

SEMICONDUCTOR CONSTRUCTIONS, ELECTRONIC SYSTEMS, AND METHODS OF FORMING CROSS-POINT MEMORY ARRAYS

ABSTRACT

The present application concerns vertical stacks of memory units (14, 16, 18), with individual memory units each having a memory element (28), a wordline (22), a bitline (24) and at least one diode (26). The memory units may correspond to cross-point memory, and the diodes may correspond to band-gap engineered diodes containing two or more dielectric layers sandwiched between metal layers. Tunneling properties of the dielectric materials and carrier injection properties of the metals may be tailored to engineer desired properties into the diodes. The diodes may be placed between the bitlines and the memory elements, or may be placed between the wordlines and memory elements. Some embodiments include methods of forming cross-point memory arrays. The memory arrays may contain vertical stacks- of memory unit cells, with individual unit cells containing cross-point memory and at least one diode, and adjacent memory units being spaced from one another by a passivation material (20).

FIGURE 1