# SMQ Series

- Downsized from current standard SMG series
- Endurance : 2,000 hours at 85℃
- Non solvent resistant type
- RoHS2 Compliant

SMQ
↑ Downsized
SMG



## ◆SPECIFICATIONS

| Items | Characteristics |
|---|---|
| Category Temperature Range | -40 to +85℃(6.3 to 400Vdc) -25 to +85℃(450Vdc) |
| Rated Voltage Range | 6.3 to 450Vdc |
| Capacitance Tolerance | ±20% (M) (at 20℃, 120Hz) |
| Leakage Current | 6.3 to 100Vdc: I=0.03CV or 4μA, whichever is greater. 160 to 450Vdc: CV≦1,000 I=0.1CV+40 max.; CV>1,000 I=0.04CV+100 max. Where, I : Max. leakage current (μA), C : Nominal capacitance (μF), V : Rated voltage (V) (at 20℃ after 1 minute) |

**Dissipation Factor (tan δ )**

| Rated voltage (Vdc) | 6.3V | 10V | 16V | 25V | 35V | 50V | 63V | 100V | 160 to 250V | 315 to 400V | 450V |
|---|---|---|---|---|---|---|---|---|---|---|---|
| tan δ (Max.) | 0.28 | 0.24 | 0.20 | 0.16 | 0.14 | 0.12 | 0.09 | 0.08 | 0.20 | 0.24 | 0.24 |

When nominal capacitance exceeds 1,000μF, add 0.02 to the value above for each 1,000μF increase. (at 20℃, 120Hz)

**Low Temperature Characteristics (Max. Impedance Ratio)**

| Rated voltage (Vdc) | | 6.3V | 10V | 16V | 25V | 35V | 50V | 63V | 100V | 160 to 200V | 250V | 350V | 400V | 450V |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Z(-25℃)/Z(+20℃) | ≦φ8 | 5 | 4 | 3 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 4 | 4 | 6 |
| | ≧φ10 | 5 | 4 | 3 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 4 | 4 | 6 |
| Z(-40℃)/Z(+20℃) | ≦φ8 | 12 | 10 | 8 | 5 | 4 | 3 | 3 | 3 | 8 | 10 | 8 | 8 | — |
| | ≧φ10 | 12 | 10 | 8 | 5 | 4 | 3 | 3 | 3 | 4 | 4 | 6 | 6 | — |

(at 120Hz)

**Endurance**

The following specifications shall be satisfied when the capacitors are restored to 20℃ after the rated voltage is applied for 2,000 hours at 85℃.

| | |
|---|---|
| Capacitance change | ≦±20% of the initial value |
| D.F. (tan δ ) | ≦200% of the initial specified value |
| Leakage current | ≦The initial specified value |

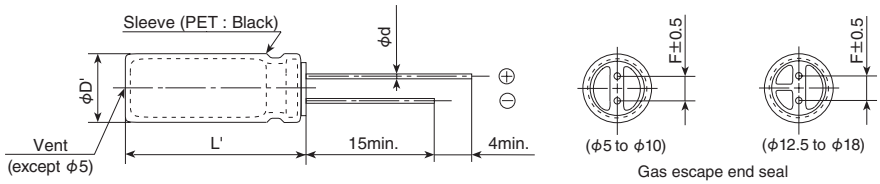
**Shelf Life**

The following specifications shall be satisfied when the capacitors are restored to 20℃ after exposing them for 1,000 hours at 85℃ without voltage applied. Before the measurement, the capacitor shall be preconditioned by applying voltage according to Item 4.1 of JIS C 5101-4.

| Rated voltage | 6.3 to 100Vdc | 160 to 450Vdc |
|---|---|---|
| Capacitance change | ≦±20% of the initial value | ≦±20% of the initial value |
| D.F. (tan δ ) | ≦200% of the initial specified value | ≦200% of the initial specified value |
| Leakage current | ≦The initial specified value | ≦500% of the initial specified value |

## ◆DIMENSIONS [mm]

● Terminal Code : E




| φD | 5 | 6.3 | 8 | 10 | 12.5 | 16 | 18 |
|---|---|---|---|---|---|---|---|
| φd | 0.5 | 0.5 | 0.6 | 0.6 | 0.6 | 0.8 | 0.8 |
| F | 2.0 | 2.5 | 3.5 | 5.0 | 5.0 | 7.5 | 7.5 |
| φD' | φD+0.5max. | | | | | | |
| L' | L+1.5max. | | | | | | |

## ◆PART NUMBERING SYSTEM

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| E | S | M | Q | | | | E | | | | | | M | | | | |

Supplement code
Size code
Capacitance tolerance code
Capacitance code (ex. 1.0μF:1R0,10μF:100,100μF:101)
Lead forming·taping code
Terminal code
Voltage code (ex. 6.3V:6R3,50V:500,100V:101)
Series code
Category

Please refer to "Product code guide (radial lead type)"

Product specifications in this catalog are subject to change without notice.Request our product specifications before purchase and/or use. Please use our products based on the information contained in this catalog and product specifications.

# SMQ Series

## ◆STANDARD RATINGS

| WV ($V_{dc}$) | Cap (μF) | Case size φD×L(mm) | tan δ | Rated ripple current (mArms/ 85℃, 120Hz) | Part No. |
|---|---|---|---|---|---|
| 6.3 | 1,000 | 8×11.5 | 0.28 | 540 | ESMQ6R3E□□102MHB5D |
| | 2,200 | 10×16 | 0.30 | 890 | ESMQ6R3E□□222MJ16S |
| | 3,300 | 10×20 | 0.32 | 1,190 | ESMQ6R3E□□332MJ20S |
| | 4,700 | 12.5×20 | 0.34 | 1,550 | ESMQ6R3E□□472MK20S |
| | 6,800 | 12.5×25 | 0.38 | 1,920 | ESMQ6R3E□□682MK25S |
| | 10,000 | 16×25 | 0.46 | 2,350 | ESMQ6R3E□□103ML25S |
| | 15,000 | 16×31.5 | 0.56 | 2,550 | ESMQ6R3E□□153MLN3S |
| | 22,000 | 18×35.5 | 0.70 | 3,200 | ESMQ6R3E□□223MMP1S |
| 10 | 220 | 5×11 | 0.24 | 240 | ESMQ100E□□221ME11D |
| | 330 | 6.3×11 | 0.24 | 290 | ESMQ100E□□331MF11D |
| | 470 | 6.3×11 | 0.24 | 350 | ESMQ100E□□471MF11D |
| | 1,000 | 10×12.5 | 0.24 | 650 | ESMQ100E□□102MJC5S |
| | 2,200 | 10×16 | 0.26 | 990 | ESMQ100E□□222MJ16S |
| | 3,300 | 12.5×20 | 0.28 | 1,450 | ESMQ100E□□332MK20S |
| | 4,700 | 12.5×25 | 0.30 | 1,800 | ESMQ100E□□472MK25S |
| | 6,800 | 16×25 | 0.34 | 2,250 | ESMQ100E□□682ML25S |
| | 10,000 | 16×31.5 | 0.42 | 2,550 | ESMQ100E□□103MLN3S |
| | 15,000 | 16×35.5 | 0.52 | 2,880 | ESMQ100E□□153MLP1S |
| | 22,000 | 18×40 | 0.66 | 3,400 | ESMQ100E□□223MM40S |
| 16 | 220 | 6.3×11 | 0.20 | 260 | ESMQ160E□□221MF11D |
| | 330 | 6.3×11 | 0.20 | 320 | ESMQ160E□□331MF11D |
| | 470 | 8×11.5 | 0.20 | 440 | ESMQ160E□□471MHB5D |
| | 1,000 | 10×12.5 | 0.20 | 700 | ESMQ160E□□102MJC5S |
| | 2,200 | 10×20 | 0.22 | 1,000 | ESMQ160E□□222MJ20S |
| | 3,300 | 12.5×25 | 0.24 | 1,700 | ESMQ160E□□332MK25S |
| | 4,700 | 16×25 | 0.26 | 2,100 | ESMQ160E□□472ML25S |
| | 6,800 | 16×25 | 0.30 | 2,250 | ESMQ160E□□682ML25S |
| | 10,000 | 16×35.5 | 0.38 | 2,710 | ESMQ160E□□103MLP1S |
| | 15,000 | 18×40 | 0.48 | 3,100 | ESMQ160E□□153MM40S |
| 25 | 100 | 5×11 | 0.16 | 180 | ESMQ250E□□101ME11D |
| | 220 | 6.3×11 | 0.16 | 280 | ESMQ250E□□221MF11D |
| | 330 | 8×11.5 | 0.16 | 440 | ESMQ250E□□331MHB5D |
| | 470 | 10×12.5 | 0.16 | 550 | ESMQ250E□□471MJC5S |
| | 1,000 | 10×16 | 0.16 | 860 | ESMQ250E□□102MJ16S |
| | 2,200 | 12.5×25 | 0.18 | 1,550 | ESMQ250E□□222MK25S |
| | 3,300 | 16×25 | 0.20 | 1,980 | ESMQ250E□□332ML25S |
| | 4,700 | 16×25 | 0.22 | 2,200 | ESMQ250E□□472ML25S |
| | 6,800 | 16×35.5 | 0.26 | 2,600 | ESMQ250E□□682MLP1S |
| | 10,000 | 18×40 | 0.34 | 2,800 | ESMQ250E□□103MM40S |
| 35 | 47 | 5×11 | 0.14 | 130 | ESMQ350E□□470ME11D |
| | 68 | 6.3×11 | 0.14 | 160 | ESMQ350E□□680MF11D |
| | 100 | 6.3×11 | 0.14 | 210 | ESMQ350E□□101MF11D |
| | 220 | 8×11.5 | 0.14 | 385 | ESMQ350E□□221MHB5D |
| | 330 | 10×12.5 | 0.14 | 490 | ESMQ350E□□331MJC5S |
| | 470 | 10×16 | 0.14 | 650 | ESMQ350E□□471MJ16S |
| | 1,000 | 12.5×20 | 0.14 | 1,150 | ESMQ350E□□102MK20S |
| | 2,200 | 16×25 | 0.16 | 1,800 | ESMQ350E□□222ML25S |
| | 3,300 | 16×31.5 | 0.18 | 2,100 | ESMQ350E□□332MLN3S |
| | 4,700 | 16×35.5 | 0.20 | 2,500 | ESMQ350E□□472MLP1S |
| | 6,800 | 18×40 | 0.24 | 2,800 | ESMQ350E□□682MM40S |
| 50 | 1.0 | 5×11 | 0.12 | 17 | ESMQ500E□□1R0ME11D |
| | 2.2 | 5×11 | 0.12 | 28 | ESMQ500E□□2R2ME11D |
| | 3.3 | 5×11 | 0.12 | 35 | ESMQ500E□□3R3ME11D |
| | 4.7 | 5×11 | 0.12 | 41 | ESMQ500E□□4R7ME11D |
| | 10 | 5×11 | 0.12 | 60 | ESMQ500E□□100ME11D |
| | 22 | 5×11 | 0.12 | 95 | ESMQ500E□□220ME11D |
| | 33 | 5×11 | 0.12 | 125 | ESMQ500E□□330ME11D |
| | 47 | 6.3×11 | 0.12 | 155 | ESMQ500E□□470MF11D |
| | 68 | 6.3×11 | 0.12 | 210 | ESMQ500E□□680MF11D |
| | 100 | 8×11.5 | 0.12 | 260 | ESMQ500E□□101MHB5D |
| | 220 | 10×12.5 | 0.12 | 430 | ESMQ500E□□221MJC5S |
| | 330 | 10×16 | 0.12 | 590 | ESMQ500E□□331MJ16S |
| | 470 | 10×20 | 0.12 | 760 | ESMQ500E□□471MJ20S |
| | 1,000 | 12.5×25 | 0.12 | 1,350 | ESMQ500E□□102MK25S |
| | 2,200 | 16×31.5 | 0.14 | 1,980 | ESMQ500E□□222MLN3S |
| | 3,300 | 18×35.5 | 0.16 | 2,500 | ESMQ500E□□332MMP1S |
| 63 | 22 | 5×11 | 0.09 | 100 | ESMQ630E□□220ME11D |
| 63 | 33 | 6.3×11 | 0.09 | 140 | ESMQ630E□□330MF11D |
| | 47 | 6.3×11 | 0.09 | 170 | ESMQ630E□□470MF11D |
| | 68 | 8×11.5 | 0.09 | 220 | ESMQ630E□□680MHB5D |
| | 100 | 8×11.5 | 0.09 | 280 | ESMQ630E□□101MHB5D |
| | 220 | 10×16 | 0.09 | 490 | ESMQ630E□□221MJ16S |
| | 330 | 10×20 | 0.09 | 710 | ESMQ630E□□331MJ20S |
| | 470 | 12.5×20 | 0.09 | 900 | ESMQ630E□□471MK20S |
| | 1,000 | 16×25 | 0.09 | 1,300 | ESMQ630E□□102ML25S |
| | 2,200 | 18×35.5 | 0.11 | 2,300 | ESMQ630E□□222MMP1S |
| 100 | 1.0 | 5×11 | 0.08 | 21 | ESMQ101E□□1R0ME11D |
| | 2.2 | 5×11 | 0.08 | 30 | ESMQ101E□□2R2ME11D |
| | 3.3 | 5×11 | 0.08 | 40 | ESMQ101E□□3R3ME11D |
| | 4.7 | 5×11 | 0.08 | 45 | ESMQ101E□□4R7ME11D |
| | 10 | 5×11 | 0.08 | 70 | ESMQ101E□□100ME11D |
| | 22 | 6.3×11 | 0.08 | 130 | ESMQ101E□□220MF11D |
| | 33 | 8×11.5 | 0.08 | 180 | ESMQ101E□□330MHB5D |
| | 47 | 8×11.5 | 0.08 | 200 | ESMQ101E□□470MHB5D |
| | 68 | 10×12.5 | 0.08 | 270 | ESMQ101E□□680MJC5S |
| | 100 | 10×16 | 0.08 | 340 | ESMQ101E□□101MJ16S |
| | 220 | 12.5×20 | 0.08 | 550 | ESMQ101E□□221MK20S |
| | 330 | 12.5×25 | 0.08 | 760 | ESMQ101E□□331MK25S |
| | 470 | 16×25 | 0.08 | 1,000 | ESMQ101E□□471ML25S |
| | 1,000 | 18×35.5 | 0.08 | 1,350 | ESMQ101E□□102MMP1S |
| 160 | 10 | 8×11.5 | 0.20 | 80 | ESMQ161E□□100MHB5D |
| | 22 | 10×12.5 | 0.20 | 130 | ESMQ161E□□220MJC5S |
| | 33 | 10×16 | 0.20 | 180 | ESMQ161E□□330MJ16S |
| | 47 | 10×20 | 0.20 | 210 | ESMQ161E□□470MJ20S |
| | 68 | 12.5×20 | 0.20 | 350 | ESMQ161E□□680MK20S |
| | 100 | 12.5×25 | 0.20 | 430 | ESMQ161E□□101MK25S |
| | 220 | 16×31.5 | 0.20 | 760 | ESMQ161E□□221MLN3S |
| | 330 | 18×35.5 | 0.20 | 995 | ESMQ161E□□331MMP1S |
| | 470 | 18×40 | 0.20 | 1,200 | ESMQ161E□□471MM40S |
| 200 | 1.0 | 6.3×11 | 0.20 | 22 | ESMQ201E□□1R0MF11D |
| | 2.2 | 6.3×11 | 0.20 | 33 | ESMQ201E□□2R2MF11D |
| | 3.3 | 6.3×11 | 0.20 | 40 | ESMQ201E□□3R3MF11D |
| | 4.7 | 6.3×11 | 0.20 | 50 | ESMQ201E□□4R7MF11D |
| | 10 | 8×11.5 | 0.20 | 80 | ESMQ201E□□100MHB5D |
| | 22 | 10×16 | 0.20 | 150 | ESMQ201E□□220MJ16S |
| | 33 | 10×20 | 0.20 | 205 | ESMQ201E□□330MJ20S |
| | 47 | 12.5×20 | 0.20 | 270 | ESMQ201E□□470MK20S |
| | 68 | 12.5×25 | 0.20 | 350 | ESMQ201E□□680MK25S |
| | 100 | 16×25 | 0.20 | 475 | ESMQ201E□□101ML25S |
| | 220 | 16×35.5 | 0.20 | 700 | ESMQ201E□□221MLP1S |
| | 330 | 18×40 | 0.20 | 950 | ESMQ201E□□331MM40S |
| 250 | 3.3 | 6.3×11 | 0.20 | 40 | ESMQ251E□□3R3MF11D |
| | 4.7 | 6.3×11 | 0.20 | 50 | ESMQ251E□□4R7MF11D |
| | 10 | 10×12.5 | 0.20 | 100 | ESMQ251E□□100MJC5S |
| | 22 | 10×20 | 0.20 | 170 | ESMQ251E□□220MJ20S |
| | 33 | 10×20 | 0.20 | 200 | ESMQ251E□□330MJ20S |
| | 47 | 12.5×20 | 0.20 | 270 | ESMQ251E□□470MK20S |
| | 68 | 16×25 | 0.20 | 380 | ESMQ251E□□680ML25S |
| | 100 | 16×25 | 0.20 | 440 | ESMQ251E□□101ML25S |
| | 220 | 18×35.5 | 0.20 | 680 | ESMQ251E□□221MMP1S |
| 350 | 2.2 | 6.3×11 | 0.24 | 30 | ESMQ351E□□2R2MF11D |
| | 3.3 | 8×11.5 | 0.24 | 46 | ESMQ351E□□3R3MHB5D |
| | 4.7 | 8×11.5 | 0.24 | 55 | ESMQ351E□□4R7MHB5D |
| | 10 | 10×12.5 | 0.24 | 90 | ESMQ351E□□100MJC5S |
| | 22 | 12.5×20 | 0.24 | 185 | ESMQ351E□□220MK20S |
| | 33 | 12.5×25 | 0.24 | 240 | ESMQ351E□□330MK25S |
| | 47 | 16×25 | 0.24 | 325 | ESMQ351E□□470ML25S |
| | 68 | 16×25 | 0.24 | 400 | ESMQ351E□□680ML25S |
| | 100 | 18×31.5 | 0.24 | 530 | ESMQ351E□□101MMN3S |
| 400 | 1.0 | 6.3×11 | 0.24 | 22 | ESMQ401E□□1R0MF11D |
| | 2.2 | 8×11.5 | 0.24 | 38 | ESMQ401E□□2R2MHB5D |
| | 3.3 | 8×11.5 | 0.24 | 48 | ESMQ401E□□3R3MHB5D |
| | 4.7 | 10×12.5 | 0.24 | 60 | ESMQ401E□□4R7MJC5S |
| | 10 | 10×16 | 0.24 | 90 | ESMQ401E□□100MJ16S |

□□ : Enter the appropriate lead forming or taping code.

Product specifications in this catalog are subject to change without notice.Request our product specifications before purchase and/or use. Please use our products based on the information contained in this catalog and product specifications.

# SMQ Series

## ◆STANDARD RATINGS

| WV ($V_{dc}$) | Cap (μF) | Case size φD×L(mm) | tan δ | Rated ripple current (mArms/ 85℃, 120Hz) | Part No. |
|---|---|---|---|---|---|
| 400 | 22 | 12.5×25 | 0.24 | 205 | ESMQ401E□□220MK25S |
| | 33 | 16×25 | 0.24 | 275 | ESMQ401E□□330ML25S |
| | 47 | 16×25 | 0.24 | 280 | ESMQ401E□□470ML25S |
| | 68 | 16×31.5 | 0.24 | 340 | ESMQ401E□□680MLN3S |
| | 100 | 18×35.5 | 0.24 | 440 | ESMQ401E□□101MMP1S |
| 450 | 2.2 | 8×11.5 | 0.24 | 28 | ESMQ451E□□2R2MHB5D |
| | 3.3 | 10×12.5 | 0.24 | 40 | ESMQ451E□□3R3MJC5S |
| 450 | 4.7 | 10×12.5 | 0.24 | 46 | ESMQ451E□□4R7MJC5S |
| | 10 | 10×20 | 0.24 | 80 | ESMQ451E□□100MJ20S |
| | 22 | 12.5×25 | 0.24 | 140 | ESMQ451E□□220MK25S |
| | 33 | 16×25 | 0.24 | 180 | ESMQ451E□□330ML25S |
| | 47 | 16×31.5 | 0.24 | 220 | ESMQ451E□□470MLN3S |
| | 68 | 18×35.5 | 0.24 | 260 | ESMQ451E□□680MMP1S |
| | 100 | 18×40 | 0.24 | 280 | ESMQ451E□□101MM40S |

□□ : Enter the appropriate lead forming or taping code.

## ◆RATED RIPPLE CURRENT MULTIPLIERS

◎Frequency Multipliers

| Capacitance(μF) \ Frequency(Hz) | 50 | 120 | 300 | 1k | 10k | 100k |
|---|---|---|---|---|---|---|
| 1.0 to 4.7 | 0.65 | 1.00 | 1.35 | 1.75 | 2.30 | 2.50 |
| 10 to 68 | 0.75 | 1.00 | 1.25 | 1.50 | 1.75 | 1.80 |
| 100 to 1,000 | 0.80 | 1.00 | 1.15 | 1.30 | 1.40 | 1.50 |
| 2,200 to | 0.85 | 1.00 | 1.03 | 1.05 | 1.08 | 1.08 |

The endurance of capacitors is reduced with internal heating produced by ripple current at the rate of halving the lifetime with every 5℃ rise. When long life performance is required in actual use, the rms ripple current has to be reduced.

Product specifications in this catalog are subject to change without notice.Request our product specifications before purchase and/or use. Please use our products based on the information contained in this catalog and product specifications.