

AN6652

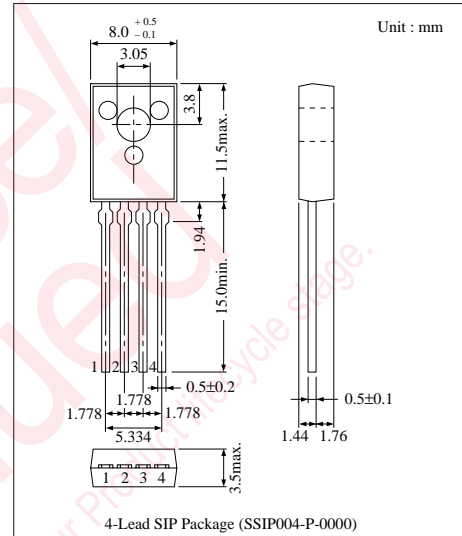
Motor Control Circuit

■ Overview

The 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

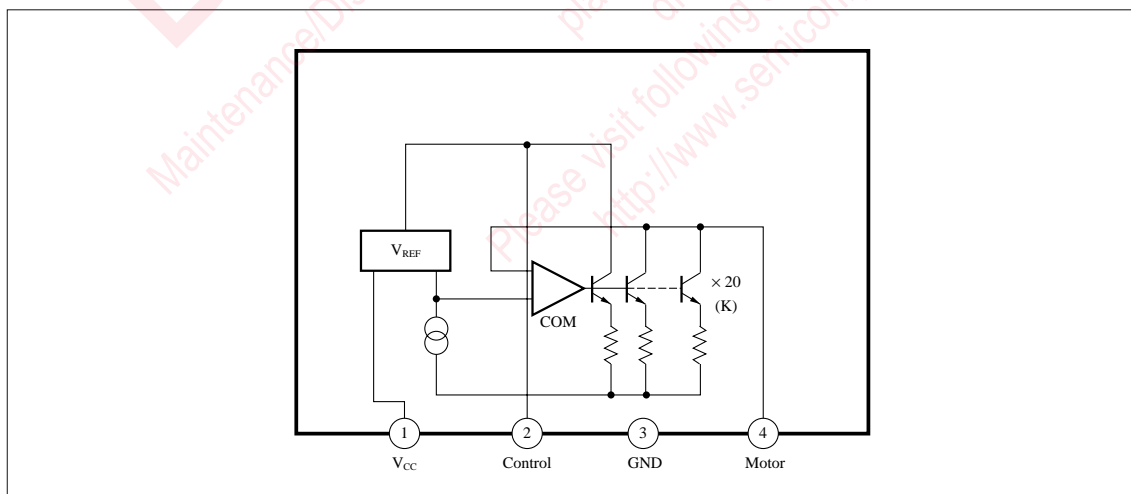
- Small four-lead plastic package for compact motor.
Fewer external parts
- Stable low reference voltage (1.25V typ.), wide motor speed setting
- Highly stable operation over a wide range of supply voltage and torque supply voltage, $V_{CC} = 6V \sim 20V$
- Reverse voltage protection circuit is built-in



■ Pin Descriptions

Pin No.	Pin Name
1	V _{CC}
2	Control Pin
3	GND
4	Motor Pin

■ Block Diagram



■ Absolute Maximum Ratings (Ta= 25°C)

Parameter	Symbol	Rating	Unit
Supply Voltage	V _{CC}	22	V
Supply Current	I _{CC} *2	1500	mA
Power Dissipation	P _D *1	1300	mW
Operating Ambient Temperature	T _{opr}	-20 ~ + 75	°C
Storage Temperature	T _{stg}	- 40 ~ +150	°C

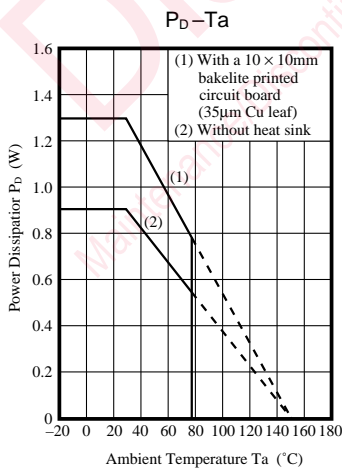
*1 Ta = 25°C, With a 10 × 10mm bakelite printed circuit board (35μm Cu leaf)

*2 t ≤ 5s

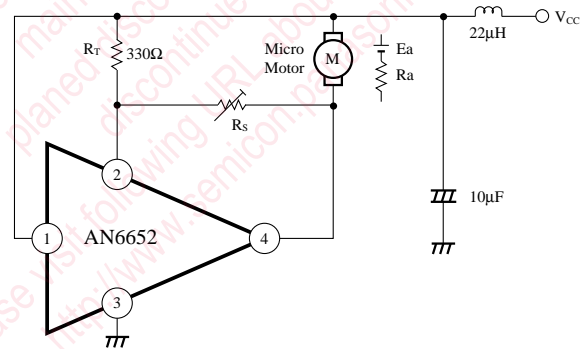
■ Electrical Characteristics (Ta = 25°C)

Parameter	Symbol	Condition	min.	typ.	max.	Unit
Reference Voltage	V _{REF}	V _{CC} = 12V, Ra = 1kΩ	1.15	1.25	1.40	V
Bias Current	I _{Bias}	V _{CC} = 12V	—	0.1	1	mA
Current Proportional Constant	K	V _{CC} = 12V, DI ₄ = 20mA	18	20	22	
Saturation Voltage	V _{sat}	V _{CC} = 8.0V, Ra = 18Ω	—	1	2	V
Voltage Characteristics (1)	$\frac{\Delta V_{REF}}{V_{REF}} / V_{CC}$	V _{CC} = 9V ~ 16V, Ra = 1kΩ	-0.6	-0.02	0.6	%/V
Voltage Characteristics (2)	$\frac{\Delta K}{K} / V_{CC}$	V _{CC} = 9V ~ 16V, DI ₄ = 20mA	-0.7	0.2	0.7	%/V
Current Characteristics (1)	$\frac{\Delta V_{REF}}{V_{REF}} / I_4$	I ₄ = 10mA ~ 50mA	-0.1	-0.03	0.1	%/mA
Current Characteristics (2)	$\frac{\Delta K}{K} / I_4$	I ₄ = 50mA ~ 100mA	-0.15	-0.01	0.15	%/mA
Temperature Characteristics (1)	$\frac{\Delta V_{REF}}{V_{REF}} / Ta$	Ta = -20°C + 75°C, V _{CC} = 12V, Ra = 1kΩ	—	0.01	—	%/°C
Temperature Characteristics (2)	$\frac{\Delta K}{K} / Ta$	Ta = -20°C + 75°C, DI ₄ = 20mA	—	0.01	—	%/°C

■ Characteristics Curve



■ Application Circuit



Motor Constants {
 K_a : Generation constant=2.4mV/rpm
 R_a : Internal resistor=18Ω
 K_T : Torque constant=200g · cm/A

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