

N-Channel Enhancement Mode MOSFET

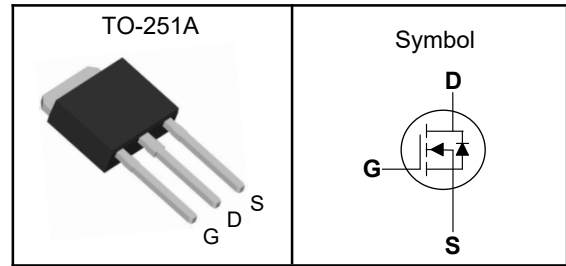
Features

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

Applications

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

Pin Description



V_{DSS}	650	V
$R_{DS(ON)-Typ}$	4.2	Ω
I_D	2	A

Absolute Maximum Ratings ($T_C=25^\circ\text{C}$, 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	95	mJ
$I_{DM}^{①}$	Pulse Drain Current Tested	6	A
I_D	Continuous Drain Current	$T_C=25^\circ\text{C}$ 2	A
P_D	Maximum Power Dissipation	$T_C=25^\circ\text{C}$ 25	W

Thermal Characteristics

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

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



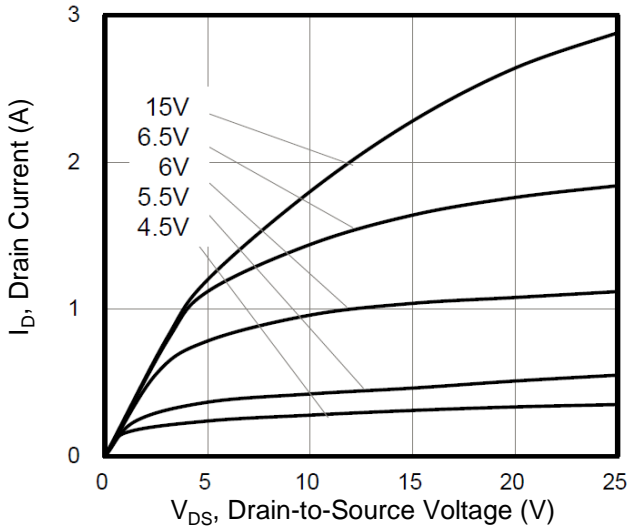
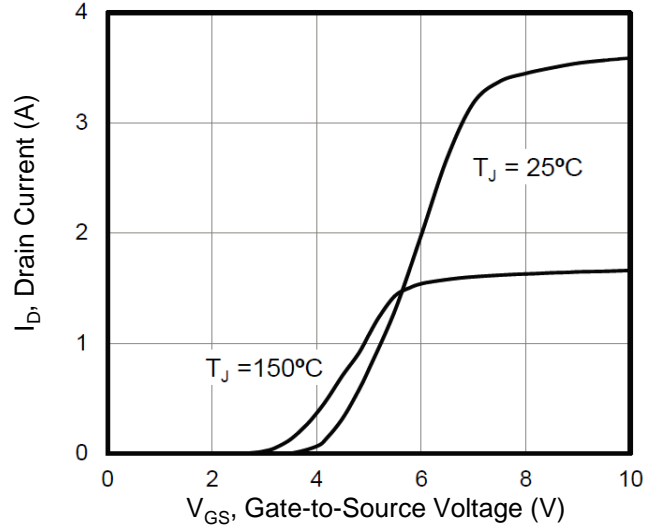
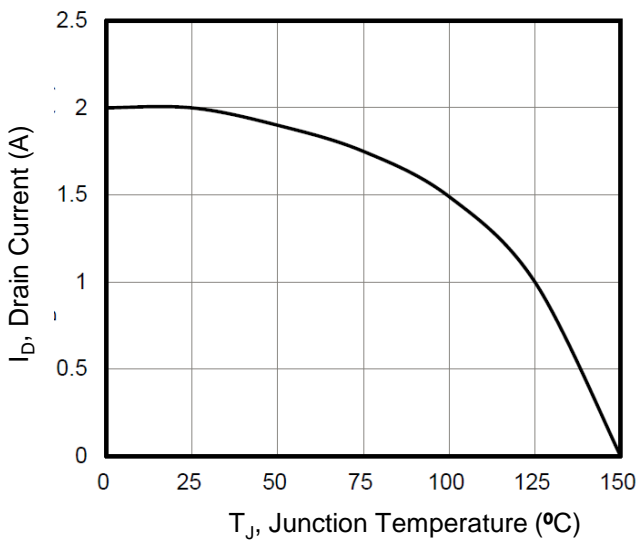
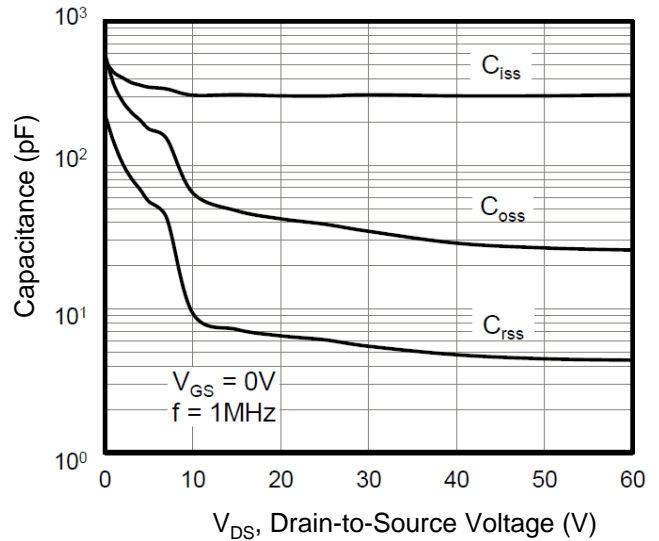
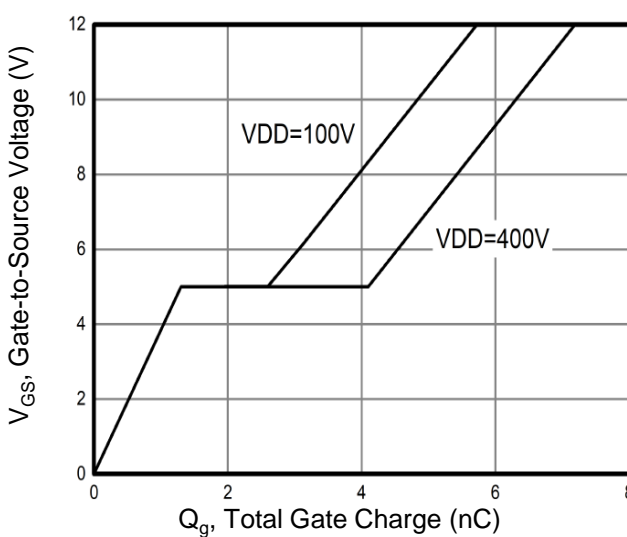
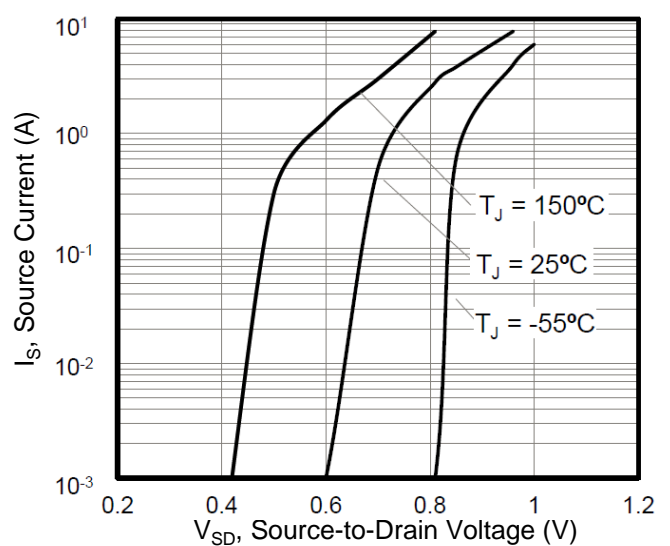
N-Channel Enhancement Mode MOSFET

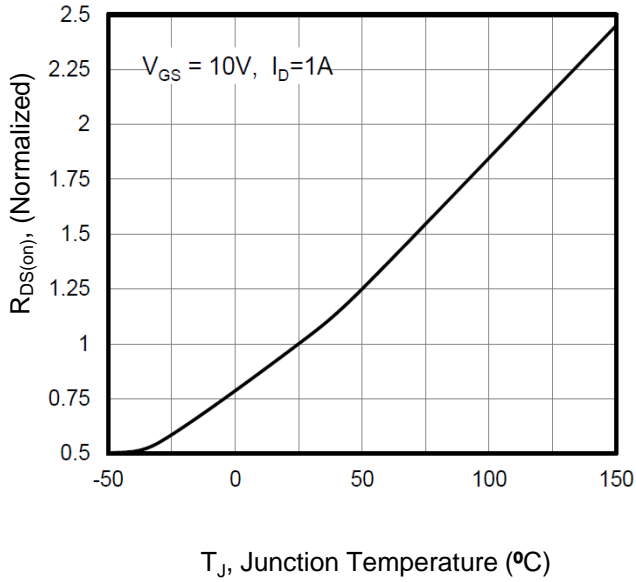
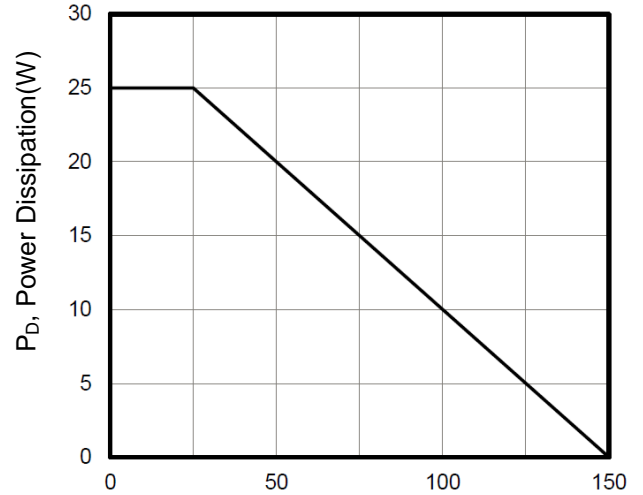
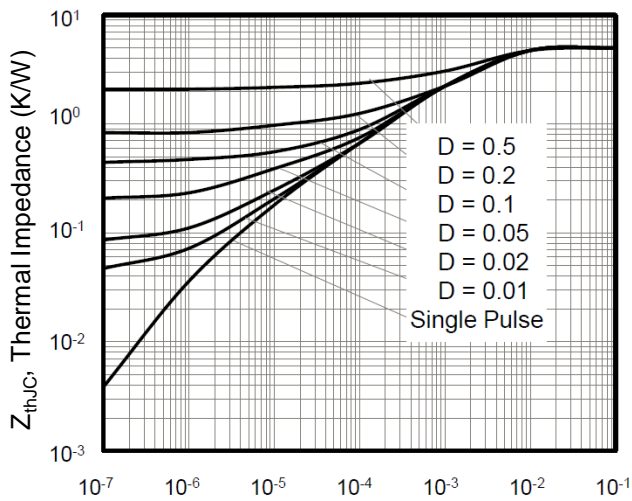
Electrical Characteristics ($T_J=25^{\circ}\text{C}$, Unless Otherwise Noted)

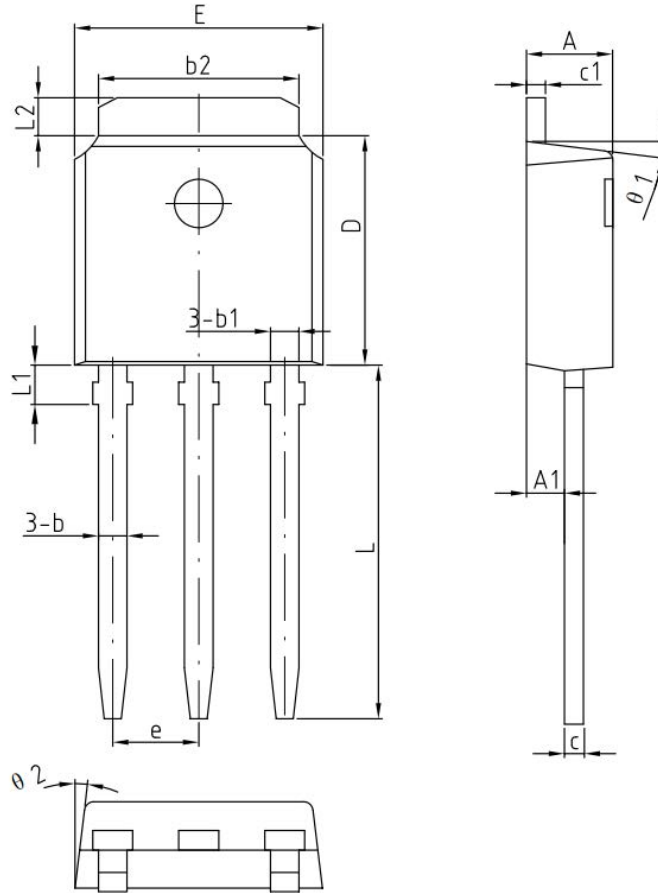
Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
Static Electrical Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250mA$	650	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=650V, V_{GS}=0V$	---	---	1	μA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	2	---	4	V
I_{GSS}	Gate Leakage Current	$V_{GS}=\pm 30V, V_{DS}=0V$	---	---	± 100	nA
$R_{DS(on)}$	Drain-Source On-state Resistance	$V_{GS}=10V, I_D=1A$	---	4.2	5.2	Ω
Dynamic Characteristics ^⑤						
C_{iss}	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=25V,$ Freq.=1MHz	---	359	---	pF
C_{oss}	Output Capacitance		---	46	---	
C_{rss}	Reverse Transfer Capacitance		---	10	---	
$T_{d(on)}$	Turn-on Delay Time	$V_{DD}=300V, R_G=25\Omega,$ $I_D=2A$	---	8	---	nS
T_r	Turn-on Rise Time		---	33	---	
$T_{d(off)}$	Turn-off Delay Time		---	23	---	
T_f	Turn-off Fall Time		---	59	---	
Q_g	Total Gate Charge	$V_{DD}=400V, V_{GS}=10V,$ $I_D=2A$	---	6.3	---	nC
Q_{gs}	Gate-Source Charge		---	1.2	---	
Q_{gd}	Gate-Drain Charge		---	2.9	---	
Source-Drain Characteristics ($T_J=25^{\circ}\text{C}$)						
V_{SD}	Diode Forward Voltage ₂	$V_{GS}=0V, I_S=2A, T_J=25^{\circ}\text{C}$	---	---	1.4	V
t_{rr}	Reverse Recovery Time	$V_R=400V, I_F=2A,$ $di_F/dt=100A/\mu s$	---	80	---	nS
Q_{rr}	Reverse Recovery Charge		---	1.8	---	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

Figure 2. Transfer Characteristics

Figure 3. Drain Current vs. Temperature

Figure 4. Capacitance

Figure 5. Gate Charge

Figure 6. Body Diode Forward Voltage


N-Channel Enhancement Mode MOSFET
Figure 7. On-Resistance vs. Temperature

Figure 8. Power Dissipation vs. Temperature

Figure 9. Transient Thermal Impedance


N-Channel Enhancement Mode MOSFET
TO-251A Package Outline Dimensions


COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	NOM	MAX
A	2.2	2.30	2.38
A1	0.90	1.01	1.10
b	0.71	0.76	0.86
b1	-	0.76	-
b2	5.13	5.33	5.46
c	0.46	0.50	0.60
c1	0.46	0.50	0.60
D	6.00	6.10	6.20
E	6.50	6.60	6.70
e	2.286BSC		
L	9.10	9.40	9.70
L1	1.05		
L2	0.90	-	1.25
θ 1	7°		
θ 2	7°		