

# DSTINIs400/DSTINIs-00x Sockets Evaluation Board

[www.maxim-ic.com](http://www.maxim-ic.com)

## GENERAL DESCRIPTION

The TINI<sup>®</sup> sockets boards are motherboards designed to host the corresponding TINI evaluation module. The combination of the two boards allows full evaluation of the features of the target microprocessor. To evaluate the DS80C400, you only need to order the DS80C400-KIT. To evaluate the DS80C410 or DS80C411, you must order both the DSTINIm410# and the DSTINIs400# and use them together. The DSTINIm410# is used to evaluate both the DS80C410 and DS80C411.

Although various boards support different evaluation modules, the most popular is the DSTINIs400#. It includes a 144-pin SODIMM connector and provides 1-Wire<sup>®</sup>, CAN 2.0B, serial, and a 10/100 Ethernet PHY for connecting the DSTINIm400# or DSTINIm410# to the physical world.

The DSTINIm400# and DSTINIm410# are designed as modules to be plugged into the 144-pin SODIMM connector on the DSTINIs400#. All are fully assembled and, when used together in the correct combinations, they form a complete evaluation system for the network microcontroller. The DSTINIm400# and DSTINIm410# modules include the DS80C400 and DS80C410 network microcontrollers, a real-time clock, 1MB flash, 1MB static RAM, and support for an external Ethernet PHY for connecting to a wide variety of networks.

Detailed information about the initial setup process and use of the TINI platform is contained in *Application Note 612: Getting Started with the TINI400 (DS80C400) Verification Module*.

## ORDERING INFORMATION

PART	INPUT VOLTAGE*	USED WITH MODULE	DIMENSIONS
DSTINIs400		Replaced with DSTINIs400#	
DSTINIs400#	5V DC regulated	DSTINIm400	12cm x 10cm
DSTINIs-005	5V DC regulated	DSTINI1-1MG, DSTINI1-512	16cm x 10cm
DSTINIs-006	9V to 18V DC	DSTINI1-1MG, DSTINI1-512	16cm x 10cm

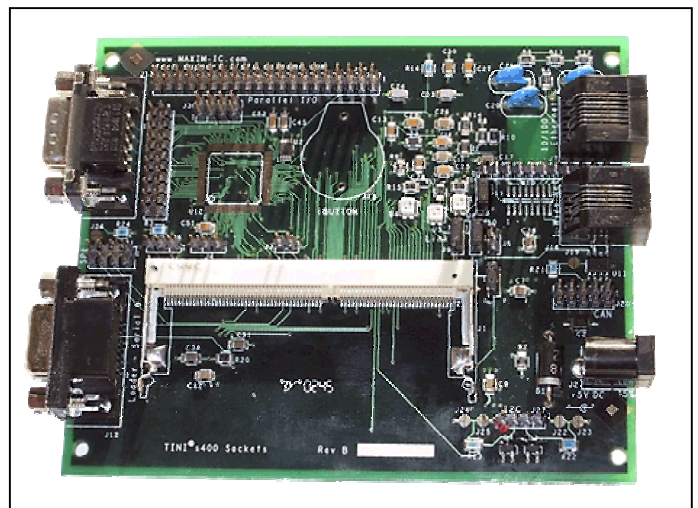
**Note:** The DSTINIm400 is an evaluation board and is only tested to prototype standards. It is not tested for use in a production product.

\*The user must supply an external power supply.

# Denotes a RoHS-compliant device that may include lead that is exempt under the RoHS requirements.

## FEATURES

- Hosts the TINI Runtime Environment in Validated Hardware Design (in Conjunction with the DSTINIm400)
- 10/100 Base-T Ethernet Port
- Two Serial Ports
- Dual 1-Wire Network Ports
- CAN 2.0B Port
- 5.0V Single-Supply Operation (DSTINIm400)
- Fully Assembled and Tested Design



## COMPONENT LIST

DESIGNATION	QTY	DESCRIPTION
C1	1	47pF capacitor (1206)
C2, C4, C5, C6	4	47µF tantalum capacitors (3528-21)
C3, C7, C9, C13, C15, C26, C28, C30, C38	9	100nF capacitors (1206)
C12, C14, C17, C19, C25, C27, C29, C33, C37	9	10nF capacitors (1206)
C8	1	220nF, 16V capacitor (1206)
C10, C31, C32, C34, C35, C36	6	1.0µF capacitors (1206)
C11	1	4.7µF capacitor (1206)

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**COMPONENT LIST (continued)**

DESIGNATION	QTY	DESCRIPTION
C16, C18	2	270pF capacitor (1206)
C20, C21, C22	3	1nF, 2kV radial capacitors (ceramic disk)
C23, C24	2	27pF capacitors (1206)
C40	1	0.10 $\mu$ F $\pm$ 10%, 50V capacitor (1206)
D1	1	1N5908 D0-201
D2	1	BAT54 SOT23
D3, D4	2	BAT54S SOT23
J1	1	SODIMM144 Molex 54698-7000
J2	1	2.5mm center, 5.5mm outside barrel connector
J3–J6, J20, J21, J27	7	Dual-row connectors, 0.025 square pins
J7	1	RJ-45 modular jack
J9, J10, J11	3	3 x 1-pin headers, 0.1 centers
J12	1	DB9 serial female
J13	1	DB9 serial male
J14	1	Pad jumper
J16	1	RJ11 modular jack
L1	1	22 $\mu$ H inductor
Q1	1	BSS84 SIPMOS FET SOT23
R1	1	205k $\Omega$ $\pm$ 1% resistor (1206)
R2	1	121k $\Omega$ $\pm$ 1% resistor (1206)
R3	1	10k $\Omega$ $\pm$ 5% resistor (1206)
R4–R7, R8, R10, R11, R12	8	49.9 $\Omega$ $\pm$ 1% resistors (1206)
R13, R9	2	47 $\Omega$ resistor (1206)
R14	1	22.1k $\Omega$ $\pm$ 1% resistor (1206)
R15, R17, R18	3	220 $\Omega$ resistors (1206)

DESIGNATION	QTY	DESCRIPTION
R16	1	10k $\Omega$ resistor (1206)
R19	1	Pad jumper
R20	1	47k $\Omega$ resistor (1206)
R21	1	124 $\Omega$ $\pm$ 1% resistor (1206)
R22, R23	2	1k $\Omega$ resistor (1206)
R24	1	10k $\Omega$ resistor (1206)
T1	1	BelFuse S558-5999-T7 transformer
U1	1	MAX1692 PWM step-down regulator
U3	1	Intel LXT972ALC Ethernet PHY
U4, U5, U6	3	Dialight 597-7741 LED
U7	1	MAX560CAI transceiver
U8	1	DS2480B serial 1-Wire line driver
U9	1	DS9502 ESD protection diode
U11	1	65HVD230D CAN transceiver
Y1	1	25.000MHz, HC49US
Z1, Z2, Z3	3	Ferrite bead, Fair-Rite 2512067007Y3
<b>UNPOPULATED COMPONENTS</b>		
J15	1	DS9094F iButton <sup>®</sup> Clip
J18, J28, J29, J30	1	Not used
U2	1	MAX1792EUA18 linear regulator
U10	1	DS2408 1-Wire 8-channel addressable switch
U12	1	Not used

*iButton is a registered trademark of Maxim Integrated Products, Inc.*

**JUMPERS (DSTINIs400)****Network Boot Jumper (J3)**

JUMPER	CONFIGURATION
1-2	DS80C400 attempts to boot through Ethernet using DHCP and TFTP

**DTR Reset Jumper (J14)**

JUMPER	CONFIGURATION
1-2	DTR reset communicates with the DS80C400 loader application.

**Quiet Boot Jumper (J5)**

JUMPER	CONFIGURATION
1-2	DS80C400 boots without sending loader information to serial port.

**DSTINIs400 Ethernet Configuration Jumpers (J9, J10, J11)**

AUTO-NEGOTIATION	SPEED (Mbps)	DUPLEX	J9	J10	J11
Disabled	10	Half	2-3 (L)	2-3 (L)	2-3 (L)
		Full	2-3 (L)	2-3 (L)	1-2 (H)
	100	Half	2-3 (L)	1-2 (H)	2-3 (L)
		Full	2-3 (L)	1-2 (H)	1-2 (H)
Enabled	100 Only	Half	1-2 (H)	2-3 (L)	2-3 (L)
		Full/Half	1-2 (H)	2-3 (L)	1-2 (H)
	10/100	Half Only	1-2 (H)	1-2 (H)	2-3 (L)
		Full or Half	1-2 (H)	1-2 (H)	1-2 (H)

**PIN HEADERS**

CONNECTOR	DESCRIPTION
J18	<b>Recreated I/O Port.</b> Latched from 1-Wire bus. Requires installation of DS2408. See schematic.
J20	<b>CAN Bus.</b> See schematic for pinout.
J21	<b>SPI™ Bus.</b> See schematic for pinout. Alternately provides connection to P5.4–P5.7
J27	<b>I<sup>2</sup>C Bus.</b> See schematic for pinout. Alternately provides connection to P1.0 and P1.1.
J28, J29, J30	<b>Unused.</b> No user-accessible pins available.

**QUICK START****Recommended Equipment**

The sockets board requires an external power supply and cables as needed to access the desired features of the board. The 5V DC power supply is mandatory, but the other cables are required only if that feature is to be used. The specific example shown here is for a DSTINIm400#/DSTINIs400# system.

**Hardware:****5V DC Power Supply**

Input Voltage: per customer requirements

Output Voltage: 5V DC  $\pm$ 10%

Output Current: >150mA

Polarization: Positive Center

Output Plug Type: 2.5mm I.D. x 5.5mm O.D. x 12mm female (P-6)

Example: Digi-Key ([www.digikey.com](http://www.digikey.com)) part number T309-P6P-ND (110V input), 5V DC power

**Ethernet Cable:**

Note: There are two types of Ethernet cable. For connection to a router or hub, use a standard "straight-through" Ethernet cable. For direct connection to an Ethernet port on the back of a PC, use a "crossover" Ethernet cable. A crossover cable is specially made for two-computer networking. These cables can be purchased from almost any computer or electronics store.

Example (straight-through): Radio Shack ([www.radioshack.com](http://www.radioshack.com)) Cat 5E (3ft) Network Cable, part number 278-1763

Example (crossover): Radio Shack Cat 5E (3m) Crossover Cable, part number 278-2011

**RS-232C Serial Cable (DB9 Male to DB9 Female):**

This cable is straight-through, not a null-modem (crossover). These cables can be purchased from any computer or electronics store.

**Important Note Regarding U12**

Component U12 is not placed on the product as supplied by Maxim, nor is it available for sale from Maxim. Inclusion of this component and related circuitry in the schematic is intended to demonstrate one method to add I/O expansion capability to the DSTINIs400, but the implementation details are left to the user; any modification of the product is not guaranteed or supported by Maxim. For more information on the possible uses of component U12, refer to *Application Note 3664: Expanding TINI's I/O Capability* and *Application Note 3412: TINIs400 External Serial Port Reference Design*.

**MORE INFORMATION**

TINI platform details can be found at [www.maxim-ic.com/TINI](http://www.maxim-ic.com/TINI). The *TINI Specification and Developer's Guide* (Addison-Wesley, 2001) is an invaluable resource when developing with the TINI platform. Download a free copy from our website at [www.maxim-ic.com/TINIGuide](http://www.maxim-ic.com/TINIGuide).

**ADDITIONAL RESOURCES**

For detailed information about the initial setup and use of the TINI platform, refer to *Application Note 612: Getting Started with the TINIm400 (DS80C400) Verification Module* at [www.maxim-ic.com/AN612](http://www.maxim-ic.com/AN612).

DS80C400 Network Microcontroller Data Sheet: [www.maxim-ic.com/DS80C400](http://www.maxim-ic.com/DS80C400)

DS80C410 Networked Microcontroller Data Sheet: [www.maxim-ic.com/DS80C410](http://www.maxim-ic.com/DS80C410)

DS80C400 Evaluation Kit (DS80C400-KIT): [www.maxim-ic.com/DS80C400-KIT](http://www.maxim-ic.com/DS80C400-KIT)

DSTINIm400 Networked Microcontroller Evaluation Board: [www.maxim-ic.com/DSTINIm400](http://www.maxim-ic.com/DSTINIm400)

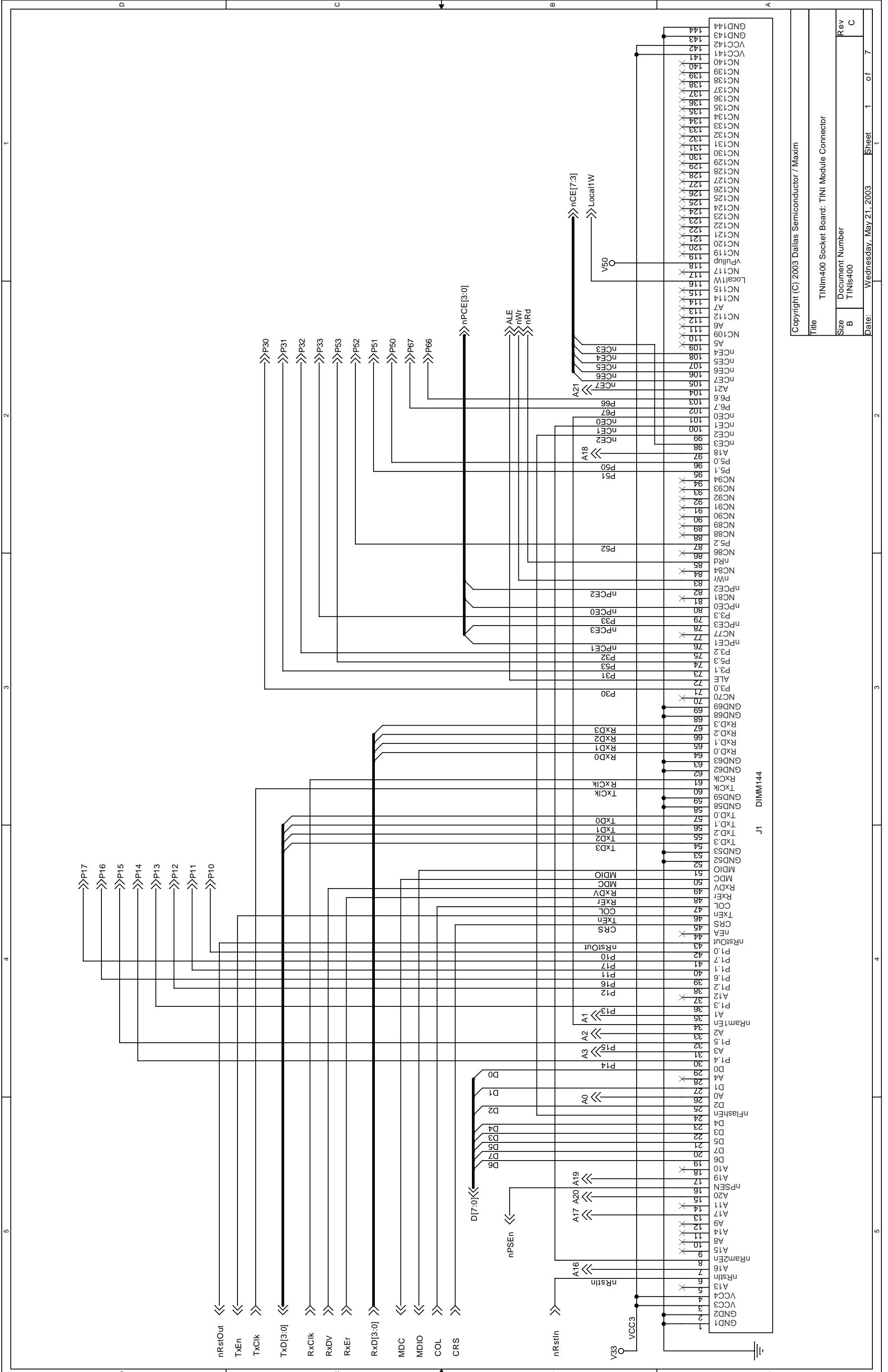
DSTINIm410 Networked Microcontroller Evaluation Board: [www.maxim-ic.com/DSTINIm410](http://www.maxim-ic.com/DSTINIm410)

Microcontroller Website: [www.maxim-ic.com/microcontrollers](http://www.maxim-ic.com/microcontrollers)

*SPI is a trademark of Motorola, Inc.*

**REVISION HISTORY**

<b>REVISION DATE</b>	<b>DESCRIPTION</b>	<b>PAGES CHANGED</b>
100906	Updated the <i>Component List</i> .	1, 2
	Replaced the Auto Negotiation Jumper (J9), 10/100Mb Ethernet Jumper (J10), and Full-Duplex Jumper (J11) sections with the <i>DSTINIs400 Ethernet Configuration Jumpers (J9, J10, J11)</i> section.	3
121406	Added “#” to the end of DSTINIs400 references	1, 3
	Updated <i>Ordering Information</i> table and added note that the DSTINIm400 is only tested to prototype standards.	1
070507	Changed the <i>DTR Reset Jumper (J4)</i> to <i>DTR Reset Jumper (J14)</i> section.	2
061608	In the <i>Component List</i> , changed the description for C2, C4, C5, C6; added “(ceramic disk)” to C20, C21, C22 description.	1, 2



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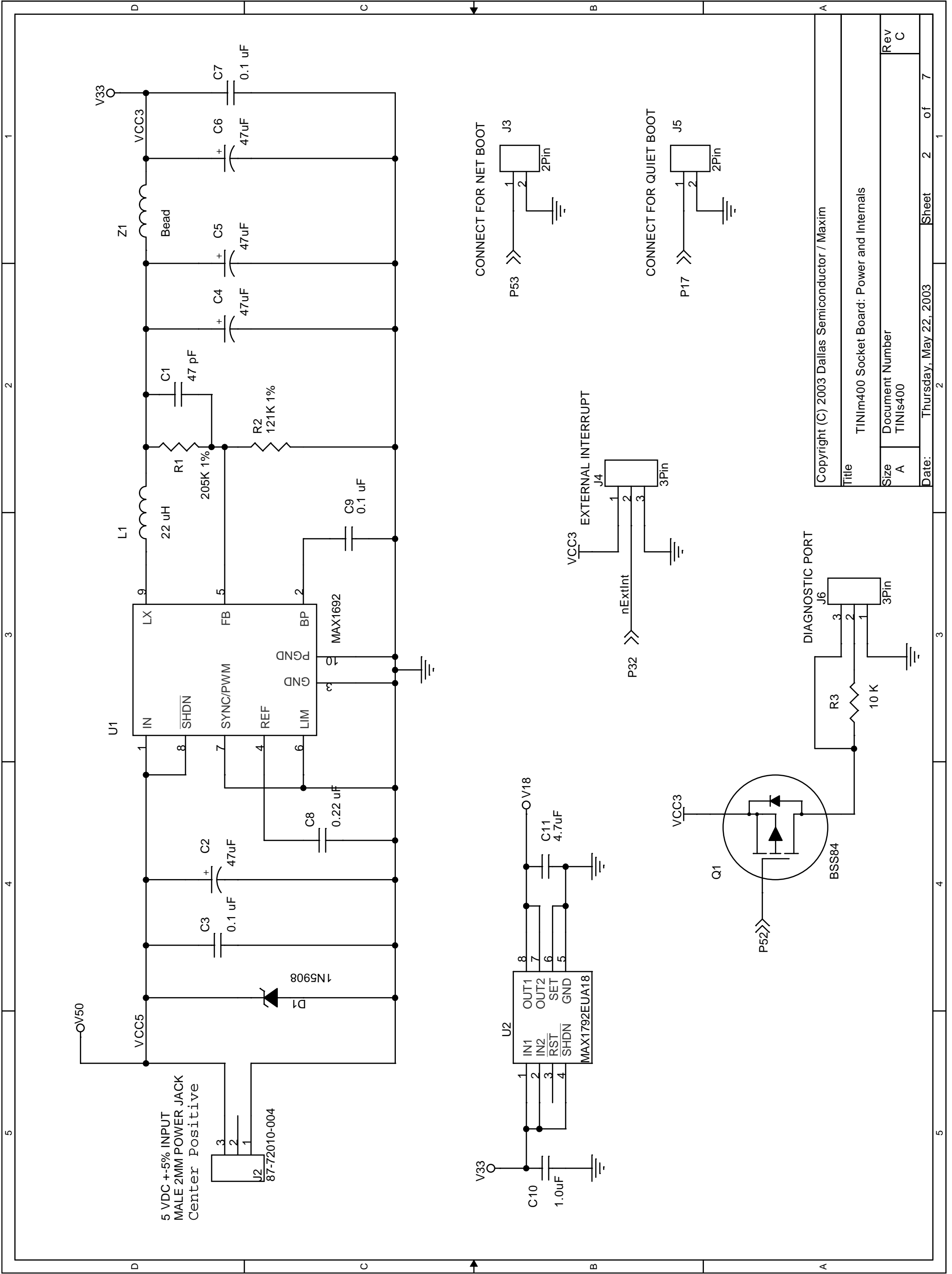
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Date: Wednesday, May 21, 2003 Sheet 1 of 7

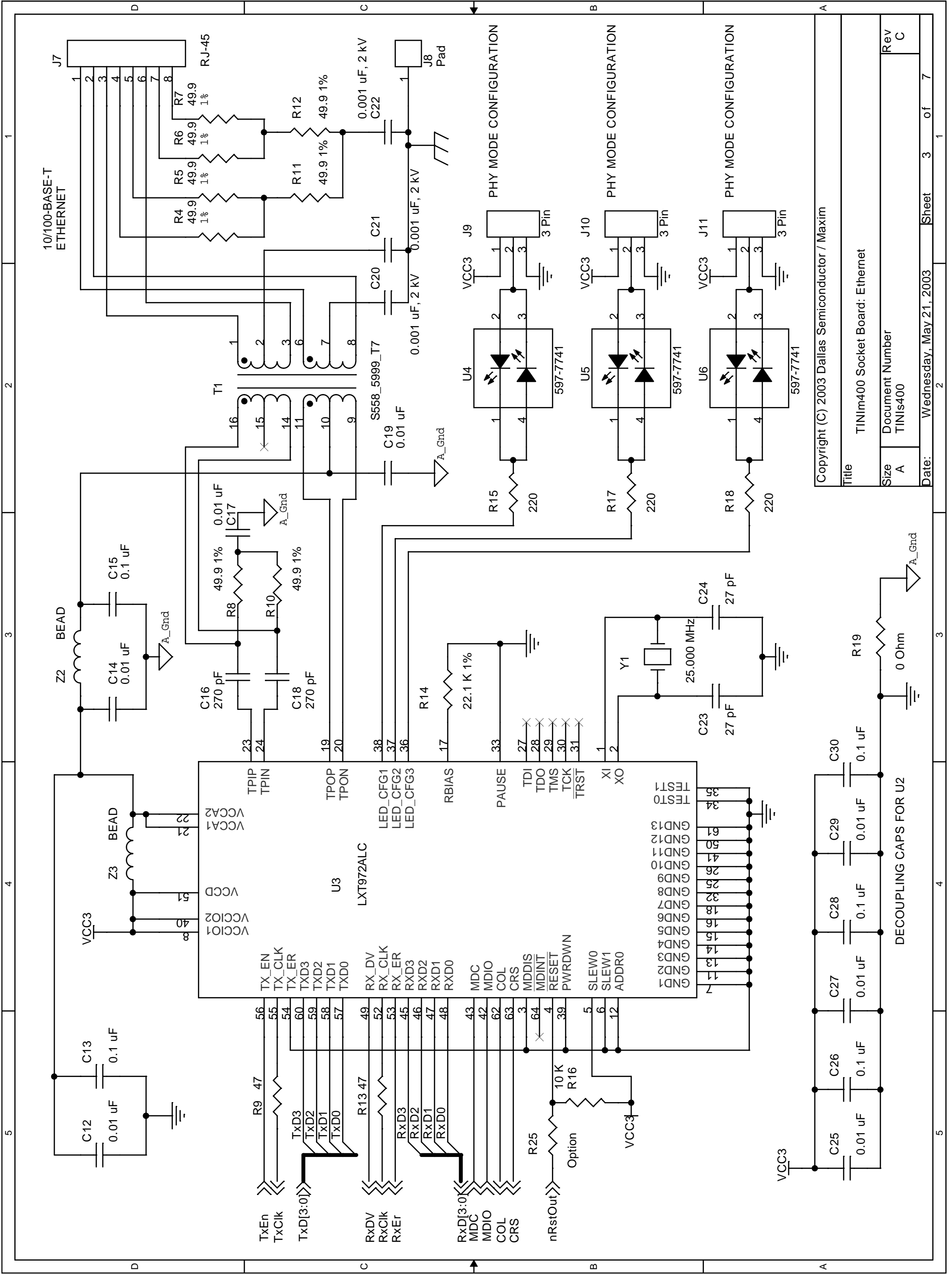
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A B C D

1 2 3 4 5



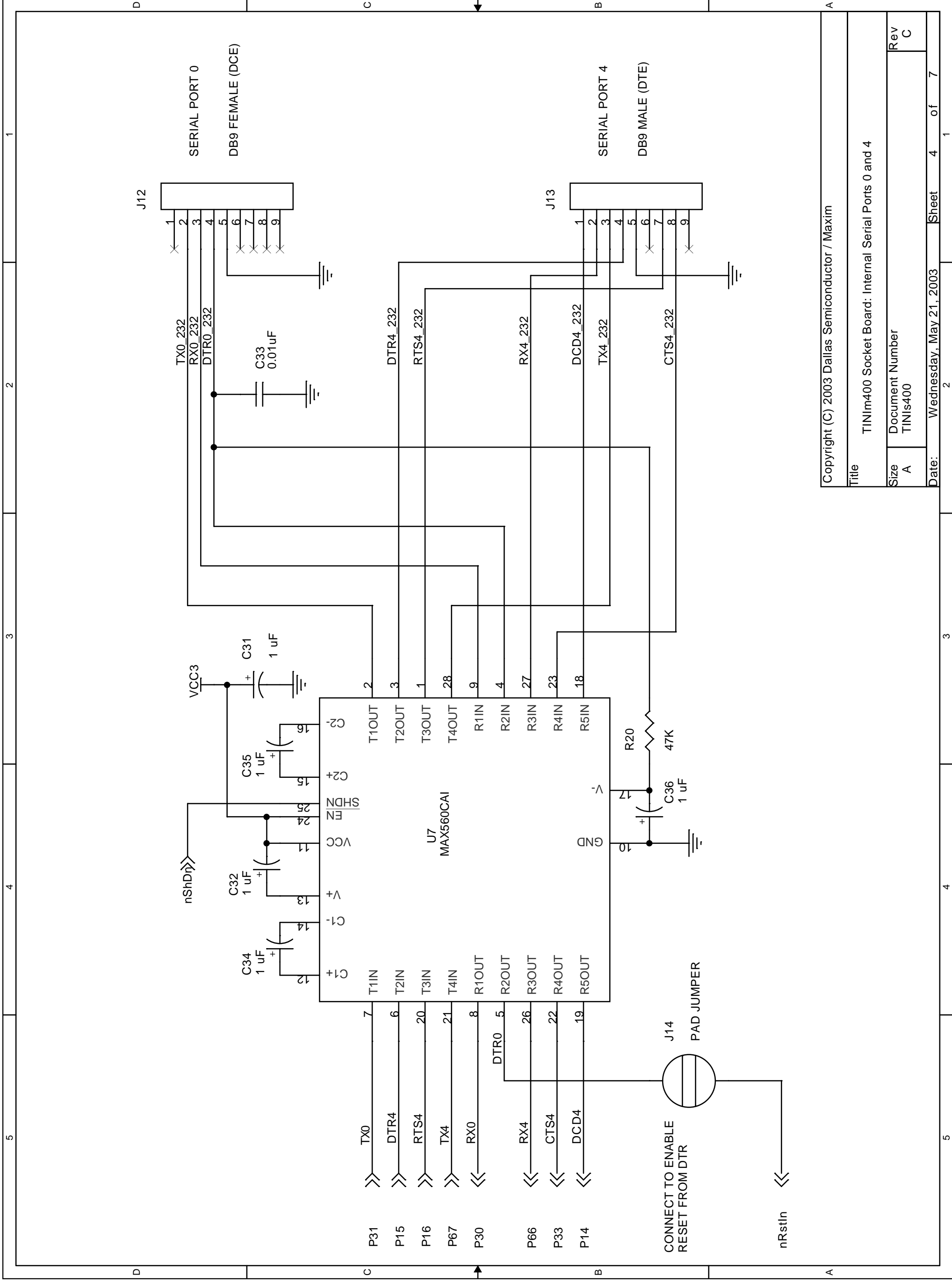
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Size	Document Number
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Date:	Thursday, May 22, 2003
Sheet	2 of 7
Rev	C



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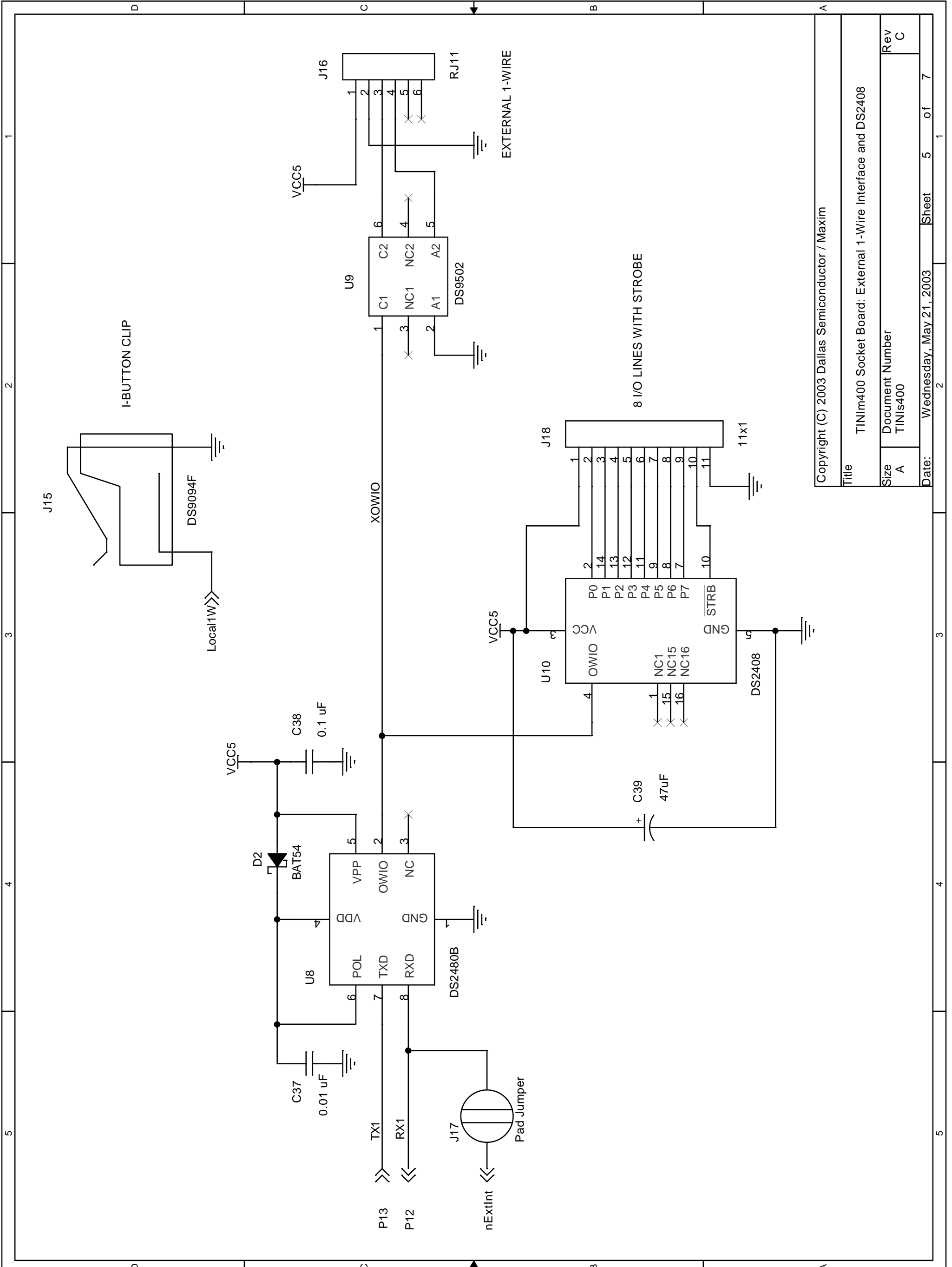
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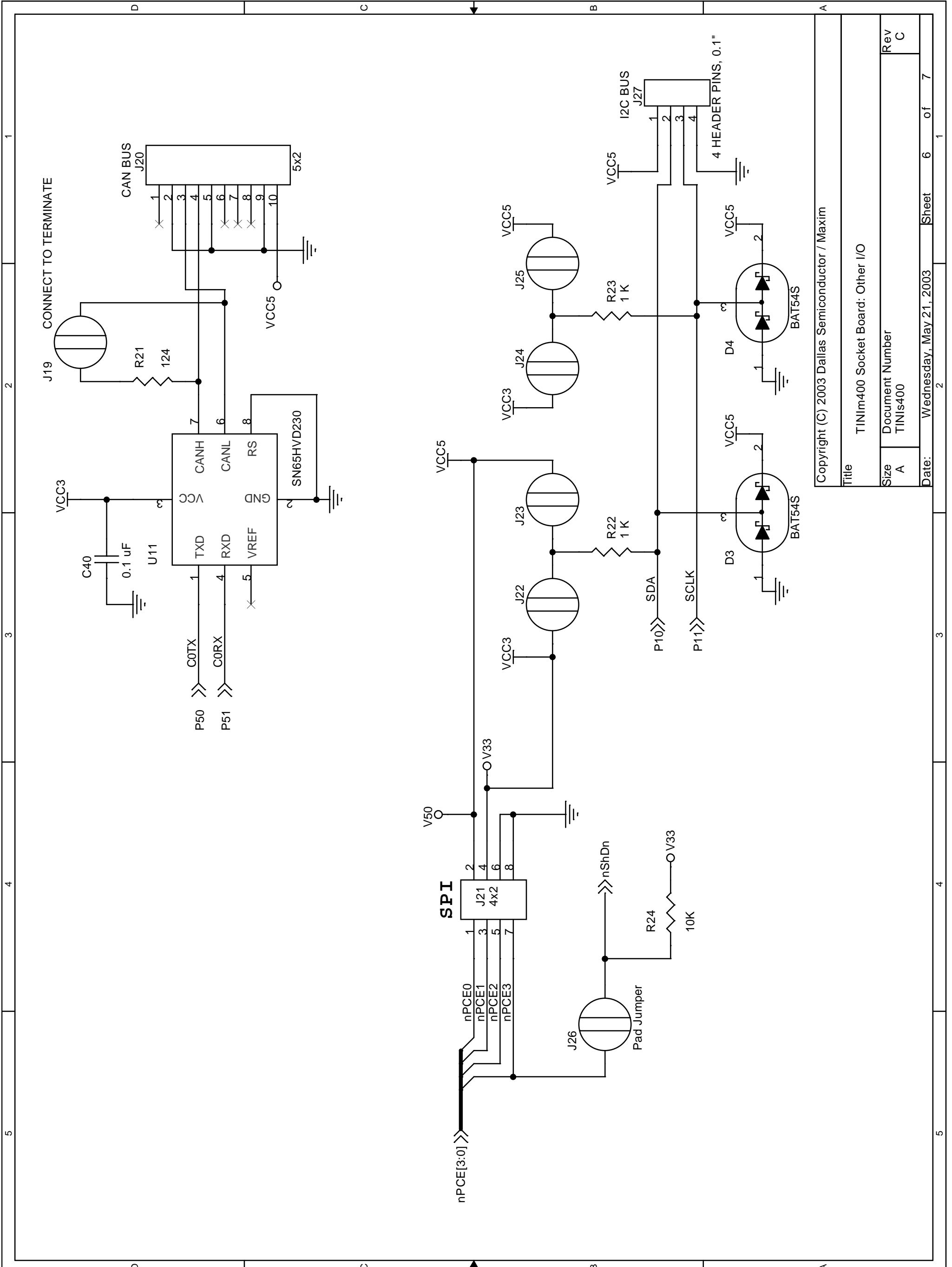
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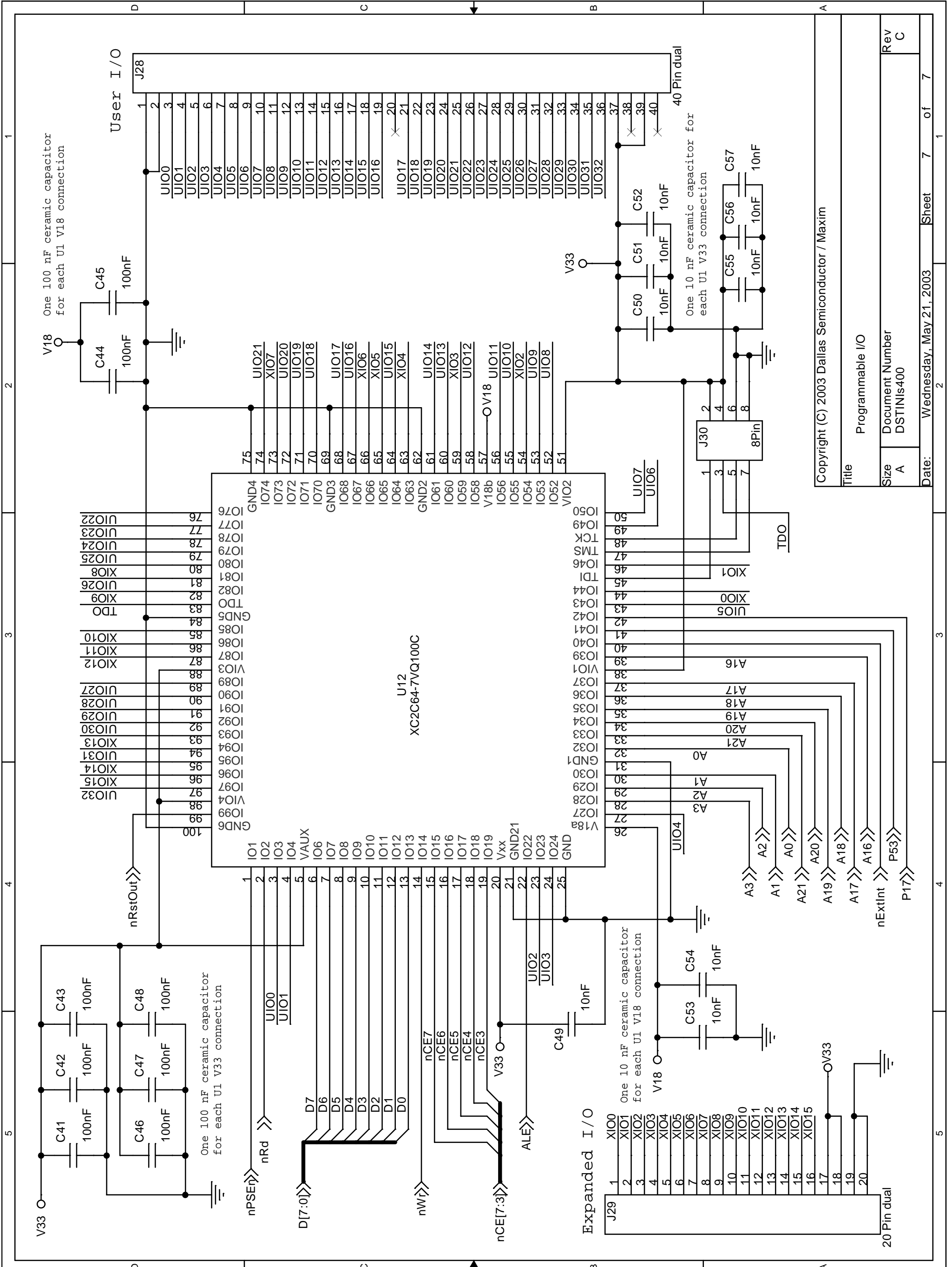


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Size	Document Number	Rev	
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Size	Document Number
A	TINIs400
Rev	C
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Title	Programmable I/O
Size	Document Number DSTINIs400
Rev	C