

F38 Series



Conductive Polymer, Miniature, Undertab Solid Electrolytic Chip Capacitors



FEATURES

- Conductive polymer electrode
- Benign failure mode under recommended use conditions
- Compliant to the RoHS2 directive 2011/65/EU
- SMD facedown
- Small and low profile
- High volumetric efficiency



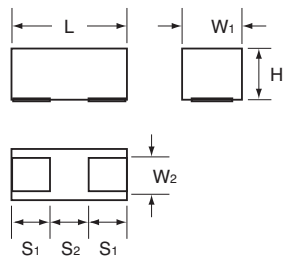
APPLICATIONS

- Smartphone
- Tablet PC
- Wireless module
- Portable game

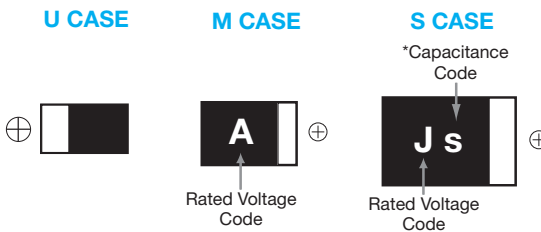
CASE DIMENSIONS: millimeters (inches)

| Code | EIA Code | EIA Metric | L | W ₁ | W ₂ | H | S ₁ | S ₂ |
|----------|----------|------------|--|--|----------------------------|--|----------------------------|----------------------------|
| M | 0603 | 1608-09 | 1.60 ^{+0.20} _{-0.10} (0.063 ^{+0.008} _{-0.004}) | 0.85 ^{+0.20} _{-0.10} (0.033 ^{+0.008} _{-0.004}) | 0.65±0.10 (0.026±0.004) | 0.80±0.10 ^{*3} (0.031±0.004) | 0.50±0.10 (0.020±0.004) | 0.60±0.10 (0.024±0.004) |
| S | 0805 | 2012-09 | 2.00 ^{+0.20} _{-0.10} (0.079 ^{+0.008} _{-0.004}) | 1.25 ^{+0.20} _{-0.10} (0.049 ^{+0.008} _{-0.004}) | 0.90±0.10 (0.035±0.004) | 0.80±0.10 (0.031±0.004) | 0.50±0.10 (0.020±0.004) | 1.00±0.10 (0.039±0.004) |
| U | 0402 | 1106-06 | 1.10±0.05 (0.043±0.002) | 0.60±0.05 (0.024±0.002) | 0.35±0.05 (0.014±0.002) | 0.55±0.05 (0.022±0.002) | 0.30±0.05 (0.012±0.002) | 0.50±0.05 (0.020±0.002) |

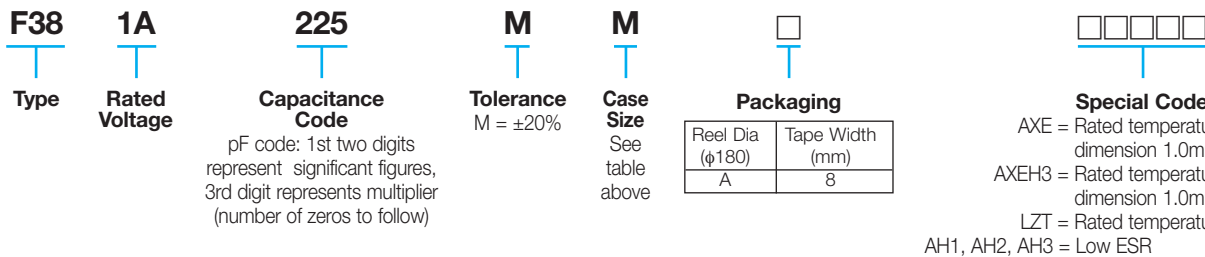
*1 F380J476MMAAXE: 1.0mm Max.



MARKING



HOW TO ORDER



TECHNICAL SPECIFICATIONS

| | |
|-----------------------------|--|
| Category Temperature Range: | -55 to +105°C |
| Rated Temperature: | +85°C (*2) |
| Capacitance Tolerance: | ±20% at 120Hz |
| Dissipation Factor: | Refer to next page (120Hz) |
| ESR 100kHz: | Refer to next page (120Hz) |
| Leakage Current: | Refer to next page At 20°C after application of rated voltage for 5 minutes Provided that: After 5 minute's application of rated voltage, leakage current at 105°C 10 times or less than 20°C specified value. |

*2 F380J476MMAAXE: Rated temperature +60°C Surge, endurance test temperature +60°C



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CAPACITANCE AND RATED VOLTAGE RANGE (LETTER DENOTES CASE SIZE)

| Capacitance | | Rated Voltage | | | *Cap Code |
|-------------|------|---------------|-----------------------|----------|-----------|
| μF | Code | 4V (0G) | 6.3V (0J) | 10V (1A) | |
| 2.2 | 225 | | | M | J |
| 4.7 | 475 | | U | M | S |
| 10 | 106 | | M/M(AH1,AH2) | M/M(AH1) | a |
| 22 | 226 | | M/M(AH3,AH1)/S/S(AH1) | S | j |
| 33 | 336 | | M**/S | S** | n |
| 47 | 476 | | M*/M*(H3)/S/S(AH1) | | s |
| 68 | 686 | | S** | | w |
| 100 | 107 | S** | | | A |

Available Ratings, (Low ESR)

*4 Rated temperature 60°C and H dimension 1.0mm Max only. Please contact AVX when you need detail spec.

**Rated temperature 60°C only. Please contact AVX when you need detail spec.

Please contact to your local AVX sales office when these series are being designed in your application.

RATINGS & PART NUMBER REFERENCE

| AVX Part No. | Case Size | Capacitance (μF) | Rated Voltage (V) | Leakage Current (μA) | DF @ 120Hz (%) | ESR @ 100kHz (mΩ) | 100kHz RMS Current (mA) | *3 ΔC/C (%) |
|-----------------------------|-----------|------------------|-------------------|----------------------|----------------|-------------------|-------------------------|-------------|
| 4 Volt | | | | | | | | |
| F380G107MSALZT | S | 100 | 4 | 80.0 | 10 | 200 | 474 | * |
| 6.3 Volt | | | | | | | | |
| F380J475MUA | U | 4.7 | 6.3 | 20.0 | 10 | 1500 | 100 | * |
| F380J106MMA | M | 10 | 6.3 | 10.0 | 8 | 500 | 224 | * |
| F380J106MMAAH1 | M | 10 | 6.3 | 10.0 | 8 | 300 | 289 | * |
| F380J106MMAAH2 | M | 10 | 6.3 | 10.0 | 8 | 200 | 354 | * |
| F380J226MMA | M | 22 | 6.3 | 13.9 | 10 | 500 | 224 | * |
| F380J226MMAAH3 | M | 22 | 6.3 | 13.9 | 10 | 300 | 289 | * |
| F380J226MMAAH1 | M | 22 | 6.3 | 13.9 | 10 | 200 | 354 | * |
| F380J226MMSA | S | 22 | 6.3 | 13.9 | 10 | 200 | 474 | * |
| F380J226MSAAH1 | S | 22 | 6.3 | 13.9 | 10 | 150 | 548 | * |
| F380J336MSA | M | 33 | 6.3 | 41.6 | 10 | 500 | 224 | * |
| F380J336MSA | S | 33 | 6.3 | 20.8 | 10 | 200 | 474 | * |
| F380J476MMAAXE ⁴ | M | 47 | 6.3 | 59.2 | 10 | 500 | 224 | * |
| F380J476MMAAXEH3 | M | 47 | 6.3 | 59.2 | 10 | 300 | 289 | * |
| F380J476MMSA | S | 47 | 6.3 | 29.6 | 10 | 200 | 474 | * |
| F380J476MSAAH1 | S | 47 | 6.3 | 29.6 | 10 | 150 | 548 | * |
| F380J686MSALZT | S | 68 | 6.3 | 86.0 | 10 | 200 | 474 | * |
| 10 Volt | | | | | | | | |
| F381A225MMA | M | 2.2 | 10 | 10.0 | 6 | 500 | 224 | * |
| F381A475MMA | M | 4.7 | 10 | 10.0 | 6 | 500 | 224 | * |
| F381A106MMA | M | 10 | 10 | 10.0 | 15 | 500 | 224 | * |
| F381A106MMAAH1 | M | 10 | 10 | 10.0 | 15 | 300 | 289 | * |
| F381A226MMSA | S | 22 | 10 | 22.0 | 10 | 200 | 474 | * |
| F381A336MSALZT | S | 33 | 10 | 99.0 | 10 | 200 | 474 | * |

3: ΔC/C Marked “”

| Item | All Case (%) |
|-----------------------------|--------------|
| Damp Heat, steady state | -20 to +30 |
| Rapid change of temperature | ±20 |
| Resistance soldering heat | ±20 |
| Surge | ±20 |
| Endurance | ±20 |

THE CORRELATIONS AMONG RATED VOLTAGE, SURGE VOLTAGE AND DERATED VOLTAGE

| | F38 (Standard) | |
|---------------------------|----------------|----|
| Rated Voltage (V) ≤85°C | 6.3 | 10 |
| 85°C Surge Voltage (V) | 8 | 13 |
| 105°C Derated Voltage (V) | 5 | 8 |

| | F38-LZT, F38-AXE | | |
|---------------------------|------------------|-----|-----|
| Rated Voltage (V) ≤60°C | 4 | 6.3 | 10 |
| 60°C Surge Voltage (V) | 5.2 | 8 | 13 |
| 85°C Derated Voltage (V) | 2.8 | 4.5 | 7.2 |
| 105°C Derated Voltage (V) | 2 | 3.3 | 5 |

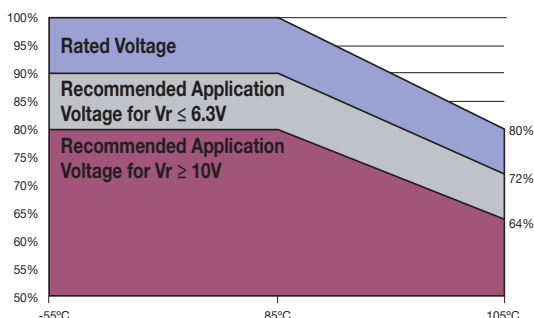
F38 Series



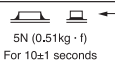
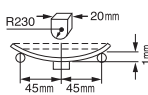
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RECOMMENDED DERATING FACTOR

Voltage and temperature derating as percentage of Vr



QUALIFICATION TABLE

| TEST | F38 series (Temperature range -55°C to +105°C) | |
|-------------------------------------|--|--|
| | Condition | |
| Damp Heat (Steady State) | At 40°C, 90 to 95% R.H., 500 hours (No voltage applied) Capacitance Change Refer to page 128 (*3) Dissipation Factor 200% or less of initial specified value Leakage Current 300% or less of Initial specified value | |
| Temperature Cycles | At -55°C / +105°C, 30 minutes each, 5 cycles Capacitance Change Refer to page 128 (*3) Dissipation Factor 200% or less of initial specified value Leakage Current 400% or less of initial specified value | |
| Resistance to Soldering Heat | 10 seconds reflow at 240°C Capacitance Change Refer to page 128 (*3) Dissipation Factor 200% or less of initial specified value Leakage Current 300% or less of initial specified value | |
| Surge | After application of surge voltage in series with a 1kΩ resistor at the rate of 30 seconds ON, 30 seconds OFF, for 1000 successive test cycles at 85°C (*2), capacitors shall meet the characteristic requirements in the table above. Capacitance Change Refer to page 128 (*3) Dissipation Factor 200% or less of initial specified value Leakage Current 300% or less of initial specified value | |
| Endurance | After 1000 hours' application of rated voltage in series with a 3Ω resistor at 85°C (*2), capacitors shall meet the characteristic requirements in the table above. Capacitance Change Refer to page 128 (*3) Dissipation Factor 200% or less of initial specified value Leakage Current 400% or less of initial specified value | |
| Shear Test | After applying the pressure load of 5N for 10±1 seconds horizontally to the center of capacitor side body which has no electrode and has been soldered beforehand on a substrate, there shall be found neither exfoliation nor its sign at the terminal electrode. |  5N (0.51kg · f) For 10±1 seconds |
| Terminal Strength | Keeping a capacitor surface-mounted on a substrate upside down and supporting the substrate at both of the opposite bottom points 45mm apart from the center of capacitor, the pressure strength is applied with a specified jig at the center of substrate so that the substrate may bend by 1mm as illustrated. Then, there shall be found no remarkable abnormality on the capacitor terminals. |  |

*2 F380J476MMAAXE: Rated temperature +60°C Surge, endurance test temperature +60°C

NOTICE: DESIGN, SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.