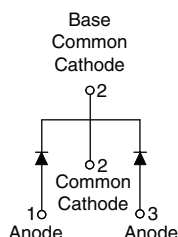


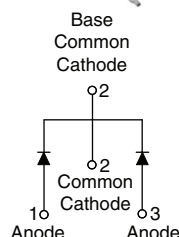
Hyperfast Rectifier, 2 x 15 A FRED P_tTM

30CTH02S



D²PAK

30CTH02-1



TO-262

FEATURES

- Hyperfast recovery time
- Low forward voltage drop
- Low leakage current
- 175 °C operating junction temperature
- Designed and qualified for industrial 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

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Reverse recovery time	t_{rr}	$I_F = 1\text{ A}$, $di_F/dt = 50\text{ A}/\mu\text{s}$, $V_R = 30\text{ V}$	-	-	35	ns
		$I_F = 1\text{ A}$, $di_F/dt = 100\text{ A}/\mu\text{s}$, $V_R = 30\text{ V}$	-	-	30	
		$T_J = 25\text{ }^{\circ}\text{C}$	-	26	-	
		$T_J = 125\text{ }^{\circ}\text{C}$	-	40	-	
Peak recovery current	I_{RRM}	$T_J = 25\text{ }^{\circ}\text{C}$	-	2.8	-	A
		$T_J = 125\text{ }^{\circ}\text{C}$	-	6.0	-	
Reverse recovery charge	Q_{rr}	$T_J = 25\text{ }^{\circ}\text{C}$	-	37	-	nC
		$T_J = 125\text{ }^{\circ}\text{C}$	-	120	-	

THERMAL - MECHANICAL SPECIFICATIONS

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNITS
Maximum junction and storage temperature range	T_J, T_{Stg}	- 65	-	175	$^{\circ}\text{C}$
Thermal resistance, junction to case per diode	R_{thJC}	-	-	1.1	$^{\circ}\text{C}/\text{W}$
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	

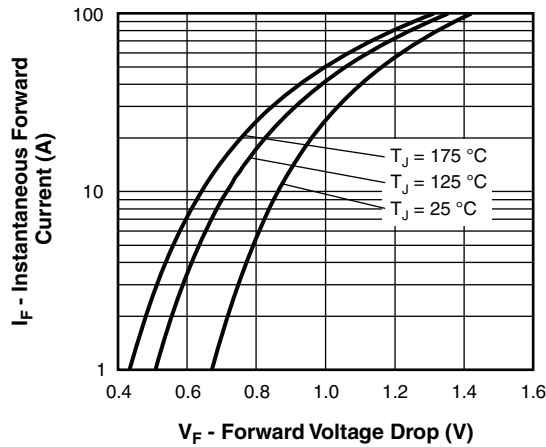


Fig. 1 - Typical Forward Voltage Drop Characteristics

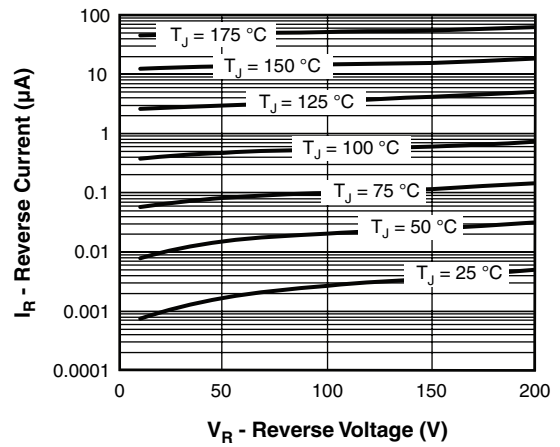


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

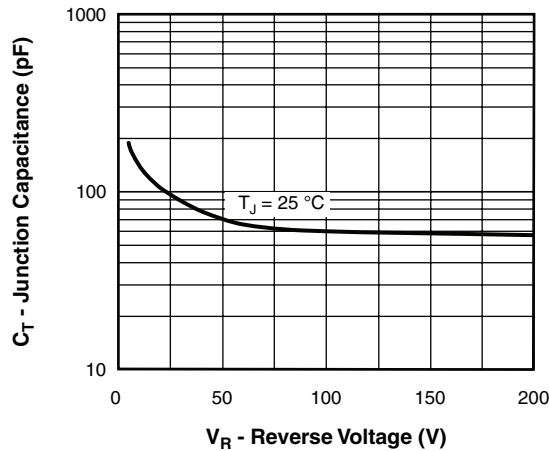
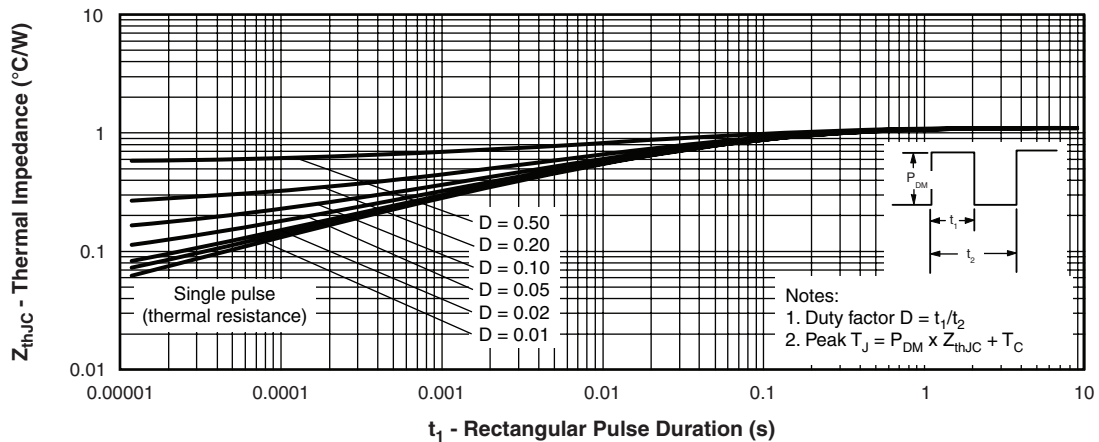


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage


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

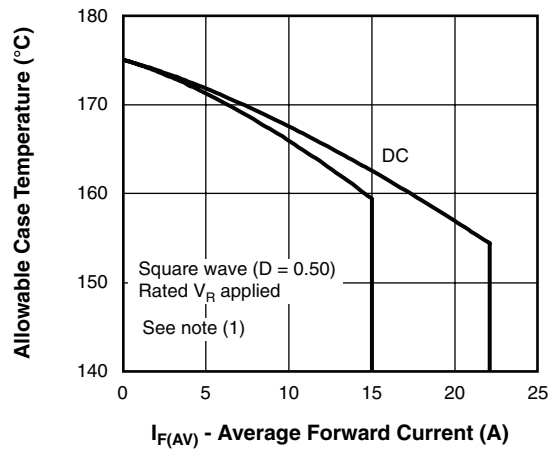


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

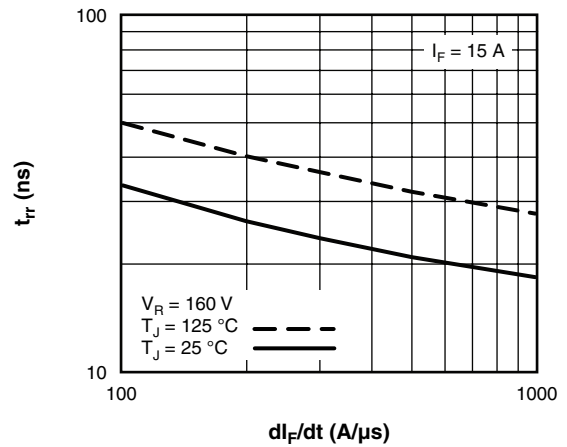


Fig. 7 - Typical Reverse Recovery Time vs. dI_F/dt

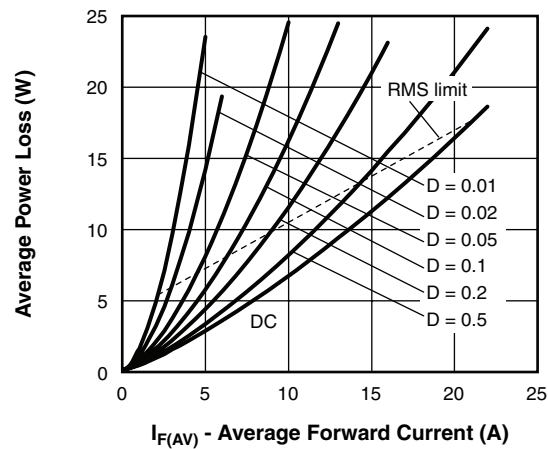


Fig. 6 - Forward Power Loss Characteristics

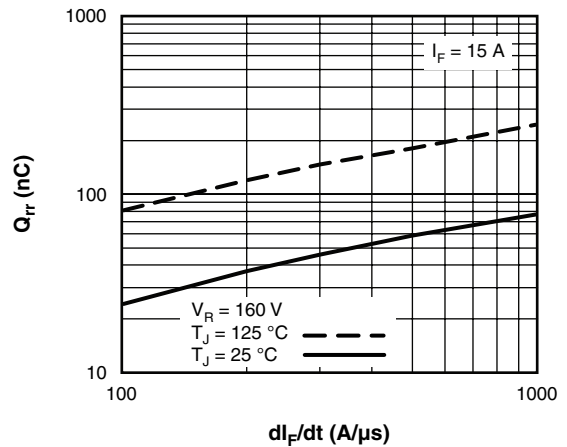


Fig. 8 - Typical Stored Charge vs. dI_F/dt

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

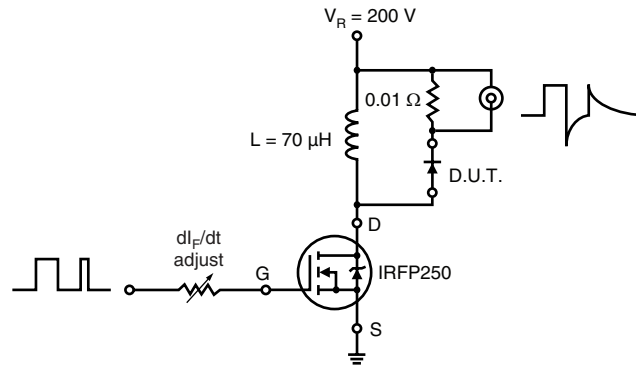


Fig. 9 - Reverse Recovery Parameter Test Circuit

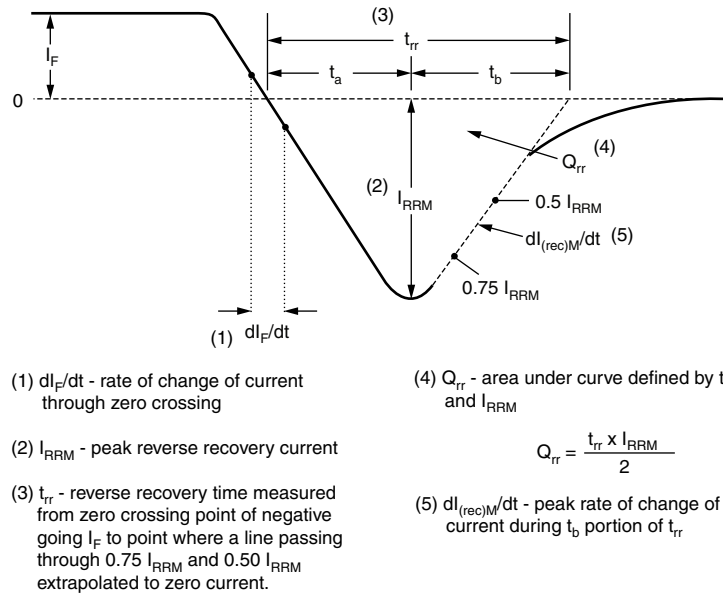


Fig. 10 - Reverse Recovery Waveform and Definitions

ORDERING INFORMATION TABLE

Device code	30	C	T	H	02	S	TRL	-
	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 recovery |
| 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 production PbF = 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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