

## ***Section 4 Principles of Operation***

### ***4-1 Introduction***

This section contains a functional description of the NTGS86AB Single-Carrier Cellular Power Amplifier module.

### ***4-2 RF Input Signal***

The maximum input power should not exceed the limits specified in table 1-1.

### ***4-3 RF Output Load***

The load impedance should be as good as possible (1.5:1 or better) in the working band for good power transfer to the load.

### ***4-4 Amplifier Functional Description***

The NTGS86AB amplifier (figures 1-1 and 4-1) is a linear, single-channel power amplifier that operates in the 25 MHz frequency band from 869 MHz to 894. The amplifier produces a typical output power of 25 watts (44 dBm). Each amplifier in a system is a self-contained module and is functionally independent of any other amplifier modules. Each amplifier module has alarms that monitor the amplifiers performance. If a failure or fault occurs in an amplifier module, it is transmitted to the host system via an RS-422 interface.

The amplifier is compliant to the requirements of FCC Part 24 with respect to spurious emissions (see table 1-1). Constant gain is maintained by continuously comparing active paths with passive references, and correcting for small variations through the RF feedback controls. All gain variations, for example those due to temperature, are reduced to the passive reference variations. The amplifier module is comprised of:

- Input amplifier
- Pre-distortion amplifier
- Driver amplifier
- Main amplifier
- Isolator

#### ***4-4.1 Input Amplifier and Predistortion Amplifier***

RF is fed to the input amplifier then to the predistortion amplifier where the input signal is distorted such that it linearizes the output of the main amplifier. All the predistortion voltages and loop voltages are controlled by a microprocessor.

#### ***4-4.2 Driver Amplifier***

The driver amplifier is a class AB amplifier. The amplifier operates on +26 Vdc with bias voltage controlled by the microprocessor.

### 4-4.3 Main Amplifier

The main amplifier is a class AB amplification stage for maximum efficiency. The RF output signal from the main amplifier is then applied to an isolator. The amplifier power performance is monitored by the microprocessor via the forward and reverse detectors. The final output power is typically 44 dBm. The amplifier operates on +26 Vdc with gate bias voltages controlled by the microprocessor.

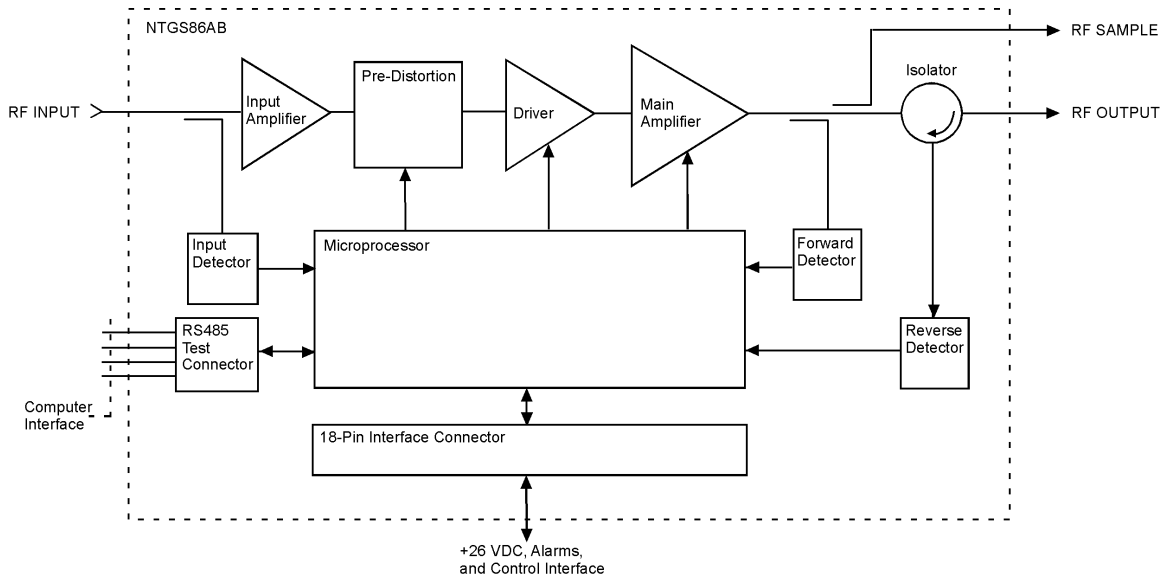


Figure 4-1 NTGS86AB Single-Channel Power Amplifier Functional Block Diagram

### 4-5 Amplifier Module Cooling

Each amplifier module is contained within a thermally conductive chassis which, when properly mounted on an adequate thermal surface, will provide sufficient cooling to maintain the amplifier within the specified operating temperature range.

### 4-6 Power Distribution

Primary DC power for the amplifier is provided by the host system. The amplifier generates all the required voltages internally from the main source.