1 Characteristics

Table 2. Absolute ratings (limiting values at T_j = 25 °C, unless otherwise specified)

Symbol	Parameter		Value	Unit
V_{RRM}	Repetitive peak reverse voltage		200	V
I_{FRM}	Repetitive peak forward current	t_p = 5 µs, F = 5 kHz	110	A
$I_{F(RMS)}$	Forward rms current	DO-201AD / DO-15	70	A
		SMC	70	
$I_{F(AV)}$	Average forward current, δ = 0.5	DO-15 T_{lead} = 50 °C	3	A
		DO-201AD T_{lead} = 90 °C		
		SMC T_c = 110 °C		
I_{FSM}	Surge non repetitive forward current	t_p = 10 ms Sinusoidal	75	A
T_{stg}	Storage temperature range		-65 to + 175	°C
T_j	Maximum operating junction temperature		175	°C
T_L	Maximum lead temperature for soldering during 10 s at 4 mm from case		230	°C

Table 3. Thermal parameters

Symbol	Parameter			Value	Unit
$R_{th(j-l)}$	Junction to lead	Lead Length = 10 mm on infinite heatsink	DO-15	45	°C/W
			DO-201AD	30	
$R_{th(j-c)}$	Junction to case		SMC	20	

Table 4. Static electrical characteristics

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
I_R(1)	Reverse leakage current	T_j = 25 °C	$V_R = V_{RRM}$			3	µA
		T_j = 125 °C			3	30	
V_F(2)	Forward voltage drop	T_j = 25 °C	I_F = 9 A			1.20	V
		T_j = 25 °C	I_F = 3 A		0.89	1.0	
		T_j = 100 °C			0.76	0.85	
		T_j = 150 °C			0.70	0.80	

1. Pulse test: t_p = 5 ms, δ < 2 %
2. Pulse test: t_p = 380 µs, δ < 2 %

To evaluate the conduction losses use the following equation:
$P = 0.68 \times I_{F(AV)} + 0.04\ I_F{}^2{}_{(RMS)}$

Table 5. Dynamic characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
t_{rr}	Reverse recovery time	I_F = 1 A, dI_F/dt = -50 A/µs, V_R = 30 V, T_j = 25 °C		24	30	ns
		I_F = 1 A, dI_F/dt = -100 A/µs, V_R = 30 V, T_j = 25 °C		16	20	
I_{RM}	Reverse recovery current	I_F = 3 A, dI_F/dt = -200 A/µs, V_R = 160 V, T_j = 125 °C		3.5	4.5	A
t_{fr}	Forward recovery time	I_F = 3 A, dI_F/dt = 100 A/µs V_{FR} = 1.1 x V_{Fmax}, T_j = 25 °C		40		ns
V_{FP}	Forward recovery voltage	I_F = 3 A, dI_F/dt = 100 A/µs, T_j = 25 °C		1.9		V

Figure 1. peak current versus duty cycle

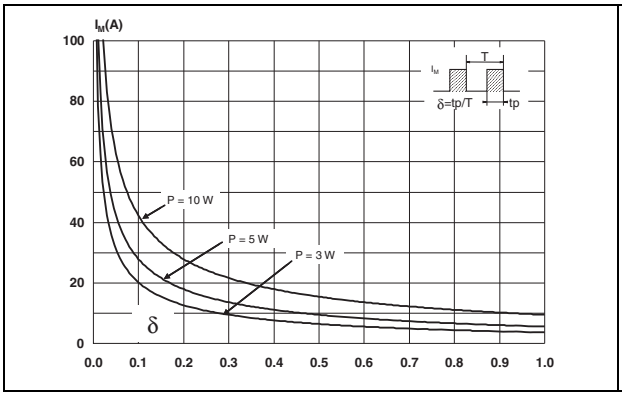


Figure 2. Forward voltage drop versus forward current (typical values)

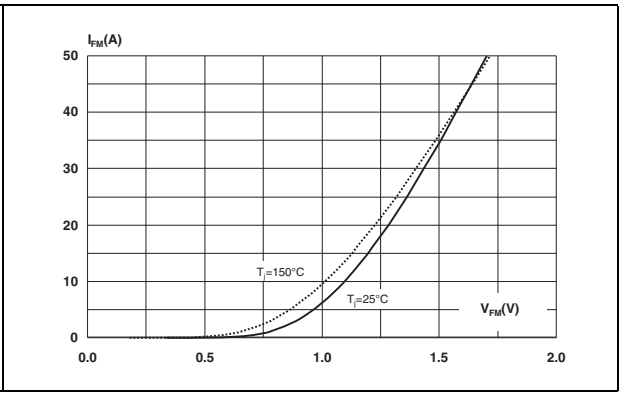


Figure 3. Forward voltage drop versus forward current (maximum values)

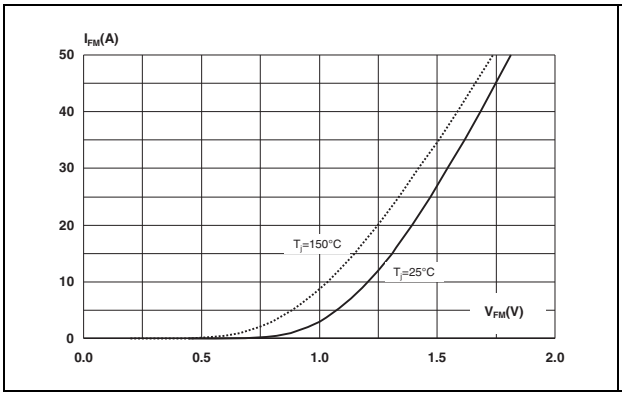


Figure 4. Relative variation of thermal impedance junction to ambient versus pulse duration - DO-201AD

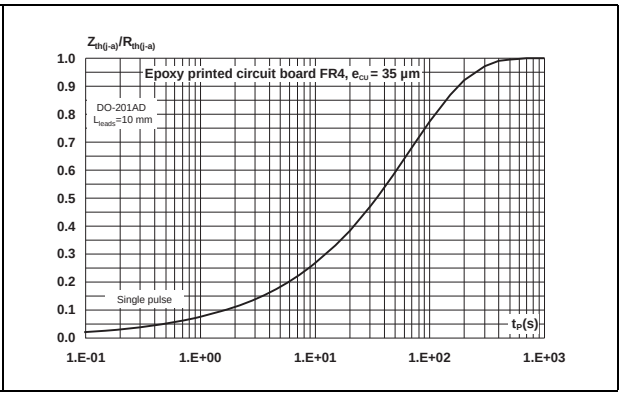


Figure 5. Relative variation of thermal impedance junction to ambient versus pulse duration - DO-15

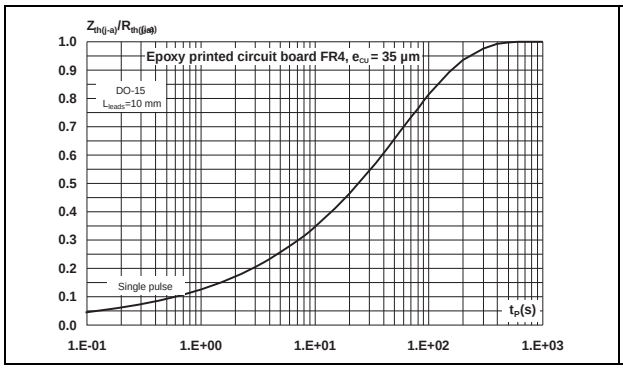


Figure 6. Relative variation of thermal impedance junction to ambient versus pulse duration - SMC

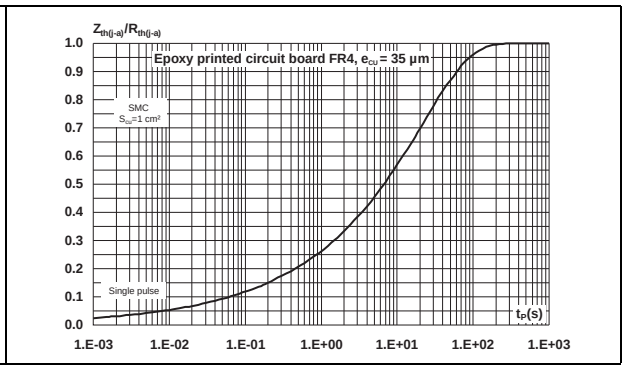


Figure 7. Junction capacitance versus reverse applied voltage (typical values)

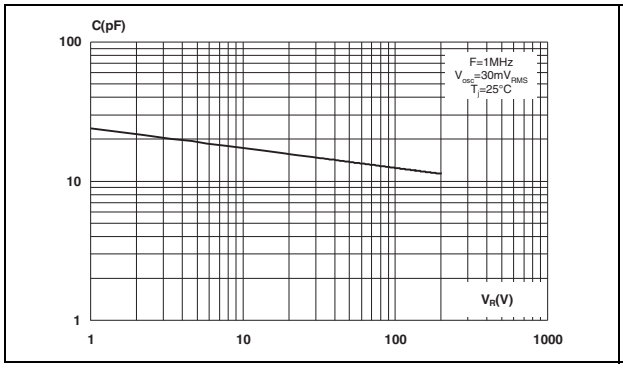


Figure 8. Reverse recovery charges versus dI_F/dt (typical values)

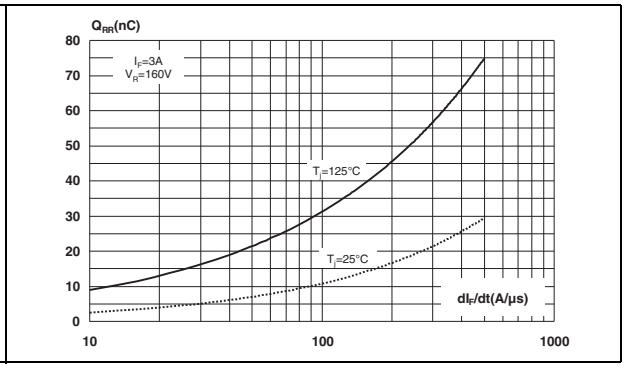


Figure 9. Reverse recovery time versus dI_F/dt (typical values)

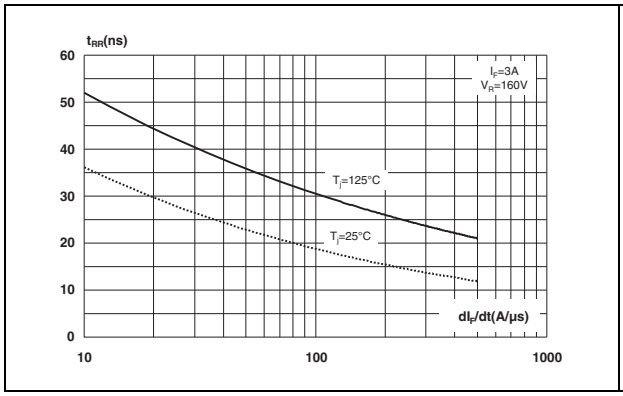


Figure 10. Peak reverse recovery current versus dI_F/dt (typical values)

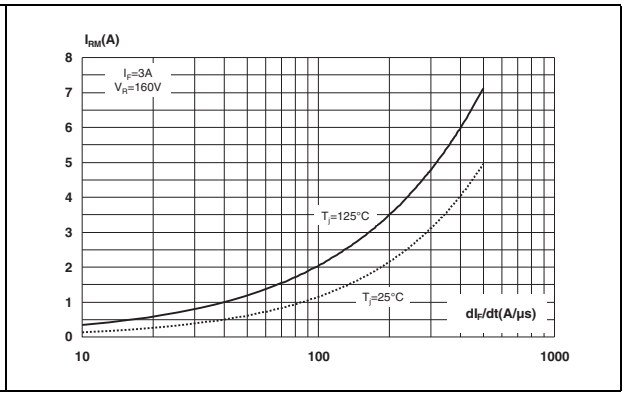


Figure 11. Dynamic parameters versus junction temperature

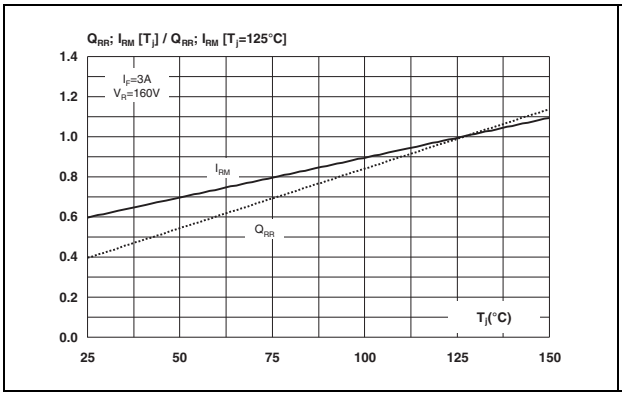


Figure 12. Thermal resistance junction to ambient versus copper surface under each lead

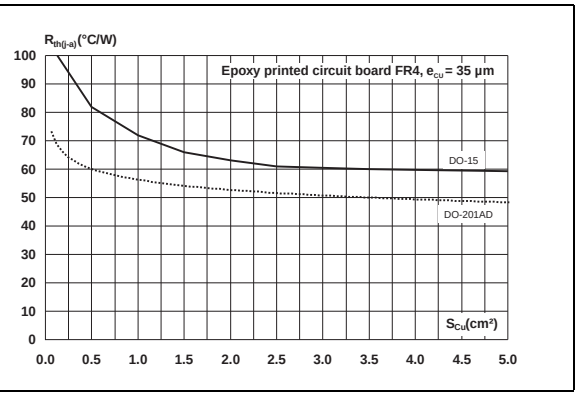


Figure 13. Thermal resistance versus copper surface under each lead for SMC

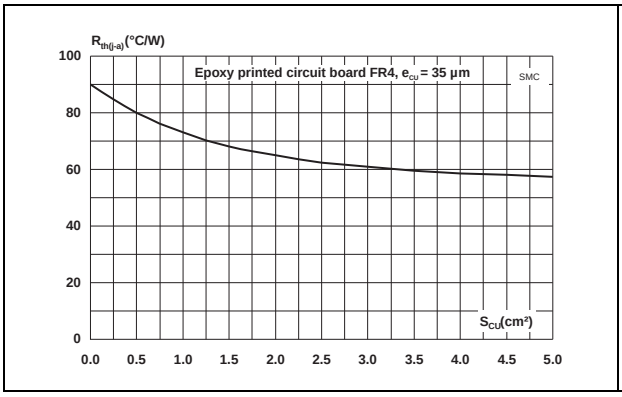
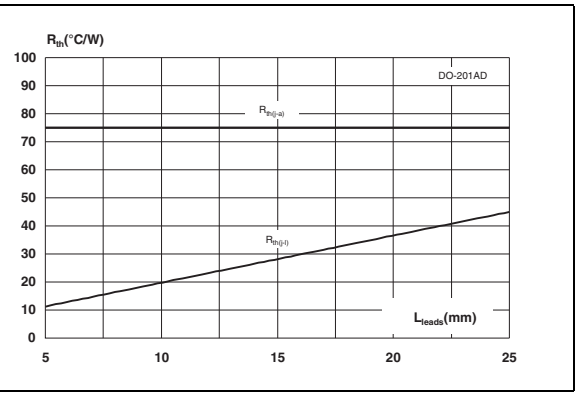
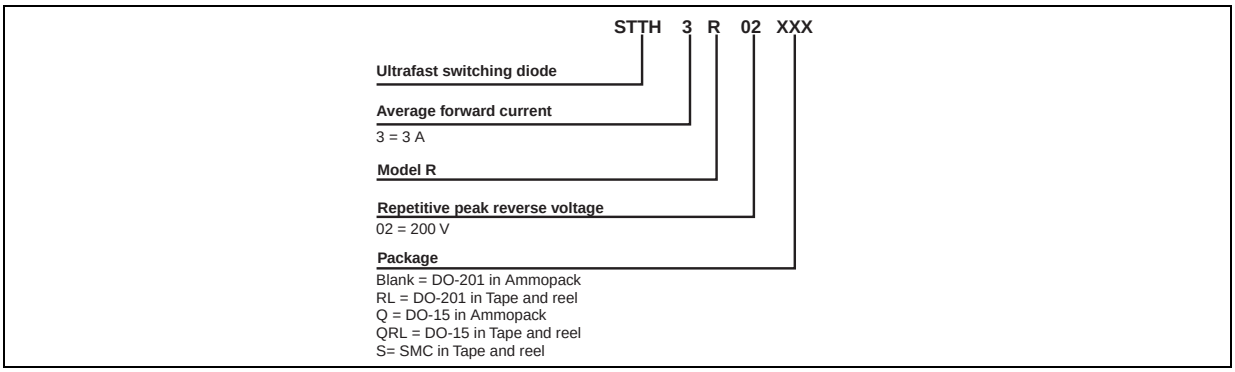


Figure 14. Thermal resistance versus lead length for DO-201AD package



2 Ordering information scheme

Figure 15. Ordering information scheme

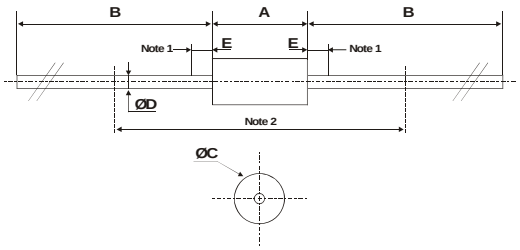


3 Package information

- Epoxy meets UL94, V0
- Cooling method: by conduction (C)

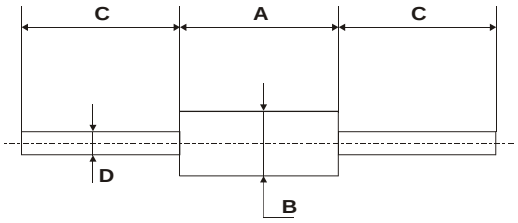
In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: www.st.com. ECOPACK® is an ST trademark.

Table 6. DO-201AD dimensions



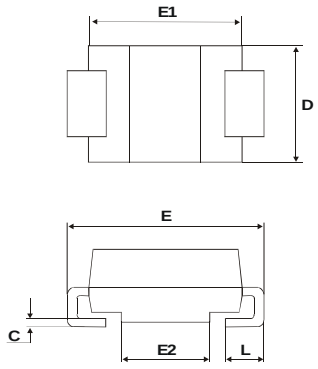
Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A		9.50		0.374
B	25.40		1.000	
C		5.30		0.209
D		1.30		0.051
E		1.25		0.049
Notes	1 - The lead diameter ø D is not controlled over zone E 2 - The minimum length which must stay straight between the right angles after bending is 0.59"(15mm)			

Table 7. DO-15 dimensions



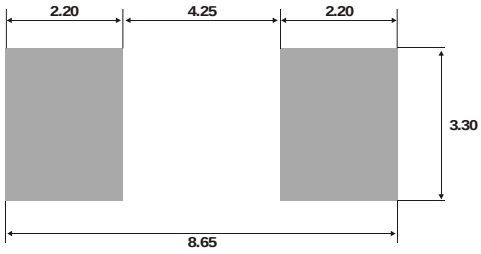
Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	6.05	6.75	0.238	0.266
B	2.95	3.53	0.116	0.139
C	26	31	1.024	1.220
D	0.71	0.88	0.028	0.035

Table 8. SMC dimensions



Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A1	1.90	2.45	0.075	0.096
A2	0.05	0.20	0.002	0.008
b	2.90	3.2	0.114	0.126
c	0.15	0.41	0.006	0.016
E	7.75	8.15	0.305	0.321
E1	6.60	7.15	0.260	0.281
E2	4.40	4.70	0.173	0.185
D	5.55	6.25	0.218	0.246
L	0.75	1.60	0.030	0.063

Figure 16. SMC footprint (dimensions in mm)



4 Ordering information

Table 9. Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
STTH3R02	STTH3R02	DO-201AD	1.16 g	600	Ammopack
STTH3R02RL	STTH3R02	DO-201AD	1.16 g	1900	Tape and reel
STTH3R02Q	STTH3R02	DO-15	0.4 g	1000	Ammopack
STTH3R02QRL	STTH3R02	DO-15	0.4 g	6000	Tape and reel
STTH3R02S	3R2S	SMC	0.243 g	2500	Tape and reel

5 Revision history

Table 10. Document revision history

Date	Revision	Changes
03-May-2006	1	First issue.
10-Oct-2006	2	Added SMC package.
17-Apr-2014	3	Updated ECOPACK statement. Reformatted to current standards.

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