

### Surface Mount Type

Series: **HB** Type: **V**

HB High temperature Lead-Free reflow (suffix:A\*)



#### ■ Features

- Endurance: 105 °C 2000 h
- Vibration-proof product is available upon request. (φ8 mm and larger)
- RoHS directive compliant

#### ■ Specifications

|                                    |   |  |     |    |    |    |    |    |                             |
|------------------------------------|---|--|-----|----|----|----|----|----|-----------------------------|
| Category Temp. Range               | -40 °C to +105 °C   |  |     |    |    |    |    |    |                             |
| Rated W.V. Range                   | 6.3 V.DC to 50 V.DC   |  |     |    |    |    |    |    |                             |
| Nominal Cap. Range                 | 0.1 μF to 1500 μF   |  |     |    |    |    |    |    |                             |
| Capacitance Tolerance              | ±20 % (120 Hz/ +20 °C)  |  |     |    |    |    |    |    |                             |
| DC Leakage Current                 | I ≤ 0.01 CV or 3 (μA) After 2 minutes (Whichever is greater)  |  |     |    |    |    |    |    |                             |
| tan δ                              | Please see the attached High temperature lead-free reflow products list.  |  |     |    |    |    |    |    |                             |
| Characteristics at Low Temperature | Standard  | W.V.(V)  | 6.3 | 10 | 16 | 25 | 35 | 50 | (Impedance ratio at 120 Hz) |
|                                    |   | Z(-25 °C)/Z(+20 °C)  | 4   | 3  | 2  | 2  | 2  | 2  |                             |
|                                    | Miniaturization product   | Z(-25 °C)/Z(+21 °C)  | 4   | 3  | 2  | 2  | 2  | 2  |                             |
|                                    |   | Z(-40 °C)/Z(+21 °C)  | 10  | 8  | 6  | 6  | 4  | 4  |                             |
| Endurance                          | After applying rated working voltage for 2000 hours at +105 °C±2 °C and then being stabilized at +20 °C, capacitors shall meet the following limits.  |  |     |    |    |    |    |    |                             |
|                                    | Capacitance change  | ±20 % of initial measured value (16 V.DC or less : Within ±25 %, Miniaturization product : Within ±35 %) |     |    |    |    |    |    |                             |
|                                    | tan δ   | ≤ 200 % of initial specified value   |     |    |    |    |    |    |                             |
|                                    | DC leakage current  | ≤ initial specified value  |     |    |    |    |    |    |                             |
| Shelf Life                         | After storage for 1000 hours at +105 °C±2 °C with no voltage applied and then being stabilized at +20 °C, capacitors shall meet the limits specified in Endurance. (With voltage treatment) |  |     |    |    |    |    |    |                             |
|                                    | After reflow soldering and then being stabilized at +20 °C, capacitors shall meet the following limits.   |  |     |    |    |    |    |    |                             |
| Resistance to Soldering Heat       | After reflow soldering and then being stabilized at +20 °C, capacitors shall meet the following limits.   |  |     |    |    |    |    |    |                             |
|                                    | Capacitance change  | ±10 % of initial measured value  |     |    |    |    |    |    |                             |
|                                    | tan δ   | ≤ initial specified value  |     |    |    |    |    |    |                             |
|                                    | DC leakage current  | ≤ initial specified value  |     |    |    |    |    |    |                             |

#### ■ Frequency correction factor for ripple current

|                   |                |      |      |         |
|-------------------|----------------|------|------|---------|
| Correction factor | Frequency (Hz) |      |      |         |
|                   | 50, 60         | 120  | 1 k  | 10 k to |
|                   | 0.70           | 1.00 | 1.30 | 1.70    |

#### ■ Marking

Example : 6.3 V 22 μF (Polarized)  
Marking color : BLACK

|   |       |   |      |
|---|-------|---|------|
| j | 6.3 V | E | 25 V |
| A | 10 V  | V | 35 V |
| C | 16 V  | H | 50 V |

#### ■ Dimensions in mm (not to scale)

(Unit : mm)

| Size code | D    | L        | A, B | H         | I   | W        | P   | K                                      |
|-----------|------|----------|------|-----------|-----|----------|-----|--|
| B         | 4.0  | 5.8±0.3  | 4.3  | 5.5 max.  | 1.8 | 0.65±0.1 | 1.0 | 0.35 <sup>+0.15</sup> <sub>-0.20</sub> |
| C         | 5.0  | 5.8±0.3  | 5.3  | 6.5 max.  | 2.2 | 0.65±0.1 | 1.5 | 0.35 <sup>+0.15</sup> <sub>-0.20</sub> |
| D         | 6.3  | 5.8±0.3  | 6.6  | 7.8 max.  | 2.6 | 0.65±0.1 | 1.8 | 0.35 <sup>+0.15</sup> <sub>-0.20</sub> |
| D8        | 6.3  | 7.7±0.3  | 6.6  | 7.8 max.  | 2.6 | 0.65±0.1 | 1.8 | 0.35 <sup>+0.15</sup> <sub>-0.20</sub> |
| E         | 8.0  | 6.2±0.3  | 8.3  | 9.5 max.  | 3.4 | 0.65±0.1 | 2.2 | 0.35 <sup>+0.15</sup> <sub>-0.20</sub> |
| F         | 8.0  | 10.2±0.3 | 8.3  | 10.0 max. | 3.4 | 0.90±0.2 | 3.1 | 0.70±0.20                              |
| G         | 10.0 | 10.2±0.3 | 10.3 | 12.0 max. | 3.5 | 0.90±0.2 | 4.6 | 0.70±0.20                              |

### High temperate Lead-Free reflow Products

Endurance : 105 °C 2000 h

| W.V.<br>(V) | Cap.<br>(±20 %)<br>(μF) | Case size    |                |               | Specification  |                               | Part No.<br>(RoHS:compliant) | Reflow | Min.<br>Packaging Q'ty |
|-------------|-------------------------|--------------|----------------|---------------|--|-------------------------------|------------------------------|--------|------------------------|
|             |                         | Dia.<br>(mm) | Length<br>(mm) | *Size<br>Code | Ripple<br>Current<br>(120 Hz)<br>(+105°C)<br>(mA r.m.s.) | tan δ<br>(120 Hz)<br>(+20 °C) |                              |        | Taping<br>(pcs)        |
| 6.3         | 22                      | 4            | 5.8            | B             | 26   | 0.30                          | EEEHBOJ220AR                 | (5)    | 2000                   |
|             | 33                      | 4            | 5.8            | B             | 29   | 0.30                          | EEEHBOJ330AR                 | (5)    | 2000                   |
|             | 47                      | 4            | 5.8            | (B)           | 26   | 0.50                          | EEEHBJ470UAR                 | (5)    | 2000                   |
|             |                         | 5            | 5.8            | C             | 46   | 0.30                          | EEEHBOJ470AR                 | (5)    | 1000                   |
|             | 100                     | 5            | 5.8            | (C)           | 42   | 0.50                          | EEEHBJ101UAR                 | (5)    | 1000                   |
|             |                         | 6.3          | 5.8            | D             | 71   | 0.30                          | EEEHBOJ101AP                 | (5)    | 1000                   |
|             | 220                     | 6.3          | 5.8            | (D)           | 80   | 0.50                          | EEEHBJ221UAP                 | (5)    | 1000                   |
|             |                         | 8            | 10.2           | F             | 150  | 0.35                          | EEEHBOJ221AP                 | (7)    | 500                    |
|             | 330                     | 8            | 6.2            | (E)           | 180  | 0.50                          | EEEHBJ331UAP                 | (7)    | 1000                   |
|             |                         | 8            | 10.2           | F             | 230  | 0.35                          | EEEHBOJ331AP                 | (7)    | 500                    |
| 470         | 8                       | 10.2         | (F)            | 230           | 0.50   | EEEHBJ471UAP                  | (7)                          | 500    |                        |
| 1500        | 10                      | 10.2         | (G)            | 290           | 0.50   | EEEHBJ152UAP                  | (7)                          | 500    |                        |
| 10          | 33                      | 4            | 5.8            | (B)           | 23   | 0.30                          | EEEHBA330UAR                 | (5)    | 2000                   |
|             |                         | 5            | 5.8            | C             | 43   | 0.26                          | EEEHB1A330AR                 | (5)    | 1000                   |
|             | 68                      | 6.3          | 5.8            | D             | 70   | 0.22                          | EEEHB1A680AP                 | (5)    | 1000                   |
|             | 100                     | 6.3          | 5.8            | (D)           | 71   | 0.30                          | EEEHBA101UAR                 | (5)    | 1000                   |
|             |                         | 8            | 6.2            | E             | 110  | 0.26                          | EEEHB1A101AP                 | (7)    | 1000                   |
|             | 150                     | 6.3          | 5.8            | (D)           | 64   | 0.50                          | EEEHBA151UAP                 | (5)    | 1000                   |
|             | 220                     | 8            | 6.2            | (E)           | 110  | 0.30                          | EEEHBA221UAP                 | (7)    | 1000                   |
|             |                         | 8            | 10.2           | F             | 160  | 0.26                          | EEEHB1A221AP                 | (7)    | 500                    |
|             | 470                     | 8            | 10.2           | (F)           | 220  | 0.35                          | EEEHBA471UAP                 | (7)    | 500                    |
|             |                         | 10           | 10.2           | G             | 270  | 0.26                          | EEEHB1A471AP                 | (7)    | 500                    |
| 16          | 10                      | 4            | 5.8            | B             | 28   | 0.16                          | EEEHB1C100AR                 | (5)    | 2000                   |
|             | 22                      | 4            | 5.8            | (B)           | 29.5   | 0.26                          | EEEHBC220UAR                 | (5)    | 2000                   |
|             |                         | 5            | 5.8            | C             | 39   | 0.16                          | EEEHB1C220AR                 | (5)    | 1000                   |
|             | 33                      | 6.3          | 5.8            | D             | 65   | 0.16                          | EEEHB1C330AP                 | (5)    | 1000                   |
|             |                         | 5            | 5.8            | (C)           | 39   | 0.26                          | EEEHBC470UAR                 | (5)    | 1000                   |
|             | 47                      | 6.3          | 5.8            | D             | 70   | 0.16                          | EEEHB1C470AP                 | (5)    | 1000                   |
|             |                         | 6.3          | 7.7            | D8            | 84   | 0.16                          | EEEHBC470XAP                 | (5)    | 900                    |
|             | 100                     | 6.3          | 5.8            | (D)           | 70   | 0.26                          | EEEHBC101UAR                 | (5)    | 1000                   |
|             |                         | 8            | 10.2           | F             | 120  | 0.20                          | EEEHB1C101AP                 | (7)    | 500                    |
|             | 220                     | 8            | 10.2           | (F)           | 150  | 0.20                          | EEEHBC221UAP                 | (7)    | 500                    |
| 10          |                         | 10.2         | G              | 210           | 0.20   | EEEHB1C221AP                  | (7)                          | 500    |                        |
| 330         | 10                      | 10.2         | G              | 230           | 0.20   | EEEHB1C331AP                  | (7)                          | 500    |                        |
| 470         | 8                       | 10.2         | (F)            | 240           | 0.40   | EEEHBC471UAP                  | (7)                          | 500    |                        |
|             | 10                      | 10.2         | G              | 340           | 0.20   | EEEHB1C471AP                  | (7)                          | 500    |                        |
| 25          | 4.7                     | 4            | 5.8            | B             | 22   | 0.14                          | EEEHB1E4R7AR                 | (5)    | 2000                   |
|             | 6.8                     | 4            | 5.8            | B             | 25   | 0.14                          | EEEHB1E6R8AR                 | (5)    | 2000                   |
|             | 10                      | 4            | 5.8            | (B)           | 28   | 0.16                          | EEEHBE100UAR                 | (5)    | 2000                   |
|             |                         | 5            | 5.8            | C             | 28   | 0.14                          | EEEHB1E100AR                 | (5)    | 1000                   |
|             | 22                      | 6.3          | 5.8            | D             | 55   | 0.14                          | EEEHB1E220AP                 | (5)    | 1000                   |
|             | 33                      | 5            | 5.8            | (C)           | 50   | 0.20                          | EEEHBE330UAR                 | (5)    | 1000                   |
|             |                         | 6.3          | 5.8            | D             | 65   | 0.14                          | EEEHB1E330AP                 | (5)    | 1000                   |
|             | 47                      | 6.3          | 5.8            | (D)           | 65   | 0.20                          | EEEHBE470UAR                 | (5)    | 1000                   |
|             |                         | 8            | 6.2            | E             | 91   | 0.16                          | EEEHB1E470AP                 | (7)    | 1000                   |
|             | 100                     | 8            | 6.2            | (E)           | 100  | 0.16                          | EEEHBE101UAR                 | (7)    | 1000                   |
| 8           |                         | 10.2         | F              | 130           | 0.16   | EEEHB1E101AP                  | (7)                          | 500    |                        |
| 220         | 8                       | 10.2         | (F)            | 130           | 0.30   | EEEHBE221UAP                  | (7)                          | 500    |                        |
|             | 10                      | 10.2         | G              | 190           | 0.16   | EEEHB1E221AP                  | (7)                          | 500    |                        |
| 330         | 8                       | 10.2         | (F)            | 130           | 0.30   | EEEHBE331UAP                  | (7)                          | 500    |                        |
|             | 10                      | 10.2         | G              | 220           | 0.16   | EEEHB1E331AP                  | (7)                          | 500    |                        |
| 470         | 10                      | 10.2         | (G)            | 230           | 0.30   | EEEHBE471UAP                  | (7)                          | 500    |                        |

\*Size code( ):Miniaturization product

If Part number exceeds 12 digits, voltage code is abbreviated as follows; 0J→J, 1A→A, 1C→C, 1E→E, 1V→V

· Please refer to the page of "Reflow Profile" and "The Taping Dimensions".

· When requesting vibration-proof product, please put the last "V" instead to "P"

Design and specifications are each subject to change without notice. Ask factory for the current technical specifications before purchase and/or use.  
Should a safety concern arise regarding this product, please be sure to contact us immediately.

### ■ High temperate Lead-Free reflow Products

Endurance : 105 °C 2000 h

| W.V. | Cap.<br>(±20 %) | Case size |        |               | Specification  |                               | Part No.<br>(RoHS:compliant) | Reflow | Min.<br>Packaging Q'ty |
|------|-----------------|-----------|--------|---------------|--|-------------------------------|------------------------------|--------|------------------------|
|      |                 | Dia.      | Length | *Size<br>Code | Ripple<br>Current<br>(120 Hz)<br>(+105°C)<br>(mA r.m.s.) | tan δ<br>(120 Hz)<br>(+20 °C) |                              |        | Taping<br><br>(pcs)    |
| (V)  | (μF)            | (mm)      | (mm)   |               |  |                               |                              |        |                        |
| 35   | 4.7             | 4         | 5.8    | B             | 21   | 0.12                          | EEEHB1V4R7AR                 | (5)    | 2000                   |
|      | 6.8             | 4         | 5.8    | (B)           | 25   | 0.12                          | EEEHBV6R8UAR                 | (5)    | 2000                   |
|      | 10              | 5         | 5.8    | C             | 28   | 0.12                          | EEEHB1V100AR                 | (5)    | 1000                   |
|      | 22              | 6.3       | 5.8    | D             | 55   | 0.12                          | EEEHB1V220AP                 | (5)    | 1000                   |
|      | 33              | 8         | 6.2    | E             | 84   | 0.14                          | EEEHB1V330AP                 | (7)    | 1000                   |
|      | 47              | 6.3       | 7.7    | D8            | 98   | 0.20                          | EEEHBV470YAP                 | (5)    | 900                    |
|      |                 | 8         | 6.2    | (E)           | 91   | 0.18                          | EEEHBV470UAP                 | (7)    | 1000                   |
|      |                 | 8         | 10.2   | F             | 98   | 0.14                          | EEEHB1V470AP                 | (7)    | 500                    |
|      | 100             | 8         | 10.2   | (F)           | 98   | 0.20                          | EEEHBV101UAP                 | (7)    | 500                    |
|      |                 | 10        | 10.2   | G             | 160  | 0.14                          | EEEHB1V101AP                 | (7)    | 500                    |
| 220  | 10              | 10.2      | (G)    | 180           | 0.14   | EEEHBV221UAP                  | (7)                          | 500    |                        |
| 50   | 0.1             | 4         | 5.8    | B             | 1  | 0.12                          | EEEHB1HR10AR                 | (5)    | 2000                   |
|      | 0.22            | 4         | 5.8    | B             | 2  | 0.12                          | EEEHB1HR22AR                 | (5)    | 2000                   |
|      | 0.33            | 4         | 5.8    | B             | 3  | 0.12                          | EEEHB1HR33AR                 | (5)    | 2000                   |
|      | 0.47            | 4         | 5.8    | B             | 5  | 0.12                          | EEEHB1HR47AR                 | (5)    | 2000                   |
|      | 0.68            | 4         | 5.8    | B             | 7  | 0.12                          | EEEHB1HR68AR                 | (5)    | 2000                   |
|      | 1               | 4         | 5.8    | B             | 10   | 0.12                          | EEEHB1H1R0AR                 | (5)    | 2000                   |
|      | 2.2             | 4         | 5.8    | B             | 16   | 0.12                          | EEEHB1H2R2AR                 | (5)    | 2000                   |
|      | 3.3             | 4         | 5.8    | B             | 16   | 0.12                          | EEEHB1H3R3AR                 | (5)    | 2000                   |
|      | 4.7             | 5         | 5.8    | C             | 23   | 0.12                          | EEEHB1H4R7AR                 | (5)    | 1000                   |
|      | 6.8             | 5         | 5.8    | C             | 23   | 0.12                          | EEEHB1H6R8AR                 | (5)    | 1000                   |
|      | 10              | 6.3       | 5.8    | D             | 35   | 0.12                          | EEEHB1H100AP                 | (5)    | 1000                   |
|      | 22              | 6.3       | 5.8    | (D)           | 35   | 0.14                          | EEEHBH220UAP                 | (5)    | 1000                   |
|      |                 | 8         | 6.2    | E             | 70   | 0.12                          | EEEHB1H220AP                 | (7)    | 1000                   |
|      | 33              | 8         | 10.2   | F             | 91   | 0.12                          | EEEHB1H330AP                 | (7)    | 500                    |
|      | 47              | 6.3       | 7.7    | D8            | 63   | 0.12                          | EEEHBH470YAP                 | (5)    | 900                    |
| 8    |                 | 10.2      | (F)    | 95            | 0.12   | EEEHBH470UAP                  | (7)                          | 500    |                        |
| 10   |                 | 10.2      | G      | 100           | 0.12   | EEEHB1H470AP                  | (7)                          | 500    |                        |
| 100  | 10              | 10.2      | (G)    | 250           | 0.12   | EEEHBH101UAP                  | (7)                          | 500    |                        |
| 220  | 10              | 10.2      | (G)    | 270           | 0.18   | EEEHBH221UAP                  | (7)                          | 500    |                        |

\*Size code( ):Miniaturization product

If Part number exceeds 12 digits, voltage code is abbreviated as follows; 0J→J, 1A→A, 1C→C, 1E→E, 1V→V

· Please refer to the page of "Reflow Profile" and "The Taping Dimensions".

· When requesting vibration-proof product, please put the last "V" instead to "P"

## Данный компонент на территории Российской Федерации

### Вы можете приобрести в компании MosChip.

Для оперативного оформления запроса Вам необходимо перейти по данной ссылке:

<http://moschip.ru/get-element>

Вы можете разместить у нас заказ для любого Вашего проекта, будь то серийное производство или разработка единичного прибора.

В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

### Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: [info@moschip.ru](mailto:info@moschip.ru)

Skype отдела продаж:

moschip.ru

moschip.ru\_4

moschip.ru\_6

moschip.ru\_9