

1 Characteristics

Table 2: Absolute ratings (limiting values at 25 °C, per diode, unless otherwise specified)

Symbol	Parameter		Value	Unit
V _{RRM}	Repetitive peak reverse voltage		40	V
I _{F(RMS)}	Forward rms current		6	A
I _{F(AV)}	Average forward current $\delta = 0.5$, square wave	T _C = 135 °C	3	A
I _{FSM}	Surge non repetitive forward current	tp = 10 ms sinusoidal	75	A
P _{ARM}	Repetitive peak avalanche power	tp = 10 μ s T _J = 125 °C	90	W
T _{stg}	Storage temperature range		-65 to +150	°C
T _J	Maximum operating junction temperature ⁽¹⁾		150	°C

Notes:

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

Table 3: Thermal parameters

Symbol	Parameter		Max. value	Unit
R _{th(j-c)}	Junction to case	Per diode	5.5	°C/W
		Per device	3	
R _{th(c)}	Coupling		0.5	

When the diodes 1 and 2 are used simultaneously:

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

Table 4: Static electrical characteristics (per diode)

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
I _R ⁽¹⁾	Reverse leakage current	T _J = 25 °C	V _R = V _{RRM}	-		100	μ A
		T _J = 125 °C		-	2	10	mA
V _F ⁽²⁾	Forward voltage drop	T _J = 25 °C	I _F = 3 A	-		0.63	V
		T _J = 125 °C		-	0.50	0.57	
		T _J = 25 °C	I _F = 6 A	-		0.84	
		T _J = 125 °C		-	0.67	0.72	

Notes:

⁽¹⁾Pulse test: t_p = 5 ms, $\delta < 2\%$

⁽²⁾Pulse test: t_p = 380 μ s, $\delta < 2\%$

To evaluate the conduction losses, use the following equation:

$$P = 0.42 \times I_{F(AV)} + 0.050 \times I_{F(RMS)}^2$$

1.1 Characteristics (curves)

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

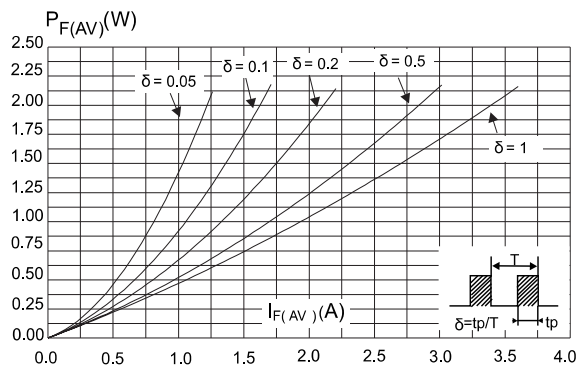


Figure 2: Average forward current versus ambient temperature (per diode, $\delta = 0.5$)

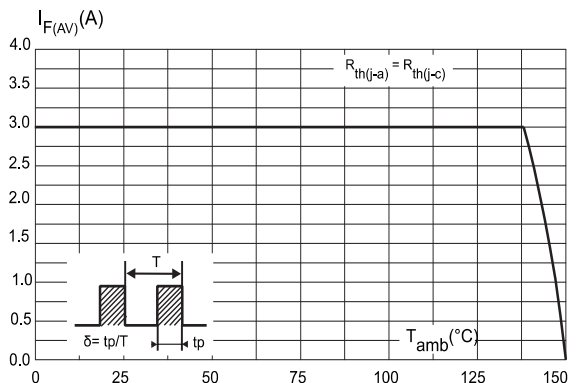


Figure 3: Normalized avalanche power derating versus pulse duration ($T_j = 125^\circ\text{C}$)

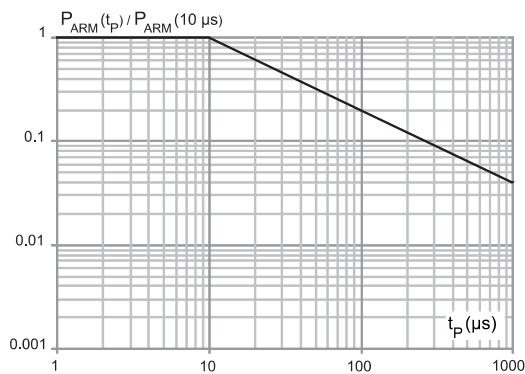


Figure 4: Relative variation of thermal impedance junction to case versus pulse duration

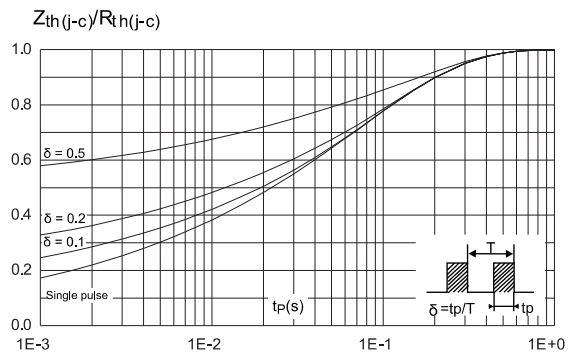


Figure 5: Reverse leakage current versus reverse voltage applied (typical values, per diode)

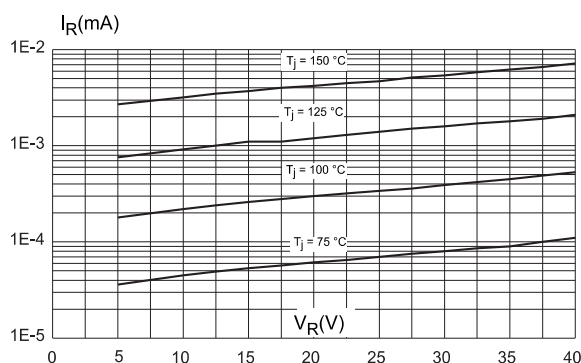


Figure 6: Junction capacitance versus reverse voltage applied (typical values, per diode)

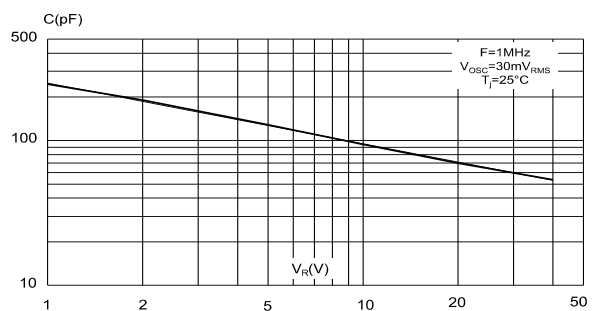
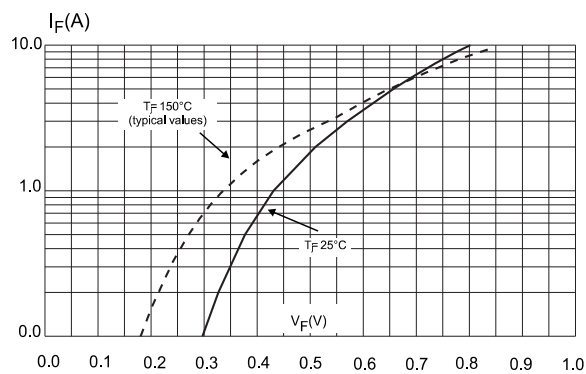
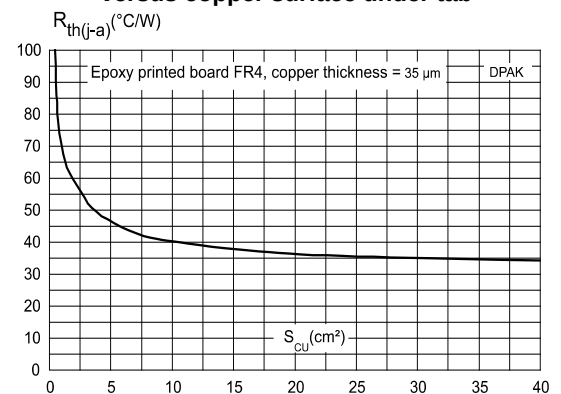


Figure 7: Forward voltage drop versus forward current (maximum values, per diode)**Figure 8: Thermal resistance junction to ambient versus copper surface under tab**

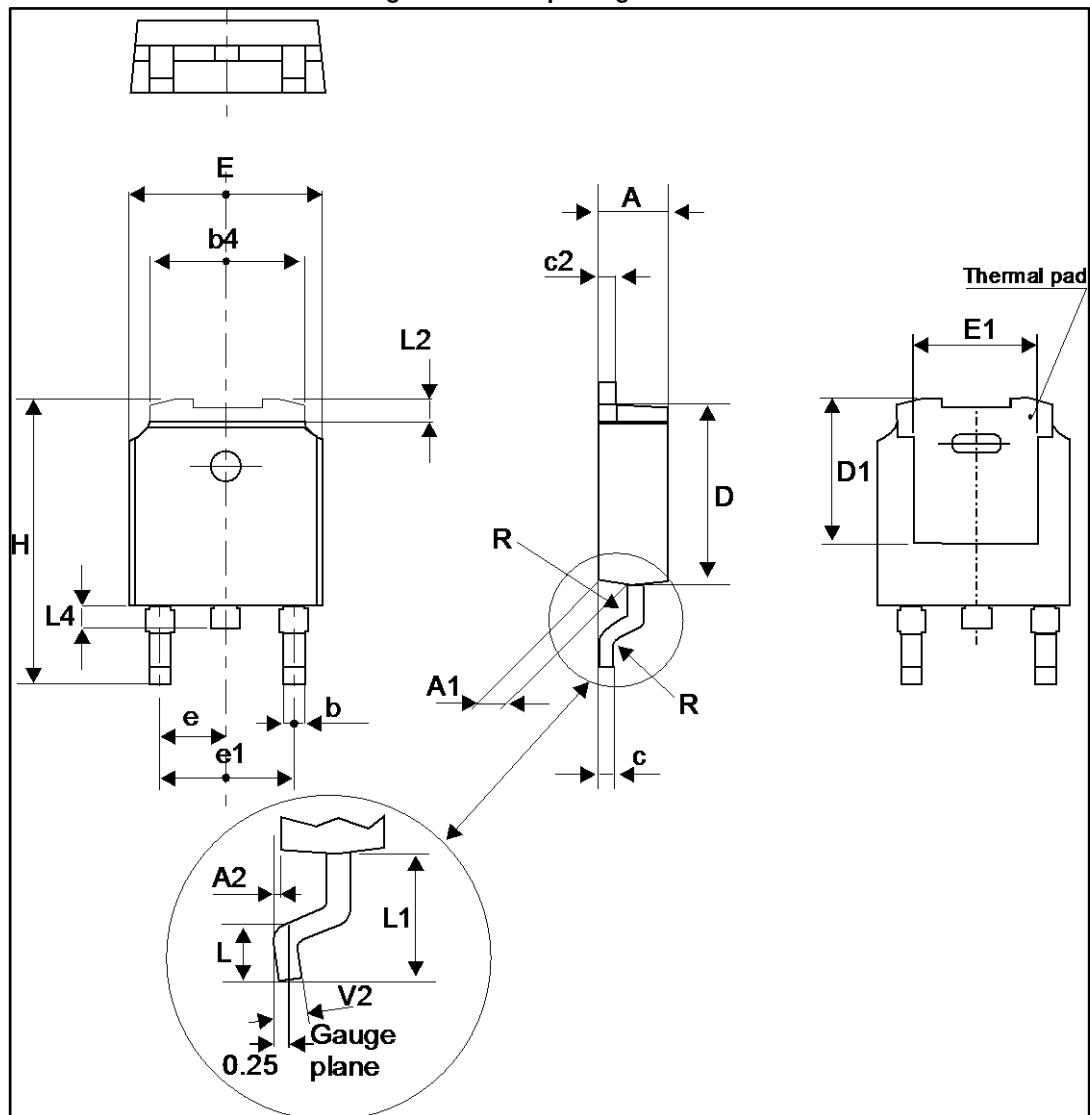
2 Package information

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. ECOPACK® is an ST trademark.

- Cooling method: by conduction (C)
- Epoxy meets UL 94,V0

2.1 DPAK package information

Figure 9: DPAK package outline

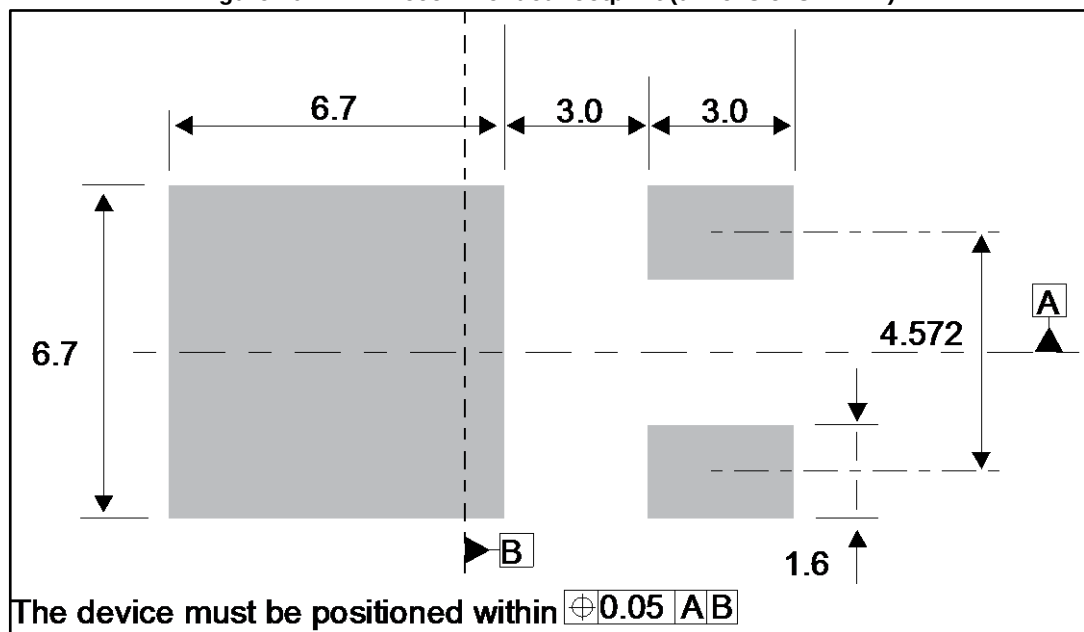


This package drawing may slightly differ from the physical package. However, all the specified dimensions are guaranteed.

Table 5: DPAK package mechanical data

Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	2.18	2.40	0.085	0.094
A1	0.90	1.10	0.035	0.043
A2	0.03	0.23	0.001	0.009
b	0.64	0.90	0.025	0.035
b4	4.95	5.46	0.194	0.215
c	0.46	0.61	0.018	0.024
c2	0.46	0.60	0.018	0.023
D	5.97	6.22	0.235	0.244
D1	4.95	5.60	0.194	0.220
E	6.35	6.73	0.250	0.265
E1	4.32	5.50	0.170	0.216
e	2.286 typ.		0.090 typ.	
e1	4.40	4.70	0.173	0.185
H	9.35	10.40	0.368	0.409
L	1.0	1.78	0.039	0.070
L2		1.27		0.050
L4	0.60	1.02	0.023	0.040
V2	-8°	+8°	-8°	+8°

Figure 10: DPAK recommended footprint (dimensions in mm)



3 Ordering information

Table 6: Ordering information

Order code	Marking	Package	Weight	Base qty	Delivery mode
STPS640CB	S6 40C	DPAK	0.32 g	75	Tube
STPS640CB-TR	S6 40C			2500	Tape and reel

4 Revision history

Table 7: Document revision history

Date	Revision	Changes
Aug-2003	6B	Last issue
22-Mar-2007	7	Updated <i>Figure 8</i> Updated ECOPACK statement.
20-Nov-2014	8	<i>Figure 3</i> . Removed PARM (T _j = 25 °C), TO-220AB and TO-220FPAB package information.
16-May-2017	9	Updated DPAK package information and reformatted to current standard.

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