SMT power inductors

PIS power inductors

Series/Type: **PIS150H**

Date: April 2023

PIS power inductors

Rated inductance 470 µH

Construction

- Ferrite core
- Magnetically shielded
- Winding enamel copper wire
- Winding soldered to terminals

Features

- Temperature range up to +150 °C
- High rated current
- Low DC resistance
- Suitable for lead-free reflow soldering as referenced in JEDEC J-STD 020E
- RoHS-compatible

Applications

- Industrial electronics
- Power over Data Line (PoDL) for 10Base-T1L (IEEE 802.3cg)

Terminals

- Base material CuSn6P
- Lead-finish Sn (lead-free)
- Electro-plated

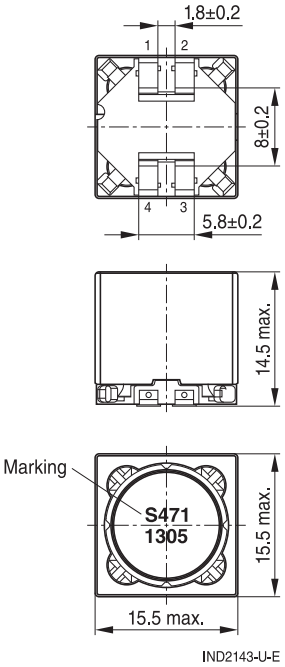
Marking

- Marking on component: Code letter “S”, L value (in µH), date of manufacture (YWWD), dot for Pin 1 identification

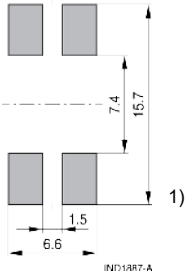
Delivery mode and packing units

- 32-mm blister tape, wound on 330-mm Ø reel
- Packing unit: 175 pcs./reel

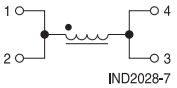
Dimensional drawing



Layout recommendation



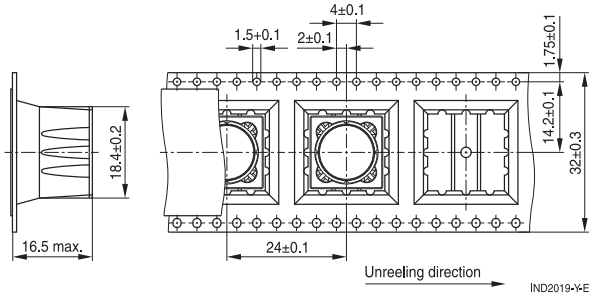
Circuit diagram



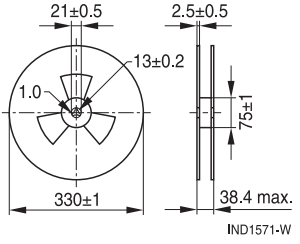
1) Pins 1 and 2 must be joined in PCB. Pins 3 and 4 must be joined in PCB.

Taping and packing

Blister tape



Reel



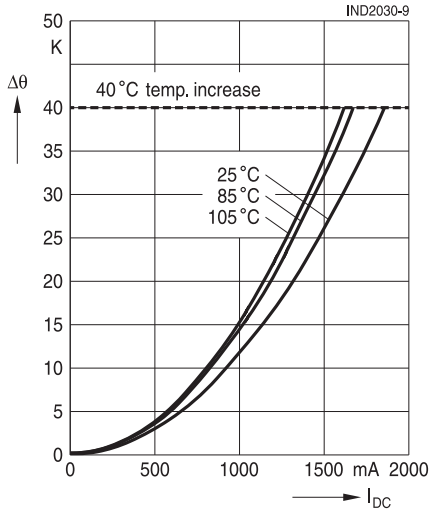
Technical data and measuring conditions

Rated inductance L_R	specified between 1&2 – 3&4, measured with LCR meter Agilent 4284A (or equivalent) at frequency f_L, 0.1 V, +23 °C ±3 °C
Tolerance	±20%
IEEE 802.3 cg Power class	Class 15 with two inductors
Operating temperature range	–40 °C to +150 °C (self-rise temperature included)
Rated current I_R	Max. typ. permissible DC with temperature increase of ≤40 K Method as per IEC62024-2
Saturation current I_{Sat}	DC with inductance decrease $\Delta L/L_0$ of approx. 30%, typical values
DC resistance	specified between 1&2 – 3&4, measured at +23 °C ±3 °C
Solderability (lead-free)	Dip and look method, Wetting of soldering area ≥95% as referenced in EIA/IPC/JEDEC J-STD-002E
Resistance to soldering heat	as referenced in JEDEC J-STD-020E
Climatic category	40/150/56 (to IEC 60068-1)
Storage conditions	Mounted: –40 °C … +150 °C Packaged: –25 °C … +40 °C, ≤75% RH
Weight	Approx. 10.5 g

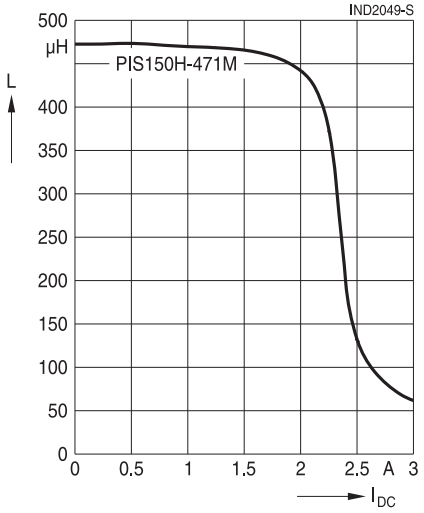
Characteristics and ordering codes

L_R	$R_{DC,typ}$	$I_{Sat,typ}$	$I_{R,typ}$ (ambient temp.)	Internal code	Ordering code
µH	Ω	mA	mA		
470	0.25	2300	1810 (+25 °C) 1650 (+85 °C) 1600 (+105 °C)	B82480P8474M000	PIS150H-471M

Temperature increase due to I_{DC} (typical values)



Inductance versus I_{DC} (typical values)



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.
- Due to product design and applied manufacturing process, appearance, symmetry, and shape of not dimensioned details could vary within same lot, as well discoloration of housing is possible. TDK does not expect detrimental effects on product function or reliability. In case of conflicts, TDK reference standard shall prevail.

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The ordering code for one and the same product can be represented differently in data sheets, data books, other publications, on the company website, or in order-related documents such as shipping notes, order confirmations and product labels. **The varying representations of the ordering codes are due to different processes employed and do not affect the specifications of the respective products**. Detailed information can be found on the Internet under www.tdk-electronics.tdk.com/orderingcodes.

Important notes

The following applies to all products named in this publication:

1. Some parts of this publication contain **statements about the suitability of our products for certain areas of application**. These statements are based on our knowledge of typical requirements that are often placed on our products in the areas of application concerned. We nevertheless expressly point out **that such statements cannot be regarded as binding statements about the suitability of our products for a particular customer application.** As a rule, we are either unfamiliar with individual customer applications or less familiar with them than the customers themselves. For these reasons, it is always ultimately incumbent on the customer to check and decide whether a product with the properties described in the product specification is suitable for use in a particular customer application.

2. We also point out that **in individual cases, a malfunction of electronic components or failure before the end of their usual service life cannot be completely ruled out in the current state of the art, even if they are operated as specified.** In customer applications requiring a very high level of operational safety and especially in customer applications in which the malfunction or failure of an electronic component could endanger human life or health (e.g. in accident prevention or life-saving systems), it must therefore be ensured by means of suitable design of the customer application or other action taken by the customer (e.g. installation of protective circuitry or redundancy) that no injury or damage is sustained by third parties in the event of malfunction or failure of an electronic component.

3. **The warnings, cautions and product-specific notes must be observed**.

4. In order to satisfy certain technical requirements, **some of the products described in this publication may contain substances subject to restrictions in certain jurisdictions (e.g. because they are classed as hazardous)**. Useful information on this will be found in our Material Data Sheets on the Internet (www.tdk-electronics.tdk.com/material). Should you have any more detailed questions, please contact our sales offices.

5. We constantly strive to improve our products. Consequently, **the products described in this publication may change from time to time**. The same is true of the corresponding product specifications. Please check therefore to what extent product descriptions and specifications contained in this publication are still applicable before or when you place an order.
   We also **reserve the right to discontinue production and delivery of products**. Consequently, we cannot guarantee that all products named in this publication will always be available. The aforementioned does not apply in the case of individual agreements deviating from the foregoing for customer-specific products.

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