

## ABSTRACT

VDSL (Very high bit rate Digital Subscriber Line) is the new variant of technology DSL (Digital Subscriber Line) which offer high rate of data services. VDSL apply frequency up to 12 MHz for achive bit rate up to 52 Mbps. But, range of services is limited about 1,5 km. System relliability which applied to support high data rate consider modulation technique on PMD (Physical Medium Dependent) layer of VDSL system. Modulation technique that applied are SCM (Single Carrier Modulation) and MCM (Multi-carrier Modulation).

SCM that applied generally is QAM (Quadrature Amplitude Modulation) modulation technique, on other hand, MCM use DMT (Discrete Multi-tone) modulation technique. Transmission channel that commonly used is twisted pair cable which is depend on cable loss and crosstalk noise like NEXT (Near End Crosstalk). Both of modulation techniques performance will be analyzed on channel condition which have 1500 meters long and distruber of NEXT up to 49 pairs.

Based on simulation results, the MCM system is able to give a good performance than SCM system. Beside that, the NEXT noise are conditioned to be increase with a number of distruber. At the maximum number of NEXT interference can cause error to SCM system on 900 meters long and MCM system on 1100 meters long. So the conclusion give the MCM system is more robust against error, especially NEXT.

**Key word: QAM (Quadrature Amplitude Modulation), DMT (Discrete Multi-tone), NEXT (Near End Crosstalk), Cable Loss.**