Abstract

Multi-bit per cell magnetic memory with perpendicular magnetization and spin torque switching

In an embodiment, a magnetoresistive device having a magnetic junction may be provided. The magnetic junction may include at least one fixed magnetic layer structure having a fixed magnetization orientation; and at least two free magnetic layer structures, each of the at least two free magnetic layer structures having a variable magnetization orientation; wherein the at least one fixed magnetic layer structure overlaps with the at least two free magnetic layer structures such that a current flow is possible through the magnetic junction; and wherein at least one fixed magnetic layer structure and the at least two free magnetic layer structures are respectively configured such that the fixed magnetization orientation and the variable magnetization orientation are oriented in a direction substantially perpendicular to a plane defined by an interface between the at least one fixed magnetic layer structure and either one of the at least two free magnetic layer structures.

Fig. 1A