# 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

- EN 50178:1997
- IEC 60950-1:2006
- IEC 61010-1:2010
- IEC 61800-5-1:2020

# 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 |
|---|---|---|---|---|---|---|
| $\varepsilon_L$ | Non-linearity error | $\pm I_{Pn}$ without offset | | ≤0.1 | | %/$I_{Pn}$ |
| $\varepsilon_G$ | 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 |

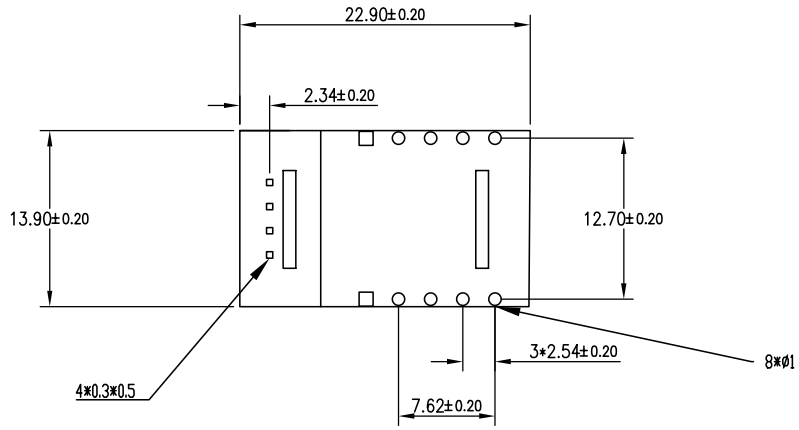
# Insulation characteristics

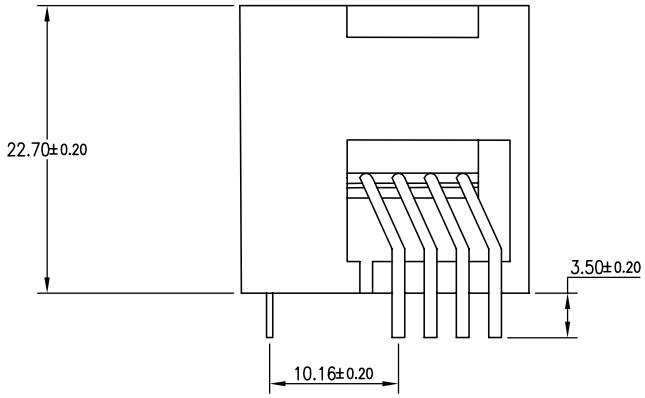
| Symbol | Parameter | Value | Unit | Comment |
|---|---|---|---|---|
| $V_D$ | Insulation voltage for isolation, 50Hz, 1 min | 4000 | V | |
| $R_{ISO}$ | Isolation resistance @ DC 500V | >500 | MΩ | |

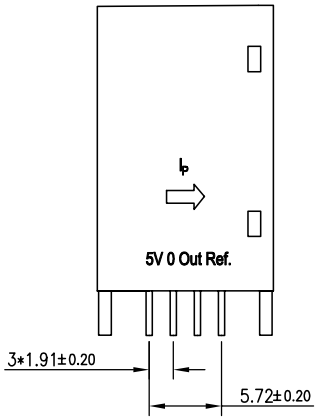
# General characteristics

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

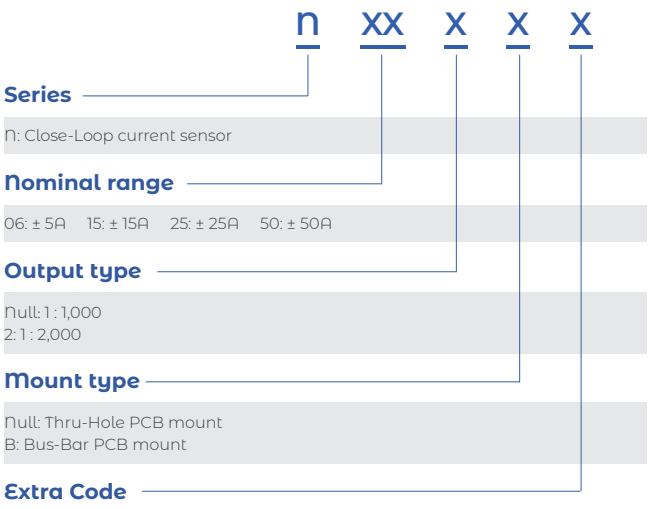
# Dimension (mm)



# 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.

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