AN6610

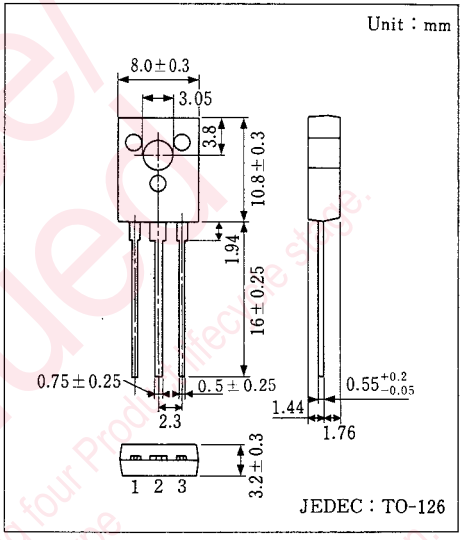
Motor Control Circuit

■ Outline

The AN6610 is an integrated circuit designed for the rotation control of a compact DC motor which is used for a tape recorder, record player, etc.

■ Features

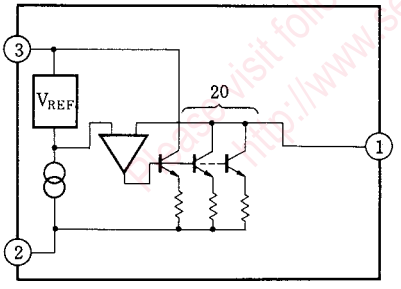
- Small, three-lead plastic package for compact motor
- Large starting torque.
- Wide range of operating voltage.
- Stable standard voltage : V_{CC}=4.5~16V.
- Highly stable operation over a wide range of supply voltages and temperature.



■ Pin

Pin No.	Pin Name
1	Motor Pin
2	GND
3	Control Pin

■ Block Diagram



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■ Absolute Maximum Ratings (Ta=25℃)

Item	Symbol	Rating	Unit
Supply Voltage	V_{CC}	16*1	V
Supply Current	I_{CC}	1000	mA
Power Dissipation	P_D	1300*2	mW
Operating Ambient Temperature	T_{opr}	−20～+70	℃
Storage Temperature	T_{stg}	−40～+150	℃

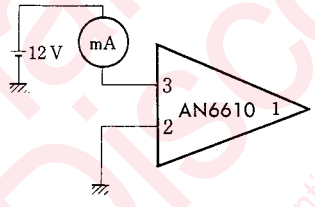
*1 Voltage is not directly applied to IC pin. Apply 14.4V to it, if necessary.
*2 T_a=25℃, With a 10×10 mm bakelite printed circuit board (35 μm Cu leaf).

■ Electrical Characteristics (Ta=25℃)

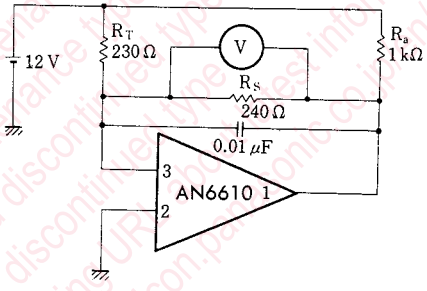
Item	Symbol	Test Circuit	Condition	min.	typ.	max.	Unit
Static Circuit Current	I_{CQ}	1	V_{CC}=12V, I_1=0			2.4	mA
Reference Voltage	V_{3-1}	2	V_{CC}=12V, R_a=1kΩ	1.07	1.22	1.37	V
Starting Current	I_a	3	V_{CC}=4.5V, R_a=5Ω	450			mA
Voltage Variation Characteristics for Rotating Speed	$\lvert\Delta N_V\rvert$	4	V_{CC}=10V～16V			20	rpm/V
Time Drift Characteristics for Rotating Speed	ΔN_T	4	V_{CC}=12V, I_{CC}=64mA		−0.2		%
Temperature Variation Characteristics for Rotating Speed	ΔN_A*	4	V_{CC}=12V, T_a=−10℃～60℃		±50		ppm/℃

*In case that only IC temperature is changed.

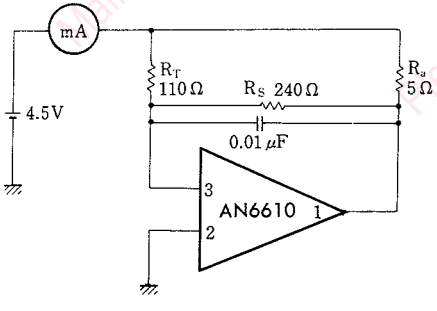
Test Circuit 1 (I_{CQ})



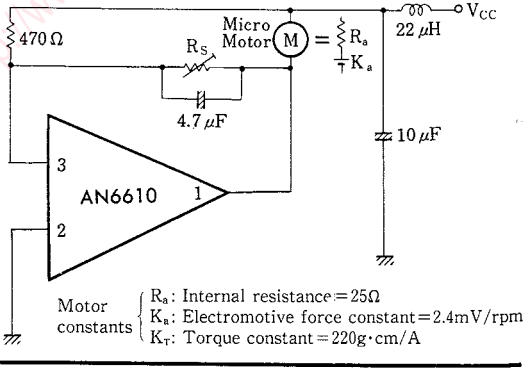
Test Circuit 2 (V_{3-1})



Test Circuit 3 (I_a)



Test Circuit 4 ($|\Delta N_V|$, ΔN_T, ΔN_A)



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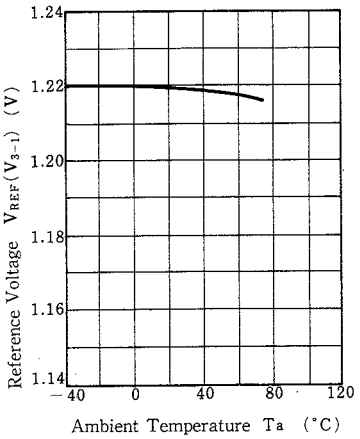
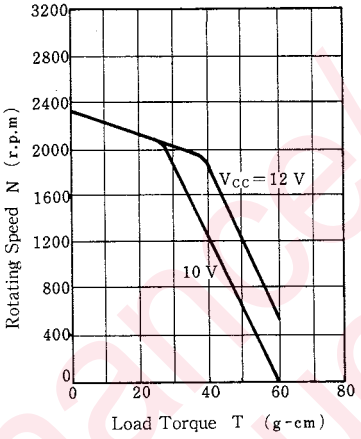
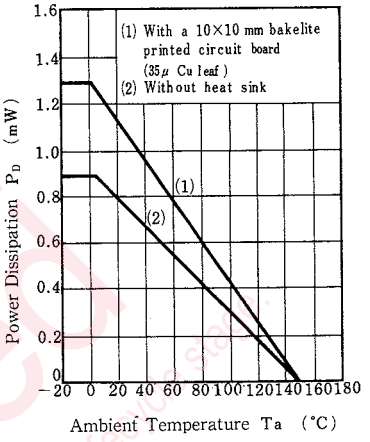
$V_{REF}(V_{3-1})-Ta$



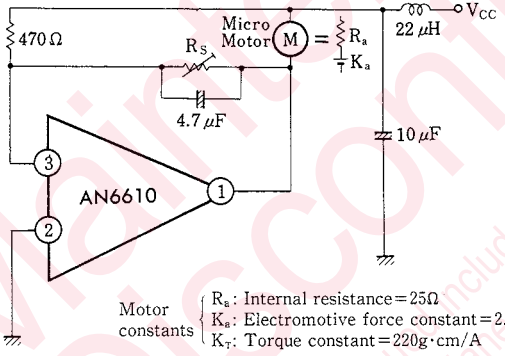
N−T



P_D-T_a



■ Application Circuit



Motor constants
- R_a: Internal resistance = 25Ω
- K_a: Electromotive force constant = 2.4mV/rpm
- K_T: Torque constant = 220g·cm/A

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