

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

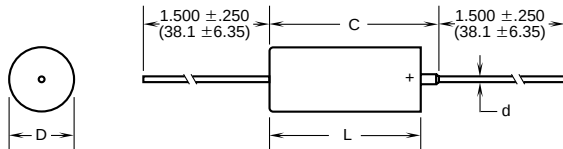
## 125 °C, Hermetically Sealed, Axial Leaded, Solid Tantalum Capacitors

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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

**Capacitance Range:** 5.6 to 330  $\mu$ F

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

**Capacitance Tolerance:**  $\pm 10\%$ ,  $\pm 20\%$ , ( $\pm 5\%$  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

### Case Sizes

| Case Code | Uninsulated                      |                                  | Insulated                        |                                  | C<br>Maximum | d<br>$\pm .001$<br>( $\pm .03$ ) | Quantity<br>Per<br>Reel |
|-----------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|--------------|----------------------------------|-------------------------|
|           | D<br>$\pm .005$<br>( $\pm .13$ ) | L<br>$\pm .031$<br>( $\pm .79$ ) | D<br>$\pm .010$<br>( $\pm .25$ ) | L<br>$\pm .031$<br>( $\pm .79$ ) |              |                                  |                         |
| 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

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| 查询 CSR21 供应商                       |                      |              |                               | MIL-C-39003/9 (CSR21) Dash Numbers     |                                          |                                               |                                                |                |                |                 |                                            |                |                 |
|------------------------------------|----------------------|--------------|-------------------------------|----------------------------------------|------------------------------------------|-----------------------------------------------|------------------------------------------------|----------------|----------------|-----------------|--------------------------------------------|----------------|-----------------|
| Cap<br>(µF)                        | Cap<br>Tol. ±<br>(%) | Case<br>code | Max<br>DCL<br>@ 25 °C<br>(µA) | Max.<br>DF<br>@ 25 °C<br>120 Hz<br>(%) | Max<br>ESR<br>@ 100 kHz<br>+25 °C<br>(Ω) | Max<br>Ripple<br>@ 40 kHz<br>+25 °<br>(A rms) | Exponential Failure Rate<br>(% per 1000 hours) |                |                |                 | Weibull Failure Rate<br>(% per 1000 hours) |                |                 |
|                                    |                      |              |                               |                                        |                                          |                                               | 'M'                                            | 'P'            | 'R'            | 'S'             | 'B'                                        | 'C'            | 'D'             |
|                                    |                      |              |                               |                                        |                                          |                                               | Level<br>(1.0)                                 | Level<br>(.10) | Level<br>(.01) | Level<br>(.001) | Level<br>(.10)                             | Level<br>(.01) | Level<br>(.001) |
| 6 WVdc @ 85 °C — 4 WVdc @ 125 °C   |                      |              |                               |                                        |                                          |                                               |                                                |                |                |                 |                                            |                |                 |
| 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            |
| 10 WVdc @ 85 °C — 7 WVdc @ 125 °C  |                      |              |                               |                                        |                                          |                                               |                                                |                |                |                 |                                            |                |                 |
| 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            |
| 15 WVdc @ 85 °C — 10 WVdc @ 125 °C |                      |              |                               |                                        |                                          |                                               |                                                |                |                |                 |                                            |                |                 |
| 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            |
| 20 WVdc @ 85 °C — 13 WVdc @ 125 °C |                      |              |                               |                                        |                                          |                                               |                                                |                |                |                 |                                            |                |                 |
| 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            |
| 35 WVdc @ 85 °C — 23 WVdc @ 125 °C |                      |              |                               |                                        |                                          |                                               |                                                |                |                |                 |                                            |                |                 |
| 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            |
| 50 WVdc @ 85 °C — 33 WVdc @ 125 °C |                      |              |                               |                                        |                                          |                                               |                                                |                |                |                 |                                            |                |                 |
| 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            |