

INTERNATIONAL RECTIFIER

1N4044 SERIES

275 Amp Avg Power Silicon Rectifier Diodes

Major Ratings and Characteristics

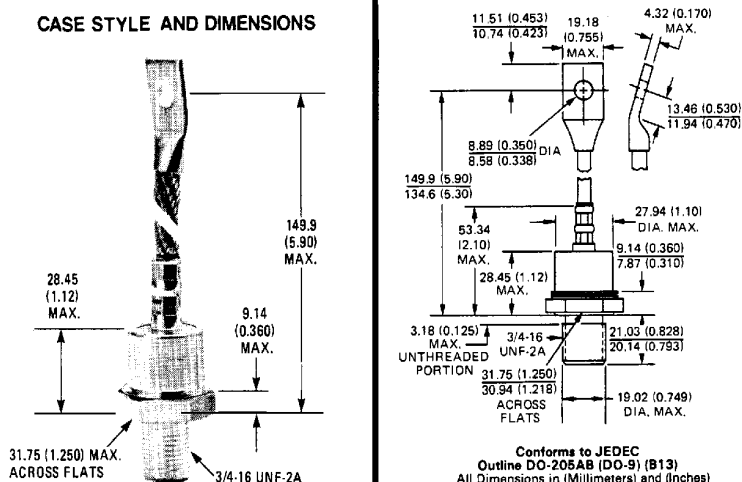
	1N4044	Units
I_{FAV}	275*	A
@ T_C	120	$^{\circ}\text{C}$
I_{FSM} @ 50 Hz	4800	A
@ 60 Hz	5000*	
I_{Tt} @ 50 Hz	115 000	A^2s
@ 60 Hz	105 000	
I_{Tt}^2	1,600,000	A^2/s
V_{RRM} Range	50-1000	V

*JEDEC registered values

Description and Features

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

CASE STYLE AND DIMENSIONS



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 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°C	$T_C = 25$ to 190°C	$T_C = -65$ to 190°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° 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
	5950		Half cycle 60 Hz sine wave or 5 ms rectangular pulse applied following surge = 0
I^2t Max. I^2t for fusing	115,000	A^2s	$t = 10$ 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^2t_{th}/T Max. I^2t_{th}/T for individual device fusing ①	1,600,000	A^2/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°	$^\circ\text{C}$	
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 $t_x = I^2\sqrt{t} \cdot \sqrt{t_x}$

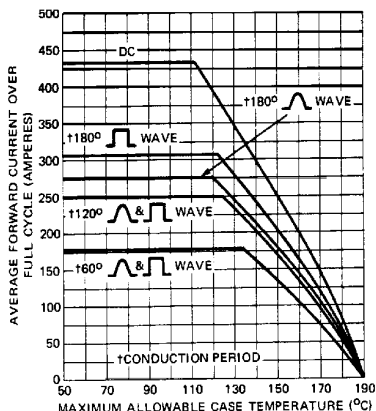


Fig. 1 — Average Forward Current Vs. Maximum Allowable Case Temperature

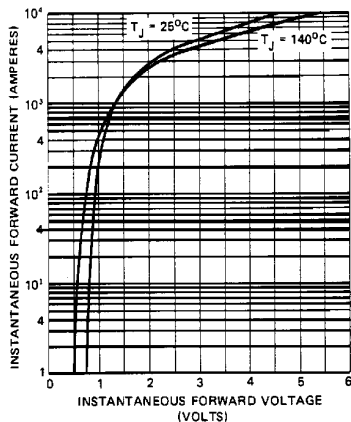


Fig. 2 — Maximum Forward Voltage Vs. Forward Current

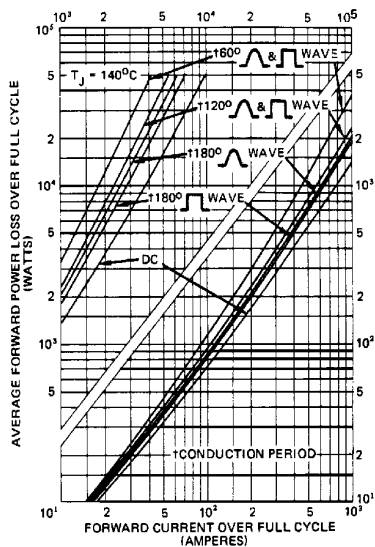


Fig. 3 — Maximum Forward Power Loss Vs. Average Forward Current

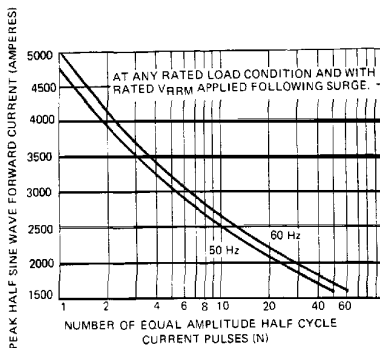


Fig. 4 – Maximum Non-Repetitive Surge Current Vs. Number of Current Pulses

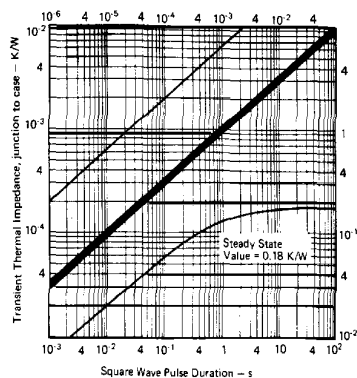


Fig. 5 – Maximum Transient Thermal Impedance, Junction-to-Case Vs. Pulse Duration