

SANYO

LA5586

General-Purpose Compact DC Motor Speed Controller

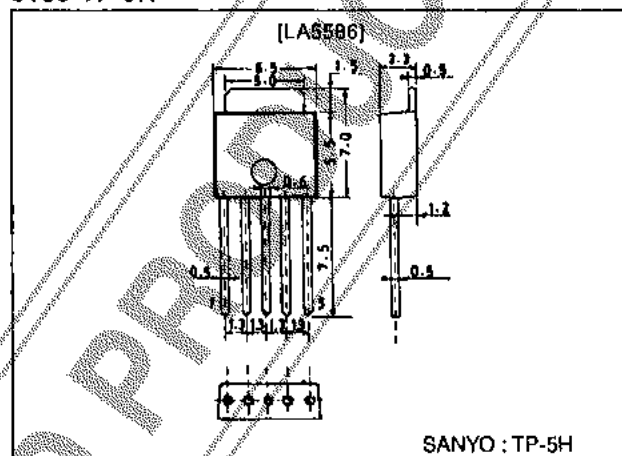
Features

- 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.

Package Dimensions

unit:mm

3103-TP-5H



Specifications

Maximum Ratings at T_a = 25°C

Parameter	Symbol	Conditions	Rating	Unit
Maximum supply voltage	$V_{CC\ max}$		18	V
Allowable power dissipation	$P_d\ max$	$T_a=25^{\circ}C$	1.0*	W
Operating temperature	T_{opr}		-20 to +80	$^{\circ}C$
Storage temperature	T_{stg}		-40 to +150	$^{\circ}C$
Start current	$I_m\ max$	3s at SW-ON or lock mode	1.4	A

*1.7W (heat of fin is radiated to 1cm² Cu foil) at T_a=25°C

Operating Conditions at $T_a = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Ratings	Unit
Supply voltage range	$V_{CC\ op}$		3.8 to 16	V
Recommended operating temperature	T_{opr}		-20 to +80	°C

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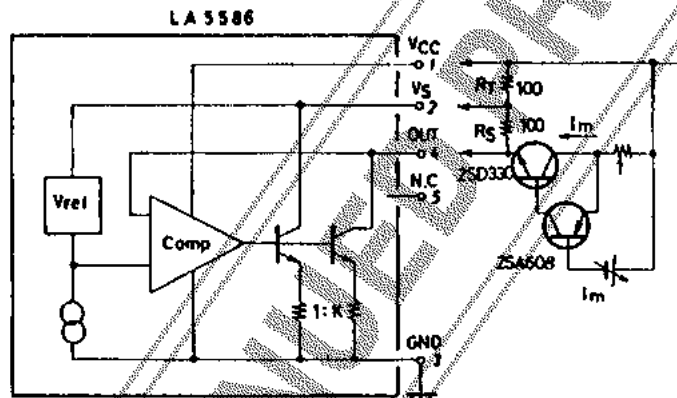
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73098HA (KT)/3230MO/8207TA, TS No.2641-1/3

Operating Characteristics at $T_a = 25^\circ\text{C}$, See specified test circuit.

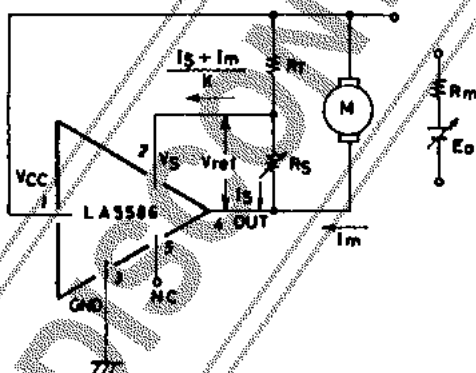
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Reference voltage	V_{ref}	$V_{CC}=12\text{V}$, $I_m=10\text{mA}$	1.08	1.21	1.27	V
Quiescent flow-in current	I_Q	$V_{CC}=12\text{V}$, $I_m=0$		1.0	1.6	mA
Shunt ratio	K	$V_{CC}=12\text{V}$, $I_m=50\text{mA}$, 150mA	18	20	22	
Saturation voltage	V_{sat}	$V_{CC}=4.2\text{V}$, $R_T=4.4\Omega$		0.94		V
Voltage of characteristic of reference voltage	$\frac{\Delta V_{ref}}{V_{ref}}$	$V_{CC}=6.3$ to 16V , $I_m=100\text{mA}$		0.06		%/V
Voltage of characteristic of shunt ratio	$\frac{\Delta K}{K}$	$V_{CC}=6.3$ to 16V , $I_m=50\text{mA}$, 150mA		0.1		%/V
Current characteristic of reference voltage	$\frac{\Delta V_{ref}}{V_{ref}}$	$V_{CC}=12\text{V}$, $I_m=30$ to 200mA		0.01		%/mA
Current characteristic of shunt ratio	$\frac{\Delta K}{K}$	$V_{CC}=12\text{V}$, $I_m=50\text{mA}$, 100 to 150mA , 200mA		0.02		%/mA
Current characteristic of reference current	$\frac{\Delta I_S}{I_S}$	$V_{CC}=6$ to 16V , $I_m=0$		0.1		%/V
Temperature characteristic of reference voltage	$\frac{\Delta V_{ref}}{V_{ref}}$	$V_{CC}=12\text{V}$, $I_m=10\text{mA}$, $T_a=-20$ to $+80^\circ\text{C}$		0.01		%/°C
Temperature characteristic of shunt ratio	$\frac{\Delta K}{K}$	$V_{CC}=12\text{V}$, $I_m=50\text{mA}$, 150mA , $T_a=-20$ to $+80^\circ\text{C}$		0.01		%/°C

Equivalent Circuit and Test Circuit



Unit (resistance: Ω)

Sample Application Circuit



$$I_m \cdot R_m + E_0 = R_T \left(I_S + \frac{I_S + I_m}{K} \right) + V_{ref}$$

From this equation,

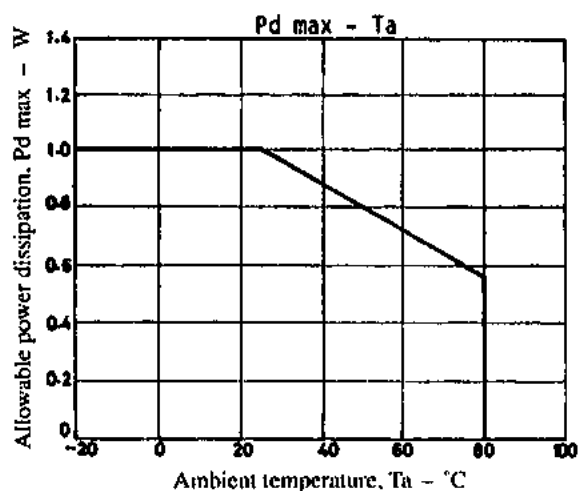
$$E_0 = V_{ref} + R_T \left(1 + \frac{1}{K} \right) I_S + \left(\frac{R_T}{K} - R_m \right) I_m$$

Assuming $K \cdot R_m = R_T$

The number of revolutions is determined by

$$E_0 = V_{ref} + R_T \left(1 + \frac{1}{K} \right) I_S$$

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



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