

## Aluminum Capacitors + 85 °C, Snap-In, General Purpose

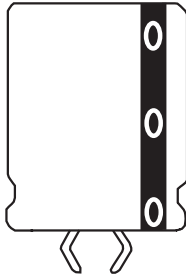


Fig.1 Component Outlines

### FEATURES

- Economical
- General purpose design
- Wide voltage range



QUICK REFERENCE DATA	
DESCRIPTION	VALUE
Nominal case size ØD x L in mm	0.87" x 1.00" (22.0 x 25.0) to 1.38" x 3.15" (35.0 x 80.0)
Operating temperature	- 40 °C to + 85 °C
Rated capacitance range, C <sub>R</sub>	39 µF to 180 000 µF
Tolerance on C <sub>R</sub>	± 20 %
Rated voltage range, U <sub>R</sub>	6.3 WVDC to 450 WVDC
Termination	Snap in
Life validation test at 85 °C	2000 hours: Δ CAP ≤ 15 % from initial measurement. Δ ESR ≤ 1.5 x initial specified limit. Δ DCL ≤ initial specified limit
Shelf life at 85 °C	500 hours: Δ CAP ≤ 15 % from initial measurement. Δ ESR ≤ 1.3 x initial specified limit. Δ DCL ≤ 2 x initial specified limit
DC leakage current	$I = K \sqrt{CV}$ K = 4.0 at + 25 °C I in µA, C in µF, V in Volts

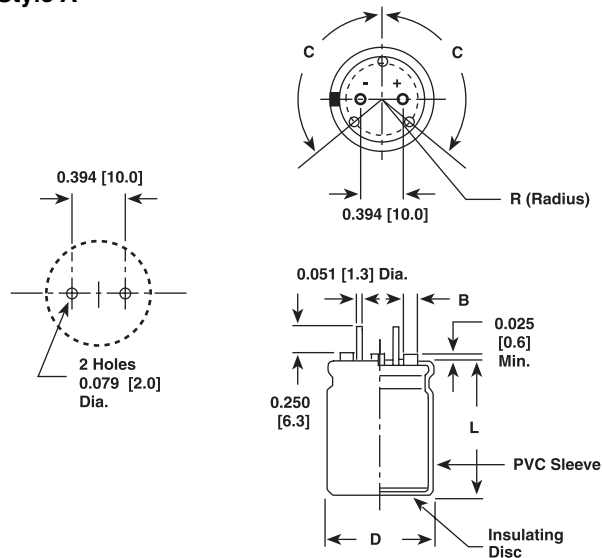
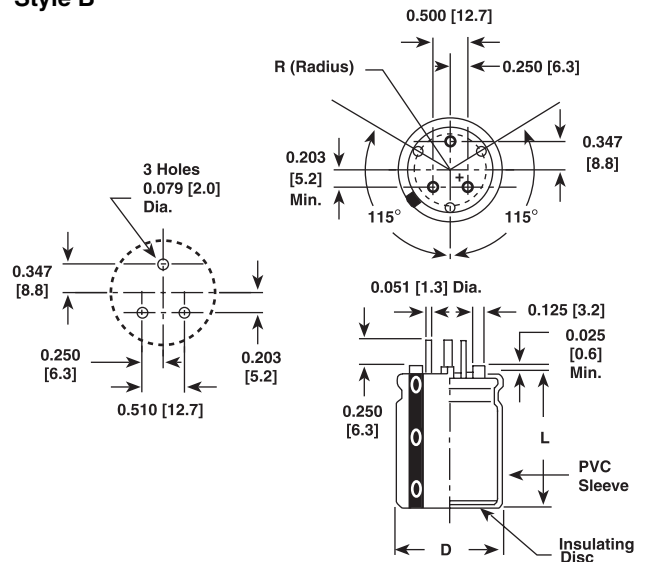
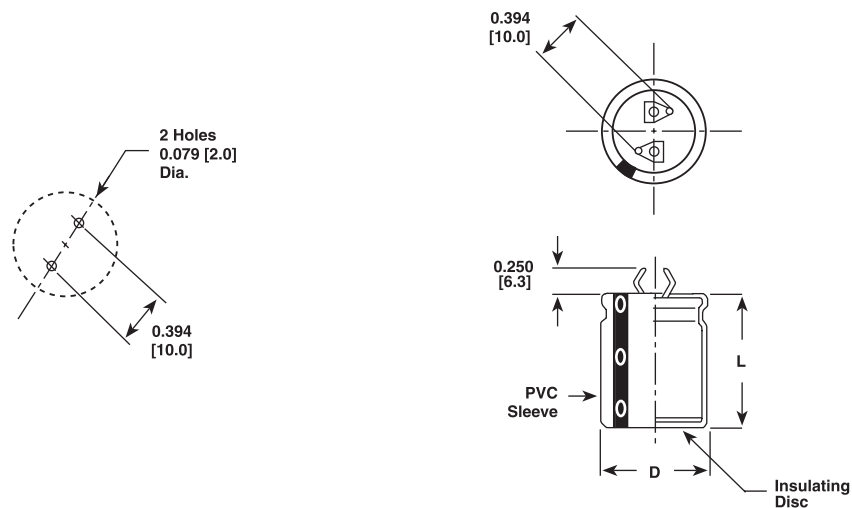
RIPPLE CURRENT MULTIPLIERS				
TEMPERATURE				
AMBIENT TEMPERATURE		MULTIPLIERS		
+ 55 °C		2.0		
+ 65 °C		1.7		
+ 75 °C		1.4		
+ 85 °C		1.0		
FREQUENCY (Hz)				
WVDC	50 TO 60	300 TO 1000	1000 AND UP	
16 - 49	0.85	1.10	1.15	
50 - 199	0.83	1.15	1.20	
200 - 400	0.80	1.30	1.40	
ESL (TYPICAL VALUES AT 1 MHz TO 10 MHz)				
Nominal Diameter	0.87 (22.0)	0.98 (25.0)	1.18 (30.0)	1.38 (35.0)
Typical ESL (nH)	6.0	8.0	10.0	12.0

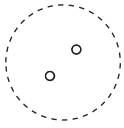
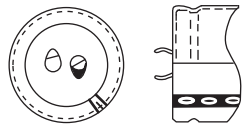
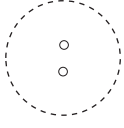
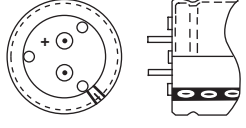
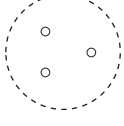
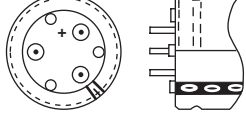
DIMENSIONS in inches (millimeters)					
CASE CODE	DIAMETER	LENGTH	CASE CODE	DIAMETER	LENGTH
	D + 0.04 - 0 (+ 1.0 - 0)	L ± 0.08 (2.0)		D + 0.04 - 0 (+ 1.0 - 0)	L ± 0.08 (2.0)
HA	0.87 (22.0)	1.00 (25.0)	KC	1.18 (30.0)	1.38 (35.0)
HB	0.87 (22.0)	1.18 (30.0)	KD	1.18 (30.0)	1.57 (40.0)
HD	0.87 (22.0)	1.57 (40.0)	KE	1.18 (30.0)	2.00 (50.0)
JA	1.00 (25.0)	1.00 (25.0)	MB	1.38 (35.0)	1.18 (30.0)
JB	1.00 (25.0)	1.18 (30.0)	MC	1.38 (35.0)	1.38 (35.0)
JC	1.00 (25.0)	1.38 (35.0)	MD	1.38 (35.0)	1.57 (40.0)
JD	1.00 (25.0)	1.57 (40.0)	ME	1.38 (35.0)	2.00 (50.0)
JE	1.00 (25.0)	2.00 (50.0)	MF	1.38 (35.0)	2.50 (63.0)
KA	1.18 (30.0)	1.00 (25.0)	MG	1.38 (35.0)	3.18 (80.0)
KB	1.18 (30.0)	1.18 (30.0)			

<b>DIMENSIONS</b> in inches (millimeters)					
CIRCUIT BOARD MOUNT TERMINAL DIMENSIONS <sup>(1)</sup>					
DIAMETER		STYLE A			STYLE B
D	CASE CODE	B	R	C	R
1.00 (25.0)	J	0.093 (2.4)	0.301 (7.6)	140°	N/A
1.18 (30.0)	K	0.125 (3.2)	0.363 (9.2)	120°	0.391 (9.9)
1.38 (35.0)	M	0.125 (3.2)	0.458 (11.6)	120°	0.458 (11.6)

**Note**

(1) Style A and B not available in 0.87" (22.0mm) diameter units

**DIMENSIONS AND AVAILABLE FORMS**
**Style A**

**Style B**

**Style D**


<b>TERMINAL CONFIGURATION</b> (numbers in brackets indicate millimeters)					
LEAD CODE	DESCRIPTION	OUTLINE DRAWINGS		AVAILABLE DIAMETERS	AVAILABLE VOLTAGES AND TYPES
		MOUNTING CONFIGURATION	TERMINAL CONFIGURATION		
D	Standard 2 pin snap-in			0.87 (22.0) - H 0.98 (25.0) - J 1.18 (30.0) - K 1.38 (35.0) - M	All voltages 81D, 81DA 82D, 82DA
A	2 straight wire lead molded cover with standoffs			0.98 (25.0) - J 1.18 (30.0) - K 1.38 (35.0) - M	All voltages 82D, 82DA  $V \leq 250 V_{DC}$ 81D, 81DA
B	3 straight wire lead molded cover with standoffs			1.18 (30.0) - K 1.38 (35.0) - M	All voltages 82D, 82DA  $V \leq 250 V_{DC}$ 81D, 81DA

**ORDERING EXAMPLE**

Electrolytic capacitor 82D series:

82D 122 M 050 HA 2 D E3

<b>DESCRIPTION</b>	
CODE	EXPLANATION
82D	product type
122	capacitance value (1200 $\mu$ F)
M	tolerance (M = $\pm 20\%$ )
50	voltage rating at 85 °C (50 V)
HA	can size (see dimensions table)
2	pvc insulating sleeve
D	terminal style (D = 2 pin snap-in)
E3	RoHS compliant

<b>ELECTRICAL DATA AND ORDERING INFORMATION</b>						
CAPACITANCE ( $\mu$ F)	PART NUMBER	NOMINAL CASE SIZE D x L	MAX. ESR at 25 °C (m $\Omega$ )		MAX. RIPPLE at + 85 °C (A)	
			120 Hz	20 to 40 kHz	120 Hz	20 to 40 kHz
<b>16 WVDC at + 85 °C, SURGE = 20 V</b>						
10 000.0	82D103M016HB2D	0.866 x 1.181 (22.0 x 30.0)	86.0	63.0	2.38	2.80
15 000.0	82D153M016HD2D	0.866 x 1.575 (22.0 x 40.0)	57.7	42.0	3.25	3.83
15 000.0 <sup>(1)</sup>	82D153M016JC2D	0.984 x 1.378 (25.0 x 35.0)	58.0	43.0	3.33	3.87
22 000.0	82D223M016KB2D	1.181 x 1.181 (30.0 x 30.0)	53.7	41.0	3.70	4.20
33 000.0	82D333M016KD2D	1.181 x 1.575 (30.0 x 40.0)	35.3	27.0	5.00	5.77
33 000.0	82D333M016MC2D	1.378 x 1.378 (35.0 x 35.0)	28.0	21.0	5.96	6.87
47 000.0	82D473M016MD2D	1.378 x 1.575 (35.0 x 40.0)	23.0	17.0	6.86	6.65

Aluminum Capacitors  
+ 85 °C, Snap-In, General Purpose

Vishay Sprague

<b>ELECTRICAL DATA AND ORDERING INFORMATION</b>						
CAPACITANCE ( $\mu$ F)	PART NUMBER	NOMINAL CASE SIZE D x L	MAX. ESR at 25 °C (m $\Omega$ )		MAX. RIPPLE at + 85 °C (A)	
			120 Hz	20 to 40 kHz	120 Hz	20 to 40 kHz
<b>25 WVDC at + 85 °C, SURGE = 30 V</b>						
3300.0	82D332M025HA2D	0.866 x 0.984 (22.0 x 25.0)	110.0	76.0	1.98	2.39
4700.0 <sup>(1)</sup>	82D472M025HB2D	0.866 x 1.181 (22.0 x 30.0)	85.0	58.0	2.40	2.91
6800.0	82D682M025JB2D	0.984 x 1.181 (25.0 x 30.0)	67.0	47.0	2.94	3.49
10 000.0	82D103M025JD2D	0.984 x 1.545 (25.0 x 40.0)	43.4	31.0	4.22	4.96
15 000.0	82D153M025JE2D	0.984 x 1.969 (25.0 x 50.0)	33.9	24.0	4.97	5.96
6800.0	82D682M025KA2D	1.181 x 0.984 (30.0 x 25.0)	71.0	54.0	3.00	3.47
10 000.0	82D103M025KB2D	1.181 x 1.181 (30.0 x 30.0)	54.0	41.0	3.70	4.20
15 000.0	82D153M025KD2D	1.181 x 1.575 (30.0 x 40.0)	36.4	27.0	5.00	5.77
22 000.0	82D223M025MD2D	1.378 x 1.575 (35.0 x 40.0)	23.0	17.0	6.84	7.96
<b>35 WVDC at + 85 °C, SURGE = 40 V</b>						
2200.0	82D222M035HA2D	0.866 x 0.984 (22.0 x 25.0)	121.0	76.0	1.88	2.39
3300.0	82D332M035HB2D	0.866 x 1.181 (22.0 x 30.0)	92.0	57.0	2.30	2.94
4700.0	82D472M035JB2D	0.984 x 1.181 (25.0 x 30.0)	72.0	47.0	2.82	3.49
6800.0	82D682M035JD2D	0.984 x 1.575 (25.0 x 40.0)	46.6	30.0	4.08	5.08
10000.0	82D103M035JE2D	0.984 x 1.969 (25.0 x 50.0)	36.3	24.0	4.87	5.96
4700.0	82D472M035KA2D	1.181 x 0.984 (30.0 x 25.0)	75.0	54.0	2.92	3.42
12 000.0	82D123M035KD2D	1.181 x 1.575 (30.0 x 40.0)	37.7	27.0	4.89	5.77
10 000.0 <sup>(1)</sup>	82D103M035MB2D	1.378 x 1.181 (35.0 x 30.0)	36.0	24.0	4.97	6.10
15 000.0	82D153M035MD2D	1.378 x 1.575 (35.0 x 40.0)	25.0	16.3	6.57	8.13
<b>50 WVDC at + 85 °C, SURGE = 63 V</b>						
1200.0	82D122M050HA2D	0.866 x 0.984 (22.0 x 25.0)	148.0	79.0	1.71	2.32
1800.0	82D182M050HB2D	0.866 x 1.181 (22.0 x 30.0)	108.0	58.0	2.12	2.90
2200.0	82D222M050JB2D	0.984 x 1.181 (25.0 x 30.0)	85.0	48.0	2.61	3.49
3900.0	82D392M050JD2D	0.984 x 1.575 (25.0 x 40.0)	53.6	31.0	3.79	4.96
2700.0	82D272M050KA2D	1.181 x 0.984 (30.0 x 25.0)	85.0	54.0	2.73	3.42
4700.0 <sup>(1)</sup>	82D472M050MB2D	1.378 x 1.181 (35.0 x 30.0)	43.0	24.0	4.56	6.10
6800.0	82D682M050MD2D	1.378 x 1.575 (35.0 x 40.0)	28.0	16.0	6.21	8.21
10 000.0	82D103M050ME2D	1.378 x 1.969 (35.0 x 50.0)	22.0	13.0	7.60	9.87
<b>63 WVDC at + 85 °C, SURGE = 79 V</b>						
1000.0 <sup>(1)</sup>	82D102M063HA2D	0.866 x 0.984 (22.0 x 25.0)	151.0	75.0	1.69	2.39
1500.0	82D152M063JA2D	0.984 x 0.984 (25.0 x 25.0)	121.0	63.0	2.05	2.86
2200.0	82D222M063JC2D	0.984 x 1.378 (25.0 x 35.0)	72.0	38.0	2.97	4.09
3300.0	82D332M063JD2D	0.984 x 1.575 (25.0 x 40.0)	57.0	30.0	3.69	5.08
3300.0	82D332M063KB2D	1.181 x 1.181 (30.0 x 30.0)	68.0	41.0	3.28	4.20
6800.0	82D682M063KE2D	1.181 x 1.969 (30.0 x 50.0)	34.0	22.0	5.56	6.89
4700.0	82D472M063MC2D	1.378 x 1.378 (35.0 x 35.0)	36.0	20.0	5.24	7.04
<b>100 WVDC at + 85 °C, SURGE = 125 V</b>						
470.0	82D471M100HB2D	0.866 x 1.181 (22.0 x 30.0)	258.0	114.0	1.37	2.07
680.0	82D681M100JB2D	0.984 x 1.181 (25.0 x 30.0)	188.0	86.0	1.75	2.59
1000.0	82D102M100KB2D	1.181 x 1.181 (30.0 x 30.0)	136.0	66.0	2.31	3.31
1500.0	82D152M100KC2D	1.181 x 1.378 (30.0 x 35.0)	106.0	52.0	2.75	3.95
2200.0	82D222M100KE2D	1.181 x 1.969 (30.0 x 50.0)	66.0	33.0	4.02	5.69

<b>ELECTRICAL DATA AND ORDERING INFORMATION</b>						
CAPACITANCE ( $\mu$ F)	PART NUMBER	NOMINAL CASE SIZE D x L	MAX. ESR at 25 °C (m $\Omega$ )		MAX. RIPPLE at + 85 °C (A)	
			120 Hz	20 to 40 kHz	120 Hz	20 to 40 kHz
<b>200 WVDC at + 85 °C, SURGE = 250V</b>						
150.0	82D151M200HA2D	0.866 x 0.984 (22.0 x 25.0)	1012.0	361.0	0.697	1.17
220.0	82D221M200HB2D	0.866 x 1.181 (22.0 x 30.0)	594.0	255.0	0.967	1.48
330.0	82D331M200HD2D	0.866 x 1.575 (22.0 x 40.0)	381.0	165.0	1.35	2.06
220.0	82D221M200JA2D	0.984 x 0.984 (25.0 x 25.0)	625.0	272.0	0.967	1.46
470.0	82D471M200JD2D	0.984 x 1.575 (25.0 x 40.0)	271.0	121.0	1.79	2.68
330.0	82D331M200KA2D	1.181 x 0.984 (30.0 x 25.0)	498.0	192.0	1.21	1.96
470.0	82D471M200KB2D	1.181 x 1.181 (30.0 x 30.0)	294.0	136.0	1.64	2.48
680.0	82D681M200KD2D	1.181 x 1.575 (30.0 x 40.0)	221.0	87.0	2.14	3.41
1000.0	82D102M200KE2D	1.181 x 1.969 (30.0 x 50.0)	142.0	67.0	2.89	4.22
820.0	82D821M200MC2D	1.378 x 1.378 (35.0 x 35.0)	189.0	93.0	2.46	3.51
1000.0	82D102M200MD2D	1.378 x 1.575 (35.0 x 40.0)	149.0	74.0	2.88	3.41
<b>250 WVDC at + 85 °C, SURGE = 300V</b>						
120.0	82D121M250HA2D	0.866 x 0.984 (22.0 x 25.0)	1077.0	385.0	68.00	1.17
180.0	82D181M250HB2D	0.866 x 1.181 (22.0 x 30.0)	722.0	261.0	88.00	1.52
220.0	82D221M250JB2D	0.984 x 1.181 (25.0 x 30.0)	513.0	189.0	1.13	1.94
330.0	82D331M250JD2D	0.984 x 1.575 (25.0 x 40.0)	382.0	121.0	1.51	2.79
470.0	82D471M250MB2D	1.378 x 1.181 (35.0 x 30.0)	281.0	117.0	1.92	3.07
680.0	82D681M250MD2D	1.378 x 1.575 (35.0 x 40.0)	209.0	74.0	2.43	4.26
1000.0	82D102M250ME2D	1.378 x 1.969 (35.0 x 50.0)	132.0	58.0	3.32	5.21
<b>400 WVDC at + 85 °C, SURGE = 450 V</b>						
47.0	82D470M400HA2D	0.866 x 0.984 (22.0 x 25.0)	4310.0	2450.0	0.34	0.45
68.0	82D680M400JA2D	0.984 x 0.984 (25.0 x 25.0)	3020.0	1720.0	0.44	0.58
100.0	82D101M400JB2D	0.984 x 1.181 (25.0 x 30.0)	2060.0	1176.0	0.56	0.74
150.0	82D151M400KB2D	1.181 x 1.181 (30.0 x 30.0)	1430.0	820.0	0.76	1.00
220.0	82D221M400KD2D	1.181 x 1.575 (30.0 x 40.0)	820.0	470.0	1.10	1.46
330.0	82D331M400MD2D	1.378 x 1.575 (35.0 x 40.0)	630.0	360.0	1.39	1.85
<b>450 WVDC at + 85 °C, SURGE = 500 V</b>						
39.0	82D390M450HA2D	0.866 x 0.984 (22.0 x 25.0)	4690.0	2460.0	0.32	0.45
56.0	82D560M450JA2D	0.984 x 0.984 (25.0 x 25.0)	3280.0	1730.0	0.42	0.58
100.0	82D101M450JC2D	0.984 x 1.378 (25.0 x 35.0)	1730.0	915.0	0.65	0.89
150.0	82D151M450KC2D	1.181 x 1.378 (30.0 x 35.0)	1150.0	610.0	0.89	1.22
220.0	82D221M450MC2D	1.378 x 1.378 (35.0 x 35.0)	870.0	460.0	1.14	1.56
330.0	82D331M450ME2D	1.378 x 1.969 (35.0 x 50.0)	510.0	274.0	1.68	2.29

**Note**

- Additional Part Numbers in stock include 82D222M050HD2D, 82D472M050JE2D and 82D681M250MD2D. Many other capacitance ratings and voltages are available upon request. Please call for a quotation.



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