



Data and signal line chokes

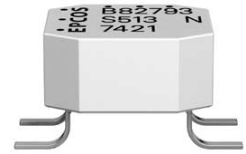
Common-mode chokes, ring core
0.005 ... 47 mH, 100 ... 2000 mA, 60 °C

Series/Type: **B82793C0/S0**

Date: April 2008

SMD

Rated voltage 42 V AC/80 V DC
Rated inductance 0.005 mH to 47 mH
Rated current 100 mA to 2000 mA


Construction

- Current-compensated double choke
- Ferrite core
- LCP case (UL 94 V-0), silicone potting
- Bifilar winding (B82793C0/K0)
- Sector winding (B82793S0/L0)

Features

- High rated currents, reduced components height
- Qualified to AEC-Q200 ($L \leq 4.7$ mH)
- Suitable for reflow soldering
- RoHS-compatible

Function

- B82793C0/K0:
Suppression of asymmetrical interference coupled in on lines, whereas data signals up to some MHz can pass unaffectedly.
- B82793S0/L0:
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
- Types with $L_R > 4.7$ mH only for telecom applications

Terminals

- Base material CuSn6
- Layer composition Ni, Sn
- Hot-dipped

Marking

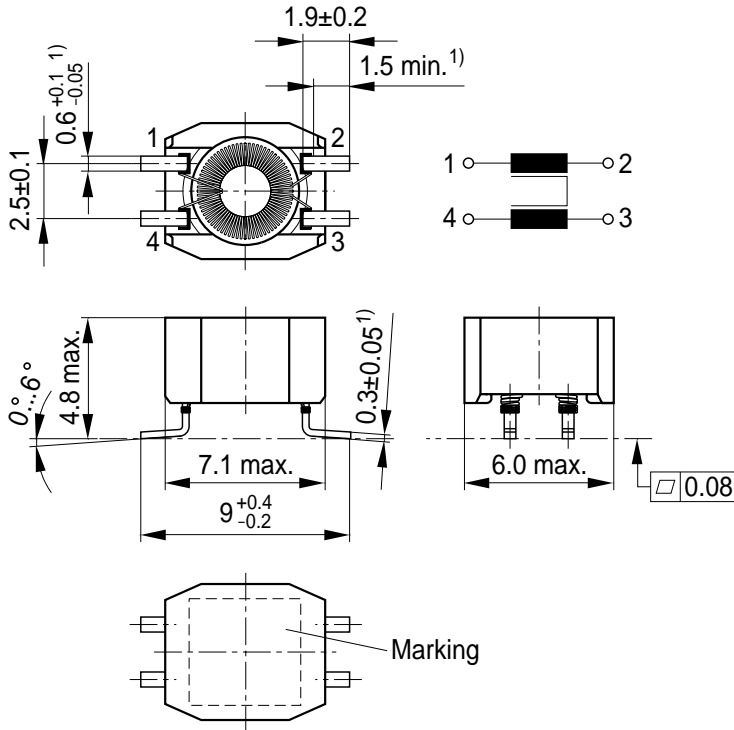
- Marking on component: Manufacturer, process location (coded), winding method (coded), ordering code (short form), date of manufacture (YMMD)
- Minimum data on reel: Manufacturer, ordering code, L value and tolerance, quantity, date of packing

Delivery mode and packing unit

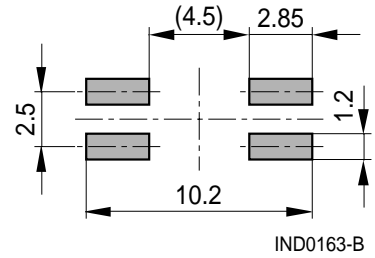
- 16-mm blister tape, wound on 330-mm \varnothing reel
- Packing unit: 1500 pcs./reel

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Dimensional drawing and pin configuration



Layout recommendation



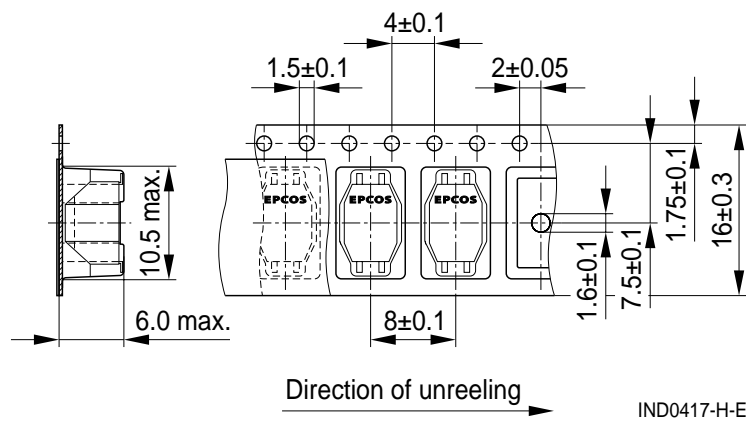
1) Soldering area

IND0010-9-E

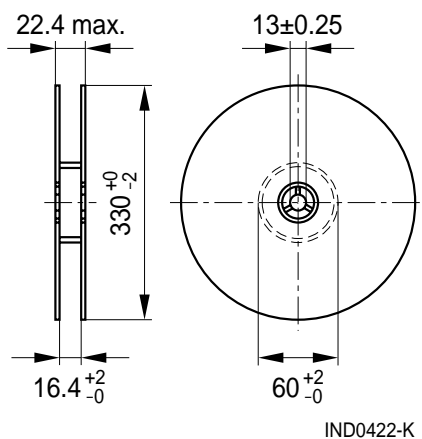
Dimensions in mm

Taping and packing

Blister tape



Reel



Dimensions in mm

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, 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 | $\pm 30\%$ ($L_R \leq 0.47$ mH), $-30/+50\%$ ($L_R \geq 1$ mH) at 20 °C |
| Inductance decrease $\Delta L/L$ | < 10% at DC magnetic bias with I_R , 20 °C |
| Stray inductance $L_{\text{stray,typ}}$ | Measured with Agilent 4284A, 5 mA, 20 °C, typical values Measuring frequency: $L_R \leq 11$ μ H = 1 MHz $L_R > 11$ μ H = 100 kHz |
| DC resistance R_{typ} | Measured at 20 °C, typical values, specified per winding |
| Solderability | SnPb: (215 \pm 3) °C, (3 \pm 0.3) s Sn96.5Ag3.0Cu0.5: (245 \pm 5) °C, (3 \pm 0.3) s Wetting of soldering area $\geq 95\%$ (to IEC 60068-2-58) |
| Resistance to soldering heat | (260 \pm 5) °C, (10 \pm 1) s (to IEC 60068-2-58) |
| Climatic category | 40/125/56 (to IEC 60068-1) |
| Storage conditions (packaged) | -25 °C ... +40 °C, $\leq 75\%$ RH |
| Weight | Approx. 0.25 g |

Characteristics and ordering codes

| L_R mH | $L_{\text{stray,typ}}$ nH | I_R mA | R_{typ} m Ω | V_{test} V DC, 2 s | Ordering code |
|-------------|------------------------------|-------------|--------------------------------|--------------------------------|-----------------|
| 0.005 | 40 | 1200 | 60 | 250 | B82793C0502N201 |
| 0.006 | 30 | 2000 | 20 | 250 | B82793K0602N201 |
| 0.006 | 250 | 2000 | 20 | 250 | B82793L0602N201 |
| 0.011 | 50 | 800 | 80 | 250 | B82793C0113N201 |
| 0.025 | 60 | 800 | 110 | 250 | B82793C0253N201 |
| 0.025 | 1400 | 800 | 110 | 250 | B82793S0253N201 |
| 0.051 | 70 | 800 | 140 | 250 | B82793C0513N201 |
| 0.051 | 2300 | 800 | 140 | 250 | B82793S0513N201 |
| 0.10 | 100 | 500 | 180 | 250 | B82793C0104N201 |
| 0.47 | 100 | 700 | 170 | 750 | B82793C0474N215 |
| 1.0 | 70 | 700 | 140 | 750 | B82793C0105N265 |
| 2.2 | 120 | 500 | 400 | 750 | B82793C0225N265 |
| 4.7 | 250 | 400 | 550 | 750 | B82793C0475N265 |

For telecommunications

| | | | | | |
|----|------|-----|------|-----|-----------------|
| 20 | 300 | 100 | 1800 | 750 | B82793C0206N265 |
| 47 | 1200 | 100 | 3700 | 750 | B82793C0476N265 |

Sample kit available. Ordering code: B82793X001.
For more information refer to chapter "Sample kits".

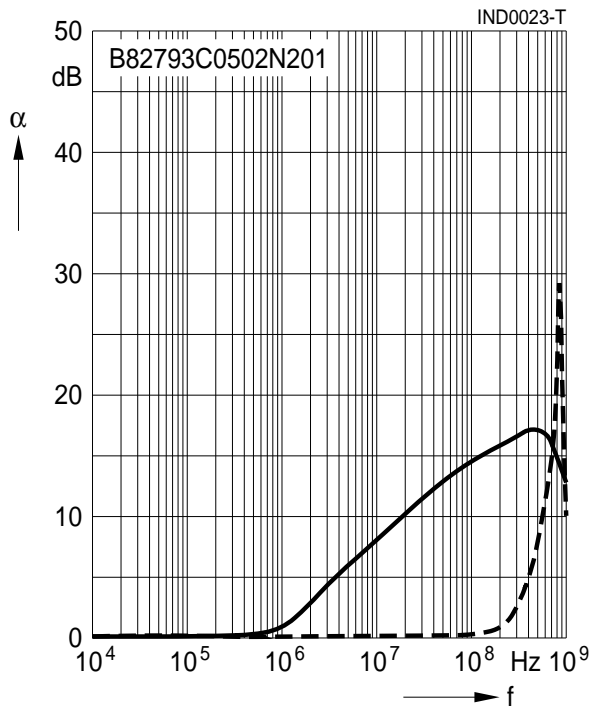
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Insertion loss α (typical values at $|Z| = 50 \Omega$, 20°C)

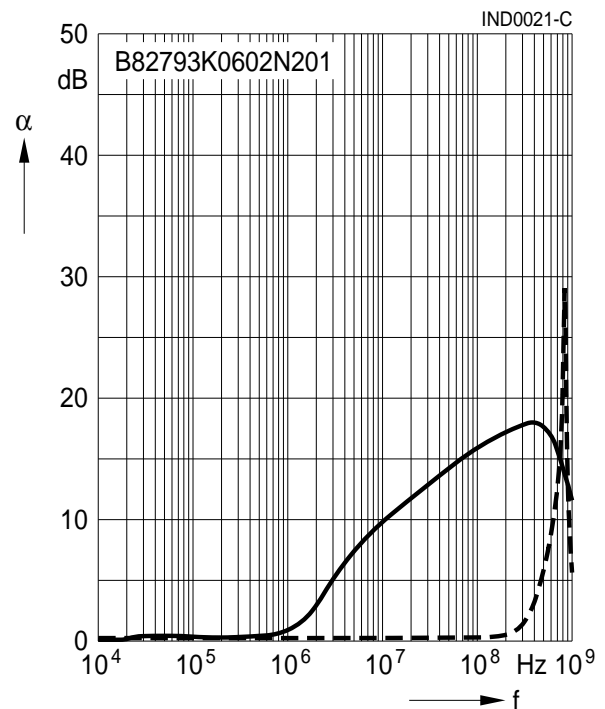
———— asymmetrical, all branches in parallel (common mode)

- - - - - symmetrical (differential mode)

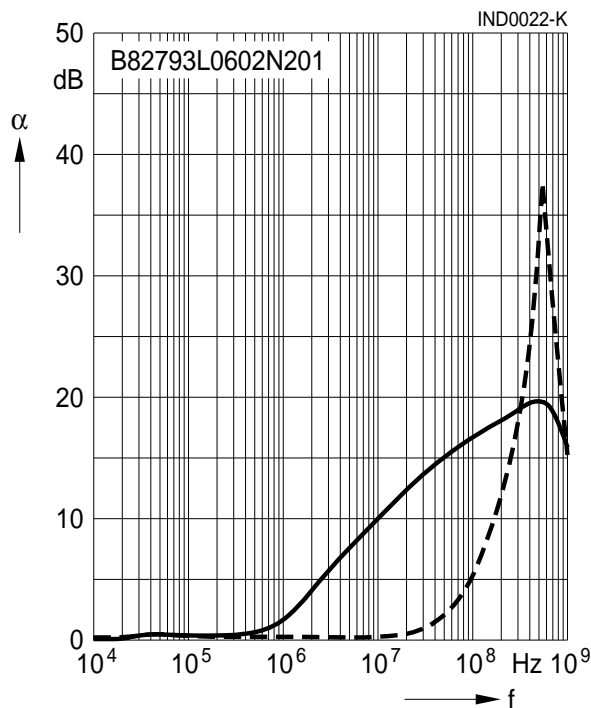
$L_R = 0.005 \text{ mH}$



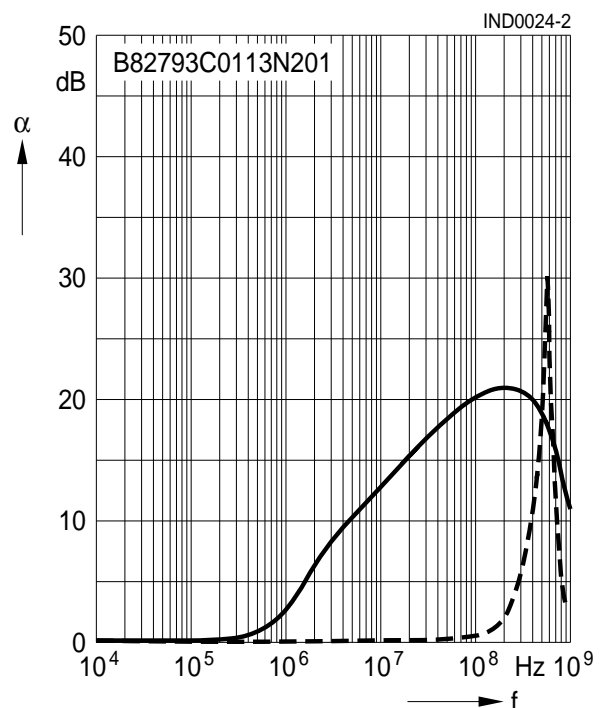
$L_R = 0.006 \text{ mH}$ (low L_{stray})



$L_R = 0.006 \text{ mH}$ (high L_{stray})



$L_R = 0.011 \text{ mH}$



SMD

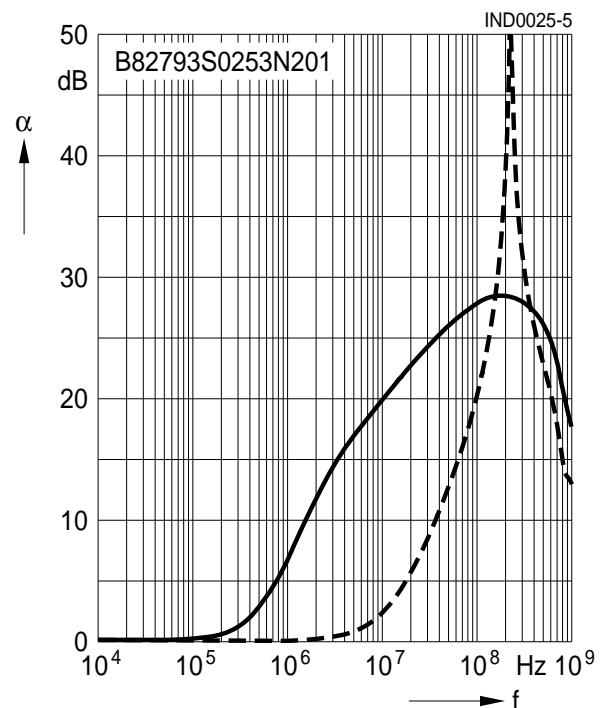
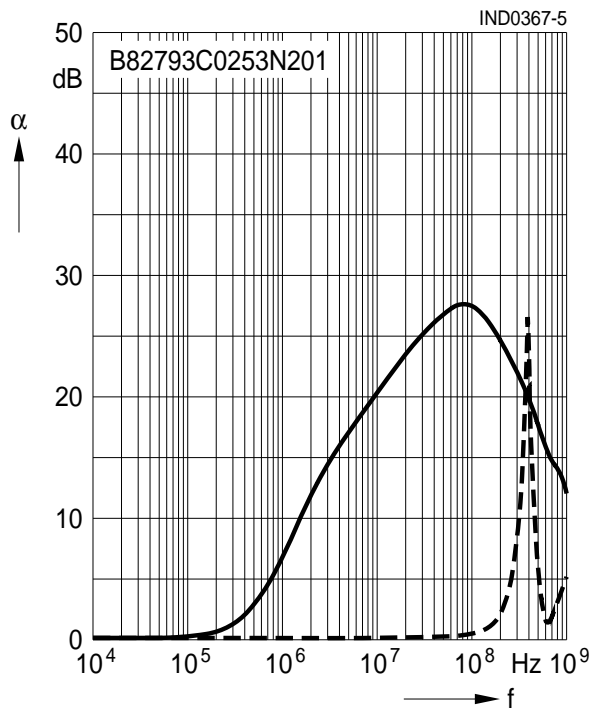
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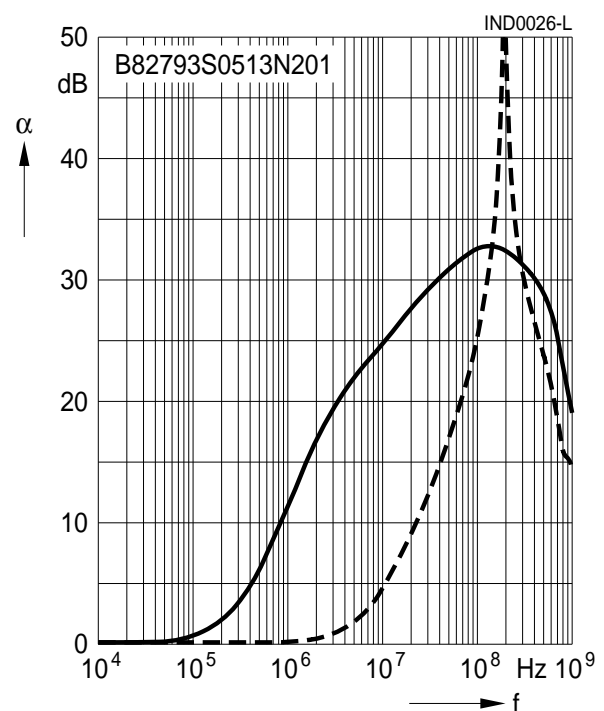
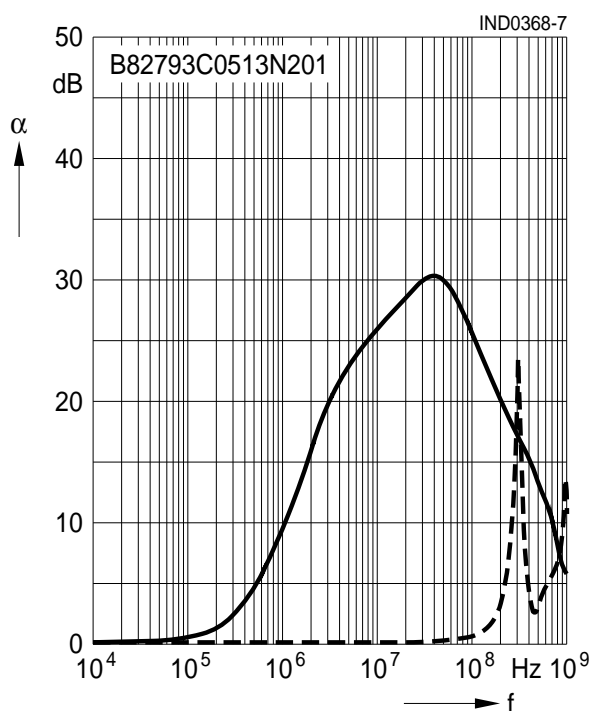
$L_R = 0.025 \text{ mH}$ (low L_{stray})

$L_R = 0.025 \text{ mH}$ (high L_{stray})



$L_R = 0.051 \text{ mH}$ (low L_{stray})

$L_R = 0.051 \text{ mH}$ (high L_{stray})



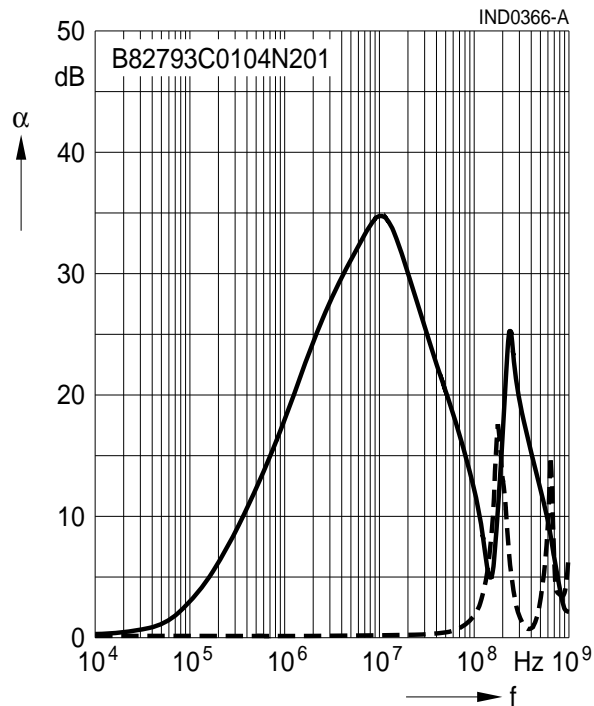
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Insertion loss α (typical values at $|Z| = 50 \Omega$, 20°C)

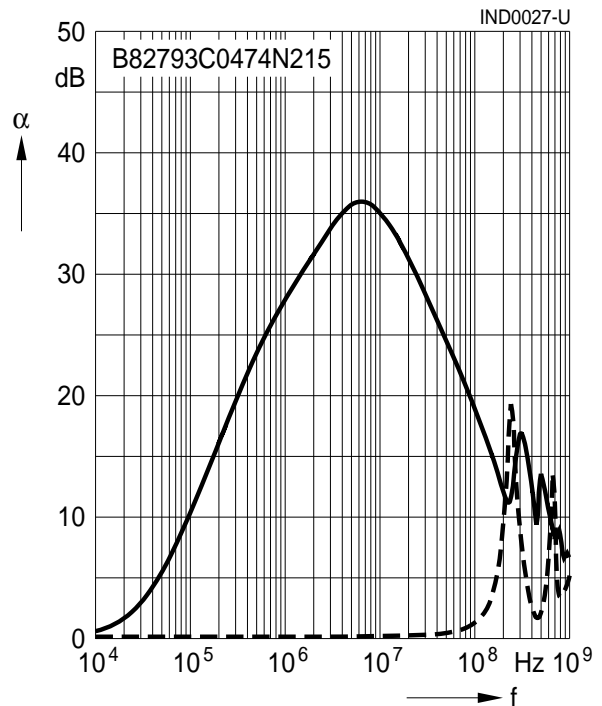
———— asymmetrical, all branches in parallel (common mode)

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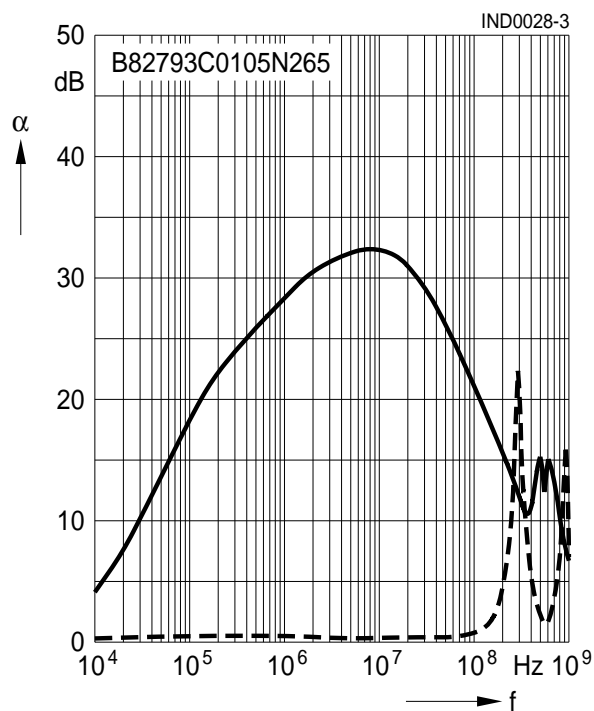
$L_R = 0.10 \text{ mH}$



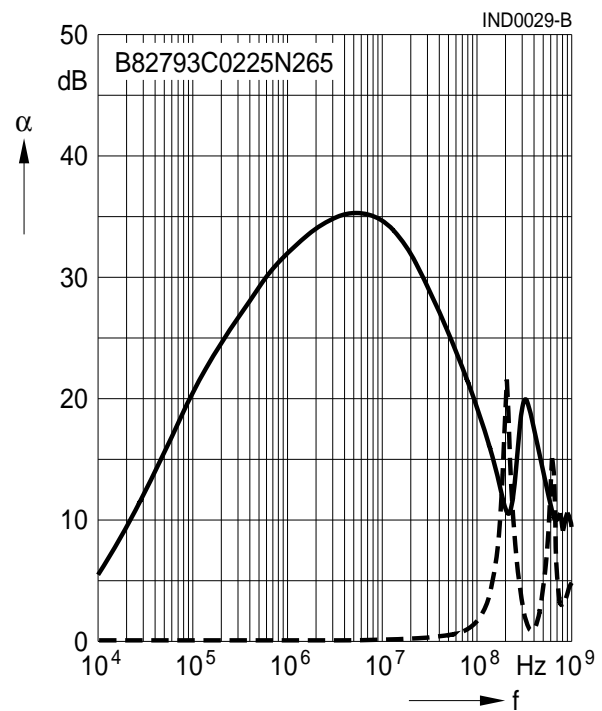
$L_R = 0.47 \text{ mH}$



$L_R = 1.0 \text{ mH}$



$L_R = 2.2 \text{ mH}$



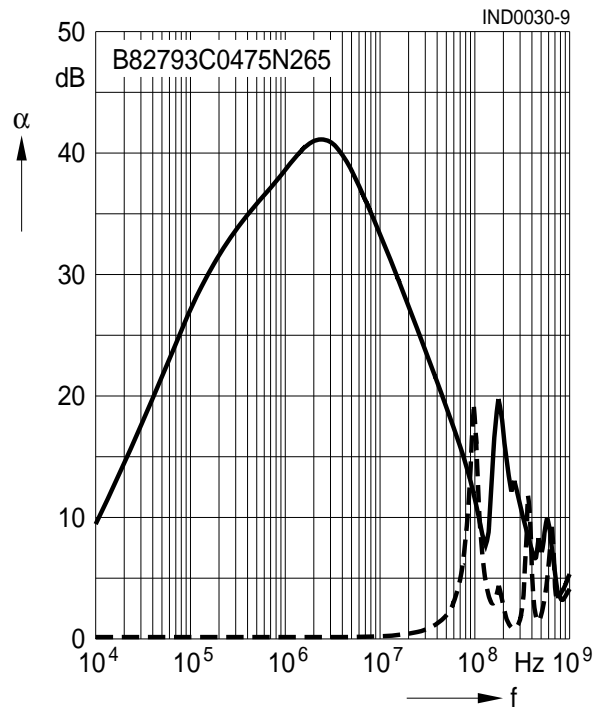
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Insertion loss α (typical values at $|Z| = 50 \Omega$, 20°C)

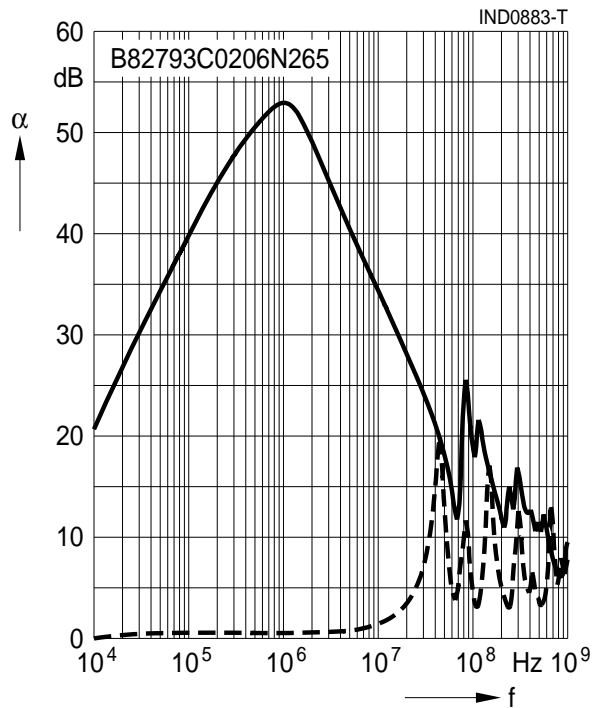
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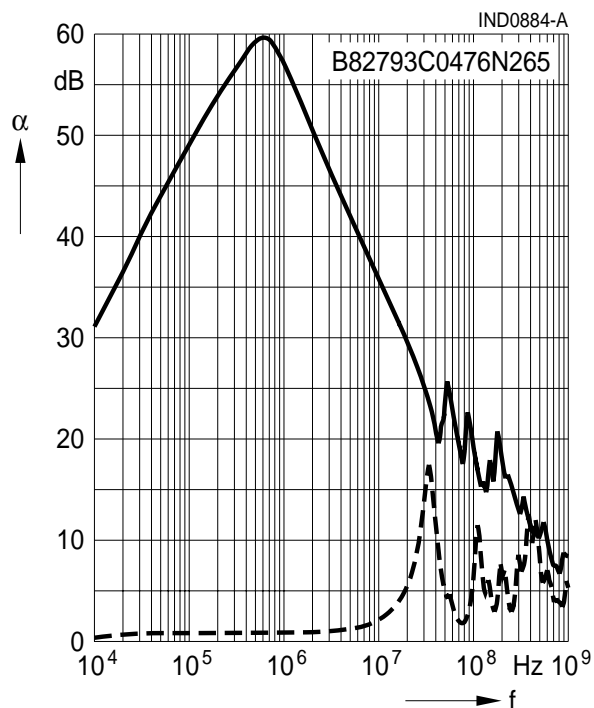
$L_R = 4.7 \text{ mH}$



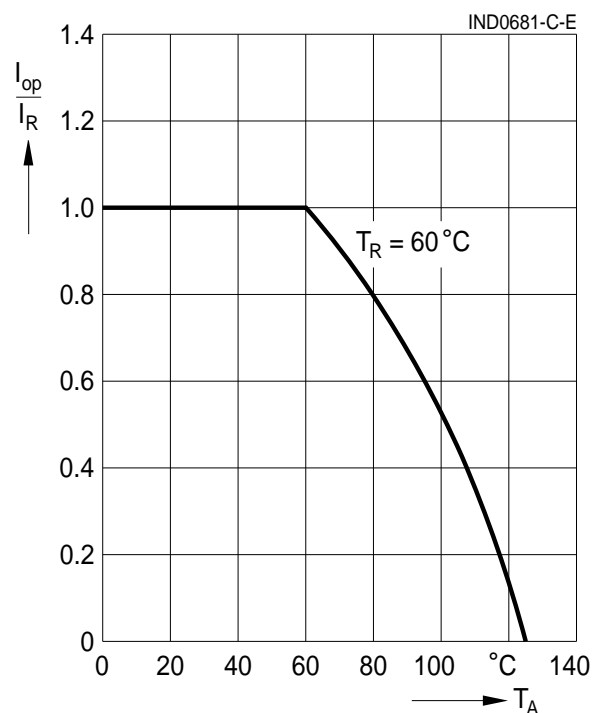
$L_R = 20 \text{ mH}$



$L_R = 47 \text{ mH}$



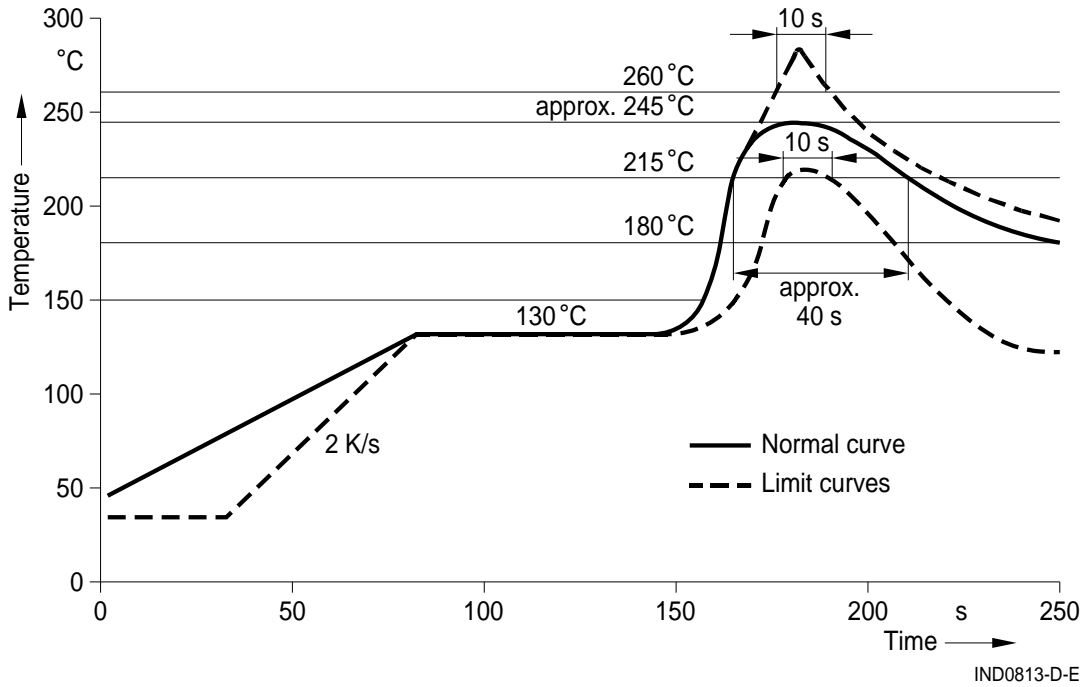
Current derating I_{op}/I_R versus ambient temperature



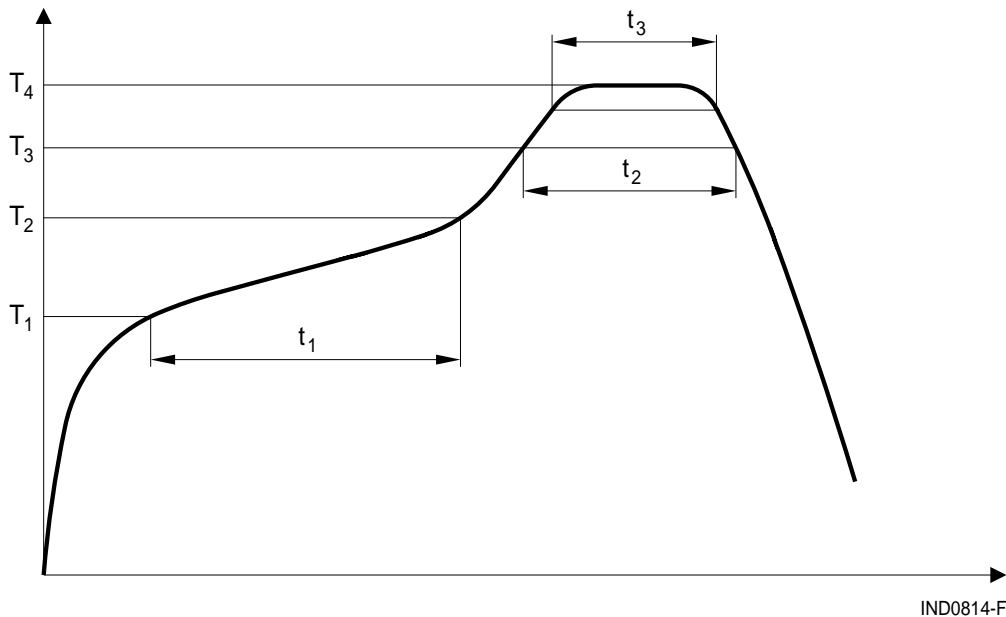
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Recommended reflow soldering curve

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



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



| 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 | < 40 @ T ₄ -5 °C |

Time from 25 °C to T₄: max 300 s

Maximal numbers of reflow cycles: 3

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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