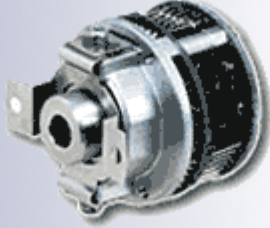




Smart Abs



SA35 (Smart Abs) is an ultra-small, multi-turn type absolute encoder with a hollow shaft. It is shaped for easy installation on small AC servo motors.

[SA35\(TS5643\)](#)

[SA35\(TS5667N120\)/SA48\(TS5667N420\)](#)

[SA48\(TS5667N440\)](#)

[SA48\(TS5667N480\)](#)

The resolution for output is 11 bits for a single turn or 13 bits for multiple turn. The number of signal lines is minimized by the use of serial data transmission mode. The encoder outputs incremental signals (2048C/T A,Bch, 1C/T Zch) in addition to absolute signals.

Features

- Ultra-small size
- Serial data transmission mode
- Self-diagnostic function
- At power outage, multiple revolution data are backed up by an externally installed battery and built-in capacitor.

SA35(TS5643):SPECIFICATION LIST

SA35(TS5643) Electrical Spec

Resolution	Absolute	11 bit/revolution, 13 bit/multiple revolution
	Incremental	2,048C/T A,Bch,1C/T Zch
Output Phase		Pure Binary Code
Power Supply		DC+5V \pm 5%
Consumption Current		150mA(Typ.) Normal Operation 60 μ A(Typ.) Battery Operation
Output Form	Line Driver	AM26C31 20mA
Max Response Frequency		170KHz Absolute Signal 170KHz Incremental Signal
Serial Data Transfer Cycle		84 μ s
Data Code		Manchester Code

SA35(TS5643) Mechanical Spec

Starting Torque	5.9 × 10 ⁻³ N·m(60gf·cm) Max
Moment of Inertia	1.0 × 10 ⁻⁶ kg·m ² Typ.(1.0g·cm ²)
Maximum Rotating Speed	88.3s ⁻¹ (5,000rpm)(mechanical Spec.)Max
Mounting Tolerances	Radial 0.05mm TIR Max
	Axial 0.2mm Max
	Angular 0.1ÿ
Operating Temp. Range	-10ÿC to +86ÿC
Storage Temp. Range	-20ÿC to +90ÿC
Protective Construction	Not Enclosed
Vibration	98m/s ² (10G)(5-2,000Hz) for 2hours
Shock	1,960m/s ² (200G)11msec,3 times
Mass	0.3kg Max Without Cable

SA35(TS5667N120)/SA48(TS5667N420):SPECIFICATION LIST

SA35(TS5667N120)/SA48(TS5667N420) Electrical Spec

Resolution	Absolute Signal	17bit/turn and 16bit turns Total 33bit
Output Phase		Pure Binary Code
Power Supply		DC+5V±5%
Consumption Current		150mA (Typ.) Normal Operation 100µA (Typ.) Battery Operation
Output Form	Line Driver	ADM485 20mA
Max Response Frequency		13MHz Normal Operation 13MHz Battery Operation
Serial Data Transfer Cycle		2.5Mbps
Data Code		Base Band NRZ (TWO-WAY)
E²PROM Accesable Address		8bit × 0 to 79Address

SA35(TS5667N120)/SA48(TS5667N420) Mechanical Spec

Starting Torque	5.9 × 10 ⁻³ N·m(60gf·cm) Max(TS5667N120)
	9.8 × 10 ⁻³ N·m(100gf·cm)Max(TS5667N420)
Moment of Inertia	1.0 × 10 ⁻⁶ kg·m ² Typ.(TS5667N120)
	6.5 × 10 ⁻⁶ kg·m ² Typ.(TS5667N420)
Maximum Rotating Speed	100s ⁻¹ (6,000rpm) (Mechanical Spec.) Max
Mounting Tolerances	Radial 0.05mm TIR Max
	Axial 0.1mm Max
	Angular 0.1ÿ
Operating Temp. Range	-10ÿC to +85ÿC
Storage Temp. Range	-20ÿC to +90ÿC
Protective Construction	Not Enclosed TS5667N120 TS5667N420
Vibration	98m/s ² (10G)(5-2,000Hz) for 2hours
Shock	1,960m/s ² (200G) 11msec, 3 times
Mass	0.3kg Max:TS5667N120
	0.5kg Max:TS5667N420 Without Cable

SA48(TS5667N440): SPECIFICATION LIST

SA48(TS5667N440) Electrical Spec		
Resolution	Absolute Signal	13bit/turn and 13bit turns Total 26bit
Output Phase		Pure Binary Code
Power Supply		DC+5V±5%
Consumption Current		150mA (Typ.) Normal Operation 100µA (Typ.) Battery Operation
Output Form	Line Driver	Differential Line Driver RS422A Compatible
Max Response Frequency		13MHz Normal Operation 13MHz Battery Operation (Multi Turn Data only)
Serial Data Transfer Cycle		Request Synchronized
Data Code		Manchester Code (RZ Format)
SA48(TS5667N440) Mechanical Spec		
Starting Torque		$9.8 \times 10^{-3} \text{N}\cdot\text{m}$ (100gf·cm) Max
Moment of Inertia		$6.5 \times 10^{-6} \text{kg}\cdot\text{cm}^2$ (65g·cm ²)Typ.
Maximum Rotating Speed		100s^{-1} (6,000rpm) (Mechanical Spec.) Max
Mounting Tolerances		Radial 0.05mm TIR Max
		Axial 0.1mm Max
		Angular 0.1°
Operating Temp. Range		-10°C to +85°C
Storage Temp. Range		-20°C to +90°C
Protective Construction		Not Enclosed
Vibration		98m/s ² (10G)(5-2,000Hz) for 2hours
Shock		1,960m/s ² (200G) 11msec, 3times
Mass		0.5kg Max Without Cable

SA48(TS5667N480) : SPECIFICATION LIST

SA48(TS5667N480) Electrical Spec		
Resolution	Absolute Signal	11bit/turn and 13bit/8192 turns (total 24bit)
	Incremental Signal	2,048 C/T, A, B Phase
Output Phase		Pure Binary Code
Power Supply		DC+5V±5%
Current Consumption		150mA (Typ.) Normal Operation 100µA (Typ.) Battery Operation
Output Form	Line Driver	Differential Line Driver RS422A Compatible
Max Response Frequency		13MHz Normal Operation 13MHz Battery Operation (Multi Turn Data only)
Serial Data Transfer Cycle		51µs
Data Code		Manchester Code (RZ Format)

SA48(TS5667N480)Mechanical Spec

Starting Torque	9.8 × 10 ⁻³ N·m (100gf·cm) Max.	
Moment of Inertia	6.5 × 10 ⁻⁶ kg·m ² (65g·cm ²)Typ.	
Maximum Rotating Speed	100s ⁻¹ (6,000rpm) (Mechanical Spec.) Max	
Mounting Tolerances	Radial	0.05mm TIR Max
	Axial	0.1mm Max
	Angular	0.1ÿ
Operating Temp. Range	-10ÿC to +85ÿC	
Storage Temp. Range	-20ÿC to +90ÿC	
Protective Construction	Not Enclosed	
Vibration	98m/s ² (10G)(5-2,000Hz) for 2hours	
Shock	1,960m/s ² (200G) 11msec, 3 times	
Mass	0.5kg Max Without Cable	



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