

Lower Voltage Ceramic Singlelayer DC Disc Capacitors 2 kV_{DC} to 7.5 kV_{DC}


FEATURES

- Low losses
- High capacitance in small sizes
- High stability
- Radial leads
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912


RoHS
COMPLIANT

APPLICATIONS

- Lighting ballasts
- SMPS
- DC and pulse high voltage

DESIGN

The capacitors consist of a ceramic disc of which both sides are silver-plated. Connection leads are made of tinned copper having diameters of 0.025" (0.64 mm) or 0.032" (0.81 mm).

The capacitors may be supplied with radial kinked or straight leads having lead spacing of 0.250" (6.35 mm) or 0.375" (9.5 mm) or 0.500" (12.7 mm).

The standard tolerances are ± 10 % or ± 20 %.

Coating is made of resin coating or flame retardant epoxy resin in accordance with "UL 94 V-0".

CAPACITANCE RANGE

10 pF to 0.10 μF

RATED VOLTAGE

2 kV_{DC}
3 kV_{DC}
6 kV_{DC}
7.5 kV_{DC}

DIELECTRIC STRENGTH BETWEEN LEADS

Component test:

2 kV_{DC} 3600 V_{DC}, 2 s
3 kV_{DC} 5000 V_{DC}, 2 s
6 kV_{DC} 10 500 V_{DC}, 2 s
7.5 kV_{DC} 11 250 V_{DC}, 2 s

CERAMIC DIELECTRIC

C0G, U2J, R3L (Class 1)
X7R, X5F, X5S, Y5S, Y5U, Y5V, Z5U (Class 2)

| QUICK REFERENCE DATA | | | | | | |
|----------------------------|----------|---------------|-------------------------|-----------------------------------|--------------------|---------------|
| DESCRIPTION | VALUE | | | | | |
| Ceramic Class | 1 | | 2 | | | |
| Ceramic Dielectric | U2J, R3L | C0G, U2J, R3L | X7R, Y5S, Y5U, Z5U, Y5V | X5F, X5R, X5S, X7R, Y5S, Y5U, Z5U | X5F, X5S, Y5U, Z5U | X5F, Y5U, Z5U |
| Voltage (V _{DC}) | 3000 | 6000 | 2000 | 3000 | 6000 | 7500 |
| Min. Capacitance (pF) | 10 | 10 | 100 | 47 | 100 | 100 |
| Max. Capacitance (pF) | 33 | 47 | 100 000 | 33 000 | 10 000 | 2500 |
| Mounting | Radial | | | | | |

INSULATION RESISTANCE

2 kV_{DC} min. 10 000 MΩ
3 kV_{DC} min. 50 000 MΩ ⁽¹⁾
6 kV_{DC} min. 75 000 MΩ
7.5 kV_{DC} min. 200 000 MΩ

Note

⁽¹⁾ Exemption: 565R30GASS33 min. 25 000 MΩ

TOLERANCE ON CAPACITANCE

± 10 %, ± 20 %, -20 % to +80 %

DISSIPATION FACTOR

Class 1: 0.2 % max. at 1 MHz; 1 V
Class 2: 2.0 % max. at 1 kHz; 1 V

CATEGORY TEMPERATURE RANGE

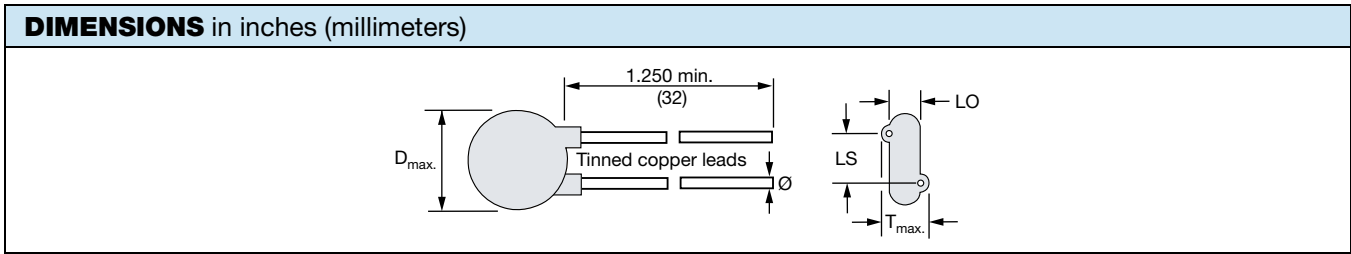
-25 °C to +85 °C

CLIMATIC CATEGORY ACC. TO EN 60068-1

25/085/21

OPERATING TEMPERATURE RANGE

-25 °C to +105 °C



| ORDERING INFORMATION, CERAMIC 2 kV _{DC} | | | | | | | | | |
|--|-------------|--|---|---|--|-----------|--------------|------------------|-------------|
| C (pF) | TOL. (%) | D _{max.} DIAMETER INCH (mm) | T _{max.} THICKNESS INCH (mm) | LS LEAD SPACE INCH (mm) ± 1 mm | LO LEAD OFFSET INCH (mm) ± 0.5 mm | WIRE SIZE | | ORDERING CODE | |
| | | | | | | AWG | INCH (mm) | | |
| X7R | | | | | | | | | |
| 100 | ± 10 | 0.330 (8.4) | 0.190 (4.8) | 0.250 (6.4) | 0.075 (1.9) | 20 | 0.032 (0.81) | 564R20TST10 | |
| 220 | | | 0.180 (4.6) | | | | | 564R20TST22 | |
| 330 | | | 0.075 (1.9) | | | | | 564R20TST33 | |
| 470 | | | 0.063 (1.6) | | | | | 564R20TST47 | |
| 560 | | | 0.087 (2.2) | | | | | 564R20TST56 | |
| 680 | | | 0.075 (1.9) | | | | | 564R20TST68 | |
| 1000 | | 0.400 (10.2) | 0.175 (4.4) | | | | | 0.083 (2.1) | 564R20TSD10 |
| 1500 | | 0.460 (11.7) | 0.160 (4.1) | | | | | 0.063 (1.6) | 564R20TSD15 |
| 1800 | | | | | | | | 0.055 (1.4) | 564R20TSD18 |
| 2200 | | 0.530 (13.5) | 0.170 (4.3) | | | | | 0.067 (1.7) | 564R20TSD22 |
| 3300 | | | | | | | | 0.063 (1.6) | 564R20TSD33 |
| 3900 | | | | | | | | 0.075 (1.9) | 564R20TSD39 |
| 4700 | | 0.680 (17.3) | 0.375 (9.5) | | | | | 0.071 (1.8) | 564R20TSD47 |
| Y5S | | | | | | | | | |
| 1000 | ± 20 | 0.330 (8.4) | 0.175 (4.4) | 0.250 (6.4) | 0.067 (1.7) | 20 | 0.032 (0.81) | 564R20TSSD10 | |
| 2200 | | 0.460 (11.7) | 0.170 (4.3) | | 0.071 (1.8) | | | 564R20TSSD22 | |
| 5600 | | 0.790 (20.0) | 0.190 (4.8) | 0.375 (9.5) | 0.091 (2.3) | | | 564R20TSSD56 | |
| Y5U | | | | | | | | | |
| 1000 | ± 20 | 0.330 (8.4) | 0.170 (4.3) | 0.250 (6.4) | 0.067 (1.7) | 20 | 0.032 (0.81) | 564R20GAD10 | |
| 1500 | | 0.330 (8.4) | 0.170 (4.3) | | 0.071 (1.8) | | | 564R20GAD15 | |
| Z5U | | | | | | | | | |
| 1800 | ± 20 | 0.360 (9.1) | 0.170 (4.3) | 0.250 (6.4) | 0.071 (1.8) | 20 | 0.032 (0.81) | 564R20GAD18 | |
| 2200 | | 0.400 (10.2) | 0.175 (4.4) | | 0.075 (1.9) | | | 564R20GAD22 | |
| 3300 | | 0.430 (10.9) | | | 0.071 (1.8) | | | 564R20GAD33 | |
| 4700 | | 0.530 (13.5) | | | 0.075 (1.9) | | | 564R20GAD47 | |
| 6800 | | 0.560 (14.2) | 0.170 (4.3) | 0.375 (9.5) | 0.067 (1.7) | | | 564R20GAD68 | |
| Y5V | | | | | | | | | |
| 0.01 μF | ± 20 | 0.620 (15.7) | 0.170 (4.3) | 0.375 (9.5) | 0.067 (1.7) | 20 | 0.032 (0.81) | 564R20GASS10 | |
| 0.05 μF | | 0.950 (24.1) | 0.174 (4.4) | | 0.067 (1.7) | | | 20 | 564R20GAS50 |
| 0.10 μF | | 0.950 (24.1) | 0.240 (6.1) | | 0.067 (1.7) | 22 | 0.025 (0.64) | 565R20GAP10 | |



| ORDERING INFORMATION, CERAMIC 3 kV _{DC} | | | | | | | | | |
|--|--------------|--|---|---|--|--------------|--------------|------------------|--------------|
| C (pF) | TOL. (%) | D _{max.} DIAMETER INCH (mm) | T _{max.} THICKNESS INCH (mm) | LS LEAD SPACE INCH (mm) ± 1 mm | LO LEAD OFFSET INCH (mm) ± 0.5 mm | WIRE SIZE | | ORDERING CODE | |
| | | | | | | AWG | INCH (mm) | | |
| U2J (N750) | | | | | | | | | |
| 10 | ± 20 | 0.330 (8.4) | 0.210 (5.3) | 0.250 (6.4) | 0.110 (2.8) | 20 | 0.032 (0.81) | 564R30GAQ10 | |
| R3L (N2200) | | | | | | | | | |
| 22 | ± 20 | 0.330 (8.4) | 0.200 (5.1) | 0.250 (6.4) | 0.102 (2.6) | 20 | 0.032 (0.81) | 564R30GAQ22 | |
| 27 | | | 0.190 (4.8) | | 0.091 (2.3) | | | 564R30GAQ27 | |
| 33 | | | 0.170 (4.3) | | 0.071 (1.8) | | | 564R30GAQ33 | |
| X5F | | | | | | | | | |
| 56 | ± 20 | 0.330 (8.4) | 0.190 (4.8) | 0.250 (6.4) | 0.091 (2.3) | 20 | 0.032 (0.81) | 564R30GAQ56 | |
| 68 | | | 0.200 (5.1) | | 0.102 (2.6) | | | 564R30GAQ68 | |
| 270 | | | 0.180 (4.6) | | 0.083 (2.1) | | | 564R30GAT27 | |
| X5R | | | | | | | | | |
| 330 | ± 20 | 0.330 (8.4) | 0.175 (4.4) | 0.250 (6.4) | 0.075 (1.9) | 20 | 0.032 (0.81) | 564R30GAT33 | |
| X5S | | | | | | | | | |
| 470 | ± 20 | 0.330 (8.4) | 0.175 (4.4) | 0.250 (6.4) | 0.075 (1.9) | 20 | 0.032 (0.81) | 564R30GAT47 | |
| X7R | | | | | | | | | |
| 47 | ± 20 | 0.330 (8.4) | 0.230 (5.8) | 0.250 (6.4) | 0.130 (3.3) | 20 | 0.032 (0.81) | 564R30GAQ47 | |
| 100 | | | 0.180 (4.6) | | 0.083 (2.1) | | | 564R30GAT10 | |
| 150 | | | 0.190 (4.8) | | 0.091 (2.3) | | | 564R30GAT15 | |
| 220 | | | 0.175 (4.4) | | 0.075 (1.9) | | | 564R30GAT22 | |
| 390 | | | 0.180 (4.6) | | 0.079 (2.0) | | | 564R30GAT39 | |
| 680 | ± 10 | 0.400 (10.2) | 0.190 (4.8) | 0.091 (2.3) | 0.091 (2.3) | 20 | 0.032 (0.81) | 564R30TST68 | |
| 1000 | | | 0.185 (4.7) | | | | | 0.087 (2.2) | 564R30TSD10 |
| 1500 | | 0.490 (12.5) | 0.185 (4.7) | 0.079 (2.0) | 564R30TSD15 | | | | |
| 1800 | | 0.530 (13.5) | | 0.079 (2.0) | 564R30TSD18 | | | | |
| 2200 | | 0.620 (15.7) | 0.185 (4.7) | 0.083 (2.1) | 564R30TSD22 | | | | |
| 2700 | | 0.720 (18.3) | 0.170 (4.3) | 0.083 (2.1) | 564R30TSD27 | | | | |
| 3300 | | | 0.185 (4.7) | 0.075 (1.9) | 564R30TSD33 | | | | |
| 3900 | | 0.900 (22.9) | 0.185 (4.7) | 0.087 (2.2) | 564R30TSD39 | | | | |
| 4700 | | | 0.175 (4.4) | 0.075 (1.9) | 564R30TSD47 | | | | |
| 6800 | | | 0.185 (4.7) | 0.087 (2.2) | 564R30TSD68 | | | | |
| 6800 | 0.185 (4.7) | | 0.087 (2.2) | 564R30TSD68 | | | | | |
| Y5S | | | | | | | | | |
| 1000 | ± 20 | 0.400 (10.2) | 0.190 (4.8) | 0.250 (6.4) | 0.098 (2.5) | 20 | 0.032 (0.81) | 564R30TSSD10 | |
| 1500 | | 0.460 (11.7) | | | 0.091 (2.3) | | | 564R30TSSD15 | |
| 1800 | | 0.490 (12.4) | | | 0.087 (2.2) | | | 564R30TSSD18 | |
| 2200 | | 0.530 (13.5) | | | 0.185 (4.7) | | | 0.083 (2.1) | 564R30TSSD22 |
| 2700 | | 0.560 (14.2) | | | | | | 0.087 (2.2) | 564R30TSSD27 |
| 3300 | | 0.620 (15.7) | 0.375 (9.5) | 0.087 (2.2) | 564R30TSSD33 | | | | |
| 3900 | | 0.680 (17.3) | | 0.091 (2.3) | 564R30TSSD39 | | | | |
| 4700 | | 0.790 (20.0) | 0.190 (4.8) | 0.091 (2.3) | 564R30TSSD47 | | | | |
| 5600 | | 0.900 (22.9) | 0.205 (5.2) | 0.102 (2.6) | 564R30TSSD56 | | | | |
| 6800 | | 0.900 (22.9) | 0.205 (5.2) | 0.102 (2.6) | 564R30TSSD68 | | | | |
| Y5U | | | | | | | | | |
| 680 | ± 20 | 0.330 (8.4) | 0.175 (4.4) | 0.250 (6.4) | 0.075 (1.9) | 20 | 0.032 (0.81) | 564R30GAT68 | |
| 0.010 µF | | 0.720 (18.3) | 0.185 (4.7) | 0.375 (9.5) | 0.091 (2.3) | | | 564R30GAS10 | |
| Z5U | | | | | | | | | |
| 1000 | ± 20 | 0.330 (8.4) | 0.190 (4.8) | 0.250 (6.4) | 0.098 (2.5) | 20 | 0.032 (0.81) | 564R30GAD10 | |
| 1500 | | 0.360 (9.1) | | | 0.091 (2.3) | | | 564R30GAD15 | |
| 1800 | | 0.400 (10.2) | | | 0.098 (2.5) | | | 564R30GAD18 | |
| 2200 | | 0.430 (10.9) | | | 0.091 (2.3) | | | 564R30GAD22 | |
| 2700 | | 0.460 (11.7) | | | 0.200 (5.1) | | | 0.098 (2.5) | 564R30GAD27 |
| 3300 | | 0.530 (13.5) | 0.185 (4.7) | 0.087 (2.2) | 564R30GAD33 | | | | |
| 3900 | | | | 0.091 (2.3) | 564R30GAD39 | | | | |
| 4700 | | 0.620 (15.7) | 0.195 (5.0) | 0.102 (2.6) | 564R30GAD47 | | | | |
| 6800 | | 0.720 (18.3) | 0.200 (5.1) | 0.375 (9.5) | 0.102 (2.6) | | | 564R30GAD68 | |
| 8200 | | | | | | | | 564R30GAD82 | |
| 0.033 µF | 0.900 (22.9) | 0.240 (6.1) | 0.087 (2.2) | 22 | 0.025 (0.64) | 565R30GASS33 | | | |



| ORDERING INFORMATION, CERAMIC 6 kV _{DC} | | | | | | | | |
|--|-------------|--|---|---|--|-----------|--------------|------------------|
| C (pF) | TOL. (%) | D _{max.} DIAMETER INCH (mm) | T _{max.} THICKNESS INCH (mm) | LS LEAD SPACE INCH (mm) ± 1 mm | LO LEAD OFFSET INCH (mm) ± 0.5 mm | WIRE SIZE | | ORDERING CODE |
| | | | | | | AWG | INCH (mm) | |
| C0G (NP0) | | | | | | | | |
| 10 | ± 20 | 0.400 (10.2) | 0.220 (5.6) | 0.375 (9.5) | 0.122 (3.1) | 20 | 0.032 (0.81) | 564R60GAQ10 |
| U2J (N750) | | | | | | | | |
| 22 | ± 20 | 0.460 (11.7) | 0.240 (6.1) | 0.375 (9.5) | 0.142 (3.6) | 20 | 0.032 (0.81) | 564R60GAQ22 |
| R3L (N2200) | | | | | | | | |
| 33 | ± 20 | 0.400 (10.2) | 0.230 (5.8) | 0.375 (9.5) | 0.130 (3.3) | 20 | 0.032 (0.81) | 564R60GAQ33 |
| 47 | | 0.460 (11.7) | | | 0.126 (3.2) | | | 564R60GAQ47 |
| X5F | | | | | | | | |
| 100 | ± 20 | 0.400 (10.2) | 0.240 (6.1) | 0.375 (9.5) | 0.142 (3.6) | 20 | 0.032 (0.81) | 564R60GAT10 |
| 220 | | | 0.265 (6.7) | | 0.165 (4.2) | | | 564R60GAT22 |
| X5S | | | | | | | | |
| 330 | ± 20 | 0.400 (10.2) | 0.260 (6.6) | 0.375 (9.5) | 0.161 (4.1) | 20 | 0.032 (0.81) | 564R60GAT33 |
| Y5U | | | | | | | | |
| 470 | ± 20 | 0.400 (10.2) | 0.290 (7.4) | 0.375 (9.5) | 0.193 (4.9) | 20 | 0.032 (0.81) | 564R60GAT47 |
| 560 | | | 0.240 (6.1) | | 0.142 (3.6) | | | 564R60GAT56 |
| Z5U | | | | | | | | |
| 1000 | ± 20 | 0.400 (10.2) | 0.270 (6.9) | 0.375 (9.5) | 0.173 (4.4) | 20 | 0.032 (0.81) | 564R60GAD10 |
| 1500 | | 0.460 (11.7) | 0.280 (7.1) | | 0.157 (4.0) | | | 564R60GAD15 |
| 2200 | | 0.530 (13.5) | 0.240 (6.1) | | 0.142 (3.6) | | | 564R60GAD22 |
| 3300 | | 0.620 (15.7) | 0.260 (6.6) | | 0.169 (4.3) | | | 564R60GAD33 |
| 4700 | | 0.790 (20.0) | | | 0.161 (4.1) | | | 564R60GAD47 |
| 0.010 μF | | 0.950 (24.1) | 0.250 (6.4) | | 0.150 (3.8) | | | 564R60GAS10 |

| ORDERING INFORMATION, CERAMIC 7.5 kV _{DC} | | | | | | | | |
|--|-------------|--|---|---|--|-----------|--------------|------------------|
| C (pF) | TOL. (%) | D _{max.} DIAMETER INCH (mm) | T _{max.} THICKNESS INCH (mm) | LS LEAD SPACE INCH (mm) ± 1 mm | LO LEAD OFFSET INCH (mm) ± 0.5 mm | WIRE SIZE | | ORDERING CODE |
| | | | | | | AWG | INCH (mm) | |
| X5F | | | | | | | | |
| 100 | ± 20 | 0.530 (13.5) | 0.310 (7.9) | 0.500 (12.7) | 0.181 (4.6) | 20 | 0.032 (0.81) | 564R75GAT10 |
| 470 | | 0.620 (15.7) | 0.270 (6.9) | | 0.161 (4.1) | | | 564R75GAT47 |
| Y5U | | | | | | | | |
| 1000 | + 80 / - 20 | 0.620 (15.7) | 0.320 (8.1) | 0.500 (12.7) | 0.181 (4.6) | 20 | 0.032 (0.81) | 564R75GAD10 |
| Z5U | | | | | | | | |
| 2500 | + 80 / - 20 | 0.620 (15.7) | 0.280 (7.1) | 0.500 (12.7) | 0.181 (4.6) | 20 | 0.032 (0.81) | 564R75GAD25 |

TAPE AND REEL OPTIONS

Part number codes and specifications for tape and reel packaging are found in the general information document - find web-link below.

| RELATED DOCUMENTS | |
|---------------------|--|
| General Information | www.vishay.com/doc?23140 |



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