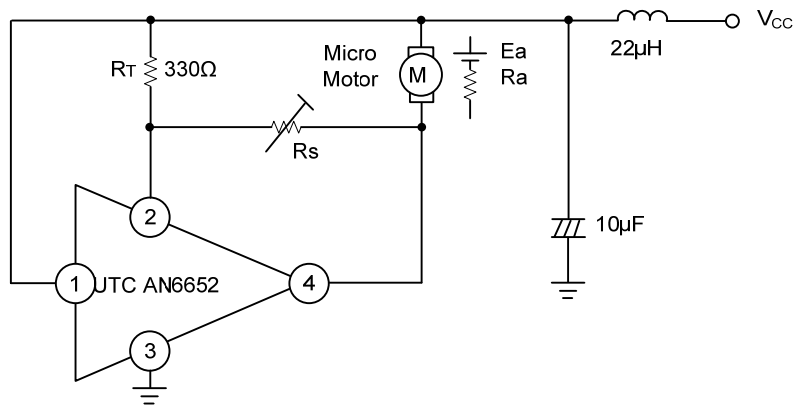
PARAMETER	SYMBOL	RATINGS	UNITS
Supply Voltage	$V_{CC}$	22	V
Supply Current	$I_{CC}$	1.5	A
Power Dissipation	$P_D$	1.3	W
Operating Temperature	$T_{OPR}$	-20 ~ +75	$^\circ\text{C}$
Storage Temperature	$T_{STG}$	-40 ~ +150	$^\circ\text{C}$

Note Absolute maximum ratings are those values beyond which the device could be permanently damaged.  
Absolute maximum ratings are stress ratings only and functional device operation is not implied.

■ **ELECTRICAL CHARACTERISTICS** ( $T_A = 25^\circ\text{C}$ , unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNITS
Reference Voltage	$V_{REF}$	$V_{CC}=12\text{V}$ , $R_a=1\text{k}\Omega$	1.15	1.25	1.40	V
Base Current	$I_{BIAS}$	$V_{CC}=12\text{V}$		0.1	1	mA
Current Proportional Constant	K	$V_{CC}=12\text{V}$ , $I_{I4}=20\text{mA}$	16	20	22	
Saturation Voltage	$V_{SAT}$	$V_{CC}=8.0\text{V}$ , $R_a=18\Omega$		1	2	V
Voltage Characteristics 1	$\frac{\Delta V_{REF} / V_{REF}}{\Delta V_{CC}}$	$V_{CC}=9\text{V}\sim 16\text{V}$ , $R_a=1\text{k}\Omega$	-0.6	-0.02	0.6	%V
Voltage Characteristics 2	$\frac{\Delta K / K}{\Delta V_{CC}}$	$V_{CC}=9\text{V}\sim 16\text{V}$ , $I_{I4}=20\text{mA}$	-0.7	0.2	0.7	
Current Characteristics 1	$\frac{\Delta V_{REF} / V_{REF}}{\Delta I_4}$	$I_4=10\text{mA} \sim 50\text{mA}$	-0.1	-0.03	0.1	%mA
Current Characteristics 2	$\frac{\Delta K / K}{\Delta I_4}$	$I_4=50\text{mA}\sim 100\text{mA}$	-0.15	-0.01	0.15	
Temperature Characteristics 1	$\frac{\Delta V_{REF} / V_{REF}}{\Delta T_A}$	$T_A=-20^\circ\text{C} \sim +75^\circ\text{C}$ , $V_{CC}=12\text{V}$ , $R_a=1\text{k}\Omega$		0.01		%/ $^\circ\text{C}$
Temperature Characteristics 2	$\frac{\Delta K / K}{\Delta T_A}$	$T_A=-20^\circ\text{C} \sim +75^\circ\text{C}$ , $I_{I4}=20\text{mA}$		0.01		

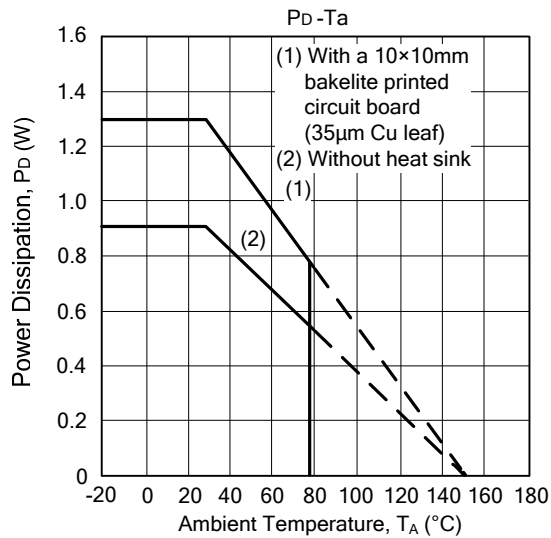
## ■ TYPICAL APPLICATION CIRCUIT



Motor Constants

{	Ka: Generation constant = 2.4mV/rpm
	Ra: Internal resistor = 18Ω
	Kt: Torque constant = 200g · cm/A

■ TYPICAL CHARACTERISTICS



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