AFBR-800EVK and AFBR-800EVB MiniPOD Evaluation Kit and Evaluation Board

For MiniPOD Pluggable Parallel-Fiber-Optics Modules

User Guide



Introduction

The purpose of this evaluation kit an evaluation board is to provide the designer with a convenient way to evaluate the electrical and optical performance of the Avago Technologies' Twelve-Channel MiniPOD transmitter and receiver modules. This user guide offers a description of the AFBR-800EVB evaluation board along with basic operating instructions.

The AFBR-800EVB Evaluation Rev. 4 board is to be used in conjunction with the Avago Technologies AFBR-81uVxyZ and AFBR-82uVxyZ family of Tx and Rx MiniPOD modules.

The AFBR-81uVxyZ and AFBR-82uVxyZ are twelve-channel, pluggable, parallel, fiber-optic MiniPOD transmitter and receiver modules, respectively. These high performance modules are intended for short-range multi-lane data communication and interconnect applications. Twelve data lanes transport greater than 120 Gbps aggregate bandwidth. Each lane can operate at 10.3125 Gbps up to 100 m using OM3 fiber. These modules are designed to operate over multimode fiber systems using a nominal wavelength of 850nm. The electrical interface uses a 9x9 MEG-Array connector with 1.27 mm pitch and 4mm contact mate height. The optical interface uses a 12-fiber Prizm[™] to MPO/MTP connector (included in the kit). These modules incorporate Avago Technologies' proven integrated circuit and VCSEL technology to provide reliable long life, high performance, and consistent operation.

MiniPOD Eval Board (AFBR-800EVB) contents:

- 1 x Evaluation board
- 2 x pair DC connection wires
- CD-ROM which includes GUI software and User Guide

MiniPOD Eval kit (AFBR-800EVK) contents:

- 1 x Evaluation board
- 2 x pair DC connection wires
- MTP Adapter
- Prizm to Male MTP cable(Flat ribbon)
- Prizm to Male MTP cable(Round ribbon)
- CD-ROM which includes GUI software and User Guide
- iPort USB interface (MIIC-204G)

Features

- The AFBR-800EVB Evaluation board can be used with the
 - Avago Technologies AFBR-81uVxyZ 12 channel transmitter
 - Avago Technologies AFBR-82uVxyZ 12 channel receiver
- Access to Low speed signals, for example, Int_L/Reset_L
- 24 Side mounted SMA connectors to connect to 12 differential TX or RX high speed lanes



Figure 1. MiniPOD Twelve-Channel Transmitter and Receiver Modules with round cable option



Figure 2. MiniPOD Twelve-Channel Module Evaluation Board

Recommended Equipment List

- 1. Avago Technologies MiniPOD module and AFBR-800EVB Evaluation Board (Figure 1 and Figure 2)
- 2. 3.3 V and 2.5 V power sources.
- 3. 12 fiber Multimode Fiber Optic Break-Out Cable with MTP-to-SC/ST Connectors
- 4. Agilent 86100C DCA-J or Equivalent Digital Communications Analyzer with Agilent 86105C or Equivalent DCA Plug-In Module
- 5. Agilent N4903 or Equivalent Pattern Generator/Bit Error Rate Tester
- 6. Optical Power Meter and Variable Optical Attenuator
- 7. High Frequency Coaxial Cables with SMA Connectors
- 8. USB iPort device plus iPort Software for module communication
- 9. Prizm to MTP cable (using round ribbon cable for round MiniPOD housing and flat ribbon cable for flat MiniPOD housing).
- 10. Optical 12 fiber cable; either ribbon or round cable, for link testing. The cable choice is not necessarily dependent on the MiniPOD module option. See Figure 3. The ribbon fiber should be female MTP to female MTP cable assembly, using 50 um core OM3 or OM4 multimode fiber (length up to 100 meters). For a list of recommended cables please see the drawing in appendix A

AFBR-800EVB Evaluation Kit optical component part numbers

MPO Adapter: Molex 106114-1200 (key-up / key-down)

Prizm to MTP Flat Cable : Fujikura PNJHE-1055-64-15 (for Flat MiniPOD housing)

Prizm to MTP Round Cable : Molex 106267-3000 (for Round MiniPOD housing)

Other Recommended Optical Components & Assemblies

MPO Adapter : USCONEC 12041 (key-up / key-down)

MPO Adapter : USCONEC 12042 (key-up / key-up)

MTP Female to MTP Female ribbon Cables

Molex Cable P/N	Length (m)
106272-2166	3
106272-2167	10
106272-2168	25
106272-2169	50
106272-2170	100



Figure 3. MiniPOD modules with a) Optical 12 fiber (round cable shown) and b) with flat ribbon fiber in a tiled arrangement.

MiniPOD Evaluation Board Description

Depicted in Figure 4 are:

- 1. MiniPOD MEG-Array Connector (shown with protective cover)
- 2. 3.3 V Power supply inputs
- 3. 2.5 V Power supply inputs
- 4. iPort Interface
- 5. Reset button



Figure 4. Evaluation Board Diagram. The Evaluation Board depicted can run either 12 TX Channels or 12 RX Channels, depending on which module is plugged into the board.

Low Speed signals:

Depicted in Figure 5 are:

- 1. Reset button
- 2. Transmit modules will respond to TWS bus addresses in the range of 50h to 5Fh depending upon the state of Adr2, Adr1 and Adr0. Similarly receiver modules will respond to addresses in the range of 60h to 6Fh.
- 3. Monitor points for the SDA, SCL, and Intl (directly from the MiniPOD module)





Figure 5. Low speed

MiniPOD Test Setup

Basic Operating Instructions for MiniPOD module Device Under test:

- A. Insert the MiniPOD (DUT) onto the Meg-Array connector on the Evaluation board labeled **1** in Figure 4
- B. Apply 3.3V and 2.5V to power pins labeled **2** and **3**, respectively, in Figure 4.
- C. Connect iPort (supplied with the AFBR-800EVK but NOT supplied with the AFBR-800EVB) to **4** in Figure 4 to communicate to the DUT using a Host computer;

Communicate to the device using a USB to iPort device and iPort Message Center or the MIniPOD Graphical User Interface (GUI)

- D. If using a TX MiniPOD, apply electrical input transmitter data, from a Bit Error Rate Tester or other suitable source, to side mounted SMA connectors **0 through 11.** Alternatively, if using an RX MiniPOD, connect these electrical outputs to an electrical Digital Communications Analyzer or Error Detector. Note that these are high speed differential signals.
- E. To measure Optical output parameters, after the Prizm-to-MTP cable (supplied with the AFBR-800EVK but NOT supplied with the AFBR-800EVB), use a break out cable with MTP-to-FC/SC/ST connectors.
- F. To establish a full link, connect the Prizm-to-MTP cable (supplied with the AFBR-800EVK but NOT supplied with the AFBR-800EVB) to another MiniPOD module (transmitter to receiver). Alternatively connect the MTP connector to a compatible module, such as an Avago CXP transceiver AFBR-83PDZ. For either link configuration an intermediate MTP female to MTP female cable must be used, because the Prizm-to-MTP cable is a male termination as is the termination at the input of a CXP module. Also note that the MTP female to MTP female cable must be flipped in polarity to properly align the TX to RX fibers, and this is achieved using an MPO adapter (Molex part number 1061141200) that features a key-up input with a keydown output. Alternatively a female MTP to female MTP cable may be used with a key-up / key-down polarity.
- G. SMA connectors **0 through 11** are used for either electrical input or electrical output signals depending on whether the DUT is a Transmitter or Receiver MiniPOD module. Note that these are high speed differential signals.
- H. Measure Optical Receiver output parameters using SMA cables to an electrical Digital Communications Analyzer.



Figure 6. MiniPOD Typical Test setup

Evaluation Board Bill of Materials

An evaluation board bill of materials is contained on the enclosed CD.

**Note: This bill of materials is subject to change at any time. However, at the time of writing of this document, the BOM is accurate.

Evaluation Board Schematic

The evaluation board electrical schematics are shown in the Appendix.

References

- 1. AFBR-81uVxyZ and AFBR-82uVxyZ Product Data Sheet
- 2. "Critical Design Guidelines for Successful Application of Parallel Fiber Optic Modules". Avago Technologies, Inc. Application Note 1280
- 3. Agilent Test Equipment User Manuals www.agilent.com
- 4. Micro Computer Control Corporation (iPorts) http://www/mcc-us.com/index.html

Avago MiniPOD Software User Guide

Installing the Avago MiniPOD Viewer Software

Included with the Avago Evaluation Board is a CD that contains the self-install customer user interface software. This user interface software is PC and Windows compatible.

Place the CD into the CD/DVD drive of the desktop PC or laptop. The Install CD front page should appear auto-

matically. If this does not happen open 'My Computer' and double-click the CD-ROM drive.

Click "Install AFBR-8xuFxyZ and AFBR-8xuRxyZ Viewer Software". Follow the instructions as prompted by the installer.



Figure 7. MiniPOD Evaluation Board Install CD interface

Once installed, an icon entitled "Avago's MiniPOD Viewer" will appear on the desktop along with an Avago ReadMe text file which includes detailed reference information about the GUI installation and revision.

Note the install CD:

- Contains evaluation board users guide documentation and Gerber files
- Provides details on the required system configuration
- Provides details on Avago Technologies' contact information and also
- Allows the user to make a complete copy of the CD installation disk

Connecting the Avago MiniPOD Evaluation Board

Before starting the GUI software it is recommended that the user connect and power up the MiniPOD Evaluation Board and iPort cables.

Included in the Avago Evaluation Board (AFBR-800EVB) is an Avago MiniPOD Evaluation PCBA. The AFBR-800EVB does not contain an iPort device and associated cables. If the iPort device is not purchased as a part of the evaluation kit, use a compatible iPort device and connect as per Figure 8.

The iPort device typically also comes with its own software and can be loaded to the PC. Note the iPort may need to be plugged in to a 120V wall receptacle for power.



Figure 8. Evaluation Board Connections

Avago MiniPOD Viewer Software

The evaluation software can be accessed by double clicking the desktop icon "Avago MiniPOD Viewer". Once the software starts the Avago Technologies front page will appear on the screen while the PC searches the COM ports for an active device. This may take a few seconds.

If the software cannot find a COM port to use, the "View MiniPOD" tab will not appear. If this happens check the



AVago

This program is used to support Avago MiniPOD products.

The computer is connected to a MiniPOD Evaluation board using an iPort. It has the ability to read and decode the various 2 wire serial registers, print reports and provide general device diagnostics.

iPort and computer connections and/or reconfigure the

The user can click the "About" tab to learn about the

Once the computer finds a valid connected device click on

Release version of the MiniPOD Evaluation software.

the "View MiniPOD" tab in the top left of the window.

COM port assignments on the computer.

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Figure 9. Interface Loading Window

Comport : 2 - BaudRate : 19200

2 Wire Serial Interface : MCC Model MIIC-204 Iport USB AFM Module

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MiniPOD Tab

Upon clicking the "View MiniPOD" tab, the main control window will open starting with the 'MiniPOD Tab'.

This tab serves as the front page and shows pictures of the MiniPOD Evaluation board as well as MiniPOD Transceivers. Note the maximum Two-wire Serial clock rate is 400 kHz. The MiniPOD modules can also communicate at lower speeds.



Figure 10. MiniPOD Tab

MiniPOD Tab

Upon clicking the "View MiniPOD" tab, the main control window will open starting with the 'MiniPOD Tab'.

This tab serves as the front page and shows pictures of the MiniPOD Evaluation board as well as MiniPOD Transceivers.

🖻 AVAGO TECHNOLOGIES - Mini POD AFBR-81uVxyZ Transmitter / AFBR-82uVxyZ Receiver										
File Supported Products 2WS Clock Rate TX Control Select Module Type Write Checks Device Images Address Format										
Selected Product. TX AFBR-81uVwZ - Mini POD 2WS ClockRate: 400 khz										
MinPOD Registers	Register Reports TX DMI RX DMI									
Part Number AFBR-811BHCZZ Serial Number Image: Serial Number Image: Mini POD Tx Base Page Image: Serial Number Image: Mini POD TX Upper Page 0 Image: Mini POD TX Upper Page 1 Image: Mini POD TX Upper Page 1 Image: Serial Number	M Decoded Data ***** PAGE ***** ***** PAGE ****** ***** ****** ***** ****** ***** ****** Identify word - describes type of device Byte 00 01 02 03 04 05 06 07 08 09 0A 08 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 <td></td>									
Write All Write Current	Clear Write Checks ReCalc All Byte Display Mode									
Read ALL Read Register Field Extended Display EDIT										

Figure 11. Register Tab

Registers List Window

Note that there are three pages for each of the MiniPODTx and Rx memory maps.

For the Tx module;

- MiniPOD Tx Base Page at Address 50
- Common Page on MiniPOD Tx Upper Page 00h
- MiniPOD Tx Upper Page 01h

For the Rx module;

- MiniPOD Rx Base Page at Address 60
- Common Page on MiniPOD Rx Upper Page 00h
- MiniPOD Rx Upper Page 01h

The left window titled "Register List" provides the address and name of the register fields. The user can toggle between decimal format and hexadecimal format by clicking the "Address Format" option in the menu bar (Figure 13).

Also, by clicking an address in the "Register List" window, the corresponding register address in Hexadecimal is highlighted in the "Field Display" matrix window. The user can expand the fields in a tree format in the "Register List". This allows the user to view the field definitions down to the single bit level. Fields that cannot be expanded are only defined at the byte level.

Decoded Data Window and Field Display

The user definable/writable fields can be found by looking at the "Decoded Data" window. Only fields that are highlighted yellow and have a check mark box next to them are writable/changeable bit fields. The writable bits/bytes correspond to the MiniPOD specification and MiniPOD Memory Map documents.

It is recommended that when the user first opens the MiniPOD Module Evaluation Program the "Read ALL" button is pressed to see the current state of all fields. Values in the Decoded Data Window can be in hexadecimal, binary or will be in text describing the state of a bit field, depending on the applicable use of the bits/bytes.



Figure 12. Register List and Decoded Data Window

To write hexadecimal values to the registers

- 1. Click the EDIT dot in the bottom middle of the page to ON.
- 2. Change the register values, either by
 - a. Using the Decoded Data column and write or toggle bit/byte fields corresponding to writable bits/bytes OR
 - b. Make changes to the user definable/changeable bits by directly writing hexadecimal numbers to the "Field Display" matrix on the right. However, be aware that unwritable bits will not be affected.
- 3. Then click the Write All button. All values will now be written to the device.
- 4. Click "Read All" and the bytes will reflect what has just been written to the device. "Read Page" or "Read Register" only updates the current page or current register respectively.

Register Reports Tab

The Register Reports Tab allows the user to dump sections of the register content into a text-style format and then save/print the file.

This feature can be used to log device settings, take a snapshot of the digital monitoring, and simplifying reporting.

- Clicking "Save to File" and choose a location to save the log file. The log file will directly reflect what the user sees in the REG Reports window. Note the user can choose which pages to dump and also the format: e.g. Byte Map or a text description of the memory map fields
- By clicking "Save to File by Part Number and Serial Number" the report will be saved in the default folder in location: C:\Program Files\Avago\MiniPOD Viewer\ Reports\

AVAGO TECHNOLOGIES - Mini POD AFBR-81 uVxyZ Transmitter / AFBR-82 uVxyZ Receiver								
File Supported Products 2W5 Clock Rate TX Control Select Module Type								
Selected Product: <u>TX AFBR-81uVxyZ - Mini PDD</u> 2WS ClockRate: 400 khz								
MinPOD Registers Register Reports TX DMI	RX DMI							
MMPUU Registers Register Reports TX DMI REG Reports Part Number AFBR-811BHCZZ SerialNumber Map Page 50 Page : 1 Page Address : 0x0050 Mini POD Tx Base Page ASCII DUMP REPORT - Map Page 50 ASCII DUMP REPORT - Map Page 50 00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F 00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F	Report Selection Select the desired report type Page: Only Visible Registers Decoded Page ✓ 0x50 ✓ 0x00 ✓ 0x00 ✓ 0x00 ✓ 0x00 ✓ 0x00 ✓ 0x00							
HEX DUMP REPORT - Map Page 00 ASCII DUMP REPORT - Map Page 00	Print							
00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F 00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F	Measure and Report							

Figure 13. Register Reports

TX DMI Tab

a VAGO TECHNOLOGIES - Mini POD AFBR-81uVxyZ Transmitter / AFBR-82uVxyZ Receiver																			
File Supported Products 2WS Clock Rate TX Control Select Module Type																			
Selected Product: TXAFBR-81uXvyZ - Mini POD 2WS ClockRate: 400 khz																			
Min	POD		Ŷ		Regi	sters		Ύ.		Registe	r Reports	:	Ĭ	TX DMI	Ì		RX	DMI	
M	1ini P	OD T	$\times 0$	ptica	l Moc	lule			СНА	NNE	L ST4	TUS				Control	Options		
C	ontro	ol anc	l Me	asur	emer	nt			1 2 3	45	678	9 10 11	1 12		123	456	789	10 11 12	
Part Number	AFBR-81	1BHCZZ	Tem	ф (C)	24.4		TXLO	S EALU T	~ ~ .	~ ~ ~	~ ~ .	~ ~ ~ ~	~ ~	Channel Disabl					
Revision	01		Vcc	3.3v PS	3.296		TYPE	FAULT						Squelch Disabl	•				
Vendor /	AVAGO		Vcc	2.5v PS	2.572		TX Bia	s High s Low	FFF	th	FFF	- Heir	1-1	Margin On	Fr Fr	tete	FFF	eee	
Serial Number			TX E	Elapsed a	28	Hrs	TX Po	wer High											
Date Code							TX Po	wer Low											
														Madu	la Otatu				
EQ Settings	CH 1	CH 2	CH 3	CH 4	CH 5	CH 6	CH7	CH 8	CH9	CH 10	CH 11	CH 12		MUUU	ie statu:				
from Module	0	lo In	10	lo In	0	0	0	0	0	0	0			Temp High Aalrm 📃 Temp Low Alarm 🗔	Tix IntL		v		
EU Settings to Write														Vcc 3.3 High Alarm	Vcc 2.5 H	igh Alarm	-		
Adjust EQ Settings														Vcc 3.3 Low Alarm	Vcc 2.5 L	ow Alarm			
Jettings																			
																	Live		
	CU 1	CL 2	CH 2	CU 4	CUE	CH C	CUZ	CU 0	CUO	CU 10	0 CU 11	CU 12					Update	-	.
TX Power(m\u/)			0.057					0.050				0.707					Stop		5
TX Power(dbm)	. 70	0.000	0.007	0.030	0.075	0.000	0.000	0.003	0.000	0.043	0.000	0.737					update		
Bias(mA)	5.38	5.39	5.39	5.29	5.30	5.39	5.39	5.29	5.39	5.28	5.39	5.39					Single Update		
	3.30	13.30	19:00	15.50	15.50	10.00	0.00	0.00	13.30	13.30	13.30	0.00							

Figure 14. TX DMI tab

Using the TX DMI Tab, the user can view all critical operating conditions of the transmitter MiniPOD module. This view shows the transmitter details:

- Identification information: e.g. Part Number, Serial Number
- Real-time operating condition diagnostics: e.g. Tx Power, Tx Bias
- Control status indicators such as: Temperature, Vcc
- Alarm status indicators such as: Tx Fault, Tx LOS a check mark indicates assertion of the alarm

Furthermore the user has software 'soft' controls of critical parameters:

- High speed channel control: e.g. Turn on/off Tx Channel Disable, Turn on/off Tx Squelch Disable
- Alarm channel control: e.g. TX LOS Mask
- Tx Equalization settings on a per channel basis

To see a snapshot of current settings, press the "Single Update" button. To see real time continuous reads, for example to see real time DMI fields, click the "Live Update" button.

Likewise for the soft control settings, in order for any change to take effect the "Single Update" button or "Live Update" button must be pressed.

As an example, if the user would like to change the equalization setting for Channel 6 to level 7.

The user must first move the "Adjust EQ Setting" bar under 'CH 6' to level 7, which will show up in "TX EQ Settings to Write". However, the setting will not be written to the byte field until "Live Update" button is pressed

RX DMI Tab

a VAGO TECHNOLOGIES - Mini POD AFBR-81uVxyZ Transmitter / AFBR-82uVxyZ Receiver								
File Supported Products 2WS Clock Rate RX Control Select Module Type								
Selected Product: RXAFBR-82uVxyZ - Mini POD Receiver 2WS ClockRate: 400 khz								
MinPOD Registers Register Reports TX DMI RX DMI								
Mini DOD DX Ontinel Martula								
Mini POD RX Optical Module								
CHANNEL STATUS Soft Control Options								
Part Number AFBR-821RN1Z Temp (C) 26.1 1 2 3 4 5 6 7 8 9 10 11 12 1 2 3 4 5 6 7 8 9 10 11 12								
Revision Vcc 3.3v 3.417 Low Rever Alarm V V V V V V V V V V V Channel Disable								
Vendor AVAGD Vcc 2.5v 2.574 High Power Alarm								
Serial Number A448008 RX Elapsed 6 Hrs								
Date Code 20101207 Module Status								
Temp High Alarm 👘 RX IntL 🎽 Squelch Disable 📑								
CH 1 CH 2 CH 3 CH 4 CH 5 CH 6 CH 7 CH 8 CH 9 CH 10 CH 11 CH 12 Vcc 3.3 High Alarm Vcc 2.5								
Invice soluting from module 2<								
Adjust RX EQ Settings								
there have been have been here here here here here								
CH 1 CH 2 CH 3 CH 4 CH 5 CH 6 CH 7 CH 8 CH 9 CH 10 CH 11 CH 12 Live								
Adjust RX Amplifier Settings								
puant Single								
CH 1 CH 2 CH 3 CH 4 CH 5 CH 6 CH 7 CH 8 CH 9 CH 10 CH 11 CH 12								
RX Power(mW) 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000								
RX Power(dbm) -80.00 -80.00 -80.00 -80.00 -80.00 -80.00 -80.00 -80.00 -80.00 -80.00 -80.00 -80.00 -80.00 -80.00								

Figure 15. RX DMI tab

Using the RX DMI Tab, the user can view all critical operating conditions of the receiver MiniPOD module. This view shows the receiver details:

- Identification information: e.g. Part Number, Serial Number
- Real-time operating condition diagnostics: e.g. Rx Optical Input Power
- Control status indicators such as: Temperature, Vcc,
- Alarm status indicators such as: Rx LOS and high or low power alarms a check mark indicates assertion of the alarm

Furthermore the user has software 'soft' controls of critical parameters:

- High speed channel control: e.g. Turn on/off Rx Channel Disable, Turn on/off Rx Squelch Disable
- Alarm channel control: e.g. RX LOS Mask
- Rx Amplifier and Pre-Emphasis settings on a per channel basis

To see a snapshot of current settings, press the "Single Update" button. To see real time continuous reads, for example to see real time DMI fields, click the "Live Update" button.

Likewise for the soft control settings, in order for any change to take effect the "Single Update" button or "Live Update" button must be pressed.

As an example, if the user would like to change the Rx amplitude setting for Channel 6 to level 7, the user must first move the "Adjust Rx Amplifier Setting" bar under 'CH 6' to level 7. This action will show up in "Rx Amplifier Settings to Write", however, the setting will not be written to the byte field until the "Live Update" button is pressed.

Schematic: Revision 3.0 Board

	Optical Fiber Exit Side											
	1	2	3	4	5	6	7	8	9			
A	GND	D2+	GND	D4+	GND	D6+	GND	D8+	GND			
В	GND -	D2-	GND	D4-	GND	D6-	GND	D8-	GND			
С	GND -	GND	ADR<2>	Vcc33	Vcc33	Vcc33	DNC	GND	GND			
D	D0+ -	D0-	GND	SDA	DNC	INTL	GND	D10-	D10+			
E	GND -	GND	ADR<1>	RESET	DNC	SCLD	NC	GND	GND			
F	D1+	D1-	GND	Vcc25	DNC	DNC	GND	D11-	D11+			
G	GND	GND	ADR<0>	Vcc25	Vcc25	Vcc25	DNC	GND	GND			
Н	GND	D3-	GND	D5-	GND	D7-	GND	D9-	GND			
J	GND	_ D3+	GND	_ D5+	GND	_ D7+	GND	_ D9+	GND			

Tx/Rx Host Board Pattern - TOP VIEW



Schematic: Revision 3.0 Board (Cont.)





Schematic: Revision 3.0 Board (Cont.)



Appendix A - Molex connector drawing



MTP KEY-||||호I

VIEW B

1	
^Z MTP KEY	

VIEW A

JUMPER P/N	LENGTH L [m]
106272-2166	3 +0.20/-0
106272-2167	10 +0.30/-0
106272-2168	25 +0.50/-0
106272-2169	50 +1.00/-0
106272-2170	100 +2.00/-0

CONNECTIONS								
P1-1	P2-1							
THRU	THRU							
P1-12	P2-12							

NOTES:

1. DUST CAPS ARE NOT SHOWN.

2. MAXIMUM INSERTION LOSS PER CONNECTOR @ 850nm: 0.5dB.

3. CABLE ATTENUATION (MAX.): @ 850nm: 0.35dB; @ 1300nm: 1.2dB.

4. OVERFILLED LAUNCH BANDWIDTH, MIN. (MHz-km): @ 850 nm =1500, @ 1300 nm =500

5. 10 GIGABIT ETHERNET LINK DISTANCE, MIN. (m): @ 850 nm =300, @ 1300 nm =NONE

6. ENVIRONMENTAL PROPERTIES: STORAGE TEMPERATURE; -40° C to +70° C OPERATING TEMPERATURE; -0° C to +70° C FLAME RESISTANCE; UL LISTED TYPE OFNP (UL 1651)

7. MECHANICAL PROPERTIES : CABLE WEIGHT ; 9.42 kg/km MAXIMUM TENSILE LOAD; 100lbs (445N) SHORT TERM 50lbs (222 N) LONG TERM MINIMUM BEND RADIUS; 2.0in (50mm) SHORT TERM

1.25in (32mm) LONG TERM

8. LABEL IS PRINTED WITH; OM3, 50um CORE FIBER, MOLEX P/N AND SERIAL NUMBER

9. TEST DATA IS SENT WITH EACH SHIPMENT.

For product information and a complete list of distributors, please go to our web site: www.avagotech.com

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