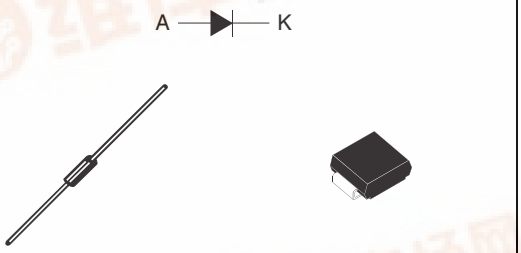
STTH2R06

HIGH EFFICIENCY ULTRAFAST DIODE

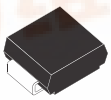
Table 1: Main Product Characteristics

$I_{F(AV)}$	2 A
V_{RRM}	600 V
T_j	175°C
V_F (typ)	1 V
t_{rr} (typ)	35 ns

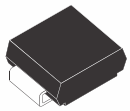


DO-41
STTH2R06

SMA
STTH2R06A



SMB
STTH2R06U



SMC
STTH2R06S

FEATURES AND BENEFITS

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

DESCRIPTION

The STTH2R06 is using ST Turbo 2 600V planar Pt doping technology. It is specially suited for switching mode base drive & transistor circuits. Packaged in axial, SMA, SMB and SMC, this device is intended for use in high frequency inverters, free wheeling and polarity protection.

Table 2: Order Codes

Part Number	Marking
STTH2R06	STTH2R06
STTH2R06RL	STTH2R06
STTH2R06A	R6A
STTH2R06U	R6U
STTH2R06S	R62

Table 3: Absolute Ratings (limiting values)

Symbol	Parameter			Value	Unit
V_{RRM}	Repetitive peak reverse voltage			600	V
$I_{F(RMS)}$	RMS forward voltage			7	A
$I_{F(AV)}$	Average forward current $\delta = 0.5$	DO-41	T_L = 70°C	2	A
		SMA	T_L = 85°C		
		SMB	T_L = 100°C		
		SMC	T_L = 115°C		
I_{FSM}	Surge non repetitive forward current	DO-41	t_p = 10ms sinusoidal	40	A
		SMA / SMB / SMC		30	
T_{stg}	Storage temperature range			-65 to + 175	°C
T_j	Operating junction temperature range			-40 to + 175	°C

Table 4: Thermal Resistance

Symbol	Parameter		Value (max).	Unit
$R_{th(j-l)}$	Junction to lead	DO-41 L = 5 mm	35	°C/W
		SMA	30	
		SMB	25	
		SMC	20	

Table 5: Static Electrical Characteristics

Symbol	Parameter	Test conditions		Min.	Typ	Max.	Unit
I_R *	Reverse leakage current	T_j = 25°C	$V_R = V_{RRM}$			2	µA
		T_j = 150°C			12	85	
V_F **	Forward voltage drop	T_j = 25°C	I_F = 2A			1.7	V
		T_j = 150°C			1.0	1.25	

Pulse test: * tp = 5 ms, δ < 2%

** tp = 380 µs, δ < 2%

To evaluate the conduction losses use the following equation: $P = 1 \times I_{F(AV)} + 0.125\ I_F{}^2{}_{(RMS)}$

Table 6: Dynamic Characteristics

Symbol	Parameter	Test conditions		Min.	Typ	Max.	Unit
t_{rr}	Reverse recovery time	T_j = 25°C	I_F = 0.5A Irr = 0.25A I_R =1A			30	ns
			I_F = 1A dI_F/dt = -50 A/µs V_R =30V		35	50	
t_{fr}	Forward recovery time	T_j = 25°C	I_F = 2A dI_F/dt = 100 A/µs $V_{FR} = 1.1 \times V_{Fmax}$			100	ns
V_{FP}	Forward recovery voltage					10	V

Figure 1: Conduction losses versus average forward current

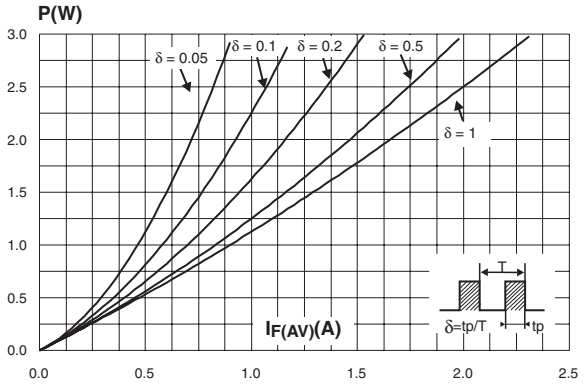


Figure 2: Forward voltage drop versus forward current

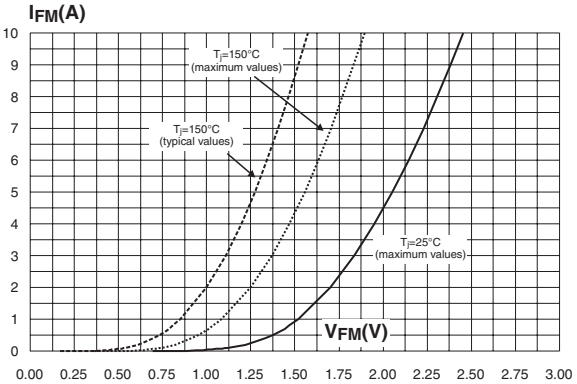


Figure 3: Relative variation of thermal impedance junction to case versus pulse duration (SMA/SMB/SMC: S_{CU} = 1cm²)

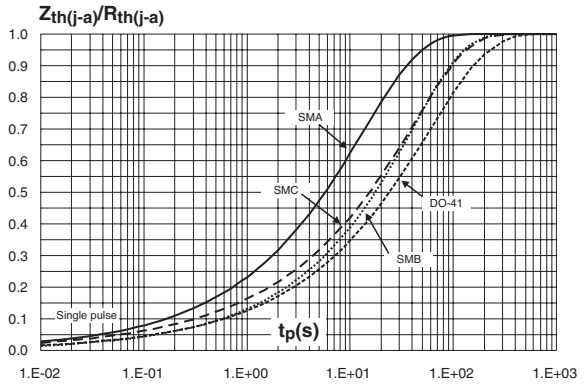


Figure 4: Peak reverse recovery current versus dI_F/dt (typical values)

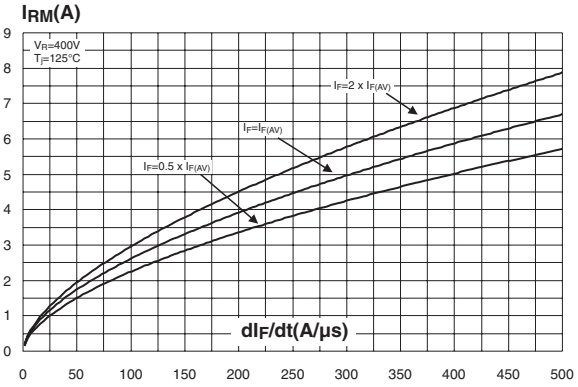


Figure 5: Reverse recovery time versus dI_F/dt (typical values)

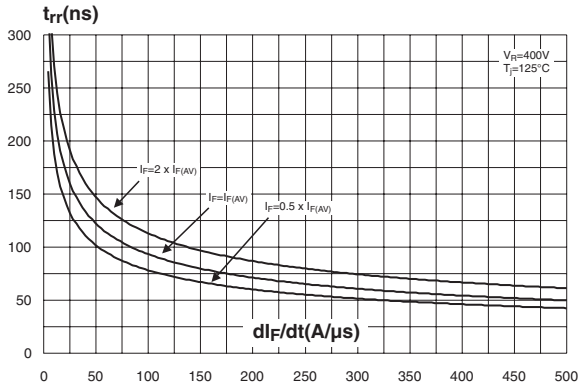


Figure 6: Reverse recovery charges versus dI_F/dt (typical values)

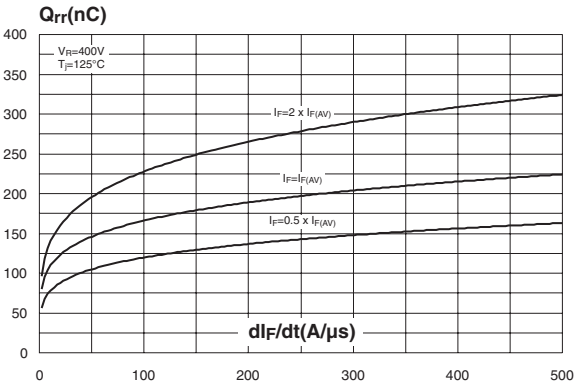


Figure 7: Relative variations of dynamic parameters versus junction temperature

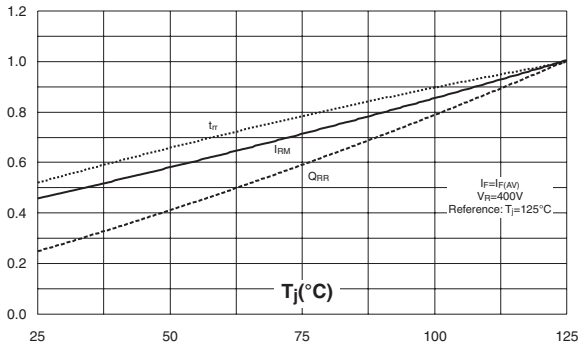


Figure 8: Transient peak forward voltage versus dI_F/dt (typical values)

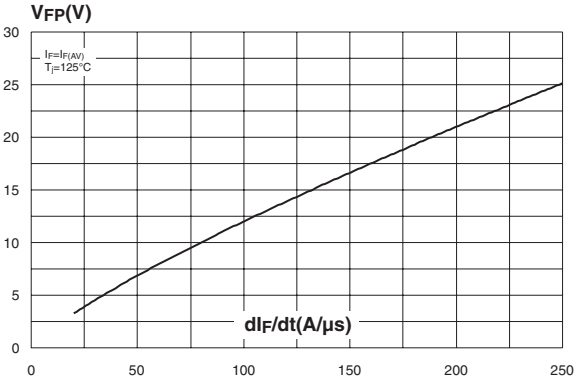


Figure 9: Forward recovery time versus dI_F/dt (typical values)

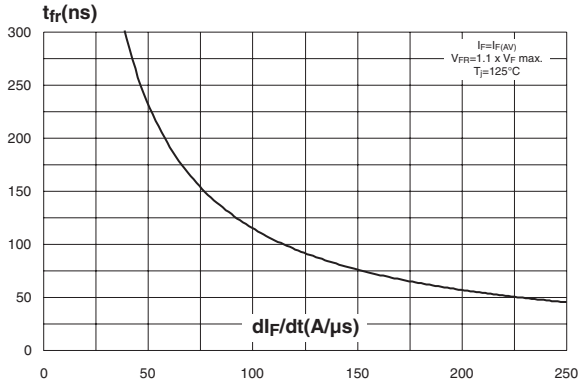


Figure 10: Junction capacitance versus reverse voltage applied (typical values)

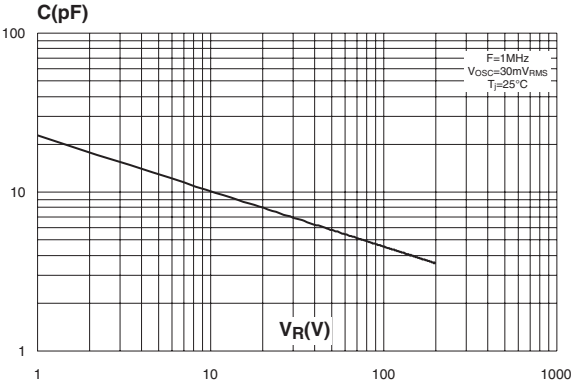


Figure 11: Thermal resistance junction to ambient versus copper surface under each lead (epoxy FR4, e_{CU}=35µm) (SMA/SMB/SMC)

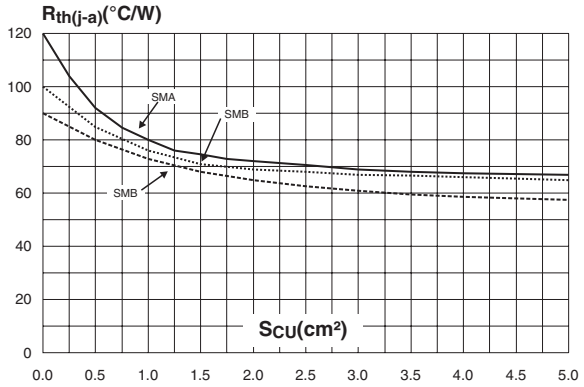


Figure 12: Thermal resistance versus lead length (DO-41)

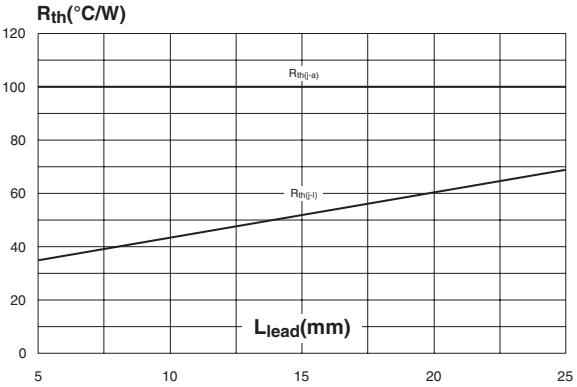
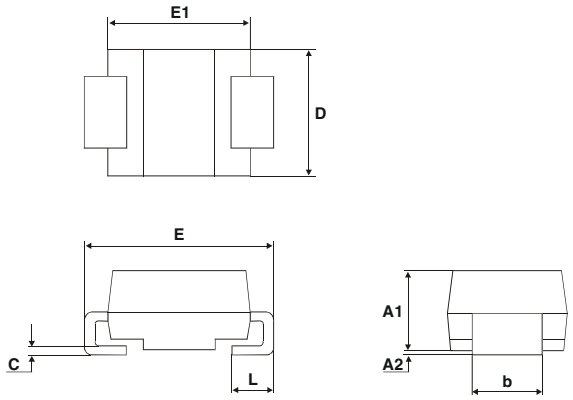


Figure 13: SMA Package Mechanical Data



REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A1	1.90	2.03	0.075	0.080
A2	0.05	0.20	0.002	0.008
b	1.25	1.65	0.049	0.065
c	0.15	0.41	0.006	0.016
E	4.80	5.60	0.189	0.220
E1	3.95	4.60	0.156	0.181
D	2.25	2.95	0.089	0.116
L	0.75	1.60	0.030	0.063

Figure 14: SMA Foot Print Dimensions
(in millimeters)

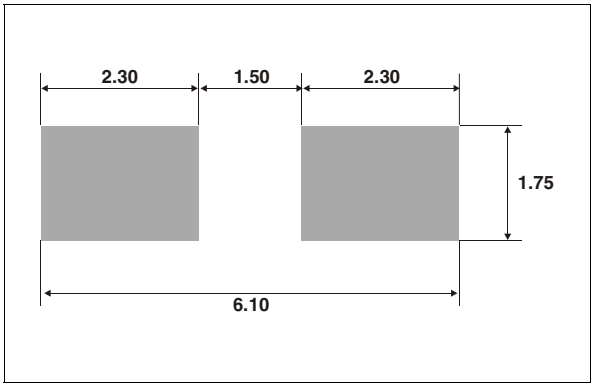
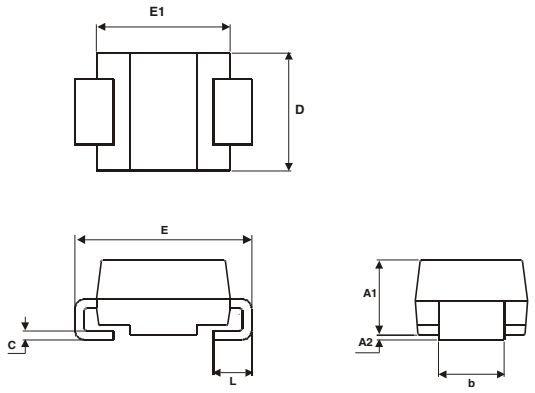


Figure 15: SMB Package Mechanical Data



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	1.95	2.20	0.077	0.087
c	0.15	0.41	0.006	0.016
E	5.10	5.60	0.201	0.220
E1	4.05	4.60	0.159	0.181
D	3.30	3.95	0.130	0.156
L	0.75	1.60	0.030	0.063

Figure 16: SMB Foot Print Dimensions
(in millimeters)

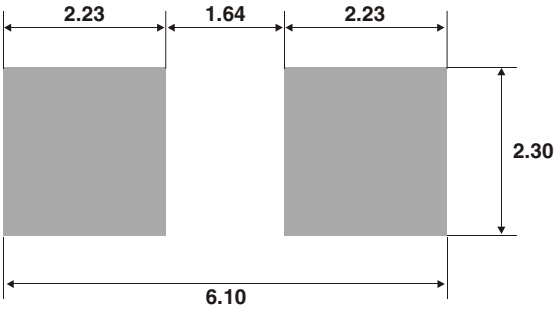
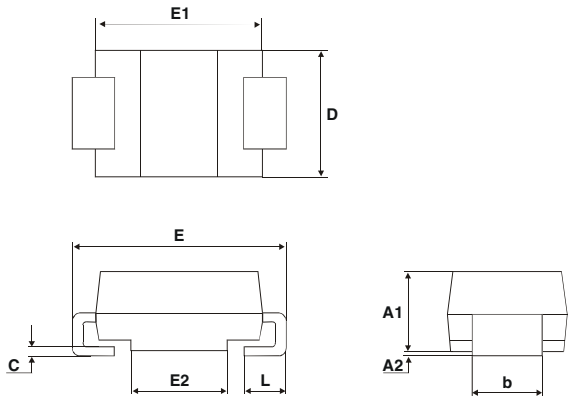


Figure 17: SMC Package Mechanical Data



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 18: SMC Foot Print Dimensions
(in millimeters)

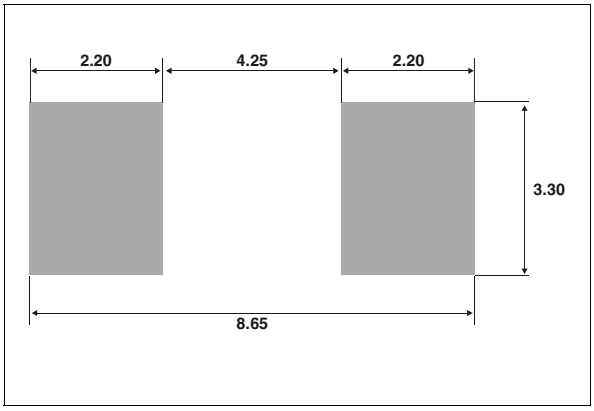
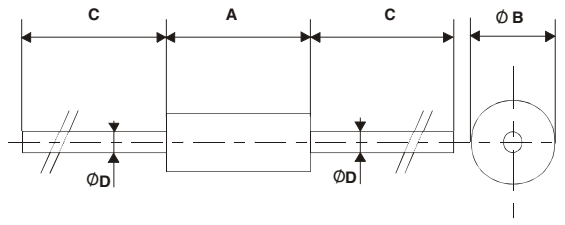


Figure 19: DO-41 Package Mechanical Data



REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.07	5.20	0.160	0.205
B	2.04	2.71	0.080	0.107
C	28		1.102	
D	0.712	0.863	0.028	0.034

Table 7: Ordering Information

Part Number	Marking	Package	Weight	Base qty	Delivery mode
STTH2R06	STTH2R06	DO-41	0.34 g	2000	Ammopack
STTH2R06RL	STTH2R06	DO-41	0.34 g	5000	Tape & reel
STTH2R06A	R6A	SMA	0.068 g	5000	Tape & reel
STTH2R06U	R6U	SMB	0.11 g	2500	Tape & reel
STTH2R06S	R62	SMC	0.243 g	2500	Tape & reel

Table 8: Revision History

Date	Revision	Description of Changes
07-Sep-2004	1	First issue.
1-Jun-2005	2	SMC package addition.