

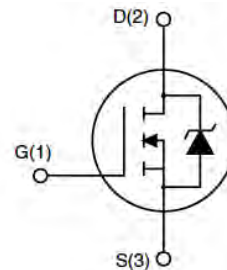
### Features

- 1200V, 6A
- $R_{DS(ON)} = 1.2\Omega$  (Typ.) @  $V_{GS} = 10V, I_D = 3A$
- Fast Switching
- 100% Avalanche Tested
- Improved dv/dt Capability

### Application

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

### Package



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

Symbol	Parameter	Max.			Units		
		TO-220C	TO-220F	TO-247			
V <sub>DSS</sub>	Drain-Source Voltage	1200			V		
V <sub>GSS</sub>	Gate-Source Voltage	±30			V		
I <sub>D</sub>	Continuous Drain Current	T <sub>C</sub> = 25°C		6	A		
		T <sub>C</sub> = 100°C		4	A		
I <sub>DM</sub>	Pulsed Drain Current <sup>note1</sup>	24			A		
E <sub>AS</sub>	Single Pulsed Avalanche Energy <sup>note2</sup>	562			mJ		
P <sub>D</sub>	Power Dissipation	T <sub>C</sub> = 25°C		100	65	130.2	W
R <sub>θJC</sub>	Thermal Resistance, Junction to Case	1.25	1.92	0.96	°C/W		
R <sub>θJA</sub>	Thermal Resistance, Junction to Ambient	62.5	62.5	60	°C/W		
T <sub>J</sub> , T <sub>STG</sub>	Operating and Storage Temperature Range	-55 to +150			°C		



**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	$V_{GS} = 0V, I_D = 250\mu A$	1200	-	-	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS} = 1200V,$ $V_{GS} = 0V, T_J = 25^{\circ}\text{C}$	-	-	1	$\mu A$
		$V_{DS} = 1200V,$ $V_{GS} = 0V, T_J = 125^{\circ}\text{C}$			100	
$I_{GSS}$	Gate to Body Leakage Current	$V_{GS} = \pm 30V$	-	-	$\pm 100$	nA
<b>On Characteristics</b>						
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu A$	3.0	3.5	4.0	V
$R_{DS(on)}$	Static Drain-Source On-Resistance	$V_{GS} = 10V, I_D = 3A$	-	1.2	1.5	$\Omega$
<b>Dynamic Characteristics</b>						
$C_{iss}$	Input Capacitance	$V_{DS} = 25V, V_{GS} = 0V,$ $f = 1.0\text{MHz}$	-	1979	-	pF
$C_{oss}$	Output Capacitance		-	233	-	pF
$C_{rss}$	Reverse Transfer Capacitance		-	53	-	pF
$Q_g$	Total Gate Charge	$V_{DD} = 1200V, I_D = 6A,$ $V_{GS} = 10V$	-	80	-	nC
$Q_{gs}$	Gate-Source Charge		-	9	-	nC
$Q_{gd}$	Gate-Drain("Miller") Charge		-	39	-	nC
<b>Switching Characteristics</b>						
$t_{d(on)}$	Turn-On Delay Time	$V_{DD} = 500V, I_D = 6A,$ $R_G = 25\Omega$	-	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		-	-	6	A
$I_{SM}$	Maximum Pulsed Drain to Source Diode Forward Current		-	-	24	A
$V_{SD}$	Drain to Source Diode Forward Voltage	$V_{GS} = 0V, I_{SD} = 6A,$ $T_J = 25^{\circ}\text{C}$	-	-	1.4	V
$t_{rr}$	Reverse Recovery Time	$V_{GS} = 0V, I_S = 6A,$ $di/dt = 100A/\mu s$	-	320	-	ns
$Q_{rr}$	Reverse Recovery Charge		-	4.2	-	$\mu C$

Typical Performance Characteristics

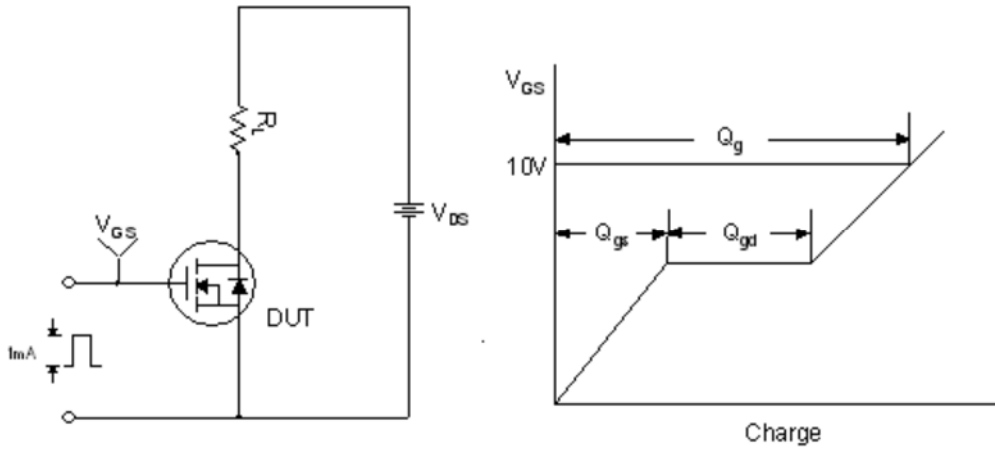


Figure 1. Gate Charge Test Circuit & Waveform

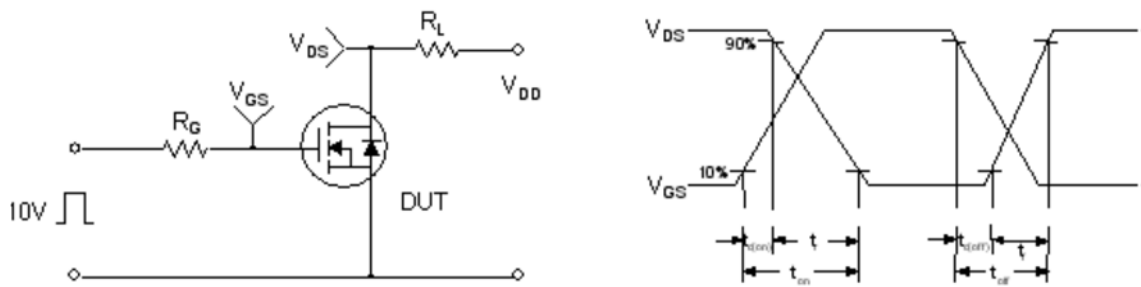


Figure 2. Resistive Switching Test Circuit & Waveforms

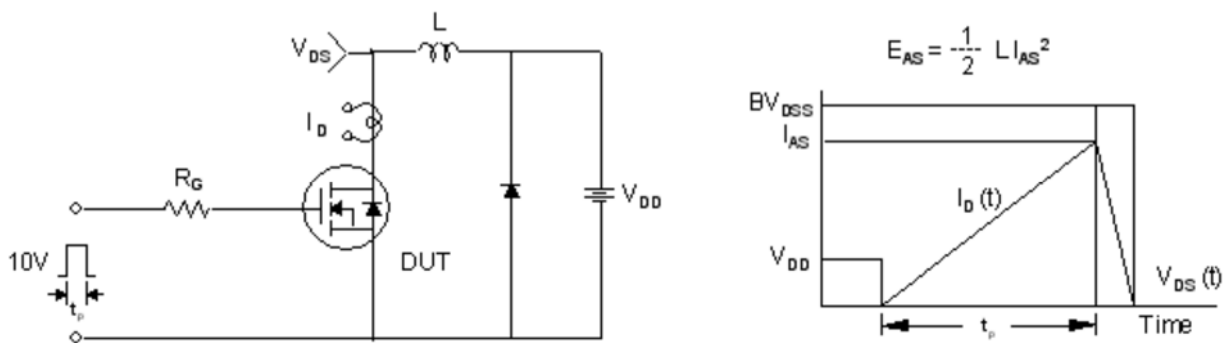


Figure 3. Unclamped Inductive Switching Test Circuit & Waveforms

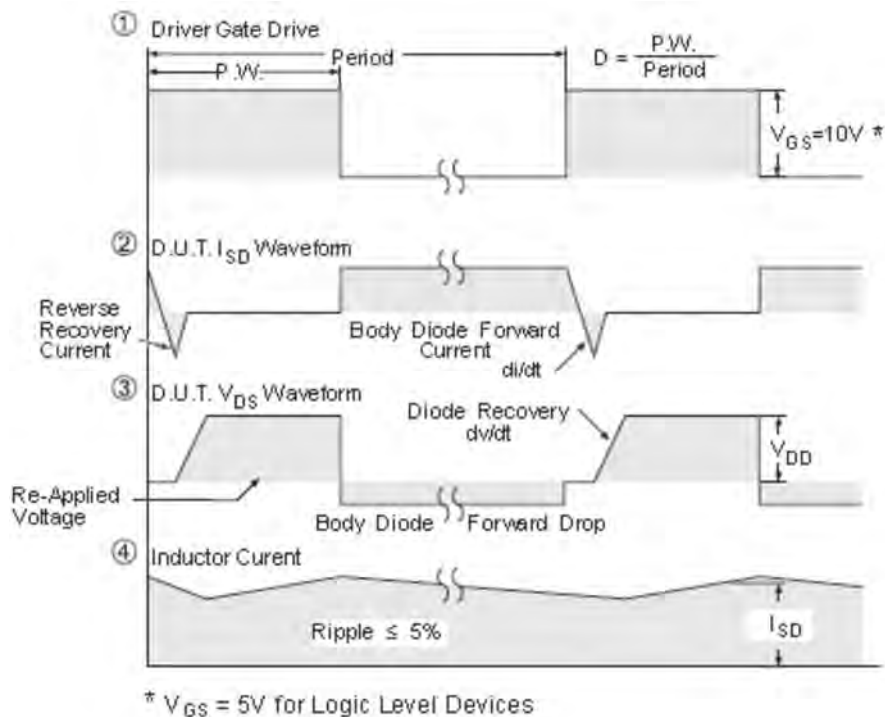
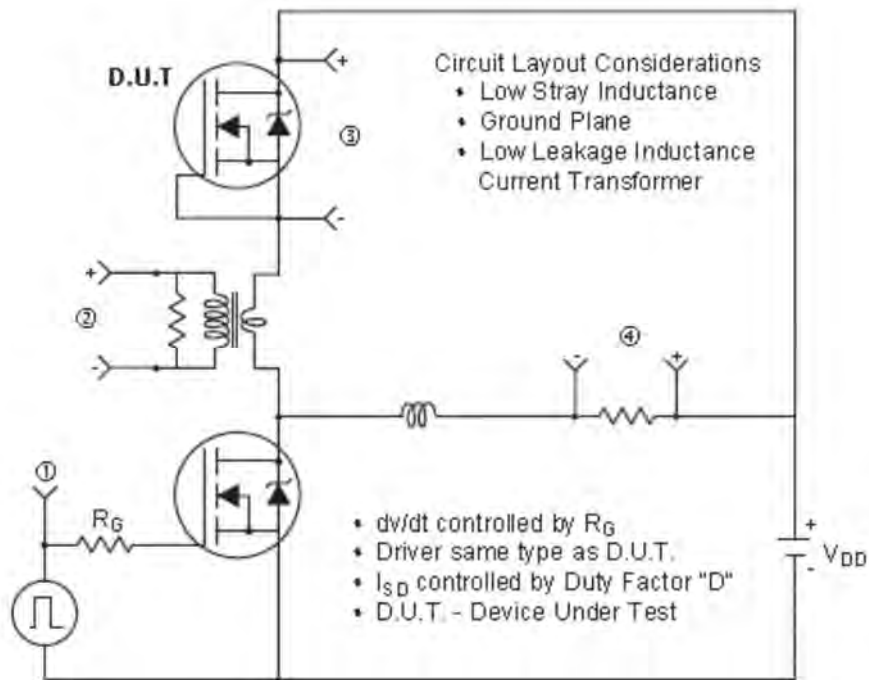
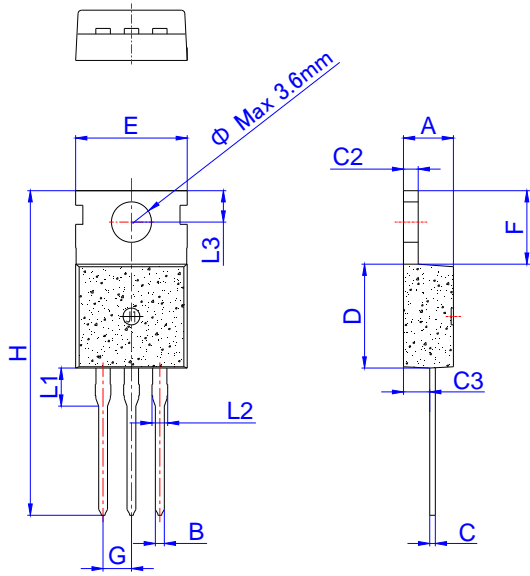


Figure 4. Peak Diode Recovery  $dv/dt$  Test Circuit & Waveforms (For N-channel)

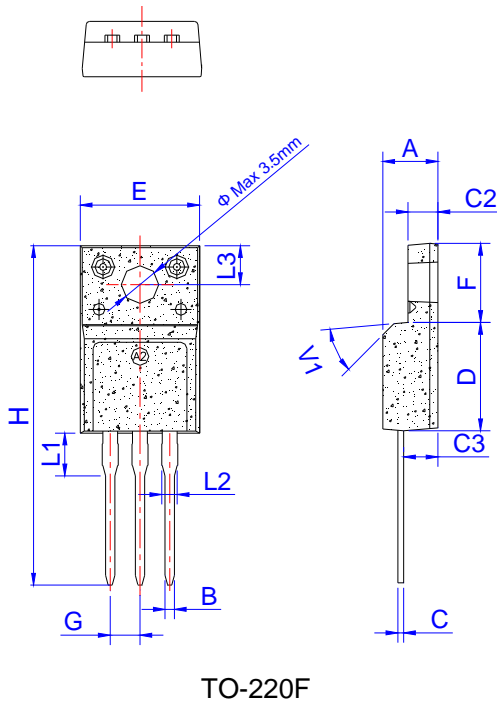
Package Mechanical Data



TO-220C

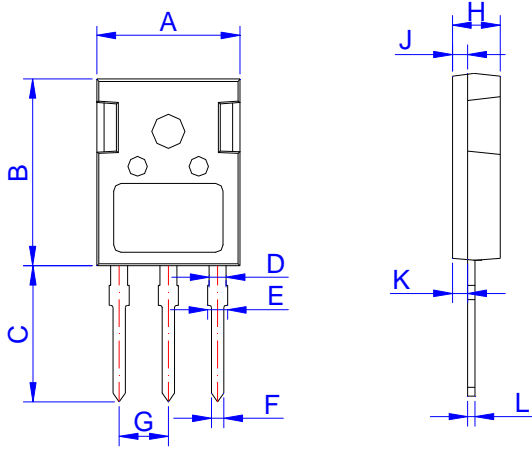
Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.40		4.60	0.173		0.181
B	0.70		0.90	0.028		0.035
C	0.45		0.60	0.018		0.024
C2	1.23		1.32	0.048		0.052
C3	2.20		2.60	0.087		0.102
D	8.90		9.90	0.350		0.390
E	9.90		10.3	0.390		0.406
F	6.30		6.90	0.248		0.272
G		2.54			0.1	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



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 Mechanical Data



TO-247

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	15.50	15.80	16.10	0.610	0.622	0.634
B	20.80	21.00	22.20	0.819	0.828	0.874
C	19.70	20.00	20.30	0.776	0.787	0.799
D	1.80	2.00	2.20	0.071	0.079	0.087
E	1.90	2.10	2.30	0.075	0.083	0.091
F	1.00	1.20	1.40	0.039	0.047	0.055
G		5.44			0.214	
H	4.80	5.00	5.20	0.189	0.197	0.205
J	1.90	2.00	2.10	0.075	0.079	0.083
K	2.20	2.35	2.50	0.087	0.093	0.098
L	0.41	0.60	0.79	0.016	0.024	0.031