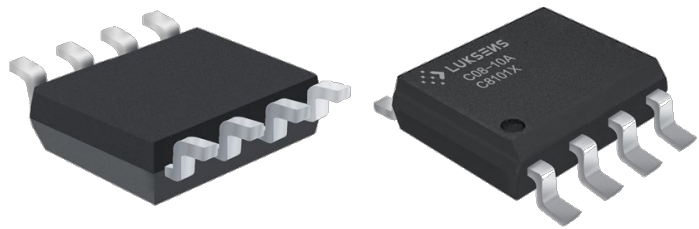


# C08 Series Current Sensor

The C08 series current sensor is a Hall-Effect sensor which is sensitive to the flux density applied orthogonally to the IC surface, and provides an analog output voltage proportional to the applied magnetic flux density. The current is sensed differentially in order to reject common-mode fields, improving accuracy in magnetically noisy environments. It is particularly adapted for high speed applications such as inverters and converters where fast response time due to fast switching is required.



## Features

- Factory trimmed sensitivity sensor
- Flexible supply voltage with factory selectable 5V or 3.3V mode
- Superior temperature stability and linearity
- Compact size for applications with limited space
- RoHs compliance (Lead-Free)

## Advantages

- Accurately measures AC, DC and pulse currents
- Fast response 3.5µs, minimal noise output
- No insertion losses
- Improving noise immunity using differential hall technology
- Excellent current overload capacity
- Very low thermal drift for wide temperature range

## Applications

- High voltage traction motor inverter
- 48V boost recuperation inverter
- DCDC converter
- Smart battery junction boxes
- Smart fuse overcurrent detection
- Redundant monitoring of battery management system (BMS)

## Standards

- IEC 618000-5-1:2027
- IEC 62109-1: 2010
- IEC 60950-1:2006

## Absolute maximum ratings

Symbol	Parameter	Min.	Max.	Unit
$V_{DD\ max.}$	Maximum supply voltage (not destructive)	-0.3	6.5	V
$I_{PM}$	Maximum measuring current	-50	50	A
$T_A$	Ambient operating temperature	-40	125	°C
$T_S$	Storage temperature range	-40	150	°C
$V_{ESD-HBM}$	ESD sensitivity HBM (Human Body Model)		6	kV

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

## Specifications ( $T_A = 25^\circ\text{C}$ , $V_{DD} = 3.3\text{V}/5.0\text{V}$ )

Symbol	Parameter	Test condition	Min.	Typ.	Max.	Unit
$V_{DD}$	Supply voltage	C08-XXA	4.75	5	5.25	V
$I_C$	Current consumption	$I_P=0\text{A}$ without load, $V_{DD}=5\text{V}$		12	15	mA
		$I_P=0\text{A}$ without load, $V_{DD}=3.3\text{V}$		9	12	
$I_{PN}$	Current nominal measuring range	C08-10A	-10		10	A
		C08-20A	-20		20	
		C08-30A	-30		30	
		C08-40A	-40		40	
		C08-50A	-50		50	
$R_{IP}$	Primary conductor resistance	$T_A=25^\circ\text{C}$		1.2		m $\Omega$
$T_{PO}$	Power-On time			1		ms
$R_L$	Output load resistance	$V_{OUT}$ to GND	4.7			k $\Omega$
$C_L$	Output load capacitance	$V_{OUT}$ to GND			10	nF
$V_{REF}$	Internal reference voltage	$I_P=0\text{A}$ , $V_{DD}=5\text{V}$	2.49	2.5	2.51	V

## Specifications ( $T_A = 25^\circ\text{C}$ , $V_{DD} = 3.3\text{V}/5.0\text{V}$ )

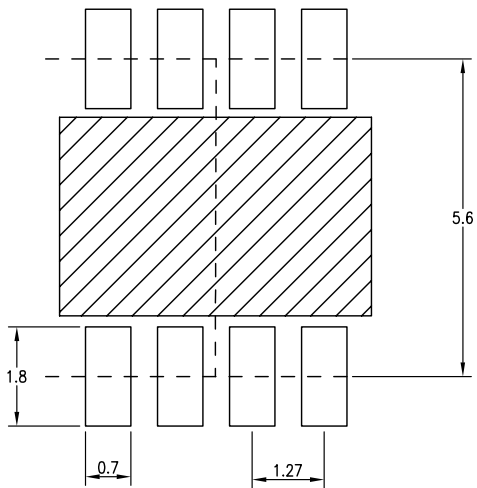
Symbol	Parameter	Test condition	Min.	Typ.	Max.	Unit
$V_o$	$V_{out} (@I_p=0A)$	Bidirectional		$V_{DD} * 0.5$		V
		Unidirectional		$V_{DD} * 0.1$		V
$V_{oE}$	Offset voltage	$I_p=0A$	-15		15	mV
$G$	Nominal sensitivity (customized available)	C08-10A		200		mV/A
		C08-20A		100		
		C08-30A		66.67		
		C08-40A		50		
		C08-50A		40		
$T_{cc}$	Temperature coefficient of G	$T_A = -40^\circ\text{C} \dots 125^\circ\text{C}$		$\pm 2.5$		%
$T_{cvo}$	Temperature coefficient of $V_o$ @ $I_p=0A$ $T_A = -40^\circ\text{C} \dots 125^\circ\text{C}$		-12		12	mV
$\epsilon_L$	Non-linearity error	$\pm I_{pn}$ without offset		$\pm 0.5$		%/ $I_{pn}$
<b>BW</b>	Frequency bandwidth (-3dB)			200		kHz
$T_R$	Step response to 90% $I_{pn}$	(Design target)		3.5		$\mu\text{s}$

## Insulation characteristics

Symbol	Parameter	Value	Unit	Comment
$V_{ISO}$	Dielectric Strength Test Voltage	4000	Vrms	Agency type-tested for 60 seconds per UL 60950-1 (edition. 2). Production tested at $V_{ISO}$ for 1 second, in accordance with UL 60950-1 (edition. 2).
$V_{SURGE}$	Impulse withstand voltage 1.2/50 $\mu\text{s}$	7000	V	
<b>D-CLE</b>	Clearance	4	mm	Shortest distance through air
<b>D-CRD</b>	Creepage distance	4	mm	Shortest distance through body

# PCB footprint (mm, general tolerance: $\pm 0.05\text{mm}$ )

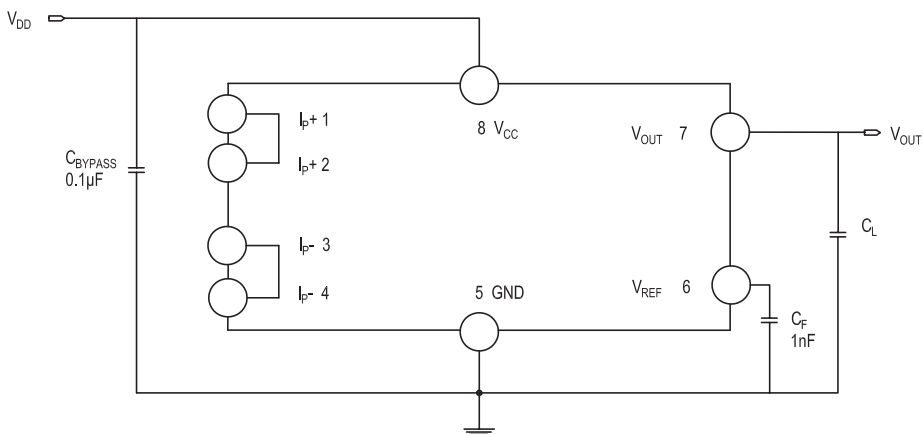
## PCB Layout



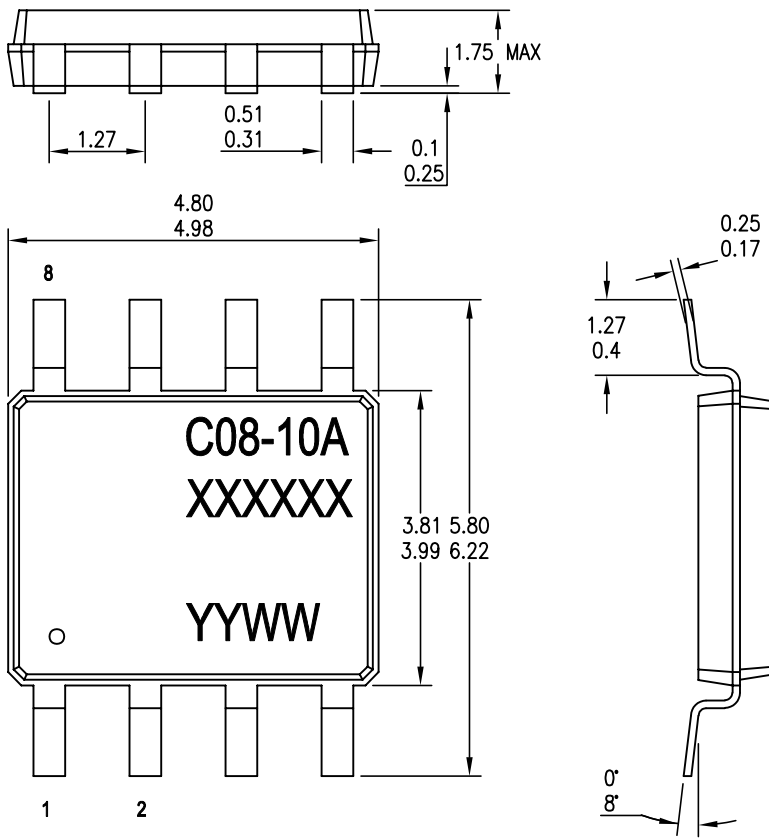
**Note:**

Maximum soldering temperature 260°C 10s

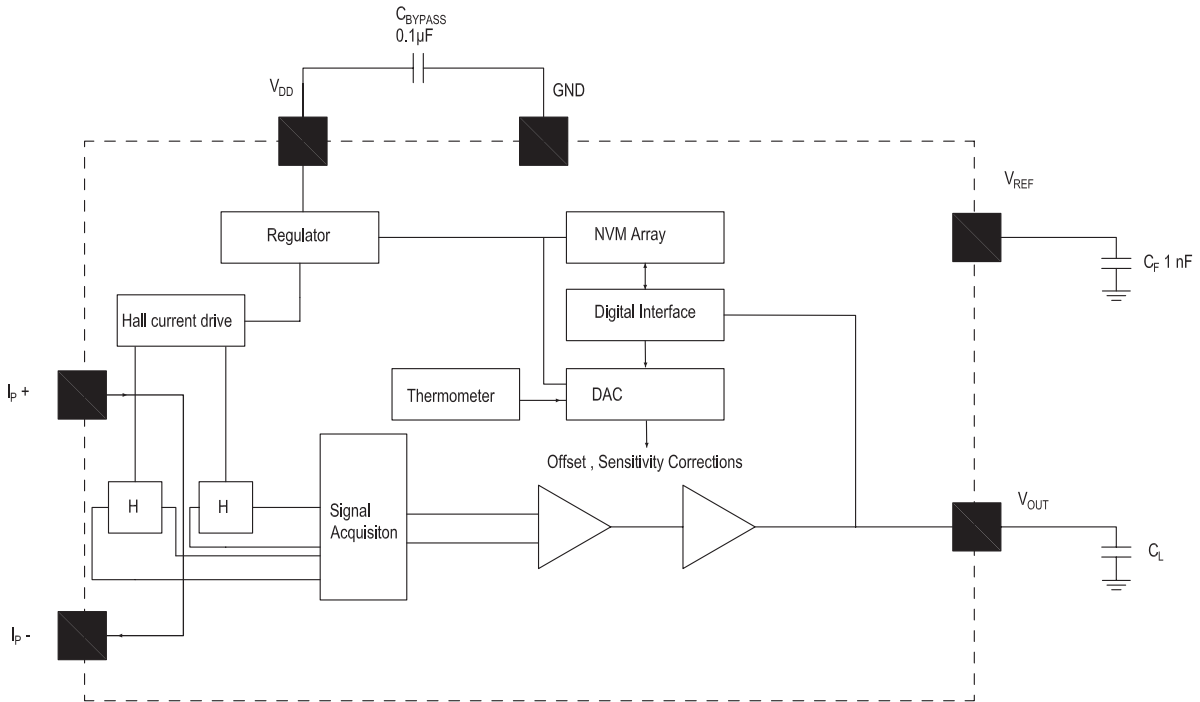
Maximum PCB thickness 2.4mm



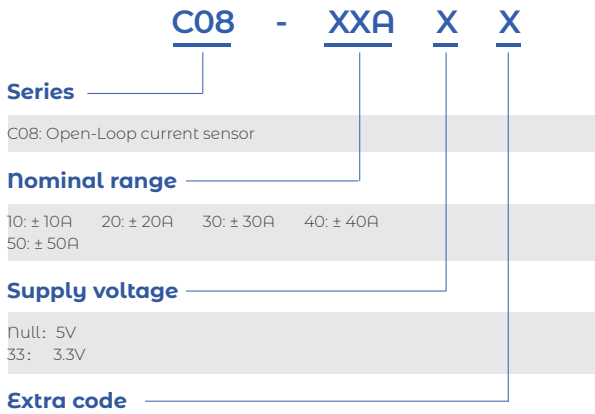
## Dimension (mm)



# Block diagram



# 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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