Dimensions: [mm]

Recommended Land Pattern: [mm]

no sensitive traces underneath the component

Schematic:

Product Marking:

Start of Winding  471 (Inductance Code)

Electrical Properties:

<table>
<thead>
<tr>
<th>Properties</th>
<th>Test conditions</th>
<th>Value</th>
<th>Unit</th>
<th>Tol.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inductance L</td>
<td>f = 100 kHz/5 mA</td>
<td>470</td>
<td>µH</td>
<td>±20%</td>
</tr>
<tr>
<td>Rated Current I</td>
<td>ΔT = 40 K</td>
<td>0.43</td>
<td>A</td>
<td>max.</td>
</tr>
<tr>
<td>Saturation Current I sat</td>
<td>ΔL/LI &lt; 10 %</td>
<td>0.55</td>
<td>A</td>
<td>typ.</td>
</tr>
<tr>
<td>DC Resistance R DC @ 25 °C</td>
<td></td>
<td>1360</td>
<td>mΩ</td>
<td>typ.</td>
</tr>
<tr>
<td>DC Resistance R DC @ 25 °C</td>
<td></td>
<td>1700</td>
<td>mΩ</td>
<td>max.</td>
</tr>
<tr>
<td>Self Resonant Frequency f res</td>
<td></td>
<td>2.8</td>
<td>MHz</td>
<td>typ.</td>
</tr>
<tr>
<td>Operating Voltage V</td>
<td></td>
<td>120</td>
<td>V</td>
<td>max.</td>
</tr>
</tbody>
</table>

Certification:

RoHS Approval: Compliant [ 2011/65/EU&2015/863 ]
REACh Approval: Conform or declared [ (EC)1907/2006 ]
Halogen Free: Conform [ JEDEC 709B ]

General Information:

Ambient Temperature (referred to T a) -40 up to +110 °C
Operating Temperature -40 up to +150 °C
Storage Conditions (in original packaging) < 40 °C ; < 75 % RH
Moisture Sensitivity Level (MSL) 1

Test conditions of Electrical Properties: +20 °C, 33 % RH if not specified differently

This electronic component has been designed and developed for usage in general electronic equipment only. This product is not authorized for use in equipment where a higher safety standard and reliability standard is especially required or where failures of the product are reasonably expected to cause severe personal injury or death. Moreover Würth Elektronik eiSos GmbH & Co KG products are neither designed nor intended for use in areas such as military, aerospace, nuclear, industrial control, automative, telecommunications, medical, space, and similar areas. Würth Elektronik eiSos GmbH & Co KG shall not be informed about the intent of such usage before the design or usage. In addition, sufficient reliability evaluation checks for usage must be performed on every electronic component which is used in electrical circuits that require high safety and reliability functions or performance.
This electronic component has been designed and developed for usage in general electronic equipment only. This product is not authorized for use in equipment where a higher safety standard and reliability standard is especially required or where a failure of the product is reasonably expected to cause severe personal injury or death. The parties executing the purchase of such a product should execute an agreement specifically governing such use. Würth Elektronik eiSos GmbH & Co. KG products are neither designed nor intended for use in areas such as military, aerospace, aviation, nuclear control, automotive, transportation (submarine, ships, aircraft), control, robot control, transportation signal, disaster prevention, medical, public information network etc. Würth Elektronik eiSos GmbH & Co. KG shall not be liable to the customer for any direct, indirect, special, incidental, or consequential damages arising out of the use of such products. Würth Elektronik eiSos GmbH & Co. KG shall not be liable to the customer for any loss of profits, loss of business, loss of contracts, loss of production, or any other economic loss even if Würth Elektronik eiSos GmbH & Co. KG is informed of the possibility of such loss or damage.
Packaging Specification - Tape and Reel: [mm]

No Component
min. 160mm
Components
min. 100mm
Cover Tape
min. 400mm

packaging is referred to the international standard IEC 60286-3:2013

This electronic component has been designed and developed for usage in general electronic equipment only. This product is not authorized for use in equipment where a higher safety standard and reliability standard is especially required or where failure of the product is reasonably expected to cause serious personal injury or death, unless the parties have executed an agreement specifically governing such use. Moreover Würth Elektronik eiSos GmbH & Co KG products are neither designed nor intended for use in areas such as military, aerospace, defense, nuclear control, astronautics, transportation, submarine control, flood control, ship control, transportation signal, disaster prevention, medical, public information networks etc. Würth Elektronik eiSos GmbH & Co KG must be informed about the intent of such usage before the design-in stage. In addition, additional reliability evaluation checks for usage must be performed on every electronic component which is used in electrical circuits that require high safety and reliability functions or performance.
Classification Reflow Profile for SMT components:

- Time
- Temperature
- $T_p$
- $T_l$
- $T_s$
- $T_{max}$
- $T_{min}$
- $T_c = -5°C$
- $T_b$

Classification Reflow Soldering Profile:

<table>
<thead>
<tr>
<th>Profile Feature</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preheat Temperature Min</td>
<td>$T_{s\ min}$ 150°C</td>
</tr>
<tr>
<td>Preheat Temperature Max</td>
<td>$T_{s\ max}$ 200°C</td>
</tr>
<tr>
<td>Preheat Time $t_b$ from $T_{s\ min}$ to $T_{s\ max}$</td>
<td>$t_b$ 60 - 120 seconds</td>
</tr>
<tr>
<td>Ramp-up Rate ($T_l$ to $T_p$)</td>
<td>3 °C/second max.</td>
</tr>
<tr>
<td>Liquidous Temperature $T_l$</td>
<td>217 °C</td>
</tr>
<tr>
<td>Time $t_l$ maintained above $T_l$</td>
<td>$t_l$ 60 - 150 seconds</td>
</tr>
<tr>
<td>Peak package body temperature $T_p$</td>
<td>see table below</td>
</tr>
<tr>
<td>Time within 5°C of actual peak temperature $T_p$</td>
<td>$t_p$ 20 - 30 seconds</td>
</tr>
<tr>
<td>Ramp-down Rate ($T_l$ to $T_p$)</td>
<td>6 °C/second max.</td>
</tr>
<tr>
<td>Time 25°C to peak temperature</td>
<td>8 minutes max.</td>
</tr>
</tbody>
</table>

Refer to IPC/ JEDEC J-STD-020E

Package Classification Reflow Temperature:

<table>
<thead>
<tr>
<th>Properties</th>
<th>Volume mm³</th>
<th>Volume mm³</th>
<th>Volume mm³</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt;350</td>
<td>350-2000</td>
<td>&gt;2000</td>
</tr>
<tr>
<td>PB-Free Assembly</td>
<td>Package Thickness &lt; 1.6 mm</td>
<td>260 °C 260 °C 260 °C</td>
<td></td>
</tr>
<tr>
<td>PB-Free Assembly</td>
<td>Package Thickness 1.6 mm - 2.5 mm</td>
<td>260 °C 250 °C 245 °C</td>
<td></td>
</tr>
<tr>
<td>PB-Free Assembly</td>
<td>Package Thickness ≥ 2.5 mm</td>
<td>250 °C 245 °C 245 °C</td>
<td></td>
</tr>
</tbody>
</table>

Refer to IPC/ JEDEC J-STD-020E

This electronic component has been designed and developed for usage in general electronic equipment only. This product is not authorized for use in equipment where a higher safety standard and reliability standard is especially required or where failure of the product can reasonably be expected to cause severe personal injury or death, unless the parties have executed an agreement specifically governing such use. Moreover Würth Elektronik eiSos GmbH & Co KG products are neither designed nor intended for use in areas such as military, aerospace, nuclear control, automotive, transportation, telecommunications, medical, radio frequency interference etc. Würth Elektronik eiSos GmbH & Co KG must be informed about the intent of such usage before the design or usage. In addition, sufficient reliability evaluation checks for usage must be performed on every electronic component which is used in electrical circuits that require high safety and reliability functions or performance.
Cautions and Warnings:

The following conditions apply to all goods within the product series of WE-PD of Würth Elektronik eiSos GmbH & Co. KG:

General:

• This electronic component is designed and manufactured for use in general electronic equipment.
• Würth Elektronik must be asked for written approval (following the PPAP procedure) before incorporating the components into any equipment in fields such as military, aerospace, aviation, nuclear control, submarine, transportation (automotive control, train control, ship control), transportation signal, disaster prevention, medical, public information network etc. where higher safety and reliability are especially required and/or if there is the possibility of direct damage or human injury.
• Electronic components that will be used in safety-critical or high-reliability applications, should be pre-evaluated by the customer.
• The component is designed and manufactured to be used within the datasheet specified values. If the usage and operation conditions specified in the datasheet are not met, the wire insulation may be damaged or dissolved.
• Do not drop or impact the components, as the core may flake apart.
• Würth Elektronik products are qualified according to international standards, which are listed in each product reliability report. Würth Elektronik does not warrant any customer qualified product characteristics beyond Würth Elektronik's specifications, for its validity and sustainability over time.
• The responsibility for the applicability of the customer specific products and use in a particular customer design is always within the authority of the customer. All technical specifications for standard products also apply to customer specific products.

Product specific:

Soldering:

• The solder profile must comply with the Würth Elektronik technical soldering specification. All other profiles will void the warranty.
• All other soldering methods are at the customers’ own risk.
• Strong forces which may affect the coplanarity of the components’ electrical connection with the PCB (i.e. pins), can damage the part, resulting in avoid of the warranty.

Cleaning and Washing:

• Washing agents used during the production to clean the customer application might damage or change the characteristics of the wire insulation, marking or plating. Washing agents may have a negative effect on the long-term functionality of the product.
• Using a brush during the cleaning process may break the wire due to its small diameter. Therefore, we do not recommend using a brush during the PCB cleaning process.

Potting:

• If the product is potted in the customer application, the potting material may shrink or expand during and after hardening. Shrinking could lead to an incomplete seal, allowing contaminants into the core. Expansion could damage the core or wire contacts. We recommend a manual inspection after potting to avoid these effects.

Storage Conditions:

• A storage of Würth Electronik products for longer than 12 months is not recommended. Within other effects, the terminals may suffer degradation, resulting in bad solderability. Therefore, all products shall be used within the period of 12 months based on the day of shipment.
• Do not expose the components to direct sunlight.
• The storage conditions in the original packaging are defined according to DIN EN 61760-2.

Handling:

• Violation of the technical product specifications such as exceeding the nominal rated current will void the warranty.
• Applying currents with audio-frequency signals may result in audible noise due to the magnetostrictive material properties.

These cautions and warnings comply with the state of the scientific and technical knowledge and are believed to be accurate and reliable. However, no responsibility is assumed for inaccuracies or incompleteness.
6. Product Life Cycle

Due to technical progress and economical evaluation we also reserve the right to discontinue production and delivery of products. As a standard reporting procedure of the Product Termination Notification (PTN) according to the JEDEC-Standard we will inform at an early stage about inevitable product discontinuance. According to this we cannot guarantee that all products within our product range will always be available. Therefore it needs to be verified with the field sales engineer or the internal sales person in charge about the current product availability expectancy before or when the product for application design-in disposal is considered. The approach named above does not apply in the case of individual agreements deviating from the foregoing for customer-specific products.

7. Property Rights

All the rights for contractual products produced by Würth Elektronik eiSos GmbH & Co. KG on the basis of ideas, development contracts as well as models or templates that are subject to copyright, patent or commercial protection supplied to the customer will remain with Würth Elektronik eiSos GmbH & Co. KG. Würth Elektronik eiSos GmbH & Co. KG does not warrant or represent that any license, either expressed or implied, is granted under any patent right, copyright, mask work right, or other intellectual property right relating to any combination, application, or process in which Würth Elektronik eiSos GmbH & Co. KG components or services are used.

8. General Terms and Conditions

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