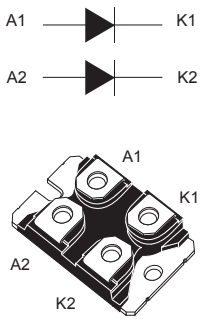
STPS120L15

Datasheet

15 V power Schottky rectifier



ISOTOP™

Features

- Very low forward voltage drop
- Avalanche capability
- Insulated package ISOTOP:
  - Insulated voltage: 2500 V_{RMS} sine
- ECOPACK®2 compliant

Applications

- OR-ing diode
- Server
- Telecom power
- Heavy duty application

Description

Dual Schottky rectifier suited for SMPS and DC to DC power converters.

Packaged in ISOTOP™, the STPS120L15 is especially intended for use as an OR-ing diode in fault tolerant power supply equipments.

Note: ISOTOP™ is an ST trademark.

Product status link
STPS120L15

Product summary	
Symbol	**Value**
$I_{F(AV)}$	2 x 60 A
V_{RRM}	15 V
T_j (max.)	125 °C
V_F (typ.)	0.27 V

1 Characteristics

Table 1. Absolute ratings (limiting values at 25 °C unless otherwise specified, per diode)

Symbol	Parameter		Value	Unit
V_{RRM}	Repetitive peak reverse voltage		15	V
$I_{F(RMS)}$	Forward rms current		160	A
$I_{F(AV)}$	Average forward current , δ = 1 square wave	T_c = 115 °C	60	A
I_{FSM}	Surge non repetitive forward current	t_p = 10 ms sinusoidal	1200	A
P_{ARM}	Repetitive peak avalanche power	t_p = 10 µs, T_j = 125 °C	5186	W
T_{stg}	Storage temperature range		-65 to +150	°C
T_j	Maximum operating junction temperature (1)		125	°C

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

Table 2. Thermal resistance parameters

Symbol	Parameter		Max. value	Unit
$R_{th(j-c)}$	Junction to case	Per diode	0.45	°C/W
		Total	0.28	
$R_{th(c)}$	Coupling		0.1	

When the diodes 1 and 2 are used simultaneously :

ΔT_j(diode 1) = P(diode1) x $R_{th(j-c)}$(Per diode) + P(diode 2) x $R_{th(c)}$

For more information, please refer to the following application note:

- AN5088 : Rectifiers thermal management, handling and mounting recommendations

Table 3. Static electrical characteristics (per diode)

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
I_R (1)	Reverse leakage current	T_j = 100 °C	V_R = 5 V	-	450		mA
		T_j = 25 °C	V_R = 12 V	-		22	
		T_j = 100 °C		-	0.7	2.2	A
V_F (1)	Forward voltage drop	T_j = 25 °C	I_F = 60 A	-		0.43	V
		T_j = 125 °C		-	0.27	0.31	

1. *Pulse test: t_p = 380 µs, δ < 2%*

To evaluate the conduction losses, use the following equation:

$P = 0.18 \times I_{F(AV)} + 0.0022 \times I_F{}^2{}_{(RMS)}$

For more information, please refer to the following application notes related to the power losses :

- AN604: Calculation of conduction losses in a power rectifier
- AN4021: Calculation of reverse losses on a power diode

1.1 Characteristics (curves)

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

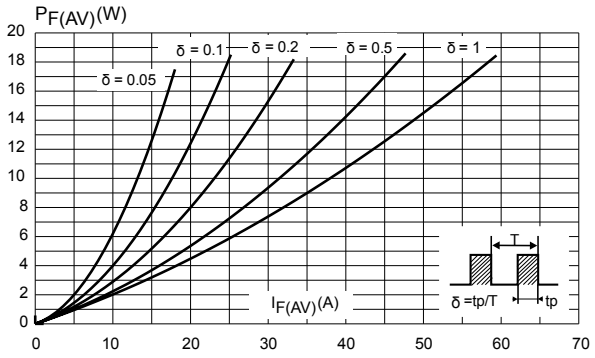


Figure 2. Average forward current versus ambient temperature (δ = 1, per diode)

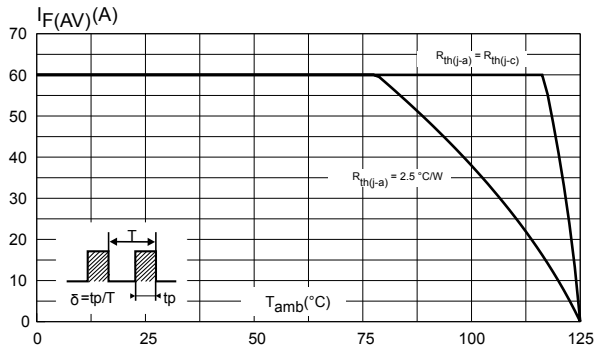


Figure 3. Normalized avalanche power derating versus pulse duration (T_j = 125 °C)

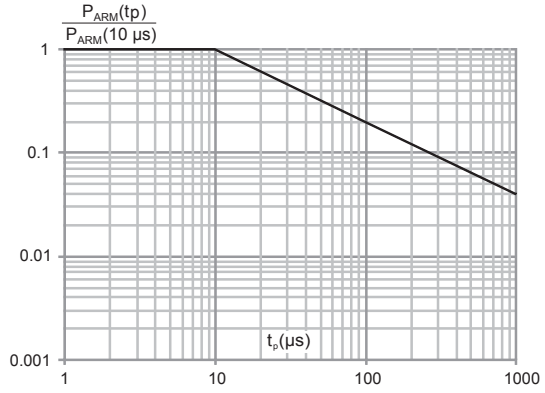


Figure 4. Relative variation of thermal impedance junction to case versus pulse duration

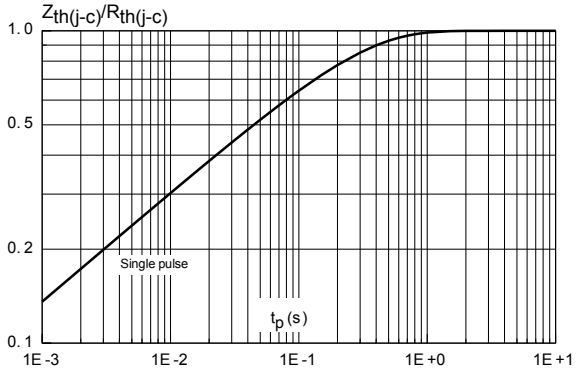


Figure 5. Reverse leakage current versus reverse voltage applied (typical values per diode)

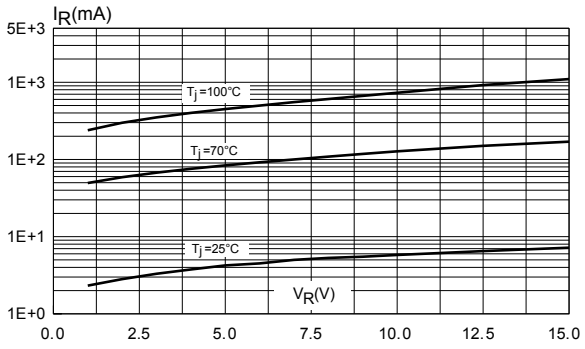


Figure 6. Junction capacitance versus reverse voltage applied (typical values per diode)

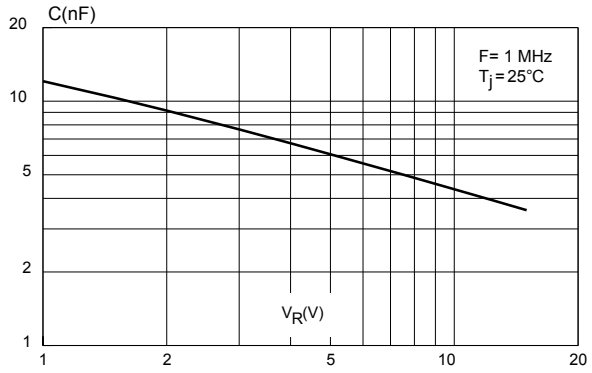
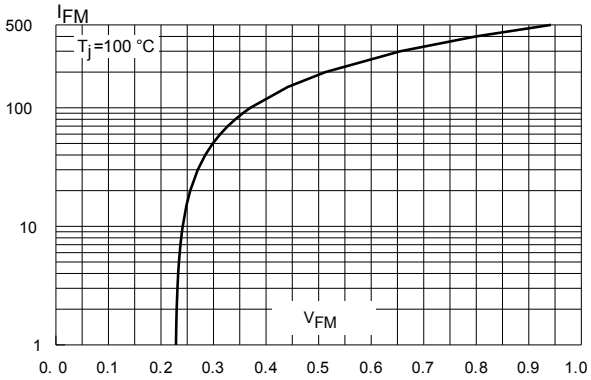


Figure 7. Forward voltage drop versus forward current (maximum values per diode)



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.

2.1 ISOTOP™ package information

- Epoxy meets UL94, V0
- Cooling method: by conduction (C)
- Recommended torque value: 1.3 N·m
- Maximum torque value: 1.5 N·m

STMicroelectronics strongly recommend the use of the screws delivered with this product.
The use of any other screws is entirely at the user's own risk and will invalidate the warranty.

Figure 8. ISOTOP™ package outline

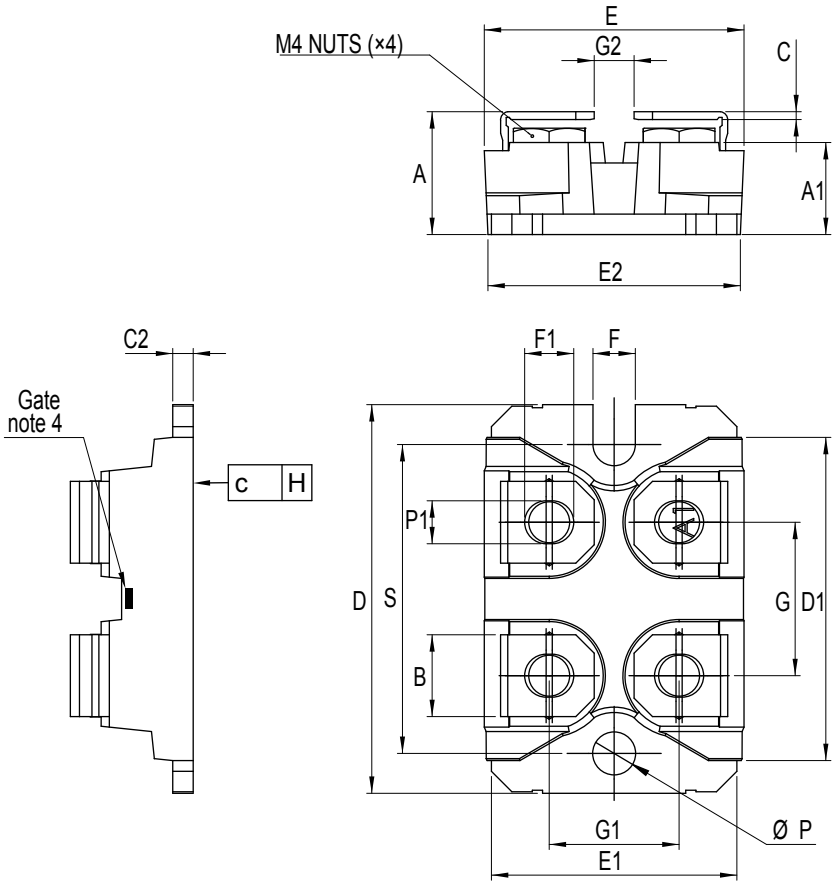


Table 4. **ISOTOP™ package mechanical data**

Ref.	Dimensions			
	Millimeters		Inches[1]	
	Min.	Max.	Min.	Max.
A	11.80	12.20	0.460	0.480
A1	8.90	9.10	0.350	0.358
B	7.80	8.20	0.307	0.323
C	0.75	0.85	0.030	0.033
C2	1.95	2.05	0.077	0.081
D	37.80	38.20	1.488	1.504
D1	31.50	31.70	1.240	1.248
E	25.15	25.50	0.990	1.004
E1	23.85	24.15	0.939	0.951
E2	24.80		0.976	
G	14.90	15.10	0.587	0.594
G1	12.60	12.80	0.496	0.504
G2	3.50	4.30	0.138	0.169
F	4.10	4.30	0.161	0.169
F1	4.60	5.00	0.181	0.197
H	-0.05	0.10	-0.002	0.004
Diam P	4.00	4.30	0.157	0.169
P1	4.00	4.40	0.157	0.173
S	30.10	30.30	1.185	1.193

1. *Inches given for reference only*

3 Ordering information

Table 5. **Ordering information**

Order code	Marking	Package	Weight	Base qty.	Delivery mode
STPS120L15TV	STPS120L15TV	ISOTOP™	27 g without screws	10 with screws	Tube

Revision history

Table 6. **Document revision history**

Date	Version	Changes
July-2003	6	Initial release.
17-Sep-2018	7	Updated cover page. Updated Table 1. Absolute ratings (limiting values at 25 °C unless otherwise specified, per diode) and Table 3. Static electrical characteristics (per diode). Removed figure 4 and figure 5. Updated Section 1.1 Characteristics (curves) and Section 3 Ordering information. Minor text change to improve readability.