

# PULSED RF POWER AMPLIFIER



## 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°C)

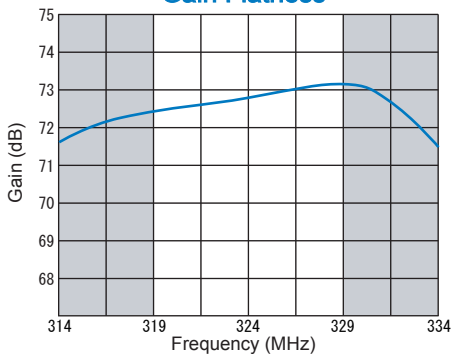
### SPECIFICATIONS @ +25°C

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	@Po=120kW
	: 20KVA(Ave.)	
Operating Temperature	: +27°C ± 2°C	
Storage Temperature	: -15°C to +55°C	
Connectors	: RF - IN	N - FEMALE
	: RF - OUT	WX-77D
Size	: (W)3600mm × (D)795mm × (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	

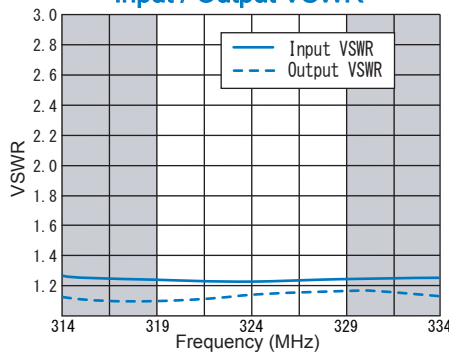
### HOW TO ORDER

Model Number  
 R&K-A324BW10-7181RP OP XX Option: Ask

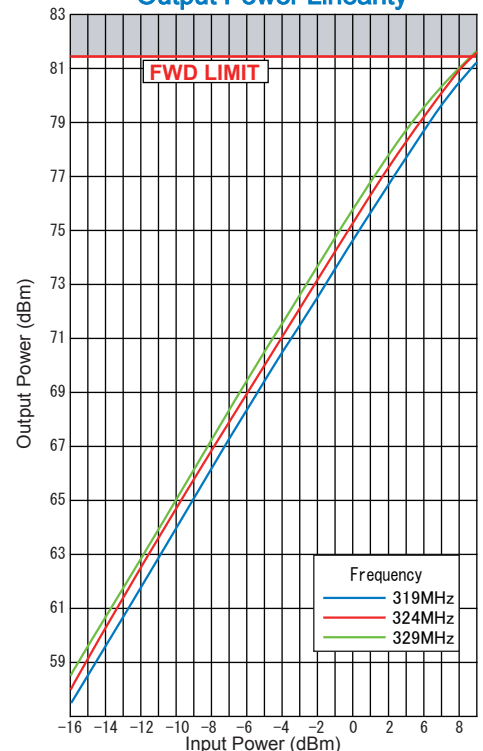
Gain Flatness



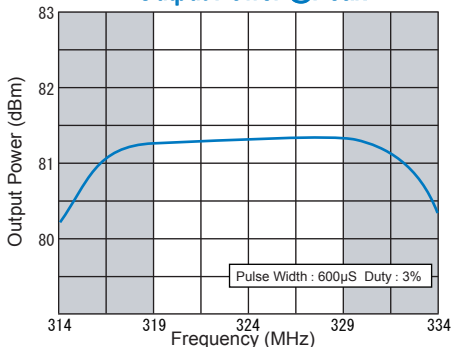
Input / Output VSWR



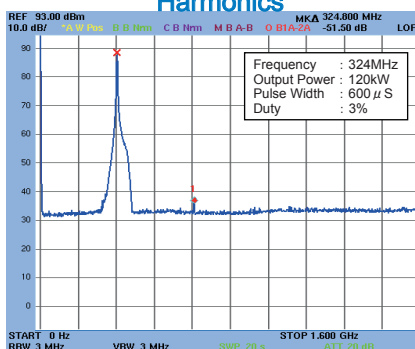
Output Power Linearity



Output Power @Peak



Harmonics



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 Tel : +81-545-31-2600 E-mail : info@rkco.jp  
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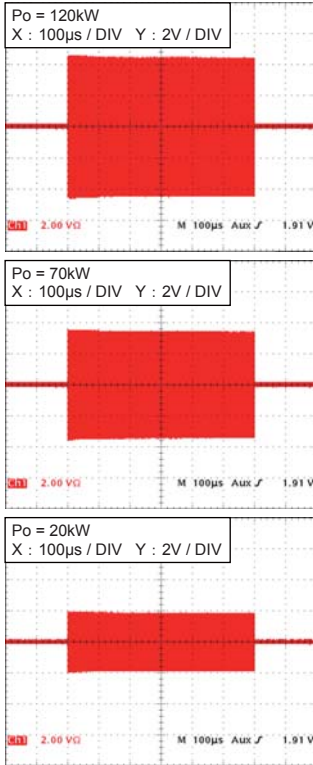
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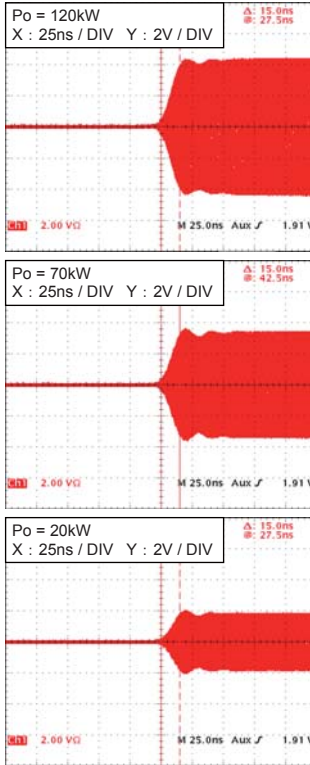
### Output Pulse Characteristics

#### Frequency: 319MHz

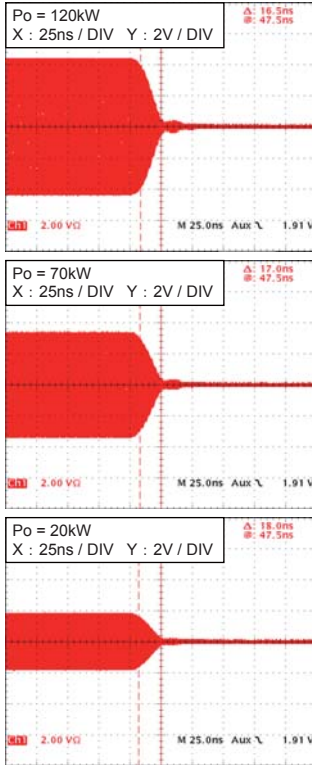
##### Output Pulse



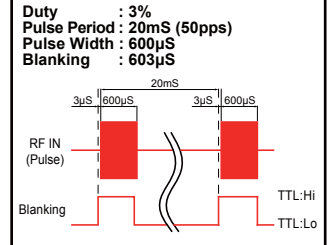
##### Pulse Rise



##### Pulse Fall

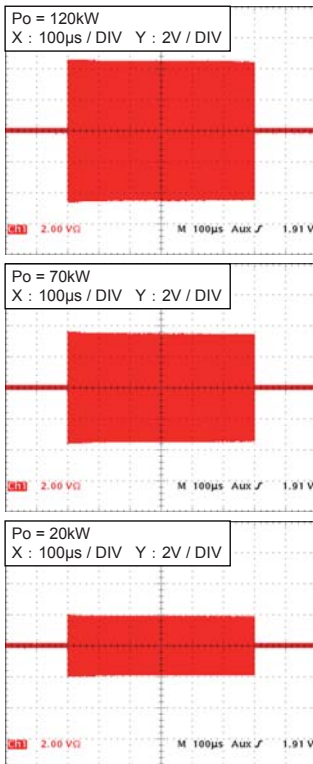


#### Measuring Points

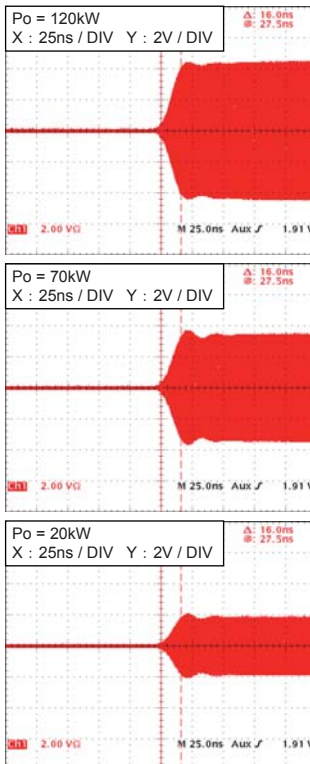


#### Frequency: 324MHz

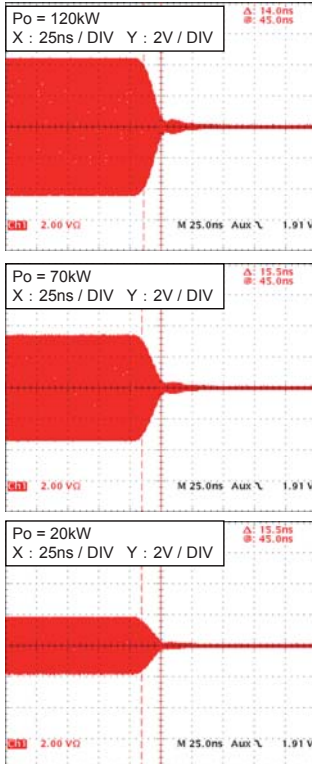
##### Output Pulse



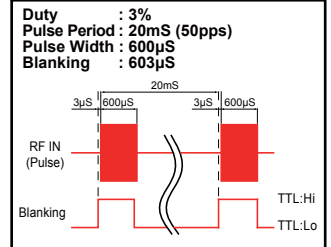
##### Pulse Rise



##### Pulse Fall



#### Measuring Points



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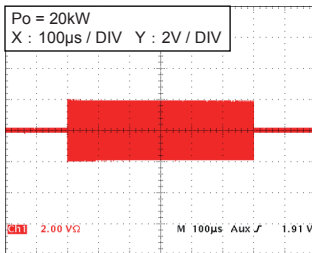
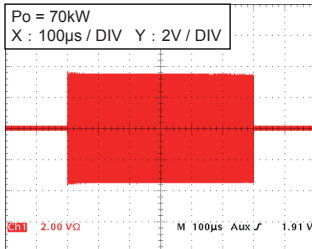
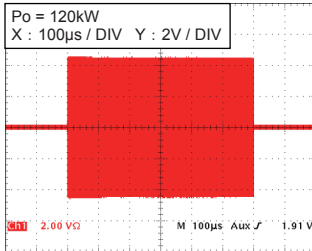
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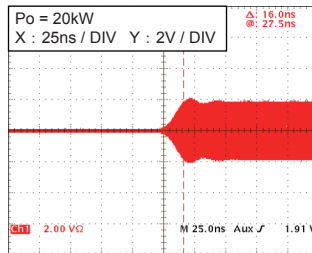
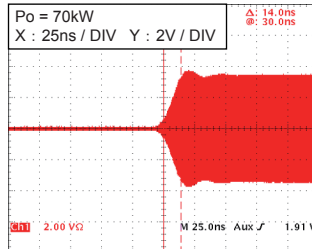
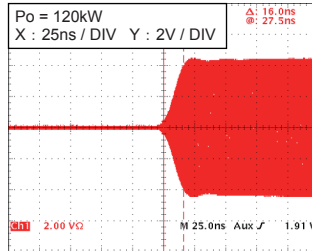
### Output Pulse Characteristics

• Frequency: 329MHz

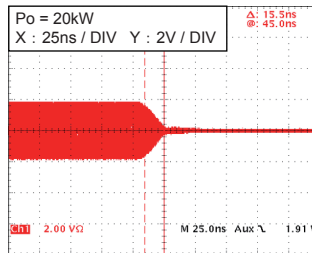
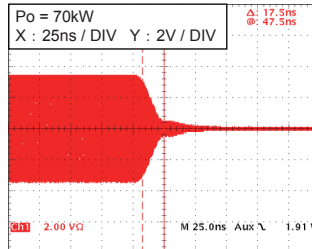
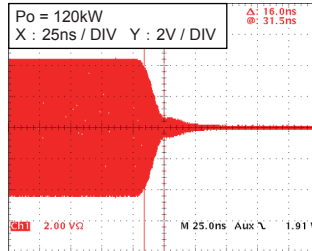
• Output Pulse



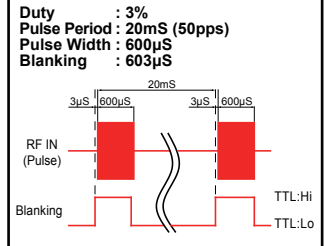
• Pulse Rise



• Pulse Fall



Measuring Points

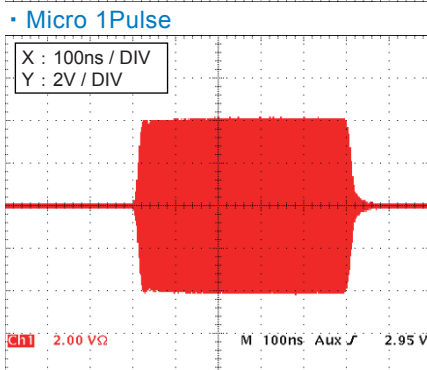
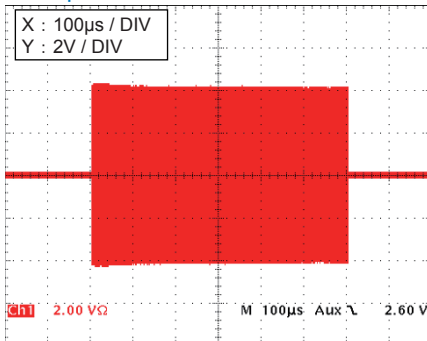


### Micro Pulse Characteristic

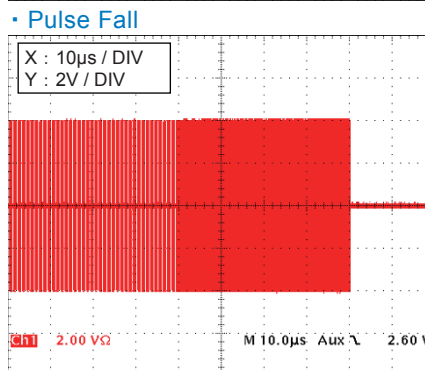
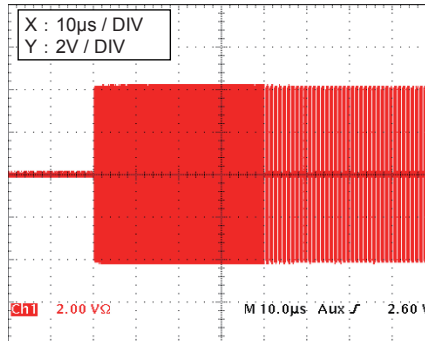
• Frequency: 324MHz / Po = 120kW

✂ CHOPPER RF PULSE AMPLIFIER

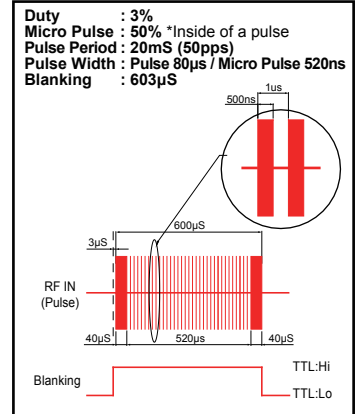
• Output Pulse



• Pulse Rise



Measuring Points



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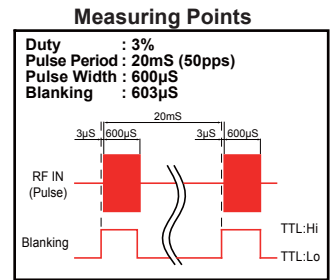
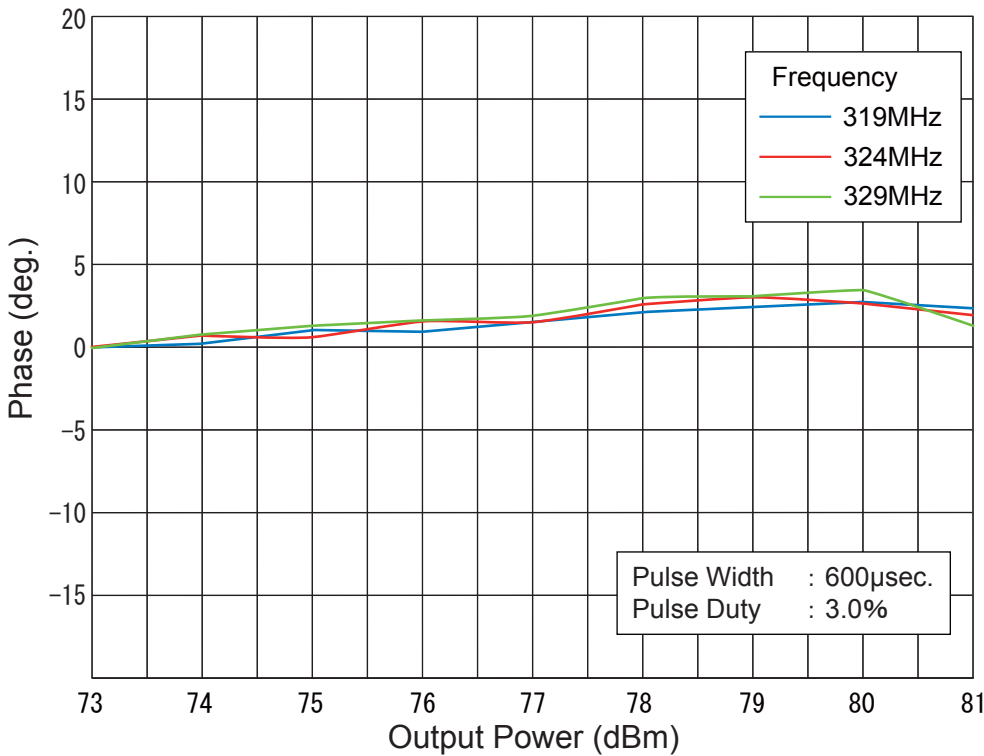
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## TYPICAL PERFORMANCE (Temp @+25°C)

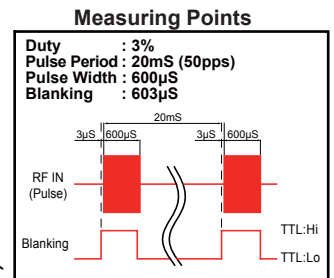
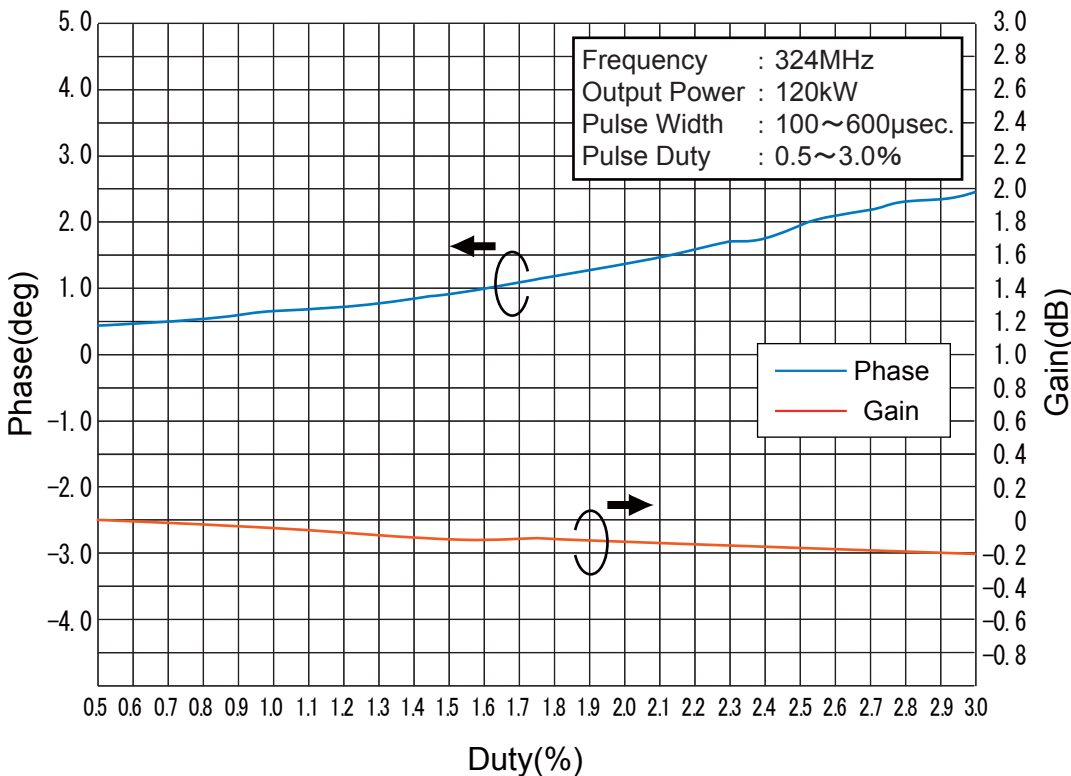
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### Output Power vs Phase



### Duty vs Phase and Gain

\*Input Level fixed



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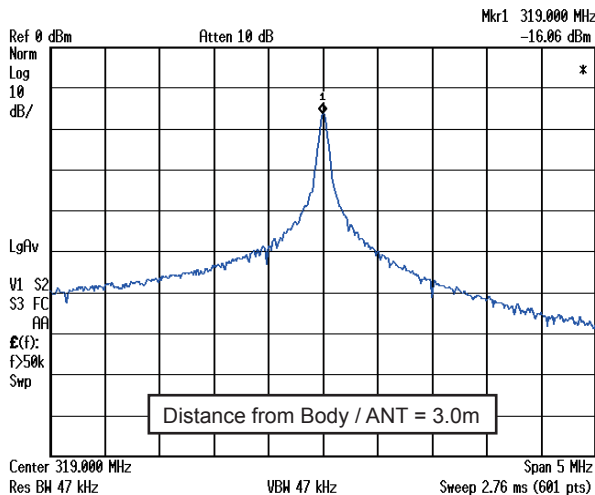


## TYPICAL PERFORMANCE (Temp @+25°C)

R&K-A324BW10-7181RP

### ■ Compromising Emanations

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



$$Er[\text{dBuV/m}] =$$

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

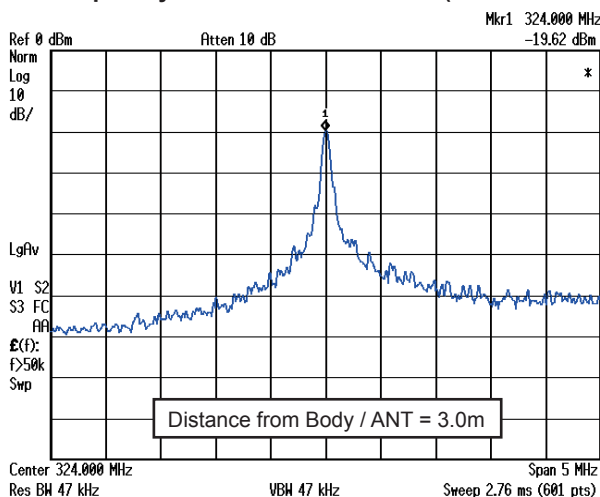
$$Er = -16.06[\text{dBm}] + 0.43[\text{dB}] + 18[\text{dB/m}] + 107[\text{dBuV/m}] = 109.37[\text{dBuV/m}]$$

$$Er[\text{V/m}] = 10^{\left(\frac{Er[\text{dBmV/m}] - 120}{20}\right)}$$

$$Er = 10^{\left(\frac{109.37[\text{dBuV/m}] - 120}{20}\right)} = 0.294[\text{V/m}]$$

$$Er = 0.294[\text{V/m}]$$

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



$$Er[\text{dBuV/m}] =$$

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

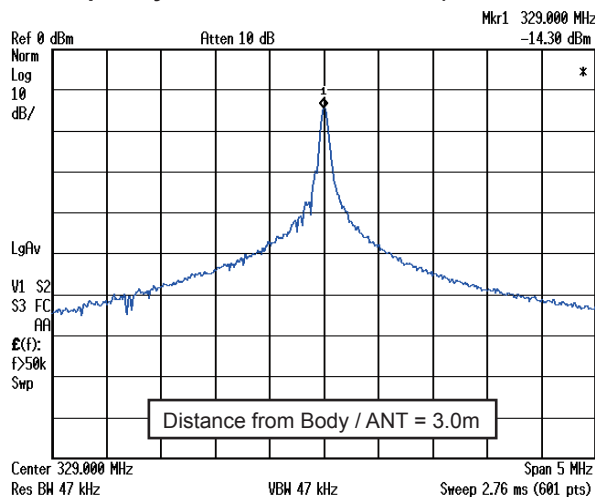
$$Er = -16.93[\text{dBm}] + 0.43[\text{dB}] + 18.1[\text{dB/m}] + 107[\text{dBuV/m}] = 108.60[\text{dBuV/m}]$$

$$Er[\text{V/m}] = 10^{\left(\frac{Er[\text{dBmV/m}] - 120}{20}\right)}$$

$$Er = 10^{\left(\frac{108.60[\text{dBuV/m}] - 120}{20}\right)} = 0.294[\text{V/m}]$$

$$Er = 0.269[\text{V/m}]$$

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



$$Er[\text{dBuV/m}] =$$

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

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

$$Er[\text{V/m}] = 10^{\left(\frac{Er[\text{dBmV/m}] - 120}{20}\right)}$$

$$Er = 10^{\left(\frac{111.33[\text{dBuV/m}] - 120}{20}\right)} = 0.367[\text{V/m}]$$

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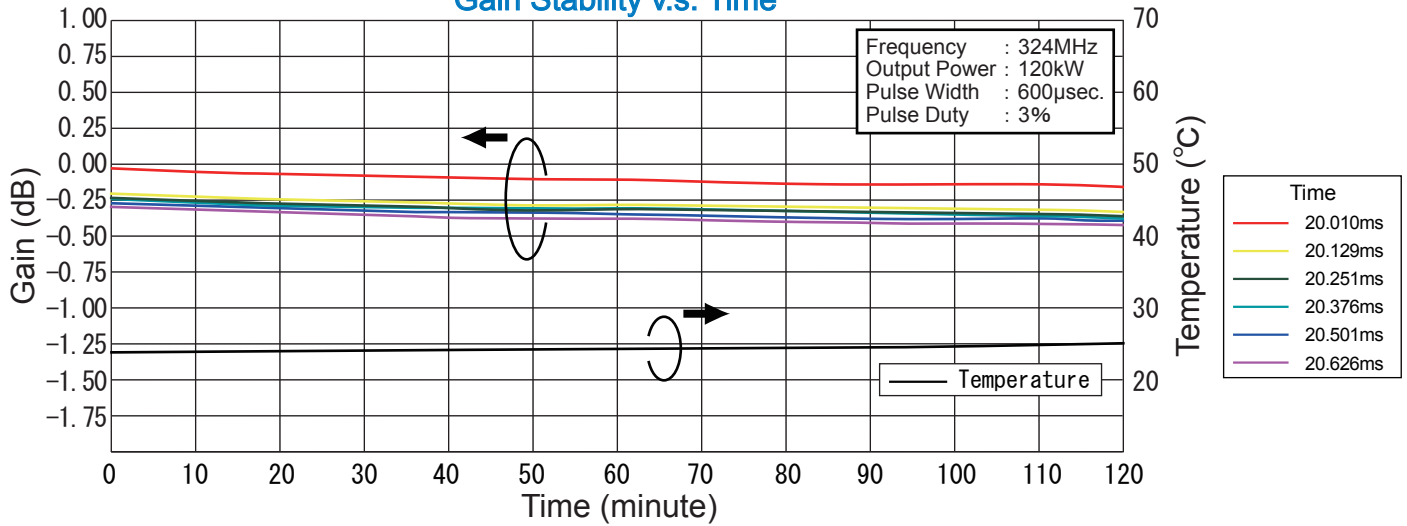
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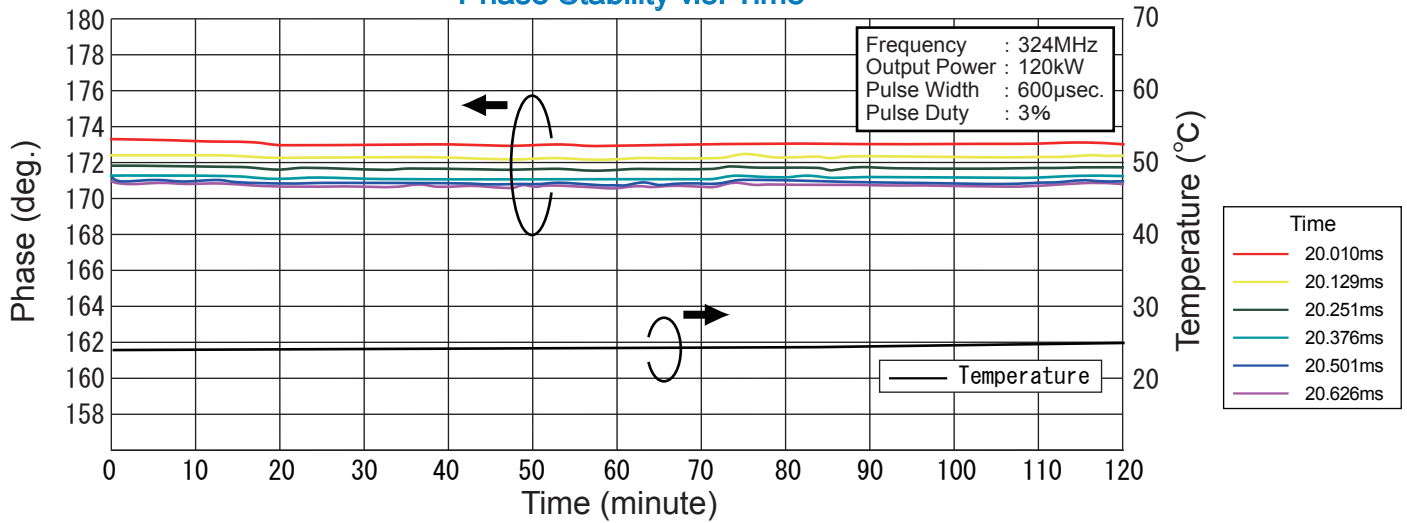
R&K-A324BW10-7181RP

### Gain / Phase Stability. (60min. after Turn ON Power Supply)

Gain Stability v.s. Time

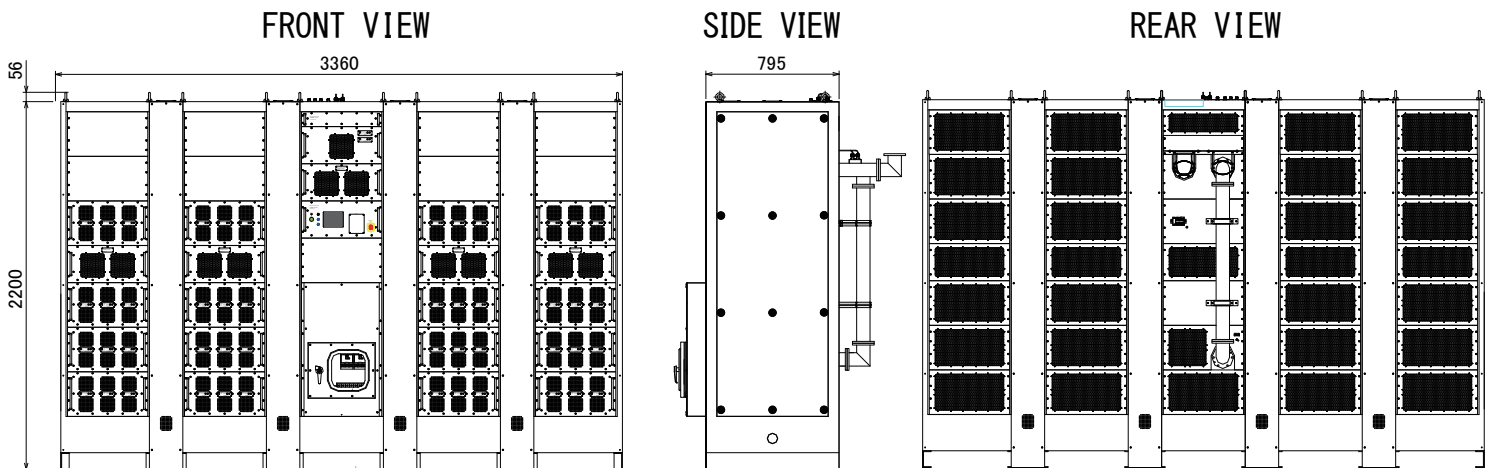


Phase Stability v.s. Time



## OUTLINE DRAWING

※IN MILLIMETERS



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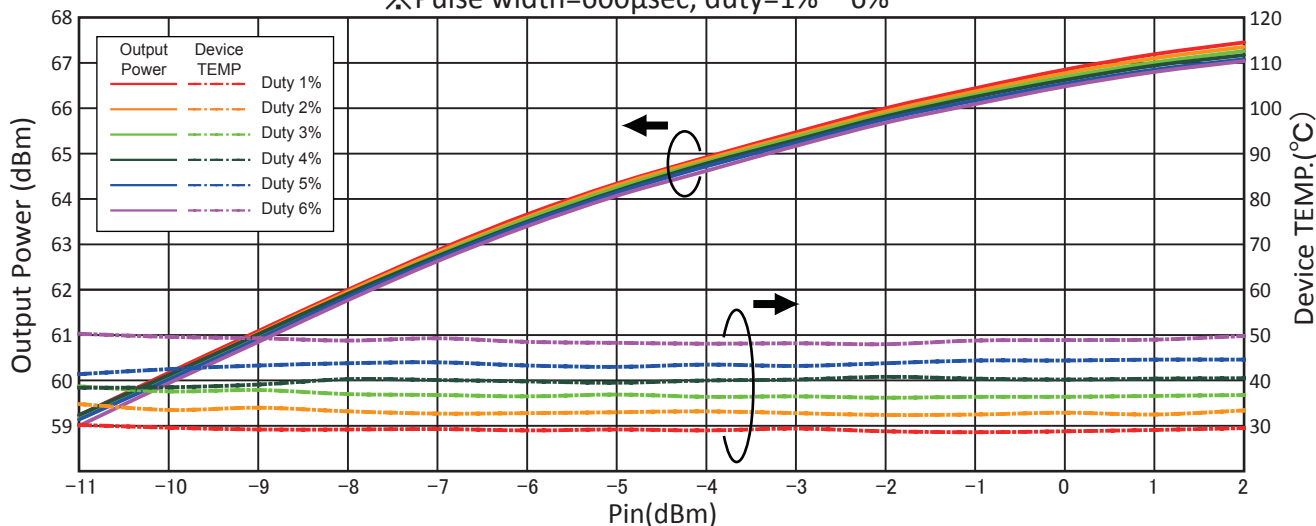
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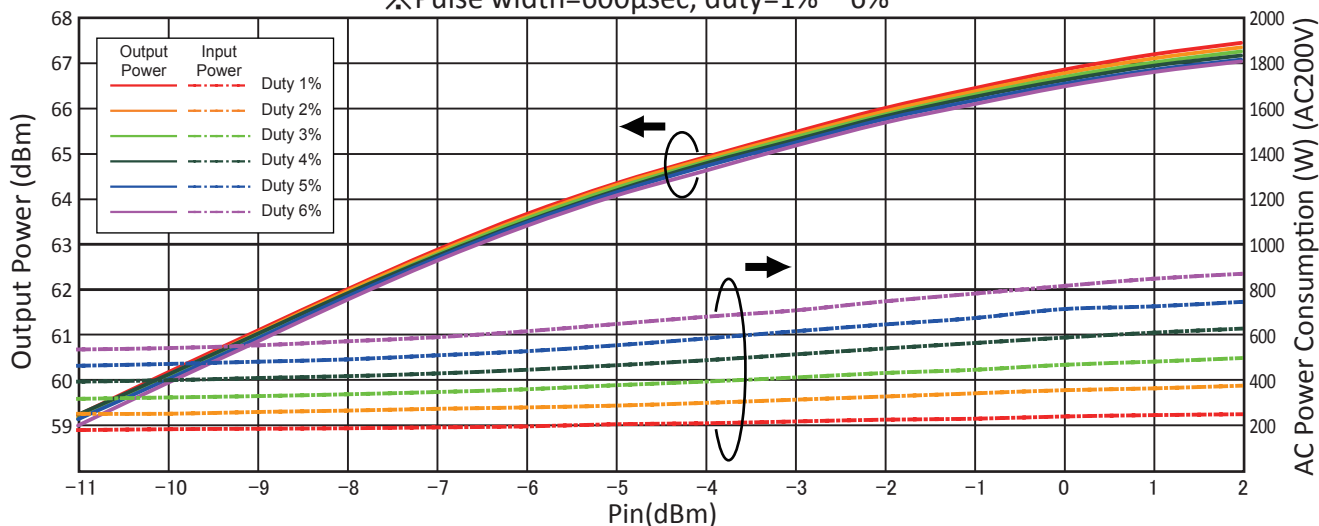
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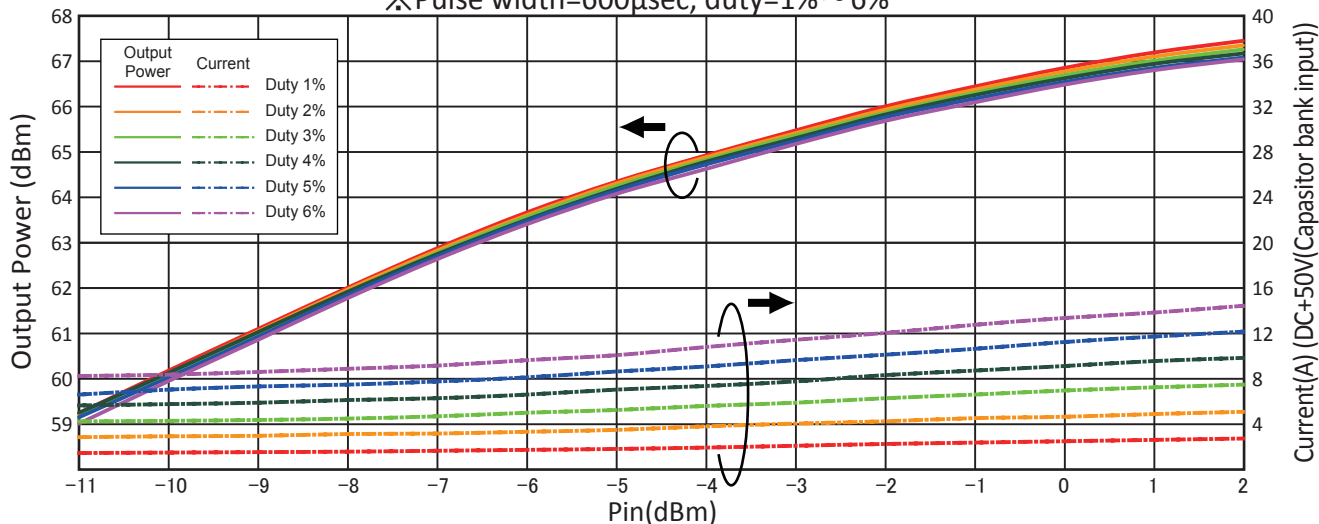
324MHz,5kW PA Single Module Output linearity&Device TEMP.  
 ※Pulse width=600μsec, duty=1%~6%



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(Capacitor bank input))  
 ※Pulse width=600μsec, duty=1%~6%



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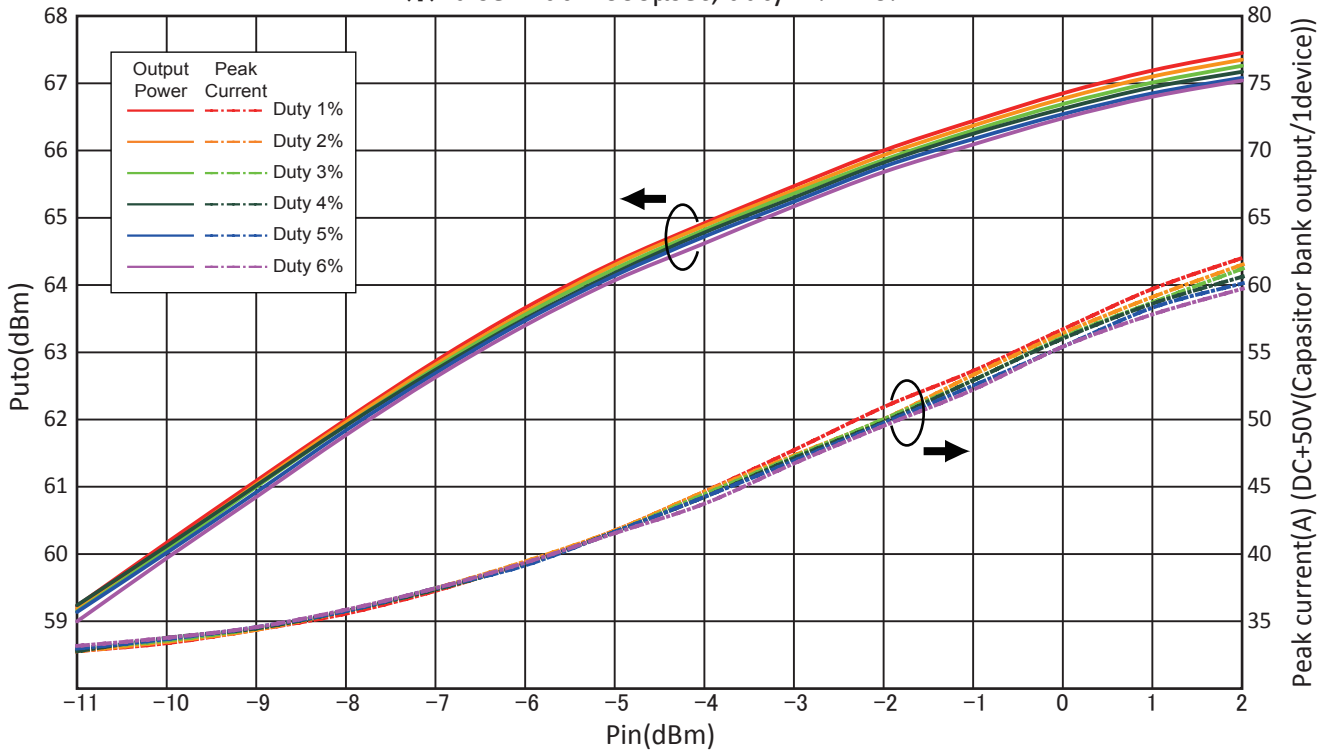
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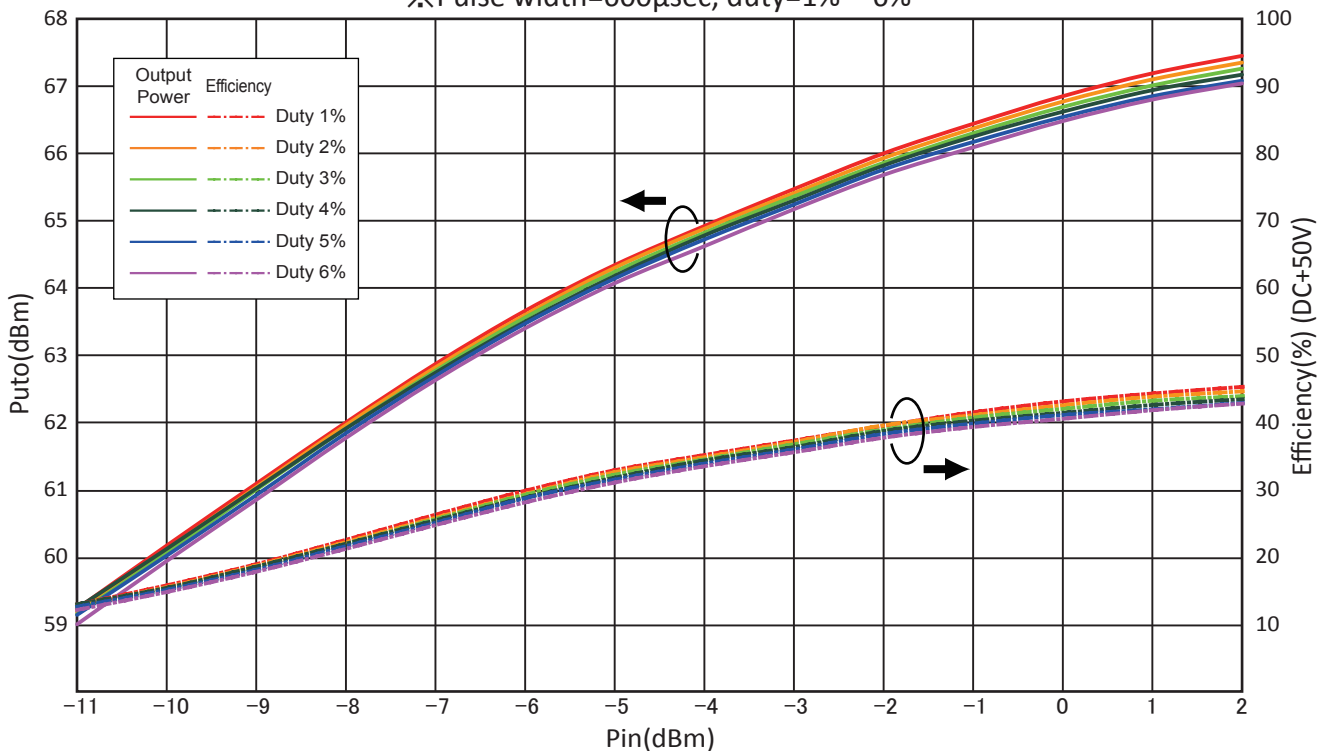
## TYPICAL PERFORMANCE (Temp @+25°C)

R&K-A324BW10-7181RP

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



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



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