

POWER SCHOTTKY RECTIFIER

MAIN PRODUCT CHARACTERISTICS

I_{F(AV)}	2x30 A
V_{RRM}	45 V
T_{j (max)}	175 °C
V_{F (max)}	0.63 V

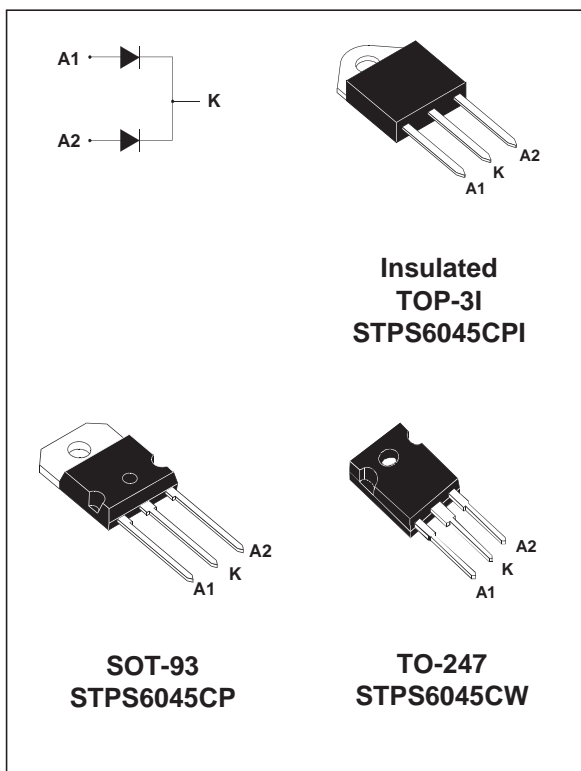
FEATURES AND BENEFITS

- VERY SMALL CONDUCTION LOSSES
- NEGLIGIBLE SWITCHING LOSSES
- EXTREME FAST SWITCHING
- LOW THERMAL RESISTANCE
- INSULATED PACKAGE: TOP-3I
Insulating voltage = 2500V_{RMS}
Capacitance = 12pF
- AVALANCHE CAPABILITY SPECIFIED

DESCRIPTION

Dual center tap Schottky rectifier suited for switchmode power supply and high frequency DC to DC converters.

Packaged either in SOT-93, TOP-3I or TO-247, this device is intended for use in low voltage, high frequency inverters, free wheeling and polarity protection applications.



ABSOLUTE RATINGS (limiting values, per diode)

Symbol	Parameter			Value	Unit	
V _{RRM}	Repetitive peak reverse voltage			45	V	
I _{F(RMS)}	RMS forward current			60	A	
I _{F(AV)}	Average forward current δ = 0.5	SOT-93 TO-247	T _c = 150°C	Per diode	30	A
		TOP-3I	T _c = 130°C	Per device	60	
I _{FSM}	Surge non repetitive forward current		tp = 10 ms sinusoidal	400	A	
I _{RRM}	Repetitive Peak reverse current		tp = 2 μs square F = 1kHz	1	A	
I _{RSM}	Non repetitive peak reverse current		tp = 100 μs square	3	A	
P _{ARM}	Repetitive peak avalanche power		tp = 1 μs T _j = 25°C	10600	W	
T _{stg}	Storage temperature range			- 65 to + 175	°C	
T _j	Maximum operating junction temperature *			175	°C	
dV/dt	Critical rate of rise of reverse voltage			10000	V/μs	

* : $\frac{dP_{tot}}{dT_j} < \frac{1}{R_{th(j-a)}}$ thermal runaway condition for a diode on its own heatsink

THERMAL RESISTANCES

Symbol	Parameter		Value	Unit
R _{th(j-c)}	Junction to case	SOT-93 / TO-247	Per diode Total	0.95 0.55
		TOP-3I	Per diode Total	1.8 1.1
R _{th(c)}		SOT-93 / TO-247	Coupling	0.15
		TOP-3I		0.4

When the diodes 1 and 2 are used simultaneously:
 $\Delta T_J(\text{diode 1}) = P(\text{diode 1}) \times R_{th(j-c)} (\text{Per diode}) + P(\text{diode 2}) \times R_{th(c)}$

STATIC ELECTRICAL CHARACTERISTICS (per diode)

Symbol	Parameter	Tests Conditions		Min.	Typ.	Max.	Unit
I _R *	Reverse leakage current	T _J = 25°C	V _R = V _{RRM}			500	μA
		T _J = 125°C			20	80	mA
V _F *	Forward voltage drop	T _J = 125°C	I _F = 30 A		0.53	0.63	V
		T _J = 25°C	I _F = 60 A			0.84	
		T _J = 125°C	I _F = 60 A		0.68	0.78	

Pulse test : ** tp = 380 μs, δ < 2%

To evaluate the conduction losses use the following equation:

$$P = 0.48 \times I_{F(AV)} + 0.005 I_{F(RMS)}^2$$

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

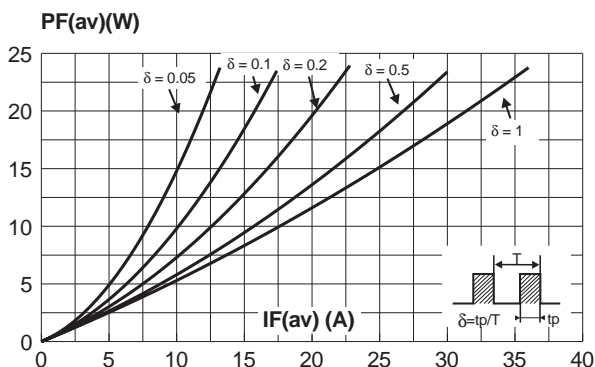


Fig. 3: Normalized avalanche power derating versus pulse duration.

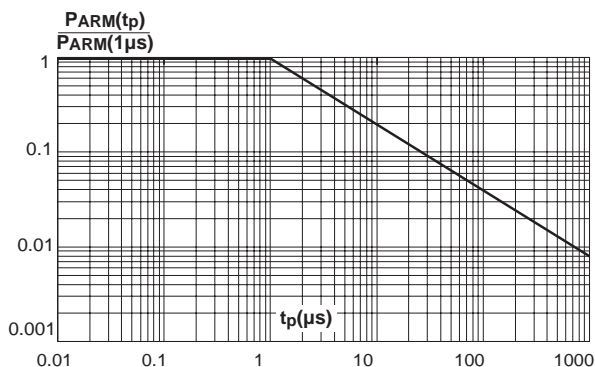


Fig. 2: Average current versus ambient temperature (δ=0.5, per diode).

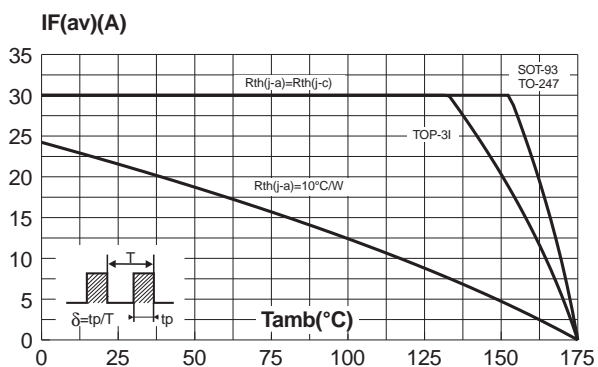


Fig. 4: Normalized avalanche power derating versus junction temperature.

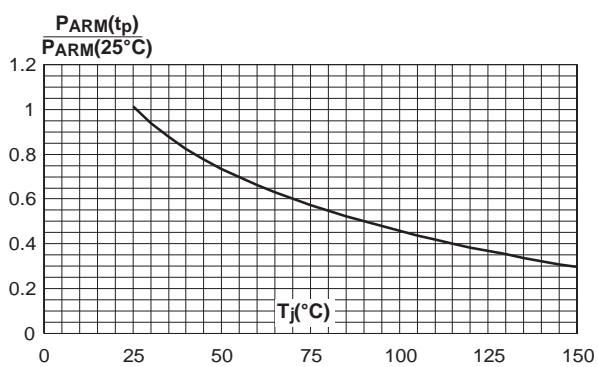


Fig. 5-1: Non repetitive surge peak forward current versus overload duration (maximum values, per diode) (SOT-93 and TO-247).

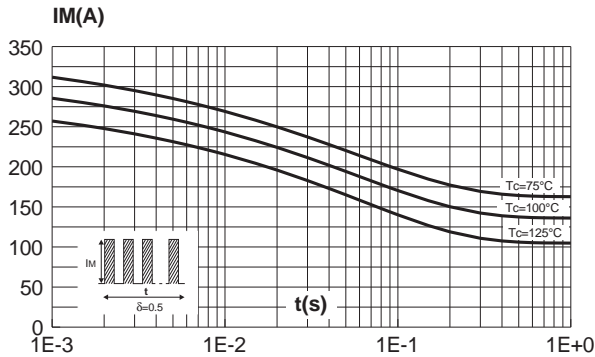


Fig. 5-2: Non repetitive surge peak forward current versus overload duration (maximum values, per diode) (TOP-3I).

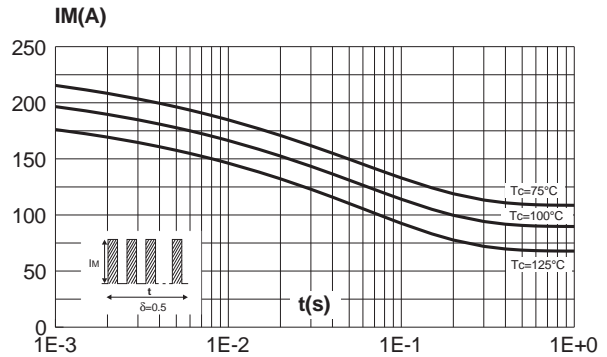


Fig. 6: Relative variation of thermal transient impedance junction to case versus pulse duration.

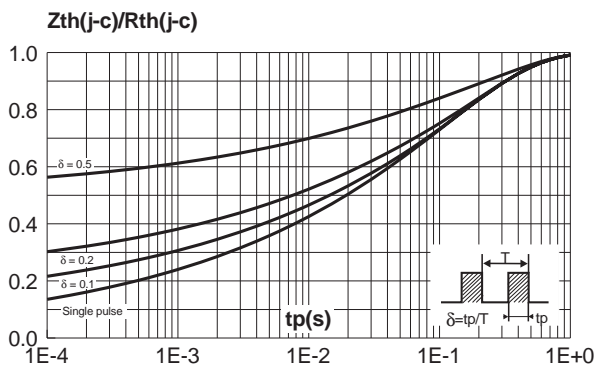


Fig. 7: Reverse leakage current versus reverse voltage applied (typical values, per diode).

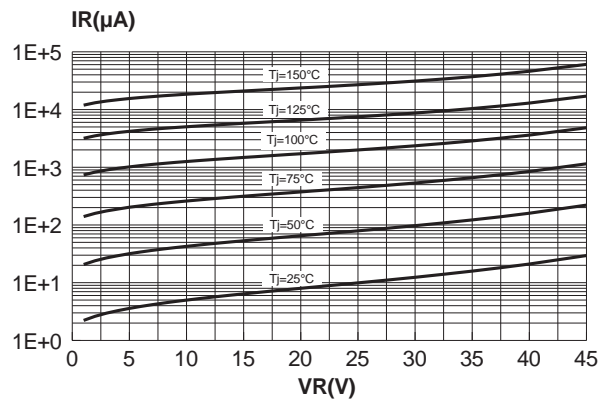


Fig. 8: Junction capacitance versus reverse voltage applied (typical values, per diode).

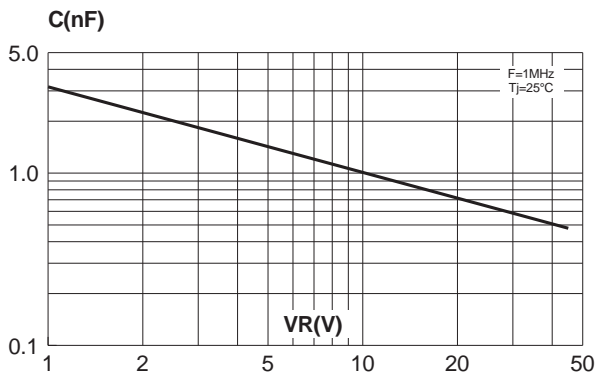
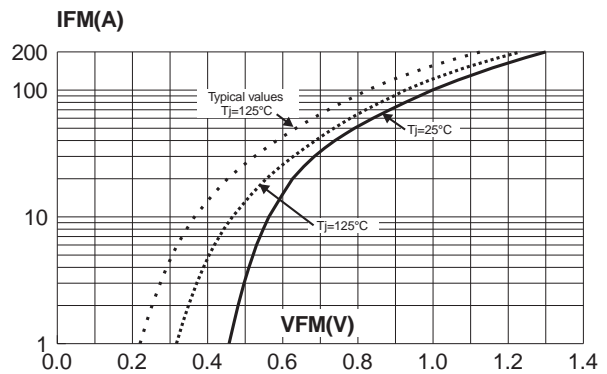
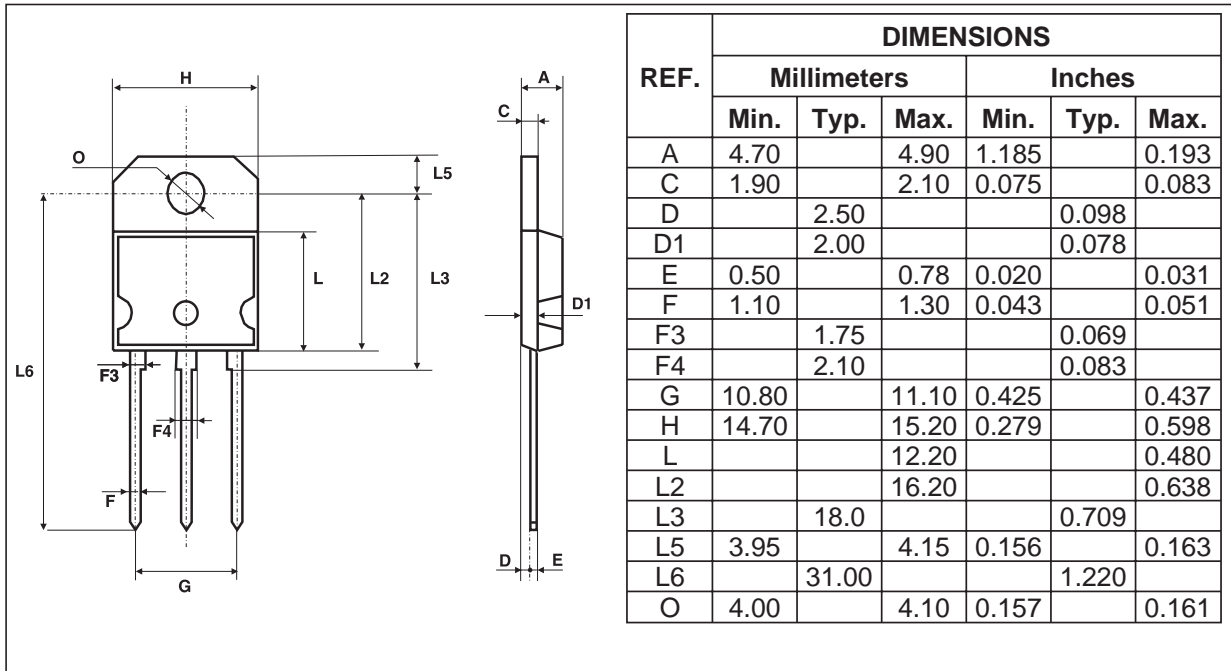


Fig. 9: Forward voltage drop versus forward current (maximum values, per diode).

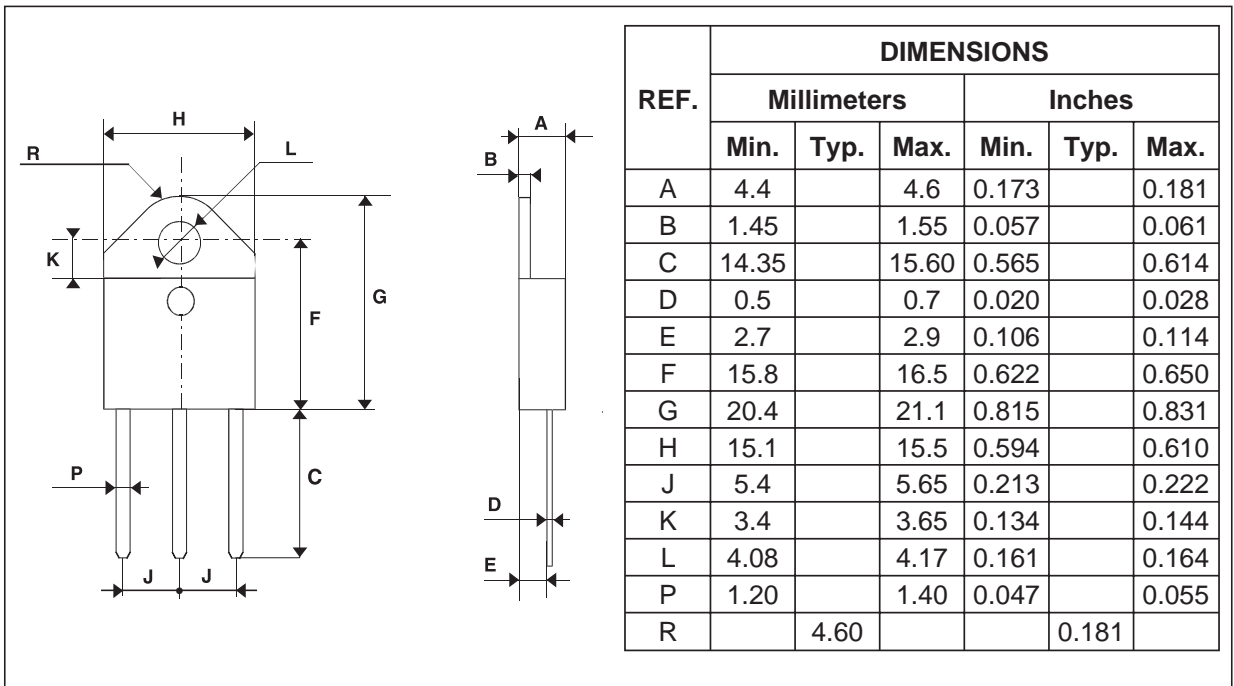


STPS6045CP/CPI/CW

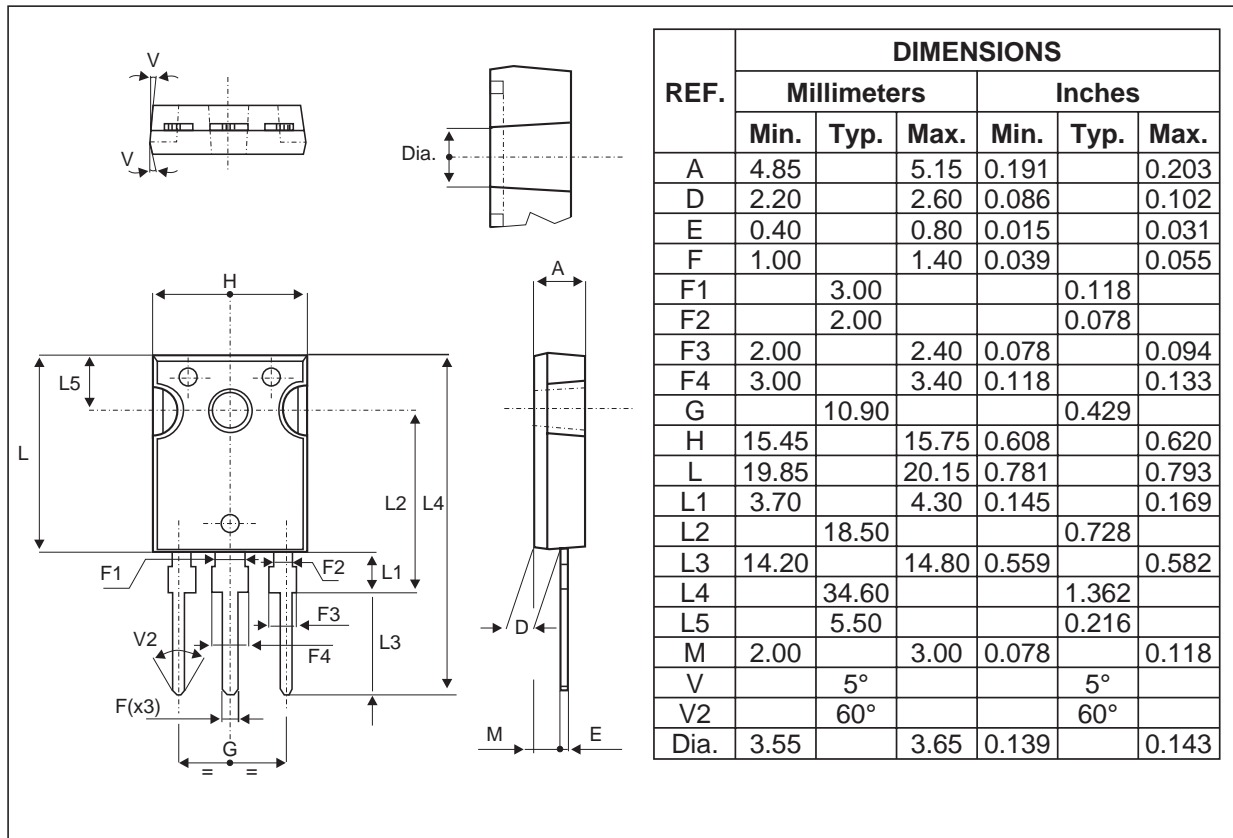
PACKAGE MECHANICAL DATA SOT-93



PACKAGE MECHANICAL DATA TOP-3I (isolated)



PACKAGE MECHANICAL DATA
TO-247



Type	Marking	Package	Weight	Base qty	Delivery mode
STPS6045CP	STPS6045CP	SOT-93	3.97 g.	30	Tube
STPS6045CPI	STPS6045CPI	TOP-3I	4.46 g.	120	Bulk
STPS6045CW	STPS6045CW	TO-247	4.36 g.	30	Tube

- Cooling method: by conduction (C)
- Recommended torque value: 0.8 N.m.
- Maximum torque value: 1.0 N.m.
- Epoxy meets UL94,V0

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