

# *Installation and Operation Manual*

**Powerwave<sup>®</sup>**  
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**THE POWER IN WIRELESS<sup>™</sup>**

*Power Amplifier Radio Module (PARM),  
869-894 MHz, 40/30-Watt*



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# **Chapter 1 General Description**

## **1-1 Introduction**

This manual contains general information, installation procedures, and specifications for the operation and use of the Power Amplifier Radio Module (PARM). The manual is organized as follows:

- Chapter 1     General Description with Specifications
- Chapter 2     Installation and Operation

## **1-2 General Description**

The PARM is designed as an integrated subassembly unit mounted in a Radio Module (RM) closed metal housing fitted with a heat sink and connected by RF coaxial and DC connectors. The PARM use a common DC/DC converter for operating power. Up to three PARM can be mounted in one RM.

The PARM's basic function is amplifying two 60 MHz band modulated RF input signals (869-894 MHz) from the TX driver subassembly, up to the level of the whole transmitter, as defined in GSM 05.05, class 1 (20 watts minimum and 40 watts maximum). The main characteristics of the PARM are:

- GSMK compliant
- 8-PSK compliant

The PARM is rated for an average output power of 40/30 watts with an EDGE signal and 40/30 watts with a GSMK signal. The electrical specifications are also designed to be in compliance with the requirements of GSM 05.05.

## **1-3 Specifications**

Specifications for the PARM are listed and described in table 1-1.

**Table 1-1 PARM Operating Specifications**

|                                     |                                                |
|-------------------------------------|------------------------------------------------|
| Frequency Range                     | 869 - 894 MHz (35 MHz Bandwidth)               |
| Total Typical / Maximum Input Power | -15.7 - +4.8 / +5.8 dBm                        |
| Average Output Power                | 40/30 Watts (46.02/44.8 dBm)                   |
| RF Gain                             | 39 - 48 dB                                     |
| Duty Cycle                          | Continuous                                     |
| DC Operating Voltage                | 27 $\pm$ 2% VDC (26.46 to 27.54 VDC)           |
| DC Operating Voltage Range          | 25 to 29.5 VDC                                 |
| Operating Temperature               | -5 °C to +60 °C                                |
| Storage Temperature                 | -40 °C to +85 °C                               |
| Operating Humidity                  | 5 % to 95 % Relative Humidity (noncondensing)  |
| Storage Humidity                    | 0 % to 100 % Relative Humidity (noncondensing) |
| Alarms                              | See Chapter 2                                  |
| RF Input Connector                  | MCX female, gold plated body and core          |
| RF Output Connector                 | QN-type female                                 |
| DC Input Connector                  | Samtec FHP-04-01-T-S, 8-pin                    |
| Power Consumption                   | 94.5 Watts                                     |
| Dimensions                          | 3.75" High, .75" Wide, 6.75" Deep              |

## Chapter 2 Installation and Operation

### 2-1 Introduction

This section contains operating instructions for the Power Amplifier Radio Module (PARM).

### 2-2 Installation

The PARM module is designed to be directly installed into the radio module.

#### 2-2.1 Alarms Interface Connector

| Pin Number | Signal          | Comment          |
|------------|-----------------|------------------|
| 1          | PA_VER_RADO     | From PARM TO LRM |
| 2          | PA_VER_RAD1     | From PARM TO LRM |
| 3          | PA_VER_RAD2     | From PARM TO LRM |
| 4          | PA_VER_RAD3     | From PARM TO LRM |
| 5          | PA_VER_RAD4     | From PARM TO LRM |
| 6          | GND             |                  |
| 7          | GND             |                  |
| 8          | PA_ID_LDMOS0    | From PARM TO LRM |
| 9          | PA_VG_LDMOS0    | From LRM TO PARM |
| 10         | GND             |                  |
| 11         | GND             |                  |
| 12         | PA_ID_DRIVER    | From PARM TO LRM |
| 13         | PA_ALA_TPTR_OUT | From PARM TO LRM |
| 14         | GND             |                  |
| 15         | GND             |                  |
| 16         | PA_OFF          | From LRM TO PARM |
| 17         | PA_VG_LDMOS1    | From LRM TO PARM |
| 18         | GND             |                  |
| 19         | PA_ID_LDMOS1    | From PARM TO LRM |
| 20         | PA_P_OUT        | From PARM TO LRM |

#### 2-2.2 Alarm Descriptions

- **High Temperature** – A temperature monitor located inside the PARM indicates the alarm status if the temperature exceeds the defined threshold.
- **High Current** - This alarm indicates when a high current is pending that could damage the PARM if the system continues to operate.