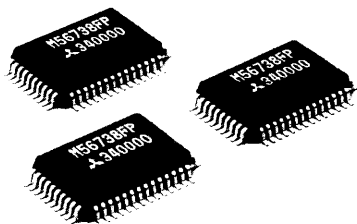


SINGLE-CHIP HDD ACTUATOR CONTROL CONTROLS BOTH THE SPINDLE AND VOICE COIL MOTORS; SUITABLE FOR THE MAK- ING OF LOW POWER-CONSUMING HDD OF A SMALLER DIAMETER

M56738FP



F E A T U R E S

- SPM controller and VCM driver housed in a single chip
- Sensorless driving (self actuator built in)
- Operates at a low supply voltage
 $5\text{ V} \pm 10\%$, $3.3\text{ V} \pm 10\%$
- Small crossover distortion
- Auto retract current adjustable with external resistor
- Permits the use of lower-capacity damping capacitor

D E S C R I P T I O N

As personal computers become more compact and thinner, hard disk drives (HDD) mounted on them are increasingly compact, thin, and less power consuming. In order to produce these units, semiconductor integrated circuits with a smaller mounting area, operating at a low supply voltage, are needed.

To meet these needs, Mitsubishi Electric has developed the M56738FP. This IC controls both the spindle motor (SPM) and voice coil motor (VCM) and is ideal for the making of low power-consuming HDD using a smaller disk.

The M56738FP is a semiconductor integrated circuit housing an SPM controller and VCM driver in a single chip. The VCM driver is used for positioning of the magnetic head. Since the internal power amplifier has only small crossover distortion and also has a linear response characteristic, the VCM driver can position the magnetic head with a high degree of accuracy. The SPM controller uses a sensorless drive mechanism eliminating the need for a hole device. As a self actuator, which generates a start signal within the IC, is provided, the IC can actuate the motor by itself. In addition, choice of external or internal actuation is available, so it is possible to start the motor by an external signal from, for example, a microcomputer. The IC is designed to operate at a supply voltage of $3.3\text{ V} \pm 10\%$ as an option.

As explained above, having integrated circuits offering two functions organized into a single chip and enabling it to operate at a low supply voltage, the M56738FP is very effective for making small HDD with low power consumption.

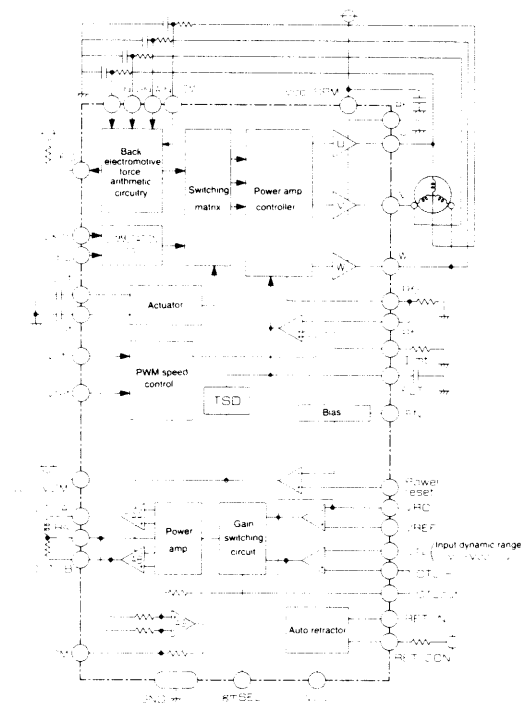


Fig. 1 Block Diagram and External Elements

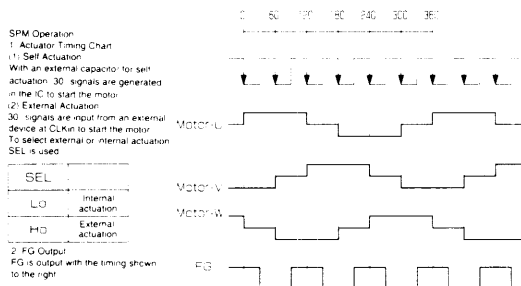


Fig. 2 SPM Control Operation

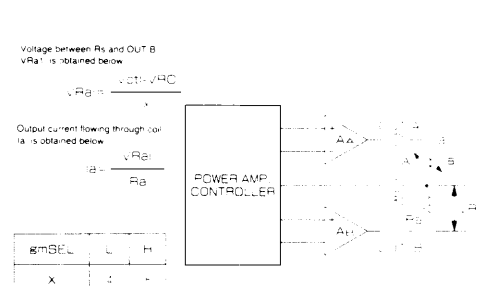


Fig. 3 VCM Driver Operation