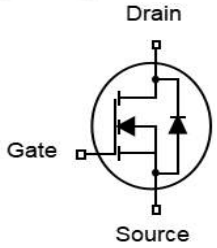
Features

- N-Channel
- Fast Switching
- Low Gate Charge and $R_{DS(ON)}$
- Low Reverse transfer capacitances
- 100% EAS Tested

V_{DS}	100	V
$R_{DS(on),TYP}$@ V_{GS}=10 V	60	mΩ
$R_{DS(on),TYP}$@ V_{GS}=4.5V	76	mΩ
I_D	18	A

TO-252

RoHS HF



Part ID	Package Type	Marking	Packing
ZTG60N10D	TO-252	ZTG60N10D	2500pcs/reel

Absolute Maximum Ratings T_A =25°C, unless otherwise specified

Symbol	Parameter		Rating	Unit
Common Ratings (T_C=25°C Unless Otherwise Noted)				
V_{GS}	Gate-Source Voltage		±20	V
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage		100	V
T_J	Maximum Junction Temperature		150	°C
T_{STG}	Storage Temperature Range		-55 to 150	°C
I_{DM}	Drain Current-Continuous@ Current-Pulsed (Note 1)	T_C =25°C	72	A
Mounted on Large Heat Sink				
I_D	Drain Current-Continuous	T_C =25°C	18	A
		T_C =100°C	12	A
P_D	Maximum Power Dissipation		31	W
$R_{\theta JC}$	Thermal Resistance-Junction to Case		4	°C/W
$R_{\theta JA}$	Thermal Resistance Junction-Ambient		52	°C/W
Drain-Source Avalanche Ratings				
EAS	Avalanche Energy, Single Pulsed (Note 2)		22	mJ

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Electrical Characteristics (T_J=25℃ unless otherwise noted)

Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Electrical Characteristics @ T_j=25°C (unless otherwise stated)						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	100	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=100V,V_{GS}=0V	--	--	1	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±20V,V_{DS}=0V	--	--	±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250μA	1.3	1.9	2.3	V
$R_{DS(on)}$	Drain-Source On-State Resistance	V_{GS}=10V, I_D=5A	--	60	75	mΩ
$R_{DS(on)}$	Drain-Source On-State Resistance	V_{GS}=4.5V, I_D=4A	--	76	95	mΩ
Dynamic Electrical Characteristics @ T_j = 25°C (unless otherwise stated)						
Ciss	Input Capacitance	V_{DS}=50V,V_{GS}=0V, f=1MHz	--	170	--	pF
Coss	Output Capacitance		--	57	--	pF
Crss	Reverse Transfer Capacitance		--	1.8	--	pF
Rg	Gate Resistance	f=1MHz	--	2.5	--	Ω
Qg	Total Gate Charge	V_{DS}=50V,I_D=10A, V_{GS}=10V	--	3.7	--	nC
Qgs	Gate-SourceCharge		--	0.8	--	nC
Qgd	Gate-DrainCharge		--	1.0	--	nC
Switching Characteristics						
Td(on)	Turn-on Delay Time	V_{DS}=50V, I_D =10A, R_L =0.75Ω, R_G=3Ω, V_{GS}=10V	--	7.8	--	ns
Tr	Turn-on Rise Time		--	16.1	--	ns
Td(off)	Turn-Off Delay Time		--	16.8	--	ns
Tf	Turn-Off Fall Time		--	13.9	--	ns
Source- Drain Diode Characteristics@ T_j = 25°C (unless otherwise stated)						
I_{SD}	Source-Drain Current (Body Diode)		--	--	18	A
V_{SD}	Forward on voltage	I_S=0.5A,V_{GS}=0V	--	--	1.2	V
Trr	Reverse Recovery Time	T_j=25℃,I_S =10A, V_{DD}=50V di/dt=100A/μs	--	22	--	ns
Qrr	Reverse Recovery Charge		--	18	--	nC

Notes:

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

2： L=0.5mH, R_g=25Ω, Starting T_J=25 ℃

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Characteristics Curve:

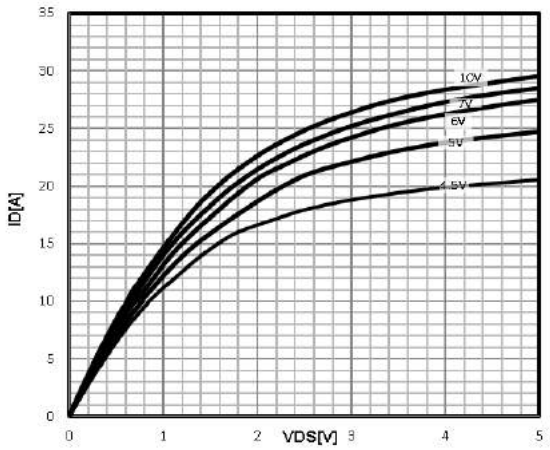

Figure 1 . output characteristics
$I_D=f(V_{DS})$

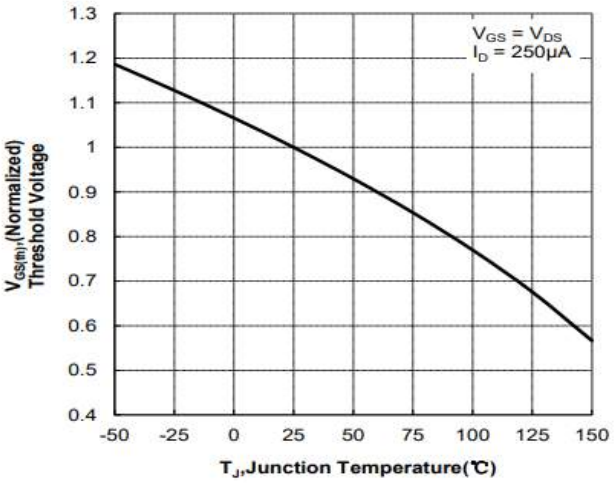

Figure 4. Gate Threshold Voltage
$V_{TH}=f(T_j)$; I_D=250uA

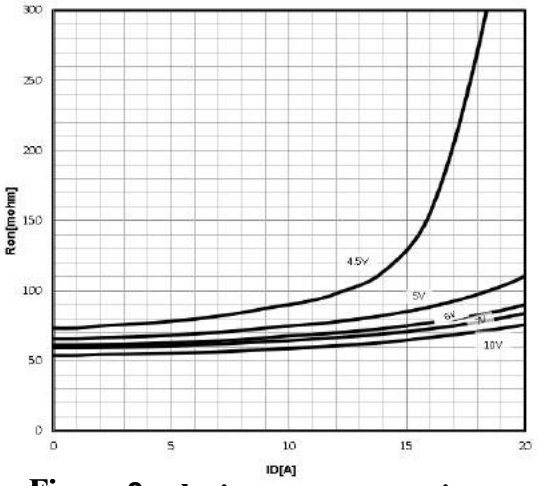

Figure 2 . drain-source on resistance
$R_{DS(on)}=f(I_D)$

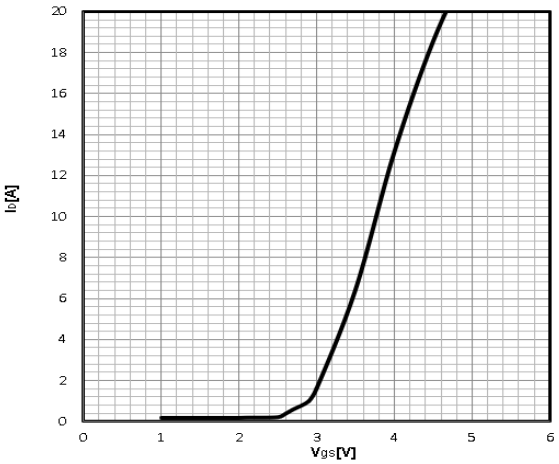

Figure 5 . transfer characteristics
$I_D=f(V_{GS})$

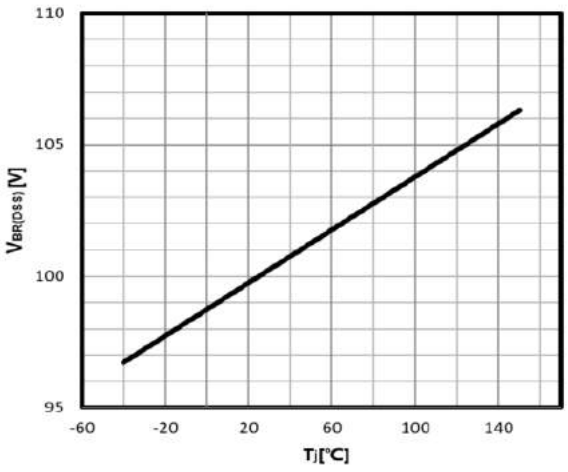

Figure 3 . Drain-source breakdown voltage
$V_{BR(DSS)}=f(T_j)$; I_D=250uA

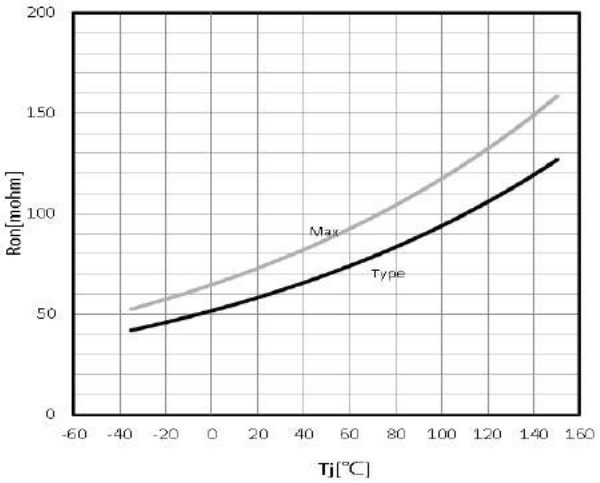

Figure 6 . Drain-source on-state resistance
$R_{DS(on)}=f(T_j)$;I_D=5A; V_{GS}=10V

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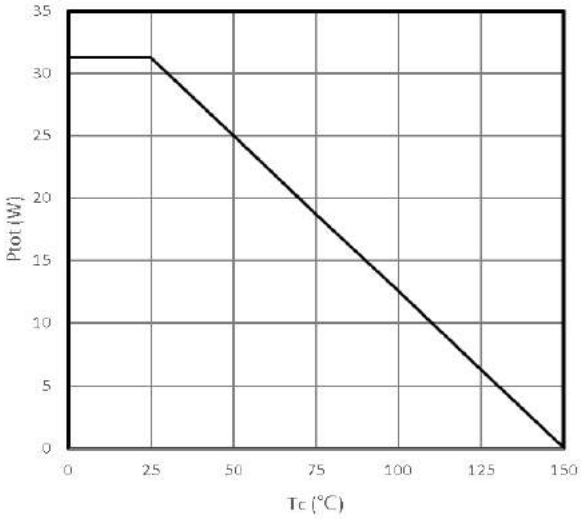

Figure 7 · Power Dissipation

$P_{tot}=f(T_C)$

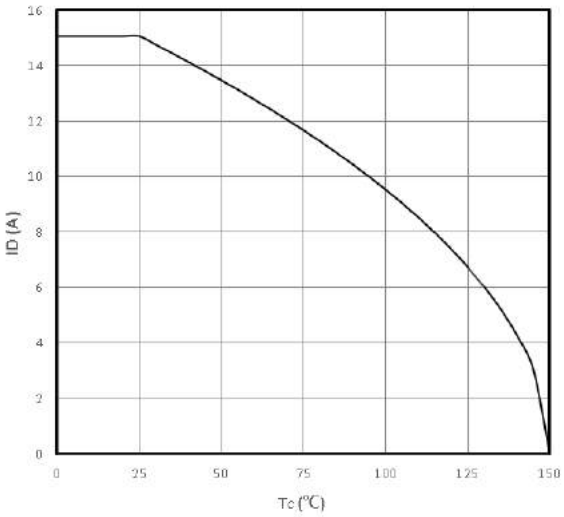

Figure 10. Maximum Drain Current

$I_D=f(T_C)$

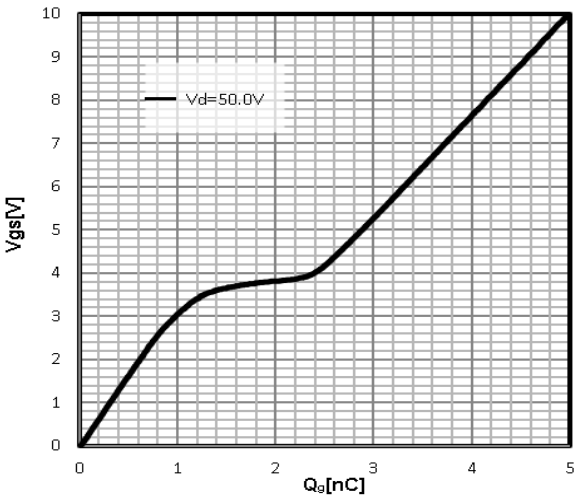

Figure 8. gate charge

$V_{GS}=f(Q_g)$; $I_D=10A$

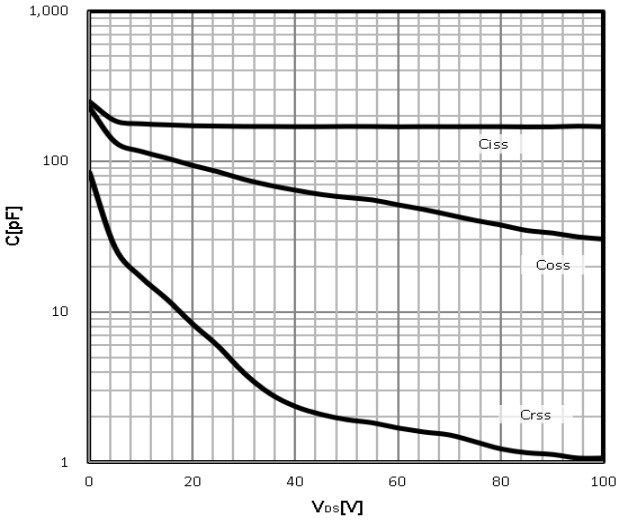

Figure 11. capacitances

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

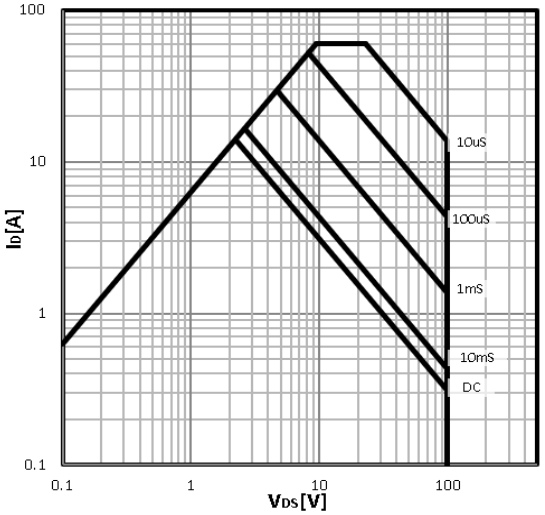

Figure 9. Safe operating area

$I_D=f(V_{DS})$

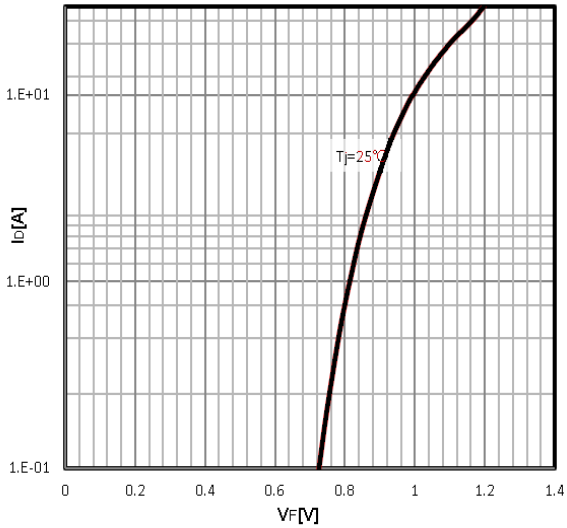

Figure 12. Body Diode Forward Voltage Variation

$I_F=f(V_{GS})$

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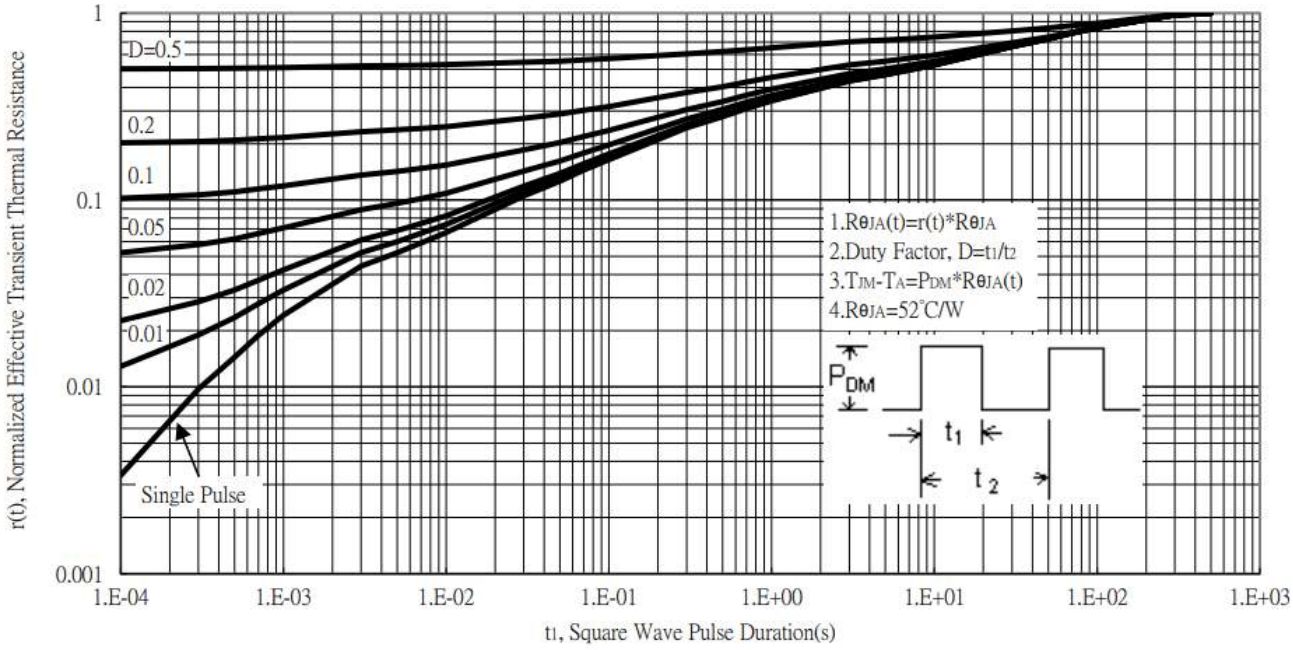

$Z_{thJC}=f(t_p)$

Figure 13. Max. transient thermal impedance

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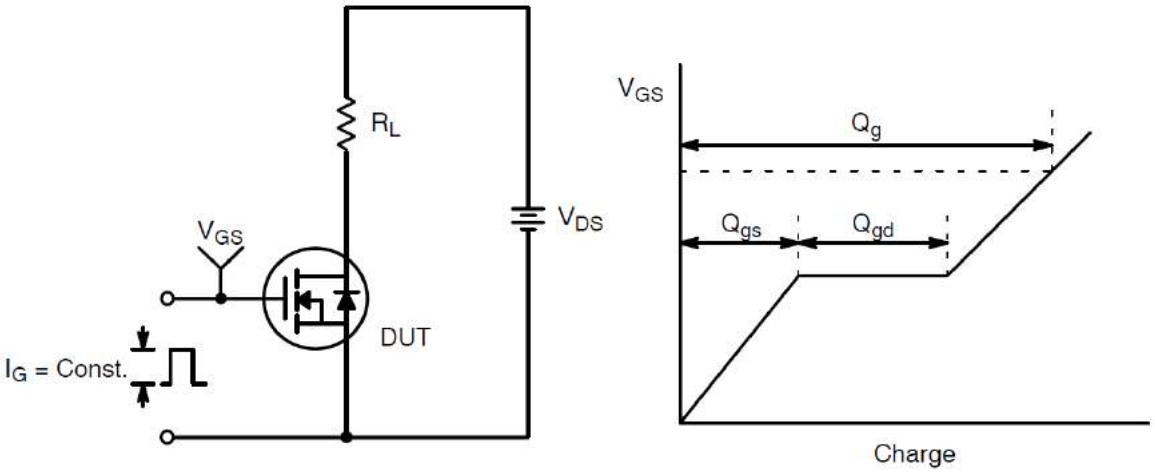
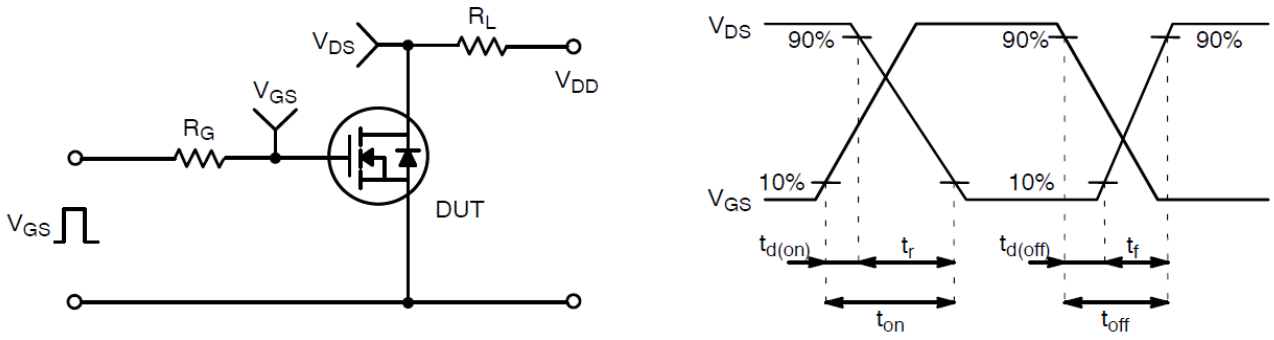
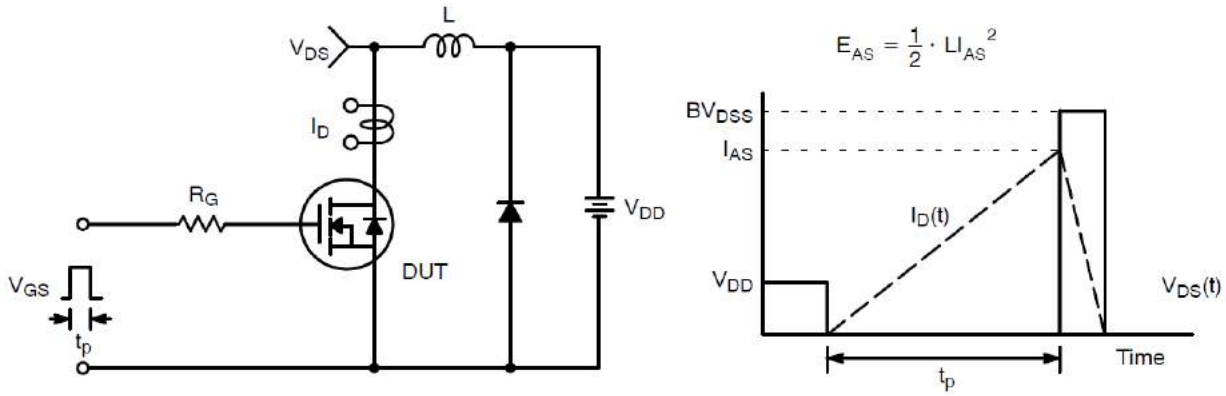
Test Circuit and Waveform:



Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms

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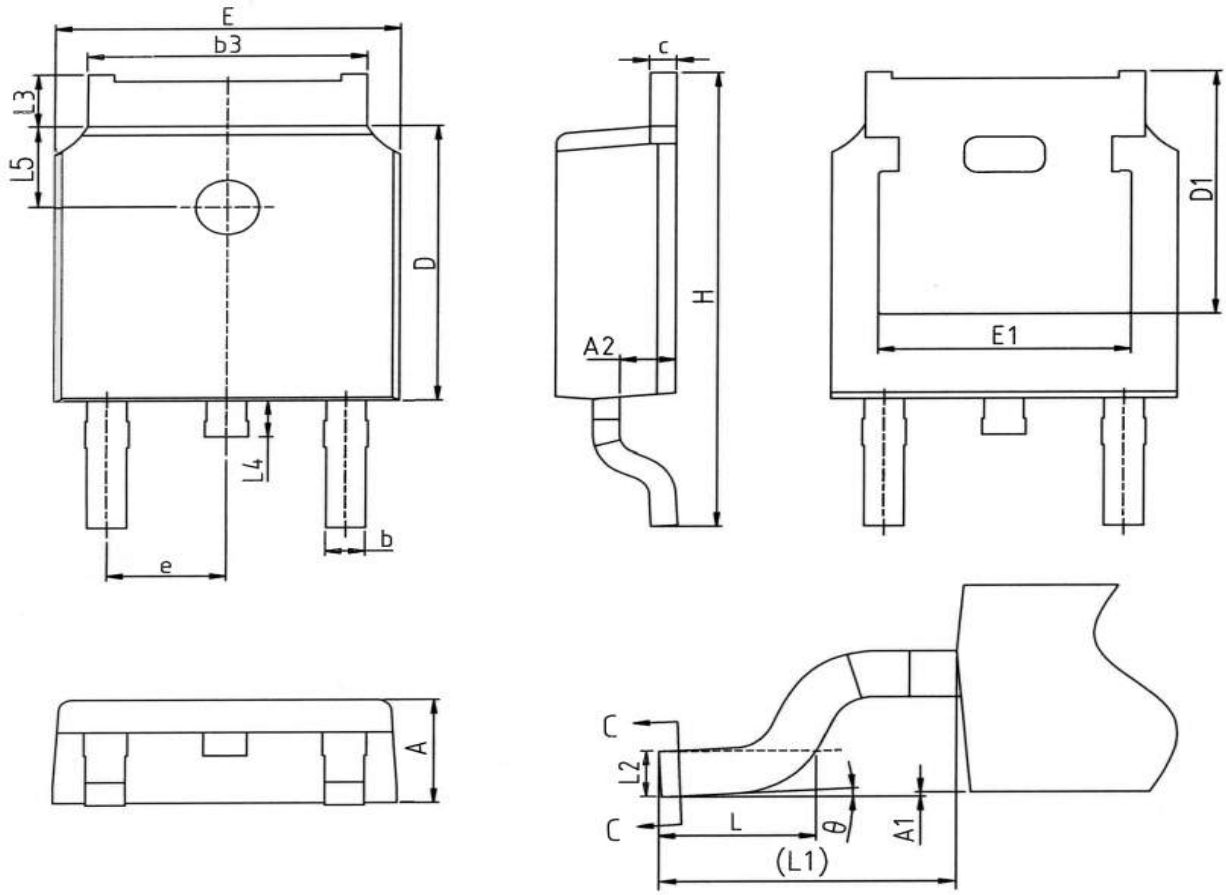
TO-252 Package Information



SYMBOL	mm		
	MIN	NOM	MAX
A	2.20	2.30	2.38
A1	0.00	–	0.12
A2	0.97	1.07	1.17
b	0.68	0.78	0.90
b3	5.20	5.33	5.46
c	0.43	0.53	0.61
D	5.98	6.10	6.22
D1	5.30REF		
E	6.40	6.60	6.73
E1	4.63	–	–
e	2.286BSC		
H	9.40	10.10	10.50
L	1.38	1.50	1.75
L1	2.90REF		
L2	0.51BSC		
L3	0.88	–	1.28
L4	0.50	–	1.00
L5	1.65	1.80	1.95
θ	0°	–	8°

Customer Service

Sales and Service:

zj@ztasemi.com

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