TA2563-xxx Power Amplifier Series
Service and Installation Manual

MAS-02563-01-01
Issue 1
June 2006

Tait Contact Information

Tait Radio Communications Corporate Head Office

Tait Electronics Ltd
P.O. Box 1645
Christchurch
New Zealand

For the address and telephone number of regional offices, refer to the TaitWorld website:

Website: http://www.taitworld.com

Technical Support

For assistance with specific technical issues, contact Technical Support:

E-mail: support@taitworld.com
Website: http://support.taitworld.com

Contents

Preface

Scope of Manual

This manual provides information about the TA2563-xxx series of power amplifiers. The manual looks at the assembly, disassembly and servicing of the XA2563-01x-PBA boards A and B used on the TA2563-xxx power amplifiers. The manual does not cover the setup or servicing of the TB8100 power amplifier used in the TA2563-xxx power amplifiers. Setup and servicing of the TB8100 power amplifier is covered in the TB8000 documentation

Enquiries and Comments

If you have any enquiries regarding this manual, or any comments, suggestions and notifications of errors, please contact Technical Support (refer to "Tait Contact Information" on page 2).

Updates of Manual and Equipment

In the interests of improving the performance, reliability or servicing of the equipment, Tait Electronics Ltd reserves the right to update the equipment or this manual or both without prior notice.

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Disclaimer

There are no warranties extended or granted by this manual. Tait Electronics Ltd accepts no responsibility for damage arising from use of the information contained in the manual or of the equipment and software it describes. It is the responsibility of the user to ensure that use of such information, equipment and software complies with the laws, rules and regulations of the applicable jurisdictions.

Associated Documentation

TB8100 Installation and Operation Manual (IPN MBA-00005-05).

TB8100 Specifications Manual (IPN MBA-00001-06).

TB8100 Service Kit and Alarm Center User's Manuals and online Help (IPN MBA-00010-03)

TB8100 Calibration Kit User's Manual and online Help.

Technical notes are published from time to time to describe applications for Tait products, to provide technical details not included in manuals, and to offer solutions for any problems that arise.

Updates may also be published on the Tait support website.

Document Conventions

Within this manual, four types of alerts may be given to the reader. The following illustrate each type of alert and its associated symbol.

Warning!! **This alert is used when there is a potential risk of death or serious injury.**

Caution **This alert is used when there is a risk of minor or moderate injury to people.**

Important This alert is used to warn about the risk of equipment damage or malfunction.

Note This alert is used to highlight information that is required to ensure procedures are performed correctly.

Publication Record

Issue	Publication Date	Description
1	June 2006	first release

Safety and Servicing Information

This chapter contains general information on safety and servicing procedures for the TA2563-xxx power amplifier series.

Personal Safety

Explosive Environments

Warning!! **Do not operate TA2563-xxx fitted equipment near electrical blasting caps or in an explosive atmosphere. Operating the equipment in these environments is a definite safety hazard.**

Proximity to RF Transmissions

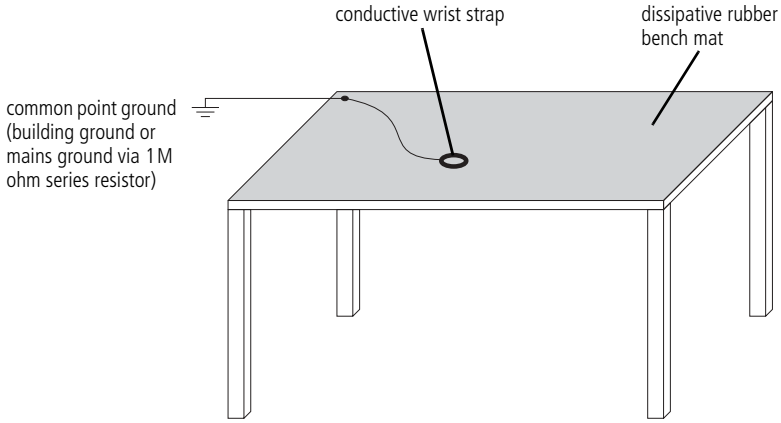
Do not operate the transmitter when someone is standing within 90 cm (3 ft) of the antenna. Do not operate the transmitter unless you have checked that all RF connectors are secure.

Equipment Safety

ESD Precautions

Important This equipment contains devices which are susceptible to damage from static charges. You must handle these devices carefully and according to the procedures described in the manufacturers' data books.

We recommend you purchase an antistatic bench kit from a reputable manufacturer and install and test it according to the manufacturer's instructions. The diagram below shows a typical antistatic bench set-up.



You can obtain further information on antistatic precautions and the dangers of electrostatic discharge (ESD) from standards such as ANSI/ESD S20.20-1999 or BS EN 100015-4 1994.

Aerial Load

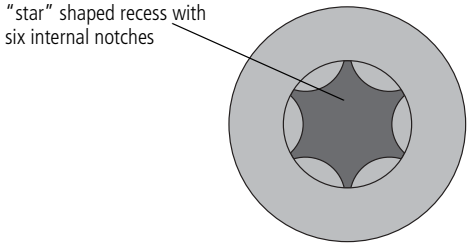
The TA2563-xxx equipment has been designed to operate safely under a wide range of aerial loading conditions. However, we strongly recommend that the transmitter should always be operated with a suitable load to prevent damage to the transmitter output power stage.

Identifying Screw Types

Torx Recess Head Screws

Torx recess head screws are the standard type of screw used in all TA2563-xxx equipment, although Pozidriv and Allen recess head screws are also used in a few special applications.

The diagram below shows a typical Torx recess head screw (actual hardware may differ slightly from this illustration due to variations in manufacturing techniques).



Allen Recess Head UNC Screws

Allen recess head 4-40 UNC thread screws are used to secure the RF power transistors in the TA2563-xxx power amplifier and cannot be interchanged with M3 screws.

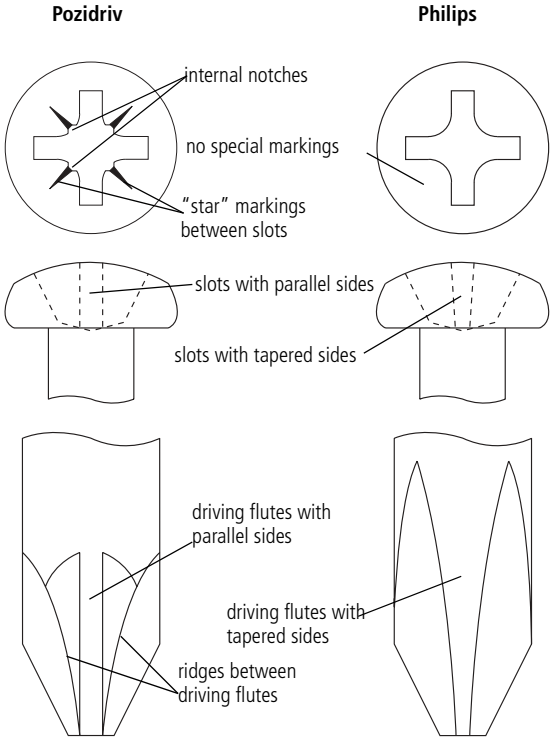
Pozidriv Recess Head Screws

Pozidriv recess head screws are used in TA2563-xxx equipment in a few special applications. It is important that you use the correct type and size screwdriver to avoid damaging the screw head.

It is particularly important that you do not use Philips screwdrivers on Pozidriv screw heads as the tapered driving flutes of the Philips screwdriver do not engage correctly with the parallel-sided slots in the Pozidriv screw head. This can result in considerable damage to the screw head if the screwdriver tip turns inside the recess.

Note If you find you need excessive downwards pressure to keep the screwdriver tip in the Pozidriv screw head, you are probably using the wrong type or size screwdriver.

The diagram below shows the main differences between typical Pozidriv and Philips screw heads and screwdriver tips (actual hardware may differ slightly from these illustrations due to variations in manufacturing techniques).



Recommended Tools

It is beyond the scope of this manual to list every tool that a service technician should carry. However, the tools specifically required for servicing TA2563-xxx equipment are listed in the table below. You can also obtain the TBA0ST2 tool kit from your nearest Tait Dealer or Customer Service Organisation. It contains the basic tools needed to install, tune and service TA2563-xxx equipment.

Driver/ Spanner	Size	Location / Function
Torx T8C*	M2.5	securing the SMA connector to the reciter and PA front panel
Torx T10*	M3	all M3 screws
Torx T20*	M4	all M4 screws
Pozidriv PZ3	M6	DC input terminals on the PMU
3/32 in Allen key	4-40 UNC	securing the RF power transistors to the PA heatsink
5.5 mm AF*	M3	securing the speaker to the control panel chassis
11 mm AF		securing the BNC/TNC connectors to the reciter rear panel

* included in the TBA0ST2 kit

Replacing Components

Ensure that any replacement components are of the same type and specifications as the originals. This will prevent the performance and safety of the TA2563-xxx hardware from being degraded.

Surface Mount Devices

Important Surface mount devices (SMDs) require special storage, handling, removal and replacement techniques. This equipment should be serviced only by an approved Tait Dealer or Customer Service Organisation equipped with the necessary facilities. Repairs attempted with incorrect equipment or by untrained personnel may result in permanent damage. If in doubt, contact your nearest Tait Dealer or Customer Service Organisation.

Leaded Components

Whenever you are doing any work on the PCB that involves removing or fitting components, you must take care not to damage the copper tracks or pads. The two satisfactory methods of removing components from plated-through hole (PTH) PCBs are detailed below.

Desoldering Iron Method

This method requires the use of a desoldering station.

1. Place the tip over the lead and, as the solder starts to melt, move the tip in a circular motion.
2. Start the suction and continue the movement until three or four circles have been completed.
3. Remove the tip while continuing suction to ensure that all solder is removed from the joint, then stop the suction.
4. **Before** pulling the lead out, ensure it is not stuck to the plating.
5. If the lead is still not free, resolder the joint and try again.

Note The desoldering iron does not usually have enough heat to desolder leads from the ground plane. Additional heat may be applied by holding a soldering iron on the tip of the desoldering iron (this may require some additional help).

Component Cutting Method

6. Cut the leads on the component side of the PCB.
7. Heat the solder joint **sufficiently** to allow **easy** removal of the lead by drawing it out from the component side: do **not** use undue force.
8. Fill the hole with solder and then clear with solderwick.

Cased Mica Capacitors

Cased mica capacitors can be removed by heating the top with a heavy-duty soldering iron and gently lifting the capacitor off the PCB with a solder-resistant spike or equivalent. Make sure that the solder at the tab solder joint is melted or removed before attempting to lift the capacitor.

Regulatory Information

Any modifications you make to this equipment which are not authorised by Tait Electronics Ltd may invalidate your compliance authority's approval to operate the equipment.

PCB Information

All PCBs are identified by a unique 10 digit IPN (internal part number) which is printed onto the PCB (usually on the top side), as shown in the example below.

The last two digits of this number define the issue status, which starts at 01 and increments through 02, 03, 04 etc. as the PCB is updated.

1 General Information

The TA2563-xxx provides a new lease of life to T800 Series I and Series II Base Stations by replacing the existing 50W PAs with a modified TB8100 power amplifier. The new product is created by adding the XA2563-xxx-PBA board A (an attenuator), the XA2563-xxx-PBA board B (a fan power distribution PCB) and three fans to the TB8000 power amplifier. With two front panel styles and variants in the attenuator, up to six new product are now available

T800 Series I racks

1. TA2563-10K
2. TA2563-10H
3. TA2563-10B

T800 Series II racks

4. TA2563-20K
5. TA2563-20H
6. TA2563-20B

Rack Mounting

The TA2563-xxx are two rack slots wide.

Power Control

There is no way to adjust the RF Output Power and have the power loop compensate for frequency, temperature and age variations at the same time. The power is set and fixed during configuration and calibration.

I2C

The I2C and all associated functions like alarming are not available

Type Approvals

This stand alone PA is not offered with Type Approvals. The end-user or system provider must complete some level of compliance for the total system as per the regulatory authorities in the country of operation

Specifications

The specifications are as found in the power amplifier section of the TB8100 specifications manual.

PA Output ruggedness

The TB8100 PA has protection added to reduce failure due to rapid output load changes. The end user is advised to be careful with PA termination changes while transmitting. In case of uncertainty an external isolator will provide 100% protection.

Fan operation.

The construction of the housing around the TB8100 PA causes a more restrictive air flow. Three fans have been added to reduce the effects of the

limited airflow. The PA does not provide any fan rotation detection, monitoring or alarm processing. The fans are turned on when the transmitter is keyed and hold their power for about 5 minutes after release of Tx-key.

Configuration and calibration

Configuration and calibration require the PA to be connected to a PMU and a reciter via the IDC connector (the PMU provides the power for the I2C bus). The reciter is mandatory as it acts as a protocol converter. CCTM and Service kit protocol messages are translated and applied to the PA.

Configuration parameters are stored in the PA, not in the reciter. These include:

- alarm thresholds
- fan ON/Off control settings
- output power settings

All calibration parameters for the PA are stored in the PA. These include:

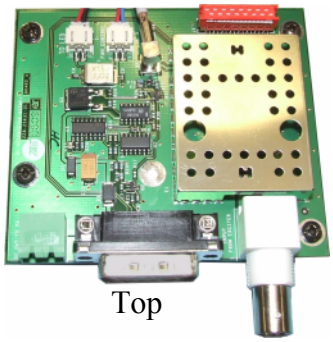
- PA Bias
- forward and reverse bias voltages
- PA output power

The process of calibration and configuration is identical to that of a TB8100 rack.

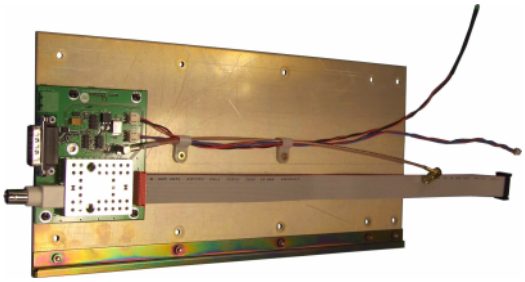
2 Installation

2.1 Mechanical

The XA2563-xxx-PBA board A attenuator module. The module has components on the top side only, the bottom side is used for heat transfer.

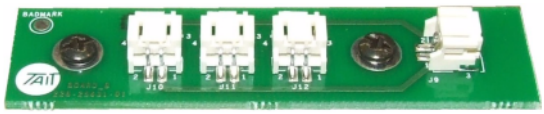


Top

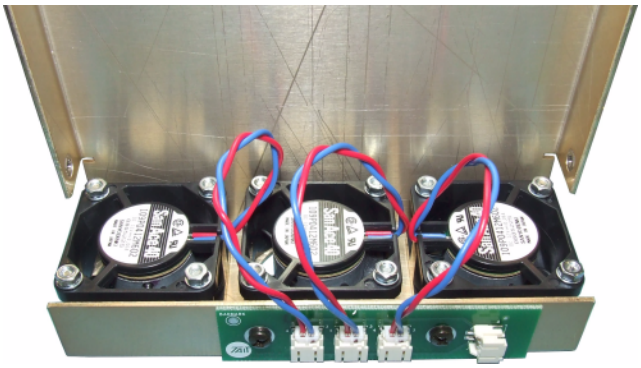


The XA2563-xxx-PBA board A is mounted to the side cover. Heatsink compound is used between the board and side cover for heat dissipation. The cables are fitted and secured to the side cover.

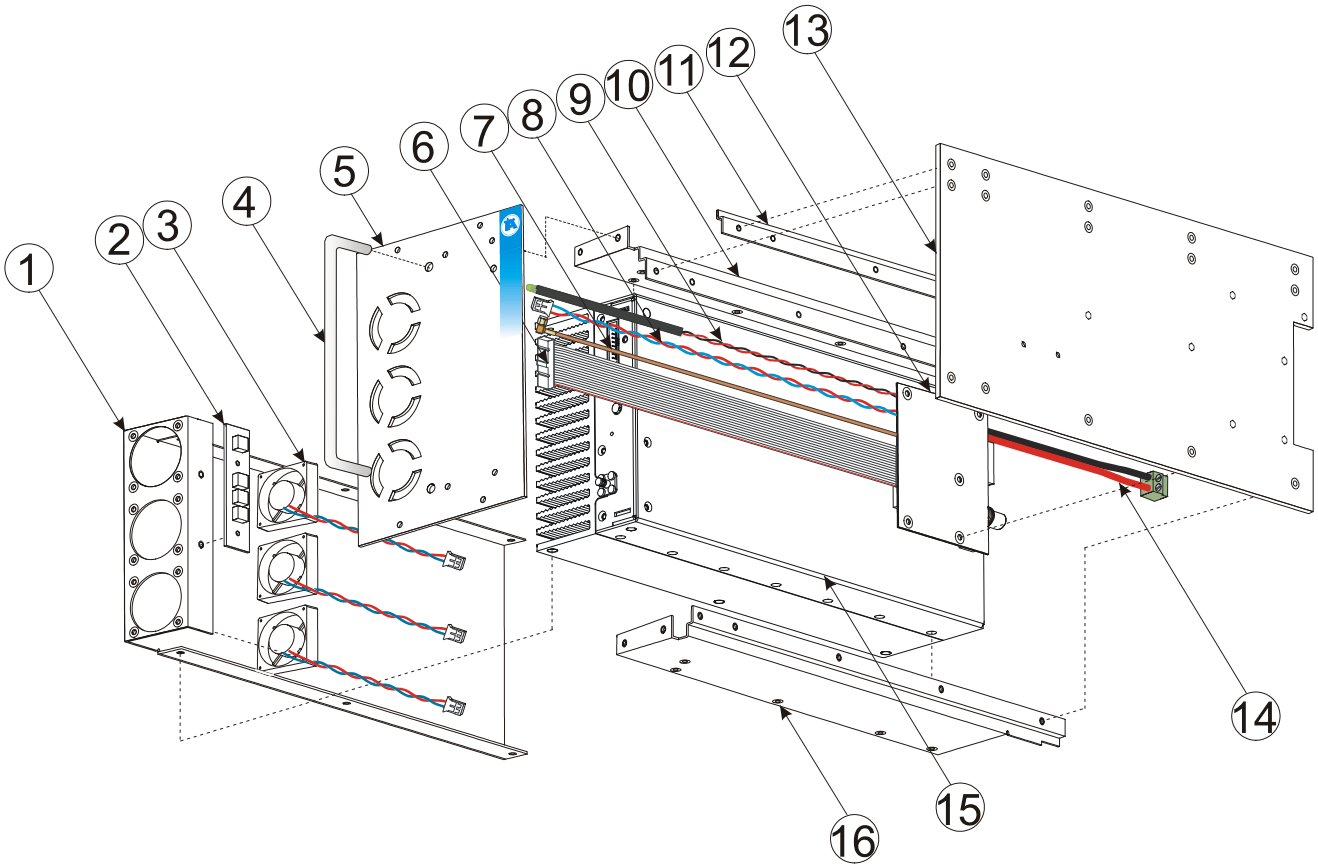
The XA2563-xxx PBA board B fan power distribution module. The module has components on the top side only.



The XA2563-xxx PBA board B is fitted to the fan side cover.



2.2 Expanded Assembly



Ref	Qty	IPN	Description
⑧	1	219-02982-00	CBL assy 2wy fan pwr TBB
⑭	1	219-03006-00	Cbl assy 2wy pwr 150mm TBA
⑨	1	219-03054-00	LED assy TA2563-01
⑦	1	219-03055-00	CBL assy RG136 MCXRA&SMARA Plg .3m
⑥	1	219-03057-00	CBL assy 16wy IDC skt 2x8 M/M Pl
③	3	219-02993-00	CBL assy 40x40 12V fan term
①	1	303-23179-01	CVR side fan TB8K-T889
⑬	1	303-23180-01	CVR side PCB TB8K-T889
⑤	1	316-06859-00	PNL frt TBA-T889 scrn cmplt S1(316-06860-00 PNL frt TBA-T889 scrn cmplt S2)
⑪	1	318-01058-00	RAIL top gde TBA-T889
⑯	1	318-01059-00	RAIL btm TBA-T889
⑩	1	318-01060-00	RAIL top TBA-T889
④	1	308/01007-02	HNDL BSTA SII int thd
⑮	1	TBA81B1-0000	TB8100 Power Amplifier 136-174M 50W 12VDC
⑫	1	XA2563-01B-P	PCB TB8100 Intfc between T800 VHF Exciter and TB8100 VHF PA Board _A
②	1	XA2563-01B-P	PCB TB8100 Intfc between T800 VHF Exciter and TB8100 VHF PA Board _B

Note The diagram and reference numbers shown are for series II only, the parts for series I are identified separately in the text.

2.3 Assembly and Disassembly

The TA2563-xxx is assembled using the parts and instructions that follow:

Note The reference number refer to the table and diagram on the previous page.

Note The screws, p-clips and nuts are not identified in the diagram but are discussed in the text.

1. Screw the top guide ⑪ to the inside of the side cover ⑬ using five M3x6 countersunk pozidriv screws (IPN: 345-40460-00).
2. Remove five screws from the top of the PA ⑮ and fit the top rail ⑩, secure with the previously removed screws.
3. Plug the cables into XA2563-xxx-PBA board A ⑫:
   - 2 way power ⑭into J4
   - 16 way micromatch ⑥ into J7
   - RG136 RF cable ⑦ into J3
   - 2 way fan power ⑧ into J5
   - front panel LED ⑨ into J6
4. Apply heatsink compound to the back of XA2563-xxx-PBA board A ⑫ and screw to the back of the side cover ⑬ using five M3x4 pan head screws (IPN: 345-40492-00).
5. Secure the cables to the side cover ⑬ using two cable clamps (IPN: 357-00010-45) and M3x6 screws (IPN: 345-40460-00). Do not secure the 16 way micromatch ⑥.
6. Remove five screws from the bottom of the PA ⑮ and fit the bottom rail ⑯ in place, secure with the previously removed screws.
7. Screw the side cover ⑬ to the PA ⑮ using ten M3x8 countersunk pozidriv screws (IPN: 345-00040-07).
8. Plug the 16 way micromatch cable ⑥ into the PA ⑮.
9. Screw the RG136 RF cable ⑦ onto the PA ⑮.
10. Plug the 2 way power ⑭into the PA ⑮.
11. Fit the XA2563-xxx-PBA board B ② onto the fan side cover ① using two M3x4 pan head screws (INP: 345-40492-00).
12. Assemble the three fans ③ into the fan side cover ① using four M3x25 screws, washers and nuts (IPN: 345-00040-18, 353-00010-13, 352-00010-08).

Note Ensure the fan airflow is from the front panel to the rear.

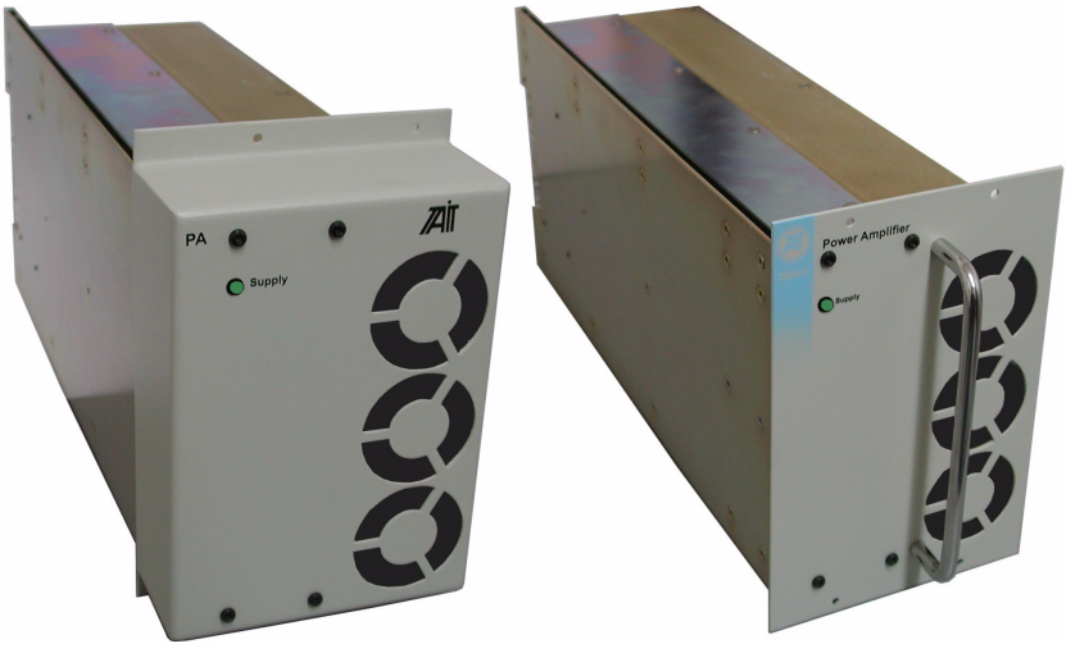
13. Fit the fan connectors into XA2563-xxx-PBA board B ② sockets J10, J11, J12.
14. Attach the fan side cover ① to the PA ⑮ using six M3x8 countersunk pozidriv screws.

15. Plug the 2 way fan power cable ⑧ into J9 on the XA2563-xxx-PBA board B ②.
16. Using a grommet (IPN: 362-00010-33) fit the front panel LED ⑨ into the front panel ⑤.
17. Attach the handle ④ to the front panel ⑤ using two M3x6 countersunk torx screws (IPN: 345-40460-00).
18. Attach the front panel ⑤ (Series I front panel IPN: 316-06859-00) to the PA ⑮ using four M3x8 taptite screws (IPN: 349-00020-36).

Note The differences for all models are with the front panel, the attenuation on XA2563-xxx-PBA board A ⑫ and the frequency bands of the PA ⑮.

Disassembly is a reverse of the above.

The assembled TA2563-xxx series I and II look like the following.



2.4 Rack Installation

The TA2563-xxx requires two rack slots in the rack as opposed to the T800 50Watt PAs, which require only a single rack slot.
To accommodate the existing rack wiring the TA2563-10x Series I replacement modules protrude trough the front of the rack, While the TA2563-20x Series II replacements are flush with the front of the rack, but take more space at the back.

3 Testing

3.1 TA2563-10K/20K (800MHz) Test

Equipment Required

- T800 Rack Series I/Series II, wired up for T889 PA
- RF test set with Power Meter for 50W or more
- T881 Series I transmitter or T881 Series II transmitter
- T808 power supply
- Associated coax cable to connect the T881 to the TA2563-10K/20K (should be part of the rack)
- Coax Cable to connect the TA2563-10K/20K output to the test set (N-male to N-male)
- Coax cable between T881 and Test set (BNC to N)

Preliminary Tests

- Ensure that the T808 produces 13.8V.
- Ensure that the T881 produces 5W +/-0.5W.

Fit the TA2563-10K20K power amplifier in the rack, plug in the D-range at the rear, the coax to the T881 and connect it to the RF test set.

Testing

Turn the power on. The Power LED should come on.

Test for RF Power by pressing the black carrier button on the transmitter and observing the RF output power displayed. This should be 50W +- 5%

Test the fans and the fan timer by measuring the time the fans take to shut down after the carrier button has been released. This should be at least five minutes.

3.2 TA2563-10H/20H (UHF) Test

Equipment Required

- T800 Rack Series I/Series II, wired up for T859 PA
- RF test set with Power Meter for 50W or more
- T857 Series I exciter or T857 Series II exciter
- T808 power supply
- Associated coax cable to connect the T857 to the TA2563-10H/20H (should be part of the rack)
- Coax Cable to connect the TA2563-10H/20H output to the test set (N-male to N-male)
- Coax cable between T857 and Test set (BNC to N)

Preliminary Tests

- Ensure that the T808 produces 13.8V
- Ensure that the T857 produces 0.7W +/-0.1W

Fit the TA2563-10H/20H power amplifier in the rack, plug in the D-range at the rear, the coax to the T857 and connect it to the RF test set.

Test

Turn the power on. The Power LED should come on.

Test for RF Power by pressing the black carrier button on the transmitter and observing the RF output power displayed. This should be 50W +- 5%

Test the fans and the fan timer by measuring the time the fans take to shut down after the carrier button has been released. This should be at least five minutes.

3.3 TA2563-10B/20B (VHF) Test

Equipment Required

- T800 Rack Series I/Series II, wired up for T839 PA
- RF test set with Power Meter for 50W or more
- T837 Series I exciter or T837 Series II exciter
- T808 power supply
- Associated coax cable to connect the T857 to the TA2563-10B/20B (should be part of the rack)
- Coax Cable to connect the TA2563-10B/20B output to the test set (N-male to N-male)
- Coax cable between T837 and test set (BNC to N)

Preliminary Tests

- Ensure that the T808 produces 13.8V
- Ensure that the T837 produces 0.7W +/-0.1W

Fit the TA2563-10B/20B power amplifier in the rack, plug in the D-range at the rear, the coax to the T837 and connect it to the RF test set.

Test

Turn the power on. The Power LED should come on.

Test for RF Power by pressing the black carrier button on the transmitter and observing the RF output power displayed. This should be 50W +- 5%

Test the fans and the fan timer by measuring the time the fans take to shut down after the carrier button has been released. This should be at least five minutes.

4 Wiring Specification

4.1 TA2563-xxx Cables

Fan power (IPN 219-02982-00)

Connections are to:

- J5 XA2563-xxx-PBA board A, 2 way header fan power out
- J9 XA2563-xxx-PBA board B. 2 way header fan power in

XA2563-xxx-PBA board A power to TB8100 PA (IPN 219-03006-00)

Connections are to:

- J4 XA2563-xxx-PBA board A, 2 way header power from PA
- PA 2 way header power to XA2563-xxx-PBA board A

LED assembly (IPN 219-03054-00)

Connections are to:

- J6 XA2563-xxx-PBA board A 2 way header front panel LED

XA2563-xxx-PBA board A RF to TB8100 PA (IPN 219-03055-00)

Connections are to:

- J3 XA2563-xxx-PBA board A MCXRA RF out to PA
- PA SMA to XA2563-xxx-PBA board A

XA2563-xxx-PBA ribbon to TB8100 PA (IPN 219-03057-00)

Connections are to:

- J7 XA2563-xxx-PBA board A micromatch to PA
- PA D-range to XA2563-xxx-PBA board A

XA2563-xxx-PBA board B fan power out (IPN 219-02993-00)

Connections are to:

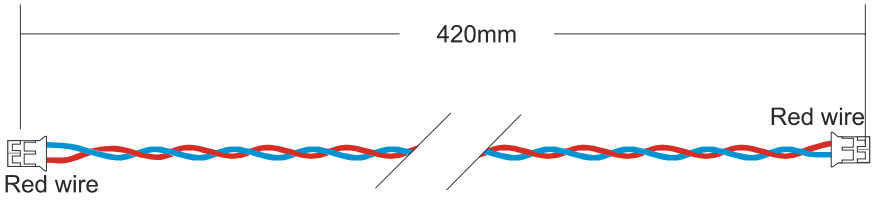
- J10 XA2563-xxx-PBA board B 2 way header power out
- J11 XA2563-xxx-PBA board B 2 way header power out
- J12 XA2563-xxx-PBA board B 2 way header power out

4.2 TA2563-xxx External Connectors

- J1 XA2563-xxx-PBA board A D-range rack cabling
- J2 XA2563-xxx-PBA board A RCA RF in from rack

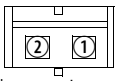
4.3 TA2563-xxx Cable Detail

Fan power (IPN 219-02982-00)

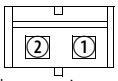


The fan power cable is a 420mm length of twisted pair with the same connector on each end. These connectors plug into J5 on XA2563-xxx-PBA board A and J9 on XA2563-xxx-PBA board B.

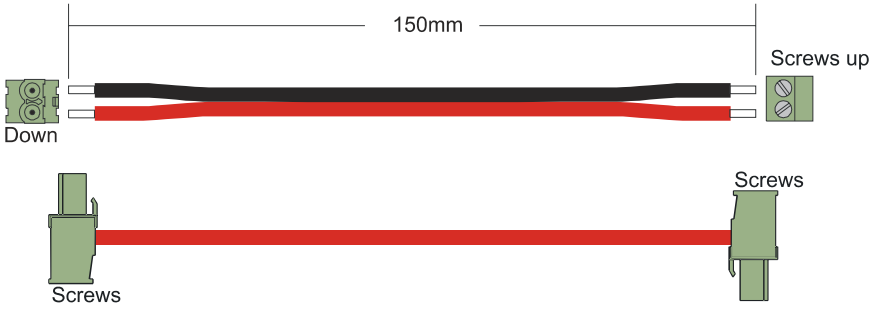
J5

Pinout	Pin	Signal Name	Signal Type
 bottom view	1	+ V	output 13.8V switched, red wire
	2	- V	ground, blue wire

J9

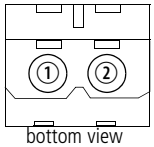
Pinout	Pin	Signal Name	Signal Type
 bottom view	1	+ V	input 13.8V switched, red wire
	2	- V	negative voltage, blue wire

XA2563-xxx-PBA board A power to TB8100 PA (IPN 219-03006-00)

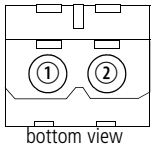


The PA power cable is a heavy pair with the same connector at each end. These connectors plug into J4 on XA2563-xxx-PBA board A and the power input on the PA.

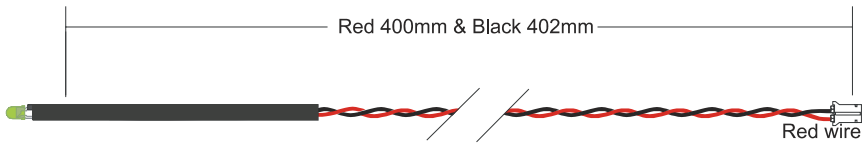
J4

Pinout	Pin	Signal Name	Signal Type
	1	+ V	output 13.8V switched, red wire
	2	GND	ground. black wire

PA Power Input

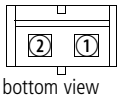
Pinout	Pin	Signal Name	Signal Type
	1	+ V	input 13.8V switched, red wire
	2	GND	ground, black wire

LED assembly (IPN 219-03054-00)

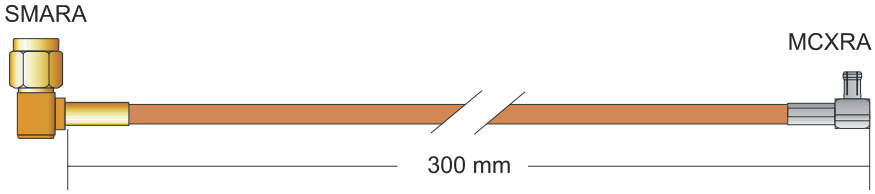


The LED assembly is the front panel power indicator. It is plugged into J6 on XA2563-xxx-PBA board A 2 and the LED is fitted into a grommet on the front panel.

J6

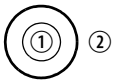
Pinout	Pin	Signal Name	Signal Type
	1	+ V	positive voltage, red wire
	2	- V	negative voltage, black wire

RF cable RG136 from XA2563-xxx-PBA to TB8100 PA (IPN 219-03055-00):

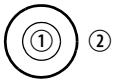


The RG136 RF cable connects the attenuated RF from the T8xx rack to the TB8100 PA. The MCXRA plugs into J3 on the XA2563-xxx-PBA board and the SMARA screws on to the PA RF input.

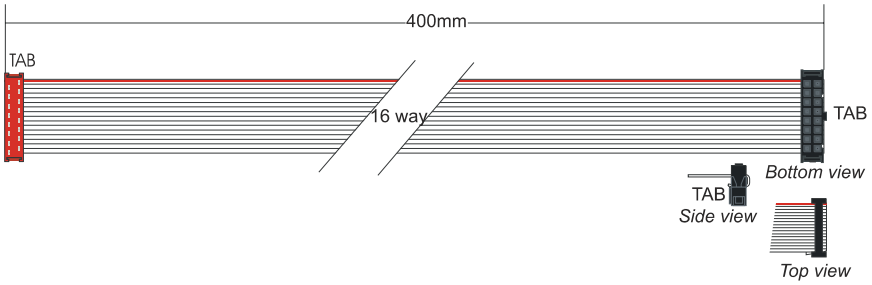
J3

Pinout	Pin	Signal Name	Signal Type
 rear view	1	RF	RF analog
	2	GND	RF ground

PA RF Input

Pinout	Pin	Signal Name	Signal Type
 rear view	1	RF	RF analog
	2	GND	RF ground

16 Way loom from XA2563-xxx-PBA to TB8100 PA (IPN 219-03057-00):

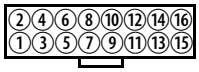


The ribbon cable plugs into the micromatch J7 on the XA2563-xxx-PBA board and the 16-way system bus on the PA.

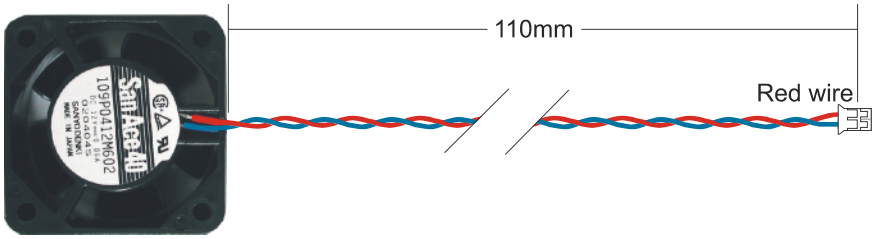
J7

Pinout	Pin	Signal Name	Signal Type
 top view of control head board	1	not used	not used
	2	not used	not used
	3	not used	not used
	4	not used	not used
	5	not used	not used
	6	REV_PWR_ALM	output from PA to T8xx rack
	7	not used	not used
	8	FWD_PWR_ALM	output from PA to T8xx rack
	9	not used	not used
	10	not used	not used
	11	not used	not used
	12	not used	not used
	13	not used	not used
	14	ground	circuit ground
	15	not used	not used
	16	not used	not used

PA System Bus

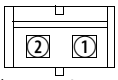
Pinout	Pin	Signal Name	Signal Type
 front view of radio body	1	not used	not used
	2	not used	not used
	3	not used	not used
	4	not used	not used
	5	not used	not used
	6	REV_PWR_ALM	output from PA to T8xx rack
	7	not used	not used
	8	FWD_PWR_ALM	output from PA to T8xx rack
	9	not used	not used
	10	not used	not used
	11	not used	not used
	12	not used	not used
	13	not used	not used
	14	ground	circuit ground
	15	not used	not used
	16	not used	not used

Cables from fans to XA2563-xxx-PBA board B (IPN 219-02993-00)



The three fans plug into J10, 11, 12 on XA2563-xxx-PBA board B.

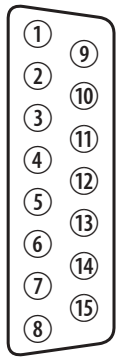
J10, J11, J12

Pinout	Pin	Signal Name	Signal Type
 bottom view	1	+ V	input 13.8V switched, red wire
	2	- V	ground, blue wire

4.4 TA2563-xxx External Connector Detail

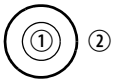
The TA2563-xxx PA has two external connectors. J7 is the 15-way D-range that is used for by the T800 rack for TX_KEY. REV_PWR_ALM, FWD_PWR_ALM and power input. J2 is the RCA connector used for RF power input.

J1

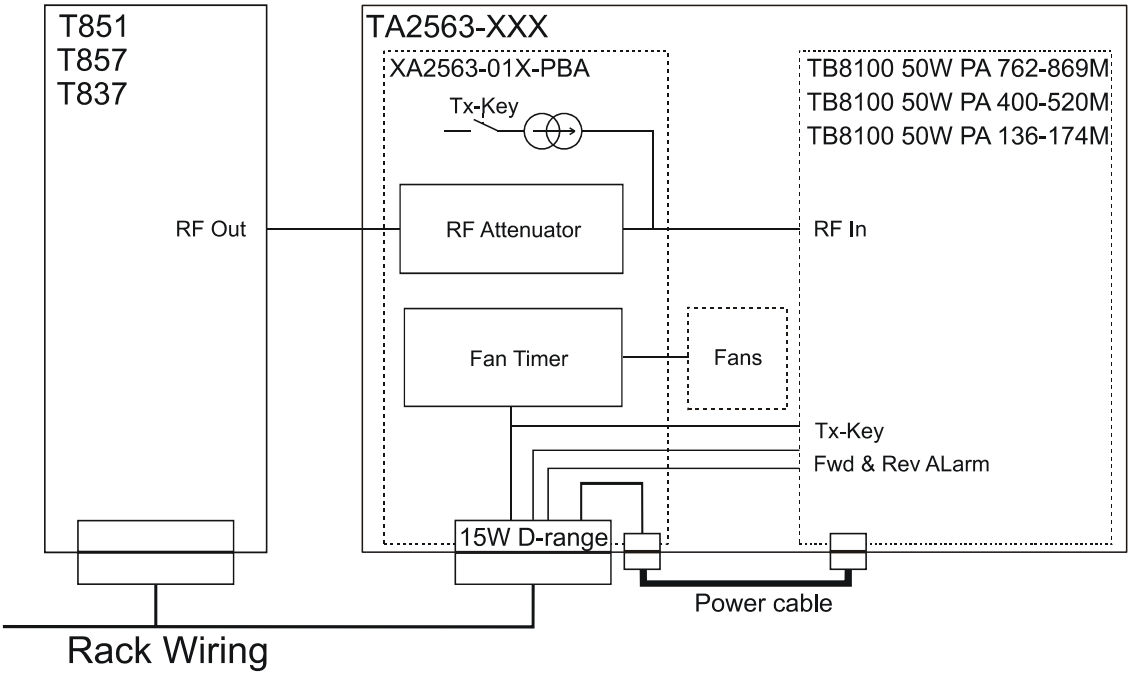
Pinout	Pin	Signal Name	Signal Type
 external view	1	POWER IN	13.8V DC from the T8xx rack
	2	POWER IN	13.8V DC from the T8xx rack
	3	FWD_PWR_ALM	output from PA to T8xx rack
	4	REV_PWR_ALM	output from PA to T8xx rack
	5	not used	not used
	6	not used	not used
	7	GND	circuit ground
	8	GND	circuit ground
	9	POWER IN	13.8V DC from the T8xx rack
	10	POWER IN	13.8V DC from the T8xx rack
	11	POWER IN	13.8V DC from the T8xx rack
	12	TX_KEY	Tx key from the T8xx rack
	13	GND	circuit ground
	14	GND	circuit ground
	15	GND	circuit ground

The maximum RF input level is +27 dBm. Higher levels may damage the radio.

J2

Pinout	Pin	Signal Name	Signal Type
 rear view	1	RF	RF analog
	2	GND	RF ground

5 Circuit Description



To match the electrical specifications of the T800 PA an RF attenuator (XA2563-xxx-PBA board A) was added to a TB8100 PA. The T885 produces 5 Watts, which needs to be attenuated to 10mW, while the T87 and T837 produce 700mW, also to be attenuated to 10mW.

The TB8100 requires a small DC current to detect RF activity from its original reciter. A simple current source switched by Tx-Key has been added to support this requirement.

A discrete timer on the PCB, based on a CMOS 4060 counter keeps the fans moving for about 5 minutes following release of PTT.

There are three versions of the XA2563-xxx-PBA used in the six TA2563-xxx product.

Product	XA2563-xxx-PBA board
TA2563-10B	XA2563-01B-PBA
TA2563-10H	XA2563-01H-PBA
TA2563-10K	XA2563-01K-PBA
TA2563-20B	XA2563-01B-PBA
TA2563-20H	XA2563-01H-PBA
TA2563-20K	XA2563-01K-PBA

6 PCB Information

The following information is included for the XA2563-xxx-PBA boards:

- The parts list contains all information for each part and designator. The "IPN" column refers to the Tait internal part number, and "Description" is how the part is described on the Tait Database. The "PCB" column provides a grid reference to the PCB layouts. The "Circuit" column provides a grid reference to the circuit diagram. Note that the initial number indicates the circuit diagram page.
- PCB layout drawings for both sides of the board
- Circuit diagram

6.1 XA2563-01B-PBA (Rev 001)

Parts List

Part	IPN	Description	PCB	Circuit
	228-25631-01	PCB RF 800MHz atten		
C1	018-12470-10	CAP 0603 47p 50V NPO ±1%	F4	1H6
C2	018-16100-00	CAP 0603 100n 16V x7R ±10%	D5	1B1
C3	018-12470-10	CAP 0603 47p 50V NPO ±1%	F6	1H6
C4	018-12470-10	CAP 0603 47p 50V NPO ±1%	E6	1J7
C5	018-12470-10	CAP 0603 47p 50V NPO ±1%	B6	1E8
C6	018-16100-00	CAP 0603 100n 16V x7R ±10%	D6	1B3
C7	018-12470-10	CAP 0603 47p 50V NPO ±1%	C6	1E7
C8	018-12470-10	CAP 0603 47p 50V NPO ±1%	F8	1G10
C9	018-12470-10	CAP 0603 47p 50V NPO ±1%	F6	1F11
C10	018-16100-00	CAP 0603 100n 16V x7R ±10%	D7	1A5
C11	015-25680-08	CAP cer 68n 50V 10% 0805 X7R	D8	1J9
C12	014-08100-03	CAP tant 10u 35V 20% D	C7	1G9
D1	001-10011-00	DIODE MBRS1100 sch 1A/100V SMB	B7	1G9
D2	001-10030-18	DIODE BZG03C18V 3W Zen SOD106	C8	1G8
E1	319-01253-00	SHLD can Paf TMA	E3	1A6
F1	265-10060-00	FUSE 1.5A reset 150/33 SMD	F7	1G11
J1	240-00010-53	PLG 15wy drng RA shld	A2	1H2
J2	240-02100-20	SKT coax BNC pnl mtg RA 50R	F5	1H6
J3	240-04021-86	SKT MCX str PCB mtg SMD	A9	1D10
J4	240-00022-10	HDR 2wy 16A PCB RA 5.08mm	G6	1G12
J5	240-04021-95	SKT 2wy hor SMD	G8	1F3
J6	240-04021-95	SKT 2wy hor SMD	H3	1C10
J7	240-10000-07	CONN 16wy 2row skt M/M SMD	G11	1G13
J9	240-04021-95	SKT 2wy hor SMD	B7	1E10
J10	240-04021-95	SKT 2wy hor SMD	C11	1G14
J11	240-04021-95	SKT 2wy hor SMD	D11	1F14
J12	240-04021-95	SKT 2wy hor SMD	E11	1E14
L1	059-16180-00	IND 0603HS 180nH 5%	F5	1H6
Q1	000-10008-40	XSTR SMD BSS84 P DMfet SOT23	E5	1J7
Q2	000-10008-47	XSTR SMD BC847B NPN SOT23	C6	1E8
Q3	000-11006-00	XSTR PCh Mfet 60V 10A Dpak	E7	1G11
R1	036-03118-10	RES 2512 18R 5% 1W	C3	1H3
R2	036-03118-10	RES 2512 18R 5% 1W	C2	1H3
R3	036-03270-10	RES 2512 270R 5% 1W	D2	1G3
R4	036-03270-10	RES 2512 270R 5% 1W	D3	1G3
R6	036-03118-10	RES 2512 18R 5% 1W	E3	1H4

Part	IPN	Description	PCB	Circuit
R8	036-03270-10	RES 2512 270R 5% 1W	E3	1G4
R9	036-03270-10	RES 2512 270R 5% 1W	E2	1G4
R10	036-03120-10	RES 1206 120R 1% 0.25W 200V	F3	1H5
R11	036-03120-10	RES 1206 120R 1% 0.25W 200V	F3	1H5
R12	036-03150-02	RES 1206 150R 5% 0.25W RC01	F4	1H5
R14	038-15470-10	RES 0603 47k 1% 1/10W	F6	1H7
R15	038-14330-10	RES 0603 3k3 1% 1/10W	F5	1J7
R16	038-15220-10	RES 0603 22k 1% 1/10W	E7	1H10
R17	038-13100-10	RES 0603 100R 1% 1/10W	C6	1F8
R18	038-16100-10	RES 0603 100k 1% 1/10W	C6	1E7
R19	038-15100-10	RES 0603 10k 1% 1/10W	C6	1F7
R20	038-15100-10	RES 0603 10k 1% 1/10W	C6	1E7
R21	038-14220-00	RES 0603 2k2 5% 1/10W	B6	1E8
R23	036-02680-07	RES 2010 68R 5% 0.5W	G3	1G5
R24	036-02470-02	RES 1206 47R 5% 0.25W 200V	F4	1H5
R25	036-03150-02	RES 1206 150R 5% 0.25W RC01	F4	1G6
R26	038-15220-10	RES 0603 22k 1% 1/10W	E6	1J8
R27	038-16220-00	RES 0603 220k 5% 1/10W	D8	1J9
R28	038-16100-10	RES 0603 100k 1% 1/10W	D7	1J9
R29	038-14220-00	RES 0603 2k2 5% 1/10W	F7	1F3
R30	038-13100-10	RES 0603 100R 1% 1/10W	E5	1B1
R31	038-13100-10	RES 0603 100R 1% 1/10W	D6	1B3
R32	038-13100-10	RES 0603 100R 1% 1/10W	D7	1B5
R35	036-10000-00	RES 0805 0R 1/8W	D6	1J9
U1	002-10040-93	IC 4093 quad 2I/P NAND trig	D6	1J8 1B4 1A4 1B3 1H8
U2	002-10040-13	IC 4013 dual D FF SO14	E6	1H10 1B1 1B2
U3	002-10040-60	IC 4060 BC & OSC	D7	1J10 1A5

6.2 XA2563-01H-PBA (Rev 001)

Parts List

Part	IPN	Description	PCB	Circuit
	228-25631-01	PCB RF 800MHz atten		
C1	018-12470-10	CAP 0603 47p 50V NPO ±1%	F4	1H6
C2	018-16100-00	CAP 0603 100n 16V x7R ±10%	D5	1B1
C3	018-12470-10	CAP 0603 47p 50V NPO ±1%	F6	1H6
C4	018-12470-10	CAP 0603 47p 50V NPO ±1%	E6	1J7
C5	018-12470-10	CAP 0603 47p 50V NPO ±1%	B6	1E8
C6	018-16100-00	CAP 0603 100n 16V x7R ±10%	D6	1B3
C7	018-12470-10	CAP 0603 47p 50V NPO ±1%	C6	1E7
C8	018-12470-10	CAP 0603 47p 50V NPO ±1%	F8	1G10
C9	018-12470-10	CAP 0603 47p 50V NPO ±1%	F6	1F11
C10	018-16100-00	CAP 0603 100n 16V x7R ±10%	D7	1A5
C11	015-25680-08	CAP cer 68n 50V 10% 0805 X7R	D8	1J9
C12	014-08100-03	CAP tant 10u 35V 20% D	C7	1G9
D1	001-10011-00	DIODE MBRS1100 sch 1A/100V SMB	B7	1G9
D2	001-10030-18	DIODE BZG03C18V 3W Zen SOD106	C8	1G8
E1	319-01253-00	SHLD can Paf TMA	E3	1A6
F1	265-10060-00	FUSE 1.5A reset 150/33 SMD	F7	1G11
J1	240-00010-53	PLG 15wy drng RA shld	A2	1H2
J2	240-02100-20	SKT coax BNC pnl mtg RA 50R	F5	1H6
J3	240-04021-86	SKT MCX str PCB mtg SMD	A9	1D10
J4	240-00022-10	HDR 2wy 16A PCB RA 5.08mm	G6	1G12
J5	240-04021-95	SKT 2wy hor SMD	G8	1F3
J6	240-04021-95	SKT 2wy hor SMD	H3	1C10
J7	240-10000-07	CONN 16wy 2row skt M/M SMD	G11	1G13
J9	240-04021-95	SKT 2wy hor SMD	B7	1E10
J10	240-04021-95	SKT 2wy hor SMD	C11	1G14
J11	240-04021-95	SKT 2wy hor SMD	D11	1F14
J12	240-04021-95	SKT 2wy hor SMD	E11	1E14

Part	IPN	Description	PCB	Circuit
L1	059-16180-00	IND 0603HS 180nH 5%	F5	1H6
Q1	000-10008-40	XSTR SMD BSS84 P DMfet SOT23	E5	1J7
Q2	000-10008-47	XSTR SMD BC847B NPN SOT23	C6	1E8
Q3	000-11006-00	XSTR PCh Mfet 60V 10A Dpak	E7	1G11
R1	036-03118-10	RES 2512 18R 5% 1W	C3	1H3
R2	036-03118-10	RES 2512 18R 5% 1W	C2	1H3
R3	036-03270-10	RES 2512 270R 5% 1W	D2	1G3
R4	036-03270-10	RES 2512 270R 5% 1W	D3	1G3
R6	036-03118-10	RES 2512 18R 5% 1W	E3	1H4
R8	036-03270-10	RES 2512 270R 5% 1W	E3	1G4
R9	036-03270-10	RES 2512 270R 5% 1W	E2	1G4
R10	036-03120-10	RES 1206 120R 1% 0.25W 200V	F3	1H5
R11	036-03120-10	RES 1206 120R 1% 0.25W 200V	F3	1H5
R12	036-03150-02	RES 1206 150R 5% 0.25W RC01	F4	1H5
R14	038-15470-10	RES 0603 47k 1% 1/10W	F6	1H7
R15	038-14330-10	RES 0603 3k3 1% 1/10W	F5	1J7
R16	038-15220-10	RES 0603 22k 1% 1/10W	E7	1H10
R17	038-13100-10	RES 0603 100R 1% 1/10W	C6	1F8
R18	038-16100-10	RES 0603 100k 1% 1/10W	C6	1E7
R19	038-15100-10	RES 0603 10k 1% 1/10W	C6	1F7
R20	038-15100-10	RES 0603 10k 1% 1/10W	C6	1E7
R21	038-14220-00	RES 0603 2k2 5% 1/10W	B6	1E8
R23	036-02680-07	RES 2010 68R 5% 0.5W	G3	1G5
R24	036-02470-02	RES 1206 47R 5% 0.25W 200V	F4	1H5
R25	036-03150-02	RES 1206 150R 5% 0.25W RC01	F4	1G6
R26	038-15220-10	RES 0603 22k 1% 1/10W	E6	1J8
R27	038-16220-00	RES 0603 220k 5% 1/10W	D8	1J9
R28	038-16100-10	RES 0603 100k 1% 1/10W	D7	1J9
R29	038-14220-00	RES 0603 2k2 5% 1/10W	F7	1F3
R30	038-13100-10	RES 0603 100R 1% 1/10W	E5	1B1
R31	038-13100-10	RES 0603 100R 1% 1/10W	D6	1B3
R32	038-13100-10	RES 0603 100R 1% 1/10W	D7	1B5
R35	036-10000-00	RES 0805 0R 1/8W	D6	1J9
U1	002-10040-93	IC 4093 quad 2I/P NAND trig	D6	1J8 1B4 1A4 1B3 1H8
U2	002-10040-13	IC 4013 dual D FF SO14	E6	1H10 1B1 1B2
U3	002-10040-60	IC 4060 BC & OSC	D7	1J10 1A5

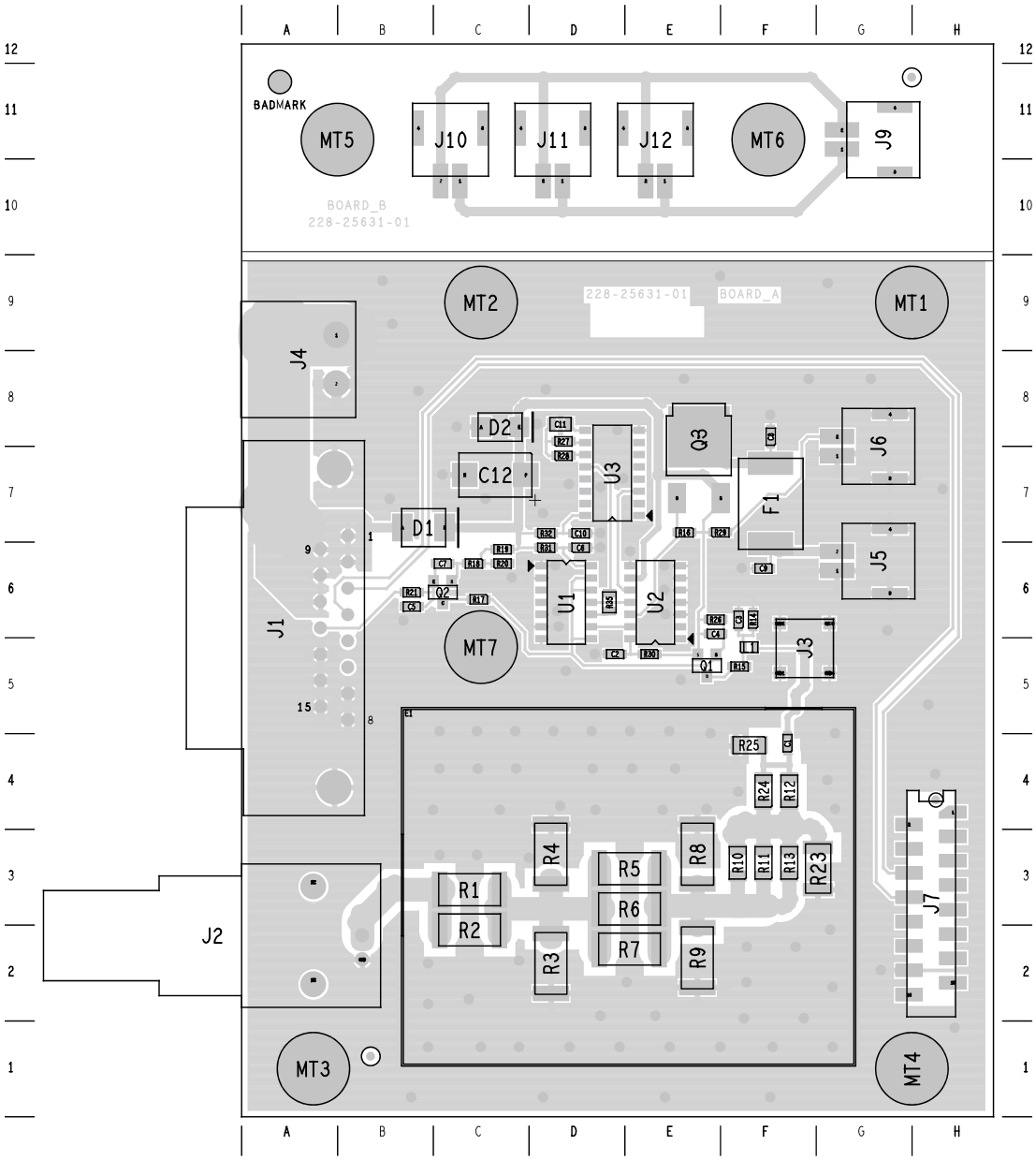
6.3 XA2563-01K-PBA (Rev 001)

Parts List

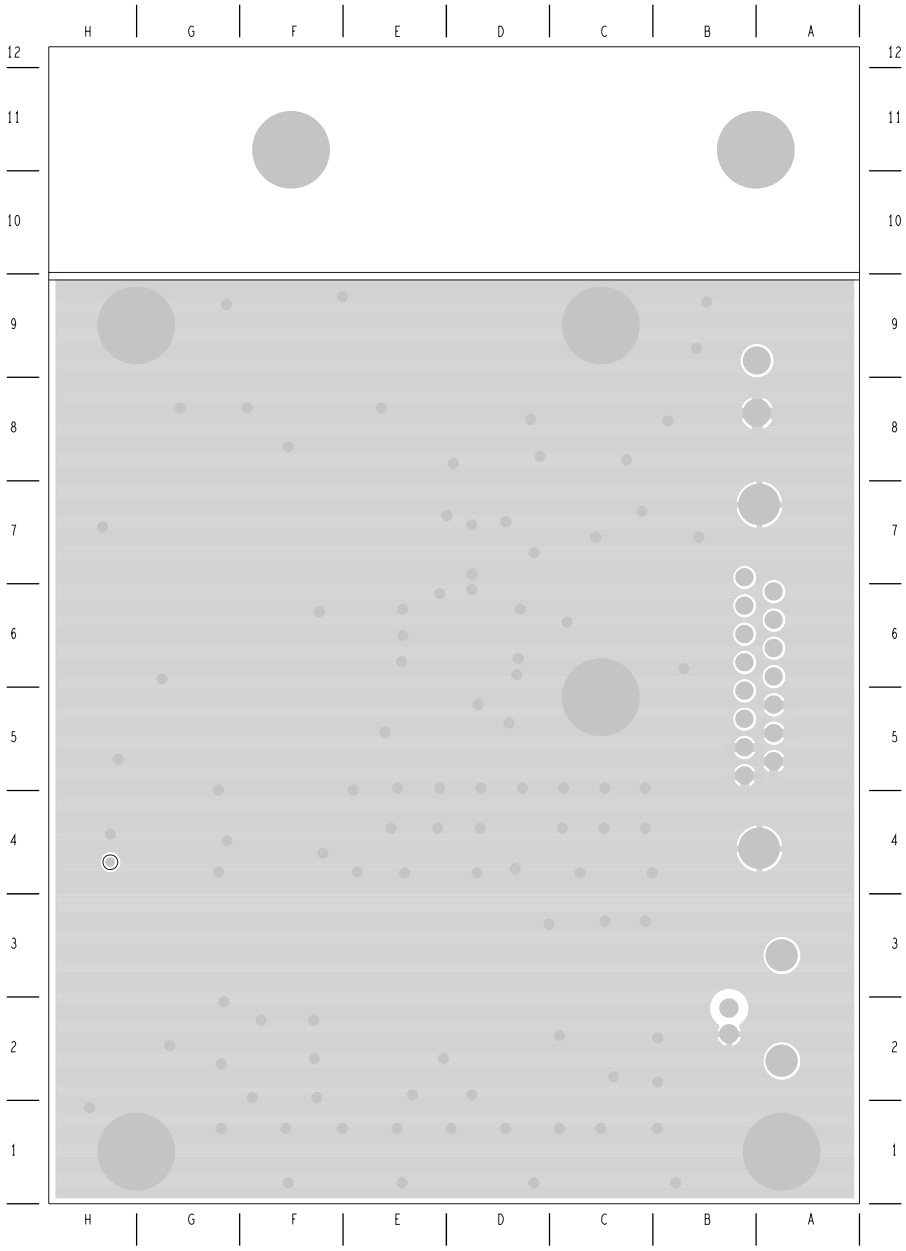
Part	IPN	Description	PCB	Circuit
	228-25631-01	PCB RF 800MHz atten		
C1	018-12470-10	CAP 0603 47p 50V NPO ±1%	F4	1H6
C2	018-16100-00	CAP 0603 100n 16V x7R ±10%	D5	1B1
C3	018-12470-10	CAP 0603 47p 50V NPO ±1%	F6	1H6
C4	018-12470-10	CAP 0603 47p 50V NPO ±1%	E6	1J7
C5	018-12470-10	CAP 0603 47p 50V NPO ±1%	B6	1E8
C6	018-16100-00	CAP 0603 100n 16V x7R ±10%	D6	1B3
C7	018-12470-10	CAP 0603 47p 50V NPO ±1%	C6	1E7
C8	018-12470-10	CAP 0603 47p 50V NPO ±1%	F8	1G10
C9	018-12470-10	CAP 0603 47p 50V NPO ±1%	F6	1F11
C10	018-16100-00	CAP 0603 100n 16V x7R ±10%	D7	1A5
C11	015-25680-08	CAP cer 68n 50V 10% 0805 X7R	D8	1J9
C12	014-08100-03	CAP tant 10u 35V 20% D	C7	1G9
D1	001-10011-00	DIODE MBRS1100 sch 1A/100V SMB	B7	1G9
D2	001-10030-18	DIODE BZG03C18V 3W Zen SOD106	C8	1G8
E1	319-01253-00	SHLD can Paf TMA	E3	1A6
F1	265-10060-00	FUSE 1.5A reset 150/33 SMD	F7	1G11
J1	240-00010-53	PLG 15wy drng RA shld	A2	1H2
J2	240-02100-20	SKT coax BNC pnl mtg RA 50R	F5	1H6

Part	IPN	Description	PCB	Circuit
J3	240-04021-86	SKT MCX str PCB mtg SMD	A9	1D10
J4	240-00022-10	HDR 2wy 16A PCB RA 5.08mm	G6	1G12
J5	240-04021-95	SKT 2wy hor SMD	G8	1F3
J6	240-04021-95	SKT 2wy hor SMD	H3	1C10
J7	240-10000-07	CONN 16wy 2row skt M/M SMD	G11	1G13
J9	240-04021-95	SKT 2wy hor SMD	B7	1E10
J10	240-04021-95	SKT 2wy hor SMD	C11	1G14
J11	240-04021-95	SKT 2wy hor SMD	D11	1F14
J12	240-04021-95	SKT 2wy hor SMD	E11	1E14
L1	059-16180-00	IND 0603HS 180nH 5%	F5	1H6
Q1	000-10008-40	XSTR SMD BSS84 P DMfet SOT23	E5	1J7
Q2	000-10008-47	XSTR SMD BC847B NPN SOT23	C6	1E8
Q3	000-11006-00	XSTR PCh Mfet 60V 10A Dpak	E7	1G11
R1	036-03118-10	RES 2512 18R 5% 1W	C3	1H3
R2	036-03118-10	RES 2512 18R 5% 1W	C2	1H3
R3	036-03270-10	RES 2512 270R 5% 1W	D2	1G3
R4	036-03270-10	RES 2512 270R 5% 1W	D3	1G3
R5	036-03100-10	RES 2512 100R 5% 1W	E3	1H4
R6	036-03100-10	RES 2512 100R 5% 1W	E3	1H4
R7	036-03100-10	RES 2512 100R 5% 1W	E3	1H4
R8	036-03100-10	RES 2512 100R 5% 1W	E3	1G4
R9	036-03100-10	RES 2512 100R 5% 1W	E2	1G4
R10	036-02680-02	RES 1206 68R 5% 0.25W 200V	F3	1H5
R11	036-02680-02	RES 1206 68R 5% 0.25W 200V	F3	1H5
R12	036-03100-02	RES 1206 100R 5% 0.25W RC01	F4	1H5
R13	036-02680-02	RES 1206 68R 5% 0.25W 200V	F3	1H5
R14	038-15470-10	RES 0603 47k 1% 1/10W	F6	1H7
R15	038-14330-10	RES 0603 3k3 1% 1/10W	F5	1J7
R16	038-15220-10	RES 0603 22k 1% 1/10W	E7	1H10
R17	038-13100-10	RES 0603 100R 1% 1/10W	C6	1F8
R18	038-16100-10	RES 0603 100k 1% 1/10W	C6	1E7
R19	038-15100-10	RES 0603 10k 1% 1/10W	C6	1F7
R20	038-15100-10	RES 0603 10k 1% 1/10W	C6	1E7
R21	038-14220-00	RES 0603 2k2 5% 1/10W	B6	1E8
R23	036-02680-07	RES 2010 68R 5% 0.5W	G3	1G5
R24	036-03100-02	RES 1206 100R 5% 0.25W RC01	F4	1H5
R25	036-03120-10	RES 1206 120R 1% 0.25W 200V	F4	1G6
R26	038-15220-10	RES 0603 22k 1% 1/10W	E6	1J8
R27	038-16220-00	RES 0603 220k 5% 1/10W	D8	1J9
R28	038-16100-10	RES 0603 100k 1% 1/10W	D7	1J9
R29	038-14220-00	RES 0603 2k2 5% 1/10W	F7	1F3
R30	038-13100-10	RES 0603 100R 1% 1/10W	E5	1B1
R31	038-13100-10	RES 0603 100R 1% 1/10W	D6	1B3
R32	038-13100-10	RES 0603 100R 1% 1/10W	D7	1B5
R35	036-10000-00	RES 0805 0R 1/8W	D6	1J9
U1	002-10040-93	IC 4093 quad 2I/P NAND trig	D6	1J8 1B4 1A4 1B3 1H8
U2	002-10040-13	IC 4013 dual D FF SO14	E6	1H10 1B1 1B2
U3	002-10040-60	IC 4060 BC & OSC	D7	1J10 1A5

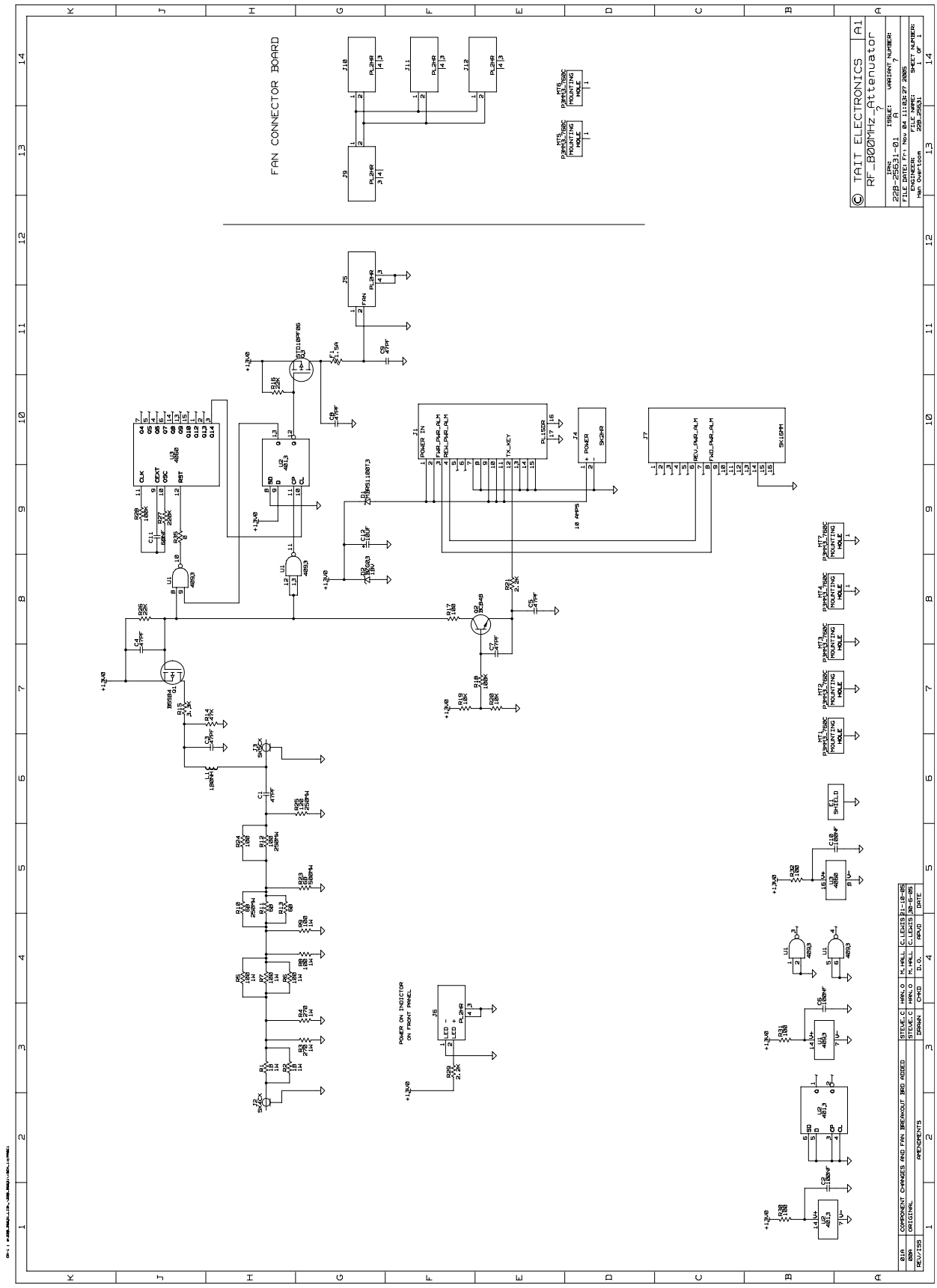
PCB Layout (top side)



PCB Layout (bottom side)



Circuit Diagram



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