

K12 Series Current Sensor

The K12 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 $\pm 5500A$ (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
- IEC 61010-1:2010

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	- 5500	5500	A
T_{PC}	Primary conductor temperature		110	°C
T_A	Ambient operating temperature	-40	85	°C
T_S	Storage temperature range	-40	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	K12D500D15	-1500	±500	1500	A
		K12D600D15	-1800	±600	1800	
		K12D850D15	-2550	±850	2550	
		K12D1000D15	-3000	±1000	3000	
		K12D1200D15	-3600	±1200	3600	
		K12D1500D15	-4500	±1500	4500	
		K12D2000D15	-5500	±2000	5500	
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		Ω
R_L	Output load resistance	V_{OUT} to GND		>1		k Ω
ϵ_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	$I_p = 0\text{A} \rightarrow I_{pn} \rightarrow 0\text{A}$		± 20		mV
T_{cvoe}	Temperature coefficient of V_{oe}		-1		1	mV/K
T_{cvoUT}	Temperature coefficient of V_{out}	$T_A = -40^\circ\text{C} \dots 85^\circ\text{C}$ (except T_{cvoe})	-0.1		0.1	%/K
T_R	Step response to 90% of I_{pn}			5		μs
BW	Frequency bandwidth(-3dB)			25		kHz

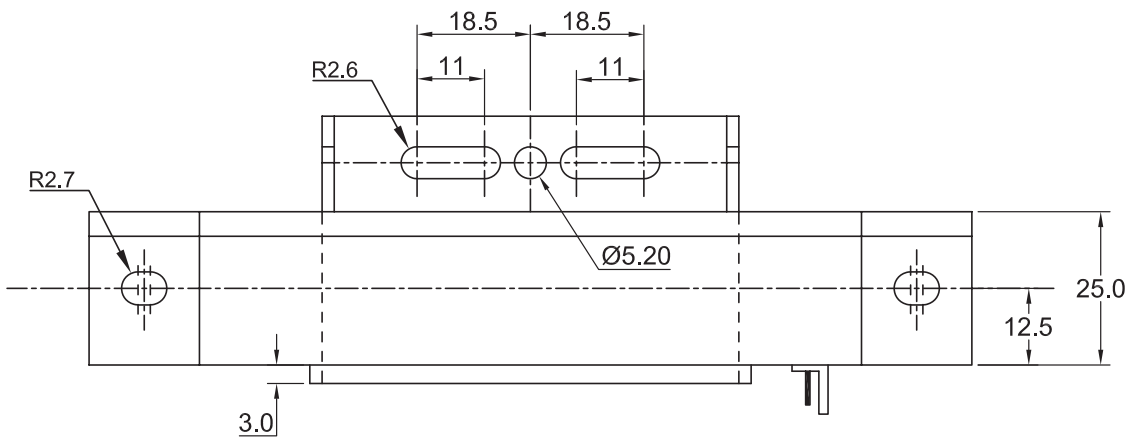
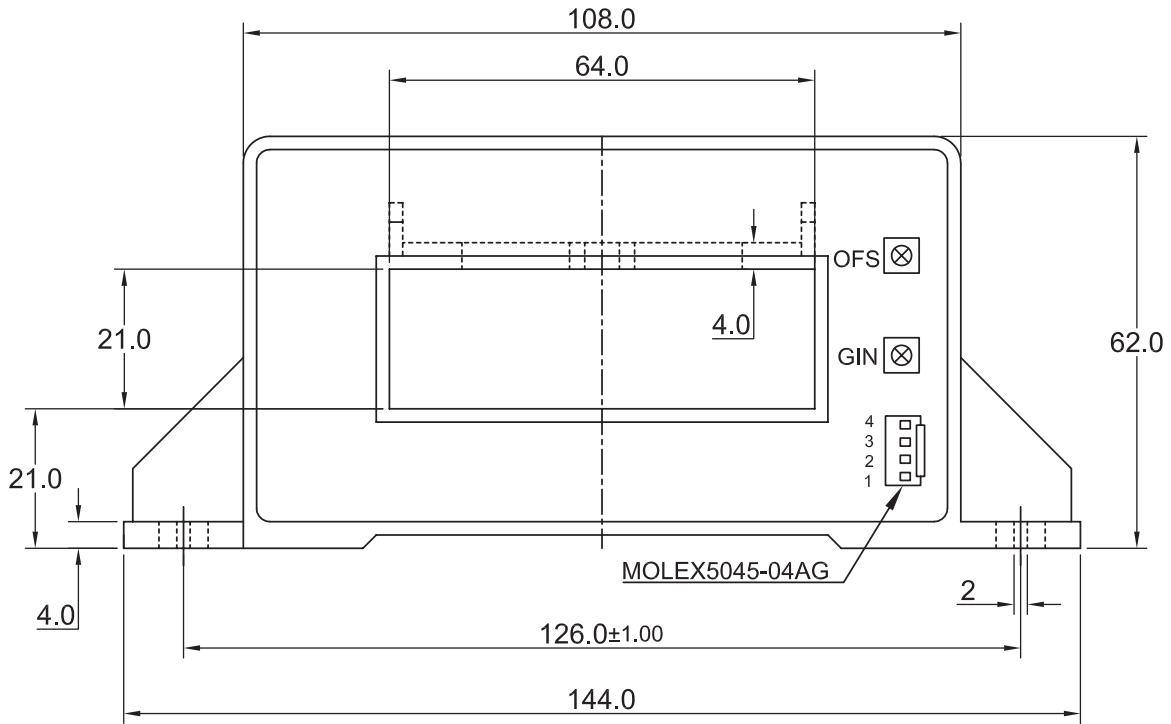
Insulation characteristics

Symbol	Parameter	Value	Unit	Comment
V_D	Insulation voltage for isolation, 50Hz, 1 min	5000	V	
R_{iso}	Isolation resistance @500VDC	>500	$M\Omega$	
D-CLE	Clearance	12.7	mm	Shortest distance through air
D-CRD	Creepage distance	15.7	mm	Shortest path along sensor body

General characteristics

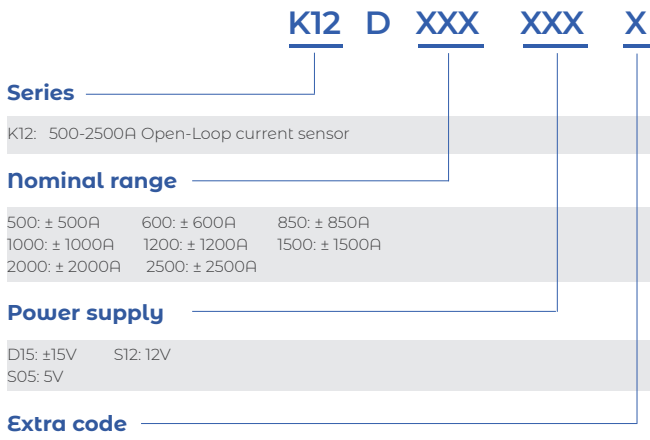
Symbol	Parameter	Value	Unit	Comment
m-HSE	Housing material	V0		Flame retardant UL 94
m-FC	Flux collector material	Oriented silicon steel		Superior magnetic permeability

Dimension (mm)



Pin	Symbol
1	+V _{DD}
2	-V _{DD}
3	V _{OUT}
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.

Important notice

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