

DIFFERENTIAL CURRENT-MODE DRIVER FOR MICROWAVE ASSISTED MAGNETIC RECORDING

ABSTRACT

The present disclosure describes aspects of a differential current-mode (iMode) driver for microwave-assisted magnetic recording (MAMR) application in hard-disk drives. In some aspects, an iMode driver circuitry employs a driver circuit coupled to power supply connections. The driver circuit is configured to provide a controlled differential bias current and includes separate source and sink output terminals. A MAMR sensor couples between the source and sink output terminals, through which the MAMR sensor receives the controlled differential bias current provided by the driver circuit. The MAMR sensor, which has a field-entry terminal and a field-exit terminal, generates microwave fields for the recording process. A common-mode feedback (CMFB) loop couples to the field-entry and field-exit terminals of the MAMR sensor, forming a feedback pathway with the driver circuit. This CMFB loop detects common-mode voltage (CMV) and adjusts the controlled differential bias current to maintain CMV regulation of the MAMR sensor.

Fig. 1