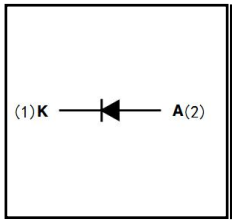
30A 600V Fast recovery diode

1 Description

30A, 600V Ultrafast Diodes They have a low forward voltage drop and are of planar, silicon nitride passivated, ion-implanted, epitaxial construction. These devices are intended for use as energy steering/clamping diodes and rectifiers in a variety of switching power supplies and other power switching applications. Their low stored charge and ultrafast recovery with soft recovery characteristics minimizes ringing and electrical noise in many power switching circuits, thus reducing power loss in the switching transistor

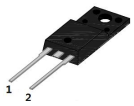
TO-220F provides insulation voltage rated at 2000V RMS from all three terminals to external heatsink. TO-220F series comply with UL standards (File ref:E252906).



V_{BR} = 600V

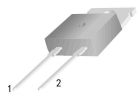
$V_{F(single)(Max)}$= 1.80V

$I_{F(AV)(single)}$ = 30A

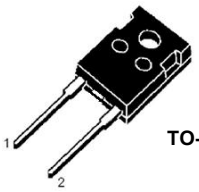


TO-220F-2L

Insulated



TO-220-2L



TO-247-2L

2 Features

- Low power loss,
- high efficiency Low forward voltage,
- high current capability High surge capacity
- Super fast recovery times
- high voltage

3 Applications

- Switching Power Supply
- Power Switching Circuits
- General Purpose

4 Electrical Characteristics

4.1 Absolute Maximum Ratings (Tc=25℃,unless otherwise noted)

PARAMETER		SYMBOL	VALUE	UNIT
Peak Repetitive Reverse Voltage		V_{RRM}	600	V
Working Peak Reverse Voltage		V_{RWM}	600	V
DC Blocking Voltage		V_R	600	V
Average Rectified Forward Current(single)	TO-220/TO-247(Tc=135℃) TO-220F(Tc=100℃)	$I_{F(AV)}$	30	A
Repetitive Peak Surge Current(single)		I_{FRM}	45	A
Nonrepetitive Peak Surge Current(single)	t=8.3ms	I_{FSM}	300	A
Avalanche Energy(single)	L=1mH	E_{AS}	80	mJ
Operating Junction Temperature Range		T_j	-55～150	℃
Storage Temperature Range		T_{stg}	-55～150	℃

4.2 Thermal Characteristics

PARAMETER	SYMBOL	VALUE			UNIT
		TO-220	TO-220F	TO-247	
Thermal Resistance, Junction to Case-sink	R_{thJC}	1.50	2.50	1.0	℃/W

4.3 Electrical Characteristics (Tc=25℃,unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Maximum Instantaneous Forward Voltage	V_F	I_F = 20A	-	1.45	1.70	V
		I_F = 30A	-	1.55	1.80	V
		I_F = 30A, T_C = 150℃	-	-	1.60	V
		I_F = 40A	-	1.56	1.90	V
Maximum Instantaneous Reverse	I_R	V_R = 600V	-	-	5	uA
		V_R = 600V, T_C = 150℃	-	-	1	mA
Maximum Reverse Recovery Time	t_{rr}	V_R=30V I_F=1A $-d_{I/dt}$=50A/us	-	35	50	ns
Total capacitance	C_{tot}	V_R=0V f=1MHz	-	680	-	pF
DC Blocking Voltage	V_{BR}	I_R=100uA	610	-	-	V

DEFINITIONS

VF = Instantaneous forward voltage (pw = 300μs, D = 2%).

IR = Instantaneous reverse current.

RθJC = Thermal resistance junction to case.

pw = pulse width.

D = duty cycle.

5 Typical characteristics diagrams

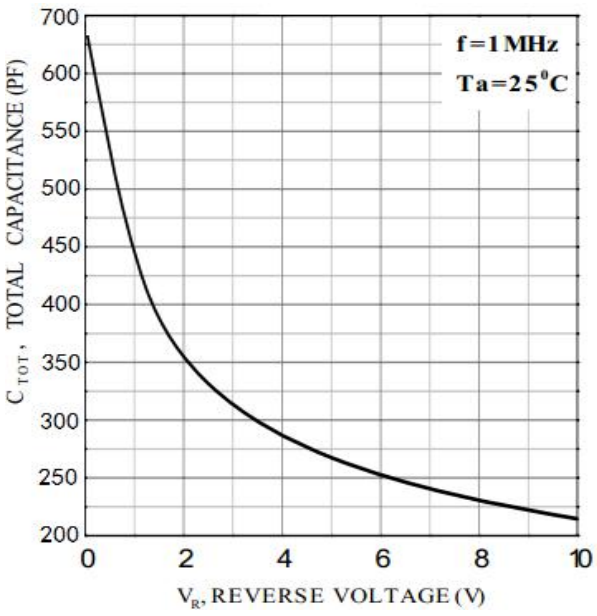


FIGURE 1. Total capacitance vs Voltage

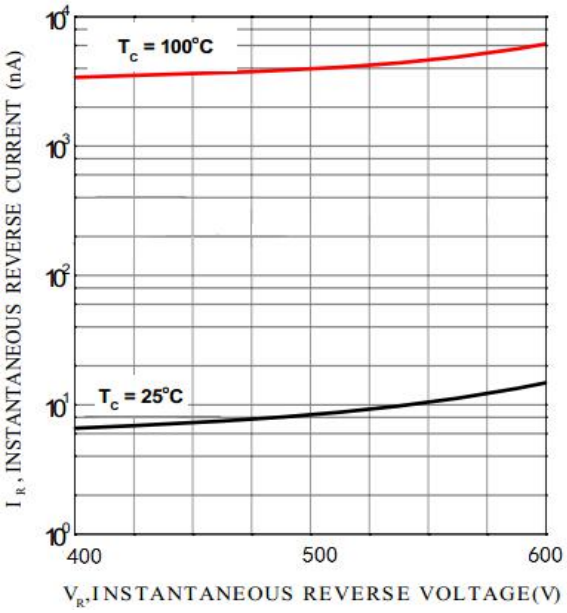


FIGURE 2. REVERSE CURRENT vs REVERSE VOLTAGE

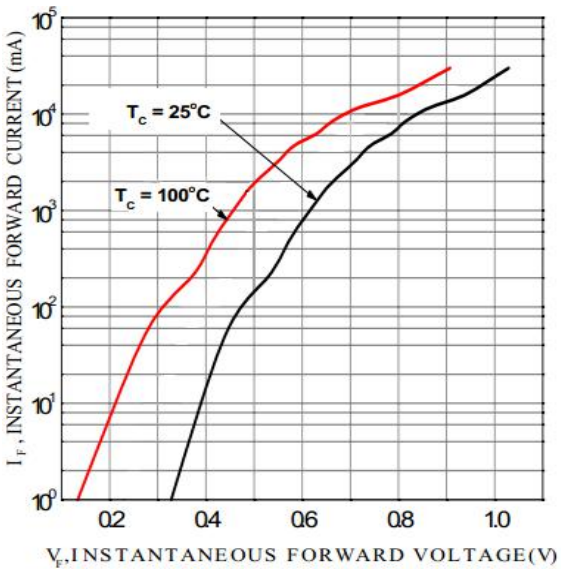


FIGURE 3. FORWARD CURRENT vs FORWARD VOLTAGE

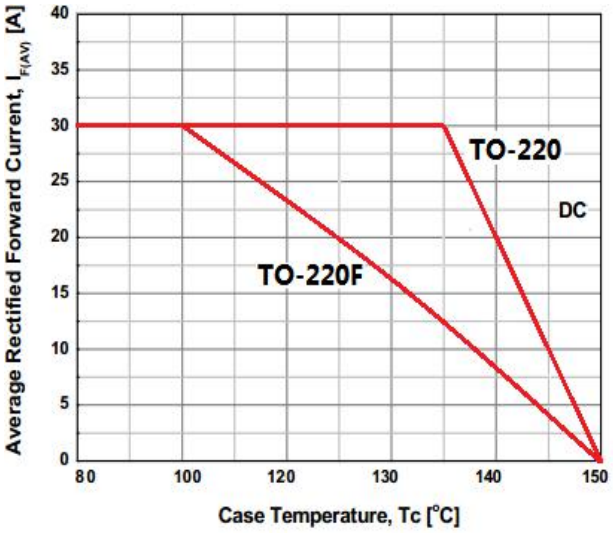


FIGURE 4. CURRENT DERATING CURVE

6 Typical Test Circuit and Waveform

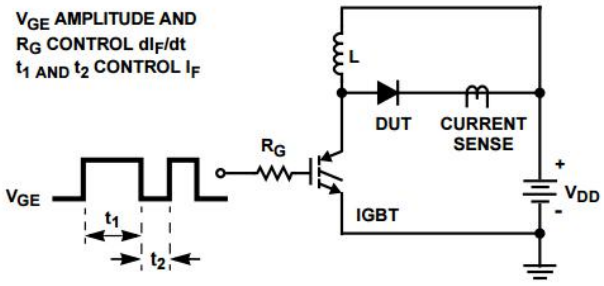


FIGURE 5. trr TEST CIRCUIT

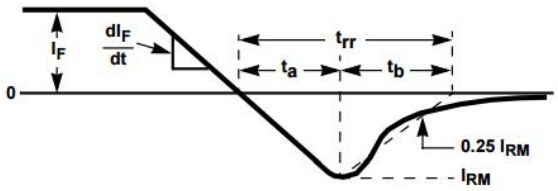


FIGURE 6. trr WAVEFORMS AND DEFINITIONS

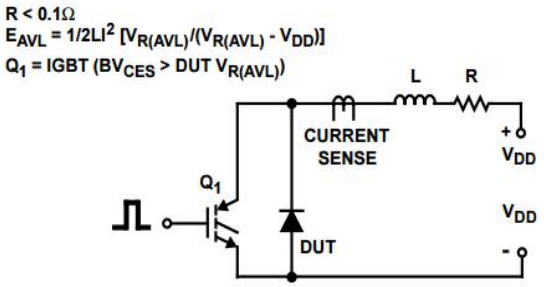


FIGURE 7. AVALANCHE ENERGY TEST CIRCUIT FIGURE

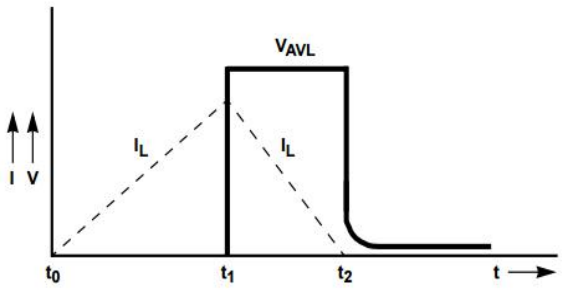


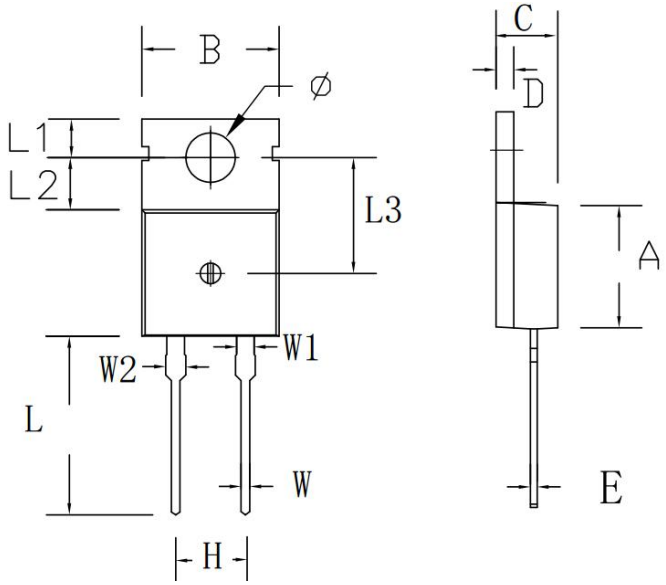
FIGURE8. AVALANCHE CURRENT AND VOLTAGE WAVEFORMS

7 Product Specifications and Packaging Models

Product Model	Package Type	Mark Name	RoHS	Package	Quantity
MUR3060	TO-220C	MUR3060	Pb-free	Tube	1000/box
MURF3060	TO-220F	MURF3060	Pb-free	Tube	1000/box
MUR3060	TO-247	MUR3060	Pb-free	Tube	300/box

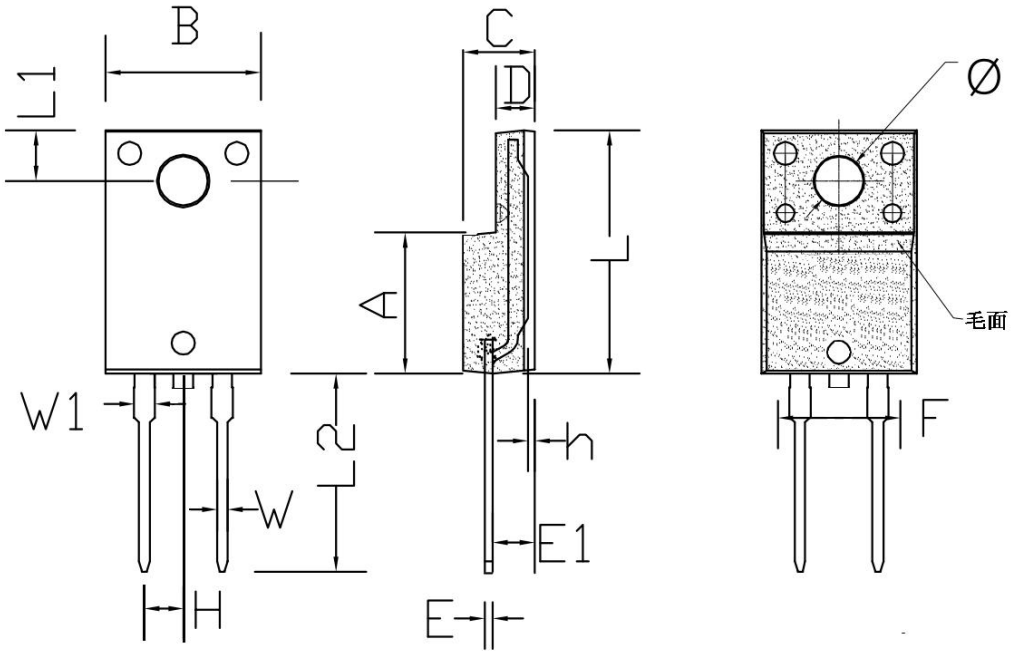
8 Dimensions

TO-220C-2L PACKAGE OUTLINE DIMENSIONS



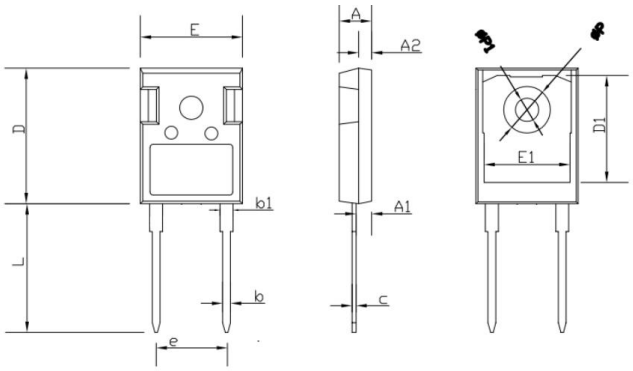
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	min.	max.	min.	max.
A	8.80	9.30	0.346	0.366
B	9.70	10.30	0.382	0.406
C	4.25	4.75	0.167	0.187
D	1.20	1.45	0.047	0.057
E	0.40	0.60	0.016	0.024
H	5.08 TYP		0.201 TYP	
W	0.60	0.95	0.024	0.037
W1	1.05	1.45	0.041	0.057
W2	1.20	1.60	0.047	0.063
L	12.60	13.40	0.496	0.528
L1	2.45	2.95	0.096	0.116
L2	3.45	3.95	0.136	0.156
L3	8.15	8.65	0.321	0.341
Φ	3.50	3.90	0.138	0.154

TO-220F-2L PACKAGE OUTLINE DIMENSIONS



Symbol	DimensionsIn Millimeters	
	min.	max.
A	7.90	8.50
B	10.00	10.50
C	4.30	4.90
D	2.80	3.20
L	14.80	15.30
h	0.40	0.60
L1	2.90	3.40
L2	12.65	13.45
W	0.60	0.80
W1	1.15	1.55
H	2.54 TYP	
E	0.60	0.70
Φ	2.90	3.40
E1	2.40	2.90
F	7.75	8.25

TO-247-2L PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	min.	max.	min.	max.
A	4.90	5.10	0.193	0.201
A1	2.31	2.51	0.091	0.099
A2	1.90	2.10	0.075	0.083
b	1.16	1.26	0.046	0.050
b1	1.96	2.06	0.0772	0.0812
c	0.59	0.66	0.0232	0.0260
D	20.90	21.10	0.8235	0.8313
D1	16.25	16.85	0.6403	0.6639
E	15.70	15.90	0.6186	0.6265
E1	13.10	13.50	0.5161	0.5319
e	10.88BCS			
L	19.80	20.10	0.7801	0.7919
ΦP	3.50	3.70	0.1379	0.1458
ΦP1	0	7.30	0	0.2876

9 Attentions

- Jiangsu Donghai Semiconductor Technology Co., Ltd. reserves the right to change the specification without prior notice! The customer should obtain the latest version of the information before making the order and verify that the information is complete and up to date.
- It is the responsibility of the purchaser for any failure or failure of any semiconductor product under certain conditions. It is the responsibility of the purchaser to comply with safety standards and to take safety measures in the system design and machine manufacturing of WXDH products in order to avoid potential risk of failure. Injury or property damage.
- Product promotion is endless, our company will be dedicated to provide customers with better products.

10 Appendix

Revision history:

Date	REV.	Description	Page
2017.03.31	1.0	Original	