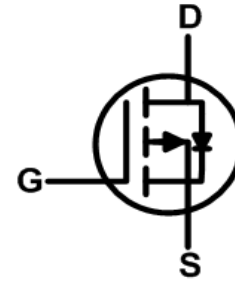




Features

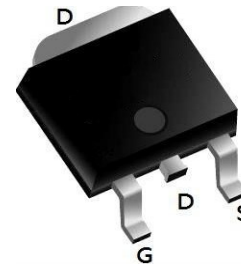
- Split Gate Trench MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$



Applications

- Battery switching application
- Hard switched and high frequency circuits
- Power management

TO- 252Pin Configuration



Product Summary

BVDSS	RDSON	ID
-100V	45mΩ	-30A

Absolute Maximum Ratings:

Symbol	Parameter	Value	Units
V_{DSS}	Drain-to-Source Voltage	-100	V
I_D	Continuous Drain Current	$T_C = 25\text{ }^\circ\text{C}$	-30
	Continuous Drain Current	$T_C = 100\text{ }^\circ\text{C}$	-17.8
I_{DM}^{a1}	Pulsed Drain Current	-112	A
E_{AS}^{a2}	Single pulse avalanche energy	225	mJ
I_{AR}	Single pulse avalanche current	30	A
V_{GS}	Gate-to-Source Voltage	± 20	V
P_D	Power Dissipation	83	W
T_J, T_{stg}	Operating Junction and Storage Temperature Range	150, -55 to 150	$^\circ\text{C}$
T_L	Maximum Temperature for Soldering	260	$^\circ\text{C}$

Thermal Characteristics:

Symbol	Parameter	Value	Units
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	1.5	$^\circ\text{C/W}$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	102	$^\circ\text{C/W}$



Electrical Characteristics (TA= 25°C unless otherwise specified) :

Static Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
V _{DSS}	Drain to Source Breakdown Voltage	V _{GS} =0V, I _D =-250μA	-100	--	--	V
I _{DSS}	Drain to Source Leakage Current	V _{DS} =-100V, V _{GS} =0V	--	--	1	μA
I _{GSS(F)}	Gate to Source Forward Leakage	V _{GS} =-20V, V _{DS} =0V	--	--	100	nA
I _{GSS(R)}	Gate to Source Reverse Leakage	V _{GS} =+20V, V _{DS} =0V	--	--	-100	nA
V _{GS(TH)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250μA	-1.5	-2.0	-2.5	V
R _{DS(ON)1}	Drain-to-Source Resistance	On- V _{GS} =-10V, I _D =-20A	--	45	55	mΩ
R _{DS(ON)2}	Drain-to-Source Resistance	On- V _{GS} =-4.5V, I _D =-10A	--	55	65	mΩ

Dynamic Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
C _{iss}	Input Capacitance	V _{GS} = 0V V _{DS} = -50V f = 1.0MHz	--	2100	--	pF
C _{oss}	Output Capacitance		--	168	--	
C _{rss}	Reverse Transfer Capacitance		--	26	--	
R _g	Gate resistance	V _{GS} = 0V, V _{DS} Open	--	2.8	--	Ω

Resistive Switching Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
t _{d(ON)}	Turn-on Delay Time	I _D = -20A V _{DS} = -50V V _{GS} = -10V R _G = 5Ω	--	8.2	--	ns
t _r	Rise Time		--	19.6	--	
t _{d(OFF)}	Turn-Off Delay Time		--	62.8	--	
t _f	Fall Time		--	41.4	--	
Q _g	Total Gate Charge	V _{GS} = -10V V _{DS} = -50V I _D = -20A	--	38	--	nC
Q _{gs}	Gate Source Charge		--	6.4	--	
Q _{gd}	Gate Drain Charge		--	6.8	--	

Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
V _{SD}	Diode Forward Voltage	I _S =-20A, V _{GS} =0V	--	--	-1.2	V
t _{rr}	Reverse Recovery time	I _S =-20A, V _{DD} =-50V dI/dt=100A/μs	--	68	--	ns
Q _{rr}	Reverse Recovery Charge		--	200	--	nC

a1 : Repetitive rating; pulse width limited by maximum junction temperature

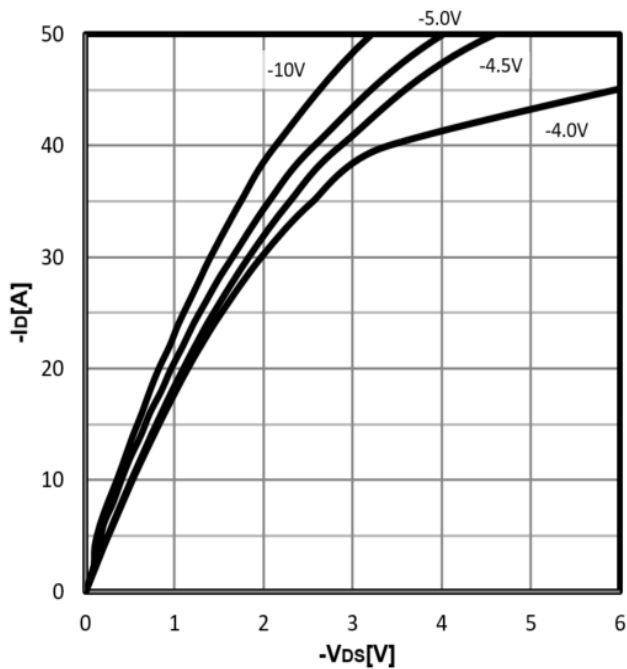
a2 : L=0.5mH, R_g=25Ω, Starting T_j=25 °C



Characteristics Curve:

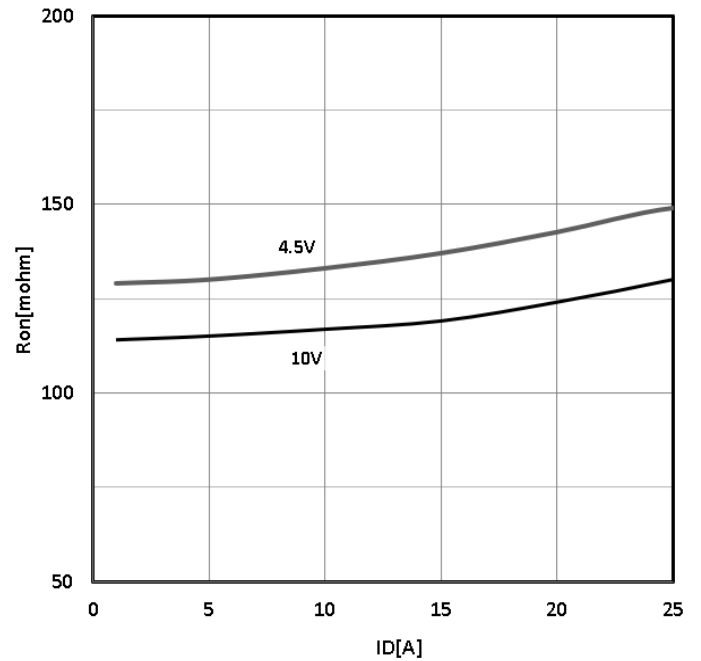
Typ. output characteristics

$$-I_D = f(-V_{DS})$$



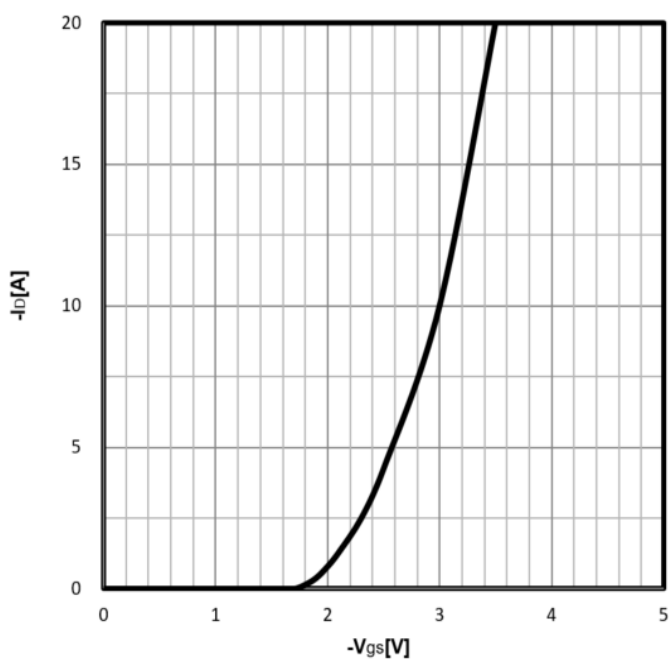
Typ. drain-source on resistance

$$R_{DS(on)} = f(-I_D)$$



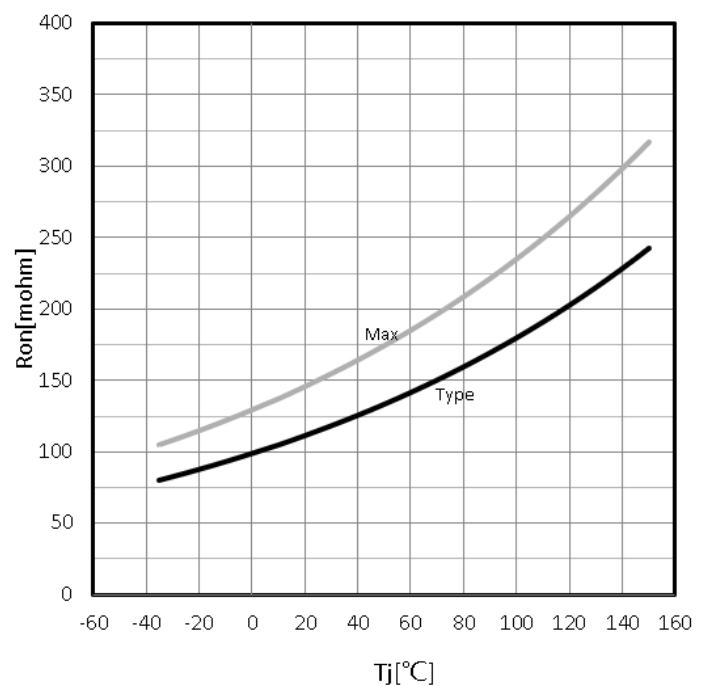
Typ. transfer characteristics

$$-I_D = f(-V_{GS})$$



Drain-source on-state resistance

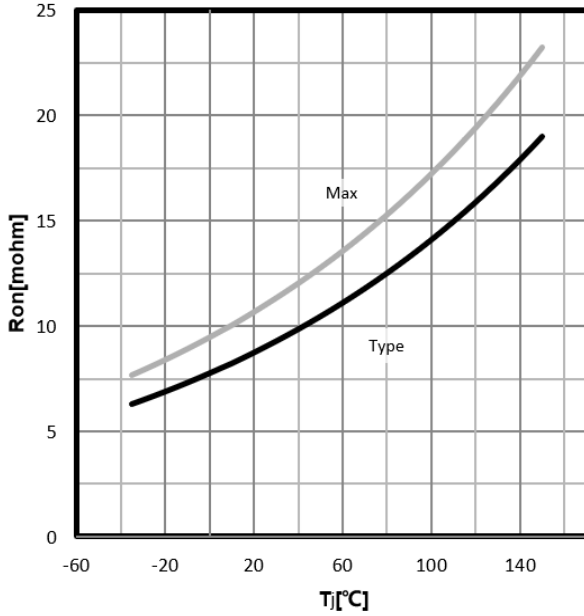
$$R_{DS(on)} = f(T_j); I_D = -5A; V_{GS} = -10V$$





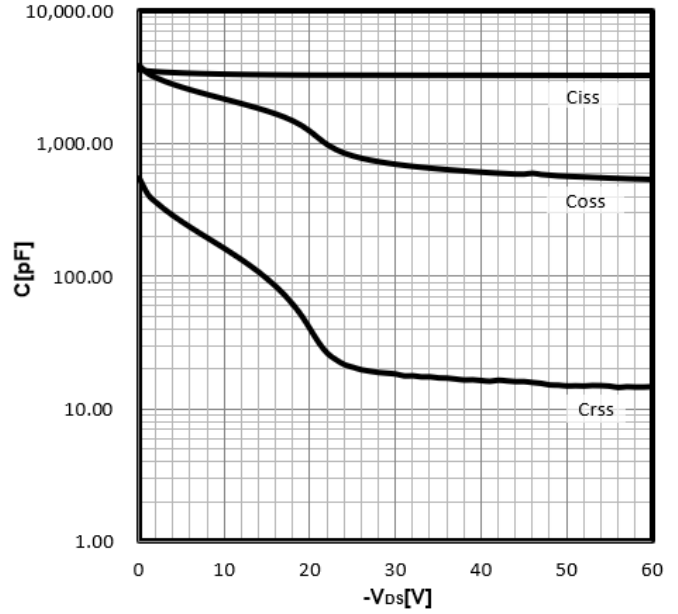
Drain-source on-state resistance

$$R_{DS(on)} = f(T_j); I_D = -20A; V_{GS} = -10V$$



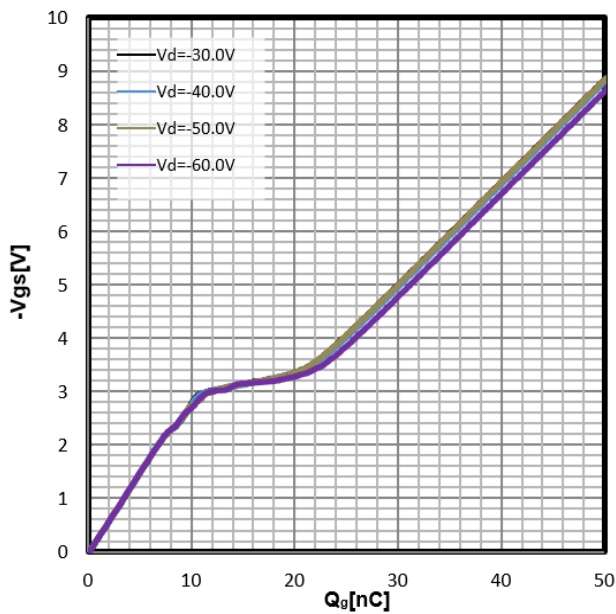
Typ. capacitances

$$C = f(V_{DS}); V_{GS} = 0V; f = 1MHz$$



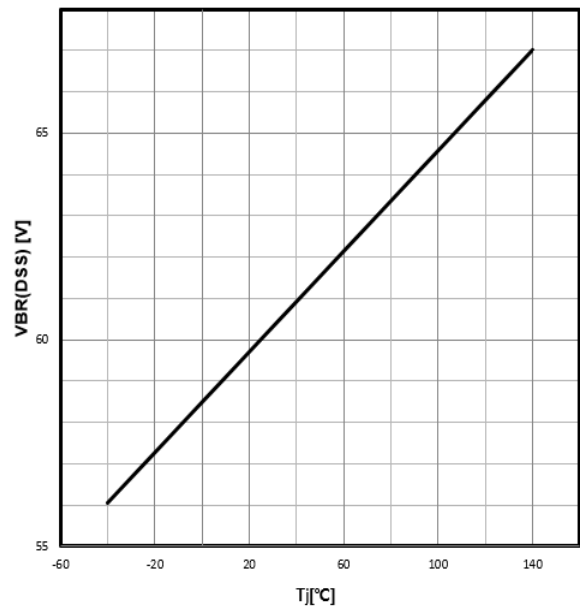
Typ. gate charge

$$V_{GS} = f(Q_{gate}); I_D = -20A$$



Drain-source breakdown voltage

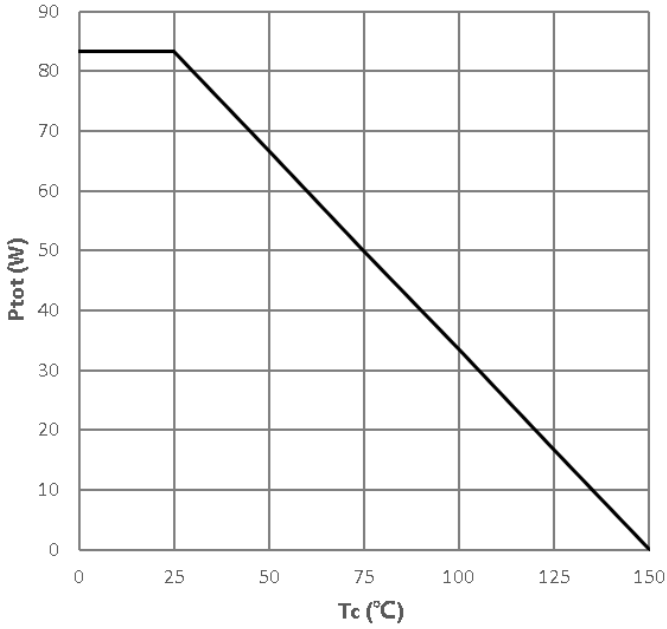
$$V_{BR(DSS)} = f(T_j); I_D = -250\mu A$$





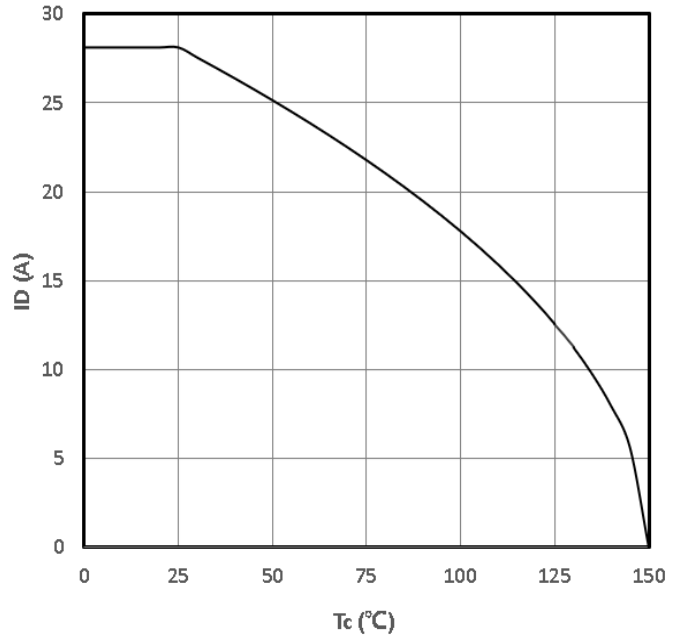
Power Dissipation

$P_{tot}=f(T_c)$



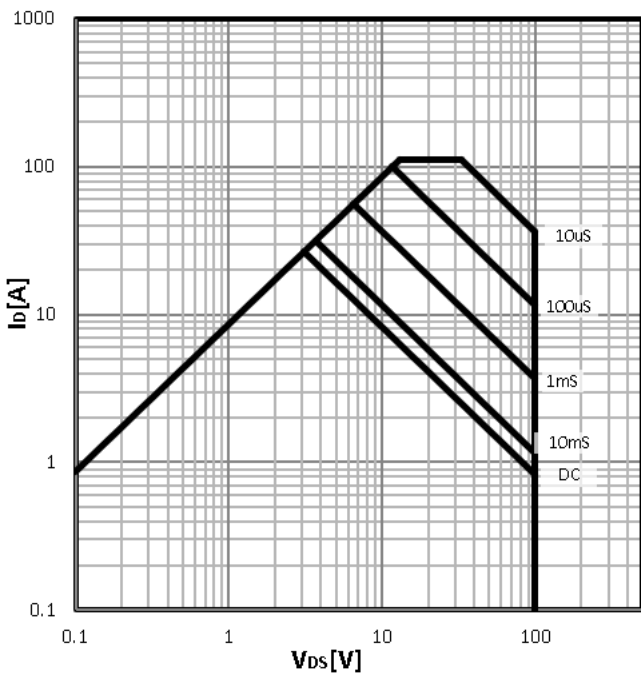
Maximum Drain Current

$-I_D=f(T_c)$



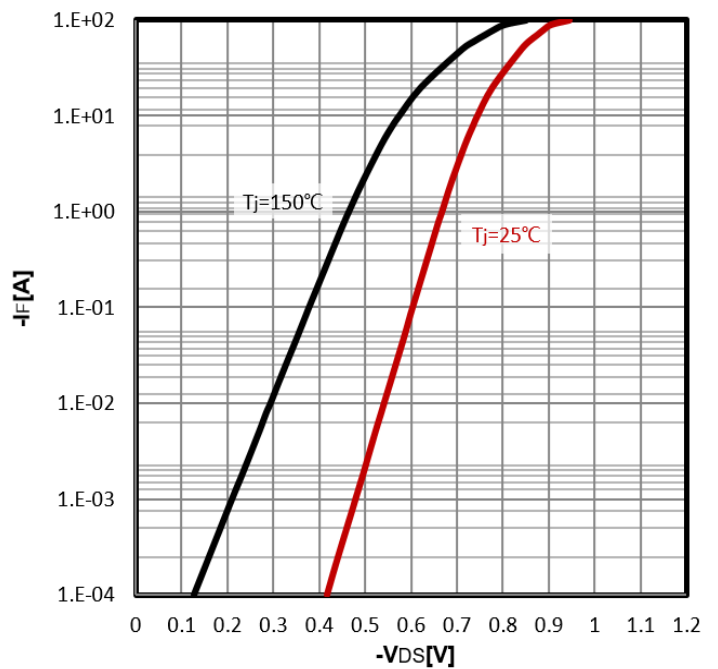
Safe operating area

$-I_D=f(-V_{DS})$



Body Diode Forward Voltage Variation

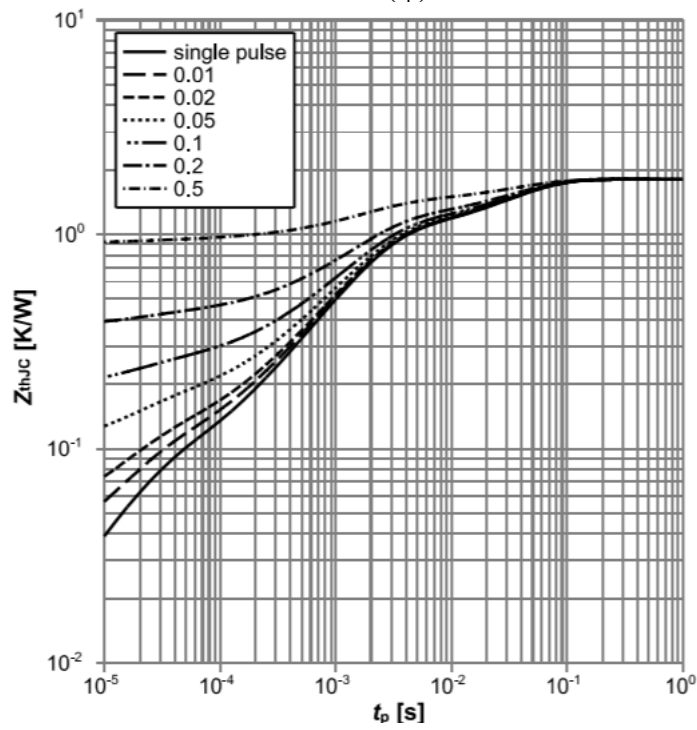
$-I_F=f(-V_{DS})$



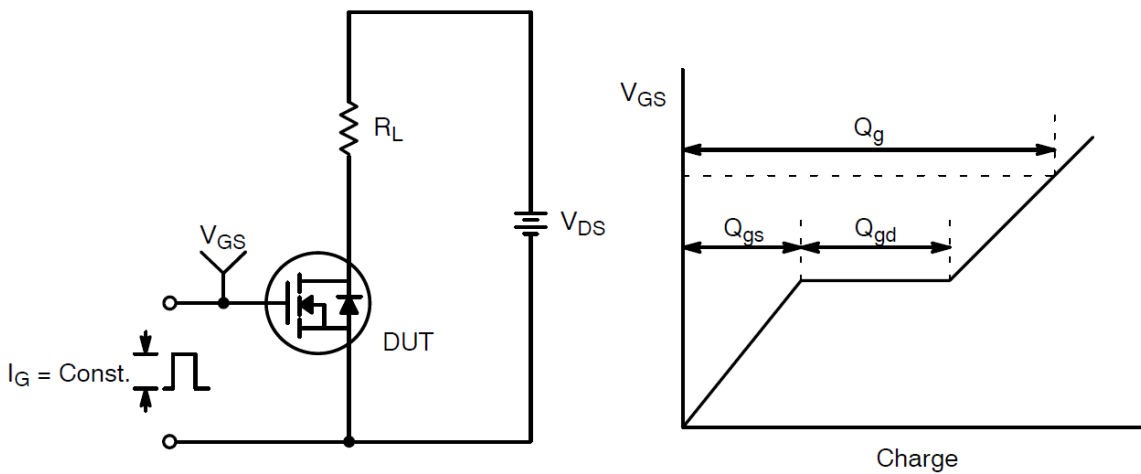


Max. transient thermal impedance

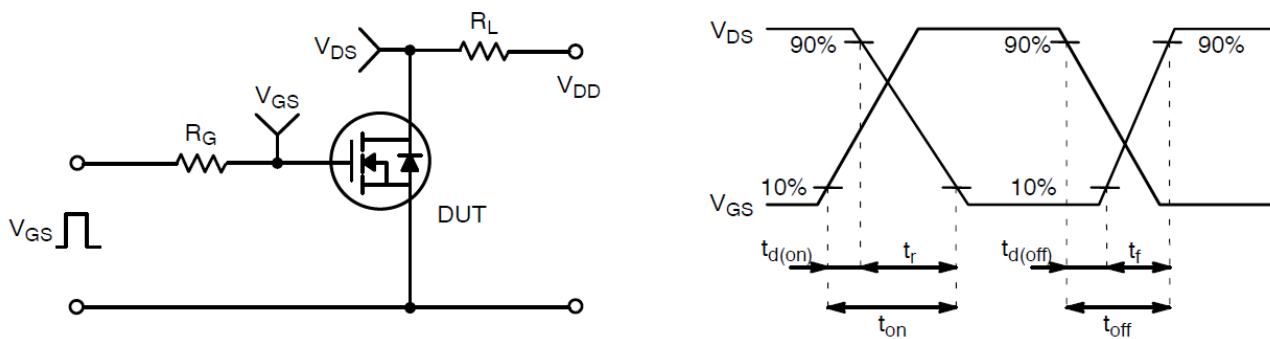
$$Z_{thJC} = f(t_p)$$



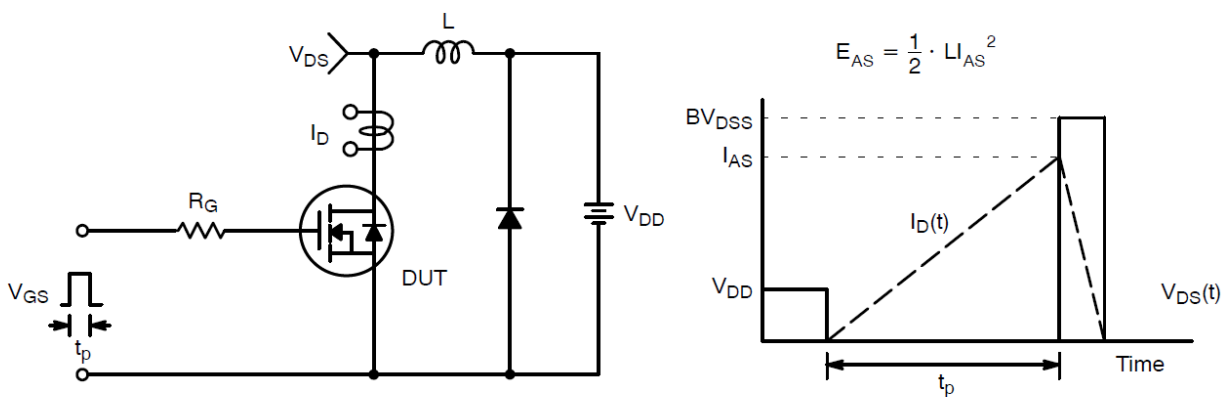
Test Circuit and Waveform:



Gate Charge Test Circuit & Waveform



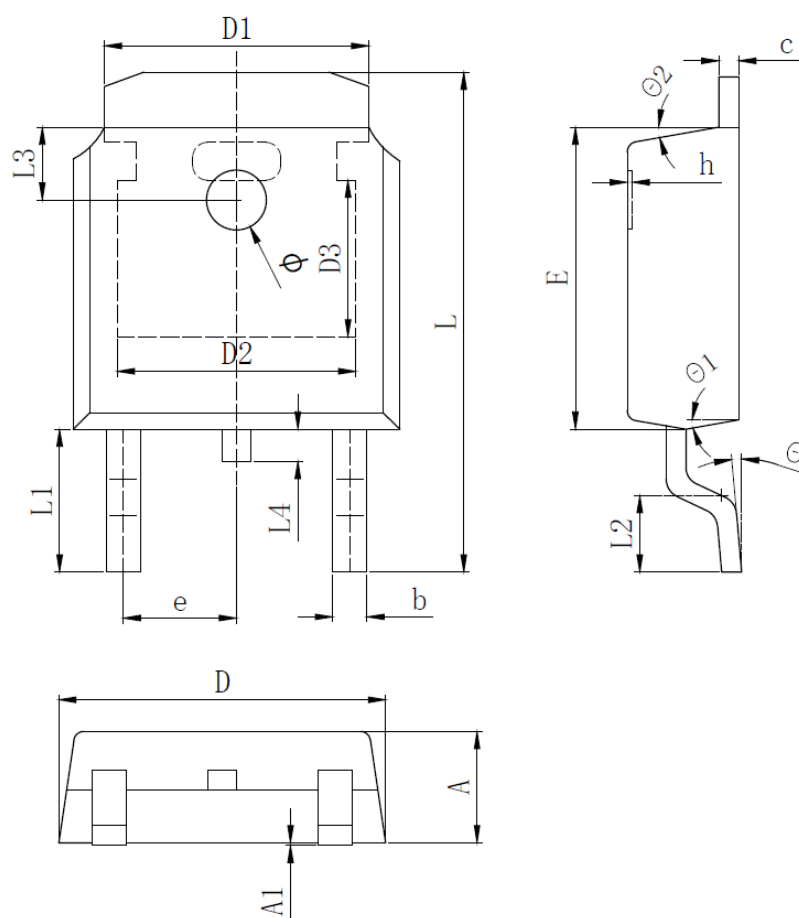
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms



TO-252 Package Information



SYMBOL	MILLIMETER		
	MIN	Typ.	MAX
A	2.200	2.300	2.400
A1	0.000		0.127
b	0.640	0.690	0.740
c(电镀后)	0.460	0.520	0.580
D	6.500	6.600	6.700
D1	5.334 REF		
D2	4.826 REF		
D3	3.166 REF		
E	6.000	6.100	6.200
e	2.286 TYP		
h	0.000	0.100	0.200
L	9.900	10.100	10.300
L1	2.888 REF		
L2	1.400	1.550	1.700
L3	1.600 REF		
L4	0.600	0.800	1.000
phi	1.100	1.200	1.300
theta	0°		8°
theta 1	9° TYP		
theta 2	9° TYP		



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