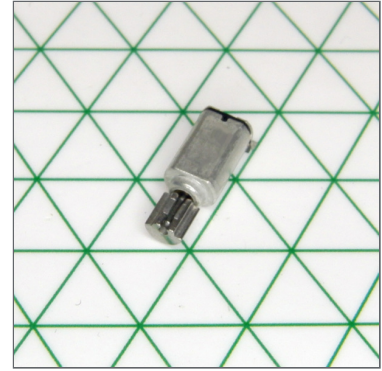


Product Data Sheet

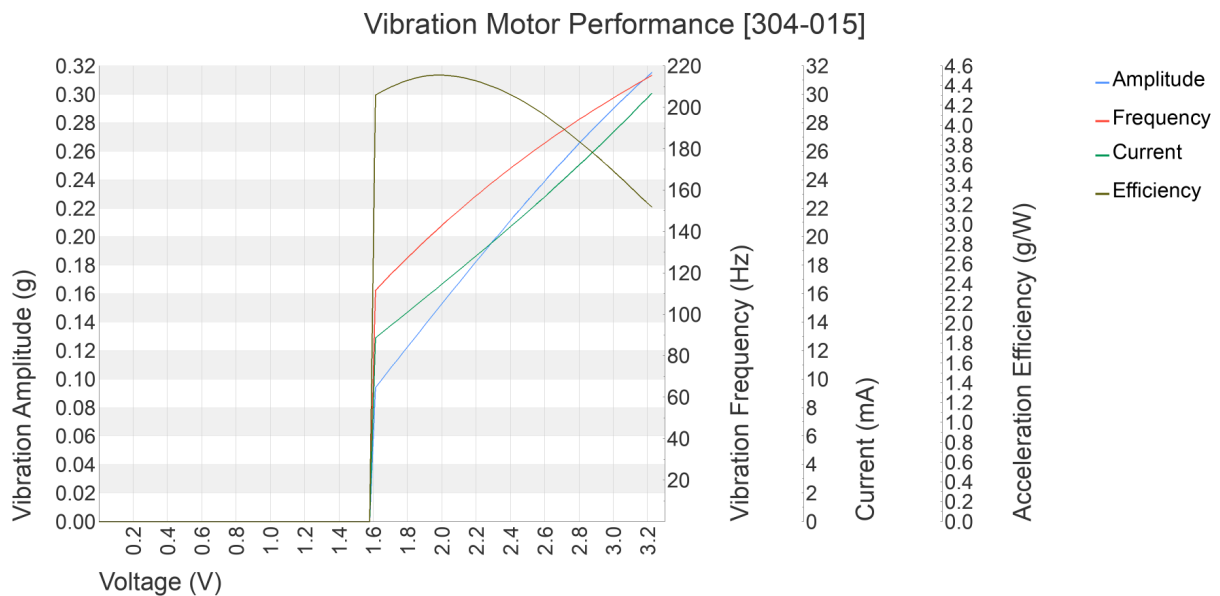
Range: Pico Vibe
Title: 4mm Vibration Motor
Type: Undefined
Model: 304-015

4mm Vibration Motor
7mm Type
Shown on 6mm Isometric Grid



KEY FEATURES	
Body Diameter	4.1 mm [± 0.2]
Body Length	6.8 mm [± 0.2]
Ecc. Weight Radius	1.4 mm [± 0.1]
Ecc. Weight Length	3 mm [± 0.1]
Shaft Orientation	Inline
Rated Operating Voltage	2.5 V
Rated Vibration Speed	11,000 rpm [$\pm 2,500$]
Typical Rated Operating Current	25 mA
Typical Norm. Amplitude	0.25 G

TYPICAL DC MOTOR PERFORMANCE CHARACTERISTICS



ORDERING INFORMATION

The model number fully defines the model, variant and additional features of the product. Please quote this number when ordering. For stocked types, testing and evaluation samples can be ordered directly through our online store.

FIND OUT HOW THIS PART COULD MEET YOUR SPECIFICATIONS

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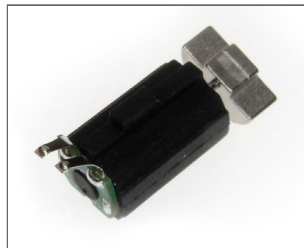
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DESIGN FOR APPLICATION CASE STUDIES



ENCAPSULATED VIBRATION MOTOR FOR A CPR TRAINING DUMMY

- Low volume, high value manufacturing
- Custom CNC machined enclosure
- Optimised haptic performance
- Custom PCB including EMI filters
- Part no. 334-401.001



VIBRATION MOTOR HIGHLY OPTIMISED FOR RUGGEDISED FIRE AND POLICE EMERGENCY RADIOS

- High volume production
- Optimised for emergency services application
- Ruggedised design with custom rubber 'suspension' cover
- Custom PCB with spring legs for simplified production assembly times
- Part no. 308-104.001



PRECISION SPEED AND TORQUE CONTROLLED SERVO WITH INTEGRATED TUNABLE PID LOOP FOR SINGLE-USE SCIENTIFIC INSTRUMENT.

- Medium volume, high value assembly
- Proprietary PID controller converts cost-effective motor design into a precision servo
- Adapted control software including digital IO (to customer's specification)
- Part no. 132-100.001



CUSTOMISED PRECISION GEAR MOTOR WITH ROBUST OPTICAL ENCODER

- High volume production
- Application specific output shaft
- Tailored motor performance curves
- Rear motor shaft with noise resistant optical encoder
- Part no. 212-116.001

PHYSICAL SPECIFICATION

PARAMETER	CONDITIONS	SPECIFICATION
Body Diameter	Max body diameter or max face dimension where non-circular	4.1 mm [+/- 0.2]
Body Length	Excl. shafts, leads and terminals	6.8 mm [+/- 0.2]
Unit Weight		0.6 g
Mounting	See drawing for details	PCB SMD Reflow
No. of Output Shafts		1
Ecc. Weight Radius	Radius from shaft for non-cylindrical weights	1.4 mm [+/- 0.1]
Ecc. Weight Length		3 mm [+/- 0.1]
Shaft Orientation		Inline

CONSTRUCTION SPECIFICATION

PARAMETER	CONDITIONS	SPECIFICATION
Motor Construction		Iron Core
Commutation		Precious Metal Brush
No. of Poles		3
Bearing Type		Sintered Bronze

OPERATIONAL SPECIFICATION

PARAMETER	CONDITIONS	SPECIFICATION
Rated Operating Voltage		2.5 V
Rated Vibration Speed	At rated voltage using the inertial test load	11,000 rpm [+/- 2,500]
Max. Rated Operating Current	At rated voltage using the inertial test load	30 mA
Max. Start Voltage	With the inertial test load	2.2 V
Max. Operating Voltage		3.2 V
Rated Inertial Test Load	Mass of standard test sled	100 g
Min. Vibration Amplitude	Peak-to-peak value at rated voltage using the inertial test load	0.15 G
Max. Start Current	At rated voltage	50 mA
Min. Insulation Resistance	At 50V DC between motor terminal and case	1 MOhm

FIND OUT HOW THIS PART COULD MEET YOUR SPECIFICATIONS

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Important: The characteristics of the motor is the typical operating parameters of the product. The data herein offers design guidance information only and supplied batches are validated for conformity against the specifications on the previous page.

TYPICAL PERFORMANCE CHARACTERISTICS

PARAMETER	CONDITIONS	SPECIFICATION
Typical Rated Operating Current	At rated voltage using the inertial test load	25 mA
Typical Vibration Amplitude	Peak-to-peak value at rated voltage using the inertial test load	0.25 G
Typical Start Current	At rated voltage	45 mA
Typical Vibration Efficiency	At rated voltage using the inertial test load	3.1 G/W
Typical Norm. Amplitude	Peak-to-peak vibration amplitude normalised by the inertial test load at rated voltage	0.25 G
Typical Start Voltage	With the inertial test load	1.5 V
Typical Terminal Resistance		80 Ohm
Typical Terminal Inductance		1,600 uH

TYPICAL HAPTIC CHARACTERISTICS

PARAMETER	CONDITIONS	SPECIFICATION
Typical Lag Time	At rated voltage using the inertial test load	27 ms
Typical Rise Time	At rated voltage using the inertial test load	28 ms
Typical Stop Time	At rated voltage using the inertial test load	15 ms
Typical Active Brake Time	Time taken from steady-state to 0.04 G under inverse polarity at max. voltage	12 ms

TYPICAL DURABILITY CHARACTERISTICS

PARAMETER	CONDITIONS	SPECIFICATION
Typical Min. Counterweight Pullout		40 N

ENVIRONMENTAL CHARACTERISTICS

PARAMETER	CONDITIONS	SPECIFICATION
Max. Operating Temp.		60 Deg.C
Min. Operating Temp.		-10 Deg.C
Max. Storage & Transportation Temp.		85 Deg.C
Min. Storage & Transportation Temp.		-40 Deg.C

TYPICAL PACKING CONDITIONS

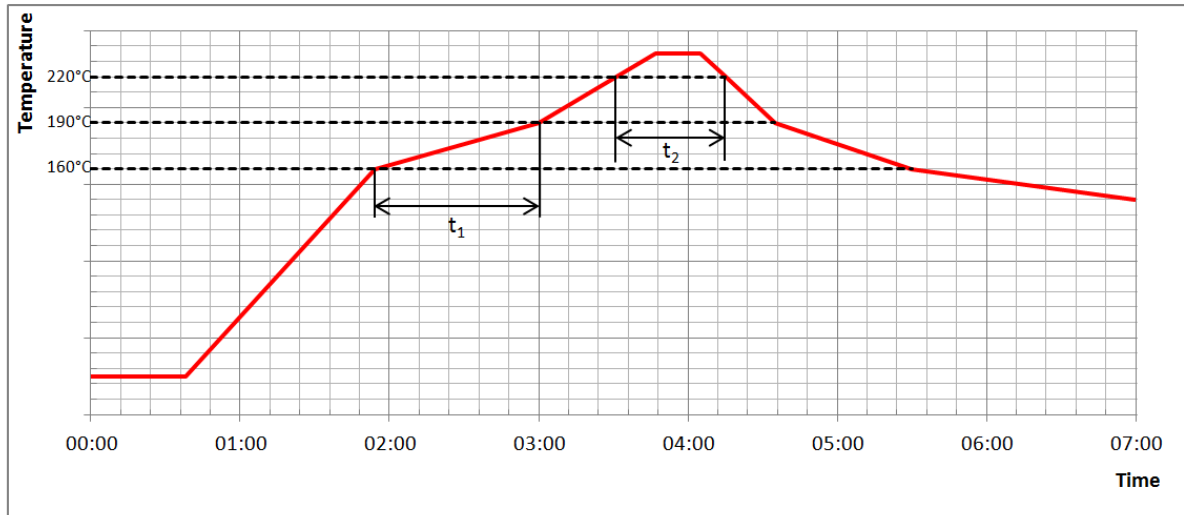
PARAMETER	CONDITIONS	SPECIFICATION
Carton Type		Reel (Ø33cm)

FIND OUT HOW THIS PART COULD MEET YOUR SPECIFICATIONS

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REFLOW TEMPERATURE PROFILE

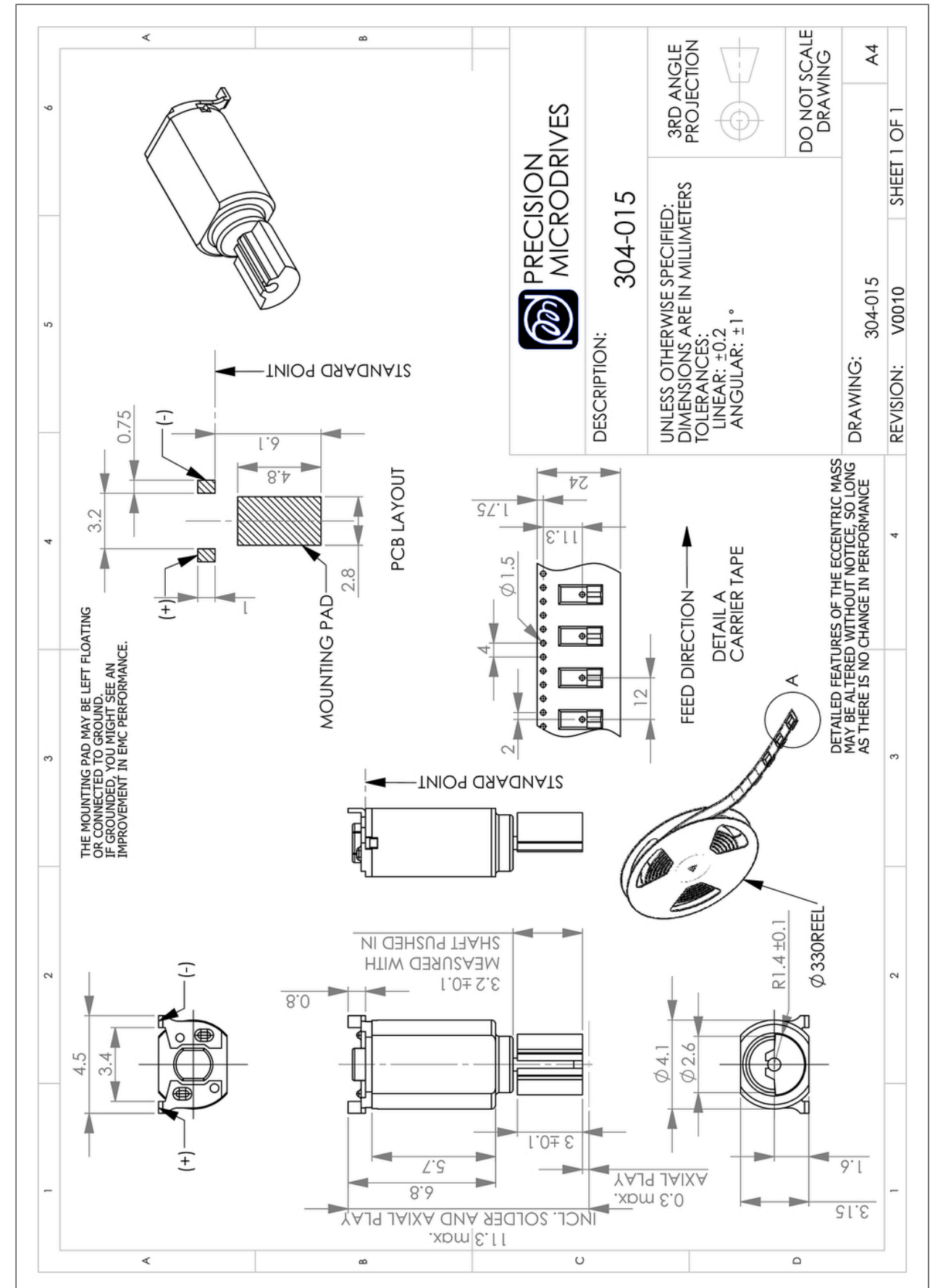
Parameter	Reference	Specification
Average Temp Gradient in Preheating		2°C/s
Pre-heat time	t ₁	40~110s (60~100s typ)
Reflow Time	t ₂	30~90s (40~70s typ)
Peak Temp in Reflow		240±10°C
Max Time at Peak Temp		5 sec



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PRODUCT DIMENSIONAL SPECIFICATION



FIND OUT HOW THIS PART COULD MEET YOUR SPECIFICATIONS

Email: enquiries@precisionmicrodrives.com
Call: +44 (0) 1932 252482

HOW TO ORDER

Call or email us with your order requirements at:

Email: **enquiries@precisionmicrodrives.com**

Phone: **+44 (0) 1932 252482**

Please quote the full part number when ordering or making an enquiry. Some products can be ordered in smaller volumes directly from our website: **www.precisionmicrodrives.com**

DATASHEET REVISION AND VERSION NUMBERING

We aim to provide our customer with the most detailed product information available. Sometimes changes are necessary, and these will be controlled by our engineering change request and notification process. To track datasheet versions we use both a 'production revision number' and a 'document version number'. These can be found at the bottom of every page. In some cases, such as documentation errors, the document version number can increase without triggering a product revision.

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1. Life support devices or systems are devices or systems which,
 - 1.1. are intended for surgical implant into the body, or
 - 1.2. support or sustain life, and whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury to the user or a third party.
2. A critical component is any component of a life support device or any other system or machine whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

BATCH NUMBERING, MANUFACTURING, TRACEABILITY AND LABELLING

Every part manufactured by Precision Microdrives is at minimum identified and traced via a batch number. Where physically practical, we try to make each part with a batch number. In addition, some parts carry a lot code or barcode serial numbers. If traceability is a core requirement for your purchase, let us know and we'll outline the production options for you.

STANDARD QUALITY CONTROLS AND ISO 9001

Precision quality control is one of our 3 key competitive advantages. All motors that we produce undergo 100% line inspection followed by strict and detailed batch sample testing in accordance with ISO 2859. All of the processes operated at Precision Microdrives are managed within our ISO 9001 quality system.



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