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TECH FOR A BETTER WORLD

SA-QSFP-40G-ESR4

40Gb/s QSFP+ SR4 Transceiver with DDM

DESCRIPTION

SA-QSFP-40G-ESR4 are designed for use in 40 Gigabit per second links over multimode fiber. They are compliant with the QSFP+ MSA and IEEE 802.3ba 40GBASE-SR4.

The optical transmitter portion of the transceiver incorporates a 4-channel VCSEL (Vertical Cavity Surface Emitting Laser) array, a 4-channel input buffer and laser driver, diagnostic monitors, control and bias blocks. For module control, the control interface incorporates a Two Wire Serial interface of clock and data signals. Diagnostic monitors for VCSEL bias, module temperature, transmitted optical power, received optical power and supply voltage are implemented and results are available through the TWS interface. Alarm and warning thresholds are established for the monitored attributes. Flags are set and interrupts generated when the attributes are outside the thresholds. Flags are also set and interrupts generated for loss of input signal (LOS) and transmitter fault conditions. All flags are latched and will remain set even if the condition initiating the latch clears and operation resumes. All interrupts can be masked and flags are reset by reading the appropriate flag register. The optical output will squelch for loss of input signal unless squelch is disabled. Fault detection or channel deactivation through the TWS interface will disable the channel. Status, alarm/warning and fault information are available via the TWS interface.

The optical receiver portion of the transceiver incorporates a 4-channel PIN photodiode array, a 4-channel TIA array, a 4 channel output buffer, diagnostic monitors, and control and bias blocks. Diagnostic monitors for optical input power are implemented and results are available through the TWS interface. Alarm and warning thresholds are established for the monitored attributes. Flags are set and interrupts generated when the attributes are outside the thresholds. Flags are also set and interrupts generated for loss of optical input signal (LOS). All flags are latched and will remain set even if the condition initiating the flag clears and operation resumes. All interrupts can be masked and flags are reset upon reading the appropriate flag register. The electrical output will squelch for loss of input signal (unless squelch is disabled) and channel de-activation through TWS interface. Status and alarm/warning information are available via the TWS interface.

FEATURES

- High Channel Capacity: 40 Gbps per module
- Up to 11.1Gbps Data rate per channel
- MTP/MPO optical connector
- Maximum link length of 100m links on OM3 multimode fiber or 150m links on OM4 multimode fiber
- High Reliability 850nm VCSEL technology
- Electrically hot-pluggable
- Digital diagnostic SFF-8436 compliant
- Case operating temperature range: 0°C to 70°C
- Power dissipation < 0.7 W

APPLICATIONS

- 40G Ethernet
- Infiniband QDR
- Fiber channel

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STANDARD

• Compliant to IEEE 802.3ba, SFF-8436, RoHS[1]

[1] The listed certifications are issued for markets in different regions. For the current status of the listed certifications in your region, please contact an authorized Starview representative.

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Storage Temperature	Ts	-40	-	85	°C	
Relative Humidity	RH	5	-	95	%	
Power Supply Voltage	VCC	-0.3	-	4	V	
Signal Input Voltage		Vcc-0.3	-	Vcc+0.3	V	
Damage threshold		3.4			dBm	

RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Case Operating Temperature	Tcase	0	-	70	°C	Without air flow
Power Supply Voltage	VCC	3.14	3.3	3.46	V	
Power Supply Current	ICC	-		200	mA	
Data Rate	BR		10.3125		Gbps	Each channel
Transmission Distance	TD		-	100	m	OM3 MMF
				150	m	OM4 MMF

ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Min	Typ	Max	Unit	NOTE
Supply Voltage	Vcc	3.14	3.3	3.46	V	
Supply Current	Icc			200	mA	
Transmitter						
Input differential impedance	Rin		100		Ω	1
Differential data input swing	Vin, pp			1000	mV	
Single ended input voltage tolerance	VinT	-0.3		4.0	V	
Receiver						
Differential data output swing	Vout, pp			850	mV	2
Single-ended output voltage		-0.3		4.0	V	

Notes:

1. Connected directly to TX data input pins. AC coupled thereafter.
2. Into 100 ohms differential termination.

OPTICAL CHARACTERISTICS

Parameter	Symbol	Min	Typ	Max	Unit	NOTE
Transmitter						
Center Wavelength	λ 0	840		860	nm	
Average Launch Power each lane		-7.6		0.5	dBm	
Spectral Width (RMS)	σ			0.65	nm	
Optical Extinction Ratio	ER	3			dB	
Average launch Power off each lane	Poff			-30	dBm	
Transmitter and Dispersion Penalty each lane	TDP			3.5	dB	
Optical Return Loss Tolerance	ORL			12	dB	
Output Eye Mask	Compliant with IEEE 802.3ba					
Receiver						
Receiver Wavelength	λ in	840		860	nm	
Rx Sensitivity per lane	RSENS			-9.5	dBm	1
Input Saturation Power (Overload)	Psat	2.4			dBm	
Receiver Reflectance	Rr			-12	dB	
LOS De-Assert	LOSD			-12	dBm	
LOS Assert	LOSA	-30			dBm	
LOS Hysteresis		0.5			dBm	

Notes:

1. Measured with a PRBS 2^{31}-1 test pattern, @10.325Gb/s, BER<10^{-12}

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