



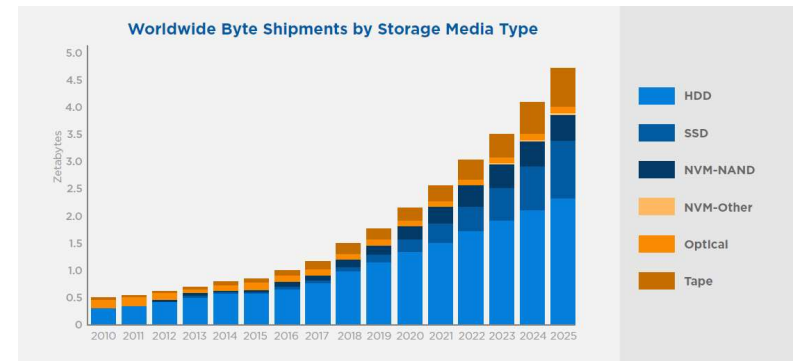
TETRAMAX: Technology TRAnSfer via Multinational Application eXperiments

HS-CHAR

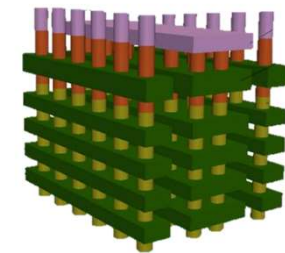
High Speed Characterization of Mass Storage Devices



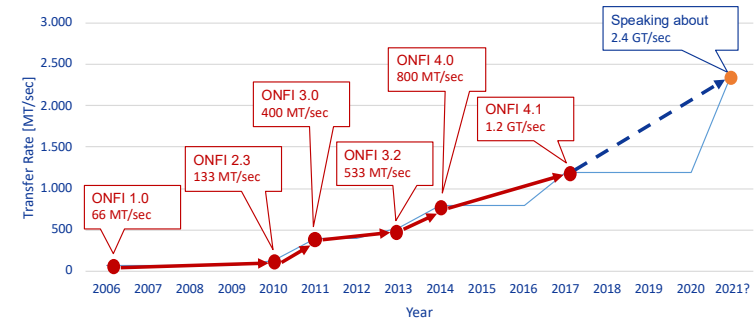
Application



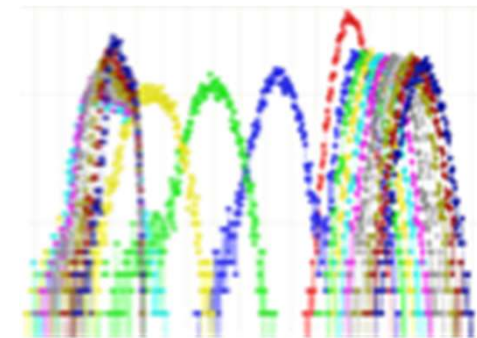
- Solid state storage is rocketing
 - AI, “green” data centers, autonomous drive
- SSDs are based on NAND technology
 - 3D, QLC, <10nm
- NAND technology is far from being perfect
 - Endurance, read errors, interference
- SSD makers need to characterize the NAND devices in order to reach target performance and reliability
- NplusT supplies equipment for NAND characterization



Problem Solved



- NAND interface speed is increasing
 - 66 MT/sec (2006) → 1.2GT/sec (2018)
- High speed interface introduces new reliability issues mainly due to the local heating
- At speed characterization is needed
- High speed testing sets a new challenge and NplusT does not have the necessary technology
 - Signal quality, sockets (!)



Team

PCB Design



- Founded in 2013
- Full engineering service
 - System design
 - Schematics and layout
 - Embedded software
- Target groups
 - High-speed digital design
 - Industrial applications
 - Start-up projects



NplusT

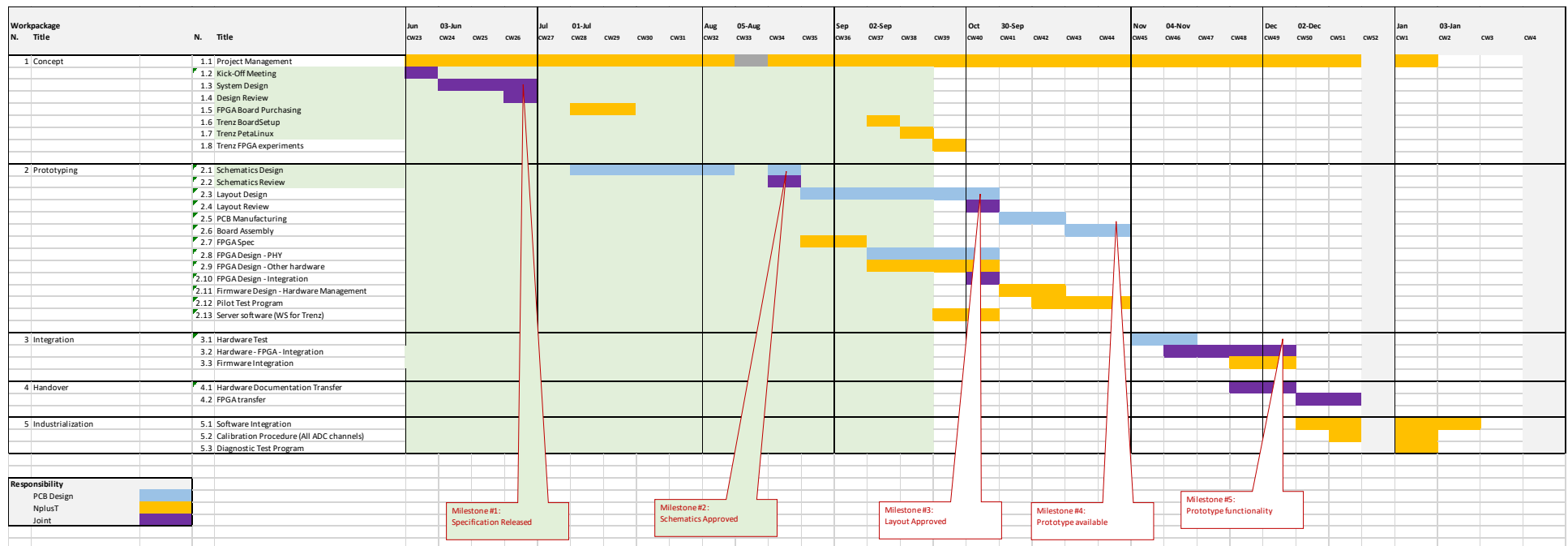


- SMI, located in Central Italy
- Founded in 2002 by Tamás Kerekes
- Semiconductor industry
 - test equipment
 - characterization tools
 - data analysis software

Matchmaker: BME MIT: TETRAMAX Competence Center

- 14 Local Economic Partners in HU
- Long-time connection with NplusT – presented the TETRAMAX program and call
- Identified PCB Design, as a technology provider to face the high-speed challenge
- NplusT & PCB Design is the only SME-SME projects

Project



Teamwork :

- Strong cooperation between the engineering teams
- Weekly status alignment
- Face-to-face working session for system specification
- Intense joint laboratory work is planned for November - integration

Conclusions and future

- Technology transfer driven by market needs
- Team created by support of BME MIT
- Ongoing development in-line with original schedule
- Huge expectations as customers are pushing for early delivery and in extended applications
 - Evolution roadmap is under definition
 - Basis of a long-term cooperation between PCB Design and NplusT