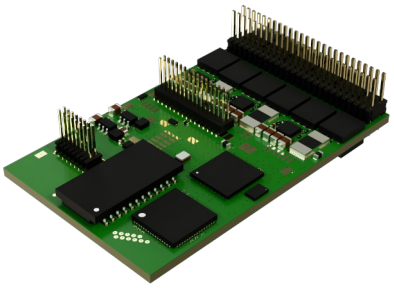
Servo amplifier

mcDS-m5-60cxx-E-SM



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 @ Ue=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
	VDD_{INC}	5V Output supply voltage for inc. encoder	4.9	5.1	5.3	V
	VDD_{HALL}	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-U_p-Resistors to VDD_{INC} on Encoder inputs. • Internal 1 kΩ Pull-U_p-Resistors to VDD_{HALL} on Hall inputs. • Reference potential is VSS_{INC} and VSS_{HALL}.						

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 RI=60 Ohm	1.5	3.5	-	V
	V_{od}	Differential output voltage RI=100 Ohm	2	4	-	V
	R_{ABS}	Input resistance (internal pull-up)	-	2	-	kΩ
	F_{ABS}	Clock frequency absolut encoder	-	t.b.d	-	
	VDD_{ABS}	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 VSS.						

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.						

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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.

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)

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 11.4 mm
	Weight	14.5 g

Additional technical data are available in mcManual.

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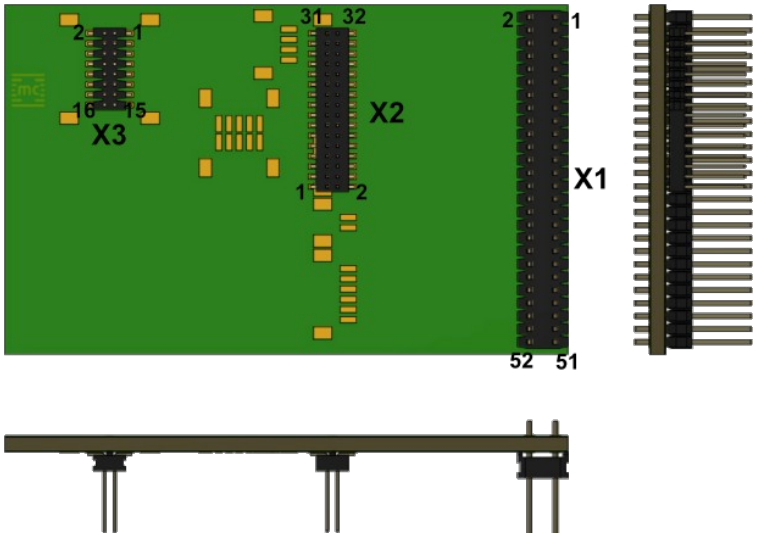
1. Scheme



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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	Pins	
1	VDD_{3V3}	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 VDD_{5V} and VDD_{3V3}
8	H3	Hall input 3
9	VSS	Ground for VDD_{5V} and VDD_{3V3}
10	H2	Hall input 2
11	VSS	Ground for VDD_{5V} and VDD_{3V3}
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	VDD_{5V}	5V output voltage for sensor power supply
18	res.	Reserved
19	VDD_{5V}	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

X3	EtherCAT	
1	TX+	EtherCAT Transmit +
2	VG2	Virtual Ground Connection via 75R (Unused RJ45 Pins)
3	TX-	EtherCAT Transmit -
4	VG2	Virtual Ground Connection via 75R (Unused RJ45 Pins)
5	RX+	EtherCAT Receive +
6	RX-	EtherCAT Receive -
7	VG1	Virtual Ground Connection via 75R (Unused RJ45 Pins)
8	VG1	Virtual Ground Connection via 75R (Unused RJ45 Pins)
9	VG1	Virtual Ground Connection via 75R (Unused RJ45 Pins)
10	VG1	Virtual Ground Connection via 75R (Unused RJ45 Pins)
11	RX-	EtherCAT Receive -
12	RX+	EtherCAT Receive +
13	VG2	Virtual Ground Connection via 75R (Unused RJ45 Pins)
14	TX-	EtherCAT Transmit -
15	VG2	Virtual Ground Connection via 75R (Unused RJ45 Pins)
16	TX+	EtherCAT Transmit +

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