7.2.2 Principles of operation

The EPON specification extends the specification of Gigabit Ethernet (in case of 1G-EPON) or 10 Gigabit Ethernet (in case of 10G-EPON) as described in IEEE Std 802.3. The Ethernet MAC operates at the data rate of 1 Gb/s (in 1G-EPON) or 10 Gb/s (in 10G-EPON) and it is connected to a media dependent interface through the GMII (in 1G-EPON) or XGMII (in 10G-EPON) interface. The EPON PCS layer extends the Ethernet PCS, adding burst-mode operation capabilities and EPON-specific FEC. New, EPON-specific layers are added:

— MPCP is placed in the MAC control layer, providing EPON media access, station discovery, and registration protocol.

— Functionality of the reconciliation sublayer (RS) was extended, creating logical links over shared passive optical medium, providing private transmission channels to each of the connected ONU.

— (Optional in 1G-EPON, mandatory in 10G-EPON) FEC functionality located between the PCS and PMA layers was added, extending the Ethernet PCS layer, enhancing reach and split performance of the EPON optical link. Figure 7–2 presents the EPON layering model.