

Aluminum Capacitors Radial Style



FEATURES

- Polarized aluminum electrolytic capacitors, non-solid electrolyte
- Radial leads, cylindrical aluminum case
- High CV-product per unit volume
- Temperature range up to 105 °C
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912


**RoHS
COMPLIANT**

APPLICATIONS

- General purpose, industrial and audio-video
- Coupling, decoupling, timing, smoothing, filtering, buffering in SMPS
- Portable and mobile equipment

| QUICK REFERENCE DATA | | | | |
|--|------|-------------------------|---------------|----------------------|
| DESCRIPTION | UNIT | VALUE | | |
| Nominal case size (Ø D x L) | mm | 5 x 11 to 8 x 11.5 | | 10 x 12.5 to 18 x 40 |
| Rated capacitance range C _R | µF | 2.2 to 22 000 | | |
| Capacitance tolerance | % | ± 20 | | |
| Rated voltage range | V | 6.3 to 100 | 160 to 350 | 400 to 450 |
| Category temperature range | °C | -55 to +105 | -40 to +105 | -25 to +105 |
| Load life | h | 1000 | | 2000 |
| Based on sectional specification | | IEC 60384-4 / EN 130300 | | |
| Climatic category IEC 60068 | | 55 / 105 / 56 | 40 / 105 / 56 | 25 / 105 / 56 |

| SELECTION CHART FOR C _R , U _R , AND RELEVANT NOMINAL CASE SIZES (Ø D x L in mm) | | | | | | | | |
|---|---|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| C _R (µF) | RATED VOLTAGE (V) (> 100 V see next page) | | | | | | | |
| | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | 100 |
| 2.2 | → | → | → | → | → | → | 5 x 11 | 5 x 11 |
| 3.3 | → | → | → | → | → | → | 5 x 11 | 5 x 11 |
| 4.7 | → | → | → | → | → | → | 5 x 11 | 5 x 11 |
| 6.8 | → | → | → | → | → | → | 5 x 11 | 5 x 11 |
| 10 | → | → | → | → | → | → | 5 x 11 | 5 x 11 |
| 15 | → | → | → | → | → | → | 5 x 11 | 6.3 x 11 |
| 22 | → | → | → | → | → | → | 5 x 11 | 6.3 x 11 |
| 33 | → | → | → | → | → | 5 x 11 | 6.3 x 11 | 8 x 11.5 |
| 47 | → | → | → | → | 5 x 11 | → | 6.3 x 11 | 10 x 12.5 |
| 68 | → | → | → | 5 x 11 | 6.3 x 11 | → | 8 x 11.5 | 10 x 16 |
| 100 | → | → | 5 x 11 | → | 6.3 x 11 | → | 8 x 11.5 | 10 x 20 |
| 150 | → | 5 x 11 | → | 6.3 x 11 | 8 x 11.5 | → | 10 x 12.5 | 12.5 x 20 |
| 220 | → | 5 x 11 | 6.3 x 11 | → | 8 x 11.5 | 10 x 12.5 | 10 x 16 | 12.5 x 25 |
| 330 | → | 6.3 x 11 | → | 8 x 11.5 | 10 x 12.5 | 10 x 16 | 10 x 20 | 16 x 25 |
| 470 | → | 6.3 x 11 | 8 x 11.5 | 10 x 12.5 | 10 x 16 | 10 x 20 | 12.5 x 20 | 16 x 25 |
| 680 | 8 x 11.5 | → | 10 x 12.5 | 10 x 16 | 12.5 x 16 | 12.5 x 20 | 12.5 x 25 | 16 x 31.5 |
| 1000 | 8 x 11.5 | 10 x 12.5 | 10 x 16 | 10 x 20 | 12.5 x 20 | 12.5 x 25 | 16 x 25 | 18 x 40 |
| 1500 | → | 10 x 16 | 12.5 x 16 | 12.5 x 20 | 16 x 20 | 16 x 25 | 16 x 35.5 | - |
| 2200 | → | 10 x 20 | 12.5 x 20 | 12.5 x 25 | 16 x 25 | 16 x 31.5 | 16 x 35.5 | - |
| 3300 | 12.5 x 16 | 12.5 x 20 | 12.5 x 25 | 16 x 25 | 16 x 35.5 | 16 x 35.5 | 18 x 40 | - |
| 4700 | 12.5 x 20 | 12.5 x 25 | 16 x 25 | 16 x 31.5 | 16 x 35.5 | - | - | - |
| 6800 | 12.5 x 25 | 16 x 25 | 16 x 31.5 | 18 x 35.5 | - | - | - | - |
| 10 000 | 16 x 25 | 16 x 35.5 | 18 x 35.5 | - | - | - | - | - |
| 15 000 | 16 x 35.5 | 18 x 35.5 | - | - | - | - | - | - |
| 22 000 | 18 x 40 | - | - | - | - | - | - | - |

| SELECTION CHART FOR C_R, U_R AND RELEVANT NOMINAL CASE SIZES ($\varnothing D \times L$ in mm) | | | | | | |
|---|-------------------|-----------|-----------|-----------|-----------|-----------|
| C_R (μF) | RATED VOLTAGE (V) | | | | | |
| | 160 | 200 | 250 | 350 | 400 | 450 |
| 2.2 | → | → | 6.3 x 11 | → | 8 x 11.5 | 10 x 12.5 |
| 3.3 | → | 6.3 x 11 | → | 8 x 11.5 | 10 x 12.5 | 10 x 16 |
| 4.7 | 6.3 x 11 | → | 8 x 11.5 | → | 10 x 12.5 | 10 x 16 |
| 6.8 | 8 x 11.5 | → | 10 x 12.5 | → | 10 x 16 | 10 x 20 |
| 10 | → | → | 10 x 12.5 | 10 x 16 | 10 x 20 | 12.5 x 20 |
| 15 | → | → | 10 x 16 | 10 x 20 | 12.5 x 20 | 12.5 x 25 |
| 22 | → | 10 x 16 | 10 x 20 | 12.5 x 20 | 12.5 x 25 | 16 x 25 |
| 33 | → | 10 x 20 | 12.5 x 20 | 12.5 x 25 | 16 x 25 | 16 x 31.5 |
| 47 | → | 12.5 x 20 | 12.5 x 25 | 16 x 25 | 16 x 31.5 | 16 x 35.5 |
| 68 | 12.5 x 25 | 16 x 20 | 16 x 25 | 16 x 31.5 | 18 x 35.5 | 18 x 40 |
| 100 | 12.5 x 25 | 16 x 25 | 16 x 31.5 | 18 x 35.5 | 18 x 40 | - |
| 150 | 16 x 25 | 16 x 35.5 | 18 x 35.5 | 18 x 40 | - | - |
| 220 | 16 x 31.5 | 18 x 35.5 | 18 x 40 | - | - | - |
| 330 | 18 x 35.5 | 18 x 40 | - | - | - | - |
| 470 | 18 x 40 | - | - | - | - | - |

| RADIAL STYLE: DIMENSIONS in millimeters | | | | | | | | | |
|--|-----|-----|-----|-----|------|-----|-----|------|------|
| | | | | | | | | | |
| $\varnothing D$ | 5 | 6.3 | 8 | 10 | 12.5 | 16 | 18 | 22 | 25 |
| S | 2.0 | 2.5 | 3.5 | 5.0 | 5.0 | 7.5 | 7.5 | 10.0 | 12.5 |
| $\varnothing d$ | 0.5 | 0.5 | 0.6 | 0.6 | 0.6 | 0.8 | 0.8 | 1.0 | 1.0 |
| β | 1.5 | | | 2.0 | | | | | |
| α | 0.5 | | | | | | | 1.0 | |

| DIMENSIONS in millimeters AND AVAILABLE FORMS | |
|---|---|
| <p>$\varnothing D \leq 18$ long leads MALREKB00...</p> | <p>$\varnothing D \leq 18$ shortened leads MALREKB05... (S = 2 mm/2.5 mm/3.5 mm/5 mm/7.5 mm)</p> |

GENERAL NOTE

- For Minimum Package Quantity (MPQ) and Minimum Order Quantity (MOQ) please refer to our price list or contact customer service.
- For other packaging forms please refer to Vishay Roederstein General Information.



| ELECTRICAL DATA | |
|-----------------|---|
| SYMBOL | DESCRIPTION |
| U_R | Rated voltage |
| C_R | Rated capacitance at 120 Hz |
| $\tan \delta$ | Max. dissipation factor at 120 Hz |
| R_{ESR} | Calculated equivalent series resistance at 120 Hz |
| I_R | Rated ripple current (RMS) at 120 Hz and upper category temperature |

Note

- Unless otherwise specified, all electrical values apply at $T_a = 20\text{ }^\circ\text{C}$, $P = 80\text{ kPa}$ to 120 kPa , $RH = 45\%$ to 75%

ORDERING EXAMPLEEKB 3300 μF / 25 V, $\pm 20\%$, size: 16 mm x 25 mm

Leads: long

Ordering code: MALREKB00JG433E00K

Leads: short

Ordering code: MALREKB05...

| ELECTRICAL DATA AND ORDERING INFORMATION | | | | | | | |
|--|--------------------------------------|-----------------------------|-------------------------|-------------------------------------|--|---------------|-----------------------------------|
| U_R (V) | C_R 120 Hz (μF) | DIMENSIONS D x L (mm) | $\tan \delta$ 120 Hz | R_{ESR} 120 Hz (Ω) | I_R 120 Hz / 105 $^\circ\text{C}$ (mA) | WEIGHT (g) | CATALOG NUMBER (Long Leads) |
| 6.3 | 680 | 8 x 11.5 | 0.28 | 0.55 | 348 | 1.10 | MALREKB00PB368B00K |
| | 1000 | 8 x 11.5 | 0.28 | 0.37 | 422 | 1.10 | MALREKB00PB410B00K |
| | 3300 | 12.5 x 16 | 0.34 | 0.14 | 983 | 3.00 | MALREKB00FD433B00K |
| | 4700 | 12.5 x 20 | 0.36 | 0.10 | 1219 | 4.00 | MALREKB00FE447B00K |
| | 6800 | 12.5 x 25 | 0.40 | 0.08 | 1480 | 5.00 | MALREKB00FG468B00K |
| | 10 000 | 16 x 25 | 0.46 | 0.06 | 1807 | 8.50 | MALREKB00JG510B00K |
| | 15 000 | 16 x 35.5 | 0.56 | 0.05 | 2233 | 11.0 | MALREKB00JL515B00K |
| | 22 000 | 18 x 40 | 0.70 | 0.04 | 2652 | 14.6 | MALREKB00KK522B00K |
| 10 | 150 | 5 x 11 | 0.24 | 2.12 | 134 | 0.45 | MALREKB00AA315C00K |
| | 220 | 5 x 11 | 0.24 | 1.45 | 162 | 0.45 | MALREKB00AA322C00K |
| | 330 | 6.3 x 11 | 0.24 | 0.96 | 228 | 0.46 | MALREKB00BA333C00K |
| | 470 | 6.3 x 11 | 0.24 | 0.68 | 272 | 0.46 | MALREKB00BA347C00K |
| | 1000 | 10 x 12.5 | 0.24 | 0.32 | 544 | 2.05 | MALREKB00DC410C00K |
| | 1500 | 10 x 16 | 0.26 | 0.23 | 680 | 2.20 | MALREKB00DD415C00K |
| | 2200 | 10 x 20 | 0.28 | 0.17 | 844 | 3.10 | MALREKB00DE422C00K |
| | 3300 | 12.5 x 20 | 0.30 | 0.12 | 1148 | 4.00 | MALREKB00FE433C00K |
| | 4700 | 12.5 x 25 | 0.32 | 0.09 | 1421 | 5.00 | MALREKB00FG447C00K |
| | 6800 | 16 x 25 | 0.36 | 0.07 | 1737 | 8.50 | MALREKB00JG468C00K |
| | 10 000 | 16 x 35.5 | 0.42 | 0.06 | 2172 | 11.0 | MALREKB00JL510C00K |
| | 15 000 | 18 x 35.5 | 0.52 | 0.05 | 2482 | 14.0 | MALREKB00KL515C00K |
| 16 | 100 | 5 x 11 | 0.20 | 2.65 | 119 | 0.45 | MALREKB00AA310D00K |
| | 220 | 6.3 x 11 | 0.20 | 1.21 | 203 | 0.46 | MALREKB00BA322D00K |
| | 470 | 8 x 11.5 | 0.20 | 0.56 | 349 | 1.10 | MALREKB00PB347D00K |
| | 680 | 10 x 12.5 | 0.20 | 0.39 | 488 | 2.05 | MALREKB00DC368D00K |
| | 1000 | 10 x 16 | 0.20 | 0.27 | 648 | 2.20 | MALREKB00DD410D00K |
| | 1500 | 12.5 x 16 | 0.22 | 0.19 | 862 | 3.00 | MALREKB00FD415D00K |
| | 2200 | 12.5 x 20 | 0.24 | 0.14 | 1055 | 4.00 | MALREKB00FE422D00K |
| | 3300 | 12.5 x 25 | 0.26 | 0.10 | 1323 | 5.00 | MALREKB00FG433D00K |
| | 4700 | 16 x 25 | 0.28 | 0.08 | 1657 | 8.50 | MALREKB00JG447D00K |
| | 6800 | 16 x 31.5 | 0.32 | 0.06 | 1982 | 10.0 | MALREKB00JS468D00K |
| | 10 000 | 18 x 35.5 | 0.38 | 0.05 | 2409 | 14.0 | MALREKB00KL510D00K |



| ELECTRICAL DATA AND ORDERING INFORMATION | | | | | | | |
|--|----------------------------------|-----------------------------|-----------------|-----------------------------------|---|--------------------|-----------------------------------|
| U _R (V) | C _R 120 Hz (μF) | DIMENSIONS D x L (mm) | tan δ 120 Hz | R _{ESR} 120 Hz (Ω) | I _R 120 Hz / 105 °C (mA) | WEIGHT (g) | CATALOG NUMBER (Long Leads) |
| 25 | 68 | 5 x 11 | 0.16 | 3.12 | 108 | 0.45 | MALREKB00AA268E00K |
| | 150 | 6.3 x 11 | 0.16 | 1.41 | 185 | 0.46 | MALREKB00BA315E00K |
| | 330 | 8 x 11.5 | 0.16 | 0.64 | 324 | 1.10 | MALREKB00PB333E00K |
| | 470 | 10 x 12.5 | 0.16 | 0.45 | 449 | 2.05 | MALREKB00DC347E00K |
| | 680 | 10 x 16 | 0.16 | 0.31 | 591 | 2.20 | MALREKB00DD368E00K |
| | 1000 | 10 x 20 | 0.16 | 0.21 | 782 | 3.10 | MALREKB00DE410E00K |
| | 1500 | 12.5 x 20 | 0.18 | 0.16 | 1017 | 4.00 | MALREKB00FE415E00K |
| | 2200 | 12.5 x 25 | 0.20 | 0.12 | 1235 | 5.00 | MALREKB00FG422E00K |
| | 3300 | 16 x 25 | 0.22 | 0.09 | 1562 | 8.50 | MALREKB00JG433E00K |
| | 4700 | 16 x 31.5 | 0.24 | 0.07 | 1916 | 10.0 | MALREKB00JS447E00K |
| | 6800 | 18 x 35.5 | 0.28 | 0.05 | 2335 | 14.0 | MALREKB00KL468E00K |
| 35 | 47 | 5 x 11 | 0.14 | 3.95 | 96 | 0.45 | MALREKB00AA247F00K |
| | 68 | 6.3 x 11 | 0.14 | 2.73 | 132 | 0.46 | MALREKB00BA268F00K |
| | 100 | 6.3 x 11 | 0.14 | 1.86 | 160 | 0.46 | MALREKB00BA310F00K |
| | 150 | 8 x 11.5 | 0.14 | 1.24 | 231 | 1.10 | MALREKB00PB315F00K |
| | 220 | 8 x 11.5 | 0.14 | 0.84 | 280 | 1.10 | MALREKB00PB322F00K |
| | 330 | 10 x 12.5 | 0.14 | 0.56 | 399 | 2.05 | MALREKB00DC333F00K |
| | 470 | 10 x 16 | 0.14 | 0.40 | 521 | 2.20 | MALREKB00DD347F00K |
| | 680 | 12.5 x 16 | 0.14 | 0.27 | 740 | 3.00 | MALREKB00FD368F00K |
| | 1000 | 12.5 x 20 | 0.14 | 0.19 | 974 | 4.00 | MALREKB00FE410F00K |
| | 1500 | 16 x 20 | 0.16 | 0.14 | 1188 | 6.00 | MALREKB00JE415F00K |
| | 2200 | 16 x 25 | 0.18 | 0.11 | 1426 | 8.50 | MALREKB00JG422F00K |
| | 3300 | 16 x 35.5 | 0.20 | 0.08 | 1857 | 11.0 | MALREKB00JL433F00K |
| | 4700 | 16 x 35.5 | 0.22 | 0.06 | 2224 | 14.0 | MALREKB00JL447F00K |
| 50 | 33 | 5 x 11 | 0.12 | 4.82 | 92 | 0.45 | MALREKB00AA233H00K |
| | 220 | 10 x 12.5 | 0.12 | 0.72 | 376 | 2.05 | MALREKB00DC322H00K |
| | 330 | 10 x 16 | 0.12 | 0.48 | 504 | 2.20 | MALREKB00DD333H00K |
| | 470 | 10 x 20 | 0.12 | 0.34 | 657 | 3.10 | MALREKB00DE347H00K |
| | 680 | 12.5 x 20 | 0.12 | 0.23 | 927 | 4.00 | MALREKB00FE368H00K |
| | 1000 | 12.5 x 25 | 0.12 | 0.16 | 1226 | 5.00 | MALREKB00FG410H00K |
| | 1500 | 16 x 25 | 0.14 | 0.12 | 1442 | 8.50 | MALREKB00JG415H00K |
| | 2200 | 16 x 31.5 | 0.16 | 0.10 | 1442 | 10.0 | MALREKB00JS422H00K |
| | 3300 | 16 x 35.5 | 0.18 | 0.07 | 1794 | 11.0 | MALREKB00JL433H00K |
| 63 | 2.2 | 5 x 11 | 0.10 | 60.29 | 26 | 0.45 | MALREKB00AA122J00K |
| | 3.3 | 5 x 11 | 0.10 | 40.19 | 32 | 0.45 | MALREKB00AA133J00K |
| | 4.7 | 5 x 11 | 0.10 | 28.22 | 38 | 0.45 | MALREKB00AA147J00K |
| | 6.8 | 5 x 11 | 0.10 | 19.50 | 46 | 0.45 | MALREKB00AA168J00K |
| | 10 | 5 x 11 | 0.10 | 13.26 | 56 | 0.45 | MALREKB00AA210J00K |
| | 15 | 5 x 11 | 0.10 | 8.84 | 68 | 0.45 | MALREKB00AA215J00K |
| | 22 | 5 x 11 | 0.10 | 6.03 | 83 | 0.45 | MALREKB00AA222J00K |
| | 33 | 6.3 x 11 | 0.10 | 4.02 | 116 | 0.46 | MALREKB00BA233J00K |
| | 47 | 6.3 x 11 | 0.10 | 2.82 | 139 | 0.46 | MALREKB00BA247J00K |
| | 68 | 8 x 11.5 | 0.10 | 1.95 | 197 | 1.10 | MALREKB00PB268J00K |
| | 100 | 8 x 11.5 | 0.10 | 1.33 | 239 | 1.10 | MALREKB00PB310J00K |
| | 150 | 10 x 12.5 | 0.10 | 0.88 | 340 | 2.05 | MALREKB00DC315J00K |
| | 220 | 10 x 16 | 0.10 | 0.60 | 451 | 2.20 | MALREKB00DD322J00K |
| | 330 | 10 x 20 | 0.10 | 0.40 | 603 | 3.10 | MALREKB00DE333J00K |
| | 470 | 12.5 x 20 | 0.10 | 0.28 | 844 | 4.00 | MALREKB00FE347J00K |
| | 680 | 12.5 x 25 | 0.10 | 0.20 | 1107 | 5.00 | MALREKB00FG368J00K |
| | 1000 | 16 x 25 | 0.10 | 0.13 | 1490 | 8.50 | MALREKB00JG410J00K |
| | 1500 | 16 x 35.5 | 0.12 | 0.11 | 1770 | 11.0 | MALREKB00JL415J00K |
| | 2200 | 16 x 35.5 | 0.14 | 0.08 | 1770 | 11.0 | MALREKB00JL422J00K |
| 3300 | 18 x 40 | 0.16 | 0.06 | 2689 | 14.6 | MALREKB00KK433J00K | |



ELECTRICAL DATA AND ORDERING INFORMATION

| U_R (V) | C_R 120 Hz (μ F) | DIMENSIONS D x L (mm) | $\tan \delta$ 120 Hz | R_{ESR} 120 Hz (Ω) | I_R 120 Hz / 105 °C (mA) | WEIGHT (g) | CATALOG NUMBER (Long Leads) |
|--------------|-------------------------------|-----------------------------|-------------------------|-------------------------------------|----------------------------------|--------------------|-----------------------------------|
| 100 | 2.2 | 5 x 11 | 0.08 | 48.23 | 26 | 0.45 | MALREKB00AA122L00K |
| | 3.3 | 5 x 11 | 0.08 | 32.15 | 32 | 0.45 | MALREKB00AA133L00K |
| | 4.7 | 5 x 11 | 0.08 | 22.58 | 38 | 0.45 | MALREKB00AA147L00K |
| | 6.8 | 5 x 11 | 0.08 | 15.60 | 46 | 0.45 | MALREKB00AA168L00K |
| | 10 | 5 x 11 | 0.08 | 10.61 | 56 | 0.45 | MALREKB00AA210L00K |
| | 15 | 6.3 x 11 | 0.08 | 7.07 | 78 | 0.46 | MALREKB00BA215L00K |
| | 22 | 6.3 x 11 | 0.08 | 4.82 | 95 | 0.46 | MALREKB00BA222L00K |
| | 33 | 8 x 11.5 | 0.08 | 3.22 | 137 | 1.10 | MALREKB00PB233L00K |
| | 47 | 10 x 12.5 | 0.08 | 2.26 | 190 | 2.05 | MALREKB00DC247L00K |
| | 68 | 10 x 16 | 0.08 | 1.56 | 251 | 2.20 | MALREKB00DD268L00K |
| | 100 | 10 x 20 | 0.08 | 1.06 | 332 | 3.10 | MALREKB00DE310L00K |
| | 150 | 12.5 x 20 | 0.08 | 0.71 | 477 | 4.00 | MALREKB00FE315L00K |
| | 220 | 12.5 x 25 | 0.08 | 0.48 | 630 | 5.00 | MALREKB00FG322L00K |
| | 330 | 16 x 25 | 0.08 | 0.32 | 856 | 8.50 | MALREKB00JG333L00K |
| | 470 | 16 x 25 | 0.08 | 0.23 | 1021 | 8.50 | MALREKB00JG347L00K |
| 680 | 16 x 31.5 | 0.08 | 0.16 | 1344 | 10.0 | MALREKB00JS368L00K | |
| 1000 | 18 x 40 | 0.08 | 0.11 | 1925 | 14.6 | MALREKB00KK410L00K | |
| 160 | 4.7 | 6.3 x 11 | 0.15 | 42.33 | 34 | 0.46 | MALREKB00BA147M00K |
| | 6.8 | 8 x 11.5 | 0.15 | 29.26 | 49 | 1.10 | MALREKB00PB168M00K |
| | 68 | 12.5 x 25 | 0.15 | 2.93 | 273 | 5.00 | MALREKB00FG268M00K |
| | 100 | 12.5 x 25 | 0.15 | 1.99 | 331 | 5.00 | MALREKB00FG310M00K |
| | 150 | 16 x 25 | 0.15 | 1.33 | 450 | 8.50 | MALREKB00JG315M00K |
| | 220 | 16 x 31.5 | 0.15 | 0.90 | 596 | 10.0 | MALREKB00JS322M00K |
| | 330 | 18 x 35.5 | 0.15 | 0.60 | 822 | 14.0 | MALREKB00KL333M00K |
| 470 | 18 x 40 | 0.15 | 0.42 | 1015 | 14.6 | MALREKB00KK347M00K | |
| 200 | 3.3 | 6.3 x 11 | 0.15 | 60.29 | 29 | 0.46 | MALREKB00BA133S00K |
| | 22 | 10 x 16 | 0.15 | 9.04 | 111 | 2.20 | MALREKB00DD222S00K |
| | 33 | 10 x 20 | 0.15 | 6.03 | 149 | 3.10 | MALREKB00DE233S00K |
| | 47 | 12.5 x 20 | 0.15 | 4.23 | 208 | 4.00 | MALREKB00FE247S00K |
| | 68 | 16 x 20 | 0.15 | 2.93 | 279 | 6.00 | MALREKB00JE268S00K |
| | 100 | 16 x 25 | 0.15 | 1.99 | 368 | 8.50 | MALREKB00JG310S00K |
| | 150 | 16 x 35.5 | 0.15 | 1.33 | 517 | 11.0 | MALREKB00JL315S00K |
| | 220 | 18 x 35.5 | 0.15 | 0.90 | 671 | 14.0 | MALREKB00KL322S00K |
| | 330 | 18 x 40 | 0.15 | 0.60 | 850 | 14.6 | MALREKB00KK333S00K |
| 250 | 2.2 | 6.3 x 11 | 0.15 | 90.43 | 23 | 0.46 | MALREKB00BA122N00K |
| | 4.7 | 8 x 11.5 | 0.15 | 42.33 | 40 | 1.10 | MALREKB00PB147N00K |
| | 6.8 | 10 x 12.5 | 0.15 | 29.26 | 56 | 2.05 | MALREKB00DC168N00K |
| | 10 | 10 x 12.5 | 0.15 | 19.89 | 68 | 2.05 | MALREKB00DC210N00K |
| | 15 | 10 x 16 | 0.15 | 13.26 | 92 | 2.20 | MALREKB00DD215N00K |
| | 22 | 10 x 20 | 0.15 | 9.04 | 121 | 3.10 | MALREKB00DE222N00K |
| | 33 | 12.5 x 20 | 0.15 | 6.03 | 175 | 4.00 | MALREKB00FE233N00K |
| | 47 | 12.5 x 25 | 0.15 | 4.23 | 227 | 5.00 | MALREKB00FG247N00K |
| | 68 | 16 x 25 | 0.15 | 2.93 | 303 | 8.50 | MALREKB00JG268N00K |
| | 100 | 16 x 31.5 | 0.15 | 1.99 | 402 | 10.0 | MALREKB00JS310N00K |
| | 150 | 18 x 35.5 | 0.15 | 1.33 | 554 | 14.0 | MALREKB00KL315N00K |
| | 220 | 18 x 40 | 0.15 | 0.90 | 694 | 14.6 | MALREKB00KK322N00K |



| ELECTRICAL DATA AND ORDERING INFORMATION | | | | | | | |
|--|-------------------------------|-----------------------------|-------------------------|-------------------------------------|----------------------------------|---------------|-----------------------------------|
| U_R (V) | C_R 120 Hz (μ F) | DIMENSIONS D x L (mm) | $\tan \delta$ 120 Hz | R_{ESR} 120 Hz (Ω) | I_R 120 Hz / 105 °C (mA) | WEIGHT (g) | CATALOG NUMBER (Long Leads) |
| 350 | 3.3 | 8 x 11.5 | 0.20 | 80.38 | 34 | 1.10 | MALREKB00PB133O00K |
| | 10 | 10 x 16 | 0.20 | 26.53 | 75 | 2.20 | MALREKB00DD210O00K |
| | 15 | 10 x 20 | 0.20 | 17.68 | 100 | 3.10 | MALREKB00DE215O00K |
| | 22 | 12.5 x 20 | 0.20 | 12.06 | 143 | 4.00 | MALREKB00FE222O00K |
| | 33 | 12.5 x 25 | 0.20 | 8.04 | 190 | 5.00 | MALREKB00FG233O00K |
| | 47 | 16 x 25 | 0.20 | 5.64 | 252 | 8.50 | MALREKB00JG247O00K |
| | 68 | 16 x 31.5 | 0.20 | 3.90 | 332 | 10.0 | MALREKB00JS268O00K |
| | 100 | 18 x 35.5 | 0.20 | 2.65 | 407 | 14.0 | MALREKB00KL310O00K |
| 400 | 150 | 18 x 40 | 0.20 | 1.77 | 523 | 14.6 | MALREKB00KK315O00K |
| | 2.2 | 8 x 11.5 | 0.20 | 120.6 | 28 | 1.10 | MALREKB00PB122X00K |
| | 3.3 | 10 x 12.5 | 0.20 | 80.38 | 39 | 2.05 | MALREKB00DC133X00K |
| | 4.7 | 10 x 12.5 | 0.20 | 56.44 | 47 | 2.05 | MALREKB00DC147X00K |
| | 6.8 | 10 x 16 | 0.20 | 39.01 | 62 | 2.20 | MALREKB00DD168X00K |
| | 10 | 10 x 20 | 0.20 | 26.53 | 82 | 3.10 | MALREKB00DE210X00K |
| | 15 | 12.5 x 20 | 0.20 | 17.68 | 118 | 4.00 | MALREKB00FE215X00K |
| | 22 | 12.5 x 25 | 0.20 | 12.06 | 155 | 5.00 | MALREKB00FG222X00K |
| 450 | 33 | 16 x 25 | 0.20 | 8.04 | 211 | 8.50 | MALREKB00JG233X00K |
| | 47 | 16 x 31.5 | 0.20 | 5.64 | 276 | 10.0 | MALREKB00JS247X00K |
| | 68 | 18 x 35.5 | 0.20 | 3.90 | 373 | 14.0 | MALREKB00KL268X00K |
| | 100 | 18 x 40 | 0.20 | 2.65 | 427 | 14.6 | MALREKB00KK310X00K |
| | 2.2 | 10 x 12.5 | 0.20 | 120.6 | 27 | 2.05 | MALREKB00DC122P00K |
| | 3.3 | 10 x 16 | 0.20 | 80.38 | 36 | 2.20 | MALREKB00DD133P00K |
| | 4.7 | 10 x 16 | 0.20 | 56.44 | 43 | 2.20 | MALREKB00DD147P00K |
| | 6.8 | 10 x 20 | 0.20 | 39.01 | 56 | 3.10 | MALREKB00DE168P00K |
| 450 | 10 | 12.5 x 20 | 0.20 | 26.53 | 80 | 4.00 | MALREKB00FE210P00K |
| | 15 | 12.5 x 25 | 0.20 | 17.68 | 107 | 5.00 | MALREKB00FG215P00K |
| | 22 | 16 x 25 | 0.20 | 12.06 | 144 | 8.50 | MALREKB00JG222P00K |
| | 33 | 16 x 31.5 | 0.20 | 8.04 | 193 | 10.0 | MALREKB00JS233P00K |
| | 47 | 16 x 35.5 | 0.20 | 5.64 | 242 | 11.0 | MALREKB00JL247P00K |
| | 68 | 18 x 40 | 0.20 | 3.90 | 352 | 14.6 | MALREKB00KK268P00K |

| LOW TEMPERATURE BEHAVIOR | | | | | | | | | | |
|------------------------------------|----------------------|----|----|----|----|----------|-----|-----------|-----|-----|
| IMPEDANCE RATIO $Z(T_2)/Z(T_1)$ | RATED VOLTAGE (V) | | | | | | | | | |
| | 6.3 | 10 | 16 | 25 | 35 | 50 ~ 100 | 160 | 200 ~ 350 | 400 | 450 |
| -25 °C / +20 °C | 5 | 4 | 3 | 2 | 2 | 2 | 3 | 4 | 6 | 10 |
| -40 °C / +20 °C | 10 | 8 | 6 | 4 | 3 | 3 | 4 | 8 | - | - |

| ADDITIONAL ELECTRICAL DATA | | |
|---|---|---|
| PARAMETER | CONDITIONS | VALUE |
| Current | | |
| Leakage current (test conditions: U_R , 20 °C) | After 1 min at U_R | $I_{L1} \leq 0.03 \times C_R \times U_R$ or 4 μ A for $U_R \leq 100$ V (whichever is greater) |
| | After 2 min at U_R | $I_{L2} \leq 0.01 \times C_R \times U_R$ or 3 μ A for $U_R \leq 100$ V (whichever is greater) |
| | After 5 min at U_R | $I_{L5} \leq 0.02 \times C_R \times U_R$ + 15 μ A for $U_R > 100$ V (whichever is greater) |
| Resistance | | |
| Equivalent series resistance (ESR) | Calculated from $\tan \delta_{max}$ and C_R | $ESR = \tan \delta / 2 \pi f C_R$ |



| MULTIPLIER OF RIPPLE CURRENT (I_R) AS A FUNCTION OF FREQUENCY | | | |
|---|---------------------------------------|---|-----------------------------|
| FREQUENCY (Hz) | I_R MULTIPLIER FOR $U_R \leq 100$ V | | |
| | $C_R \leq 47 \mu\text{F}$ | $C_R = 68 \mu\text{F}$ to $680 \mu\text{F}$ | $C_R \geq 1000 \mu\text{F}$ |
| 50 | 0.75 | 0.80 | 0.85 |
| 120 | 1.00 | 1.00 | 1.00 |
| 300 | 1.35 | 1.25 | 1.10 |
| 1000 | 1.55 | 1.35 | 1.15 |
| $\geq 10\ 000$ | 2.00 | 1.50 | 1.15 |

| MULTIPLIER OF RIPPLE CURRENT (I_R) AS A FUNCTION OF FREQUENCY | | |
|---|--|----------------------------|
| FREQUENCY (Hz) | I_R MULTIPLIER FOR U_R 160 V to ≤ 450 V | |
| | $C_R = 47 \mu\text{F}$ to $220 \mu\text{F}$ | $C_R \geq 330 \mu\text{F}$ |
| 50 | 0.80 | 0.90 |
| 120 | 1.00 | 1.00 |
| 300 | 1.25 | 1.10 |
| 1000 | 1.40 | 1.13 |
| $\geq 10\ 000$ | 1.60 | 1.15 |

| TEST PROCEDURES AND REQUIREMENTS | | |
|----------------------------------|---|---|
| TEST | PROCEDURE (quick reference) | REQUIREMENTS |
| Load life | $T_{\text{amb}} = 105\ ^\circ\text{C}$ U_R and I_R applied After 1000 h $\varnothing 5$ mm, $\varnothing 6.3$ mm, $\varnothing 8$ mm After 2000 h $\geq \varnothing 10$ mm | $\Delta C/C: \pm 25\ %$ of initial value $I_L \leq \text{spec. limit}$ $\tan \delta \leq 2 \times \text{spec. limit}$ |
| Shelf life | $T_{\text{amb}} = 105\ ^\circ\text{C}$ No voltage applied After 1000 h After test: U_R to be applied for 30 min 24 h to 48 h before measurement | $\Delta C/C: \pm 20\ %$ of initial value $I_L \leq \text{spec. limit}$ $\tan \delta \leq 2 \times \text{spec. limit}$ |

Statements about product lifetime are based on calculations and internal testing. They should only be interpreted as estimations. Also due to external factors, the lifetime in the field application may deviate from the calculated lifetime. In general, nothing stated herein shall be construed as a guarantee of durability.



Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.