

HIGH EFFICIENCY ULTRAFAST DIODE

MAIN PRODUCT CHARACTERISTICS

$I_{F(AV)}$	2 x 4A
V_{RRM}	200 V
T_j (max)	175 °C
V_F (max)	0.95 V
t_{rr} (max)	20 ns

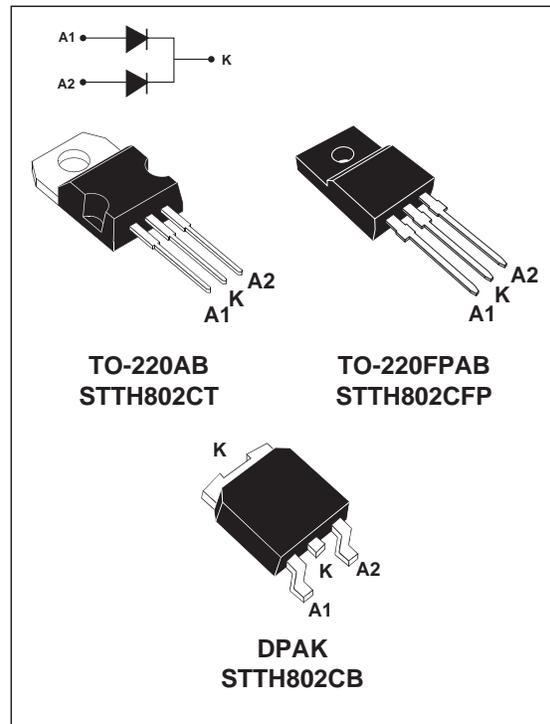
FEATURES AND BENEFITS

- Suited for SMPS
- Low losses
- Low forward and reverse recovery times
- High surge current capability
- High junction temperature
- Insulated package: TO-220FPAB

DESCRIPTION

Dual center tap rectifier suited for Switch Mode Power Supplies and High frequency DC to DC converters.

Packaged in DPAK, TO-220AB or TO-220FPAB. This device is intended for use in low voltage, high frequency inverters, free wheeling and polarity protection applications.



ABSOLUTE RATINGS (limiting values)

Symbol	Parameter			Value	Unit	
V_{RRM}	Repetitive peak reverse voltage			200	V	
$I_{F(RMS)}$	RMS forward current	TO-220AB / TO-220FPAB / DPAK		10	A	
$I_{F(AV)}$	Average forward current $\delta = 0.5$	TO-220AB / DPAK	$T_c = 155^\circ\text{C}$	Per diode	4	A
		TO-220FPAB	$T_c = 145^\circ\text{C}$			
		TO-220AB / DPAK	$T_c = 150^\circ\text{C}$	Per device	8	A
		TO-220FPAB	$T_c = 130^\circ\text{C}$			
I_{FSM}	Surge non repetitive forward current		$t_p = 10 \text{ ms}$ Sinusoidal	50	A	
T_{stg}	Storage temperature range			- 65 + 175	°C	
T_j	Maximum operating junction temperature			175	°C	

STTH802/CT/CB/CFP

THERMAL PARAMETERS

Symbol	Parameter			Maximum	Unit
R _{th(j-c)}	Junction to case	TO-220AB / DPAK	Per diode	4.0	°C/W
		TO-220FPAB		6.5	
		TO-220AB / DPAK	Total	2.5	
		TO-220FPAB		5	
R _{th(j-c)}	Coupling	TO-220AB / DPAK		1	°C/W
		TO-220FPAB		3.5	

When the diodes 1 and 2 are used simultaneously:

$$\Delta T_j (\text{diode1}) = P(\text{diode1}) \times R_{th(j-c)} (\text{per diode}) + P(\text{diode2}) \times R_{th(c)}$$

STATIC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Tests conditions		Min.	Typ.	Max.	Unit
I _R *	Reverse leakage current	T _j = 25°C	V _R = V _{RRM}			4	μA
		T _j = 125°C			2	40	
V _F **	Forward voltage drop	T _j = 25°C	I _F = 4 A			1.1	V
		T _j = 125°C	I _F = 4 A		0.81	0.95	
		T _j = 25°C	I _F = 8 A			1.25	
		T _j = 125°C	I _F = 8 A		0.95	1.1	

Pulse test: * t_p = 5ms, δ < 2%

** t_p = 380μs, δ < 2%

To evaluate the maximum conduction losses use the following equation :

$$P = 0.80 \times I_{F(AV)} + 0.037 I_{F(RMS)}^2$$

DYNAMIC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Tests conditions		Min.	Typ.	Max.	Unit
t _{rr}	Reverse recovery time	T _j = 25°C	I _F = 0.5 A I _{rr} = 0.25 A I _R = 1A		13	20	ns
t _{fr}	Forward recovery time	T _j = 25°C	I _F = 4 A dI _F /dt = 100 A/μs V _{FR} = 1.1 x V _{Fmax}		50		ns
V _{FP}	Forward recovery voltage	T _j = 25°C	I _F = 4 A dI _F /dt = 100 A/μs		2.4		V

Fig. 1: Average forward power dissipation versus average forward current (per diode).

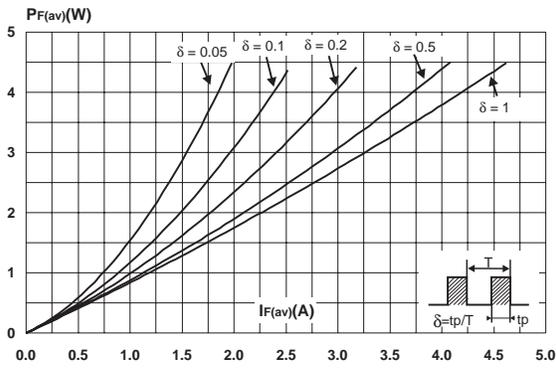


Fig. 2: Peak current versus form factor (per diode).

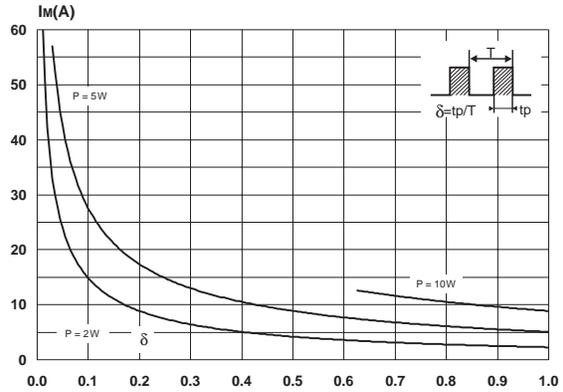


Fig. 3: Forward voltage drop versus forward current (per diode).

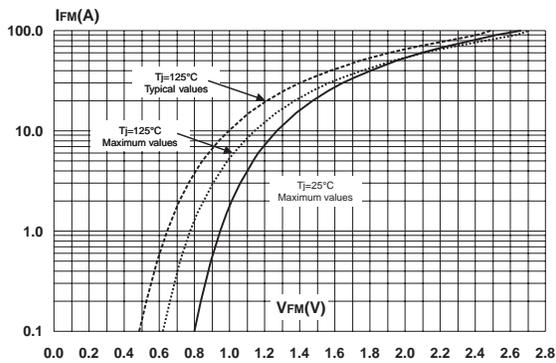


Fig. 4-1: Relative variation of thermal impedance junction to case versus pulse duration (TO-220AB, DPAK).

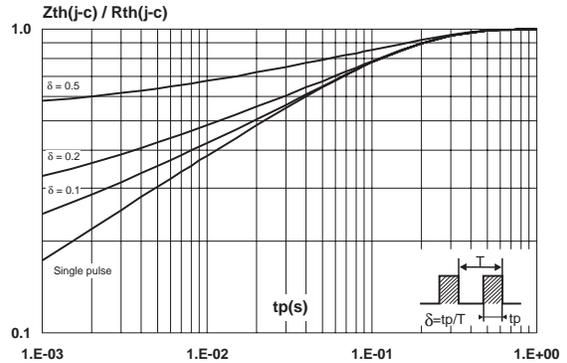


Fig. 4-2: Relative variation of thermal impedance junction to case versus duration (TO-220FPAB).

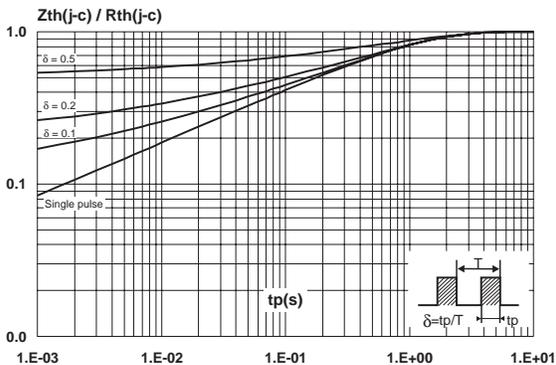


Fig. 5-1: Non repetitive surge peak forward current versus overload duration per diode (TO-220AB, DPAK).

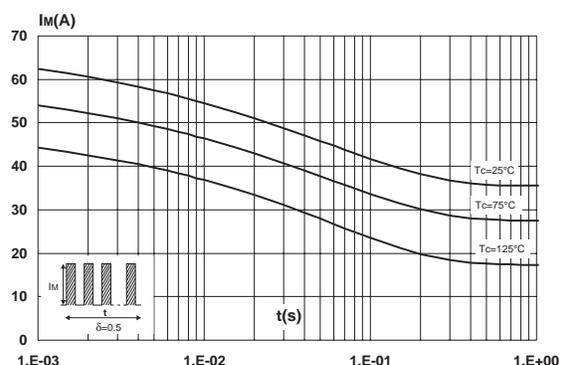


Fig. 5-2: Non repetitive surge peak forward current versus overload duration per diode (TO-220FPAB).

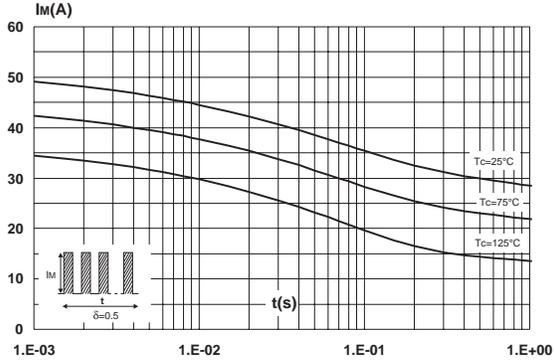


Fig. 6: Average forward current versus ambient temperature ($\delta = 0.5$, per diode).

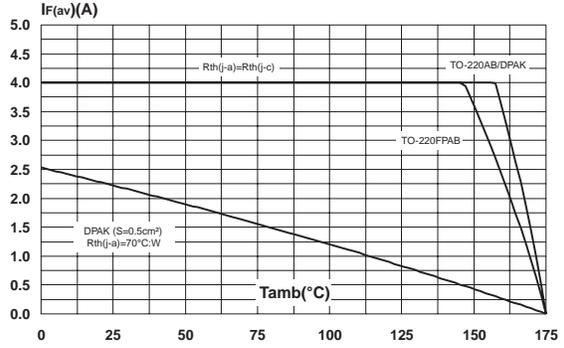


Fig. 7: Junction capacitance versus reverse voltage applied (typical values, per diode).

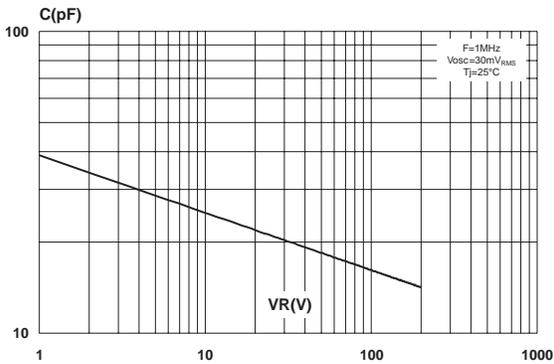


Fig. 8: Reverse recovery charges versus dIF/dt (90% confidence, per diode).

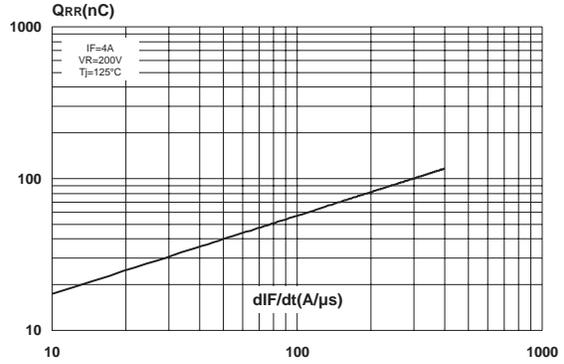


Fig. 9: Peak reverse recovery current versus dIF/dt (90% confidence, per diode).

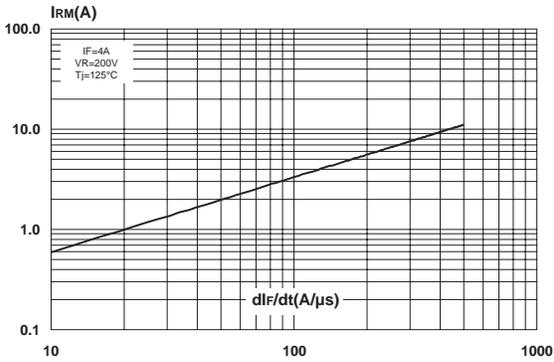


Fig. 10: Dynamic parameters versus junction temperature.

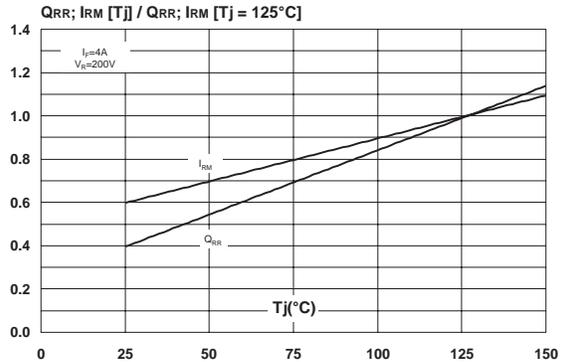
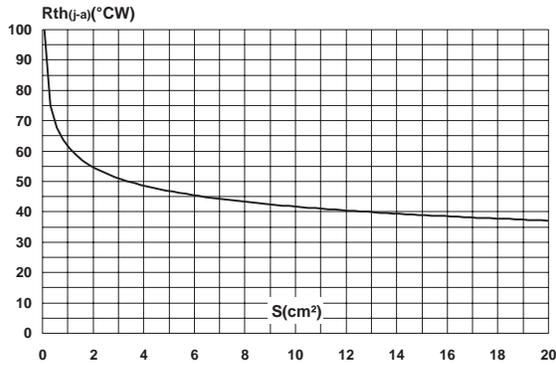
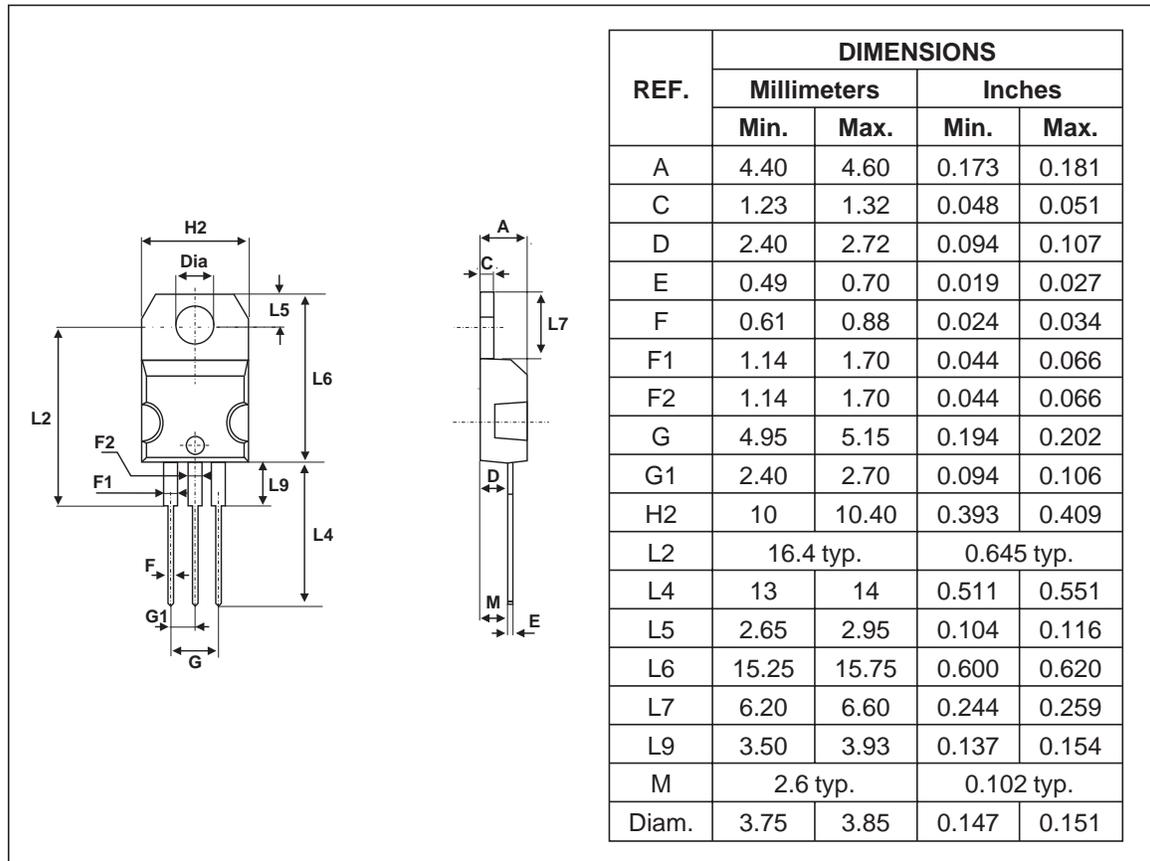


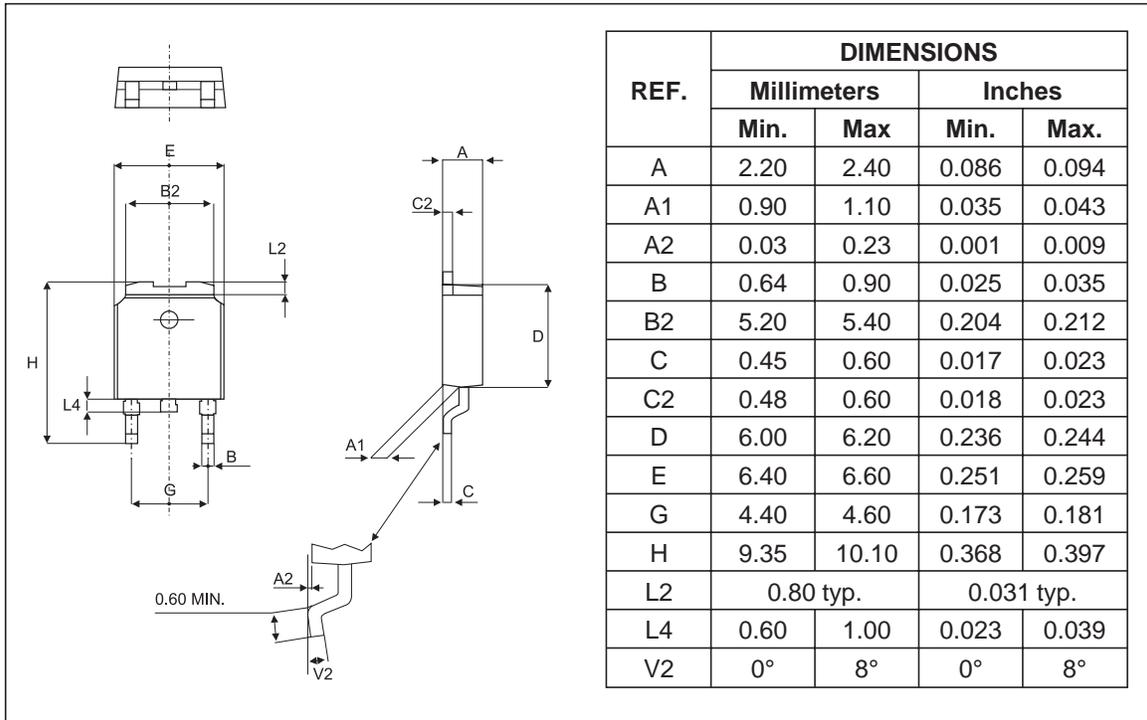
Fig. 11: Thermal resistance junction to ambient versus copper surface under tab (Epoxy printed circuit board FR4, copper thickness: 35µm) for DPAK.



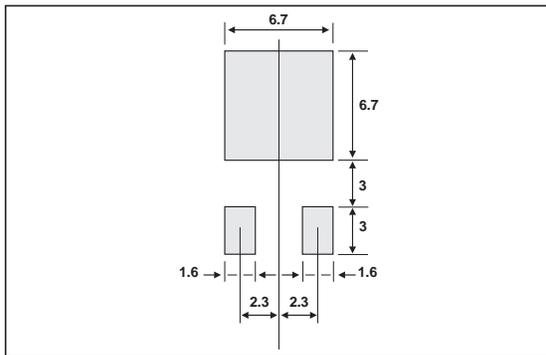
PACKAGE MECHANICAL DATA
TO-220AB

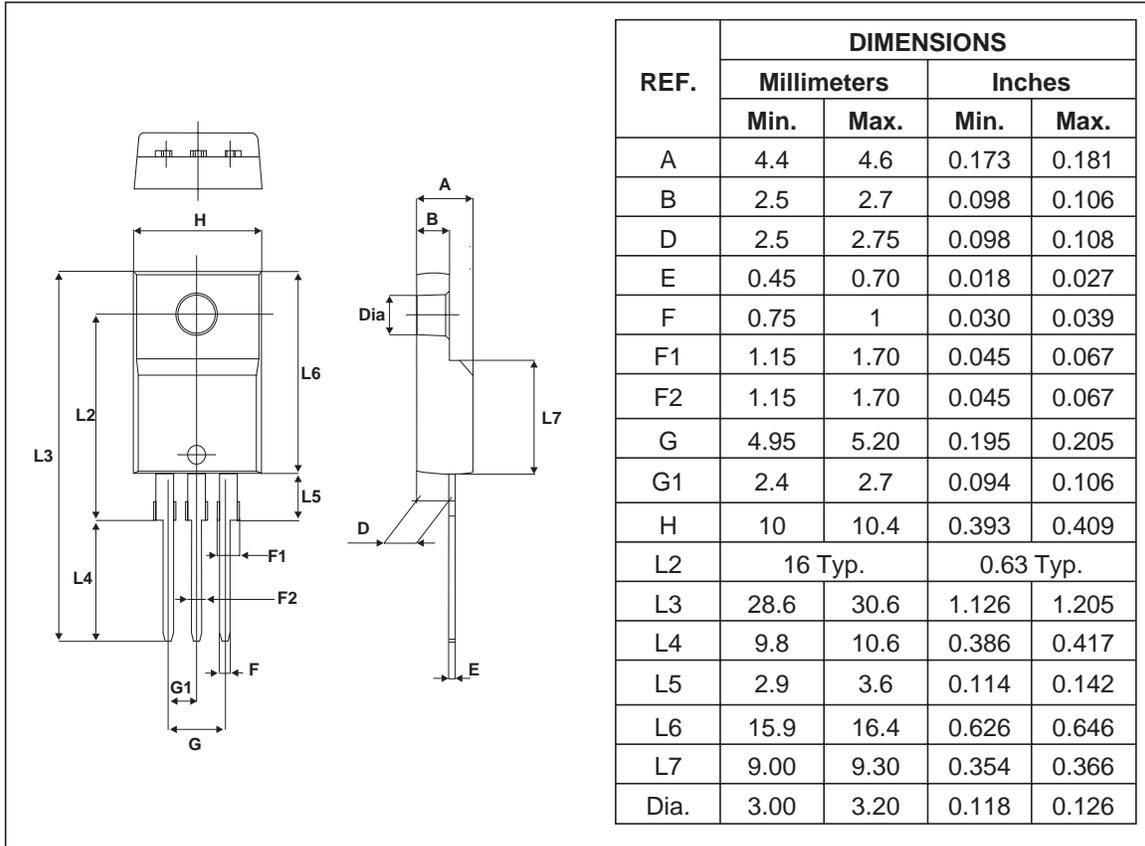


PACKAGE MECHANICAL DATA
DPAK



FOOTPRINT



PACKAGE MECHANICAL DATA
 TO-220FPAB


Ordering code	Marking	Package	Weight	Base qty	Delivery mode
STTH802CT	STTH802CT	TO-220AB	2.23 g	50	Tube
STTH802CB	STTH802CB	DPAK	0.3 g	75	Tube
STTH802CB-TR	STTH802CB	DPAK	0.3 g	2500	Tape & reel
STTH802CFP	STTH802CFP	TO-220FPAB	2.0 g	50	Tube

- Cooling method: by conduction (method C)
- Recommended torque value (TO-220AB): 0.8 N.m
- Maximum torque value (TO-220AB): 1.0 N.m
- Recommended torque value (TO-220FPAB): 0.55 N.m
- Maximum torque value (TO-220FPAB): 0.7 N.m
- Epoxy meets UL 94,V0

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