



# LA5528N, 5528NM

## Low-Voltage DC Motor Speed Controllers

### Overview

Especially suited for controlling speed of a low-voltage (3V min.) DC motor for cassette tape recorders, 8mm motion-picture cameras, record players.

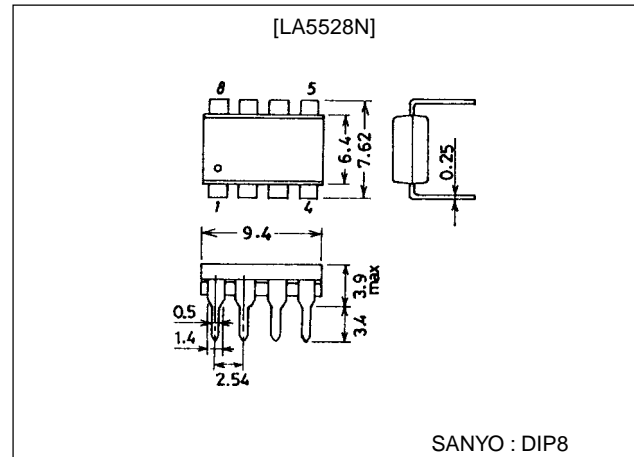
### Features

- Wide operating voltage range LA5528N : 1.8 to 10V  
LA5528NM : 1.8 to 6V
- Easy to very speed.
- Large starting torque.
- Easy to control rotational speed from very low speed to high speed.

### Package Dimensions

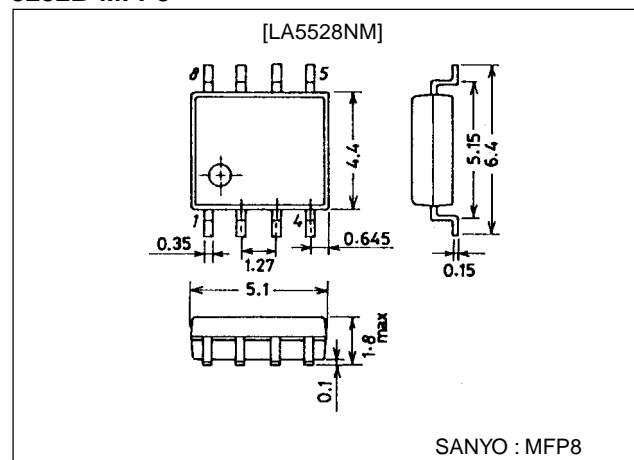
unit:mm

#### 3001B-DIP8



unit:mm

#### 3232B-MFP8



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# LA5528N, 5528NM

## Specifications

### Maximum Ratings at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V <sub>CC</sub> max	LA5528N	12.0	V
		LA5528NM	8.0	V
Allowable power dissipation	Pd max	LA5528N	1.0	W
		LA5528NM	0.3	W
Operating temperature	Topr		-20 to +80	°C
Storage temperature	Tstg		-40 to +150	°C
Motor current	I <sub>m</sub>	LA5528N	1000	mA
		LA5528NM	700	mA

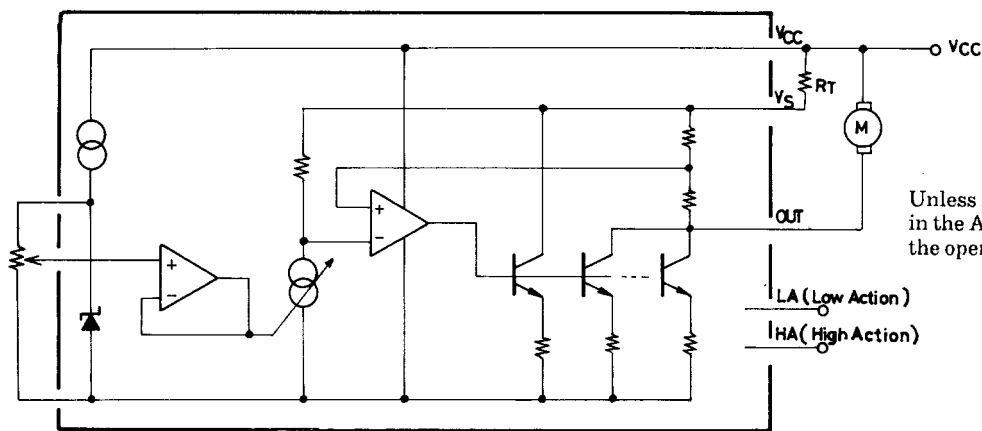
### Operating Conditions at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Recommended supply voltage	V <sub>CC</sub>	LA5528N	1.8 to 10	V
		LA5528NM	1.8 to 6	V
Recommended operating temperature	Topg		-10 to +60	°C

### Operating Characteristics at Ta = 25°C

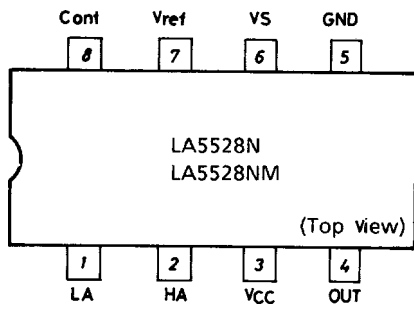
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Reference voltage	V <sub>ref</sub>	V <sub>CC</sub> =3V, I <sub>m</sub> =100mA	1.15	1.25	1.3	V
Quiescent flow-in current	I <sub>d</sub>	V <sub>CC</sub> =3V, I <sub>m</sub> =100mA		3.0	6.0	mA
Shunt ratio	K	V <sub>CC</sub> =3V, I <sub>m</sub> =50mA, 150mA	45	50	55	
Residual voltage	V <sub>sat</sub>	V <sub>CC</sub> =3V, I <sub>m</sub> =200mA, V <sub>ref</sub> =V <sub>cont</sub>		0.3	0.5	V
Voltage of characteristic of reference voltage	$\frac{\Delta V_{ref}}{V_{ref}} / \Delta V_{CC}$	LA5528N: I <sub>m</sub> =100mA, V <sub>CC</sub> =1.8 to 10V LA5528NM: I <sub>m</sub> =100mA, V <sub>CC</sub> =1.8 to 6V		0.1	0.3	%/V
Voltage of characteristic of shunt ratio	$\frac{\Delta K}{K} / \Delta V_{CC}$	LA5528N: I <sub>m</sub> =50mA, 150mA, V <sub>CC</sub> =1.8 to 10V LA5528NM: I <sub>m</sub> =50mA, 150mA, V <sub>CC</sub> =1.8 to 6V		0.25	0.5	%/V
Current characteristic of reference voltage	$\frac{\Delta V_{ref}}{V_{ref}} / \Delta I_m$	I <sub>m</sub> =20 to 200mA, V <sub>CC</sub> =3V		0.005	0.01	%/mA
Current characteristic of shunt ratio	$\frac{\Delta K}{K} / \Delta I_m$	V <sub>CC</sub> =3V, I <sub>m</sub> =20mA, 50mA to 170mA, 200mA	-0.02	-0.005	+0.02	%/mA
Temperature characteristic of reference voltage	$\frac{\Delta V_{ref}}{V_{ref}} / \Delta T_a$	V <sub>CC</sub> =3V, I <sub>m</sub> =100mA, T <sub>a</sub> =-20 to +80°C		0.02		%/°C
Temperature characteristics of shunt ratio	$\frac{\Delta K}{K} / \Delta T_a$	V <sub>CC</sub> =3V, I <sub>m</sub> =50mA, 150mA, T <sub>a</sub> =-20 to +80°C		-0.002		%/°C
Bias current at off-state	I <sub>(st)</sub>	V <sub>CC</sub> =3V, R <sub>L</sub> =100Ω		0.4	30	μA
HA on-state voltage	V <sub>H(on)</sub>	V <sub>CC</sub> =3V, I <sub>m</sub> =100mA	1.8		V <sub>CC</sub>	V
LA on-state voltage	V <sub>L(on)</sub>	V <sub>CC</sub> =3V, I <sub>m</sub> =100mA	0		1.0	V

### Equivalent Circuit Block Diagram

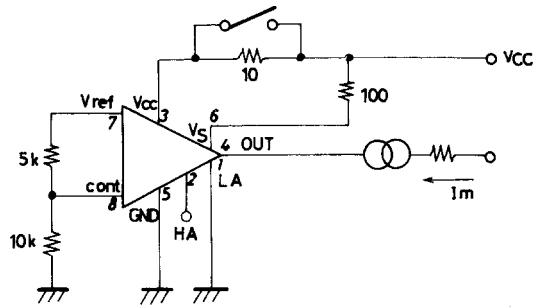


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## Pin Assignment

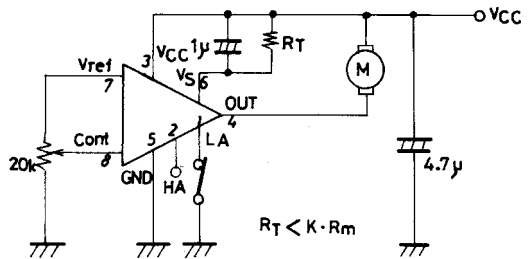


## Test Circuit

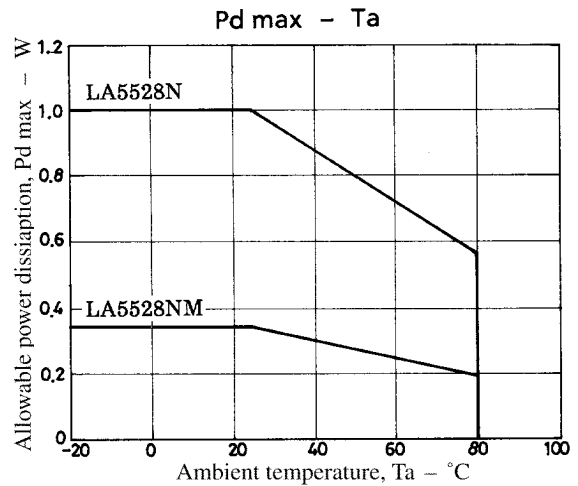


Unit (resistance:  $\Omega$ )

## Sample Application Circuit



Unit (capacitance : F)



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