

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



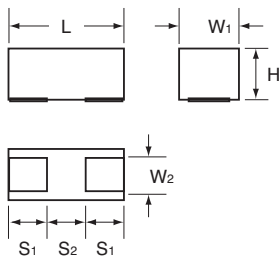
APPLICATIONS

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

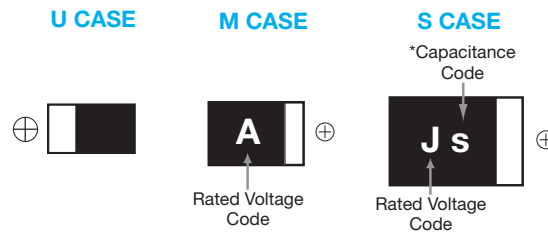
CASE DIMENSIONS: millimeters (inches)

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



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 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 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)	25V (1E)	
1.0	105		U			A
2.2	225			M		J
4.7	475		U	M	S	S
10	106		M/M(AH1,AH2)/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
68	686		S**			w
100	107	S**	S**			A

Released ratings, (Low ESR)

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

** (LZT) 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.

THE CORRELATIONS AMONG RATED VOLTAGE, SURGE VOLTAGE AND DERATED VOLTAGE

	F38 (Standard)		
Rated Voltage (V) ≤85°C	6.3	10	25
85°C Surge Voltage (V)	8	13	32
105°C Derated Voltage (V)	5	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)				*1 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
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
F380J336MMALZT	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*4	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
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
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												
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

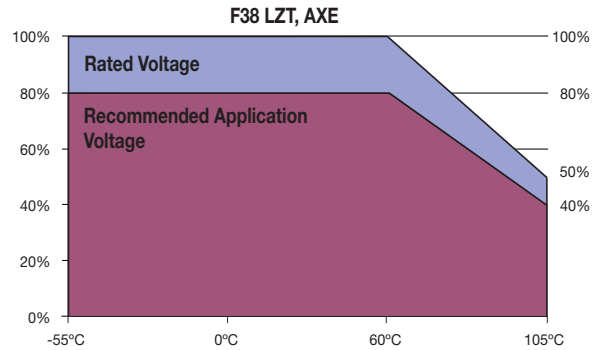
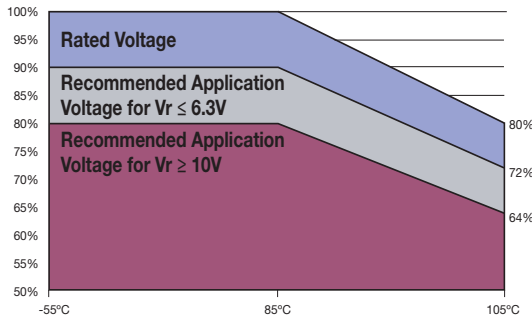
F38 Series



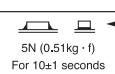
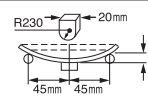
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RECOMMENDED DERATING FACTOR

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

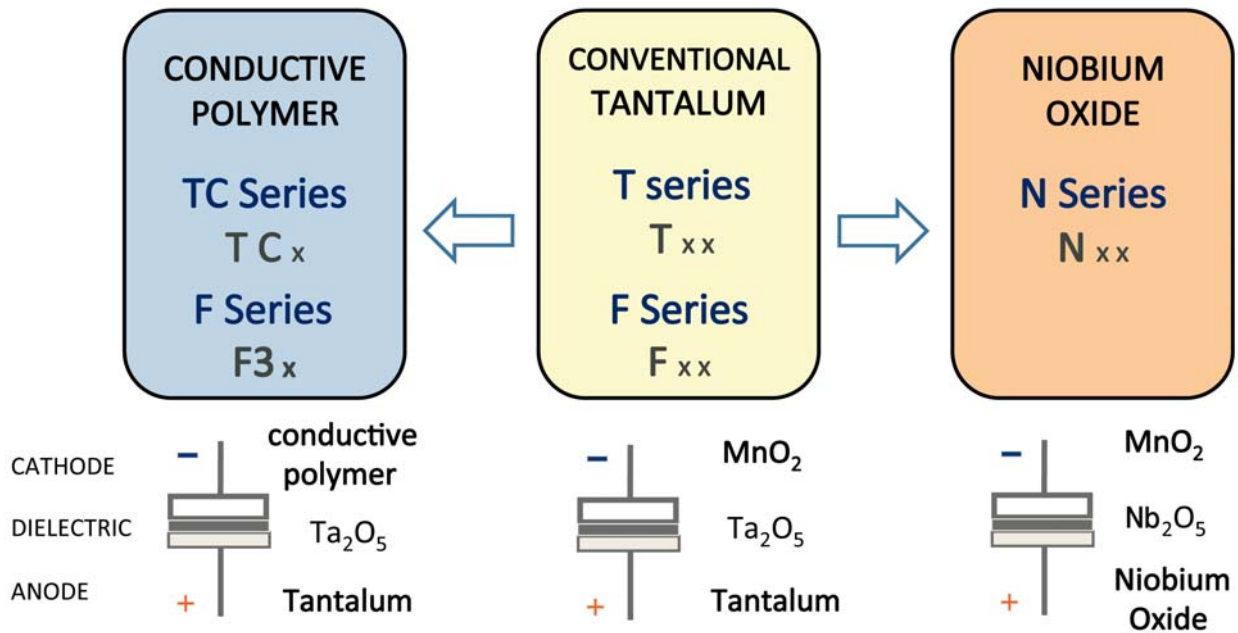
NOTICE: DESIGN, SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.

F38 Series

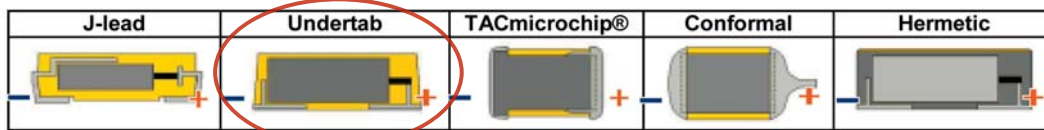


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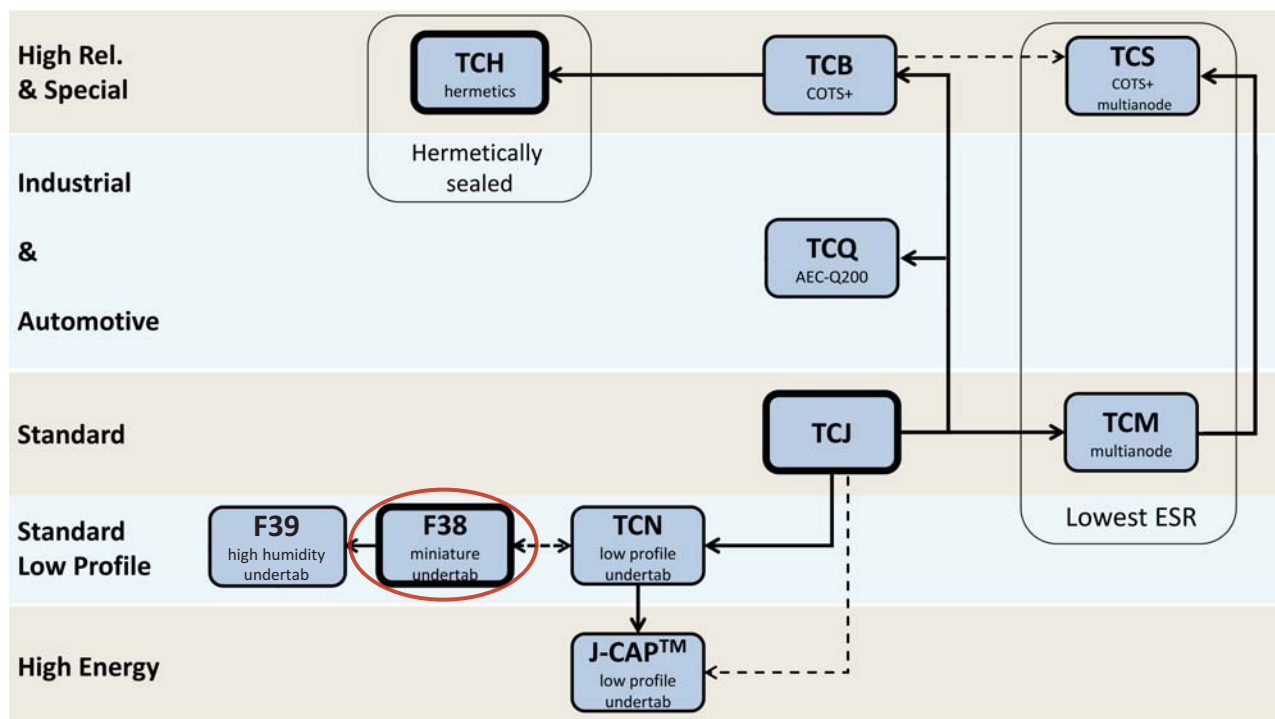
AVX SOLID ELECTROLYTIC CAPACITOR ROADMAP



Five Capacitor Construction Styles



SERIES LINE UP: CONDUCTIVE POLYMER



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