

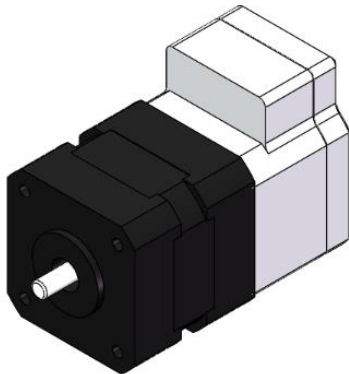
FEATURES

The **MSM942038-24** is part of a family of fully integrated smart motor solutions for servo motor applications. This 42mm (NEMA 17), 38W power motor integrates a brushless DC motor and driver module. The user can choose one of three options: speed control mode, position control mode, or speed/position control mode. Two control interface options are available: an RS485 interface or a PULSE/DIR interface.

Easy-to-use GUI software provides flexibility by allowing users to optimize the design online through the RS485 control interface. The parameters are saved in the motor's non-volatile memory. A design guide for the GUI is available for download at www.monolithicpower.com.

In addition to the fully integrated smart motor solutions, the driver modules can be ordered separately for customization into different motor types. The **MMP742038-24** is the driver module part number.

A datasheet for the MMP742038-24 is available for download at www.monolithicpower.com.



DESCRIPTION

- 18V to 36V Input Voltage Range
- Max 38W Continuous Power Output
- 0.12N-m Rated Torque (0.36N-m Peak Torque)
- 0.3° Position Resolution
- RS485 Interface and PULSE/DIR Interface
- Position Control and Speed Control
- Operating Temperature: 0°C to 70°C (Power Derated > 40°C)
- Storage Temperature: -40°C to +125°C

ORDERING INFORMATION

| Part Number | MSM942038-24-S-R | MSM942038-24-P-R | MSM942038-24-C-R | MSM942038-24-P-D |
|---------------------|------------------|------------------|------------------|------------------|
| Diameter (mm) | 42 | 42 | 42 | 42 |
| Power (W) | 38 | 38 | 38 | 38 |
| Typical Voltage (V) | 24 | 24 | 24 | 24 |
| Control Mode | Speed | Position | Speed/Position | Position |
| Interface | RS485 | RS485 | RS485 | PULSE/DIR |

To evaluate the smart motor, an evaluation kit can be ordered directly from monolithicpower.com.

Evaluation Kit EVKT-942038-24

| # | Part Number | Item | Quantity |
|---|-----------------------------------|--|----------|
| 1 | MSM942038-24-X-X | Smart motor | 1 |
| 2 | eMotion System™ communication kit | USB communication interface with cable | 1 |

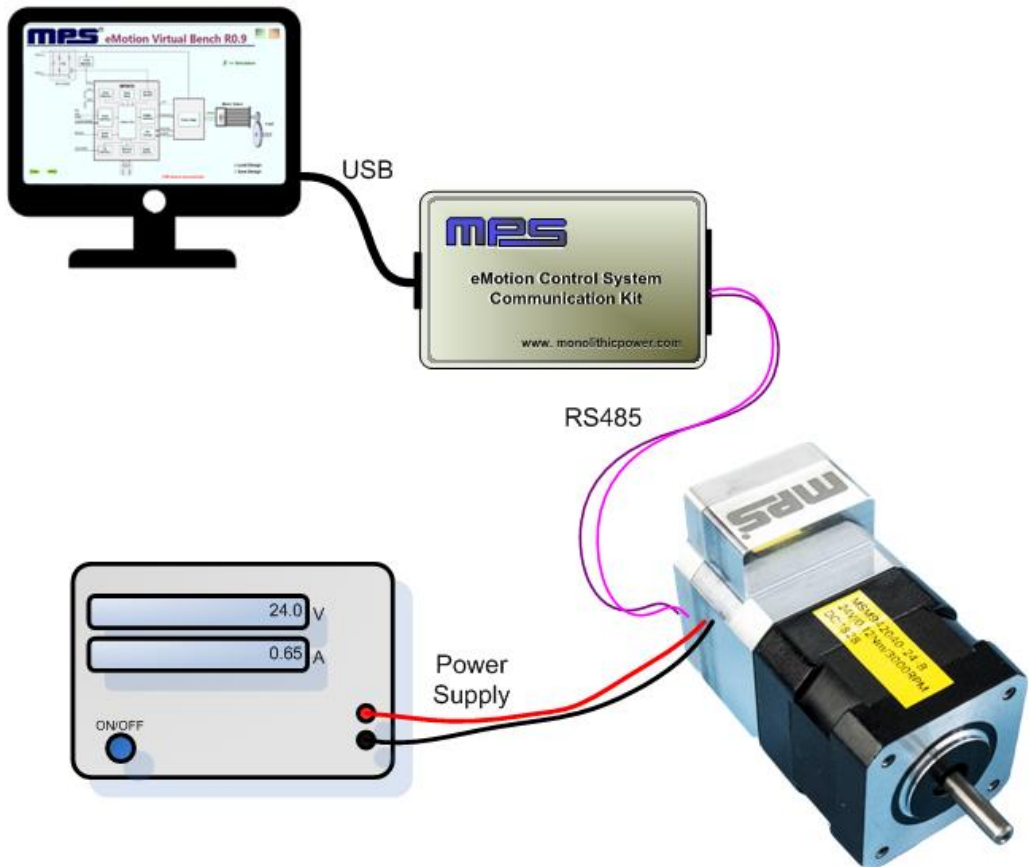
SMART MOTOR SPECIFICATIONS

| Smart Motor | | | |
|---------------------|-------------|-------|-------------------|
| Parameters | Condition | Value | Units |
| Input voltage | | 24 | V |
| Output power | 0°C to 40°C | 38 | W |
| Position resolution | | 0.3 | ° |
| Nominal speed | | 3000 | rpm |
| Nominal torque | | 0.12 | N-m |
| Rotor inertia | | 24 | g-cm ² |
| Diameter | | 42 | mm |
| Shaft diameter | | 5 | mm |
| Length | Body only | 40 | mm |
| Weight | | 300 | g |

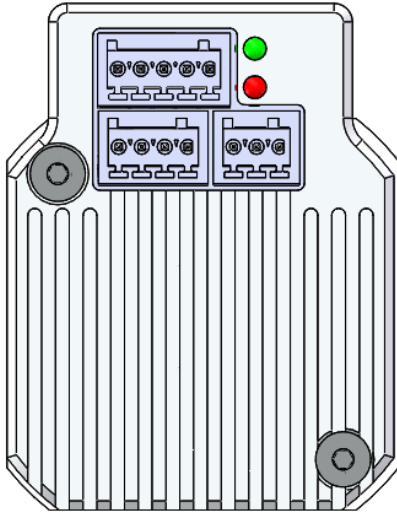
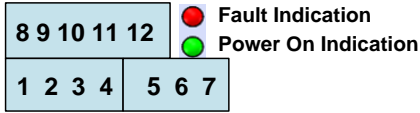
RECOMMENDED OPERATION CONDITIONS

Input voltage 18V to 36V
 Control interface voltage 0V to 5.5V
 Max pulse frequency 500kHz
 RS485 A/B voltage 0V to 5.5V
 RS485 common mode voltage ±15V
 Operation temperature 0°C to 70°C
 Storage temperature -40°C to +125°C

HARDWARE CONNECTION FOR SMART MOTOR



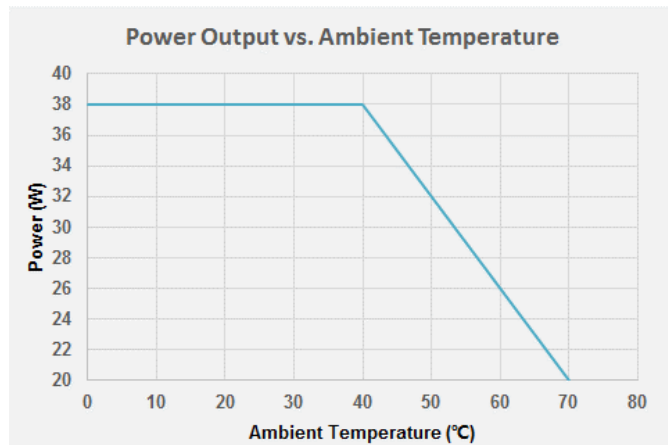
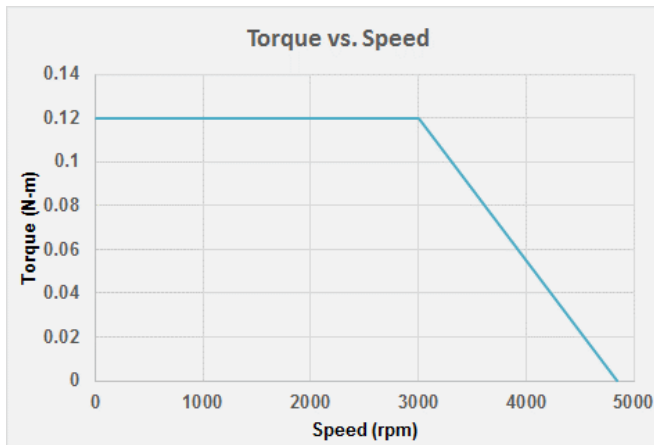
PIN CONFIGURATION



| Pin Number | Designation | Pin Description |
|--------------------------|-------------|-----------------------------------|
| RS485 Interface | | |
| 1 | EXT_5V | 5V input for firmware programming |
| 2 | B | RS485 node B |
| 3 | AGND | RS485 ground |
| 4 | A | RS485 node A |
| Power Interface | | |
| 5 | GND | Power ground |
| 6 | R- | Shunt resistor return node |
| 7 | VIN | Input power supply |
| Control Interface | | |
| 8 | COM- | Common return |
| 9 | EN+ | Enable input |
| 10 | PEND+ | Position end output |
| 11 | PUL+ | Pulse input |
| 12 | DIR+ | Direction input |

TYPICAL PERFORMANCE CHARACTERISTICS

$T_A = 25^\circ\text{C}$, $V_{IN} = 24\text{V}$, unless otherwise noted.



SMART MOTOR MECHANICAL DRAWING

