

Data Sheet No. PD-2.087

INTERNATIONAL RECTIFIER 

## 1N1183, 1N3765, 1N1183A, 1N2128A SERIES

### 35, 40 and 60 Amp Power Silicon Rectifier Diodes

#### Major Ratings and Characteristics

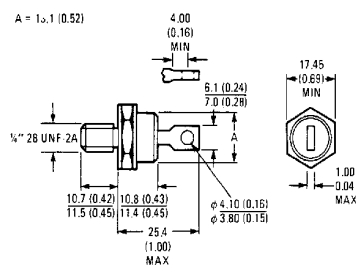
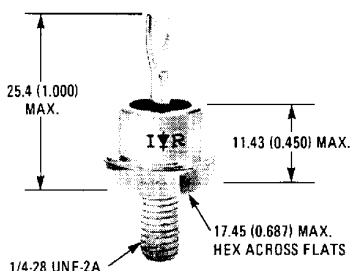
	1N1183	1N3765	1N1183A	1N2128A	Units
$I_{F(AV)}$	35*	35*	40*	60*	A
@ Max. $T_C$	140*	140*	150*	140*	°C
$I_{FSM}$ @ 50 Hz	480	380	785	880	A
@ 60 Hz	500*	400*	800*	900*	
$I^2_t$ @ 50 Hz	1140	730	2900	3700	A <sup>2</sup> s
@ 60 Hz	1040	670	2850	3400	
$I_{V_T}^2$	16 100	10 300	41 000	52 500	A <sup>2</sup> /s
$V_{RRM}$ Range	50* to 600*	700* to 1000*	50* to 600*	50* to 600*	V

\*JEDEC registered values.

#### Description and Features

- Low leakage current series
- Good surge current capability up to 1000 amps
- Can be supplied to meet stringent military, aerospace and other high-reliability requirements.

#### CASE STYLE AND DIMENSIONS



Conforms to JEDEC Outline DO-203AB (DO-5)  
Dimensions in Millimeters and (Inches)

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

INTERNATIONAL RECTIFIER 

VOLTAGE RATINGS

Part Number ①			V <sub>RRM</sub> - Max. Repetitive Peak Reverse Voltage (V)	V <sub>R</sub> - Max. Direct Reverse Voltage (V)
			T <sub>C</sub> = -65°C to 200°C ②	T <sub>C</sub> = -65°C to 200°C ②
1N1183	1N1183A	1N2128A	50*	50*
1N1184	1N1184A	1N2129A	100*	100*
1N1185	1N1185A	1N2130A	150*	150*
1N1186	1N1186A	1N2131A	200*	200*
1N1187	1N1187A	1N2133A	300*	300*
1N1188	1N1188A	1N2135A	400*	400*
1N1189	1N1189A	1N2137A	500*	500*
1N1190	1N1190A	1N2138A	600*	600*
1N3765			700*	700*
1N3766			800*	800*
1N3767			900*	900*
1N3768			1000*	1000*

ELECTRICAL SPECIFICATIONS

	1N1183	1N3765	1N1183A	1N2128A	Units	Conditions
I <sub>F(AV)</sub> Max. average forward current @ Max. T <sub>C</sub>	35*	35*	40*	60*	A	1-phase operation, 180° conduction
I <sub>FSM</sub> Max. peak one-cycle non-repetitive surge current	480	380	785	860	A	Half cycle 50 Hz sine wave or 6 ms rectangular pulse
	500*	400*	800*	900*		Half cycle 60 Hz sine wave or 5 ms rectangular pulse
	570	455	910	1000	A	Half cycle 50 Hz sine wave or 6 ms rectangular pulse
	595	475	960	1050		Half cycle 60 Hz sine wave or 5 ms rectangular pulse
i <sup>2</sup> t Max. i <sup>2</sup> t for fusing	1140	730	2900	3700	A <sup>2</sup> s	t = 10ms With rated V <sub>RRM</sub> applied following surge, initial T <sub>J</sub> = T <sub>J</sub> max.
	1040	670	2650	3400		t = 8.3ms
	1610	1030	4150	5250	A <sup>2</sup> s	t = 10ms With V <sub>RRM</sub> = 0 following surge, initial T <sub>J</sub> = T <sub>J</sub> max.
	1470	940	3750	4750		t = 8.3ms
i <sup>2</sup> √t Max. i <sup>2</sup> √t for individual device fusing ③	16 100	10 300	41 500	52 500	A <sup>2</sup> √s	t = 0.1 to 10 ms, V <sub>RRM</sub> = 0 following surge.
V <sub>FM</sub> Max. peak forward voltage @ I <sub>FM</sub>	1.7*	1.8*	1.3*	1.3*	V	T <sub>J</sub> = 25°C
	110	110	126	188	A	
I <sub>R(AV)</sub> Max. average reverse current	—	5.0*	—	—	mA	Max. rated I <sub>F(AV)</sub> and T <sub>C</sub> , V <sub>RRM</sub> = 700V
	—	4.0*	—	—		800V
	—	3.0*	—	—		900V
	—	2.0*	—	—		1000V
	10*	—	2.5*	10*	mA	Max. rated I <sub>F(AV)</sub> , V <sub>RRM</sub> and T <sub>C</sub> .

① Basic part number indicates cathode-to-case. For anode-to-case, add "R" to part number, i.e., 1N1188R, 1N3786R, 1N1186RA, 1N2135RA

② For 1N1183 series and 1N3765 series T<sub>C</sub> = -65 to 190°C.

③ I<sup>2</sup>t for t<sub>x</sub> = i<sup>2</sup>√t<sub>x</sub> · √t<sub>x</sub>.

\* JEDEC registered values.



THERMAL-MECHANICAL SPECIFICATIONS

		1N1183	1N3765	1N1183A	1N2128A	Units	Conditions
$T_C$	Max. operating case temperature range	-65 to 190*	-65 to 190*	-65 to 200	-65 to 200	°C	
$T_{stg}$	Max. storage temperature range	-65 to 175*	-65 to 175*	-65 to 200	-65 to 200	°C	
$R_{thJC}$	Max. internal thermal resistance, junction-to-case	1.00*	1.1*	0.65*	0.65*	deg. C/W	DC operation
$R_{thCS}$	Thermal resistance, case-to-sink	0.25			0.25	deg. C/W	Mounting surface flat, smooth, and greased.
$T$	Mounting torque	Min.	2.3 (20)				Nm
		Max.	3.4 (30)				(lbf.in)
wt	Approximate weight	17 (0.6)					g (oz)
	Case style	DU-ZU3AB (DU-5)					JEDEC

\*JEDEC registered values.

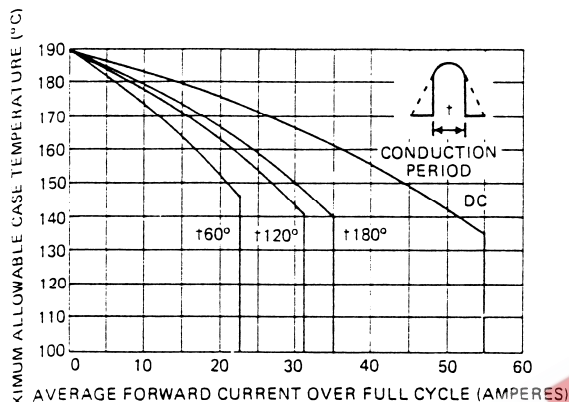


Fig. 1 - Maximum Allowable Case Temperature Vs. Average Forward Current, 1N1183 and 1N3765 Series

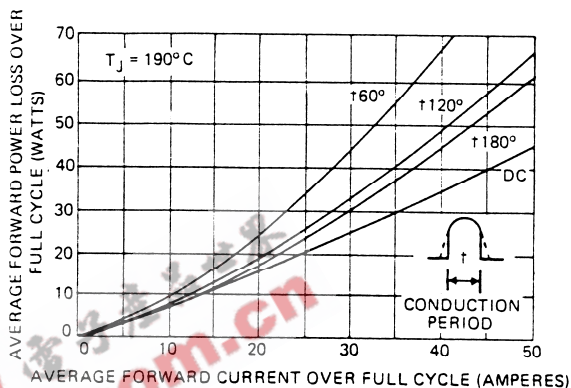


Fig. 2 - Typical Low Level Forward Power Loss Vs. Average Forward Current (Sinusoidal Current Waveform), 1N1183 and 1N3765 Series

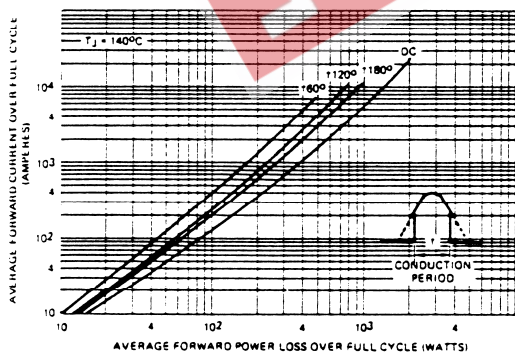


Fig. 3 - Typical High Level Forward Power Loss Vs. Average Forward Current (Sinusoidal Current Waveform), 1N1183 and 1N3765 Series

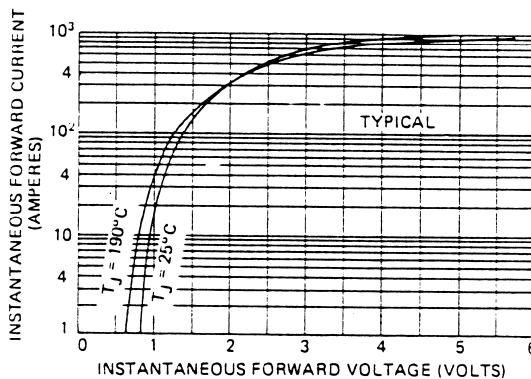


Fig. 4 - Typical Forward Voltage Vs. Forward Current, 1N1183 and 1N3765 Series

B

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

INTERNATIONAL RECTIFIER **IR**

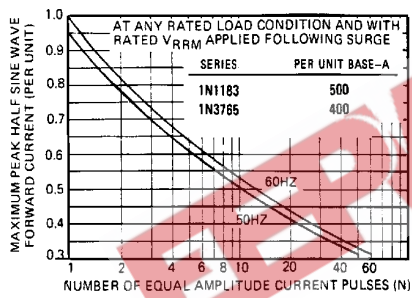


Fig. 5 - Maximum Non-Repetitive Surge Current Vs. Number of Current Pulses, 1N1183 and 1N3765 Series

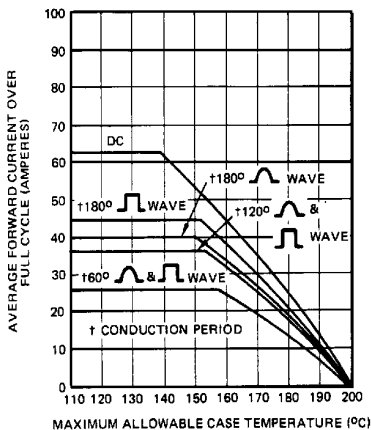


Fig. 6 - Average Forward Current Vs. Maximum Allowable Case Temperature, 1N1183A Series

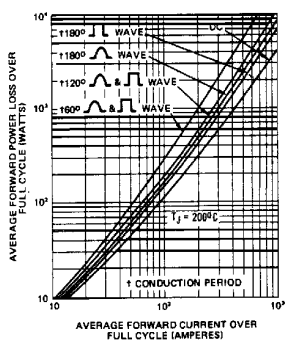


Fig. 8 - Maximum High Level Forward Power Loss Vs. Average Forward Current, 1N1183A Series.

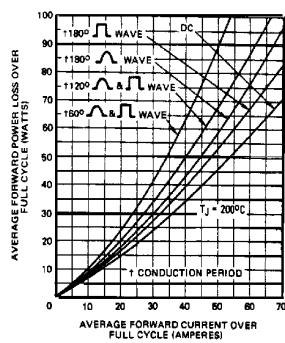


Fig. 7 - Maximum Low Level Forward Power Loss Vs. Average Forward Current, 1N1183A Series

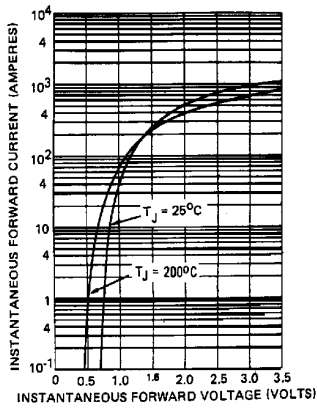


Fig. 9 - Maximum Forward Voltage Vs. Forward Current, 1N1183A Series

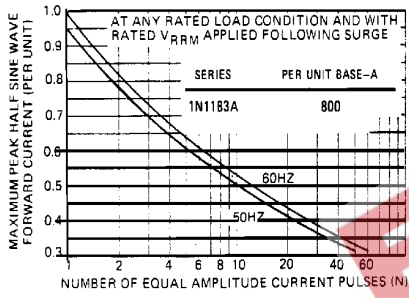


Fig. 10 - Maximum Non-Repetitive Surge Current Vs. Number of Current Pulses, 1N1183A Series

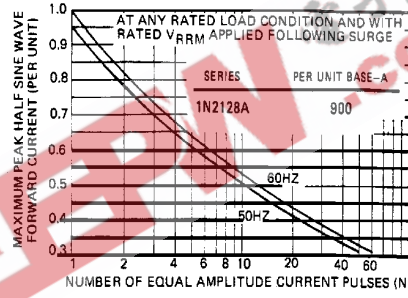


Fig. 11 - Maximum Non-Repetitive Surge Current Vs. Number of Current Pulses, 1N2128A Series

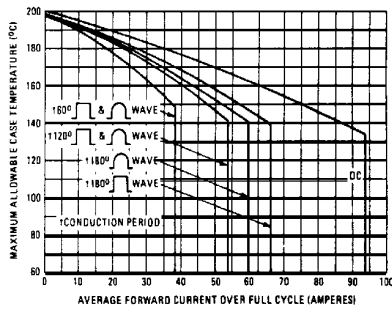


Fig. 12 - Maximum Allowable Case Temperature Vs. Average Forward Current, 1N2128A Series

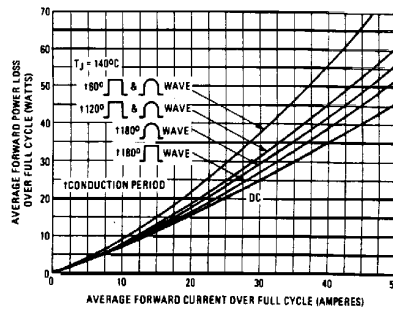


Fig. 13 - Maximum Low Level Forward Power Loss Vs. Average Forward Current, 1N2128A Series

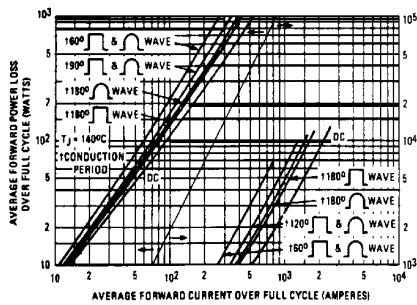


Fig. 14 - Maximum High Level Forward Power Loss Vs. Average Forward Current, 1N2128A Series

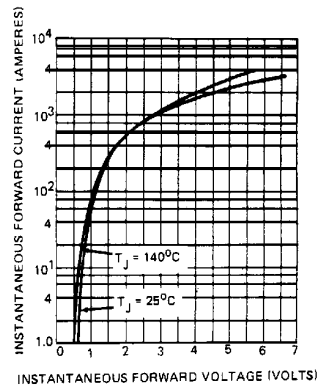


Fig. 15 - Maximum Forward Voltage Vs. Forward Current, 1N2128A Series