IEEE1394 S100/S200 Dual Mode POF/HPCF Links

October 16, 1997
P1394B S100TG - POF/HPCF PMD Gr.-

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Calculated Eye Diagram of ATMF 155Mb POF/HPCF Links

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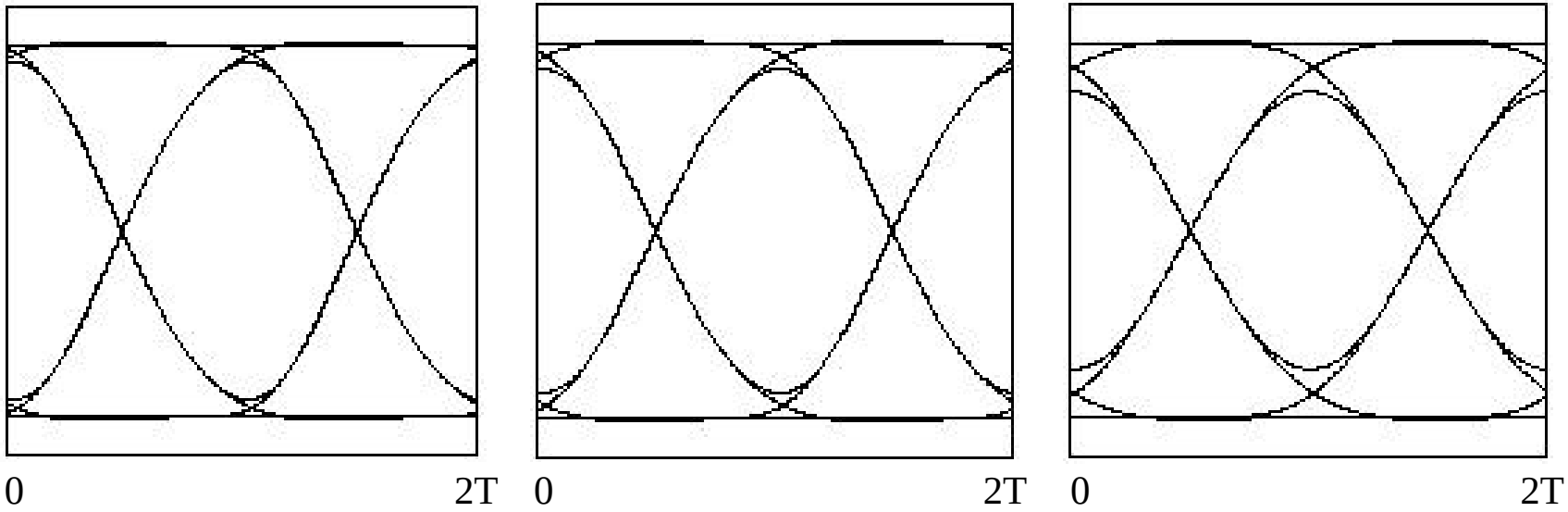

Transmitter	50m POF (10MHzkm)	100m HPCF (10MHzkm)
Tr/Tf=4.5ns	Tr/Tf=4.82ns (75.0%) Eye center Pe=-0.62dB Spec. max. Tr/Tf=5.0ns	Tr/Tf=5.52ns (85.8%) Eye center Pe=-1.28dB Spec. max. Tr/Tf=6.0ns

Calculated Rise / Fall Time vs. Fiber Bandwidth

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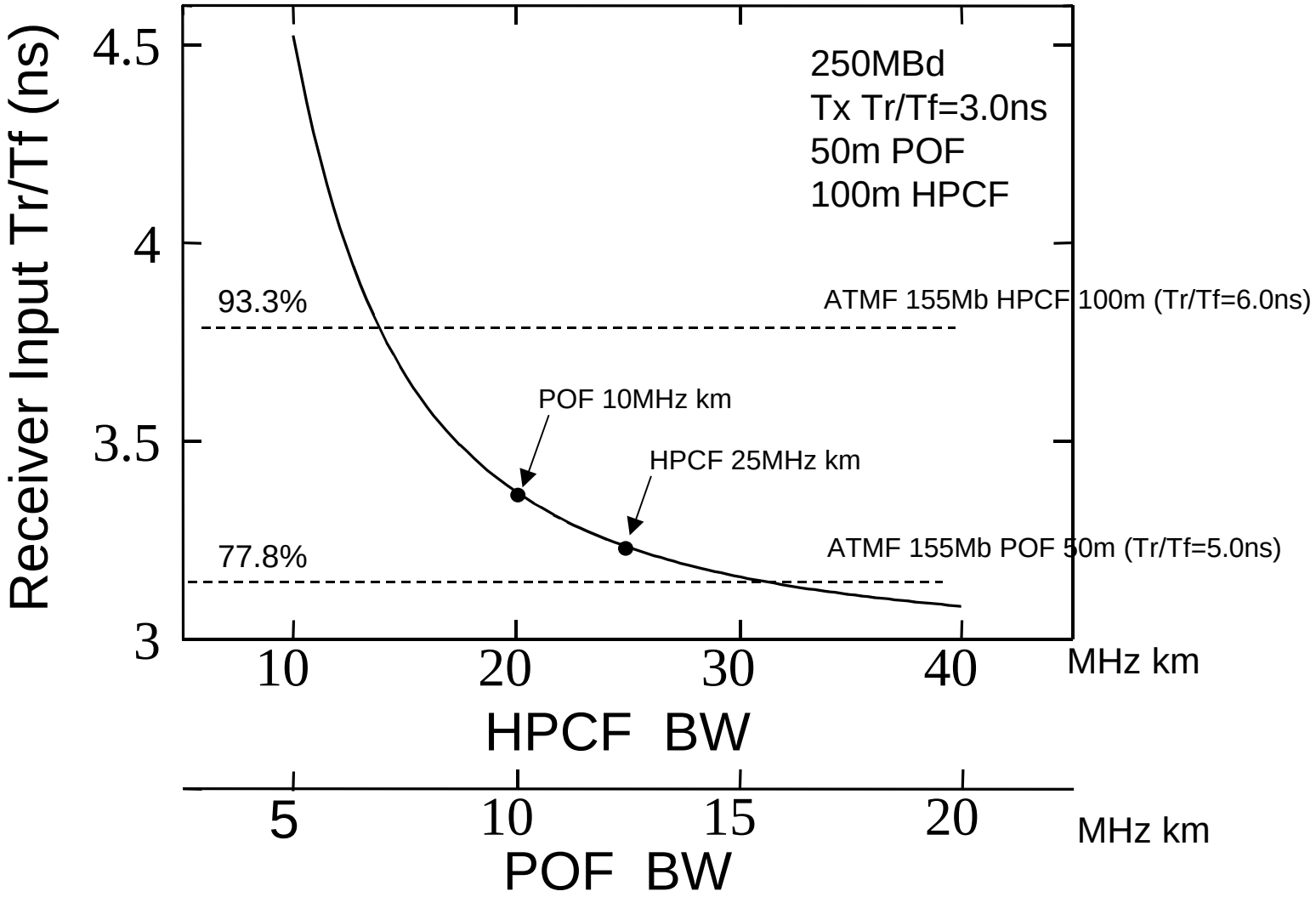

Calculated Eye Center Penalty vs. Fiber Bandwidth

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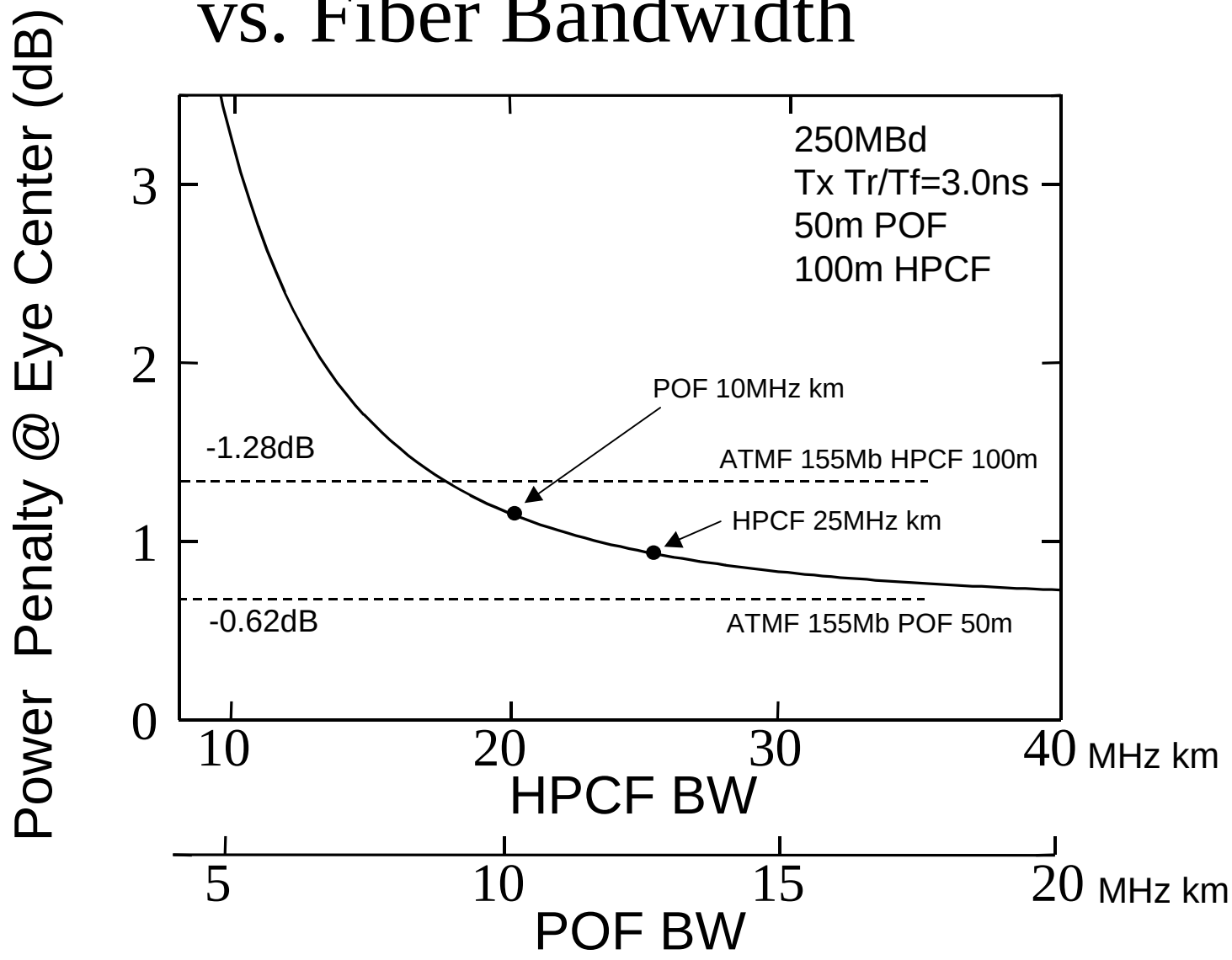

Calculated Eye Diagram of P1394B 250MBd POF/HPCF Links

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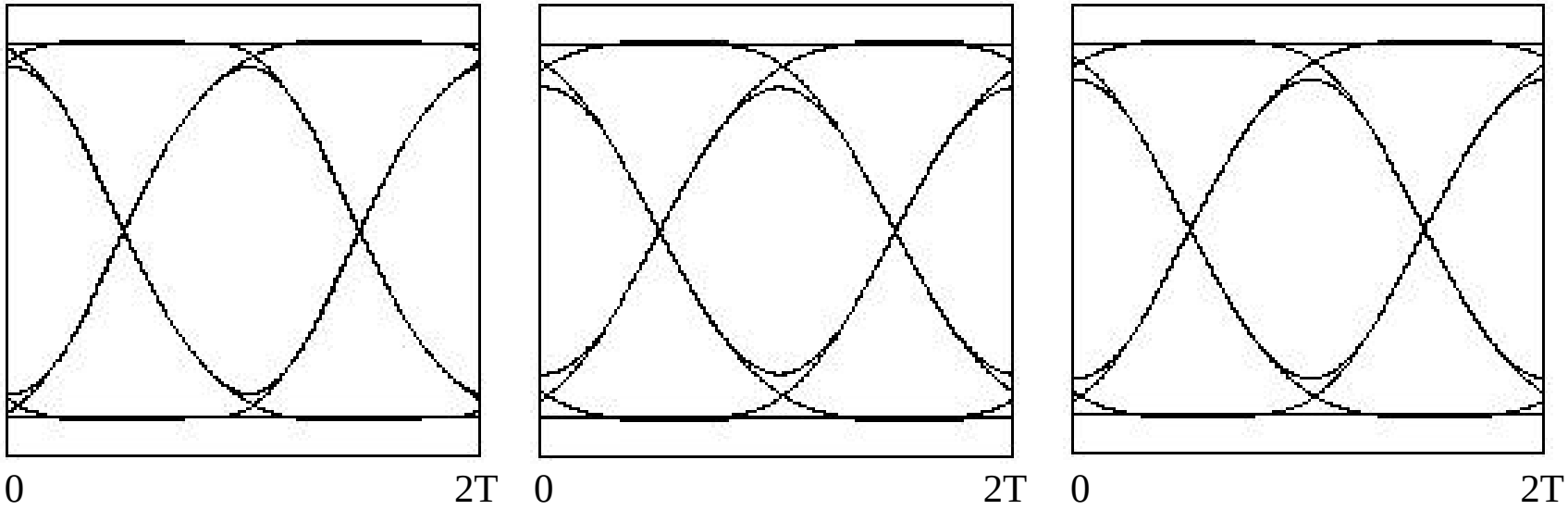

Transmitter	50m POF (10MHzkm)	100m HPCF (25MHzkm)
Tr/Tf=3.0ns	Tr/Tf=3.40ns (83.9%) Eye center Pe=-1.15dB	Tr/Tf=3.26ns (80.1%) Eye center Pe=-0.95dB

Fiber Launch Power

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Keep commonality of transmitter level for an interoperable S100/S200 dual mode transceiver

	155Mb ATMF Specification	125MBd Measured	250MBd Measured	Proposed Specification (125/250MBd)
POF	Min:-8dBm Max:-2dBm	Typ:-5.4dBm	Typ:-5.6dBm	Min:-8dBm Max:-2dBm
HPCF	Min:-14dBm Max:-20dBm (SI-HPCF)	Typ:-18.7dBm (SI-HPCF) Typ:-18.2dBm (GI-HPCF)	Typ:-18.4dBm (GI-HPCF)	Min:-14dBm Max:-20dBm (GI-HPCF)

Fiber Loss

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	Attenuation		Bending Loss*	
	Spec.	Measured	Spec.	Measured
POF 50m	12.5dB	10.6dB	0.5dB	0.15dB
HPCF 100m	2.8dB	1.3dB	0.1dB	0.03dB

Typical values were measured with 650nm LED

* R=25.4mm, 90 degree, 10 turns

Proposed Specification of 125/250MBd Dual Mode Transceiver

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	SI-POF	GI-HPCF	Unit
Transmitter Interface Characteristics			
Center Wavelength	640 to 660	640 to 660	nm
Maximum Spectral Width (FWHM)	40	40	nm
Mean Launched Power	-8 to –2	-20 to –14	dBm
Source NA	0.2 to 0.3	0.2 to 0.3	
Minimum Extinction Ratio	10	10	dB
Maximum Rise (Fall) Time, (10-90%)	3.0	3.0	ns
Maximum Overshoot	25	25	%
Maximum Systematic Interface Jitter	0.8	0.8	ns
Maximum Random Interface Jitter	0.3	0.3	ns
Receiver Interface Characteristics			
Minimum Receiver Input Power	-21	-24	dBm
Minimum Overload	-2	-14	dBm
Maximum Rise (Fall) Time, (10-90%)	3.5	3.5	ns
Maximum Systematic Interface Jitter	0.8	0.8	ns
Maximum Random Interface Jitter	0.3	0.3	ns
Minimum Receiver Eye Opening	0.8	0.8	ns

Proposed Specification of 125MBd Transceiver

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	SI-POF	GI-HPCF	Unit
Transmitter Interface Characteristics			
Center Wavelength	640 to 660	640 to 660	nm
Maximum Spectral Width (FWHM)	40	40	nm
Mean Launched Power	-8 to –2	-20 to –14	dBm
Source NA	0.2 to 0.3	0.2 to 0.3	
Minimum Extinction Ratio	10	10	dB
Maximum Rise (Fall) Time, (10-90%)	4.5	4.5	ns
Maximum Overshoot	25	25	%
Maximum Systematic Interface Jitter	1.6	1.6	ns
Maximum Random Interface Jitter	0.6	0.6	ns
Receiver Interface Characteristics			
Minimum Receiver Input Power	-21	-24	dBm
Minimum Overload	-2	-14	dBm
Maximum Rise (Fall) Time, (10-90%)	5.0	5.0	ns
Maximum Systematic Interface Jitter	1.6	1.6	ns
Maximum Random Interface Jitter	0.6	0.6	ns
Minimum Receiver Eye Opening	1.53	1.53	ns

Measured Eye Diagram of 250MBd SI-POF Link

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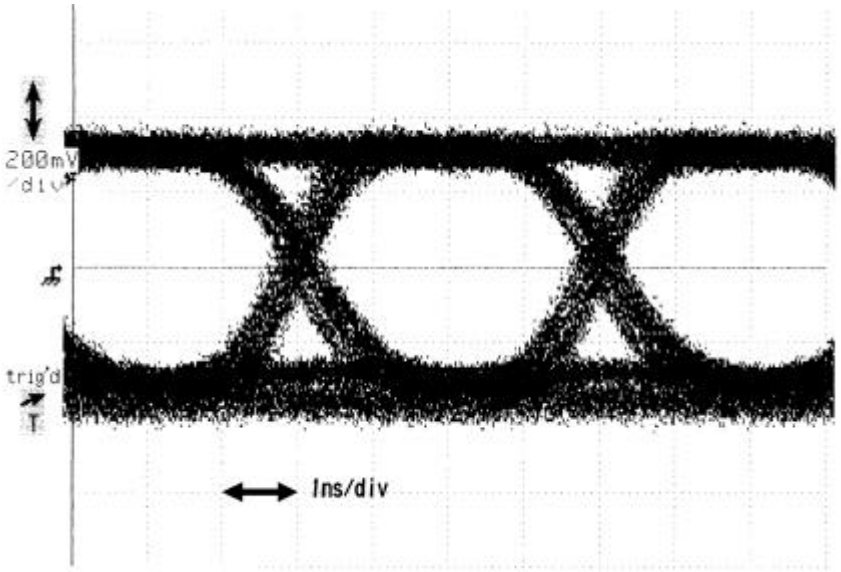
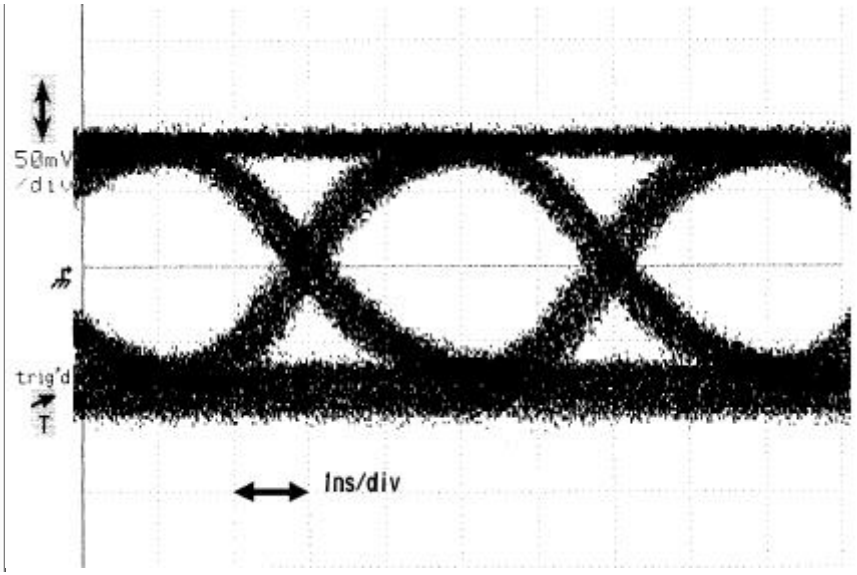


Transmitter

Tr/Tf=1.8/1.5ns



50m POF Transmission

Tr/Tf=2.9/2.4ns

Measured Eye Diagram of 250MBd GI-HPCF Link

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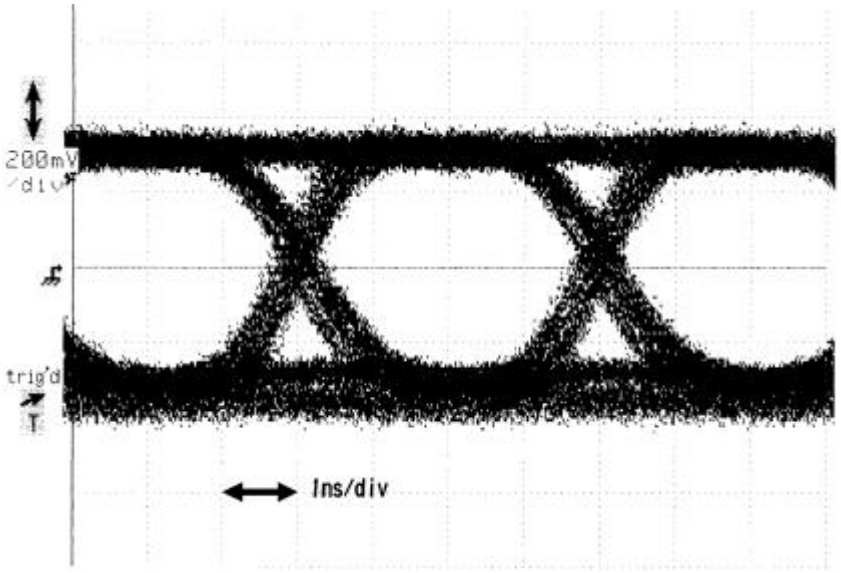
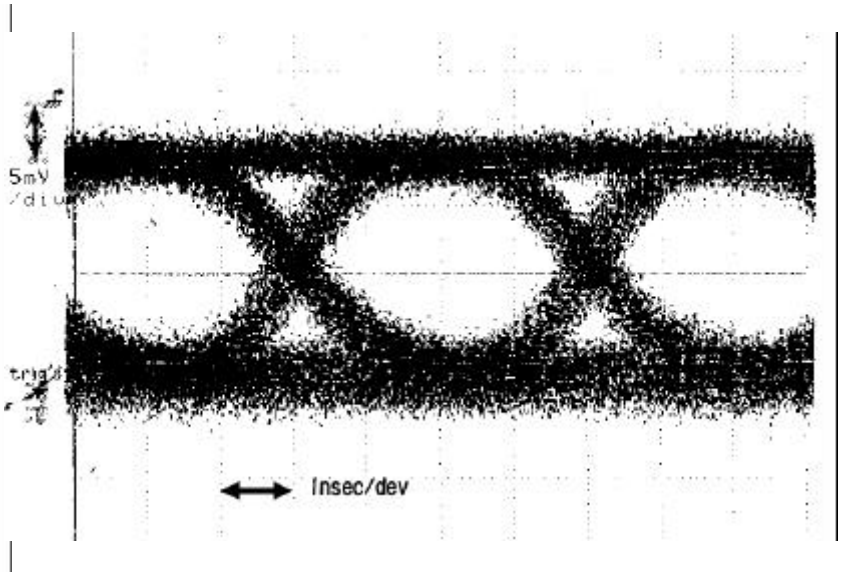


Transmitter

Tr/Tf=1.8/1.5ns



100m HPCF Transmission

Tr/Tf=2.6/2.0ns

Measured Eye Opening of 250MBd SI-POF Link

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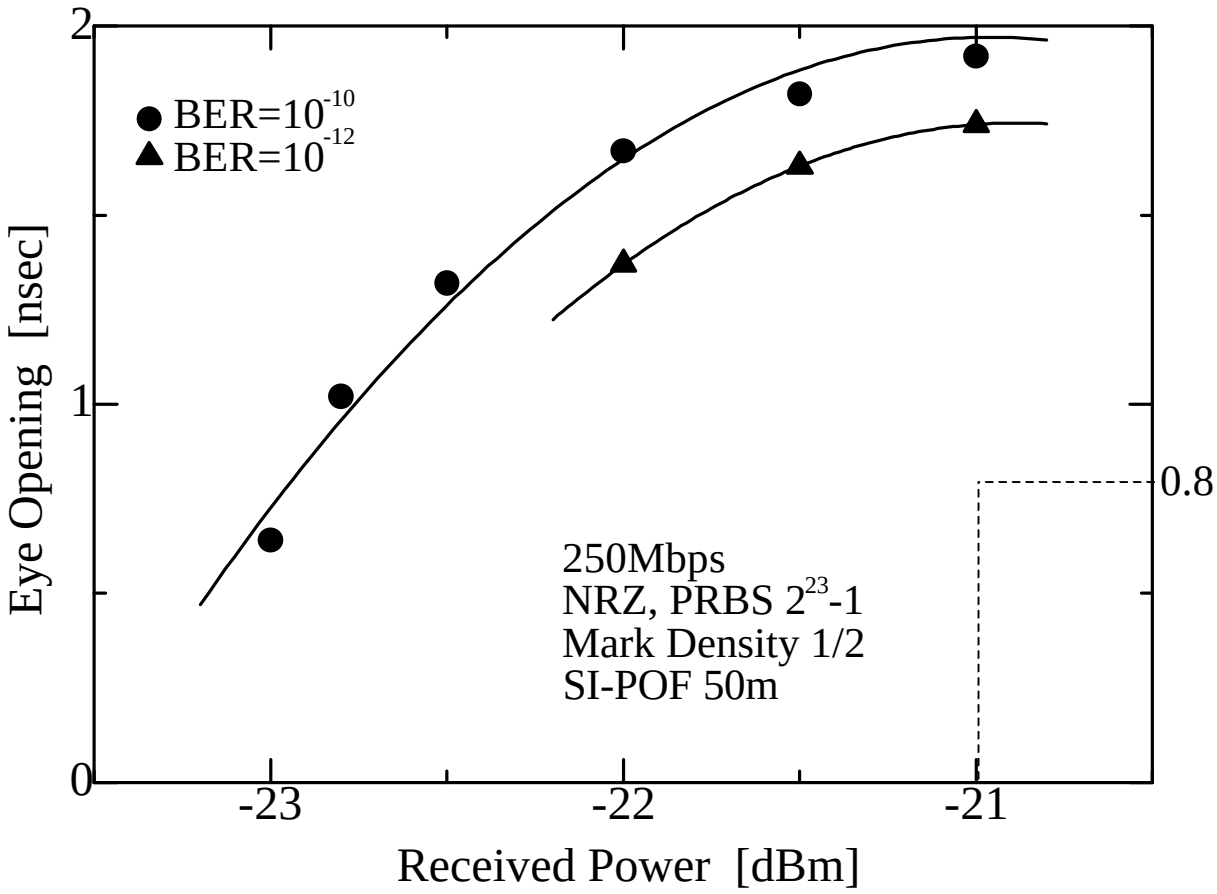

Measured Eye Opening of 250MBd GI-HPCF Link

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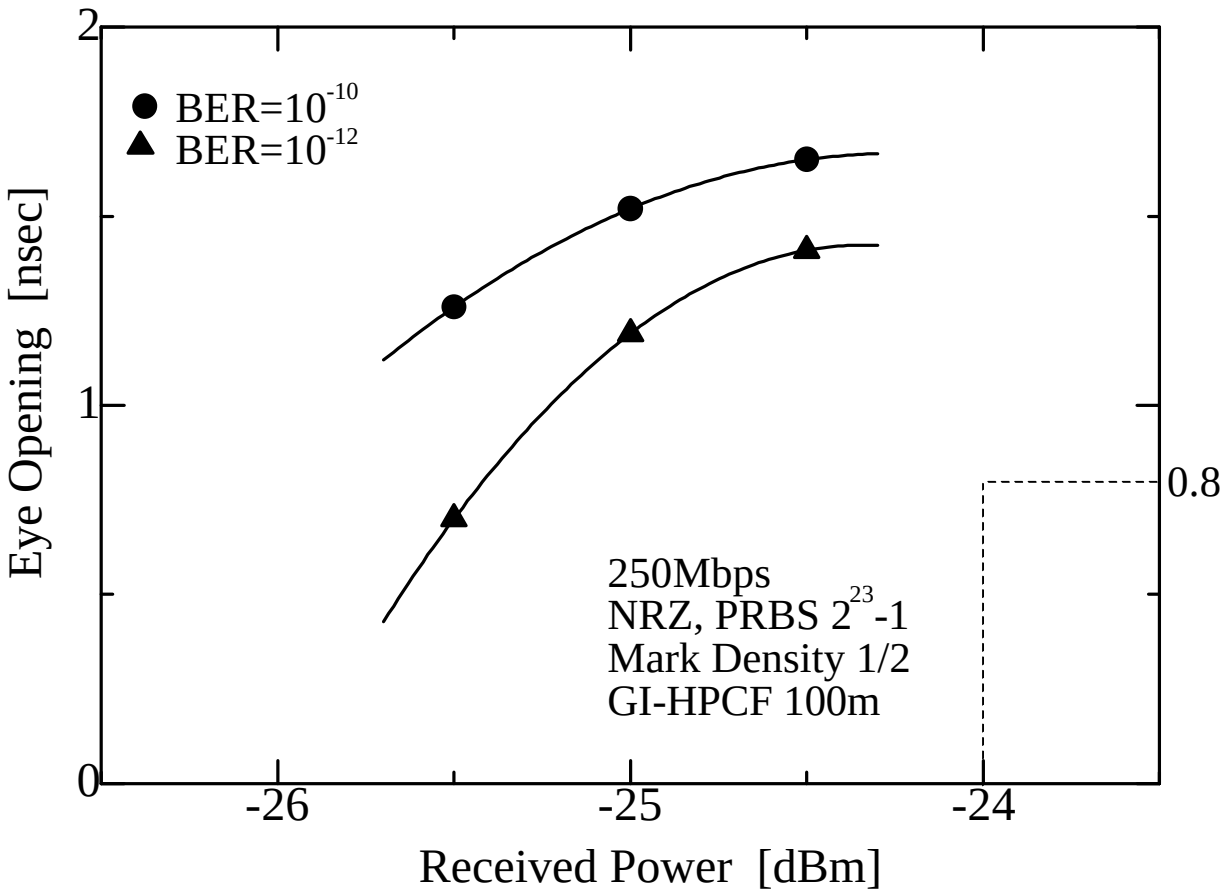

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Conclusions

- S100/S200 dual mode LED link is achievable with 10MHzkm SI-POF or 25MHzkm GI-HPCF.