NxxF01 Series Current Sensor

The NxxF01 series is a current transducer which operates on the principle of magnetic compensation. It measures DC, AC or pulse currents and their combinations, with galvanic isolation techniques used to separate the primary and secondary circuits.

Features

- Non-contact measurement of high current
- Close-Loop measurement (compensated)
- Max. measuring range ±150A (DC or AC peak)
- High frequency bandwidth 100kHz
- Superior temperature stability and linearity
- RoHs compliance (Lead-Free)

Advantages

- Accurately measures AC, DC and pulse currents
- Fast response 0.5μs
- High immunity from external interference
- Excellent current overload capacity

Applications

- Solar inverters
- Servo motor drives
- Uninterruptible power supplies
- Battery management systems
- Welding applications

Standards

- IEC 60068-2 Series
- EN 61000-4 Series
- EN 50178: 1998
- IEC 62109: 2010

Absolute maximum ratings

Symbol	Parameter	Min.	Max.	Unit
$V_{DD\ Max.}$	Maximum supply voltage (not destructive)	4.75	5.25	V
T_{PC}	Primary conductor temperature		110	°C
T_A	Ambient operating temperature	-40	105	°C
T_S	Storage temperature range	-40	105	°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_{DD}= 5.0V)

Symbol	Parameter	Test condition	Min.	Typ.	Max.	Unit
V_{DD}	Supply voltage			5		V
I_C	Current consumption (I_P=0A without load)			<15		mA
I_{Pn}	Current nominal measuring range	N06F01	-20	±06	20	A
		N15F01	-50	±15	50	
		N25F01	-85	±25	85	
		N50F01	-150	±50	150	
n_p	Number of primary turns		1, 2, 3, 4			
n_s	Number of secondary turns		1,000			
V_{REF1}	Internal reference voltage	I_P=0A	2.48	2.5	2.52	V
V_{REF2}	External reference voltage		1-2.75			V
V_{OUT}	Output voltage range	I_P=I_{Pn}	V_0+(0.625±0.5%)			V
V_0	Zero current output voltage	I_P=0A	2.5			V
T_{CVO}	Temperature coefficient of V_0 @I_P=0A T_A=-40°C ...105°C, V_0=2.5V		≤±0.5			mV/°C
T_{CIOT}	Temperature coefficient of I_{OUT} @-40°C ...105 °C		≤±0.5			mV/°C

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

Symbol	Parameter	Test condition	Min.	Typ.	Max.	Unit
ε_L	Non-linearity error	$\pm I_{Pn}$ without offset		≤0.1		%/I_{Pn}
ε_G	Sensitivity error	$\pm I_{Pn}$		≤0.4		%/I_{Pn}
T_R	Step response to 90% of I_{Pn}			0.5		μs
BW	Frequency bandwidth (-3dB)			100		kHz
di/dt	di/dt accurately followed			>50		A/μs

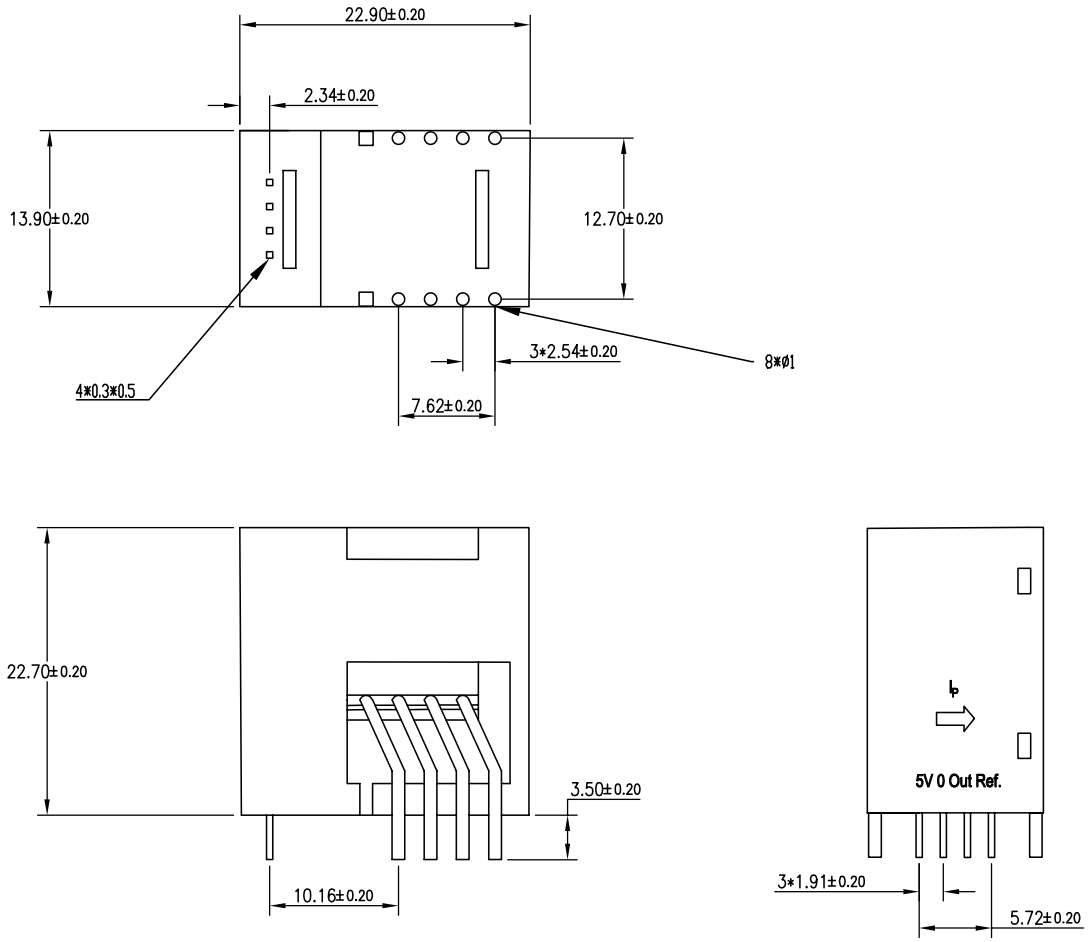
Insulation characteristics

Symbol	Parameter	Value	Unit	Comment
V_D	Insulation voltage for isolation, 50Hz, 1 min	4000	V	
R_{ISO}	Isolation resistance @ DC 500V	>500	MΩ	

General characteristics

Symbol	Parameter	Value	Unit	Comment
M-HSE	Housing material	V0		Flame retardant UL 94
M-CDT	Conductor material	H62		
M	Mass	12	grams	

Dimension (mm)



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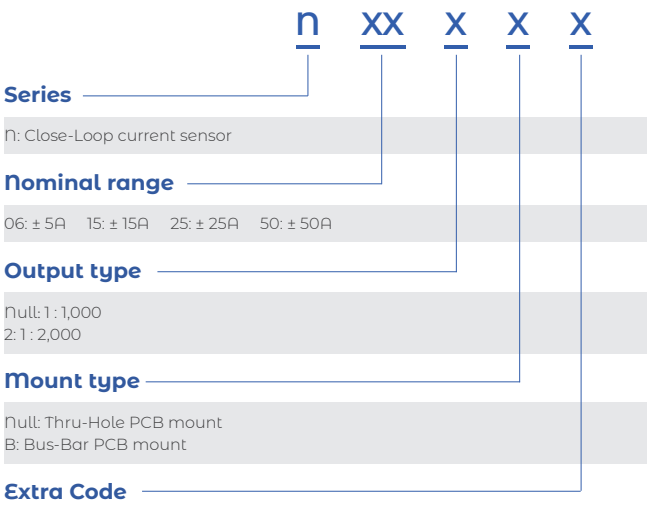

Notes

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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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