

Product Selector Magnetic Angle Sensors / On-Axis Rotary Encoder ICs • Silicon for Motion®



	iC-MA	iC-MA3	iC-MP	iC-MHA	iC-MH8	iC-MH16	iC-MHM	iC-MV	iC-PV	iC-PVL	iC-PMX	iC-TW11
Application	Incremental, Analog	Analog Sin/Cos	Potentiometer replacement	Analog Sin/Cos	Incremental, Singleturn absol., Motor commut.	Incremental, Singleturn absol., Motor commut.	Single- / Multiturn absolute	Gear Multiturn	Battery Multiturn	On/Off-Axis Battery Multiturn	Energy Harvesting Multiturn (Wiegand Wire)	Singleturn absol., Servo/stepper feedback, Portable HMI
Sensors	Quad Hall dia 2 mm	Quad Hall dia 2.1 mm	Quad Hall dia 2 mm	Quad Hall dia 2 mm	Quad Hall dia 2 mm	Quad Hall dia 2 mm	Quad Hall dia 2.41 mm	Quad Hall dia 1.5 mm	Quad Hall dia 1.75 mm	Quad Hall dia 2.25 mm	Quad Hall dia 3.25 mm	Triple Hall dia 2 mm
Magnetic Setup	Diametric magnet 20...100 kA/m	Diametric magnet 20...110 kA/m 15...65 kA/m (5V)	Diametric magnet 20...100 kA/m	Diametric magnet 20...100 kA/m	Diametric magnet 20...100 kA/m	Diametric magnet 20...100 kA/m	Diametric magnet 20...100 kA/m	Diametric magnet 20...100 kA/m	Diametric magnet 10...100 kA/m	Diametric magnet 10...100 kA/m	Diametric magnet 10...400 kA/m	Diametric magnet 25...150 kA/m
Rotary Speed	60,000 rpm	60,000 rpm	12,000 rpm	20,000 rpm	120,000 rpm	200,000 rpm	10,000 rpm (80,000 rpm)	24,000 rpm	> 12,000 rpm (adj.)	> 24,000 rpm (adj.)	30,000 rpm	24,000 rpm
Digital Resolution	6 / 7 / 8 bit		8 bit		Up to 12 bit	Up to 12 bit	9...14 bit (12 bit)	2 to 8 bit	3 bit	3 bit		10 bit
Angle Resolution	1.4°		1.4°		0.09°	0.09°	0.02°	1.4°	45°	45°		0.35°
Accuracy	+/- 3°	+/- 0.5° (corrected)	+/- 3°	+/- 0.5° (corrected)	+/- 0.5° (calibr.)	+/- 0.35° (calibr.)	+/- 0.35° (calibr.)	+/- 3°	+/- 10°	+/- 10°		+/- 1°
Position Lag	20 µs	16 ... 5800 µs	40 µs	60 µs	12 ... 60 µs	10 ... 45 µs	10 ... 45 µs	20 ... 160 µs	10 µs	10 µs		40 ... 225 µs
Incremental (A,B,Z)	A, B, Z	-	-	-	A, B, Z	A, B, Z		A, B, Z	-	-		-
Pulses Per Revolution	16, 32, 64				1, 2, 4, 8, 16, 32, 64, 128, 256, 512, 1024	1 ... 1024		1, 2, 4, 8, 16, 32, 64				
Commutation (U,V,W)	Counter signals				U, V, W	U, V, W						
Pulses Per Revolution	-	-	-	-	1, 2, 4	1 ... 16						
Line Drivers	-	-	-	-	RS422	RS422	RS422 / LVDS Transceiver	-	-	-		-
Analog Outputs	Sin/Cos 2 Vpp; Sawtooth, Triangle (ratiometric)	Sin/Cos: diff./single 0.25, 0.5, 1.0 Vpk	Ratiometric 0...5 V (0.5...4.5 V), selectable full scale range of 90°, 180°, 270°, 360°	Sin/Cos: 1 Vpp-diff. @ 100 Ω	Sin/Cos: 1 Vpp-diff. @ 100 Ω	(Sin/Cos 2 Vpp-diff. with test mode)	Sin/Cos: 1 Vpp-diff. @ 100 Ω	(Sin/Cos with test mode)	-	-	1 Diff. Output for Capacitive ADCs	-
Serial I/O	-	-	Shift-Register, BiSS	-	BiSS, SSI	BiSS, SSI	BiSS, SPI	Shift-Register, SSI	Shift-Register, SSI	Shift-Register, SSI	SPI	SPI (1.8 to 3.3 V)
Parallel I/O	-	-	-	-	-	-	-	• 3-bit absolute	• 3-bit absolute	• 3-bit absolute		
Multiturn Interface	-	-	-	-	-	-	• SSI					
EEPROM Interface	-	-	-	-	-	-	• I ² C Multi-master	• I ² C Multi-master	• I ² C Multi-master	• I ² C Multi-master		
Configuration	By pins	By pins	OTP ROM, BiSS	ROM (factory programmed)	OTP ROM, BiSS	OTP ROM, BiSS	External EEPROM, SPI, BiSS	External EEPROM	External EEPROM	External EEPROM	SPI	SPI
Supply	5 V (14 mA)	3...5.5 V (8 mA)	5 V (8 mA)	5 V (23 mA)	5 V (23 mA)	5 V (20 mA)	5 V (20 mA)	5 V (3 mA)	3...5 V (3 mA) (Battery < 10 µA)	3...5 V (4 mA) (Battery < 10 µA)	5 V (4 mA)	3.3 V (22 µA)
Operating Temperature	-40 ... +125°C	-40 ... +125°C	-40 ... +125°C	-40 ... +125°C	-40 ... +125°C	-40 ... +125°C	-40 ... +125°C	-40 ... +125°C	-40 ... +125°C	-40 ... +125°C	-40 ... +125°C	-40 ... +125°C
Special Functions			Daisy-chain capable				Reverse-polarity protection, GPIO pins (4x)	Reverse-polarity protection, GPIO pins (3x)	Daisy-chain capable			
Package	DFN10 4x4	QFN16 4x4	DFN10 4x4	QFN28 5x5	QFN28 5x5	QFN28 5x5	QFN28 5x5	QFN16 3x3	QFN16 3x3	QFN16 4x4	QFN32 5x5	QFN16 4x4

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