

# RECTIFIER TECHNOLOGIES

## **Telecommunications Rack Power Systems - Product Licensing from Rectifier Technologies.**

*A fast way to gain market entry with the latest technology in high efficiency rectifiers by transfer of product and manufacturing know-how from Rectifier Technologies' highly experienced design team.*

### **Introduction**

Rectifier Technologies Pacific Pty. Ltd. specialises in the design of Rack Power Systems using novel techniques to achieve the highest levels of power efficiency. The experienced design team has specialised in providing tailored and proven designs to established manufacturers of telecommunications power equipment for over 15 years.

Rectifier Technologies provides:

- Technology and Know-how,
- Completed product design and documentation, and
- Assistance in manufacturing start-up and market entry.

**Rectifier Technologies allows established equipment manufacturers to bypass the expensive and risky R&D project and move directly into manufacturing start-up and market entry with the latest in power technology in as little as three months. The benefits of an early market entry reflect in long term market share and profitability and the cost is a fraction of that of an internal development project!**

Product Licensing from Rectifier Technologies equips the Licensee to understand, manufacture and maintain the:-

- advanced, high frequency rectifier modules
- Control and Supervisory Unit and accessories, and
- cost-effective Rack Power System (19" rack design, AC and DC distribution modules) .

After the training has been completed, the Licensee will be sufficiently experienced to maintain the licensed products in terms of design improvement and modification. The Licensee may maintain an ongoing relationship with Rectifier Technologies for access to further new power products.

The Product Licensing Program consists of the following elements:-

- Training
- Products to use as samples for approval testing and manufacturing models
- Design information
- Manufacturing information
- Production assistance

***The Product Licensing Contract*** provides a Licensee with the exclusive right to manufacture specified products in an agreed territory. **The sales territory for these products is unrestricted.**

**The cost of the Product License** has two elements. A Fee is charged for the technology and training and consists of progressive payments over a period of about six months. A Royalty is charged on each unit manufactured.

**Further assistance** is available from Rectifier Technologies on an "as needed" basis, such as additional training, checking of design developments, answering queries and liaison with component suppliers.

**Optional Market Introduction Support** is provided by Rectifier Technologies through the supply of quantities of complete rectifier and supervisory modules, and/or SKD and CKD kits to facilitate rapid start-up in the market.

**Other items** and services **available** but not included in the standard Product Licensing Program are:

- a) test equipment for testing of PCB sub-assemblies;
- b) test equipment for testing completed units;
- c) MOSFET "active" load used for testing completed rectifiers;
- d) assistance in the sourcing of standard software packages for drafting and documentation;
- e) assistance in the sourcing of standard test instrumentation for manufacture.

## **The Product Licensing Program In Detail**

### **Project Leader**

The Program requires that the customer nominate a Project Leader with responsibility for :-

- achieving the agreed objectives according to a project plan
- liaison with Rectifier Technologies
- securing adequate and appropriate resources to undertake the project
- management of staff and other resources allocated to this project
- contact with end-customer to ensure that the product meets their requirements
- arranging local approvals from regulatory authorities
- ensuring that equipment and components are available when required by the project plan.

### **Training**

Training is the single most important aspect of the Program for the Licensee to achieve a rapid growth of knowledge and experience of all staff involved.

Training is undertaken in two stages during the Program. The first stage is near the beginning at Rectifier Technologies in Melbourne, Australia. The second is at the end, after sample products have been manufactured by the Licensee, and is carried out at the Licensee's premises.

Rectifier Technologies emphasises that it is a key task of the Licensee Project Manager to maximise the effectiveness of the transfer of information, and to make the most of training time allocated.

Information provided is in English. Training will be by a combination of tutorial, demonstration and written notes.

The training covers the following topics:

- Training in the particular design of
  - Rectifier module, including PCBs etc.
  - Control Supervisory Unit, including remote interfacing
  - Rack Power System (RPS), including distribution module electronics
- Training in manufacturing techniques that are unique to the products.

Material from Rectifier Technology's library is available for reading or photocopying during the training period.

### **Design Information**

An understanding of the design concepts is important for the engineering and R&D support people of the Licensee. To be able to support local customers, make modifications to the standard design and to be able to make ongoing improvements requires familiarity with the origins and objectives of the designs.

In this part of the Program, information is provided on :-

- Rectifier module specification
- Control and Supervisory Unit specification
- Rack Power System concepts
- Written description of system and module operation
- Definition of rectifier module internal interfaces
- Detailed description of the individual circuits for each of the PCB subassemblies
- Definition of Control and Supervisory Unit interfaces
- Reliability and other calculations for key components
- Test methods, recommended tests and circuits for test equipment

Two comprehensive manuals, Training Manual and Operation and Technical Manual, containing information on the above subjects, are provided.

### **Manufacturing Information**

To facilitate the introduction of the product to manufacturing it is critical that relevant information is provided to meet the needs of :-

- production planning
- purchasing
- production assembly
- quality assurance and testing.

The manufacturing information provided is comprehensive, and has been devised to meet the requirements of a manufacturer competent in electronics manufacture, including PCB assembly.

In the material provided, it requires that standard electronic manufacturing processes such as hand or wave-soldering, PCB assembly, loom preparation, forming of metalwork and other standard processes are both available and under control.

The following items are provided in detail.

- Bills of material, along with benchmark prices
- Component manufacturers and alternatives where possible

- Special component specifications
- Wiring looms drawings
- Sheet metal drawings
- PCB artwork, drilling plans, component overlays, etc.
- PCB schematics
- PCB test procedures
- Finished product test procedures
- Circuits for test fixtures and test equipment
- Assembly instructions for modules.

A fully functional sample of the rectifier module and a fully functional sample of the Control and Supervisory Unit are assembled and tested by the Licensee's personnel during training at Rectifier Technologies premises. These samples are supplied to the Licensee free of charge.

### **Production Assistance**

Production assistance is provided whilst Rectifier Technologies staff are at the Licensee's site.

Assistance is provided in many ways including:

- assistance in understanding manufacturing documentation
- supply of SKD/CKD kits
- component sourcing

### **Specific Exclusions of Product Licensing Program**

The following costs are specifically excluded

- Travel, accommodation and other costs for Licensee's staff
- Any items purchased on behalf of the Licensee, with the authority of the Project Manager
- Any costs incurred by Rectifier Technologies which are outside the scope of the agreement.

### **Specific Inclusions of Product Licensing Program**

The following costs are specifically included

- The supply of a completed rectifier and Control and Supervisory Unit.
- Phone calls and FAX costs at Rectifier Technologies premises.
- Travel, accommodation and other costs for Rectifier Technologies visit to Licensee's premises.
- Training, support and other assistance via e-mail/fax/phone.