Consumer Applications –
The Evolution of SSD Form Factor in
Consumer Applications

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Agenda

• Storage Trend 2014 ~2017
• Client Market Segmentation
• NAND Trend
• Form Factor Trend
• Take Away
Storage Trends

- Worldwide Device Shipments to Grow 1.5% Percent, to Reach 2.5 Billion Units in 2015

Source from: Gartner Inc. (July 2015)  http://www.gartner.com/newsroom/id/3088221
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SSD Market Segmentation

- AIC, 2.5”, M.2
- M.2, BGA
- • 2.5”, M.2
- M.2

Enthusiast Tower
Mainstream DT and All-In-One (AIO)
Convertible Notebooks/Ultramobile
High End Notebook

Phison Electronics Corp.
Storage Form Factor

3.5”  2.5”  1.8”

Add-In-Card (AIC)

MO-276 (BGA)

Mainstream in 2015

M.2 2242
M.2 2260
M.2 2280
M.2 22110

MO-300a (mSATA)
MO-300b (mSATA mini)
MO-297 (Half Slim)
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NAND Mono Density Is Increasing

Die Density

- 256GB As Mainstream
- 8 NAND 16/32Gb
- 4 NAND 3Xnm 32/64Gb
- 8 NAND 32/64Gb
- 4 NAND 3Xnm 32/64Gb
- 2 NAND 1X/1Y/1Znm 32/64/128Gb
- 1 NAND 3D 256Gb

Process Node
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Client Market Trend

Portability/ Responsiveness/ Reliability/ Cost Orientated

3.5 Inch → 2.5 Inch → M.2

2.5 Inch → mSATA → M.2

mSATA → M.2 → BGA
An Example

It was from DRAM, now is SSD……

*Picture from iFixit.com
Key Takeaways

- M.2 is the current generation cost effective SSDs storage
- M.2 Enables expanded capacity options
- Once 256Gb mono mature and become mainstream, BGA SSD will replace module. SSD will be embedded!

BGA Form Factor will be the Future
High-end Client
Entry-Level Client
High-end Client
Industrial
EL Enterprise

Market Leadership

- **In-house** SATA III, PCIe Gen 3 IP
- Process node moving into 40nm & 28nm
- **StrongECC** for the next generation 3D MLC/TLC; more advantageous compared to LDPC

Aggressive SSD Development Plan

- **4 SATA controllers** currently in productions
- **6 NEW SSD controllers** to be expected from 2015 – 2016 1H
- Broad Portfolio:
  - SATA III: 8Ch, 4Ch, 2Ch
  - PCIe: Gen3x4, Gen3x2, Gen3x1
Phison Product Line Up

PCle Gen3 Ultra Speed Solution
• x2 (2GB/s)
• x4 (4GB/s)

SATA 6Gb/s Mainstream Storage
• 8CH
• 4CH
• 2CH

eMMC Mobile Device
• 4.41
• 4.5
• 5.0
• UFS
# Rich Diversity of SSD Solution

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<th>AIC</th>
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<th>Half Slim</th>
<th>mSATA</th>
<th>M.2 22110</th>
<th>M.2 2280</th>
<th>M.2 2260</th>
<th>BGA uSSD</th>
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Thank You

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