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

LEAD-FREE
LEAD-FREE COMPATIBLE COMPONENT

RoHS COMPLIANT

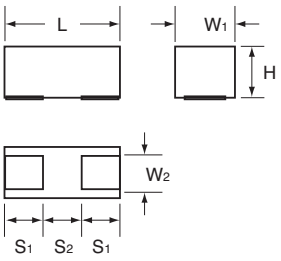
APPLICATIONS

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

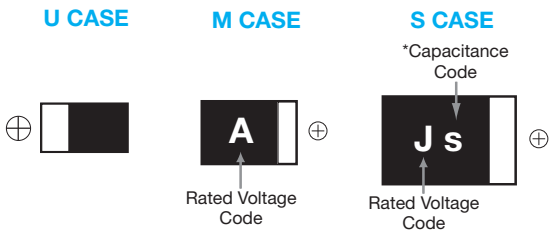
CASE DIMENSIONS: millimeters (inches)

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*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

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

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 20ºC 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 20ºC specified value.

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

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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)	
1.0	105		U		A
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)	M*4/S	j
33	336		M**/S	S**	n
47	476		M*4/M*4(H3)/S/S(AH1)	S**	s
68	686		S**		w
100	107	S**			A

Released ratings, (Low ESR)
*4 Rated temperature 60℃ and H dimension 1.0mm Max only. Please contact AVX when you need detail spec.
**Rated temperature 60ºC 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) 45ºC	*3 ΔC/C (%)	MSL
4 Volt									
F380G107MSALZT	S	100	4	80.0	10	200	474	*	3
6.3 Volt									
F380J105MUA	U	1	6.3	0.6	6	1500	100	*	3
F380J475MUA	U	4.7	6.3	20.0	10	1500	100	*	3
F380J106MMA	M	10	6.3	10.0	8	500	224	*	3
F380J106MMAAH1	M	10	6.3	10.0	8	300	289	*	3
F380J106MMAAH2	M	10	6.3	10.0	8	200	354	*	3
F380J226MMA	M	22	6.3	13.9	10	500	224	*	3
F380J226MMAAH3	M	22	6.3	13.9	10	300	289	*	3
F380J226MMAAH1	M	22	6.3	13.9	10	200	354	*	3
F380J226MSA	S	22	6.3	13.9	10	200	474	*	3
F380J226MSAAH1	S	22	6.3	13.9	10	150	548	*	3
F380J336MMALZT	M	33	6.3	41.6	10	500	224	*	3
F380J336MSA	S	33	6.3	20.8	10	200	474	*	3
F380J476MMAAXE*4	M	47	6.3	59.2	10	500	224	*	3
F380J476MMAAXEH3	M	47	6.3	59.2	10	300	289	*	3
F380J476MSA	S	47	6.3	29.6	10	200	474	*	3
F380J476MSAAH1	S	47	6.3	29.6	10	150	548	*	3
F380J686MSALZT	S	68	6.3	86.0	10	200	474	*	3
10 Volt									
F381A225MMA	M	2.2	10	10.0	6	500	224	*	3
F381A475MMA	M	4.7	10	10.0	6	500	224	*	3
F381A106MMA	M	10	10	10.0	15	500	224	*	3
F381A106MMAAH1	M	10	10	10.0	15	300	289	*	3
F381A226MMAAXE	M	22	10	44.0	10	500	224	*	3
F381A226MSA	S	22	10	22.0	10	200	474	*	3
F381A336MSALZT	S	33	10	99.0	10	200	474	*	3
F381A476MSALZT	S	47	10	94.0	10	200	474	*	3

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

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

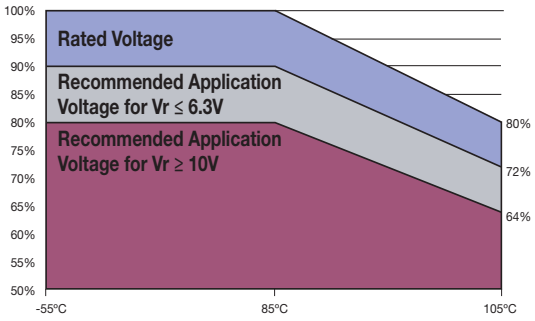
THE CORRELATIONS AMONG RATED VOLTAGE, SURGE VOLTAGE AND DERATED VOLTAGE

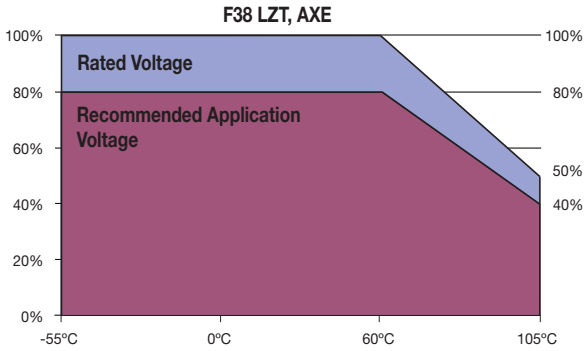
	F38 (Standard)	
Rated Voltage (V) ≤85ºC	6.3	10
85ºC Surge Voltage (V)	8	13
105ºC Derated Voltage (V)	5	8

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

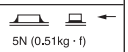
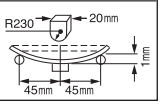
RECOMMENDED DERATING FACTOR

Voltage and temperature derating as percentage of Vr





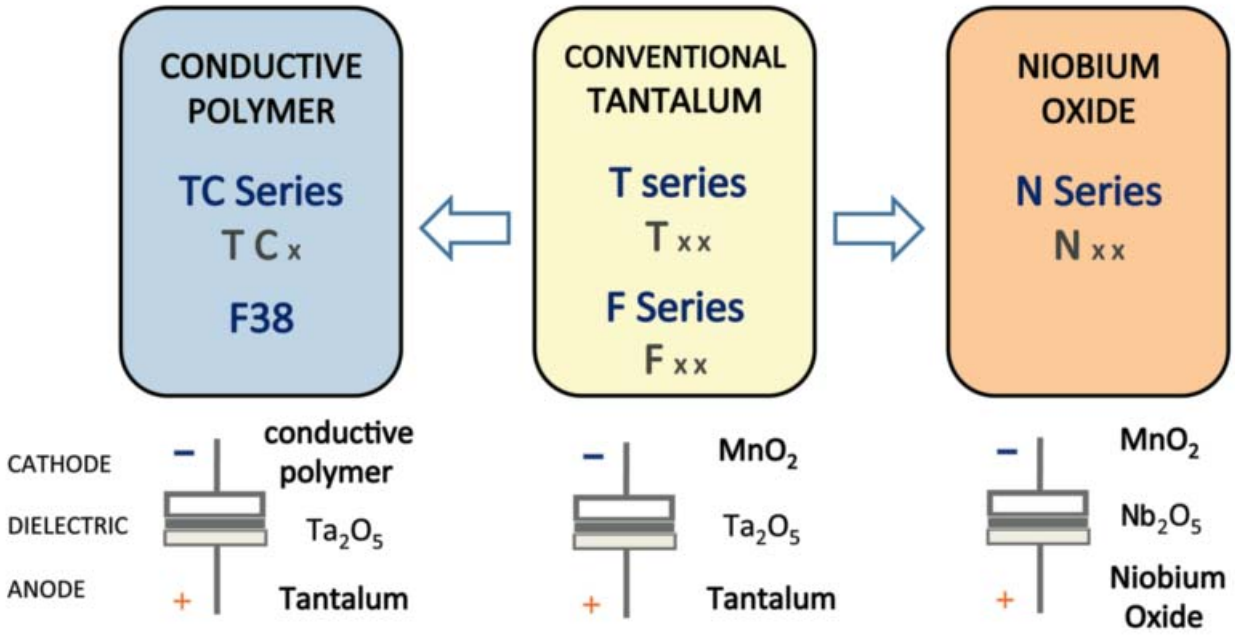
QUALIFICATION TABLE

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 228 (*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 228 (*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 228 (*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 228 (*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 228 (*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.  R230 20mm 1mm 45mm 45mm

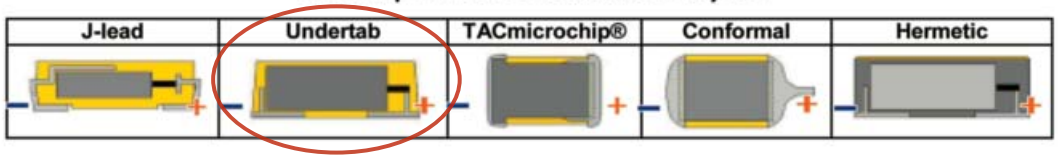
*2 F380J476MMAAXE: Rated temperature +60ºC Surge, endurance test temperature +60ºC

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

AVX SOLID ELECTROLYTIC CAPACITOR ROADMAP



Five Capacitor Construction Styles



SERIES LINE UP: CONDUCTIVE POLYMER