

# K09 Series Current Sensor

The K09 series is an Open-Loop current sensor based on the Hall effect. It provides electronic measurement of DC, AC or pulse currents at same time, and their combinations with galvanic between the primary (high current) and secondary circuits.



## Features

- Non-contact measurement of high current
- Output voltage proportional to carried current
- Max. measuring range  $\pm 1000\text{A}$  (DC or AC peak)
- RoHs compliance (Lead-Free)

## Applications

- Frequency converters
- Servo motor drives
- Battery management systems
- Welding applications

## Advantages

- Design for wide current range measurement
- High immunity from external interference
- High ESD sensitivity (Human Body Model) 8kV

## Standards

- EN 50178:1997

## Absolute maximum ratings

Symbol	Parameter	Min.	Max.	Unit
$V_{DD\ max.}$	Maximum supply voltage (not destructive)	-15.7	15.7	V
$I_{PM}$	Maximum measuring current	-1000	1000	A
$T_{PC}$	Primary conductor temperature		110	°C
$T_A$	Ambient operating temperature	-25	85	°C
$T_S$	Storage temperature range	-25	85	°C
$V_{ESD-HBM}$	ESD sensitivity HBM (Human Body Model)		4	kV

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

## Specifications ( $T_A = 25^\circ\text{C}$ , $V_{DD} = \pm 15.0\text{V}$ )

Symbol	Parameter	Test condition	Min.	Typ.	Max.	Unit
$V_{DD}$	Supply voltage			±15		V
$I_C$	Current consumption	$I_P=0\text{A}$ without load		15	20	mA
$I_{PN}$	Current nominal measuring range	K09D050D15	-150	±50	150	A
		K09D100D15	-300	±100	300	
		K09D200D15	-600	±200	600	
		K09D300D15	-900	±300	900	
		K09D400D15	-1000	±400	1000	
		K09D500D15	-1000	±500	1000	
		K09D600D15	-1000	±600	1000	
$V_{OUT}$	Output voltage	$\pm I_{PN}$		±4		V
$V_{OE}$	Offset voltage	$I_P=0\text{A}$	-20		20	mV
$R_{OUT}$	Output internal resistance			100		$\Omega$
$R_L$	Output load resistance	$V_{OUT}$ to GND		>1		k $\Omega$
$\epsilon_L$	Non-linearity error	$\pm I_{PN}$ without offset		1		%/ $I_{PN}$

## Specifications ( $T_A = 25^\circ\text{C}$ , $V_{DD} = \pm 15.0\text{V}$ )

Symbol	Parameter	Test condition	Min.	Typ.	Max.	Unit
$V_{om}$	Magnetic offset voltage	$I_p = 0\text{A} \rightarrow I_{pn} \rightarrow 0\text{A}$		$\pm 20$		mV
$T_{cvoe}$	Temperature coefficient of $V_{oe}$	K09D050D15	-2		2	mV/K
		K09D100...600D15	-1		1	mV/K
$T_{cvoUT}$	Temperature coefficient of $V_{out}$	$T_A = -25^\circ\text{C} \dots 85^\circ\text{C}$ (except $T_{cvoe}$ )	-0.1		0.1	%/K
$T_R$	Step response to 90% of $I_{pn}$			3		$\mu\text{s}$
<b>BW</b>	Frequency bandwidth(-3dB)			50		kHz

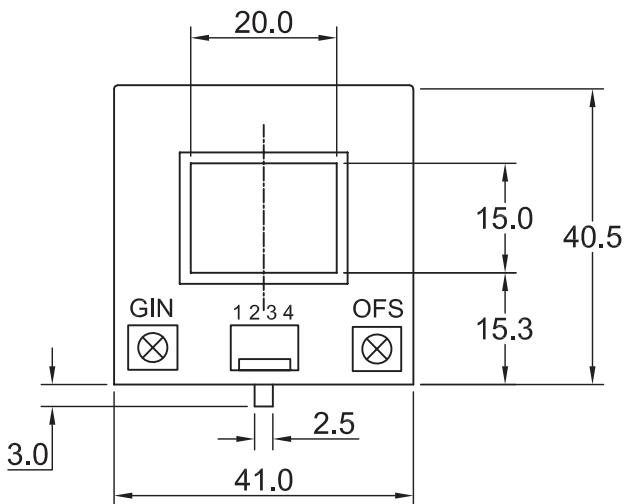
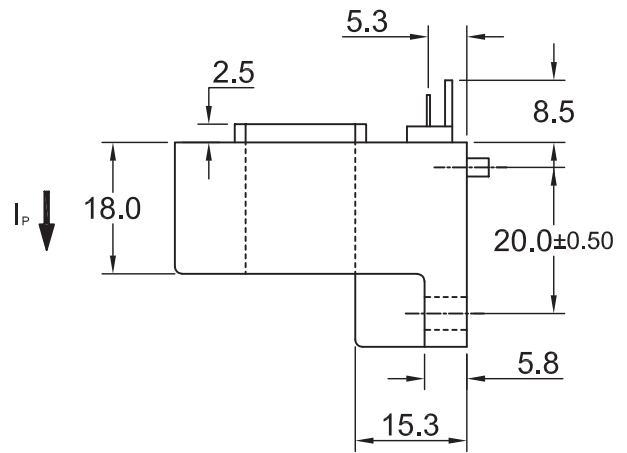
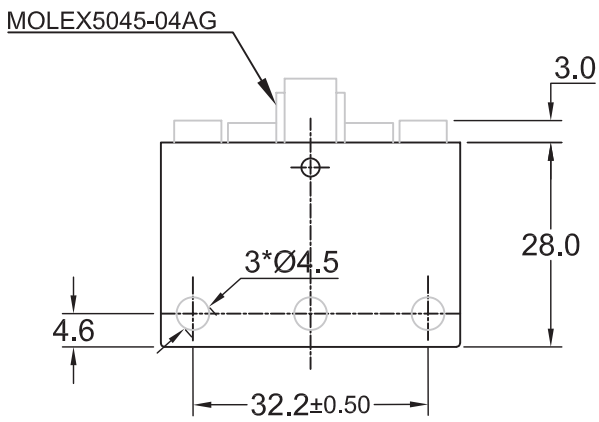
## Insulation characteristics

Symbol	Parameter	Value	Unit	Comment
$V_D$	Insulation voltage for isolation, 50Hz, 1 min	3000	V	
$R_{iso}$	Isolation resistance @500VDC	>500	$M\Omega$	
<b>D-CLE</b>	Clearance	9.8	mm	Shortest distance through air
<b>D-CRD</b>	Creepage distance	12.1	mm	Shortest path along sensor body

## General characteristics

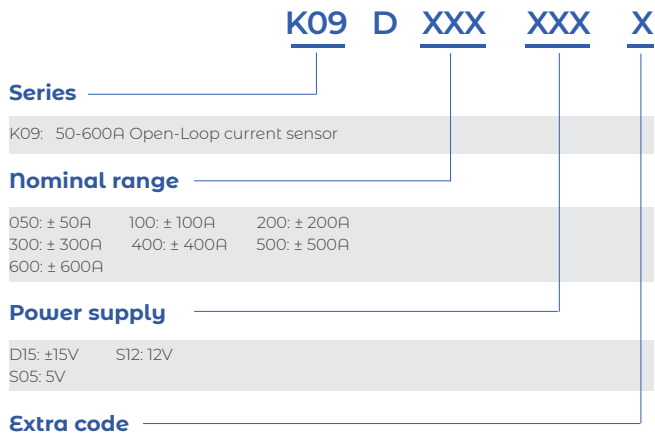
Symbol	Parameter	Value	Unit	Comment
<b>m-HSE</b>	Housing material	V0		Flame retardant UL 94
<b>m-FC</b>	Flux collector material	Oriented silicon steel		Superior magnetic permeability

## Dimension (mm)



Pin	Symbol
1	+V <sub>DD</sub>
2	-V <sub>DD</sub>
3	V <sub>OUT</sub>
4	GND

# Name Guide Description



## Notes

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# Safety and Environment



The product is to be installed by manufacturer trained personnel or competent person trained in accordance with manufacturer installation instructions.

With respect to applicable standards IEC 61010-1/ EN 61010-1 *safety requirements for electrical equipment for measurement, control and laboratory use part 1 general requirements*, the product should be used in limited energy secondary circuits.



## Risk of electrical shock

Certain parts of the module can carry hazardous voltage during the operation process of the product because hazardous live voltage of primary conductor, power supply occurs, injury and/or serious damage will be caused if this warning is ignored.

Conducting parts must be inaccessible after installation of the product. Additional protection including shield or protective housing could be used according to IEC 60664 Insulation coordination for equipment within low-voltage supply systems.

Disconnection of the main supply will protect against possible injury and serious damage.



## ESD protection

Damage from an ESD event will occur if the personnel is not well grounded when handling.

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