



**Preliminary  
QuikPAC Module Data**

**QPP-028  
35W, 890-915MHz  
Class AB Driver Stage**

**General description:**

The **QPP-028 QuikPAC™** RF power module is an impedance matched Class AB amplifier stage designed for use in cellular repeater systems. The power transistor is fabricated using Xemod's advanced design LDMOS process. This unit has a factory set, regulated and temperature compensated gate bias, eliminating the need for the user to provide adjustable gate bias voltage circuits and make individual bias adjustments during stage alignment.

**Features:**

Single Polarity Operation  
Matched for 50  $\Omega$  RF interfaces  
XeMOS FET Technology  
Stable Performance  
QuikPAC System Compatible  
QuikClip or Flange Mounting

**Standard Operating Conditions**

| Parameter  | Symbol          | Min  | Nom  | Max  | Units |
|--|-----------------|------|------|------|-------|
| Frequency Range  | F               | 890  |      | 915  | MHz   |
| Supply (Drain) Voltage                                 | V <sub>D</sub>  | 26.0 | 28.0 | 32.0 | VDC   |
| Bias (Gate) Voltage                                    | V <sub>G</sub>  | 11.0 | 12.0 | 13.0 | VDC   |
| Bias (Gate) Current, Average                           | I <sub>G</sub>  |      |      | 20   | mA    |
| RF Source & Load Impedance                             | $\Omega$        |      | 50   |      | Ohms  |
| Load Impedance for Stable Operation (All Phases)       | VSWR            |      |      | 10:1 |       |
| Operating Baseplate Temperature                        | T <sub>OP</sub> | -20  |      | +90  | °C    |
| Output Device Thermal Resistance, Channel to Baseplate | $\Theta_{jc}$   |      | 1.9  |      | °C/W  |

**Maximum Ratings**

| Parameter  | Symbol           | Value       | Units |
|--|------------------|-------------|-------|
| Supply (Drain) Voltage                                 | V <sub>D</sub>   | 35          | VDC   |
| Control (Gate) Voltage, V <sub>D</sub> = 0 VDC         | V <sub>G</sub>   | 15          | VDC   |
| Input RF Power   | P <sub>IN</sub>  | 2.5         | W     |
| Load Impedance for continuous operation without damage | VSWR             | 3:1         |       |
| Output Device Channel Temperature                      |                  | 200         | °C    |
| Lead Soldering Temperature                             |                  | +190        | °C    |
| Storage Temperature                                    | T <sub>STG</sub> | -65 to +150 | °C    |

**Performance at 28VDC & 25°C**

| Parameter  | Symbol            | Min  | Nom  | Max  | Units |
|--|-------------------|------|------|------|-------|
| Supply (Drain) Voltage   | V <sub>D1,2</sub> | 27.8 | 28.0 | 28.2 | VDC   |
| Quiescent Current (total) (1)  | I <sub>DQ</sub>   | 270  | 300  | 330  | mA    |
| Power Output at 1 dB Compression (single tone)                       | P <sub>-1</sub>   | 35   | 40   |      | W     |
| Gain at 35W PEP (two tone)   | G                 | 14.5 | 15.5 |      | dB    |
| Gain Variation over frequency at 35W Output (two tone)               | $\Delta G$        |      | 0.3  | 0.5  | dB    |
| Input Return Loss (50 $\Omega$ Ref) at 35W PEP (two tone)            | IRL               | 12.0 | 18.0 |      | dB    |
| Drain Efficiency at 35W PEP (two tone)                               | $\eta$            | 32   | 34   |      | %     |
| 3 <sup>rd</sup> Order IMD Product (2 tone at 35W PEP; 1 MHz spacing) |                   |      | -29  | -27  | dBc   |

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## Performance at 28VDC & 25°C (continued)

| Parameter  | Symbol   | Min | Nom | Max | Units   |
|--|----------|-----|-----|-----|---------|
| IMD Variation – 100 kHz to 25 MHz tone spacing                 |          |     | 1.0 | 2.0 | dB      |
| 2 <sup>nd</sup> Harmonic at 35W P <sub>out</sub> (single tone) |          | -35 |     |     | dBc     |
| 3 <sup>rd</sup> Harmonic at 35W P <sub>out</sub> (single tone) |          | -40 |     |     | dBc     |
| Group (Signal) Delay   | $\tau_d$ |     | 3.5 |     | ns      |
| Transmission Phase Flatness                                    |          |     | 0.5 |     | degrees |

## Performance at 28VDC Over Temperature

| Parameter  | Symbol          | Min  | Nom  | Max | Units   |
|--|-----------------|------|------|-----|---------|
| Power Output at 1 dB Compression (single tone)                       | P <sub>-1</sub> |      |      |     | W       |
| Gain Variation over frequency at 7W Output (single tone)             | $\Delta G$      |      |      |     | dB      |
| Input Return Loss (50 $\Omega$ Ref)                                  | IRL             | 11.5 | 14.0 |     | dB      |
| Drain Efficiency at 35W PEP (two tone)                               | $\eta$          |      |      |     | %       |
| 3 <sup>rd</sup> Order IMD Product (2 tone at 35W PEP; 1 MHz spacing) |                 |      | -28  | -26 | dBc     |
| Group (Signal) Delay   | $\tau_d$        |      | 3.5  |     | ns      |
| Transmission Phase Flatness  |                 |      | 0.5  |     | degrees |

### Notes:

This GR-version QuikPAC module has an internally regulated gate voltage that is preset at the factory. A voltage of +12VDC ( $\pm 1V$ ) should be applied to the gate lead (pins 3). No further adjustment is required. The gate voltage is thermally compensated for operation over the temperature range listed in the data sheet. Although the module will operate with lower voltages applied, the internal regulator is not functioning and the specified performance may not be achieved.

Gate voltage must be applied coincident with or after application of the drain voltage to prevent potentially destructive oscillations. Bias voltages should never be applied to a module unless it is terminated on both input and output.

The quiescent current set during manufacture will be within the range specified in the Performance section (nominal  $\pm 10\%$ ) and is selected to balance IMD, input return loss, and efficiency. This setting is suitable for most applications. Modules with different optimization profiles are available by special order.

Internal RF decoupling is included on all bias leads. No additional bypass elements are required, however some applications may require energy storage on the drain leads to accommodate time-varying waveforms.

The RF leads are internally protected against DC voltages up to 100V. Care should be taken to avoid video transients that may damage the active devices.

## Package Styles

This model is available in both A (H10535) and AF (H10890) package styles. Style AF is shown for reference. Please see the applicable outline drawing for specific dimensions.

