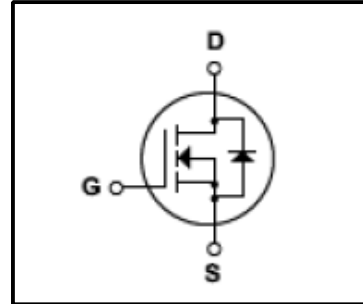
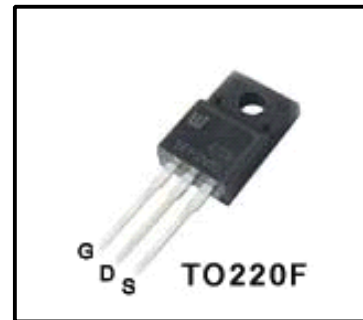


**Silicon N-Channel MOSFET**
**Features**

- 10A,600V, $R_{DS(on)}$ (Max 0.75 $\Omega$ )@ $V_{GS}=10V$
- Ultra-low Gate Charge(Typical 34nC)
- Fast Switching Capability
- 100%Avalanche Tested
- Isolation Voltage( $V_{ISO}=4000V$  AC)
- Improved dv/dt capability


**General Description**

This Power MOSFET is produced using Winsemi's advanced planar stripe,VDMOS technology. This latest technology has been especially designed to minimize on-state resistance,have a high rugged avalanche characteristics. This devices is specially well suited for high efficiency switch mode power supplies , power factor correction, UPS and a electronic lamp ballast base on half bridge.


**Absolute Maximum Ratings**

Symbol	Parameter	Value	Units
$V_{DSS}$	Drain Source Voltage	600	V
$I_D$	Continuous Drain Current(@ $T_c=25^\circ C$ )	10*	A
	Continuous Drain Current(@ $T_c=100^\circ C$ )	6.0*	A
$I_{DM}$	Drain Current Pulsed (Note1)	40*	A
$V_{GS}$	Gate to Source Voltage	$\pm 30$	V
$E_{AS}$	Single Pulsed Avalanche Energy (Note2)	713	mJ
$E_{AR}$	Repetitive Avalanche Energy (Note1)	18	mJ
dv/dt	Peak Diode Recovery dv /dt (Note3)	4.5	V/ ns
$P_D$	Total Power Dissipation(@ $T_c=25^\circ C$ )	50	W
	Derating Factor above 25 $^\circ C$	0.4	W/ $^\circ C$
$T_J, T_{stg}$	Junction and Storage Temperature	-55~150	$^\circ C$
$T_L$	Channel Temperature	300	$^\circ C$

\*Drain current limited by maximum junction temperature

**Thermal Characteristics**

Symbol	Parameter	Value			Units
		Min	Typ	Max	
$R_{QJC}$	Thermal Resistance , Junction -to -Case	-	-	2.5	$^\circ C/W$
$R_{QJA}$	Thermal Resistance , Junction-to -Ambient	-	-	62.5	$^\circ C/W$

## Electrical Characteristics(Tc=25°C)

Characteristics	Symbol	Test Condition	Min	Type	Max	Unit	
Gate leakage current	I <sub>GSS</sub>	V <sub>GS</sub> =±30V,V <sub>DS</sub> =0V	-	-	±100	nA	
Gate-source breakdown voltage	V <sub>(BR)GSS</sub>	I <sub>G</sub> =±10 μA,V <sub>DS</sub> =0V	±30	-	-	V	
Drain cut -off current	I <sub>DSS</sub>	V <sub>DS</sub> =600V,V <sub>GS</sub> =0V	-	-	1	μA	
Drain -source breakdown voltage	V <sub>(BR)DSS</sub>	I <sub>D</sub> =250 μA,V <sub>GS</sub> =0V	500	-	-	V	
Gate threshold voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =10V,I <sub>D</sub> =250 μA	3	-	4.5	V	
Drain -source ON resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> =10V,I <sub>D</sub> =4.75A	-	0.66	0.75	Ω	
Forward Transconductance	g <sub>fs</sub>	V <sub>DS</sub> =50V,I <sub>D</sub> =4.75A	-	8.2	-	S	
Input capacitance	C <sub>iss</sub>	V <sub>DS</sub> =25V,	-	1610	2065	pF	
Reverse transfer capacitance	C <sub>rss</sub>	V <sub>GS</sub> =0V,	-	156	210		
Output capacitance	C <sub>oss</sub>	f=1MHz	-	20	26		
Switching time	Rise time	tr	V <sub>DD</sub> =300V, I <sub>D</sub> =10A, R <sub>G</sub> =25Ω, (Note4,5)	-	68	91	ns
	Turn-on time	ton		-	109	150	
	Fall time	tf		-	214	300	
	Turn-off time	toff		-	85	165	
Total gate charge(gate-source plus gate-drain)	Q <sub>g</sub>	V <sub>DD</sub> =480V, V <sub>GS</sub> =10V,	-	34	45	nC	
Gate-source charge	Q <sub>gs</sub>	I <sub>D</sub> =10A	-	6.9	-		
Gate-drain("miller") Charge	Q <sub>gd</sub>	(Note4,5)	-	12	-		

## Source-Drain Ratings and Characteristics(Ta=25°C)

Characteristics	Symbol	Test Condition	Min	Type	Max	Unit
Continuous drain reverse current	I <sub>DR</sub>	-	-	-	10	A
Pulse drain reverse current	I <sub>DRP</sub>	-	-	-	38	A
Forward voltage(diode)	V <sub>DSF</sub>	I <sub>DR</sub> =10A,V <sub>GS</sub> =0V	-	1.05	1.4	V
Reverse recovery time	trr	I <sub>DR</sub> =10A,V <sub>GS</sub> =0V,	-	442	633	ns
Reverse recovery charge	Q <sub>rr</sub>	dI <sub>DR</sub> / dt ≤ 100 A / μs	-	2.16	3.24	μC

Note 1.Repeativity rating :pulse width limited by junction temperature

2.L=14.5mH I<sub>AS</sub>=10A,V<sub>DD</sub>=50V,R<sub>G</sub>=0Ω ,Starting T<sub>J</sub>=25°C

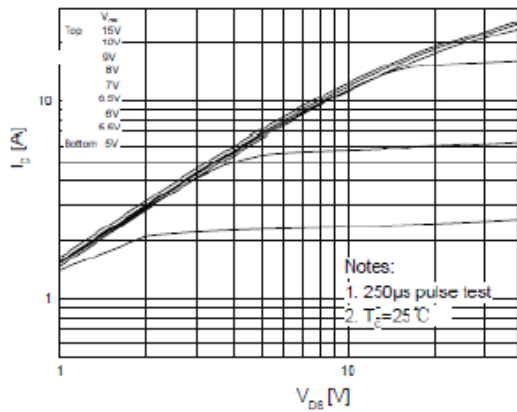
3.I<sub>SD</sub>≤10A,di/dt≤300A/μs,V<sub>DD</sub><BV<sub>DSS</sub>,STARTING T<sub>J</sub>=25°C

4.Pulse Test:Pulse Width≤300us,Duty Cycles≤2%

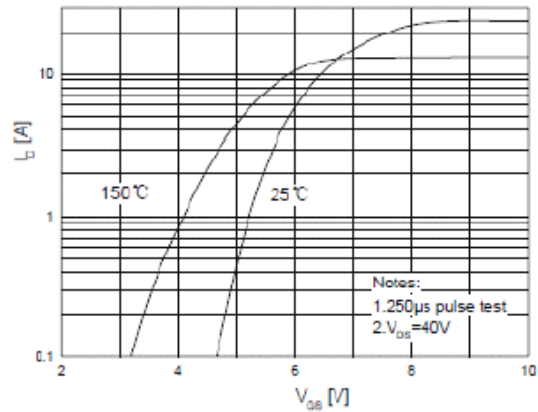
5. Essentially independent of operating temperature.

This transistor is an electrostatic sensitive device

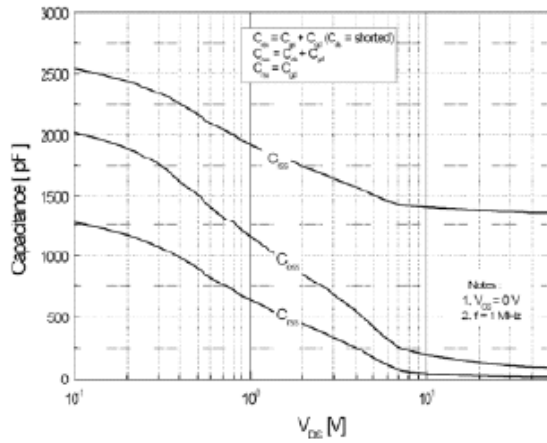
Please handle with caution



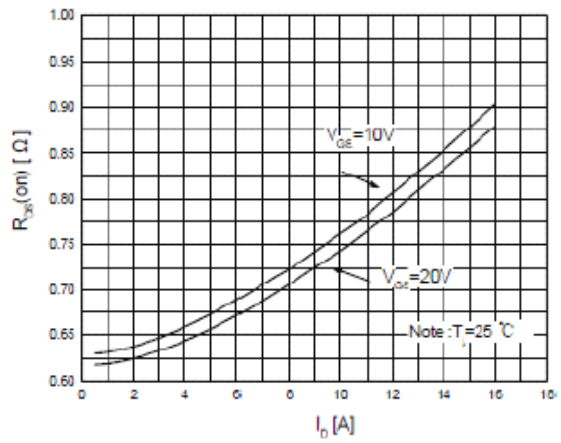
**Fig.1 On-State Characteristics**



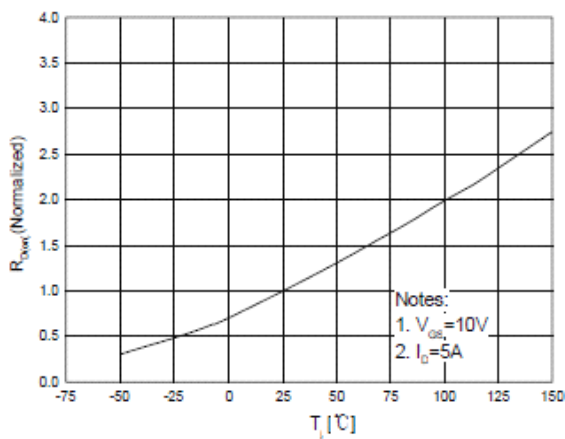
**Fig.2 Transfer characteristics**



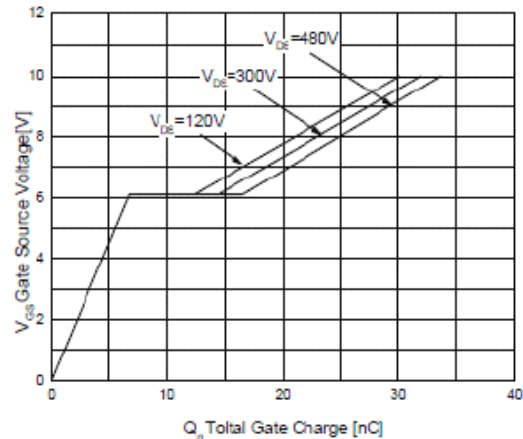
**Fig.3 Capacitance Variation vs Drain voltage**



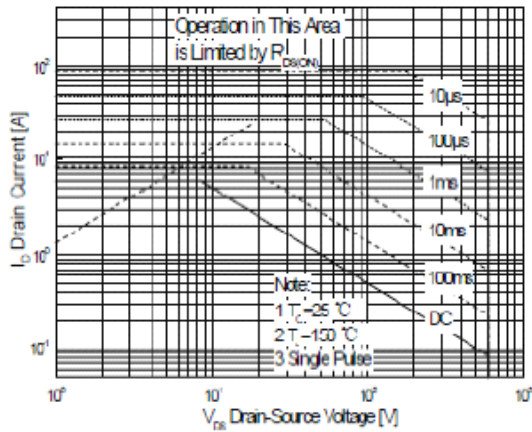
**Fig.4 On-Resistance Variation Energy vs Drain current and Gate Voltage**



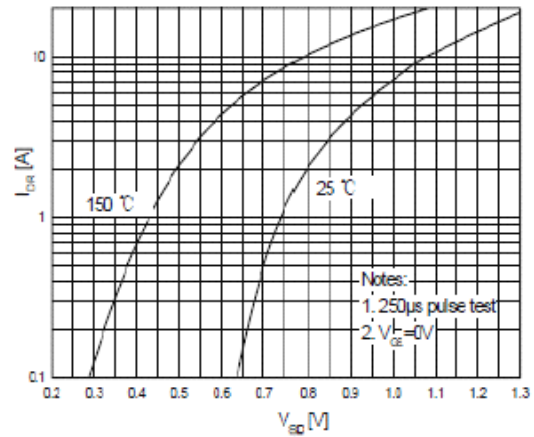
**Fig.5 On-Resistance Variation vs Junction Temperature**



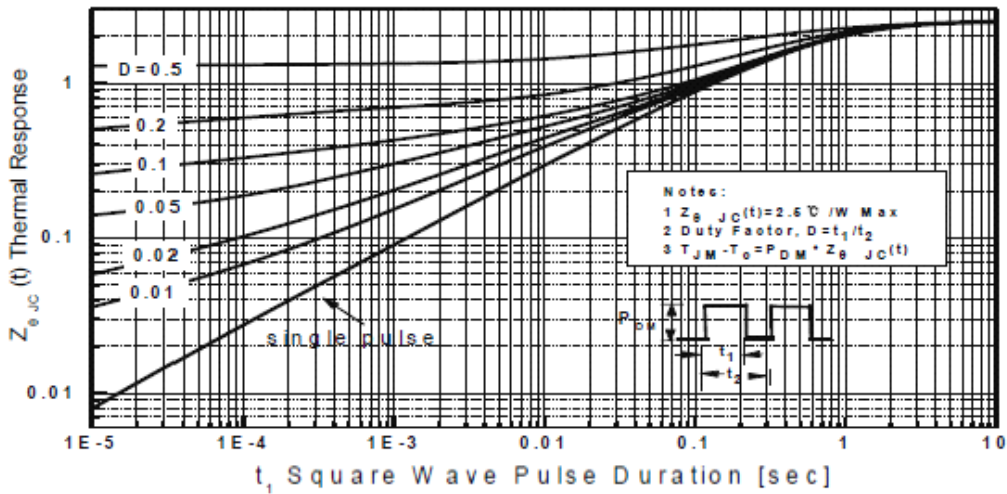
**Fig.6 Gate Charge Characteristics**



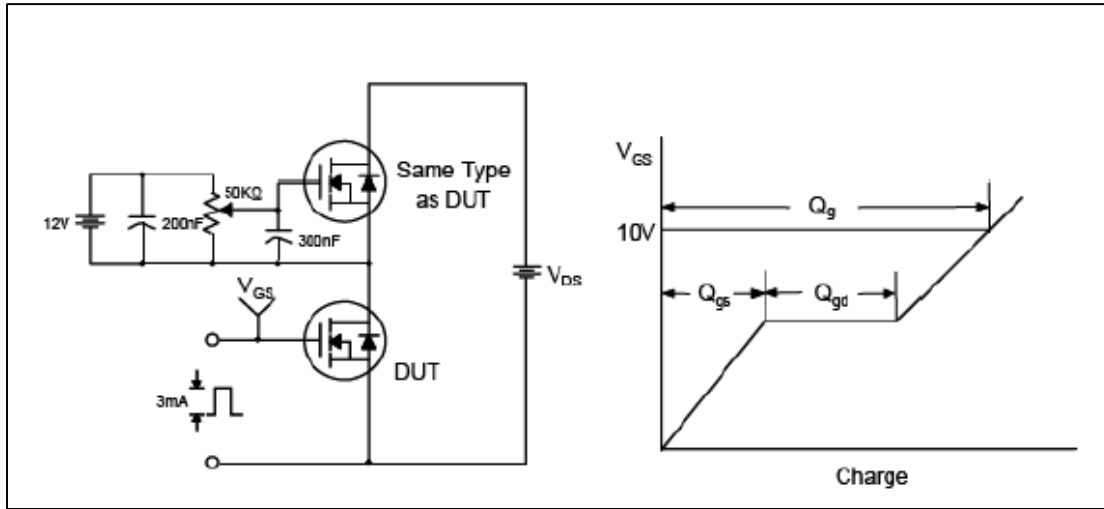
**Fig.7 Maximum Safe Operation Area**



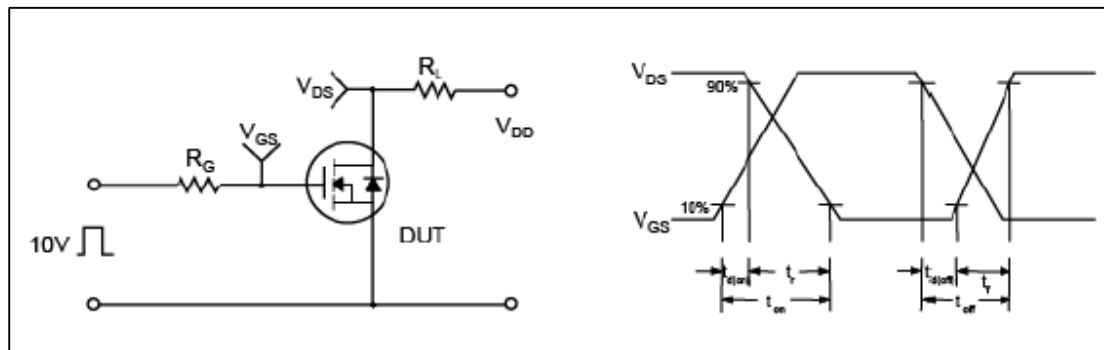
**Fig.8 Diode Forward voltage Variation vs Source Current and Temperature**



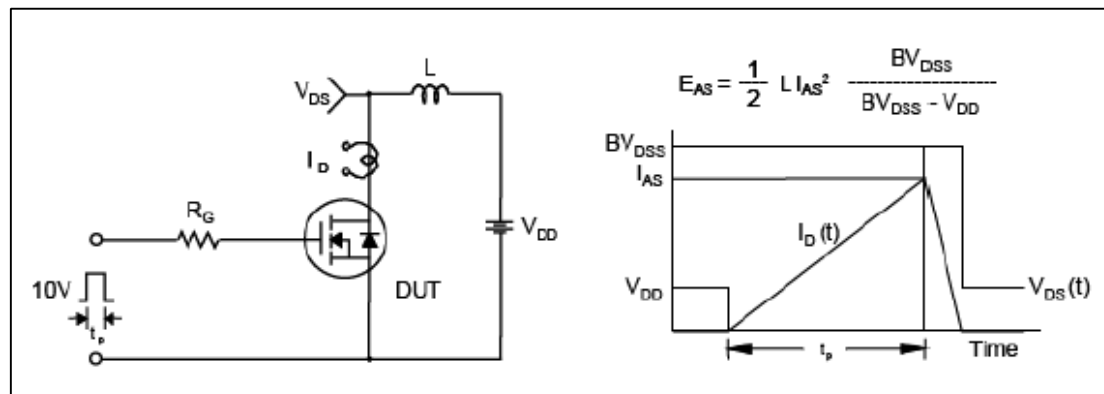
**Fig.9 Transient Thermal Response curve**



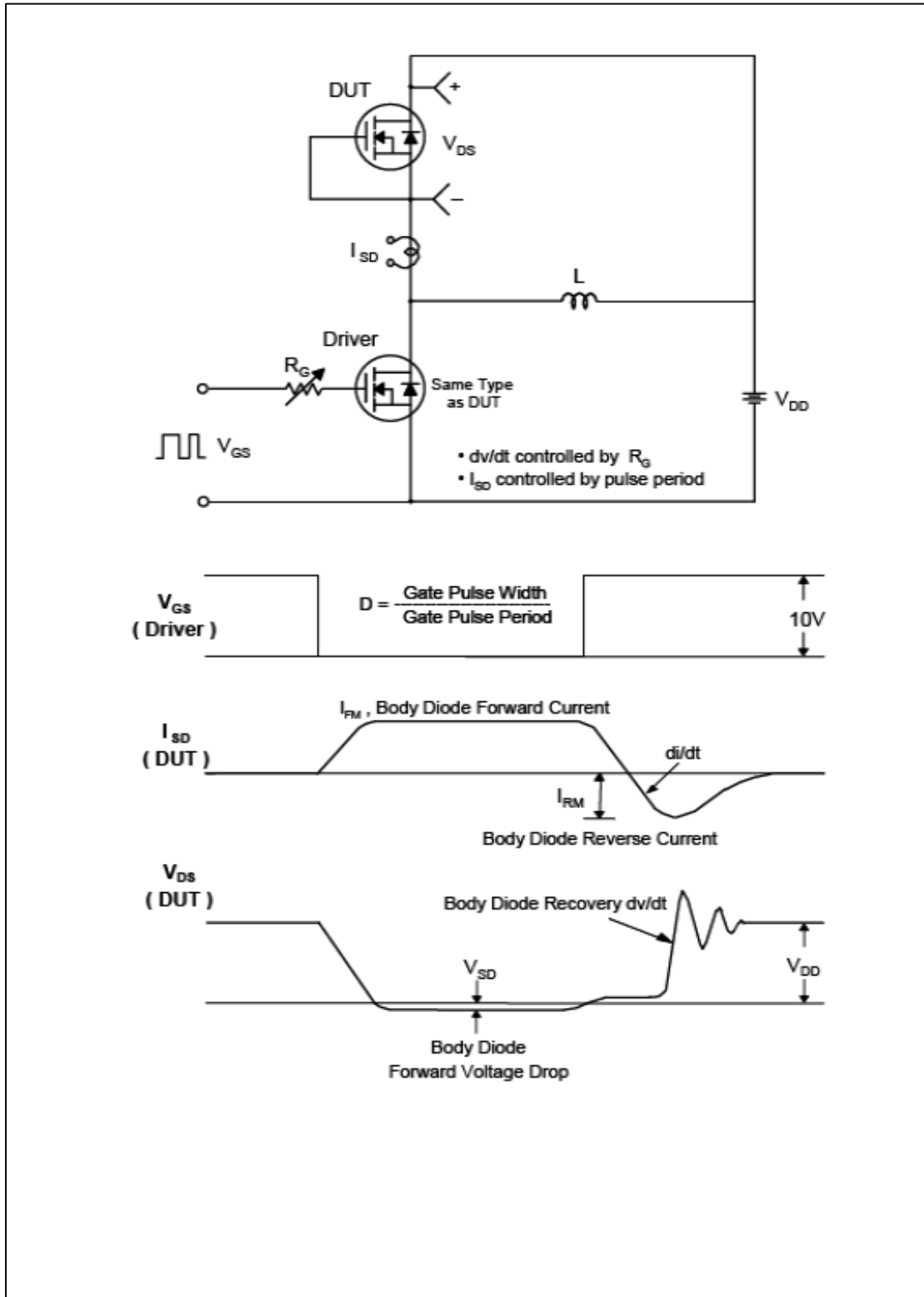
**Fig.10 Gate Test circuit & Waveform**



**Fig.11 Resistive Switching Test Circuit & Waveform**



**Fig.12 Uncamped Inductive Switching Test Circuit & Waveform**



**Fig.13 Peak Diode Recovery  $dv/dt$  Test Circuit & Waveform**

**TO-220F Package Dimension**

