

## Aluminum Capacitors + 105 °C, Snap-In

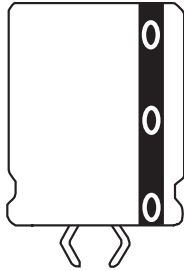


Fig.1 Component Outlines

### FEATURES

- Operating temperature to + 105 °C
- High ripple current capability
- Low ESR



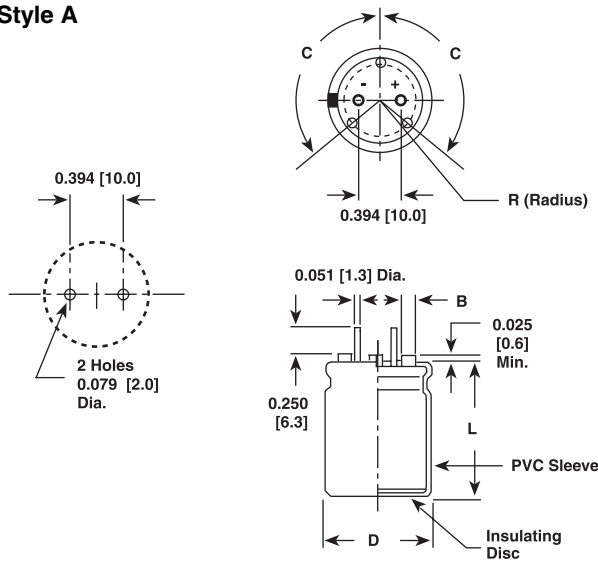
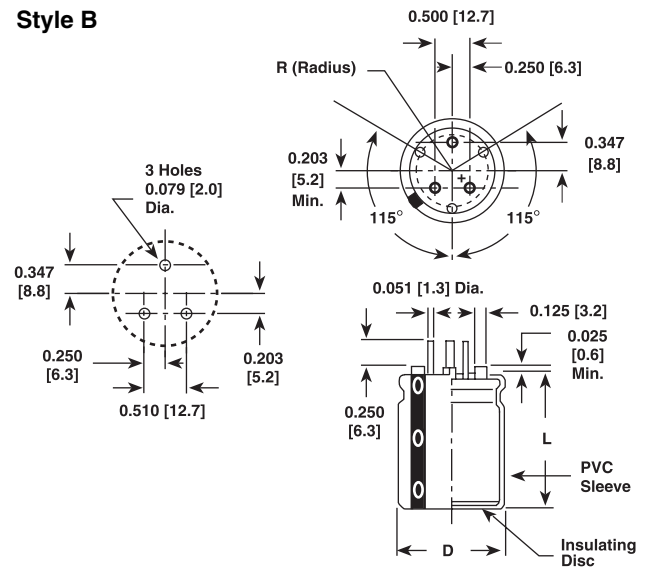
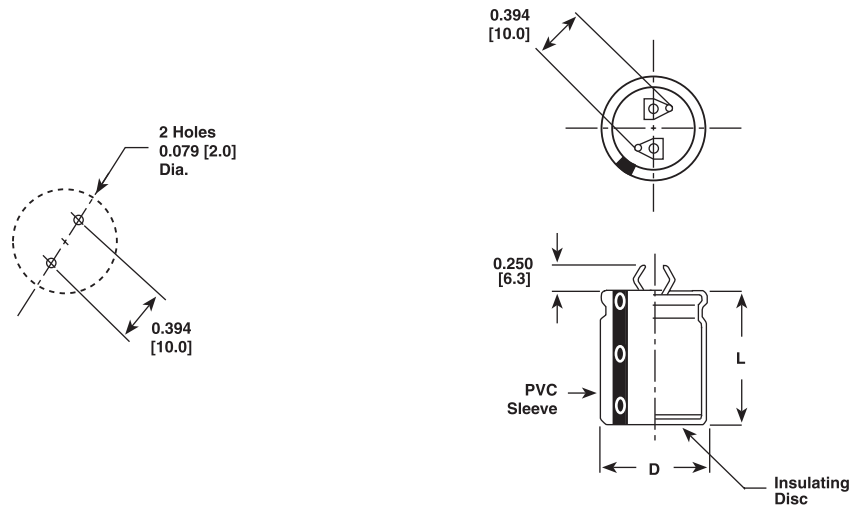
QUICK REFERENCE DATA	
DESCRIPTION	VALUE
Nominal case size Ø D x L in mm	0.87" x 1.00" (22.0 x 25.0) to 1.38" x 3.15" (35.0 x 80.0)
Operating temperature	- 40 °C to + 105 °C
Rated capacitance range C <sub>R</sub>	68 µF to 47 000 µF
Capacitance tolerance	± 20 %
Voltage rating	16 WVDC to 400 WVDC
Termination	Snap mount
Life validation test at 105 °C	2000 h: Δ CAP ≤ 15 % from initial measurement. Δ ESR ≤ 1.3 x initial specified limit. Δ DCL ≤ initial specified limit
Shelf life at 85 °C	500 h: 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

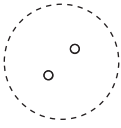
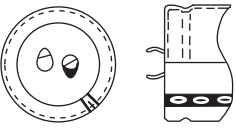
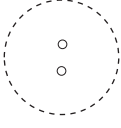
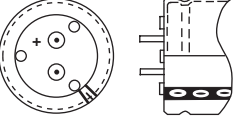
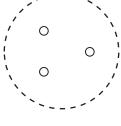
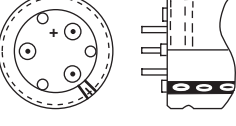
RIPPLE CURRENT MULTIPLIERS				
TEMPERATURE				
AMBIENT TEMPERATURE		MULTIPLIERS		
+ 55 °C		1.6		
+ 65 °C		1.4		
+ 75 °C		1.2		
+ 85 °C		1.0		
+ 95 °C		0.70		
+ 105 °C		0.50		
FREQUENCY (Hz)				
WVDC	50 TO 60	300 TO 1000	1000 AND UP	
0 - 49	0.85	1.10	1.15	
50 - 199	0.83	1.15	1.20	
200 - 250	0.80	1.30	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**
<sup>(1)</sup> Style A and B not available in 0.87" (22.0 mm) 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 81D series:

81D 221 M 250 HD 2 D E3

<b>DESCRIPTION</b>	
CODE	EXPLANATION
81D	product type
221	capacitance value (220 $\mu$ F)
M	tolerance (M = $\pm 20$ %)
250	voltage rating at 105 °C (250 V)
HD	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 + 105 °C, SURGE = 20 V</b>						
15 000.0	81D153M016JC2D	0.984 x 1.378 (25.0 x 35.0)	58.0	43.0	4.72	5.47
22 000.0	81D223M016KB2D	1.181 x 1.181 (30.0 x 30.0)	53.7	41.0	5.24	5.94
33 000.0	81D333M016MC2D	1.378 x 1.378 (35.0 x 35.0)	28.0	21.0	8.42	9.71
47 000.0	81D473M016MD2D	1.378 x 1.575 (35.0 x 40.0)	23.0	17.0	9.70	11.20
<b>25 WVDC at + 105 °C, SURGE = 30 V</b>						
3300.0	81D332M025HA2D	0.866 x 0.984 (22.0 x 25.0)	110.0	76.0	2.81	3.38
4700.0	81D472M025JA2D	0.984 x 0.984 (25.0 x 25.0)	86.0	60.0	3.44	4.15
6800.0	81D682M025KA2D	1.181 x 0.984 (30.0 x 25.0)	71.0	54.0	4.25	4.91
10 000.0	81D103M025KB2D	1.181 x 1.181 (30.0 x 30.0)	54.0	41.0	5.24	5.94
15 000.0	81D153M025KD2D	1.181 x 1.575 (30.0 x 40.0)	36.4	27.0	7.07	8.16
22 000.0 (1)	81D223M025MD2D	1.378 x 1.575 (35.0 x 40.0)	23.0	17.0	9.41	11.20



Aluminum Capacitors  
+ 105 °C, Snap-In

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>35 WVDC at + 105 °C, SURGE = 40 V</b>						
4700.0	81D472M035KA2D	1.181 x 0.984 (30.0 x 25.0)	75.0	54.0	4.13	4.84
6800.0	81D682M035KB2D	1.181 x 1.181 (30.0 x 30.0)	57.0	41.0	5.10	5.94
12 000.0	81D123M035KD2D	1.181 x 1.575 (30.0 x 40.0)	37.7	27.0	6.92	8.16
10 000.0	81D103M035MB2D	1.378 x 1.181 (35.0 x 30.0)	36.0	24.0	7.04	8.63
<b>50 WVDC at + 105 °C, SURGE = 63 V</b>						
1200.0	81D122M050HA2D	0.866 x 0.984 (22.0 x 25.0)	148.0	79.0	2.41	3.29
2200.0	81D222M050JB2D	0.984 x 1.181 (25.0 x 30.0)	85.0	48.0	3.69	4.93
4700.0	81D472M050KC2D	1.181 x 1.378 (30.0 x 35.0)	53.0	33.0	5.51	7.05
6800.0 <sup>(1)</sup>	81D682M050KE2D	1.181 x 1.969 (30.0 x 50.0)	33.0	22.0	8.04	9.74
<b>63 WVDC at + 105 °C, SURGE = 79 V</b>						
1000.0	81D102M063HA2D	0.866 x 0.984 (22.0 x 25.0)	151.0	75.0	2.39	3.39
1500.0	81D152M063HB2D	0.866 x 1.181 (22.0 x 30.0)	118.0	59.0	2.87	4.06
2200.0	81D222M063JC2D	0.984 x 1.378 (25.0 x 35.0)	72.0	38.0	4.21	5.78
4700.0	81D472M063KD2D	1.181 x 1.575 (30.0 x 40.0)	44.0	27.0	6.32	8.16
<b>100 WVDC at + 105 °C, SURGE = 125 V</b>						
470.0	81D471M100HB2D	0.866 x 1.181 (22.0 x 30.0)	258.0	114.0	1.94	2.93
680.0	81D681M100JB2D	0.984 x 1.181 (25.0 x 30.0)	188.0	86.0	2.48	3.67
1000.0	81D102M100KB2D	1.181 x 1.181 (30.0 x 30.0)	136.0	66.0	3.28	4.69
1500.0	81D152M100KC2D	1.181 x 1.378 (30.0 x 35.0)	106.0	52.0	3.90	5.59
2200.0 <sup>(1)</sup>	81D222M100KE2D	1.181 x 1.969 (30.0 x 50.0)	66.0	33.0	5.69	8.05
<b>200 WVDC at + 105 °C, SURGE = 250V</b>						
220.0	81D221M200JA2D	0.984 x 0.984 (25.0 x 25.0)	625.0	272.0	1.37	2.08
330.0	81D331M200KA2D	1.181 x 0.984 (30.0 x 25.0)	498.0	192.0	1.71	2.77
470.0	81D471M200KB2D	1.181 x 1.181 (30.0 x 30.0)	294.0	136.0	2.39	3.51
1000.0	81D102M200KE2D	1.181 x 1.969 (30.0 x 50.0)	142.0	67.0	4.09	5.95
820.0	81D821M200MC2D	1.378 x 1.378 (35.0 x 35.0)	189.0	93.0	3.47	4.94
1000.0 <sup>(1)</sup>	81D102M200MD2D	1.378 x 1.575 (35.0 x 40.0)	149.0	74.0	4.07	5.78
<b>250 WVDC at + 105 °C, SURGE = 300V</b>						
220.0	81D221M250HD2D	0.866 x 1.575 (22.0 x 40.0)	558.0	166.0	1.57	2.89
330.0	81D331M250JD2D	0.984 x 1.575 (25.0 x 40.0)	382.0	121.0	2.12	3.81
470.0	81D471M250JE2D	0.984 x 1.969 (25.0 x 25.0)	243.0	93.0	2.81	4.54
680.0	81D681M250KE2D	1.181 x 1.969 (30.0 x 50.0)	198.0	67.0	3.47	5.99
1000.0 <sup>(1)</sup>	81D102M250ME2D	1.378 x 1.969 (35.0 x 50.0)	132.0	58.0	4.69	7.07
<b>400 WVDC at + 105 °C, SURGE = 450V</b>						
68.0	81D680M400HB2D	0.866 x 1.181 (22.0 x 30.0)	3550.0	1890.0	0.536	0.707
100.0	81D101M400JB2D	0.984 x 1.181 (25.0 x 30.0)	2920.0	1550.0	0.683	0.902
150.0	81D151M400JD2D	0.984 x 1.575 (25.0 x 40.0)	1650.0	880.0	1.000	1.1329
220.0	81D221M400KD2D	1.181 x 1.575 (30.0 x 40.0)	1110.0	580.0	1.476	1.781
330.0	81D331M400MD2D	1.378 x 1.575 (35.0 x 40.0)	730.0	390.0	1.695	2.257

**Note**<sup>(1)</sup> These ratings are normally stocked



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