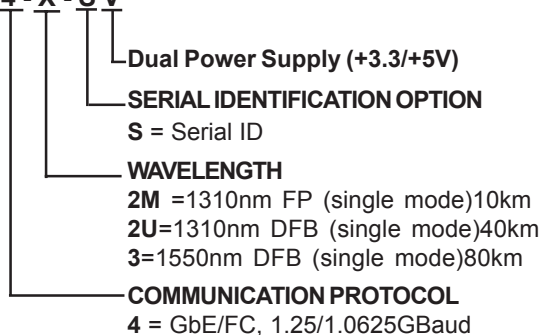


MGBC-20-4-X-SV Optical Gigabit Ethernet/Fibre Channel Single Mode Dual Voltage GBIC -- 1.25/1.0625GBaud ---. +3.3/+5V



ORDERING INFORMATION

MGBC-20 - 4 - X - S V



Optoelectronic Products

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Features

- 1.25 Gbps Gigabit Ethernet compliant
- 1.0625 Gbps Fibre Channel compliant
- Compliant with Gigabit Interface Converter (GBIC) specification
- Compliant with 1000BASE_LX specification for optical links
- Hot Pluggable
- 150Ω differential AC coupled PECL level Inputs/Outputs
- +3.3V and +5V Power Supply (Dual Voltage)
- Serial ID functionality (MOD_DEF 4)

PRODUCT OVERVIEW

The MGBC-20-4-X-SV GBIC transceiver module is a high performance integrated duplex data link for bi-directional communication over single mode optical fiber. It is compliant with the Gigabit Interface Converter (GBIC) specification. The MGBC-20-4 is specifically designed for high speed Gigabit Ethernet/Fibre Channel data links up to 1.25 Gbps. The Stratos Lightwave GBIC transceiver is hot pluggable which allows a suitably designed enclosure to be changed from one type of external interface to another simply by plugging in a GBIC having the alternative external interface.

This optoelectronic transceiver module is a Class 1 Laser product compliant with FDA Radiation Performance Standards, 21 CFR Subchapter J. This component is also a Class 1 Laser compliant according to the International Safety Standard IEC-825-1.

LONG WAVELENGTH LASER

The MGBC-20-4-2/2U/3-SV are provided with single mode optics. The uncooled single mode laser with angle polished fiber stub provides highly reliable single mode communications which meets or exceeds Gigabit Ethernet/Fibre Channel distance requirements.

MODULE SPECIFICATIONS - ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	MIN	MAX	UNITS	NOTES
Storage Temperature	Tstg	-40	+85	°C	
Supply Voltage	V _{ccT} , V _{ccR}		6.0	V	VCC - ground
Data AC Voltage	Tx+, Tx-		2.6	V _{pp}	Differential
Data DC Voltage	Tx+, Tx-	-10	10	V _{pk}	V (Tx+ or Tx-) - ground

MODULE SPECIFICATION - RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	NOTES
Operating Case Temperature	T _c	0		+70	°C	
Supply Voltage	VDDT, VDDR	+3.15		+5.25	VDC	
Baud Rate	BRate	1.0625		1.25	GBaud	

MGBC-20-4-X-SV Optical Gigabit Ethernet/Fibre Channel Single Mode Dual Voltage GBIC -- 1.25/1.0625GBaud --- +3.3/+5V



PERFORMANCE SPECIFICATIONS - ELECTRICAL

0°C < Tc < +70°C; +3.15V < Vcc < +5.25V

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	NOTES
Supply Current (MGBC-20-4-2M-SV)	I _{cc}		120	150	mA	Tc = +25°C, Vcc = +3.3 V
			180	250		Tc = +25°C, Vcc = +5.0 V
				300		0° C < Tc < +70°C, +3.15V < Vcc < +5.25V
Supply Current (MGBC-20-4-2U-SV)	I _{cc}		160	250	mA	Tc = +25°C, Vcc = +3.3 V
			170	260		Tc = +25°C, Vcc = +5.0 V
				300		0° C < Tc < +70°C, +3.15V < Vcc < +5.25V
Supply Current (MGBC-20-4-3-SV)	I _{cc}		160	250	mA	Tc = +25°C, Vcc = +3.3 V
			170	260		Tc = +25°C, Vcc = +5.0 V
				300		0° C < Tc < +70°C, +3.15V < Vcc < +5.25V
Surge Current	I _{surge}			+30	mA	Surge above steady state value
TRANSMITTER						
PECL Input (Differential)		650		2000	mVpp	AC coupled inputs
Input Impedance (Differential)	Z _{in}	135	150	165	ohms	R _{in} > 100 kohms @ DC
Tx_DISABLE Input Voltage - High	V _{iH}	2		V _{DD} T+0.3	V	
Tx_DISABLE Input Voltage - Low	V _{iL}	0		0.8	V	
Tx_FAULT Output Voltage -- High	V _{toH}	Vcc-0.5		Vcc+0.3	V	I _o = 400µA; Host Vcc
Tx_FAULT Output Voltage -- Low	V _{toL}	0		0.5	V	I _o = -4.0mA
RECEIVER						
PECL Output (Differential)		400	750	2000	mVpp	AC coupled outputs
Output Impedance (Differential)	Z _{out}	135	150	165	ohms	
Rx_LOS Output Voltage - High	V _{roH}	Vcc-0.5		Vcc+0.3	V	I _o = 400µA; Host Vcc
Rx_LOS Output Voltage - Low	V _{roL}	0		0.5	V	I _o = -4.0mA
Total Jitter [Pk - Pk]	T _J			130	ps	Measured with 2 ⁷ - 1 PRBS
MOD_DEF (0:2)	V _{oH}	2.5			V	With Serial ID
	V _{oL}	0		0.5	V	

MGBC-20-4-2M-SV OPTICAL SPECIFICATIONS - 1310 nm FP Single Mode Laser

0°C < Tc < +70°C; +3.15V < Vcc < +5.25V

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	NOTES
9µm Core Diameter SMF		10			km	BER < 1.0E-12 @ 1.25/1.0625GBaud
TRANSMITTER						
Optical Center Wavelength	λ	1285	1310	1335	nm	Tcase = +25°C
Spectral Width	Δλ			3	nm	RMS
Optical Transmit Power	P _{opt}	-9.5		-3	dBm	Average @ 1310nm
Extinction Ratio	ER	9			dB	P1/P0
Optical Modulation Amplitude	OMA	180			µW	pk-pk
Relative Intensity Noise	RIN			-120	dB/Hz	Tcase = +25°C
Total Jitter	T _J			170	ps	Measured with 2 ⁷ - 1 PRBS
Output Rise/Fall Time	t _r , t _f			260	ps	20-80%; measured unfiltered
RECEIVER						
Optical Input Wavelength	λ	1270		1610	nm	
Optical Input Power	P _r	-20		-3	dBm	BER < 1.0E-12 @ 1.25/1.0625GBaud
Optical Modulation Amplitude	OMA	15			µW	pk-pk
Optical Return Loss	ORL	12			dB	
RX_LOS - Asserted	P _a	-32			dBm	Measured on transition - Low to High
RX_LOS - Deasserted	P _d			-20	dBm	Measured on transition - High to Low
RX_LOS - Hysteresis	P _a -P _d		1.5	5.0	dB	

MGBC-20-4-X-SV Optical Gigabit Ethernet/Fibre Channel Single Mode Dual Voltage GBIC -- 1.25/1.0625GBaud ---. +3.3/+5V



MGBC-20-4-2U-SV OPTICAL SPECIFICATIONS - 1310 nm DFB Single Mode Laser 0°C<Tc<+70°C; +3.15V<Vcc<+5.25V

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	NOTES
9µm Core Diameter SMF		40			km	BER<1.0E-12 @ 1.25/1.0625GBaud
TRANSMITTER						
Optical Center Wavelength	λ	1290	1310	1330	nm	Tcase = +25°C
Side Mode Suppression Ratio	SMSR	30	40		dB	
Optical Transmit Power	Popt	-5		+1	dBm	Average @ 1310nm (note 1)
Extinction Ratio	ER	9			dB	P1/P0
Optical Modulation Amplitude	OMA	505			µW	pk-pk
Relative Intensity Noise	RIN			-120	dB/Hz	Tcase = +25°C
Total Jitter	TJ			170	ps	Measured with 2 ⁷ - 1 PRBS
Output Rise/Fall Time	t _R , t _F			260	ps	20-80%; measured unfiltered
RECEIVER						
Optical Input Wavelength	λ	1270		1610	nm	
Optical Input Power	Pr	-25		-3	dBm	BER<1.0E-12 @ 1.25/1.0625GBaud
Optical Modulation Amplitude	OMA	5			µW	pk-pk
Optical Return Loss	ORL	12			dB	
RX_LOS - Asserted	Pa	-32			dBm	Measured on transition - Low to High
RX_LOS - Deasserted	Pd			-25	dBm	Measured on transition - High to Low
RX_LOS - Hysteresis	Pa-Pd		1.5	5.0	dB	

MGBC-20-4-3-SV OPTICAL SPECIFICATIONS - 1550 nm DFB Single Mode Laser 0°C<Tc<+70°C; +3.15V<Vcc<+5.25V

PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS	NOTES
9µm Core Diameter SMF		80			km	BER<1.0E-12 @ 1.25/1.0625GBaud
TRANSMITTER						
Optical Center Wavelength	λ	1530	1550	1570	nm	Tcase = +25°C
Side Mode Suppression Ratio	SMSR	30	40		dB	
Optical Transmit Power	Popt	-2		+4	dBm	Average @ 1550nm (Note 1)
Extinction Ratio	ER	9			dB	P1/P0
Optical Modulation Amplitude	OMA	1000			µW	pk-pk
Relative Intensity Noise	RIN			-120	dB/Hz	Tcase = +25°C
Total Jitter	TJ			170	ps	Measured with 2 ⁷ - 1 PRBS
Output Rise/Fall Time	t _R , t _F			260	ps	20-80%; measured unfiltered
RECEIVER						
Optical Input Wavelength	λ	1270		1610	nm	
Optical Input Power	Pr	-26		-3	dBm	BER<1.0E-12 @ 1.25/1.0625GBaud
Optical Modulation Amplitude	OMA	4			µW	pk-pk
Optical Return Loss	ORL	12			dB	
RX_LOS - Asserted	Pa	-32			dBm	Measured on transition - Low to High
RX_LOS - Deasserted	Pd			-26	dBm	Measured on transition - High to Low
RX_LOS - Hysteresis	Pa-Pd		1.5	5.0	dB	

Note 1: Average power coupled into Single Mode Fiber (SMF)



TERMINATION CIRCUITS

Inputs to the MGBC-20 transmitter are AC coupled and internally terminated through 75 ohms to AC ground. These modules can operate with PECL logic level. The input signal must have at least a 650mV peak-to-peak (differential) signal swing. Output from the receiver section of the module is also AC coupled PECL level and is expected to drive into a 75 ohm load. Different termination strategies may be required depending on the particular Serializer/Deserializer chip set used. **The MGBC-20 product family is designed with AC coupled data inputs and outputs to provide the following advantages:**

- Close positioning of SERDES with respect to transceiver; allows for shorter line lengths and at gigabit speeds reduces EMI.
- Minimum number of external components.
- Internal termination reduces the potential for unterminated stubs which would otherwise increase jitter and reduce transmission margin.

Subsequently, this affords the customer the ability to optimally locate the SERDES as close to the MGBC-20 as possible and save valuable real estate. At gigabit rates this can provide a significant advantage resulting in better transmission performance and accordingly better signal integrity.

Figure 1 illustrates the recommended transmit and receive data line terminations.

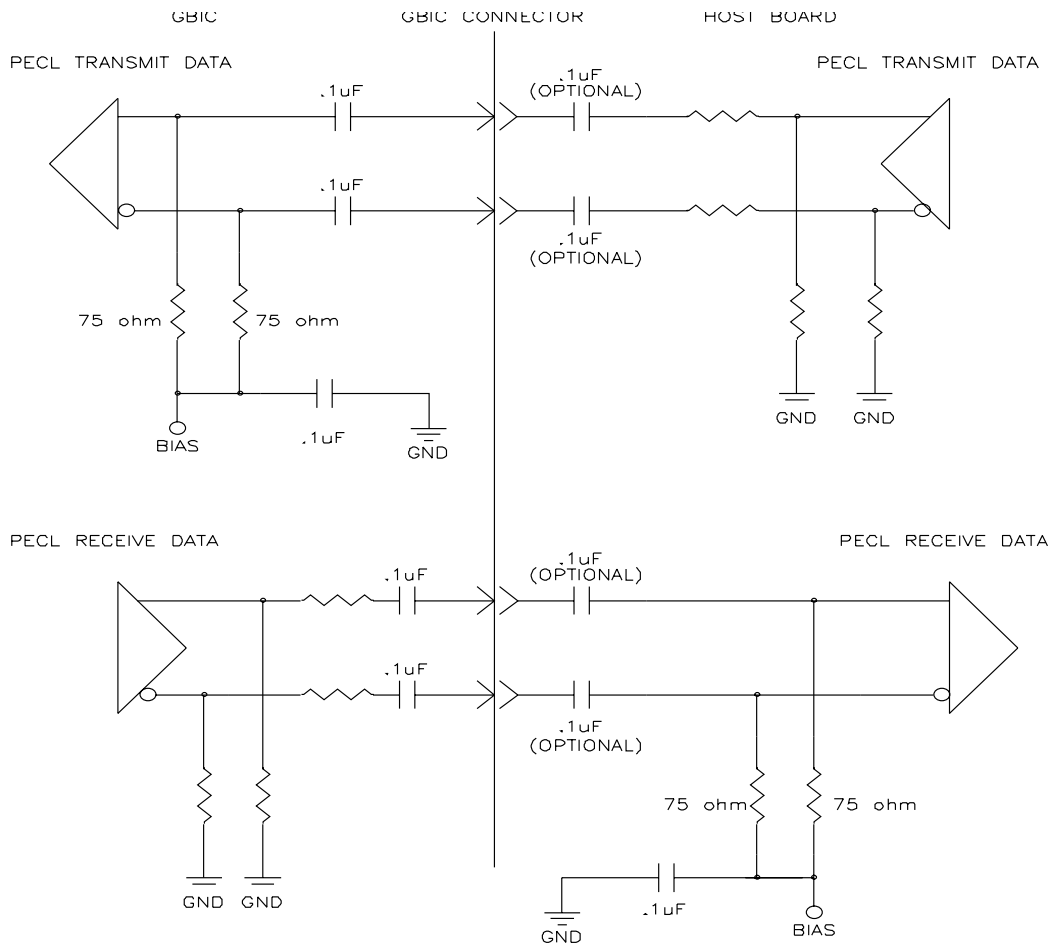


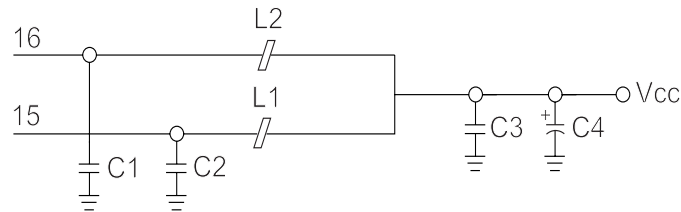
FIGURE 1: Example of termination circuits for Drivers and Receivers in the host and the GBIC

MGBC-20-4-X-SV Optical Gigabit Ethernet/Fibre Channel Single Mode Dual Voltage GBIC -- 1.25/1.0625GBaud ---. +3.3/+5V



POWER COUPLING

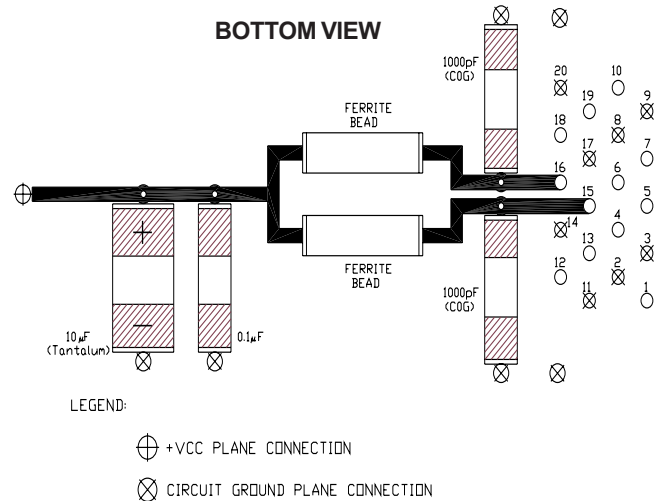
A suggested layout for power and ground connections is given in figure 2A below. Connections are made via separate voltage and ground planes. The mounting posts are at case ground and should not be connected to circuit ground. The ferrite bead should provide a real impedance of 220ohms at 100MHz. Bypass capacitors should be placed as close to the 20 pin connector as possible.



Values:

- C1, C2 = 1000pF, COG
- C3 = 0.1µF
- C4 = 10µF, Tantalum
- L1, L2 = Real Impedance of 220Ω @ 100MHz

**Figure 2A. Suggested Power Coupling
-Electrical Schematic**



**Figure 2B. Suggested Power Coupling
-Component Placement**

ELECTRICAL INTERFACE, PIN DESCRIPTIONS

PIN 1	RX_LOS	The RX_LOS signal is intended as a preliminary indication to the system in which the GBIC is installed that the link signals are likely to be outside the required values for proper operation. The host shall provide a 4.7K to 10K ohm pull-up resistor to VDDR
PIN 2	RGND	Receiver Ground
PIN 3	RGND	Receiver Ground
PIN 4	MOD_DEF (0)	GBIC module definition and presence, bit 0, 4.7K to 10K Ohm pull-up resistor to VDDT on host.
PIN 5	MOD_DEF (1)	GBIC module definition and presence, bit 1 4.7K to 10K Ohm pull-up resistor to VDDT on host.
PIN 6	MOD_DEF (2)	GBIC module definition and presence, bit 2, 4.7K to 10K Ohm pull-up resistor to VDDT on host.
PIN 7	TX_DISABLE	Active high logic input which disables the optical output . This signal is driven by the host. This pin is internally pulled up to VDDT through a resistor.
PIN 8	TGND	Transmitter Ground
PIN 9	TGND	Transmitter Ground
PIN 10	TX_FAULT	Active high signal. A TX_FAULT is defined as the failure of the optical output of the GBIC and it is internally latched. The host shall provide a 4.7K to 10K ohm pull-up resistor to VDDT
PIN 11	RGND	Receiver Ground
PIN 12	-RX_DAT	Receiver Data inverted differential output.
PIN 13	+RX_DAT	Receiver Data Non-inverted differential output.
PIN 14	RGND	Receiver Ground
PIN 15	VDDR	+3.3/+5V Power supply for Receiver section.
PIN 16	VDDT	+3.3/+5V Power supply for Transmitter section.
PIN 17	TGND	Transmitter Ground
PIN 18	+TX_DAT	Transmitter Data Non-inverted differential output.
PIN 19	-TX_DAT	Transmitter Data inverted differential output.
PIN 20	TGND	Transmitter Ground

MGBC-20-4-X-SV Optical Gigabit Ethernet/Fibre Channel Single Mode Dual Voltage GBIC -- 1.25/1.0625GBaud --- +3.3/+5V



SIGNAL DESCRIPTION:

TX_FAULT: Active high signal. A TX_FAULT is defined as the failure of the optical output of the GBIC and it is internally latched. On the rising edge of the TX_DISABLE, the latched laser fault will be cleared and TX_FAULT will remain deasserted while TX_DISABLE is asserted. The host shall provide a 4.7K to 10K Ohm pull up resistor to Vcc. The TX_FAULT will also be asserted but not latched if the Vcc falls below the lower Vcc limit.

TX_DISABLE : Active high logic input which disables the optical output. This signal is driven by the host. While asserted, the GBIC module disables all laser light output. This pin is internally pulled up to Vcc through a 10K Ohm resistor for short wavelength and a 4.7K Ohm resistor for long wavelength. The TX_DISABLE must be pulled low or connected to circuit ground by the host to enable the GBIC output.

RX_LOS : The RX_LOS signal is intended as a preliminary indication to the system in which the GBIC is installed that the link signals are likely to be outside the required values for proper operation. Such indications typically point to non-installed cables, broken cables, or a disabled, failing or powered off transmitter at the far end of the cable. Additional indications are provided by the system in which the GBIC is installed to verify that the information being transmitted is valid, correctly encoded and in the correct format. Such additional indications are outside the scope of the GBIC specification. RX_LOS will also be asserted if the Vcc falls below the lower Vcc limit. The host shall provide a 4.7k to 10k Ohm pullup resistor to Vcc.

RGND

Receiver ground. It is internally connected to TGND plane.

TGND

Transmitter ground. It is internally connected to RGND plane.

±RX_DAT

High speed serial differential PECL receiver data.

±TX_DAT

High speed serial differential PECL transmit data.

VDDT

Transmitter power supply

VDDR

Receiver power supply

GBIC TIMING PARAMETERS

The Timing parameters For GBIC management are shown in table 2.

PARAMETER	SYMBOL	MIN.	MAX.	UNIT	CONDITIONS
TX_DISABLE assert time	t _{off}		10	µsec	Rising edge of TX_DISABLE to fall of output signal below 10% of nominal
TX_DISABLE negate time	t _{on}		1	msec	Falling edge of TX_DISABLE to rise of output signal above 90% of nominal
Time to initialize includes reset of TX_FAULT	t _{init}		300	msec	From power on or hot plug after VDDT > 4.75 volts or from negation of TX_DISABLE during reset of TX_FAULT
TX_FAULT from fault to assertion	t _{fault}		100	µsec	From occurrence of fault (output safety violation or VDDT < 4.5 volts)
TX_DISABLE time to start reset	t _{reset}	10		µsec	TX_DISABLE HIGH before TX_DISABLE set LOW
RX_LOS assert delay	t _{loss_on}		100	µsec	From detection of loss of signal to assertion of RX_LOS
RX_LOS negate delay	t _{loss_off}		100	µsec	From detection of presence of signal to negation of RX_LOS

Table 1: Timing parameters for GBIC management

MGBC-20-4-X-SV Optical Gigabit Ethernet/Fibre Channel Single Mode Dual Voltage GBIC -- 1.25/1.0625GBaud ---. +3.3/+5V



SERIAL IDENTIFICATION:

A GBIC having module definition 4 provides access to sophisticated identification information that describes the GBIC's capabilities, standard interfaces, manufacturer and other information. The serial interface uses the 2-wire serial CMOS E2PROM protocol defined for the ATMEL AT24C01A/02/04 family of components. The memories are organized as a series of 8-bit data words that can be addressed individually or sequentially.

Data Address	FieldSize (Bytes)	Name of field	Description of field
BASE OF FIELDS			
0	1	Identifier	Type of serial transceiver (see table 3.2)
1	1	Ext. Identifier	Extended Identifier of type of serial transceiver (see table 3.3)
2	1	Connector	Code for connector type (see table 3.4)
3-10	8	Transceiver	Code for electronic compatibility or optical compatibility (see table 3.5)
11	1	Encoding	Code for serial encoding algorithm (see table 3.6)
12	1	BR, Nominal	Nominal bit rate, units of 100Mbps
13	1	Reserved	
14	1	Length (9 μ) - km	Link Length supported for 9/125 μ m fiber, units of km
15	1	Length (9 μ)	Link Length supported for 9/125 μ m fiber, units of 100 m
16	1	Length (50 μ)	Link Length supported for 50/125 μ m fiber, units of 10 m
17	1	Length (62.5 μ)	Link Length supported for 62.5/125 μ m fiber, units of 10 m
18	1	Length (Copper)	Link Length supported for copper, units of meters
19	1	Reserved	
20-35	16	Vendor name	SFP vendor name (ASCII)
36	1	Reserved	
37-39	3	Vendor OUI	SFP vendor IEEE company ID
40-55	16	Vendor PN	Part number provided by SFP vendor (ASCII)
56-59	4	Vendor rev.	Revision level for part number provided by vendor (ASCII)
60-61	2	Wavelength	Laser Wavelength
62	1	Reserved	
63	1	CC_BASE	Check code for Base ID fields (address 0 to 62)
EXTENDED FIELDS			
64-65	2	Options	Indicates which optional SFP signals are implemented (see table 3.7)
66	1	BR, Max	Upper bit rate margin, units of %
67	1	BR, Min	Lower bit rate margin, units of %
68-83	16	Vendor SN	Serial number provided by vendor (ASCII)
84-91	8	Date Code	Vendor's manufacturing date code (see table 3.8)
92-94	1	Reserved	
95	1	CC_EXT	Check code for the Extended ID fields (address 64 to 94)
VENDOR SPECIFIC ID FIELDS			
96-127	32	Vendor Specific	Vendor specific EEPROM
128-255	128	Reserved	Reserved for future use

Table 3.1: Serial ID: Data Fields -- Address "A0"



IDENTIFIER

The identifier value specifies the physical device described by the serial information. This value shall be included in the serial data. The defined identifier values are shown in table 3.2.

Value	Description of physical device
00h	Unknown or unspecified
01h	GBIC
02h	Module/connector soldered to motherboard
03h	SFP transceiver
04-7Fh	Reserved
80-FFh	Vendor specific

Table 3.2: Identifier Values

Extended Identifier

The extended identifier value provides additional information about the transceiver. At present, extended identifier values are specified only for the identifier value of 01h (GBIC). The Extended Identifier value is reserved for all other identifier values. In many cases, the GBIC elects to use MOD_DEF 4 to make additional information about the GBIC available, even though the GBIC is actually compliant with one of the 6 other MOD_DEF values. The extended identifier allows the GBIC to explicitly specify such compliance without requiring the MOD_DEF value to be inferred from the other information provided. The defined extended identifier values for the GBIC are shown in table 3.3.

Value	Description of connector
00h	GBIC definition is not specified or the GBIC definition is not compliant with a defined MOD_DEF. See product specification for details.
01h	GBIC is compliant with MOD_DEF 1
02h	GBIC is compliant with MOD_DEF 2
03h	GBIC is compliant with MOD_DEF 3
04h	GBIC/SFP function is defined by serial ID only
05h	GBIC is compliant with MOD_DEF 5
06h	GBIC is compliant with MOD_DEF 6
07h	GBIC is compliant with MOD_DEF 7
08-FFh	Reserved

Table 3.3: Extended Identifier values



CONNECTOR

The connector value indicates the external connector provided on the interface. This value shall be included in the serial data. The defined connector values are shown in table 3.4.

Value	Description of connector
00h	Unknown or unspecified
01h	SC
02h	Fibre Channel Style 1 copper connector
03h	Fibre Channel Style 2 copper connector
04h	BNC/TNC
05h	Fibre Channel Coaxial headers
06h	Fibre Jack
07h	LC
08h	MT-RJ
09h	MU
0Ah	SG
0Bh	Optical Pigtail
0C-1Fh	Reserved
20h	HSSDC II
21h	Copper Pigtail
22-7Fh	Reserved
80-FFh	Vendor specific

Table 3.4: Connector Values



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MGBC-20-4-X-SV Optical Gigabit Ethernet/Fibre Channel Single Mode Dual Voltage GBIC -- 1.25/1.0625GBaud --- +3.3/+5V



TRANSCEIVER

The following bit significant indicators define the or optical interfaces that are supported by the GBIC. At least one bit shall be set in this field. For the Fibre Channel GBICs, the Fibre Channel speed, transmission media, transmitter technology, and the distance capability shall all be indicated. The defined transceiver codes are shown in table 3.5.

Data Addr	Bit'	Description of transceiver	Data Addr	Bit'	Description of transceiver
Infiniband Compliance Codes			Fibre Channel link length		
3	4-7	Reserved	7	7	Very Long Distance (V)
3	3	1xSX	7	6	Short distance (S)
3	1	1xLX	7	5	Intermediate distance (I)
3	1	1x Copper Active	7	4	Long distance (L)
3	0	1x Copper Passive			
SONET Compliance Codes			Fibre Channel transmitter technology		
4	5	Reserved	7	3-2	Reserved
4	4	SONET reach specifier bit 1	7	1	Longwave laser (LC)
4	3	SONET reach specifier bit 2	7	0	Electrical inter-enclosure (EL)
4	2	OC-48, long reach	8	7	Electrical intra-enclosure (EL)
4	1	OC-48, intermediate reach	8	6	Shortwave laser w/o OFC (SN)
4	0	OC-48, short reach	8	5	Shortwave laser w/ OFC (SL)
5	7	Reserved	8	4	Longwave laser (LL)
5	6	OC-12, single mode long reach	8	0-3	Reserved
5	5	OC-12, single mode intermediate reach	Fibre Channel Transmission Media		
5	4	OC-12, multi-mode short reach	9	7	Twin axial pair (TW)
5	3	Reserved	9	6	Shielded twisted pair (TP)
5	2	OC-3, single mode long reach	9	5	Miniature coax (MI)
5	1	OC-3, single mode intermediate reach	9	4	Video coax (TV)
5	0	OC-3, multi-mode short reach	9	3	Multi-mode, 62.5µ (M6)
Gigabit Ethernet Compliance Codes			9	2	Multi-mode, 50µ (M5)
6	7-4	Reserved	9	1	Reserved
6	3	1000BASE-T	9	0	Single mode (SM)
6	2	1000BASE-CX	Fibre Channel speed		
6	1	1000BASE-LX	10	7-5	Reserved
6	0	1000BASE-SX	10	4	400 MBytes/Sec
			10	3	Reserved
			10	2	200 MBytes/Sec
			10	1	Reserved
			10	0	100 MBytes/Sec

Table 3.5: Transceiver Codes

Note 1: Bit 7 is the high order bit and is transmitted first in each byte.



ENCODING

The encoding value indicates the serial encoding mechanism that is the nominal design target of the particular GBIC. The value shall be contained in the serial data. The defined encoding values are shown in table 3.6

Code	Description of encoding mechanism
00h	Unspecified
01h	8B10B
02h	4B5B
03h	NRZ
04h	Manchester
05h	SONET scrambled
06h - FFh	Reserved

Table 3.6: Encoding Codes

BR, nominal

The nominal bit rate (BR, nominal) is specified in units of 100 Megabits per second, rounded off to the nearest 100 Megabits per second. The bit rate includes those bits necessary to encode and delimit the signal as well as those bits carrying data information. A value of 0 indicates that the bit rate is not specified and must be determined from the transceiver technology. The actual information transfer rate will depend on the encoding of the data, as defined by the encoding value.

Length (9µm)

This value specifies the link length that is supported by the GBIC while operating in compliance with the applicable standards using single mode fiber. The value is in units of 100 meters. A value of 255 means that the GBIC supports a link length greater than 25.4 km. A value of zero means that the GBIC does not support single mode fiber or that the length information must be determined from the transceiver technology.

Length (50µm)

This value specifies the link length that is supported by the GBIC while operating in compliance with the applicable standards using 50 micron multimode fiber. The value is in units of 10 meters. A value of 255 means that the GBIC supports a link length greater than 2.54 km. A value of zero means that the GBIC does not support 50 micron multimode fiber or that the length information must be determined from the transceiver technology.

Length (62.5µm)

The value specifies the link length that is supported by the GBIC while operation in compliance with the applicable standards using 62.5 micron multi-mode fiber. The value is in units of 10 meters. A value of 255 means that the GBIC supports a link length greater than 2.54km. A value of zero means that the GBIC does not support 62.5 micron multi-mode fiber or that the length information must be determined from the transceiver technology. It is common for GBICs to support both 50 micron and 62.5 micron fiber.

Length (Copper)

The value will always be zero which means that the GBIC does not support copper cables.

Vendor name

The vendor name is a 16 character field that contains ASCII characters, left-aligned and padded on the right with ASCII spaces (20h). The vendor name shall be the full name of the corporation, a commonly accepted abbreviation of the name of the corporation, the SCSI company code for the corporation, or the stock exchange code for the corporation. At least one of the vendor name or the vendor OUI fields shall contain valid serial data.

Vendor OUI

The vendor organizationally unique identifier field (vendor OUI) is a 3-byte field that contains the IEEE Company Identifier for the vendor. A value of zero in the 3-byte field indicates that the Vendor OUI is unspecified.

Vendor PN

The vendor part number (vendor PN) is a 16-byte field that contains ASCII characters, left-aligned and padded on the right with ASCII spaces (20h), defining the vendor part number or product name. A value of all zero in the 16-byte field indicates that the vendor PN is unspecified.

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Vendor Rev

The vendor revision number (vendor rev) is a 4-byte field that contains ASCII characters, left-aligned and padded on the right with ASCII spaces (20h), defining the vendor's product revision number. A value of all zero in the 4-byte field indicates that the vendor PN is unspecified.

CC_BASE

The check code is a one byte code that can be used to verify that the first 64 bytes of serial information in the GBIC is valid. The check code shall be the low order 8 bits of the sum of the contents of all the bytes from byte 0 to 62, inclusive

OPTIONS

The bits in the option field shall specify the options implemented in the GBIC as described in table 3.7.

Data Address	Bit	Description of option
64	7-0	Reserved
65	7-6	Reserved
65	5	RATE_SELECT is implemented. NOTE: Lack of implementation does not indicate lack of simultaneous compliance with multiple standard rates. Compliance with particular standards should be determined from transceiver code section (Table 3.5)
65	4	TX_DISABLE is implemented and disables the serial output.
65	3	TX_FAULT signal implemented. (See SFP MSA)
65	2	Loss of signal implemented, signal inverted from standard definition in SFP MSA. NOTE: This is not standard GBIC behavior and should be avoided, since non-interoperable behavior results.
65	1	Loss of signal implemented
65	0	Reserved

Table 3.7: Option values

BR, max

The upper bit rate limit at which the GBIC will still meet its specifications (BR, max) is specified in units of 1% above the nominal bit rate. A value of zero indicates that this field is not specified.

BR, min

The lower bit rate limit at which the GBIC will still meet its specifications (BR, min) is specified in units of 1% below the nominal bit rate. A value of zero indicates that this field is not specified.

Vendor SN

The vendor serial number (vendor SN) is a 16 character field that contains ASCII characters, left-aligned and padded on the right with ASCII spaces (20h), defining the vendor's serial number for the GBIC. A value of all zero in the 16-byte field indicates that the vendor PN is unspecified.

Date Code

The date code is an 8-byte field that contains the vendor's date code in ASCII characters. The date code is mandatory. The date code shall be in format specified by table 3.8.

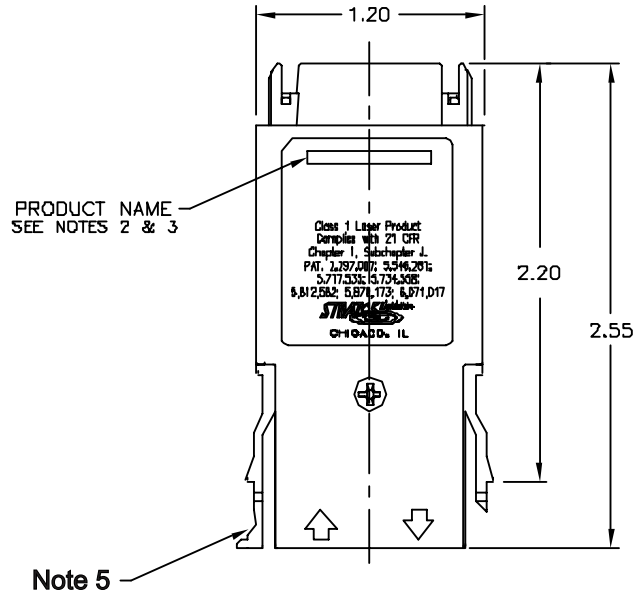
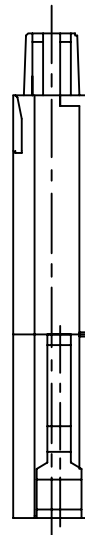
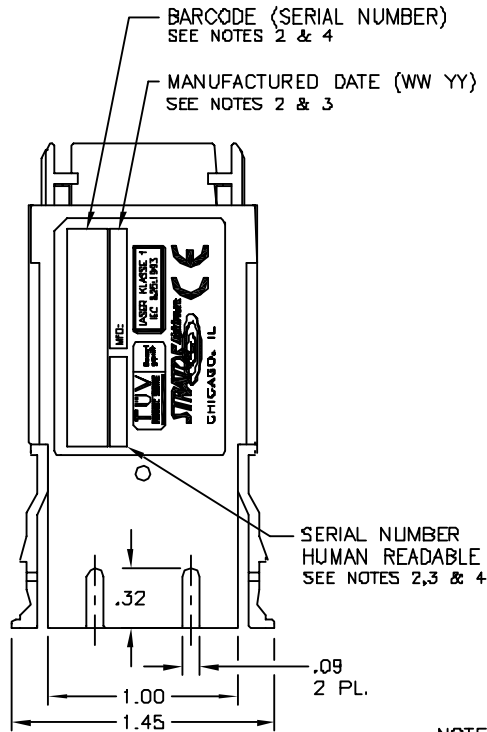
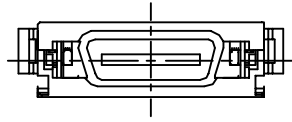
Data Address	Description of field
84-85	ASCII code, two low order digits of year. (00 = 2000).
86-87	ASCII code, digits of month (01 = Jan through 12 = Dec)
88-89	ASCII code, day of month (01-31)
90-91	ASCII code, vendor specific lot code, may be blank

Table 3.8: Date Code

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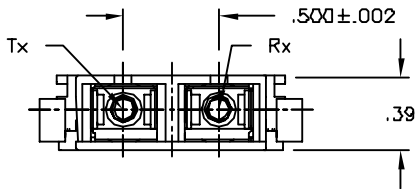


MECHANICAL DIMENSIONS (inches)



NOTES:

1. DIMENSIONS ARE IN INCHES [mm]
2. TO BE PRINTED AT STRATOS.
3. FONT TO BE 8PT. CG TRIUMVIRATE BOLD CONDENSED.
4. 7 DIGIT SERIAL NUMBER FOLLOWED BY 3 LAST DIGITS TAKEN FROM 101-XXX ASSEMBLY PART NUMBER.



Note 5. All GBIC release levels are color coded blue to designate single mode GBIC and black to designate multimode GBIC.



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