

N-Channel Enhancement Mode MOSFET

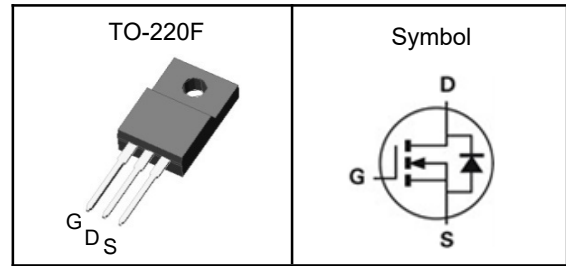
Features

- 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}	150	V
$R_{DS(ON)-Typ}$	6.5	m Ω
I_D	108	A

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

Symbol	Parameter		Rating	Unit
V_{DSS}	Drain-Source Voltage		150	V
V_{GSS}	Gate-Source Voltage		± 20	V
T_J	Maximum Junction Temperature		-55 to 175	$^\circ\text{C}$
T_{STG}	Storage Temperature Range		-55 to 175	$^\circ\text{C}$
$I_{DM}^{(1)}$	Pulse Drain Current Tested	$T_C=25^\circ\text{C}$	420	A
I_D	Continuous Drain Current	$T_C=25^\circ\text{C}$	108	A
P_D	Maximum Power Dissipation	$T_C=25^\circ\text{C}$	125	W
$I_{AS}^{(2)}$	Avalanche Current, Single pulse	$L=0.5\text{mH}$	60	A
$E_{AS}^{(2)}$	Avalanche Energy, Single pulse	$L=0.5\text{mH}$	900	mJ

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JA}^{(3)}$	Thermal Resistance-Junction to Ambient	60	$^\circ\text{C}/\text{W}$
$R_{\theta JC}$	Thermal Resistance-Junction to Case	1.0	$^\circ\text{C}/\text{W}$

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

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

Note ③ : Surface Mounted on 1in^2 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	$V_{GS}=0V, I_D=250\mu A$	150	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=150V, V_{GS}=0V$	---	---	1	μA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	2	3	4	V
I_{GSS}	Gate Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 100	nA
$R_{DS(on)}$	Drain-Source On-state Resistance	$V_{GS}=10V, I_D=20A$	---	6.5	7.2	m Ω
Dynamic Characteristics ^⑤						
C_{iss}	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=75V,$ Freq.=1MHz	---	5220	---	pF
C_{oss}	Output Capacitance		---	412	---	
C_{rss}	Reverse Transfer Capacitance		---	10	---	
$T_{d(on)}$	Turn-on Delay Time	$V_{GS}=10V, V_{DD}=75V,$ $I_D=100A, R_G=1.6\Omega$	---	22	---	nS
T_r	Turn-on Rise Time		---	110	---	
$T_{d(off)}$	Turn-off Delay Time		---	44	---	
T_f	Turn-off Fall Time		---	100	---	
Q_g	Total Gate Charge	$V_{GS}=10V, V_{DD}=75V,$ $I_D=20A$	---	72	---	nC
Q_{gs}	Gate-Source Charge		---	18	---	
Q_{gd}	Gate-Drain Charge		---	10	---	
Source-Drain Characteristics						
V_{SD} ^④	Diode Forward Voltage	$I_S=10A, V_{GS}=0V$	---	---	1.2	V
t_{rr}	Reverse Recovery Time	$I_F=100A, V_R=75V$ $di_F/dt=100A/\mu s$	---	45	---	nS
Q_{rr}	Reverse Recovery Charge		---	12	---	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

Diagram 1: Typ. transfer characteristics

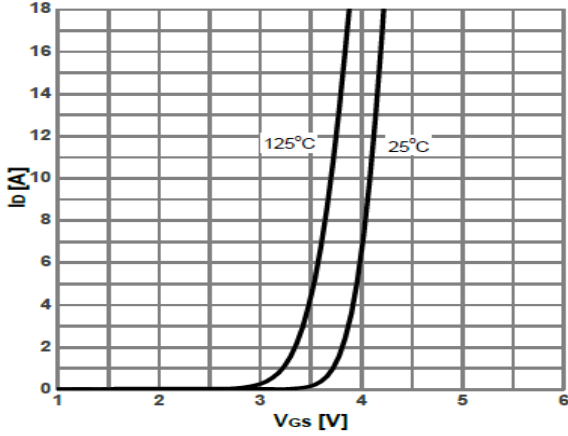


Diagram 2: Gate threshold voltage vs. Junction temperature

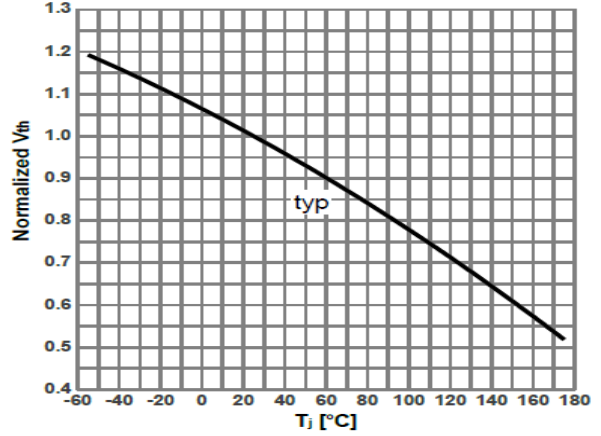


Diagram 3: On-state resistance vs. Drain current

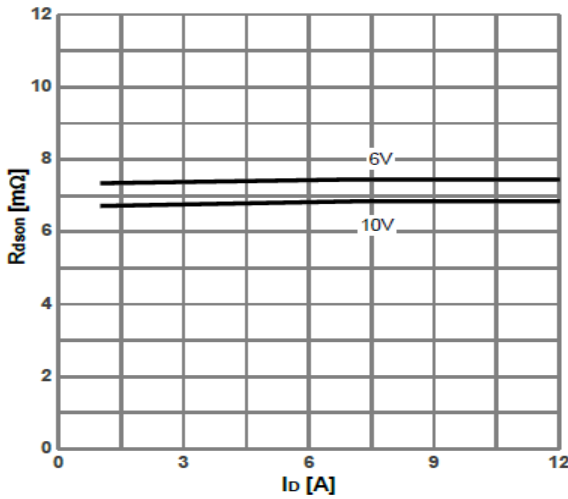


Diagram 4: On-state resistance vs. Junction temperature

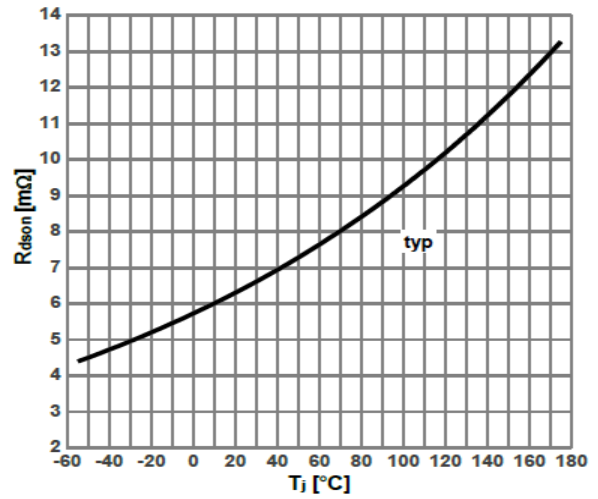


Diagram 5: Forward characteristics of reverse diode

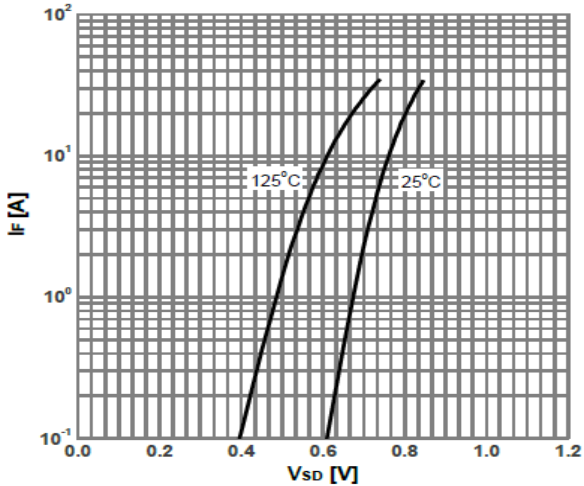
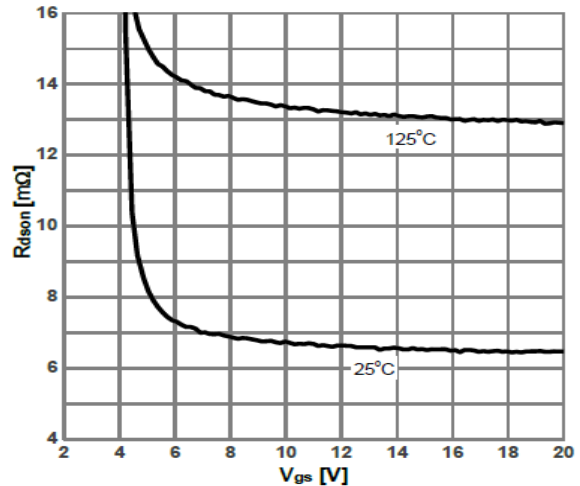
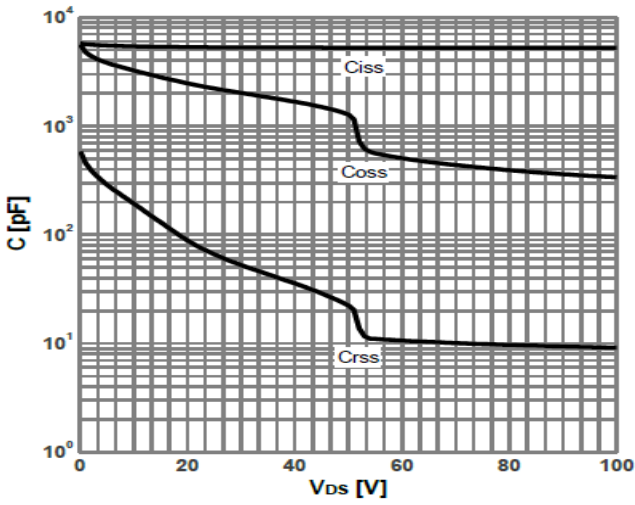
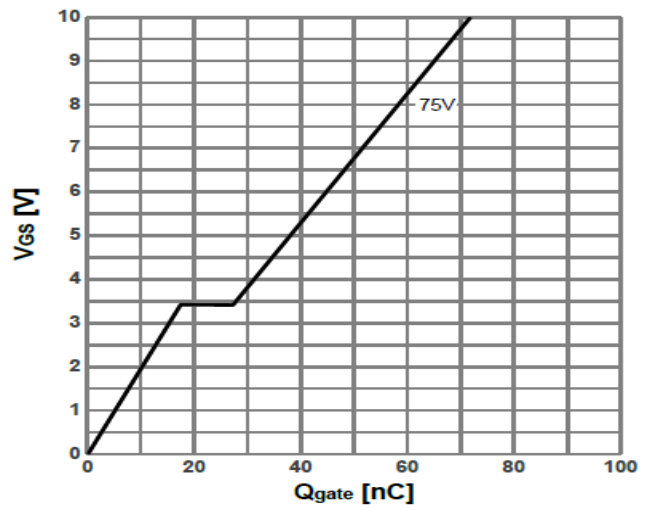
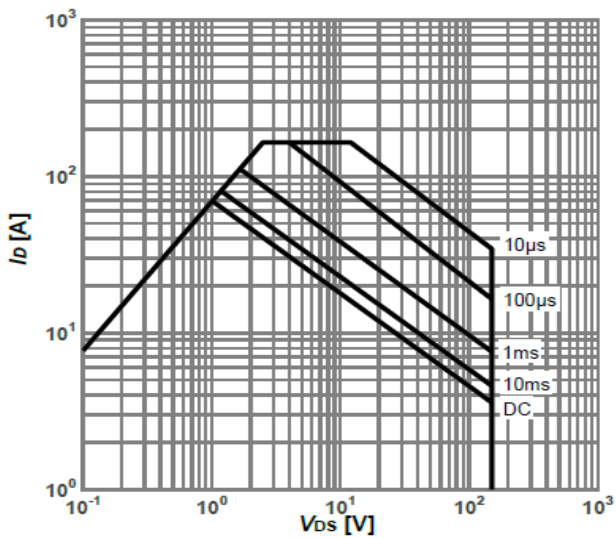
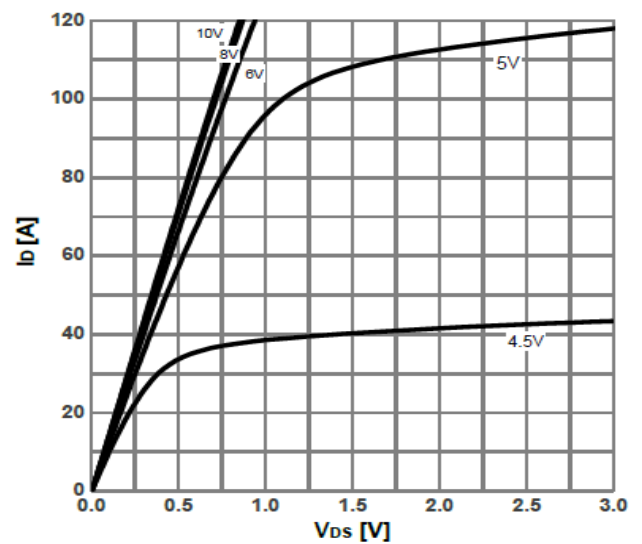
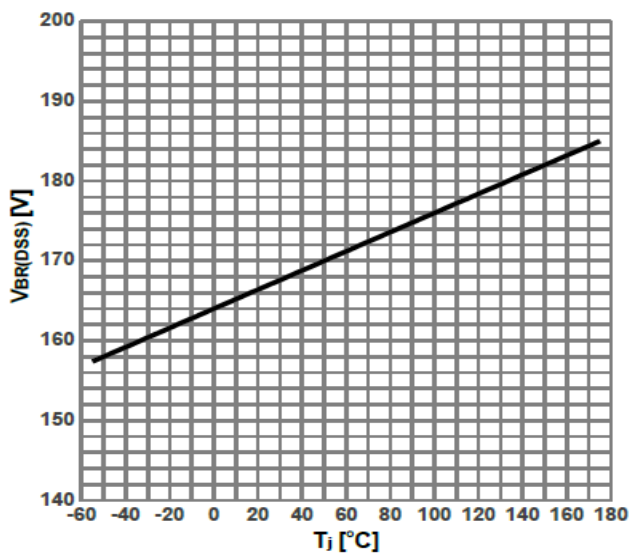
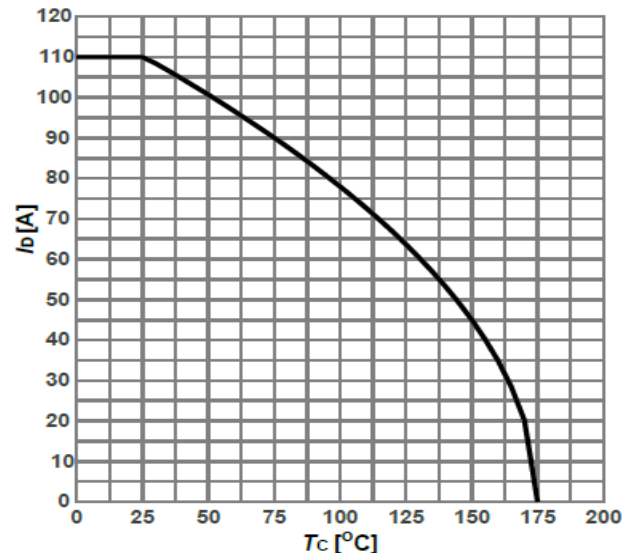


Diagram 6: On-state resistance vs. Vgs characteristics



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Diagram 7: Typ. capacitances

Diagram 8: Typ. gate charge

Diagram 9: Safe operating area

Diagram 10: Typ. output characteristics

Diagram 11: Breakdown Voltage Variation vs. Temperature

Diagram 12: Maximum Drain Current


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TO-220F Package Outline Data
