

Features

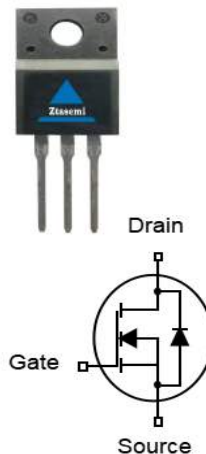
- N-Channel
- Fast Switching
- Improved dv/dt Capability
- 100% EAS Tested

V_{DS}	650	V
$R_{DS(on),TYP}@ V_{GS}=10V$	1.1	Ω
I_D	8	A



Part ID	Package Type	Marking	Packing
ZT8N65F	TO-220F	ZT8N65F	1000pcs/Tape

TO-220F



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	± 30	V	
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	650	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)	$T_c=25^\circ\text{C}$ 28	A	
Mounted on Large Heat Sink				
I_D	Drain Current-Continuous	$T_c=25^\circ\text{C}$	8	A
		$T_c=100^\circ\text{C}$	4.5	A
P_D	Maximum Power Dissipation	60	W	
$R_{\theta JC}$	Thermal Resistance-Junction to Case	2.1	$^\circ\text{C/W}$	
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	62.5	$^\circ\text{C/W}$	
Drain-Source Avalanche Ratings				
EAS	Avalanche Energy, Single Pulsed (Note 2)	245	mJ	

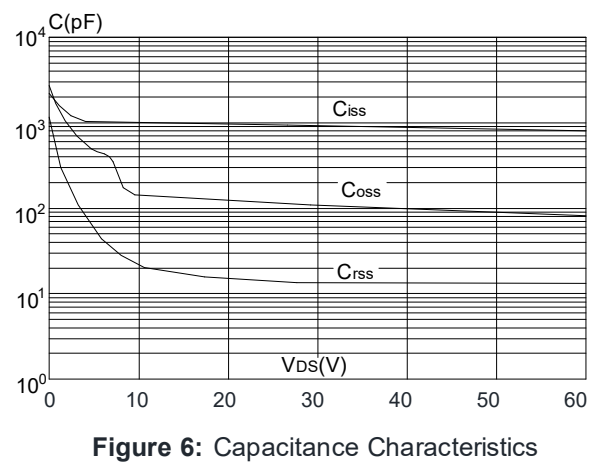
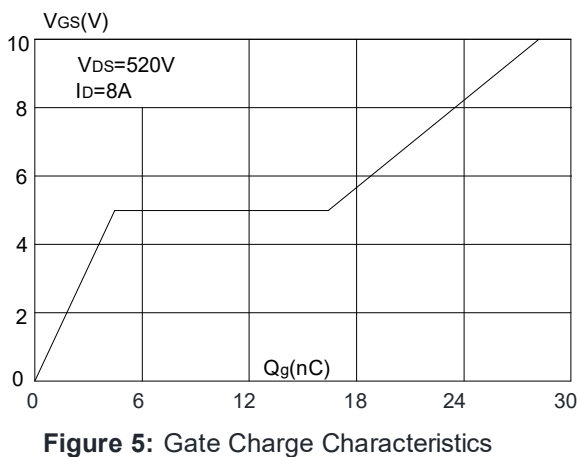
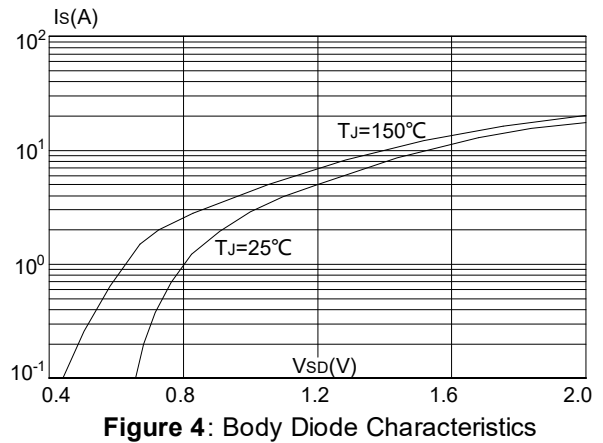
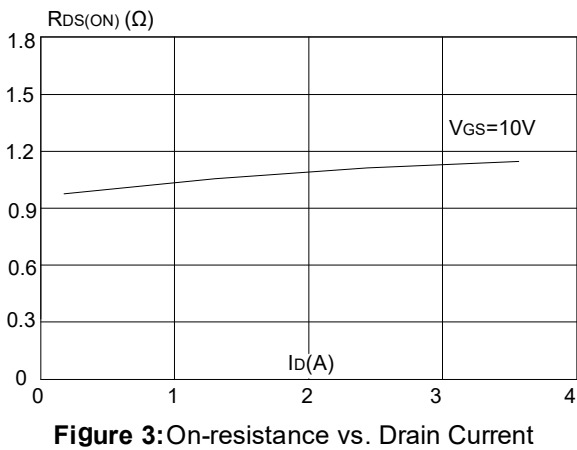
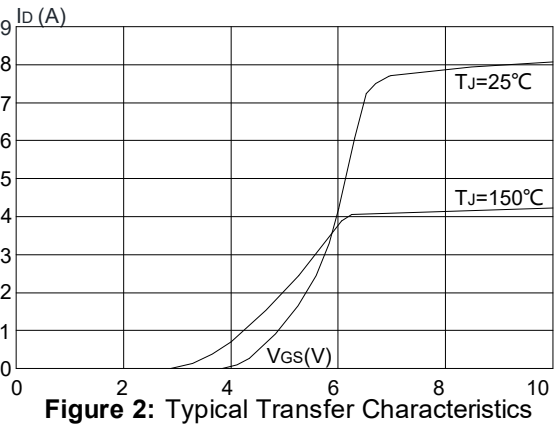
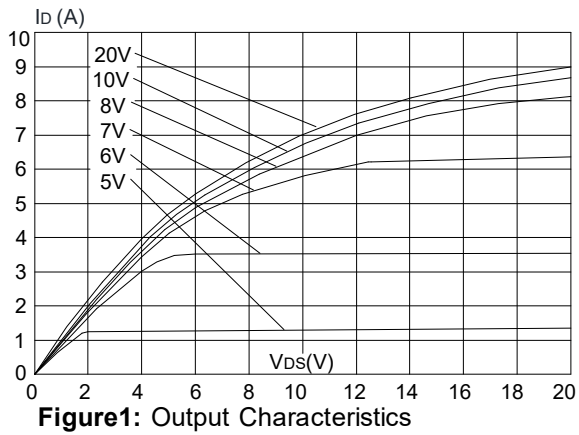
Electrical Characteristics (T_J=25°C unless otherwise noted)

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	650	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =650V, V _{GS} =0V	--	--	1	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±30V, V _{DS} =0V	--	--	±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	2.0	--	4.0	V
R _{DS(on)}	Drain-Source On-State Resistance	V _{GS} =10V, I _D =3.5A	--	1.1	1.35	Ω
Dynamic Electrical Characteristics @ T_J = 25°C (unless otherwise stated)						
C _{iss}	Input Capacitance	V _{DS} =25V, V _{GS} =0V, f=1MHz	--	943	--	pF
C _{oss}	Output Capacitance		--	106	--	pF
C _{rss}	Reverse Transfer Capacitance		--	15	--	pF
Q _g	Total Gate Charge	V _{DD} =520V, I _D =8A, V _{GS} =10V	--	28	--	nC
Q _{gs}	Gate-Source Charge		--	4.5	--	nC
Q _{gd}	Gate-Drain Charge		--	12	--	nC
Switching Characteristics						
T _{d(on)}	Turn-on Delay Time	V _{DD} =325V, I _D =8A, R _G =25Ω, V _{GS} =10V	--	19	--	ns
T _r	Turn-on Rise Time		--	49	--	ns
T _{d(off)}	Turn-Off Delay Time		--	89	--	ns
T _f	Turn-Off Fall Time		--	54	--	ns
Source- Drain Diode Characteristics @ T_J = 25°C (unless otherwise stated)						
I _{SD}	Source-Drain Current (Body Diode)		--	--	8	A
V _{SD}	Forward on voltage	I _S =8A, V _{GS} =0V	--	--	1.4	V
T _{rr}	Reverse Recovery Time	T _J =25°C, I _S =8A, di/dt=100A/μs	--	400	--	ns
Q _{rr}	Reverse Recovery Charge		--	3.3	--	μC

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. EAS condition: T_J = 25°C, V_{DD} = 50V, V_G = 10V, L = 10mH, I_{AS} = 8 A
3. Pulse Test: Pulse width ≤ 300μs, Duty Cycle ≤ 1%

Typical Performance Characteristics



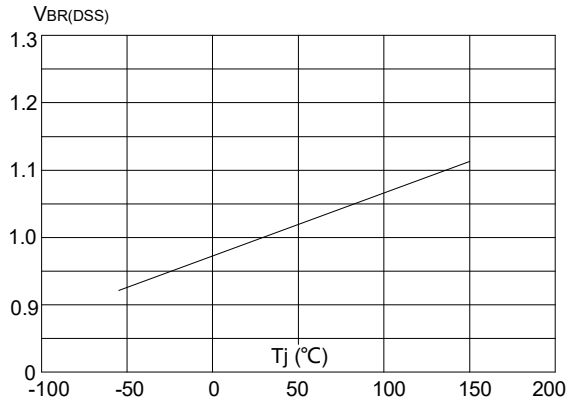


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

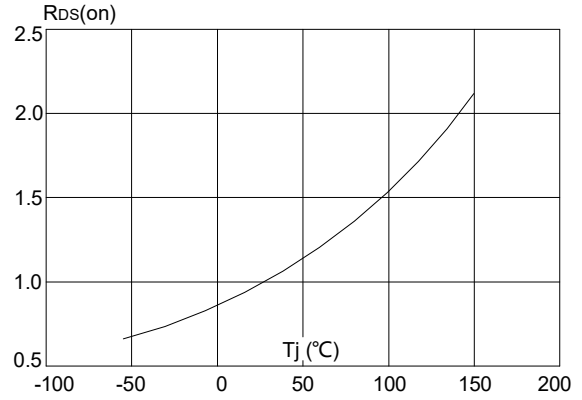


Figure 8: Normalized on Resistance vs. Junction Temperature

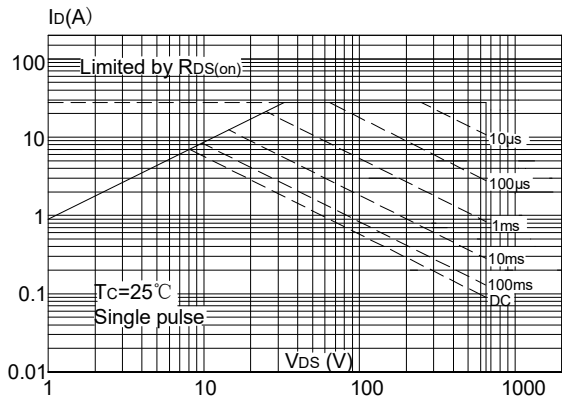


Figure 9: Maximum Safe Operating Area

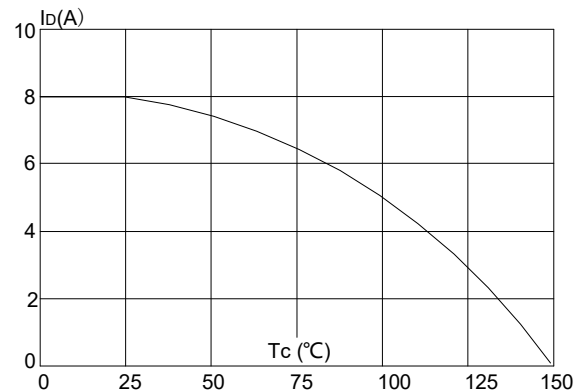


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

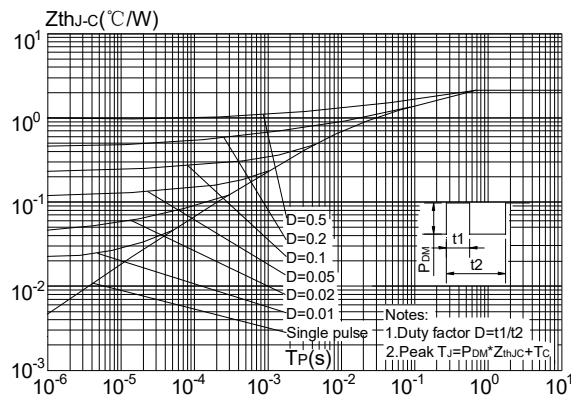


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case

Test Circuit

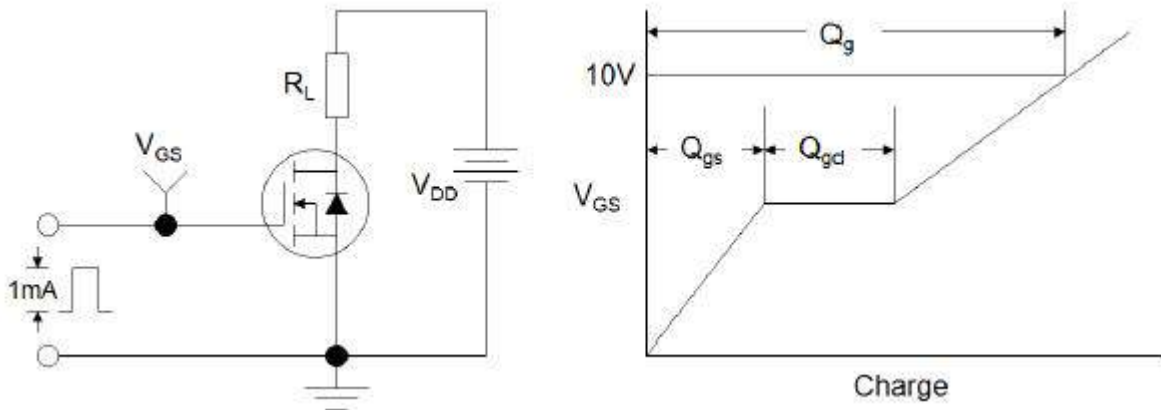


Figure1:Gate Charge Test Circuit & Waveform

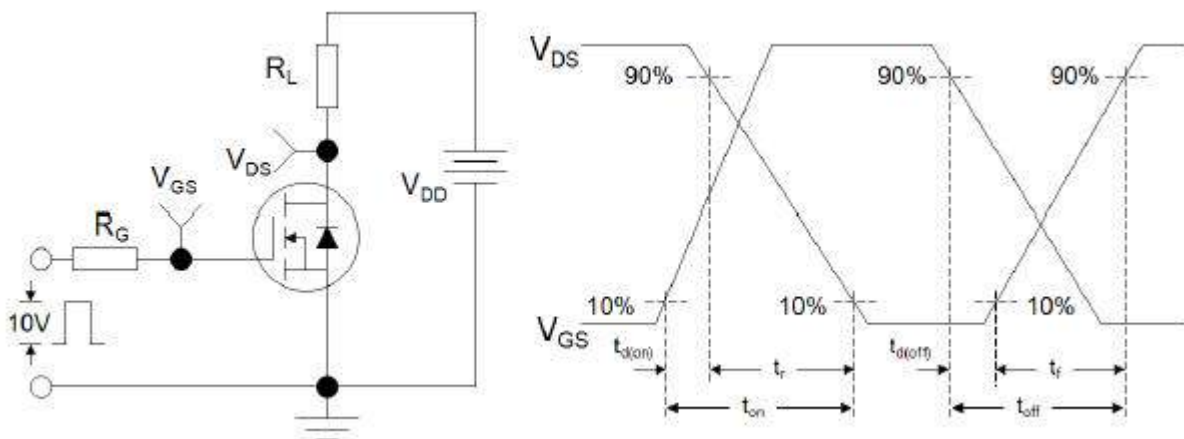


Figure 2: Resistive Switching Test Circuit & Waveforms

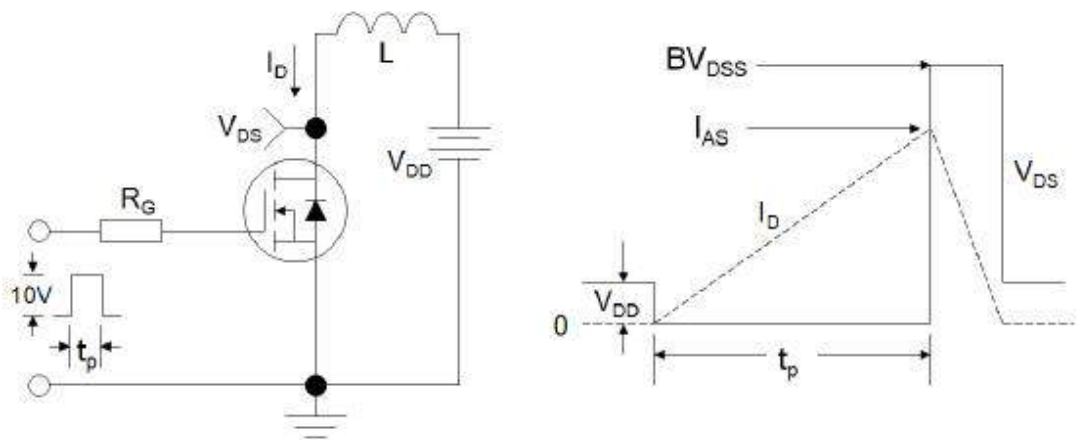
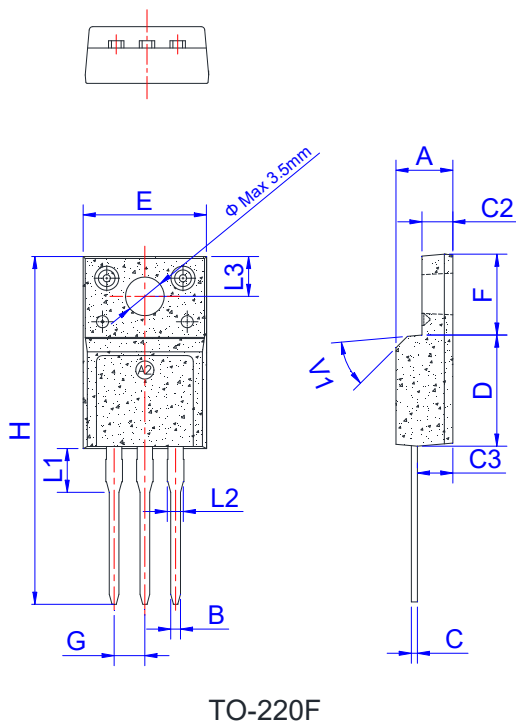


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms

Mechanical Dimensions for TO-220F



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.50		4.90	0.177		0.193
B	0.74	0.80	0.83	0.029	0.031	0.033
C	0.47		0.65	0.019		0.026
C2	2.45		2.75	0.096		0.108
C3	2.60		3.00	0.102		0.118
D	8.80		9.30	0.346		0.366
E	9.80		10.4	0.386		0.410
F	6.40		6.80	0.252		0.268
G		2.54			0.1	
H	28.0		29.8	1.102		1.173
L1		3.63			0.143	
L2	1.14		1.70	0.045		0.067
L3		3.30			0.130	
V1		45°			45°	

Customer Service

Sales and Service:

zj@ztasemi.com