

1.Description

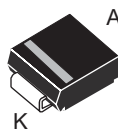
The STTH3R04 series uses 400V planar Pt doping technology. The STTH3R04 is specially suited for switching mode base drive and transistor circuits.

Packaged in axial and surface mount packages, this device is intended for use in low voltage, high frequency inverters, free wheeling and polarity protection.

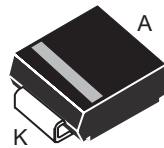
2.Features

- Negligible switching losses
- Low forward and reverse recovery times
- High junction temperature

3.Pinning Information



SMB



SMC

Table 1. Device summary

Symbol	Value
$I_{F(AV)}$	3A
V_{RRM}	400V
$T_{j(max)}$	175°C
$V_{F(typ)}$	0.9V
$t_{rr(typ)}$	18ns



4. Absolute Ratings (Limiting Values)

Parameter			Symbol	Value	Unit
Repetitive Peak Reverse Voltage			V _{RRM}	400	V
Average Forward Current δ = 0.5	SMB	T _L =70°C	I _{F(AV)}	3	A
	SMC	T _L =100°C		3	A
Surge Non Repetitive Forward Current	t _p =10 ms sinusoidal		I _{FSM}	60	A
Storage Temperature Range			T _{STG}	-65 to 175	°C
Maximum Operating Junction Temperature ⁽¹⁾			T _J	175	°C

1. On infinite heatsink with 10 mm lead length

5. Thermal Parameters

Parameter		Symbol	Max	Units
Junction To Lead	SMB	$R_{th(j-l)}$	25	$^\circ\text{C/W}$
	SMC		17	$^\circ\text{C/W}$

6. Static Electrical Characteristics

Parameter		Symbol	Conditions	Min	Typ	Max	Unit
Reverse Leakage Current	$T_J = 25^\circ\text{C}$	$I_R^{(1)}$	$V_R = V_{RRM}$			5	μA
	$T_J = 125^\circ\text{C}$				5	50	μA
Forward Voltage Drop	$T_J = 25^\circ\text{C}$	$V_F^{(2)}$	$I_F = 3\text{A}$			1.5	V
	$T_J = 100^\circ\text{C}$				1.0	1.25	V
	$T_J = 150^\circ\text{C}$				0.9	1.15	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:

$$P = 0.9 \times I_{F(AV)} + 0.083 I_{F(RMS)}^2$$



7.Dynamic Characteristics

Parameter		Symbol	Conditions	Typ	Max	Unit
Reverse Recovery Time	$T_J=25^{\circ}\text{C}$	t_{rr}	$I_F=1\text{A}$, $dI_F/dt=-50\text{A}/\mu\text{s}$, $V_R=30\text{V}$		35	ns
	$T_J=25^{\circ}\text{C}$		$I_F=1\text{A}$, $dI_F/dt=-100\text{A}/\mu\text{s}$, $V_R=30\text{V}$	18	25	ns
Reverse recovery current	$T_J=125^{\circ}\text{C}$	I_{RM}	$I_F=3\text{A}$, $dI_F/dt=-200\text{A}/\mu\text{s}$, $V_R=320\text{V}$	4	5.5	A
Forward recovery time	$T_J=25^{\circ}\text{C}$	t_{fr}	$I_F=3\text{A}$, $dI_F/dt=100\text{A}/\mu\text{s}$, $V_{FR}=1.1 \times V_{Fmax}$		75	ns
Forward recovery voltage		V_{FP}	$I_F=3\text{A}$, $dI_F/dt=100\text{A}/\mu\text{s}$	2.5		V



8.1 Typical Characteristic

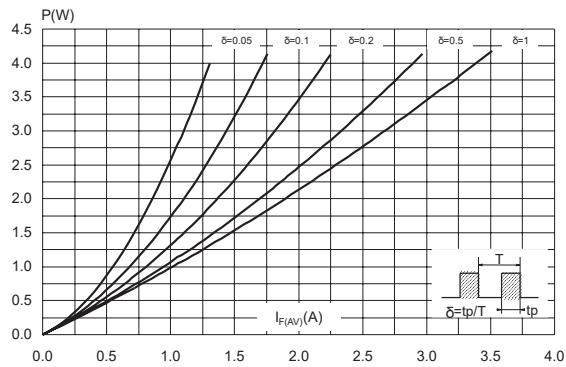


Figure 1: Conduction losses versus average forward current

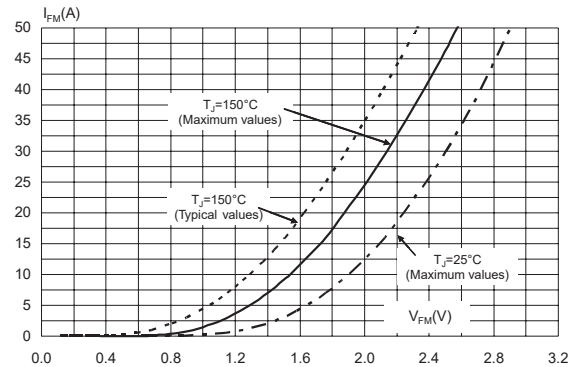


Figure 2: Forward voltage drop versus forward current

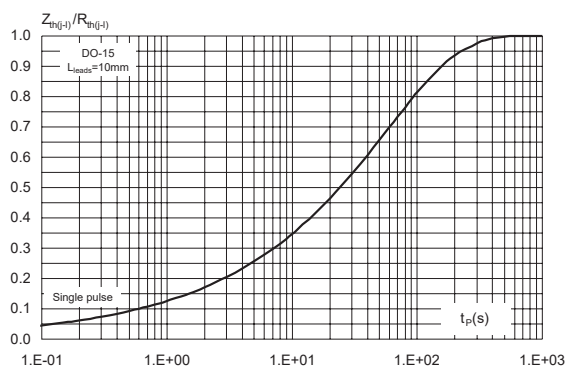


Figure 3: Relative variation of thermal impedance junction to lead versus pulse duration, DO-15 (epoxy FR4, copper thickness = 35 μm)

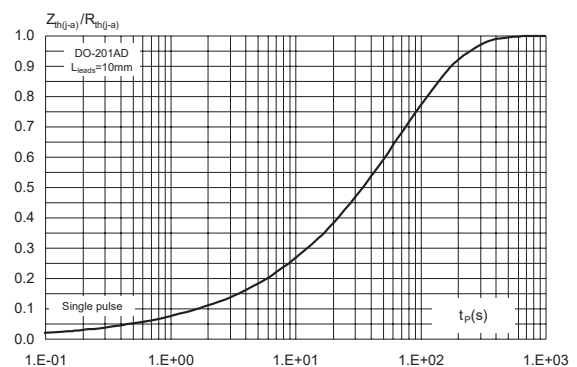


Figure 4: Relative variation of thermal impedance junction to ambient versus pulse duration, DO-201AD (epoxy FR4, copper thickness=35μm)

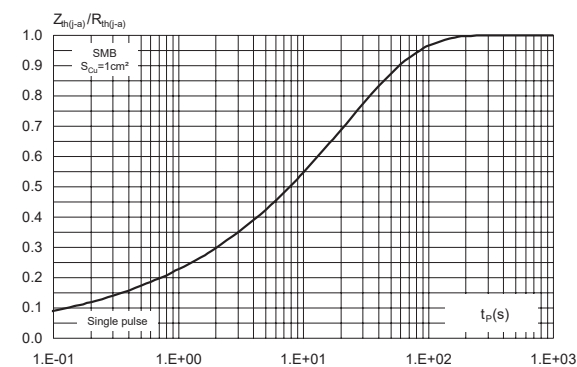


Figure 5: Relative variation of thermal impedance junction to ambient versus pulse duration, SMB (epoxy FR4, copper thickness = 35 μm)

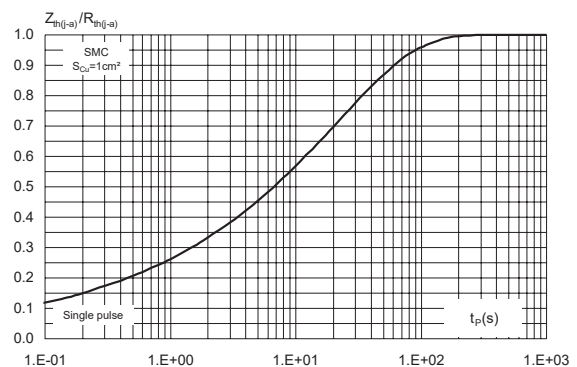


Figure 6: Relative variation of thermal impedance junction to ambient versus pulse duration, SMC



8.2 Typical Characteristic

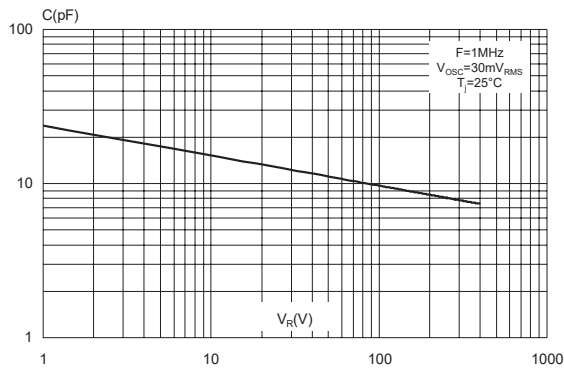


Figure 7: Junction capacitance versus reverse voltage applied (typical values)

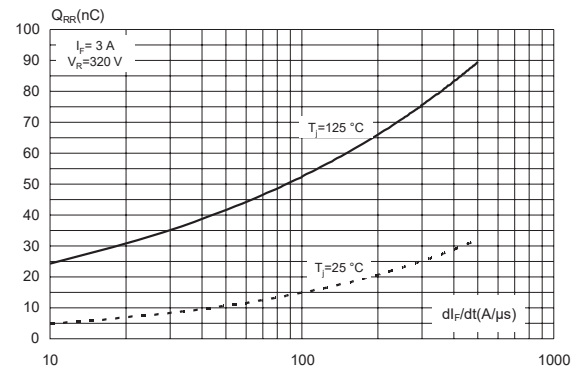


Figure 8: Reverse recovery charges versus dI_F/dt (typical values)

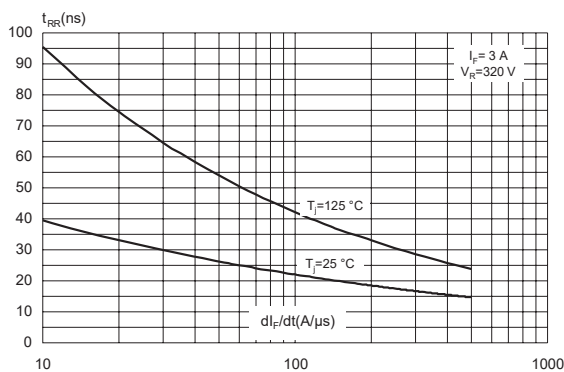


Figure 9: Reverse recovery time versus dI_F/dt (typical values)

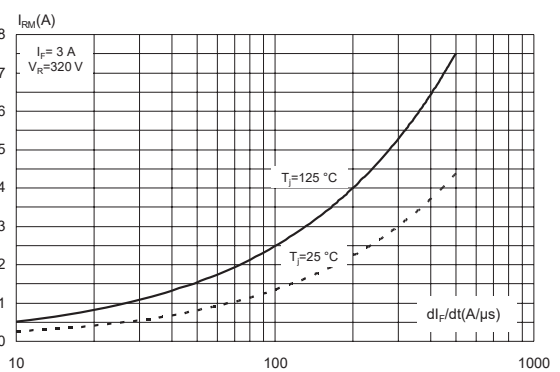


Figure 10: Peak reverse recovery current versus dI_F/dt (typical values)

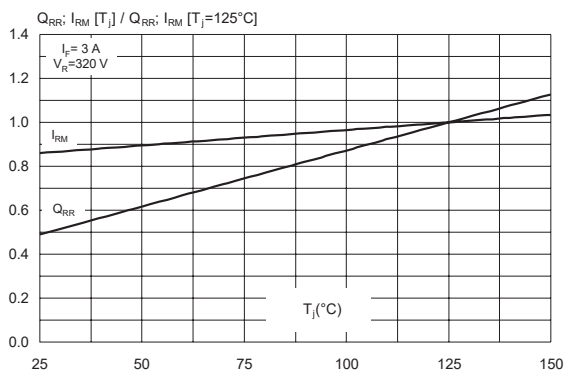


Figure 11: Relative variations of dynamic parameters versus junction temperature

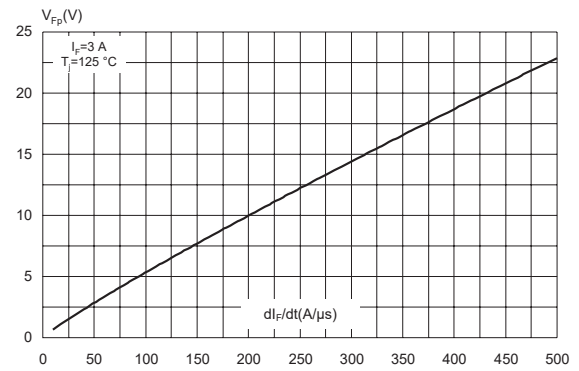
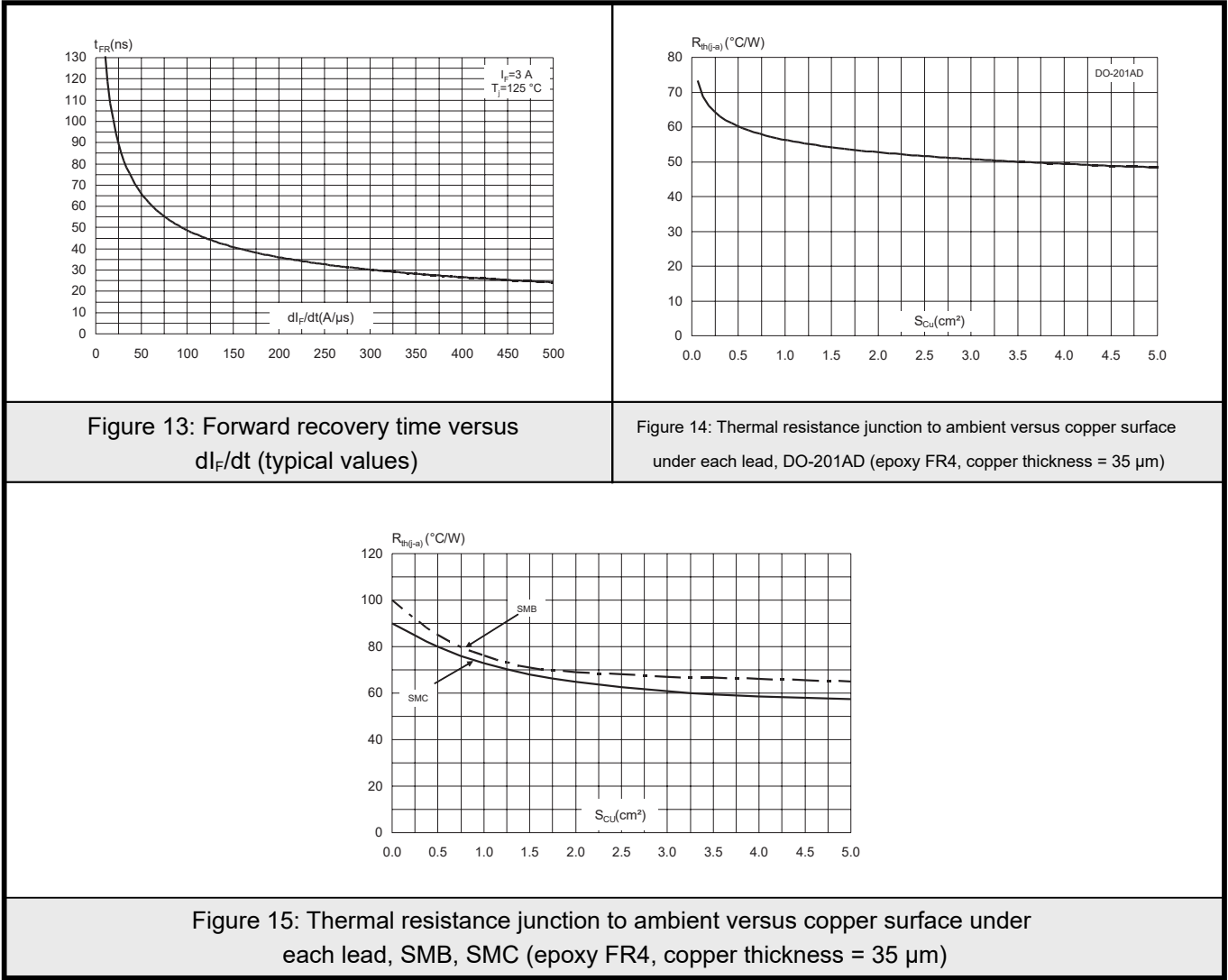


Figure 12: Transient peak forward voltage versus dI_F/dt (typical values)

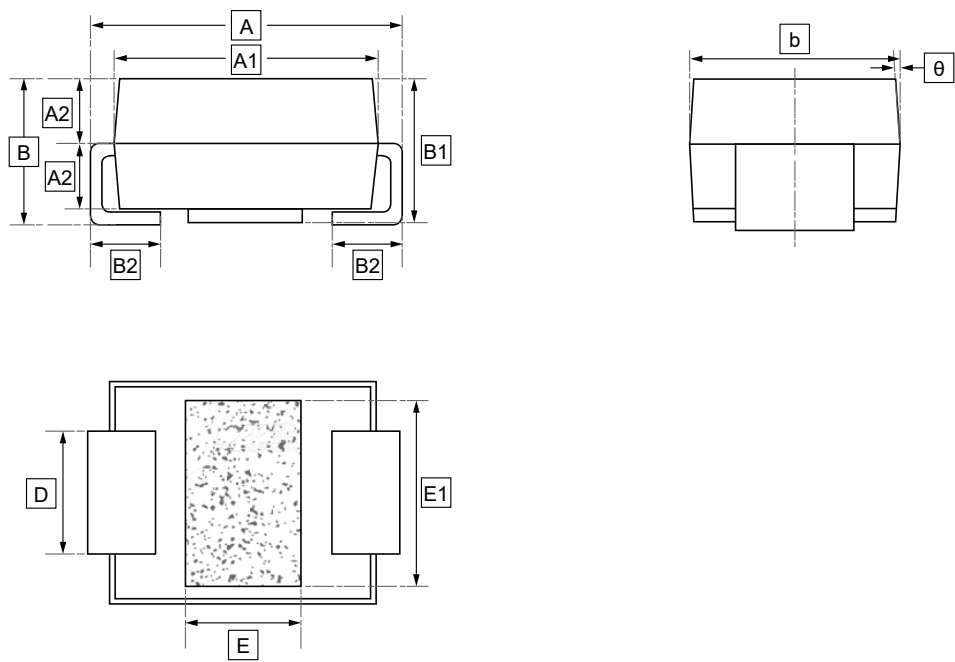


8.3 Typical Characteristic





9.1 SMB Package Outline Dimensions

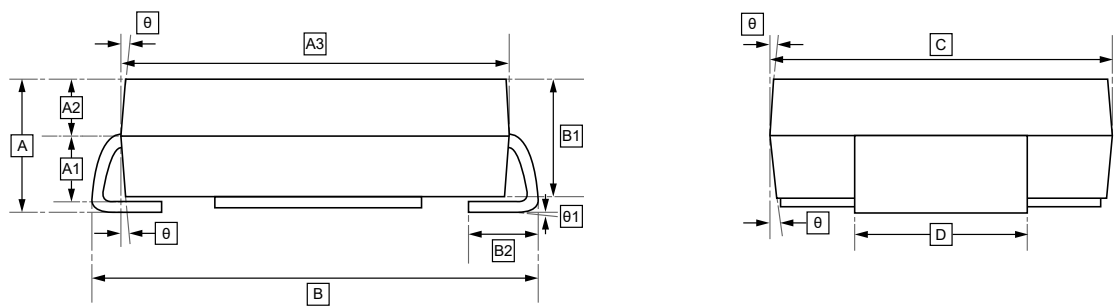


DIMENSIONS (mm are the original dimensions)

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

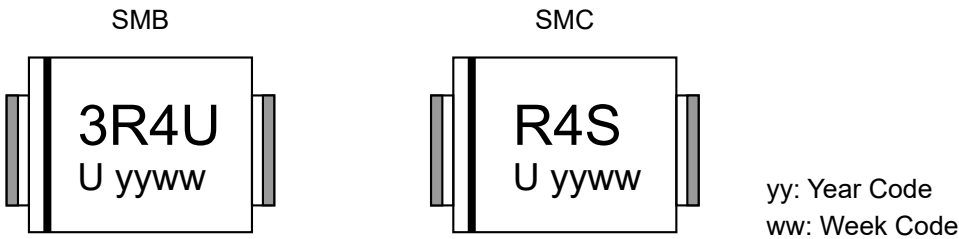


DIMENSIONS (mm are the original dimensions)

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



Order Code	Marking	Package	Base QTY	Delivery Mode
UMW STTH3R04S	R4S	SMC	2500	Tape and reel
UMW STTH3R04U	3R4U	SMB	2500	Tape and reel



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