



Design of Optical Network Terminal(ONT) for Gigabit Passive Optical Network(GPON)

Our Client

A new player in the Gigabit Passive Optical Network (GPON) device market in the Asia Pacific Region.

Why they needed us

They were looking to manufacture and sell Optical Network Terminals (ONT) and they needed someone to handle the design. They approached us for our expertise and experience in product engineering and GPON related technologies.

What we did

- Conceptualized and defined the industrial design with electrical and mechanical intensive features.
- Evaluated various Class A components like GPON SoC, memories, SFP, connectors and all relevant components that have mechanical impact.
- Documented High Level Design (HLD) for electrical and mechanical.
- Designed Electrical Schematics based on HLD using OrCAD.
- Generated gerber files for the PCB.
- Designed the Electrical Layout of the Board using Cadence Allegro.
- Designed the Mechanical Model of the housing based on the HLD using SolidWorks.
- Ensured that there were no obstruction of the electrical components with the mechanical model using EMN and EMP files.
- Routed the PCB based on the schematic and layout using Cadence Allegro.
- Generated mechanical BOM, gerber files, assembly diagrams and assembly instructions which our client used to manufacture and assemble the PCB and the Housing.
- Tested and debugged the assembled PCB.
- Tested for Electromagnetic Compatibility and Electromagnetic Interference along with various tests for Reliability.
- Conducted various reliability and functionality test for the different features implemented, such as VoIP features, L2 Features, L3 routing features, Wi-Fi features etc.

Product Specification

Feature	Description
Layer 2	<ol style="list-style-type: none"> 1. Untagged port configuration 2. Standard Ethernet bridging 3. Virtual switch based on 802.1Q VLAN 4. VLAN tagging/Untagging per Ethernet port 5. VLAN stacking (Q-in- Q), VLAN translation, VLAN trunking 6. IP ToS/DSCP to 802.1p mapping 7. CoS based on VLAN-ID, 802.1p bit, ToS/DSCP 8. Marking/remarking of 802.1p 9. MAC address learning with auto ageing (upto 4K MAC addresses)
Multicast	<ol style="list-style-type: none"> 1. IGMP snooping – V2/V3
QoS	<ol style="list-style-type: none"> 1. HW-based internal IEEE 802.1p (CoS) 2. Strict Priority (SP) 3. 8 queues per port

Wi-Fi	<ol style="list-style-type: none"> 1. IEEE802.11b/g/n compliant 2. Multiple SSIDs, Bandwidth: 2.4GHz 3. 64/128bit wireless encryption protocol (WEP) 4. Max. data rate: 54Mbps in 802.11g
VoIP	<ol style="list-style-type: none"> 1. SIP (RFC3261/3262/3264) 2. RTP, RTCP (RFC3550/3551) 3. DTMF dialling / Pulse dialling 4. Multiple codecs: G.711,G.723.1, G729 5. T.38 FAX mode 6. Echo cancellation
VLAN	<ol style="list-style-type: none"> 1. VLAN port filtering 2. Destination address port filtering
RGU (L3 Routing mode)	<ol style="list-style-type: none"> 1. PPPoE client : multi client per RG ONT 2. DHCP server / client 3. DNS Relay server (DNS relay, DNS transparent) 4. NAT and NAPT: 16K session (US 8K, DS 8K) 5. Port forwarding 6. Stateful packet inspection firewall with ACL

How they benefited

They were able to utilise our expertise in the field of mechanical & electronics design and our extensive knowledge about the Gigabit Passive Optical Network (GPON) and associated devices to bring to market their product in a short amount of time.

About Redeem Systems

Redeem Systems is a pure-play Engineering and Digital Services Company with focus on mission critical highly engineered + high availability systems. Our global presence spans Asia-Pacific, Middle-east, Europe and North-America.

Our focus verticals include – Tele-communications, Medical Electronics and Aerospace & Strategic Electronics.

Our Product Engineering competencies include Product Design and Development, Verification & Validation, Emerging Markets Strategy and Product Life-Cycle Extension through Value Analysis and Value Engineering

Our Digital competencies are focused on Industrial Internet-of-Things (IIoT), Engineering Big Data Analytics and Software Defined Networking (SDN)/ Network Functions Virtualization (NFV).