

**2-PHASE DD MOTOR DRIVER**

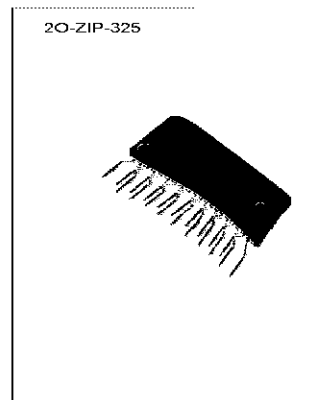
The KA8310 is a monolithic integrated circuit for 2-phase full wave linear DD motor driving. This IC contains hall AMP, control circuit, CW/CCW circuit, thermal shutdown circuit and motor drivers.

**FUNCTION**

- TSD
- CTL/AMP
- CW/CCW
- HALL AMP
- Driver & AMP

**FEATURES**

- Incorporates rotation direction switching function.
- With regulated power supply for hall device feeding.
- High output current-control current ratio.
- High power dissipation.
- Built-in TSD (Thermal Shut Down) circuit.



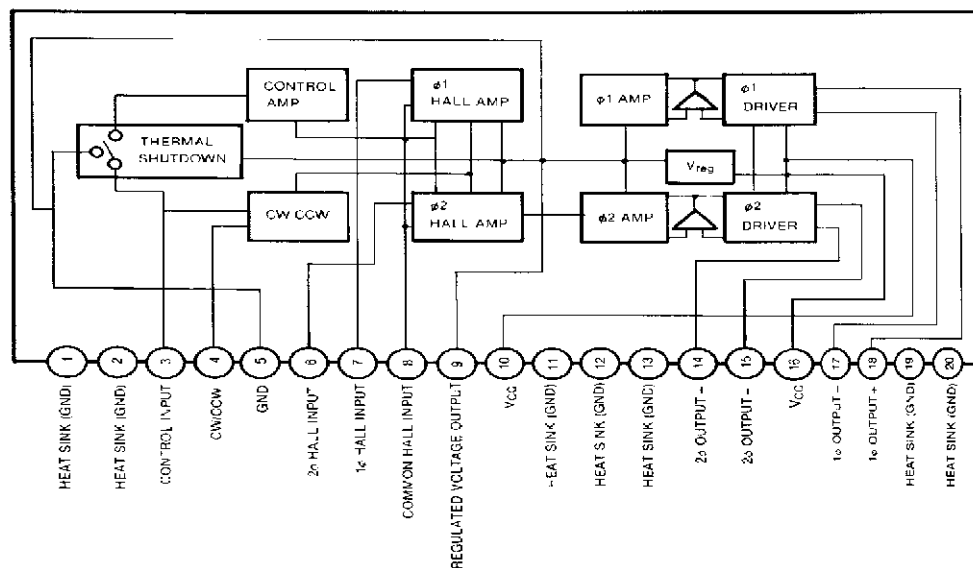
**APPLICATION**

- VCRs, video disk players
- Compact disk players
- Tape recorders

**ORDERING INFORMATION**

| Device | Package    | Operating Temperature |
|--------|------------|-----------------------|
| KA8310 | 20-ZIP-325 | -20°C ~ +75°C         |

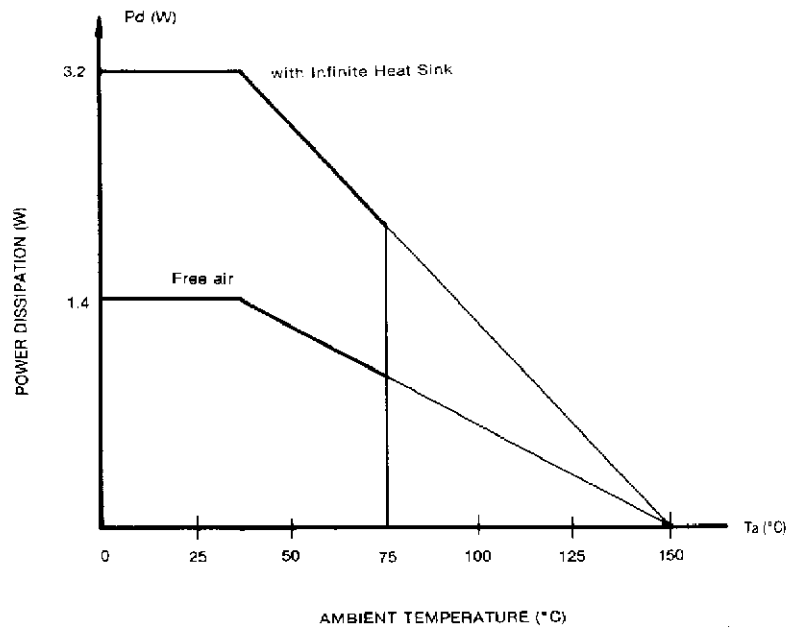
**BLOCK DIAGRAM**



**ABSOLUTE MAXIMUM RATINGS**

| Characteristic             | Symbol     | Value    | Unit | Remark               |
|----------------------------|------------|----------|------|----------------------|
| Supply Voltage             | $V_{CC}$   | 20       | V    |                      |
| Maximum Output Current (1) | $I_{O1}$   | 2.4      | A    | No Signal            |
| Maximum Output Current (2) | $I_{O2}$   | 1.6      |      |                      |
| Hall Input Voltage         | $V_H$      | 6        | V    | DC                   |
| Pin 3 Current              | $I_S$      | 1        | mA   |                      |
| Pin 4 Voltage              | $V_A$      | VREG     | V    |                      |
| Output Current             | $I_{REG}$  | 40       | mA   |                      |
| Pin 16 Voltage             | $V_{16}$   | VCC      | V    | $V_{CC} \geq V_{16}$ |
| AMP Common Input Voltage   | $V_{COM}$  | VREG-1.0 | V    |                      |
| Hall Device Frequency      | $f_{HALL}$ | 1        | KHz  |                      |
| Operating Voltage Range    | $V_{OPR}$  | 7.2~20   | V    |                      |
| Junction Temperature       | $T_J$      | 150      | °C   |                      |
| Operating Temperature      | $T_{OPR}$  | -20~+75  | °C   |                      |
| Storage Temperature        | $T_{STG}$  | -40~+150 | °C   |                      |

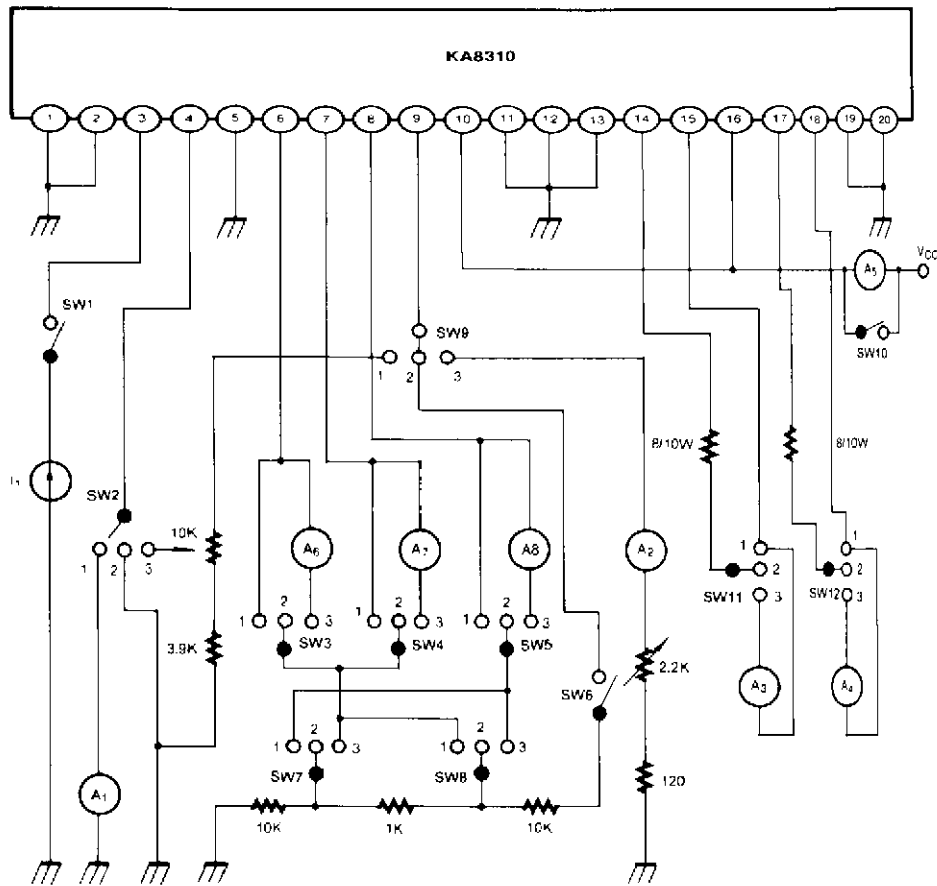
**POWER DISSIPATION CURVE**



**ELECTRICAL CHARACTERISTICS** ( $V_{CC} = 12V$ ,  $T_A = 25^\circ C$ )

| Characteristics                   | Symbol     | Test Condition  | Min  | Typ  | Max  | Unit    |
|-----------------------------------|------------|---|------|------|------|---------|
| Quiescent Current                 | $I_Q$      | $I_1 = Q \mu A$   | 4.5  | 6.5  | 8.5  | mA      |
| Regulated Voltage (1)             | $V_{REG1}$ | $I_1 = 0 \mu A$   | 6.0  | 6.7  | 7.4  | V       |
| Regulated Voltage (2)             | $V_{REG2}$ | $I_1 = Q \mu A$<br>$A_2 = 10mA$   | 6.0  | 6.7  | 7.4  | V       |
| Regulated Voltage (3)             | $V_{REG3}$ | $I_1 = Q \mu A$<br>$A_2 = 30mA$   | 6.0  | 6.7  | 7.4  | V       |
| Control Input Voltage             | $V_{CT1}$  | $I_1 10 \mu A$  | 1.2  | 1.35 | 1.5  | V       |
| CW/CCW Output Current             | $I_4$      | $I_1 = 0 \mu A$   | 200  | 410  | 600  | $\mu A$ |
| CW/CCW Threshold Voltage (1)      | $V_{T1}$   | $V_6 = V_7 = 3.1V$<br>$V_8 = 3.4V$<br>$I_1 = 50 \mu A$                      | 2.5  | —    | —    | V       |
| CW/CCW Threshold Voltage (1)      | $V_{T2}$   | $V_6 = V_7 = 3.1V$<br>$V_8 = 3.4V$<br>$I_1 = 50 \mu A$                      | 2.5  |      |      | V       |
| Current Gain (1)                  | $G_1$      | $V_6 = 3.1V$<br>$V_8 = 3.4V$<br>$I_1 = 100 \mu A$<br>$G_1 = I_{OUT2} / I_1$ | 4000 | 4700 | 5500 | .       |
| Current Gain (2)                  | $G_2$      | $V_6 = 3.4V$<br>$V_8 = 3.1V$<br>$I_1 = 100 \mu A$<br>$G_2 = I_{OUT2} / I_1$ | 4000 | 4700 | 5500 | .       |
| $\phi 1$ , $\phi 2$ Current Ratio | R          | $R = G_1 / G_2$   | 0.8  | 1    | 1.2  |         |
| Output Current (1)                | $I_{OUT1}$ | $V_6 = 3.4V$<br>$V_8 = 3.1V$<br>$I_1 = 180 \mu A$                           | 750  | 890  | 1150 | mA      |
| Output Current (2)                | $I_{OUT2}$ | $V_7 = 3.4V$<br>$V_8 = 3.1V$<br>$I_1 = 180 \mu A$                           | 750  | 890  | 1150 | mA      |

TEST CIRCUIT

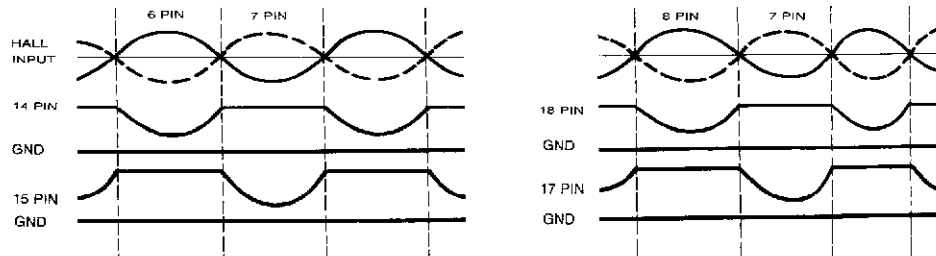


**TEST METHOD** ( $V_{CC}=12V$ )

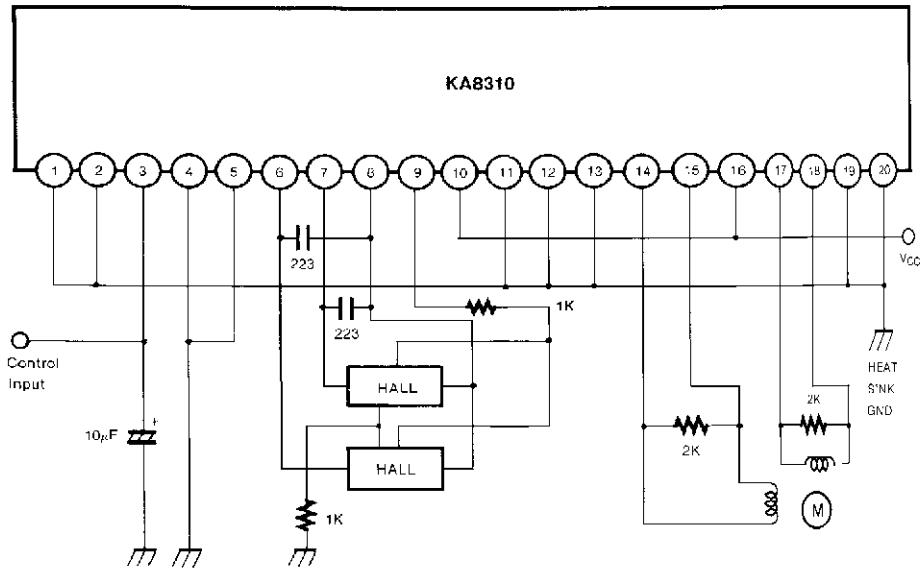
| TEST<br>Characteristic         | Condition                                     | Switch Condition |     |     |     |     |     |     |     |     |      |      |      | Test<br>Point |
|--------------------------------|---|------------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|---------------|
|                                |   | SW1              | SW2 | SW3 | SW4 | SW5 | SW6 | SW7 | SW8 | SW9 | SW10 | SW11 | SW12 |               |
| Quiescent Current              | $I_1=0\mu A$                                  | 1                | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2    | 2    | 2    | A5            |
| Regulated Voltage (1)          | $I_1=0\mu A$                                  | 1                | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2    | 1    | 2    | Pin9          |
| Regulated Voltage (2)          | $I_1=0\mu A$<br>$A_2=10mA$                    | 1                | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 3    | 1    | 2    | Pin9          |
| Regulated Voltage (3)          | $I_1=0\mu A$<br>$A_2=30mA$                    | 1                | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 3    | 1    | 2    | Pin9          |
| Control Input Voltage          | $I_1=10\mu A$                                 | 1                | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2    | 1    | 2    | Pin3          |
| CW/CCW Output Current          | $I_1=0\mu A$                                  | 1                | 1   | 2   | 2   | 2   | 2   | 2   | 2   | 2   | 2    | 1    | 2    | A1            |
| CW/CCW Threshold Voltage (1)   | $V_6=V_7=3.1V$<br>$V_8=3.4V$<br>$I_1=50\mu A$ | 1                | 3   | 1   | 1   | 1   | 1   | 3   | 3   | 1   | 1    | 3    | 2    | Pin4<br>(A3)  |
| CW/CCW Threshold Voltage (2)   | $V_6=V_7=3.1V$<br>$V_8=3.4V$<br>$I_1=50\mu A$ | 1                | 3   | 1   | 1   | 1   | 1   | 3   | 3   | 1   | 1    | 2    | 3    | Pin4<br>(A4)  |
| Current Gain (1)               | $V_6=3.1V$<br>$V_8=3.4V$<br>$I_1=100\mu A$    | 1                | 2   | 1   | 2   | 1   | 1   | 3   | 3   | 2   | 1    | 3    | 2    | A3/I1         |
| Current Gain (2)               | $V_6=3.4V$<br>$V_8=3.1V$<br>$I_1=100\mu A$    | 1                | 2   | 2   | 1   | 1   | 1   | 3   | 3   | 2   | 1    | 2    | 3    | A4/I1         |
| $\phi 1, \phi 2$ Current Ratio |   |                  |     |     |     |     |     |     |     |     |      |      |      |               |
| Output Current (1)             | $V_6=3.4V$<br>$V_8=3.1V$<br>$I_1=180\mu A$    | 1                | 2   | 1   | 2   | 1   | 1   | 1   | 1   | 2   | 1    | 3    | 2    | A3            |
| Output Current (2)             | $V_7=3.4V$<br>$V_8=3.1V$<br>$I_1=180\mu A$    | 1                | 2   | 2   | 1   | 1   | 1   | 1   | 1   | 2   | 1    | 2    | 3    | A4            |

**APPLICATION INFORMATION**

**OUTPUT WAVE FORM (4 PIN GND)**



**APPLICATION CIRCUIT**



\*The Application of HALL BIAS Pins must to follow above circuits.

Dimensions in Millimeters

