

SMT current sense transformers

EE 12.6

Series/Type: **B82801C**
Date: December 2012

Application

- Switching power supplies
- Feedback control
- Overload sensing
- Load drop/shut down detection

Features

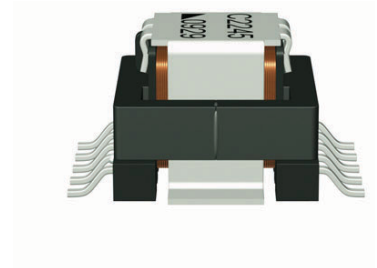
- Very low DC resistance
- Different turns ratios
- Small package
- Other pinning on request
- RoHS compatible

Marking

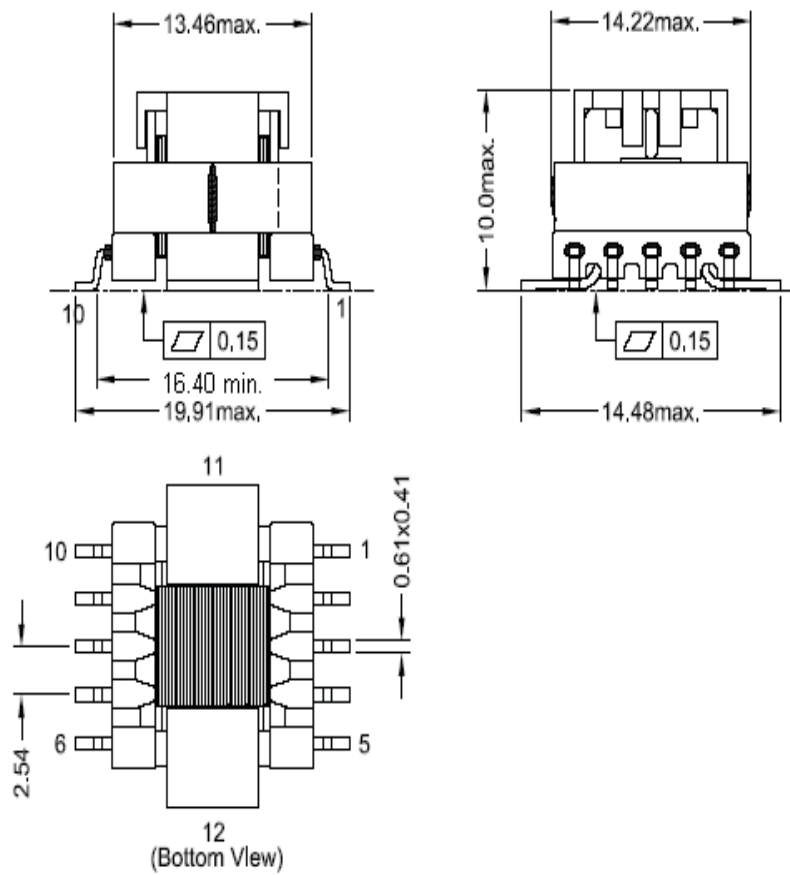
Middle block of ordering code

Delivery mode and packing units

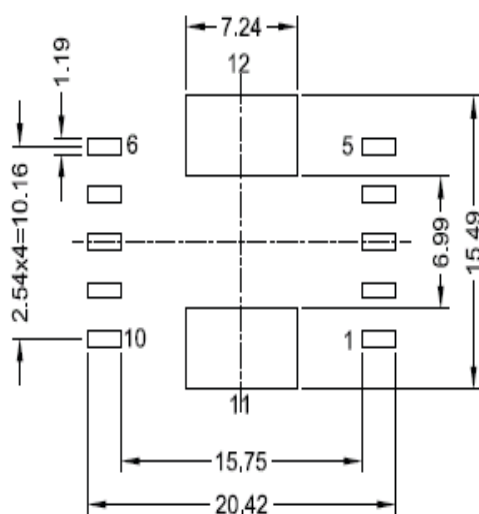
- 32 mm blister tape, 330 mm \varnothing reel
- Carton packaging
- Packing units: 200 pcs./reel;
800 pcs./carton



Dimensional drawing

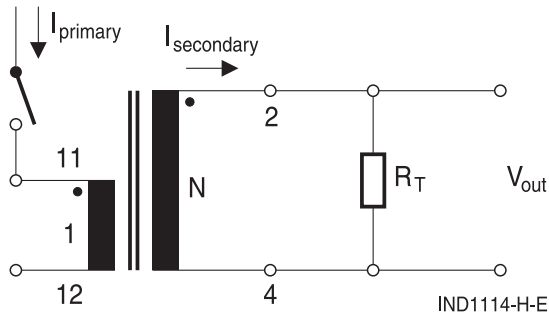


Recommended PCB Layout
(Top View)



Dimensions in mm

Application circuit and pinning



Technical data and measuring conditions

Frequency range	50 ... 500 kHz
Hi-pot	1500 V AC, 2 s (winding to winding)
Inductance L (1-3)	100 kHz, 100 mV, @ +25 °C
DC resistance R_{max}	Measured at +25 °C (specified per winding)
Sensed current	The max. primary current of 40 A causes approx. +40 °C temperature rise
Solderability	≥ 99.9 Sn, lead-free. Or Sn96.5Ag3.0Cu0.5: +(245 ±5) °C, (3 ±0.3) s Wetting of soldering area ≥ 95% (to IEC 60068-2-58)
Resistance to soldering heat	+(260 ± 5) °C, (10 ± 1 s) to IEC 60068-2-58
Storage conditions	−20 °C ... +40 °C, ≤ 75% RH
Test voltage V_{test}	50 Hz, 1 s
Operating temperature range	−40 °C ... +125 °C
Weight	Approx. 4.8 g

$$B_{\max} = \frac{V_{\text{sense, max}} \cdot \delta_{\max}}{n_s \cdot A_e \cdot f_{\text{osc}}}$$

With:

B_{\max} Maximum magnetic flux density in the ferrite core of the current sense transformer

$V_{\text{sense, max}}$ Maximum output voltage of the measurement signal

δ_{\max} Maximum duty cycle

n_s Number of turns of the secondary winding of the current sense transformer

A_e Effective magnetic area of the ferrite core

f_{osc} Operating frequency of the switching operator IC

Typical value for A_e : $12.4 \times 10^{-6} \text{ m}^2$

Typical B_{\max} : 200 mT

$$R_T = \frac{V_{\text{sense, max}} \cdot n_s}{I_{\text{prim, max}}}$$

With:

R_T Resistance of burden resistor

$V_{\text{sense, max}}$ Maximum output voltage of the measurement signal

n_s Number of turns on the secondary side of the CT

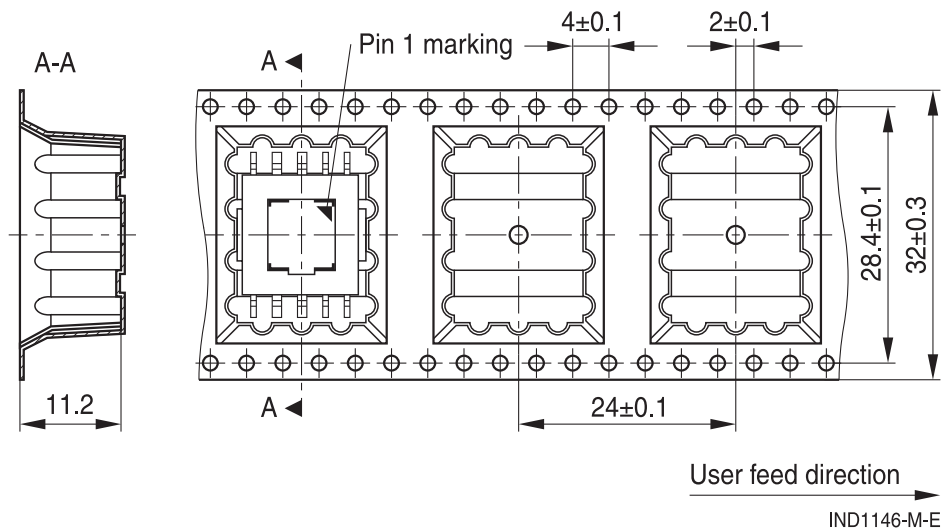
$I_{\text{prim, max}}$ Maximum primary current (peak current)

Characteristics and ordering codes

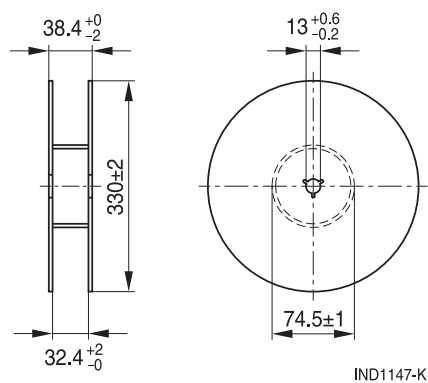
L_{\min}	Turns ratio	DC resistance R_{\max} (m Ω)		Voltage- time product	Recomm. R_T	Ordering code
mH	$N_p : N_s$	primary	secondary	V \cdot μ s	Ω	
1.4	1 : 50	0.28	400	124	50	B82801C0145A050
5.6	1 : 100	0.28	1000	248	100	B82801C0565A100
12.6	1 : 150	0.28	2200	372	150	B82801C1265A150
22.4	1 : 200	0.28	2900	496	200	B82801C2245A200

Taping and packing

Blister tape



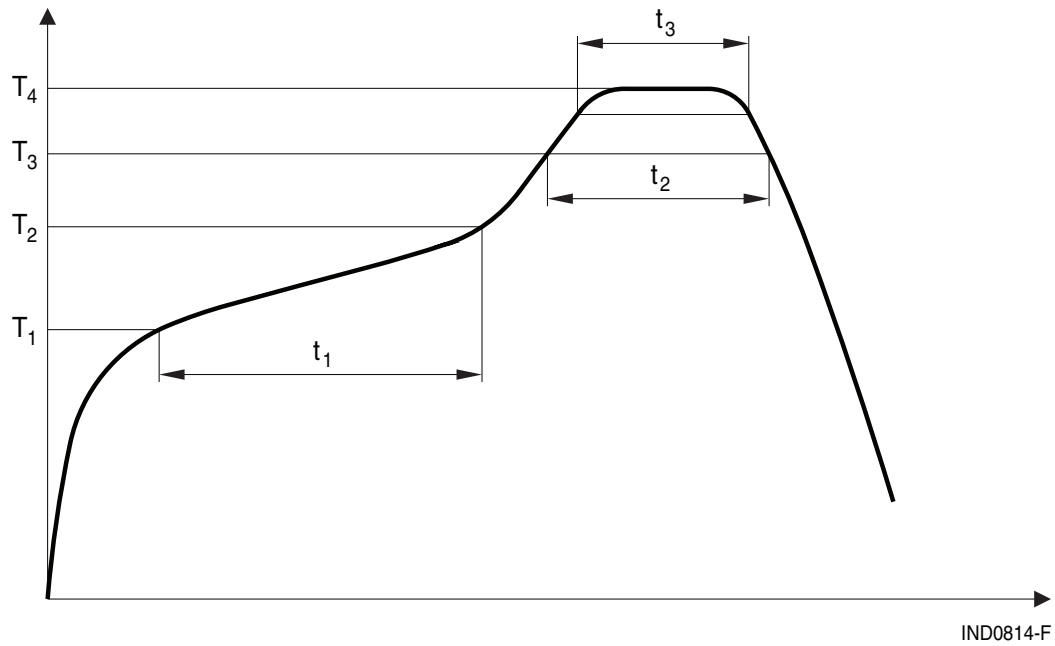
Reel



Dimensions in mm

Recommended reflow soldering curve

Pb-free solder material (based on JEDEC J-STD 020D)



T_1 °C	T_2 °C	T_3 °C	T_4 °C	T_1 sec	T_2 sec	T_3 sec
150	200	217	245	<110	<90	20 ... 40

Max. time from +25 °C to T: 300 seconds

Max. 3 reflow cycles

Cautions and warnings

- Please note the recommendations in our Inductors data book (latest edition) and in the data sheets.
 - Particular attention should be paid to the derating curves given there. Derating must be applied in case the ambient temperature in the application exceeds the rated temperature of the component.
 - Ensure the operation temperature (which is the sum of the ambient temperature and the temperature rise caused by losses / self-heating) of the component in the application does not exceed the maximum value specified in the climatic category.
 - The soldering conditions should also be observed. Temperatures quoted in relation to wave soldering refer to the pin, not the housing.
- If the components are to be washed varnished it is necessary to check whether the washing varnish agent that is used has a negative effect on the wire insulation, any plastics that are used, or on glued joints. In particular, it is possible for washing varnish agent residues to have a negative effect in the long-term on wire insulation.

Washing processes may damage the product due to the possible static or cyclic mechanical loads (e.g. ultrasonic cleaning). They may cause cracks to develop on the product and its parts, which might lead to reduced reliability or lifetime.
- The following points must be observed if the components are potted in customer applications:
 - Many potting materials shrink as they harden. They therefore exert a pressure on the plastic housing or core. This pressure can have a deleterious effect on electrical properties, and in extreme cases can damage the core or plastic housing mechanically.
 - It is necessary to check whether the potting material used attacks or destroys the wire insulation, plastics or glue.
 - The effect of the potting material can change the high-frequency behaviour of the components.
- Ferrites are sensitive to direct impact. This can cause the core material to flake, or lead to breakage of the core.
- Even for customer-specific products, conclusive validation of the component in the circuit can only be carried out by the customer.

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