



**THE DATASHEET OF
VS-1N2138RA**





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 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
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 ($T_J = -65\text{ °C to }+200\text{ °C}$ ⁽²⁾) V	V_{RM} , MAXIMUM DIRECT REVERSE VOLTAGE ($T_J = -65\text{ °C to }+200\text{ °C}$ ⁽²⁾) V
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 $T_C = -65\text{ °C to }+190\text{ °C}$



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
Maximum I ² t for fusing	I ² t	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 ² t 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 √t for individual device fusing	I ² √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		-	5.0 ⁽¹⁾	-	-	mA	
				-	4.0 ⁽¹⁾	-	-		
				-	3.0 ⁽¹⁾	-	-		
				-	2.0 ⁽¹⁾	-	-		
				Maximum rated I _{F(AV)} , V _{RRM} and T _C		10 ⁽¹⁾	-		2.5 ⁽¹⁾

Notes

- (1) JEDEC® registered values
- (2) I²t for time t_x = I²√t x √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, 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-5 (DO-203AB)				

Notes

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

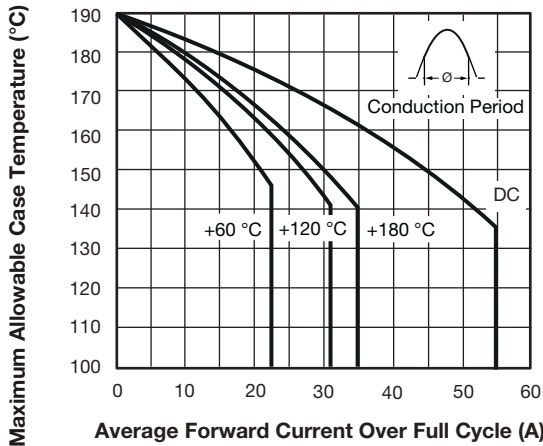


Fig. 1 - Maximum Allowable Case Temperature vs. Average Forward Current, 1N1183 and 1N3765 Series

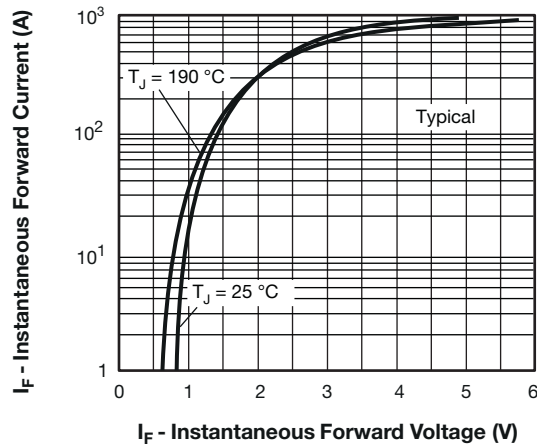


Fig. 4 - Typical Forward Voltage vs. Forward Current, 1N1183 and 1N3765 Series

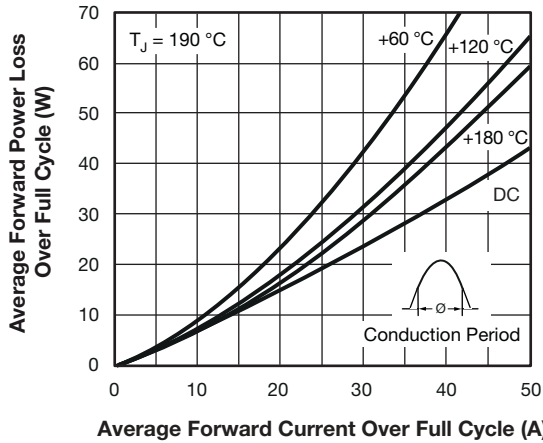


Fig. 2 - Typical Low Level Forward Power Loss vs. Average Forward Current (Sinusoidal Current Waveform), 1N1183 and 1N3765 Series

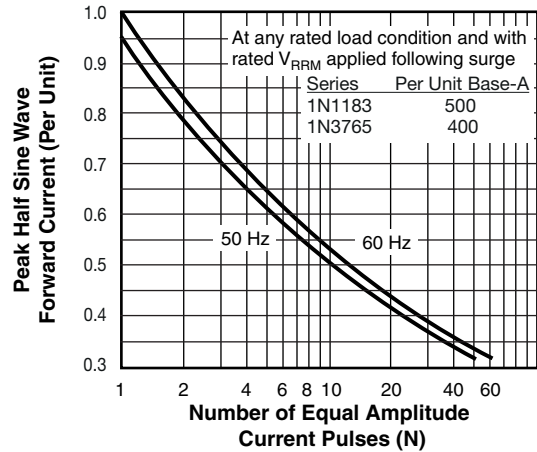


Fig. 5 - Maximum Non-Repetitive Surge Current vs. Number of Current Pulses, 1N1183 and 1N3765 Series

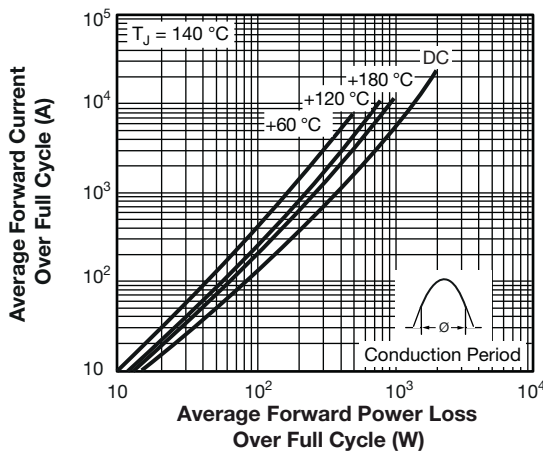


Fig. 3 - Typical High Level Forward Power Loss vs. Average Forward Current (Sinusoidal Current Waveform), 1N1183 and 1N3765 Series

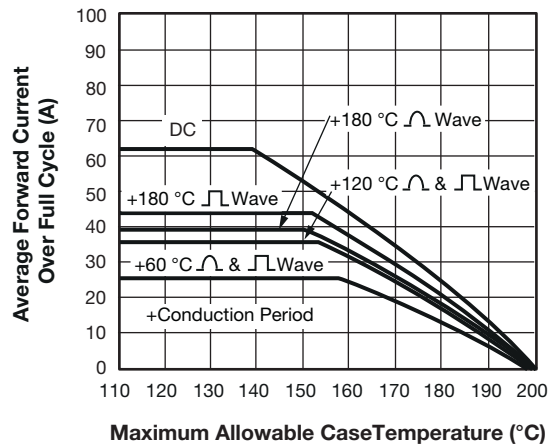


Fig. 6 - Average Forward Current vs. Maximum Allowable Case Temperature, 1N1183A Series

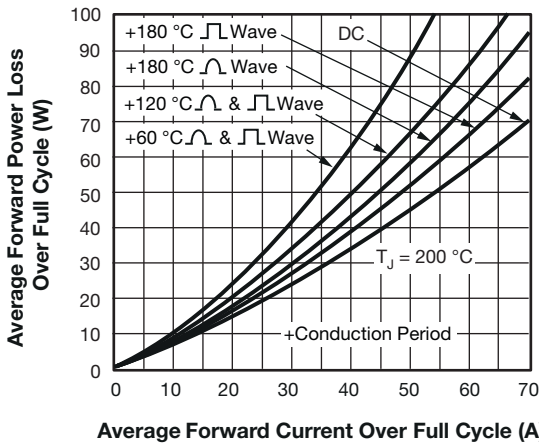


Fig. 7 - Maximum Low Level Forward Power Loss vs. Average Forward Current, 1N1183A Series

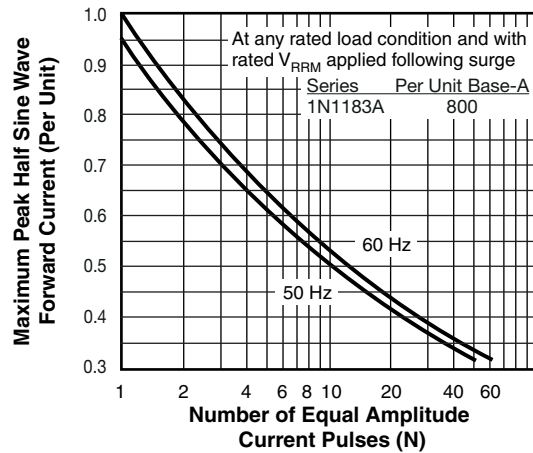


Fig. 10 - Maximum Non-Repetitive Surge Current vs. Number of Current Pulses, 1N1183A Series

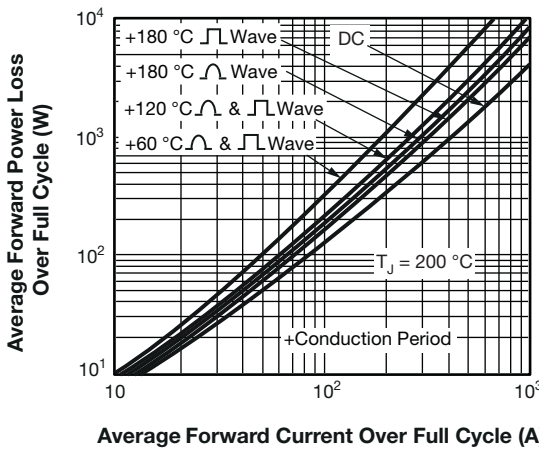


Fig. 8 - Maximum High Level Forward Power Loss vs. Average Forward Current, 1N1183A Series

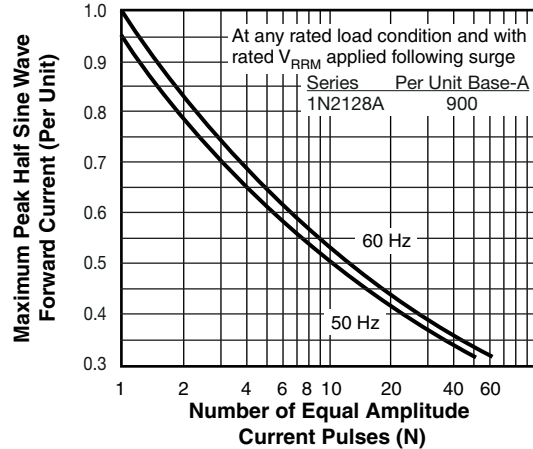


Fig. 11 - Maximum Non-Repetitive Surge Current vs. Number of Current Pulses, 1N2128A Series

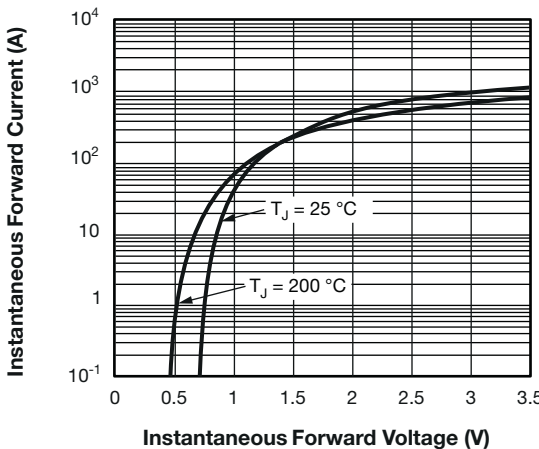


Fig. 9 - Maximum Forward Voltage vs. Forward Current, 1N1183A Series

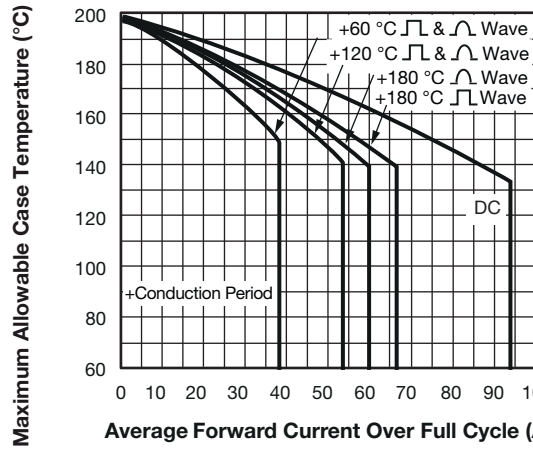


Fig. 12 - Maximum Allowable Case Temperature vs. Average Forward Current, 1N2128A Series

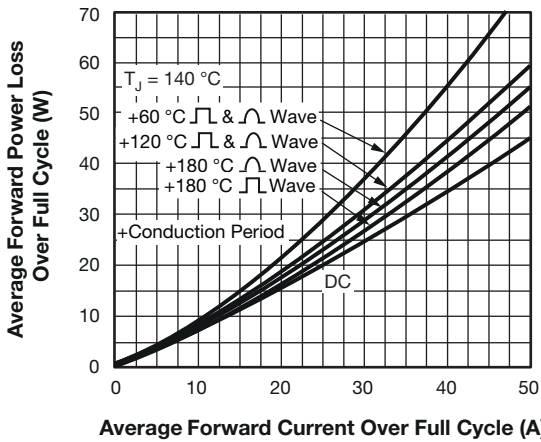


Fig. 13 - Maximum Low Level Forward Power Loss vs. Average Forward Current, 1N2128A Series

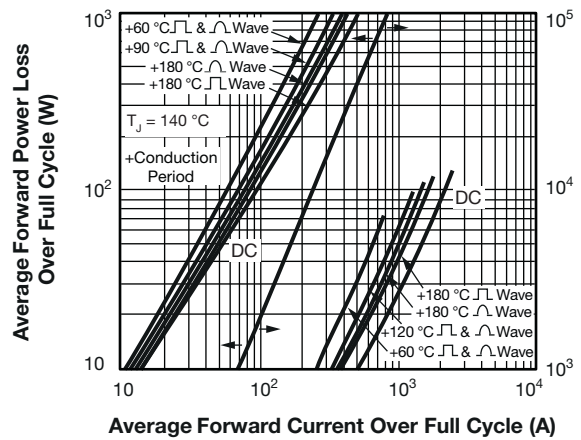


Fig. 14 - Maximum High Level Forward Power Loss vs. Average Forward Current, 1N2128A Series

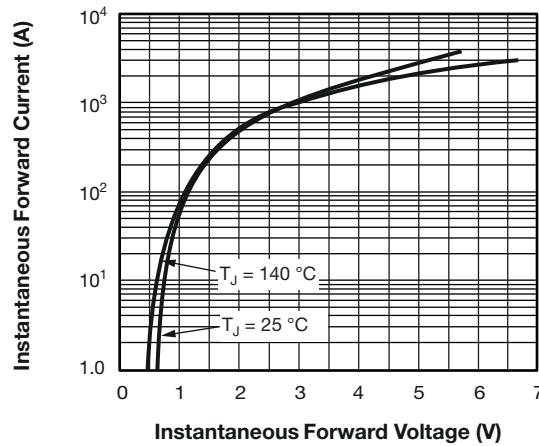


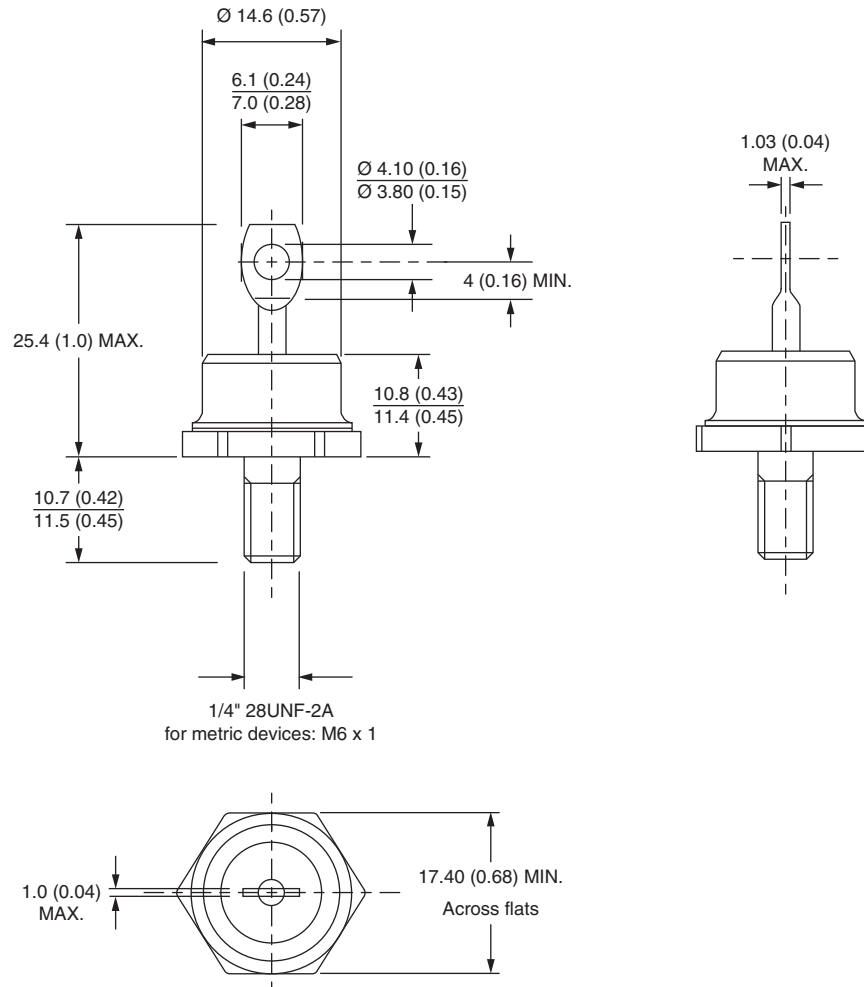
Fig. 15 - Maximum Forward Voltage vs. Forward Current, 1N2128A Series

LINKS TO RELATED DOCUMENTS

Dimensions	www.vishay.com/doc?95360
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DO-203AB (DO-5) for 1N1183, 1N3765, 1N1183A, 1N2128A, 1N3208 Series

DIMENSIONS in millimeters (inches)





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