

# 1 Characteristics

**Table 2. Absolute ratings (limiting values, per diode)**

Symbol	Parameter			Value	Unit
$V_{RRM}$	Repetitive peak reverse voltage			45	V
$I_{F(RMS)}$	Forward rms voltage			30	A
$I_{F(AV)}$	Average forward current $\delta = 0.5$	$T_C = 155\text{ }^{\circ}\text{C}$	Per diode Per device	10 30	A
$I_{FSM}$	Surge non repetitive forward current	$t_p = 10\text{ ms}$	sinusoidal	220	A
$P_{ARM}$	Repetitive peak avalanche power	$t_p = 1\text{ }\mu\text{s}$	$T_j = 25\text{ }^{\circ}\text{C}$	6000	W
$T_{stg}$	Storage temperature range			-65 to +175	$^{\circ}\text{C}$
$T_j$	Maximum operating junction temperature <sup>(1)</sup>			-40 to +175	$^{\circ}\text{C}$
$dV/dt$	Critical rate of rise reverse voltage			10000	V/ $\mu\text{s}$

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

**Table 3. Thermal resistance parameters**

Symbol	Parameter		Value	Unit
$R_{th(j-c)}$	Junction to case	Per diode Total	1.60 0.85	$^{\circ}\text{C/W}$
$R_{th(c)}$	Coupling		0.10	$^{\circ}\text{C/W}$

When the diodes 1 and 2 are used simultaneously :

$$\Delta T_j(\text{diode } 1) = P(\text{diode } 1) \times R_{th(j-c)}(\text{Per diode}) + P(\text{diode } 2) \times R_{th(c)}$$

**Table 4. Static electrical characteristics (per diode)**

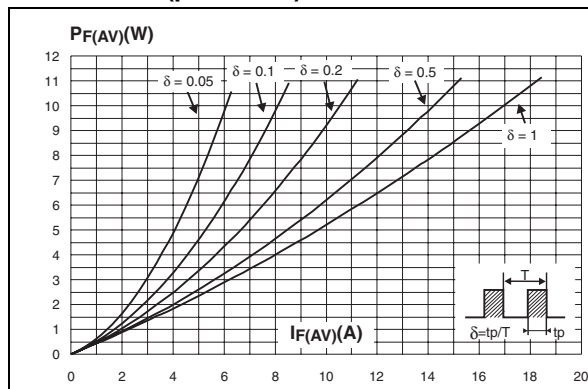
Symbol	Parameter	Tests conditions		Min.	Typ.	Max.	Unit
$I_R^{(1)}$	Reverse leakage current	$T_j = 25\text{ }^{\circ}\text{C}$	$V_R = V_{RRM}$	-	-	200	$\mu\text{A}$
		$T_j = 125\text{ }^{\circ}\text{C}$		-	11	40	mA
$V_F^{(1)}$	Forward voltage drop	$T_j = 125\text{ }^{\circ}\text{C}$	$I_F = 15\text{ A}$	-	0.5	0.57	V
		$T_j = 25\text{ }^{\circ}\text{C}$	$I_F = 30\text{ A}$	-	-	0.84	
		$T_j = 125\text{ }^{\circ}\text{C}$		-	0.65	0.72	

1. Pulse test:  $t_p = 380\text{ }\mu\text{s}$ ,  $\delta < 2\%$

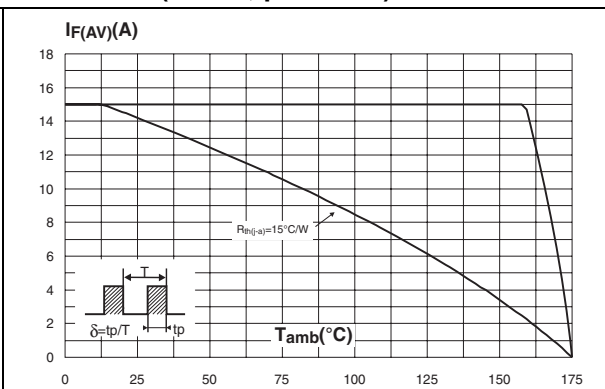
To evaluate the conduction losses use the following equation:

$$P = 0.42 \times I_{F(AV)} + 0.01 I_{F(RMS)}^2$$

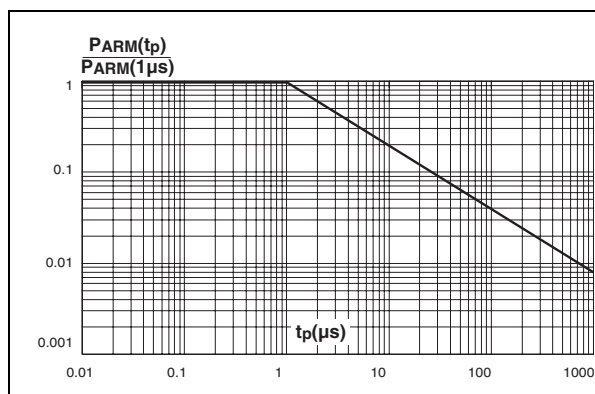
**Figure 1. Average forward power dissipation versus average forward current (per diode)**



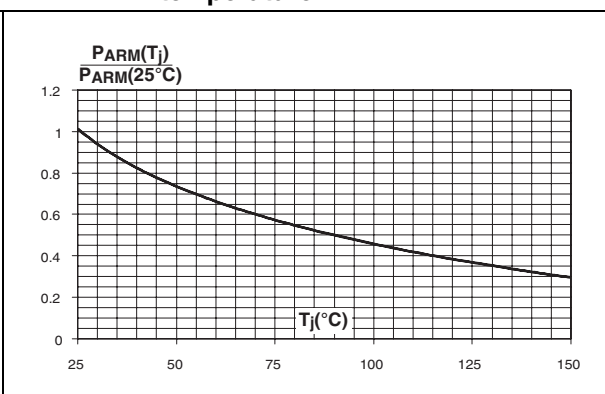
**Figure 2. Average forward current versus ambient temperature ( $\delta = 0.5$ , per diode)**



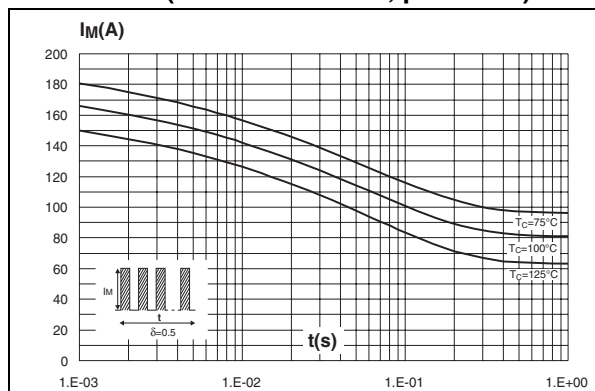
**Figure 3. Normalized avalanche power derating versus pulse duration**



**Figure 4. Normalized avalanche power derating versus junction temperature**



**Figure 5. Non repetitive surge peak forward current versus overload duration (maximum values, per diode)**



**Figure 6. Relative variation of thermal impedance junction to ambient versus pulse duration**

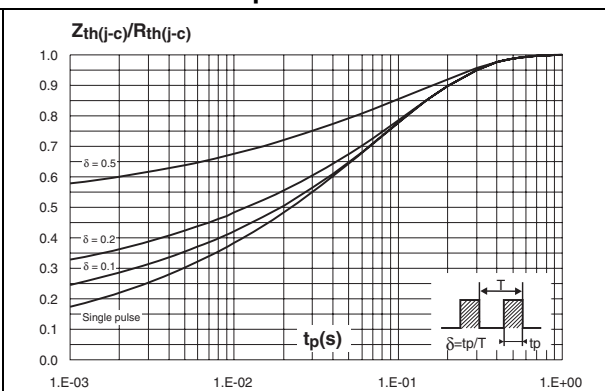


Figure 7. Reverse leakage current versus reverse voltage applied (typical values, per diode)

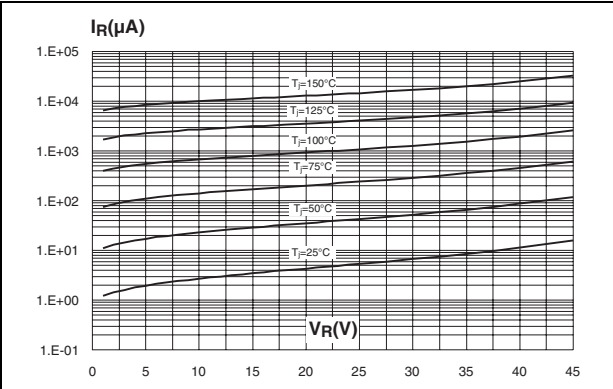


Figure 8. Junction capacitance versus reverse voltage applied (typical values, per diode)

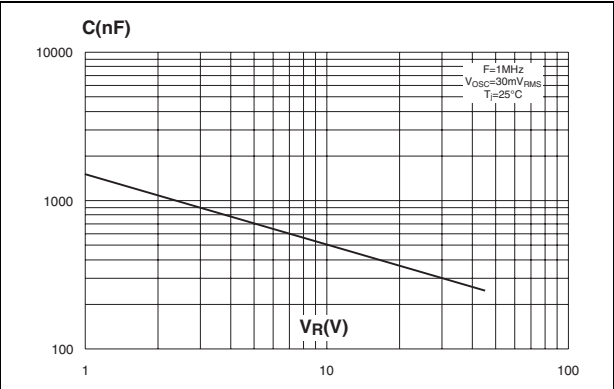


Figure 9. Forward voltage drop versus forward current (maximum values, per diode)

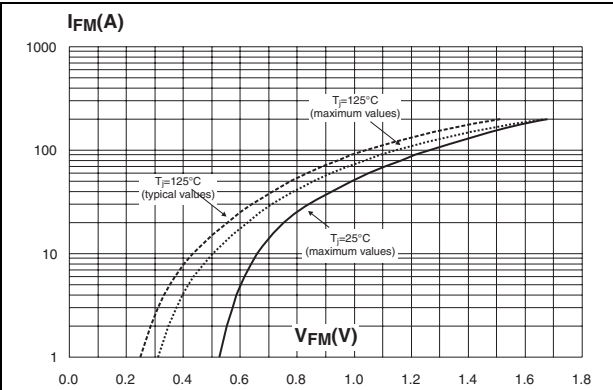
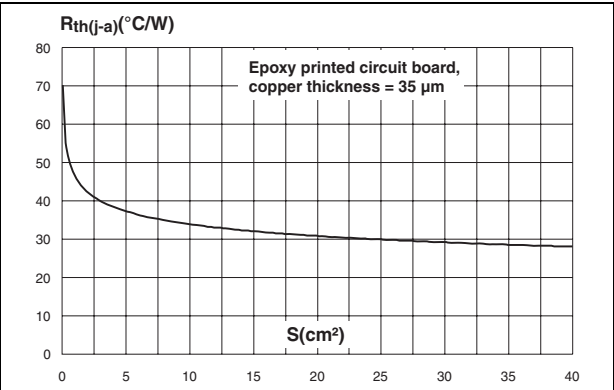


Figure 10. Thermal resistance junction to ambient versus copper surface under tab



2 Package information

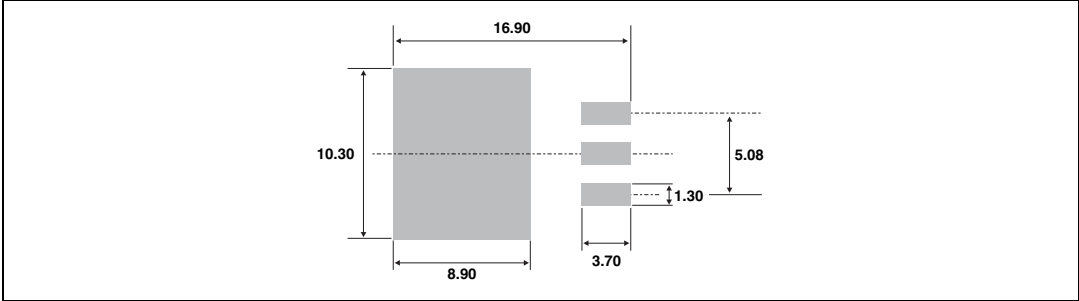
- Epoxy meets UL94,V0
- Lead-free package

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: [www.st.com](http://www.st.com). ECOPACK® is an ST trademark.

Table 5. Package dimensions D<sup>2</sup>PAK

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 11. Footprint dimensions (in millimeters)



### 3 Ordering information

**Table 6. Ordering information**

Order code	Marking	Package	Weight	Base qty	Delivery mode
STPS3045CGY-TR	STPS3045CGY	D <sup>2</sup> PAK	1.48 g	1000	Tape and reel

### 4 Revision history

**Table 7. Document revision history**

Date	Revision	Changes
24-May-2011	1	Initial release.

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