

ABSTRACT

[0033] A magnetic recording medium having a composite magnetic recording structure comprising the combination of a hard magnetic layer and a metamagnetic layer that possesses a field induced metamagnetic transition characteristic at ambient operating temperature. Under an applied external magnetic field, the metamagnetic layer transitions from an antiferromagnetic state to a ferromagnetic state, and the magnetic field induces magnetization of the metamagnetic layer. The hard magnetic recording layer is magnetically exchange coupled to the magnetized metamagnetic layer. This results in the softening of the coercivity of the overall magnetic recording structure and reduction of the required switching field during data recording. Upon removal of the applied magnetic field, the metamagnetic layer experiences transition back to an antiferromagnetic state and the coercivity of the hard magnetic layer is restored. This restoration allows the written bit to be stored at a high thermostability ratio and thus, preventing magnetization thermal decay of the data bit.

FIGURE 2