

Vishay High Power Products

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



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
- RoHS compliant

MAJOR RATINGS AND CHARACTERISTICS							
PARAMETER	TEST CONDITIONS	1N1183	1N3765	1N1183A	1N2128A	UNITS	
1		35 (1)	35 (1)	40 (1)	60 (1)	А	
IF(AV)	T <sub>C</sub>	140 (1)	140 (1)	150 <sup>(1)</sup>	140 <sup>(1)</sup>	°C	
1	50 Hz	480	380	765	860	٨	
IFSM	60 Hz	500 (1)	400 (1)	800 (1)	900 (1)	A	
l <sup>2</sup> t	50 Hz	1140	730	2900	3700	A <sup>2</sup> s	
1-1	60 Hz	1040	670	2650	3400	A-S	
l²√t		16 100	10 300	41 000	52 500	A²√s	
V <sub>RRM</sub>	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

**PRODUCT SUMMARY** 

I<sub>F(AV)</sub>

### **ELECTRICAL SPECIFICATIONS**

VOLTAGE RATINGS						
TYPE NUMBER <sup>(3)</sup>		V <sub>RRM</sub> , MAXIMUM REPETITIVE PEAK REVERSE VOLTAGE V	V <sub>RM</sub> , MAXIMUM DIRECT REVERSE VOLTAGE V			
		$T_{J} = -65 \ ^{\circ}C \ TO \ 200 \ ^{\circ}C \ ^{(2)}$	$T_J$ = - 65 °C TO 200 °C <sup>(2)</sup>			
1N1183	1N1183A	1N2128A	50 <sup>(1)</sup>	50 <sup>(1)</sup>		
1N1184	1N1184A	1N2129A	100 (1)	100 (1)		
1N1185	1N1185A	1N2130A	150 <sup>(1)</sup>	150 <sup>(1)</sup>		
1N1186	1N1186A	1N2131A	200 (1)	200 (1)		
1N1187	1N1187A	1N2133A	300 (1)	300 (1)		
1N1188	1N1188A	1N2135A	400 (1)	400 (1)		
1N1189	1N1189A	1N2137A	500 <sup>(1)</sup>	500 <sup>(1)</sup>		
1N1190	1N1190A	1N2138A	600 <sup>(1)</sup>	600 (1)		
1N3765			700 (1)	700 (1)		
1N3766			800 (1)	800 (1)		
1N3767			900 (1)	900 (1)		
1N3768			1000 (1)	1000 (1)		

#### Notes

(1) JEDEC registered values

 $^{(2)}$  For 1N1183 Series and 1N3765 Series  $T_C$  = - 65 to 190  $^\circ C$ 

(3) Basic part number indicates cathode to case. For anode to case, add "R" to part number, i.e., 1N1188R, 1N3766R, 1N1186RA, 1N2135RA



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FORWARD CONDUCTION	ON							
PARAMETER	SYMBOL	TEST CONDITIONS		1N1183	1N3765	1N1183A	1N2128A	UNITS
Maximum average forward current	1	1-phase operation, 180° sinusoidal conduction		35 <sup>(1)</sup>	35 <sup>(1)</sup>	40 (1)	60 <sup>(1)</sup>	А
at case temperature	I <sub>F(AV)</sub>			140 <sup>(1)</sup>	140 (1)	150 <sup>(1)</sup>	140 (1)	°C
		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
Maximum peak one cycle		Half cycle 60 Hz sine wave or 5 ms rectangular pulse		500 <sup>(1)</sup>	400 (1)	800 (1)	900 (1)	
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 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	– l <sup>2</sup> t	t = 10 ms	With rated $V_{RRM}$ applied followingsurge, initial $T_J = T_J$ maximumWith $V_{RRM} = 0$ following surge,initial $T_J =$ $T_J$ maximum	1140	730	2900	3700	A <sup>2</sup> s
Maximum int for fusing		t = 8.3 ms		1040	670	2650	3400	
Maximum I <sup>2</sup> t for individual		t = 10 ms		1610	1030	4150	5250	
device fusing		t = 8.3 ms		1470	940	3750	4750	
Maximum I <sup>2</sup> \t for individual device fusing	²√t (2)	t = 0.1 to 10 ms, $V_{RRM}$ = 0 following surge		16 100	10 300	41 500	52 500	A²√s
Maximum peak forward voltage	V <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
at maximum forward current ( $\ensuremath{I_{FM}}\xspace)$	¥ FM	1j=25°C		110	110	126	188	А
V <sub>RRM</sub> = 700		Maximum rated $I_{F(AV)}$ and $T_{C}$		-	5.0 <sup>(1)</sup>	-	-	mA
V <sub>RRM</sub> = 800				-	4.0 (1)	-	-	
Maximum average reverse current	I <sub>R(AV)</sub>			-	3.0 <sup>(1)</sup>	-	-	
V <sub>RRM</sub> = 1000				-	2.0 (1)	-	-	
		Maximum rated $I_{F(AV)},V_{RRM}$ and $T_{C}$		10 <sup>(1)</sup>	-	2.5 <sup>(1)</sup>	10 <sup>(1)</sup>	

#### Notes

(1) JEDEC registered values

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



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THERMAL AND MECHANICAL SPECIFICATIONS							
PARAMETER	SYMBOL	TEST CONDITIONS	1N1183	1N3765	1N1183A	1N2128A	UNITS
Maximum operating case temperature range	т <sub>с</sub>		- 65 to 190 <sup>(1)</sup>		- 65 to 200		⊃°
Maximum storage temperature range	T <sub>Stg</sub>		- 65 to 175 <sup>(1)</sup> - 65 to 200		o 200	U	
Maximum internal thermal resistance, junction to case	R <sub>thJC</sub>	DC operation	1.00 <sup>(1)</sup> 1.1 <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			0/14	
minimum		Non-lubricated threads	2.3 (20)				N ⋅ m (lbf ⋅ in)
Mounting torque maximum		Non-Iubricated trifeads	3.4 (30)				
Approximato woight		17			g		
Approximate weight			0.6			oz.	
Case style		JEDEC	DO-203AB (DO-5)				

#### Note

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

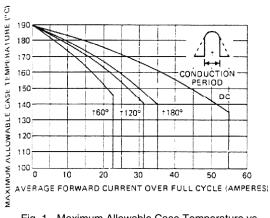
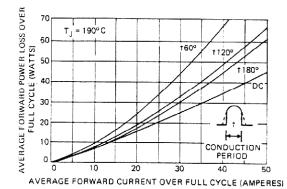
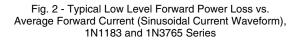


Fig. 1 - Maximum Allowable Case Temperature vs. Average Forward Current, 1N1183 and 1N3765 Series





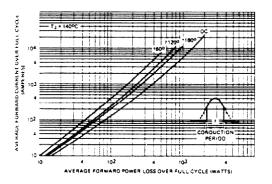
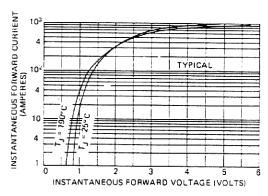
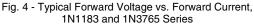


Fig. 3 - Typical High Level Forward Power Loss vs. Average Forward Current (Sinusoidal Current Waveform), 1N1183 and 1N3765 Series





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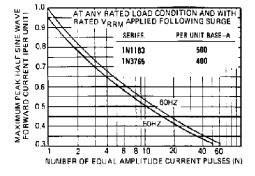


Fig. 5 - Maximum Non-Repetitive Surge Current vs. Number of Current Pulses, 1N1183 and 1N3765 Series

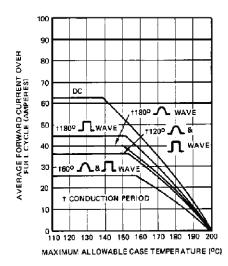


Fig. 6 - Average Forward Current vs. Maximum Allowable Case Temperature, 1N1183A Series

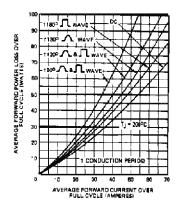


Fig. 7 - Maximum Low Level Forward Power Loss vs. Average Forward Current, 1N1183A Series

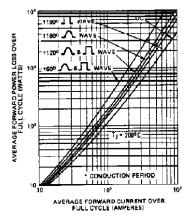


Fig. 8 - Maximum High Level Forward Power Loss vs. Average Forward Current, 1N1183A Series

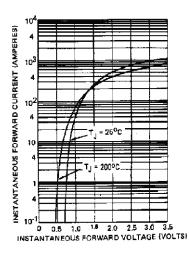


Fig. 9 - Maximum Forward Voltage vs. Forward Current, 1N1183A Series

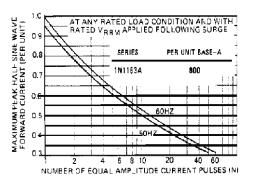


Fig. 10 - Maximum Non-Repetitive Surge Current vs. Number of Current Pulses, 1N1183A Series



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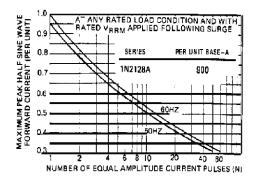


Fig. 11 - Maximum Non-Repetitive Surge Current vs. Number of Current Pulses, 1N2128A Series

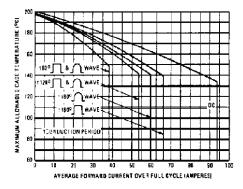


Fig. 12 - Maximum Allowable Case Temperature vs. Average Forward Current, 1N2128A Series

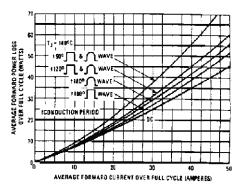
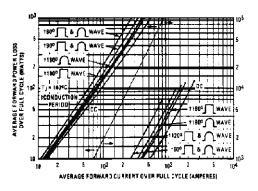
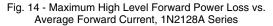
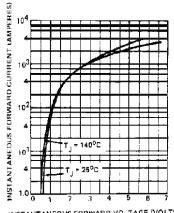


Fig. 13 - Maximum Low Level Forward Power Loss vs. Average Forward Current, 1N2128A Series







INSTANTANEOUS FORWARD VOLTAGE (VOLTS)

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

LINKS TO RELATED DOCUMENTS			
Dimensions	http://www.vishay.com/doc?95360		



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