MOTOR CONTROL CIRCUIT AM6651B

General Description

The AM6651B is a monolithic integrated circuit that provides motor speed control, reverse voltage protection, and stable reference voltage. This IC is specially designed for tape recorder and recorder player.

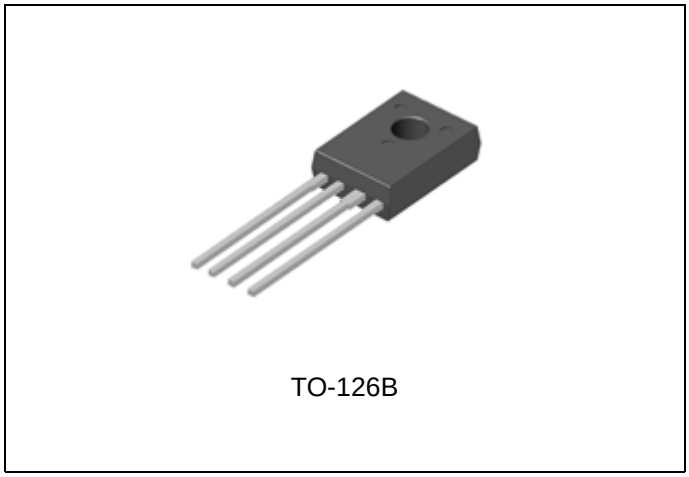
The AM6651B is available in plastic TO-126B package.

Features

- Small 4-lead Plastic Package for Compact Motor
- Few External Components
- Stable Low Reference Voltage (1.0V, Typ)
- Wide Motor Speed Control
- Highly Stable Operation over a Wide Range of Supply Voltage, V_{CC}=3.5V to 14.4V
- Reverse Voltage Protection Circuit Built-in

Applications

- Tape Recorder
- Recorder Player



TO-126B

Figure 1. Package Type of AM6651B

Pin Configuration

U Package
(TO-126B)

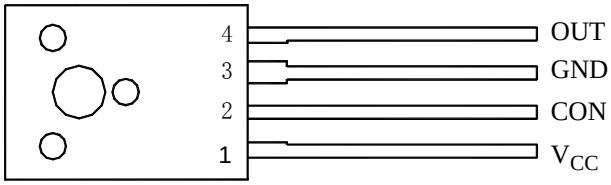


Figure 2. Pin Configuration of AM6651B (Top View)

Pin Description

Pin Number	Pin Name	Function
1	V_{CC}	Supply voltage
2	CON	Control pin
3	GND	Ground
4	OUT	Output

Functional Block Diagram

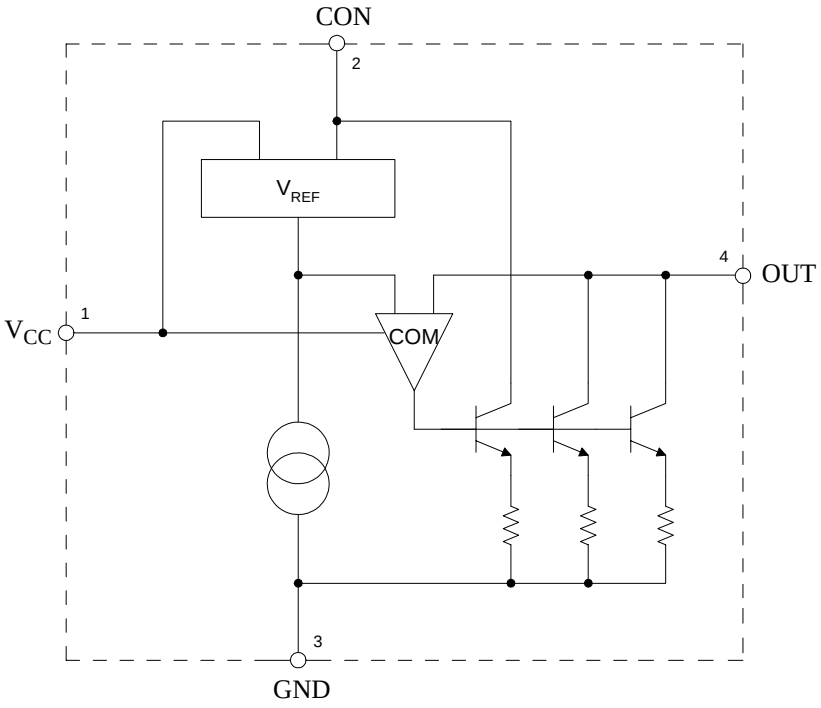
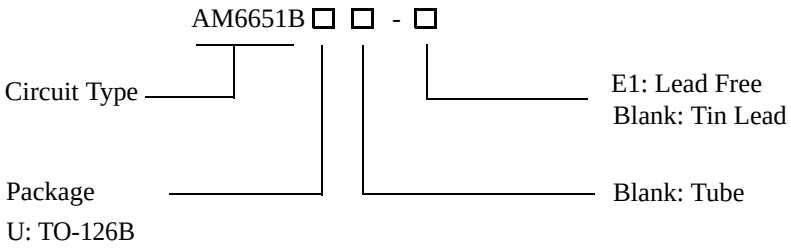


Figure 3. Functional Block Diagram of AM6651B

MOTOR CONTROL CIRCUIT AM6651B

Ordering Information



Package	Temperature Range	Part Number		Marking ID		Packing Type
		Tin Lead	Lead Free	Tin Lead	Lead Free	
TO-126B	0 to 70 ℃	AM6651BU	AM6651BU-E1	AM6651BU	AM6651BU-E1	Tube

BCD Semiconductor's Pb-free products, as designated with "E1" suffix in the part number, are RoHS compliant.

Absolute Maximum Ratings (Note 1)

Parameter	Symbol	Value	Unit
Supply Voltage	V_{CC}	16	V
Supply Current	I_{CC}	500 (Note 2)	mA
Power Dissipation	P_D	1300	mW
Storage Temperature Range	T_{STG}	-40 to 150	℃

Note 1: Stresses greater than those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under "Recommended Operating Conditions" is not implied. Exposure to "Absolute Maximum Ratings" for extended periods may affect device reliability.
Note 2: The transient startup/shutdown current is allowed to exceed 1.0A.

Recommended Operating Conditions

Parameter	Symbol	Min	Max	Unit
Supply Voltage	V_{CC}	3.5	14.4	V
Operating Temperature	T_A	0	70	℃

Electrical Characteristics

(V_{CC}=6V, T_A=25°C, unless otherwise specified.)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Reference Voltage	V_{REF}	V_{CC}=6V, R_A=1kΩ (Figure 6)	0.90	1.0	1.10	V
Bias Current	I_{BIAS}	V_{CC}=6V (Figure 5)		0.9	1.8	mA
Current Coefficient	K	V_{CC}=6V, ΔI_4=40mA (Figure 4) (Note 3)	35		45	
Saturation Voltage	V_{SAT}	V_{CC}=4.2V, R_A=5Ω		1.06	2	V
Voltage Characteristic of Reference Voltage	$(\Delta V_{REF}/V_{REF})/\Delta V_{CC}$	V_{CC}=3.5 to 14V, R_A=1kΩ		-0.02		%/V
Voltage Characteristic of Current Coefficient	$(\Delta K/K)/\Delta V_{CC}$	V_{CC}=3.5 to 14V, ΔI_4=40mA		0.39		%/V
Current Characteristic of Reference Voltage	$(\Delta V_{REF}/V_{REF})/\Delta I_4$	I_4=50 to 200mA		-0.06		%/mA
Current Characteristic of Current Coefficient	$(\Delta K/K)/\Delta I_4$	I_4=50 to 200mA		-0.01		%/mA
Temperature Characteristic of Reference Voltage	$(\Delta V_{REF}/V_{REF})/\Delta T_A$	V_{CC}=6V, R_A=1kΩ T_A=0 to 70 ℃		0.01		%/ ℃
Temperature Characteristic of Current Coefficient	$(\Delta K/K)/\Delta T_A$	V_{CC}=6V, ΔI_4=40mA T_A=0 to 70 ℃		0.01		%/ ℃

Note 3: I_4 is the motor driver current, please see Figures 4 and 5.

Test Circuits

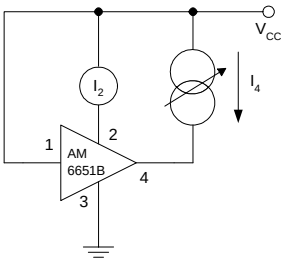


Figure 4. Test Circuit 1 ($K = \Delta I_4/\Delta I_2$)

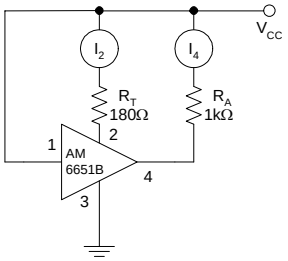


Figure 5. Test Circuit 2 ($I_{BIAS}=I_2-I_4/K$)

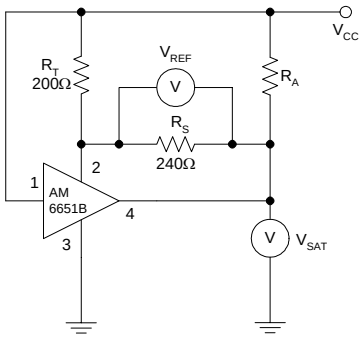
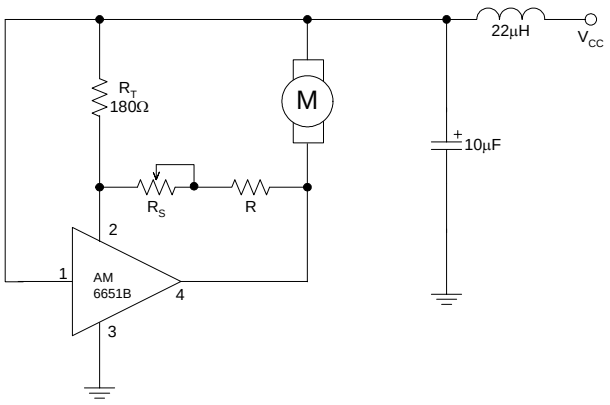


Figure 6. Test Circuit 3

Typical Application

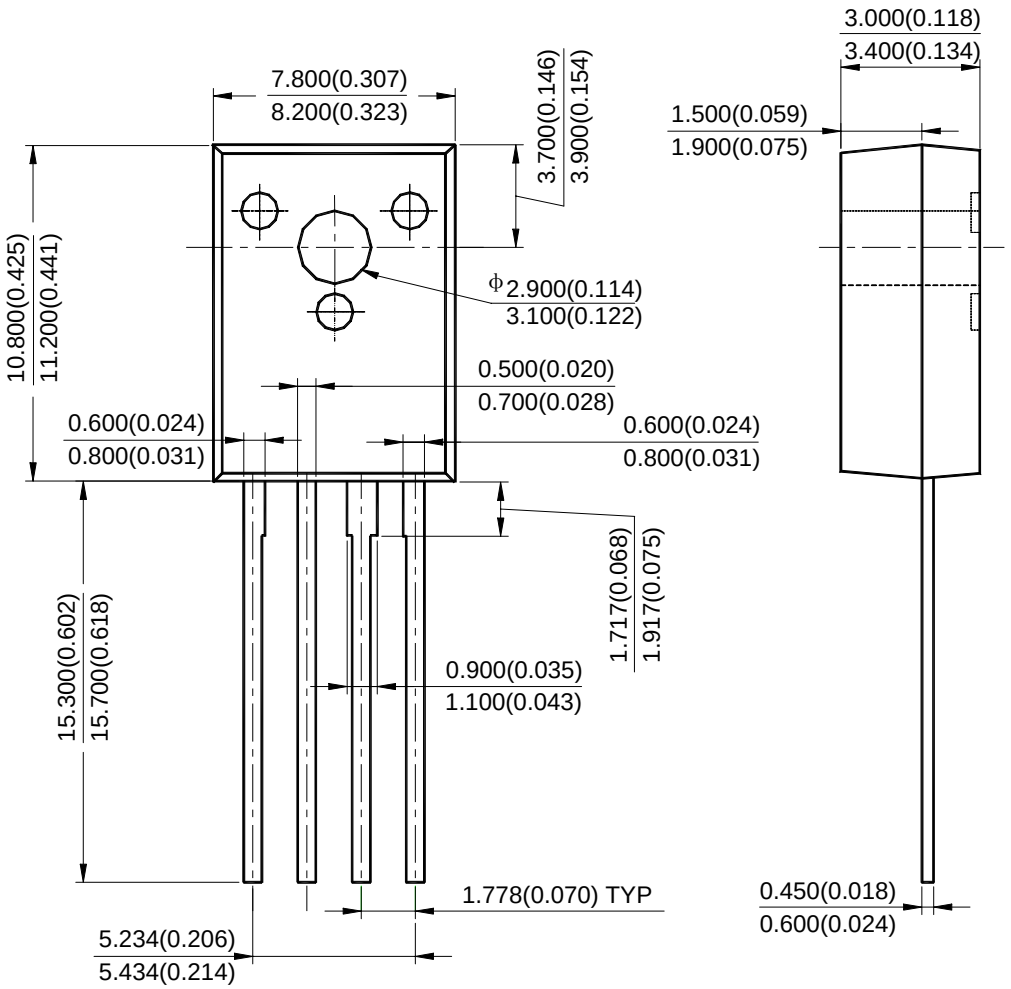


Motor (6V DC Motor) constants
K_A: Electromotive force constant
= 1.1mV/rpm
R_A: Internal resistor = 5Ω
K_T: Torque constant = 100g.cm/A

Figure 7. Typical Application of AM6651B

Mechanical Dimensions

TO-126B **Unit: mm(inch)**



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