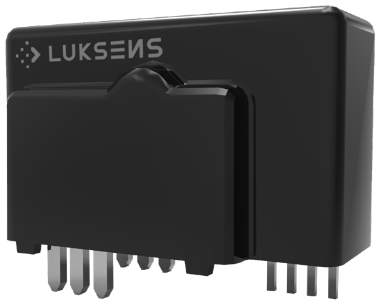
NxxNEP Current Sensor

The NxxNEP 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 ±200A (DC or AC peak)
- Nearly zero magnetic hysteresis
- Superior Temperature stability and linearity
- High frequency bandwidth 100kHz
- 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

- Home appliances
- AC variable speed drives and servo motor drives
- Static converters for DC motor drives
- Battery management systems
- Uninterruptible power supplies (UPS)
- Switched-mode power supplies (SMPS)
- Overcurrent protections
- Short circuit protections

Standards

- EN 61000-4 Series
- IEC60068-2 Series
- EN 50178: 1998
- IEC62109-1: 2010
- IEC61800-3: 2017
- IEC61800-5-1: 2016

Absolute maximum ratings

Symbol	Parameter	Min.	Max.	Unit
$V_{DD\ max.}$	Maximum supply voltage (not destructive)	-15.75	15.75	V
I_{pm}	Maximum measuring current	-200	200	A
T_A	Ambient operating temperature	-25	85	°C
T_S	Storage temperature range	-40	90	°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	N25NEP	N502NEP	N1002NEP	N125NEP	Unit
V_{DD}	Supply voltage	±12...15				V
I_{pn}	Current nominal measuring range	±25	±50	±100	±125	A
I_{pm}	Current maximum measuring range	±50	±110	±160	±200	A
K_n	Conversion ratio	1:1,000	1:2,000	1:2,000	1:1,000	
I_{sn}	Secondary nominal rms current	±25	±25	±50	±125	mA
R_m(N25NEP)	Measuring resistance with±12V @T_A=70°C	0~248@I_{pn} [±A DC], 0~182@I_{pn} [A RMS]*1				Ω
	Measuring resistance with±15V @T_A=70°C	67~398@I_{pn} [±A DC], 67~263@I_{pn} [A RMS]*1				Ω
	Measuring resistance with±12V @T_A=85°C	0~280@I_{pn} [±A DC], 0~178@I_{pn} [A RMS]*1				Ω
	Measuring resistance with±15V @T_A=85°C	70~394@I_{pn} [±A DC], 67~259@I_{pn} [A RMS]*1				Ω
R_m(N502NEP)	Measuring resistance with±12V @T_A=70°C	0~221@I_{pn} [±A DC], 0~115@I_{pn} [A RMS]*1				Ω
	Measuring resistance with±15V @T_A=70°C	0~335@I_{pn} [±A DC], 0~195@I_{pn} [A RMS]*1				Ω
	Measuring resistance with±12V @T_A=85°C	0~214@I_{pn} [±A DC], 0~108@I_{pn} [A RMS]*1				Ω
	Measuring resistance with±15V @T_A=85°C	0~327@I_{pn} [±A DC], 0~188@I_{pn} [A RMS]*1				Ω
R_m(N1002NEP)	Measuring resistance with±12V @T_A=70°C	0~63@I_{pn} [±A DC], 0~11@I_{pn} [A RMS]*1				Ω
	Measuring resistance with±15V @T_A=70°C	20~120@I_{pn} [±A DC], 20~51@I_{pn} [A RMS]*1				Ω
	Measuring resistance with±12V @T_A=85°C	0~57@I_{pn} [±A DC], 0~5@I_{pn} [A RMS]*1				Ω
	Measuring resistance with±15V @T_A=85°C	45~114@I_{pn} [±A DC], 45~45@I_{pn} [A RMS]*1				Ω

*1 Sinusoidal wave 50 Hz.

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

Symbol	Parameter	N25NEP	N502NEP	N1002NEP	N125NEP	Unit
R_m(N125NEP)	Measuring resistance with±12V @T_A=70°C	0~49@±125A_{max} ,0~14@±200A_{max}				Ω
	Measuring resistance with±15V @T_A=70°C	22~72@±125A_{max} ,22~28@±200A_{max}				Ω
	Measuring resistance with±12V @T_A=85°C	14~48@±125A_{max} ,14~15@±200A_{max}				Ω
	Measuring resistance with±15V @T_A=85°C	29~70@±125A_{max} ,29~29@±200A_{max}				Ω
T_{CIOT}	Temperature coefficient of I_{OUT} @-25°C ...85 °C	0.6				mA
TEB	Full scale of I_{PN}	±0.4				%/I_{PN}
ε_L	Non-linearity error @±I_{PN} without offset	<0.15				%/I_{PN}
I_{OE}	Offset current @I_P=0	±0.2				mA
I_{OM}	Magnetic offset current @I_P= 0A → I_{PN}→ 0A	±0.1				mA
T_{RA}	Step response to 10% of I_{PN}	<0.5				μs
T_R	Step response to 90% of I_{PN}	<1				μs
BW	Frequency bandwidth (-3dB)	100				kHz

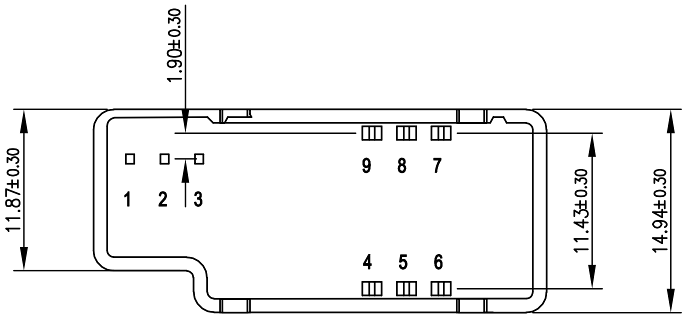
Insulation characteristics

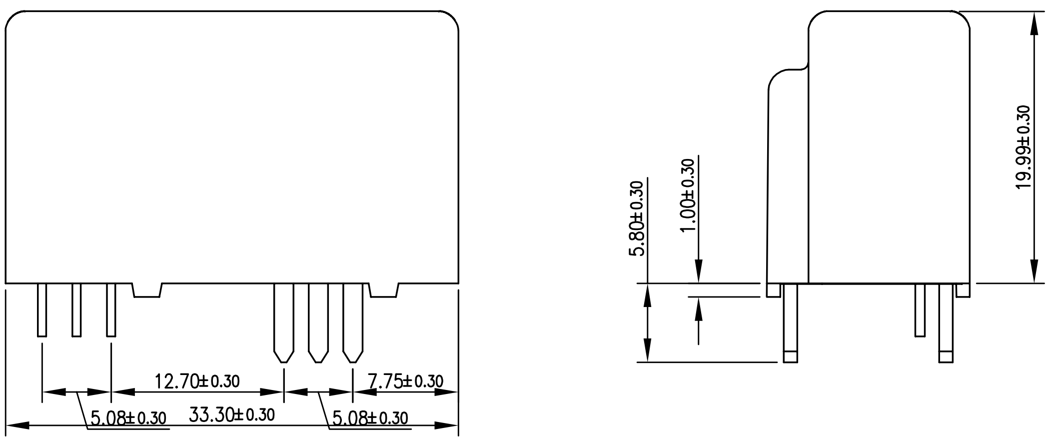
Symbol	Parameter	Value	Unit	Comment
V_D	Insulation voltage for isolation, 50Hz, 1 min	2500	V	
R_{ISO}	Isolation Resistance @500VDC	>500	MΩ	

General characteristics

Symbol	Parameter	Value	Unit	Comment
M-HSE	Housing material	V0		Flame retardant UL 94
M-CDT	Conductor material	H62		Busbar version

Dimension (mm)





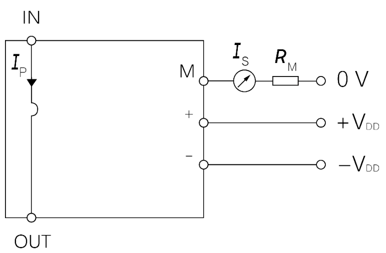
Mechanical characteristics:

Fastening & connection of primary: 6 pins 1.4 × 1 mm

Fastening & connection of secondary: 3 pins 0.7 × 0.6 mm

Pin	Symbol
1	O/P
2	$+V_{DD}$
3	$-V_{DD}$
4,5,6	$+I_P$
7,8,9	$-I_P$

Connection diagram:



Name Guide Description

n xx x x x

Series

n: Close-Loop current sensor

Nominal range

25: ± 25A 50: ± 50A
100: ± 100A 125: ± 125A

Output type

Null: 1 : 1,000
2: 1 : 2,000

Mount type

Null: Thru-Hole PCB mount
B: Bus-Bar PCB mount

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.

Important notice

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