

TABLE 1—COMPARISON OF SOFT-ERROR SOURCES

| SER type | Source | Mechanism | Trend |
|-----------------|--|--|--|
| Alpha | Thorium and uranium contamination in-mold compound, silicon, or lead bumps | 2- to 9-MeV alpha particle creating electron-hole funnel traveling 25 microns in silicon | Exponential increase with scaling |
| Cosmic | Intergalactic sources modulated by solar flares | High-energy neutrons/protons (10 MeV to 1 GeV) colliding with silicon nuclei | Decrease in failures in time per megabit |
| Thermal neutron | Boron present in BPSG25-meV neutrons | Collision with B10 in BPSG | Highest, always dominates if present |