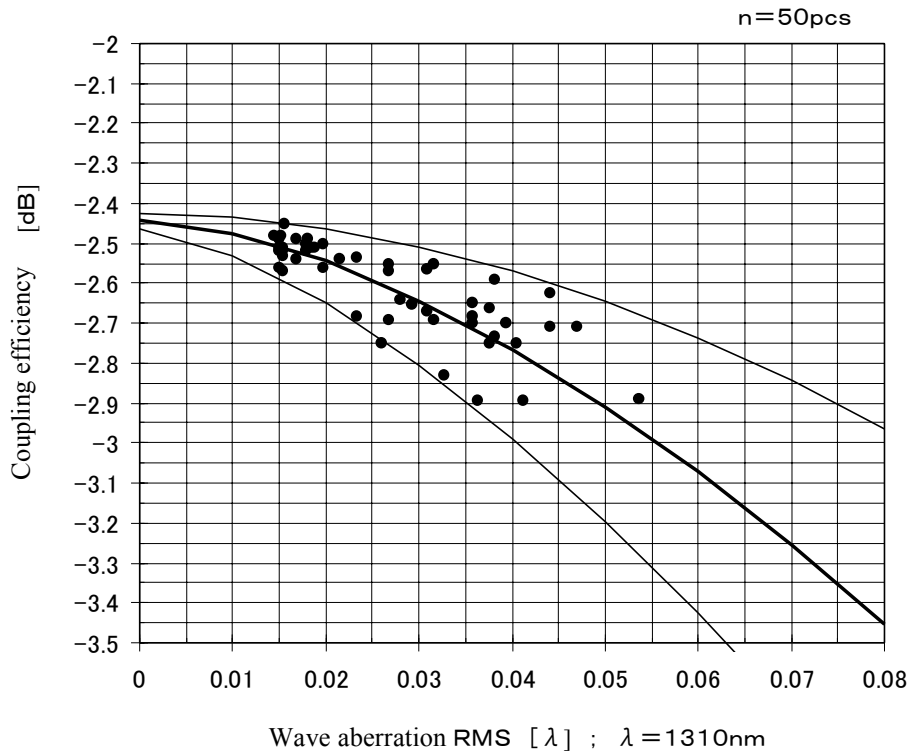


Aberration and Coupling efficiency

Aspherical lens is designed as aberration becomes the minimum on a specified condition. But when the lens is used by a magnification different from the design and is given the axis gaps other than specified condition, the aberration is occurred.

The relation between the aberration and coupling efficiency changes depending on the kind of the occurred aberration (Spherical aberration, Astigmatism, Coma) and the used fiber. This relation changes depending on the aberration that LD itself has too. The graph of the relation between the aberration and coupling efficiency when the spherical aberration is mainly changed is shown below. (Actual measurement data that used a lens which gave an intention aberration)

Wave aberration vs. Coupling efficiency



Condition	
Lens	Effective entrance NA0.55 the side of LD, magnification=5
LD	Wavelength 1310nm, Emission angle 28x32deg (FWHM)
Fiber	SMF for 1310nm
Others	Adjustment as it becomes best efficiency

About Data

Aberration and coupling efficiency is not correlation within the narrow range by kind of aberration accuracy of coupling test and rotation direction of lens, LD and fiber. But the correlation and the transition of the aberration and the coupling efficiency within the range from MIN, TYP, MAX can be known from above the graph.

The absolute value of the coupling efficiency is controlled by LD, the lens, the kind of the fiber and those arrangement. Although above mentioned data is an example. The correlation curve of the aberration and the coupling efficiency shows similar behavior.