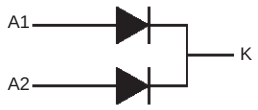
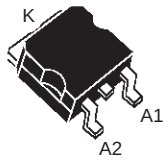
STTH2003CT/CG/CF

HIGH FREQUENCY SECONDARY RECTIFIER

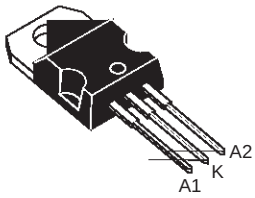
MAJOR PRODUCT CHARACTERISTICS

$I_{F(AV)}$	2 x 10 A
V_{RRM}	300 V
Tj (max)	175 °C
V_F (max)	1 V
trr (max)	35 ns

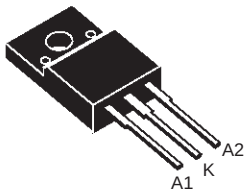




D^2PAK
STTH2003CG



TO-220AB
STTH2003CT



ISOWATT220AB
STTH2003CF

FEATURES AND BENEFITS

- COMBINES HIGHEST RECOVERY AND REVERSE VOLTAGE PERFORMANCE
- ULTRAFAST, SOFT AND NOISE-FREE RECOVERY FOR LOW SIDE EFFECTS

DESCRIPTION

Dual center tap Fast Recovery Epitaxial Diodes suited for Switch Mode Power Supply and high frequency DC/DC converters.

Packaged in TO-220AB or D^2PAK this device is especially intended for secondary rectification.

ABSOLUTE RATINGS (limiting values, per diode)

Symbol	Parameter				Value	Unit
V_{RRM}	Repetitive peak reverse voltage				300	V
$I_{F(RMS)}$	RMS forward current				30	A
$I_{F(AV)}$	Average forward current $\delta = 0.5$	TO-220AB / D^2PAK	Tc=140°C	Per diode	10	A
				Per device	20	
		ISOWATT220AB	Tc=105°C			
I_{FSM}	Surge non repetitive forward current		tp = 10 ms sinusoidal		110	A
I_{RSM}	Non repetitive avalanche current		tp = 20 µs square		5	A
T_{stg}	Storage temperature range				-65 + 175	°C
Tj	Maximum operating junction temperature				175	°C

THERMAL RESISTANCES

Symbol	Parameter			Value	Unit
$R_{th\ (j-c)}$	Junction to case	TO-220AB / D^2PAK	Per diode	2.5	°C/W
			Total	1.3	
		ISOWATT220AB	Per diode	3.2	
			Total	3.9	
$R_{th\ (c)}$		TO-220AB / D^2PAK	Coupling	0.1	
		ISOWATT220AB	Coupling	2.5	

STATIC ELECTRICAL CHARACTERISTICS (per diode)

Symbol	Parameter	Tests conditions		Min.	Typ.	Max.	Unit
I_R*	Reverse leakage current	V_R = 300 V	Tj = 25°C			20	µA
			Tj = 125°C		30	300	
V_F**	Forward voltage drop	I_F = 10 A	Tj = 25°C			1.25	V
		I_F = 10 A	Tj = 125°C		0.85	1	

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

To evaluate the maximum conduction losses use the following equation :
$P = 0.75 \times I_{F(AV)} + 0.025\ I_{F^2(RMS)}$

RECOVERY CHARACTERISTICS

Symbol	Tests conditions		Min.	Typ.	Max.	Unit
trr	I_F = 0.5 A Irr = 0.25 A I_R = 1 A	Tj = 25°C			25	ns
	I_F = 1 A dI_F/dt = - 50 A/µs V_R = 30 V	Tj = 25°C			35	
tfr	I_F = 10 A dI_F/dt = 100 A/µs V_{FR} = 1.1 x V_F max.	Tj = 25°C			230	ns
V_{FP}		Tj = 25°C			3.5	V
S_{factor}	Vcc = 200V I_F = 10 A dI_F/dt = 200 A/µs	Tj = 125°C		0.3		-
I_{RM}					8	A

Fig. 1: Conduction losses versus average current (per diode).

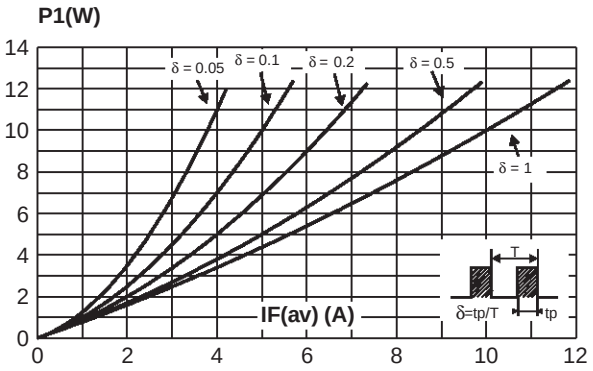


Fig. 2: Forward voltage drop versus forward current (maximum values, per diode).

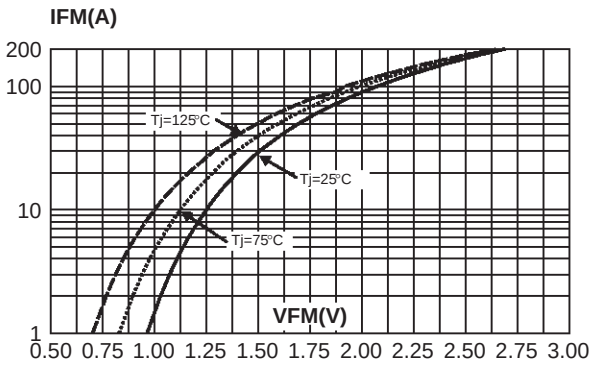


Fig. 3-1: Relative variation of thermal impedance junction to case versus pulse duration (TO-220AB / D^2PAK).

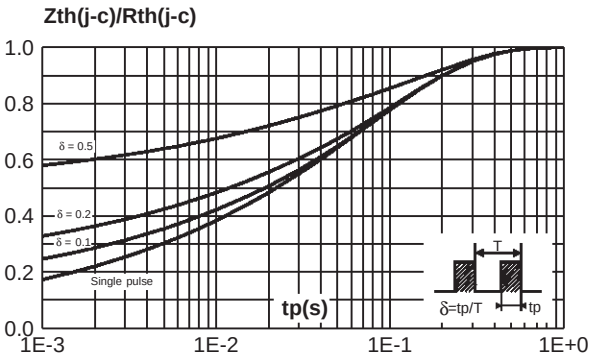


Fig. 3-2: Relative variation of thermal impedance junction to case versus pulse duration (ISOWATT220AB).

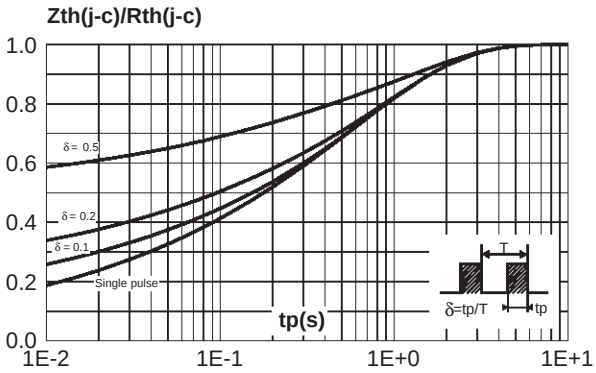


Fig. 4: Peak reverse recovery current versus dIF/dt (90% confidence, per diode).

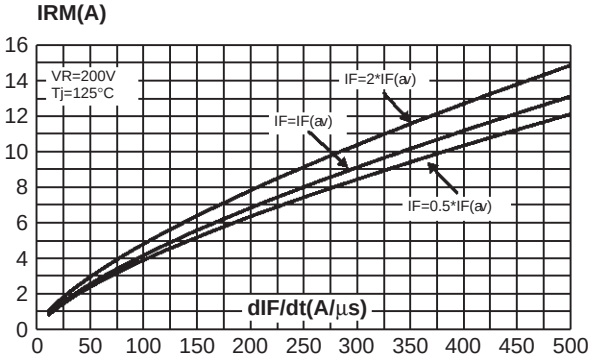


Fig. 5: Reverse recovery time versus dIF/dt (90% confidence, per diode).

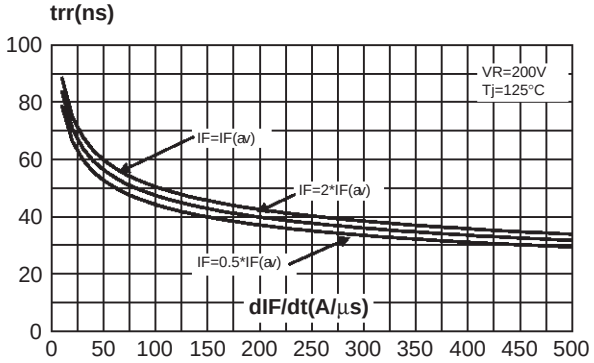


Fig. 6: Softness factor (tb/ta) versus dIF/dt (typical values, per diode).

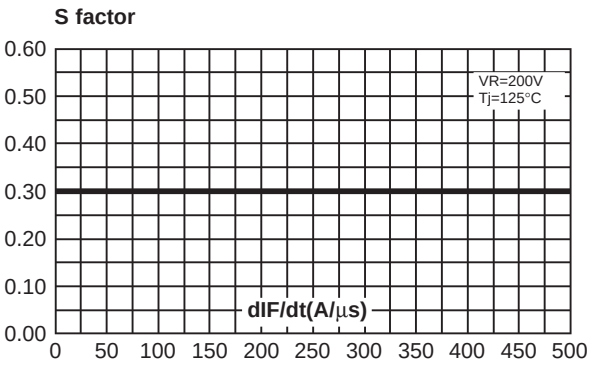


Fig. 7: Relative variation of dynamic parameters versus junction temperature (reference: Tj = 125°C).

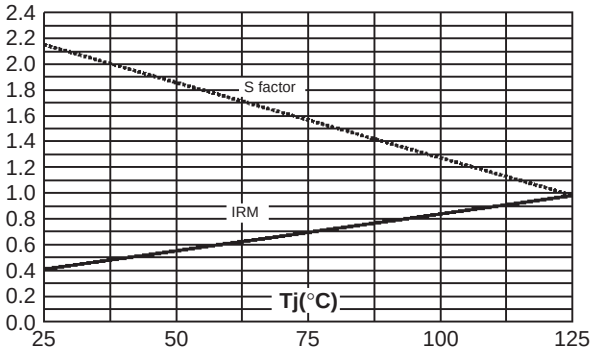


Fig. 8: Transient peak forward voltage versus dIF/dt (90% confidence, per diode) (TO-220AB).

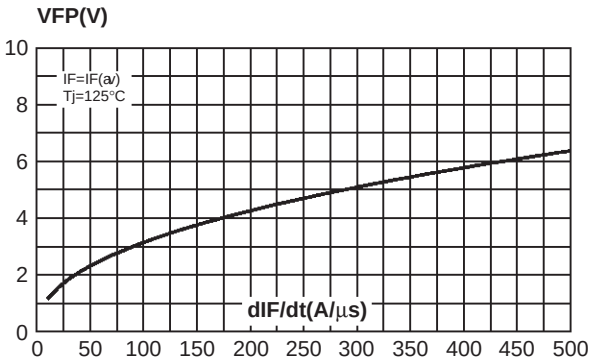


Fig. 9: Forward recovery time versus dIF/dt (90% confidence, per diode).

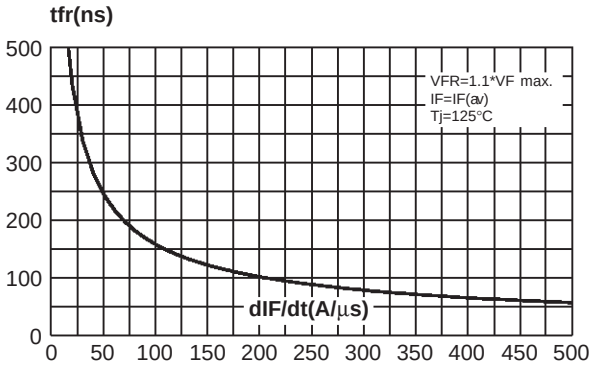
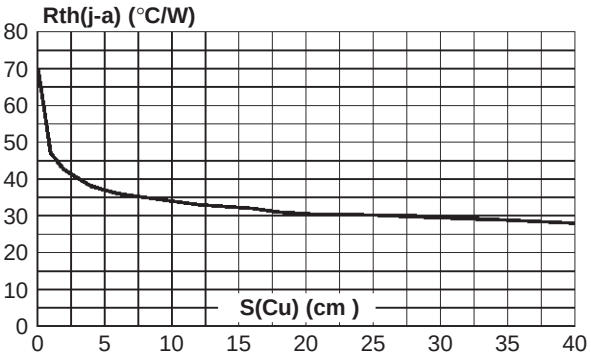
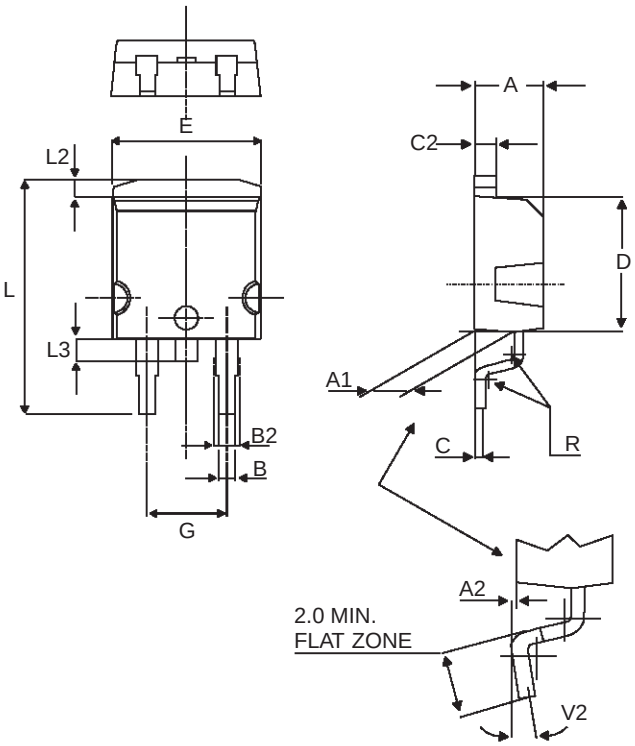


Fig. 10: Thermal resistance junction to ambient versus copper surface under tab (Epoxy printed circuit board FR4, copper thickness: 35µm) (D^2PAK)



PACKAGE MECHANICAL DATA

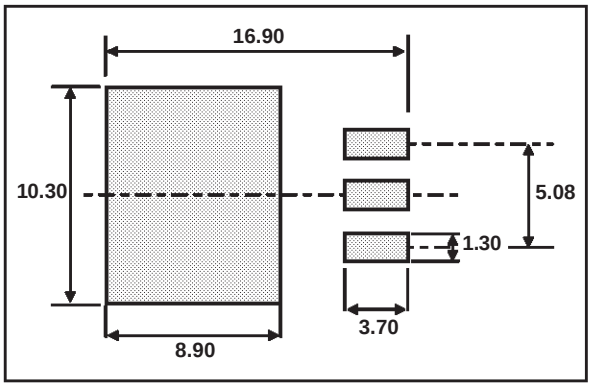
D^2PAK



REF.	DIMENSIONS					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.30		4.60	0.169		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	1.25	1.40		0.049	0.055	
C	0.45		0.60	0.017		0.024
C2	1.21		1.36	0.047		0.054
D	8.95		9.35	0.352		0.368
E	10.00		10.28	0.393		0.405
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
R		0.40			0.016	
V2	0°		8°	0°		8°

FOOT PRINT DIMENSIONS (in millimeters)

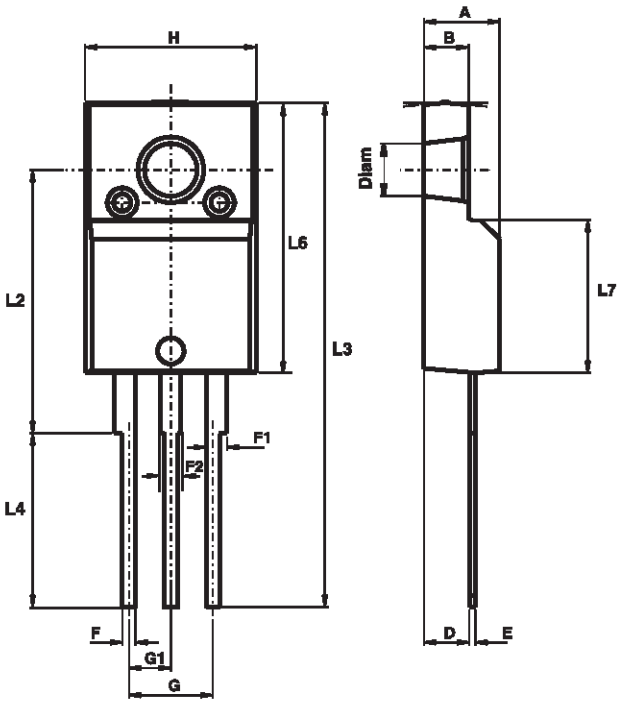
D^2PAK



■ Cooling method : by conduction (method C)

PACKAGE MECHANICAL DATA

ISOWATT220AB

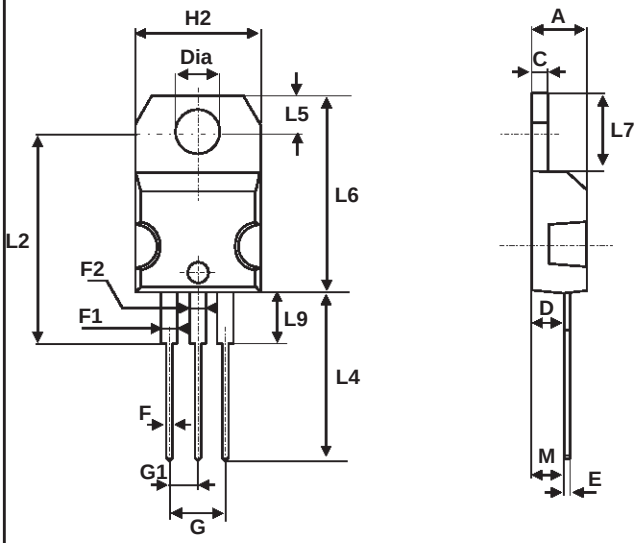


REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.60	0.173	0.181
B	2.50	2.70	0.098	0.106
D	2.50	2.75	0.098	0.108
E	0.40	0.70	0.016	0.028
F	0.75	1.00	0.030	0.039
F1	1.15	1.70	0.045	0.067
F2	1.15	1.70	0.045	0.067
G	4.95	5.20	0.195	0.205
G1	2.40	2.70	0.094	0.106
H	10.00	10.40	0.394	0.409
L2	16.00 typ.		0.630 typ.	
L3	28.60	30.60	1.125	1.205
L4	9.80	10.60	0.386	0.417
L6	15.90	16.40	0.626	0.646
L7	9.00	9.30	0.354	0.366
Diam	3.00	3.20	0.118	0.126

- Cooling method : C
- Recommended torque value : 0.55 m.N
- Maximum torque value : 0.70 m.N

PACKAGE MECHANICAL DATA

TO-220AB



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

- Cooling method : by conduction (C)
- Recommended torque value : 0.55 m.N
- Maximum torque value : 0.70 m.N

Ordering code	Marking	Package	Weight	Base qty	Delivery mode
STTH2003CT	STTH2003CT	TO-220AB	2.2g	50	Tube
STTH2003CG	STTH2003CG	D^2PAK	1.48g	50	Tube
STTH2003CF	STTH2003CF	ISOWATT220AB	2.08g	50	Tube

- Epoxy meets UL 94,V0