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Neighborhood LMDS

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Abstract

Given the high cost of LMDS RF equipment, as well as the daunting propagation problems posed by rain, trees, and line-of-sight clearance requirements, many licensees and equipment vendors have understandingly focused their efforts on relatively expensive architectures serving high revenue customers in urban areas. However, LMDS can also provide broadband wireless access to residential and business users through the development and deployment of low-cost very low power transceivers and up/down converters.

We are developing an architecture based on low-cost low-power LMDS transceivers deployed on utility poles. If there is fiber on the poles, the transceivers serve wireless branches that go from the fiber to the users. If fiber is not available, the transceivers provide a wireless backbone. Although the transceivers have a range of only a few hundred meters, their target price of \$300 makes them affordable enough for multiple purchases by a system operator. Their short range greatly simplifies frequency reuse and largely removes the rain fade problem. If the terrain and vegetation permit, the wireless branches can connect directly to individual users. If it is necessary to penetrate vegetation, the last hop can be provided by links at the U-NII, MMDS, or 2.4 GHz bands. System cost can be minimized if the LMDS transceivers are designed with their IF frequencies in the band chosen for connecting with the users.

Currently we are testing the key components of a system based on \$60 single-purchase Gunn diode modules manufactured for 25 GHz Doppler radar motion sensors. In these units a single diode serves as both a transmit oscillator and a receive LO. With minor modification it is easy to build a 2 Mbps transceiver, and it is likely that the technique can be extended to at least 10 Mbps.