High Efficiency Power Amplifier

Model: HePA1900 V3

Operation Instruction

Date: May 14, 2008
Version. 1.1
Ref# : FCC ID:S8L-100576HePA & IC:2237-100576HePA

Introduction

This document presents description of the Andrew Corporation 1900 Band HePA (High Efficiency Power Amplifier) amplifiers. The HePA1900V3 amplifier is a high power, RF amplifier intended to provide signal amplification and conditioning. The HePA1900V3 amplifier is compatible with GSM and EDGE air interfaces operating in U.S. domestic cell sites where FCC compliance is mandatory.

The Cell band (1930 MHz to 1990 MHz) HePA1900V3 RF power amplifier is capable of amplifying a single carrier of different modulation types to a composite power level of 60Watts.

HePA1900 Specifications

The HePA1900 provide linear amplification of single-carrier signals in the cellular frequency band. The 1900 Band HePA, have the following specifications:

Parameter	Specification
Operating RF Band	1930-1990MHz
In band RF gain	48dB
Input signal types	GSM or EDGE single carrier
Input DC Power	-48 VDC, nominal
DC voltage input range	-38VDC to -58.5VDC
Rated Output Power @ -38VDC to -58.5VDC input	60W average/GSM & 45W average/EDGE
DC-RF Efficiency	28%, rated output power, nominal input voltage
Physical dimensions	10” x 14” x 3”
Weight	< 15lbs
Cooling technique	External cooling when the Amplifier is placed in the customer frame.
Temperature Range	0°C to +60°C meeting specifications.

Table 1 HePA1900V3 Specifications

Functional Blocks:

The Andrew HePA is comprised of the following functional areas:

– Preamplifier with unit gain control

This block gives to the unit its specified gain through 3 amplifier stages and helps keeping this gain constant over temperature through a variable attenuator, this one being controlled by the controller circuit.

– Amplifier power Final stage

This stage brings the signal to its desired high power level, it is the heart of the RF section of the unit. The unit power, linearity and efficiency directly come from this block.

- Power conversion and conditioning circuit

This block is made of a DC/DC converter and various voltage regulators to do the interface between the customer supply network and the internal functions of the unit. It provides all the voltages and signal interface to the internal blocks of the unit.

- Controller circuit

This block is the "intelligence" of the unit, it is based on the CPU and computes all the internal functions of the unit. These are the power up sequences, the performances compensation over temperature, manages the monitoring and control of the unit, it also records many events in the so called flight recorder .

- Communications circuit

The communication circuit is associated to the controller circuit to communicate with the outside world. It handles the customer specific protocol to bring in and out all monitoring and control commands.

Inputs and Outputs:

The amplifier is powered from a DC supply voltage, which can range from -38VDC to -58.5VDC. The DC power is brought into the amplifier through a D-Sub connector located on the face plate of the amplifier.
A second multipoint connector located on the amplifier face plate is used for serial communication, monitoring and control. This connector is used both during factory tests and at the system level by the customer .

Alarms and operating state are communicated to the outside world through the serial communications bus and through the face plate LED.

The RF signal is brought into the amplifier through a female SMA type connector located on the face plate of the amplifier. The amplifier RF signal is brought out of the amplifier through a N type connector located on the face plate of the amplifier.

Control System:

A microprocessor controller is used to control the amplifier alarm system, control environmental compensation of the amplifier.

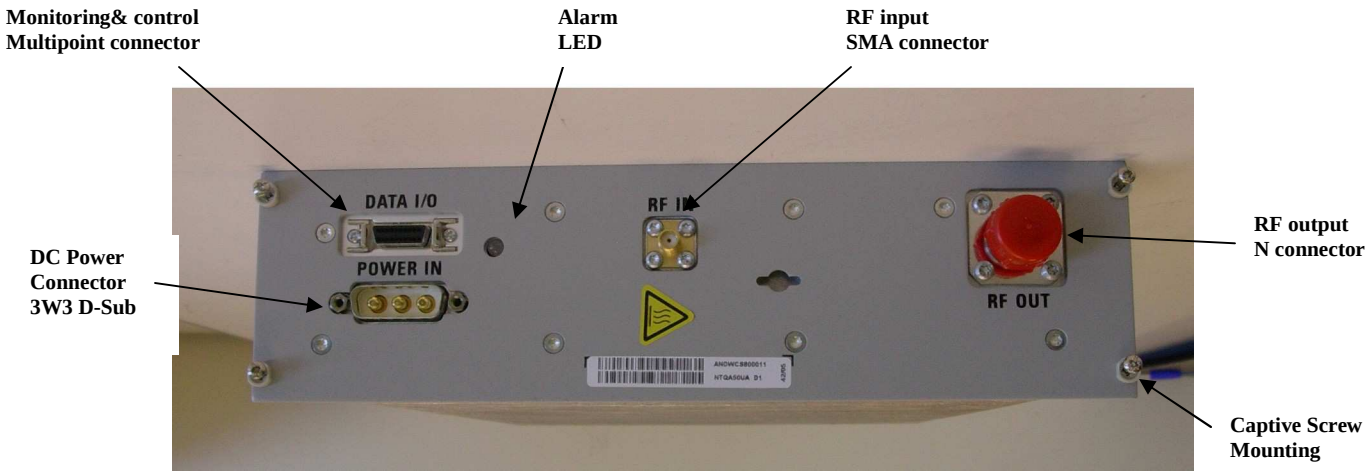

Figure HePA1900 Face plate view

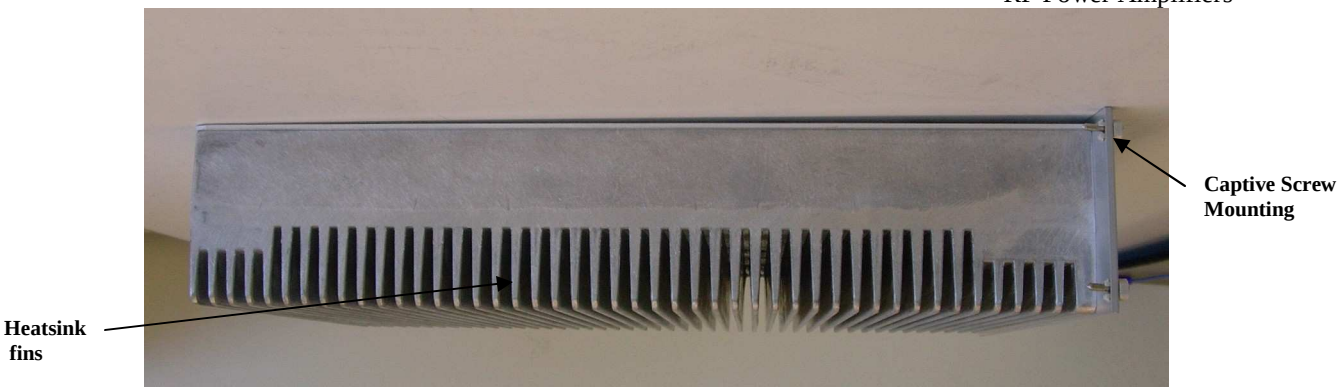

Figure 1 HePA1900 side view

The alarms are mapped to front panel LED behavior, as indicated:

- LED red =major alarm/reset/disable : the PA is not operational
- LED green = the PA is operational = synch present, no alarm, PA ready to amplify

The amplifier monitoring and control is also managed through a serial link and a customer specific protocol.

Installation and Operation Set-Up

The HePA1900V3 is easy to operate and use, only requiring a special cables for DC power and serial bus control connection into the customer frame. RF input and output connections are done with industry standard SMA and N connectors.

FCC Statements:

FCC ID TBD

This devise complies with Part 2, 15 & 24 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.

Warning

Changes of modifications not expressly approved by the manufacturer could void the user's authority to operate the equipments.