

# SBHxDB24GE2D – SFP Single Fibre CWDM High SW-SF CWDM / 24dB / Gigabit Ethernet

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

SBHxDB24GE2D is a high performance transceiver module for up to 1.25Gbps 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 24dB end of life (EOL). The transmitter is a cooled CWDM High DFB laser, the receiver is a PIN photodiode operating in the CWDM Low sub band. Consequently, a module with a CWDM Low transmitter and a CWDM High receiver is required at the opposite side of the link. The recommended counterpart is SBHXUB24GE2D.

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
- Single LC connector
- Cooled CWDM DFB transmitter
- Power budget  $\geq 24$ dB
- Operating temperature range  $-40^{\circ}\text{C}$  to  $85^{\circ}\text{C}$
- Power consumption  $\leq 1.65$ W
- Digital Diagnostics Monitoring (DDM)



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

## 3. Applications

- Gigabit Ethernet
- 1x Fiber Channel
- CPRI: 1.2288Gbps

## 4. Optical Interface

P/N	Wavelength [nm]	Optical Output 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]
SBHxDB24GE2D	ITU CWDM High	-2.5 to 2	$\leq -26.5$	$\leq 2.0$	2	$\geq 24$

1. EOL, over operating temperature range

2. Measured with 1.25Gbps PRBS 2<sup>7</sup>-1, ER=8.2dB, BER $\leq 10^{-12}$ , 40km SMF

3. The optical input to the receiver should not exceed this value. Transmitters must never be directly connected to receivers 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			500	mA	

### 5.2. Transmitter Optical Specifications

Parameter	Min	Typ	Max	Unit	Notes
Average Output Power	-2.5		2	dBm	4
Centre Wavelength Range	1270		1610	nm	
Wavelength (CWDM High)	$\lambda_T + 2.0$		$\lambda_T + 6.5$	nm	5
Spectral Width (-20dB)			1	nm	
Extinction Ratio	8,2			dB	
Dispersion Penalty			1.5	dB	6
			2.0		7

4. Output power coupled into a 9/125µm single mode fibre  
 5.  $\lambda_T$  according to the ITU-T G.694.2 CWDM grid, see ordering information for details  
 6. Measured with 1.25Gbps PRBS 2<sup>7</sup>-1, ER=8.2dB, BER≤10<sup>-12</sup>, 20km SMF  
 7. Measured with 1.25Gbps PRBS 2<sup>7</sup>-1, ER=8.2dB, BER≤10<sup>-12</sup>, 40km SMF

### 5.3. Receiver Optical Specifications

Parameter	Min	Typ	Max	Unit	Notes
Receiver Sensitivity			-26.5	dBm	8
Receiver Overload	2			dBm	8
Receiver Operating Range (CWDM Low)	$\lambda_T - 6.5$		$\lambda_T - 1.5$	nm	5

8. Measured with 1.25Gbps PRBS 2<sup>7</sup>-1, ER=8.2dB, BER≤10<sup>-12</sup>

## 6. Transceiver Electrical Pad Layout

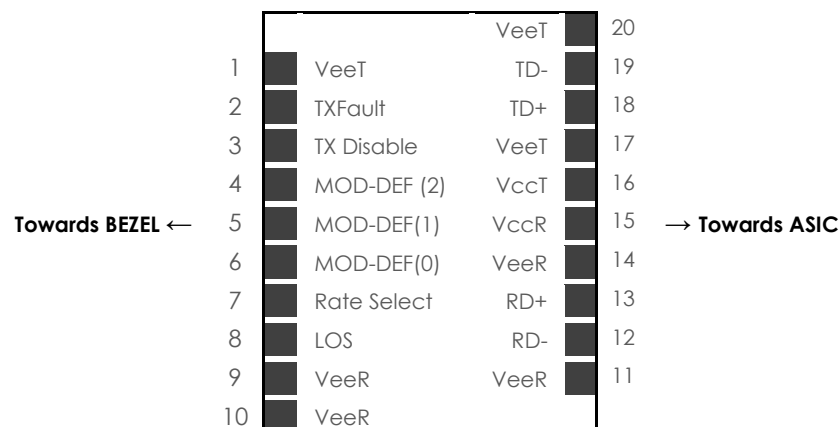


Figure 2. Transceiver Electrical Pad Layout

**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 with DDM (SFF-8472)

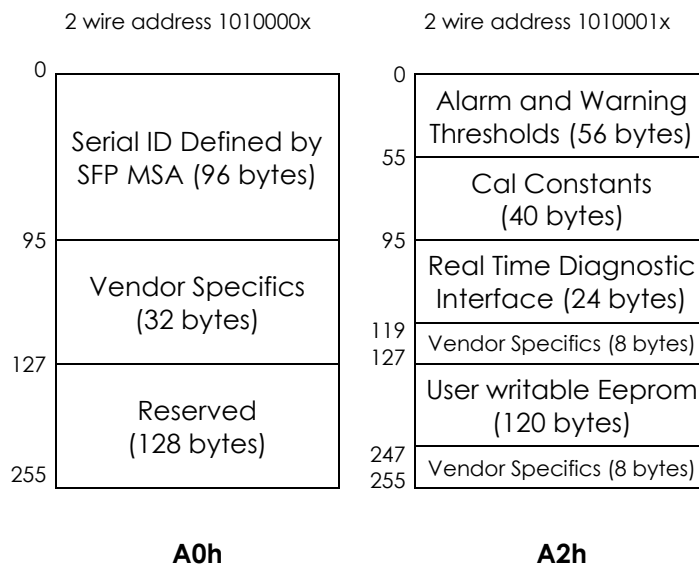


Figure 3. EEPROM of a SFP with DDM

9. Ordering Information

Part Number	Description
SBHIDB24GE2D	SFP CWDM Single Fibre, <b>Tx 1270nm</b> , High (CWDM DFB), <b>Rx 1270nm</b> , High (PIN), power budget 24dB, Gigabit Ethernet, LC connector, -40°C to 85°C, DDM
SBHJDB24GE2D	SFP CWDM Single Fibre, <b>Tx 1290nm</b> , High (CWDM DFB), <b>Rx 1290nm</b> , High (PIN), power budget 24dB, Gigabit Ethernet, LC connector, -40°C to 85°C, DDM
SBHKDB24GE2D	SFP CWDM Single Fibre, <b>Tx 1310nm</b> , High (CWDM DFB), <b>Rx 1310nm</b> , High (PIN), power budget 24dB, Gigabit Ethernet, LC connector, -40°C to 85°C, DDM
SBHLDB24GE2D	SFP CWDM Single Fibre, <b>Tx 1330nm</b> , High (CWDM DFB), <b>Rx 1330nm</b> , High (PIN), power budget 24dB, Gigabit Ethernet, LC connector, -40°C to 85°C, DDM
SBHMDB24GE2D	SFP CWDM Single Fibre, <b>Tx 1350nm</b> , High (CWDM DFB), <b>Rx 1350nm</b> , High (PIN), power budget 24dB, Gigabit Ethernet, LC connector, -40°C to 85°C, DDM
SBHNDB24GE2D	SFP CWDM Single Fibre, <b>Tx 1370nm</b> , High (CWDM DFB), <b>Rx 1370nm</b> , High (PIN), power budget 24dB, Gigabit Ethernet, LC connector, -40°C to 85°C, DDM
SBHODB24GE2D	SFP CWDM Single Fibre, <b>Tx 1390nm</b> , High (CWDM DFB), <b>Rx 1390nm</b> , High (PIN), power budget 24dB, Gigabit Ethernet, LC connector, -40°C to 85°C, DDM
SBHPDB24GE2D	SFP CWDM Single Fibre, <b>Tx 1410nm</b> , High (CWDM DFB), <b>Rx 1410nm</b> , High (PIN), power budget 24dB, Gigabit Ethernet, LC connector, -40°C to 85°C, DDM
SBHQDB24GE2D	SFP CWDM Single Fibre, <b>Tx 1430nm</b> , High (CWDM DFB), <b>Rx 1430nm</b> , High (PIN), power budget 24dB, Gigabit Ethernet, LC connector, -40°C to 85°C, DDM
SBHRDB24GE2D	SFP CWDM Single Fibre, <b>Tx 1450nm</b> , High (CWDM DFB), <b>Rx 1450nm</b> , High (PIN), power budget 24dB, Gigabit Ethernet, LC connector, -40°C to 85°C, DDM
SBHADB24GE2D	SFP CWDM Single Fibre, <b>Tx 1470nm</b> , High (CWDM DFB), <b>Rx 1470nm</b> , High (PIN), power budget 24dB, Gigabit Ethernet, LC connector, -40°C to 85°C, DDM
SBHBDB24GE2D	SFP CWDM Single Fibre, <b>Tx 1490nm</b> , High (CWDM DFB), <b>Rx 1490nm</b> , High (PIN), power budget 24dB, Gigabit Ethernet, LC connector, -40°C to 85°C, DDM
SBHCDB24GE2D	SFP CWDM Single Fibre, <b>Tx 1510nm</b> , High (CWDM DFB), <b>Rx 1510nm</b> , High (PIN), power budget 24dB, Gigabit Ethernet, LC connector, -40°C to 85°C, DDM
SBHddb24GE2D	SFP CWDM Single Fibre, <b>Tx 1530nm</b> , High (CWDM DFB), <b>Rx 1530nm</b> , High (PIN), power budget 24dB, Gigabit Ethernet, LC connector, -40°C to 85°C, DDM
SBHEDB24GE2D	SFP CWDM Single Fibre, <b>Tx 1550nm</b> , High (CWDM DFB), <b>Rx 1550nm</b> , High (PIN), power budget 24dB, Gigabit Ethernet, LC connector, -40°C to 85°C, DDM
SBHFDB24GE2D	SFP CWDM Single Fibre, <b>Tx 1570nm</b> , High (CWDM DFB), <b>Rx 1570nm</b> , High (PIN), power budget 24dB, Gigabit Ethernet, LC connector, -40°C to 85°C, DDM
SBHGDB24GE2D	SFP CWDM Single Fibre, <b>Tx 1590nm</b> , High (CWDM DFB), <b>Rx 1590nm</b> , High (PIN), power budget 24dB, Gigabit Ethernet, LC connector, -40°C to 85°C, DDM
SBHHDB24GE2D	SFP CWDM Single Fibre, <b>Tx 1610nm</b> , High (CWDM DFB), <b>Rx 1610nm</b> , High (PIN), power budget 24dB, Gigabit Ethernet, LC connector, -40°C to 85°C, DDM

10. Document Revision Information

Revision	Description
A	Initial release
B	Dispersion penalty value at 40km SMF added

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.

For questions on this product please contact:  
[support@skylaneoptics.com](mailto:support@skylaneoptics.com)

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