INTEGRATED CIRCUIT DEVICES WITH SOLDERABLE LEAD FRAME

Abstract

A packaged device with a lead frame, a lead frame and an article of manufacture comprising a base metal, a layer of nickel on the base metal, and a protective composite of metal layers on the nickel. The composite includes, in succession from the nickel layer, a layer of palladium or soft gold strike, a layer of palladium-nickel alloy, a layer of palladium and a layer of gold. The palladium or soft gold strike layer acts primarily as a bonding (an adhesive) layer between the Ni and Pd-Ni alloy layers and as a layer that enhances reduction in porosity of subsequent layers. Pd-Ni alloy layer acts as a trap for base metal ions, Pd layer acts as a trap for Ni ions from the Pd-Ni alloy layer, and the outer gold layer synergistically enhances the quality to the Pd layer. The various layers are in thickness sufficient to effectively accomplish each of their designated roles, depending on the processing and use conditions. Pd on soft Au strike layer may be 1-5 microinches thick, Pd-Ni alloy layer from 4 to 100 microinches, Pd layer from 1 to 100 microinches and the outer gold layer from 1 to 100 microinches in thickness.

Figure 3

This Sheet Has Been Replaced