



## DIODES

### FRED Pt® Gen 5 1200 V Hyperfast and Ultrafast Rectifiers

#### 30 A and 60 A FRED Pt® Gen 5 1200 V Hyperfast and Ultrafast Rectifiers Reduce Conduction and Switching Losses



#### KEY BENEFITS

- Forward currents of 30 A and 60 A
- Offered in TO-247AD 2L and 2L TO-220AC packages
- Available in X-type hyperfast and H-type ultrafast speed classes
  - X-type rectifiers offer the advantage of lower  $Q_{rr}$
  - H-type devices feature lower forward voltage
- High temperature operation to +175 °C

#### APPLICATIONS

- Three-phase T-type PFC and output rectification stages for EV / HEV battery charging stations, booster stages for solar inverters, and UPS and welding applications

#### RESOURCES

- Datasheets: please see table on next page for the list of products
- For technical questions, contact [DiodesAmericas@vishay.com](mailto:DiodesAmericas@vishay.com), [DiodesEurope@vishay.com](mailto:DiodesEurope@vishay.com), [DiodesAsia@vishay.com](mailto:DiodesAsia@vishay.com)
- Material categorization: for definitions of compliance, please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)





# DIODES

## FRED Pt® Gen 5 1200 V Hyperfast and Ultrafast Rectifiers

Vishay introduces six new 30 A and 60 A FRED Pt® Gen 5 1200 V hyperfast and ultrafast rectifiers that offer the best conduction and switching loss trade-off for devices in their classes. These rectifiers are designed to increase the efficiency of high frequency converters, and hard- and soft-switched or resonant designs.

- Matched to operate with MOSFETs or high speed IGBTs
- Offer up to 10 % lower losses than competing silicon solutions
  - Cut the efficiency gap with SiC diodes in half
  - Provide a cost-effective alternative for applications with frequencies in the range of 50 kHz
- Offer the same forward voltage as competing solutions, while delivering up to 40 % lower switching losses and  $Q_{rr}$

### KEY SPECIFICATIONS: SINGLE DIODE, 1200 V, 30 A CURRENT RATING

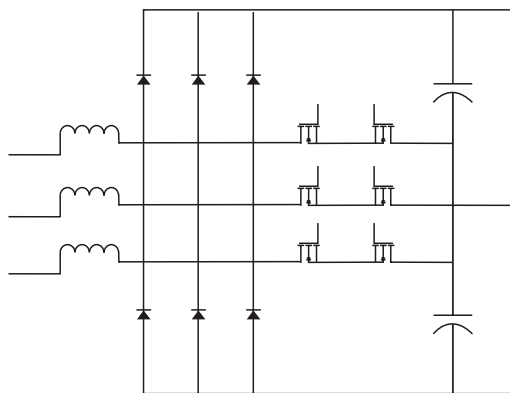
PART NUMBER	$V_{CES}$ (V)	$I_{F(AV)}$ , $D = 0.5$ (A)	SPEED CLASS	TYPICAL $V_F$ (V), $T_J = 125^\circ\text{C}$ , $I_F = 30\text{ A}$	TYPICAL $Q_{rr}$ (nC), $T_J = 125^\circ\text{C}$ , $I_F = 20\text{ A}$ , $V_R = 400\text{ V}$ , $di_F/dt = 600\text{ A}/\mu\text{s}$	$t_{rr}$ CLASS (ns), $T_J = 25^\circ\text{C}$ , $I_F = 1\text{ A}$ , $V_R = 30\text{ V}$ , $di_F/dt = 100\text{ A}/\mu\text{s}$	PACKAGE
<a href="#">VS-E5PX3012L-N3</a>	1200	30	X	2.1	1550	26	TO-247AD 2L
<a href="#">VS-E5TX3012-N3</a>		30	X	2.1	1550	26	2L TO-220AC
<a href="#">VS-E5PH3012L-N3</a>		30	H	1.7	2150	32	TO-247AD 2L
<a href="#">VS-E5TH3012-N3</a>		30	H	1.7	2150	32	2L TO-220AC

### KEY SPECIFICATIONS: SINGLE DIODE, 1200 V, 60 A CURRENT RATING

PART NUMBER	$V_{CES}$ (V)	$I_{F(AV)}$ , $D = 0.5$ (A)	SPEED CLASS	TYPICAL $V_F$ (V), $T_J = 125^\circ\text{C}$ , $I_F = 30\text{ A}$	TYPICAL $Q_{rr}$ (nC), $T_J = 125^\circ\text{C}$ , $I_F = 20\text{ A}$ , $V_R = 400\text{ V}$ , $di_F/dt = 600\text{ A}/\mu\text{s}$	$t_{rr}$ CLASS (ns), $T_J = 25^\circ\text{C}$ , $I_F = 1\text{ A}$ , $V_R = 30\text{ V}$ , $di_F/dt = 100\text{ A}/\mu\text{s}$	PACKAGE
<a href="#">VS-E5PX6012L-N3</a>	1200	60	X	2.1	2950	30	TO-247AD 2L
<a href="#">VS-E5PH6012L-N3</a>		60	H	1.7	4080	38	TO-247AD 2L

**DIODES****FRED Pt® Gen 5 1200 V Hyperfast and Ultrafast Rectifiers****Three-Level T-Type PFC - Typical Application Schematic**

Featuring a unique combination of low conduction and switching losses, these 1200 V rectifiers are the right choice for high frequency converters, both hard switched and soft switched / resonant.



Specifically designed to improve the efficiency of PFC and output rectification stages of EV / HEV battery charging stations, the booster stage of solar inverters, and UPS applications, these 1200 V, devices are perfectly matched to operate with MOSFETs or high speed IGBTs.

**Efficiency of Real-World T-Type PFC vs. Output Power Using Various Diodes, Tested at 50 °C Ambient**