

AN6650/S

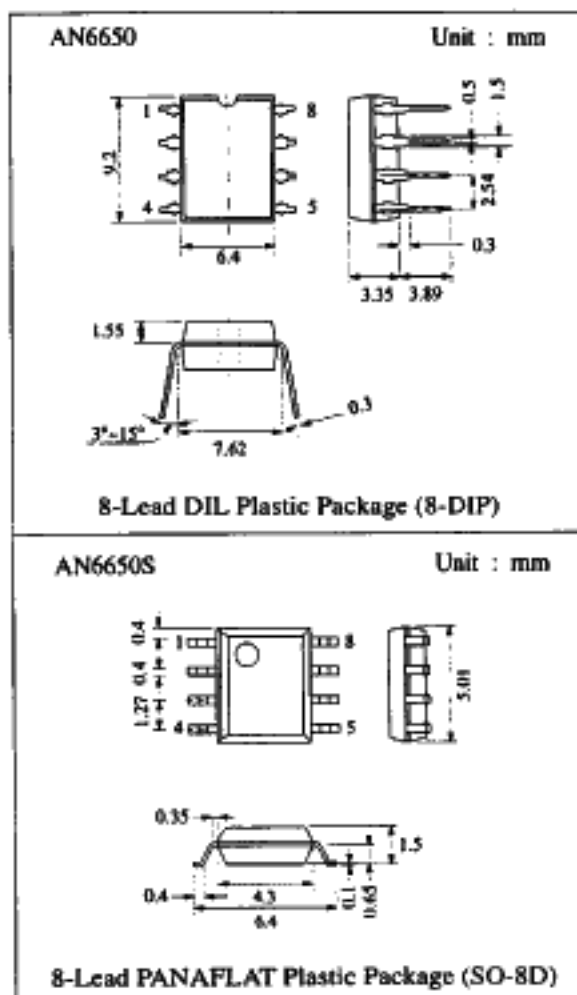
Motor Control Circuits

■ Description

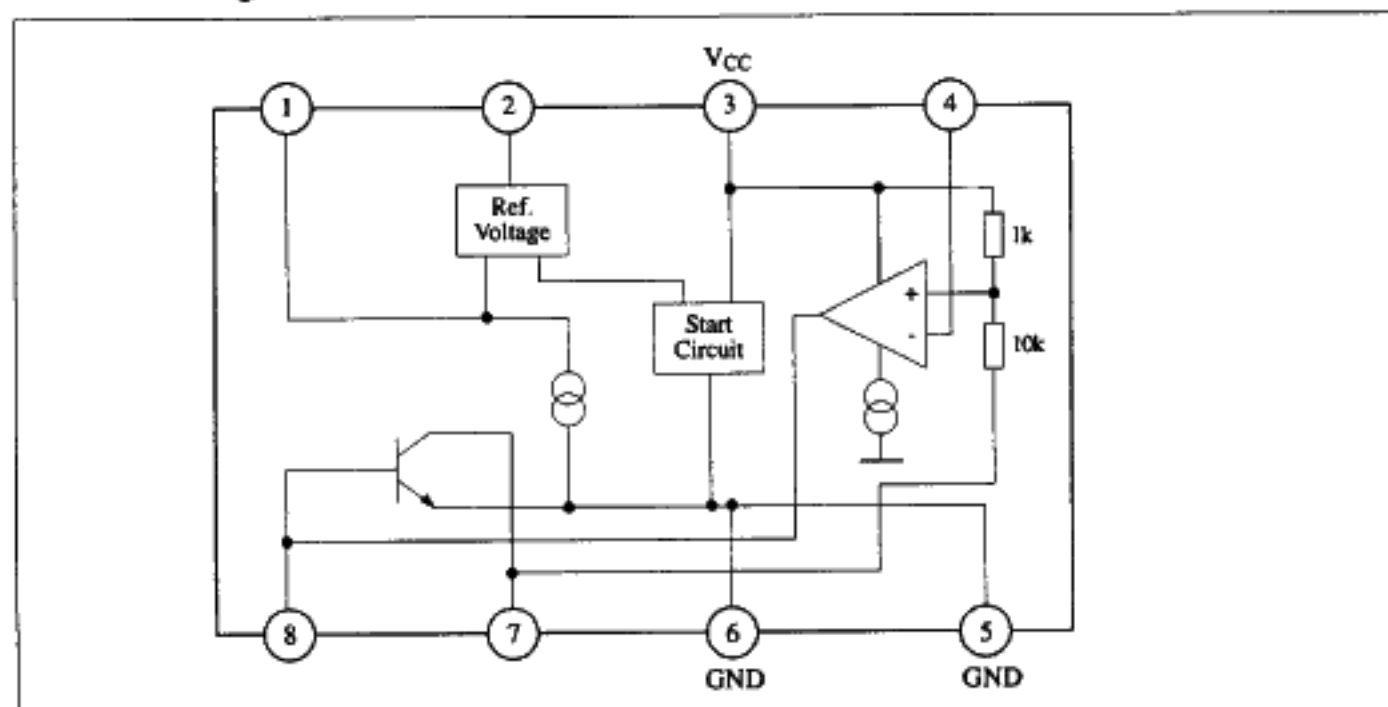
The AN6650/S are the monolithic electronic governor integrated circuits suitable for a low-voltage and compact DC motor which is used for a tape recorder, etc.

■ Features

- Wide range of operating voltage
AN6650: $V_{CC(opr)} = 1.8V \sim 7.0V$
AN6650S: $V_{CC(opr)} = 1.8V \sim 3.6V$
- Fewer external parts
- Speed control in steps with linear fine control



■ Block Diagram



■ Absolute Maximum Ratings (Ta=25°C)

Item		Symbol	Rating		Unit
Supply Voltage	AN6650	V _{CC}	7.5		V
	AN6650S		4		
Circuit Voltage	AN6650	V _{n-5,6} (n = 1, 2, 3, 4)	-0.5	7.5	V
	AN6650S		-0.5	4	
Circuit Voltage		V _{n-5,6}	-0.5	1	V
Supply Current		I _{CC} *	1000		mA
Circuit Current		I _T	-	1000	mA
Power Dissipation	AN6650	P _D	750		mW
	AN6650S		360		
Operating Ambient Temperature	AN6650	T _{opr}	-20 ~ +75		°C
	AN6650S		-20 ~ +60		
Storage Temperature	AN6650	T _{stg}	-40 ~ +150		°C
	AN6650S		-40 ~ +125		

* AN6650: t ≤ 5s, AN6650S: t ≤ 1s

Operating Supply Voltage Range (AN6650): V_{CC} = 1.8V ~ 7.0V

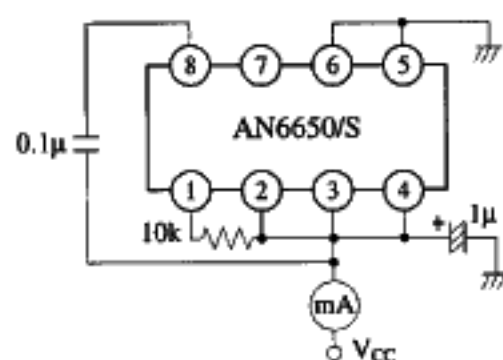
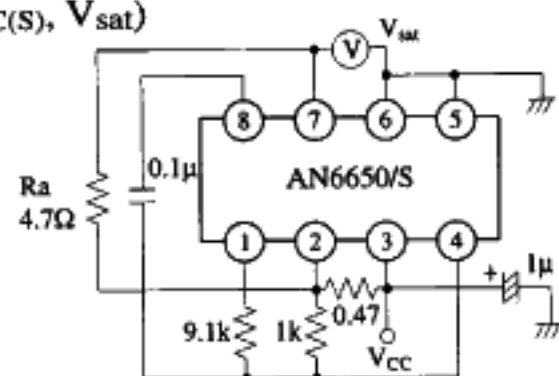
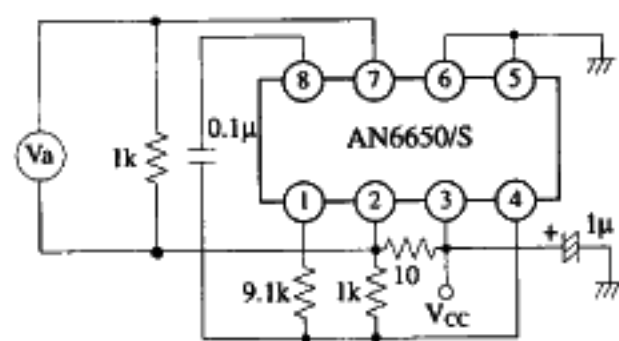
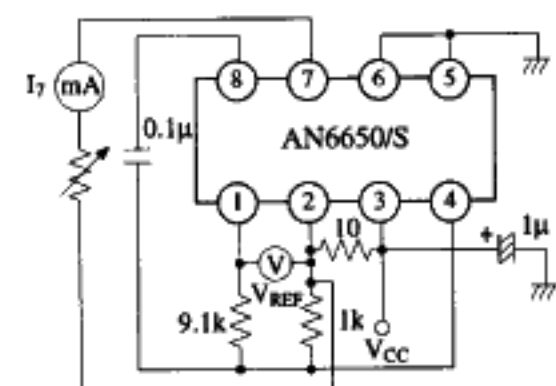
Operating Supply Voltage Range (AN6650S): V_{CC} = 1.8V ~ 3.6V

■ Electrical Characteristics (Ta=25°C)

Item	Symbol	Test Circuit	Condition	min.	typ.	max.	Unit
Supply Current	I _{CC}	1	V _{CC} = 3V		2	3	mA
Reference Voltage	V _{REF}	4	V _{CC} = 3V, R ₂₋₁ > 10kΩ	1.20	1.28	1.35	V
Starting Voltage	V _{CC(S)}	2	Supply voltage in which 30mA current flows to R _s		1.0	1.2	V
Saturation Voltage	V _{sat}	2	V _{CC} = 1.8V, R _s = 4.7Ω		0.2	0.5	V
Voltage Characteristics 1	AN6650	$\frac{\Delta V_{REF}}{V_{REF}} / \Delta V_{CC}$	V _{CC} = 1.8 ~ 7V, V _{CC} = 1.8 ~ 3.6V	-1.25	0.1	1.25	% / V
	AN6650S						
Voltage Characteristics 2	AN6650	$\frac{\Delta V_s}{V_s} / \Delta V_{CC}$	V _{CC} = 1.8 ~ 7V, V _{CC} = 1.8 ~ 3.6V	-1.2	0.1	1.2	% / V
	AN6650S						
Current Characteristics	$\frac{\Delta V_{REF}}{V_{REF}} / \Delta I_T$	4	I _T = 1mA ~ 20mA	-0.2	0.01	0.2	% / mA
Temperature current Characteristics	$\frac{\Delta V_{REF}}{V_{REF}} / \Delta T_a$	4	V _{CC} = 3V T _a = -20°C ~ 60°C		0.01		% / °C

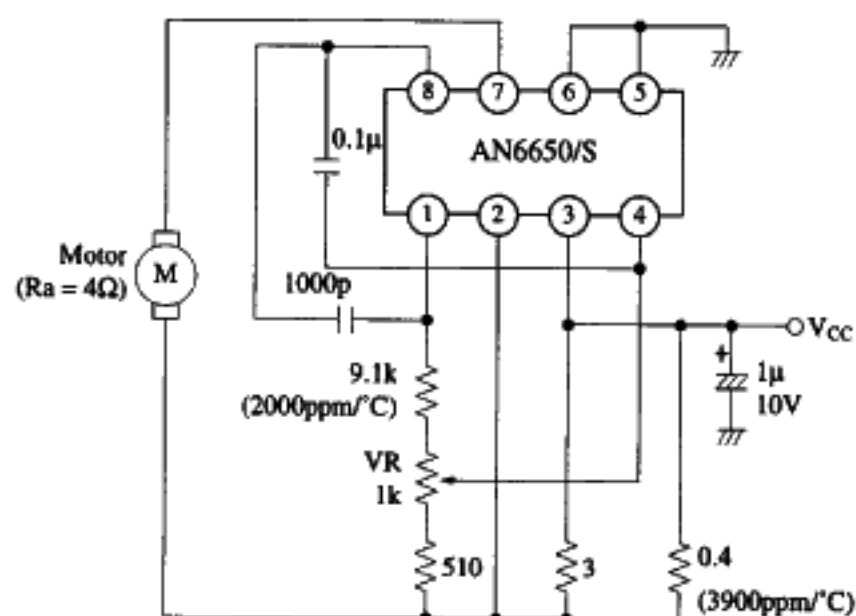
■ Pin

Pin No	Pin Name	Pin No	Pin Name
1	V _{REF} ⊖	5	GND
2	V _{REF} ⊕	6	GND
3	V _{CC}	7	Motor Pin
4	Comparator Input	8	Phase Compensation

Test Circuit 1 (I_{CC} , $\frac{\Delta V_{REF}}{V_{REF}}/\Delta V_{CC}$)Test Circuit 2 ($V_{CC(S)}$, V_{sat})Test Circuit 3 ($\frac{\Delta V_a}{V_a}/\Delta V_{CC}$)Test Circuit 4 ($\frac{\Delta V_{REF}}{V_{REF}}/\Delta I_7$, $\frac{\Delta V_{REF}}{V_{REF}}/\Delta T_a$)

■ Application Circuit

Speed Control Circuit with 3V Core Motor



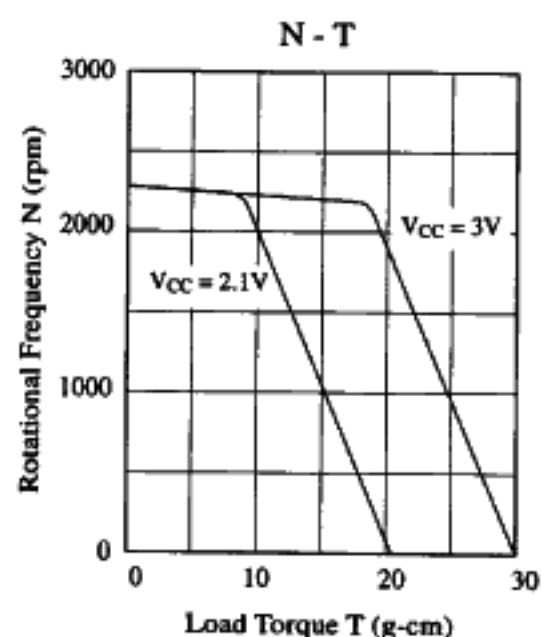
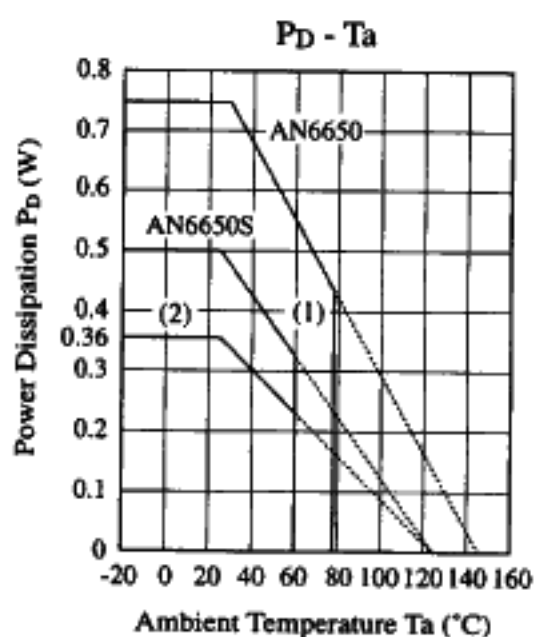
Motor Constants

R_a : Internal resistor = 4Ω

K_a : Electromotive force constant = 0.4mV/rpm

K_T : Torque constant = $30\text{g}\cdot\text{cm/A}$

■ Characteristics Curve



In case of AN6650S

(1) Epoxy substrate mounted (55mm x 20mm x 0.7mm)

(2) Single unit.