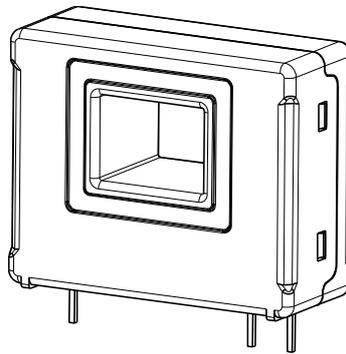


CS3A P51 SERIES

Current Sensor

Model Number:

CS3A 50 P51
CS3A 100 P51



For the electronic measurement of current:DC,AC, pulsed..., with galvanic separation between the primary and the secondary circuits.

Features

- ✧ Closed loop (compensated) current sensor using the Hall Effect
- ✧ Galvanic separation between primary and secondary
- ✧ Insulating plastic case recognized according to UL 94-V0
- ✧ Very good linearity
- ✧ High accuracy
- ✧ Very low offset drift over temperature
- ✧ No insertion loss
- ✧ Standards:
 - IEC 50178:1997
 - IEC 61010-1:2000
 - IEC 508: 2010

Applications

- ✧ AC variable speed and servo motor drives
- ✧ Uninterruptible Power Supplies (UPS)
- ✧ Static converters for DC motor drives
- ✧ Switch Mode Power Supplies (SMPS)
- ✧ Power supplies for welding applications
- ✧ Battery management
- ✧ Wind energy inverter
- ✧ Test and detection devices

Safety

This sensor must be used according to IEC 61010-1.

This sensor must be used in electric/electronic equipment with respect to applicable standards and safety requirements in accordance with the following manufacture's operating instructions.

Caution, risk of electrical shock!



When operating the sensor, certain parts of the module can carry hazardous voltage (e.g., Primary busbar, power supply). Ignore this warning can lead to injury and/or cause serious damage.

This sensor is a built-in device, whose conducting parts must be inaccessible after installation. A protective housing or additional shield could be used.

Main supply must be able to be disconnected.

Absolute maximum ratings(not operating)

Parameter	Symbol	Unit	Value
Supply voltage	V_C	V	± 18
Primary conductor temperature	T_B	$^{\circ}\text{C}$	100

- ※ Stresses above these ratings may cause permanent damage.
- ※ Exposure to absolute maximum ratings for extended periods may degrade reliability.

Environmental and mechanical characteristics

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Ambient operating temperature	T_A	$^{\circ}\text{C}$	-40		85	
Ambient storage temperature	T_S	$^{\circ}\text{C}$	-40		85	
Mass	m	g		25		
Standards	EN 50178, IEC 61010-1, UL 508C					

Insulation coordination

Parameter	Symbol	Unit	Value	Comment
Rms voltage for AC insulation test @ 50Hz,1min	V_d	kV	3	
Impulse withstand voltage 1.2/50 μs	V_W	kV	7	
Clearance (pri.- sec.)	d_{Cl}	mm	6.7	
Creepage distance (pri.- sec.)	d_{Cp}	mm	6.7	
Plastic case	-	-	UL94-V0	
Comparative tracking index	CTI	PLC	3	
Application example	-	-	300V CAT III PD2	Reinforced insulation,according to EN 50178, EN 61010-1
Application example	-	-	600V CAT III PD2	Basic insulation,according to EN 50178, EN 61010-1

Electrical data

CS3A 50 P51

※ With $T_A = 25^\circ\text{C}$, $V_C = \pm 15\text{V}$, $R_M = 30\Omega$, unless otherwise noted.

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal rms current	I_{PN}	A		± 50		
Primary current, measuring range	I_{PM}	A	-90		90	
Measuring resistance	R_M	Ω	0		114	@ $\pm 12\text{V}$, 75°C , $\pm 50\text{A}$
			0		8	@ $\pm 12\text{V}$, 75°C , $\pm 90\text{A}$
			30		230	@ $\pm 15\text{V}$, 75°C , $\pm 50\text{A}$
			30		158	@ $\pm 15\text{V}$, 75°C , $\pm 90\text{A}$
Secondary nominal rms current	I_{SN}	mA		± 50		
Secondary current, measuring range	I_{SP}	mA	-90		90	
Secondary coil resistance	R_S	Ω		30		@ 70°C
Number of secondary turns	N_S	-		1000		
Theoretical sensitivity	G_{th}	mA/A		1.0		
Supply voltage	V_C	V	± 12		± 15	@ $\pm 5\%$
Current consumption	I_C	mA		$30 + I_S$		
Zero offset current	I_O	mA	-0.2	± 0.1	0.2	
Thermal drift of offset current	I_{OT}	mA	-0.5	± 0.2	0.5	@ $-20^\circ\text{C} \sim 75^\circ\text{C}$
Residual current @ $I_P=0$ after $1 \times I_{PN}$	I_{OM}	mA	-0.2	± 0.1	0.2	
Sensitivity error	\mathcal{E}_G	%	-0.1		0.1	Exclusive of I_O
Linearity error $0 \dots I_{PN}$	\mathcal{E}_L	% of I_{PN}	-0.1	± 0.05	0.1	Exclusive of I_O
Accuracy @ I_{PN}	X	% of I_{PN}	-0.5	± 0.3	0.5	Exclusive of I_O
Response time @ 90% of I_{PN}	t_r	μs		0.5		
Frequency bandwidth (-1dB)	BW	kHz		150		

Electrical data

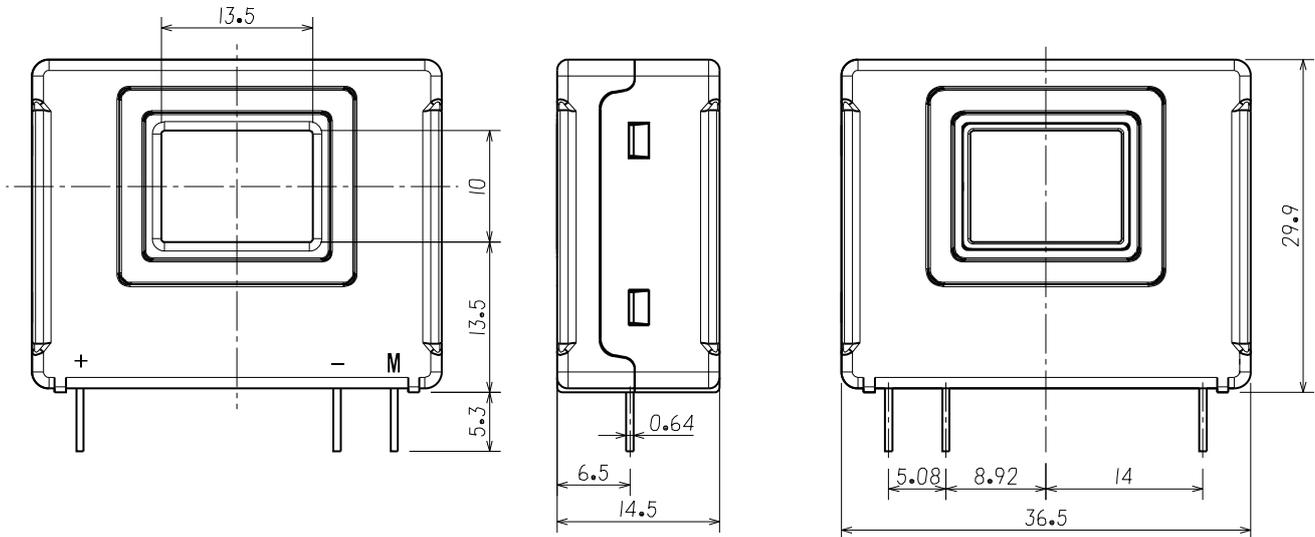
CS3A 100 P51

※ With $T_A=25^{\circ}\text{C}$, $V_C=\pm 15\text{V}$, $R_M=30\Omega$, unless otherwise noted.

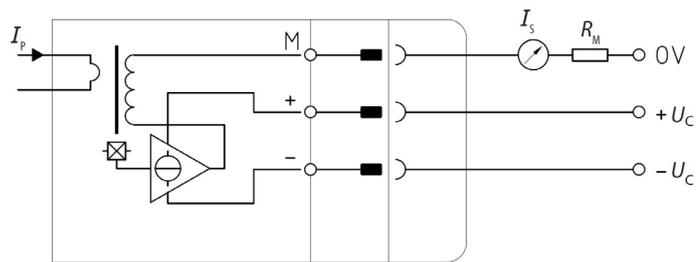
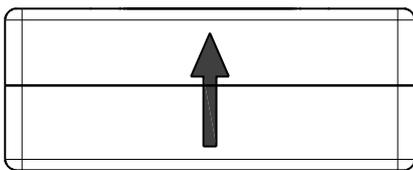
Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal rms current	I_{PN}	A		± 100		
Primary current, measuring range	I_{PM}	A	-150		150	
Measuring resistance	R_M	Ω	0		64	@ $\pm 12\text{V}$, 75°C , $\pm 100\text{A}$
			0		32	@ $\pm 12\text{V}$, 75°C , $\pm 150\text{A}$
			30		100	@ $\pm 15\text{V}$, 75°C , $\pm 100\text{A}$
			30		56	@ $\pm 15\text{V}$, 75°C , $\pm 150\text{A}$
Secondary nominal rms current	I_{SN}	mA		± 100		
Secondary current, measuring range	I_{SP}	mA	-150		150	
Secondary coil resistance	R_S	Ω		30		@ 70°C
Number of secondary turns	N_S	-		1000		
Theoretical sensitivity	G_{th}	mA/A		1.0		
Supply voltage	V_C	V	± 12		± 15	@ $\pm 5\%$
Current consumption	I_C	mA		$30+I_S$		
Zero offset current	I_O	mA	-0.2	± 0.1	0.2	
Thermal drift of offset current	I_{OT}	mA	-0.5	± 0.2	0.5	@ $-20^{\circ}\text{C}\sim 75^{\circ}\text{C}$
Residual current@ $I_P=0$ after $1X I_{PN}$	I_{OM}	mA	-0.2	± 0.1	0.2	
Sensitivity error	\mathcal{E}_G	%	-0.1		0.1	Exclusive of I_O
Linearity error 0... I_{PN}	\mathcal{E}_L	% of I_{PN}	-0.1	± 0.05	0.1	Exclusive of I_O
Accuracy @ I_{PN}	X	% of I_{PN}	-0.5	± 0.3	0.5	Exclusive of I_O
Response time@ 90% of I_{PN}	t_r	μs		0.5		
Frequency bandwidth (-1dB)	BW	kHz		150		

CS3A P51 SERIES

Dimensions (in mm. 1 mm = 0.0394 inch)



Connection



Mechanical characteristics

- ◇ General tolerance ± 0.3 mm
- ◇ Primary busbar 13.5x10.0mm
- ◇ Connection of secondary 3pins
0.64x0.64mm
- ◇ Recommended PCB hole $\Phi 1.0$ mm

Remarks

- ◇ V_{OUT} and I_P are in the same direction, when I_P flows in the direction of arrow.
- ◇ Temperature of primary conductor should not exceed 100°C.
- ◇ Dynamic performances (di/dt and response time) are best with a single bar completely filling the primary hole.

This is a series of standard models, for different versions (supply voltages, connectors...), please contact CHIPSENSE.