



# 8 lane compliance boards

**Tom Palkert**

**Molex**

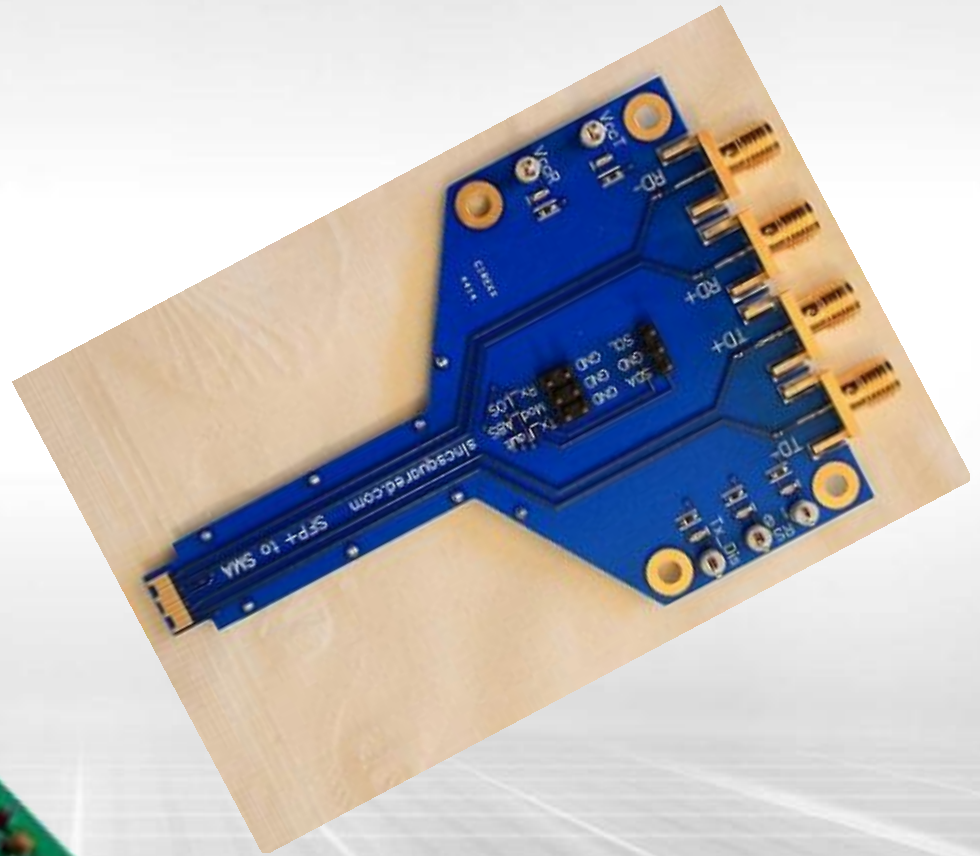
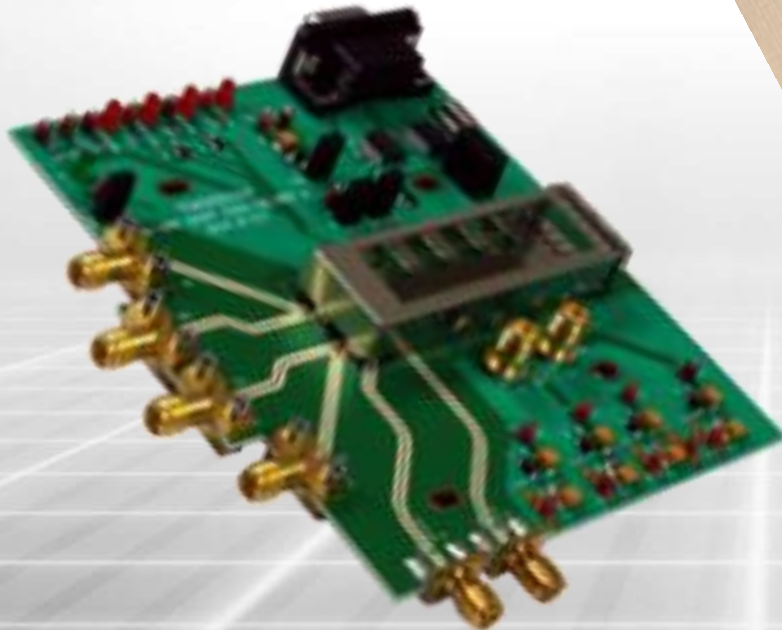
# Introduction

## 8 lane compliance boards are required to implement 400G interfaces

- No electrical MDI is included in 802.3bs
  - Two 8 lane MDIs being proposed in 802.3cd
- CAUI-8 requires compliance test boards
- Current document references 802.3bj clause 92 with 4 lane QSFP MDI

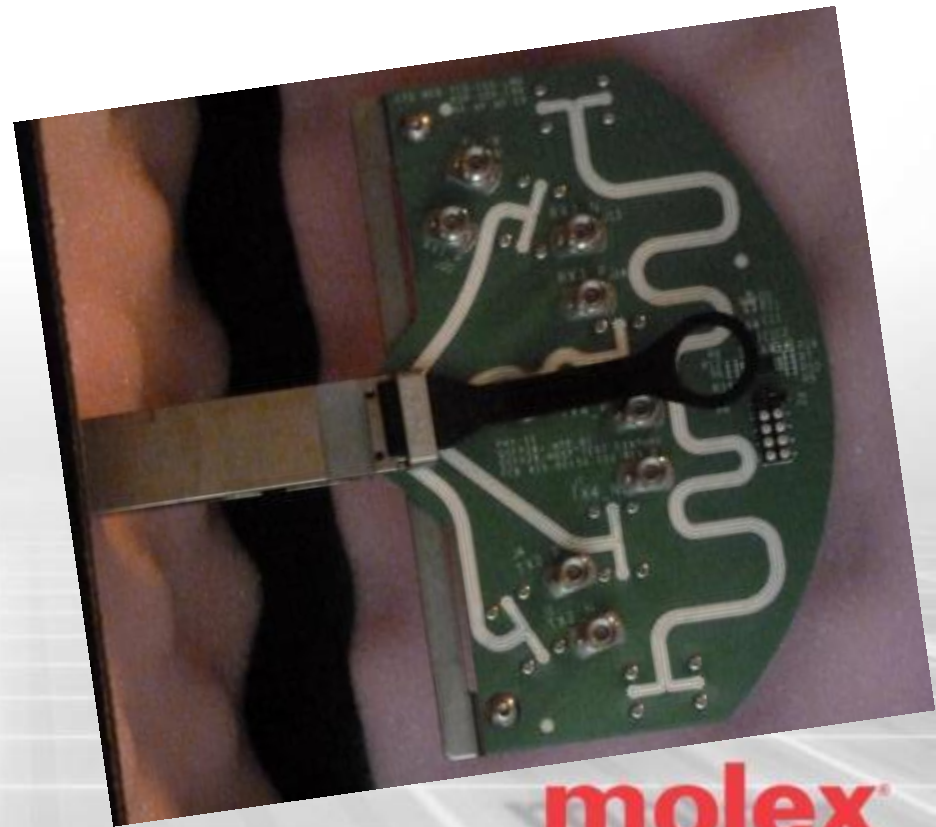
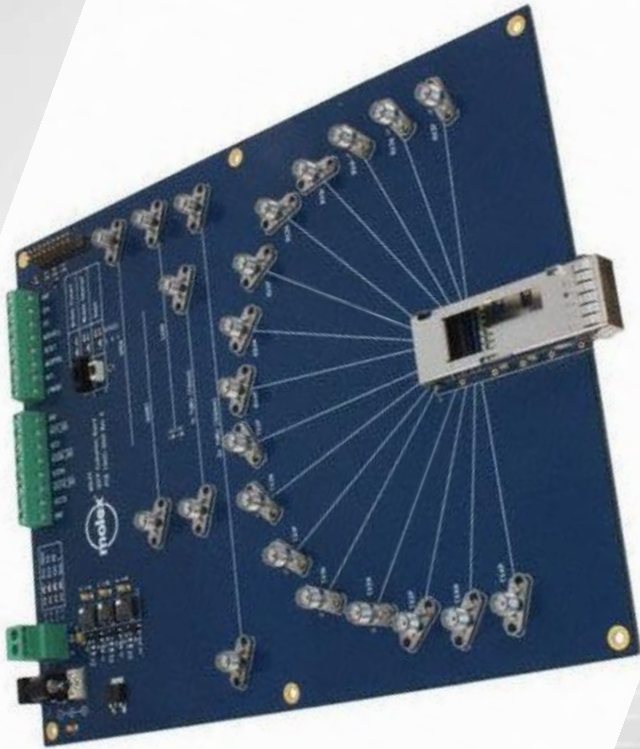
# SFP compliance boards

- › Shortest traces
- › Lowest crosstalk
- › Worst return loss



# QSFP compliance boards

➤ Current bs spec written around 4 lanes



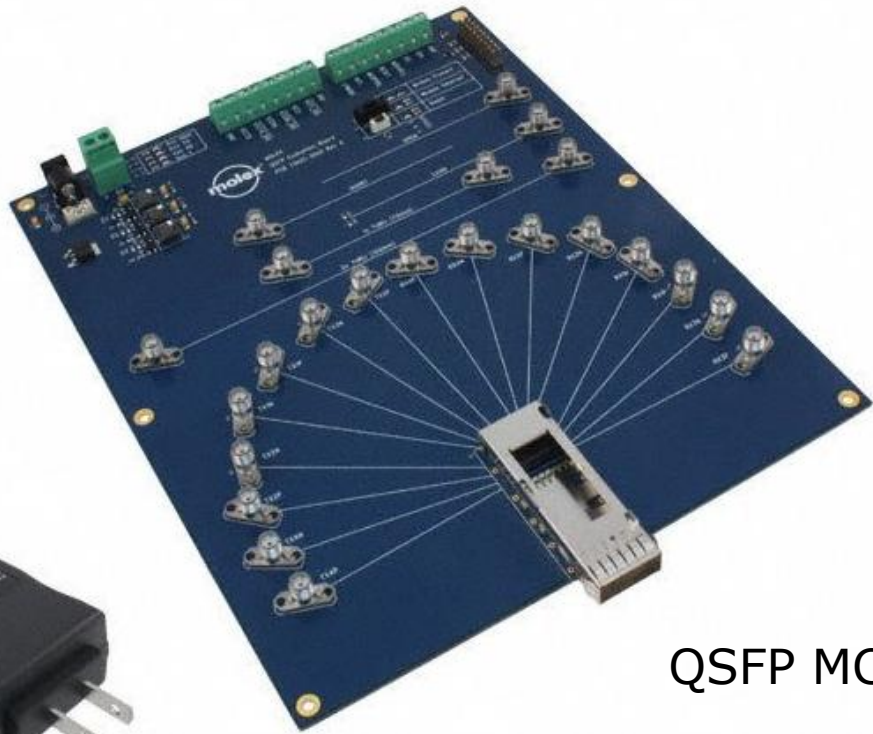
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# 8 lane issues

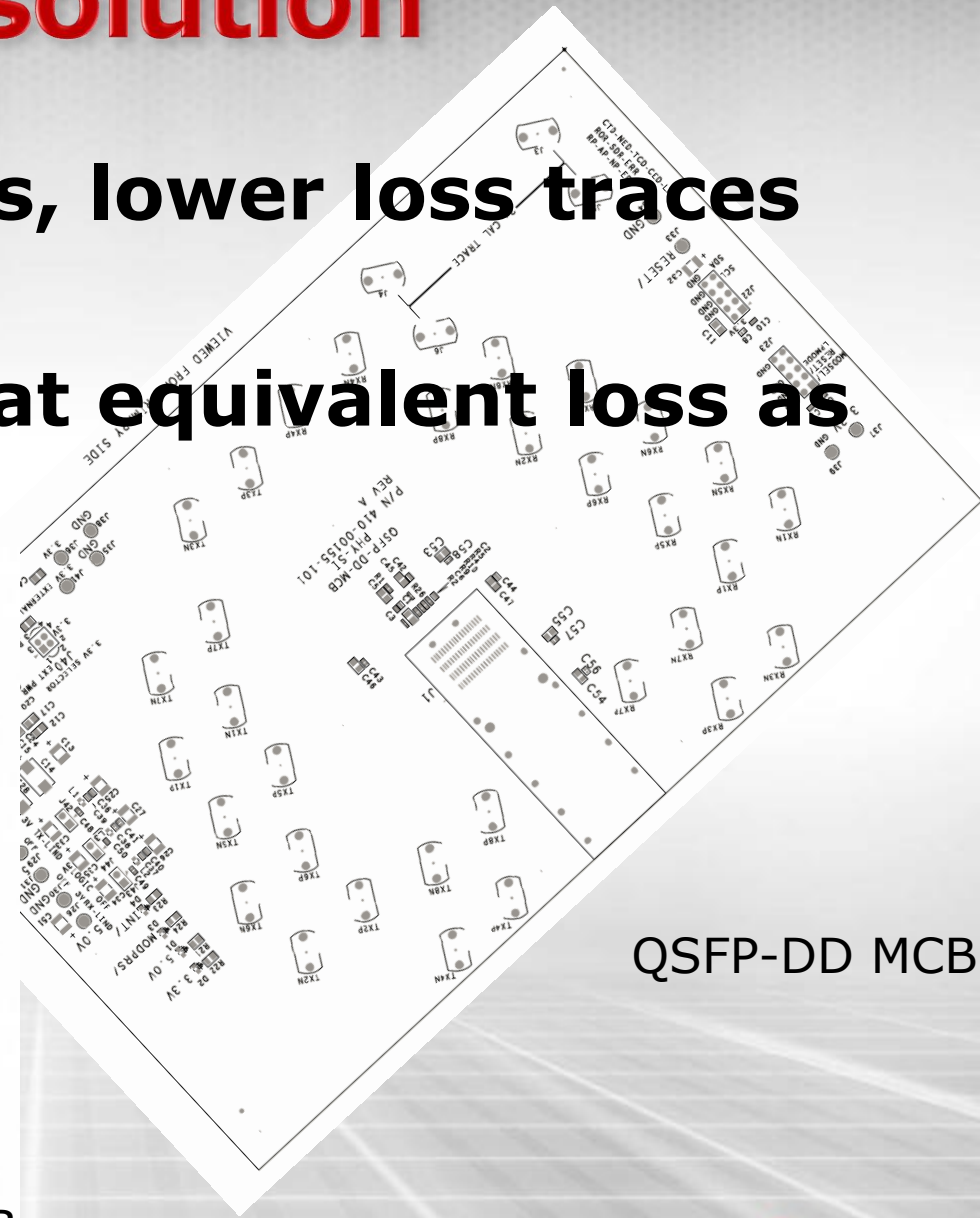
- › **8 lanes = higher loss, higher crosstalk**
- › **Unless:**
  - Use better materials
  - Use higher density connectors
  - Split traces across multiple compliance boards

# Proposed MCB solution

- Use better materials, lower loss traces etc to
- achieve 2x density at equivalent loss as QSFP MCB



QSFP MCB



QSFP-DD MCB

# HCB Issues

- **Module width puts restrictions on:**
  - Trace width
  - Trace spacing
- **Module length requires longer trace lengths (longer than QSFP)**
- **Module PCB thickness limits number of PCB layers**

# Possible HCB solution 1: Split traces

## ➤ **Option 1: Re-use QSFP HCB for legacy traces**

### – Issues:

- Does not terminated additional TX pairs
- Does not contain crosstalk signals

## ➤ **Option 2: All TX on one board, all RX on second board**

### – Issues: No NEXT

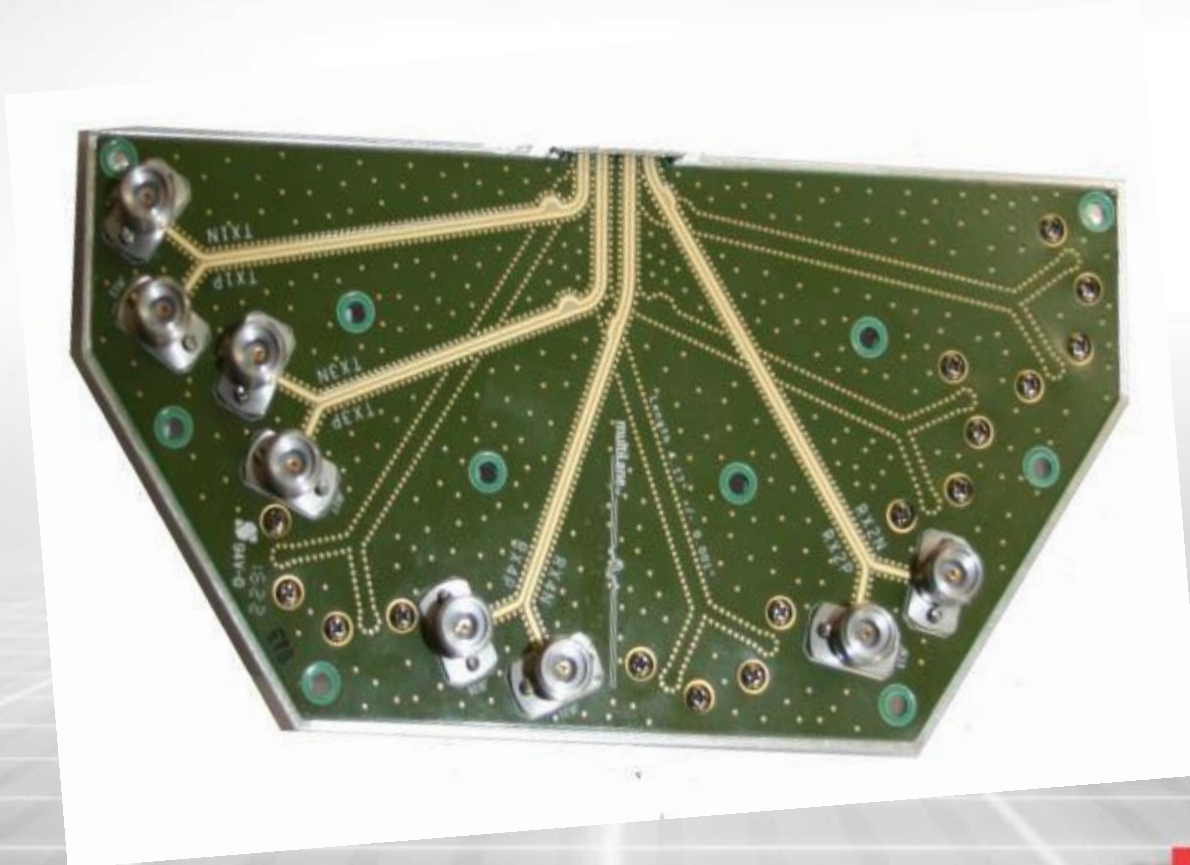
## ➤ **Option 3: 4 TX, 4 RX on one board, terminate unused TX**

### – Issues: Captures some but not all crosstalk



## Split traces on 2 HCBs

- Achieves equivalent loss to QSFP but lacks all crosstalk sources



# Possible HCB solution 2: High Density connectors

- **Reduced insertion loss compared to sma but may still exceed QSFP insertion loss spec**
- **All crosstalk pairs included**
  - Issues:
    - Crosstalk /ICN may be higher than QSFP
    - Reliability
    - Calibration

