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 δ = 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 µs 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:

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

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	µA
		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, δ < 2%

[2]Pulse test: t_p = 380 µs, δ < 2%

To evaluate the conduction losses, use the following equation:

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

1.1 Characteristics (curves)

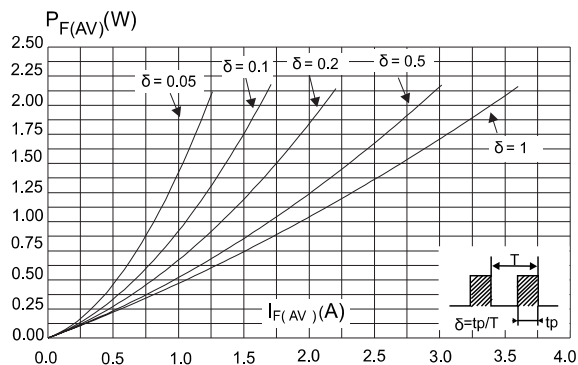**Figure 1: Average forward power dissipation versus average forward current(per diode)**

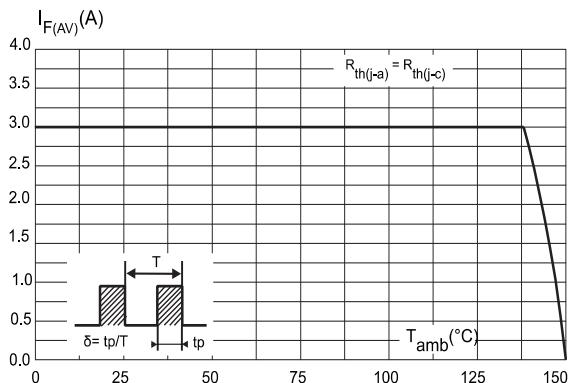**Figure 2: Average forward current versus ambient temperature (per diode, δ = 0.5)**

Figure 3: Normalized avalanche power derating versus pulse duration (T$_j$ = 125 °C)
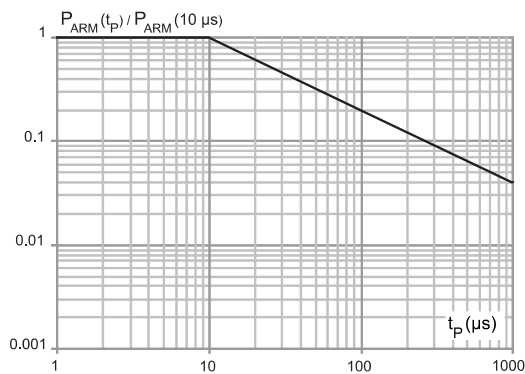

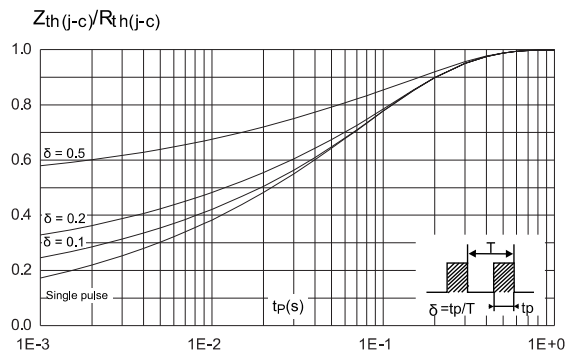**Figure 4: Relative variation of thermal impedance junction to case versus pulse duration**

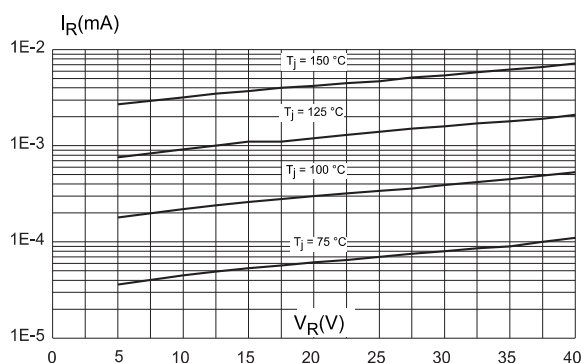**Figure 5: Reverse leakage current versus reverse voltage applied (typical values, per diode)**

Figure 6: Junction capacitance versus reverse voltage applied (typical values, per diode)
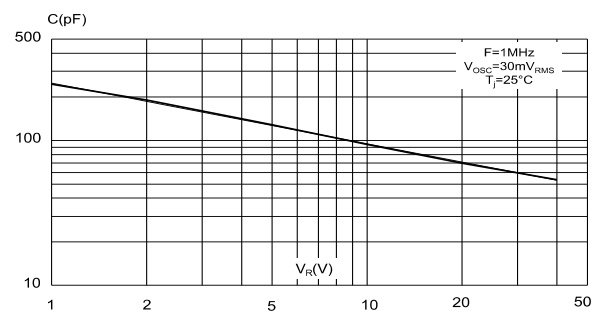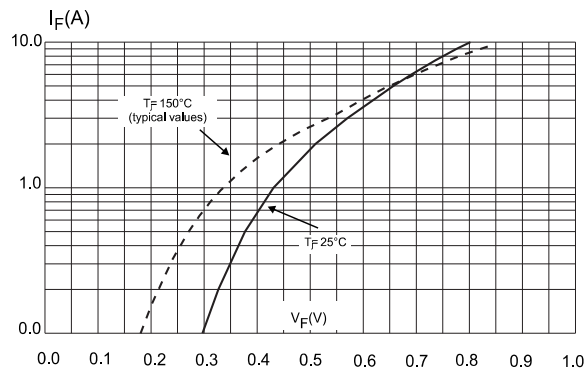
Figure 7: Forward voltage drop versus forward current (maximum values, per diode)

$I_F(A)$

T_F 150°C
(typical values)

T_F 25°C

$V_F(V)$

Figure 8: Thermal resistance junction to ambient versus copper surface under tab

$R_{th(j-a)}$(°C/W)

Epoxy printed board FR4, copper thickness = 35 μm   DPAK

S_{CU}(cm²)
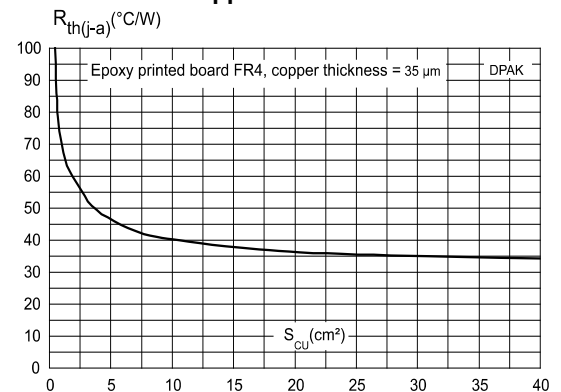
2   Package information

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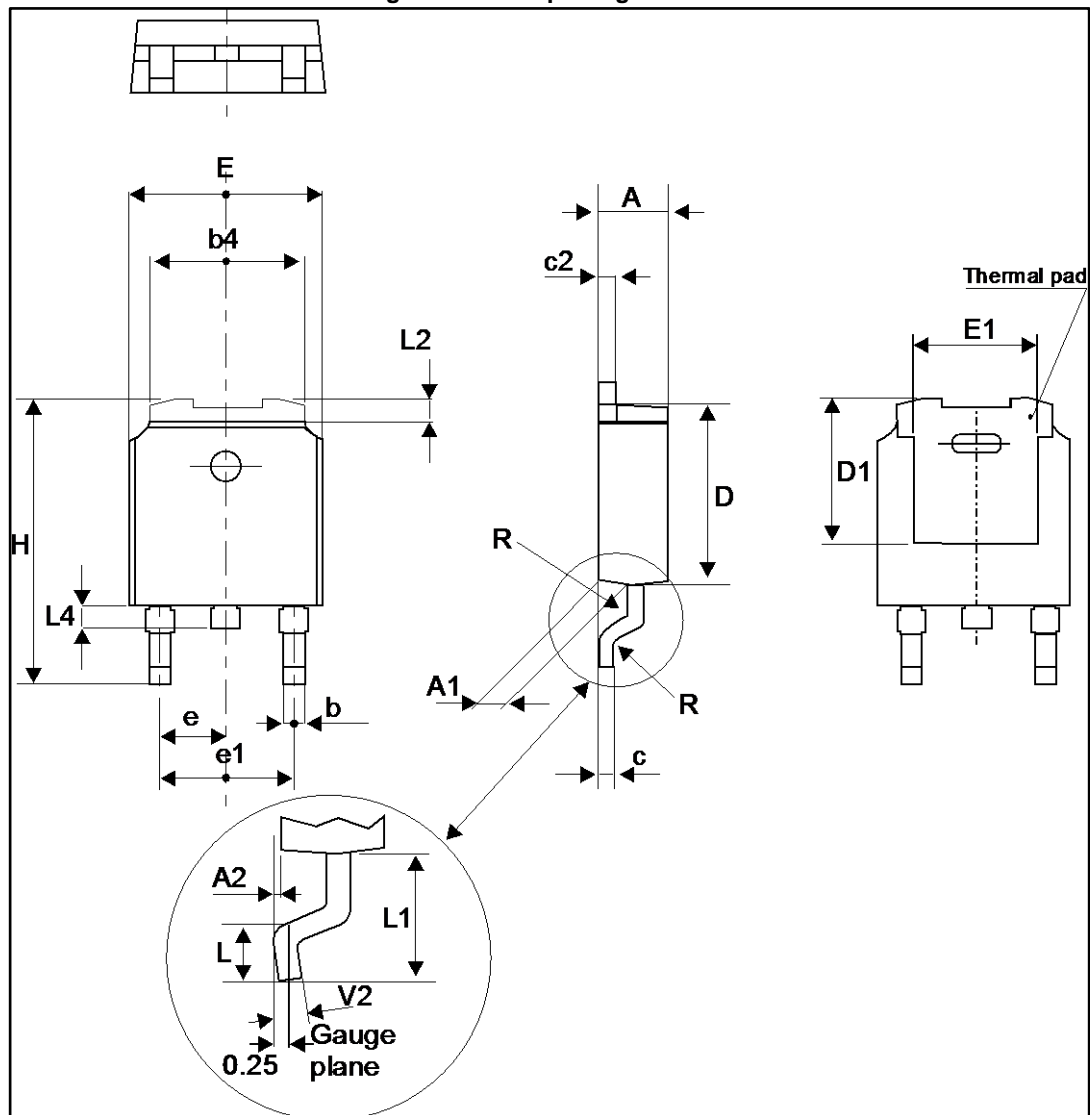
> This package drawing may slightly differ from the physical package. However, all
> the specified dimensions are guaranteed.

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)
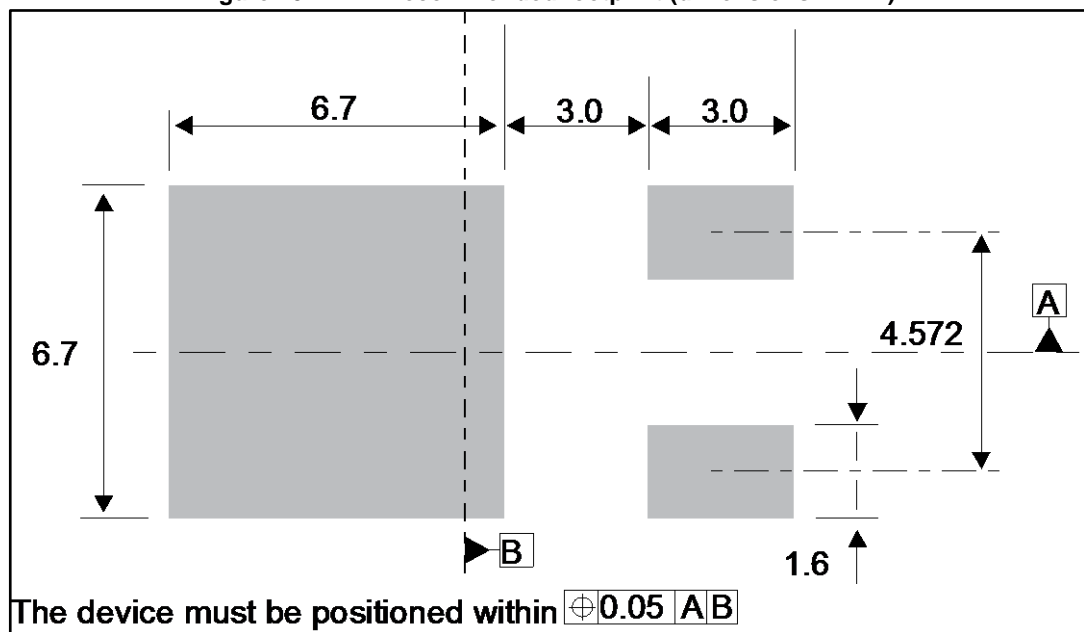
3   Ordering information

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 *Figure 8* Updated ECOPACK statement.
20-Nov-2014	8	*Figure 3.* Removed PARM (Tj = 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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