Thin-film sample aging at 150°C for different time

Polish it for OM, SEM,EDX to observe structure change

Electromigration test under 0.28A to get life time, and use IR. Polish it for OM, SEM, EDX to observe structure change.

Thick-film sample aging at 150°C for different time

Polish it for OM, SEM, EDX to observe structure change

Measure bump resistance by 4-point measure

Electromigration test under 0.75A to get life time, and use IR. Polish it for OM, SEM, EDX to observe structure change.

Fig. 3.1 A flow sheet of our experiment (a) thin-film bump (b) thick-film bump
Fig. 3.2 Thin-film sample (a) schematic diagram of bump UBM (b) SEI image

Fig. 3.3 Schematic diagram of electromigration test sample
Fig. 3.4 Thick-film sample chip and FR-4 board sketch map

Fig. 3.5 Chip side Al line and bump connect sketch map
Fig. 3.6 The bump which isn’t aging (a) OM image (b) BEI X 300times (c) BEI X 1000times
Fig. 3.7 To assume that IMC can reduce current crowding effect, schematic diagram of electromigration test sample in thick-film bump (a) no aging sample (b) aging have thicker IMC
Fig. 3.8 Schematic diagram of electromigration test sample in thick-film bump

Fig. 3.9 Four-point measure in thick-film bump (a) schematic diagram (b) photograph image