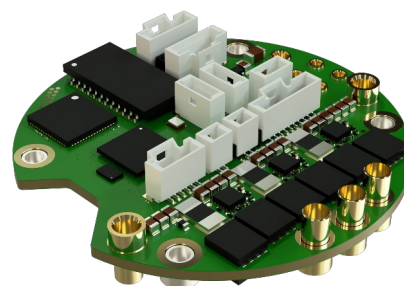


Servo amplifier

mcDS-i5-60cXX-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)

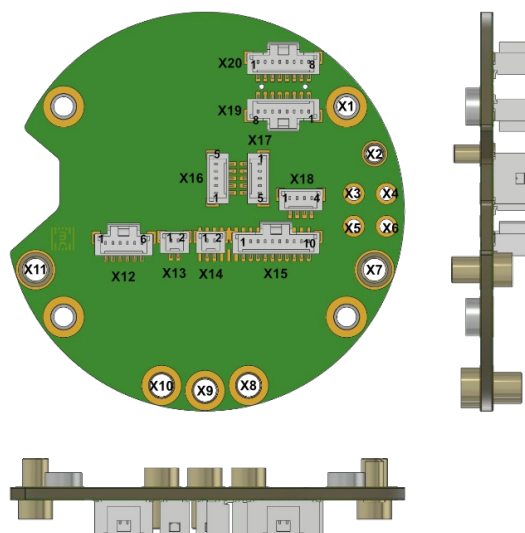
Mechanical		
Name	Description	Value
MECH	Dimensions Ø x H	55 x 11,15 mm
	Weight	t.b.d

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 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

X13 CAN		
1	CAN-Hi	CAN interface for external connections
2	CAN-Lo	CAN interface for external connections

X14 CAN		
1	CAN-Hi	CAN interface for external connections
2	CAN-Lo	CAN interface for external connections

X15 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

X16 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

X17	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

X18	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)

X19	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)

X20	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)