

MAGNETIC TUNNEL JUNCTION MAGNETORESISTIVE READ HEAD WITH SENSING LAYER AS REAR FLUX GUIDE

ABSTRACT

A magnetic tunnel junction (MTJ) magnetoresistive read head for a magnetic recording system has the MTJ device or free ferromagnetic layer (132) also functioning as a flux guide to direct magnetic flux from the magnetic recording medium to the tunnel junction. The MTJ fixed ferromagnetic layer (118) and the MTJ tunnel barrier layer (120) have their front edges (206) substantially coplanar with the sensing surface (200) of the head. Both the fixed (118) and free (132) ferromagnetic layers are in contact with opposite surfaces of the MTJ tunnel barrier layer (120) but the free ferromagnetic layer (132) extends beyond the back edge of either the tunnel barrier layer (120) or the fixed ferromagnetic layer (118), whichever back edge is closer to the sensing surface. This assures that the magnetic flux is non-zero in the tunnel junction region. The magnetization direction of the fixed ferromagnetic layer (118) is fixed in a direction generally perpendicular to the sensing surface.

Fig 5