

**USER MANUAL**  
**PCS EDGE and GSM Dual Power Amplifier**  
REMEC Model DPA-4040E

**DPA-4040E User Manual**

REMEC's PCS Edge-GSM Dual Power Amplifier Model DPA-4040E product consists of two power amplifiers and a power combiner integrated into one compact housing capable of amplifying and / or combining one or two PCS 1900 Edge or GSM modulated RF carriers.

Two supplied user jumper cables allow the user to combine the 2 independent and isolated RF radio carriers into one common output port via the integrated power combiner. This option reduces the available output power for each RF carrier to 46 dBm per carrier, or a composite 2-carrier power of 49 dBm. This mode of operation is noted as Combined Output Mode.

The user has the option of removing the jumper cables and connecting directly to the two independent isolated output connectors of the Dual Power Amplifier. In this configuration, the output power for each output port is 49.5 dBm separately. This mode of operation is noted as Isolated Output Mode

The DPA-4040E has factory configurable gain only, so input power adjustments must be made by the user in order to adjust the output power.

This product has integrated DC power-conditioning circuits, monitoring circuits, control circuits, digital interface circuits and fans. The available monitoring, control circuitry, and digital interface circuits can be factory configured to meet customer needs of capability and cost flexibility.

The DPA-4040E is a piece of a larger product solution that allows for up to 6 DPAs to be placed in a common shelf side by side in a 19 inch Rack. The larger product solution consists of an AC to DC power rectifier and a cable kit to interface input signal, output signal, AC and DC power to OEM radio equipment. The larger product solution has an optional Amplifier Monitoring Module (AMM) that can interface to OEM base station alarms or local monitoring by means of a Graphical User Interface (GUI). The entire larger product solution is space efficient, consuming only 6RU of height in a 19-inch rack.

The following instructions should be followed when installing the unit for service:

## **1. Installation Instructions**

- 1.1 Apply a 27VDC input voltage to the DC Input connector of the DPA-4040E
- 1.2 Ensure that the DC Source is capable of delivering up to 25 Amps at 27VDC.
- 1.3 Apply either an Edge or GSM modulated signal to each RF input port of the DPA-4040E.
- 1.4 Measure the RF output port to ensure the proper output power is present.

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- 1.5 Adjust the input power level to ensure the output power level is in compliance with the values indicated in Table 1 or Table 2 depending upon the mode of operation (Combined or Isolated).
- 1.6 To comply with the FCC limits at the second harmonic, 20 dB minimum rejection must be provided between the DPA and free space. Any or all of the following system elements can be utilized to provide the required rejection:
  - 1.6.1 A transmit filter
  - 1.6.2 A transmit duplexer
  - 1.6.3 An antenna feed with loss
  - 1.6.4 Antenna pattern attenuation

**Note:**

The user must adjust the RF input power to the Booster Amplifier such that the RF output power level does not exceed the FCC certified power levels. The FCC certified power level is determined by the RF output spectral emissions to be compliant with the FCC spurious emissions limit of -13 dBm outside of the assigned frequency block. Near the block edges, the Edge and GMSK signal is such that the output power level must be further reduced so that the -13 dBm spurious level is not exceeded.

**These levels must not be exceeded for FCC compliance.**

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**2. Table 1: Maximum Combined Mode Output Power per Carrier (Edge or GSM)**

<b>Block</b>	<b>Channel Center Frequency (MHz)</b>	<b>Maximum RF Output Power per Carrier (dBm) Combined Port</b>	<b>Maximum RF Output Power per Carrier (W) Combined Port</b>
<b>A</b>	<b>1930.4</b>	<b>44.6</b>	<b>28.8</b>
<b>A</b>	<b>1930.6 - 1944.4</b>	<b>46</b>	<b>40</b>
<b>A</b>	<b>1944.6</b>	<b>44.6</b>	<b>28.8</b>
<b>D</b>	<b>1945.4</b>	<b>44.6</b>	<b>28.8</b>
<b>D</b>	<b>1945.6 - 1949.4</b>	<b>46</b>	<b>40</b>
<b>D</b>	<b>1949.6</b>	<b>44.6</b>	<b>28.8</b>
<b>B</b>	<b>1950.4</b>	<b>44.6</b>	<b>28.8</b>
<b>B</b>	<b>1950.6 - 1964.4</b>	<b>46</b>	<b>40</b>
<b>B</b>	<b>1964.6</b>	<b>44.6</b>	<b>28.8</b>
<b>E</b>	<b>1965.4</b>	<b>44.6</b>	<b>28.8</b>
<b>E</b>	<b>1965.6 - 1969.4</b>	<b>46</b>	<b>40</b>
<b>E</b>	<b>1969.6</b>	<b>44.6</b>	<b>28.8</b>
<b>F</b>	<b>1970.4</b>	<b>44.6</b>	<b>28.8</b>
<b>F</b>	<b>1970.6 - 1974.4</b>	<b>46</b>	<b>40</b>
<b>F</b>	<b>1974.6</b>	<b>44.6</b>	<b>28.8</b>
<b>C</b>	<b>1975.4</b>	<b>44.6</b>	<b>28.8</b>
<b>C</b>	<b>1975.6 - 1989.4</b>	<b>46</b>	<b>40</b>
<b>C</b>	<b>1989.6</b>	<b>44.6</b>	<b>28.8</b>

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**3. Table 2: Maximum Isolated Mode Output Power Per Carrier (Edge or GSM)**

Block	Channel Center Frequency (MHz)	Maximum RF Output Power per Carrier (dBm) Each Isolated Port	Maximum RF Output Power per Carrier (W) Each Isolated Port
A	1930.4	48.1	64.5
A	1930.6 - 1944.4	49.5	89.1
A	1944.6	48.1	64.5
D	1945.4	48.1	64.5
D	1945.6 - 1949.4	49.5	89.1
D	1949.6	48.1	64.5
B	1950.4	48.1	64.5
B	1950.6 - 1964.4	49.5	89.1
B	1964.6	48.1	64.5
E	1965.4	48.1	64.5
E	1965.6 - 1969.4	49.5	89.1
E	1969.6	48.1	64.5
F	1970.4	48.1	64.5
F	1970.6 - 1974.4	49.5	89.1
F	1974.6	48.1	64.5
C	1975.4	48.1	64.5
C	1975.6 - 1989.4	49.5	89.1
C	1989.6	48.1	64.5

**4. Tune-Up Procedure**

There are no user tunable components in the design so no Tune-up procedure is required.

**5. FCC Part 24 compliance**

Changes or Modifications, not expressly approved by the manufacturer, could void the user's authority to operate the equipment.

FCC rules for RF exposure require that the antenna connected to this DPA-4040E equipment is fixed on an outdoor structure with a minimum separation distance of 2 meters between it and any person.