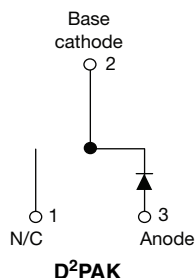


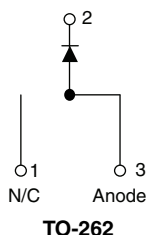
Ultrafast Rectifier, 30 A FRED Pt®



VS-ETU3006SHM3



VS-ETU3006-1HM3



FEATURES

- Low forward voltage drop
- Ultrafast recovery time
- 175 °C operating junction temperature
- Low leakage current
- AEC-Q101 qualified, meets JESD 201 class 1A whisker test
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE

DESCRIPTION/APPLICATIONS

Ultralow V_F , soft-switching ultrafast rectifiers optimized for Discontinuous (Critical) Mode (DCM) Power Factor Correction (PFC).

The minimized conduction loss, optimized stored charge and low recovery current minimized the switching losses and reduce over dissipation in the switching element and snubbers.

The device is also intended for use as a freewheeling diode in power supplies and other power switching applications.

APPLICATIONS

AC/DC SMPS 70 W to 400 W

e.g. laptop and printer AC adaptors, desktop PC, TV and monitor, games units, and DVD AC/DC power supplies.

PRODUCT SUMMARY

Package	TO-263AB (D ² PAK), TO-262AA
$I_{F(AV)}$	30 A
V_R	600 V
V_F at I_F	2 V
t_{rr} (typ.)	30 ns
T_J max.	175 °C
Diode variation	Single die

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS	MAX.	UNITS
Repetitive peak reverse voltage	V_{RRM}		600	V
Average rectified forward current	$I_{F(AV)}$	$T_C = 113\text{ °C}$	30	A
Non-repetitive peak surge current	I_{FSM}	$T_C = 25\text{ °C}$	200	
Operating junction and storage temperatures	T_J, T_{Stg}		-65 to 175	°C

ELECTRICAL SPECIFICATIONS ($T_J = 25\text{ °C}$ unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Breakdown voltage, blocking voltage	V_{BR}, V_R	$I_R = 100\text{ }\mu\text{A}$	600	-	-	V
Forward voltage	V_F	$I_F = 30\text{ A}$	-	1.4	2.0	
		$I_F = 30\text{ A}, T_J = 150\text{ °C}$	-	1.15	1.35	
Reverse leakage current	I_R	$V_R = V_R$ rated	-	0.02	30	μA
		$T_J = 150\text{ °C}, V_R = V_R$ rated	-	30	250	
Junction capacitance	C_T	$V_R = 600\text{ V}$	-	20	-	pF
Series inductance	L_S	Measured lead to lead 5 mm from package body	-	8.0	-	nH

**DYNAMIC RECOVERY CHARACTERISTICS** ($T_J = 25\text{ }^{\circ}\text{C}$ unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Reverse recovery time	t_{rr}	$I_F = 1\text{ A}$, $dI_F/dt = 50\text{ A}/\mu\text{s}$, $V_R = 30\text{ V}$	-	30	45	ns
		$T_J = 25\text{ }^{\circ}\text{C}$	-	45	-	
		$T_J = 125\text{ }^{\circ}\text{C}$	-	100	-	
Peak recovery current	I_{RRM}	$T_J = 25\text{ }^{\circ}\text{C}$	-	5.6	-	A
		$T_J = 125\text{ }^{\circ}\text{C}$	-	10	-	
Reverse recovery charge	Q_{rr}	$T_J = 25\text{ }^{\circ}\text{C}$	-	127	-	nC
		$T_J = 125\text{ }^{\circ}\text{C}$	-	580	-	

THERMAL - MECHANICAL SPECIFICATIONS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Maximum junction and storage temperature range	T_J , T_{Stg}		- 65	-	175	$^{\circ}\text{C}$
Thermal resistance, junction to case	R_{thJC}		-	0.95	1.4	$^{\circ}\text{C}/\text{W}$
Thermal resistance, junction to ambient	R_{thJA}	Typical socket mount	-	-	70	
Thermal resistance, case to heatsink	R_{thCS}	Mounting surface, flat, smooth and greased	-	0.5	-	
Weight			-	2.0	-	g
			-	0.07	-	oz.
Mounting torque			6 (5)	-	12 (10)	kgf · cm (lbf · in)
Marking device		Case style D ² PAK modified	ETU3006SH			
		Case style TO-262	ETU3006-1H			

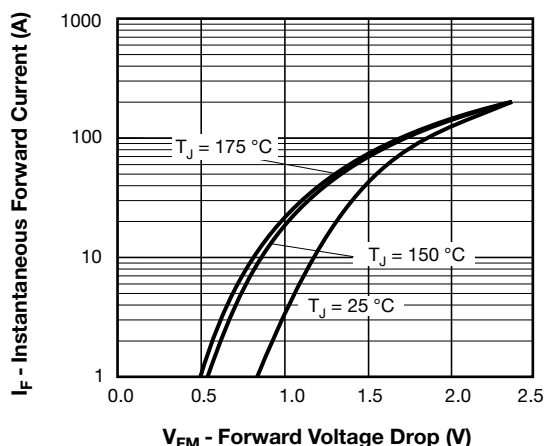


Fig. 1 - Typical Forward Voltage Drop Characteristics

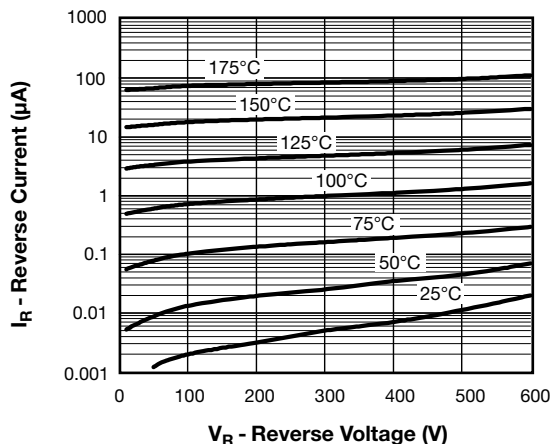


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

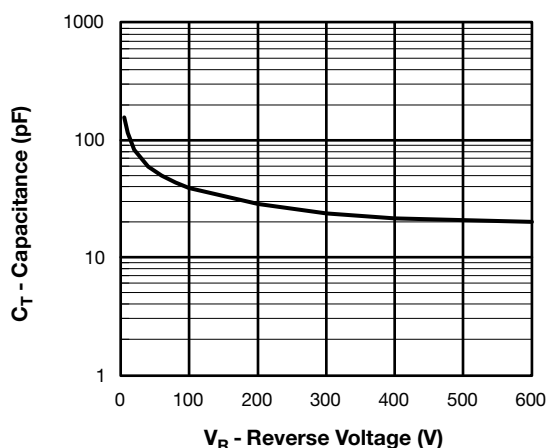


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

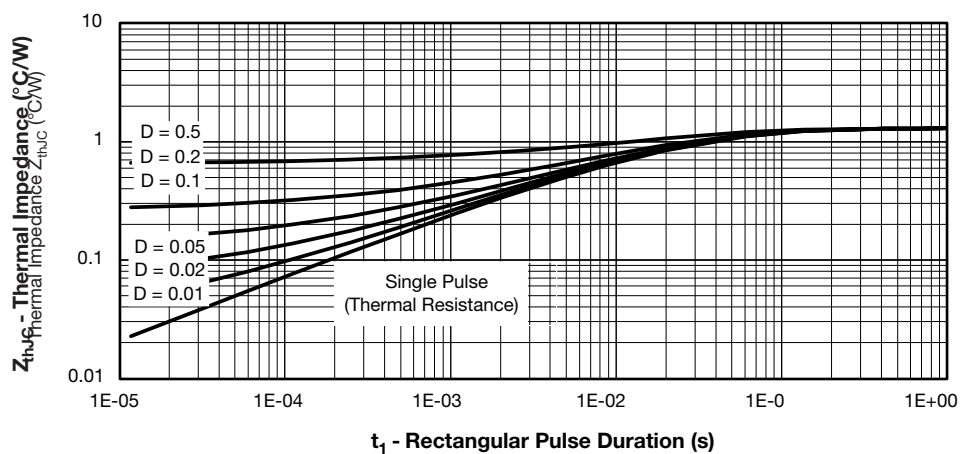


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics

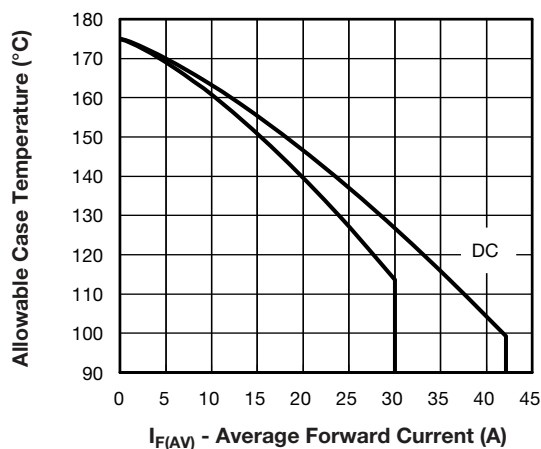


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

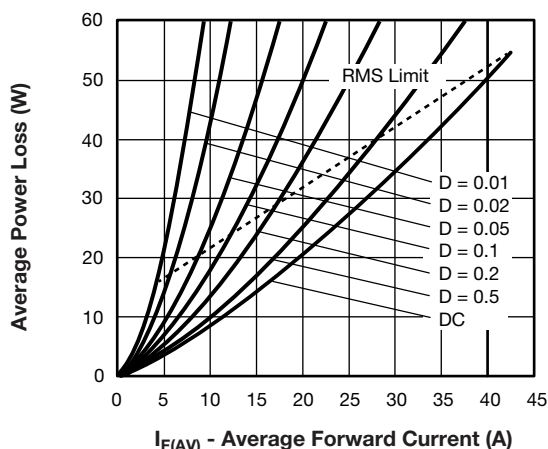


Fig. 6 - Forward Power Loss Characteristics

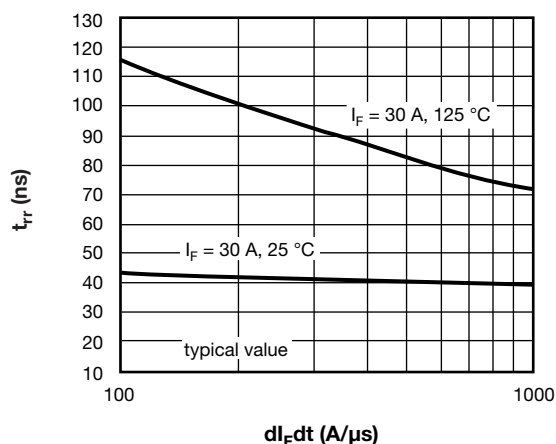
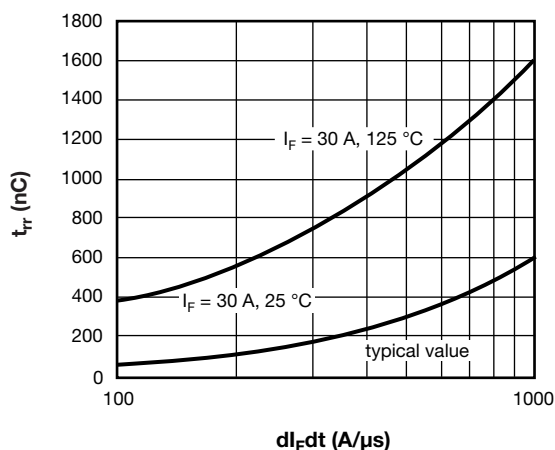
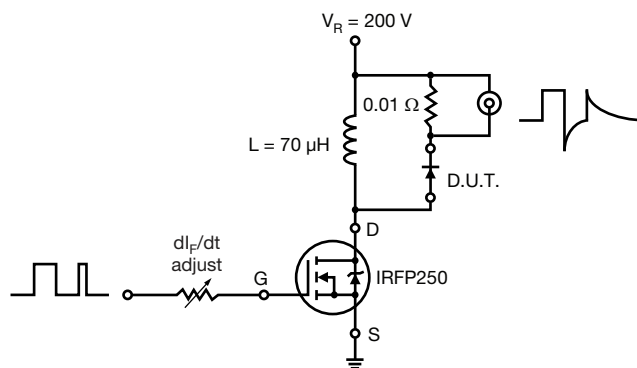

Fig. 7 - Typical Reverse Recovery vs. dI_F/dt

Fig. 8 - Typical Stored Charge vs. dI_F/dt


Fig. 9 - Reverse Recovery Parameter Test Circuit

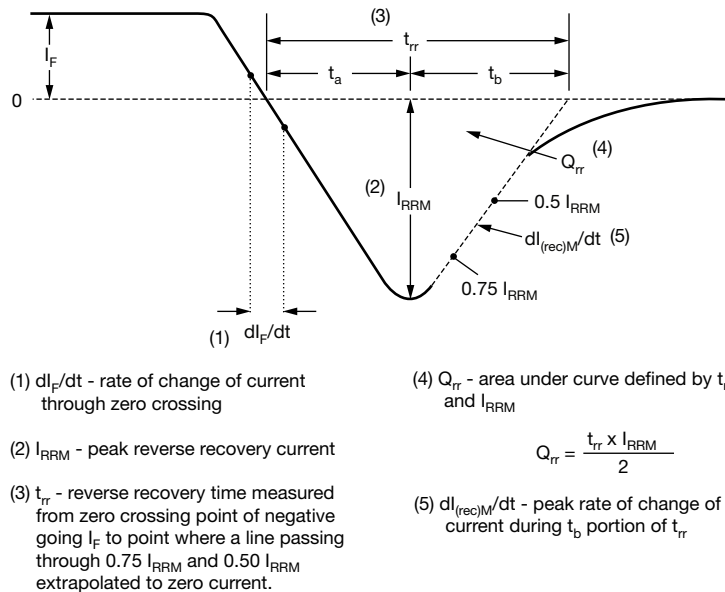


Fig. 10 - Reverse Recovery Waveform and Definitions

**ORDERING INFORMATION TABLE**

Device code	VS-	E	T	U	30	06	S	TRL	H	M3
	1	2	3	4	5	6	7	8	9	10

- 1** - Vishay Semiconductors product
- 2** - Circuit configuration
E = Single diode
- 3** - T = TO-220
- 4** - U = Ultrafast recovery time
- 5** - Current code (30 = 30 A)
- 6** - Voltage code (06 = 600 V)
- 7** -
 - S = D²PAK
 - -1 = TO-262
- 8** -
 - None = Tube
 - TRL = Tape and reel (left oriented, for D²PAK package)
 - TRR = Tape and reel (right oriented, for D²PAK package)
- 9** - H = AEC-Q101 qualified
- 10** - Environmental digit:
 - M3 = Halogen-free, RoHS compliant, and terminations lead (Pb)-free

ORDERING INFORMATION (Example)

PREFERRED P/N	QUANTITY PER TUBE	MINIMUM ORDER QUANTITY	PACKAGING DESCRIPTION
VS-ETU3006SHM3	50	1000	Antistatic plastic tube
VS-ETU3006-1HM3	50	1000	Antistatic plastic tube
VS-ETU3006STRRHM3	800	800	13" diameter reel
VS-ETU3006STRLHM3	800	800	13" diameter reel

LINKS TO RELATED DOCUMENTS

Dimensions	TO-263AB (D ² PAK)	www.vishay.com/doc?95046
	TO-262AA	www.vishay.com/doc?95419
Part marking information	TO-263AB (D ² PAK)	www.vishay.com/doc?95444
	TO-262AA	www.vishay.com/doc?95443
Packaging information	TO-263AB (D ² PAK)	www.vishay.com/doc?95032



Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and/or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.

Material Category Policy

Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as RoHS-Compliant fulfill the definitions and restrictions defined under Directive 2011/65/EU of The European Parliament and of the Council of June 8, 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (EEE) - recast, unless otherwise specified as non-compliant.

Please note that some Vishay documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.

Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as Halogen-Free follow Halogen-Free requirements as per JEDEC JS709A standards. Please note that some Vishay documentation may still make reference to the IEC 61249-2-21 definition. We confirm that all the products identified as being compliant to IEC 61249-2-21 conform to JEDEC JS709A standards.

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

Vishay:

[VS-ETU3006-1HM3](#) [VS-ETU3006SHM3](#) [VS-ETU3006STRLHM3](#)