

TO-220 Plastic-Encapsulate Diodes

HYPERFAST RECTIFIER, FRED

MAIN CHARACTERISTICS

I_o	20(10×2)A
V_{RRM}	400V
T_{rr}	23ns
T_j	175°C
$V_{F(typ)}$	0.9V(@ $T_j=150^{\circ}C$)

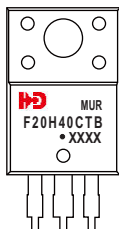
FEATURES

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

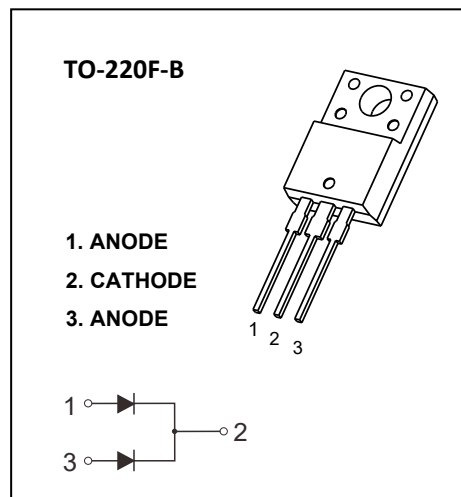
APPLICATIONS

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



MURF20H40CTB = Device code
Solid dot = Green molding compound device
if none, the normal device
XXXX = Code



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

Symbol	Parameter	MURF20H40CTB	Unit
V_{RRM}	Peak Repetitive Reverse Voltage	400	V
V_R	DC Blocking Voltage		
$I_{F(AV)}$	Average rectified output current@ Per leg($T_c=141^{\circ}C$)	10	A
	Average rectified output current@ Total device($T_c=141^{\circ}C$)	20	
$I_{F(RMS)}$	RMS Forward Current($T_c=141^{\circ}C$)	14	A
I_{FSM}	Non-Repetitive Surge Forward Current (8.3ms)	168	A
P_D	Power dissipation	125	W
$R_{\theta JC}$	Thermal Resistance From Junction to Case	1.2	$^{\circ}C/W$
T_j	Operating Junction Temperature Range	-55 ~ +175	$^{\circ}C$
T_{stg}	Storage Temperature Range	-55 ~ +175	$^{\circ}C$

Typical Characteristics

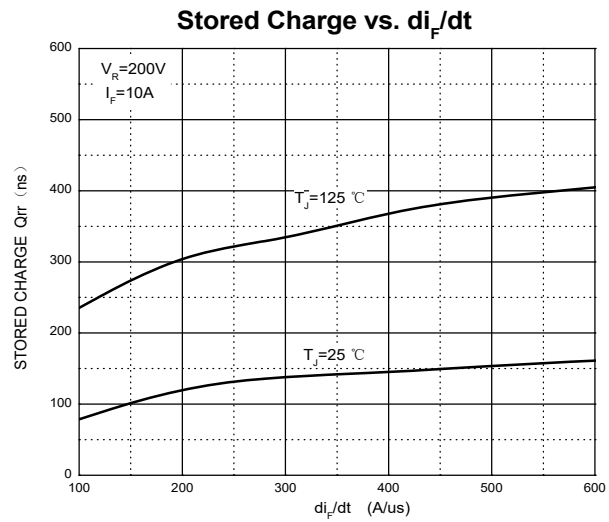
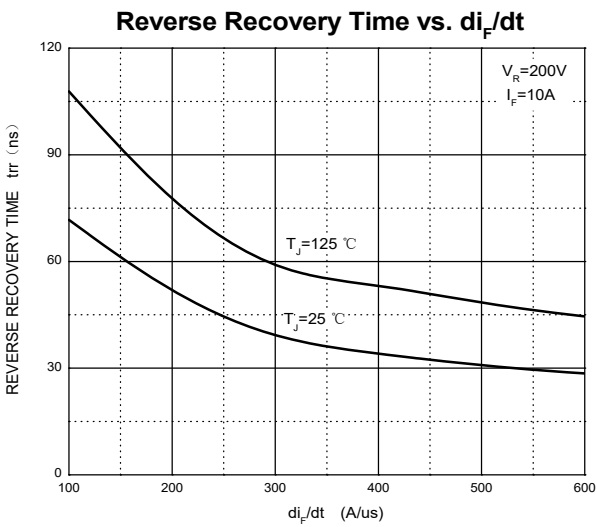
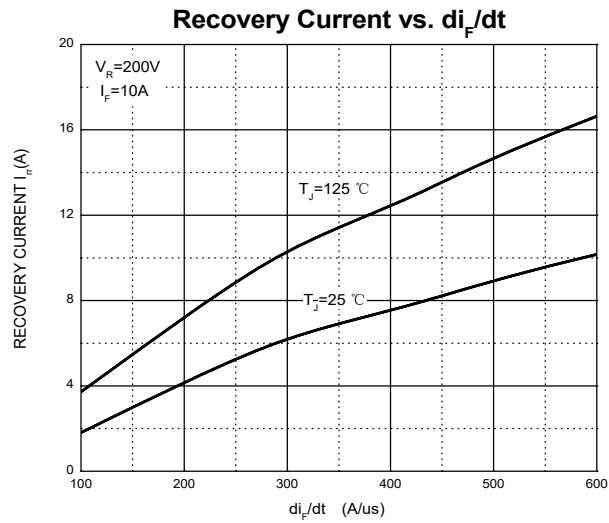
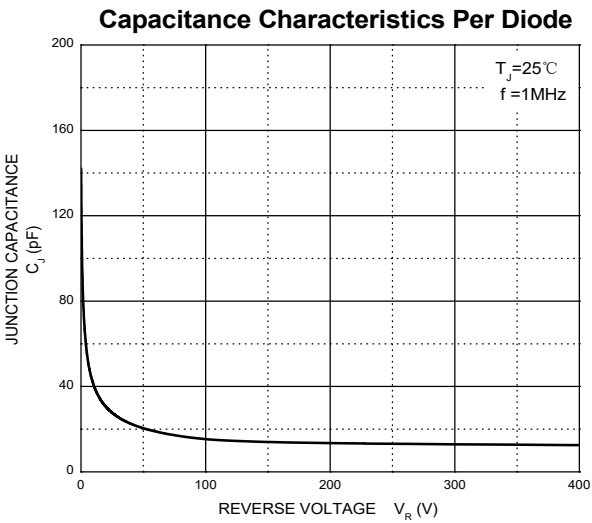
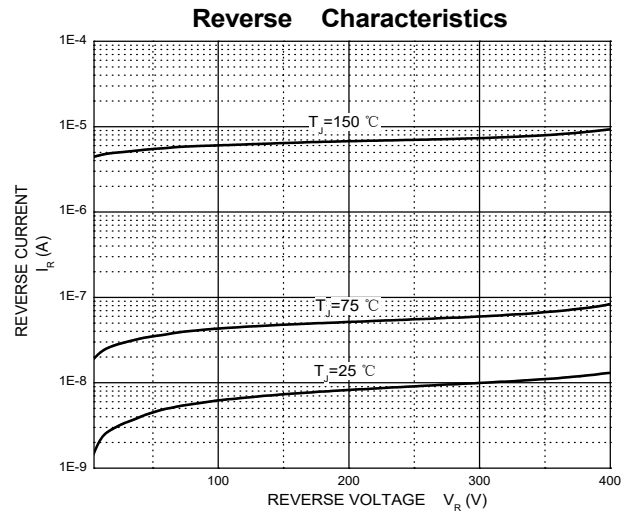
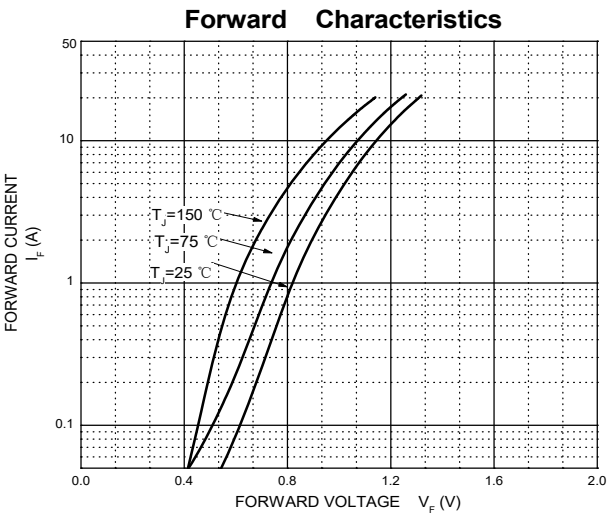
ELECTRICAL CHARACTERISTICS ($T_c=25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_{(BR)}$	Reverse Voltage	$I_R=100\mu\text{A}$	400			V
I_R	Reverse Current	$V_R=400\text{V}$			10	μA
					500	μA
V_F	Forward Voltage	$I_F=10\text{A}$		1.1	1.4	V
				0.9		V
C_{tot}	Total Capacitance	$V_R=200\text{V}, f=1\text{MHz}$		13.5		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

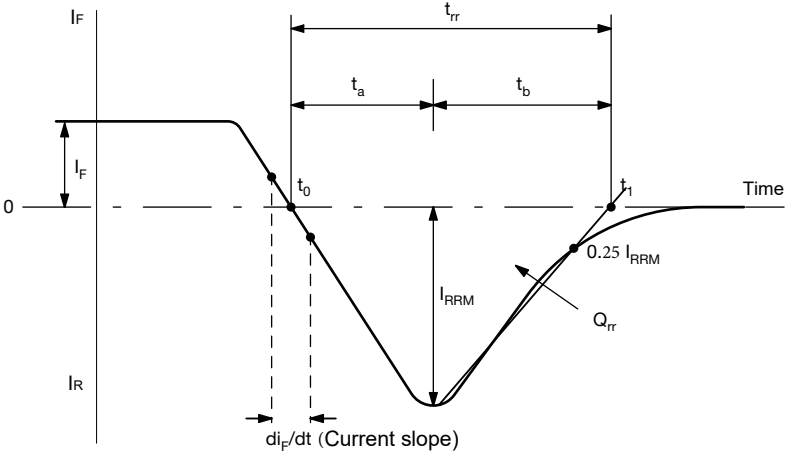
ELECTRICAL CHARACTERISTICS ($T_c=25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
t_{rr}	Reverse Recovery Time	$I_F=10\text{A}, V_R=200\text{V}, di_F/dt=200\text{A}/\mu\text{s}$		50.5		ns
I_{RRM}	Max. Reverse Recovery Current			4.2		A
Q_{rr}	Reverse Recovery Charge			125		nC
t_{rr}	Reverse Recovery Time	$I_F=10\text{A}, V_R=200\text{V}, di_F/dt=200\text{A}/\mu\text{s}, T_j=125^\circ\text{C}$		75.5		ns
I_{RRM}	Max. Reverse Recovery Current			7.2		A
Q_{rr}	Reverse Recovery Charge			314		nC
t_{rr}	Reverse Recovery Time	$I_F=10\text{A}, V_R=200\text{V}, di_F/dt=600\text{A}/\mu\text{s}, T_j=125^\circ\text{C}$		44		ns
I_{RRM}	Max. Reverse Recovery Current			16.6		A
Q_{rr}	Reverse Recovery Charge			403		nC

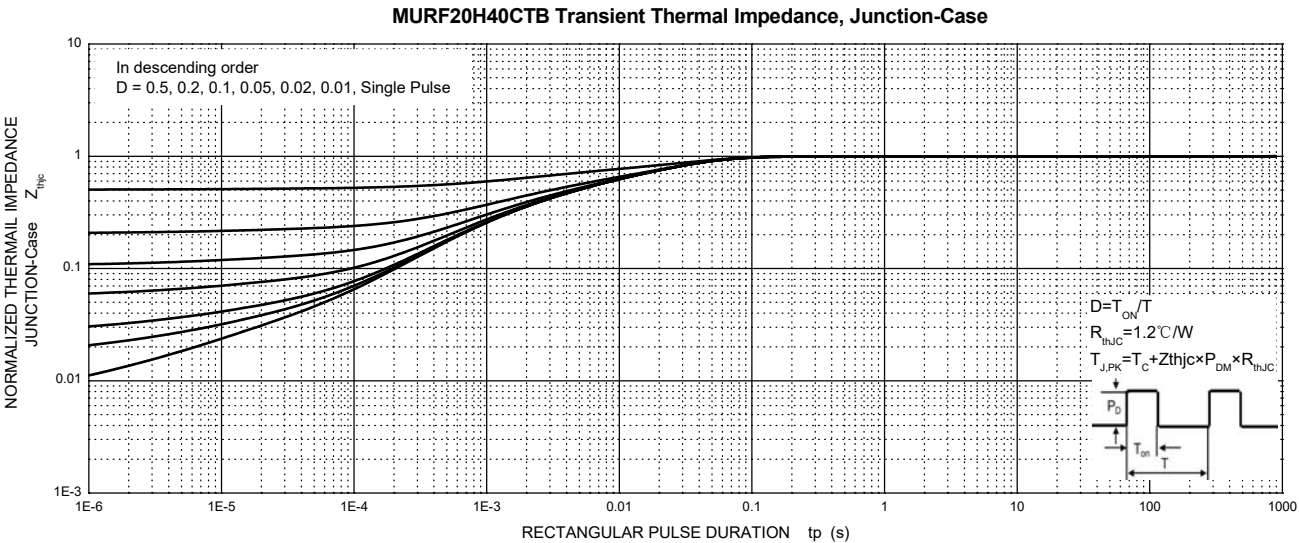
Typical Characteristics



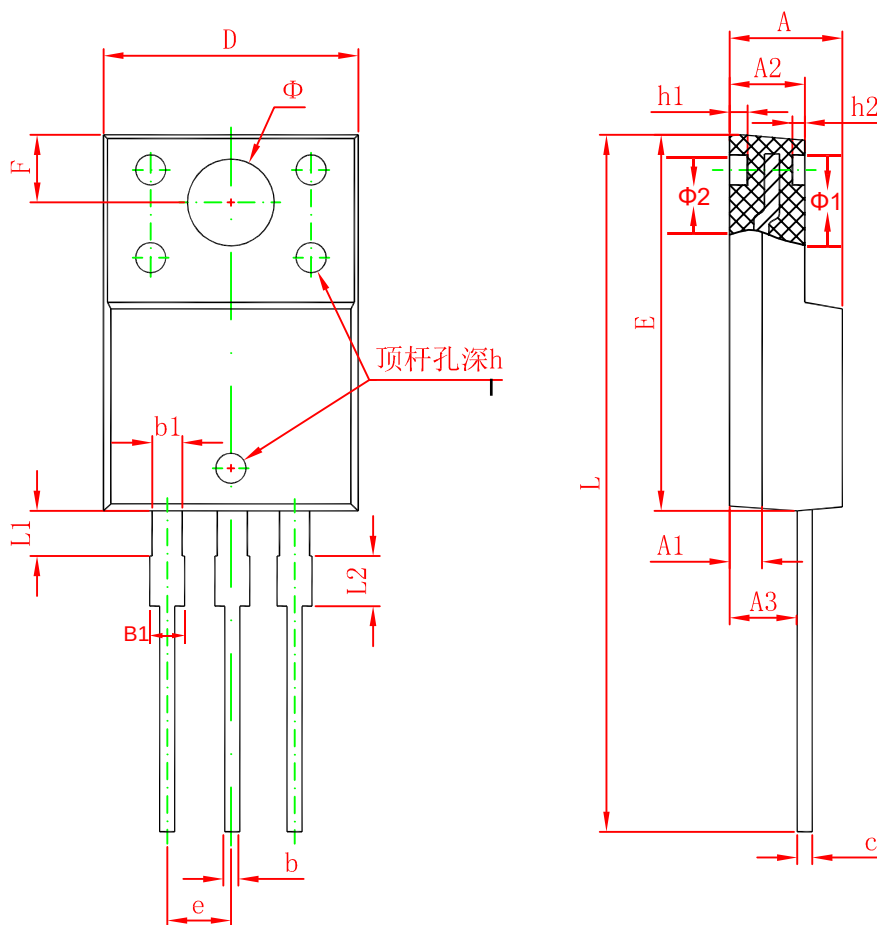
Typical Characteristics



Reverse Recovery Waveform and Definitions



TO-220F-B Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.300	4.700	0.169	0.185
A1	1.200 REF.		0.047 REF.	
A2	2.800	3.200	0.110	0.126
A3	2.500	2.900	0.098	0.114
b	0.710	0.910	0.028	0.036
b1	1.100	1.350	0.043	0.053
B1	1.150	1.400	0.045	0.055
c	0.500	0.750	0.020	0.030
D	9.960	10.360	0.392	0.408
E	14.800	15.200	0.583	0.598
e	2.540 TYP.		0.100 TYP.	
F	2.700 REF.		0.106 REF.	
Φ 1	3.300	3.700	0.130	0.146
Φ 2	3.000	3.400	0.118	0.126
h	0.000	0.300	0.000	0.012
h1	0.800 REF.		0.031 REF.	
h2	0.500 REF.		0.020 REF.	
L	28.000	28.400	1.102	1.118
L1	2.100	2.400	0.082	0.094
L2	1.300	1.700	0.051	0.066