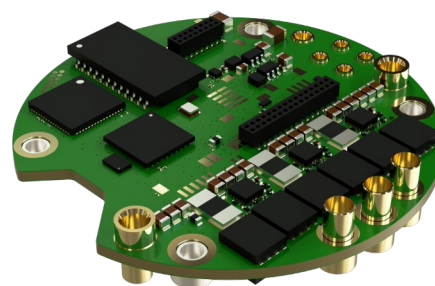


Servo amplifier

mcDS-i5-60cXX-E-M



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}.						

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)

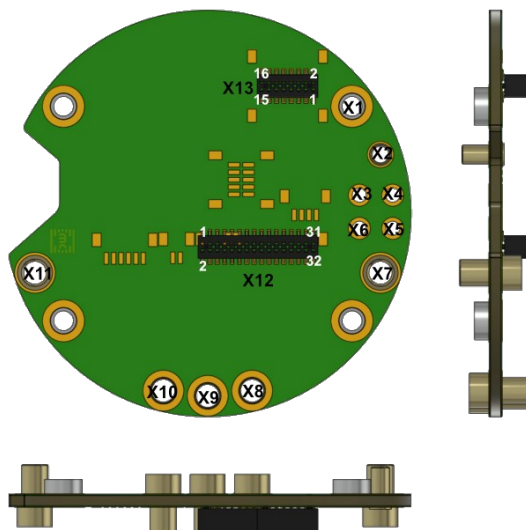
Mechanical		
Name	Description	Value
MECH	Dimensions Ø x H	55 x 9,83 mm
	Weight	t.b.d

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

Additional technical data are available in mcManual.

1. Scheme



2. Terminal assignment

X1 Supply		
1	FE	Functional earth

X2 Supply		
1	U _e	Electronic supply voltage

X3 Temperatur		
1	VSS _{MT}	Ground for external motor temperature (KTY84-130, PT1000)

X4 I/O's		
1	VSS _{BR}	Ground for Digital output 0 / parking brake

X5 Temperatur		
1	MT	External motor temperature input (KTY84-130, PT1000)

X6 I/O's		
1	DOUT0-BR	Digital output 0 / parking brake

X7 Supply		
1	U _p	Power supply voltage

X8 Motor		
1	Ma	Motor phase A

X9 Motor		
1	Mb	Motor phase B

X10 Motor		
1	Mc	Motor phase C

X11 Supply		
1	GND	Ground

X12 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	ABS-DATA	DATA - absolut encoder (protocol: SSI, BiSS-C)
26	DIN3	Digital input 3
27	ABS-/DATA	DATA - absolut encoder inverted (protocol: SSI, BiSS-C)
28	res.	Reserved
29	ABS-CLK	CLK
30	DOUT0-BR	Digital output 0 / parking brake
31	ABS-/CLK	/CLK inverted
32	DOUT1	Digital output 1

X13	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 +