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INTERNATIONAL RECTIFIER

# 1N4044 SERIES

## 275 Amp Avg Power Silicon Rectifier Diodes

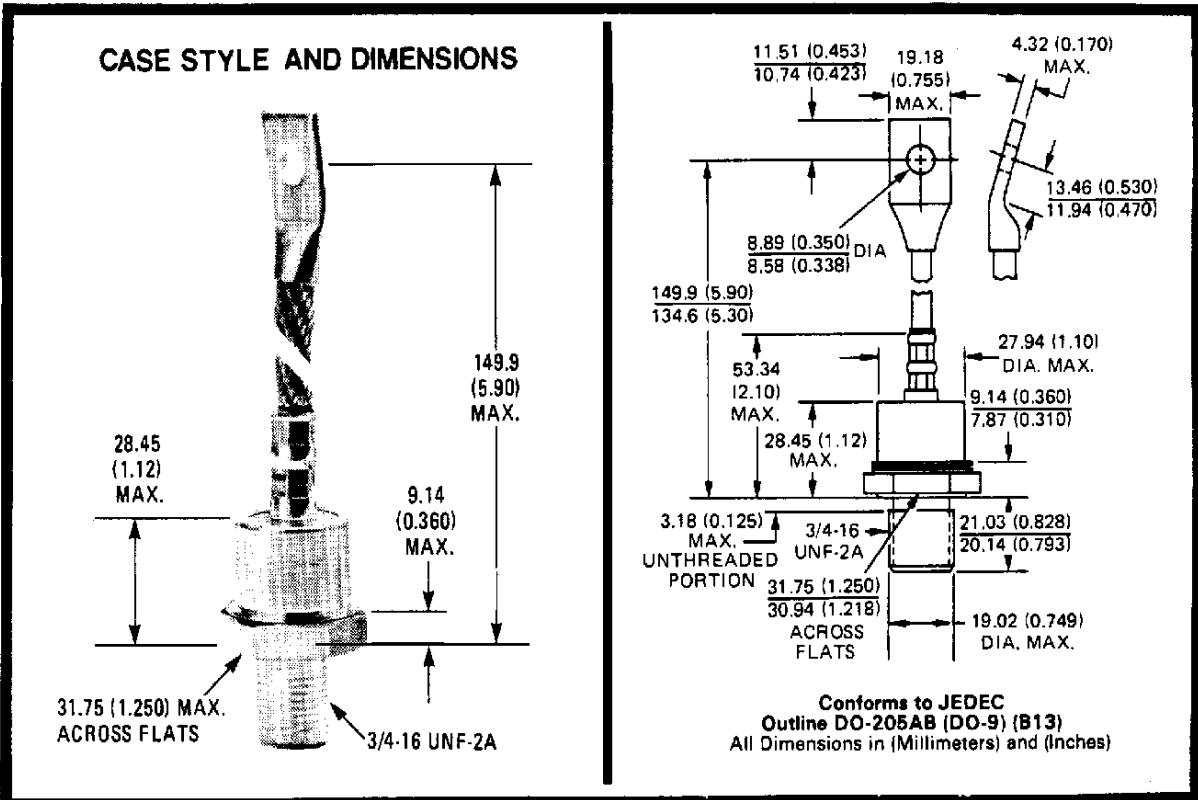
### Major Ratings and Characteristics

	1N4044	Units
$I_{F(AV)}$	275*	A
@ $T_C$	120	°C
$I_{FSM}$	@ 50 Hz	4800
	@ 60 Hz	5000*
$I^2_t$	@ 50 Hz	115 000
	@ 60 Hz	105 000
		A <sup>2</sup> s
$I^2_{\sqrt{t}}$	1,600,000	A <sup>2</sup> /√s
$V_{RRM}$ Range	50-1000	V

\*JEDEC registered values

### Description and Features

- Peak reverse voltage up to 1000V
- Popular series for rough service
- For many AC-to-DC circuit applications



1N4044 Series



VOLTAGE RATINGS

① Part Number	$V_{RRM}$ – Max. Repetitive Peak Reverse Voltage (V)	$V_{RSM}$ – Max. Non-repetitive Peak Reverse Voltage (V)	$V_R$ – Max. Direct Reverse Voltage (V)	$I_R(AV)$ – Max. Average Reverse Current @ Max. Rated $I_F(AV)$ and $V_{RRM}$ . $T_C = 120^\circ\text{C}$ (1 Phase Operation) (mA)
DO-205AB (DO-9) (B-13)	$T_C = -65$ to $190^\circ\text{C}$	$T_C = 25$ to $190^\circ\text{C}$	$T_C = -65$ to $190^\circ\text{C}$	
1N4044	50*	100*	50*	15*
1N4045	100*	200*	100*	15*
1N4046	150*	250*	150*	15*
1N4047	200*	300*	200*	15*
1N4048	250*	350*	250*	15*
1N4049	300*	400*	300*	15*
1N4050	400*	525*	400*	15*
1N4051	500*	650*	500*	15*
1N4052	600*	800*	600*	15*
1N4053	700*	925*	700*	15*
1N4054	800*	1050*	800*	15*
1N4055	900*	1175*	900*	15*
1N4056	1000*	1300*	1000*	15*

ELECTRICAL SPECIFICATIONS

	1N4044	Units	Conditions
$I_F(AV)$ Max. average forward current	275*	A	$180^\circ$ sinusoidal conduction Max. $T_C = 120^\circ\text{C}$
$I_{FSM}$ Max. peak one-cycle non-repetitive surge current	4800	A	Half cycle 50 Hz sine wave or 6 ms rectangular pulse Following any rated load condition and with rated $V_{RRM}$ applied
	5000*		Half cycle 60 Hz sine wave or 5 ms rectangular pulse
	5700		Half cycle 50 Hz sine wave or 6 ms rectangular pulse Following any rated load condition and with $V_{RRM}$ applied following surge = 0
	5950		Half cycle 60 Hz sine wave or 5 ms rectangular pulse
$I^2t$ Max. $I^2t$ for fusing	115,000	$\text{A}^2\text{s}$	$t = 10$ ms With rated $V_{RRM}$ applied following surge, initial $T_J$
	105,000		$t = 8.3$ ms
	160,000		$t = 10$ ms With $V_{RRM} = 0$ following surge, initial $T_J$
	145,000		$t = 8.3$ ms
$I^2\sqrt{t}$ Max. $I^2\sqrt{t}$ for individual device fusing ①	1,600,000	$\text{A}^2\sqrt{\text{s}}$	$t = 0.1$ to $10$ ms, $V_{RRM} = 0$ following surge
$V_{FM}$ Max. peak forward voltage	1.35*	V	$I_F(AV) = 275\text{A}$ (864A peak), $T_C = 180^\circ\text{C}$

THERMAL-MECHANICAL SPECIFICATIONS

$T_C$ Max. operating case temperature range	-65 to $190^\circ$	$^\circ\text{C}$	
$T_{stg}$ Max. storage temperature range	-65 to 190	$^\circ\text{C}$	
$R_{thJC}$ Max. internal thermal resistance, junction-to-case	0.18	deg C/W	DC operation
$R_{thCS}$ Thermal resistance, case-to-sink	0.08	deg C/W	Mounting surface flat, smooth, and greased.
T Mounting torque	31.1–36.7 (275–325)	Nm (lbf-in)	
wt Approximate weight	213 (7.5)	g (oz)	
Case style	DO-205AB (DO-9)		JEDEC

\*JEDEC registered values.

① Basic number indicates cathode-to-case. For anode-to-case add "R" to part number, e.g. 1N4045R.

②  $I^2t$  for time  $t_x = I^2\sqrt{t} \cdot \sqrt{t_x}$

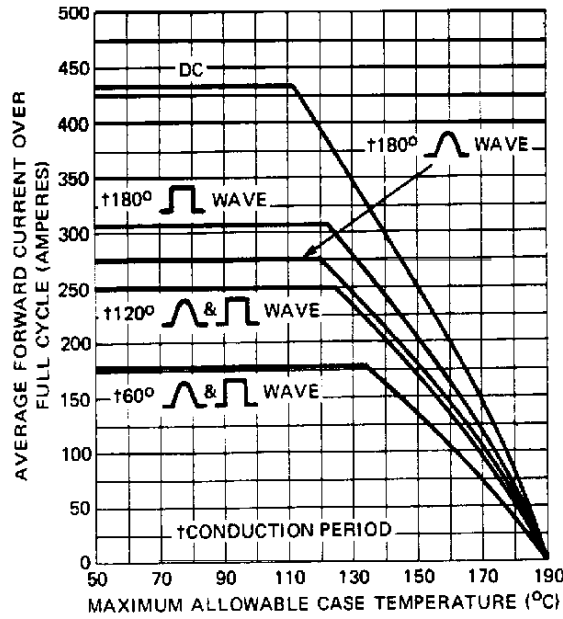


Fig. 1 – Average Forward Current Vs. Maximum Allowable Case Temperature

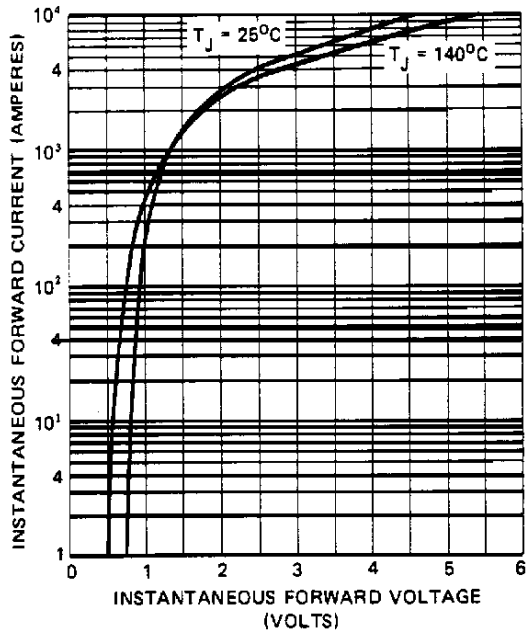


Fig. 2 – Maximum Forward Voltage Vs. Forward Current

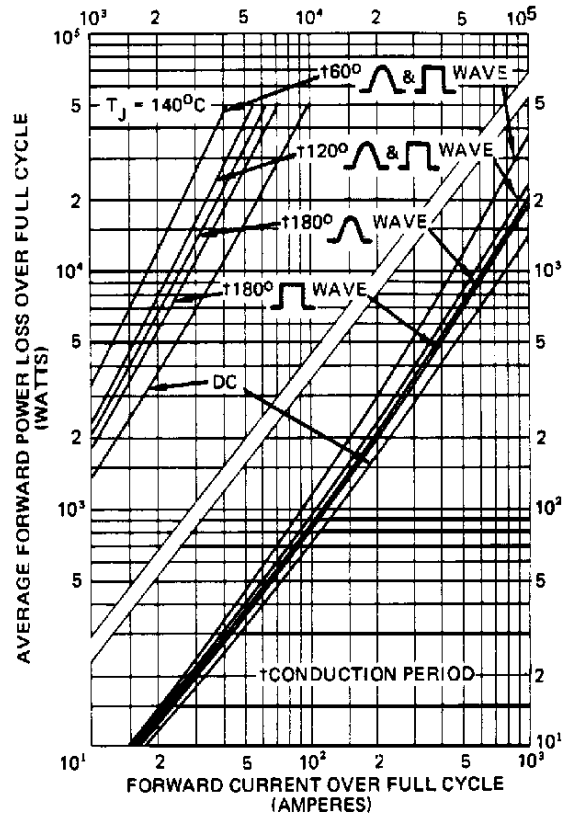


Fig. 3 – Maximum Forward Power Loss Vs. Average Forward Current

1N4044 Series

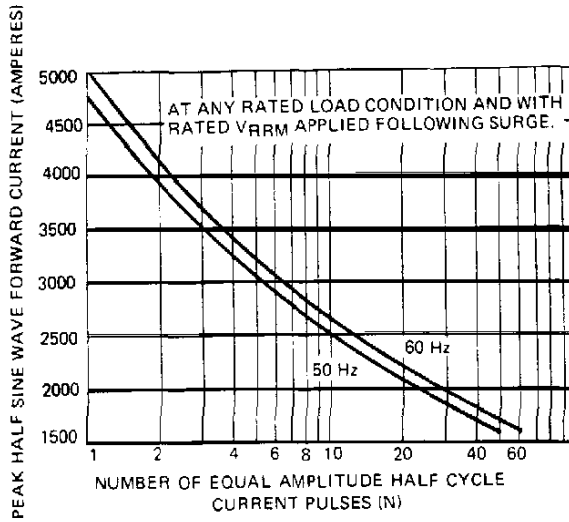


Fig. 4 – Maximum Non-Repetitive Surge Current Vs. Number of Current Pulses

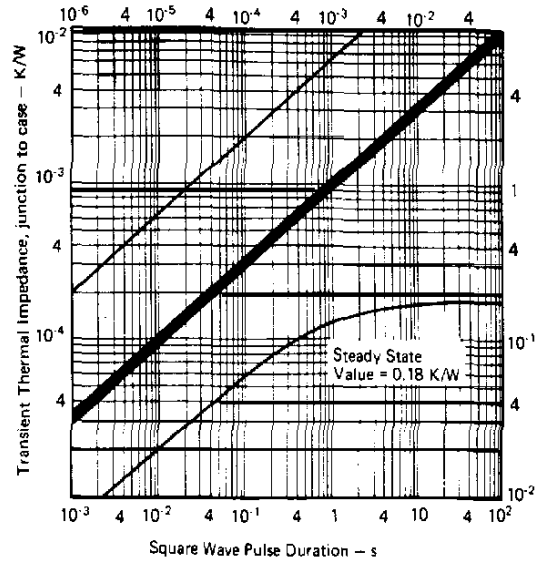


Fig. 5 – Maximum Transient Thermal Impedance, Junction-to-Case Vs. Pulse Duration