

N-Channel Enhancement Mode MOSFET

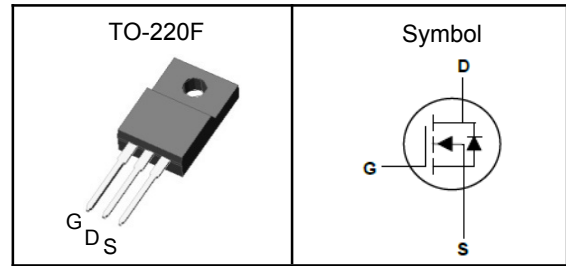
Features

- Fast switching speed
- Reliable and Rugged
- ROHS Compliant
- 100% UIS and Rg Tested

Applications

- Power Management in Desktop Computer
- DC/DC Converters

Pin Description



V_{DSS}	500	V
$R_{DS(ON)-Typ}$	635	m Ω
I_D	9	A

Absolute Maximum Ratings ($T_J=25^\circ\text{C}$, Unless Otherwise Noted)

Symbol	Parameter	Rating	Unit	
V_{DSS}	Drain-Source Voltage	500	V	
V_{GSS}	Gate-Source Voltage	± 30	V	
T_J	Maximum Junction Temperature	-55 to 150	$^\circ\text{C}$	
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$	
E_{AS}	Single Pulse Avalanche Energy ^③	250	mJ	
$I_{DM}^{①}$	Pulse Drain Current Tested	36	A	
I_D	Continuous Drain Current	$T_c=25^\circ\text{C}$	9	A
P_D	Maximum Power Dissipation	$T_c=25^\circ\text{C}$	42	W

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ^①	62.5	$^\circ\text{C}/\text{W}$
$R_{\theta JC}$	Thermal Resistance Junction-Case ^①	3.0	$^\circ\text{C}/\text{W}$

Note ① : Max. current is limited by bonding wire.

Note ② : UIS tested and pulse width are limited by maximum junction temperature 150 $^\circ\text{C}$.

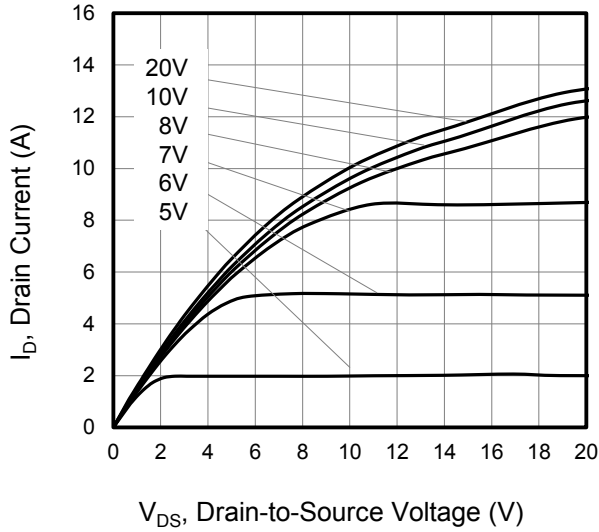
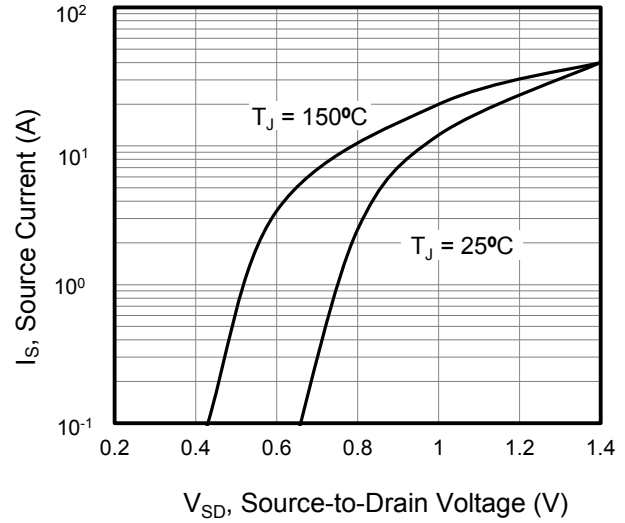
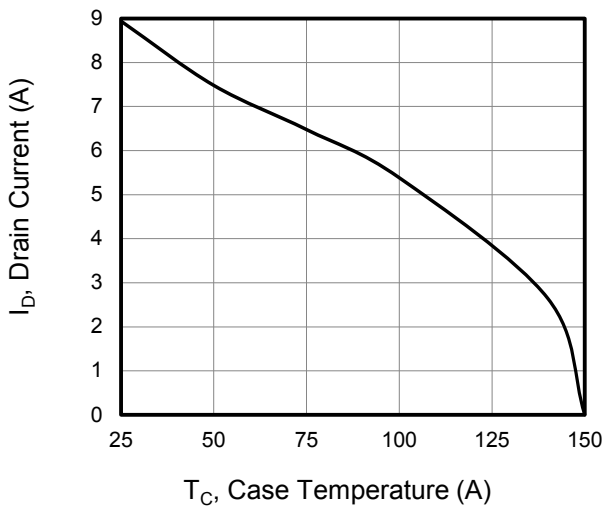
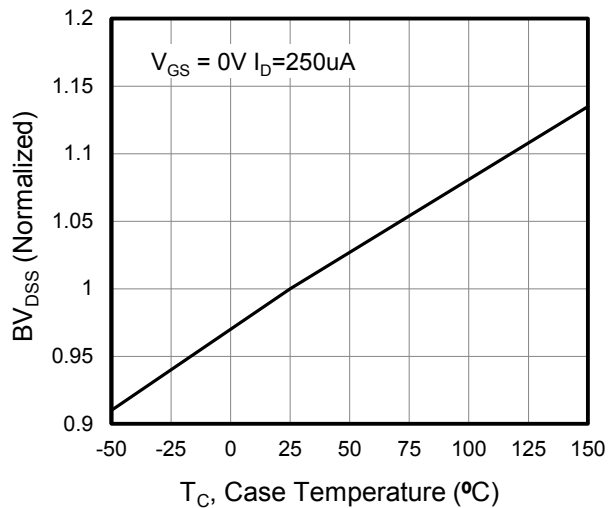
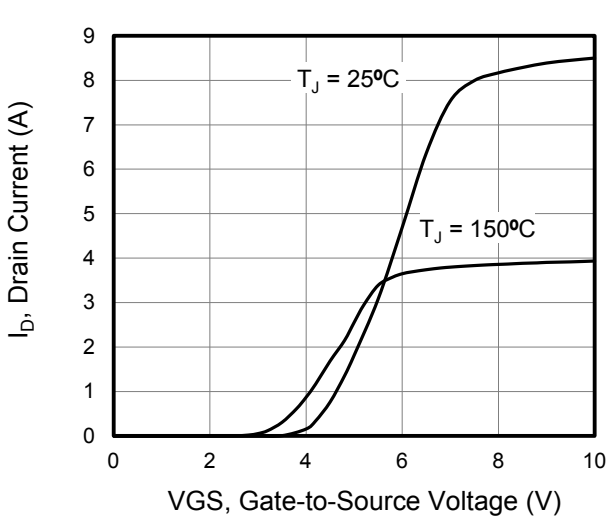
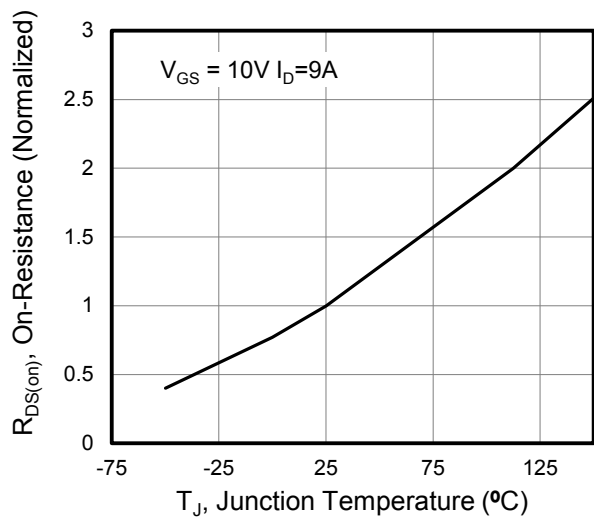
Note ③ : Surface Mounted on 1in² FR-4 board with 1oz.

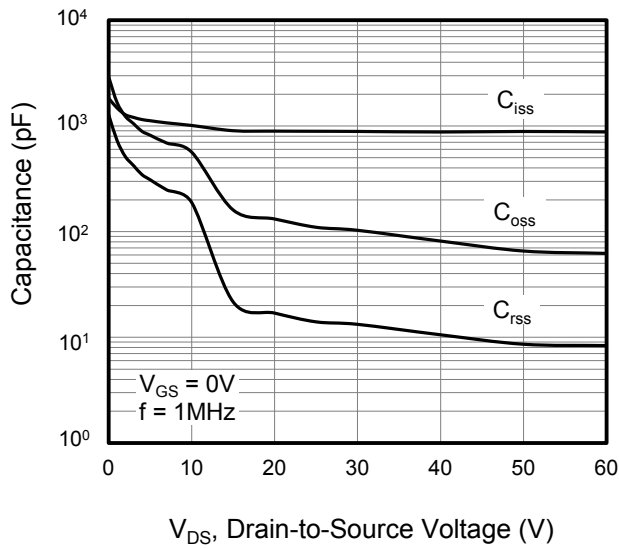
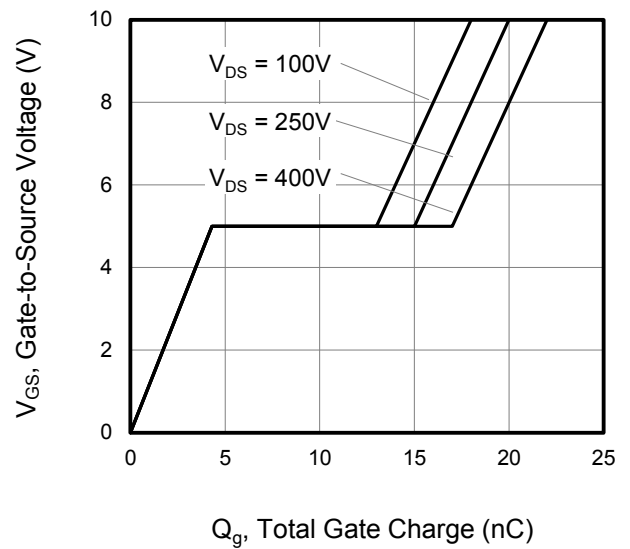
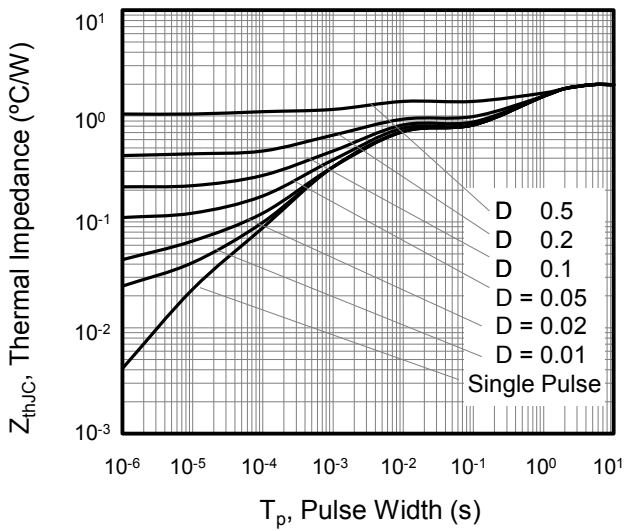
**N-Channel Enhancement Mode MOSFET****Electrical Characteristics** ($T_J=25^\circ\text{C}$, Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
Static Electrical Characteristics						
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
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	2	---	4	V
I_{GSS}	Gate Leakage Current	$V_{GS}=\pm 30V, V_{DS}=0V$	---	---	± 0.1	μA
$R_{DS(ON)}$	Drain-Source On-state Resistance	$V_{GS}=10V, I_D=9A$	---	635	750	$m\Omega$
Dynamic Characteristics ^⑤						
C_{iss}	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=25V,$ $Freq.=1MHz$	---	845	---	pF
C_{oss}	Output Capacitance		---	6.2	---	
C_{rss}	Reverse Transfer Capacitance		---	110	---	
$T_{d(on)}$	Turn-on Delay Time	$V_{DS}=400V, V_{GS}=10V,$ $R_G=25\Omega, I_D=9A$	---	23	---	nS
T_r	Turn-on Rise Time		---	32	---	
$T_{d(off)}$	Turn-off Delay Time		---	26	---	
T_f	Turn-off Fall Time		---	38	---	
Q_g	Total Gate Charge	$V_{DD}=400V, V_{GS}=10V,$ $I_D=9A$	---	21	---	nC
Q_{gs}	Gate-Source Charge		---	2.6	---	
Q_{gd}	Gate-Drain Charge		---	3.2	---	
Source-Drain Characteristics ($T_J=25^\circ\text{C}$)						
V_{SD}	Diode Forward Voltage ²	$V_{GS}=0V, I_S=9A, T_J=25^\circ\text{C}$	---	0.8	1.2	V
t_{rr}	Reverse Recovery Time	$I_F=9A,$ $di/dt=100A/\mu s, T_J=25^\circ\text{C}$	---	136	---	nS
Q_{rr}	Reverse Recovery Charge		---	1.4	---	nC

Note ④ : Pulse test (pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$).

Note ⑤ : Guaranteed by design, not subject to production testing.

N-Channel Enhancement Mode MOSFET
Typical Characteristics
Figure 1. Output Characteristics ($T_J = 25^\circ\text{C}$)

Figure 2. Body Diode Forward Voltage

Figure 3. Drain Current vs. Temperature

Figure 4. BV_{DSS} Variation vs. Temperature

Figure 5. Transfer Characteristics

Figure 6. On-Resistance vs. Temperature


N-Channel Enhancement Mode MOSFET
Figure 7. Capacitance

Figure 8. Gate Charge

Figure 9. Transient Thermal Impedance
TO-220F


N-Channel Enhancement Mode MOSFET
TO-220F Package Outline Data
