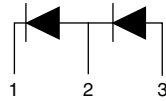


Hyperfast Rectifier, 15 A FRED Pt®


3L TO-220 FULL-PAK

FEATURES

- Hyperfast recovery time, extremely low Q_{rr}
- 175 °C maximum operating junction temperature
- High frequency PFC CCM operation
- Low leakage current
- Halogen-free according to IEC 61249-2-21 definition
- Designed and qualified for industrial level


DESCRIPTION

VS-15STH06FP 600 V series are the state of the art tandem hyperfast recovery rectifiers: excellent switching performance and extremely low forward voltage drop trade off is overcome, boosting overall application performance. Specially designed for CCM PFC application, these devices show incomparable performance in every current intensive hard switching application.

Optimized reverse recovery stored charge enables downsizing of boosting switch and cooling system, increased operating frequency make possible use of smaller reactive elements. Cost effective PFC application is then possible with high efficiency over wide input voltage range and loading factor.

Plastic insulated package features easy mounting together with not insulated parts.

PRODUCT SUMMARY

Package	3L TO-220FP
$I_{F(AV)}$	15 A
V_R	600 V
V_F at I_F	2.4 V
t_{rr} (typ.)	See Recovery table
T_J max.	175 °C
Diode variation	Doubler

ABSOLUTE MAXIMUM RATINGS FOR BOTH DIODES

PARAMETER	SYMBOL	TEST CONDITIONS	MAX.	UNITS
Repetitive peak reverse voltage	V_{RRM}		600	V
DC forward current	I_F	$T_C = 73\text{ °C}$	15	A
Non-repetitive peak surge current	I_{FSM}	$T_C = 25\text{ °C}$	115	
Operating junction and storage temperatures	T_J, T_{Stg}		- 55 to 175	°C

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Breakdown voltage, blocking voltage	V_{BR}, V_R	$I_R = 100\ \mu\text{A}$	600	-	-	V
Forward voltage	V_F	$I_F = 15\text{ A}$	-	2.2	2.4	
		$I_F = 15\text{ A}, T_J = 125\text{ °C}$	-	1.9	2.1	
Reverse leakage current	I_R	$V_R = V_R$ rated	-	< 1	10	μA
		$T_J = 125\text{ °C}, V_R = V_R$ rated	-	10	100	
		$T_J = 150\text{ °C}, V_R = V_R$ rated	-	40	200	
Junction capacitance	C_T	$V_R = 600\text{ V}$	-	17	-	pF

DYNAMIC RECOVERY CHARACTERISTICS FOR BOTH DIODES ($T_J = 25\text{ }^\circ\text{C}$ unless otherwise specified)							
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS	
Reverse recovery time	t_{rr}	$I_F = 1.0\text{ A}$, $di_F/dt = -50\text{ A}/\mu\text{s}$, $V_R = 30\text{ V}$	-	-	28	ns	
		$T_J = 25\text{ }^\circ\text{C}$	-	20	-		
		$T_J = 125\text{ }^\circ\text{C}$	-	45	-		
Peak recovery current	I_{RRM}	$I_F = 15\text{ A}$ $di_F/dt = -200\text{ A}/\mu\text{s}$ $V_R = 390\text{ V}$	$T_J = 25\text{ }^\circ\text{C}$	-	2.6	-	A
			$T_J = 125\text{ }^\circ\text{C}$	-	5.6	6.5	
Reverse recovery charge	Q_{rr}	$T_J = 25\text{ }^\circ\text{C}$	$T_J = 25\text{ }^\circ\text{C}$	-	28	-	nC
			$T_J = 125\text{ }^\circ\text{C}$	-	140	-	

THERMAL - MECHANICAL SPECIFICATIONS FOR BOTH DIODES						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Maximum junction and storage temperature range	T_J, T_{Stg}		- 55	-	175	$^\circ\text{C}$
Thermal resistance, junction to case	R_{thJC}		-	-	3.9	$^\circ\text{C}/\text{W}$
Thermal resistance, case to heatsink	R_{thCS}	Mounting surface, flat, smooth and greased	-	0.2	-	
Weight			-	2.0	-	g
			-	0.07	-	oz.
Mounting torque			6.0 (5.0)	-	12 (10)	kgf · cm (lbf · in)
Marking device		Case style 3L TO-220 FULL-PAK	15STH06FP			

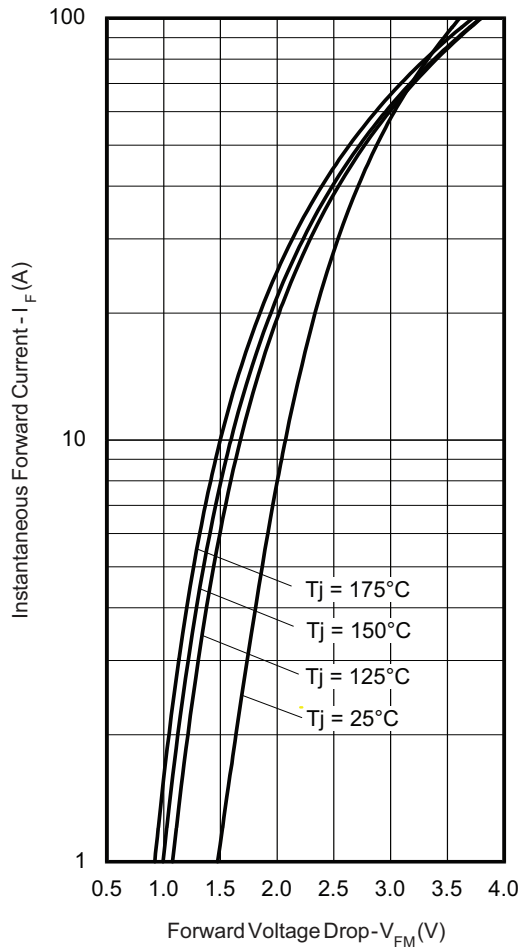


Fig. 1 - Maximum Forward Voltage Drop Characteristics

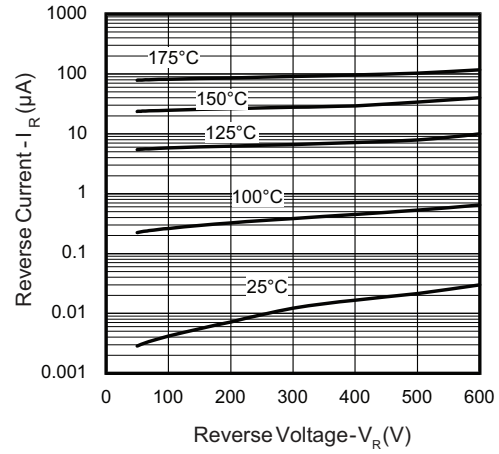


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

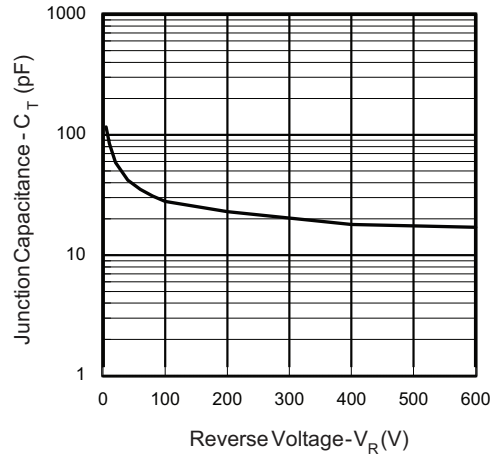
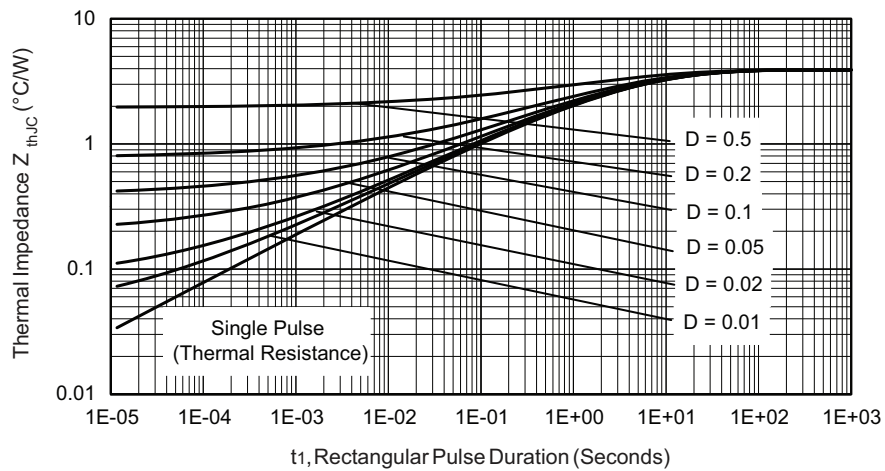


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage


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

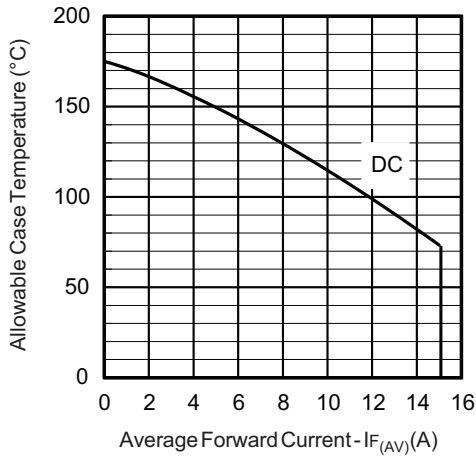


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

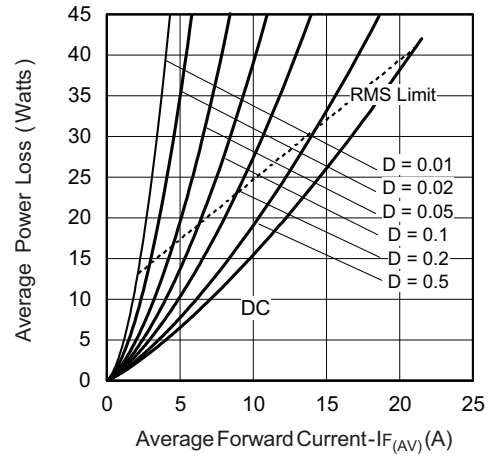


Fig. 6 - Forward Power Loss Characteristics

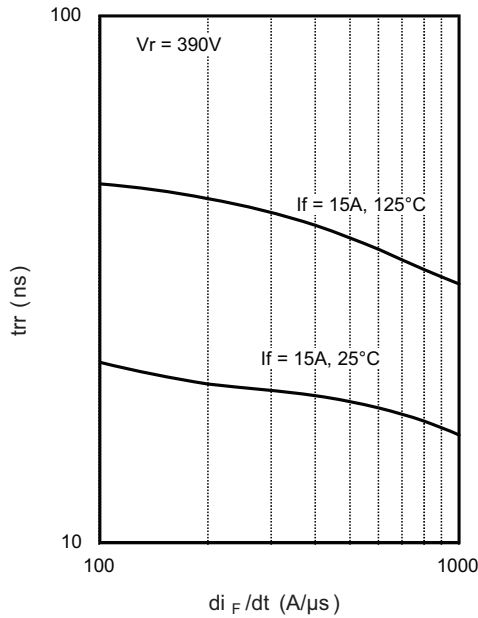


Fig. 7 - Typical Reverse Recovery Time vs. di_F/dt

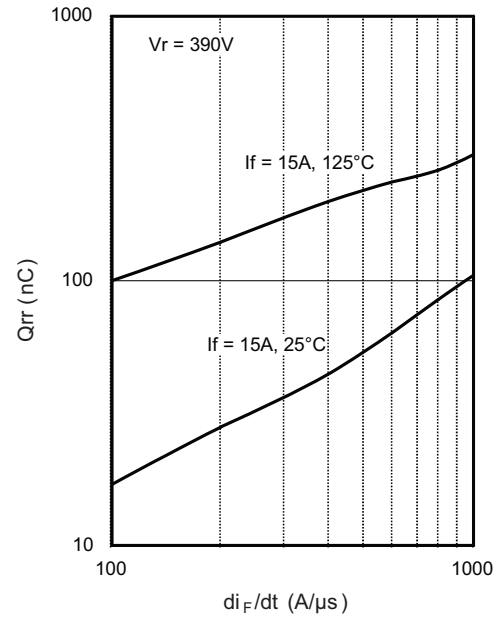
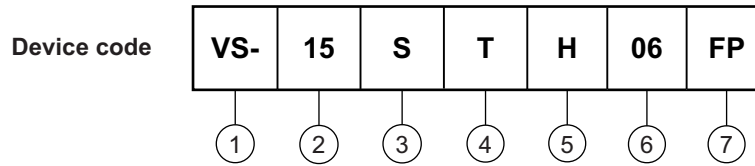


Fig. 8 - Typical Stored Charge vs. di_F/dt



ORDERING INFORMATION TABLE

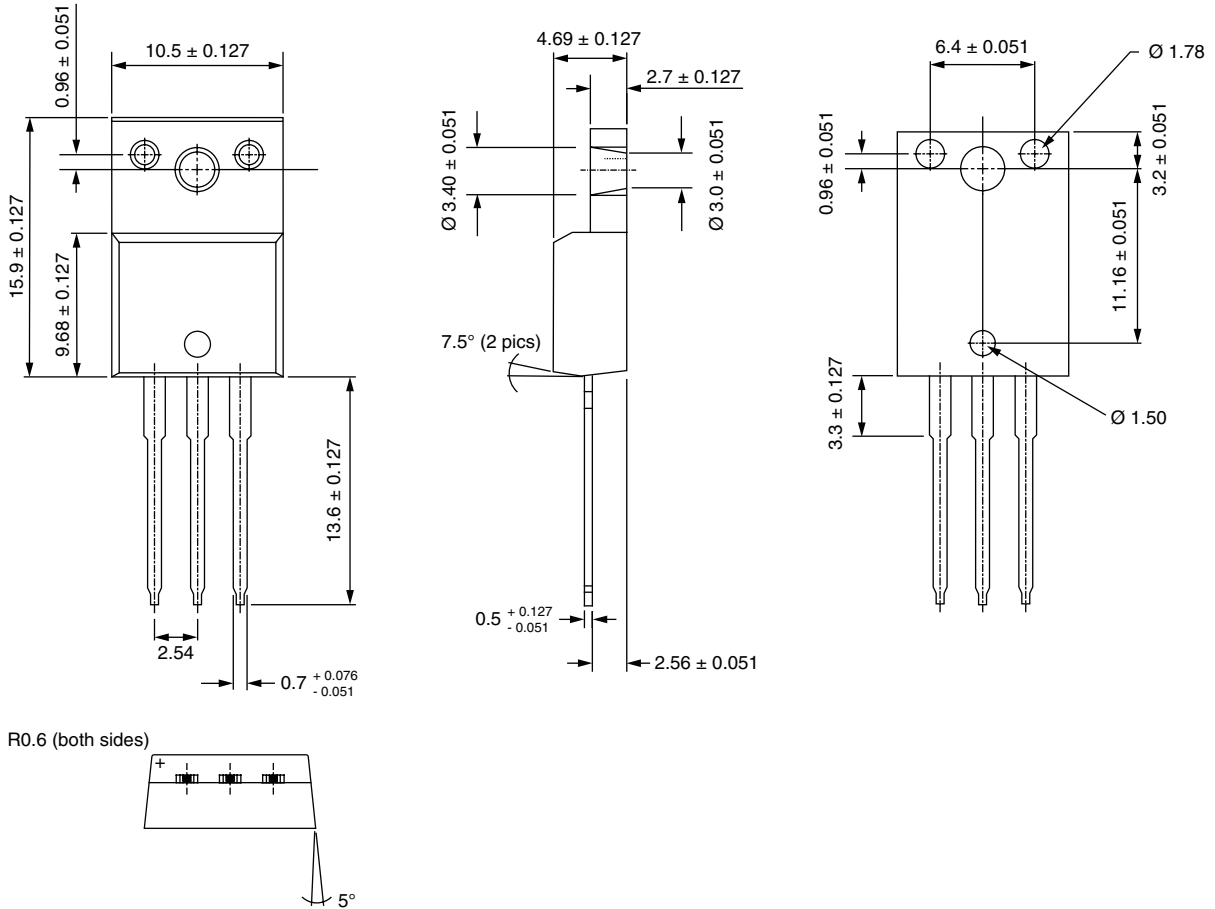


- 1** - Vishay Semiconductors product suffix
- 2** - Current rating (15 = 15 A)
- 3** - S = Doubler
- 4** - T = TO-220
- 5** - H = Hyperfast recovery
- 6** - Voltage rating (06 = 600 V)
- 7** - FP = TO-220 FULL-PAK

LINKS TO RELATED DOCUMENTS	
Dimensions	www.vishay.com/doc?95264
Part marking information	www.vishay.com/doc?95266

TO-220 (3 PIN) FULL-PAK Tandem

DIMENSIONS in millimeters





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