



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

Vishay High Power Products

## 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
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### 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 PEAK REVERSE VOLTAGE ( $T_J = -65\text{ °C TO }200\text{ °C}^{(2)}$ ) V	$V_{RM}$ , MAXIMUM DIRECT REVERSE VOLTAGE ( $T_J = -65\text{ °C TO }200\text{ °C}^{(2)}$ ) 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

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FORWARD CONDUCTION								
PARAMETER	SYMBOL	TEST CONDITIONS		1N1183	1N3765	1N1183A	1N2128A	UNITS
Maximum average forward current at case temperature	$I_{F(AV)}$	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	$I_{FSM}$	Half cycle 50 Hz sine wave or 6 ms rectangular pulse	Following any rated load condition and with rated $V_{RRM}$ 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 $\frac{1}{2} V_{RRM}$ applied following surge = 0	570	455	910	1000	
		Half cycle 60 Hz sine wave or 5 ms rectangular pulse		595	475	950	1050	
Maximum $I^2t$ for fusing	$I^2t$	t = 10 ms	With rated $V_{RRM}$ applied following surge, initial $T_J = T_J$ maximum	1140	730	2900	3700	A <sup>2</sup> s
		t = 8.3 ms		1040	670	2650	3400	
Maximum $I^2t$ for individual device fusing		t = 10 ms	With $V_{RRM} = 0$ following surge, initial $T_J = T_J$ maximum	1610	1030	4150	5250	
		t = 8.3 ms		1470	940	3750	4750	
Maximum $I^2\sqrt{t}$ for individual device fusing	$I^2\sqrt{t}$ <sup>(2)</sup>	t = 0.1 to 10 ms, $V_{RRM} = 0$ following surge		16 100	10 300	41 500	52 500	A <sup>2</sup> √s
Maximum peak forward voltage at maximum forward current ( $I_{FM}$ )	$V_{FM}$	$T_J = 25$ °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	$I_{R(AV)}$	Maximum rated $I_{F(AV)}$ and $T_C$		$V_{RRM} = 700$	5.0 <sup>(1)</sup>	-	-	mA
				$V_{RRM} = 800$	4.0 <sup>(1)</sup>	-	-	
				$V_{RRM} = 900$	3.0 <sup>(1)</sup>	-	-	
				$V_{RRM} = 1000$	2.0 <sup>(1)</sup>	-	-	
		Maximum rated $I_{F(AV)}$ , $V_{RRM}$ and $T_C$		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  $t_x = I^2\sqrt{t} \times \sqrt{t_x}$



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THERMAL AND MECHANICAL SPECIFICATIONS							
PARAMETER	SYMBOL	TEST CONDITIONS	1N1183	1N3765	1N1183A	1N2128A	UNITS
Maximum operating case temperature range	$T_C$		- 65 to 190 <sup>(1)</sup>		- 65 to 200		°C
Maximum storage temperature range	$T_{Stg}$		- 65 to 175 <sup>(1)</sup>		- 65 to 200		
Maximum internal thermal resistance, junction to case	$R_{thJC}$	DC operation	1.00 <sup>(1)</sup>		1.1 <sup>(1)</sup>	0.65 <sup>(1)</sup>	°C/W
Thermal resistance, case to sink	$R_{thCS}$	Mounting surface, smooth, flat and greased	0.25				
Maximum allowable mounting torque (+ 0 %, - 10 %)		Not lubricated thread, tightening on nut <sup>(2)</sup>	3.4 (30)				N · m (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

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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



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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

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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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