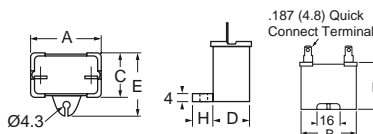


# Panasonic Dry Film AC Capacitors

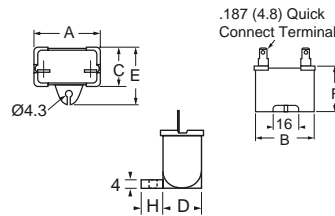
## Stack Type

Panasonic's "stack type" construction offers significant reduction in case size (compared to oil-filled can type) with a built-in mounting foot. **Features:** • Compact size compared to oil-filled type capacitors. • 0.187 inch (4.75mm) terminals standard (0.250 inch [6.35mm] available). • 180, 200, 230 are standard voltages. • U.L. 810 (File # E76560) and C.S.A listed. (CSA-C22.2 No. 0-M91 File # LR99617) • JIS standard is available. (JIS C 4908). • Primary applications: refrigeration, motor run, lighting, etc. • Flame retardant plastic case is rated 94 V-0.



## Wound Type

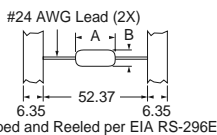
Panasonic's "wound type" construction brings dry film technology to higher voltage and microfarad applications, not available from our "stack type" construction. **Features:** • Replacement for typical oil-filled aluminum or plastic can capacitor. • Compact size — ideal where space is a premium. • Built-in mounting bracket eliminates need for mounting strap. • Meets U.L. 810 (File # E76560). • Primary applications: motor run, lighting, etc. • Terminals: 0.187 inch (4.75mm).



Voltage VAC	Cap. µF	Dimensions								Digi-Key Part No.	Pricing				Panasonic Part No.
		A	B	C	D	E	F	H	1		10	100	500		
Stack Type - SQ Case															
180	7.5	39.5	38.0	17.5	16.0	28.0	30.5	11.0	P9400-ND	3.38	27.00	229.50	1012.50	JSU18X755AQF	
180	10	39.5	38.0	22.0	20.5	32.5	30.5	11.0	P9401-ND	4.03	32.20	273.70	1207.50	JSU18X106AQJ	
180	12	39.5	38.0	22.0	20.5	34.2	32.0	13.0	P9402-ND	4.50	36.00	306.00	1350.00	JSU18X126AQH	
180	15	39.5	38.0	26.7	25.2	37.0	32.0	11.0	P9403-ND	5.03	40.20	341.70	1507.50	JSU18X156AQP	
180	20	39.5	38.0	26.7	25.2	37.0	41.0	11.0	P9404-ND	6.43	51.40	436.90	1927.50	JSU18X206AQD	
210	10	39.5	38.0	22.0	20.5	34.2	32.0	13.0	P9405-ND	4.15	33.20	282.20	1245.00	JSU21X106AQB	
210	12	39.5	38.0	26.7	25.2	37.0	32.0	11.0	P9406-ND	4.65	37.20	316.20	1395.00	JSU21X126AQE	
210	15	39.5	38.0	26.7	25.2	37.0	32.0	11.0	P9407-ND	5.58	44.60	379.10	1672.50	JSU21X156AQH	
230	10	39.5	38.0	22.0	20.5	34.2	32.0	13.0	P9408-ND	4.88	39.00	331.50	1462.50	JSU23X106AQC	
230	12	39.5	38.0	26.7	25.2	37.0	32.0	11.0	P9409-ND	5.38	43.00	365.50	1612.50	JSU23X126AQE	
230	15	39.5	38.0	26.7	25.2	37.0	41.0	11.0	P9410-ND	6.95	55.60	472.60	2085.00	JSU23X156AQE	
Wound Type - O Case															
250	10	49.7	48.3	24.0	22.5	34.5	34.5	11.5	P9411-ND	6.68	53.40	453.90	2002.50	SPU25X106AQSD	
250	12	50.0	48.5	26.7	25.3	37.5	38.0	11.5	P9412-ND	7.60	60.80	516.80	2280.00	SPU25X126AQSA	
250	15	50.0	48.5	30.5	28.8	41.0	36.0	11.5	P9413-ND	8.98	71.80	610.30	2692.50	SPU25X156AQSA	



## Axial Ceramic Capacitors



Taped and Reeled per EIA RS-296E

Size Code	A	B
15	3.81mm Max	2.54mm Max
20	5.08mm Max	3.05mm Max
29	7.37mm Max	3.81mm Max

### MECHANICAL PARAMETERS:

**Terminal Strength:** 2.2 Kg (5 lbs) Minimum pull to destruction, per Method B5 of RS-198-CII, Test Condition A.  
**Lead Materials:** #24 AWG (.020" ±0.001") Tinned, Copper Clad Steel. 30% Conductivity. Temper: Soft; Tensile Strength: 65000 PSI Max.  
**Body:** Conformally coated Epoxy.

### ELECTRICAL PARAMETERS:

**Capacitance:** Measured @ 1MHz @ 1.0 ±0.2 VRMS @ 25°C for COG types with C ≤1000pF.

Measured @ Khz @ 1.0 ±0.2 VRMS @ 25°C for COG types with C >1000pF. Measured @ 1Khz @ 1.0 VRMS ±2 VRMS @ 25°C for X7R types. Measure @ 1Khz @ .0.5 VRMS ±.1 VRMS @ 25°C for Z5U types.

**Dissipation Factor:** .1% Maximum for COG types, 2.5% Maximum for X7R types and 4.0% for Z5U types; measurement conditions are the same as for capacitance measurement.

**Dielectric Strength:** Parts are subjected for up to 5 seconds @ 25°C to 250% of Rated Voltage and will exhibit no evidence of breakdown.

**Insulation Resistance:** When measured @ 25°C and Rated Voltage, the following Minimum Values will be met: 100K MegΩ or 1000QF (whichever is less) for COG and X7R types, 10K MegΩ or 1000QF (whichever is less) for Z5U types.

**Body Insulation:** 500VDC Minimum, in accordance with RS-198-CII.

**Operating Temperature Range:** -55°C to +125°C for COG, -55°C to +125°C for X7R, -55°C to +85°C for Z5U

**Packaging:** Mono-Axial parts are supplied in tape and reel and form per EIA RS-296.

Type	Volt.	Cap.	Cap. Tol.(%)	Size Code	Digi-Key Part No.	Cut Tape Pricing			Digi-Key Part No.	Tape & Reel Pricing		BC Components Part No.
						10	100	1,000		5,000	10,000	
COG	100V	10pf	±5	15	1011PHCT-ND	1.91	13.81	95.63	1011PHTR-ND	63.75/M	59.50/M	A100J15C0GHVVWA
		15pf	±5	15	1012PHCT-ND	1.91	13.81	95.63	1012PHTR-ND	63.75/M	59.50/M	A150J15C0GHVVWA
		18pf	±5	15	1013PHCT-ND	1.91	13.81	95.63	1013PHTR-ND	63.75/M	59.50/M	A180J15C0GHVVWA
		22pf	±5	15	1014PHCT-ND	1.91	13.81	95.63	1014PHTR-ND	63.75/M	59.50/M	A220J15C0GHVVWA
		27pf	±5	15	1015PHCT-ND	1.91	13.81	95.63	1015PHTR-ND	63.75/M	59.50/M	A270J15C0GHVVWA
		33pf	±5	15	1016PHCT-ND	1.91	13.81	95.63	1016PHTR-ND	63.75/M	59.50/M	A330J15C0GHVVWA
		47pf	±5	15	1017PHCT-ND	1.95	14.11	97.65	1017PHTR-ND	65.10/M	60.76/M	A470J15C0GHVVWA
		68pf	±5	15	1018PHCT-ND	1.99	14.37	99.45	1018PHTR-ND	66.30/M	61.88/M	A680J15C0GHVVWA
		82pf	±5	15	1019PHCT-ND	2.03	14.63	101.25	1019PHTR-ND	67.50/M	63.00/M	A820J15C0GHVVWA
	50V	100pf	±5	15	1001PHCT-ND	2.03	14.63	101.25	1001PHTR-ND	67.50/M	63.00/M	A101J15C0GFVWA
		150pf	±5	15	1002PHCT-ND	2.14	15.47	107.10	1002PHTR-ND	71.40/M	66.64/M	A151J15C0GFVWA
		180pf	±5	15	1003PHCT-ND	2.14	15.47	107.10	1003PHTR-ND	71.40/M	66.64/M	A181J15C0GFVWA
		220pf	±5	15	1004PHCT-ND	2.14	15.47	107.10	1004PHTR-ND	71.40/M	66.64/M	A221J15C0GFVWA
		330pf	±5	15	1005PHCT-ND	2.14	15.47	107.10	1005PHTR-ND	71.40/M	66.64/M	A331J15C0GFVWA
		390pf	±5	15	1006PHCT-ND	2.14	15.47	107.10	1006PHTR-ND	71.40/M	66.64/M	A391J15C0GFVWA
		470pf	±5	15	1007PHCT-ND	2.14	15.47	107.10	1007PHTR-ND	71.40/M	66.64/M	A471J15C0GFVWA
		560pf	±5	15	1008PHCT-ND	2.14	15.47	107.10	1008PHTR-ND	71.40/M	66.64/M	A561J15C0GFVWA
		680pf	±5	15	1009PHCT-ND	2.14	15.47	107.10	1009PHTR-ND	71.40/M	66.64/M	A681J15C0GFVWA
1000pf	±5	15	1010PHCT-ND	2.37	17.13	118.58	1010PHTR-ND	79.05/M	73.78/M	A102J15C0GFVWA		
X7R	100V	220pf	±10	15	1110PHCT-ND	1.84	13.26	91.80	1110PHTR-ND	61.20/M	57.12/M	A221K15X7RHVVWA
		270pf	±10	15	1111PHCT-ND	1.84	13.26	91.80	1111PHTR-ND	61.20/M	57.12/M	A271K15X7RHVVWA
		330pf	±10	15	1112PHCT-ND	1.84	13.26	91.80	1112PHTR-ND	61.20/M	57.12/M	A331K15X7RHVVWA
		470pf	±10	15	1113PHCT-ND	1.84	13.26	91.80	1113PHTR-ND	61.20/M	57.12/M	A471K15X7RHVVWA
		680pf	±10	15	1114PHCT-ND	1.84	13.26	91.80	1114PHTR-ND	61.20/M	57.12/M	A681K15X7RHVVWA
		820pf	±10	15	1115PHCT-ND	1.84	13.26	91.80	1115PHTR-ND	61.20/M	57.12/M	A821K15X7RHVVWA
		.001µf	±10	15	1116PHCT-ND	1.84	13.26	91.80	1116PHTR-ND	61.20/M	57.12/M	A102K15X7RHVVWA
		.0012µf	±10	15	1117PHCT-ND	1.84	13.26	91.80	1117PHTR-ND	61.20/M	57.12/M	A122K15X7RHVVWA
		.0015µf	±10	15	1118PHCT-ND	1.84	13.26	91.80	1118PHTR-ND	61.20/M	57.12/M	A152K15X7RHVVWA
	.0022µf	±10	15	1119PHCT-ND	1.84	13.26	91.80	1119PHTR-ND	61.20/M	57.12/M	A222K15X7RHVVWA	
	50V	.0033µf	±10	15	1101PHCT-ND	1.87	13.52	93.60	1101PHTR-ND	62.40/M	58.24/M	A332K15X7RFVWVA
		.0047µf	±10	15	1102PHCT-ND	1.87	13.52	93.60	1102PHTR-ND	62.40/M	58.24/M	A472K15X7RFVWVA
		.01µf	±10	15	1103PHCT-ND	2.19	15.88	59.40	1103PHTR-ND	39.60/M	36.96/M	A103K15X7RFVWVA
		.015µf	±10	15	1104PHCT-ND	2.14	15.47	107.10	1104PHTR-ND	71.40/M	66.64/M	A153K15X7RFVWVC
		.022µf	±10	15	1105PHCT-ND	2.37	17.13	118.58	1105PHTR-ND	79.05/M	73.78/M	A223K15X7RFVWVE
		.033µf	±10	15	1106PHCT-ND	2.57	18.53	128.25	1106PHTR-ND	85.50/M	79.80/M	A333K15X7RFVWVG
		.047µf	±10	20	1107PHCT-ND	2.64	19.08	132.08	1107PHTR-ND	88.05/M	82.18/M	A473K20X7RFVWVJ
		.056µf	±10	20	1108PHCT-ND	2.87	20.74	143.55	1108PHTR-ND	95.70/M	89.32/M	A563K20X7RFVWVK
.1µf		±10	29	1109PHCT-ND	3.44	24.86	172.13	1109PHTR-ND	114.75/M	107.10/M	A104K20X7RFVWVN	
Z5U	50V	.01µf	±20	15	1206PHCT-ND	1.15	8.29	57.38	1206PHTR-ND	38.25/M	35.70/M	A103M15Z5UFVWVA
		.01µf	+80, -20	15	1201PHCT-ND	1.15	8.29	57.38	1201PHTR-ND	38.25/M	35.70/M	A103Z15Z5UFVWVA
		.022µf	±20	15	1207PHCT-ND	1.38	9.95	68.85	1207PHTR-ND	45.90/M	42.84/M	A223M15Z5UFVWVE
		.033µf	±20	15	1208PHCT-ND	1.38	9.95	68.85	1208PHTR-ND	45.90/M	42.84/M	A333M15Z5UFVWVG
		.047µf	±20	15	1209PHCT-ND	1.45	10.50	72.68	1209PHTR-ND	48.45/M	45.22/M	A473M15Z5UFVWVJ
		.047µf	+80, -20	15	1202PHCT-ND	1.38	9.95	68.85	1202PHTR-ND	45.90/M	42.84/M	A473Z15Z5UFVWVJ
		.1µf	±20	15	1210PHCT-ND	1.15	8.29	57.38	1210PHTR-ND	38.25/M	35.70/M	A103M15Z5UFVWVN
		.1µf	+80, -20	15	1203PHCT-ND	1.15	8.29	57.38	1203PHTR-ND	38.25/M	35.70/M	A104Z15Z5UFVWVN
		.22µf	±20	20	1211PHCT-ND	3.02	21.84	151.20	1211PHTR-ND	100.80/M	94.08/M	A224M20Z5UFVWVT
	.22µf	+80, -20	20	1204PHCT-ND	2.95	21.29	147.38	1204PHTR-ND	98.25/M	91.70/M	A224Z20Z5UFVWVT	
	.27µf	+80, -20	29	1212PHCT-ND	2.95	21.29	147.38	1212PHTR-ND	98.25/M	91.70/M	A274Z20Z5UFVWVW	
	.33µf	±20	29	1213PHCT-ND	3.06	22.10	153.00	1213PHTR-ND	102.00/M	95.20/M	A334M20Z5UFVWVW	
	.33µf	+80, -20	29	1205PHCT-ND	2.98	21.55	149.18	1205PHTR-ND	99.45/M	92.82/M	A334Z20Z5UFVWVW	
	.47µf	+80, -20	29	1214PHCT-ND	5.70	41.18	285.08	1214PHTR-ND	190.05/M	177.38/M	A474Z20Z5UFVWVY	

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