Monolithic Linear IC

No.2641A

LA5586

General-Purpose Compact DC Motor Speed Controller

Features

- Wide operating voltage range (3.8 to 16V)
- Possible to make the equipment compact because of minimum number of external parts required and small-sized package
- Easy to change the speed
- Easy to increase the power dissipation because of the use of a fin
- Various lead formings available for making the equipment compact
- On-chip protector against inverted connection of power supply

Maximum Ratings at Ta=25°C

				unit
Maximum Supply Voltage	V_{CC} max		18	V
Allowable Power Dissipation	Pd max	Ta=25°C	1.0*	W
Operating Temperature	Topr		-20 to +80	°C
Storage Temperature	Tstg		-40 to +150	°C
Start Current	Im max	3sec at SW-ON or lock mode	1.4	A

*1.7W(heat of fin is radiated to 1cm^2 Cu foil) at Ta=25°C

Operating Conditions at Ta=25°C

			unit
Supply Voltage Range	V_{CC} op	3.8 to 16	V
Recommended Operating Temperature	Topr	-20 to +80	°C

Operating Characteristics at Ta=25°C, See specified Test Circuit.

			min	typ	max	unit
Reference Voltage	Vref	V_{CC}=12V, Im=10mA	1.08	1.21	1.27	V
Quiescent Current Dissipation	Id	V_{CC}=12V, Im=0		1.0	1.6	mA
Shunt Ratio	K	V_{CC}=12V, Im=50 to 150mA	18	20	22	
Saturation Voltage	V(sat)	V_{CC}=4.2V, R_T=4.4ohms		0.94		V
Voltage Characteristic of Reference Voltage	$\frac{\Delta Vref}{Vref}/\Delta V_{CC}$	V_{CC}=6.3 to 16V, Im=100mA		0.06		%/V
Voltage Characteristic of Shunt Ratio	$\frac{\Delta K}{K}/\Delta V_{CC}$	V_{CC}=6.3 to 16V, Im=50 to 150mA		0.1		%/V
Current Characteristic of Reference Voltage	$\frac{\Delta Vref}{Vref}/\Delta Im$	V_{CC}=12V, Im=30 to 200mA		-0.01		%/mA

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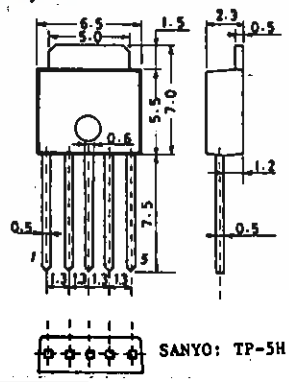
Package Dimensions
(unit: mm)
3103



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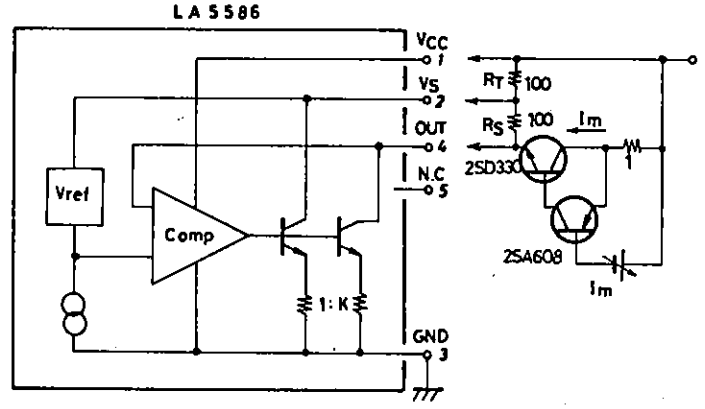
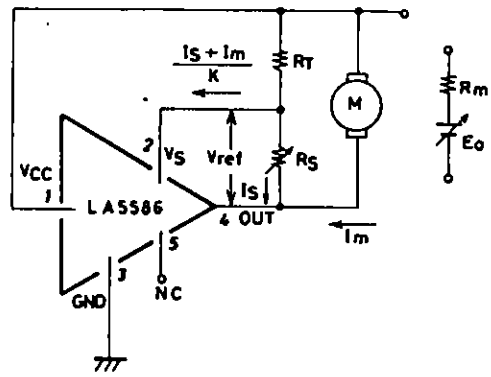
			min	typ	max	unit
Current Characteristic of Shunt Ratio	$\frac{\Delta K}{K}/\Delta Im$	V_{CC}=12V, Im=50-100 to 150-200mA		0.02		%/mA
Current Characteristic of Reference Current	$\frac{\Delta Is}{Is}/\Delta V_{CC}$	V_{CC}=6 to 16V,Im=0		0.1		%/V
Temperature Characteristic of Reference Voltage	$\frac{\Delta Vref}{Vref}/\Delta Ta$	V_{CC}=12V,Im=10mA, Ta=-20 to +80°C		-0.01		%/°C
Temperature Characteristic of Shunt Ratio	$\frac{\Delta K}{K}/\Delta Ta$	V_{CC}=12V,Im=50-150mA, Ta=-20 to +80°C		-0.01		%/°C

Equivalent Circuit and Test Circuit



Unit (resistance: Ω)

Sample Application Circuit



$$Im \cdot Rm + E_O = R_T\left(Is + \frac{Is+Im}{K}\right) + Vref$$

From this equation,

$$E_O = Vref + R_T\left(1+\frac{1}{K}\right)Is + \left(\frac{R_T}{K} - Rm\right)Im$$

Assuming $K \cdot Rm = R_T$

The number of revolutions is determined by

$$E_O = Vref + R_T\left(1+\frac{1}{K}\right)Is$$

Unless $R_m(max) < K \cdot Rm(min)$ in the Sample Application Circuit, the operation becomes unstable.