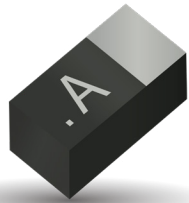


F38 Series

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

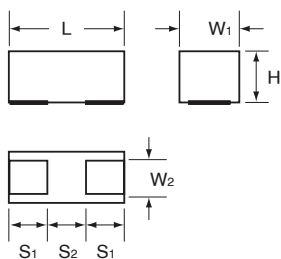
- Smartphone
- Tablet PC
- Wireless module
- Portable game
- Bulk decoupling of SoC (System on chip)

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 ⁻¹ (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

U CASE

M CASE

S CASE



Rated Voltage Code

Rated Voltage Code

*Capacitance Code

HOW TO ORDER

F38

Type

1A

Rated Voltage

225

Capacitance Code

pF code: 1st two digits represent significant figures, 3rd digit represents multiplier (number of zeros to follow)

M

Tolerance
M=±20%

M

Case Size
See table above



Packaging

| Reel Dia (φ180) | Tape Width (mm) |
|-----------------|-----------------|
| A | 8 |



Special Code

AXE = Rated temperature 60°C and H dimension 1.0mm Max.
 AXEH3 = Rated temperature 60°C and H dimension 1.0mm Max., Low ESR
 LZT = Rated temperature 60°C
 LZTH1 = Rated temperature 60°C, Low ESR
 AH1, AH2, AH3 = Low ESR

TECHNICAL SPECIFICATIONS

| | |
|-----------------------------|--|
| Category Temperature Range: | -55 to +105°C |
| Rated Range: | +85°C or +60°C (*2) |
| Capacitance Tolerance: | ±20% at 120Hz |
| Dissipation Factor: | Refer to next page (120Hz) |
| ESR 100kHz: | Refer to next page (120Hz) |
| Leaking 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. |
| Termination Finish: | M, S case: Gold Plating (standard), U case: Sn-3.5Ag Plating (standard) |

*2 LZT and AXE: Rated temperature +60°C, Surge and Endurance test temperature +60°C

F38 Series

Conductive Polymer, Miniature, Undertab Solid Electrolytic Chip Capacitors



CAPACITANCE AND RATED VOLTAGE RANGE (LETTER DENOTES CASE SIZE)

| Capacitance | | Rated Voltage | | | | | *Cap Code |
|-------------|------|---------------|-----------------------|---------|----------|----------|-----------|
| µF | Code | 4V (0G) | 6.3V (0J) | 8V (0K) | 10V (1A) | 25V (1E) | |
| 1.0 | 105 | | U | | | | A |
| 2.2 | 225 | | | | M | M | J |
| 4.7 | 475 | | U | | M/S | S | S |
| 10 | 106 | | M/M(AH1,AH2)/S/U | | M/M(AH1) | | a |
| 22 | 226 | | M/M(AH3,AH1)/S/S(AH1) | | M*/S | | j |
| 33 | 336 | | M**/S | | S** | | n |
| 47 | 476 | | M*/M*(H3)/S/S(AH1) | S | S** | | s |
| 68 | 686 | | S** | | | | w |
| 100 | 107 | S** | S**/S**(H1) | | | | A |

Released ratings, (Low ESR)

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

** (LZT) Rated temperature 60°C. 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.

THE CORRELATIONS AMONG RATED VOLTAGE, SURGE VOLTAGE AND DERATED VOLTAGE

| | F38 (Standard) | | | |
|---------------------------|----------------|-----|----|----|
| Rated Voltage (V) ≤85°C | 6.3 | 8 | 10 | 25 |
| 85°C Surge Voltage (V) | 8 | 10 | 13 | 32 |
| 105°C Derated Voltage (V) | 5 | 6.3 | 8 | 20 |

| | 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 |

RATINGS & PART NUMBER REFERENCE

| AVX Part No. | Case Size | Capacitance (µF) | Rated Voltage (V) | DCL (µA) | DF @ 120Hz (%) | ESR @ 100kHz (mΩ) | 100kHz RMS Current (mA) | | | | *3 ΔC/C (%) | MSL |
|------------------|-----------|------------------|-------------------|----------|----------------|-------------------|-------------------------|------|------|-------|-------------|-----|
| | | | | | | | 45°C | 60°C | 85°C | 105°C | | |
| 4 Volt | | | | | | | | | | | | |
| F380G107MSALZT | S | 100 | 4 | 80.0 | 10 | 200 | 474 | 332 | - | 237 | * | 3 |
| 6.3 Volt | | | | | | | | | | | | |
| F380J105MUA | U | 1 | 6.3 | 0.6 | 6 | 1500 | 100 | - | 70 | 50 | * | 3 |
| F380J475MUA | U | 4.7 | 6.3 | 20.0 | 10 | 1500 | 100 | - | 70 | 50 | * | 3 |
| F380J106MMA | M | 10 | 6.3 | 10.0 | 8 | 500 | 224 | - | 157 | 112 | * | 3 |
| F380J106MMAAH1 | M | 10 | 6.3 | 10.0 | 8 | 300 | 289 | - | 202 | 144 | * | 3 |
| F380J106MMAAH2 | M | 10 | 6.3 | 10.0 | 8 | 200 | 354 | - | 247 | 177 | * | 3 |
| F380J106MSA | S | 10 | 6.3 | 6.3 | 10 | 250 | 424 | - | 297 | 212 | * | 3 |
| F380J106MUA | U | 10 | 6.3 | 20.0 | 10 | 1500 | 100 | - | 70 | 50 | * | 3 |
| F380J226MMA | M | 22 | 6.3 | 13.9 | 10 | 500 | 224 | - | 157 | 112 | * | 3 |
| F380J226MMAAH3 | M | 22 | 6.3 | 13.9 | 10 | 300 | 289 | - | 202 | 144 | * | 3 |
| F380J226MMAAH1 | M | 22 | 6.3 | 13.9 | 10 | 200 | 354 | - | 247 | 177 | * | 3 |
| F380J226MSA | S | 22 | 6.3 | 13.9 | 10 | 200 | 474 | - | 332 | 237 | * | 3 |
| F380J226MSAAH1 | S | 22 | 6.3 | 13.9 | 10 | 150 | 548 | - | 383 | 274 | * | 3 |
| F380J336MMAALZT | M | 33 | 6.3 | 41.6 | 10 | 500 | 224 | 157 | - | 112 | * | 3 |
| F380J336MSA | S | 33 | 6.3 | 20.8 | 10 | 200 | 474 | - | 332 | 237 | * | 3 |
| F380J476MMAAXE | M | 47 | 6.3 | 59.2 | 10 | 500 | 224 | 157 | - | 112 | * | 3 |
| F380J476MMAAXEH3 | M | 47 | 6.3 | 59.2 | 10 | 300 | 289 | 202 | - | 144 | * | 3 |
| F380J476MSA | S | 47 | 6.3 | 29.6 | 10 | 200 | 474 | - | 332 | 237 | * | 3 |
| F380J476MSAAH1 | S | 47 | 6.3 | 29.6 | 10 | 150 | 548 | - | 383 | 274 | * | 3 |
| F380J686MSALZT | S | 68 | 6.3 | 86.0 | 10 | 200 | 474 | 332 | - | 237 | * | 3 |
| F380J107MSALZT | S | 100 | 6.3 | 126.0 | 10 | 200 | 474 | 332 | - | 237 | * | 3 |
| F380J107MSALZTH1 | S | 100 | 6.3 | 126.0 | 10 | 150 | 548 | 383 | - | 274 | * | 3 |
| 8 Volt | | | | | | | | | | | | |
| F380K476MSA | S | 47 | 8 | 37.6 | 10 | 200 | 474 | - | 332 | 237 | * | 3 |
| 10 Volt | | | | | | | | | | | | |
| F381A225MMA | M | 2.2 | 10 | 10.0 | 6 | 500 | 224 | - | 157 | 112 | * | 3 |
| F381A475MMA | M | 4.7 | 10 | 10.0 | 6 | 500 | 224 | - | 157 | 112 | * | 3 |
| F381A475MSA | S | 4.7 | 10 | 4.7 | 10 | 300 | 387 | - | 271 | 194 | * | 3 |
| F381A106MMA | M | 10 | 10 | 10.0 | 15 | 500 | 224 | - | 157 | 112 | * | 3 |
| F381A106MMAAH1 | M | 10 | 10 | 10.0 | 15 | 300 | 289 | - | 202 | 144 | * | 3 |
| F381A226MMAAXE | M | 22 | 10 | 44.0 | 10 | 500 | 224 | 157 | - | 112 | * | 3 |
| F381A226MSA | S | 22 | 10 | 22.0 | 10 | 200 | 474 | - | 332 | 237 | * | 3 |
| F381A336MSALZT | S | 33 | 10 | 99.0 | 10 | 200 | 474 | 332 | - | 237 | * | 3 |
| F381A476MSALZT | S | 47 | 10 | 94.0 | 10 | 200 | 474 | 332 | - | 237 | * | 3 |
| 25 Volt | | | | | | | | | | | | |
| F381E225MMA | M | 2.2 | 25 | 10.0 | 10 | 500 | 224 | - | 157 | 112 | * | 3 |
| F381E475MSA | S | 4.7 | 25 | 11.8 | 10 | 500 | 300 | - | 210 | 150 | * | 3 |

*3: ΔC/C Marked "**"

Moisture Sensitivity Level (MSL) is defined according to J-STD-020

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



The Important Information/Disclaimer is incorporated in the catalog where these specifications came from or available online at www.avx.com/disclaimer/ by reference and should be reviewed in full before placing any order.

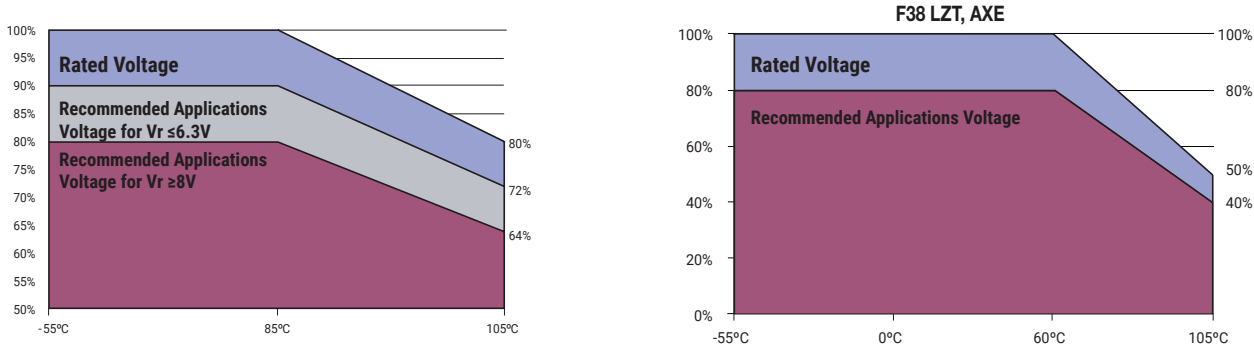
F38 Series

Conductive Polymer, Miniature, Undertab Solid Electrolytic Chip Capacitors



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 229 (*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 229 (*3) Dissipation Factor 200% or less of initial specified value Leakage Current 400% or less of initial specified value | |
| Resistance to Soldering Heat | 5 seconds reflow at 260°C Capacitance Change Refer to page 229 (*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 or 60°C (*2), capacitors shall meet the characteristic requirements in the table above. Capacitance Change Refer to page 229 (*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 or 60°C (*2), capacitors shall meet the characteristic requirements in the table above. Capacitance Change Refer to page 229 (*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. | |
| 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 LZT and AXE: Rated temperature 60°C, Surge and Endurance test temperature 60°C

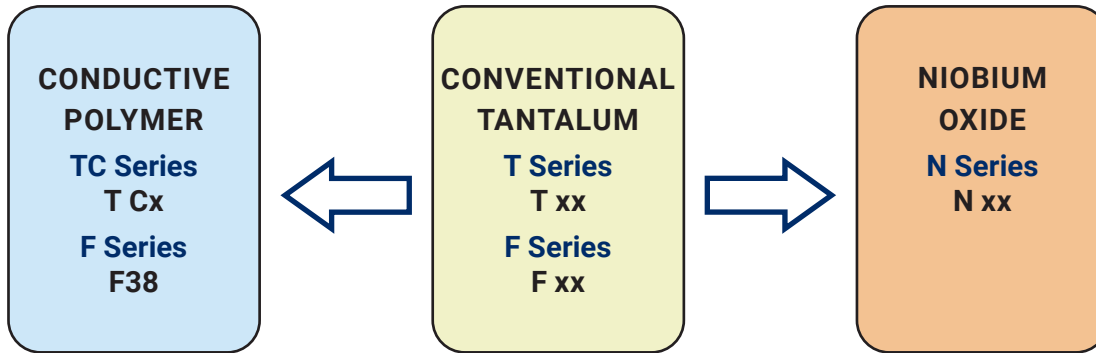
NOTICE: DESIGN, SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.

F38 Series

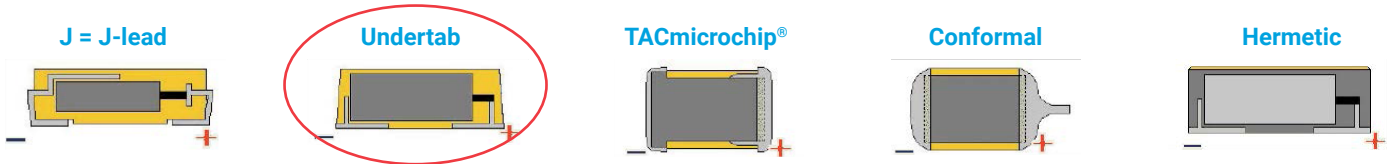
Conductive Polymer, Miniature, Undertab Solid Electrolytic Chip Capacitors



SOLID ELECTROLYTIC CAPACITOR ROADMAP



FIVE CAPACITOR CONSTRUCTION STYLES



SERIES LINE UP : Conductive Polymer

