



SMT current sense transformers

EE 4.2 core

Series/Type: B82801A
Date: December 2012

Applications

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

Features

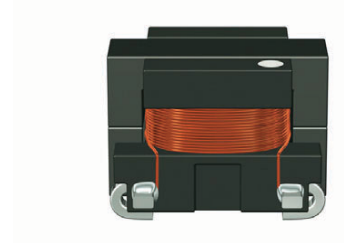
- Very low DC resistance
- Different turns ratios
- Very small package
- RoHS compatible

Marking

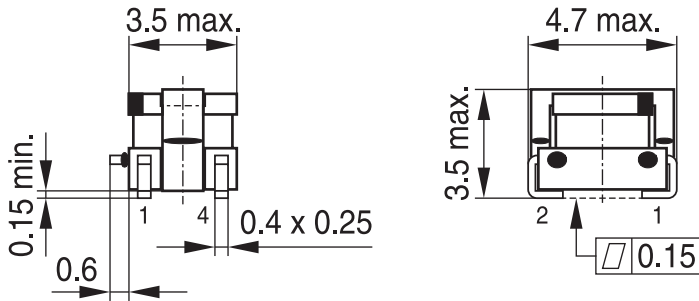
No marking on component

Delivery mode and packing units

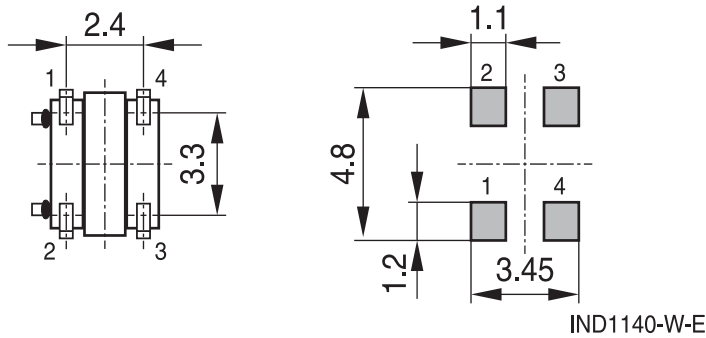
- 12 mm blister tape, 178 mm \varnothing reel
- Carton packaging
- Packing units: 600 pcs./reel;
3000 pcs./carton



Dimensional drawing

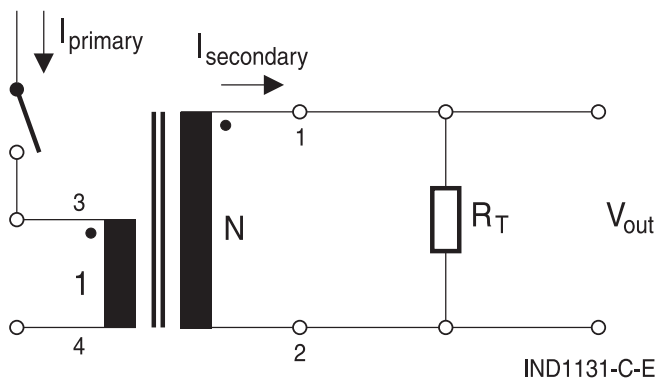


Recommended PCB layout
(Top View)



Dimensions in mm

Application circuit and pinning



Technical data and measuring conditions

Frequency range	50 kHz ... 1 MHz
Hi-pot	500 V AC, 2 s (winding to winding)
Inductance L (1-2)	100 kHz, 100 mV, @ +25 °C
DC resistance R _{max}	Measured at +25 °C
Sensed current	The max. primary current of 7 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. 0.15 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 : $1.44 \times 10^{-6} \text{ m}^2$

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

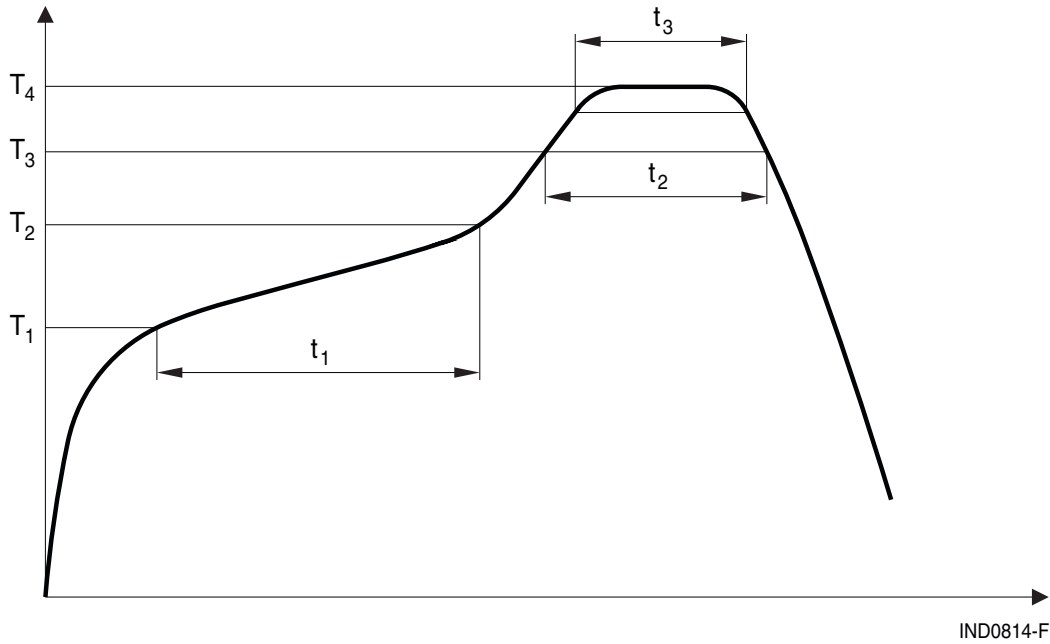
$I_{\text{prim, max}}$ Maximum primary current (peak current)

Characteristics and ordering codes

L_{\min} μH	Turns ratio $N_p : N_s$	DC resistance R_{\max} (m Ω)		Voltage- time product $V \cdot \mu\text{s}$	Recomm. R_T	Ordering code
		primary	secondary			
33	1 : 20	2.5	320	5.76	20	B82801A0333A020
74	1 : 30	2.5	800	8.6	30	B82801A0743A030
132	1 : 40	2.5	1300	11.5	40	B82801A0134A040
205	1 : 50	2.5	2200	14.4	50	B82801A0214A050
295	1 : 60	2.5	3600	17.3	60	B82801A0304A060
400	1 : 70	2.5	4600	20.0	70	B82801A0404A070
820	1 : 100	2.5	8700	28.8	100	B82801A0824A100
1280	1 : 125	2.5	13000	36.0	125	B82801A0135A125
1840	1 : 150	2.5	21000	43.2	150	B82801A0185A150

Recommended reflow soldering curve

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



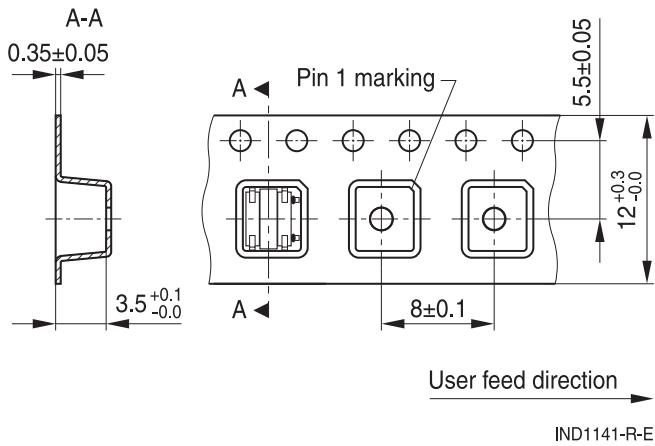
T₁ °C	T₂ °C	T₃ °C	T₄ °C	T₁ sec	T₂ sec	T₃ sec
150	200	217	245	<110	<90	20 ... 40

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

Max. 3 reflow cycles

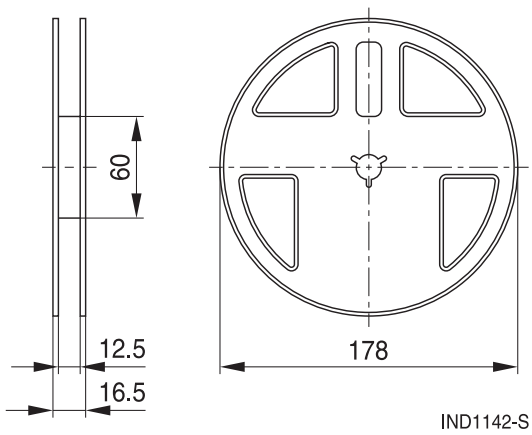
Taping and packing

Blister tape



Dimensions in mm

Reel



Dimensions in mm

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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