SPP-ER

1550nm SFP+ single-Mode Transceiver, With Diagnostic Monitoring Duplex SFP+ Transceiver, RoHS 6 Compliant

Features

- 1550nm EML Transmitter
- Distance up to 40km over SMF
- Single 3.3V Power supply and TTL Logic Interface
- Duplex LC Connector Interface
- Hot Pluggable
- Power Dissipation < 1.5 W (Typical < 1W)
- Dispersion Tolerance 800ps/nm
- Operating Case Temperature Standard: 0 °C ~+70 °C
- Compliant with SFF-8431 MSA
- Compliant with SFF-8432 MSA
- Compliant with SFF-8472 MSA

Applications

- 10GBASE-ER/EW
- 8G/10G FC
- Other optical links

Product Description

The SPP-ER series single mode transceiver is small form factor pluggable module for duplex optical data communications up to 10G. It is with the SFP+ 20-pin connector to allow hot plug capability.
This module is designed for single mode fiber and operates at a nominal wavelength of 1550 nm. The transmitter section uses a 1550nm EML, which is class 1 laser compliant according to International Safety Standard IEC-60825.
The receiver section uses an integrated InGaAs detector preamplifier (IDP) mounted in an optical header and a limiting post-amplifier IC.

For more information please contact:

Opticonnect
tel : +31 79 73 70 152
email : sales@opticonnect.eu

Opticonnect SYSTEMS B.V., an Optical Networking vendor with its headquarters in the Netherlands, provides Optical Transport solutions and Optical Transceivers at the best price performance ratio possible. Our goal is to simplify the planning, deployment and maintenance of complex Optical Networks. This is achieved by our user friendly planning apps and information, sophisticated products and transparent support. Relying on our superior product quality, all items are supplied with life time warranty.

Ordering information

Part No.	Data Rate	Laser	Fiber Type	Distance	Interface	Temp.	DDMI
SPP-ER	8.5Gbps to 10.3Gbps	1550nm DFB	SMF	40km	LC	Standard	YES

Regulatory Compliance

Feature	Standard	Performance
Electrostatic Discharge (ESD) to the Electrical Pins	MIL-STD-883G Method 3015.7	Class 1C (>1000 V)
Electrostatic Discharge to the enclosure	EN 55024:1998+A1+A2 IEC-61000-4-2 GR-1089-CORE	Compliant with standards
Electromagnetic Interference (EMI)	FCC Part 15 Class B EN55022:2006 CISPR 22B :2006 VCCI Class B	Compliant with standards Noise frequency range: 30 MHz to 6 GHz. Good system EMI design practice required to achieve Class B margins. System margins depend on customer host board and chassis design.
Immunity	EN 55024:1998+A1+A2 IEC 61000-4-3	Compliant with standards. 1kHz sine-wave, 80% AM, from 80 MHz to 1 GHz. No effect on transmitter/ receiver performance is detectable between these limits.
Laser Eye Safety	FDA 21CFR 1040.10 and 1040.11 EN (IEC) 60825-1:2007 EN (IEC) 60825-2:2004+A1	CDRH compliant and Class I laser product. TüV Certificate No. 50135086
Component Recognition	UL and CUL EN60950-1:2006	UL file E317337 TüV Certificate No. 50135086 (CB scheme)
RoHS6	2002/95/EC 4.1&4.2 2005/747/EC 5&7&13	Compliant with standards *note1

Note1: For update of the equipments and strict control of raw materials, Opticonnect has the ability to supply the customized products since Jan 1st, 2007, which meets the requirements of RoHS6 (Restrictions on use of certain Hazardous Substances) of European Union. In light of item 5 in RoHS exemption list of RoHS Directive 2002/95/EC, Item 5: Lead in glass of cathode ray tubes, electronic components and fluorescent tubes. In light of item 13 in RoHS exemption list of RoHS Directive 2005/747/EC, Item 13: Lead and cadmium in optical and filter glass. The three exemptions are being concerned for Opticonnect transceivers, because Opticonnects transceivers use glass, which may contain Pb, for components such as lenses, windows, isolators, and other electronic components.

Absolute Maximum Ratings *note2

Parameter	Symbol	Min.	Max.	Unit
Storage Temperature	T_S	-40	+85	°C
Supply Voltage	V_{CC}	-0.5	3.6	V
Input Voltage	Vin	-0.5	Vcc	V
Output Current	Io	-	50	mA

Note2: Exceeding any one of these values may destroy the device permanently

Recommended Operating Conditions

Parameter	Symbol		Min.	Typical	Max.	Unit
Operating Case Temperature	T_c	SPP-ER	0		+70	°C
		SPP-ER-I	-40		+85	
Power Supply Voltage	V_{CC}		3.15	3.3	3.45	V
Power Supply Current	I_{CC}				455	mA
Surge Current	I_{Surge}				+30	mA
Baud Rate	10GBASE-ER			10.31		Gbps
	10GBASE-EW			9.95		

Performance Specifications – Electrical

Parameter	Symbol	Min.	Typ.	Max	Unit	Notes
Transmitter						
CML Inputs(Differential)	Vin	150		1200	mVpp	AC coupled inputs
Input Impedance (Differential)	Zin	85	100	115	ohm	Rin > 100 kohms @ DC
Tx_DISABLE Input Voltage – High		2		Vcc+0.3	V	
Tx_DISABLE Input Voltage – Low		0		0.8	V	
Tx_FAULT Output Voltage – High		2		Vcc+0.3	V	Io = 400µA; Host Vcc
Tx_FAULT Output Voltage – Low		0		0.5	V	Io = -4.0mA
Receiver						
CML Outputs (Differential)	Vout	350		700	mVpp	AC coupled outputs
Output Impedance (Differential)	Zout	85	100	115	ohms	
Rx_LOS Output Voltage – High		2		Vcc+0.3	V	Io = 400µA; Host Vcc
Rx_LOS Output Voltage – Low		0		0.8	V	Io = -4.0mA
MOD_DEF (0:2)	VoH	2.5			V	With Serial ID
	VoL	0		0.5	V	

Performance Specifications – Optical

Parameter	Symbol	Min.	Typical	Max.	Unit
9µm Core Diameter SMF			40		Km
Data Rate				10.3	Gbps
Transmitter					
Centre Wavelength	λ_C	1480	1550	1600	nm
Spectral Width (-20dB)	$\Delta\lambda$			1	nm
Average Output Power *note4	P_{out}	-1		+4	dBm

Extinction Ratio		ER	3.5			dB
Side Mode Suppression Ratio		SMSR	30			dB
Transmitter Dispersion Penalty		TDP			2	dB
Average Power of OFF Transmitter			-	-	-30	dBm
Relative Intensity Noise		RIN	-	-	-128	dB/Hz
Input Differential Impedance		ZIN	90	100	110	Ω
Input Differential Impedance		t_off	-	-	10	us
Receiver						
Centre Wavelength		λc	1260		1600	nm
Sensitivity *Note5		P_{min}			-15.8	dBm
Receiver Overload		P_{max}	-1			dBm
Output Differential Impedance		Pin	90	100	110	Ω
LOS De-Assert		LOS_D			-16.5	dBm
LOS Assert		LOS_A	-30			dBm
LOS	High		2.0		V_{CC}+0.3	V
	Low		0		0.8	

Note4: Output is coupled into a 9/125um SMF. The -4.7dBm is reference IEEE 802.3ae, the typical value is -1dBm.
Note5: Minimum average optical power measured at the BER less than 1E-12, back to back. The measure pattern is PRBS 231-1.