GIGOPTIX

FAQ

Optical Interconnect Devices

Frequently Asked Questions

Evaluation Boards

I want to order an EVB. Who should I contact?

Please contact sales at sales@gigoptix.com.

What VCSEL or PD array can be assembled on the EVB?

We want our customers to evaluate our devices in the best environment. GigOptix offers the possibility to mount any compatible VCSEL or PD selected by the customer. If the selected optical device is not available in GigOptix stock, the customer will be requested to send 5 samples to our Zürich offices. GigOptix always performs functional and high speed tests on the EVB prior to shipping.

Is it possible to order EVBs without optical devices?

EVB without optical devices can be ordered. However no RF tests will be performed on the EVB prior to shipping.

Is there also a software package available to allow user to communicate with EVB for VCSEL driver and TIA setting changes?

Yes, we offer an I2C software package with GUI to support user access to memories inside VCSEL driver and TIA array to change setting. Please contact with HXSupport@gigoptix.com to find out how to get the software package.

What is the lead time to get an EVB?

2 Weeks ARO.

Chip On Board and Flip-Chip Assemblies

How should I bond VCSEL driver and TIA array chips to substrate?

Silver conductive epoxy with high cure temperature (>110C) could be used to bond VCSEL driver and TIA array chips on substrate. The gaps between VCSEL driver and VCSEL laser chip and between TIA and PD array chips should be > 100um to avoid excessive amount silver conductive epoxy to bridge the gap.

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How should I do wire bonding for VCSEL driver and TIA array chips with VCSEL laser and PD arrays?

A wedge bonder with 1mil gold wire should be used. Wire lengths connecting driver and VCSEL laser bonding pads and connecting TIA and PD array bonding pads should be as short as possible (<650um) with loop height from chip surface < 150um for better high speed performance and avoiding crosstalk and backward coupling between inputs and outputs of VCSEL driver and TIA array.

Are the devices available with bumps for flip chip assembly?

Some of our devices are available with bumps. It is also possible to buy tested wafers and then to apply your own bumping process.

How to cover the chip in case of COB assembly?

Most of our customers apply glob-top. The equipment used to apply the resin must be well grounded to the device ground to avoid ESD damages.

For RSSI output, should both pads on each side of TIA chip be connected to get input signal monitor current?

No, only one side of RSSI connected should be enough.

There are many pads for low speed connections are the same on both sides of VCSEL driver and TIA chips. How should I connect them?

For the other low speed pins presented on both sides of chip, using the connections on one side of the chips only should be enough. For power supply and grounding pads, the best practice is to connection both sides. If it is not possible, the connections on one side should also be fine.

Measurement

How to couple light?

The EVB User Guide describes how to set up the measurement test bench. Fiber alignment is done by means of an XYZ manipulator. A cleaved fiber is directly butt coupled to the optical device (no lens at the end of the fiber).

I have problem to get good eye when I use single end high speed connection to EVB. What is the problem?

We do not put AC coupled capacitors on our EVB. So, DC blockers should be used for every port under testing. If a single end connection is made, a DC blocker should also be placed at terminated port to keep differential line pair balanced.

What the minimum bit rate supported by the device?

There is almost no limitation for the TX. For the RX, it depends on the low cut-off frequency of the device and the pattern density. With pattern equivalent to PRBS7, bit rates below 1 Gb/s can be achieved.

Do you have a program to control and monitor the device?

The I2C GUI program supports most of the devices. It can be downloaded from (please indicate a new FTP source because we can't use Martin's FTP for ever). The program is only compatible with the Totalphase Aardvark I2C-USB Adapter (see Totalphase web site for more information).

Reference Design

Do you have a reference design for QSFP+?

We are working on it and we understand it is a strong requirement to speed up your design.

Bottom and top sides of the devices have the same pad arrangement. Can I bond just one side?

The pad arrangement was especially designed for this purpose. It allows reducing the spacing between RX and TX devices. Bond wires between the devices and the optical elements are in straight line.

How to connect the devices to a microcontroller?

In a module, the I2C bus used to communicate with the devices must be isolated from the I2C bus used to communicate with the host. In most of the design, the I2C or TWI module of the microcontroller must be set as slave and must be connected to the QSFP+ I2C interface. In addition, two software I2C interfaces must be developed to respectively support the communication with the TX and the RX. Such a software interface is also called bit-banging interface.

Do you have IBIS/Spice models for the devices?

We currently don't provide IBIS and Spice models

Do you have Autocad models for the devices?

Autocad DXF models of our devices are available.

Generation Differences

What are improved in HX51xx product family from HX41xx?

HX51xx has improved high speed performance, reduced power consumption, added equalization function to VCSEL driver inputs, increased pre emphasis range for TIA output. Table 1 summarizes the major performance differences between them.

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Tx	HXT5104	HXT5004	HXT4004	Units		Rx	HXR5104	HXR5004	HXR4104	Units
Bit rate	14.05	12.5	10	Gb/s		Bitrate	14.05	12.5	12.5	Gb/s
Input voltage (pp) (min)	100	100	100	mV		Output voltage (pp) (min)	320	320	320	mV
Input voltage (pp) (max)	1600	1600	1900	mV		Output voltage (pp) (max)	1000	1000	1200	mV
Rise/fall times (max)	35	35	30	ps		Rise/fall times (max)	30	35	60	ps
RJ	1	5	5	ps		TJ (max)	35	42	70	ps
DJ (@10.3Gb/s)	5	15	15	ps		DJ (@10.3Gb/s)	10	20	25	ps
Pre emphasis	30	30	30	%		Pre emphasis	60	60	15	%
Bias current (max)	10	10	8	mA		Sensitivity (@10.3Gb/s)	19	22	25	uA
Modulation current (max)	10	10	8	mA		Overload	1500	1500	1800	uA
Power per channel @10.3Gb/s *	58	58	95	mW		Power per channel @10.3Gb/s *	73	73	95	mW

* lowest power required to achieve a link jitter budget of <0.6 UI

Are HX51xx drop in replaceable to HX41xx?

HX51xx have the same chip sizes and pin numbers as HX41xx. However, there are a few pins assigned to differences functions. Therefore, PCB layout should be modified. Also, HX51xx could operate at higher speed. High speed lines on PCB should also be modified to achieve better high speed performances.

What are differences between HX50xx and HX51xx?

Both HX50xx and HX51xx are designed with the same circuit structure and fabricated by the same processes. Performance wise, HX50xx are guaranteed to achieve high speed performances up to 10.3G. HX5100 are guaranteed to achieve high speed performances up to 14G.

Quality

Do you have reliability data available?

Reliability data and RoHS certificates are available for most of our devices.