

## Standard Recovery Diodes, (Hockey PUK), 2100 A



K-PUK (DO-200AC)

### FEATURES

- Wide current range
- High voltage ratings up to 4500 V
- High surge current capabilities
- Diffused junction
- Hockey PUK version
- Case style K-PUK (DO-200AC)
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)


**RoHS  
COMPLIANT**

| PRIMARY CHARACTERISTICS |                  |
|-------------------------|------------------|
| $I_{F(AV)}$             | 2100 A           |
| Package                 | K-PUK (DO-200AC) |
| Circuit configuration   | Single           |

### TYPICAL APPLICATIONS

- Converters
- Power supplies
- Machine tool controls
- High power drives
- Medium traction applications

| MAJOR RATINGS AND CHARACTERISTICS |                 |              |              |                   |
|-----------------------------------|-----------------|--------------|--------------|-------------------|
| PARAMETER                         | TEST CONDITIONS | SD1700C..K   |              | UNITS             |
|                                   |                 | 24 to 36     | 40 to 45     |                   |
| $I_{F(AV)}$                       |                 | 2080         | 1875         | A                 |
|                                   | $T_{hs}$        | 55           | 55           | °C                |
| $I_{F(RMS)}$                      |                 | 3600         | 3280         | A                 |
|                                   | $T_{hs}$        | 25           | 25           | °C                |
| $I_{FSM}$                         | 50 Hz           | 24 000       | 20 000       | A                 |
|                                   | 60 Hz           | 25 150       | 20 950       |                   |
| $I^2t$                            | 50 Hz           | 2890         | 2000         | kA <sup>2</sup> s |
|                                   | 60 Hz           | 2630         | 1826         |                   |
| $V_{RRM}$                         | Range           | 2400 to 3600 | 4000 to 4500 | V                 |
| $T_J$                             |                 | -40 to +150  | -40 to +150  | °C                |

### ELECTRICAL SPECIFICATIONS

| VOLTAGE RATINGS |              |  |  |  |
|-----------------|--------------|--|--|--|
| TYPE NUMBER     | VOLTAGE CODE | $V_{RRM}$ , MAXIMUM REPETITIVE PEAK REVERSE VOLTAGE<br>V | $V_{RSM}$ , MAXIMUM NON-REPETITIVE PEAK REVERSE VOLTAGE<br>V | $I_{RRM}$ MAXIMUM AT $T_J = T_J$ MAXIMUM<br>mA |
| VS-SD1700C..K   | 24           | 2400   | 2500   | 75   |
|                 | 30           | 3000   | 3100   |  |
|                 | 36           | 3600   | 3700   |  |
|                 | 40           | 4000   | 4100   |  |
|                 | 45           | 4500   | 4600   |  |



| FORWARD CONDUCTION  |               |   |            |                           |            |                    |                   |
|---|---------------|---|------------|---------------------------|------------|--------------------|-------------------|
| PARAMETER   | SYMBOL        | TEST CONDITIONS   |            | SD1700C..K                |            | UNITS              |                   |
|   |               |   |            | 24 to 36                  | 40 to 45   |                    |                   |
| Maximum average forward current at heatsink temperature       | $I_{F(AV)}$   | 180° conduction, half sine wave<br>Double side (single side) cooled                     |            | 2080<br>(1000)            | 1875 (920) | A                  |                   |
|   |               |   |            | 55 (85)                   | 55 (85)    | °C                 |                   |
| Maximum RMS forward current                                   | $I_{F(RMS)}$  | 25 °C heatsink temperature double side cooled   |            | 3600                      | 3280       |                    |                   |
| Maximum peak, one cycle forward, non-repetitive surge current | $I_{FSM}$     | Sinusoidal half wave,<br>initial $T_J = T_J$ maximum                                    | t = 10 ms  | No voltage reappplied     | 24 000     | 20 000             | A                 |
|   |               |   | t = 8.3 ms | No voltage reappplied     | 25 150     | 20 950             |                   |
|   |               |   | t = 10 ms  | 50 % $V_{RRM}$ reappplied | 20 200     | 16 800             |                   |
|   |               |   | t = 8.3 ms | 50 % $V_{RRM}$ reappplied | 21 150     | 17 600             |                   |
| Maximum $I^2t$ for fusing                                     | $I^2t$        |   | t = 10 ms  | No voltage reappplied     | 2890       | 2000               | kA <sup>2</sup> s |
|   |               |   | t = 8.3 ms | No voltage reappplied     | 2630       | 1826               |                   |
|   |               |   | t = 10 ms  | 50 % $V_{RRM}$ reappplied | 2040       | 1415               |                   |
|   |               |   | t = 8.3 ms | 50 % $V_{RRM}$ reappplied | 1860       | 1292               |                   |
| Maximum $I^2\sqrt{t}$ for fusing                              | $I^2\sqrt{t}$ | t = 0.1 to 10 ms, no voltage reappplied   |            | 28 900                    | 20 000     | kA <sup>2</sup> √s |                   |
| Low level value of threshold voltage                          | $V_{F(TO)1}$  | (16.7 % $\times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)}$ , $T_J = T_J$ maximum) |            | 0.89                      | 0.88       | V                  |                   |
| High level value of threshold voltage                         | $V_{F(TO)2}$  | (I > $\pi \times I_{F(AV)}$ , $T_J = T_J$ maximum)                                      |            | 1.02                      | 0.99       |                    |                   |
| Low level value of forward slope resistance                   | $r_{f1}$      | (16.7 % $\times \pi \times I_{F(AV)} < I < \pi \times I_{F(AV)}$ , $T_J = T_J$ maximum) |            | 0.23                      | 0.31       | mΩ                 |                   |
| High level value of forward slope resistance                  | $r_{f2}$      | (I > $\pi \times I_{F(AV)}$ , $T_J = T_J$ maximum)                                      |            | 0.21                      | 0.29       |                    |                   |
| Maximum forward voltage drop                                  | $V_{FM}$      | $I_{pk} = 4000$ A, $T_J = T_J$ maximum, $t_p = 10$ ms sinusoidal wave                   |            | 1.81                      | 2.11       | V                  |                   |

| THERMAL AND MECHANICAL SPECIFICATIONS            |              |   |                  |        |
|--|--------------|---|------------------|--------|
| PARAMETER  | SYMBOL       | TEST CONDITIONS                               | VALUES           | UNITS  |
| Maximum junction operating temperature range     | $T_J$        |   | -40 to +150      | °C     |
| Maximum storage temperature range                | $T_{Stg}$    |   | -55 to +200      |        |
| Maximum thermal resistance, junction to heatsink | $R_{thJ-hs}$ | DC operation single side cooled               | 0.042            | K/W    |
|  |              | DC operation double side cooled               | 0.020            |        |
| Mounting force, ± 10 %                           |              |   | 22 250 (2250)    | N (kg) |
| Approximate weight                               |              |   | 425              | g      |
| Case style                                       |              | See dimensions - link at the end of datasheet | K-PUK (DO-200AC) |        |

| $\Delta R_{thJ-hs}$ CONDUCTION |                       |             |                        |             |                     |       |
|--------------------------------|-----------------------|-------------|------------------------|-------------|---------------------|-------|
| CONDUCTION ANGLE               | SINUSOIDAL CONDUCTION |             | RECTANGULAR CONDUCTION |             | TEST CONDITIONS     | UNITS |
|                                | SINGLE SIDE           | DOUBLE SIDE | SINGLE SIDE            | DOUBLE SIDE |                     |       |
| 180°                           | 0.002                 | 0.002       | 0.001                  | 0.001       | $T_J = T_J$ maximum | K/W   |
| 120°                           | 0.002                 | 0.002       | 0.002                  | 0.002       |                     |       |
| 90°                            | 0.003                 | 0.003       | 0.003                  | 0.003       |                     |       |
| 60°                            | 0.004                 | 0.004       | 0.004                  | 0.004       |                     |       |
| 30°                            | 0.007                 | 0.007       | 0.007                  | 0.007       |                     |       |

**Note**

- The table above shows the increment of thermal resistance  $R_{thJ-hs}$  when devices operate at different conduction angles than DC

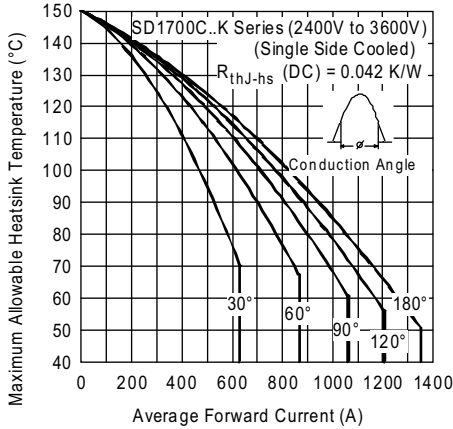


Fig. 1 - Current Ratings Characteristics

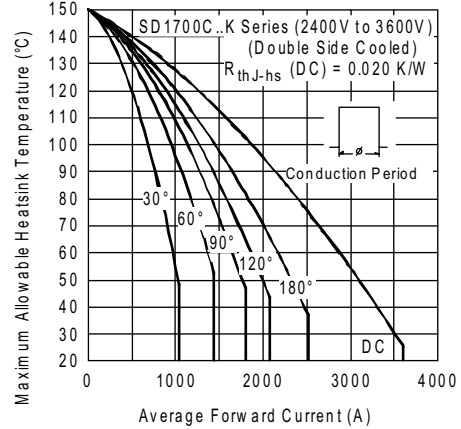


Fig. 4 - Current Ratings Characteristics

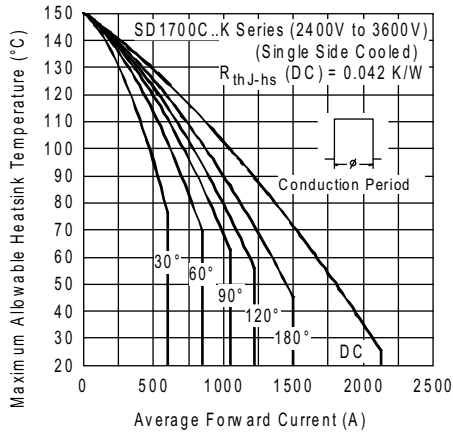


Fig. 2 - Current Ratings Characteristics

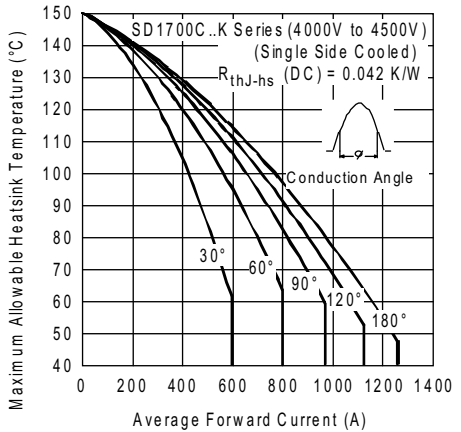


Fig. 5 - Current Ratings Characteristics

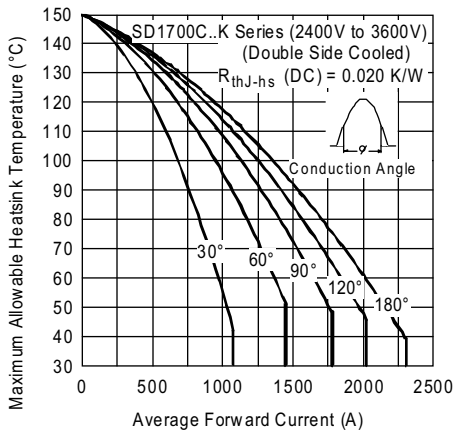


Fig. 3 - Current Ratings Characteristics

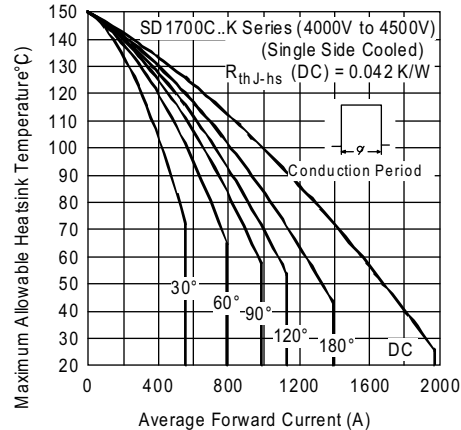


Fig. 6 - Current Ratings Characteristics

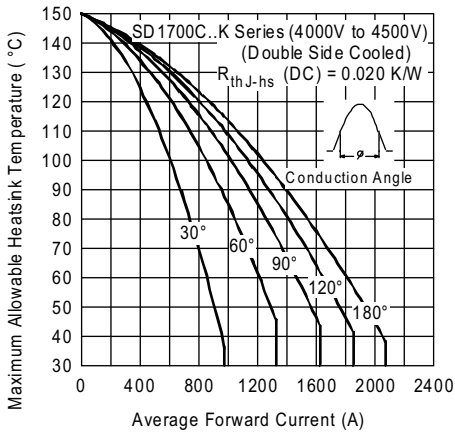


Fig. 7 - Current Ratings Characteristics

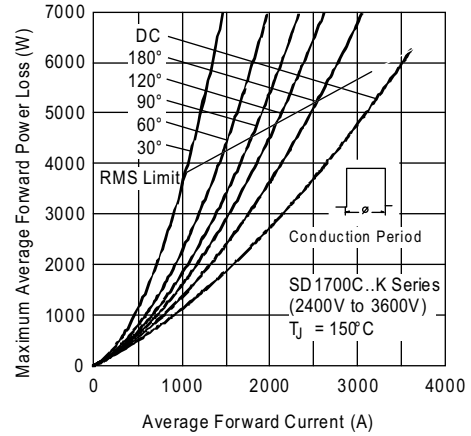


Fig. 10 - Forward Power Loss Characteristics

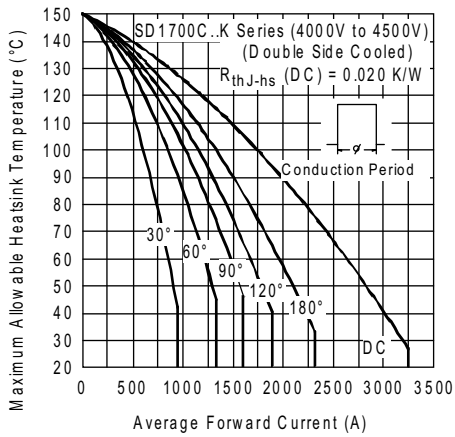


Fig. 8 - Current Ratings Characteristics

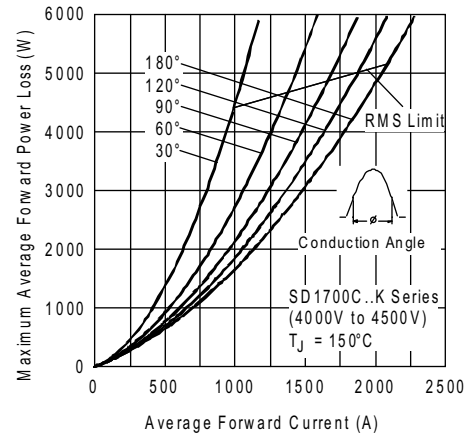


Fig. 11 - Forward Power Loss Characteristics

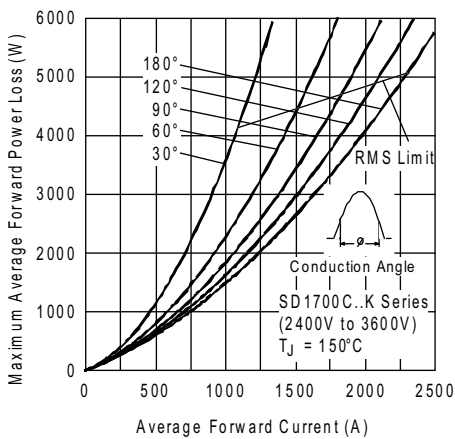


Fig. 9 - Forward Power Loss Characteristics

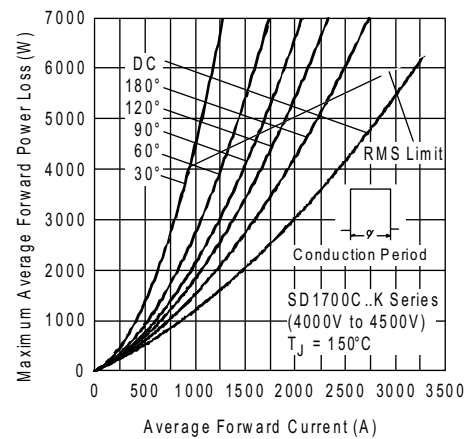


Fig. 12 - Forward Power Loss Characteristics

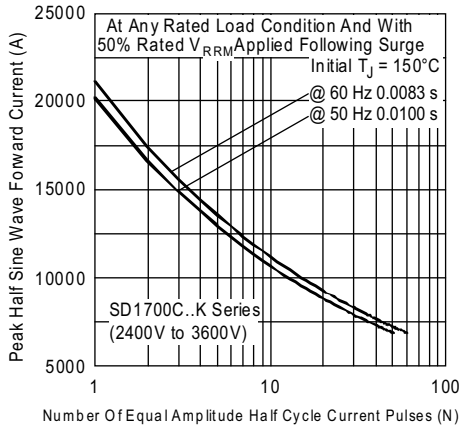


Fig. 13 - Maximum Non-Repetitive Surge Current Single and Double Side Cooled

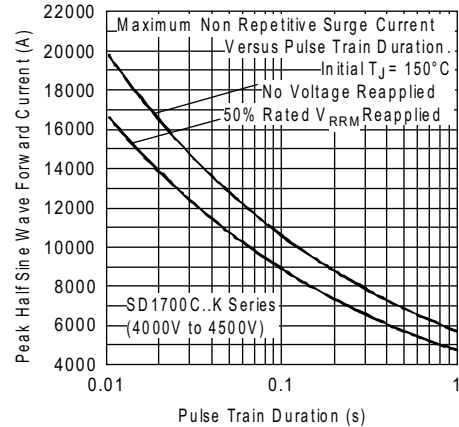


Fig. 16 - Maximum Non-Repetitive Surge Current Single and Double Side Cooled

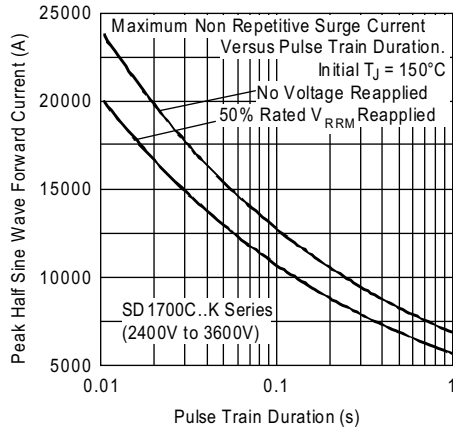


Fig. 14 - Maximum Non-Repetitive Surge Current Single and Double Side Cooled

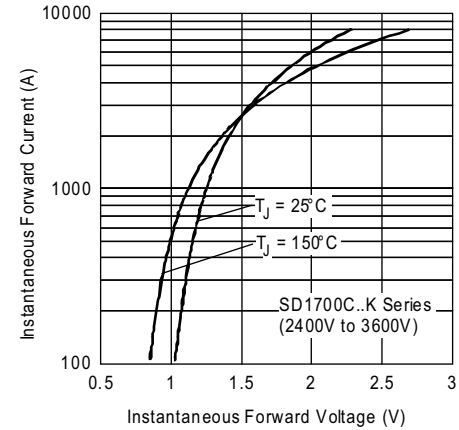


Fig. 17 - Forward Voltage Drop Characteristics

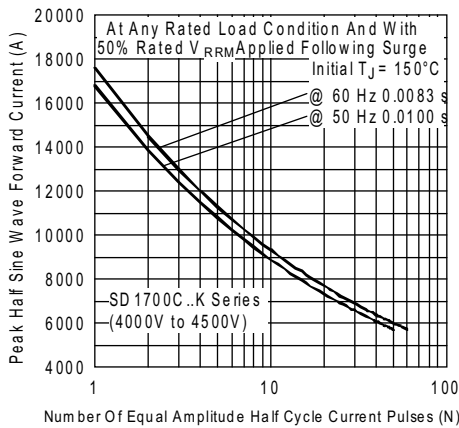


Fig. 15 - Maximum Non-Repetitive Surge Current Single and Double Side Cooled

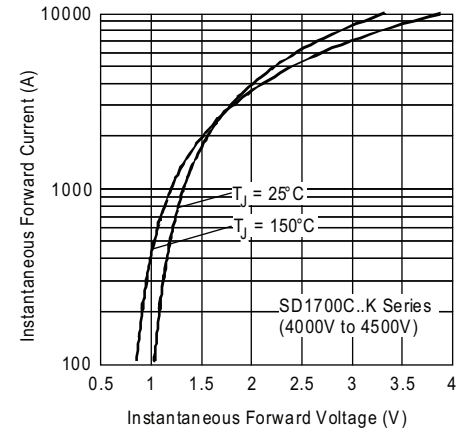


Fig. 18 - Forward Voltage Drop Characteristics

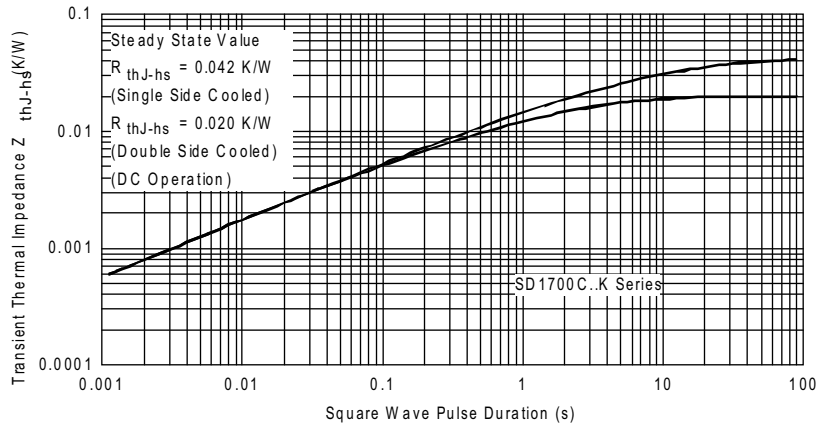


Fig. 19 - Thermal Impedance  $Z_{thJC}$  Characteristics

**ORDERING INFORMATION TABLE**

|             |            |           |                               |          |          |                 |          |   |  |
|-------------|------------|-----------|-------------------------------|----------|----------|-----------------|----------|---|--|
| Device code | <b>VS-</b> | <b>SD</b> | <b>170</b>                    | <b>0</b> | <b>C</b> | <b>45</b>       | <b>K</b> |   |  |
|             | ①          | ②         | ③                             | ④        | ⑤        | ⑥               | ⑦        |   |  |
|             | <b>1</b>   | -         | Vishay Semiconductors product | <b>2</b> | -        | Diode           | <b>3</b> | - | Essential part number                                      |
|             | <b>4</b>   | -         | 0 = standard recovery         | <b>5</b> | -        | C = ceramic PUK | <b>6</b> | - | Voltage code x 100 = $V_{RRM}$ (see Voltage Ratings table) |
|             | <b>7</b>   | -         | K = PUK case K-PUK (DO-200AC) |          |          |                 |          |   |  |

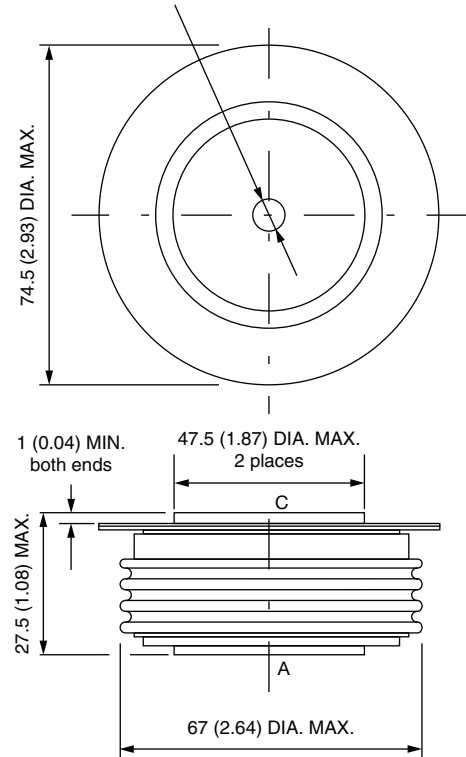
| LINKS TO RELATED DOCUMENTS |  |
|----------------------------|--|
| Dimensions                 | <a href="http://www.vishay.com/doc?95247">www.vishay.com/doc?95247</a> |



## K-PUK (DO-200AC)

**DIMENSIONS** in millimeters (inches)

3.5 (0.14) DIA. NOM. x  
1.8 (0.07) deep MIN. both ends



**Note:**

A = Anode

C = Cathode

Quote between upper and lower pole pieces has to be considered after application of mounting force (see Thermal and Mechanical Specifications)



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