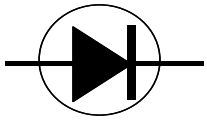
Fast Soft Recovery Rectifier Diode

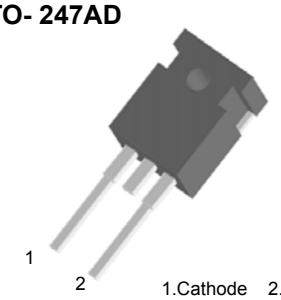


I_{FAVM} = 80A
V_{RRM} = 600V
t_{rr} = 65ns

Features

- ◆ Plastic material meets UL94V-0
- ◆ Glass passivated chips
- ◆ Very short recovery time
- ◆ Extremely low switching loss
- ◆ Soft recovery behavior
- ◆ High ruggedness type

TO- 247AD



1.Cathode 2. Anode

General Description

The SDW80S600 FRD has been designed for applications requiring low forward voltage drop and soft recovery characteristics. Typical applications are output rectification for SMPS, UPS, Welding and freewheeling in inverter, chopper and converter.

Absolute Maximum Ratings

Symbol	Parameter	Value	Units
V_{RRM}	Repetitive Peak Reverse Voltage	600	V
$I_{F(AV)}$	Average Rectified Forward Current @ T_C = 82°C	80	A
I_{FSM}	Non-Repetitive Peak Surge Current (t=8.3ms) (Surge applied at rated load conditions half sinewave,single phase, 60HZ)	800	A
I^2t	I^2t for Fusing (t = 8.3ms ,60Hz sine pulse)	2650	A
P_{tot}	Total Power Dissipation @ T_C = 25°C	270	W
T_J/T_{STG}	Maximum Junction / Storage Temperature Range	- 40 ~ 150	°C

Thermal Characteristics

Symbol	Parameter	Value	Units
R_{thJC}	Maximum Thermal Resistance, Junction-to-Case	0.47	°C/W
R_{thCS}	Typical Thermal Resistance, Case-to-Heatsink	0.25	°C/W
R_{thJA}	Maximum Thermal Resistance, Junction-to-Ambient	35	°C/W

SDW80S600

Electrical Characteristics

Symbol	Parameter	Min	Typ	Max	Units
I_R	Reverse Leakage Current $V_R = V_{RRM}$ T_C = 25 °C T_C = 150 °C	- -	- -	0.1 14	mA
V_F	Forward Voltage Drop I_F = 80A T_C = 25 °C I_F = 80 A T_C = 150 °C	- -	1.5 1.3	1.8 1.5	V
rt	Forward Slope Resistance, Tj =150°C	-	-	8.0	mΩ
$V_{F(TO)}$	Threshold Voltage	-	-	0.85	V

Recovery Characteristics

Symbol	Parameter	Min	Typ	Max	Units
t_{rr}	Reverse Recovery Time ① I_F = 40A , V_R=30V ,di/dt = -50A/us ② I_F = 1A , V_R=30V ,di/dt = -50A/us	- -	80 65	130 100	ns
I_{rr}	Reverse Recovery Current I_F = 40A , V_R=30V ,di/dt = -50A/us	-	-	3.5	A
Q_{rr}	Reverse Recovery Charge	-	-	0.5	uC

Fig 1. di/dt vs. maximum reverse current (T_C=25°C)

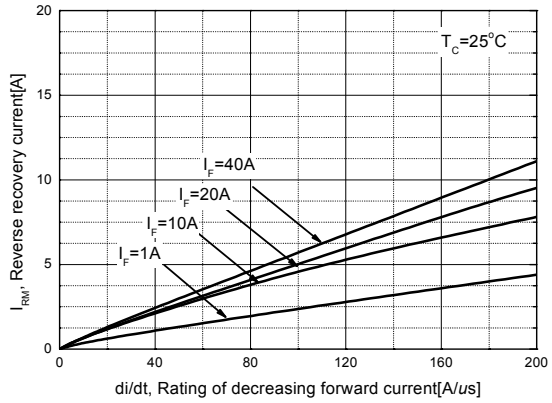


Fig 2. di/dt vs. maximum reverse current (T_C=150°C)

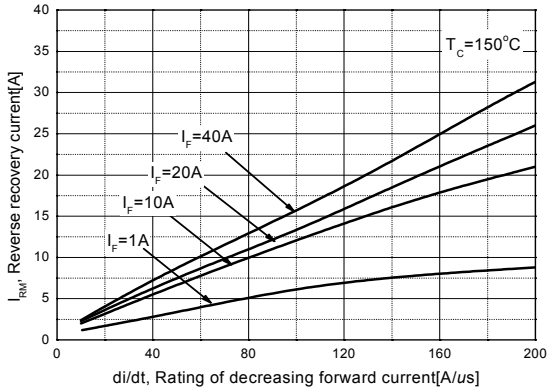


Fig 3. di/dt vs. reverse recovery time (T_C=25°C)

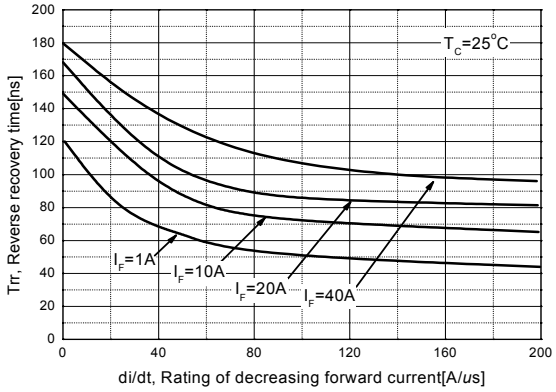


Fig 4. di/dt vs. reverse recovery time (T_C=150°C)

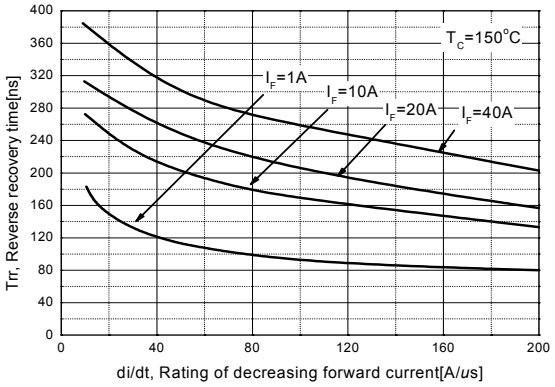


Fig 5. di/dt vs. reverse recovery charge (T_C=25°C)

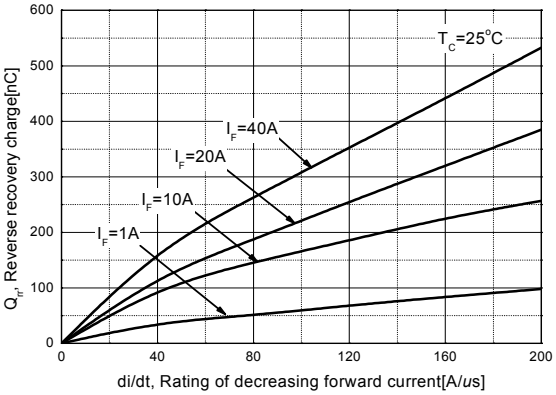


Fig 6. di/dt vs. reverse recovery charge (T_C=150°C)

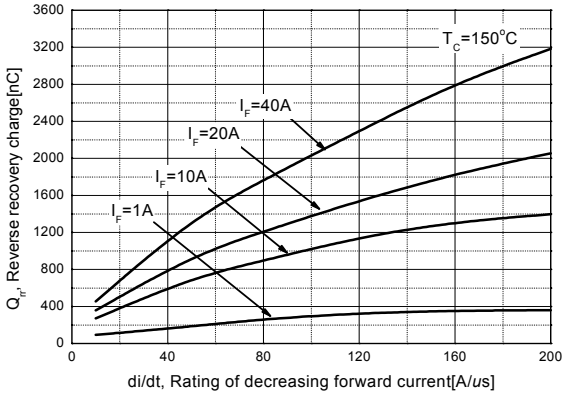


Fig 7. Forward average current vs. forward voltage drop

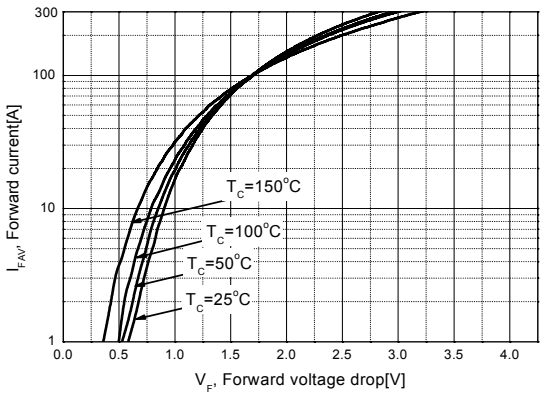


Fig 8. Reverse leakage current vs. reverse voltage

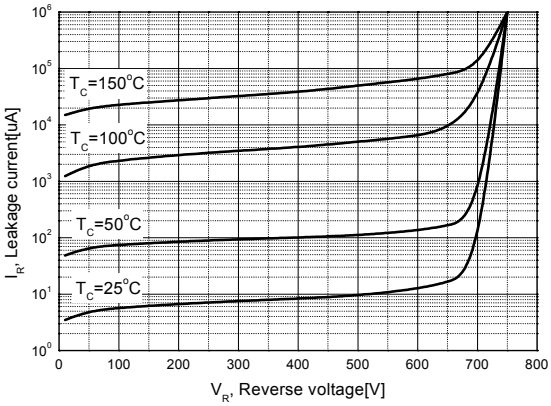


Fig 9. Juntion capacitance vs. reverse voltage.

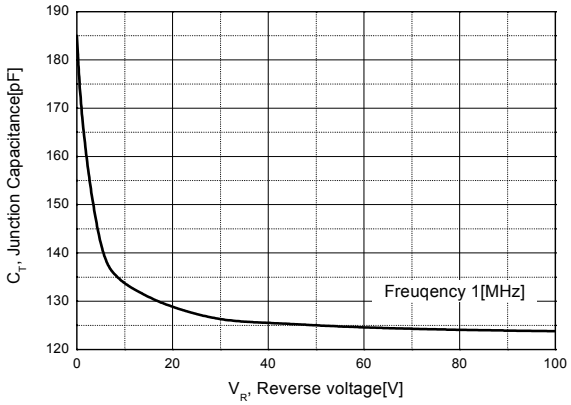


Fig 10. Maximum allowable case temperature

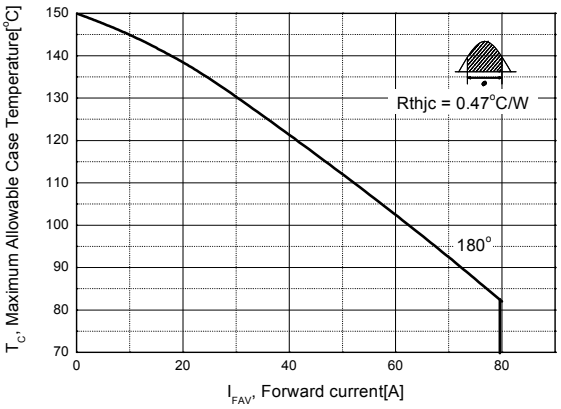
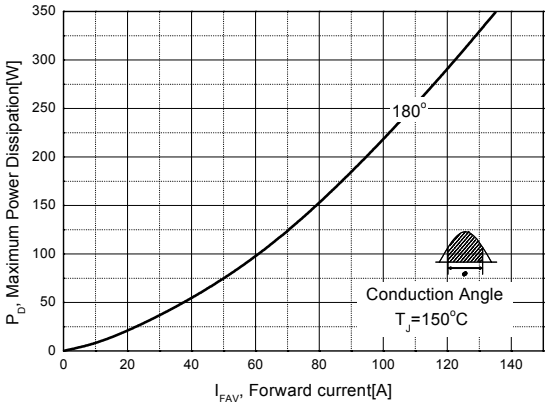


Fig 11. Maximum power dissipation vs. forward average current



TO-247 AD Package Dimension

Dim.	mm			Inch		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	15.77		16.03	0.621		0.631
B	20.80		21.10	0.819		0.831
C	20.05		20.31	0.789		0.800
D	4.48		4.58	0.176		0.180
E	4.27		4.37	0.168		0.172
F	10.64		11.16	0.418		0.440
G	4.90		5.16	0.193		0.203
H	1.90		2.06	0.075		0.081
I	2.35		2.45	0.093		0.096
J		0.6			0.024	
K	1.93		2.13	0.076		0.084
L	1.07		1.33	0.042		0.052
Φ	3.56		3.66	0.140		0.144