



# Inductors

RF chokes, BC series

**Series/Type:** B78108S, B78148S

**Date:** June 2012

**BC chokes (Bobbin Core)**
**Rated inductance 1 ... 4700  $\mu$ H**
**Rated current 55 ... 1200 mA**
**Construction**

- Ferrite drum core
- Winding: enamel copper wire
- Flame-retardant lacquer coating

**Features**

- Wide inductance range
- Suitable for general-purpose application
- Special versions available
- Suitable for wave soldering
- RoHS-compatible

**Applications**

- RF blocking and filtering
- Decoupling and interference suppression
- For antenna systems, automotive electronics, energy-saving lamps, entertainment electronics

**Terminals**

- Central axial leads (B78108S)
- Radially bent to 5 mm lead spacing (B78148S)
- Base material Cu
- Electroplated with nickel and pure tin

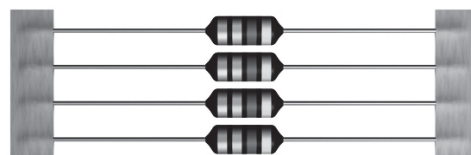
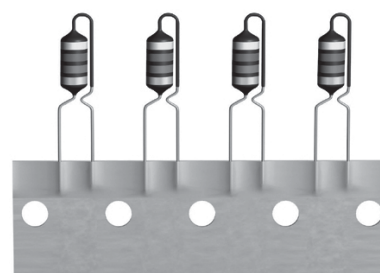
**Marking**

Inductance indicated by color bands to IEC 60062

**Delivery mode and packing units**

- Taped, Ammo and reel packing
- Packing units:

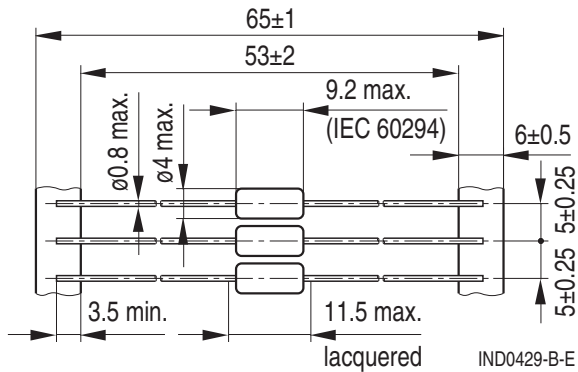
|        | Ammo<br>(pcs./pack.) | Reel<br>(pcs./reel) |
|--------|----------------------|---------------------|
| Axial  | 2500                 | 5000                |
| Radial | 2500                 | 2000                |


**B78108S**

**B78148S**

## Dimensional drawings

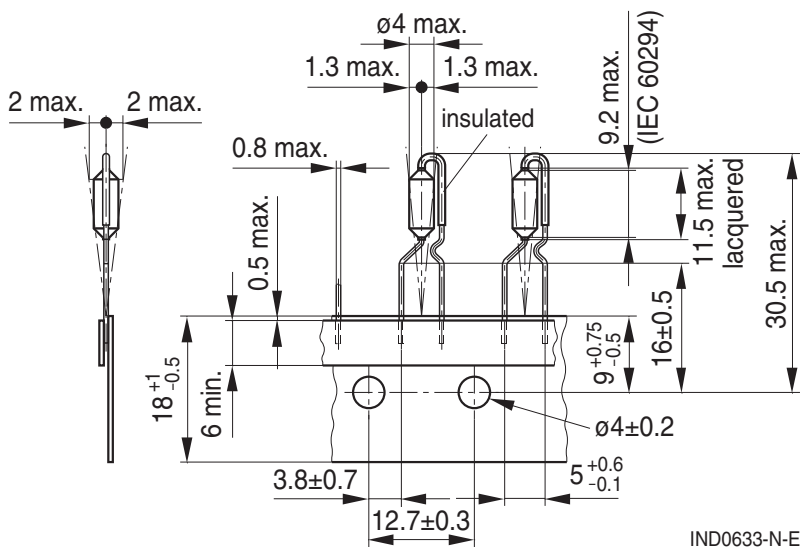
B78108S (axial leads, taped)

Dimensions in mm

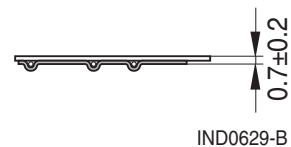


Minimum lead spacing 12.5 mm

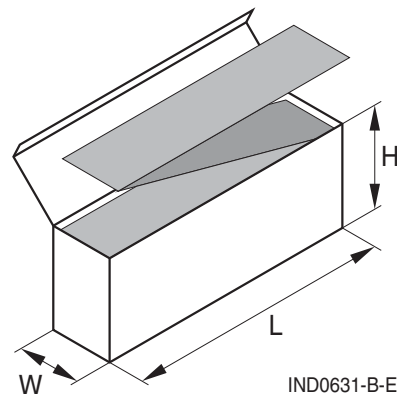
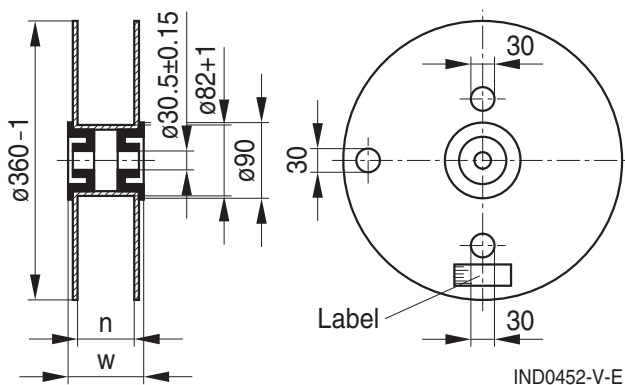
B78148S (central radial leads, taped)



Thickness of tape



## Packing



n (mm): Axial 72 +1, radial 42 +1  
w (mm): Axial 84 max., radial 54 max.

L × W × H (max. mm):  
Axial: 275 × 80 × 140, radial: 340 × 50 × 210

**Technical data and measuring conditions**

|                                           |                                                                                                                                                                                                                                                                             |
|-------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Rated inductance $L_R$                    | Measured with LCR meter Agilent 4284A<br>or impedance analyzer Agilent 4294A<br>Measuring frequency: $L_R \leq 10 \mu\text{H}$ = 1 MHz<br>$10 \mu\text{H} < L_R \leq 4700 \mu\text{H}$ = 100 kHz<br>Measuring current: $\leq 1 \text{ mA}$<br>Measuring temperature: +20 °C |
| Q factor $Q_{\min}$                       | Measured with precision impedance analyzer Agilent 4294A, +20 °C                                                                                                                                                                                                            |
| Rated temperature $T_R$                   | +40 °C                                                                                                                                                                                                                                                                      |
| Rated current $I_R$                       | Maximum permissible DC current at rated temperature                                                                                                                                                                                                                         |
| Inductance decrease $\Delta L/L_0$        | $\leq 10\%$ (referred to initial value) at $I_R$ , +20 °C                                                                                                                                                                                                                   |
| DC resistance $R_{\max}$                  | Measured at 20 °C                                                                                                                                                                                                                                                           |
| Resonance frequency $f_{\text{res},\min}$ | Measured with Agilent 4294A or 8753ES, +20 °C                                                                                                                                                                                                                               |
| Solderability (lead-free)                 | Sn95.5Ag3.8Cu0.7: +(245 ±5) °C, (3 ±0.3) s<br>Wetting of soldering area $\geq 90\%$<br>(to IEC 60068-2-20, test Ta)                                                                                                                                                         |
| Resistance to soldering heat              | +(260 ±5) °C, 10 s (to IEC 60068-2-20, test Tb)                                                                                                                                                                                                                             |
| Tensile strength of leads                 | $\geq 20 \text{ N}$ (to IEC 60068-2-21, test Ua)                                                                                                                                                                                                                            |
| Climatic category                         | 55/125/56 (to IEC 60068-1)                                                                                                                                                                                                                                                  |
| Storage conditions                        | Mounted: -55 °C ... +125 °C<br>Packaged: -25 °C ... +40 °C, $\leq 75\%$ RH                                                                                                                                                                                                  |
| Weight                                    | Approx. 0.38 g                                                                                                                                                                                                                                                              |

** Mounting information**

When bending the leads, take care that the start-of-winding areas at the face ends (protected by glue and lacquer) are not subjected to any mechanical stress.

**Characteristics and ordering codes**

| $L_R$<br>$\mu\text{H}$ | Tolerance <sup>1)</sup> | $Q_{\min}$ | $f_Q$<br>MHz | $I_R$<br>mA | $R_{\max}$<br>$\Omega$ | $f_{\text{res, min}}$<br>MHz | Ordering code <sup>2)</sup><br>(reel packing) <sup>3)</sup> |
|------------------------|-------------------------|------------|--------------|-------------|------------------------|------------------------------|-------------------------------------------------------------|
| 1.0                    | $\pm 10\% \triangleq K$ | 55         | 7.96         | 1200        | 0.16                   | 205                          | B781*8S1102K000                                             |
| 1.2                    |                         | 55         | 7.96         | 1150        | 0.18                   | 185                          | B781*8S1122K000                                             |
| 1.5                    |                         | 55         | 7.96         | 1100        | 0.20                   | 165                          | B781*8S1152K000                                             |
| 1.8                    |                         | 55         | 7.96         | 1030        | 0.22                   | 155                          | B781*8S1182K000                                             |
| 2.2                    |                         | 55         | 7.96         | 1000        | 0.25                   | 140                          | B781*8S1222K000                                             |
| 2.7                    |                         | 60         | 7.96         | 940         | 0.26                   | 125                          | B781*8S1272K000                                             |
| 3.3                    |                         | 60         | 7.96         | 900         | 0.29                   | 115                          | B781*8S1332K000                                             |
| 3.9                    |                         | 60         | 7.96         | 850         | 0.31                   | 105                          | B781*8S1392K000                                             |
| 4.7                    |                         | 60         | 7.96         | 820         | 0.34                   | 95                           | B781*8S1472K000                                             |
| 5.6                    |                         | 60         | 7.96         | 780         | 0.38                   | 85                           | B781*8S1562K000                                             |
| 6.8                    |                         | 65         | 7.96         | 670         | 0.51                   | 75                           | B781*8S1682K000                                             |
| 8.2                    |                         | 65         | 7.96         | 690         | 0.48                   | 50                           | B781*8S1822K000                                             |
| 10                     |                         | 70         | 2.52         | 680         | 0.49                   | 35                           | B781*8S1103K000                                             |
| 12                     |                         | 70         | 2.52         | 650         | 0.55                   | 30                           | B781*8S1123K000                                             |
| 15                     |                         | 60         | 2.52         | 610         | 0.60                   | 20                           | B781*8S1153K000                                             |
| 18                     |                         | 60         | 2.52         | 580         | 0.67                   | 17                           | B781*8S1183K000                                             |
| 22                     |                         | 55         | 2.52         | 560         | 0.74                   | 13                           | B781*8S1223K000                                             |
| 27                     |                         | 55         | 2.52         | 530         | 0.83                   | 10                           | B781*8S1273K000                                             |
| 33                     |                         | 55         | 2.52         | 500         | 0.92                   | 9.0                          | B781*8S1333K000                                             |
| 39                     |                         | 50         | 2.52         | 470         | 1.02                   | 8.0                          | B781*8S1393K000                                             |

BC chokes with temperature range up to +140 °C on request.

BC chokes up to 33  $\mu\text{H}$  with higher resonance frequency on request.

1) Closer tolerances on request.

2) Replace the \* by code number »0« for axial taping or by »4« for radial taping.

3) For Ammo pack the last digit has to be a »9«. Example: B78108S1102K009

**Characteristics and ordering codes**

| L <sub>R</sub><br>μH | Tolerance <sup>1)</sup> | Q <sub>min</sub> | f <sub>Q</sub><br>MHz | I <sub>R</sub><br>mA | R <sub>max</sub><br>Ω | f <sub>res, min</sub><br>MHz | Ordering code <sup>2)</sup><br>(reel packing) <sup>3)</sup> |
|----------------------|-------------------------|------------------|-----------------------|----------------------|-----------------------|------------------------------|-------------------------------------------------------------|
| 47                   | ±5% ± J                 | 45               | 2.52                  | 450                  | 1.10                  | 7.5                          | B781*8S1473J000                                             |
| 56                   |                         | 40               | 2.52                  | 430                  | 1.23                  | 7.0                          | B781*8S1563J000                                             |
| 68                   |                         | 40               | 2.52                  | 410                  | 1.35                  | 6.5                          | B781*8S1683J000                                             |
| 82                   |                         | 35               | 2.52                  | 390                  | 1.54                  | 6.0                          | B781*8S1823J000                                             |
| 100                  |                         | 70               | 0.796                 | 370                  | 1.70                  | 5.0                          | B781*8S1104J000                                             |
| 120                  |                         | 70               | 0.796                 | 300                  | 2.40                  | 4.5                          | B781*8S1124J000                                             |
| 150                  |                         | 70               | 0.796                 | 280                  | 2.80                  | 4.2                          | B781*8S1154J000                                             |
| 180                  |                         | 70               | 0.796                 | 270                  | 3.00                  | 3.9                          | B781*8S1184J000                                             |
| 220                  |                         | 70               | 0.796                 | 250                  | 3.30                  | 3.7                          | B781*8S1224J000                                             |
| 270                  |                         | 70               | 0.796                 | 200                  | 5.70                  | 2.8                          | B781*8S1274J000                                             |
| 330                  |                         | 70               | 0.796                 | 190                  | 6.40                  | 2.7                          | B781*8S1334J000                                             |
| 390                  |                         | 70               | 0.796                 | 180                  | 7.00                  | 2.4                          | B781*8S1394J000                                             |
| 470                  |                         | 70               | 0.796                 | 170                  | 7.90                  | 2.2                          | B781*8S1474J000                                             |
| 560                  |                         | 60               | 0.796                 | 160                  | 8.80                  | 2.0                          | B781*8S1564J000                                             |
| 680                  |                         | 55               | 0.796                 | 150                  | 10.0                  | 1.9                          | B781*8S1684J000                                             |
| 820                  |                         | 50               | 0.796                 | 140                  | 12.0                  | 1.6                          | B781*8S1824J000                                             |
| 1000                 |                         | 50               | 0.252                 | 130                  | 14.0                  | 1.6                          | B781*8S1105J000                                             |
| 1200                 |                         | 50               | 0.252                 | 115                  | 17.5                  | 1.3                          | B781*8S1125J000                                             |
| 1500                 |                         | 50               | 0.252                 | 100                  | 23.0                  | 1.25                         | B781*8S1155J000                                             |
| 1800                 |                         | 50               | 0.252                 | 95                   | 26.0                  | 1.2                          | B781*8S1185J000                                             |
| 2200                 |                         | 40               | 0.252                 | 80                   | 34.7                  | 1.1                          | B781*8S1225J000                                             |
| 2700                 |                         | 40               | 0.252                 | 75                   | 40.0                  | 1.0                          | B781*8S1275J000                                             |
| 3300                 |                         | 40               | 0.252                 | 62                   | 59.5                  | 0.9                          | B781*8S1335J000                                             |
| 3900                 |                         | 40               | 0.252                 | 59                   | 66.0                  | 0.8                          | B781*8S1395J000                                             |
| 4700                 |                         | 35               | 0.252                 | 55                   | 78.0                  | 0.7                          | B781*8S1475J000                                             |

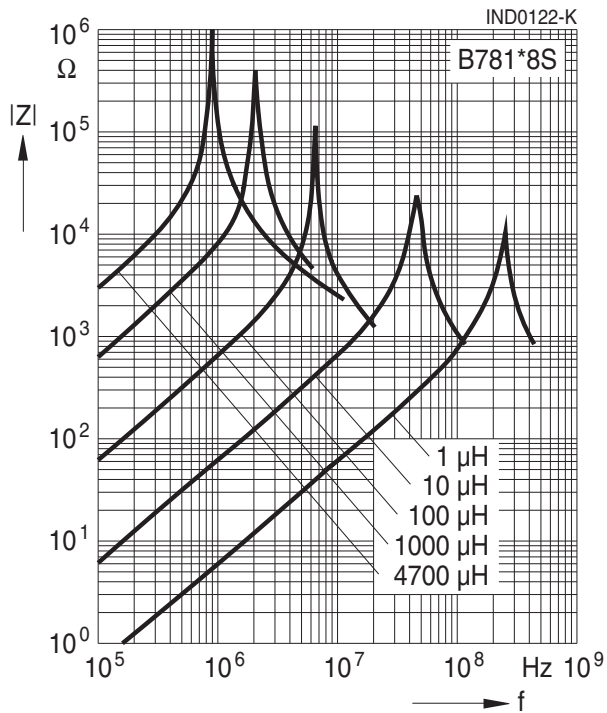
BC chokes with temperature range up to +140 °C on request.

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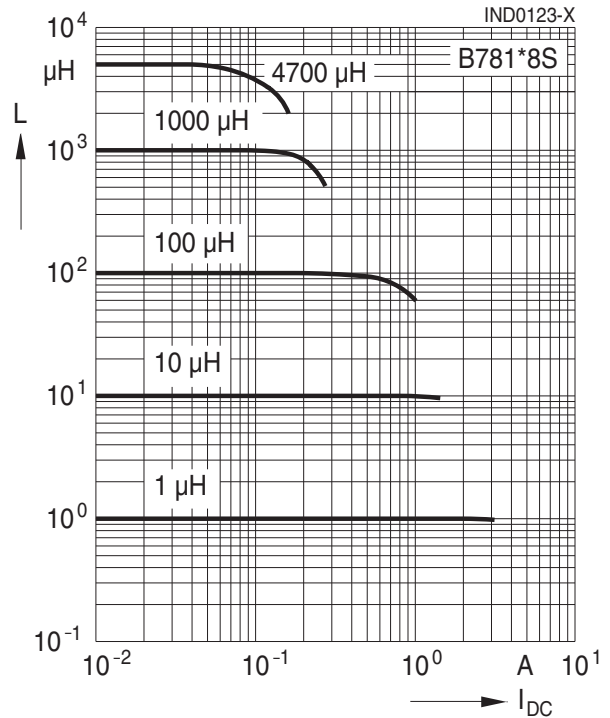
2) Replace the \* by code number »0« for axial taping or by »4« for radial taping.

3) For Ammo pack the last digit has to be a »9«. Example: B78108S1473J009

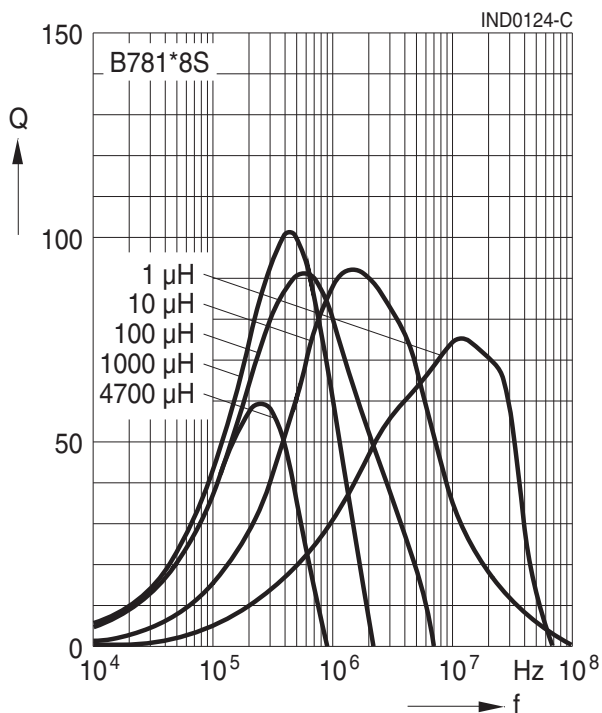
**Impedance  $|Z|$  versus frequency  $f$**   
measured with impedance analyzer Agilent 4294A or S-parameter network analyzer Agilent 8753ES, typical values at +20 °C



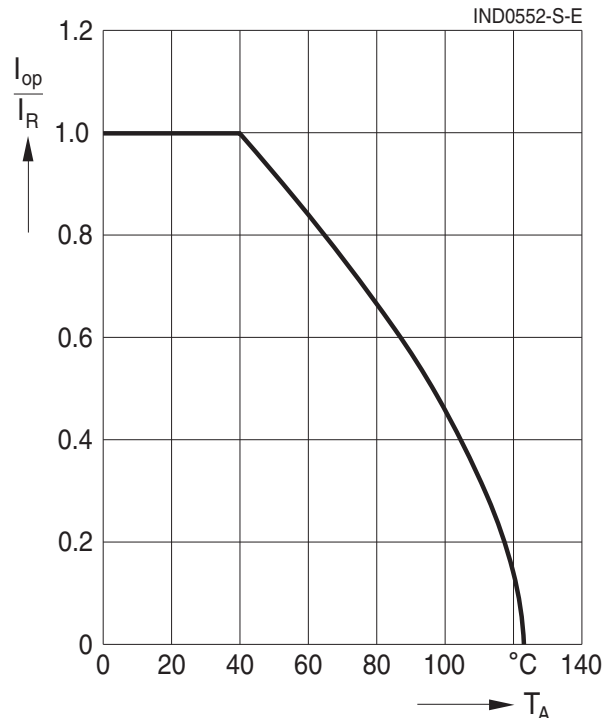
**Inductance  $L$  versus DC load current  $I_{DC}$**   
measured with LCR meter Agilent 4284A, typical values at +20 °C



**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  $T_R = +40$  °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 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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