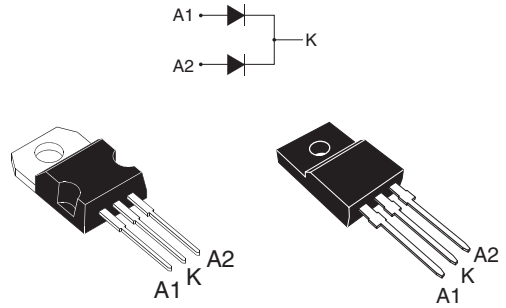
STTH16L06C

TURBO 2 ULTRAFAST HIGH VOLTAGE RECTIFIER

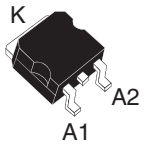
Table 1: Main Product Characteristics

$I_{F(AV)}$	Up to 2 x 10 A
V_{RRM}	600 V
T_j	175°C
V_F (typ)	1.05 V
t_{rr} (max)	35 ns



TO-220AB
STTH16L06CT

TO-220FPAB
STTH16L06CFP



D²PAK
STTH16L06CG

FEATURES AND BENEFITS

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

DESCRIPTION

The STTH16L06, which is using ST Turbo 2 600V technology, is specially suited for use in switching power supplies, and industrial applications, as rectification and discontinuous mode PFC boost diode.

Table 2: Order Codes

Part Number	Marking
STTH16L06CT	STTH16L06CT
STTH16L06CFP	STTH16L06CFP

Part Number	Marking
STTH16L06CG	STTH16L06CG
STTH16L06GG-TR	STTH16L06CG

Table 3: Absolute Ratings (limiting values, per diode)

Symbol	Parameter				Value	Unit
V_{RRM}	Repetitive peak reverse voltage				600	V
$I_{F(RMS)}$	RMS forward voltage				30	A
$I_{F(AV)}$	Average forward current $\delta = 0.5$	TO-220AB / D^2PAK	Tc = 140°C Tc = 135°C Tc = 130°C Tc = 120°C	Per diode Per device Per diode Per device	8 16 10 20	A
		TO-220FPAB	Tc = 110°C Tc = 80°C	Per diode Per device	8 16	
I_{FSM}	Surge non repetitive forward current		tp = 10ms sinusoidal		90	A
T_{stg}	Storage temperature range				-65 to + 175	°C
T_j	Maximum operating junction temperature				175	°C

Table 4: Thermal Resistance

Symbol	Parameter			Value (max).	Unit
$R_{th(j-c)}$	Junction to case	TO-220AB / D^2PAK	Per diode	2.5	°C/W
		TO-220FPAB	Per diode	5	
		TO-220AB / D^2PAK	Total	1.6	
		TO-220FPAB	Total	3.8	
$R_{th(c)}$	Coupling	TO-220AB / D^2PAK		0.7	°C/W
		TO-220FPAB		2.5	

When the diodes 1 and 2 are used simultaneously:
Δ Tj(diode 1) = P(diode 1) x $R_{th(j-c)}$(Per diode) + P(diode 2) x $R_{th(c)}$

Table 5: Static Electrical Characteristics

Symbol	Parameter	Test conditions		Min.	Typ	Max.	Unit
I_R *	Reverse leakage current	T_j = 25°C	$V_R = V_{RRM}$			8	µA
		T_j = 150°C			25	240	
V_F **	Forward voltage drop	T_j = 25°C	I_F = 8A			1.8	V
		T_j = 150°C			1.05	1.35	
		T_j = 25°C	I_F = 16A			2.08	
		T_j = 150°C			1.28	1.64	

Pulse test: * tp = 5 ms, δ < 2%
** tp = 380 µs, δ < 2%

To evaluate the conduction losses use the following equation: P = 1.06 x $I_{F(AV)}$ + 0.036 I_F^2(RMS)

Table 6: Dynamic Characteristics (per diode)

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			35	ns
			I_F = 1A dI_F/dt = 50 A/µs V_R =30V		40	55	
I_{RM}	Reverse recovery current	T_j = 125°C	I_F = 8A V_R = 400V dI_F/dt = 100 A/µs		4.5	6.5	A
t_{fr}	Forward recovery time	T_j = 25°C	I_F = 8A dI_F/dt = 100 A/µs V_{FR} = 1.1 x V_{Fmax}			200	ns
V_{FP}	Forward recovery voltage	T_j = 25°C	I_F = 8A dI_F/dt = 100 A/µs V_{FR} = 1.1 x V_{Fmax}		3.5		V

Figure 1: Conduction losses versus average forward current (per diode)

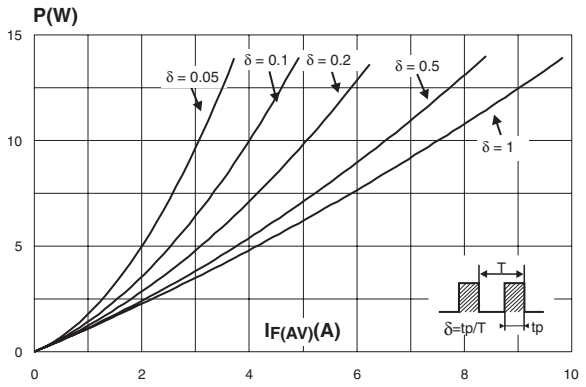


Figure 2: Forward voltage drop versus forward current (per diode)

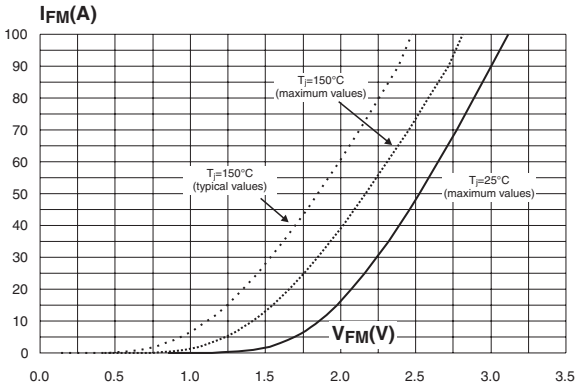


Figure 3: Relative variation of thermal impedance junction to case versus pulse duration (TO-220AB & D^2PAK)

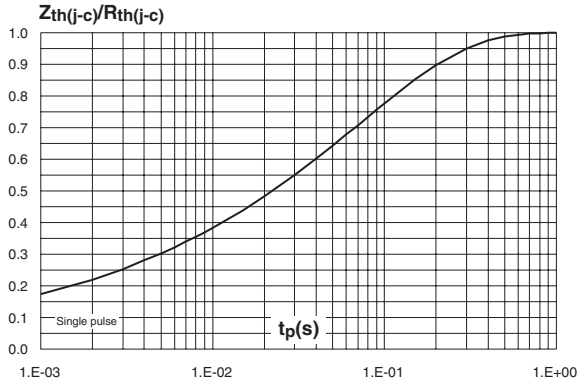


Figure 4: Relative variation of thermal impedance junction to case versus pulse duration (TO-220FPAB)

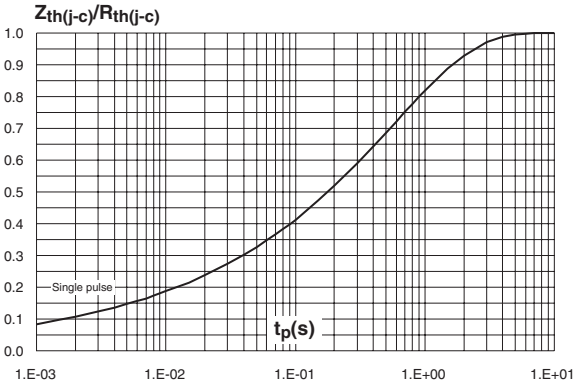


Figure 5: Peak reverse recovery current versus dI_F/dt (typical values, per diode)

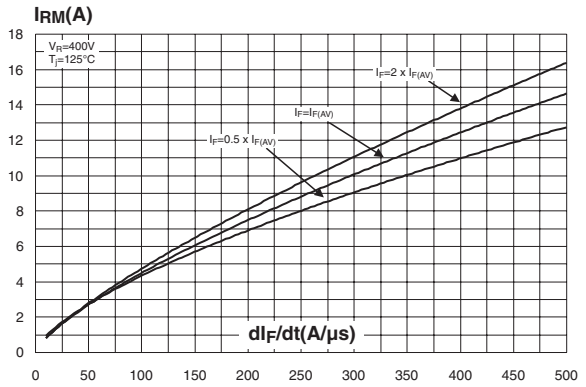


Figure 6: Reverse recovery time versus dI_F/dt (typical values, per diode)

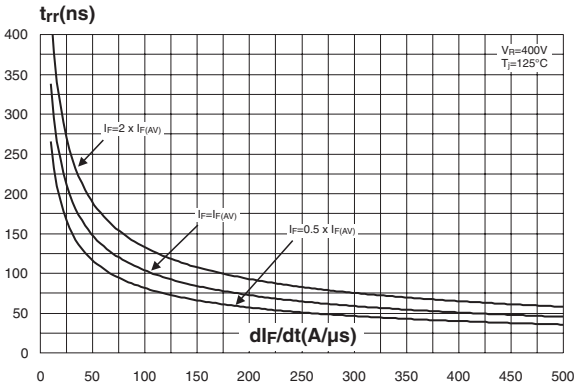


Figure 7: Reverse recovery charges versus dI_F/dt (typical values, per diode)

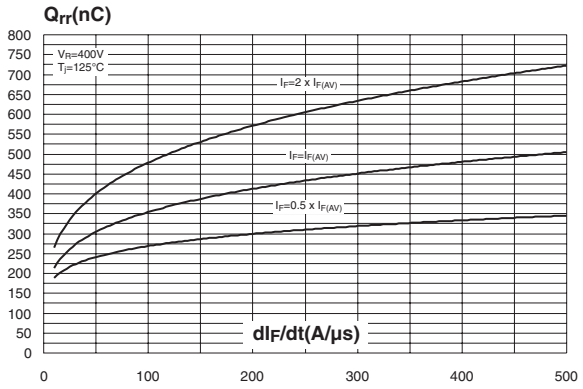


Figure 8: Reverse recovery softness factor versus dI_F/dt (typical values, per diode)

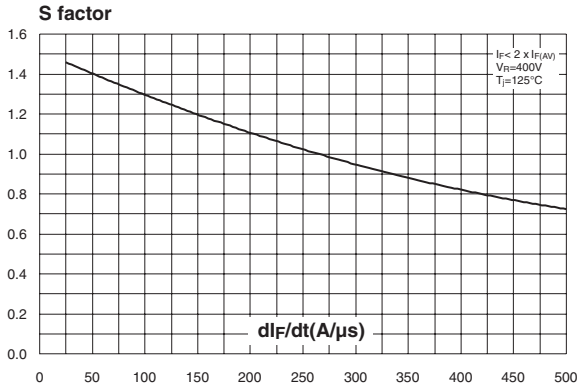


Figure 9: Relative variations of dynamic parameters versus junction temperature

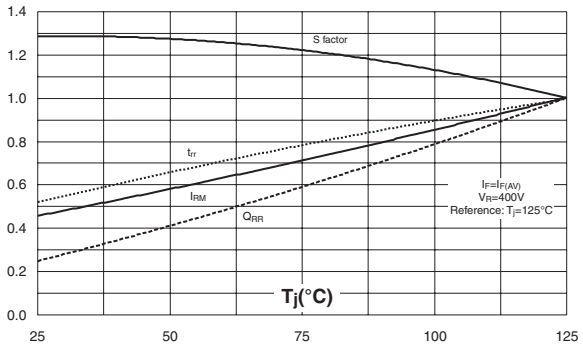


Figure 10: Transient peak forward voltage versus dI_F/dt (typical values, per diode)

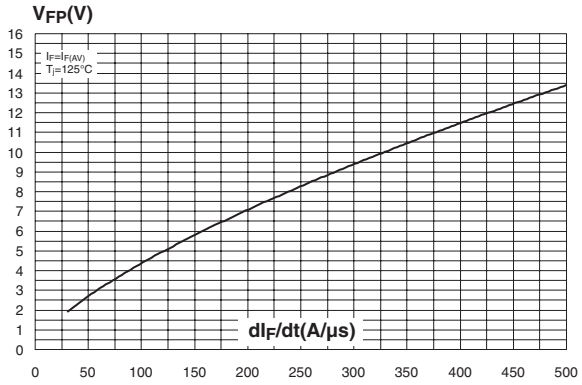


Figure 11: Forward recovery time versus dI_F/dt (typical values, per diode)

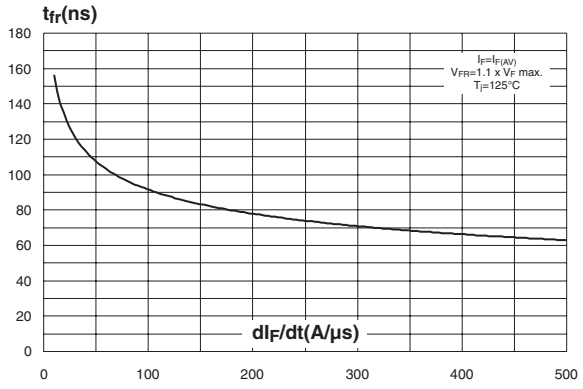


Figure 12: Junction capacitance versus reverse voltage applied (typical values, per diode)

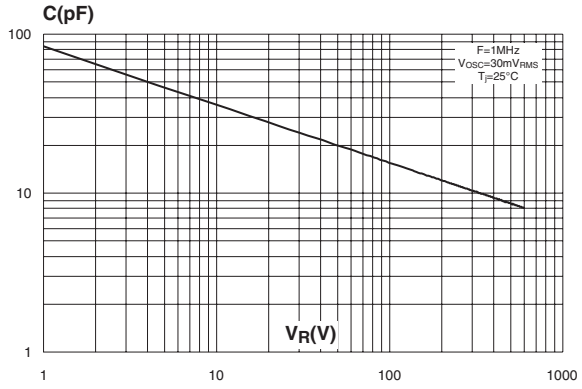


Figure 13: Thermal resistance junction to ambient versus copper surface under tab (epoxy FR4, e_{CU}=35µm) (D^2PAK)

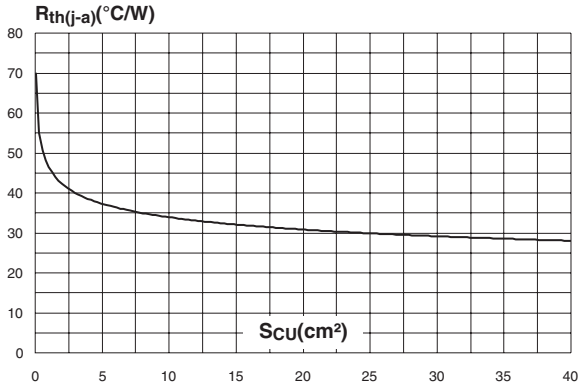
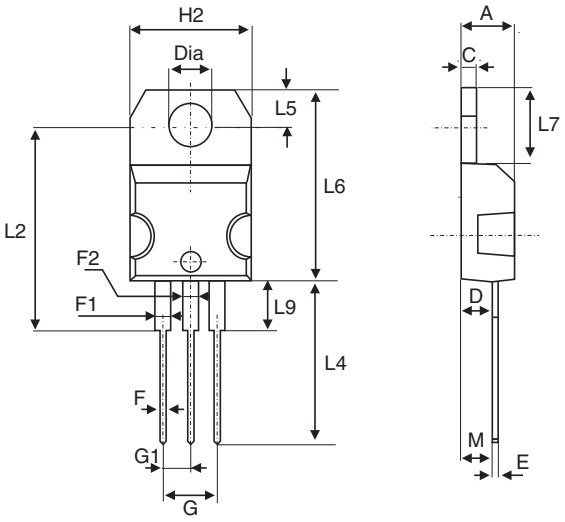
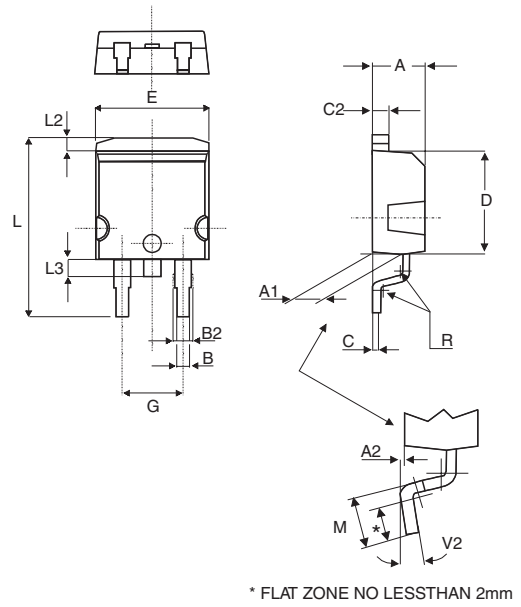


Figure 14: TO-220AB Package Mechanical Data



REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.60	0.173	0.181
C	1.23	1.32	0.048	0.051
D	2.40	2.72	0.094	0.107
E	0.49	0.70	0.019	0.027
F	0.61	0.88	0.024	0.034
F1	1.14	1.70	0.044	0.066
F2	1.14	1.70	0.044	0.066
G	4.95	5.15	0.194	0.202
G1	2.40	2.70	0.094	0.106
H2	10	10.40	0.393	0.409
L2	16.4 typ.		0.645 typ.	
L4	13	14	0.511	0.551
L5	2.65	2.95	0.104	0.116
L6	15.25	15.75	0.600	0.620
L7	6.20	6.60	0.244	0.259
L9	3.50	3.93	0.137	0.154
M	2.6 typ.		0.102 typ.	
Diam.	3.75	3.85	0.147	0.151

Figure 15: D²PAK Package Mechanical Data



REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.60	0.173	0.181
A1	2.49	2.69	0.098	0.106
A2	0.03	0.23	0.001	0.009
B	0.70	0.93	0.027	0.037
B2	1.14	1.70	0.045	0.067
C	0.45	0.60	0.017	0.024
C2	1.23	1.36	0.048	0.054
D	8.95	9.35	0.352	0.368
E	10.00	10.40	0.393	0.409
G	4.88	5.28	0.192	0.208
L	15.00	15.85	0.590	0.624
L2	1.27	1.40	0.050	0.055
L3	1.40	1.75	0.055	0.069
M	2.40	3.20	0.094	0.126
R	0.40 typ.		0.016 typ.	
V2	0°	8°	0°	8°

Figure 16: D²PAK Foot Print Dimensions
(in millimeters)

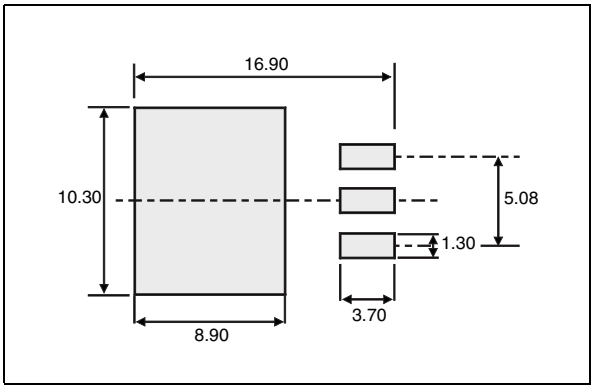
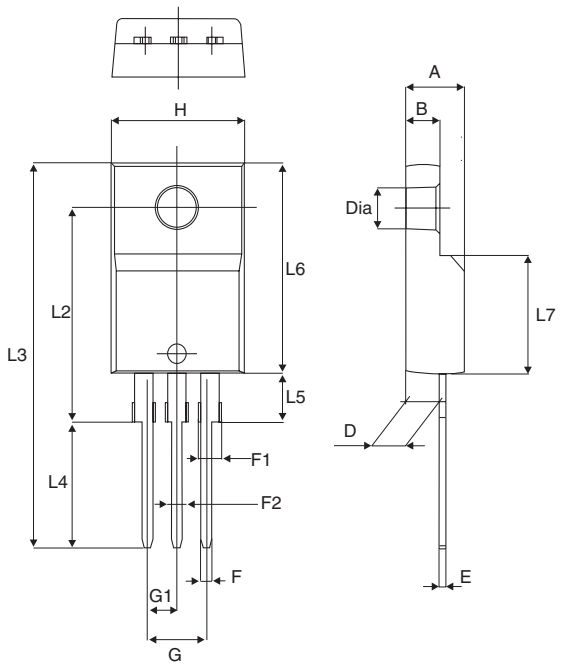


Figure 17: TO-220FPAB Package Mechanical Data



REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.4	4.6	0.173	0.181
B	2.5	2.7	0.098	0.106
D	2.5	2.75	0.098	0.108
E	0.45	0.7	0.018	0.027
F	0.75	1	0.03	0.039
F1	1.15	1.7	0.045	0.067
F2	1.15	1.7	0.045	0.067
G	4.95	5.2	0.195	0.205
G1	2.4	2.7	0.094	0.106
H	10	10.4	0.393	0.409
L2	16	Typ.	0.63	Typ.
L3	28.6	30.6	1.126	1.205
L4	9.8	10.6	0.386	0.417
L5	2.9	3.6	0.114	0.142
L6	15.9	16.4	0.626	0.646
L7	9	9.3	0.354	0.366
Dia.	3	3.2	0.118	0.126

Table 7: Ordering Information

Ordering type	Marking	Package	Weight	Base qty	Delivery mode
STTH16L06CT	STTH16L06CT	TO-220AB	2.23 g	50	Tube
STTH16L06CG	STTH16L06CG	D^2PAK	1.48 g	50	Tube
STTH16L06CG-TR	STTH16L06CG	D^2PAK	1.48 g	1000	Tape & eel
STTH16L06CFP	STTH16L06CFP	TO-220FPAB	1.70 g	50	Tube

- Epoxy meets UL94, V0
- Cooling method: by conduction (C)
- Recommended torque value: 0.8 m.N. (TO-220FPAB) / 0.55 m.N. (TO-220AB)
- Maximum torque value: 1.0 m.N. (TO-220FPAB) / 0.70 m.N. (TO-220AB)

Table 8: Revision History

Date	Revision	Description of Changes
07-Sep-2004	1	First issue

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