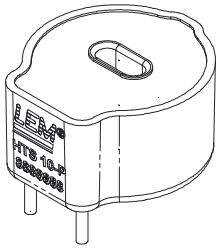
Current Transducer HTS 10-P

I_{PN} = 10 A

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 [1]	10	A
I_P	Primary current, measuring range [1]	0 .. ± 15	A
V_{OUT}	Analog output voltage @ + 25°C @ I_P [3]	V_{OE} + (e_G x I_P)	V
V_{OE}	Electrical offset voltage (I_P = 0) @ + 25°C [3]	V_C/2 ± 12 %	V
	Gain (error) @ + 25°C [3]	V_C x 20 ± 30 %	mV/A
	Linear output voltage range [4] [7]	0.5 to V_C -0.5	V
R_L	Load resistance [4]	≥ 5	kΩ
R_{OUT}	Output Internal resistance (Typical)	2	Ω
V_C	Supply voltage (± 10 %) [3]	+ 5	V
I_C	Current consumption @ V_C = 5.5 V	Max 12	mA

Accuracy - Dynamic performance data

X	Global accuracy @ I_{PN} , T_A = 25°C [5]		± 31	%
e_L	Linearity error @ + 25°C [6] [7]		Max 1	%
			Max	
TCV_{OE}	Thermal drift of V_{OE} @ I_P = 0	- 40°C .. + 70°C	± 2	mV/K
TCe_G	Thermal drift of the gain	- 40°C .. + 70°C	± 0.2 % of I_{PN}/K	
V_{OM}	Residual voltage @ I_P = 0,after an overload of 4.5 x I_{PN}		± 0.6	%
t_{ra}	Reaction time @ 10 % of I_{PN} [8]		< 12	µs
t_r	Response time @ 90 % of I_{PN} [8]		< 20	µs
di/dt	di/dt accurately followed		> 10	A/µs
f	Frequency bandwidth (0 .. - 3 dB)		DC .. 16	kHz
	(0 .. - 1 dB)		DC .. 8	kHz

General data

T_A	Ambient operating temperature	- 40 .. + 70	°C
T_S	Ambient storage temperature	- 55 .. + 85	°C
m	Mass	< 5	g
	Standards (see remarks)	EN 50178 : 1997	

Notes : [1] By using internal primary winding.
[2] By using aperture.
[3] This device is ratiometric : gain and offset vary in direct proportion to supply voltage.
[4] Output current < 1 mA source or sink.
[5] Due mainly to the gain error (± 30 %) - gain error can be compensated. Without offset.
[6] Including hysteresis offset voltage @ I_P = 0 after an excursion of 1 x I_P.
[7] Output linearity is not guaranteed within 500 mV of the supply rails.
[8] Tested with 2-10 A/µs rising and falling edge.

Features

- Open loop current transducer using the Hall effect
- Unipolar voltage supply
- Insulated plastic case recognized according to UL 94-V0
- Compact design for PCB mounting
- Low power comsumption.

Advantages

- Small size and space saving
- Ratiometric device, making it ideal for use with a ratiometric A/D converter using V_C as the reference potential
- Repeatability.

Applications

- Low cost drives (overload protection)
- Garage and Electrical door openers, Electrical gates, Awnings or Shutters (Threshold Detection & motor protection).

Application Domain

- Industrial.

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Isolation characteristics

V_d	R.m.s. voltage for AC isolation test, 50 Hz, 1 mn [1]	2.5	kV
V_d	R.m.s. voltage for AC isolation test, 50 Hz, 1 mn [2]	0.35	kV
V_e	R.m.s. voltage for partial discharge extinction @ 10 pC	> 2	kV
V_w	Peak impulse withstand voltage 1.2/50 µs [1]	8	kV
V_w	Peak impulse withstand voltage 1.2/50 µs [2]	1.5	kV
dCp	Creepage distance [1]	11.39	mm
dCp	Creepage distance [2]	1.60	mm
dCl	Clearance distance [1]	9.80	mm
dCl	Clearance distance [2]	0.90	mm
CTI	Comparative tracking index (Group I)	600	
UL94	Classification	V0	

Isolation category

Rated isolation voltage : 1250 V [1]
Rated isolation voltage : 100 V [2] with **EN 50178** standard and following conditions :

- Single isolation
- Over voltage category OV III
- Pollution degree PD2
- Heterogeneous field

Nominal voltage : CAT III 300 V RMS [1]
Nominal voltage : CAT III 50 V RMS [2] with **IEC 61010-1** standard and following conditions :

- Single isolation
- Over voltage category OV III
- Pollution degree PD2
- Heterogeneous field

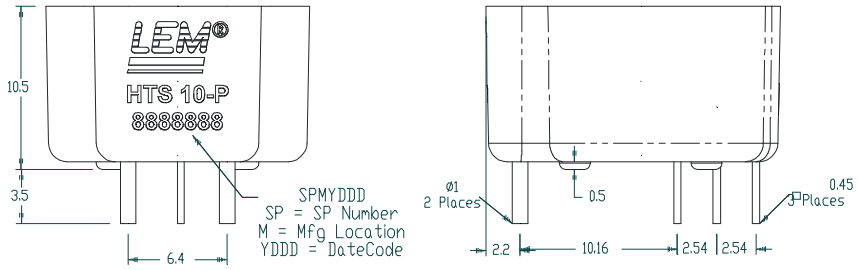
If isolated cable is used for the primary circuit in the transducer aperture, the voltage category could be improved with the following table :

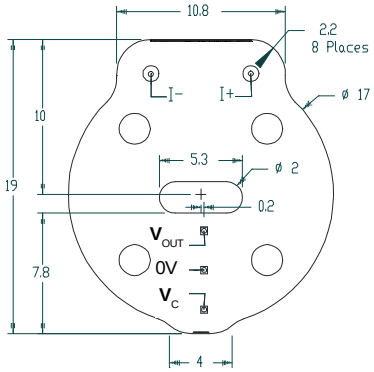
Cable isolation (primary)	Category
HAR 03	200 V CAT III
HAR 05	300 V CAT III
HAR 07	400 V CAT III

Mechanical characteristics

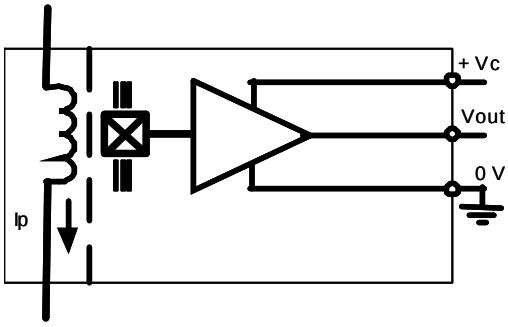
- General tolerance ± 0.2 mm
- Fastening & connection of primary 2 pins ∅ 1 mm
  Recommended PCB hole 2 x 1.3 mm
- Fastening & connection of secondary 3 pins 0.45 x 0.45 mm
  Recommended PCB hole 3 x 0.8 mm
- Additional primary through-hole 5.3 mm x ∅ 2 mm
- External primary wire(s) may also be used through the aperture.
  The sensitivity for this arrangement is V_C x T x 6.67 ± 30 % mV/A.
  (T : number of primary turns in the aperture).
  The primary conductor must not exceed 70°C.
  V_{OUT} is positive when the primary current flows from bottom to top.

Dimensions HTS 10-P (in mm. 1 mm = 0.0394 inch)





Operation principle



Remarks

- $\mathbf{V}_{OUT}$ is positive when $\mathbf{I}_P$ flows from terminals I + to I -.
- Optimum performance is attained with 0.1 µF capacitor between + $\mathbf{V}_C$ and 0 V and a 100 pF capacitor between OUT and 0 V, placed as close to the HTS 10-P pins as possible.
  (The product is tested with these caps and 10 kΩ from $\mathbf{V}_{OUT}$ to 0 V).
- This device is sensitive to ELECTROSTATIC DISCHARGE (ESD) and must be handled appropriately.
- For IEC 61000-4-3 EMC test : 10 % error between 90 MHz and 120 MHz.
- For IEC 61000-4-6 EMC test : 16 % error from 150 to 160 kHz.

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.