



## **SMT power inductors**

Size 12.5 x 12.5 x 8.5 mm

**Series/Type:**            **B82477D4**

**Ordering code:**

**Date:**                    June 2013

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## SMT power inductors

Size 12.5 x 12.5 x 8.5 mm

B82477D4

**Rated inductance 2 ... 100µH**

### Construction

- Ferrite core
- Magnetically shielded
- Winding: enamel copper wire
- Winding soldered to terminals
- Special winding technology for low stray inductance and high coupling factor



### Features

- High rated current, low DC resistance
- Temperature range up to +150 °C
- Suitable for lead-free reflow soldering as referenced in JEDEC J-STD 020D
- Qualified to AEC-Q200
- RoHS-compatible
- Coupling factor of typically 99% in average

### Applications

- Common mode choke
- DC/DC converters, especially for SEPIC topology
- 1:1 transformer

### Terminals

- Base material CuSn6P
- Layer composition Ni, Sn (lead-free)
- Electro-plated

### Marking

- Marking on component:  
Manufacturer, L value (in µH), Date code
- Minimum data on reel:  
Manufacturer, ordering code, L value, quantity, date of packing

### Delivery mode and packing unit

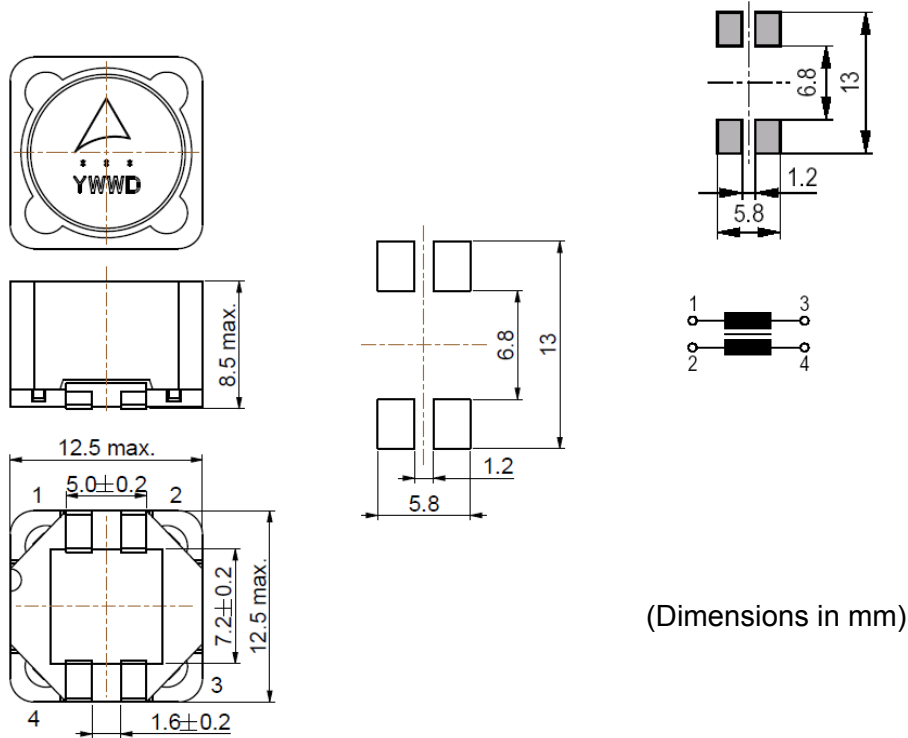
- 24-mm blister tape, wound on 330-mm Ø reel
- Packing unit: 350 pcs./reel

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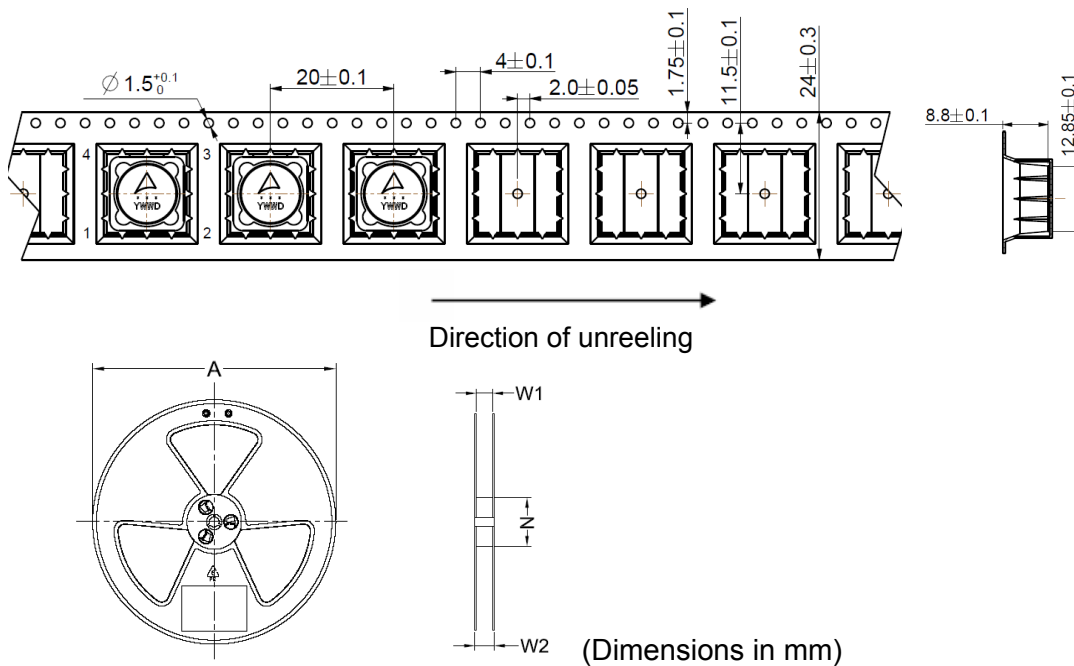
Size 12.5 x 12.5 x 8.5 mm

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## Dimensional drawing and circuit diagram



## Taping and packing



A:330±2

N:75±1

W1:24.4 typ

W2:30.4 max

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**Technical data and measuring conditions**

Rated inductance $L_1, L_2$	Measured with LCR meter Agilent 4284A at frequency $f_L$ , 0.1 V, +20 °C.
Leakage or stray inductance $L_s$	Test $L_{1-3}$ :(short 2+4) .Measured with LCR meter Agilent 4284A at 100khz, 0.1 V, +20 °C.
Coupling factor $K_{typ}$	Coupling in between the 2 windings. $k = \sqrt{1 - \frac{L_s}{L_n}}$
Operating temperature range	−55°C to +150 °C
Rated current $I_R$	Max. permissible DC with temperature increase of ≤ 40 K
Saturation current $I_{Sat}$	DC with inductance decrease $\Delta L/L_0$ of approx. 10%
DC resistance $R_1, R_2$ , (max)	Measured at +20 °C
Solderability (lead-free)	Dip and look method Sn95.5Ag3.8Cu0.7: +(245 ±5) °C, (3 ±0.3) s Wetting of soldering area ≥ 90% (based on IEC 60068-2-58)
Resistance to soldering heat	+260 °C, 40 s (as referenced in JEDEC J-STD-020D)
Climatic category	55/150/56 (to IEC 60068-1)
Storage conditions	Mounted: −55 °C ... +150 °C Packaged: −25 °C ... +40 °C, ≤ 75% RH
Weight	Approx. 4.2 g

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## Characteristics and ordering codes

L <sub>1</sub> , L <sub>2</sub> μH	L <sub>s,typ</sub> μH	K <sub>typ</sub> %	Tolerance	f <sub>L</sub> MHz	I <sub>sat,typ</sub> A	I <sub>sat,min</sub> A	I <sub>R</sub> A	R <sub>1</sub> , R <sub>2</sub> /mΩ max   typ	Ordering code
2.0	0.20	94.9	±20% $\triangle$ M	0.1	15	13	5.75	20   16.5	B82477D4202M000
3.0	0.25	95.7			12	10.25	5.50	22   18.1	B82477D4302M000
4.7	0.25	97.3			10	8.75	5.00	26   23.2	B82477D4472M000
6.8	0.25	98.1			8.25	7.25	4.15	35   28.5	B82477D4682M000
10	0.25	98.7			6.50	5.75	3.75	42   35.5	B82477D4103M000
15	0.30	99.0			5.50	4.80	3.25	60   52.5	B82477D4153M000
22	0.30	99.3			4.50	4.00	2.80	78   69.5	B82477D4223M000
33	0.35	99.5			3.80	3.30	2.30	110   96.4	B82477D4333M000
47	0.45	99.5			3.30	3.10	1.85	145   115	B82477D4473M000
68	0.50	99.6			2.50	2.30	1.55	215   190	B82477D4683M000
100	0.60	99.7			2.20	2.00	1.35	280   267	B82477D4104M000

Inductance is per winding. When leads are connected in parallel, inductance is the same value. When leads are connected in series, inductance is four times the value.

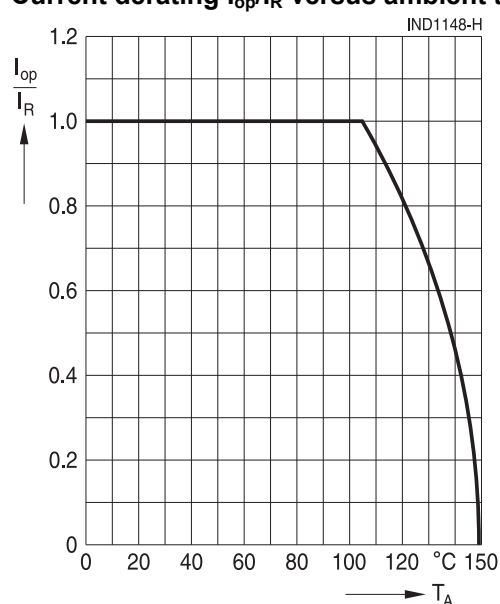
DCR is for each winding. When leads are connected in parallel, DCR is half the value. When leads are connected in series, DCR is twice the value.

I<sub>sat</sub> is the current flowing through one winding. When leads are connected in parallel, I<sub>sat</sub> is the same. When leads are connected in series, I<sub>sat</sub> is half the value.

I<sub>R</sub> is the total current through both windings

I<sub>1</sub> and I<sub>2</sub> can be calculated like this:  $I_1^2 + I_2^2 = I_R^2$

## Current derating I<sub>op</sub>/I<sub>R</sub> versus ambient temperature T<sub>A</sub>



**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.
- 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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