High Speed DC Fan with PWM and Tach Output

04028DA (R-Type)

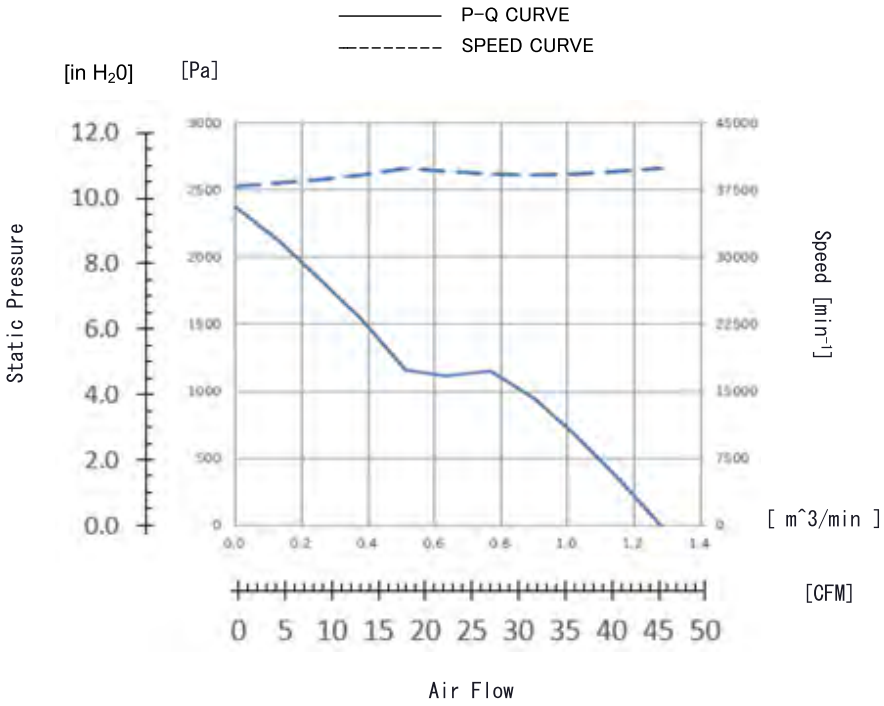
NMB

General Specifications

Motor Type:
DC Brushless Three Phase 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

- High performance fan with PWM speed control
- Three phase motor technology for high performance 40,000 RPM Speed
- Available in 12 volts with Tach output for speed monitoring
- Energy saving, low vibration, and increased efficiency for long life
- Outfitted with NMB precision machined ball bearings for long life 50,000 RPM version coming soon!

Life Expectancy L10

70,000 Hours at 40 Celsius

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

Specifications

Model	Rating Voltage	Operating Voltage	Current		Input Power		Speed	Max Air Flow		Max Static Pressure		Noise	Mass
	V	V	Avg	Max	Avg	Max	min-1*	m^3/min*	CFM*	Pa	In H2O	dB*	g
			A*	A*	W*	W*							
04028DA-12T-A6R-9	12	10.8 to 12.6	2.90	3.50	34.80	42.00	40,000	1.28	45.2	2,370	9.50	77.5	57

**: Values in Free Air*

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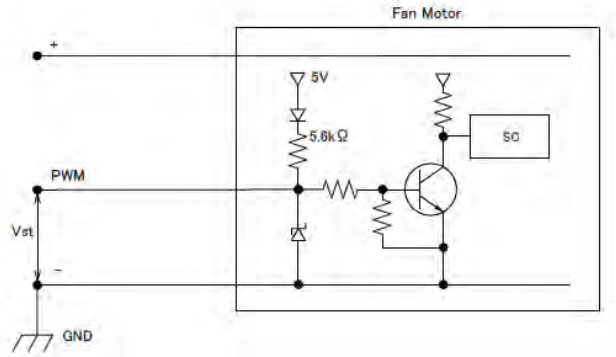
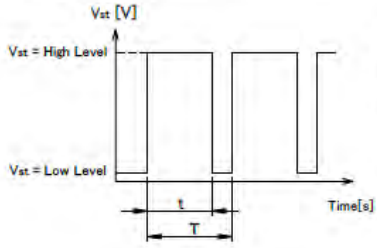
PWM Specifications

Connection



1. PWM Control
   Vst = Low Level (0V~0.4V) → Stop (On Duty 0%)
   Vst = High Level (4.0V~5.0V) → Full Speed (On Duty 100%)
   Vst = Open → Full Speed

2. PWM Duty & PWM Input Pulse



PWM Duty means that a ratio of high level time (t)/PWM Input Pulse(T).

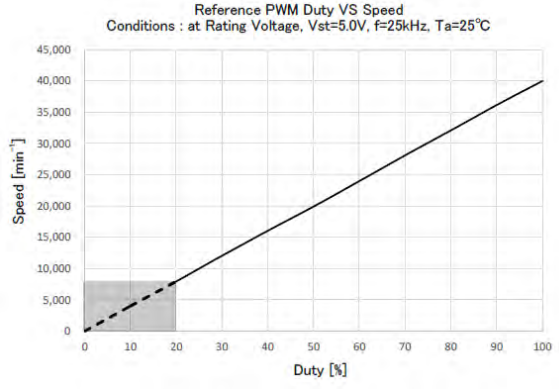
(t/T) × 100 : On Duty 0%~100%

PWM Frequency f = 25±5[kHz]

3. The condition for PWM control are as follows

- Please install the fan in your system when testing the PWM function. If the PWM duty cycle is very low, the fan might not start up.
- Run the fan at rated voltage only
- Please start the fan with duty cycle of 20% or more at
- 25kHz.[At rated voltage input, Ambient temperature 25C]

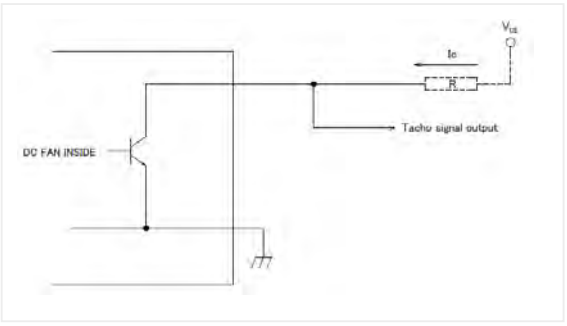
PWM Characteristic Curve



TACHO Specifications

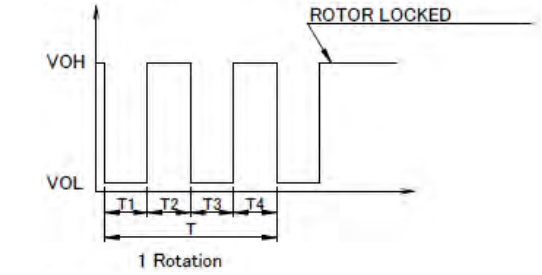
Tachometer Signal

1. Output Circuit: Open Collector
2. Specification
   Absolute Maximum Ratings at Ta=25°C
   V_{CE}max: +15V
   $I_D$max: 5mA[V_{CE}(sat)max=1.5V]

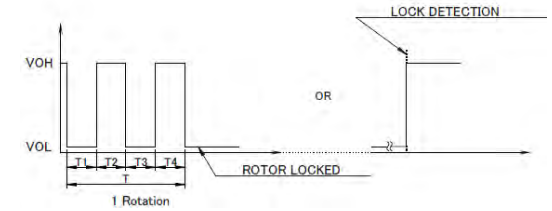


3. Output Waveform: At Rated Voltage
   Output Signal Voltage

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 or signal keeps VOH position under locked rotor protect function

3) T=T1+T2+T3+T4=60/m=1 rotation

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

   Tacho Duty Cycle=50%±10%

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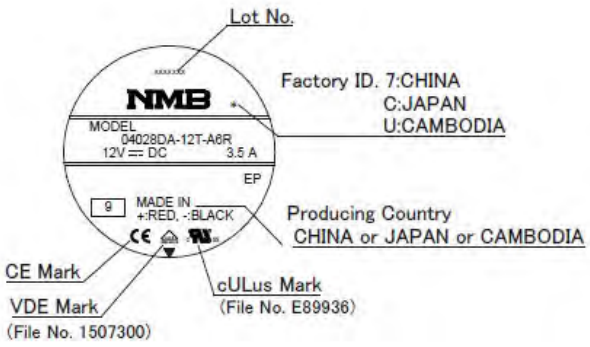
Outlines

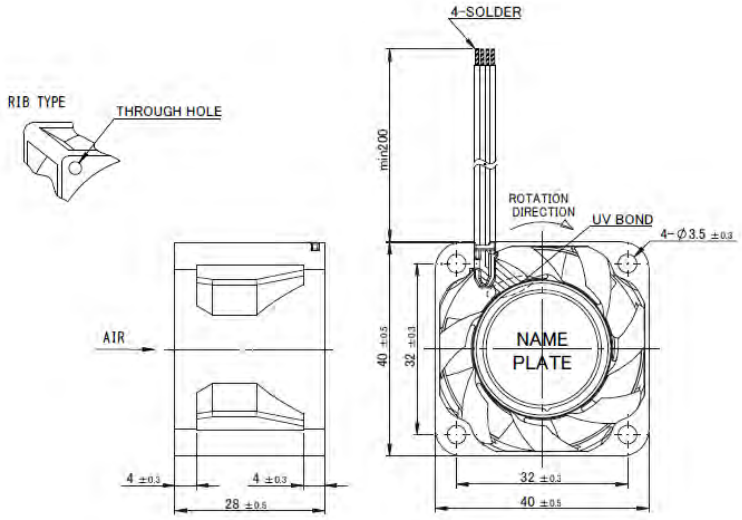
(Name Plate)



Materials

Casing: Plastic (Black UL 94V-0)
Impeller: Plastic (Black UL 94V-0)
Bearing: Ball Bearings
Lead Wire: UL10368 AWG24 or equivalent for
Red (+)
Black (-)
UL10368 AWG26 or equivalent for
Tach (White)
PWM (Brown)

(Outline)



(Panel Out-line)