



# EPoC Deployment Scenarios

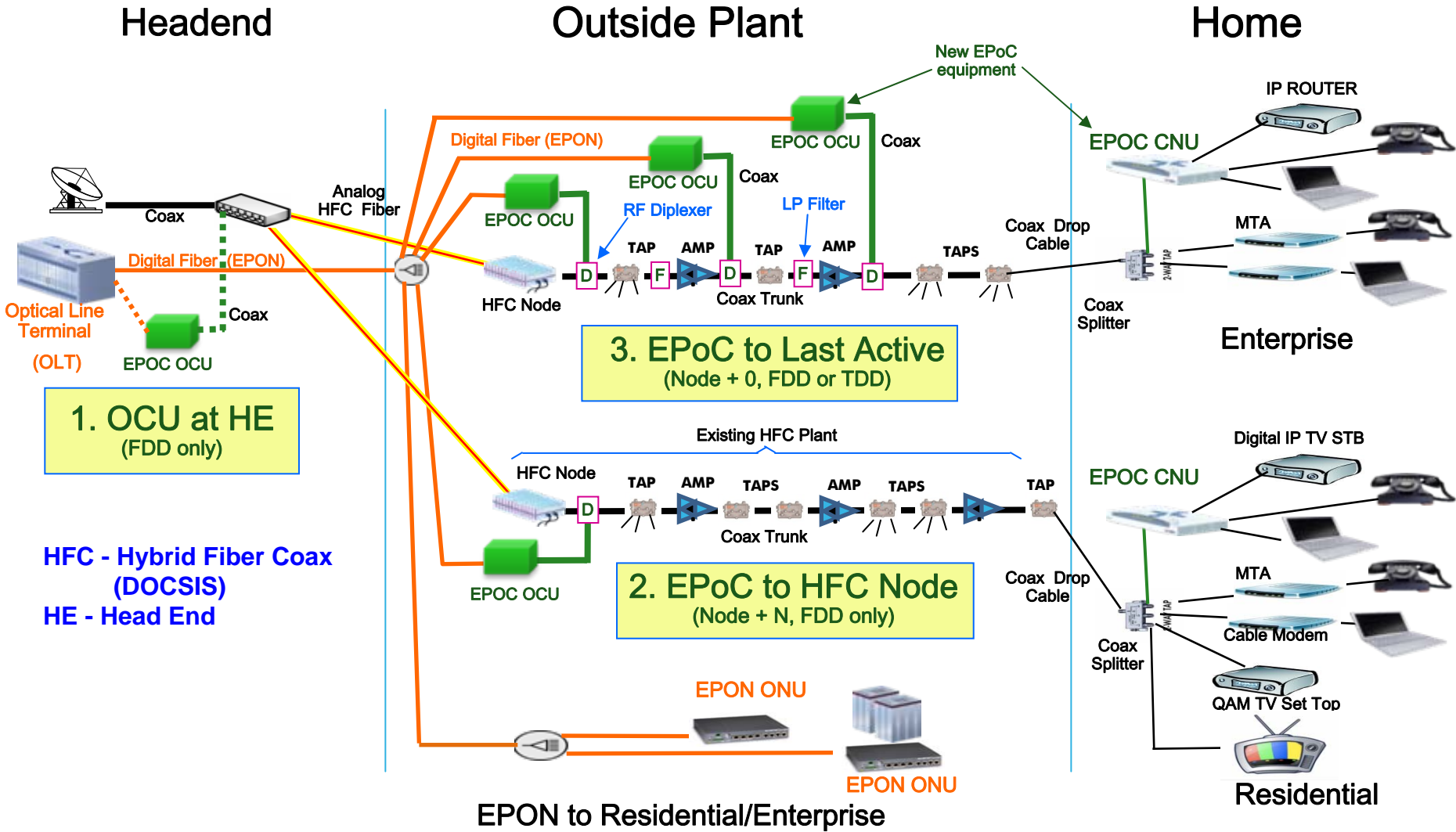
Bill Powell & Randy Sharpe  
Alcatel-Lucent  
October 28, 2012

802.3bn Interim meeting  
Hangzhou, China

# Agenda

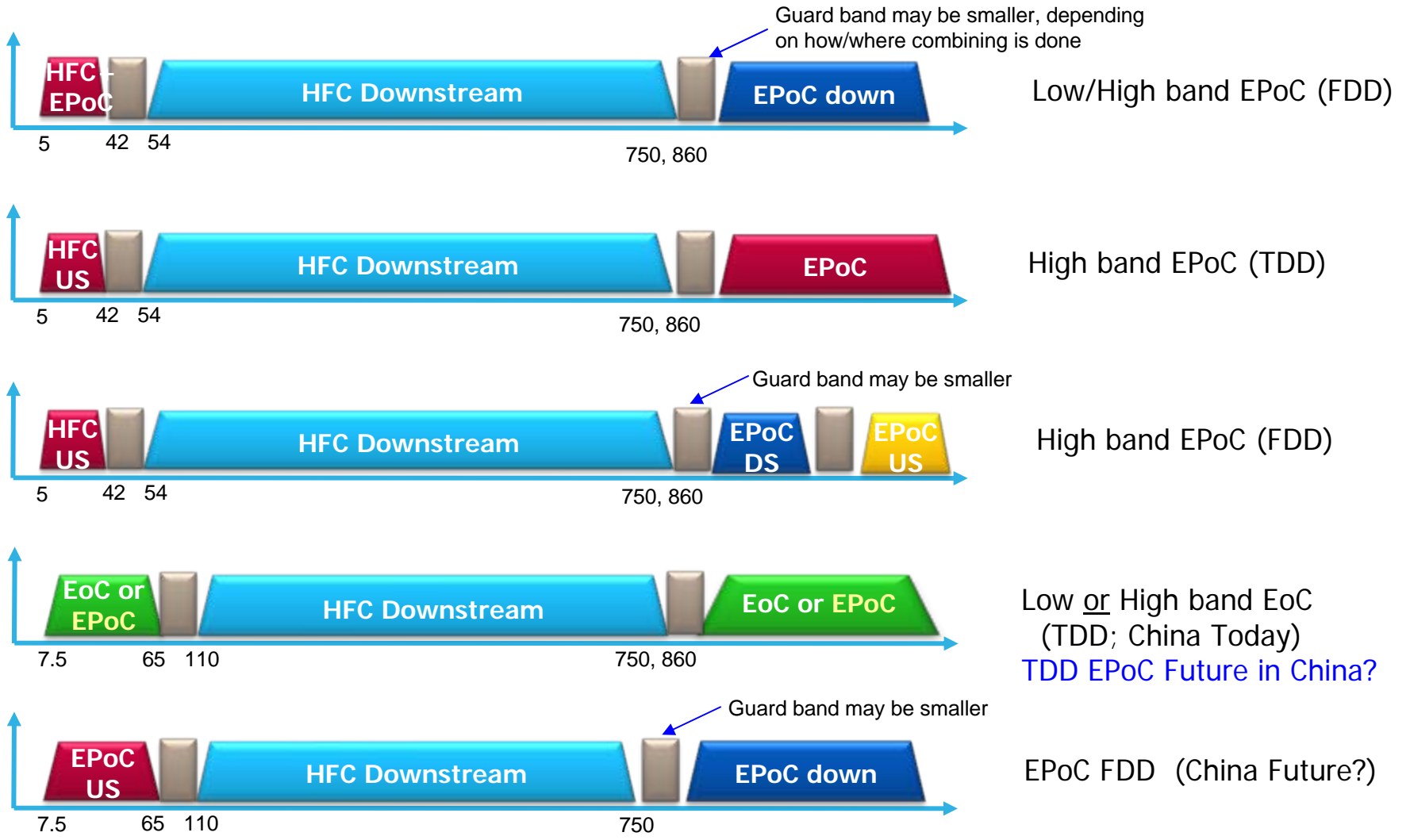
- EPoC use cases
- Coax spectrum examples
- Spectrum insertion/extraction
- Operator questions
- Summary

# EPoC Use Cases



# HFC, EPoC, EoC

## Coax Spectrum Examples

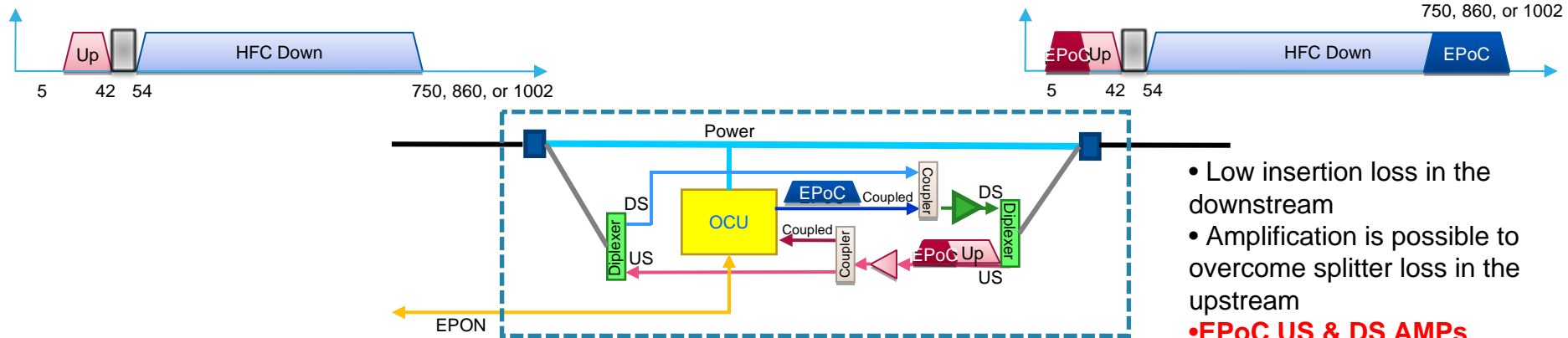


# EPoC Spectrum Insertion/Extraction

## Low Band US, High Band DS

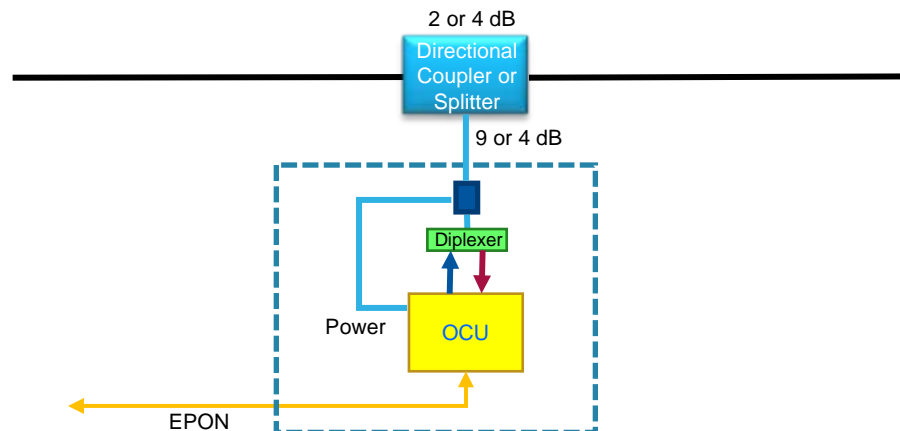
- Sharing EPoC upstream with DOCSIS (HFC) upstream spectrum will be difficult

- In-line OCU



- Low insertion loss in the downstream
- Amplification is possible to overcome splitter loss in the upstream
- **EPoC US & DS AMPs have to source whole HFC + EPoC spectrum**

- Bypass OCU

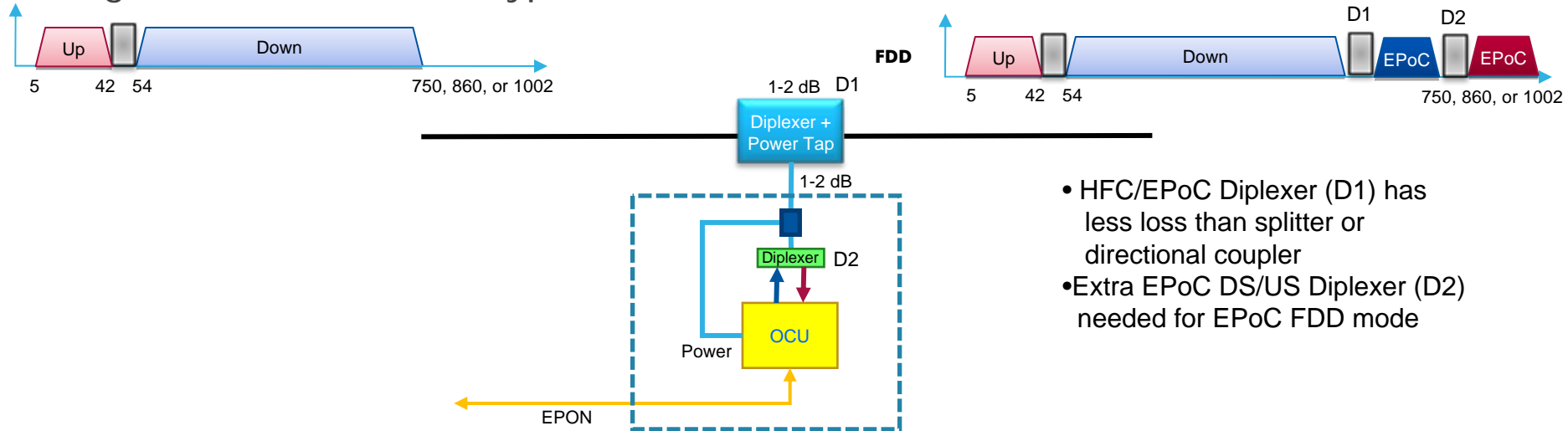


- **High insertion loss in both downstream and upstream**
- **Not acceptable**

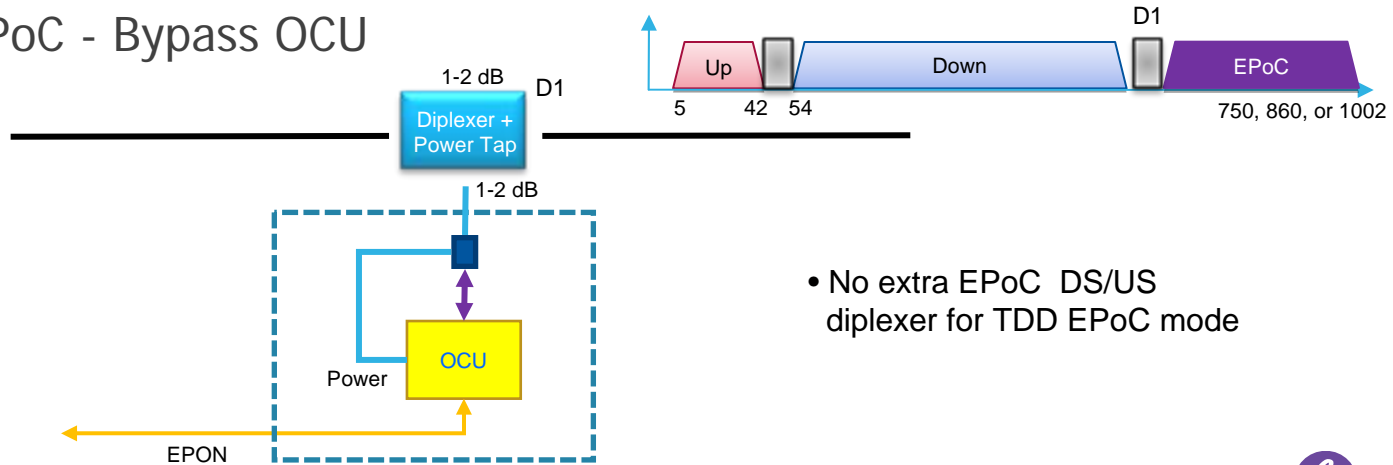
# EPoC Spectrum Insertion/Extraction

## High Band DS + US (overlay)

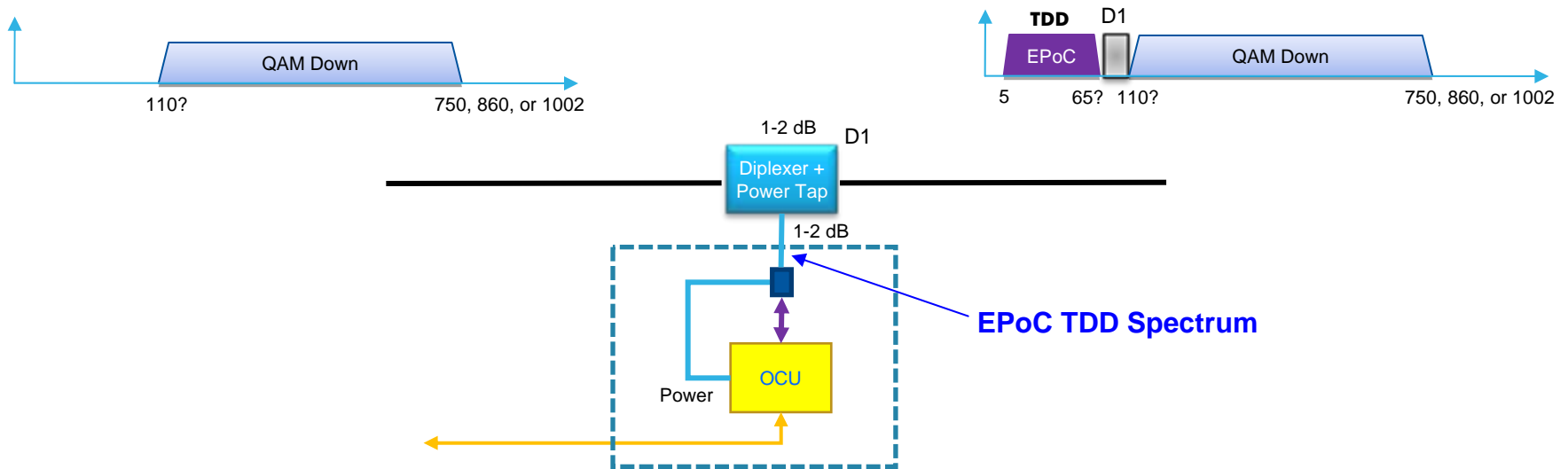
### • High-Band FDD EPoC - Bypass OCU



### • High Band TDD EPoC - Bypass OCU



# Spectrum Insertion/Extraction Low Band EPoC TDD (Overlay)



- EPoC insertion/extraction diplexer has low loss
- Primary EPoC deployment model for China MSOs?
- EPoC RF spectrum range: 5 - 65 MHz?

EPON

# EPoC Spectrum Choices

- EPoC US Spectrum

- **Low Band US** (in HFC US band) => Requires new "EPoC-integrated" Nodes and Amps



- **High Band US (Overlay)**: Can be added above current HFC spectrum with:



- Node + 0 Overlay
    - Using Existing Nodes & Amps
    - **FDD or TDD**
    - May require Taps/Splitter upgrades in coax segments being used (depends on Freq)
    - Requires EPON fiber extension to each Node or Amp where Node+0 EPoC Spectrum used
    - QAM/DOCSIS DS to 860 MHz, ~100 MHz Guard, 2x120 MHz EPoC ~ max 1200 MHz Spectrum



- Difficult to fit 1 GHz FDD EPoC in spectrum from 860-1200 MHz due to extra EPoC DS/US guard band





# Operator Questions

- Would like Operator input on probability of use of
  - High-band TDD EPoC use for Enterprise and/or Residential (above QAM/HFC DS)
  - Low-band EPoC TDD use (below QAM downstream)
- Probable frequency ranges for high-band TDD EPoC
- Probable frequency ranges for low-band TDD EPoC
- Probable use of EPoC over other EoC solutions in China

# Summary

- High-band EPoC (TDD mode) can deliver ~1Gb/s DS and ~1Gb/s US on a Node+0 plant with "1 GHz" passives (assumes usability to ~1.2 GHz)
- Can be useful to serve Enterprise customers on mixed Residential/Enterprise plant w/o changing actives
- Low-band EPoC (TDD) can provide a viable standardized solution to ethernet data transport, over other EoC solutions

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Thank You!