1. Description

This series are state−of−the−art devices designed for use in switching power supplies, inverters and as free wheeling diodes.

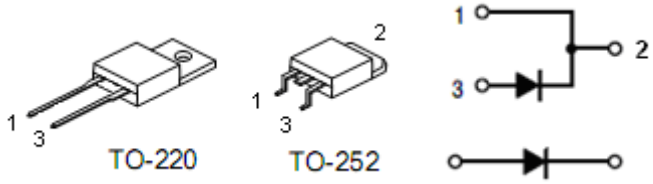
2. Features

- Ultrafast 35 nanosecond recovery time
- 175°C operating junction temperature
- Popular TO−220 package
- Epoxy meets UL 94 V−0 @ 0.125 in
- Low forward voltage
- Low leakage current
- High temperature glass passivated junction
- Reverse voltage to 600 V
- Pb−free packages are available

3. Mechanical Characteristics

- Case: epoxy, molded
- Weight: 1.9 grams (approximately)
- Finish: all external surfaces corrosion resistant and terminal
- Leads are readily solderable
- Lead temperature for soldering purposes: 260°C max for 10 seconds

4. Pin configuration



Pin（TO-220）	Function
1	Cathode
3	Anode

Pin (TO-252)	Function
1	Date
2	Drain
3	Source

5. Maximum ratings

Parameter	Symbol	Rating	Units
Peak repetitive reverse voltage Working peak reverse voltage DC blocking voltage	V_{RRM} V_{RWM} V_R	600	V
Average rectified forward current Total device, (Rated VR), T_C = 150°C	$I_{F(AV)}$	8.0	A
Peak repetitive forward current (Rated VR, square wave, 20 kHz), T_C = 150°C	I_{FM}	16	A
Nonrepetitive peak surge current (Surge applied at rated load conditions halfwave, single phase, 60 Hz)	I_{FSM}	100	A
Operating junction temperature and storage temperature range	T_J,T_{stg}	-65 to +175	ºC

6. Thermal characteristics

Parameter	Symbol	Rating	Unit
Maximum thermal resistance, junction−to−case	$R_{\theta JC}$	1.8	ºC/W

7. Electrical characteristics

Parameter	Symbol	Conditions	Rating	Unit
Maximum Instantaneous Forward Voltage (Note 1)	V_F	I_F=8.0 A, T_C=25°C	1.7	V
Maximum Instantaneous Reverse Current (Note 1)	I_R	rated DC voltage, T_J=150°C rated DC voltage, T_J=25°C	500 10	μA
Maximum Reverse Recovery Time	t_{rr}	I_F=1.0 A, di/dt=50 A/μs I_F=0.5 A, I_R=1.0 A, I_{REC}=0.25 A	25 20	ns

Note:1. Pulse test: pulse width = 300 μs, Duty cycle ≤ 2.0%.

8. Test circuits and waveforms

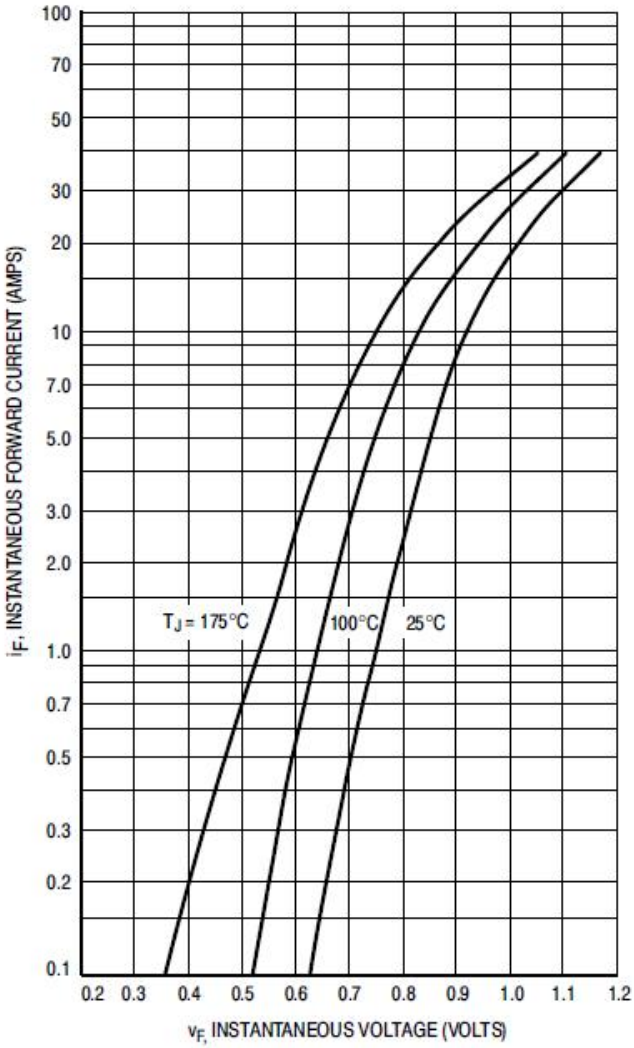


Figure 1. Typical Forward Voltage

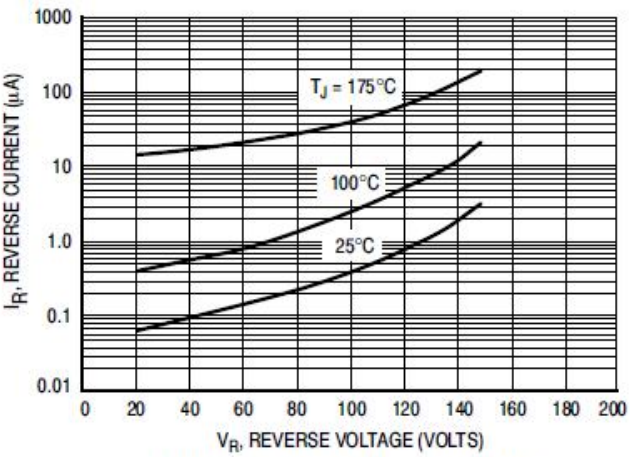


Figure 2. Typical Reverse Current*

* The curves shown are typical for the highest voltage device in the grouping. Typical reverse current for lower voltage selections can be estimated from these same curves if V_R is sufficiently below rated V_R.

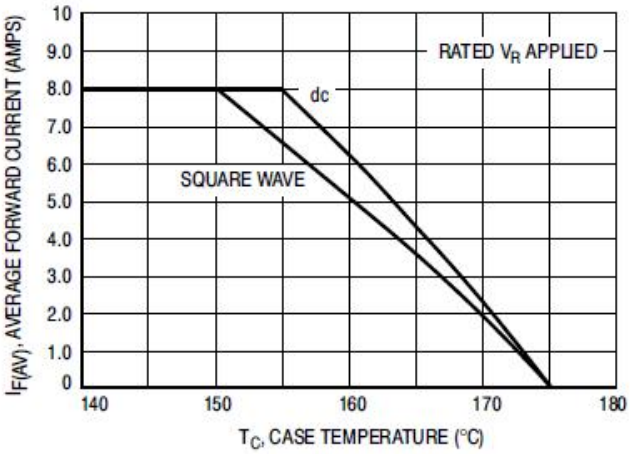


Figure 3. Current Derating, Case

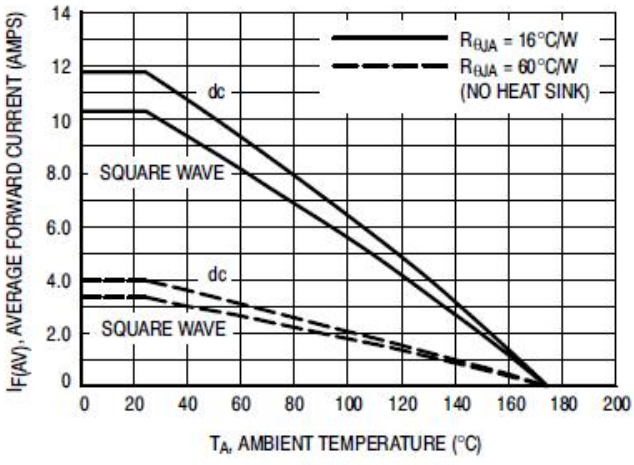


Figure 4. Current Derating, Ambient

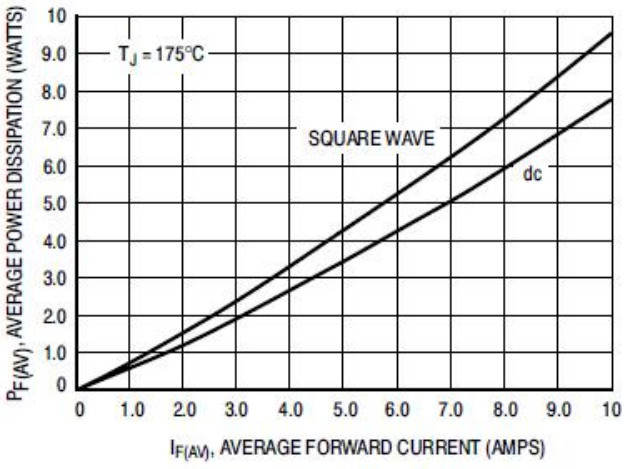


Figure 5. Power Dissipation

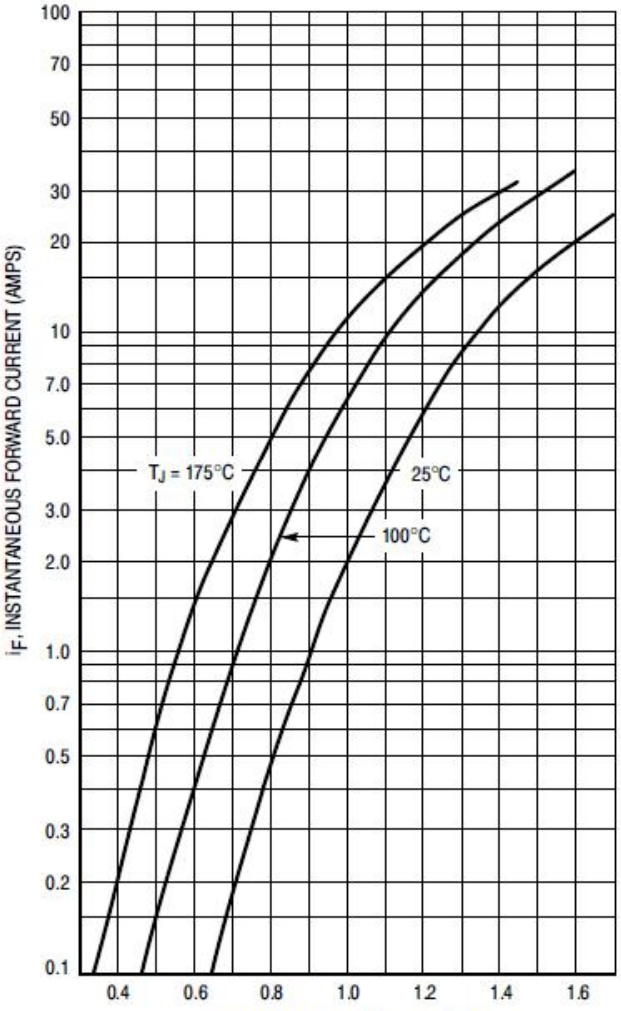


Figure 6. Typical Forward Voltage

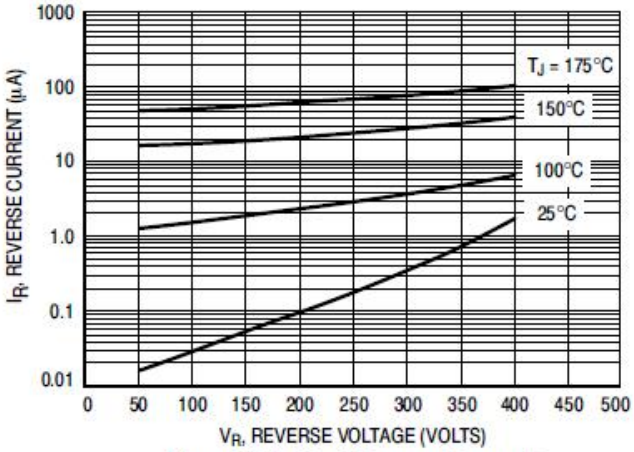


Figure 7. Typical Reverse Current*

* The curves shown are typical for the highest voltage device in the grouping. Typical reverse current for lower voltage selections can be estimated from these same curves if V_R is sufficiently below rated V_R.

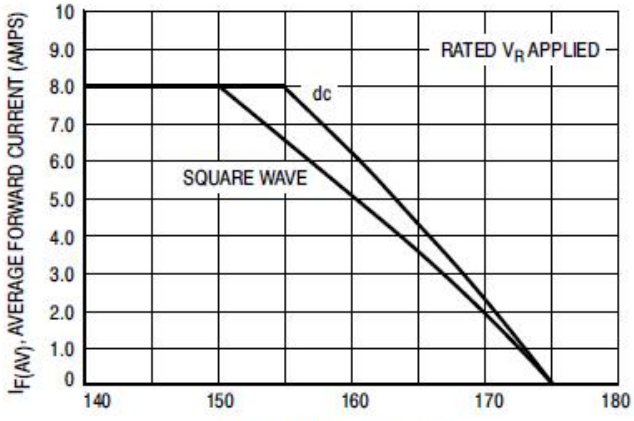


Figure 8. Current Derating, Case

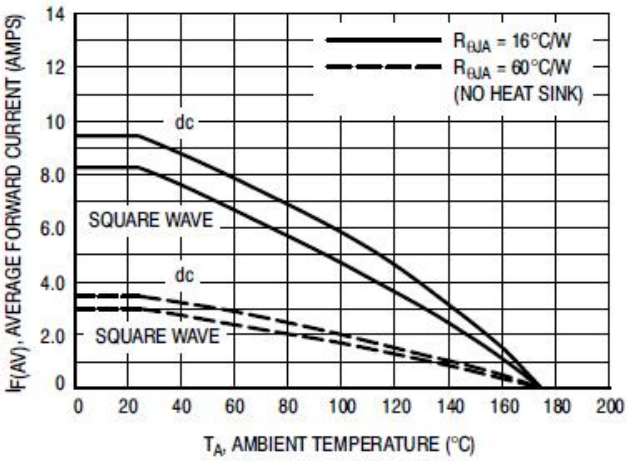


Figure 9. Current Derating, Ambient

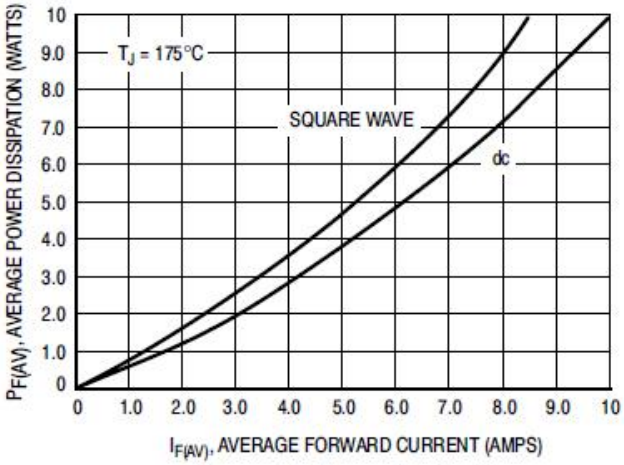


Figure 10. Power Dissipation

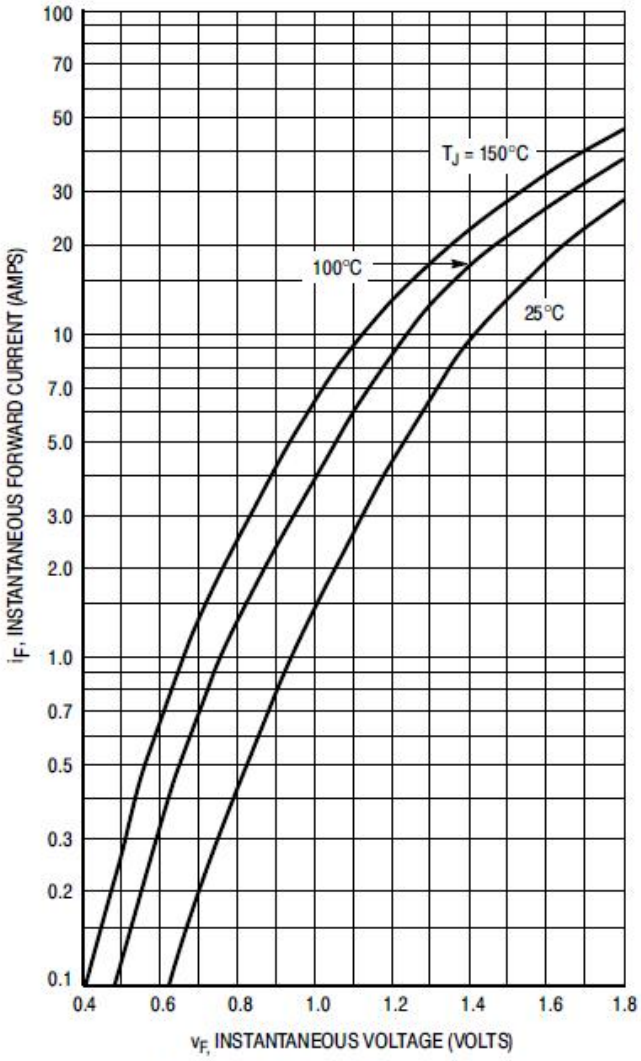


Figure 11. Typical Forward Voltage

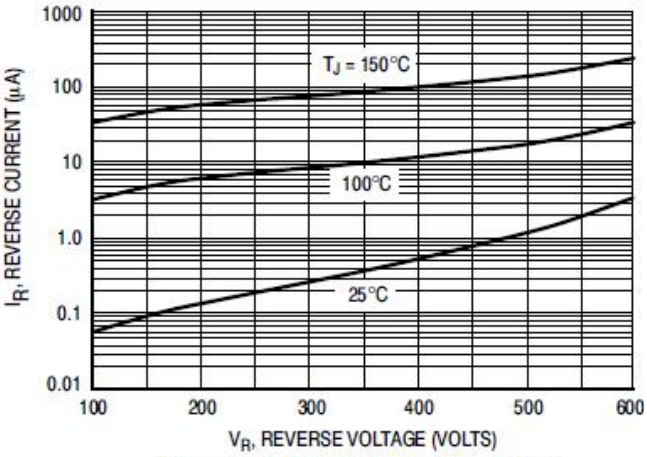


Figure 12. Typical Reverse Current*

*The curves shown are typical for the highest voltage device in the grouping. Typical reverse current for lower voltage selections can be estimated from these same curves if V_R is sufficiently below rated V_R.

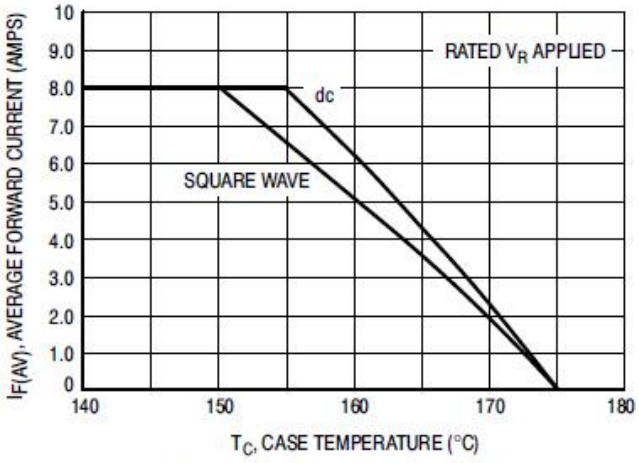


Figure 13. Current Derating, Case

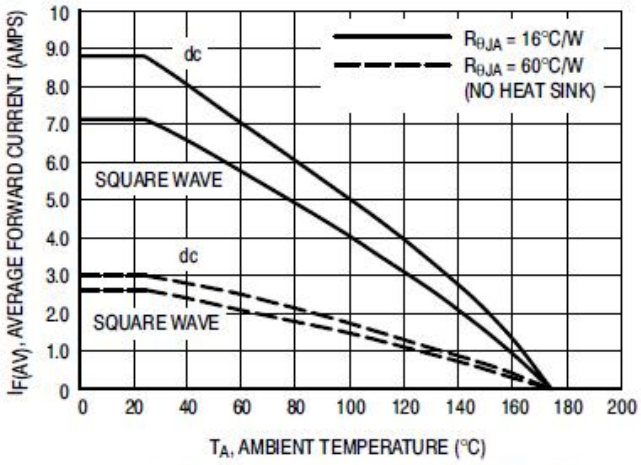


Figure 14. Current Derating, Ambient

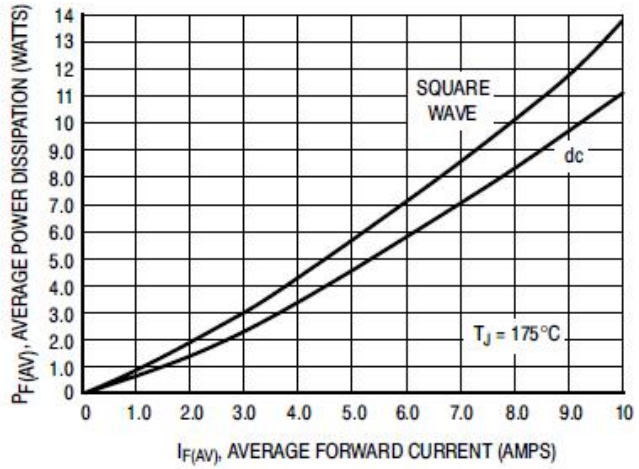


Figure 15. Power Dissipation

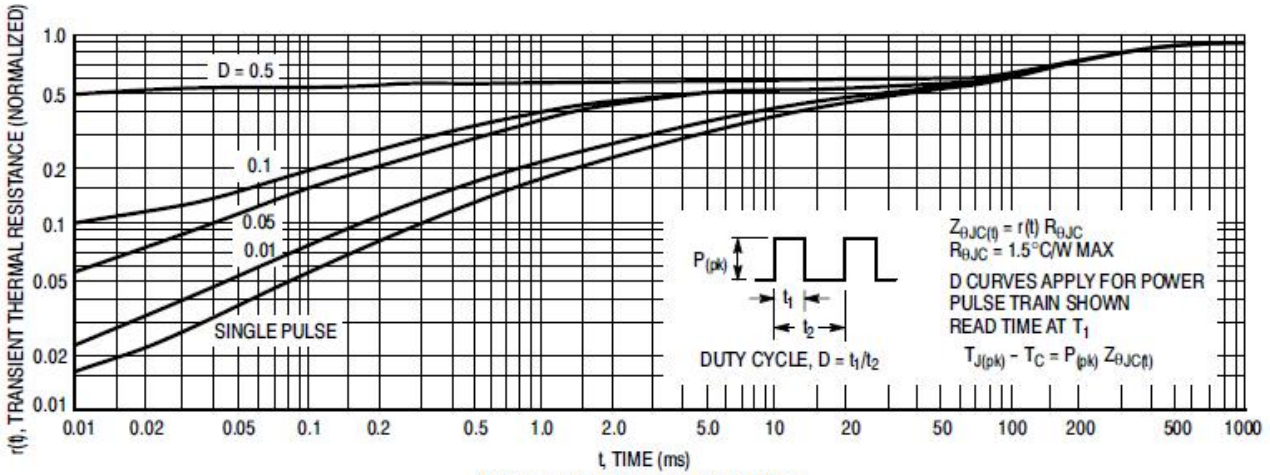


Figure 16. Thermal Response

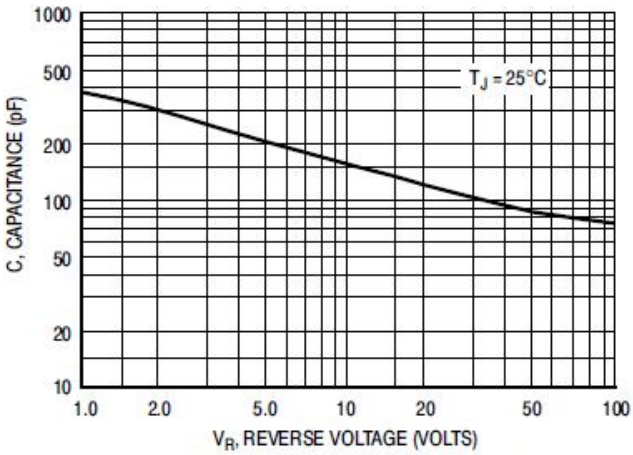


Figure 17. Typical Capacitance