

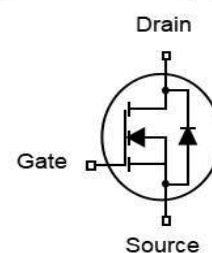
## Features

- N-Channel
- Low FOM  $R_{DS(on)} \times Q_{gd}$
- 100% avalanche tested
- Easy to use/drive
- RoHS compliant
- 100% EAS Tested

$V_{DS}$	60	V
$R_{DS(on),TYP@ V_{GS}=10V}$	25	m $\Omega$
$R_{DS(on),TYP@ V_{GS}=4.5V}$	32	m $\Omega$
$I_D$	20	A

**DFN5x6**


Part ID	Package Type	Marking	Packing
ZT25N06G	DFN5x6	ZT25N06G	5000pcs/Reel



## 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	60	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 3)	$T_c = 25^\circ\text{C}$ 80	A	
<b>Mounted on Large Heat Sink</b>				
$I_D$	Drain Current-Continuous (Note 2)	$T_c = 25^\circ\text{C}$	20	A
		$T_c = 100^\circ\text{C}$	14	A
$P_D$	Maximum Power Dissipation	23	W	
$R_{\theta JC}$	Thermal Resistance-Junction to Case	5.5	$^\circ\text{C/W}$	
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	55	$^\circ\text{C/W}$	
<b>Drain-Source Avalanche Ratings</b>				
EAS	Avalanche Energy, Single Pulsed (Note 1)	48	mJ	

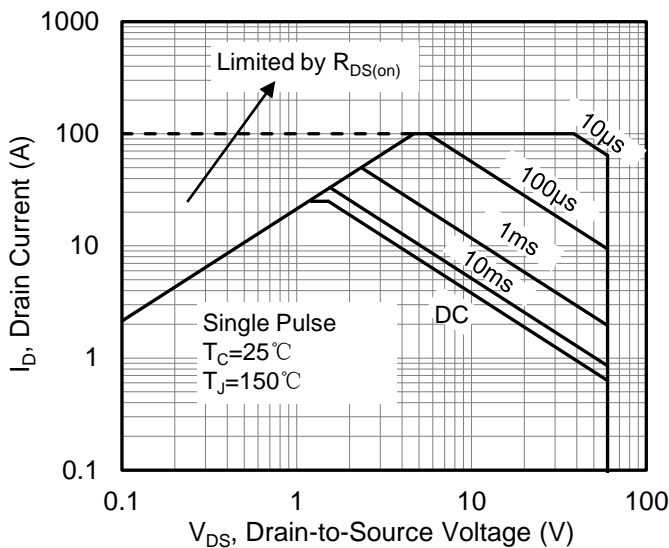
**Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise noted)**

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	60	--	--	V
IDSS	Zero Gate Voltage Drain Current	V <sub>DS</sub> =60V, 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	1.2	1.8	2.5	V
RDS(on)	Drain-Source On-State Resistance	V <sub>GS</sub> =10V, I <sub>D</sub> =20A	--	25	30	mΩ
RDS(on)	Drain-Source On-State Resistance	V <sub>GS</sub> =4.5V, I <sub>D</sub> =10A	--	32	41	mΩ
<b>Dynamic Electrical Characteristics @ T<sub>J</sub> = 25°C (unless otherwise stated)</b>						
Ciss	Input Capacitance	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V, f=1MHz	--	1056	--	pF
Coss	Output Capacitance		--	62	--	pF
Crss	Reverse Transfer Capacitance		--	52	--	pF
Rg	Gate Resistance	f=1MHz	--	1.6	--	Ω
Qg	Total Gate Charge	V <sub>DS</sub> =30V, I <sub>D</sub> =20A, V <sub>GS</sub> =10V	--	25	--	nC
Qgs	Gate-Source Charge		--	5.5	--	nC
Qgd	Gate-Drain Charge		--	5.1	--	nC
Vplateau	Gate plateau voltage		--	4.0	--	V
<b>Switching Characteristics (Note 2)</b>						
Td(on)	Turn-on Delay Time	V <sub>DS</sub> =30V, I <sub>D</sub> =20A, R <sub>G</sub> =3.0Ω, V <sub>GS</sub> =10V	--	8.2	--	ns
Tr	Turn-on Rise Time		--	8.3	--	ns
Td(off)	Turn-Off Delay Time		--	35	--	ns
Tf	Turn-Off Fall Time		--	5.1	--	ns
<b>Source- Drain Diode Characteristics @ T<sub>J</sub> = 25°C (unless otherwise stated)</b>						
IS	Diode Forward Current		--	--	20	A
VSD	Forward on voltage	I <sub>S</sub> =20A, V <sub>GS</sub> =0V	--	--	1.2	V
Trr	Reverse Recovery Time	T <sub>J</sub> =25°C, I <sub>F</sub> =20A, V <sub>GS</sub> =0V,	--	18	--	ns
Qrr	Reverse Recovery Charge	di/dt=100A/μs	--	13	--	uC

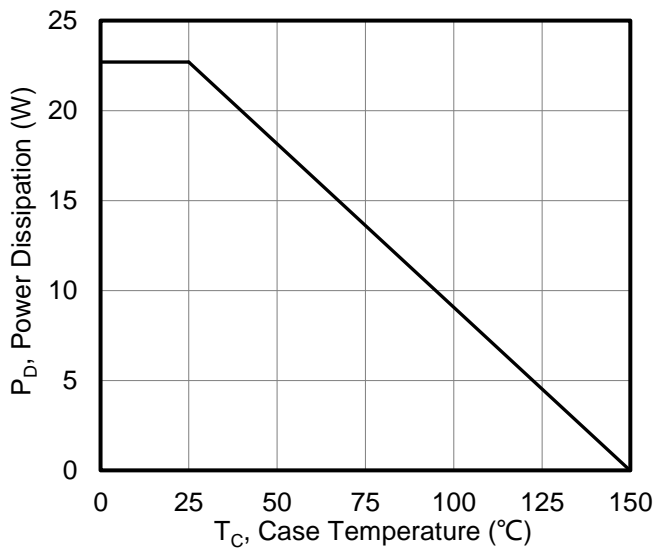
Notes:

1. L=0.5mH, V<sub>DD</sub>=30V, Start T<sub>J</sub>=25°C.
2. Limited by maximum junction temperature.
3. Repetitive Rating: Pulse width limited by maximum junction temperature.

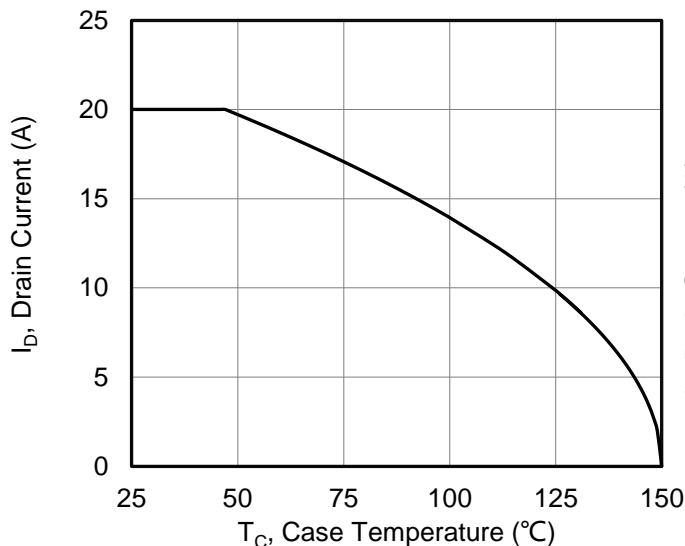
**Typical Characteristics**  $T_J = 25^\circ\text{C}$ , unless otherwise noted



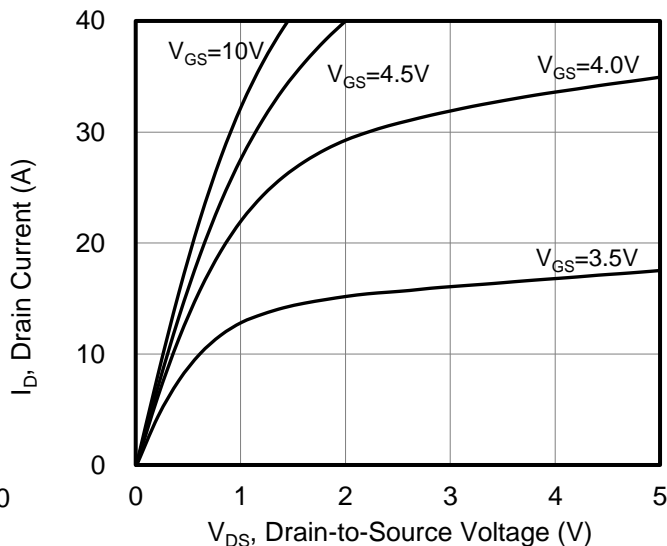
**Figure 1. Maximum Safe Operating Area**



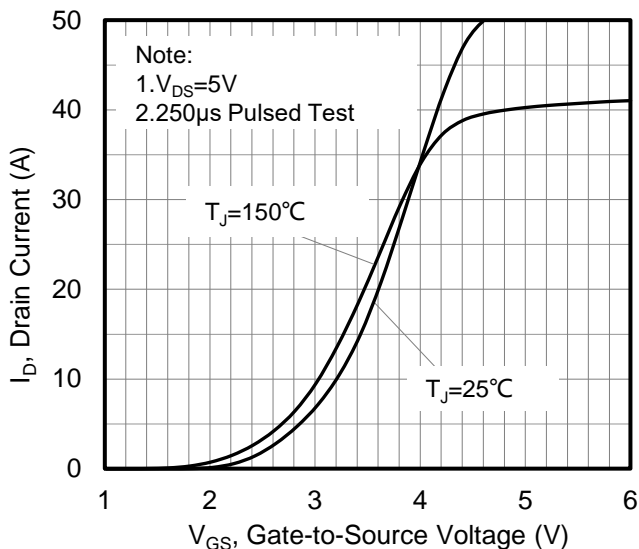
**Figure 4. Maximum Power Dissipation vs Case Temperature**



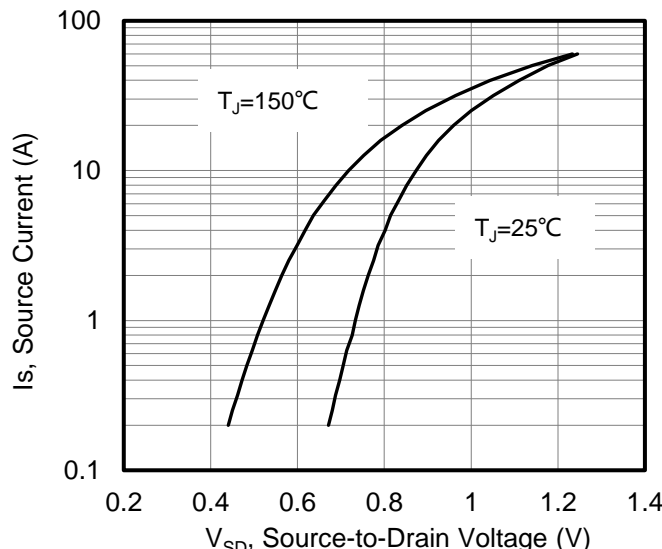
**Figure 2. Maximum Continuous Drain Current vs Case Temperature**



**Figure 5. Typical output Characteristics**

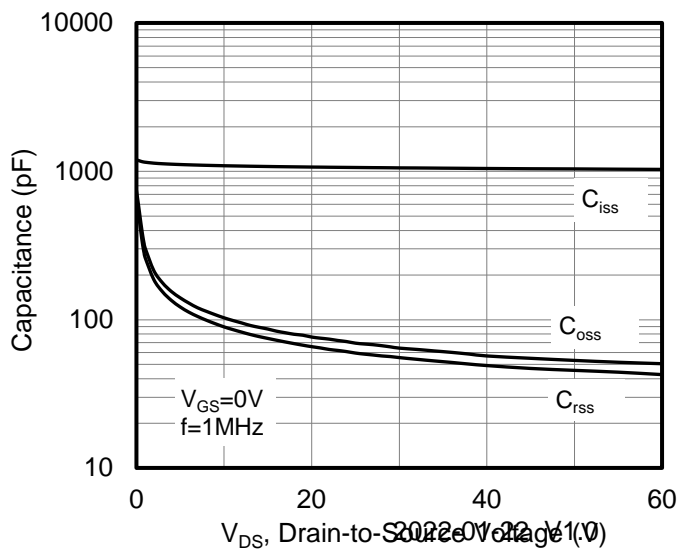


**Figure 3. Typical Transfer Characteristics**

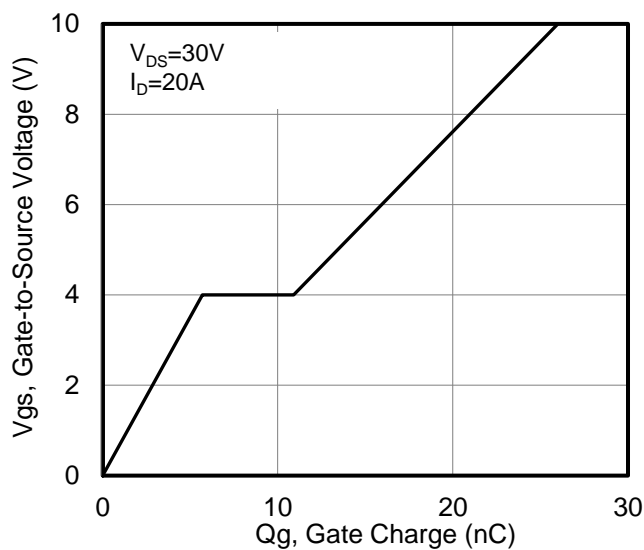


**Figure 6. Typical Body Diode Transfer Characteristics**

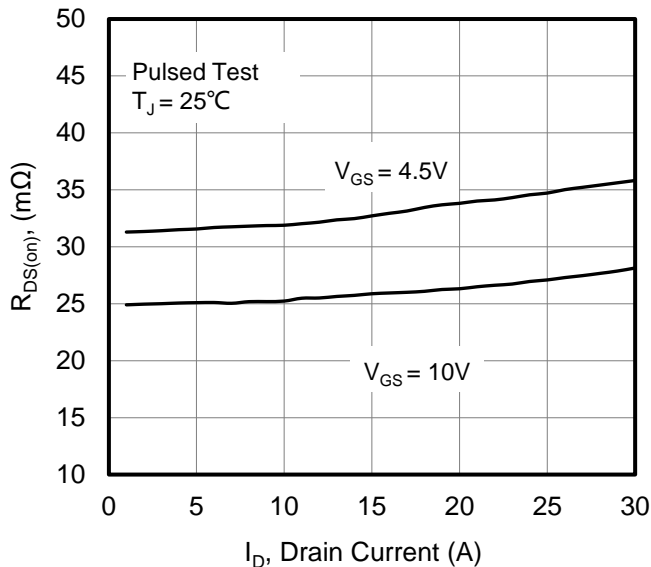
**Typical Characteristics**  $T_J = 25^\circ\text{C}$ , unless otherwise noted



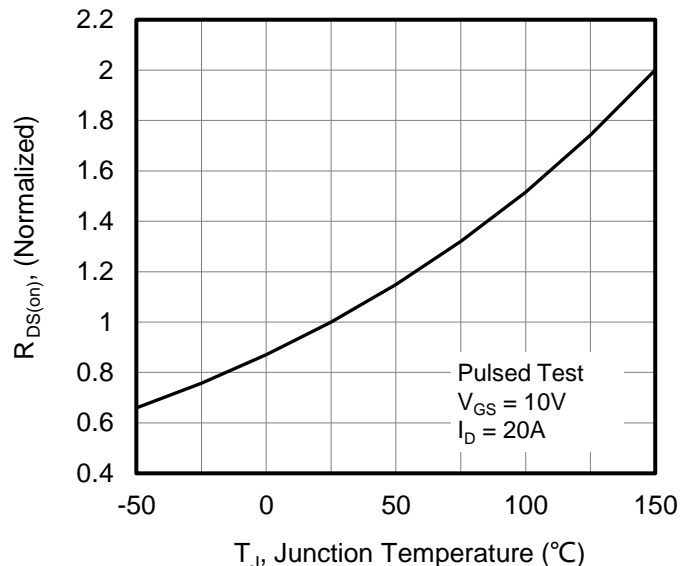
**Figure 7. Capacitance Characteristics**



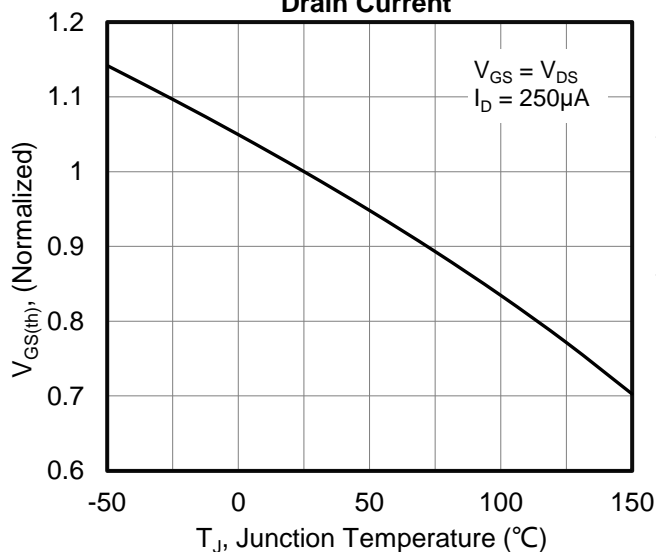
**Figure 10. Typical Gate Charge vs Gate to Source Voltage**



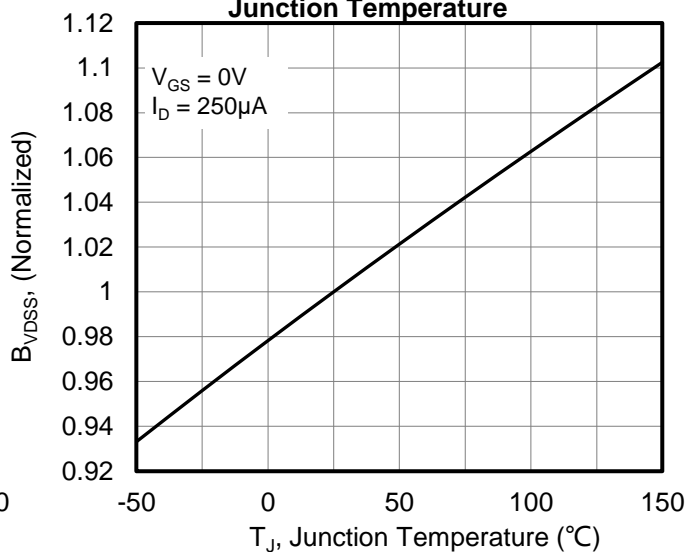
**Figure 8. Drain-to-Source On Resistance vs Drain Current**



**Figure 11. Normalized On Resistance vs Junction Temperature**

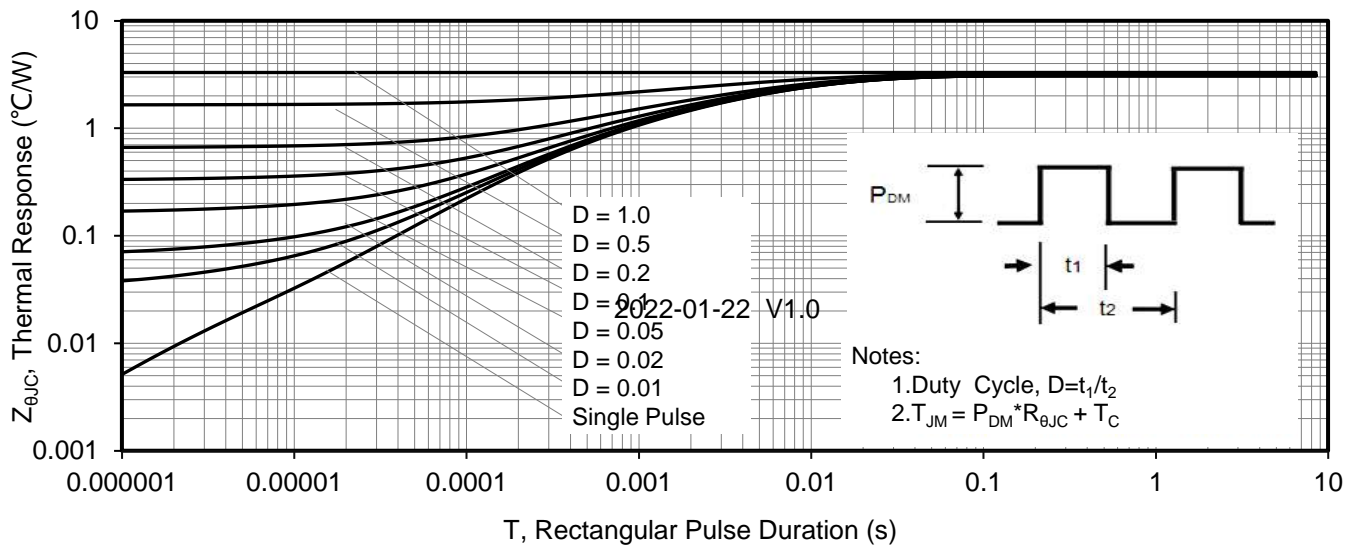


**Figure 9. Normalized Threshold Voltage vs Junction Temperature**



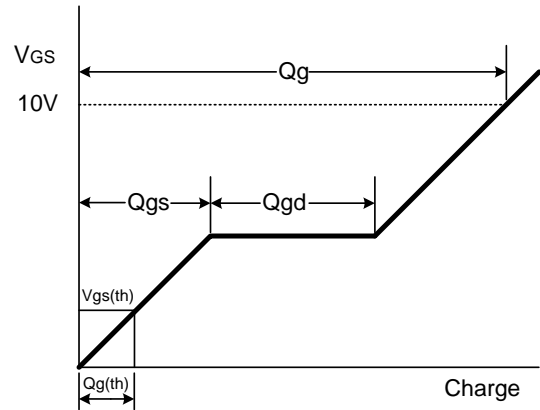
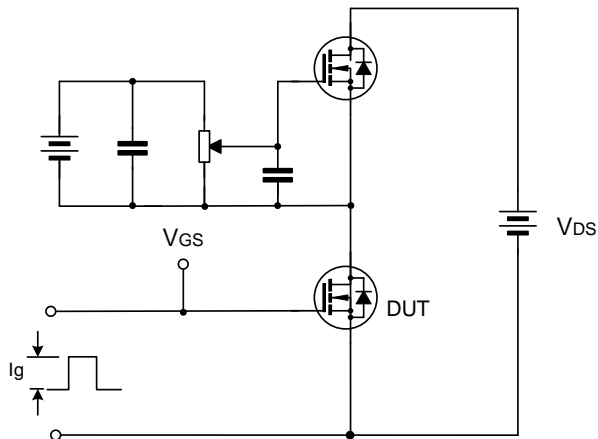
**Figure 12. Normalized Breakdown Voltage vs Junction Temperature**

**Typical Characteristics**  $T_J = 25^\circ\text{C}$ , unless otherwise noted

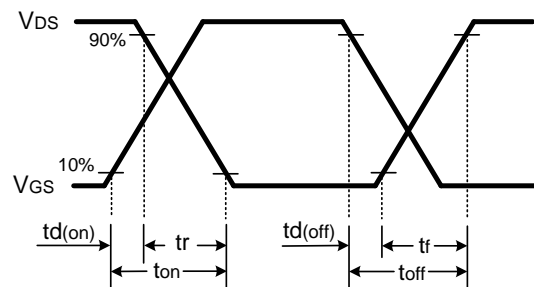
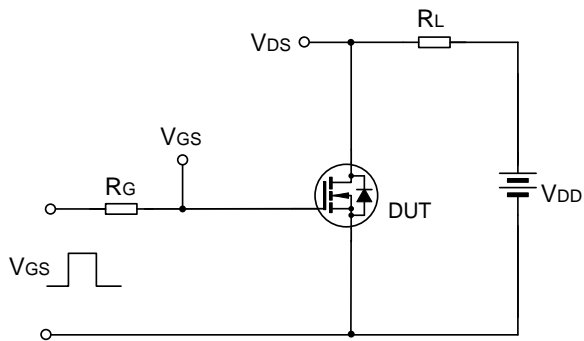


**Figure 13. Maximum Effective Thermal Impedance, Junction to Case**

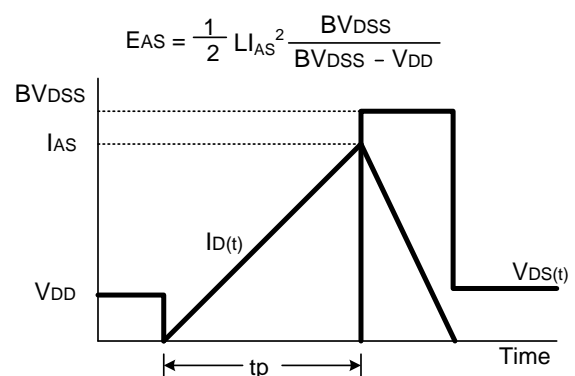
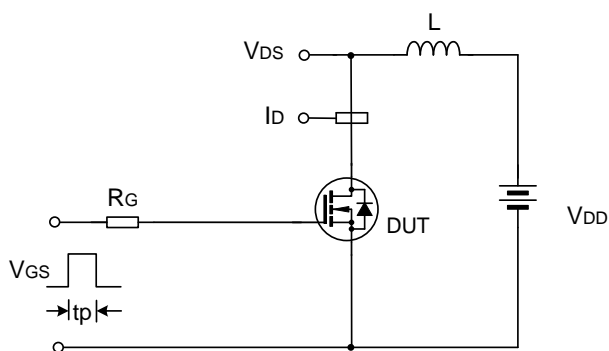
## Test Circuit and Waveform



Gate Charge Test Circuit & Waveform

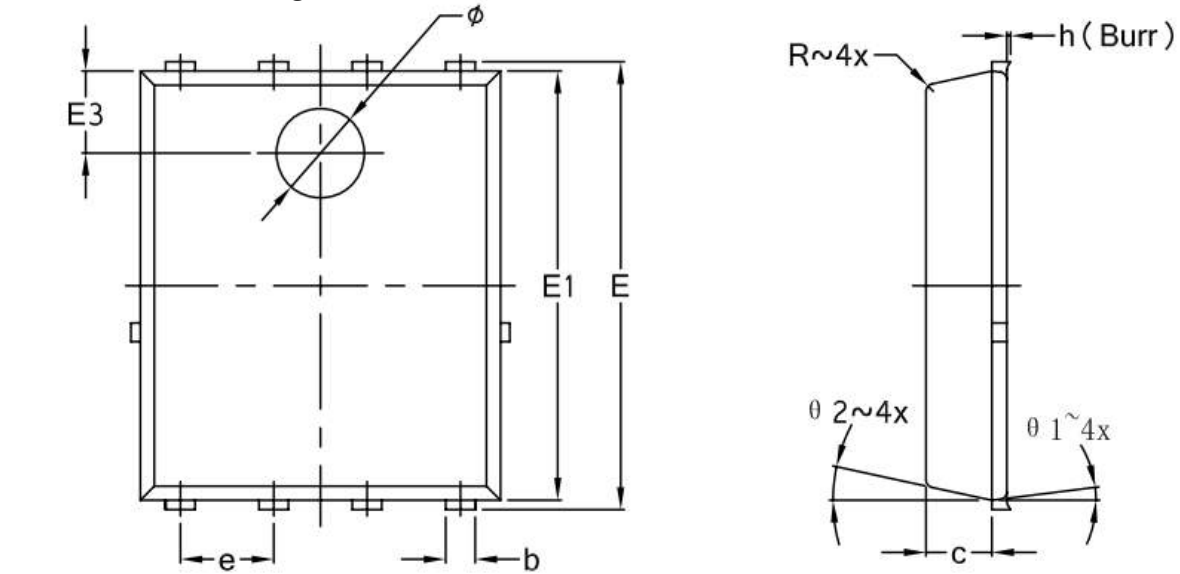


Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Circuit & Waveforms

### DFN5x6-8L Package Information



SYMBOL	COMMON			
	MM		INCH	
	MIN.	MAX.	MIN.	MAX.
A	1.03	1.17	0.0406	0.0461
b	0.35	0.46	0.0138	0.0181
c	0.84	0.95	0.0331	0.0374
D	4.83	5.37	0.1902	0.2114
D1	4.14	4.28	0.1630	0.1685
D2	4.83	4.97	0.1902	0.1957
E	6.03	6.13	0.2374	0.2413
E1	5.68	5.82	0.2236	0.2291
E2	1.65	—	0.0650	—
E3	1.03	1.17	0.0406	0.0461
e	1.27 BSC		0.0500 BSC	
L	0.05	0.25	0.0020	0.0098
L1	0.40	0.48	0.0157	0.0189
L2	0.40	0.48	0.0157	0.0189
H	3.315	3.475	0.1305	0.1368
I	—	0.16	—	0.0063
phi	1.13	1.27	0.0445	0.0500
R	0.10		0.0039	
theta 1	7° REF		7° REF	
theta 2	12° REF		12° REF	
h	0.08 MAX		0.0031	

### Customer Service

Sales and Service:

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