

Magnetic Proportion System / Through Type, Ta=105°C Operating

L55S D15 SERIES



[STANDARDS]
 •UL508
 •CSA C22.2 No.14-18
 •EN 62477-1

RoHS

ABSOLUTE MAXIMUM RATINGS

Parameters	Symbol	Unit	Value	Comment
Supply voltage	V _{CC}	V	± 18V	
Primary conductor temperature	—	°C	120	

ISOLATION CHARACTERISTICS

Parameters	Symbol	Unit	Value	Comment
Insulation voltage	V _d	—	AC5000V, for 1minute (Sensing current 0.5mA)	Primary ↔ Secondary
Impulse withstand voltage	V _w	kV	12	Primary ↔ Secondary Input waveform : • Front time 1.2μs • Time to half value 50μs • single
Insulation resistance	R _{IS}	—	≥ 1000M Ω (at DC500V)	Primary ↔ Secondary
Clearance distance	d _{CL}	—	14.0mm (MIN)	Primary ↔ Secondary
Creepage distance	d _{CP}	—	14.0mm (MIN)	Primary ↔ Secondary
Case material	—	—	UL94 V-0	
Filler material	—	—	UL94 V-0	
Comparative Tracking Index ; (CTI)	Case	CTI	V	600 (group I)
	Filler	CTI	V	600 (group I)

ENVIRONMENTAL AND MECHANICAL CHARACTERISTICS

Parameters	Symbol	Unit	Value			Comment
			MIN	TYP	MAX	
Ambient operating temperature * 1	T _A	°C	− 40		+ 105	
Ambient storage temperature	T _S	°C	− 40		+ 105	
Mass	m	g		620		
Internal magnetic core	—	—	Silicon steel			

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

SPECIFICATIONS

Ta=+25°C, RL=10kΩ, Vcc=±15V

Parameters			Symbol	Unit	Value			Comment
					MIN	TYP	MAX	
Primary nominal current	L55S1T5D15***		I _{PN}	A		1500		
	L55S2T0D15***					2000		
	L55S2T5D15***					2500		
Primary current, measuring range * 1, 2	L55S1T5D15***	5%	I _{PM}	A	−4500		4500	
	L55S2T0D15***	5%			−4500		4500	
		10%			−5500		5500	
	L55S2T5D15***	5%			−4500		4500	
		10%			−5500		5500	
Supply Voltage			V _{CC}	V	± 12(± 5%)	± 15(± 5%)		
Consumption current			I _{CC}	mA		20	30	at I _p = 0A, I _{CC} = 20 + V _{out} / R _L
Rated output voltage			V _O	V	3.960	4.000	4.040	at I _{PN}
Offset voltage * 3	L55S1T5D15***		V _{OF}	V	−0.030	0.000	+0.030	at I _p = 0A
	L55S2T0D15***				−0.020	0.000	+0.020	
	L55S2T5D15***				−0.020	0.000	+0.020	
Hysteresis error			V _{OH}	mV	−15		15	at 0A → I _{PN} → 0A
Temperature coefficient of V _O			TcV _O	%/°C	−0.05		+0.05	Without TcV _{OF}
Temperature coefficient of V _{OF}			TcV _{OF}	mV/°C	−1		+1	at I _p = 0A
Linearity error (0A ~ I _{PN})			ε _L	%	−1		+1	
Output load resistance			R _L	kΩ		10		
Response time (@90% of I _{PN}) * 4			t _r	μs			5	di/dt=100A/μs
Frequency bandwidth (-3dB) * 5			BW	kHz	25			at very low current

*1 If the product of 1500A or less operate at V_{CC} = ± 12V power supplies, measuring range is reduced to 2.5 x I_{PN}.

*2 The value of measured current which indicates an output with a greater than ± 5%(or 10%) deviation from 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 1 turn in through hole.

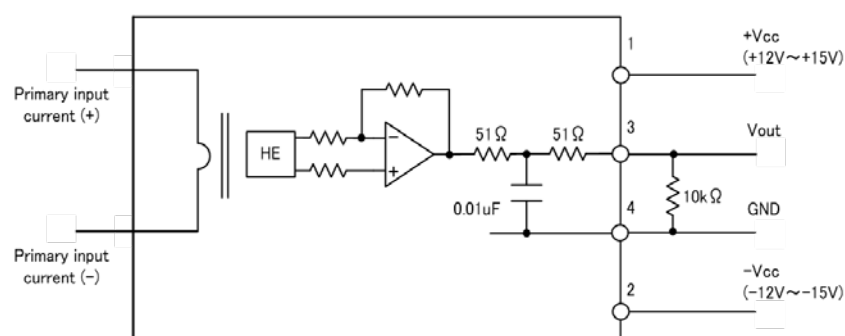
*5 High fundamental frequency primary current and/or harmonic current may result in excessive heating in magnetic core (Silicon steel).



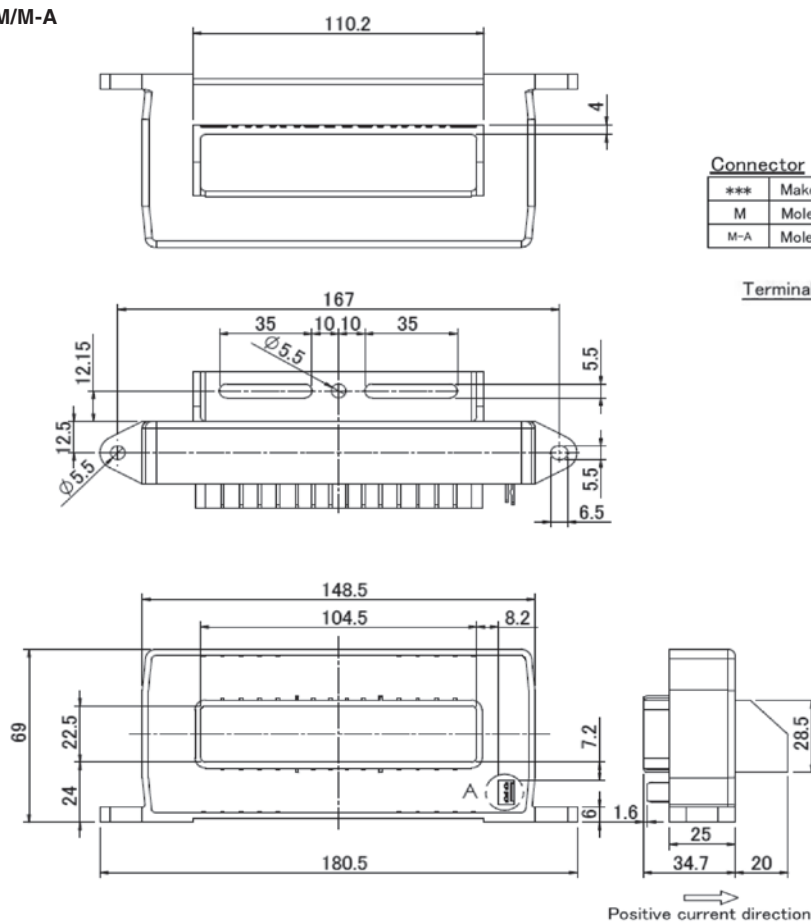
Rated voltage 1000V, CAT III, PD2, Reinforced isolation, non uniform field



Rated voltage 1000V, PD2

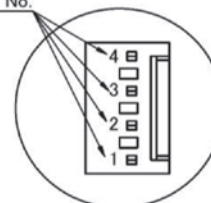


L55SxxD15M/M-A



***	Maker	Parts No.	Old Parts No
M	Molex	22-04-1041	5045-04A
M-A	Molex	22-11-1041	5045-04AG

Terminal No.



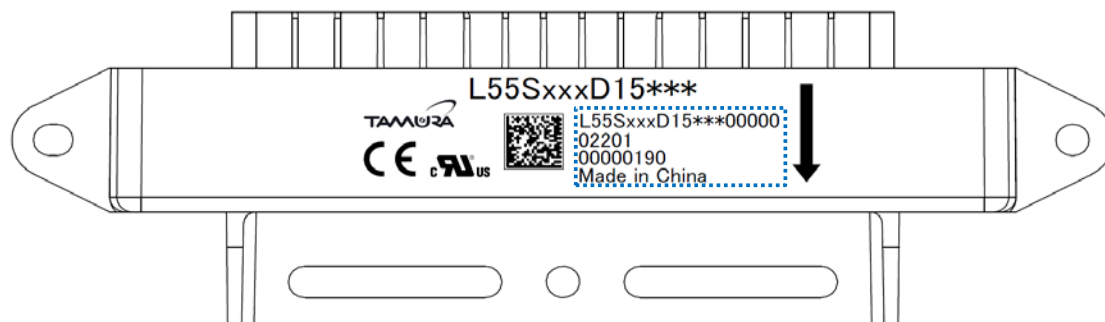
Detail A
Scale 2 : 1

Terminal No.
1. +Vcc(+15V)
2. -Vcc(-15V)
3. Vout
4. GND

Tolerance: ± 1
Unit: mm

Recommended fastening screw type : M5 with flat washer and spring washer
Recommended fastening torque : $< 1.5 \text{ N} \cdot \text{m}$

MARKING



Lot No.例 Example of Lot No.

L55SxxxD15*** (*6)

02201

00000190

Made in China

Types

Revision code(1 figure), Date code(4 figures)

Serial No.(6 figures)

Country of production

*6 Digit number adjustment code

Order number and Connector number (terminal plating)

Types		Connector			
		Manufacturer	Part Number	Old Part Number	Plating of terminal
L55SxxxD15M	Standard	Molex	22-04-1041	5045-04A	Sn
L55SxxxD15M-A	Build to Order		22-11-1041	5045-04AG	Au

* As for the L55SxxxD15M series of a gold-plated connector, ' -A ' attaches to the end of the product name.

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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 abnormal 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.