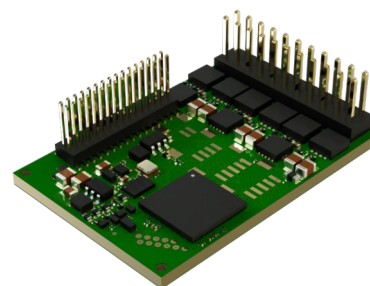


Servo amplifier

## mcDS-m3-25cXX-PM



Picture similar

## 1. Technical data

| Power stage                                                      |                      |                      |      |         |      |                  |
|------------------------------------------------------------------|----------------------|----------------------|------|---------|------|------------------|
| Name                                                             | Symbol               | Description          | min. | Value   | max. | Unit             |
| U <sub>p</sub><br>Ma, Mb, Mc                                     | U <sub>p</sub>       | Power supply voltage | 10   | -       | 60   | V                |
|                                                                  | I <sub>out_MAX</sub> | Max. output current  | -    | -       | 25   | A                |
|                                                                  | U <sub>out</sub>     | Output voltage       | -    | -       | 97   | % U <sub>p</sub> |
|                                                                  | F <sub>PWM</sub>     | PWM frequency        | -    | 40      | -    | kHz              |
|                                                                  | η <sub>p</sub>       | Efficiency           | -    | typ. 98 | -    | %                |
| • I <sub>out_CONT</sub> applies to max. 40°C ambient temperatur. |                      |                      |      |         |      |                  |

| Electronic supply                                                            |                        |                                                      |      |         |      |      |
|------------------------------------------------------------------------------|------------------------|------------------------------------------------------|------|---------|------|------|
| Name                                                                         | Symbol                 | Description                                          | min. | Value   | max. | Unit |
| U <sub>e</sub>                                                               | U <sub>e</sub>         | Electronic supply voltage                            | 10   | 24      | 30   | V    |
|                                                                              | U <sub>e_WO_DOUT</sub> | Electronic supply voltage for devices without DOUT's | 10   | 24      | 60   | V    |
|                                                                              | I <sub>e</sub>         | Electronic supply current @ U <sub>e</sub> =24V      | -    | typ. 70 | -    | mA   |
| • I <sub>e</sub> applies to unconnected DOUT's and unconnected HALL/Encoder. |                        |                                                      |      |         |      |      |

| Inc.-Encoder and Hall                                                                                                                                                                                                                                                              |                                               |                                                                    |      |       |      |      |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|--------------------------------------------------------------------|------|-------|------|------|
| Name                                                                                                                                                                                                                                                                               | Symbol                                        | Description                                                        | min. | Value | max. | Unit |
| INC-A, INC-B, INC-<br>INX, H1, H2, H3                                                                                                                                                                                                                                              | U <sub>INC_HALL_LOW</sub>                     | Input voltage: low-state                                           | 0    | -     | 1.2  | V    |
|                                                                                                                                                                                                                                                                                    | U <sub>INC_HALL_HIGH</sub>                    | Input voltage: high-state                                          | 3.5  | -     | 5.0  | V    |
|                                                                                                                                                                                                                                                                                    | R <sub>INC_HALL</sub>                         | Input resistance                                                   | -    | 1     | -    | kΩ   |
|                                                                                                                                                                                                                                                                                    | F <sub>INC</sub>                              | Input frequency inc. encoder                                       | -    | -     | 500  | kHz  |
|                                                                                                                                                                                                                                                                                    | F <sub>HALL</sub>                             | Input frequency hall sensors                                       | -    | -     | 10   | kHz  |
|                                                                                                                                                                                                                                                                                    | V <sub>DDINC</sub>                            | 5V Output supply voltage for inc. encoder                          | 4.9  | 5.1   | 5.3  | V    |
|                                                                                                                                                                                                                                                                                    | V <sub>DDHALL</sub>                           | 5V Output supply voltage for hall sensors                          | 4.9  | 5.1   | 5.3  | V    |
|                                                                                                                                                                                                                                                                                    | I <sub>VDD_INC</sub><br>I <sub>VDD_HALL</sub> | Summarized output supply current for inc. encoder and hall sensors | -    | -     | 190  | mA   |
| <ul style="list-style-type: none"> <li>Internal 1 kΩ Pull-Up-Resistors to V<sub>DDINC</sub> on Encoder inputs.</li> <li>Internal 1 kΩ Pull-Up-Resistors to V<sub>DDHALL</sub> on Hall inputs.</li> <li>Reference potential is V<sub>SSINC</sub> and V<sub>SSHALL</sub>.</li> </ul> |                                               |                                                                    |      |       |      |      |

| Digital inputs                             |                       |                           |      |       |      |      |
|--------------------------------------------|-----------------------|---------------------------|------|-------|------|------|
| Name                                       | Symbol                | Description               | min. | Value | max. | Unit |
| DIN0, DIN1, DIN2,<br>DIN3,<br>STO-A, STO-B | U <sub>DIN_LOW</sub>  | Input voltage: low-state  | 0    | -     | 5    | V    |
|                                            | U <sub>DIN_HIGH</sub> | Input voltage: high-state | 9    | -     | 30   | V    |
|                                            | R <sub>DIN</sub>      | Input resistance          | -    | 24.1  | -    | kΩ   |
| • Reference potential is GND.              |                       |                           |      |       |      |      |

| Digital outputs                                                                                                                                                                                                                                            |                        |                            |      |       |                |      |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|----------------------------|------|-------|----------------|------|
| Name                                                                                                                                                                                                                                                       | Symbol                 | Description                | min. | Value | max.           | Unit |
| DOUT0-BR, DOUT1                                                                                                                                                                                                                                            | U <sub>DOUT_HIGH</sub> | Output voltage: high-state | 0    | -     | U <sub>e</sub> |      |
|                                                                                                                                                                                                                                                            | I <sub>DOUT_HIGH</sub> | Output current: high-state | -    | -     | 700            | mA   |
| <ul style="list-style-type: none"> <li>Reference potential is GND.</li> <li>DOUT0-BR has a free-wheeling diode to GND</li> <li>DOUT0-BR load: resistive, inductive</li> <li>DOUT1 load: resistive</li> <li>The outputs switch to U<sub>e</sub>.</li> </ul> |                        |                            |      |       |                |      |

| Analog inputs                                                                                                                                                                                                               |                  |                  |      |       |       |      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|------------------|------|-------|-------|------|
| Name                                                                                                                                                                                                                        | Symbol           | Description      | min. | Value | max.  | Unit |
| MT, AIN                                                                                                                                                                                                                     | U <sub>MT</sub>  | Input voltage    | 0    | -     | 2.047 | V    |
|                                                                                                                                                                                                                             | U <sub>AIN</sub> | Input voltage    | 0    | -     | 10.24 | V    |
|                                                                                                                                                                                                                             | R <sub>MT</sub>  | Input resistance | -    | 1.5   | -     | kΩ   |
|                                                                                                                                                                                                                             | R <sub>AIN</sub> | Input resistance | -    | 15    | -     | kΩ   |
| <ul style="list-style-type: none"> <li>MT: Temp. sensor KTY84-130, PT1000.</li> <li>MT, AIN Tolerance = 3%</li> <li>Reference potential for MT is VSS<sub>MT</sub>.</li> <li>Reference potential for AIN is VSS.</li> </ul> |                  |                  |      |       |       |      |

| Magnetchip-Encoder                                                                                                                                                                                                                                                                                                                                                                                |                                   |                                       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|---------------------------------------|
| Name                                                                                                                                                                                                                                                                                                                                                                                              | Description                       | Value                                 |
| MCHIP-ENC                                                                                                                                                                                                                                                                                                                                                                                         | Resolution                        | 15 Bit                                |
|                                                                                                                                                                                                                                                                                                                                                                                                   | Magnet                            | neodymium alloy (N35) Ø 6 mm x 2.5 mm |
|                                                                                                                                                                                                                                                                                                                                                                                                   | Air gap between magnet and sensor | typ. 1 mm                             |
|                                                                                                                                                                                                                                                                                                                                                                                                   | Radial positioning accuracy       | 0.5 mm                                |
| <ul style="list-style-type: none"> <li>A typical magnet is a cylinder made of a neodymium alloy (N35) with a diameter of 6 mm and a height of 2.5 mm, inserted into an aluminum shaft. The typical air gap between the magnet and the sensor is between 1 mm and 2 mm. To ensure good measurement linearity, the sensor must be positioned with a radial accuracy of typically 0.5 mm.</li> </ul> |                                   |                                       |

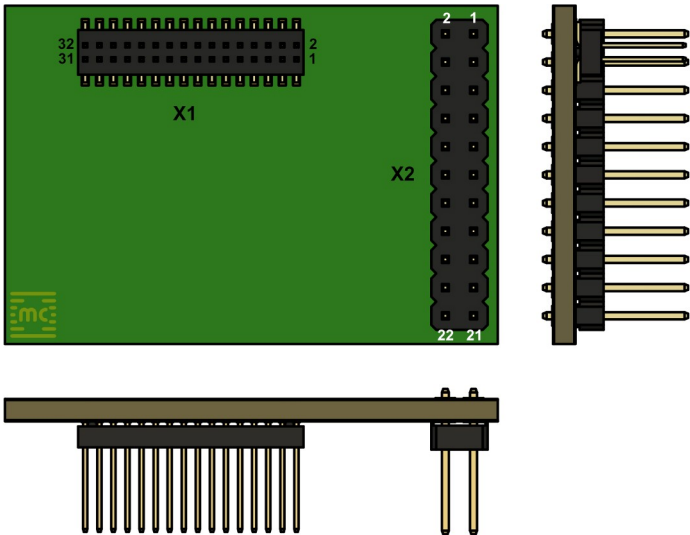
| CAN Interface  |                       |                     |
|----------------|-----------------------|---------------------|
| Name           | Description           | Value               |
| CAN-Hi, CAN-Lo | Protocol              | CANopen DS301       |
|                | Device profile        | DS402 and miControl |
|                | CAN specification     | 2.0.B               |
|                | Max. baudrate         | 1 Mbit/s            |
|                | Galvanically isolated | no                  |

| Environment |                                 |                            |
|-------------|---------------------------------|----------------------------|
| Name        | Description                     | Value                      |
| ENV         | Protection class                | IP00                       |
|             | Ambient temperature - operating | -40 .. 105 °C              |
|             | Ambient temperature - storage   | -40 .. 70 °C               |
|             | Pollution degree                | 1                          |
|             | Humidity                        | 5 .. 90 % (non-condensing) |

| Mechanical |                  |                   |
|------------|------------------|-------------------|
| Name       | Description      | Value             |
| MECH       | Dimensions LxBxH | 35 x 24 x 10.5 mm |
|            | Weight           | t.b.d             |

Additional technical data are available in mcManual.

1. Scheme



2. Terminal assignment

| X1 | I/O's and CAN |                                                      |
|----|---------------|------------------------------------------------------|
| 1  | VDD3V3        | 3.3V output voltage analog signals, module output    |
| 2  | INC-INX       | Inc. encoder, index channel                          |
| 3  | INC-B         | Inc. encoder, B channel                              |
| 4  | CAN-Hi        | CAN interface for external connections               |
| 5  | INC-A         | Inc. encoder, A channel                              |
| 6  | CAN-Lo        | CAN interface for external connections               |
| 7  | VSS           | Ground for VDD5V and VDD3V3                          |
| 8  | H3            | Hall input 3                                         |
| 9  | VSS           | Ground for VDD5V and VDD3V3                          |
| 10 | H2            | Hall input 2                                         |
| 11 | VSS           | Ground for VDD5V and VDD3V3                          |
| 12 | H1            | Hall input 1                                         |
| 13 | I2C1-SCL      | I2C Interface 1                                      |
| 14 | res.          | Reserved                                             |
| 15 | I2C1-SDA      | I2C Interface 1                                      |
| 16 | AIN           | Analog input                                         |
| 17 | VDD5V         | 5V output voltage for sensor power supply            |
| 18 | res.          | Reserved                                             |
| 19 | VDD5V         | 5V output voltage for sensor power supply            |
| 20 | DIN0          | Digital input 0                                      |
| 21 | MT            | External motor temperature input (KTY84-130, PT1000) |
| 22 | DIN1          | Digital input 1                                      |
| 23 | I2C1-/INT     | I2C Interface 1 interrupt                            |
| 24 | DIN2          | Digital input 2                                      |
| 25 | res.          | Reserved                                             |
| 26 | DIN3          | Digital input 3                                      |
| 27 | res.          | Reserved                                             |
| 28 | res.          | Reserved                                             |
| 29 | res.          | Reserved                                             |
| 30 | DOUT0         | Digital output 0                                     |
| 31 | res.          | Reserved                                             |
| 32 | DOUT1         | Digital output 1                                     |

| X2 | Supply and Motor |                           |
|----|------------------|---------------------------|
| 1  | res.             | Reserved                  |
| 2  | Ue               | Electronic supply voltage |
| 3  | Ma               | Motor phase A             |
| 4  | Ma               | Motor phase A             |
| 5  | Ma               | Motor phase A             |
| 6  | Ma               | Motor phase A             |
| 7  | Up               | Power supply voltage      |
| 8  | Up               | Power supply voltage      |
| 9  | Up               | Power supply voltage      |
| 10 | Up               | Power supply voltage      |
| 11 | Mb               | Motor phase B             |
| 12 | Mb               | Motor phase B             |
| 13 | Mb               | Motor phase B             |
| 14 | Mb               | Motor phase B             |
| 15 | GND              | Ground                    |
| 16 | GND              | Ground                    |
| 17 | GND              | Ground                    |
| 18 | GND              | Ground                    |
| 19 | Mc               | Motor phase C             |
| 20 | Mc               | Motor phase C             |
| 21 | Mc               | Motor phase C             |
| 22 | Mc               | Motor phase C             |