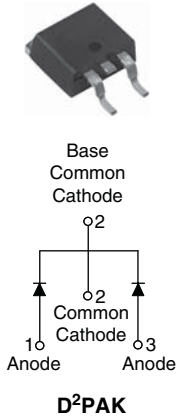
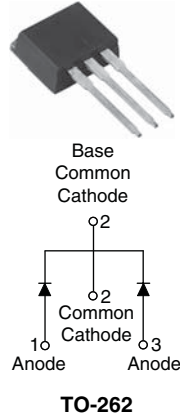


Hyperfast Rectifier, 2 x 15 A FRED P⁺

30CTH02SPbF



30CTH02-1PbF



FEATURES

- Hyperfast recovery time
- Low forward voltage drop
- Low leakage current
- 175 °C operating junction temperature
- Lead (Pb)-free ("PbF" suffix)
- Designed and qualified for Q101 level



DESCRIPTION/APPLICATIONS

Vishay HPP's 200 V series are the state of the art hyperfast recovery rectifiers designed with optimized performance of forward voltage drop and hyperfast recovery time.

The planar structure and the platinum doped life time control, guarantee the best overall performance, ruggedness and reliability characteristics.

These devices are intended for use in the output rectification stage of SMPS, UPS, dc-to-dc converters as well as freewheeling diode in low voltage inverters and chopper motor drives.

Their extremely optimized stored charge and low recovery current minimize the switching losses and reduce over dissipation in the switching element and snubbers.

PRODUCT SUMMARY

t_{rr} (maximum)	30 ns
$I_{F(AV)}$	2 x 15 A
V_R	200 V

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS	MAX.	UNITS
Peak repetitive reverse voltage	V_{RRM}		200	V
Average rectified forward current	$I_{F(AV)}$	$T_C = 159\text{ °C}$	15	A
			30	
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	$I_R = 100\text{ }\mu\text{A}$	200	-	-	V
Forward voltage	V_F	$I_F = 15\text{ A}$	-	0.92	1.05	V
		$I_F = 15\text{ A}, T_J = 125\text{ °C}$	-	0.78	0.85	
Reverse leakage current	I_R	$V_R = V_R\text{ rated}$	-	-	10	μA
		$T_J = 125\text{ °C}, V_R = V_R\text{ rated}$	-	5	300	
Junction capacitance	C_T	$V_R = 200\text{ V}$	-	57	-	pF
Series inductance	L_S	Measured lead to lead 5 mm from package body	-	8	-	nH

* Pb containing terminations are not RoHS compliant, exemptions may apply

30CTH02SPbF/30CTH02-1PbF



Vishay High Power Products

Hyperfast Rectifier,
2 x 15 A FRED Pt™

DYNAMIC RECOVERY CHARACTERISTICS (T _C = 25 °C unless otherwise specified)						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Reverse recovery time	t _{rr}	I _F = 1 A, dI _F /dt = 50 A/μs, V _R = 30 V	-	-	35	ns
		I _F = 1 A, dI _F /dt = 100 A/μs, V _R = 30 V	-	-	30	
		T _J = 25 °C	-	26	-	
		T _J = 125 °C	-	40	-	
Peak recovery current	I _{RRM}	T _J = 25 °C	-	2.8	-	A
		T _J = 125 °C	-	6.0	-	
Reverse recovery charge	Q _{rr}	T _J = 25 °C	-	37	-	nC
		T _J = 125 °C	-	120	-	

THERMAL - MECHANICAL SPECIFICATIONS					
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNITS
Maximum junction and storage temperature range	T _J , T _{Stg}	- 65	-	175	°C
Thermal resistance, junction to case per diode	R _{thJC}	-	-	1.1	°C/W
Weight		-	2.0	-	g
		-	0.07	-	oz.
Mounting torque		6.0 (5.0)	-	12 (10)	kgf · cm (lbf · in)
Marking device		Case style D ² PAK		30CTH02S	
		Case style TO-262		30CTH02-1	

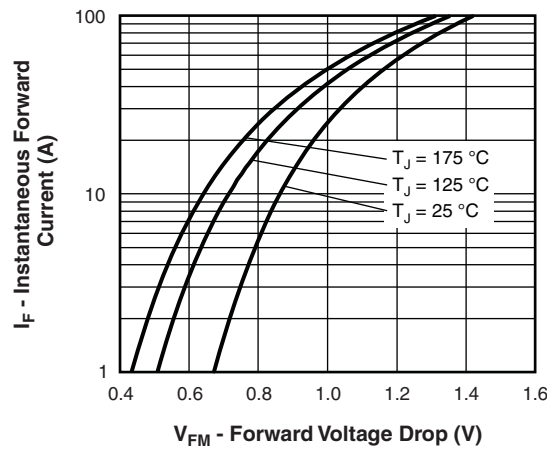


Fig. 1 - Maximum Forward Voltage Drop Characteristics

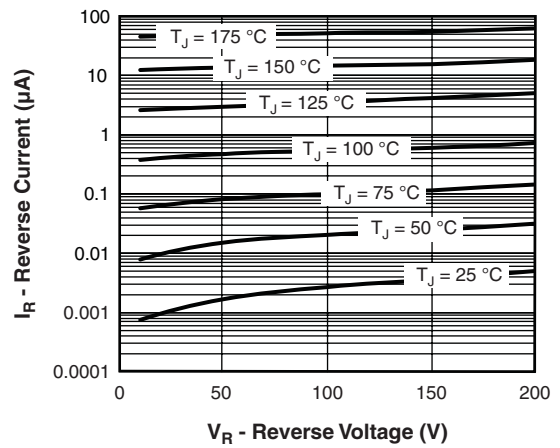


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

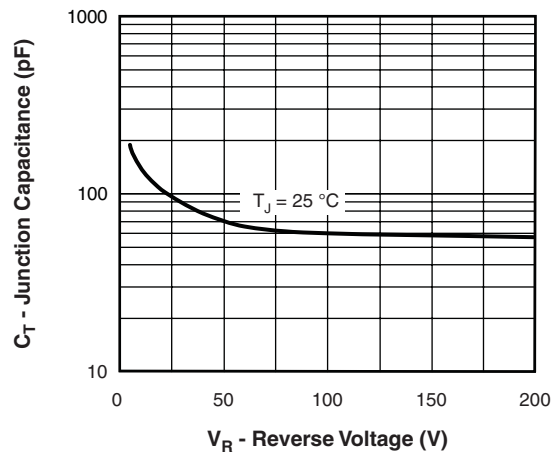


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

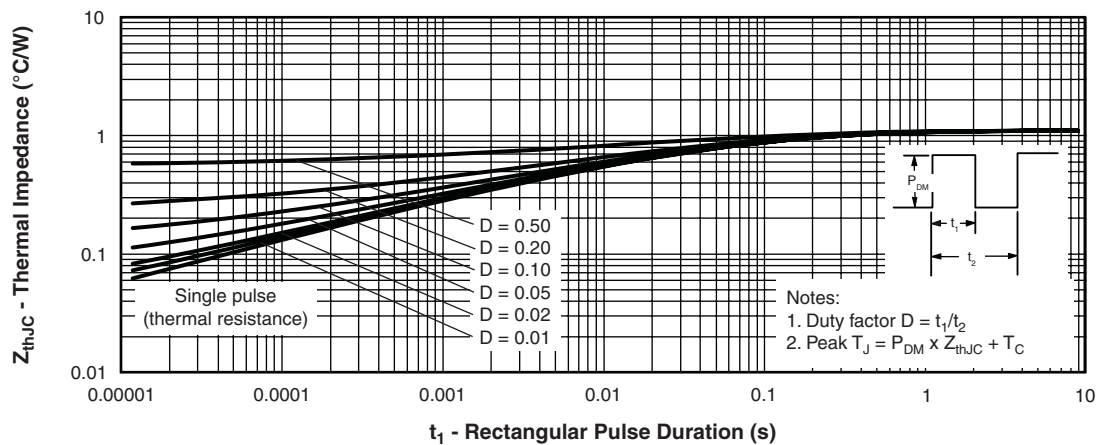


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

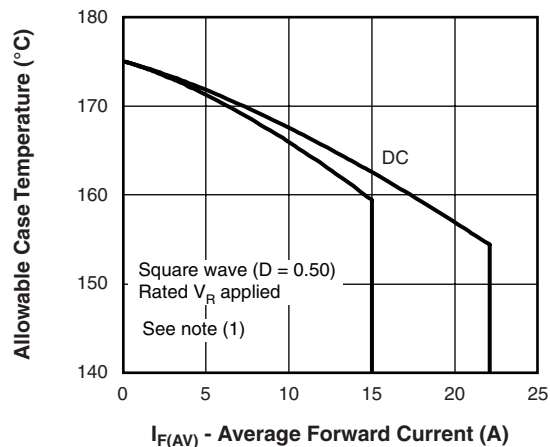


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

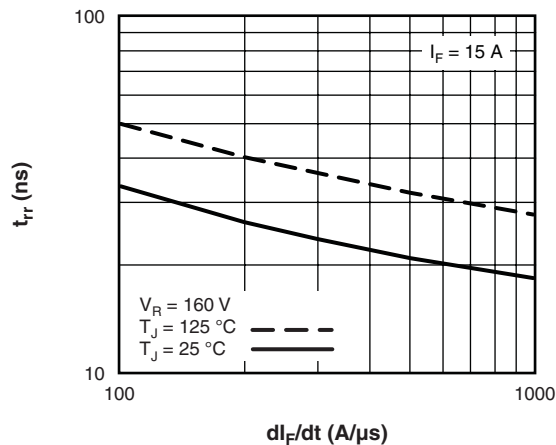


Fig. 7 - Typical Reverse Recovery Time vs. dI_F/dt

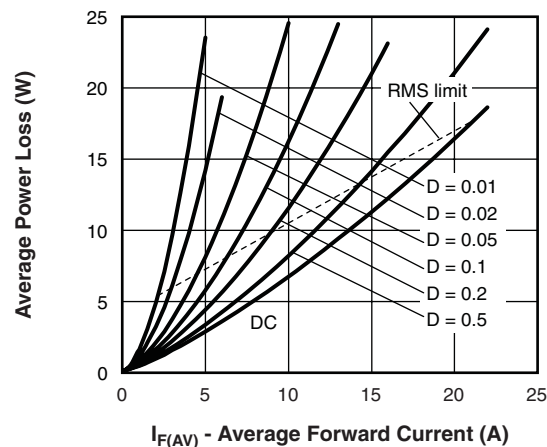


Fig. 6 - Forward Power Loss Characteristics

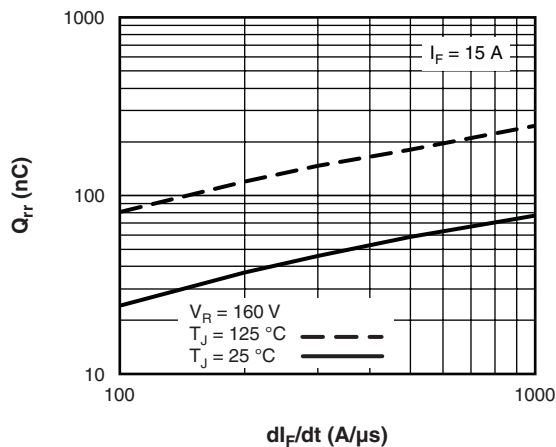


Fig. 8 - Typical Stored Charge vs. dI_F/dt

Note

- (1) Formula used: $T_C = T_J - (P_d + P_{d_{REV}}) \times R_{thJC}$;
 P_d = Forward power loss = $I_{F(AV)} \times V_{FM}$ at $(I_{F(AV)}/D)$ (see fig. 6);
 $P_{d_{REV}}$ = Inverse power loss = $V_{R1} \times I_R (1 - D)$; I_R at V_{R1} = Rated V_R

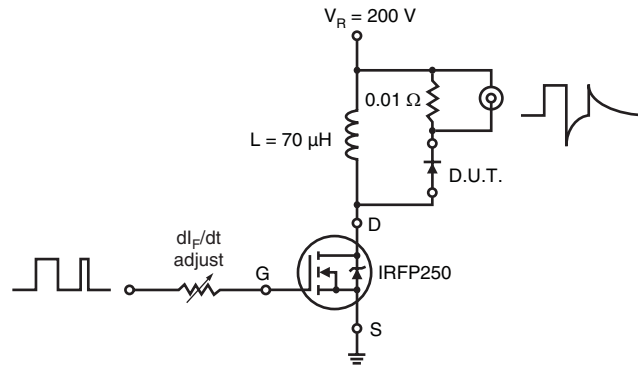


Fig. 9 - Reverse Recovery Parameter Test Circuit

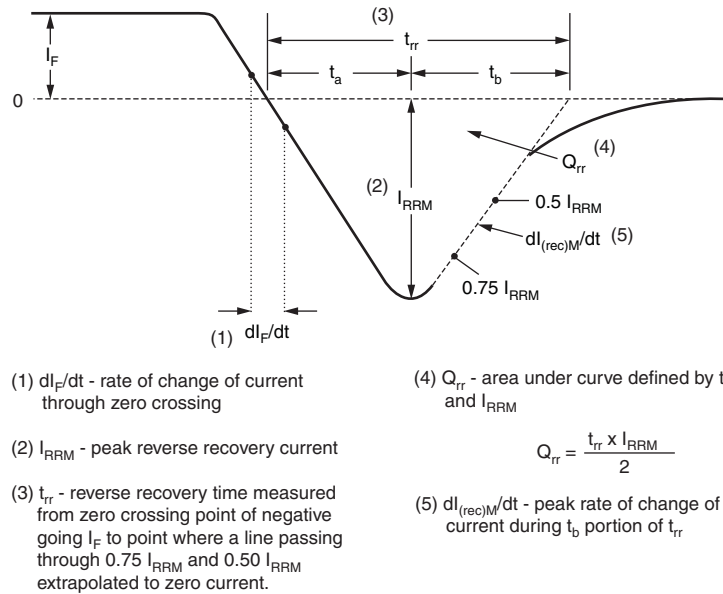


Fig. 10 - Reverse Recovery Waveform and Definitions

30CTH02SPbF/30CTH02-1PbF

Vishay High Power Products

Hyperfast Rectifier,
2 x 15 A FRED Pt™



ORDERING INFORMATION TABLE

Device code	30	C	T	H	02	S	TRL	PbF
	1	2	3	4	5	6	7	8

- | | | |
|---|---|--|
| 1 | - | Current rating (30 A) |
| 2 | - | C = Common cathode |
| 3 | - | T = TO-220, D ² PAK |
| 4 | - | H = Hyperfast rectifier |
| 5 | - | Voltage rating (02 = 200 V) |
| 6 | - | <ul style="list-style-type: none">S = D²PAK-1 = TO-262 |
| 7 | - | <ul style="list-style-type: none">None = Tube (50 pieces)TRL = Tape and reel (left oriented, for D²PAK package)TRR = Tape and reel (right oriented, for D²PAK package) |
| 8 | - | <ul style="list-style-type: none">None = Standard productionPbF = Lead (Pb)-free |

LINKS TO RELATED DOCUMENTS	
Dimensions	http://www.vishay.com/doc?95014
Part marking information	http://www.vishay.com/doc?95008
Packaging information	http://www.vishay.com/doc?95032



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