Current Transducer LTSR 6-NP

I_{PN} = 6 At

For the electronic measurement of currents: DC, AC, pulsed, mixed, with galvanic isolation between the primary circuit (high power) and the secondary circuit (electronic circuit).

16073

Electrical data

I_{PN}	Primary nominal current rms		6	At
I_{PM}	Primary current, measuring range		0 .. ± 19.2 [1]	At
$\hat{I}_P$	Overload capability		250	At
V_{OUT}	Output voltage (Analog) @ I_P		2.5 ± (0.625·I_P/I_{PN})	V
		I_P = 0	2.5 [2]	V
V_{REF}	Reference voltage (internal reference), Ref_{OUT} mode		2.5 [3]	V
	Reference voltage (external reference), Ref_{IN} mode		1.9 .. 2.7 [4]	V
G	Sensitivity		104.16	mV/A
N_S	Number of secondary turns (± 0.1 %)		2000	
R_L	Load resistance		≥ 2	kΩ
$C_{L\,max}$	Maximum capacitive loading		500	pF
R_{IM}	Internal measuring resistance (± 0.5 %)		208.33	Ω
TCR_{IM}	Temperature coefficient of R_{IM}		< 50	ppm/K
V_C	Supply voltage (± 5 %)		5	V
I_C	Current consumption @ V_C = 5 V	Typ	28+I_S [5]+($V_{OUT}R/_L$)	mA

Accuracy - Dynamic performance data

X	Accuracy @ I_{PN}, T_A = 25°C		± 0.2	%
	Accuracy with R_{IM} @ I_{PN}, T_A = 25°C		± 0.7	%
ε_L	Linearity error		< 0.1	%
			Max	
TCV_{OUT}	Temperature coefficient of V_{OUT}/V_{REF} @ I_P = 0			
		- 40°C .. + 85°C	150	ppm/K
TCG	Temperature coefficient of G	- 40°C .. + 85°C	50 [6]	ppm/K
V_{OM}	Magnetic offset voltage @ I_P = 0,			
	after an overload of	3 x I_{PN}	± 7	mV
		5 x I_{PN}	± 8	mV
		10 x I_{PN}	± 10	mV
TCV_{REF}	Temperature coefficient of internal V_{REF}			
	@ I_P = 0	- 10°C .. + 85°C	50	ppm/K
		- 40°C .. - 10°C	100	ppm/K
t_{ra}	Reaction time @ 10 % of I_{PN}		< 100	ns
t_r	Response time to 90 % of I_{PN} step		< 400	ns
di/dt	di/dt accurately followed		> 15	A/µs
BW	Frequency bandwidth (0 .. - 0.5 dB)		DC .. 100	kHz
		(- 0.5 .. 1 dB)	DC .. 200	kHz

Notes: [1] Only in ref_{OUT} mode or with external REF less than 2.525 V and greater than 2.475 V. For external REF out of these limits see leaflet. [2] V_{OUT} is linked to V_{REF}, by conception the difference between these two nodes for I_P = 0 is maximum ± 25 mV, 2.475 V < V_{OUT} < 2.525 V. [3] In Ref_{OUT} mode at T_A = 25°C, 2.475 V< V_{REF} < 2.525 V. The minimal impedance loading the ref pin should be > 220 kΩ. Internal impedance = 600 Ω. For most applications you need to buffer this output to feed it into an ADC for example. [4] To overdrive the REF (1.9 V .. 2.7 V) max ± 1 mA is needed. [5] $I_S = I_P/N_S$. [6] Only due to TCR_{IM}.

Features

- Closed loop (compensated) multirange current transducer using the Hall effect
- Unipolar voltage supply
- Isolated plastic case recognized according to UL 94-V0
- Compact design for PCB mounting
- Incorporated measuring resistance
- Extended measuring range
- Access to the internal voltage reference
- Possibility to feed the transducer reference from external supply.

Advantages

- Excellent accuracy
- Very good linearity
- Very low temperature drift
- Optimized response time
- Wide frequency bandwidth
- No insertion losses
- High immunity to external interference
- Current overload capability.

Applications

- AC variable speed drives and servo motor drives
- Static converters for DC motor drives
- Battery supplied applications
- Uninterruptible Power Supplies (UPS)
- Switched Mode Power Supplies (SMPS)
- Power supplies for welding applications.

Application Domain

- Industrial.

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General data

T_A	Ambient operating temperature	- 40 .. + 85	°C
T_S	Ambient storage temperature	- 40 .. + 100	°C
	Insulating material group	III a	
m	Mass	10	g
	Standards [1]	EN 50178: 1997 IEC 60950-1: 2001	

Isolation characteristic

V_d	Rms voltage for AC isolation test, 50 Hz, 1 min	3	kV
$\hat{V}_w$	Impulse withstand voltage 1.2/50 µs	> 8 Min	kV
V_e	Rms voltage for partial discharge extinction 10 pC	> 1.5 Min	kV
dCp	Creepage distance [2]	15.35	mm
dCl	Clearance distance [3]	6.2	mm
CTI	Comparative Tracking Index (group IIIa)	175	

Applications examples

According to EN 50178 and CEI 61010-1 standards and following conditions:

- Over voltage category OV 3
- Pollution degree PD2
- Non-uniform field

	EN 50178	EIC 61010-1
dCp, dCl, $\hat{V}_w$	Rated insulation voltage	Nominal voltage
Single insulation	600 V	600 V
Reinforced insulation	300 V	300 V

Notes: [1] Specification according to IEC 1000-4-8 not adhered to in DC, error according to two axes 1.5% instead of 1%
[2] On housing
[3] On PCB with soldering pattern UTEC93-703.

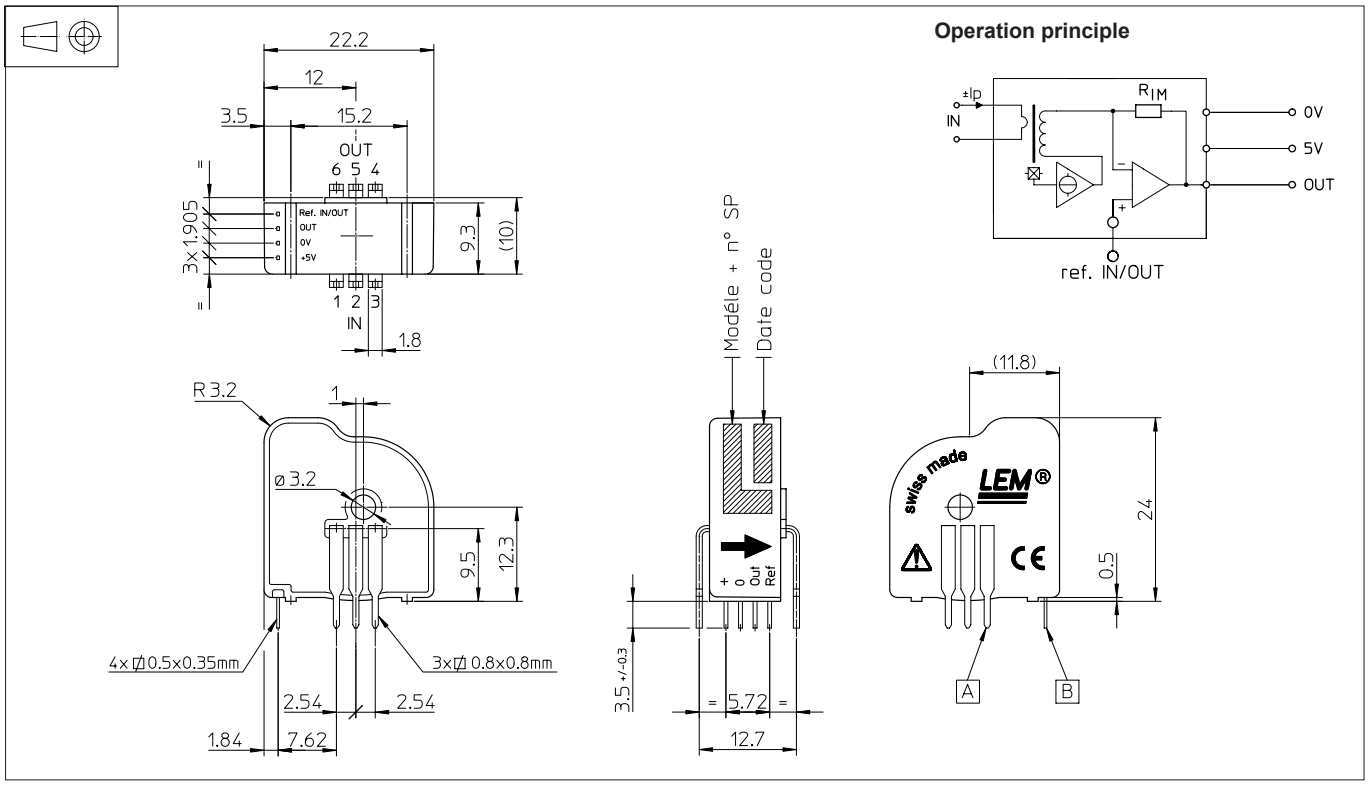
Safety

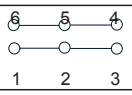
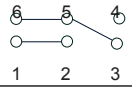
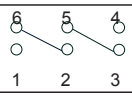
This transducer must be used in electric/electronic equipment with respect to applicable standards and safety requirements in accordance with the manufacturer's operating instructions.

Caution, risk of electrical shock

When operating the transducer, certain parts of the module can carry hazardous voltage (eg. primary busbar, power supply).
Ignoring this warning can lead to injury and/or cause serious damage.
This transducer is a built-in device, whose conducting parts must be inaccessible after installation.
A protective housing or additional shield could be used.
Main supply must be able to be disconnected.

Dimensions LTSR 6-NP (in mm.)

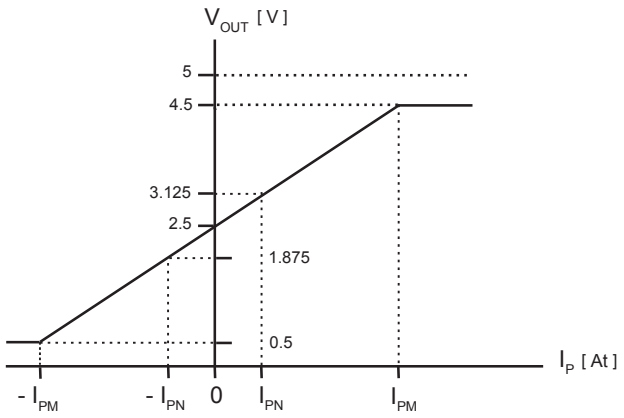


Number of primary turns	Primary nominal current rms I_{PN} [A]	Nominal [1] output voltage V_{OUT} [V]	Primary resistance R_P [mΩ]	Primary insertion inductance L_P [µH]	Recommended connections
1	± 6	2.5 ± 0.625	0.18	0.013	
2	± 3	2.5 ± 0.625	0.81	0.05	
3	± 2	2.5 ± 0.625	1.62	0.12	

Mechanical characteristics

- General tolerance ± 0.2 mm
- Fastening & connection of primary 6 pins 0.8 x 0.8 mm
  Recommended PCB hole 1.3 mm
- Fastening & connection of secondary 4 pins 0.5 x 0.35 mm
  Recommended PCB hole 0.8 mm
- Additional primary through-hole ∅ 3.2 mm

Output Voltage - Primary Current



Remarks

- V_{OUT} swings above the 2.5 V offset when I_P flows from terminals 1, 2, 3 to terminals 4, 5, 6 (with the arrow)
- For the EMC, the acceptance criteria are available on request
- Temperature of the primary conductor should not exceed 100°C.

Note: [1] Output voltage when LTSR 6-NP is used with internal reference.