

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



| QUICK REFERENCE DATA | |
|--|--|
| DESCRIPTION | VALUE |
| Nominal case size Ø D x L in mm | 0.75" x 1.125" [19.05 x 28.575] to 1.375" x 4.125" [34.925 x 104.775] |
| Operating temperature | -40 °C to +85 °C |
| Rated capacitance range, C _R | 15 µF to 220 000 µF |
| Tolerance on C _R | -10 %, +50 %; -10 %, +75 % |
| Rated voltage range, U _R | 6.3 WV _{DC} to 450 WV _{DC} |
| Termination | Axial leads |
| Life validation test at 85 °C | 1000 h: ΔCAP ≤ 15 % from initial measurement. ΔESR ≤ 1.5 x initial specified limit. ΔDCL ≤ initial specified limit. |
| Shelf life at 85 °C | 500 h: ΔCAP ≤ 10 % from initial measurement. ΔESR ≤ 1.3 x initial specified limit. ΔDCL ≤ 2.0 x initial specified limit. |
| DC leakage current (after 5 min charge) | $I = k\sqrt{CV}$ k = 6.0 at +25 °C; k = 36.0 at +85 °C I in µA, C in µF, V in Volts |

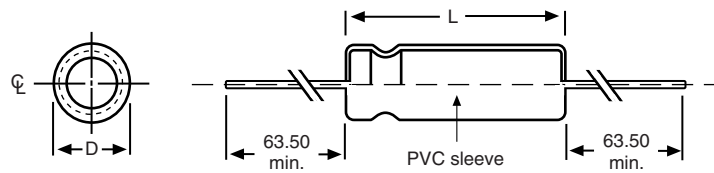
| RIPPLE CURRENT MULTIPLIERS | | | |
|----------------------------|----------|-------------|-------------|
| TEMPERATURE | | | |
| AMBIENT TEMPERATURE | | MULTIPLIERS | |
| +75 °C | | 1.4 | |
| +65 °C | | 1.7 | |
| +45 °C and below | | 2.0 | |
| FREQUENCY (Hz) | | | |
| WV _{DC} | 50 TO 60 | 300 TO 400 | 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 ^{-40 °C} / C ^{+25 °C} MINIMUM AT 120 Hz | |
| Rated Voltage (WV _{DC}) | 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 ^{-40 °C} / ESR ^{+25 °C} MAXIMUM AT 120 Hz | |
| Rated Voltage (WV _{DC}) | 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 [19.3 ± 0.51] | 1.141 ± 0.062 [29.0 ± 1.58] | 0.46 oz. (13 g) | GL | 0.760 ± 0.020 [19.3 ± 0.51] | 2.141 ± 0.062 [54.4 ± 1.58] | 0.74 oz. (21 g) |
| GJ | 0.760 ± 0.020 [19.3 ± 0.51] | 1.641 ± 0.062 [41.7 ± 1.58] | 0.67 oz. (19 g) | GP | 0.760 ± 0.020 [19.3 ± 0.51] | 2.641 ± 0.062 [67.1 ± 1.58] | 0.88 oz. (25 g) |
| GS | 0.760 ± 0.020 [19.3 ± 0.51] | 3.141 ± 0.062 [79.8 ± 1.58] | 1.16 oz. (33 g) | KS | 1.135 ± 0.020 [28.8 ± 0.51] | 3.141 ± 0.062 [79.8 ± 1.58] | 2.54 oz. (72 g) |
| GT | 0.760 ± 0.020 [19.3 ± 0.51] | 3.641 ± 0.062 [92.5 ± 1.58] | 1.34 oz. (38 g) | KT | 1.135 ± 0.020 [28.8 ± 0.51] | 3.641 ± 0.062 [92.5 ± 1.58] | 2.96 oz. (84 g) |
| HE | 0.885 ± 0.020 [22.5 ± 0.51] | 1.141 ± 0.062 [29.0 ± 1.58] | 0.63 oz. (18 g) | KD | 1.135 ± 0.020 [28.8 ± 0.51] | 4.141 ± 0.062 [105.2 ± 1.58] | 3.35 oz. (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 [22.5 ± 0.51] | 1.641 ± 0.062 [41.7 ± 1.58] | 0.95 oz. (27 g) | LE | 1.260 ± 0.020 [32.0 ± 0.51] | 1.141 ± 0.062 [29.0 ± 1.58] | 1.13 oz. (32 g) |
| HL | 0.885 ± 0.020 [22.5 ± 0.51] | 2.141 ± 0.062 [54.4 ± 1.58] | 1.02 oz. (29 g) | LJ | 1.260 ± 0.020 [32.0 ± 0.51] | 1.641 ± 0.062 [41.7 ± 1.58] | 1.62 oz. (46 g) |
| HP | 0.885 ± 0.020 [22.5 ± 0.51] | 2.641 ± 0.062 [67.1 ± 1.58] | 1.38 oz. (39 g) | LL | 1.260 ± 0.020 [32.0 ± 0.51] | 2.141 ± 0.062 [54.4 ± 1.58] | 2.11 oz. (60 g) |
| HS | 0.885 ± 0.020 [22.5 ± 0.51] | 3.141 ± 0.062 [79.8 ± 1.58] | 1.73 oz. (49 g) | LP | 1.260 ± 0.020 [32.0 ± 0.51] | 2.641 ± 0.062 [67.1 ± 1.58] | 2.65 oz. (75 g) |
| HT | 0.885 ± 0.020 [22.5 ± 0.51] | 3.641 ± 0.062 [92.5 ± 1.58] | 2.08 oz. (59 g) | LS | 1.260 ± 0.020 [32.0 ± 0.51] | 3.141 ± 0.062 [79.8 ± 1.58] | 3.14 oz. (89 g) |
| JE | 1.010 ± 0.020 [25.7 ± 0.51] | 1.141 ± 0.062 [29.0 ± 1.58] | 0.81 oz. (23 g) | LT | 1.260 ± 0.020 [32.0 ± 0.51] | 3.641 ± 0.062 [92.5 ± 1.58] | 3.63 oz. (103 g) |
| JJ | 1.010 ± 0.020 [25.7 ± 0.51] | 1.641 ± 0.062 [41.7 ± 1.58] | 1.02 oz. (29 g) | LD | 1.260 ± 0.020 [32.0 ± 0.51] | 4.141 ± 0.062 [105.2 ± 1.58] | 4.16 oz. (118 g) |
| JL | 1.010 ± 0.020 [25.7 ± 0.51] | 2.141 ± 0.062 [54.4 ± 1.58] | 1.55 oz. (44 g) | ME | 1.375 ± 0.020 [34.9 ± 0.51] | 1.141 ± 0.062 [29.0 ± 1.58] | 1.38 oz. (39 g) |
| JP | 1.010 ± 0.020 [25.7 ± 0.51] | 2.641 ± 0.062 [67.1 ± 1.58] | 1.87 oz. (53 g) | MJ | 1.375 ± 0.020 [34.9 ± 0.51] | 1.641 ± 0.062 [41.7 ± 1.58] | 1.98 oz. (56 g) |
| JS | 1.010 ± 0.020 [25.7 ± 0.51] | 3.141 ± 0.062 [79.8 ± 1.58] | 2.22 oz. (63 g) | ML | 1.375 ± 0.020 [34.9 ± 0.51] | 2.141 ± 0.062 [54.4 ± 1.58] | 2.57 oz. (73 g) |
| JT | 1.010 ± 0.020 [25.7 ± 0.51] | 3.641 ± 0.062 [92.5 ± 1.58] | 2.54 oz. (72 g) | MP | 1.375 ± 0.020 [34.9 ± 0.51] | 2.641 ± 0.062 [67.1 ± 1.58] | 3.21 oz. (91 g) |
| KE | 1.135 ± 0.020 [28.8 ± 0.51] | 1.141 ± 0.062 [29.0 ± 1.58] | 0.92 oz. (26 g) | MS | 1.375 ± 0.020 [34.9 ± 0.51] | 3.141 ± 0.062 [79.8 ± 1.58] | 3.81 oz. (108 g) |
| KJ | 1.135 ± 0.020 [28.8 ± 0.51] | 1.641 ± 0.062 [41.7 ± 1.58] | 1.31 oz. (37 g) | MT | 1.375 ± 0.020 [34.9 ± 0.51] | 3.641 ± 0.062 [92.5 ± 1.58] | 4.44 oz. (126 g) |
| KL | 1.135 ± 0.020 [28.8 ± 0.51] | 2.141 ± 0.062 [54.4 ± 1.58] | 1.73 oz. (49 g) | MD | 1.375 ± 0.020 [34.9 ± 0.51] | 4.141 ± 0.062 [105.2 ± 1.58] | 5.04 oz. (143 g) |
| KP | 1.135 ± 0.020 [28.8 ± 0.51] | 2.641 ± 0.062 [67.1 ± 1.58] | 2.15 oz. (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



| ELECTRICAL DATA AND ORDERING INFORMATION | | | | |
|---|----------------------|--------------------|---|--|
| CAPACITANCE (μF) | CASE CODE | PART NUMBER | MAX. ESR AT +25 °C 120 Hz (mΩ) | MAX. RMS RIPPLE AT +85 °C 120 Hz (mA) |
| 16 WV_{DC} AT +85 °C, SURGE = 18 V | | | | |
| 6900.0 | HJ | 53D692G016HJ6 | 73 | 2150 |
| 10 000.0 | HL | 53D103G016HL6 | 52 | 2840 |
| 25 WV_{DC} AT +85 °C, SURGE = 35 V | | | | |
| 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 |
| 35 WV_{DC} AT +85 °C, SURGE = 45 V | | | | |
| 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 |
| 50 WV_{DC} AT +85 °C, SURGE = 70 V | | | | |
| 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 |
| 63 WV_{DC} AT +85 °C, SURGE = 80 V | | | | |
| 1000.0 | GJ | 53D102G063GJ6 | 145 | 1400 |
| 2200.0 | HL | 53D222G063HL6 | 86 | 2210 |
| 200 WV_{DC} AT +85 °C, SURGE = 250 V | | | | |
| 350.0 | JL | 53D351F200JL6 | 499 | 1000 |
| 460.0 | JP | 53D461F200JP6 | 379 | 1250 |
| 250 WV_{DC} AT +85 °C, SURGE = 300 V | | | | |
| 56.0 | GE | 53D560F250GE6 | 3035 | 263 |
| 100.0 | GJ | 53D101F250GJ6 | 1593 | 420 |
| 130.0 | HJ | 53D131F250HJ6 | 1238 | 520 |
| 400 WV_{DC} AT +85 °C, SURGE = 450 V | | | | |
| 100.0 | JL | 53D101F400JL6 | 1524 | 560 |
| 140.0 | JS | 53D141F400JS6 | 1084 | 790 |
| 150.0 | JS | 53D151F400JS6 | 1011 | 820 |

Statements about product lifetime are based on calculations and internal testing. They should only be interpreted as estimations. Also due to external factors, the lifetime in the field application may deviate from the calculated lifetime. In general, nothing stated herein shall be construed as a guarantee of durability.



Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and / or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Hyperlinks included in this datasheet may direct users to third-party websites. These links are provided as a convenience and for informational purposes only. Inclusion of these hyperlinks does not constitute an endorsement or an approval by Vishay of any of the products, services or opinions of the corporation, organization or individual associated with the third-party website. Vishay disclaims any and all liability and bears no responsibility for the accuracy, legality or content of the third-party website or for that of subsequent links.

Vishay products are not designed for use in life-saving or life-sustaining applications or any application in which the failure of the Vishay product could result in personal injury or death unless specifically qualified in writing by Vishay. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.