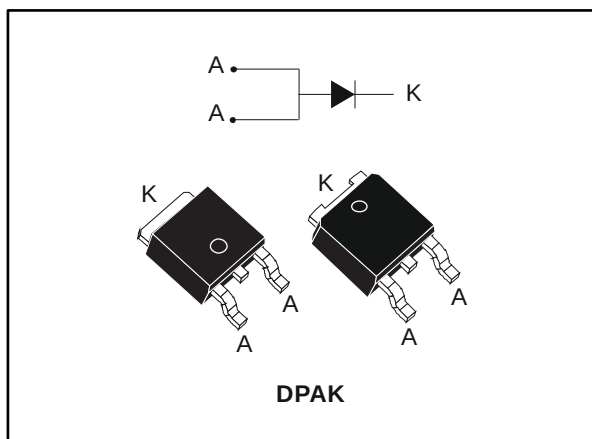


50 V field-effect rectifier diode

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.

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

Table 1: Device summary

Symbol	Value
$I_{F(AV)}$	15 A
V_{RRM}	50 V
$V_F(\text{typ.})$	0.31 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_{RRM}	Repetitive peak reverse voltage		50	V
$I_{F(RMS)}$	Forward rms current		25	A
$I_{F(AV)}$	Average forward current $\delta = 0.5$, square wave	$T_C = 130\text{ °C}$	15	A
I_{FSM}	Surge non repetitive forward current	$t_p = 10\text{ ms sinusoidal}$	100	A
T_{stg}	Storage temperature range		-65 to +175	°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 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	$T_j = 25\text{ °C}$	$V_R = 35\text{ V}$	-		470	μA
		$T_j = 125\text{ °C}$		-	16	32	mA
		$T_j = 25\text{ °C}$	$V_R = V_{RRM}$	-	250	650	μA
		$T_j = 125\text{ °C}$		-	20	40	mA
$V_F^{(2)}$	Forward voltage drop	$T_j = 25\text{ °C}$	$I_F = 5\text{ A}$	-	0.36		V
		$T_j = 125\text{ °C}$		-	0.31	0.36	
		$T_j = 25\text{ °C}$	$I_F = 10\text{ A}$	-	0.43	0.48	
		$T_j = 125\text{ °C}$		-	0.42	0.46	
		$T_j = 25\text{ °C}$	$I_F = 15\text{ A}$	-	0.49		
		$T_j = 125\text{ °C}$		-	0.49	0.55	

Notes:

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

⁽²⁾Pulse test: $t_p = 380\text{ μs}$, $\delta < 2\%$

To evaluate the maximum conduction losses use the following equation:

$$P = 0.25 \times I_{F(AV)} + 0.02 \times I_{F(RMS)}^2$$

1.1 Characteristics (curves)

Figure 1: Average forward power dissipation versus average forward current

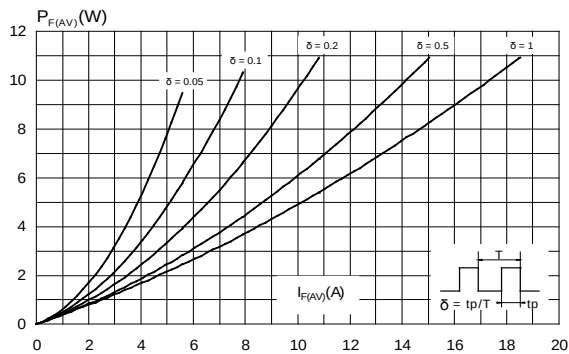


Figure 2: Average forward current versus ambient temperature ($\delta = 0.5$)

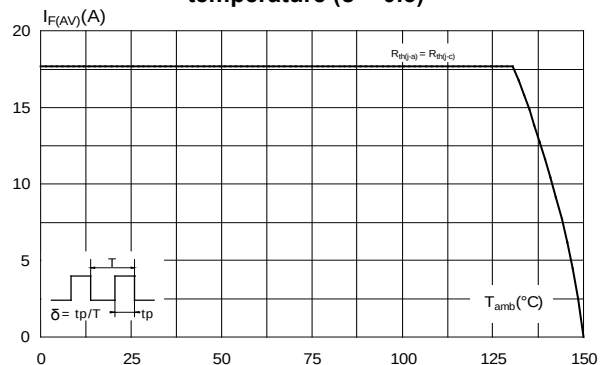


Figure 3: Relative variation of thermal impedance junction to case versus pulse duration

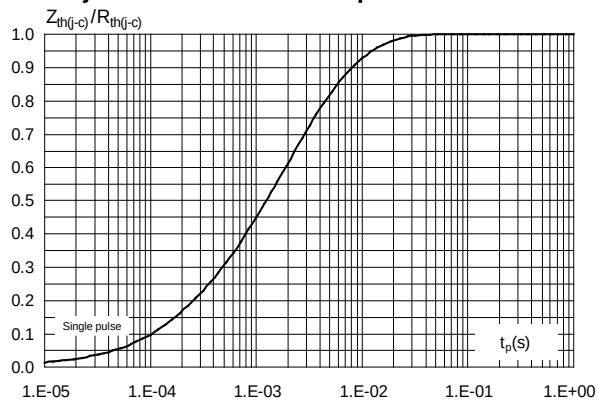


Figure 4: Reverse leakage current versus reverse voltage applied (typical values)

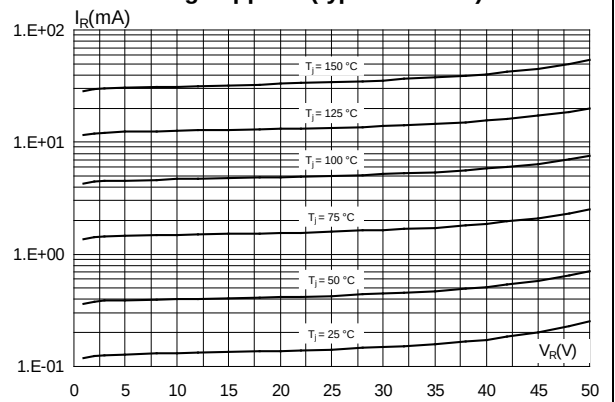


Figure 5: Junction capacitance versus reverse voltage applied (typical values)

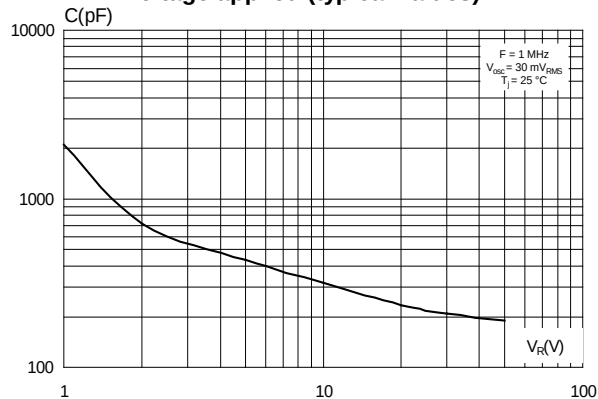


Figure 6: Forward voltage drop versus forward current (typical values)

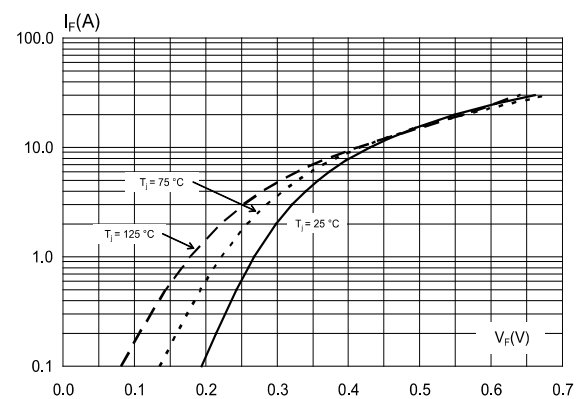
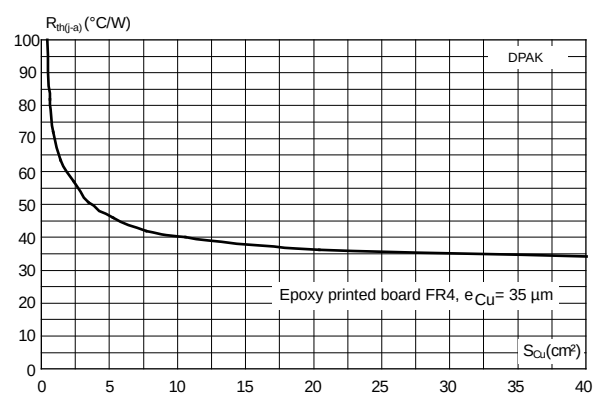


Figure 7: Thermal resistance junction to ambient versus copper surface under tab for DPAK (typical values)



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

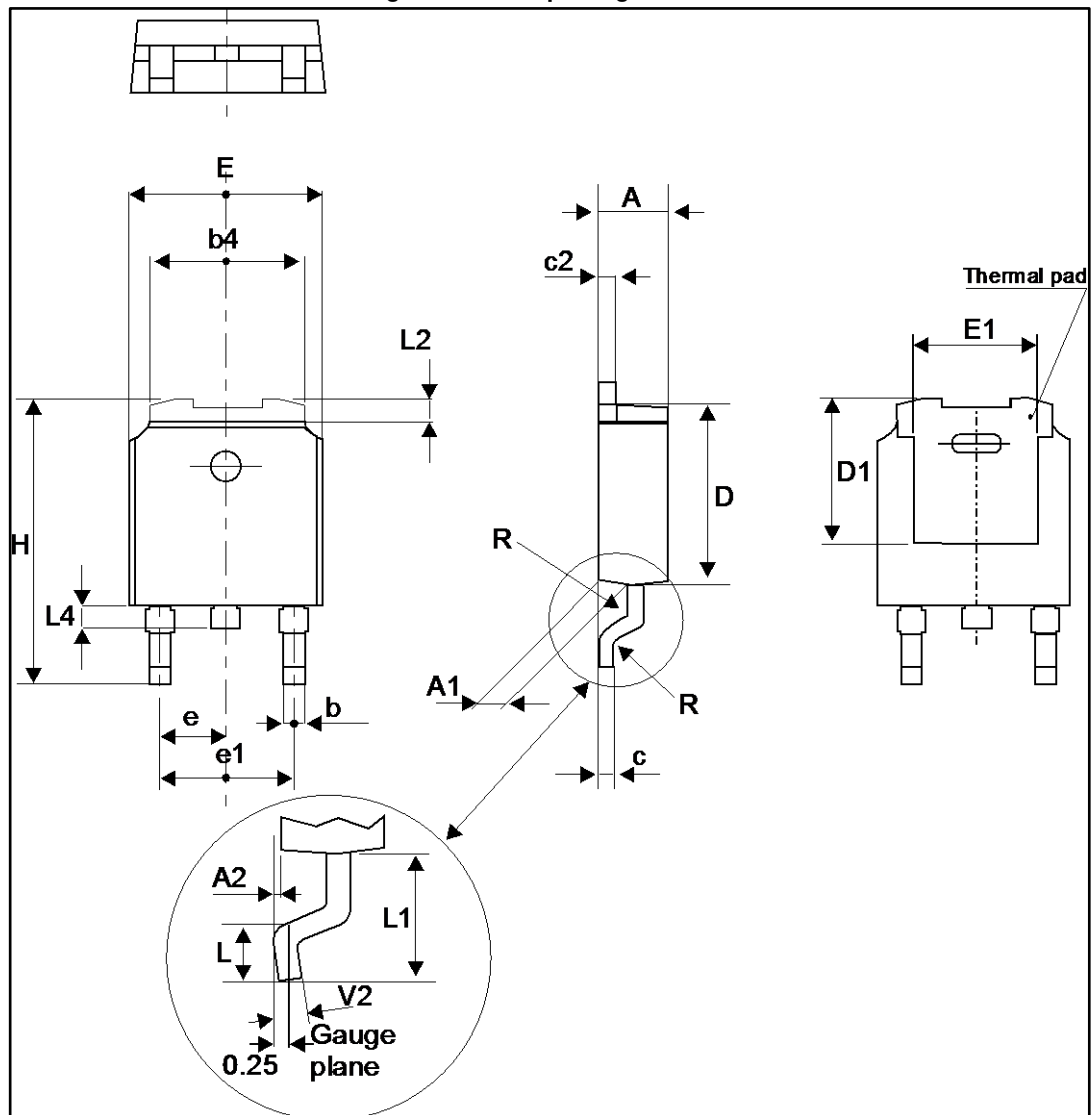
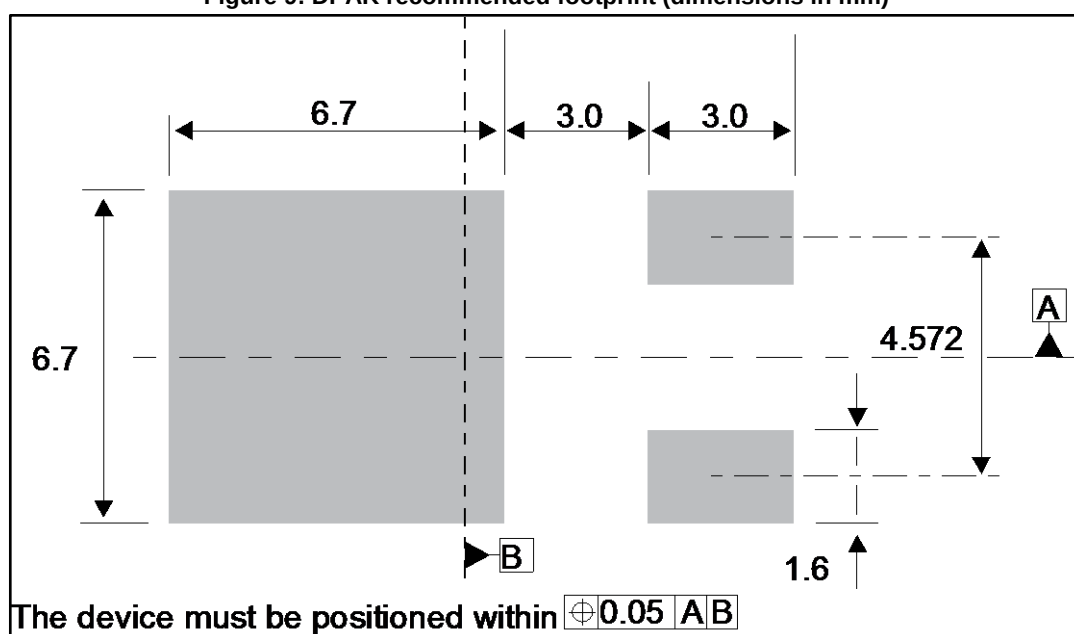


Table 5: DPAK package mechanical data

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
FERD15S50SB-TR	FERD 15S50	DPAK	0.32 g	2500	Tape and reel

4 Revision history

Table 7: Document revision history

Date	Revision	Changes
09-Feb-2017	1	Initial release.

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