Blackfin® USB-LAN EZ-Extender® Manual

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Analog Devices, Inc.
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ANALOG DEVICES

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Regulatory Compliance

The Blackfin USB-LAN EZ-Extender is designed to be used solely in a laboratory environment. The board is not intended for use as a consumer end product or as a portion of a consumer end product. The board is an open system design which does not include a shielded enclosure and therefore may cause interference to other electrical devices in close proximity. This board should not be used in or near any medical equipment or RF devices.

The Blackfin USB-LAN EZ-Extender has been certified to comply with the essential requirements of the European EMC directive 89/336/EEC amended by 93/68/EEC and therefore carries the "**CE**" mark.

The Blackfin USB-LAN EZ-Extender has been appended to Analog Devices, Inc. Technical Construction File (TCF) referenced '**DSPTOOLS1**' dated December 21, 1997 and was awarded CE Certification by an appointed European Competent Body as listed below.

Technical Certificate No: Z600ANA1.022

Issued by:
Technology International (Europe) Limited
60 Shrivenham Hundred Business Park
Shrivenham, Swindon, SN6 8TY, UK

The Blackfin USB-LAN EZ-Extender contains ESD (electrostatic discharge) sensitive devices. Electrostatic charges readily accumulate on the human body and equipment and can discharge without detection. Permanent damage may occur on devices subjected to high-energy discharges. Proper ESD precautions are recommended to avoid performance degradation or loss of functionality. Store unused extender boards in the protective shipping package.

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PREFACE

Thank you for purchasing the Blackfin® USB-LAN EZ-Extender®, Analog Devices, Inc. extender board to the EZ-KIT Lite® evaluation system for the ADSP-BF533, ADSP-BF537, and ADSP-BF561 Blackfin processors.

Blackfin processors are embedded processors that support a Media Instruction Set Computing (MISC) architecture. This architecture is the natural merging of RISC, media functions, and digital signal processing characteristics towards delivering signal processing performance in a microprocessor-like environment.

EZ-KIT Lites and USB-LAN EZ-Extenders are designed to be used in conjunction with the CrossCore® Embedded Studio (CCES) and VisualDSP++® software development environments. The development environment facilitates advanced application code development and debug, such as:

- Create, compile, assemble, and link application programs written in C++, C, and USB-LAN EZ-Extender assembly
- Load, run, step, halt, and set breakpoints in application programs
- Read and write data and program memory
- Read and write core and peripheral registers
- Plot memory

To learn more about Analog Devices development software, go to http://www.analog.com/processors/tools.

Product Overview

The Blackfin USB-LAN EZ-Extender is a separately sold extender board that plugs onto the expansion interface of the ADSP-BF533, ADSP-BF537, or ADSP-BF561 EZ-KIT Lite evaluation system.

The extender board aids the design and prototyping phases of the ADSP-BF533, ADSP-BF537, or ADSP-BF561 processor targeted applications.

The board extends the capabilities of the evaluation system by providing a connection between the asynchronous memory bus of the Blackfin processor (asynchronous memory bank 3) and either a USB 2.0 or a 10/100 Mbps Ethernet device.

Please visit www.analog.com/EX1-USBLAN for additional information, including CCES support.

The following is a list of the Blackfin USB-LAN EZ-Extender interfaces.

- USB 2.0 interface:
    - PLX Technology NetChip 2272 device
    - USB driver and application code
    - USB logo certified
- Ethernet interface:
    - SMSC LAN 91C111 device supported on the ADSP-BF533 and ADSP-BF561 EZ-KIT Lites
    - IEEE802.3.AF compliant Power-Over-Ethernet (PoE) application on the ADSP-BF537 EZ-KIT Lite

    - SMSC Media Independent Interface (MII) connector to evaluate different PHYs with the ADSP-BF537 EZ-KIT Lite
    - Ethernet stack and application code
- No power supply required: derives power from the EZ-KIT Lite
- CE certified
- Dimensions: 3.13 in. (height) x 3.6 in. (width)

Before using any of the interfaces, follow the setup procedure in "USB-LAN EZ-Extender Setup" on page 1-1.

Example programs are available to demonstrate capabilities of the Blackfin USB-LAN EZ-Extender board.

Purpose of This Manual

The *Blackfin USB-LAN EZ-Extender Manual* describes operation and configuration of the extender board's components. A schematic and a bill of materials are provided as a reference for future Blackfin processor board designs.

Intended Audience

This manual is a user's guide and reference to the Blackfin USB-LAN EZ-Extender. Programmers who are familiar with the Analog Devices Blackfin processor architecture, operation, and development tools are the primary audience for this manual.

Programmers who are unfamiliar with Analog Devices processors can use this manual but should supplement it with other texts that describe your target architecture. For the locations of these documents, see "Related Documents".

Programmers who are unfamiliar with CCES or VisualDSP++ should refer to the online help and user's manuals.

Manual Contents

The manual consists of:

- Chapter 1, "USB-LAN EZ-Extender Interfaces" on page 1-1
  Provides basic board information.
- Chapter 2, "USB-LAN EZ-Extender Hardware Reference" on page 2-1
  Provides information on the hardware aspects of the board.
- Appendix A, "USB-LAN EZ-Extender Bill of Materials" on page A-1
  Provides a list of components used to manufacture the EZ-Extender board.
- Appendix B, "USB-LAN EZ-Extender Schematic" on page B-1
  Provides the resources to allow EZ-KIT Lite board-level debugging or to use as a reference design. Appendix B is part of the online help.

What's New in This Manual

This is revision 2.2 of the *Blackfin USB-LAN EZ-Extender Manual*. The manual has been updated to include CCES information. In addition, modifications and corrections based on errata reports against the previous manual revision have been made.

For the latest version of this manual, please refer to the Analog Devices Web site.

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- Post your questions in the processors and DSP support community at EngineerZone®:
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- Submit your questions to technical support directly at:
  `http://www.analog.com/support`
- E-mail your questions about processors, DSPs, and tools development software from **CrossCore Embedded Studio** or **VisualDSP++**:

  Choose **Help > Email Support**. This creates an e-mail to `processor.tools.support@analog.com` and automatically attaches your **CrossCore Embedded Studio** or **VisualDSP++** version information and `license.dat` file.
- E-mail your questions about processors and processor applications to:
  `processor.support@analog.com` or
  `processor.china@analog.com` (Greater China support)

- In the **USA only**, call **1-800-ANALOGD** (1-800-262-5643)
- Contact your Analog Devices sales office or authorized distributor. Locate one at:
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- Send questions by mail to:
  Processors and DSP Technical Support
  Analog Devices, Inc.
  Three Technology Way
  P.O. Box 9106
  Norwood, MA 02062-9106
  USA

Supported Products

The Blackfin USB-LAN EZ-Extender is designed as an extender board to the ADSP-BF533, ADSP-BF537, and ADSP-BF561 EZ-KIT Lite evaluation systems.

Product Information

Product information can be obtained from the Analog Devices Web site and the online help.

Analog Devices Web Site

The Analog Devices Web site, www.analog.com, provides information about a broad range of products—analog integrated circuits, amplifiers, converters, and digital signal processors.

To access a complete technical library for each processor family, go to http://www.analog.com/processors/technical_library. The manuals selection opens a list of current manuals related to the product as well as a link to the previous revisions of the manuals. When locating your manual title, note a possible errata check mark next to the title that leads to the current correction report against the manual.

Also note, MyAnalog is a free feature of the Analog Devices Web site that allows customization of a Web page to display only the latest information about products you are interested in. You can choose to receive weekly e-mail notifications containing updates to the Web pages that meet your interests, including documentation errata against all manuals. MyAnalog provides access to books, application notes, data sheets, code examples, and more.

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Use EngineerZone to connect with other DSP developers who face similar design challenges. You can also use this open forum to share knowledge and collaborate with the ADI support team and your peers. Visit http://ez.analog.com to sign up.

Related Documents

For additional information about the product, refer to the following publications.

Table 1. Related Processor Publications

Title	Description
• *ADSP-BF531/ADSP-BF532/ADSP-BF533 Blackfin Embedded Processor Data Sheet* • *ADSP-BF534/ADSP-BF536/ADSP-BF537 Blackfin Embedded Processor Data Sheet* • *ADSP-BF561 Blackfin Embedded Symmetric Multiprocessor Data Sheet*	General functional description, pinout, and timing of the processor
• *ADSP-BF533 Blackfin Processor Hardware Reference* • *ADSP-BF537 Blackfin Processor Hardware Reference* • *ADSP-BF561 Blackfin Processor Hardware Reference*	Description of the internal processor architecture and all register functions
Blackfin Processor Programming Reference	Description of all allowed processor assembly instructions

1 USB-LAN EZ-EXTENDER INTERFACES

This chapter provides the setup procedures for both the Blackfin USB-LAN EZ-Extender and the EZ-KIT Lite (ADSP-BF533, ADSP-BF537 or ADSP-BF561) and describes the interfaces the extender supports.

The information is presented in the following order.

- "USB-LAN EZ-Extender Setup" on page 1-1
- "USB 2.0 Interface" on page 1-3
- "Ethernet Interface" on page 1-4
- "Optional ADSP-BF537 EZ-KIT Lite Interfaces" on page 1-5

USB-LAN EZ-Extender Setup

It is very important to set up all components of the system containing the Blackfin USB-LAN EZ-Extender, then apply power to the system. The following procedure is recommended for the correct setup.

Power your system after these steps are completed:

1. Read the applicable design interface section in this chapter—the text provides an overview of the interfac capabilities.
2. Read "System Architecture" on page 2-2 to understand the physical connections of the extender board. For detailed information, refer to "USB-LAN EZ-Extender Schematic" on page B-1.

3. Remove any rubber feet that may be attached to the EZ-KIT Lite. Install the four nylon feet and screws provided with the USB-LAN EZ-Extender in place of the rubber feet, in the mounting holes of the EZ-KIT Lite's printed circuit board (PCB). Flip the EZ-KIT Lite upside down so that the three expansion headers (`J1–3`) are facing up.
4. Set the switches and jumpers on the USB-LAN EZ-Extender board. Use the block diagram in Figure 2-1 on page 2-2 in conjunction with "Jumper Settings" on page 2-3 and "Switch Settings" on page 2-6.
5. Set the switches and jumpers on the EZ-KIT Lite board. If not already, familiarize yourself with the EZ-KIT Lite documentation and schematic drawings (see "Product Information").

   Compare the expansion interface signals of the USB-LAN EZ-Extender board with the EZ-KIT Lite signals to ensure there is no contention. For example, it may be necessary to disable other devices connected to the expansion interface of the processor and disable the push buttons on the EZ-KIT Lite.
6. Install the USB-LAN EZ-Extender on the EZ-KIT Lite via the three-connector expansion interface.
7. Configure any other interfacing boards; for example, another EZ-Extender board.

USB Software

For information on the USB software (host-side and device-side), refer to the readme text files in the `Examples` folder of the installation directory.

Ethernet Software

For information on the LAN software, refer to the readme text files in the `Examples` folder of the installation directory.

USB 2.0 Interface

The Blackfin USB-LAN EZ-Extender enables a connection between a USB 2.0 chip and Blackfin processor without any other programmable logic. The PLX Technology's NetChip 2272 device ties directly to the asynchronous memory bank 3 of the Blackfin processor. You can read from and write to the USB 2.0 controller by addressing the named memory bank directly.

You can reset the NetChip 2272 processor by asserting `LOW` these flag pins:

- `PF11` on the ADSP-BF533 processor
- `PF6` on the ADSP-BF537 processor
- `PF11` on the ADSP-BF561 processor

The flag pins can be used for push buttons or LEDs on the respective EZ-KIT Lite; consequently, you must make the proper changes to that EZ-KIT Lite. The switch settings required for each of the respective EZ-KIT Lites are described in the readme text files in the `Examples` folder of the installation directory. The readme file describes the USB software, source code, drivers, and explains how to run a USB-based application.

For correct switch settings, refer to the schematic drawing of the respective device.

The USB IRQ line of the extender connects to PF10 on the ADSP-BF533/ADSP-BF561 processors and PF7 on the ADSP-BF537 processors. The flag pins can be used for push buttons or LEDs on the respective EZ-KIT Lites; consequently, you must make the proper changes to that EZ-KIT Lite.

When writing to and reading from the USB device using the EZ-KIT Lite, use memory addresses from Table 1-1.

Table 1-1. USB Device Memory

Device Connects to	Starting Address	Ending Address
ADSP-BF533 EZ-KIT Lite	0x2030 0000	0x2030 007F
ADSP-BF537 EZ-KIT Lite	0x2030 0000	0x2030 007F
ADSP-BF561 EZ-KIT Lite	0x2C00 0000	0x2C00 007F

Ethernet Interface

The USB-LAN EZ-Extender allows you to connect a 10/100 Mbps Ethernet chip to a Blackfin processor. The SMSC LAN91C111 device ties directly to the asynchronous memory bank 3 of the processor. You can read from and write to the Ethernet controller by addressing the named memory bank directly.

You can reset the Ethernet device by asserting the board reset on the ADSP-BF533 and ADSP-BF561 EZ-KIT Lites. The reset connects to a supervisory reset circuit managed by the Analog Devices ADM708 IC. ADM708 also asserts a reset to the Ethernet device at power-up.

The Ethernet IRQ line connects to the PF9 flag pin of the ADSP-BF533 processor and PF9 of the ADSP-BF561 processor. The flag pins can be used for push buttons or LEDs on the respective EZ-KIT Lites; consequently, you must make the proper changes to that EZ-KIT Lite. The switch settings required for each of the respective EZ-KIT Lites are

described in the readme text files in the `Examples` folder of the installation directory. The readme file describes the LAN software, source code, drivers, and explains how to run an Ethernet application.

For correct switch settings, refer to the schematic drawing of the respective device.

When writing to and reading from the Ethernet device using the EZ-KIT Lite, use memory ranges from Table 1-2.

Table 1-2. LAN Device Memory

Device Connects to	Starting Address	Ending Address
ADSP-BF533 EZ-KIT Lite	0x2031 0000	0x2031 FFFF
ADSP-BF561 EZ-KIT Lite	0x2C01 0000	0x2C01 FFFF

Optional ADSP-BF537 EZ-KIT Lite Interfaces

"Power-Over-Ethernet" and "MII Interface" are two optional interfaces of the ADSP-BF537 EZ-KIT Lite. A description of each interface is as follows.

Power-Over-Ethernet

When used in conjunction with the ADSP-BF537 EZ-KIT Lite, the Blackfin USB-LAN EZ-Extender allows you to power both the EZ-KIT Lite and extender via a 10/100 Mbps switch or a Midspan device that supports IEEE802.3.AF.

The ADSP-BF537 EZ-KIT Lite and extender must not be powered via the 7.5V supply when in Power-over-Ethernet (PoE) mode. You can make the appropriate jumper changes to the EZ-KIT Lite and extender, then connect the kit to the extender to power both boards via the switch or the

Midspan device. You must use a switch or a Midspan device that supports power via the data pairs. The PoE circuitry does not work if a Midspan device powers only over the spare pins.

Table 1-3 shows a recommended Midspan device that supports both power over the spare pins and power over the data pairs.

Table 1-3. Midspan Device

Power Sourcing Equipment	Manufacturer	Part Number
Midspan device	POWERDSINE 6	PD-8006/AC

Use the Ethernet connector on the EZ-KIT Lite for PoE applications. Power-over-Ethernet does not work properly if the Ethernet connector is used on the extender board. When in PoE mode, the blinking LEDs (`LED1-6`) confirm successful power-up. Since PoE is intended as a simple demonstration of the power circuitry, you are not able to start a VisualDSP ++ session while in PoE mode.

Refer to "Power Select Jumper (JP1)" on page 2-4 for the extender's PoE settings. Refer to the *ADSP-BF537 EZ-KIT Lite Evaluation System Manual* for the EZ-KIT Lite's PoE settings.

MII Interface

The Media Independent Interface (MII) allows you to evaluate different PHY devices with the ADSP-BF537 EZ-KIT Lite. A separately purchased PHY evaluation board connects directly to the USB-LAN EZ-Extender. You need to purchase the `J2` connector and solder it in order to connect the two boards. The part numbers for the SMSC evaluation boards and `J2` connector are shown in Table 1-4.

Table 1-4. PHY Devices

Part Description	Manufacturer	Manufacturer Part #
J2 20 x 2 connector	AMP/TYCO ELECTRONICS	787170-4
MII evaluation board	SMSC	EVB185
MII evaluation board	SMSC	EVB183

2 USB-LAN EZ-EXTENDER HARDWARE REFERENCE

This chapter describes the hardware design of the Blackfin USB-LAN EZ-Extender.

The following topics are covered.

- "System Architecture" on page 2-2
  Describes the board configuration and explains how the board components interface with the processor and EZ-KIT Lite.
- "Jumper Settings" on page 2-3
  Describes the on-board configuration jumpers.
- "Switch Settings" on page 2-6
  Describes the on-board switches.

System Architecture

A block diagram of the Blackfin USB-LAN EZ-Extender is shown in Figure 2-1.

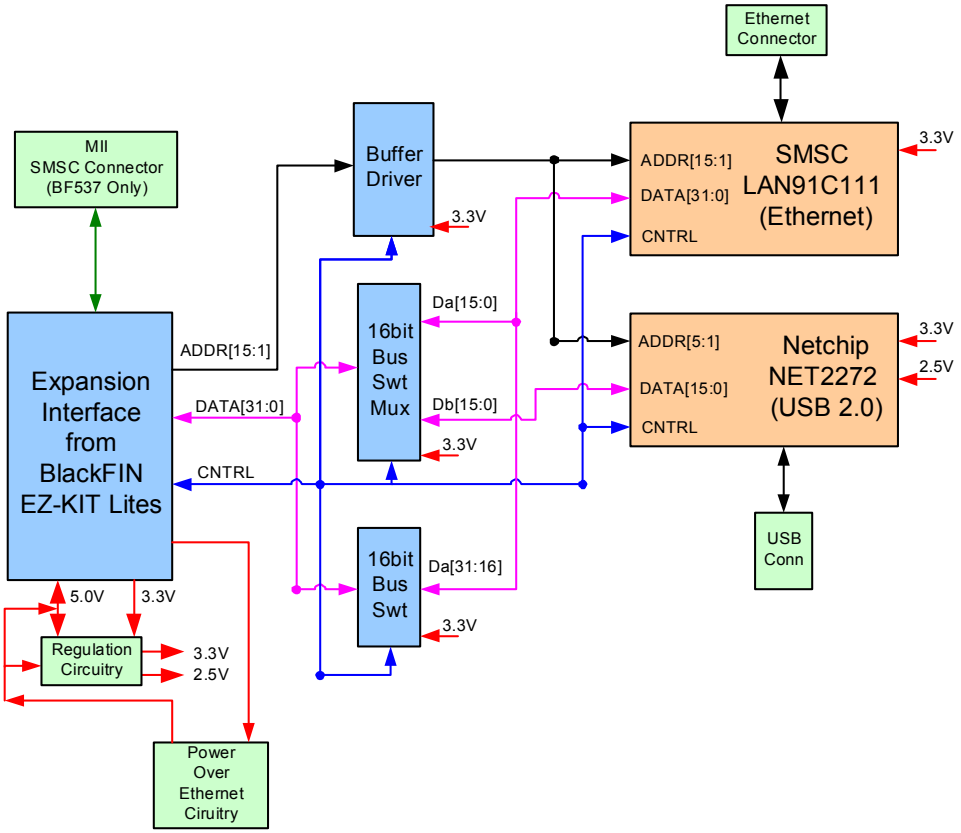


Figure 2-1. Block Diagram

Jumper Settings

Before using the Blackfin USB-LAN EZ-Extender, follow the setup procedure in "USB-LAN EZ-Extender Setup" on page 1-1.

Figure 2-2 shows the locations of all jumper headers. A two-pin jumper can be placed on the respective jumper header for different functionality. The following sections describe all possible jumper settings and associated functionality.

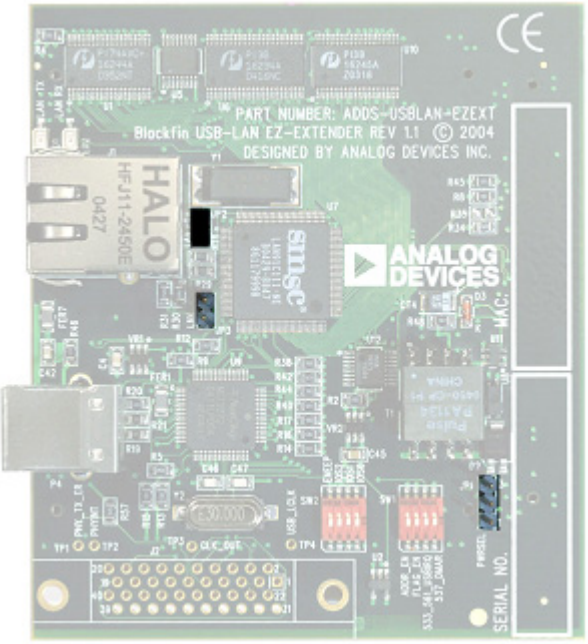


Figure 2-2. Jumper Locations

Power Select Jumper (JP1)

By default, the power select jumper, JP1, must have no jumpers on any of its pins. The jumpers can be used only when the extender is plugged onto an ADSP-BF537 EZ-KIT Lite (see Table 2-1).

Table 2-1. JP1 Settings

Source of 5V Power	JP1 Setting
EZ-KIT Lite power	**No jumpers (default)**
USB test mode (do not use)	JP1.1 and JP1.2
Power-over-Ethernet	JP1.2 and JP1.3

When using the extender with an ADSP-BF533 or an ADSP-BF561 EZ-KIT Lite, you must not place any jumpers on JP1. Placing a jumper on JP1 can damage the extender board and/or the EZ-KIT Lite. You must power the ADSP-BF533/ADSP-BF561 EZ-KIT Lite and USB-LAN EZ-Extender with the 7.5V power supply provided with the EZ-KIT Lite.

When using the extender with an ADSP-BF537 EZ-KIT Lite with the Power-over-Ethernet feature, you must place a jumper between JP1 pin 2 and JP1 pin 3. You must power both the EZ-KIT Lite and USB-LAN EZ-Extender with the CAT5E Ethernet cable, which provides power over the signal pairs. The Ethernet cable must be plugged into the Ethernet connector of the ADSP-BF537 EZ-KIT Lite, but not the USB-LAN EZ-Extender. Use the 7.5V power supply provided with the EZ-KIT Lite.

When using the extender with an ADSP-BF537 EZ-KIT Lite without the Power-over-Ethernet, you must not place any jumpers on JP1. You must power both the EZ-KIT Lite and extender with the 7.5V power supply provided with the EZ-KIT Lite.

For an overview of the Power-over-Ethernet interface, refer to "Power-Over-Ethernet" on page 1-5.

LAN Power Jumper (JP2)

The LAN power jumper, JP2, is used to power the SMSC 91C111 device with 3.3V (see Table 2-2). By default and in general, the jumper is plugged in for extra flexibility. You must make changes to JP2 only when no power is applied to the USB-LAN EZ-Extender and/or the EZ-KIT Lite.

Table 2-2. JP2 Settings

Functionality	JP2 Setting
No power to the LAN91C111	No jumper
All other cases	**JP2.1 and JP2.2 (default)**

Link Jumper (JP3)

The link jumper, JP3, connects directly to the link status pin of the SMSC 91C111 device (see Table 2-3). The default setting is to keep JP3 unpopulated. When JP3 is populated, it sends a logic 0 or LOW to the input port used to convey the LINK status (EPHSR bit 14). For more information about populating the link jumper, refer to the SMSC LAN91C111 data sheet.

Table 2-3. JP3 Settings

Functionality	JP3 Setting
Logic low on 91C111 link status pin	JP3.1 and JP3.2
All other cases	**No jumper (default)**

Switch Settings

Before using the Blackfin USB-LAN EZ-Extender, follow the setup procedure in "USB-LAN EZ-Extender Setup" on page 1-1.

Figure 2-3 shows the locations of all switches. The following sections describe all possible switch settings and associated functionality.

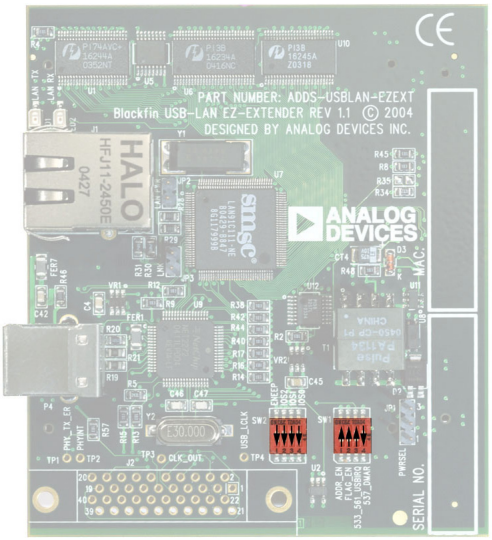


Figure 2-3. Switch Locations

ADDR Enable Switch (SW1.1)

The address enable switch, `SW1.1`, is used to control output of the Blackfin address bus buffer (see Table 2-4). By default, the switch is set to `ON`. When `SW1.1` is `OFF`, you cannot communicate to the USB or Ethernet processor. The address enable switch adds flexibility to the processors because you can turn the switch `OFF` when capacitive loading is an issue present with other peripherals on the EZ-KIT Lite.

Table 2-4. SW1.1 Settings

Functionality	SW1.1 Setting
Blackfin address buffer (U1) enabled	**ON (default)**
Blackfin address buffer (U1) disabled	OFF

FLAGS Enable Switch (SW1.2)

The flags enable switch, SW1.2, is used to control output of the Blackfin flags multiplexer (see Table 2-5). By default, the SW1.2 switch is set to ON. When SW1.2 is OFF, you cannot communicate to the USB or Ethernet processor. The flags enable switch adds flexibility to the extender—when the switch is OFF, the flags can be used for other peripherals on the EZ-KIT Lite.

Table 2-5. SW1.2 Settings

Functionality	SW1.2 Setting
FLAGS (U12) enabled	**ON (default)**
Blackfin FLAGS (U12) disabled	OFF

USB IRQ Enable Switch (SW1.3)

The USB IRQ enable switch, SW1.3, is used to control a connection between the Netchip 2272 IRQ line and respective flag pin of the Blackfin processor (see Table 2-6). The switch connects the USB_IRQ line with PF10 on the ADSP-BF533/ADSP-BF561 processor and PF7 on the ADSP-BF537 processor. By default, the USB IRQ enable switch is ON. When SW1.3 is OFF, communication with the USB device cannot be established. The SW1.3 adds flexibility to the extender—when the switch is OFF, the flag can be used for other peripherals on the EZ-KIT Lite.

Table 2-6. SW1.3 Settings

Functionality	SW1.3 Setting
USB IRQ enabled	**ON (default)**
USB IRQ disabled	OFF

Test Mode Enable Switch (SW1.4)

The test mode enable switch, SW1.4, is an internal test pin and should not be used (see Table 2-7). By default SW1.4 is OFF.

Table 2-7. SW1.4 Settings

Functionality	SW1.4 Setting
Test mode enabled	ON
Test mode disabled	**OFF (default)**

Serial ROM Enable Switch (SW2.1)

The serial ROM enable switch, SW2.1, is used to control a connection between the LAN91C111 Ethernet chip and its serial ROM (U3) (see Table 2-8). When the switch is disabled, the Ethernet chip loads its Media Access Control (MAC) address from the serial ROM. By default SW2.1 is OFF. When the switch is ON, you cannot communicate with the provided Ethernet application code. The switch adds flexibility to the extender—you can modify the application code and generate another MAC address when SW2.1 is ON.

Table 2-8. SW2.1 Settings

Functionality	SW2.1 Setting
Serial ROM disabled	ON
Serial ROM enabled	**OFF (default)**

IOS[2:0] Switch (SW2.2, SW2.3, SW2.4)

The IOS[2:0] bits on the Blackfin USB-LAN EZ-Extender are connected directly to the IOS[2:0] pins of the LAN91C111 Ethernet chip. By default, the switches are OFF. The IOS[2:0] pins are used in conjunction with the Serial ROM Enable Switch (SW2.1) to select between the pre-defined EEPROM configurations. For more information about the switches, refer to the SMSC LAN91C111 data sheet.

A USB-LAN EZ-EXTENDER BILL OF MATERIALS

The bill of materials corresponds to "USB-LAN EZ-Extender Schematic" on page B-1.

Ref.	Qty.	Description	Reference Designator	Manufacturer	Part Number
1	1	25MHZ OSC005	Y1	EPSON	MA-505 25.0000 MHZ
2	1	SN74AHC1G00 SOT23-5	U2	TI	SN74AHC1G00DBVR
3	1	PI74AVC+16244 TSSOP48	U1	PERICOM SEMI	PI74AVC+16244AE
4	1	93LC46B SOIC8	U3	MICROCHIP	93LC46B/SNG
5	1	LAN91C111 TQFP128	U7	SMSC	LAN91C111-NU
6	1	NET2272 TQFP64	U9	NET CHIP	NET2272REV1A-LF
7	3	PI3B16245 TSSOP48	U10,U16-17	PERICOM SEMI	PI3B16245AE
8	1	PI3B3257 TSSOP16	U12	PERICOM SEMI	PI3B3257LE
9	1	74LVC139 TSSOP16	U5	PHILIPS	74LVC139PW
10	1	30MHZ OSC010	Y2	ECLIPTEK	E2SAA10-30.000M
11	1	PA1134 ICS005	T1	PULSE	PA1134NL
12	1	PS2911-1 ICS006	U8	NEC	PS2911-1-F3-A
13	1	SI3440DV TSOP6	U11	VISHAY	Si3440DV-T1-E3

Ref.	Qty.	Description	Reference Designator	Manufacturer	Part Number
14	1	TLV431A SOT23-3	U13	ON-SEMI	TLV431ASN1T1G
15	1	LTC4267 SSOP16	U4	LINEAR TECH	LTC4267CGN#PBF
16	1	ADP3330ARTZ-33 SOT23-6	VR2	ANALOG DEVICES	ADP3330ARTZ3.3-RL7
17	1	ADP3330ARTZ-25 SOT23-6	VR1	ANALOG DEVICES	ADP3330ARTZ-2.5-R7
18	1	USB 4PIN CON009	J3	MILL MAX	897-43-004-90-000000
19	3	0.05 45x2 CON018	P1-3	SAMTEC	TFC-145-32-F-D
20	2	DIP4 SWT018	SW1-2	ITT	TDA04HOSB1
21	1	RJ45 8PIN CON_RJ45B	J1	HALO ELEC-TRONIC	HFJ11-2450E-RL
22	2	IDC 2X1 IDC2X1	JP2-3	FCI	90726-402HLF
23	1	IDC 3X1 IDC3X1	JP1	FCI	90726-403HLF
24	1	0 1/4W 5% 1206	R56	KOA	0.0ECTRk7372BTTED
25	2	YELLOW LED001	LED1-2	PANASONIC	LN1461C
26	7	0.01UF 100V 10% 0805	C1,C3,C6,C8, C11,C13,C16	AVX	08051C103KAT2A
27	36	0.1UF 50V 10% 0805	C2,C7,C9-10, C12,C19-27, C30-41,C43, C48-56	AVX	08055C104KAT
28	32	10K 1/10W 5% 0805	R1-4,R8,R10-18, R36-45,R48,R57, R60-65	VISHAY	CRCW080510K0JNEA
29	1	33 1/10W 5% 0805	R55	VISHAY	CRCW080533R0JNEA
30	1	4.7K 1/10W 5% 0805	R34	VISHAY	CRCW08054K70JNEA

Ref.	Qty.	Description	Reference Designator	Manufacturer	Part Number
31	1	1M 1/10W 5% 0805	R6	VISHAY	CRCW08051M00JNEA
32	1	1.5K 1/10W 5% 0805	R20	VISHAY	CRCW08051K50FKEA
33	3	10UF 16V 10% B	CT1-3	AVX	TAJB106K016R
34	1	300MA LL4148 DL35	D3	DIODES INC	LL4148-13
35	5	600 100MHZ 500MA 1206	FER1-4,FER7	STEWARD	HZ1206B601R-10
36	1	11.0K 1/8W 1% 1206	R25	VISHAY	CRCW120611K0FKEA
37	2	30PF 100V 5% 1206	C14-15	AVX	12061A300JAT2A
38	1	47.0K 1/10W 1% 0805	R7	VISHAY	CRCW080547K0FKEA
39	4	0 1/10W 5% 0805	R28-29,R46,R54	VISHAY	CRCW08050000Z0EA
40	1	3.32K 1/10W 1% 0805	R53	PANASONIC	ERJ-6ENF3321V
41	2	42 100MHZ 4A 0805	FER5-6	DIGI-KEY	587-1768-2-ND
42	2	39.0 1/10W 1% 0805	R19,R21	DIGI-KEY	311-39.0CRTR-ND
43	4	0.47UF 16V 10% 0805	C4-5,C44-45	AVX	0805YC474KAT2A
44	3	1UF 10V 10% 0805	C17-18,C42	AVX	0805ZC105KAT2A
45	1	680UF 6.3V 10% E	CT6	AVX	TPSE687K006R0045
46	1	100.0 1/10W 1% 0805	R51	DIGI-KEY	311-100CRCT-ND
47	2	10PF 50V 5% 0805	C46-47	AVX	08055A100JAT2A

Ref.	Qty.	Description	Reference Designator	Manufacturer	Part Number
48	4	24.9 1/10W 1% 0805	R26-27,R30-31	DIGI-KEY	311-24.9CRTR-ND
49	2	49.9 1/10W 1% 0805	R32-33	DIGI-KEY	311-49.9CRCT-ND
50	1	2.43K 1/10W 1% 0805	R5	DIGI-KEY	311-2.43KCRTR-ND
51	1	40A SMAJ58A DIO003	D1	DIODES INC	SMAJ58A-13-F
52	1	10A SBM1040 DIO004	D2	DIODES INC	SBM1040-13-F
53	1	0.8A HD01 MDIP4	D4	DIODES INC	HD01-T
54	1	68.1 1/10W 1% 0805	R47	VISHAY	CRCW080568R1FNEA
55	1	6.81K 1/10W 1% 0805	R49	VISHAY	CRCW08056K81FNEA
56	1	0.12 1/10W 1% 0603	R50	PANASONIC	ERJ-3RSFR12V
57	2	330 1/8W 5% 1206	R22-23	DALE	CRCW1206330RJNEA
58	1	10.0K 1/8W 1% 1206	R52	DALE	CRCW120610K0FKEA
59	1	4.7UF 10V 20% B	CT4	DIGI-KEY	399-3724-2-ND
60	1	1K 1/8W 5% 0805	R9	DIGI-KEY	311-1.0KARTR-ND

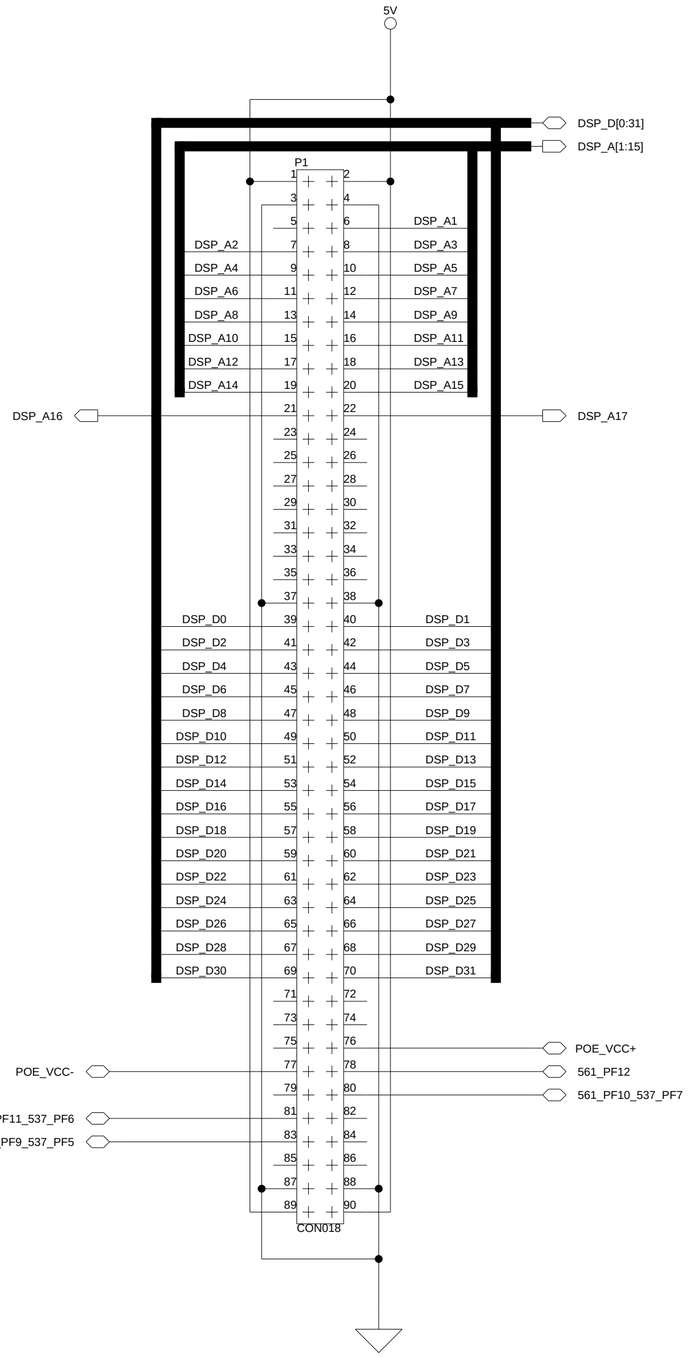
BLACKFIN USB-LAN EZ-EXTENDER

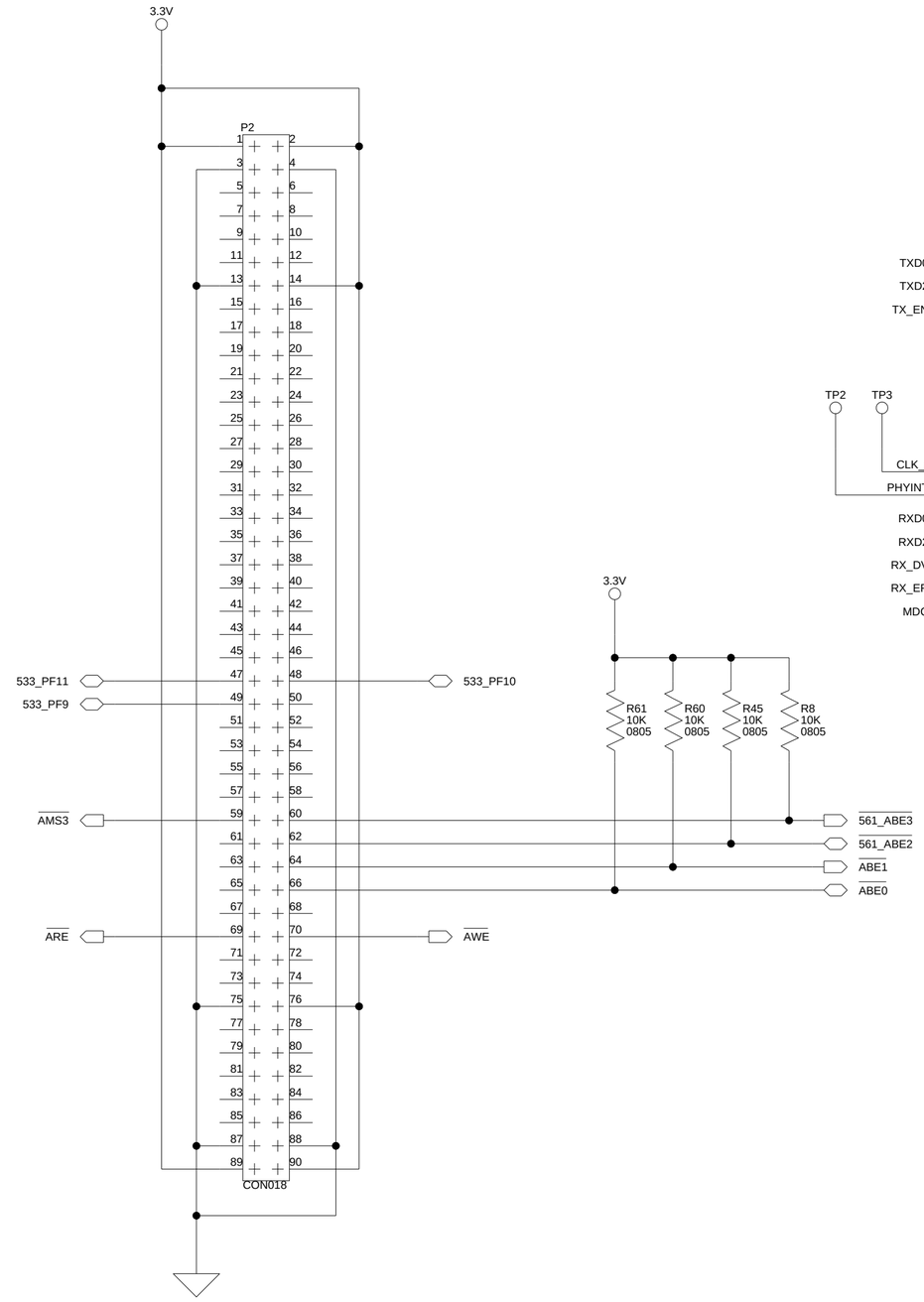
SCHEMATIC

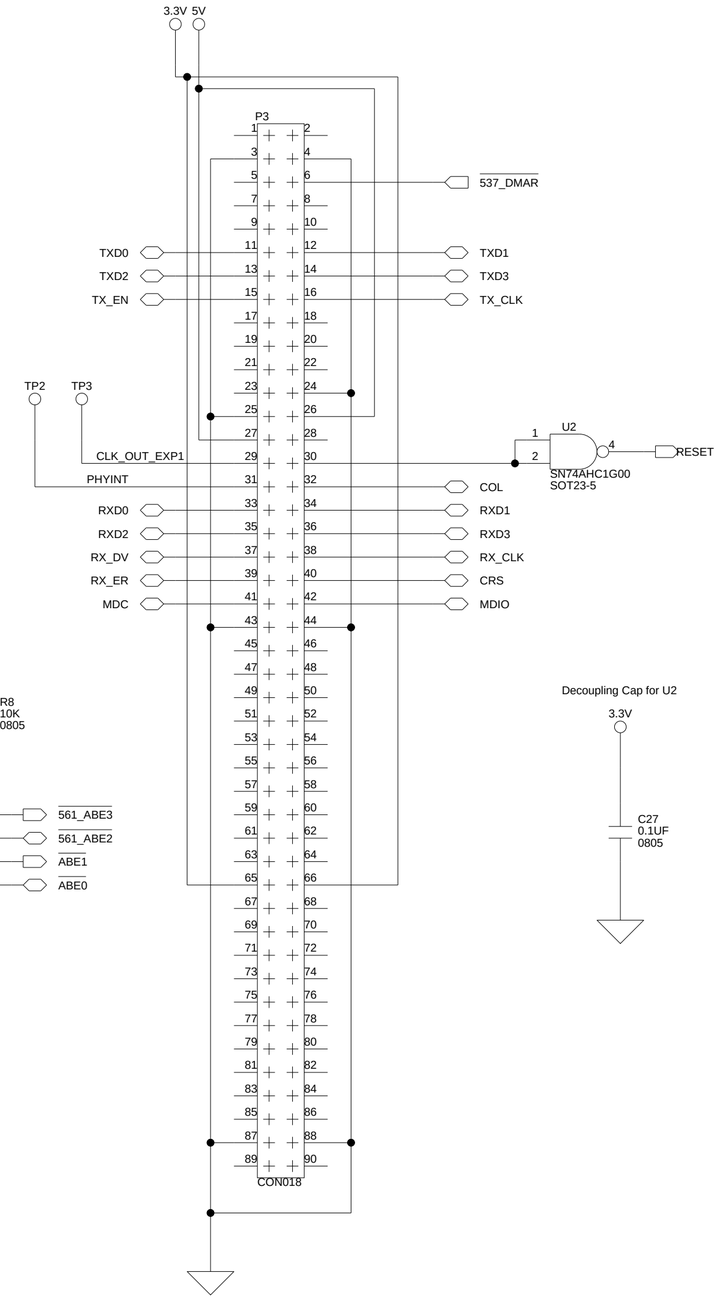
ANALOG DEVICES
20 Cotton Road
Nashua, NH 03063
PH: 1-800-ANALOGD

Title	BLACKFIN USB-LAN EZ-EXTENDER TITLE		
Size C	**Board No.** A0187-2003		**Rev** 2.1
Date 10-11-2007_16:18		**Sheet** 1 **of** 6	

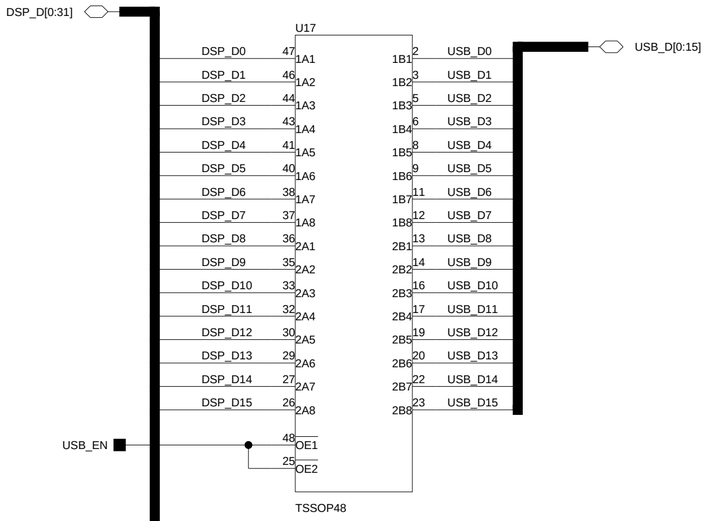
EXPANSION INTERFACE (TYPE B)

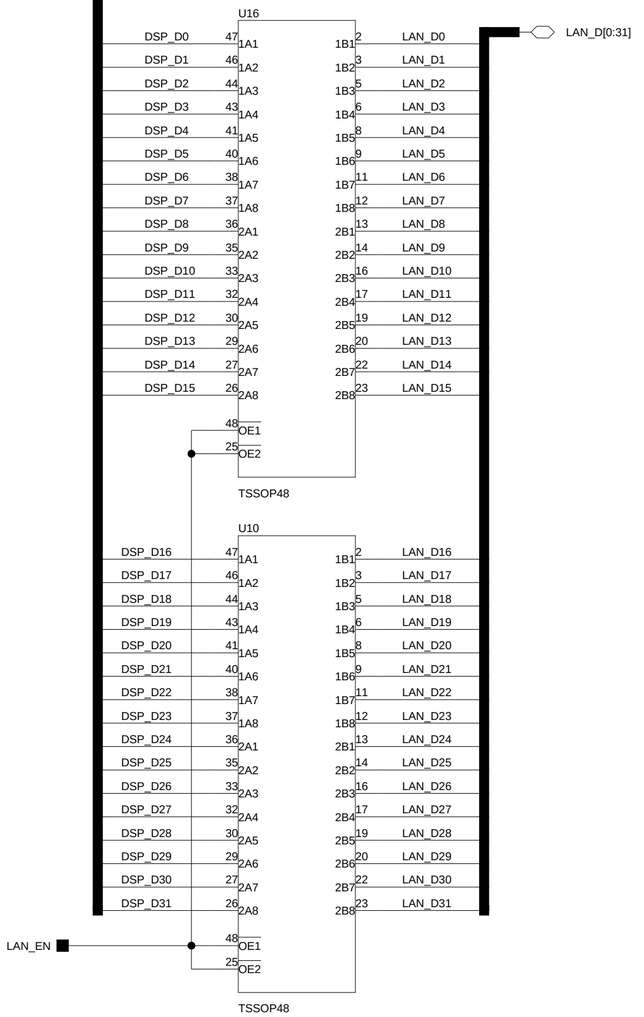


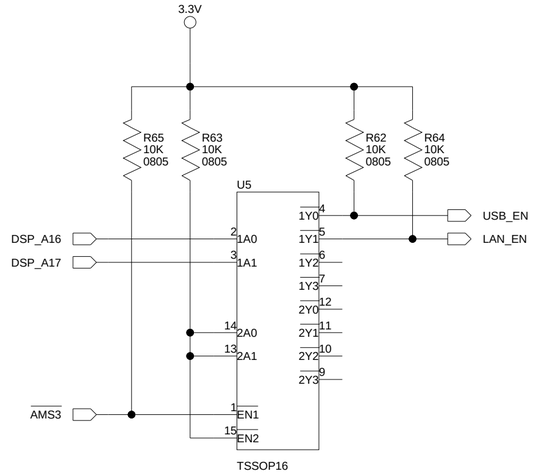


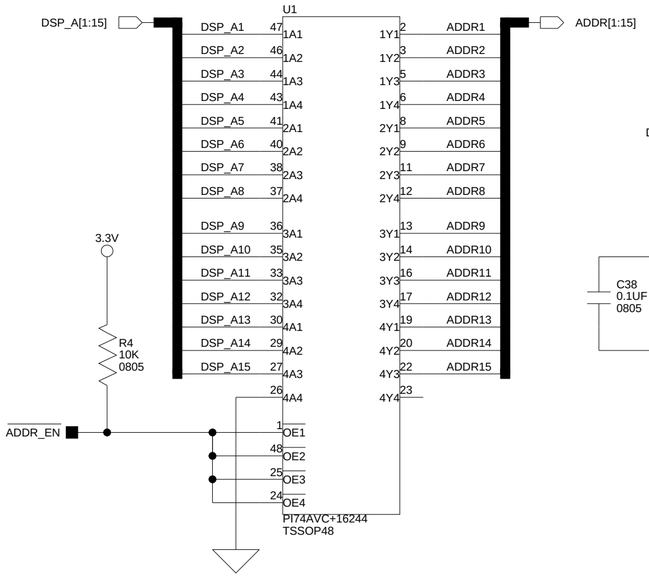


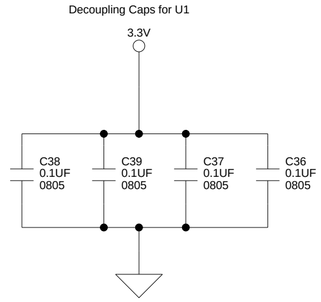
ANALOG DEVICES	20 Cotton Road Nashua, NH 03063 PH: 1-800-ANALOGD	
Title	BLACKFIN USB-LAN EZ-EXTENDER EXPANSION INTERFACE	
Size C	**Board No.** A0187-2003	**Rev** 2.1
Date 10-11-2007_16:18	**Sheet** 2 **of** 6	

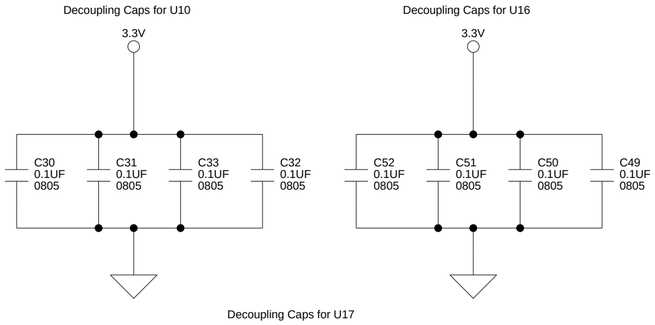


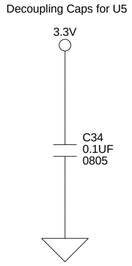


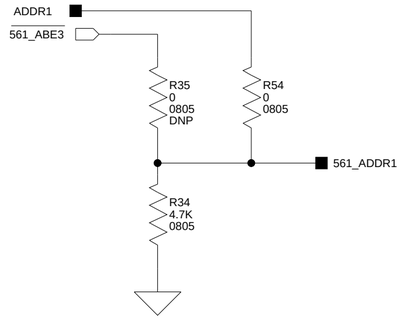












	* SW1.1 ON	SW1.1 OFF
ADDR_EN	U1 ENABLED	U1 HI-Z

	* SW1.2 ON	SW1.2 OFF
FLAG_EN	U12 ENABLED	U12 HI-Z

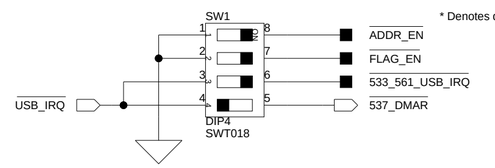
SEL=0 FOR BF561 USE

SEL=0 FOR BF537 USE

SEL=1 FOR BF533 USE

	SW1.3	SW1.4
533 OPERATION	* ON	* OFF
561 OPERATION	ON	OFF
537 OPERATION	ON	OFF

DEFAULT SETTING = ON



* Denotes default position

A17	A16	BF561 DSP ADDR RANGE	PERIPHERAL
0	0	0x2C00 0000 - 0x2C00 007F	USB
0	1	0x2C01 0000 - 0x2C01 FFFF	LAN
1	0	0x2C02 0000 - 0x2C02 FFFF	N/A
1	1	0x2C03 0000 - 0x2C03 FFFF	N/A

A17	A16	BF533/BF537 DSP ADDR RANGE	PERIPHERAL
0	0	0x2030 0000 - 0x2030 007F	USB
0	1	0x2031 0000 - 0x2031 FFFF	LAN
1	0	0x2032 0000 - 0x2032 FFFF	N/A
1	1	0x2033 0000 - 0x2033 FFFF	N/A

ANALOG DEVICES
20 Cotton Road
Nashua, NH 03063
PH: 1-800-ANALOGD

Title	BLACKFIN USB-LAN EZ-EXTENDER BUS SWITCHES	
Size C	Board No. A0187-2003	Rev 2.1
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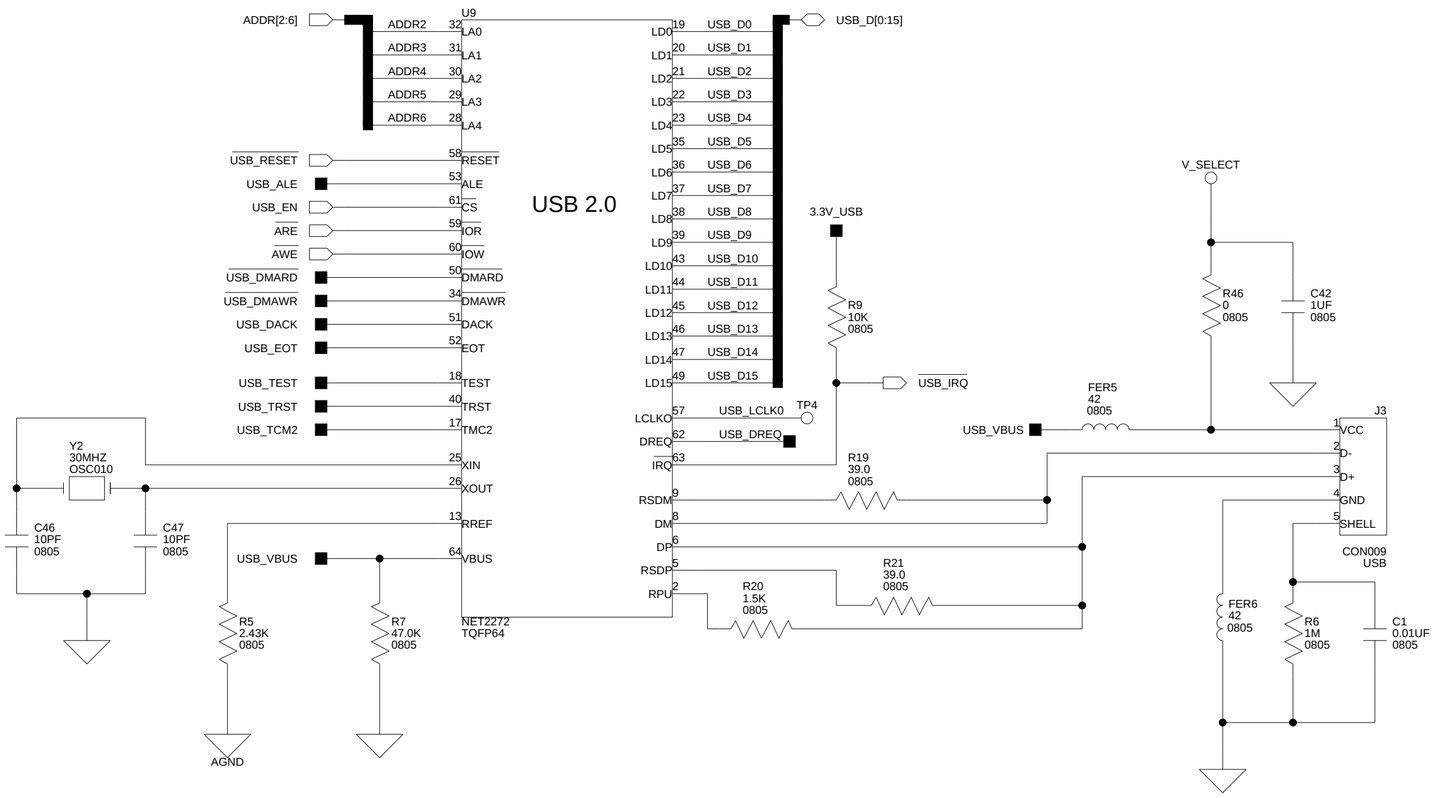

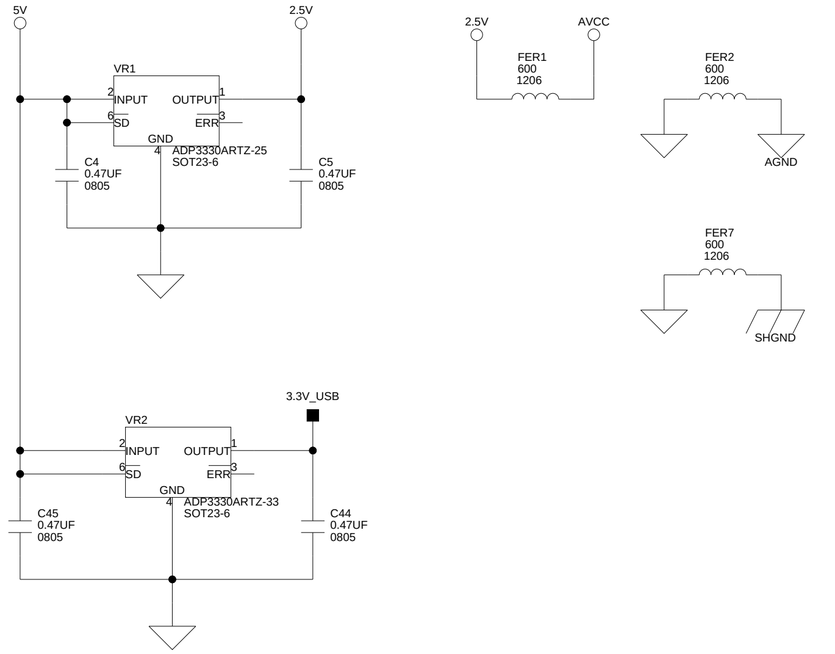

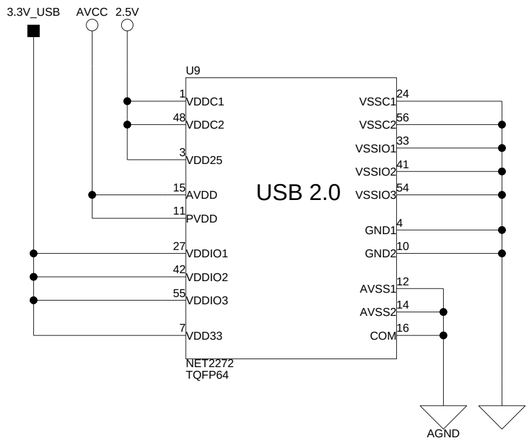

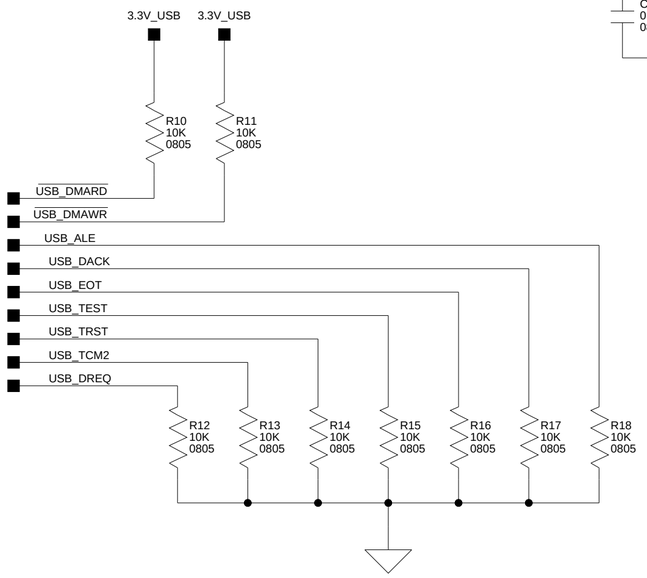

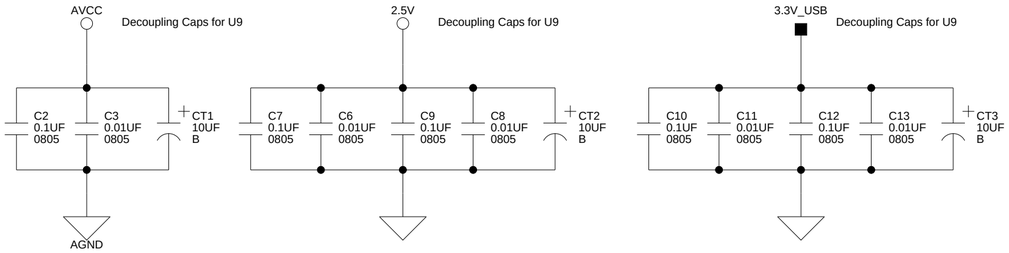

ANALOG DEVICES	20 Cotton Road Nashua, NH 03063 PH: 1-800-ANALOGD		
Title	BLACKFIN USB-LAN EZ-EXTENDER USB		
Size C	**Board No.** A0187-2003		**Rev** 2.1
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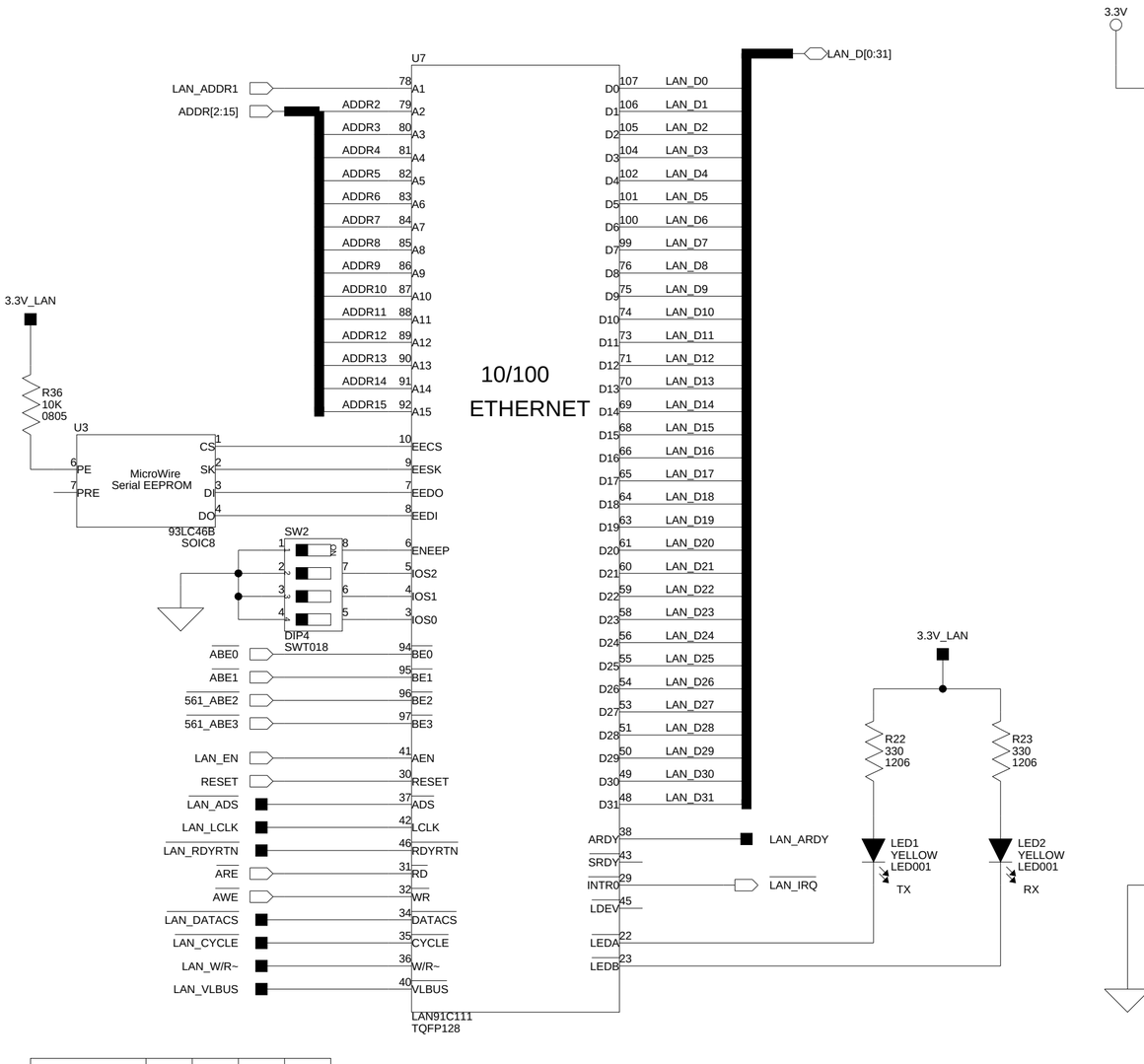
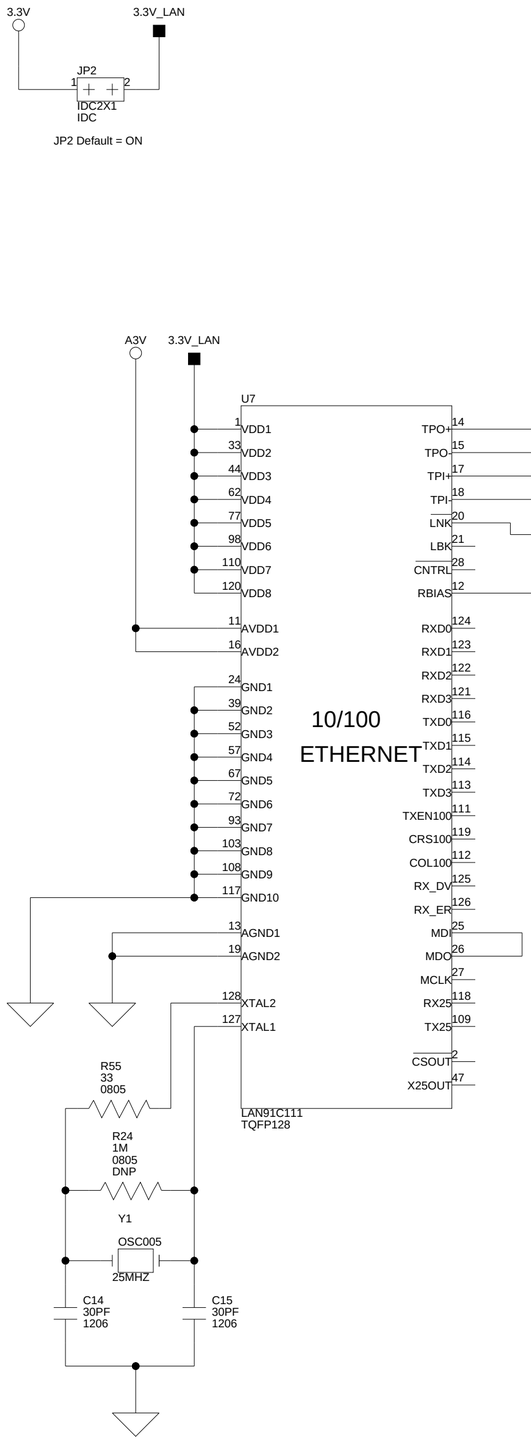
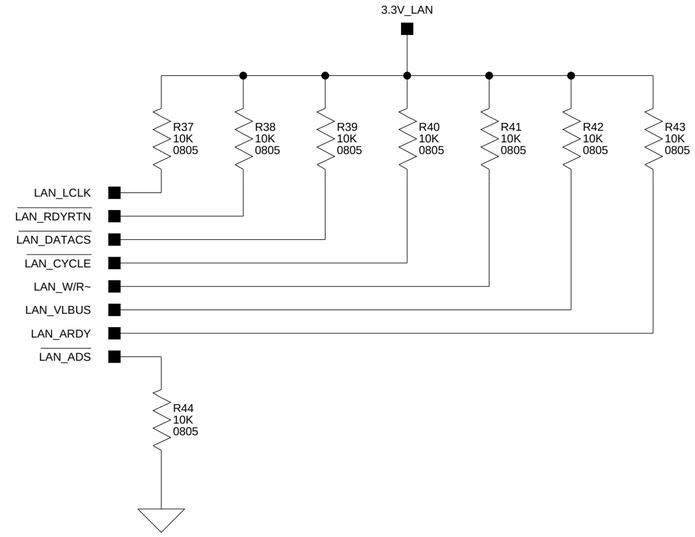






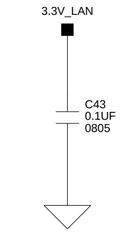
	SW2.1	SW2.2	SW2.3	SW2.4
EEPROM DISABLED	ON	X	X	X
* EEPROM ENABLED	OFF	X	X	X

* Denotes Default Setting

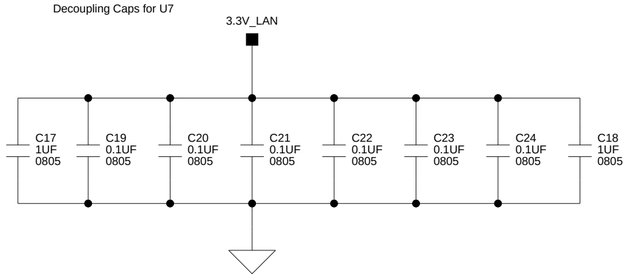
"X" DENOTES DON'T CARE VALUE

PLEASE REFER TO SMSC DATASHEET FOR MORE INFO ON IOS[2:0]

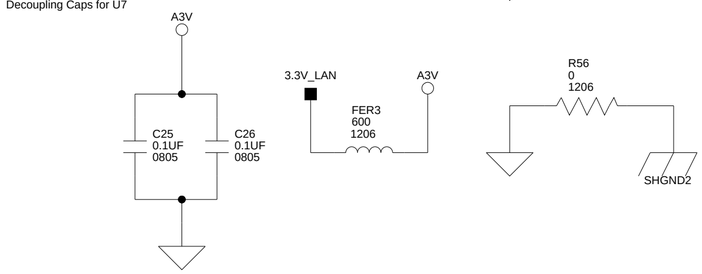
Decoupling Cap for U3



Decoupling Caps for U7



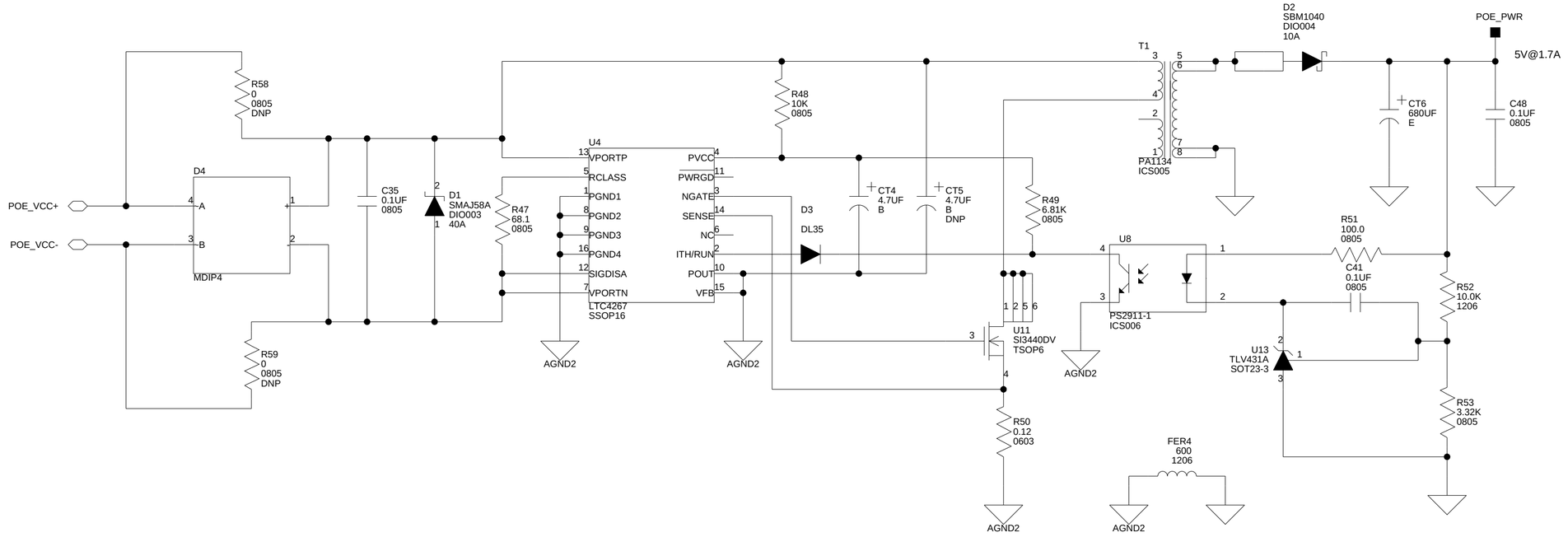
Decoupling Caps for U7



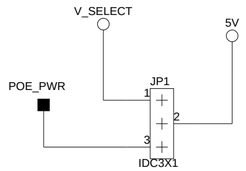
ANALOG DEVICES	20 Cotton Road Nashua, NH 03063 PH: 1-800-ANALOGD		
Title	BLACKFIN USB-LAN EZ-EXTENDER LAN		
Size C	Board No. A0187-2003		Rev 2.1
Date 10-11-2007_16:18		Sheet 5 of 6	

POWER OVER ETHERNET CIRCUITRY

FOR USE WITH ADSP-BF537 EZ-KIT LITE ONLY



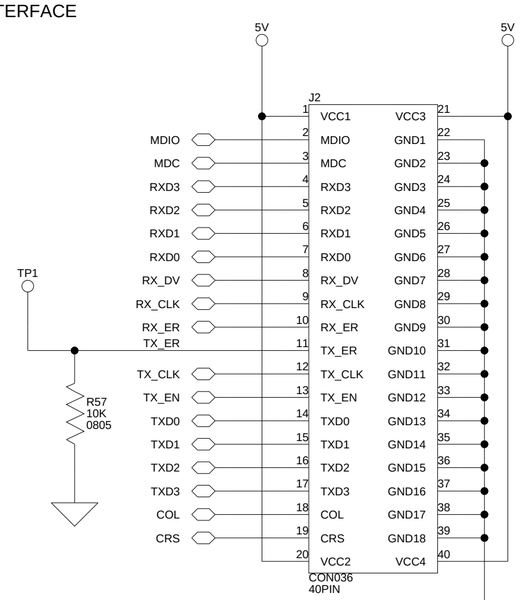
WARNING: THE EZ-KIT LITE MUST NOT BE POWERED WHEN THESE JUMPERS ARE POPULATED.



SOURCE OF 5V PWR	JP1 SETTING
EZ-KIT POWER	* NO JUMPER
USB TEST MODE	JP1 and JP2
POE POWER ADSP-BF537 EZ-KIT LITE ONLY	JP2 and JP3

*DENOTES DEFAULT SETTING

MII INTERFACE



FOR USE WITH ADSP-BF537 EZ-KIT LITE ONLY

ANALOG DEVICES

20 Cotton Road
Nashua, NH 03063
PH: 1-800-ANALOGD

Title	BLACKFIN USB-LAN EZ-EXTENDER POE, MII, PWR SELECTION		
Size C	**Board No.** A0187-2003		**Rev** 2.1
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