AC5 Series Current Sensor

The AC5 Series provides efficient and precise sensor solutions for AC, DC and pulse currents in automotive applications. It covers from low voltage to high voltage, and provides galvanic separation between the primary circuit and the secondary circuit. It consists of three main components: an accurate low-temperature drift linear hall sensor, a flux collector and a current transformer. It offers markedly low resistance, reducing power loss and temperature drift to deliver exceptional performance.

Feature

- Max. sensing range ±900A (DC or AC peak)
- Noncontact measurement of high current
- Nearly zero magnetic hysteresis
- Superior Temperature stability and linearity
- High frequency bandwidth 150kHZ
- Compact size for applications with limited space
- RoHs Compliance (Lead-Free)

Advantage

- Accurately measures AC, DC and pulse currents
- Rapid response time 3μs
- High immunity from ambient temperature
- High ESD sensitivity (Human Body Model) 4kV
- No insertion losses
- Excellent current over-load capacity

Application

- DC/DC Converters
- Starter Generators
- Electrical Power Steering

Standard

- IEC 60068-2-1:2007
- IEC 60068-2-2:2007
- IEC 60068-2-14:2009
- IEC 60068-2-27:2008
- IEC 60068-2-78 :2001
- ISO 11452-1

Absolute maximum ratings

Symbol	Parameter	Min.	Max.	Unit
$V_{DD\ max.}$	Maximum supply voltage (not destructive)	-0.3	6.5	V
T_A	Ambient operating temperature	-40	125	°C
T_S	Storage temperature range	-40	125	°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°C, V_{CC}= 5.0V)

Symbol	Characteristic	Test condition	Min.	Typ.	Max.	Unit
V_{CC}	Supply voltage		4.75	5	5.25	V
I_C	Current consumption	I_P=0A without load		13	20	mA
V_0	Zero voltage	I_P=0A, T_A=25°C		2.5		V
I_{PN}	Current nominal measuring range	AC5-100	-100		100	A
		AC5-200	-200		200	
		AC5-300	-300		300	
		AC5-400	400		400	
		AC5-500	-500		500	
		AC5-600	-600		600	
		AC5-700	-700		700	
		AC5-800	-800		800	
		AC5-900	-900		900	
R_L	Output load resistance	V_{OUT} to GND	4.7	10		kΩ
C_L	Output load capacitance	V_{OUT} to GND			10	nF
G	Nominal sensitivity (customized available)	V_{DD}=5.0V	2000mV@I_{PN}			
V_{OE}	Offset voltage	I_P=0A	-10		10	mV

Specifications (T_A= 25°C, V_{CC}= 5.0V)

Symbol	Characteristic	Test condition	Min.	Typ.	Max.	Unit
T_{CVOE}	Temperature coefficient of V_{OE}	T_A=-40°C ...125°C	-0.2	±0.1	0.2	mV/K
T_{CVOUT}	Temperature coefficient of V_{OUT}	T_A=-40°C ...125°C (except T_{CVOE})	-0.5	±0.3	0.5	mV/K
E_L	Non-linearity error	@±I_{PN} without offset	-1		1	%/I_{PN}
BW	Frequency bandwidth (-3dB)			150		kHz
T_R	Step response to 90% I_{PN}	(Design target)		3		µs
V_{om}	Magnetic offset voltage	I_P= 0A → I_{PN}→ 0A		±20		mV
NP2P	Output voltage noise peak-peak	DC to 1MHz			15	mV
E_G	Sensitivity error				±0.6	%/I_{PN}

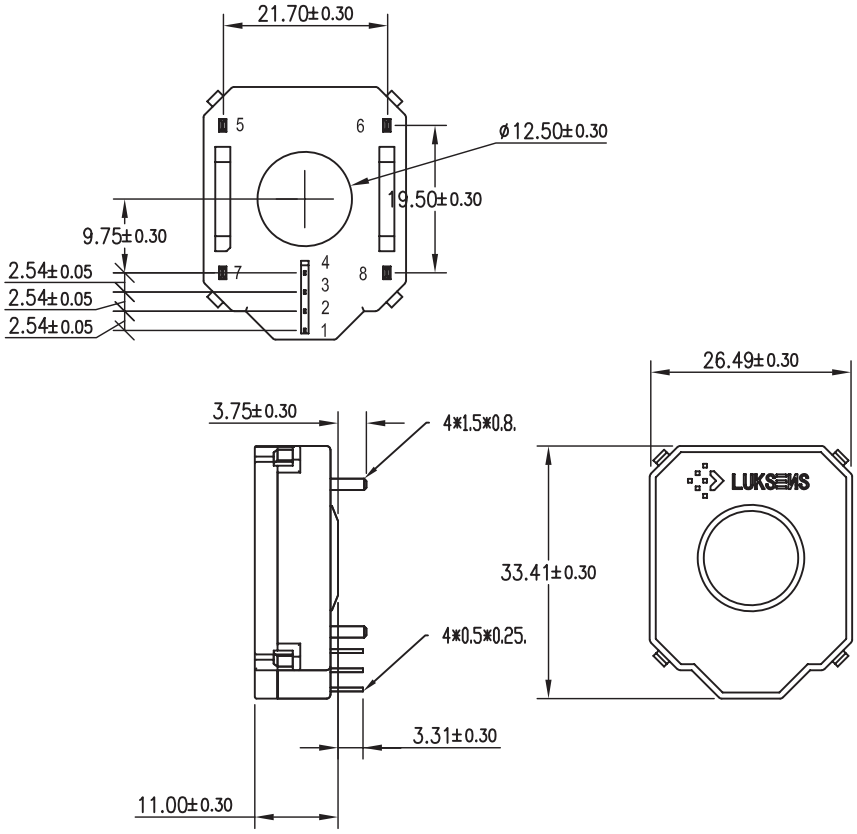
Insulation characteristics

Symbol	Characteristic	Value	Unit	Comment
V_D	Insulation voltage for isolation, 50Hz, 1 min	2500	V	
R_{ISO}	Isolation resistance @500VDC	>500	MΩ	
D-CLE	Clearance	2.95	mm	Normal Version
D-CRD	Creepage distance	2.95	mm	Normal Version

General characteristics

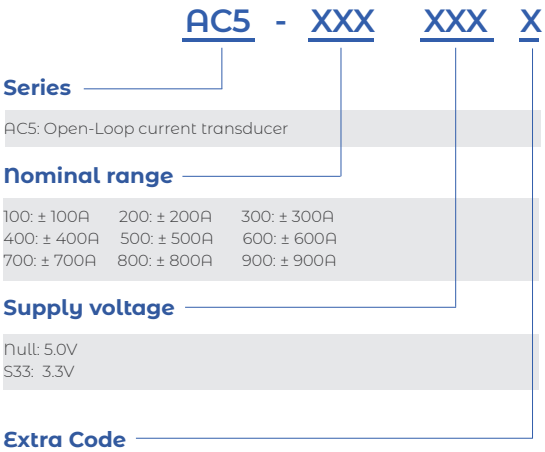
Symbol	Characteristic	Value	Unit	Comment
M-HSE	Housing material	V0		Flame retardant UL 94
M-FC	Flux collector material	Oriented Silicon Steel		Superior magnetic permeability

Dimension (mm)



Pin	Symbol
1	V_{REF}
2	V_{OUT}
3,5,6,7,8	GND
4	V_{CC}

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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