## KEY CHALLENGES:

The latest 100G optical module standards now require *Reed Solomon - Forward Error Correction* (RS-FEC) encoding to extend the reach and/or reliability of these optical links. RS-FEC encoding, as defined by the IEEE in 802.3bj, is applied to the 4x25G interface commonly used to connect these 100GE optical modules, such as QSFP28 pluggable modules.

Unfortunately, this RS-FEC encoding cannot be applied at the original 10x10G signaling interfaces used in earlier 100GbE standards and is incompatible with the 10x10G-to-4x25G "Gearbox" function as defined in IEEE 802.3ba. This makes it difficult to utilize FPGAs and ASICs with lower-speed SerDes (10-11G) to implement the latest 100GbE interfaces.

KEY SYSTEM CONSIDERATIONS:

- Support industry communication standards
- Support Reed Solomon - Forward Error Correction (RS-FEC) encoding for newer 100G optical interfaces (e.g. SR4, PSM4, CWDM)
- Retimer capability for 40GbE and OTU3 optical modules
- Strong signal integrity ensuring reliable data transfer
- Automatic RX adaptation to simplify system implementation
- Package and power options supporting line card, daughter card and module applications are integral to system power and heat issues
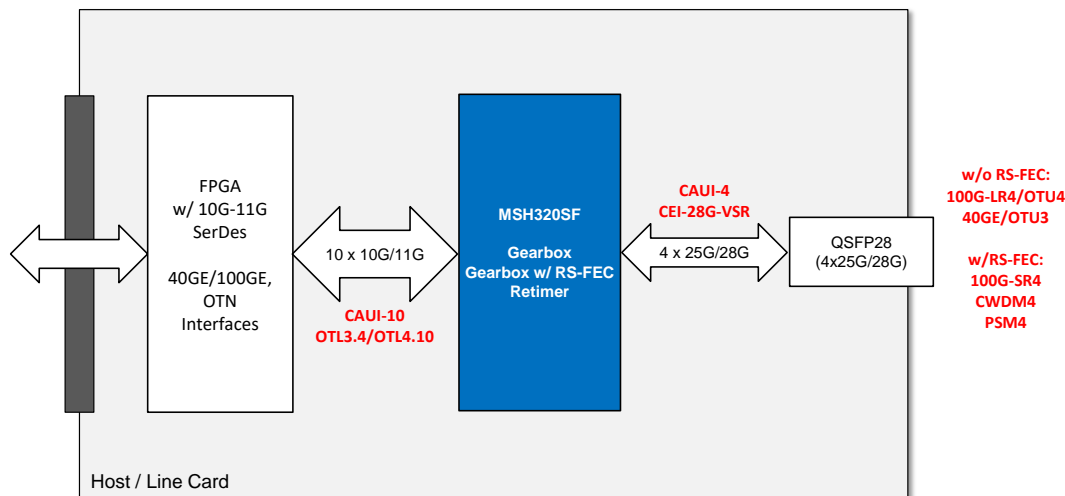
THE MOSYS SOLUTION:

The MoSys MSH320SF device is the best fit for 100GE optical interfaces.

- Supports critical industry standards, such as:
  - IEEE and OIF 10G, 25G, 40G and 100G standards
  - Forward Error Correction (FEC) payload support allows direct connection to 100G optical standards requiring RS-FEC (e.g. SR4, CWDM, PSM4)
- 100G QSFP28 optical module support using lower-cost FPGAs with 10-11G SerDes Interfaces
  - Supports Gearbox and Gearbox with RS-FEC modes for 100G QSFP28 modules
  - Supports Retimer mode for 40GbE/OTN Modules (QSFP+) in the same footprint
- Signal integrity is key to ensuring reliable transfer of data
  - MoSys self-adapting RX equalizers for ease of connection
  - Reduce board design and bring-up time by eliminating per-lane "tuning"
- Package and power options for line card, daughter card, and module applications
  - Board power is always an issue in a system. The MSH320SF has an excellent power/performance ratio
- Cost/performance must be considered in any system design:
  - Some devices in volume are priced at less than $50 each

KEY POINTS SUMMARY:

- Adherence to industry standards for interoperability with other available industry devices and interfaces.
- Strong signal integrity and package/power options support cable, backplane, printed circuit boards and module level solutions.
- Single device supports 100G FEC, 100G non-FEC, OTN, and 40G standard optics

TYPICAL APPLICATIONS:

- Data Centers and Cloud Computing
- Datacom and Telecom Systems
- 100G Line Cards and Switches
- Data loss prevention in critical systems

ADDITIONAL RESOURCES:

- [Linespeed Product Line](#)
- [Linespeed Product Brief](#)
- [Linespeed Press Release](#)