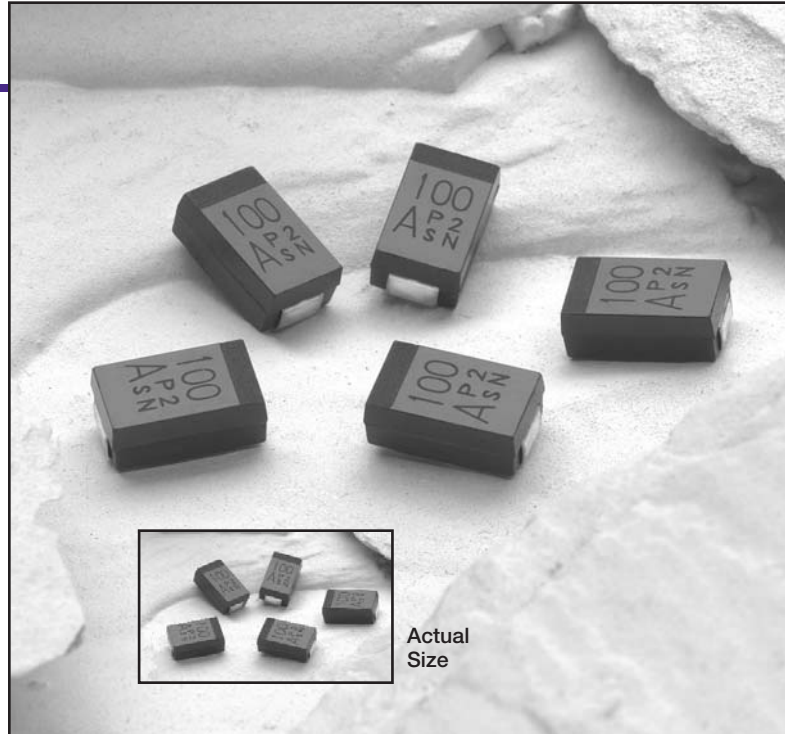


- **Tantalum Solid Functional Polymer Chip**
- **35% to 50% Lower ESR Than Manganese Type**
- **Lead-Free Construction**
- **+105°C Maximum Temperature**



The PT series is a tantalum electrolytic chip capacitor series that is designed with a solid functional polymer as the electrolyte and constructed of lead-free non-combustible materials. These PT chips offer 35% to 50% lower ESR and higher ripple current capability than the manganese oxide types. The PT chips have a wide operating temperature range of -55°C to $+105^{\circ}\text{C}$ and provide stable electrical parameters and high reliability over a rated life of 1,000 hours at $+105^{\circ}\text{C}$. The PT chips can withstand high temperature lead-free alloy melting points over 230°C for 40 seconds max. during reflow soldering. Target applications include DC-DC converters, voltage regulators and decoupling applications where low ESR at high frequency is required.

The PT 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 $680\mu\text{F}$.**
- **Voltage range: 2.5 to 10VDC.**
- **Category temperature range: -55°C to $+105^{\circ}\text{C}$.**
- **Standard capacitance tolerance: $\pm 20\%$**
- **Nominal case size (L \times W \times H): $2.0 \times 1.25 \times 1.2\text{mm}$ to $7.3 \times 4.3 \times 3.8\text{mm}$.**
- **Rated lifetime: 1,000 hours at $+105^{\circ}\text{C}$.**

PT Specifications

Item	Characteristics																		
Category Temperature Range	-55 to +105°C																		
Rated Voltage Range	2.5 to 10VDC																		
Capacitance Range	10 to 680 μ F																		
Capacitance Tolerance	$\pm 20\%$ (M) at +20°C, 120Hz																		
Leakage Current	I = 0.1CV maximum after 5 minutes at +20°C. Where I = Max. leakage current (μ A), C = Nominal capacitance (μ F) and V = Rated voltage (V)																		
Dissipation Factor (Tan δ)	At +20°C, 120Hz <table border="1" style="margin-left: 20px;"> <tr> <td>Rated Voltage (V)</td> <td>2.5-6.3</td> <td>10</td> </tr> <tr> <td>Max. Tan δ (DF)</td> <td>0.08</td> <td>0.10</td> </tr> </table>	Rated Voltage (V)	2.5-6.3	10	Max. Tan δ (DF)	0.08	0.10												
Rated Voltage (V)	2.5-6.3	10																	
Max. Tan δ (DF)	0.08	0.10																	
Temperature Characteristics	At 120Hz, the change in electrical performance at -55°C, +85°C or +105°C compared to the initial measured value at +20°C shall not exceed the values given below. <table border="1" style="margin-left: 20px;"> <tr> <td>Temperature</td> <td>-55°C</td> <td>+85°C</td> <td>+105°C</td> </tr> <tr> <td>Capacitance Change</td> <td>-15 to 0%</td> <td>0 to +20%</td> <td>0 to +30%</td> </tr> <tr> <td>Max. Tan δ (DF)</td> <td>\leq initial specified value</td> <td>$\leq 150\%$ of initial specified value</td> <td>$\leq 150\%$ of initial specified value</td> </tr> <tr> <td>Leakage Current</td> <td>—</td> <td>$\leq 1.0CV$ (μA)</td> <td>$\leq 1.0CV$ (μA)</td> </tr> </table>	Temperature	-55°C	+85°C	+105°C	Capacitance Change	-15 to 0%	0 to +20%	0 to +30%	Max. Tan δ (DF)	\leq initial specified value	$\leq 150\%$ of initial specified value	$\leq 150\%$ of initial specified value	Leakage Current	—	$\leq 1.0CV$ (μ A)	$\leq 1.0CV$ (μ A)		
Temperature	-55°C	+85°C	+105°C																
Capacitance Change	-15 to 0%	0 to +20%	0 to +30%																
Max. Tan δ (DF)	\leq initial specified value	$\leq 150\%$ of initial specified value	$\leq 150\%$ of initial specified value																
Leakage Current	—	$\leq 1.0CV$ (μ A)	$\leq 1.0CV$ (μ A)																
Rated Ripple Current Multipliers	Ambient Temperature (°C) <table border="1" style="margin-left: 20px;"> <tr> <td>+45°C</td> <td>+65°C</td> <td>+85°C</td> <td>+105°C</td> </tr> <tr> <td>1.00</td> <td>0.75</td> <td>0.60</td> <td>0.40</td> </tr> </table> Frequency (kHz) <table border="1" style="margin-left: 20px;"> <tr> <td>10kHz</td> <td>40kHz</td> <td>100kHz</td> <td>400kHz</td> <td>500kHz</td> </tr> <tr> <td>0.25</td> <td>0.95</td> <td>1.00</td> <td>1.15</td> <td>1.25</td> </tr> </table>	+45°C	+65°C	+85°C	+105°C	1.00	0.75	0.60	0.40	10kHz	40kHz	100kHz	400kHz	500kHz	0.25	0.95	1.00	1.15	1.25
+45°C	+65°C	+85°C	+105°C																
1.00	0.75	0.60	0.40																
10kHz	40kHz	100kHz	400kHz	500kHz															
0.25	0.95	1.00	1.15	1.25															
Soldering Heat Resistance	The following specifications shall be satisfied when the capacitors are restored to +20°C after subjecting them to reflow soldering conditions of 40 seconds max. over 230°C with a 250°C max. peak temperature. Capacitance change : $\leq \pm 10\%$ of initial measured value Tan δ (DF) : $\leq 200\%$ of initial specified value Leakage current : $\leq 300\%$ of initial specified value																		
Humidity Test	The following specifications shall be satisfied when the capacitors are restored to +20°C after exposing them for 500 hours at +60°C, 90-95% RH without voltage applied. Capacitance change : $\leq -20\%$ to +30% of initial measured value Tan δ (DF) : $\leq 150\%$ of initial specified value Leakage current : $\leq 300\%$ of initial specified value																		
Surge Voltage	The following specifications shall be satisfied when the capacitors are restored to +20°C after applying the specified surge voltage at +85°C for 1,000 cycles (1 cycle = 30 seconds charge through a 33 Ω protective resistor and 5 minutes and 30 seconds discharge). Capacitance change : $\leq \pm 20\%$ of initial measured value Tan δ (DF) : \leq initial specified value Leakage current : \leq initial specified value																		
Endurance (Load Life)	The following specifications shall be satisfied when the capacitors are restored to +20°C after applying the DC rated voltage for 1,000 hours at +105°C. (8V category voltage shall be applied for the capacitors with a rated voltage of 10V.) Capacitance change : $\leq \pm 20\%$ of initial measured value Tan δ (DF) : $\leq 150\%$ of initial specified value Leakage current : initial specified value																		

Diagram of Dimensions

Polymer Tantalum Chips Unit: mm

Case Dimensions

Case Code	L	W	H	a	b
P	2.0±0.2	1.25±0.2	1.2 Max.	0.5±0.2	0.9±0.2
A	2.2±0.2	1.6±0.2	1.6±0.2	0.8±0.2	1.2±0.2
B2	3.5±0.2	2.8±0.2	1.9±0.1	0.8±0.2	2.2±0.2
D4	7.3±0.2	4.3±0.2	1.9±0.1	1.3±0.2	2.4±0.2
D6	7.3±0.2	4.3±0.2	2.8±0.2	1.3±0.2	2.4±0.2
D8	7.3±0.2	4.3±0.2	3.8±0.2	1.3±0.2	2.4±0.2

Marking Examples

Case P: 6.3V, 10µF

Rated Capacitance (µF)
Rated Voltage (VDC)
Polarity (Anode)

Case A: 4V, 33µF

Rated Capacitance (µF)
Rated Voltage (VDC)
Polarity (Anode)

Cases B2, D4, D6, D8: 10V, 100µF

Polarity (Anode)
Rated Capacitance (µF)
Lot No.
Rated Voltage (VDC)

Marking Codes

Rated Voltage	Code All Cases	Rated Capacitance	Code P Case	Code A Case
2.5V	e	10µF	Ā	A7
4V	g	15µF	-	E7
6.3V	j	22µF	-	J7
10V	A	33µF	-	N7

Recommended Reflow Soldering Conditions

Temperature Profile for Air or Infrared Reflow Soldering Methods

Recommended time and temperature for soldering conditions is specified for the surface and terminal temperature of the polymer tantalum chip capacitors.

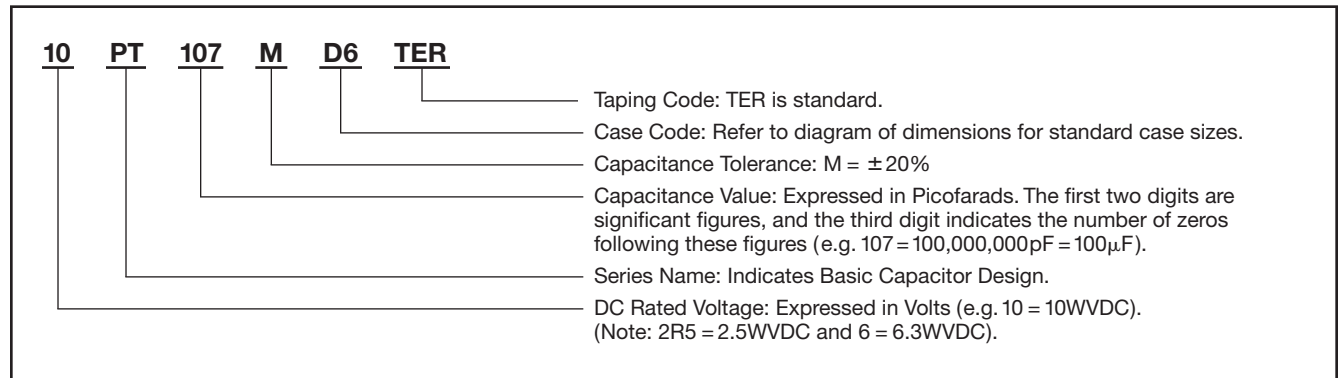
Time and Temperature Ranges

Reflow Conditions		Case Code B2, D4, D6, D8
Preheat	Max. Time	120 seconds
	Temperature	150°C
Reflow	Max. Time Over 200°C	60 seconds
	Max. Time Over 230°C	40 seconds
	Max. Peak Temperature	250°C

PT TANTALUM CHIP

Part Numbering System for PT Series

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



Standard Voltage Ratings - Polymer Tantalum Chips

Rated Voltage (WVDC)	Category Voltage at $> +85^{\circ}\text{C}$ (WVDC)	Capacitance (μF)	Catalog Part Number	Nominal Case Size* L x W x H (mm)	Case Code	Maximum ESR ($\text{m}\Omega$) at $+20^{\circ}\text{C}$, 100kHz	Rated Ripple Current (mA rms) at $+45^{\circ}\text{C}$, 100kHz
2.5 Volts 3.2 Volts Surge	—	100	2R5PT107MB2TER	3.5 x 2.8 x 1.9	B2	70	1,100
	—	220	2R5PT227MD4TER	7.3 x 4.3 x 1.9	D4	45	1,700
	—	330	2R5PT337MD6TER	7.3 x 4.3 x 2.8	D6	40	1,900
	—	680	2R5PT687MD8TER	7.3 x 4.3 x 3.8	D8	40	3,000
4 Volts 5.2 Volts Surge	—	10	4PT106MPTER	2.0 x 1.25 x 1.2	P	500	224
	—	33	4PT336MATER	2.2 x 1.6 x 1.6	A	500	387
	—	68	4PT686MB2TER	3.5 x 2.8 x 1.9	B2	70	1,100
	—	150	4PT157MD4TER	7.3 x 4.3 x 1.9	D4	45	1,700
	—	220	4PT227MD4TER	7.3 x 4.3 x 1.9	D4	40	1,900
	—	220	4PT227MD6TER	7.3 x 4.3 x 2.8	D6	40	1,900
	—	330	4PT337MD6TER	7.3 x 4.3 x 2.8	D6	40	2,000
6.3 Volts 8 Volts Surge	—	10	6PT106MPTER	2.0 x 1.25 x 1.2	P	500	224
	—	15	6PT156MATER	2.2 x 1.6 x 1.6	A	500	387
	—	22	6PT226MATER	2.2 x 1.6 x 1.6	A	500	387
	—	47	6PT476MB2TER	3.5 x 2.8 x 1.9	B2	70	1,100
	—	100	6PT107MD4TER	7.3 x 4.3 x 1.9	D4	45	1,700
	—	150	6PT157MD4TER	7.3 x 4.3 x 1.9	D4	45	1,700
	—	150	6PT157MD6TER	7.3 x 4.3 x 2.8	D6	40	1,900
	—	220	6PT227MD6TER	7.3 x 4.3 x 2.8	D6	40	2,000
10 Volts 13 Volts Surge	8	10	10PT106MATER	2.2 x 1.6 x 1.6	A	300	500
	8	33	10PT336MB2TER	3.5 x 2.8 x 1.9	B2	100	1,100
	8	68	10PT686MD4TER	7.3 x 4.3 x 1.9	D4	55	1,700
	8	100	10PT107MD4TER	7.3 x 4.3 x 1.9	D4	45	1,700
	8	100	10PT107MD6TER	7.3 x 4.3 x 2.8	D6	55	1,900
	8	150	10PT157MD6TER	7.3 x 4.3 x 2.8	D6	40	1,900

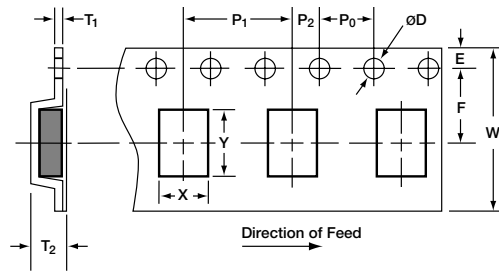
*Refer to diagram for detailed case size dimensions.

Tape and Reel Specifications

Polymer Tantalum Chips

Unit: mm

Taping

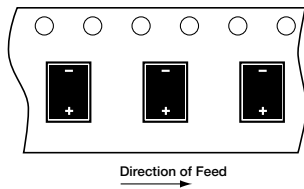


Taping Dimensions

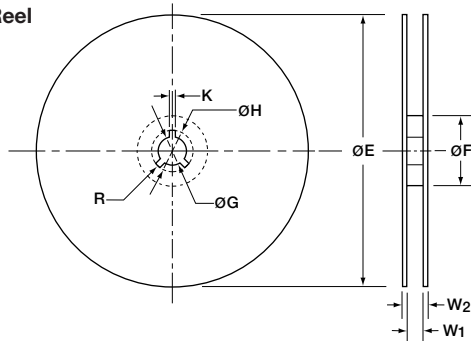
Dimension	Case Code					
	P	A	B2	D4	D6	D8
X ± 0.1	1.4 ± 0.2	1.9	3.1	4.8 ± 0.2	4.8 ± 0.2	4.8 ± 0.2
Y ± 0.1	2.2 ± 0.2	3.5	3.8	7.7 ± 0.2	7.7 ± 0.2	7.7 ± 0.2
W ± 0.3	8.0	8.0	8.0	12.0	12.0	12.0
E ± 0.1	1.75	1.75	1.75	1.75	1.75	1.75
F ± 0.05	3.5	3.5	3.5	5.5	5.5	5.5
P1 ± 0.1	4.0	4.0	4.0	8.0	8.0	8.0
P2 ± 0.05	2.0	2.0	2.0	2.0	2.0	2.0
P0 ± 0.1	4.0	4.0	4.0	4.0	4.0	4.0
øD +0.1, -0	1.5	1.5	1.5	1.5	1.5	1.5
T1	0.3	0.2 to 0.3	0.2 to 0.3	0.2 to 0.3	0.2 to 0.3	0.4
T2 ± 0.2	1.7 Max.	2.0 Max.	2.2	2.5	3.6	4.6

Orientation of Component Polarity

Taping Code: TER (standard)



Reel



Reel Dimensions and Quantity Per Reel

Dimension	Case Code					
	P	A	B2	D4	D6	D8
øE +0, -3.0	180	180	180	180	180	180
øF +1.0, -0	60	60	60	60	60	60
øG ± 0.2	13	13	13	13	13	13
øH ± 0.8	21	21	21	21	21	21
K ± 0.5	2	2	2	2	2	2
W1 ± 0.3	9	9	9	13	13	13
W2 ± 1.0	11.4	11.4	11.4	15.4	15.4	15.4
R	1.0	1.0	1.0	1.0	1.0	1.0
Pieces Per Reel	3,000	2,000	2,000	500	500	500

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[United Chemi-Con \(UCC\):](#)

[4PT157MD4TER](#)