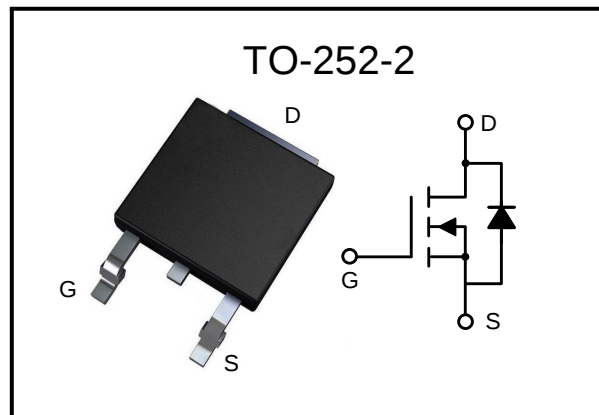


Features

- $V_{(BR)DSS}=20V$, $I_D=80A$
- Extremely Low $R_{DS(on)}$:
 $R_{DS(on)}@V_{GS}=4.5V$, TYP=3m Ω
- Good stability and uniformity
- Excellent package for good heat dissipation
- Advanced trench technology
- Low gate charge

Package



Applications

- Load Switch
- Power Management
- PWM Application

Absolute Maximum Ratings ($T_J=25^{\circ}C$ unless otherwise specified)

Symbol	Parameter		Value	Units
V_{DSS}	Drain-Source Voltage		20	V
I_D	Drain Current	$T_C=25^{\circ}C$	80	A
		$T_C=100^{\circ}C$	52	
I_{DM}	Drain Current-Pulsed ⁽¹⁾		320	A
V_{GSS}	Gate-Source Voltage		± 12	V
E_{AS}	Single Pulsed Avalanche Energy ⁽²⁾		90	mJ
P_D	Power Dissipation	$T_C=25^{\circ}C$	57	W
		Derate above $25^{\circ}C$	0.54	W/ $^{\circ}C$
$R_{\theta JA}$	Thermal Resistance from Junction to Ambient		72.91	$^{\circ}C/W$
$R_{\theta JC}$	Thermal Resistance From Junction to Case		2.201	$^{\circ}C/W$
T_J	Junction Temperature		-55 to +150	$^{\circ}C$
T_{stg}	Storage Temperature Range		-55 to +150	$^{\circ}C$



Electrical Characteristics ($T_J=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Static Characteristics						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D =250uA	20	—	—	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 19.5V, V _{GS} =0V	—	—	1	uA
Gate-Body Leakage Current	I _{GSS}	V _{GS} = ±12V, V _{DS} =0V	—	—	±100	nA
Gate Threshold Voltage	V _{GS(TH)}	V _{GS} = V _{DS} , I _D =250uA	0.5	0.7	1.1	V
Static Drain-source On Resistance	R _{DS(ON)}	V _{GS} =4.5V, I _D =30A	—	3.0	4	mΩ
		V _{GS} =2.5V, I _D =20A	—	3.8	5.6	
Dynamic Characteristics						
Input capacitance	C _{iss}	V _{DS} =10V, V _{GS} =0V, f = 1MHz	—	2720	—	pF
Output capacitance	C _{oss}		—	415	—	
Reverse transfer capacitance	C _{rss}		—	395	—	
Turn-on delay time	T _{d(on)}	V _{DD} =10V, V _{GS} =4.5V, R _G =3Ω, I _D =30A ^(3,4)	—	10	—	ns
Turn-on Rise time	T _r		—	39	—	
Turn -Off Delay Time	T _{d(off)}		—	71	—	
Turn -Off Fall time	T _f		—	33	—	
Gate to Drain Charge	Q _g	V _{DS} =10V, V _{GS} =4.5V, I _D =30A ^(3,4)	—	37.2	—	nC
Gate to Source Charge	Q _{gs}		—	4.4	—	
Gate to Drain Charge	Q _{gd}		—	12	—	
Drain-Source Diode Characteristics						
Continuous Diode Forward Current	I _S	—	—	—	80	A
Pulsed Diode Forward Current	I _{SM}	—	—	—	320	A
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =30A	—	—	1.2	V
Reverse Recovery Time	t _{rr}	I _F =30A, dI _F /dt=100A/us	—	26.6	—	ns
Reverse Recovery Charge	Q _{rr}		—	9.8	—	nC

Notes:

- (1) Repetitive Rating: pulse width limited by maximum junction temperature.
- (2) E_{AS} Condition: $V_{DD} = 10V, V_G=4.5V, R_G=25\Omega, L=0.5mH$, Starting $T_J=25^{\circ}\text{C}$.
- (3) $I_{SD} \leq 30A, di_F/dt=100A/\mu s, V_{DD} \leq V_{(BR)DSS}$, Starting $T_J=25^{\circ}\text{C}$.
- (4) Pulsed Test: pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.



Typical Performance Characteristics ($T_J = 25^\circ\text{C}$, unless otherwise noted)

Figure 1: Power Dissipation Derating Curve

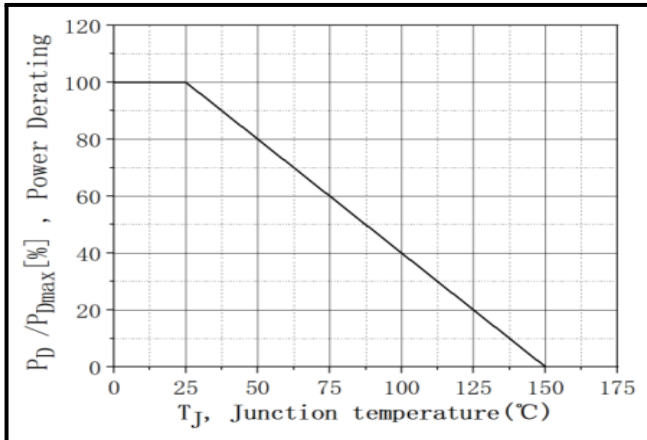


Figure 2: Avalanche Energy Derating Curve vs. Junction Temperature

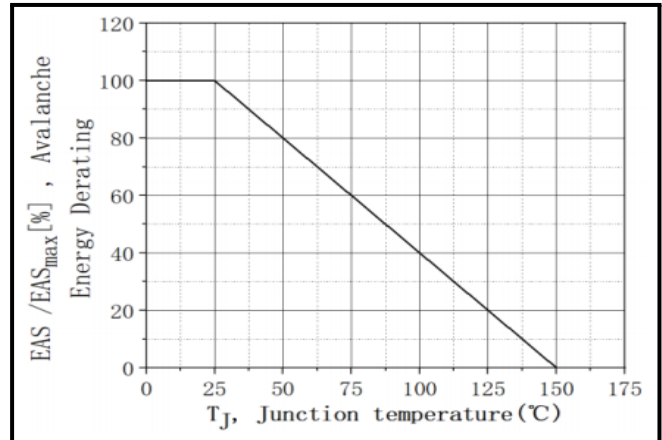


Figure 3: Typical Output Characteristics

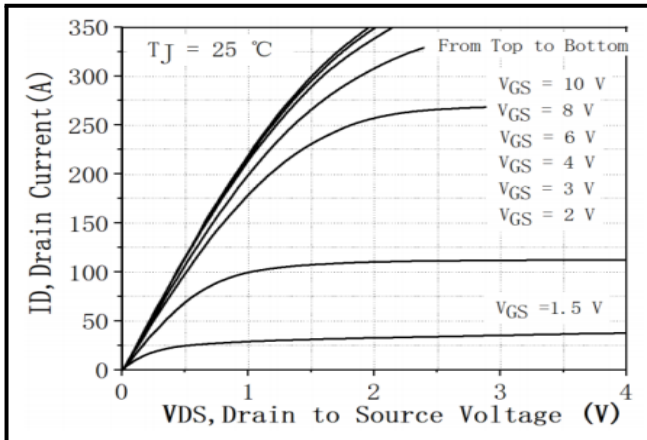


Figure 4: Typical Transfer Characteristics

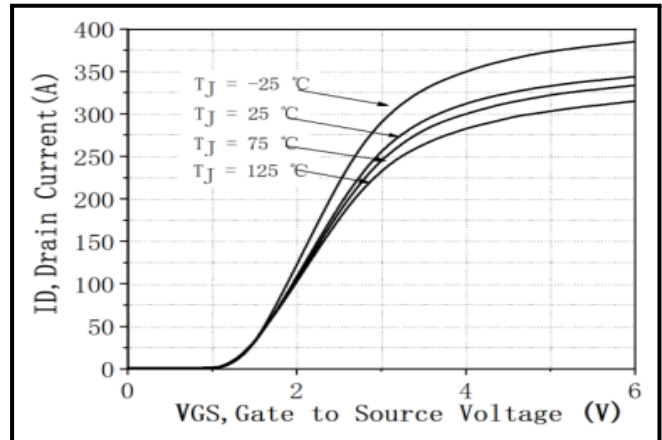


Figure 5: State Resistance vs. Drain Current

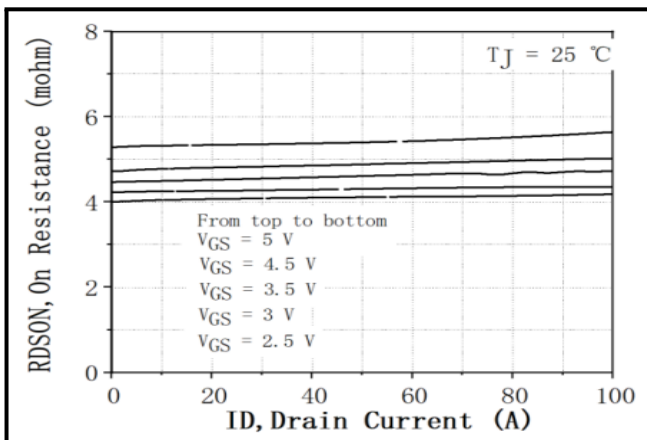
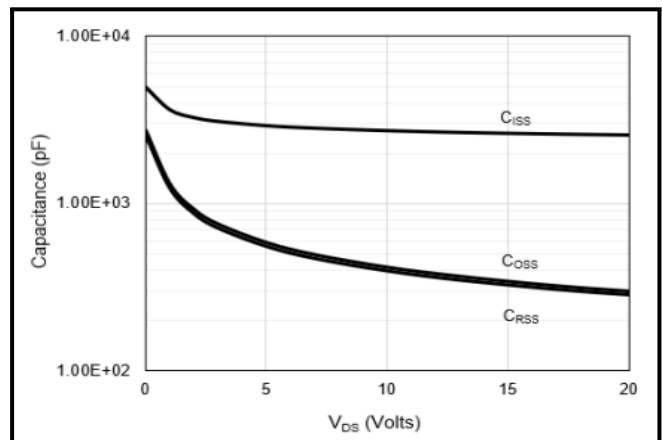


Figure 6: Typical Capacitance vs. Drain Source Voltage



Typical Performance Characteristics ($T_J = 25^\circ\text{C}$, unless otherwise noted)

Figure 7: Dynamic Input Characteristics

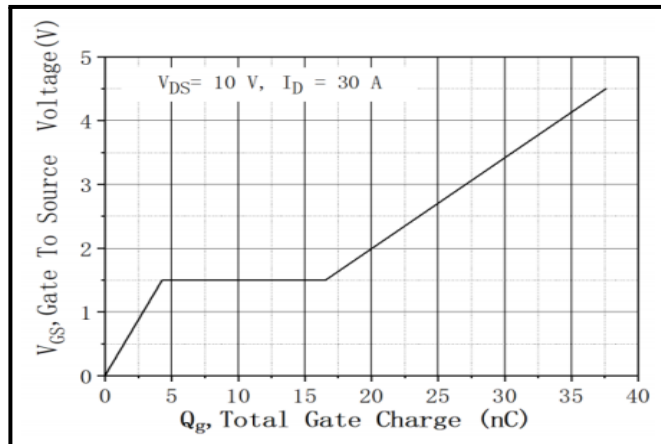


Figure 8: Breakdown Voltage vs. Junction Temperature

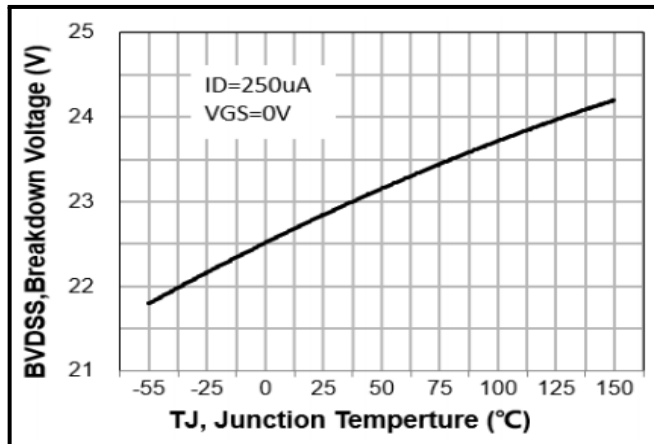


Figure 9: Gate Threshold Voltage vs. Junction Temperature

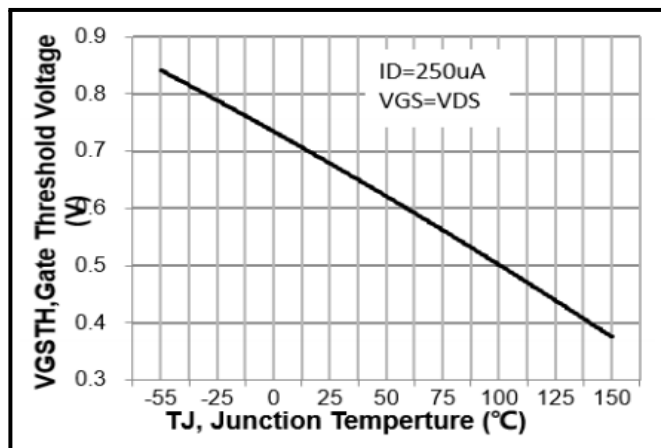
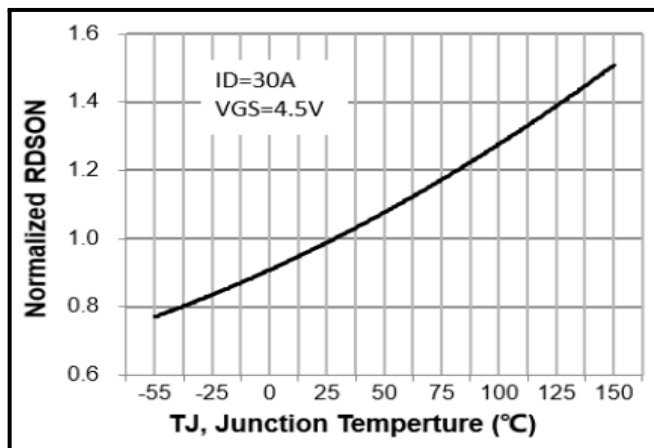


Figure 10: On-Resistance Variation vs. Junction Temperature



Typical Performance Characteristics ($T_J = 25^\circ\text{C}$, unless otherwise noted)

Figure 11: Maximum Drain Current vs. Case Temperature

ture

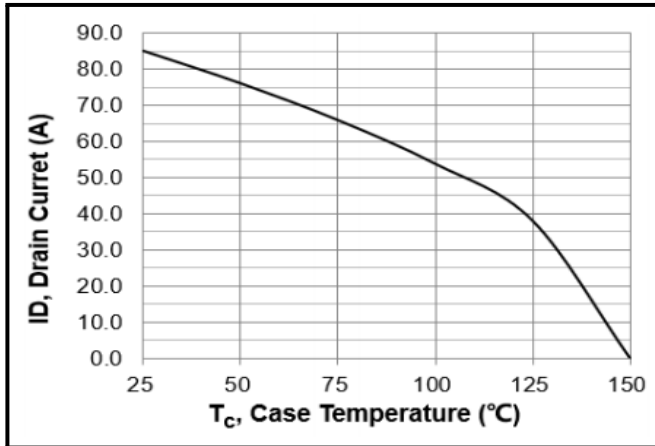


Figure 12: Safe Operating Area

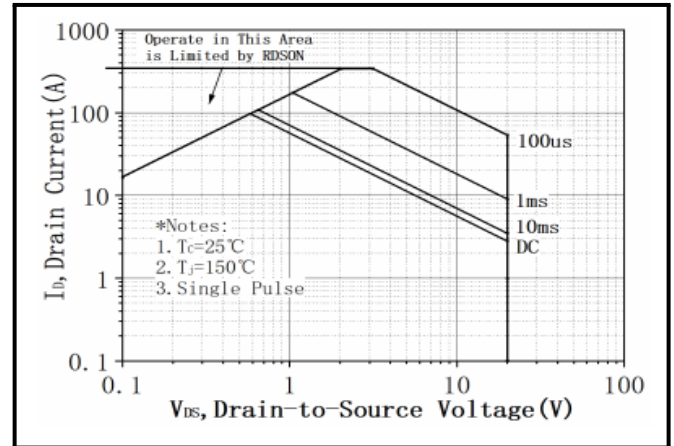
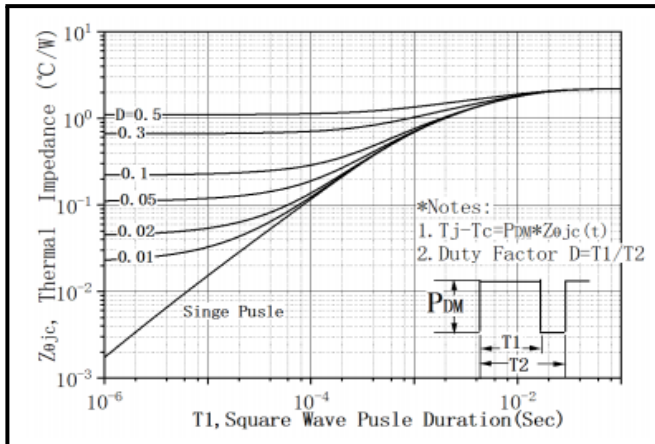


Figure 13: Transient Thermal Response Curve



Test Circuit

Figure A: Gate Charge Test Circuit and Waveform

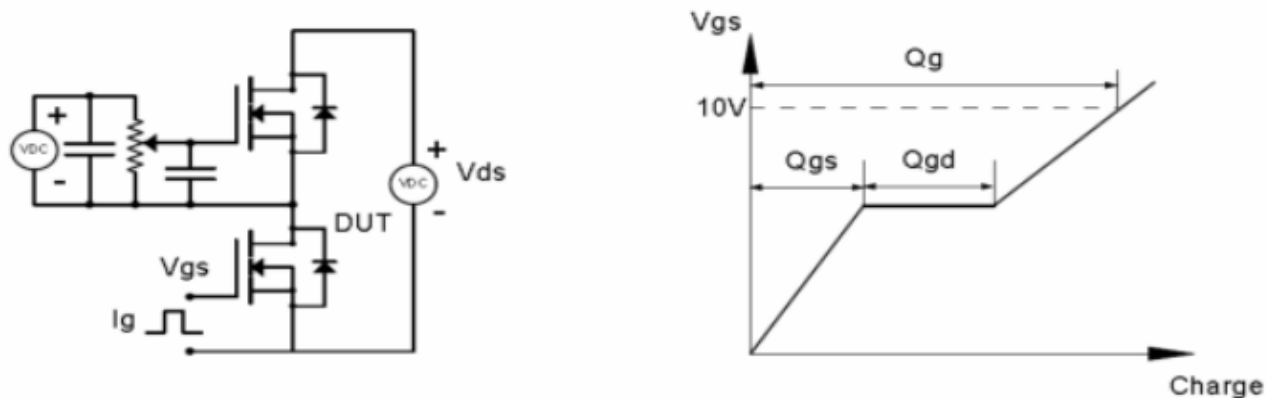


Figure B: Resistive Switching Test Circuit and Waveform

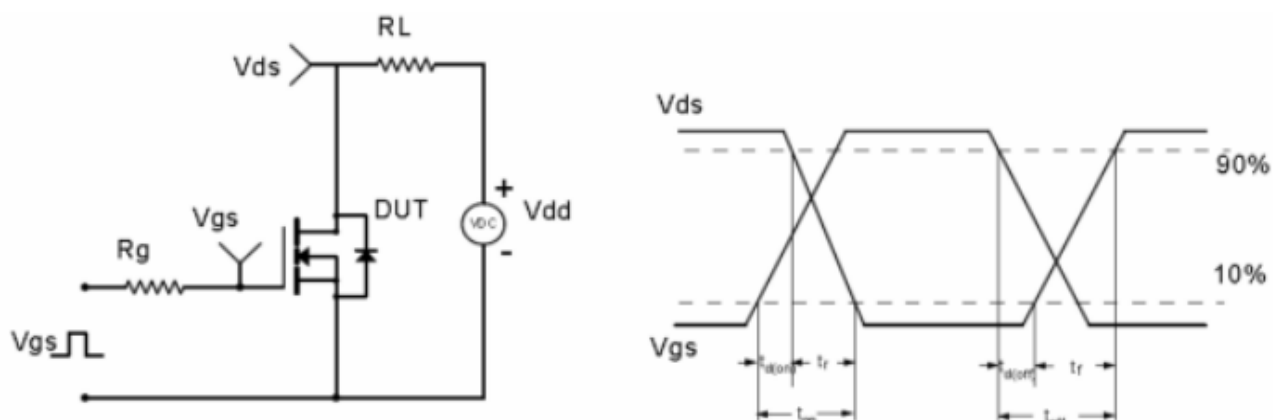
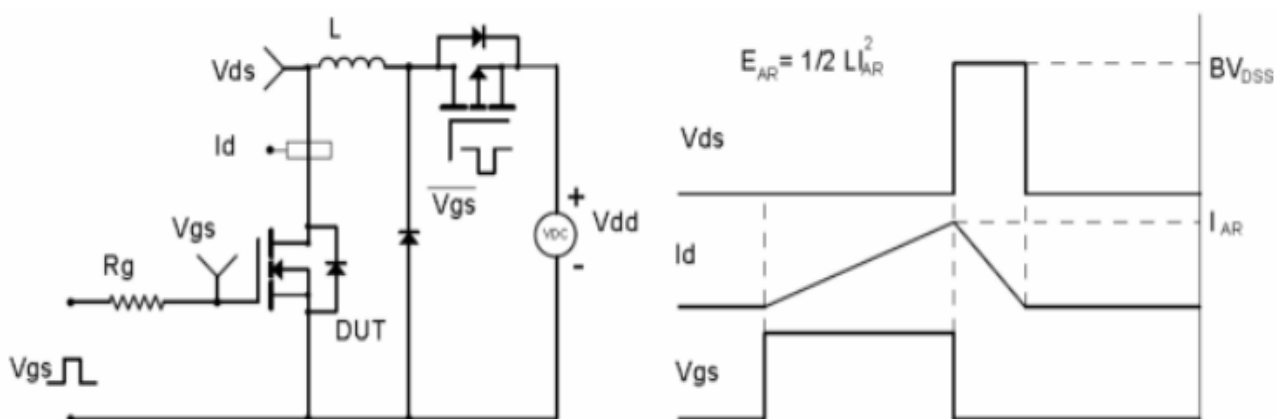
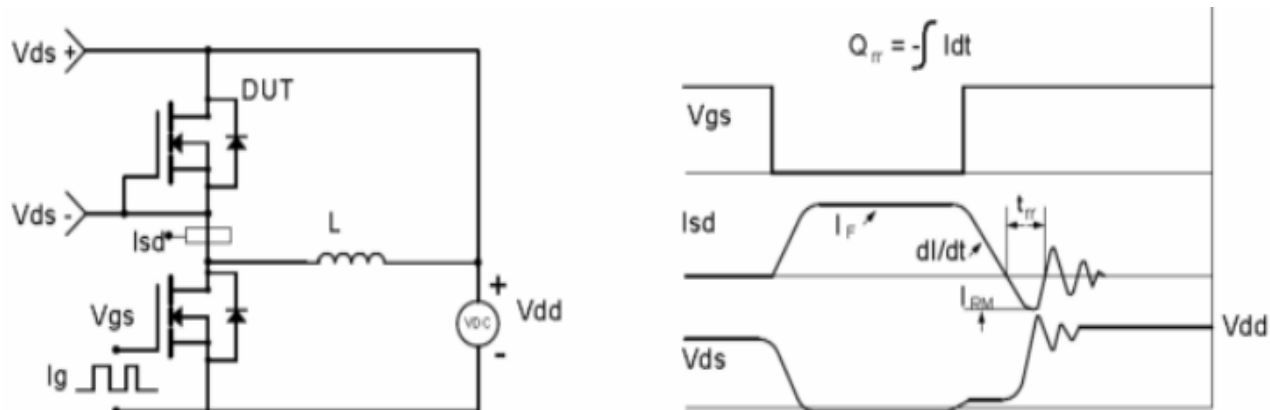


Figure C: Unclamped Inductive Switching Test Circuit and Waveform

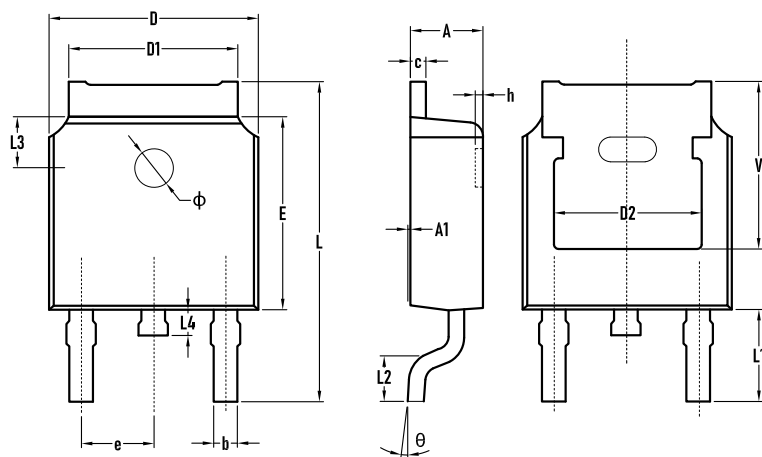


Test Circuit

Figure D: Diode Recovery Test Circuit and Waveform



Packaging Tape - TO-252-2



Symbol	Millimeters		Inches	
	MIN.	MAX.	MIN.	MAX.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.660	0.860	0.026	0.034
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 TYP.		0.190 TYP.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.800	10.400	0.386	0.409
L1	2.900 TYP.		0.114 TYP.	
L2	1.400	1.700	0.055	0.067
L3	1.600 TYP.		0.063 TYP.	
L4	0.600	1.000	0.024	0.039
φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.350 TYP.		0.211 TYP.	

