



## LA5550, 5550M

### Low-Voltage DC Motor Speed Controller with Logic Circuit

#### Applications

The LA5550, 5550M are low-voltage (3V min.) DC motor speed control IC with bidirectional driver and logic circuit. Speed control, function control of DC motor for cassette tape recorder, tape deck, telephone answering machine.

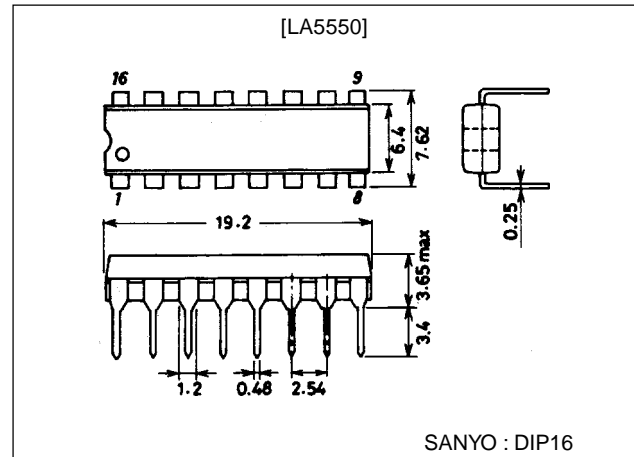
#### Features

- Wide operating voltage range :1.8 to 8V.
- Has a logic circuit which operates in such a manner as 2 logic inputs cause FF, REW, GOVERNOR, BRAKE mode to occur.
- Easy to vary speed at the GOVERNOR mode.
- Turning OFF the strobe pin cause little  $I_{CC}$  to flow (100 $\mu$ A).
- Large starting torque.

#### Package Dimensions

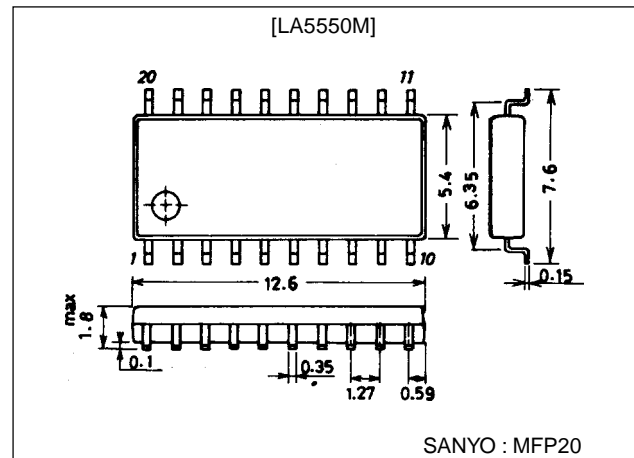
unit:mm

##### 3006B-DIP16



unit:mm

##### 3036B-MFP20



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**SANYO Electric Co., Ltd. Semiconductor Business Headquarters**

TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

73098HA (KT)/1100YT/9087KI/4035MY, TS No.1402-1/4

# LA5550, 5550M

## Specifications

### Maximum Ratings at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	$V_{CC\ max}$		8	V
Allowable power dissipation	$Pd\ max$	LA5550	1	W
		LA5550M	0.42	W
Maximum motor current	$I_m\ max$		1000	mA
Operating temperature	$T_{opr}$		-20 to +80	°C
Storage temperature	$T_{stg}$		-40 to +150	°C

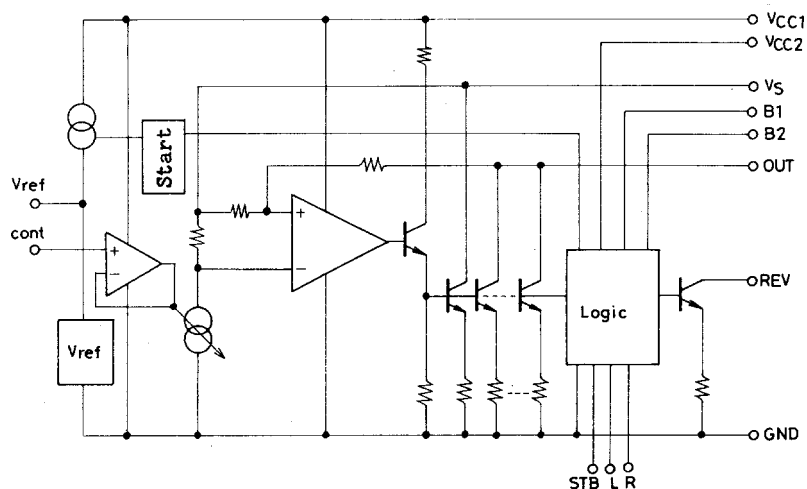
### Operating Conditions at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Supply voltage range	$V_{CC\ op}$		1.8 to 8	V

### Operating Characteristics at Ta = 25°C

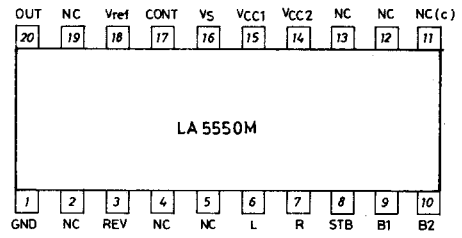
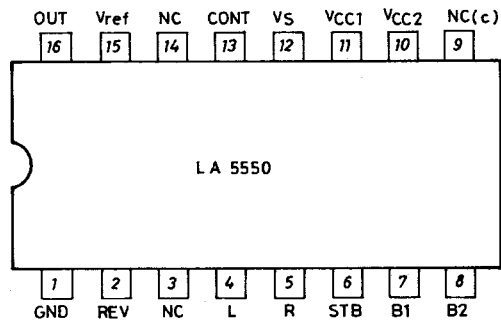
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max[	
[GOVERNOR Mode (G)]						
Reference voltage	$V_{ref}$	$V_{CC}=3V, I_m=100mA$	1.1	1.2	1.3	V
Quiescent flow-in current dissipation	$I_d$	$V_{CC}=3V, \text{motor open}$		8	15	mA
Shunt ratio	$K$	$V_{CC}=3V, I_m=50mA, 150mA$	45	50	55	
Residual voltage	$V_{sat}(G)$	$V_{CC}=3V, I_m=200mA$		0.27	0.5	V
Voltage characteristic of reference voltage	$\frac{\Delta V_{ref}}{V_{ref}} / \Delta V$	$V_{CC}=1.8 \text{ to } 8V, I_m=100mA$		0.26	0.5	%/V
Voltage characteristic of shunt ratio	$\frac{\Delta K}{K} / \Delta V$	$V_{CC}=1.8 \text{ to } 8V, I_m=50mA, 150mA$		0.45		%/V
Current characteristic of reference voltage	$\frac{\Delta V_{ref}}{V_{ref}} / \Delta I_m$	$V_{CC}=3V, I_m=20 \text{ to } 200mA,$		0.05	0.1	%/mA
Current characteristic of shunt ratio	$\frac{\Delta K}{K} / \Delta I_m$	$V_{CC}=3V, I_m=50, 100mA \text{ to } 150, 200mA$		-0.02		%/mA
[FF Mode]						
Quiescent current dissipation	$I_d(F)$	$V_{CC}=3V, \text{motor open}$		18.5	23	mA
Residual voltage	$V_{ast}(F)$	$V_{CC}=3V, I_m=200mA$		0.28	0.5	V
[REW Mode]						
Quiescent current dissipation	$I_d(R)$	$V_{CC}=3V, \text{motor open}$		18.5	23	mA
Residual voltage	$V_{ast}(R)$	$V_{CC}=3V, I_m=200mA$		0.30	0.5	V
[STOP Mode]						
Quiescent current dissipation	$I_d(S)$	$V_{CC}=3V \text{ (STB-OFF)}$		26	30	mA
Strobe current	$I_{STB}$	$V_{CC}=3V \text{ (STB-OFF)}$		100	200	μA
Base Pull-in current	$I_{B1}, I_{B2}$	$V_{CC}=3V, \text{Modes other than BRAKE}$	3.8	4.4	5.8	mA

### Equivalent Circuit Block Diagram



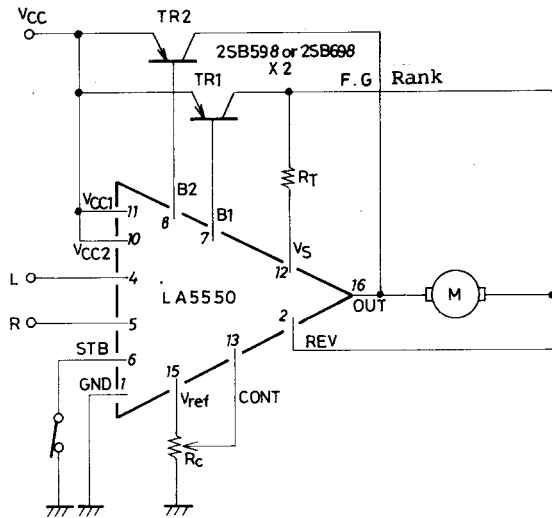
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## Pin Assignments



(Top view)

## Sample Application Circuit (1)



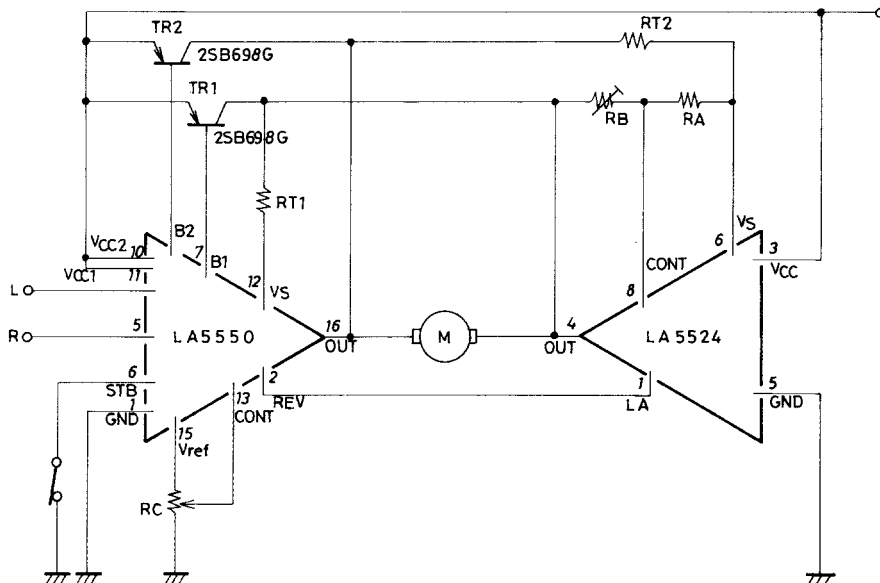
\* Assuming  $R_T < K \cdot R_m$

Mode	L	R
High-speed FF	0	0
GOVERNOR FF	0	1
High-speed REW	1	0
Brake	1	1

0 : 0 to 0.3V

1 : 1.8V to  $V_{CC}$

## Sample Application Circuit (2) : Bidirectional Governor



$R_A = 2.2k\Omega$

$R_C = 50K V_R$

$R_C = 30K V_R$

Turning OFF the STB pin causes  $I_{CC} < 100\mu A$  (at 3V).

Mode	L	R
High-speed FF	0	0
FF control	0	1
REW control	1	0
Brake	1	1

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