

UM4-S4-4X03L-I (Preliminary)

Dual Bi-directional SFP
Gigabit Ethernet / 2x Fiber Channel
1550 nm Tx /1310 nm Rx

RoHS Compliant

www.palconnusa.com

Description

PALCONN high density solution in CO site, the UM4-S4-4X03L-I is a special design for double space again from small form factor pluggable (SFP) transceiver. It is a high performance, low cost solution in optical fiber communication, which consists of 2 LC receptacle Bi-Directional modules. With this solution, it is easier to optimize not only space in CO site to allocate space for more other different applications and extend double bandwidth, but extend bandwidth as double. Save more cost in chassis and switch.



Features

- 1550 nm DFB laser Transmitter
- 1310 nm Receiver
- Distance Up to 10 km / 20 km /40km (by different module)
- Single +3.3 V Power Supply
- Dual LC Connector
- LVPECL Differential Inputs and Outputs
- LVTTTL Signal Detection Output
- Class 1 Laser international Safety Standard IEC 825 Compliant
- Optical Isolation > 30 dB
- Cross Talk < -40 dB
- AC / AC Inputs and Outputs
- RoHS Compliance
- DDMI function

Applications

- WDM 1.25 Gb/s Links
- SONET/SDH Equipment Interconnect
- Fiber channel

Laser Safety

This single-mode transceiver is a Class 1 laser product. It complies with IEC 825 and FDA 21 CFR 1040.10 and 1040.11. The transceiver must be operated within the specified temperature and voltage limits. The optical ports of the module shall be terminated with an optical connector or with a dust plug.

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Ordering Information

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Recommended Operating Conditions

Parameter	Symbol	Min	Typ.	Max	Units	Note
Storage Temperature	T _{stg}	-40	-	85	°C	
Operating Temperature	T _{opr}	0	-	70	°C	1
		-40	-	85	°C	2, casing temperature
Supply Voltage	V _{cc}	3.1	3.3	3.5	V	
Power Consumption	I	-	320	600	mA	3, 10km, 20km
			400	600		3, 40km

Notes:

1. UM4-S4-4103K-I/ UM4-S4-4203K-I / UM4-S4-4403K-I
2. UM4-S4-4203L-I / UM4-S4-4203L-I / UM4-S4-4403L-I
3. The typical consumption is measured in 25°C. The real consumption will be higher in a higher temperature.

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Transmitter Optical Interface

Parameter	Symbol	Min	Typ.	Max	Units	Note
Transmitter Differential Input Voltage	TD +/-	400	-	2000	mVp-p	1
Optical Output Power	P _O	-9	-	-3	dBm	1, 2
		-7	-	-2	dBm	1, 3
		-3	-	+2	dBm	1, 4
Optical Extinction Ratio	E _R	9	-	-	dB	1
Center Wavelength	λ _C	1500	1550	1600	nm	1
Spectral Width	Δλ	-	-	1	nm	1
Side Mode Suppression Ratio	SMSR	30	-	-	dB	1
Optical Rise / Fall Time	T _r / T _f	-	-	0.25	nsec	1, 5
Tx_Disable - High	V _{Disable_H}	2	-	V _{CC}	V	1
Tx_Disable - Low	V _{Disable_L}	V _{EE}	-	V _{EE} +0.8	V	1

Notes:

1. All of data is measured at 1250 Mbps, PRBS 2⁷-1, NRZ.
2. For UM4-S4-4103K-I /UM4-S4-4103L-I.
3. For UM4-S4-4203K-I /UM4-S4-4203L-I.
4. For UM4-S4-4403K-I /UM4-S4-4403L-I.
5. 20%~80%

Receiver Optical Interface

Parameter	Symbol	Min	Typ.	Max	Unit	Note
Receiver Differential Output Voltage	RD +/-	600	800	-	mV _{P-P}	
Receiver Overload	P _{IN} MAX	-3	-	-	dBm	1, 4
Receiver Sensitivity	P _{IN} MIN	-	-	-20	dBm	1, 2, 4
		-	-	-23		1, 3, 4
Operating Center Wavelength	λ _C	1260	1310	1360	nm	
Receiver LOS Assert Level	P _{RX_LOS A}	-	-	-20.5	dBm	4
Receiver LOS Deassert Level	P _{RX_LOS D}	-35	-	-	dBm	4
Receiver Loss of Signal Hysteresis	-	0.5	2	-	dB	4

Notes:

1. With BER better than or equal to 1×10⁻¹²
2. For 10Km
3. For 20Km, 40Km
4. Measured in the center of the eye opening with 2⁷ -1 PRBS, NRZ

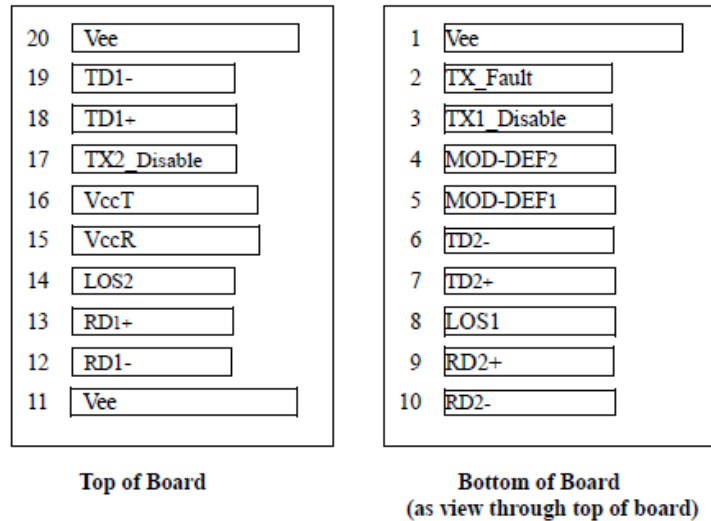
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Pin Assignment



Pin No.	Pin Name	Function
1	Vee	Transceiver Ground
2	TX_Fault	Transmitter Fault Indication
3	TX1_Disable	Transmitter Disable of Ch1; Turns off transmitter laser output of Ch1
4	MOD-DEF2	2-wire Serial Interface Data Line(SDA)
5	MOD-DEF1	2-wire Serial Interface Clock(SCL)
6	TD2-	Inverted Transmit Data Input of Ch2
7	TD2+	Transmit Data Input of Ch2
8	LOS1	Loss of Signal for Ch1
9	RD2+	Received Data Output of Ch2
10	RD2-	Inverted Received Data Output of Ch2
11	Vee	Transceiver Ground
12	RD1-	Inverted Received Data Output of Ch1
13	RD1+	Received Data Output of Ch1
14	LOS2	Loss of Signal for Ch2
15	VccR	Receiver Power
16	VccT	Transmitter Power
17	TX2_Disable	Transmitter Disable of Ch2; Turns off transmitter laser output of Ch2
18	TD1+	Transmit Data Input of Ch1
19	TD1-	Inverted Transmit Data Input of Ch1
20	Vee	Transceiver Ground

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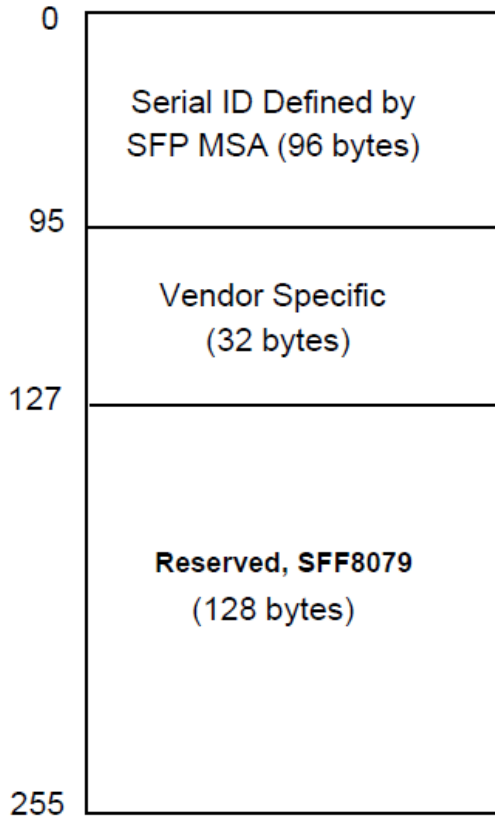
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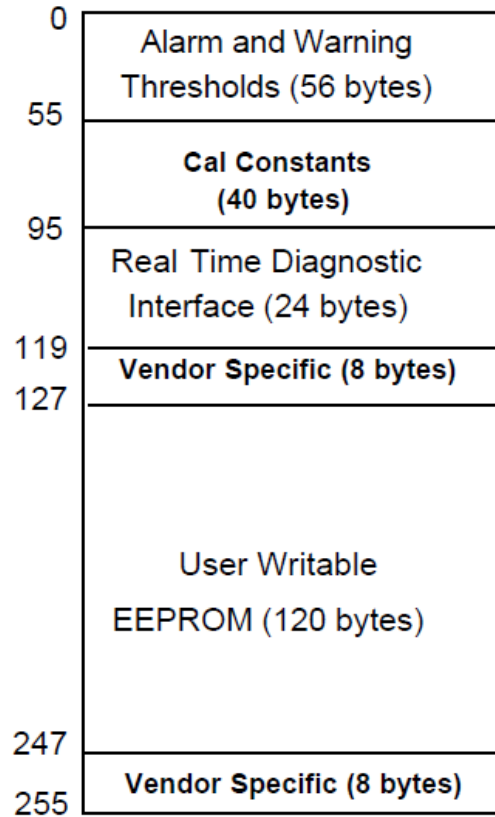
Digital Diagnostics Monitoring Interface

Mapping Address

Channel 1:2 wire address 1010000X(A0h)
 Channel 2:2 wire address 1011000X(B0h)



Channel 1:2 wire address 1010001X(A2h)
 Channel 2:2 wire address 1011001X(B2h)





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Two-wire interface ID: Data Fields – Address A0h

Data Address	Size (Bytes)	Name of Field	Description of Field
BASE ID FIELDS			
0	1	Identifier	Type of transceiver
1	1	Ext.Identifier	Extended identifier of type transceiver
2	1	Connector	Code for connector type
3-10	8	Transceiver	Code for electronic compatibility or optical compatibility
11	1	Encoding	Code for high speed serial encoding algorithm
12	1	BR, Nominal	Nominal signaling rate, units of 100MBd.
13	1	Rate Identifier	Type of rate select functionality
14	1	Length(SMF, km)	Link length supported for single mode fiber, units of km
15	1	Length(SMF)	Link length supported for single mode fiber, units of 100 m
16	1	Length(50um)	Link length supported for 50 um OM2 fiber, units of 10 m
17	1	Length(62.5um)	Link length supported for 62.5 um OM1 fiber, units of 10 m
18	1	Length(Copper)	Link length supported for copper, units of meters
19	1	Length(OM3)	Link length supported for 50 um OM3 fiber, units of 10 m
20-35	16	Vendor name	SFP vendor name (ASCII)
36	1	Unallocated	
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	Unallocated	
63	1	CC_BASE	Check code for Base ID Fields (addresses 0 to 62)
EXTENDED ID FIELDS			
64-65	2	Options	Indicates which optional transceiver signals are implemented
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
92	1	Diagnostic Monitoring Type	Indicates which type of diagnostic monitoring is implemented (if any) in the transceiver
93	1	Enhanced Options	Indicates which optional enhanced features are implemented (if any) in the transceiver
94	1	SFF-8472 Compliance	Indicates which revision of SFF-8472 the transceiver complies with.
95	1	CC_EXT	Check code for the Extended ID Fields (addresses 64 to 94)
VENDOR SPECIFIC ID FIELDS			
96-127	32	Vendor Specific	Vendor Specific EEPROM
128-255	128	Reserved	Reserved for SFF-8079



UM4-S4-4X03L-I (Preliminary)

Dual Bi-directional SFP
Gigabit Ethernet / 2x Fiber Channel
1550 nm Tx / 1310 nm Rx

RoHS Compliant

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Diagnostics: Data Fields – Address A2h

Data Address	Size (Bytes)	Name of Field	Description of Field
DIAGNOSTIC AND CONTROL/STATUS FIELDSBASE ID FIELDS			
0-39	40	A/W Thresholds	Diagnostic Flag Alarm and Warning Thresholds
40-55	16	Unallocated	
56-91	36	Ext Cal Constants	Diagnostic calibration constants for optional External Calibration
92-94	3	Unallocated	
95	1	CC_DMI	Check code for Base Diagnostic Fields (addresses 0 to 94)
96-105	10	Diagnostics	Diagnostic Monitor Data (internally or externally calibrated)
106-109	4	Unallocated	
110	1	Status/Control	Optional Status and Control Bits
111	1	Reserved	Reserved for SFF-8079
112-113	2	Alarm Flags	Diagnostic Alarm Flag Status Bits
114-115	2	Unallocated	
116-117	2	Warning Flags	Diagnostic Warning Flag Status Bits
118-119	2	Ext Status/Control	Extended module control and status bytes
GENERAL USE FIELDS			
120-127	8	Vendor Specific	Vendor specific memory addresses
128-247	120	User EEPROM	User writable non-volatile memory
248-255	8	Vendor Control	Vendor specific control addresses

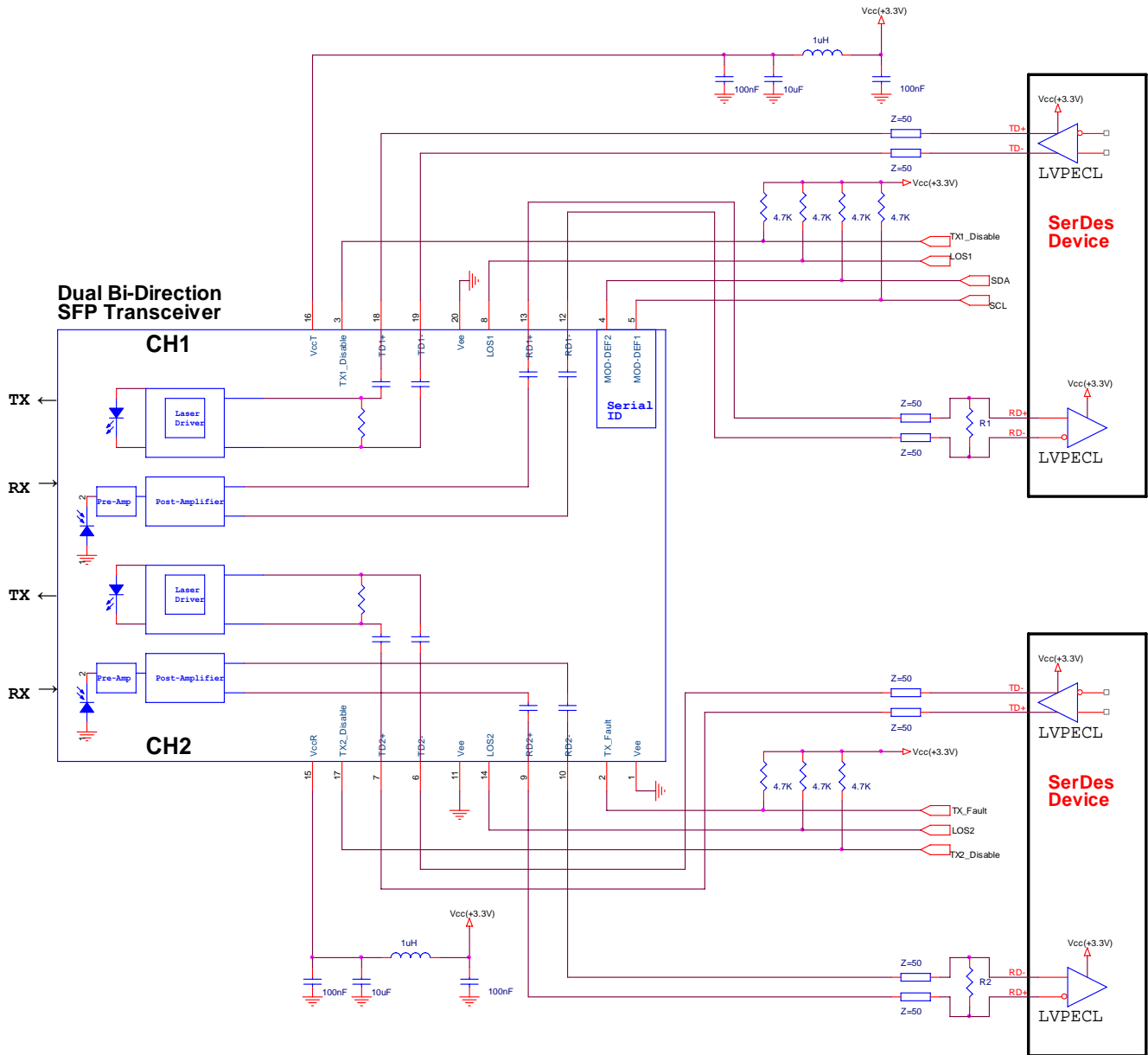
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Application Circuit



R1,R2 Depend on SerDes

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Mechanical Dimension

