

## Lower Voltage Ceramic Disc Capacitors 2 kV<sub>DC</sub> to 7.5 kV<sub>DC</sub>



| LEAD OFFSET "LO" |                               |
|------------------|-------------------------------|
| <b>NOMINAL</b>   | ~ THICKNESS - 0.100"          |
|                  | 0.07" (1.8 mm) -565R20GAP10   |
| <b>EXCEPTION</b> | 0.08" (2.0 mm) -565R30GASS20  |
|                  | 0.10" (2.54 mm) -565R30GASS33 |

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

### INSULATION RESISTANCE

|                      |                 |
|----------------------|-----------------|
| 2 kV <sub>DC</sub>   | min. 10 000 MΩ  |
| 3 kV <sub>DC</sub>   | min. 50 000 MΩ  |
| 6 kV <sub>DC</sub>   | min. 75 000 MΩ  |
| 7.5 kV <sub>DC</sub> | min. 200 000 MΩ |

### TOLERANCE ON CAPACITANCE

± 10 %, ± 20 %, - 20 % to + 80 %

### DISSIPATION FACTOR

0.2 % max. at 1 MHz; 1 V  
2.0 % max. at 1 kHz; 1 V

### CATEGORY TEMPERATURE RANGE

- 25 °C to + 85 °C

### CLIMATIC CATEGORY ACC. TO EN60068-1

25/085/21

### OPERATING TEMPERATURE RANGE

- 25 °C to + 105 °C

### 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](http://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<sub>DC</sub>  
3 kV<sub>DC</sub>  
6 kV<sub>DC</sub>  
7.5 kV<sub>DC</sub>

### DIELECTRIC STRENGTH BETWEEN LEADS

Component test:

|                      |                              |
|----------------------|------------------------------|
| 2 kV <sub>DC</sub>   | 3500 V <sub>DC</sub> , 2 s   |
| 3 kV <sub>DC</sub>   | 5000 V <sub>DC</sub> , 2 s   |
| 6 kV <sub>DC</sub>   | 10 500 V <sub>DC</sub> , 2 s |
| 7.5 kV <sub>DC</sub> | 11 250 V <sub>DC</sub> , 2 s |

### CERAMIC DIELECTRIC

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



| ORDERING INFORMATION, CERAMIC 2 kV <sub>DC</sub> |              |                            |                             |                               |              |              |                  |             |    |              |              |
|--|--------------|----------------------------|-----------------------------|-------------------------------|--------------|--------------|------------------|-------------|----|--------------|--------------|
| C<br>(pF)  | TOL.<br>(%)  | D<br>DIAMETER<br>INCH (mm) | T<br>THICKNESS<br>INCH (mm) | LS<br>LEAD SPACE<br>INCH (mm) | WIRE SIZE    |              | ORDERING<br>CODE |             |    |              |              |
|  |              |                            |                             |                               | AWG          | INCH (mm)    |                  |             |    |              |              |
| <b>X7R</b>                                       |              |                            |                             |                               |              |              |                  |             |    |              |              |
| 100  | ± 10         | 0.330 (8.4)                | 0.190 (4.8)                 | 0.250 (6.4)                   | 20           | 0.032 (0.81) | 564R20TST10      |             |    |              |              |
| 220  |              |                            | 0.180 (4.6)                 |                               |              |              | 564R20TST22      |             |    |              |              |
| 330  |              |                            | 0.170 (4.3)                 |                               |              |              | 564R20TST33      |             |    |              |              |
| 470  |              |                            | 0.185 (4.7)                 |                               |              |              | 564R20TST47      |             |    |              |              |
| 560  |              |                            | 0.170 (4.3)                 |                               |              |              | 564R20TST56      |             |    |              |              |
| 680  |              |                            | 0.175 (4.4)                 |                               |              |              | 564R20TST68      |             |    |              |              |
| 1000   |              | 0.430 (10.9)               | 0.160 (4.1)                 |                               |              |              | 564R20TSD10      |             |    |              |              |
| 1500   |              | 0.460 (11.7)               | 0.170 (4.3)                 |                               |              |              | 564R20TSD15      |             |    |              |              |
| 1800   |              | 0.530 (13.5)               | 0.170 (4.3)                 |                               |              |              | 564R20TSD18      |             |    |              |              |
| 2200   |              | 0.680 (17.3)               | 0.170 (4.3)                 |                               |              |              | 564R20TSD22      |             |    |              |              |
| 2700   |              | 0.375 (9.5)                | 0.160 (4.1)                 |                               |              |              | 564R20TSD27      |             |    |              |              |
| 3300   |              |                            | 0.170 (4.3)                 |                               |              |              | 564R20TSD33      |             |    |              |              |
| 3900   |              |                            | 0.170 (4.3)                 |                               |              |              | 564R20TSD39      |             |    |              |              |
| 4700   |              |                            | 0.170 (4.3)                 |                               |              |              | 564R20TSD47      |             |    |              |              |
| 5600   |              |                            | 0.170 (4.3)                 |                               |              |              | 564R20TSD56      |             |    |              |              |
| 6800   | 0.170 (4.3)  | 0.375 (9.5)                | 564R20TSD68                 |                               |              |              |                  |             |    |              |              |
| 4700   |              |                            | 564R20TSD47                 |                               |              |              |                  |             |    |              |              |
| <b>Y5S</b>                                       |              |                            |                             |                               |              |              |                  |             |    |              |              |
| 1000   | ± 20         | 0.330 (8.4)                | 0.175 (4.4)                 | 0.250 (6.4)                   | 20           | 0.032 (0.81) | 564R20TSSD10     |             |    |              |              |
| 1500   |              | 0.400 (10.2)               | 0.170 (4.3)                 |                               |              |              | 564R20TSSD15     |             |    |              |              |
| 1800   |              | 0.430 (10.9)               |                             |                               |              |              | 564R20TSSD18     |             |    |              |              |
| 2200   |              | 0.460 (11.7)               |                             |                               |              |              | 564R20TSSD22     |             |    |              |              |
| 2700   |              | 0.530 (13.5)               |                             |                               |              |              | 564R20TSSD27     |             |    |              |              |
| 3300   |              | 0.175 (4.4)                | 0.170 (4.3)                 |                               |              |              | 564R20TSSD33     |             |    |              |              |
| 3900   |              |                            |                             |                               |              |              | 564R20TSSD39     |             |    |              |              |
| 4700   |              |                            |                             |                               |              |              | 564R20TSSD47     |             |    |              |              |
| 5600   |              | 0.680 (17.3)               | 0.170 (4.3)                 |                               |              |              | 564R20TSSD56     |             |    |              |              |
| 6800   |              | 0.720 (18.3)               |                             |                               |              |              | 564R20TSSD68     |             |    |              |              |
| <b>Y5U</b>                                       |              |                            |                             |                               |              |              |                  |             |    |              |              |
| 1000   |              | ± 20                       | 0.330 (8.4)                 |                               |              |              | 0.170 (4.3)      | 0.250 (6.4) | 20 | 0.032 (0.81) | 564R20GAD10  |
| 1500   | 0.330 (8.4)  |                            | 0.170 (4.3)                 | 564R20GAD15                   |              |              |                  |             |    |              |              |
| <b>Z5U</b>                                       |              |                            |                             |                               |              |              |                  |             |    |              |              |
| 1800   | ± 20         | 0.360 (9.1)                | 0.170 (4.3)                 | 0.250 (6.4)                   | 20           | 0.032 (0.81) | 564R20GAD18      |             |    |              |              |
| 2200   |              | 0.400 (10.2)               | 0.175 (4.4)                 |                               |              |              | 564R20GAD22      |             |    |              |              |
| 2700   |              | 0.430 (10.9)               |                             |                               |              |              | 564R20GAD27      |             |    |              |              |
| 3300   |              | 0.490 (12.4)               |                             |                               |              |              | 564R20GAD33      |             |    |              |              |
| 3900   |              | 0.560 (14.2)               |                             |                               |              |              | 564R20GAD39      |             |    |              |              |
| 4700   |              | 0.170 (4.3)                | 0.170 (4.3)                 |                               |              |              | 564R20GAD47      |             |    |              |              |
| 6800   |              |                            |                             |                               |              |              | 564R20GAD68      |             |    |              |              |
| 0.010 μF   |              |                            |                             |                               |              |              | 0.680 (17.3)     | 564R20GAS10 |    |              |              |
| <b>Y5V</b>                                       |              |                            |                             |                               |              |              |                  |             |    |              |              |
| 0.01 μF  |              | ± 20                       | 0.620 (15.7)                |                               |              |              | 0.170 (4.3)      | 0.375 (9.5) | 20 | 0.032 (0.81) | 564R20GASS10 |
| 0.05 μF  | 0.950 (24.1) |                            | 0.174 (4.4)                 | 20                            | 564R20GAS50  |              |                  |             |    |              |              |
| 0.10 μF  | 0.950 (24.1) |                            | 0.240 (6.1)                 | 22                            | 0.025 (0.64) | 565R20GAP10  |                  |             |    |              |              |

**TAPE AND REEL OPTIONS**

To specify tape and reel, add two letter suffix to the ordering code (for details of the packaging code see general section of the catalog).



| ORDERING INFORMATION, CERAMIC 3 kV <sub>DC</sub> |              |                            |                             |                               |              |              |                  |
|--|--------------|----------------------------|-----------------------------|-------------------------------|--------------|--------------|------------------|
| C<br>(pF)  | TOL.<br>(%)  | D<br>DIAMETER<br>INCH (mm) | T<br>THICKNESS<br>INCH (mm) | LS<br>LEAD SPACE<br>INCH (mm) | WIRE SIZE    |              | ORDERING<br>CODE |
|  |              |                            |                             |                               | AWG          | INCH (mm)    |                  |
| <b>U2J (N750)</b>                                |              |                            |                             |                               |              |              |                  |
| 10   | ± 20         | 0.330 (8.4)                | 0.210 (5.3)                 | 0.250 (6.4)                   | 20           | 0.032 (0.81) | 564R30GAQ10      |
| 12   |              |                            | 0.210 (5.3)                 |                               |              |              | 564R30GAQ12      |
| 15   |              |                            | 0.180 (4.6)                 |                               |              |              | 564R30GAQ15      |
| <b>R3L (N2200)</b>                               |              |                            |                             |                               |              |              |                  |
| 22   | ± 20         | 0.330 (8.4)                | 0.200 (5.1)                 | 0.250 (6.4)                   | 20           | 0.032 (0.81) | 564R30GAQ22      |
| 27   |              |                            | 0.190 (4.8)                 |                               |              |              | 564R30GAQ27      |
| 33   |              |                            | 0.170 (4.3)                 |                               |              |              | 564R30GAQ33      |
| <b>X7R</b>                                       |              |                            |                             |                               |              |              |                  |
| 47   | ± 20         | 0.330 (8.4)                | 0.230 (5.8)                 | 0.250 (6.4)                   | 20           | 0.032 (0.81) | 564R30GAQ47      |
| 56   |              |                            | 0.190 (4.8)                 |                               |              |              | 564R30GAQ56      |
| 68   |              |                            | 0.200 (5.1)                 |                               |              |              | 564R30GAQ68      |
| 100  |              |                            | 0.180 (4.6)                 |                               |              |              | 564R30GAT10      |
| 150  |              |                            | 0.190 (4.8)                 |                               |              |              | 564R30GAT15      |
| 220  |              |                            | 0.175 (4.4)                 |                               |              |              | 564R30GAT22      |
| 270  |              |                            | 0.180 (4.6)                 |                               |              |              | 564R30GAT27      |
| 330  |              |                            | 0.175 (4.4)                 |                               |              |              | 564R30GAT33      |
| 390  |              |                            | 0.180 (4.6)                 |                               |              |              | 564R30GAT39      |
| 470  |              |                            | 0.175 (4.4)                 |                               |              |              | 564R30GAT47      |
| 680  | ± 10         | 0.400 (10.2)               | 0.180 (4.6)                 | 0.375 (9.5)                   | 20           | 0.032 (0.81) | 564R30TST68      |
| 1000   |              |                            | 0.175 (4.4)                 |                               |              |              | 564R30TSD10      |
| 1500   |              |                            | 0.490 (12.5)                |                               |              |              | 564R30TSD15      |
| 1800   |              |                            | 0.185 (4.7)                 |                               |              |              | 564R30TSD18      |
| 2200   |              |                            | 0.530 (13.5)                |                               |              |              | 564R30TSD22      |
| 2700   |              |                            | 0.180 (4.6)                 |                               |              |              | 564R30TSD27      |
| 3300   |              |                            | 0.185 (4.7)                 |                               |              |              | 564R30TSD33      |
| 3900   |              |                            | 0.170 (4.3)                 |                               |              |              | 564R30TSD39      |
| 4700   |              |                            | 0.720 (18.3)                |                               |              |              | 564R30TSD47      |
| 6800   |              |                            | 0.175 (4.4)                 |                               |              |              | 564R30TSD68      |
| 6800   | 0.900 (22.9) | 0.185 (4.7)                |                             |                               |              |              | 564R30TSD68      |
| <b>Y5S</b>                                       |              |                            |                             |                               |              |              |                  |
| 1000   | ± 20         | 0.400 (10.2)               | 0.190 (4.8)                 | 0.250 (6.4)                   | 20           | 0.032 (0.81) | 564R30TSSD10     |
| 1500   |              | 0.460 (11.7)               |                             |                               |              |              | 564R30TSSD15     |
| 1800   |              | 0.490 (12.4)               |                             |                               |              |              | 564R30TSSD18     |
| 2200   |              | 0.530 (13.5)               |                             |                               |              |              | 564R30TSSD22     |
| 2700   |              | 0.560 (14.2)               | 0.185 (4.7)                 | 0.375 (9.5)                   | 564R30TSSD27 |              |                  |
| 3300   |              | 0.620 (15.7)               |                             |                               | 564R30TSSD33 |              |                  |
| 3900   |              | 0.680 (17.3)               | 0.185 (4.7)                 | 0.375 (9.5)                   | 564R30TSSD39 |              |                  |
| 4700   |              | 0.790 (20.0)               | 0.190 (4.8)                 | 0.375 (9.5)                   | 564R30TSSD47 |              |                  |
| 5600   |              | 0.790 (20.0)               | 0.190 (4.8)                 | 0.375 (9.5)                   | 564R30TSSD56 |              |                  |
| 6800   |              | 0.900 (22.9)               | 0.205 (5.2)                 | 0.375 (9.5)                   | 564R30TSSD68 |              |                  |
| <b>Y5U</b>                                       |              |                            |                             |                               |              |              |                  |
| 680  | ± 20         | 0.330 (8.4)                | 0.175 (4.4)                 | 0.250 (6.4)                   | 20           | 0.032 (0.81) | 564R30GAT68      |
| <b>Z5U</b>                                       |              |                            |                             |                               |              |              |                  |
| 1000   | ± 20         | 0.330 (8.4)                | 0.195 (5.0)                 | 0.250 (6.4)                   | 20           | 0.032 (0.81) | 564R30GAD10      |
| 1500   |              | 0.360 (9.1)                | 0.190 (4.8)                 |                               |              |              | 564R30GAD15      |
| 1800   |              | 0.400 (10.2)               | 0.190 (4.8)                 |                               |              |              | 564R30GAD18      |
| 2200   |              | 0.430 (10.9)               | 0.190 (4.8)                 |                               |              |              | 564R30GAD22      |
| 2700   |              | 0.460 (11.7)               | 0.200 (5.1)                 | 0.375 (9.5)                   | 564R30GAD27  |              |                  |
| 3300   |              | 0.490 (12.4)               | 0.185 (4.7)                 | 0.375 (9.5)                   | 564R30GAD33  |              |                  |
| 3900   |              | 0.530 (13.5)               | 0.185 (4.7)                 | 0.375 (9.5)                   | 564R30GAD39  |              |                  |
| 4700   |              | 0.620 (15.7)               | 0.195 (5.0)                 | 0.375 (9.5)                   | 564R30GAD47  |              |                  |
| 6800   |              | 0.680 (17.3)               | 0.185 (4.7)                 | 0.375 (9.5)                   | 564R30GAD68  |              |                  |
| 8200   |              | 0.680 (17.3)               | 0.185 (4.7)                 | 0.375 (9.5)                   | 564R30GAD82  |              |                  |
| 0.010 μF   |              | 0.720 (18.3)               | 0.265 (6.7)                 | 0.375 (9.5)                   | 22           | 0.025 (0.64) | 565R30GASS20     |
| 0.020 μF   |              | 0.720 (18.3)               | 0.265 (6.7)                 | 0.375 (9.5)                   | 22           | 0.025 (0.64) | 565R30GASS20     |
| 0.033 μF   |              | 0.900 (22.9)               | 0.240 (6.1)                 | 0.375 (9.5)                   | 22           | 0.025 (0.64) | 565R30GASS33     |
| <b>Y5V</b>                                       |              |                            |                             |                               |              |              |                  |
| 0.010 μF   | ± 20         | 0.720 (18.3)               | 0.185 (4.7)                 | 0.375 (9.5)                   | 20           | 0.032 (0.81) | 564R30GASS10     |

**TAPE AND REEL OPTIONS**

To specify tape and reel, add two letter suffix to the ordering code (for details of the packaging code see general section of the catalog).



| ORDERING INFORMATION, CERAMIC 6 kV <sub>DC</sub> |             |                            |                             |                               |           |              |                  |
|--|-------------|----------------------------|-----------------------------|-------------------------------|-----------|--------------|------------------|
| C<br>(pF)  | TOL.<br>(%) | D<br>DIAMETER<br>INCH (mm) | T<br>THICKNESS<br>INCH (mm) | LS<br>LEAD SPACE<br>INCH (mm) | WIRE SIZE |              | ORDERING<br>CODE |
|  |             |                            |                             |                               | AWG       | INCH (mm)    |                  |
| <b>C0G (NP0)</b>                                 |             |                            |                             |                               |           |              |                  |
| 10   | ± 20        | 0.400 (10.2)               | 0.220 (5.6)                 | 0.375 (9.5)                   | 20        | 0.032 (0.81) | 564R60GAQ10      |
| <b>U2J (N750)</b>                                |             |                            |                             |                               |           |              |                  |
| 22   | ± 20        | 0.460 (11.7)               | 0.240 (6.1)                 | 0.375 (9.5)                   | 20        | 0.032 (0.81) | 564R60GAQ22      |
| <b>R3L (N2200)</b>                               |             |                            |                             |                               |           |              |                  |
| 33   | ± 20        | 0.400 (10.2)               | 0.230 (5.8)                 | 0.375 (9.5)                   | 20        | 0.032 (0.81) | 564R60GAQ33      |
| 47   |             | 0.460 (11.7)               | 0.205 (5.2)                 |                               |           |              | 564R60GAQ47      |
| <b>X5F</b>                                       |             |                            |                             |                               |           |              |                  |
| 100  | ± 20        | 0.400 (10.2)               | 0.240 (6.1)                 | 0.375 (9.5)                   | 20        | 0.032 (0.81) | 564R60GAT10      |
| 220  |             |                            | 0.265 (6.7)                 |                               |           |              | 564R60GAT22      |
| <b>X5S</b>                                       |             |                            |                             |                               |           |              |                  |
| 330  | ± 20        | 0.400 (10.2)               | 0.260 (6.6)                 | 0.375 (9.5)                   | 20        | 0.032 (0.81) | 564R60GAT33      |
| <b>Y5U</b>                                       |             |                            |                             |                               |           |              |                  |
| 470  | ± 20        | 0.400 (10.2)               | 0.265 (6.7)                 | 0.375 (9.5)                   | 20        | 0.032 (0.81) | 564R60GAT47      |
| 560  |             |                            | 0.240 (6.1)                 |                               |           |              | 564R60GAT56      |
| <b>Z5U</b>                                       |             |                            |                             |                               |           |              |                  |
| 1000   | ± 20        | 0.400 (10.2)               | 0.270 (6.9)                 | 0.375 (9.5)                   | 20        | 0.032 (0.81) | 564R60GAD10      |
| 1500   |             | 0.460 (11.7)               | 0.280 (7.1)                 |                               |           |              | 564R60GAD15      |
| 2200   |             | 0.530 (13.5)               | 0.240 (6.1)                 |                               |           |              | 564R60GAD22      |
| 3300   |             | 0.620 (15.7)               | 0.260 (6.6)                 |                               |           |              | 564R60GAD33      |
| 4700   |             |                            |                             |                               |           |              | 0.790 (20.0)     |
| 0.010 µF   |             | 0.950 (24.1)               | 0.250 (6.4)                 |                               |           |              | 564R60GAS10      |

| ORDERING INFORMATION, CERAMIC 7.5 kV <sub>DC</sub> |             |                            |                             |                               |           |              |                  |
|--|-------------|----------------------------|-----------------------------|-------------------------------|-----------|--------------|------------------|
| C<br>(pF)  | TOL.<br>(%) | D<br>DIAMETER<br>INCH (mm) | T<br>THICKNESS<br>INCH (mm) | LS<br>LEAD SPACE<br>INCH (mm) | WIRE SIZE |              | ORDERING<br>CODE |
|  |             |                            |                             |                               | AWG       | INCH (mm)    |                  |
| <b>X5F</b>   |             |                            |                             |                               |           |              |                  |
| 100  | ± 20        | 0.530 (13.5)               | 0.310 (7.9)                 | 0.500 (12.7)                  | 20        | 0.032 (0.81) | 564R75GAT10      |
| 470  |             | 0.620 (15.7)               | 0.270 (6.9)                 |                               |           |              | 564R75GAT47      |
| <b>Y5U</b>   |             |                            |                             |                               |           |              |                  |
| 1000   | + 80/- 20   | 0.620 (15.7)               | 0.320 (8.1)                 | 0.500 (12.7)                  | 20        | 0.032 (0.81) | 564R75GAD10      |
| <b>Z5U</b>   |             |                            |                             |                               |           |              |                  |
| 2500   | + 80/- 20   | 0.620 (15.7)               | 0.280 (7.1)                 | 0.500 (12.7)                  | 20        | 0.032 (0.81) | 564R75GAD25      |



## Disclaimer

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