

PRODUCTS

Current sense transformers

Features

- Current sense transformers used to detect switching currents in power semiconductors for control and monitoring functions or in current limiting circuits.
- Wide range of standard products available.
- Special versions according to customers' requirements
- Manufactured according to EN61558 and EN60950 standards
- Compact size

Technical description

UTK current sense transformers are normally used to detect switching currents in power semiconductors, for control, monitoring and protection purposes or to read the current in "current mode" control circuits. They are necessary in all applications where a galvanic insulation between the measured current and the measuring circuit is required. Unlike the current transformers used for measurement application, these devices don't give very high accuracy. Their main application concerns in fact other factors, as for example cost and circuit simplicity, since they have to detect peak values or current trends rather than absolute values with the utmost precision.

In addition to the galvanic insulation between the power line and the control circuit, the current sensors give many advantages compared with resistive current sensing. The lower power dissipation of a current sense transformer allows a much higher signal level, improving the signal to noise environment of the control system. Unlike resistive shunts, where the resistance to inductance ratio is very poor, they also allow high working frequencies.

UTK Component current transformers have the following characteristics:

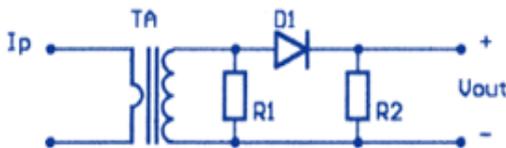
- Compact construction. They are vacuum-filled and encapsulated in plastic box made with self extinguishing material UL94-HB, suitable for the application on high density PCBs.
- Availability in a standard temperature range (0+80°) or an extended
- High turns ratio, from 1:50 to 1:800
- Primary current from 20 to 100A
- High working frequency (up to 200KHz)
- Safe and reliable galvanic insulation
- Maximum working voltage up to 1KV. Dielectric strength tests are conducted according to the international standards EN61558 and EN60950.
- Low losses.

A wide range of standard products is available for the most common applications. In order to satisfy specific requirements UTK Component can develop special products according to the customers' needs.

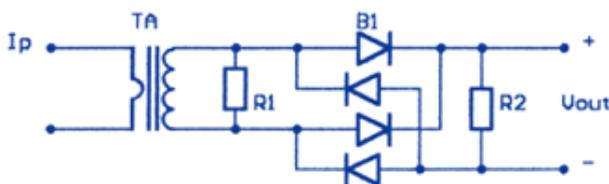
UTK Component controls closely the production during the process and at the end of it, granting the quality and reliability of the product. The carried out tests include:

- Visual inspection
- Pinout and polarity check
- Value of the reference parameters
- Dielectric strength

Applications



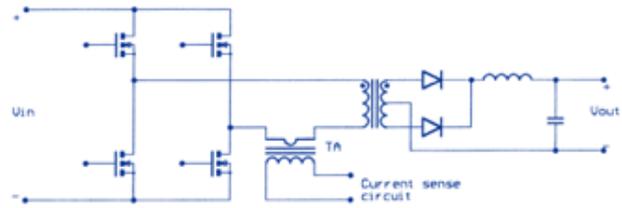
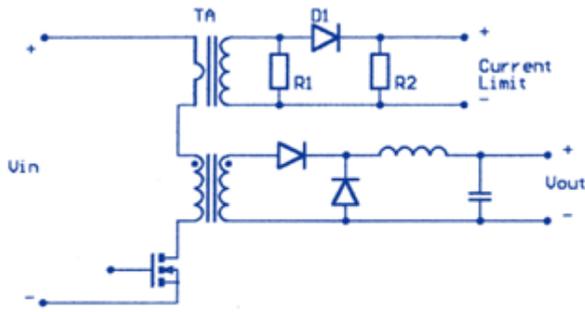
Current sense transformer and secondary circuit for the measure of unipolar pulses. Voltage on resistor R2 gives a good measure of the primary current. Diode D1 blocks inverse voltage during core demagnetization. Resistor R1, with its high value, allows a fast core recovery to detect very closely spaced pulses without core saturation.



Current sense transformer and secondary circuit for the measure of bipolar pulses. The circuit can detect positive and negative current pulses thanks to diode bridge.

Current measure circuit in a single-ended forward power conversion stage.

Current measure circuit in a full-bridge power conversion stage.



Reference parameters

Winding ratio n

Turns ratio of the primary winding to the secondary. The primary winding is usually a single turn of high cross sectional area supplied by the user. A high winding ratio

provides high secondary inductance, more accurate measures and lower insertion losses on the primary circuit.

Primary current I_p

Nominal value of the primary current, mainly related to the cross sectional area of the windings.

Voltage time area $\int udt$

Voltage time Integral on the secondary winding, or voltage time area. In case of measure of unipolar pulses, $\int udt$ shows the maximum permitted value for the integral of secondary voltage, to avoid saturation of the magnetic core. Expressed in μVs . Measuring circuits should provide adequate mechanisms for core demagnetization, also with very closely spaced pulses.

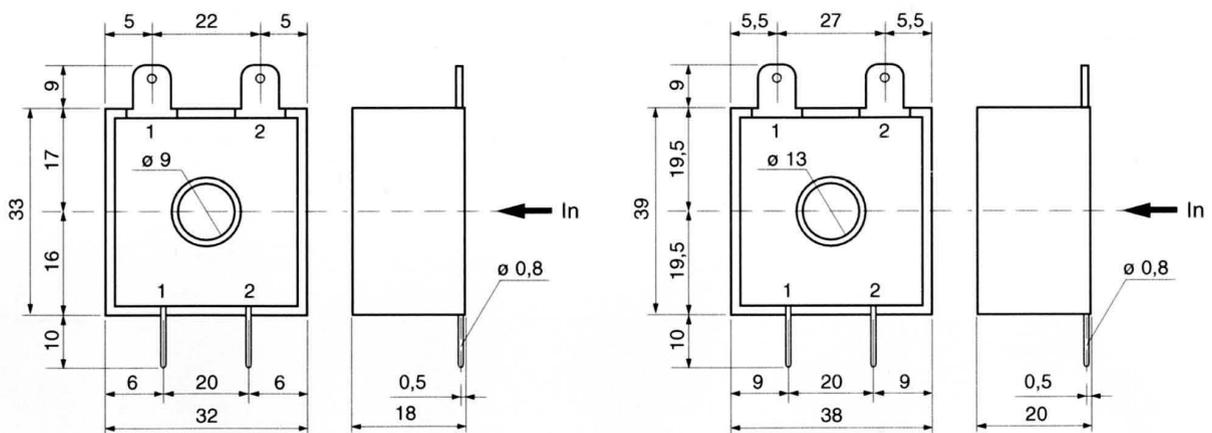
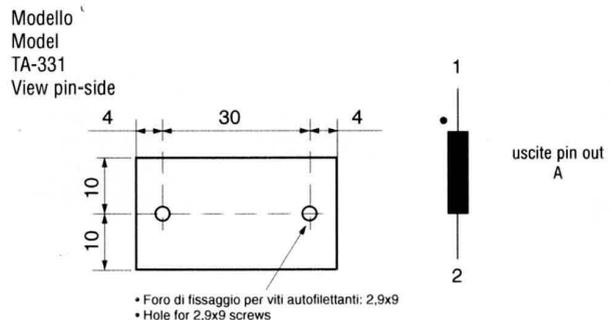
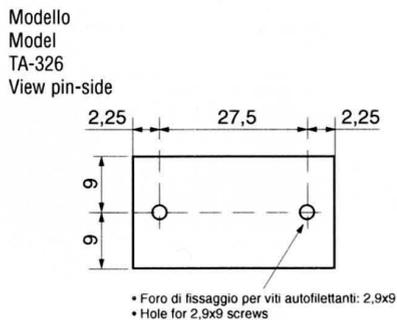
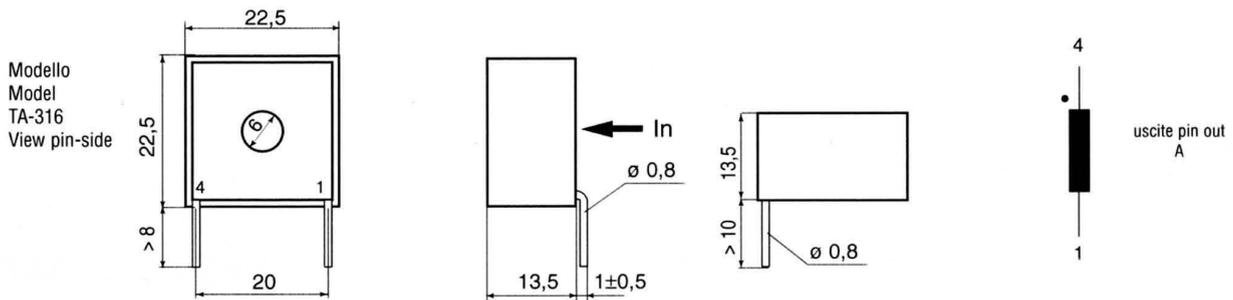
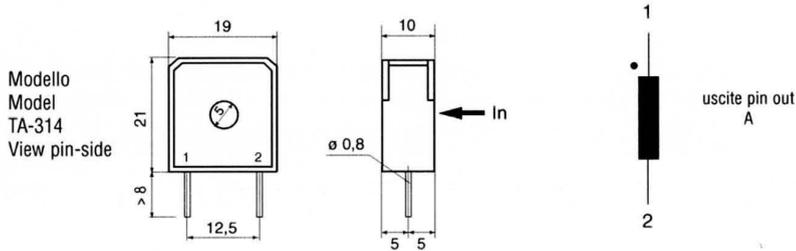
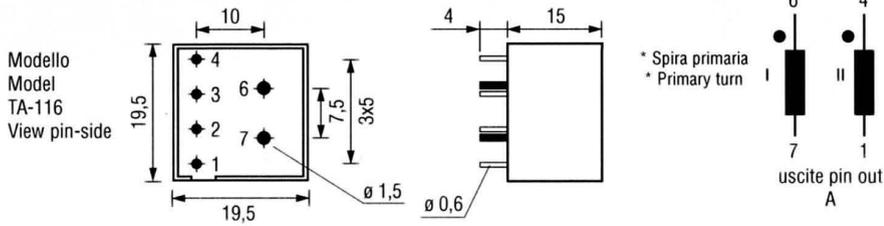
Secondary Inductance L_s

Nominal value of inductance on secondary winding. The maximum deviation from the nominal value (tolerance) is $\pm 25\%$. Measured with LCR meter at the primary winding (Ambient temp $25^\circ C$, frequency $10KHz$, drive $UAC_{rms}=250mV$). The higher the inductance value, the lower the magnetizing current and more accurate the measure. Usually a magnetizing current equal to 10% of the primary current at the end of on time, gives a high quality measure in most applications.

Winding resistance R_s

Resistance measured with LCR meter at the secondary winding.

Code	n	I_p (A)	$\int udt$ (μVs)	L_s (mH)	R_s (Ω)	Model	Pin Out
TA-314050	1:50	20	250	7	0.16	TA-314	A
TA-314100	1:100	20	450	28	0.63	TA-314	A
TA-314200	1:200	20	950	112	2.85	TA-314	A
TA-316050	1:50	30	250	7	0.16	TA-316	A
TA-316100	1:100	30	450	28	0.63	TA-316	A
TA-316200	1:200	30	950	112	2.85	TA-316	A
TA-326100	1:100	60	600	56	0.46	TA-326	A-Pin
TA326110	1:100	60	600	56	0.46	TA-326	A-faston
TA-326200	1:200	60	2500	224	2.00	TA-326	A-Pin
TA-326210	1:200	60	2500	224	2.00	TA-326	A-faston
TA-331100	1:100	100	1900	24	0.35	TA-331	A-Pin
TA-331110	1:100	100	1900	24	0.35	TA-331	A-faston
TA-331200	1:200	100	3800	98	1.10	TA-331	A-Pin
TA-331210	1:200	100	3800	98	1.10	TA-331	A-faston
TA-116100	1:100	25	500	13	0.95	TA-116	A
TA-116200	1:200	25	1000	52	2.00	TA-116	A
TA-116500	1:500	25	2500	350	19	TA-116	A
TA-116800	1:800	25	4000	900	50	TA-116	A



[Back to index](#)

UTK COMPONENT - Via del Progresso 35/37 - 36025 Noventa Vicentina VI - Tel. (+39) 0444 760770 r.a. - Fax (+39) 0444 860963