



Flash Memory Summit

Lenovo

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





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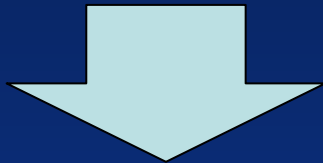
Notebook PC Form Factor Trend





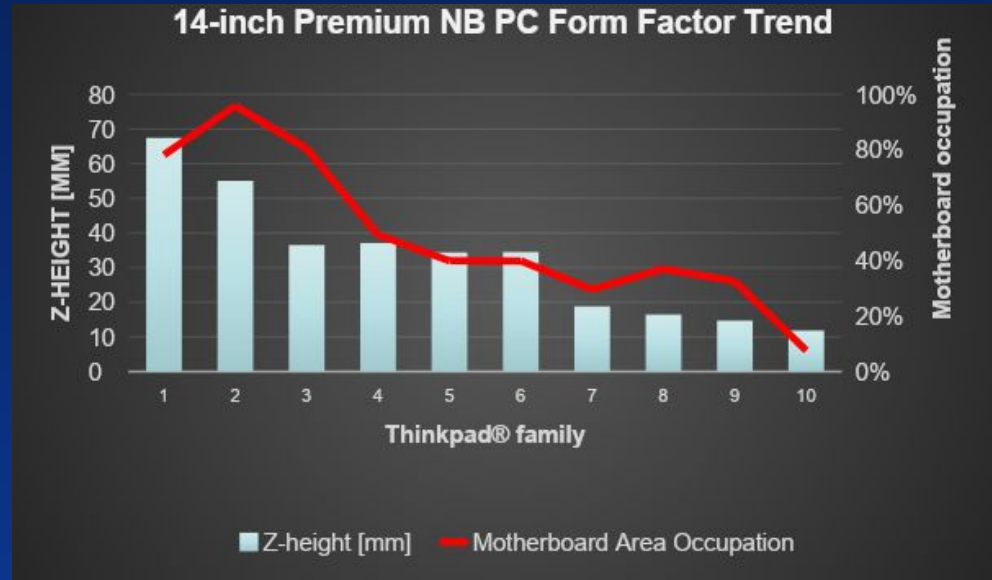
Notebook PC Form Factor Trend

- 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



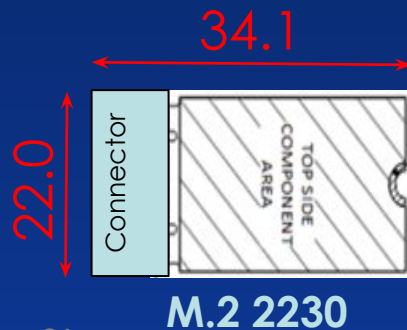
Need a removable SSD smaller than M.2



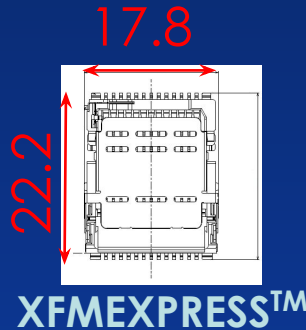
Introduction of XFMEXPRESS™

- 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

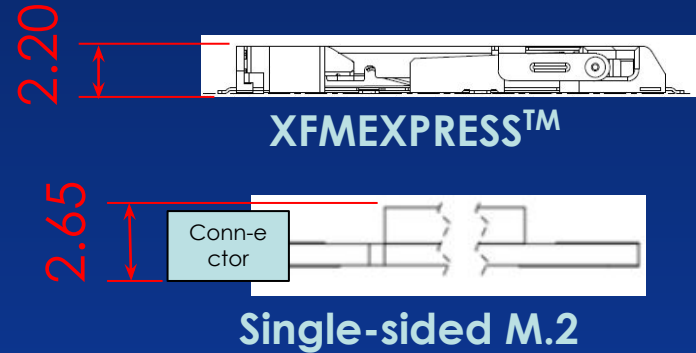
Note) Data is provided for information purposes only, and does not constitute a warranty. Offers, specifications and availability may change without notice.



M.2 2230



XFMEXPRESS™



XFMEXPRESS™

Single-sided M.2



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



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THANK YOU!

For more information,
visit **Booth #307, Toshiba Memory**