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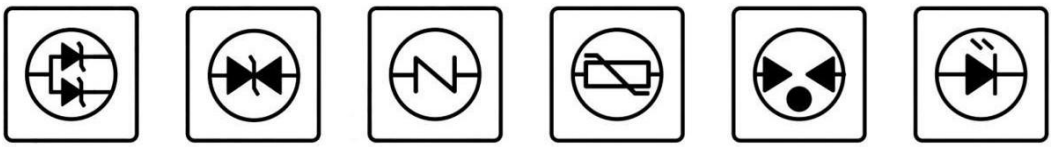
SEMICONDUCTOR



STTH212x-MS

Product specification

STTH212x-MS

High voltage ultrafast diode

Description

This device is an ultrafast diode based on a high voltage planar technology, it is perfectly suited for freewheeling, clamping, snubbering, demagnetization in power supplies and other power switching applications.

Housed in SMB and SMC packages, this diode reduces the losses in high switching frequency operations.

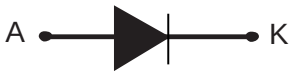
Features

- Low forward voltage drop
- High reliability
- High surge current capability
- Soft switching for reduced EMI disturbances
- Planar technology

Reference News

STTH212U-MS	MARKING
 DO-214AA(SMB)	MSKSEMI U22

STTH212S-MS	MARKING
 DO-214AB(SMC)	MSKSEMI S12



Device summary

Symbol	Value
$I_{F(AV)}$	2 A
V_{RRM}	1200 V
T_j	175 °C
V_F (typ.)	1.0 V
t_{rr} (max.)	75 ns

Characteristics

Absolute ratings (limiting values per diode at 25 °C, unless otherwise specified)

Symbol	Parameter			Value	Unit
V_{RRM}	Repetitive peak reverse voltage			1200	V
$V_{(RMS)}$	RMS voltage			850	V
$I_{F(AV)}$	Average forward current δ = 0.5, square wave	SMB	T_{lead} = 90 °C	2	A
		SMC	T_{lead} = 105 °C		
$I_{F(RMS)}$	RMS forward current			10	A
I_{FSM}	Forward surge current t_p = 8.3 ms			40	
T_{stg}	Storage temperature range			-50 to +175	°C
T_j	Maximum operating junction temperature			175	°C

Thermal parameters

Symbol	Parameter		Maximum	Unit
$R_{th(j-l)}$	Junction to lead	SMB	25	°C/W
		SMC	20	

Static electrical characteristics (per diode)

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
I_R	Reverse leakage current	T_j = 25 °C	$V_R = V_{RRM}$	-		10	μA
		T_j = 125 °C		-		100	
V_F	Forward voltage drop	T_j = 25 °C	I_F = 2 A	-		1.75	V
		T_j = 125 °C		-	1.07	1.50	
		T_j = 150 °C		-	1.0	-	

To evaluate the conduction losses, use the following equation:

$P = 1.26 \times I_{F(AV)} + 0.12 \times I_{F^2(RMS)}$

Dynamic characteristics

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
t_{rr}	Reverse recovery time	T_j = 25 °C	I_F = 1 A; dI_F/dt = -100 A/μs; V_R = 30 V	-	-	75	ns
t_{fr}	Forward recovery time	T_j = 25 °C	I_F = 2 A; dI_F/dt = 50 A/μs; V_{FR} = 1.1 x V_{Fmax}	-	-	500	
V_{FP}	Forward recovery voltage			-	-	30	V

Characteristics (curves)

Figure 1: Conduction losses versus average forward current

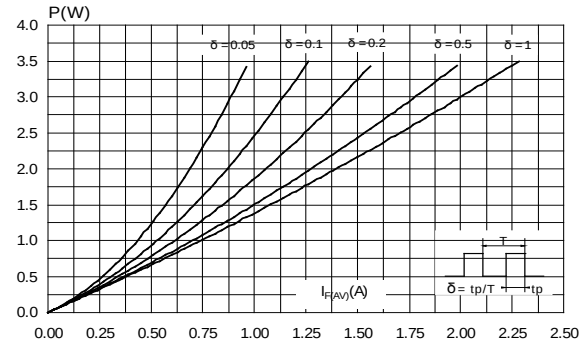


Figure 2: Forward voltage drop versus forward current

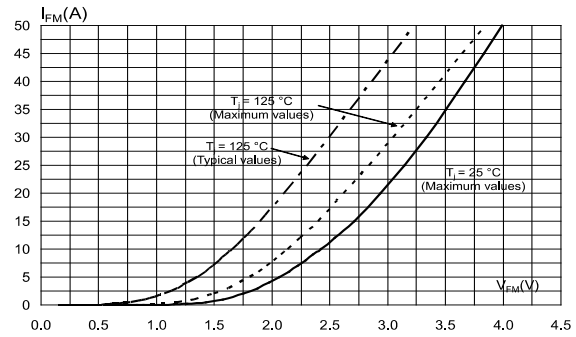


Figure 3: Relative variation of thermal impedance junction to ambient versus pulse duration (Epoxy printed circuit board FR4, S_{CU} = 1 cm2)

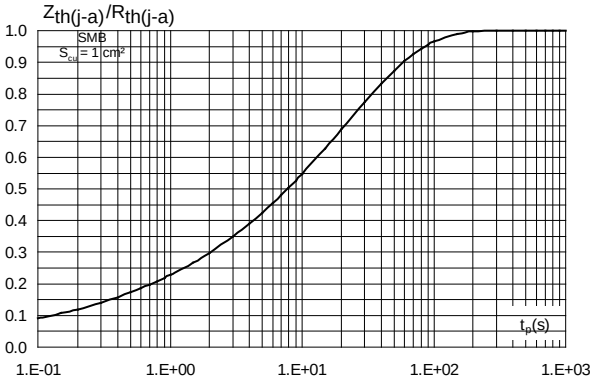


Figure 4: Relative variation of thermal impedance junction to ambient versus pulse duration (Epoxy printed circuit board FR4, S_{CU} = 1 cm2)

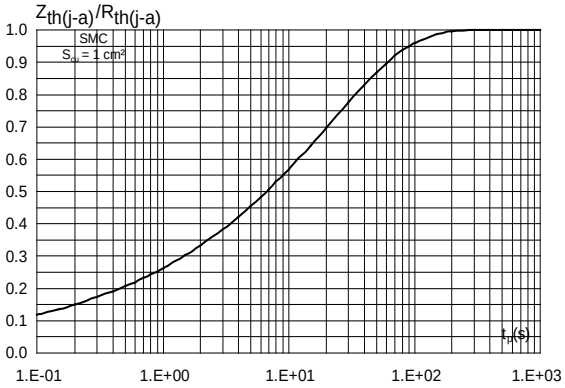


Figure 5: Reverse recovery current versus dI_F/dt (typical values)

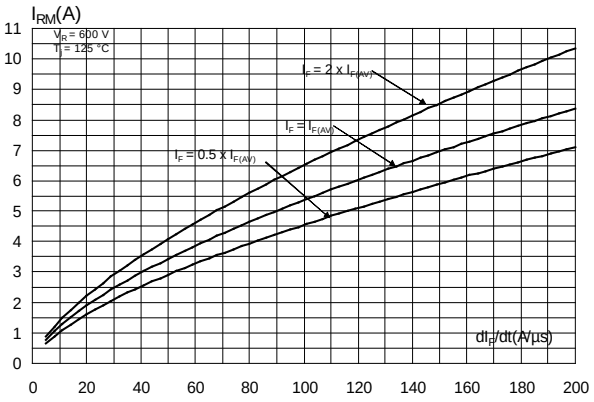


Figure 6: Reverse recovery time versus dI_F/dt (typical values)

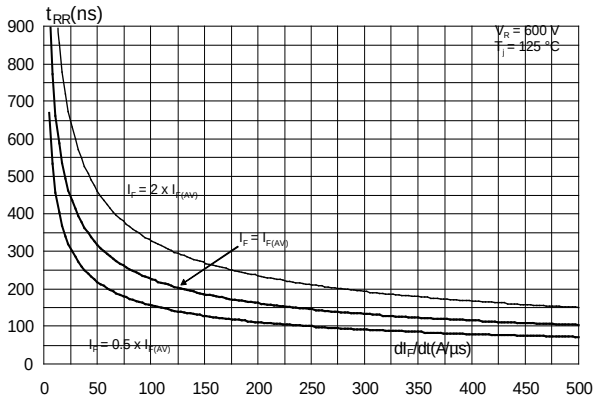


Figure 7: Reverse recovery charges versus dI_F/dt (typical values)

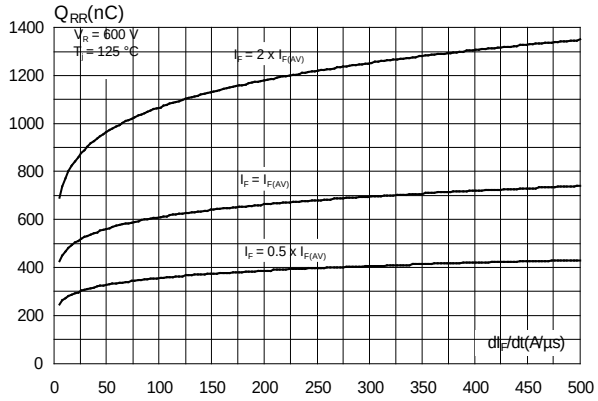


Figure 8: Softness factor versus dI_F/dt (typical values)

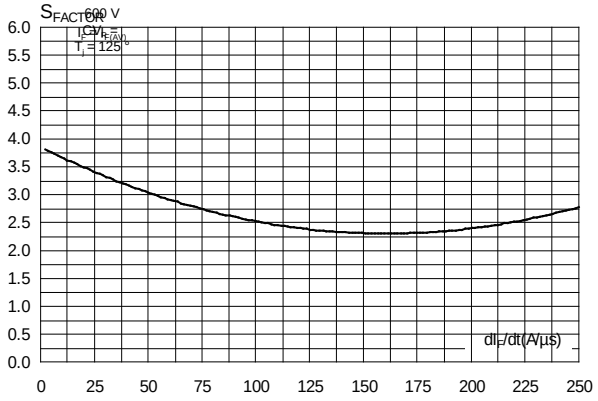


Figure 9: Relative variations of dynamic parameters versus junction temperature

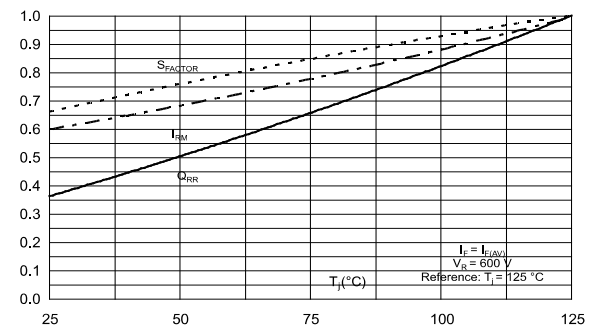


Figure 10: Transient peak forward voltage versus dI_F/dt (typical values)

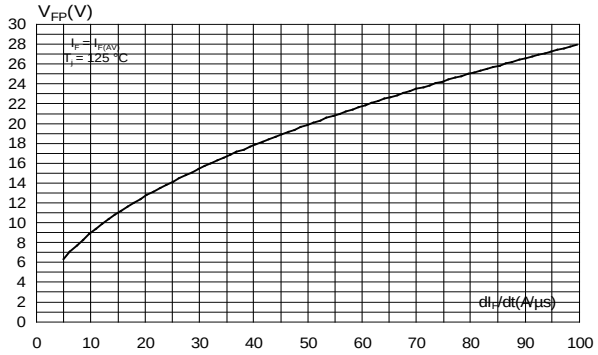


Figure 11: Forward recovery time versus dI_F/dt (typical values)

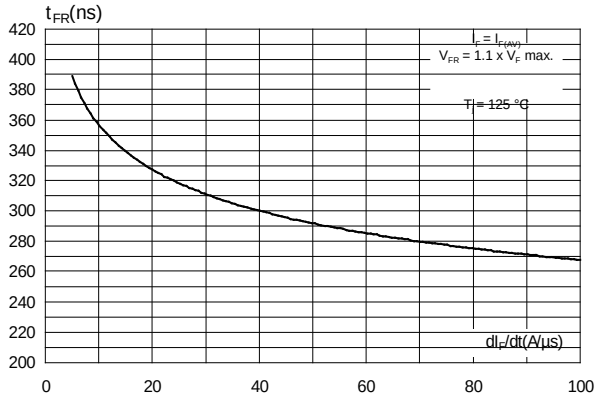


Figure 12: Junction capacitance versus reverse voltage applied (typical values)

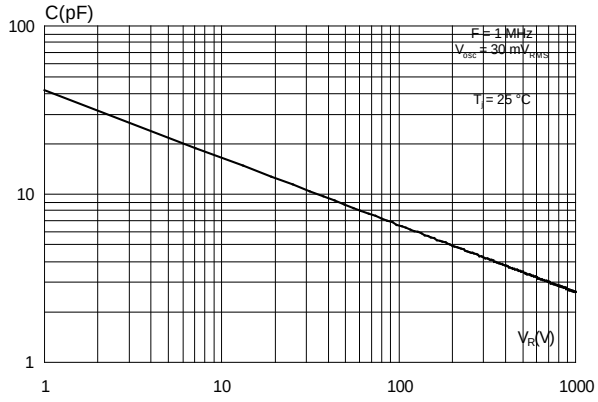
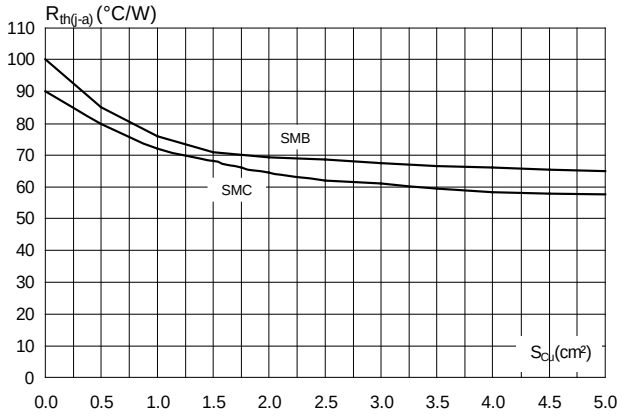
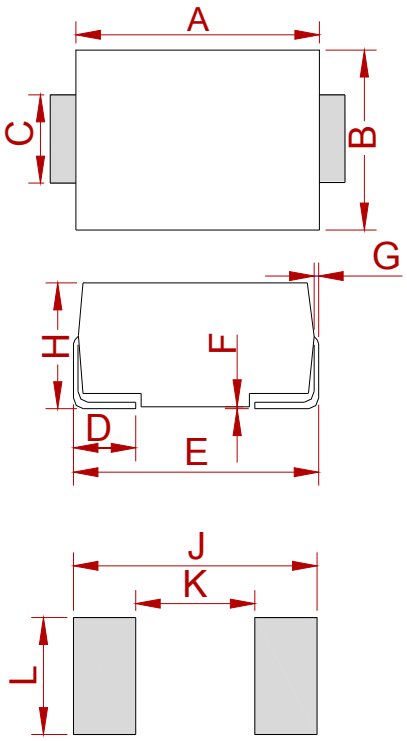


Figure 13: Thermal resistance junction to ambient versus copper surface under each lead (Epoxy printed circuit board FR4, e_{CU} = 35 µm)



PACKAGE MECHANICAL DATA



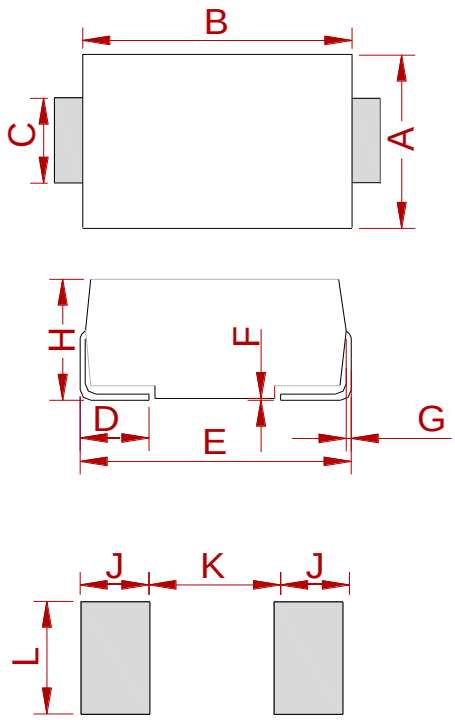
DO-214AA (SMB)

Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.25	4.75	0.167	0.187
B	3.30	3.94	0.130	0.155
C	1.85	2.21	0.073	0.087
D	0.76	1.52	0.030	0.060
E	5.08	5.59	0.200	0.220
F	0.051	0.203	0.002	0.008
G	0.15	0.31	0.006	0.012
H	2.11	2.44	0.083	0.096
J	6.80		0.270	
K		2.60		0.100
L	2.40		0.090	

REELSPECIFICATION

P/N	PKG	QTY
STTH212U-MS	DO-214AA (SMB)	2500

PACKAGE MECHANICAL DATA



DO-214AB (SMC)

Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	5.75	6.25	0.226	0.246
B	6.90	7.40	0.272	0.291
C	2.75	3.25	0.108	0.128
D	0.95	1.52	0.037	0.060
E	7.70	8.20	0.303	0.323
F	0.051	0.203	0.002	0.008
G	0.15	0.31	0.006	0.012
H	2.15	2.62	0.085	0.103
J	2.40		0.094	
K		4.20		0.165
L	3.30		0.130	

REEL SPECIFICATION

P/N	PKG	QTY
STTH212S-MS	DO-214AB (SMC)	2500

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