

Receptacles Selection of 10G Pluggable
Optics For Modeling



WE *light* IT UP

Kevin Zhang PhD

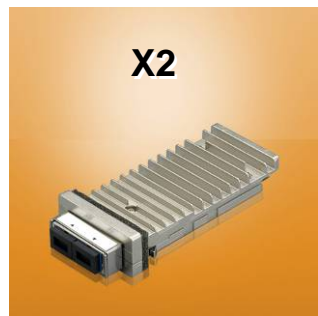
Field Application Engineering

Opnext – NA Sales

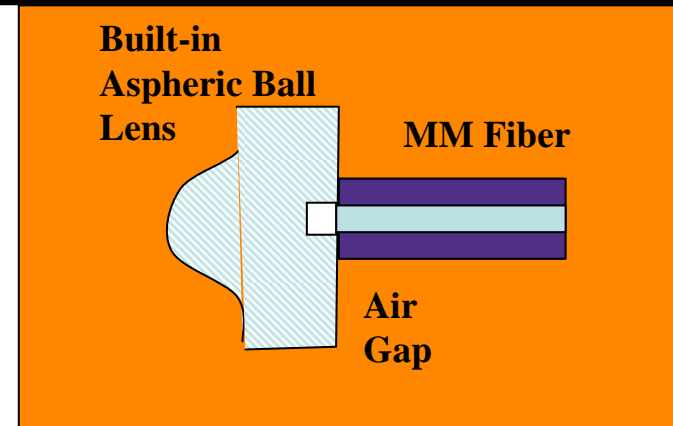
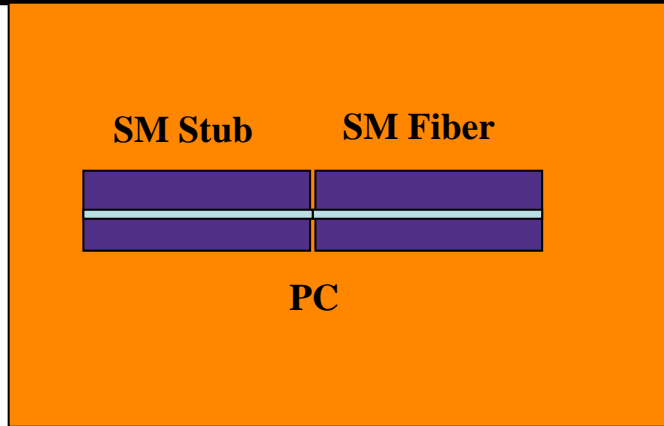
- **Application overview of 10G pluggable optics**
- **Typical model for both TOSA and ROSA receptacles**

Application Overview of Optical Receptacles in 10G Pluggable Optics

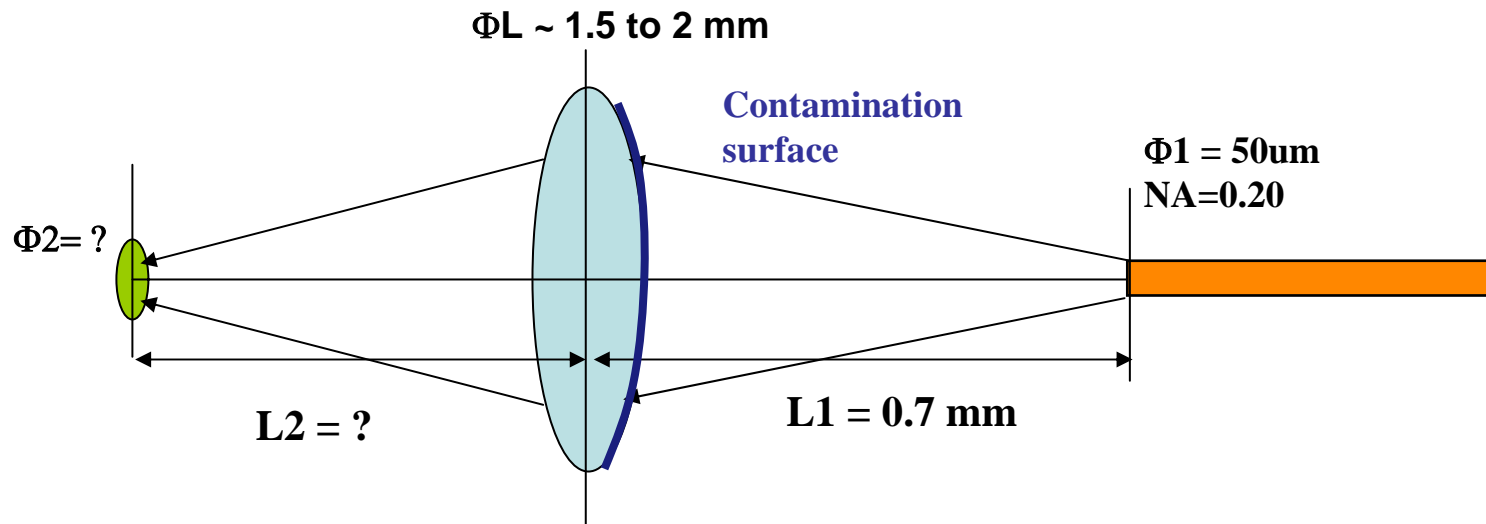
Application	Fiber Type	Active Devices	Interface	OSA Type	Field Deployment
Long Reach (>80km)	SM	EA-DFB and APD	SM Stub with PC	TOSA & ROSA	Medium
Intermediate Reach (40 km)	SM	EA-DFB and PIN	SM Stub with PC	TOSA	Small
			MM Stub with PC or Air with no PC	ROSA	
Short Reach (<10km)	SM & MM	VECSEL or DFB and PIN	Air with no PC	TOSA & ROSA	Large



- We see a large deployment for short reach application, specially on multimode fiber application
- TOSA and ROSA are the key optics
- Optical interface selection is mostly determined by technology and price
- Built-in Lens OSA package with air gap (non physical contact) to fiber input is popular design



- Long reach and intermediate reach applications: SM fiber with physical contact interface with SM stub - Industry has established the inspection criteria and there is a standard cleaning method and procedure
- Short reach application where large volume transceivers are deployed: Built-in lens with air gap to SM or MM fibers - there is no inspection criteria established
- Direct coupling by a built-in aspheric ball lens between MM fiber and Laser chip or Photo-detector
- Model should be based on MM fiber coupled by a plastic ball lens without physical contact



- Lens material: Plastic Lens and Φ_L is the diameter of ball lens
- Fiber Type: MMF 50 μm (Φ_1) as worst case study
- Typical distance to lens is about 0.7 mm (L_1)
- Φ_2 is the area of active device as LD or PD, varied from vendor to vendor
- Distance (L_2) is variable from vendor to vendor, TOSA and ROSA are different
- The relative changes due to surface contamination or scratches will provide sufficient guidance to inspection criteria