

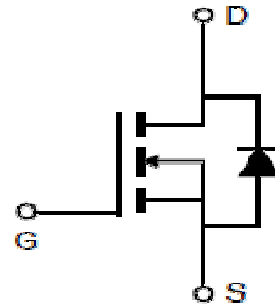
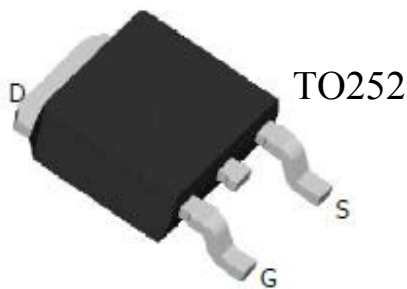
Features

- Lead free and Green Device Available
- Low Rds-on to Minimize Conductive Loss
- High avalanche Current

Application

- Power Tool
- Boost Converters for LED Lighting
- SMPS

V_{DSS}	30V
R_{DS(on)} V_{GS}=10V typ.	9mΩ
max.	11mΩ
R_{DS(on)} V_{GS}=4.5V typ.	11mΩ
max.	13mΩ
I_D @ V_{GS}=10V (Silicon limited)	45A
I_D (Package limited)	20A



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

Symbol	Param	Maximum	Unit	
V _{DSS}	Drain-to-Source Voltage	30	V	
V _{GSS}	Gate-to-Source Voltage	±20	V	
I _D V _{GS} =10V I _D V _{GS} =4.5V	Continuous Drain Current	T _C =25°C (Silicon limited)	45	A
		T _C =100°C (Silicon limited)	32	
		T _C =25°C (Package limited)	20	
		T _C =25°C (Silicon limited)	41	
		T _C =100°C (Silicon limited)	29	
		T _C =25°C (Package limited)	20	
I _{DP}	Pulsed Drain Current	T _C =25°C	-	A
I _{AS}	Avalanche Current (L=0.3mH)	11	A	
E _{AS}	Avalanche Energy (L=0.3mH)	18	mJ	
P _D	Maximum Power Dissipation	T _C =25°C	40	W
		T _C =100°C	20	
T _J , T _{STG}	Junction & Storage Temperature Range	-55~175	°C	

Thermal Characteristics

Symbol	Parameter	Max.	Unit
R _{thJC}	Thermal resistance, junction to case	3.7	°C/W
R _{thJA}	Thermal resistance, junction to ambient	86	°C/W

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

Symbol	Parameter	Test Conditions	Min.	Typ	Max.	Unit
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	30	—	—	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=30V, V_{GS}=0V$	—	—	1	μA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	0.8	—	1.8	V
I_{GSS}	Gate Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	—	—	± 100	nA
$R_{DS(on)}$	Drain-Source On-Resistance	$V_{GS}=10V, I_D=12A$	—	9	11	m Ω
		$V_{GS}=4.5V, I_D=10A$	—	11	13	
G_{fs}	Forward Transconductance	$V_{DS}=5V, I_D=12A$	—	43	—	S
Diode Characteristics						
V_{SD}	Diode Forward Voltage	$I_{SD}=25A, V_{GS}=0V$	—	0.8	1.3	V
I_S	Diode Continuous Forward Current		—	—	20	A
t_{rr}	Reverse Recovery Time	$I_S=12A,$ $di/dt=100A/\mu s$	—	13	—	nS
Q_{rr}	Reverse Recovery Charge		—	1.6	—	nC
Dynamic Characteristics						
R_G	Gate Resistance	$V_{GS}=0V, V_{DS}=0V,$ Frequency=1MHz	—	2.5	—	Ω
C_{iss}	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=15V,$ F=1MHz	—	1250	—	pF
C_{oss}	Output Capacitance		—	168	—	
C_{rss}	Reverse Transfer Capacitance		—	127	—	
$t_{d(on)}$	Turn-On Delay Time	$V_{DS}=15V,$ $I_D=1A,$ $R_g=3\ \Omega,$ $V_{GS}=4.5V$	—	15	—	nS
t_r	Rise Time		—	25	—	
$t_{d(off)}$	Turn-Off Delay Time		—	39	—	
t_f	Fall Time		—	22	—	
Gate Charge Characteristics						
Q_g	Total Gate Charge	$V_{DS}=25V,$ $V_{GS}=10V,$ $I_D=14A$	—	23	—	nC
Q_{gs}	Gate-to-Source Charge		—	2.2	—	
Q_{gd}	Gate-to-Drain Charge		—	5.5	—	

Typical Operating Characteristics

Figure 1. Typ. Output Characteristics

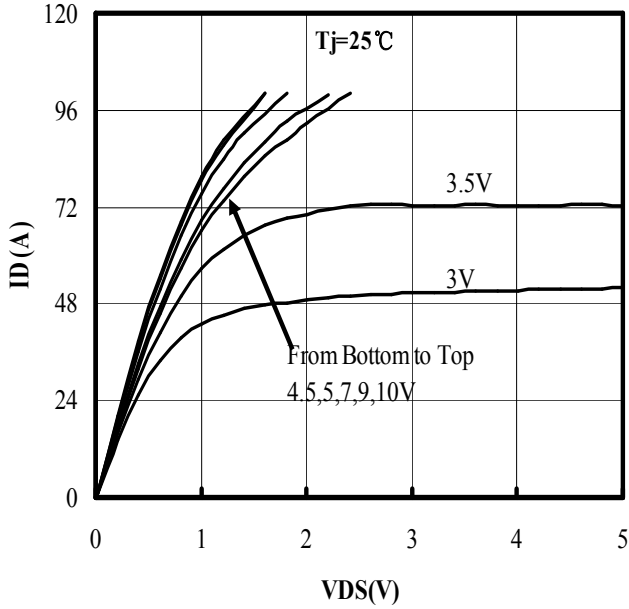


Figure 2. Typ. Output Characteristics

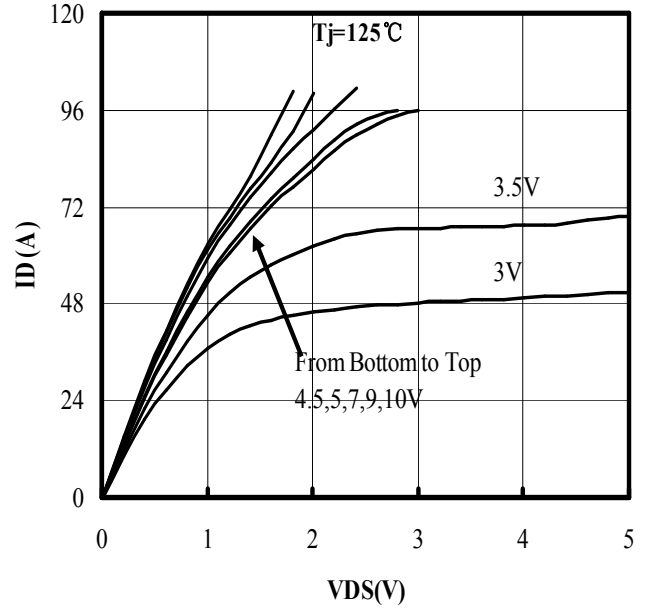


Figure 3. Transfer Characteristics

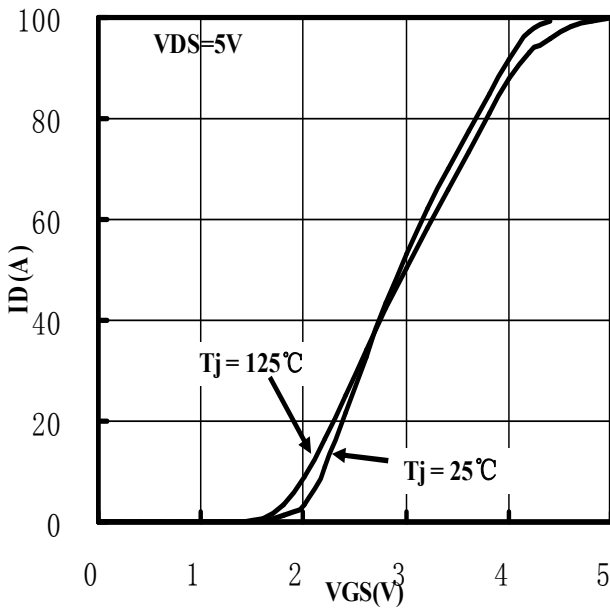
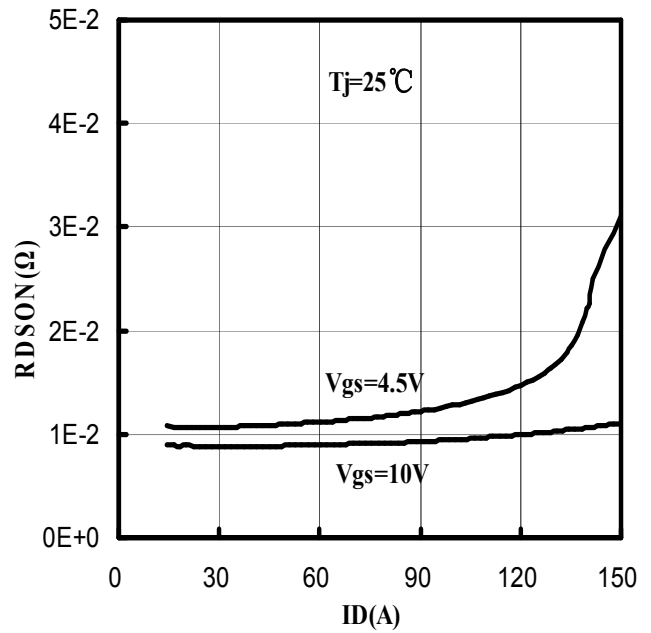


Figure 4. Rdson vs. Drain Current Characteristics



Typical Operating Characteristics

Figure 5. Gate Threshold Voltage Characteristics

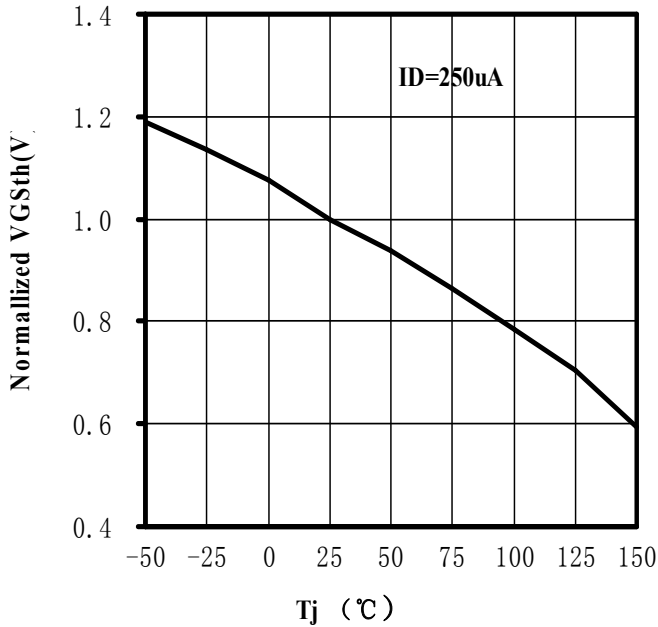


Figure 7. Rdson vs. VGS Characteristics

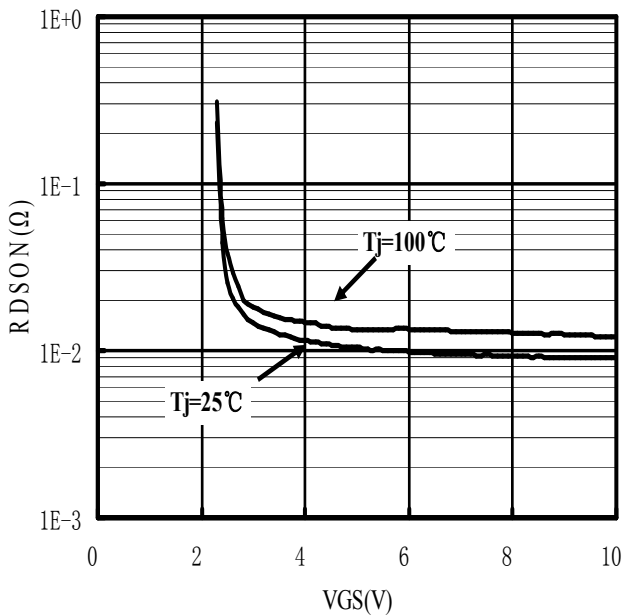


Figure 6. Rdson vs. Junction Tem Characteristics

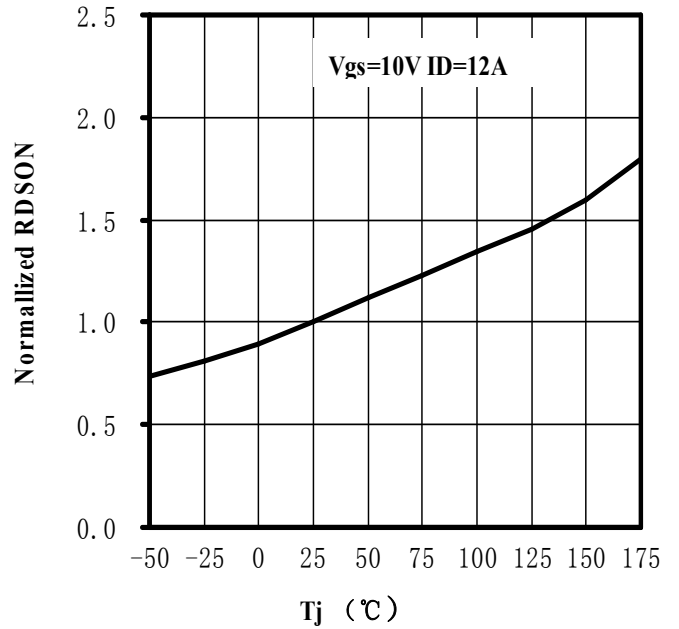
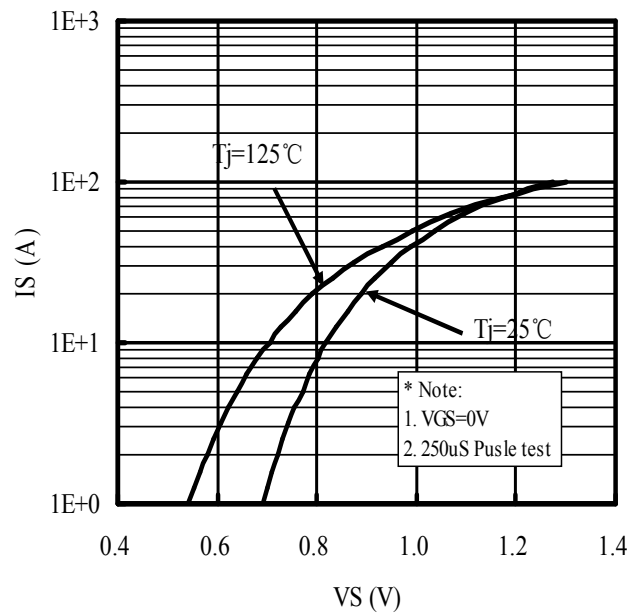


Figure 8. IS vs. VSD Characteristics



Typical Operating Characteristics

Figure 9. Gate Charge Characteristics

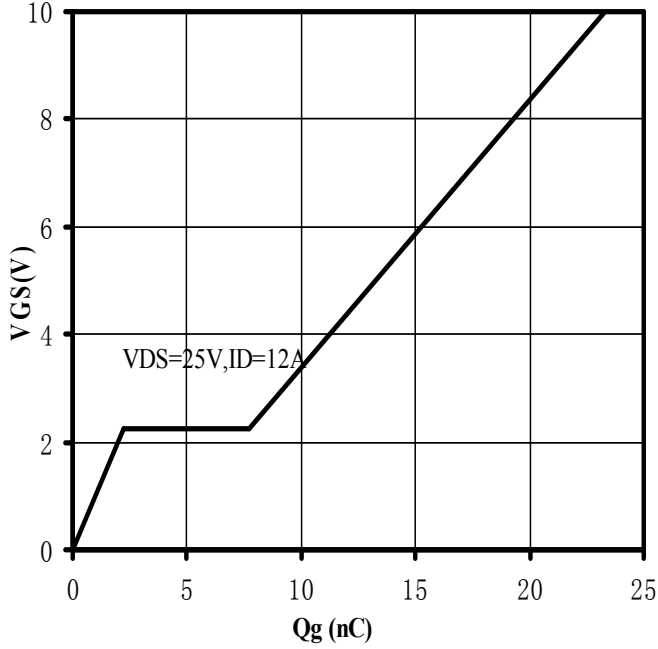


Figure 10. Capacitance Characteristics

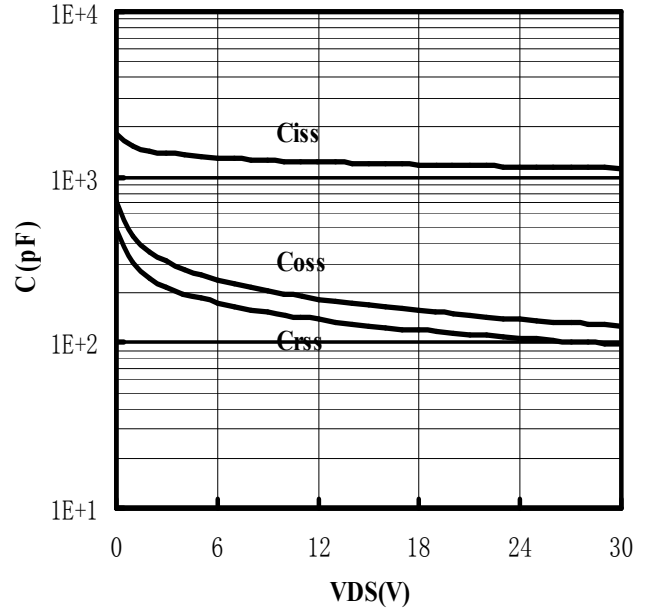


Figure 11. Thermal Resistance Characteristics

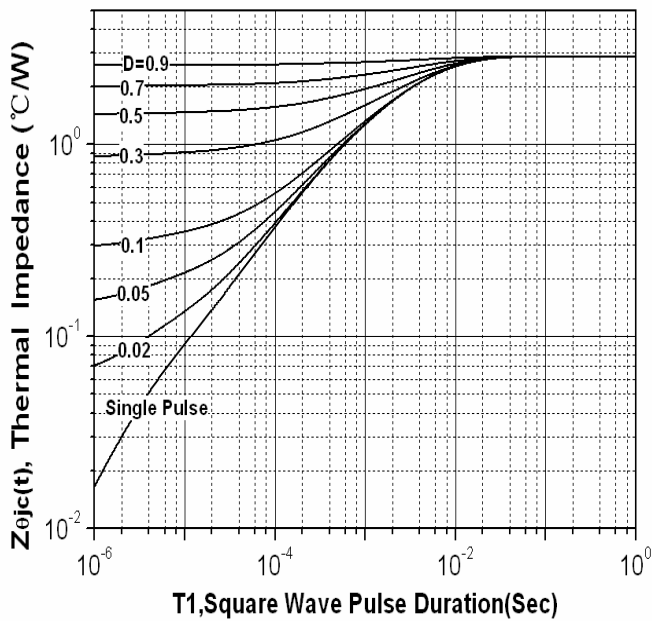
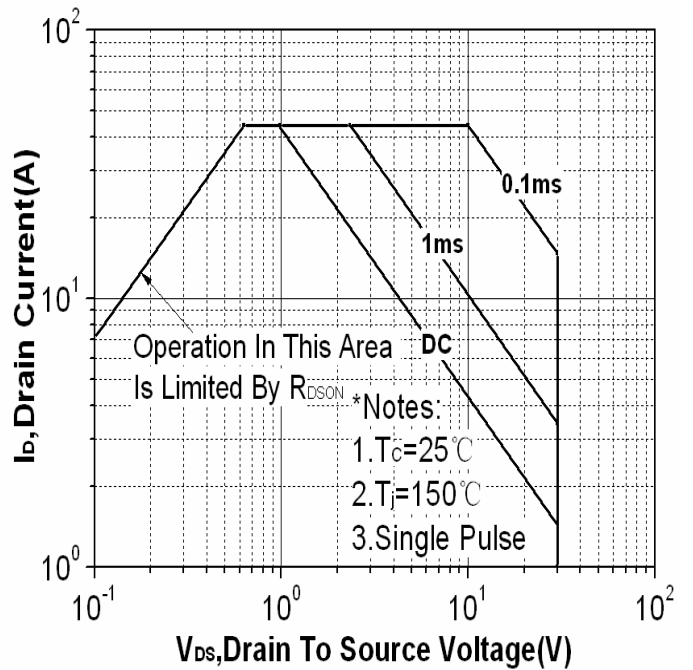


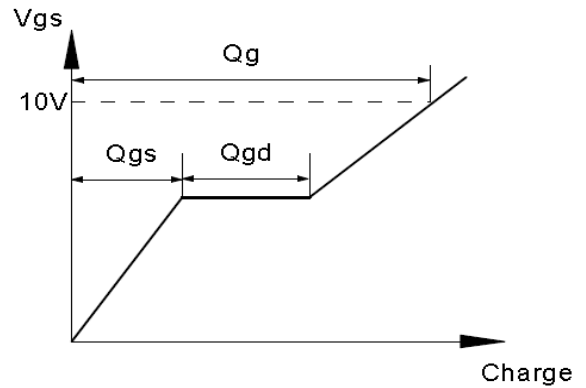
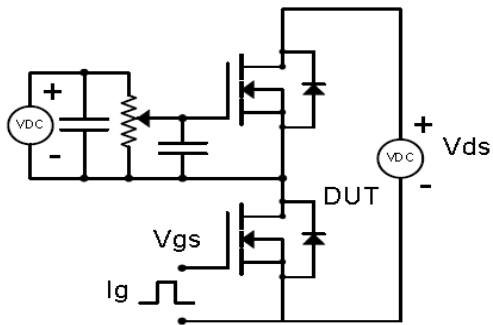
Figure 12. SOA



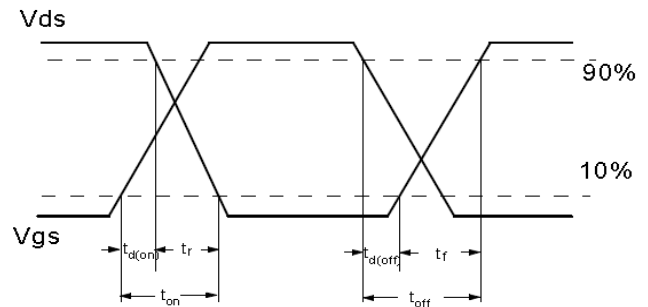
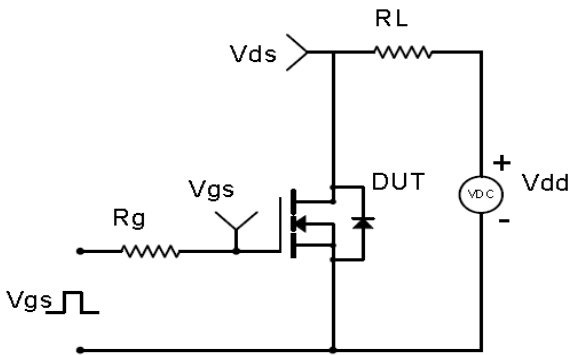
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Test Circuit & Waveform

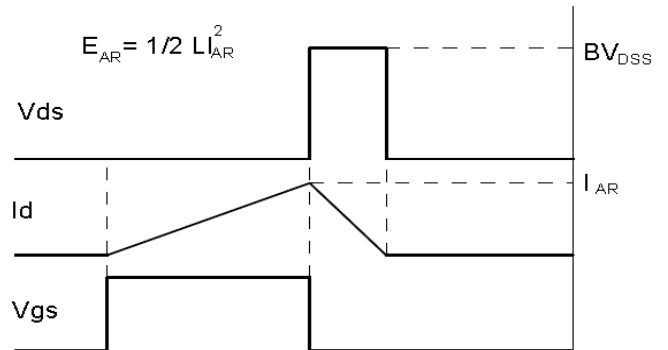
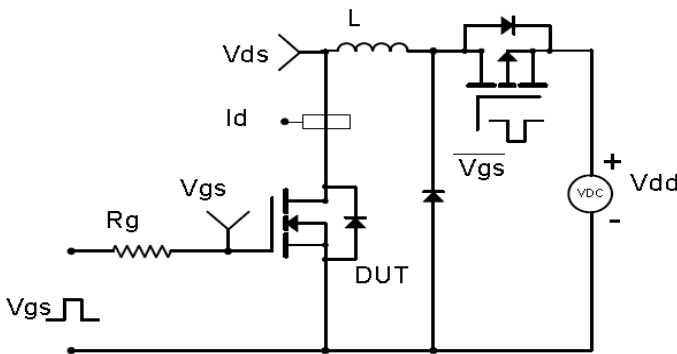
Gate Charge Test Circuit & Waveform



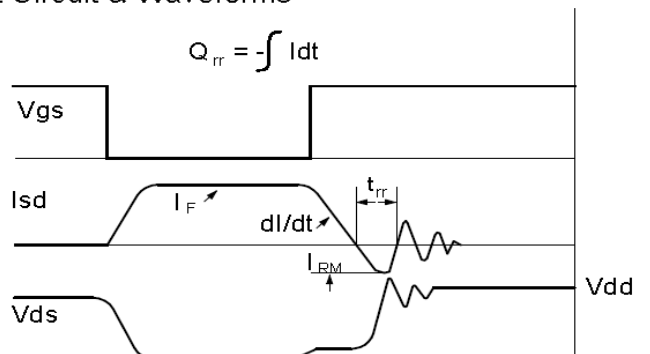
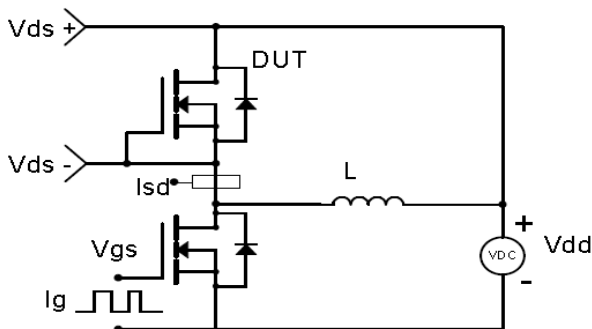
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

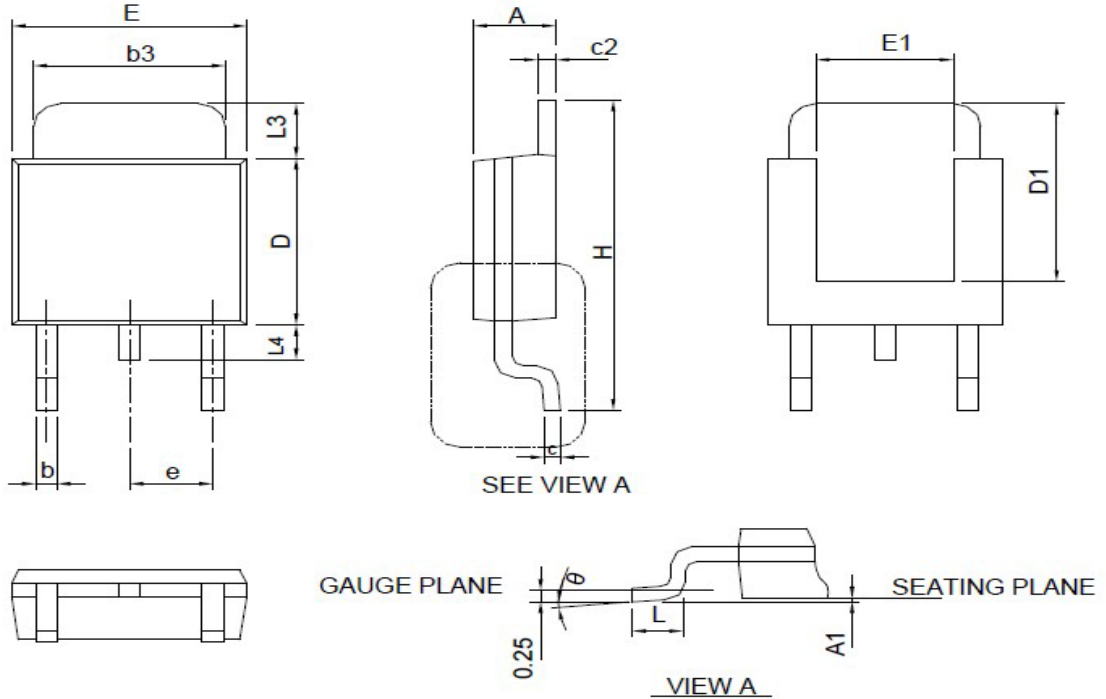


Diode Recovery Test Circuit & Waveforms



Package Information

TO-252-3



DIMENSIONS	TO-252-3			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	2.18	2.39	0.086	0.094
A1		0.13		0.005
b	0.50	0.89	0.020	0.035
b3	4.95	5.46	0.195	0.215
c	0.46	0.61	0.018	0.024
c2	0.46	0.89	0.018	0.035
D	5.33	6.22	0.210	0.245
D1	4.57	6.00	0.180	0.236
E	6.35	6.73	0.250	0.265
E1	3.81	6.00	0.150	0.236
e	2.29 BSC		0.090 BSC	
H	9.40	10.41	0.370	0.410
L	0.90	1.78	0.035	0.070
L3	0.89	2.03	0.035	0.080
L4		1.02		0.040
θ	0°	8°	0°	8°

Note : Follow JEDEC TO-252 .