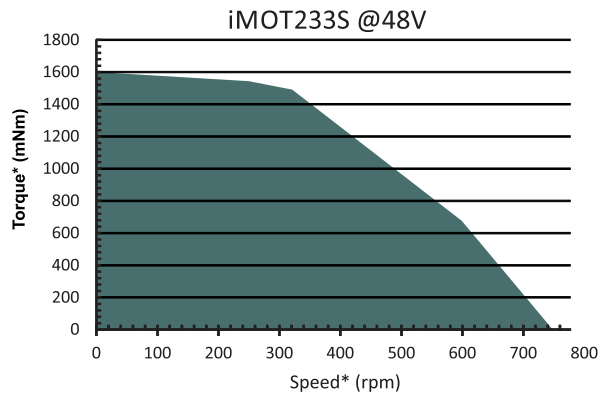
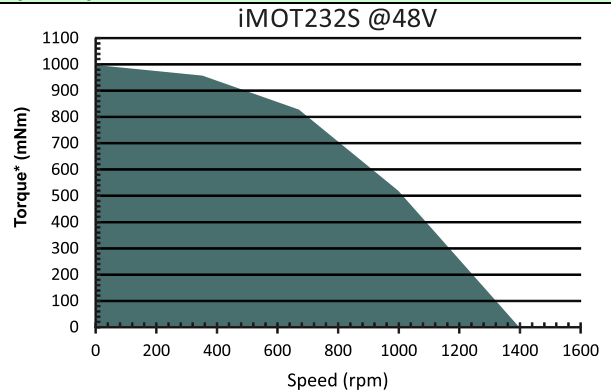


All dimensions are expressed in mm. Drawing not to scale.

Features

- Fully digital intelligent 2 phase step motor with embedded motion controller, drive and absolute position sensor
- Available in 2 motor lengths, offering 1000 and 1600 mNm of continuous torque
- Motor supply: 12.5-48V; Logic supply 12.5-36V; Rated current 2.8 A
- No load speed of 750 and 1400 rpm at 48V
- 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
- 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
- Standalone operation with stored motion sequences
- Communication:
 - TMLCAN and CANopen (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 \times 16 SRAM for data acquisition
- 4K \times 16 E²ROM for TML motion programs and data storage

Torque – Speed characteristic



* All values $\pm 10\%$ at 20°C

Mating Connector				
Connector	Producer	Part No.	Description	Wire Gauge
J1, J4	MOLEX	43045-0400	MICROFIT RECEPTACLE HOUSING, 2x2 WAY	AWG 20..24
J2	MOLEX	43045-1000	MICROFIT RECEPTACLE HOUSING, 2x5 WAY	AWG 20..24
J3	MOLEX	43045-0600	MICROFIT RECEPTACLE HOUSING, 2x3 WAY	AWG 20..24
J1, J2, J3, J4	MOLEX	43030-0007	CRIMP PIN, MICROFIT, 5A	AWG 20..24

Ordering Information	
Part Number	Description
P036.222.E120	iMOT232S XM-CAN Intelligent Step Motor, CAN
P036.232.E120	iMOT233S XM-CAN Intelligent Step Motor, CAN
P034.001.E002	EasyMotion Studio Software
P040.001.Exxx	TML_LIB Motion Library
P038.040.C089	Complete cable set 100 cm
P038.040.C069	Housing & crimp pins set

Name EP	First edition 29/05/2015	Document template: P099.TQT.564.0001	Last edition 25 May 2023	Visa:
		Title of document iMOT23xS XM-CAN PRODUCT DATA SHEET	N° document P036.2x2.E120.DSH.10L	Page : 1 of 3

iMOT23xS XM-CAN DATASHEET

P/N: P036.2x2.E120

Connector J1 & J4 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; Internally connected to all GND pins.
3	Can-Hi	I/O	CAN-Bus positive line (dominant high)
4	Can-Lo	I/O	CAN-Bus negative line (dominant low)

Connector J2 Description			
Pin	Name	Type	Description
1	Enable	I	5-36V digital PNP/NPN input. Enable input
2	GND	-	Return ground for I/O pins; Internally connected to all GND 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; Internally connected to all GND 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

Connector J3 Description			
Pin	Name	Type	Description
1	232RX	I	RS-232 Data Reception
2	GND	-	Return ground; Internally connected to all GND pins.
3	GND	-	Return ground; Internally connected to all GND pins.
4	232TX	O	RS-232 Data Transmission
5	+V _{LOG}	I	Positive terminal of the logic supply: 12.5 to 36V _{DC}
6	+V _{MOT}	I	Positive terminal of the motor supply: 12 to 48V _{DC}

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	iMOT232	1000	mNm
	iMOT233	1600	
Rated current	iMOT232	2.8	A
	iMOT233	2.8	
Microstepping resolution in open loop control		102400	Bits/rot
Absolute position feedback in closed loop control		4096	Bits/rot
Rotor inertia	iMOT232	275	gcm ²
	iMOT233	480	
		Axial	Radial
Shaft play	0.08	0.06	mm
At load	450	450	g

Operating Conditions		Min.	Typ.	Max.	Units
Ambient temperature ¹		0		+40	°C
Ambient humidity		Non-condensing		90	%Rh
Altitude / pressure ²		-0.1	0 + 2.5	2	Km
		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

Logic Supply Input (+V _{LOG})		Min.	Typ.	Max.	Units
Supply voltage	Nominal values	12.5	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	mA
	+V _{LOG} = 24V	47	120		
	+V _{LOG} = 36V	36	100		

Motor Supply Input (+V _{MOT})		Min.	Typ.	Max.	Units
Supply voltage	Nominal values	12.5	24	48	V _{DC}
	Absolute maximum values, continuous	-0.5		50	V _{DC}
	Absolute maximum values, surge (duration ≤ 8ms)	-1		55	V
Supply current	Idle		1	5	mA
	Operating	-13.6	±3	+13.6	

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				±10	bits
Gain error			±1%	±3%	% FS ³
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 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	HW rotary HEX switch	1 + 15 and 255 (CANopen/TMLCAN)			
	Software	1 + 127 (CANopen); 1- 255 (TMLCAN)			
ESD protection	Human body model	±15			kV

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

² iMOT23xS 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.

³ "FS" stands for "Full Scale"

Name	First edition	Document template: P099.TQT.564.0001	Last edition	Visa:
EP	29/05/2015		25 May 2023	
 TECHNOSOFT		Title of document	N° document	
		iMOT23xS XM-CAN	P036.2x2.E120.DSH.10L	
		PRODUCT DATA SHEET	Page : 2 of 3	

iMOT23xS XM-CAN DATASHEET

P/N: P036.2x2.E120


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		

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	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

Environmental Characteristics		Min.	Typ.	Max.	Units
Size (Length x Width x Height)	iMOT232	63 x 58 x 74			mm
		~2.48 x 2.28 x 2.91			inch
	iMOT233	87 x 58 x 74			mm
		~3.43 x 2.28 x 2.91			inch
Weight	Without mating connectors	iMOT232			g
		750			
Power dissipation	Idle (no load) Operating	iMOT233			W
		1100			
Efficiency		98			%
Cleaning agents	Dry cleaning is recommended	Only Water- or Alcohol- based			
Protection degree	According to IEC60529, UL508	IP20			-

[†] 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.

Name EP	First edition 29/05/2015	Document template: P099.TQT.564.0001	Last edition 25 May 2023	Visa:	
 TECHNOSOFT		iMOT23xS XM-CAN PRODUCT DATA SHEET	N° document P036.2x2.E120.DSH.10L Page : 3 of 3		