

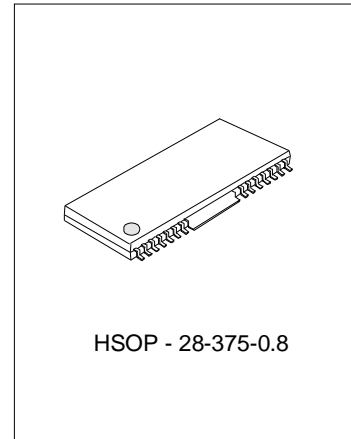
ACTUATOR DRIVER WITH CURRENT FEEDBACK FOR CD – ROM / DVD

DESCRIPTION

The SA5954 is a four-channel BTL driver IC. Two of them can drive DC motors and two can drive coils, such as focus and tracking actuators of a CD-ROM/DVD-ROM/DVD-PLAYER system, with current feedback.

FEATURES

- * 2 channels of DC motor BTL driver
- * 2 channels of BTL driver for coils with current feedback
- * Build-in thermal shutdown circuit
- * Operating voltage:4.3V~13.2V



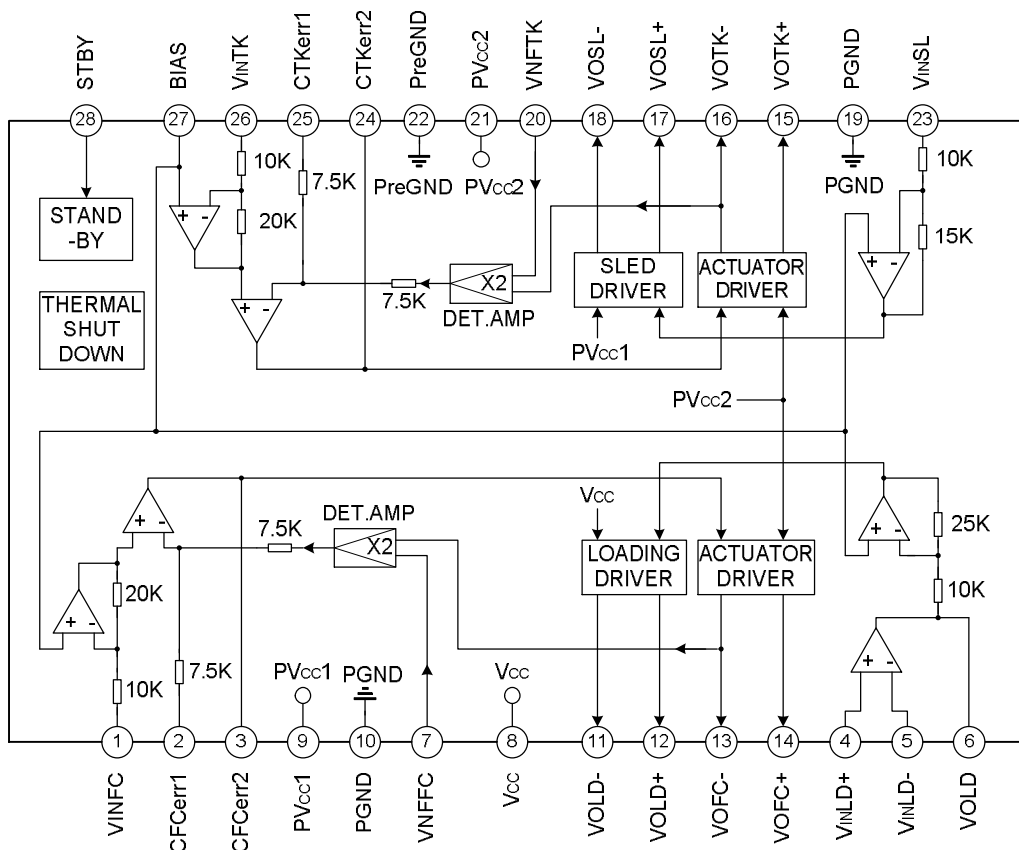
APPLICATIONS

- * CD-ROM, DVD

ORDERING INFORMATION

| Device | Package |
|--------|-----------------|
| SA5954 | HSOP-28-375-0.8 |

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATING (T_{amb}=25°C)

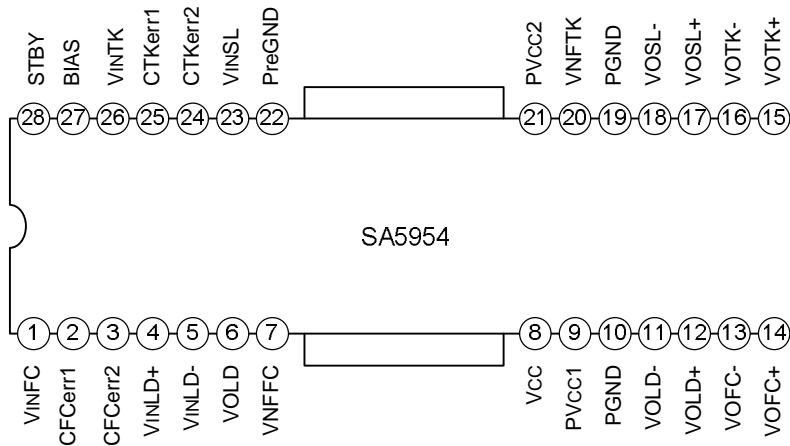
| Characteristics | Symbol | Ratings | Unit |
|-----------------------|--|----------|------|
| Power Supply Voltage | V _{CC} , PV _{CC1/2} | 13.5 | V |
| Power Dissipation | PD | 1.7* | W |
| Operating Temperature | T _{opr} | -35~+85 | °C |
| Storage Temperature | T _{stg} | -55~+150 | °C |

*When mounted on a 70mm X 70mm X 1.6mm glass epoxy board.

Reduced by 13.6mW for each increase in T_{amb} of 1°C over 25°C

ELECTRICAL CHARACTERISTICS (Unless other specified, T_{amb}=25°C, V_{CC}=12V, PV_{CC1}=PV_{CC2}=5V, BIAS=2.5V, R_L=8Ω, R_d=0.5Ω, C= 100pF)

| Characteristics | Symbol | Test conditions | Min. | Typ. | Max. | Unit |
|--------------------------|--------------------|---|------|------|-----------------|------|
| Power Supply Voltage | V _{CC} | | 4.3 | | 13.2 | V |
| | PV _{CC1} | | 4.3 | | V _{CC} | |
| | PV _{CC2} | | 4.3 | | V _{CC} | |
| Quiescent Current | I _{CC} | | -- | 18 | 27 | mA |
| Actuator Driver | | | | | | |
| Output Offset Current | I _{OOF} | | -6 | -- | 6 | mA |
| Maximum Output Amplitude | V _{OM} | V _{IN} =BIAS ±1.5V | 3.6 | 4.0 | -- | V |
| Gain | G _M | V _{IN} =BIAS ±0.2V | 1.3 | 1.5 | 1.7 | A/V |
| Loading Driver | | | | | | |
| Maximum Output Voltage | V _{OHP} | No load | 10.8 | 11.1 | -- | V |
| Output Voltage Offset | V _{OFLD} | | -100 | 0 | 100 | mV |
| Closed Loop Gain | G _{VLD} | V _{IN} =BIAS ±0.2V | 18.0 | 20.0 | 22.0 | dB |
| Sled Driver | | | | | | |
| Output Voltage Offset | V _{OFSL} | | -50 | 0 | 50 | mV |
| Maximum Output Voltage | V _{OMSL} | V _{IN} =BIAS ± 1.5V PV _{CC1} =5V | 3.6 | 4.0 | -- | V |
| Closed Loop Gain | G _{VSL} | V _{IN} =BIAS ±0.2V | 13.5 | 15.5 | 17.5 | dB |
| Gain error | ΔG _{VSL} | V _{IN} =BIAS ±0.2V | 0 | 1 | 2 | dB |
| STBY Logic | | | | | | |
| STBY On Voltage | V _{STBY1} | All Channels Off | 0 | -- | 0.5 | V |
| STBY Off Voltage | V _{STBY2} | All Channels On | 2.0 | -- | -- | V |

PIN CONFIGURATION

PIN DESCRIPTION

| Pin No. | Pin Name | Description |
|---------|----------|---|
| 1 | VINFC | Input for focus driver |
| 2 | CFCerr1 | Connection with capacitor for focus driver |
| 3 | CFCerr2 | |
| 4 | VINLD+ | Input (+) for the Loading driver |
| 5 | VINLD- | Input (-) for the Loading driver |
| 6 | VOLD | Output for the Loading driver |
| 7 | VNFFC | Feedback for focus driver |
| 8 | VCC | VCC |
| 9 | PVcc1 | Power VCC for sled driver block |
| 10 | PGND | Power ground |
| 11 | VOLD- | Output (-) for loading driver |
| 12 | VOLD+ | Output (+) for loading driver |
| 13 | VOFC- | Output (-) for focus driver |
| 14 | VOFC+ | Output (+) for focus driver |
| 15 | VOTK+ | Output (+) for tracking driver |
| 16 | VOTK- | Output (-) for tracking driver |
| 17 | VOSL+ | Output (+) for sled driver |
| 18 | VOSL- | Output (-) for sled driver |
| 19 | PGND | Power ground |
| 20 | VNFTK | Feedback for tracking driver |
| 21 | PVcc2 | Power VCC 2 |
| 22 | PreGND | Pre ground |
| 23 | VINSL | Input for sled driver |
| 24 | CTKerr2 | Connection with capacitor for tracking driver |
| 25 | CTKerr1 | |

(To be continued)

(Continued)

| Pin No. | Pin Name | Description |
|---------|----------|---------------------------|
| 26 | VINTK | Input for tracking driver |
| 27 | BIAS | Bias input |
| 28 | STBY | Standby |

Notes: The indicated polarities for the output pins are under the condition that all inputs are (+).

The power supply are PVcc2 for the focus, tracking drivers are PVcc2, PVcc1 for the sled driver, and Vcc for the pre-block and loading driver. Therefore, make sure $V_{CC} \geq PV_{CC1}, 2$.

APPLICATION INFORMATION

(1) Thermal shutdown

If the chip temperature rises above 175°C, the thermal shutdown (TSD) circuit is activated and the output circuit enters the mute state, which is off state. The TSD circuit has a temperature hysteresis of 25°C.

(2) The driver buffer is switched off when the supply voltage falls below 3.5V (Typ.), and is switched back on when the voltage reaches 3.7V (Typ.) again.

(3) The stand by circuit logic

| Stand-by input voltage | operation |
|------------------------|---|
| Below 0.5V or open | The stand-by function is activated so the bias block and power block are disabled |
| Above 2.0V | Recover the normal operation |

ELECTRICAL CHARACTERISTICS CURVES

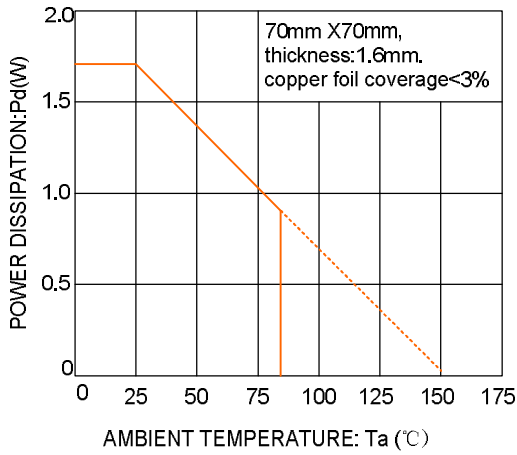


Fig 1. Thermal dissipation curve

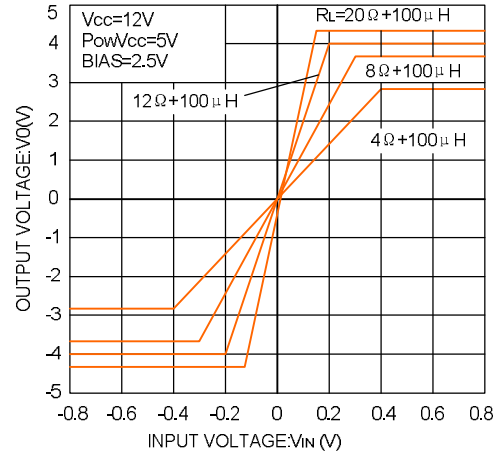


Fig 2. Driver I/O characteristics (focus and tracking)

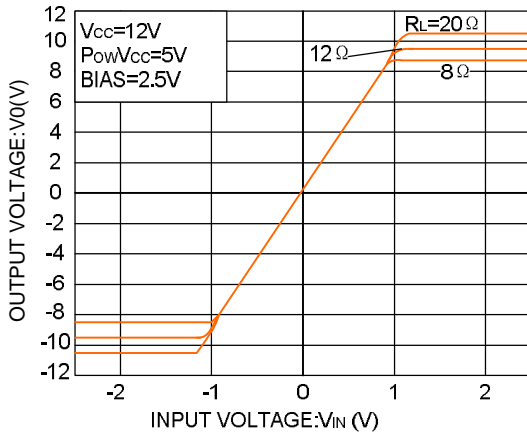


Fig 3. Driver I/O characteristics (Loading)

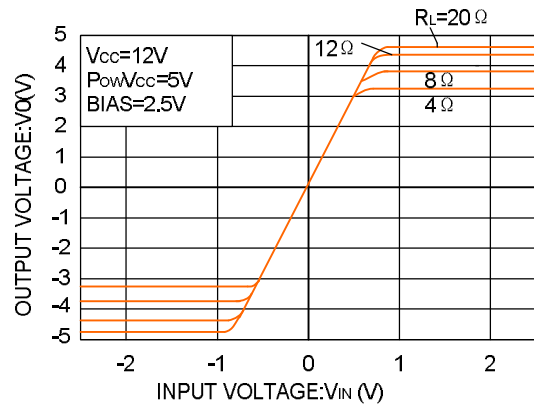


Fig 4. Driver I/O characteristics (slew)

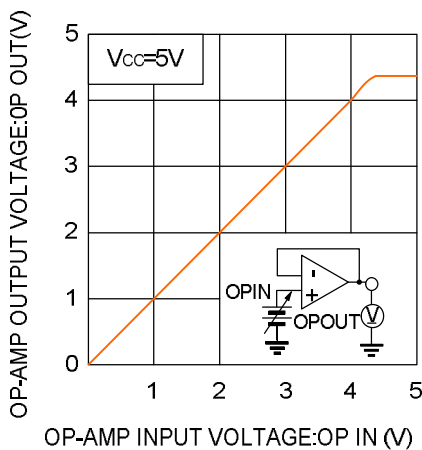


Fig 5. Op-amp I/O characteristics

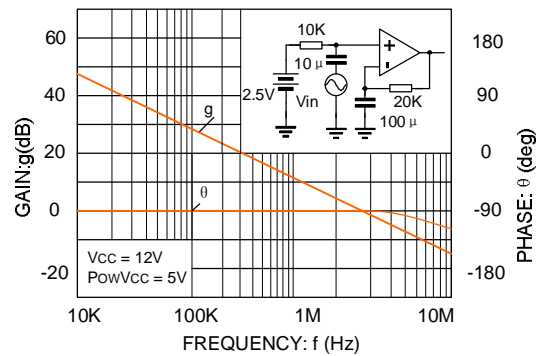
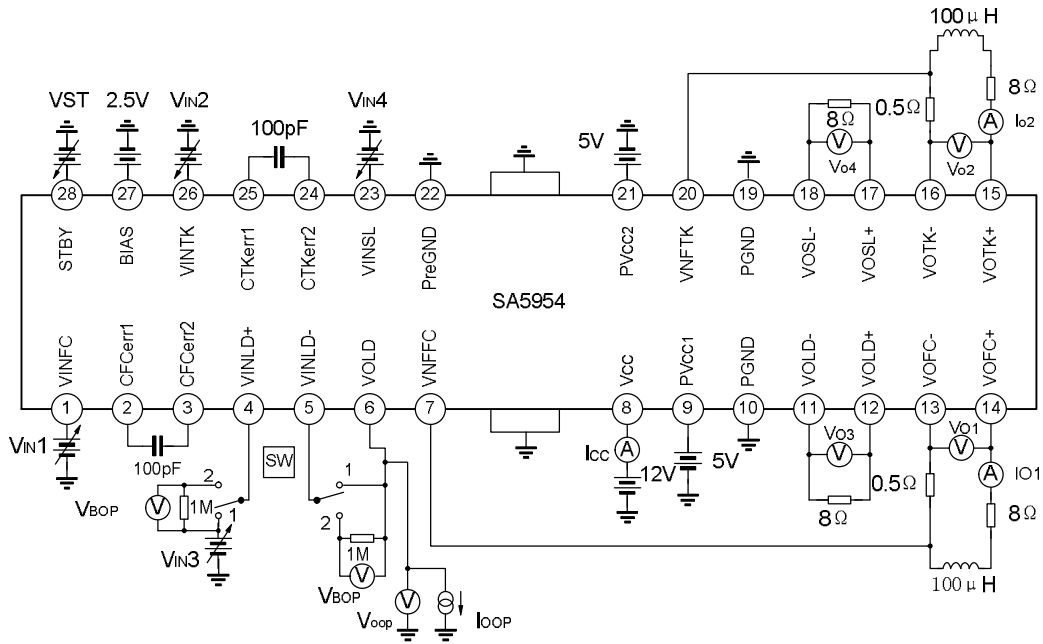
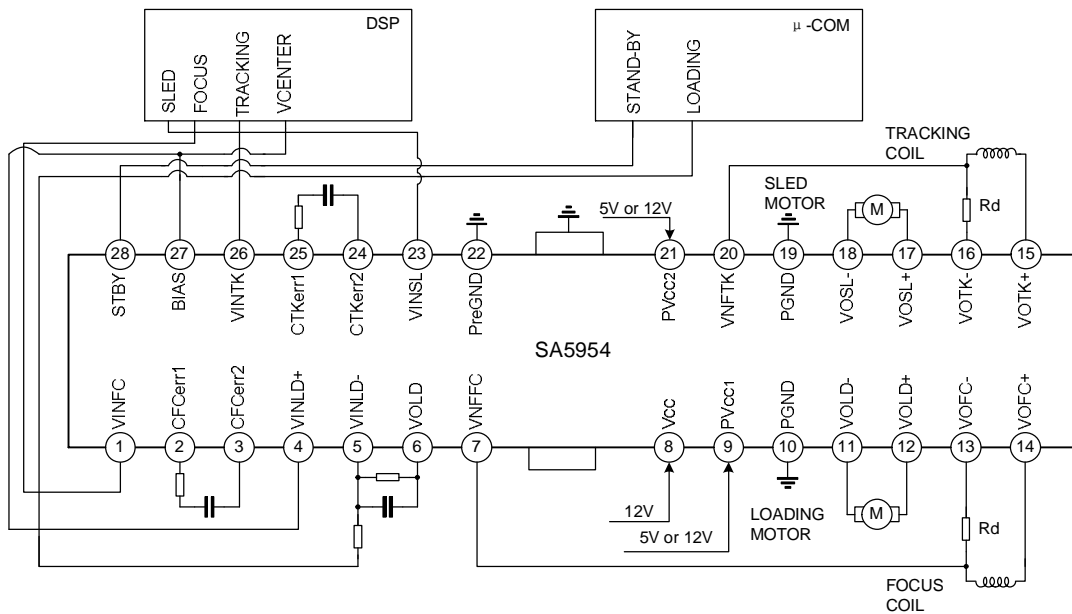


Fig 6. Op-amp phase-frequency, amplitude-frequency characteristics

TEST CIRCUIT



TYPICAL APPLICATION CIRCUIT



PACKAGE OUTLINE

