

N-Channel Enhancement Mode MOSFET

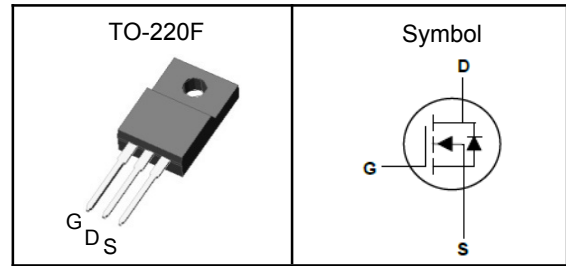
Features

- 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}	650	V
$R_{DS(ON)-Typ}$	0.32	Ω
I_D	28	A

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

Symbol	Parameter	Rating	Unit	
V_{DSS}	Drain-Source Voltage	650	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	675	mJ	
$I_{DM}^{①}$	Pulse Drain Current Tested	112	A	
I_D	Continuous Drain Current	$T_c=25^\circ\text{C}$	28	A
P_D	Maximum Power Dissipation	$T_c=25^\circ\text{C}$	35	W

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ^①	80	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance Junction-Case ^①	3.57	$^\circ\text{C/W}$

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

Note ② : UIS tested and pulse width are limited by maximum junction temperature 150°C .

Note ③ : Surface Mounted on 1in^2 FR-4 board with 1oz.



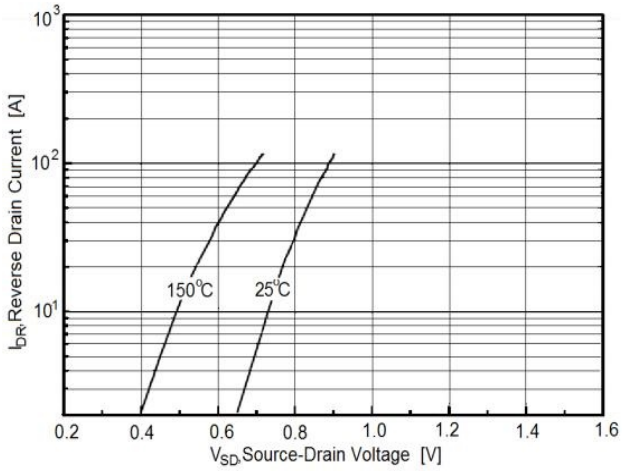
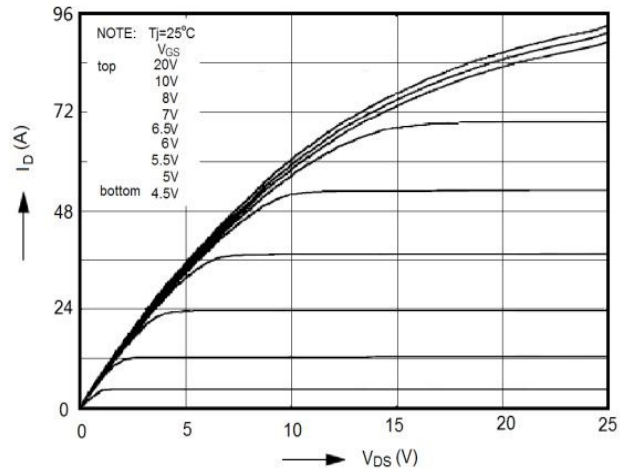
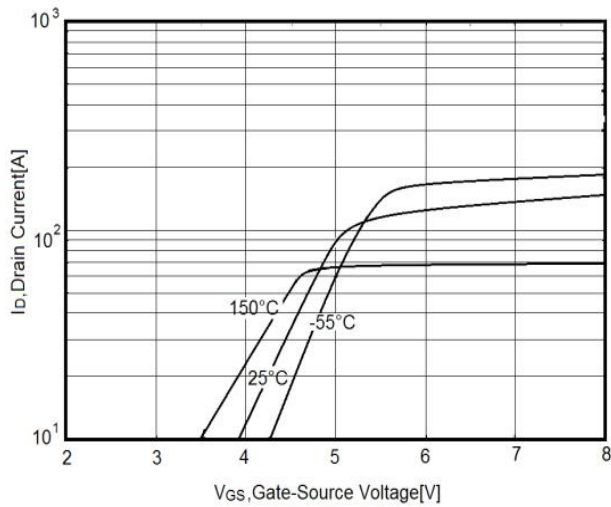
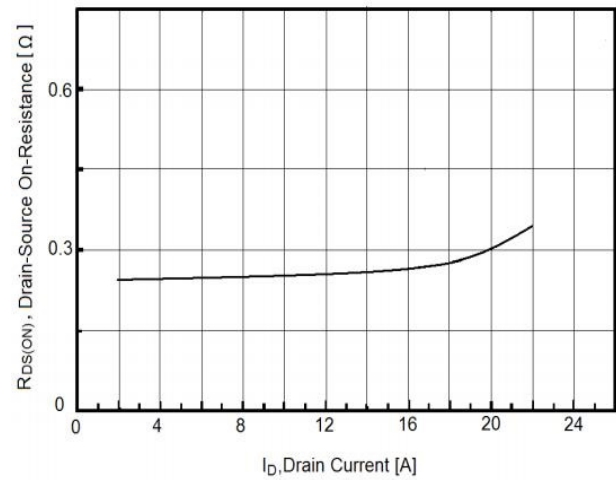
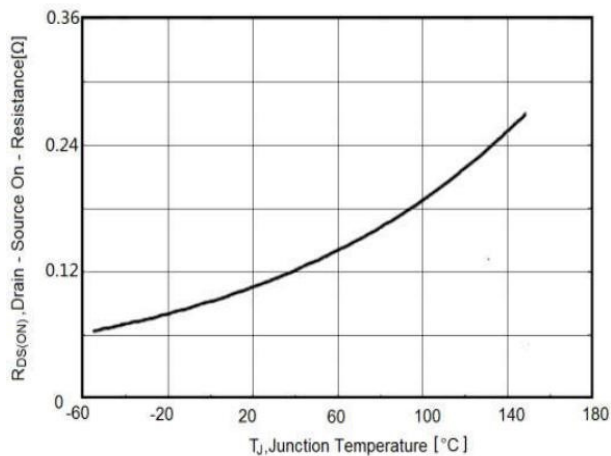
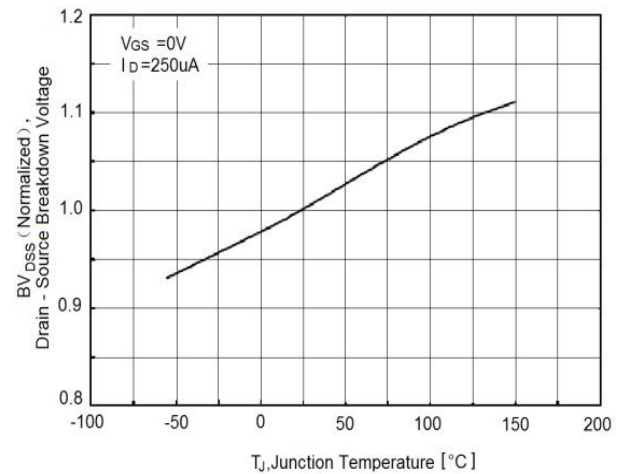
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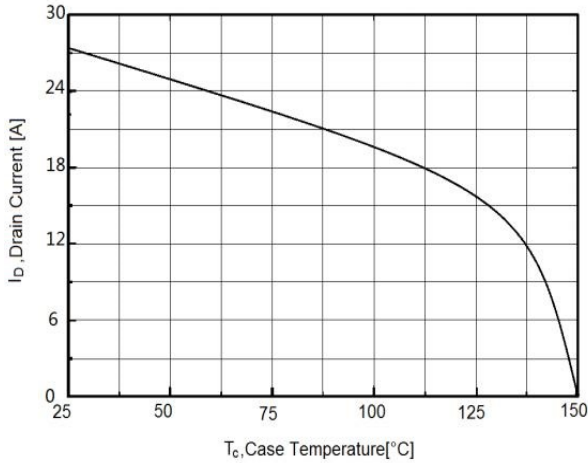
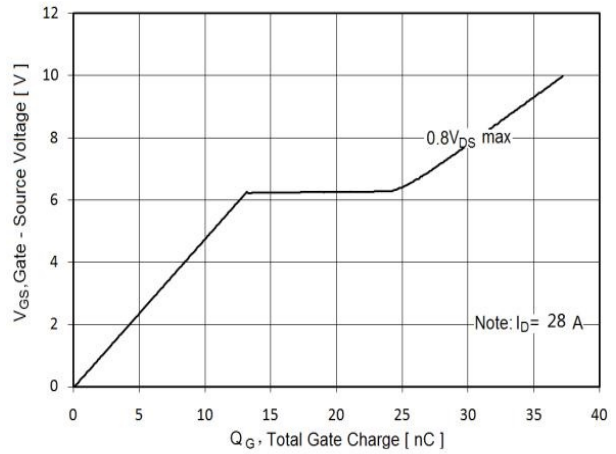
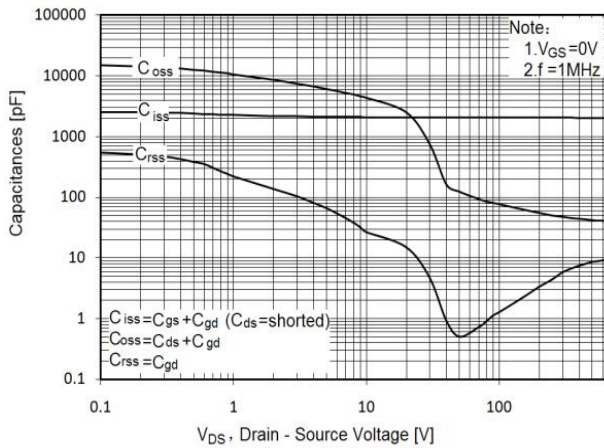
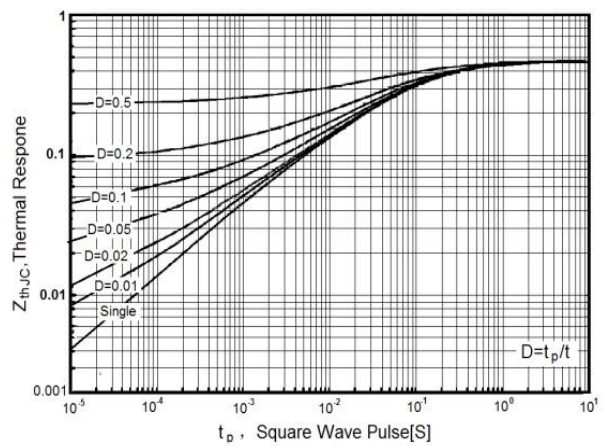
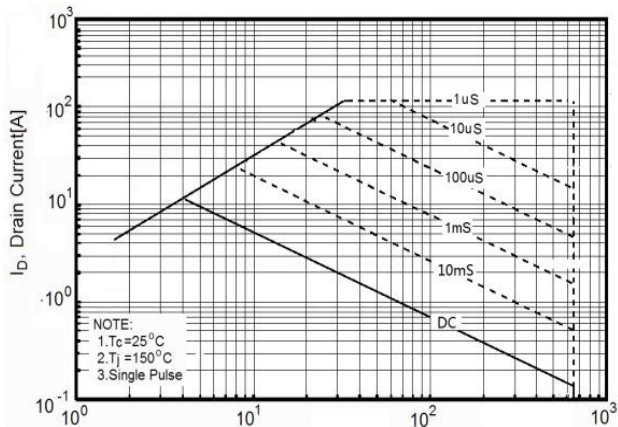
Electrical Characteristics ($T_J=25^{\circ}\text{C}$, Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
Static Electrical Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	650	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=650V, V_{GS}=0V$	---	---	1	μA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	2.0	---	4.0	V
I_{GSS}	Gate Leakage Current	$V_{GS}=\pm 30V, V_{DS}=0V$	---	---	± 100	nA
$R_{DS(ON)}$	Drain-Source On-state Resistance	$V_{GS}=10V, I_D=14A$	---	0.32	0.4	Ω
Dynamic Characteristics ^⑤						
C_{iss}	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=50V,$ $Freq.=1MHz$	---	2075	---	pF
C_{oss}	Output Capacitance		---	123	---	
C_{rss}	Reverse Transfer Capacitance		---	0.5	---	
$T_{d(on)}$	Turn-on Delay Time	$V_{DD}=380V,$ $V_{GS}=10V,$ $R_G=2.3\Omega, I_D=14A$	---	14	---	nS
T_r	Turn-on Rise Time		---	12.3	---	
$T_{d(off)}$	Turn-off Delay Time		---	65	---	
T_f	Turn-off Fall Time		---	11.2	---	
Q_g	Total Gate Charge	$V_{DD}=480V,$ $V_{GS}=10V, I_D=28A$	---	37	---	nC
Q_{gs}	Gate-Source Charge		---	13.4	---	
Q_{gd}	Gate-Drain Charge		---	11	---	
Source-Drain Characteristics ($T_J=25^{\circ}\text{C}$)						
V_{SD}	Diode Forward Voltage ₂	$V_{GS}=0V, I_S=28A, T_J=25^{\circ}\text{C}$	---	---	1.4	V
t_{rr}	Reverse Recovery Time	$I_F=14A,$ $di/dt=100A/\mu s, T_J=25^{\circ}\text{C}$	---	350	---	nS
Q_{rr}	Reverse Recovery Charge		---	5.5	---	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.

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Typical Characteristics
Figure1. Source-Drain Diode Forward Voltage

Figure2. Output characteristics

Figure3. Transfer characteristics

Figure4. Static drain-source on resistance

Figure5. $R_{DS(on)}$ vs Junction Temperature

Figure6. BV_{DSS} vs Junction Temperature


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Figure7. Maximum I_D vs Junction Temperature

Figure 8 . Gate charge waveforms

Figure 9 . Capacitance

Figure10. Transient Thermal Impedance

Figure11.Safe operating area for


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TO-220F Package Outline Data
