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STTH2R02x-MS

Product specification

Description

The STTH2R02x-MS uses 200 V planar Pt doping technology, and it is specially suited for switching mode base drive and transistor circuits.

Packaged in SMA, SMB, the STTH2R02x-MS is optimized for use low voltage, high frequency inverters, free wheeling and polarity protection

Features

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

Applications

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

Reference News

STTH2R02A-MS	MARKING
 DO-214AC(SMA)	

STTH2R02U-MS	MARKING
 DO-214AA(SMB)	



Device summary

Symbol	Value
$I_F(AV)$	2 A
V_{RRM}	200 V
$T_{j(max.)}$	175 °C
$V_F(typ.)$	0.7 V
$t_{rr}(typ.)$	15 ns

Characteristics

Absolute ratings (limiting values)

Symbol	Parameter			Value	Unit
V _{RRM}	Repetitive peak reverse voltage			200	V
I _{F(AV)}	Average forward current $\delta = 0.5$, square wave	SMA	T _L = 90 °C	2	A
		SMB	T _L = 90 °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	Operating junction temperature			+175	°C

Thermal parameters

Symbol	Parameter		Max. value	Unit
R _{th(j-l)}	Junction to lead	SMA / SMB	30	°C/W

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

- AN5088 : Rectifiers thermal management, handling and mounting recommendations

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		-	2	20	
V _F (2)	Forward voltage drop	T _j = 25 °C	I _F = 6 A	-		1.20	V
		T _j = 25 °C	I _F = 2 A	-	0.89	1.00	
		T _j = 100 °C		-	0.76	0.85	
		T _j = 150 °C		-	0.70	0.80	

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

2. Pulse test: t_p = 380 μs, $\delta < 2\%$

To evaluate the conduction losses, use the following equation:

$$P = 0.68 \times I_{F(AV)} + 0.06 \times I_{F(RMS)}^2$$

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

Dynamic characteristics (T_j = 25 °C unless otherwise specified)

Symbol	Parameters	Test conditions	Min.	Typ.	Max.	Unit
t _{rr}	Reverse recovery time	I _# = 1 A, dI _F /dt = -50 A/μs, V _R = 30 V	-	23	30	ns
		I _# = 1 A, dI _F /dt = -100 A/μs, V _R = 30 V	-	15	20	
I _{RM}	Reverse recovery current	F = 2 A, dI _F /dt = -200 A/μs, V _R = 160 V, T _j = 125 °C	-	3	4	A
t _{fr}	Forward recovery time	F = 2 A, dI _F /dt = 100 A/μs, V _{FR} = 1.1 V _{F(max.)}	-	40		ns
V _{FP}	Forward recovery voltage	I _F = 2 A, dI _F /dt = 100 A/μs	-	2.0		V

Characteristics (curves)

Figure 1. Peak current versus duty cycle

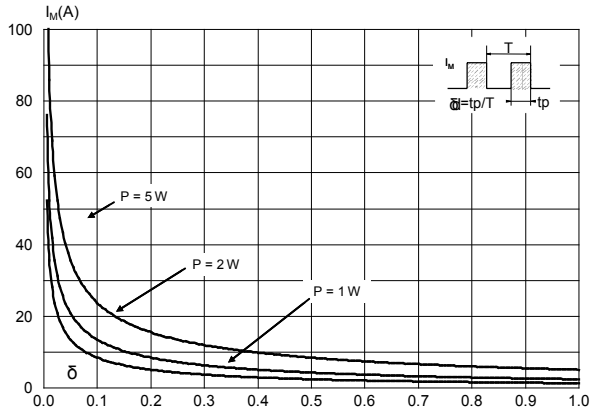


Figure 2. Forward voltage drop versus forward current (typical values)

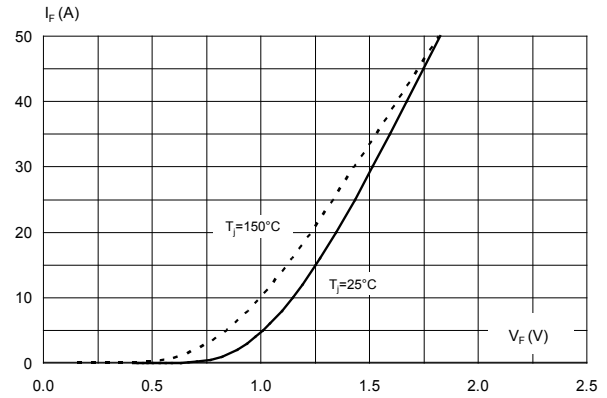


Figure 3. Forward voltage drop versus forward current (maximum values)

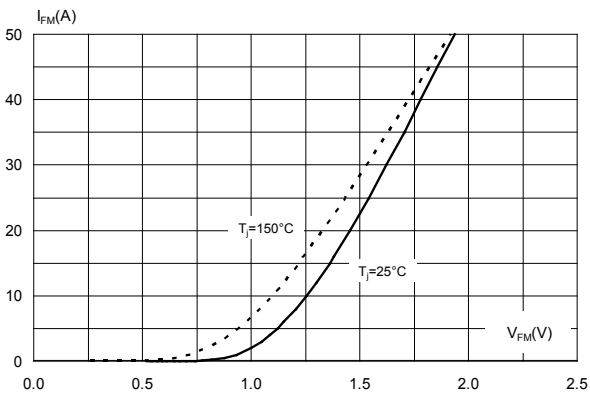


Figure 4. Relative variation of thermal impedance junction to lead versus pulse duration (SMA)

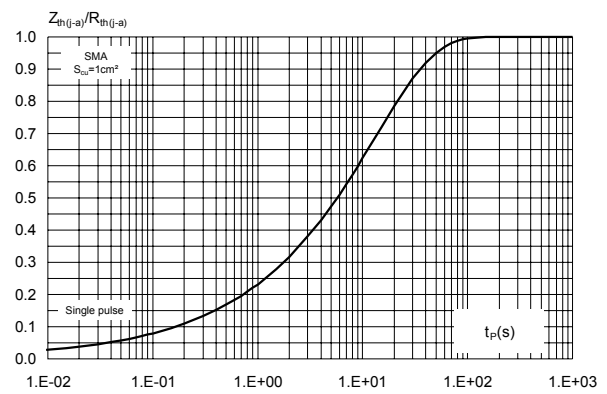


Figure 5. Relative variation of thermal impedance junction to lead versus pulse duration (SMB)

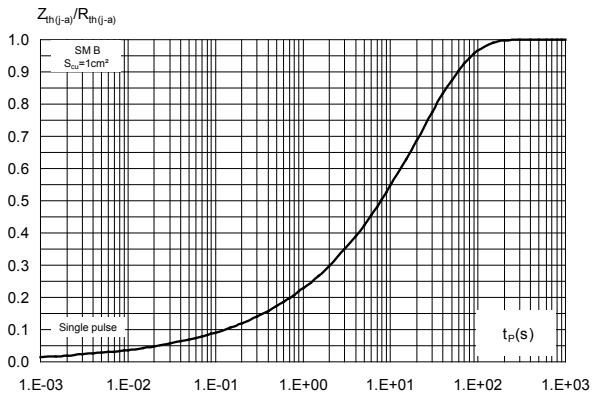


Figure 6. Junction capacitance versus reverse voltage applied (typical values)

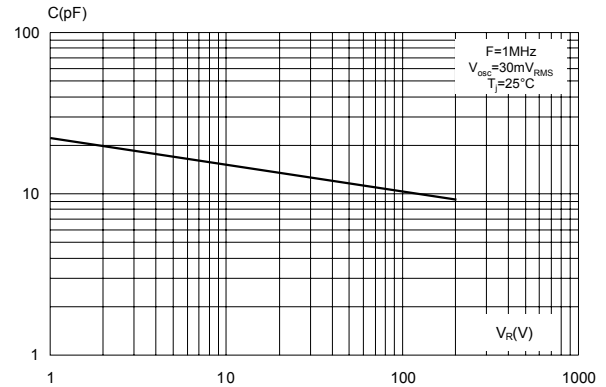


Figure 7. Reverse recovery charges versus di_F/dt (typical values)

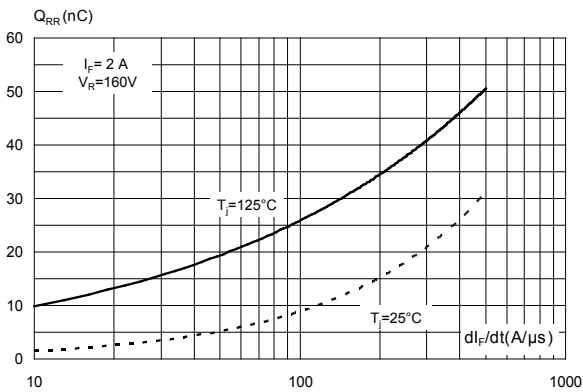


Figure 8. Reverse recovery time versus di_F/dt (typical values)

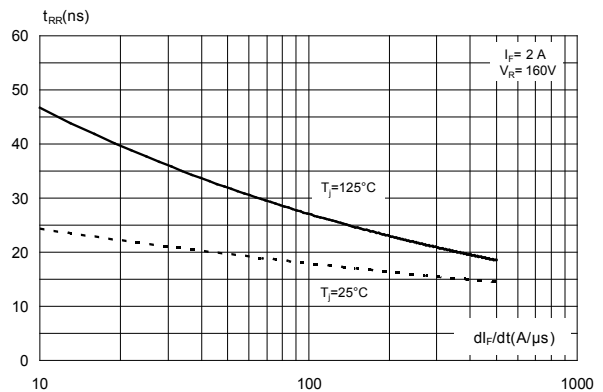


Figure 9. Peak reverse recovery current versus di_F/dt (typical values)

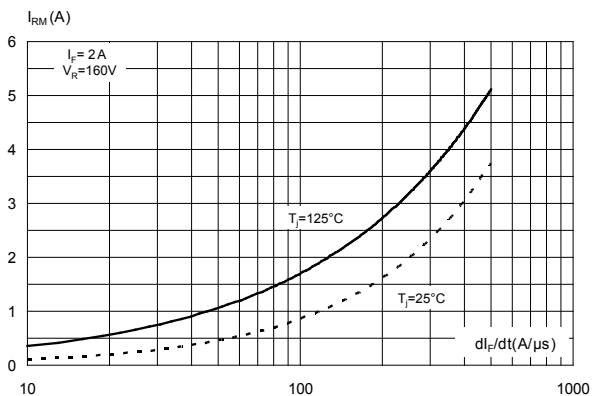


Figure 10. Relative variations of dynamic parameters versus junction temperature

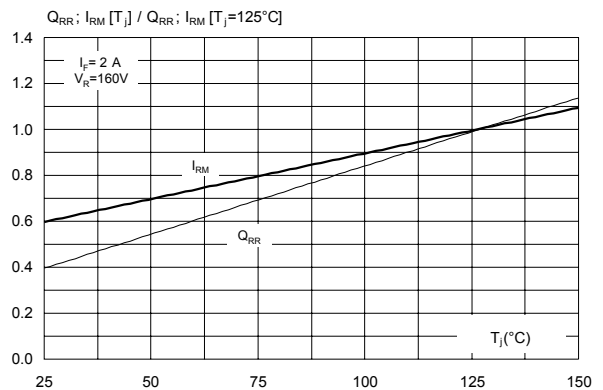


Figure 11. Thermal resistance junction to ambient versus copper surface under each lead (typical values)

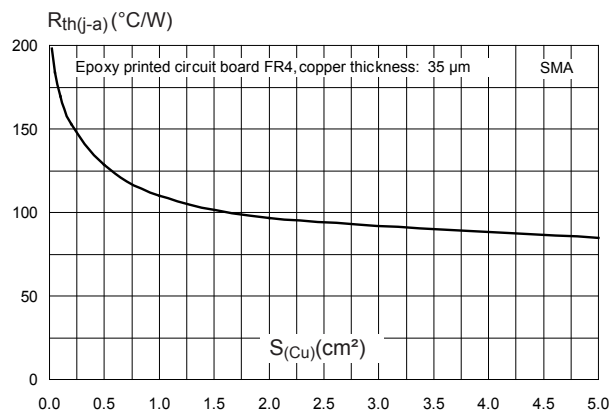
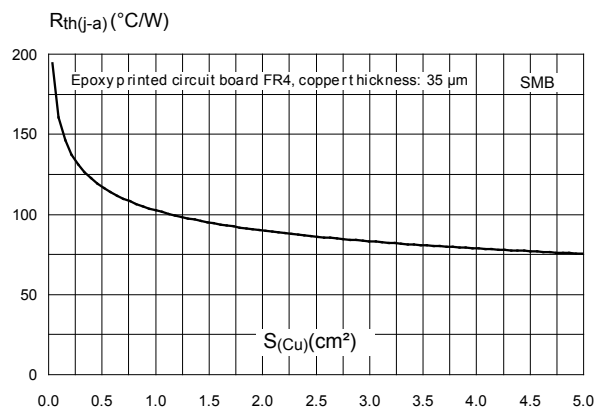
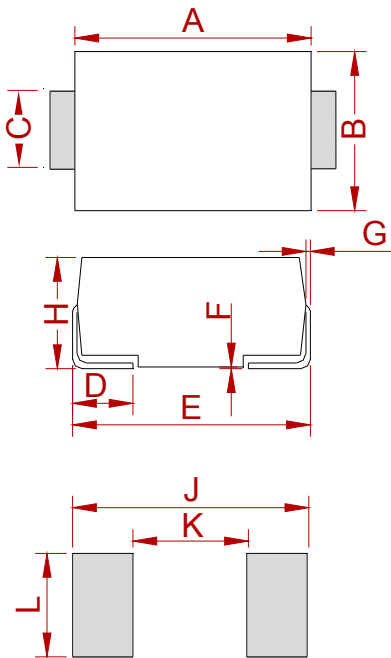


Figure 12. Thermal resistance junction to ambient versus copper surface under each lead (typical values)



PACKAGE MECHANICAL DATA



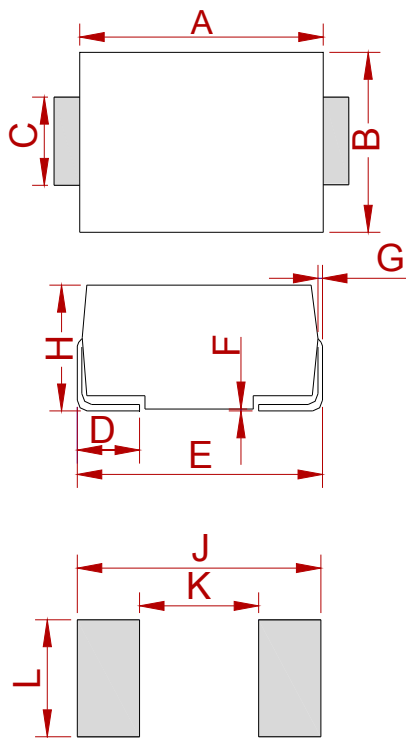
DO-214AC (SMA)

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
STTH2R02A-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	

REEL SPECIFICATION

P/N	PKG	QTY
STTH2R02U-MS	DO-214AA (SMB)	2500

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