

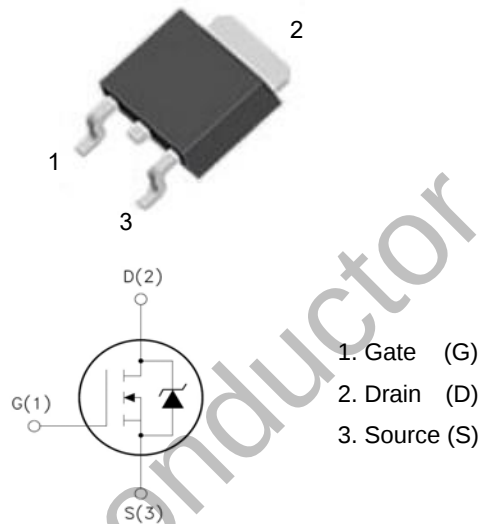


WGD11N45SE

Features:

- ☐ Low Intrinsic Capacitances.
- ☐ Excellent Switching Characteristics.
- ☐ Extended Safe Operating Area.
- ☐ Unrivalled Gate Charge :Qg=28nC (Typ.).
- ☐ BVDSS=450V, I_D=11A
- ☐ R_{DS(on)} : 0.55Ω (Max) @V_G=10V
- ☐ 100% Avalanche Tested

TO-252



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

Symbol	Parameter		Value	Unit
V _{DSS}	Drain-Source Voltage		450	V
I _D	Drain Current	T _C =25°C	11	A
		T _C =100°C	6.3	
V _{GSS}	Gate-Source Voltage		±30	V
E _{AS}	Single Pulse Avalanche Energy (note1)		500	mJ
I _{AR}	Avalanche Current (note2)		11	A
P _D	Power Dissipation (Tc=25°C)		45	W
T _j	Junction Temperature(Max)		150	°C
T _{stg}	Storage Temperature		-55~+150	
TL	Maximum lead temperature for soldering purpose, 1/8" from case for 5 seconds		300	

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
R _{θJC}	Thermal Resistance, Junction to Case	-	2.7	°C/W
R _{θJA}	Thermal Resistance, Junction to Ambient	-	62.5	
R _{θCS}	Thermal Resistance, Case to Sink	0.5	-	

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

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
Off Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	I _D =250μA, V _{GS} =0	450	460	-	V
ΔBVDSS/ΔT _J	Breakdown Voltage Temperature Coefficient	I _D =250μA ,Reference to 25℃	-	0.55	-	V/℃
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =450V, V _{GS} =0V	-	-	1	μA
		V _{DS} =360V, T _c =125℃			10	
I _{GSSF}	Gate-body leakage Current, Forward	V _{GS} =+30V, V _{DS} =0V	-	-	100	nA
I _{GSSR}	Gate-body leakage Current, Reverse	V _{GS} =-30V, V _{DS} =0V	-	-	-100	
On Characteristics						
V _{GS(TH)}	Gate Threshold Voltage	I _D =250μA,V _{DS} =V _{GS}	2	-	4	V
R _{DS(ON)}	Static Drain-Source On-Resistance	I _D =5.5A,V _{GS} =10V	-	0.48	0.55	Ω
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =25V, V _{GS} =0, f=1.0MHz	-	1200	-	pF
C _{oss}	Output Capacitance		-	150	-	
C _{rss}	Reverse Transfer Capacitance		-	20	-	
Switching Characteristics						
T _{d(on)}	Turn-On Delay Time	V _{DD} =200V, I _D =11A R _G =12Ω (Note 3,4)	-	14	-	ns
T _r	Turn-On Rise Time		-	25	-	
T _{d(off)}	Turn-Off Delay Time		-	44	-	
T _f	Turn-Off Rise Time		-	28	-	
Q _g	Total Gate Charge	V _{DS} =200V,V _{GS} =10V, I _D =11A (Note 3,4)	-	28	35	nC
Q _{gs}	Gate-Source Charge		-	7.0	-	
Q _{gd}	Gate-Drain Charge		-	11.0	-	
Drain-Source Diode Characteristics and Maximum Ratings						
I _S	Max. Diode Forward Current	-	-	-	11	A
I _{SM}	Max. Pulsed Forward Current	-	-	-	40	
V _{SD}	Diode Forward Voltage	I _D =11A	-	-	1.5	V
T _{rr}	Reverse Recovery Time	I _S =11A,V _{GS} =0V diF/dt=100A/μs	-	303	-	nS
Q _{rr}	Reverse Recovery Charge	(Note3)	-	1.8	-	μC

Notes : 1, L=2.26mH, I_{AS}=11A, V_{DD}=50V, R_G=25Ω, Starting T_J=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 1. Maximum Effective Thermal Impedance, Junction-to-Case

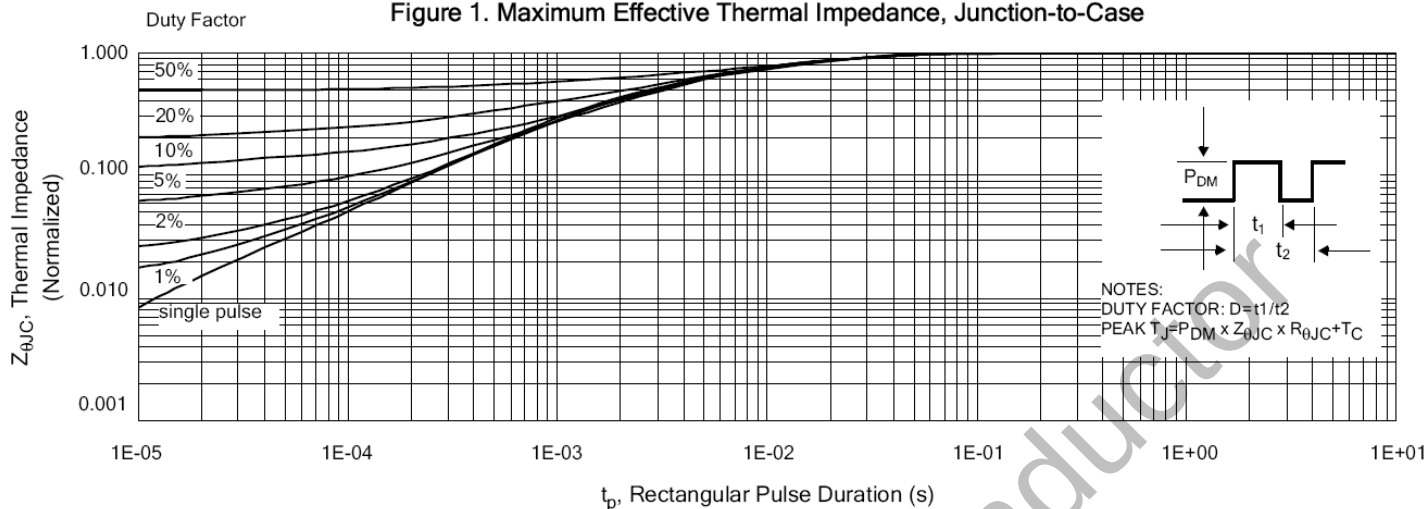


Figure 2. Maximum Power Dissipation vs Case Temperature

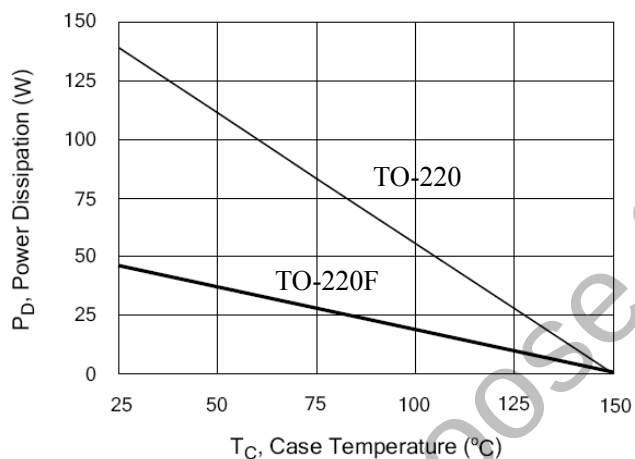


Figure 3. Maximum Continuous Drain Current vs Tc

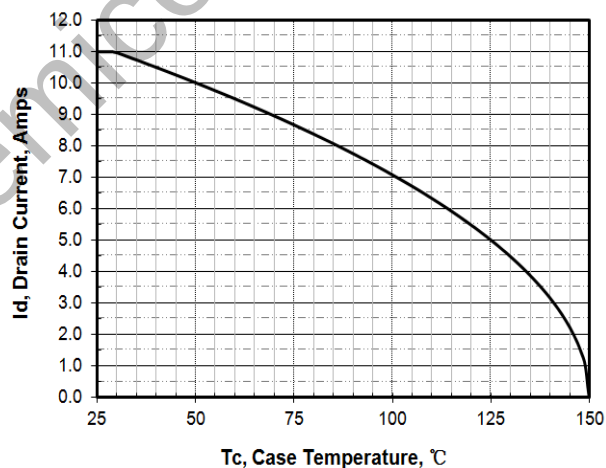


Figure 4. Typical Output Characteristics

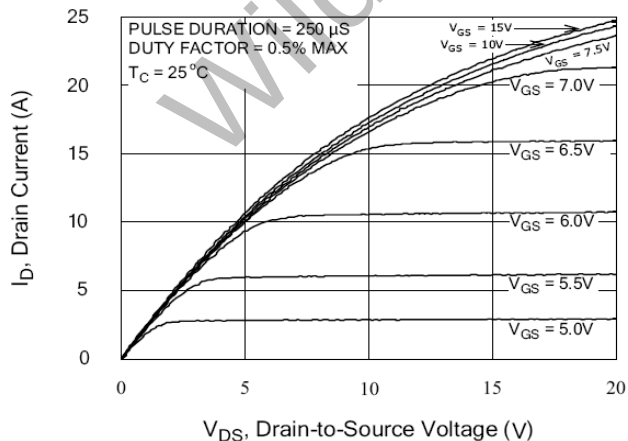
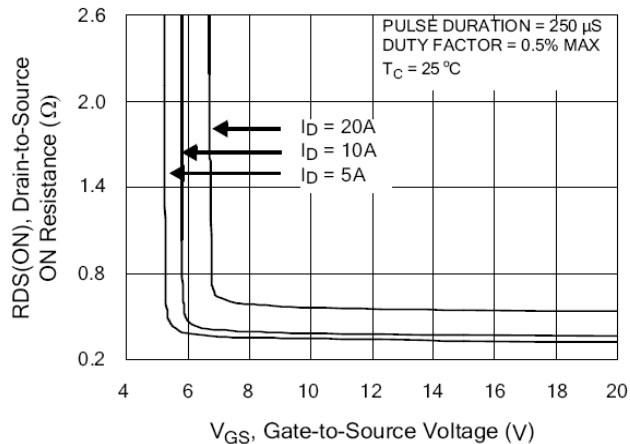


Figure 5. Typical Drain-to-Source ON Resistance vs Gate Voltage and Drain Current



Typical Characteristics (Continued)

Figure 11. Typical Breakdown Voltage vs Junction Temperature

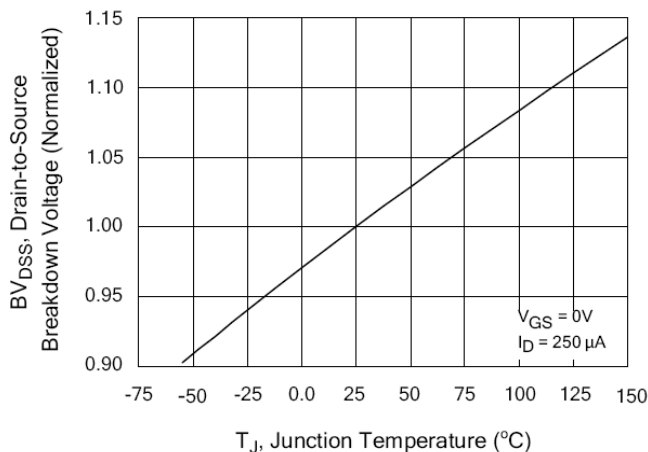


Figure 12. Typical Threshold Voltage vs Junction Temperature

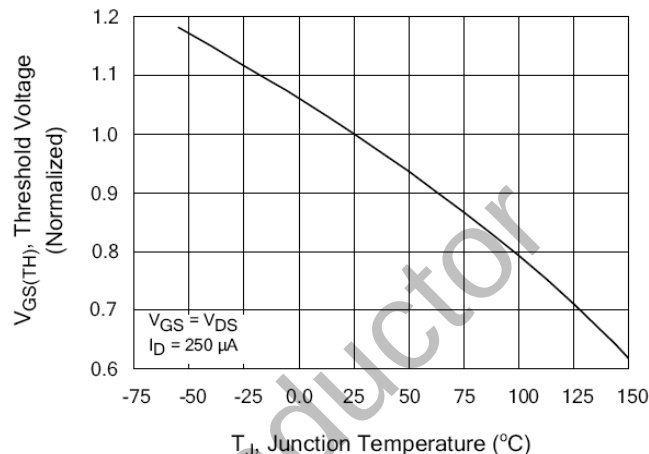


Figure 13. Maximum Safe Operating Area

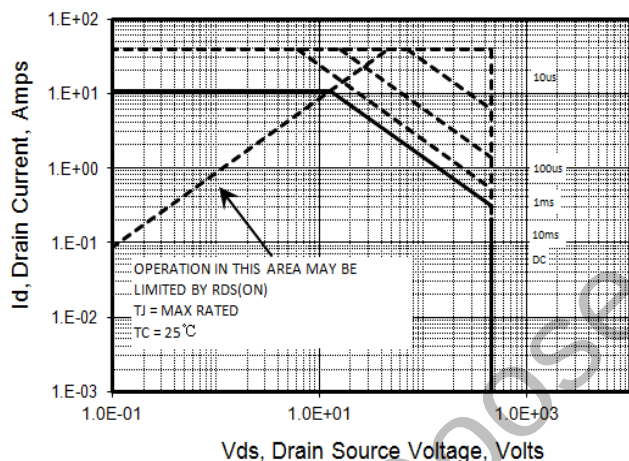


Figure 14. Typical Capacitance vs Drain-to-Source Voltage

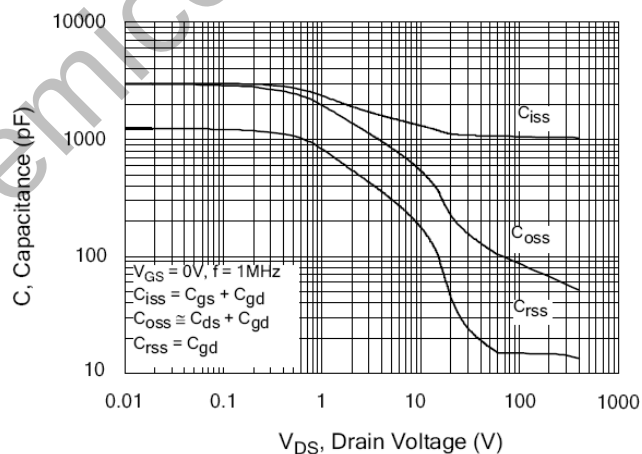


Figure 15. Typical Gate Charge vs Gate-to-Source Voltage

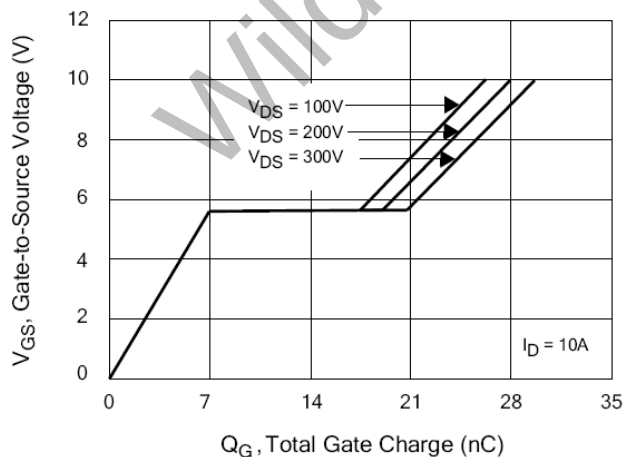
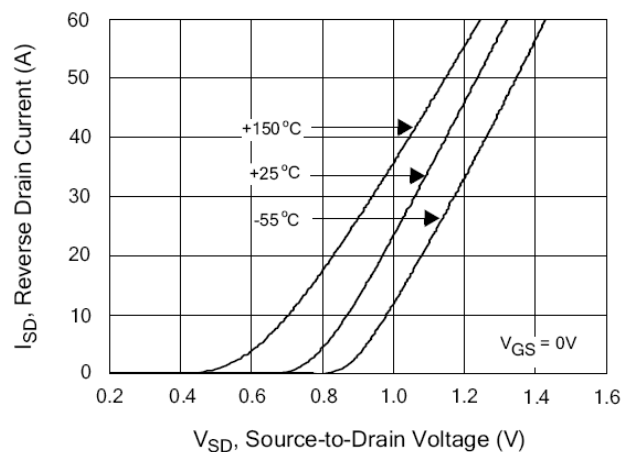
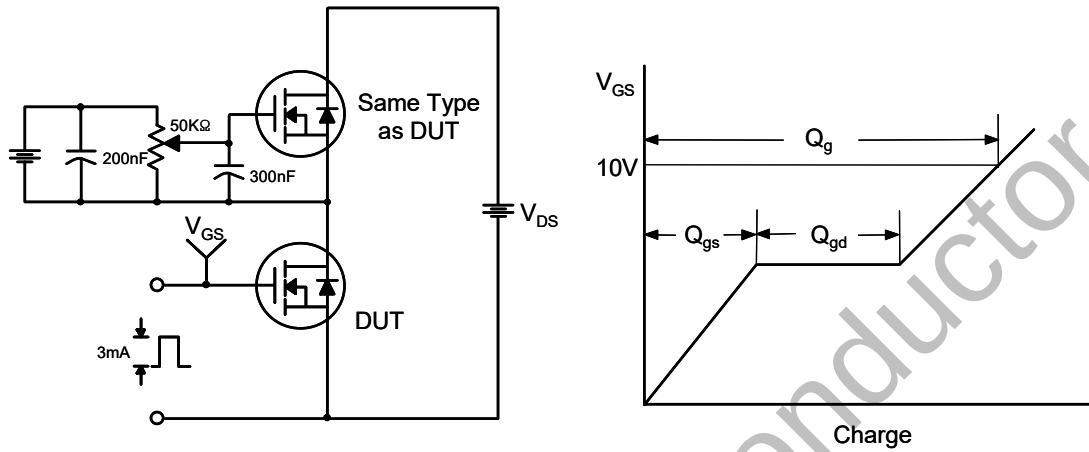


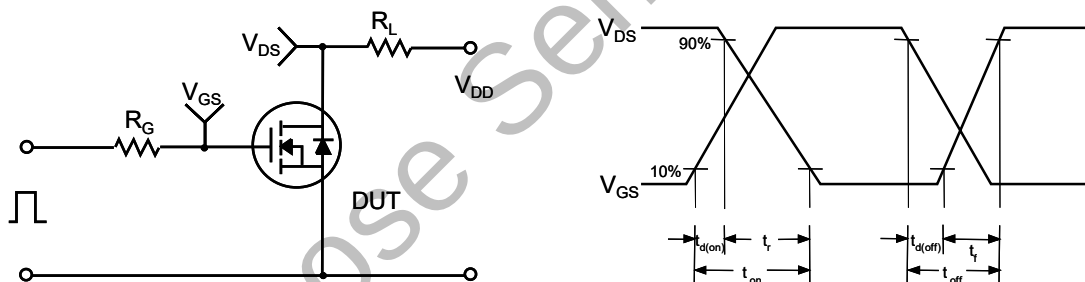
Figure 16. Typical Body Diode Transfer Characteristics



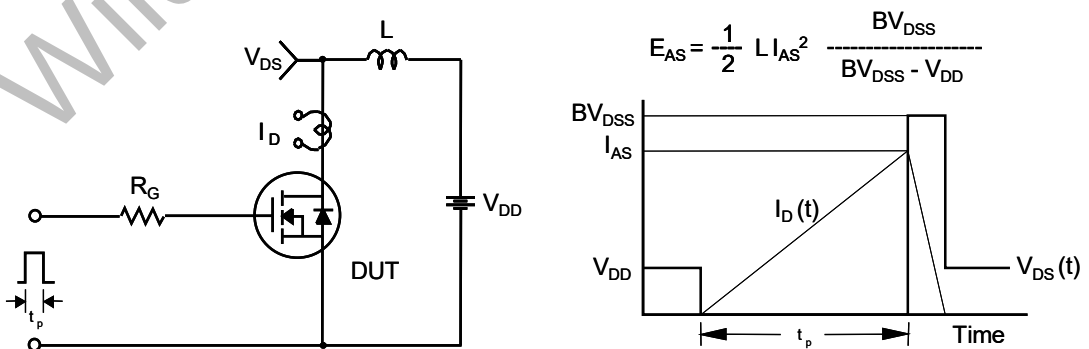
Gate Charge Test Circuit & Waveform

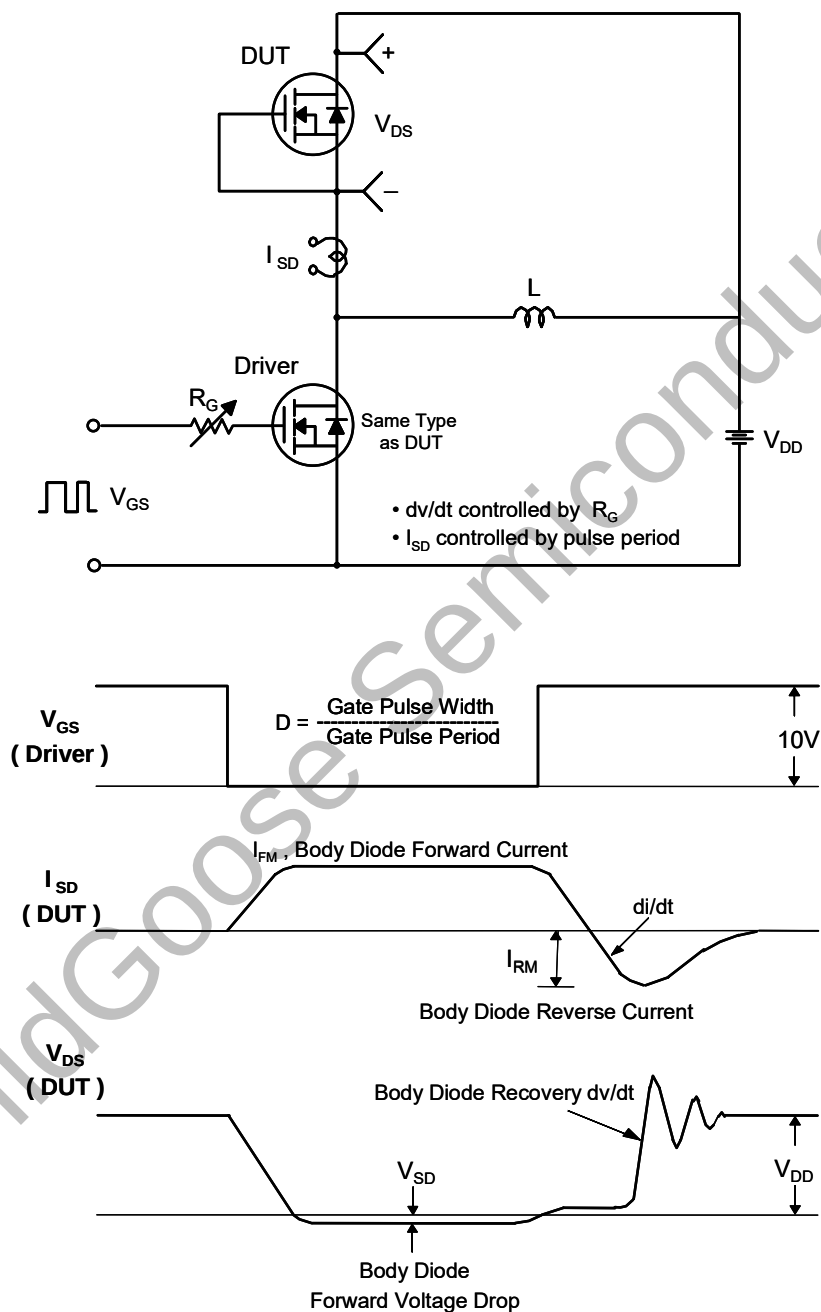


Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms

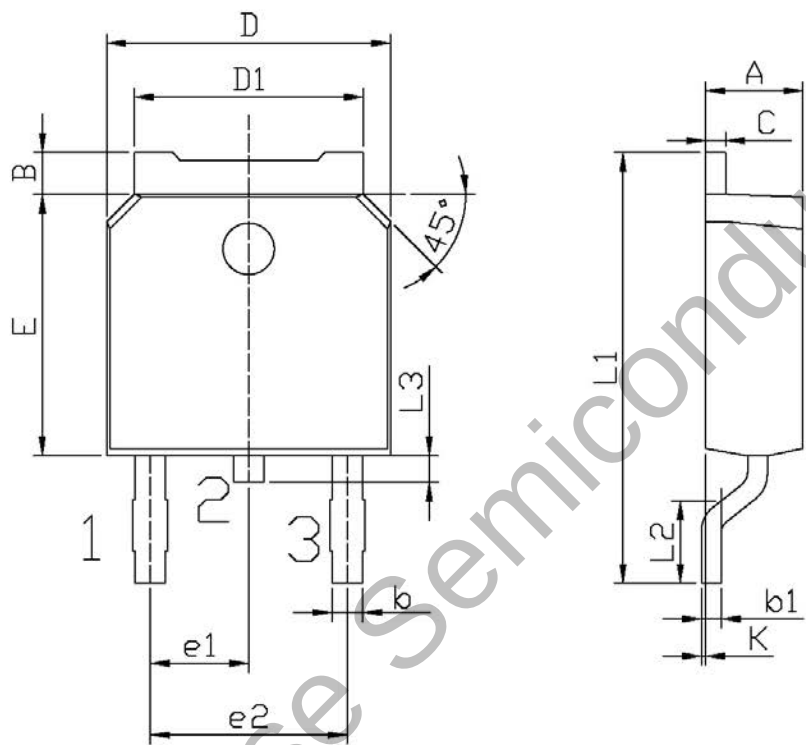


Peak Diode Recovery dv/dt Test Circuit & Waveforms

Package Dimension

TO-252

Unit:mm



Symbol	Dimensions In Millimeters		Symbol	Dimensions In Millimeters	
	Min	Max		Min	Max
A	2.20	2.40	E	5.95	6.25
B	0.95	1.25	e1	2.24	2.34
b	0.70	0.90	e2	4.43	4.73
b1	0.45	0.55	L1	9.85	10.35
C	0.45	0.55	L2	1.25	1.75
D	6.45	6.75	L3	0.60	0.90
D1	5.20	5.40	K	0.00	0.10