Magnetic Proportion System / Through Type, Ta=105℃ Operating

L34S D15T SERIES

ABSOLUTE MAXIMUM RATINGS

Parameters	Symbol	Unit	Value	Comment
Supply voltage	Vcc	V	± 18V	
Primary conductor temperature	—	℃	105	
Minimum load resistance	R_L	—	2 kΩ	Recommend R_L = 10k Ω

ISOLATION CHARACTERISTICS

Parameters	Symbol	Unit	Value	Comment
Insulation voltage	Vd	—	AC3000V, for 1minute (Sensing current 0.5mA)	Primary ⇔ Secondary
Impulse withstand voltage	Vw	kV	6.0	Primary ⇔ Secondary Input waveform : ・Front time 1.2μs ・Time to half value 50μs ・single
Insulation resistance	R_{IS}	—	≧ 500M Ω (at DC500V)	Primary ⇔ Secondary
Clearance distance	d_{Cl}	—	6.6mm (MIN)	Primary ⇔ Secondary
Creepage distance	d_{Cp}	—	6.6mm (MIN)	Primary ⇔ Secondary
Case material	—	—	UL94 V-0	
Comparative Tracking Index ; (CTI)	CTI	V	200 (group IIIa)	
Application example	—	—	300V, CAT Ⅲ, PD2	Reinforced isolation, non uniform field according to EN62477-1 : 2012 and EN62477-1 : 2012/A11 2014
	—	—	600V, CAT Ⅲ, PD2	Basic isolation, non uniform field according to EN62477-1 : 2012 and EN62477-1 : 2012/A11 2014

ENVIRONMENTAL AND MECHANICAL CHARACTERISTICS

Parameters	Symbol	Unit	Value			Comment
			MIN	TYP	MAX	
Ambient operating temperature ＊1	T_A	℃	− 40		+ 105	
Ambient storage temperature	T_S	℃	− 40		+ 105	
Mass	m	g		165		
Internal magnetic core	—	—	Silicon steel			

＊1 Temperature of the connector should not exceed 105℃ because the absolute maximum temperature of the connector is +105℃.

SPECIFICATIONS

Ta=+25℃,R_L=10kΩ,V_{CC}=±15V

Parameters		Symbol	Unit	Value			Comment
				MIN	TYP	MAX	
Primary norminal current	**L34S200D15T**	I_{PN}	A		200		
	L34S300D15T				300		
	L34S400D15T				400		
	L34S500D15T				500		
	L34S600D15T				600		
	L34S800D15T				800		
	L34S1T0D15T				1000		
	L34S1T2D15T				1200		
	L34S1T5D15T				1500		
Primary current, measuring range ＊1,2	**L34S200D15T**	I_{PM}	A	600			
	L34S300D15T			900			
	L34S400D15T			1200			
	L34S500D15T			1500			
	L34S600D15T			1800			
	L34S800D15T			2400			
	L34S1T0D15T			2500			
	L34S1T2D15T			2500			
	L34S1T5D15T			2500			
Supply Voltage		Vcc	V	± 12 (± 5%)	± 15 (± 5%)		
Consumption current		Icc	mA		16	25	
Rated output voltage		Vo	V	3.960	4.000	4.040	at I_{PN}
Offset voltage ＊3		Vof	V	− 0.020	0.000	+ 0.020	at Ip = 0A
Hysteresis error		V_{OH}	mV	− 10		± 10	at 0A → I_{PN} → 0A
Temperature coefficient of Vo		TcVo	%/℃	− 0.05		+ 0.05	Without TcVof
Temperature coefficient of Vof		TcVref	mV/℃	− 1.0		± 1.0	at Ip = 0A
Linearity error (0A ～ I_{PN})		ε_L	%	− 0.5		+ 0.5	at 0A , 1/2I_{PN} , I_{PN}
Response time (@90% of Ip) ＊4		tr	μs			5	di/dt=100A/μs
Frequency bandwidth (− 3dB) ＊5		BW	kHz	25			at very low current

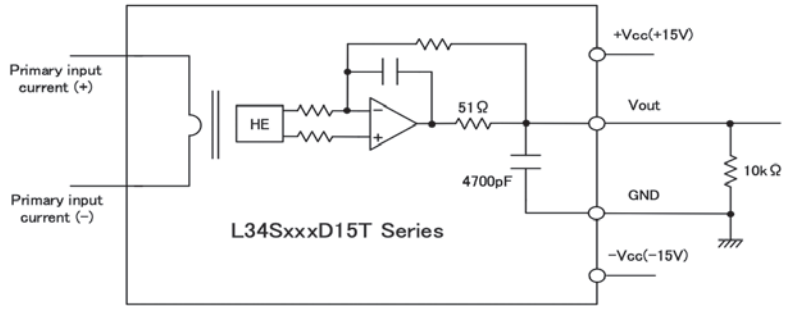
＊1 If the product of 800A or less operate at Vcc = ± 12V power supplies, measuring range reduced to 2.5 x I_{PN}.
＊2 The value of measured current which indicates an output with a greater than ± 5% deviation from the theoretical output value.
＊3 Offset voltage value is after removal of core hysteresis.
＊4 Measurement condition : Primary conductor cross sectional area is as same as through hole, and penetration with 1turn in through hole.
＊5 High fundamental frequency primary current and/or harmonic current may result in excessive heating in magnetic core (Silicon steel).

STANDARDS

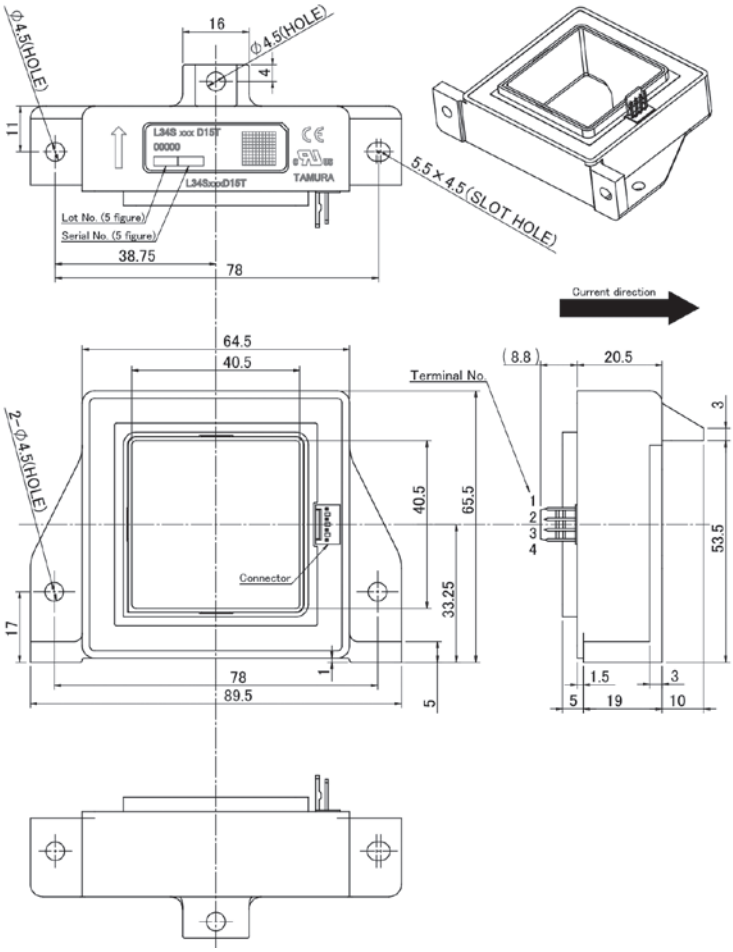
EN62477-1 : 2012 and EN62477-1 : 2012/A11 2014, UL508, CSA

※ Please refer to the another sheet about conditions of UL Recognition.

CONNECTION



DIMENSIONS (mm)



Terminal number

1 +Vcc (+15V)
2 −Vcc (−15V)
3 Vout
4 GND

Unit mm

Note

Unless otherwise specified tolerances shall be ±0.5mm.

Order number and Connector number (terminal plating)

Types		Connector			
		Manufacturer	Part Number	Old Part Number	Plating of terminal
L34SxxxD15T	Standard	Molex	22-04-1041	5045-04A	Sn
L34SxxxD15T-A	Build to Order		22-11-1041	5045-04AG	Au

*As for the L34SxxxD15T series of a gold-plated connector, '−A' attaches to the end of the product name.

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2. This product is intended to be used in general electronics applications (electric home appliances, business equipment, information equipment, communication terminal equipment, measuring devices, industrial equipment, and so on). This product is neither intended nor warranted for use in following equipment or devices:

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   - *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 = 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.

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