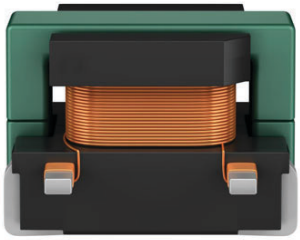
SMT current sense transformers

EE 4.2 core

Series/Type: **B82801A1**

Date: March 2020

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

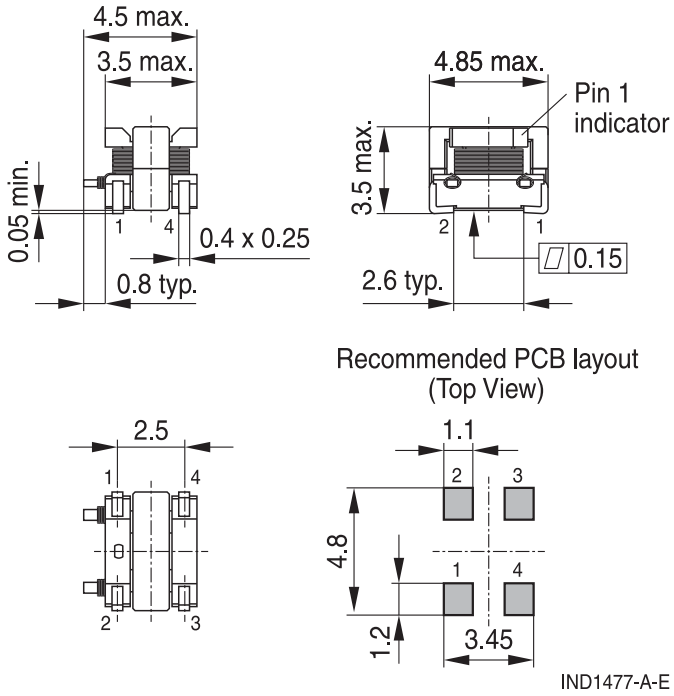
Delivery mode and packing units

- 16 mm blister tape, 178 mm ∅ reel
- Carton packaging
- Packing units: 600 pcs./reel;
  3000 pcs./carton

Remark

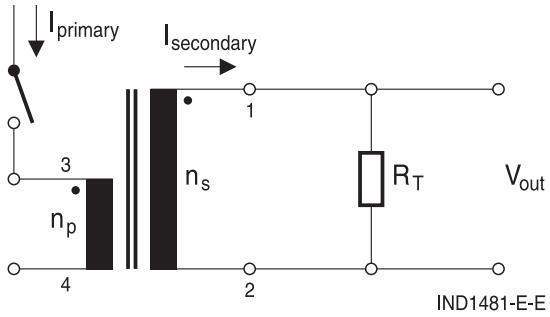
- Variation in core coating color is possible

Dimensional drawing



Dimensions in mm

Application circuit and pinning



Technical data and measuring conditions

Frequency range	50 kHz ... 1 MHz
Hi-pot	500 V_{rms}, 50 Hz, 2 s (n_p to n_s)
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 (packaged)	–20 °C … +40 °C, ≤ 75% RH
Operating temperature range	–40 °C … +125 °C
Weight	Approx. 0.15 g

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

With:

B_{max} Maximum magnetic flux density in the ferrite core of the current sense transformer
$V_{sense,max}$ 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 x 10^{-6} m^2

Typical B_{max}: 200 mT

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

With:

R_T Resistance of burden resistor
$V_{sense,max}$ Maximum output voltage of the measurement signal
n_s Number of turns on the secondary side of the CT
$I_{prim,max}$ Maximum primary current (peak current)

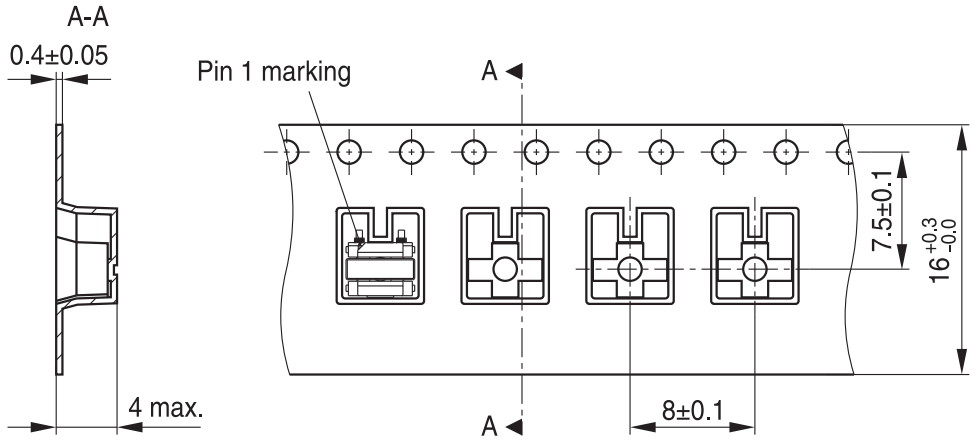
Characteristics and ordering codes

L_{min}	Turns ratio	DC resistance R_{max} (mΩ)		Voltage-time product at n_s [1]	Recomm. R_T	Ordering code
µH	$n_p : n_s$	primary	secondary	V · µs	Ω	
33	1 : 20	2.5	700	5.76	20	B82801A1333A020
74	1 : 30	2.5	1100	8.6	30	B82801A1743A030
132	1 : 40	2.5	1500	11.5	40	B82801A1134A040
205	1 : 50	2.5	2400	14.4	50	B82801A1214A050
295	1 : 60	2.5	3600	17.3	60	B82801A1304A060
400	1 : 70	2.5	4600	20.0	70	B82801A1404A070
820	1 : 100	2.5	9000	28.8	100	B82801A1824A100
1280	1 : 125	2.5	15000	36.0	125	B82801A1135A125
1840	1 : 150	2.5	22700	43.2	150	B82801A1185A150

1) The maximum volt-sec rating limits the peak flux density to 200 mT when used in a unipolar drive application. For bi-polar drive applications, a maximum volt-sec of two times is acceptable.

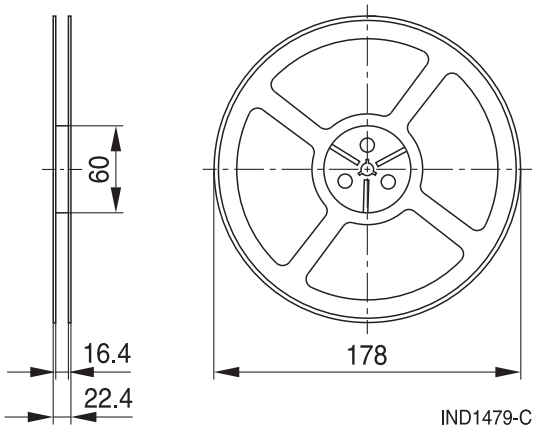
Taping and packing

Blister tape



IND1478-B-E Dimensions in mm

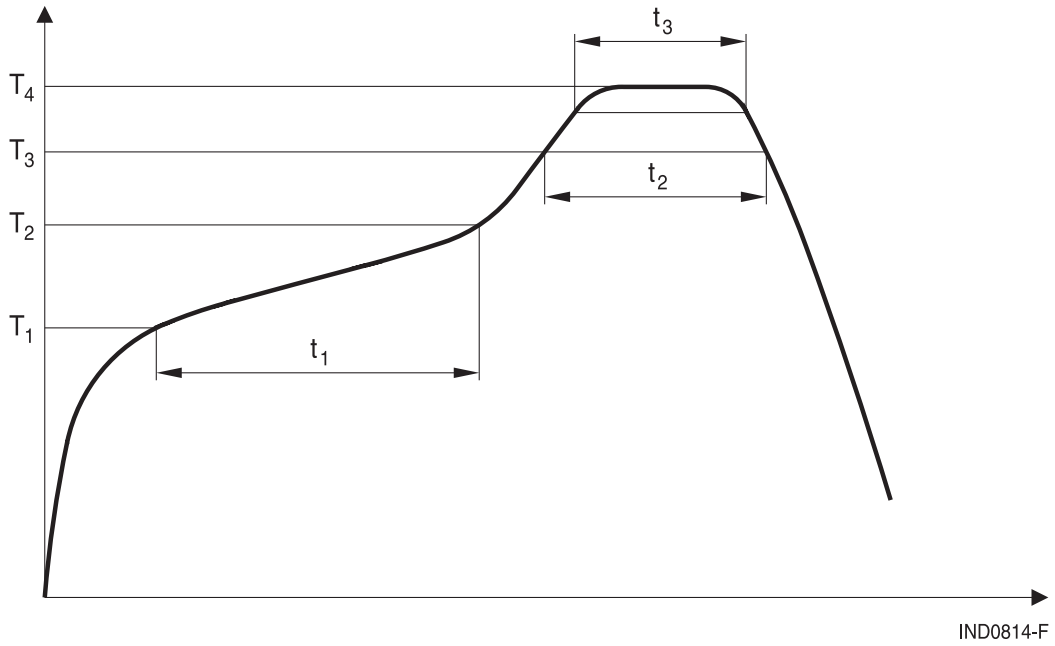
Reel



IND1479-C 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.
  - 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, wire insulation, plastics or glue.
  - The effect of the potting material can change the high-frequency behaviour of the components.
  - Many coating materials have a negative effect (chemically and mechanically) on the winding wires, insulation materials and connecting points. Customers are always obligated to determine whether and to what extent their coating materials influence the component.
    Customers are responsible and bear all risk for the use of the coating material. TDK Electronics does not assume any liability for failures of our components that are caused by the coating material.
- Ceramics / 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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