

# TAJ Series

## Standard Tantalum



- General purpose SMT chip tantalum series
- 6 case sizes available
- Low profile options available
- CV range: 0.10-2200 $\mu$ F / 2.5-50V



SnPb termination option is not RoHS compliant.

### CASE DIMENSIONS: millimeters (inches)



For part marking see page 132

| Code | EIA Code | EIA Metric | L $\pm$ 0.20 (0.008) | W $\pm$ 0.20 (0.008) -0.10 (0.004) | H $\pm$ 0.20 (0.008) -0.10 (0.004) | W $\pm$ 0.20 (0.008) | A $\pm$ 0.30 (0.012) -0.20 (0.008) | S Min.       |
|------|----------|------------|----------------------|------------------------------------|------------------------------------|----------------------|------------------------------------|--------------|
| A    | 1206     | 3216-18    | 3.20 (0.126)         | 1.60 (0.063)                       | 1.60 (0.063)                       | 1.20 (0.047)         | 0.80 (0.031)                       | 1.10 (0.043) |
| B    | 1210     | 3528-21    | 3.50 (0.138)         | 2.80 (0.110)                       | 1.90 (0.075)                       | 2.20 (0.087)         | 0.80 (0.031)                       | 1.40 (0.055) |
| C    | 2312     | 6032-28    | 6.00 (0.236)         | 3.20 (0.126)                       | 2.60 (0.102)                       | 2.20 (0.087)         | 1.30 (0.051)                       | 2.90 (0.114) |
| D    | 2917     | 7343-31    | 7.30 (0.287)         | 4.30 (0.169)                       | 2.90 (0.114)                       | 2.40 (0.094)         | 1.30 (0.051)                       | 4.40 (0.173) |
| E    | 2917     | 7343-43    | 7.30 (0.287)         | 4.30 (0.169)                       | 4.10 (0.162)                       | 2.40 (0.094)         | 1.30 (0.051)                       | 4.40 (0.173) |
| V    | 2924     | 7361-38    | 7.30 (0.287)         | 6.10 (0.240)                       | 3.55 (0.140)                       | 3.10 (0.120)         | 1.30 (0.051)                       | 4.40 (0.173) |

W<sub>1</sub> dimension applies to the termination width for A dimensional area only.

### HOW TO ORDER

| TAJ  | C                            | 106                                                                                                                                      | M                             | 035                                                                                                                                    | R                                                                                                                                                                                                                                           | NJ                                           | —                                                                                                        |
|------|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|----------------------------------------------------------------------------------------------------------|
| Type | Case Size<br>See table above | Capacitance Code<br>pF code: 1st two digits represent significant figures<br>3rd digit represents multiplier (number of zeros to follow) | Tolerance<br>K=±10%<br>M=±20% | Rated DC Voltage<br>002=2.5Vdc<br>004=4Vdc<br>006=6.3Vdc<br>010=10Vdc<br>016=16Vdc<br>020=20Vdc<br>025=25Vdc<br>035=35Vdc<br>050=50Vdc | Packaging<br>R = Pure Tin 7" Reel<br>S = Pure Tin 13" Reel<br>A = Gold Plating 7" Reel<br>B = Gold Plating 13" Reel<br>H = Tin Lead 7" Reel<br>(Contact Manufacturer)<br>K = Tin Lead 13" Reel<br>(Contact Manufacturer)<br>H, K = Non RoHS | Specification Suffix<br>NJ = Standard Suffix | Additional characters may be added for special requirements<br>V = Dry pack Option (selected codes only) |

### TECHNICAL SPECIFICATIONS

|                                    |                                                                                                            |     |     |     |    |    |    |    |    |    |  |
|------------------------------------|------------------------------------------------------------------------------------------------------------|-----|-----|-----|----|----|----|----|----|----|--|
| Technical Data:                    | All technical data relate to an ambient temperature of +25°C                                               |     |     |     |    |    |    |    |    |    |  |
| Capacitance Range:                 | 0.10 $\mu$ F to 2200 $\mu$ F                                                                               |     |     |     |    |    |    |    |    |    |  |
| Capacitance Tolerance:             | ±10%; ±20%                                                                                                 |     |     |     |    |    |    |    |    |    |  |
| Rated Voltage (V <sub>R</sub> )    | ≤ +85°C:                                                                                                   | 2.5 | 4   | 6.3 | 10 | 16 | 20 | 25 | 35 | 50 |  |
| Category Voltage (V <sub>C</sub> ) | ≤ +125°C:                                                                                                  | 1.7 | 2.7 | 4   | 7  | 10 | 13 | 17 | 23 | 33 |  |
| Surge Voltage (V <sub>S</sub> )    | ≤ +85°C:                                                                                                   | 3.3 | 5.2 | 8   | 13 | 20 | 26 | 32 | 46 | 65 |  |
| Surge Voltage (V <sub>S</sub> )    | ≤ +125°C:                                                                                                  | 2.2 | 3.4 | 5   | 8  | 13 | 16 | 20 | 28 | 40 |  |
| Temperature Range:                 | -55°C to +125°C                                                                                            |     |     |     |    |    |    |    |    |    |  |
| Reliability:                       | 1% per 1000 hours at 85°C, V <sub>R</sub> with 0.1 $\Omega$ /V series impedance, 60% confidence level      |     |     |     |    |    |    |    |    |    |  |
| Qualification:                     | CECC 30801 - 005 issue 2<br>EIA 535BAAC                                                                    |     |     |     |    |    |    |    |    |    |  |
| Termination Finished:              | Sn Plating (standard), Gold and SnPb Plating upon request<br>For AEC-Q200 availability, please contact AVX |     |     |     |    |    |    |    |    |    |  |

## Standard Tantalum

### CAPACITANCE AND RATED VOLTAGE, VR (VOLTAGE CODE) RANGE (LETTER DENOTES CASE SIZE)

| Capacitance          |                   | Rated voltage DC (V <sub>R</sub> ) to 85°C                      |                                       |                                         |                                           |                                         |                                          |                                         |                       |                                         |
|----------------------|-------------------|-----------------------------------------------------------------|---------------------------------------|-----------------------------------------|-------------------------------------------|-----------------------------------------|------------------------------------------|-----------------------------------------|-----------------------|-----------------------------------------|
| μF                   | Code              | 2.5V (e)                                                        | 4V (G)                                | 6.3V (J)                                | 10V (A)                                   | 16V (C)                                 | 20V (D)                                  | 25V (E)                                 | 35V (V)               | 50V (T)                                 |
| 0.10<br>0.15<br>0.22 | 104<br>154<br>224 |                                                                 |                                       |                                         |                                           |                                         |                                          |                                         | A<br>A<br>A           | A<br>A/B<br>A/B                         |
| 0.33<br>0.47<br>0.68 | 334<br>474<br>684 |                                                                 |                                       |                                         |                                           |                                         | A                                        | A<br>A                                  | A<br>A/B<br>A/B       | A/B<br>A/B/C<br>A/B/C                   |
| 1.0<br>1.5<br>2.2    | 105<br>155<br>225 |                                                                 |                                       | A                                       | A<br>A                                    | A<br>A<br>A/B                           | A<br>A<br>A/B                            | A<br>A/B<br>A/B                         | A/B<br>A/B/C<br>A/B/C | A <sup>(M)</sup> /B/C<br>B/C/D<br>B/C/D |
| 3.3<br>4.7<br>6.8    | 335<br>475<br>685 |                                                                 | A<br>A                                | A<br>A<br>A/B                           | A<br>A/B<br>A/B                           | A/B<br>A/B<br>A/B/C                     | A/B<br>A/B/C<br>A/B/C                    | A/B/C<br>A/B/C<br>B/C                   | B/C<br>B/C/D<br>C/D   | C/D<br>C/D<br>C/D                       |
| 10<br>15<br>22       | 106<br>156<br>226 |                                                                 | A<br>A/B<br>A                         | A/B<br>A/B<br>A/B/C                     | A/B/C<br>A/B/C<br>A/B/C                   | A/B/C<br>A <sup>(M)</sup> /B/C<br>B/C/D | A <sup>(M)</sup> */B/C<br>B/C/D<br>B/C/D | B/C/D<br>C/D<br>C/D                     | C/D/E<br>C/D<br>D/E   | D/E/V<br>D/E/V<br>V                     |
| 33<br>47<br>68       | 336<br>476<br>686 | A<br>A<br>A                                                     | A/B<br>A/B<br>A/B/C                   | A/B/C<br>A/B/C/D<br>B/C/D               | A/B/C/D<br>B/C/D<br>B/C/D                 | B/C/D<br>C/D<br>C/D                     | C/D<br>C/D/E<br>C <sup>(M)</sup> /D/E    | D/E<br>D/E<br>E/V                       | D/E/V<br>E/V<br>V     |                                         |
| 100<br>150<br>220    | 107<br>157<br>227 | A/B<br>B<br>B/D                                                 | A/B/C<br>B/C<br>B <sup>(M)</sup> /C/D | B/C/D<br>B <sup>(M)</sup> /C/D<br>C/D/E | B <sup>(M)</sup> /C/D/E<br>C/D/E<br>C/D/E | C/D/E<br>D/E/V<br>E/V                   | D/E/V<br>E/V                             | E <sup>(M)</sup> /V<br>V <sup>(M)</sup> |                       |                                         |
| 330<br>470<br>680    | 337<br>477<br>687 | D<br>C/D<br>C/D/E                                               | C/D/E<br>C/D/E<br>D/E                 | C/D/E<br>D/E/V<br>E/V                   | D/E/V<br>E/V                              | E <sup>(M)</sup>                        |                                          |                                         |                       |                                         |
| 1000<br>1500<br>2200 | 108<br>158<br>228 | D <sup>(M)</sup> /E<br>D/E/V <sup>(M)</sup><br>V <sup>(M)</sup> | D/E/V<br>E/V <sup>(M)</sup>           | E <sup>(M)</sup> /V <sup>(M)</sup>      |                                           |                                         |                                          |                                         |                       |                                         |

Not recommended for new designs, higher voltage or smaller case size substitution are offered.

Released codes <sup>(M tolerance only)</sup>

Engineering samples - please contact manufacturer

\*Codes under development - subject to change

Note: Voltage ratings are minimum values. AVX reserves the right to supply higher ratings in the same case size, to the same reliability standards.

## RATINGS &amp; PART NUMBER REFERENCE

| AVX Part No.                              | Case Size | Cap (μF) | Rated Voltage (V) | DCL (μA) Max. | DF % Max. | ESR Max. (Ω) @100kHz | MSL             |
|-------------------------------------------|-----------|----------|-------------------|---------------|-----------|----------------------|-----------------|
| <b>2.5 Volt @ 85°C (1.7 Volt @ 125°C)</b> |           |          |                   |               |           |                      |                 |
| TAJA336*002#NJ                            | A         | 33       | 2.5               | 0.8           | 8         | 1.7                  | 1               |
| TAJA476*002#NJ                            | A         | 47       | 2.5               | 0.9           | 6         | 3                    | 1               |
| TAJA686*002#NJ                            | A         | 68       | 2.5               | 1.4           | 8         | 1.5                  | 1               |
| TAJA107*002#NJ                            | A         | 100      | 2.5               | 2.5           | 30        | 1.4                  | 1               |
| TAJB107*002#NJ                            | B         | 100      | 2.5               | 2.5           | 8         | 1.4                  | 1               |
| TAJB157*002#NJ                            | B         | 150      | 2.5               | 3             | 10        | 1.6                  | 1               |
| TAJB227*002#NJ                            | B         | 220      | 2.5               | 4.4           | 16        | 1.6                  | 1               |
| TAJD227*002#NJ                            | D         | 220      | 2.5               | 5.5           | 8         | 0.3                  | 1               |
| TAJD337*002#NJ                            | D         | 330      | 2.5               | 8.2           | 8         | 0.3                  | 1               |
| TAJC477*002#NJ                            | C         | 470      | 2.5               | 9.4           | 12        | 0.2                  | 1               |
| TAJD477*002#NJ                            | D         | 470      | 2.5               | 11.6          | 8         | 0.2                  | 1               |
| TAJC687*002#NJ                            | C         | 680      | 2.5               | 17.0          | 18        | 0.2                  | 1               |
| TAJD687*002#NJ                            | D         | 680      | 2.5               | 17            | 16        | 0.2                  | 1               |
| TAJE687*002#NJ                            | E         | 680      | 2.5               | 17            | 10        | 0.2                  | 1 <sup>1)</sup> |
| TAJD108M002#NJ                            | D         | 1000     | 2.5               | 25            | 20        | 0.2                  | 1               |
| TAJE108*002#NJ                            | E         | 1000     | 2.5               | 20            | 14        | 0.4                  | 1 <sup>1)</sup> |
| TAJD158*002#NJ                            | D         | 1500     | 2.5               | 37.5          | 60        | 0.2                  | 1               |
| TAJE158*002#NJ                            | E         | 1500     | 2.5               | 37            | 20        | 0.2                  | 1 <sup>1)</sup> |
| TAJV158M002#NJ                            | V         | 1500     | 2.5               | 30            | 20        | 0.2                  | 1 <sup>1)</sup> |
| TAJV228M002#NJ                            | V         | 2200     | 2.5               | 55            | 50        | 0.2                  | 1 <sup>1)</sup> |
| <b>4 Volt @ 85°C (2.7 Volt @ 125°C)</b>   |           |          |                   |               |           |                      |                 |
| TAJA336*004#NJ                            | A         | 33       | 4                 | 1.3           | 6         | 3                    | 1               |
| TAJA476*004#NJ                            | A         | 47       | 4                 | 1.9           | 8         | 2.6                  | 1               |
| TAJA686*004#NJ                            | A         | 68       | 4                 | 2.7           | 10        | 1.5                  | 1               |
| TAJB686*004#NJ                            | B         | 68       | 4                 | 2.7           | 6         | 1.8                  | 1               |
| TAJA107*004#NJ                            | A         | 100      | 4                 | 4             | 30        | 1.4                  | 1               |
| TAJB107*004#NJ                            | B         | 100      | 4                 | 4             | 8         | 0.9                  | 1               |
| TAJB157*004#NJ                            | B         | 150      | 4                 | 6             | 10        | 1.5                  | 1               |
| TAJC157*004#NJ                            | C         | 150      | 4                 | 6             | 6         | 0.3                  | 1               |
| TAJB227M004#NJ                            | B         | 220      | 4                 | 8.8           | 12        | 1.1                  | 1               |
| TAJC227*004#NJ                            | C         | 220      | 4                 | 8.8           | 8         | 1.2                  | 1               |
| TAJD227*004#NJ                            | D         | 220      | 4                 | 8.8           | 8         | 0.9                  | 1               |
| TAJC337*004#NJ                            | C         | 330      | 4                 | 13.2          | 8         | 0.3                  | 1               |
| TAJD337*004#NJ                            | D         | 330      | 4                 | 13.2          | 8         | 0.9                  | 1               |
| TAJC477*004#NJ                            | C         | 470      | 4                 | 18.8          | 14        | 0.3                  | 1               |
| TAJD477*004#NJ                            | D         | 470      | 4                 | 18.8          | 12        | 0.9                  | 1               |
| TAJE477*004#NJ                            | E         | 470      | 4                 | 18.8          | 10        | 0.5                  | 1 <sup>1)</sup> |
| TAJD687*004#NJ                            | D         | 680      | 4                 | 27.2          | 14        | 0.5                  | 1               |
| TAJE687*004#NJ                            | E         | 680      | 4                 | 27.2          | 14        | 0.9                  | 1 <sup>1)</sup> |
| TAJD108*004#NJ                            | D         | 1000     | 4                 | 40            | 60        | 0.2                  | 1               |
| TAJE108*004#NJ                            | E         | 1000     | 4                 | 40            | 14        | 0.4                  | 1 <sup>1)</sup> |
| TAJV108*004#NJ                            | V         | 1000     | 4                 | 40            | 16        | 0.2                  | 1 <sup>1)</sup> |
| TAJE158*004#NJ                            | E         | 1500     | 4                 | 60            | 30        | 0.2                  | 1 <sup>1)</sup> |
| TAJV158M004#NJ                            | V         | 1500     | 4                 | 60            | 30        | 0.2                  | 1 <sup>1)</sup> |
| <b>6.3 Volt @ 85°C (4 Volt @ 125°C)</b>   |           |          |                   |               |           |                      |                 |
| TAJA106*006#NJ                            | A         | 10       | 6.3               | 0.6           | 6         | 4                    | 1               |
| TAJA156*006#NJ                            | A         | 15       | 6.3               | 0.9           | 6         | 3.5                  | 1               |
| TAJA226*006#NJ                            | A         | 22       | 6.3               | 1.4           | 6         | 3                    | 1               |
| TAJA336*006#NJ                            | A         | 33       | 6.3               | 2.1           | 8         | 2.2                  | 1               |
| TAJA476*006#NJ                            | A         | 47       | 6.3               | 2.8           | 10        | 1.6                  | 1               |
| TAJB476*006#NJ                            | B         | 47       | 6.3               | 3             | 6         | 2                    | 1               |
| TAJC476*006#NJ                            | C         | 47       | 6.3               | 3             | 6         | 1.6                  | 1               |
| TAJB686*006#NJ                            | B         | 68       | 6.3               | 4             | 8         | 0.9                  | 1               |
| TAJC686*006#NJ                            | C         | 68       | 6.3               | 4.3           | 6         | 1.5                  | 1               |
| TAJB107*006#NJ                            | B         | 100      | 6.3               | 6.3           | 10        | 1.7                  | 1               |
| TAJC107*006#NJ                            | C         | 100      | 6.3               | 6.3           | 6         | 0.9                  | 1               |
| TAJB157M006#NJ                            | B         | 150      | 6.3               | 9.5           | 10        | 1.2                  | 1               |
| TAJC157*006#NJ                            | C         | 150      | 6.3               | 9.5           | 6         | 1.3                  | 1               |

| AVX Part No.                            | Case Size | Cap (μF) | Rated Voltage (V) | DCL (μA) Max. | DF % Max. | ESR Max. (Ω) @100kHz | MSL             |
|-----------------------------------------|-----------|----------|-------------------|---------------|-----------|----------------------|-----------------|
| <b>10 Volt @ 85°C (7 Volt @ 125°C)</b>  |           |          |                   |               |           |                      |                 |
| TAJD157*006#NJ                          | D         | 150      | 6.3               | 9.5           | 6         | 0.9                  | 1               |
| TAJC227*006#NJ                          | C         | 220      | 6.3               | 13.9          | 8         | 1.2                  | 1               |
| TAJD227*006#NJ                          | D         | 220      | 6.3               | 13.9          | 8         | 0.4                  | 1               |
| TAJE227*006#NJ                          | E         | 220      | 6.3               | 13.9          | 8         | 0.4                  | 1 <sup>1)</sup> |
| TAJC337*006#NJ                          | C         | 330      | 6.3               | 19.8          | 12        | 0.5                  | 1               |
| TAJD337*006#NJ                          | D         | 330      | 6.3               | 20.8          | 8         | 0.4                  | 1               |
| TAJE337*006#NJ                          | E         | 330      | 6.3               | 20.8          | 8         | 0.4                  | 1 <sup>1)</sup> |
| TAJD477*006#NJ                          | D         | 470      | 6.3               | 28            | 12        | 0.4                  | 1               |
| TAJE477*006#NJ                          | E         | 470      | 6.3               | 28            | 10        | 0.4                  | 1 <sup>1)</sup> |
| TAJV477*006#NJ                          | V         | 470      | 6.3               | 28            | 10        | 0.4                  | 1 <sup>1)</sup> |
| TAJE687*006#NJ                          | E         | 680      | 6.3               | 42.8          | 10        | 0.5                  | 1 <sup>1)</sup> |
| TAJV687*006#NJ                          | V         | 680      | 6.3               | 42.8          | 10        | 0.5                  | 1 <sup>1)</sup> |
| TAJE108M006#NJ                          | E         | 1000     | 6.3               | 60            | 20        | 0.2                  | 1 <sup>1)</sup> |
| TAJV108M006#NJ                          | V         | 1000     | 6.3               | 60            | 16        | 0.2                  | 1 <sup>1)</sup> |
| <b>16 Volt @ 85°C (10 Volt @ 125°C)</b> |           |          |                   |               |           |                      |                 |
| TAJA475*010#NJ                          | A         | 4.7      | 10                | 0.5           | 6         | 5                    | 1               |
| TAJA685*010#NJ                          | A         | 6.8      | 10                | 0.7           | 6         | 4                    | 1               |
| TAJA106*010#NJ                          | A         | 10       | 10                | 1             | 6         | 3                    | 1               |
| TAJA156*010#NJ                          | A         | 15       | 10                | 1.5           | 6         | 3.2                  | 1               |
| TAJB156*010#NJ                          | B         | 15       | 10                | 1.5           | 6         | 2.8                  | 1               |
| TAJA226*010#NJ                          | A         | 22       | 10                | 2.2           | 8         | 3                    | 1               |
| TAJB226*010#NJ                          | B         | 22       | 10                | 2.2           | 6         | 2.4                  | 1               |
| TAJA336*010#NJ                          | A         | 33       | 10                | 3.3           | 8         | 1.7                  | 1               |
| TAJB336*010#NJ                          | B         | 33       | 10                | 3.3           | 6         | 1.8                  | 1               |
| TAJC336*010#NJ                          | C         | 33       | 10                | 3.3           | 6         | 1.6                  | 1               |
| TAJB476*010#NJ                          | B         | 47       | 10                | 4.7           | 8         | 1                    | 1               |
| TAJC476*010#NJ                          | C         | 47       | 10                | 4.7           | 6         | 1.2                  | 1               |
| TAJB686*010#NJ                          | B         | 68       | 10                | 6.8           | 6         | 1.4                  | 1               |
| TAJC686*010#NJ                          | C         | 68       | 10                | 6.8           | 6         | 1.3                  | 1               |
| TAJB107M010#NJ                          | B         | 100      | 10                | 10            | 8         | 1.4                  | 1               |
| TAJC107*010#NJ                          | C         | 100      | 10                | 10            | 8         | 1.2                  | 1               |
| TAJD107*010#NJ                          | D         | 100      | 10                | 10            | 6         | 0.9                  | 1               |
| TAJC157*010#NJ                          | C         | 150      | 10                | 15            | 8         | 0.9                  | 1               |
| TAJD157*010#NJ                          | D         | 150      | 10                | 15            | 8         | 0.9                  | 1               |
| TAJE157*010#NJ                          | E         | 150      | 10                | 15            | 8         | 0.9                  | 1 <sup>1)</sup> |
| TAJC227*010#NJ                          | C         | 220      | 10                | 22            | 18        | 0.5                  | 1               |
| TAJD227*010#NJ                          | D         | 220      | 10                | 22            | 8         | 0.5                  | 1               |
| TAJE227*010#NJ                          | E         | 220      | 10                | 22            | 8         | 0.5                  | 1 <sup>1)</sup> |
| TAJD337*010#NJ                          | D         | 330      | 10                | 33            | 8         | 0.9                  | 1               |
| TAJE337*010#NJ                          | E         | 330      | 10                | 33            | 8         | 0.9                  | 1 <sup>1)</sup> |
| TAJV337*010#NJ                          | V         | 330      | 10                | 33            | 10        | 0.9                  | 1 <sup>1)</sup> |
| TAJE477*010#NJ                          | E         | 470      | 10                | 47            | 10        | 0.5                  | 1 <sup>1)</sup> |
| TAJV477*010#NJ                          | V         | 470      | 10                | 47            | 10        | 0.5                  | 1 <sup>1)</sup> |
| <b>16 Volt @ 85°C (10 Volt @ 125°C)</b> |           |          |                   |               |           |                      |                 |
| TAJA225*016#NJ                          | A         | 2.2      | 16                | 0.5           | 6         | 6.5                  | 1               |
| TAJA335*016#NJ                          | A         | 3.3      | 16                | 0.5           | 6         | 5                    | 1               |
| TAJB335*016#NJ                          | B         | 3.3      | 16                | 0.5           | 6         | 4.5                  | 1               |
| TAJA475*016#NJ                          | A         | 4.7      | 16                | 0.8           | 6         | 4                    | 1               |
| TAJB475*016#NJ                          | B         | 4.7      | 16                | 0.8           | 6         | 3.5                  | 1               |
| TAJA685*016#NJ                          | A         | 6.8      | 16                | 1.1           | 6         | 3.5                  | 1               |
| TAJB685*016#NJ                          | B         | 6.8      | 16                | 1.1           | 6         | 2.5                  | 1               |
| TAJA106*016#NJ                          | A         | 10       | 16                | 1.6           | 6         | 3                    | 1               |
| TAJB106*016#NJ                          | B         | 10       | 16                | 1.6           | 6         | 2.8                  | 1               |
| TAJC106*016#NJ                          | C         | 10       | 16                | 1.6           | 6         | 2                    | 1               |
| TAJA156M016#NJ                          | A         | 15       | 16                | 2.4           | 6         | 2                    | 1               |
| TAJB156*016#NJ                          | B         | 15       | 16                | 2.4           | 6         | 2.5                  | 1               |
| TAJC156*016#NJ                          | C         | 15       | 16                | 2.4           | 6         | 1.8                  | 1               |
| TAJB226*016#NJ                          | B         | 22       | 16                | 3.5           | 6         | 2.3                  | 1               |
| TAJC226*016#NJ                          | C         | 22       | 16                | 3.5           | 6         | 1                    | 1               |

<sup>1)</sup> Dry pack option (see How to order) recommended for reduction of stress during soldering. Dry pack parts should be treated as MSL 3.

Moisture Sensitivity Level (MSL) is defined according to J-STD-020.

For AEC-Q200 availability, please contact AVX.

All technical data relates to an ambient temperature of +25°C. Capacitance and DF are measured at 120Hz, 0.5V RMS with a maximum DC bias of 2.2 volts. DCL is measured at rated voltage after 5 minutes.

For typical weight and composition see page 126.

**NOTE: AVX reserves the right to supply a higher voltage rating or tighter tolerance part in the same case size, to the same reliability standards.**

### RATINGS & PART NUMBER REFERENCE

| AVX Part No.                            | Case Size | Cap (μF) | Rated Voltage (V) | DCL (μA) Max. | DF % Max. | ESR Max. (Ω) @100kHz | MSL             |
|-----------------------------------------|-----------|----------|-------------------|---------------|-----------|----------------------|-----------------|
| TAJD226*016#NJ                          | D         | 22       | 16                | 3.5           | 6         | 1.1                  | 1               |
| TAJB336*016#NJ                          | B         | 33       | 16                | 5.3           | 8         | 2.1                  | 1               |
| TAJC336*016#NJ                          | C         | 33       | 16                | 5.3           | 6         | 1.5                  | 1               |
| TAJD336*016#NJ                          | D         | 33       | 16                | 5.3           | 6         | 0.9                  | 1               |
| TAJC476*016#NJ                          | C         | 47       | 16                | 7.5           | 6         | 0.5                  | 1               |
| TAJD476*016#NJ                          | D         | 47       | 16                | 7.5           | 6         | 0.9                  | 1               |
| TAJC686*016#NJ                          | C         | 68       | 16                | 10.9          | 6         | 1.3                  | 1               |
| TAJD686*016#NJ                          | D         | 68       | 16                | 10.9          | 6         | 0.9                  | 1               |
| TAJC107*016#NJ                          | C         | 100      | 16                | 16            | 8         | 1                    | 1               |
| TAJD107*016#NJ                          | D         | 100      | 16                | 16            | 6         | 0.6                  | 1               |
| TAJE107*016#NJ                          | E         | 100      | 16                | 16            | 6         | 0.9                  | 1 <sup>1)</sup> |
| TAJD157*016#NJ                          | D         | 150      | 16                | 24            | 6         | 0.9                  | 1               |
| TAJE157*016#NJ                          | E         | 150      | 16                | 23            | 8         | 0.3                  | 1 <sup>1)</sup> |
| TAJV157*016#NJ                          | V         | 150      | 16                | 24            | 8         | 0.5                  | 1 <sup>1)</sup> |
| TAJE227*016#NJ                          | E         | 220      | 16                | 35.2          | 10        | 0.5                  | 1 <sup>1)</sup> |
| TAJV227*016#NJ                          | V         | 220      | 16                | 35.2          | 8         | 0.9                  | 1 <sup>1)</sup> |
| TAJE337M016#NJ                          | E         | 330      | 16                | 52.8          | 30        | 0.4                  | 1 <sup>1)</sup> |
| <b>20 Volt @ 85°C (13 Volt @ 125°C)</b> |           |          |                   |               |           |                      |                 |
| TAJA105*020#NJ                          | A         | 1        | 20                | 0.5           | 4         | 9                    | 1               |
| TAJA155*020#NJ                          | A         | 1.5      | 20                | 0.5           | 6         | 6.5                  | 1               |
| TAJA225*020#NJ                          | A         | 2.2      | 20                | 0.5           | 6         | 5.3                  | 1               |
| TAJB225*020#NJ                          | B         | 2.2      | 20                | 0.5           | 6         | 3.5                  | 1               |
| TAJA335*020#NJ                          | A         | 3.3      | 20                | 0.7           | 6         | 4.5                  | 1               |
| TAJB335*020#NJ                          | B         | 3.3      | 20                | 0.7           | 6         | 3                    | 1               |
| TAJA475*020#NJ                          | A         | 4.7      | 20                | 0.9           | 6         | 4                    | 1               |
| TAJB475*020#NJ                          | B         | 4.7      | 20                | 0.9           | 6         | 3                    | 1               |
| TAJA685*020#NJ                          | A         | 6.8      | 20                | 1.4           | 6         | 2.4                  | 1               |
| TAJB685*020#NJ                          | B         | 6.8      | 20                | 1.4           | 6         | 2.5                  | 1               |
| TAJC685*020#NJ                          | C         | 6.8      | 20                | 1.4           | 6         | 2                    | 1               |
| TAJB106*020#NJ                          | B         | 10       | 20                | 2             | 6         | 2.1                  | 1               |
| TAJC106*020#NJ                          | C         | 10       | 20                | 2             | 6         | 1.2                  | 1               |
| TAJB156*020#NJ                          | B         | 15       | 20                | 3             | 6         | 2                    | 1               |
| TAJC156*020#NJ                          | C         | 15       | 20                | 3             | 6         | 1.7                  | 1               |
| TAJB226*020#NJ                          | B         | 22       | 20                | 4.4           | 6         | 1.8                  | 1               |
| TAJC226*020#NJ                          | C         | 22       | 20                | 4.4           | 6         | 1.6                  | 1               |
| TAJD226*020#NJ                          | D         | 22       | 20                | 4.4           | 6         | 0.9                  | 1               |
| TAJC336*020#NJ                          | C         | 33       | 20                | 6.6           | 6         | 1.5                  | 1               |
| TAJD336*020#NJ                          | D         | 33       | 20                | 6.6           | 6         | 0.9                  | 1               |
| TAJC476*020#NJ                          | C         | 47       | 20                | 9.4           | 6         | 0.5                  | 1               |
| TAJD476*020#NJ                          | D         | 47       | 20                | 9.4           | 6         | 0.9                  | 1               |
| TAJE476*020#NJ                          | E         | 47       | 20                | 9.4           | 6         | 0.9                  | 1 <sup>1)</sup> |
| TAJC686M020#NJ                          | C         | 68       | 20                | 13.6          | 8         | 0.5                  | 1               |
| TAJD686*020#NJ                          | D         | 68       | 20                | 13.6          | 6         | 0.4                  | 1               |
| TAJE686*020#NJ                          | E         | 68       | 20                | 13.6          | 6         | 0.9                  | 1 <sup>1)</sup> |
| TAJD107*020#NJ                          | D         | 100      | 20                | 20            | 6         | 0.5                  | 1               |
| TAJE107*020#NJ                          | E         | 100      | 20                | 20            | 6         | 0.4                  | 1 <sup>1)</sup> |
| TAJV107*020#NJ                          | V         | 100      | 20                | 20            | 8         | 0.9                  | 1 <sup>1)</sup> |
| TAJE157*020#NJ                          | E         | 150      | 20                | 30            | 8         | 0.3                  | 1 <sup>1)</sup> |
| TAJV157*020#NJ                          | V         | 150      | 20                | 30            | 8         | 0.3                  | 1 <sup>1)</sup> |
| <b>25 Volt @ 85°C (17 Volt @ 125°C)</b> |           |          |                   |               |           |                      |                 |
| TAJA474*025#NJ                          | A         | 0.47     | 25                | 0.5           | 4         | 14                   | 1               |
| TAJA684*025#NJ                          | A         | 0.68     | 25                | 0.5           | 4         | 10                   | 1               |
| TAJA105*025#NJ                          | A         | 1        | 25                | 0.5           | 4         | 8                    | 1               |
| TAJA155*025#NJ                          | A         | 1.5      | 25                | 0.5           | 6         | 7.5                  | 1               |
| TAJB155*025#NJ                          | B         | 1.5      | 25                | 0.5           | 6         | 5                    | 1               |
| TAJA225*025#NJ                          | A         | 2.2      | 25                | 0.6           | 6         | 7                    | 1               |
| TAJB225*025#NJ                          | B         | 2.2      | 25                | 0.6           | 6         | 4.5                  | 1               |
| TAJA335*025#NJ                          | A         | 3.3      | 25                | 0.8           | 6         | 3.7                  | 1               |

| AVX Part No.                            | Case Size | Cap (μF) | Rated Voltage (V) | DCL (μA) Max. | DF % Max. | ESR Max. (Ω) @100kHz | MSL             |
|-----------------------------------------|-----------|----------|-------------------|---------------|-----------|----------------------|-----------------|
| TAJB335*025#NJ                          | B         | 3.3      | 25                | 0.8           | 6         | 3.5                  | 1               |
| TAJA475*025#NJ                          | A         | 4.7      | 25                | 1.2           | 6         | 3.1                  | 1               |
| TAJB475*025#NJ                          | B         | 4.7      | 25                | 1.2           | 6         | 1.5                  | 1               |
| TAJB685*025#NJ                          | B         | 6.8      | 25                | 1.7           | 6         | 2.8                  | 1               |
| TAJC685*025#NJ                          | C         | 6.8      | 25                | 1.7           | 6         | 2                    | 1               |
| TAJB106*025#NJ                          | B         | 10       | 25                | 2.5           | 6         | 2.5                  | 1               |
| TAJC106*025#NJ                          | C         | 10       | 25                | 2.5           | 6         | 1.8                  | 1               |
| TAJD106*025#NJ                          | D         | 10       | 25                | 2.5           | 6         | 1.2                  | 1               |
| TAJC156*025#NJ                          | C         | 15       | 25                | 3.8           | 6         | 1.6                  | 1               |
| TAJD156*025#NJ                          | D         | 15       | 25                | 3.8           | 6         | 1                    | 1               |
| TAJC226*025#NJ                          | C         | 22       | 25                | 5.5           | 6         | 1.4                  | 1               |
| TAJD226*025#NJ                          | D         | 22       | 25                | 5.5           | 6         | 0.9                  | 1               |
| TAJD336*025#NJ                          | D         | 33       | 25                | 8.3           | 6         | 0.9                  | 1               |
| TAJE336*025#NJ                          | E         | 33       | 25                | 8.3           | 6         | 0.9                  | 1 <sup>1)</sup> |
| TAJD476*025#NJ                          | D         | 47       | 25                | 11.8          | 6         | 0.9                  | 1               |
| TAJE476*025#NJ                          | E         | 47       | 25                | 11.8          | 6         | 0.9                  | 1 <sup>1)</sup> |
| TAJE686*025#NJ                          | E         | 68       | 25                | 17            | 6         | 0.9                  | 1 <sup>1)</sup> |
| TAJV686*025#NJ                          | V         | 68       | 25                | 17            | 6         | 0.9                  | 1 <sup>1)</sup> |
| TAJE107M025#NJ                          | E         | 100      | 25                | 25            | 10        | 0.3                  | 1 <sup>1)</sup> |
| TAJV107*025#NJ                          | V         | 100      | 25                | 25            | 8         | 0.4                  | 1 <sup>1)</sup> |
| TAJV157M025#NJ                          | V         | 150      | 25                | 37.5          | 10        | 0.4                  | 1 <sup>1)</sup> |
| <b>35 Volt @ 85°C (23 Volt @ 125°C)</b> |           |          |                   |               |           |                      |                 |
| TAJA104*035#NJ                          | A         | 0.1      | 35                | 0.5           | 4         | 24                   | 1               |
| TAJA154*035#NJ                          | A         | 0.15     | 35                | 0.5           | 4         | 21                   | 1               |
| TAJA224*035#NJ                          | A         | 0.22     | 35                | 0.5           | 4         | 18                   | 1               |
| TAJA334*035#NJ                          | A         | 0.33     | 35                | 0.5           | 4         | 15                   | 1               |
| TAJA474*035#NJ                          | A         | 0.47     | 35                | 0.5           | 4         | 12                   | 1               |
| TAJB474*035#NJ                          | B         | 0.47     | 35                | 0.5           | 4         | 10                   | 1               |
| TAJA684*035#NJ                          | A         | 0.68     | 35                | 0.5           | 4         | 8                    | 1               |
| TAJB684*035#NJ                          | B         | 0.68     | 35                | 0.5           | 4         | 8                    | 1               |
| TAJA105*035#NJ                          | A         | 1        | 35                | 0.5           | 4         | 7.5                  | 1               |
| TAJB105*035#NJ                          | B         | 1        | 35                | 0.5           | 4         | 6.5                  | 1               |
| TAJA155*035#NJ                          | A         | 1.5      | 35                | 0.5           | 6         | 7.5                  | 1               |
| TAJB155*035#NJ                          | B         | 1.5      | 35                | 0.5           | 6         | 5.2                  | 1               |
| TAJC155*035#NJ                          | C         | 1.5      | 35                | 0.5           | 6         | 4.5                  | 1               |
| TAJA225*035#NJ                          | A         | 2.2      | 35                | 0.8           | 6         | 4.5                  | 1               |
| TAJB225*035#NJ                          | B         | 2.2      | 35                | 0.8           | 6         | 4.2                  | 1               |
| TAJC225*035#NJ                          | C         | 2.2      | 35                | 0.8           | 6         | 3.5                  | 1               |
| TAJB335*035#NJ                          | B         | 3.3      | 35                | 1.2           | 6         | 3.5                  | 1               |
| TAJC335*035#NJ                          | C         | 3.3      | 35                | 1.2           | 6         | 2.5                  | 1               |
| TAJB475*035#NJ                          | B         | 4.7      | 35                | 1.6           | 6         | 3.1                  | 1               |
| TAJC475*035#NJ                          | C         | 4.7      | 35                | 1.6           | 6         | 2.2                  | 1               |
| TAJD475*035#NJ                          | D         | 4.7      | 35                | 1.6           | 6         | 1.5                  | 1               |
| TAJC685*035#NJ                          | C         | 6.8      | 35                | 2.4           | 6         | 1.8                  | 1               |
| TAJD685*035#NJ                          | D         | 6.8      | 35                | 2.4           | 6         | 1.3                  | 1               |
| TAJC106*035#NJ                          | C         | 10       | 35                | 3.5           | 6         | 1.6                  | 1               |
| TAJD106*035#NJ                          | D         | 10       | 35                | 3.5           | 6         | 1                    | 1               |
| TAJE106*035#NJ                          | E         | 10       | 35                | 3.5           | 6         | 0.9                  | 1 <sup>1)</sup> |
| TAJC156*035#NJ                          | C         | 15       | 35                | 5.3           | 6         | 1.4                  | 1               |
| TAJD156*035#NJ                          | D         | 15       | 35                | 5.3           | 6         | 0.9                  | 1               |
| TAJD226*035#NJ                          | D         | 22       | 35                | 7.7           | 6         | 0.9                  | 1               |
| TAJE226*035#NJ                          | E         | 22       | 35                | 7.7           | 6         | 0.5                  | 1 <sup>1)</sup> |
| TAJD336*035#NJ                          | D         | 33       | 35                | 11.6          | 6         | 0.9                  | 1               |
| TAJE336*035#NJ                          | E         | 33       | 35                | 11.6          | 6         | 0.9                  | 1 <sup>1)</sup> |
| TAJV336*035#NJ                          | V         | 33       | 35                | 11.6          | 6         | 0.5                  | 1 <sup>1)</sup> |
| TAJE476*035#NJ                          | E         | 47       | 35                | 16.5          | 6         | 0.9                  | 1 <sup>1)</sup> |
| TAJV476*035#NJ                          | V         | 47       | 35                | 16.5          | 6         | 0.4                  | 1 <sup>1)</sup> |
| TAJV686*035#NJ                          | V         | 68       | 35                | 23.8          | 6         | 0.5                  | 1 <sup>1)</sup> |

<sup>1)</sup> Dry pack option (see How to order) recommended for reduction of stress during soldering. Dry pack parts should be treated as MSL 3.

Moisture Sensitivity Level (MSL) is defined according to J-STD-020.

For AEC-Q200 availability, please contact AVX.

All technical data relates to an ambient temperature of +25°C. Capacitance and DF are measured at 120Hz, 0.5V RMS with a maximum DC bias of 2.2 volts.

DCL is measured at rated voltage after 5 minutes.

For typical weight and composition see page 126.

**NOTE:** AVX reserves the right to supply a higher voltage rating or tighter tolerance part in the same case size, to the same reliability standards.

### RATINGS & PART NUMBER REFERENCE

| AVX Part No.                     | Case Size | Cap (μF) | Rated Voltage (V) | DCL (μA) Max. | DF % Max. | ESR Max. (Ω) @100kHz | MSL             |
|----------------------------------|-----------|----------|-------------------|---------------|-----------|----------------------|-----------------|
| 50 Volt @ 85°C (33 Volt @ 125°C) |           |          |                   |               |           |                      |                 |
| TAJA104*050#NJ                   | A         | 0.1      | 50                | 0.5           | 4         | 22                   | 1               |
| TAJA154*050#NJ                   | A         | 0.15     | 50                | 0.5           | 4         | 15                   | 1               |
| TAJB154*050#NJ                   | B         | 0.15     | 50                | 0.5           | 4         | 17                   | 1               |
| TAJA224*050#NJ                   | A         | 0.22     | 50                | 0.5           | 4         | 18                   | 1               |
| TAJB224*050#NJ                   | B         | 0.22     | 50                | 0.5           | 4         | 14                   | 1               |
| TAJA334*050#NJ                   | A         | 0.33     | 50                | 0.5           | 4         | 17                   | 1               |
| TAJB334*050#NJ                   | B         | 0.33     | 50                | 0.5           | 4         | 12                   | 1               |
| TAJA474*050#NJ                   | A         | 0.47     | 50                | 0.5           | 4         | 9.5                  | 1               |
| TAJB474*050#NJ                   | B         | 0.47     | 50                | 0.7           | 4         | 9.5                  | 1               |
| TAJC474*050#NJ                   | C         | 0.47     | 50                | 0.5           | 4         | 8                    | 1               |
| TAJA684*050#NJ                   | A         | 0.68     | 50                | 0.5           | 4         | 7.9                  | 1               |
| TAJB684*050#NJ                   | B         | 0.68     | 50                | 0.5           | 4         | 8                    | 1               |
| TAJC684*050#NJ                   | C         | 0.68     | 50                | 0.5           | 4         | 7                    | 1               |
| TAJA105*050#NJ                   | A         | 1        | 50                | 0.5           | 4         | 6.6                  | 1               |
| TAJB105*050#NJ                   | B         | 1        | 50                | 0.5           | 6         | 7                    | 1               |
| TAJC105*050#NJ                   | C         | 1        | 50                | 0.5           | 4         | 5.5                  | 1               |
| TAJB155*050#NJ                   | B         | 1.5      | 50                | 0.8           | 8         | 5.4                  | 1               |
| TAJC155*050#NJ                   | C         | 1.5      | 50                | 0.8           | 6         | 4.5                  | 1               |
| TAJD155*050#NJ                   | D         | 1.5      | 50                | 0.8           | 6         | 4                    | 1               |
| TAJB225*050#NJ                   | B         | 2.2      | 50                | 1.1           | 8         | 4.5                  | 1               |
| TAJC225*050#NJ                   | C         | 2.2      | 50                | 1.1           | 8         | 2.5                  | 1               |
| TAJD225*050#NJ                   | D         | 2.2      | 50                | 1.1           | 6         | 2.5                  | 1               |
| TAJC335*050#NJ                   | C         | 3.3      | 50                | 1.6           | 6         | 2.5                  | 1               |
| TAJD335*050#NJ                   | D         | 3.3      | 50                | 1.7           | 6         | 2                    | 1               |
| TAJC475*050#NJ                   | C         | 4.7      | 50                | 0.5           | 4         | 1.4                  | 1               |
| TAJD475*050#NJ                   | D         | 4.7      | 50                | 2.4           | 6         | 1.4                  | 1               |
| TAJC685*050#NJ                   | C         | 6.8      | 50                | 3.4           | 6         | 1                    | 1               |
| TAJD685*050#NJ                   | D         | 6.8      | 50                | 3.4           | 6         | 1                    | 1               |
| TAJD106*050#NJ                   | D         | 10       | 50                | 5             | 6         | 0.8                  | 1               |
| TAJE106*050#NJ                   | E         | 10       | 50                | 5             | 6         | 1                    | 1 <sup>1)</sup> |
| TAJV106*050#NJ                   | V         | 10       | 50                | 5             | 6         | 0.65                 | 1 <sup>1)</sup> |
| TAJD156*050#NJ                   | D         | 15       | 50                | 7.5           | 6         | 0.6                  | 1               |
| TAJE156*050#NJ                   | E         | 15       | 50                | 7.5           | 6         | 0.6                  | 1 <sup>1)</sup> |
| TAJV156*050#NJ                   | V         | 15       | 50                | 7.5           | 6         | 0.6                  | 1 <sup>1)</sup> |
| TAJV226*050#NJ                   | V         | 22       | 50                | 11            | 8         | 0.6                  | 1 <sup>1)</sup> |

<sup>1)</sup> Dry pack option (see How to order) recommended for reduction of stress during soldering. Dry pack parts should be treated as MSL 3.

For AEC-Q200 availability, please contact AVX.

Moisture Sensitivity Level (MSL) is defined according to J-STD-020.

All technical data relates to an ambient temperature of +25°C. Capacitance and DF are measured at 120Hz, 0.5V RMS with a maximum DC bias of 2.2 volts. DCL is measured at rated voltage after 5 minutes.

For typical weight and composition see page 126.

**NOTE: AVX reserves the right to supply a higher voltage rating or tighter tolerance part in the same case size, to the same reliability standards.**

# TAJ Automotive Range



## Standard Tantalum - Automotive Product Range

### TAJ AUTOMOTIVE RANGE CAPACITANCE AND RATED VOLTAGE, $V_R$ (VOLTAGE CODE) RANGE (LETTER DENOTES CASE SIZE)

| Capacitance          |                   | Rated voltage DC ( $V_R$ ) to 85°C |                       |                       |                   |                   |                     |                 |
|----------------------|-------------------|------------------------------------|-----------------------|-----------------------|-------------------|-------------------|---------------------|-----------------|
| $\mu F$              | Code              | 6.3V (J)                           | 10V (A)               | 16V (C)               | 20V (D)           | 25V (E)           | 35V (V)             | 50V (T)         |
| 0.10<br>0.15<br>0.22 | 104<br>154<br>224 |                                    |                       |                       |                   |                   |                     | A               |
| 0.33<br>0.47<br>0.68 | 334<br>474<br>684 |                                    |                       |                       |                   | A<br>A<br>A       | A<br>A<br>A         | A<br>A/B<br>B   |
| 1.0<br>1.5<br>2.2    | 105<br>155<br>225 |                                    | A                     | A<br>A<br>A/B         | A<br>A<br>A/B     | A<br>A<br>A/B     | A/B<br>A/B<br>B/C   | B/C<br>C<br>C/D |
| 3.3<br>4.7<br>6.8    | 335<br>475<br>685 | A                                  | A/B<br>A/B<br>A/B     | A/B<br>A/B<br>A/B     | A/B<br>A/B<br>B/C | B<br>B/C<br>B/C   | B/C<br>B/C/D<br>C/D | C/D<br>C/D<br>D |
| 10<br>15<br>22       | 106<br>156<br>226 | A/B<br>A<br>A/B/C                  | A/B<br>A/B/C<br>A/B/C | A/B/C<br>B/C<br>B/C/D | B/C<br>B/C<br>C/D | C/D<br>C/D<br>C/D | C/D<br>D<br>D/E     | D/E             |
| 33<br>47<br>68       | 336<br>476<br>686 | A/B<br>B/C<br>B/C                  | B/C<br>B/C/D<br>C/D   | C/D<br>C/D<br>C/D     | C/D<br>D<br>D/E   | D<br>D/E          | E                   |                 |
| 100<br>150<br>220    | 107<br>157<br>227 | C/D<br>C/D<br>D                    | C/D<br>D/E<br>D/E     | D/E<br>E              | E                 |                   |                     |                 |
| 330<br>470<br>680    | 337<br>477<br>687 | D/E<br>D/E<br>E                    | E                     |                       |                   |                   |                     |                 |

Not recommended for new designs, higher voltage or smaller case size substitution are offered.

Released codes

Note: Voltage ratings are minimum values. AVX reserves the right to supply higher ratings in the same case size, to the same reliability standards.

## HOW TO ORDER

| TAJ  | C                            | 106                                                                                                                                    | M                                             | 035                                                                                                                        | T                                                                                  | NJ                                      |
|------|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-----------------------------------------|
| Type | Case Size<br>See table above | Capacitance Code<br>pF code: 1st two digits represent significant figures, 3rd digit represents multiplier (number of zeros to follow) | Tolerance<br>K = $\pm 10\%$<br>M = $\pm 20\%$ | Rated DC Voltage<br>006 = 6.3Vdc<br>010 = 10Vdc<br>016 = 16Vdc<br>020 = 20Vdc<br>025 = 25Vdc<br>035 = 35Vdc<br>050 = 50Vdc | Packaging<br>T = Automotive Lead Free 7" Reel<br>U = Automotive Lead Free 13" Reel | Specification Suffix<br>NJ = Std Suffix |

## TECHNICAL SPECIFICATIONS

Technical Data:

All technical data relate to an ambient temperature of +25°C

Capacitance Range: 0.22  $\mu F$  to 680  $\mu F$

Capacitance Tolerance:  $\pm 10\%$ ;  $\pm 20\%$

|                            |                       |     |    |    |    |    |    |    |
|----------------------------|-----------------------|-----|----|----|----|----|----|----|
| Rated Voltage ( $V_R$ )    | $\leq +85^\circ C$ :  | 6.3 | 10 | 16 | 20 | 25 | 35 | 50 |
| Category Voltage ( $V_C$ ) | $\leq +125^\circ C$ : | 4   | 7  | 10 | 13 | 17 | 23 | 33 |
| Surge Voltage ( $V_S$ )    | $\leq +85^\circ C$ :  | 8   | 13 | 20 | 26 | 32 | 46 | 65 |
| Surge Voltage ( $V_S$ )    | $\leq +125^\circ C$ : | 5   | 8  | 13 | 16 | 20 | 28 | 40 |

Temperature Range: -55°C to +125°C

Environmental Classification: 55/125/56 (IEC 68-2)

Reliability: 1% per 1000 hours at 85°C,  $V_R$  with 0.1 $\Omega/V$  series impedance, 60% confidence level

Termination Finished: Sn Plating (standard), Gold and SnPb Plating upon request

Meets requirements of AEC-Q200



# TAJ Automotive Range



## Standard Tantalum - Automotive Product Range

### RATINGS & PART NUMBER REFERENCE

| AVX Part No.*                           | Case Size | Cap (µF) | Rated Voltage (V) | DCL (µA) Max. | DF % Max. | ESR Max. (Ω) @100kHz | MSL |
|-----------------------------------------|-----------|----------|-------------------|---------------|-----------|----------------------|-----|
| <b>6.3 Volt @ 85°C (4 Volt @ 125°C)</b> |           |          |                   |               |           |                      |     |
| TAJA335*006TNJ                          | A         | 3.3      | 6.3               | 0.5           | 6         | 7                    | 1   |
| TAJA106*006TNJ                          | A         | 10       | 6.3               | 0.6           | 6         | 4                    | 1   |
| TAJB106*006TNJ                          | B         | 10       | 6.3               | 0.6           | 6         | 3                    | 1   |
| TAJA156*006TNJ                          | A         | 15       | 6.3               | 0.9           | 6         | 3.5                  | 1   |
| TAJA226*006TNJ                          | A         | 22       | 6.3               | 1.4           | 6         | 3                    | 1   |
| TAJB226*006TNJ                          | B         | 22       | 6.3               | 1.4           | 6         | 2.5                  | 1   |
| TAJC226*006TNJ                          | C         | 22       | 6.3               | 1.4           | 6         | 2                    | 1   |
| TAJA336*006TNJ                          | A         | 33       | 6.3               | 2.1           | 8         | 2.2                  | 1   |
| TAJB336*006TNJ                          | B         | 33       | 6.3               | 2.1           | 6         | 2.2                  | 1   |
| TAJB476*006TNJ                          | B         | 47       | 6.3               | 3             | 6         | 2                    | 1   |
| TAJC476*006TNJ                          | C         | 47       | 6.3               | 3             | 6         | 1.6                  | 1   |
| TAJB686*006TNJ                          | B         | 68       | 6.3               | 4             | 8         | 0.9                  | 1   |
| TAJC686*006TNJ                          | C         | 68       | 6.3               | 4.3           | 6         | 1.5                  | 1   |
| TAJC107*006TNJ                          | C         | 100      | 6.3               | 6.3           | 6         | 0.9                  | 1   |
| TAJD107*006TNJ                          | D         | 100      | 6.3               | 6.3           | 6         | 0.9                  | 3   |
| TAJC157*006TNJ                          | C         | 150      | 6.3               | 9.5           | 6         | 1.3                  | 1   |
| TAJD157*006TNJ                          | D         | 150      | 6.3               | 9.5           | 6         | 0.9                  | 3   |
| TAJD227*006TNJ                          | D         | 220      | 6.3               | 13.9          | 8         | 0.4                  | 3   |
| TAJD337*006TNJ                          | D         | 330      | 6.3               | 20.8          | 8         | 0.4                  | 3   |
| TAJE337*006TNJ                          | E         | 330      | 6.3               | 20.8          | 8         | 0.4                  | 3   |
| TAJD477*006TNJ                          | D         | 470      | 6.3               | 28            | 12        | 0.4                  | 3   |
| TAJE477*006TNJ                          | E         | 470      | 6.3               | 28            | 10        | 0.4                  | 3   |
| TAJE687*006TNJ                          | E         | 680      | 6.3               | 42.8          | 10        | 0.5                  | 3   |
| <b>10 Volt @ 85°C (7 Volt @ 125°C)</b>  |           |          |                   |               |           |                      |     |
| TAJA225*010TNJ                          | A         | 2.2      | 10                | 0.5           | 6         | 7                    | 1   |
| TAJA475*010TNJ                          | A         | 4.7      | 10                | 0.5           | 6         | 5                    | 1   |
| TAJB475*010TNJ                          | B         | 4.7      | 10                | 0.5           | 6         | 4                    | 1   |
| TAJA685*010TNJ                          | A         | 6.8      | 10                | 0.7           | 6         | 4                    | 1   |
| TAJB685*010TNJ                          | B         | 6.8      | 10                | 0.7           | 6         | 3                    | 1   |
| TAJA106*010TNJ                          | A         | 10       | 10                | 1             | 6         | 3                    | 1   |
| TAJB106*010TNJ                          | B         | 10       | 10                | 1             | 6         | 2.1                  | 1   |
| TAJA156*010TNJ                          | A         | 15       | 10                | 1.5           | 6         | 3.2                  | 1   |
| TAJB156*010TNJ                          | B         | 15       | 10                | 1.5           | 6         | 2.8                  | 1   |
| TAJC156*010TNJ                          | C         | 15       | 10                | 1.5           | 6         | 2                    | 1   |
| TAJA226*010TNJ                          | A         | 22       | 10                | 2.2           | 8         | 3                    | 1   |
| TAJB226*010TNJ                          | B         | 22       | 10                | 2.2           | 6         | 2.4                  | 1   |
| TAJC226*010TNJ                          | C         | 22       | 10                | 2.2           | 6         | 1.8                  | 1   |
| TAJB336*010TNJ                          | B         | 33       | 10                | 3.3           | 6         | 1.8                  | 1   |
| TAJC336*010TNJ                          | C         | 33       | 10                | 3.3           | 6         | 1.6                  | 1   |
| TAJB476*010TNJ                          | B         | 47       | 10                | 4.7           | 8         | 1                    | 1   |
| TAJC476*010TNJ                          | C         | 47       | 10                | 4.7           | 6         | 1.2                  | 1   |
| TAJD476*010TNJ                          | D         | 47       | 10                | 4.7           | 6         | 0.4                  | 3   |
| TAJC686*010TNJ                          | C         | 68       | 10                | 6.8           | 6         | 1.3                  | 1   |
| TAJD686*010TNJ                          | D         | 68       | 10                | 6.8           | 6         | 0.9                  | 3   |
| TAJC107*010TNJ                          | C         | 100      | 10                | 10            | 8         | 1.2                  | 1   |
| TAJD107*010TNJ                          | D         | 100      | 10                | 10            | 6         | 0.9                  | 3   |
| TAJD157*010TNJ                          | D         | 150      | 10                | 15            | 8         | 0.9                  | 3   |
| TAJE157*010TNJ                          | E         | 150      | 10                | 15            | 8         | 0.9                  | 3   |
| TAJD227*010TNJ                          | D         | 220      | 10                | 22            | 8         | 0.5                  | 3   |
| TAJE227*010TNJ                          | E         | 220      | 10                | 22            | 8         | 0.5                  | 3   |
| TAJE337*010TNJ                          | E         | 330      | 10                | 33            | 8         | 0.9                  | 3   |
| <b>16 Volt @ 85°C (10 Volt @ 125°C)</b> |           |          |                   |               |           |                      |     |
| TAJA105*016TNJ                          | A         | 1        | 16                | 0.5           | 4         | 11                   | 1   |
| TAJA225*016TNJ                          | A         | 2.2      | 16                | 0.5           | 6         | 6.5                  | 1   |
| TAJA335*016TNJ                          | A         | 3.3      | 16                | 0.5           | 6         | 5                    | 1   |
| TAJB335*016TNJ                          | B         | 3.3      | 16                | 0.5           | 6         | 4.5                  | 1   |
| TAJA475*016TNJ                          | A         | 4.7      | 16                | 0.8           | 6         | 4                    | 1   |
| TAJB475*016TNJ                          | B         | 4.7      | 16                | 0.8           | 6         | 3.5                  | 1   |

| AVX Part No.*                           | Case Size | Cap (µF) | Rated Voltage (V) | DCL (µA) Max. | DF % Max. | ESR Max. (Ω) @100kHz | MSL |
|-----------------------------------------|-----------|----------|-------------------|---------------|-----------|----------------------|-----|
| <b>20 Volt @ 85°C (13 Volt @ 125°C)</b> |           |          |                   |               |           |                      |     |
| TAJA685*016TNJ                          | A         | 6.8      | 16                | 1.1           | 6         | 3.5                  | 1   |
| TAJB685*016TNJ                          | B         | 6.8      | 16                | 1.1           | 6         | 2.5                  | 1   |
| TAJA106*016TNJ                          | A         | 10       | 16                | 1.6           | 6         | 3                    | 1   |
| TAJB106*016TNJ                          | B         | 10       | 16                | 1.6           | 6         | 2.8                  | 1   |
| TAJC106*016TNJ                          | C         | 10       | 16                | 1.6           | 6         | 2                    | 1   |
| TAJB156*016TNJ                          | B         | 15       | 16                | 2.4           | 6         | 2.5                  | 1   |
| TAJC156*016TNJ                          | C         | 15       | 16                | 2.4           | 6         | 1.8                  | 1   |
| TAJB226*016TNJ                          | B         | 22       | 16                | 3.5           | 6         | 2.3                  | 1   |
| TAJC226*016TNJ                          | C         | 22       | 16                | 3.5           | 6         | 1                    | 1   |
| TAJD226*016TNJ                          | D         | 22       | 16                | 3.5           | 6         | 1.1                  | 3   |
| TAJC336*016TNJ                          | C         | 33       | 16                | 5.3           | 6         | 1.5                  | 1   |
| TAJD336*016TNJ                          | D         | 33       | 16                | 5.3           | 6         | 0.9                  | 3   |
| TAJC476*016TNJ                          | C         | 47       | 16                | 7.5           | 6         | 0.5                  | 1   |
| TAJD476*016TNJ                          | D         | 47       | 16                | 7.5           | 6         | 0.9                  | 3   |
| TAJC686*016TNJ                          | C         | 68       | 16                | 10.9          | 6         | 1.3                  | 1   |
| TAJD686*016TNJ                          | D         | 68       | 16                | 10.9          | 6         | 0.9                  | 3   |
| TAJD107*016TNJ                          | D         | 100      | 16                | 16            | 6         | 0.6                  | 3   |
| TAJE107*016TNJ                          | E         | 100      | 16                | 16            | 6         | 0.9                  | 3   |
| TAJE157*016TNJ                          | E         | 150      | 16                | 23            | 8         | 0.3                  | 3   |
| <b>25 Volt @ 85°C (17 Volt @ 125°C)</b> |           |          |                   |               |           |                      |     |
| TAJA105*020TNJ                          | A         | 1        | 20                | 0.5           | 4         | 9                    | 1   |
| TAJA155*020TNJ                          | A         | 1.5      | 20                | 0.5           | 6         | 6.5                  | 1   |
| TAJA225*020TNJ                          | A         | 2.2      | 20                | 0.5           | 6         | 5.3                  | 1   |
| TAJB225*020TNJ                          | B         | 2.2      | 20                | 0.5           | 6         | 3.5                  | 1   |
| TAJA335*020TNJ                          | A         | 3.3      | 20                | 0.7           | 6         | 4.5                  | 1   |
| TAJB335*020TNJ                          | B         | 3.3      | 20                | 0.7           | 6         | 3                    | 1   |
| TAJA475*020TNJ                          | A         | 4.7      | 20                | 0.9           | 6         | 4                    | 1   |
| TAJB475*020TNJ                          | B         | 4.7      | 20                | 0.9           | 6         | 3                    | 1   |
| TAJB685*020TNJ                          | B         | 6.8      | 20                | 1.4           | 6         | 2.5                  | 1   |
| TAJC685*020TNJ                          | C         | 6.8      | 20                | 1.4           | 6         | 2                    | 1   |
| TAJB106*020TNJ                          | B         | 10       | 20                | 2             | 6         | 2.1                  | 1   |
| TAJC106*020TNJ                          | C         | 10       | 20                | 2             | 6         | 1.2                  | 1   |
| TAJB156*020TNJ                          | B         | 15       | 20                | 3             | 6         | 2                    | 1   |
| TAJC156*020TNJ                          | C         | 15       | 20                | 3             | 6         | 1.7                  | 1   |
| TAJC226*020TNJ                          | C         | 22       | 20                | 4.4           | 6         | 1.6                  | 1   |
| TAJD226*020TNJ                          | D         | 22       | 20                | 4.4           | 6         | 0.9                  | 3   |
| TAJC336*020TNJ                          | C         | 33       | 20                | 6.6           | 6         | 1.5                  | 1   |
| TAJD336*020TNJ                          | D         | 33       | 20                | 6.6           | 6         | 0.9                  | 3   |
| TAJD476*020TNJ                          | D         | 47       | 20                | 9.4           | 6         | 0.9                  | 3   |
| TAJD686*020TNJ                          | D         | 68       | 20                | 13.6          | 6         | 0.4                  | 3   |
| TAJE686*020TNJ                          | E         | 68       | 20                | 13.6          | 6         | 0.9                  | 3   |
| TAJE107*020TNJ                          | E         | 100      | 20                | 20            | 6         | 0.4                  | 3   |
| <b>25 Volt @ 85°C (17 Volt @ 125°C)</b> |           |          |                   |               |           |                      |     |
| TAJA474*025TNJ                          | A         | 0.47     | 25                | 0.5           | 4         | 14                   | 1   |
| TAJA684*025TNJ                          | A         | 0.68     | 25                | 0.5           | 4         | 10                   | 1   |
| TAJA105*025TNJ                          | A         | 1        | 25                | 0.5           | 4         | 8                    | 1   |
| TAJA155*025TNJ                          | A         | 1.5      | 25                | 0.5           | 6         | 7.5                  | 1   |
| TAJA225*025TNJ                          | A         | 2.2      | 25                | 0.6           | 6         | 7                    | 1   |
| TAJB225*025TNJ                          | B         | 2.2      | 25                | 0.6           | 6         | 4.5                  | 1   |
| TAJB335*025TNJ                          | B         | 3.3      | 25                | 0.8           | 6         | 3.5                  | 1   |
| TAJB475*025TNJ                          | B         | 4.7      | 25                | 1.2           | 6         | 1.5                  | 1   |
| TAJC475*025TNJ                          | C         | 4.7      | 25                | 1.2           | 6         | 2.4                  | 1   |
| TAJB685*025TNJ                          | B         | 6.8      | 25                | 1.7           | 6         | 2.8                  | 1   |
| TAJC685*025TNJ                          | C         | 6.8      | 25                | 1.7           | 6         | 2                    | 1   |
| TAJC106*025TNJ                          | C         | 10       | 25                | 2.5           | 6         | 1.8                  | 1   |
| TAJD106*025TNJ                          | D         | 10       | 25                | 2.5           | 6         | 1.2                  | 3   |
| TAJC156*025TNJ                          | C         | 15       | 25                | 3.8           | 6         | 1.6                  | 1   |
| TAJD156*025TNJ                          | D         | 15       | 25                | 3.8           | 6         | 1                    | 3   |
| TAJC226*025TNJ                          | C         | 22       | 25                | 5.5           | 6         | 1.4                  | 1   |

Moisture Sensitivity Level (MSL) is defined according to J-STD-020

\*Please use "U" instead of "T" in the suffix letter for 13" reel packaging

Please use specific PN for automotive version – see "HOW TO ORDER".

All technical data relates to an ambient temperature of +25°C. Capacitance and DF are measured at 120Hz, 0.5V RMS with a maximum DC bias of 2.2 volts.

DCL is measured at rated voltage after 5 minutes.

For typical weight and composition see page 126.

**NOTE: AVX reserves the right to supply a higher voltage rating or tighter tolerance part in the same case size, to the same reliability standards.**

# TAJ Automotive Range



## Standard Tantalum - Automotive Product Range

### RATINGS & PART NUMBER REFERENCE

| AVX Part No.*                           | Case Size | Cap (µF) | Rated Voltage (V) | DCL (µA) Max. | DF % Max. | ESR Max. (Ω) @100kHz | MSL |
|-----------------------------------------|-----------|----------|-------------------|---------------|-----------|----------------------|-----|
| TAJD226*025TNJ                          | D         | 22       | 25                | 5.5           | 6         | 0.9                  | 3   |
| TAJD336*025TNJ                          | D         | 33       | 25                | 8.3           | 6         | 0.9                  | 3   |
| TAJD476*025TNJ                          | D         | 47       | 25                | 11.8          | 6         | 0.9                  | 3   |
| TAJE476*025TNJ                          | E         | 47       | 25                | 11.8          | 6         | 0.9                  | 3   |
| <b>35 Volt @ 85°C (23 Volt @ 125°C)</b> |           |          |                   |               |           |                      |     |
| TAJA334*035TNJ                          | A         | 0.33     | 35                | 0.5           | 4         | 15                   | 1   |
| TAJA474*035TNJ                          | A         | 0.47     | 35                | 0.5           | 4         | 12                   | 1   |
| TAJA684*035TNJ                          | A         | 0.68     | 35                | 0.5           | 4         | 8                    | 1   |
| TAJA105*035TNJ                          | A         | 1        | 35                | 0.5           | 4         | 7.5                  | 1   |
| TAJB105*035TNJ                          | B         | 1        | 35                | 0.5           | 4         | 6.5                  | 1   |
| TAJA155*035TNJ                          | A         | 1.5      | 35                | 0.5           | 6         | 7.5                  | 1   |
| TAJB155*035TNJ                          | B         | 1.5      | 35                | 0.5           | 6         | 5.2                  | 1   |
| TAJB225*035TNJ                          | B         | 2.2      | 35                | 0.8           | 6         | 4.2                  | 1   |
| TAJC225*035TNJ                          | C         | 2.2      | 35                | 0.8           | 6         | 3.5                  | 1   |
| TAJB335*035TNJ                          | B         | 3.3      | 35                | 1.2           | 6         | 3.5                  | 1   |
| TAJC335*035TNJ                          | C         | 3.3      | 35                | 1.2           | 6         | 2.5                  | 1   |
| TAJB475*035TNJ                          | B         | 4.7      | 35                | 1.6           | 6         | 3.1                  | 1   |
| TAJC475*035TNJ                          | C         | 4.7      | 35                | 1.6           | 6         | 2.2                  | 1   |
| TAJD475*035TNJ                          | D         | 4.7      | 35                | 1.6           | 6         | 1.5                  | 3   |
| TAJC685*035TNJ                          | C         | 6.8      | 35                | 2.4           | 6         | 1.8                  | 1   |
| TAJD685*035TNJ                          | D         | 6.8      | 35                | 2.4           | 6         | 1.3                  | 3   |
| TAJC106*035TNJ                          | C         | 10       | 35                | 3.5           | 6         | 1.6                  | 1   |
| TAJD106*035TNJ                          | D         | 10       | 35                | 3.5           | 6         | 1                    | 3   |
| TAJD156*035TNJ                          | D         | 15       | 35                | 5.3           | 6         | 0.9                  | 3   |
| TAJD226*035TNJ                          | D         | 22       | 35                | 7.7           | 6         | 0.9                  | 3   |
| TAJE226*035TNJ                          | E         | 22       | 35                | 7.7           | 6         | 0.5                  | 3   |
| TAJE336*035TNJ                          | E         | 33       | 35                | 11.6          | 6         | 0.9                  | 3   |
| <b>50 Volt @ 85°C (33 Volt @ 125°C)</b> |           |          |                   |               |           |                      |     |
| TAJA224*050TNJ                          | A         | 0.22     | 50                | 0.5           | 4         | 18                   | 1   |
| TAJA334*050TNJ                          | A         | 0.33     | 50                | 0.5           | 4         | 17                   | 1   |
| TAJA474*050TNJ                          | A         | 0.47     | 50                | 0.5           | 4         | 9.5                  | 1   |
| TAJB474*050TNJ                          | B         | 0.47     | 50                | 0.7           | 4         | 9.5                  | 1   |
| TAJB684*050TNJ                          | B         | 0.68     | 50                | 0.5           | 4         | 8                    | 1   |
| TAJB105*050TNJ                          | B         | 1        | 50                | 0.5           | 6         | 7                    | 1   |
| TAJC105*050TNJ                          | C         | 1        | 50                | 0.5           | 4         | 5.5                  | 1   |
| TAJC155*050TNJ                          | C         | 1.5      | 50                | 0.8           | 6         | 4.5                  | 1   |
| TAJC225*050TNJ                          | C         | 2.2      | 50                | 1.1           | 8         | 2.5                  | 1   |
| TAJD225*050TNJ                          | D         | 2.2      | 50                | 1.1           | 6         | 2.5                  | 3   |
| TAJC335*050TNJ                          | C         | 3.3      | 50                | 1.6           | 6         | 2.5                  | 1   |
| TAJD335*050TNJ                          | D         | 3.3      | 50                | 1.7           | 6         | 2                    | 3   |
| TAJC475*050TNJ                          | C         | 4.7      | 50                | 0.5           | 4         | 1.4                  | 1   |
| TAJD475*050TNJ                          | D         | 4.7      | 50                | 2.4           | 6         | 1.4                  | 3   |
| TAJD685*050TNJ                          | D         | 6.8      | 50                | 3.4           | 6         | 1                    | 3   |
| TAJD106*050TNJ                          | D         | 10       | 50                | 5             | 6         | 0.8                  | 3   |
| TAJE106*050TNJ                          | E         | 10       | 50                | 5             | 6         | 1                    | 3   |

Moisture Sensitivity Level (MSL) is defined according to J-STD-020

\*Please use "U" instead of "T" in the suffix letter for 13" reel packaging

Please use specific PN for automotive version – see "HOW TO ORDER".

All technical data relates to an ambient temperature of +25°C. Capacitance and DF are measured at 120Hz, 0.5V RMS with a maximum DC bias of 2.2 volts.

DCL is measured at rated voltage after 5 minutes.

For typical weight and composition see page 126.

**NOTE: AVX reserves the right to supply a higher voltage rating or tighter tolerance part in the same case size, to the same reliability standards.**

## Данный компонент на территории Российской Федерации

**Вы можете приобрести в компании MosChip.**

Для оперативного оформления запроса Вам необходимо перейти по данной ссылке:

<http://moschip.ru/get-element>

Вы можете разместить у нас заказ для любого Вашего проекта, будь то серийное производство или разработка единичного прибора.

В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

### Офис по работе с юридическими лицами:

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