K18 Series Current Sensor

The K18 series is a Open-Loop current sensor based on the Hall effect. It provides electronic measurement of DC, AC or pulse current at same time, and their combinations with galvanic between the primary (high current) and secondary circuits, PCB mount design is suitable for general low power applications.

Features

- Non-contact measurement of high current
- Output voltage proportional to carried current
- Max. measuring range ±180A (DC or AC peak)
- RoHs compliance (Lead-Free)

Advantages

- Compact design for general industrial measurement
- Excellent dv/dt performance
- Enhanced humidity and dust resistance
- High ESD sensitivity (Human Body Model) 8kV

Applications

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

Standards

- IEC60068-2 Series
- EN 61000-4 Series
- EN 55014-1: 2017
- EN 55014-2: 2015
- EN 50178: 1998
- IEC61800-3: 2017
- IEC61800-5-1: 2016

Absolute maximum ratings

Symbol	Parameter	Min.	Max.	Unit
$V_{DD\ max.}$	Maximum supply voltage (not destructive)	-18	18	V
I_{PM}	Maximum measuring current	- 180	180	A
T_A	Ambient operating temperature	-30	80	°C
T_S	Storage temperature range	-40	85	°C
$V_{ESD-HBM}$	ESD sensitivity HBM (Human Body Model)	4	8	kV

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

Specifications (T_A= 25°C, V_{DD}= ±15.0V)

Symbol	Parameter	Test condition	Min.	Typ.	Max.	Unit
V_{DD}	Supply voltage			±12 …15		V
I_C	Current consumption	I_p=0A without load		14	18	mA
I_{PN}	Current nominal measuring range	K18D003D15	-9	±3	9	A
		K18D005D15	-15	±5	15	A
		K18D010D15	-30	±10	30	A
		K18D015D15	-45	±15	45	A
		K18D020D15	-60	±20	60	A
		K18D025D15	-75	±25	75	A
		K18D030D15	-90	±30	90	A
		K18D040D15	-120	±40	120	A
		K18D050D15	-150	±50	150	A
		K18D060D15	-180	±60	180	A
V_{OUT}	Output voltage	±I_{pn}		±4		V
V_{OE}	Offset voltage	I_p=0A K18D003…030D15	-40		40	mV
		I_p=0A K18D040…060D15	-50		50	mV
ε_L	Non-linearity error	±I_{pn} without offset		<±1		%/I_{pn}
V_{om}	Magnetic offset voltage @I_p= 0A → I_{pn}→ 0A	K18DxxxD15(xxx:003-030)			25	mV
		K18DxxxD15(xxx:040-060)			40	mV
T_{CVOUT}	Temperature coefficient of V_{OUT}	T_A = -30°C …80°C (except T_{CVOE})	-1		1	mV/°C
T_{CVOE}	Temperature coefficient of offset	T_A = -30°C …80°C	-1.5		1.5	mV/°C
T_R	Step response to 90% of I_{pn}			3	5	μs
BW	Frequency bandwidth(-3dB)			50		kHz

Insulation characteristics

Symbol	Parameter	Value	Unit	Comment
V_D	Insulation voltage for isolation, 50Hz, 1 min	3600	V	
R_{ISO}	Isolation resistance @500VDC	>500	mΩ	
D-CLƐ	Clearance	5.5	mm	Shortest distance through air
D-CRD	Creepage distance	5.5	mm	Shortest path along sensor body

General characteristics

Symbol	Parameter	Value	Unit	Comment
m-HSƐ	Housing material	V0		Flame retardant UL 94
m-CDT	Conductor material	H62		
m	Mass	8	grams	

Dimension (mm)

Pin	Symbol
1	$-V_{DD}$
2	GND
3	$+V_{DD}$
4	V_{OUT}
5	$+I_P$
6	$-I_P$

Current	Primary conductor
3A	Φ0.6mm
5A	Φ0.8mm
10A	Φ1.1mm
15A	Φ1.4mm
20A	Φ1.6mm
25A	Φ1.6mm
30A	Φ1.6mm
40A	40A Busbar 1.0X6.3mm
50A	50A Busbar 1.0X6.3mm
60A	60A Busbar 1.0X6.3mm
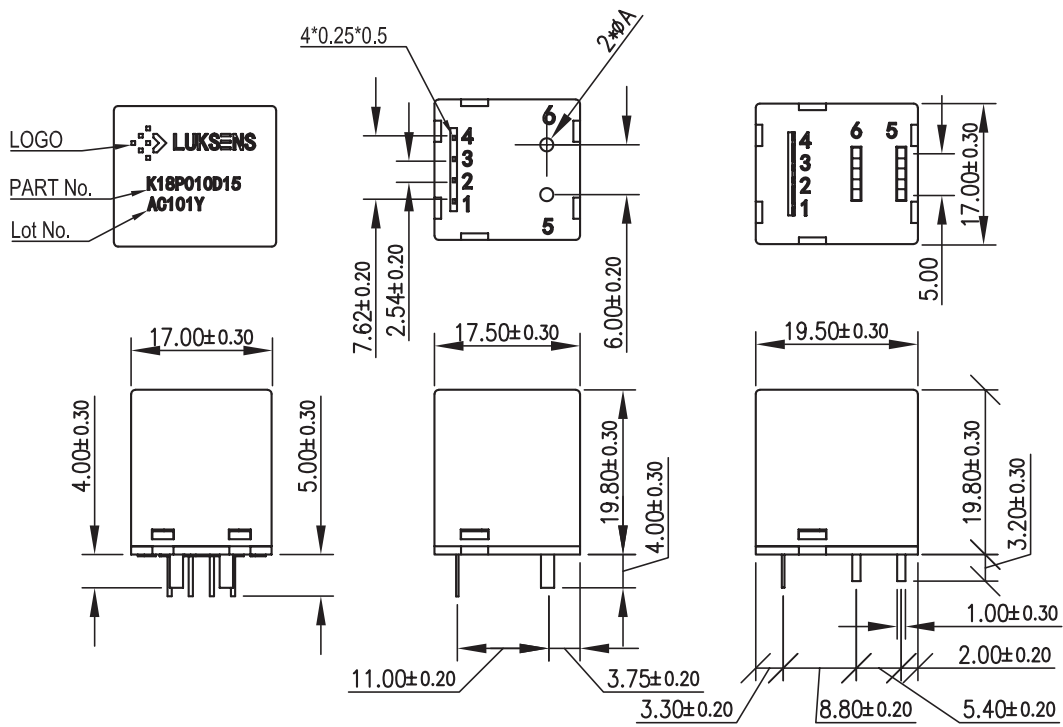
Name Guide Description

K18 D XXX XXX X
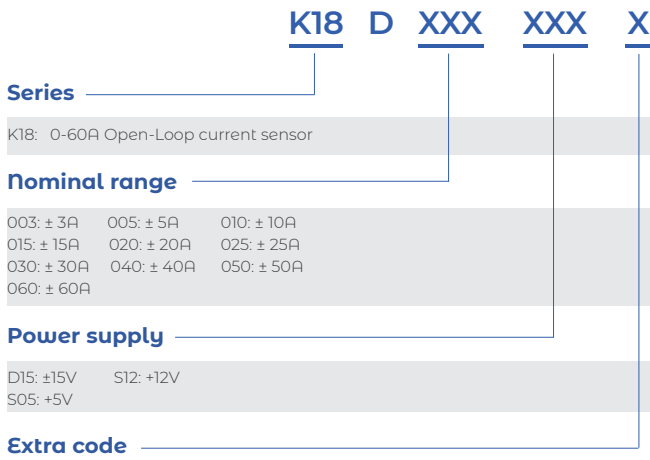
Series

K18: 0-60A Open-Loop current sensor

Nominal range

003: ± 3A   005: ± 5A   010: ± 10A
015: ± 15A   020: ± 20A   025: ± 25A
030: ± 30A   040: ± 40A   050: ± 50A
060: ± 60A

Power supply

D15: ±15V   S12: +12V
S05: +5V

Extra code

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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