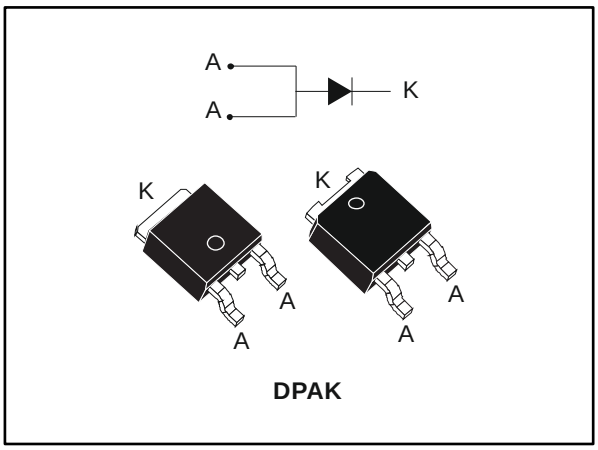
FERD2045S

45 V field-effect rectifier diode

Datasheet - production data



DPAK

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

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(typ.)	0.29 V
T_j(max.)	150 °C

1 Characteristics

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

Symbol	Parameter		Value	Unit
V_{RRM}	Repetitive peak reverse voltage		45	V
$I_{F(RMS)}$	Forward rms current		40	A
$I_{F(AV)}$	Average forward current δ = 0.5, square wave	T_C = 125 °C	20	A
I_{FSM}	Surge non repetitive forward current	t_p = 10 ms sinusoidal	180	A
T_{stg}	Storage temperature range		-65 to +175	°C
T_j	Maximum operating junction temperature range(1)		-40 to +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 resistance parameters

Symbol	Parameter	Value	Unit
$R_{th(j-c)}$	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_R(1)	Reverse leakage current	T_j = 25 °C	V_R = 35 V	-	100	300	µA
		T_j = 125 °C		-	12	24	mA
		T_j = 25 °C	$V_R = V_{RRM}$	-	200	600	µA
		T_j = 125 °C		-	18	40	mA
V_F(2)	Forward voltage drop	T_j = 25 °C	I_F = 5 A	-	0.35		V
		T_j = 125 °C		-	0.29		
		T_j = 25 °C	I_F = 10 A	-	0.41	0.45	
		T_j = 125 °C		-	0.38	0.42	
		T_j = 25 °C	I_F = 20 A	-	0.51	0.55	
		T_j = 125 °C		-	0.52	0.57	

Notes:

(1)Pulse test: t_p = 5 ms, δ < 2%

(2)Pulse test: t_p = 380 µs, δ < 2%

To evaluate the maximum conduction losses use the following equation:

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

1.1 Characteristics (curves)

Figure 1: Average forward current versus ambient temperature (δ = 0.5)

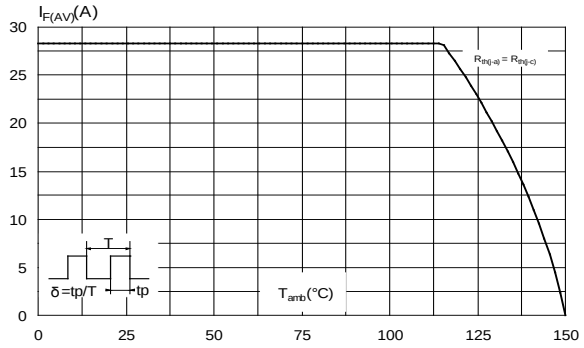


Figure 2: Relative variation of thermal impedance junction to case versus pulse duration

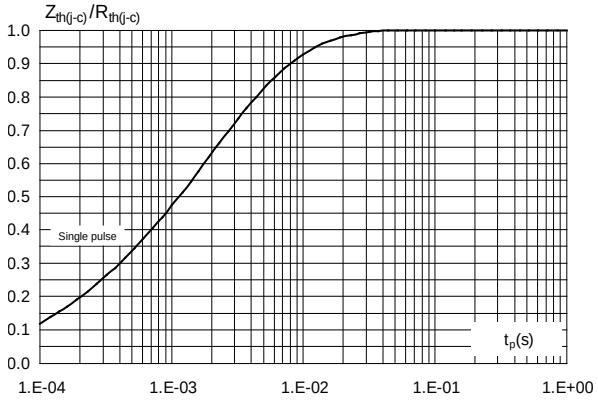


Figure 3: Reverse leakage current versus reverse voltage applied (typical values)

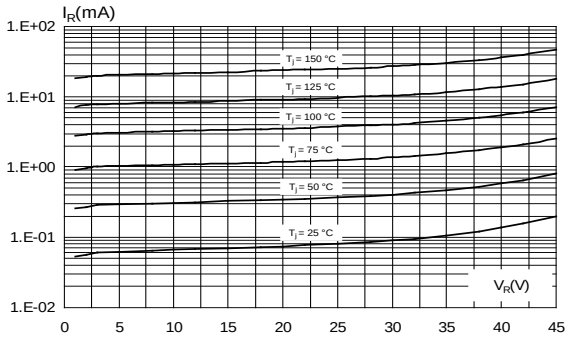


Figure 4: Junction capacitance versus reverse voltage applied (typical values)

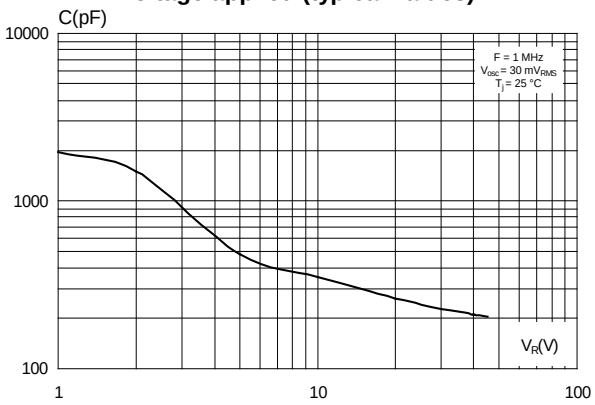


Figure 5: Forward voltage drop versus forward current (typical values)

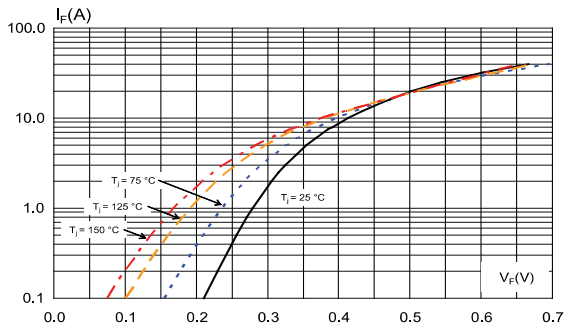


Figure 6: Forward voltage drop versus forward current (typical values)

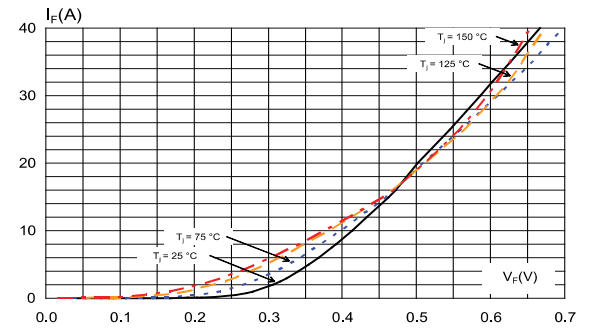
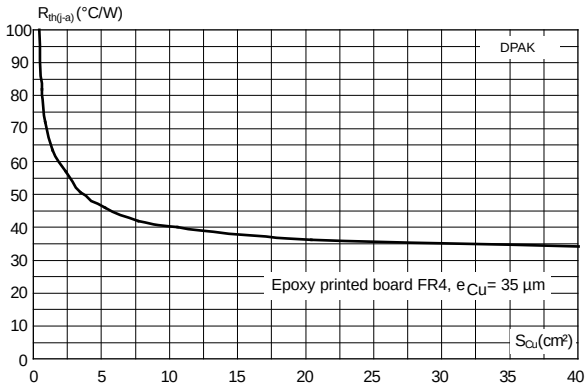


Figure 7: Thermal resistance junction to ambient versus copper surface under tab for DPAK



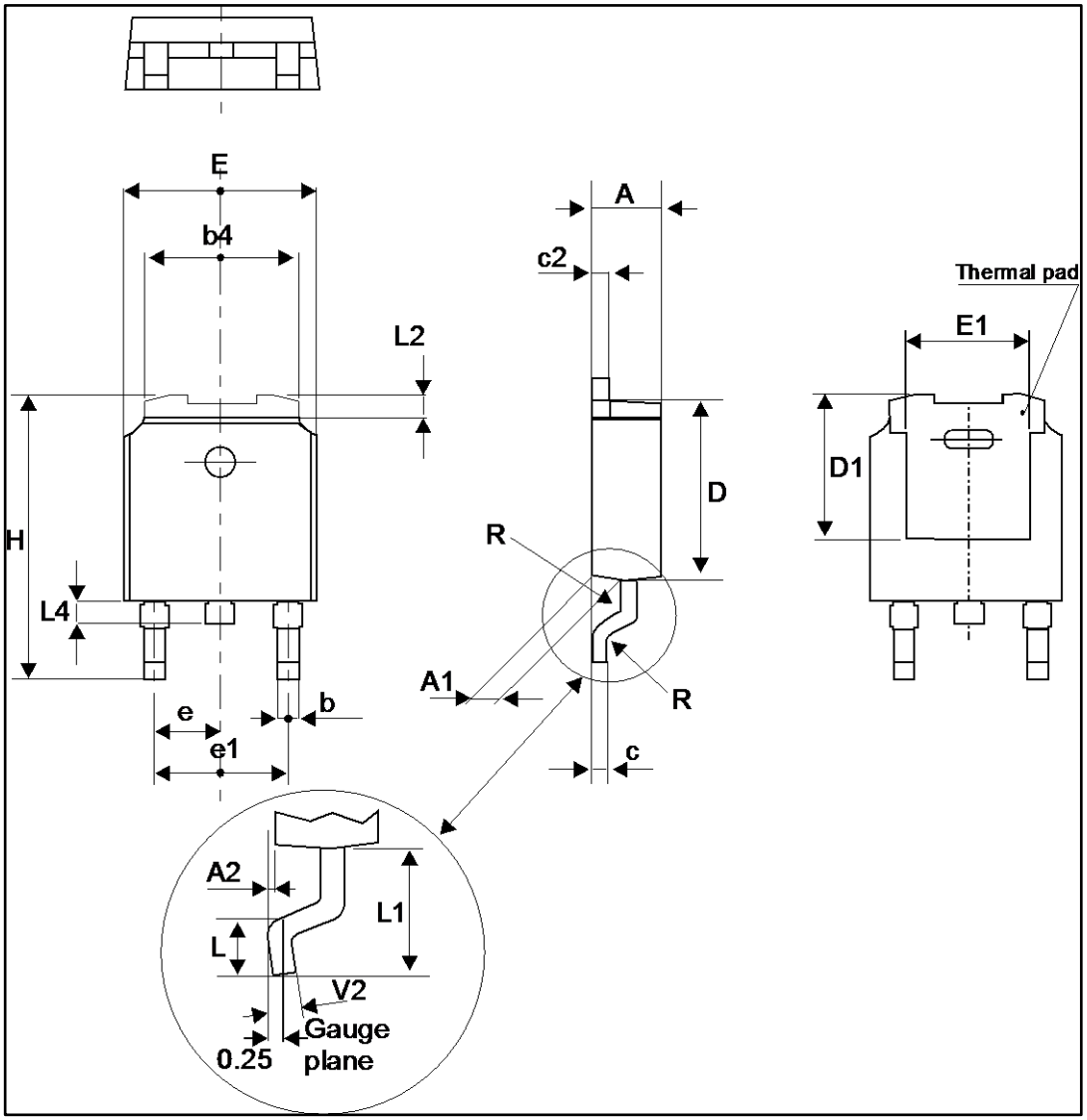
2 Package information

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***. 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

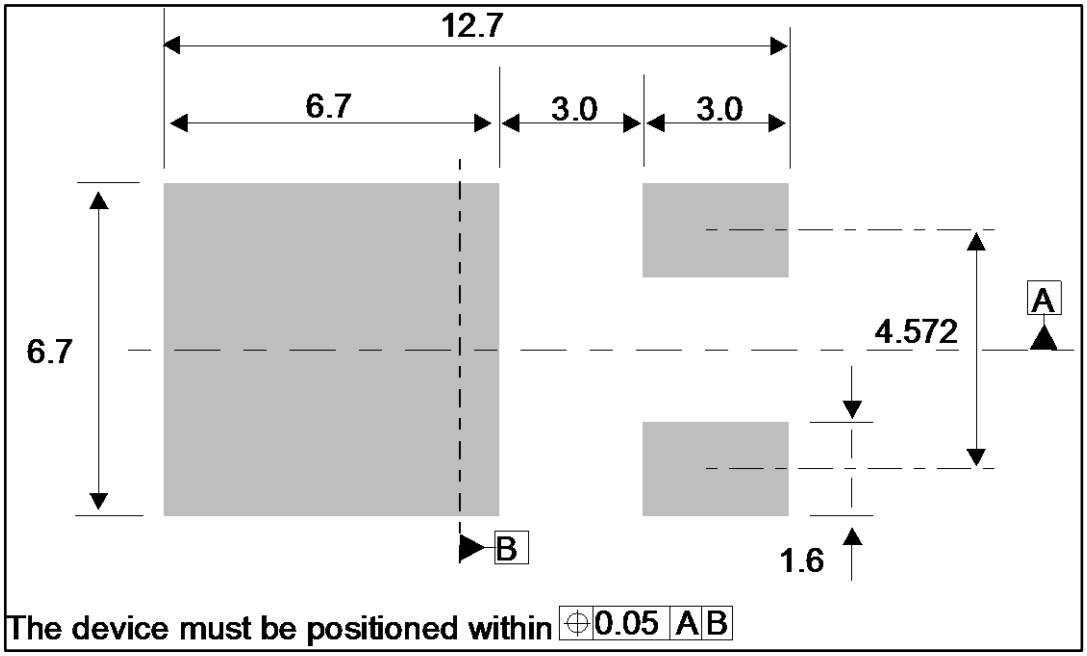


This package drawing may slightly differ from the physical package. However, all the specified dimensions are guaranteed.

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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