

## Power Silicon Rectifier Diodes, 35 A/40 A/60 A



### DESCRIPTION/FEATURES

- Low leakage current series
- Good surge current capability up to 1000 A
- Can be supplied to meet stringent military, aerospace and other high reliability requirements
- Compliant to RoHS directive 2002/95/EC



**RoHS**  
COMPLIANT

### PRODUCT SUMMARY

|             |                |
|-------------|----------------|
| $I_{F(AV)}$ | 35 A/40 A/60 A |
|-------------|----------------|

### MAJOR RATINGS AND CHARACTERISTICS

| PARAMETER     | TEST CONDITIONS | 1N1183                   | 1N3765                     | 1N1183A                  | 1N2128A                  | UNITS             |
|---------------|-----------------|--------------------------|----------------------------|--------------------------|--------------------------|-------------------|
| $I_{F(AV)}$   |                 | 35 <sup>(1)</sup>        | 35 <sup>(1)</sup>          | 40 <sup>(1)</sup>        | 60 <sup>(1)</sup>        | A                 |
|               | $T_C$           | 140 <sup>(1)</sup>       | 140 <sup>(1)</sup>         | 150 <sup>(1)</sup>       | 140 <sup>(1)</sup>       | °C                |
| $I_{FSM}$     | 50 Hz           | 480                      | 380                        | 765                      | 860                      | A                 |
|               | 60 Hz           | 500 <sup>(1)</sup>       | 400 <sup>(1)</sup>         | 800 <sup>(1)</sup>       | 900 <sup>(1)</sup>       |                   |
| $I^2t$        | 50 Hz           | 1140                     | 730                        | 2900                     | 3700                     | A <sup>2</sup> s  |
|               | 60 Hz           | 1040                     | 670                        | 2650                     | 3400                     |                   |
| $I^2\sqrt{t}$ |                 | 16 100                   | 10 300                     | 41 000                   | 52 500                   | A <sup>2</sup> √s |
| $V_{RRM}$     | Range           | 50 to 600 <sup>(1)</sup> | 700 to 1000 <sup>(1)</sup> | 50 to 600 <sup>(1)</sup> | 50 to 600 <sup>(1)</sup> | V                 |

#### Note

<sup>(1)</sup> JEDEC registered values

### ELECTRICAL SPECIFICATIONS

#### VOLTAGE RATINGS

| TYPE NUMBER |         |         | $V_{RRM}$ , MAXIMUM REPETITIVE<br>PEAK REVERSE VOLTAGE<br>( $T_J = -65\text{ °C TO }200\text{ °C}^{(2)}$ )<br>V | $V_{RM}$ , MAXIMUM DIRECT<br>REVERSE VOLTAGE<br>( $T_J = -65\text{ °C TO }200\text{ °C}^{(2)}$ )<br>V |
|-------------|---------|---------|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| 1N1183      | 1N1183A | 1N2128A | 50 <sup>(1)</sup>                                                                                               | 50 <sup>(1)</sup>                                                                                     |
| 1N1184      | 1N1184A | 1N2129A | 100 <sup>(1)</sup>                                                                                              | 100 <sup>(1)</sup>                                                                                    |
| 1N1185      | 1N1185A | 1N2130A | 150 <sup>(1)</sup>                                                                                              | 150 <sup>(1)</sup>                                                                                    |
| 1N1186      | 1N1186A | 1N2131A | 200 <sup>(1)</sup>                                                                                              | 200 <sup>(1)</sup>                                                                                    |
| 1N1187      | 1N1187A | 1N2133A | 300 <sup>(1)</sup>                                                                                              | 300 <sup>(1)</sup>                                                                                    |
| 1N1188      | 1N1188A | 1N2135A | 400 <sup>(1)</sup>                                                                                              | 400 <sup>(1)</sup>                                                                                    |
| 1N1189      | 1N1189A | 1N2137A | 500 <sup>(1)</sup>                                                                                              | 500 <sup>(1)</sup>                                                                                    |
| 1N1190      | 1N1190A | 1N2138A | 600 <sup>(1)</sup>                                                                                              | 600 <sup>(1)</sup>                                                                                    |
| 1N3765      |         |         | 700 <sup>(1)</sup>                                                                                              | 700 <sup>(1)</sup>                                                                                    |
| 1N3766      |         |         | 800 <sup>(1)</sup>                                                                                              | 800 <sup>(1)</sup>                                                                                    |
| 1N3767      |         |         | 900 <sup>(1)</sup>                                                                                              | 900 <sup>(1)</sup>                                                                                    |
| 1N3768      |         |         | 1000 <sup>(1)</sup>                                                                                             | 1000 <sup>(1)</sup>                                                                                   |

#### Notes

<sup>(1)</sup> JEDEC registered values

<sup>(2)</sup> For 1N1183 Series and 1N3765 Series  $T_C = -65\text{ °C to }190\text{ °C}$

- Basic type number indicates cathode to case. For anode to case, add "R" to part number, e.g., 1N1188R, 1N3766R, 1N1186AR, 1N2135AR

# 1N1183, 1N3765, 1N1183A, 1N2128A Series

Vishay High Power Products Power Silicon Rectifier Diodes,  
35 A/40 A/60 A



| FORWARD CONDUCTION                                                         |                                  |                                                                        |                                                                                                      |                    |                    |                    |                    |                   |
|----------------------------------------------------------------------------|----------------------------------|------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|--------------------|--------------------|--------------------|--------------------|-------------------|
| PARAMETER                                                                  | SYMBOL                           | TEST CONDITIONS                                                        |                                                                                                      | 1N1183             | 1N3765             | 1N1183A            | 1N2128A            | UNITS             |
| Maximum average forward current at case temperature                        | I <sub>F(AV)</sub>               | 1-phase operation, 180° sinusoidal conduction                          |                                                                                                      | 35 <sup>(1)</sup>  | 35 <sup>(1)</sup>  | 40 <sup>(1)</sup>  | 60 <sup>(1)</sup>  | A                 |
|                                                                            |                                  |                                                                        |                                                                                                      | 140 <sup>(1)</sup> | 140 <sup>(1)</sup> | 150 <sup>(1)</sup> | 140 <sup>(1)</sup> | °C                |
| Maximum peak one cycle non-repetitive surge current                        | I <sub>FSM</sub>                 | Half cycle 50 Hz sine wave or 6 ms rectangular pulse                   | Following any rated load condition and with rated V <sub>RRM</sub> applied                           | 480                | 380                | 765                | 860                | A                 |
|                                                                            |                                  | Half cycle 60 Hz sine wave or 5 ms rectangular pulse                   |                                                                                                      | 500 <sup>(1)</sup> | 400 <sup>(1)</sup> | 800 <sup>(1)</sup> | 900 <sup>(1)</sup> |                   |
|                                                                            |                                  | Half cycle 50 Hz sine wave or 6 ms rectangular pulse                   | Following any rated load condition and with ½ V <sub>RRM</sub> applied following surge = 0           | 570                | 455                | 910                | 1000               |                   |
|                                                                            |                                  | Half cycle 60 Hz sine wave or 5 ms rectangular pulse                   |                                                                                                      | 595                | 475                | 950                | 1050               |                   |
| Maximum I <sup>2</sup> t for fusing                                        | I <sup>2</sup> t                 | t = 10 ms                                                              | With rated V <sub>RRM</sub> applied following surge, initial T <sub>J</sub> = T <sub>J</sub> maximum | 1140               | 730                | 2900               | 3700               | A <sup>2</sup> s  |
|                                                                            |                                  | t = 8.3 ms                                                             |                                                                                                      | 1040               | 670                | 2650               | 3400               |                   |
| Maximum I <sup>2</sup> t for individual device fusing                      |                                  | t = 10 ms                                                              | With V <sub>RRM</sub> = 0 following surge, initial T <sub>J</sub> = T <sub>J</sub> maximum           | 1610               | 1030               | 4150               | 5250               |                   |
|                                                                            |                                  | t = 8.3 ms                                                             |                                                                                                      | 1470               | 940                | 3750               | 4750               |                   |
| Maximum I <sup>2</sup> √t for individual device fusing                     | I <sup>2</sup> √t <sup>(2)</sup> | t = 0.1 to 10 ms, V <sub>RRM</sub> = 0 following surge                 |                                                                                                      | 16 100             | 10 300             | 41 500             | 52 500             | A <sup>2</sup> √s |
| Maximum peak forward voltage at maximum forward current (I <sub>FM</sub> ) | V <sub>FM</sub>                  | T <sub>J</sub> = 25 °C                                                 |                                                                                                      | 1.7 <sup>(1)</sup> | 1.8 <sup>(1)</sup> | 1.3 <sup>(1)</sup> | 1.3 <sup>(1)</sup> | V                 |
|                                                                            |                                  |                                                                        |                                                                                                      | 110                | 110                | 126                | 188                | A                 |
| Maximum average reverse current                                            | I <sub>R(AV)</sub>               | Maximum rated I <sub>F(AV)</sub> and T <sub>C</sub>                    |                                                                                                      | -                  | 5.0 <sup>(1)</sup> | -                  | -                  | mA                |
|                                                                            |                                  |                                                                        |                                                                                                      | -                  | 4.0 <sup>(1)</sup> | -                  | -                  |                   |
|                                                                            |                                  |                                                                        |                                                                                                      | -                  | 3.0 <sup>(1)</sup> | -                  | -                  |                   |
|                                                                            |                                  |                                                                        |                                                                                                      | -                  | 2.0 <sup>(1)</sup> | -                  | -                  |                   |
|                                                                            |                                  | Maximum rated I <sub>F(AV)</sub> , V <sub>RRM</sub> and T <sub>C</sub> |                                                                                                      | 10 <sup>(1)</sup>  | -                  | 2.5 <sup>(1)</sup> | 10 <sup>(1)</sup>  |                   |

## Notes

<sup>(1)</sup> JEDEC registered values

<sup>(2)</sup>  $I^2t$  for time  $t_x = I^2\sqrt{t} \times \sqrt{t_x}$



# 1N1183, 1N3765, 1N1183A, 1N2128A Series

Power Silicon Rectifier Diodes, Vishay High Power Products  
35 A/40 A/60 A

| THERMAL AND MECHANICAL SPECIFICATIONS                 |                   |                                                             |                            |        |                    |                     |                     |
|-------------------------------------------------------|-------------------|-------------------------------------------------------------|----------------------------|--------|--------------------|---------------------|---------------------|
| PARAMETER                                             | SYMBOL            | TEST CONDITIONS                                             | 1N1183                     | 1N3765 | 1N1183A            | 1N2128A             | UNITS               |
| Maximum operating case temperature range              | T <sub>C</sub>    |                                                             | - 65 to 190 <sup>(1)</sup> |        | - 65 to 200        |                     | °C                  |
| Maximum storage temperature range                     | T <sub>Stg</sub>  |                                                             | - 65 to 175 <sup>(1)</sup> |        | - 65 to 200        |                     |                     |
| Maximum internal thermal resistance, junction to case | R <sub>thJC</sub> | DC operation                                                | 1.00 <sup>(1)</sup>        |        | 1.1 <sup>(1)</sup> | 0.65 <sup>(1)</sup> | °C/W                |
| Thermal resistance, case to sink                      | R <sub>thCS</sub> | Mounting surface, smooth, flat and greased                  | 0.25                       |        |                    |                     |                     |
| Maximum allowable mounting torque<br>(+ 0 %, - 10 %)  |                   | Not lubricated thread, tightening on nut <sup>(2)</sup>     | 3.4 (30)                   |        |                    |                     | N · m<br>(lbf · in) |
|                                                       |                   | Lubricated thread, tightening on nut <sup>(2)</sup>         | 2.3 (20)                   |        |                    |                     |                     |
|                                                       |                   | Not lubricated thread, tightening on hexagon <sup>(3)</sup> | 4.2 (37)                   |        |                    |                     |                     |
|                                                       |                   | Lubricated thread, tightening on hexagon <sup>(3)</sup>     | 3.2 (28)                   |        |                    |                     |                     |
| Approximate weight                                    |                   |                                                             | 17                         |        |                    |                     | g                   |
|                                                       |                   |                                                             | 0.6                        |        |                    |                     | oz.                 |
| Case style                                            |                   | JEDEC                                                       | DO-203AB (DO-5)            |        |                    |                     |                     |

## Notes

- (1) JEDEC registered values
- (2) Recommended for pass-through holes
- (3) Recommended for holed threaded heatsinks

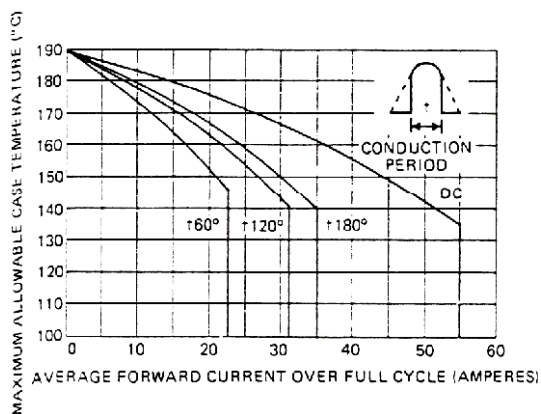


Fig. 1 - Maximum Allowable Case Temperature vs. Average Forward Current, 1N1183 and 1N3765 Series

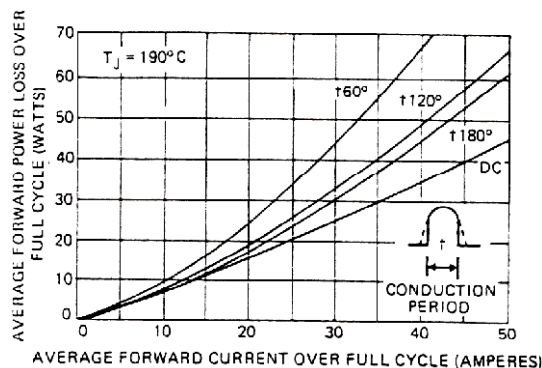


Fig. 2 - Typical Low Level Forward Power Loss vs. Average Forward Current (Sinusoidal Current Waveform), 1N1183 and 1N3765 Series

# 1N1183, 1N3765, 1N1183A, 1N2128A Series

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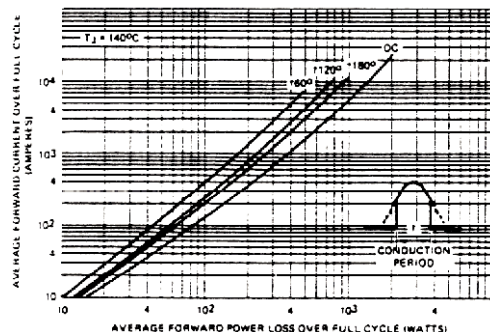


Fig. 3 - Typical High Level Forward Power Loss vs. Average Forward Current (Sinusoidal Current Waveform), 1N1183 and 1N3765 Series

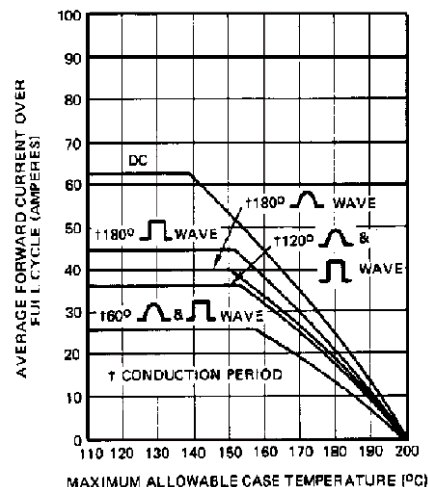


Fig. 6 - Average Forward Current vs. Maximum Allowable Case Temperature, 1N1183A Series

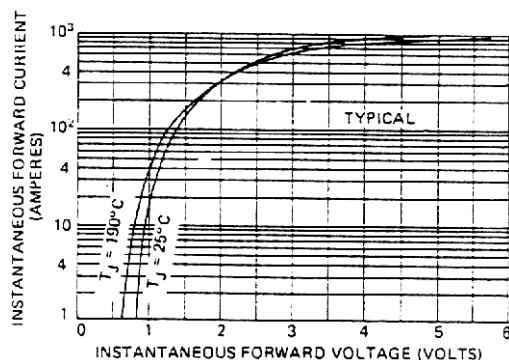


Fig. 4 - Typical Forward Voltage vs. Forward Current, 1N1183 and 1N3765 Series

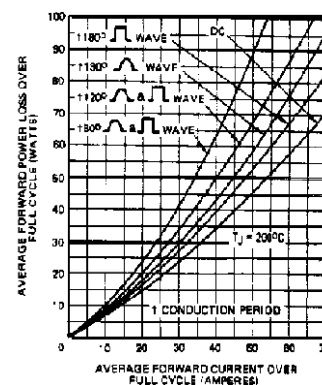


Fig. 7 - Maximum Low Level Forward Power Loss vs. Average Forward Current, 1N1183A Series

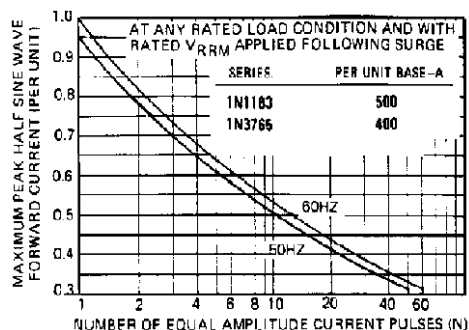


Fig. 5 - Maximum Non-Repetitive Surge Current vs. Number of Current Pulses, 1N1183 and 1N3765 Series

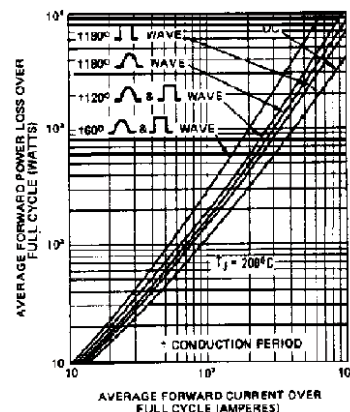


Fig. 8 - Maximum High Level Forward Power Loss vs. Average Forward Current, 1N1183A Series



# 1N1183, 1N3765, 1N1183A, 1N2128A Series

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35 A/40 A/60 A

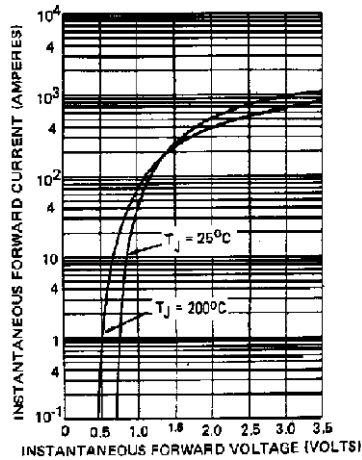


Fig. 9 - Maximum Forward Voltage vs. Forward Current, 1N1183A Series

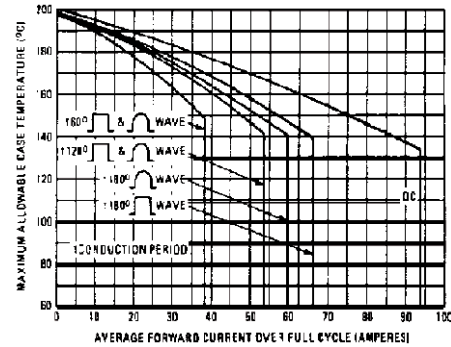


Fig. 12 - Maximum Allowable Case Temperature vs. Average Forward Current, 1N2128A Series

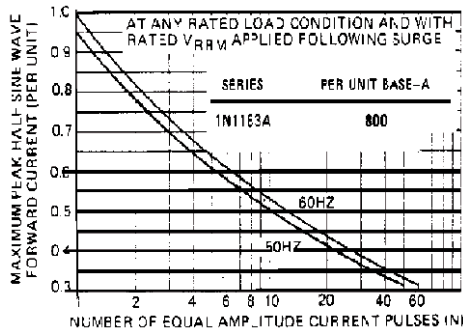


Fig. 10 - Maximum Non-Repetitive Surge Current vs. Number of Current Pulses, 1N1183A Series

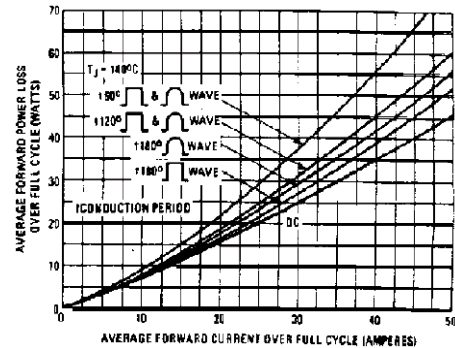


Fig. 13 - Maximum Low Level Forward Power Loss vs. Average Forward Current, 1N2128A Series

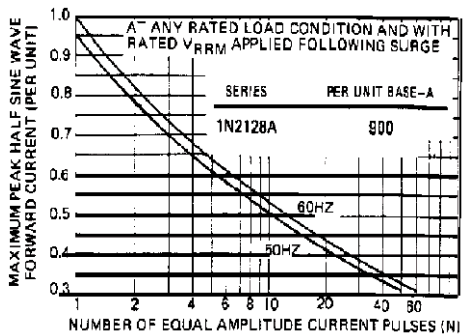


Fig. 11 - Maximum Non-Repetitive Surge Current vs. Number of Current Pulses, 1N2128A Series

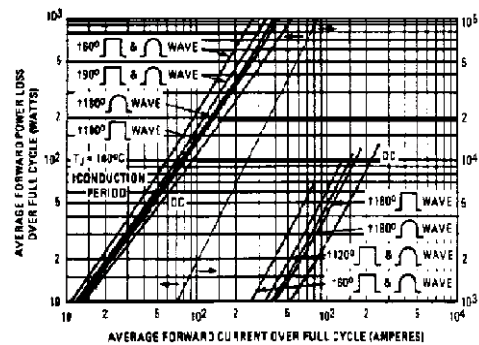


Fig. 14 - Maximum High Level Forward Power Loss vs. Average Forward Current, 1N2128A Series

# 1N1183, 1N3765, 1N1183A, 1N2128A Series

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35 A/40 A/60 A

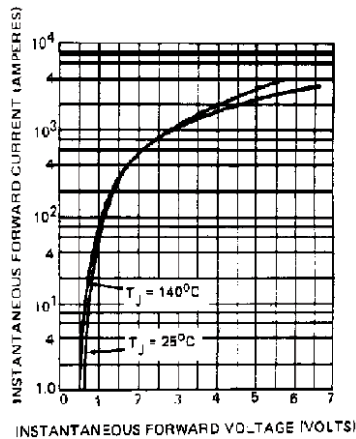
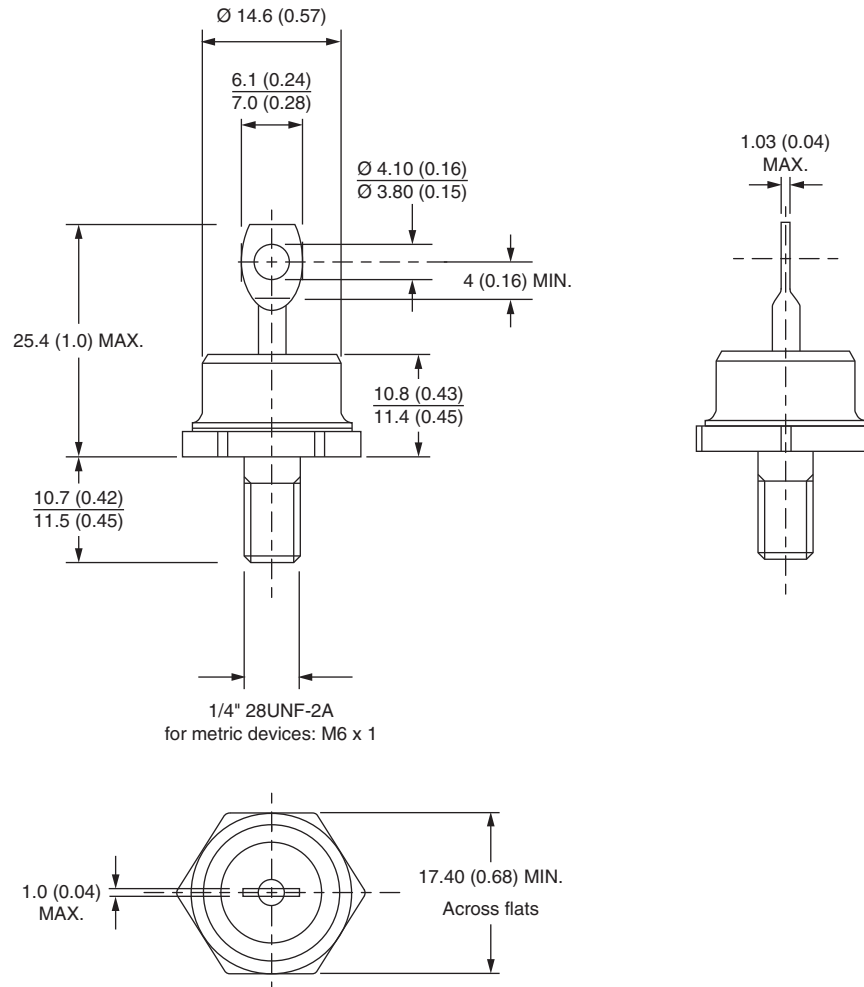


Fig. 15 - Maximum Forward Voltage vs. Forward Current,  
1N2128A Series

| LINKS TO RELATED DOCUMENTS |                                                                        |
|----------------------------|------------------------------------------------------------------------|
| Dimensions                 | <a href="http://www.vishay.com/doc?95360">www.vishay.com/doc?95360</a> |

## DO-203AB (DO-5) for 1N1183, 1N3765, 1N1183A, 1N2128A, 1N3208 Series

**DIMENSIONS** in millimeters (inches)





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**Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as RoHS-Compliant fulfill the definitions and restrictions defined under Directive 2011/65/EU of The European Parliament and of the Council of June 8, 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (EEE) - recast, unless otherwise specified as non-compliant.**

**Please note that some Vishay documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.**



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Электрон  
Связь**

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Благодаря сотрудничеству с мировыми поставщиками мы осуществляем комплексные и плановые поставки широчайшего спектра электронных компонентов.

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