

Eclipse Series

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PA50 Amplifier **Operation and Maintenance Manual**

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Contents

1	Operating Instructions	3
	1.2 Front Panel Indicators	3
2	Internal Adjustments	3
3	Test Points	4
4	I/O Connections	4
5	Circuit Description	5
	5.1 Driver Stage	5
	5.2 Output Stage	5
	5.3 Low Pass Filter	5
	5.4 Bias Supply	5
	5.5 Reflectometer	6
	5.6 Metering Circuits	6
6	Specifications	7
	6.1 Physical Configuration	7
	6.2 Indicators and Test Points	7
	6.3 Electrical Specifications	7
	6.3.1 Power Requirements	7
A	Engineers Drawings	9
B	Parts List	10

WARNING

Changes or modifications not expressly approved by RF Technology could void your authority to operate this equipment. Specifications may vary from those given in this document in accordance with requirements of local authorities. RF Technology equipment is subject to continual improvement and RF Technology reserves the right to change performance and specification without further notice.

1 Operating Instructions

The PA50 is part of the Eclipse range of modular base station equipment. It is a power amplifier capable of delivering 120 Watts in the VHF frequency range. It is designed to complement the T50 transmitter, and mounts in a standard Eclipse sub-rack.

1.2 Front Panel Indicators

PWR LED Power LED indicates that the PA50 is connected to a DC power source.

RFO LED RF Output LED indicates that the PA50 is being driven by the exciter and RF Output is available at the antenna socket.

TEMP LED Temperature LED indicates that the output transistors are above 90 degrees. This is only an indication and not an alarm condition as the exciter monitors the PA50 temperature at all times in order to keep within safe operating limits.

2 Internal Adjustments

All internal adjustments are factory set and should not need to be changed under normal conditions.

R238	Driver bias adjustment
R239	O/P Q101 bias adjustment
R240	O/P Q100 bias adjustment
R227	Forward power meter adjustment
R228	Reverse power meter adjustment
C209	Reflectometer balance adjustment

3 Test Points

These test points are provided on the PCB and the DB9 front panel connector for use by maintenance personnel

TP100 and TP101	Driver drain current measurement. A multimeter placed across these pins will indicate 1 volt for 1 amp of Q102 drain current
TP102 and TP103	O/P stage drain current measurement. A multimeter placed across these pins will indicate 1 volt for 10 amps of Q100 and Q101 drain current
TP200	PA Temperature reading. 1 volt indicates a temperature of 40 degrees. This reading deviates by 10mV per degree of change
TP203	Reverse voltage output from the reflectometer
TP204	Forward voltage output from the reflectometer
DB9 pin 1	GND
DB9 pin 2	O/P drain current
DB9 pin 3	
DB9 pin 4	Reverse voltage
DB9 pin 5	+28V
DB9 pin 6	Driver drain current
DB9 pin 7	
DB9 pin 8	Forward voltage
DB9 pin 9	

4 I/O Connections

There are 3 I/O connectors on the rear panel with the following functions

25 pin connector	DC power and exciter logic interface
Pin 1 2 3 4 14 15 16 17	GND
Pin 10 11 12 13 22 23 24 25	+28V
Pin 7	DATA-IO
Pin 19	CLK
Pin 20	CS
Pin 18	VREFB
Pin 6	Forward Volts
Pin 8	Reverse Volts
Pin 21	Temperature

BNC Connector: RF Input from exciter approximately 1 Watt

N Connector: RF Output to antenna, up to 150 Watts

5 Circuit Description

The following descriptions should be read as an aid to understanding the block and schematic diagrams.

5.1 Driver Stage

The function of the driver stage is to transform the RF input signal from the exciter to the appropriate levels and impedance required by the output stage. The RF input signal is applied to the high pass filter (C121, C130, C131, C132, C133, L102 and L106). This filter suppresses any residual low frequency spurious that may be present at the exciter output. T100 is used to transform the nominal 50 ohm output from the exciter to match the input of Q102. A negative feedback network (C120, R130, R132, R131, R133, R125, R129, L107 and R124) is used to achieve a reasonably flat gain across the frequency of operation and to match the drive level requirements of the PA50 to the output level provided by the exciter. DC bias is applied to the gate of Q102 via R120 and R121 and is decoupled by C106 and C116. The DC feed for Q102 drain is decoupled by L100, C112, C102, C100 and C118. T101 is used for impedance matching between the driver and output stage and to provide a balanced feed for the push-pull output stage

5.2 Output Stage

The output stage amplifies the 5 – 10 W from the driver to in excess of 150 W for final delivery into the low pass filter. Q100 and 101 are driven in push-pull configuration by the outputs of T101. L105, R126, C126 and L104 R127 C127 form negative feedback paths in order to achieve a reasonably flat frequency response across the frequency of operation. T102 is used to provide the DC feed via the centre tap in the primary winding to Q100 and Q101. T102 also combines the balanced output of the transistors into a single ended output as well as provide the necessary impedance transformation from the transistors into a nominal 50 ohms. A small DC bias is applied to the gates of Q100 and Q102 via R118, 119, 122 and 123 and decoupled by C103, 113, 107 and 117. The DC feed to the transformer is decoupled by L103, L101, C101, 119, 104, 114, 105, 115 and 128.

5.3 Low Pass Filter

The low pass filter attenuates spurious emissions to less than –86dBc.

5.4 Bias Supply

The function of the bias supplies is to provide a temperature compensated bias voltage to the gates of Q100 Q101 and Q102 for adjustment to their quiescent currents. U205 and R213, R214 and R215 provide the bias voltages. U200D provides a decreasing output voltage with increasing temperature. The resistive dividers R214, R229 and

R213, R230 and R208, R215 provide the bias voltage to the transistors so that quiescent current is maintained across the operating temperature range.

5.5 Reflectometer

The reflectometer provides an indication of load mismatch. A200 is a current transformer with a single turn primary being passed through the centre of a toroid. The multiturn secondary has an output voltage that is proportional to the current flowing in the primary. The voltages appearing at the anodes of D205 and D206 are of equal amplitude and opposite phase. A sample of the line voltage is applied to the junction of the divider resistors R218 and R220. C209 is adjusted for equal amplitude with the transformer. Since the transformer has 180 degree phase shifted outputs the application of the line voltage will cause cancellation at D205 and addition at D206. This phase relationship will change when a mismatch occurs resulting in an increase in the voltage at D205. D205 and D206 rectify these voltages so that a DC level proportional to the forward and reflected voltages are available for the metering circuits. L200 provides a DC reference point for the diodes.

5.6 Metering Circuits

These circuits are included so that the exciter can interrogate the PA and read all the vital operating levels. U203 is an A to D converter with the following inputs:

- Reverse voltage
- Forward voltage
- Temperature
- DC Input volts
- O/P drain current
- Driver drain current
- Q100 bias voltage
- Q101 bias voltage
- Model identification jumpers

Forward and reverse voltages are supplied from the reflectometer outputs and factory set to the correct levels by R227 and R228. U204 (temperature sensor) is mounted on the same pad as the source lead of Q101 to provide a temperature reading of the O/P transistor cases. DC Power Input voltage is provided by a resistive divider (R3 and R4). The O/P drain current is provided by measuring the small voltage drop across R113 and R128. Driver drain current is provided by measuring the small voltage drop across R112 and R138. The bias voltages are read directly from the bias supplies. The model identification is determined by the jumper settings of J203, 204 and 205.

PA50A	25 – 32 MHz	J203 on, J204 and J205 off
PA50B	30 – 40 MHz	J204 on, J203 and J205 off
PA50C	38 – 50 MHz	J205 on, J203 and J204 off

U202 and associated components provide a 3 wire serial interface to allow the exciter to interrogate the A to D converter. U200C is a comparator that switches the fan on

when the temperature rises above 40 degrees C. U201D is a comparator that switches the TEMP LED on when the temperature rises above 90 degrees C. Q203 samples the line output RF voltage to turn on the RFO LED.

6 Specifications

The PA50 is designed for use with the T50 exciter to provide 20 to 150 Watts output. Output power regulation is performed by the exciter as it continually monitors PA performance. The exciter also monitors important levels such as temperature reverse power and drain currents to keep them within operating limits.

6.1 Physical Configuration

The PA50 is designed to fit into a 19 inch rack mounted frame. The installed height is 4RU or 178mm and the depth is 350mm The amplifier is 125mm wide. An extruded aluminium heatsink with vertical fins and an enclosed fan is used. The temperature rise can be as high as 50 degrees depending on output power.

6.2 Indicators and Test Points

Power On	Green LED
RF Power	Yellow LED
Temperature 75 degrees +	Red LED
Forward Power	DB9 pin 8 and GND
Reverse Power	DB9 pin 4 and GND
O/P Drain Current	DB9 pins 2 and 5
Driver Drain Current	DB9 pins 6 and 5
+28V	DB9 pin 5
GND	DB9 pin 1

6.3 Electrical Specifications

6.3.1 Power Requirements

Operating Voltage	26 to 30VDC (available O/P power reduced below 26V)
Current Drain	Approx 10A at 28V and 100W O/P
Polarity	Negative Ground
Frequency Range	PA50A25 to 32MHz PA50B30 to 40MHz PA50C38 to 50MHz

Nominal Antenna Impedance:	50 ohms
Output Power:	20 to 100 Watts
Transmit Duty Cycle:	100W Continuous up to 60 degrees C ambient
Spurious Emissions:	less than 0.25uW
Maximum Heatsink Temperature:	110 degrees C
Mismatch Protection:	Protected from damage by control from the exciter
Connectors:	Antenna connector - N type female on rear panel
	Power and exciter interface - DB25 Female on rear panel
	RF Input - BNC female on rear panel
	Test connector - DB9 female on front panel

A Engineering Drawings

- 1. Block Diagram**
- 2. Main PCB Schematics (3 sheets)**

B Parts List

Main PCB Assembly

Ref.	Description	Part Number
A200	Transformer Reflectometer	37/PA50/REFL
C1	Capacitor 100nF 10% 63V X7R 1206	46/3310/100N
C2	Capacitor 100nF 10% 63V X7R 1206	46/3310/100N
C3	Capacitor 100nF 10% 63V X7R 1206	46/3310/100N
C4	Capacitor 100nF 10% 63V X7R 1206	46/3310/100N
C5	Capacitor 100nF 10% 63V X7R 1206	46/3310/100N
C6	Capacitor 100nF 10% 63V X7R 1206	46/3310/100N
C7	Capacitor 1nF 5% 63V NPO 1206	46/3310/01N0
C8	Capacitor 330-560uF 35-50V low ESR electrolytic 5mm pitch	41/200L/470U
C100	Capacitor 100nF 10% 63V X7R 1206	46/3310/100N
C101	Capacitor 100nF 10% 63V X7R 1206	46/3310/100N
C102	Capacitor 100nF 10% 63V X7R 1206	46/3310/100N
C103	Capacitor 100nF 10% 63V X7R 1206	46/3310/100N
C104	Capacitor 100nF 10% 63V X7R 1206	46/3310/100N
C105	Capacitor 100nF 10% 63V X7R 1206	46/3310/100N
C106	Capacitor 100nF 10% 63V X7R 1206	46/3310/100N
C107	Capacitor 100nF 10% 63V X7R 1206	46/3310/100N
C108	Capacitor 1nF 5% 63V NPO 1206	46/3310/01N0
C109	Capacitor 1nF 5% 63V NPO 1206	46/3310/01N0
C110	Capacitor 1nF 5% 63V NPO 1206	46/3310/01N0
C111	Capacitor 1nF 5% 63V NPO 1206	46/3310/01N0
C112	Capacitor 1nF 5% 63V NPO 1206	46/3310/01N0
C113	Capacitor 1nF 5% 63V NPO 1206	46/3310/01N0
C114	Capacitor 1nF 5% 63V NPO 1206	46/3310/01N0
C115	Capacitor 1nF 5% 63V NPO 1206	46/3310/01N0
C116	Capacitor 1nF 5% 63V NPO 1206	46/3310/01N0
C117	Capacitor 1nF 5% 63V NPO 1206	46/3310/01N0
C118	Capacitor 10uF +80/-20% 35V electrolytic 2.5mm pitch	41/200L/010U
C119	Capacitor 10uF +80/-20% 35V electrolytic 2.5mm pitch	41/200L/010U
C120	Capacitor 10nF 10% 50V NPO 1812	46/82N1/010N
C122	Capacitor 10nF 10% 50V NPO 1812	46/82N1/010N
C123	Capacitor 10nF 10% 50V NPO 1812	46/82N1/010N
C124	Capacitor 10nF 10% 50V NPO 1812	46/82N1/010N
C125	Capacitor 10nF 10% 50V NPO 1812	46/82N1/010N
C126	Capacitor 10nF 10% 50V NPO 1812	46/82N1/010N
C127	Capacitor 10nF 10% 50V NPO 1812	46/82N1/010N
C128	Capacitor 10nF 10% 50V NPO 1812	46/82N1/010N
C129	Capacitor 10nF 10% 50V NPO 1812	46/82N1/010N
C200	Capacitor 100nF 10% 63V X7R 1206	46/3310/100N
C201	Capacitor 100nF 10% 63V X7R 1206	46/3310/100N
C202	Capacitor 100nF 10% 63V X7R 1206	46/3310/100N

B PA50 PARTS LIST

Ref.	Description	Part Number
C203	Capacitor 100nF 10% 63V X7R 1206	46/3310/100N
C204	Capacitor 10uF +80/-20% 35V electrolytic 2.5mm pitch	41/200L/010U
C205	Capacitor 10uF +80/-20% 35V electrolytic 2.5mm pitch	41/200L/010U
C206	Capacitor 100nF 10% 63V X7R 1206	46/3310/100N
C207	Capacitor 68pF 5% 63V NPO 1206	46/3300/068P
C208	Capacitor 68pF 5% 63V NPO 1206	46/3300/068P
C209	Capacitor 6-100pF variable	49/3006/100P
C210	Capacitor 3p3F +/- 0.5pF 500V silver mica 1210	48/3003/03P3
C211	Capacitor 100nF 10% 63V X7R 1206	46/3310/100N
C212	Capacitor 100nF 10% 63V X7R 1206	46/3310/100N
C213	Capacitor 1nF 5% 63V NPO 1206	46/3310/01N0
C214	Capacitor 1nF 5% 63V NPO 1206	46/3310/01N0
C217	Capacitor 22pF 5% 63V NPO 1206	46/3300/022P
C218	Capacitor 22pF 5% 63V NPO 1206	46/3300/022P
C219	Capacitor 1nF 5% 63V NPO 1206	46/3310/01N0
C220	Capacitor 1nF 5% 63V NPO 1206	46/3310/01N0
C221	Capacitor 1nF 5% 63V NPO 1206	46/3310/01N0
C222	Capacitor 1nF 5% 63V NPO 1206	46/3310/01N0
D100	Diode BAV99 SOT-23	21/3010/AV99
D101	Diode BAV99 SOT-23	21/3010/AV99
D102	Diode BAV99 SOT-23	21/3010/AV99
D103	Diode BAV99 SOT-23	21/3010/AV99
D200	Diode BAV99 SOT-23	21/3010/AV99
D201	Diode BAV99 SOT-23	21/3010/AV99
D202	Diode ZRC400F03 4.096V reference 3% 100ppm SOT-23	29/VREF/0001
D203	Diode SM4004 Std recovery 50V !A SMA package	24/SMA1/4004
D204	Diode BAS21 SOT-23	21/000B/AS21
D205	Diode BAT17 SOT-23	21/3030/0017
D206	Diode BAT17 SOT-23	21/3030/0017
D207	Diode BZX84C10 10V zener 350mW 10% SOT-23	21/4050/C10V
J1	Connector 6.35mm QC Vertical Tab	35/0635/0001
J2	Connector 6.35mm QC Vertical Tab	35/0635/0001
J3	Connector 10 way female	35/2501/0010
J201	Connector 6 way male	35/2501/0006
J202	Connector 2 way male locking	35/2505/0002
J203	Connector 2 way male	35/2501/0002
J204	Connector 2 way male	35/2501/0002
J205	Connector 2 way male	35/2501/0002
L1	Inductor 3u3H 20% >100mA 1008	37/3320/P101
L100	Inductor Ferrite beads 3x4x1 4S2	37/1022/0001
L101	Inductor Ferrite beads 3x4x1 4S2	37/1022/0001
L103	Inductor 8 turns on 20mm toroid	37/PA50/0003
L104	Inductor 315nH 11 turns CW 6.35mm ID	37/0635/1511
L105	Inductor 315nH 11 turns CW 6.35mm ID	37/0635/1511
L107	Inductor 247nH 9 turns CW 6.35mm ID	37/0635/1509
L200	Inductor 33uH 10% >100mA 1812	37/3320/P102
Q100	Transistor MRF174 RF Power mosfet	27/3020/MRF174

Ref.	Description	Part Number
Q101	Transistor MRF174 RF Power mosfet	27/3020/MRF174
Q102	Transistor MRF136 RF Power mosfet	27/3020/MRF136
Q200	Transistor MMBT3904 NPN SOT-23	27/3020/3904
Q201	Transistor MMBT3904 NPN SOT-23	27/3020/3904
Q202	Transistor NDT3055 n-ch mosfet SOT-223	27/3020/3055
R1	Resistor 1K2 5% 1206	51/3380/01K2
R2	Resistor 1K2 5% 1206	51/3380/01K2
R3	Resistor 15K 1% 200ppm 0805	51/8511/015K
R4	Resistor 1K2 1% 200ppm 0805	51/8511/01K2
R100	Resistor 470R 1% 200ppm 0805	51/8511/470R
R101	Resistor 470R 1% 200ppm 0805	51/8511/470R
R102	Resistor 470R 1% 200ppm 0805	51/8511/470R
R103	Resistor 470R 1% 200ppm 0805	51/8511/470R
R104	Resistor 15K precision 0.5% 50ppm 0805	51/85P1/015K
R105	Resistor 15K precision 0.5% 50ppm 0805	51/85P1/015K
R106	Resistor 15K precision 0.5% 50ppm 0805	51/85P1/015K
R107	Resistor 15K precision 0.5% 50ppm 0805	51/85P1/015K
R108	Resistor 15K precision 0.5% 50ppm 0805	51/85P1/015K
R109	Resistor 15K precision 0.5% 50ppm 0805	51/85P1/015K
R110	Resistor 15K precision 0.5% 50ppm 0805	51/85P1/015K
R111	Resistor 15K precision 0.5% 50ppm 0805	51/85P1/015K
R112	Resistor 1R 10% 3W axial wirewound	51/1053/001R
R113	Resistor 0R05 20W T0-220	51/T220/0R05
R114	Resistor 100K 1% 200ppm 0805	51/8511/100K
R115	Resistor 100K 1% 200ppm 0805	51/8511/100K
R116	Resistor 100K 1% 200ppm 0805	51/8511/100K
R117	Resistor 100K 1% 200ppm 0805	51/8511/100K
R118	Not Fitted	
R119	Resistor 1K5 5% 1W 200ppm 1218	51/8251/01K5
R120	Resistor 100R 5% 1W 200ppm 1218	51/8251/0100
R121	Resistor 100R 5% 1W 200ppm 1218	51/8251/0100
R122	Not Fitted	
R123	Resistor 1K5 5% 1W 200ppm 1218	51/8251/01K5
R124	Resistor 220R 5% 1W 200ppm 1218	51/8251/0220
R125	Resistor 150R 5% 1W 200ppm 1218	51/8251/0150
R126	Resistor 100R 20W T0-220	51/T220/0100
R127	Resistor 100R 20W T0-220	51/T220/0100
R128	Resistor 0R05 20W T0-220	51/T220/0R05
R129	Resistor 150R 5% 1W 200ppm 1218	51/8251/0150
R130	Resistor 150R 5% 1W 200ppm 1218	51/8251/0150
R131	Resistor 150R 5% 1W 200ppm 1218	51/8251/0150
R132	Resistor 150R 5% 1W 200ppm 1218	51/8251/0150
R133	Resistor 150R 5% 1W 200ppm 1218	51/8251/0150
R134	Resistor 15K precision 0.5% 50ppm 0805	51/85P1/015K
R135	Resistor 15K precision 0.5% 50ppm 0805	51/85P1/015K
R136	Resistor 15K precision 0.5% 50ppm 0805	51/85P1/015K
R137	Resistor 15K precision 0.5% 50ppm 0805	51/85P1/015K
R138	Resistor 2R7 10% 3W axial wirewound	51/1053/02R7
R200	Resistor 15K 1% 200ppm 0805	51/8511/015K
R201	Resistor 6K8 1% 200ppm 0805	51/8511/06K8

Ref.	Description	Part Number
R202	Resistor 1K5 5% 1206	51/3380/01K5
R203	Resistor 39K 1% 200ppm 0805	51/8511/039K
R204	Resistor 39K 1% 200ppm 0805	51/8511/039K
R208	Resistor 68K 1% 200ppm 0805	51/8511/068K
R209	Resistor 4K7 1% 200ppm 0805	51/8511/04K7
R210	Resistor 10K 1% 200ppm 0805	51/8511/010K
R211	Resistor 10K 1% 200ppm 0805	51/8511/010K
R212	Resistor 10K 1% 200ppm 0805	51/8511/010K
R213	Resistor 10K 1% 200ppm 0805	51/8511/010K
R214	Resistor 10K 1% 200ppm 0805	51/8511/010K
R215	Resistor 10K 1% 200ppm 0805	51/8511/010K
R216	Resistor 100K 1% 200ppm 0805	51/8511/100K
R217	Resistor 100K 1% 200ppm 0805	51/8511/100K
R218	Resistor 22R 5% 1W 200ppm 1218	51/8251/0022
R219	Resistor 1K 1% 200ppm 0805	51/8511/01K0
R222	Resistor 4K7 1% 200ppm 0805	51/8511/04K7
R223	Resistor 100R 1% 200ppm 0805	51/8511/100R
R224	Resistor 560R 1% 200ppm 0805	51/8511/560R
R225	Resistor 470R 1% 200ppm 0805	51/8511/470R
R226	Resistor 470R 1% 200ppm 0805	51/8511/470R
R227	Resistor 22R 5% 1W 200ppm 1218	51/8251/0022
R228	Resistor 100K variable 11 turn 4mm gull wing	53/SMV1/100K
R238	Resistor 100K variable 11 turn 4mm gull wing	53/SMV1/100K
R235	Resistor 33R 5% 1W 200ppm 1218	51/8251/0033
R236	Resistor 4K7 5% 1206	51/3380/04K7
R237	Resistor 4K7 5% 1206	51/3380/04K7
R238	Resistor 1K variable 11 turn 4mm gull wing	53/SMV1/001K
R239	Resistor 1K variable 11 turn 4mm gull wing	53/SMV1/001K
R240	Resistor 1K variable 11 turn 4mm gull wing	53/SMV1/001K
R242	Resistor 1M 1% 200ppm 0805	51/8511/01M0
R243	Resistor 10K 1% 200ppm 0805	51/8511/010K
R244	Resistor 4K7 1% 200ppm 0805	51/8511/04K7
T100	Transformer 4:1 Unbalanced	37/PA50/0004
T101	Transformer 1:1 Balun	37/PA50/0004
T102	Transformer 1:9 RF Output	37/PA50/0001
U100	IC LM224 Quad op-amp SO-14	29/000L/M224
U200	IC LM224 Quad op-amp SO-14	29/000L/M224
U201	IC LM224 Quad op-amp SO-14	29/000L/M224
U202	IC 74HC125 buffer SO-14	26/2030/C125
U203	IC TLC542 8 bit A/D converter SO-20	29/00TL/C542
U204	IC LM61 Temperature sensor SOT-23	29/0001/LM61
U205	IC LM7805CT Regulator TO-220	25/2040/85CT

Frequency Dependant Parts PA50A (25 – 32 MHz)

C9	Capacitor 27pF 1% 500V Silver Mica 1210	48/3003/027P
C10	Capacitor 33pF 1% 500V Silver Mica 1210	48/3003/033P
C11	Capacitor 18pF 1% 500V Silver Mica 1210	48/3003/018P
C12	Capacitor 3p3F +/- 0.1pF 500V Silver Mica 1210	48/3003/03P3
C13	Capacitor 56pF 1% 500V Silver Mica 1210	48/3003/056P

Ref.	Description	Part Number
C14	Capacitor 18pF 1% 500V Silver Mica 1210	48/3003/018P
C15	Capacitor 27pF 1% 500V Silver Mica 1210	48/3003/027P
C16	Capacitor 100pF 1% 500V Silver Mica 1210	48/3003/100P
C17	Capacitor 33pF 1% 500V Silver Mica 1210	48/3003/033P
C18	Not Fitted	
C19	Capacitor 100pF 1% 500V Silver Mica 1210	48/3003/100P
C20	Capacitor 56pF 1% 500V Silver Mica 1210	48/3003/056P
C21	Not Fitted	
C22	Capacitor 100pF 1% 500V Silver Mica 1210	48/3003/100P
C23	Capacitor 68pF 1% 500V Silver Mica 1210	48/3003/068P
C24	Capacitor 3p3F +/- 0.1pF 500V Silver Mica 1210	48/3003/03P3
C25	Capacitor 100pF 1% 500V Silver Mica 1210	48/3003/100P
C26	Capacitor 10pF +/- 0.1pF 500V Silver Mica 1210	48/3003/010P
C28	Capacitor 68pF 1% 500V Silver Mica 1210	48/3003/068P
C29	Capacitor 68pF 1% 500V Silver Mica 1210	48/3003/068P
C121	Capacitor 120pF 5% 63V NPO 1206	46/3300/120P
C130	Capacitor 470pF 5% 63V NPO 1206	46/3300/470P
C131	Capacitor 100pF 5% 63V NPO 1206	46/3300/100P
C132	Capacitor 120pF 5% 63V NPO 1206	46/3300/120P
C133	Capacitor 220pF 5% 63V NPO 1206	46/3300/220P
C1000	Capacitor 180pF 1% 500V Silver Mica 1210	48/3003/180P
C1001	Not Fitted	
L2	Inductor 184nH 7 turns CW 6.35mm ID	37/0635/1507
L3	Inductor 247nH 9 turns CW 6.35mm ID	37/0635/1509
L4	Inductor 247nH 10 turns CW 6.35mm ID	37/0635/1510
L5	Inductor 284nH 10 turns CW 6.35mm ID	37/0635/1510
L6	Inductor 247nH 9 turns CW 6.35mm ID	37/0635/1509
L102	Inductor 307nH Coilcraft Maxispring	37/MAXI/307N
L106	Inductor 558nH Coilcraft Maxispring	37/MAXI/558N

Frequency Dependant Parts PA50B (30 – 40 MHz)

C9	Capacitor 33pF 1% 500V Silver Mica 1210	48/3003/033P
C10	Capacitor 27pF 1% 500V Silver Mica 1210	48/3003/027P
C11	Capacitor 12pF 1% 500V Silver Mica 1210	48/3003/012P
C12	Capacitor 5p6F +/- 0.1pF 500V Silver Mica 1210	48/3003/05P6
C13	Capacitor 47pF 1% 500V Silver Mica 1210	48/3003/047P
C14	Capacitor 15pF 1% 500V Silver Mica 1210	48/3003/015P
C15	Capacitor 12pF 1% 500V Silver Mica 1210	48/3003/012P
C16	Capacitor 100pF 1% 500V Silver Mica 1210	48/3003/100P
C17	Capacitor 12pF 1% 500V Silver Mica 1210	48/3003/012P
C18	Capacitor 4p7F +/- 0.1pF 500V Silver Mica 1210	48/3003/04P7
C19	Capacitor 82pF 1% 500V Silver Mica 1210	48/3003/082P
C20	Capacitor 47pF 1% 500V Silver Mica 1210	48/3003/047P
C21	Capacitor 4p7F +/- 0.1pF 500V Silver Mica 1210	48/3003/04P7
C22	Capacitor 100pF 1% 500V Silver Mica 1210	48/3003/100P
C23	Capacitor 47pF 1% 500V Silver Mica 1210	48/3003/047P
C24	Not Fitted	
C25	Capacitor 82pF 1% 500V Silver Mica 1210	48/3003/082P
C26	Capacitor 10pF +/- 0.1pF 500V Silver Mica 1210	48/3003/010P

Ref.	Description	Part Number
C28	Capacitor 100pF 1% 500V Silver Mica 1210	48/3003/100P
C29	Capacitor 100pF 1% 500V Silver Mica 1210	48/3003/100P
C121	Capacitor 82pF 5% 63V NPO 1206	46/3300/082P
C130	Capacitor 330pF 5% 63V NPO 1206	46/3300/330P
C131	Capacitor 100pF 5% 63V NPO 1206	46/3300/100P
C132	Capacitor 100pF 5% 63V NPO 1206	46/3300/100P
C133	Capacitor 180pF 5% 63V NPO 1206	46/3300/180P
C1000	Capacitor 150pF 1% 500V Silver Mica 1210	48/3003/150P
C1001	Not Fitted	
L2	Inductor 150nH 6 turns CW 6.35mm ID	37/0635/1506
L3	Inductor 184nH 7 turns CW 6.35mm ID	37/0635/1507
L4	Inductor 215nH 8 turns CW 6.35mm ID	37/0635/1508
L5	Inductor 215nH 8 turns CW 6.35mm ID	37/0635/1508
L6	Inductor 215nH 8 turns CW 6.35mm ID	37/0635/1508
L102	Inductor 307nH Coilcraft Maxispring	37/MAXI/307N
L106	Inductor 491nH Coilcraft Maxispring	37/MAXI/491N

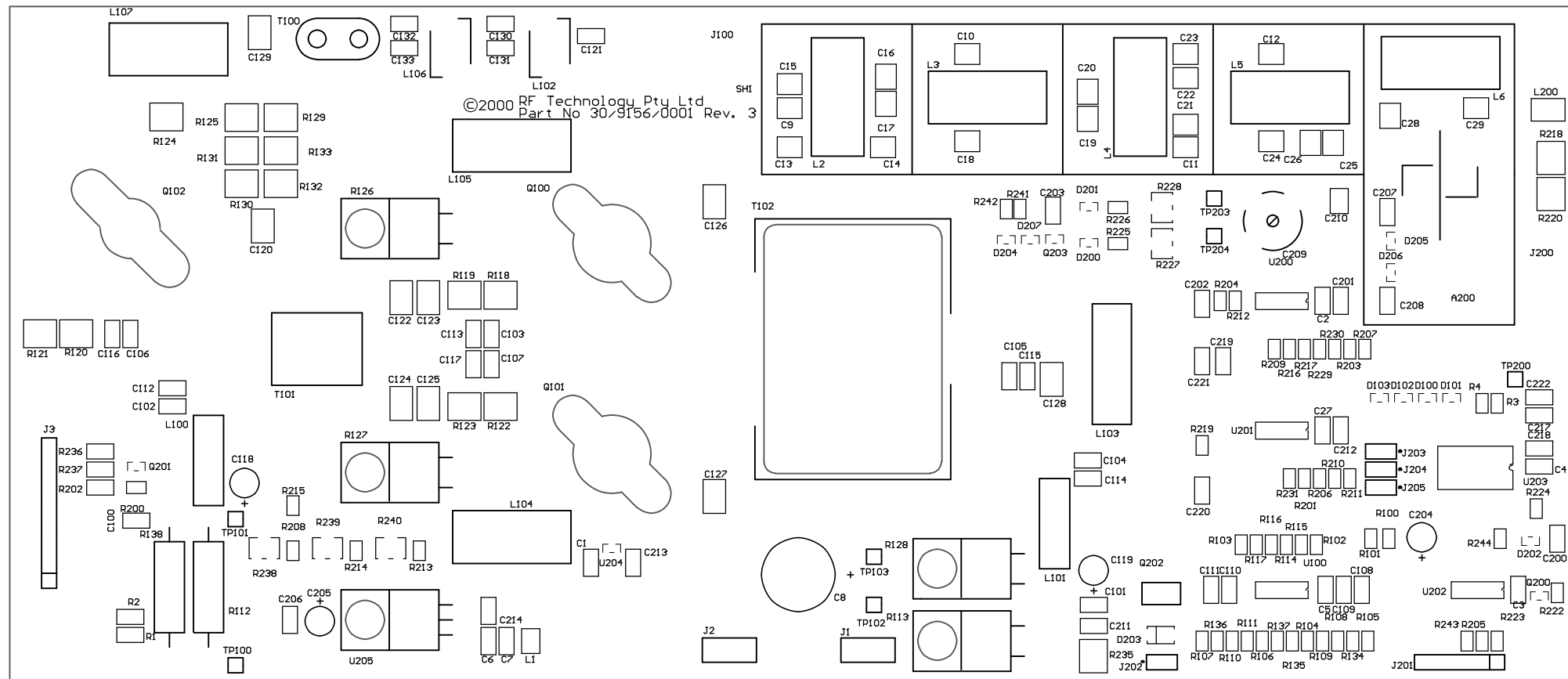
Frequency Dependant Parts PA50C (38 – 50 MHz)

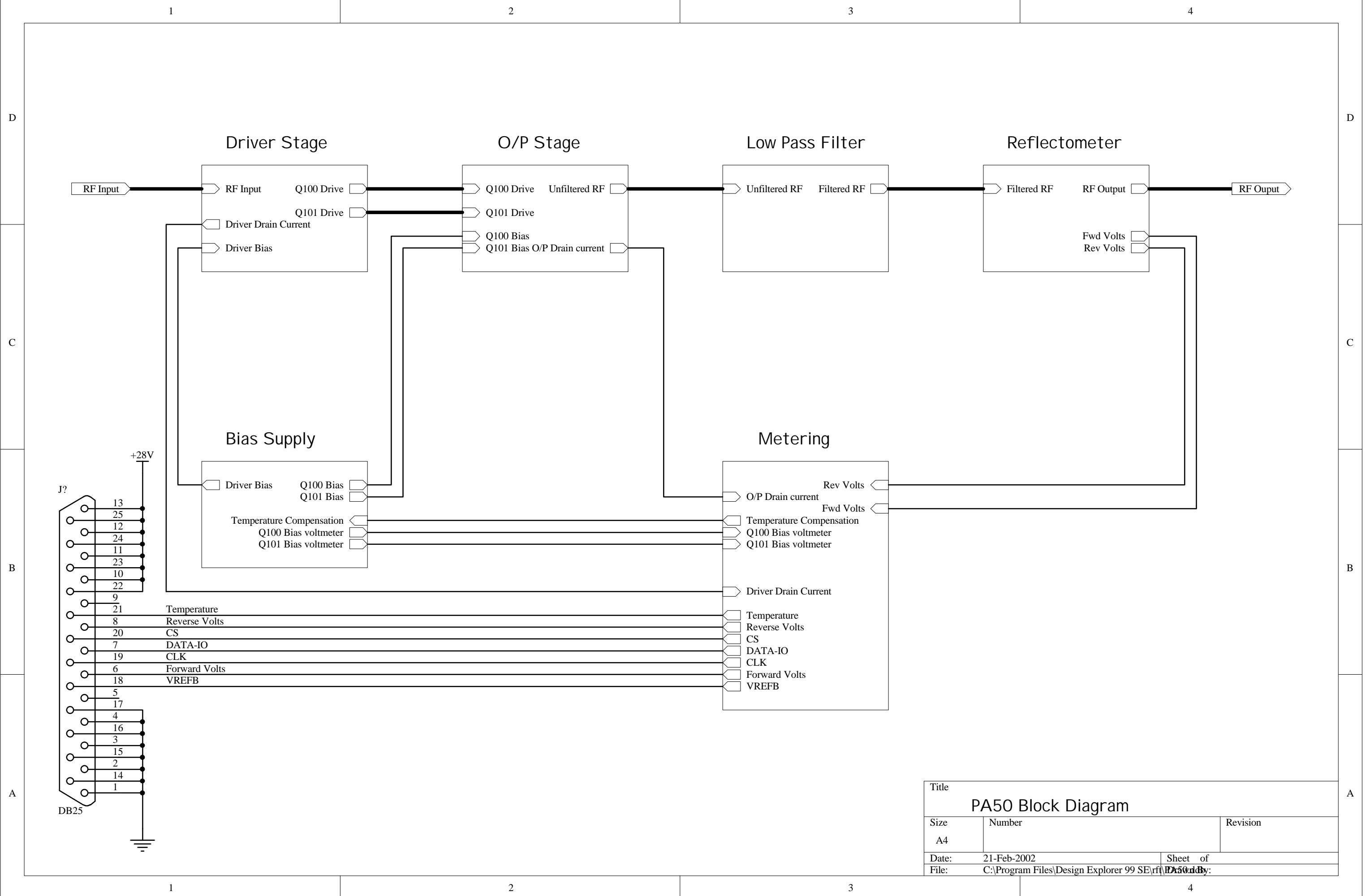
C9	Capacitor 15pF 1% 500V Silver Mica 1210	48/3003/015P
C10	Capacitor 12pF 1% 500V Silver Mica 1210	48/3003/012P
C11	Capacitor 12pF 1% 500V Silver Mica 1210	48/3003/012P
C12	Capacitor 3p9F +/- 0.1pF 500V Silver Mica 1210	48/3003/03P9
C13	Capacitor 47pF 1% 500V Silver Mica 1210	48/3003/047P
C14	Not Fitted	
C15	Capacitor 18pF 1% 500V Silver Mica 1210	48/3003/018P
C16	Capacitor 82pF 1% 500V Silver Mica 1210	48/3003/082P
C17	Capacitor 4p7F +/- 0.1pF 500V Silver Mica 1210	48/3003/04P7
C18	Capacitor 12pF 1% 500V Silver Mica 1210	48/3003/012P
C19	Capacitor 100pF 1% 500V Silver Mica 1210	48/3003/100P
C20	Not Fitted	
C21	Not Fitted	
C22	Capacitor 100pF 1% 500V Silver Mica 1210	48/3003/100P
C23	Capacitor 12pF 1% 500V Silver Mica 1210	48/3003/012P
C24	Not Fitted	
C25	Capacitor 33pF 1% 500V Silver Mica 1210	48/3003/033P
C26	Capacitor 39pF +/- 0.1pF 500V Silver Mica 1210	48/3003/039P
C28	Capacitor 68pF 1% 500V Silver Mica 1210	48/3003/068P
C29	Capacitor 68pF 1% 500V Silver Mica 1210	48/3003/068P
C121	Capacitor 82pF 5% 63V NPO 1206	46/3300/082P
C130	Capacitor 180pF 5% 63V NPO 1206	46/3300/180P
C131	Capacitor 68pF 5% 63V NPO 1206	46/3300/068P
C132	Capacitor 68pF 5% 63V NPO 1206	46/3300/068P
C133	Capacitor 180pF 5% 63V NPO 1206	46/3300/180P
C1000	Capacitor 100pF 1% 500V Silver Mica 1210	48/3003/100P
C1001	Not Fitted	
L2	Inductor 121nH 5 turns CW 6.35mm ID	37/0635/1505
L3	Inductor 150nH 6 turns CW 6.35mm ID	37/0635/1506
L4	Inductor 184nH 7 turns CW 6.35mm ID	37/0635/1507
L5	Inductor 184nH 7 turns CW 6.35mm ID	37/0635/1507

Ref.	Description	Part Number
L6	Inductor 150nH 6 turns CW 6.35mm ID	37/0635/1506
L102	Inductor 246nH Coilcraft Maxispring	37/MAXI/246N
L106	Inductor 380nH Coilcraft Maxispring	37/MAXI/380N

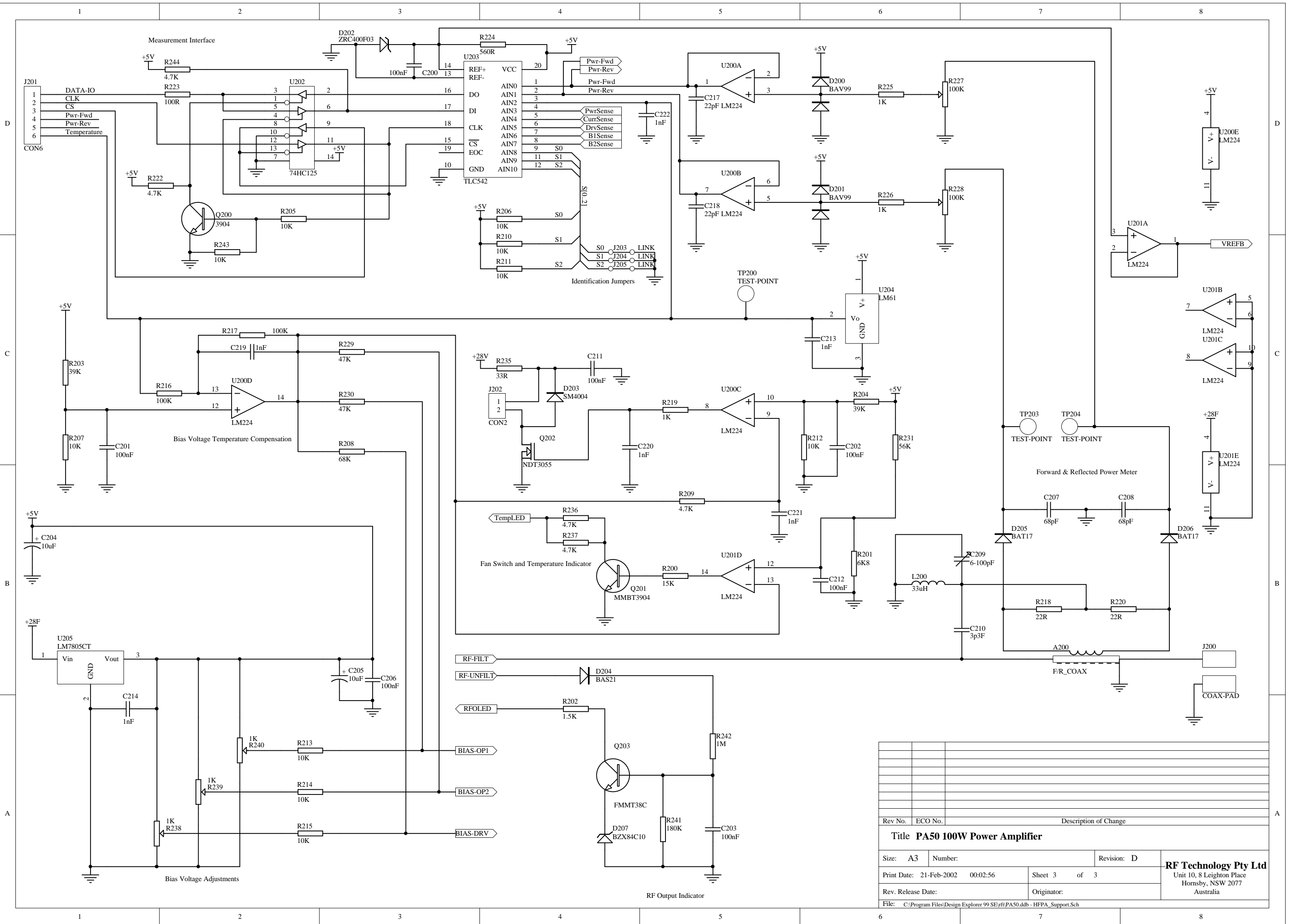
Front Panel PCB

R1	Resistor 100R 5% 0.25W axial	51/1040/0100
D1	Diode LED Yellow RA	21/1010/LEDY
D2	Diode LED Red RA	21/1010/LEDR
D3	Diode LED Green RA	21/1010/LEDG
J1	Connector 10 way header	35/2501/0010
J2	Connector DB9/F RA PCB mount	35/5012/009F

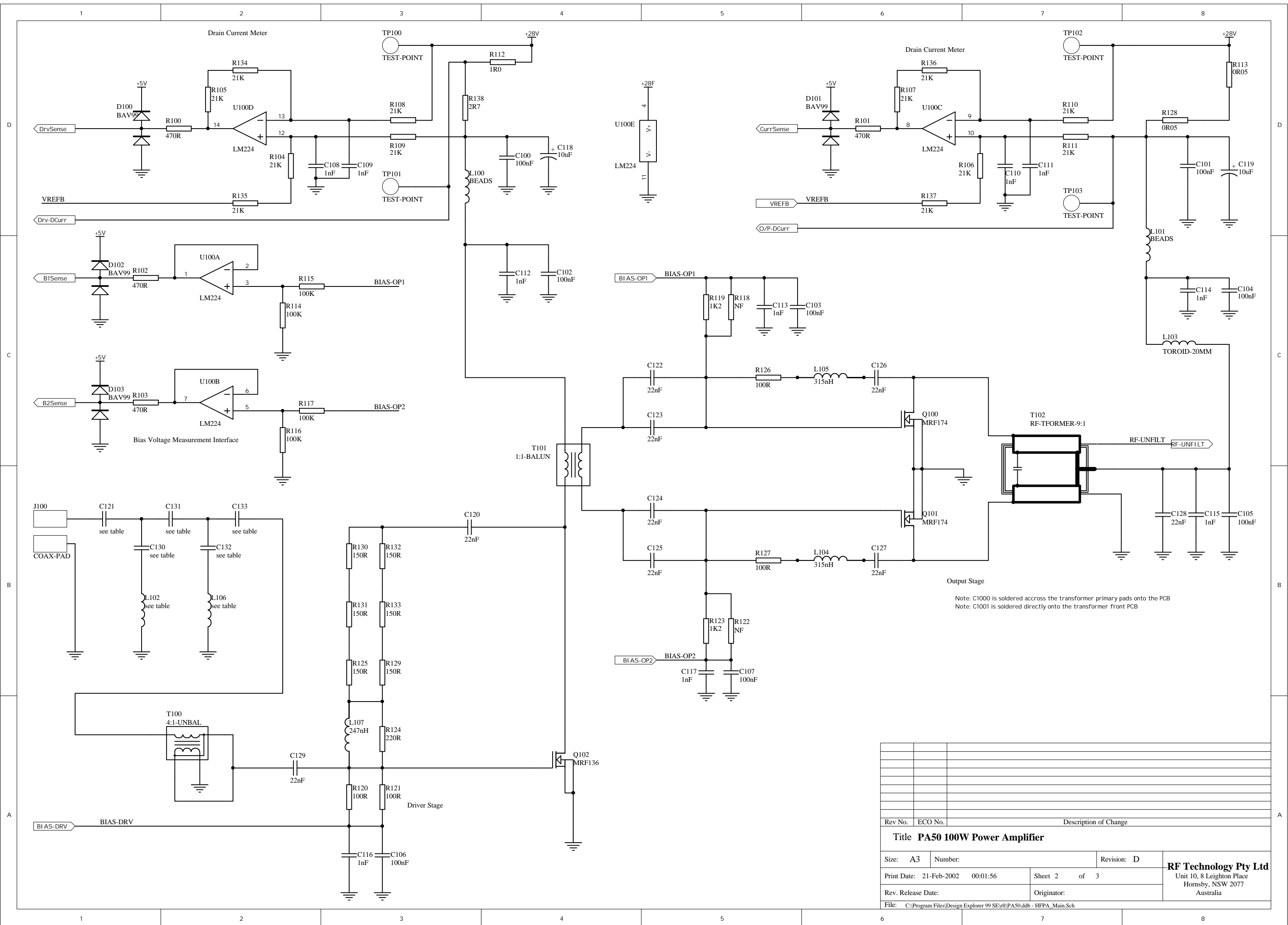




Title		
PA50 Block Diagram		
Size	Number	Revision
A4		
Date:	21-Feb-2002	Sheet of
File:	C:\Program Files\Design Explorer 99 SE\rf\PA50.d	



Rev No.	ECO No.	Description of Change		
Title PA50 100W Power Amplifier				
Size: A3	Number:	Revision: D	RF Technology Pty Ltd Unit 10, 8 Leighton Place Hornsby, NSW 2077 Australia	
Print Date: 21-Feb-2002 00:02:56		Sheet 3 of 3		
Rev. Release Date:		Originator:		
File: C:\Program Files\Design Explorer 99 SE\rf\PA50.ddb - HPPA_Support.Sch				

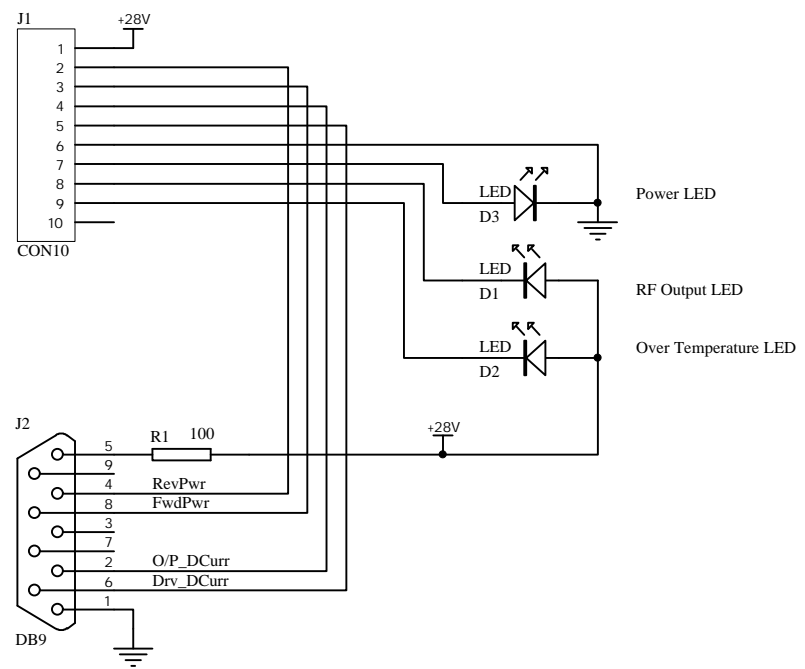


Note: C1000 is soldered across the transformer primary pads onto the PCB
 Note: C1001 is soldered directly onto the transformer front PCB

Rev No.	ECO No.	Description of Change

Title PA50 100W Power Amplifier		Revision: D	RF Technology Pty Ltd Unit 10, 8 Leighton Place Hornsby, NSW 2077 Australia
Size: A3	Number:	Sheet 2 of 3	
Print Date: 21-Feb-2002 00:01:56	Originator:		
Rev. Release Date:			

File: C:\Program Files\Design Explorer 99 SE\rt\PA50.ddb - HPPA_Main.Sch



Title		
Size A3	Number	Revision
Date: 21-Feb-2002	Sheet of	
File: C:\Program Files\Design Explorer 99 SE\rf\B50001.dwg		

