UMW STTH3L06

Turbo 2 ultrafast high voltage rectifier

1.Description

This device uses 2600V technology, and is particularly suited as boost diode in discontinuous or critical mode power factor corrections.

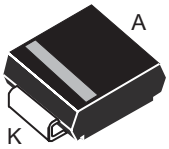
It is also intended for use as a freewheeling diode in power supplies and other power switching applications.

2.Features

- Ultrafast switching
- Low forward voltage drop
- Low thermal resistance
- Low leakage current (platinum doping)

3.Pinning Information

SMB



SMC

Table 1. Device summary

Symbol	Value
$I_{F(AV)}$	3A
V_{RRM}	600V
$I_{R(max)}$	100μA
$T_{j(max)}$	175°C
$V_{F(typ)}$	0.85V
$t_{rr(max)}$	60ns

4.Absolute Ratings (Limiting Values)

Parameter			Symbol	Value	Unit
Repetitive Peak Reverse Voltage			V_{RRM}	600	V
Forward RMS Voltage			$I_{F(RMS)}$	10	A
Average forward current δ=0.5, square wave	SMB	T_L=80°C	$I_{F(AV)}$	3	A
Surge Non Repetitive Forward Current, t_p=10ms Sinusoidal		SMB/SMC	I_{FSM}	60	A
Storage Temperature Range			T_{STG}	-65 to 175	°C
Maximum Operating Junction Temperature			T_J	175	°C

5.Thermal Parameters

Parameter		Symbol	Max	Units
Junction To Lead	SMB	$R_{th(j-l)}$	25	°C/W
	SMC		20	°C/W

1. Rth(j-a) is measured with a copper area S=5cm^2 (see Figure 14.)

6.Static Electrical Characteristics

Parameter		Symbol	Conditions	Min	Typ	Max	Unit
Reverse Leakage Current	T_J=25°C	I_R	V_R=V_{RRM}			3	μA
	T_J=150°C				15	100	μA
Forward Voltage Drop	T_J=25°C	V_F	I_F=3A			1.3	V
	T_J=150°C				0.85	1.05	V

To evaluate the conduction losses use the following equation:

$P=0.89 \times I_{F(AV)} + 0.055\ I_F^2{}_{(RMS)}$

7.Dynamic Characteristics

Parameter		Symbol	Conditions	Typ	Max	Unit
Reverse Recovery Time	T_J=25°C	t_{rr}	I_F=1A, dI_F/dt=-50A/μs, V_R=30V	60	85	ns
Forward Recovery Time	T_J=25°C	t_{fr}	I_F=3A,dI_F/dt=100A/μs,V_{FR}=1.1 x V_{Fmax}		100	ns
Forward Recovery Voltage	T_J=25°C	V_{FP}	I_F=3A, dI_F/dt=100A/μs		7.5	V

8.1 Typical Characteristic

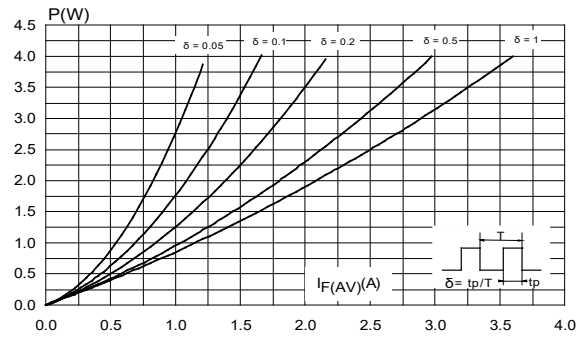


Figure 1: Conduction losses versus average current

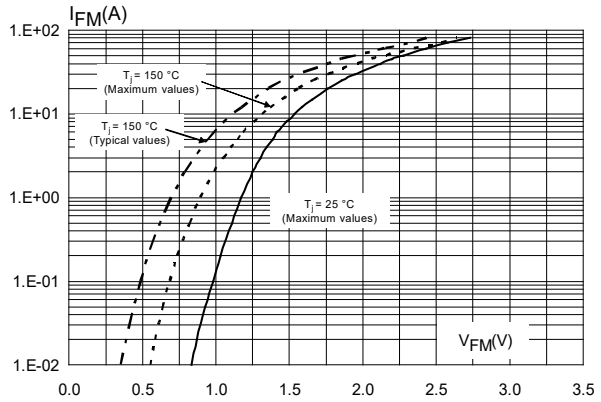


Figure 2: Forward voltage drop versus forward current

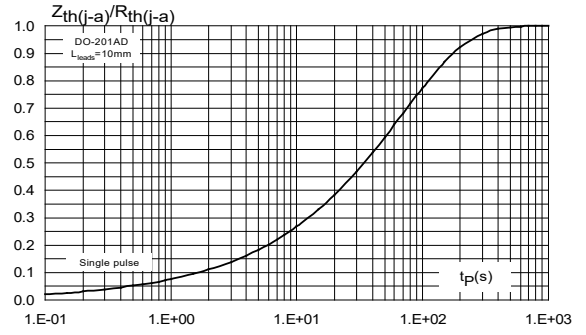


Figure 3: Relative variation of thermal impedance junction ambient versus pulse duration (epoxy printed circuit FR4, e_{CU}=35µm)

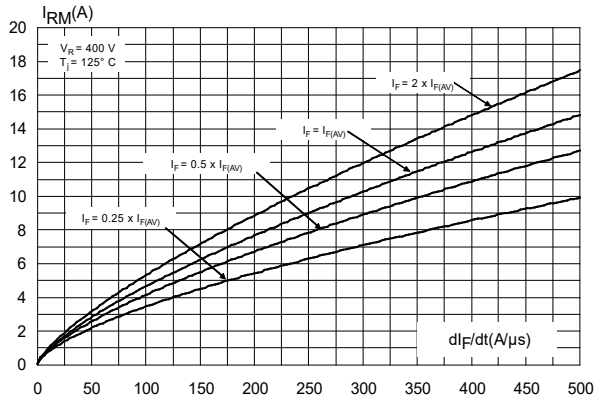


Figure 4: Peak reverse recovery current versus dI_F/dt (typical values)

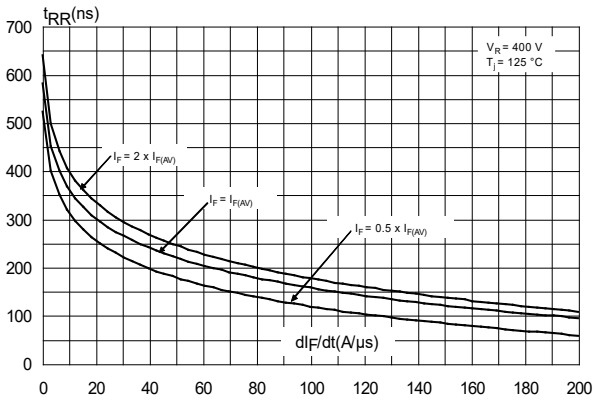


Figure 5: Reverse recovery time versus dI_F/dt (typical values)

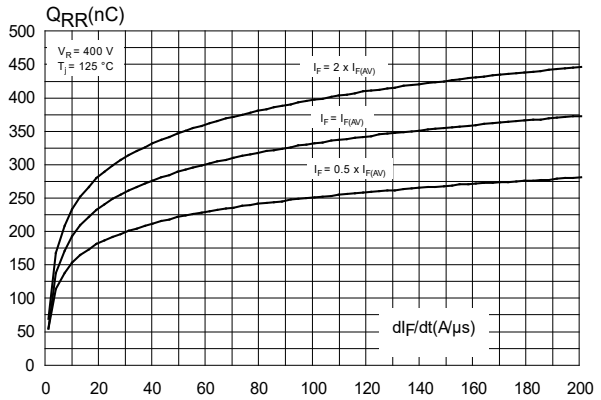


Figure 6: Reverse recovery charges versus dI_F/ dt (typical values)

8.2 Typical Characteristic

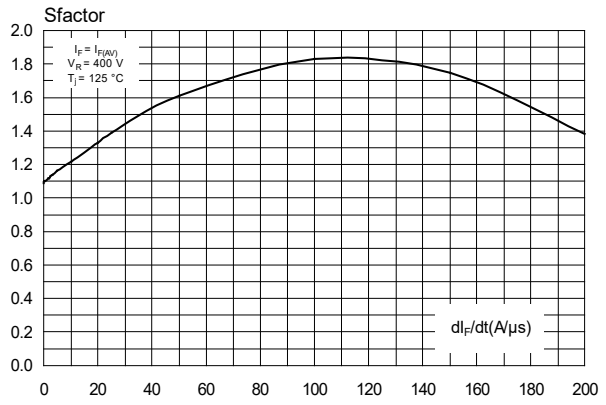


Figure 7: Softness factor versus dI_F/dt (typical values)

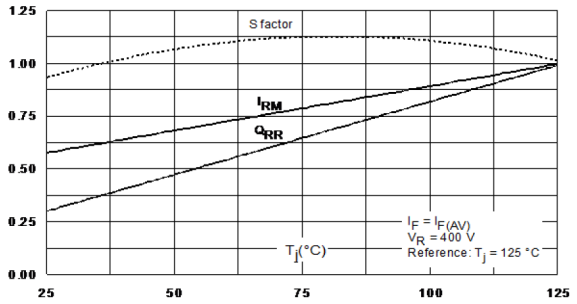


Figure 8: Relative variations of dynamic parameters versus junction temperature

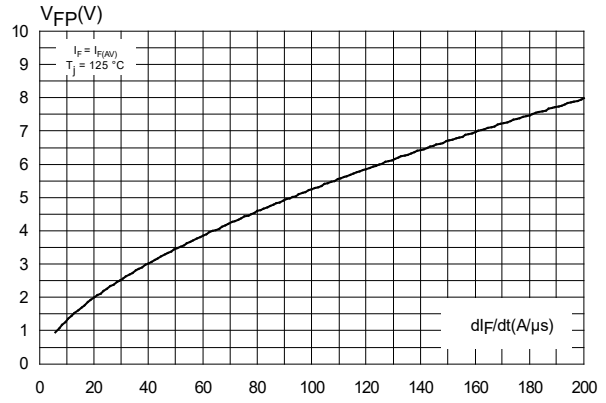


Figure 9: Transient peak forward voltage versus dI_F/dt (typical values)

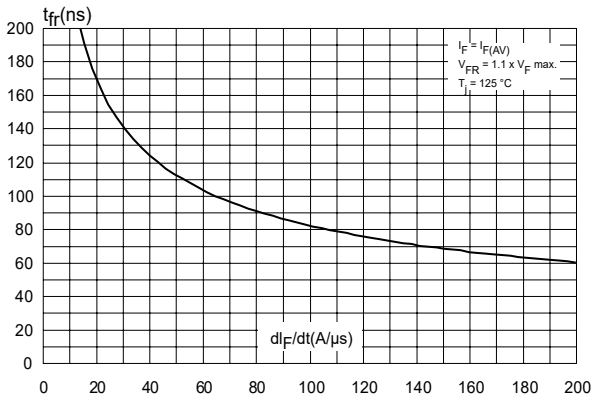


Figure 10: Forward recovery time versus dI_F/dt (typical values)

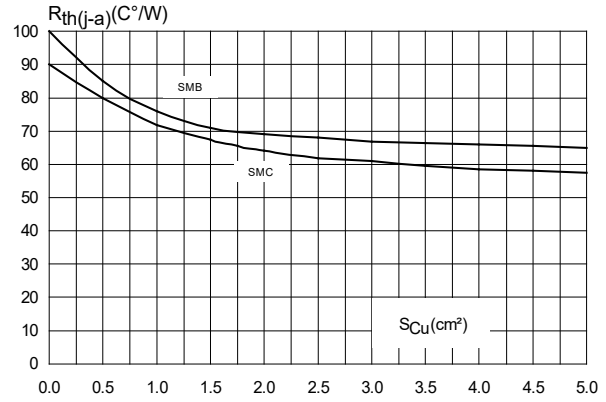


Figure 11: Thermal resistance junction to ambient versus copper surface under lead (epoxy FR4, e_{CU}=35µm) (SMB/SMC)

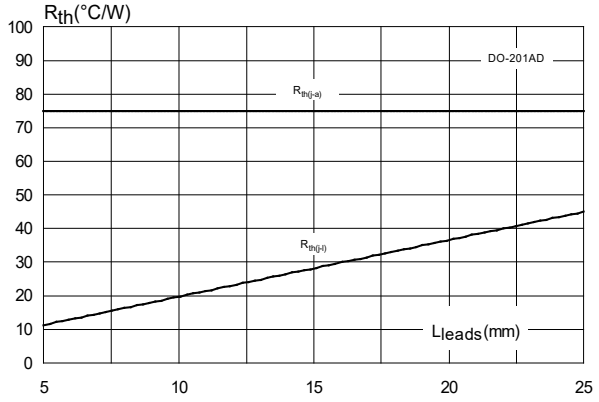
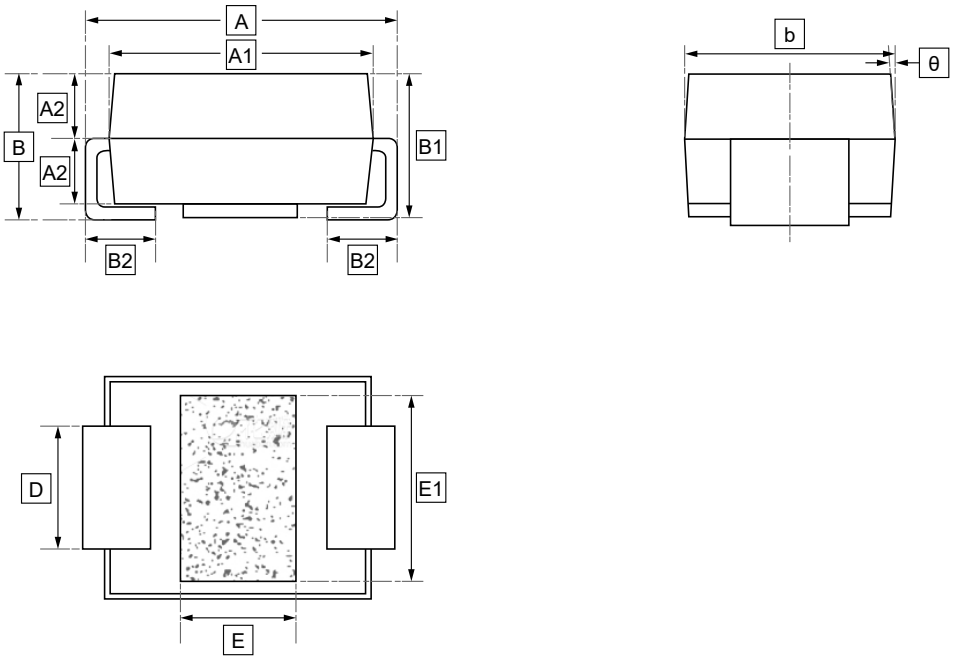


Figure 12: Thermal resistance versus lead length

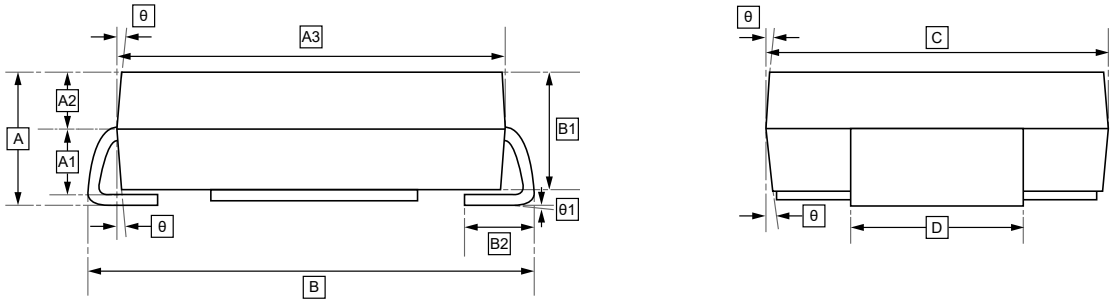
9.1 SMB Package Outline Dimensions



DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	B	B1	B2	b	D	E	E1	θ
Min	5.1	4.4	1.02	2.25	2.25	1.0	3.55	1.98	1.8	2.9	5°
Max	5.3	4.5	1.08	2.45	2.35	1.4	3.65	2.02	2.0	3.1	

9.2 SMC Package Outline Dimensions

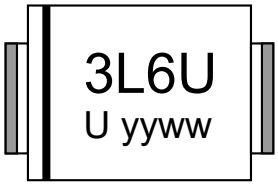


DIMENSIONS (mm are the original dimensions)

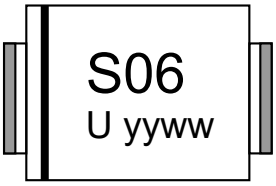
Symbol	A	A1	A2	A3	B	B1	B2	C	D	θ	θ1
Min	2.2	1.0	0.9	6.7	7.7	2.0	1.0	5.7	2.8	0°	0°
Max	2.6	1.4	1.2	6.9	8.2	2.5	1.4	6.2	3.2	5°	5°

10.Ordering Information

SMB



SMC



yy: Year Code
ww: Week Code

Order Code	Marking	Package	Base QTY	Delivery Mode
UMW STTH3L06U	3L6U	SMB	2500	Tape and reel
UMW STTH3L06S	S06	SMC	2500	Tape and reel

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