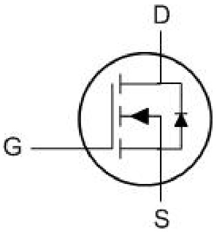
Features

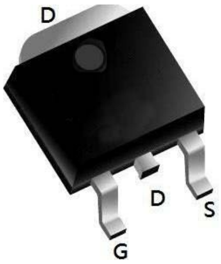


- Split Gate Trench MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$

Applications

- DC-DC Converters
- Power management functions
- Synchronous-rectification applications

TO252 Pin Configuration



Product Summary

BVDSS	RDSON	ID
100V	61mΩ	15A

Absolute Maximum Ratings (TC= 25℃ unless otherwise specified) :

Symbol	Parameter		Value	Units
V_{DSS}	Drain-to-Source Voltage		100	V
I_D	Continuous Drain Current	T_C = 25 °C	15	A
		T_C = 100 °C	10.7	A
I_{DM}[a1]	Pulsed Drain Current		80	A
E_{AS}[a2]	Single pulse avalanche energy		22	mJ
V_{GS}	Gate-to-Source Voltage		±20	V
P_D	Power Dissipation		46	W
T_J, T_{STG}	Operating Junction and Storage Temperature Range		150, –55 to 150	℃
T_L	Maximum Temperature for Soldering		260	℃

Thermal Characteristics:

Symbol	Parameter	Value	Units
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	2.7	℃/W

Electrical Characteristics (T$_J$= 25℃ 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	--	--	100	nA
$I_{GSS(R)}$	Gate to Source Reverse Leakage	V_{GS} =+20V	--	--	-100	nA
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250μA	1.3	1.8	2.3	V
$R_{DS(ON)}$	Drain-to-Source On-Resistance	V_{GS}=10V,I_D=5A	--	61	75	mΩ
		V_{GS}=4.5V,I_D=4A		77	100	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	--	228	--	pF
C_{oss}	Output Capacitance		--	58	--	
C_{rss}	Reverse Transfer Capacitance		--	1.9	--	

Resistive Switching Characteristics

Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	I_D=10A, R_L=0.75Ω V_{DS}=50V V_{GS}= 10V R_G= 3Ω	--	8	--	ns
tr	Rise Time		--	16	--	
$t_{d(OFF)}$	Turn-Off Delay Time		--	17	--	
t_f	Fall Time		--	14	--	
Q_g	Total Gate Charge	V_{GS}=10V V_{DS}=50V I_D=10A	--	3.7	--	nC
Q_{gs}	Gate Source Charge		--	0.8	--	
Q_{gd}	Gate Drain Charge		--	1	--	

Source-Drain Diode Characteristics

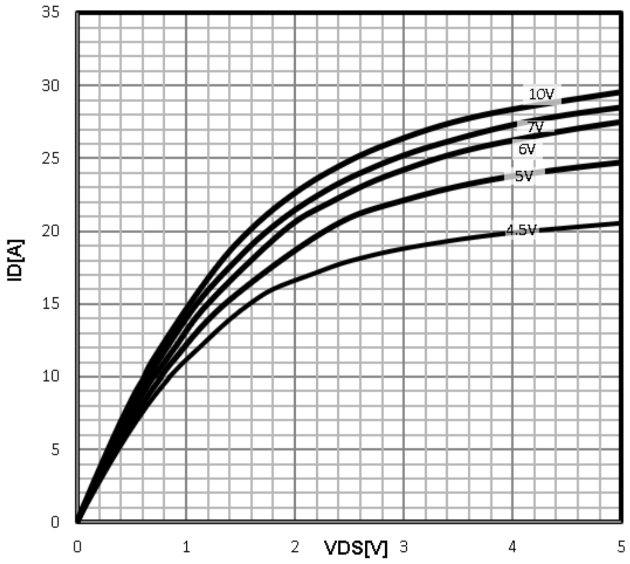
Symbol	Parameter	Test Conditions	Value			Units
			Min.	Typ.	Max.	
I_S	Diode Forward Current	T_C=25 °C	--	--	15	A
V_{SD}	Diode Forward Voltage	I_S=0.5A,V_{GS}=0V	--	--	1.2	V
t_{rr}	Reverse Recovery time	I_S=10A, V_{DD}=50V dI/dt=100A/μs	--	22	--	ns
Q_{rr}	Reverse Recovery Charge		--	18	--	nC

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

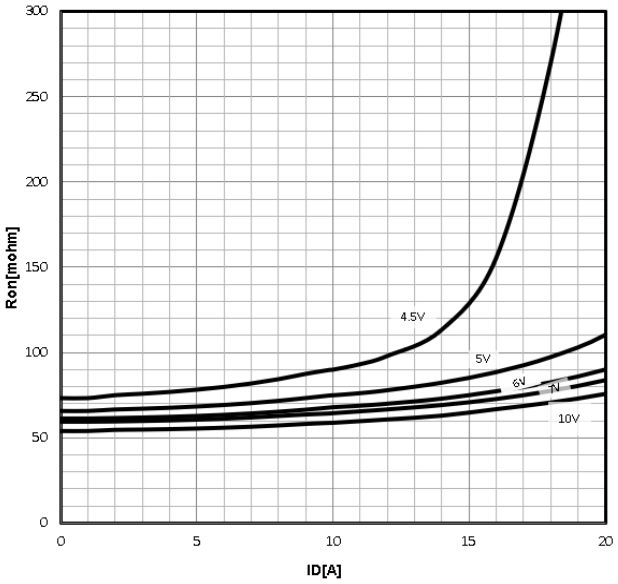
[a2]: L=5mH, R_g=25Ω, Starting T_J=25 ℃

Characteristics Curve:

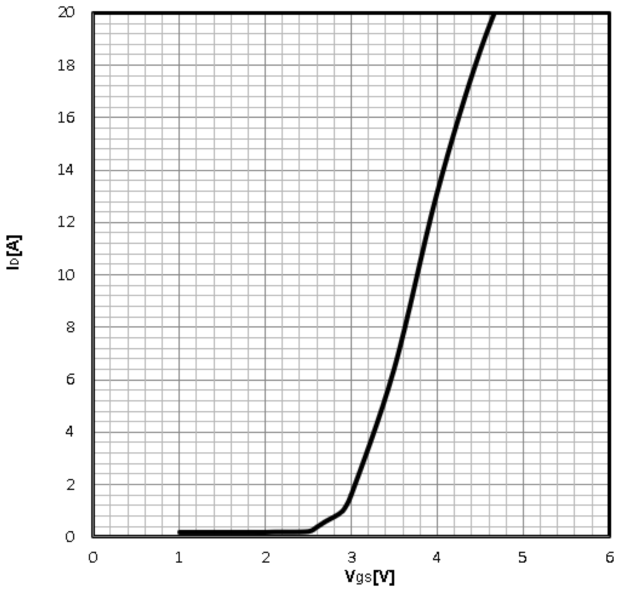
Typ. output characteristics
$I_D=f(V_{DS})$



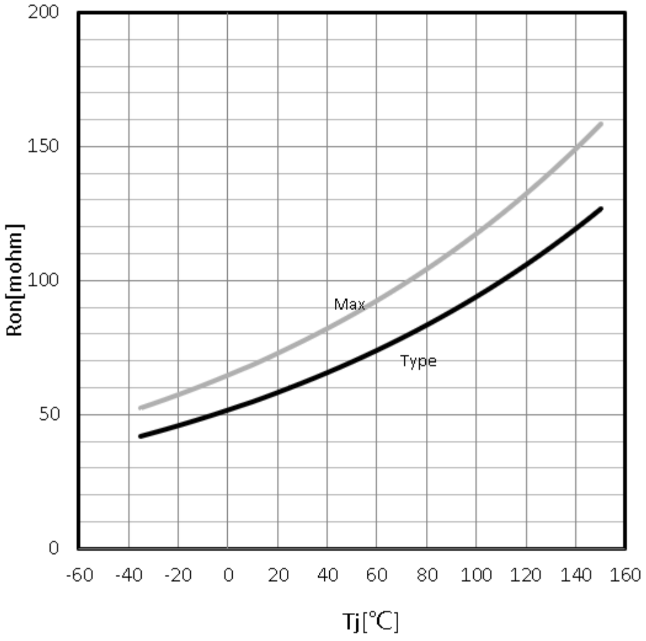
Typ. drain-source on resistance
$R_{DS(on)}=f(I_D)$



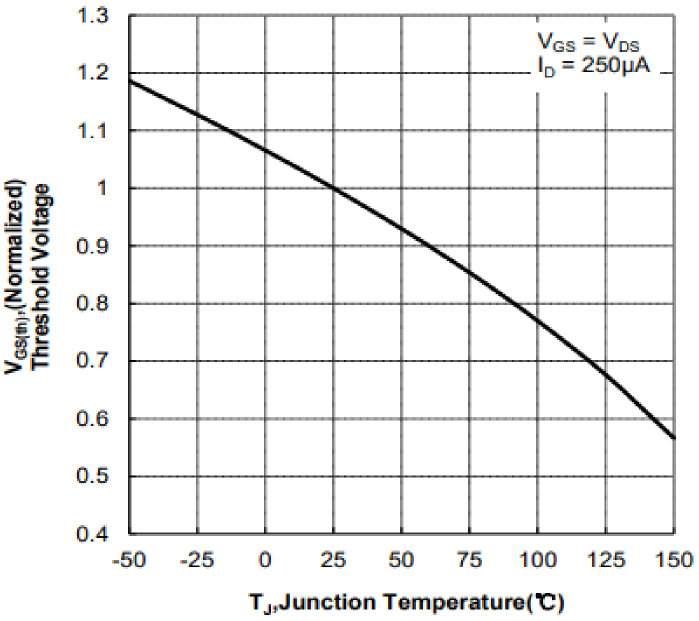
Typ. transfer characteristics
$I_D=f(V_{GS})$



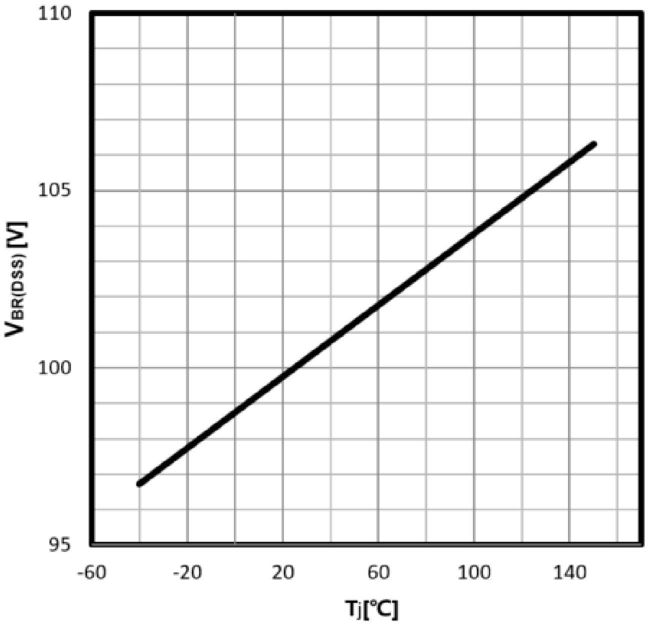
Drain-source on-state resistance
$R_{DS(on)}=f(T_j);I_D=5A;\ V_{GS}=10V$



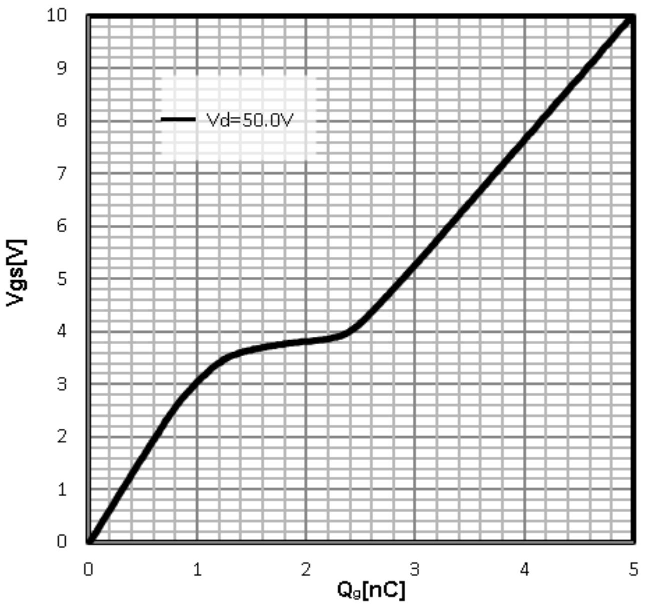
Gate Threshold Voltage
$V_{TH}=f(T_j)$; $I_D=250uA$



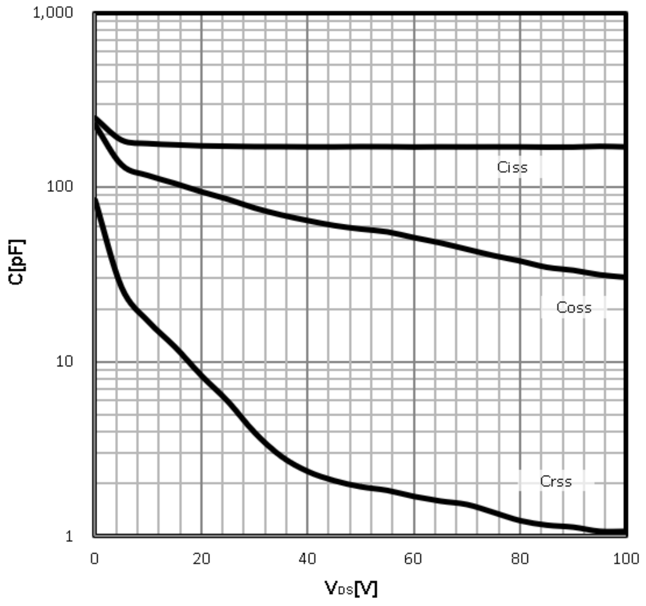
Drain-source breakdown voltage
$V_{BR(DSS)}=f(T_j)$; $I_D=250uA$

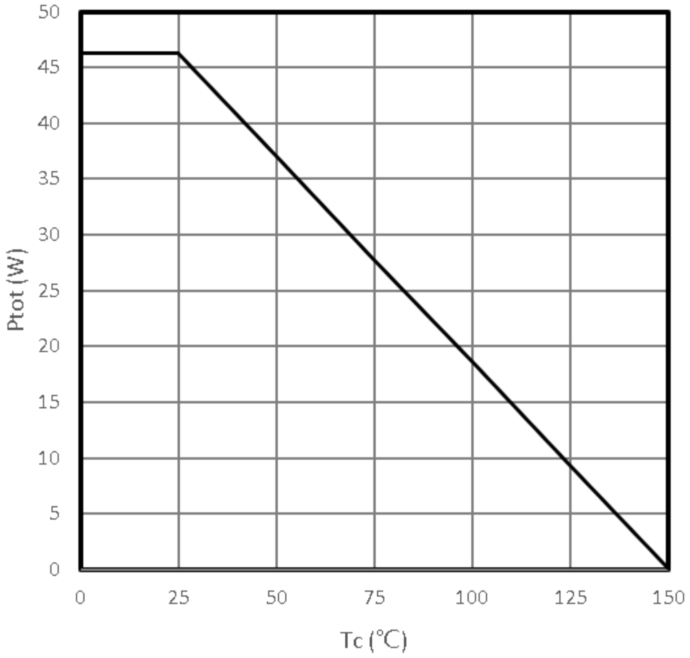


Typ. gate charge
$V_{GS}=f(Q_g)$; $I_D=10A$

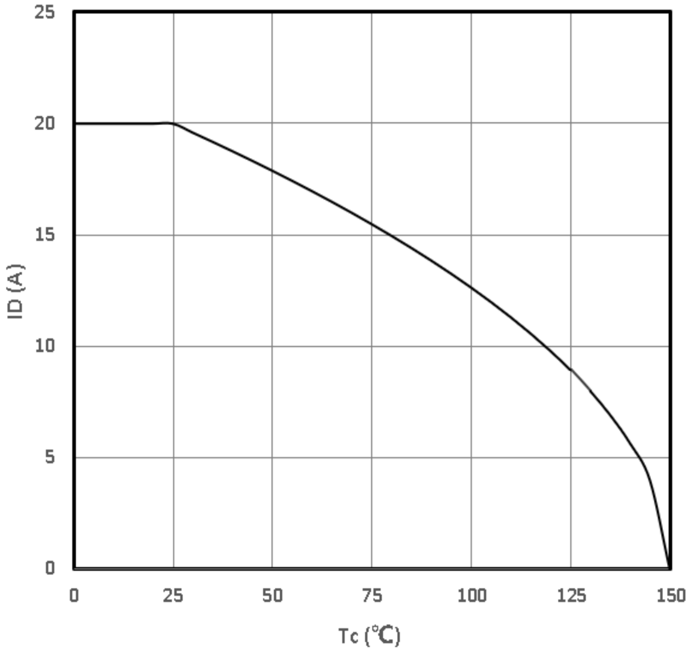


Typ. capacitances
$C=f(V_{DS})$; $V_{GS}=0V$; $f=1MHz$

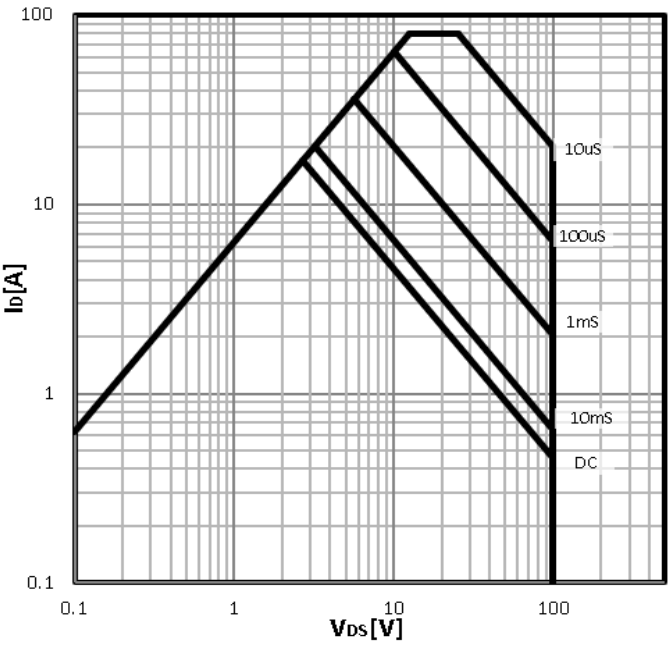




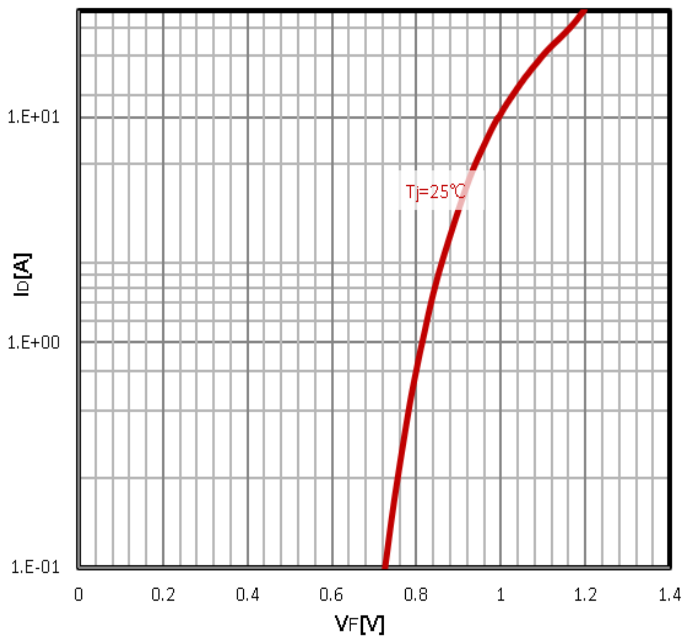
Power Dissipation
$P_{tot}=f(T_C)$



Maximum Drain Current $I_D=f(T_C)$



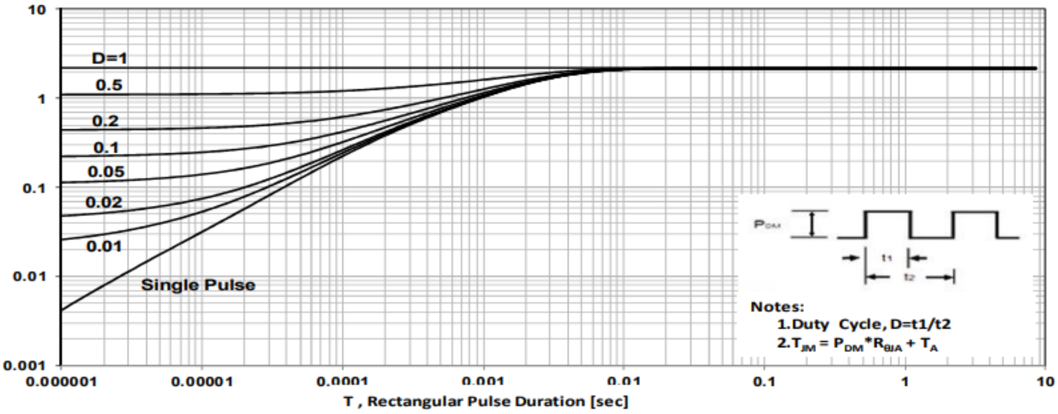
Safe operating area
$I_D=f(V_{DS})$



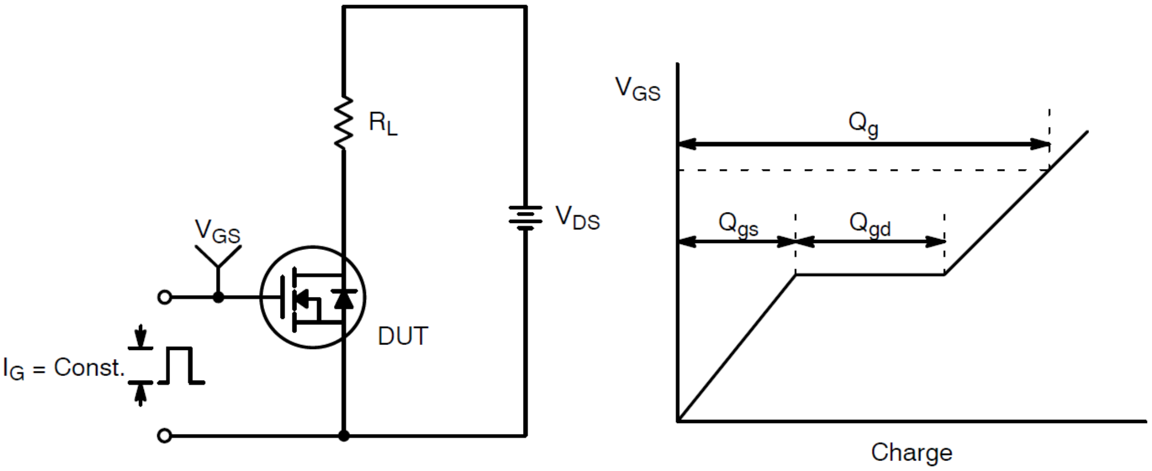
Body Diode Forward Voltage Variation
$I_F=f(V_{GS})$

Max. transient thermal impedance

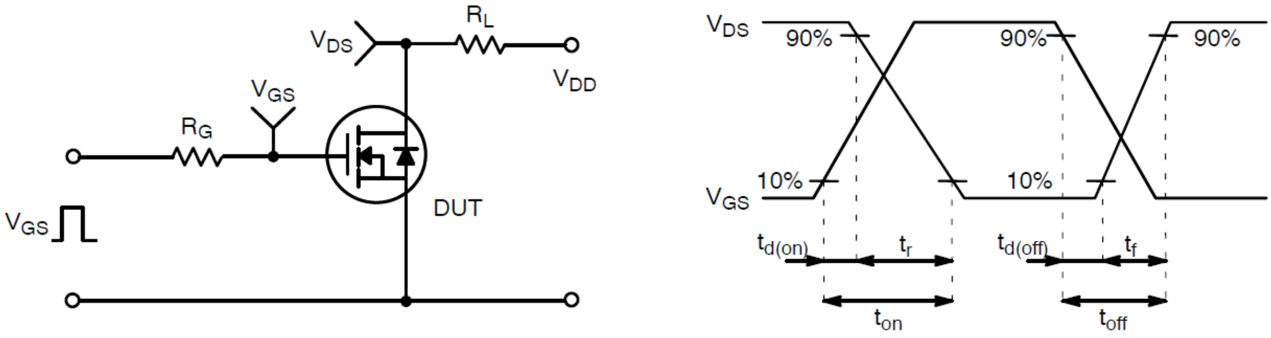
$Z_{thJC}=f(t_p)$



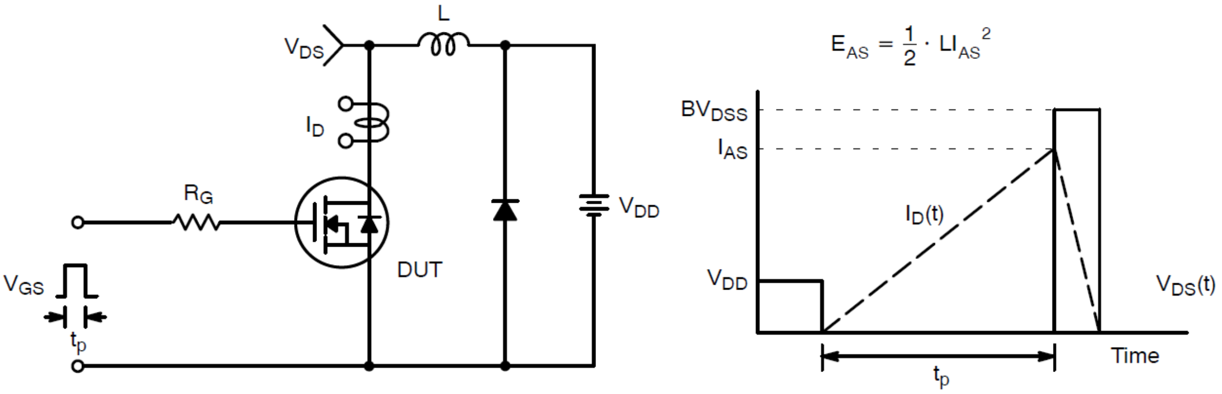
Test Circuit and Waveform:



Gate Charge Test Circuit & Waveform

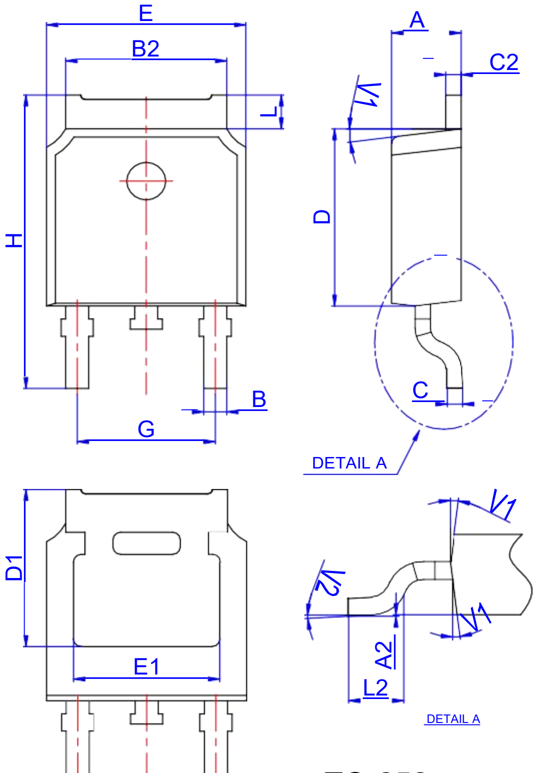


Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms

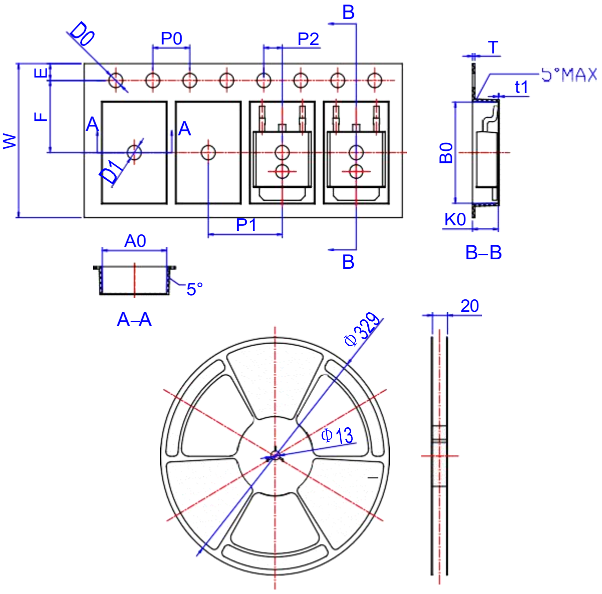
Package Mechanical Data TO 252



TO-252

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.10		2.50	0.083		0.098
A2	0		0.10	0		0.004
B	0.66		0.86	0.026		0.034
B2	5.18		5.48	0.202		0.216
C	0.40		0.60	0.016		0.024
C2	0.44		0.58	0.017		0.023
D	5.90		6.30	0.232		0.248
D1	5.30REF			0.209REF		
E	6.40		6.80	0.252		0.268
E1	4.63			0.182		
G	4.47		4.67	0.176		0.184
H	9.50		10.70	0.374		0.421
L	1.09		1.21	0.043		0.048
L2	1.35		1.65	0.053		0.065
V1		7°			7°	
V2	0°		6°	0°		6°

Reel Specification-TO-252-4R



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
W	15.90	16.00	16.10	0.626	0.630	0.634
E	1.65	1.75	1.85	0.065	0.069	0.073
F	7.40	7.50	7.60	0.291	0.295	0.299
D0	1.40	1.50	1.60	0.055	0.059	0.063
D1	1.40	1.50	1.60	0.055	0.059	0.063
P0	3.90	4.00	4.10	0.154	0.157	0.161
P1	7.90	8.00	8.10	0.311	0.315	0.319
P2	1.90	2.00	2.10	0.075	0.079	0.083
A0	6.85	6.90	7.00	0.270	0.271	0.276
B0	10.45	10.50	10.60	0.411	0.413	0.417
K0	2.68	2.78	2.88	0.105	0.109	0.113
T	0.24		0.27	0.009		0.011
t1	0.10			0.004		
10P0	39.80	40.00	40.20	1.567	1.575	1.583

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