Notebook PC Form Factor Trends affect Storage

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Biography – Takashi Sugawara

Principal Storage Engineer with Lenovo

• 28 years in storage technology, with IBM and Lenovo

• Led innovations of client PC design
  • HDD Active Protection System
  • BGA SSD Security Wipe
  • Host Controlled SSD Thermal Management

• Inventor with 20 registered patents
Notebook PC Form Factor Trend

1992
ThinkPad® 700C

1998
ThinkPad® 600

2008
ThinkPad® X300

2019
ThinkPad® X1 Carbon 7th
Notebook PC Form Factor Trend

- Thinner profile
- Longer battery life
- Squeeze MB area
- M.2 getting too large

Migrate to BGA SSD (16x20)?
Serviceability Requirement

- If a PC breaks with a soldered-down SSD on board
  - Returned PC results in lost data
  - Data security risk!

- A removable device is mandatory for corporate customers

Need a removable SSD smaller than M.2
Introduction of XFMEXPRESS™

- New removable SSD with a footprint similar to a BGA 1620
- -47% smaller area, -0.45mm lower Z-height than M.2 2230
- -2.0g lighter weight than M.2 2230
- High performance: up to 4-lanes of PCIe®
- Thermal-aware connector design
- Similar cost basis with M.2

Note) Data is provided for information purposes only, and does not constitute a warranty. Offers, specifications and availability may change without notice.

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Conclusion

• XFMEXPRESS™ provides
  • Removability versus a soldered-down BGA SSD
  • Lighter, smaller and lower Z-height than M.2
  • Equivalent performance & cost as M.2

• Next steps
  • More SSD developers to adopt XFMEXPRESS™
  • More suppliers to build connectors
THANK YOU!

For more information,
visit Booth #307, Toshiba Memory