1063-Mbps GBIC and 1250-Mbps GBIC

Gigabit Interface Converters for optical data transfer

Highlights

The IBM 1063-Mbps and 1250-Mbps Gigabit Interface Converters (GBICs) are laser-based, hot-pluggable, data communications transceivers for a wide range of networking applications requiring high data rates. The transceivers, which are designed for ease of configuration and replacement, are well-suited for Gigabit Ethernet, Fibre Channel, and 1394b applications.

The 1063-Mbps GBIC and IBM 1250-Mbps GBIC are available in both short-wavelength and long-wavelength versions, providing configuration flexibility. Users can easily add a GBIC in the field to accommodate a new configuration requirement or replace an existing device to allow for increased availability.

Advanced Features

- *Short-wavelength (SW) or long-wavelength (LW) lasers*
- *Hot-pluggable and compact*
- *Ease of configuration/field replaceable*
- *Low-loss SC-type push-pull optical connectors*
- *Bit error rate less than 10^{-12}*
- *Serial ID*

Product Description

The 1063-Mbps GBIC and 1250-Mbps GBIC are integrated fiber-optic transceivers providing a high-speed serial electrical interface for connecting processors, switches and peripherals through an optical fiber cable. In the Gigabit Ethernet environment, for example, these transceivers can be used in local area network (LAN) switches or hubs, as well as in interconnecting processors. In storage area networks (SANs), they can be used for transmitting data between peripheral devices and processors.

The GBICs use lasers that enable cost-effective data transmission over optical fibers at distances of up to 10 km. These compact, hot-pluggable, field-replaceable modules are designed to connect easily to a system card through an industry-standard connector. Single-mode or multi-mode optical fiber cables, terminated with industry-standard SC connectors, can be used.

A 20-pin straddle mount connector interfaces the host card to the GBIC. Encoded (8B/10B) differential serial data signals traverse this connector. The GBIC converts the data to an optical signal that is coupled to one of the fibers of a duplex cable. An opto-electronic integrated photo-receiver, located in the SC receptacle, detects incoming, modulated light from the other fiber. The optical signal is then converted to an electrical signal, amplified, and delivered to the host card as a differential serial data signal through the same 20-pin connector.

Standards Compliance and Safety

The 1063-Mbps GBIC and 1250-Mbps GBIC support the physical layer of the American National Standards Institute's (ANSI's) Fibre Channel standard and the Institute of Electrical and Electronics Engineers' (IEEE's) Gigabit Ethernet standard, respectively. Both products are approved internationally as Class 1 laser safe products and feature optical emission levels below the recommended levels for eye safety.

Applications

The IBM 1063-Mbps GBIC and IBM 1250-Mbps GBIC are ideally suited for:

- Networking
- Processor-to-peripheral interconnects
- Client/server environments
- Distributed multiprocessing
- Fault-tolerant applications
- Channel extenders and data storage

The GBIC 1063/1250s are designed for ease of configuration and replacement.

Specifications	SW	LW
Electrical Interface		
Transmit signal input differential swing	400 to 2000 mVpp	400 to 2000 mVpp
Transmit signal input differential impedance	150 ohms Nominal	150 ohms Nominal
Receive signal output differential swing	800 to 1600 mVpp	800 to 1600 mVpp
Receive signal output differential impedance	150 ohms Nominal	150 ohms Nominal
Control I/O signals	TTL	TTL
Optical		
Data rate	1062.5 or 1250.0 Mbps	1062.5 or 1250.0 Mbps
Wavelength	770 nm to 860 nm	1270 nm to 1350 nm
Maximum launch power into fiber (avg.)	-5.0 dBm	-3.0 dBm
Minimum launch power into fiber (avg.)	-9.5 dBm	-9.5 dBm
Maximum receiver input (avg.)	0.0 dBm	-3.0 dBm
Minimum receiver sensitivity (avg.)	-17.0 dBm	-20.0 dBm
Power		
Voltage	+5V +/-5%	+5V +/-5%
Current	300 mA maximum	300 mA maximum
9/125 µm Optical Fiber		
Distance	n/a	10 km
50/125 µm Optical Fiber		
Distance	2 to 550 m	2 to 550 m
62.5/125 µm Optical Fiber		
Distance	2 to 275 m	2 to 550 m
Environmental		
Operating temperature	0°C to 60°C	0°C to 60°C
Operating humidity	8% RH to 80% RH	8% RH to 80% RH
Storage temperature	-40°C to 75°C	-40°C to 75°C
Physical Size		
Height	10.00 mm (0.39 in)	10.00 mm (0.39 in)
Width	30.48 mm (1.20 in)	30.48 mm (1.20 in)
Depth	65.33 mm (2.57 in)	65.33 mm (2.57 in)
Laser Safety (Class I) and Certifications		
U.S.	DHHS 21 CFR(J) Conformant and UL	DHHS 21 CFR(J) Conformant and UL
International	IEC 825-1 Conformant and CSA	IEC 825-1 Conformant and CSA
Reliability		
Average failure rate (AFR)	<0.0195%/1,000 hrs (45°C)	<0.0195%/1,000 hrs (45°C)
Bit error rate	$<10^{-12}$ at -17 dBm	$<10^{-12}$ at -20 dBm

Technology

The 1063-Mbps GBIC and 1250-Mbps GBIC incorporate the latest in IBM fiber-optic innovation, including the first commercialized use of metal-semiconductor-metal (MSM) planar photo-detectors, which are monolithically integrated with a Gallium-Arsenide (GaAs), low-noise transimpedance amplifier. These MSM photo-receivers provide a cost-effective solution for gigabit optical links. In addition, each GBIC includes a single IBM silicon chip that contains both high-speed laser driver/control circuits and post-amplifier/signal-detect circuits. Implementation of these functions in a single chip results in a compact, cost-effective solution.

Through ongoing technology investments, IBM has achieved cost targets with the GBICs that enable widespread deployment of gigabit fiber communications for Fibre Channel and Gigabit Ethernet applications.

For more information, visit our web site at www.chips.ibm.com.

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