Factors to be Evaluated for the POF Cable Plant Loss Budget

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POF Promotion

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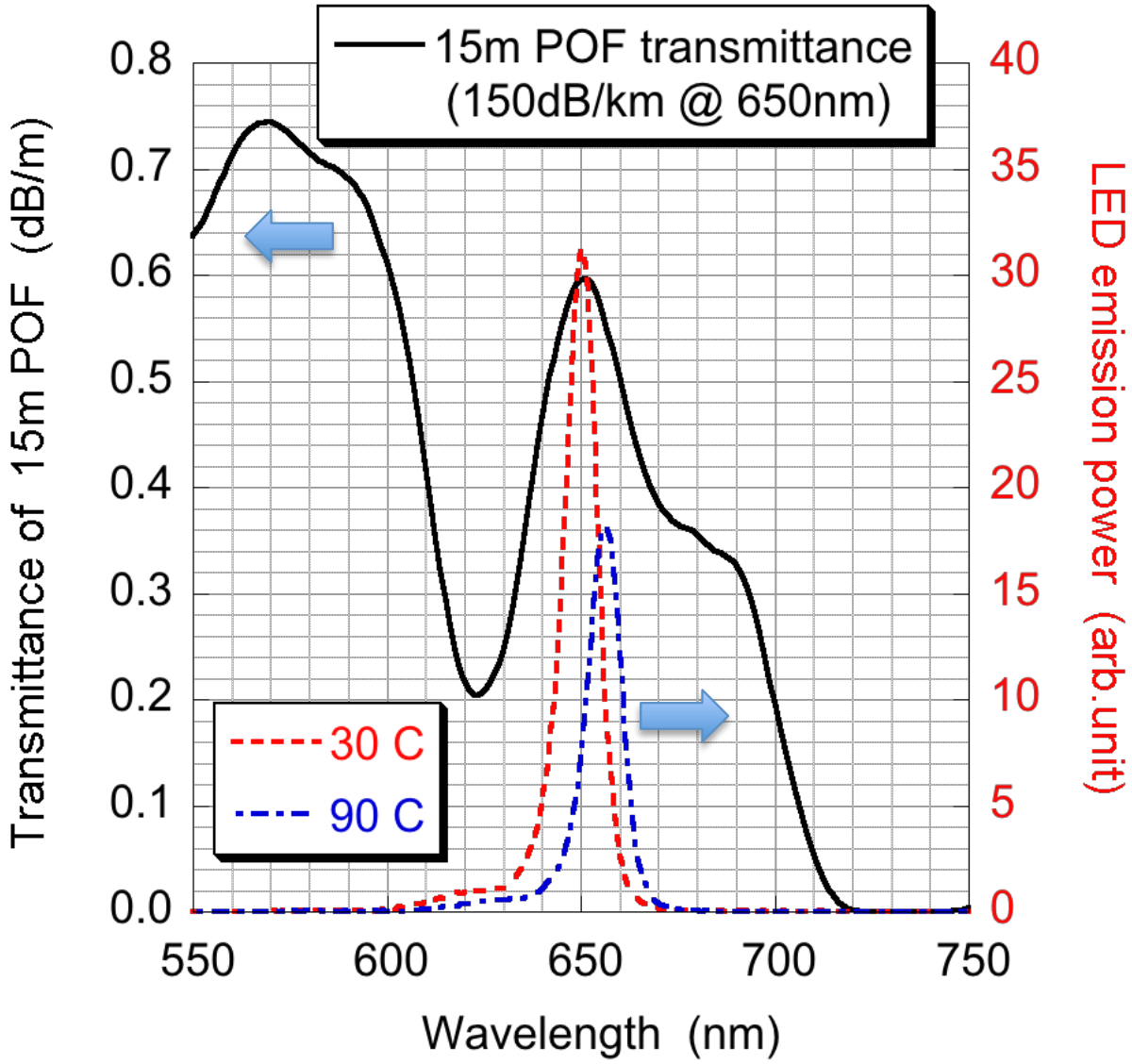
Characteristics	Factors
Transmission Loss	Base transmission loss
	Launch condition dependence ⇨ MRC report -1
	Loss increment due to ambient temperature and humidity ⇨ MRC report -2
	Transmission loss change due to the light source
	Peak emission wavelength and spectrum width
	Temperature dependence of the emission spectrum
Bandwidth	Launch condition dependence
	Mode conversion at connection points
Connection Loss	Base connection loss
	Lateral offset
	Tilt
	End separation
	Environment (Vibration, temperature, etc.)

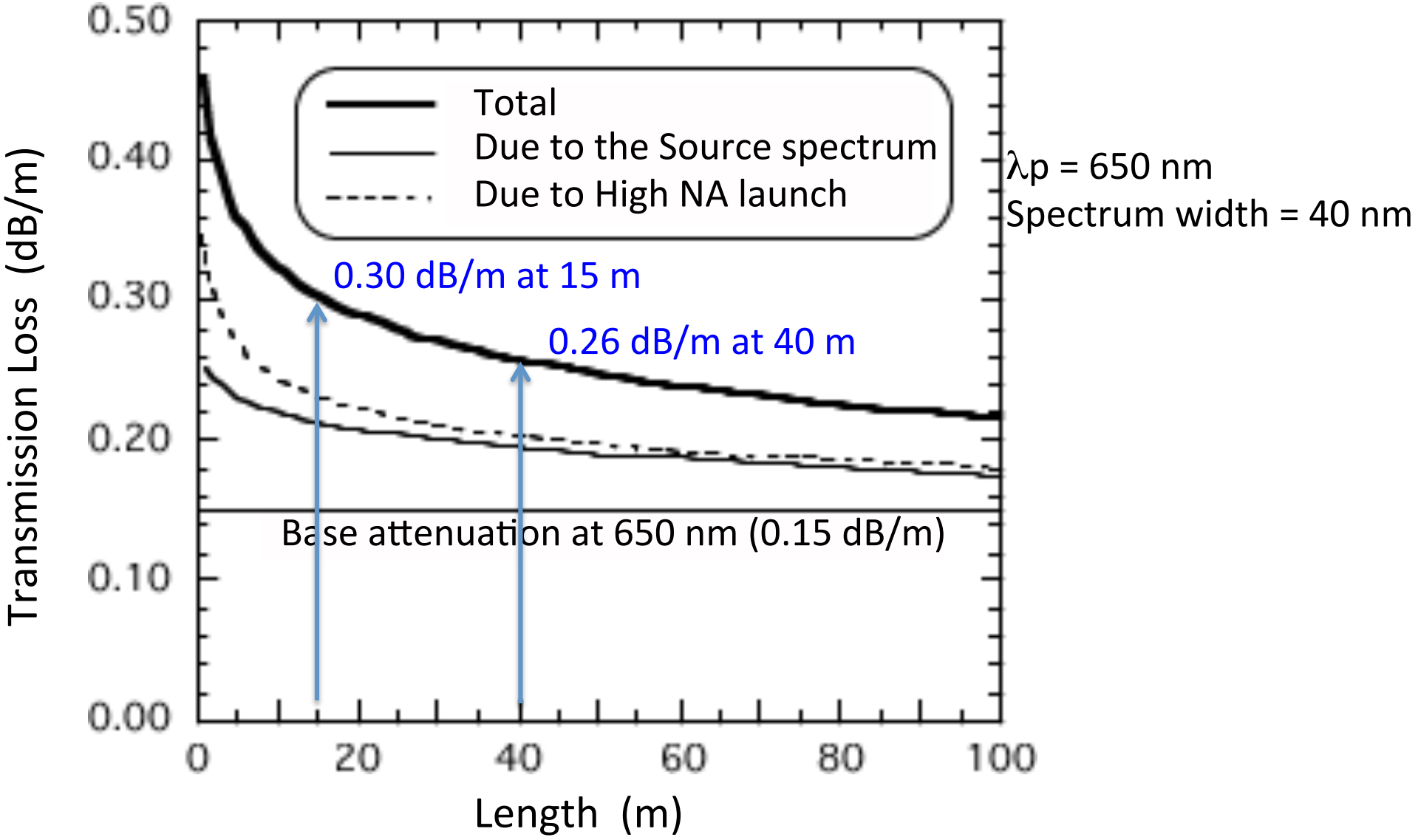
Transmission loss change due to the light source



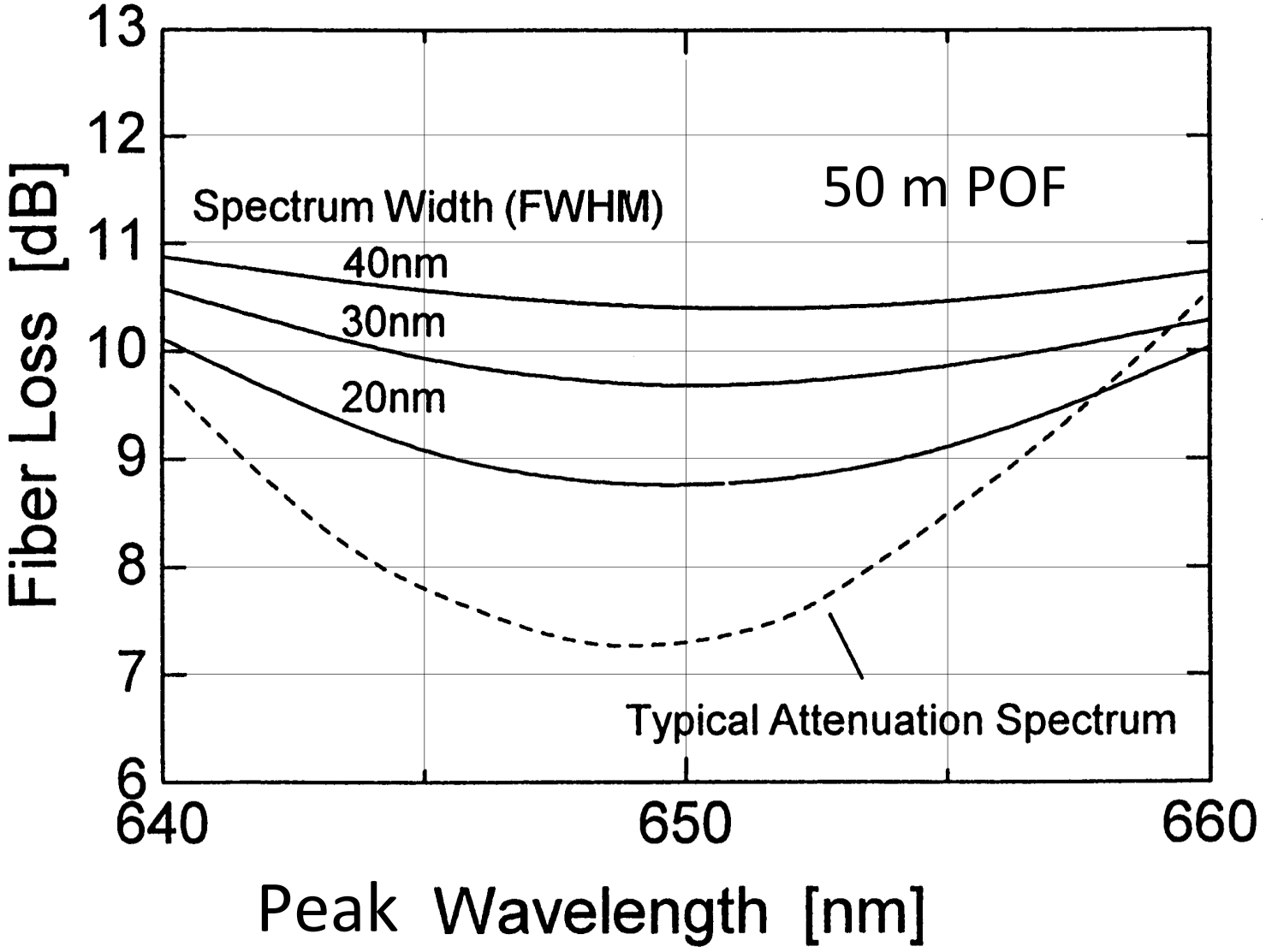
- ✓ Transmission loss depends on the wavelength
- ✓ Emission spectrum of LED varies with ambient temperature

Transmission loss change due to the light source

Loss Increment Factor: Source spectrum and Launch NA



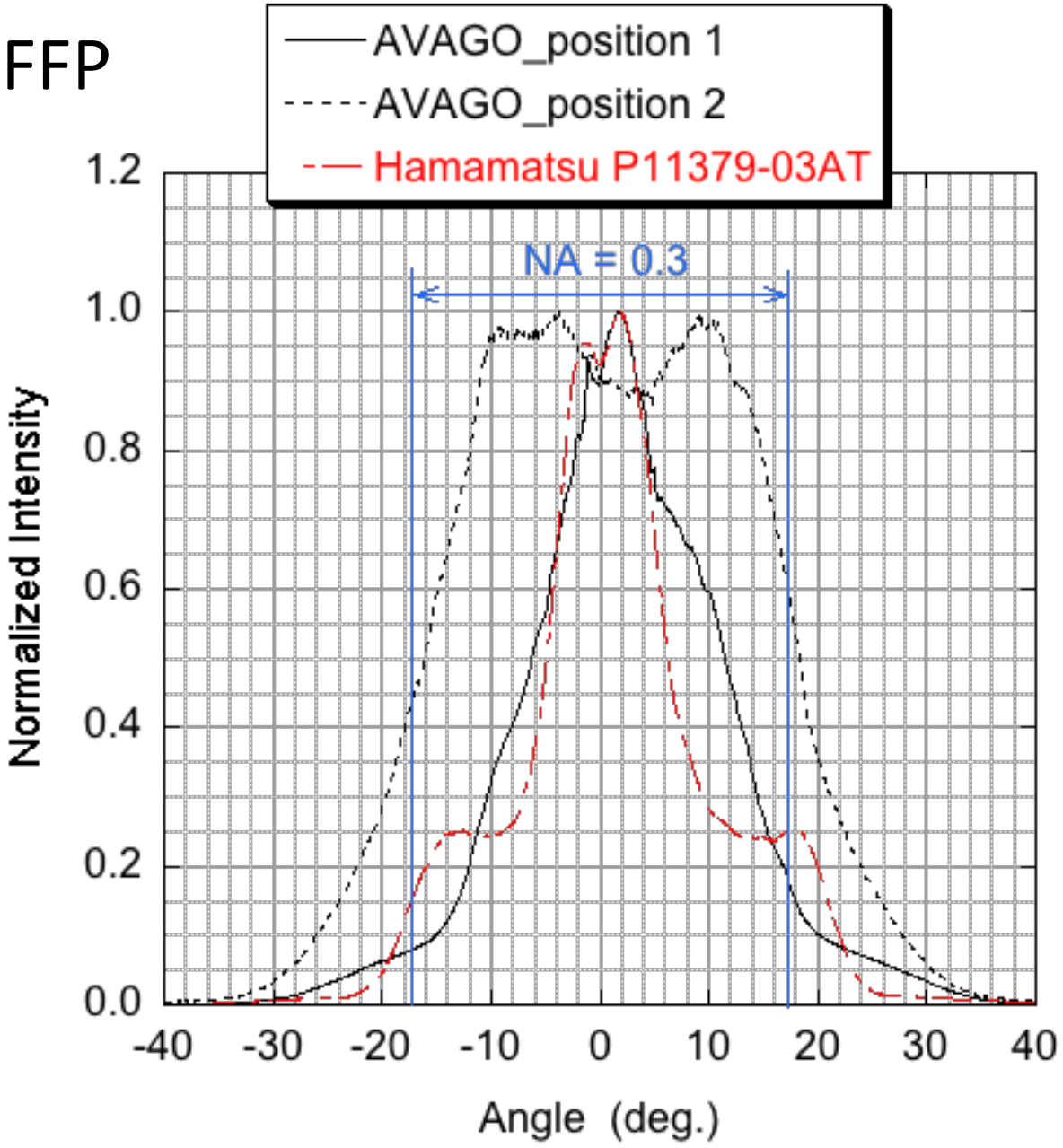
Example: Transmission Loss calculated Considering Peak Emission Wavelength and Spectrum Width of the Light Source (IEEE1394b)



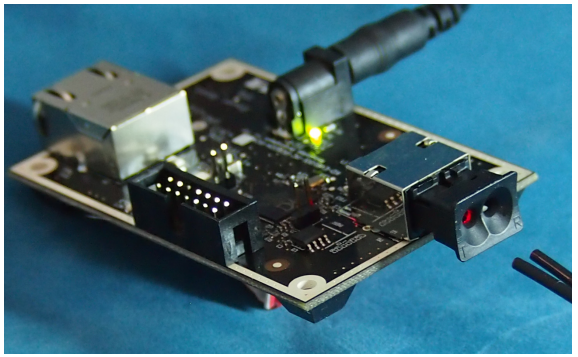
Source: NEC
LED: NL2100

Launch Condition with FOTs

FFP



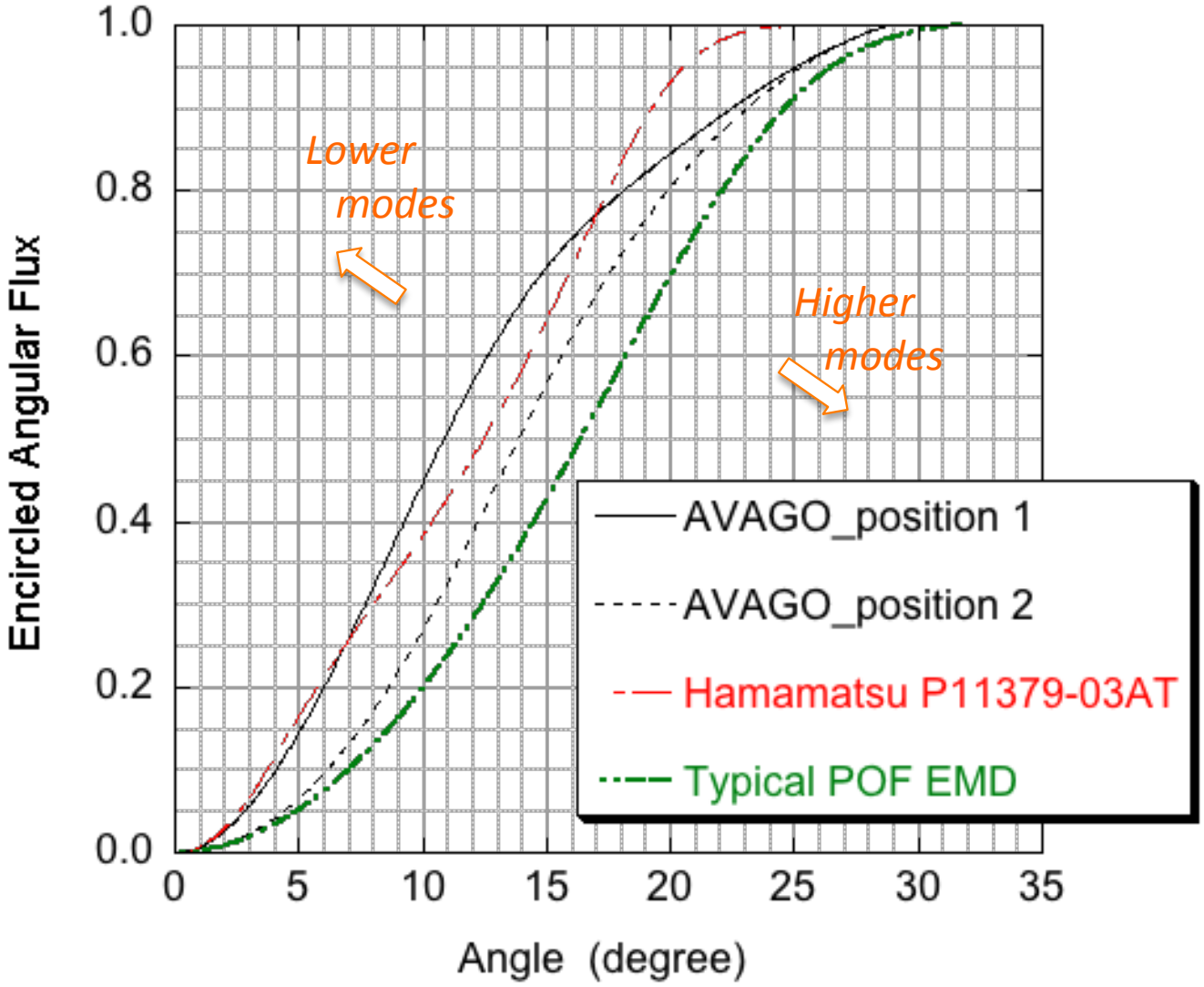
AVAGO
(on a KDPOF evaluation board)



Hamamatsu
P11379-04AT

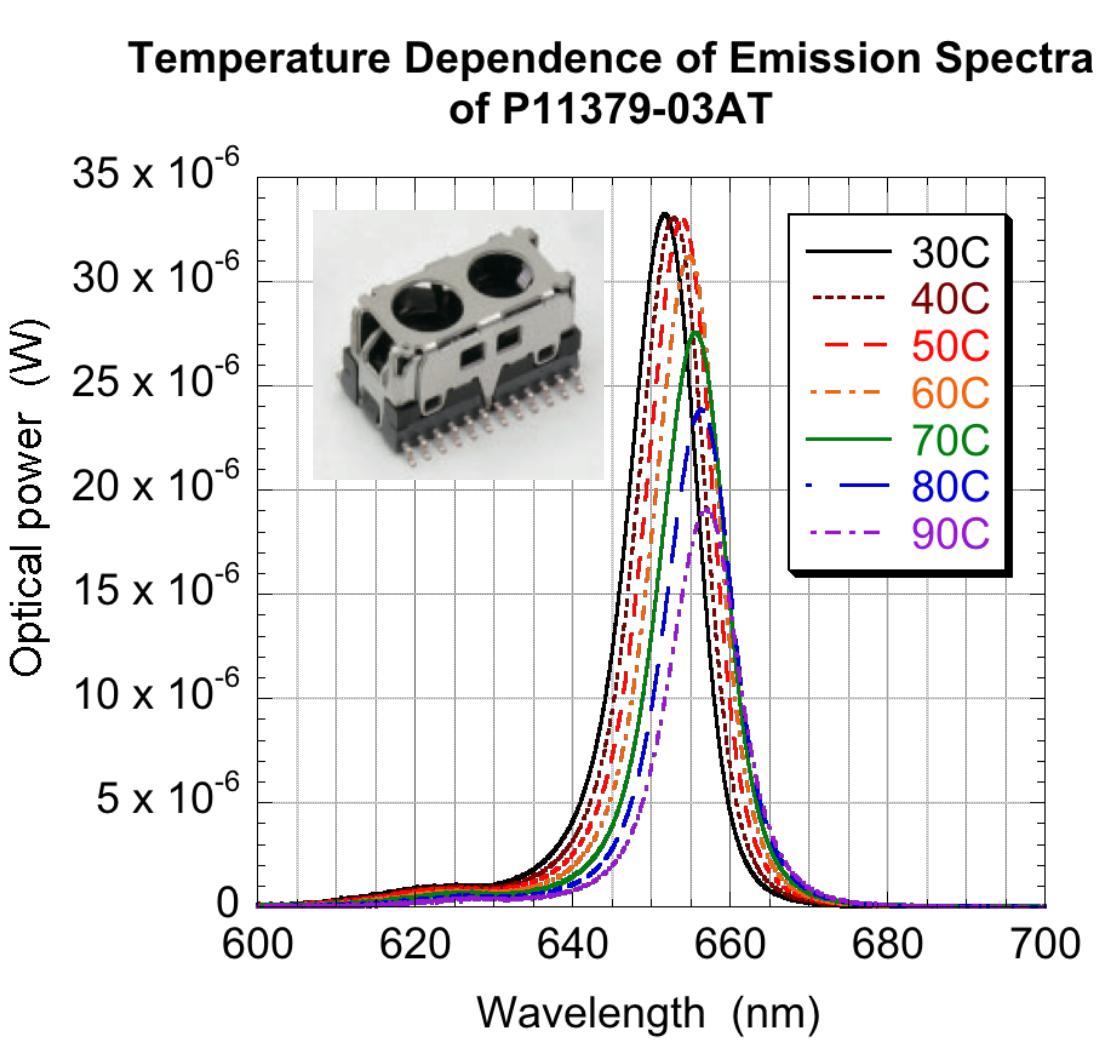
Launch Condition with FOTs

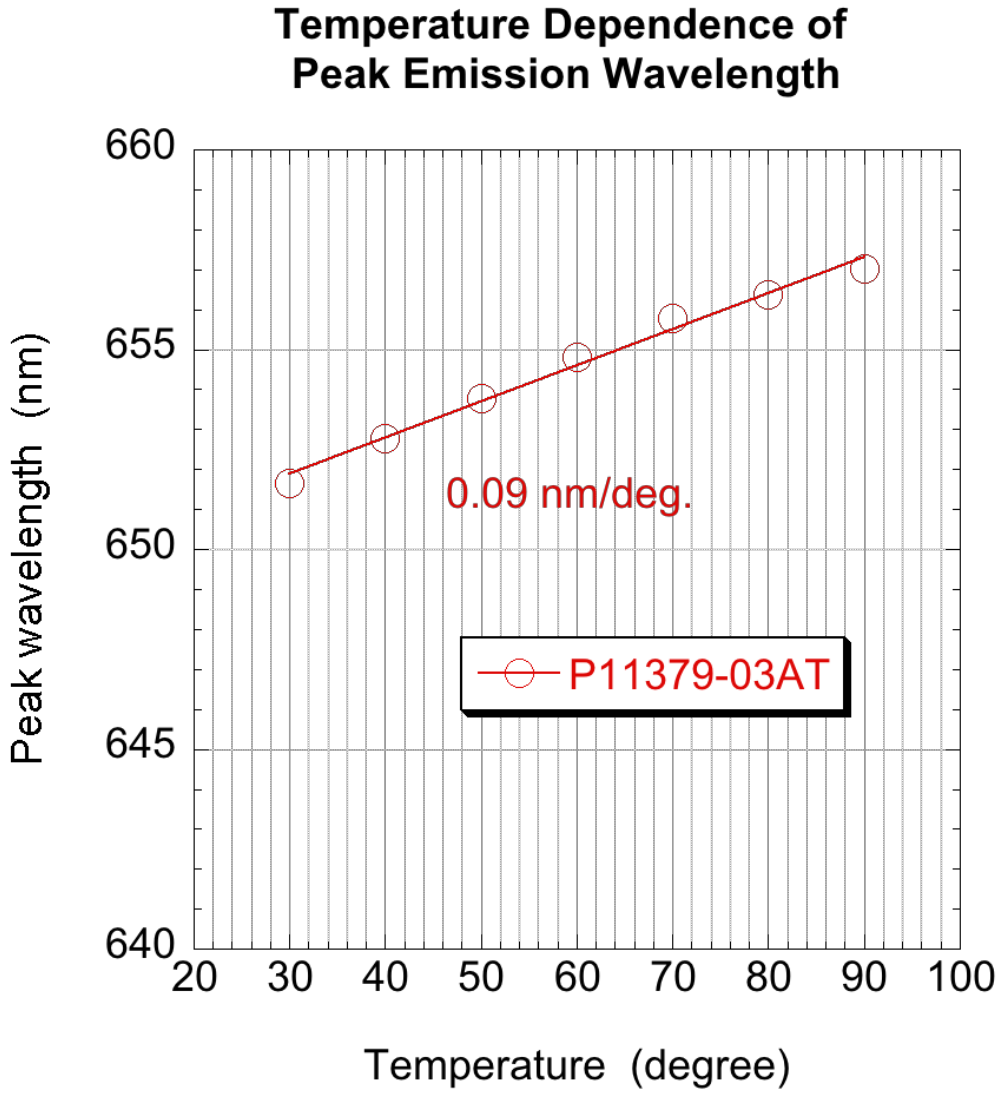
Encircled Angular Flux



- ✓ Launch conditions of AVAGO FOT and Hamatsu FOT are **Lower** than typical **EMD** of category A4a.2 POF

Temperature Dependence of Emission Spectrum of the Light Source





Example: POF Cable Plant Loss Budget of IEEE 1394b S100/S200

Transmission loss of 50 m POF (A4d) without connection

Loss factor	Typical (dB)	Worst (dB)	Condition
Base transmission loss	7.3	7.8	650nm, Launch NA=0.1
Environment	0	0.8	70 C, 95 %RH
Launch NA	0.2	0.5	0.2 < Launch NA <0.3
Spectrum of the light source	3.1	3.4	λp=660nm, FWHM=40nm
Macrobend loss	0	0.5	10 quarter bends, 25mmR
Total	10.6	13.0	

- Maximum POF Attenuation = 0.26 dB/m
- Maximum connection loss = 2.08 dB / connection

Transmission length will be shortened 8 m a connection.

Thank you for your attention