

## XQX5400 100G CWDM4-10km QSFP28

*10 km Reach Optimized for Data Center*

The **CWDM4-10km QSFP28** module is a highly integrated 4x28G transceiver focused on reach, bandwidth, density and cost for high-port-count 100G systems, and client-side 100G interfaces. It is compliant with the 100G 4WDM-10 MSA, which is based on the CWDM4 MSA version 1.1, but alters some of the specifications to extend the link reach from 2 km to 10 km. It is interoperable with CWDM4 transceivers over a 2 km reach.

This product is built on the **LightScale™2** platform.

Leveraging its novel hybrid integration technology, **KaiaM** is able to design and produce high-speed optical modules for high bandwidth applications such as router and data center interconnect. All of **KaiaM's** products allow for superior performance at 40Gb/s and beyond with duplex single mode fiber.

### KEY FEATURES

- *Reach: 10 km via SMF*
- *Interoperable with 2 km CWDM4 modules*
- *Optical link budget: Supports 6.5 dB of link budget*
- *Link budget assumes the use of KR4 FEC by the host*
- *Uncooled CWDM DFB lasers, directly modulated*
- *Electrical interface: retimed CAUI-4 per 100G Ethernet IEEE 802.3bm Annex 83E*
- *User controllable Transmit Input Equalization and Receiver Output Amplitude*
- *Fiber connector: SMF LC duplex connector*
- *Digital diagnostics via I2C interface*
- *Hot pluggable*
- *0–70°C operating temp*
- *Power dissipation < 3.5W*



**OPTICAL TRANSMITTER PERFORMANCE**

PARAMETER		SYMBOL	MIN	MAX	UNITS
Channel Wavelength	Ch0	$\lambda_0$	1264.5	1277.5	nm
	Ch1	$\lambda_1$	1284.5	1297.5	
	Ch2	$\lambda_2$	1304.5	1317.5	
	Ch3	$\lambda_3$	1324.5	1337.5	
Bit Rate per Channel		B	25.78125±100ppm		Gb/s
Side-Mode Suppression Ratio		SMSR	30		dB
Average launch power, each lane			-6.5	2.5	dBm
Optical Modulation Amplitude (each lane)		OMA	-4.0	2.5	dBm
Launch power in OMA minus TDP, each lane		OMA-TDP	-5.0		dBm
Transmission & dispersion penalty, each lane		TDP		3.0	dB
RIN <sub>20 OMA</sub>				-130	dB/Hz
Transmitter Reflectance				-20	dB
Extinction Ratio		ER	3.5		dB
Transmitter Optical Mask		MM	Compliant with 100G-CWDM4		

**OPTICAL RECEIVER PERFORMANCE**

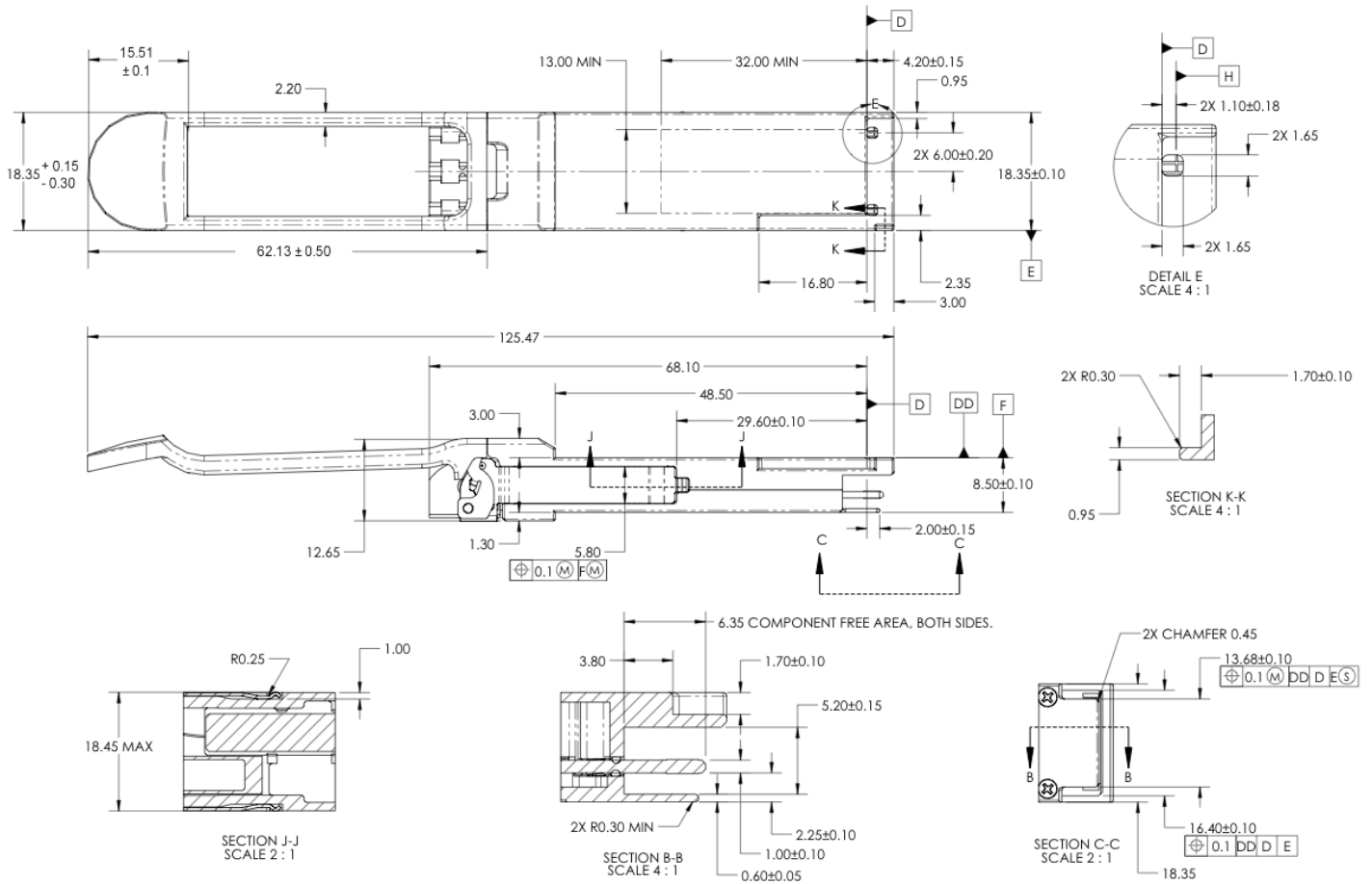
PARAMETER		SYMBOL	MIN	TYP	MAX	UNITS
Channel Wavelength	Ch0	$\lambda_0$	1264.5	1271	1277.5	nm
	Ch1	$\lambda_1$	1284.5	1291	1297.5	
	Ch2	$\lambda_2$	1304.5	1311	1317.5	
	Ch3	$\lambda_3$	1324.5	1331	1337.5	
Average Receive Power, each lane (BER= $5 \times 10^{-5}$ , PRBS= $2^{31} - 1$ )			-13		2.5	dBm
Receiver Sensitivity (OMA) per channel		$OMA_{in}$			-11.5	dBm
Stressed Receiver Sensitivity (OMA)		$OMA_{in, str}$			-8.6	dBm
Receiver Reflectance		ORL			-26	dB
Vertical eye closure penalty, each lane		VECP		2.6		dB
Stressed eye J2 Jitter, each lane		J2		0.33		UI
Stressed eye J9 Jitter, each lane		J9		0.48		UI

**NOMINAL OPERATING CONDITIONS**

PARAMETER	MIN	TYP	MAX	UNITS	NOTES
Operating Case Temperature	0		+70	°C	
Supply Voltage	3.135	3.3	3.465	V	+/- 5%
IIC Clock Frequency		100	400	kHz	
IIC Clock Stretching			500	$\mu$ s	
IIC Data Hold Time			900	ns	

**QSFP28 MODULE MECHANICAL OUTLINE**

(all dimensions in mm)



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