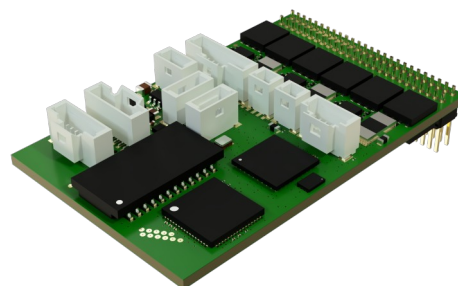


Servo amplifier

mcDS-m5-60cXX-E



Picture similar

1. Technical data

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

Electronic supply						
Name	Symbol	Description	min.	Value	max.	Unit
U _e	U _e	Electronic supply voltage	10	24	30	V
	U _{e_WO_DOUT}	Electronic supply voltage for devices without DOUT's	10	24	60	V
	I _e	Electronic supply current @ U _e =24V	-	typ. 70	-	mA
• I _e 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- INX, H1, H2, H3	U _{INC_HALL_LOW}	Input voltage: low-state	0	-	1.2	V
	U _{INC_HALL_HIGH}	Input voltage: high-state	3.5	-	5.0	V
	R _{INC_HALL}	Input resistance	-	1	-	kΩ
	F _{INC}	Input frequency inc. encoder	-	-	500	kHz
	F _{HALL}	Input frequency hall sensors	-	-	10	kHz
	V _{DDINC}	5V Output supply voltage for inc. encoder	4.9	5.1	5.3	V
	V _{DDHALL}	5V Output supply voltage for hall sensors	4.9	5.1	5.3	V
	I _{VDD_INC} I _{VDD_HALL}	Summarized output supply current for inc. encoder and hall sensors	-	-	190	mA
- Internal 1 kΩ Pull-Up-Resistors to V_{DDINC} on Encoder inputs. - Internal 1 kΩ Pull-Up-Resistors to V_{DDHALL} on Hall inputs. - Reference potential is V_{SSINC} and V_{SSHALL}.						

SSI-, BISS-C Absolute encoder						
Name	Symbol	Description	min.	Value	max.	Unit
ABS-DATA, ABS-/DATA, ABS- CLK, ABS-/CLK	V _{id}	Permissible Differential Input Voltage	-15	-	15	V
	V _{th+}	Receiver switching threshold (positive)	200	-	-	mV
	V _{th-}	Receiver switching threshold (negative)	-200	-	-	mV
	V _{od}	Differential output voltage R _I =60 Ohm	1.5	3.5	-	V
	V _{od}	Differential output voltage R _I =100 Ohm	2	4	-	V
	R _{ABS}	Input resistance (internal pull-up)	-	2	-	kΩ
	F _{ABS}	Clock frequency absolut encoder	-	t.b.d	-	
	V _{DDABS}	5V output voltage for absolute encoder supply	4.9	5.1	5.3	V
	I _{VDD_ABS}	Output supply current for absolut encoder	-	-	190	mA
• Reference potential is V _{SS} .						

Digital inputs						
Name	Symbol	Description	min.	Value	max.	Unit
DIN0, DIN1, DIN2, DIN3	U _{DIN_LOW}	Input voltage: low-state	0	-	5	V
	U _{DIN_HIGH}	Input voltage: high-state	9	-	30	V
	R _{DIN}	Input resistance	-	24.1	-	kΩ
• Reference potential is GND.						

Digital outputs						
Name	Symbol	Description	min.	Value	max.	Unit
DOUT0-BR, DOUT1	U _{DOUT_HIGH}	Output voltage: high-state	0	-	U _e	
	I _{DOUT_HIGH}	Output current: high-state	-	-	700	mA
- Reference potential is GND. - DOUT0-BR has a free-wheeling diode to GND - DOUT0-BR load: resistive, inductive - DOUT1 load: resistive - The outputs switch to U_e.						

Analog inputs						
Name	Symbol	Description	min.	Value	max.	Unit
MT, AIN	U _{MT}	Input voltage	0	-	2.047	V
	U _{AIN}	Input voltage	0	-	10.24	V
	R _{MT}	Input resistance	-	1.5	-	kΩ
	R _{AIN}	Input resistance	-	15	-	kΩ
- MT: Temp. sensor KTY84-130, PT1000. - MT, AIN Tolerance = 3% - Reference potential for MT is VSS_{MT}. - Reference potential for AIN is VSS.						

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
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.		

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)

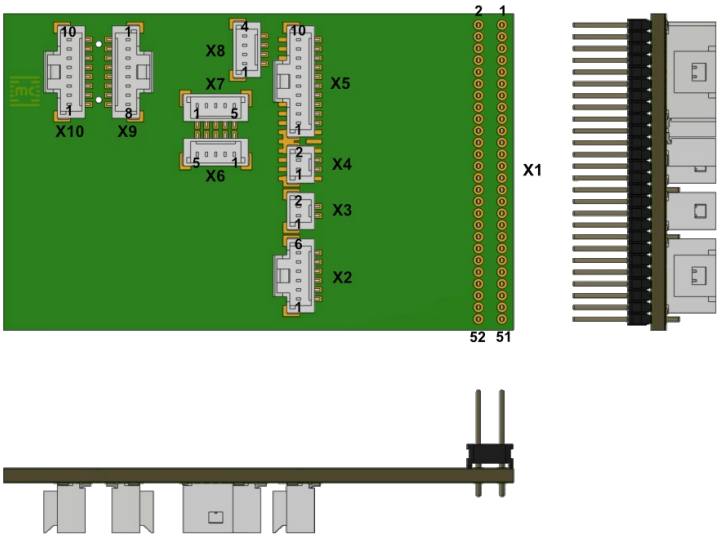
CAN Interface		
Name	Description	Value
CAN-Hi, CAN-Lo	Protocol	CANopen DS301
	Device profile	DS402 and miControl
	CAN specification	2.0.B
	Max. baudrate	1 Mbit/s
	Galvanically isolated	no

EtherCAT® Interface		
Name	Description	Value
ETCAT1, ETCAT2	Protocol	CoE
	Type	EtherCAT Slave
	Max. baudrate	100 Mbit/s
	Physical layer	100 Base-Tx EtherCAT
	Number of ports	2

Mechanical		
Name	Description	Value
MECH	Dimensions LxBxH	55 x 34 x 11,43 mm
	Weight	17 g

Additional technical data are available in mcManual.

1. Scheme



2. Terminal assignment

X1	Pins	
1	U _e	Electronic supply voltage
2	U _e	Electronic supply voltage
3	Ma	Motor phase A
4	Ma	Motor phase A
5	Ma	Motor phase A
6	Ma	Motor phase A
7	Ma	Motor phase A
8	Ma	Motor phase A
9	Ma	Motor phase A
10	Ma	Motor phase A
11	Ma	Motor phase A
12	Ma	Motor phase A
13	U _p	Power supply voltage
14	U _p	Power supply voltage
15	U _p	Power supply voltage
16	U _p	Power supply voltage
17	U _p	Power supply voltage
18	U _p	Power supply voltage
19	U _p	Power supply voltage
20	U _p	Power supply voltage
21	U _p	Power supply voltage
22	U _p	Power supply voltage
23	Mb	Motor phase B
24	Mb	Motor phase B
25	Mb	Motor phase B
26	Mb	Motor phase B
27	Mb	Motor phase B
28	Mb	Motor phase B
29	Mb	Motor phase B
30	Mb	Motor phase B
31	Mb	Motor phase B
32	Mb	Motor phase B
33	GND	Ground
34	GND	Ground
35	GND	Ground
36	GND	Ground
37	GND	Ground
38	GND	Ground
39	GND	Ground
40	GND	Ground
41	GND	Ground
42	GND	Ground
43	Mc	Motor phase C
44	Mc	Motor phase C
45	Mc	Motor phase C
46	Mc	Motor phase C
47	Mc	Motor phase C
48	Mc	Motor phase C
49	Mc	Motor phase C
50	Mc	Motor phase C
51	Mc	Motor phase C
52	Mc	Motor phase C

X2	Encoder	
1	ABS-DATA	DATA - absolut encoder (protocol: SSI, BiSS-C)
2	ABS-/DATA	DATA - absolut encoder inverted (protocol: SSI, BiSS-C)
3	ABS-CLK	CLK
4	ABS-/CLK	/CLK inverted
5	VDD _{ABS}	5V output voltage for absolute encoder supply
6	VSS _{ABS}	Ground for absolute encoder supply

X3	CAN	
1	CAN-Hi	CAN interface for external connections
2	CAN-Lo	CAN interface for external connections

X4	CAN	
1	CAN-Hi	CAN interface for external connections
2	CAN-Lo	CAN interface for external connections

X5	I/O's	
1	res.	Reserved
2	AIN	Analog input
3	res.	Reserved
4	DIN0	Digital input 0
5	DIN1	Digital input 1
6	DIN2	Digital input 2
7	DIN3	Digital input 3
8	res.	Reserved
9	DOUT0-BR	Digital output 0 / parking brake
10	DOUT1	Digital output 1

X6	Encoder	
1	INC-A	Inc. encoder, A channel
2	INC-B	Inc. encoder, B channel
3	INC-INX	Inc. encoder, index channel
4	VDD _{INC}	5V output voltage for incremental sensor supply
5	VSS _{INC}	Ground for incremental sensor supply

X7	Hall	
1	H1	Hall input 1
2	H2	Hall input 2
3	H3	Hall input 3
4	VDD _{HALL}	5V output voltage for Hall supply
5	VSS _{HALL}	Ground for Hall supply

X8	Brake, Temperatur	
1	DOUT0-BR	Digital output 0 / parking brake
2	VSS _{BR}	Ground for Digital output 0 / parking brake
3	MT	External motor temperature input (KTY84-130, PT1000)
4	VSS _{MT}	Ground for external motor temperature (KTY84-130, PT1000)

X9	EtherCAT	
1	TX+	EtherCAT Transmit +
2	TX-	EtherCAT Transmit -
3	RX+	EtherCAT Receive +
4	VG1	Virtual Ground Connection via 75R (Unused RJ45 Pins)
5	VG1	Virtual Ground Connection via 75R (Unused RJ45 Pins)
6	RX-	EtherCAT Receive -
7	VG2	Virtual Ground Connection via 75R (Unused RJ45 Pins)
8	VG2	Virtual Ground Connection via 75R (Unused RJ45 Pins)

X10	EtherCAT	
1	TX+	EtherCAT Transmit +
2	TX-	EtherCAT Transmit -
3	RX+	EtherCAT Receive +
4	VG1	Virtual Ground Connection via 75R (Unused RJ45 Pins)
5	VG1	Virtual Ground Connection via 75R (Unused RJ45 Pins)
6	RX-	EtherCAT Receive -
7	VG2	Virtual Ground Connection via 75R (Unused RJ45 Pins)
8	VG2	Virtual Ground Connection via 75R (Unused RJ45 Pins)