

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



DO-203AB (DO-5)

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 ⁽¹⁾	35 ⁽¹⁾	40 ⁽¹⁾	60 ⁽¹⁾	A
	T_C	140 ⁽¹⁾	140 ⁽¹⁾	150 ⁽¹⁾	140 ⁽¹⁾	°C
I_{FSM}	50 Hz	480	380	765	860	A
	60 Hz	500 ⁽¹⁾	400 ⁽¹⁾	800 ⁽¹⁾	900 ⁽¹⁾	
I^2t	50 Hz	1140	730	2900	3700	A ² s
	60 Hz	1040	670	2650	3400	
$I^2\sqrt{t}$		16 100	10 300	41 000	52 500	A ² √s
V_{RRM}	Range	50 to 600 ⁽¹⁾	700 to 1000 ⁽¹⁾	50 to 600 ⁽¹⁾	50 to 600 ⁽¹⁾	V

Note

⁽¹⁾ 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 ⁽¹⁾	50 ⁽¹⁾
1N1184	1N1184A	1N2129A	100 ⁽¹⁾	100 ⁽¹⁾
1N1185	1N1185A	1N2130A	150 ⁽¹⁾	150 ⁽¹⁾
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 ⁽¹⁾	500 ⁽¹⁾
1N1190	1N1190A	1N2138A	600 ⁽¹⁾	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 $T_C = -65\text{ °C to }190\text{ °C}$

- 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



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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 ⁽¹⁾	35 ⁽¹⁾	40 ⁽¹⁾	60 ⁽¹⁾	A
				140 ⁽¹⁾	140 ⁽¹⁾	150 ⁽¹⁾	140 ⁽¹⁾	°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 ⁽¹⁾	400 ⁽¹⁾	800 ⁽¹⁾	900 ⁽¹⁾	
		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 ² 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	$I^2\sqrt{t}$ ⁽²⁾	t = 0.1 to 10 ms, $V_{RRM} = 0$ following surge		16 100	10 300	41 500	52 500	A ² √s
Maximum peak forward voltage at maximum forward current (I_{FM})	V_{FM}	$T_J = 25$ °C		1.7 ⁽¹⁾	1.8 ⁽¹⁾	1.3 ⁽¹⁾	1.3 ⁽¹⁾	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 ⁽¹⁾	-	-	mA
				$V_{RRM} = 800$	4.0 ⁽¹⁾	-	-	
				$V_{RRM} = 900$	3.0 ⁽¹⁾	-	-	
				$V_{RRM} = 1000$	2.0 ⁽¹⁾	-	-	
		Maximum rated $I_{F(AV)}$, V_{RRM} and T_C		10 ⁽¹⁾	-	2.5 ⁽¹⁾	10 ⁽¹⁾	

Notes

⁽¹⁾ JEDEC registered values

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



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

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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 ⁽¹⁾		- 65 to 200		°C
Maximum storage temperature range	T_{Stg}		- 65 to 175 ⁽¹⁾		- 65 to 200		
Maximum internal thermal resistance, junction to case	R_{thJC}	DC operation	1.00 ⁽¹⁾		1.1 ⁽¹⁾	0.65 ⁽¹⁾	°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 ⁽²⁾	3.4 (30)				N · m (lbf · in)
		Lubricated thread, tightening on nut ⁽²⁾	2.3 (20)				
		Not lubricated thread, tightening on hexagon ⁽³⁾	4.2 (37)				
		Lubricated thread, tightening on hexagon ⁽³⁾	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

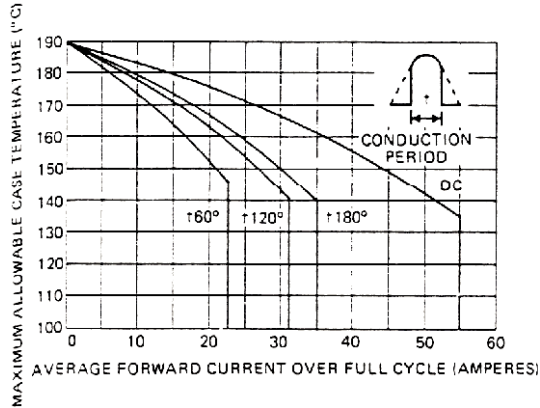


Fig. 1 - Maximum Allowable Case Temperature vs. Average Forward Current, 1N1183 and 1N3765 Series

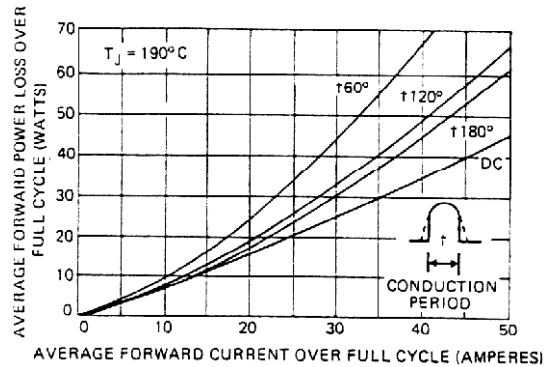


Fig. 2 - Typical Low Level Forward Power Loss vs. Average Forward Current (Sinusoidal Current Waveform), 1N1183 and 1N3765 Series

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

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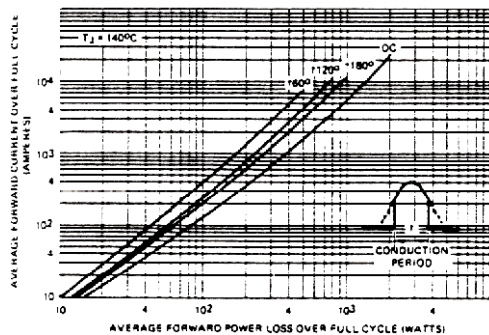


Fig. 3 - Typical High Level Forward Power Loss vs. Average Forward Current (Sinusoidal Current Waveform), 1N1183 and 1N3765 Series

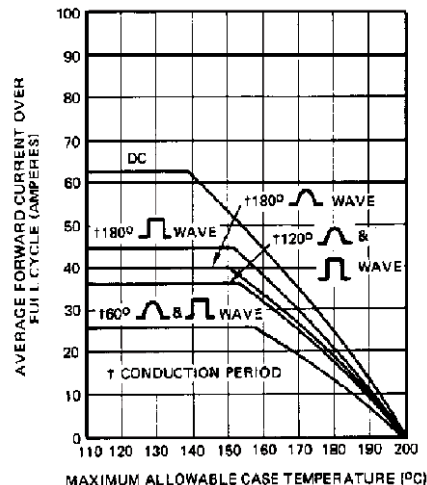


Fig. 6 - Average Forward Current vs. Maximum Allowable Case Temperature, 1N1183A Series

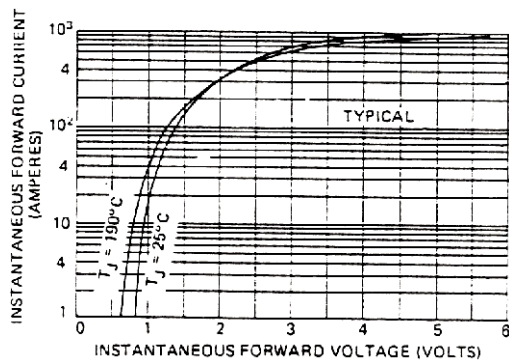


Fig. 4 - Typical Forward Voltage vs. Forward Current, 1N1183 and 1N3765 Series

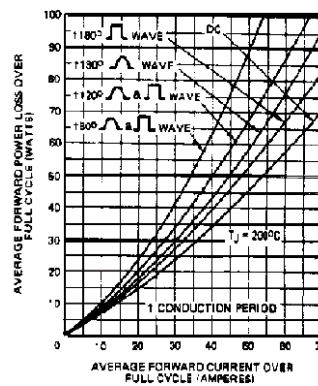


Fig. 7 - Maximum Low Level Forward Power Loss vs. Average Forward Current, 1N1183A Series

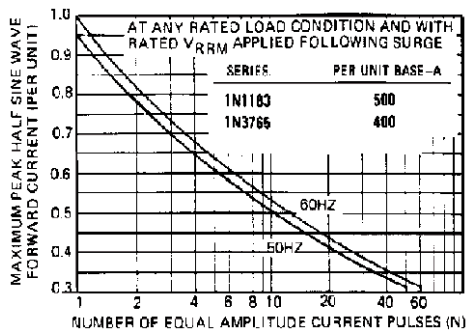


Fig. 5 - Maximum Non-Repetitive Surge Current vs. Number of Current Pulses, 1N1183 and 1N3765 Series

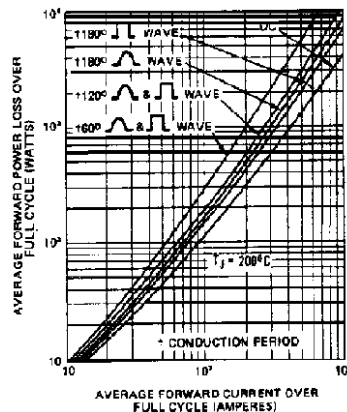


Fig. 8 - Maximum High Level Forward Power Loss vs. Average Forward Current, 1N1183A Series



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

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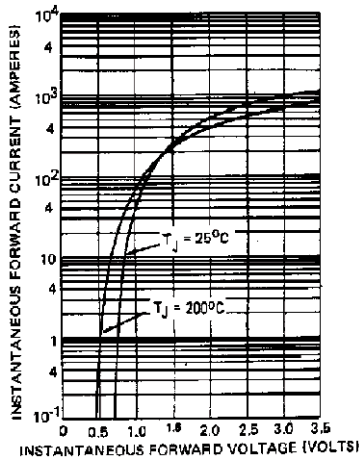


Fig. 9 - Maximum Forward Voltage vs. Forward Current, 1N1183A Series

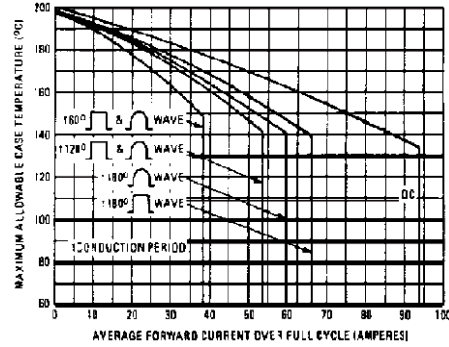


Fig. 12 - Maximum Allowable Case Temperature vs. Average Forward Current, 1N2128A Series



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

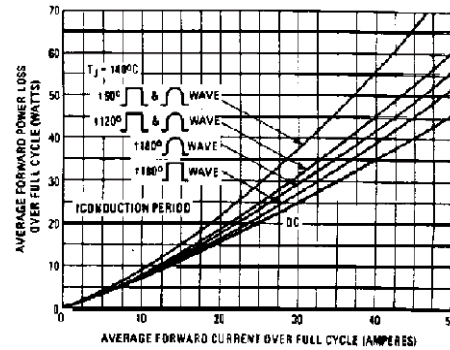


Fig. 13 - Maximum Low Level Forward Power Loss vs. Average Forward Current, 1N2128A Series



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

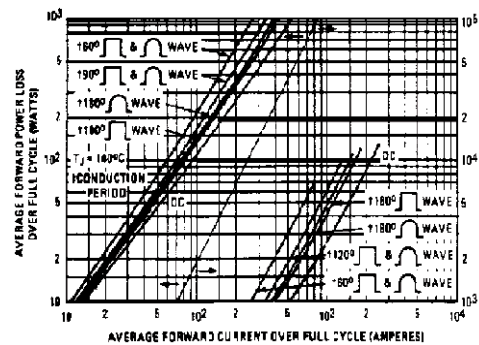


Fig. 14 - Maximum High Level Forward Power Loss vs. Average Forward Current, 1N2128A Series

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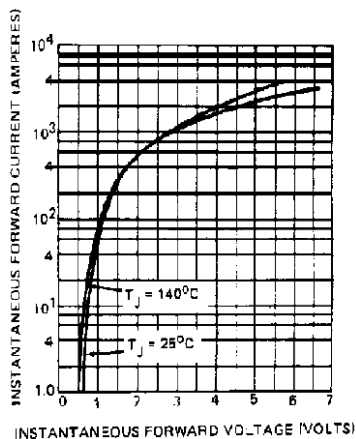


Fig. 15 - Maximum Forward Voltage vs. Forward Current, 1N2128A Series

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



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