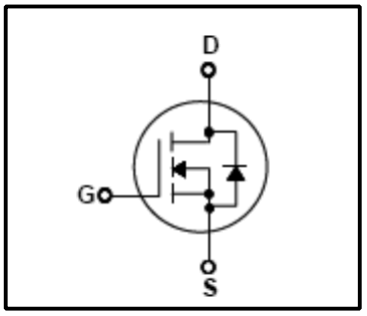
WFP70N06

Silicon N-Channel MOSFET

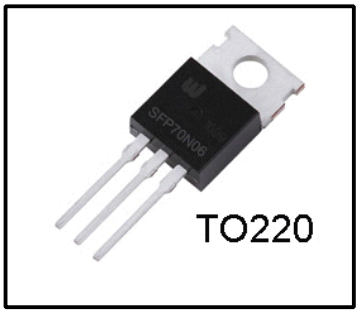
Features

- 70A,60V, RDS(on)(Max0.014Ω)@VGS=10V
- Ultra-low Gate charge(Typical 70nC)
- Low Crss (Typical 160pF)
- Improved dv/dt capability
- 100%Avalanche Tested
- Maximum Junction Temperature Range(175℃)



General Description

This Power MOSFET is produced using Semiwell's advanced planar stripe,DMOS technology.This latest technology has been especially designed to minimize on-state resistance, have a low gate charge with superior switching performance, and rugged avalanche characteristics,DC-DC Converters and power management in portableand,battery operatedproducts.



Absolute Maximum Ratings

Symbol	Parameter		Value	Units
V_{DSS}	Drain Source Voltage		60	V
I_D	Continuous Drain Current(@Tc=25℃)		70	A
	Continuous Drain Current(@Tc=100℃)		51	A
I_{DM}	Drain Current Pulsed	(Note1)	280	A
V_{GS}	Gate to Source Voltage		±25	V
E_{AS}	Single Pulsed Avalanche Energy	(Note2)	800	mJ
dv/dt	Peak Diode Recovery dv /dt	(Note3)	7.0	V/ ns
P_D	Total Power Dissipation(@Tc=25℃)		158	W
	Derating Factor above 25℃		1.05	W/℃
T_J,T_{stg}	Junction and Storage Temperature		-55~175	℃
T_L	Maximum Lead Temperature for soldering purpose, 1/8 form Case for 5 seconds		300	℃

Thermal Characteristics

Symbol	Parameter	Value			Units
		Min	Typ	Max	
R_{QJC}	Thermal Resistance , Junction -to -Case	-	-	0.95	℃/W
R_{QCS}	Thermal Resistance , Case-to-Sink	-	0.5	-	℃/W
R_{QJA}	Thermal Resistance , Junction-to -Ambient	-	-	62.5	℃/W

Electrical Characteristics(Tc=25℃)

Characteristics		Symbol	Test Condition	Min	Type	Max	Unit
Gate leakage current		I_{GSS}	V_{GS}=±25V,V_{DS}=0V	-	-	±100	nA
Drain cut -off current		I_{DSS}	V_{DS}=60V,V_{GS}=0V	-	-	1	μA
Drain -source breakdown voltage		$V_{(BR)DSS}$	I_D=250 μA,V_{GS}=0V	60	-	-	V
Breakdown voltage Temperature Coefficient		$\triangle BV_{DSS}/\triangle T_J$	I_D=250μA,Referenced to 25℃	-	0.066	-	V/℃
Gate threshold voltage		$V_{GS(th)}$	V_{DS}=10V,I_D=250 μA	2.0	-	4.0	V
Drain -source ON resistance		$R_{DS(ON)}$	V_{GS}=10V,I_D=35A	-	-	0.014	Ω
Input capacitance		C_{iss}	V_{DS}=25V,	-	2350	3050	pF
Reverse transfer capacitance		C_{rss}	V_{GS}=0V,	-	160	200	
Output capacitance		C_{oss}	f=1MHz	-	690	890	
Switching time	Rise time	tr	V_{DD}=30V,	-	60	130	ns
	Turn-on time	ton	I_D=35A	-	30	70	
	Fall time	tf	R_G=50Ω	-	95	200	
	Turn-off time	toff	(Note4,5)	-	125	260	
Total gate charge(gate-source plus gate-drain)		Qg	V_{DS}=48V,	-	70	90	nC
Gate-source charge		Qgs	V_{GS}=10V,	-	18	-	
Gate-drain("miller") Charge		Qgd	I_D=70A (Note4,5)	-	24	-	

Source-Drain Ratings and Characteristics(Ta=25℃)

Characteristics	Symbol	Test Condition	Min	Type	Max	Unit
Continuous drain reverse current	I_{DR}	Integral Reverse p-n Junction	-	-	70	A
Pulse drain reverse current	I_{DRP}	Diode in the MOSFET	-	-	280	A
Forward voltage(diode)	V_{DSF}	I_{DR}=70A,V_{GS}=0V	-	-	1.5	V
Reverse recovery time	trr	I_{DR}=70A,V_{GS}=0V,	-	62	-	ns
Reverse recovery charge	Qrr	dI_{DR} / dt =100 A / μs	-	110	-	μC

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

2.L=250uH I_{AS}=70A,V_{DD}=25V,R_G=0Ω,Starting T_J=25℃

3.I_{SD}≤70A,di/dt≤300A/us,V_{DD}<BV_{DSS},STARTING T_J=25℃

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

5. Essentially independent of operating temperature.

This transistor is an electrostatic sensitive device

Please handle with caution

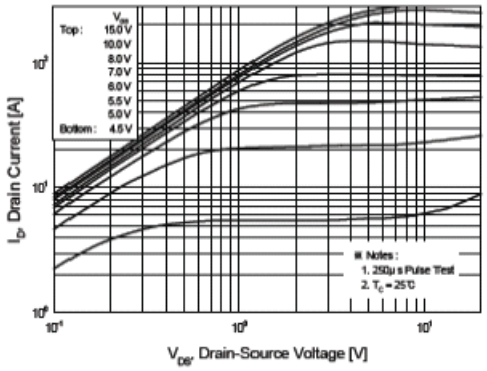


Fig.1 On State Characteristics

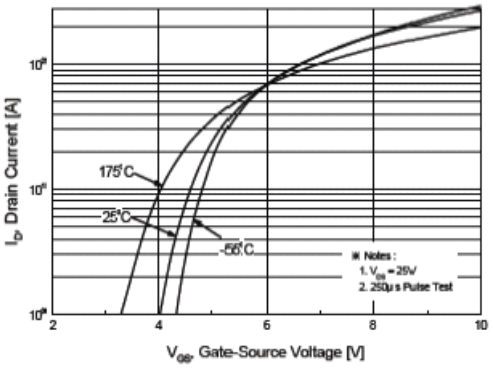


Fig.2 Transfer Characteristics

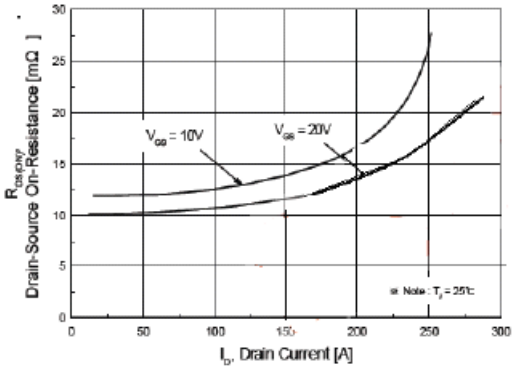


Fig.3 On Resistance Variation Vs Drain Current and Gate Voltage

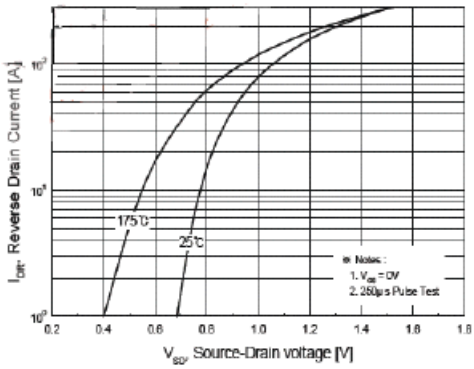


Fig.4 On State Current vs Allowable case Temperature

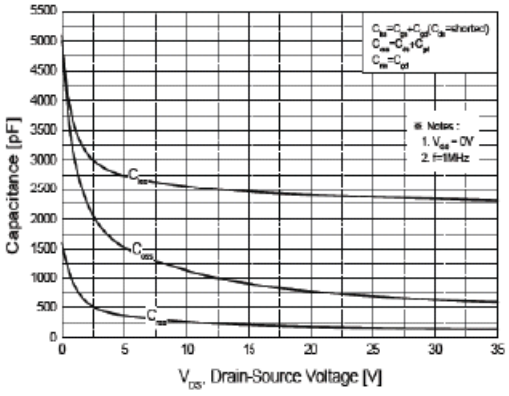


Fig.5Chpacitance Characteristics

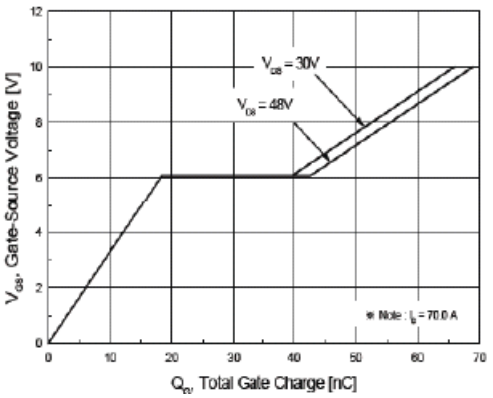


Fig.6 Gate Charge Characteristics

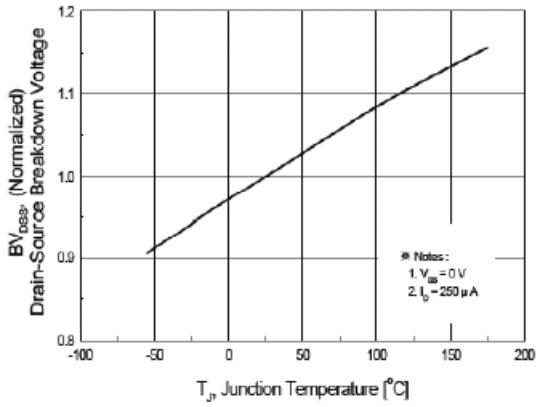


Fig.7Breakdown Voltage Variation vs,Junction temperature

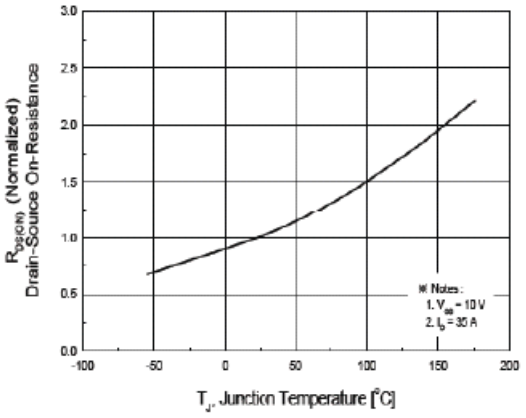


Fig.8 On-Resistance Variation vs Junction temperature

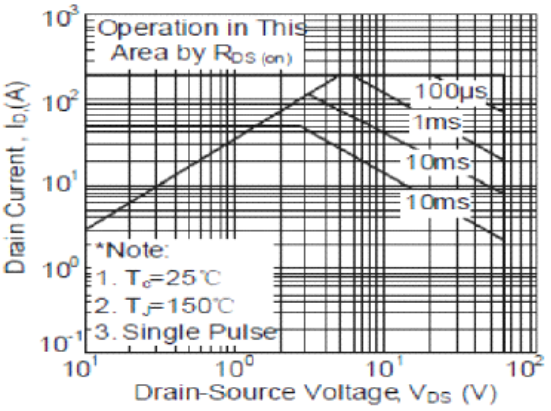


Fig.9 Maximum Safe Operation Area

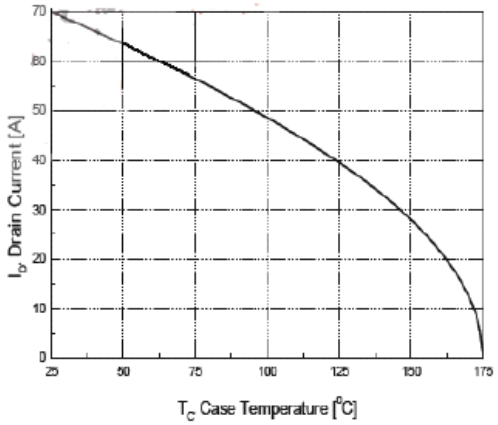


Fig.10 Maximum Drain Current vs Case temperature

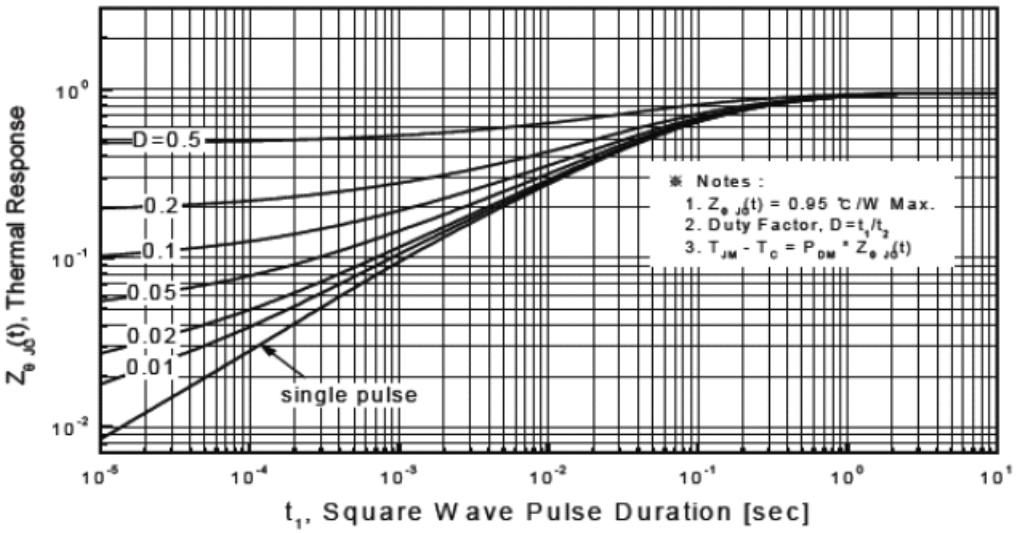


Fig.11 Transient thermal Response Curve

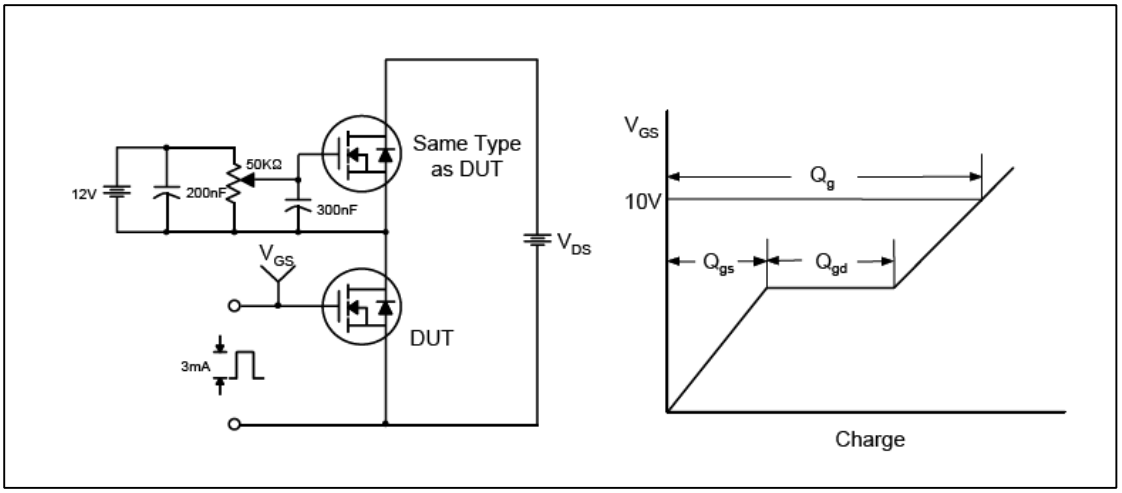


Fig.12 Gate Test circuit & Waveform

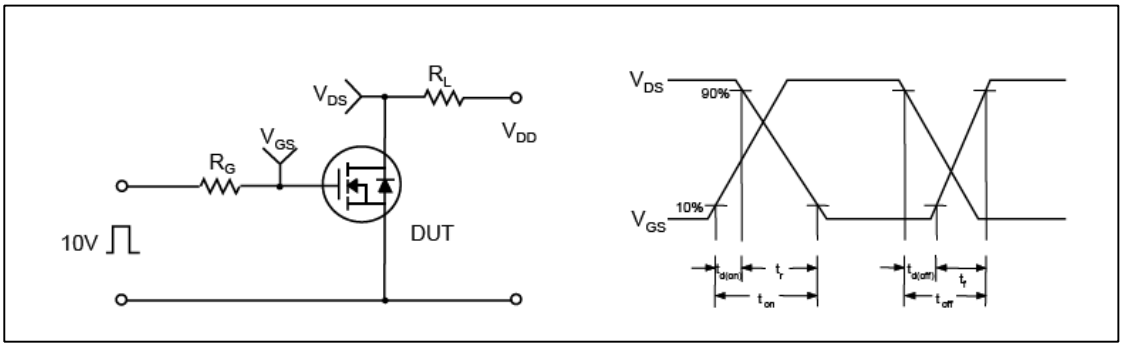


Fig.13 Resistive Switching Test Circuit & Waveform

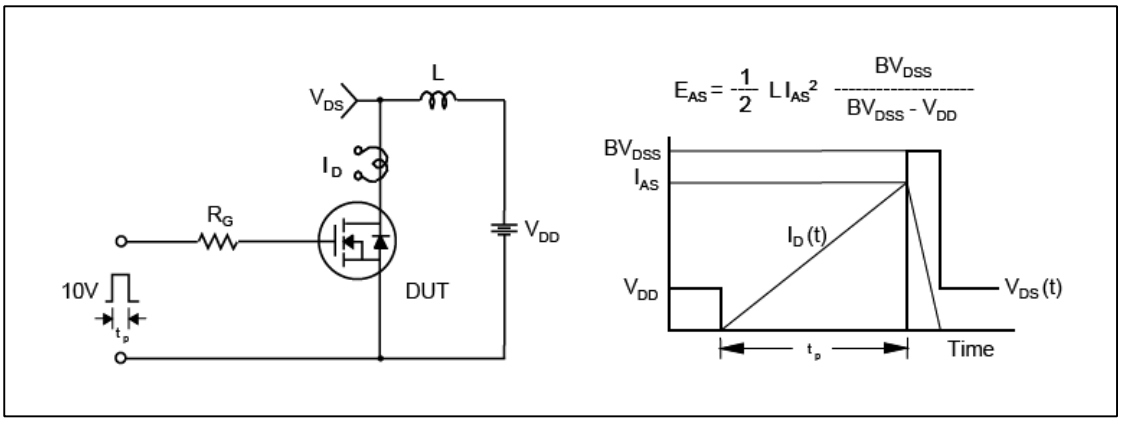


Fig.14 Unclamped Inductive Switching Test Circuit & Waveform

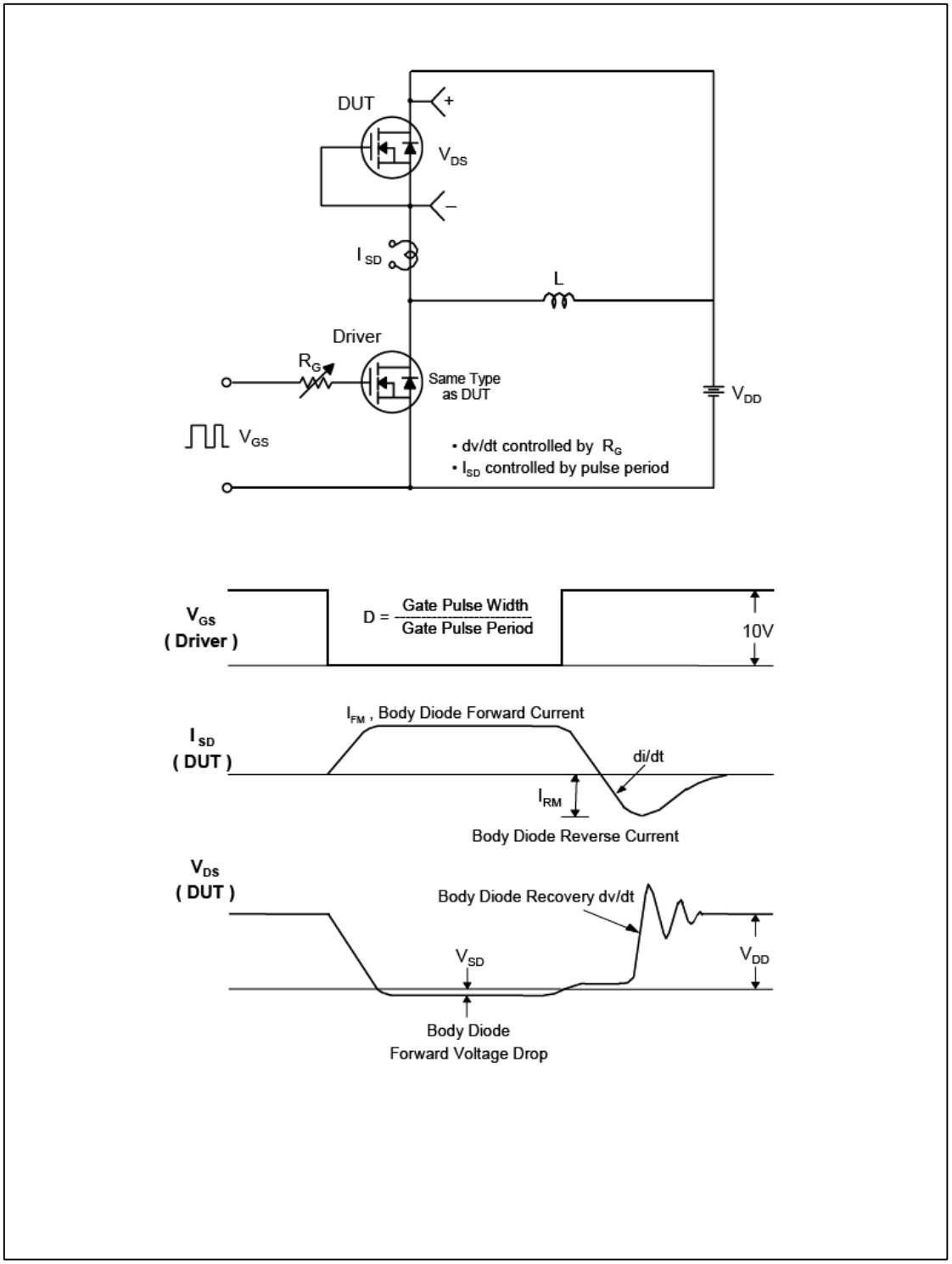


Fig.15 Peak Diode Recovery dv/dt Test Circuit & Waveform

TO-220 Package Dimension

Unit:mm