



Comparison of bit rate between single-mode and multimode optical fiber in case of step index and graded index at varied distances

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Abstract: Development of the telecommunication through optical fiber has been widely used. Optical fiber has the characteristics of long haul communication and large information carrying capacity. Optical fibers provide super transmission

bandwidth. Optical fiber is currently a transmission medium of choice for long range distance and high speed transmission in telecommunications networks. The performance of any communication system is ultimately limited by available bandwidth of channel. Bandwidth of a channel depends upon maximum data rate that it can provide for transmission of data signal. This research paper focus on maximum bit rate in single mode fiber and multimode fiber in case of step index and graded index of fiber optic communication systems.



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Keywords- Optical fiber, single mode, multimode, step index, graded index, maximum bit rate

I. INTRODUCTION:

Now days, fibers optic networks are gaining its popularity because it has high data rate speed, high density and high bandwidth for signal transmission etc. Compared with traditional copper cables, optical fibers cables can support much advance distance although exact distance is limited by many factors. For super fast optical communication, signal transmission distance has already become most vital issue. Optical fibers in different modes such as in single- mode step index, multimode step index and multimode graded mode provide enormous & unsurpassed transmission bandwidth with negligible latency & are now transmission medium of choice for long distance & high data rate transmission in telecommunication networks.

The optical signal might become weak over long distance that's only due to dispersion occur in the signal flow. There is a tradeoff present between bit rate of data signal and transmission distance. Thus we employ a method that has been adopted to analyze bit rate with respect to the optical transmission distance. This article will emphasize factors on the optical transmission distance and bit rate. Typically dispersion in fibers optic cables can have great impact on transmission distance and bit rate.

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