

OPERATIONS MANUAL

PPM-10/100

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REVISION HISTORY

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ECO Number	Date Code	Rev Level
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1 GENERAL INFORMATION

1.1 Features

- IEEE 802.3 10BASE-T and 100BASE-TX compatible
- Intel 82559 single-chip controller for increased performance and reliability
- 10/100 auto-negotiation provides flexible support for Ethernet, Fast Ethernet and mixed bandwidth networks.
- PC/104Plus 5 volt compatible
- Full driver suite for broad compatibility, flexibility, and advanced functionality for Windows 95, 98, UNIX, Netware, Windows NT and Linux
- Full duplex allows for two-way transmission between nodes for up to 200Mbps on Fast Ethernet segments.
- -40° to +85° C operating temperature
- Socket for Intel boot agent firmware provided
- Software compatible with the Intel PRO/100+ family of PCI ethernet adapters

1.2 Introduction

The PPM-10/100 is an auto-negotiating PC/104Plus Ethernet adapter. The PPM-10/100 utilizes the popular Intel 82559 single-chip controller which integrates both the Media Access Controller (MAC) and the physical layer (PHY) on a single chip. The 82559 is a full bus mastering controller and also incorporates 6K of buffer memory. Full duplex operation provides throughput of up to 200Mbps on fast ethernet segments. The module is compatible with the PC/104Plus 5 volt bus specification.

Intel provides a vast array of driver support for all of the popular network operating systems including : Windows CE, Windows 95, Windows 98, Windows 98SE, Windows ME, Windows NT, Windows 2000, Novell Netware 3.11- 4.1, Solaris, Linux, and Unix.

The optional Intel Boot Agent firmware allows for remote booting of the system for O/S's that support BOOTP or the PXE 2.0 or 2.1 specification. Some versions of the Boot Agent also include support for remote Program Load (RPL) runtime and loader software.

The PPM-10/100 is a full plug and play board which must be used with a CPU board with a Plug and play BIOS which will assign the necessary I/O, Memory, DMA, and IRQ resources required by the board.

1.3 Specifications

1.3.1 Electrical

PC/104Plus Bus : 32-bit ,5 volt
PC/104 Bus : 16-bit, stackthrough
VCC : +5V 270mA typical
Wiring : Cat5 2PR

1.3.2 Mechanical

Dimensions : 3.6" X 3.8" (90mm x 96mm)
PC Board : FR4, 4 layer epoxy glass with screened component legend and plated through holes
Jumpers : 0.025" square posts on 0.10" centers
Connectors : Ethernet : RJ-45
PC/104 Bus : 74-Pin SAMTEC type ESQ-132-12-G-D
40-Pin SAMTEC type ESQ-120-12-G-D
PC/104Plus Bus : COMM CON 50808-120Q

1.3.3 Environmental

Operating Temperature : -40° to +85°
Non-condensing relative humidity: 5% to 95%

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PPM-10/100 TECHNICAL REFERENCE

2.1 Introduction

This section of the manual is intended to provide sufficient information regarding the configuration and usage of the PPM-10/100 board. WinSystems maintains a Technical Support Group to help answer questions regarding configuration, or usage of the board. For answers to questions not adequately addressed in this manual, contact Technical Support at (817) 274-7553 between 8AM and 5PM Central Time.

2.2 Intel 82559 Ethernet Controller

The 82559 is part of Intel's second generation family of fully integrated 10BASE-T/100BASE-TX LAN solutions. The 82559 consists of both the Media Access Controller (MAC) and the physical layer (PHY) combined into a single component solution.

The 82559 is a 32-bit PCI controller that features enhanced scatter-gather bus mastering capabilities which enables it to perform high-speed data transfers over the PCI bus. The 82559 bus master capabilities enable the component to process high level commands and perform multiple operations off-loading communications tasks from the system CPU. Two large transmit and receive FIFOs of 3 Kbytes each help prevent data underruns and overruns, allowing the 82559 to transmit data with minimum inter-frame spacing (IFS).

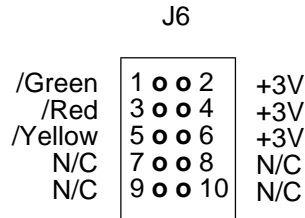
The 82559 can operate in either full duplex or half duplex mode. In full duplex mode the 82559 adheres to the IEEE 802.3x Flow Control specification. Half duplex performance is enhanced by a proprietary collision reduction mechanism.

The 82559 includes a simple PHY interface to the wire transformer at rates of 10BASE-T and 100BASE-TX, and auto-negotiation for speed, duplex, and flow control. The 82559 also includes an interface to a serial EEPROM. The EEPROM provides power-on initialization for hardware and software configuration parameters. The 82559 is 100% PnP compatible and is configured through this interface. Ethernet connection to the PPM-10/100 is provided via the RJ-45 connector at J2.

There are three ethernet status LEDs at D1, D2, and D3. The color and function of each is listed below :

- D1 - (Green) Ethernet Activity
- D2 - (Red) Speed indication, lit = 100BASE-TX
- D3 - (Yellow) Link Active

The PPM-10/100 also provides for a factory installed connector supporting remote mounted LEDs using a 10-pin connector populated at J6. The pin definitions for this connector are shown here :



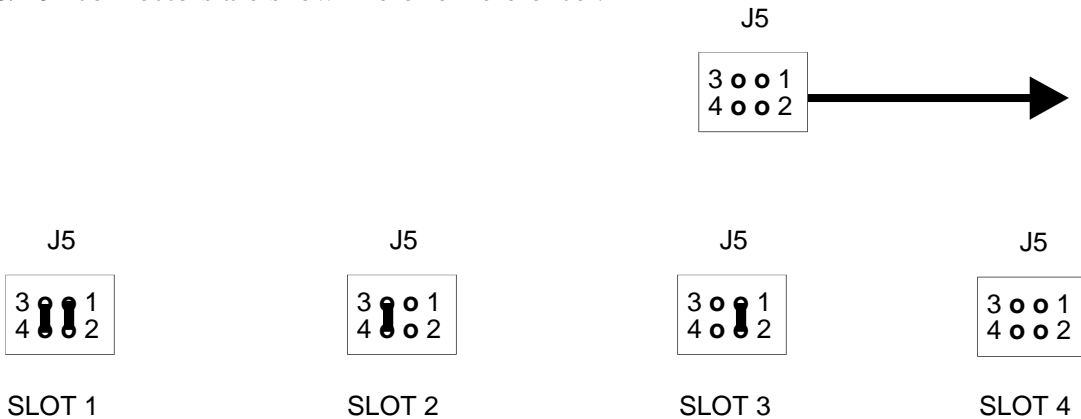
NOTE : when attaching external LED's via J6 the onboard LED's at D1, D2, and D3 must be removed.

2.3 PC/104Plus Slot Selection

J5 is used to select the "slot" number of the PCI connection for the board. Each PC/104Plus board installed in a system must have a unique "slot" assignment and must not conflict with any PCI "slot" assignments on the CPU card. The jumperings for J5 are shown here :

2.4 PC/104 Bus Pin Definitions

J3 and J4 are the PC/104 Bus connectors. The PPM-10/100 does not use any connections to the PC/104 bus but provides the connectors to allow stacking of PC/104 modules. The pin definitions for the PC/104 connectors are shown here for reference :



2.5 PC/104Plus Pin Definitions

J1 is the PC/104Plus bus connector. The pin definitions for this connector are shown here for reference:

J3				J4					
GND	B1	o	A1	IOCHK	GND	C0	o	D0	GND
RESET	B2	o	A2	BD7	SBHE	C1	o	D1	MEMCS16
+5V	B3	o	A3	BD6	LA23	C2	o	D2	IOCS16
IRQ9	B4	o	A4	BD5	LA22	C3	o	D3	IRQ10
-5V	B5	o	A5	BD4	LA21	C4	o	D4	IRQ11
DRQ2	B6	o	A6	BD3	LA20	C5	o	D5	IRQ12
-12V	B7	o	A7	BD2	LA19	C6	o	D6	IRQ15
OWS	B8	o	A8	BD1	LA18	C7	o	D7	IRQ14
+12V	B9	o	A9	BD0	LA17	C8	o	D8	DACK0
GND	B10	o	A10	IOCHRDY	MEMR	C9	o	D9	DRQ0
MEMW	B11	o	A11	AEN	MEMW	C10	o	D10	DACK5
MEMR	B12	o	A12	SA19	SD8	C11	o	D11	DRQ5
IOW	B13	o	A13	SA18	SD9	C12	o	D12	DACK6
IOR	B14	o	A14	SA17	SD10	C13	o	D13	DRQ6
DACK3	B15	o	A15	SA16	SD11	C14	o	D14	DACK7
DRQ3	B16	o	A16	SA15	SD12	C15	o	D15	DRQ7
DACK1	B17	o	A17	SA14	SD13	C16	o	D16	VCC
DRQ1	B18	o	A18	SA13	SD14	C17	o	D17	MASTER
REFRESH	B19	o	A19	SA12	SD15	C18	o	D18	GND
SYSCLK	B20	o	A20	SA11	KEY	C19	o	D19	GND
IRQ7	B21	o	A21	SA10					
IRQ6	B22	o	A22	SA9					
IRQ5	B23	o	A23	SA8					
IRQ4	B24	o	A24	SA7					
IRQ3	B25	o	A25	SA6					
DACK2	B26	o	A26	SA5					
TC	B27	o	A27	SA4					
BALE	B28	o	A28	SA3					
+5V	B29	o	A29	SA2					
OSC	B30	o	A30	SA1					
GND	B31	o	A31	SA0					
GND	B32	o	A32	GND					

Pin	A	B	C	D
1	GND/5.0 KEY	Reserved	+5	AD00
2	VI/O	AD02	AD01	+5V
3	AD05	GND	AD04	AD03
4	C/BE0*	AD07	GND	AD06
5	GND	AD09	AD08	GND
6	AD11	VI/O	AD10	M66EN
7	AD14	AD13	GND	AD06
8	+3.3V	C/BE1*	AD15	+3.3V

9	SERR*	GND	SB0*	PAR
10	GND	PERR*	+3.3V	SDONE
11	STOP*	+3.3V	LOCK*	GND
12	+3.3V	TRDY*	GND	DEVSEL*
13	FRAME*	GND	IRDY*	+3.3V
14	GND	AD16	+3.3.V	C/BE3*
15	AD18	+3.3V	AD17	GND
16	AD21	AD20	GND	AD19
17	+3.3V	AD23	AD22	+3.3V
18	IDSEL0	GND	IDSEL1	IDSEL2
19	AD24	C/BE3*	VI/O	IDSEL3
20	GND	AD26	AD25	GND
21	AD29	+5V	AD28	AD27
22	+5V	AD30	GND	AD31
23	REQ0*	GND	REQ1*	VI/O
24	GND	REQ2*	+5V	GNT0*
25	GNT1*	VI/O	GNT2*	GND
26	+5V	CLK0	GND	CLK1
27	CLK2	+5V	CLK3	GND
28	GND	INTD*	+5V	RST*
29	+12V	INTA*	INTB*	INTC*
30	-12V	Reserved	Reserved	GND/3.3V KEY

2.6 PPM-10/100 Software/Driver Support

The PPM-10/100 is software compatible with the Intel line of Pro 100+ PCI adapters.

The PPM-10/100 is supported by a number of network operating systems directly. Intel provides the latest drivers through their web site at :

<http://support.intel.com/support/network/adapter/pro100/pro100plus/index.htm>

Alternately, most drivers will be available from the WinSystems site at :

http://www.winsystems.com/resources/appnotes/ftp/ebctx_drivers/100pdisk.exe

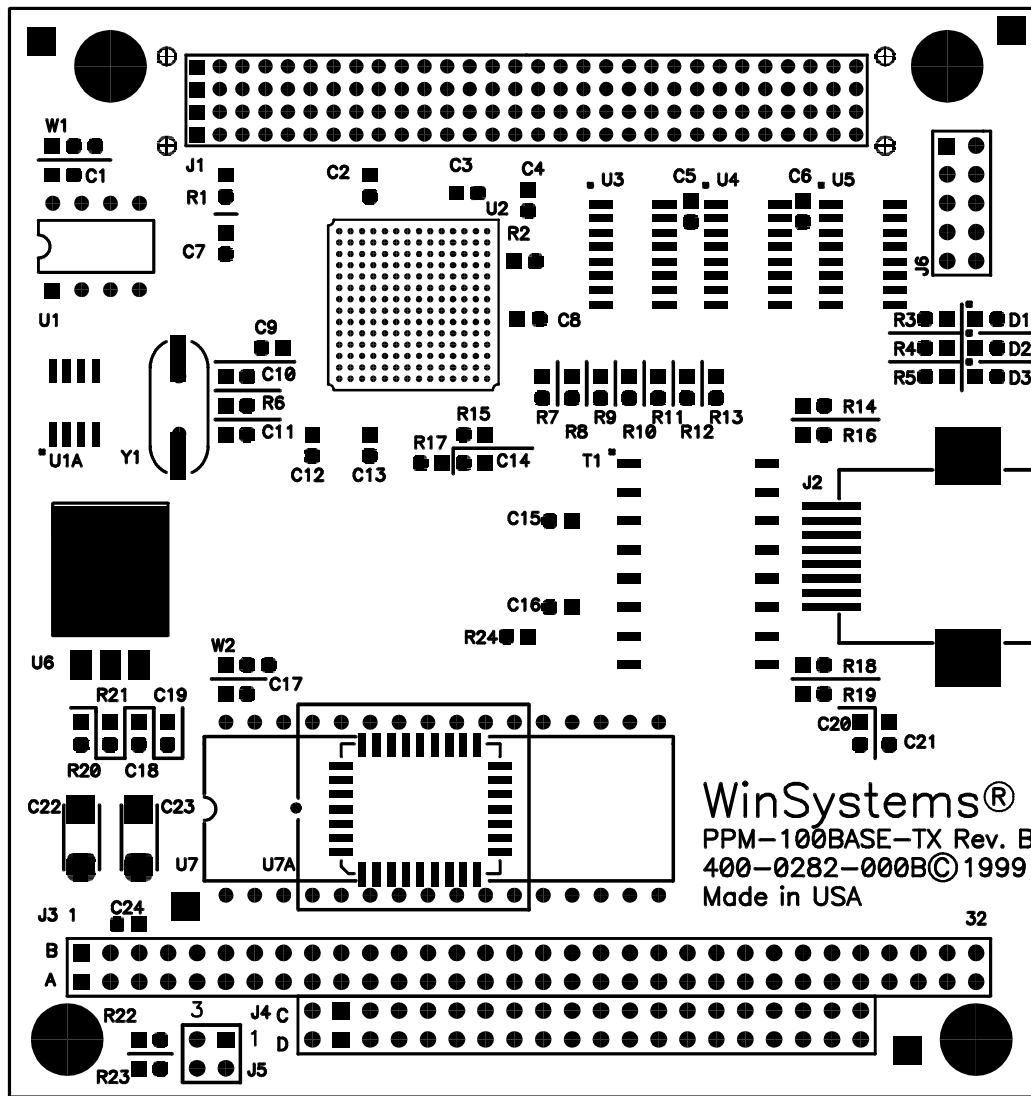
2.7

Connector/Jumper Summary

Connector/ Jumper	Description	Page Reference
J1	PC/104Plus Connector	2-4
J2	RJ-45 Ethernet Connector	N/A
J3	PC/104-8 Connector	2-3
J4	PC/104-16 Connector	2-3
J5	PC/104Plus Slot select jumper	2-2
J6	External status LED connector	2-2

3 APPENDIX A

PPM-10/100 Parts Placement Guide



4 APPENDIX B

PPM-10/100 Parts List

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 13:41:01
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 PARENT LOC FROM: <FIRST>

BOM for Manuals
 WinSystems, Inc.
 DEFAULT COMPONENT LOCATION: ARLIN

PAGE 1
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 PARENT LOC THRU: <LAST>

LVL	ITEM KEY	ITEM DESCRIPTION	BOM COMMENT	ITEM TYPE	QTY
PPM-10/100		PC/104 PLUS 10/100 ETHERNET BOARD	PC/104 PLUS 10/100 ETHERNET BOARD	F	1.0
1	999-9999-001	SPECIAL NOTES	03/21/01 MEB (NEW FINISHED# PPM-10/100)	I	1.0
1	0282-000-0000B	ASSY, TOP SMT PPM-10/100 ENET REV.B	ASSY, TOP SMT PPM-10/100 ENET REV.B	F	1.0
2	999-9999-001	SPECIAL NOTES	09-08-00 MEB ECO 99-69	I	1.0
2	999-9999-001	SPECIAL NOTES	04-05-99 MEB (REVA)	I	1.0
2	603-1047-803	CAP .1uF 50v 20% CER 0805	C1-C9,C12,C13,C17-C19,C21,C24	I	16.0
2	603-2207-503	CAP 22PF 50v 2% NPO 0805	C10,C11	I	2.0
2	603-82R7-303	CAP 8.2pF 50v .50pF CER 0805	C14	I	1.0
2	603-1527-803	CAP .0015uF 50v 20% CER 0805	C20	I	1.0
2	603-1065-82D	CAP 10uF 25v 20% TAN 6032	C22,C23	I	2.0
2	607-0005-005	LED, GREEN SMT	D1	I	1.0
2	607-0006-005	LED, RED SMT	D2	I	1.0
2	607-0007-005	LED, YELLOW SMT	D3	I	1.0
2	650-0120-09A	PC104 PLUS, COMM CON 50808-120G	J1	I	1.0
2	650-3008-0A0	CONN, RJ45 SURFACE MOUNT	J2	I	1.0
2	201-0072-120	HDR 2X36 UN TSW-136-07-G-D	J5=2X2	I	.4
2	601-0103-503	RES 10K Ohm 5% 1/10W 0805	R1,R8,R10-R13,R22,R23	I	8.0
2	601-1000-303	RES 100 Ohm 1% 1/10w 0805	R2,R15	I	2.0
2	601-0201-503	RES 200 Ohm 5% 1/10w 0805	R3,R4,R5	I	3.0
2	601-0330-503	RES 33 Ohm 5% 1/10w 0805	R6	I	1.0
2	601-5760-303	RES 576 Ohms 1% 1/10W 0805	R7	I	1.0
2	601-6040-303	RES 604 Ohms 1% 1/10W 0805	R9	I	1.0
2	601-0750-503	RES 75 Ohm 5% 1/10W 0805	R14,R16,R18,R19	I	4.0
2	601-1210-303	RES 121 Ohm 1% 1/10w 0805	R17,R21	I	2.0
2	601-2000-303	RES 200 Ohm 1% 1/10w 0805	R20	I	1.0
2	621-0023-025	IC, 82559 PCI ETHERNET CONTROLLER	U2	I	1.0
2	672-0001-101	IC, P15C3253W DUAL 4:1 MUX/DEMUX	U3,U4,U5	I	3.0
2	670-0001-025	REGULATOR 5V-3.3V LINEAR TECH. LT1086CM	U6	I	1.0
2	650-0032-002	SOCKET 32P AMP 822498-1 (28)	U7	I	1.0
2	601-0000-503	RES 0 Ohm 5% 1/10w 0805	W1,W2=2-3	I	1.0
2	681-0001-005	XTAL 25MHZ U49SM-18-250F	Y1	I	1.0
2	606-0005-000	IC, XFMR 10/100 ENET	T1	I	1.0
2	650-0104-0CA	CONNECTOR PC/104 COMM CON 50711C-104G	J3,J4	I	2.0
2	635-0001-001	IC, 24C02 SEEPROM S08 IS93C46-3GR	U1A	I	1.0
2	400-0282-000B	PCB, PPM-100BASE-TX REV B	PCB, PPM-100BASE-TX REV B	I	1.0

SUB-ASSEMBLY TOTAL: 0282-000-0000B ARLIN - 32 Items

1	0282-100-0000B	SUB ASSY, PPM-10/100 ENET REV.B	SUB ASSY, PPM-10/100 ENET REV.B	F	1.0
2	999-9999-001	SPECIAL NOTES	09-08-00 MEB ECO 99-69	I	1.0
2	999-9999-001	SPECIAL NOTES	04-05-99 MEB (REVA)	I	1.0
2	201-0002-000	PLUG JUMPER 999-19-310-00-000000	J5=1-2 3-4	I	2.0
2	200-0120-001	PC104 PLUS SHROUDED COMM CON 1264-120	PC104 PLUS SHROUDED COMM CON 1264-120	I	1.0

SUB-ASSEMBLY TOTAL: 0282-100-0000B ARLIN - 4 Items

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PARENT LOC FROM: <FIRST>

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WinSystems, Inc.
DEFAULT COMPONENT LOCATION: ARLIN

PAGE 2

ASSM ITEM THRU: PPM-10/100
PARENT LOC THRU: <LAST>

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1	910-0024-000	LABEL, STATIC SENSITIVE 130-02	LABEL, STATIC SENSITIVE 130-02	I	1.0
1	500-0200-174	VINYL, PC-104 PROTECTIVE ESD CAP.	VINYL, PC-104 PROTECTIVE ESD CAP.	I	1.0
1	KIT-PCM-STANDOFF-2	PC/104 STANDOFF KIT CONSISTING OF 2	PC/104 STANDOFF KIT CONSISTING OF 2	F	2.0
2	CONTRACT LABOR	OUTSIDE CONTRACT LABOR		L	.3
2	999-9999-001	SPECIAL NOTES	04-28-95 MEB (NEW BOM)	I	2.0
2	500-0200-091	SPACER M/F RAF 4000-440-N-MODL.600	SPACER M/F RAF 4000-440-N-MODL.600	I	4.0
2	500-0200-033	SCREW PPH 4-40 X 1/4"	SCREW PPH 4-40 X 1/4"	I	4.0
2	500-0200-092	NUT HEX NYLON 4-40	NUT HEX NYLON 4-40	I	4.0
2	525-0304-001	SIZE 3 COIN ENVLPE 2.5" X 4.25" 50260	SIZE 3 COIN ENVELOPE 2 1/2 X 4 1/4	I	2.0

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TOP ASSEMBLY TOTAL: PPM-10/100 ARLIN - 7 Items

REPORT RECAP

0 WARNING(S)

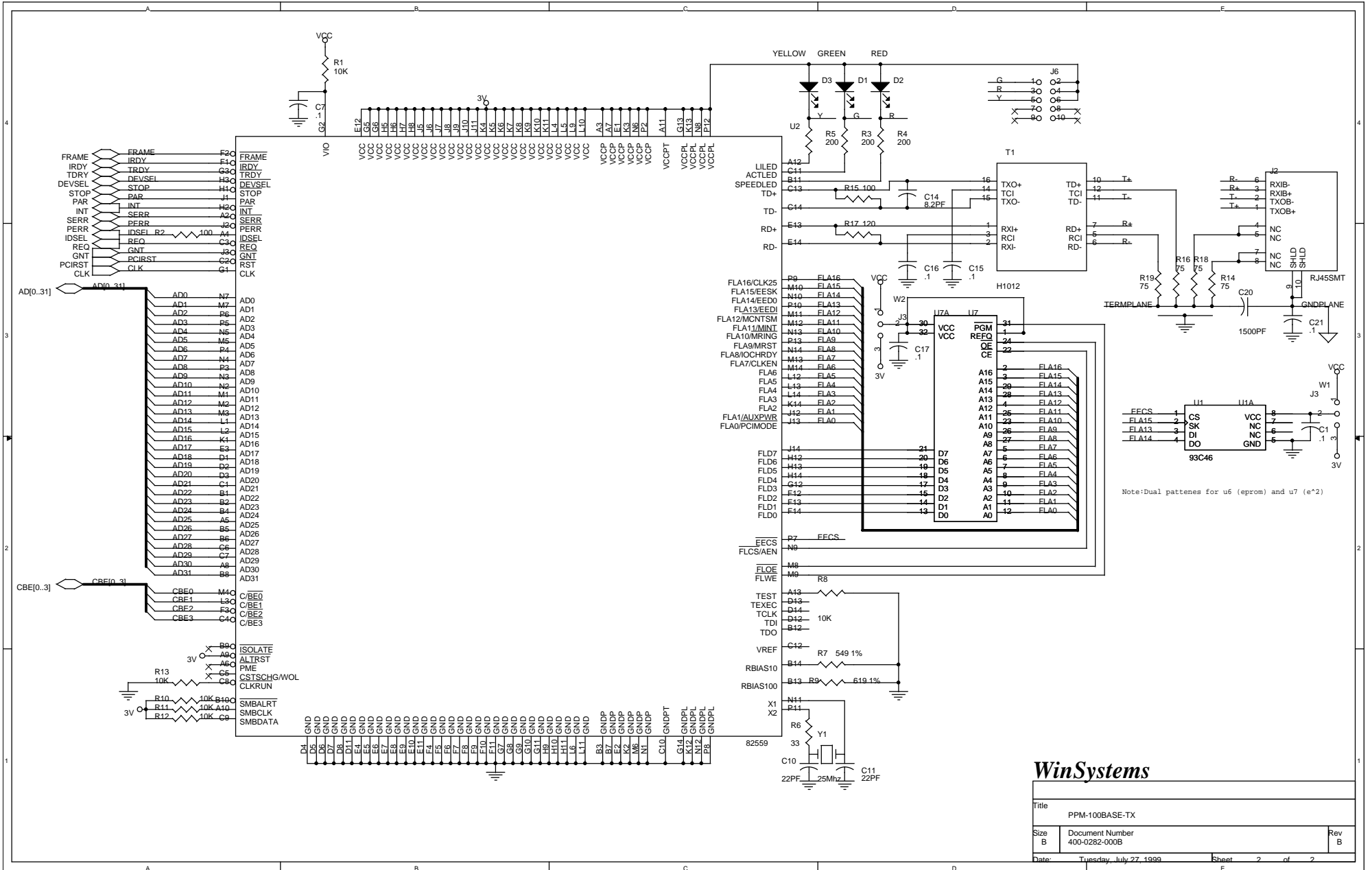
PARAMETER RECAP

PARAMETER KEY : 10 BOM with Ref. Desc.
REPORT TITLE : BOM for Manuals

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PARENT LOC RANGE : <FIRST> THRU <LAST> QUANTITY TO EXPLODE : 1
PRODUCT KEY RANGE : <FIRST> THRU <LAST> USE SCRAP FACTOR (Y/N) : N
COMMODITY KEY RANGE : <FIRST> THRU <LAST> UPDATE INV STD COST : N
NO. LEVELS TO EXPLODE : 999
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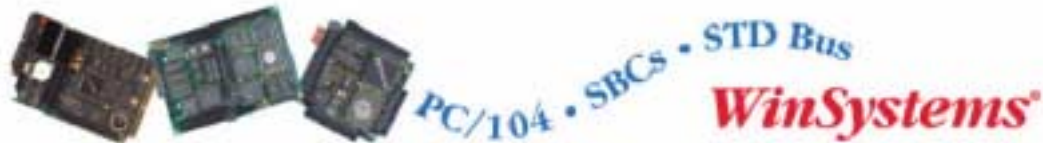
5 APPENDIX C

PPM-10/100 Schematic Diagrams



WinSystems

Title		
PPM-100BASE-TX		
Size	Document Number	Rev
B	400-0282-000B	B
Date:	Tuesday, July 27, 1999	Sheet 2 of 2



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1. Description and quantity of the product(s) to be returned including its serial number.
2. Reason for the return.
3. Invoice number and date of purchase (if available), and original purchase order number.
4. Name, address, telephone and FAX number of the person making the request.
5. Do not debit WinSystems for the repair. WinSystems does not authorize debits.

After the RMA number is issued, please return the products promptly. Make sure the RMA number is visible on the outside of the shipping package.

The customer must send the product freight prepaid and insured. The product must be enclosed in an anti-static bag to protect it from damage caused by static electricity. Each bag must be completely sealed. Packing material must separate each unit returned and placed as a cushion between the unit(s) and the sides and top of the shipping container. WinSystems is not responsible for any damage to the product due to inadequate packaging or static electricity.