

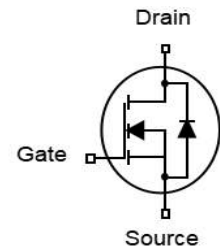
Features

- N-Channel
- Low $R_{DS(on)}$ & FOM
- Easy to use/drive
- 100% Avalanche Tested
- RoHS compliant
- 100% EAS Tested

V_{DS}	30	V
$R_{DS(on),TYP@ V_{GS}=10V}$	2.0	$m\Omega$
$R_{DS(on),TYP@ V_{GS}=4.5V}$	3.0	$m\Omega$
I_D	100	A

DFN5x6


Part ID	Package Type	Marking	Packing
ZT020N03G	DFN5x6	ZT020N03G	5000pcs/Reel



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

Symbol	Parameter	Rating	Unit	
Common Ratings ($T_C = 25^\circ\text{C}$ Unless Otherwise Noted)				
V_{GS}	Gate-Source Voltage	± 20	V	
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	30	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)	$T_C = 25^\circ\text{C}$ 252	A	
Mounted on Large Heat Sink				
I_D	Drain Current-Continuous (Note 2)	$T_C = 25^\circ\text{C}$	100	A
		$T_C = 100^\circ\text{C}$	76	A
P_D	Maximum Power Dissipation	41.6	W	
$R_{\theta JC}$	Thermal Resistance-Junction to Case	3	$^\circ\text{C/W}$	
$R_{\theta JA}$	Thermal Resistance Junction-Ambient	35	$^\circ\text{C/W}$	
Drain-Source Avalanche Ratings				
EAS	Avalanche Energy, Single Pulsed (Note 1)	178	mJ	

Electrical Characteristics (T_J=25°C 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	30	--	--	V
IDSS	Zero Gate Voltage Drain Current	V _{DS} =30V, V _{GS} =0V	--	--	1	μA
IGSS	Gate-Body Leakage Current	V _{GS} =±20V, V _{DS} =0V	--	--	±100	nA
VGS(th)	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	1.4	1.8	2.2	V
RDS(on)	Drain-Source On-State Resistance	V _{GS} =10V, I _D =20A	--	2.0	2.5	mΩ
RDS(on)	Drain-Source On-State Resistance	V _{GS} =4.5V, I _D =20A	--	3.0	3.6	mΩ
Dynamic Electrical Characteristics @ T_J = 25°C (unless otherwise stated) (Note 5)						
Ciss	Input Capacitance	V _{DS} =15V, V _{GS} =0V, f=1MHz	--	3182	--	pF
Coss	Output Capacitance		--	663	--	pF
Crss	Reverse Transfer Capacitance		--	559	--	pF
Rg	Gate Resistance	f=1MHz	--	1.0	--	Ω
Qg	Total Gate Charge	V _{DS} =15V, I _D =20A, V _{GS} =10V	--	72	--	nC
Qgs	Gate-Source Charge		--	12.2	--	nC
Qgd	Gate-Drain Charge		--	15.7	--	nC
Switching Characteristics (Note 5)						
Td(on)	Turn-on Delay Time	V _{DS} =15V, I _D =20A, R _G =3.0Ω, V _{GS} =10V	--	22	--	ns
Tr	Turn-on Rise Time		--	18	--	ns
Td(off)	Turn-Off Delay Time		--	44	--	ns
Tf	Turn-Off Fall Time		--	15	--	ns
Source- Drain Diode Characteristics @ T_J = 25°C (unless otherwise stated)						
IS	Diode Forward Current (Note 3)		--	--	100	A
VSD	Forward on voltage (Note 6)	I _S =20A, V _{GS} =0V	--	--	1.2	V
Trr	Reverse Recovery Time (Note 4)	T _J =25°C, I _F =20A	--	22	--	ns
Qrr	Reverse Recovery Charge	di/dt=100A/μs	--	47	--	nC

Notes

1. L=0.1mH, V_{DD}=20V, Start T_J=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

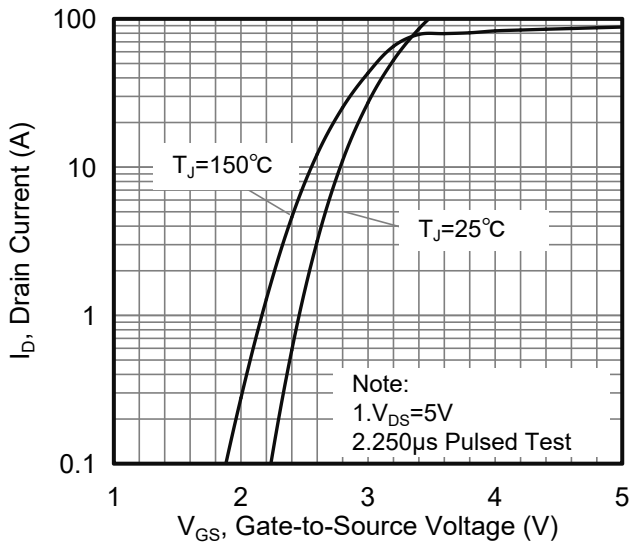


Figure 1. Typical Transfer Characteristics

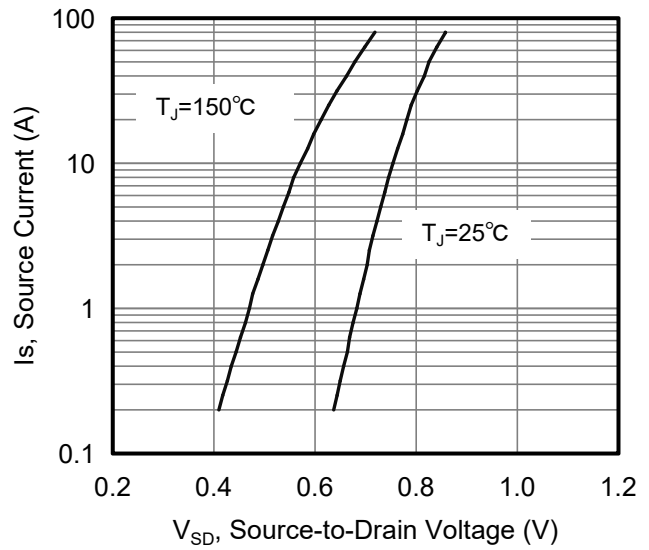


Figure 4. Typical Body Diode Transfer Characteristics

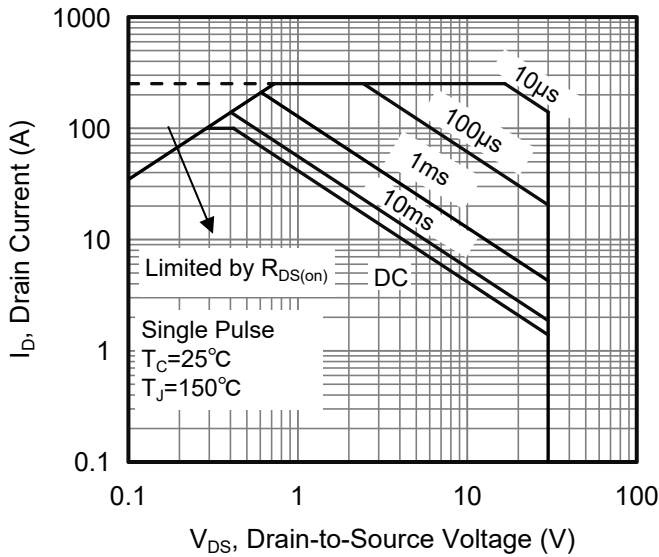


Figure 2. Maximum Safe Operating Area

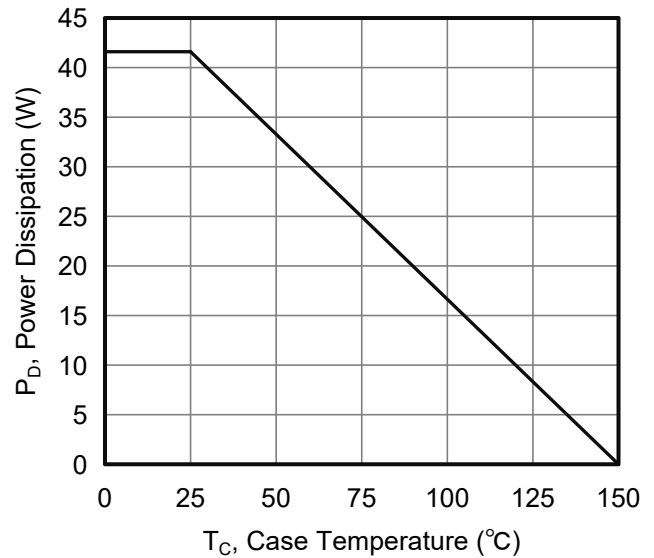


Figure 5. Maximum Power Dissipation vs Case Temperature

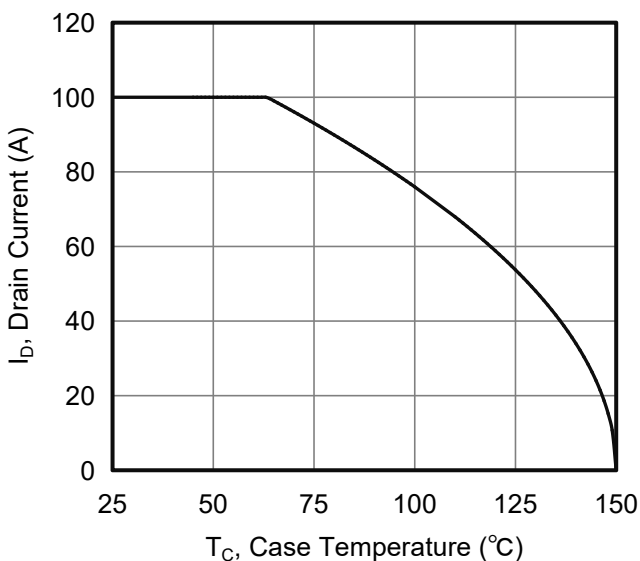


Figure 3. Maximum Continuous Drain Current vs Case Temperature

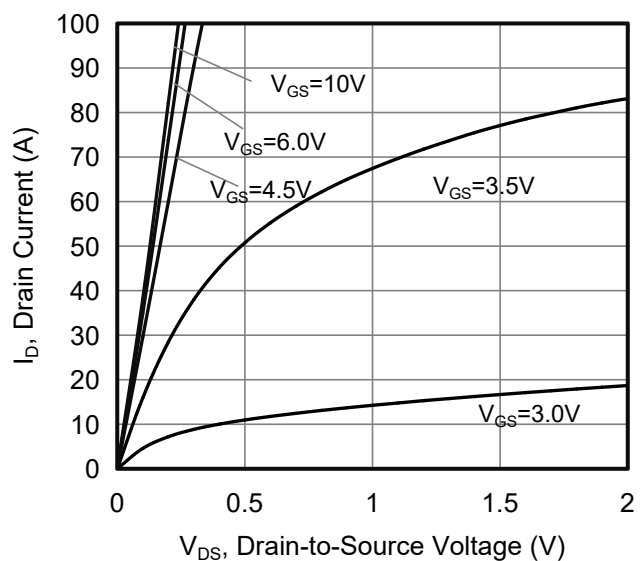


Figure 6. Typical output Characteristics

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

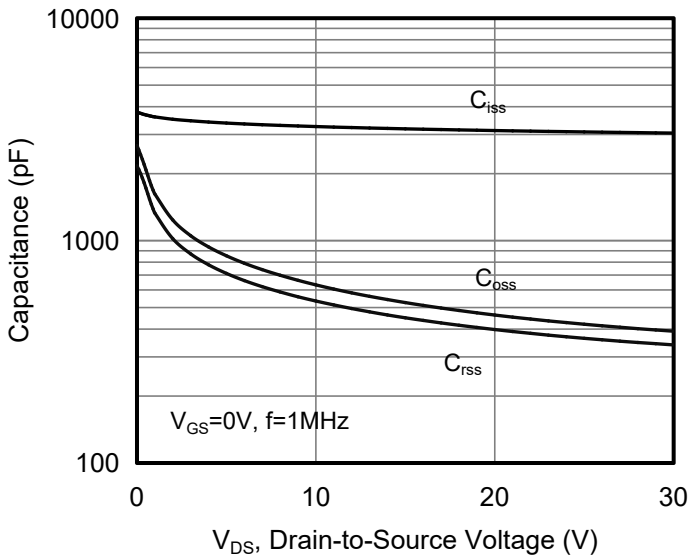


Figure 7 . Capacitance Characteristics

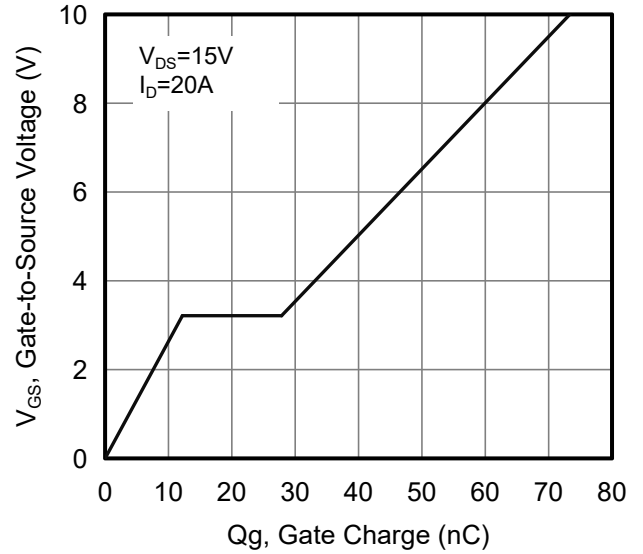


Figure 10. Typical Gate Charge vs Gate to Source Voltage

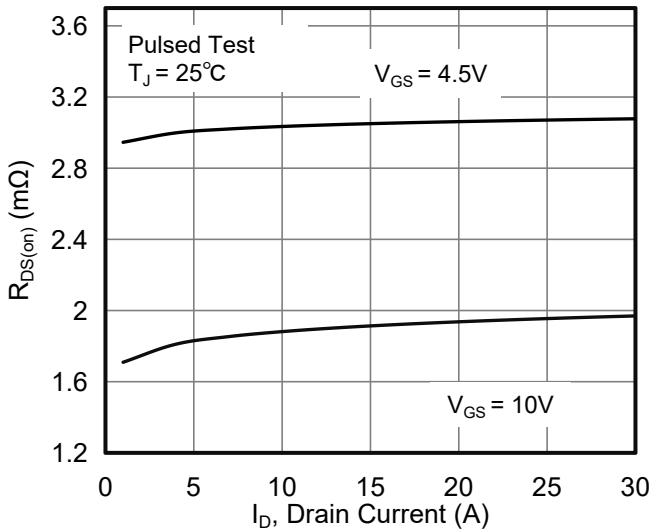


Figure 8. Drain-to-Source On Resistance vs Drain Current

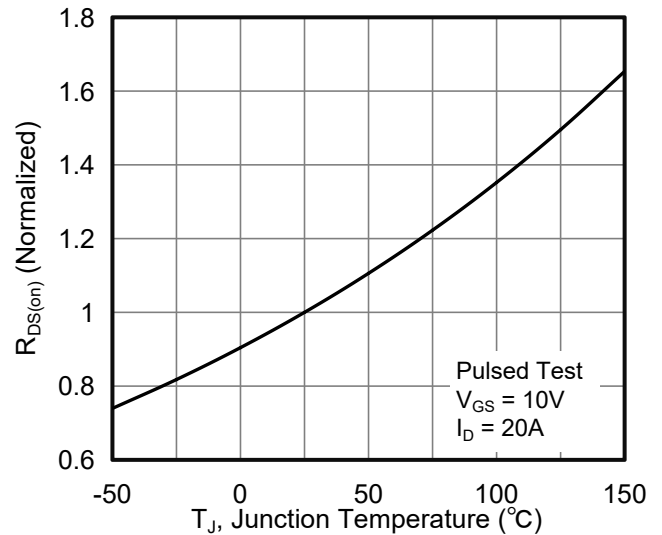


Figure 11. Normalized On Resistance vs Junction Temperature

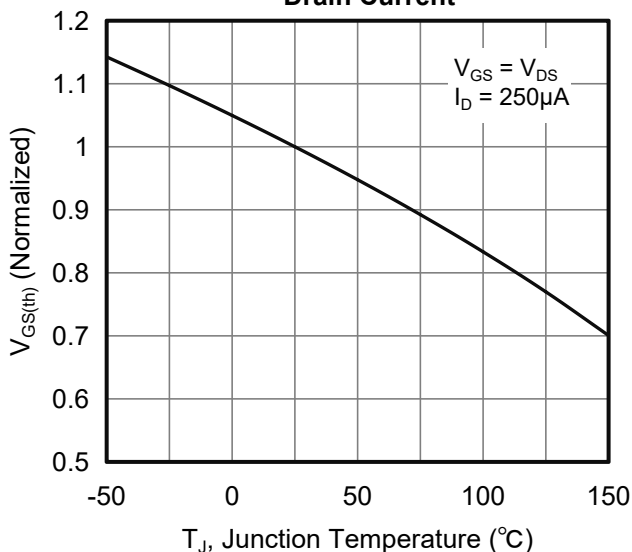


Figure 9 . Normalized Threshold Voltage vs Junction Temperature

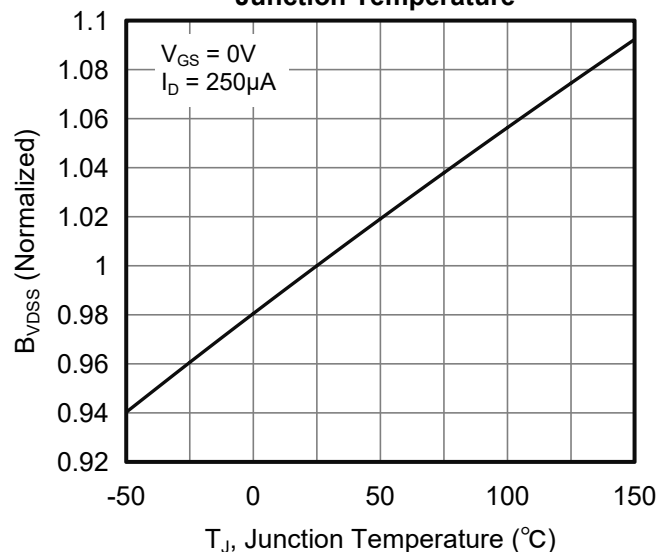


Figure 12. Normalized Breakdown Voltage vs Junction Temperature

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

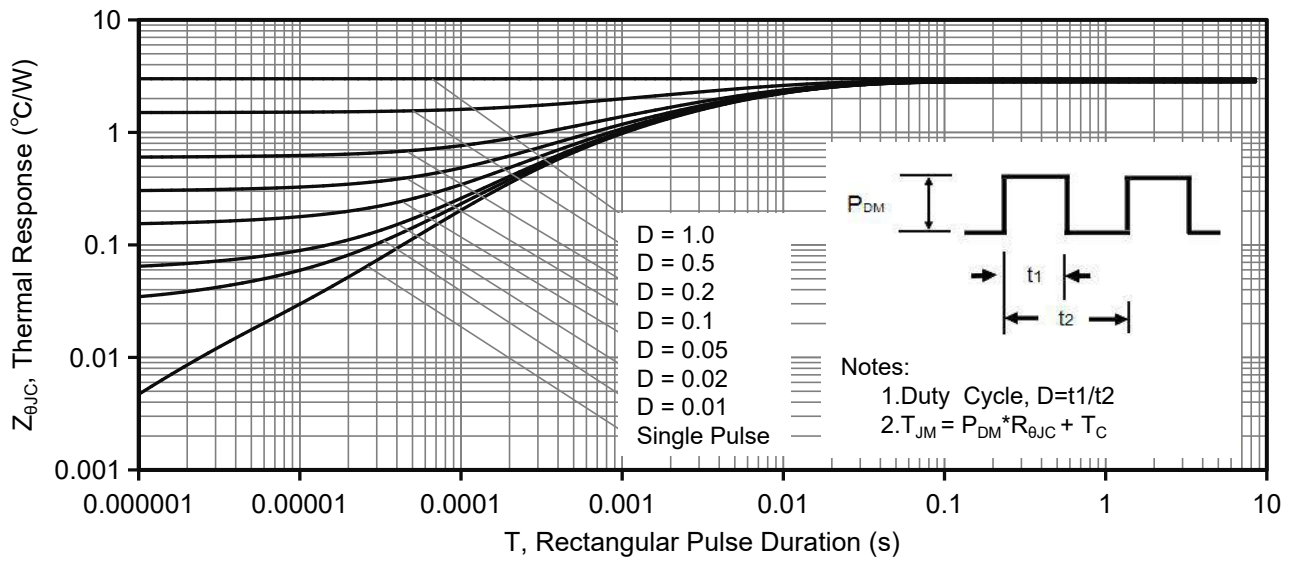


Figure 13. Maximum Effective Thermal Impedance, Junction to Case

Figure A: Gate Charge Test Circuit and Waveform

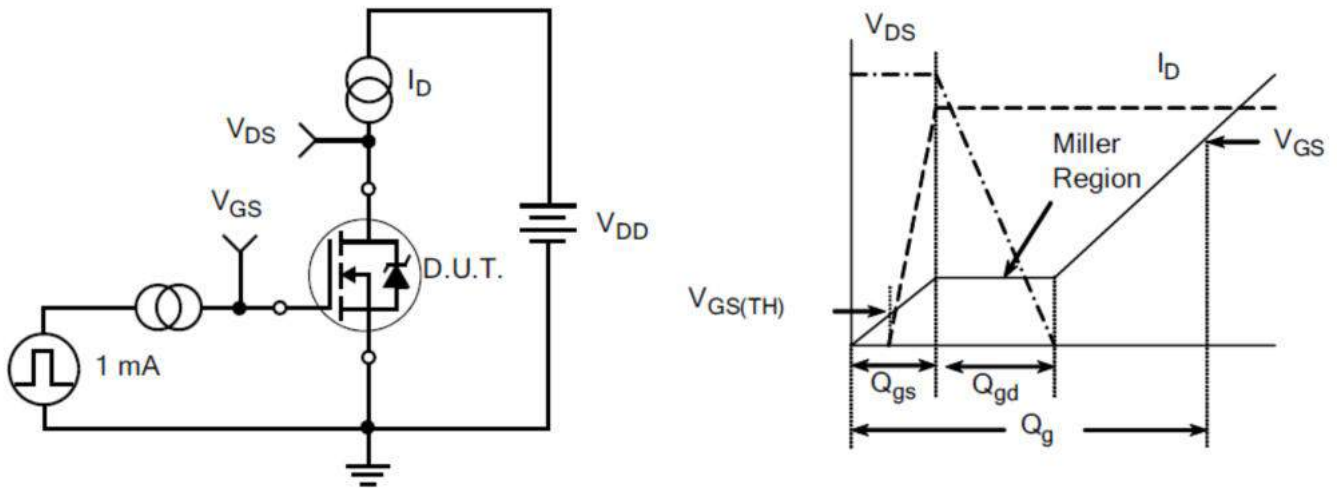


Figure B: Resistive Switching Test Circuit and Waveform

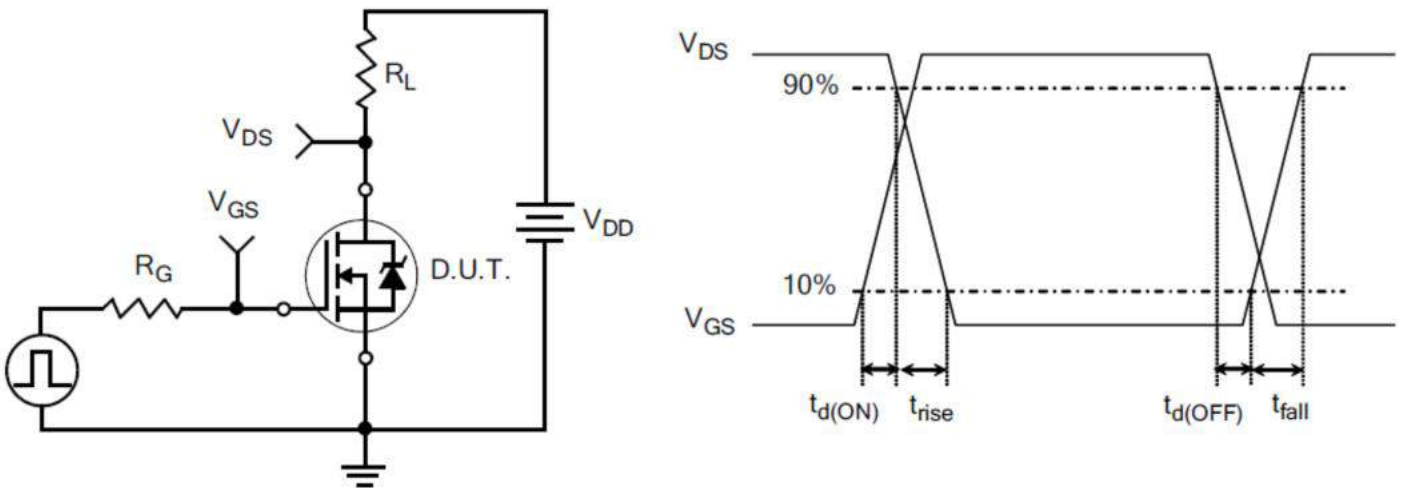
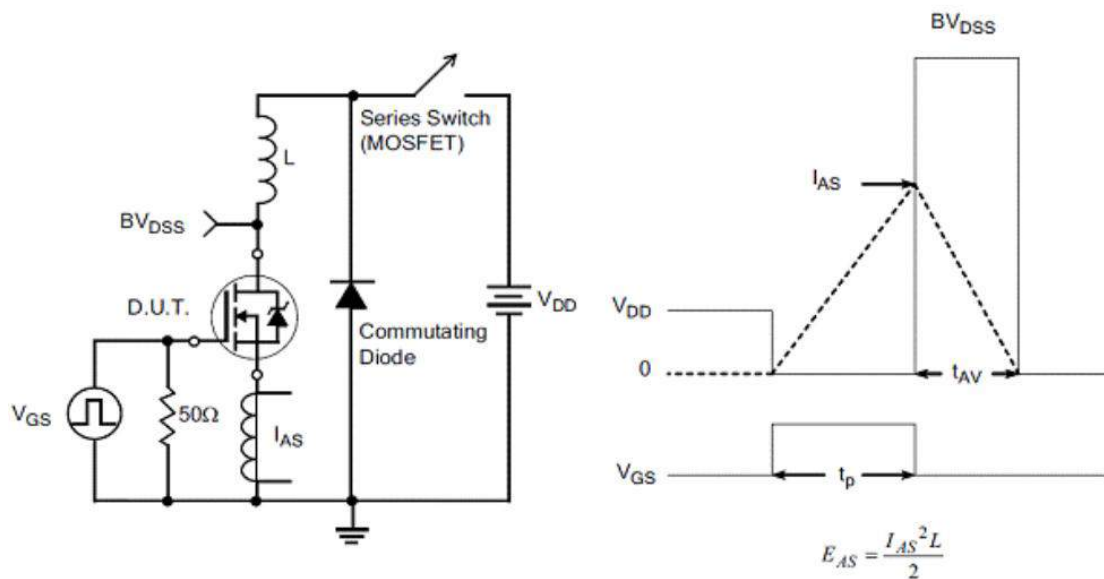
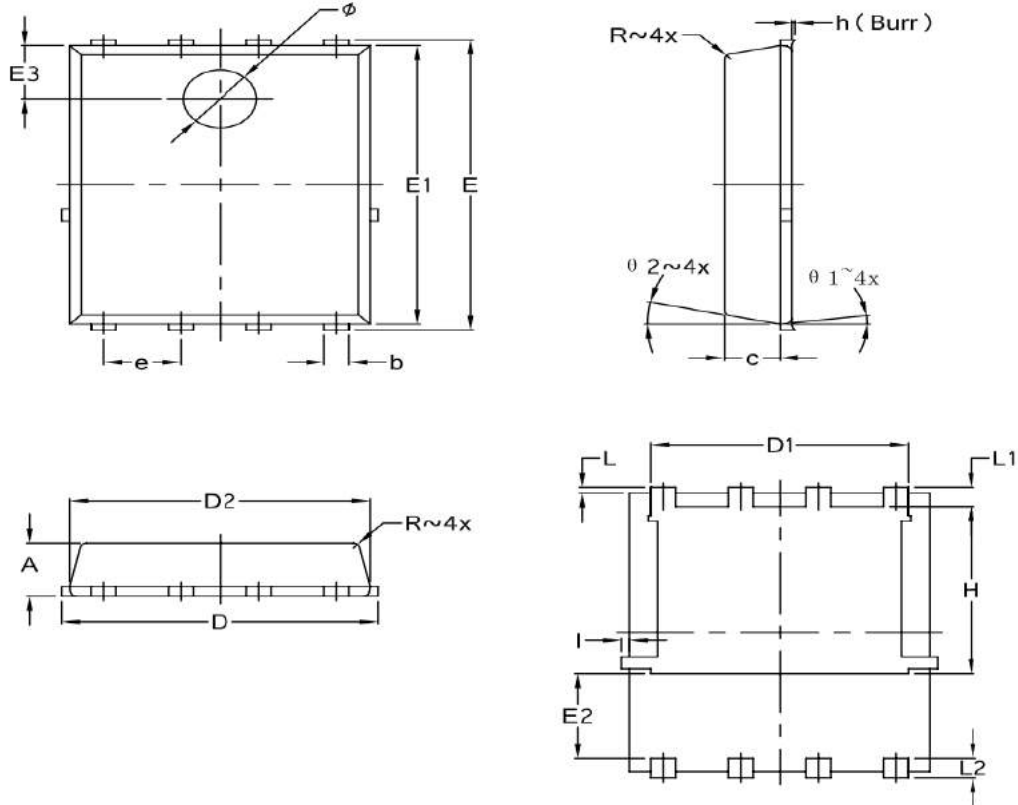


Figure C: Unclamped Inductive Switching Test Circuit and Waveform



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
ϕ	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