



## Chokes and inductors

For high frequency and EMC  
RF chokes, LBC series, axial

**Series/Type:** B82144A  
**Date:** November 2005

**LBC choke (Large Bobbin Core)**  
**Rated current 20 to 2200 mA**  
**Rated inductance 1 to 100 000  $\mu$ H**

### Construction

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

### Features

- Very wide inductance range
- High rated current
- RoHS-compatible (see page 6)

### Applications

- RF blocking and filtering
- Decoupling and interference suppression
- For telecommunications (12- or 16-kHz blocking filter), automotive electronics, energy-saving lamps, entertainment electronics

### Terminals

- Central axial leads, lead-free tinned

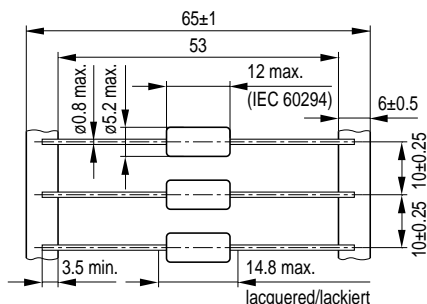
### Marking

Inductance indicated by color bands to IEC 60062

### Delivery mode

Taped, Ammo and reel packing (packing see page 8)

### Dimensional drawing



IND0431-4

Minimum lead spacing 15 mm

Approx. weight 1.1 g

**Characteristics and ordering codes**

For further technical data see page 6.

| $L_R$<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<br>(reel packing) <sup>2)</sup> |
|------------------------|------------------------------|-----------------------------|--------------|-------------|------------------------|------------------------------|---|
| 1.0                    | $\pm 10\%$<br>$\triangleq K$ | 40                          | 7.96         | 2200        | 0.08                   | 200                          | B82144A2102K000                               |
| 1.5                    |                              | 40                          | 7.96         | 2100        | 0.09                   | 190                          | B82144A2152K000                               |
| 2.2                    |                              | 40                          | 7.96         | 1900        | 0.11                   | 140                          | B82144A2222K000                               |
| 3.3                    |                              | 40                          | 7.96         | 1750        | 0.13                   | 120                          | B82144A2332K000                               |
| 4.7                    |                              | 40                          | 7.96         | 1600        | 0.16                   | 100                          | B82144A2472K000                               |
| 6.8                    |                              | 40                          | 7.96         | 1500        | 0.19                   | 80                           | B82144A2682K000                               |
| 10                     |                              | 60                          | 2.52         | 1400        | 0.22                   | 60                           | B82144A2103K000                               |
| 15                     |                              | 60                          | 2.52         | 1250        | 0.28                   | 20                           | B82144A2153K000                               |
| 22                     |                              | 50                          | 2.52         | 1100        | 0.35                   | 12                           | B82144A2223K000                               |
| 33                     |                              | $\pm 5\%$<br>$\triangleq J$ | 40           | 2.52        | 900                    | 0.43                         | 8.0   |
| 47                     | 40                           |                             | 2.52         | 800         | 0.50                   | 5.0                          | B82144A2473J000                               |
| 68                     | 30                           |                             | 2.52         | 700         | 0.60                   | 4.5                          | B82144A2683J000                               |
| 100                    | 50                           |                             | 0.796        | 600         | 0.70                   | 3.5                          | B82144A2104J000                               |
| 150                    | 50                           |                             | 0.796        | 500         | 0.90                   | 3.0                          | B82144A2154J000                               |
| 220                    | 50                           |                             | 0.796        | 400         | 1.60                   | 2.4                          | B82144A2224J000                               |
| 330                    | 50                           |                             | 0.796        | 330         | 1.90                   | 2.0                          | B82144A2334J000                               |
| 470                    | 40                           |                             | 0.796        | 280         | 2.50                   | 1.5                          | B82144A2474J000                               |
| 680                    | 30                           |                             | 0.796        | 240         | 2.80                   | 1.3                          | B82144A2684J000                               |
| 1000                   | 60                           |                             | 0.252        | 200         | 3.80                   | 1.2                          | B82144A2105J000                               |
| 1500                   | 60                           | 0.252                       | 160          | 6.00        | 1.0                    | B82144A2155J000              |   |
| 2200                   | 60                           | 0.252                       | 120          | 9.00        | 0.8                    | B82144A2225J000              |   |
| 3300                   | 60                           | 0.252                       | 110          | 12.0        | 0.6                    | B82144A2335J000              |   |
| 4700                   | 60                           | 0.252                       | 90           | 20.0        | 0.5                    | B82144A2475J000              |   |
| 6800                   | 60                           | 0.252                       | 80           | 30.0        | 0.4                    | B82144A2685J000              |   |
| 10000                  | 50                           | 0.0796                      | 60           | 42.0        | 0.35                   | B82144A2106J000              |   |
| 15000                  | 50                           | 0.0796                      | 50           | 68.0        | 0.30                   | B82144A2156J000              |   |
| 22000                  | 50                           | 0.0796                      | 40           | 120         | 0.26                   | B82144A2226J000              |   |

1) Closer tolerances upon request.

2) For Ammo pack the last digit has to be a »9«. Example: B82144A2102K009

**Characteristics and ordering codes** (continued)

For further technical data see page 6..

| $L_R$<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<br>(reel packing) <sup>2)</sup> |
|------------------------|-------------------------|------------|--------------|-------------|------------------------|------------------------------|---|
| 33000                  | $\pm 5\%$               | 50         | 0.0796       | 35          | 150                    | 0.22                         | B82144A2336J000                               |
| 47000                  | $\triangleq J$          | 40         | 0.0796       | 30          | 230                    | 0.18                         | B82144A2476J000                               |
| 68000                  |                         | 40         | 0.0796       | 25          | 290                    | 0.15                         | B82144A2686J000                               |
| 100000                 |                         | 40         | 0.0796       | 20          | 420                    | 0.12                         | B82144A2107J000                               |

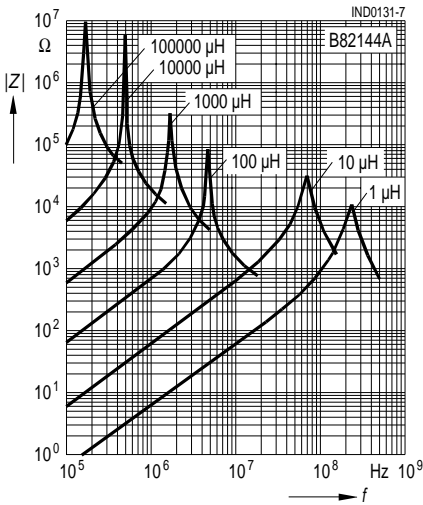
For telecommunications in the blocking filter for 12-kHz and 16-kHz counting pulses

|      |                |    |       |     |      |     |                 |
|------|----------------|----|-------|-----|------|-----|-----------------|
| 980  | $\pm 3\%$      | 25 | 0.016 | 200 | 3.8  | 1.2 | B82144A2984A000 |
| 1450 | $\triangleq A$ | 25 | 0.016 | 140 | 6.0  | 1.0 | B82144A2145A500 |
| 2600 |                | 20 | 0.012 | 120 | 11.0 | 0.7 | B82144A2265A000 |
| 3050 |                | 25 | 0.016 | 100 | 12.0 | 0.6 | B82144A2305A500 |
| 5330 |                | 20 | 0.012 | 90  | 25.0 | 0.5 | B82144A2535A300 |

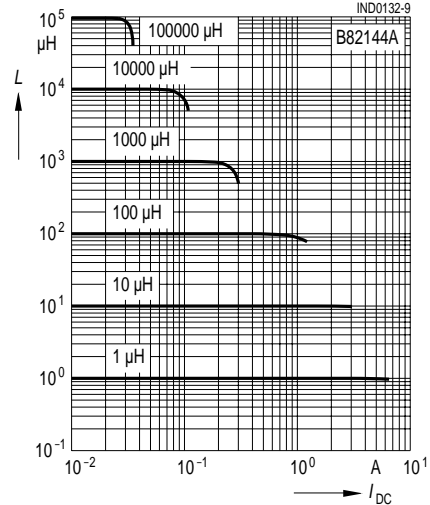
1) Closer tolerances upon request.

2) For Ammo pack the last digit has to be a »9«. Example: B82144A2336J009

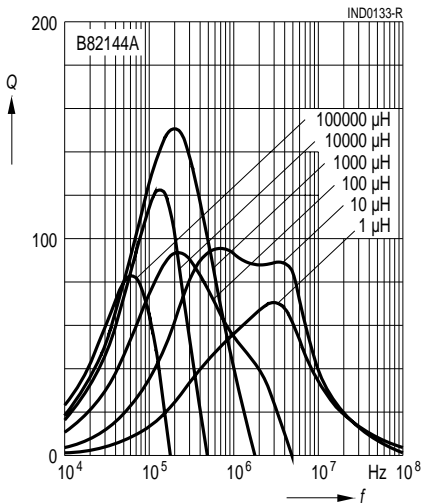
Impedance  $|Z|$   
 versus frequency  $f$   
 measured with impedance analyzer  
 HP 4191A / HP 4194A



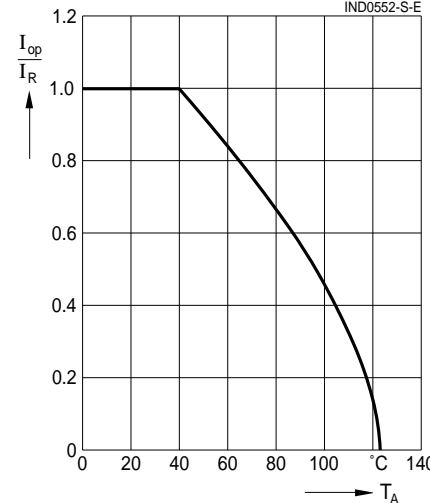
Inductance  $L$   
 versus DC load current  $I_{DC}$   
 measured with LCR meter  
 HP 4275A




Q factor  
 versus frequency  $f$   
 measured with impedance analyzer  
 HP 4194A



Current derating  $I_{op}/I_R$   
 versus ambient temperature  $T_A$   
 (rated temperature  $T_R = 40$   $^{\circ}\text{C}$ )



**General technical data**

|   |   |
|---|---|
| Rated inductance $L_R$  | Measuring frequency: $L \leq 10 \mu\text{H}$ = 1 MHz<br>$10 \mu\text{H} < L \leq 4700 \mu\text{H}$ = 100 kHz<br>$L > 4700 \mu\text{H}$ = 10 kHz<br>Measuring current: $\leq 1 \text{ mA}$<br>Distance between measuring clamps: 25.4 mm   |
| Q factor $Q_{\min}$   | Measured with HP 4342A  |
| Rated current $I_R$   | Maximum permissible DC current referred to 40 °C ambient temperature, for derating see below  |
| Inductance decrease $\Delta L/L_0$  | $\leq 10\%$ (referred to initial value) at $I_R$ at 20 °C ambient temperature   |
| DC resistance $R_{\max}$  | Measured at 20 °C ambient temperature, distance between measuring clamps: 25.4 mm   |
| Resonance frequency $f_{\text{res, min}}$   | Measured with Scalar Network Analyzer ZAS from Rohde & Schwarz  |
| Climatic category   | 55/125/56 (-55 °C/+125 °C/56 days damp heat test) to IEC 60068-1  |
| Solderability   | 235 °C, 2 s, $\geq 90\%$ wetting to IEC 60068-2-20, test Ta   |
| Resistance to soldering heat  | To IEC 60068-2-20, test Tb 260 °C, 10 s   |
| Tensile strength of leads   | To IEC 60068-2-21, test Ua $\geq 20 \text{ N}$  |
| RoHS-compatible   | RoHS-compatible is defined as compatible with the following documents:<br>DIRECTIVE 2002/95/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 13 February 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment COM (2004) 606 final Proposal for a COUNCIL DECISION amending Directive 2002/95/EC of the European Parliament and of the Council for the purposes of establishing the maximum concentration values for certain hazardous substances in electrical and electronic equipment. |
|  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.  |

**Color coding of the inductance value**

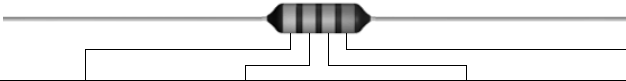
The inductance value and tolerance are encoded by means of colored bands in accordance with IEC 60062. The basic unit is  $\mu\text{H}$ .

1<sup>st</sup> band 1<sup>st</sup> digit of inductance value

2<sup>nd</sup> band 2<sup>nd</sup> digit of inductance value

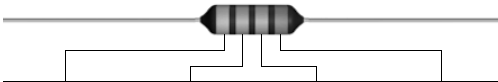
3<sup>rd</sup> band multiplier, i.e. the power of ten, by which the first two digits have to be multiplied.

4<sup>th</sup> band tolerance of the inductance value.

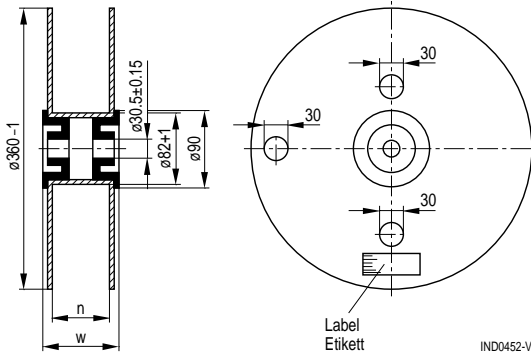


| Color code | 1 <sup>st</sup> band =<br>1 <sup>st</sup> digit | 2 <sup>nd</sup> band =<br>2 <sup>nd</sup> digit | 3 <sup>rd</sup> band =<br>multiplier              | 4 <sup>th</sup> band =<br>tolerance   |
|------------|---|---|---|---|
| Colorless  | —   | —   | —   | $\pm 20\%$ (M)  |
| Silver     | —   | —   | $\times 10^{-2} \mu\text{H} =$ 0.01 $\mu\text{H}$ | $\pm 10\%$ (K)  |
| Gold       | —   | —   | $\times 10^{-1} \mu\text{H} =$ 0.1 $\mu\text{H}$  | $\pm 5\%$ (J)   |
| Black      | —   | 0   | $\times 10^0 \mu\text{H} =$ 1 $\mu\text{H}$       | —   |
| Brown      | 1   | 1   | $\times 10^1 \mu\text{H} =$ 10 $\mu\text{H}$      |   |
| Red        | 2   | 2   | $\times 10^2 \mu\text{H} =$ 100 $\mu\text{H}$     | $\pm 2\%$ (G)   |
| Orange     | 3   | 3   | $\times 10^3 \mu\text{H} =$ 1000 $\mu\text{H}$    |   |
| Yellow     | 4   | 4   | $\times 10^4 \mu\text{H} =$ 10000 $\mu\text{H}$   |   |
| Green      | 5   | 5   | $\times 10^5 \mu\text{H} =$ 100000 $\mu\text{H}$  |   |
| Blue       | 6   | 6   |   | Special designs manufactured to customer specifications are identified by a white tolerance band. |
| Violet     | 7   | 7   |   |   |
| Grey       | 8   | 8   |   |   |
| White      | 9   | 9   |   |   |

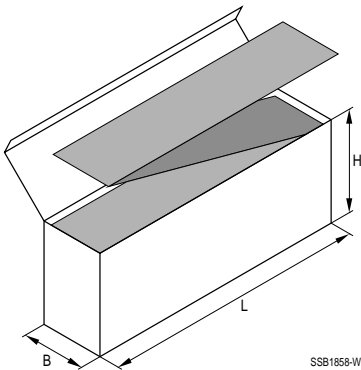
Examples:



| 1 <sup>st</sup> band | 2 <sup>nd</sup> band | 3 <sup>rd</sup> band             | 4 <sup>th</sup> band | Decoding  |
|----------------------|----------------------|----------------------------------|----------------------|---|
| Yellow<br>4          | Violet<br>7          | Gold<br>$\times 0.1 \mu\text{H}$ | Silver<br>$\pm 10\%$ | $= 47 \times 0.1 \mu\text{H} \pm 10\% = 4.7 \mu\text{H} \pm 10\%$ |
| Brown<br>1           | Green<br>5           | Red<br>$\times 100 \mu\text{H}$  | Gold<br>$\pm 5\%$    | $= 15 \times 100 \mu\text{H} \pm 5\% = 1500 \mu\text{H} \pm 5\%$  |

**Packing**
**Reel packing**


|        | Axial   |
|--------|---------|
| n (mm) | 72 +1   |
| w (mm) | 84 max. |

**Ammo packing**


|        | Axial    |
|--------|----------|
| L (mm) | 265 max. |
| B (mm) | 75 max.  |
| H (mm) | 125 max. |

**Packing units**

|       | Reel packing<br>pcs./reel | Ammo pack<br>pcs./pack. |
|-------|---------------------------|-------------------------|
| Axial | 1500                      | 1250                    |



## Important notes

The following applies to all products named in this publication:

1. Some parts of this publication contain **statements about the suitability of our products for certain areas of application**. These statements are based on our knowledge of typical requirements that are often placed on our products in the areas of application concerned. We nevertheless expressly point out **that such statements cannot be regarded as binding statements about the suitability of our products for a particular customer application**.

As a rule, EPCOS is either unfamiliar with individual customer applications or less familiar with them than the customers themselves. For these reasons, it is always ultimately incumbent on the customer to check and decide whether an EPCOS product with the properties described in the product specification is suitable for use in a particular customer application.

2. We also point out that in **individual cases, a malfunction of passive electronic components or failure before the end of their usual service life cannot be completely ruled out in the current state of the art, even if they are operated as specified**. In customer applications requiring a very high level of operational safety and especially in customer applications in which the malfunction or failure of a passive electronic component could endanger human life or health (e.g. in accident prevention or life-saving systems), it must therefore be ensured by means of suitable design of the customer application or other action taken by the customer (e.g. installation of protective circuitry or redundancy) that no injury or damage is sustained by third parties in the event of malfunction or failure of a passive electronic component.
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