

Surface Mount Type  
Aluminum Electrolytic Capacitors

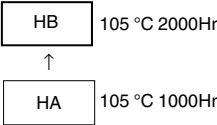
Japan

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

Surface mount type

Long life

High Reliability

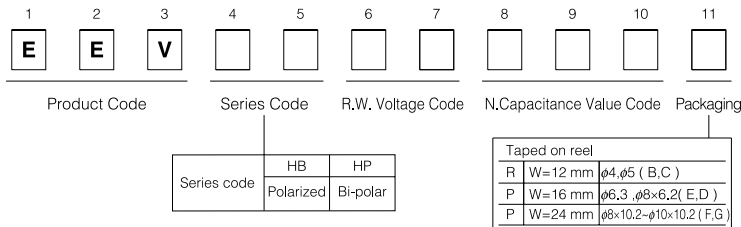


- Features
- Lifetime: 105 °C 2000 h
  - 6.1 mm height ( ≤ ϕ 6.3)
- Recommended Applications
- AV (TV, Video, Audio), Office, Home appliance, CCTV
- Specifications

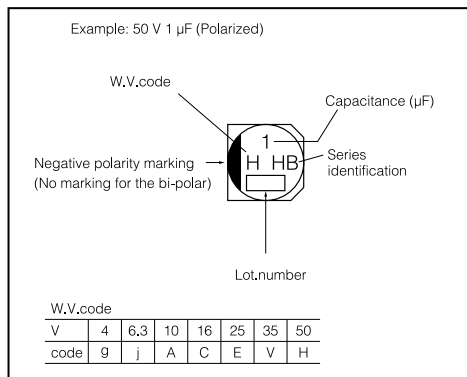
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|                                    |                                                                                                                                                                 |          |                                                                         |      |      |      |      |      |                               |      |
|------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-------------------------------------------------------------------------|------|------|------|------|------|-------------------------------|------|
| Operating Temp. Range              | -40 to +105 °C                                                                                                                                                  |          |                                                                         |      |      |      |      |      |                               |      |
| Rated W.V. Range                   | 4 to 50 V.DC                                                                                                                                                    |          |                                                                         |      |      |      |      |      |                               |      |
| Nominal Cap. Range                 | 0.1 to 470 μF                                                                                                                                                   |          |                                                                         |      |      |      |      |      |                               |      |
| Capacitance Tolerance              | ±20 % (120 Hz/+20 °C)                                                                                                                                           |          |                                                                         |      |      |      |      |      |                               |      |
| DC Leakage Current                 | I ≤ 0.01 CV or 3 (μA) after 2 minutes<br>(Bi-polar I = 0.02 CV or 6 (μA) after 2 minutes)      ( Whichever, greater )                                           |          |                                                                         |      |      |      |      |      |                               |      |
| Dissipation Factor                 | W.V. (V)                                                                                                                                                        |          |                                                                         |      |      |      |      |      | (120 Hz/+20 °C)<br>(max.)     |      |
|                                    | D.F.                                                                                                                                                            | φ4~6.3   | 0.50                                                                    | 0.30 | 0.22 | 0.16 | 0.14 | 0.12 |                               |      |
|                                    |                                                                                                                                                                 | φ8~10    |                                                                         | 0.35 | 0.26 | 0.20 | 0.16 | 0.14 |                               | 0.12 |
|                                    |                                                                                                                                                                 | Bi-polar |                                                                         |      |      |      |      |      |                               |      |
|                                    | W.V. (V)                                                                                                                                                        |          |                                                                         |      |      |      |      |      |                               |      |
|                                    | D.F.                                                                                                                                                            | 0.60     | 0.44                                                                    | 0.32 | 0.28 | 0.24 | 0.24 |      |                               |      |
| Characteristics at Low Temperature | W.V. (V)                                                                                                                                                        |          |                                                                         |      |      |      |      |      | ( Impedance ratio at 120 Hz ) |      |
|                                    | -25/+20 °C                                                                                                                                                      | 7        | 4                                                                       | 3    | 2    | 2    | 2    | 2    |                               |      |
|                                    | -40/+20 °C                                                                                                                                                      | 15       | 8                                                                       | 6    | 4    | 4    | 3    | 3    |                               |      |
|                                    |                                                                                                                                                                 |          |                                                                         |      |      |      |      |      |                               |      |
| Endurance                          | After applying rated working voltage for 2000 hours at +105 °C and then being stabilized at +20 °C, capacitors shall meet the following limits                  |          |                                                                         |      |      |      |      |      |                               |      |
|                                    | Capacitance change                                                                                                                                              |          | ±20 % of initial measured value (4 W.V.: ±35 %, 6.3 W.V.: ±25 % φ4~6.3) |      |      |      |      |      |                               |      |
|                                    | D.F.                                                                                                                                                            |          | ≤ 200 % of initial specified value                                      |      |      |      |      |      |                               |      |
|                                    | DC leakage current                                                                                                                                              |          | ≤ Initial specified value                                               |      |      |      |      |      |                               |      |
| Shelf Life                         | After storage for 1000 hours at +105 °C with no voltage applied and then being stabilized at +20 °C, capacitor shall meet the limits specified in "Endurance".  |          |                                                                         |      |      |      |      |      |                               |      |
|                                    | (With voltage treatment)                                                                                                                                        |          |                                                                         |      |      |      |      |      |                               |      |
| Resistance to Soldering Heat       | After reflow soldering (Refer to page 20 for recommendable temperature profile) and then being stabilized at +20 °C, capacitor shall meet the following limits. |          |                                                                         |      |      |      |      |      |                               |      |
|                                    | Capacitance change                                                                                                                                              |          | ±10 % of initial measured value                                         |      |      |      |      |      |                               |      |
|                                    | D.F.                                                                                                                                                            |          | ≤ Initial specified value                                               |      |      |      |      |      |                               |      |
|                                    | DC leakage current                                                                                                                                              |          | ≤ Initial specified value                                               |      |      |      |      |      |                               |      |

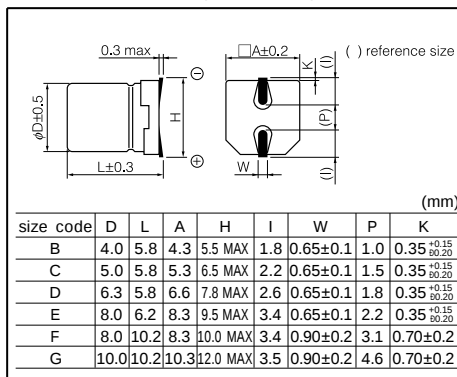
### ■ Explanation of Part Numbers



### ■ Marking



### ■ Dimensions in mm (not to scale)



### ■ Case size/Ripple current

#### ● Polarized

| Cap. (μF)  | W.V. (V) | 4 (0G) | 6.3 (0J) | 10 (1A) | 16 (1C) | 25 (1E) | 35 (1V) | 50 (1H) |
|------------|----------|--------|----------|---------|---------|---------|---------|---------|
| 0.1 (R10)  |          |        |          |         |         |         |         | B 1     |
| 0.22 (R22) |          |        |          |         |         |         |         | B 2     |
| 0.33 (R33) |          |        |          |         |         |         |         | B 3     |
| 0.47 (R47) |          |        |          |         |         |         |         | B 5     |
| 1.0 (1R0)  |          |        |          |         |         |         |         | B 10    |
| 2.2 (2R2)  |          |        |          |         |         |         |         | B 16    |
| 3.3 (3R3)  |          |        |          |         |         |         |         | B 16    |
| 4.7 (4R7)  |          |        |          |         |         | B 22    |         | C 23    |
| 6.8 (6R8)  |          |        |          |         |         | B 25    |         | C 23    |
| 10 (100)   |          |        |          |         | B 28    |         | C 28    | D 35    |
| 22 (220)   |          |        | B 26     |         | C 39    |         | D 55    | F 70    |
| 33 (330)   |          |        | B 29     | C 43    |         | D 65    | E 84    | F 91    |
| 47 (470)   | B 34     | C 46   |          |         | D 70    | E 91    | F 98    | G 100   |
| 100 (101)  | C 61     | D 71   | E 110    |         | F 120   | F 130   | G 160   |         |
| 150 (151)  | D 82     |        |          |         |         |         |         |         |
| 220 (221)  | D 82     | F 150  | F 160    |         | G 210   | G 190   |         |         |
| 330 (331)  |          | F 230  |          |         | G 230   |         |         |         |
| 470 (471)  |          |        | G 270    |         |         |         |         |         |

#### ● Bi-polar

| Cap. (μF)  | W.V. (V) | 6.3 (0J) | 10 (1A) | 16 (1C) | 25 (1E) | 35 (1V) | 50 (1H) |
|------------|----------|----------|---------|---------|---------|---------|---------|
| 0.22 (R22) |          |          |         |         |         |         | B 2     |
| 0.33 (R33) |          |          |         |         |         |         | B 3     |
| 0.47 (R47) |          |          |         |         |         |         | B 5     |
| 1.0 (1R0)  |          |          |         |         |         |         | B 10    |
| 2.2 (2R2)  |          |          |         |         |         | B 10    |         |
| 3.3 (3R3)  |          |          |         |         | B 12    |         | D 16    |
| 4.7 (4R7)  |          |          |         |         | B 12    |         | D 23    |
| 10 (100)   |          | B 20     | C 25    |         | D 28    |         |         |
| 22 (220)   |          |          |         |         | D 55    |         |         |
| 33 (330)   |          |          | D 26    |         |         |         |         |
| 47 (470)   | D 35     |          |         |         |         |         |         |

( ) shows W.V. and capacitance code.

■ Standard Products

| W.V.<br>(V) | Cap. .<br>( $\mu$ F) | Case size    |                |              | Specification                                    |      | Part No.    | Min. Packaging<br>Q'ty |
|-------------|----------------------|--------------|----------------|--------------|--------------------------------------------------|------|-------------|------------------------|
|             |                      | Dia.<br>(mm) | Length<br>(mm) | Size<br>Code | Ripple<br>current<br>(120Hz)<br>(+105°C)<br>(mA) | D.F. |             | Taping<br>(pcs)        |
| 4           | 47                   | 4            | 5.8            | B            | 34                                               | 0.50 | EEVHB0G470R | 2000                   |
|             | 100                  | 5            | 5.8            | C            | 61                                               | 0.50 | EEVHB0G101R | 1000                   |
|             | 150                  | 6            | 5.8            | D            | 82                                               | 0.50 | EEVHB0G151P | 1000                   |
|             | 220                  | 6            | 5.8            | D            | 82                                               | 0.50 | EEVHB0G221P | 1000                   |
| 6.3         | 22                   | 4            | 5.8            | B            | 26                                               | 0.30 | EEVHB0J220R | 2000                   |
|             | 33                   | 4            | 5.8            | B            | 29                                               | 0.30 | EEVHB0J330R | 2000                   |
|             | 47                   | 5            | 5.8            | C            | 46                                               | 0.30 | EEVHB0J470R | 1000                   |
|             | 100                  | 6.3          | 5.8            | D            | 71                                               | 0.30 | EEVHB0J101P | 1000                   |
|             | 220                  | 8            | 10.2           | F            | 150                                              | 0.35 | EEVHB0J221P | 500                    |
|             | 330                  | 8            | 10.2           | F            | 230                                              | 0.35 | EEVHB0J331P | 500                    |
| 10          | 33                   | 5            | 5.8            | C            | 43                                               | 0.22 | EEVHB1A330P | 1000                   |
|             | 100                  | 8            | 6.2            | E            | 110                                              | 0.26 | EEVHB1A101P | 1000                   |
|             | 220                  | 8            | 10.2           | F            | 160                                              | 0.26 | EEVHB1A221P | 500                    |
|             | 470                  | 10           | 10.2           | G            | 270                                              | 0.26 | EEVHB1A471P | 500                    |
| 16          | 10                   | 4            | 5.8            | B            | 28                                               | 0.16 | EEVHB1C100R | 2000                   |
|             | 22                   | 5            | 5.8            | C            | 39                                               | 0.16 | EEVHB1C220R | 1000                   |
|             | 47                   | 6.3          | 5.8            | D            | 70                                               | 0.16 | EEVHB1C470P | 1000                   |
|             | 100                  | 8.0          | 10.2           | F            | 120                                              | 0.20 | EEVHB1C101P | 500                    |
|             | 220                  | 10           | 10.2           | G            | 210                                              | 0.20 | EEVHB1C221P | 500                    |
|             | 330                  | 10           | 10.2           | G            | 230                                              | 0.20 | EEVHB1C331P | 500                    |
| 25          | 4.7                  | 4            | 5.8            | B            | 22                                               | 0.14 | EEVHB1E4R7R | 2000                   |
|             | 6.8                  | 4            | 5.8            | B            | 25                                               | 0.14 | EEVHB1E6R8R | 2000                   |
|             | 33                   | 6.3          | 5.8            | D            | 65                                               | 0.14 | EEVHB1E330P | 1000                   |
|             | 47                   | 8            | 6.2            | E            | 91                                               | 0.16 | EEVHB1E470P | 1000                   |
|             | 100                  | 8            | 10.2           | F            | 130                                              | 0.16 | EEVHB1E101P | 500                    |
|             | 220                  | 10           | 10.2           | G            | 190                                              | 0.16 | EEVHB1E221P | 500                    |
| 35          | 10                   | 5            | 5.8            | C            | 28                                               | 0.12 | EEVHB1V100R | 1000                   |
|             | 22                   | 6.3          | 5.8            | D            | 55                                               | 0.12 | EEVHB1V220P | 1000                   |
|             | 33                   | 8            | 6.2            | E            | 84                                               | 0.14 | EEVHB1V330P | 1000                   |
|             | 47                   | 8            | 10.2           | F            | 98                                               | 0.14 | EEVHB1V470P | 500                    |
|             | 100                  | 10           | 10.2           | G            | 160                                              | 0.14 | EEVHB1V101P | 500                    |
| 50          | 0.1                  | 4            | 5.8            | B            | 1                                                | 0.12 | EEVHB1HR10R | 2000                   |
|             | 0.22                 | 4            | 5.8            | B            | 2                                                | 0.12 | EEVHB1HR22R | 2000                   |
|             | 0.33                 | 4            | 5.8            | B            | 3                                                | 0.12 | EEVHB1HR33R | 2000                   |
|             | 0.47                 | 4            | 5.8            | B            | 5                                                | 0.12 | EEVHB1HR47R | 2000                   |
|             | 1                    | 4            | 5.8            | B            | 10                                               | 0.12 | EEVHB1H1R0R | 2000                   |
|             | 2.2                  | 4            | 5.8            | B            | 16                                               | 0.12 | EEVHB1H2R2R | 2000                   |
|             | 3.3                  | 4            | 5.8            | B            | 16                                               | 0.12 | EEVHB1H3R3R | 2000                   |
|             | 4.7                  | 5            | 5.8            | C            | 23                                               | 0.12 | EEVHB1H4R7R | 1000                   |
|             | 6.8                  | 5            | 5.8            | C            | 23                                               | 0.12 | EEVHB1H6R8R | 1000                   |
|             | 10                   | 6.3          | 5.8            | D            | 35                                               | 0.12 | EEVHB1H100P | 1000                   |
|             | 22                   | 8            | 10.2           | F            | 70                                               | 0.12 | EEVHB1H220P | 500                    |

The taping dimension are explained on p of our Catalog.  
Please use it as a reference guide.  
High temperature Load Life test : 105°C 2000h

■ Standard Products

| W.V.<br>(V) | Cap .<br>(~20%)<br>(μF) | Case size    |                |           | Specification                                 |      | Part No.    | Min.Packaging Q'ty |
|-------------|-------------------------|--------------|----------------|-----------|-----------------------------------------------|------|-------------|--------------------|
|             |                         | Dia.<br>(mm) | Length<br>(mm) | Size Code | Ripple current<br>(120Hz)<br>(+105°C)<br>(mA) | D.F. |             | Taping<br>(pcs)    |
| 50          | 33                      | 8            | 10.2           | F         | 91                                            | 0.12 | EEVHB1H330P | 500                |
|             | 47                      | 10           | 10.2           | G         | 100                                           | 0.12 | EEVHB1H470P | 500                |

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High temperature Load Life test : 105°C 2000h

■ Standard Products(Bi-polar)

| W.V.<br>(V) | Cap .<br>(~20%)<br>(μF) | Case size    |                |           | Specification                                 |      | Part No.    | Min.Packaging Q'ty |
|-------------|-------------------------|--------------|----------------|-----------|-----------------------------------------------|------|-------------|--------------------|
|             |                         | Dia.<br>(mm) | Length<br>(mm) | Size Code | Ripple current<br>(120Hz)<br>(+105°C)<br>(mA) | D.F. |             | Taping<br>(pcs)    |
| 6.3         | 47                      | 6.3          | 5.8            | D         | 35                                            | 0.60 | EEVHP0J470P | 1000               |
| 10          | 10                      | 4            | 5.8            | B         | 20                                            | 0.44 | EEVHP1A100R | 2000               |
|             | 33                      | 6.3          | 5.8            | D         | 26                                            | 0.44 | EEVHP1A330P | 1000               |
| 16          | 10                      | 5            | 5.8            | C         | 25                                            | 0.32 | EEVHP1C100R | 1000               |
| 25          | 3.3                     | 4            | 5.8            | B         | 12                                            | 0.28 | EEVHP1E3R3R | 2000               |
|             | 4.7                     | 4            | 5.8            | B         | 12                                            | 0.28 | EEVHP1E4R7R | 2000               |
|             | 10                      | 6.3          | 5.8            | D         | 28                                            | 0.28 | EEVHP1E100P | 1000               |
|             | 22                      | 6.3          | 5.8            | D         | 55                                            | 0.28 | EEVHP1E220P | 1000               |
| 35          | 2.2                     | 4            | 5.8            | B         | 10                                            | 0.24 | EEVHP1V2R2R | 2000               |
| 50          | 0.22                    | 4            | 5.8            | B         | 2                                             | 0.24 | EEVHP1HR22R | 2000               |
|             | 0.33                    | 4            | 5.8            | B         | 3                                             | 0.24 | EEVHP1HR33R | 2000               |
|             | 0.47                    | 4            | 5.8            | B         | 5                                             | 0.24 | EEVHP1HR47R | 2000               |
|             | 1                       | 4            | 5.8            | B         | 10                                            | 0.24 | EEVHP1H1R0R | 2000               |
|             | 3.3                     | 6.3          | 5.8            | D         | 16                                            | 0.24 | EEVHP1H3R3P | 1000               |
|             | 4.7                     | 6.3          | 5.8            | D         | 23                                            | 0.24 | EEVHP1H4R7P | 1000               |

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High temperature Load Life test : 105°C 2000h