

# SBHxUB22L32D – SFP Single Fibre CWDM Low SW-SF CWDM / 22dB / 3.1Gbps

For your product safety, please read the following information carefully before any manipulation of the transceiver:



**ESD**

This transceiver is specified as ESD threshold 1kV for SFI pins and 2kV for all others electrical input pins, tested per MIL-STD-883G, Method 3015.4 / JESD22-A114-A (HBM). However, normal ESD precautions are still required during the handling of this module.



**LASER SAFETY**

This is a Class 1 Laser Product according to IEC 60825-1:2007. This product complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated (June 24, 2007).

The optical ports of the module need to be terminated with an optical connector or with a dust plug in order to avoid contamination.

## 1. Overview

SBHxUB22L32D is a high performance transceiver module for up to 3.072Gbps bidirectional data links over one single mode fibre within one single CWDM channel, which is split into two sub bands called CWDM High and CWDM Low.

The power budget is minimum 22dB end of life (EOL). The transmitter is a cooled CWDM Low DFB laser, the receiver is a PIN photodiode operating in the CWDM High sub band. Consequently, a module with a CWDM High transmitter and a CWDM Low receiver is required at the opposite side of the link. The recommended counterpart is SBHxDB22L32D

This transceiver module is compliant with the Small Form-factor Pluggable (SFP) Multisource Agreement (MSA) and hot pluggable. Always contact Skylane Optics® commercial agents for compatibility with different equipment platforms.

## 2. Features

- SFP Multi-Source Agreement compliant [SFF-8431]
- Hot pluggable SFP footprint
- Serial ID functionality supported according to [SFF-8472]
- Class 1 laser safety standard IEC 60825 compliant
- Supports data rates up to 3.072Gbps
- Single LC connector
- Cooled CWDM DFB transmitter
- Power budget >22dB
- Operating temperature range -40°C to 85°C
- Power consumption <1.8W
- Digital Diagnostics Monitoring (DDM)



Figure 1. SFP Single Fibre (non-binding illustration)

## 3. Applications

- Radio Base Station internal interface (CPRI/OBSA)

## 4. Optical Interface

P/N	Wavelength [nm]	Output Optical Power <sup>1</sup> [dBm]	Optical Receiver Sensitivity <sup>2</sup> [dBm]	Dispersion Penalty <sup>2</sup> [dB]	Optical Receiver Overload <sup>3</sup> [dBm]	Power Budget <sup>1</sup> [dB]
SBHxUB22L32D	ITU CWDM Low	-1.5 to 3	≤ -23.5	≤ 1.5	2	≥ 22

1. EOL, over operating temperature range

2. Measured with 3.072Gbps PRBS 2<sup>7</sup>-1, ER=6dB, BER≤10<sup>-12</sup> (dispersion penalty is specified over 20km SMF)

3. The optical input to the receiver should not exceed this value. Transmitters must never be directly connected to receivers (optical loop back) before ensuring that proper optical attenuation is used.

5. Technical Parameters

5.1. Recommended Operating Conditions

Parameter	Min	Typ	Max	Unit	Notes
Storage temperature	-40		85	°C	
Operating Case Temperature	-40		85	°C	
Relative Humidity	5		95	%	Non condensing
Power Supply Voltage	3.135		3.465	V	
Power Supply Current		280	550	mA	

5.2. Transmitter Optical Specifications

Parameter	Min	Typ	Max	Unit	Notes
Average Output Power	-1.5		3	dBm	4
Centre Wavelength Range	1270		1610	nm	
Wavelength (CWDM Low)	$\lambda_T - 6.5$		$\lambda_T - 1.5$	nm	5
Spectral Width (-20dB)			1	nm	
Extinction Ratio	6			dB	
Dispersion Penalty			1.5	dB	6

4. Output power coupled into a 9/125µm µm single mode fibre

5.  $\lambda_T$  according to the ITU-T G.694.2 CWDM grid, see ordering information for details

5.3. Receiver Optical Specifications

Parameter	Min	Typ	Max	Unit	Notes
Receiver Sensitivity			-23.5	dBm	6
Receiver Overload	2			dBm	6
Receiver Operating Range (CWDM High)	$\lambda_T + 2.0$		$\lambda_T + 6.5$	nm	5

6. Measured with 3.072Gbps PRBS 2<sup>7</sup>-1, ER=6dB, BER≤10<sup>-12</sup> (dispersion penalty is specified over 20km SMF)

6. Transceiver Electrical Pad Layout

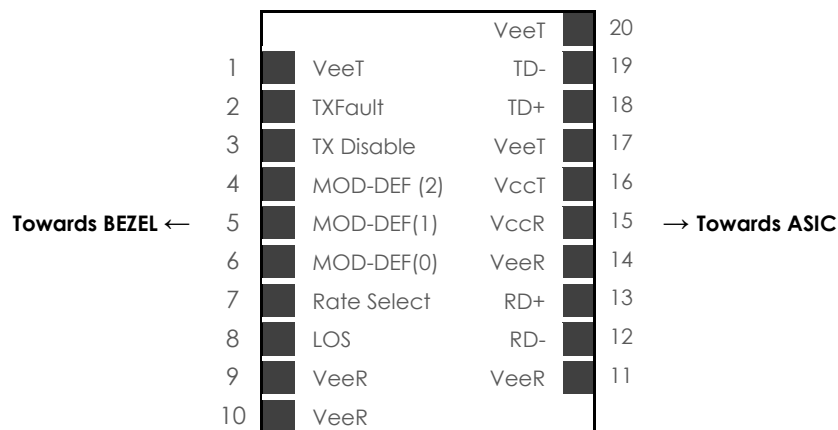


Figure 2. Transceiver Electrical Pad Layout

7. Module Electrical Pin Definition

SFP MSA (INF-8074i)

Pin Number	Name	Function
1	VeeT	Transmitter Ground
2	TX Fault	Transmitter Fault Indication
3	TX_Disable	Transmitter Disable
4	MOD-DEF2	2-Wire Serial Interface Data
5	MOD-DEF1	2-Wire Serial Interface Clock
6	MOD-DEF0	Grounded in Module
7	Rate Select	Not Used
8	LOS	Loss of Signal
9	VeeR	Receiver Ground
10	VeeR	Receiver Ground
11	VeeR	Receiver Ground
12	RD-	Inverted Received Data Out
13	RD+	Received Data Out
14	VeeR	Receiver Ground
15	VccR	Receiver Power
16	VccT	Transmitter Power
17	VeeT	Transmitter Ground
18	TD+	Transmit Data In
19	TD-	Inverted Transmit Data In
20	VeeT	Transmitter Ground

8. EEPROM

SFP+ MSA (SFF-8472)

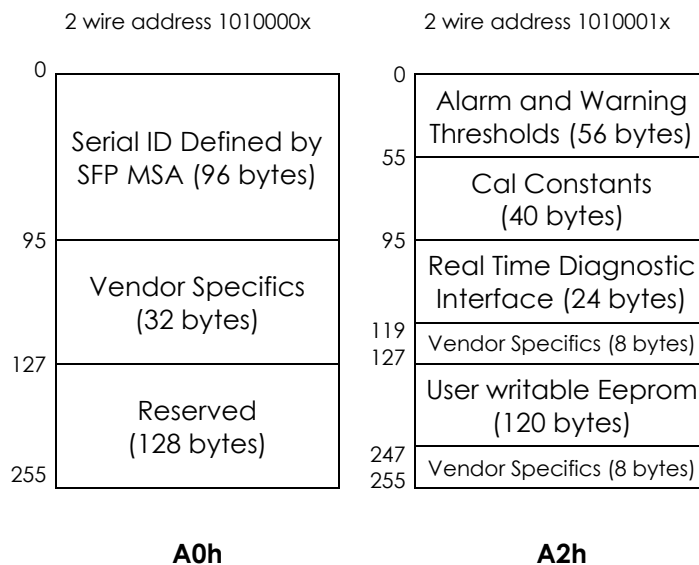


Figure 3. EEPROM of a SFP+

9. Ordering Information

Part Number	Description
SBHIUB22L32D	SFP CWDM Single Fibre, <b>Tx 1270nm</b> , Low (CWDM DFB), <b>Rx 1270nm</b> , Low (PIN), power budget 22dB, 3.1Gbps, LC connector, -40°C to 85°C, DDM
SBHJUB22L32D	SFP CWDM Single Fibre, <b>Tx 1290nm</b> , Low (CWDM DFB), <b>Rx 1290nm</b> , Low (PIN), power budget 22dB, 3.1Gbps, LC connector, -40°C to 85°C, DDM
SBHKUB22L32D	SFP CWDM Single Fibre, <b>Tx 1310nm</b> , Low (CWDM DFB), <b>Rx 1310nm</b> , Low (PIN), power budget 22dB, 3.1Gbps, LC connector, -40°C to 85°C, DDM
SBHLUB22L32D	SFP CWDM Single Fibre, <b>Tx 1330nm</b> , Low (CWDM DFB), <b>Rx 1330nm</b> , Low (PIN), power budget 22dB, 3.1Gbps, LC connector, -40°C to 85°C, DDM
SBHMUB22L32D	SFP CWDM Single Fibre, <b>Tx 1350nm</b> , Low (CWDM DFB), <b>Rx 1350nm</b> , Low (PIN), power budget 22dB, 3.1Gbps, LC connector, -40°C to 85°C, DDM
SBHNUB22L32D	SFP CWDM Single Fibre, <b>Tx 1370nm</b> , Low (CWDM DFB), <b>Rx 1370nm</b> , Low (PIN), power budget 22dB, 3.1Gbps, LC connector, -40°C to 85°C, DDM
SBHOUB22L32D	SFP CWDM Single Fibre, <b>Tx 1390nm</b> , Low (CWDM DFB), <b>Rx 1390nm</b> , Low (PIN), power budget 22dB, 3.1Gbps, LC connector, -40°C to 85°C, DDM
SBHPUB22L32D	SFP CWDM Single Fibre, <b>Tx 1410nm</b> , Low (CWDM DFB), <b>Rx 1410nm</b> , Low (PIN), power budget 22dB, 3.1Gbps, LC connector, -40°C to 85°C, DDM
SBHQUB22L32D	SFP CWDM Single Fibre, <b>Tx 1430nm</b> , Low (CWDM DFB), <b>Rx 1430nm</b> , Low (PIN), power budget 22dB, 3.1Gbps, LC connector, -40°C to 85°C, DDM
SBHRUB22L32D	SFP CWDM Single Fibre, <b>Tx 1450nm</b> , Low (CWDM DFB), <b>Rx 1450nm</b> , Low (PIN), power budget 22dB, 3.1Gbps, LC connector, -40°C to 85°C, DDM
SBHAUB22L32D	SFP CWDM Single Fibre, <b>Tx 1470nm</b> , Low (CWDM DFB), <b>Rx 1470nm</b> , Low (PIN), power budget 22dB, 3.1Gbps, LC connector, -40°C to 85°C, DDM
SBHBUB22L32D	SFP CWDM Single Fibre, <b>Tx 1490nm</b> , Low (CWDM DFB), <b>Rx 1490nm</b> , Low (PIN), power budget 22dB, 3.1Gbps, LC connector, -40°C to 85°C, DDM
SBHCUB22L32D	SFP CWDM Single Fibre, <b>Tx 1510nm</b> , Low (CWDM DFB), <b>Rx 1510nm</b> , Low (PIN), power budget 22dB, 3.1Gbps, LC connector, -40°C to 85°C, DDM
SBHDUB22L32D	SFP CWDM Single Fibre, <b>Tx 1530nm</b> , Low (CWDM DFB), <b>Rx 1530nm</b> , Low (PIN), power budget 22dB, 3.1Gbps, LC connector, -40°C to 85°C, DDM
SBHEUB22L32D	SFP CWDM Single Fibre, <b>Tx 1550nm</b> , Low (CWDM DFB), <b>Rx 1550nm</b> , Low (PIN), power budget 22dB, 3.1Gbps, LC connector, -40°C to 85°C, DDM
SBHFUB22L32D	SFP CWDM Single Fibre, <b>Tx 1570nm</b> , Low (CWDM DFB), <b>Rx 1570nm</b> , Low (PIN), power budget 22dB, 3.1Gbps, LC connector, -40°C to 85°C, DDM
SBHGUB22L32D	SFP CWDM Single Fibre, <b>Tx 1590nm</b> , Low (CWDM DFB), <b>Rx 1590nm</b> , Low (PIN), power budget 22dB, 3.1Gbps, LC connector, -40°C to 85°C, DDM
SBHHUB22L32D	SFP CWDM Single Fibre, <b>Tx 1610nm</b> , Low (CWDM DFB), <b>Rx 1610nm</b> , Low (PIN), power budget 22dB, 3.1Gbps, LC connector, -40°C to 85°C, DDM

Skylane Optics® supplies a broad range of optical transceivers. Our engineers work closely with our customers to find the best solutions for every application. We are committed to provide high quality products and services to our customers.

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