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DESCRIPTION

The SSI 32H6816 Integrated Servo and Spindle Driver, a BiCMOS monolithic integrated circuit housed in a 56-Lead TSSOP package, operates from a single +5 V supply and integrates all the required functions for head positioning and spindle control. It is designed to drive a 5 V voice coil actuator and a 3-phase hall-sensorless spindle motor.

Actuator current is commanded via an on-chip 10-bit D/A converter. A 6-bit D/A converter is included to null out the actuator offset current. Precision current mirrors sense actuator and spindle motor current. Servo retract is activated upon command. Shock detector circuitry is also included. Spindle current is set by either an on-chip 6-bit D/A or a speed charge pump, thus spindle speed regulation can be accomplished with on-chip frequency lock loop (FLL) or 6-bit D/A in conjunction with an external processor. Configuration and control registers are set via the 3-pin serial port to interface commonly used microcontrollers (μ C) and digital signal processors (DSP).

The device is ideal for use in 5 V small-form factor disk drive applications.

FEATURES

VCM INTERFACE

- 0.6 A 1.8 Ω $R_{DS,TOTAL}$ VCM driver
- No deadband, low crossover distortion, class-AB output
- Precision VCM current control - no external sense resistor required
- 10-bit, 1 MHz D/A for VCM current control
- On-chip current sense mirrors
- 6-bit VCM offset cancellation D/A
- Selectable gains for a wide range of position error signals

SPINDLE INTERFACE

- 1.5 A 1 Ω $R_{DS,TOTAL}$ driver
- Precision SPM current control - no external sense resistor required
- 6-bit SPM current control D/A
- Programmable FLL speed control with $\pm 0.02\%$ resolution
- Jitter-immune PLL commutation
- SPM current slew rate control - no snubbers needed
- Commutation phase pre-compensation for optimal motor efficiency

FAULT DETECTION / RETRACT

- Synchronous back EMF rectifier for retract - no external Schottky diodes required
- Precision voltage reference
- Low voltage and thermal faults detection with retract circuitry

GENERAL

- 56-Lead TSSOP package
- Multiple power save modes
- Serial interface
- Shock detection circuitry
- 3.3 V voltage regulator predriver

SSI 32H6816

5 V Servo and Spindle Driver

BLOCK DIAGRAM

