

# Type CSR21 (MIL-C-39003/09) Solid Tantalum Capacitors

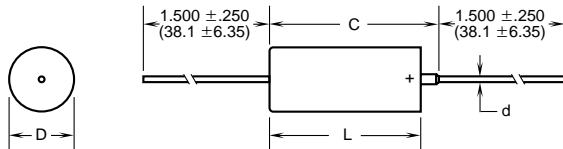
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## 125 °C, Hermetically Sealed, Axial Leaded, Solid Tantalum Capacitors



Type CSR21 (MIL-C-39003/09) military grade, axial leaded, solid tantalum capacitors are hermetically sealed for rugged environmental applications. They have a very low ESR and are great for high frequency applications.

### Outline Drawing



### Highlights

- Very Low ESR
- High Frequency Operation
- Hermetically Sealed
- Graded Failure Rates
- Low DC Leakage
- Temperature Stable
- Frequency Stable

### Specifications

<b>Capacitance Range:</b>	5.6 to 330 $\mu$ F
<b>Voltage Range:</b>	6 to 50 WVdc at +85 °C; 4 to 33 WVdc at 125 °C
<b>Capacitance Tolerance:</b>	$\pm$ 10%, $\pm$ 20%, ( $\pm$ 5% by special order)
<b>Operating Temperature Range:</b>	-55 to +125 °C

<b>Reverse Voltage (Non-continuous)</b>	15% of rated voltage @ +25 °C
	5% of rated voltage @ +85 °C
	1% of rated voltage @ +125 °C

<b>DC Leakage:</b>	At +25 °C – See ratings limit
	At +85 °C – 10 x ratings limit
	At +125 °C – 12.5 x ratings limit

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<b>Capacitance Change Maximum:</b>	-10% @ -55°C
	+8% @ +85 °C
	+12% @ +125 °C

### Case Sizes

Case Code	Uninsulated		Insulated		C Maximum	d $\pm$ .001 ( $\pm$ .03)	Quantity Per Reel
	D $\pm$ .005 ( $\pm$ .13)	L $\pm$ .031 ( $\pm$ .79)	D $\pm$ .010 ( $\pm$ .25)	L $\pm$ .031 ( $\pm$ .79)			
C	.279 (7.09)	.650 (16.51)	.289 (7.34)	.686 (17.42)	.822 (20.88)	.025 (.64)	500
D	.341 (8.66)	.750 (19.05)	.351 (8.92)	.786 (19.96)	.922 (23.42)	.025 (.64)	400

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## Ratings

Cap (µF)	Cap Tol. ± (%)	Case code	Max DCL @ 25 °C (µA)	Max. DF @ 25 °C 120 Hz (%)	Max ESR @ 100 kHz +25 °C (Ω)	Max Ripple @ 40 kHz +25 ° (A rms)	MIL-C-39003/9 (CSR21) Dash Numbers						
							Exponential Failure Rate (% per 1000 hours)				Weibull Failure Rate (% per 1000 hours)		
							'M' Level (1.0)	'P' Level (.10)	'R' Level (.01)	'S' Level (.001)	'B' Level (.10)	'C' Level (.01)	'D' Level (.001)
<b>6 WVdc @ 85 °C — 4 WVdc @ 125 °C</b>													
150	10	C	4.5	10	0.065	3.3	2	102	202	302	2002	3002	4002
150	20	C	4.5	10	0.065	3.3	3	103	203	303	2003	3003	4003
180	10	C	5.5	10	0.060	3.4	5	105	205	305	2005	3005	4005
270	10	D	6.5	10	0.050	4.1	7	107	207	307	2007	3007	4007
330	10	D	7.5	12	0.045	4.3	9	109	209	309	2009	3009	4009
330	20	D	7.5	12	0.045	4.3	10	110	210	310	2010	3010	4010
<b>10 WVdc @ 85 °C — 7 WVdc @ 125 °C</b>													
82	10	C	4.0	8	0.085	2.9	12	112	212	312	2012	3012	4012
100	10	C	5.0	8	0.075	3.0	14	114	214	314	2014	3014	4014
100	20	C	5.0	8	0.075	3.0	15	115	215	315	2015	3015	4015
120	10	C	6.0	8	0.070	3.2	17	117	217	317	2017	3017	4017
180	10	D	9.0	8	0.060	3.7	19	119	219	319	2019	3019	4019
220	10	D	10.0	10	0.055	3.9	21	121	221	321	2021	3021	4021
220	20	D	10.0	10	0.055	3.9	22	122	222	322	2022	3022	4022
<b>15 WVdc @ 85 °C — 10 WVdc @ 125 °C</b>													
56	10	C	4.0	6	0.100	2.6	24	124	224	324	2024	3024	4024
68	10	C	5.0	6	0.095	2.7	26	126	226	326	2026	3026	4026
68	20	C	5.0	6	0.095	2.7	27	127	227	327	2027	3027	4027
120	10	D	9.0	8	0.070	3.5	29	129	229	329	2029	3029	4029
150	10	D	10.0	8	0.065	3.6	31	131	231	331	2031	3031	4031
150	20	D	10.0	8	0.065	3.6	32	132	232	332	2032	3032	4032
<b>20 WVdc @ 85 °C — 13 WVdc @ 125 °C</b>													
27	10	C	2.5	5	0.145	2.2	34	134	234	334	2034	3034	4034
33	10	C	3.5	5	0.130	2.3	36	136	236	336	2036	3036	4036
33	20	C	3.5	5	0.130	2.3	37	137	237	337	2037	3037	4037
39	10	C	4.0	5	0.120	2.4	39	139	239	339	2039	3039	4039
47	10	C	4.5	6	0.110	2.5	41	141	241	341	2041	3041	4041
47	20	C	4.5	6	0.110	2.5	42	142	242	342	2042	3042	4042
56	10	D	5.5	6	0.100	2.9	44	144	244	344	2044	3044	4044
68	10	D	7.0	6	0.095	3.0	46	146	246	346	2046	3046	4046
68	20	D	7.0	6	0.095	3.0	47	147	247	347	2047	3047	4047
82	10	D	8.0	6	0.085	3.1	49	149	249	349	2049	3049	4049
100	10	D	10.0	8	0.075	3.3	51	151	251	351	2051	3051	4051
100	20	D	10.0	8	0.075	3.3	52	152	252	352	2052	3052	4052
<b>35 WVdc @ 85 °C — 23 WVdc @ 125 °C</b>													
22	10	C	4.0	4	0.160	2.1	54	154	254	354	2054	3054	4054
22	20	C	4.0	4	0.160	2.1	55	155	255	355	2055	3055	4055
27	10	D	4.5	4	0.145	2.4	57	157	257	357	2057	3057	4057
33	10	D	5.5	5	0.130	2.5	59	159	259	359	2059	3059	4059
33	20	D	5.5	5	0.130	2.5	60	160	260	360	2060	3060	4060
39	10	D	7.0	5	0.120	2.6	62	162	262	362	2062	3062	4062
47	10	D	8.0	5	0.110	2.7	64	164	264	364	2064	3064	4064
47	20	D	8.0	5	0.110	2.7	65	165	265	365	2065	3065	4065
<b>50 WVdc @ 85 °C — 33 WVdc @ 125 °C</b>													
5.6	10	C	2.2	3	0.300	1.5	67	167	267	367	2067	3067	4067
6.8	10	C	2.2	3	0.275	1.6	69	169	269	369	2069	3069	4069
6.8	20	C	2.2	3	0.250	1.6	70	170	270	370	2070	3070	4070
8.2	10	C	2.5	3	0.250	1.6	72	172	272	372	2072	3072	4072
10	10	C	2.5	3	0.230	1.7	74	174	274	374	2074	3074	4074
10	20	C	2.5	3	0.230	1.7	75	175	275	375	2075	3075	4075
12	10	C	3.0	3	0.210	1.8	77	177	277	377	2077	3077	4077
15	10	C	4.0	3	0.190	1.9	79	179	279	379	2079	3079	4079
15	20	C	4.0	3	0.190	1.9	80	180	280	380	2080	3080	4080
18	10	C	4.5	4	0.175	2.0	82	182	282	382	2082	3082	4082
22	10	D	5.5	4	0.160	2.3	84	184	284	384	2084	3084	4084
22	20	D	5.5	4	0.160	2.3	85	185	285	385	2085	3085	4085

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