Power Silicon Rectifier Diodes, (Stud Version), 35 A, 40 A, 60 A



DO-5 (DO-203AB)

FEATURES

- Low leakage current series
- Good surge current capability up to 1000 A
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

RoHS COMPLIANT

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	35 A, 40 A, 60 A
Package	DO-5 (DO-203AB)
Circuit configuration	Single

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^2s
	60 Hz	1040	670	2650	3400	
$I^2\sqrt{t}$		16 100	10 300	41 000	52 500	$A^2\sqrt{s}$
V_{RRM}	Range	50 to 600 (1)	700 to 1000 (1)	50 to 600 (1)	50 to 600 (1)	V
T_J		-65 to +200	-65 to +200	-65 to +200	-65 to +200	°C

Note

(1) JEDEC® registered values

ELECTRICAL SPECIFICATIONS

VOLTAGE RATINGS				
TYPE NUMBER			V_{RRM}, MAXIMUM REPETITIVE PEAK REVERSE VOLTAGE (T_J = -65 °C to +200 °C (2)) V	V_{RM}, MAXIMUM DIRECT REVERSE VOLTAGE (T_J = -65 °C to +200 °C (2)) V
VS-1N1183	VS-1N1183A	VS-1N2128A	50 (1)	50 (1)
VS-1N1184	VS-1N1184A	VS-1N2129A	100 (1)	100 (1)
VS-1N1185	VS-1N1185A	VS-1N2130A	150 (1)	150 (1)
VS-1N1186	VS-1N1186A	VS-1N2131A	200 (1)	200 (1)
VS-1N1187	VS-1N1187A	VS-1N2133A	300 (1)	300 (1)
VS-1N1188	VS-1N1188A	VS-1N2135A	400 (1)	400 (1)
VS-1N1189	VS-1N1189A	VS-1N2137A	500 (1)	500 (1)
VS-1N1190	VS-1N1190A	VS-1N2138A	600 (1)	600 (1)
VS-1N3765	VS-1N2160		700 (1)	700 (1)
VS-1N3766			800 (1)	800 (1)
VS-1N3767			900 (1)	900 (1)
VS-1N3768			1000 (1)	1000 (1)

Notes

- Basic type number indicates cathode to case. For anode to case, add “R” to part number, e.g., 1N1188R, 1N3766R, 1N1186RA, 1N2135RA

(1) JEDEC® registered values

(2) For 1N1183 Series and 1N3765 Series T_C = -65 °C to +190 °C

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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 ½ 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^2s
		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	$A^2\sqrt{s}$
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 — V_{RRM} = 700	$I_{R(AV)}$	Maximum rated $I_{F(AV)}$ and T_C		-	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 $t_x = I^2\sqrt{t} \times \sqrt{t_x}$

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, tighting on nut (2)	3.4 (30)				N · m (lbf · in)
		Lubricated thread, tighting on nut (2)	2.3 (20)				
		Not lubricated thread, tighting on hexagon (3)	4.2 (37)				
		Lubricated thread, tighting on hexagon (3)	3.2 (28)				
Approximate weight			17				g
			0.6				oz.
Case style		JEDEC®	DO-5 (DO-203AB)				

Notes

(1) JEDEC registered values®

(2) Recommended for pass-through holes

(3) Recommended for holed threaded heatsinks

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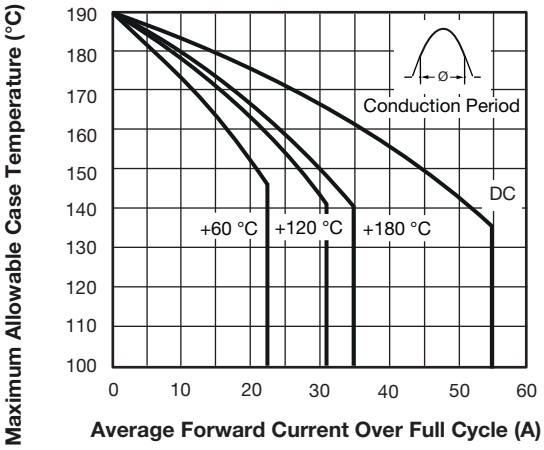


Fig. 1 - Maximum Allowable Case Temperature vs. Average Forward Current, 1N1183 and 1N3765 Series

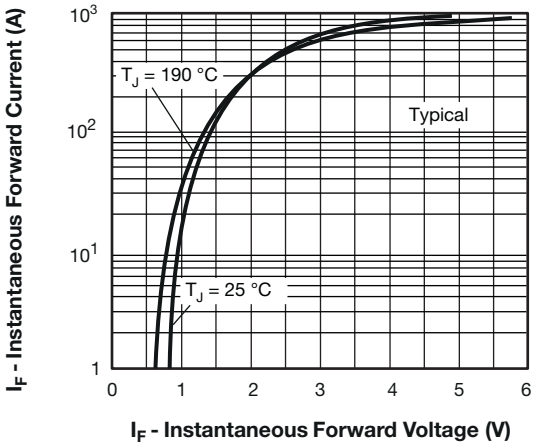


Fig. 4 - Typical Forward Voltage vs. Forward Current, 1N1183 and 1N3765 Series

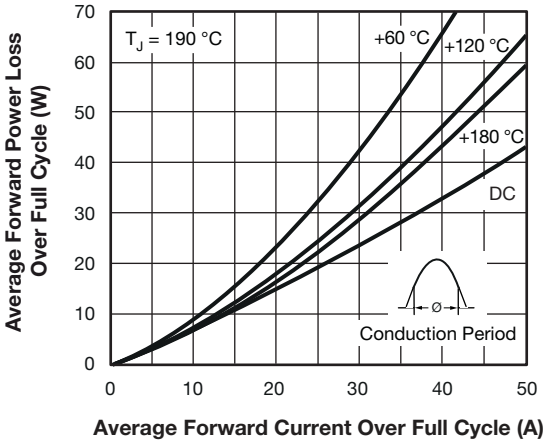


Fig. 2 - Typical Low Level Forward Power Loss vs. Average Forward Current (Sinusoidal Current Waveform), 1N1183 and 1N3765 Series

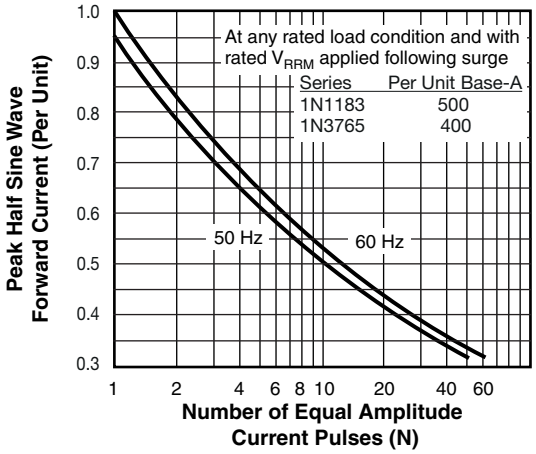


Fig. 5 - Maximum Non-Repetitive Surge Current vs. Number of Current Pulses, 1N1183 and 1N3765 Series

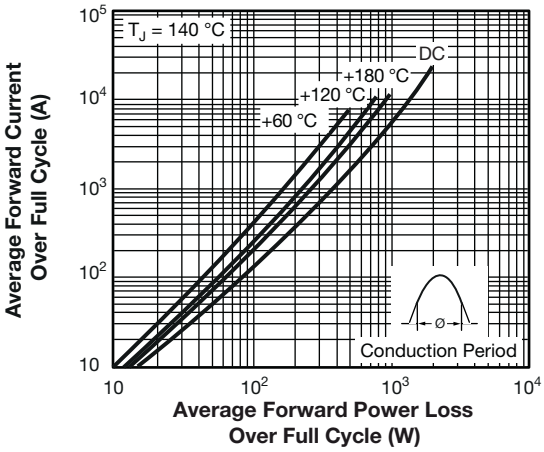


Fig. 3 - Typical High Level Forward Power Loss vs. Average Forward Current (Sinusoidal Current Waveform), 1N1183 and 1N3765 Series

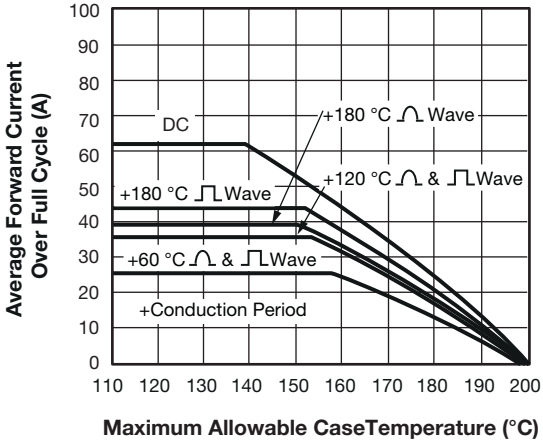


Fig. 6 - Average Forward Current vs. Maximum Allowable Case Temperature, 1N1183A Series

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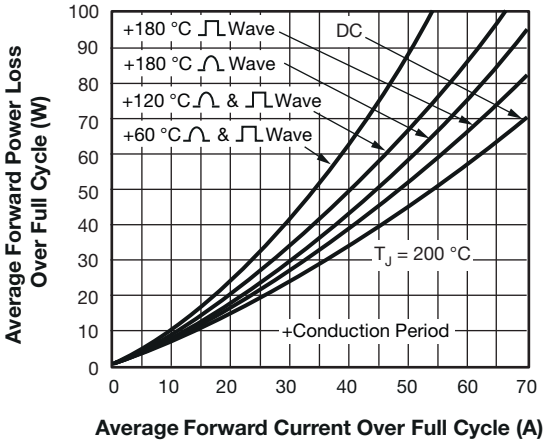


Fig. 7 - Maximum Low Level Forward Power Loss vs. Average Forward Current, 1N1183A Series

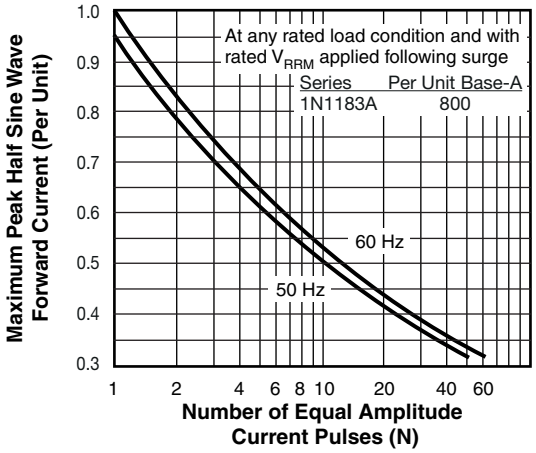


Fig. 10 - Maximum Non-Repetitive Surge Current vs. Number of Current Pulses, 1N1183A Series

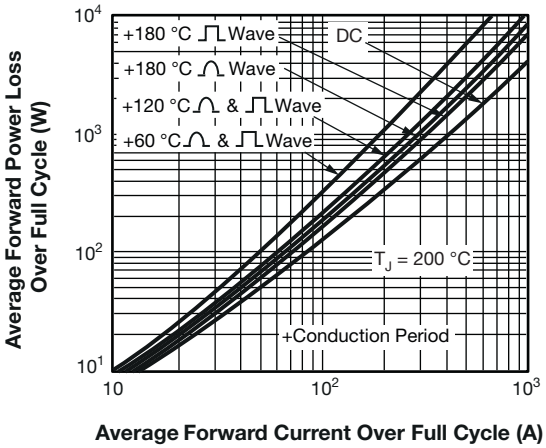


Fig. 8 - Maximum High Level Forward Power Loss vs. Average Forward Current, 1N1183A Series

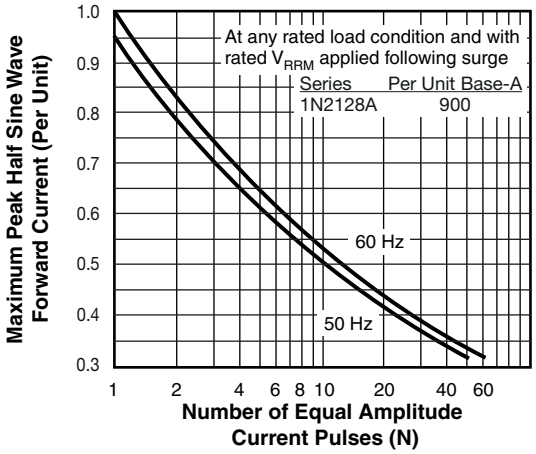


Fig. 11 - Maximum Non-Repetitive Surge Current vs. Number of Current Pulses, 1N2128A Series

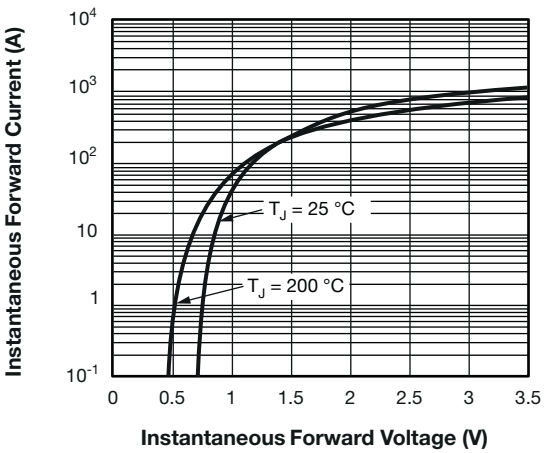


Fig. 9 - Maximum Forward Voltage vs. Forward Current, 1N1183A Series

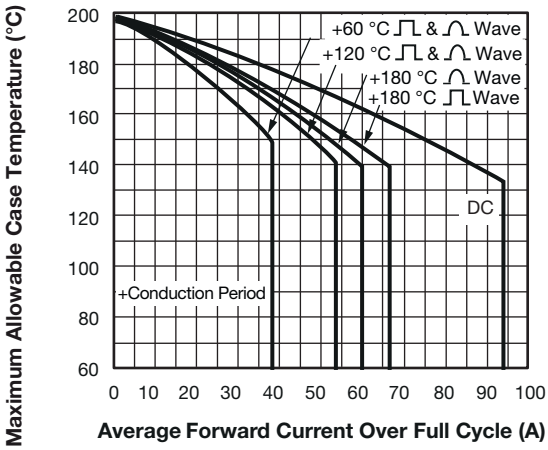


Fig. 12 - Maximum Allowable Case Temperature vs. Average Forward Current, 1N2128A Series

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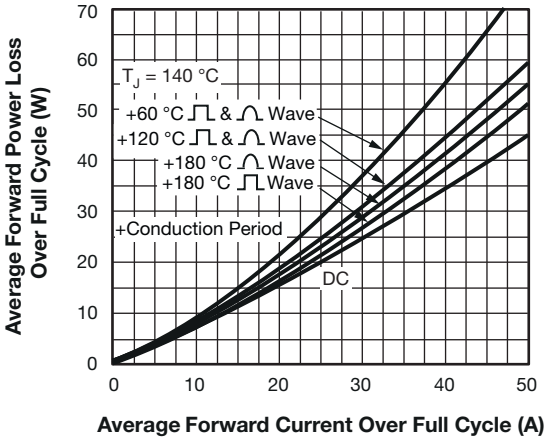


Fig. 13 - Maximum Low Level Forward Power Loss vs. Average Forward Current, 1N2128A Series

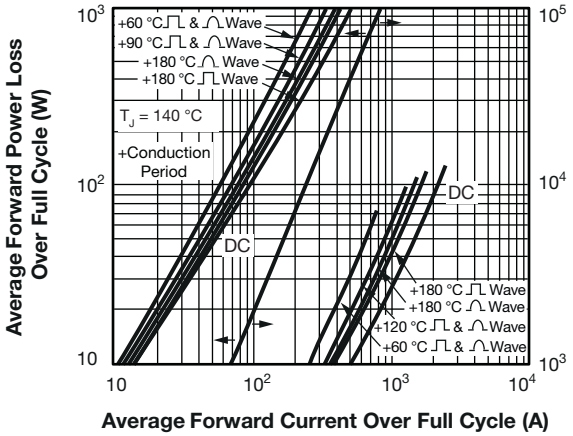


Fig. 14 - Maximum High Level Forward Power Loss vs. Average Forward Current, 1N2128A Series

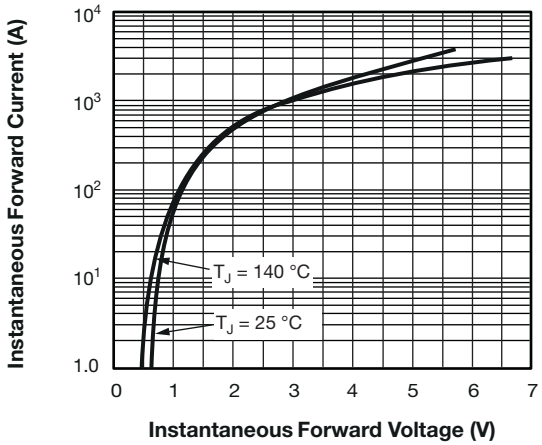


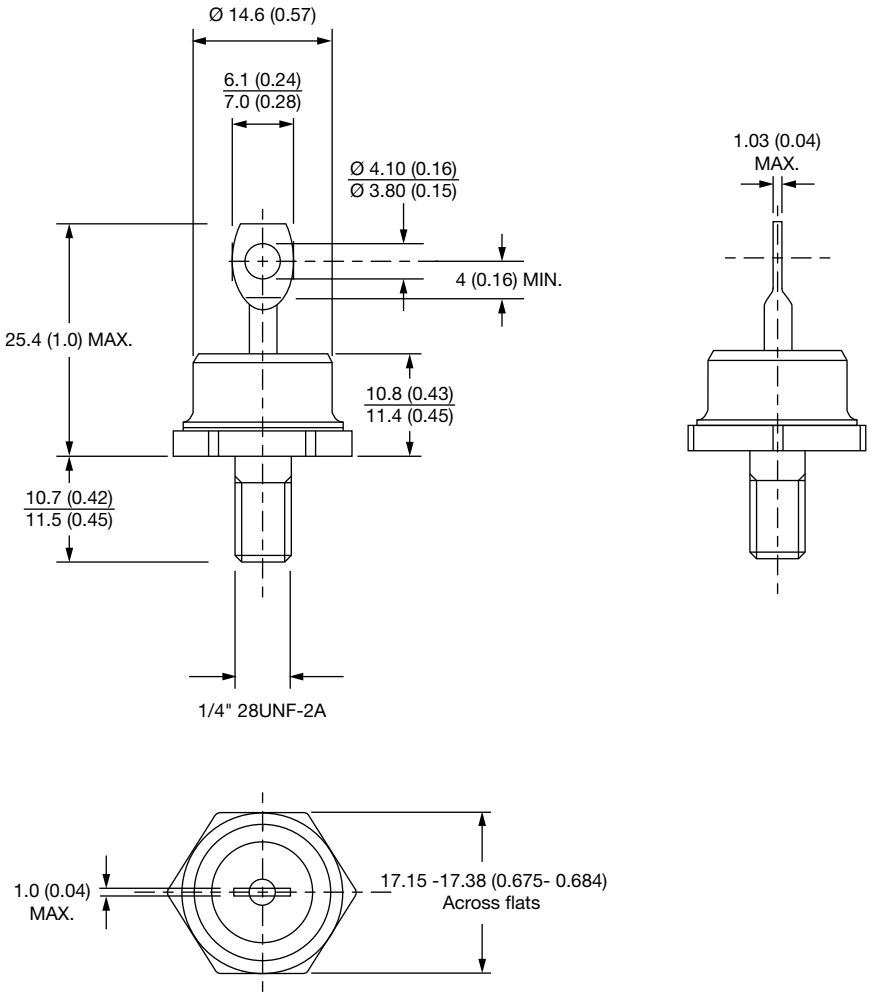
Fig. 15 - Maximum Forward Voltage vs. Forward Current, 1N2128A Series

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

DIMENSIONS in millimeters (inches)



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