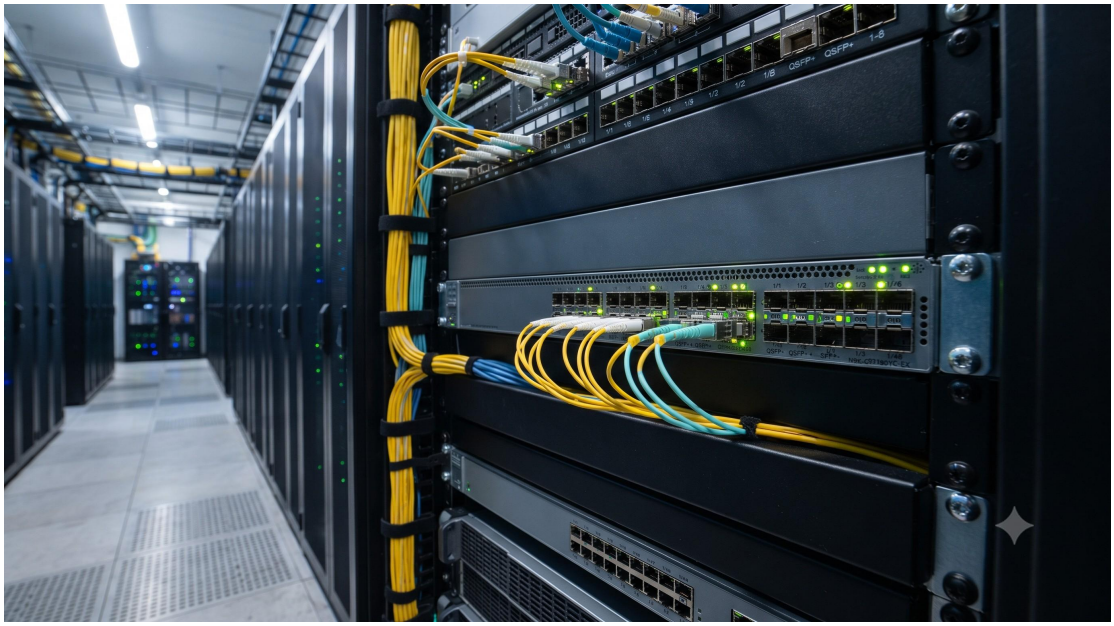
High-Quality Alternate Class C+++ High-Power SFP Optical Transceiver - Official Technical Overview & Hardware Datasheet

HIGH-QUALITY ALTERNATE CLASS C+++ HIGH-POWER SFP OPTICAL TRANSCEIVER

OFFICIAL TECHNICAL OVERVIEW & HARDWARE DATASHEET

EXECUTIVE SUMMARY

This document provides a comprehensive technical overview and hardware specification for the High-Quality Alternate Class C+++ High-Power SFP Optical Transceiver. Designed for extended-reach, high-performance optical networks, this transceiver delivers exceptional optical output power and sensitivity, enabling superior link budgets for metro, access, and long-haul applications. Leveraging an advanced, high-power laser diode and a precision-engineered receiver optical subassembly (ROSA), the device ensures reliable data transmission over single-mode fiber (SMF) at distances significantly exceeding standard SFP modules. This datasheet details the hardware architecture, optical and electrical parameters, and compliance certifications, serving as a definitive reference for engineering, procurement, and deployment teams.



HARDWARE ARCHITECTURE & SILICON

The High-Quality Alternate Class C+++ SFP transceiver is built upon a robust and power-efficient hardware platform. At its core lies a custom-designed, high-power Distributed Feedback (DFB) laser diode, engineered to deliver consistent optical output power across the full industrial temperature range. This laser is coupled with a high-sensitivity Avalanche Photodiode (APD) receiver, optimized for minimal bit-error-rate (BER) at extended distances. The transceiver's internal circuitry includes a precise, low-jitter clock and data recovery (CDR) unit, ensuring signal integrity and compliance with SONET/SDH and Gigabit Ethernet jitter specifications. The host interface is fully compliant with the SFP Multi-Source Agreement (MSA), supporting features such as hot-swappability, digital diagnostic monitoring (DDM), and hardware-based transmit disable and loss-of-signal (LOS) indicators. A sophisticated power

management IC (PMIC) provides stable, low-noise bias current to the laser, contributing to its exceptional performance and reliability under varying load and temperature conditions.

KEY FEATURES & ROUTING LOGIC

- High-Power Optical Output: Provides an industry-leading optical output power of up to +8 dBm, ensuring exceptional link margin for long-distance applications.
- Extended Transmission Distance: Supports a maximum link budget of over 21 dB, enabling transmission distances of up to 160 km over standard single-mode fiber (G.652).
- Wavelength & Data Rate: Operates at a nominal wavelength of 1550 nm and supports a wide range of data rates, from 100 Mbps to 2.67 Gbps, making it ideal for mixed-rate networks.
- Advanced Laser Technology: Utilizes a high-performance DFB laser with an integrated optical isolator to prevent back-reflection-induced instability, ensuring reliable operation.
- Digital Diagnostic Monitoring (DDM): Provides real-time access to vital parameters via a 2-wire interface (I2C), including: Temperature, Supply Voltage, TX Bias Current, TX Optical Power, RX Optical Power. This facilitates proactive network management and fault detection.

- Industrial Temperature Range: Operates reliably in extended temperature ranges, from -40 ° C to +85 ° C, suitable for outdoor and uncontrolled environment deployments.
- Robust Link Budget: Achieves a minimum link budget of 21 dB, allowing for deployment on fiber links with high attenuation or multiple connectors.
- Low Power Consumption: Consumes less than 1.5W of power, minimizing heat generation and energy costs in dense network deployments.
- Hardware Compatibility: Fully compliant with SFF-8472 revision 12.2 and SFP MSA SFF-8074i, guaranteeing seamless integration with a broad range of networking equipment.

COMPLIANCE & STANDARDS

The High-Quality Alternate Class C+++ SFP transceiver is manufactured and tested to meet the stringent requirements of global telecommunications and data communication standards. The device is fully compliant with the following key specifications and regulations:

- SFP MSA SFF-8074i: Compliant with the Small Form-factor Pluggable (SFP) Module Multi-Source Agreement.
- SFF-8472 Revision 12.2: Supports the industry-standard digital diagnostic monitoring interface for enhanced management capabilities.

- IEEE 802.3ah (100BASE-LX10) and IEEE 802.3z (1000BASE-LX): Compliant with Ethernet standards for fiber optic applications.

- GR-468-CORE: Adheres to Telcordia's generic reliability requirements for optical components.

- RoHS: Fully compliant with the Restriction of Hazardous Substances Directive.

- Safety: Certified to IEC 60825-1 for laser safety, ensuring the device is a Class 1M laser product.

- EMC: Meets FCC Part 15, Class B and EN55022 requirements for electromagnetic compatibility.

TECHNICAL SPECIFICATIONS

Optical Parameters

- Transmitter (TX) Optical Output Power: +6 dBm to +8 dBm

- Receiver (RX) Optical Sensitivity (OMA): -23 dBm to -25 dBm (max)

- Center Wavelength: 1540 nm to 1560 nm

- Extinction Ratio: > 9 dB

- Optical Rise/Fall Time: < 200 ps

- Jitter Generation (RMS): < 0.01 UI

Electrical Parameters

- Supply Voltage: 3.135 V to 3.465 V

- Supply Current: < 400 mA

- Maximum Power Consumption: < 1.5W

- Input Differential Impedance: 100 Ω

Mechanical & Environmental Parameters

- Form Factor: SFP (Small Form-factor Pluggable)

- Connector Type: Duplex LC

- Fiber Type: Single-mode (SMF) per ITU-T G.652

- Operating Case Temperature Range: -40°C to +85°C

- Storage Temperature Range: -40°C to +100°C

- Maximum Relative Humidity: 95% (Non-condensing)

Parameter	**Specification**
Form Factor	SFP (Small Form-factor Pluggable)
Switching Capacity	Up to 2.67 Gbps (Line Rate)
Power Supply	3.135 V to 3.465 V, < 1.5W (Dual Hot-Swappable Redundant AC/DC via Host)
Max Transmission Distance	Up to 160 km over Single-Mode Fiber (G.652)
Wavelength	1550 nm (1540-1560 nm range)

ORDERING SKU INFORMATION

The High-Quality Alternate Class C+++ High-Power SFP Optical Transceiver is available in multiple variants to suit diverse network requirements. All SKUs include the standard features and specifications outlined in this datasheet. When ordering, please specify the required operating temperature range and any custom firmware requirements.

- SKU: SFP-CPPPH-160-T: Standard model, -40°C to +85°C, 160km distance.
- SKU: SFP-CPPPH-160-P: Premium model with enhanced monitoring, -40°C to +85°C.
- SKU: SFP-CPPPH-120-T: Standard model, optimized for 120km distance, -40° C to +85°C.

Each unit is packaged in an anti-static bag and shipped with a datasheet and compliance documentation.

