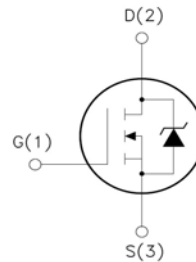
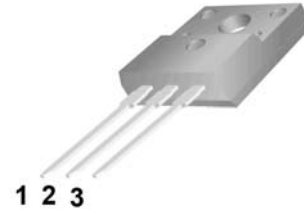


### Features

- Low Intrinsic Capacitance.
- Excellent Switching Characteristics.
- Extended Safe Operating Area.
- Unrivalled Gate Charge :Qg=34nC (Typ.).
- VDSS= 800V,Id=7A
- RDS(on) : 1.8Ω (Max) @VG=10V
- 100% Avalanche Tested

### Package

TO-220F



- 1. Gate (G)
- 2. Drain (D)
- 3. Source (S)

### Absolute Maximum Ratings (Ta=25°C unless otherwise noted)

Symbol	Parameter	Value	Unit
V <sub>DSS</sub>	Drain-Source Voltage	800	V
I <sub>D</sub>	Drain Current	T <sub>j</sub> =25°C	7.0
		T <sub>j</sub> =100°C	4.4
V <sub>GSS</sub>	Gate - Source voltage	±30	V
E <sub>AS</sub>	Single Pulse Avalanche Energy (note1)	150	mJ
I <sub>AR</sub>	Avalanche Current (note2)	7.0	A
P <sub>D</sub>	Power Dissipation (T <sub>j</sub> =25°C)	48	W
T <sub>j</sub>	Junction Temperature(Max)	150	°C
T <sub>stg</sub>	Storage Temperature	-55~+150	°C
TL	Maximum lead temperature for soldering purpose, 1/8" from case for 5 seconds	300	°C

### Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
R <sub>θJC</sub>	Thermal Resistance, Junction to Case	-	2.6	°C/W
R <sub>θJA</sub>	Thermal Resistance, Junction to Ambient	-	62.5	°C/W



**Electrical Characteristics (Ta=25°C unless otherwise noted)**

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
<b>Off Characteristics</b>						
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	I <sub>b</sub> =250μA, V <sub>GS</sub> =0	800	-	-	V
ΔBV <sub>DSS</sub> /ΔT <sub>J</sub>	Breakdown Voltage Temperature Coefficient	I <sub>b</sub> =250μA, Reference to 25°C	-	0.67	-	V/°C
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =800V, V <sub>GS</sub> =0V	-	-	10	μA
		V <sub>DS</sub> =640V, T <sub>j</sub> =125°C	-	-	100	
I <sub>GSSF</sub>	Gate-body leakage Current, Forward	V <sub>GS</sub> =+30V, V <sub>DS</sub> =0V	-	-	100	nA
I <sub>GSSR</sub>	Gate-body leakage Current, Reverse	V <sub>GS</sub> =-30V, V <sub>DS</sub> =0V	-	-	-100	
<b>On Characteristics</b>						
V <sub>GS(TH)</sub>	Gate Threshold Voltage	I <sub>b</sub> =250μA, V <sub>DS</sub> =V <sub>GS</sub>	2	-	4	V
R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance	I <sub>b</sub> =3.5A, V <sub>GS</sub> =10V	-	1.5	1.8	Ω
<b>Dynamic Characteristics</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =25V, V <sub>GS</sub> =0, f=1.0MHz	-	1350	-	pF
C <sub>oss</sub>	Output Capacitance		-	115	-	
C <sub>rss</sub>	Reverse Transfer Capacitance		-	12	-	
<b>Switching Characteristics</b>						
T <sub>d(on)</sub>	Turn-On Delay Time	V <sub>DD</sub> =400V, I <sub>D</sub> =7A, R <sub>G</sub> =12Ω	-	15	-	ns
T <sub>r</sub>	Turn-On Rise Time		-	25	-	
T <sub>d(off)</sub>	Turn-Off Delay Time		-	51	-	
T <sub>f</sub>	Turn-Off Rise Time		-	31	-	
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =400V, V <sub>GS</sub> =10V, I <sub>b</sub> =7A	-	34	-	nC
Q <sub>gs</sub>	Gate-Source Charge		-	6.0	-	
Q <sub>gd</sub>	Gate-Drain Charge		-	14	-	
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
I <sub>S</sub>	Max. Diode Forward Current	-	-	-	7	A
I <sub>SM</sub>	Max. Pulsed Forward Current	-	-	-	28	
V <sub>SD</sub>	Diode Forward Voltage	I <sub>b</sub> =7A	-	-	1.5	V
T <sub>rr</sub>	Reverse Recovery Time	I <sub>S</sub> =7A, V <sub>GS</sub> =0V, diF/dt=100A/μs (Note3)	-	186	-	nS
Q <sub>rr</sub>	Reverse Recovery Charge		-	878	-	μC

- Notes : 1, L=25.0mH, I<sub>AS</sub>=7A, V<sub>DD</sub>=50V, R<sub>G</sub>=25Ω, Starting T<sub>J</sub> =25°C  
 2, Repetitive Rating : Pulse width limited by maximum junction temperature  
 3, Pulse Test : Pulse Width ≤ 300μs, Duty Cycle ≤ 2%  
 4, Essentially Independent of Operating Temperature

**Typical Characteristics**

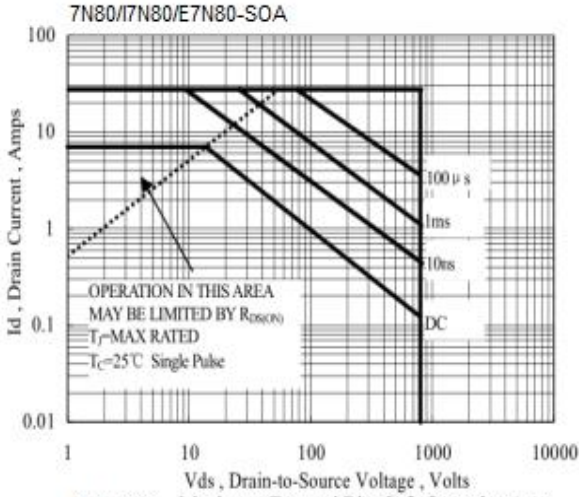


Figure 1a Maximum Forward Bias Safe Operating Area

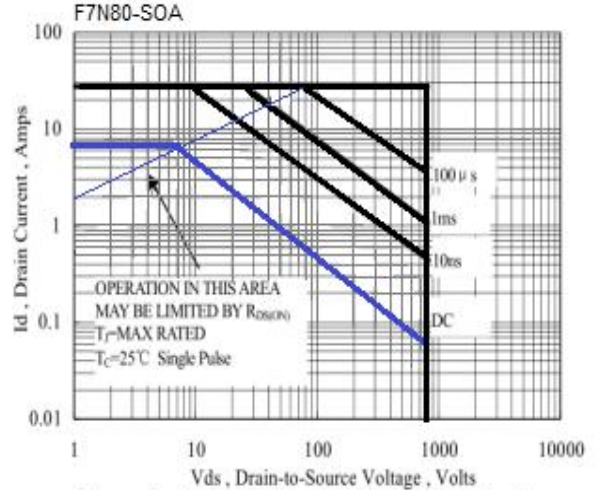


Figure 1b Maximum Forward Bias Safe Operating Area

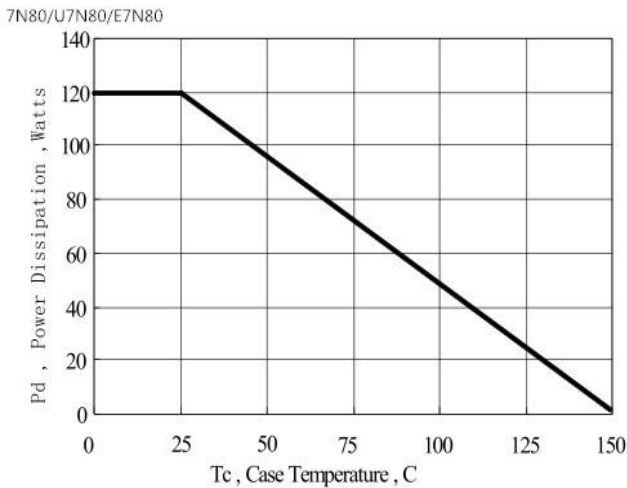


Figure.2(a) Maximum Power Dissipation VS Case Temperature

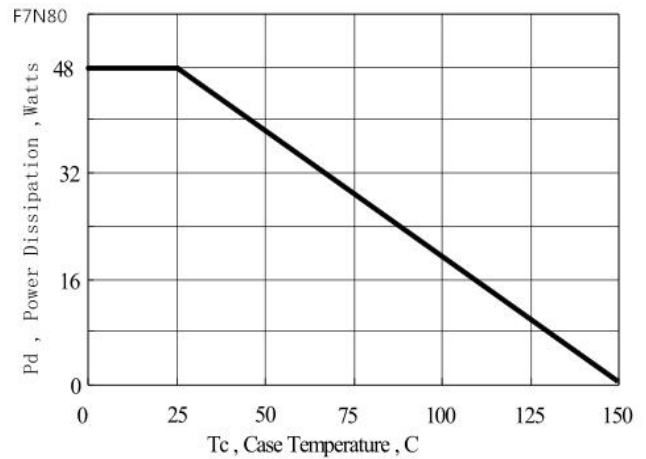


Figure.2(b) Maximum Power Dissipation VS Case Temperature

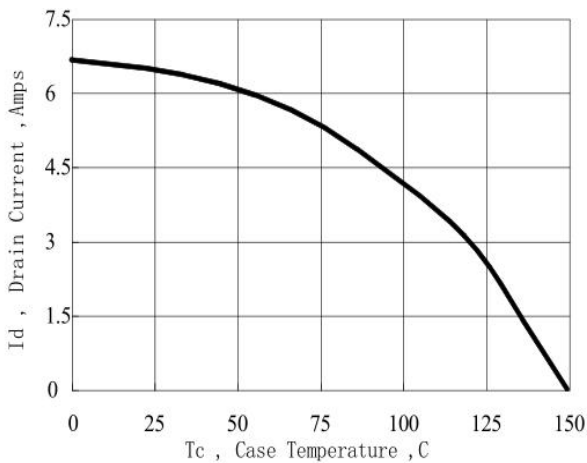


Figure 3 Maximum Continuous Drain Current vs Case Temperature

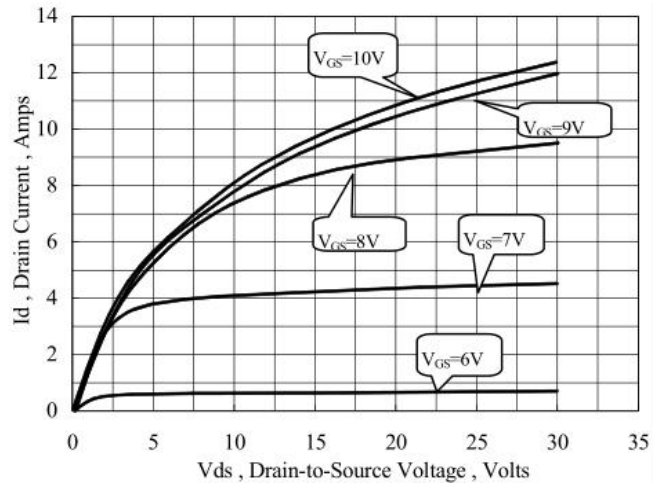


Figure 4 Typical Output Characteristics

Typical Characteristics (Continued)

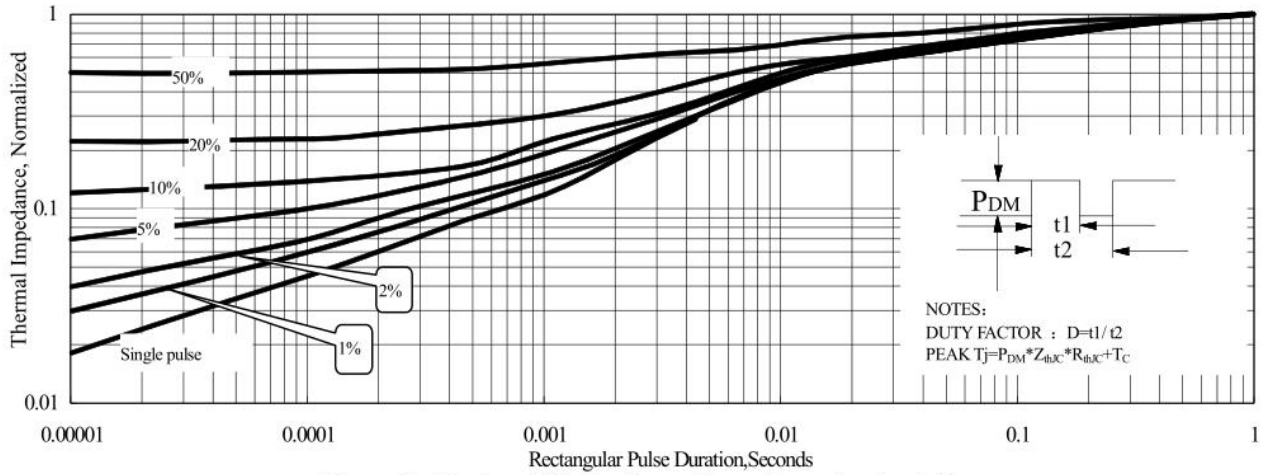


Figure 5 Maximum Effective Thermal Impedance , Junction to Case

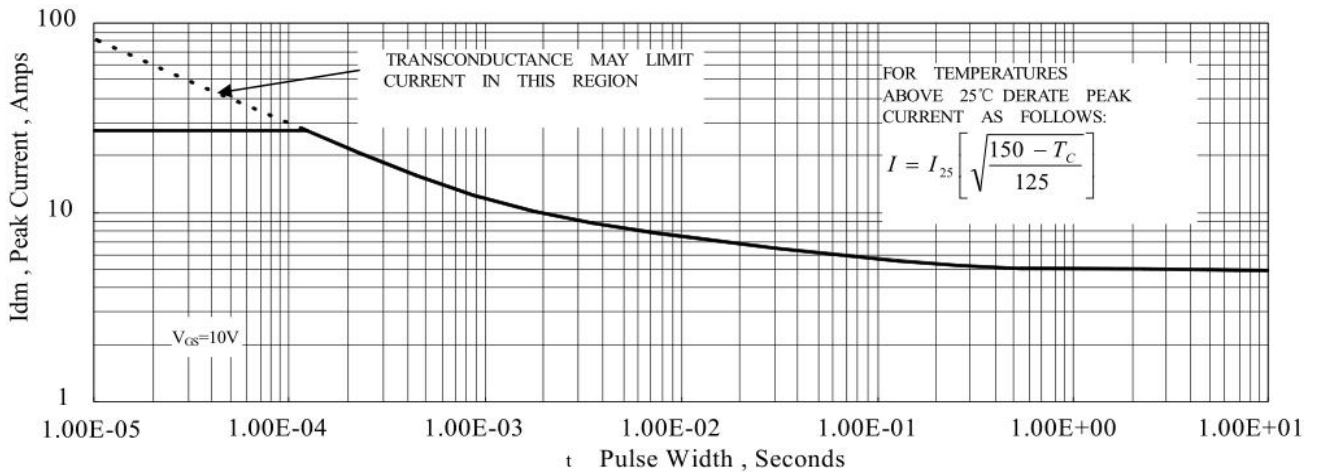


Figure 6 Maximum Peak Current Capability

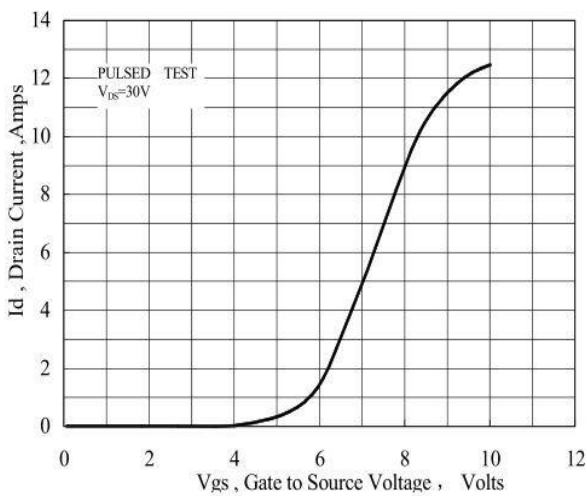


Figure 7 Typical Transfer Characteristics

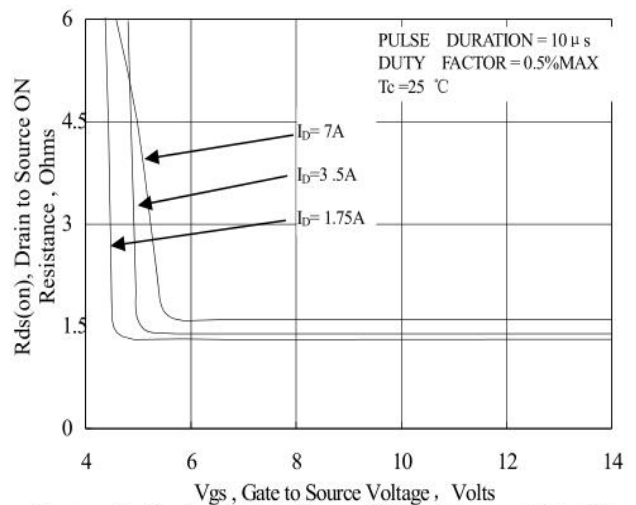
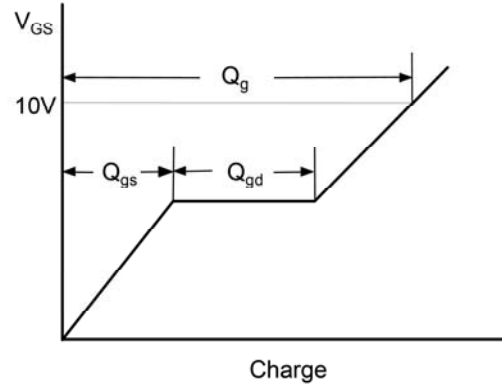
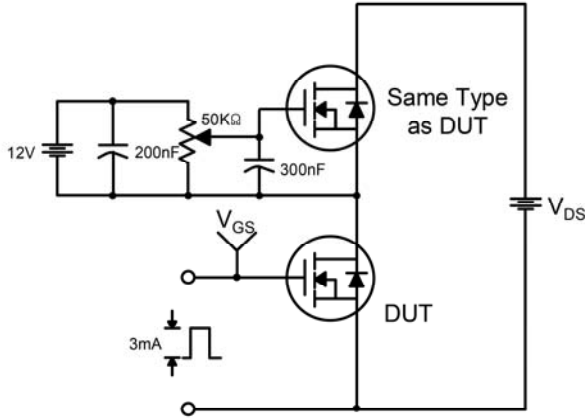
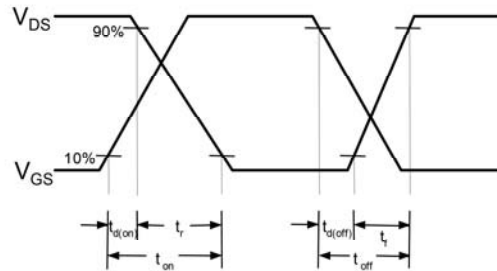
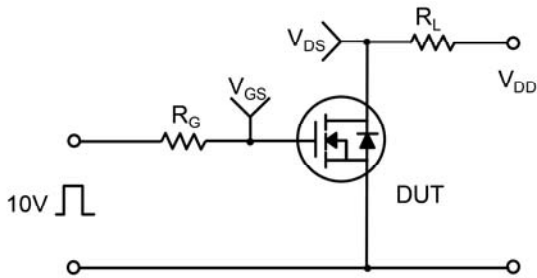


Figure 8 Typical Drain to Source ON Resistance vs Gate Voltage and Drain Current

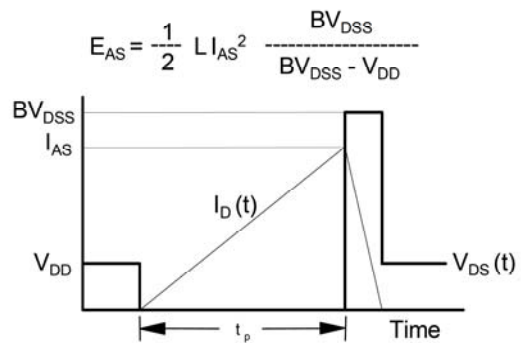
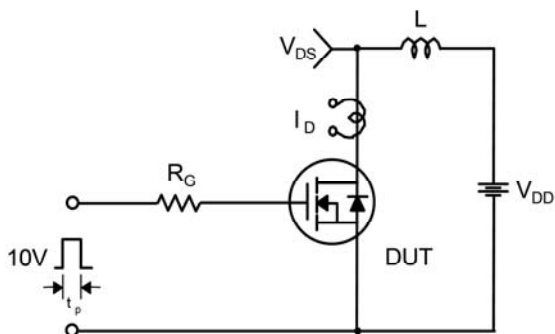
### Gate Charge Test Circuit & Waveform



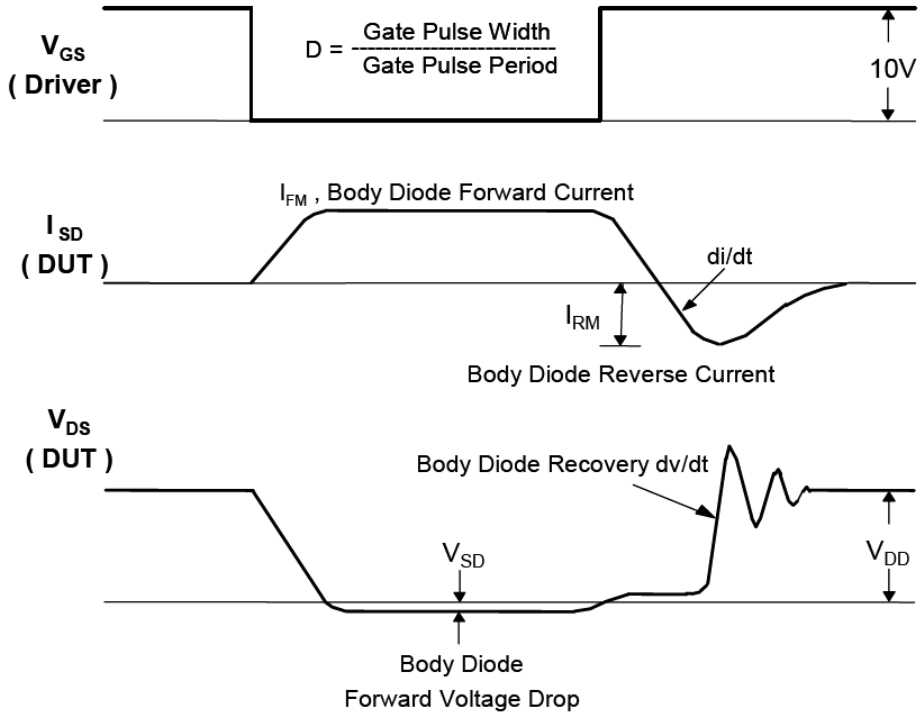
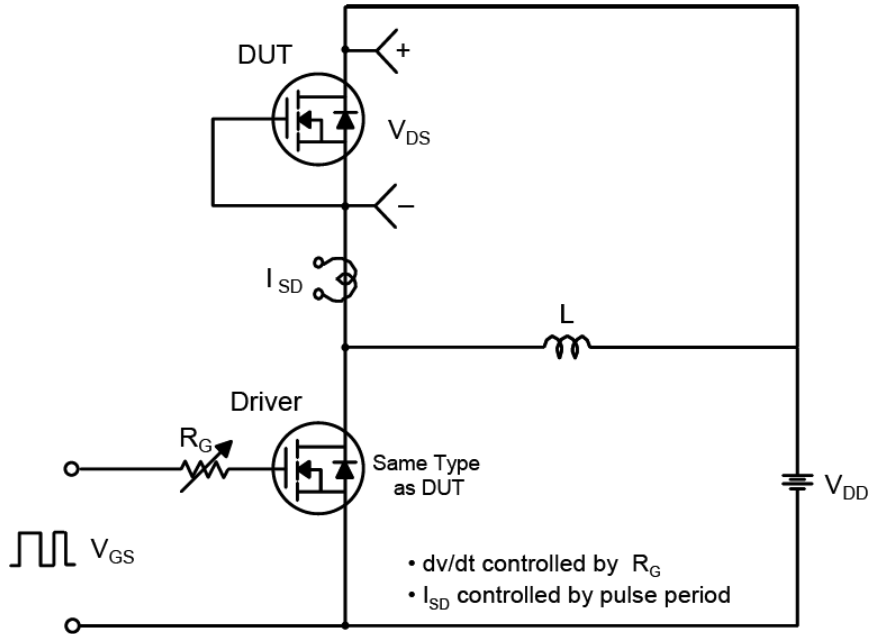
### Resistive Switching Test Circuit & Waveforms



### Unclamped Inductive Switching Test Circuit & Waveforms



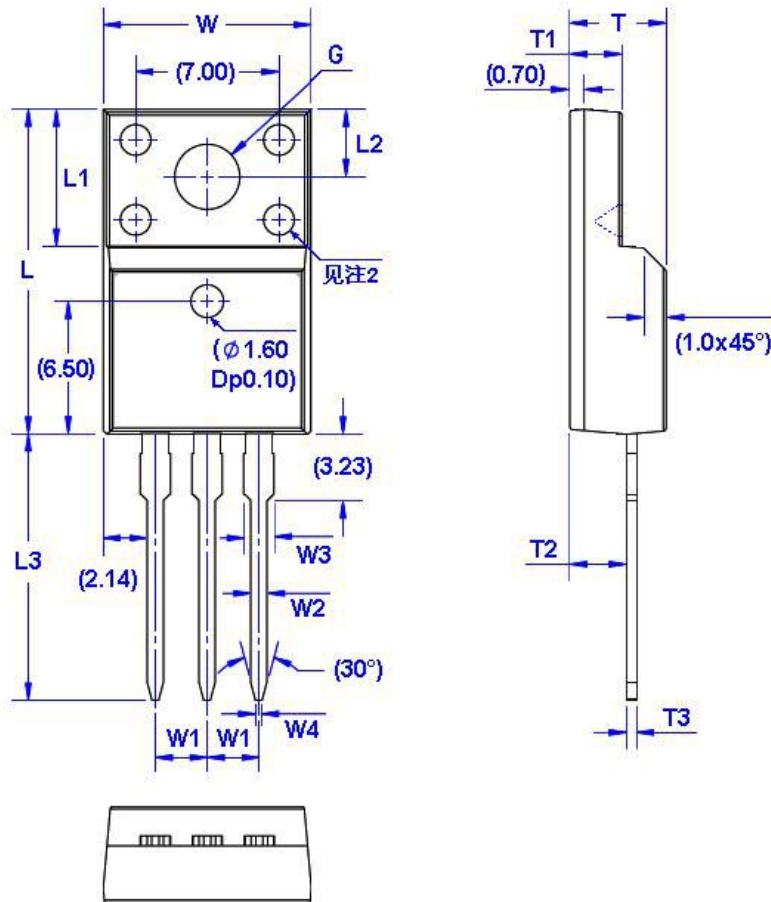
### Peak Diode Recovery dv/dt Test Circuit & Waveform



Package Dimension

TO-220F

Unit: mm



Symbol	Size		Symbol	Size		Symbol	Size		Symbol	Size	
	Min	Max		Min	Max		Min	Max		Min	Max
W	9.96	10.36	W4	0.25	0.45	L3	12.78	13.18	T3	0.45	0.60
W1	2.54 (TYP)		L	15.67	16.07	T	4.50	4.90	G(Φ)	3.08	3.28
W2	0.70	0.90	L1	6.48	6.88	T1	2.34	2.74			
W3	1.24	1.47	L2	3.20	3.40	T2	2.56	2.96			