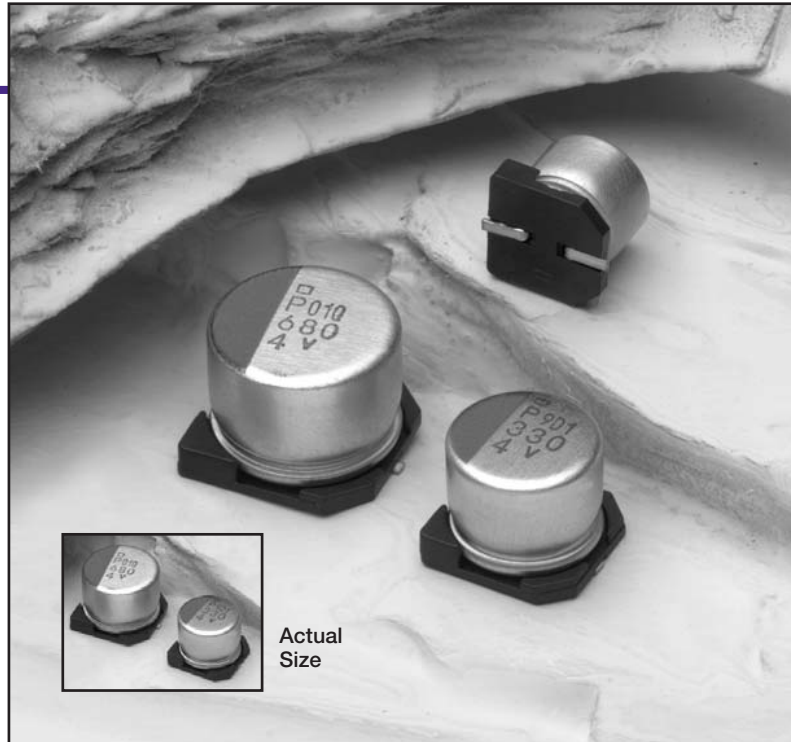


# PXA Series

**UPGRADE**  
Engineering Bulletin Jul 03



- **Solid Functional Polymer Aluminum**
- **For Lead-Free Reflow Soldering**
- **Ultra Low ESR**
- **Vertical Chip**
- **+105°C Max. Temperature**



The PXA series is a surface mount aluminum chip capacitor series that uses a solid functional polymer electrolyte. This polymer design allows higher temperature resistance, much lower ESR and impedance and higher ripple current capability than liquid electrolyte capacitors. This series has been upgraded to include new case sizes,  $\varnothing 8 \times 12$  mm and  $\varnothing 10 \times 12.2$  mm, which extend the capacitance range and offer significantly reduced ESR and very high ripple current capability. The PXA capacitors are constructed of durable heavy-duty materials that can withstand two reflow soldering cycles when exposed to lead-free alloy melting points up to 230°C. These capacitors are suitable for DC-DC converters, voltage regulators and decoupling applications used in computer equipment.

The PXA series capacitors are solvent proof. Refer to the Mini-Glossary for cleaning guidelines and recommended cleaning agents that are compatible with United Chemi-Con products.

## Summary of Specifications

- **Surface mount lead terminals.**
- **Capacitance range: 10 to 1,500 $\mu$ F.**
- **Voltage range: 2.5 to 25VDC.**
- **Category temperature range: -55°C to +105°C.**
- **Leakage current: 0.2CV maximum after 2 minutes at +20°C.**
- **Standard capacitance tolerance:  $\pm 20\%$**
- **Nominal case size (D  $\times$  L): 6.3  $\times$  5.2mm to 10  $\times$  12.2mm.**
- **Rated lifetime: 2,000 hours at +105°C.**

## PXA Specifications

Item	Characteristics						
Category Temperature Range	-55 to +105°C						
Rated Voltage Range	2.5 to 25VDC						
Capacitance Range	10 to 1,500 $\mu$ F						
Capacitance Tolerance	$\pm$ 20% (M) at +20°C, 120Hz						
Leakage Current	<p><math>I = 0.2CV</math> maximum after 2 minutes at +20°C.                      Note: If you need to measure the leakage current, apply a voltage treatment by subjecting the capacitors to the DC rated voltage for 120 minutes at +105°C before the measurement.                      Where <math>I</math> = Max. leakage current (<math>\mu</math>A), <math>C</math> = Nominal capacitance (<math>\mu</math>F) and <math>V</math> = Rated voltage (V)</p>						
Dissipation Factor (Tan $\delta$ )	0.12 maximum at +20°C, 120Hz						
Low Temperature Characteristics	<p>At 100kHz, impedance (Z) ratio between the -25°C or -55°C value and +20°C value shall not exceed the values given below.</p> <table border="1"> <tr> <td>Rated Voltage (V)</td> <td>2.5-25</td> </tr> <tr> <td>Z(-25°C) / Z(+20°C)</td> <td><math>\leq</math> 1.15</td> </tr> <tr> <td>Z(-55°C) / Z(+20°C)</td> <td><math>\leq</math> 1.25</td> </tr> </table>	Rated Voltage (V)	2.5-25	Z(-25°C) / Z(+20°C)	$\leq$ 1.15	Z(-55°C) / Z(+20°C)	$\leq$ 1.25
Rated Voltage (V)	2.5-25						
Z(-25°C) / Z(+20°C)	$\leq$ 1.15						
Z(-55°C) / Z(+20°C)	$\leq$ 1.25						
Endurance (Load Life)	<p>The following specifications shall be satisfied when the capacitors are restored to +20°C after subjecting them to the DC rated voltage for 2,000 hours at +105°C.</p> <p>Appearance : no significant damage                      Capacitance change: <math>\leq \pm</math>20% of the initial measured value                      Tan <math>\delta</math> (DF) : <math>\leq</math> 150% of the initial specified value                      ESR : <math>\leq</math> 150% of the initial specified value                      Leakage current : <math>\leq</math> initial specified value</p>						
Bias Humidity Test	<p>The following specifications shall be satisfied when the capacitors are restored to +20°C after subjecting them to the DC rated voltage for 500 hours at +60°C, 90-95%RH.</p> <p>Appearance : no significant damage                      Capacitance change: <math>\leq \pm</math>20% of the initial measured value                      Tan <math>\delta</math> (DF) : <math>\leq</math> 150% of the initial specified value                      ESR : <math>\leq</math> 150% of the initial specified value                      Leakage current : <math>\leq</math> initial specified value</p>						
Surge Voltage Test	<p>The following specifications shall be satisfied when the capacitors are restored to +20°C after the surge voltage is applied at +105°C through a protective resistor of 1,000 ohms at a cycling of 30 seconds on, 5.5 minutes off for 1,000 cycles. The surge voltage shall not exceed 115% of the rated voltage.</p> <p>Appearance : no significant damage                      Capacitance change: <math>\leq \pm</math>20% of the initial measured value                      Tan <math>\delta</math> (DF) : <math>\leq</math> 150% of the initial specified value                      ESR : <math>\leq</math> 150% of the initial specified value                      Leakage current : <math>\leq</math> initial specified value</p>						
Failure Rate	1% maximum per 1,000 hours at +105°C with rated voltage applied. (Confidence level 60%)						

## Part Numbering System for PXA Series

When ordering, always specify complete catalog number for PXA Series.

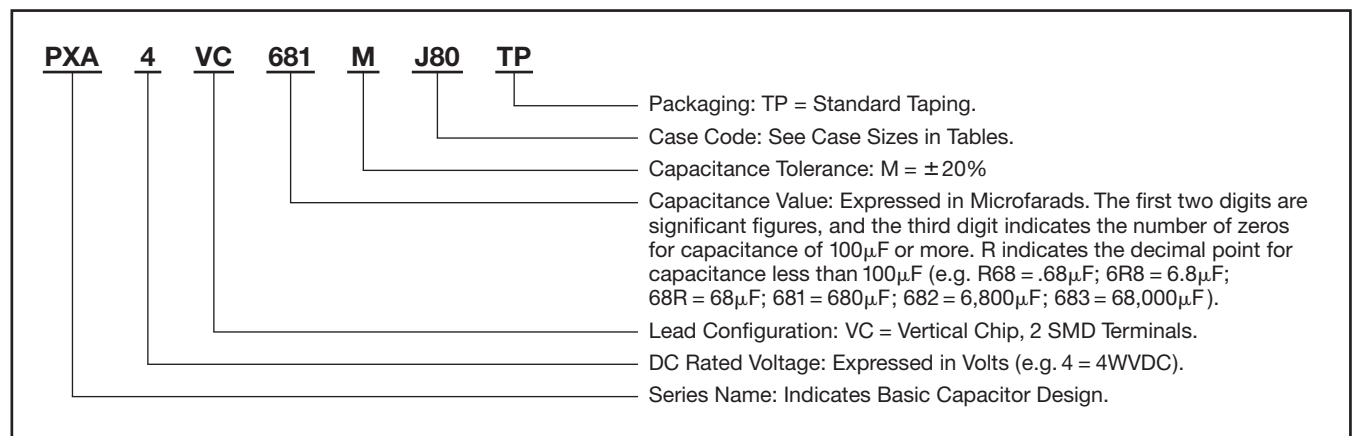


Diagram of Dimensions

### Vertical Chip SMD Lead Terminals

VC Type

MARKING STYLE A

Capacitance

Rated Voltage

ØD

L

0.3 MAX.

A

B

C

P

W

### Recommended PCB Land Pattern

Location of Capacitor

a

b

c

Solder Land

Unit: mm

Refer to Packaging section for Surface Mount taping and reel specifications.

Case Code	ØD ±0.5	L ±0.3	A ±0.2	B ±0.2	C ±0.2	W	P	a	b	c
F55	Ø6.3	5.2	6.6	6.6	7.2	0.5-0.8	1.9	1.9	3.5	1.6
F60	Ø6.3	5.7	6.6	6.6	7.2	0.5-0.8	1.9	1.9	3.5	1.6
H70	Ø8	6.7	8.3	8.3	9.0	0.7-1.1	3.1	3.1	4.2	2.2
H12	Ø8	12.0	8.3	8.3	9.0	0.7-1.1	3.1	3.1	4.2	2.2
J80	Ø10	7.7	10.3	10.3	11.0	0.7-1.1	4.5	4.5	4.4	2.2
J12	Ø10	12.2	10.3	10.3	11.0	0.7-1.1	4.5	4.5	4.4	2.2

Recommended Reflow Soldering Conditions

### Temperature Profile for Air or Infrared Reflow Soldering Methods

Peak

230

200

150

25

Time (sec.)

Preheat 150°C 120 sec. max.

Peak Temperature

Max. Time Over 230°C

Max. Time Over 200°C

Refer to Surface Mount Soldering section for additional reflow soldering guidelines and precautions.

### Time and Temperature Ranges

Reflow Conditions		For One Reflow Cycle	For Two Reflow Cycles (if necessary)
Preheat	Max. Time	120 seconds	120 seconds
	Temperature	150°C	150°C
Reflow	Max. Time Over 200°C	60 (50*) seconds	50 seconds
	Max. Time Over 230°C	40 (30*) seconds	30 seconds
	Max. Peak Temperature	250°C (240°C*)	250°C (240°C*)

\*Applies to 20V, 82µF and 25V, 39µF J80 models plus all H12 and J12 models.

## Standard Voltage Ratings - Surface Mount

Rated Voltage (WVDC)	Capacitance (µF)	Catalog Part Number	Nominal Case Size* D × L (mm)	Case Code	Maximum ESR (mΩ) at +20°C 100k-300kHz	Rated Ripple Current (mA rms) at -55°C to +105°C 100k-300kHz
<b>2.5 Volts</b> 2.9 Volts Surge	220	PXA2.5VC221MF55TP	6.3 × 5.2	F55	25	2,500
	220	PXA2.5VC221MF60TP	6.3 × 5.7	F60	25	2,500
	560	PXA2.5VC561MH70TP	8 × 6.7	H70	23	3,100
	680	PXA2.5VC681MH12TP	8 × 12.0	H12	12	4,770
	1,000	PXA2.5VC102MJ80TP	10 × 7.7	J80	19	4,240
	1,500	PXA2.5VC152MJ12TP	10 × 12.2	J12	10	5,500
<b>4 Volts</b> 4.6 Volts Surge	100	PXA4VC101MF55TP	6.3 × 5.2	F55	26	2,450
	100	PXA4VC101MF60TP	6.3 × 5.7	F60	26	2,450
	150	PXA4VC151MF55TP	6.3 × 5.2	F55	26	2,450
	150	PXA4VC151MF60TP	6.3 × 5.7	F60	26	2,450
	220	PXA4VC221MH70TP	8 × 6.7	H70	25	3,020
	330	PXA4VC331MH70TP	8 × 6.7	H70	25	3,020
	470	PXA4VC471MJ80TP	10 × 7.7	J80	20	4,130
	560	PXA4VC561MH12TP	8 × 12.0	H12	12	4,770
	680	PXA4VC681MJ80TP	10 × 7.7	J80	20	4,130
	820	PXA4VC821MJ12TP	10 × 12.2	J12	10	5,500
1,200	PXA4VC122MJ12TP	10 × 12.2	J12	10	5,500	
<b>6.3 Volts</b> 7.2 Volts Surge	68	PXA6.3VC68RMF60TP	6.3 × 5.7	F60	27	2,400
	82	PXA6.3VC82RMF55TP	6.3 × 5.2	F55	27	2,400
	82	PXA6.3VC82RMF60TP	6.3 × 5.7	F60	27	2,400
	100	PXA6.3VC101MF55TP	6.3 × 5.2	F55	27	2,400
	100	PXA6.3VC101MF60TP	6.3 × 5.7	F60	27	2,400
	120	PXA6.3VC121MF60TP	6.3 × 5.7	F60	27	2,400
	150	PXA6.3VC151MH70TP	8 × 6.7	H70	25	3,020
	220	PXA6.3VC221MH70TP	8 × 6.7	H70	25	3,020
	330	PXA6.3VC331MJ80TP	10 × 7.7	J80	20	4,130
	390	PXA6.3VC391MH12TP	8 × 12.0	H12	12	4,770
	470	PXA6.3VC471MH12TP	8 × 12.0	H12	12	4,770
	470	PXA6.3VC471MJ80TP	10 × 7.7	J80	20	4,130
	680	PXA6.3VC681MJ12TP	10 × 12.2	J12	10	5,500
820	PXA6.3VC821MJ12TP	10 × 12.2	J12	10	5,500	
<b>10 Volts</b> 11.5 Volts Surge	47	PXA10VC47RMF60TP	6.3 × 5.7	F60	31	2,250
	56	PXA10VC56RMF55TP	6.3 × 5.2	F55	31	2,250
	56	PXA10VC56RMF60TP	6.3 × 5.7	F60	31	2,250
	120	PXA10VC121MH70TP	8 × 6.7	H70	27	2,800
	150	PXA10VC151MH70TP	8 × 6.7	H70	27	2,800
	270	PXA10VC271MH12TP	8 × 12.0	H12	14	4,420
	270	PXA10VC271MJ80TP	10 × 7.7	J80	24	3,770
	330	PXA10VC331MH12TP	8 × 12.0	H12	14	4,420
	330	PXA10VC331MJ80TP	10 × 7.7	J80	24	3,770
	470	PXA10VC471MJ12TP	10 × 12.2	J12	12	5,300
	560	PXA10VC561MJ12TP	10 × 12.2	J12	12	5,300
<b>16 Volts</b> 18.4 Volts Surge	33	PXA16VC33RMF60TP	6.3 × 5.7	F60	37	2,050
	39	PXA16VC39RMF55TP	6.3 × 5.2	F55	37	2,050
	39	PXA16VC39RMF60TP	6.3 × 5.7	F60	37	2,050
	82	PXA16VC82RMH70TP	8 × 6.7	H70	30	2,700
	150	PXA16VC151MJ80TP	10 × 7.7	J80	26	3,430
	180	PXA16VC181MH12TP	8 × 12.0	H12	16	4,360
	180	PXA16VC181MJ80TP	10 × 7.7	J80	26	3,430
	220	PXA16VC221MJ12TP	10 × 12.2	J12	14	5,050
330	PXA16VC331MJ12TP	10 × 12.2	J12	14	5,050	

\*Refer to diagrams for detailed case size dimensions.

## Standard Voltage Ratings - Surface Mount

Rated Voltage (WVDC)	Capacitance (µF)	Catalog Part Number	Nominal Case Size* D × L (mm)	Case Code	Maximum ESR (mΩ) at +20°C 100k-300kHz	Rated Ripple Current (mA rms) at -55°C to +105°C 100k-300kHz
<b>20 Volts</b> 23 Volts Surge	22	PXA20VC22RMF55TP	6.3 × 5.2	F55	50	1,650
	22	PXA20VC22RMF60TP	6.3 × 5.7	F60	50	1,650
	39	PXA20VC39RMH70TP	8 × 6.7	H70	45	2,000
	47	PXA20VC47RMH70TP	8 × 6.7	H70	45	2,000
	82	PXA20VC82RMJ80TP	10 × 7.7	J80	40	2,500
<b>25 Volts</b> 28.7 Volts Surge	10	PXA25VC10RMF60TP	6.3 × 5.7	F60	65	1,500
	22	PXA25VC22RMH70TP	8 × 6.7	H70	50	1,800
	39	PXA25VC39RMJ80TP	10 × 7.7	J80	45	2,100

\*Refer to diagrams for detailed case size dimensions.