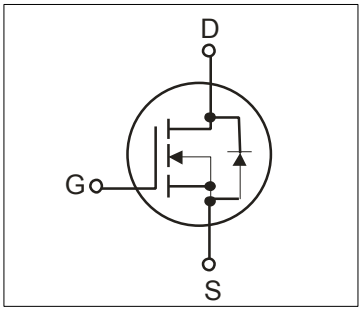
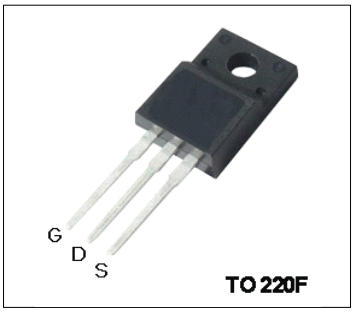
Features



- 4.5A,650V,$R_{DS(on)}$(Max2.8Ω)@V_{GS}=10V
- Ultra-low Gate charge(Typical 14.5nC)
- Fast Switching Capability
- 100%Avalanche Tested
- Enhanced EMI capability
- Maximum Junction Temperature Range(150℃)

General Description

This Power MOSFET is N channel enhanced high voltage power MOS field effect transistor fabrication by F-Cell™ planar high pressure VDMOS process technology. this product have lower resistance,Superior switching performance and high EAS capability. The product can be widely used in AC-DC switching power supply, DC-DC power converter, and high H bridge PWM motor drive.



Absolute Maximum Ratings

Symbol	Parameter		Value	Units
V_{DSS}	Drain Source Voltage		650	V
I_D	Continuous Drain Current(@Tc=25℃)		4.5*	A
	Continuous Drain Current(@Tc=100℃)		2.5*	A
I_{DM}	Drain Current Pulsed	(Note1)	16	A
V_{GS}	Gate to Source Voltage		±30	V
E_{AS}	Single Pulsed Avalanche Energy	(Note2)	200	mJ
E_{AR}	Repetitive Avalanche Energy	(Note1)	14	mJ
P_D	Total Power Dissipation(@Tc=25℃)		30	W
	Derating Factor above 25℃		0.24	W/℃
T_J,T_{stg}	Junction and Storage Temperature		-55~150	℃

Thermal Characteristics

Symbol	Parameter	Value			Units
		Min	Typ	Max	
$R_{\theta JC}$	Thermal Resistance , Junction -to -Case	-	-	4.17	℃/W
$R_{\theta JA}$	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}=±30V,V_{DS}=0V	-	-	±100	nA
Gate-source breakdown voltage		$V_{(BR)GSS}$	I_G=±10 μA,V_{DS}=0V	±30	-	-	V
Drain Cut -off current		I_{DSS}	V_{DS}=650V,V_{GS}=0V	-	-	1.0	μA
			V_{DS}=500V,Tc=125℃	-	-	100	μA
Drain -source breakdown voltage		$V_{(BR)DSS}$	I_D=250 μA,V_{GS}=0V	650	-	-	V
Gate threshold voltage		$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250 μA	2	-	4	V
Drain -source ON resistance		$R_{DS(ON)}$	V_{GS}=10V,I_D=2.0A	-	2.4	2.8	Ω
Forward Transconductance		gfs	V_{DS}=15V,I_D=2.0A	-	3.5	-	S
Input capacitance		C_{iss}	V_{DS}=25V,	-	611	-	pF
Reverse transfer capacitance		C_{rss}	V_{GS}=0V,	-	3.6	-	
Output capacitance		C_{oss}	f=1MHz	-	54	-	
Switching time	Turn-on Rise time	tr	V_{DD}=325V,	-	16	-	ns
	Turn-on delay time	Td(on)	I_D=4A	-	14	-	
	Turn-off Fall time	tf	R_G=10Ω	-	11	-	
	Turn-off delay time	Td(off)	(Note3,4)	-	32	-	
Total gate charge(gate-source plus gate-drain)		Qg	V_{DD}=520V,	-	14.5	-	nC
Gate-source charge		Qgs	V_{GS}=10V,	-	3.0	-	
Gate-drain("miller") Charge		Qgd	I_D=4A (Note3,4)	-	6.5	-	

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

Characteristics	Symbol	Test Condition	Min	Type	Max	Unit
Continuous drain reverse current	I_{DR}	-	-	-	4	A
Pulse drain reverse current	I_{DRP}	-	-	-	16	A
Forward voltage(diode)	V_{DSF}	I_{DR}=4A,V_{GS}=0V	-	-	1.5	V
Reverse recovery time	trr	I_{DR}=4A,V_{GS}=0V,	-	256	-	ns
Reverse recovery charge	Qrr	dI_{DR} /dt =100 A /μs	-	1.2	-	μC
Reverse recovery current	Irrm		-	9.4	-	A

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

2.L=10mH I_{AS}=6.3A,V_{DD}=500V,R_G=25Ω,Starting T_J=25℃

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

4. Essentially independent of operating temperature.

This transistor is an electrostatic sensitive device

Please handle with caution

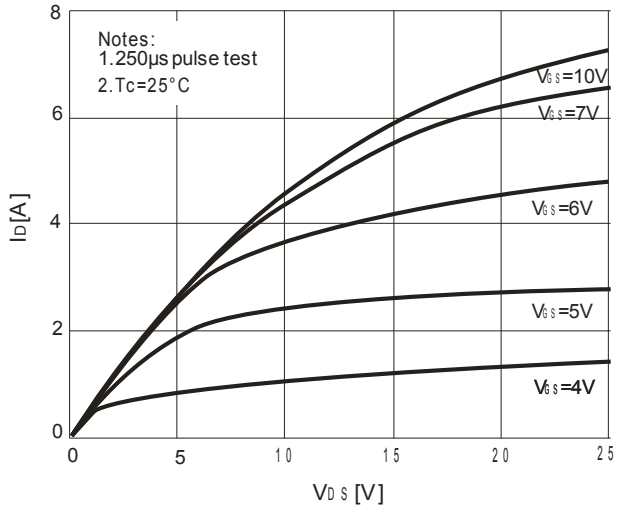


Fig.1 Output Characteristics

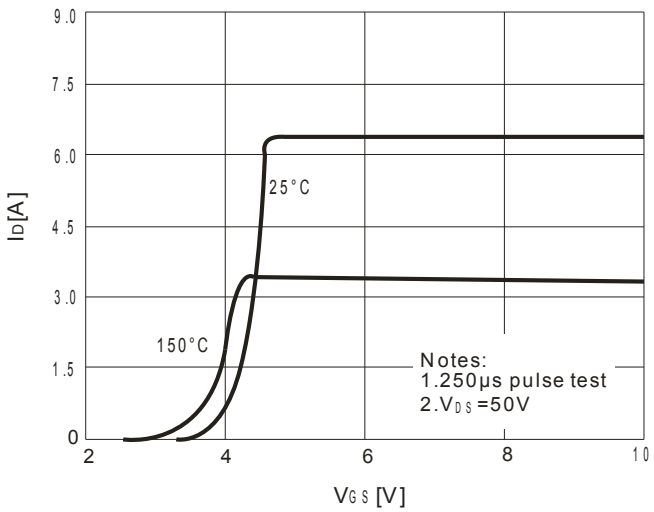


Fig.2 Transfer Characteristics

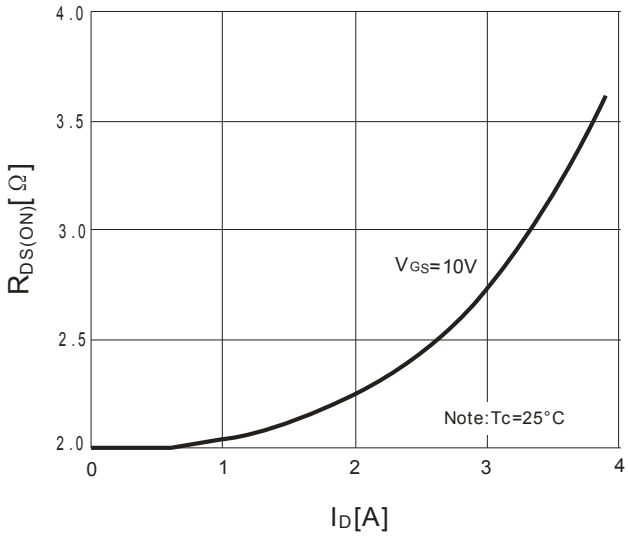


Fig.3 Drain to Source ON Resistance vs Drain Current

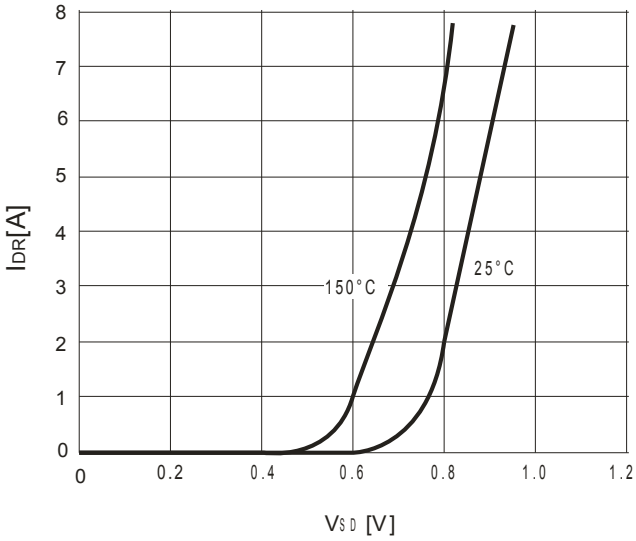


Fig.4 Body Diode Transfer Characteristics

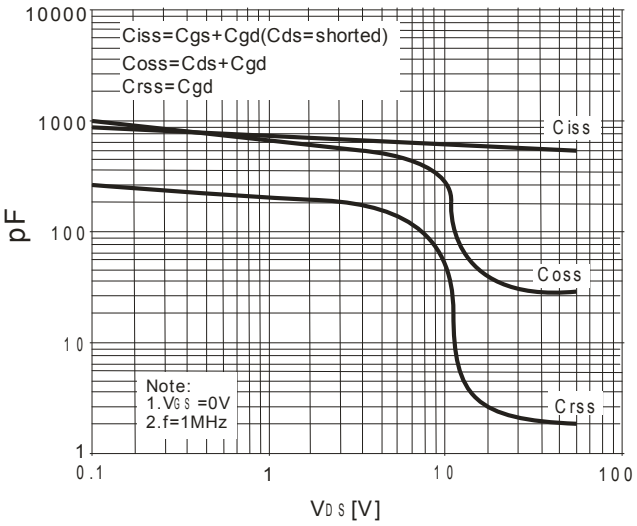


Fig.5 Capacitance vs Drain to source Voltage

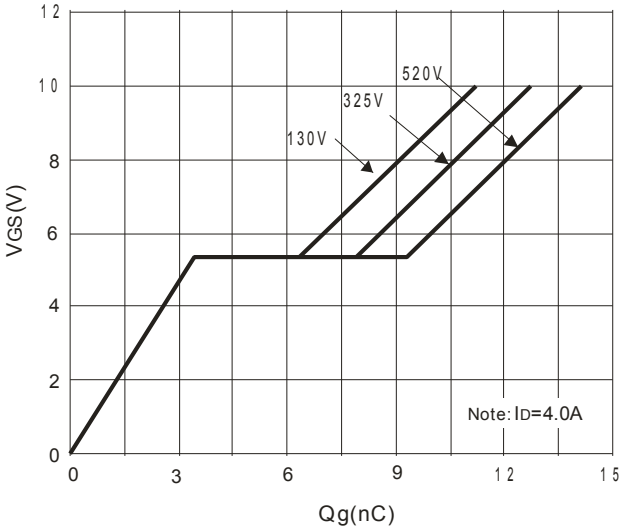


Fig.6 Gate Charge vs Gate to source Voltage

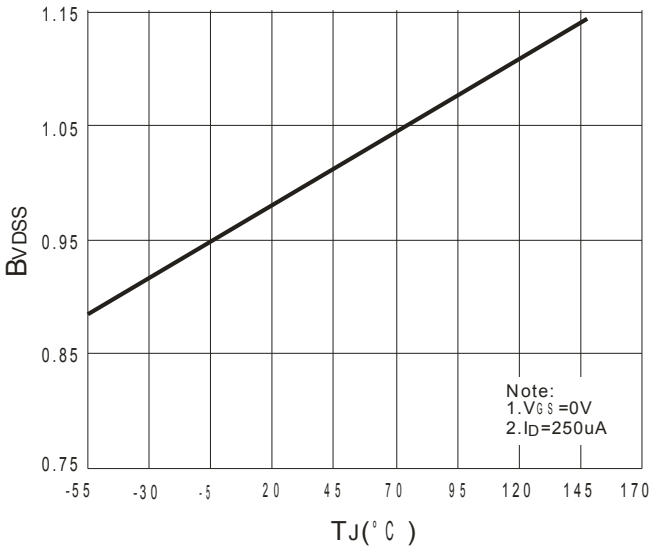


Fig.7 Breakdown Voltage vs Junction Temperature

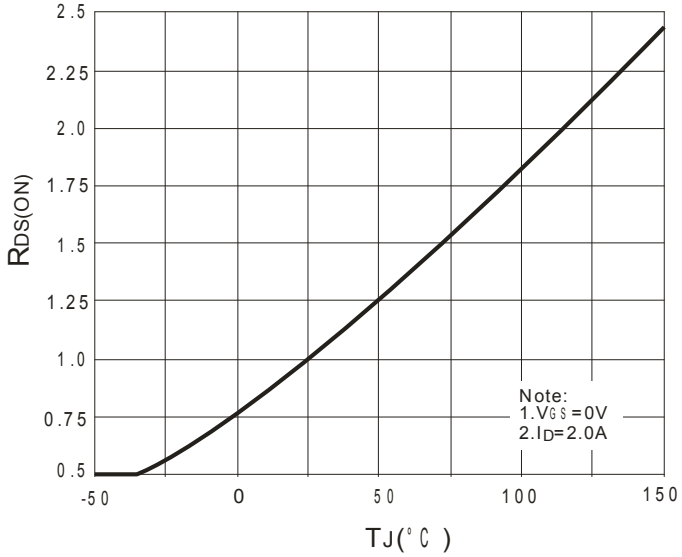


Fig.8 Drian to Source On-Resistance vs Junction Temperature

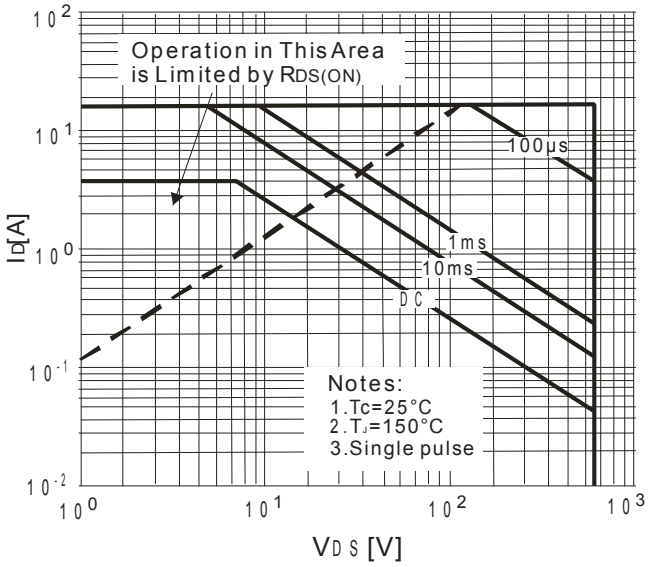


Fig.9 Maximum Forward Bias Safe Operatiing Area

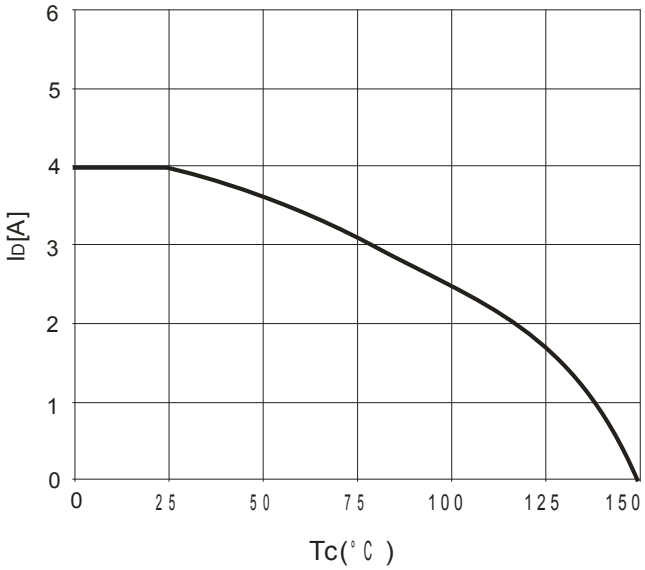


Fig.10 Maximum Continuous Drain Current vs Case temperature

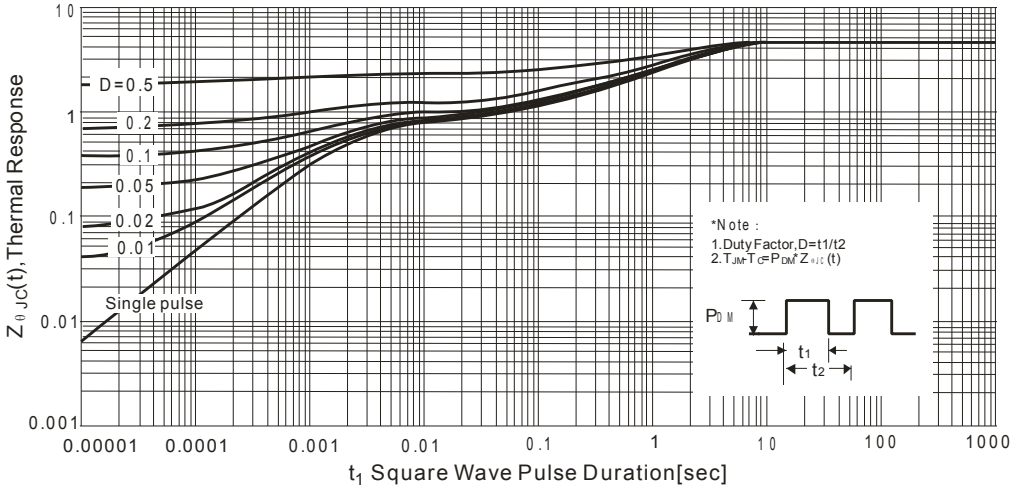


Fig.11 Maximum Effective Thermal Impendance Junction to Case

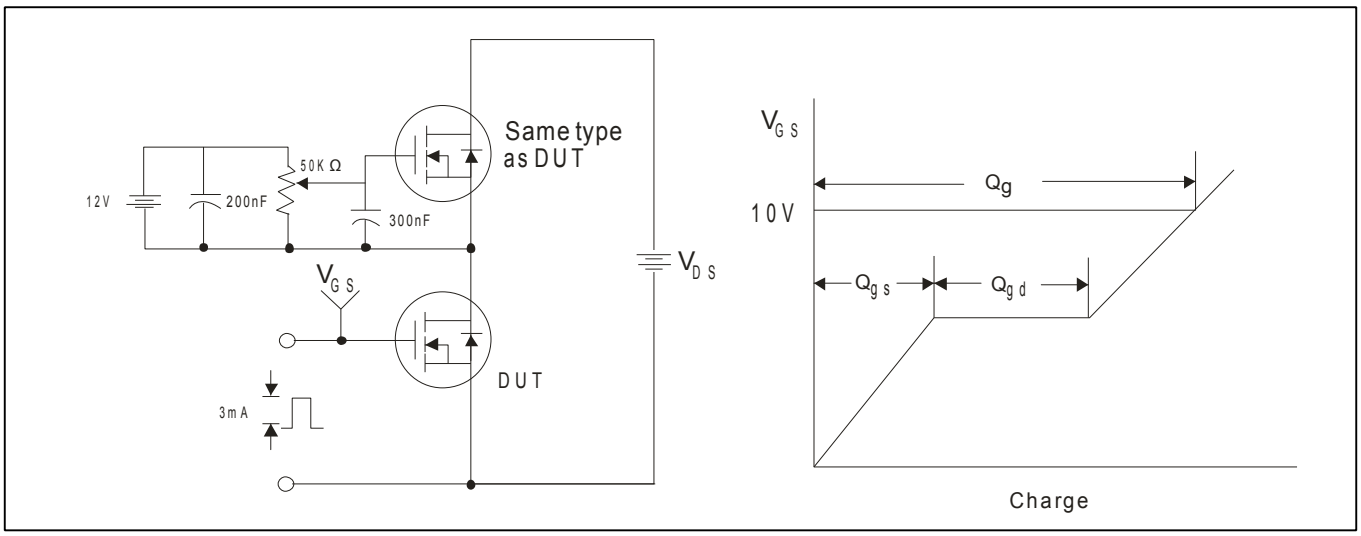


Fig.12 Gate Test circuit & Waveform

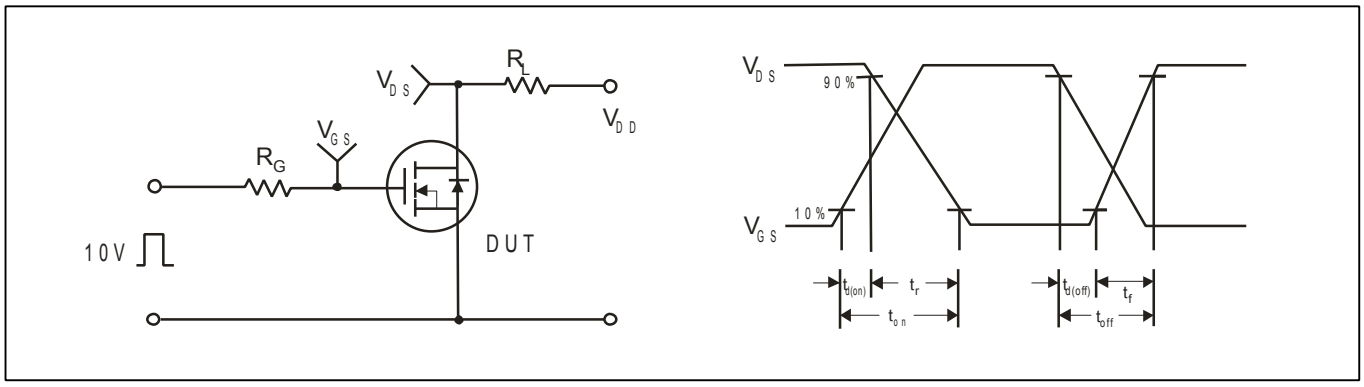


Fig.13 Resistive Switching Test Circuit & Waveform

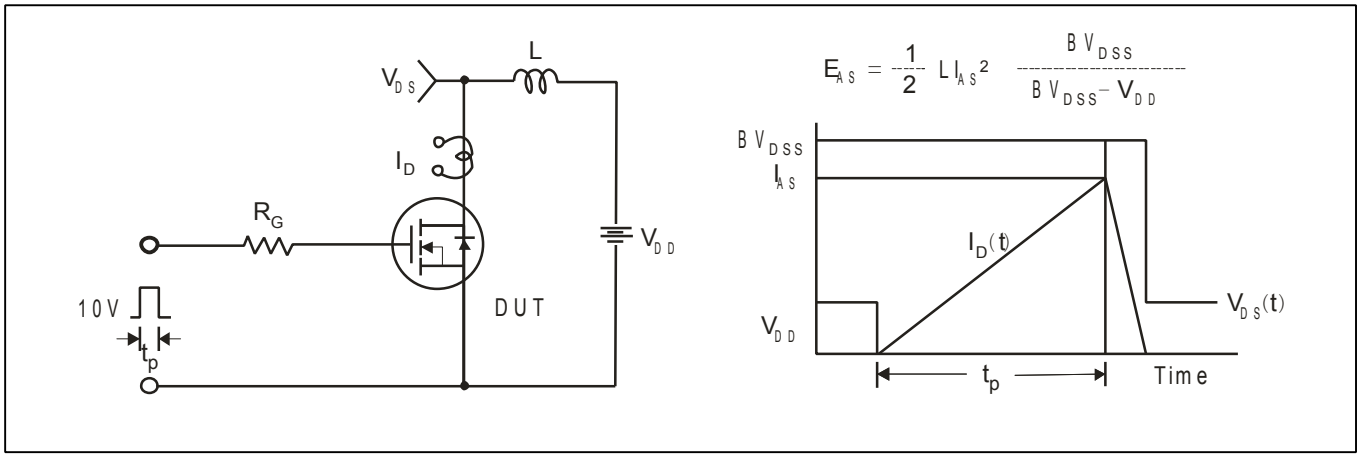


Fig.14 Unclamped Inductive Switching Test Circuit & Waveform

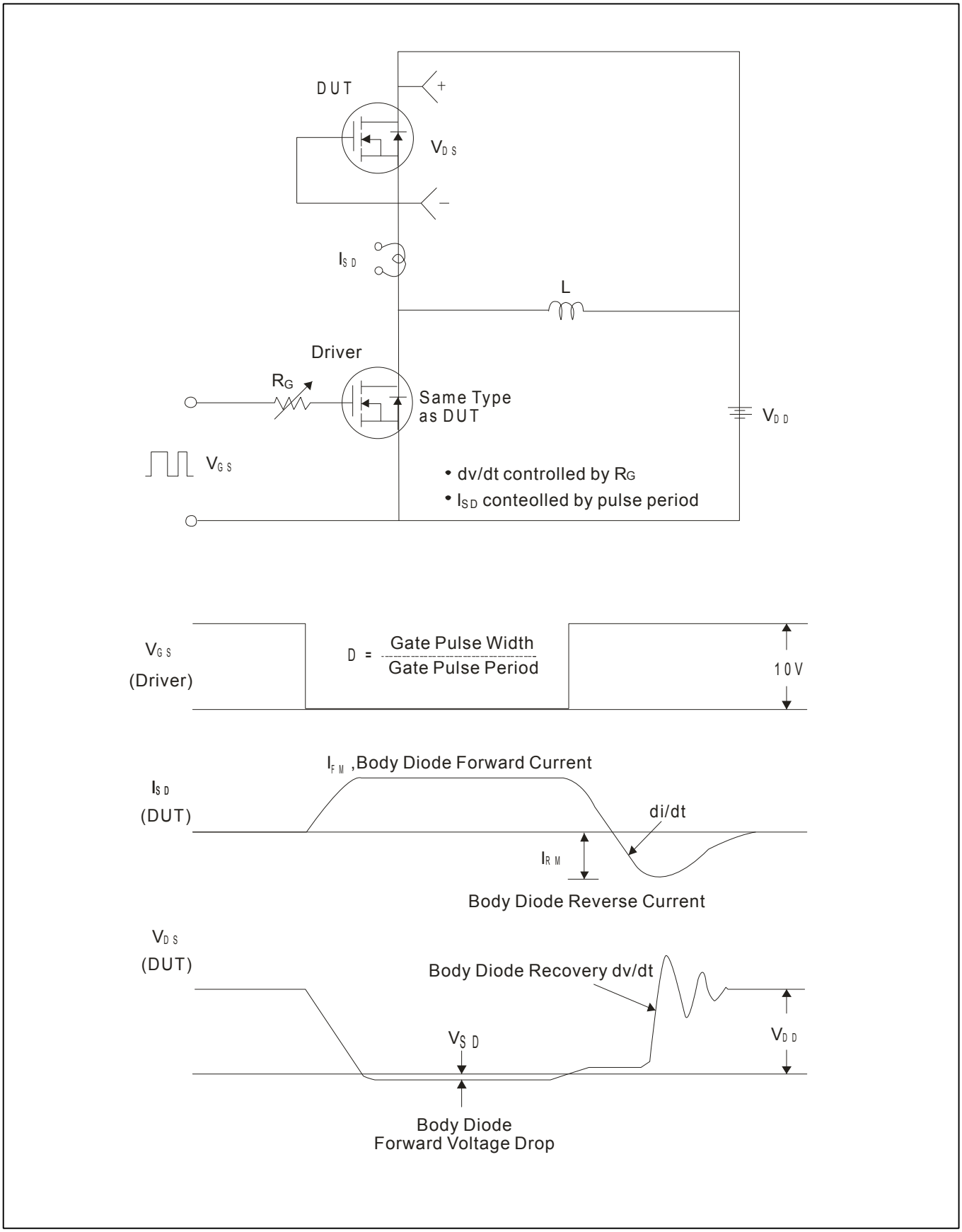
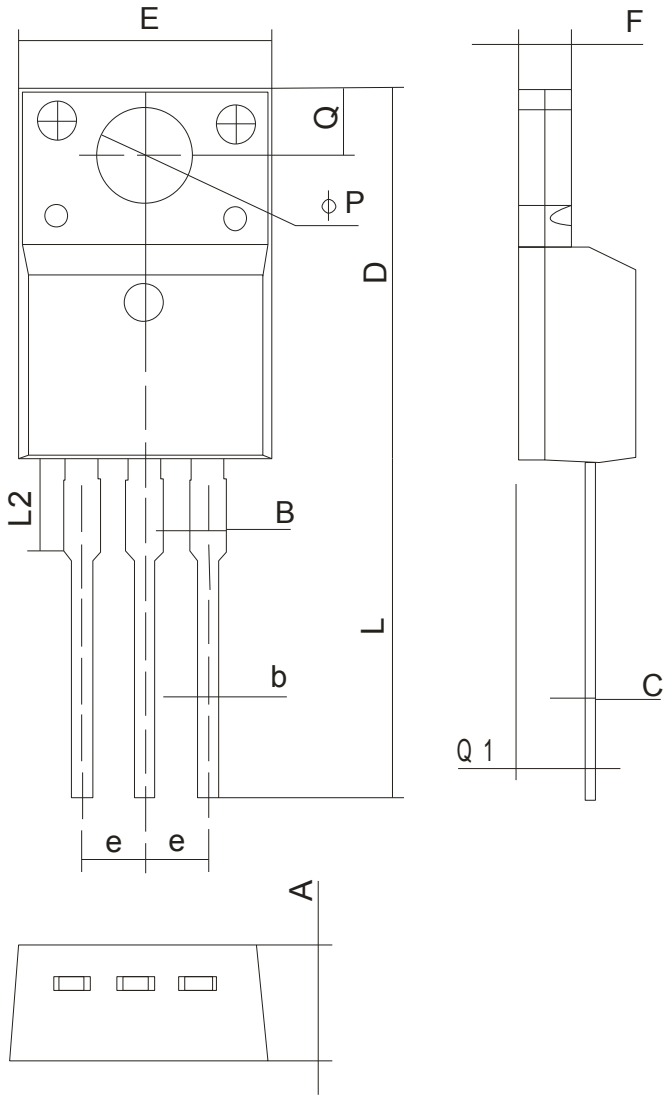


Fig.15 Peak Diode Recovery dv/dt Test Circuit & Waveform

TO-220F Package Dimension

Unit:mm



符 号 Symbol	MIN	MAX
A	4.5	4.9
B	-	1.47
b	0.7	0.9
c	0.45	0.6
D	15.67	16.07
E	9.96	10.36
e	2.54TYPE	
F	2.34	2.74
L	12.58	13.38
L2	3.13	3.33
ΦP	3.08	3.28
Q	3.2	3.4
Q1	2.56	2.96

NOTE:

1.We strongly recommend customers check carefully on the trademark when buying our product, if there is any question, please don't be hesitate to contact us.

2.Please do not exceed the absolute maximum ratings of the device when circuit designing.

3.Winsemi Microelectronics Co., Ltd reserved the right to make changes in this specification sheet and is subject to change without prior notice.

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