

6-channel Combo driver IC

BD7907FS

● Description

BD7907FS is a 6-channel driver IC that integrates all drivers necessary for CD-ROM, and DVD-ROM systems into a single chip. The built-in 2-channel sled motor driver is used for the stepping motor. Low heat operation can be achieved by applying the PWM driving system for sled and spindle motor drivers.

● Features

- 1) Motor drivers for spindle, sled (2-channel) and loading, and actuator drivers for tracking are all integrated into a single chip.
- 2) ON/OFF for each driver, brake mode switching of spindle and stand-by mode switching can be controlled by 2-wire serial data.
- 3) Built-in triangular-wave generator
- 4) SSOP-A54 package
- 5) Built-in thermal shut-down circuit

<Spindle driver>

- 6) Highly efficient by applying the PWM drive and Low ON resistance POWER MOSFET
- 7) Built-in current limit, hall bias, short brake, FG 3-phase synthesis output, and reverse protection circuit

<Sled motor driver>

- 8) Highly efficient due to the PWM drive
- 9) Built-in 2-channel for the stepping motor

<Actuator, loading driver>

- 10) Low noise due to the linear BTL driver and smooth spin

● Applications

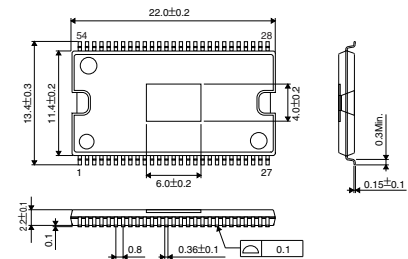
CD-ROM, DVD-ROM, and any other equipment driven by optical DISC

● Absolute Maximum Ratings (Ta=25°C)

| Parameter | Symbol | Limits | Unit |
|------------------------------|----------------------|------------|------|
| Power MOS supply voltage | SPVM1,2, SLRNF1,2 | 15 | V |
| Pre/BTL power supply voltage | VCC, SLVDD, AVM | 15 | V |
| PWM control supply voltage | DVCC | 7 | V |
| Power dissipation | Pd | 2.6 *1 | W |
| Operating temperature range | Topr | -35 ~ +85 | °C |
| Storage temperature range | Tstg | -55 ~ +150 | °C |

*Derating : 20.8mW/°C for operation above Ta=25°C PCB (70mm ¥ 70mm ¥ 1.6mm glass epoxy board)

● Dimension (Units : mm)



SSOP-A54

● Recommended Operating Conditions (Ta=25°C)

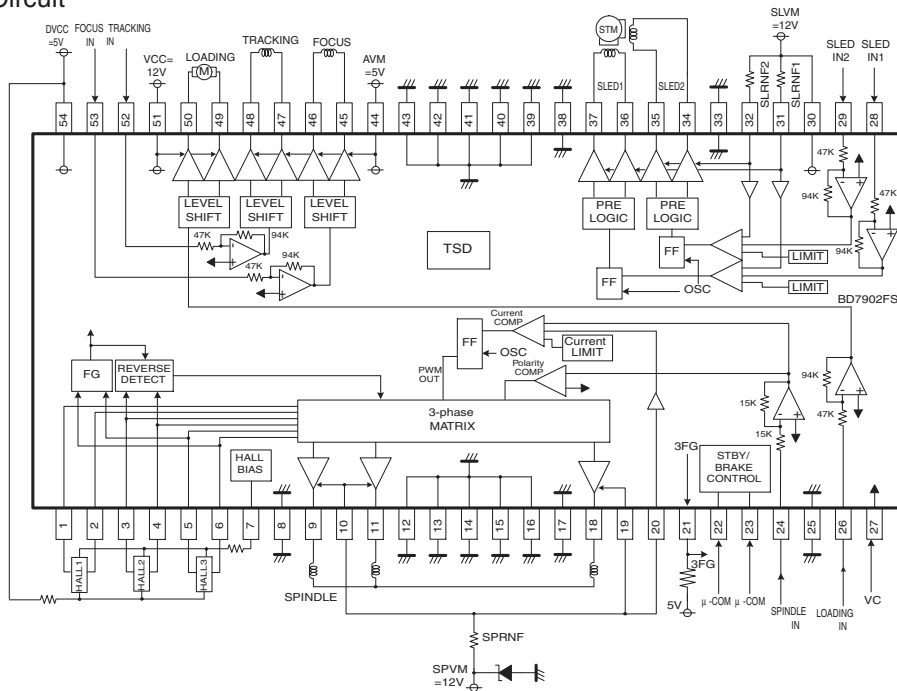
| Parameter | Symbol | Min. | Typ. | Max. | Unit |
|-----------------------------|-----------|------|---------------------|------|------|
| Power MOS supply voltage1 | SPVM1,2 | — | VCC ^{*2} | — | V |
| Power MOS supply voltage2 | SLRNF1,2 | — | SLVDD ^{*2} | — | V |
| Pre-driver supply voltage | SLVDD,VCC | AVM | 12 | 14 | V |
| Power driver supply voltage | AVM | 4.3 | 5.0 | Vcc | V |
| PWM control supply voltage | DVCC | 4.3 | 5.0 | 6.0 | V |

*2 SPVM1,2 must be established with the same voltage of Vcc and, SLRNF1,2 must be established with the same voltage of SLVDD.

● Electrical Characteristics (Unless otherwise noted; Ta=25°C, SLVDD=VCC=12V, DVCC=AVM=5V, VC=1.65V, SPRNF=0.33Ω, SLRNF=0.5Ω)

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Conditions |
|-------------------------------------|--------|------|------|------|------|-----------------------|
| Feed motor driver | | | | | | |
| Input dead zone (One-side) | VDZSL | 15 | 40 | 65 | mV | |
| I/O gain | gmSL | 0.8 | 1.0 | 1.2 | A/V | SLRNF=0.5Ω |
| Output ON resistance | RONUSL | — | 3.2 | 4.2 | Ω | Io=500mA (Top+Bottom) |
| Output limit current | ILIMSL | 0.8 | 0.94 | 1.08 | A | SLRNF=0.5Ω |
| Spindle driver <Torque command I/O> | | | | | | |
| Input dead zone (One-side) | VDZSP | 20 | 50 | 90 | mV | |
| I/O gain | gmSP | 2.4 | 3.0 | 3.6 | A/V | SPRNF=0.33Ω |
| Output ON resistance | RONUSP | — | 0.95 | 1.7 | Ω | Ip=500mA (Top+Bottom) |
| Output limit current | ILIMSL | 1.2 | 1.42 | 1.64 | A | SPRNF=0.33Ω |
| Actuator driver | | | | | | |
| Output offset voltage | VOFFT | -50 | 0 | 50 | mV | |
| Output saturation voltage | VOHFT | — | 0.9 | 1.6 | V | Io=500mA (Top+Bottom) |
| Voltage gain | GVFT | 16.0 | 17.5 | 19.0 | dB | |
| Loading driver | | | | | | |
| Output offset voltage | VOFLD | -50 | 0 | 50 | mV | |
| Output saturation voltage | VOHLD | — | 1.55 | 2.2 | V | Io=500mA (Top+Bottom) |
| Voltage gain | GVLD | 16.0 | 17.5 | 19.0 | dB | |

● Application Circuit



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