



## Description

### JMP N-channel MOSFET

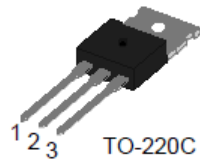
#### Features

- 600V,10A
- $R_{DS(ON)} = 0.74\Omega$  (Typ.) @  $V_{GS} = 10V, I_D = 5A$
- Fast Switching
- Improved dv/dt Capability
- 100% Avalanche Tested

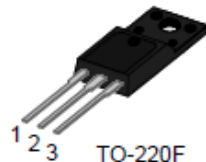
#### Application

- Switch Mode Power Supply(SMPS)
- Uninterruptible Power Supply(UPS)
- Power Factor Correction (PFC)

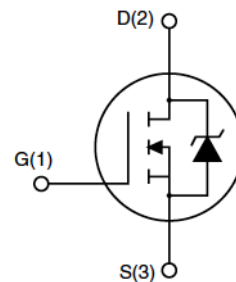
#### Package



JMPC10N60B



JMPF10N60B



### Absolute Maximum Ratings ( $T_C=25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Max.		Units	
		TO-220F	TO-220C		
$V_{DSS}$	Drain-Source Voltage	600		V	
$V_{GSS}$	Gate-Source Voltage	$\pm 30$		V	
$I_D$	Continuous Drain Current	$T_C = 25^\circ\text{C}$	10	A	
		$T_C = 100^\circ\text{C}$	6.5	A	
$I_{DM}$	Pulsed Drain Current <sup>note1</sup>	40		A	
$E_{AS}$	Single Pulsed Avalanche Energy <sup>note2</sup>	350		mJ	
$P_D$	Power Dissipation	$T_C = 25^\circ\text{C}$	64	130	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case		1.95	0.96	$^\circ\text{C}/\text{W}$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient		62.5	62.5	$^\circ\text{C}/\text{W}$
$T_J, T_{STG}$	Operating and Storage Temperature Range	-55 to +150		$^\circ\text{C}$	



## Electrical Characteristics (T<sub>C</sub>=25°C unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
<b>Off Characteristic</b>						
V <sub>(BR)DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	600	-	-	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> = 600V, V <sub>GS</sub> = 0V, T <sub>J</sub> = 25°C	-	-	1	μA
I <sub>GSS</sub>	Gate to Body Leakage Current	V <sub>DS</sub> =0V, V <sub>GS</sub> = ±30V	-	-	±100	nA
<b>On Characteristics</b>						
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> =250μA	2	-	4	V
R <sub>DS(on)</sub> <small>note3</small>	Static Drain-Source on-Resistance	V <sub>GS</sub> =10V, I <sub>D</sub> =5A	-	0.74	0.85	Ω
<b>Dynamic Characteristics</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> = 25V, V <sub>GS</sub> = 0V, f = 1.0MHz	-	1110	-	pF
C <sub>oss</sub>	Output Capacitance		-	129	-	pF
C <sub>rss</sub>	Reverse Transfer Capacitance		-	20	-	pF
Q <sub>g</sub>	Total Gate Charge	V <sub>DD</sub> = 480V, I <sub>D</sub> =10A, V <sub>GS</sub> = 10V	-	32	-	nC
Q <sub>gs</sub>	Gate-Source Charge		-	5	-	nC
Q <sub>gd</sub>	Gate-Drain("Miller") Charge		-	16	-	nC
<b>Switching Characteristics</b>						
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>DD</sub> = 300V, I <sub>D</sub> = 10A, R <sub>G</sub> = 25Ω	-	23	-	ns
t <sub>r</sub>	Turn-on Rise Time		-	15	-	ns
t <sub>d(off)</sub>	Turn-off Delay Time		-	90	-	ns
t <sub>f</sub>	Turn-off Fall Time		-	30	-	ns
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
I <sub>S</sub>	Maximum Continuous Drain to Source Diode Forward Current		-	-	10	A
I <sub>SM</sub>	Maximum Pulsed Drain to Source Diode Forward Current		-	-	40	A
V <sub>SD</sub>	Drain to Source Diode Forward Voltage	V <sub>GS</sub> = 0V, I <sub>SD</sub> =10A	-	-	1.4	V
t <sub>rr</sub>	Reverse Recovery Time	V <sub>GS</sub> =0V, I <sub>S</sub> =10A, di/dt=100A/μs	-	310	-	ns
Q <sub>rr</sub>	Reverse Recovery Charge		-	4.1	-	μC

Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

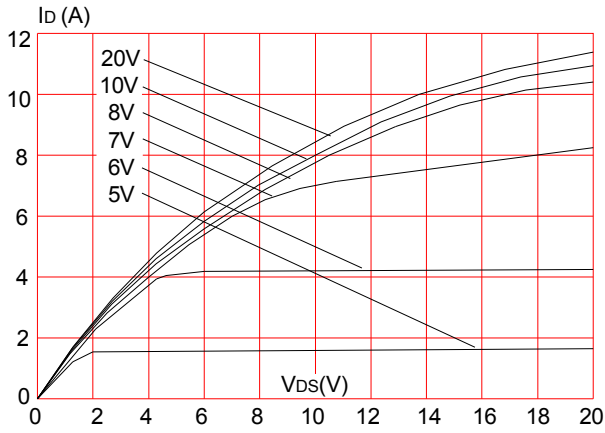
2. I<sub>AS</sub> =6A, V<sub>DD</sub> = 50V, R<sub>G</sub> = 25 Ω, Starting T<sub>J</sub> = 25°C

3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤1%

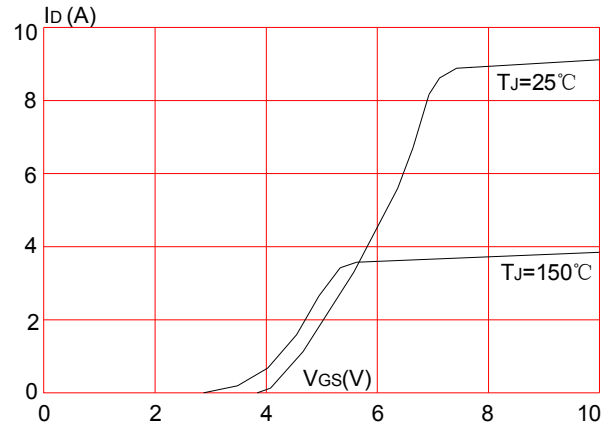


## Typical Performance Characteristics

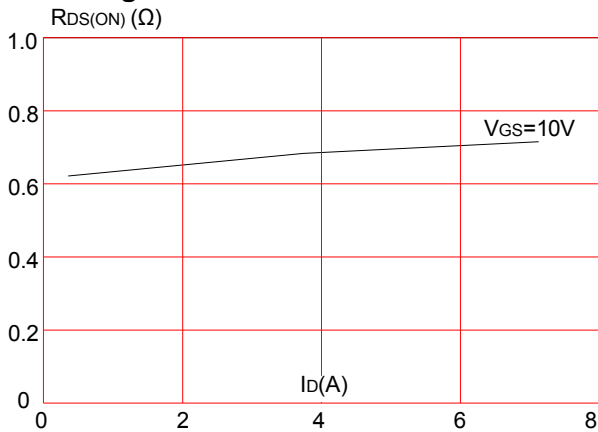
**Figure 1: Output Characteristics**



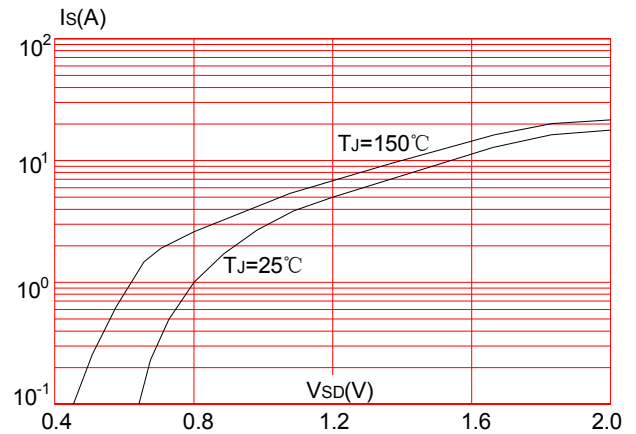
**Figure 2: Typical Transfer Characteristics**



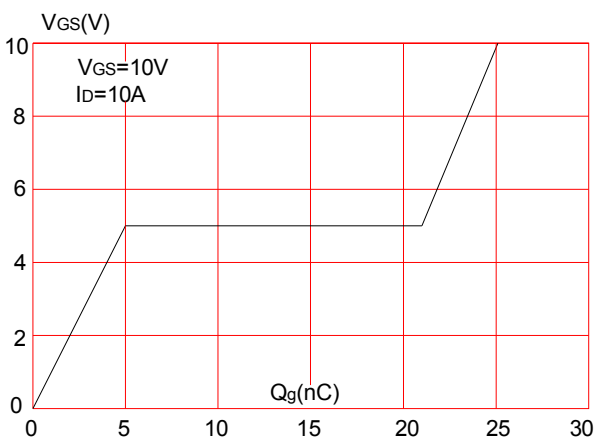
**Figure 3: On-resistance vs. Drain Current**



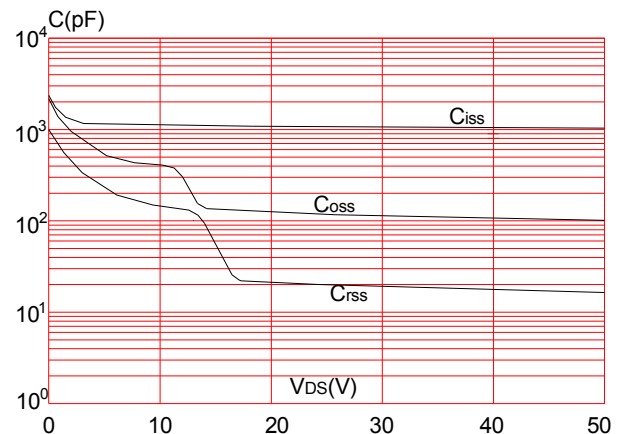
**Figure 4: Body Diode Characteristics**



**Figure 5: Gate Charge Characteristics**



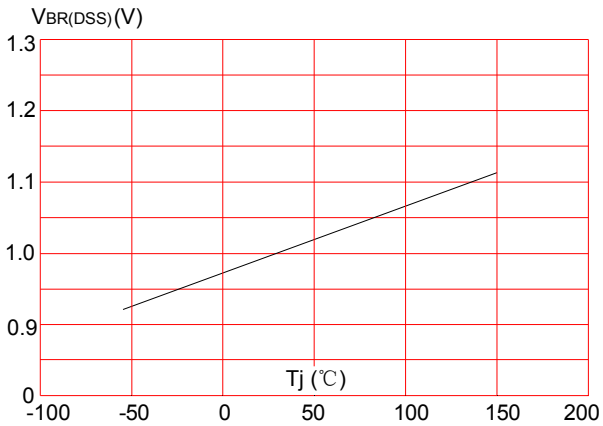
**Figure 6: Capacitance Characteristics**



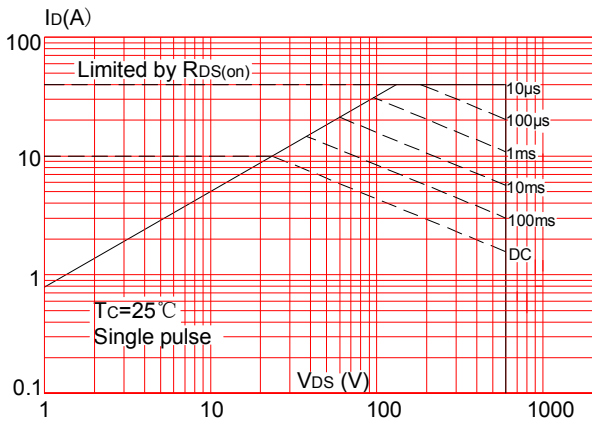


# JMP(C.F)10N60B

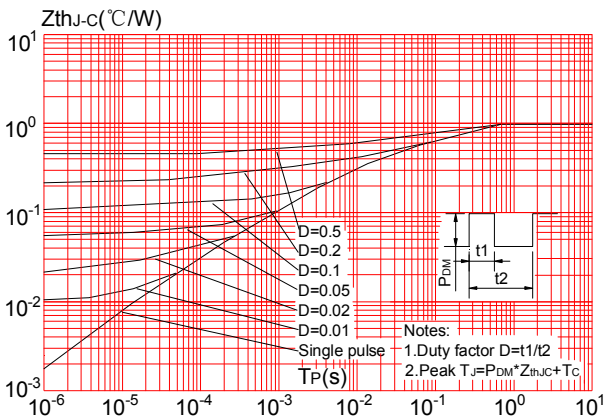
**Figure 7:** Normalized Breakdown Voltage vs. Junction Temperature



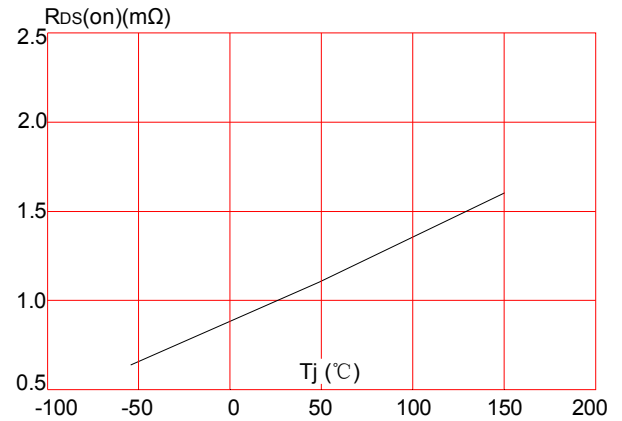
**Figure 9:** Maximum Safe Operating Area



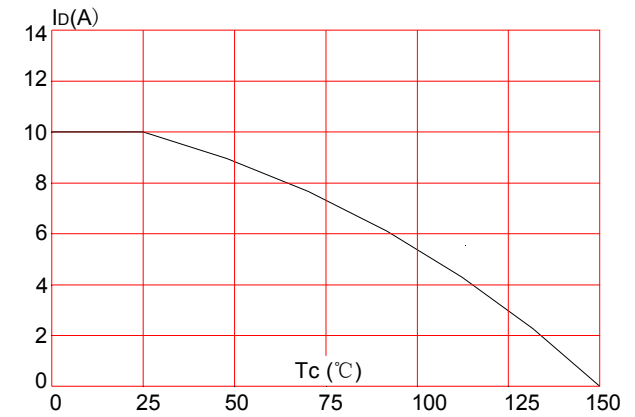
**Figure.11:** Maximum Effective Transient Thermal Impedance, Junction-to-Case (TO-220C)



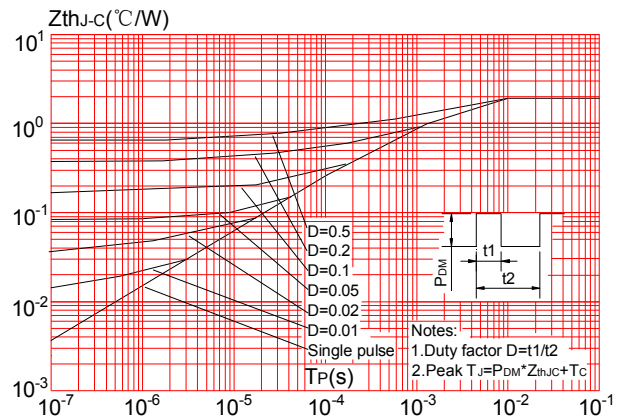
**Figure 8:** Normalized on Resistance vs. Junction Temperature



**Figure 10:** Maximum Continuous Drain Current vs. Case Temperature



**Figure.12:** Maximum Effective Transient Thermal Impedance, Junction-to-Case (TO-220F)



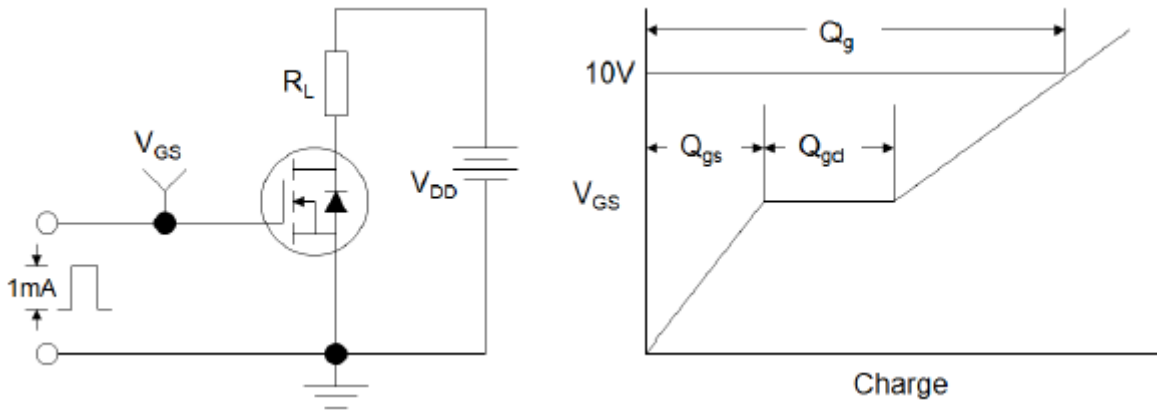


Figure1:Gate Charge Test Circuit & Waveform

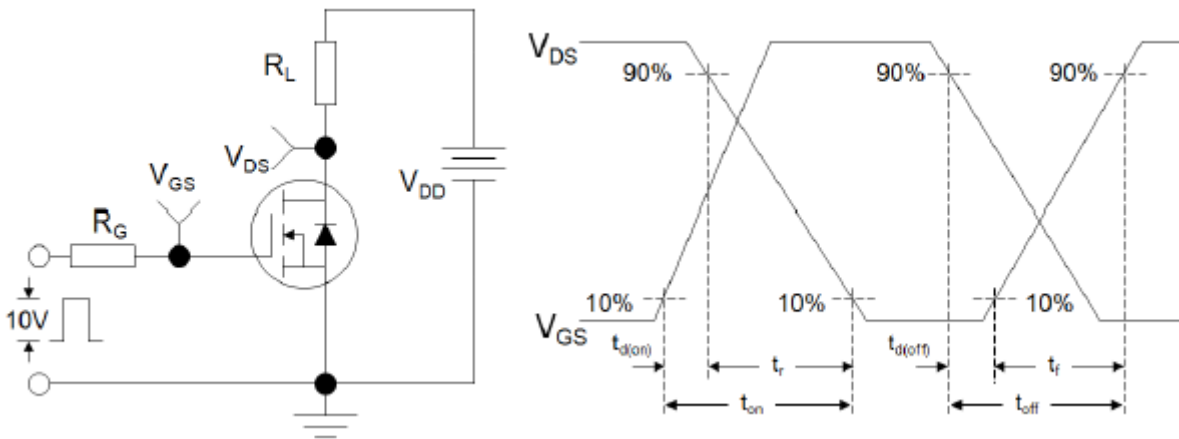


Figure 2: Resistive Switching Test Circuit & Waveforms

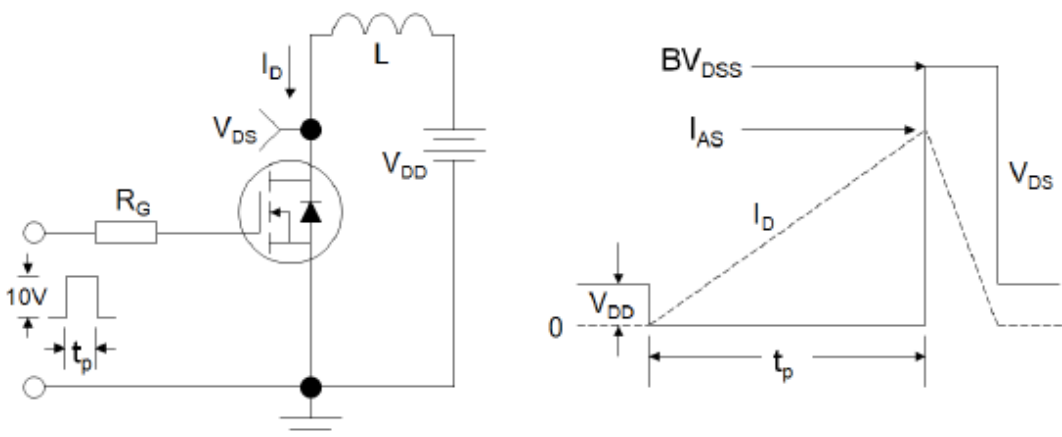


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms

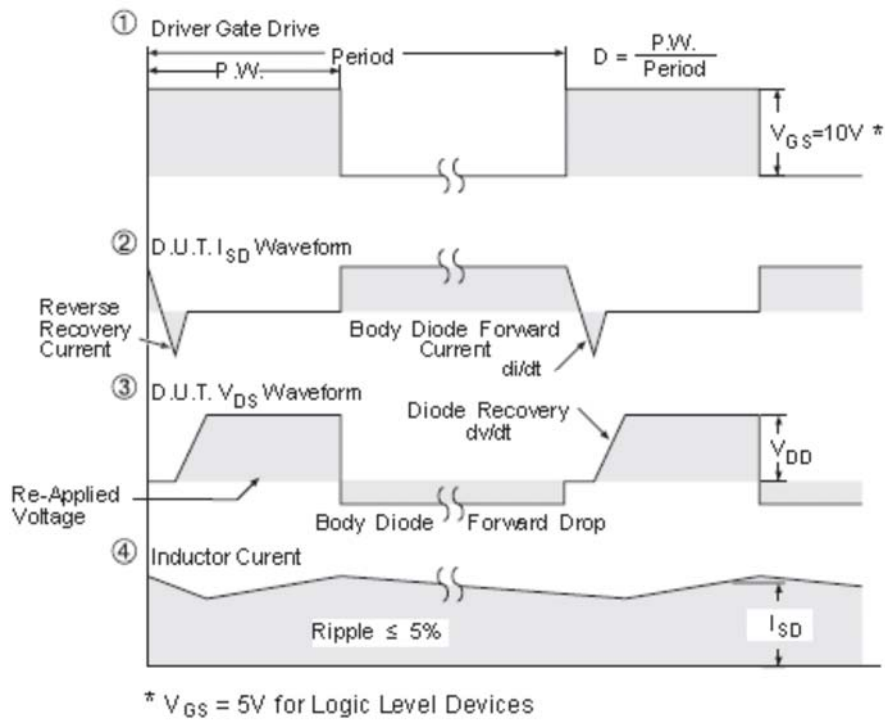
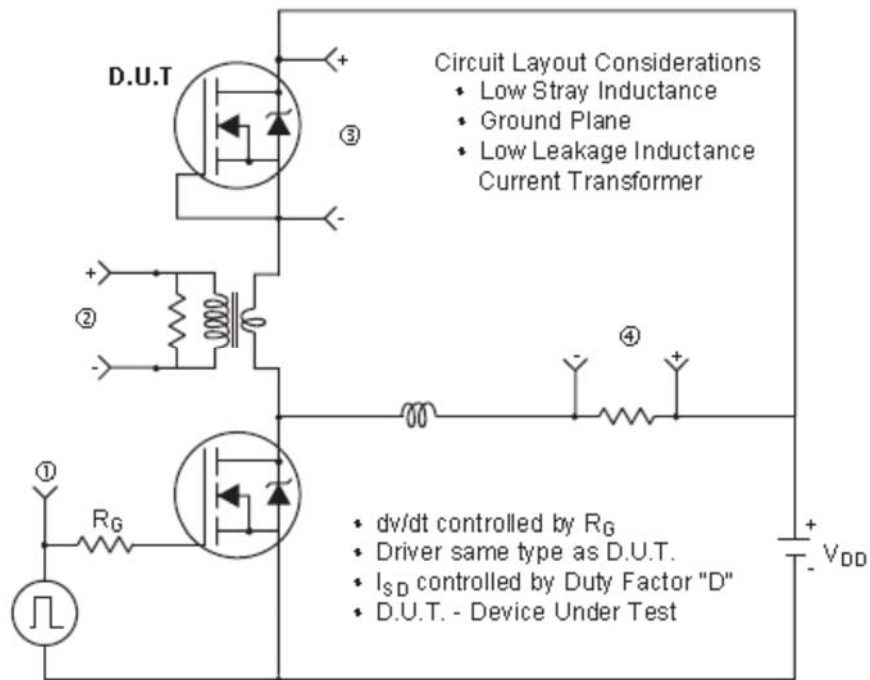
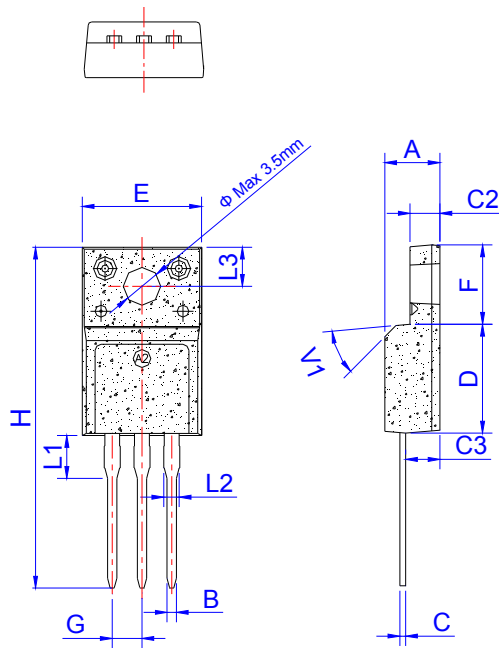


Figure 4: Peak Diode Recovery dv/dt Test Circuit & Waveforms (For N-channel)



## Package Mechanical Data



TO-220F

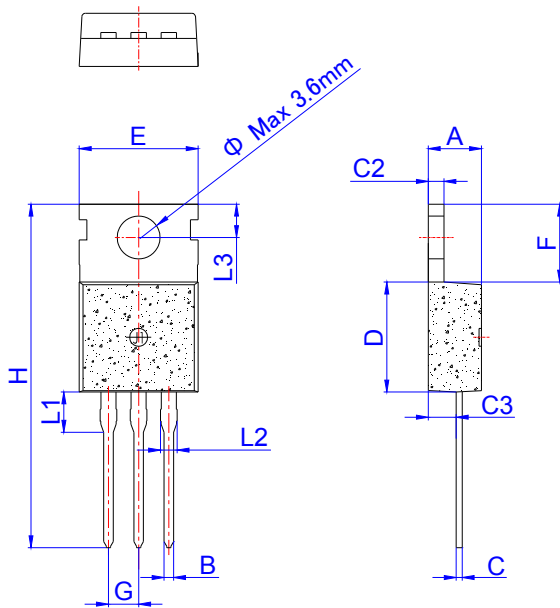
Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.50		4.90	0.177		0.193
B	0.74	0.80	0.83	0.029	0.031	0.033
C	0.47		0.65	0.019		0.026
C2	2.45		2.75	0.096		0.108
C3	2.60		3.00	0.102		0.118
D	8.80		9.30	0.346		0.366
E	9.80		10.4	0.386		0.410
F	6.40		6.80	0.252		0.268
G		2.54			0.1	
H	28.0		29.8	1.102		1.173
L1		3.63			0.143	
L2	1.14		1.70	0.045		0.067
L3		3.30			0.130	
V1		45°			45°	

## Package Information -TO-220F

OUTLINE	TUBE (PCS)	INNER BOX (PCS)	PER CARTON (PCS)
TUBE	50	1,000	8,000



## Package Mechanical Data



TO-220C

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.40		4.60	0.173		1.181
B	0.70		0.90	0.027		0.035
C	0.45		0.60	0.018		0.024
C2	1.23		1.32	0.048		0.052
C3	2.20		2.60	0.086		0.102
D	8.90		9.90	0.350		0.390
E	9.90		10.3	0.390		0.406
F	6.30		6.90	0.248		0.272
G		2.54			0.1	
H	28.0		29.8	11.0		11.7
L1		3.39			0.133	
L2	1.14		1.70	0.045		0.067
L3	2.65		2.95	0.104		0.116
Φ		3.6			0.142	

## Package Information -TO-220C

OUTLINE	TUBE (PCS)	INNER BOX (PCS)	PER CARTON (PCS)
TUBE	50	1,000	8,000

Information furnished in this document is believed to be accurate and reliable. However, Jiangsu JieJie Microelectronics Co.,Ltd assumes no responsibility for the consequences of use without consideration for such information nor use beyond it.

Information mentioned in this document is subject to change without notice, apart from that when an agreement is signed, Jiangsu JieJie complies with the agreement.

Products and information provided in this document have no infringement of patents. Jiangsu JieJie assumes no responsibility for any infringement of other rights of third parties which may result from the use of such products and information.

This document is the first version which is made in 2-July-2018. This document supersedes and replaces all information previously supplied.



is a registered trademark of Jiangsu JieJie Microelectronics Co.,Ltd.

Copyright ©2018 Jiangsu JieJie Microelectronics Co.,Ltd. Printed All rights reserved.