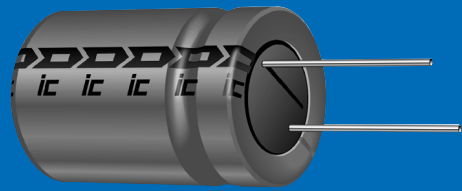


FXM

+105°C Low Profile Radial Lead Aluminum Electrolytic Capacitors



For all general purpose applications

FEATURES

- Low Profile
- Extended Life
- Voltage Range: 6.3 WVDC to 400 WVDC
- Capacitance Range: 0.1 μ F to 10,000 μ F

SPECIFICATIONS

| | | | | | | | | | | | | | |
|--|--|---|----------------|-----|------|---|---|------------------|-----|----------------------|-----|-----|-----|
| Capacitance Tolerance | | $\pm 20\%$ at 120Hz, 25°C | | | | | | | | | | | |
| Operating Temperature Range | | -55°C to + 105°C | | | | | | | | -40°C to + 105°C | | | |
| Dissipation Factor 120Hz, 20 | WVDC | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | 100 | 160 | 200 | 250 | 400 |
| | $\tan \delta$ | .28 | .24 | .20 | .16 | .14 | .12 | .1 | .08 | .2 | .2 | .2 | .25 |
| Note: For above D.F. specifications, add .02 for every 1,000 μ F above 1,000 μ F | | | | | | | | | | | | | |
| Impedance Ratio (Max.) @120Hz | WVDC | 6.3 | 10 | 16 | 25 | 35 | 50 | 63 | 100 | 160 | 200 | 250 | 400 |
| | -25°C/20°C | 5 | 4 | 3 | 2 | 2 | 2 | 2 | 2 | 4 | 4 | 4 | 4 |
| | -40°C/20°C | 10 | 8 | 6 | 4 | 3 | 3 | 3 | 3 | 15 | 15 | 15 | 10 |
| Leakage Current | WVDC | ≤ 100 WVDC | | | | ≤ 100 WVDC | | | | ≥ 160 WVDC | | | |
| | Time | 1 minute | | | | 2 minutes | | | | 1 minute | | | |
| | | .03 CV or 4 μ A whichever is greater | | | | .01 CV or 3 μ A whichever is greater | | | | .04 CV + 100 μ A | | | |
| Load Life | 1000 hours at +105°C with rated WVDC | | | | | | | | | | | | |
| | Capacitance change Dissipation factor Leakage current | | | | | | $\leq 20\%$ of initial measured value $\leq 200\%$ of initial specified value $\leq 100\%$ of specified value | | | | | | |
| Shelf Life | 1,000 hours at +105°C with no voltage applied. Units will meet load life specifications | | | | | | | | | | | | |
| Ripple Current Multipliers | WVDC | Capacitance (μ F) | Frequency (Hz) | | | | | Temperature (°C) | | | | | |
| | | | 50 | 120 | 300 | 1K | 10K | +105 | +85 | +60 | | | |
| | 6.3 to 100 | $C \leq 47$ | .75 | 1.0 | 1.35 | 1.57 | 2.0 | 1.0 | 1.4 | 1.75 | | | |
| | 6.3 to 100 | $47 < C \leq 470$ | .8 | 1.0 | 1.23 | 1.34 | 1.5 | 1.0 | 1.4 | 1.75 | | | |
| | 6.3 to 100 | $C > 470$ | .85 | 1.0 | 1.10 | 1.13 | 1.15 | 1.0 | 1.4 | 1.75 | | | |
| | 160 to 400 | $10 \leq C \leq 150$ | .8 | 1.0 | 1.25 | 1.40 | 1.6 | 1.0 | 1.4 | 1.75 | | | |

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SPECIAL ORDER OPTIONS

(See pages 33 thru 37)

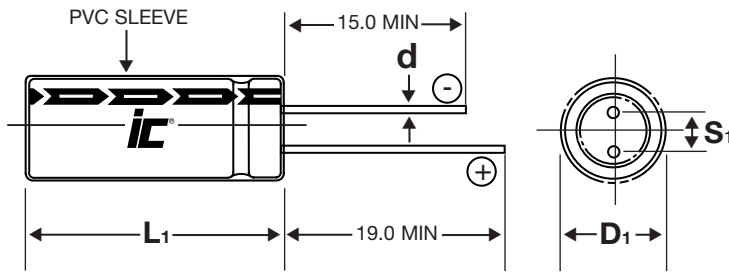
- Special tolerances: $\pm 10\%$ (K), $-10\% + 30\%$ (Q)
- Tape and Reel/Ammo-Pack
- Cut, Formed, Cut and Formed, and Snap In Leads

PHYSICAL DIMENSIONS

| WVDC (SV) (μF) | 6.3 (7.9) | 10 (13) | 16 (20) | 25 (32) | 35 (44) | 50 (63) | 63 (79) | 100 (125) | 160 (200) | 200 (250) | 250 (300) | 400 (450) |
|-------------------|-----------|---------|-----------|---------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| 0.1 | | | | | | 5x9 | | 5x9 | | | | |
| 0.22 | | | | | | 5x9 | | 5x9 | | | | |
| 0.33 | | | | | | 5x9 | | 5x9 | | | | |
| 0.47 | | | | | | 5x9 | | 5x9 | | | | |
| 1 | | | | | | 5x9 | | 5x9 | | | | |
| 2.2 | | | | | | 5x9 | | 5x9 | | | | |
| 3.3 | | | | | | 5x9 | | 5x9 | | | | |
| 4.7 | | | | | | 5x9 | | 5x9 | | | | |
| 10 | | | | | | 5x9 | 5x9 | 6.3x9 | | | | 16x15 |
| 22 | | | | | | 5x9 | 6.3x9 | 8x9 | | | 16x15 | 18x15 |
| 33 | | | | | 5x9 | 6.3x9 | 6.3x9 | 10x9 | | 16x15 | 18x15 | 18x20 |
| 47 | | | | 5x9 | 6.3x9 | 6.3x9 | 8x9 | 10x12.5 | 16x15 | 18x15 | 18x20 | 18x25 |
| 68 | | | | | | | | | 18x15 | 18x20 | 18x20 | |
| 100 | 5x9 | 6.3x9 | 6.3x9 | 8x9 | 10x9 | 10x12.5 | 10x12.5 | 12.5x15 | 18x20 | 18x25 | 18x25 | |
| 150 | | | | | | | | | 18x25 | 18x25 | | |
| 220 | 6.3x9 | 6.3x9 | 8x9 | 10x9 | 10x9 | 10x12.5 | 12.5x12.5 | 16x15 | | | | |
| 330 | 6.3x9 | 8x9 | 10x9 | 10x9 | 10x12.5 | 12.5x12.5 | 12.5x15 | 18x20 | | | | |
| 470 | 8x9 | 8x9 | 10x9 | 10x12.5 | 12.5x12.5 | 16x15 | 18x15 | 18x25 | | | | |
| 1000 | 10x9 | 10x12.5 | 12.5x12.5 | 12.5x15 | 16x15 | 18x20 | 18x25 | | | | | |
| 2200 | 12.5x15 | 12.5x15 | 16x15 | 18x15 | 18x20 | | | | | | | |
| 3300 | 16x15 | 16x15 | 18x15 | 18x20 | | | | | | | | |
| 4700 | 16x15 | 18x15 | 18x20 | 18x25 | | | | | | | | |
| 6800 | 18x15 | 18x20 | 18x25 | | | | | | | | | |
| 10000 | 18x20 | 18x25 | | | | | | | | | | |

Convert to inches, divide by 25.4

DxL(mm)



Note: Case Vent is standard on all diameters ≥ 8.0 mm.

LEAD INFORMATION V.S. CASE DIAMETER

| D | 5.0 | 6.3 | 8.0 | 10.0 | 12.5 | 16.0 | 18.0 |
|---|-----|-----|-----|------|------|------|------|
| S | 2.0 | 2.5 | 3.5 | 5.0 | 5.0 | 7.5 | 7.5 |
| d | 0.5 | 0.5 | 0.6 | 0.6 | 0.6 | 0.8 | 0.8 |
| B | 0.5 | 0.5 | 0.5 | 0.5 | 0.8 | 0.5 | 0.5 |

L₁=L+1.5mm Max. L≤20mm

L₁=L+2mm Max. L>20mm

D₁=D+B Max.

S₁=S±0.5 Max.

STANDARD PART LISTING

| Capacitance (μF) | WVDC | IC [®] PART NUMBER | Maximum ESR Ω 120Hz,+20°C | Maximum RMS Ripple Current (mA) 120Hz,+105°C | Dimensions DxL (mm) |
|------------------|------|-----------------------------|------------------------------|---|---------------------|
| 0.1 | 50 | 104FXM050M | 1989.437 | 1 | 5x9 |
| 0.1 | 100 | 104FXM100M | 1326.291 | 2 | 5x9 |
| 0.22 | 50 | 224FXM050M | 904.289 | 2 | 5x9 |
| 0.22 | 100 | 224FXM100M | 602.860 | 4 | 5x9 |
| 0.33 | 50 | 334FXM050M | 602.860 | 3 | 5x9 |
| 0.33 | 100 | 334FXM100M | 401.906 | 7 | 5x9 |
| 0.47 | 50 | 474FXM050M | 423.284 | 5 | 5x9 |
| 0.47 | 100 | 474FXM100M | 282.190 | 10 | 5x9 |
| 1 | 50 | 105FXM050M | 198.944 | 12 | 5x9 |
| 1 | 100 | 105FXM100M | 132.629 | 15 | 5x9 |
| 2.2 | 50 | 225FXM050M | 90.429 | 18 | 5x9 |
| 2.2 | 100 | 225FXM100M | 60.286 | 21 | 5x9 |
| 3.3 | 50 | 335FXM050M | 60.286 | 25 | 5x9 |
| 3.3 | 100 | 335FXM100M | 40.191 | 29 | 5x9 |
| 4.7 | 50 | 475FXM050M | 42.328 | 30 | 5x9 |
| 4.7 | 100 | 475FXM100M | 28.219 | 32 | 5x9 |
| 10 | 50 | 106FXM050M | 19.894 | 46 | 5x9 |
| 10 | 63 | 106FXM063M | 16.579 | 50 | 5x9 |
| 10 | 100 | 106FXM100M | 13.263 | 55 | 6.3x9 |
| 10 | 400 | 106FXM400M | 41.447 | 100 | 16x15 |
| 22 | 50 | 226FXM050M | 9.043 | 85 | 5x9 |
| 22 | 63 | 226FXM063M | 7.536 | 80 | 6.3x9 |
| 22 | 100 | 226FXM100M | 6.029 | 95 | 8x9 |
| 22 | 250 | 226FXM250M | 15.071 | 200 | 16x15 |
| 22 | 400 | 226FXM400M | 18.839 | 200 | 18x15 |
| 33 | 35 | 336FXM035M | 7.033 | 75 | 5x9 |
| 33 | 50 | 336FXM050M | 6.029 | 85 | 6.3x9 |
| 33 | 63 | 336FXM063M | 5.024 | 95 | 6.3x9 |
| 33 | 100 | 336FXM100M | 4.019 | 120 | 10x9 |
| 33 | 200 | 336FXM200M | 10.048 | 250 | 16x15 |
| 33 | 250 | 336FXM250M | 10.048 | 250 | 18x15 |
| 33 | 400 | 336FXM400M | 12.560 | 250 | 18x20 |
| 47 | 25 | 476FXM025M | 5.644 | 80 | 5x9 |
| 47 | 35 | 476FXM035M | 4.938 | 95 | 6.3x9 |
| 47 | 50 | 476FXM050M | 4.233 | 100 | 6.3x9 |
| 47 | 63 | 476FXM063M | 3.527 | 125 | 8x9 |
| 47 | 100 | 476FXM100M | 2.822 | 165 | 10x12.5 |
| 47 | 160 | 476FXM160M | 7.055 | 300 | 16x15 |

| Capacitance (μF) | WVDC | IC [®] PART NUMBER | Maximum ESR Ω 120Hz,+20°C | Maximum RMS Ripple Current (mA) 120Hz,+105°C | Dimensions DxL (mm) |
|------------------|------|-----------------------------|------------------------------|---|---------------------|
| 47 | 200 | 476FXM200M | 7.055 | 300 | 18x15 |
| 47 | 250 | 476FXM250M | 7.055 | 300 | 18x20 |
| 47 | 400 | 476FXM400M | 8.818 | 300 | 18x25 |
| 68 | 160 | 686FXM160M | 4.876 | 350 | 18x15 |
| 68 | 200 | 686FXM200M | 4.876 | 350 | 18x20 |
| 68 | 250 | 686FXM250M | 4.876 | 350 | 18x20 |
| 100 | 10 | 107FXM010M | 3.979 | 95 | 5x9 |
| 100 | 16 | 107FXM016M | 3.316 | 115 | 6.3x9 |
| 100 | 25 | 107FXM025M | 2.653 | 130 | 6.3x9 |
| 100 | 35 | 107FXM035M | 2.321 | 155 | 8x9 |
| 100 | 50 | 107FXM050M | 1.989 | 170 | 10x9 |
| 100 | 63 | 107FXM063M | 1.658 | 220 | 10x12.5 |
| 100 | 100 | 107FXM100M | 1.326 | 260 | 12.5x15 |
| 100 | 160 | 107FXM160M | 3.316 | 420 | 18x20 |
| 100 | 200 | 107FXM200M | 3.316 | 420 | 18x25 |
| 100 | 250 | 107FXM250M | 3.316 | 420 | 18x25 |
| 150 | 160 | 157FXM160M | 2.210 | 510 | 18x25 |
| 150 | 200 | 157FXM200M | 2.210 | 510 | 18x25 |
| 220 | 6.3 | 227FXM6R3M | 2.110 | 145 | 6.3x9 |
| 220 | 10 | 227FXM010M | 1.809 | 155 | 6.3x9 |
| 220 | 16 | 227FXM016M | 1.507 | 205 | 8x9 |
| 220 | 25 | 227FXM025M | 1.206 | 220 | 10x9 |
| 220 | 35 | 227FXM035M | 1.055 | 235 | 10x9 |
| 220 | 50 | 227FXM050M | 0.904 | 290 | 10x12.5 |
| 220 | 63 | 227FXM063M | 0.754 | 330 | 12.5x12.5 |
| 220 | 100 | 227FXM100M | 0.603 | 440 | 16x15 |
| 330 | 6.3 | 337FXM6R3M | 1.407 | 180 | 6.3x9 |
| 330 | 10 | 337FXM010M | 1.206 | 210 | 8x9 |
| 330 | 16 | 337FXM016M | 1.005 | 240 | 10x9 |
| 330 | 25 | 337FXM025M | 0.804 | 270 | 10x9 |
| 330 | 35 | 337FXM035M | 0.703 | 340 | 10x12.5 |
| 330 | 50 | 337FXM050M | 0.603 | 370 | 12.5x12.5 |
| 330 | 63 | 337FXM063M | 0.502 | 430 | 12.5x15 |
| 330 | 100 | 337FXM100M | 0.402 | 590 | 18x20 |
| 470 | 6.3 | 477FXM6R3M | 0.988 | 235 | 8x9 |
| 470 | 10 | 477FXM010M | 0.847 | 275 | 8x9 |
| 470 | 16 | 477FXM016M | 0.705 | 290 | 10x9 |
| 470 | 25 | 477FXM025M | 0.564 | 370 | 10x12.5 |

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STANDARD PART LISTING

| Capacitance (μF) | WVDC | ic [®] PART NUMBER | Maximum ESR Ω 120Hz, +20°C | Maximum RMS Ripple Current (mA) 120Hz, +105°C | Dimensions DxL (mm) |
|------------------|------|-----------------------------|-------------------------------|--|---------------------|
| 470 | 35 | 477FXM035M | 0.494 | 420 | 12.5x12.5 |
| 470 | 50 | 477FXM050M | 0.423 | 540 | 16x15 |
| 470 | 63 | 477FXM063M | 0.353 | 600 | 18x15 |
| 470 | 100 | 477FXM100M | 0.282 | 770 | 18x25 |
| 1000 | 6.3 | 108FXM6R3M | 0.464 | 370 | 10x9 |
| 1000 | 10 | 108FXM010M | 0.398 | 450 | 10x12.5 |
| 1000 | 16 | 108FXM016M | 0.332 | 520 | 12.5x12.5 |
| 1000 | 25 | 108FXM025M | 0.265 | 590 | 12.5x15 |
| 1000 | 35 | 108FXM035M | 0.232 | 720 | 16x15 |
| 1000 | 50 | 108FXM050M | 0.199 | 830 | 18x20 |
| 1000 | 63 | 108FXM063M | 0.166 | 1000 | 18x25 |
| 2200 | 6.3 | 228FXM6R3M | 0.241 | 635 | 12.5x15 |
| 2200 | 10 | 228FXM010M | 0.211 | 690 | 12.5x15 |
| 2200 | 16 | 228FXM016M | 0.181 | 830 | 16x15 |
| 2200 | 25 | 228FXM025M | 0.151 | 970 | 18x15 |

| Capacitance (μF) | WVDC | ic [®] PART NUMBER | Maximum ESR Ω 120Hz, +20°C | Maximum RMS Ripple Current (mA) 120Hz, +105°C | Dimensions DxL (mm) |
|------------------|------|-----------------------------|-------------------------------|--|---------------------|
| 2200 | 35 | 228FXM035M | 0.136 | 1110 | 18x20 |
| 3300 | 6.3 | 338FXM6R3M | 0.171 | 860 | 16x15 |
| 3300 | 10 | 338FXM010M | 0.151 | 940 | 16x15 |
| 3300 | 16 | 338FXM016M | 0.131 | 1050 | 18x15 |
| 3300 | 25 | 338FXM025M | 0.111 | 1220 | 18x20 |
| 4700 | 6.3 | 478FXM6R3M | 0.127 | 1010 | 16x15 |
| 4700 | 10 | 478FXM010M | 0.113 | 1120 | 18x15 |
| 4700 | 16 | 478FXM016M | 0.099 | 1260 | 18x20 |
| 4700 | 25 | 478FXM025M | 0.085 | 1470 | 18x25 |
| 6800 | 6.3 | 688FXM6R3M | 0.098 | 1200 | 18x15 |
| 6800 | 10 | 688FXM010M | 0.088 | 1330 | 18x20 |
| 6800 | 16 | 688FXM016M | 0.078 | 1560 | 18x25 |
| 10000 | 6.3 | 109FXM6R3M | 0.076 | 1450 | 18x20 |
| 10000 | 10 | 109FXM010M | 0.070 | 1700 | 18x25 |