

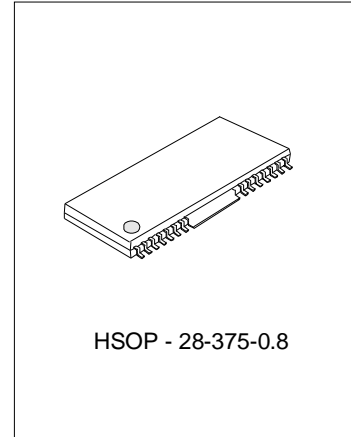
ACTUATOR DRIVER WITH CURRENT FEEDBACK FOR CD – ROM / DVD

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



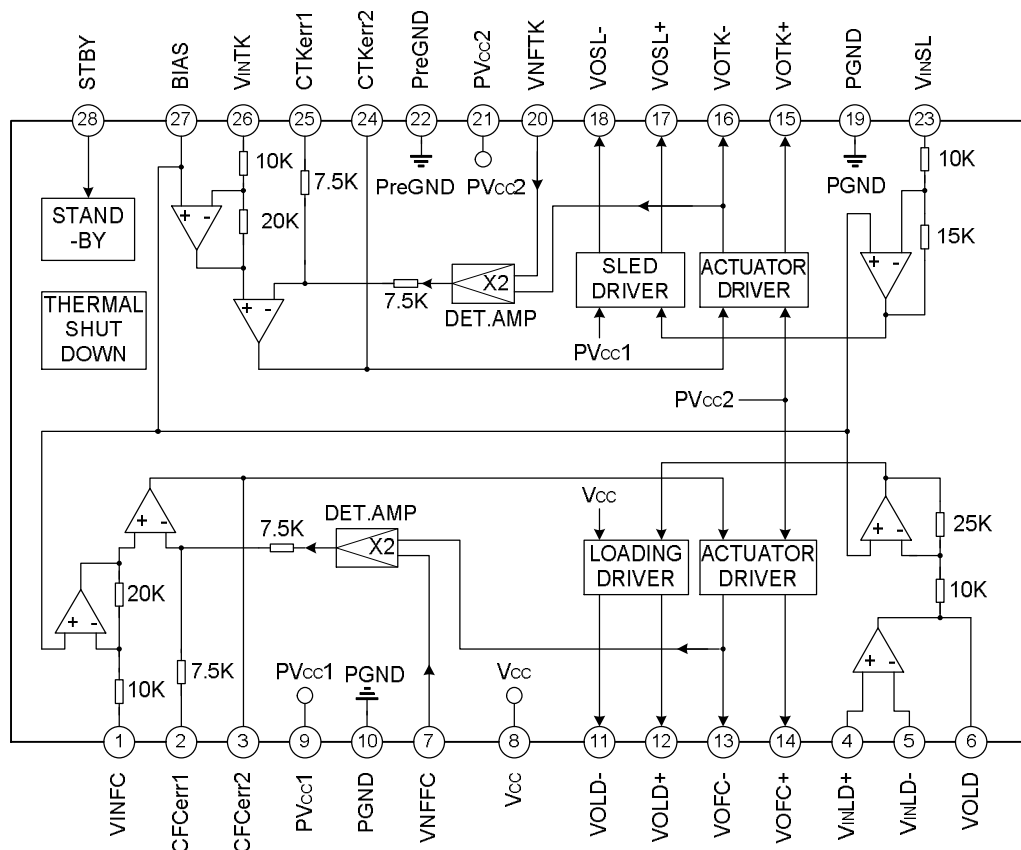
APPLICATIONS

- \* CD-ROM, DVD

ORDERING INFORMATION

Device	Package
SA5954	HSOP-28-375-0.8

BLOCK DIAGRAM



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

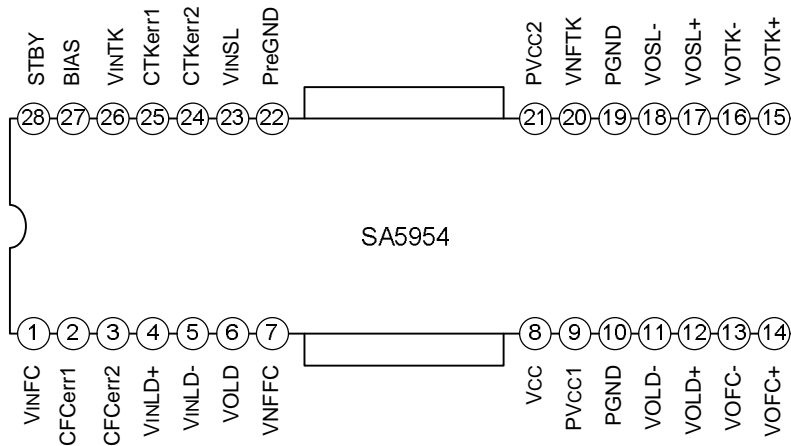
Characteristics	Symbol	Ratings	Unit
Power Supply Voltage	VCC, PVCC1/2	13.5	V
Power Dissipation	PD	1.7*	W
Operating Temperature	T <sub>opr</sub>	-35~+85	°C
Storage Temperature	T <sub>stg</sub>	-55~+150	°C

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

Reduced by 13.6mW for each increase in T<sub>amb</sub> of 1°C over 25°C

 ELECTRICAL CHARACTERISTICS (Unless other specified,  $T_{amb}=25^{\circ}C$ , VCC=12V, PVCC1=PVCC2=5V, BIAS=2.5V, R<sub>L</sub>=8Ω, R<sub>d</sub>=0.5Ω, C= 100pF)

Characteristics	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Power Supply Voltage	VCC		4.3		13.2	V
	PVCC1		4.3		VCC	
	PVCC2		4.3		VCC	
Quiescent Current	I <sub>CC</sub>		--	18	27	mA
Actuator Driver						
Output Offset Current	I <sub>OFF</sub>		-6	--	6	mA
Maximum Output Amplitude	V <sub>OM</sub>	V <sub>IN</sub> =BIAS ±1.5V	3.6	4.0	--	V
Gain	G <sub>M</sub>	V <sub>IN</sub> =BIAS ±0.2V	1.3	1.5	1.7	A/V
Loading Driver						
Maximum Output Voltage	V <sub>OHP</sub>	No load	10.8	11.1	--	V
Output Voltage Offset	V <sub>OFLD</sub>		-100	0	100	mV
Closed Loop Gain	G <sub>VLD</sub>	V <sub>IN</sub> =BIAS ±0.2V	18.0	20.0	22.0	dB
Sled Driver						
Output Voltage Offset	V <sub>OFSL</sub>		-50	0	50	mV
Maximum Output Voltage	V <sub>MSL</sub>	V <sub>IN</sub> =BIAS ±1.5V PVCC1=5V	3.6	4.0	--	V
Closed Loop Gain	G <sub>VSL</sub>	V <sub>IN</sub> =BIAS ±0.2V	13.5	15.5	17.5	dB
Gain error	ΔG <sub>VSL</sub>	V <sub>IN</sub> =BIAS ±0.2V	0	1	2	dB
STBY Logic						
STBY On Voltage	V <sub>STBY1</sub>	All Channels Off	0	--	0.5	V
STBY Off Voltage	V <sub>STBY2</sub>	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

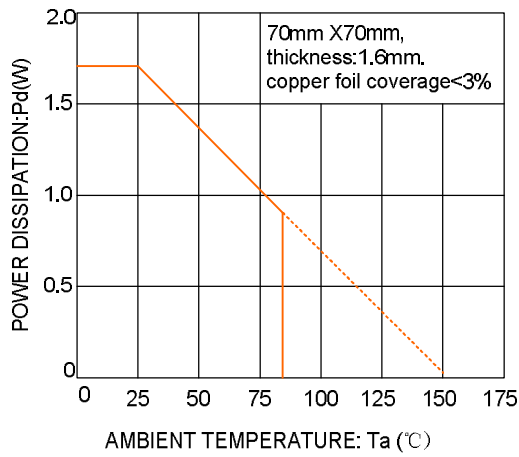


Fig 1. Thermal dissipation curve

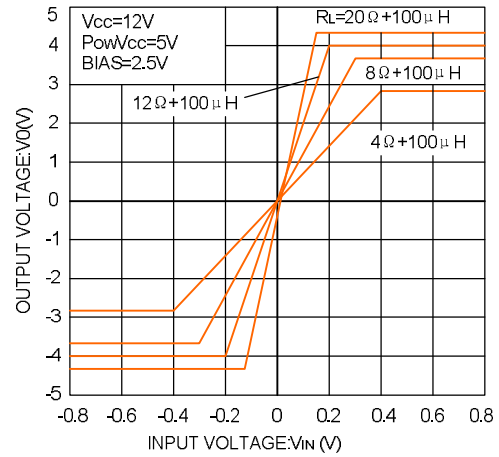


Fig 2. Driver I/O characteristics (focus and tracking)

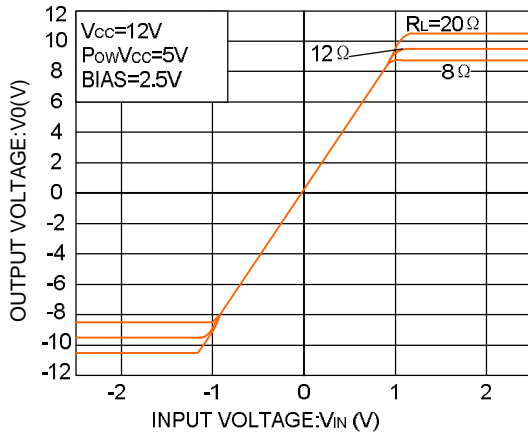


Fig 3. Driver I/O characteristics (Loading)

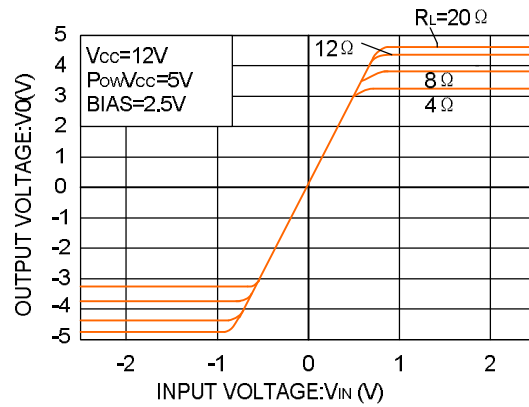


Fig 4. Driver I/O characteristics (slew)

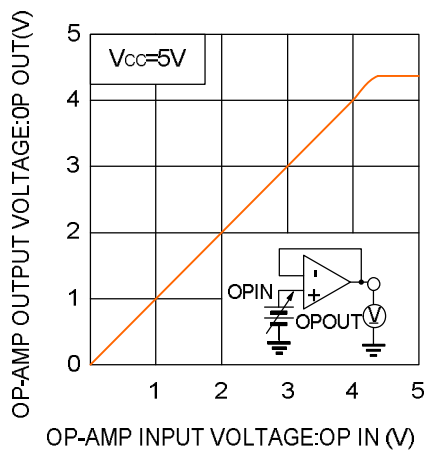


Fig 5. Op-amp I/O characteristics

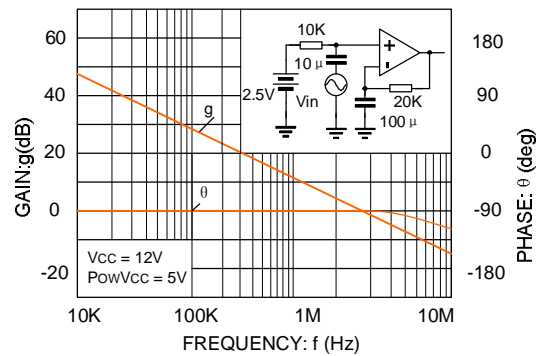
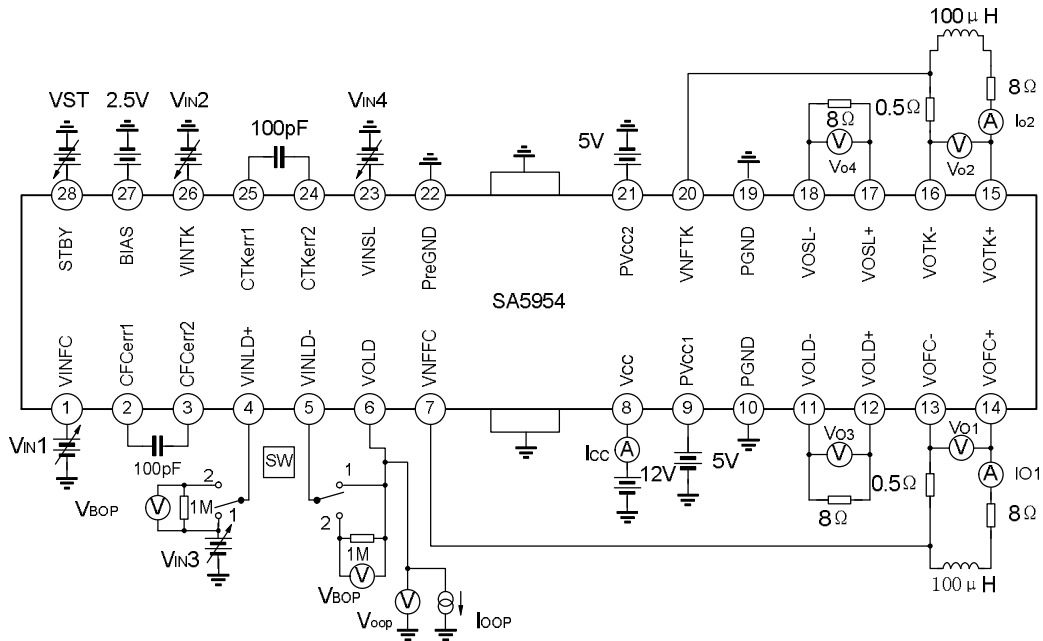
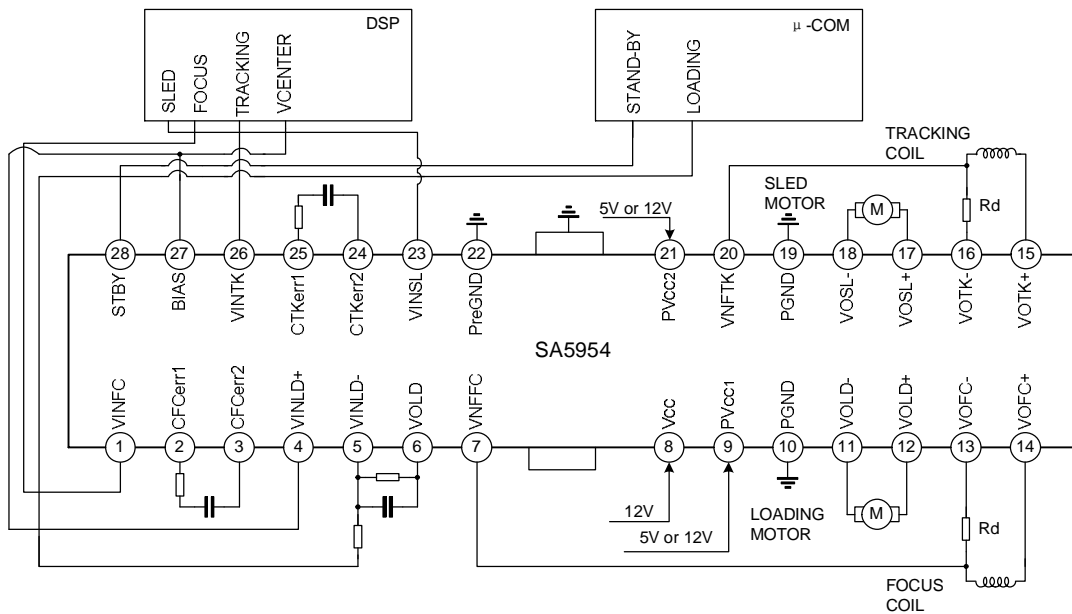


Fig 6. Op-amp phase-frequency, amplitude-frequency characteristics

TEST CIRCUIT



TYPICAL APPLICATION CIRCUIT



PACKAGE OUTLINE

