

### Product Overview

The PT0-M3-4D33Q-I of the Enhanced Small Form Factor Pluggable (SFP+) transceiver module is designed for high performance integrated data link over dual multi-mode optical fibers. The high-speed laser diode and photodiode are provided as a light source and a detector, respectively. Digital diagnostics monitoring information and detailed product information for the host equipment is accessed by the 2-wire serial CMOS EEPROM protocol. It complies with SFF 8472, SFF 8431, SFF 8432 and IEEE 802.3ae 10GBASE-SR/SW.



### Features

- RoHS Compliant
- Operation Case Temperature: -10°C~85°C
- 850nm VCSEL
- 850nm receiver with Limiting amplifier
- Link distance Up to 300m(2000MHz/km, 50µm MMF)@10G links
- Hot pluggable
- Single 3.3V power supply
- Low Power Consumption(typically 600mW)
- Digital Diagnostic compliant to SFF 8472
- Compliant to electrical SFF 8431
- Compliant to mechanical SFF 8432
- Compliant to specification IEEE-802.3ae 10GBASE-SR/SW at 10.3125Gb/s

### Applications

- 10G link specifications
- 8G Fiber Channel links

### Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Storage Temperature	T <sub>s</sub>	-40		85	°C	
Relative Humidity	RH	5		95	%	noncondensing
Power Supply Voltage	V <sub>ccT,R</sub>	0		3.8	V	

### Ordering Information

P	T	0	-	M	3	-	4	D	3	3	Q	-	I																																																																																																																																										
a	b	-	X	-	c	d	e	f	-	g	h																																																																																																																																												
<table border="1"> <tr> <td rowspan="4">Function parameter</td> <td>P:</td> <td>may be Blank, or 000~999→ Pigtail length ( unit : cm )</td> </tr> <tr> <td>C:</td> <td>or 0-9 → Case Color ( 0: Black, 1: Blue )</td> </tr> <tr> <td>S:</td> <td>or B/F→ Shield ( B: Backward , F: Forward ,X:Non)</td> </tr> <tr> <td>1~4</td> <td>→ Composite Specifications</td> </tr> <tr> <td colspan="3"> <table border="1"> <tr> <td>1:</td> <td>Case Color Blue + Shield Forward</td> </tr> <tr> <td>W:</td> <td>2: Case Color Blue + Shield Backward ,Lead pin X 6 (TB:Half Shield ,Lead</td> </tr> <tr> <td></td> <td>3: Case Color Blue + Full Shield Backward,Lead pin X 4</td> </tr> <tr> <td></td> <td>4:Case Color Black + Full Shield Backward,Lead pin X 6</td> </tr> </table> </td> </tr> <tr> <td colspan="3"> <table border="1"> <tr> <td>Function distinction</td> <td colspan="2">may be Blank, or P ( P→ Pigtail ), or C(Case Color), or S ( S→ Shield ) , or W ( W→ Composite Specifications ), or F ( F→POF), or I(I→DDMI)</td> </tr> </table> </td> </tr> <tr> <td colspan="3"> <table border="1"> <tr> <td rowspan="6">Potential energy &amp; temperature</td> <td>I→AC/AC PECL</td> <td>0℃~70℃</td> <td>RoHS</td> <td>W→DC/AC TTL</td> <td>0℃~70℃</td> <td>RoHS</td> </tr> <tr> <td>J→AC/AC PECL</td> <td>-40℃~85℃</td> <td>RoHS</td> <td>N→DC/DC PECL</td> <td>-40℃~85℃</td> <td>RoHS</td> </tr> <tr> <td>K→AC/AC TTL</td> <td>0℃~70℃</td> <td>RoHS</td> <td>O→DC/DC TTL</td> <td>0℃~70℃</td> <td>RoHS</td> </tr> <tr> <td>L→AC/AC TTL</td> <td>-40℃~85℃</td> <td>RoHS</td> <td>P→DC/DC TTL</td> <td>-40℃~85℃</td> <td>RoHS</td> </tr> <tr> <td>M→DC/DC PECL</td> <td>0℃~70℃</td> <td>RoHS</td> <td>R→DC/DC PECL</td> <td>-10℃~85℃</td> <td>RoHS</td> </tr> <tr> <td>Q→AC/AC TTL</td> <td>-10℃~85℃</td> <td>RoHS</td> <td>X→DC/AC TTL</td> <td>-40℃~85℃</td> <td>RoHS</td> </tr> </table> </td> </tr> <tr> <td colspan="3"> <table border="1"> <tr> <td>Operating voltage</td> <td>3→3.3V</td> <td>5→5V</td> </tr> </table> </td> </tr> <tr> <td colspan="3"> <table border="1"> <tr> <td>Distance</td> <td>D1~D9 : D1→100M, D2→200M</td> <td>01~99 : 01→1km, 10→10km</td> <td>00→100km</td> </tr> </table> </td> </tr> <tr> <td colspan="3"> <table border="1"> <tr> <td>Optical connector</td> <td>1→FC</td> <td>2→SC</td> <td>3→ST</td> <td>4→LC</td> </tr> </table> </td> </tr> <tr> <td colspan="3"> <table border="1"> <tr> <td rowspan="3">Wavelength</td> <td>M3→Multi-mode 850 nm</td> <td>S1→Single-mode 1310 nm</td> <td>S3→For Bi-direction : Single-mode Tx1310 / Rx1550 nm</td> </tr> <tr> <td>M4→Multi-mode 1310 nm</td> <td>S2→Single-mode 1550 nm</td> <td>S4→For Bi-direction : Single-mode Tx1550 / Rx1310 nm</td> </tr> <tr> <td>00~99 (CWDM)</td> <td></td> <td>S5→For Bi-direction : Single-mode Tx1310 / Rx1490 nm</td> </tr> <tr> <td></td> <td></td> <td>S6→For Bi-direction : Single-mode Tx1490 / Rx1310 nm</td> </tr> </table> </td> </tr> <tr> <td colspan="3"> <table border="1"> <tr> <td rowspan="2">Bit rate</td> <td>1→155Mbps</td> <td>3→1.0625Gbps</td> <td>5→2.125Gbps</td> <td>7→2.7Gbps</td> <td>9→4.25Gbps</td> </tr> <tr> <td>2→622Mbps</td> <td>4→1.25Gbps</td> <td>6→2.5Gbps</td> <td>8→3.125Gbps</td> <td>0→10Gbps</td> </tr> </table> </td> </tr> <tr> <td colspan="3"> <table border="1"> <tr> <td rowspan="6">Electric connector</td> <td>TR→Dual Fiber 1×9 Transceiver</td> <td>FB→Single Fiber SFF Transceiver</td> <td>EUFB→ EPON ONU SFF 2×5 BIDI Transceiver</td> </tr> <tr> <td>TB→Single Fiber 1×9 Transceiver</td> <td>PT→Dual Fiber SFP Transceiver</td> <td>ETFB→ EPON OLT SFF 2×5 BIDI Transceiver</td> </tr> <tr> <td>FT→Dual Fiber SFF Transceiver</td> <td>PB→Single Fiber SFP Transceiver</td> <td>GUFB→ GPON ONU SFF 2×5 BIDI Transceiver</td> </tr> <tr> <td>UB→Dual Bi-Direction SFP Transceiver (OM PIN Assignemnt)</td> <td></td> <td>GTFB→ GPON OLT SFF 2×5 BIDI Transceiver</td> </tr> <tr> <td>UM→Dual Bi-Direction SFP Transceiver(CSFP MSA)</td> <td></td> <td>GUFM→GPON OLT SFF 2×5 BIDI Transceiver(DDMI)</td> </tr> <tr> <td>UT→Quad Bi-Direction SFP Transceiver</td> <td></td> <td></td> </tr> </table> </td> </tr> </table>													Function parameter	P:	may be Blank, or 000~999→ Pigtail length ( unit : cm )	C:	or 0-9 → Case Color ( 0: Black, 1: Blue )	S:	or B/F→ Shield ( B: Backward , F: Forward ,X:Non)	1~4	→ Composite Specifications	<table border="1"> <tr> <td>1:</td> <td>Case Color Blue + Shield Forward</td> </tr> <tr> <td>W:</td> <td>2: Case Color Blue + Shield Backward ,Lead pin X 6 (TB:Half Shield ,Lead</td> </tr> <tr> <td></td> <td>3: Case Color Blue + Full Shield Backward,Lead pin X 4</td> </tr> <tr> <td></td> <td>4:Case Color Black + Full Shield Backward,Lead pin X 6</td> </tr> </table>			1:	Case Color Blue + Shield Forward	W:	2: Case Color Blue + Shield Backward ,Lead pin X 6 (TB:Half Shield ,Lead		3: Case Color Blue + Full Shield Backward,Lead pin X 4		4:Case Color Black + Full Shield Backward,Lead pin X 6	<table border="1"> <tr> <td>Function distinction</td> <td colspan="2">may be Blank, or P ( P→ Pigtail ), or C(Case Color), or S ( S→ Shield ) , or W ( W→ Composite Specifications ), or F ( F→POF), or I(I→DDMI)</td> </tr> </table>			Function distinction	may be Blank, or P ( P→ Pigtail ), or C(Case Color), or S ( S→ Shield ) , or W ( W→ Composite Specifications ), or F ( F→POF), or I(I→DDMI)		<table border="1"> <tr> <td rowspan="6">Potential energy &amp; temperature</td> <td>I→AC/AC PECL</td> <td>0℃~70℃</td> <td>RoHS</td> <td>W→DC/AC TTL</td> <td>0℃~70℃</td> <td>RoHS</td> </tr> <tr> <td>J→AC/AC PECL</td> <td>-40℃~85℃</td> <td>RoHS</td> <td>N→DC/DC PECL</td> <td>-40℃~85℃</td> <td>RoHS</td> </tr> <tr> <td>K→AC/AC TTL</td> <td>0℃~70℃</td> <td>RoHS</td> <td>O→DC/DC TTL</td> <td>0℃~70℃</td> <td>RoHS</td> </tr> <tr> <td>L→AC/AC TTL</td> <td>-40℃~85℃</td> <td>RoHS</td> <td>P→DC/DC TTL</td> <td>-40℃~85℃</td> <td>RoHS</td> </tr> <tr> <td>M→DC/DC PECL</td> <td>0℃~70℃</td> <td>RoHS</td> <td>R→DC/DC PECL</td> <td>-10℃~85℃</td> <td>RoHS</td> </tr> <tr> <td>Q→AC/AC TTL</td> <td>-10℃~85℃</td> <td>RoHS</td> <td>X→DC/AC TTL</td> <td>-40℃~85℃</td> <td>RoHS</td> </tr> </table>			Potential energy & temperature	I→AC/AC PECL	0℃~70℃	RoHS	W→DC/AC TTL	0℃~70℃	RoHS	J→AC/AC PECL	-40℃~85℃	RoHS	N→DC/DC PECL	-40℃~85℃	RoHS	K→AC/AC TTL	0℃~70℃	RoHS	O→DC/DC TTL	0℃~70℃	RoHS	L→AC/AC TTL	-40℃~85℃	RoHS	P→DC/DC TTL	-40℃~85℃	RoHS	M→DC/DC PECL	0℃~70℃	RoHS	R→DC/DC PECL	-10℃~85℃	RoHS	Q→AC/AC TTL	-10℃~85℃	RoHS	X→DC/AC TTL	-40℃~85℃	RoHS	<table border="1"> <tr> <td>Operating voltage</td> <td>3→3.3V</td> <td>5→5V</td> </tr> </table>			Operating voltage	3→3.3V	5→5V	<table border="1"> <tr> <td>Distance</td> <td>D1~D9 : D1→100M, D2→200M</td> <td>01~99 : 01→1km, 10→10km</td> <td>00→100km</td> </tr> </table>			Distance	D1~D9 : D1→100M, D2→200M	01~99 : 01→1km, 10→10km	00→100km	<table border="1"> <tr> <td>Optical connector</td> <td>1→FC</td> <td>2→SC</td> <td>3→ST</td> <td>4→LC</td> </tr> </table>			Optical connector	1→FC	2→SC	3→ST	4→LC	<table border="1"> <tr> <td rowspan="3">Wavelength</td> <td>M3→Multi-mode 850 nm</td> <td>S1→Single-mode 1310 nm</td> <td>S3→For Bi-direction : Single-mode Tx1310 / Rx1550 nm</td> </tr> <tr> <td>M4→Multi-mode 1310 nm</td> <td>S2→Single-mode 1550 nm</td> <td>S4→For Bi-direction : Single-mode Tx1550 / Rx1310 nm</td> </tr> <tr> <td>00~99 (CWDM)</td> <td></td> <td>S5→For Bi-direction : Single-mode Tx1310 / Rx1490 nm</td> </tr> <tr> <td></td> <td></td> <td>S6→For Bi-direction : Single-mode Tx1490 / Rx1310 nm</td> </tr> </table>			Wavelength	M3→Multi-mode 850 nm	S1→Single-mode 1310 nm	S3→For Bi-direction : Single-mode Tx1310 / Rx1550 nm	M4→Multi-mode 1310 nm	S2→Single-mode 1550 nm	S4→For Bi-direction : Single-mode Tx1550 / Rx1310 nm	00~99 (CWDM)		S5→For Bi-direction : Single-mode Tx1310 / Rx1490 nm			S6→For Bi-direction : Single-mode Tx1490 / Rx1310 nm	<table border="1"> <tr> <td rowspan="2">Bit rate</td> <td>1→155Mbps</td> <td>3→1.0625Gbps</td> <td>5→2.125Gbps</td> <td>7→2.7Gbps</td> <td>9→4.25Gbps</td> </tr> <tr> <td>2→622Mbps</td> <td>4→1.25Gbps</td> <td>6→2.5Gbps</td> <td>8→3.125Gbps</td> <td>0→10Gbps</td> </tr> </table>			Bit rate	1→155Mbps	3→1.0625Gbps	5→2.125Gbps	7→2.7Gbps	9→4.25Gbps	2→622Mbps	4→1.25Gbps	6→2.5Gbps	8→3.125Gbps	0→10Gbps	<table border="1"> <tr> <td rowspan="6">Electric connector</td> <td>TR→Dual Fiber 1×9 Transceiver</td> <td>FB→Single Fiber SFF Transceiver</td> <td>EUFB→ EPON ONU SFF 2×5 BIDI Transceiver</td> </tr> <tr> <td>TB→Single Fiber 1×9 Transceiver</td> <td>PT→Dual Fiber SFP Transceiver</td> <td>ETFB→ EPON OLT SFF 2×5 BIDI Transceiver</td> </tr> <tr> <td>FT→Dual Fiber SFF Transceiver</td> <td>PB→Single Fiber SFP Transceiver</td> <td>GUFB→ GPON ONU SFF 2×5 BIDI Transceiver</td> </tr> <tr> <td>UB→Dual Bi-Direction SFP Transceiver (OM PIN Assignemnt)</td> <td></td> <td>GTFB→ GPON OLT SFF 2×5 BIDI Transceiver</td> </tr> <tr> <td>UM→Dual Bi-Direction SFP Transceiver(CSFP MSA)</td> <td></td> <td>GUFM→GPON OLT SFF 2×5 BIDI Transceiver(DDMI)</td> </tr> <tr> <td>UT→Quad Bi-Direction SFP Transceiver</td> <td></td> <td></td> </tr> </table>			Electric connector	TR→Dual Fiber 1×9 Transceiver	FB→Single Fiber SFF Transceiver	EUFB→ EPON ONU SFF 2×5 BIDI Transceiver	TB→Single Fiber 1×9 Transceiver	PT→Dual Fiber SFP Transceiver	ETFB→ EPON OLT SFF 2×5 BIDI Transceiver	FT→Dual Fiber SFF Transceiver	PB→Single Fiber SFP Transceiver	GUFB→ GPON ONU SFF 2×5 BIDI Transceiver	UB→Dual Bi-Direction SFP Transceiver (OM PIN Assignemnt)		GTFB→ GPON OLT SFF 2×5 BIDI Transceiver	UM→Dual Bi-Direction SFP Transceiver(CSFP MSA)		GUFM→GPON OLT SFF 2×5 BIDI Transceiver(DDMI)	UT→Quad Bi-Direction SFP Transceiver		
Function parameter	P:	may be Blank, or 000~999→ Pigtail length ( unit : cm )																																																																																																																																																					
	C:	or 0-9 → Case Color ( 0: Black, 1: Blue )																																																																																																																																																					
	S:	or B/F→ Shield ( B: Backward , F: Forward ,X:Non)																																																																																																																																																					
	1~4	→ Composite Specifications																																																																																																																																																					
<table border="1"> <tr> <td>1:</td> <td>Case Color Blue + Shield Forward</td> </tr> <tr> <td>W:</td> <td>2: Case Color Blue + Shield Backward ,Lead pin X 6 (TB:Half Shield ,Lead</td> </tr> <tr> <td></td> <td>3: Case Color Blue + Full Shield Backward,Lead pin X 4</td> </tr> <tr> <td></td> <td>4:Case Color Black + Full Shield Backward,Lead pin X 6</td> </tr> </table>			1:	Case Color Blue + Shield Forward	W:	2: Case Color Blue + Shield Backward ,Lead pin X 6 (TB:Half Shield ,Lead		3: Case Color Blue + Full Shield Backward,Lead pin X 4		4:Case Color Black + Full Shield Backward,Lead pin X 6																																																																																																																																													
1:	Case Color Blue + Shield Forward																																																																																																																																																						
W:	2: Case Color Blue + Shield Backward ,Lead pin X 6 (TB:Half Shield ,Lead																																																																																																																																																						
	3: Case Color Blue + Full Shield Backward,Lead pin X 4																																																																																																																																																						
	4:Case Color Black + Full Shield Backward,Lead pin X 6																																																																																																																																																						
<table border="1"> <tr> <td>Function distinction</td> <td colspan="2">may be Blank, or P ( P→ Pigtail ), or C(Case Color), or S ( S→ Shield ) , or W ( W→ Composite Specifications ), or F ( F→POF), or I(I→DDMI)</td> </tr> </table>			Function distinction	may be Blank, or P ( P→ Pigtail ), or C(Case Color), or S ( S→ Shield ) , or W ( W→ Composite Specifications ), or F ( F→POF), or I(I→DDMI)																																																																																																																																																			
Function distinction	may be Blank, or P ( P→ Pigtail ), or C(Case Color), or S ( S→ Shield ) , or W ( W→ Composite Specifications ), or F ( F→POF), or I(I→DDMI)																																																																																																																																																						
<table border="1"> <tr> <td rowspan="6">Potential energy &amp; temperature</td> <td>I→AC/AC PECL</td> <td>0℃~70℃</td> <td>RoHS</td> <td>W→DC/AC TTL</td> <td>0℃~70℃</td> <td>RoHS</td> </tr> <tr> <td>J→AC/AC PECL</td> <td>-40℃~85℃</td> <td>RoHS</td> <td>N→DC/DC PECL</td> <td>-40℃~85℃</td> <td>RoHS</td> </tr> <tr> <td>K→AC/AC TTL</td> <td>0℃~70℃</td> <td>RoHS</td> <td>O→DC/DC TTL</td> <td>0℃~70℃</td> <td>RoHS</td> </tr> <tr> <td>L→AC/AC TTL</td> <td>-40℃~85℃</td> <td>RoHS</td> <td>P→DC/DC TTL</td> <td>-40℃~85℃</td> <td>RoHS</td> </tr> <tr> <td>M→DC/DC PECL</td> <td>0℃~70℃</td> <td>RoHS</td> <td>R→DC/DC PECL</td> <td>-10℃~85℃</td> <td>RoHS</td> </tr> <tr> <td>Q→AC/AC TTL</td> <td>-10℃~85℃</td> <td>RoHS</td> <td>X→DC/AC TTL</td> <td>-40℃~85℃</td> <td>RoHS</td> </tr> </table>			Potential energy & temperature	I→AC/AC PECL	0℃~70℃	RoHS	W→DC/AC TTL	0℃~70℃	RoHS	J→AC/AC PECL	-40℃~85℃	RoHS	N→DC/DC PECL	-40℃~85℃	RoHS	K→AC/AC TTL	0℃~70℃	RoHS	O→DC/DC TTL	0℃~70℃	RoHS	L→AC/AC TTL	-40℃~85℃	RoHS	P→DC/DC TTL	-40℃~85℃	RoHS	M→DC/DC PECL	0℃~70℃	RoHS	R→DC/DC PECL	-10℃~85℃	RoHS	Q→AC/AC TTL	-10℃~85℃	RoHS	X→DC/AC TTL	-40℃~85℃	RoHS																																																																																																																
Potential energy & temperature	I→AC/AC PECL	0℃~70℃		RoHS	W→DC/AC TTL	0℃~70℃	RoHS																																																																																																																																																
	J→AC/AC PECL	-40℃~85℃		RoHS	N→DC/DC PECL	-40℃~85℃	RoHS																																																																																																																																																
	K→AC/AC TTL	0℃~70℃		RoHS	O→DC/DC TTL	0℃~70℃	RoHS																																																																																																																																																
	L→AC/AC TTL	-40℃~85℃		RoHS	P→DC/DC TTL	-40℃~85℃	RoHS																																																																																																																																																
	M→DC/DC PECL	0℃~70℃		RoHS	R→DC/DC PECL	-10℃~85℃	RoHS																																																																																																																																																
	Q→AC/AC TTL	-10℃~85℃	RoHS	X→DC/AC TTL	-40℃~85℃	RoHS																																																																																																																																																	
<table border="1"> <tr> <td>Operating voltage</td> <td>3→3.3V</td> <td>5→5V</td> </tr> </table>			Operating voltage	3→3.3V	5→5V																																																																																																																																																		
Operating voltage	3→3.3V	5→5V																																																																																																																																																					
<table border="1"> <tr> <td>Distance</td> <td>D1~D9 : D1→100M, D2→200M</td> <td>01~99 : 01→1km, 10→10km</td> <td>00→100km</td> </tr> </table>			Distance	D1~D9 : D1→100M, D2→200M	01~99 : 01→1km, 10→10km	00→100km																																																																																																																																																	
Distance	D1~D9 : D1→100M, D2→200M	01~99 : 01→1km, 10→10km	00→100km																																																																																																																																																				
<table border="1"> <tr> <td>Optical connector</td> <td>1→FC</td> <td>2→SC</td> <td>3→ST</td> <td>4→LC</td> </tr> </table>			Optical connector	1→FC	2→SC	3→ST	4→LC																																																																																																																																																
Optical connector	1→FC	2→SC	3→ST	4→LC																																																																																																																																																			
<table border="1"> <tr> <td rowspan="3">Wavelength</td> <td>M3→Multi-mode 850 nm</td> <td>S1→Single-mode 1310 nm</td> <td>S3→For Bi-direction : Single-mode Tx1310 / Rx1550 nm</td> </tr> <tr> <td>M4→Multi-mode 1310 nm</td> <td>S2→Single-mode 1550 nm</td> <td>S4→For Bi-direction : Single-mode Tx1550 / Rx1310 nm</td> </tr> <tr> <td>00~99 (CWDM)</td> <td></td> <td>S5→For Bi-direction : Single-mode Tx1310 / Rx1490 nm</td> </tr> <tr> <td></td> <td></td> <td>S6→For Bi-direction : Single-mode Tx1490 / Rx1310 nm</td> </tr> </table>			Wavelength	M3→Multi-mode 850 nm	S1→Single-mode 1310 nm	S3→For Bi-direction : Single-mode Tx1310 / Rx1550 nm	M4→Multi-mode 1310 nm	S2→Single-mode 1550 nm	S4→For Bi-direction : Single-mode Tx1550 / Rx1310 nm	00~99 (CWDM)		S5→For Bi-direction : Single-mode Tx1310 / Rx1490 nm			S6→For Bi-direction : Single-mode Tx1490 / Rx1310 nm																																																																																																																																								
Wavelength	M3→Multi-mode 850 nm	S1→Single-mode 1310 nm		S3→For Bi-direction : Single-mode Tx1310 / Rx1550 nm																																																																																																																																																			
	M4→Multi-mode 1310 nm	S2→Single-mode 1550 nm		S4→For Bi-direction : Single-mode Tx1550 / Rx1310 nm																																																																																																																																																			
	00~99 (CWDM)		S5→For Bi-direction : Single-mode Tx1310 / Rx1490 nm																																																																																																																																																				
		S6→For Bi-direction : Single-mode Tx1490 / Rx1310 nm																																																																																																																																																					
<table border="1"> <tr> <td rowspan="2">Bit rate</td> <td>1→155Mbps</td> <td>3→1.0625Gbps</td> <td>5→2.125Gbps</td> <td>7→2.7Gbps</td> <td>9→4.25Gbps</td> </tr> <tr> <td>2→622Mbps</td> <td>4→1.25Gbps</td> <td>6→2.5Gbps</td> <td>8→3.125Gbps</td> <td>0→10Gbps</td> </tr> </table>			Bit rate	1→155Mbps	3→1.0625Gbps	5→2.125Gbps	7→2.7Gbps	9→4.25Gbps	2→622Mbps	4→1.25Gbps	6→2.5Gbps	8→3.125Gbps	0→10Gbps																																																																																																																																										
Bit rate	1→155Mbps	3→1.0625Gbps		5→2.125Gbps	7→2.7Gbps	9→4.25Gbps																																																																																																																																																	
	2→622Mbps	4→1.25Gbps	6→2.5Gbps	8→3.125Gbps	0→10Gbps																																																																																																																																																		
<table border="1"> <tr> <td rowspan="6">Electric connector</td> <td>TR→Dual Fiber 1×9 Transceiver</td> <td>FB→Single Fiber SFF Transceiver</td> <td>EUFB→ EPON ONU SFF 2×5 BIDI Transceiver</td> </tr> <tr> <td>TB→Single Fiber 1×9 Transceiver</td> <td>PT→Dual Fiber SFP Transceiver</td> <td>ETFB→ EPON OLT SFF 2×5 BIDI Transceiver</td> </tr> <tr> <td>FT→Dual Fiber SFF Transceiver</td> <td>PB→Single Fiber SFP Transceiver</td> <td>GUFB→ GPON ONU SFF 2×5 BIDI Transceiver</td> </tr> <tr> <td>UB→Dual Bi-Direction SFP Transceiver (OM PIN Assignemnt)</td> <td></td> <td>GTFB→ GPON OLT SFF 2×5 BIDI Transceiver</td> </tr> <tr> <td>UM→Dual Bi-Direction SFP Transceiver(CSFP MSA)</td> <td></td> <td>GUFM→GPON OLT SFF 2×5 BIDI Transceiver(DDMI)</td> </tr> <tr> <td>UT→Quad Bi-Direction SFP Transceiver</td> <td></td> <td></td> </tr> </table>			Electric connector	TR→Dual Fiber 1×9 Transceiver	FB→Single Fiber SFF Transceiver	EUFB→ EPON ONU SFF 2×5 BIDI Transceiver	TB→Single Fiber 1×9 Transceiver	PT→Dual Fiber SFP Transceiver	ETFB→ EPON OLT SFF 2×5 BIDI Transceiver	FT→Dual Fiber SFF Transceiver	PB→Single Fiber SFP Transceiver	GUFB→ GPON ONU SFF 2×5 BIDI Transceiver	UB→Dual Bi-Direction SFP Transceiver (OM PIN Assignemnt)		GTFB→ GPON OLT SFF 2×5 BIDI Transceiver	UM→Dual Bi-Direction SFP Transceiver(CSFP MSA)		GUFM→GPON OLT SFF 2×5 BIDI Transceiver(DDMI)	UT→Quad Bi-Direction SFP Transceiver																																																																																																																																				
Electric connector	TR→Dual Fiber 1×9 Transceiver	FB→Single Fiber SFF Transceiver		EUFB→ EPON ONU SFF 2×5 BIDI Transceiver																																																																																																																																																			
	TB→Single Fiber 1×9 Transceiver	PT→Dual Fiber SFP Transceiver		ETFB→ EPON OLT SFF 2×5 BIDI Transceiver																																																																																																																																																			
	FT→Dual Fiber SFF Transceiver	PB→Single Fiber SFP Transceiver		GUFB→ GPON ONU SFF 2×5 BIDI Transceiver																																																																																																																																																			
	UB→Dual Bi-Direction SFP Transceiver (OM PIN Assignemnt)			GTFB→ GPON OLT SFF 2×5 BIDI Transceiver																																																																																																																																																			
	UM→Dual Bi-Direction SFP Transceiver(CSFP MSA)			GUFM→GPON OLT SFF 2×5 BIDI Transceiver(DDMI)																																																																																																																																																			
	UT→Quad Bi-Direction SFP Transceiver																																																																																																																																																						

\* Please contact us for the released types



10G/1Gt Ethernet / 8G Fiber Channel  
850TX/850RX SFP+ Transceiver  
RoHS Compliant

## PT0-M3-4D33Q-I

[www.palconnusa.com](http://www.palconnusa.com)

### Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Operating Case Temperature	T <sub>OP</sub>	-10		85	°C	Case temperature
Power Supply Voltage	V <sub>CC,T,R</sub>	3.14	3.30	3.46	V	
Data Rate			10.3125	10.52	Gb/s	
Power Supply Current	I <sub>CC</sub>		180	250	mA	TX+RX

### Transmitter Electro-Optical Interface (T<sub>C</sub> = -10°C~ 85°C, V<sub>CCT,R</sub>=3.14V<V<sub>CC</sub><3.46V)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
<b>Optical</b>						
Optical Output Power(average)	P <sub>O</sub>	-7.3		-1.0	dBm	
Optical Output Power(OMA)	P <sub>OMA</sub>	*				
RMS spectral width	Δλ			0.45	nm	
Extinction Ratio	ER	3.0			dB	
Output Eye mask	Compliant with IEEE 802.3ae Clause 52					
Center Wavelength	λ <sub>C</sub>	840	850	860	nm	
Laser off power	P <sub>OFF</sub>			-30	dBm	
Transmitter Dispersion Penalty	TDP			3.9	dB	
Relative Intensity Noise(OMA)	RIN			-128	dB/Hz	12dB reflection
<b>Electrical</b>						
Differential Data Input Voltage	V <sub>IH</sub> -V <sub>IL</sub>	200		800	mVpp	Internal AC coupled
Differential Input Impedance	R <sub>IN</sub>		100		Ω	
TX-Disable Input Voltage-Low	V <sub>IL</sub>	0		0.8	V	1
TX-Disable Input Voltage-High	V <sub>IH</sub>	2.0		V <sub>CC</sub>	V	1
TX-Fault Output Voltage-Low	V <sub>OL</sub>	0		0.8	V	2
TX-Fault Output Voltage-High	V <sub>OH</sub>	2.0		V <sub>CC</sub>	V	2

\*Trade-offs between center wavelength, spectral width, and minimum OMA based on IEEE 802.3ae Table 52-8 are used.



10G/1G Ethernet / 8G Fiber Channel  
850TX/850RX SFP+ Transceiver  
RoHS Compliant

## PT0-M3-4D33Q-I

[www.palconnusa.com](http://www.palconnusa.com)

### Receiver Electro-Optical Interface ( $T_C = -10^{\circ}\text{C} \sim 85^{\circ}\text{C}$ , $V_{\text{CCT,R}}=3.15\text{V} < V_{\text{CC}} < 3.45\text{V}$ )

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
<b>Optical</b>						
Receiver Sensitivity(OmA)	$P_{\text{MIN}}$			-11.1	dBm	3
Stressed Sensitivity(OmA)	$P_{\text{MIN}}$			-7.5	dBm	
Receive Power Overload(average)	$P_{\text{OVER}}$	-1			dBm	
Receiver Reflectance	RL			-12	dB	
Center Wavelength	$\lambda_c$	840	850	860	nm	
LOS-Asserted(OmA)	$P_A$	-30			dBm	
LOS-Deasserted(OmA)	$P_D$			-11	dBm	
LOS-Hysteresis(OmA)	$P_D - P_A$	0.5			dB	
<b>Electrical</b>						
Differential Data Output Voltage	$V_{\text{OH}} - V_{\text{OL}}$	300		800	mV	Internal AC coupled
Differential Output Impedance	$R_{\text{OUT}}$		100		$\Omega$	
LOS-Asserted Output Voltage-Low	$V_{\text{OL}}$	0		0.8	V	2
LOS-Deasserted Output Voltage-High	$V_{\text{OH}}$	2.0		Vcc	V	2

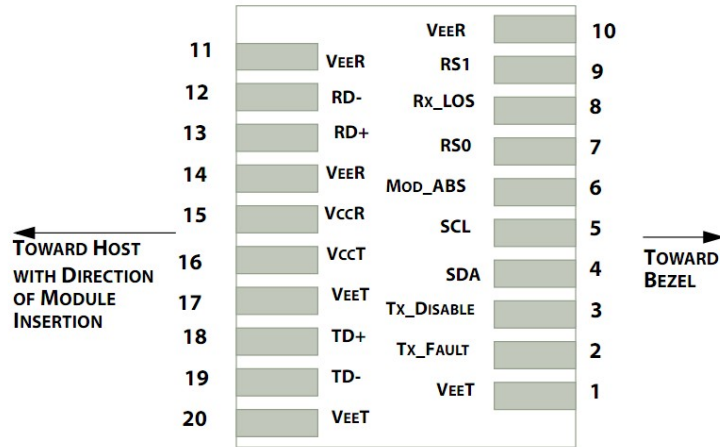
Notes:

1. TX-Disable has an internal 4.7K $\Omega$  to 10K $\Omega$  pull-up to VccT
2. Measure with 4.7K $\Omega$  pull-up to Vcc on host board
3. Measure with  $2^{31}-1$  PRBS at BER <  $10^{-12}$

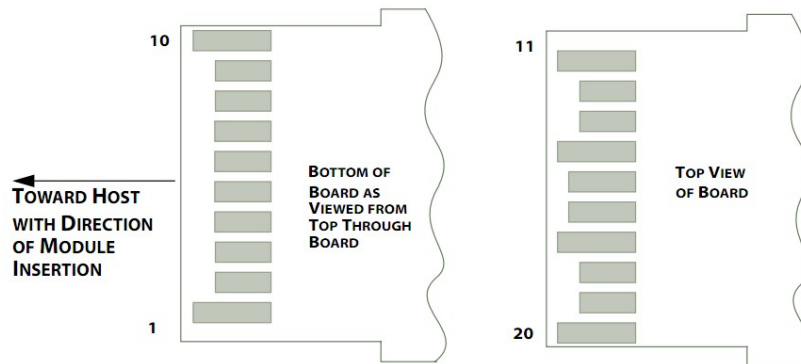
### DIGITAL DIAGNOSTIC MONITOR ACCURACY ( $T_C = -10^{\circ}\text{C} \sim 85^{\circ}\text{C}$ , $V_{\text{CCT,R}}=3.15\text{V} < V_{\text{CC}} < 3.45\text{V}$ )

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
<b>Optical</b>						
Transceiver Internal Temperature	$T_{\text{INT}}$	-3		+3	$^{\circ}\text{C}$	
Transceiver Internal Supply Voltage	$V_{\text{INT}}$	-3		+3	%	
Transmitter Laser DC Bias Current	$I_{\text{INT}}$	-10		+10	%	
Transmitted Average Optical Output Power	$P_T$	-3		+3	dB	
Received Average Optical Input Power	$P_R$	-3		+3	dB	

### Pin Description



Host PCB SFP+ pad assignment top view



SFP+ module contact assignment



**SFP+ module and Host Electrical contact definition**

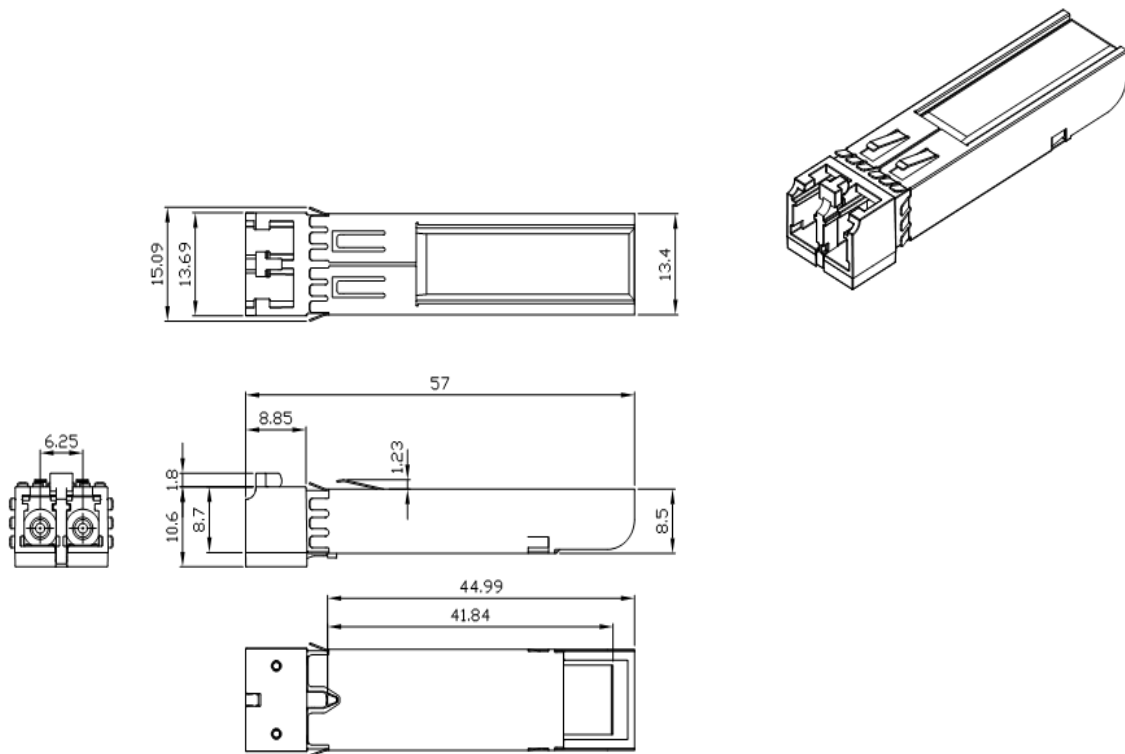
Pin No.	Pin Name	Function	Plug Seq.	Notes
1	VeeT	Transmitter Ground	1	1
2	Tx_Fault	Transmitter Fault Indication	3	2
3	Tx_Disable	Transmitter Disable	3	3
4	SDA	I2C Data Line	3	4
5	SCL	I2C Clock Line	3	4
6	MOD_ABS	Module Absent	3	4
7	RS0	Rate Select 0,control SFP+ receiver	3	6
8	Rx_LOS	Receiver Loss of Signal indication	3	5
9	RS1	Rate Select 1,control SFP+ transmitter	1	6
10	VeeR	Receiver Ground	1	1
11	VeeR	Receiver Ground	1	1
12	RD-	Receiver inverted Data Output	3	
13	RD+	Receiver non-inverted Data Output	3	
14	VeeR	Receiver Ground	1	1
15	VccR	Receiver Power	2	
16	VccT	Transmitter Power	2	
17	VeeT	Transmitter Ground	1	1
18	TD+	Transmitter non-inverted Data Input	3	
19	TD-	Transmitter inverted Data Input	3	
20	VeeT	Transmitter Ground	1	1

Note:

- 1, Circuit ground is internally isolated from chassis ground
- 2, Open-Collector outputs, asserted when LD and/or APC function fail.
- 3, Disable when high voltage (>2.0V or Open)
- 4, Should be pulled up with 4.7KΩ – 10KΩ on host board to a voltage between 2.0V and 5.5V. MOD\_ABS pulls line low to indicate module is plugged in.
- 5, LOS is open collector output. Should be pulled up with 4.7KΩ – 10KΩ to on host board to a voltage between 2.0V and 5.5V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.
- 6.

parameter	state	conditions
RS0	Low	RX signaling rate less than or equal to 4.25GBd
	High	RX signaling rate greater than 4.25GBd
RS1	Low	TX signaling rate less than or equal to 4.25GBd
	High	TX signaling rate greater than 4.25GBd

Mechanical Dimensions (Units in mm)



### Application Circuit

