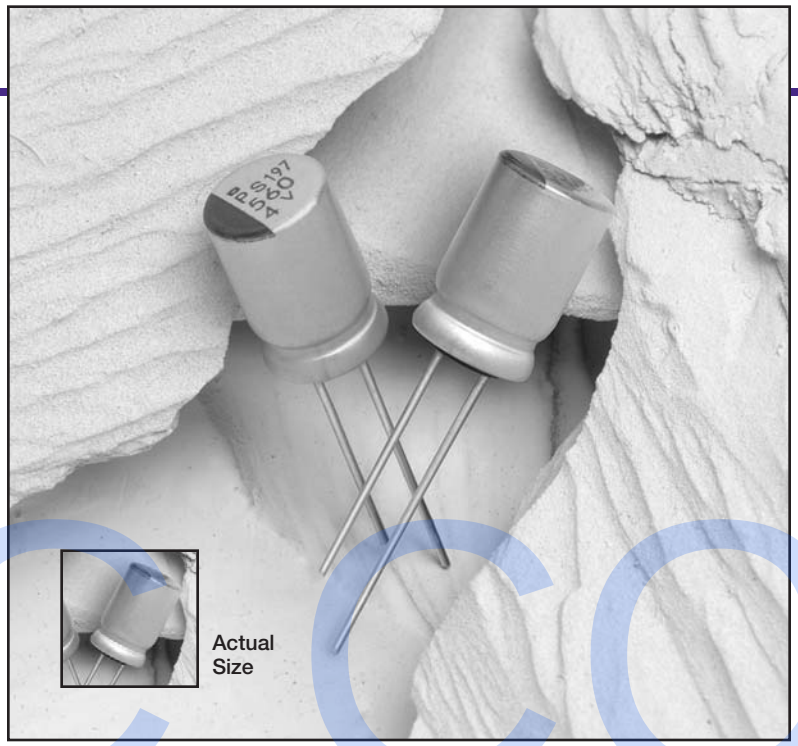
PS Series

UPGRADE
Engineering Bulletin Jul 03

UNITED CHEMI-CON

- Solid Functional Polymer Aluminum
- Radial Lead
- Ultra Low ESR
- Lead-Free Construction
- Solvent Proof
- +105°C Max. Temperature



The PS series is a radial lead miniature series of aluminum capacitors that uses a solid functional polymer as the electrolyte. This durable solid capacitor design allows more stable performance and higher reliability over the expected lifetime than normal liquid electrolyte capacitors. The PS series features large capacitance, ultra low ESR, high ripple current capability, and lead-free construction that can withstand the harsh environment of lead-free alloy soldering. The PS capacitors are suitable for DC-DC converters, voltage regulators, and decoupling applications for computer motherboards. The PS series has been upgraded to include new 20 and 25 volt models which are recommended as cost-effective replacements for OS-CON™ capacitors.

The PS 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

- **Radial lead terminals.**
- **Capacitance range: 68 to 1,500µF.**
- **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: ±20%**
- **Nominal case size (D×L): 8×11.5mm and 10×12.5mm.**
- **Rated lifetime: 2,000 hours at +105°C.**

PS Specifications

Item	Characteristics
Category Temperature Range	−55 to +105°C
Rated Voltage Range	2.5 to 25VDC
Capacitance Range	68 to 1,500µF
Capacitance Tolerance	±20% (M) at +20°C, 120Hz
Leakage Current	I = 0.2CV maximum after 2 minutes at +20°C. To verify maximum leakage current, apply the DC rated voltage to the capacitors for 120 minutes at +105°C before measurement. Where I = Max. leakage current (µA), C = Nominal capacitance (µF) and V = Rated voltage (V)
Dissipation Factor (Tan δ)	0.12 maximum at +20°C, 120Hz
Low Temperature Characteristics	At 100kHz, impedance (Z) ratio between the −25°C or −55°C value and +20°C value shall not exceed the values given below. Rated Voltage (V) | 2.5-25 Z(−25°C)/Z(+20°C) | ≤ 1.15 Z(−55°C)/Z(+20°C) | ≤ 1.25
Endurance (Load Life)	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. Appearance : no significant damage Capacitance change: ≤ ±20% of the initial measured value Tan δ (DF) : ≤ 150% of the initial specified value ESR : ≤ 150% of the initial specified value Leakage current : ≤ initial specified value
Bias Humidity Test	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. Appearance : no significant damage Capacitance change: ≤ ±20% of the initial measured value Tan δ (DF) : ≤ 150% of the initial specified value ESR : ≤ 150% of the initial specified value Leakage current : ≤ initial specified value
Surge Voltage Test	The following specifications shall be satisfied when the capacitors are restored to +20°C after the surge voltage at +105°C is applied 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. Appearance : no significant damage Capacitance change: ≤ ±20% of the initial measured value Tan δ (DF) : ≤ 150% of the initial specified value ESR : ≤ 150% of the initial specified value Leakage current : ≤ initial specified value
Failure Rate	1% maximum per 1,000 hours at +105°C with rated voltage applied. (Confidence level 60%)

Part Numbering System for PS Series

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

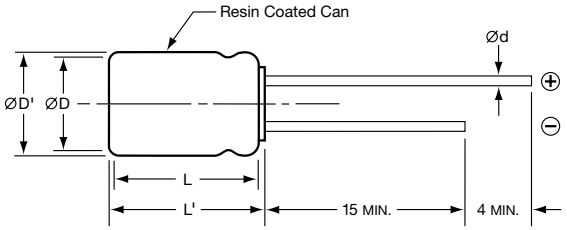
4 PS 560 M _ H11 T15

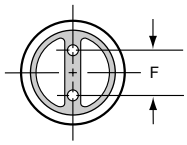
- T15: Lead Code: T15 = Ø8 (F = 3.5mm) in Tape & Ammo Pack Box.
  T14 = Ø10 (F = 5.0mm) in Tape & Ammo Pack Box.
  E = Optional 5mm Short Leads in Bulk.
  Blank = Standard Lead Length in Bulk.
- H11: Case Code: See Case Sizes in Tables.
- _: Design Code: Use only if design change code number is assigned by the factory. Ask United Chemi-Con for details.
- M: Capacitance Tolerance: M = ±20%
- 560: Capacitance Value: Expressed in Microfarads. An R indicates a decimal point (e.g. 2R2 = 2.2µF).
- PS: Series Name: Indicates Basic Capacitor Design.
- 4: DC Rated Voltage: Expressed in Volts (e.g. 4 = 4WVDC).
  Note: Prefix code 6 = 6.3WVDC; 2R5 = 2.5WVDC.

Diagram of Dimensions

Radial Lead

Unit: mm





Marking Example: 4V, 560µF

Refer to Packaging section for Miniature taping and ammo box specifications and Lead Configurations section for Miniature radial lead cut and lead forming options.

Case Code	ØD	L	ØD' max.	L' max.	Ød	F ± 0.5
H11	Ø8	11.5	ØD + 0.5	L + 1.5	0.6	3.5
J12	Ø10	12.5	ØD + 0.5	L + 1.5	0.6	5.0

Standard Voltage Ratings - Radial Lead

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 +105°C, 100kHz
2.5 Volts **2.9 Volts Surge**	680	2R5PS680MH11	8 × 11.5	H11	10	5,230
	1,500	2R5PS1500MJ12	10 × 12.5	J12	8	5,500
4 Volts **4.6 Volts Surge**	560	4PS560MH11	8 × 11.5	H11	10	5,230
	820	4PS820MJ12	10 × 12.5	J12	8	5,500
6.3 Volts **7.2 Volts Surge**	390	6PS390MH11	8 × 11.5	H11	12	4,770
	680	6PS680MJ12	10 × 12.5	J12	10	5,500
10 Volts **11.5 Volts Surge**	270	10PS270MH11	8 × 11.5	H11	14	4,420
	470	10PS470MJ12	10 × 12.5	J12	12	5,300
16 Volts **18.4 Volts Surge**	180	16PS180MH11	8 × 11.5	H11	16	4,360
	330	16PS330MJ12	10 × 12.5	J12	14	5,050
20 Volts **23 Volts Surge**	100	20PS100MH11	8 × 11.5	H11	24	3,320
	150	20PS150MJ12	10 × 12.5	J12	20	4,320
25 Volts **28.7 Volts Surge**	68	25PS68MH11	8 × 11.5	H11	24	3,320
	100	25PS100MJ12	10 × 12.5	J12	20	4,320

***Refer to diagram for detailed case sizes.**