



Power Schottky trench diodes

STPSTxH100 series





1 Introduction to trench diodes

2 Trench diode applications and electrical performances

3 Promotional tools

4 Sampling program



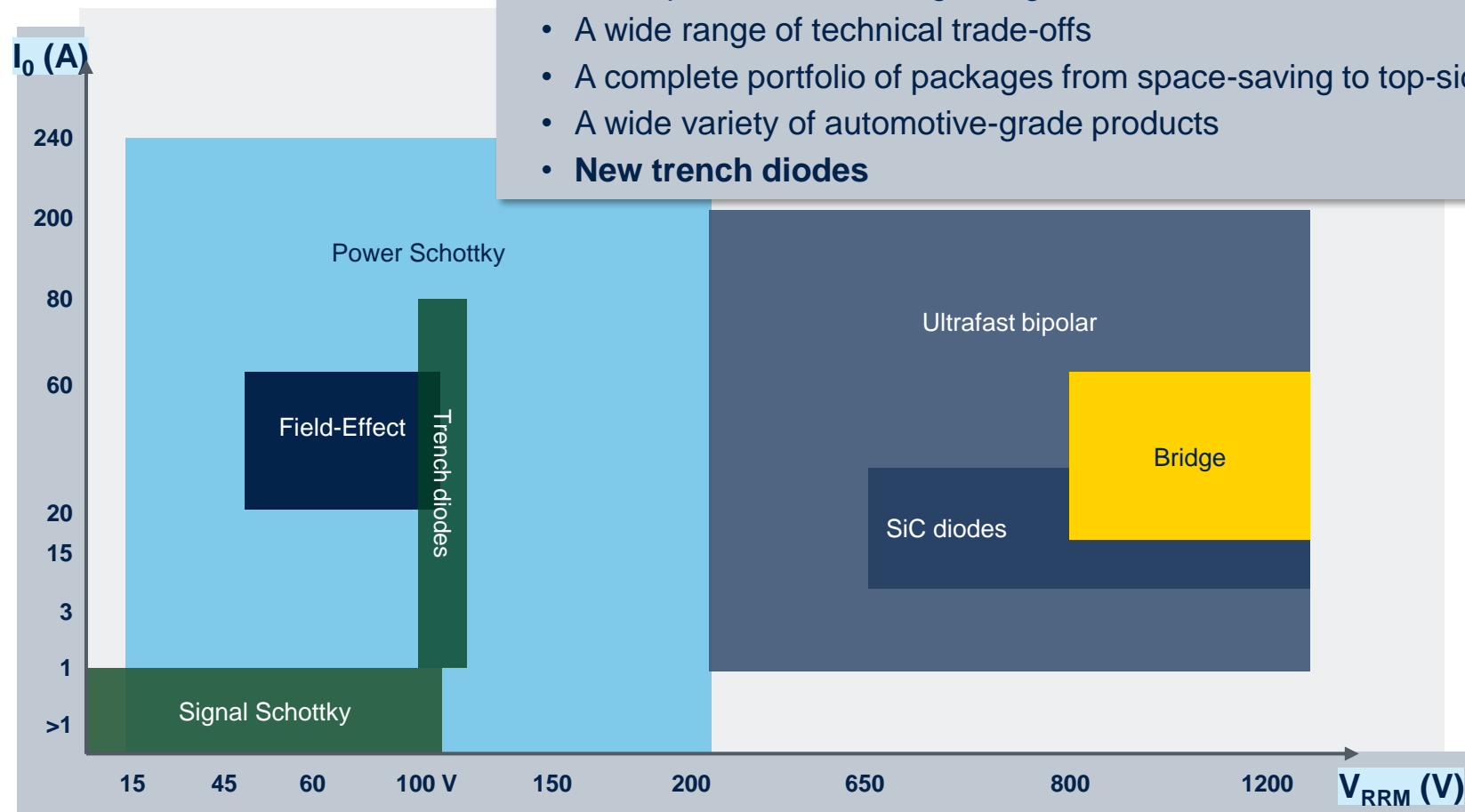
Introducing the ST trench diode series



A portfolio designed to fit our customer needs

ST products are designed for the highest levels of performance and benchmark quality

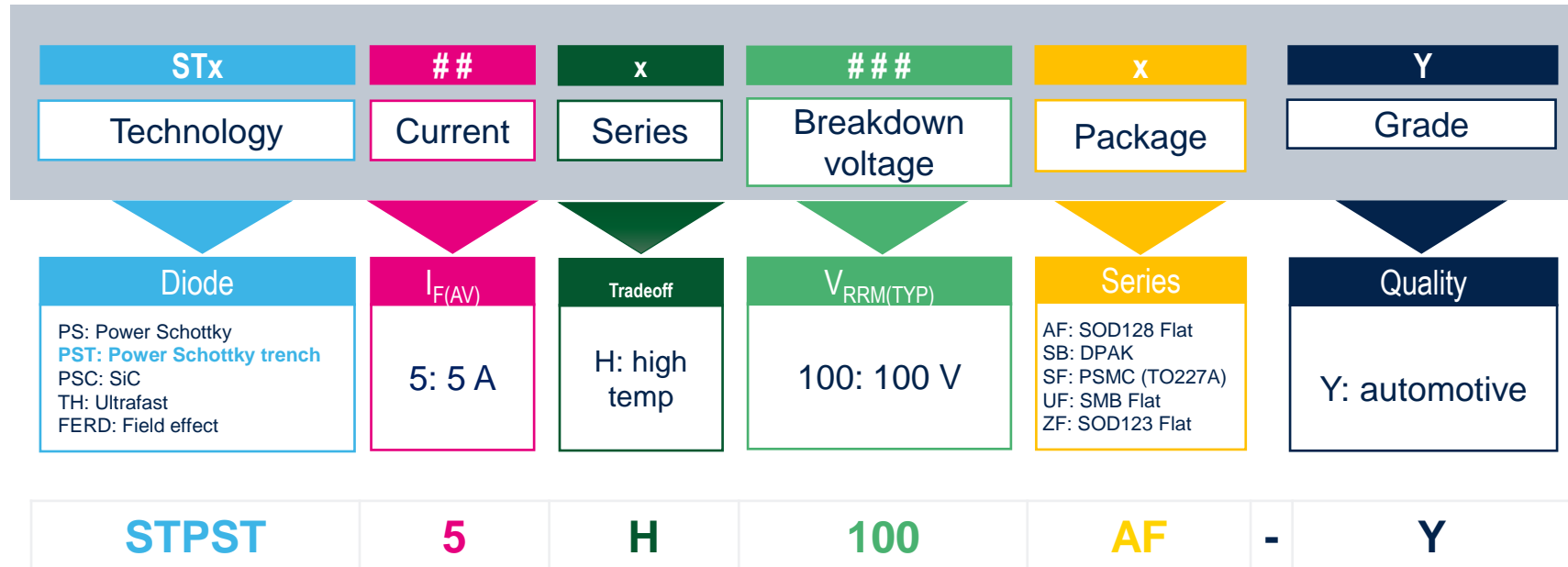
- A complete current/voltage range
- A wide range of technical trade-offs
- A complete portfolio of packages from space-saving to top-side cooling
- A wide variety of automotive-grade products
- **New trench diodes**





ST rectifier order numbering

The new 100 V power Schottky trench diodes range
29 references | 9 $I_{F(AV)}$ current values available | 6 packages



ST trench diodes increase total system efficiency

Up to 60% higher power integration vs standard power Schottky
Ideal for high-frequency switching applications

Optimized portfolio

Automotive

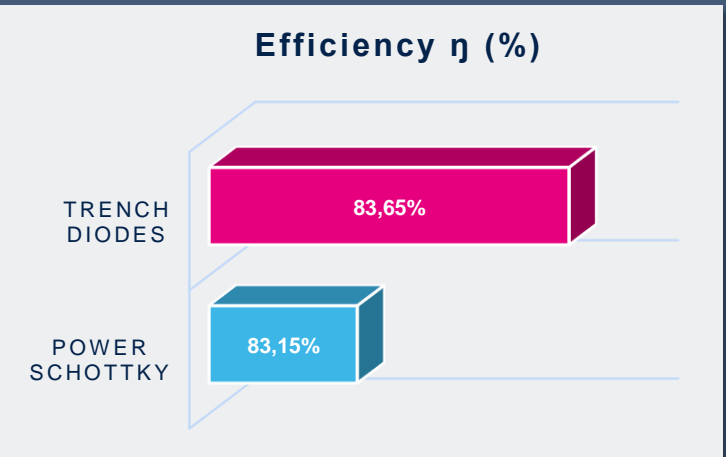
LED lighting
Reverse battery protection
Low-voltage DC-DC

Industrial

Auxiliary power supply
SMPS

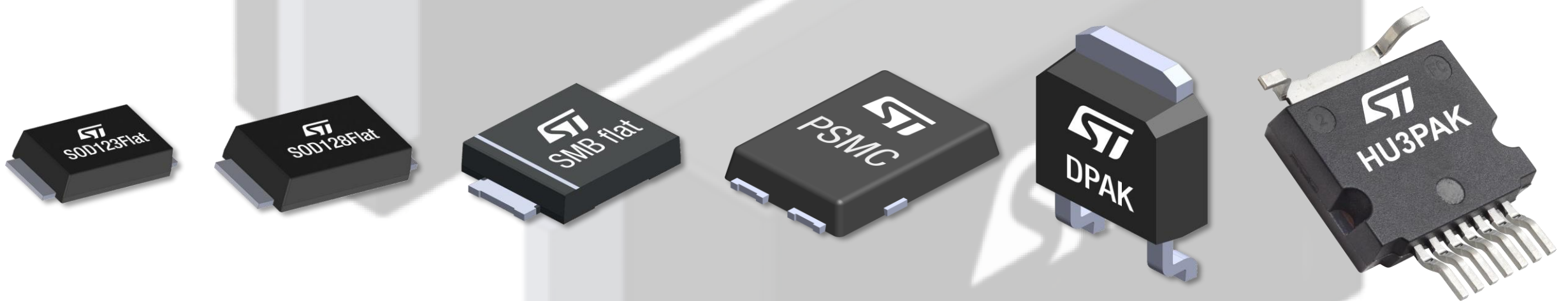
29 products from 1 to 80 A
4 SMD + DPAK package +
top-side cooled package

Improved efficiency

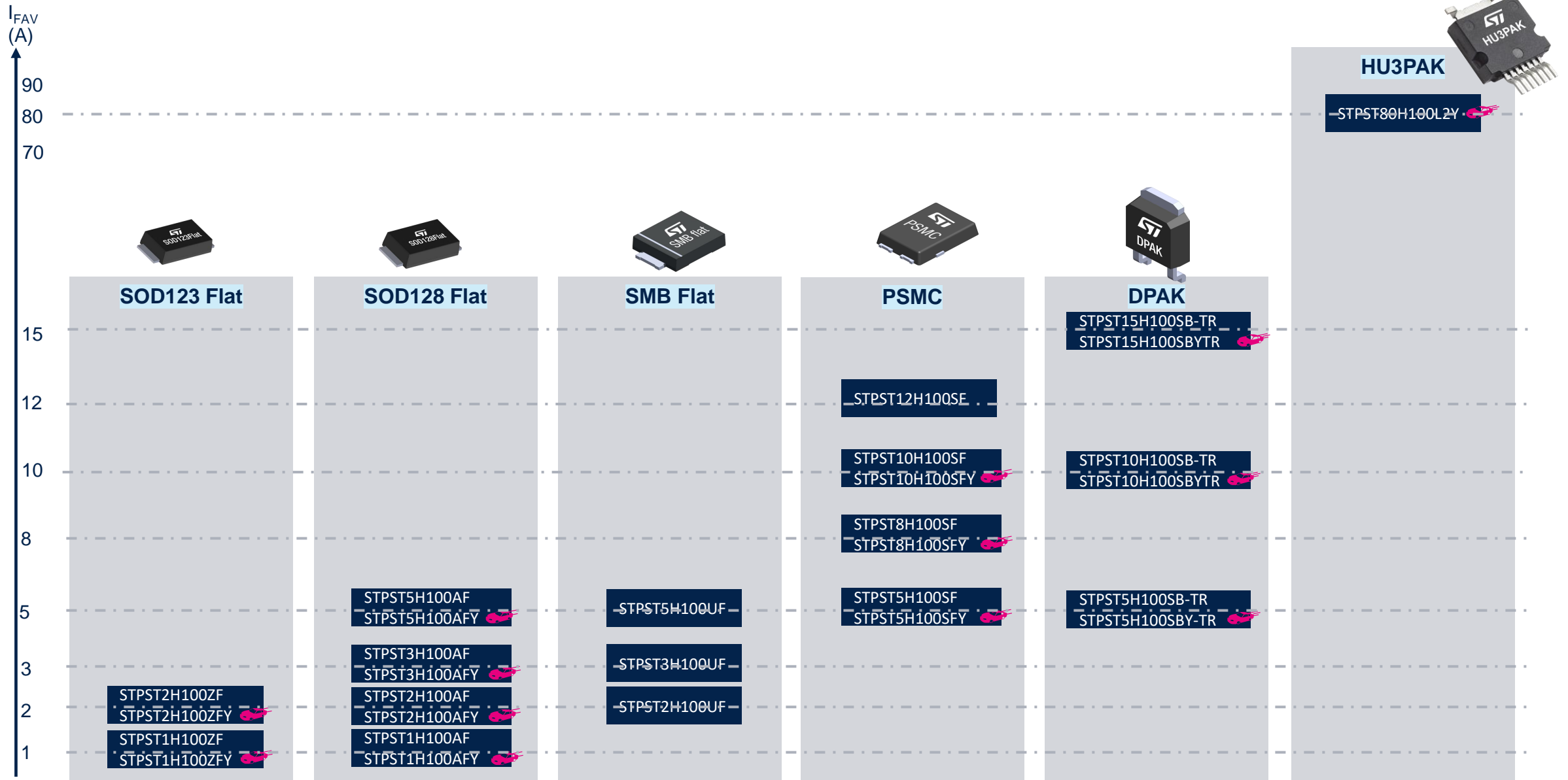


A wide selection of space-saving packages

Featuring leading ST packaging innovation to improve power density



STPST 100 V diode portfolio



Trench diodes for specific topologies

Applications



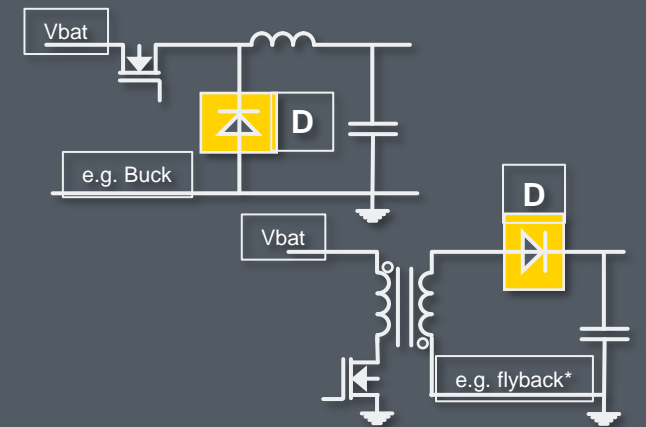
- Automotive
- Industrial

Segments



- LED lighting
- SMPS
- Low-voltage DC-DC

Topologies

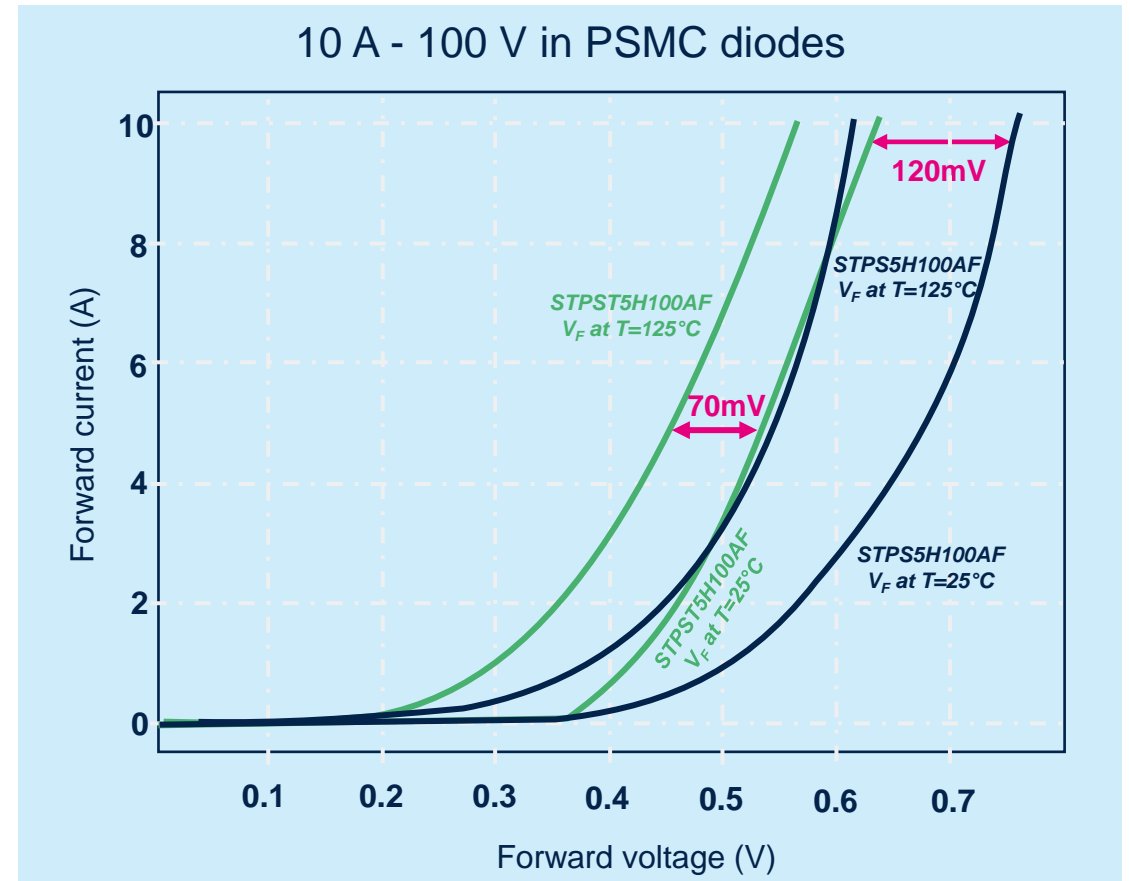
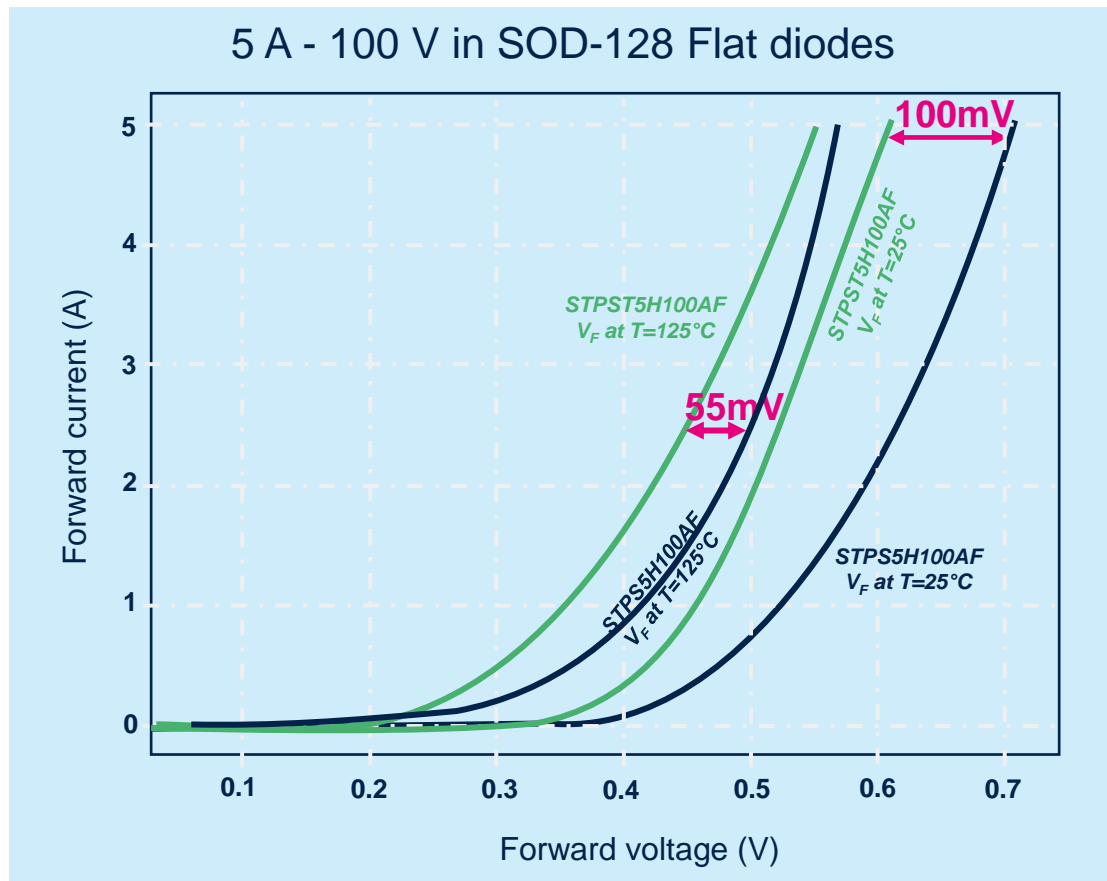


- Boost + buck
- SEPIC
- Flyback
- OR ring

Electrical performances

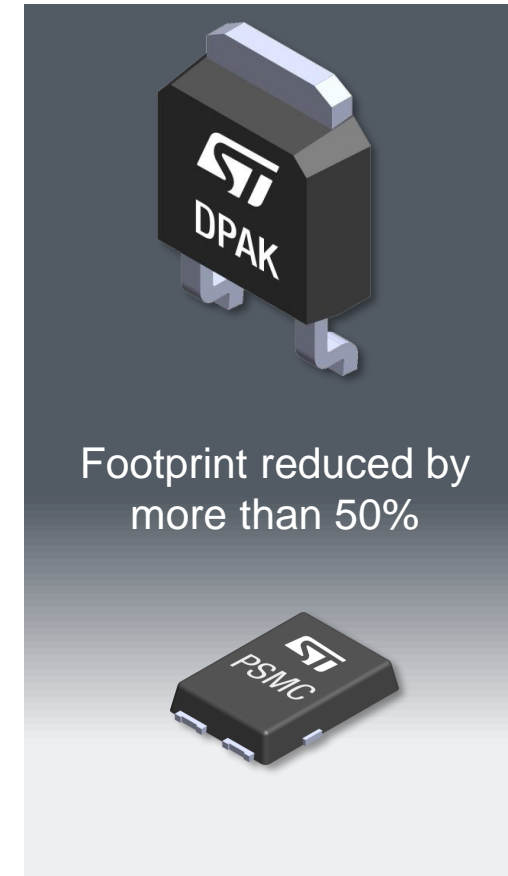
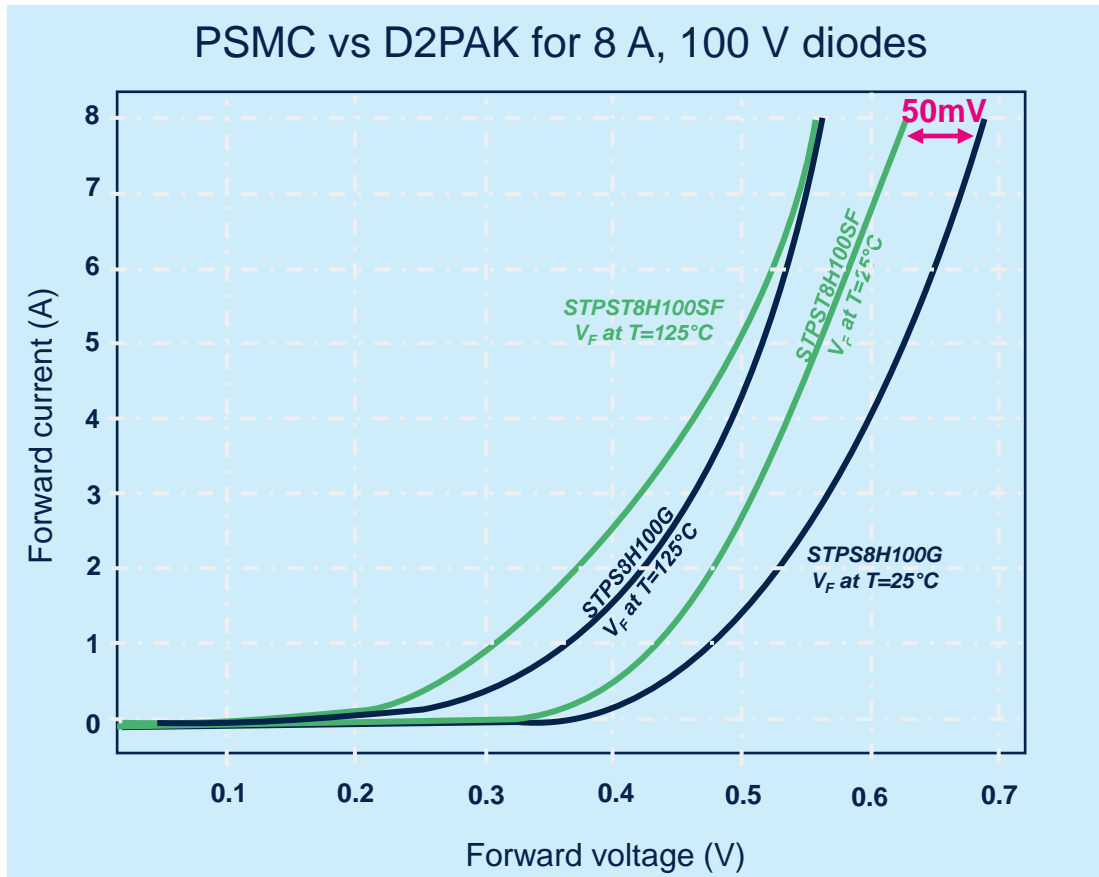
Trench diodes for superior V_F

V_F improved by 50 to 100mV on current and temperature conditions



Trench diodes for superior power density

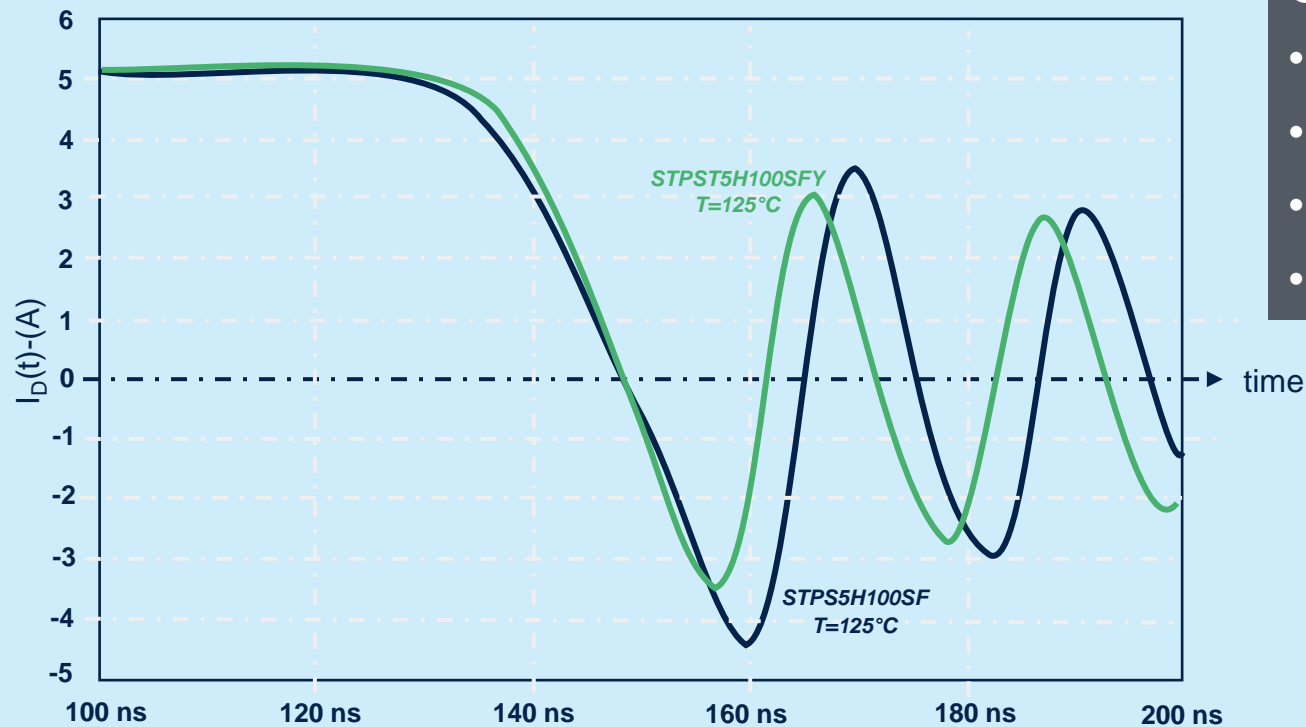
Similar or better V_F with trench technology in a ~50% smaller package



Switching performance comparison

Better switching performances with trench diodes vs Schottky

5 A trench vs power Schottky – PSMC, auto-grade

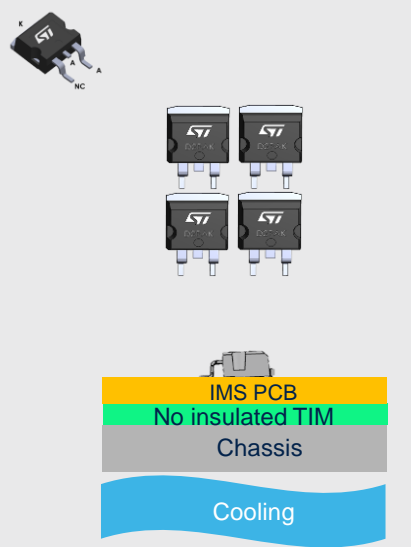


Conditions:

- $V_R = 60\text{ V}$
- $di_F/dt = 400\text{ A}/\mu\text{s}$
- $I_F = 5\text{ A}$
- $T_j = 125^\circ\text{C}$

HU3PAK package for maximum thermal performance

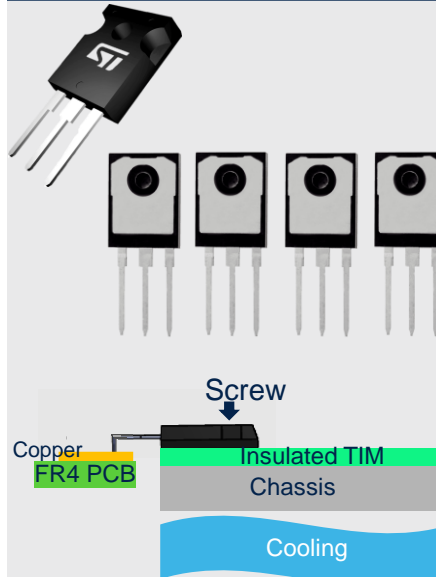
D2PAK



The diagram shows a D2PAK package being mounted on an IMS PCB. The assembly stack consists of the IMS PCB, a layer of No insulated TIM, and a Chassis. A blue wavy arrow labeled 'Cooling' points downwards from the chassis, indicating heat dissipation through the bottom of the package.

- Automatic assembly possible
- Heat dissipation limitation through PCB
- Expensive solution with IMS boards

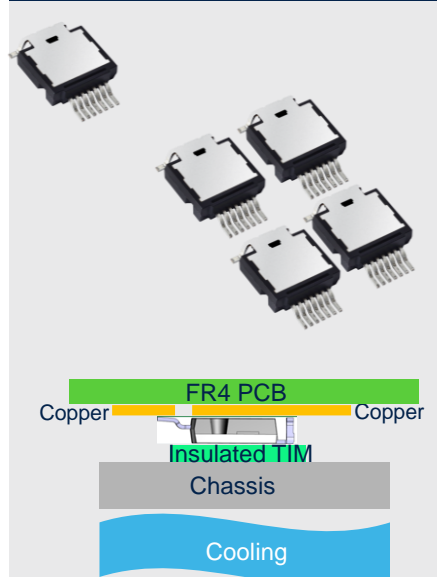
TO-247 LL



The diagram shows a TO-247 LL package being mounted on an FR4 PCB. A screw is used to secure the package to the PCB. The assembly stack includes the FR4 PCB, Insulated TIM, and Chassis. A blue wavy arrow labeled 'Cooling' points downwards from the chassis, indicating heat dissipation through the bottom of the package.

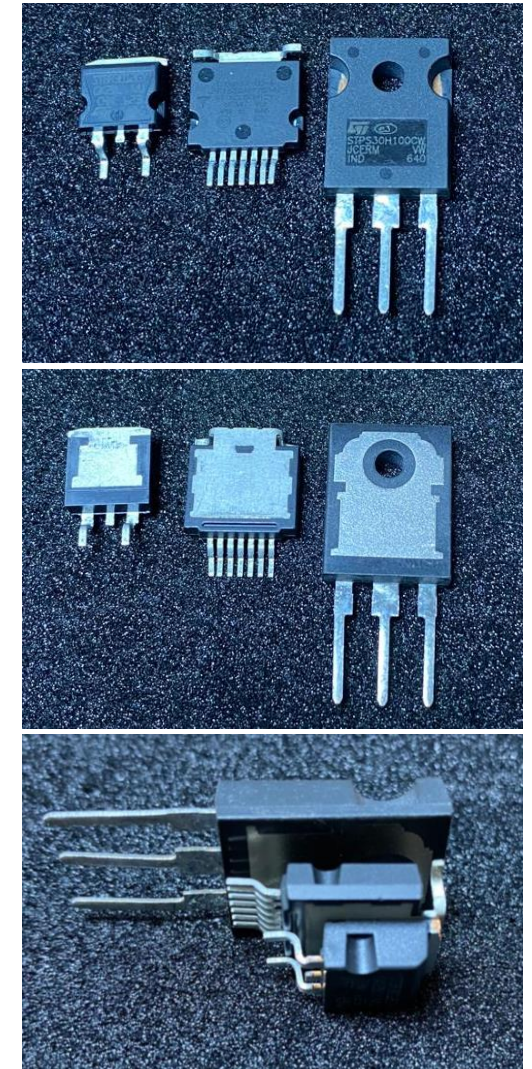
- Good thermal behavior
- Possibility to bend the leads
- Manual assembly
- Low power density
- High stray inductances

HU3PAK



The diagram shows an HU3PAK package being mounted on an FR4 PCB. The package is secured to the PCB with copper leads. The assembly stack includes the FR4 PCB, Insulated TIM, and Chassis. A blue wavy arrow labeled 'Cooling' points downwards from the chassis, indicating heat dissipation through the bottom of the package.

- Good thermal behavior
- Top-side cooling
- No need for IMS substrate (FR4 is enough)
- Automatic assembly possible
- Modular approach possible



Targeted applications

ST trench diodes for high-frequency applications



- LED lighting
- Reverse battery protection
- Low-voltage DC-DC



- Auxiliary power supply
- SMPS

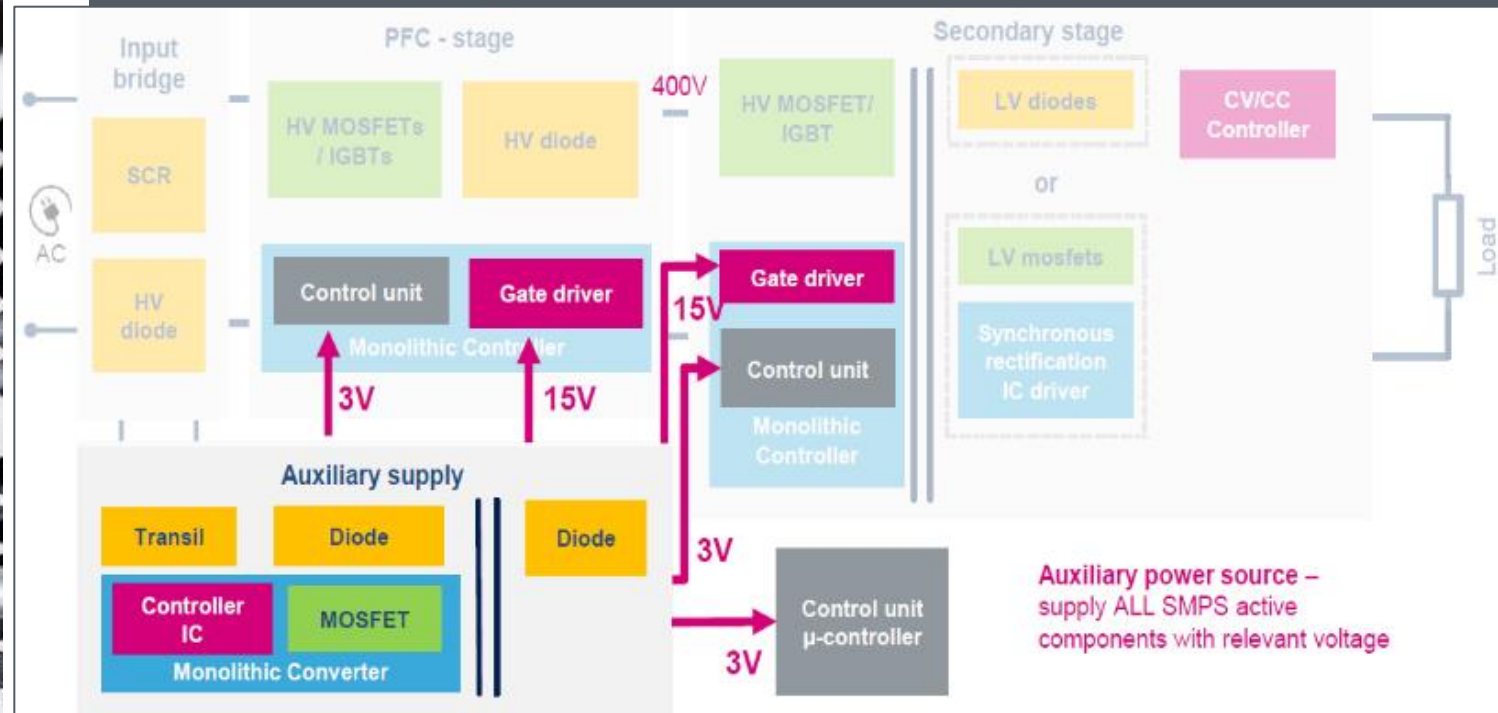


- Freewheeling
- OR ring
- ST ViPer companion for flyback topology

Combining ST devices in power applications



PFC stage + secondary stage



- VIPer devices & ST trench diodes form complete kit in flyback converters
- LED lighting (35/60 W) HVLED001A
- Aux power supply in industrial, open frame (10/15 W with VIPer25, 37, 38)
- Multiple output smart metering & PLC isolated flyback (VIPer26K)

Trench diodes for automotive applications

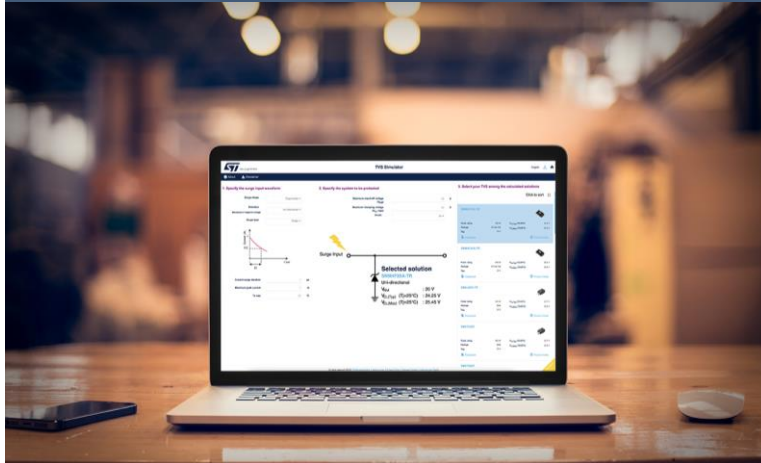


Note: Part numbers listed here are examples. For an exhaustive list, please visit <https://www.st.com/diodes> or contact your sales representative

Design and development tools

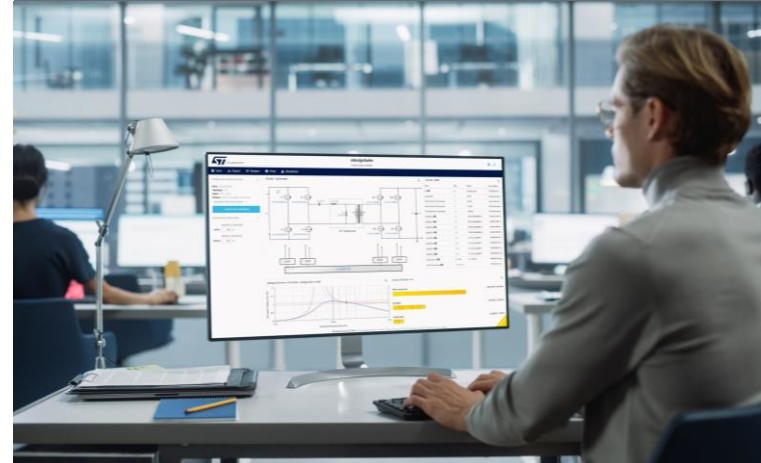
Available tools

ST eDesignSuite



Diodes (Schottky and FERD)
simulator, footprints, and 3D models

SPICE models



For simulation

Sample program
Click To Order





ST trench diode portfolio

29 references, 9 $I_{F(AV)}$ current values available, 6 packages

Trade off	CP	Package	Industrial/Auto
1A/100V	STPST1H100AF(Y)	SOD128 Flat	Industrial/Auto
	STPST1H100ZF(Y)	SOD123 Flat	Industrial/Auto
2A/100V	STPST2H100AF(Y)	SOD128 Flat	Industrial/Auto
	STPST2H100UF	SMB Flat	Industrial
	STPST2H100ZF(Y)	SOD123 Flat	Industrial/Auto
3A/100V	STPST3H100AF(Y)	SOD128 Flat	Industrial/Auto
	STPST3H100UF	SMB Flat	Industrial

Trade off	CP	Package	Industrial/Auto
5A/100V	STPST5H100AF(Y)	SOD128 Flat	Industrial Automotive
	STPST5H100SB(Y)-TR	DPAK	Industrial Automotive
	STPST5H100SF(Y)	PSMC	Industrial Automotive
	STPST5H100UF	SMB Flat	Industrial
8A/100V	STPST8H100SF(Y)	PSMC	Industrial Automotive
10A/100V	STPST10H100SB(Y)-TR	DPAK	Industrial Automotive
	STPST10H100SF(Y)	PSMC	Industrial Automotive
12A/100V	STPST12H100SF	PSMC	Industrial
15A/100V	STPST15H100B(Y)-TR	DPAK	Industrial Automotive
80A/100V	STPST80H100L2Y	HU3PAK	Automotive



Our technology starts with You



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