

SANYO

No.2181A

LA5536N

Monolithic Linear IC

COMPACT DC MOTOR SPEED CONTROLLER**Applications**

- Speed control of compact DC motor for cassette tape recorder, radio-cassette recorder, record player

Features

- 4-pin SEP package facilitating mounting
- On-chip stable voltage reference meeting the requirements for various motors
- Excellent stability in each characteristic against ambient temperature change
- On-chip protector against inverted connection of supply voltage
- Minimum number of external parts required
- On-chip kickback absorber

Maximum Ratings at Ta=25°C

			unit
Maximum Supply Voltage	V _{CC max}	20	V
Allowable Power Dissipation	P _{d max}	1.2	W
Motor Current	I _{m max}	5sec or 100msec duty 0.1% (at motor lock or start mode)	1.4 A
Operating Temperature	T _{opg}	-20 to +80	°C
Storage Temperature	T _{stg}	-40 to +150	°C

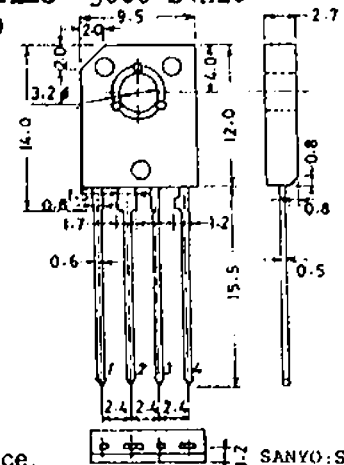
Operating Conditions at Ta=25°C

			unit
Supply Voltage Range	V _{CC op}	3.8 to 18	V
Recommended Operating Temperature	T _{opg}	-10 to +60	°C

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

			min	typ	max	unit
Reference Voltage	V _{ref}	V _{CC} =10V, I _m =100mA	1.1	1.2	1.3	V
Quiescent Flow-in Current	I _d	V _{CC} =10V, I _m =100mA	1.0	1.8	3.0	mA
Shunt Ratio	K	V _{CC} =10V, I _m =50-150mA	23	25	27	
Residual Voltage	V _(sat)	V _{CC} =4.2V, I _m =450mA	0.5	0.8		V

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Case Outline 3080-S4HIC
(unit:mm)

The application circuit diagrams and circuit constants herein are included as an example and provide no guarantee for designing equipment to be mass produced. The information herein is believed to be accurate and reliable. However, no responsibility is assumed by SANYO for its use nor for any infringements of patents or other rights of third parties which may result from its use.

Specifications and information herein are subject to change without notice.

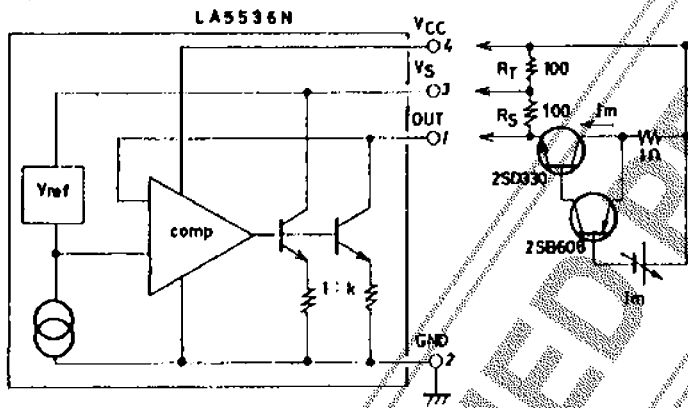
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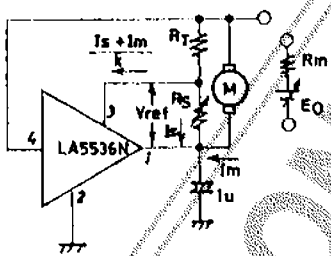
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			min	typ	max	unit
Voltage Characteristic of Reference Voltage	$\frac{\Delta V_{ref}}{V_{ref}} / \Delta V_{CC}$	$I_m = 100mA,$ $V_{CC} = 3.8 \text{ to } 18V$		0.1	0.3	%/V
Voltage Characteristic of Shunt Ratio	$\frac{\Delta K}{K} / \Delta V_{CC}$	$I_m = 0.05 - 0.15A,$ $V_{CC} = 3.8 \text{ to } 18V$		0.4	0.8	%/V
Current Characteristic of Reference Voltage	$\frac{\Delta V_{ref}}{V_{ref}} / \Delta I_m$	$V_{CC} = 10V,$ $I_m = 30 \text{ to } 200mA$		0.005	0.02	%/mA
Current Characteristic of Shunt Ratio	$\frac{\Delta K}{K} / \Delta I_m$	$V_{CC} = 10V, I_m = 30 - 80mA$ to $150 - 200mA$		0.03	0.1	%/mA
Temperature Characteristic of Reference Voltage	$\frac{\Delta V_{ref}}{V_{ref}} / \Delta T_a$	$V_{CC} = 10V, I_m = 100mA,$ $T_a = -20 \text{ to } +80^\circ C$		0.007		%/°C
Temperature Characteristic of Shunt Ratio	$\frac{\Delta K}{K} / \Delta T_a$	$V_{CC} = 10V, I_m = 50 - 150mA,$ $T_a = -20 \text{ to } +80^\circ C$		0.03		%/°C

Equivalent Circuit Block Diagram and Test Circuit



Sample Application Circuit



The number of revolutions is calculated by using the equation shown below.

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

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

Assuming $K \cdot R_m = R_T$,

The number of revolutions is determined by

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

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

