

# Servo amplifier mcDSA-F37-EtherCAT

Article number: 1514236

Certification:  E475093



Picture similar

## Technical data

| Absolute maximum rating (destruction limits)                               |                        |
|--|------------------------|
| Power supply voltage Up<br>no polarity reversal protection                 | 70 V                   |
| Continuous Electronic supply voltage Ue<br>no polarity reversal protection | 33 V                   |
| Short term peak voltage < 1s Ue<br>no polarity reversal protection         | 37 V                   |
| Power  |                        |
| Electronic supply voltage Ue   | 18..30 V               |
| Electronic current consumption@ Ue=24V**                                   | typ. 85 mA             |
| Power supply voltage Up  | 9..60 V                |
| Max. output current  | 120 A                  |
| Continuous output current (certified UL/CE)**3<br>@Up ≤ 24V                | 19.5 A                 |
| @Up ≤ 60V  | 13.4 A                 |
| Continuous output current (not certified)**4<br>@Up ≤ 24V                  | 21 A                   |
| @Up ≤ 48V  | 15 A                   |
| PWM  |                        |
| PWM frequency  | 32 kHz                 |
| Mechanical   |                        |
| Size LxWxH   | 78 x 74 x 49 mm        |
| Weight   | 141 g                  |
| Environment  |                        |
| Protection class   | IP20                   |
| Installation requirements **5  | IP54                   |
| Ambient temperature (operation) (certified UL)                             | -40..40 °C             |
| Ambient temperature (operation) (certified CE)                             | -40..55 °C             |
| Ambient temperature (operation) (not certified)                            | -40..70 °C             |
| Ambient temperature (storage)  | -40..85 °C             |
| Rel. humidity (non-condensing)   | 5..90 %                |
| CAN bus  |                        |
| Protocol   | DS301                  |
| Device profile   | DS402                  |
| Max. baudrate  | 1 Mbit/s               |
| CAN specification  | 2.0B                   |
| Galvanically isolated  | no                     |
| RS485  |                        |
| Type   | 2-Wire EIA-485         |
| Signals  | DATA, /DATA, CLK, /CLK |
| Functional safety  |                        |
| Safety function<br>refer safety manual                                     | Safe Torque Off (STO)  |
| Safety Integrity Level (SIL)   | up to SIL 3            |
| Performance Level (PL)   | up to PL e             |

| EtherCAT                                    |                                   |
|---|-----------------------------------|
| Type  | EtherCAT Slave                    |
| Physical layer                              | 100 Base-Tx EtherCAT              |
| Bus controller                              | ET1100                            |
| Max. baudrate                               | 100 Mbit/s                        |
| Number of ports                             | 2xRJ45 (In,Out)                   |
| Protocol                                    | CoE (CANopen over EtherCAT)       |
| Sensor supply (Hall)                        |                                   |
| Output voltage                              | 5 V                               |
| Max. output current                         | 0.05 A                            |
| Sensor supply (Encoder/SSI)                 |                                   |
| Output voltage                              | 5 V                               |
| Max. output current                         | 0.2 A                             |
| Sensor supply (HiPerface)                   |                                   |
| Output voltage                              | 10 V                              |
| Max. output current                         | 0.25 A                            |
| Encoder                                     |                                   |
| Type  | sin / cos                         |
| Signals                                     | +Sin, -Sin, +Cos, -Cos            |
| Resolution                                  | 13 bit per sine period            |
| Input voltage                               | 1 V peak-peak, differential       |
| Signal type                                 | sine/cosine, analog, differential |
| Hall sensors                                |                                   |
| Signals                                     | H1, H2, H3                        |
| Max. frequency (per channel)                | 10 kHz                            |
| Input voltage                               | 0..5 V                            |
| Signal type                                 | open collector, single ended      |
| Digital inputs                              |                                   |
| Number - digital inputs                     | 6 (Din0..5)                       |
| Low voltage                                 | 0.5 V                             |
| High voltage                                | 8..30 V                           |
| STO channels (STO-A..B)                     |                                   |
| Low voltage                                 | 0.5 V                             |
| High voltage                                | 8..30 V                           |
| Digital outputs                             |                                   |
| Number                                      | 3 (Dout0..2)                      |
| Continuous output current (certified UL/CE) | 1 A                               |
| Continuous output current (not certified)   | 1.5 A                             |
| Load Dout0..1                               | resistive, low inductive          |
| Load Dout2                                  | resistive, inductive              |
| Output voltage                              | Electronic supply voltage Ue      |
| Signal type                                 | positive switching                |
| Analog inputs                               |                                   |
| Number                                      | 1 (Ain0)                          |
| Signal type - Ain                           | +/- 10 V, 12 Bit, differential    |

\*1 The certified performance data must be observed (see UL Instruction Note and Safety Manual (CE))

\*2 power amplifier switched off, 5V output (sensor supply) is free, STO active

\*3 connector cable with max. possible cable cross-section, PWM frequency 32 kHz (SVPWM), ambient temperature 40 °C, I/O's and 5V output active, RMS current: 19.5 A → 14 Aeff, 13.4 A → 9.5 Aeff

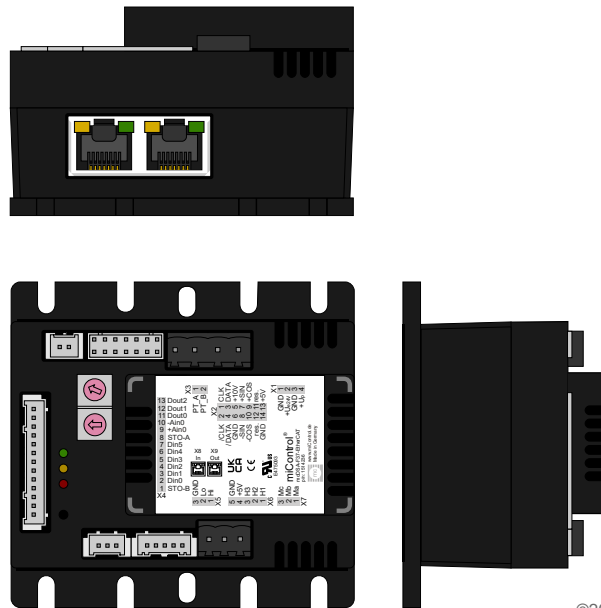
\*4 connector cable with max. possible cable cross-section, PWM frequency 32 kHz (SVPWM), ambient temperature 40 °C, I/O's and 5V output free, RMS current: 21 A → 14.8 Aeff, 15 A → 10.6 Aeff

no guarantee, since value is determined empirical, please consider the application notes to determine the continuous current

\*5 or equivalent protection class (see Safety Manual (CE))

Additional technical data are available in mcManual.

## Scheme



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## Terminal assignment

| X1 Supply  |        |   |
|------------|--------|---|
| 1          | GND    | Ground for electronic supply voltage                              |
| 2          | +Ue24V | Electronic supply voltage   |
| 3          | GND    | Ground for power supply voltage                                   |
| 4          | +Up    | Power supply voltage  |
| X2 Encoder |        |   |
| 1          | CLK    | SSI clk   |
| 2          | /CLK   | /SSI clk  |
| 3          | DATA   | SSI data  |
| 4          | /DATA  | /SSI data   |
| 5          | +10V   | 10V output voltage for sensor supply<br>Sensors: Hiperface        |
| 6          | GND    | Ground for sensor supply<br>Notice: don't connect with system GND |
| 7          | +SIN   | Encoder, plus sine signal   |
| 8          | -SIN   | Encoder, minus sine signal  |
| 9          | +COS   | Encoder, plus cosine signal                                       |
| 10         | -COS   | Encoder, minus cosine signal                                      |
| 11         | res.   | Reserved  |
| 12         | res.   | Reserved  |
| 13         | +5V    | 5V output voltage for sensor supply<br>Sensors: encoder, SSI      |
| 14         | GND    | Ground for sensor supply<br>Notice: don't connect with system GND |
| X3 PT1000  |        |   |
| 1          | PT_A   | PT_A  |
| 2          | PT_B   | PT_B  |
| X4 I/O's   |        |   |
| 1          | STO-B  | STO channel B   |
| 2          | Din0   | Digital input 0   |
| 3          | Din1   | Digital input 1   |
| 4          | Din2   | Digital input 2   |
| 5          | Din3   | Digital input 3   |
| 6          | Din4   | Digital input 4   |
| 7          | Din5   | Digital input 5   |
| 8          | STO-A  | STO channel A   |
| 9          | +Ain0  | Analog input, plus  |
| 10         | -Ain0  | Analog input, minus   |
| 11         | Dout0  | Digital output 0  |
| 12         | Dout1  | Digital output 1  |
| 13         | Dout2  | Digital output 2  |

| X5 CAN bus             |         |   |
|------------------------|---------|---|
| 1                      | CAN Hi  | CAN High  |
| 2                      | CAN Lo  | CAN Low   |
| 3                      | CAN GND | CAN Ground  |
| X6 Hall encoder        |         |   |
| 1                      | H1      | Hall sensor 1   |
| 2                      | H2      | Hall sensor 2   |
| 3                      | H3      | Hall sensor 3   |
| 4                      | +U5V    | 5V output voltage for sensor supply<br>Sensors: hall              |
| 5                      | GND     | Ground for sensor supply<br>Notice: don't connect with system GND |
| X7 Motor               |         |   |
| 1                      | Ma      | Motor phase A   |
| 2                      | Mb      | Motor phase B   |
| 3                      | Mc      | Motor phase C   |
| X8 EtherCAT - In port  |         |   |
| -                      | In      | In  |
| X9 EtherCAT - Out port |         |   |
| -                      | Out     | Out   |