

1.Description

The STTH1R02 uses 200V planar Pt doping technology, and it is specially suited for switching mode base drive and transistor circuits. Packaged in SMA, SMB, the STTH1R02 is ideal for use low voltage, high frequency inverters, free wheeling and polarity protection

2.Features

- Very low conduction losses
- Negligible switching losses
- Low forward voltage drop
- High junction temperature

3.Applications

- Switching diode
- LED Lighting
- Auxiliary power supply
- Flyback diode

4.Pinning Information

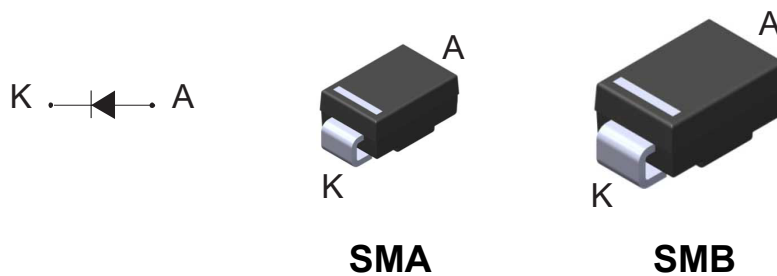


Table 1. Device summary

Symbol	Value
$I_{F(AV)}$	1.5A
V_{RRM}	200V
$T_{J(max)}$	175°C
$V_{F(typ)}$	0.7V
$t_{rr(typ)}$	15ns



5. Absolute Ratings (Limiting Values)

Parameter			Symbol	Value	Unit
Repetitive Peak Reverse Voltage			V _{RRM}	200	V
Average Forward Current δ=0.5, square wave	SMA/SMB	T _L =150°C	I _{F(AV)}	1.5	A
Surge Non Repetitive Forward Current	t _p =10 ms sinusoidal		I _{FSM}	60	A
Storage Temperature Range			T _{STG}	-65 to 175	°C
Operating Junction Temperature			T _J	175	°C

6. Thermal Parameters

Parameter		Symbol	Max	Units
Junction To Lead	SMA/SMB	$R_{th(j-l)}$	30	$^{\circ}\text{C/W}$

For more information, please refer to the following application note :

AN5088 : Rectifiers thermal management, handling and mounting recommendations

7. Static Electrical Characteristics

Parameter		Symbol	Conditions	Min	Typ	Max	Unit
Reverse Leakage Current	$T_J=25^{\circ}\text{C}$	$I_R^{(1)}$	$V_R=V_{RRM}$			3	μA
	$T_J=125^{\circ}\text{C}$				2	20	μA
Forward Voltage Drop	$T_J=25^{\circ}\text{C}$	$V_F^{(2)}$	$I_F=1.5\text{A}$		0.89	1	V
	$T_J=100^{\circ}\text{C}$				0.76	0.85	V
	$T_J=150^{\circ}\text{C}$				0.7	0.8	V

1. Pulse test: $t_p=5\text{ms}$, $\delta < 2\%$

2. Pulse test: $t_p=380\mu\text{s}$, $\delta < 2\%$

To evaluate the maximum conduction losses use the following equation:

$$P=0.68 \times I_{F(AV)} + 0.08 \times I_{F(RMS)}^2$$

For more information, please refer to the following application notes related to the power losses :

AN604: Calculation of conduction losses in a power rectifier

AN4021: Calculation of reverse losses on a power diode



8.Dynamic Characteristics

Parameter	Symbol	Conditions	Typ	Max	Unit
Reverse Recovery Time	t_{rr}	$I_F=1A, dI_F/dt=-50A/\mu s, V_R=30V$	23	30	ns
		$I_F=1A, dI_F/dt=-100A/\mu s, V_R=30V$	15	20	ns
Reverse Recovery Current	I_{RM}	$I_F=1.5A, dI_F/dt=-200A/\mu s, V_R=160V, T_J=125^\circ C$	3	4	A
Forward Recovery Time	t_{fr}	$I_F=1.5A, dI_F/dt=100A/\mu s, V_{FR}=1.1 \times V_{Fmax}$	50		ns
Forward Recovery Voltage	V_{FP}	$I_F=1.5A, dI_F/dt=100A/\mu s$	2.1		V



9.1 Typical Characteristic

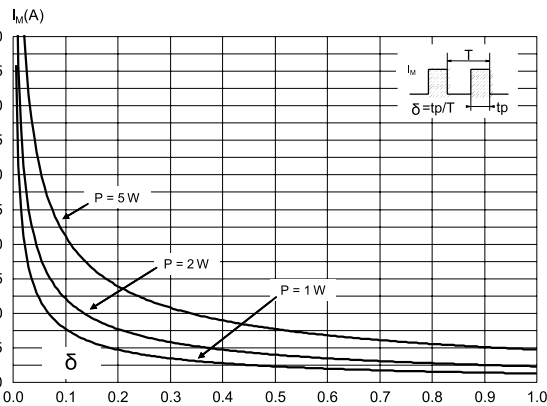


Figure 1: Peak current versus duty cycle

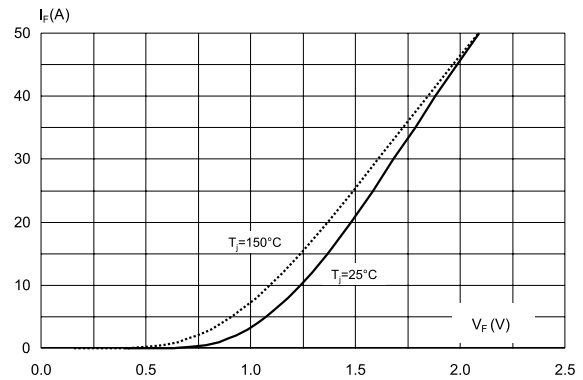


Figure 2: Forward voltage drop versus forward current (typical values)

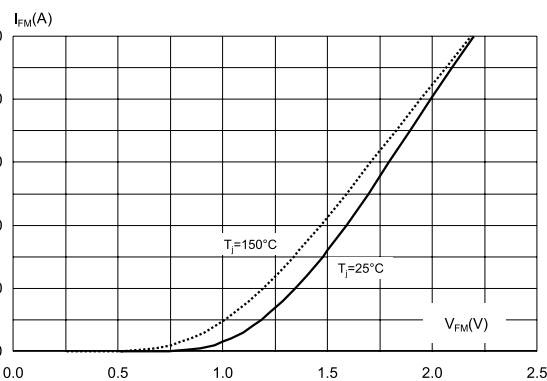


Figure 3: RForward voltage drop versus forward current (maximum values)

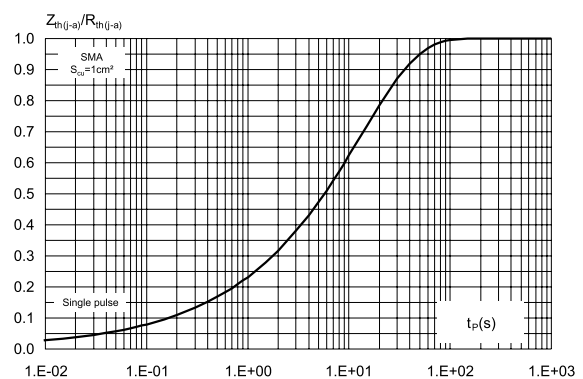


Figure 4: Relative variation of thermal impedance junction to lead versus pulse duration (SMA)

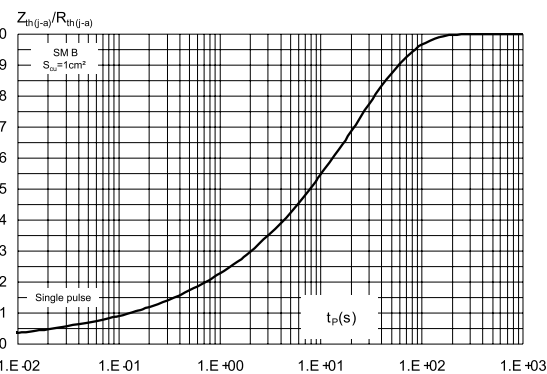


Figure 5: Relative variation of thermal impedance junction to lead versus pulse duration (SMB)

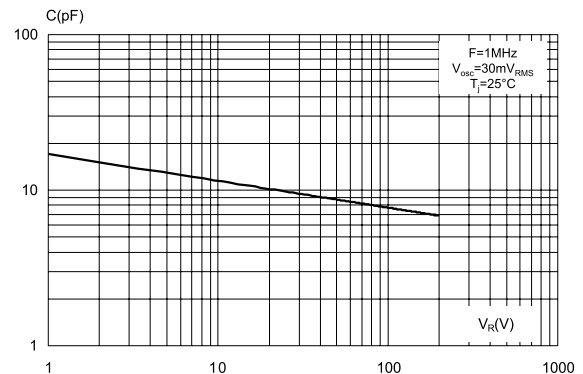


Figure 6: Junction capacitance versus reverse voltage applied (typical values)



9.2 Typical Characteristic

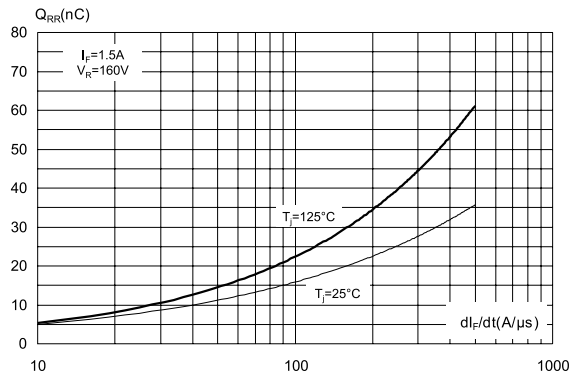


Figure 7: Reverse recovery charges versus di_F/dt (typical values)

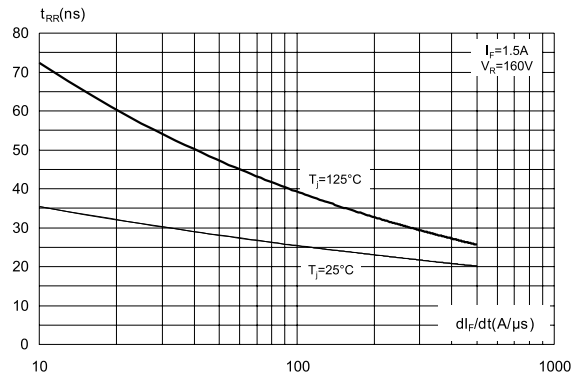


Figure 8: Reverse recovery charges versus di_F/dt (typical values)

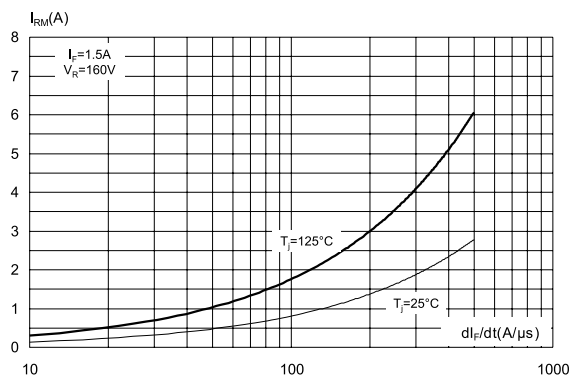


Figure 9: Peak reverse recovery current versus di_F/dt (typical values)

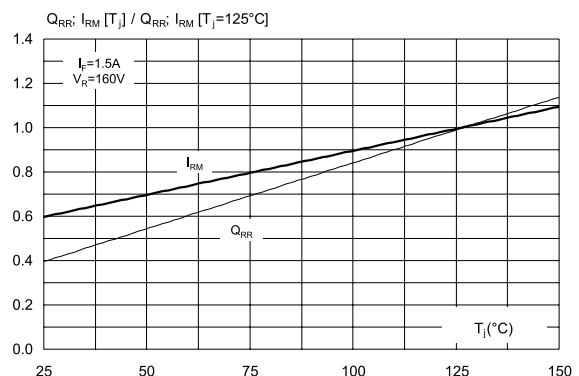


Figure 10: Relative variations of dynamic parameters versus junction temperature

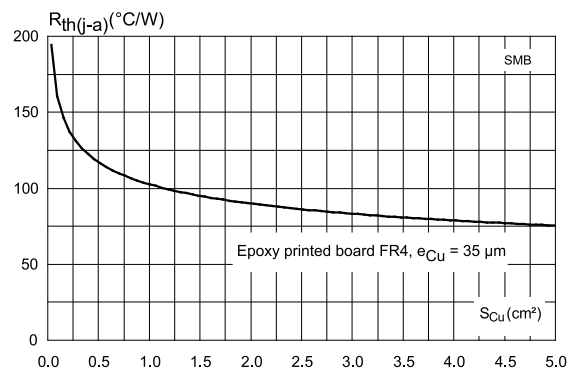


Figure 11: Thermal resistance junction to ambient versus copper surface under each lead (typical values)

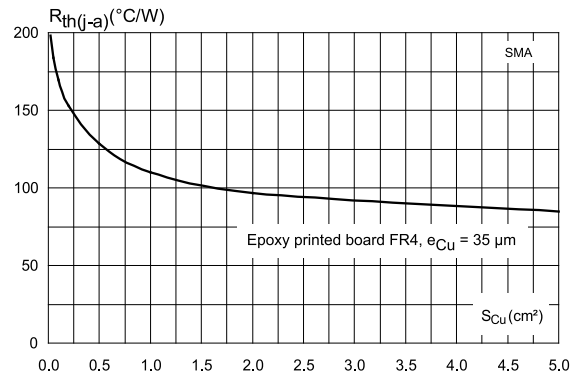
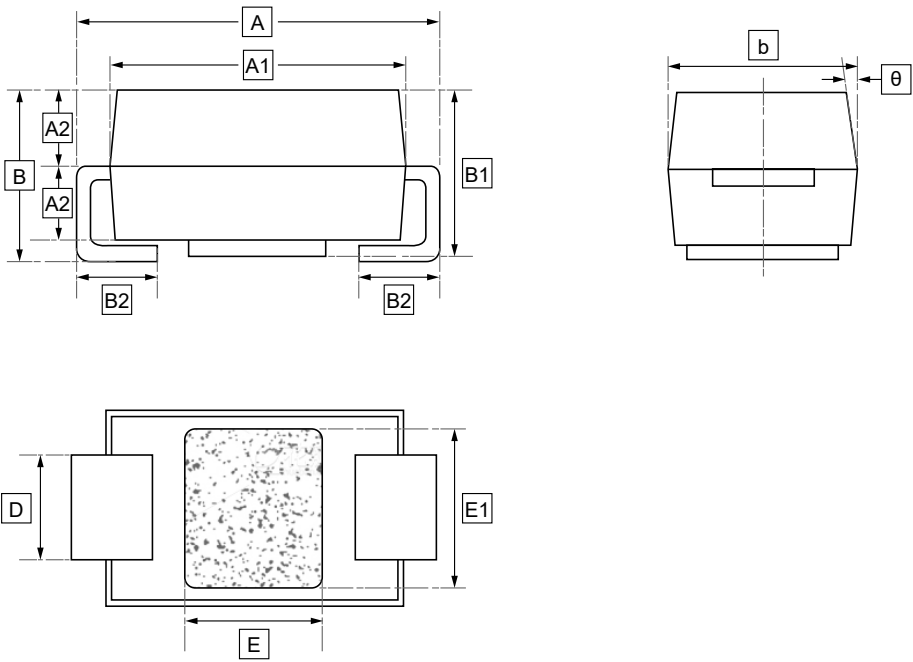


Figure 12: Thermal resistance junction to ambient versus copper surface under each lead (typical values)



10.1 SMA Package Outline Dimensions

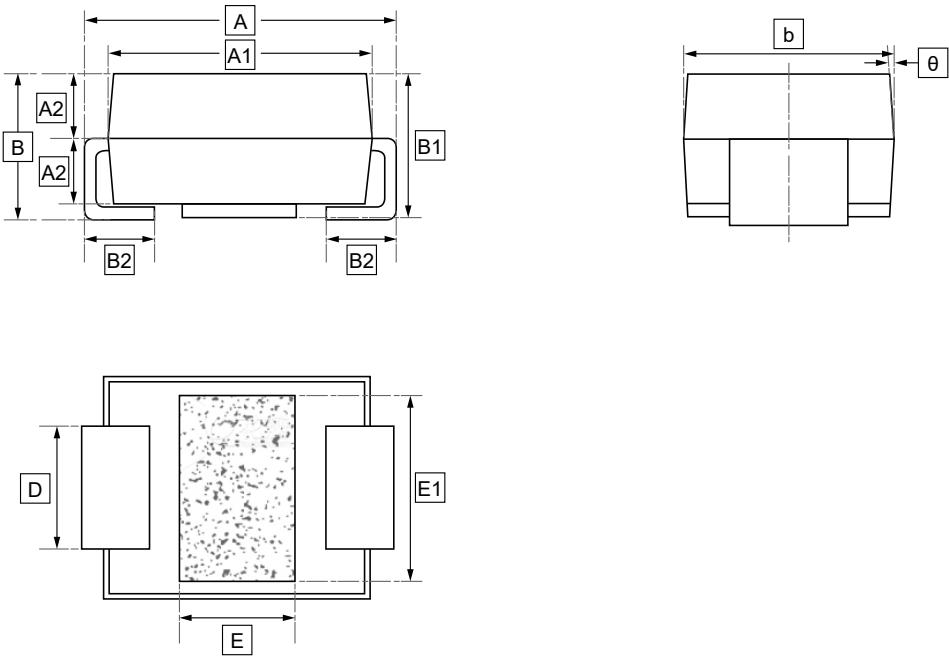


DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	B	B1	B2	b	D	E	E1	θ
Min	4.9	4.05	0.97	2.18	2.15	1.0	2.55	1.38	1.8	2.0	5°
Max	5.1	4.15	1.03	2.38	2.25	1.4	2.65	1.42	2.0	2.2	



10.2 SMB Package Outline Dimensions

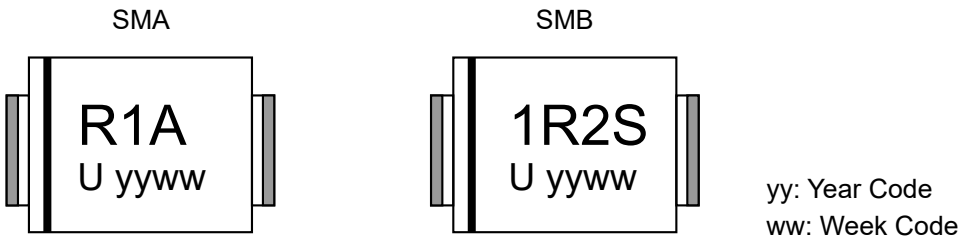


DIMENSIONS (mm are the original dimensions)

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	



11.Ordering Information



Order Code	Marking	Package	Base QTY	Delivery Mode
UMW STTH1R02A	R1A	SMA	5000	Tape and reel
UMW STTH1R02U	1R2S	SMB	2500	Tape and reel



12.Disclaimer

UMW reserves the right to make changes to all products, specifications. Customers should obtain the latest version of product documentation and verify the completeness and currency of the information before placing an order.

When applying our products, please do not exceed the maximum rated values, as this may affect the reliability of the entire system. Under certain conditions, any semiconductor product may experience faults or failures. Buyers are responsible for adhering to safety standards and implementing safety measures during system design, prototyping, and manufacturing when using our products to prevent potential failure risks that could lead to personal injury or property damage.

Unless explicitly stated in writing, UMW products are not intended for use in medical, life-saving, or life-sustaining applications, nor for any other applications where product failure could result in personal injury or death. If customers use or sell the product for such applications without explicit authorization, they assume all associated risks.

When reselling, applying, or exporting, please comply with export control laws and regulations of China, the United States, the United Kingdom, the European Union, and other relevant countries, regions, and international organizations.

This document and any actions by UMW do not grant any intellectual property rights, whether express or implied, by estoppel or otherwise. The product names and marks mentioned herein may be trademarks of their respective owners.