



## TO-3PF Plastic-Encapsulate Diode

### MURPF30H60CTB HYPERFAST RECTIFIER, FRED

#### MAIN CHARACTERISTICS

$I_o$	30(15×2)A
$V_{RRM}$	600V
$T_{rr}$	23ns
$T_j$	175°C
$V_{F(typ)}$	1.1V(@ $T_j=150^\circ\text{C}$ )

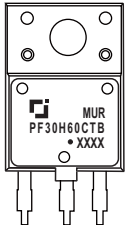
#### FEATURES

- Ultrafast Recovery Times and Low Recovery Loss
- Low Forward Voltage
- Low Reverse Leakage Current

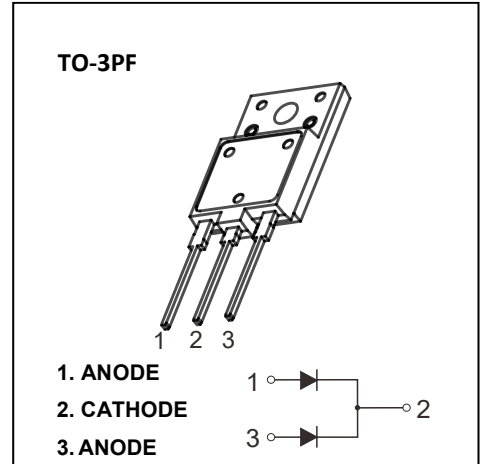
#### APPLICATIONS

Specifically designed to improve efficiency of PFC and output rectification stages of EV / HEV battery charging stations, booster stage of solar inverters and UPS applications, these devices are perfectly matched to operate with MOSFETs or high speed IGBTs.

#### MARKING



MURPF30H60CTB = Device code  
 Solid dot = Green molding compound device  
 if none, the normal device  
 XXXX = Code



#### MAXIMUM RATINGS ( $T_c=25^\circ\text{C}$ unless otherwise noted )

Symbol	Parameter	MURPF30H60CTB	Unit
$V_{RRM}$	Peak Repetitive Reverse Voltage	600	V
$V_R$	DC Blocking Voltage		
$I_{F(AV)}$	Average rectified output current@ Per leg( $T_c=158^\circ\text{C}$ )	15	A
	Average rectified output current@ Total device( $T_c=158^\circ\text{C}$ )	30	
$I_{F(RMS)}$	RMS Forward Current( $T_c=158^\circ\text{C}$ )	21	A
$I_{FSM}$	Non-Repetitive Surge Forward Current (8.3ms)	200	A
$P_D$	Power dissipation	136	W
$R_{\theta JC}$	Thermal Resistance From Junction to Case@ Per leg	1.1	$^\circ\text{C}/\text{W}$
$T_j$	Operating Junction Temperature Range	-55 ~ +175	$^\circ\text{C}$
$T_{stg}$	Storage Temperature Range	-55 ~ +175	$^\circ\text{C}$

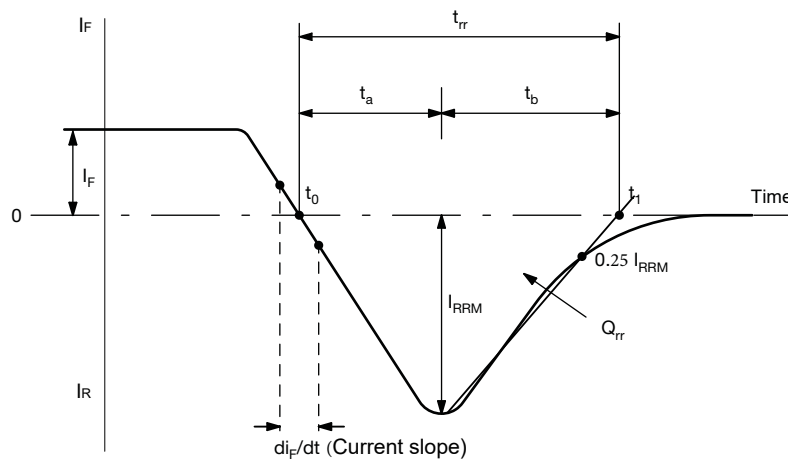
# Typical Characteristics

## ELECTRICAL CHARACTERISTICS ( $T_c=25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_{(BR)}$	Reverse Voltage	$I_R=100\mu\text{A}$	600			V
$I_R$	Reverse Current	$V_R=600\text{V}$	$T_j=25^\circ\text{C}$		1	$\mu\text{A}$
			$T_j=150^\circ\text{C}$		500	$\mu\text{A}$
$V_F$	Forward Voltage	$I_F=15\text{A}$	$T_j=25^\circ\text{C}$	1.28	1.8	V
			$T_j=150^\circ\text{C}$	1.1		V
$C_{tot}$	Total Capacitance	$V_R=200\text{V}, f=1\text{MHz}$		19		pF
$t_{rr}$	Reverse Recovery time	$I_F=0.5\text{A}, I_R=1\text{A}, I_{rr}=0.25\text{A}$		28		ns
		$I_F=1\text{A}, V_R=30\text{V}, di_f/dt=200\text{A}/\mu\text{s}$		23		ns

## ELECTRICAL CHARACTERISTICS ( $T_c=25^\circ\text{C}$ unless otherwise specified)

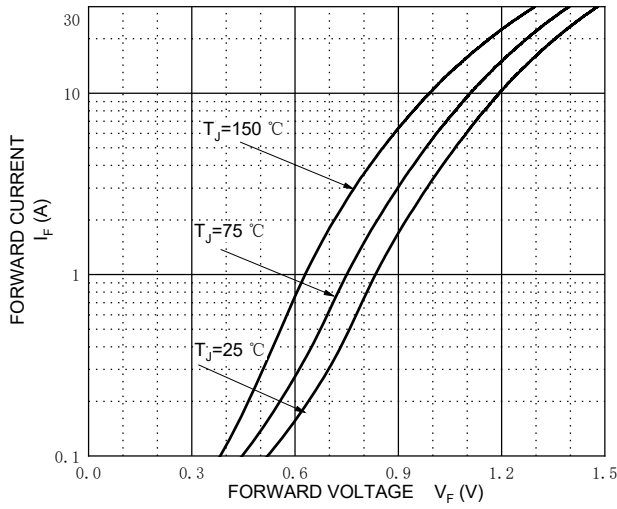
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$t_{rr}$	Reverse Recovery Time	$I_F=15\text{A}, V_R=400\text{V}, di_f/dt=200\text{A}/\mu\text{s}$		80		ns
$I_{RRM}$	Max. Reverse Recovery Current		5		A	
$Q_{rr}$	Reverse Recovery Charge		240		nC	
$t_{rr}$	Reverse Recovery Time	$I_F=15\text{A}, V_R=400\text{V}, di_f/dt=200\text{A}/\mu\text{s}, T_j=125^\circ\text{C}$		112		ns
$I_{RRM}$	Max. Reverse Recovery Current		9		A	
$Q_{rr}$	Reverse Recovery Charge		570		nC	
$t_{rr}$	Reverse Recovery Time	$I_F=15\text{A}, V_R=400\text{V}, di_f/dt=600\text{A}/\mu\text{s}, T_j=125^\circ\text{C}$		62		ns
$I_{RRM}$	Max. Reverse Recovery Current		22		A	
$Q_{rr}$	Reverse Recovery Charge		780		nC	



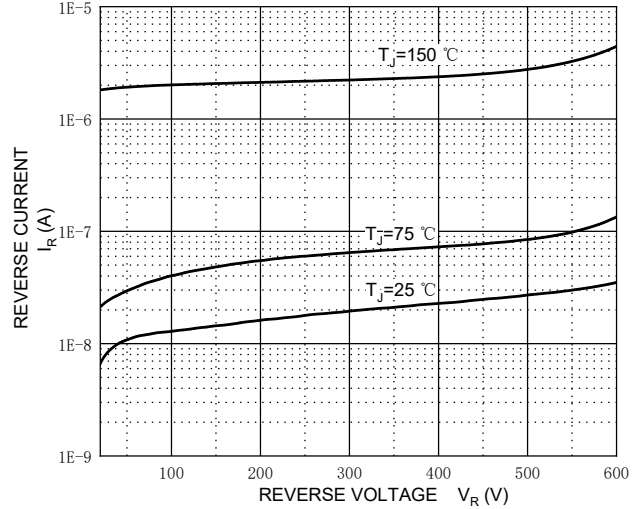
Reverse Recovery Waveform and Definitions

# Typical Characteristics

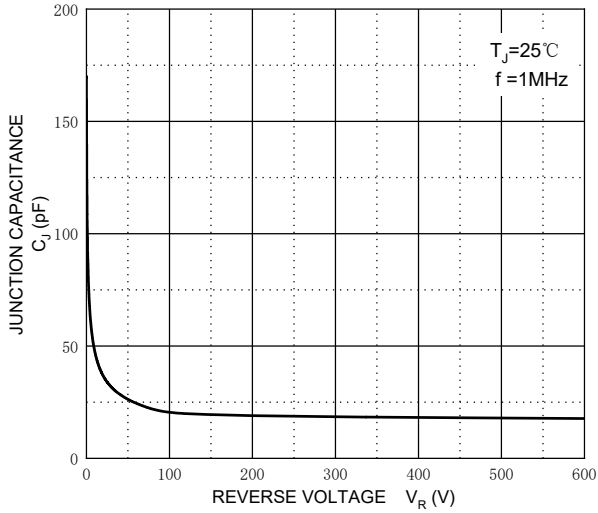
### Forward Characteristics



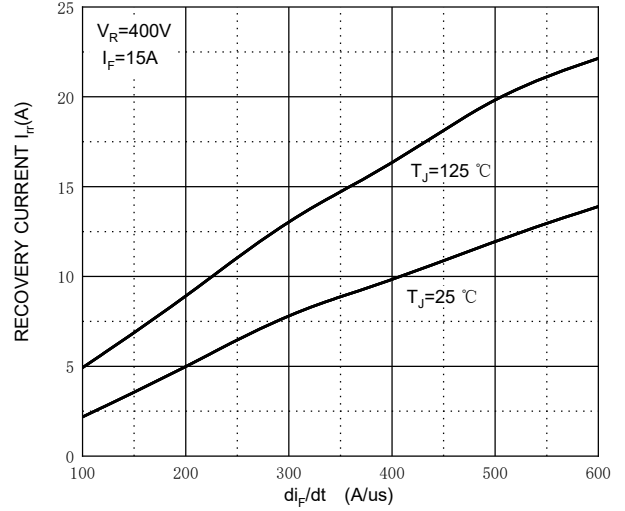
### Reverse Characteristics



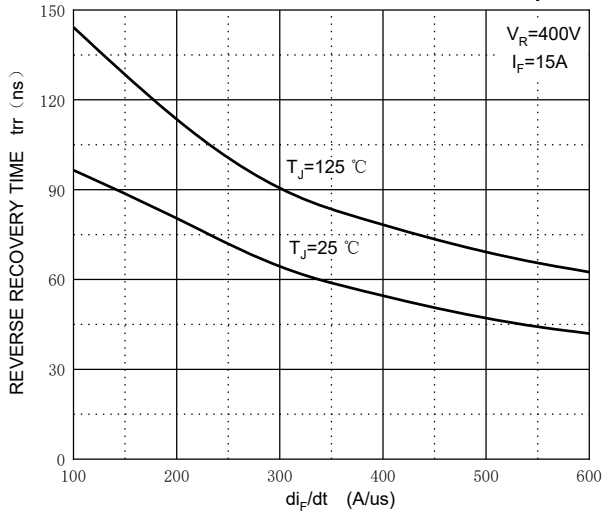
### Capacitance Characteristics Per Diode



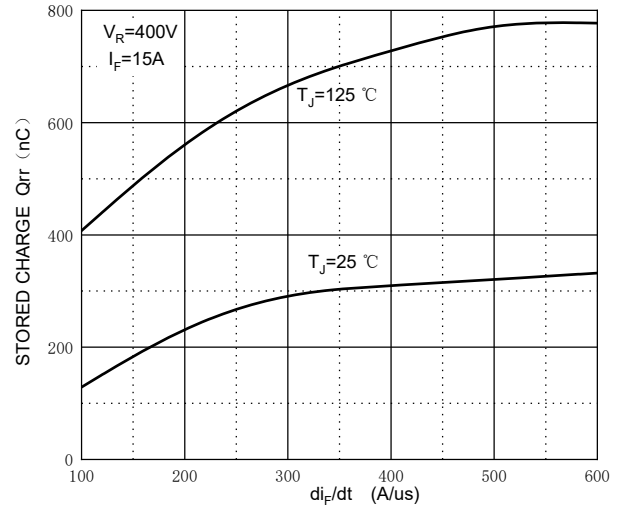
### Recovery Current vs. $di_F/dt$



### Reverse Recovery Time vs. $di_F/dt$

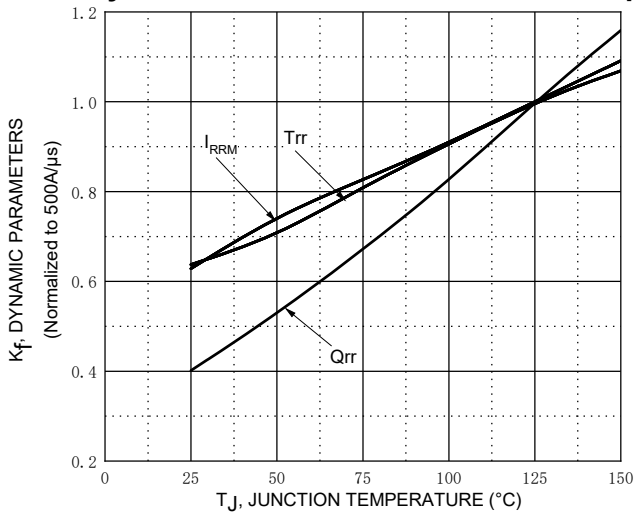


### Stored Charge vs. $di_F/dt$

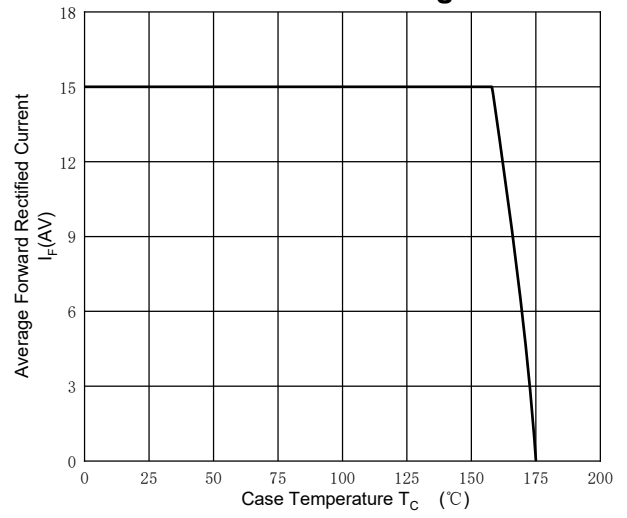


# Typical Characteristics

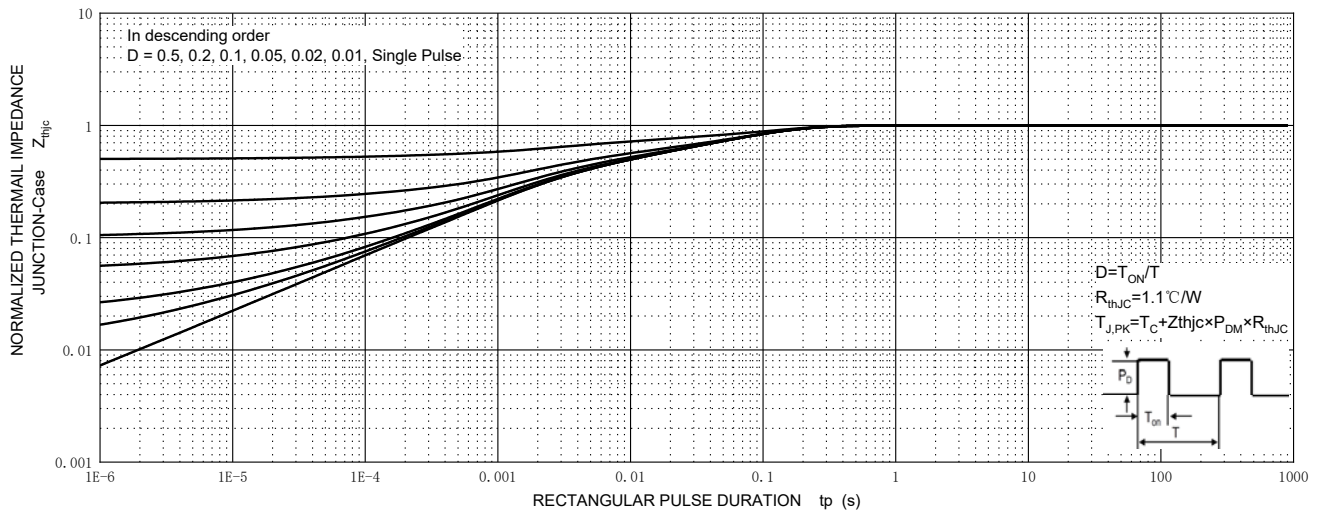
## Dynamic Parameters vs. Junction Temperature



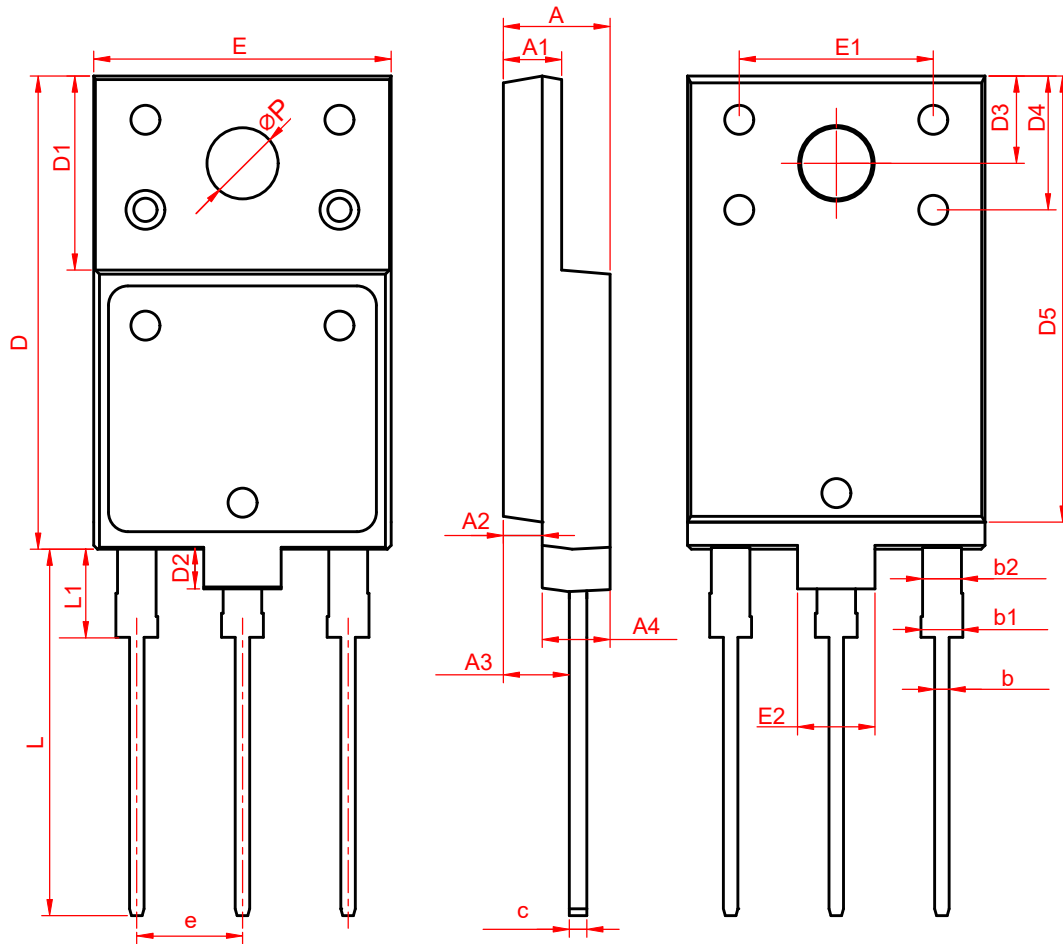
## Current Derating



## MURPF30H60CTB Transient Thermal Impedance, Junction-Case



# TO-3PF Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	5.30	5.70	0.209	0.224
A1	2.80	3.20	0.110	0.126
A2	1.85	2.15	0.073	0.085
A3	3.30	3.50	0.130	0.138
A4	3.35	3.65	0.132	0.144
b	0.68	0.83	0.027	0.033
b1	2.06	2.26	0.081	0.089
b2	1.92	2.08	0.076	0.082
c	0.82	0.98	0.032	0.039
D	24.20	24.60	0.953	0.969
D1	9.80	10.20	0.386	0.402
D2	1.85	2.25	0.073	0.089
D3	4.35	4.65	0.171	0.183
D4	6.70	7.10	0.264	0.280
D5	22.75	23.25	0.896	0.915
e	5.45 BSC		0.215 BSC	
E	15.15	15.55	0.596	0.612
E1	9.75	10.25	0.384	0.404
E2	3.85	4.15	0.152	0.163
L	18.70	19.10	0.736	0.752
L1	4.40	4.70	0.173	0.185
ΦP	3.57	3.77	0.141	0.148