Current Transducer LTSR 25-NP

I_{PN} = 25 At

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

Electrical data

I_{PN}	Primary nominal r.m.s. current		25	At
I_P	Primary current, measuring range		0 .. ± 80 [1]	At
V_{OUT}	Analog output voltage @ I_P		2.5 ± (0.625·I_P/I_{PN})	V
	I_P = 0		2.5 [2]	V
V_{REF}	Voltage reference (internal reference), refout mode		2.5 [3]	V
	Voltage reference (external reference), refin mode		1.9 .. 2.7 [4]	V
N_S	Number of secondary turns (± 0.1 %)		2000	
R_L	Load resistance		≥ 2	kΩ
C_L	Max. capacitive loading		500	pF
R_{IM}	Internal measuring resistance (± 0.5 %)		50	Ω
TCR_{IM}	Thermal drift 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}	Thermal drift of V_{OUT} / V_{REF} @ I_P = 0			
		- 40°C .. + 85°C	37.5	ppm/K
$TC\varepsilon_G$	Thermal drift of the gain	- 40°C .. + 85°C	50 [6]	ppm/K
V_{OM}	Residual voltage @ I_P = 0, after an overload of 3 x I_{PN}		± 0.5	mV
		5 x I_{PN}	± 2.0	mV
		10 x I_{PN}	± 2.0	mV
TCV_{REF}	Thermal drift 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 @ 90 % of I_{PN}		< 400	ns
di/dt	di/dt accurately followed		> 60	A/µs
f	Frequency bandwidth (0 .. - 0.5 dB)		DC .. 100	kHz
	(- 0.5 .. 1 dB)		DC .. 200	kHz

General data

T_A	Ambient operating temperature	- 40 .. + 85	°C
T_S	Ambient storage temperature	- 40 .. + 100	°C
m	Mass	10	g
	Standards	EN 50178 : 1997	
		IEC 60950-1 : 2001	

Notes : see overleaf.

Features

- Closed loop (compensated) multi-range current transducer using the Hall effect
- Unipolar voltage supply
- Insulated 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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Isolation characteristics

$\mathbf{V}_d$	R.m.s. voltage for AC isolation test, 50/60 Hz, 1 mn	3	kV
$\hat{\mathbf{V}}_w$	Impulse withstand voltage 1.2/50 µs	> 8	kV
$\mathbf{V}_e$	R.m.s. voltage for partial discharge extinction @ 10pC	Min > 1.5	kV
dCp	Creepage distance [7]	Min 15.35	mm
dCl	Clearance distance [8]	6.2	mm
CTI	Comparative Tracking Index (Group III a)	175	

Application examples

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

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

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

Notes

[1] Only in refout 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] $\mathbf{V}_{OUT}$ is linked to $\mathbf{V}_{REF}$, by conception the difference between these two nodes for $\mathbf{I}_P = 0$ is maximum ± 25 mV, 2.475 V < $\mathbf{V}_{OUT}$ < 2.525 V.

[3] In Refout mode at $\mathbf{T}_A$ = 25°C, 2.475 V< $\mathbf{V}_{REF}$ < 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] Please see the operation principle on the other side.

[6] Only due to $\mathbf{TCR}_{IM}$. [7] On housing.

[8] 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 following 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).

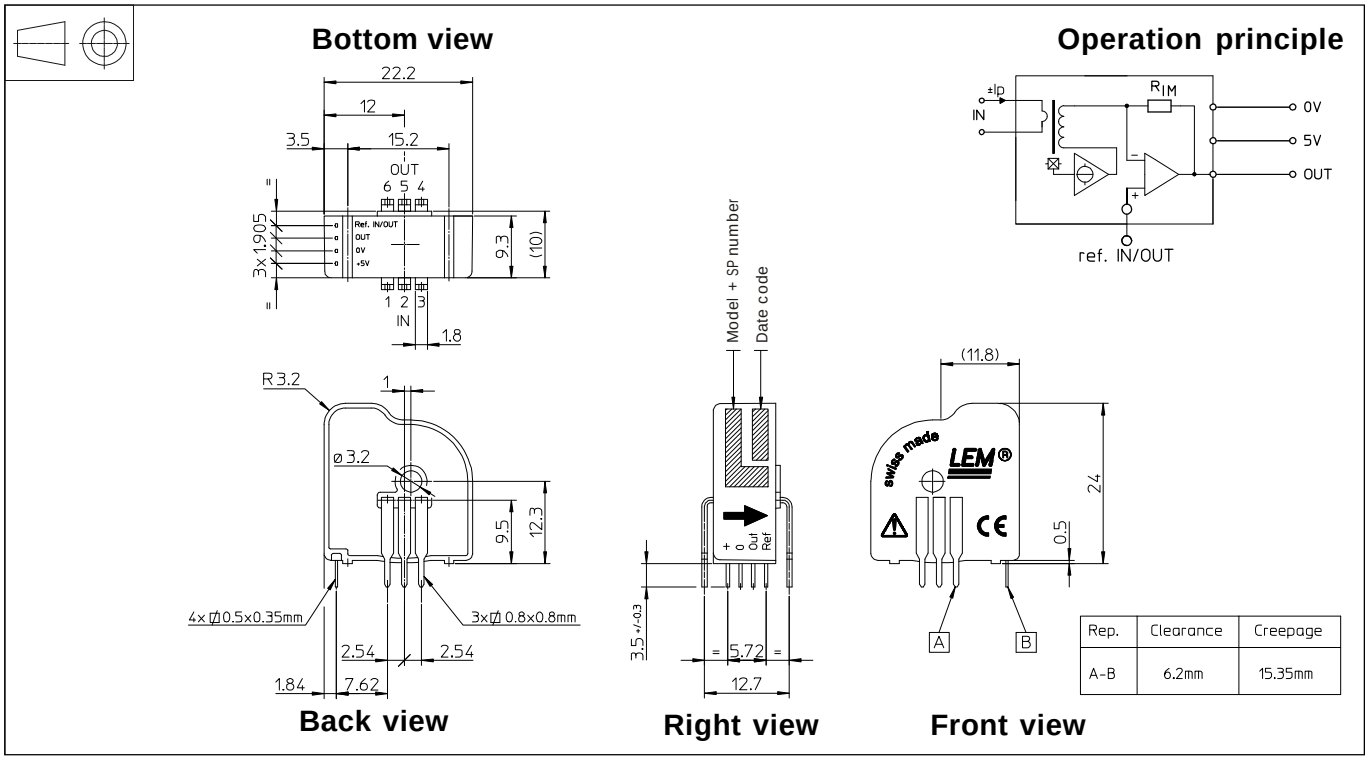
Ignoring this warning can lead to injury and/or cause serious damage.

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 25-NP (in mm. 1 mm = 0.0394 inch)



Number of primary turns	Primary nominal r.m.s. current I_{PN} [A]	Nominal[9] output voltage V_{OUT} [V]	Primary resistance R_P [mΩ]	Primary insertion inductance L_P [µH]	Recommended connections
1	± 25	2.5 ± 0.625	0.18	0.013	OUT 6 5 4 / IN 1 2 3
2	± 12	2.5 ± 0.600	0.81	0.05	OUT 6 5 4 / IN 1 2 3
3	± 8	2.5 ± 0.600	1.62	0.12	OUT 6 5 4 / IN 1 2 3

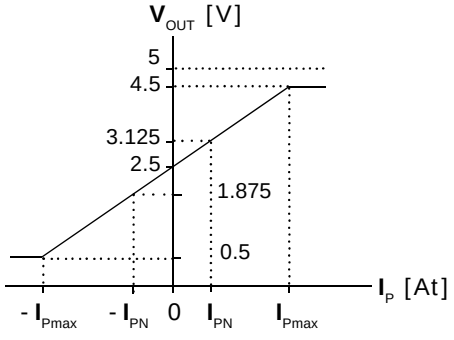
Mechanical characteristics

- 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

Remarks

- V_{OUT} is positive when I_P flows from terminals 1, 2, 3 to terminals 6, 5, 4
- For the EMC, the acceptance criteria are available on request.
- Temperature of the primary jumper should not exceed 100 [°C].

Output Voltage - Primary Current



Note : [9] Output voltage when LTSR 25-NP is used with internal reference.