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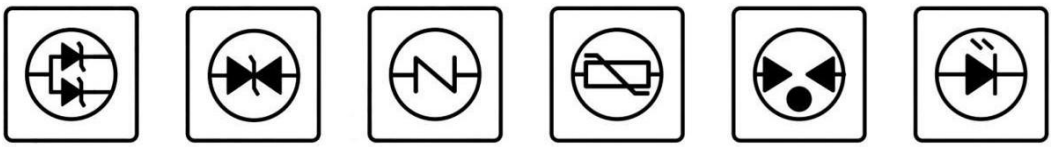
SEMICONDUCTOR



STTH1R06x-MS

Product specification

STTH1R06x-MS

ultrafast high voltage rectifier

Description

The STTH1R06x-MS, which is using Turbo 2 600 V technology, is specially suited as boost diode in power factor correction circuitry.

The device is also intended for use as a free wheeling diode in power supplies and other power switching applications.

Features

- Ultrafast switching
- Low reverse recovery current
- Low thermal resistance
- Reduces switching and conduction losses

Reference News

STTH1R06A-MS	MARKING
 DO-214AC(SMA)	MSKSEMI HR6

STTH1R06U-MS	MARKING
 DO-214AA(SMB)	MSKSEMI BR6

Device summary

Symbol	Value
$I_{F(AV)}$	1 A
V_{RRM}	600 V
I_R (max)	75 µA
T_j	175 °C
V_F (typ)	1.0 V
t_{rr} (max)	25 ns

Electrical characteristics

Absolute ratings (limiting values)

Symbol	Parameter			Value	Unit
V_{RRM}	Repetitive peak reverse voltage			600	V
$I_{F(RMS)}$	Forward rms current	SMA / SMB		7	A
$I_{F(AV)}$	Average forward current	SMA	T_c = 125 °C δ = 0.5	1	A
		SMB	T_c = 135 °C δ = 0.5		
I_{FSM}	Surge non repetitive forward current	SMA / SMB	t_p = 10ms sinusoidal	25	A
				20	
T_{stg}	Storage temperature range			-65 to + 175	°C
T_j	Maximum operating junction temperature			175	°C

Thermal resistance

Symbol	Parameter		Value(max)	Unit
$R_{th(j-l)}$	Junction to lead	SMA	30	°C/W
		SMB	25	

1. $R_{th(j-a)}$ is measured with a copper area S = Scm2 (see *Figure 14*).

Static electrical characteristics

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
I_R	Reverse leakage current	T_j = 25 °C	$V_R = V_{RRM}$			1	μA
		T_j = 150 °C			10	75	
V_F	Forward voltage drop	T_j = 25 °C	I_F = 1A			1.7	V
		T_j = 150 °C			1.0	1.25	

To evaluate the conduction losses use the following equation: $P = 1.03 \times I_{F(AV)} + 0.27\ I_F{}^2{}_{(RMS)}$

Dynamic characteristics

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
t_{rr}	Reverse recovery time	T_j = 25 °C	I_F = 0.5A I_{rr} = 0.25A I_R =1A			25	ns
			I_F = 1A dI_F/dt = -50 A/μs V_R =30V		30	45	
t_{fr}	Forward recovery time	T_j = 25 °C	I_F = 1A dI_F/dt = 100 A/μs V_{FR} = 1.1 x V_{Fmax}			100	ns
V_{FP}	Forward recovery voltage	T_j = 25 °C	I_F = 1A dI_F/dt = 100 A/μs V_{FR} = 1.1 x V_{Fmax}			10	V

Figure 1. Conduction losses versus average forward current

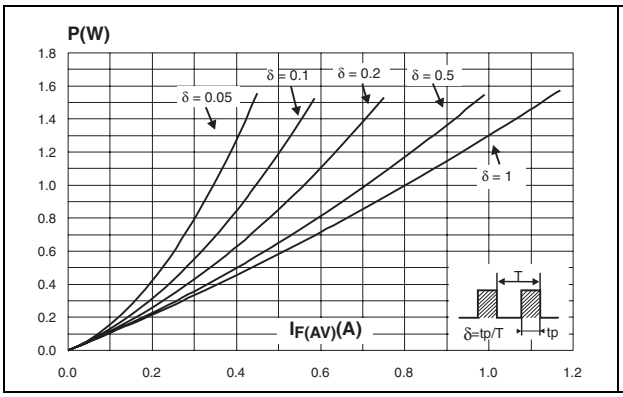


Figure 2. Forward voltage drop vs forward current

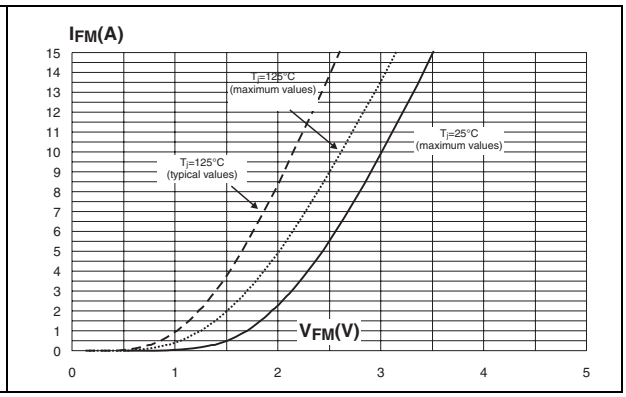


Figure 3. Relative variation of thermal impedance junction to case vs pulse duration (DO-41)

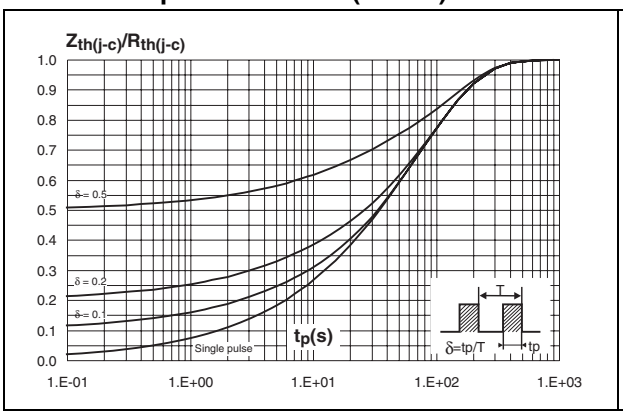


Figure 4. Relative variation of thermal impedance junction to case vs pulse duration (SMA)

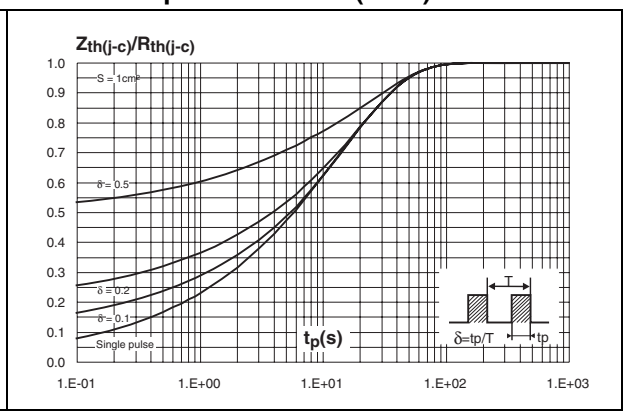


Figure 5. Relative variation of thermal impedance junction to case vs pulse duration (SMB)

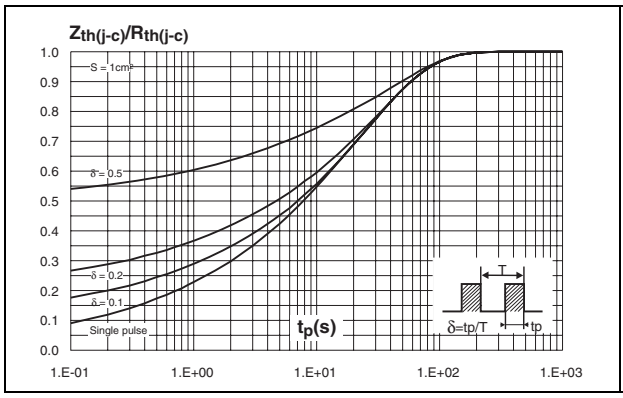


Figure 6. Peak reverse recovery current vs dI_F/dt (typical values)

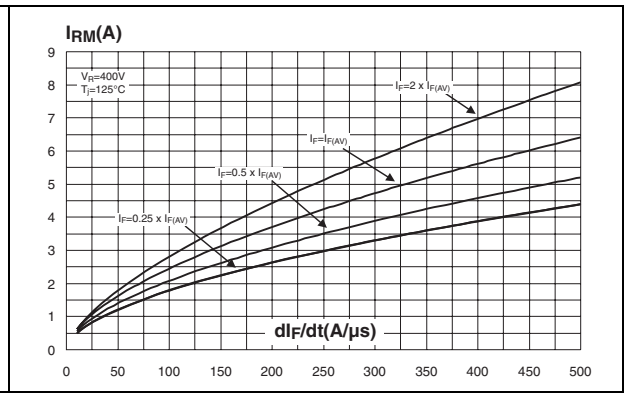


Figure 7. Reverse recovery time versus dI_F/dt (typical values)

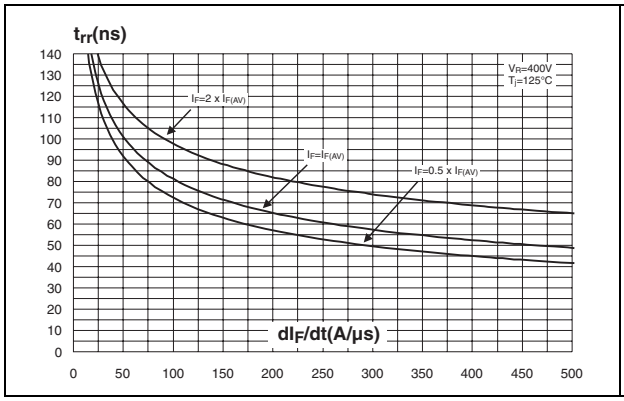


Figure 8. Reverse recovery charges versus dI_F/dt (typical values)

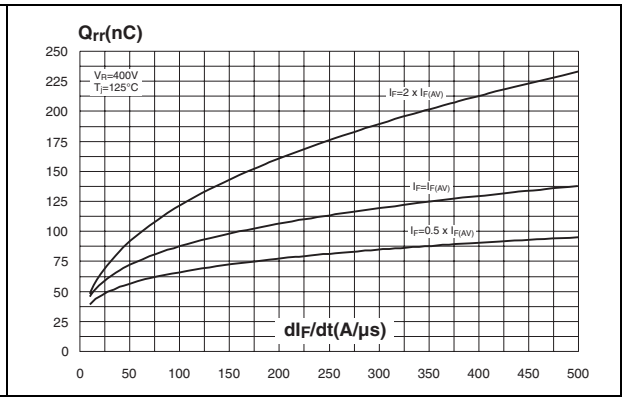


Figure 9. Reverse recovery softness factor vs dI_F/dt (typical values)

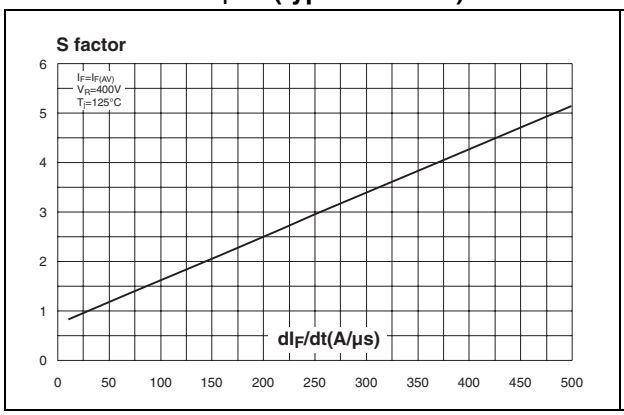


Figure 10. Relative variations of dynamic parameters vs junction temperature

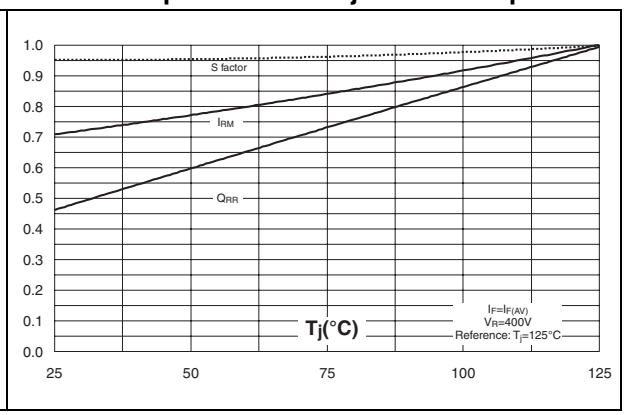


Figure 11. Transient peak forward voltage vs dI_F/dt (typical values)

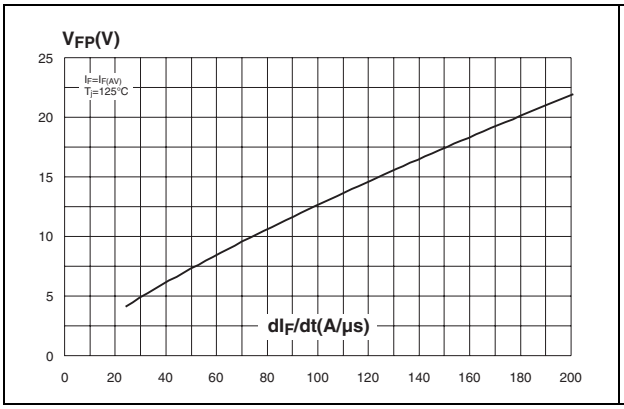


Figure 12. Forward recovery time vs dI_F/dt (typical values)

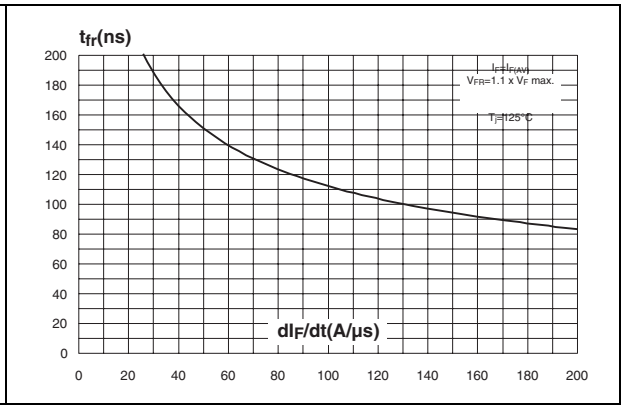


Figure 13. Junction capacitance versus reverse voltage applied (typical values)

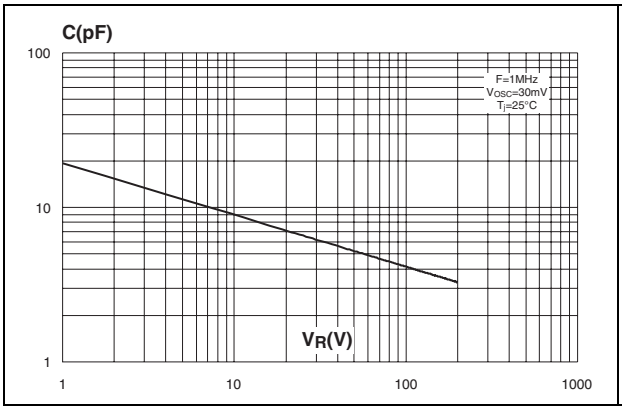


Figure 14. Thermal resistance junction to ambient versus copper surface under each lead

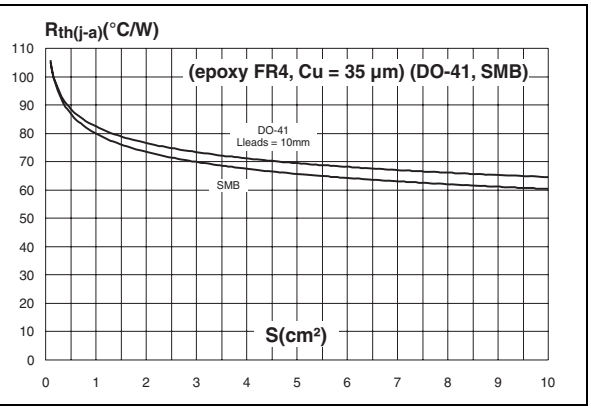
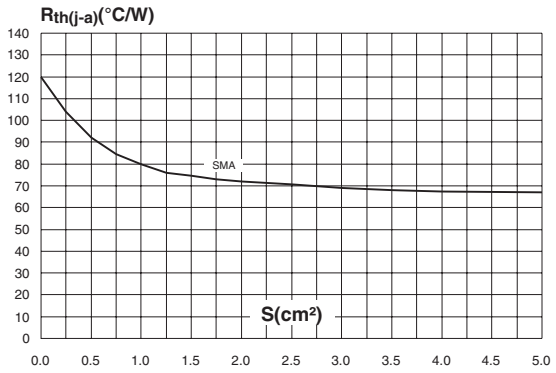
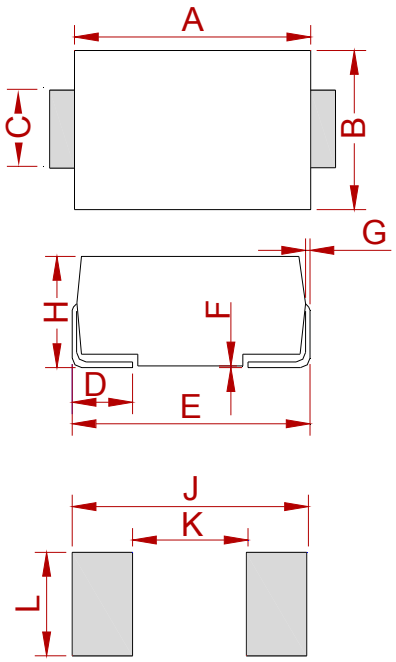


Figure 15. Thermal resistance junction to ambient versus copper surface under each lead (epoxy FR4, Cu = 35 µm) (SMA)



PACKAGE MECHANICAL DATA



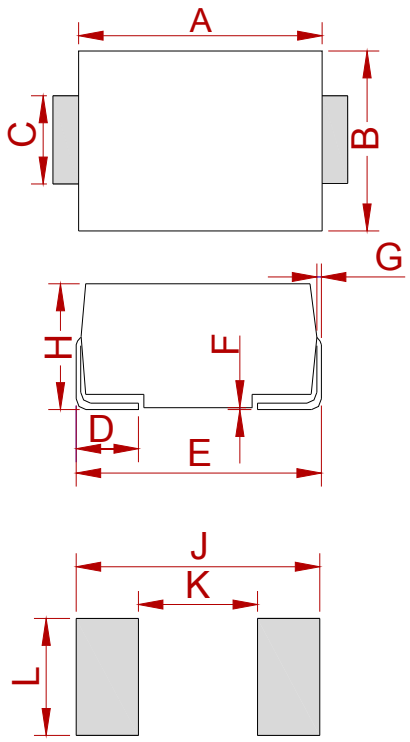
DO-214AC (SMA)

Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.25	4.65	0.167	0.183
B	2.50	2.90	0.098	0.114
C	1.35	1.65	0.053	0.065
D	0.76	1.52	0.030	0.060
E	4.93	5.28	0.194	0.208
F	0.051	0.203	0.002	0.008
G	0.15	0.31	0.006	0.012
H	1.98	2.41	0.078	0.095
J	6.50		0.256	
K		2.30		0.090
L	1.70		0.067	

REEL SPECIFICATION

P/N	PKG	QTY
STTH1R06A-MS	DO-214AC (SMA)	5000

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
STTH1R06U-MS	DO-214AA (SMB)	2500

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