Data and signal line chokes

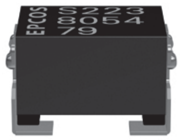
SIMDAD 1812, common-mode chokes
42 V AC/80 V DC, 11 … 100 µH, 150 … 300 mA

Series/Type: **B82789C0/S0**

Date: August 2019

SMD

Rated voltage 42 V AC/80 V DC
Rated inductance 11 ... 100 µH
Rated current 150 ... 300 mA



Construction

- Current-compensated double choke
- Ferrite I core
- Winding: enamel copper wire
- Winding welded to terminals
- Bifilar winding (B82789C0…)
- Sector winding (B82789S0…)

Features

- Temperature range up to +150 °C (B82789C0/S0*H)
- Suitable for lead-free reflow soldering as referenced in JEDEC J-STD 020D
- For gold-plated terminals conductive adhesion possible
- Qualified to AEC-Q200
- RoHS-compatible

Function

- B82789C0:
  Suppression of asymmetrical interference coupled in on lines,
  whereas data signals up to some MHz can pass unaffectedly.
- B82789S0:
  Suppression of asymmetrical (by L_R) 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 and FlexRay bus
- Industrial field bus systems
- Line cards for telecom

Terminals

Tinned terminals (B82789C0/S0*002)

- Base material CuSn6
- Layer composition Ni, Ag, Sn [1)]
- Lead-free tinned

Gold-plated terminals (B82789C0/S0*001)

- Base material CuSn6
- Layer composition Ni, Ag, Au
- Gold plated

1) Ni-barrier-plated terminals (NiSn) on request (B82789C0/S0*H052).

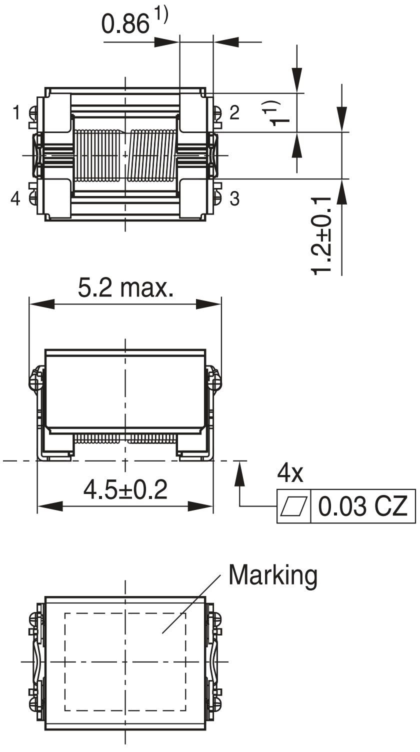
Marking

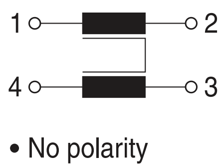
- Marking on component:
  Manufacturer, bifilar or sector winding (coded),
  L value (in nH; for version B82789C0/S0*H052 underlined),
  date of manufacture (YWWD), two last digits of production order
- Minimum data on reel:
  Manufacturer, ordering code, L value (in nH), quantity, date of packing

Delivery mode and packing unit

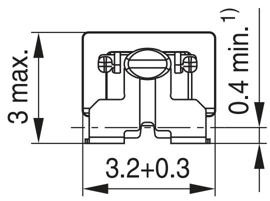
- 12-mm blister tape, wound on 330-mm ∅ reel
- Packing unit: 2500 pcs./reel

Dimensional drawing and pin configuration





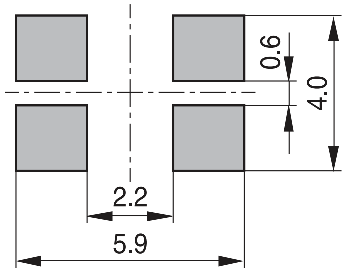
IND1314-P-E



1) Soldering area

IND1305-G-E

Layout recommendation

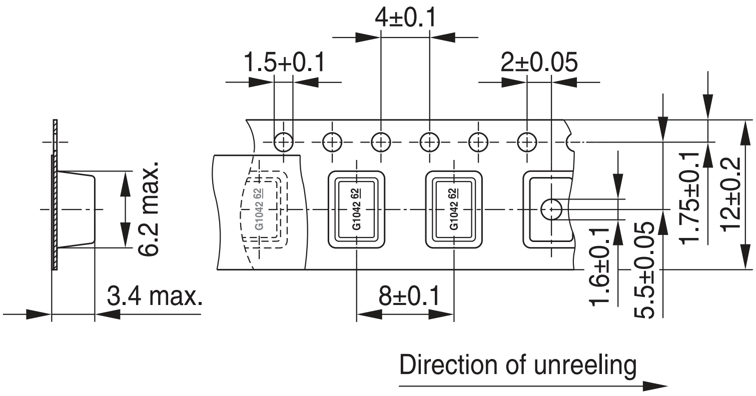


IND0302-8

Dimensions in mm

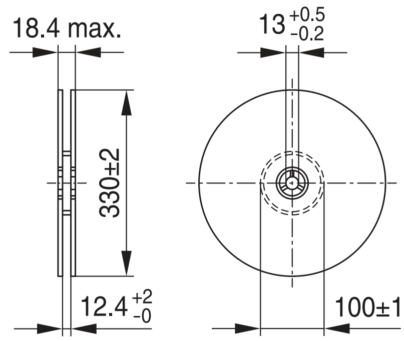
Taping and packing

Blister tape



IND1559-K-E

Reel



IND1526-N

Dimensions in mm

Technical data and measuring conditions

Rated voltage V_R	42 V AC (50/60 Hz) / 80 V DC
Test voltage V_{test}	250 V DC, 2 s (line/line)
Rated temperature T_R	+85 °C / +110 °C
Rated current I_R	Referred to 50 Hz and rated temperature
Rated inductance L_R	Measured with Agilent 4284A at 100 kHz, 0.1 mA, +20 °C Inductance is specified per winding.
Inductance tolerance	–30/+50% at +20 °C
Inductance decrease $\Delta L/L_0$	Common mode < 10% at DC magnetic bias with I_R, +20 °C
Stray inductance $L_{stray,typ}$	Measured with Agilent 4284A at 100 kHz, 5 mA, +20 °C, typical values
DC resistance R_{max}	Measured at +20 °C, specified per winding
Solderability (lead-free)	Dip and look method Sn95.5Ag3.8Cu0.7: +(245 ±5) °C, (3 ±0.3) s Wetting of soldering area ≥ 90% (based on IEC 60068-2-58)
Resistance to soldering heat	+260 °C, 40 s as referenced in JEDEC J-STD 020D
Climatic category	55/125/56 (B82789*N) 55/150/56 (B82789*H) (to IEC 60068-1)
Storage conditions	Mounted: –55 °C … +125 °C (B82789C0/S0*N) –55 °C … +150 °C (B82789C0/S0*H) Packaged: –25 °C … +40 °C, ≤ 75% RH
Weight	Approx. 0.16 g

Characteristics and ordering codes

L_R µH	$L_{stray,typ}$ µH	I_R mA	R_{max} mΩ	T_R °C	Ordering code Gold-plated terminals	Ordering code Tinned terminals
B82789C0/S0*N (operating temperature: –55 … +125 °C)						
11	0.06	300	250	85	B82789C0113N001	B82789C0113N002
22	0.10	250	580	85	B82789C0223N001	B82789C0223N002
22	3.0	250	580	85	B82789S0223N001	B82789S0223N002
51	0.10	250	550	85	B82789C0513N001	B82789C0513N002
100	0.25	150	1500	85	B82789C0104N001	B82789C0104N002
B82789C0/S0*H (operating temperature: –55 … +150 °C)						
11	0.06	300	250	110	B82789C0113H001	B82789C0113H002[1)]
22	0.10	250	580	110	B82789C0223H001	B82789C0223H002[1)]
22	3.0	250	580	110	B82789S0223H001	B82789S0223H002[1)]
51	0.10	250	550	110	B82789C0513H001	B82789C0513H002[1)]
100	0.25	150	1500	110	B82789C0104H001	B82789C0104H002[1)]

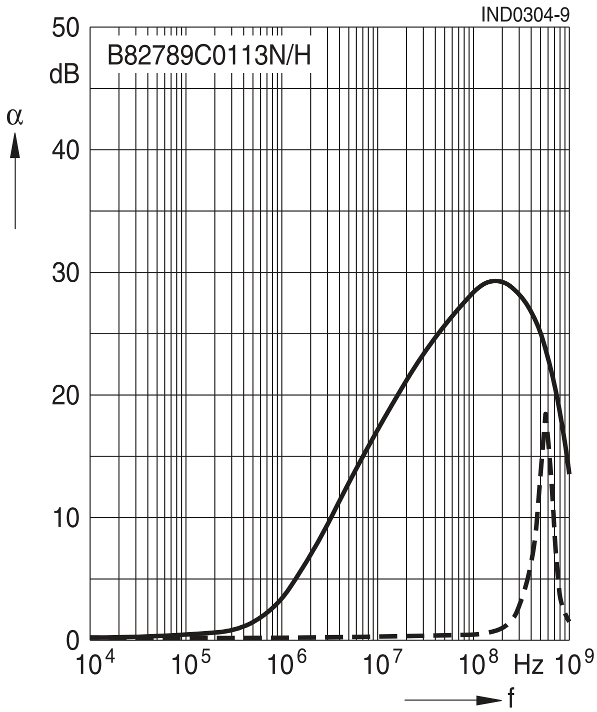
1) Replace the two last digits “02” by “52” for Ni-barrier-plated terminals.

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

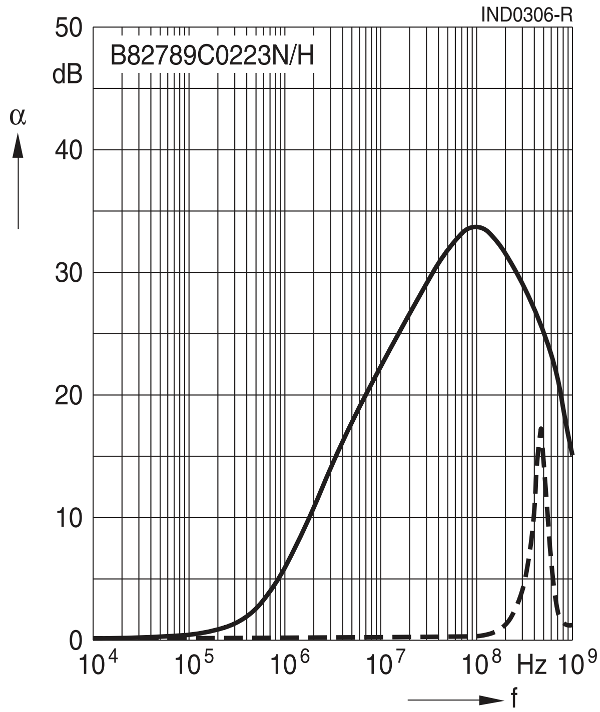
——— asymmetrical, all branches in parallel (common mode)

- - - - - symmetrical (differential mode)

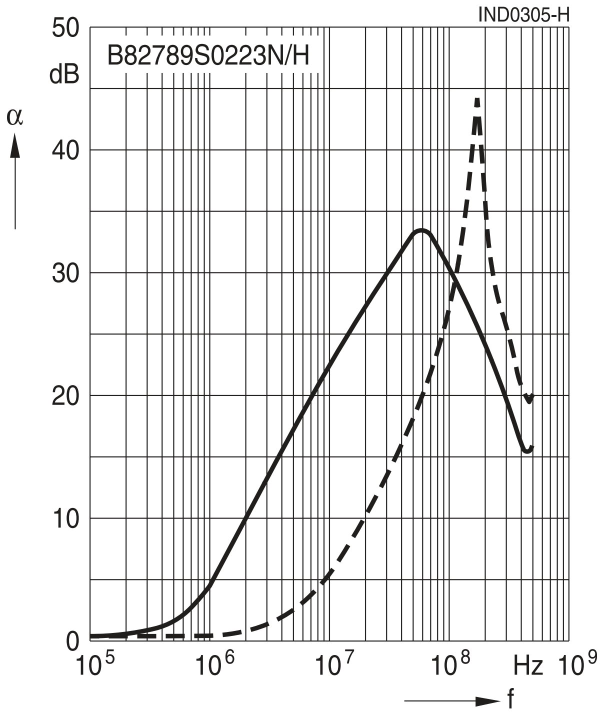
L_R = 11 µH



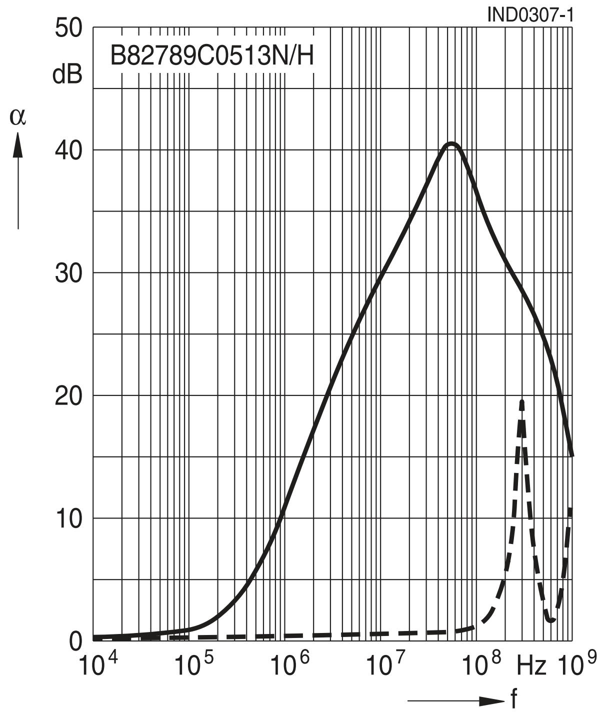
L_R = 22 µH (low L_{stray})



L_R = 22 µH (high L_{stray})



L_R = 51 µH

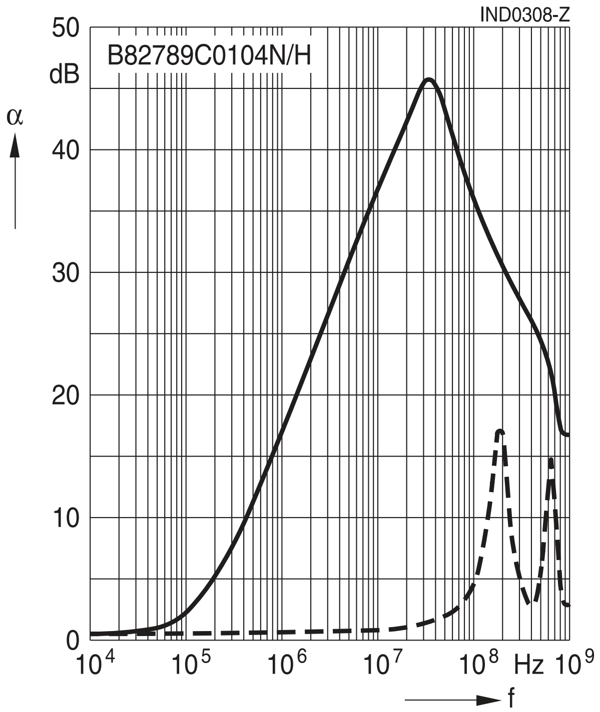


Insertion loss α (typical values at |Z| = 50 Ω, +20 °C)

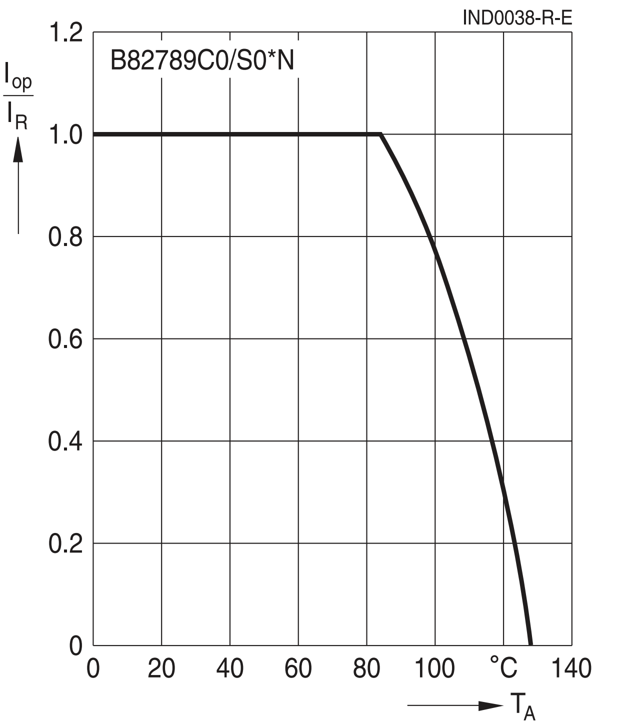
——— asymmetrical, all branches in parallel (common mode)

- - - - - - symmetrical (differential mode)

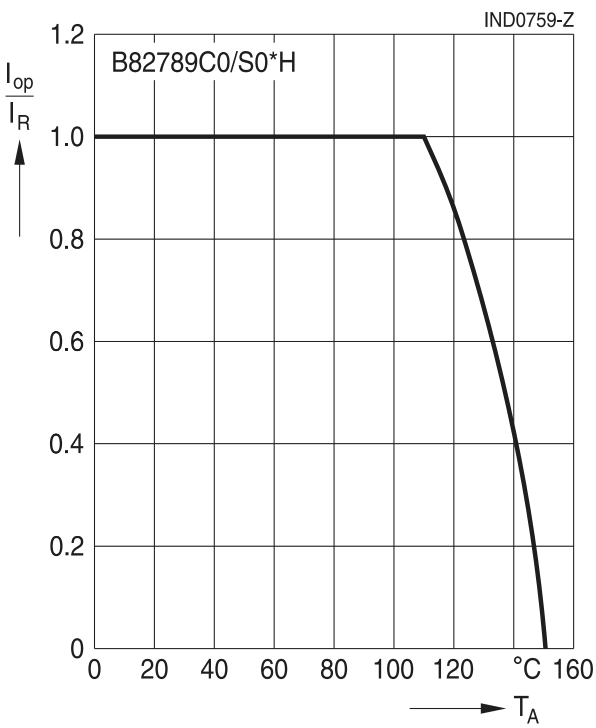
L_R = 100 µH



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



Current derating I_{op}/I_R versus ambient temperature (rated temperature T_R = +110 °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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Release 2018-10