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New FRED Pt® Gen 5 600 V Hyperfast and Ultrafast Rectifiers

Vishay has expanded its portfolio of FRED Pt® Gen 5 600 V Hyperfast and Ultrafast rectifiers. Designed for use in the power path of both AC/DC and DC/DC stages to boost converter efficiency, new Gen 5 devices show a strong improvement in reverse recovery charge (Q_{rr}) and energy (E_{rec}), with good control over conduction losses across the full operating temperature range to +175 °C. Compared to previous-generation solutions, the rectifiers lower recovery losses by up to 90 %.

Five new FRED Pt Gen 5 600 V Hyperfast and Ultrafast rectifiers are now available, and enhance our offering by adding:

- Dual-die, common-cathode configurations to provide more circuit design options
- The "W" series with lower E_{rec} for maximum efficiency in applications that work with higher switching frequencies

The Key Specifications

Part Number	V_R (V)	$I_{F(AV)}$ (A)	V_F typ. (V) ¹	Q_{rr} typ. (nC) ²	Speed Class	t_{rr} typ. (ns) ³	Package
VS-E5PW3006LHN3	600	30	1.6	650	W	20	TO-247AD 2L
VS-E5PW6006LHN3	600	30	1.7	1025	W	24	TO-247AD 2L
VS-C5PH6006LHN3	600	2 x 30	1.15	1560	H	25	TO-247AD 3L
VS-C5PX6006LHN3	600	2 x 30	1.3	952	X	22	TO-247AD 3L
VS-C5PW6006LHN3	600	2 x 30	1.6	650	W	20	TO-247AD 3L

Notes

¹ I_F = rated current, T_J = 125 °C

² T_J = 125 °C, I_F = rated current, V_R = 1000 V, dI_F/dt = 800 A/μs

³ T_J = 25 °C, I_F = 1 A, dI_F/dt = 100 A/μs, V_R = 30 V



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Product Benefits

- AEC-Q101 qualified
- Forward currents of 60 A
- Offered in the following packages: TO-247AD 2L (single diode) and TO-247AD 3L (dual common cathode)
- Available in H-type, X-type, and W-type speed classes:
 - H-type devices feature lower forward voltage
 - X-type rectifiers offer the advantage of lower Q_{rr}
 - The new W-type provides extreme or very low E_{rec}
- High temperature operation to +175 °C
- RoHS-compliant and halogen-free

Market Applications

- High speed LLC output rectification stages for EV / HEV on-board chargers and battery charging stations, and high frequency stages for UPS applications

Useful Links

- FRED Pt Gen 5 600 V (Industrial) Press Release [npi_210329-NPI-VS-E5TH1506-N3etal.pdf \(vishay.com\)](#)
- FRED Pt Gen 5 600 V (Automotive) Press Release [npi_211103NP-VS-E5PH3006LHN3etal.pdf \(vishay.com\)](#)
- FRED Pt Did You Know: [www.vishay.com/doc?48720](#)
- Webinar: FRED Pt: The Optimized Solution for Charging Applications:
 - (Video) [Vishay - Proxy Notification \(youtu.be\)](#)
 - (Presentation) [www.vishay.com/doc?48810](#)
- How to Calculate Power Losses in Gen 5 Diodes (Application Notes): [www.vishay.com/doc?98280](#)
- Infographic: [www.vishay.com/doc?48741](#)

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