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光通信与光信息技术

TDM-PON上行信号光功率均衡器的锁模特性

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摘要： 为了减小时分复用无源光网络（TDM-PON）上行信号光波长的飘移，基于TDM-PON上行信号光功率均衡器架构，采用单模激光注入锁定光网络单元（ONU）法布里-珀罗（F-P）激光器（LD）方法，研究了F-P LD输出光波长的锁模特性，包括锁模的范围、驱动电流对锁模特性的影响、锁模前后温度变化引起F-P LD光波长变化情况等。结果表明，当驱动电流为9mA时，F-P LD可被锁模的波长范围为0.38nm，大于ONU上行光波长因环境温度变化5℃而产生的波长位移量0.25nm，F-P LD被锁模可使ONU上行信号的光波长相同且稳定，降低光功率均衡后的噪声。

关键词： 光通信 光功率均衡 光注入锁定 法布里-珀罗激光器 分布反馈半导体激光器

Mode-locking characteristics of TDM-PON upstream traffic optical power equalizers

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Abstract: In order to reduce the wavelength drift of the time division multiplexing passive optical network (TDM-PON) upstream traffic,based on a architecture with optical power equalization of the upstream traffic in a TDM-PON, using single mode

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laser injection locking Fabry-Perot laser diode (F-P LD) of optical network unit (ONU), the mode-locking characteristics of Fabry-Perot output laser wavelength was discussed, such as the range of injection-locking, the influence of driving current on mode-locking characteristics, the influence of temperature variation on the wavelength with or without injection-locking. The results show that, for such a laser, when the driving current is 9mA, the injection-locking wavelength range is 0.38nm which is larger than the 0.25nm upstream wavelength drift of the ONU caused by the 5℃ change of environmental temperature. The identical and stable wavelength of the ONU upstream traffic and the low noise after the optical power equalization were achieved by the injection-locking F-P LD.

Keywords: optical communications optical power equalization optical injection-locked Fabry-Perot laser diode distributed feedback semiconductor laser

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参考文献：

[1] LEE C H, SORIN W V, KIM B Y. Fiber to the home using a PON infrastructure[J].Journal of Lightwave Technology, 2006, 24(12):4568-4573.

[2] EFFENBERGER F, EL-BAWAB T S. Passive optical networks (PONs): past, present, and future[J]. Optical Switching and Networking, 2009, 6(3): 143-150.

[3] DHAINI A R, HO P H, SHEN G X. Toward green

next-generation passive optical networks[J]. IEEE Communications Magazine, 2011, 49(11): 94-101.
[4] YOUNGIL P, CHUNGHWAN L, INKWUN J. ONU power equalization of ethernet PON systems[J]. IEEE Photonics Technology Letters, 2004, 16(8): 1984-1986.
[5] LING Y, QIU K, ZHANG W, *et al*. Optical power equalization using Fabry-Perot semiconductor optical amplifier[J].Chinese Optics Letters, 2006, 4 (12):690-693.
[6] VERHULST D, BAUWELINCK J, MARTENS Y, *et al*. A fast and intelligent automatic power control for a GPON burst-mode optical transmitter[J]. IEEE Photonics Technology Letters, 2005, 17(11):2439-2441.
[7] YEH C H, HSU D Z, CHI S. Upstream power equalization in a gigabit passive optical network[J]. Optics Express, 2007, 15(8):5191-5195.
[8] CHEN X W, CHENG E. An optical power equalization of upstream traffic in TDM-PON