

Product Selector Magnetic Linear / Off-Axis Rotary Encoder ICs • Silicon for Motion®



	NEW Linear and Off-Axis Rotary						NEW		Gear Tooth	
	iC-ML	iC-MHL100	iC-MHL200	iC-MU	iC-MU150	iC-MU200	iC-PVL	iC-SM2L	iC-SM5L	iC-MZ
Application	Linear incremental	Linear incr./absol. Rotary incr.		Rotary/linear incremental ST/MT absolute Motor comm.			Off-Axis Battery Multiturn / 3-bit SSI Encoder	Linear incremental	Linear incremental	True Zero-Speed Gear Tooth Sensor
Sensors	Hall Line (1x) Tape / Polewheel 20...100 kA/m	Hall Line (1x) Tape / Polewheel 20...100 kA/m		Hall Line (2x) 2-Track Tape or Polewheel 15...100 kA/m			Hall Line (1x) Tape / Polewheel 10...100 kA/m	MR Bridges Tape > 25 kA/m	MR Bridges Tape > 25 kA/m	Dual Hall Back-bias magnet Hdiff 4...120 kA/m Hmax 400 kA/m 2.0 mm m 1.27
Pole Pitch / Tooth Module	2.56 mm	1.0 mm	2.0 mm	1.28 mm	1.50 mm	2.0 mm	1.0 ... 5.0 mm	2.0 mm	5.0 mm	
Absolute Meas. Length (Inp. Period)	5.12 mm	2.0 mm	4.0 mm	82 mm 655 / 2621 mm	96 mm (2-Track) 768 / 3072 mm (3-T.)	128 mm 1024 / 4096 mm	Up to 10 mm >10 m (counted)	2.0 mm	5.0 mm	
Rotary Speed				12,000 rpm (19 bit)	12,000 rpm (19 bit)	12,000 rpm (19 bit)	> 12,000 rpm (adj.)	-	-	0 to 40 kHz
Linear Speed	5 m/s	4 m/s	8 m/s	16 m/s	18 m/s	25 m/s				
Digital Resolution	6 / 7 / 8 bit	Up to 12 bit	Up to 12 bit	18...20 bit	18...20 bit	18...20 bit	3 bit			1 bit
Angle Resolution				2.5 arcsec (19 bit)	2.5 arcsec (19 bit)	2.5 arcsec (19 bit)	45°	Infinite	Infinite	
Linear Resolution	20 µm	0.49 µm	0.98 µm	0.156 µm	0.183 µm	0.243 µm				
Accuracy	+/- 50 µm			+/- 0.1° (calibr.)	+/- 0.1° (calibr.)	+/- 0.1° (calibr.)	+/- 10°	Typ. 10 µm	Typ. 20 µm	
Position Lag	20 µs	12...60 µs	12...60 µs	10...3000 µs	10...3000 µs	10...3000 µs	10 µs			10 µs
Incremental (A,B,Z)	A, B, Z	A, B, Z		A, B, Z						A/NA
Pulses Per Inp. Period	16, 32, 64	1 ... 1024		FlexCount® : 1 ... 65536						diff. push-pull
Commutation (U,V,W)	Counter signals	U, V, W		STEP / DIR, CW / CCW						
Pulses Per Inp. Period		1, 2		1 ... 16						
Line Drivers	-	RS422		-						4.5...36 V +/- 60 mA
Analog Outputs	Sin/Cos 2 Vpp; Sawtooth, Triangle (ratiometric)	(Sin/Cos with test mode)		Sin/Cos 250 mVpk				Diff. Sin/Cos (≈80 mVpp @ 5V)	Diff. Sin/Cos (≈80 mVpp @ 5V)	Differential Hall voltage (340 mVpp)
Serial I/O	-	BiSS, SSI		BiSS, SSI, SPI			Shift-Reg., SSI			
Parallel I/O		• SSI		• SSI			• 3-bit absolute			
Multiturn Interface		• I ² C Multi-master		• I ² C Multi-master			• I ² C Multi-master			
EEPROM Interface										
Configuration	By pins	OTP ROM, BiSS		External EEPROM, BiSS, SPI			External EEPROM	-	-	-
Supply	5 V (14 mA)	5 V (14 mA)		5 V (50 mA)			3...5 V (4 mA) (Battery < 10 µA)	5 V (5 mA)	5 V (7 mA)	4.5...36 V (10 mA)
Operating Temperature	-40 ... +125°C	-40 ... +125°C		-40 ... +110°C			-40 ... +125°C	-40 ... +125°C	-40 ... +125°C	-40 ... +125°C
Special Functions										
Package	TSSOP20	TSSOP20	TSSOP20	DFN16 5x5	DFN16 5x5	QFN48 7x7	QFN16 4x4	SM2C LGA	SM2C LGA	DFN10 4x4
		QFN32 5x5		QFN48 7x7	QFN48 7x7			7.6 x 2.8 mm ²	7.6 x 2.8 mm ²	

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