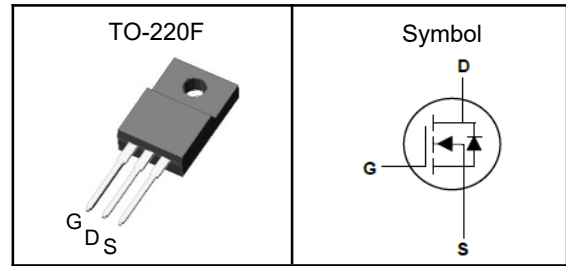


# N-Channel Enhancement Mode MOSFET

## Features

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

## Pin Description



## Applications

- High Frequency Point-of-Load, Synchronous Buck Converter
- Networking DC-DC Power System
- Load Switch

$V_{DSS}$	80	V
$R_{DS(ON)-Typ}$	5	m $\Omega$
$I_D$	60	A

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

Symbol	Parameter	N-Channel	Unit
$V_{DSS}$	Drain-Source Voltage	80	V
$V_{GSS}$	Gate-Source Voltage	$\pm 20$	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 <sup>③</sup>	300	mJ
$I_{DM}^{①}$	Pulse Drain Current Tested	240	A
$I_D$	Continuous Drain Current	$T_C=25^\circ\text{C}$	A
$P_D$	Maximum Power Dissipation	$T_C=25^\circ\text{C}$	W

## Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient <sup>①</sup> (Max)	60	$^\circ\text{C}/\text{W}$
$R_{\theta JC}$	Thermal Resistance Junction-Case <sup>①</sup>	5	$^\circ\text{C}/\text{W}$

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 1in<sup>2</sup> FR-4 board with 1oz.



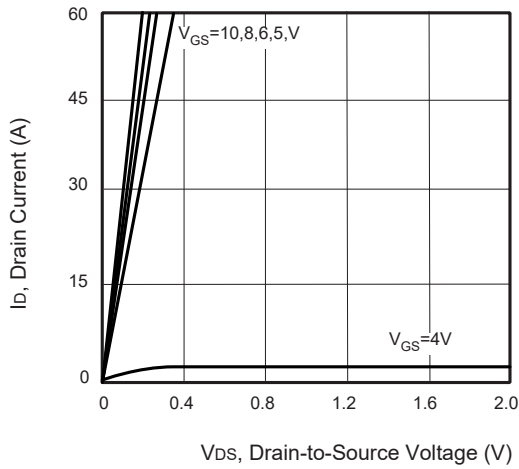
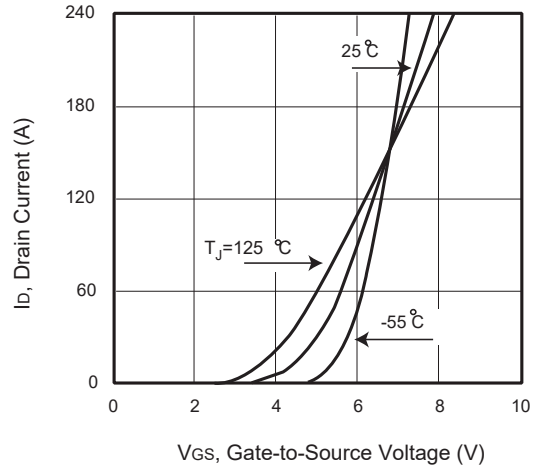
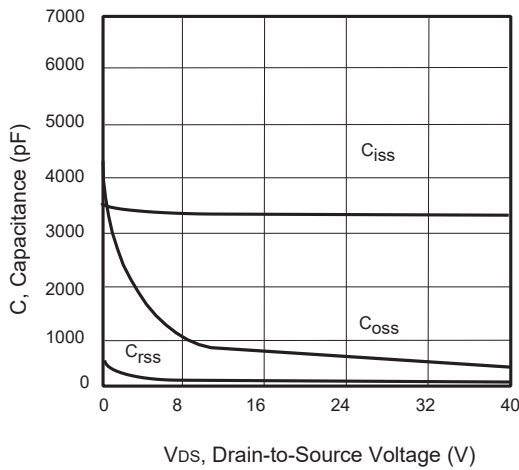
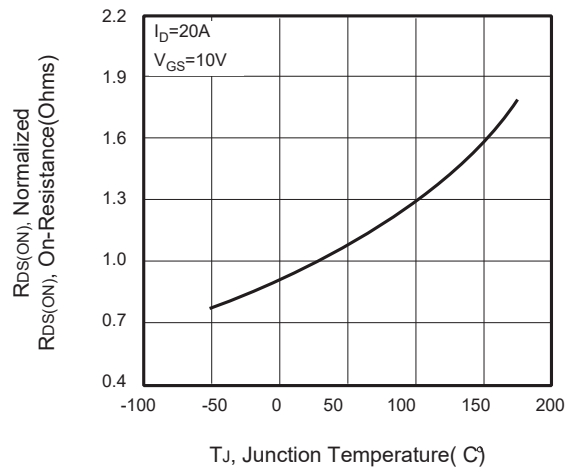
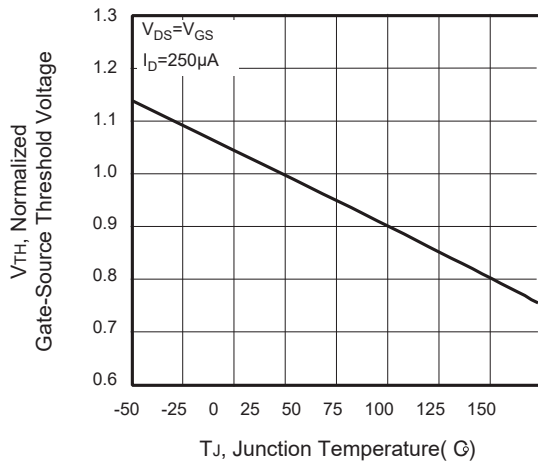
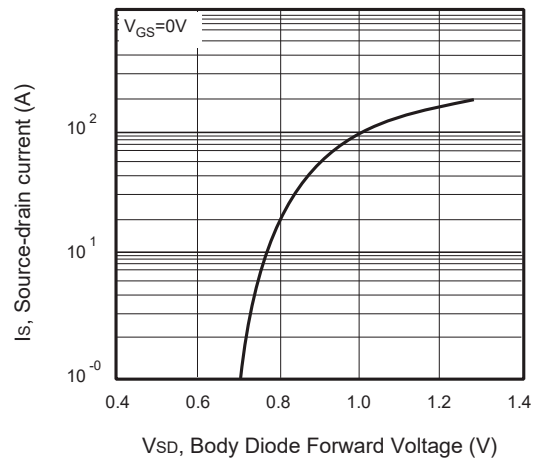
**N-Channel Enhancement Mode MOSFET**

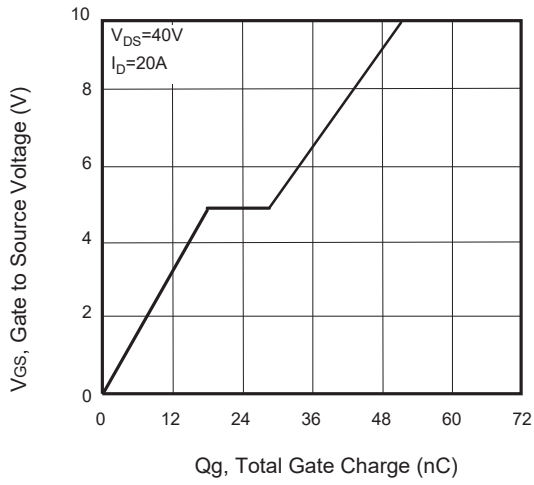
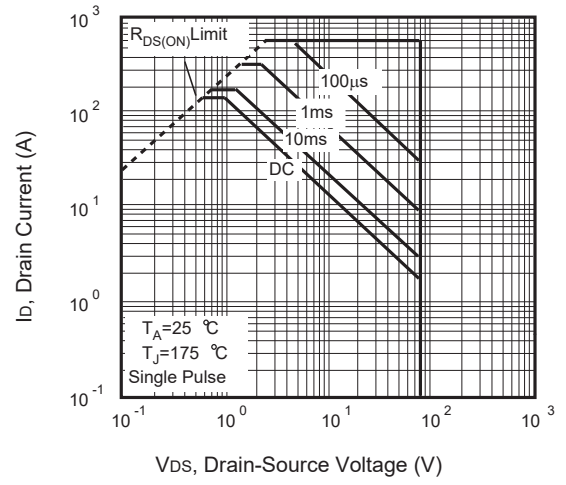
**Electrical Characteristics** ( $T_J=25^{\circ}\text{C}$ , Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
<b>Static Electrical Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	80	---	---	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=80V, V_{GS}=0V$	---	---	1	$\mu A$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	2.5	---	3.5	V
$I_{GSS}$	Gate Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	$\pm 100$	nA
$R_{DS(on)}$	Drain-Source On-state Resistance	$V_{GS}=10V, I_D=20A$	---	5	6	m $\Omega$
<b>Dynamic Characteristics</b> <sup>⑤</sup>						
$C_{iss}$	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=40V,$ Freq.=1MHz	---	3325	---	pF
$C_{oss}$	Output Capacitance		---	470	---	
$C_{rss}$	Reverse Transfer Capacitance		---	22	---	
$T_{d(on)}$	Turn-on Delay Time	$V_{DD}=40V,$ $V_{GS}=10V, I_D=20A$	---	16	---	nS
$T_r$	Turn-on Rise Time		---	13	---	
$T_{d(off)}$	Turn-off Delay Time		---	35	---	
$T_f$	Turn-off Fall Time		---	13	---	
$Q_g$	Total Gate Charge	$V_{DD}=40V, V_{GS}=10V,$ $I_D=20A$	---	51	---	nC
$Q_{gs}$	Gate-Source Charge		---	15	---	
$Q_{gd}$	Gate-Drain Charge		---	13	---	
<b>Source-Drain Characteristics</b> ( $T_J=25^{\circ}\text{C}$ )						
$V_{SD}$	Diode Forward Voltage <sub>z</sub>	$V_{GS}=0V, I_S=1A, T_J=25^{\circ}\text{C}$	---	0.7	---	V
$t_{rr}$	Reverse Recovery Time	$V_{GS}=0V, I_S=20A,$ $di/dt=100A/\mu s, T_J=25^{\circ}\text{C}$	---	40	---	nS
$Q_{rr}$	Reverse Recovery Charge		---	100	---	nC

Note ④ : Pulse test (pulse width $\leq$ 300us, 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**

**Figure 2. Transfer Characteristics**

**Figure 3. Capacitance**

**Figure 4. On-Resistance Variation with Temperature**

**Figure 5. Gate Threshold Variation with Temperature**

**Figure 6. Body Diode Forward Voltage Variation with Source Current**

**N-Channel Enhancement Mode MOSFET**

**Figure 7. Gate Charge**

**Figure 8. Maximum Safe Operating Area**

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