MAGNETORESISTIVE (MR) SENSOR WITH COEFFICIENT ENHANCING LAYER THAT PROMOTES THERMAL STABILITY

ABSTRACT

An MR sensor with an improved MR coefficient and improved thermal stability is provided by employing one or more chromium based spacer layers which are interfacially adjacent a Permalloy (NiFe) stripe. The chromium based spacer layers may be NiFeCr or NiCr. The best compositions have been found to be $(Ni_{89}Fe_{21})_{60}Cr_{40}$ and $Ni_{60}Cr_{40}$. For NiCr the MR coefficient of the MR stripe is most enhanced when the NiCr layer is deposited on a layer of tantalum (Ta). Further, when the thicknesses of the NiFeCr and the NiCr layers are 25Å and 50Å respectively the MR coefficients are optimized. Both spacer layers have a high resistance compatible with low shunting of the sense current.

Fig. 2