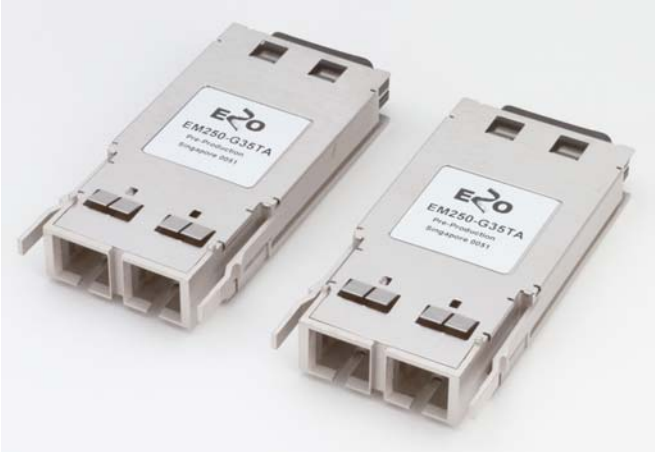
3.3V / 5V GBIC Transceiver for InfiniBand™

850 nm VCSEL for Multimode Fiber

EM250-GDTA
Data Sheet



Features

- **850nm Vertical Cavity Surface Emitting Laser (VCSEL) Source Technology**
- **Designed for use in InfiniBand Architecture (IBA) IB-1X-SX at 2.5 Gbps applications**
- **Compliant with specifications for IEEE-802.3z Gigabit Ethernet (1000Base-SX) at 1.25 Gbps**
- **Conforms to Industry Standard Gigabit Interface Converter (GBIC) specification Rev. 5.5**
- **20-pin SCA Electrical Connector**
- **Duplex SC Optical Connector**
- **Operates with 50 µm and 62.5 µm multimode optical fibers**
- **Class 1 Laser Safety Compliant**
- **Single +3.3V or +5V Power Supply**
- **Hot-Pluggable**
- **EEPROM with Serial ID Functionality**

Product Description

The EM250-GDTA from E2O Communications is a +3.3V or +5V duplex-SC transceiver designed for use in InfiniBand applications. The transceiver conforms to the Gigabit Interface Converter (GBIC) specification and meets the mezzanine height requirement of 9.8 mm. Each EM250-GDTA transceiver consists of a transmitter optical subassembly, a receiver optical subassembly, and an electrical subassembly. All are packaged inside a metallized plastic frame with metal cover.

The transmitter consists of a high-performance 850-nm VCSEL while the receiver consists of a GaAs PIN and a preamplifier. At the same time, a serial EEPROM in the transceiver allows the user to access information such as the GBIC's capabilities, the standard interfaces as well as the manufacturer. Details of the Serial Identification Protocol are contained in Annex D of the GBIC Multi-Source Agreement (MSA) specification.

All EM250-GDTA transceivers also include a loss-of-Signal-Detect circuit which provides a TTL logic high output when an unusable input optical signal level is detected.

Electromagnetic Interference (EMI)

Most equipment utilizing high-speed transceivers will be required to meet the following requirements:

1) FCC in the United States
2) CENELEC EN55022 (CISPR 22) in Europe. and
3) VCCI in Japan.

To assist the customer in managing the overall equipment EMI performance, the EM250-GDTA transceivers have been designed to perform to the specified limits. All transceivers comply with the FCC Class B limits.

Immunity

The EM250-GDTA transceiver has been designed to provide good immunity to radio-frequency electromagnetic fields. Key components to achieve the good electromagnetic compliance (EMC) are the metallized plastic frame, the metal cover, and the chassis shield.

Eye Safety

The EM250-GDTA 850-nm VCSEL-based transceivers have been designed to meet Class 1 eye safety and comply with FDA 21CFR 1040.10 and 1040.11 and the IEC 825-1.

Ordering Information

EM250-G D T A

- A (Coupling)
  - A = AC
- T (Loss Signal Detect)
  - T = TTL
- D (+3.3 or +5.0 Supply Voltage)

EB-GBIC-A (Evaluation Board)

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNITS	NOTES
Storage Temperature	T_S	-40		85	°C	
Supply Voltage	V_{CC}			6.0	V	Vcc – ground

RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNITS	NOTES
Ambient Operating Temperature	T_A	0		70	°C	
+3.3V Supply Voltage	V_{CC}	3.1		3.5	V	
+5V Supply Voltage	Vcc	4.75		5.25	V	
Transmitter Differential Input Voltage	V_D	0.6		2.0	V	

ELECTRICAL CHARACTERISTICS (T_A = 0°C to 70°C, V_{CC} = 3.1V to 3.5V; 4.75V to 5.25V)

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNITS	NOTES
TRANSMITTER						
Supply Current	I_{CCT}		80	100	mA	
RECEIVER						
Supply Current	I_{CCR}		100	200	mA	
Data Output Peak-to-Peak Differential Voltage	$V_{O,P-P}$	0.5		1.9	V	
Data Output Rise & Fall Times	t_r,t_f			0.20	ns	20-80%
Loss Signal Detect Output - High	Voh,TTL	2.0		Vcc	V	
Loss Signal Detect Output - Low	Vol,TTL	0.0		0.5	V	

OPTICAL CHARACTERISTICS (T_A = 0°C to 70°C, V_{CC} = 3.1V to 3.5V; 4.75V to 5.25V)

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNITS	NOTES
TRANSMITTER						
Output Optical Power 50/125 µm, NA = 0.20 fiber	P_{OUT}	-9.5		-4	dBm avg.	
Output Optical Power 62.5/125 µm, NA = 0.275 fiber	P_{OUT}	-9.5		-4	dBm avg.	
Optical Extinction Ratio		9			dB	
Center Wavelength	λ_C	840	850	860	nm	
Spectral Width – rms	σ			0.85	nm	
Optical Rise/Fall Time	t_r / t_f			0.15	ns	20-80% note 1.
Relative Intensity Noise	RIN		-122	-117	dB/Hz	
Transmitter Optical Contributed Jitter (TOTAL)	TJ			150	ps	
RECEIVER						
Minimum Optical Input Power (Sensitivity)	P_{IN} Min			-17	dBm avg.	
Maximum Optical Input Power (Saturation)	P_{IN} Max	0			dBm avg.	
Operating Center Wavelength	λ_c	770		860	Nm	
Return Loss		12			dB	
Signal Detect – Asserted	P_A			-17	dBm avg.	
Signal Detect – Deasserted	P_D	-30			dBm avg.	
Signal Detect – Hysteresis	P_A - P_D	0.5		5.0	dB	

Note 1. measured with the 4th order BT filter off.

Figure 1 – Package Outline in mm [inches].