

AN6656, AN6656S

Micromotor Forward/Reverse Electronic Governors

Overview

The AN6656 and the AN6656S are electronic governor ICs capable of controlling the forward/reverse speed, fast forward, rewind, and start stop of the micromotors used for the radio/cassette tape recorders, automatic answering telephone sets, and so on.

Features

- Operating supply voltage range : $V_{CC}=1.8V$ to $6V$
- Stable reference voltage (120mV) and easy speed control
- Capable of controlling forward/reverse rotation, fast forward/constant speed, and start/stop via 3 input pins
- Capable of controlling a fast forward/rewind speed
- Large starting torque and maximum control torque
- Good secular drift because of external power transistor
- Provided with the motor stop function : $I_{CC}=50\mu A$ or less at stop time Package (S0-16D)

Applications

Speed control of the micromotors for the radio cassettes

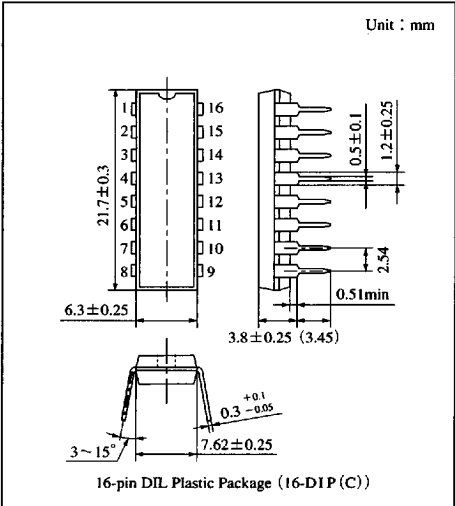
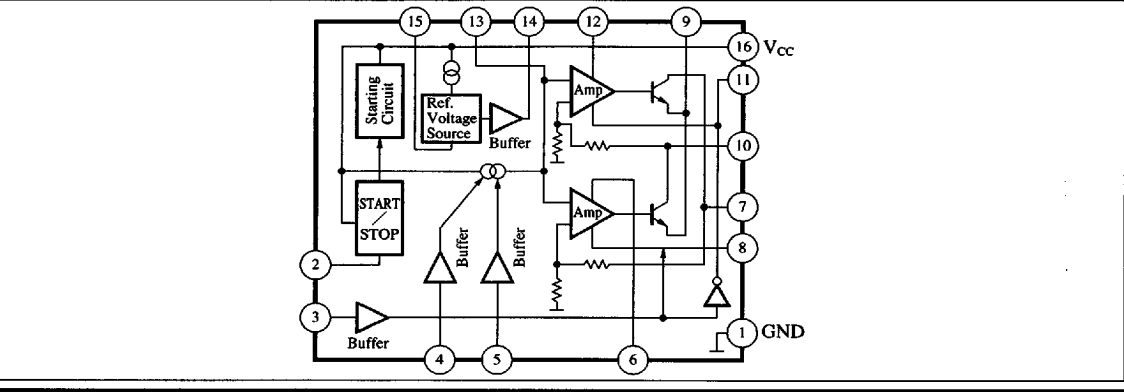
Speed control of the micromotors for the microcassettes of the automatic answering telephone sets

Control of the tape loading motors for the DATs, etc.

Pin Name

Pin No.	Pin name	Pin No.	Pin name
1	GND	9	Load characteristic setting
2	Start/stop	10	Drive 2
3	Forward/reverse	11	Output control 2
4	FF (REW) select	12	Phase compensation
5	FF (REW) speed control	13	Speed setting
6	Phase compensation	14	Reference voltage ⊕
7	Drive 1	15	Reference voltage ⊖
8	Output control 1	16	V_{CC}

Block Diagram



■ Absolute Maximum Ratings (Ta=25°C)

Parameter		Symbol	Rating	Unit
Supply voltage		V _{CC}	6.5	V
Supply current		I _{CC}	25	mA
Output current		I _O	1000	mA
Power dissipation	AN6656	P _D	500	mW
	AN6656S		380	
Operating ambient temperature		T _{opr}	−20 to +70	℃
Storage temperature	AN6656	T _{stg}	−55 to +150	℃
	AN6656S		−55 to +125	

■ Recommended Operating Range (Ta=25°C)

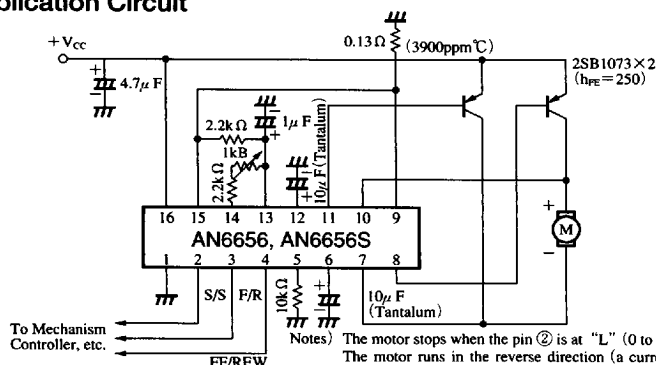
Parameter	Symbol	Range
Operating supply voltage range	V _{CC}	1.8V to 6V

■ Electrical Characteristics (Ta=25°C)

Parameter	Symbol	Condition	min	typ	max	Unit
Bias current	I_{bias}	$V_{CC}=5V$	—	5	15	mA
Prestart current	I_{stop}	$V_{CC}=5V$	—	—	50	μA
Reference voltage	V_{ref}	$V_{CC}=3V$	85	120	150	mV
Start voltage	$V_{CC(S)}$	Supply voltage at which a 50mA current flows to Ra	—	—	1.2	V
Start current	I_{st}	$V_{CC}=1.8V, R_a=4.9\Omega$	180	—	—	mA
Rated load r.p.m.	N_L	$V_{CC}=3V, I_L=100mA, N=2400rpm$	-10	0	10	%
Forward/reverse r.p.m. difference	ΔN_{logi}	$V_{CC}=3V, I_L=100mA, N=2400rpm$	-8	0	8	%
R.p.m. characteristics on voltage change	ΔN_V	$V_{CC}=3V$ to 6V, $I_L=100mA$	—	—	60	rpm/V
R.p.m. characteristics on load change	ΔN_L	$V_{CC}=1.8V, I_L=50mA$ to 100mA	—	—	150	rpm
Select mode input H	V_H		0.9	—	$V_{CC}+0.5$	V
Select mode input L	V_L		0	—	0.3	V
Ref. voltage temperature characteristic	$\Delta V_r/T_a$	$V_{CC}=3V, T_a=0^\circ C$ to $60^\circ C$	—	0.01	—	%/ $^\circ C$

ICs for Motor

■ Application Circuit



Notes) The motor stops when the pin ② is at "L" (0 to 3V), and starts at "H" (0.9 to $V_{CC}+0.5V$). The motor runs in the reverse direction (a current flows from the motor ⊖ pin to ⊕ pin) when the pin ③ is at "L" (0 to 3V).
The motor runs in the forward direction (a current flows from the motor ⊕ pin to ⊖ pin) when the pin ③ is at "H" (0.9 to $V_{CC}+0.5V$).
The motor runs at a normal speed when the pin ④ is at "L" (0 to 3V), and runs at a high-speed (fast forward, rewind) when at "H" (0.9 to $V_{CC}+0.5V$).
At high-speed rotation, the motor speed can be controlled with the resistor between the pin ⑤ and GND.