



# JMP(C.E.F)10N65B

## Description

### JMP N-channel MOSFET

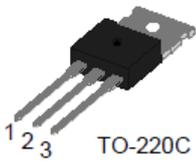
#### Features

- 650V, 10A
- $R_{DS(ON)} = 0.85\Omega$  (Typ.) @  $V_{GS} = 10V, I_D = 5A$
- Fast Switching
- Improved dv/dt Capability
- 100% Avalanche Tested

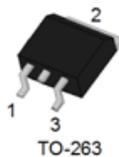
#### Application

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

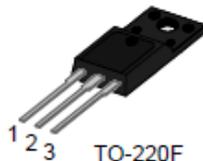
#### Package



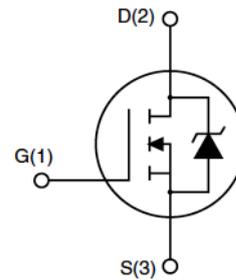
JMPC10N65B



JMPE10N65B



JMPF10N65B



## Absolute Maximum Ratings (T<sub>C</sub>=25°C unless otherwise specified)

Symbol	Parameter	Max.		Units	
		TO-220F	TO-220C/TO-263		
V <sub>DSS</sub>	Drain-Source Voltage	650		V	
V <sub>GSS</sub>	Gate-Source Voltage	±30		V	
I <sub>D</sub>	Continuous Drain Current	T <sub>C</sub> = 25°C	10	A	
		T <sub>C</sub> = 100°C	6.5	A	
I <sub>DM</sub>	Pulsed Drain Current <sup>note1</sup>	40		A	
E <sub>AS</sub>	Single Pulsed Avalanche Energy <sup>note2</sup>	80		mJ	
P <sub>D</sub>	Power Dissipation	T <sub>C</sub> = 25°C	64	160	W
			1.95	0.78	
R <sub>θJC</sub>	Thermal Resistance, Junction to Case	62.5	62.5	°C/W	
R <sub>θJA</sub>	Thermal Resistance, Junction to Ambient	-55 to +150		°C	
T <sub>J</sub> , T <sub>STG</sub>	Operating and Storage Temperature Range				



# JMP(C.E.F)10N65B

## Electrical Characteristics ( $T_C=25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
<b>Off Characteristic</b>						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	650	-	-	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=650V, V_{GS}=0V, T_J=25^\circ\text{C}$	-	-	1	$\mu A$
$I_{GSS}$	Gate to Body Leakage Current	$V_{DS}=0V, V_{GS}=\pm 30V$	-	-	$\pm 100$	nA
<b>On Characteristics</b>						
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	2	-	4	V
$R_{DS(on)}$ <small>note3</small>	Static Drain-Source on-Resistance	$V_{GS}=10V, I_D=5A$	-	0.85	1.0	$\Omega$
<b>Dynamic Characteristics</b>						
$C_{iss}$	Input Capacitance	$V_{DS}=25V, V_{GS}=0V, f=1.0\text{MHz}$	-	1110	-	pF
$C_{oss}$	Output Capacitance		-	129	-	pF
$C_{riss}$	Reverse Transfer Capacitance		-	20	-	pF
$Q_g$	Total Gate Charge	$V_{DD}=520V, I_D=10A, V_{GS}=10V$	-	32	-	nC
$Q_{gs}$	Gate-Source Charge		-	5	-	nC
$Q_{gd}$	Gate-Drain("Miller") Charge		-	16	-	nC
<b>Switching Characteristics</b>						
$t_{d(on)}$	Turn-on Delay Time	$V_{DD}=325V, I_D=10A, R_G=25\Omega$	-	23	-	ns
$t_r$	Turn-on Rise Time		-	15	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	90	-	ns
$t_f$	Turn-off Fall Time		-	30	-	ns
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
$I_S$	Maximum Continuous Drain to Source Diode Forward Current		-	-	10	A
$I_{SM}$	Maximum Pulsed Drain to Source Diode Forward Current		-	-	40	A
$V_{SD}$	Drain to Source Diode Forward Voltage	$V_{GS}=0V, I_{SD}=10A$	-	-	1.4	V
$t_{rr}$	Reverse Recovery Time	$V_{GS}=0V, I_S=10A, di/dt=100A/\mu s$	-	310	-	ns
$Q_{rr}$	Reverse Recovery Charge		-	4.1	-	$\mu C$

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

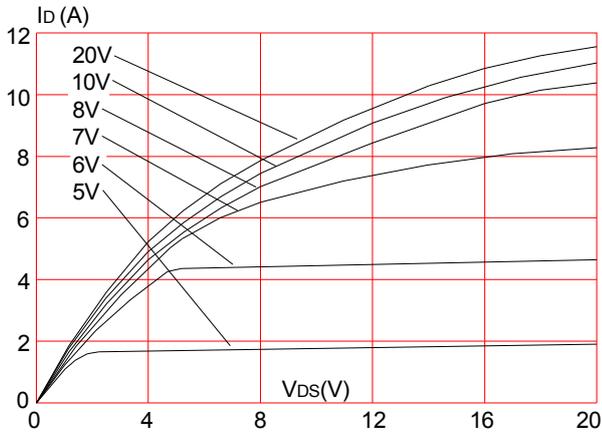
2.  $I_{AS}=6A, V_{DD}=50V, R_G=25\Omega$ , Starting  $T_J=25^\circ\text{C}$

3. Pulse Test: Pulse Width $\leq 325\mu s$ , Duty Cycle $\leq 1\%$

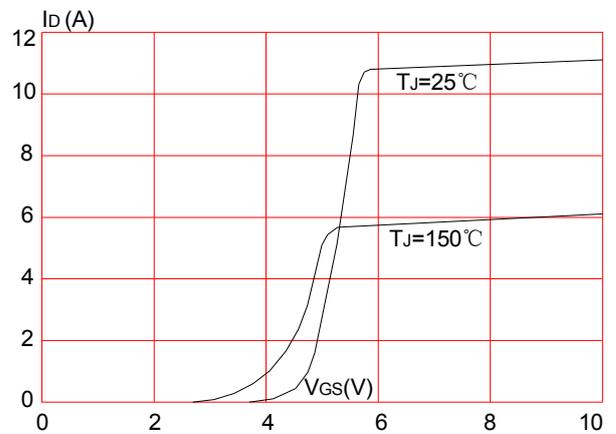


## Typical Performance Characteristics

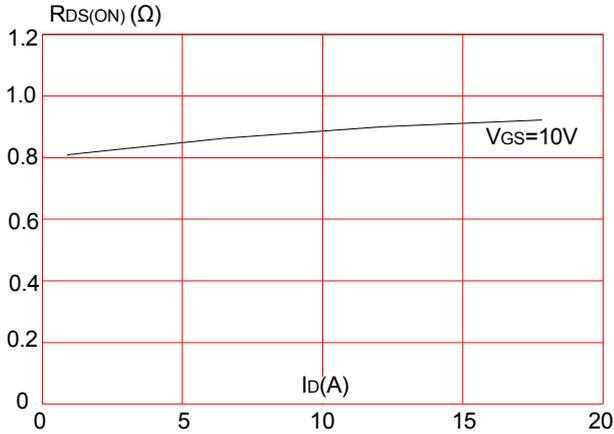
**Figure 1: Output Characteristics**



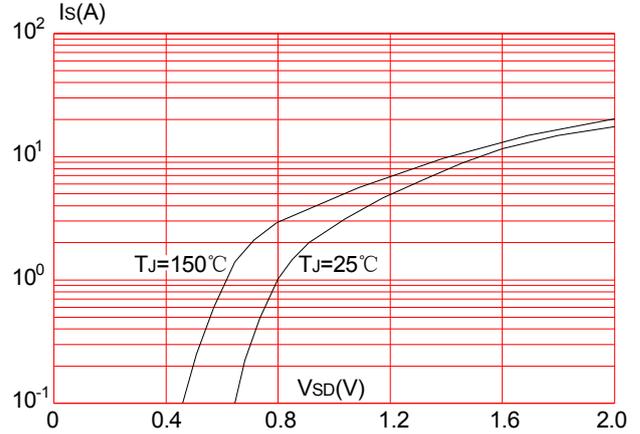
**Figure 2: Typical Transfer Characteristics**



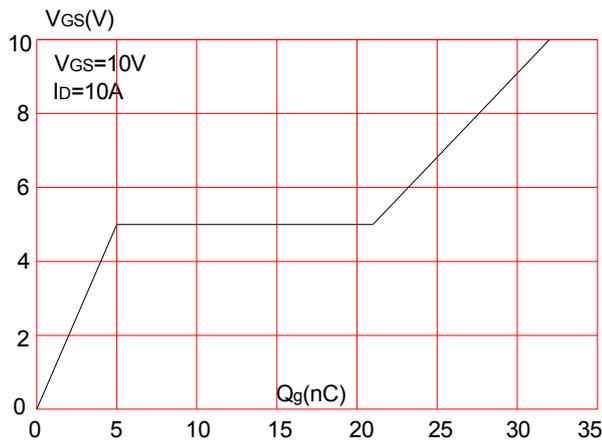
**Figure 3: On-resistance vs. Drain Current**



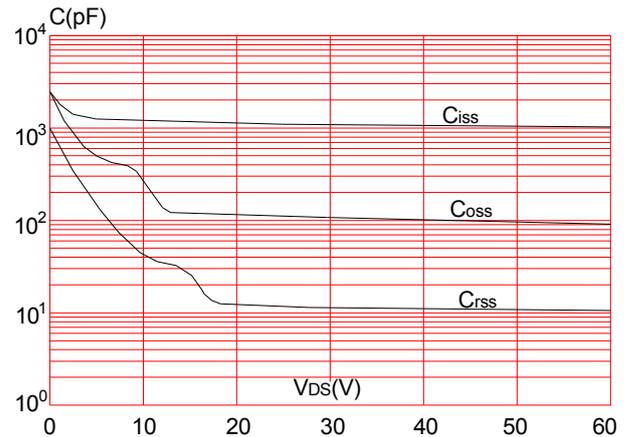
**Figure 4: Body Diode Characteristics**



**Figure 5: Gate Charge Characteristics**



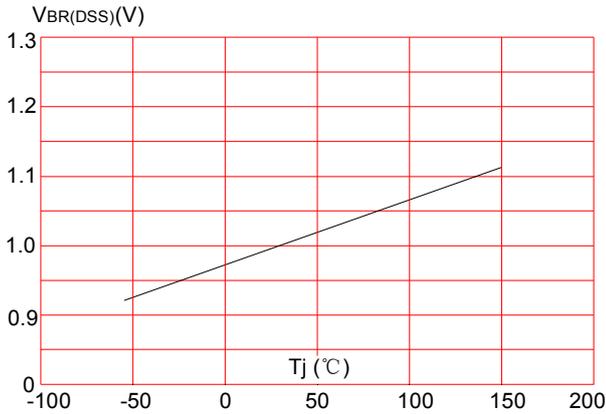
**Figure 6: Capacitance Characteristics**



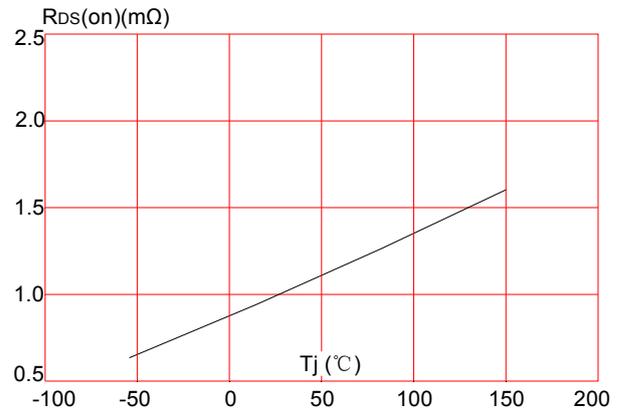


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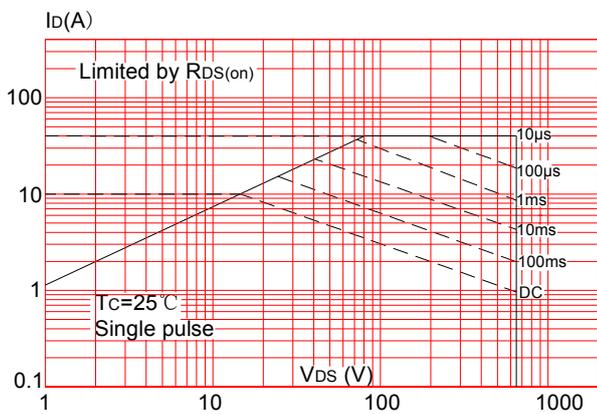
**Figure 7:** Normalized Breakdown Voltage vs. Junction Temperature



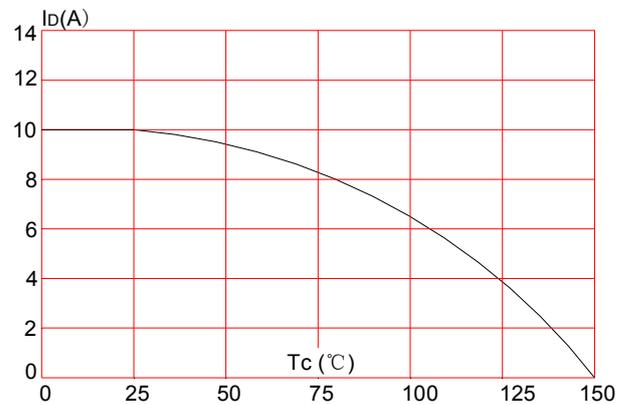
**Figure 8:** Normalized on Resistance vs. Junction Temperature



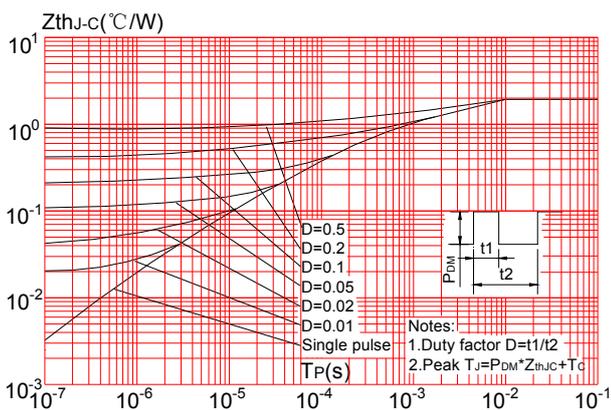
**Figure 9:** Maximum Safe Operating Area



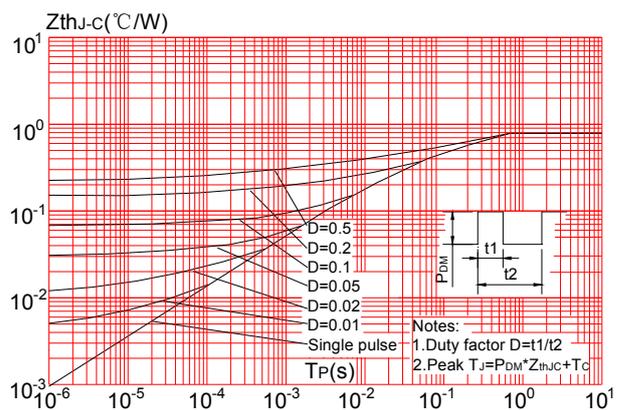
**Figure 10:** Maximum Continuous Drain Current vs. Case Temperature



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



**Figure.12:** Maximum Effective Transient Thermal Impedance, Junction-to-Case (TO-220C, TO-263)



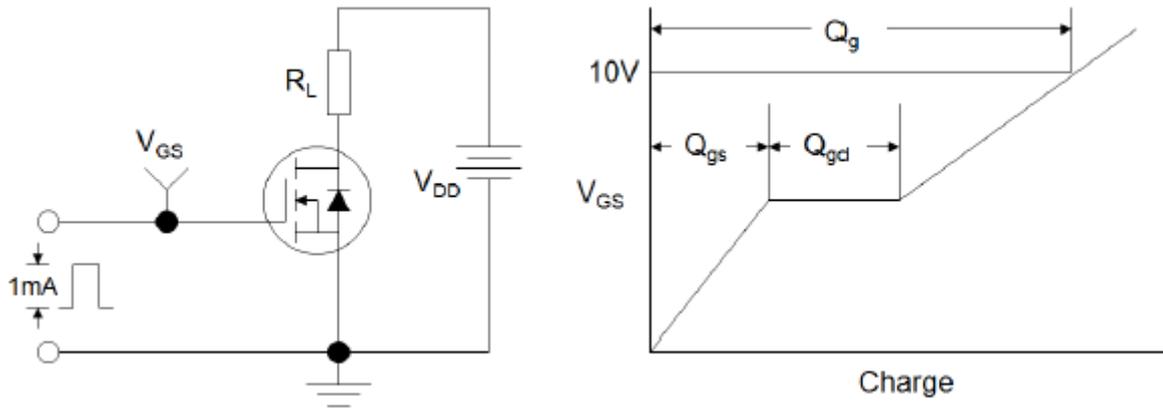


Figure1:Gate Charge Test Circuit & Waveform

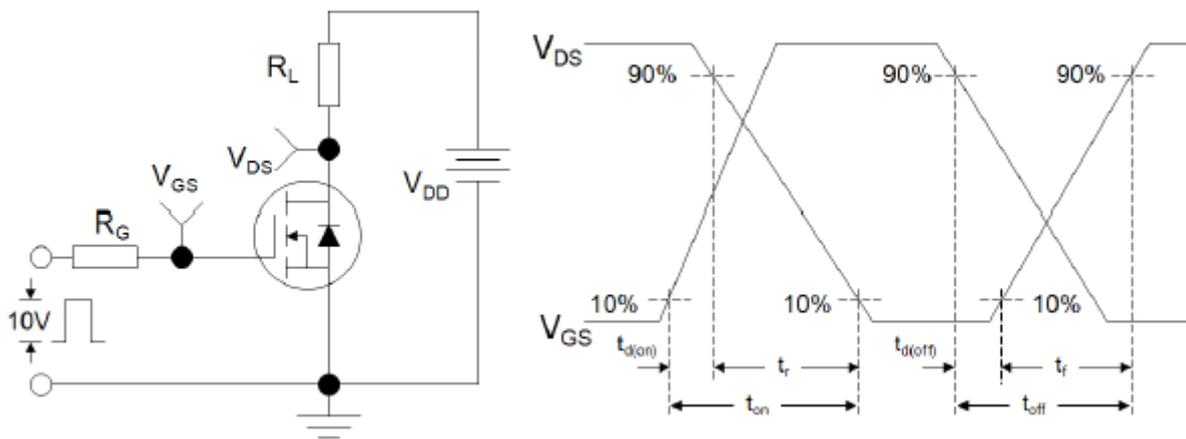


Figure 2: Resistive Switching Test Circuit & Waveforms

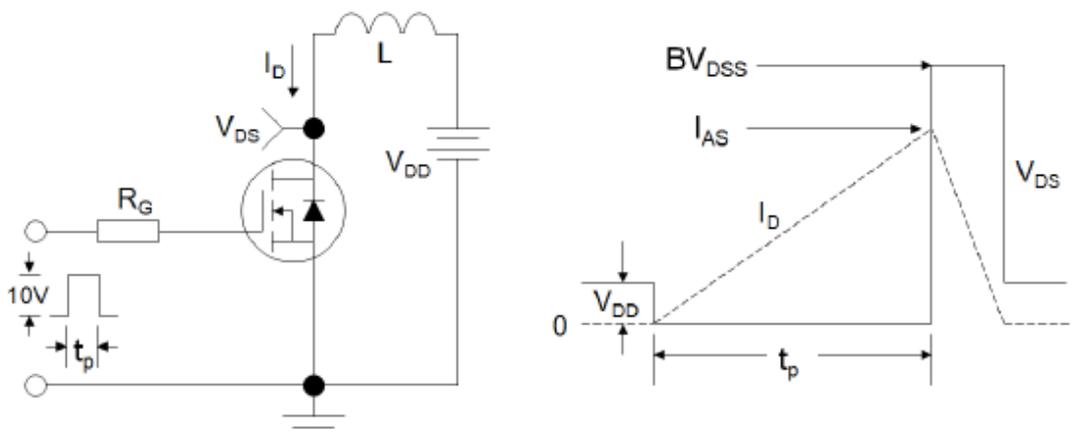


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms

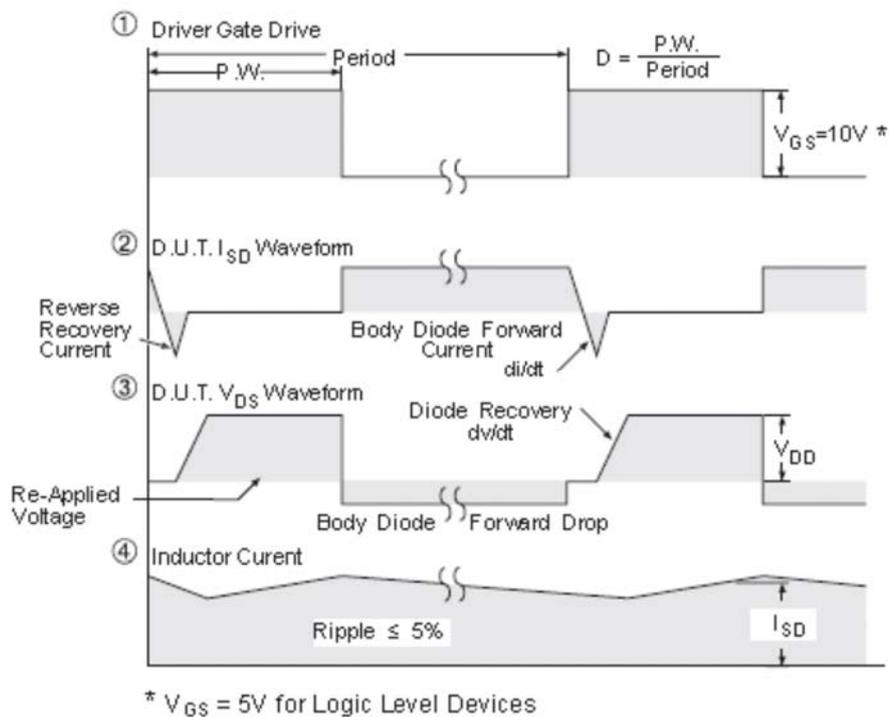
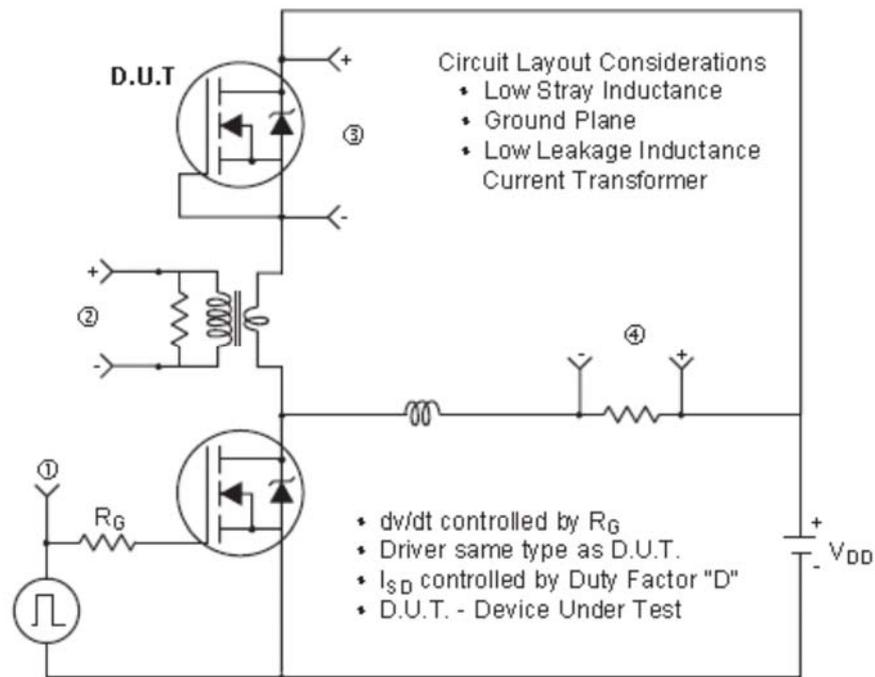
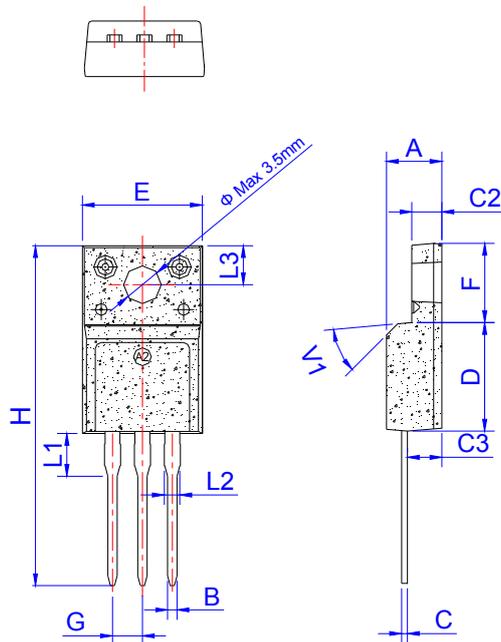


Figure 4: Peak Diode Recovery dv/dt Test Circuit & Waveforms (For N-channel)



## 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°	

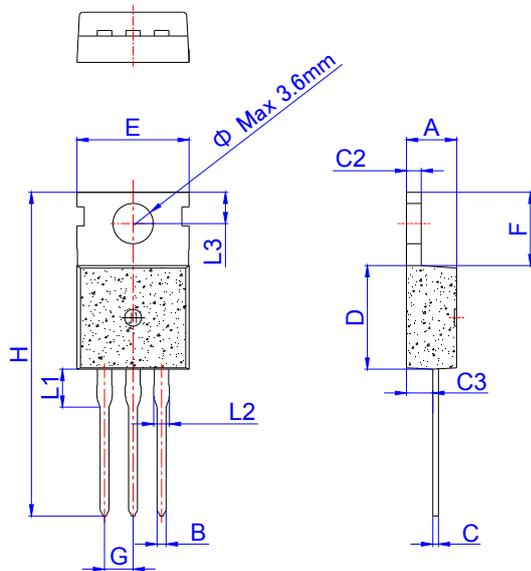
## Package Information -TO-220F

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



# JMP(C.E.F)10N65B

## Package Mechanical Data



TO-220C

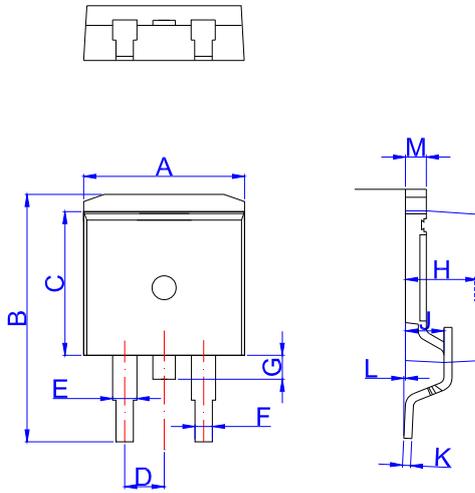
Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.40		4.60	0.173		0.181
B	0.70		0.90	0.028		0.035
C	0.45		0.60	0.018		0.024
C2	1.23		1.32	0.048		0.052
C3	2.20		2.60	0.087		0.102
D	8.90		9.90	0.350		0.390
E	9.90		10.3	0.390		0.406
F	6.30		6.90	0.248		0.272
G		2.54			0.1	
H	28.0		29.8	1.102		1.173
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



## Package Mechanical Data



TO-263

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	9.90		10.20	0.390		0.402
B	14.70		15.80	0.579		0.622
C	9.4		9.6	0.37		0.378
D		2.54			0.100	
E	1.20		1.40	0.047		0.055
F	0.75		0.85	0.029		0.033
G			1.75			0.069
H	4.40		4.70	0.173		0.185
J	2.30		2.70	0.091		0.106
K	0.38		0.55	0.015		0.022
L	0	0.10	0.25	0	0.004	0.010
M	1.25		1.35	0.049		0.053

## Package Information -TO-263

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

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