Innovative Service Around the Globe YAGEO

# DATA SHEET

## INDUCTOR

Power inductors

BDHE Series

**RoHS compliant & Halogen Free**

YAGEO

Product specification – March 26, 2021 V.0



# BDHE Series



The BDHE Series is designed specifically to enhance both PFM and PWM application performance.Q(Rac) value at light load and the RDC value at heavy load are both exceptional. Furthermore, the saturated current performance is also optimal, helping to reduce the ripple current and enhance the efficiency.

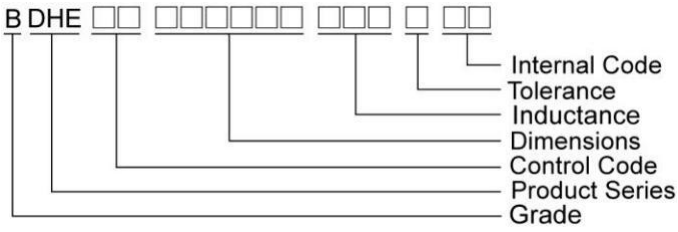
## Features

- RoHS, Halogen Free and REACH Compliance
- High Efficiency
- Excellent Q, RDC and saturation current
- Low profile and miniature size down to 1.6*0.8*0.8mm

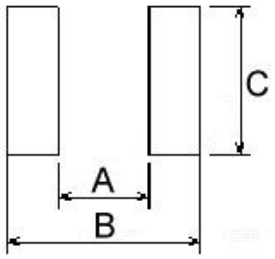
## Applications

- Smartphones, tablets and wearable devices
- HDD, SSD and PC peripheral devices
- DSC, camcorders
- PND
- DC/DC converters

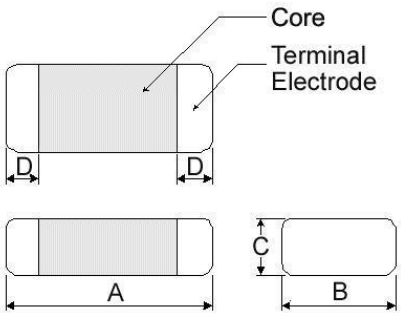
## Product Identification




## Recommended Pattern




## Shape and Dimensions




Dimensions in mm

| TYPE | A | B | C | D |
|---|---|---|---|---|
| BDHE00160808 | 1.6±0.2 | 0.80±0.2 | 0.8Max | 0.3±0.2 |
| BDHE00201208 | 2.0±0.2 | 1.25±0.2 | 0.8Max | 0.5±0.3 |
| BDHE00201210 | 2.0±0.2 | 1.25±0.2 | 1.0Max | 0.5±0.3 |
| BDHE00201608 | 2.0±0.2 | 1.60±0.2 | 0.8Max | 0.5±0.3 |
| BDHE00201610 | 2.0±0.2 | 1.60±0.2 | 1.0Max | 0.5±0.3 |
| BDHE00201612 | 2.0±0.2 | 1.60±0.2 | 1.2Max | 0.5±0.3 |
| BDHE00252010 | 2.5±0.3 | 2.00±0.3 | 1.0Max | 0.6±0.3 |
| BDHE00252012 | 2.5±0.3 | 2.00±0.3 | 1.2Max | 0.6±0.3 |
| BDHE00322510 | 3.2±0.3 | 2.50±0.3 | 1.0Max | 0.5±0.3 |
| BDHE00322512 | 3.2±0.3 | 2.50±0.3 | 1.2Max | 0.5±0.3 |
| BDHE00322525 | 3.2±0.3 | 2.50±0.3 | 2.50±0.3 | 0.5±0.3 |

Dimensions in mm

| TYPE | A | B | C |
|---|---|---|---|
| BDHE00160808 | 0.7 | 1.8 | 1 |
| BDHE00201208 | 0.8 | 2.4 | 1.45 |
| BDHE00201210 | 0.8 | 2.4 | 1.45 |
| BDHE00201608 | 0.7 | 2.3 | 1.8 |
| BDHE00201610 | 0.7 | 2.3 | 1.8 |
| BDHE00201612 | 0.7 | 2.3 | 1.8 |
| BDHE00252010 | 1.2 | 2.8 | 2.3 |
| BDHE00252012 | 1.2 | 2.8 | 2.3 |
| BDHE00322510 | 1.7 | 3.5 | 2.8 |
| BDHE00322512 | 1.7 | 3.5 | 2.8 |
| BDHE00322525 | 1.7 | 3.5 | 2.8 |

## Electrical Characteristics

| Part Number | Inductance (uH) | Tolerance (±%) | Test Frequency (MHz) | RDC(mΩ) Max(Typ.) | Isat(A) Max(Typ.) | Irms(A) Max(Typ.) |
|---|---|---|---|---|---|---|
| BDHE00160808R47MQ1 | 0.47 | 20 | 2 | 100(87) | 2.2(2.6) | 1.6(2.0) |
| BDHE001608081R0MQ1 | 1.0 | 20 | 2 | 195(170) | 1.6(1.8) | 1.5(1.7) |

**Note: When ordering, please specify tolerance code. Tolerance: M=±20%**

- Operating temperature range - 40℃ ~ 125℃(Including self - temperature rise)
- Isat for Inductance drop 30% from its value without current
- Irms for a 40℃ temperature rise from 25℃ ambient with current
- Rated current：Isat or Irms, whichever is smaller
- Absolute maximum voltage 15VDC
- Measure Equipment：

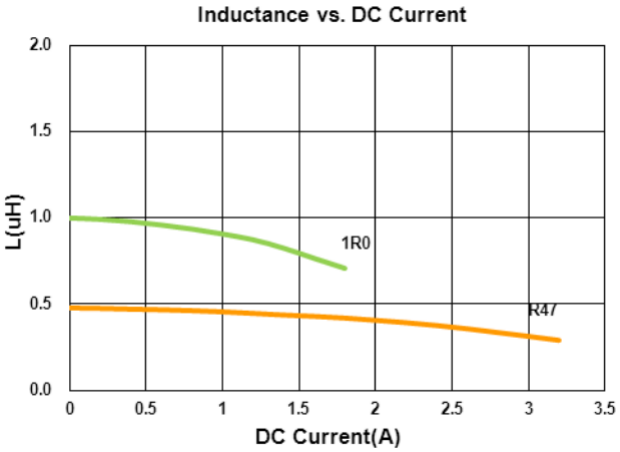
  L：Agilent E4991/HP4286A+16197A (or equivalent), 2MHz 0.2V

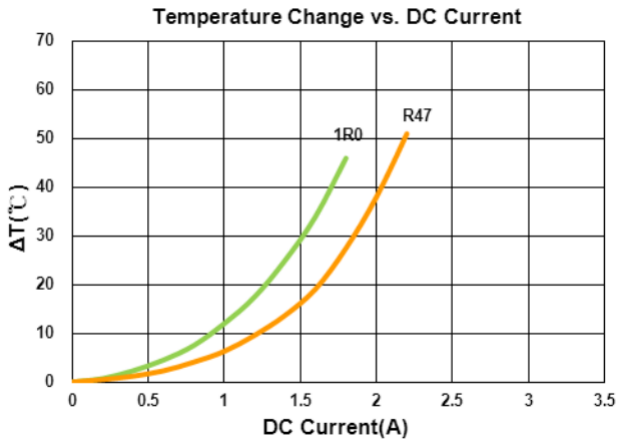
  RDC：CHEN HWA502BC/HP4338B (or equivalent)

  Isat：Agilent E4980A+HP42841A (or equivalent)

  Irms：Agilent 6641 SYSTEM DC POWER SUPPLY (or equivalent)

**Test Instruments**：E4991A Impedance / Material Analyzer



## Electrical Characteristics

| Part Number | Inductance (uH) | Tolerance (±%) | Test Frequency (MHz) | RDC(mΩ) Max(Typ.) | Isat(A) Max(Typ.) | Irms(A) Max(Typ.) |
|---|---|---|---|---|---|---|
| BDHE00201208R24MQ1 | 0.24 | 20 | 2 | 25(19) | 4.8(5.4) | 4.2(4.8) |
| BDHE00201208R47MQ1 | 0.47 | 20 | 2 | 48(40) | 3.2(3.6) | 3.0(3.4) |

**Note: When ordering, please specify tolerance code. Tolerance: M=±20%**

- Operating temperature range - 40℃ ~ 125℃(Including self - temperature rise)
- Isat for Inductance drop 30% from its value without current
- Irms for a 40℃ temperature rise from 25℃ ambient with current
- Rated current：Isat or Irms, whichever is smaller
- Absolute maximum voltage 20VDC
- Measure Equipment：

  L：Agilent E4991/HP4286A+16197A (or equivalent), 2MHz 0.2V

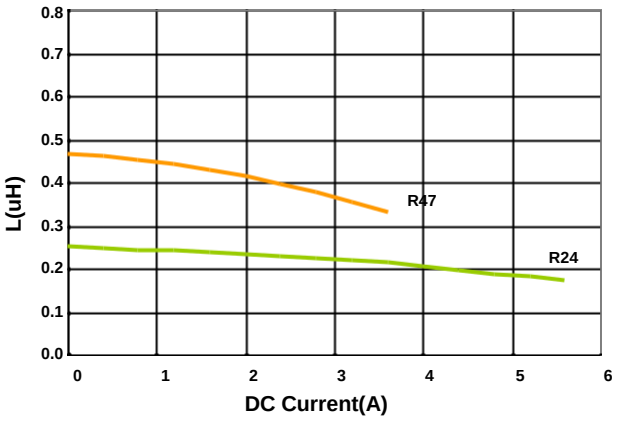
  RDC：CHEN HWA502BC/HP4338B (or equivalent)

  Isat：Agilent E4980A+HP42841A (or equivalent)

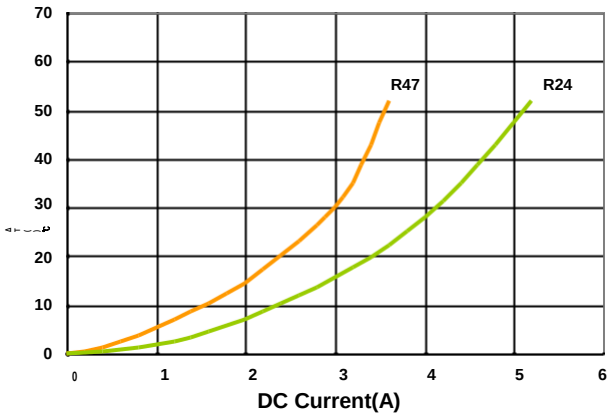
  Irms：Agilent 6641 SYSTEM DC POWER SUPPLY (or equivalent)

**Test Instruments**：E4991A Impedance / Material Analyzer

**Inductance vs. DC Current**




**Temperature Change vs. DC Current**



## Electrical Characteristics

| Part Number | Inductance (uH) | Tolerance (±%) | Test Frequency (MHz) | RDC(mΩ) Max(Typ.) | Isat(A) Max(Typ.) | Irms(A) Max(Typ.) |
|---|---|---|---|---|---|---|
| BDHE00201210R24MQ1 | 0.24 | 20 | 2 | 28(22) | 4.5(5.7) | 3.7(4.6) |
| BDHE00201210R47MQ1 | 0.47 | 20 | 2 | 42(33) | 3.3(4.2) | 3.0(3.7) |
| BDHE002012101R0MQ1 | 1.0 | 20 | 2 | 78(69) | 2.3(2.8) | 2.2(2.7) |
| BDHE002012101R5MQ1 | 1.5 | 20 | 2 | 126(108) | 1.7(2.2) | 1.6(2.1) |
| BDHE002012102R2MQ1 | 2.2 | 20 | 2 | 176(166) | 1.6(1.7) | 1.4(1.5) |

**Note: When ordering, please specify tolerance code. Tolerance: M=±20%**

- Operating temperature range - 40℃ ~ 125℃(Including self - temperature rise)
- Isat for Inductance drop 30% from its value without current
- Irms for a 40℃ temperature rise from 25℃ ambient with current
- Rated current：Isat or Irms, whichever is smaller
- Absolute maximum voltage 20VDC
- Measure Equipment：

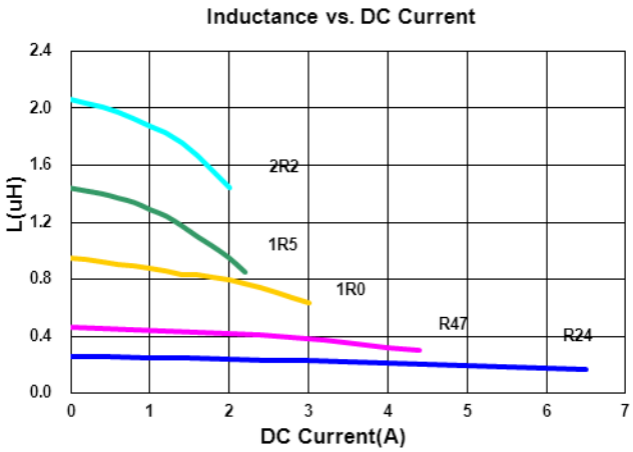
  L：Agilent E4991/HP4286A+16197A (or equivalent), 2MHz 0.2V

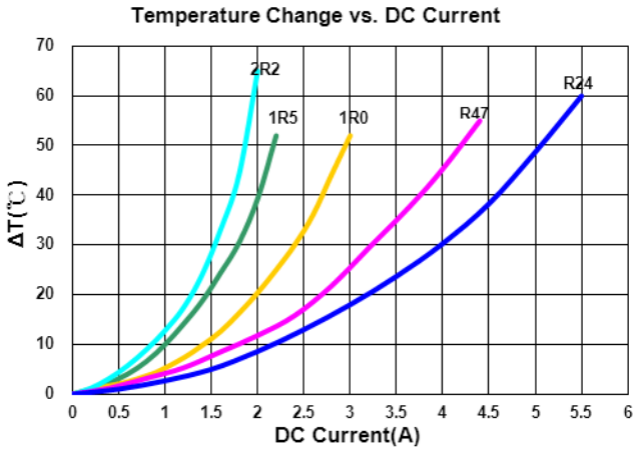
  RDC：CHEN HWA502BC/HP4338B (or equivalent)

  Isat：Agilent E4980A+HP42841A (or equivalent)

  Irms：Agilent 6641 SYSTEM DC POWER SUPPLY (or equivalent)

**Test Instruments**：E4991A Impedance / Material Analyzer



## Electrical Characteristics

| Part Number | Inductance (uH) | Tolerance (±%) | Test Frequency (MHz) | RDC(mΩ) Max(Typ.) | Isat(A) Max(Typ.) | Irms(A) Max(Typ.) |
|---|---|---|---|---|---|---|
| BDHE00201608R47MQ1 | 0.47 | 20 | 2 | 51(42) | 3.3(3.6) | 3.1(3.4) |
| BDHE002016081R0MQ1 | 1.0 | 20 | 2 | 87(76) | 2.5(2.8) | 2.3(2.7) |

**Note: When ordering, please specify tolerance code. Tolerance: M=±20%**

- Operating temperature range - 40℃ ~ 125℃(Including self - temperature rise)
- Isat for Inductance drop 30% from its value without current
- Irms for a 40℃ temperature rise from 25℃ ambient with current
- Rated current：Isat or Irms, whichever is smaller
- Absolute maximum voltage 20VDC
- Measure Equipment：

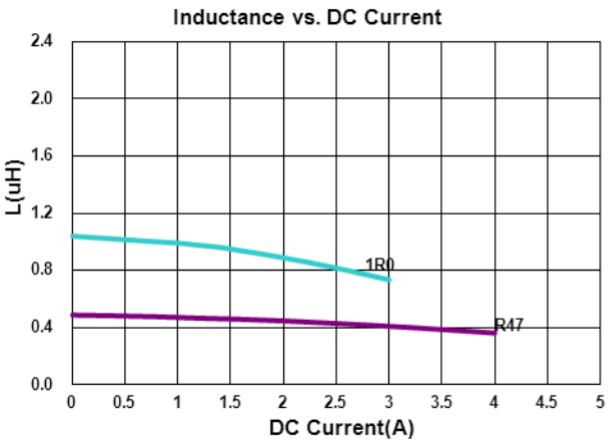
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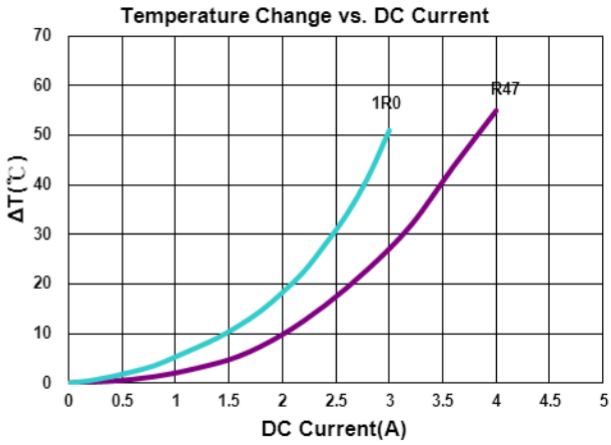
  RDC：CHEN HWA502BC/HP4338B (or equivalent)

  Isat：Agilent E4980A+HP42841A (or equivalent)

  Irms：Agilent 6641 SYSTEM DC POWER SUPPLY (or equivalent)

**Test Instruments**：E4991A Impedance / Material Analyzer



## Electrical Characteristics

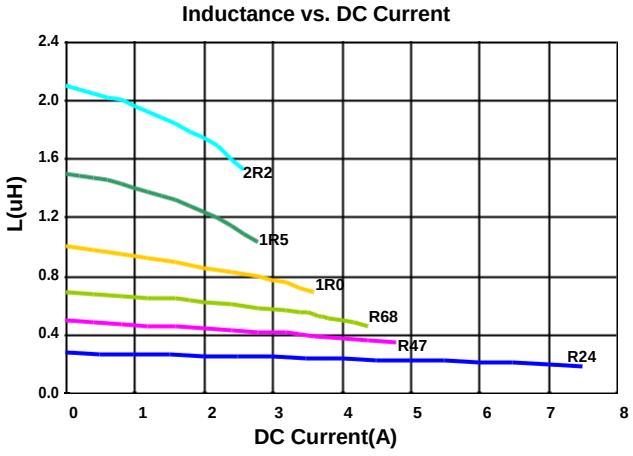
| Part Number | Inductance (uH) | Tolerance (±%) | Test Frequency (MHz) | RDC(mΩ) Max(Typ.) | Isat(A) Max(Typ.) | Irms(A) Max(Typ.) |
|---|---|---|---|---|---|---|
| BDHE00201610R24MQ1 | 0.24 | 20 | 2 | 27(21) | 5.6(7.0) | 3.9(4.8) |
| BDHE00201610R47MQ1 | 0.47 | 20 | 2 | 42(33) | 3.9(4.8) | 3.5(4.2) |
| BDHE00201610R68MQ1 | 0.68 | 20 | 2 | 56(43) | 3.2(4.0) | 2.7(3.4) |
| BDHE002016101R0MQ1 | 1.0 | 20 | 2 | 65(53) | 2.9(3.6) | 2.5(3.1) |
| BDHE002016101R5MQ1 | 1.5 | 20 | 2 | 85(75) | 2.5(2.8) | 2.3(2.7) |
| BDHE002016102R2MQ1 | 2.2 | 20 | 2 | 135(112) | 2.4(2.7) | 1.8(2.2) |

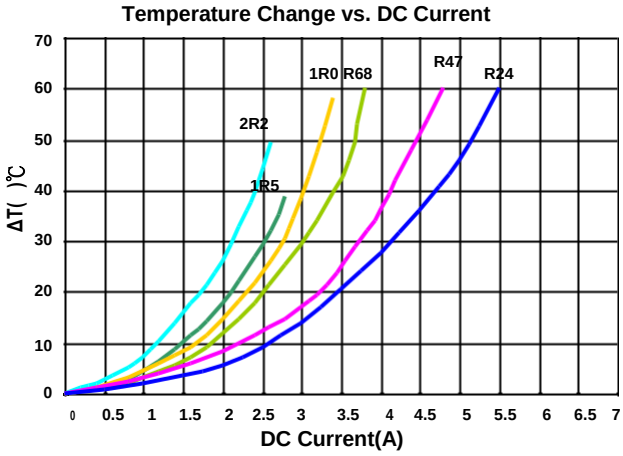
**Note: When ordering, please specify tolerance code. Tolerance: M=±20%**

- Operating temperature range - 40℃ ~ 125℃(Including self - temperature rise)
- Isat for Inductance drop 30% from its value without current
- Irms for a 40℃ temperature rise from 25℃ ambient with current
- Rated current：Isat or Irms, whichever is smaller
- Absolute maximum voltage 20VDC
- Measure Equipment：

  L：Agilent E4991/HP4286A+16197A (or equivalent), 2MHz 0.2V
  RDC：CHEN HWA502BC/HP4338B (or equivalent)
  Isat：Agilent E4980A+HP42841A (or equivalent)
  Irms：Agilent 6641 SYSTEM DC POWER SUPPLY (or equivalent)

**Test Instruments**：E4991A Impedance / Material Analyzer



## Electrical Characteristics

| Part Number | Inductance (uH) | Tolerance (±%) | Test Frequency (MHz) | RDC(mΩ) Max(Typ.) | Isat(A) Max(Typ.) | Irms(A) Max(Typ.) |
|---|---|---|---|---|---|---|
| BDHE002016121R0MQ1 | 1.0 | 20 | 2 | 52(43) | 3.2(3.8) | 3.0(3.5) |
| BDHE002016121R2MQ1 | 1.2 | 20 | 2 | 78(69) | 3.0(3.4) | 2.7(3.1) |

**Note: When ordering, please specify tolerance code. Tolerance: M=±20%**

- Operating temperature range - 40℃ ~ 125℃(Including self - temperature rise)
- Isat for Inductance drop 30% from its value without current
- Irms for a 40℃ temperature rise from 25℃ ambient with current
- Rated current：Isat or Irms, whichever is smaller
- Absolute maximum voltage 20VDC
- Measure Equipment：

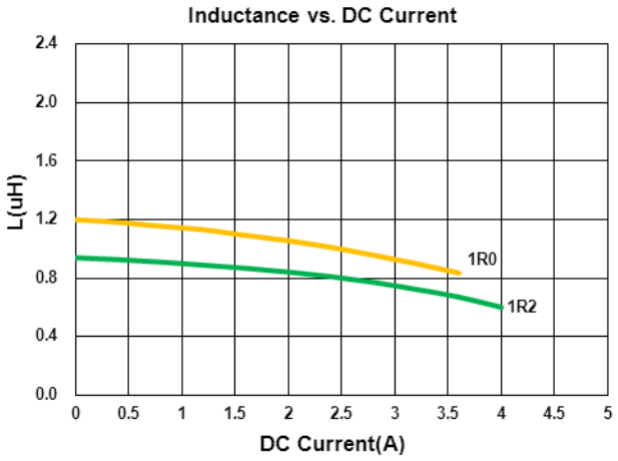
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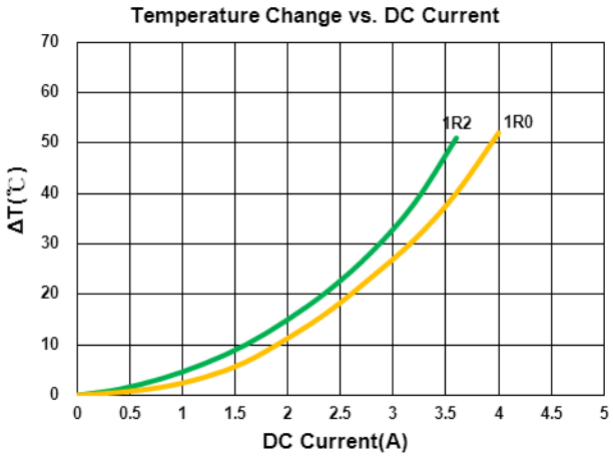
  RDC：CHEN HWA502BC/HP4338B (or equivalent)

  Isat：Agilent E4980A+HP42841A (or equivalent)

  Irms：Agilent 6641 SYSTEM DC POWER SUPPLY (or equivalent)

**Test Instruments**：E4991A Impedance / Material Analyzer



## Electrical Characteristics

| Part Number | Inductance (uH) | Tolerance (±%) | Test Frequency (MHz) | RDC(mΩ) Max(Typ.) | Isat(A) Max(Typ.) | Irms(A) Max(Typ.) |
|---|---|---|---|---|---|---|
| BDHE00252010R24MQ1 | 0.24 | 20 | 2 | 18(13) | 8.0(9.5) | 5.5(6.5) |
| BDHE00252010R33MQ1 | 0.33 | 20 | 2 | 24(18) | 6.5(8.0) | 4.8(5.5) |
| BDHE00252010R47MQ1 | 0.47 | 20 | 2 | 35(27) | 5.0(6.2) | 3.9(4.5) |
| BDHE00252010R68MQ1 | 0.68 | 20 | 2 | 40(32) | 4.5(5.6) | 3.7(4.2) |
| BDHE002520101R0MQ1 | 1.0 | 20 | 2 | 53(45) | 3.7(4.6) | 3.0(3.5) |
| BDHE002520101R5MQ1 | 1.5 | 20 | 2 | 75(68) | 3.1(3.8) | 2.4(2.8) |
| BDHE002520102R2MQ1 | 2.2 | 20 | 2 | 97(87) | 2.5(3.0) | 2.2(2.5) |

**Note: When ordering, please specify tolerance code. Tolerance: M=±20%**

- Operating temperature range - 40℃ ~ 125℃(Including self - temperature rise)
- Isat for Inductance drop 30% from its value without current
- Irms for a 40℃ temperature rise from 25℃ ambient with current
- Rated current：Isat or Irms, whichever is smaller
- Absolute maximum voltage 20VDC
- Measure Equipment：

  L：Agilent E4991/HP4286A+16197A (or equivalent), 2MHz 0.2V

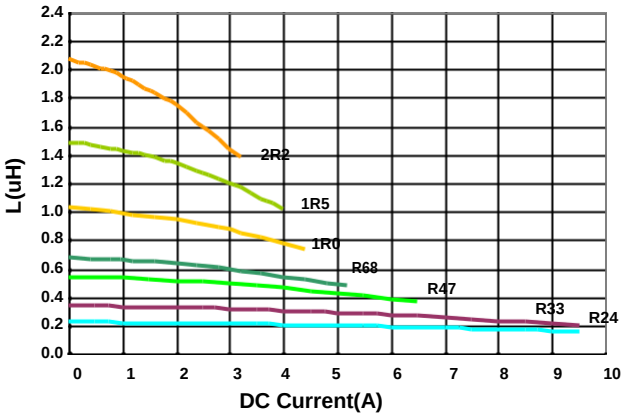
  RDC：CHEN HWA502BC/HP4338B (or equivalent)

  Isat：Agilent E4980A+HP42841A (or equivalent)

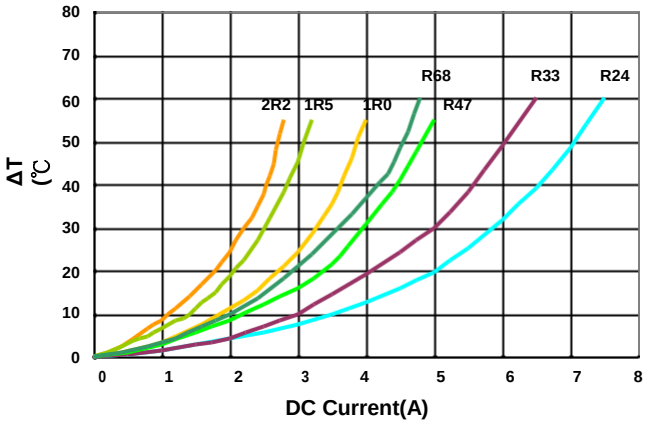
  Irms：Agilent 6641 SYSTEM DC POWER SUPPLY (or equivalent)

**Test Instruments**：E4991A Impedance / Material Analyzer

**Inductance vs. DC Current**




**Temperature Change vs. DC Current**



## Electrical Characteristics

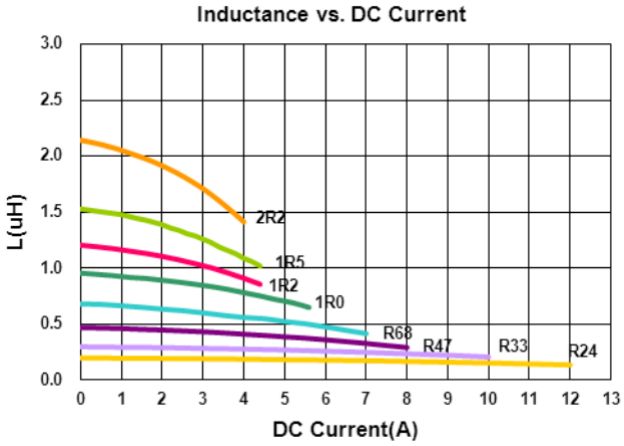
| Part Number | Inductance (uH) | Tolerance (±%) | Test Frequency (MHz) | RDC(mΩ) Max(Typ.) | Isat(A) Max(Typ.) | Irms(A) Max(Typ.) |
|---|---|---|---|---|---|---|
| BDHE00252012R24MQ1 | 0.24 | 20 | 2 | 15(11.5) | 9.0(10.5) | 6.2(7.3) |
| BDHE00252012R33MQ1 | 0.33 | 20 | 2 | 18(14.5) | 8.5(10) | 5.8(6.4) |
| BDHE00252012R47MQ1 | 0.47 | 20 | 2 | 33(28) | 5.6(7.0) | 3.8(4.5) |
| BDHE00252012R68MQ1 | 0.68 | 20 | 2 | 36(30) | 5.0(6.2) | 3.8(4.4) |
| BDHE002520121R0MQ1 | 1.0 | 20 | 2 | 42(35) | 4.4(5.5) | 3.6(4.1) |
| BDHE002520121R2MQ1 | 1.2 | 20 | 2 | 54(45) | 3.9(4.4) | 3.2(3.8) |
| BDHE002520121R5MQ1 | 1.5 | 20 | 2 | 65(57) | 3.4(4.2) | 2.7(3.1) |
| BDHE002520122R2MQ1 | 2.2 | 20 | 2 | 83(74) | 3.0(3.7) | 2.5(2.9) |

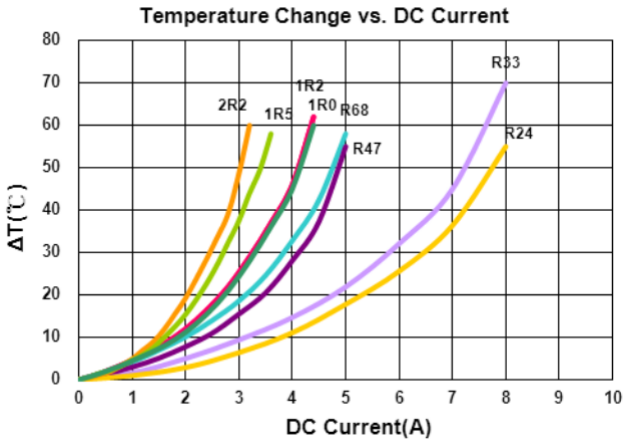
**Note: When ordering, please specify tolerance code. Tolerance: M=±20%**

- Operating temperature range - 40℃ ~ 125℃(Including self - temperature rise)
- Isat for Inductance drop 30% from its value without current
- Irms for a 40℃ temperature rise from 25℃ ambient with current
- Rated current：Isat or Irms, whichever is smaller
- Absolute maximum voltage 20VDC
- Measure Equipment：

  L：Agilent E4991/HP4286A+16197A (or equivalent), 2MHz 0.2V
  RDC：CHEN HWA502BC/HP4338B (or equivalent)
  Isat：Agilent E4980A+HP42841A (or equivalent)
  Irms：Agilent 6641 SYSTEM DC POWER SUPPLY (or equivalent)

**Test Instruments**：E4991A Impedance / Material Analyzer



## Electrical Characteristics

| Part Number | Inductance (uH) | Tolerance (±%) | Test Frequency (MHz) | RDC(mΩ) Max(Typ.) | Isat(A) Max(Typ.) | Irms(A) Max(Typ.) |
|---|---|---|---|---|---|---|
| BDHE00322510R24MQ1 | 0.24 | 20 | 2 | 16(12) | 9.0(11.5) | 6.0(6.8) |
| BDHE00322510R33MQ1 | 0.33 | 20 | 2 | 17(12.5) | 8.0(9.5) | 5.8(6.5) |
| BDHE00322510R47MQ1 | 0.47 | 20 | 2 | 24(19) | 6.0(7.3) | 4.5(5.4) |
| BDHE003225101R0MQ1 | 1.0 | 20 | 2 | 46(39) | 4.1(4.7) | 3.3(3.7) |
| BDHE003225101R5MQ1 | 1.5 | 20 | 2 | 58(50) | 3.5(4.0) | 3.2(3.5) |
| BDHE003225102R2MQ1 | 2.2 | 20 | 2 | 85(73) | 3.0(3.5) | 2.5(2.8) |

**Note: When ordering, please specify tolerance code. Tolerance: M=±20%**

- Operating temperature range - 40℃ ~ 125℃(Including self - temperature rise)
- Isat for Inductance drop 30% from its value without current
- Irms for a 40℃ temperature rise from 25℃ ambient with current
- Rated current：Isat or Irms, whichever is smaller
- Absolute maximum voltage 20VDC
- Measure Equipment：

  L：Agilent E4991/HP4286A+16197A (or equivalent), 2MHz 0.2V

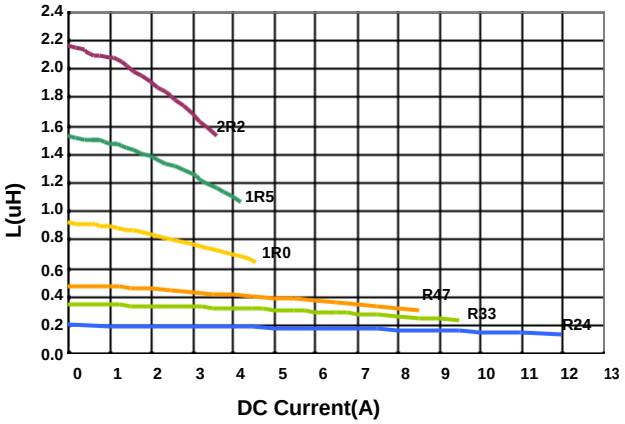
  RDC：CHEN HWA502BC/HP4338B (or equivalent)

  Isat：Agilent E4980A+HP42841A (or equivalent)

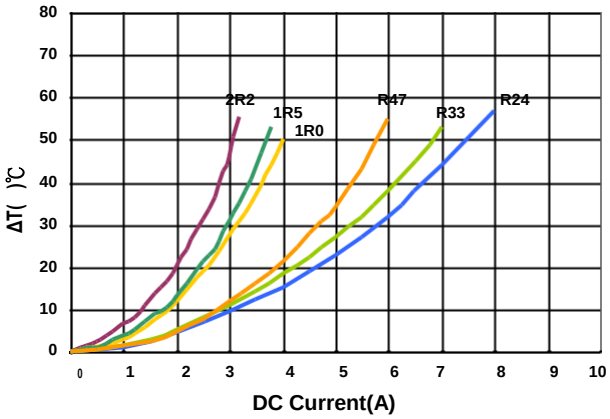
  Irms：Agilent 6641 SYSTEM DC POWER SUPPLY (or equivalent)

**Test Instruments**：E4991A Impedance / Material Analyzer

**Inductance vs. DC Current**




**Temperature Change vs. DC Current**



## Electrical Characteristics

| Part Number | Inductance (uH) | Tolerance (±%) | Test Frequency (MHz) | RDC(mΩ) Max(Typ.) | Isat(A) Max(Typ.) | Irms(A) Max(Typ.) |
|---|---|---|---|---|---|---|
| BDHE00322512R47MQ1 | 0.47 | 20 | 2 | 25(19) | 7.0(8.2) | 4.6(5.2) |
| BDHE003225121R0MQ1 | 1.0 | 20 | 2 | 34(27.5) | 5.7(6.5) | 3.7(4.2) |
| BDHE003225121R5MQ1 | 1.5 | 20 | 2 | 59(51) | 4.0(4.6) | 2.8(3.2) |
| BDHE003225122R2MQ1 | 2.2 | 20 | 2 | 73(64) | 3.5(4.0) | 2.7(3.0) |

**Note: When ordering, please specify tolerance code. Tolerance: M=±20%**

- Operating temperature range - 40℃ ~ 125℃(Including self - temperature rise)
- Isat for Inductance drop 30% from its value without current
- Irms for a 40℃ temperature rise from 25℃ ambient with current
- Rated current：Isat or Irms, whichever is smaller
- Absolute maximum voltage 20VDC
- Measure Equipment：

  L：Agilent E4991/HP4286A+16197A (or equivalent), 2MHz 0.2V

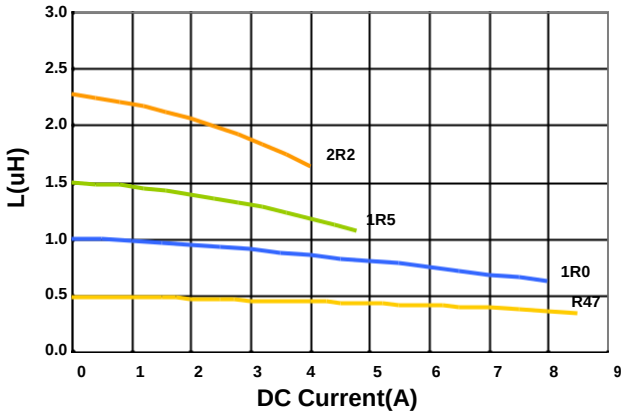
  RDC：CHEN HWA502BC/HP4338B (or equivalent)

  Isat：Agilent E4980A+HP42841A (or equivalent)

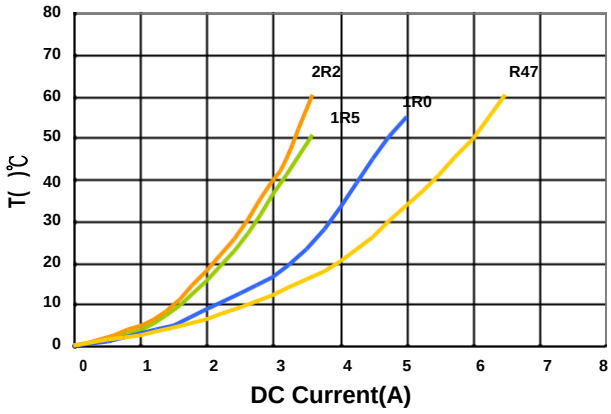
  Irms：Agilent 6641 SYSTEM DC POWER SUPPLY (or equivalent)

**Test Instruments：**E4991A Impedance / Material Analyzer

**Inductance vs. DC Current**




**Temperature Change vs. DC Current**



## Electrical Characteristics

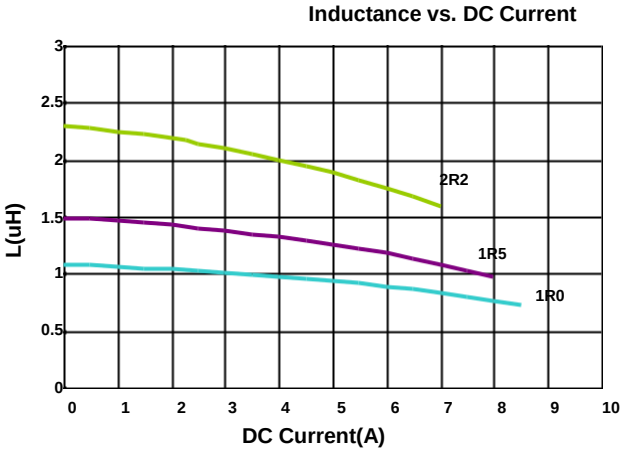
| Part Number | Inductance (uH) | Tolerance (±%) | Test Frequency (MHz) | RDC(mΩ) Max(Typ.) | Isat(A) Max(Typ.) | Irms(A) Max(Typ.) |
|---|---|---|---|---|---|---|
| BDHE003225251R0MQ1 | 1.0 | 20 | 2 | 34(28) | 6.0(8.0) | 3.5(4.3) |
| BDHE003225251R5MQ1 | 1.5 | 20 | 2 | 45(35) | 5.5(7.5) | 3.2(3.9) |
| BDHE003225252R2MQ1 | 2.2 | 20 | 2 | 60(49) | 4.8(6.5) | 3.0(3.3) |

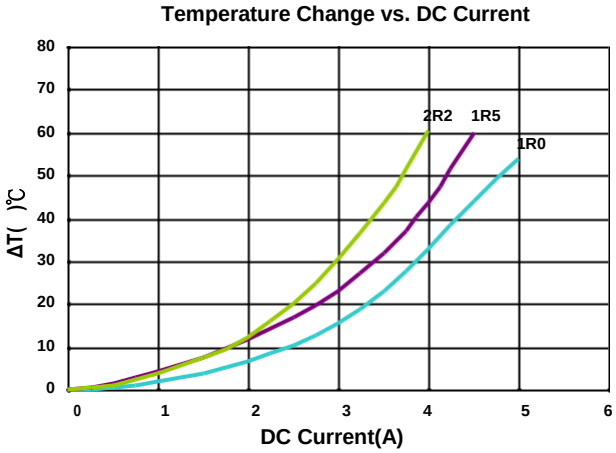
**Note: When ordering, please specify tolerance code. Tolerance: M=±20%**

- Operating temperature range - 40℃ ~ 125℃(Including self - temperature rise)
- Isat for Inductance drop 30% from its value without current
- Irms for a 40℃ temperature rise from 25℃ ambient with current
- Rated current：Isat or Irms, whichever is smaller
- Absolute maximum voltage 20VDC
- Measure Equipment：

  L：Agilent E4991/HP4286A+16197A (or equivalent), 2MHz 0.2V
  RDC：CHEN HWA502BC/HP4338B (or equivalent)
  Isat：Agilent E4980A+HP42841A (or equivalent)
  Irms：Agilent 6641 SYSTEM DC POWER SUPPLY (or equivalent)

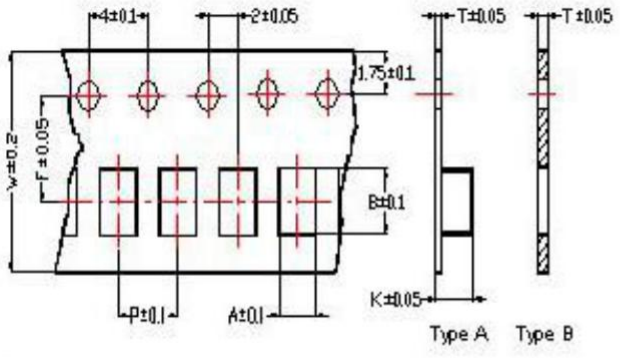
**Test Instruments**：E4991A Impedance / Material Analyzer



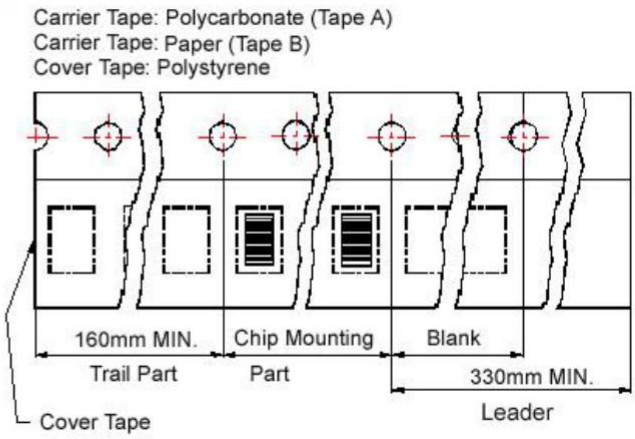



## Packaging Specifications

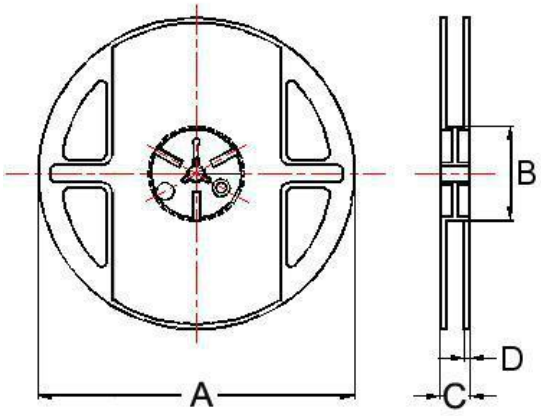
**Tape Dimensions**




**Tape Material**




**Reel Dimensions**




**Dimensions in mm**

| TYPE | Tape | Tape Dimensions | | | | | | | Reel Dimensions | | | | Quantity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | A | B | T | W | P | F | K | A | B | C | D | PCS / REEL |
| BDHE00160808 | B | 1.20 | 1.88 | 0.95 | 8 | 4 | 3.5 | - | 178 | 60 | 12 | 1.5 | 4000 |
| BDHE00201208 | A | 1.45 | 2.25 | 0.22 | 8 | 4 | 3.5 | 1.04 | 178 | 60 | 12 | 1.5 | 3000 |
| BDHE00201210 | A | 1.50 | 2.25 | 0.22 | 8 | 4 | 3.5 | 1.15 | 178 | 60 | 12 | 1.5 | 3000 |
| BDHE00201608 | A | 1.80 | 2.35 | 0.23 | 8 | 4 | 3.5 | 0.85 | 178 | 60 | 12 | 1.5 | 3000 |
| BDHE00201610 | A | 1.80 | 2.20 | 0.22 | 8 | 4 | 3.5 | 1.15 | 178 | 60 | 12 | 1.5 | 3000 |
| BDHE00201612 | A | 1.80 | 2.20 | 0.22 | 8 | 4 | 3.5 | 1.15 | 178 | 60 | 12 | 1.5 | 3000 |
| BDHE00252010 | A | 2.25 | 2.80 | 0.22 | 8 | 4 | 3.5 | 1.15 | 178 | 60 | 12 | 1.5 | 3000 |
| BDHE00252012 | A | 2.25 | 2.80 | 0.22 | 8 | 4 | 3.5 | 1.35 | 178 | 60 | 12 | 1.5 | 3000 |
| BDHE00322510 | A | 2.80 | 3.55 | 0.23 | 8 | 4 | 3.5 | 1.20 | 178 | 60 | 12 | 1.5 | 3000 |
| BDHE00322512 | A | 2.80 | 3.50 | 0.23 | 8 | 4 | 3.5 | 1.34 | 178 | 60 | 12 | 1.5 | 3000 |
| BDHE00322525 | A | 2.90 | 3.50 | 0.23 | 8 | 4 | 3.5 | 2.90 | 178 | 60 | 12 | 1.5 | 1500 |