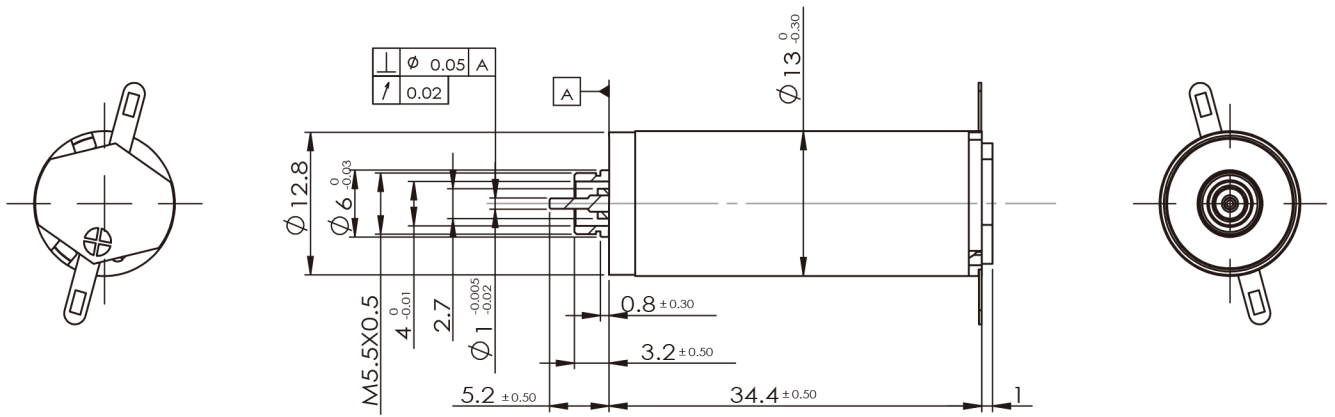




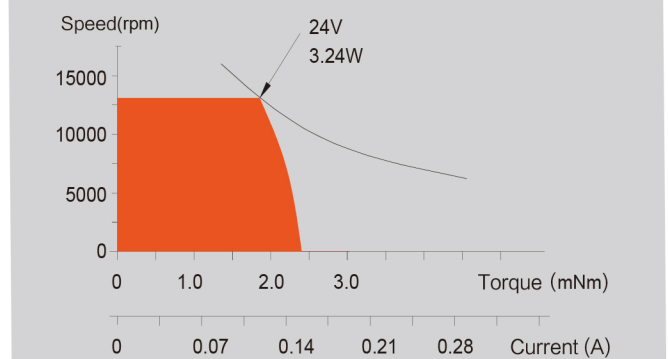
## Motor Data

|    | Motor model           |                  |         | DR133503B | DR133506B | DR133509B | DR133512B | DR133524B |
|----|-----------------------|------------------|---------|-----------|-----------|-----------|-----------|-----------|
| 1  | Nominal voltage       | V                | V       | 3         | 6         | 9         | 12        | 24        |
| 2  | No load speed         | rpm              | Wnl     | 11600     | 13300     | 12500     | 12500     | 15500     |
| 3  | No load current       | mA               | InI     | 100       | 42        | 22        | 18        | 12        |
| 4  | Nominal speed         | rpm              | Wc      | 10400     | 10400     | 10100     | 10300     | 12900     |
| 5  | Nominal torque        | mNm              | Tc      | 2         | 2.3       | 2.5       | 2.4       | 2.4       |
| 6  | Nominal current       | A                | Ic      | 0.84      | 0.53      | 0.37      | 0.27      | 0.16      |
| 7  | Output power          | W                | Pc      | 2.2       | 2.5       | 2.6       | 2.6       | 3.24      |
| 8  | Stall torque          | mNm              | Tmax    | 15.6      | 11.7      | 12.7      | 13.3      | 13.42     |
| 9  | Stall current         | A                | Imax    | 6.52      | 2.73      | 1.88      | 1.46      | 0.92      |
| 10 | Max. efficiency       | %                | ηmax    | 87        | 78.2      | 78.1      | 78.3      | 82        |
| 11 | Terminal resistance   | Ω                | Rt      | 0.46      | 2.2       | 4.8       | 8.2       | 26.1      |
| 12 | Torque constant       | mNm / A          | Kt      | 2.4       | 4.31      | 6.79      | 9.05      | 14.59     |
| 13 | Speed constant        | rpm / V          | Kn      | 3995      | 2298      | 1405      | 1054      | 654       |
| 14 | Speed torque gradient | rpm / mNm        | Δn / ΔT | 677       | 1261      | 933       | 890       | 1085      |
| 15 | Terminal inductance   | mH               | L       | 0.012     | 1.2       | 0.58      | 1.09      | 1.1       |
| 16 | Rotor inertia         | gcm <sup>2</sup> | J       | 0.7       | 0.6       | 0.56      | 0.57      | 0.58      |

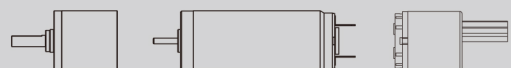
## Specifications

|    |                                    |          |              |
|----|------------------------------------|----------|--------------|
| 1  | ambient temperature                | Ta       | -20~+65 °C   |
| 2  | max. winding temperature           | Tcoilmax | +85 °C       |
| 3  | max. speed                         | Nmax     | 17050 rpm    |
| 4  | axial play                         | Δt       | 0.05-0.15 mm |
| 5  | number of pole pairs               | 2p       | 1            |
| 6  | number of commutator segments      |          | 5            |
| 7  | weight of motor                    | Wt       | 16 g         |
| 8  | Max. axial load (dynamic)          |          | 0.8N         |
| 9  | Max. force for press fits (static) |          | 15N          |
| 10 | Max. radial load, 4 mm from flange |          | 1.4N         |

## Operating Range



## SMJ Modular System



Planetary Gearhead  
Model number P12H  
Outside Diameter φ12  
Torque 0.004~0.2N·m  
See page 47

Encoder  
1000 CPT  
3 Channels  
see page 45