

# Aluminum Capacitors + 85 °C, Tubular, Axial Lead, General Purpose


**FEATURES**

- General purpose capacitor
- Rugged construction
- Largest CV ratings in axial lead capacitor
- Material categorization: For definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



| QUICK REFERENCE DATA                    |                                                                                                                                |
|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| DESCRIPTION                             | VALUE                                                                                                                          |
| Nominal case size<br>Ø D x L in mm      | 0.75" x 1.125"<br>[19.05 x 28.575]<br>to<br>1.375" x 4.125"<br>[34.925 x 104.775]                                              |
| Operating temperature                   | - 40 °C to + 85 °C                                                                                                             |
| Rated capacitance range, C <sub>R</sub> | 15 µF to 220 000 µF                                                                                                            |
| Tolerance on C <sub>R</sub>             | - 10 %, + 50 %; - 10 %, + 75 %                                                                                                 |
| Rated voltage range, U <sub>R</sub>     | 6.3 WV <sub>DC</sub> to 450 WV <sub>DC</sub>                                                                                   |
| Termination                             | Axial leads                                                                                                                    |
| Life validation test at 85 °C           | 1000 h: ΔCAP ≤ 15 % from initial measurement.<br>ΔESR ≤ 1.5 x initial specified limit.<br>ΔDCL ≤ initial specified limit.      |
| Shelf life at 85 °C                     | 500 h: ΔCAP ≤ 10 % from initial measurement.<br>ΔESR ≤ 1.3 x initial specified limit.<br>ΔDCL ≤ 2.0 x initial specified limit. |
| DC leakage current                      | $I = K\sqrt{CV}$<br>K = 6.0 at + 25 °C;<br>36.0 at + 85 °C<br>I in µA, C in µF, V in Volts                                     |

| RIPPLE CURRENT MULTIPLIERS |          |             |             |
|----------------------------|----------|-------------|-------------|
| TEMPERATURE                |          |             |             |
| AMBIENT TEMPERATURE        |          | MULTIPLIERS |             |
| + 75 °C                    |          | 1.4         |             |
| + 65 °C                    |          | 1.7         |             |
| + 45 °C and below          |          | 2.0         |             |
| FREQUENCY (Hz)             |          |             |             |
| WV <sub>DC</sub>           | 50 TO 60 | 300 TO 400  | 1000 AND UP |
| 0 to 50                    | 0.85     | 1.10        | 1.15        |
| 51 to 299                  | 0.85     | 1.15        | 1.20        |
| 300 to up                  | 0.80     | 1.30        | 1.40        |

| LOW TEMPERATURE PERFORMANCE                                                  |                       |
|------------------------------------------------------------------------------|-----------------------|
| CAPACITANCE RATIO C <sup>-40 °C</sup> /C <sup>+25 °C</sup> MINIMUM AT 120 Hz |                       |
| Rated Voltage (WV <sub>DC</sub> )                                            | Capacitance Remaining |
| 0 to 40                                                                      | 35                    |
| 41 to 63                                                                     | 45                    |
| 64 to 100                                                                    | 60                    |
| 101 to 350                                                                   | 20                    |
| 351 to 450                                                                   | 15                    |
| ESR RATIO ESR <sup>-40 °C</sup> /ESR <sup>+25 °C</sup> MAXIMUM AT 120 Hz     |                       |
| Rated Voltage (WV <sub>DC</sub> )                                            | Multiplier            |
| 0 to 40                                                                      | 60                    |
| 41 to 63                                                                     | 55                    |
| 64 to 100                                                                    | 65                    |
| 101 to 350                                                                   | 180                   |
| 351 to 450                                                                   | 190                   |

| DIMENSIONS in inches [millimeters] |                                |                                |                    |           |                                |                                 |                    |
|------------------------------------|--------------------------------|--------------------------------|--------------------|-----------|--------------------------------|---------------------------------|--------------------|
| CASE CODE                          | STYLE 6 AND 7                  |                                | TYPICAL WEIGHT     | CASE CODE | STYLE 6 AND 7                  |                                 | TYPICAL WEIGHT     |
|                                    | D                              | L                              |                    |           | D                              | L                               |                    |
| GE                                 | 0.760 ± 0.020<br>[19.3 ± 0.51] | 1.141 ± 0.062<br>[29.0 ± 1.58] | 0.46 oz.<br>(13 g) | GL        | 0.760 ± 0.020<br>[19.3 ± 0.51] | 2.141 ± 0.062<br>[54.4 ± 1.58]  | 0.74 oz.<br>(21 g) |
| GJ                                 | 0.760 ± 0.020<br>[19.3 ± 0.51] | 1.641 ± 0.062<br>[41.7 ± 1.58] | 0.67 oz.<br>(19 g) | GP        | 0.760 ± 0.020<br>[19.3 ± 0.51] | 2.641 ± 0.062<br>[67.1 ± 1.58]  | 0.88 oz.<br>(25 g) |
| GS                                 | 0.760 ± 0.020<br>[19.3 ± 0.51] | 3.141 ± 0.062<br>[79.8 ± 1.58] | 1.16 oz.<br>(33 g) | KS        | 1.135 ± 0.020<br>[28.8 ± 0.51] | 3.141 ± 0.062<br>[79.8 ± 1.58]  | 2.54 oz.<br>(72 g) |
| GT                                 | 0.760 ± 0.020<br>[19.3 ± 0.51] | 3.641 ± 0.062<br>[92.5 ± 1.58] | 1.34 oz.<br>(38 g) | KT        | 1.135 ± 0.020<br>[28.8 ± 0.51] | 3.641 ± 0.062<br>[92.5 ± 1.58]  | 2.96 oz.<br>(84 g) |
| HE                                 | 0.885 ± 0.020<br>[22.5 ± 0.51] | 1.141 ± 0.062<br>[29.0 ± 1.58] | 0.63 oz.<br>(18 g) | KD        | 1.135 ± 0.020<br>[28.8 ± 0.51] | 4.141 ± 0.062<br>[105.2 ± 1.58] | 3.35 oz.<br>(95 g) |

| DIMENSIONS in inches [millimeters] |                                |                                |                    |           |                                |                                 |                     |
|------------------------------------|--------------------------------|--------------------------------|--------------------|-----------|--------------------------------|---------------------------------|---------------------|
| CASE CODE                          | STYLE 6 AND 7                  |                                | TYPICAL WEIGHT     | CASE CODE | STYLE 6 AND 7                  |                                 | TYPICAL WEIGHT      |
|                                    | D                              | L                              |                    |           | D                              | L                               |                     |
| HJ                                 | 0.885 ± 0.020<br>[22.5 ± 0.51] | 1.641 ± 0.062<br>[41.7 ± 1.58] | 0.95 oz.<br>(27 g) | LE        | 1.260 ± 0.020<br>[32.0 ± 0.51] | 1.141 ± 0.062<br>[29.0 ± 1.58]  | 1.13 oz.<br>(32 g)  |
| HL                                 | 0.885 ± 0.020<br>[22.5 ± 0.51] | 2.141 ± 0.062<br>[54.4 ± 1.58] | 1.02 oz.<br>(29 g) | LJ        | 1.260 ± 0.020<br>[32.0 ± 0.51] | 1.641 ± 0.062<br>[41.7 ± 1.58]  | 1.62 oz.<br>(46 g)  |
| HP                                 | 0.885 ± 0.020<br>[22.5 ± 0.51] | 2.641 ± 0.062<br>[67.1 ± 1.58] | 1.38 oz.<br>(39 g) | LL        | 1.260 ± 0.020<br>[32.0 ± 0.51] | 2.141 ± 0.062<br>[54.4 ± 1.58]  | 2.11 oz.<br>(60 g)  |
| HS                                 | 0.885 ± 0.020<br>[22.5 ± 0.51] | 3.141 ± 0.062<br>[79.8 ± 1.58] | 1.73 oz.<br>(49 g) | LP        | 1.260 ± 0.020<br>[32.0 ± 0.51] | 2.641 ± 0.062<br>[67.1 ± 1.58]  | 2.65 oz.<br>(75 g)  |
| HT                                 | 0.885 ± 0.020<br>[22.5 ± 0.51] | 3.641 ± 0.062<br>[92.5 ± 1.58] | 2.08 oz.<br>(59 g) | LS        | 1.260 ± 0.020<br>[32.0 ± 0.51] | 3.141 ± 0.062<br>[79.8 ± 1.58]  | 3.14 oz.<br>(89 g)  |
| JE                                 | 1.010 ± 0.020<br>[25.7 ± 0.51] | 1.141 ± 0.062<br>[29.0 ± 1.58] | 0.81 oz.<br>(23 g) | LT        | 1.260 ± 0.020<br>[32.0 ± 0.51] | 3.641 ± 0.062<br>[92.5 ± 1.58]  | 3.63 oz.<br>(103 g) |
| JJ                                 | 1.010 ± 0.020<br>[25.7 ± 0.51] | 1.641 ± 0.062<br>[41.7 ± 1.58] | 1.02 oz.<br>(29 g) | LD        | 1.260 ± 0.020<br>[32.0 ± 0.51] | 4.141 ± 0.062<br>[105.2 ± 1.58] | 4.16 oz.<br>(118 g) |
| JL                                 | 1.010 ± 0.020<br>[25.7 ± 0.51] | 2.141 ± 0.062<br>[54.4 ± 1.58] | 1.55 oz.<br>(44 g) | ME        | 1.375 ± 0.020<br>[34.9 ± 0.51] | 1.141 ± 0.062<br>[29.0 ± 1.58]  | 1.38 oz.<br>(39 g)  |
| JP                                 | 1.010 ± 0.020<br>[25.7 ± 0.51] | 2.641 ± 0.062<br>[67.1 ± 1.58] | 1.87 oz.<br>(53 g) | MJ        | 1.375 ± 0.020<br>[34.9 ± 0.51] | 1.641 ± 0.062<br>[41.7 ± 1.58]  | 1.98 oz.<br>(56 g)  |
| JS                                 | 1.010 ± 0.020<br>[25.7 ± 0.51] | 3.141 ± 0.062<br>[79.8 ± 1.58] | 2.22 oz.<br>(63 g) | ML        | 1.375 ± 0.020<br>[34.9 ± 0.51] | 2.141 ± 0.062<br>[54.4 ± 1.58]  | 2.57 oz.<br>(73 g)  |
| JT                                 | 1.010 ± 0.020<br>[25.7 ± 0.51] | 3.641 ± 0.062<br>[92.5 ± 1.58] | 2.54 oz.<br>(72 g) | MP        | 1.375 ± 0.020<br>[34.9 ± 0.51] | 2.641 ± 0.062<br>[67.1 ± 1.58]  | 3.21 oz.<br>(91 g)  |
| KE                                 | 1.135 ± 0.020<br>[28.8 ± 0.51] | 1.141 ± 0.062<br>[29.0 ± 1.58] | 0.92 oz.<br>(26 g) | MS        | 1.375 ± 0.020<br>[34.9 ± 0.51] | 3.141 ± 0.062<br>[79.8 ± 1.58]  | 3.81 oz.<br>(108 g) |
| KJ                                 | 1.135 ± 0.020<br>[28.8 ± 0.51] | 1.641 ± 0.062<br>[41.7 ± 1.58] | 1.31 oz.<br>(37 g) | MT        | 1.375 ± 0.020<br>[34.9 ± 0.51] | 3.641 ± 0.062<br>[92.5 ± 1.58]  | 4.44 oz.<br>(126 g) |
| KL                                 | 1.135 ± 0.020<br>[28.8 ± 0.51] | 2.141 ± 0.062<br>[54.4 ± 1.58] | 1.73 oz.<br>(49 g) | MD        | 1.375 ± 0.020<br>[34.9 ± 0.51] | 4.141 ± 0.062<br>[105.2 ± 1.58] | 5.04 oz.<br>(143 g) |
| KP                                 | 1.135 ± 0.020<br>[28.8 ± 0.51] | 2.641 ± 0.062<br>[67.1 ± 1.58] | 2.15 oz.<br>(61 g) | -         | -                              | -                               | -                   |

## DIMENSIONS AND AVAILABLE FORMS



Lead diameter  
No. 18 AWG (0.040" [1.016 mm] Dia.)

## ORDERING EXAMPLE

Electrolytic capacitor 53D series: 53D 282 G 025 GJ 6

| DESCRIPTION |                                                  |
|-------------|--------------------------------------------------|
| CODE        | EXPLANATION                                      |
| 53D         | Product type                                     |
| 282         | Capacitance value (2800 µF)                      |
| G           | Tolerance (G = - 10 %/+ 75 %; F = - 10 %/+ 50 %) |
| 025         | Voltage rating at 85 °C (025 = 25 V)             |
| GJ          | Can size (see Dimensions table)                  |
| 6           | Sleeve and sealing (6 = P.V.C. sleeve)           |

### Note

- For lead (Pb)-free/RoHS compliant products add suffix "E3" to part number.  
Example: 53D282G025GJ6E3



| <b>ELECTRICAL DATA AND ORDERING INFORMATION</b>      |                      |                    |                                                                  |                                                       |
|------------------------------------------------------|----------------------|--------------------|------------------------------------------------------------------|-------------------------------------------------------|
| <b>CAPACITANCE<br/>(<math>\mu</math>F)</b>           | <b>CASE<br/>CODE</b> | <b>PART NUMBER</b> | <b>MAX. ESR AT + 25 °C<br/>120 Hz<br/>(m<math>\Omega</math>)</b> | <b>MAX. RMS RIPPLE AT + 85 °C<br/>120 Hz<br/>(mA)</b> |
| <b>16 WV<sub>DC</sub> AT + 85 °C, SURGE = 18 V</b>   |                      |                    |                                                                  |                                                       |
| 6900.0                                               | HJ                   | 53D692G016HJ6      | 73                                                               | 2150                                                  |
| 10 000.0                                             | HL                   | 53D103G016HL6      | 52                                                               | 2840                                                  |
| <b>25 WV<sub>DC</sub> AT + 85 °C, SURGE = 35 V</b>   |                      |                    |                                                                  |                                                       |
| 2800.0                                               | GJ                   | 53D282G025GJ6      | 103                                                              | 1650                                                  |
| 4300.0                                               | HJ                   | 53D432G025HJ6      | 72                                                               | 2170                                                  |
| 6200.0                                               | HL                   | 53D622G025HL6      | 51                                                               | 2870                                                  |
| 11 000.0                                             | JP                   | 53D113G025JP6      | 33                                                               | 4230                                                  |
| <b>35 WV<sub>DC</sub> AT + 85 °C, SURGE = 45 V</b>   |                      |                    |                                                                  |                                                       |
| 1100.0                                               | GE                   | 53D112G035GE6      | 219                                                              | 980                                                   |
| 2100.0                                               | GJ                   | 53D212G035GJ6      | 111                                                              | 1590                                                  |
| 3200.0                                               | HJ                   | 53D322G035HJ6      | 77                                                               | 2090                                                  |
| 4700.0                                               | HL                   | 53D472G035HL6      | 54                                                               | 2780                                                  |
| 8300.0                                               | JP                   | 53D832G035JP6      | 34                                                               | 4110                                                  |
| <b>50 WV<sub>DC</sub> AT + 85 °C, SURGE = 70 V</b>   |                      |                    |                                                                  |                                                       |
| 1000.0                                               | GE                   | 53D102G050GE6      | 231                                                              | 950                                                   |
| 1300.0                                               | GJ                   | 53D132G050GJ6      | 131                                                              | 1470                                                  |
| 1900.0                                               | HJ                   | 53D192G050HJ6      | 94                                                               | 1900                                                  |
| 2800.0                                               | HL                   | 53D282G050HL6      | 65                                                               | 2540                                                  |
| 3800.0                                               | JL                   | 53D382G050JL6      | 51                                                               | 3090                                                  |
| 5000.0                                               | JP                   | 53D502G050JP6      | 40                                                               | 3810                                                  |
| <b>63 WV<sub>DC</sub> AT + 85 °C, SURGE = 80 V</b>   |                      |                    |                                                                  |                                                       |
| 1000.0                                               | GJ                   | 53D102G063GJ6      | 145                                                              | 1400                                                  |
| 2200.0                                               | HL                   | 53D222G063HL6      | 86                                                               | 2210                                                  |
| <b>200 WV<sub>DC</sub> AT + 85 °C, SURGE = 250 V</b> |                      |                    |                                                                  |                                                       |
| 350.0                                                | JL                   | 53D351F200JL6      | 499                                                              | 1000                                                  |
| 460.0                                                | JP                   | 53D461F200JP6      | 379                                                              | 1250                                                  |
| <b>250 WV<sub>DC</sub> AT + 85 °C, SURGE = 300 V</b> |                      |                    |                                                                  |                                                       |
| 56.0                                                 | GE                   | 53D560F250GE6      | 3035                                                             | 263                                                   |
| 100.0                                                | GJ                   | 53D101F250GJ6      | 1593                                                             | 420                                                   |
| 130.0                                                | HJ                   | 53D131F250HJ6      | 1238                                                             | 520                                                   |
| <b>400 WV<sub>DC</sub> AT + 85 °C, SURGE = 450 V</b> |                      |                    |                                                                  |                                                       |
| 100.0                                                | JL                   | 53D101F400JL6      | 1524                                                             | 560                                                   |
| 140.0                                                | JS                   | 53D141F400JS6      | 1084                                                             | 790                                                   |
| 150.0                                                | JS                   | 53D151F400JS6      | 1011                                                             | 820                                                   |



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