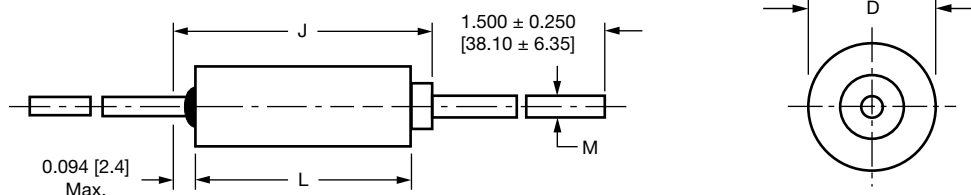


DIMENSIONS in inches [millimeters]


CASE CODE	L ± 0.031 [0.79]	D + 0.016 [0.41] - 0.015 [0.38]	M ± 0.002 [0.05]	J (MAX.)
A	0.286 [7.26]	0.135 [3.43]	0.020 [0.51]	0.422 [10.72]
B	0.474 [12.04]	0.185 [4.70]	0.020 [0.51]	0.610 [15.49]
C	0.686 [17.42]	0.289 [7.34]	0.025 [0.64]	0.822 [20.88]
D	0.786 [19.96]	0.351 [8.92]	0.025 [0.64]	0.922 [23.42]

Notes

- The case insulation shall extend 0.015" [0.38 mm] minimum beyond each end. However, when a shrink-fitted insulation is used, it shall lap over the ends of the capacitor body
- A minimum lead length of 1.0" [2.54 mm] for use with tape and reel automatic insertion equipment is available upon request

RATINGS AND CASE CODES

μF	6 V	10 V	15 V	20 V	35 V	50 V
1.2						A
1.5						A
1.8					A	
2.7				A		
3.3				A		
3.9				A		
4.7			A			
5.6			A			B
6.8		A				B
8.2		A			B	
10	A				B	
12	A					
18				B		
22				B		C
27				B		C
33			B		C	D
39			B		C	D
47		B			C	
56		B		C	D	
68		B		C	D	
82		B		C		
100	B			C		
120				C		
150			C	D		
180			C	D		
220		C	D			
270		C	D			
330	C		D			
390	C	D				
470	C	D				
560		D				
680	D					
820	D					
1000	D					



STANDARD RATINGS

CAPACITANCE (μF)			CASE CODE			CAP. TOL. (± %)			PART NO. M39003/03- FAILURE RATE LEVEL (%/1000 h)								MAX. DCL (μA) AT			MAX. DF (%) AT
									M 1.0	P 0.1	R 0.01	S 0.001	B 0.1	C 0.01	D 0.001	+25 °C	+85 °C	+125 °C	-55 °C TO +125 °C	
6 V _{DC} AT +85 °C, SURGE = 8 V; 4 V _{DC} AT +125 °C																				
10	A	10	0101	0201	0301	0401	2001	3001	4001	0.90	9.0	11.0	6							
10	A	20	0102	0202	0302	0402	2002	3002	4002	0.90	9.0	11.0	6							
12	A	10	0103	0203	0303	0403	2003	3003	4003	1.0	10.0	12.5	6							
100	B	10	0104	0204	0304	0404	2004	3004	4004	6.0	60.0	75.0	8							
100	B	20	0105	0205	0305	0405	2005	3005	4005	6.0	60.0	75.0	8							
330	C	10	0106	0206	0306	0406	2006	3006	4006	15.0	150	188	8							
330	C	20	0107	0207	0307	0407	2007	3007	4007	15.0	150	188	8							
390	C	10	0108	0208	0308	0408	2008	3008	4008	15.0	150	188	10							
470	C	10	0109	0209	0309	0409	2009	3009	4009	15.0	150	188	10							
470	C	20	0110	0210	0310	0410	2010	3010	4010	15.0	150	188	10							
680	D	10	0111	0211	0311	0411	2011	3011	4011	20.0	200	250	10							
680	D	20	0112	0212	0312	0412	2012	3012	4012	20.0	200	250	10							
820	D	10	0113	0213	0313	0413	2013	3013	4013	20.0	200	250	10							
1000	D	10	0114	0214	0314	0414	2014	3014	4014	30.0	300	375	10							
1000	D	20	0115	0215	0315	0415	2015	3015	4015	30.0	300	375	10							
10 V _{DC} AT +85 °C, SURGE = 13 V; 7 V _{DC} AT +125 °C																				
6.8	A	10	0116	0216	0316	0416	2016	3016	4016	1.0	10.0	12.5	6							
6.8	A	20	0117	0217	0317	0417	2017	3017	4017	1.0	10.0	12.5	6							
8.2	A	10	0118	0218	0318	0418	2018	3018	4018	1.2	12.0	15.0	6							
47	B	10	0119	0219	0319	0419	2019	3019	4019	5.0	50.0	63.0	6							
47	B	20	0120	0220	0320	0420	2020	3020	4020	5.0	50.0	63.0	6							
56	B	10	0121	0221	0321	0421	2021	3021	4021	6.0	60.0	75.0	6							
68	B	10	0122	0222	0322	0422	2022	3022	4022	7.0	70.0	88.0	6							
68	B	20	0123	0223	0323	0423	2023	3023	4023	7.0	70.0	88.0	6							
82	B	10	0124	0224	0324	0424	2024	3024	4024	8.0	80.0	100	6							
220	C	10	0125	0225	0325	0425	2025	3025	4025	15.0	150	188	8							
220	C	20	0126	0226	0326	0426	2026	3026	4026	15.0	150	188	8							
270	C	10	0127	0227	0327	0427	2027	3027	4027	15.0	150	188	8							
390	D	10	0128	0228	0328	0428	2028	3028	4028	20.0	200	250	10							
470	D	10	0129	0229	0329	0429	2029	3029	4029	20.0	200	250	10							
470	D	20	0130	0230	0330	0430	2030	3030	4030	20.0	200	250	10							
560	D	10	0131	0231	0331	0431	2031	3031	4031	30.0	300	375	10							
15 V _{DC} AT +85 °C, SURGE = 20 V; 10 V _{DC} AT +125 °C																				
4.7	A	10	0132	0232	0332	0432	2032	3032	4032	1.0	10.0	12.5	4							
4.7	A	20	0133	0233	0333	0433	2033	3033	4033	1.0	10.0	12.5	4							
5.6	A	10	0134	0234	0334	0434	2034	3034	4034	1.3	13.0	16.5	4							
33	B	10	0135	0235	0335	0435	2035	3035	4035	6.0	60.0	75.0	6							
33	B	20	0136	0236	0336	0436	2036	3036	4036	6.0	60.0	75.0	6							
39	B	10	0137	0237	0337	0437	2037	3037	4037	6.0	60.0	75.0	6							
150	C	10	0138	0238	0338	0438	2038	3038	4038	15.0	150	188	8							
150	C	20	0139	0239	0339	0439	2039	3039	4039	15.0	150	188	8							
180	C	10	0140	0240	0340	0440	2040	3040	4040	15.0	150	188	8							
220	D	10	0141	0241	0341	0441	2041	3041	4041	20.0	200	250	8							
220	D	20	0142	0242	0342	0442	2042	3042	4042	20.0	200	250	8							
270	D	10	0143	0243	0343	0443	2043	3043	4043	20.0	200	250	8							
330	D	10	0144	0244	0344	0444	2044	3044	4044	20.0	200	250	8							
330	D	20	0145	0245	0345	0445	2045	3045	4045	20.0	200	250	8							



STANDARD RATINGS

CAPACITANCE (μF)	CASE CODE	CAP. TOL. (± %)	PART NO. M39003/03- FAILURE RATE LEVEL (%/1000 h)								MAX. DCL (μA) AT			MAX. DF (%) AT
			M	P	R	S	B	C	D	+25 °C	+85 °C	+125 °C	-55 °C TO +125 °C	
			1.0	0.1	0.01	0.001	0.1	0.01	0.001					
20 V _{DC} AT +85 °C, SURGE = 26 V; 13 V _{DC} AT +125 °C														
2.7	A	10	0146	0246	0346	0446	2046	3046	4046	0.80	8.0	10.0	4	
3.3	A	10	0147	0247	0347	0447	2047	3047	4047	1.0	10.0	12.5	4	
3.3	A	20	0148	0248	0348	0448	2048	3048	4048	1.0	10.0	12.5	4	
3.9	A	10	0149	0249	0349	0449	2049	3049	4049	1.2	12.0	15.0	4	
18	B	10	0150	0250	0350	0450	2050	3050	4050	4.0	40.0	50.0	6	
22	B	10	0151	0251	0351	0451	2051	3051	4051	4.0	40.0	50.0	6	
22	B	20	0152	0252	0352	0452	2052	3052	4052	4.0	40.0	50.0	6	
27	B	10	0153	0253	0353	0453	2053	3053	4053	5.0	50.0	63.0	6	
56	C	10	0154	0254	0354	0454	2054	3054	4054	9.0	90.0	110	6	
68	C	10	0155	0255	0355	0455	2055	3055	4055	10.0	100	125	6	
68	C	20	0156	0256	0356	0456	2056	3056	4056	10.0	100	125	6	
82	C	10	0157	0257	0357	0457	2057	3057	4057	10.0	100	125	6	
100	C	10	0158	0258	0358	0458	2058	3058	4058	15.0	150	188	6	
100	C	20	0159	0259	0359	0459	2059	3059	4059	15.0	150	188	6	
120	C	10	0160	0260	0360	0460	2060	3060	4060	15.0	150	188	6	
150	D	10	0161	0261	0361	0461	2061	3061	4061	20.0	200	250	8	
150	D	20	0162	0262	0362	0462	2062	3062	4062	20.0	200	250	8	
180	D	10	0163	0263	0363	0463	2063	3063	4063	20.0	200	250	8	
35 V _{DC} AT +85 °C, SURGE = 46 V; 23 V _{DC} AT +125 °C														
1.8	A	10	0164	0264	0364	0464	2064	3064	4064	1.0	10.0	12.5	4	
8.2	B	10	0165	0265	0365	0465	2065	3065	4065	3.5	35.0	44.0	6	
10	B	10	0166	0266	0366	0466	2066	3066	4066	4.0	40.0	50.0	6	
10	B	20	0167	0267	0367	0467	2067	3067	4067	4.0	40.0	50.0	6	
33	C	10	0168	0268	0368	0468	2068	3068	4068	10.0	100	125	6	
33	C	20	0169	0269	0369	0469	2069	3069	4069	10.0	100	125	6	
39	C	10	0170	0270	0370	0470	2070	3070	4070	10.0	100	125	6	
47	C	10	0171	0271	0371	0471	2071	3071	4071	10.0	100	125	6	
47	C	20	0172	0272	0372	0472	2072	3072	4072	10.0	100	125	6	
56	D	10	0173	0273	0373	0473	2073	3073	4073	15.0	150	188	6	
68	D	10	0174	0274	0374	0474	2074	3074	4074	15.0	150	188	6	
68	D	20	0175	0275	0375	0475	2075	3075	4075	15.0	150	188	6	
50 V _{DC} AT +85 °C, SURGE = 65 V; 33 V _{DC} AT +125 °C														
1.2	A	10	0176	0276	0376	0476	2076	3076	4076	0.9	9.0	11.0	4	
1.5	A	10	0177	0277	0377	0477	2077	3077	4077	1.2	12.0	15.0	4	
1.5	A	20	0178	0278	0378	0478	2078	3078	4078	1.2	12.0	15.0	4	
5.6	B	10	0179	0279	0379	0479	2079	3079	4079	4.5	45.0	56.0	4	
6.8	B	10	0180	0280	0380	0480	2080	3080	4080	4.5	45.0	56.0	6	
6.8	B	20	0181	0281	0381	0481	2081	3081	4081	4.5	45.0	56.0	6	
22	C	10	0182	0282	0382	0482	2082	3082	4082	10.0	100	125	6	
22	C	20	0183	0283	0383	0483	2083	3083	4083	10.0	100	125	6	
27	C	10	0184	0284	0384	0484	2084	3084	4084	10.0	100	125	6	
33	D	10	0185	0285	0385	0485	2085	3085	4085	10.0	100	125	6	
33	D	20	0186	0286	0386	0486	2086	3086	4086	10.0	100	125	6	
39	D	10	0187	0287	0387	0487	2087	3087	4087	10.0	100	125	6	

**STANDARD PACKAGING QUANTITY**

CASE CODE	QUANTITY (pcs/reel)			BULK QUANTITY	
	FULL REEL /TR; /RR; /WR	HALF REEL /HR	PARTIAL REEL /PR	PER TRAY	PER BOX
A	1000	500	100	n/a	100
B	1000	500	100	20	100
C	500	250	100	20	100
D	500	250	100	20	80

INSIDE TAPE SPACING

PACKAGING OPTION	CASE CODE	TAPE SPACING
/TR; /HR; /PR	A, B	2.47 ± 0.02 [62.7 ± 0.51]
	C, D	2.88 ± 0.02 [73.0 ± 0.51]
/RR	A, B	2.05 ± 0.02 [52.1 ± 0.51]
	C, D	2.47 ± 0.02 [62.7 ± 0.51]
/WR	A, B	-
	C, D	2.05 ± 0.02 [52.1 ± 0.51]

PRODUCT INFORMATION

Quick Reference Guide	www.vishay.com/doc?40037
Selector Guide	www.vishay.com/doc?49054
Parameter Comparison Guide	www.vishay.com/doc?40033
Mounting of Through-Hole Components	www.vishay.com/doc?40108
Frequently Asked Questions	www.vishay.com/doc?40110
Solid Tantalum Capacitors (With MnO ₂ Electrolyte) Voltage Derating	www.vishay.com/doc?40246



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