



LA5588

**General-Purpose Compact DC Motor
Speed Controller**

Suited for use in speed control of general-purpose compact DC motors for radio-cassette 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

Maximum Ratings at Ta = 25°C

Maximum Supply Voltage	V _S max		20	V	unit
Allowable Power Dissipation	P _d max	Heat is radiated to Cu foil of 1cm ² : 1.7W	1.0	W	
Operating Temperature	T _{opr}		-20 to +80	°C	
Storage Temperature	T _{stg}		-40 to +150	°C	
Starting Current	I _M max	Switch ON or lock	1.4	A	

Operating Conditions at Ta = 25°C

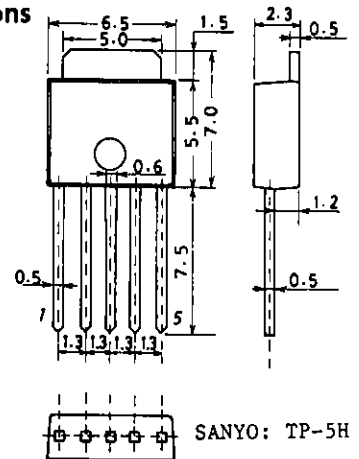
Supply Voltage	V _S		3 to 18	V	unit
Control Resistance	RA + RB		100	kΩ	

Operating Characteristics at Ta = 25°C

			min	typ	max	unit
Reference Voltage	V _{ref}	V _S =8V, I _M =100mA	1.1	1.2	1.3	V
2nd Reference Voltage	V _{ref} '	V _S =8V, I _M =100mA	2.0	2.15	2.3	V
Quiescent Flow-in Current	I _d	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	$\frac{\Delta V_{ref}}{V_{ref}} / \Delta V_S$	V _S =3 to 18V, I _M =100mA	-0.02	0	+0.02	%/V

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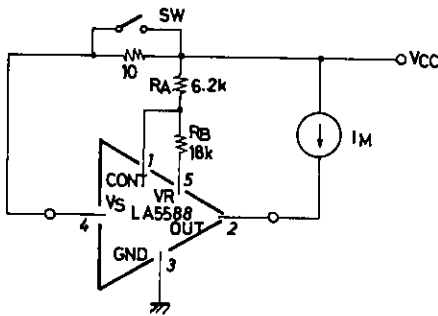
**Package Dimensions
(unit: mm)
3103**



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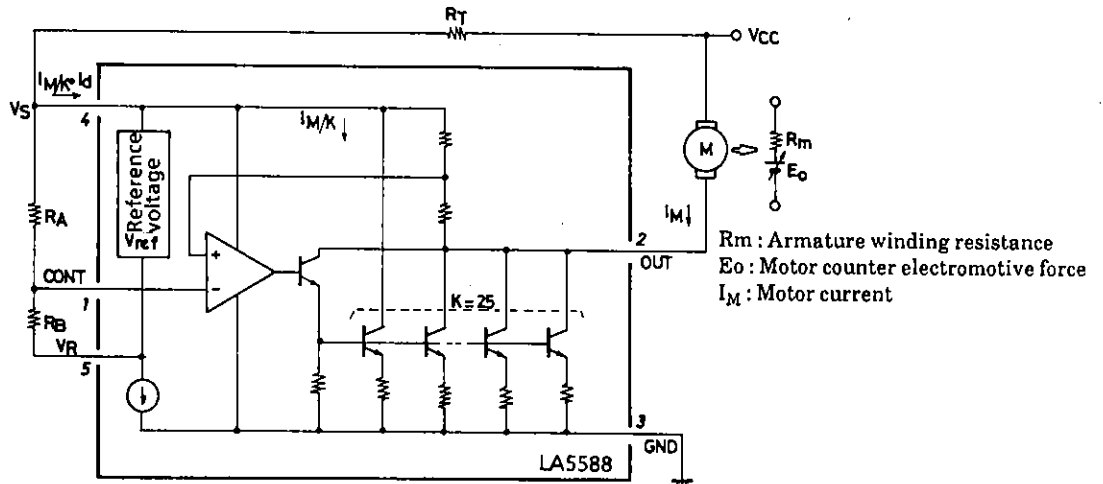
			min	typ	max	unit
Voltage Characteristic of 2nd Reference Voltage	$\frac{\Delta V_{ref'}}{V_{ref'}} / \Delta V_S$	$V_S = 3 \text{ to } 18V, I_M = 100mA$	-0.05	0.025	0.1	%/V
Voltage Characteristic of Quiescent Flow-in Current	$\frac{\Delta I_d}{I_d} / \Delta V_S$	$V_S = 3 \text{ to } 18V, I_M = 0$		0.3	0.8	%/V
Voltage Characteristic of Shunt Ratio	$\frac{\Delta K}{K} / \Delta V_S$	$V_S = 3 \text{ to } 18V, I_M = 0-100mA$	-0.8	-0.3	0.3	%/V
Current Characteristic of Reference Voltage	$\frac{\Delta V_{ref'}}{V_{ref'}} / \Delta I_M$	$V_S = 8V, I_M = 50 \text{ to } 150mA$	-0.002	0	0.002	%/mA
Current Characteristic of 2nd Reference Voltage	$\frac{\Delta V_{ref'}}{V_{ref'}} / \Delta I_M$	$V_S = 8V, I_M = 50 \text{ to } 150mA$	-0.1	-0.013	0.05	%/mA
Current Characteristic of Shunt Ratio	$\frac{\Delta K}{K} / \Delta I_M$	$V_S = 8V, I_M = 50 - 100mA$ to 150 - 200mA		0.008	0.025	%/mA
Temperature Characteristic of Reference Voltage	$\frac{\Delta V_{ref'}}{V_{ref'}} / \Delta T_a$	$V_S = 8V, I_M = 100mA,$ $T_a = 20 \text{ to } 80^\circ C$		0		%/°C
Temperature Characteristic of 2nd Reference Voltage	$\frac{\Delta V_{ref'}}{V_{ref'}} / \Delta T_a$	$V_S = 8V, I_M = 100mA,$ $T_a = 20 \text{ to } 80^\circ C$		0		%/°C
Temperature Characteristic of Quiescent Flow-in Current	$\frac{\Delta I_d}{I_d} / \Delta T_a$	$V_S = 8V, I_M = 100mA,$ $T_a = 20 \text{ to } 80^\circ C$		0.12		%/°C
Temperature Characteristic of Shunt Ratio	$\frac{\Delta K}{K} / \Delta T_a$	$V_S = 8V, I_M = 100mA,$ $T_a = 20 \text{ to } 80^\circ C$		0.02		%/°C

Test Circuit



- 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 (I_d)
Measure using the voltage across the resistor of 10Ω with the SW OFF.
- 4) Shunt ratio (K)
With the SW OFF, measure I_d, I_{d1} at $I_M = I_{M1}$ and I_d, I_{d2} at $I_M = I_{M2}$ and calculate using the following formula.
$$K = \frac{(I_{M2} - I_{M1})}{(I_{d2} - I_{d1})}$$
- 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



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