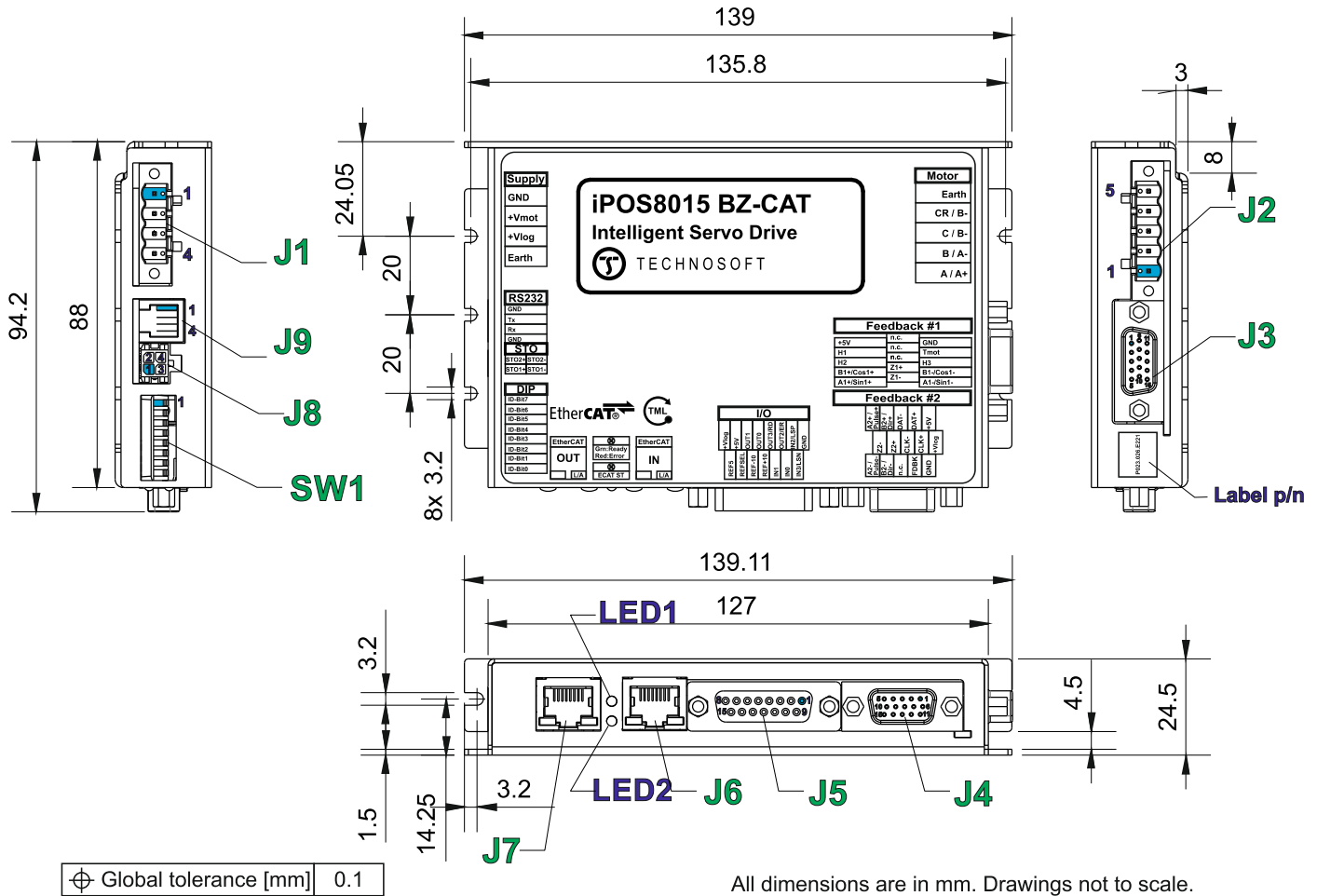




All dimensions are in mm. Drawings not to scale.

Motor – sensor configurations

Sensor	Motor	PMSM	BLDC	DC BRUSH	STEP (2-ph)	STEP (3-ph)
Incr. Encoder		✓		✓	✓	
Incr. Encoder + Dig. Hall		✓	✓			
Digital Hall control only		✓				
Analog Sin/Cos encoder		✓	✓	✓	✓	
SSI / BiSS-C/ EnDAT/ TAMAGAWA/ Panasonic/ Nikon/ Sanyo Denki		✓	✓	✓	✓	
Tacho				✓		
Open-loop (no sensor)					✓	✓

Features

- Motion controller and drive in a single compact unit based on MotionChip™ technology
- Universal solution for control of rotary and linear brushless, brushed and 2 or 3-phase step motors
- Advanced motion control capabilities (PVT, S-curve, electronic cam)
- Motor supply: 11-80V; Logic SELV/ PELV supply: 9-36V; STO SELV/ PELV supply: 18-40V
- Motor current:
 - Nominal: 15A_{RMS} / 21A amplitude;
 - Peak: 28A_{RMS} / 40A amplitude.

Feedback Devices (dual-loop support)

- 1st feedback devices supported:
 - Incremental encoder interface (differential)
 - Analogue sin/cos encoder interface (differential 1V_{pp})
 - Digital Hall sensor interface (single-ended and open collector)
- 2nd feedback devices supported:
 - Incremental encoder interface (differential)
 - pulse & direction interface (differential) for external (master) digital reference
 - SSI / BiSS-C/ EnDAT/ TAMAGAWA/ Panasonic/ Nikon/ Sanyo Denki encoder interface
- STO: 2 safe torque-off inputs, safety integrity level (SIL3/Cat3/PLe) acc. to EN61800-5-1; -2/ EN61508-3; -4/ EN ISO 13849-1.
- 4 digital inputs, 12-36V, PNP/NPN programmable: 2 for limit switches, 2 general-purpose
- 4 digital outputs, 5-36V, NPN open-collector: Ready, Error, OUT1 0.5A and OUT0 2A (software selectable as general-purpose or brake)
- 2 analogue inputs: 12 bit, +/-10V and 0-5V: Reference and Feedback (for Tacho) or general purpose
- RS-232 serial & dual 100Mbps RJ45 EtherCAT® interfaces
- Commissioning (set-up) possible through USB, FoE (file-over-EtherCAT®), EoE (Ethernet-over-EtherCAT®)
- 255 h/w addresses selectable by h/w sliding switches
- 16k x 16 SRAM memory for data acquisition
- 24k x16 E2ROM to store setup data, TML motion programs, cam tables and other user data
- NTC/PTC analogue Motor Temperature sensor input

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Mating Connectors			
Ref	Producer	Part No.	Description
J1	Camden	CTBA9208/4FL	Supply input, 4x5.08 female counter part for cable
J2	Camden	CTBA9208/5FL	Motor power, 5x5.08 female counter part for cable
J3,J4	Generic	15-pin High Density D-Sub male	Feedback #1 +Hall & #2
J9	generic	RJ10-4/4 phone plug	RS232
J5	generic	15-pin D-Sub male, DB15	I/O; Analog
J8	MOLEX	43025-0400	MICROFIT RECEPTACLE HOUSING, 2x2 WAY
J8	MOLEX	43030-0007	CRIMP PIN, MICROFIT, 5A
J6,J7	-	-	Standard 8P8C modular jack (RJ-45) male

Connector Description			
Pin	Name	Type	Description
J1	1	GND	- Negative return (ground) of the power supply
	2	+VMOT	I Positive terminal of the motor supply: 12 to 80V _{DC} .
	3	+VLOG	I Positive terminal of the logic supply input: 12 to 36V _{DC}
	4	Earth	- Earth connection
Pin	Name	Type	Description
J2	1	A/A+	O Phase A for 3-ph motors, A+ for 2-ph steppers, Motor+ for DC brush motors
	2	B/A-	O Phase B for 3-ph motors, A- for 2-ph steppers, Motor- for DC brush motors
	3	C/B+	O Phase C for 3-ph motors, B+ for 2-ph steppers
	4	CR / B-	O Chopping Resistor output/ Phase B- for step motors
	5	Earth	- Earth connection
Pin	Name	Type	Description
J8	1	STO1+	I Safe Torque Off input 1, positive input (opto-isolated, 18÷40V)
	2	STO2+	I Safe Torque Off input 2, positive input (opto-isolated, 18÷40V)
	3	STO1-	I Safe Torque Off input 1, negative return (opto-isolated, 0V)
	4	STO2-	I Safe Torque Off input 2, negative return (opto-isolated, 0V)
			Apply between both STO1+, STO2+ and STO1-, STO2- 24V DC from SELV/ PELV power supply for motor PWM output operation
Pin	Name	Type	Description
J3	1	+5V _{OUT}	O 5V output supply for I/O usage
	2	Hall 1	I Digital input Hall 1 sensor
	3	Hall 2	I Digital input Hall 2 sensor
	4	B1+/Cos+	I Incr. encoder1 B+ diff. input, or analogue encoder Cos+ diff. input
	5	A1+/Sin+	I Incr. encoder1 A+ diff. input, or analogue encoder Sin+ diff. input
	6...8	n.c.	Not connected
	9	Z1+	I Incr. encoder1 Z+ diff. input
	10	Z1-	I Incr. encoder1 Z- diff. input
	11	GND	- Return ground for sensors supply
	12	Temp Mot	I Analogue input, 12-bit, 0-3.3V. Used to read an analog temperature value
	13	Hall 3	I Digital input Hall 3 sensor
	14	B1-/Cos-	I Incr. encoder1 B- diff. input, or analogue encoder Cos- diff. input
	15	A1-/Sin-	I Incr. encoder1 A- diff. input, or analogue encoder Sin- diff. input

Pin	Name	Type	Description
1	+5V _{OUT}	O	5V output supply for I/O usage
2	Data+/SL+	I	Data+ for SSI, or Slave+ for BiSS C; has 120Ω resistor between pins 2 and 3
3	Data-/SL-	I	Data- for SSI, or Slave- for BiSS C; has 120Ω resistor between pins 2 and 3
4	B2+/Dir+	I	Incr. encoder2 B+ diff. input, or Dir+; has 120Ω resistor between pins 4 and 14
5	A2+/Pulse+	I	Incr. encoder2 A+ diff. input, or Pulse+; has 120Ω resistor between pins 5 and 15
6	+V _{LOG}	I	Positive terminal of the logic supply input: 9 to 36V _{DC}
7	CLK+/MA+	O	Clock+ for SSI, or Master+ for BiSS C
8	CLK-/MA-	O	Clock- for SSI, or Master- for BiSS C
9	Z2+	I	Incr. encoder2 Z+ diff. input
10	Z2-	I	Incr. encoder2 Z- diff. input
11	GND	-	Return ground for sensors supply
12	FDBK	I	Analogue input, 12-bit, 0-5V. Used to read an analog position or speed feedback (as tach), or used as general-purpose analog input
13	n.c.		Not connected
14	B2-/Dir-	I	Incr. encoder2 B- diff. input, or Dir-; has 120Ω resistor between pins 4 and 14
15	A2-/Pulse-	I	Incr. encoder2 A- diff. input, or Pulse-; has 120Ω resistor between pins 5 and 15
Port	Name	Type	Description
J6	ECAT IN	I	EtherCAT standard RJ45 Ethernet IN port
J7	ECAT OUT	O	EtherCAT standard RJ45 Ethernet OUT port
Pin	Name	Type	Description
1	GND	-	Return ground for RS-232 pins
2	232TX	O	RS-232 Data Transmission
3	232RX	I	RS-232 Data Reception
4	GND	-	Return ground for RS-232 pins
Pin	Name	Type	Description
1	GND	-	Return ground for I/O pins
2	IN2/LSP	I	12-36V digital PNP/NPN input. Positive limit switch input
3	OUT2/Error	O	5-36V 0.5A, drive Error output, active low, NPN open-collector/TTL pull-up. Also drives the red LED
4	OUT3/Ready	O	5-36V 0.5A, drive Ready output, active low, NPN open-collector/TTL pull-up. Also drives the green LED.
5	OUT0	O	5-36V 2A, software selectable general-purpose or brake digital output, NPN open-collector/TTL pull-up
6	OUT1	O	5-36V 0.5A, general-purpose digital output, NPN open-collector/TTL pull-up
7	+5V _{OUT}	O	5V output supply for I/O usage
8	+V _{LOG}	I	Positive terminal of the logic supply input: 12 to 36V _{DC}
9	IN3/LSN	I	12-36V digital PNP/NPN input. Negative limit switch input
10	IN0	I	12-36V general-purpose digital PNP/NPN input
11	IN1	I	12-36V general-purpose digital PNP/NPN input
12	REF10+	I	Analogue input, 11-bit, positive +/-10V input. Used to read an analog position, speed or torque reference.
13	REF10-	I	Analogue input, 11-bit, negative +/-10V input. Used to read an analog position, speed or torque reference. Connected to GND when REF5 is used.
14	REFSEL	I	Analogue selection, floating for +/-10V input, GND connected when REF5+ is used.
15	REF5	I	Analogue input, 12-bit, 0-5V input. Used to read an analog position, speed or torque reference.

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Pin	Name	Type	Description
1	ID-Bit7	-	SW1 Sets hardware Axis ID that is found in the ECAT register called " <i>configured station alias</i> ". <i>Pin 8 is Bit 0... Pin 1 is Bit 7 of the Axis value.</i> Possible values: from 1 to 255 when all pins OFF; When Axis ID is 255, the EtherCAT register called " <i>configured station alias</i> " will be 0.
2	ID-Bit6	-	
3	ID-Bit5	-	
4	ID-Bit4	-	
5	ID-Bit3	-	
6	ID-Bit2	-	
7	ID-Bit1	-	
8	ID-Bit0	-	

Electrical characteristics

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

- $T_{amb} = 24^{\circ}\text{C}$, $V_{LOG} = 24\text{ V}_{DC}$; $V_{MOT} = 80\text{ V}_{DC}$;
- Supplies start-up / shutdown sequence: any
- Load current (sinusoidal amplitude / cont. BLDC, DC, stepper) = 15 A_{RMS}

Operating Conditions		Min.	Typ.	Max.	Units
Ambient temperature ¹		0		+40	°C
Ambient humidity	Non-condensing	0		90	%Rh
Altitude / pressure ²	Altitude (vs. sea level)	-0.1	0 ÷ 2	2	km
	Ambient Pressure	0 ²	0.75 ÷ 1	10.0	atm
Storage Conditions		Min.	Typ.	Max.	Units
Ambient temperature		-40		+85	°C
Ambient humidity	Non-condensing	0		100	%Rh
Ambient Pressure		0		10.0	atm
Mechanical Mounting		Min.	Typ.	Max.	Units
Airflow		natural convection ³ , closed box			
Environmental Characteristics		Min.	Typ.	Max.	Units
Size (Length x Width x Height)	Without mating connectors	139 x 94.2 x 24.5			mm
		~5.47 x 3.7 x 0.97			inch
Weight	Without mating connectors	253			g
Power dissipation	Idle (no load)		3.6		W
	Operating		11		
Voltage Efficiency	F _{PWM} = 20 kHz		95.2		%
	F _{PWM} = 100 kHz		75.13		
Surface temperature	Idle (I _{MOT} = 0A)		55		°C
	Full power (I _{MOT} = nominal)			100	
Cleaning agents	Dry cleaning is recommended	Only Water- or Alcohol- based			
Power dissipation	Idle (I _{MOT} = 0A)		2		W
	Full power (I _{MOT} = nominal)		8		
Logic Supply Input (+V _{LOG})		Min.	Typ.	Max.	Units
Supply voltage	Nominal values	12	24	36	V _{DC}
	Absolute maximum values, drive operating but outside guaranteed parameters	8	24	40	V _{DC}
	Absolute maximum values, surge (duration ≤ 10ms) [†]	-1		+45	V
Supply current	No Load on Digital Outputs	+V _{LOG} = 12V	270	280	mA
		+V _{LOG} = 24V	160	170	
		+V _{LOG} = 36V	125	130	
Utilization category	Acc. to 60947-4-1(I _{PEAK} ≤1.05*I _{NOM})	DC-1			
Motor Supply Input (+V _{MOT})		Min.	Typ.	Max.	Units
Supply voltage	Nominal values	12	80	90	V _{DC}
	Absolute maximum values, drive operating but outside guaranteed parameters	11		94	V _{DC}
	Absolute maximum values, surge (duration ≤ 10ms) ⁴	-1		95	V
Supply current	Idle		1	5	mA
	Operating	-40	±22	+40	A
	Absolute maximum value, short-circuit condition (duration ≤ 10ms) ¹			45	A
Voltage measurement error			±0.3	±0.5	V
Utilization category	Acc. to 60947-4-1 (I _{PEAK} ≤4.0*I _{NOM})	DC-3			

Motor Outputs (A/A+, B/A-, C/B+, CR/B-)				Min.	Typ.	Max.	Units
Nominal current (without heatsink)	PMSM motors sinusoidal amplitude					18.4	A
	PMSM motors sinusoidal RMS					13	A _{RMS}
	DC/BLDC/STEP motors continuous					16	A
Nominal current (with heatsink)	PMSM motors sinusoidal amplitude					21	A
	PMSM motors sinusoidal RMS					15	A _{RMS}
	DC/BLDC/STEP motors continuous					22	A
Peak current	maximum 10s			-40		+40	A
Short-circuit protection threshold				±22.5		±45	A
Short-circuit protection delay				5	10		µs
On-state voltage drop	Nominal output current; including typical mating connector contact resistance				±0.3	±0.5	V
Off-state leakage current					±0.5	±1	mA
Motor inductance (phase-to-phase)	Recommended value to avoid spurious short-circuit protection, triggered by ripple	Fast loop ⁴ V _{MOT}					µH
		50µs 48V			133		
		100µs 48V			266		
		50µs 24V			66		
		100µs 24V			133		
Motor electrical time-constant (L/R)	Recommended value for ±5% current measurement error	F _{PWM} = 20 kHz			330		µs
		F _{PWM} = 40 kHz			170		
		F _{PWM} = 60 kHz			140		
		F _{PWM} = 80 kHz			80		
		F _{PWM} = 100 kHz			66		
Current measurement	Crt Scale = 40A	Noise (I<=5A)		±25	±35	mA	
		Noise (I>=5A)		±110	±130		
	Crt Scale = 20A	Noise (I<=2.5A)		±15	±25		
		Noise (I>=2.5A)		±60	±70		
Digital Inputs (IN0, IN1, IN2/LSP, IN3/LSN) ⁶				Min.	Typ.	Max.	Units
Mode compliance				PNP			
Default state	Input floating (wiring disconnected)			Logic LOW			
Input voltage	Logic "LOW"			-36	0	2.4	V
	Logic "HIGH"			7.5	24	36	
	Hysteresis			1.2	2.4	2.8	
	Floating voltage (not connected)				0		
	Absolute maximum, continuous			-36		+39	
	Absolute maximum, surge (duration ≤ 1s) [†]			-50		+50	
Input current	Logic "LOW"; pulled to GND				0		mA
	Logic "HIGH"; pulled to +24V				9	10	
Mode compliance				NPN			
Default state	Input floating (wiring disconnected)			Logic HIGH			
Input voltage	Logic "LOW"			-36	0	2.2	V
	Logic "HIGH"			7.5		36	
	Hysteresis			1.2	2.4	2.8	
	Floating voltage (not connected)				23		
	Absolute maximum, continuous			-36		+39	
	Absolute maximum, surge (duration ≤ 1s) [†]			-50		+50	
Input current	Logic "LOW"; Pulled to GND				8	10	mA
	Logic "HIGH"; Pulled to +24V			0	0	0.4	
Input frequency				0		150	kHz
Minimum pulse				3.3			µs
ESD protection - Human body model				±2			kV
Digital Outputs (OUT0, OUT1, OUT2/Error, OUT3/ Ready)				Min.	Typ.	Max.	Units
Mode compliance	All outputs (OUT0, OUT1, OUT2/Error, OUT3/Ready)			NPN 24V			
Load type				Resistive, Inductive			
Default state	Not supplied (+V _{LOG} floating)			High-Z (floating)			
	Immediately after power-up	OUT0, OUT1, OUT2/Error, OUT3/ Ready			Logic "HIGH"		
		OUT0, OUT1, OUT2/Error			Logic "HIGH"		
	Normal operation			OUT3/Ready			Logic "LOW"
Output voltage	Logic "LOW"; output current = 2A for OUT0/0.5A for the other digital outputs					0.8	V
	Logic "HIGH"; output current = 0			4	4.5	5	
	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	

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

² iPOS8015 BZ-CAT 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 It is recommended to mount the iPOS8015 BZ-CAT on a metallic support using the provided mounting holes, for better reliability and reduced de-rating due to heat dissipation

⁴ 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.

⁵ Fast loop period of 50µs is not possible with all feedback device types.

⁶ The digital inputs are software selectable as PNP or NPN

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Output current	Logic "LOW", sink current, continuous	OUT2/Error, OUT3/Ready, OUT1			0.5	A
		OUT0 (Brake)			2	A
	Logic "HIGH", source current; external load to GND; $V_{OUT} \geq 2.0V$	OUT0, OUT1, OUT2/ Error, OUT3/ Ready			7	mA
	Logic "HIGH", leakage current; external load to $+V_{LOG}$; $V_{OUT} = V_{LOG} \max = 40V$			0.05	0.7	mA
Minimum pulse width			0.5			μs
ESD protection - Human body model			± 15			kV
Digital Hall Inputs (Hall1, Hall2, Hall3)			Min.	Typ.	Max.	Units
Mode compliance			TTL / CMOS / Open-collector			
Default state Input floating (wiring disconnected)			Logic HIGH			
Input voltage	Logic "LOW"		0	0.8	V	
	Logic "HIGH"	1.8				
	Floating voltage (not connected)		4.5			
	Absolute maximum, surge (duration $\leq 1s$) ¹	-10		+15		
Input current	Logic "LOW"; Pull to GND		5	3	mA	
	Logic "HIGH"; Internal 1K Ω pull-up to +5	0	0	0		
Minimum pulse width			2			μs
ESD protection - Human body model			± 5			kV
Encoder Inputs (A+, A-, B+, B-, Z+, Z-, A2+, A2-, B2+, B2-, Z2+, Z2-) ²			Min.	Typ.	Max.	Units
Differential mode compliance	For full RS422 compliance, see ²		TIA/EIA-422-A			
Input voltage	Hysteresis		± 0.06	± 0.1	± 0.2	V
	Differential mode		-14		+14	
	Common-mode range (A+ to GND, etc.)		-11		+14	
Input impedance, differential	A+, A2+, B+, B2+, Z+, Z2+ A-, A2-, B-, B2-, Z-, Z2-		2.2 1.6			k Ω
Input frequency	Differential mode		0		10	MHz
Minimum pulse width	Differential mode		50			ns
ESD protection	Human body model		± 3			kV
Sin-Cos Encoder Inputs (Sin+, Sin-, Cos+, Cos-) ²			Min.	Typ.	Max.	Units
Input voltage, differential	Sin+ to Sin-, Cos+ to Cos-			1	1.25	V _{PP}
Input voltage, any pin to GND	Operational range		-1	2.5	4	V
	Absolute maximum values, continuous		-7		+7	
	Absolute maximum, surge (duration $\leq 1s$) ¹		-11		+14	
Input impedance	Differential, Sin+ to Sin-, Cos+ to Cos-		4.2	4.7		k Ω
	Common-mode, to GND			2.2		k Ω
Resolution with interpolation	Software selectable, for one sine/cosine period		2		10	bits
Frequency	Sin-Cos interpolation		0		450	kHz
	Quadrature, no interpolation		0		10	MHz
ESD protection	Human body model		± 2			kV
Analog 0...5V Inputs (REF, FDBK)			Min.	Typ.	Max.	Units
Input voltage	Operational range		0		5	V
	Absolute maximum values, continuous		-0.5		+9.5	
	Absolute maximum, surge (duration $\leq 1s$) ¹		-1		± 10	
Input impedance	To GND			10		k Ω
Resolution				12		bits
Integral linearity					± 4	bits
Offset error					± 1	bits
Gain error				$\pm 1\%$	$\pm 3\%$	% FS ³
Bandwidth (-3dB)	Software selectable		0		600	Hz
ESD protection	Human body model		± 2			kV
Analog $\pm 10V$ Input (Ref)			Min.	Typ.	Max.	Units
Differential voltage range				± 10		V
Common-mode voltage range		Referenced to GND	-12	0...10	+50	V
Input impedance		Differential		40		k Ω
Common-mode impedance		Referenced to GND		20		k Ω
Resolution				12		bits
Integral linearity					± 4	LSB
Differential Linearity		No missing codes			± 1	LSB
Offset error	Common-mode voltage = 0...10 V				1	V
Gain error	Common-mode voltage = 0...10 V			± 10	± 12	%FS ³
Bandwidth (-3dB)	Depending on software settings			600		Hz
RS-232			Min.	Typ.	Max.	Units
Compliance			TIA/EIA-232-C			
Bit rate		Software selectable	9600		115200	Baud
Output voltage			± 5	± 7.8		V
Short-circuit			232TX short to GND			
Input voltage			Absolute maximum, continuous			
ESD protection			Human body model			

EtherCAT®		Min.	Typ.	Max.	Units
Compliance		IEEE802.3, IEC61158			
J6, J7 pinout	EtherCAT® supports MDI/MDI-X auto-crossover	TIA/EIA-568-A or TIA/EIA-568-B			
Software protocols compatibility		CoE, CiA402, IEC61800-7-301			
Transmission line	According to TIA/EIA-568-5-A	5	5e	6	Category
		UTP	FTP	STP	Shield
Auto	swap + / - inside a pair	Yes (MLT3 encoding)			
	swap Rx / Tx pairs	Yes (auto-MDI/MDIX)			
	Swap port0(IN) / port1(OUT)	NO (EtherCAT requirement)			
Node addressing	By hardware DIP switch	1 ÷ 255			-
	By software				
MAC addressing		none			-
ESD protection	Human body model	±15			kV
Safe torque OFF (STO1+, STO1-, STO2+, STO2+)		Min.	Typ.	Max.	Units
Safety function		STO (Safe Torque OFF)			
EN 61800-5-1 / -2 and EN 61508-5-3 / -4 Classification		Safety integrity level 3 (SIL3)			
		PFHd (Probability of Failures per Hour - dangerous)		8*10 ⁻¹⁰ hour ⁻¹ (0.8 FIT)	
EN13849-1 Classification	Performance Level	Cat3/PLe			
	MTTFd (meantime to dangerous failure)	377			years
Mode compliance		PNP			
Default state		Input floating (wiring disconnected) Logic LOW			
Input voltage	Logic "LOW" (PWM operation disabled)	-20		5.6	V
	Logic "HIGH" (PWM operation enabled)	18		36	
	Absolute maximum, continuous	-20		+40	
Input current	Logic "LOW"; pulled to GND		0		mA
	Logic "HIGH", pulled to +V _{LOG}		5	13	
Repetitive test pulses (high-low-high)	Ignored high-low-high			5	ms
				20	Hz
Fault reaction time	From internal fault detection to register DER bit 14 =1 and OUT2/Error high-to-low			30	ms
PWM operation delay	From external STO low-high transition to PWM operation enabled			30	ms
ESD protection	Human body model	±2			kV
Absolute encoder interface: SSI, BiSS-C, EnDAT, Nikon, Sanyo Denki, Panasonic, Tamagawa		Min.	Typ.	Max.	Units
Differential mode (CLOCK, DATA) ¹		For full RS422 compliance, see ¹ TIA/EIA-422			
CLOCK Output voltage	Differential; 50Ω differential load	2.0	2.5	5.0	V
	Common-mode, referenced to GND	2.3	2.5	2.7	
Output Short-circuit protection		Yes, protected		±160	mA
CLOCK frequency	Software selectable	Nikon, Sanyo Denki			
		2.5, 4			
		Panasonic, Tamagawa			
		2.5			
		SSI			
DATA Input hysteresis	Differential mode	±0.1			
		±0.2			
		±0.5			
Data input impedance	Termination resistor on-board		120		Ω
DATA Input common mode range	Referenced to GND	-7		+12	
	Absolute maximum, surge (duration≤1s) [†]	-25		+25	
DATA format	Software selectable	Binary / Gray			
		Single-turn / Multi-turn			
		Counting direction			
DATA resolution	Single-turn			56	Bits
	Multi-turn and single-turn			56	
	If total resolution >31 bits, some bits must be ignored by software setting to achieve a max 31 bits resolution				
Supply Output (+5V)		Min.	Typ.	Max.	Units
Output voltage	Current sourced = 250mA	4.8	5	5.2	V
Output current		350	400		mA
Short-circuit		NOT protected			
Over-voltage		NOT protected			
ESD protection	Human body model	±2			kV
Conformity		Min.	Typ.	Max.	Units
EU Declaration	2014/30/EU (EMC), 2014/35/EU (LVD), 2011/65/EU (RoHS), 1907/2006/EC (REACH), 93/68/EEC (CE Marking Directive), EC 428/2009 (non dual-use item, output frequency limited to 590Hz)				

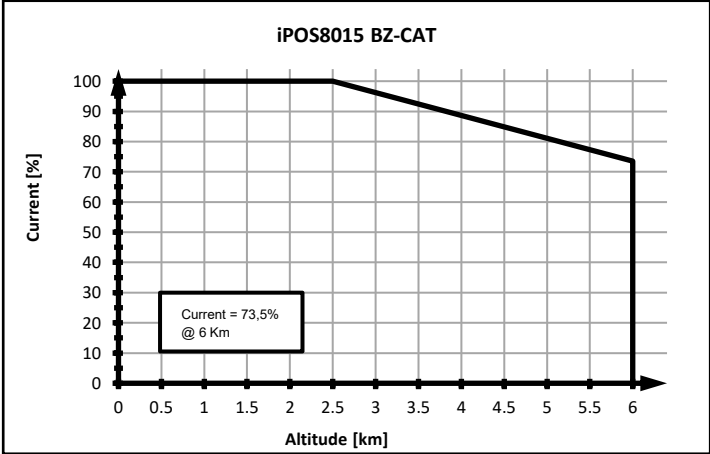
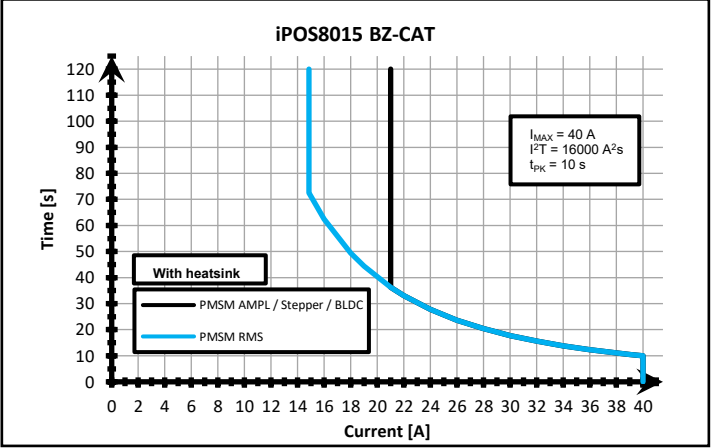
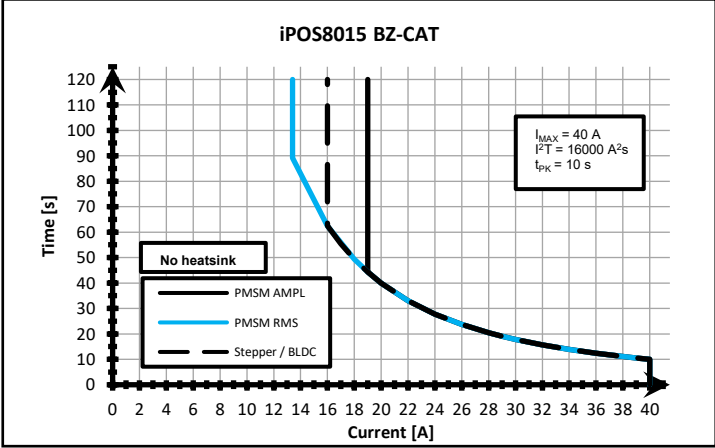
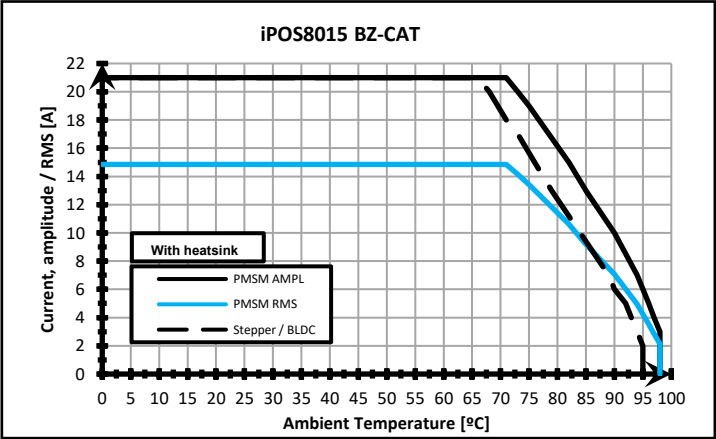
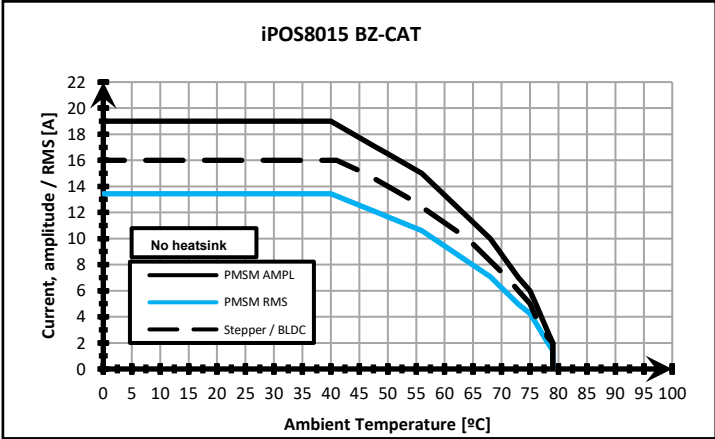
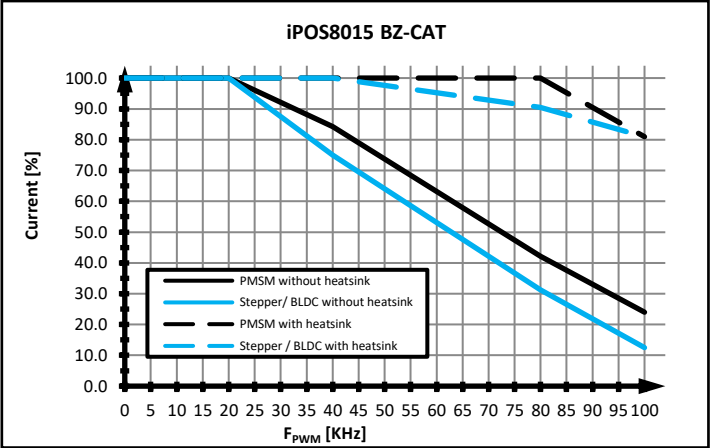
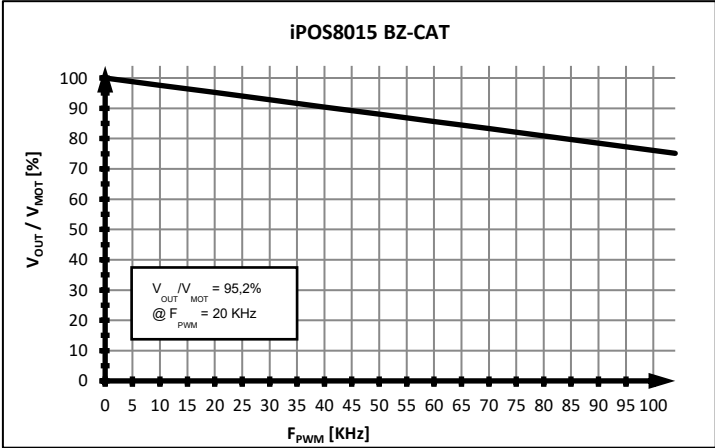
¹ Stresses beyond values listed under "absolute maximum ratings" may cause permanent damage to the device. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

² All differential input pins have internal 120 Ω termination resistors connected across

³ "FS" stands for "Full Scale"

¹ 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.

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