

**MANSON ENGINEERING INDUSTRIAL LTD.**

**SERVICE MANUAL  
FOR  
EPA-9300**

*Rev 1.0 10/2003*

## **CONTENTS**

<b>1. USER MANUAL</b>	<b><i>P.1</i></b>
<b>2. PRODUCTION SPECIFICATIONS</b>	<b><i>P.3</i></b>
<b>3. DIAGRAMS</b>	<b><i>P.4</i></b>
<b>3.1 SCHEMATICS</b>	<b><i>P.4</i></b>
<b>3.2 Main PCB BOARD 1 SILKSCREEN</b>	<b><i>P.5</i></b>
<b>3.3 Main PCB BOARD 2 SILKSCREEN</b>	<b><i>P.6</i></b>
<b>4. BILL OF MATERIAL COMPONENT</b>	<b><i>P.7</i></b>

# EPA9300

# EPD9300

REGULATED DC POWER SUPPLY

## INTRODUCTION

- ⇒ The EPA9300 and EPD9300 DC Regulated Power Supplies provide large power output. Suitable for a variety of uses, especially for DC operated radio equipment, source from an AC outlet and providing a variable voltages of 1V to 15V and under 28A continuous operation at 13.8Vdc output.
- ⇒ Please read through this operating instruction carefully and follow the instructions to prevent from abuse or misuse. This manual must be kept for reference at anytime in need.

## FEATURES

### Overload Protection

A current foldback circuit is adopted to prevent the unit from overload. The overload indicator will light up when the unit is overloaded.

*Note: When the overload protection circuitry is activated, switch off the unit and disconnect the loading immediately. Extended operation under overload conditions will eventually cause damage to the unit.*

### High RFI Stability

The unit is specifically designed for use with radio communication equipment. It therefore includes extensive filtering to provide high immunity from erratic operation caused by Radio Frequency Interference (RFI).

### Variable Speed Cooling Fan

The cooling fan of the unit varies with the temperature of the unit. The unit becomes hotter the speed of the fan becomes faster. It is more effective than the ordinary cooling fan with fixed speed.

### Multiple DC Output Terminals

The unit has two pairs of (3A) snap-in DC connections and a pair of (28A) screw-on DC output terminal.

### Variable Output

The variable output voltages from 1V to 15V enables good fits with various uses.

## INSTALLATION

- ⇒ Make grounding the unit to prevent from electric shock at high voltage caused by leakage or lightning.
- ⇒ **DO NOT** place the unit in high humid, dusty and/or sunny places.
- ⇒ Place the unit in a location where allows free air circulation.
- ⇒ **DO NOT** place the unit close the TV sets or CRT monitor.
- ⇒ Couple with an AC outlet directly, as source via distribution cables may heat plugs and cables.
- ⇒ Put the unit horizontally for accurate meter readings.

## CAUTION

- ⇒ **DO NOT** use the unit for the equipment requiring higher current input than the designed value otherwise damage the unit.

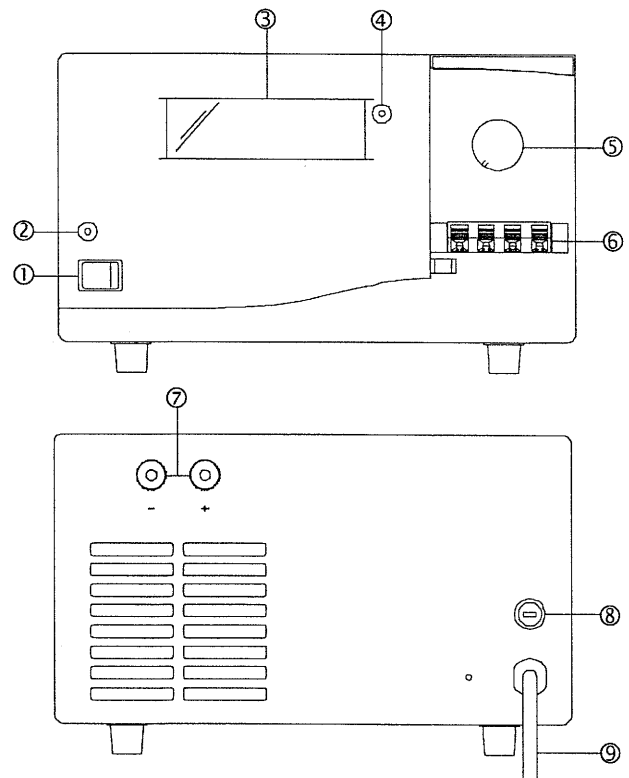
- ⇒ **DO NOT** use the unit for the equipment, which require high current input at starting and it may damage the unit, for examples, lamps and motorized equipment.
- ⇒ **DO NOT** replace the fuse before ceasing problems and the assigned value of fuse must be used in place.

## SAFETY PRECAUTIONS

The following precautions **MUST** be read carefully to help prevent from electric shock.

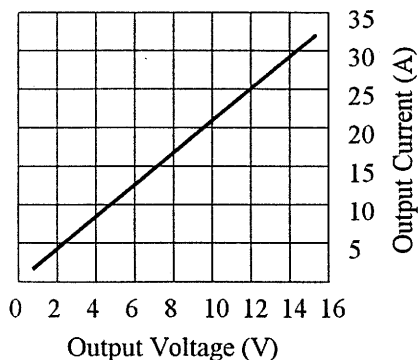
- ⇒ **NEVER** remove the metal cover of the power supply while AC power is connected.
- ⇒ **NEVER** touch the power supply when your hands are wet.
- ⇒ **NEVER** operate the power supply if foreign materials such as metallic objects, water, or other debris have fallen inside. Contact your dealer for check and repair.
- ⇒ **NEVER** operate the unit that was being damaged, as the voltage regulation circuitry may have been disabled. The resulting high DC voltage could cause damage to your equipment.
- ⇒ **NEVER** allow foreign objects to touch the DC Power Output terminals.
- ⇒ If you have the need to inspect the interior of the power supply, be contained to let it cool down completely, as some components may be hot enough to burn your hands in the event of component failure.

## FRONT AND REAR PANEL



- ① POWER SWITCH: Switch On/Off the unit.
- ② POWER LED: Lights up when the unit is operated.

- ③ METER: Current and Voltage indications being operated respectively.
- ④ OVERLOAD INDICATOR: Lights up when Overload Protection circuit is activated.
- ⑤ VOLTAGE ADJUSTMENT KNOB: To adjust the output voltage from 1-15V. One touch 13.8V setting is made at a clicking point. The normal operating output current limit against the output voltage is shown as below.



- ⑥ 3A OUTPUT TERMINAL: Two pairs of easy snap-in output terminal for 3A Maximum. Red is (+) positive and Black is (-) negative.

- ⑦ 28A OUTPUT TERMINAL: Screw-on high capacity output terminal. Red is (+) positive and Black is (-) negative.
- ⑧ FUSE.
- ⑨ POWER CORD.

#### CONNECTION AND OPERATION

- ① Turn off the unit.
- ② Be sure an AC power source fits the unit labeled input voltage and plug it in the AC outlet.
- ③ Turn ON the unit and adjust an output voltage to match with the input voltage of the equipment. Then turn OFF the unit.
- ④ Make sure the equipment is/are turned off.
- ⑤ Connect red (+) output terminal of the unit to the positive polarity input of the equipment and connect black (-) output terminal of the unit to the negative polarity input of the equipment.
- ⑥ First turn ON the unit and then turn the equipment ON.
- ⑦ When an operation is over, turn OFF the equipment first and then turn OFF the unit.

#### SPECIFICATIONS

	EPA9300	EPD9300
OUTPUT VOLTAGE	DC 1-15V Variable	
OUTPUT CURRENT	28A (at 13.8Vdc Output)	
RIPPLE & NOISE	5mV ( peak to peak )	
LINE REGULATION	5mV ( ±2% Variation )	
LOAD REGULATION	50mV ( 0-100% Load )	
POWER SOURCE	230V/50Hz (or requested)	
VOLTMETER TYPE	Precision Analog	Digital LED
AMMETER TYPE	Precision Analog	Digital LED
COOLING FAN	Temperature Sensitive Variable Speed Cooling Fan	
DIMENSION ( WxHxD )	250mm x 140mm x 225mm	
WEIGHT	9 Kg	
ACCESSORIES	User Manual	

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# MANSON ENGINEERING INDUSTRIAL LTD.


## PRODUCTION SPECIFICATION DC REGULATED POWER SUPPLY

MODEL : EPA-9300-000	REV. 1.3	DATE :26-11-2002
DESCRIPTION : 1 - 15V 28A DC REGULATED POWER SUPPLY		
INPUT VOLTAGE : 230 VAC	FREQUENCY : 50 Hz	
ENVIRONMENT TEMPERATURE : 25°C		

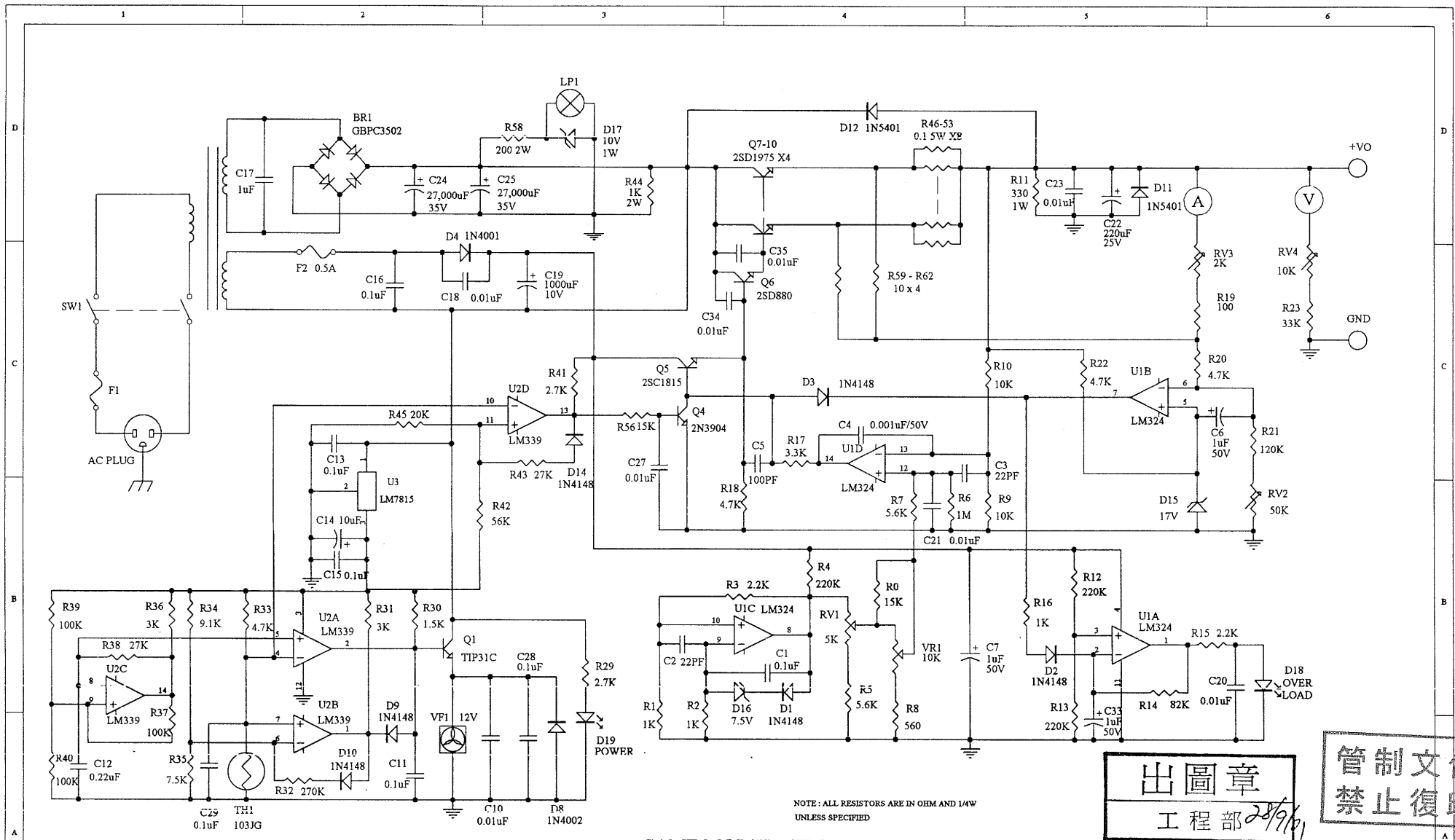
	MIN.	TYP.	MAX.	UNIT
Output Voltage Range	1		15	V
Min. Output Voltage	0.5		1	V
Max. Output Voltage	15.1		16	V
Output Current		28		A
Max. Output Current				A
Protection Current ( start point )	30	33	36	A
Voltage Regulation :				
Load ( 0 ~ 100% load )			50	mV
Line ( ±2% Variation )			5	mV
Ripple & Noise			5	mVrms
No Load Input Current			360	mA
Full Load Input Current			4	A
Withstanding test(60 sec. 1mA) Input V.S Output	1500			V
Insulation Resistance (500 VDC ) Input V.S Output	100			MΩ
Voltmeter Accuracy			±7	FS%
Ammeter Accuracy			±7	FS%
Fuse		6.3		A
Short circuit protection current			1500	mA

### REMARKS :

1. Rated load is 13.8V 28A .
2. Overload LED indicator will turn ON , either overload or output short circuit .
3. High frequency interference test ( sample 3% ) Test frequency : 1. 437MHz ( 5W )    2. 144MHz (5W ) Result : No function have been affected . Output voltage $\leq \pm 0.5V$ Variation .

Prepared by : 

Checked by  Approved by : 



NOTE: ALL RESISTORS ARE IN OHM AND 1/4W UNLESS SPECIFIED

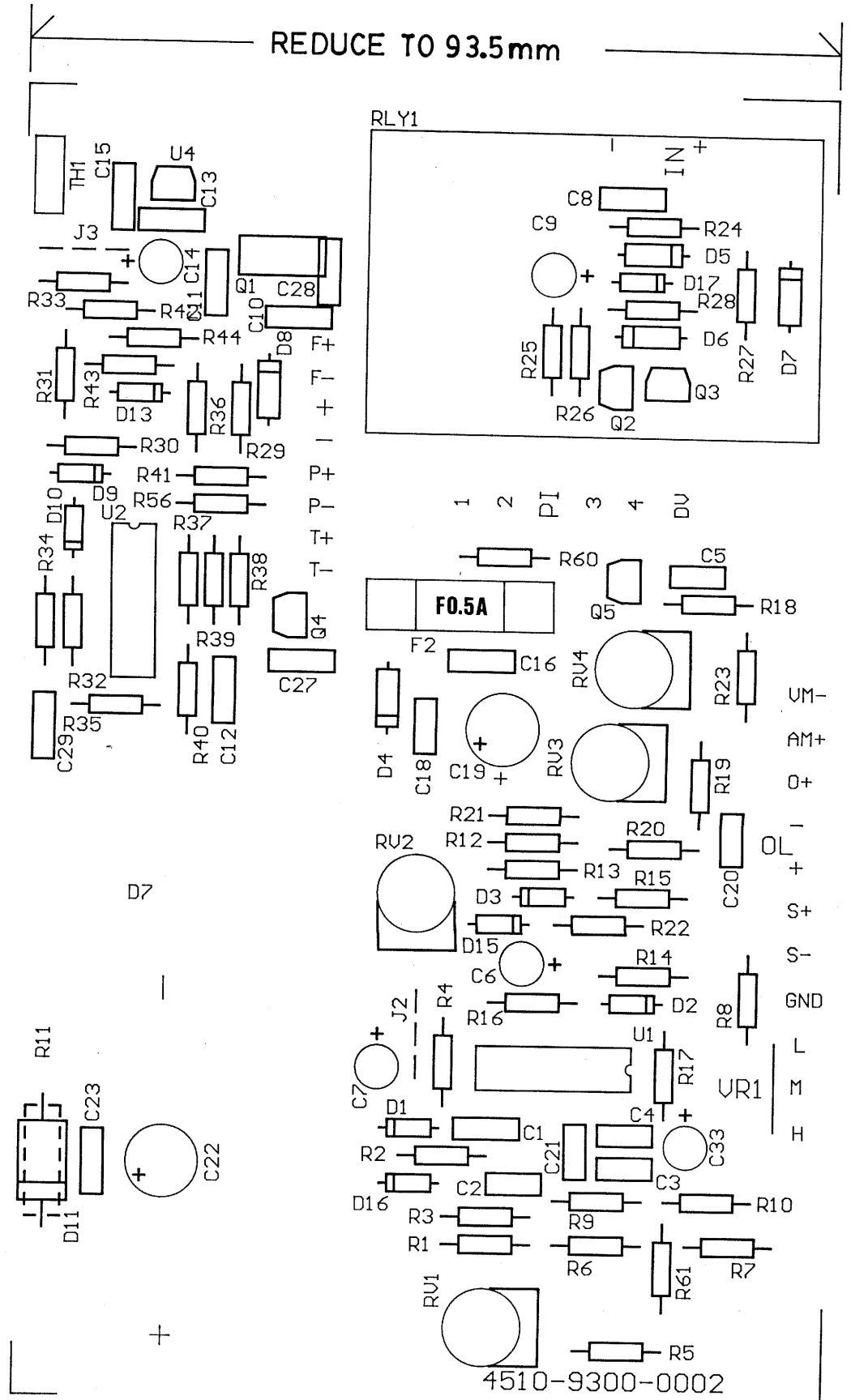
SAME MODEL: EPA-9300-004, 101-F, 221

出圖章  
工程部 28/9/01

管制文件  
禁止復印

TITLE: EPA-9300-000.SCH		DWG.NO.: 9800-9300-0000		MANSON ENGINEERING INDUSTRIAL LTD.	
DRAWN BY: <i>Zey</i>	CHECKED BY: <i>J. Ming</i>	APPROVED BY: <i>K.K. Leung</i>	SHEET 1 OF 1	REVISION: 1.2	DATE: 28-09-2001

MAIN PCB BOARD 1 SILKSCREEN







Model #: EPA-9300-000 Description: 1-15V ADJ. 28/33A DC REGULATEDPOWER SUPPLY W/ANALOG METERS Rev Date: 08/09/2003

Specification: EPA-9300-000

Level Code # Description/Remarks Usage U/M Op PMS Iss Sp Scrp  
Net.Wt Ftr Rev Date

Level	Code #	Description/Remarks	Usage	U/M	Op	PMS	Iss	Sp	Scrp
Net.Wt	Ftr	Rev Date							
1	0555-0100-0616 16/03/1998	WIRE WOUND RESISTOR	8.00000	PCS	CA	P	Y	N	0.00%
		Location : 5W 0.1ohm +/-5% CEMENT TYPE R46,R47,R48,R49,R50,R51,R52,R53.							
1	1011-1041-0171 16/03/1998	CERAMIC CAPACITOR 0.01UF 50V	2.00000	PCS	CA	P	Y	N	0.00%
		Location : +80%/-20% C34,C35							
1	1061-1063-4191 16/03/1998	METALLIZED POLYESTER CAPACITOR	1.00000	PCS	CA	P	Y	N	0.00%
		Location : 1MFD 100V +/-10% PITCH=10mm C17.							
1	3036-0880-2402 16/03/1998	POWER TRANSISTOR NPN 2SD880Y	1.00000	PCS	CA	P	Y	N	0.00%
		Location : T0-220 "TOSHIBA" Q6.							
1	3039-1975-2610 16/03/1998	POWER NPN TRANSISTOR 2SD1975S	4.00000	PCS	CA	P	Y	N	0.00%
		Location : T0-3P(I) "PANASONIC" Q7,Q8,Q9,Q10.							
1	3211-5401-9031 07/04/1998	RECTIFIER 1N5401 DISCRETE	1.00000	PCS	CA	P	Y	N	0.00%
		Location : D12.							
1	3222-3502-9360 16/03/1998	BRIDGE RECTIFIER GBPC3502	1.00000	PCS	CA	P	Y	N	0.00%
		Location : "VISHAY" BR1.							
1	3670-0631-2702 28/09/1998	FUSE 6.3A 250V GFE " TF"	1.00000	PCS	CA	P	Y	N	0.00%
		Location : UL LISTED 20mm STANDARD LED EL204HD DIA. 3mm							
1	4021-0204-2038 16/03/1998	LED EL204HD DIA. 3mm	1.00000	PCS	CA	P	Y	N	0.00%
		Location : DIFFUSED RED "EVERLIGHT" D18.							
1	4021-0204-5038 16/03/1998	LED EL204GD DIA. 3mm	1.00000	PCS	CA	P	Y	N	0.00%
		Location : DIFFUSED GREEN "EVERLIGHT" D19.							
0	EPA-9300-IN-000 09/03/1998	EPA-9300-000 MATERIALS FOR	1.00000	SET	IN	M	N	N	0.00%
		Location : INSERTION							
1	0513-1001-0611 05/09/1998	CARBON FILM RESISTOR	4.00000	PCS	IN	P	Y	N	0.00%
		Location : 1/4W 10ohm +/-5% T/B							
1	0513-1002-0611 15/06/1998	CARBON FILM RESISTOR	1.00000	PCS	IN	P	Y	N	0.00%
		Location : 1/4W 100ohm +/-5% T/B R19.							
1	0513-1003-0611 10/03/1998	CARBON FILM RESISTOR	3.00000	PCS	IN	P	Y	N	0.00%
		Location : 1/4W 1Kohm +/-5% T/B R1,R2,R16							
1	0513-1004-0611 10/03/1998	CARBON FILM RESISTOR	2.00000	PCS	IN	P	Y	N	0.00%
		Location : 1/4W 10Kohm +/-5% T/B R9,R10.							
1	0513-1006-0611 10/03/1998	CARBON FILM RESISTOR	1.00000	PCS	IN	P	Y	N	0.00%
		Location : 1/4W 1Mohm +/-5% T/B R6.							
1	0513-1205-0611 15/06/1998	CARBON FILM RESISTOR	1.00000	PCS	IN	P	Y	N	0.00%
		Location : 1/4W 120Kohm +/-5% T/B R21.							
1	0513-1503-0611 10/03/1998	CARBON FILM RESISTOR	1.00000	PCS	IN	P	Y	N	0.00%
		Location : 1/4W 1.5Kohm +/-5% T/B R30.							
1	0513-1504-0611	CARBON FILM RESISTOR	1.00000	PCS	IN	P	Y	N	0.00%



1	0522-7503-0411 05/09/1998	Location : R33. METAL FILM RESISTOR	1.00000 PCS IN	P	Y	N	0.00%
1	0522-9103-0411 05/09/1998	1/4W 7.5Kohm +/-1% T/B METAL FILM RESISTOR	1.00000 PCS IN	P	Y	N	0.00%
1	0605-1104-4010 10/03/1998	1/4W 9.1Kohm +/-1% T/B VARIABLE RESISTOR 10K CCWACTS	1.00000 PCS IN	P	Y	N	0.00%
1	0681-0104-2110 07/10/2000	Location : CTS 296UD103B3C CENTER DETENT VR1. SEMI-VARIABLE RESISTOR 10K	1.00000 PCS IN	P	Y	N	0.00%
1	0681-0203-2110 07/10/2000	SM-085 "TOKYO" RV4. SEMI-VARIABLE RESISTOR 2K	1.00000 PCS IN	P	Y	N	0.00%
1	0681-0503-2110 07/10/2000	SM-085 "TOKYO" RV3 SEMI-VARIABLE RESISTOR 5K	1.00000 PCS IN	P	Y	N	0.00%
1	0681-0504-2110 30/11/2002	SM-085 "TOKYO" RV1. SEMI-VARIABLE RESISTOR 50K	1.00000 PCS IN	P	Y	N	0.00%
1	1011-1023-0171 10/03/1998	SM-085 "TOKYO" RV2 CERAMIC CAPACITOR 100PF 50V	1.00000 PCS IN	P	Y	N	0.00%
1	1011-1031-0171 10/03/1998	+/-10% C5. CERAMIC CAPACITOR 0.001UF 50V	1.00000 PCS IN	P	Y	N	0.00%
1	1011-1041-0151 10/03/1998	+80%/-20% C4. CERAMIC CAPACITOR 0.01UF 25V	1.00000 PCS IN	P	Y	N	0.00%
1	1011-1041-0171 05/09/1998	+80%/-20% C20. CERAMIC CAPACITOR 0.01UF 50V	5.00000 PCS IN	P	Y	N	0.00%
1	1011-1051-0151 10/06/1998	+80%/-20% C10,C18,C21,C23,C27. CERAMIC CAPACITOR 0.1UF 25V	7.00000 PCS IN	P	Y	N	0.00%
1	1011-2211-0151 10/03/1998	+80%/-20% C1,C11,C13,C15,C16,C28,C29. CERAMIC CAPACITOR 22PF 25V	2.00000 PCS IN	P	Y	N	0.00%
1	1021-1062-0171 10/03/1998	+/-10% C2,C3. ELECT. CAPACITOR 1UF 50V	3.00000 PCS IN	P	Y	N	0.00%
1	1021-1072-0171 10/03/1998	+/-20% DIM. 5 X 11 MM C6,C7,C33. ELECT. CAPACITOR 10UF 50V	1.00000 PCS IN	P	Y	N	0.00%
1	1021-2282-0151 15/06/1998	+/-20% DIM. 5 X 11 MM "GS" C14. ELECT. CAPACITOR 220UF 25V	1.00000 PCS IN	P	Y	N	0.00%
1	1022-1032-3132 10/03/1998	+/-20% DIM. 8 X 11.5 MM "GS" C22. ELECT. CAPACITOR 1000UF 10V	1.00000 PCS IN	P	Y	N	0.00%
1	1022-2732-4160 10/03/1998	+/-20% DIM. 8 X 14 MM C19. ELECT. CAPACITOR 27000UF 35V	2.00000 PCS IN	P	Y	N	0.00%
1	1062-2253-0181 22/05/1998	80C +/-20% P=10mm DIM 35X45mm C24,C25. METALLIZED POLYESTER CAP	1.00000 PCS IN	P	Y	N	0.00%
1	2531-7815-0199 11/12/1998	0.22UF 63VDC +/-10% BOX TYPE C12 IC 78L15CP "JRC" TO-92	1.00000 PCS IN	P	Y	N	0.00%
1	2541-0324-0061 10/03/1998	Location : U3 IC LM324N "ST" LOW POWER QUAD	1.00000 PCS IN	P	Y	N	0.00%

1	2543-0339-0001 10/03/1998	Location : OP-AMP U1. IC LM339	1.00000	PCS	IN	P	Y	N	0.00%
1	3010-3904-0001 10/03/1998	Location : QUAD VOLTAGE COMPARATOR "ST" U2. NPN TRANSISTOR 2N3904 "ON"	1.00000	PCS	IN	P	Y	N	0.00%
1	3017-1815-0001 10/03/1998	Location : Q4. NPN SMALL SIGNAL TRANSISTOR	1.00000	PCS	IN	P	Y	N	0.00%
1	3033-0031-0002 10/03/1998	Location : 2SC1815GR TO-92 Q5. TRANSISTOR TIP31C TO-220 "ST"	1.00000	PCS	IN	P	Y	N	0.00%
1	3201-4148-9002 10/03/1998	Location : Q1. Si SIGNAL DIODE 1N4148 TNR	6.00000	PCS	IN	P	Y	N	0.00%
1	3211-4005-9031 07/10/2000	Location : "TEMIC" D1,D2,D3,D9,D10,D14. RECTIFIER 1N4005 DISCRETE	2.00000	PCS	IN	P	Y	N	0.00%
1	3211-5401-9031 07/04/1998	Location : D4,D8 RECTIFIER 1N5401 DISCRETE	1.00000	PCS	IN	P	Y	N	0.00%
1	3261-1011-0002 15/06/1998	Location : D11. ZENER DIODE 10V 1W TNR	1.00000	PCS	IN	P	Y	N	0.00%
1	3261-1710-5521 29/05/2003	Location : D17. ZENER DIODE 17V 1/2W DISCRETE	1.00000	PCS	IN	P	Y	N	0.00%
1	3261-7500-5312 10/03/1998	Location : HZ18-1 "HITACHI" D15 ROHM 0.5W ZENER 7.5V MTZJ7.5C	1.00000	PCS	IN	P	Y	N	0.00%
1	3631-1045-0019 22/08/2000	Location : TNR D16. F.Y.I. THERMISTOR NTC 10K AT	1.00000	PCS	IN	P	Y	N	0.00%
1	3670-0053-0002 07/04/1998	25DEG B=3720K DIA. 1.85 FUSE 0.5A 250V UL LISTED 20mm STANDARD GLASS TUBE	1.00000	PCS	IN	P	Y	N	0.00%

=== End Of Report ===

END