

## 40A 400V Fast recovery diode

### 1 Description

40A, 400V 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

### 2 Features

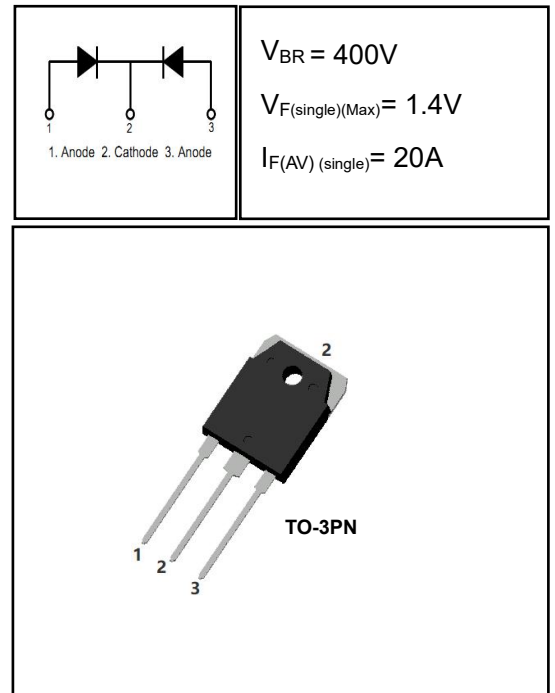
- Low power loss,
- high efficiency Low forward voltage,
- high current capability High surge capacity
- Super fast recovery times
- high voltage

### 3 Applications

- Switching Power Supply
- Power Switching Circuits
- General Purpose

### 4 install

- Recommended torque value (TO-247): 0.8 N.m
- Recommended torque value (TO-3PN/3P): 0.8 N.m
- Maximum torque value (TO-247): 1.2 N.m
- Maximum torque value(TO-3PN/3P): 1.1 N.m



## 5 Electrical Characteristics

### 5.1 Absolute Maximum Ratings (Tc=25°C, unless otherwise noted)

PARAMETER		SYMBOL	VALUE	UNIT
Peak Repetitive Reverse Voltage		$V_{RRM}$	400	V
Working Peak Reverse Voltage		$V_{RWM}$	400	V
DC Blocking Voltage		$V_R$	400	V
Average Rectified Forward Current(single)	T <sub>C</sub> =135°C	$I_{F(AV)}$	20	A
Average Rectified Forward Current(double)			40	A
Repetitive Peak Surge Current(single)		$I_{FRM}$	30	A
Nonrepetitive Peak Surge Current(single)	t=8.3ms	$I_{FSM}$	200	A
Avalanche Energy(single)	L=1mH	$E_{AS}$	50	mJ
Operating Junction Temperature Range		$T_j$	-55~150	°C
Storage Temperature Range		$T_{stg}$	-55~150	°C

### 5.2 Thermal Characteristics

PARAMETER	SYMBOL	VALUE	UNIT
Thermal Resistance, Junction to Case-sink	$R_{thJC}$	0.9	°C/W

## 5.3 Electrical Characteristics (Tc=25°C, unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Maximum Instantaneous Forward Voltage	V <sub>F</sub>	I <sub>F</sub> = 5A	-	0.99	-	V
		I <sub>F</sub> = 10A	-	1.09	-	V
		I <sub>F</sub> = 15A	-	1.15	1.35	V
		I <sub>F</sub> = 20A,	-	1.19	1.40	V
		I <sub>F</sub> = 20A, T <sub>C</sub> = 150°C	-	0.95	-	V
		I <sub>F</sub> = 30A	-	1.65	-	V
Maximum Instantaneous Reverse	I <sub>R</sub>	V <sub>R</sub> = 400V	-	-	5	uA
		V <sub>R</sub> = 400V, T <sub>C</sub> = 150°C	-	-	500	uA
Maximum Reverse Recovery Time	t <sub>rr</sub>	V <sub>R</sub> =30V IF=1A -di/dt=50A/us	-	32	45	ns
Total capacitance	C <sub>tot</sub>	V <sub>R</sub> =0V f=1MHz	-	350	-	pF
DC Blocking Voltage	V <sub>BR</sub>	I <sub>R</sub> =100uA	410	440	-	V

### DEFINITIONS

V<sub>F</sub> = Instantaneous forward voltage (pw = 300μs, D = 2%).

I<sub>R</sub> = Instantaneous reverse current.

RθJC = Thermal resistance junction to case.

pw = pulse width.

D = duty cycle.

## 6 Typical characteristics diagrams

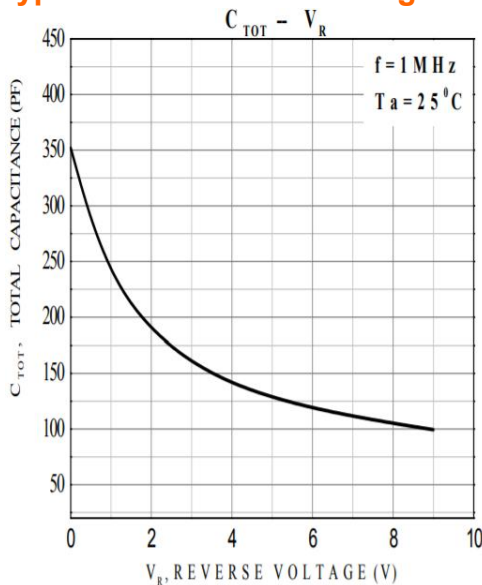


FIGURE 1. Total capacitance vs Voltage

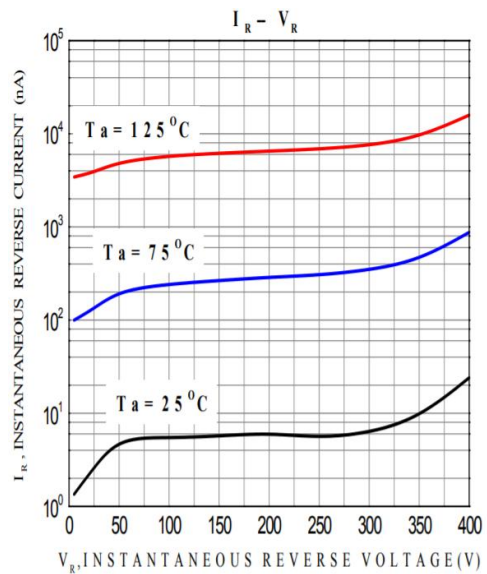


FIGURE 2. REVERSE CURRENT vs REVERSE VOLTAGE

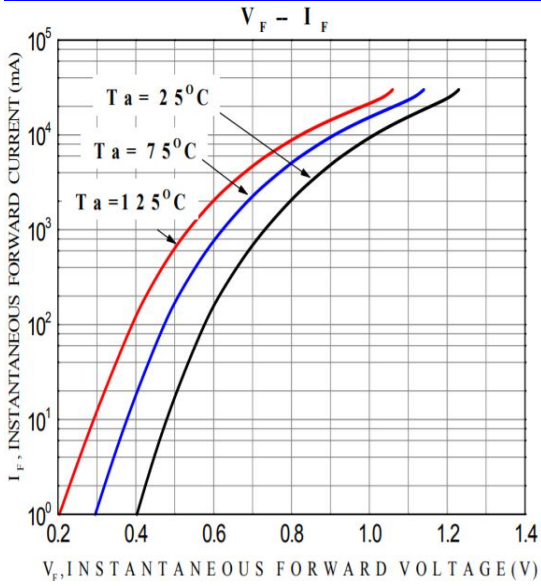


FIGURE 3. FORWARD CURRENT vs FORWARD VOLTAGE

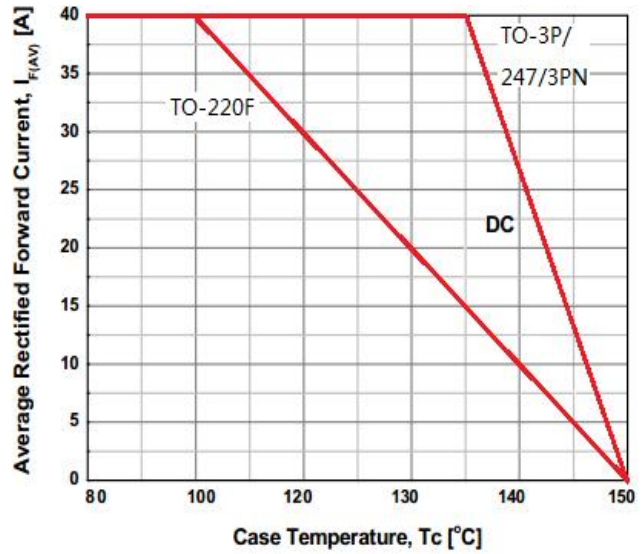


FIGURE 4. CURRENT DERATING CURVE

## 7 Typical Test Circuit and Waveform

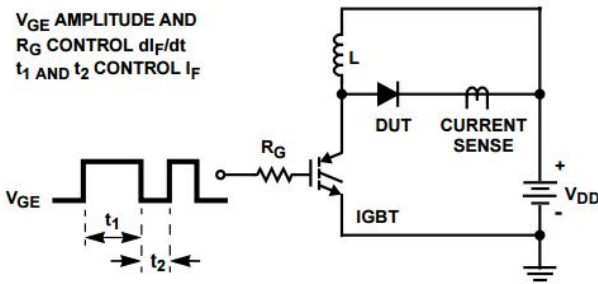


FIGURE 5. trr TEST CIRCUIT

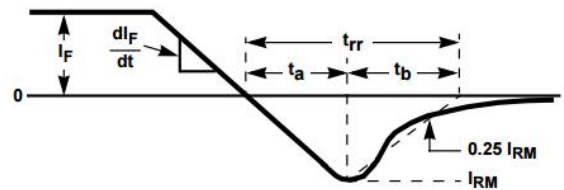


FIGURE 6. trr WAVEFORMS AND DEFINITIONS

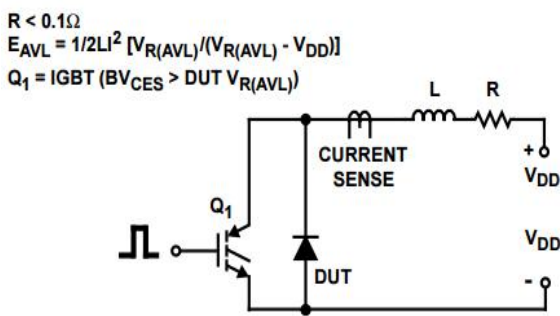


FIGURE 7. AVALANCHE ENERGY TEST CIRCUIT FIGURE

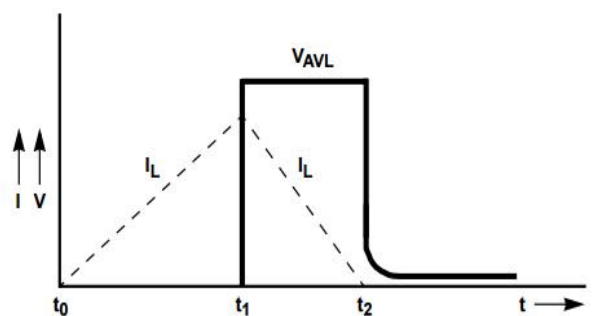


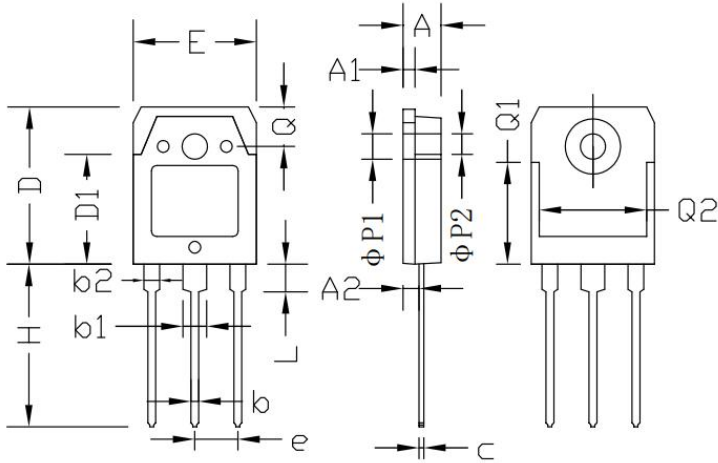
FIGURE 8. AVALANCHE CURRENT AND VOLTAGE WAVEFORMS

## 8 Product Specifications and Packaging Models

Product Model	Package Type	Mark Name	RoHS	Package	Quantity
MUR40FU40NCT	TO-3PN	MUR40FU40NCT	Pb-free	Tube	300/box

## 9 Dimensions

### TO-3PN PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	min.	max.	min.	max.
A	4.60	5.00	0.181	0.197
A1	1.45	1.65	0.057	0.065
A2	2.20	2.60	0.087	0.102
b	0.80	1.20	0.032	0.047
b1	2.80	3.20	0.110	0.126
b2	1.80	2.20	0.071	0.087
C	0.55	0.75	0.022	0.030
D	19.20	19.80	0.756	0.780
D1	13.10	14.70	0.516	0.578
E	15.40	15.80	0.607	0.623
e	5.45 TYP		0.215 TYP	
H	19.80	20.50	0.780	0.807
L	3.20	3.70	0.126	0.146
ΦP1	3.20 TYP		0.126 TYP	
ΦP2	3.50 TYP		0.138 TYP	
Q	5.00 TYP		0.197 TYP	
Q1	12.40 TYP		0.488 TYP	
Q2	12.6	-	0.496	-

## 10 Attentions

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- Product promotion is endless, our company will be dedicated to provide customers with better products.

## 11 Appendix

Revision history:

Date	REV.	Description	Page
2023.1.4	1.0	Original	