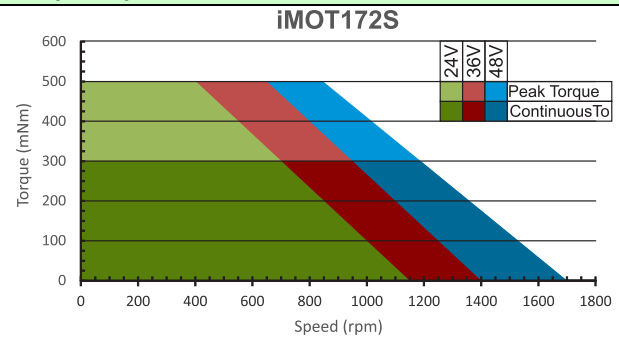


Features

- Fully digital intelligent 2 phase stepless motor with embedded motion controller, drive and absolute position feedback, offering a continuous torque up to 300 mNm at 1200rpm.
- Motor supply: 12-48V; Logic supply 15-36V
- No load speed of 1700 rpm at 48V
- Two control options: stepless closed loop servo using an absolute feedback sensor; stepper open loop using microstepping and step loss detection based on the feedback sensor
- Separate or combined logic and power supply for safety or reduced wiring requirements
- Advanced motion control capabilities (PVT, S-curve, electronic cam)
- Motion programming via TML (Technosoft Motion Language) or motion libraries for Visual C / VB / LabVIEW / Linux and PLC
- Standalone operation with stored motion sequences
- Communication:
 - TMLCAN and CANopen (CiA 301 v4.2 and CiA 402 v3.0) protocols selectable by hardware pin
- Digital and analogue I/Os:
 - 5 digital programmable inputs, 5-24V, PNP/NPN
 - 2 digital outputs, 24V/TTL, NPN/0.5A
 - 1 analogue input: 12 bits resolution, 0-5V
- Feedback devices:
 - Integrated absolute position sensor offering a resolution of 4096 bits / revolution
- Protections:
 - Over-current, over-temperature, short circuit
 - Over and undervoltage, i2t, control error
- 16 h/w addresses selectable by hex switch
- 2.5K × 16 SRAM for data acquisition
- 4K × 16 E²ROM for TML motion programs and data storage

Torque – Speed characteristic



Torque Speed Characteristic

Mating Connectors

Connector	Producer	Part No.	Description	Wire Gauge
J1	MOLEX	43045-0600	MICROFIT RECEPTACLE HOUSING, 2x3 WAY	AWG 20...24
J2	MOLEX	43045-0400	MICROFIT RECEPTACLE HOUSING, 2x2 WAY	AWG 20...24
J3	MOLEX	43045-1000	MICROFIT RECEPTACLE HOUSING, 2x5 WAY	AWG 20...24
J1, J2, J3	MOLEX	43030-0007	CRIMP PIN, MICROFIT, 5A	AWG 20...24

Connector J1 Description

Pin	Name	Type	Description
1	232RX	I	RS-232 Data Reception
2	GND	-	Return ground for RS-232 pins
3	GND	-	Negative return (ground) of the power supply
4	232TX	O	RS-232 Data Transmission
5	+V _{Log}	I	Positive terminal of the logic supply and digital I/Os functionality: 15 to 36V _{DC}
6	+V _{MOT}	I	Positive terminal of the motor supply: 12 to 48V _{DC}

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Connector J2 Description			
Pin	Name	Type	Description
1	CANopen	I	Connect to GND to enable CANopen protocol; Leave unconnected for TMLCAN protocol
2	GND	-	Return ground for CAN-Bus
3	Can-Hi	I/O	CAN-Bus positive line (dominant high)
4	Can-Lo	I/O	CAN-Bus negative line (dominant low)

Connector J3 Description			
Pin	Name	Type	Description
1	Enable	I	5-36V digital PNP/NPN input. Enable input
2	GND	-	Return ground for I/O pins
3	IN0	I	5-36V general-purpose digital PNP/NPN input
4	IN3/LSN	I	5-36V digital PNP/NPN input. Negative limit switch input
5	OUT1	-	5-36V 0.5A, general-purpose digital output, NPN open-collector/TTL pull-up
6	IN1	I	5-36V general-purpose digital PNP/NPN input
7	GND	-	Return ground for I/O pins
8	IN2/LSP	I	5-36V digital PNP/NPN input. Positive limit switch input
9	OUT0	O	5-36V 0.5A, general-purpose digital output, NPN open-collector/TTL pull-up
10	ANLG	I	Analogue input, 12-bit, 0-5V. Used to read an analogue position/speed reference or feedback, or used as general-purpose analogue input

SW1 Axis ID selection switch	
Position	Description
0	H/W Axis ID 255
1...F	HW Axis ID 1 to 15

Characteristics

All parameters were measured under the following conditions (unless otherwise specified):

- Tamb = 25°C, logic supply (VLOG) = 24VDC, motor supply (VMOT) = 48VDC;
- Supplies start-up / shutdown sequence: -any-;

Motor and feedback sensor parameters	Value	Units	
Step angle	1.8	°	
Rated torque	300	mNm	
Rated current	3	A	
Microstepping resolution in open loop control	102400	Bits/rot	
Absolute position feedback in closed loop control	4096	Bits/rot	
Rotor inertia	82	gcm ²	
Axial – Force FA	7	N	
Distance A	5 10 15 20	mm	
Radial-Force FR	58 36 26 20	N	
	Axial Radial		
Shaft play	0.08	0.02	mm
At load	4.5	4.5	N

Operating Conditions	Min.	Typ.	Max.	Units
Ambient temperature ¹	0		+40	°C
Ambient humidity	Non-condensing		90	%Rh
Altitude / pressure ²	Altitude (vs. sea level)		0 + 2.5	km
	Ambient Pressure		0 ² 0.75 + 1	10.0 atm
Magnetic field			20	mT

Storage Conditions	Min.	Typ.	Max.	Units
Ambient temperature	-40		+105	°C
Ambient humidity	Non-condensing		100	%Rh
Ambient Pressure	0		10.0	atm

Environmental Characteristics	Min.	Typ.	Max.	Units
Size (Length x Width x Height)	68 x 61 x 45			mm
	~2.68 x 2.4 x 1.78			inch
Weight	Without mating connectors		413	g
Cleaning agents	Only dry cleaning is recommended			
Protection degree	According to IEC60529, UL508		IP20	-

Logic Supply Input (+VLOG)	Min.	Typ.	Max.	Units	
Supply voltage	Nominal values		15 24 36	V _{DC}	
	Absolute maximum values, drive operating but outside guaranteed parameters		5.9	39	V _{DC}
	Absolute maximum values, continuous		0	39	V _{DC}
Supply current	Absolute maximum values, surge (duration ≤ 10ms) [†]		0	+45	V
	No Load on Digital Outputs	+V _{LOG} = 15V		70	200
		+V _{LOG} = 24V		47	120
+V _{LOG} = 36V		36	100		


Motor Supply Input (+VMOT)	Min.	Typ.	Max.	Units	
Supply voltage	Nominal values		12 24 48	V _{DC}	
	Absolute maximum values, continuous		-0.5		50
	Absolute maximum values, surge (duration ≤ 8ms)		-1		55
Supply current	Idle		1	5	mA
	Operating		-13.6	±3	+13.6

Digital Inputs (IN0, IN1, IN2/LSP, IN3/LSN, Enable)	Min.	Typ.	Max.	Units		
Input voltage	Logic "LOW"		2.2	1.2	V	
	Logic "HIGH"		4.8	3.8		
	Hysteresis		0.8	1.6		2.8
	Absolute maximum, continuous		-36			+36
	Absolute maximum, surge (duration ≤ 1s) [†]		-50			50
	Floating voltage, PNP (not connected)			0		
	Floating voltage, NPN (not connected)			+V _{LOG}		
Input frequency	0		400	kHz		
Minimum pulse	-15	1.2	0.9	ms		
ESD protection	Human body model		±15		kV	

Mode compliance	Internal 10kΩ resistor to GND	PNP		
Default state	Input floating (wiring disconnected)	Logic LOW		
Input current	Logic "LOW";		0	mA
	Logic "HIGH"; pulled to +24V	6	8	
	Hysteresis	0.5		
Mode compliance	Internal 10kΩ resistor to +V _{LOG}	NPN / TTL / CMOS / Open-collector		
Default state	Input floating (wiring disconnected)	Logic LOW		
Input current	Logic "HIGH"		0	mA
	Logic "LOW"; pulled to GND	6	8	
	Hysteresis	0.5		

¹ Operating temperature can be extended up to +65°C with reduced current and power ratings.

² iMOT172S XM-CAN can be operated in vacuum (no altitude restriction), but at altitudes over 2,500m, current and power rating are reduced due to thermal dissipation efficiency.

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Digital Outputs (OUT0, OUT1)		Min.	Typ.	Max.	Units
Mode compliance		TTL / CMOS / Open-collector / NPN 24V			
Default state	Not supplied (+V _{LOG} floating or to GND)	High-Z (floating)			
	Normal operation	OUT0 Logic "HIGH"			
Output voltage	Logic "LOW"; output current = 0.5A		0.2	0.8	V
	Logic "HIGH"; output current = 0, no load	2.8	3	3.3	
	Logic "HIGH", external load to +V _{LOG}		V _{LOG}		
	Absolute maximum, continuous	-0.5		V _{LOG} +0.5	
	Absolute maximum, surge (duration ≤ 1s) [†]	-1		V _{LOG} +1	

Output current	Logic "LOW", sink current, continuous			0.5	A
	Logic "LOW", sink current, pulse ≤ 5 s			1	A
	Logic "HIGH", source current; external load to GND; V _{OUT} ≥ 2.0V			1	mA
	Logic "HIGH", leakage current; external load to +V _{LOG} ; V _{OUT} = V _{LOG} max = 36V		0.1	0.2	mA
Minimum pulse width		2			μs
ESD protection	Human body model	±15			kV


Analog Input (ANLG)		Min.	Typ.	Max.	Units
Input voltage	Operational range	0		5	V
	Absolute maximum values, continuous	-8		+12	
	Absolute maximum, surge (duration ≤ 1s) [†]			±24	
Input impedance	To 0.23V		33		kΩ
Resolution			12		bits
Integral linearity				±2	bits
Offset error				±2	bits
Gain error				±1%	% FS [†]
Bandwidth (-3dB)	Software selectable	0		250	Hz
ESD protection	Human body model	±5			kV

RS-232		Min.	Typ.	Max.	Units
Compliance		TIA/EIA-232-C			
Bit rate	Software selectable	9600		115200	Baud
Short-circuit	232TX short to GND	Guaranteed			
ESD protection	Human body model	±15			kV

CAN-Bus		Min.	Typ.	Max.	Units
Compliance		ISO11898, CiA-301v4.2, CiA 402v3.0			
Bit rate	Software selectable	125		1000	Kbps
Bus length	1Mbps			25	m
	500Kbps			100	
	≤ 250Kbps			250	
Resistor	Between CAN-Hi, CAN-Lo	none on-board			
Node addressing	Software	1 + 127 (CANopen); 1- 255 (TMLCAN)			
ESD protection	Human body model	±15			kV

[†] Stresses beyond values listed under "absolute maximum ratings" may cause permanent damage to the device. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

¹ "FS" stands for "Full Scale"

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