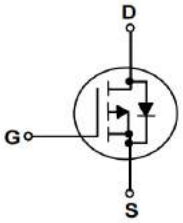
Features

- P-Channel
- High density celldesign for ultra low on-resistance
- Super high dense cell design
- Advanced trench process technology
- Reliable and rugged
- 100% EAS Tested

V_{DS}	-100	V
$R_{DS(on),TYP}$@ V_{GS}=-10 V	120	mΩ
$R_{DS(on),TYP}$@ V_{GS}=-4.5 V	122	mΩ
I_D	-15	A

TO-252



Part ID	Package Type	Marking	Packing
ZT120P10D	TO-252	ZT120P10D	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	T_C =25°C	-52	A
Mounted on Large Heat Sink				
I_D	Drain Current-Continuous	T_C =25°C	-15	A
		T_C =100°C	-9.2	A
P_D	Maximum Power Dissipation	T_C =25°C	40	W
	Derating factor		0.27	W/°C
$R_{\theta JC}$	Thermal Resistance-Junction to Case (Note 2)		3.75	°C/W
Drain-Source Avalanche Ratings				
EAS	Avalanche Energy, Single Pulsed (Note 5)		110	mJ

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	-1.4	-1.7	-2.5	V
$R_{DS(on)}$	Drain-Source On-State Resistance	V_{GS}=-10V,I_D=-15A	--	120	150	mΩ
$R_{DS(on)}$	Drain-Source On-State Resistance	V_{GS}=-4.5V,I_D=-10A	--	122	180	mΩ
g_{FS}	Forward Transconductance	V_{DS}=-5V ,I_D=-5A	12	--	--	S
Dynamic Electrical Characteristics @ T_j = 25°C (unless otherwise stated) (Note 4)						
Ciss	Input Capacitance	V_{DS}=-50V,V_{GS}=0V, f=1MHz	--	1732	--	pF
Coss	OutputCapacitance		--	85	--	pF
Crss	ReverseTransferCapacitance		--	40	--	pF
Qg	Total Gate Charge	V_{DS}=-50V,I_D=-10A, V_{GS}=-10V	--	33	--	nC
Qgs	Gate-SourceCharge		--	4.2	--	nC
Qgd	Gate-DrainCharge		--	7.1	--	nC
Switching Characteristics (Note 4)						
Td(on)	Turn-on Delay Time	V_{DS}=-50V, I_D =-10A, R_G=9.1Ω, V_{GS}=-10V	--	12	--	ns
Tr	Turn-on Rise Time		--	52	--	ns
Td(off)	Turn-Off Delay Time		--	28	--	ns
Tf	Turn-Off Fall Time		--	38	--	ns
Source- Drain Diode Characteristics@ T_j = 25°C (unless otherwise stated)						
I_{SD}	Source-Drain Current (Body Diode) (Note 2)		--	--	-15	A
V_{SD}	Forward on voltage (Note 3)	I_S =-10A,V_{GS}=0V	--	--	-1.4	V
Trr	Reverse Recovery Time	T_j=25℃,I_F =-10A, V_{GS}=0V di/dt=100A/μs	--	35	--	ns
Qrr	Reverse Recovery Charge		--	46	--	nC

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production
5. E_{AS} condition： Tj=25℃,V_{DD}=-50V,V_G=-10V,L=0.5mH,Rg=25Ω

Typical Electrical and Thermal Characteristics (Curves)

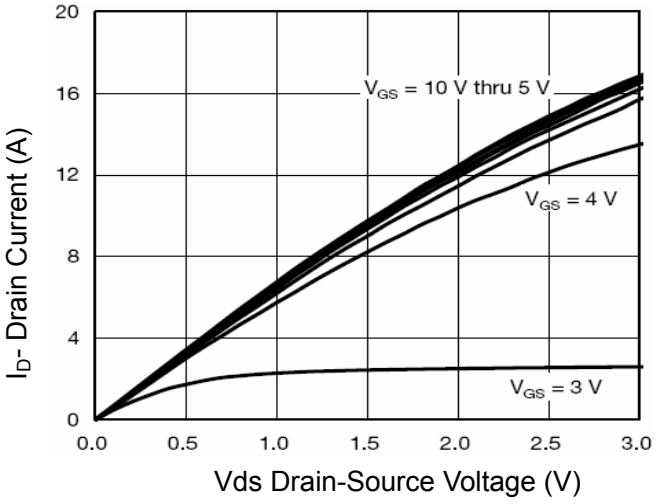


Figure 1 Output Characteristics

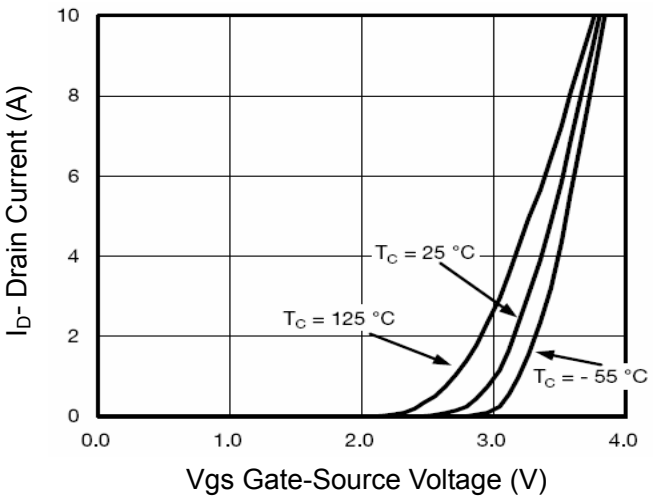


Figure 2 Transfer Characteristics

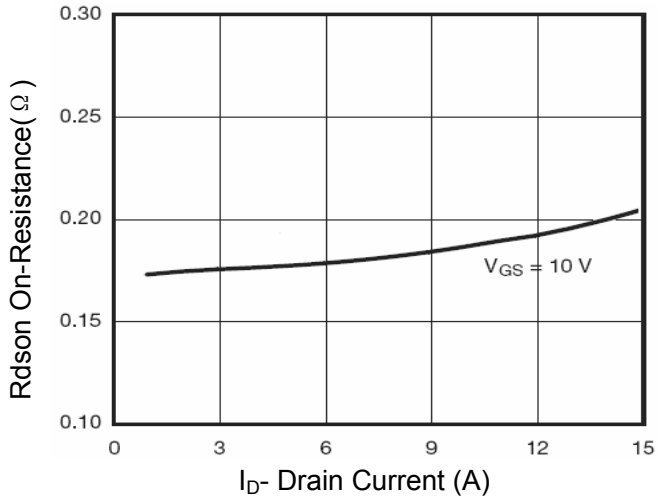


Figure 3 Rdson- Drain Current

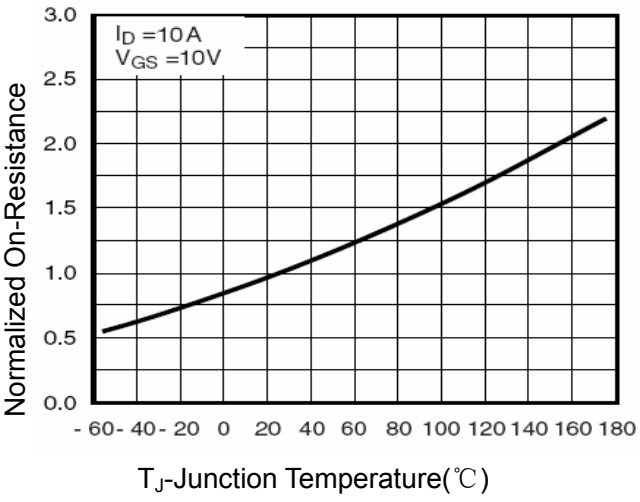


Figure 4 Rdson-JunctionTemperature

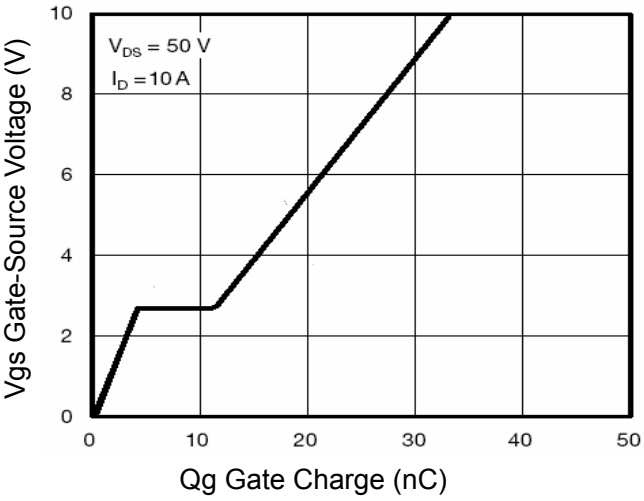


Figure 5 Gate Charge

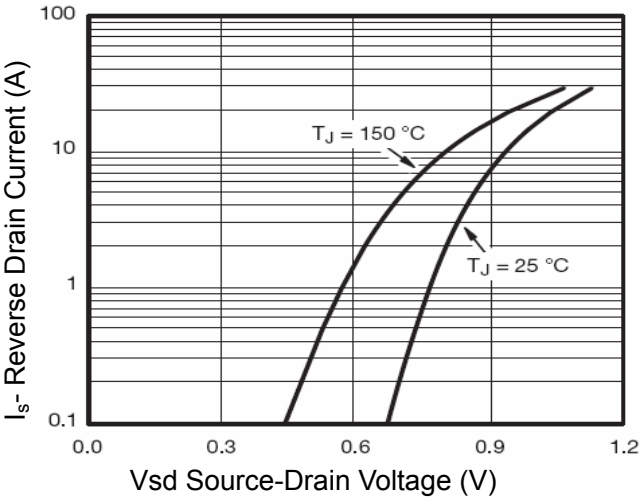


Figure 6 Source- Drain Diode Forward

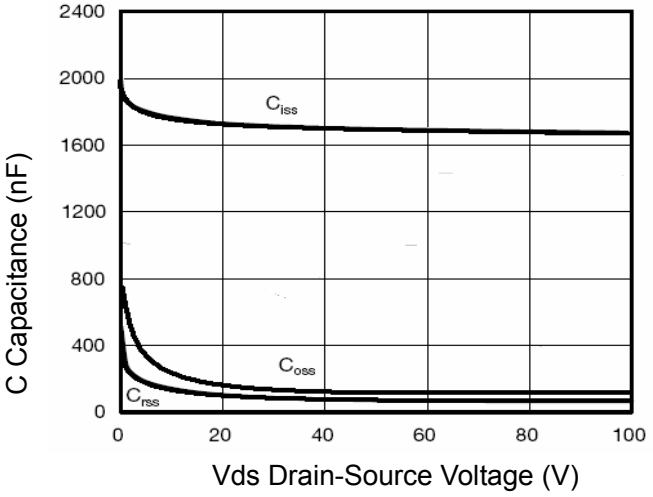


Figure 7 Capacitance vs Vds

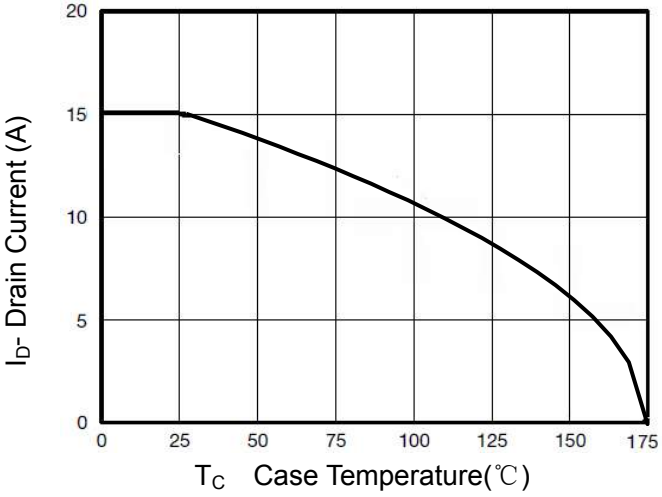


Figure 9 Drain Current vs Case Temperature

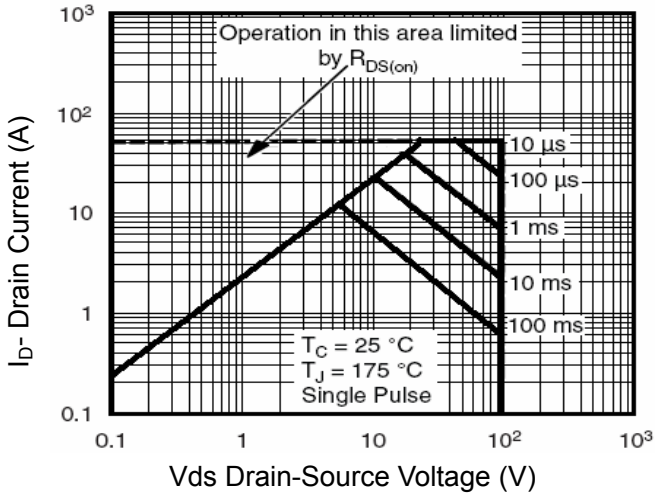


Figure 8 Safe Operation Area

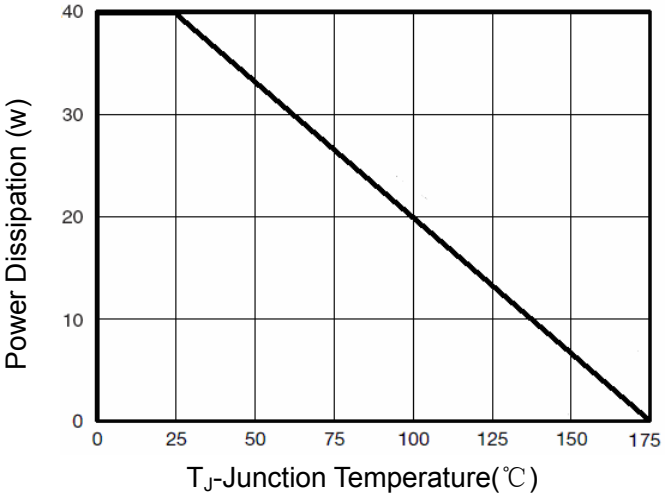


Figure 10 Power De-rating

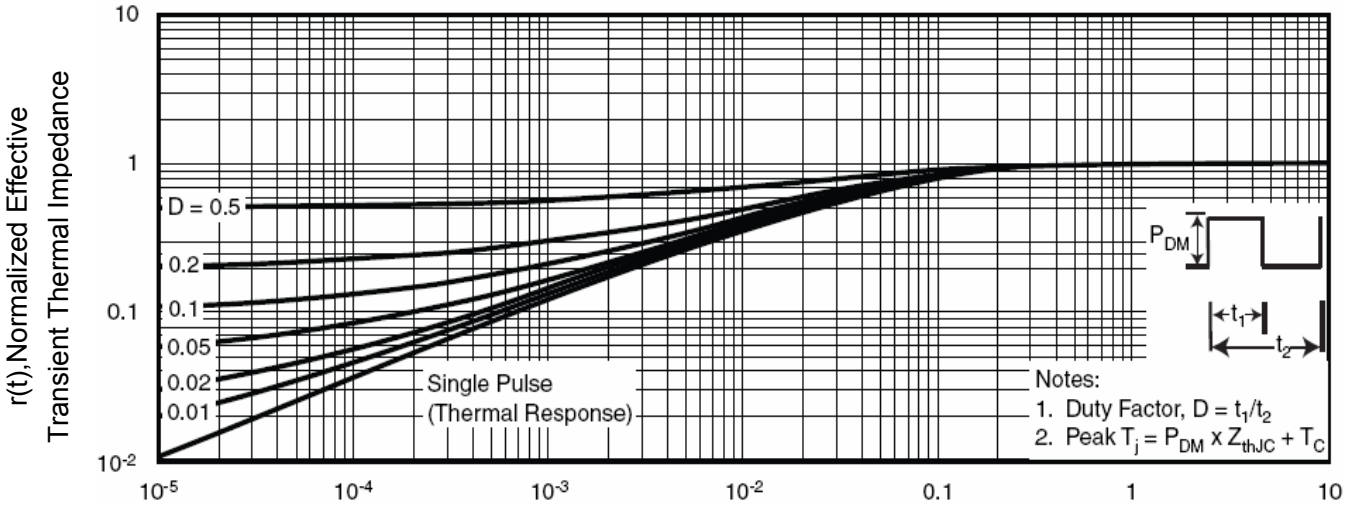
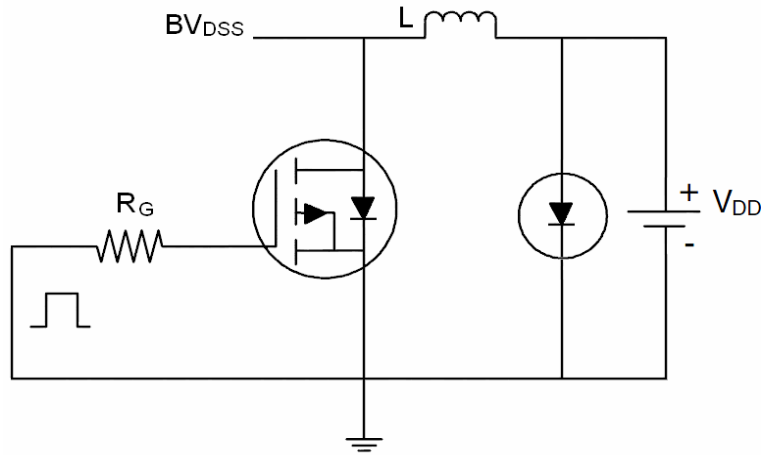


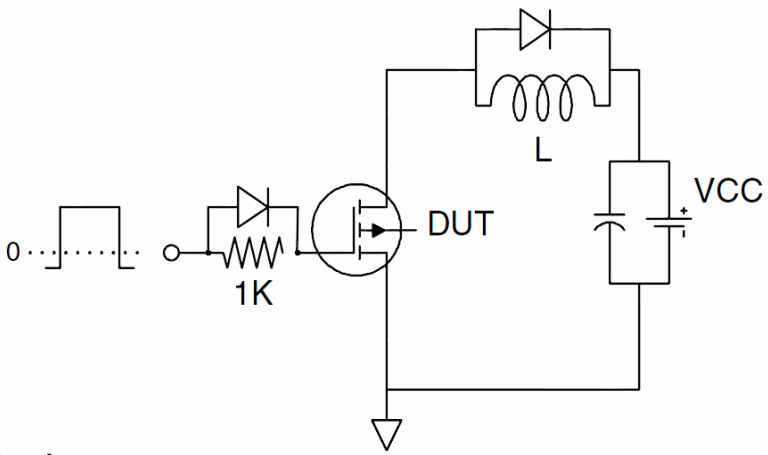
Figure 11 Normalized Maximum Transient Thermal Impedance

Test Circuit

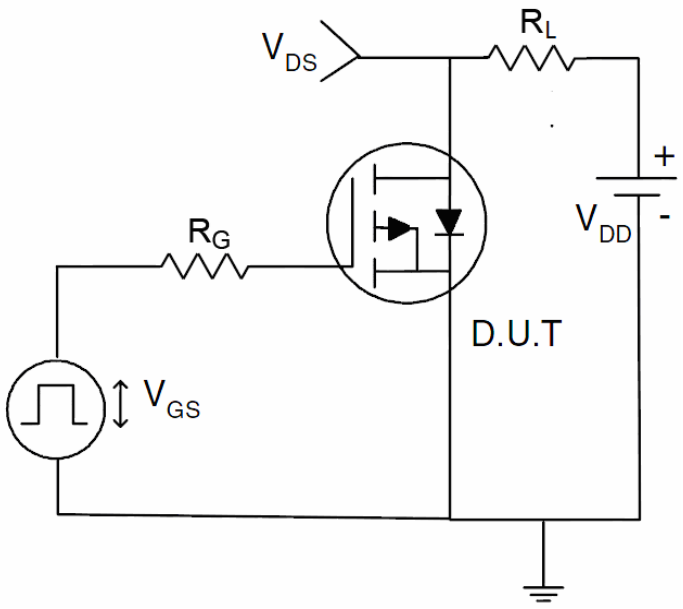
1) E_{AS} Test Circuit



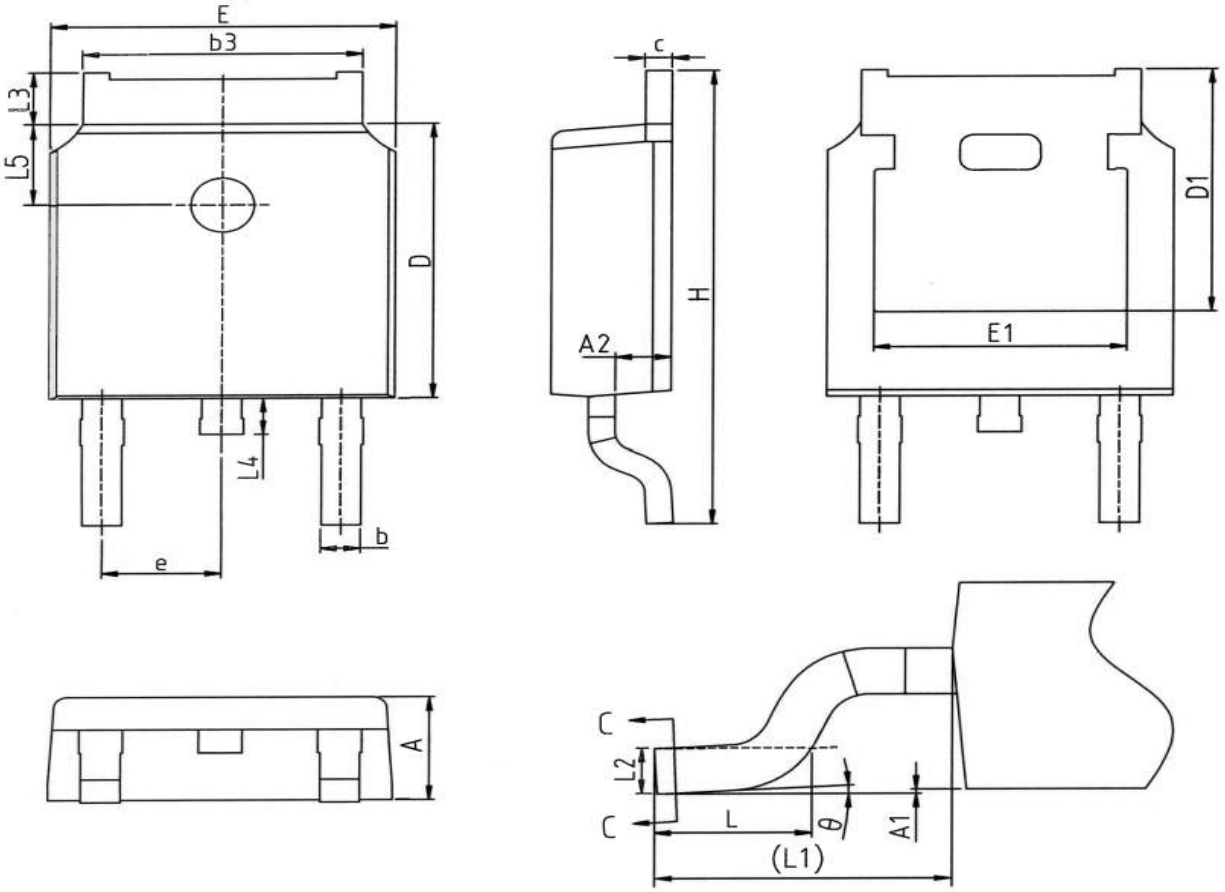
2) Gate Charge Test Circuit



3) Switch Time Test Circuit



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:

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