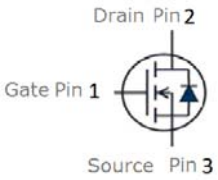
V_{DS}	100	V
$R_{DS(on),TYP}$@ V_{GS}=10V	14	mΩ
$R_{DS(on),TYP}$@ V_{GS}=4.5 V	15	mΩ
I_D	37	A

Features

- N-Channel，5V Logic Level Control
- Enhancement mode
- Very low on-resistance $R_{DS(on)}$ @ V_{GS}=4.5 V
- Fast Switching
- 100% Avalanche Tested
- Pb-free lead plating; RoHS compliant

Pb-Free RoHS HF Halogen-Free

TO-220F



Part ID	Package Type	Marking	Tape and reel information
VSF018N10MS	TO-220F	018N10M	50pcs/Tube

Maximum ratings, at T_j=25°C, unless otherwise specified

Symbol	Parameter		Rating	Unit
$V_{(BR)DSS}$	Drain-Source breakdown voltage		100	V
I_S	Diode continuous forward current	T_C=25°C	37	A
I_D	Continuous drain current @V_{GS}=10V	T_C=25°C	37	A
		T_C=100°C	23	A
I_{DM}	Pulse drain current tested ①	T_C=25°C	148	A
EAS	Avalanche energy, single pulsed ②		210	mJ
P_D	Maximum power dissipation	T_C=25°C	42	W
V_{GS}	Gate-Source voltage		±20	V
T_{STG} T_J	Storage and operating temperature range		-55 to 175	°C

Thermal Characteristics

Symbol	Parameter	Typical	Unit
$R_{\theta JC}$	Thermal Resistance-Junction to Case	3.5	°C/W
$R_{\theta JA}$	Thermal Resistance Junction-Ambient	62.5	°C/W

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	100	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=100V,V_{GS}=0V	--	--	1	μA
	Zero Gate Voltage Drain Current(Tj=125℃)	V_{DS}=100V,V_{GS}=0V	--	--	100	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	2.0	3.0	V
$R_{DS(ON)}$	Drain-Source On-State Resistance③	V_{GS}=10V, I_D=35A	--	14.0	18	mΩ
$R_{DS(ON)}$	Drain-Source On-State Resistance③	V_{GS}=4.5V, I_D=20A	--	15.0	20	mΩ
Dynamic Electrical Characteristics @ T_j= 25°C (unless otherwise stated)						
R_g	Gate Resistance	V_{DS}=30V,V_{GS}=0V, f=1MHz	--	1.5	--	Ω
C_{iss}	Input Capacitance			3040	--	pF
C_{oss}	Output Capacitance		--	195	--	pF
C_{rss}	Reverse Transfer Capacitance		--	125	--	pF
Q_g	Total Gate Charge	V_{DS}=50V,I_D=20A, V_{GS}=10V	--	53	--	nC
Q_{gs}	Gate-Source Charge		--	13	--	nC
Q_{gd}	Gate-Drain Charge		--	16.5	--	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=50V, I_D=5A, R_G=6.8Ω, V_{GS}=10V	--	21	--	nS
t_r	Turn-on Rise Time		--	18	--	nS
$t_{d(off)}$	Turn-Off Delay Time		--	25	--	nS
t_f	Turn-Off Fall Time		--	10	--	nS
Source- Drain Diode Characteristics@ T_j = 25°C (unless otherwise stated)						
V_{SD}	Forward on voltage	I_{SD}=35A,V_{GS}=0V	--	0.88	1.2	V
t_{rr}	Reverse Recovery Time	T_j=25℃,I_{sd}=20A, V_{GS}=0V di/dt=500A/μs	--	20	--	nS
Q_{rr}	Reverse Recovery Charge			88		nC

NOTE:

① Repetitive rating; pulse width limited by max. junction temperature.

② Limited by T_{Jmax}, starting T_J = 25°C, L = 0.5mH,R_G = 25Ω, I_{AS} = 29A, V_{GS} =10V. Part not recommended for use above this value

③ Pulse width ≤ 300μs; duty cycle≤ 2%.

Typical Characteristics

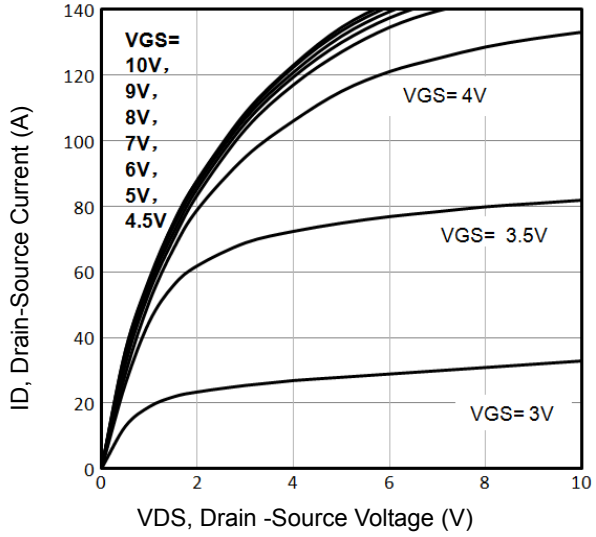


Fig1. Typical Output Characteristics

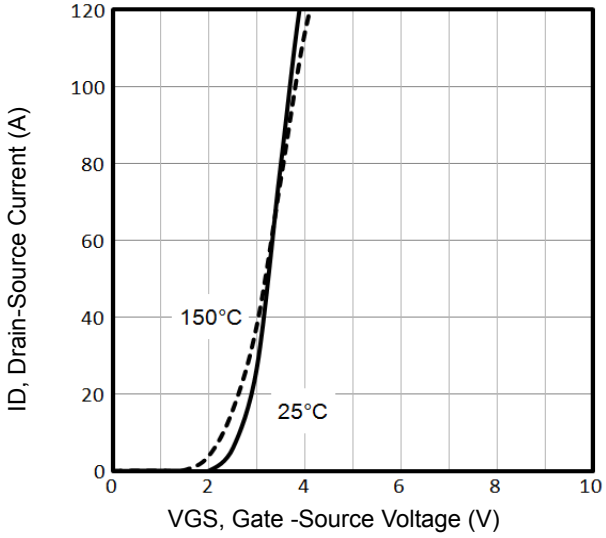


Fig2. Typical Transfer Characteristics

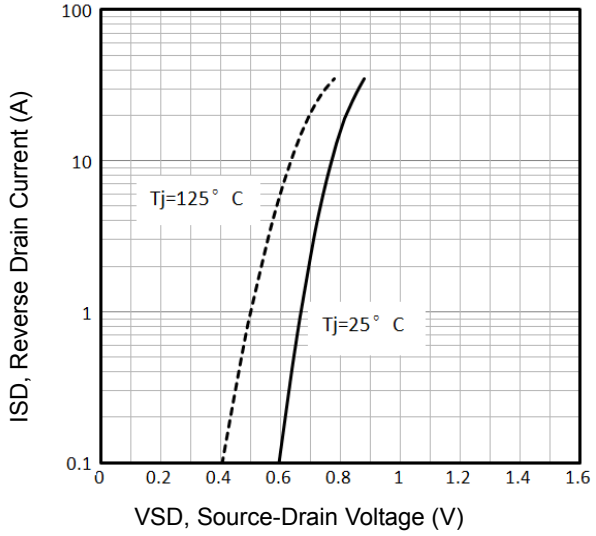


Fig3. Typical Source-Drain Diode Forward Voltage

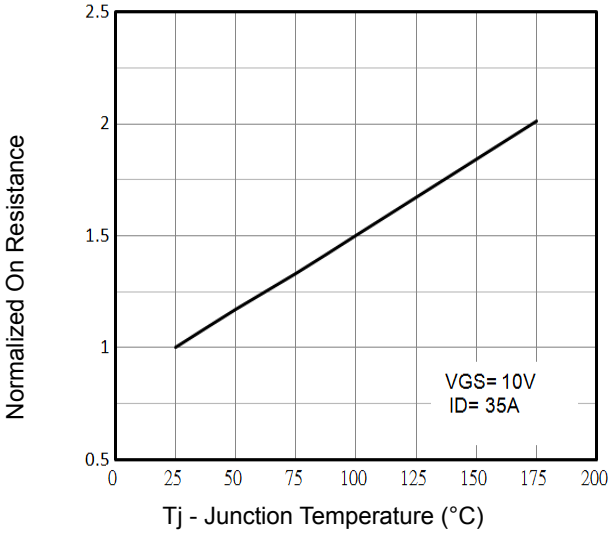


Fig4. Normalized On-Resistance Vs. Tj

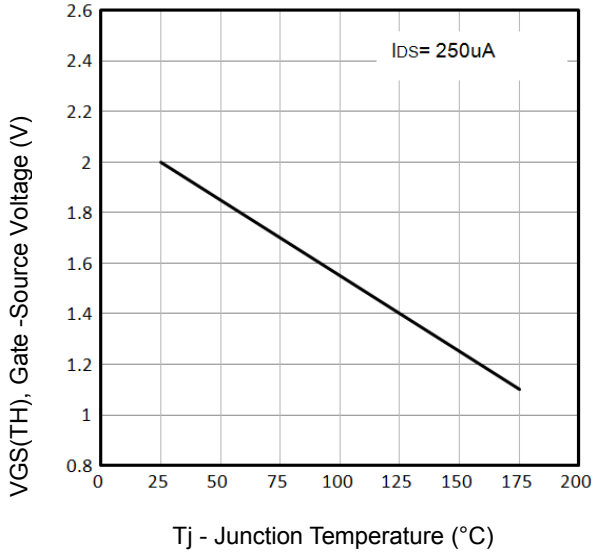


Fig5. $V_{GS(TH)}$ Gate -Source Voltage Vs.Tj

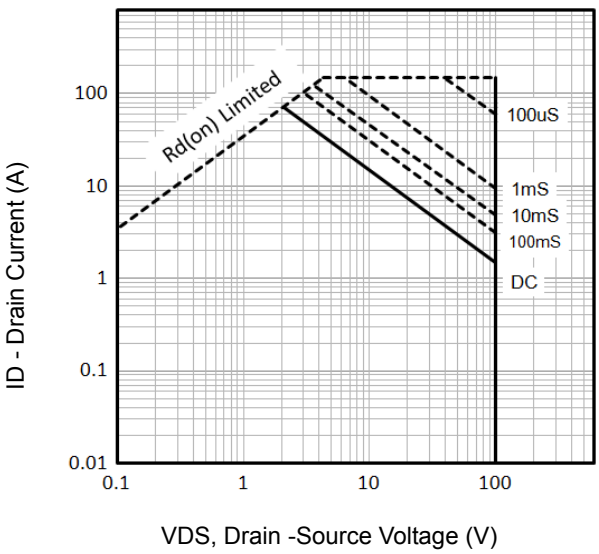


Fig6. Maximum Safe Operating Area

Typical Characteristics

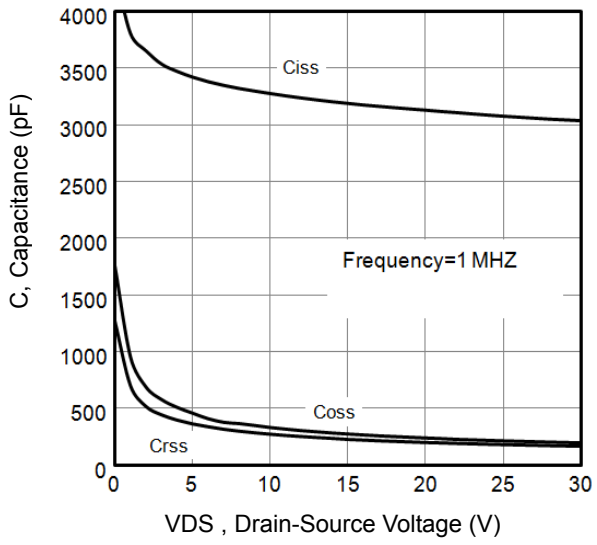


Fig7. Typical Capacitance Vs.Drain-Source Voltage

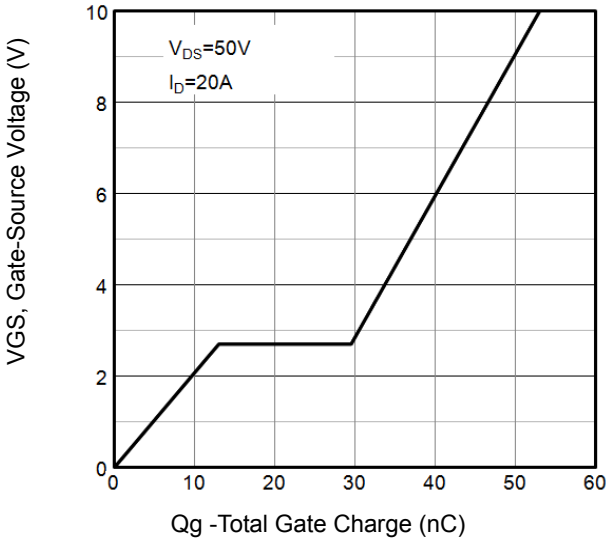


Fig8. Typical Gate Charge Vs.Gate-Source Voltage

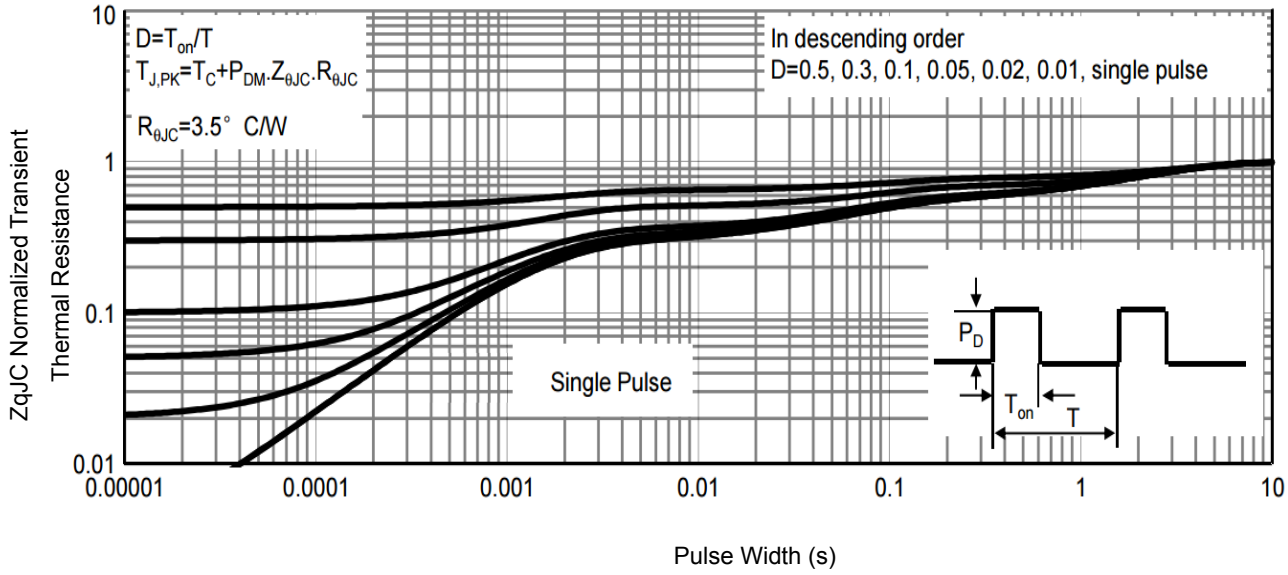


Fig9. Normalized Maximum Transient Thermal Impedance

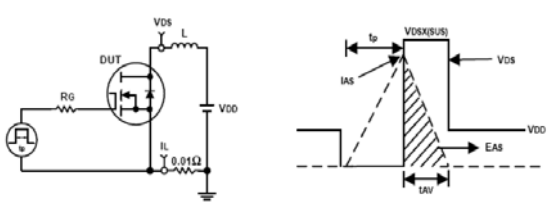


Fig10. Unclamped Inductive Test Circuit and waveforms

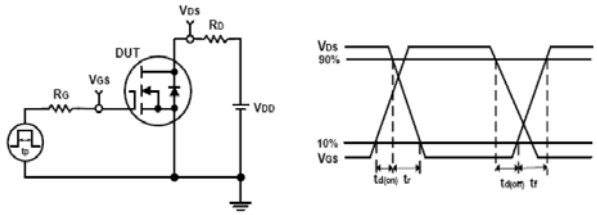
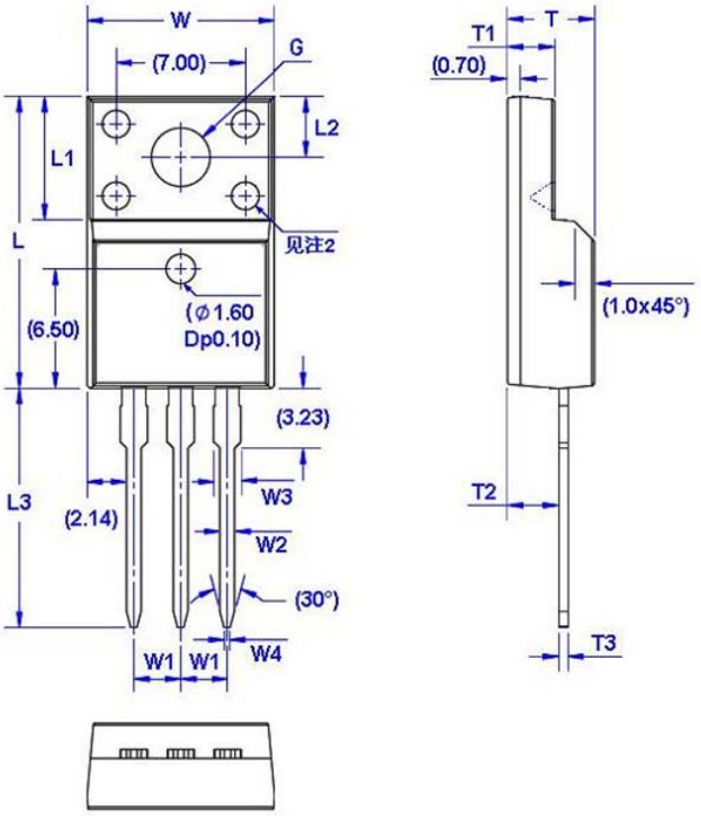


Fig11. Switching Time Test Circuit and waveforms

TO-220F Package Outline Data



DIMENSIONS (unit : mm)

Symbol	Min	Typ	Max	Symbol	Min	Typ	Max
W	9.96	9.15	10.36	**L2**	3.20	3.30	3.40
W1	--	2.54	--	**L3**	12.78	12.98	13.18
W2	0.70	0.80	0.90	**T**	4.50	4.70	4.90
W3	1.24	1.35	1.47	**T1**	2.34	2.55	2.74
W4	0.25	0.36	0.45	**T2**	2.56	2.75	2.96
L	15.67	15.85	16.07	**T3**	0.45	0.52	0.60
L1	6.48	6.70	6.88	**G(Φ)**	3.08	3.16	3.28

Customer Service

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