

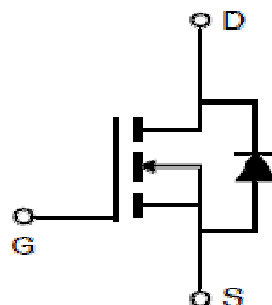
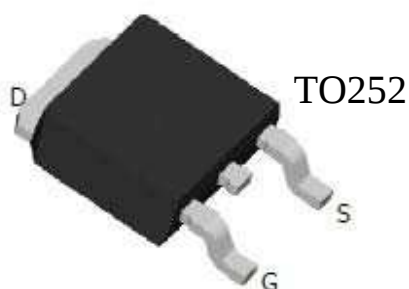
Features

- 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 =250uA	30	—	—	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =30V,V _{GS} =0V	—	—	1	uA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} ,I _D =250uA	0.8	—	1.8	V
I _{GSS}	Gate Leakage Current	V _{GS} =±20V, V _{DS} =0V	—	—	±100	nA
R _{DS(on)}	Drain-Source On-Resistance	V _{GS} =10V, I _D =12A	—	9	11	mΩ
		V _{GS} =4.5V, I _D =10A	—	11	13	
G _{fs}	Forward Transconductance	VDS=5V, ID=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	IS=12A, di/dt=100A/us	—	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	VGS=0V, VDS=15V, F=1MHz	—	1250	—	pF
C _{oss}	Output Capacitance		—	168	—	
C _{rss}	Reverse Transfer Capacitance		—	127	—	
t _{d(on)}	Turn-On Delay Time	VDS=15V, ID=1A, Rg=3 Ω, VGS=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	VDS=25V, VGS=10V, ID=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

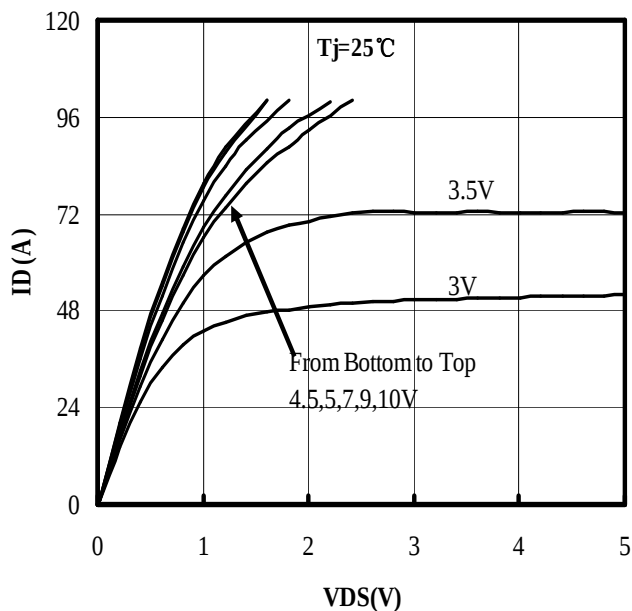


Figure 2. Typ. Output Characteristics

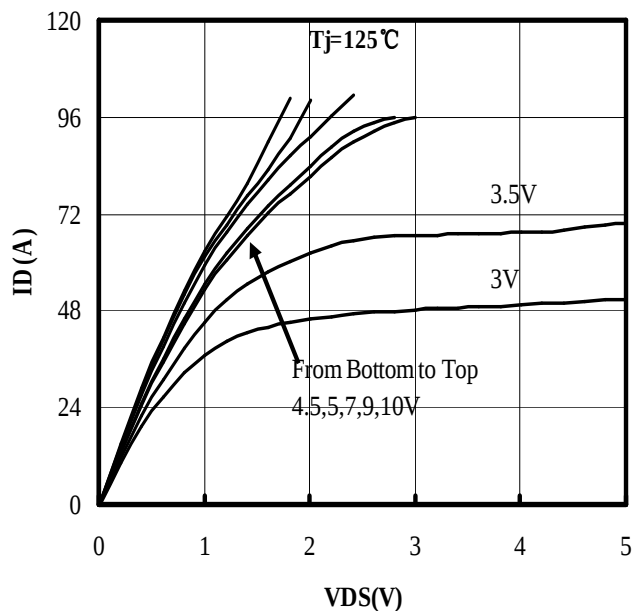


Figure 3. Transfer Characteristics

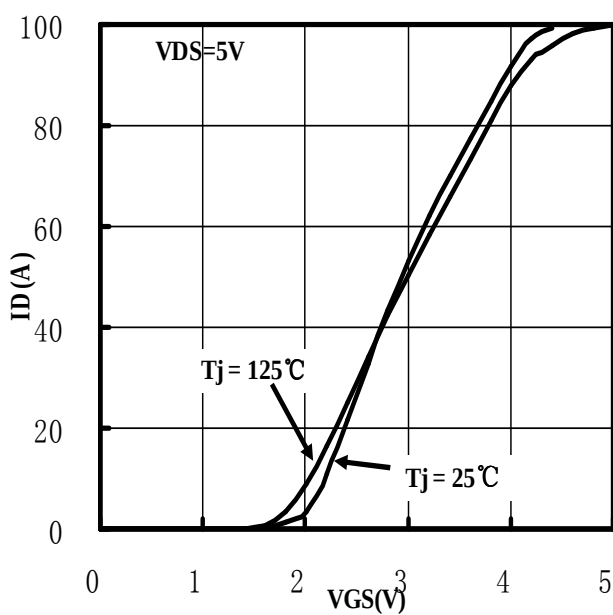
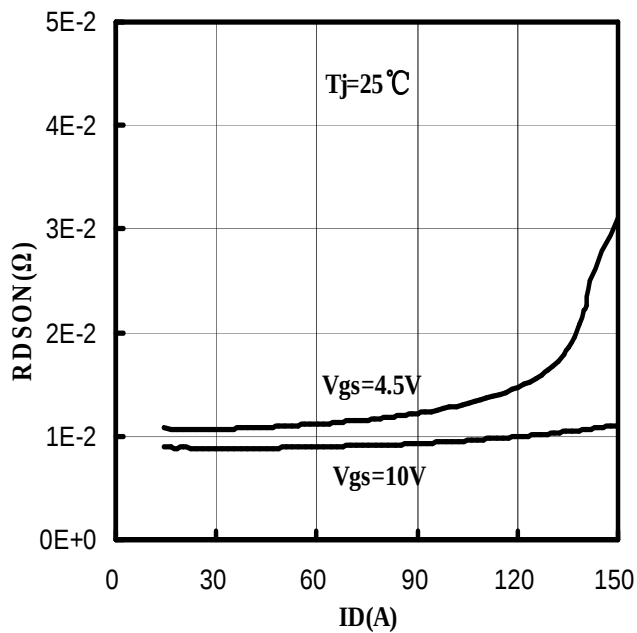


Figure 4. Rdson vs. Drain Current Characteristics



Typical Operating Characteristics

Figure 5. Gate Threshold Voltage Characteristics

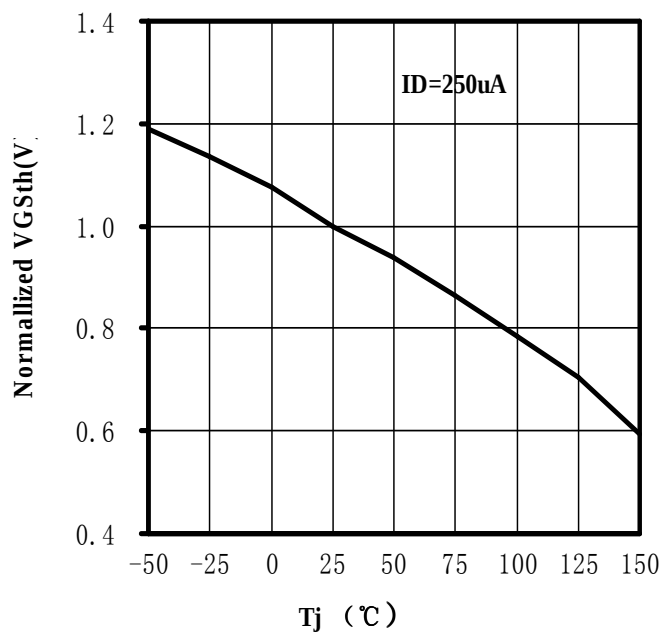


Figure 6. Rdson vs. Junction Tem Characteristics

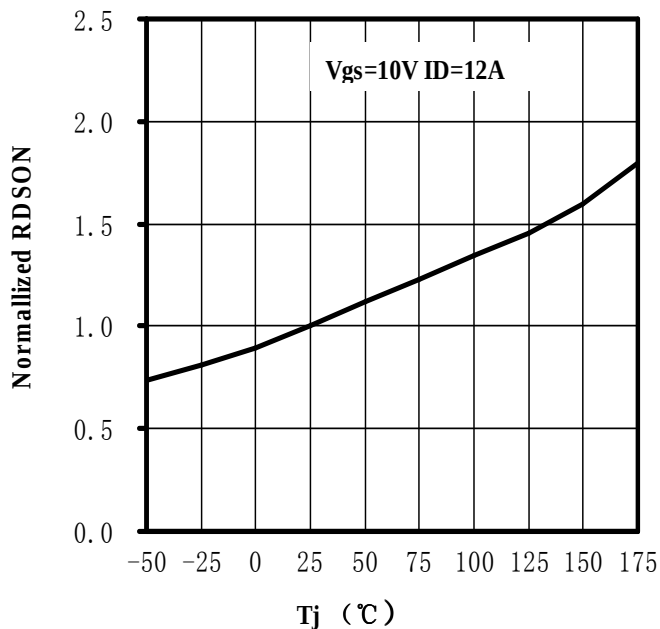


Figure 7. Rdson vs. VGS Characteristics

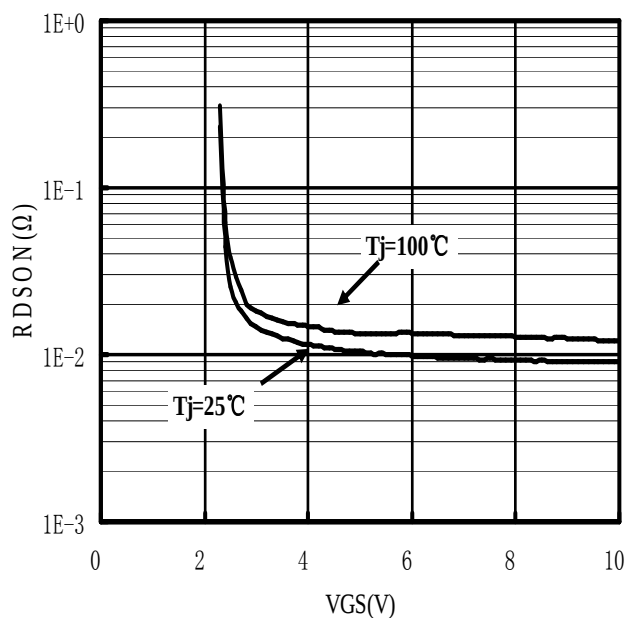
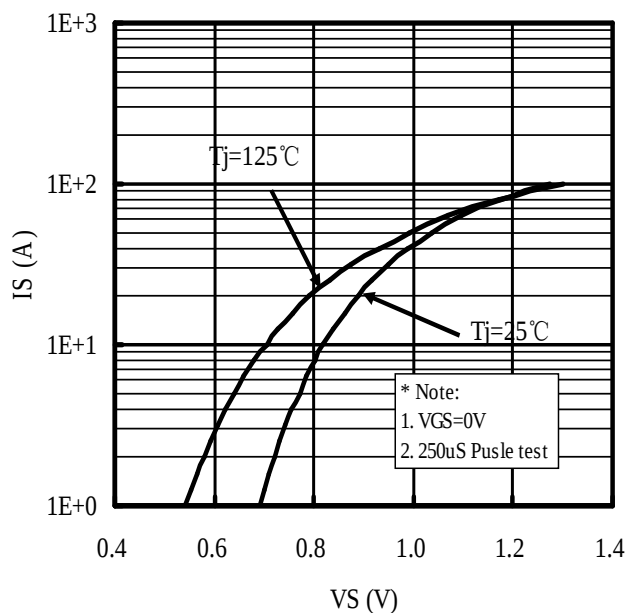


Figure 8. IS vs. VSD Characteristics



Typical Operating Characteristics

Figure 9. Gate Charge Characteristics

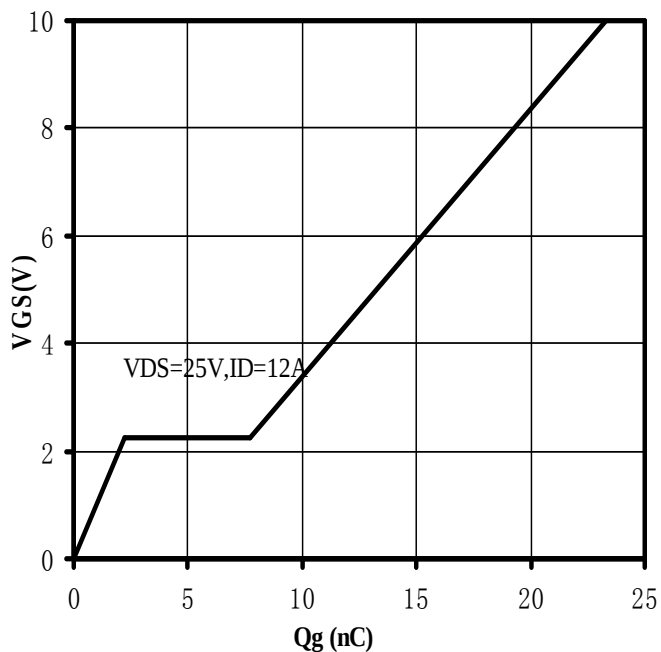


Figure 10. Capacitance Characteristics

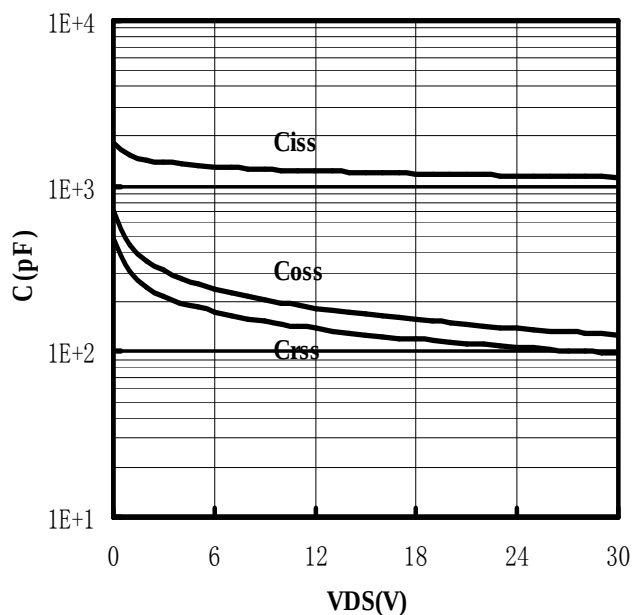


Figure 11. Thermal Resistance Characteristics

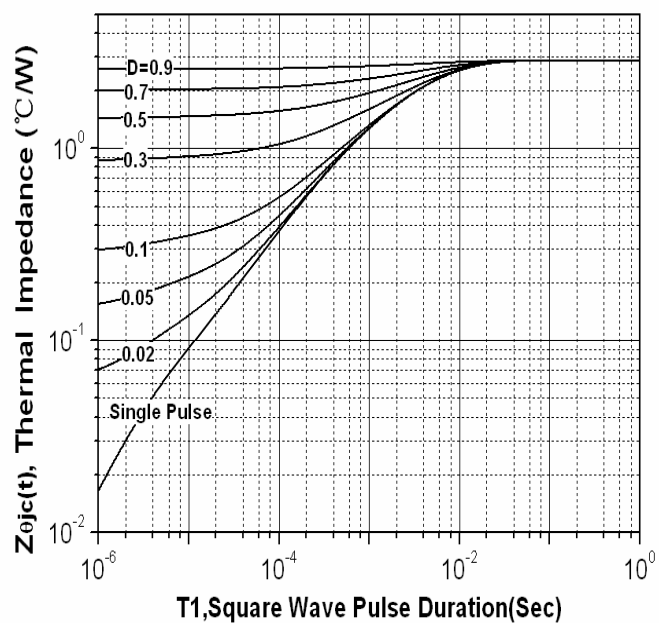
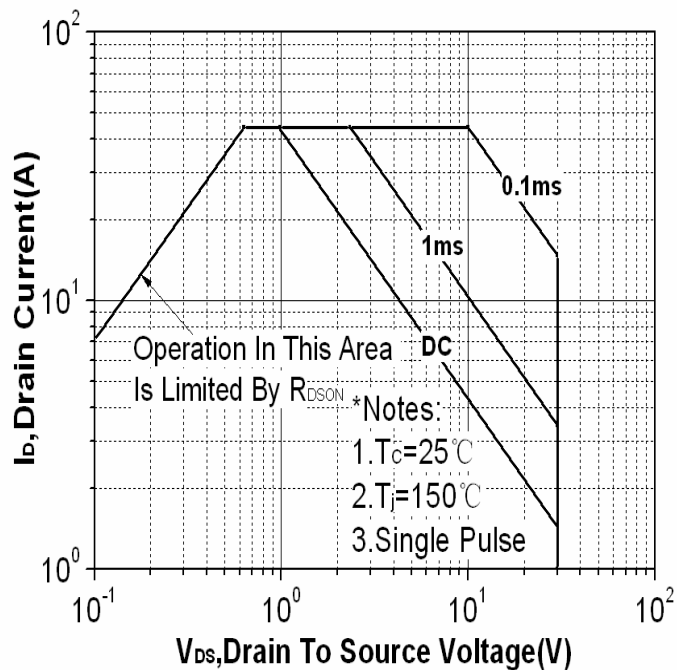
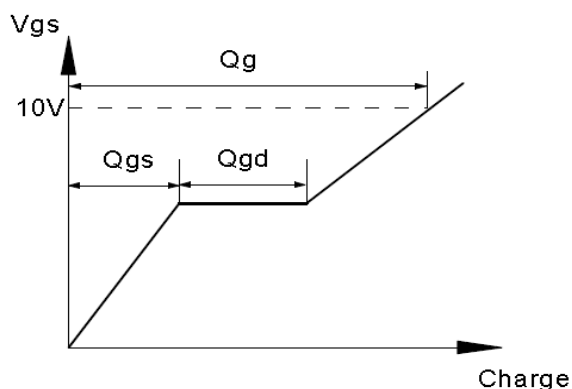
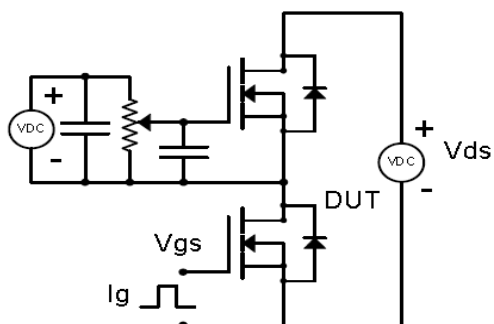


Figure 12. SOA

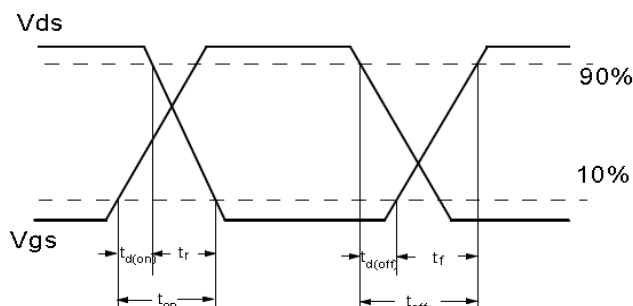
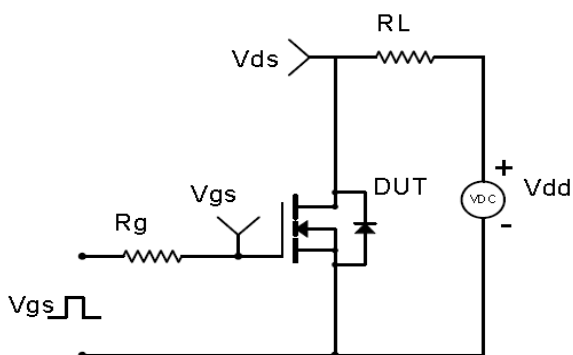


Test Circuit & Waveform

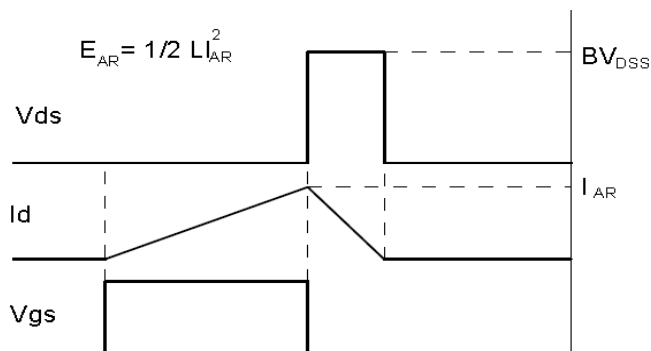
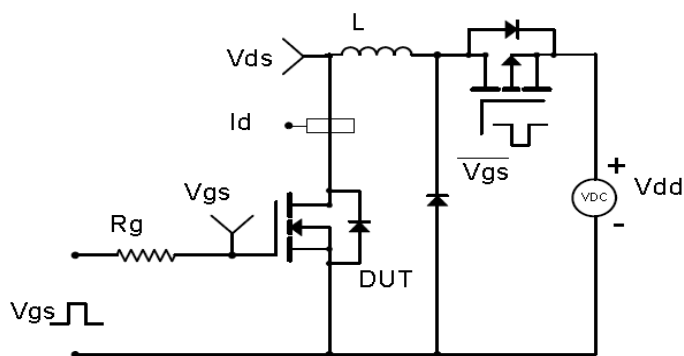
Gate Charge Test Circuit & Waveform



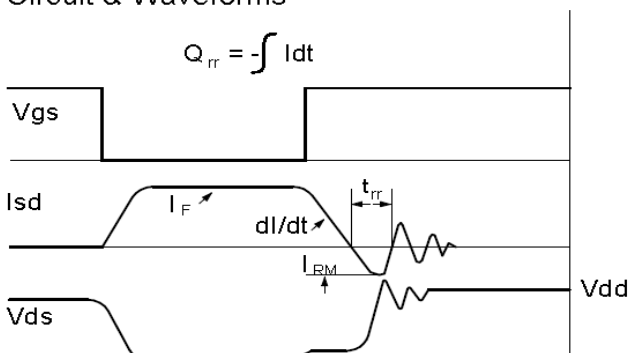
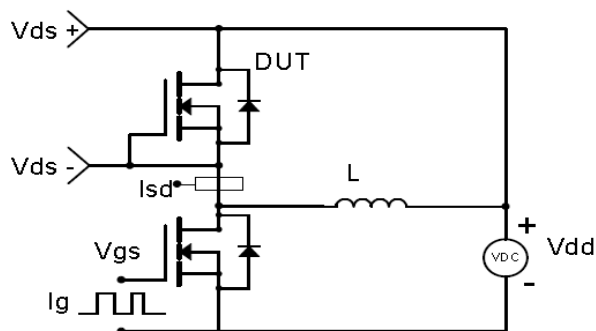
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

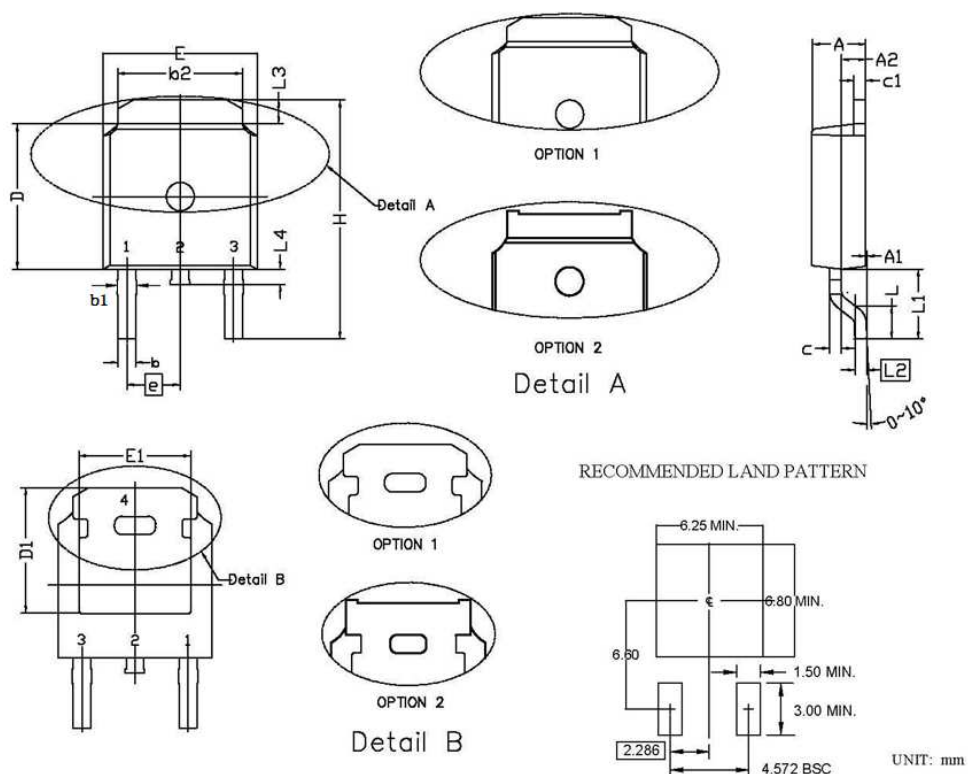


Diode Recovery Test Circuit & Waveforms



Package Information

Package Outline: TO-252-3L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.15	2.45	0.085	0.096
A1	0.00	0.15	0.000	0.006
A2	0.76	1.36	0.030	0.054
b	0.60	0.91	0.024	0.036
b1	0.65	1.15	0.026	0.045
b2	5.00	5.64	0.197	0.222
c	0.45	0.61	0.018	0.024
c1	0.36	0.66	0.014	0.026
D	5.80	6.30	0.228	0.248
D1	5.00	6.00	0.197	0.236
e	2.29 BSC.		0.090 BSC.	
E	6.30	6.90	0.248	0.272
E1	4.55	5.30	0.179	0.209
H	9.40	10.48	0.370	0.413
L	1.18	1.70	0.046	0.067
L1	2.92 REF		0.115 REF	
L2	0.36	0.66	0.014	0.026
L3	0.72	1.35	0.028	0.053
L4	0.60	1.20	0.024	0.047

Revision History

Revision	Date	Major changes
1.0	2018-5-18	Release of formal version
2.0	2021-9-3	Update Package Outline