

AN6657, AN6657S

Micromotor Forward/Reverse Electronic Governors

■ Overview

The AN6657 and the AN6657S 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 : $V_{CC}=4.5V$ to $14V$
 - Stable reference voltage ($1.3V$) and easy speed control
 - Large starting torque and maximum control torque Good secular drift because of external power transistor
 - Provided with the motor stop function : $I_{CC}=20\mu A$ or less at stop time
 - Capable of controlling forward/reverse rotation, fast forward/constant speed, and start/stop via 3 input pins

■ Applications

Speed control of the micromotors for the radio cassettes

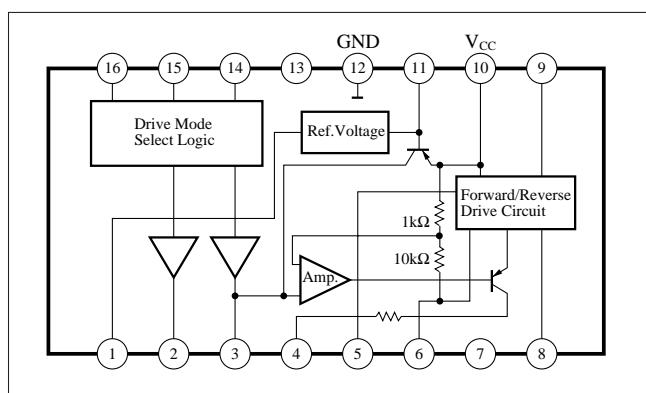
Speed control of the micromotors for the microcassettes of the automatic answering telephone sets

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

■ Pin Name

Pin No.	Pin name	Pin No.	Pin name
1	Constant speed setting	9	Load characteristic setting
2	Speed control	10	V _{CC}
3	Speed control	11	To the pin 9
4	Phase compensation	12	GND pin
5	Motor drive \oplus	13	NC
6	Collector connection	14	Start/Stop
7	Base connection	15	Forward/reverse
8	Motor drive \ominus	16	Constant speed/FF

■ Block Diagram



The diagram illustrates the physical dimensions of a 16-pin DIL package. Key dimensions include:

- Total height: 21.7 ± 0.3 mm
- Width of the body: 6.3 ± 0.25 mm
- Width of the lead frame: 3.8 ± 0.25 mm (or 3.45 mm)
- Lead pitch: 1.25 ± 0.25 mm
- Lead thickness: 0.51 ± 0.05 mm
- Lead width: 2.54 mm
- Lead profile height: 0.51 ± 0.1 mm
- Lead profile width: 0.3 ± 0.05 mm
- Lead profile thickness: 7.62 ± 0.25 mm
- Lead profile angle: $3 \sim 15^\circ$

The figure consists of two parts: a top view and a side view of the AN6657S package. The top view shows a rectangular package with a central circular depression and a grid of pins. Dimension lines indicate the following: height from bottom to top edge is 0.4 mm; distance from bottom to pin 1 is 0.4±0.25 mm; distance from bottom to pin 6 is 1.27 mm; distance from bottom to pin 8 is 1.27 mm; distance from bottom to pin 16 is 1.1 mm; width of the package is 10.1±0.3 mm; and the height of the package body is 0.1±0.1 mm. The side view provides a detailed look at the lead profile, showing a lead thickness of 0.3 mm, a lead height of 4.2±0.3 mm, and a lead width of 6.5±0.3 mm. There are also lead clearance dimensions of 0.15 mm and 0.65 mm.

■ Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Rating	Unit
Supply voltage	V _{CC}	14.4	V
Supply current	I _{CC}	50	mA
Output current	I _O	700	mA
Power dissipation	AN6657	P _D	500
	AN6657S		380
Operating ambient temperature	T _{opr}	-20 to +70	°C
Storage temperature	AN6657	T _{stg}	-55 to +150
	AN6657S		-55 to +125

■ Recommended Operating Range (Ta=25°C)

Parameter	Symbol	Range
Operating supply voltage range	V _{CC}	4.5V to 14V

■ Electrical Characteristics (Ta=25°C)

Parameter	Symbol	Condition	min	typ	max	Unit
Bias current	I _{bias}	V _{CC} =5V	—	4	10	mA
Prestart current	I _{stop}	V _{CC} =5V	—	—	20	µA
Reference voltage	V _{ref}	V _{CC} =5V	1.1	1.3	1.5	V
Start voltage	V _{CC (s)}	Supply voltage at which a 50mA current flows to R _a	—	—	3	V
Start current	I _{st}	V _{CC} =4.5V, R _a =13Ω	130	—	—	mA
Rated load r.p.m.	N _L	V _{CC} =5V, I _L =55mA, N=2000rpm	-10	0	10	%
Forward/reverse r.p.m. difference	ΔN _{Logi}	V _{CC} =5V, I _L =55mA, N=2000rpm	-5	0	5	%
FF/rated r.p.m. ratio	ΔN	V _{CC} =5V, I _L =55mA, N=4000rpm	1.85	2	2.15	times
R.p.m. characteristics on voltage change	ΔN _V	V _{CC} =4.5V to 9V, I _L =55mA	—	—	50	rpm/V
R.p.m. characteristics on load change	ΔN _L	V _{CC} =4.5V, I _L =55mA to 90mA	—	—	120	rpm
Select mode input H	V _H	V _{CC} =5V to 14V	3	—	6	V
Select mode input L	V _L	V _{CC} =5V to 14V	0	—	0.7	V
Current limiting starting voltage	V _{Lim}	V _{CC} =9V, R _T =1.3Ω	0.55	0.62	0.7	V
Ref. voltage temperature characteristic	ΔV _{r/Ta}	V _{CC} =5V, Ta=0°C to 60°C	—	0.015	—	%/°C

■ Application Circuit

