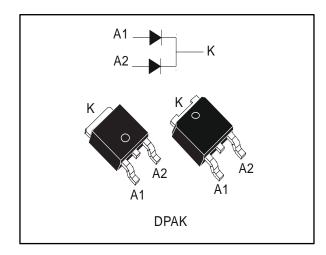
STPS640C



Power Schottky rectifier

Datasheet - production data



Features

- Very small conduction losses
- Extremely fast switching
- Low thermal resistance
- Negligible switching losses
- Low forward voltage drop
- Low capacitance
- Avalanche specification
- ECOPACK[®]2 compliant component for DPAK on demand

Description

This dual Schottky rectifier is designed for switch mode power supplies and other power converters.

This device is intended for use in low and medium voltage operation, and in particular high frequency circuits where low switching losses are required (free wheeling and polarity protection).

Table 1: Device summary

Symbol	Value
I _{F(AV)}	2 x 3 A
V_{RRM}	40 V
T _j (max)	150 °C
V _F (typ)	0.50 V

Characteristics STPS640C

1 Characteristics

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

Symbol	Parameter	Value	Uni t	
V _{RRM}	Repetitive peak reverse voltage	40	V	
I _{F(RMS)}	Forward rms current	6	Α	
I _{F(AV)}	Average forward current δ = 0.5, square wave T_C = 135 °C		3	Α
I _{FSM}	Surge non repetitive forward current tp = 10 ms sinusoidal		75	Α
P _{ARM}	Repetitive peak avalanche power		90	W
T _{stg}	Storage temperature range	-65 to +150	°C	
Tj	Maximum operating junction temperature (1)	150	°C	

Notes:

Table 3: Thermal parameters

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

When the diodes 1 and 2 are used simultaneously:

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

Table 4: Static electrical characteristics (per diode)

Symbol	Parameter	Test conditions		Min.	Тур.	Max.	Unit
1_ (1)	I _R ⁽¹⁾ Reverse leakage current	T _j = 25 °C	V _R = V _{RRM}	-		100	μΑ
IR'''		T _j = 125 °C		-	2	10	mA
	Forward voltage drop	T _j = 25 °C	I _F = 3 A	-		0.63	V
V _F (2)		T _j = 125 °C		-	0.50	0.57	
VF(=)		T _j = 25 °C	I _F = 6 A	-		0.84	V
		T _j = 125 °C		-	0.67	0.72	

Notes:

 $^{(1)}$ Pulse test: t_p = 5 ms, δ < 2%

 $^{(2)}$ Pulse test: t_p = 380 μ s, δ < 2%

To evaluate the conduction losses, use the following equation:

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

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

STPS640C Characteristics

1.1 Characteristics (curves)

Figure 1: Average forward power dissipation

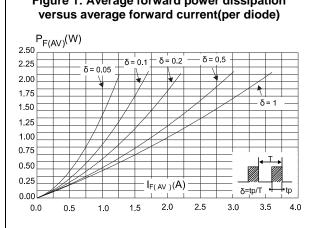


Figure 2: Average forward current versus ambient temperature (per diode, $\delta = 0.5$) $I_{F(\mathsf{AV})}(\mathsf{A})$ 4.0 R_{th(j-a)} = R_{th(j-c)} 3.5 3.0 2.5 2.0 1.5 1.0 0.5 T_{amb}(°C) δ= tp/T 0.0 0 25 50 75 100 125 150

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

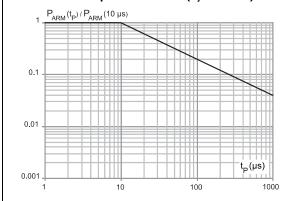


Figure 4: Relative variation of thermal impedance junction to case versus pulse duration

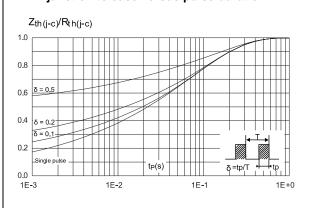


Figure 5: Reverse leakage current versus reverse voltage applied (typical values, per diode)

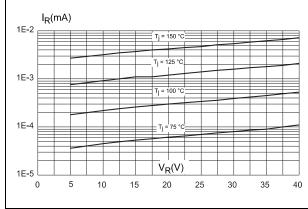
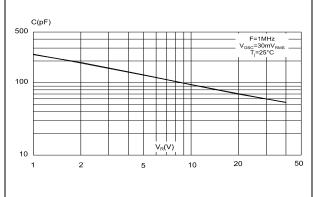


Figure 6: Junction capacitance versus reverse voltage applied (typical values, per diode)



Characteristics STPS640C

Figure 7: Forward voltage drop versus forward current (maximum values, per diode)

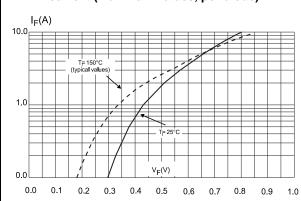
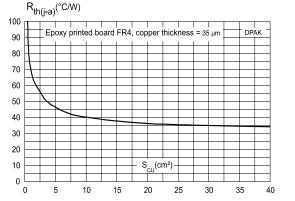


Figure 8: Thermal resistance junction to ambient versus copper surface under tab



STPS640C Package information

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 **b4** c2, Thermal pad **E1** L2 D1 D R Gauge 0.25 plane



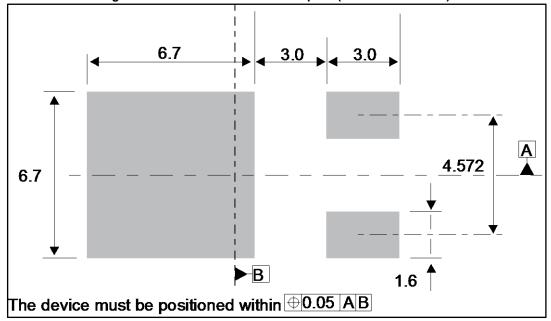
This package drawing may slightly differ from the physical package. However, all the specified dimensions are guaranteed.

Package information STPS640C

Table 5: DPAK package mechanical data

	Dimensions				
Ref.	Milli	meters	Inc	hes	
	Min.	Max.	Min.	Max.	
А	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	
С	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	
Е	6.35	6.73	0.250	0.265	
E1	4.32	5.50	0.170	0.216	
е	2.286 typ.		0.090	O typ.	
e1	4.40	4.70	0.173	0.185	
Н	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)



STPS640C Ordering information

3 Ordering information

Table 6: Ordering information

Order code		Marking	g Package Weight		Base gty	Delivery mode	
	Order Code	wai Kiliy	rackage	weight	Dase quy	Delivery Illoue	
	STPS640CB	S6 40C	DDAK	0.00 =	75	Tube	
	STPS640CB-TR	S6 40C	DPAK	0.32 g	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.

IMPORTANT NOTICE - PLEASE READ CAREFULLY

STMicroelectronics NV and its subsidiaries ("ST") reserve the right to make changes, corrections, enhancements, modifications, and improvements to ST products and/or to this document at any time without notice. Purchasers should obtain the latest relevant information on ST products before placing orders. ST products are sold pursuant to ST's terms and conditions of sale in place at the time of order acknowledgement.

Purchasers are solely responsible for the choice, selection, and use of ST products and ST assumes no liability for application assistance or the design of Purchasers' products.

No license, express or implied, to any intellectual property right is granted by ST herein.

Resale of ST products with provisions different from the information set forth herein shall void any warranty granted by ST for such product.

ST and the ST logo are trademarks of ST. All other product or service names are the property of their respective owners.

Information in this document supersedes and replaces information previously supplied in any prior versions of this document.

© 2017 STMicroelectronics - All rights reserved

