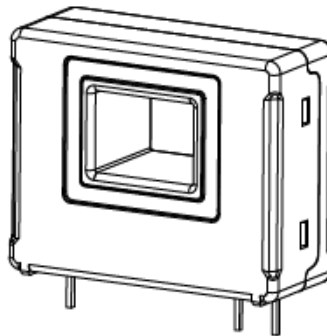


# CS3A P21 SERIES

## Current Sensor

### Model Number:

CS3A 100 P21



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	$\pm 18$
Primary conductor temperature	$T_B$	°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	$T_A$	°C	-40		85	
Ambient storage temperature	$T_S$	°C	-40		90	
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 1.2/50μs	$V_W$	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

# CS3A P21 SERIES

## Electrical data

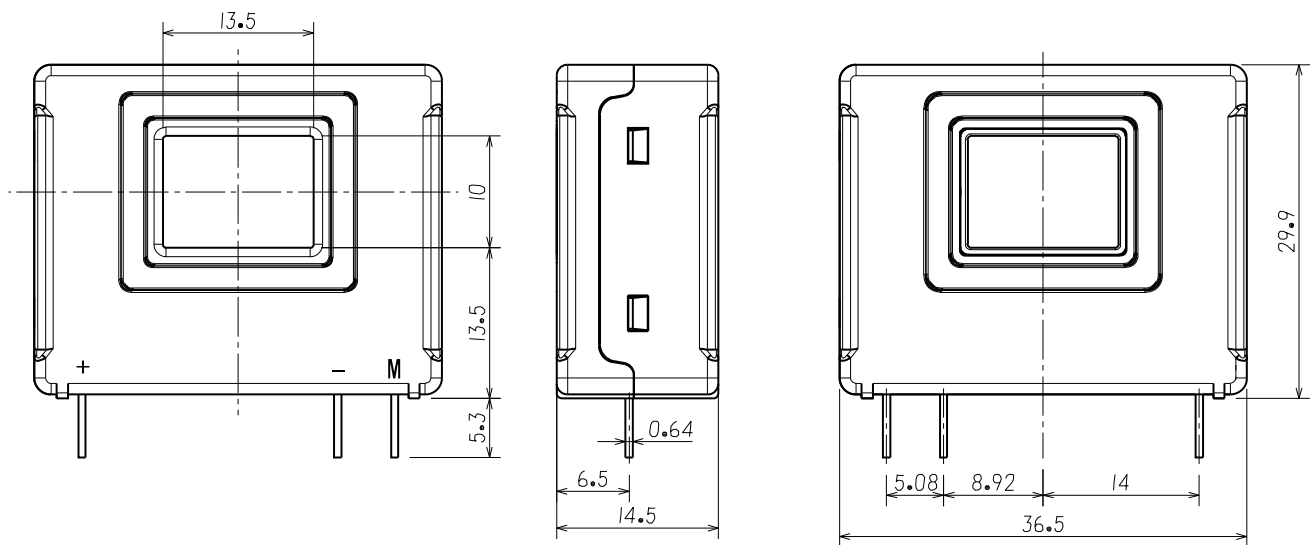
### CS3A 100 P21

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

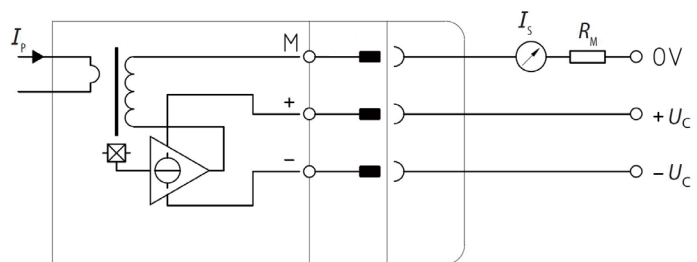
Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal rms current	$I_{PN}$	A		$\pm 100$		
Primary current, measuring range	$I_{PM}$	A	-150		150	
Measuring resistance	$R_M$	$\Omega$	0 0 0 0		100 50 170 90	@ $\pm 12\text{V}$ , $85^{\circ}\text{C}$ , $\pm 100\text{A}$ @ $\pm 12\text{V}$ , $85^{\circ}\text{C}$ , $\pm 150\text{A}$ @ $\pm 15\text{V}$ , $85^{\circ}\text{C}$ , $\pm 100\text{A}$ @ $\pm 15\text{V}$ , $85^{\circ}\text{C}$ , $\pm 150\text{A}$
Secondary nominal rms current	$I_{SN}$	mA		$\pm 50$		
Secondary current, measuring range	$I_{SP}$	mA	-75		75	
Secondary coil resistance	$R_S$	$\Omega$		75		@ $70^{\circ}\text{C}$
Number of secondary turns	$N_S$	-		2000		
Theoretical sensitivity	$G_{th}$	mA/A		0.5		
Supply voltage	$V_C$	V	$\pm 12$		$\pm 15$	@ $\pm 5\%$
Current consumption	$I_C$	mA		$30+I_S$		
Zero offset current	$I_O$	mA	-0.2	$\pm 0.1$	0.2	
Thermal drift of offset current	$I_{OT}$	mA	-0.5		0.5	@ $-40^{\circ}\text{C}\sim 85^{\circ}\text{C}$
Residual current@ $I_P=0$ after $1\times I_{PN}$	$I_{OM}$	mA	-0.15		0.15	
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	$\pm 0.05$	0.1	Exclusive of $I_O$
Accuracy @ $I_{PN}$	$X$	% of $I_{PN}$	-0.5	$\pm 0.3$	0.5	Exclusive of $I_O$
Response time@ 90% of $I_{PN}$	$t_r$	$\mu\text{s}$			1	
Frequency bandwidth (-1dB)	$BW$	kHz		150		

# CS3A P21 SERIES

Dimensions (in mm. 1 mm = 0.0394 inch)



## Connection



## Mechanical characteristics

- ✧ General tolerance  $\pm 0.3$  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  $100^{\circ}\text{C}$ .
- ✧ 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.