

# 09238RG-24P (D-Type)

## General Specifications

**Motor Type:**

DC Brushless Motor

**Motor Protection:**

Auto Restart / Polarity Protection (Motor withstands reverse connection for positive and negative leads.)

**Insulation Resistance:**

10MΩ or over with a DC 500V Megger

**Dielectric Withstand Voltage:**

AC 500V 1min or AC 700V 1sec

**Allowable Ambient Temperature Range:**

-10°C ~ + 70°C (Operating)

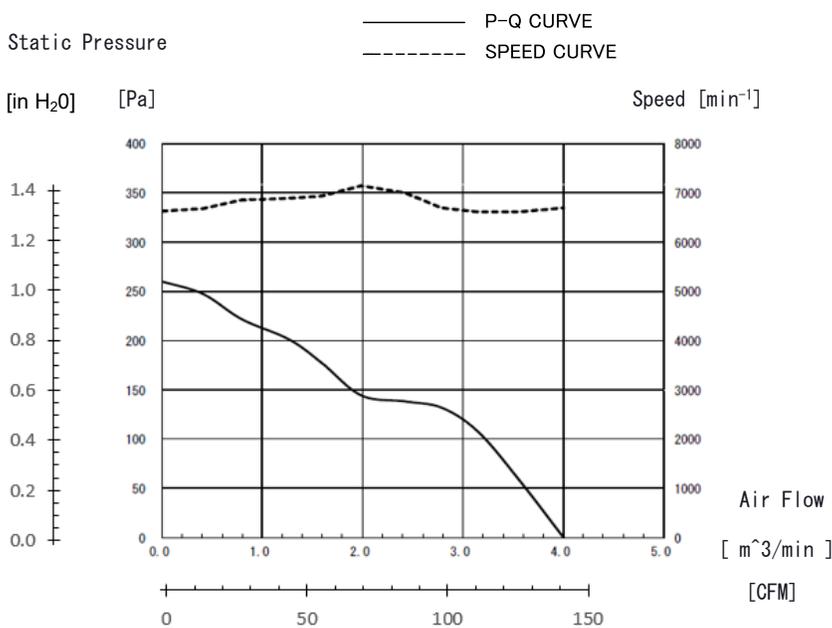
-40°C ~ + 70°C (Storage)

(non-condensing environment)



\*For reference only. Please see fan outline for details

## Characteristic Curves



## Features

- DC axial fan with outstanding P-Q performance, IP68 protection, PWM speed control, and tach output
- Vertically integrated manufacturing, with components made in-house
- IP68 with highest level of protection from water/dust ingress and GR-487 salt fog compliant
- Outfitted with NMB precision machined ceramic ball bearings for longer life in high temperatures and electrical corrosion resistance
- Ideal for applications such as EV chargers, PV inverters, telecom cabinets, small cell 5G network and other outdoor applications\*\*

## Life Expectancy L10

120,000 Hours at 25 Celsius

\*Fan life expectation is based on free air operation at 25°C, rated voltage, and indoor benign lab environment

\*\*For stationary applications only

\*1: Values in Free Air

## Specifications

MODEL	Rating Voltage	Operating Voltage	Current		Input Power		Speed	Max. Air Flow		Max. Static Pressure		Noise	Mass
	(V)	(V)	Avg (A)*1	Max (A)*1	Avg (W)*1	Max (W)*1		(CFM)	(m <sup>3</sup> /min)	(in H <sub>2</sub> O)	(Pa)		
	(V)	(V)	(A)*1	(A)*1	(W)*1	(W)*1	(min <sup>-1</sup> )*1	(CFM)	(m <sup>3</sup> /min)	(in H <sub>2</sub> O)	(Pa)	(dB)*1	(g)
09238RG-24P-GUD-1	24	14.0 to 26.4	0.92	1.20	22.08	28.80	6,700	141	4.00	1.04	260	61	270

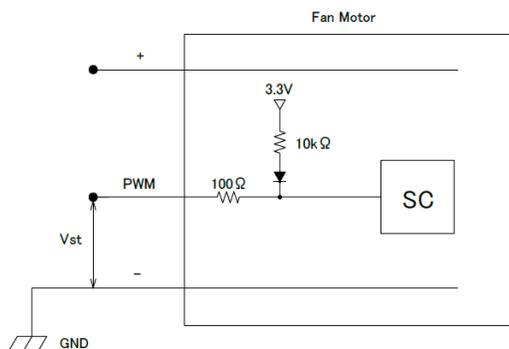
# IP68 Protected DC Fan with PWM and Tach Output

## 09238RG-24P (D-Type)

NMB

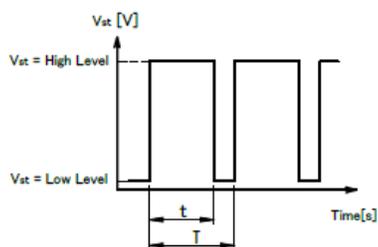
### PWM Specifications

#### Connection



1. PWM Control  
 $V_{st} = \text{Low Level (0V} \sim \text{0.4V)} \rightarrow \text{Stop (On Duty 0\%)}$   
 $V_{st} = \text{High Level (4.5V} \sim \text{5.0V)} \rightarrow \text{Full Speed (On Duty 100\%)}$   
 $V_{st} = \text{Open} \rightarrow \text{Full Speed}$

#### 2. PWM Duty & PWM Input Pulse

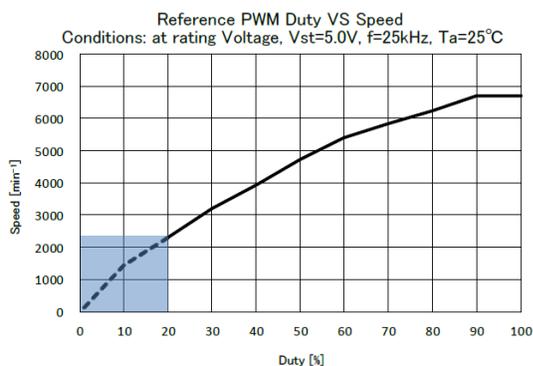


PWM Duty means that a ratio of high level time (t)/PWM Input Pulse(T).  
 $(t/T) \times 100 : \text{On Duty 0\%} \sim \text{100\%}$   
**PWM Frequency  $f = 25[\text{kHz}]$**

#### 3. The condition for PWM control are as follows

- When you use this under PWM control, always be sure the motor's operation under practical mounting state. Fan motor may not start up caused by PWM control at very low speed condition.
- To run at Rating Voltage
- Please use the start with Duty 20% or more at 25kHz.[At rated voltage input, Ambient temperature 25°C]

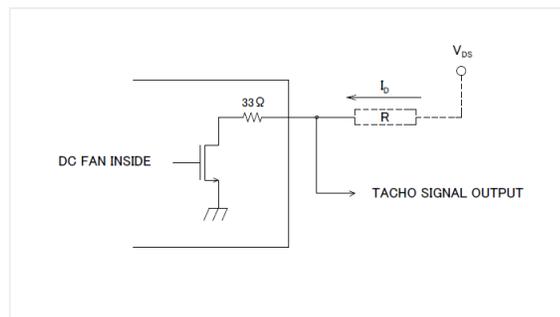
### PWM Characteristic Curve



### TACHO Specifications

#### Tachometer Signal

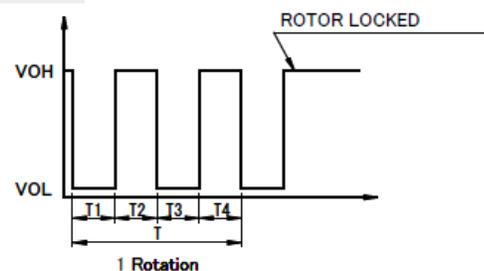
1. Output Circuit: Open Drain
2. Specification  
*Absolute Maximum Ratings at  $T_a=25^\circ\text{C}$*   
 $V_{DSmax}: +30V$   
 $I_{Dmax}: 5mA [V_{DS(sat)max}=1.5V]$



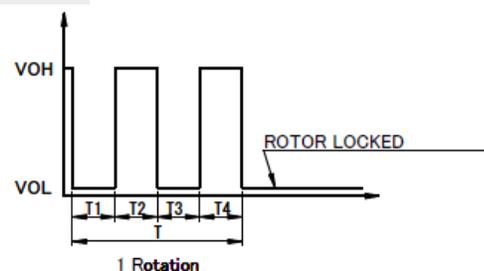
#### 3. Output Waveform: At Rated Voltage

Output Signal Voltage

##### Case-1



##### Case-2



- 1) When the rotor is locked at VOH position of signal, signal keeps VOH position.
- 2) When the rotor is locked at VOL position of signal, signal keeps VOL position.
- 3)  $T=T1+T2+T3+T4=60/m=1 \text{ rotation}$

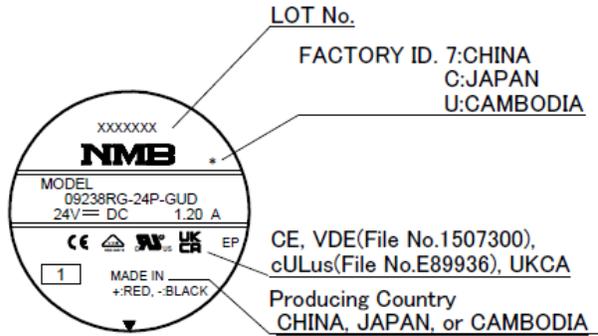
$m$ : Fan Speed ( $\text{min}^{-1}$ )

Tacho Duty Cycle=50%±10%

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## Outlines

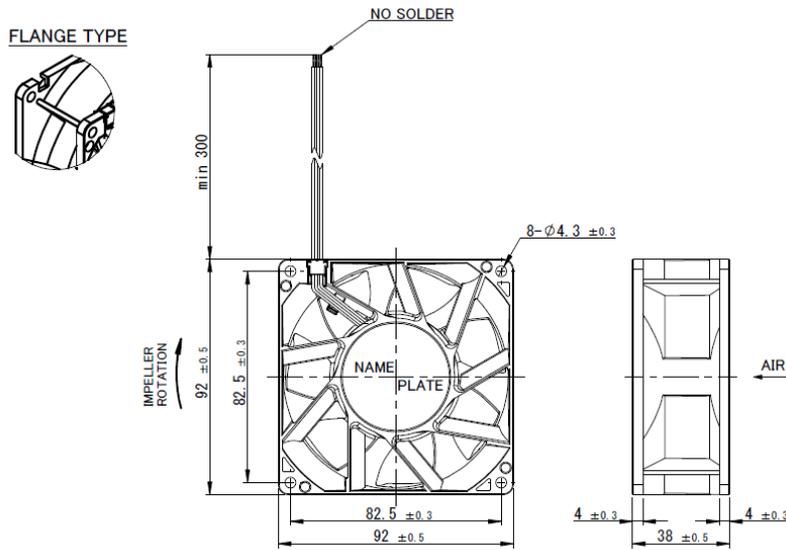
(Name Plate)



## Materials

- Casing:** Plastic (Black UL 94V-0)
- Impeller:** Plastic (Black UL 94V-0)
- Bearing:** Ceramic Ball Bearing
- Lead Wire:** UL3443 AWG24 for
  - Red (+)
  - Black (-)
  - White (Tach)
  - Brown (PWM)

(Outline)



(Panel Out-line)

