



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

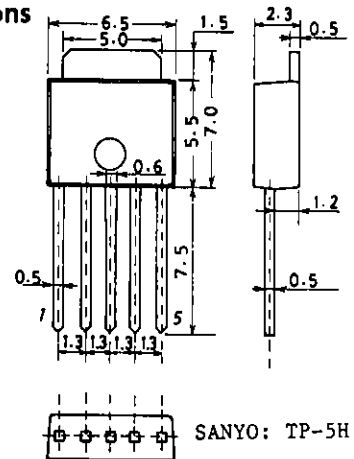
Supply Voltage	V _S		3 to 18	V	unit
Control Resistance	RA + RB		100	kΩ	

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

Continued on next page.

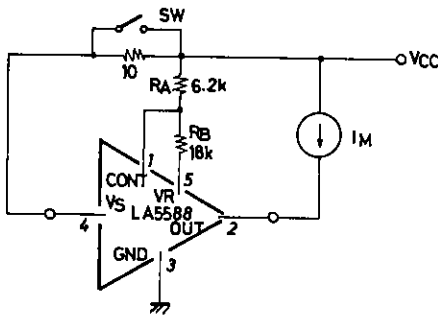
**Package Dimensions
(unit: mm)
3103**



Continued from preceding page.

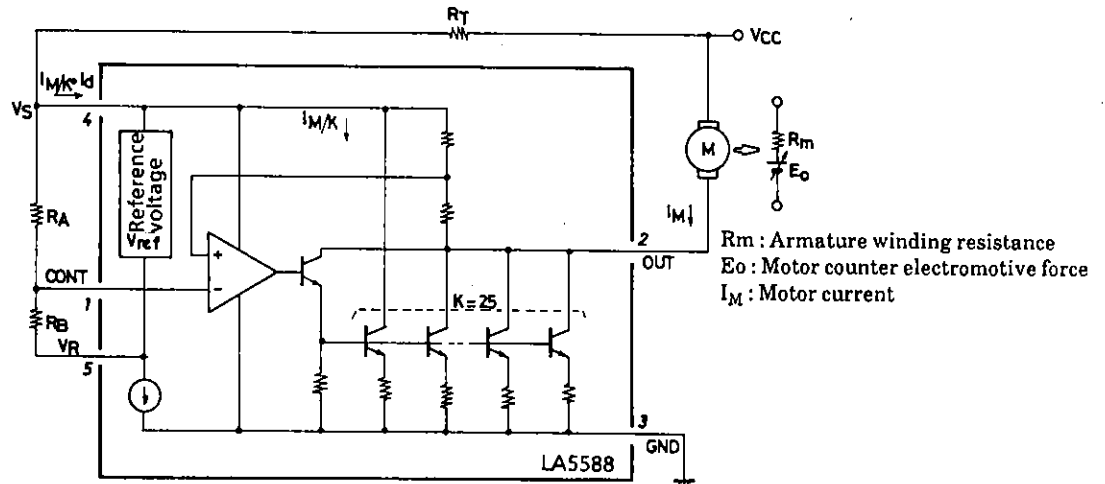
			min	typ	max	unit
Voltage Characteristic of 2nd Reference Voltage	$\frac{\Delta V_{ref'}}{V_{ref'}} / \Delta V_S$	$V_S = 3 \text{ to } 18V, I_M = 100mA$	-0.05	0.025	0.1	%/V
Voltage Characteristic of Quiescent Flow-in Current	$\frac{\Delta I_d}{I_d} / \Delta V_S$	$V_S = 3 \text{ to } 18V, I_M = 0$		0.3	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 (V_{ref})
Measure the voltage across pins V_S and V_R with the SW ON.
- 2) 2nd reference voltage (V_{ref}')
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



- No products described or contained herein are intended for use in surgical implants, life-support systems, aerospace equipment, nuclear power control systems, vehicles, disaster/crime-prevention equipment and the like, the failure of which may directly or indirectly cause injury, death or property loss.
- Anyone purchasing any products described or contained herein for an above-mentioned use shall:
 - ① Accept full responsibility and indemnify and defend SANYO ELECTRIC CO., LTD., its affiliates, subsidiaries and distributors and all their officers and employees, jointly and severally, against any and all claims and litigation and all damages, cost and expenses associated with such use:
 - ② Not impose any responsibility for any fault or negligence which may be cited in any such claim or litigation on SANYO ELECTRIC CO., LTD., its affiliates, subsidiaries and distributors or any of their officers and employees jointly or severally.
- Information (including circuit diagrams and circuit parameters) herein is for example only; it is not guaranteed for volume production. SANYO believes information herein is accurate and reliable, but no guarantees are made or implied regarding its use or any infringements of intellectual property rights or other rights of third parties.