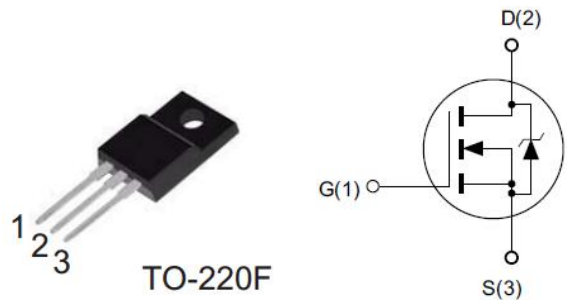


Features

- ◆ 500V, 8A, $R_{DS(ON)}(Typ.) = 0.68\Omega @ V_{GS} = 10V$.
- ◆ Low C_{rss}
- ◆ Fast Switching
- ◆ 100% Avalanche Tested

Application

- ◆ Charger
- ◆ Standby Power



Absolute Maximum Ratings $T_c = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Limit	Unit
		TO-220F	
V_{DS}	Drain-Source Voltage ^a	500	V
V_{GS}	Gate-Source Voltage	± 30	V
I_D	Drain Current-Continuous, $T_c = 25^\circ\text{C}$	8	A
	Drain Current-Continuous, $T_c = 100^\circ\text{C}$	5	A
I_{DM}	Drain Current-Pulsed ^b	32	A
P_D	Maximum Power Dissipation @ $T_J = 25^\circ\text{C}$	34	W
E_{AS}	Single Pulsed Avalanche Energy ^d	245	mJ
dv/dt	Peak Diode Recovery dv/dt ^e	5.0	V/ns
T_J, T_{STG}	Operating and Store Temperature Range	-55 to 150	$^\circ\text{C}$

Thermal Characteristics

Symbol	Parameter	Value	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-Case Max.	3.72	$^\circ\text{C/W}$
$R_{\theta JA}$	Thermal Resistance Junction-Ambient Max.	62.5	$^\circ\text{C/W}$

Electrical Characteristics $T_J = 25^\circ\text{C}$ unless otherwise noted.

Off Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	500	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 500V, V_{GS} = 0V$	-	-	1	μA
I_{GSS}	Forward Gate Body Leakage Current	$V_{DS} = 0V, V_{GS} = \pm 30V$	-	-	± 100	nA

■ On Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu A$	2.0	-	4.0	V
$R_{DS(on)}$	Static Drain-Source On-Resistance ^c	$V_{GS} = 10V, I_D = 4.0A$	-	0.68	0.85	Ω

■ Dynamic Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
g_{fs}	Forward Transconductance	$V_{DS}=15V, I_D=4A$	-	6.5	-	S
C_{iss}	Input Capacitance	$V_{DS} = 25V,$ $V_{GS} = 0V,$ $f = 1.0MHz$	-	1091	-	pF
C_{oss}	Output Capacitance		-	111	-	pF
C_{rss}	Reverse Transfer Capacitance		-	6.6	-	pF

■ On Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
$t_{d(on)}$	Turn-On Delay Time	$V_{DD} = 250V, I_D = 8A,$ $R_G = 10\Omega, V_{GS}=10V$	-	16	-	ns
t_r	Turn-On Rise Time		-	18	-	ns
$t_{d(off)}$	Turn-Off Delay Time		-	40	-	ns
t_f	Turn-Off Fall Time		-	14	-	ns
Q_g	Total Gate Charge	$V_{DS} = 400V, I_D = 8A,$ $V_{GS} = 10V$	-	22	-	nC
Q_{gs}	Gate-Source Charge		-	4.6	-	nC
Q_{gd}	Gate-Drain Charge		-	8.2	-	nC

■ Drain-Source Diode Characteristics

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
I_S	Drain-Source Diode Forward Continuous Current	$V_{GS} = 0V$	-	-	8	A
I_{SM}	Maximum Pulsed Current	$V_{GS} = 0V$	-	-	32	A
V_{SD}	Drain-Source Diode Forward Voltage	$V_{GS} = 0V, I_S = 8A$	-	-	1.4	V
T_{rr}	Body Diode Reverse Recovery Time	$di/dt=100A/us$ $I_F=8A, V_{GS}=0V$	-	345	-	ns
Q_{rr}	Reverse Recovery Charge		-	2.95	-	μC

Notes:

a. $T_J = +25^\circ C$ to $+150^\circ C$

b. Repetitive rating; pulse width limited by maximum junction temperature.

c. Pulse width $\leq 300\mu s$; duty cycle $\leq 2\%$.

d. $L=10mH, V_{DD}=50V, I_D=7.0A$, Start $T_J=25^\circ C$.

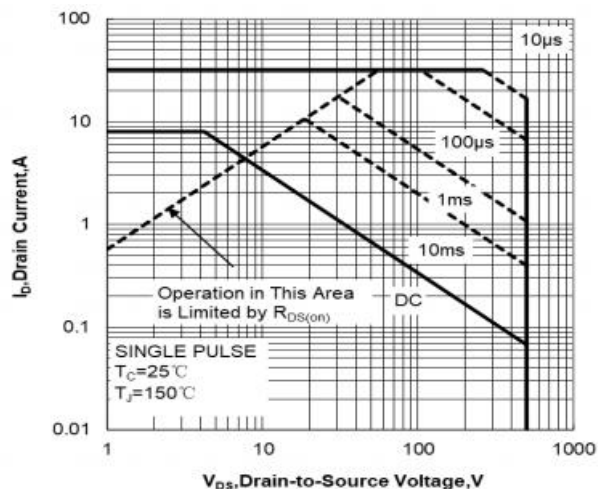


Figure 1. Maximum Safe Operating Area

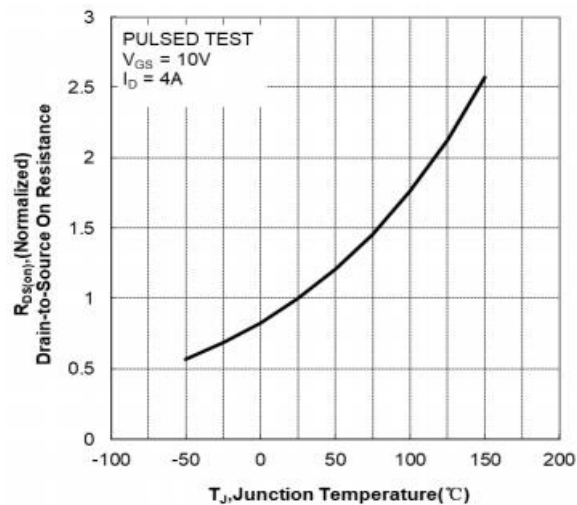


Figure 2. Normalized On-Resistance Variation with Temperature

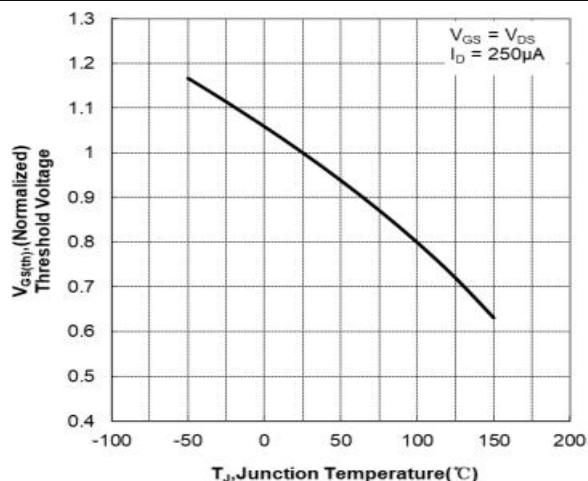


Figure 3. Typical Threshold Voltage vs Junction Temperature

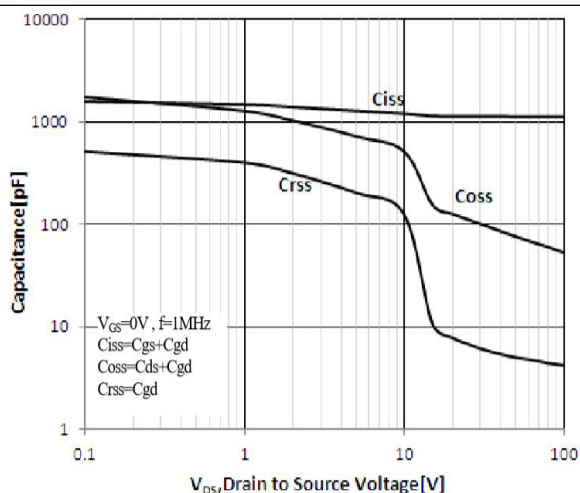


Figure 4. Capacitance Characteristics

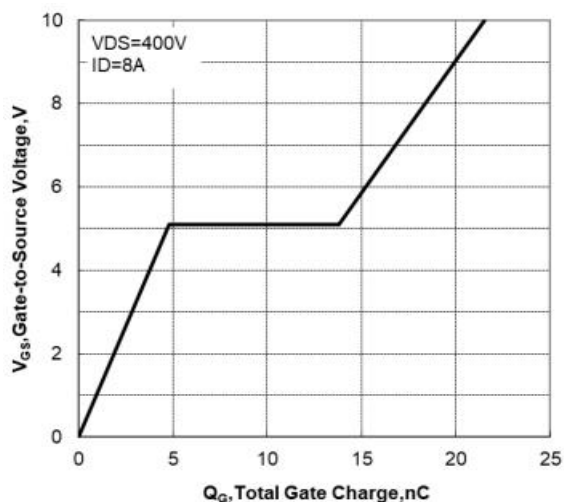


Figure 5. Gate Charge Characteristics

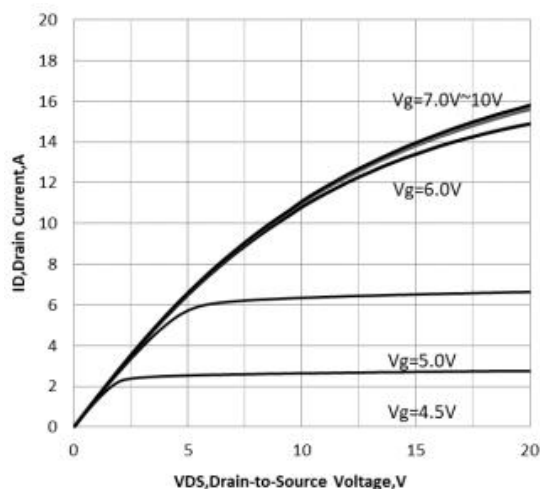


Figure 6. On-State Characteristics

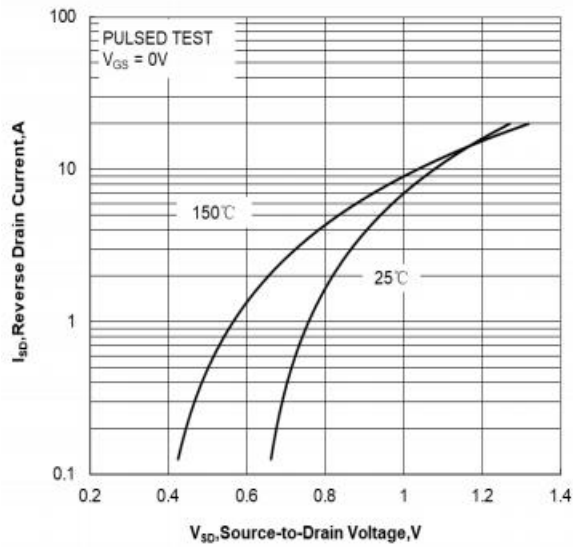


Figure 7. Typical Body Diode Transfer Characteristics

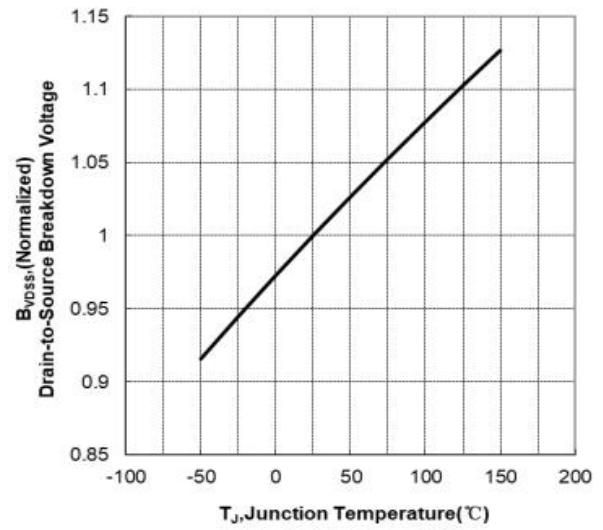


Figure 8. Typical Breakdown Voltage vs Junction Temperature

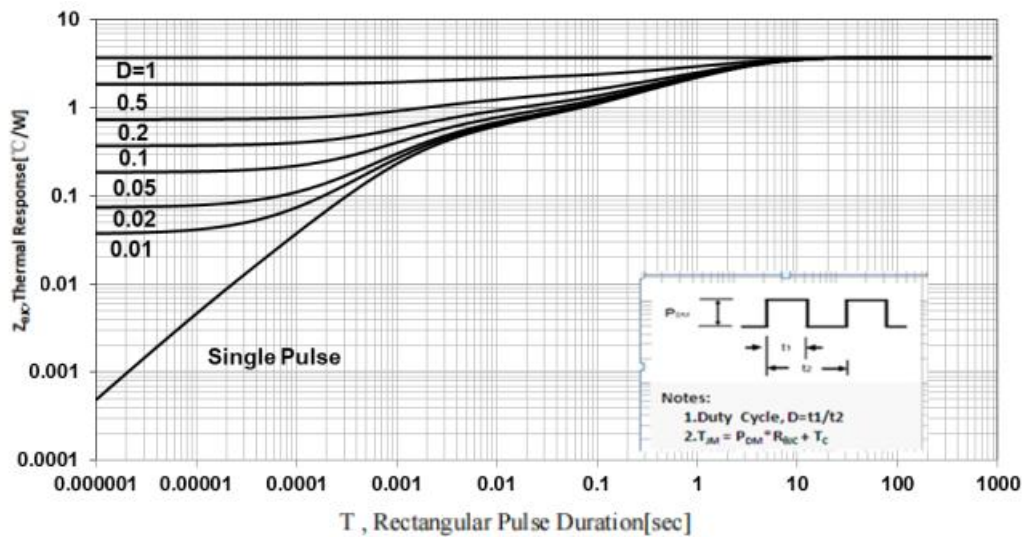


Figure 9. Normalized Effective Transient Thermal Impedance With Pulse Duration

■ Package Information

