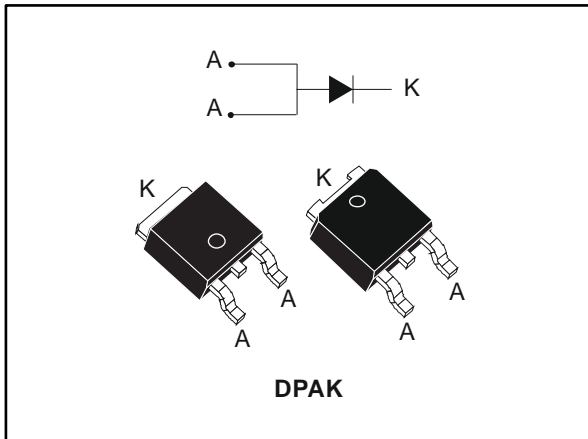


## 45 V field-effect rectifier diode

Datasheet - production data



### Description

This single rectifier is based on a proprietary technology that achieves the best in class  $V_F/I_R$  trade-off for a given silicon surface.

Therefore it can advantageously replace 45 V low voltage Schottky diodes.

Packaged in DPAK, this device is intended to be used in rectification and freewheeling operations in power supplies.

**Table 1: Device summary**

Symbol	Value
$I_{F(AV)}$	20 A
$V_{RRM}$	45 V
$V_F(\text{typ.})$	0.29 V
$T_J(\text{max.})$	150 °C

### Features

- ST advanced rectifier process
- Stable leakage current over reverse voltage
- Low forward voltage drop
- High frequency operation
- ECOPACK®2 compliant component for DPAK on demand

# 1 Characteristics

**Table 2: Absolute ratings (limiting values at 25 °C, unless otherwise specified, anode terminals short-circuited)**

Symbol	Parameter		Value	Unit
V <sub>RRM</sub>	Repetitive peak reverse voltage		45	V
I <sub>F(RMS)</sub>	Forward rms current		40	A
I <sub>F(AV)</sub>	Average forward current $\delta = 0.5$ , square wave	T <sub>C</sub> = 125 °C	20	A
I <sub>FSM</sub>	Surge non repetitive forward current	t <sub>p</sub> = 10 ms sinusoidal	180	A
T <sub>stg</sub>	Storage temperature range		-65 to +175	°C
T <sub>j</sub>	Maximum operating junction temperature range <sup>(1)</sup>		-40 to +150	°C

**Notes:**

<sup>(1)</sup>(dP<sub>tot</sub>/dT<sub>j</sub>) < (1/R<sub>th(j-a)</sub>) condition to avoid thermal runaway for a diode on its own heatsink.

**Table 3: Thermal resistance parameters**

Symbol	Parameter	Value	Unit
R <sub>th(j-c)</sub>	Junction to case	1.4	°C/W

**Table 4: Static electrical characteristics (anode terminals short circuited)**

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
I <sub>R</sub> <sup>(1)</sup>	Reverse leakage current	T <sub>j</sub> = 25 °C	V <sub>R</sub> = 35 V	-	100	300	μA
		T <sub>j</sub> = 125 °C		-	12	24	mA
		T <sub>j</sub> = 25 °C	V <sub>R</sub> = V <sub>RRM</sub>	-	200	600	μA
		T <sub>j</sub> = 125 °C		-	18	40	mA
V <sub>F</sub> <sup>(2)</sup>	Forward voltage drop	T <sub>j</sub> = 25 °C	I <sub>F</sub> = 5 A	-	0.35		V
		T <sub>j</sub> = 125 °C		-	0.29		
		T <sub>j</sub> = 25 °C	I <sub>F</sub> = 10 A	-	0.41	0.45	
		T <sub>j</sub> = 125 °C		-	0.38	0.42	
		T <sub>j</sub> = 25 °C	I <sub>F</sub> = 20 A	-	0.51	0.55	
		T <sub>j</sub> = 125 °C		-	0.52	0.57	

**Notes:**

<sup>(1)</sup>Pulse test: t<sub>p</sub> = 5 ms,  $\delta < 2\%$

<sup>(2)</sup>Pulse test: t<sub>p</sub> = 380 μs,  $\delta < 2\%$

To evaluate the maximum conduction losses use the following equation:

$$P = 0.27 \times I_{F(AV)} + 0.015 \times I_{F(RMS)}^2$$

### 1.1 Characteristics (curves)

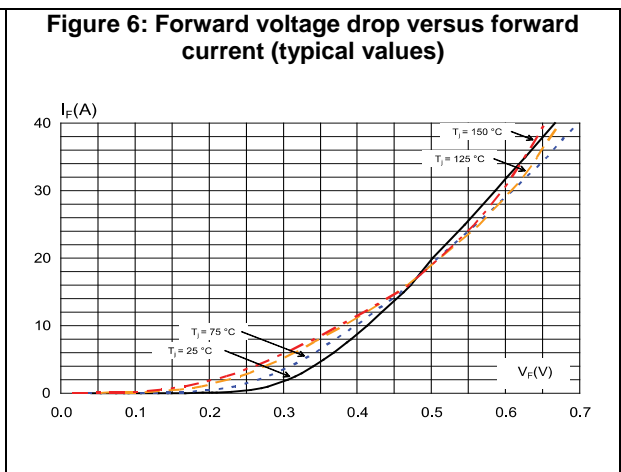
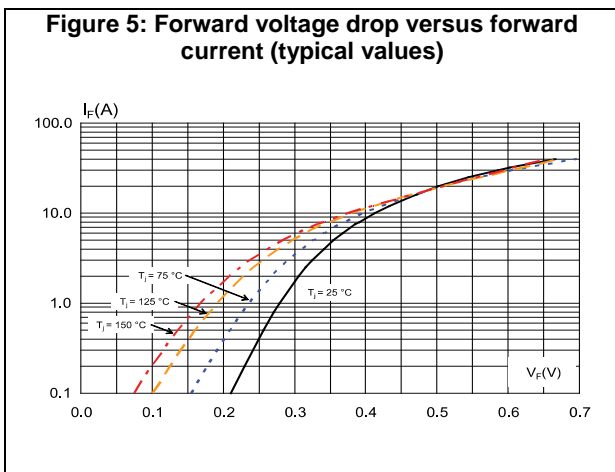
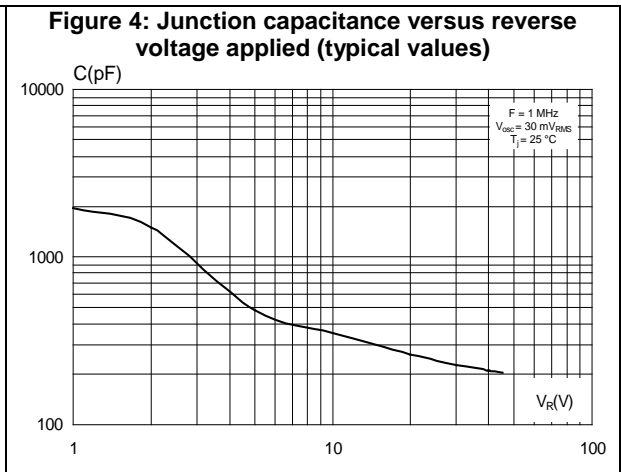
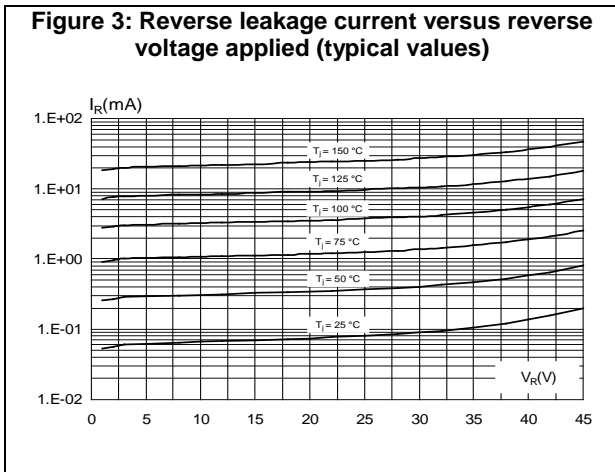
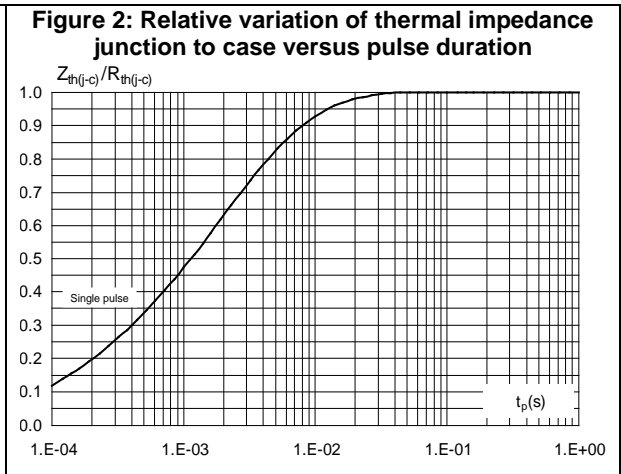
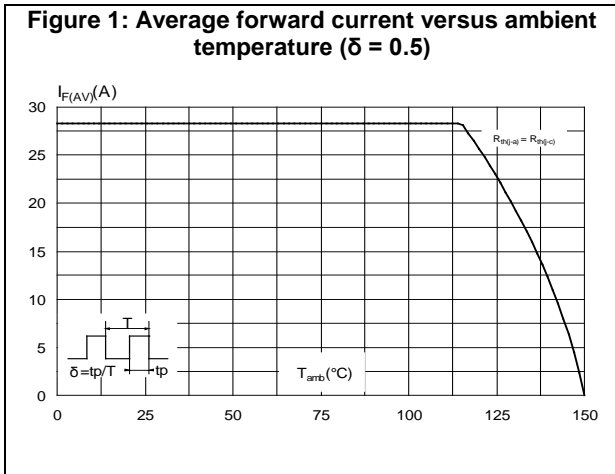
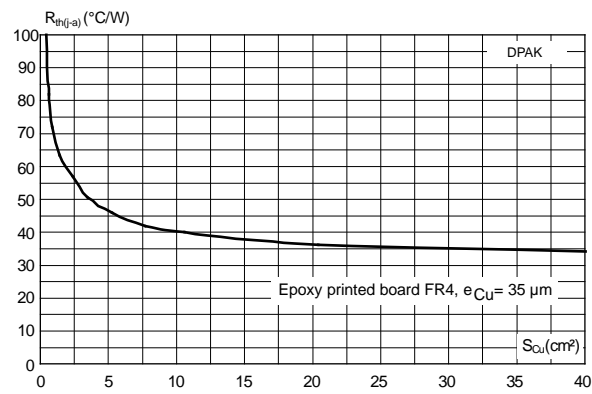


Figure 7: Thermal resistance junction to ambient versus copper surface under tab for DPAK



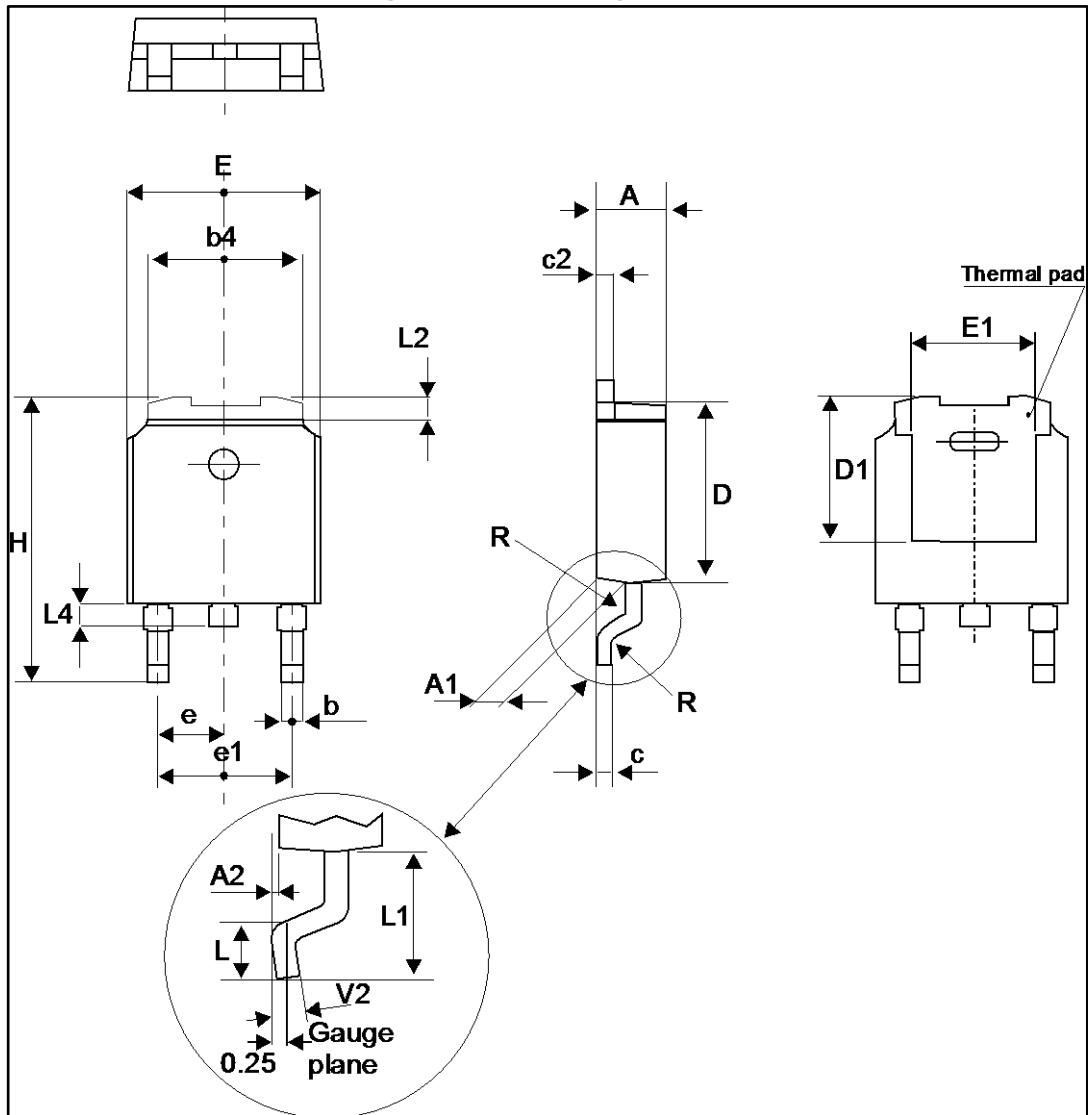
## 2 Package information

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](http://www.st.com). ECOPACK® is an ST trademark.

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

### 2.1 DPAK package information

Figure 8: DPAK package outline

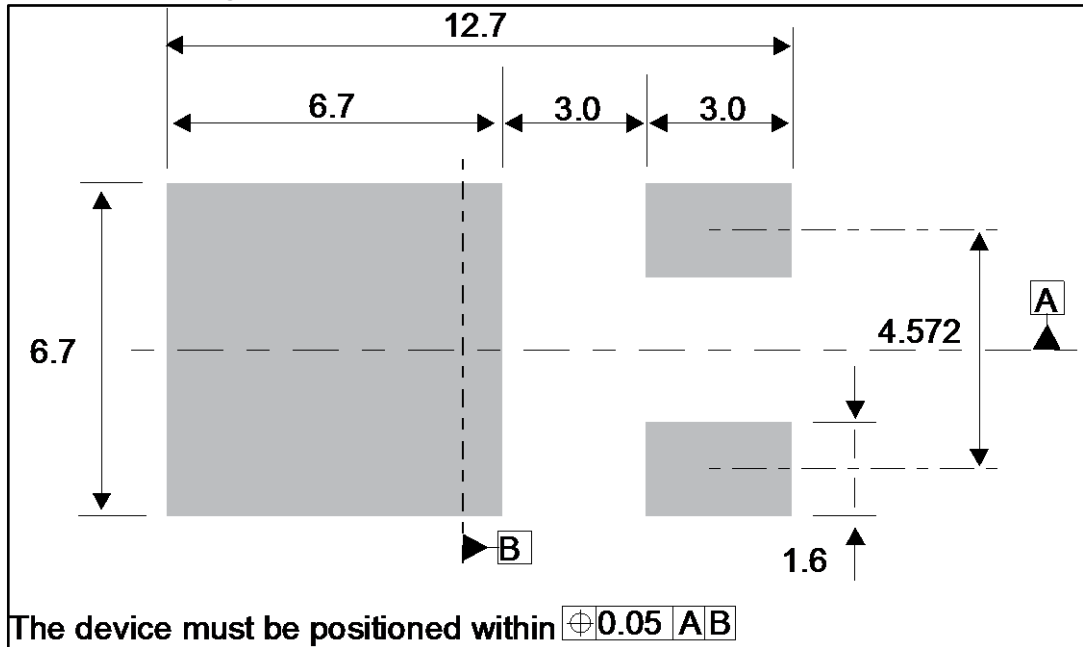


This package drawing may slightly differ from the physical package. However, all the specified dimensions are guaranteed.

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 9: DPAK recommended footprint (dimensions in mm)



### 3 Ordering information

Table 6: Ordering information

Order code	Marking	Package	Weight	Base qty.	Delivery mode
FERD2045SB-TR	FERD 2045	DPAK	0.32 g	2500	Tape and reel

### 4 Revision history

Table 7: Document revision history

Date	Revision	Changes
15-Jan-2018	1	Initial release.

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