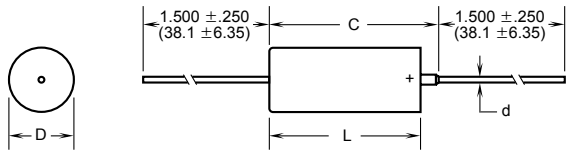
# Type CSR23 (MIL-C-39003/03) Solid Tantalum Capacitors

## 125 °C, Hermetically Sealed, Axial Leaded, Solid Tantalum Capaci-



Type CSR23 (MIL-C-39003/03) military grade, axial leaded, solid tantalum capacitors are hermetically sealed for rugged environmental applications. They are miniature in size and have an extended capacitance range up to 1000 µF at 6WVdc.

## Outline Drawing




## Highlights

- Extended Capacitance Range
- Hermetically Sealed
- Graded Failure Rates
- Low DC Leakage
- Low DF
- Temperature Stable
- Frequency Stable

## Specifications

**Capacitance Range:** 1.2 to 1000 µF

**Voltage Range:** 6 to 50 WVdc at +85 °C; 4 to 33 WVdc at 125 °C

**Capacitance Tolerance:** ±10%, ±20%, (±5% by special order)

**Operating Temperature Range:** –55 to +125 °C

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

**DC Leakage:**
At +25 °C – See ratings limit
At +85 °C – 10 x ratings limit
At +125 °C – 12.5 x ratings limit

**Capacitance Change Maximum:**
–10% @ –55°C
+8% @ +85 °C
+12% @ +125 °C

**Maximum Power Dissipation @ +25 °C:**

| Case Code | Watts |
|---|---|
| A | .090 |
| B | .100 |
| C | .125 |
| D | .180 |

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## Case Sizes

| Case Code | Uninsulated | | Insulated | | | | |
|---|---|---|---|---|---|---|---|
| | D ±.005 (±.13) | L ±.031 (±.79) | D ±.010 (±.25) | L ±.031 (±.79) | C Maximum | d ±.001 (±.03) | Quantity Per Reel |
| A | .125 (3.18) | .250 (6.35) | .135 (3.43) | .286 (7.26) | .422 (10.72) | .020 (.51) | 3,500 |
| B | .175 (4.45) | .438 (11.13) | .185 (4.70) | .474 (12.04) | .610 (15.49) | .020 (.51) | 2,500 |
| 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 |

# Type CSR23 (MIL-C-39003/03) Solid Tantalum Capacitors

## Ratings

| Cap (µF) | Cap Tol. ± (%) | Case Code | Max DCL @ 25 °C (µA) | Max. DF @ 25 °C 120 Hz (%) | MIL-C-39003/03 (CSR23) 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) |
| 6 WVdc @ 85 °C — 4 WVdc @ 125 °C | | | | | | | | | | | |
| 10 | 10 | A | 0.9 | 6 | 101 | 201 | 301 | 401 | 2001 | 3001 | 4001 |
| 10 | 20 | A | 0.9 | 6 | 102 | 202 | 302 | 402 | 2002 | 3002 | 4002 |
| 12 | 10 | A | 1.0 | 6 | 103 | 203 | 303 | 403 | 2003 | 3003 | 4003 |
| 100 | 10 | B | 6.0 | 8 | 104 | 204 | 304 | 404 | 2004 | 3004 | 4004 |
| 100 | 20 | B | 6.0 | 8 | 105 | 205 | 305 | 405 | 2005 | 3005 | 4005 |
| 330 | 10 | C | 15.0 | 8 | 106 | 206 | 306 | 406 | 2006 | 3006 | 4006 |
| 330 | 20 | C | 15.0 | 8 | 107 | 207 | 307 | 407 | 2007 | 3007 | 4007 |
| 390 | 10 | C | 15.0 | 10 | 108 | 208 | 308 | 408 | 2008 | 3008 | 4008 |
| 470 | 10 | C | 15.0 | 10 | 109 | 209 | 309 | 409 | 2009 | 3009 | 4009 |
| 470 | 20 | C | 15.0 | 10 | 110 | 210 | 310 | 410 | 2010 | 3010 | 4010 |
| 680 | 10 | D | 20.0 | 10 | 111 | 211 | 311 | 411 | 2011 | 3011 | 4011 |
| 680 | 20 | D | 20.0 | 10 | 112 | 212 | 312 | 412 | 2012 | 3012 | 4012 |
| 820 | 10 | D | 20.0 | 10 | 113 | 213 | 313 | 413 | 2013 | 3013 | 4013 |
| 1000 | 10 | D | 30.0 | 10 | 114 | 214 | 314 | 414 | 2014 | 3014 | 4014 |
| 1000 | 20 | D | 30.0 | 10 | 115 | 215 | 315 | 415 | 2015 | 3015 | 4015 |
| | | | | | | | | | | | |
| 10 WVdc @ 85 °C — 7 WVdc @ 125 °C | | | | | | | | | | | |
| 6.8 | 10 | A | 1.0 | 6 | 116 | 216 | 316 | 416 | 2016 | 3016 | 4016 |
| 6.8 | 20 | A | 1.0 | 6 | 117 | 217 | 317 | 417 | 2017 | 3017 | 4017 |
| 8.2 | 10 | A | 1.2 | 6 | 118 | 218 | 318 | 418 | 2018 | 3018 | 4018 |
| 47 | 10 | B | 5.0 | 6 | 119 | 219 | 319 | 419 | 2019 | 3019 | 4019 |
| 47 | 20 | B | 5.0 | 6 | 120 | 220 | 320 | 420 | 2020 | 3020 | 4020 |
| 56 | 10 | B | 6.0 | 6 | 121 | 221 | 321 | 421 | 2021 | 3021 | 4021 |
| 68 | 10 | B | 7.0 | 6 | 122 | 222 | 322 | 422 | 2022 | 3022 | 4022 |
| 68 | 20 | B | 7.0 | 6 | 123 | 223 | 323 | 423 | 2023 | 3023 | 4023 |
| 82 | 10 | B | 8.0 | 6 | 124 | 224 | 324 | 424 | 2024 | 3024 | 4024 |
| 220 | 10 | C | 15.0 | 6 | 125 | 225 | 325 | 425 | 2025 | 3025 | 4025 |
| 220 | 20 | C | 15.0 | 6 | 126 | 226 | 326 | 426 | 2026 | 3026 | 4026 |
| 270 | 10 | C | 15.0 | 8 | 127 | 227 | 327 | 427 | 2027 | 3027 | 4027 |
| 390 | 10 | D | 20.0 | 10 | 128 | 228 | 328 | 428 | 2028 | 3028 | 4028 |
| 470 | 10 | D | 20.0 | 10 | 129 | 229 | 329 | 429 | 2029 | 3029 | 4029 |
| 470 | 20 | D | 20.0 | 10 | 130 | 230 | 330 | 430 | 2030 | 3030 | 4030 |
| 560 | 10 | D | 30.0 | 10 | 131 | 231 | 331 | 431 | 2031 | 3031 | 4031 |
| 15 WVdc @ 85 °C — 10 WVdc @ 125 °C | | | | | | | | | | | |
| 4.7 | 10 | A | 1.0 | 4 | 132 | 232 | 332 | 432 | 2032 | 3032 | 4032 |
| 4.7 | 20 | A | 1.0 | 4 | 133 | 233 | 333 | 433 | 2033 | 3033 | 4033 |
| 5.6 | 10 | A | 1.3 | 4 | 134 | 234 | 334 | 434 | 2034 | 3034 | 4034 |
| 33 | 10 | B | 6.0 | 6 | 135 | 235 | 335 | 435 | 2035 | 3035 | 4035 |
| 33 | 20 | B | 6.0 | 6 | 136 | 236 | 336 | 436 | 2036 | 3036 | 4036 |
| 39 | 10 | B | 15.0 | 6.0 | 137 | 237 | 337 | 437 | 2037 | 3037 | 4037 |
| 150 | 10 | C | 15.0 | 8.0 | 138 | 238 | 338 | 438 | 2038 | 3038 | 4038 |
| 150 | 20 | C | 15.0 | 8.0 | 139 | 239 | 339 | 439 | 2039 | 3039 | 4039 |
| 180 | 10 | C | 20.0 | 8.0 | 140 | 240 | 340 | 440 | 2040 | 3040 | 4040 |
| 220 | 10 | D | 20.0 | 8.0 | 141 | 241 | 341 | 441 | 2041 | 3041 | 4041 |
| 220 | 20 | D | 20.0 | 8.0 | 142 | 242 | 342 | 442 | 2042 | 3042 | 4042 |
| 270 | 10 | D | 20.0 | 8.0 | 143 | 243 | 343 | 443 | 2043 | 3043 | 4043 |
| 330 | 10 | D | 20.0 | 8.0 | 144 | 244 | 344 | 444 | 2044 | 3044 | 4044 |

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**TO ORDER:** Indicate the prefex M39003/03 followed by the applicable MIL dash number.
Example: For M39003/03-0182; order CSR230182

## Ratings

| Cap (µF) | Cap Tol. ± (%) | Case Code | Max DCL @ 25 °C (µA) | Max. DF @ 25 °C 120 Hz (%) | MIL-C-39003/03 (CSR23) 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) |
| 20 WVdc @ 85 °C — 13 WVdc @ 125 °C | | | | | | | | | | | |
| 2.7 | 10 | A | 0.8 | 4 | 146 | 246 | 346 | 446 | 2046 | 3046 | 4046 |
| 3.3 | 10 | A | 1.0 | 4 | 147 | 247 | 347 | 447 | 2047 | 3047 | 4047 |
| 3.3 | 20 | A | 1.0 | 4 | 148 | 248 | 348 | 448 | 2048 | 3048 | 4048 |
| 3.9 | 10 | A | 1.2 | 4 | 149 | 249 | 349 | 449 | 2049 | 3049 | 4049 |
| 18 | 10 | B | 4.0 | 6 | 150 | 250 | 350 | 450 | 2050 | 3050 | 4050 |
| 22 | 10 | B | 4.0 | 6 | 151 | 251 | 351 | 451 | 2051 | 3051 | 4051 |
| 22 | 20 | B | 4.0 | 6 | 152 | 252 | 352 | 452 | 2052 | 3052 | 4052 |
| 27 | 10 | B | 5.0 | 6 | 153 | 253 | 353 | 453 | 2053 | 3053 | 4053 |
| 56 | 10 | C | 9.0 | 6 | 154 | 254 | 354 | 454 | 2054 | 3054 | 4054 |
| 68 | 10 | C | 10.0 | 6 | 155 | 255 | 355 | 455 | 2055 | 3055 | 4055 |
| 68 | 20 | C | 10.0 | 6 | 156 | 256 | 356 | 456 | 2056 | 3056 | 4056 |
| 82 | 10 | C | 10.0 | 6 | 157 | 257 | 357 | 457 | 2057 | 3057 | 4057 |
| 100 | 10 | C | 15.0 | 6 | 158 | 258 | 358 | 458 | 2058 | 3058 | 4058 |
| 100 | 20 | C | 15.0 | 6 | 159 | 259 | 359 | 459 | 2059 | 3059 | 4059 |
| 120 | 10 | C | 15.0 | 6 | 160 | 260 | 360 | 460 | 2060 | 3060 | 4060 |
| 150 | 10 | D | 20.0 | 8 | 161 | 261 | 361 | 461 | 2061 | 3061 | 4061 |
| 150 | 20 | D | 20.0 | 8 | 162 | 262 | 362 | 462 | 2062 | 3062 | 4062 |
| 180 | 10 | D | 20.0 | 8 | 163 | 263 | 363 | 463 | 2063 | 3063 | 4063 |
| 35 WVdc @ 85 °C — 23 WVdc @ 125 °C | | | | | | | | | | | |
| 1.8 | 10 | A | 1.0 | 4 | 164 | 264 | 364 | 464 | 2064 | 3064 | 4064 |
| 8.2 | 10 | B | 3.5 | 6 | 165 | 265 | 365 | 465 | 2065 | 3065 | 4065 |
| 10.0 | 10 | B | 4.0 | 6 | 166 | 266 | 366 | 466 | 2066 | 3066 | 4066 |
| 10.0 | 20 | B | 4.0 | 6 | 167 | 267 | 367 | 467 | 2067 | 3067 | 4067 |
| 33.0 | 10 | C | 10.0 | 6 | 168 | 268 | 368 | 468 | 2068 | 3068 | 4068 |
| 33.0 | 20 | C | 10.0 | 6 | 169 | 269 | 369 | 469 | 2069 | 3069 | 4069 |
| 39.0 | 10 | C | 10.0 | 6 | 170 | 270 | 370 | 470 | 2070 | 3070 | 4070 |
| 47.0 | 10 | C | 10.0 | 6 | 171 | 271 | 371 | 471 | 2071 | 3071 | 4071 |
| 47.0 | 20 | C | 10.0 | 6 | 172 | 272 | 372 | 472 | 2072 | 3072 | 4072 |
| 56.0 | 10 | D | 15.0 | 6 | 173 | 273 | 373 | 473 | 2073 | 3073 | 4073 |
| 68.0 | 10 | D | 15.0 | 6 | 174 | 274 | 374 | 474 | 2074 | 3074 | 4074 |
| 68.0 | 20 | D | 15.0 | 6 | 175 | 275 | 375 | 475 | 2075 | 3075 | 4075 |
| 50 WVdc @ 85 °C — 33 WVdc @ 125 °C | | | | | | | | | | | |
| 1.2 | 10 | A | 0.9 | 4 | 176 | 276 | 376 | 476 | 2076 | 3076 | 4076 |
| 1.5 | 10 | A | 1.2 | 4 | 177 | 277 | 377 | 477 | 2077 | 3077 | 4077 |
| 1.5 | 20 | A | 1.2 | 4 | 178 | 278 | 378 | 478 | 2078 | 3078 | 4078 |
| 5.6 | 10 | B | 4.5 | 4 | 179 | 279 | 379 | 479 | 2079 | 3079 | 4079 |
| 6.8 | 10 | B | 4.5 | 6 | 180 | 280 | 380 | 480 | 2080 | 3080 | 4080 |
| 6.8 | 20 | B | 4.5 | 6 | 181 | 281 | 381 | 481 | 2081 | 3081 | 4081 |
| 22 | 10 | C | 10 | 6 | 182 | 282 | 382 | 482 | 2082 | 3082 | 4082 |
| 22 | 20 | C | 10 | 6 | 183 | 283 | 383 | 483 | 2083 | 3083 | 4083 |
| 27 | 10 | C | 10 | 6 | 184 | 284 | 384 | 484 | 2084 | 3084 | 4084 |
| 33 | 10 | D | 10 | 6 | 185 | 285 | 385 | 485 | 2085 | 3085 | 4085 |
| 33 | 20 | D | 10 | 6 | 186 | 286 | 386 | 486 | 2086 | 3086 | 4086 |
| 39 | 10 | D | 10 | 6 | 187 | 287 | 387 | 487 | 2087 | 3087 | 4087 |

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**TO ORDER:** Indicate the prefex M39003/03 followed by the applicable MIL dash number. Example: For M39003/03-0182; order CSR230182

+ C failure rate: Not QPL for -3085 thru -3087
+D failure rate: Not QPL for -4085 thru -4087

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