Ordering number:EN3028

Monolithic Linear IC

LA5588

General-Purpose Compact DC Motor Speed Controller

Overview

Suited for use in speed control of general-purpose compact DC motors for radio-casette recorders, car stereos.

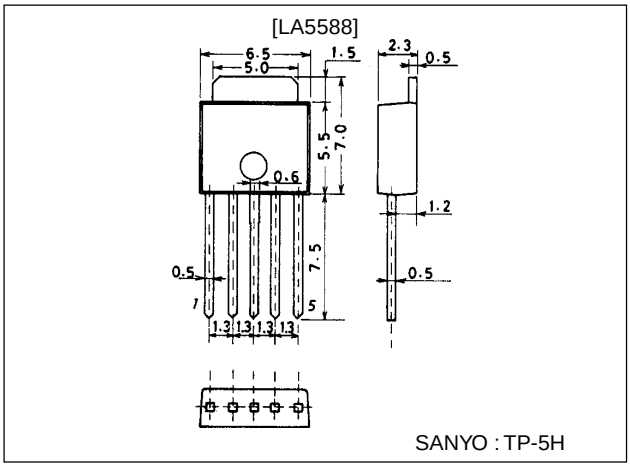
Features and Functions

- Wide operating voltage range (4.5 to 18V).
- Possible to make the equipment compact because of minimum number of external parts required and small-sized package.
- Facilitates speed control.
- Easy to control rotational speed from low speed to high speed.
- On-chip kickback absorber.
- High stability in oscillation.
- Facilitates heat radiation because of the use of a fin.

Package Dimensions

unit:mm

3103-TP-5H



Specifications

Maximum Ratings at Ta = 25˚C

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V_S max		20	V
Allowable power dissipation	Pd max	Heat is radiated to Cu foil of 1cm² : 1.7W	1.0	W
Operating temperature	Topr		–20 to +80	˚C
Storage temperature	Tstg		–40 to +150	˚C
Strating Current	I_m max	Switch ON or lock	1.4	A

Operating Conditions at Ta = 25˚C

Parameter	Symbol	Conditions	Ratings	Unit
Supply voltage	V_S		3 to 18	V
Control Resistance	RA+RB		100	kΩ

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SANYO Electric Co.,Ltd. Semiconductor Bussiness Headquaters

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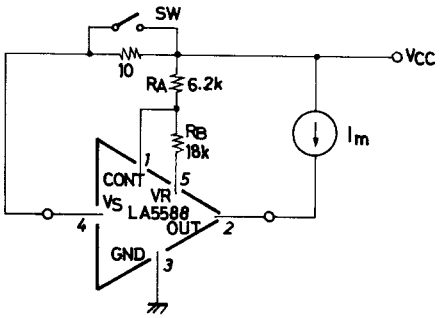
Operating Characteristics at Ta = 25°C

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Reference voltage	Verf	V_S=8V, I_m=100mA	1.1	1.2	1.3	V
2nd reference voltage	Verf'	V_S=8V, I_m=100mA	2.0	2.15	2.3	V
Quiescent flow-in current	Id	V_S=8V, I_m=0	0.5	1.73	2.5	mA
Shunt ratio	K	V_S=8V, I_m=0, 100mA	22	24	26	
Residual voltage	V(sat)	V_S=3V, I_m=200mA		1.1	1.4	V
Voltage characteristic of reference voltage	$\frac{\Delta Vref}{Vref}/\Delta V_S$	V_S=3 to 18V, I_m=100mA	–0.02	0	+0.02	%/V
Voltage characteristic of 2nd reference voltage	$\frac{\Delta Vref'}{Vref'}/\Delta V_S$	V_S=3 to 18V, I_m=100mA	–0.05	0.025	0.1	%/V
Voltage characteristic of quiescent flow-in current	$\frac{\Delta Id}{Id}/\Delta V_S$	V_S=3 to 18V, I_m=0		0.3	0.8	%/V
Voltage characteristic of shunt ratio	$\frac{\Delta K}{K}/\Delta V_S$	V_S=3 to 18V, I_m=0, 100mA	–0.8	–0.3	0.3	%/V
Current characteristic of reference voltage	$\frac{\Delta Vref}{Vref}/\Delta I_m$	V_S=8V, I_m=50 to 150mA	–0.002	0	0.002	%/mA
Current characteristic of 2nd reference voltage	$\frac{\Delta Vref'}{Vref'}/\Delta I_m$	V_S=8V, I_m=50 to 150mA	–0.1	–0.013	0.05	%/mA
Current characteristic of shunt ratio	$\frac{\Delta K}{K}/\Delta I_m$	V_S=8V, I_m=50mA, 100mA to 150mA, 200mA		0.008	0.025	%/mA
Temperature characteristic of reference voltage	$\frac{\Delta Vref}{Vref}/\Delta Ta$	V_S=8V, I_m=100mA, Ta=20 to 80°C		0		%/°C
Temperature characteristic of 2nd reference voltage	$\frac{\Delta Vref'}{Vref'}/\Delta Ta$	V_S=8V, I_m=100mA, Ta=20 to 80°C		0		%/°C
Temperature characteristic of Quiescent flow-in current	$\frac{\Delta Id}{Id}/\Delta Ta$	V_S=8V, I_m=100mA, Ta=20 to 80°C		0.12		%/°C
Temperature characteristic of shunt ratio	$\frac{\Delta K}{K}/\Delta Ta$	V_S=8V, I_m=100mA, Ta=20 to 80°C		0.02		%/°C

Test Circuit



Unit(resistance : Ω)

1) Reference voltage (Vref)
Measure the voltage across pins V_S and V_R with the SW ON.

2) 2nd reference voltage (Vref')
Measure the voltage across pins V_S and OUT with the SW ON.

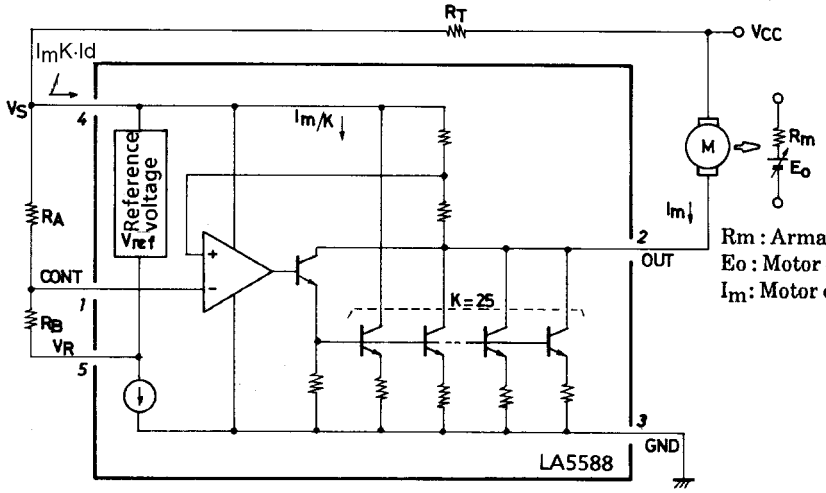
3) Quiescent flow-in current (Id)
Measure using the voltage across the resistor of 10Ω with the SW OFF.

4) Shunt ratio (K)
With the SW OFF, measure Id,Id1 at $I_m = I_m1$ and Id,Id2 at $I_m = I_m2$ and calculate using the following formula.

$$K = \frac{(I_m2 - I_m1)}{(Id2 - Id1)}$$

5) Residual voltage (V_{sat})
With the SW OFF, measure the voltage across pins OUT and GND at $V_S = 3V$, $I_m = 200mA$.

Block Diagram



Rm : Armature winding resistance
Eo : Motor counter electromotive force
I_m: Motor current

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