**R&K-A324BW10-7181RP**

- **All Solid-State Amplifier**
- **Frequency Range:** 324MHz ± 5MHz
- **Output Power:** 120kW (min.) @ Peak
- **RF Pulse:** Chopper Amplifier
- **Building Block Construction**

**APPLICATION**

- Accelerator Application

**TYPICAL PERFORMANCE (Temp @+25℃)**

**SPECIFICATIONS** @ +25℃

- **Frequency Range:** 324MHz ± 5MHz
- **Gain:** +71.0dB (min.) @ Po=120kW
- **Gain Flatness:** ±0.7dB (typ.) @ Po=120kW
- **Output Power:** 120kW (min.) @ Peak
- **Duty:** 3% (max.)
- **Pulse Width:** 210 ~ 600μs
- **Repetition:** 1 ~ 50pps
- **Operation Mode:** Class AB
- **Pulse Rise / Fall Time:** 20ns (max.)
- **Harmonics:** −40.0dBc (max.) @ Po=120kW
- **Impedance:** 50Ω
- **Input VSWR:** 1.3 (typ.)
- **Output VSWR:** 1.2 (typ.)
- **AC Supply Input:** AC200V ± 10% / 3φ 50/60Hz, 20kVA (Ave.) @ Po=120kW
- **Operating Temperature:** +27℃ ± 2℃
- **Storage Temperature:** −15℃ to +55℃
- **Connectors:** RF - IN N - FEMALE, RF - OUT WX-77D
- **Size:** (W)3600mm x (D)795mm x (H)2200mm
- **Weight:** 1600.0kg (max.)
- **Cooling:** Forced Air Cooling
- **Protection Circuits:** Over Temperature Protection, Power Supply Voltage Protection, Output Over Power Protection, Output Over Reflection Power Protection
- **Other:** R&K Multi Monitoring System With Output Circulator

**HOW TO ORDER**

Model Number

R&K-A324BW10-7181RP  OP XX

Option: Ask
**Output Pulse Characteristics**

- **Frequency: 319MHz**
  - **Output Pulse**
  - **Pulse Rise**
  - **Pulse Fall**

- **Frequency: 324MHz**
  - **Output Pulse**
  - **Pulse Rise**
  - **Pulse Fall**

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**Measuring Points**

- Duty: 3%
- Pulse Period: 20mS (50pps)
- Pulse Width: 600μS
- Blanking: 603μS

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R&K reserves the right to make changes in the specifications or discontinue products at any time without notice. R&K products shall not be used for or in connection with equipment that requires an extremely high level of reliability and safety such as aerospace uses or medical life support equipment. Further, R&K cannot accept products to any country for use in military or defense applications.

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TYPICAL PERFORMANCE (Temp @+25°C)

Output Pulse Characteristics

- Frequency: 329MHz
  - Output Pulse
    - Po = 120kW
      - Duty: 3%
        - Pulse Period: 20mS (50pps)
        - Pulse Width: 600μS
        - Blanking: 60μS
    - Pulse Rise
      - Po = 120kW
        - X: 100μs / DIV
        - Y: 2V / DIV
      - Po = 70kW
        - X: 100μs / DIV
        - Y: 2V / DIV
      - Po = 20kW
        - X: 100μs / DIV
        - Y: 2V / DIV
    - Pulse Fall
      - Po = 120kW
        - X: 100μs / DIV
        - Y: 2V / DIV
      - Po = 70kW
        - X: 100μs / DIV
        - Y: 2V / DIV
      - Po = 20kW
        - X: 100μs / DIV
        - Y: 2V / DIV

Micro Pulse Characteristics

- Frequency: 324MHz / Po = 120kW
  - Output Pulse
    - X: 100μs / DIV
    - Y: 2V / DIV
  - Pulse Rise
    - X: 10μs / DIV
    - Y: 2V / DIV
  - Micro Pulse
    - X: 100ns / DIV
    - Y: 2V / DIV
  - Pulse Fall
    - X: 10μs / DIV
    - Y: 2V / DIV

CHOPPER RF PULSE AMPLIFIER

- Frequency: 324MHz / Po = 120kW
  - Output Pulse
    - X: 100μs / DIV
    - Y: 2V / DIV
  - Pulse Rise
    - X: 10μs / DIV
    - Y: 2V / DIV
  - Micro Pulse
    - X: 100ns / DIV
    - Y: 2V / DIV
  - Pulse Fall
    - X: 10μs / DIV
    - Y: 2V / DIV

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**PULSED RF POWER AMPLIFIER**

**TYPICAL PERFORMANCE (Temp @+25°C)**

### Output Power vs Phase

- **Frequency**
  - 319MHz
  - 324MHz
  - 329MHz

- **Phase (deg.)**
- **Output Power (dBm)**

- **Pulse Width**: 600μsec.
- **Pulse Duty**: 3.0%

### Duty vs Phase and Gain

- **Input Level fixed**
- **Frequency**: 324MHz
- **Output Power**: 120kW
- **Pulse Width**: 100～600μsec.
- **Pulse Duty**: 0.5～3.0%

- **Phase (deg.)**
- **Gain (dB)**

### Measuring Points

- **Duty**: 3%
- **Pulse Period**: 20mS (50pps)
- **Pulse Width**: 600μS
- **Blanking**: 600μS

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**TYPICAL PERFORMANCE (Temp @+25°C)**

### Compromising Emanations

- **Frequency: 319MHz / Po = 120kW (Pulse Width:600us Duty:3%)**

\[
E_r [\text{dBuV/m}] = \text{Actual measurement} [\text{dBm}] + \text{Cable Loss} [\text{dB}] + \text{Antenna Factor} [\text{dB/m}] + 107 [\text{dBuV/m}]
\]

\[
E_r = -16.06 [\text{dBm}] + 0.43 [\text{dB}] + 18 [\text{dB/m}] + 107 [\text{dBuV/m}] = 109.37 [\text{dBuV/m}]
\]

\[
E_r [\text{V/m}] = 10^{( \frac{E_r [\text{dBuV/m}] - 120}{20} )} = 0.294 [\text{V/m}]
\]

\[
E_r = 0.294 [\text{V/m}]
\]

- **Frequency: 324MHz / Po = 120kW (Pulse Width:600us Duty:3%)**

\[
E_r [\text{dBuV/m}] = \text{Actual measurement} [\text{dBm}] + \text{Cable Loss} [\text{dB}] + \text{Antenna Factor} [\text{dB/m}] + 107 [\text{dBuV/m}]
\]

\[
E_r = -16.93 [\text{dBm}] + 0.43 [\text{dB}] + 18.1 [\text{dB/m}] + 107 [\text{dBuV/m}] = 108.60 [\text{dBuV/m}]
\]

\[
E_r [\text{V/m}] = 10^{( \frac{E_r [\text{dBuV/m}] - 120}{20} )} = 0.294 [\text{V/m}]
\]

\[
E_r = 0.269 [\text{V/m}]
\]

- **Frequency: 329MHz / Po = 120kW (Pulse Width:600us Duty:3%)**

\[
E_r [\text{dBuV/m}] = \text{Actual measurement} [\text{dBm}] + \text{Cable Loss} [\text{dB}] + \text{Antenna Factor} [\text{dB/m}] + 107 [\text{dBuV/m}]
\]

\[
E_r = -14.30 [\text{dBm}] + 0.43 [\text{dB}] + 18.2 [\text{dB/m}] + 107 [\text{dBuV/m}] = 111.33 [\text{dBuV/m}]
\]

\[
E_r [\text{V/m}] = 10^{( \frac{E_r [\text{dBuV/m}] - 120}{20} )} = 0.367 [\text{V/m}]
\]

\[
E_r = 0.367 [\text{V/m}]
\]
Gain / Phase Stability, (60min, after Turn ON Power Supply)

- Gain Stability v.s. Time
  - Frequency: 324MHz
  - Output Power: 120kW
  - Pulse Width: 600μsec
  - Pulse Duty: 3%

- Phase Stability v.s. Time
  - Frequency: 324MHz
  - Output Power: 120kW
  - Pulse Width: 600μsec
  - Pulse Duty: 3%

OUTLINE DRAWING

※IN MILLIMETERS

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TYPICAL PERFORMANCE (Temp @+25°C)

324MHz, 5kW PA Single Module  Output linearity & Device TEMP.
※Pulse width=600μsec, duty=1%～6%

324MHz, 5kW PA Single Module  Output linearity & Input Power (AC200V)
※Pulse width=600μsec, duty=1%～6%

324MHz, 5kW PA Single Module  Output linearity & Current (DC+50V (Capasitor bank input))
※Pulse width=600μsec, duty=1%～6%

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324MHz, 5kW PA Single Module
Output linearity & Peak current (DC+50V(Capacitor bank output/1 device))
※Pulse width=600μsec, duty=1% 〜 6%

Output Power Efficiency
Duty 1%
Duty 2%
Duty 3%
Duty 4%
Duty 5%
Duty 6%

PULSED RF POWER AMPLIFIER

TYPICAL PERFORMANCE (Temp @+25℃)

324MHz, 5kW PA Single Module
Output linearity & Efficiency
※Pulse width=600μsec, duty=1% 〜 6%