TEXAS INSTRUMENTS

TLS2242

Servo-Combination Driver

STORAGE
Products Group

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DESCRIPTION

The TLS2242 is a driver designed for use in 5 V hard-disk-drive (HDD) applications. The TLS2242 can drive a voice-coil motor (VCM) and spindle motor (SPM). Both the VCM and spindle sections are complete servo systems including power and predrivers requiring only a few additional discrete components for full functionality.

FEATURES

- **GENERAL**
  - **5 V operation**
  - **Serial Port Interface (20 Mbit/s data transfer rate)**
- **VOICE-COIL MOTOR (VCM) DRIVER**
  - **High efficiency drivers, 1.5 Ω on-state drain-source resistance (R_{DS}) total (worst case)**
  - **0.4 A capacity**
  - **3 gain ranges (1:2:8)**
  - **2 modes selectable for power-off Retract operation:**
    - **For CSS operation on-chip circuitry provides VCM voltage from spindle back electromotive force (EMF)**
    - **For ramp loading/unloading off-chip circuitry provides VCM voltage from spindle back EMF**
  - **10-bit DAC current control and 6-bit DAC for offset adjust control**
  - **Current and voltage monitor circuit for ramp loading**
  - **Sense resistor current control**
- **SPINDLE MOTOR DRIVER**
  - **High efficiency drivers, 1 Ω on-state R_{DS} total (worst case)**
  - **1 A capability**
  - **Digital commutation delay and blanking**
  - **Bipolar drive**
  - **Dynamic braking/power-off braking after retract**
  - **6-bit DAC for startup current control (also used as offset adjust for the VCM)**
  - **Driver slew rate control by setting an external capacitor**
  - **Frequency-locked loop (FLL) rotation speed control**
- **SHOCK DETECTION CIRCUIT**
  - **Shock sensor amplifier**
  - **On-chip low-pass filter (LPF) and shock detection voltage that is adjustable using serial port**
- **VOLTAGE MONITOR/VOLTAGE REFERENCE**
  - **Fault detector provides ±2% supply voltage tolerance**
  - **Reset circuit provides ±2% tolerance**

BLOCK DIAGRAM