



SMT inductors

SIMID series, SIMID 2220-T

Series/Type: **B82442T**

Date: **March 2020**

SMD

Size 2220 (EIA) or 5650 (IEC)
Rated inductance 1 ... 10000 μ H
Rated current 46 ... 3510 mA



Construction

- Ferrite drum core
- Laser-welded winding
- Flame-retardant molding

Features

- Temperature range up to +150 °C
- Very high current handling capability
- High L values
- Qualified to AEC-Q200
- Suitable for lead-free reflow soldering as referenced in JEDEC J-STD 020D
- RoHS-compatible
- Halogen-free

Applications

- Filtering of supply voltages, coupling, decoupling
- DC/DC converters/switch-mode power supplies
- Automotive electronics
- Telecommunications
- Consumer electronics
- Industrial electronics

Terminals

- Base material CuSn6
- Layer composition Cu, Ag, Sn (lead-free) or Ni, Sn (lead-free)
- Electro-plated

Marking

- Marking on component:
 Manufacturer, letter "T", L value (in μ H),
 tolerance of L value (coded), date of manufacture (YWWDD)
- Minimum data on reel:
 Manufacturer, ordering code, L value, quantity, date of packing

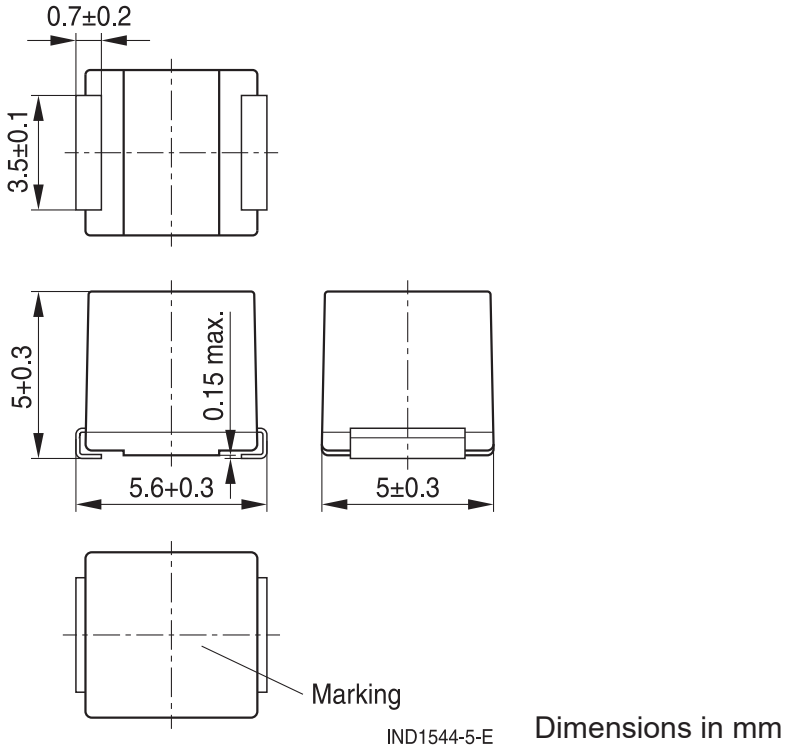
Delivery mode and packing unit

- 12-mm blister tape, wound on 330-mm \varnothing reel
- Packing unit: 1500 pcs./reel

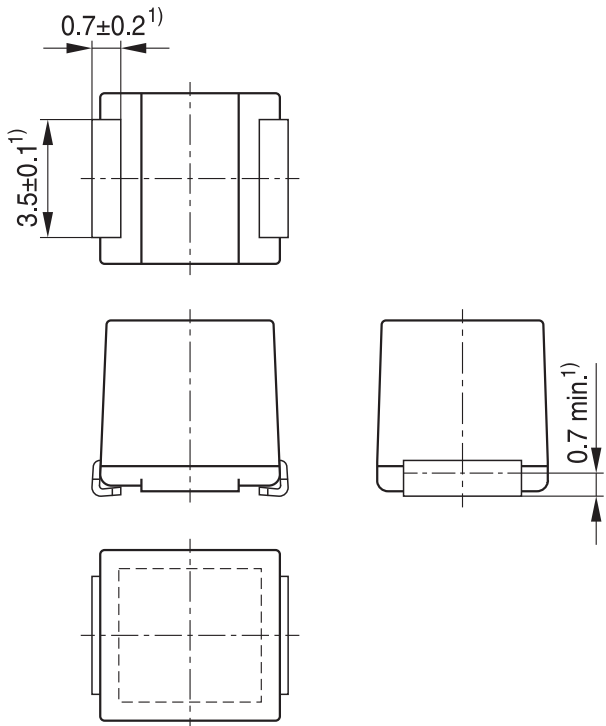
SIMID 2220-T

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Dimensional drawing



Soldering Area



1) Soldering area

Layout recommendation



| A | B | C | D |
|-----|-----|-----|-----|
| 4.5 | 2.0 | 3.6 | 7.6 |

Dimensions in mm

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Taping and packing

Blister tape

Reel


Technical data and measuring conditions

| | |
|--|---|
| Rated inductance L_R | Measured with Agilent 4294A or equivalent at frequency f_L , 0.5 V, $+23 \pm 5 \text{ }^\circ\text{C}$ |
| Inductance tolerance | $L_R \leq 1 \text{ mH}$: $\pm 10\%$ $L_R > 1 \text{ mH}$: $\pm 5\%$ or $\pm 10\%$ |
| Q factor Q_{\min} | Measured with Agilent 4294A or equivalent at frequency f_Q , 0.5 V, $+23 \pm 5 \text{ }^\circ\text{C}$ |
| Operating temperature range | $-55 \text{ }^\circ\text{C} \dots +150 \text{ }^\circ\text{C}$ |
| Rated current I_{temp} | Maximum permissible DC with temperature increase of $\leq 65 \text{ K}$ at $+85 \text{ }^\circ\text{C}$ |
| Saturation current $I_{\text{sat, min}}$ | Maximum permissible DC with inductance decrease $\Delta L/L_0 \leq 10\%$, at $+23 \pm 5 \text{ }^\circ\text{C}$ |
| Saturation current $I_{\text{sat, typ}}$ | Maximum permissible DC with inductance decrease $\Delta L/L_0 \leq 30\%$, at $+23 \pm 5 \text{ }^\circ\text{C}$ |
| Self-resonance frequency $f_{\text{res, min}}$ | Measured with impedance analyzer Agilent 4294A / E4991A or equivalent at $+23 \pm 5 \text{ }^\circ\text{C}$ |
| DC resistance R_{max} | Measured at $+23 \pm 5 \text{ }^\circ\text{C}$ |
| Solderability (lead-free) | Sn95.5Ag3.8Cu0.7: $+(245 \pm 5) \text{ }^\circ\text{C}$, $(5 \pm 0.3) \text{ s}$ Wetting of soldering area $\geq 90\%$ (based on IEC 60068-2-58) |
| Resistance to soldering heat | $+260 \text{ }^\circ\text{C}$, 40 s (as referenced in JEDEC J-STD 020D) |
| Climatic category | 55/150/56 (to IEC 60068-1) |
| Storage conditions | Mounted: $-55 \text{ }^\circ\text{C} \dots +150 \text{ }^\circ\text{C}$ Packaged: $-25 \text{ }^\circ\text{C} \dots +40 \text{ }^\circ\text{C}$, $\leq 75\% \text{ RH}$ |
| Weight | Approx. 0.4 g |

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Characteristics and ordering codes

| L_R μH | Q_{\min} | $f_L; f_Q$ MHz | $I_{\text{sat,typ}}$ mA | $I_{\text{sat,min}}$ mA | I_{temp} mA | R_{max} Ω | $f_{\text{res,min}}$ MHz | Ordering code ^{1) 2)} |
|------------------------|------------|-------------------|----------------------------|----------------------------|-------------------------|------------------------------|-----------------------------|--------------------------------|
| 1.0 | 15 | 7.96 | 9000 | 7330 | 3510 | 0.025 | 111 | B82442T1102K000 |
| 1.2 | 15 | 7.96 | 8500 | 6030 | 3090 | 0.028 | 75 | B82442T1122K000 |
| 1.5 | 15 | 7.96 | 7600 | 5480 | 3020 | 0.033 | 60 | B82442T1152K000 |
| 1.8 | 15 | 7.96 | 6900 | 4890 | 2770 | 0.035 | 55 | B82442T1182K000 |
| 2.2 | 15 | 7.96 | 6300 | 4820 | 2710 | 0.038 | 46 | B82442T1222K000 |
| 2.7 | 15 | 7.96 | 5500 | 3980 | 2530 | 0.042 | 36 | B82442T1272K000 |
| 3.3 | 15 | 7.96 | 5200 | 4010 | 2460 | 0.046 | 36 | B82442T1332K000 |
| 3.9 | 15 | 7.96 | 4800 | 3310 | 2170 | 0.057 | 33 | B82442T1392K000 |
| 4.7 | 15 | 7.96 | 4300 | 3450 | 1950 | 0.073 | 30 | B82442T1472K000 |
| 5.6 | 15 | 7.96 | 4100 | 2780 | 1850 | 0.078 | 28 | B82442T1562K000 |
| 6.8 | 15 | 7.96 | 3700 | 2770 | 1680 | 0.106 | 23 | B82442T1682K000 |
| 8.2 | 15 | 7.96 | 3300 | 2330 | 1510 | 0.118 | 21 | B82442T1822K000 |
| 10 | 15 | 2.52 | 2800 | 2280 | 1420 | 0.132 | 19 | B82442T1103K000 |
| 12 | 15 | 2.52 | 2700 | 2160 | 1380 | 0.141 | 19 | B82442T1123K000 |
| 15 | 15 | 2.52 | 2400 | 1870 | 1260 | 0.190 | 16 | B82442T1153K000 |
| 18 | 15 | 2.52 | 2160 | 1780 | 1090 | 0.210 | 14 | B82442T1183K000 |
| 22 | 15 | 2.52 | 2050 | 1590 | 1040 | 0.238 | 13 | B82442T1223K000 |
| 27 | 15 | 2.52 | 1780 | 1400 | 880 | 0.307 | 11 | B82442T1273K000 |
| 33 | 15 | 2.52 | 1700 | 1380 | 840 | 0.360 | 11 | B82442T1333K000 |
| 39 | 15 | 2.52 | 1550 | 1190 | 720 | 0.456 | 9.0 | B82442T1393K000 |
| 47 | 15 | 2.52 | 1350 | 1120 | 700 | 0.519 | 8.0 | B82442T1473K000 |
| 56 | 15 | 2.52 | 1200 | 1010 | 600 | 0.679 | 7.5 | B82442T1563K000 |
| 68 | 15 | 2.52 | 1050 | 900 | 570 | 0.781 | 7.0 | B82442T1683K000 |
| 82 | 15 | 2.52 | 1000 | 830 | 540 | 0.832 | 6.6 | B82442T1823K000 |
| 100 | 20 | 0.796 | 980 | 760 | 510 | 0.99 | 6.1 | B82442T1104K000 |
| 120 | 20 | 0.796 | 900 | 670 | 440 | 1.29 | 5.3 | B82442T1124K000 |
| 150 | 20 | 0.796 | 800 | 610 | 410 | 1.50 | 4.6 | B82442T1154K000 |
| 180 | 20 | 0.796 | 720 | 550 | 350 | 1.96 | 4.2 | B82442T1184K000 |
| 220 | 20 | 0.796 | 640 | 500 | 330 | 2.21 | 3.9 | B82442T1224K000 |
| 270 | 20 | 0.796 | 560 | 450 | 290 | 2.95 | 3.5 | B82442T1274K000 |
| 330 | 20 | 0.796 | 550 | 430 | 280 | 3.29 | 3.4 | B82442T1334K000 |
| 390 | 20 | 0.796 | 520 | 390 | 260 | 3.70 | 3.0 | B82442T1394K000 |
| 470 | 20 | 0.796 | 460 | 350 | 240 | 4.73 | 2.6 | B82442T1474K000 |
| 560 | 20 | 0.796 | 410 | 320 | 220 | 5.21 | 2.4 | B82442T1564K000 |
| 680 | 20 | 0.796 | 380 | 300 | 210 | 5.87 | 2.3 | B82442T1684K000 |
| 820 | 20 | 0.796 | 360 | 270 | 170 | 7.86 | 2.2 | B82442T1824K000 |
| 1000 | 30 | 0.252 | 310 | 246 | 150 | 9.5 | 1.8 | B82442T1105K000 |

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| L_R μH | Q_{\min} | $f_L; f_Q$ MHz | $I_{\text{sat,typ}}$ mA | $I_{\text{sat,min}}$ mA | I_{temp} mA | R_{max} Ω | $f_{\text{res,min}}$ MHz | Ordering code ^{1) 2)} |
|------------------------|------------|-------------------|----------------------------|----------------------------|-------------------------|------------------------------|-----------------------------|--------------------------------|
| 1200 | 30 | 0.252 | 290 | 223 | 140 | 12.6 | 1.7 | B82442T1125+000 |
| 1500 | 30 | 0.252 | 250 | 200 | 130 | 14.9 | 1.5 | B82442T1155+000 |
| 1800 | 30 | 0.252 | 230 | 183 | 110 | 19.7 | 1.4 | B82442T1185+000 |
| 2200 | 30 | 0.252 | 205 | 168 | 100 | 22.5 | 1.2 | B82442T1225+000 |
| 2700 | 30 | 0.252 | 185 | 151 | 90 | 29.5 | 1.1 | B82442T1275+000 |
| 3300 | 30 | 0.252 | 175 | 138 | 85 | 32.8 | 1.0 | B82442T1335+000 |
| 3900 | 30 | 0.252 | 155 | 127 | 74 | 43.5 | 0.9 | B82442T1395+000 |
| 4700 | 30 | 0.252 | 145 | 119 | 73 | 48.6 | 0.8 | B82442T1475+000 |
| 5600 | 30 | 0.252 | 135 | 109 | 66 | 54.7 | 0.8 | B82442T1565+000 |
| 6800 | 30 | 0.252 | 125 | 102 | 65 | 60.3 | 0.6 | B82442T1685+000 |
| 8200 | 30 | 0.252 | 115 | 92 | 54 | 80.6 | 0.6 | B82442T1825+000 |
| 10000 | 25 | 0.0796 | 110 | 81 | 46 | 112 | 0.5 | B82442T1106+000 |

1) For Ni-barrier plated terminals replace the last two digits "00" by "50"

2) Replace the "+" in the ordering code

J: $\pm 5\%$

K: $\pm 10\%$

Closer tolerances and intermediate values on request.

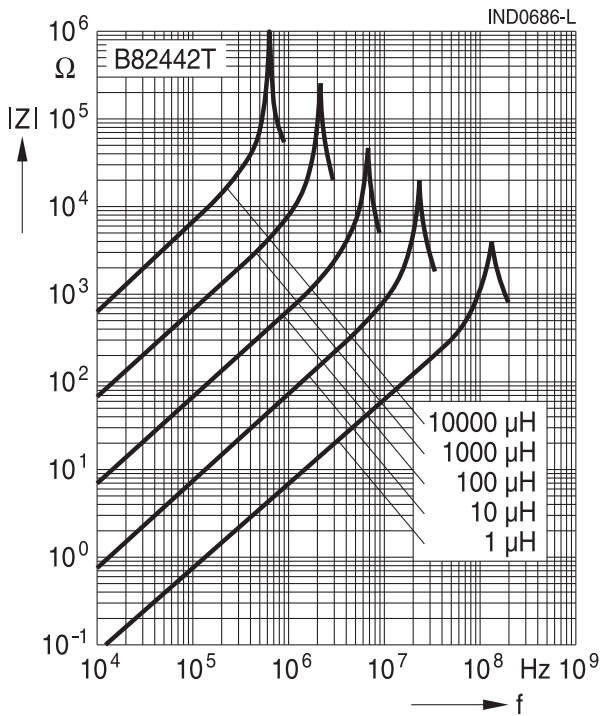
Higher currents possible at temperatures $< T_R$ on request.

Sample kit available. Ordering code: B82442X002

For more information refer to chapter "Sample kits".

SMD

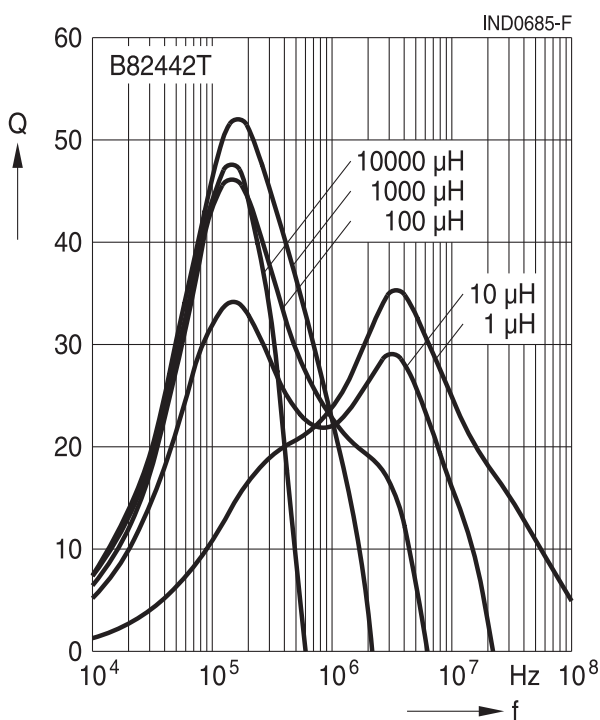
Impedance $|Z|$ versus frequency f
measured with impedance analyzer Agilent 4294A/E4991A, typical values at +20 °C



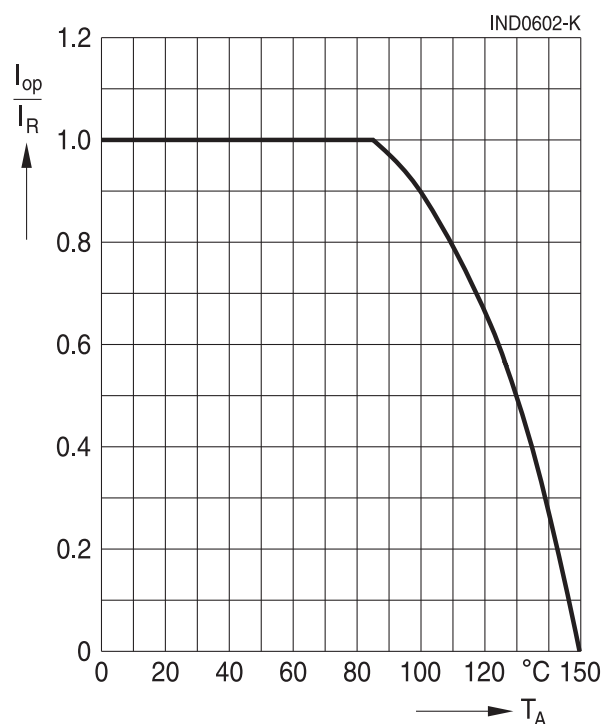
Inductance L versus DC load current I_{DC}
measured with LCR meter Agilent 4285A, typical values at +20 °C



Q factor versus frequency f
measured with impedance analyzer Agilent 4294A, typical values at +20 °C



Current derating I_{op}/I_R versus ambient temperature T_A
(rated temperature $T_R = +85$ °C)



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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