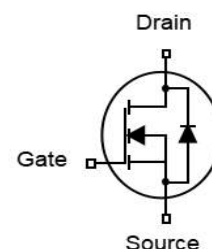


## Features

- N-Channel
- Low gate Charge
- Low reverse transfer capacitance
- Fast switching capability
- 100% EAS Tested

$V_{DS}$	250	V
$R_{DS(on),TYP}@ V_{GS}=10V$	15	m $\Omega$
$I_D$	90	A

TO-247



Part ID	Package Type	Marking	Packing
ZT15N25T	TO-247	ZT15N25T	600pcs/Tape

## Absolute Maximum Ratings $T_A=25^\circ\text{C}$ , unless otherwise specified

Symbol	Parameter	Rating	Unit	
<b>Common Ratings (<math>T_c=25^\circ\text{C}</math> Unless Otherwise Noted)</b>				
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V	
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	250	V	
$T_J$	Maximum Junction Temperature	150	$^\circ\text{C}$	
$T_{STG}$	Storage Temperature Range	-55 to 150	$^\circ\text{C}$	
$I_{DM}$	Drain Current-Continuous@ Current-Pulsed (Note 1)	$T_c=25^\circ\text{C}$ 360	A	
<b>Mounted on Large Heat Sink</b>				
$I_D$	Drain Current-Continuous	$T_c=25^\circ\text{C}$	90	A
		$T_c=100^\circ\text{C}$	57	A
$P_D$	Maximum Power Dissipation	520	W	
$R_{\theta JC}$	Thermal Resistance-Junction to Case	0.24	$^\circ\text{C/W}$	
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	40	$^\circ\text{C/W}$	
<b>Drain-Source Avalanche Ratings</b>				
EAS	Avalanche Energy, Single Pulsed (Note 2)	1097	mJ	

**Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise noted)**

Symbol	Parameter	Condition	Min	Typ	Max	Unit
<b>Static Electrical Characteristics @ T<sub>J</sub>=25°C (unless otherwise stated)</b>						
V(BR)DSS	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	250	--	--	V
IDSS	Zero Gate Voltage Drain Current	V <sub>DS</sub> =250V, V <sub>GS</sub> =0V	--	--	1	μA
IGSS	Gate-Body Leakage Current	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	--	--	±100	nA
VGS(th)	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	3.0	--	5.0	V
RDS(on)	Drain-Source On-State Resistance	V <sub>GS</sub> =10V, I <sub>D</sub> =50A	--	15	18.5	mΩ
<b>Dynamic Electrical Characteristics @ T<sub>J</sub> = 25°C (unless otherwise stated)</b>						
Ciss	Input Capacitance	V <sub>DS</sub> =50V, V <sub>GS</sub> =0V, f=1MHz	--	12396	--	pF
Coss	Output Capacitance		--	598	--	pF
Crss	Reverse Transfer Capacitance		--	261	--	pF
Rg	Gate Resistance	f=1MHz	--	1.7	--	Ω
Qg	Total Gate Charge	V <sub>DS</sub> =100V, I <sub>D</sub> =50A, V <sub>GS</sub> =10V	--	210	--	nC
Qgs	Gate-Source Charge		--	75	--	nC
Qgd	Gate-Drain Charge		--	71	--	nC
<b>Switching Characteristics</b>						
Td(on)	Turn-on Delay Time	V <sub>DS</sub> =100V, I <sub>D</sub> =50A, R <sub>G</sub> =5Ω, V <sub>GS</sub> =10V	--	34	--	ns
Tr	Turn-on Rise Time		--	163	--	ns
Td(off)	Turn-Off Delay Time		--	66	--	ns
Tf	Turn-Off Fall Time		--	103	--	ns
<b>Source- Drain Diode Characteristics @ T<sub>J</sub> = 25°C (unless otherwise stated)</b>						
IS	Diode Forward Current		--	--	90	A
VSD	Forward on voltage	I <sub>S</sub> =50A, V <sub>GS</sub> =0V	--	--	1.2	V
Trr	Reverse Recovery Time	T <sub>J</sub> =25°C, I <sub>S</sub> =50A, V <sub>DD</sub> =50V, di/dt=100A/μs	--	160	--	ns
Qrr	Reverse Recovery Charge		--	1400	--	nC

**Notes:**

- 1.Repetitive rating; pulse width limited by maximum junction temperature
- 2.V<sub>DD</sub>=100V, L=0.5mH, R<sub>g</sub>=25Ω, Starting T<sub>J</sub>=25 °C

## Electrical Characteristics Diagrams

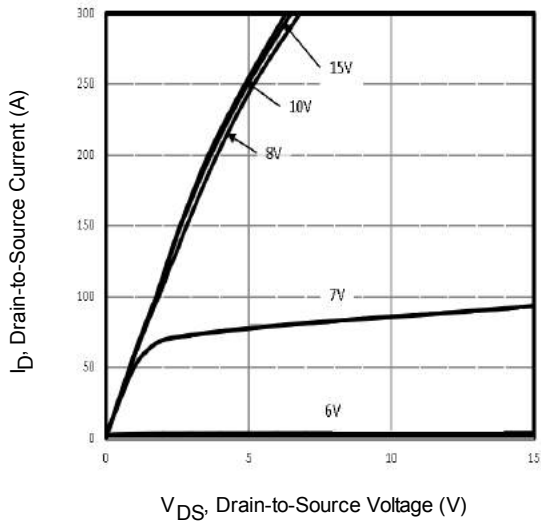


Fig 1. Typical Output Characteristics

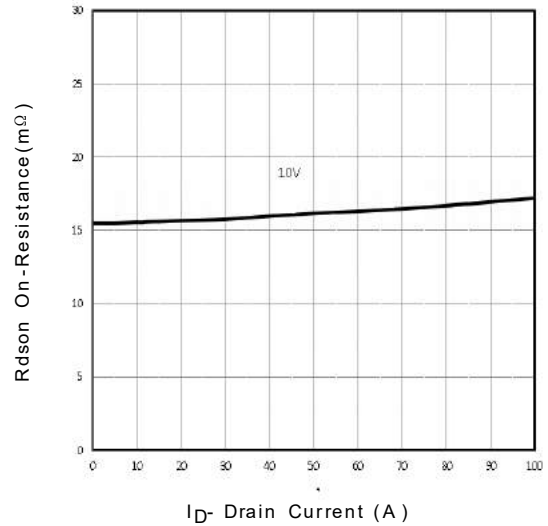


Fig 4. Rdson-Drain Current

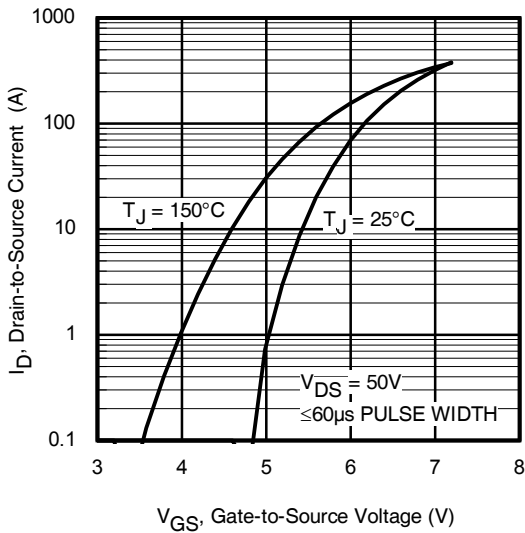


Fig 2. Typical Transfer Characteristics

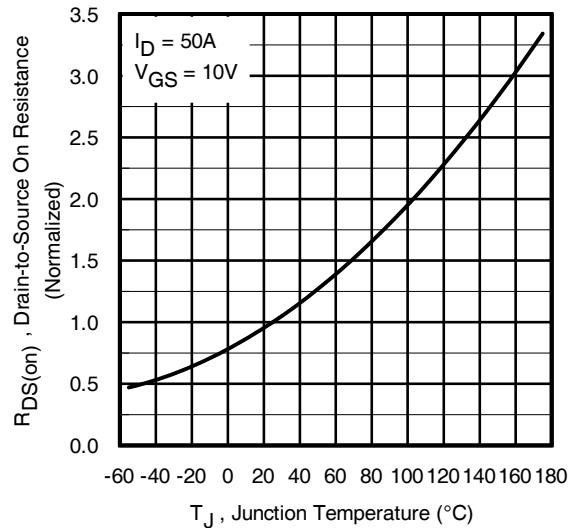


Fig 5. Normalized On-Resistance vs. Temperature

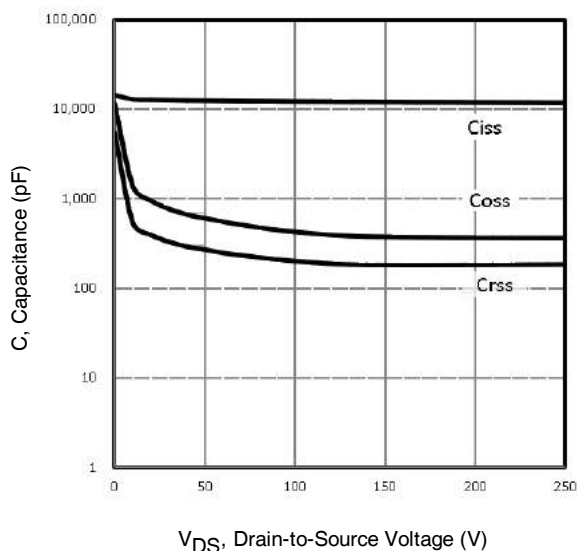


Fig 3. Typical Capacitance vs. Drain-to-Source Voltage

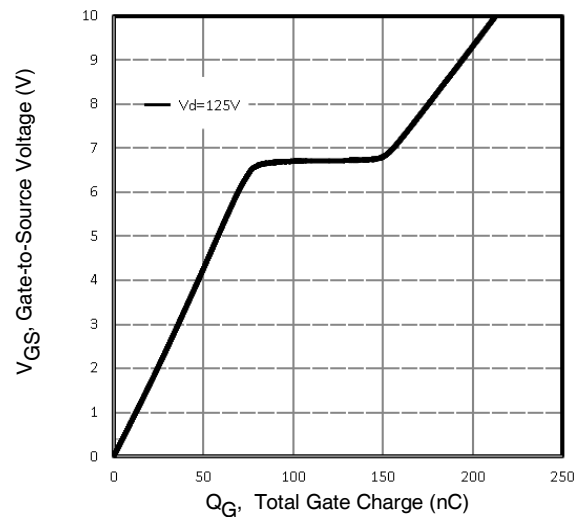


Fig 6. Typical Gate Charge vs. Gate-to-Source Voltage

## Electrical Characteristics Diagrams

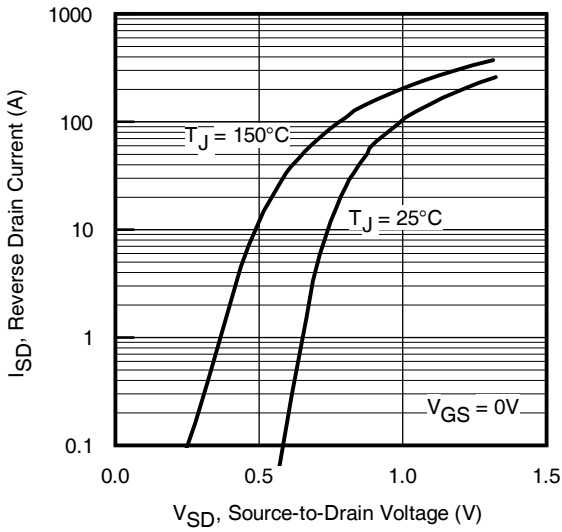


Fig 7. Typical Source-Drain Diode Forward Voltage

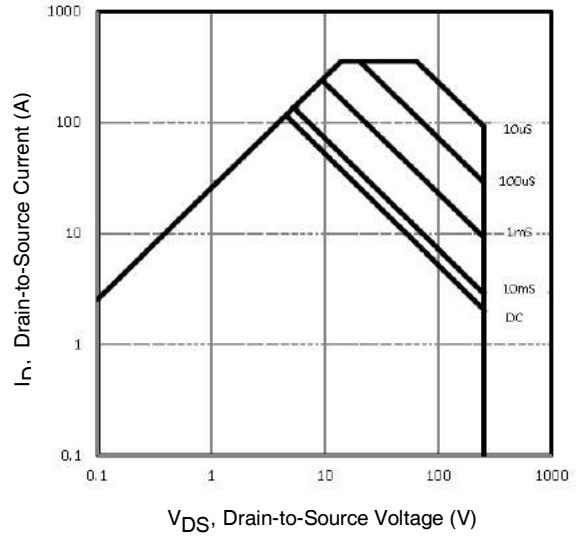


Fig 9. Maximum Safe Operating Area

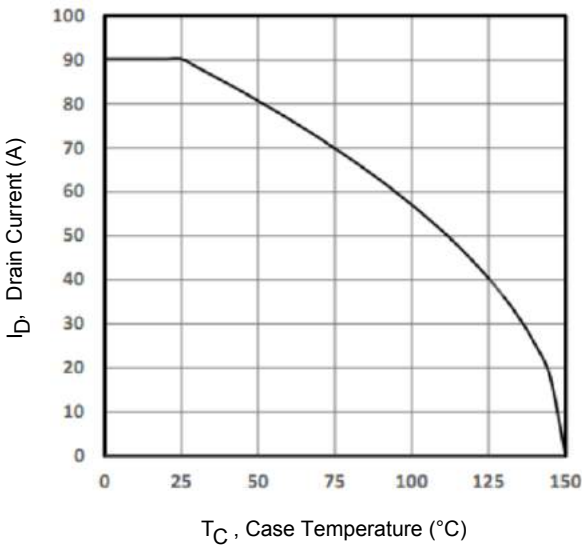


Fig 8. Maximum Drain Current vs. Case Temperature

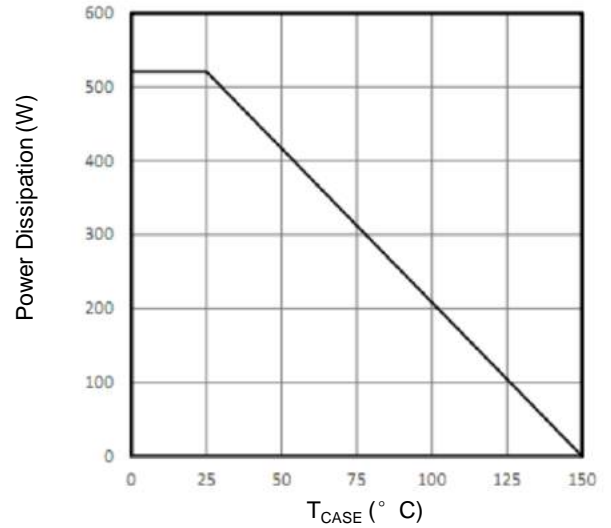


Fig 10. Power De-rating

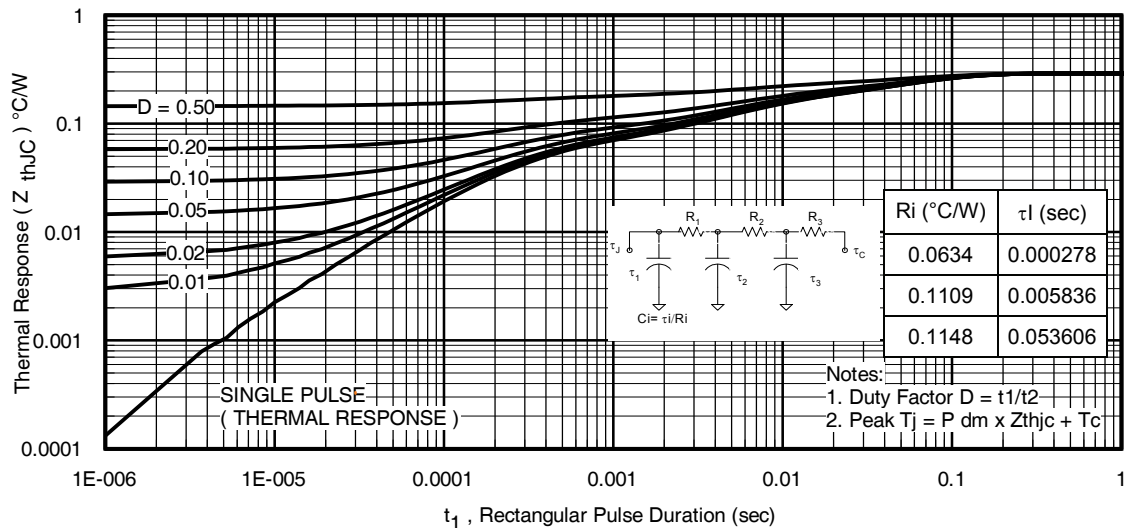
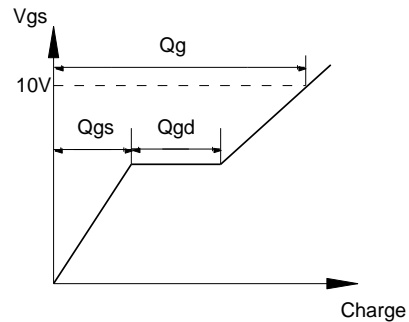
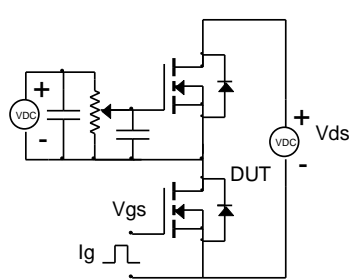


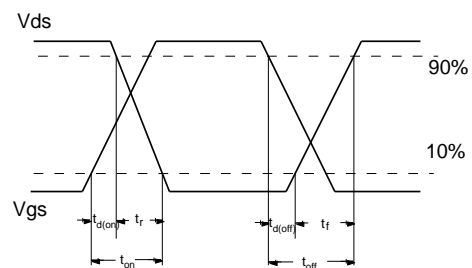
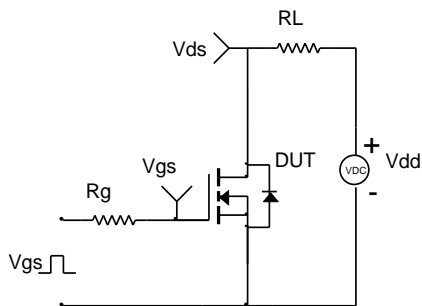
Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Case

## Test Circuit and Waveform

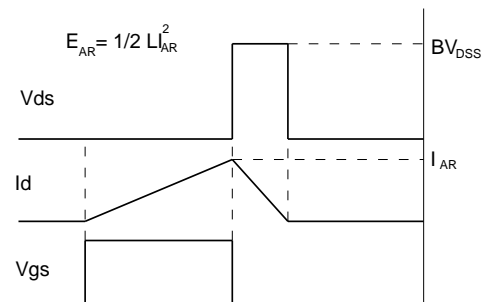
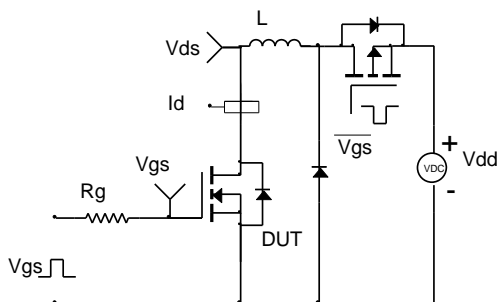
Gate Charge Test Circuit & Waveform



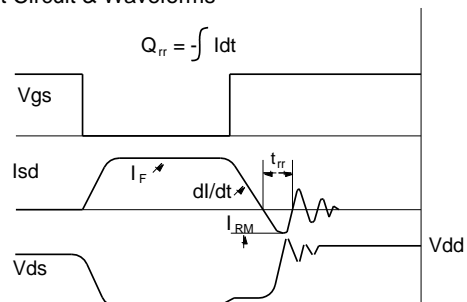
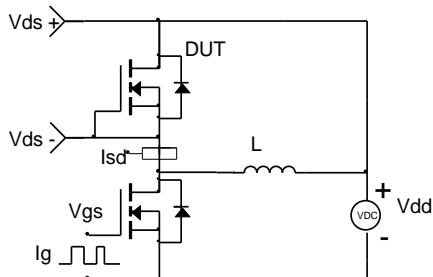
Resistive Switching Test Circuit & Waveforms



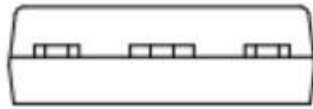
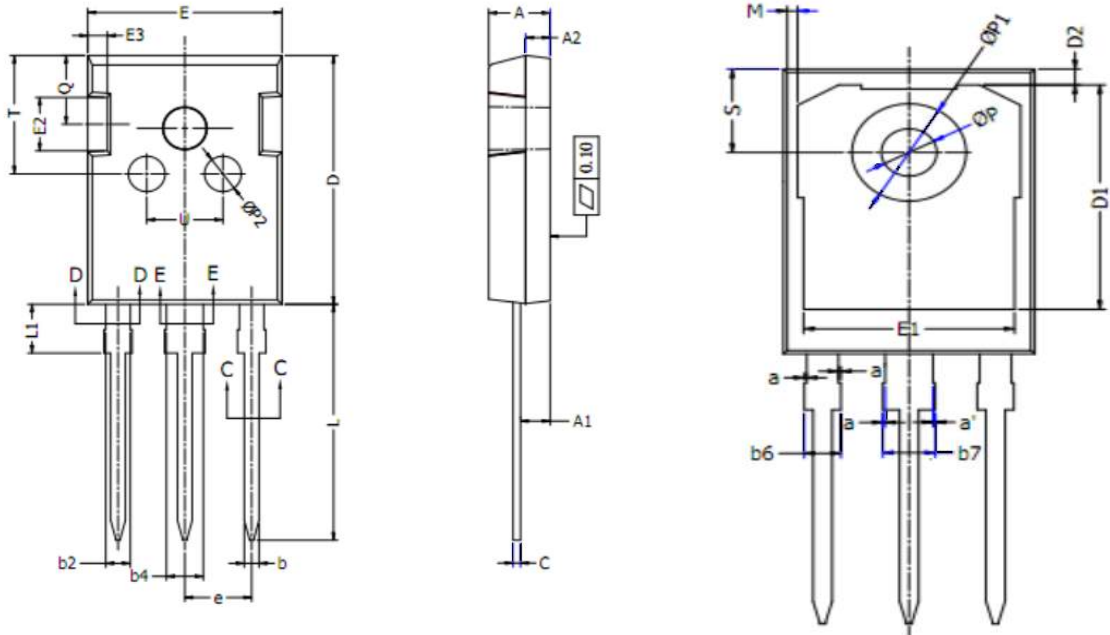
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



## TO-247 Package Information



SYMBOL	MIN	NOM	MAX
A	4.90	5.00	5.10
A1	2.31	2.41	2.51
A2	1.90	2.00	2.10
a	0	---	0.15
a'	0	---	0.15
b	1.16	---	1.26
b1	1.15	1.2	1.22
b2	1.96	---	2.06
b3	1.95	2.00	2.02
b4	2.96	---	3.06
b5	2.96	3.00	3.02
b6	---	---	2.25
b7	---	---	3.25
c	0.59	---	0.66
c1	0.58	0.60	0.62
D	20.90	21.00	21.10
D1	16.25	16.55	16.85
D2	1.05	1.17	1.35
E	15.70	15.80	15.90
E1	13.10	13.30	13.50
E2	4.40	4.50	4.60
E3	1.50	1.60	1.70
e	5.436 BSC		
L	19.80	19.92	20.10
L1	---	---	4.30
M	0.35	---	0.95
P	3.40	3.50	3.60
P1	7.00	---	7.40
P2	2.40	2.50	2.60
Q	5.60	---	6.00
S	6.05	6.15	6.25
T	9.80	---	10.20
U	6.00	---	6.40

## Customer Service

Sales and Service:

[zj@ztasemi.com](mailto:zj@ztasemi.com)