

Servo system Current-output type

S29S D24 SERIES



SPECIFICATIONS

Ta=25°C, Vcc=±24V

Spec	Types	Symbol	S29S1T0D24Z	S29S1T0D24ZM	S29S1T0D24ZJ	
Connector		—	39-28-8040 [5566-04A-210] (Molex)	38-00-6293 [6410-03C (102)] (Molex)	BH3P-VH-1 (JST)	
Rated current		If	1000A			
Maximum current 3sec		If max	± 2100A			
Measuring resistance	R <sub>L</sub>	± 15V	70°C	1000A 0Ω~ 21Ω 1200A 0Ω~ 9Ω 1300A 0Ω~ 5Ω		
			85°C	1000A 0Ω~ 18Ω 1200A 0Ω~ 7Ω		
		± 24V	70°C	1000A 0Ω~ 60.5Ω 1800A 0Ω~ 14Ω 2100A 0Ω~ 4Ω		
			85°C	1000A 10Ω~ 58.5Ω 1800A 10Ω~ 12Ω		
Output current		Io	200mA (Conversion Ratio 1:5000)			
Output current accuracy		X <sub>G</sub>	Io ± 0.4% (without Iof)			
Offset current		Iof	≤ ± 0.4mA (at If=0A) * 1			
Output linearity		ε <sub>L</sub>	≤ ± 0.1% (at If)			
Power supply voltage		Vcc	± 15V (± 5%) ~ ± 24V (± 5%)			
Consumption current		Icc	≤ ± 35mA (Without Io)			
di/dt response time (@90% of If)		tr	≤ 1us (di/dt=100A/us)			
Thermal drift of gain		TCl <sub>o</sub>	≤ ± 0.01%/°C (without TCl <sub>o</sub> f)			
Thermal drift of offset		TCl <sub>o</sub> f	≤ ± 0.5mA max (at - 10°C~+ 70°C) ≤ ± 0.8mA max (at - 40°C~+ 85°C)			
Hysteresis error		I <sub>oH</sub>	≤ ± 0.2mA (at If=0A ⇒ 3 × If ⇒ 0A )			
Insulation withstanding		Vd	AC4,000V, for 1minute (sensing current 0.5mA) ,inside of through hole ⇔ terminal			
Insulation resistance		R <sub>is</sub>	≥ 500MΩ (at DC500V) inside of through hole ⇔ terminal			
Ambient Operating temperature		T <sub>A</sub>	- 40°C~+ 85°C			
Ambient storage temperature		T <sub>S</sub>	- 40°C~+ 90°C			
Secondary coil resistance		R <sub>s</sub>	48Ω (Ta=70°C) 50Ω (Ta=85°C)			

\* 1 Offset current value is after removal of core hysteresis. \* Temperature of the primary conductor(busbar) should not exceed 100°C .  
\* Please refer to the another sheet about conditions of UL Recognition.



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  - Use that involves exposure to direct sunlight, outdoor exposure, or dusty conditions.
  - Use in locations where corrosive gases such as sea winds, Cl<sub>2</sub>, H<sub>2</sub>S, NH<sub>3</sub>, SO<sub>2</sub>, or NO<sub>2</sub>, are present. (Some product improves durability)
  - Use in environments with strong static electricity or electromagnetic radiation.
  - Use that involves placing inflammable material next to the product.
  - Use of this product either sealed with a resin filling or coated with resin.
  - Use of water or a water soluble detergent for flux cleaning.
  - Use in locations where condensation is liable to occur.
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# Application notes

## <General Considerations>

1. The sensor uses polar electronic components. When the polarity of the power supply is mistaken, the sensor is damaged.
2. Static electricity or excessive voltage can increase an offset voltage in the Hall element, and cause offset voltage to change. Please exercise care in handling and application.
3. In order to prevent the influence of noise, the use of twisted cable or shielded cable for the output line is recommended
4. If using this device within a magnetic field generated by other devices, the specified accuracy may not be obtainable.
5. Our products (several models are excluded ) are adjusted with the trimming method by the measurement condition (Load resistance, Power supply voltage) of specification sheets. Therefore, characteristics (Offset, Output, etc.) and its deviation may be changed in different circuit conditions from the measurement condition. All change characteristic items are not indicated on specification sheets.
6. The performance of current sensors with through-hole (aperture) is dependent on the position of the primary conductor. Tamura specifications are based on a primary conductor completely filling the through-hole (aperture) area.
7. The current sensor rated current in DC Amps.
8. Please use mating connector with equivalent terminal plating material to insure proper operation and avoid possibility of 'galvanic corrosion' .
9. Please do not store in high-temperature and high-humidity storage environment. Please use it after confirming soldering when it is kept for six months or more. (product soldered with substrate)
10. We recommend performing a zero offset adjustment by measuring the offset voltage at startup. In continuously operation for a few months, or at change of ambient temperature or humidity is large, we recommend regularly performing a zero offset adjustment at being idling (it is clear that the current is not apply) .
11. The current sensor doesn't have built-in protection circuit (devices and fuses, etc.). As a failure mode of the sensor, there is a short circuit and open state. In the case of a short-circuit state, the abnor-mal temperature rise of the internal parts is assumed, and there is a possibility to smoke and to ignite. If it is used in safety critical circuit blocks, please take appropriate measures by protection devices, protection circuits, etc. For closed loop -type sensors and flux gate (closed loop type) sensors, the consumption current of the secondary power supply varies in proportion to the measurement current.

## <Open loop>

1. High frequency primary current may result in excessive heating in iron magnetic core and cause damage to internal circuitry; for high frequency applications select current sensor with ferrite core material.
2. If the measured current exceeds the rated current, magnetic core saturation will occur and the output voltage signal will not be linearly proportional to the measured current.

## <Closed Loop>

1. For closed loop current sensors please insure the power supply voltage is balanced, symmetrical, and, applied simultaneously to avoid potential increase in DC offset error.
2. Maximum rated current measurement duration is timedependent. Maximum rated current applied in excess of the time limit can result in damage to internal electronic circuitry; please consult Tamura for assistance.
3. When using a measurement resistor to convert current output to voltage output select a resistor with stable temperature characteristic to insure accuracy of the output voltage.
4. Compensation current supplied to the secondary winding varies in proportion to the measured current based on the conversion ratio. (If/ $KN$ ;  $KN = \text{secondary turns}$ ) Please insure the PSU has required current capacity to supply compensation current to the secondary winding.

## <Flux-Gate>

1. Compensation current supplied to the secondary winding varies in proportion to the measured current. Please insure the PSU has required current capacity to supply compensation current to the secondary winding.
2. There is 450kHz ripple voltage present on the output and reference output voltage signals . An external capacitor maybe added if necessary.