Data and signal line chokes

Common-mode chokes, ring core
0.005 … 4.7 mH, 200 … 1000 mA, +60 °C

Series/Type: **B82790C0/S0**

Date: August 2019

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Common-mode chokes, ring core

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Rated voltage 42 V AC/80 V DC
Rated inductance 0.005 ... 4.7 mH
Rated current 200 ... 1000 mA



Construction

- Current-compensated ring core double choke
- Ferrite core
- PPS case (UL 94 V-0)
- Bifilar winding (B82790C0)
- Sector winding (B82790S0)

Features

- Suitable for reflow soldering
- Qualified to AEC-Q200
- RoHS-compatible

Function

- B82790C0:
  Suppression of asymmetrical interference coupled in on lines, whereas data signals up to some MHz can pass unaffectedly.
- B82790S0:
  Suppression of asymmetrical and symmetrical interference (by L_{stray}) coupled in on lines. The high-frequency portions of the symmetrical data signal are decreased so far that EMC problems can be significantly reduced.

Applications

- Automotive applications, e.g. CAN bus
- Industrial applications

Terminals

- Base material CuSn6
- Layer composition Ni, Sn
- Electro-plated

Marking

- Marking on component: Manufacturer, process location (coded), winding method (coded), ordering code (short form), date of manufacture (YMMD)
- Minimum data on reel: Manufacturer, ordering code, L value and tolerance, quantity, date of packing

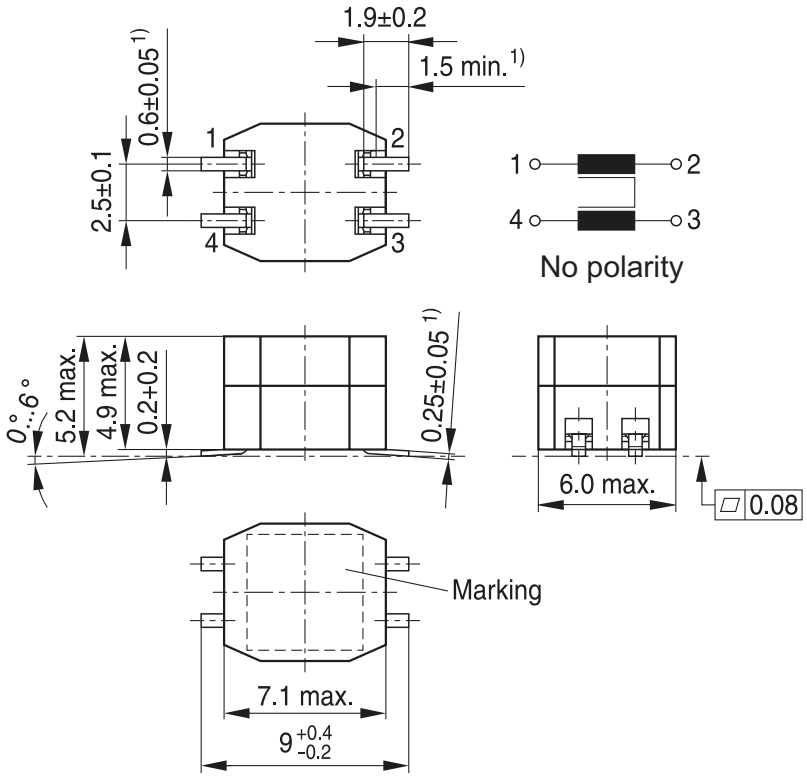
Delivery mode and packing unit

- 16-mm blister tape, wound on 330-mm ∅ reel
- Packing unit: 1500 pcs./reel

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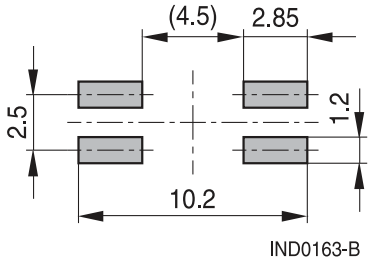
Dimensional drawing and pin configuration



1) Soldering area

IND0009-B-E

Layout recommendation

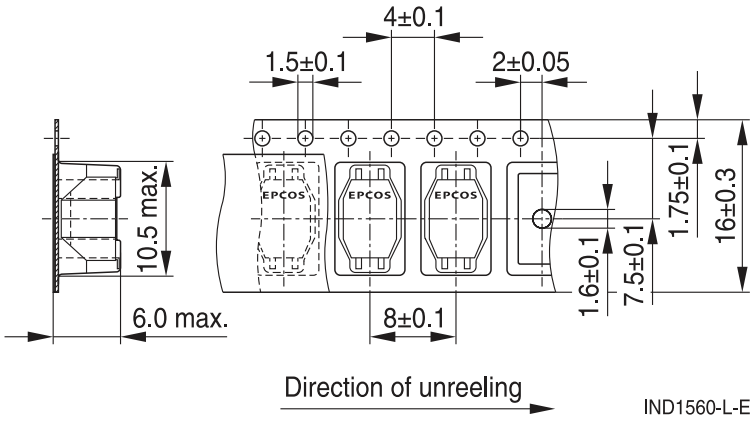


IND0163-B

Dimensions in mm

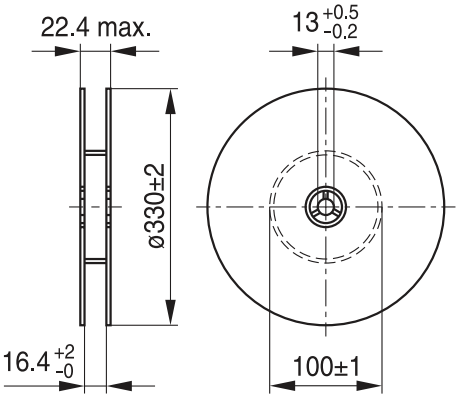
Taping and packing

Blister tape



IND1560-L-E

Reel



IND1302-D

Dimensions in mm

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Technical data and measuring conditions

Rated voltage V_R	42 V AC (50/60 Hz) / 80 V DC
Rated temperature T_R	+60 °C
Rated current I_R	Referred to 50 Hz and rated temperature
Rated inductance L_R	Measured with Agilent 4284A at 0.1 mA, +20 °C Measuring frequency: $L_R \leq 1$ mH = 100 kHz $L_R > 1$ mH = 10 kHz Inductance is specified per winding.
Inductance tolerance	±30% ($L_R \leq 0.47$ mH), –30/+50% ($L_R \geq 1$ mH) at +20 °C
Inductance decrease $\Delta L/L_0$	< 10% at DC magnetic bias with I_R, +20 °C
Stray inductance $L_{stray,typ}$	Measured with Agilent 4284A at 5 mA, +20 °C, typ. values Measuring frequency: $L_R \leq 11$ µH = 1 MHz $L_R > 11$ µH = 100 kHz
DC resistance R_{typ}	Measured at +20 °C, typical values, specified per winding
Solderability	SnPb: +(215 ±3) °C, (3 ±0.3) s 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)
Climatic category	40/125/56 (to IEC 60068-1)
Storage conditions (packaged)	–25 °C … +40 °C, ≤ 75% RH
Weight	Approx. 0.3 g

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Characteristics and ordering codes

L_R mH	$L_{stray,typ}$ nH	I_R mA	R_{typ} mΩ	V_{test} V DC, 2 s	Ordering code
0.005	40	1000	60	250	B82790C0502N201
0.011	50	500	80	250	B82790C0113N201
0.025	60	500	110	250	B82790C0253N201
0.025	1400	500	110	250	B82790S0253N201
0.051	70	500	140	250	B82790C0513N201
0.051	2100	500	140	250	B82790S0513N201
0.470	100	500	170	250	B82790C0474N215
1.0	100	500	170	250	B82790C0105N240
2.2	200	400	400	250	B82790C0225N265
4.7	300	200	510	250	B82790C0475N265

Types with $L_R \geq 0.47$ mH:
750 V DC possible for soldering process with Pb containing solder material.
For lead-free soldering please use series B82793.

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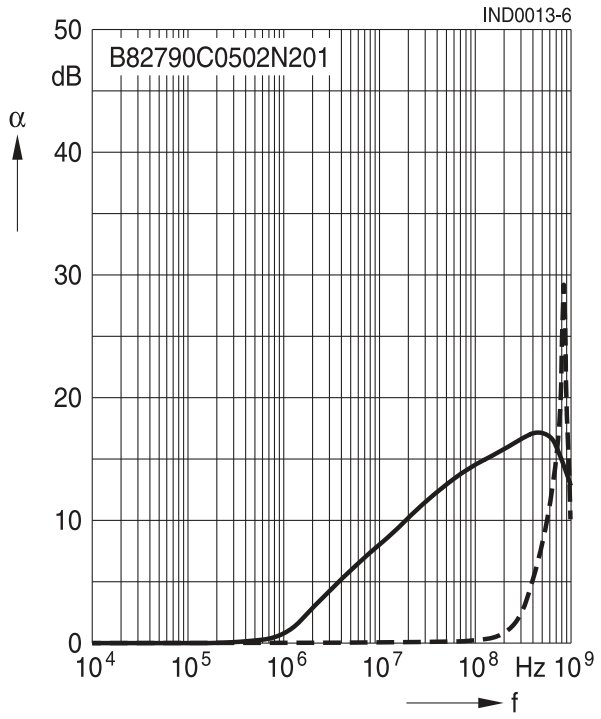
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Insertion loss α (typical values at |Z| = 50 Ω, +20 °C)

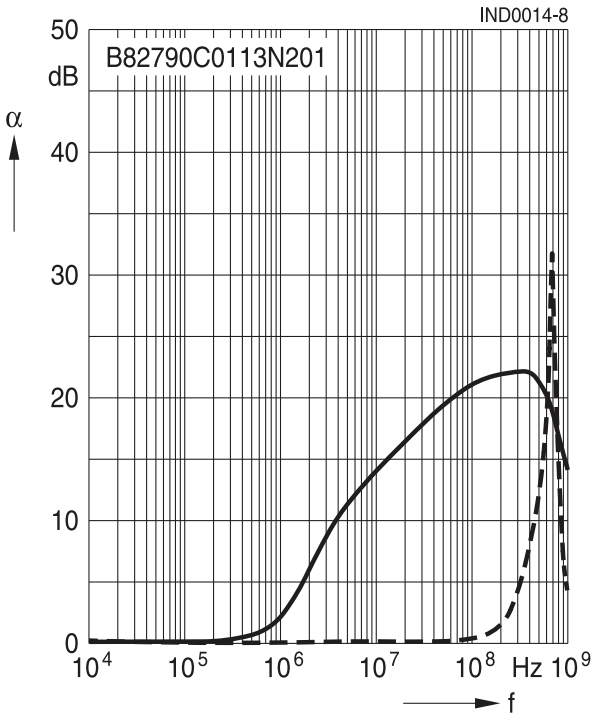
——— asymmetrical, all branches in parallel (common mode)

- - - - - - - symmetrical (differential mode)

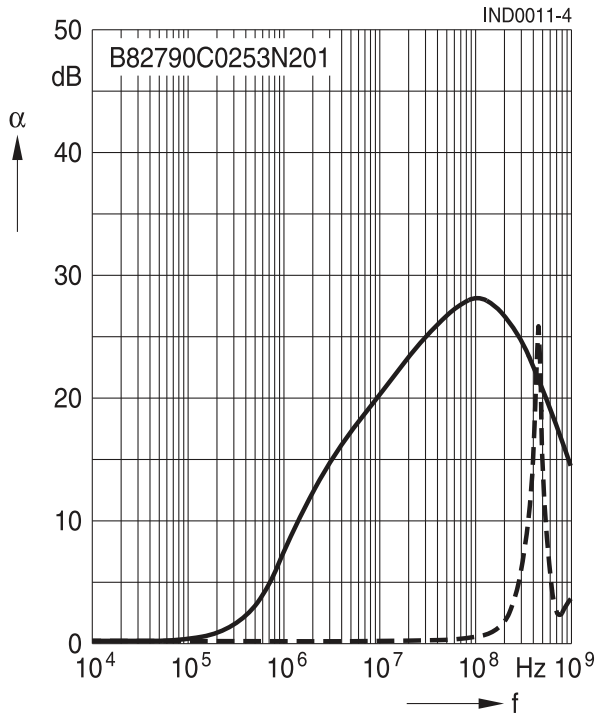
L_R = 0.005 mH



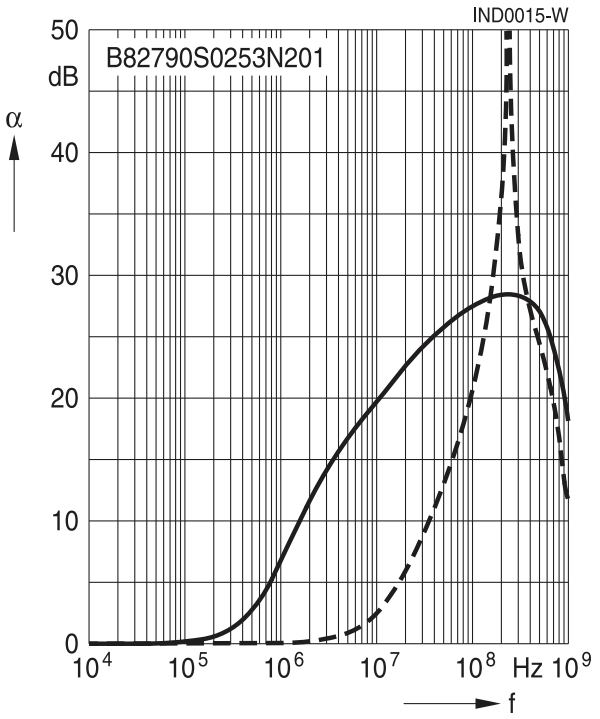
L_R = 0.011 mH



L_R = 0.025 mH (low L_{stray})



L_R = 0.025 mH (high L_{stray})



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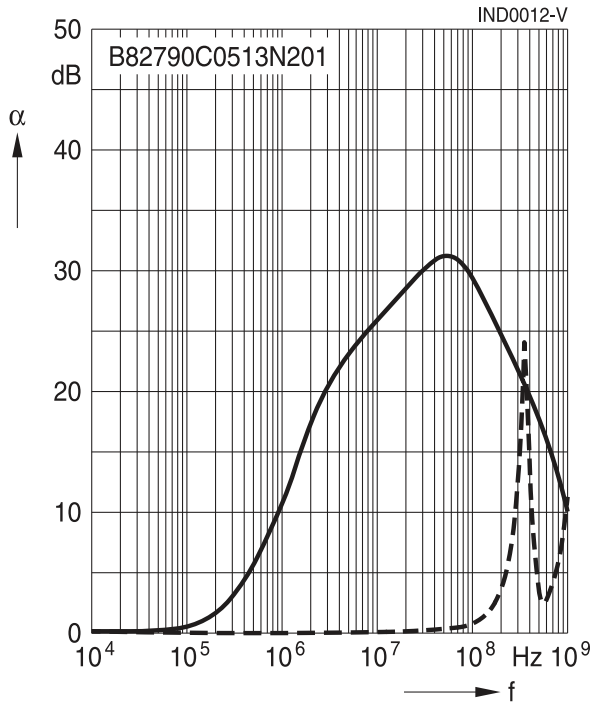
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Insertion loss α (typical values at |Z| = 50 Ω, +20 °C)

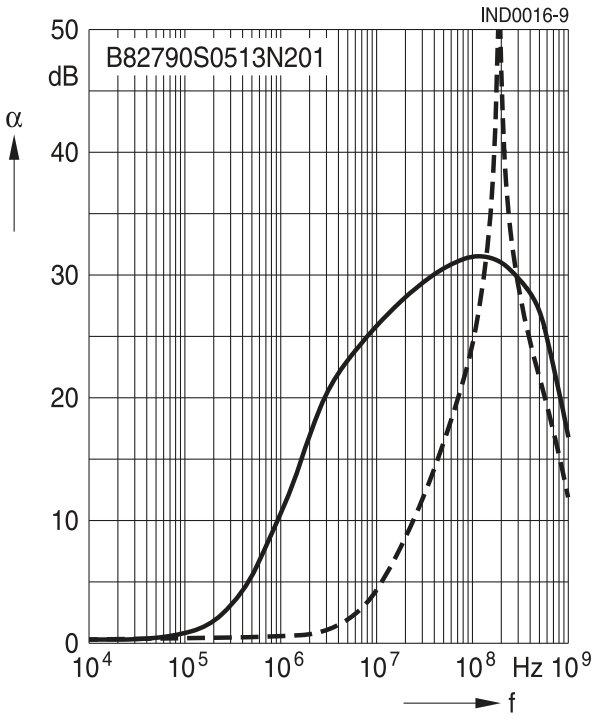
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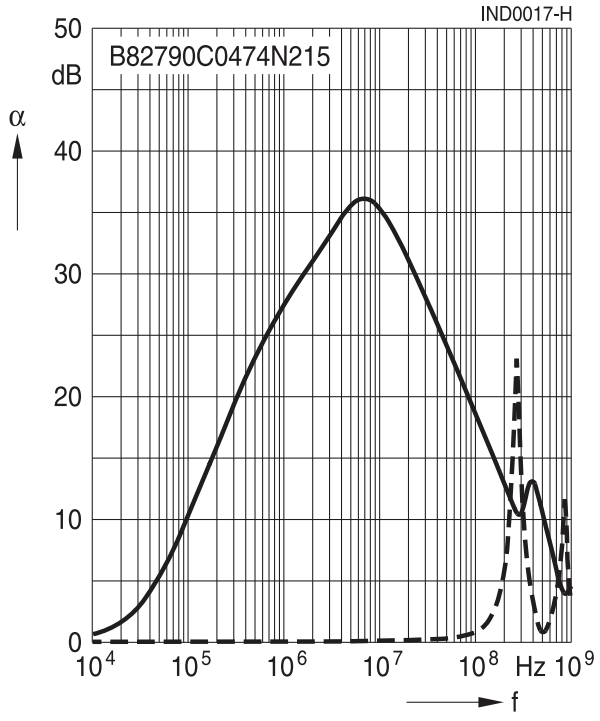
L_R = 0.051 mH (low L_{stray})



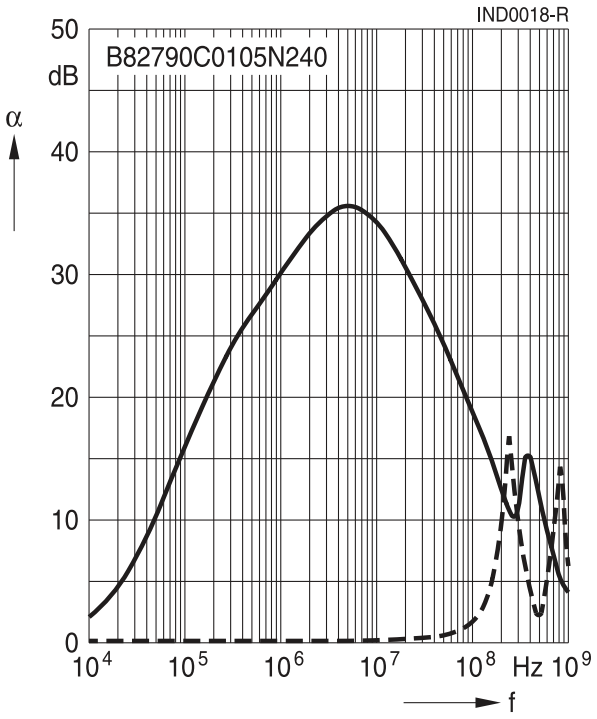
L_R = 0.051 mH (high L_{stray})



L_R = 0.47 mH



L_R = 1.0 mH



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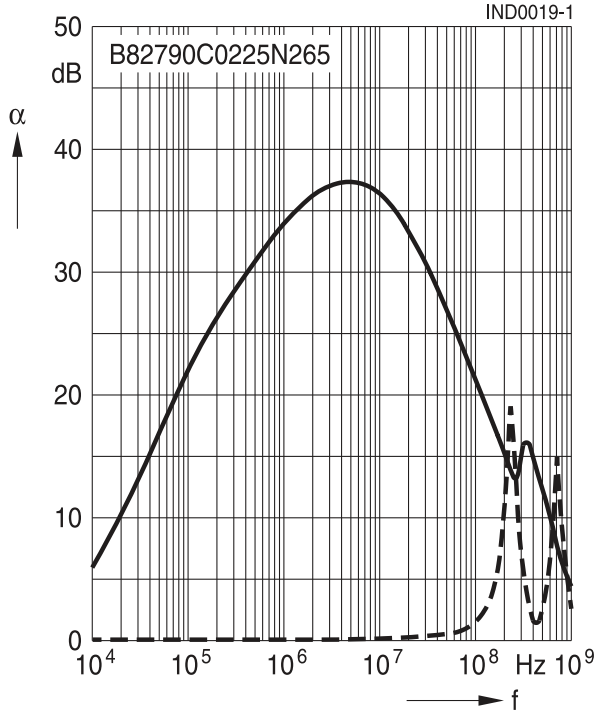
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Insertion loss α (typical values at |Z| = 50 Ω, +20 °C)

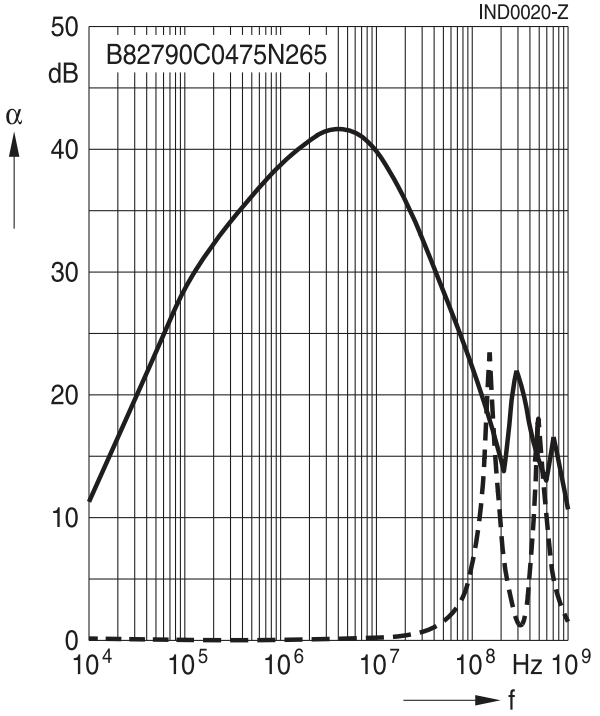
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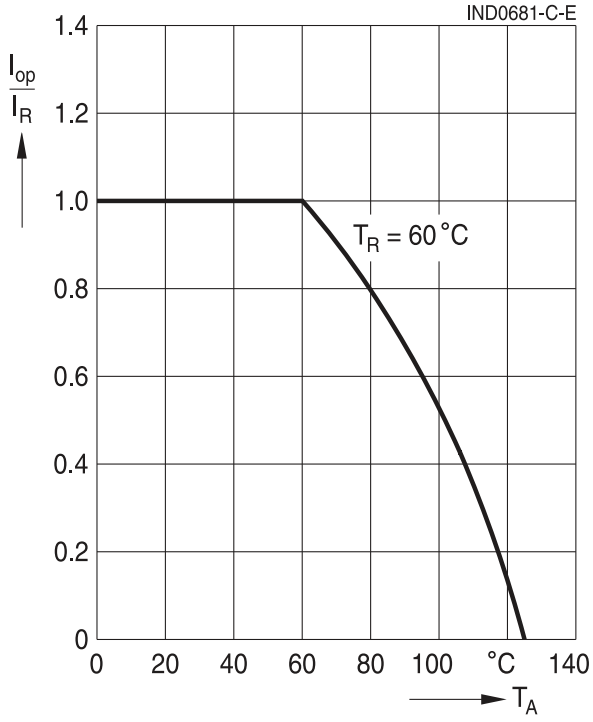
L_R = 2.2 mH



L_R = 4.7 mH



Current derating I_{op}/I_R versus ambient temperature

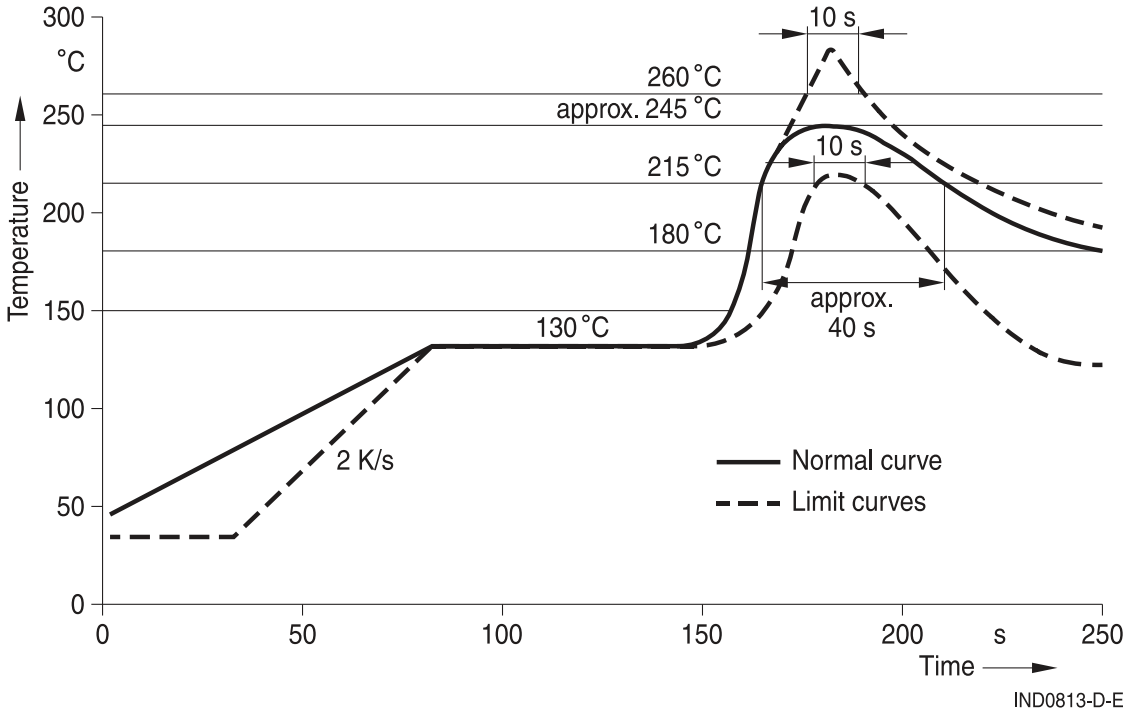


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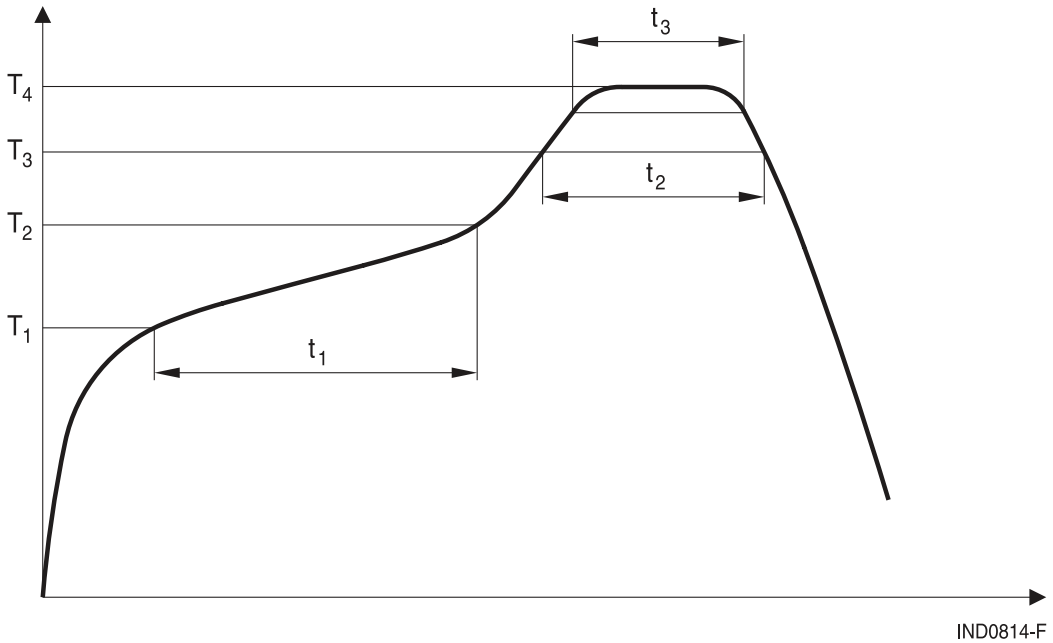
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Recommended reflow soldering curve

Pb containing solder material (based on CECC 00802 edition 2)



Pb-free solder material (based on JEDEC J-STD 020D)



T_1 °C	T_2 °C	T_3 °C	T_4 °C	t_1 s	t_2 s	t_3 s
150	200	217	250	< 110	< 90	< 30 @ T_4 –5 °C

Time from +25 °C to T_4: max 300 s
Maximal numbers of reflow cycles: 3

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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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