

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



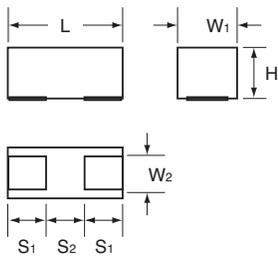
APPLICATIONS

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

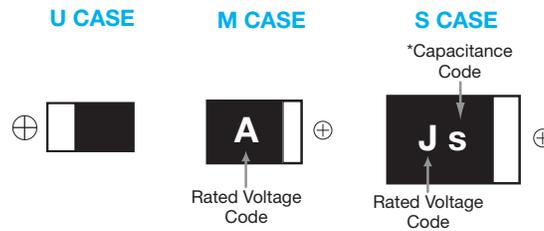
CASE DIMENSIONS: millimeters (inches)

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)	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**				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.

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) @ 45°C	*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
25 Volt									
F381E475MSA	S	4.7	25	11.8	10	500	300	*	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) ≤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

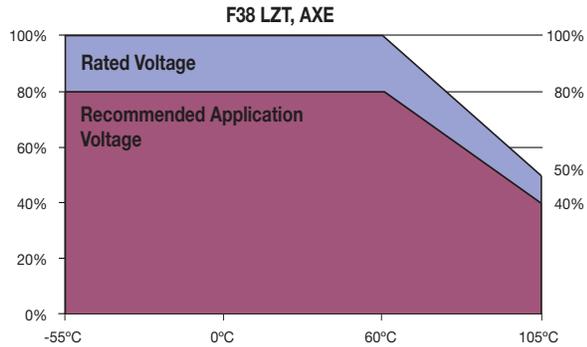
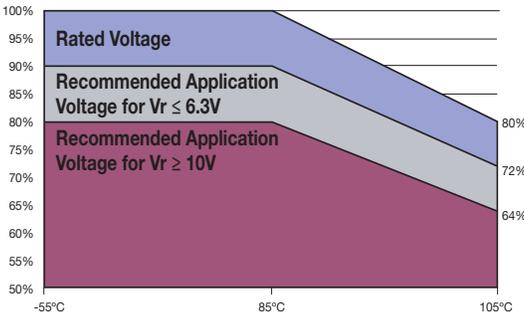
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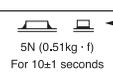
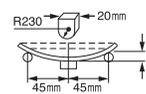
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RECOMMENDED DERATING FACTOR

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

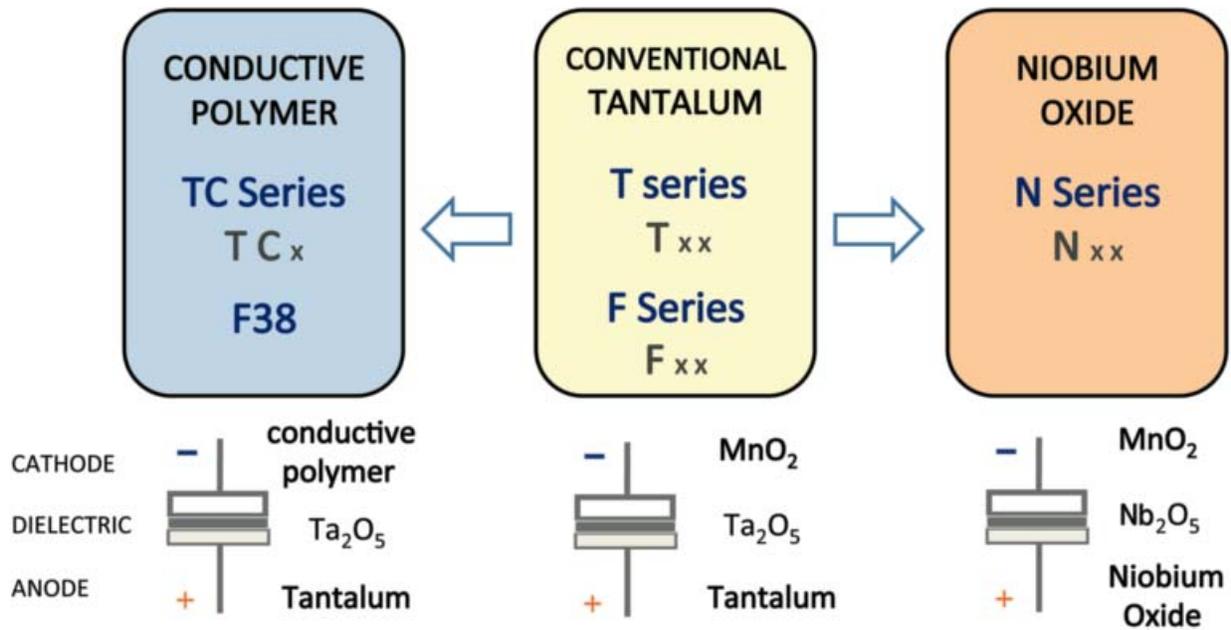
NOTICE: DESIGN, SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.

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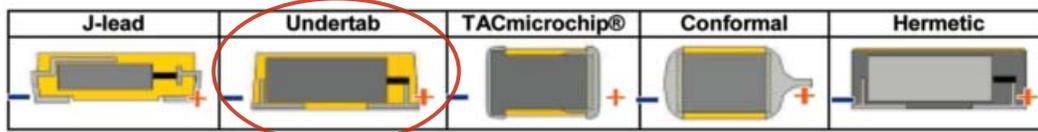


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AVX SOLID ELECTROLYTE CAPACITOR ROADMAP



Five Capacitor Construction Styles



SERIES LINE UP: CONDUCTIVE POLYMER

