

## 0524EE-Table3

Table 3: Socket (Module) Versus Chip On-Board Tradeoffs

	<b>Chip-on-board</b>	<b>Socket (module)</b>	<b>System-on-a-chip</b>
Space (cubic)	Least board-space efficient	Less board-space efficient	Most board-space efficient
Manufacturing complexity	Populate board with multiple components	Simple socket interface; module assembled by memory supplier	Simple component, complex placement/rework process
Board-layout complexity	More complex due to multiple components	Straightforward, simple layout for motherboard	Multiple motherboard layer layout
Rugged	Most vibration-proof	Least rugged (standard module)	Vibration-proof
Purchasing consideration	Short lead time; testing done by manufacturer	Shorter lead time; module tested by suppliers; more predictable supply	Long lead time; high cost
Electrical consideration	Most impedance control	Possible impedance mismatch due to memory connector socket	Least impedance control
Upgradability	Not upgradable	Easily upgradable	Not upgradable
Field failure support	Whole motherboard replacement required	Easy on-site module replacement	Whole motherboard replacement required
Manufacturing process of memory	Uses finished/tested package component from semiconductor	Uses finished/tested package component from semiconductor; assembled onto a module	Uses silicon package; requires clean-room processing
Reusability	Single-chip replacement possible; difficult chip removal and replacement	Simple chip replacement on memory module; easy testing	Cannot reuse (silicon package)

Courtesy of Virtium Technology