

# Technical Issues with Single Wavelength PMDs

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# Introduction

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## **Question:**

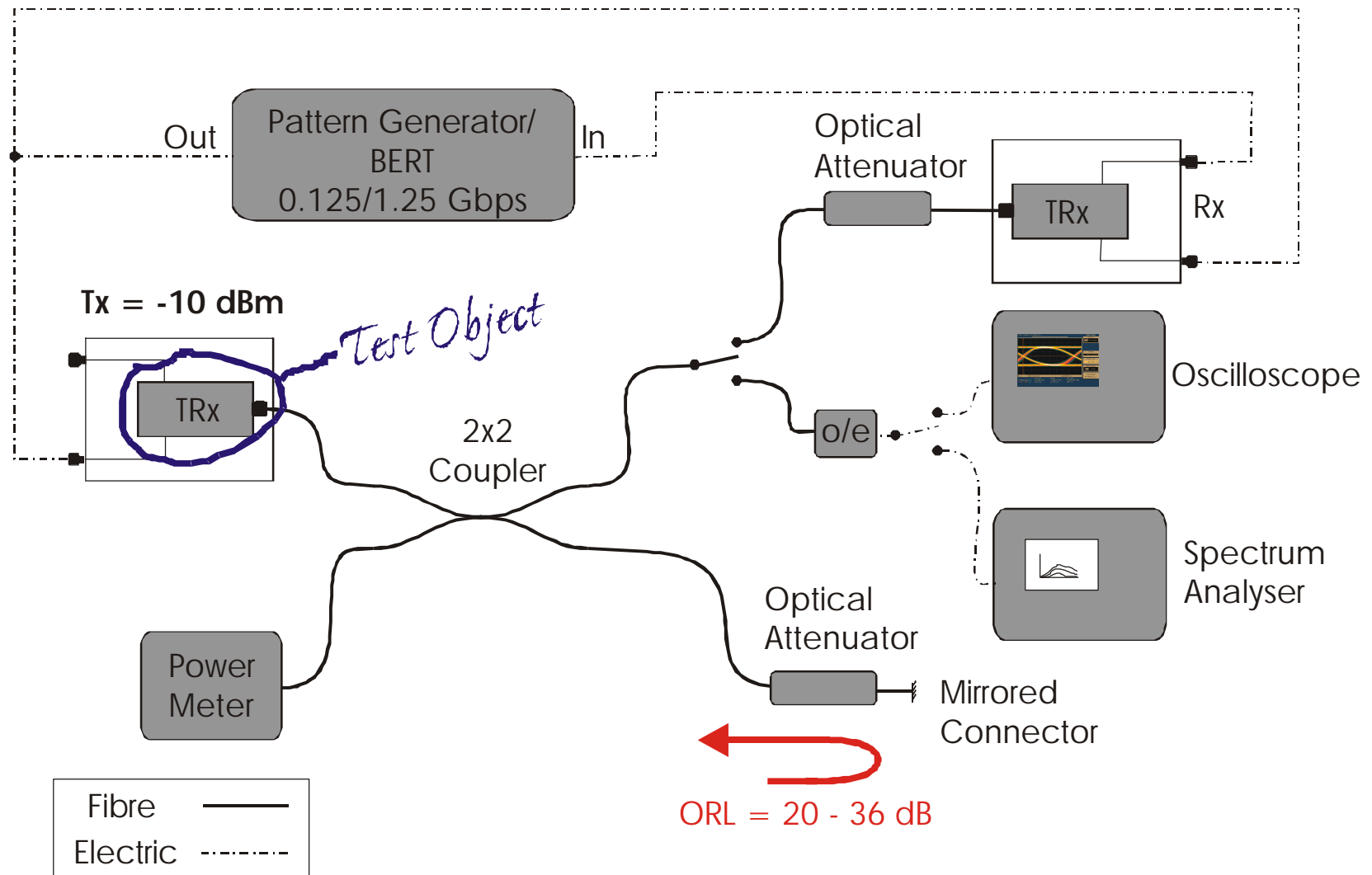
What is the effect of worst case reflection (ORL = 20 dB) or foreign ingress into the transmitting laser on single wavelength 1310/1310 nm P2P links

## **Answer:**

Link performance was maintained over worst case instances of back reflection and foreign ingress

# Reflection Issues

## Experimental set-up to test effect of reflection on laser



# Reflection Issues

20 dB ORL not an issue for laser performance

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## Experiment:

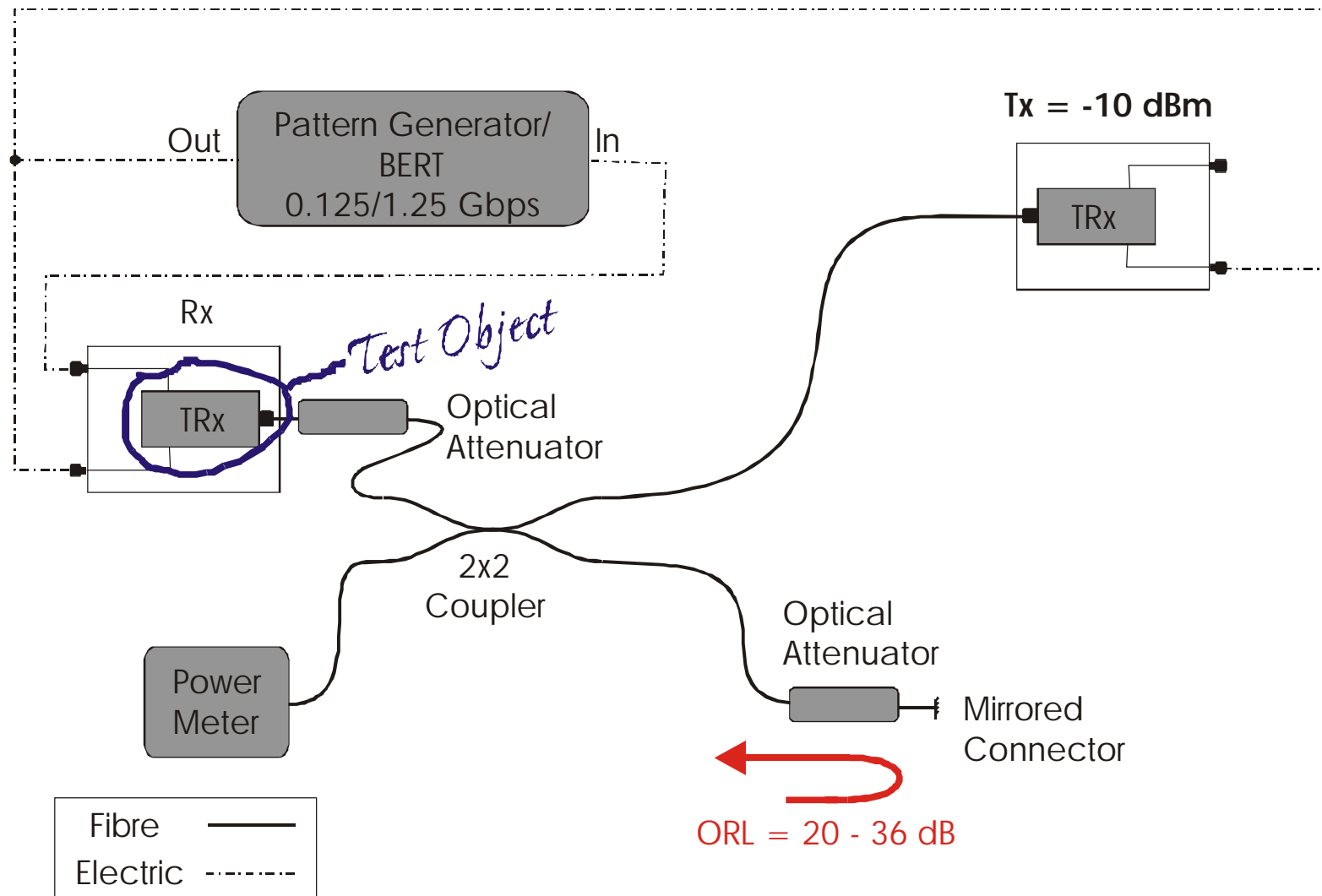
Optical return loss of fibre plant varied between 20 and 36 dB.  
Monitored the laser RIN, eye values and link sensitivity

## Results:

Parameter	Comment
RIN	Increase from -131 to -126 dB/Hz
Eye values	Jitter increase of 2-3 psec
Sensitivity	No decrease in sensitivity observed

# Reflection Issues

Experimental set-up to test effect of reflection on receiver



# Reflection Issues

20 dB ORL not an issue for receiver performance

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## Experiment:

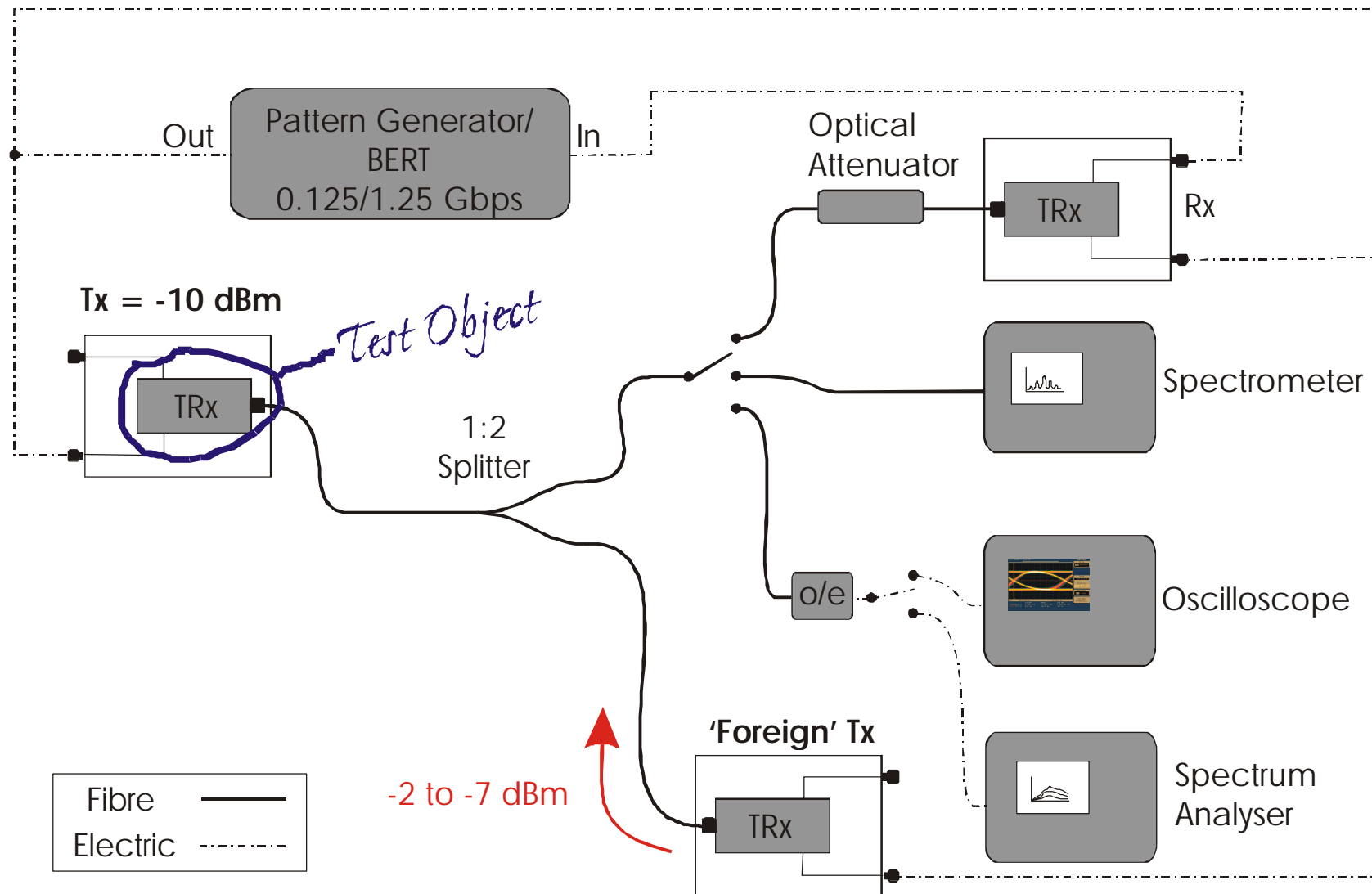
Optical return loss of fibre plant varied between 20 and 36 dB.  
Monitored the link sensitivity

## Results:

Parameter	Comment
Sensitivity	No decrease in sensitivity observed

# Foreign Ingress

Experimental set-up to test effect of foreign ingress on laser



# Reflection Issues

No loss of link performance for worst case foreign ingress

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## Experiment:

'Foreign' Tx output intensity varied between -10 and -5 dBm, modulated or CW operation and temperature cycled to ensure wavelength overlap. Monitored laser output spectrum, RIN, eye values and link sensitivity.

## Results:

Parameter	Comment
Spectrum	No change in spectral output
RIN	Maximum transient increase from -131 to -128 dB/Hz
Eye values	Transient jitter increase of 3 psec
Sensitivity	No decrease in sensitivity measurable



# Summary

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- All tests performed at 100 Mbps and 1 Gbps
- No degradation to either laser or receiver performance with worst case fibre plant ORL of 20 dB.
- Foreign ingress examined for the two extremes, i.e., short link with maximum foreign intensity and maximum sensitivity and for long links with minimum ingress intensity and minimum sensitivity. No loss of link performance was observed in either case.

## **Note:**

Eye diagrams, RIN curves and optical spectra available in backup slides