

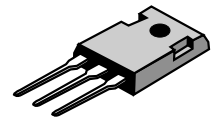
Switchmode Dual Ultrafast Power Rectifiers

... Designed for use in switching power supplies, inverters and as free wheeling diodes. These state-of-the-art devices have the following features:

- * High Surge Capacity
- * Low Power Loss, High efficiency
- * Glass Passivated chip junctions
- * 150 °C Operating Junction Temperature
- * Low Stored Charge Majority Carrier Conduction
- * Low Forward Voltage , High Current Capability
- * High-Switching Speed 50 Nanosecond Recovery Time
- * Plastic Material used Carries Underwriters Laboratory

**ULTRA FAST
RECTIFIERS**

**30 AMPERES
300 -- 600 VOLTS**



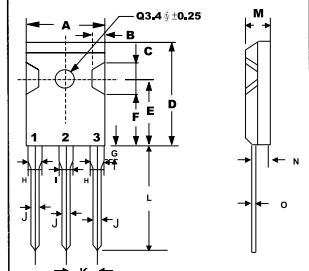
TO-247 (3P)

MAXIMUM RATINGS

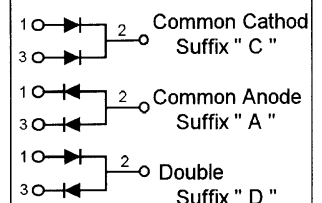
Characteristic	Symbol	U30D				Unit
		30	40	50	60	
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	V_{RRM} V_{RWM} V_R	300	400	500	600	V
RMS Reverse Voltage	$V_{R(RMS)}$	210	280	350	420	V
Average Rectifier Forward Current Per Leg $T_c=125^{\circ}C$ Per Total Device	$I_{F(AV)}$	15 30				A
Peak Repetitive Forward Current (Rate V_R , Square Wave, 20kHz, $T_c=125^{\circ}C$)	I_{FM}	30				A
Non-Repetitive Peak Surge Current (Surge applied at rate load conditions halfwave, single phase, 60Hz)	I_{FSM}	250				A
Operating and Storage Junction Temperature Range	T_J, T_{stg}	- 65 to + 150				$^{\circ}C$

ELECTRICAL CHARACTERISTICS

Characteristic	Symbol	U30D				Unit
		30	40	50	60	
Maximum Instantaneous Forward Voltage ($I_F=15$ Amp, $T_c = 25^{\circ}C$) ($I_F=15$ Amp, $T_c = 100^{\circ}C$)	V_F	1.30 1.16		1.50 1.37		V
Maximum Instantaneous Reverse Current (Rated DC Voltage, $T_c = 25^{\circ}C$) (Rated DC Voltage, $T_c = 125^{\circ}C$)	I_R	10 700				μA
Reverse Recovery Time ($I_F = 0.5$ A, $I_R=1.0$, $I_{rr}=0.25$ A)	T_{rr}	50				ns
Typical Junction Capacitance (Reverse Voltage of 4 volts & f=1 MHz)	C_P	150		120		pF



DIM	MILLIMETERS	
	MIN	MAX
A	--	16.2
B	1.7	2.7
C	5.0	6.0
D	--	23.0
E	14.8	15.2
F	11.7	12.7
G	--	4.5
H	--	2.5
I	--	3.5
J	1.1	1.4
K	5.25	5.65
L	19	--
M	4.7	5.3
N	2.8	3.2
O	0.45	0.85



The graph shows the relationship between forward voltage and instantaneous forward current for two diode models. The y-axis is logarithmic, representing current in amperes (Amp.), with major grid lines at 1, 5, 10, 50, and 100. The x-axis is linear, representing forward voltage in volts (Volts.), with major grid lines every 0.2 units from 0.6 to 2.4. Two curves are plotted: U30D30-40 and U30D50-60. The U30D30-40 curve is steeper, indicating a lower forward voltage drop for a given current compared to the U30D50-60 curve.

Forward Voltage (Volts.)	Instantaneous Forward Current (Amp.) - U30D30-40	Instantaneous Forward Current (Amp.) - U30D50-60
0.75	1.0	-
0.8	3.0	1.0
1.0	10.0	5.0
1.2	25.0	15.0
1.4	50.0	35.0
1.6	70.0	55.0
1.8	85.0	75.0
2.0	95.0	90.0
2.2	98.0	95.0
2.4	99.0	98.0

The graph shows the relationship between instantaneous reverse current and peak reverse voltage for two diode models. The y-axis is logarithmic, representing current in microamperes (uA) from 0.001 to 10. The x-axis is linear, representing the percentage of peak reverse voltage from 0 to 140. Both diodes show an exponential increase in current as the voltage approaches their peak rating.

Percent of Peak Reverse Voltage (%)	U30D50-60 Instantaneous Reverse Current (uA)	U30D30-40 Instantaneous Reverse Current (uA)
0	0.001	0.001
20	0.002	0.0015
40	0.005	0.003
60	0.015	0.008
80	0.04	0.02
100	0.1	0.05
110	0.3	0.2
115	1.0	0.5
118	10.0	1.0

The graph shows the relationship between average forward rectified current and case temperature for the 2N3055 transistor. The current is constant at 30 Amps for temperatures up to 50°C. Beyond 50°C, the current decreases linearly, reaching 0 Amps at 150°C.

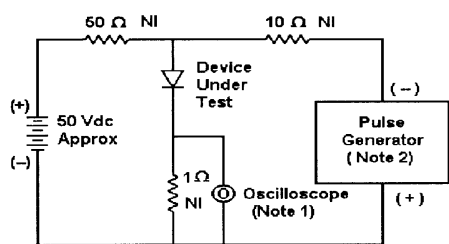
Case Temperature (°C)	Average Forward Rectified Current (Amp.)
0	30
50	30
75	24
100	18
125	12
150	0

A log-log graph showing the junction capacitance in picofarads (pF) on the y-axis versus the reverse voltage in volts on the x-axis. The y-axis ranges from 10 to 500 pF, and the x-axis ranges from 1 to 100 volts. Two curves are plotted: one for the U30D30-40 diode and one for the U30D50-60 diode. Both curves show a decrease in capacitance as reverse voltage increases, with the U30D30-40 diode having a higher capacitance across the entire voltage range.

Reverse Voltage (Volts)	U30D30-40 Junction Capacitance (pF)	U30D50-60 Junction Capacitance (pF)
1	~450	~350
5	~180	~120
10	~100	~70
50	~45	~30
100	~35	~25

A line graph showing the relationship between Peak Forward Surge Current (Amp.) on the y-axis and Pulse Width (sec.) on the x-axis for a 1N4001 diode. The y-axis ranges from 0 to 250 in increments of 50. The x-axis is logarithmic, with major ticks at 1, 5, 10, 50, and 100. A solid black curve starts at (1, 250) and decreases as pulse width increases, passing through approximately (5, 160) and (10, 145), ending at approximately (100, 125).

Pulse Width (sec.)	Peak Forward Surge Current (Amp.)
1	250
5	160
10	145
100	125



Graph of current i versus number of cycles at 60 Hz. The current starts at $+0.5\text{ A}$, crosses zero, reaches a minimum of -1.0 A , and then returns to zero. The time interval t_{tr} is marked from the start to the return to zero.

Fig-6 Reverse Recovery Time Characteristic and Test Circuit Diagram