Ways to Use High Performance Storage for IoT and AI from a "Best-Fit" Point of View

Flash Memory, IoT and AI
- Bringing it All Together

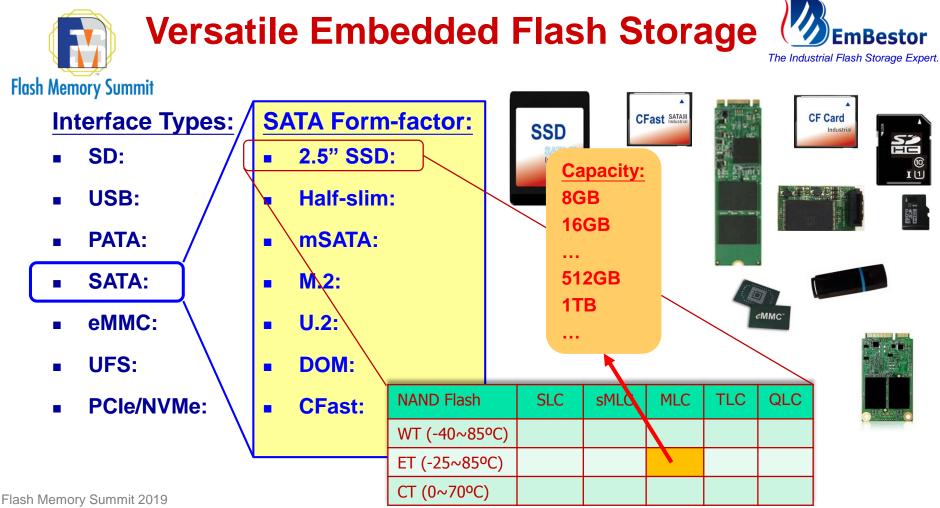EMBD 302B-1: PANEL DISCUSSION

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Versatile Embedded Flash Storage

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The Industrial Flash Storage Expert.

Interface Types:

- **SD:**
- **USB:**
- **PATA:**
- **SATA:**
- **eMMC:**
- **UFS:**
- **PCIe/NVMe:**

SATA Form-factor:

- **2.5" SSD:**
- **Half-slim:**
- **mSATA:**
- **M.2:**
- **U.2:**
- **DOM:**
- **CFast:**

Capacity:
8GB
16GB
…
512GB
1TB
…

NAND Flash	SLC	sMLC	MLC	TLC	QLC
WT (-40~85ºC)					
ET (-25~85ºC)					
CT (0~70ºC)					

EFS Design-In Check List

Basic Functions:

- **Interface:**
- **Form-factor:**
- **Memory Type:**
- **Capacity:**
- **Performance:**
- **Data Read/Write behavior:**
- **Power Consumption:**

Additional Functions:

- **Workload & product lifecycle.**
- **Data Integrity: Data Retention, Power-fails, Data Robustness.**
- **Data Security.**

Environmental:

- **Operation Temperature Range.**
- **Dusty, Humid, Chemical.**
- **Electro-Magnetic: EMI, EMC.**
- **Mechanical: Vibration, Shock.**

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Flash Memory Summit

Factors in Storage for IoT and AI

- **Application Scenario**: Operation behavior, Workload, Environments, Frequently using functions, …

- **Physicals**: Interface, Form-factor, Flash memory type, Capacity, Temperature grade, Water/Dust proof, …

- **Response and Data Transfer Rate**: Random IOPS, Throughput.

- **Data Integrity**: ECC, Flash memory maintenance, Security, ...

- **Computation Power**: MCU type? Multi-core? Architecture, ...

- **System Management:** Power, Thermal, Health monitoring, …

- **System Index**: Price/Perf, Perf/Watt, TCO.

- **Customized functions**: for vendor application specific.

Select the "Best-Fit" EFS

- **Must be Satisfied**: Items by Check-list Table.

Item Specification	CHK	Item Specification	CHK
Form-factor, MO297	√	S.M.A.R.T. items	√
Interface, SATA 3	√	Customized items	√
Temperature, -40~85	√	….. …..	√

- **Selectable Items**: by optimizing the Performance Index.

Performance Index = f *(Capacity, Data Rate, $/Perf, Perf/Watt, …)*

- **Configurable**: Flexible, Extensible, Adaptive, ...