

Features

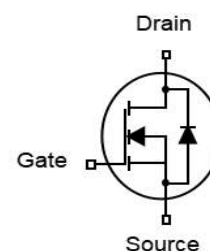
- N-Channel
- Low Crss
- Very low on-resistance RDS(ON)
- Fast switching
- 100% avalanche tested
- Improved dv/dt capability
- 100% EAS Tested

V_{DS}	40	V
$R_{DS(on),TYP@ V_{GS}=10V}$	4.3	mΩ
$R_{DS(on),TYP@ V_{GS}=4.5V}$	5.6	mΩ
I_D	80	A

DFN5x6



Part ID	Package Type	Marking	Packing
ZT040N04G	DFN5x6	ZT040N04G	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	40	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)	$T_C = 25^\circ\text{C}$ 320	A	
Mounted on Large Heat Sink				
I_D	Drain Current-Continuous	$T_C = 25^\circ\text{C}$	80	A
		$T_C = 100^\circ\text{C}$	52	A
P_D	Maximum Power Dissipation	64	W	
$R_{\theta JC}$	Thermal Resistance-Junction to Case	1.95	°C/W	
Drain-Source Avalanche Ratings				
EAS	Avalanche Energy, Single Pulsed (Note 2)	210	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	40	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =40V, 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	1.0	1.6	2.5	V
R _{DS(on)}	Drain-Source On-State Resistance	V _{GS} =10V, I _D =20A	--	4.3	5.2	mΩ
R _{DS(on)}	Drain-Source On-State Resistance	V _{GS} =4.5V, I _D =15A	--	5.6	7.8	mΩ
Dynamic Electrical Characteristics @ T_J = 25°C (unless otherwise stated)						
C _{iss}	Input Capacitance	V _{DS} =15V, V _{GS} =0V, f=1MHz	--	2676	--	pF
C _{oss}	Output Capacitance		--	243	--	pF
C _{rss}	Reverse Transfer Capacitance		--	221	--	pF
R _g	Gate Resistance	f=1MHz	--	1.7	--	Ω
Q _g	Total Gate Charge	V _{DS} =20V, I _D =30A, V _{GS} =10V	--	56	--	nC
Q _{gs}	Gate-Source Charge		--	9	--	nC
Q _{gd}	Gate-Drain Charge		--	14	--	nC
Switching Characteristics						
T _{d(on)}	Turn-on Delay Time	V _{DS} =20V, I _D =30A, R _G =3.0Ω, V _{GS} =10V	--	7.5	--	ns
T _r	Turn-on Rise Time		--	16.5	--	ns
T _{d(off)}	Turn-Off Delay Time		--	22.4	--	ns
T _f	Turn-Off Fall Time		--	13.2	--	ns
Source- Drain Diode Characteristics @ T_J = 25°C (unless otherwise stated)						
I _S	Diode Forward Current		--	--	80	A
I _{SM}	Maximum Pulsed Drain-Source Diode Forward Current		--	--	320	A
V _{SD}	Forward on voltage ^(Note 3)	I _S =20A, V _{GS} =0V	--	--	1.2	V

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition: T_J=25°C, V_{DD}=20V, V_G=10V, R_G=25Ω, L=0.5mH.
3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

N- Channel Typical Characteristics

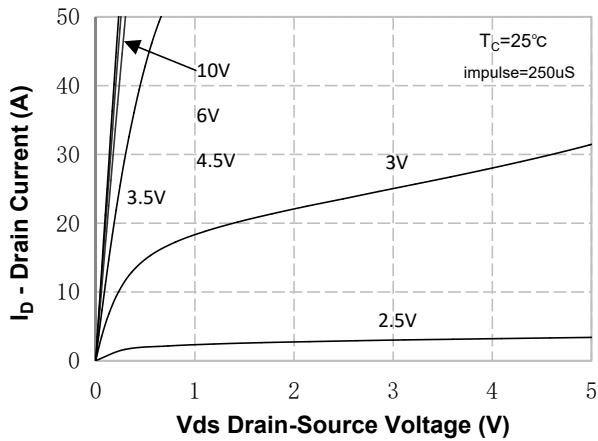


Figure 1. On-Region Characteristics

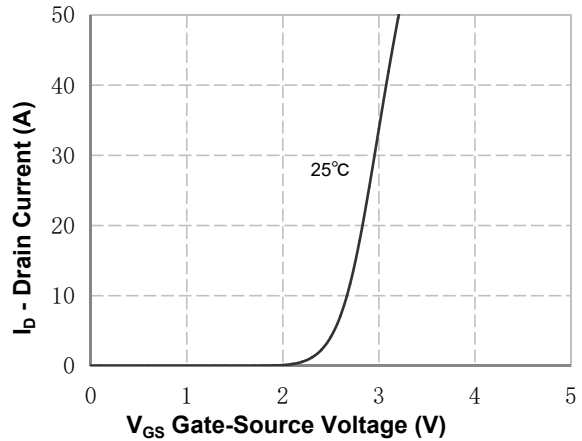


Figure 4. Transfer Characteristics

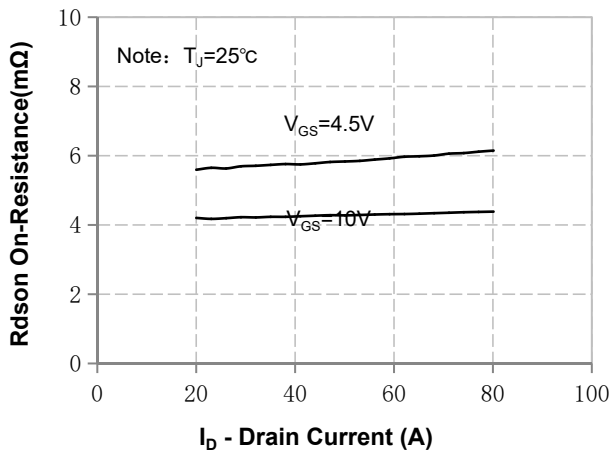


Figure 2. On-Resistance Variation vs Drain Current and Gate Voltage

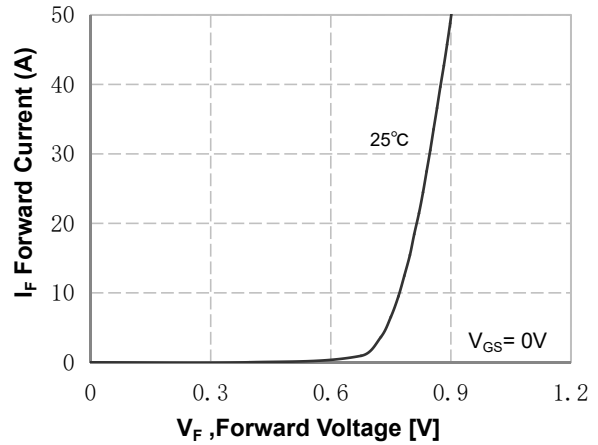


Figure 5. Body Diode Forward Voltage Variation with Source Current

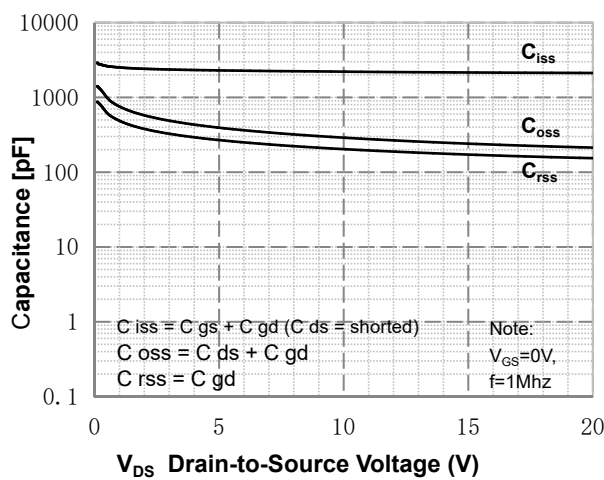


Figure 3. Capacitance Characteristics

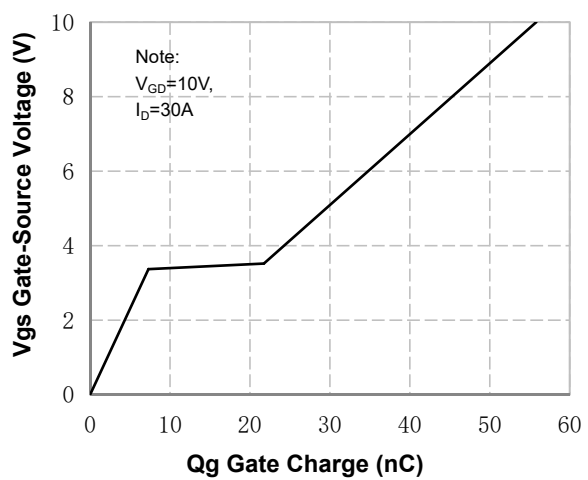


Figure 6. Gate Charge Characteristics

N Channel Typical Characteristics (Continued)

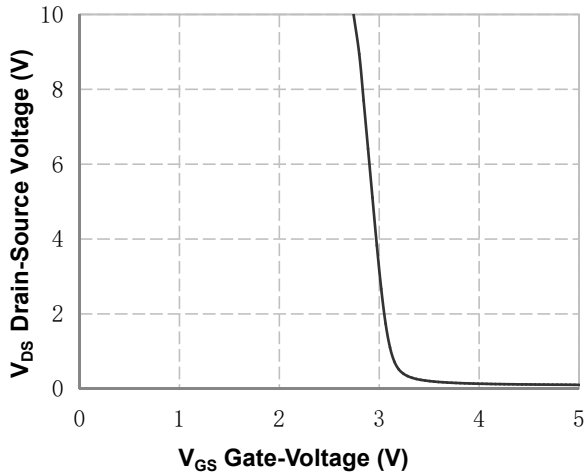


Figure 7. V_{DS} Drain-Source Voltage vs Gate Voltage

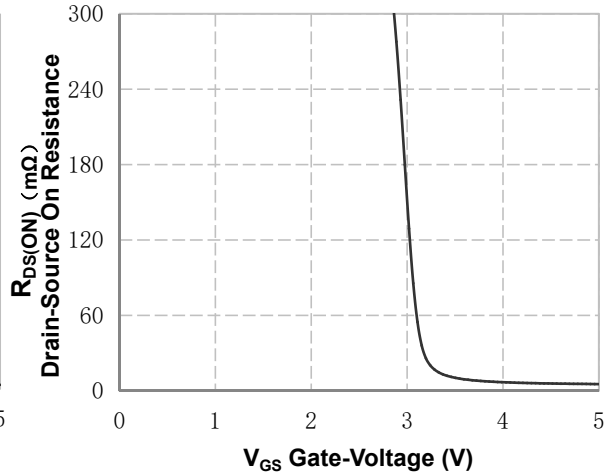


Figure 9. On-Resistance vs Gate Voltage

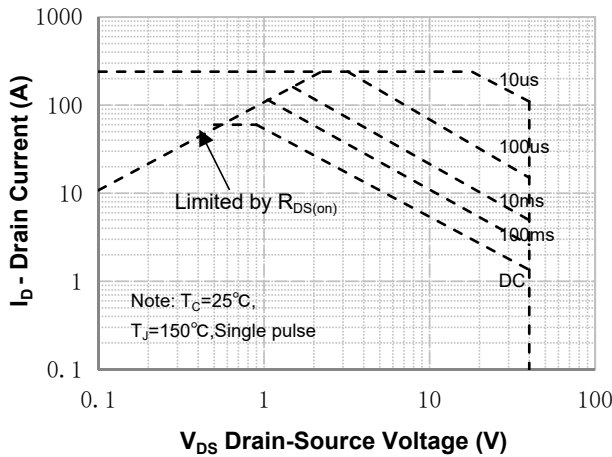


Figure 8. Maximum Safe Operating Area

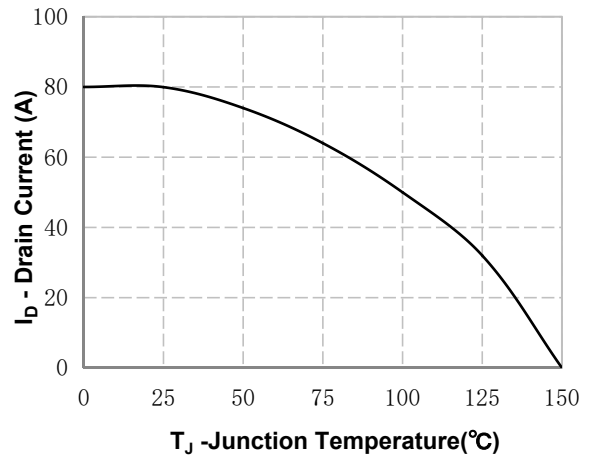


Figure 10. Maximum Continuous Drain Current vs Temperature

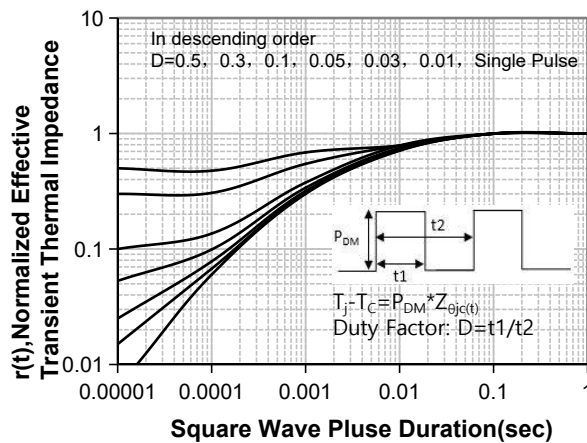
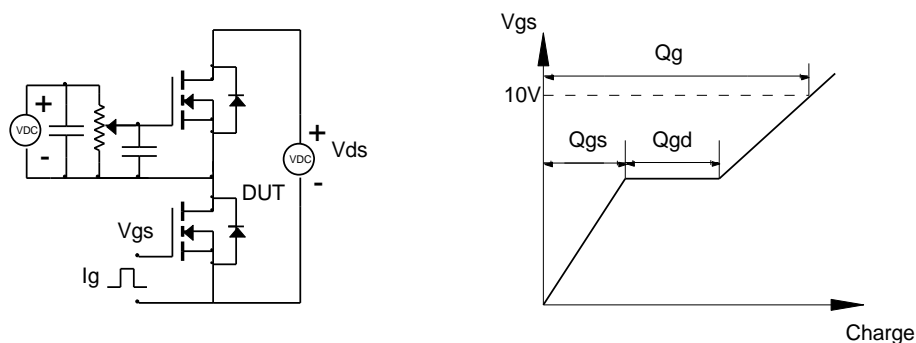


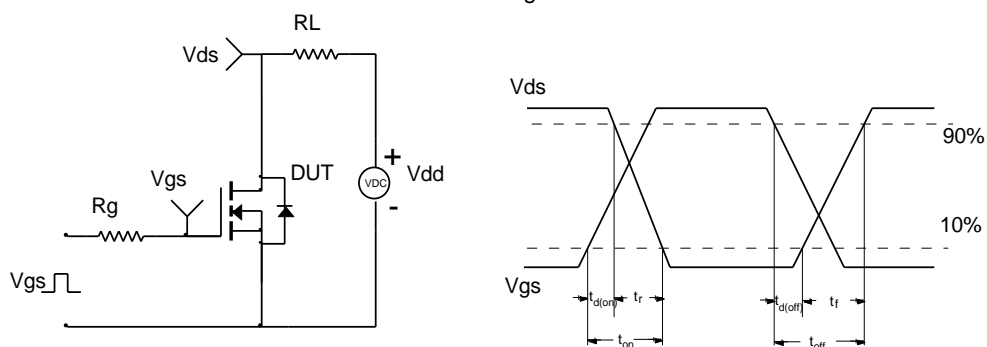
Figure 11. Transient Thermal Response Curve

Test Circuit and Waveform

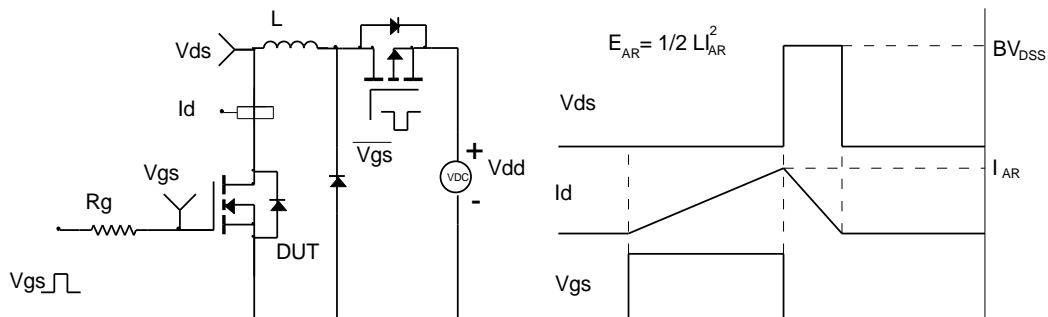
Gate Charge Test Circuit & Waveform



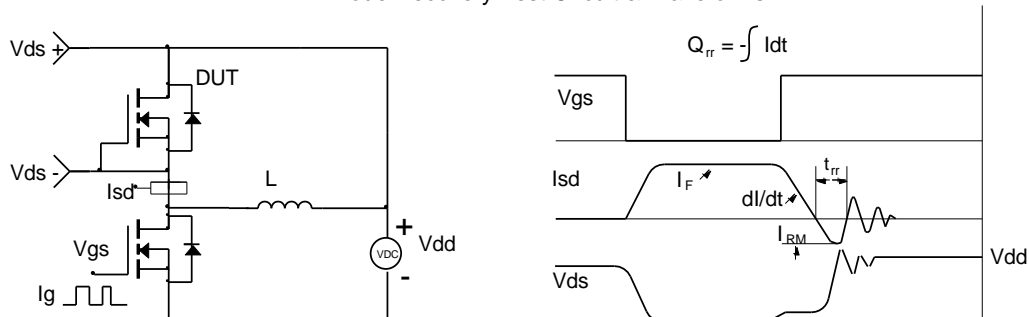
Resistive Switching Test Circuit & Waveforms



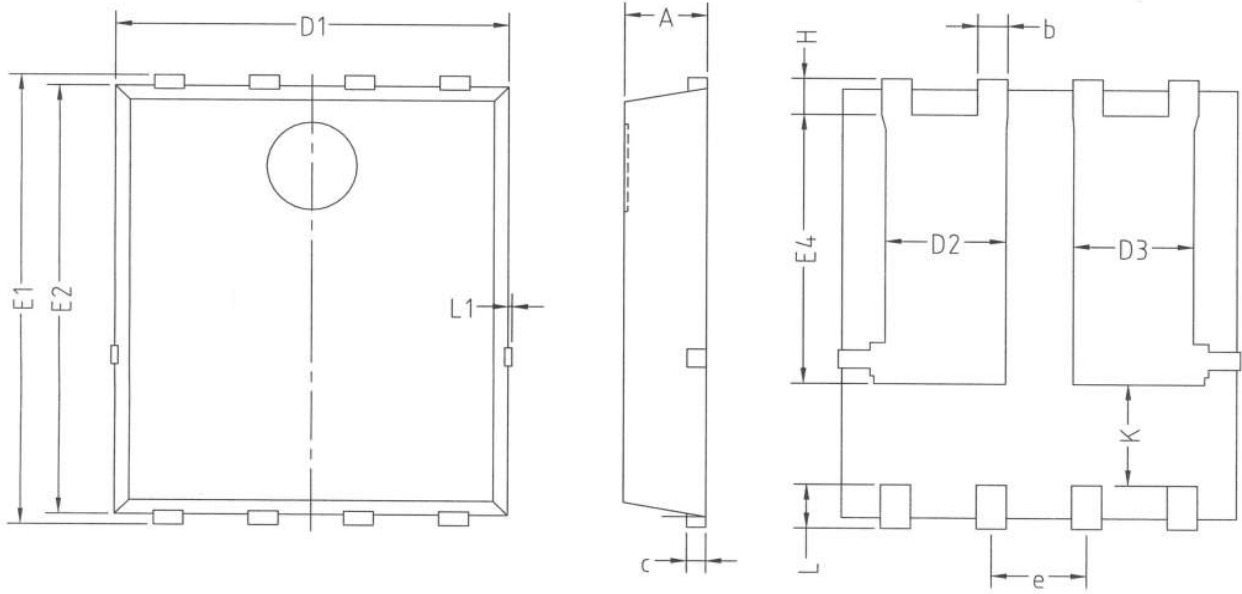
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



DFN5x6-8L Package Information



COMMON DIMENSIONS

SYMBOL	mm		
	MIN	NOM	MAX
A	1.00	1.10	1.20
b	0.30	0.40	0.50
c	0.154	0.254	0.354
D1	5.00	5.20	5.40
D2	1.40	1.60	1.80
D3	1.40	1.60	1.80
e	1.27BSC		
E1	5.95	6.15	6.35
E2	5.66	5.86	6.06
E4	3.47	3.67	3.87
H	0.40	0.50	0.60
K	1.23	1.38	1.53
L	0.30	0.60	0.70
L1			0.12

Customer Service

Sales and Service:

zj@ztasemi.com