

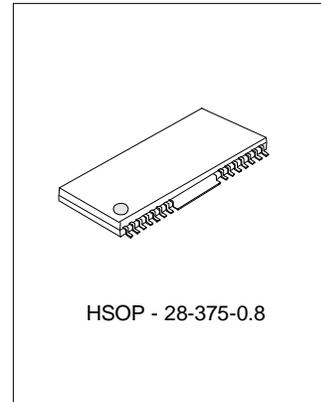
5-CH BTL DRIVER FOR DVD PLAYER WITH REGULATOR AND RESET CONTROL

DESCRIPTION

The SA5809 is a 5-channel motor driver IC for driving the motors and actuators such as CD-P / VCD-P/DVD-P drivers. It is composed of 4-CH BTL drivers and 1-CH forward/reverse DC motor driver. It also integrates build-in independent precision voltage regulators and reset controllers.

FEATURES

- * Built-in five drivers build-in: 4-CH BTL drivers and 1-CH forward/reverse controlled DC motor driver.
- * Built-in level shift circuit on chip.
- * Built-in thermal shutdown circuit on chip.
- * Mute mode built-in.
- * Power Save mode built-in.
- * Reset controller built-in.
- * Regulator controller built-in.



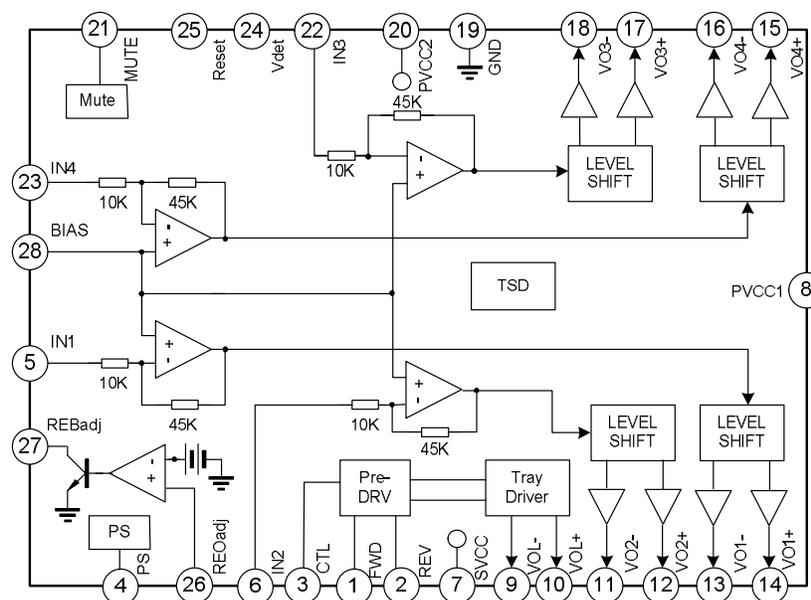
ORDERING INFORMATION

| Part No. | Package |
|----------|-----------------|
| SA5809 | HSOP-28-375-0.8 |

APPLICATIONS

- * CD- PLAYER
- * VCD- PLAYER
- * DVD- PLAYER

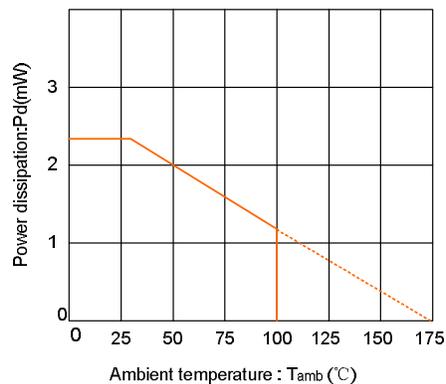
BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATING ($T_{amb}=25^{\circ}C$)

| Characteristics | Symbol | Value | Unit |
|-----------------------|------------|----------|-------------|
| Power Supply Voltage | SVCC, PVCC | 15 | V |
| Power Dissipation | PD | 1.7* | W |
| Operating Temperature | Topr | -35~+85 | $^{\circ}C$ |
| Storage Temperature | Tstg | -55~+150 | $^{\circ}C$ |

* Note: When mounted on a 50mm x 50mm x 1mm glass epoxy board. Reduced by 18.4mW for each increase in T_{amb} of $1^{\circ}C$ when $T_{amb} > 25^{\circ}C$.

POWER DISSIPATION CURVE

ELECTRICAL CHARACTERISTICS

(Unless other specified, $T_{amb}=25^{\circ}C$, $V_{CC}=12V$, $PV_{CC1}=PV_{CC2}=5V$, $BIAS=1.65V$, $R_L=8\Omega$)

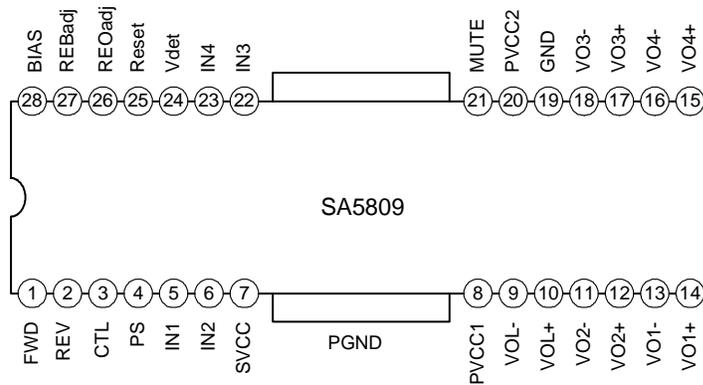
| Characteristics | Symbol | Test conditions | Min. | Typ. | Max. | Unit |
|----------------------------------|------------------|---------------------------------------|---------------------|-----------|---------------------|------|
| Signal Supply Voltage | SVCC | | 4.3 | - | 13.5 | V |
| Power Supply Voltage1 | PVCC1 | | 4.3 | - | SVCC* | V |
| Power Supply Voltage2 | PVCC2 | | 4.3 | - | SVCC | V |
| Quiescent Circuit Current | ICC | No Load | - | 20 | 30 | mA |
| Power Save On Current | IPS | Pin5=GND | - | 0.5 | 2.0 | mA |
| Power Save On Voltage | Vpson | Pin5=sweep | - | - | 0.5 | V |
| Power Save Off Voltage | Vpsoff | Pin5=sweep | 2.0 | - | - | V |
| ADJUSTABLE REGULATOR PART | | | | | | |
| Output Voltage | VREG | $I_L=100mA$ | V_{out}^* 0.95 | V_{out} | V_{out}^* 1.05 | V |
| Load Regulation | ΔV_{om} | $I_L=0 \rightarrow 200mA$ | -50 | 0 | 50 | mV |
| Line Regulation | ΔV_{CC} | $V_{CC}=6 \rightarrow 10V, I_L=100mA$ | -50 | 0 | 50 | mV |
| RESET CONTROLLER PART | | | | | | |
| Detecting Voltage | Vdet | Pin24=sweep (low->high) | 2.6 | 2.9 | 3.2 | V |
| Hysteresis Voltage | ΔV_{det} | | - | 50 | - | mV |
| Maximum Output Sink Current | Isink | | 3 | 6 | - | mA |
| Output Saturation Voltage | Vsat | $R_L=1k\ ohm$ | - | - | 0.4 | V |

(To be continued)

(Continued)

| Characteristics | Symbol | Test conditions | Min. | Typ. | Max. | Unit |
|----------------------------|-------------------|---|------|------|------|------|
| BTL DRIVER PART | | | | | | |
| Output offset Voltage | V _{oos} | V _{in} =V _{ref} | -100 | - | +100 | mV |
| Maximum Output Voltage | V _{oms} | | 3.6 | 4.0 | - | V |
| Closed-Loop Voltage Gain | A _{vfs} | V _{in} =0.1V _{rms} , f=1kHz | 17 | 19 | 21 | dB |
| Mute On Voltage | V _{mon} | Pin21=sweep | - | - | 0.5 | V |
| Mute Off Voltage | V _{moff} | Pin21=sweep | 1.5 | - | - | V |
| Mute Pin Current | I _{mp} | Pin21=5.0V | | 200 | 300 | uA |
| Bias Pin Current | I _{bias} | Pin28=2.5V | | 80 | 120 | uA |
| LOADING DRIVER PART | | | | | | |
| Input High Level Voltage | V _{ih} | | 1.5 | - | - | V |
| Input Low Level Voltage | V _{il} | | - | - | 0.5 | V |
| FWD/REV Pin Current | I _{in} | Pin1=Pin2=5.0V | - | 200 | 300 | uA |
| Maximum Output Voltage | V _o | R _L =25Ω | 9.0 | 10 | - | V |
| Voltage Gain | G _{vf} | Pin3=sweep | 7 | 9 | 11 | dB |

PIN CONFIGURATION



PIN DESCRIPTIONS

| Pin No. | Pin Name | Pin Description |
|---------|----------|------------------------------|
| 1 | FWD | Loading motor forward input. |
| 2 | REV | Loading motor reverse input. |
| 3 | CTL | Loading motor speed control. |
| 4 | PS | Powers save. |
| 5 | IN1 | CH1 input. |
| 6 | IN2 | CH2 input. |

(To be continued)

(Continued)

| Pin No. | Pin Name | Pin Description |
|---------|----------|--------------------------------|
| 7 | SVcc | Signal power supply. |
| 8 | PVcc1 | Power supply 1. |
| 9 | VOL- | Loading driver output (-). |
| 10 | VOL+ | Loading driver output (+). |
| 11 | VO2- | CH2 driver output (-). |
| 12 | VO2+ | CH2 driver output (+). |
| 13 | VO1- | CH1 driver output (-). |
| 14 | VO1+ | CH1 driver output (+). |
| 15 | VO4+ | CH4 driver output (+). |
| 16 | VO4- | CH4 driver output (-). |
| 17 | VO3+ | CH3 driver output (+). |
| 18 | VO3- | CH3 driver output (-). |
| 19 | GND | Ground. |
| 20 | PVcc2 | Power supply 2. |
| 21 | MUTE | Mute. |
| 22 | IN3 | CH3 input. |
| 23 | IN4 | CH4 input. |
| 24 | Vdet | Reset controller input. |
| 25 | Reset | Reset controller output. |
| 26 | REOadj | Adjustable regulator feedback. |
| 27 | REBadj | Adjustable regulator control. |
| 28 | BIAS | Bias. |

 Notes: The indicated polarities for the output pins are positive(+), and $V_{CC} \geq PV_{CC}$.

FUNCTION DESCRIPTION

Operation notes

- (1) This IC has a built in thermal shutdown circuit that mutes the output current when the chip temperature reaches 185°C (typ.). The hysteresis is set to 25°C (typ.), so the driver circuits start up again when the chip temperature falls to 150°C (typ.).
- (2) Floating the mute pin voltage or lowering it below 0.5V can mute the output current. This pin should be pulled up above 1.1V during normal operation.
- (3) Muting state is open when the bias pin voltage drops below 0.7V. This pin should stay above 1.1V during normal operating conditions.
- (4) Lowering the Power Save pin below 0.5V can shut down all the channels and until return 2.0 V will loading normal operation.
- (5) Reset pin will turn to high level when the voltage of Vdet pin is above 2.9V and lower level if Vdet pin drops below 2.9V.
- (6) The internal driving loop circuit will be turn off if power supply is lower than 3.0V, until return 4.1V, the circuit turns on.

(7) If the power supply is too low, the internal thermal shutdown circuit will close the driver. When the mute and bias voltage is too low, BTL driver (except loading driver) will enter mute state, but the pre-amplifier will not mute.

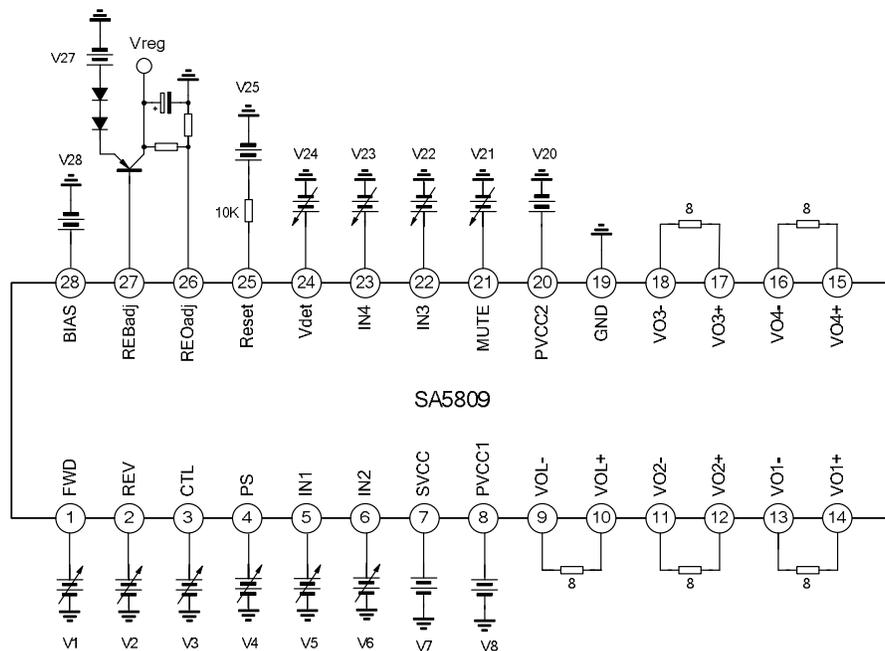
(8) Tray driver logic input:

| FWD(pin1) | REV(pin2) | VOTR+(pin10) | VOTR-(pin9) | Function |
|-----------|-----------|--------------|-------------|--------------|
| L | L | OPEN | OPEN | Open mode |
| L | H | L | H | Reverse mode |
| H | L | H | L | Forward mode |
| H | H | L | L | Brake mode |

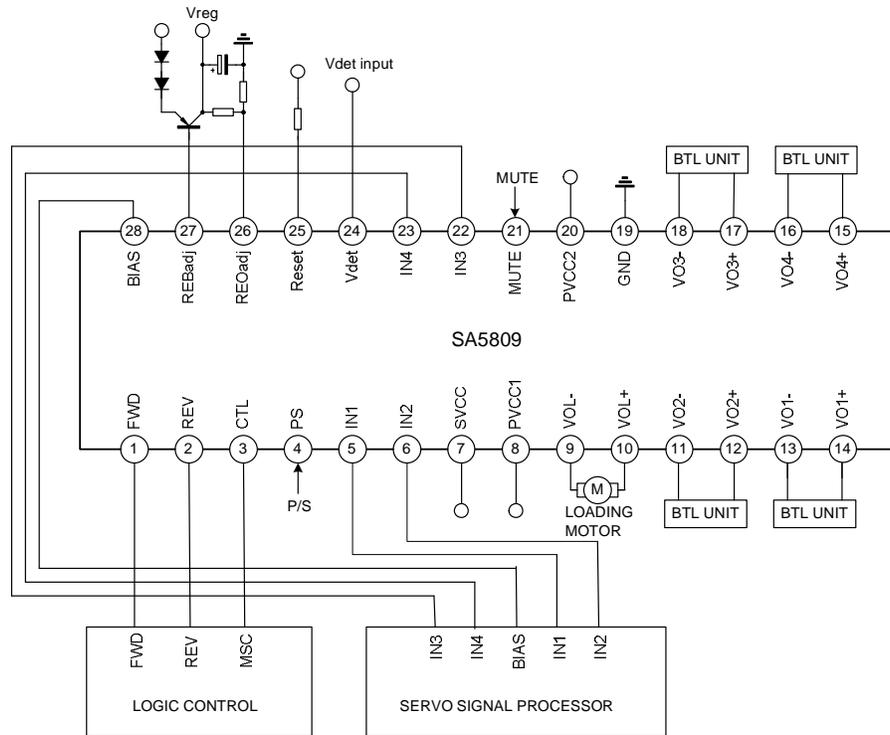
The design of 1,2 pin, consider the driver upper and lower unable to duct at the same time, so the motor forward and reverse will input at the open mode, and the interval of the open mode is more than 10ms.

Output high level voltage(VOL+, VOL-),changed with the motor controller, it can output 3 times voltage of 3 pin at most. In this time, the low level voltage input power pipe is as the output saturation voltage.

TEST CIRCUIT



TYPICAL APPLICATION CIRCUIT



PACKAGE OUTLINE

