

N-Channel Enhancement Mode MOSFET

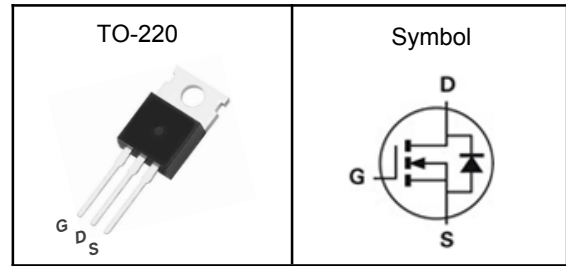
Features

- 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
$R_{DS(ON)-Typ}$	1100	m Ω
I_D	7	A

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

Symbol	Parameter	N-Channel	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	230	mJ
$I_{DM}^{①}$	Pulse Drain Current Tested	28	A
I_D	Continuous Drain Current	$T_C=25^\circ\text{C}$	7
P_D	Maximum Power Dissipation	$T_C=25^\circ\text{C}$	97

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	1.29	$^\circ\text{C}/\text{W}$

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

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

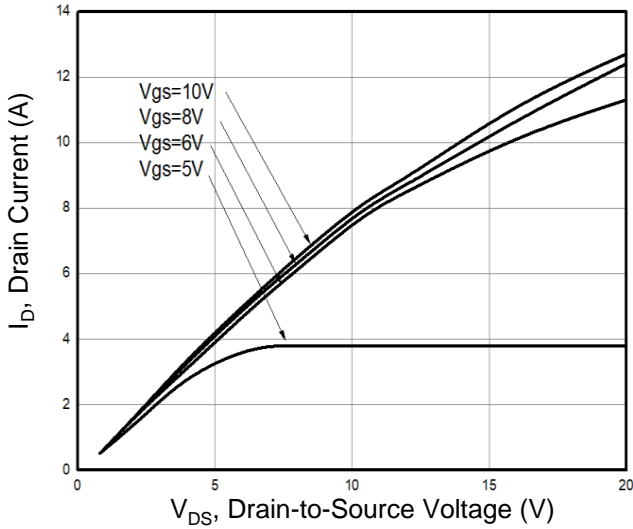
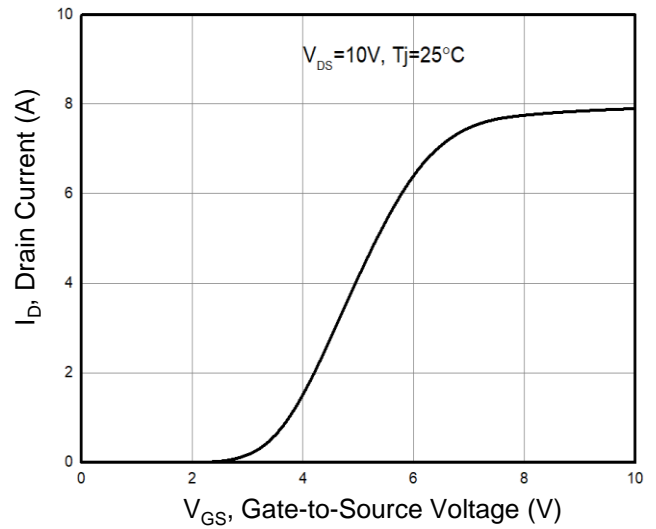
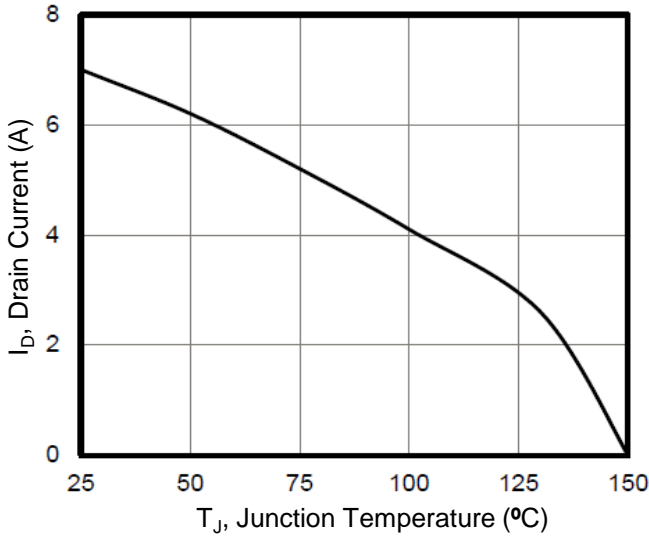
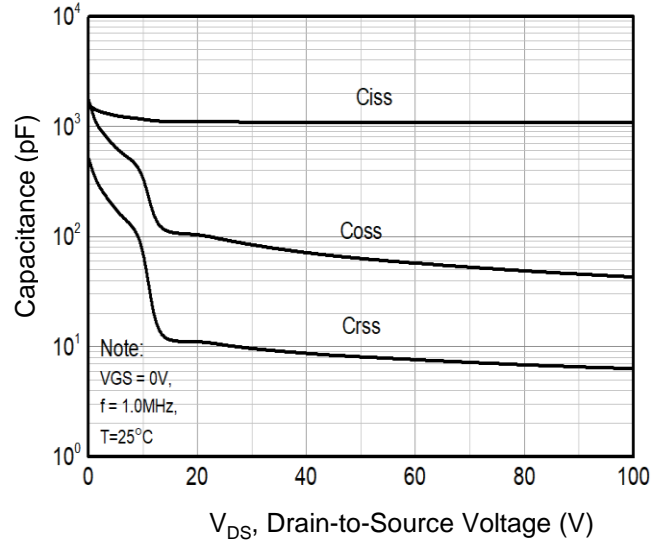
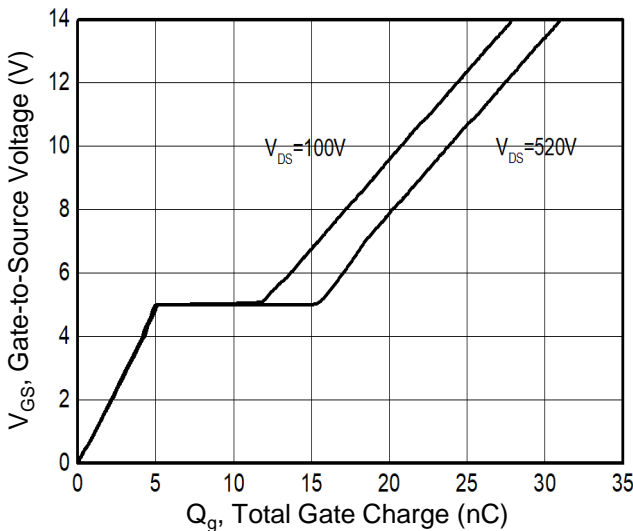
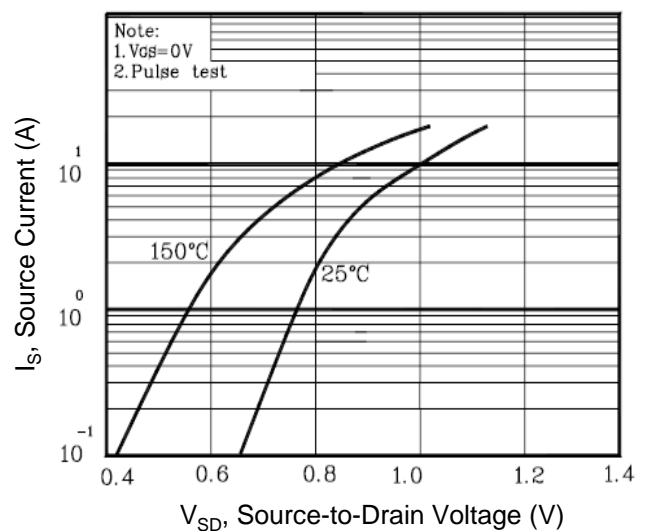
Note ③ : Surface Mounted on 1in² FR-4 board with 1oz.

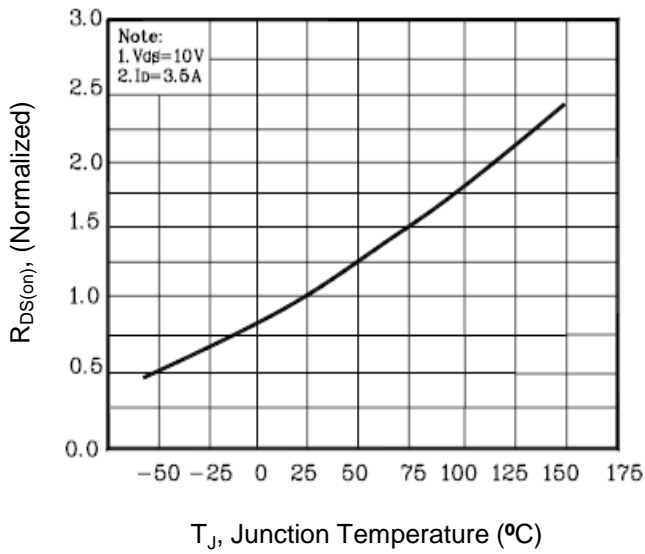
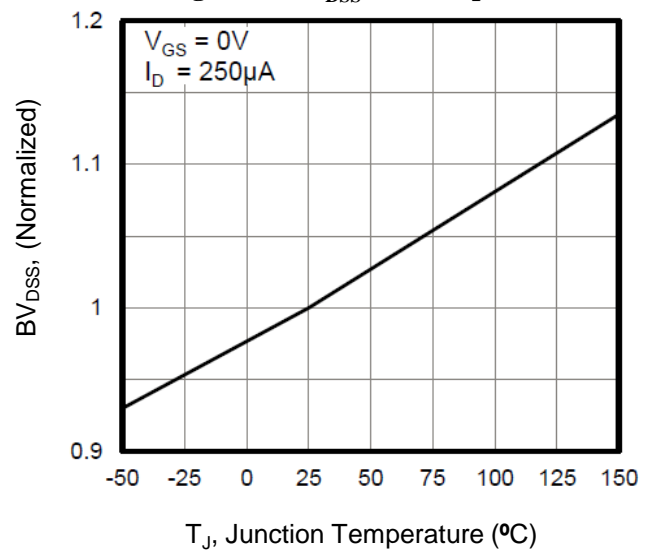
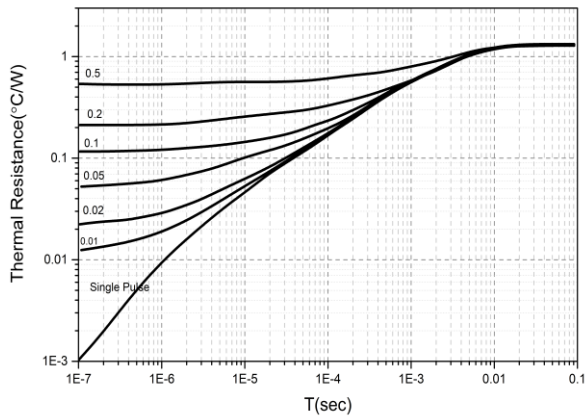
**N-Channel Enhancement Mode MOSFET****Electrical Characteristics** ($T_J=25^\circ\text{C}$, Unless Otherwise Noted)

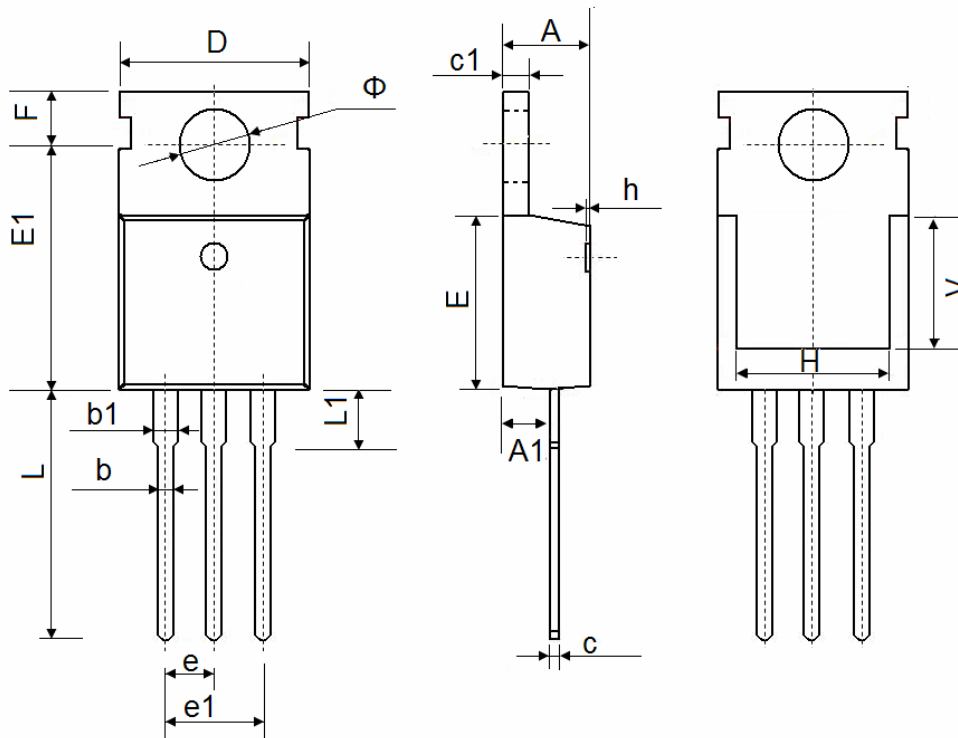
Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
Static Electrical Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	650	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=650V, V_{GS}=0V$	---	---	1	μA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	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	$V_{GS}=10V, I_D=3.5A$	---	1100	1300	$m\Omega$
Dynamic Characteristics ^⑤						
C_{iss}	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=25V,$ Freq.=1MHz	---	1098	---	pF
C_{oss}	Output Capacitance		---	93	---	
C_{rss}	Reverse Transfer Capacitance		---	11	---	
$T_{d(on)}$	Turn-on Delay Time	$V_{DD}=325V, R_G=25\Omega,$ $I_D=7A$	---	29	---	nS
T_r	Turn-on Rise Time		---	48	---	
$T_{d(off)}$	Turn-off Delay Time		---	39	---	
T_f	Turn-off Fall Time		---	33	---	
Q_g	Total Gate Charge	$V_{DD}=400V, V_{GS}=10V,$ $I_D=7A$	---	20	---	nC
Q_{gs}	Gate-Source Charge		---	4	---	
Q_{gd}	Gate-Drain Charge		---	7	---	
Source-Drain Characteristics ($T_J=25^\circ\text{C}$)						
V_{SD}	Diode Forward Voltage ₂	$V_{GS}=0V, I_S=7A, T_J=25^\circ\text{C}$	---	---	1.4	V
t_{rr}	Reverse Recovery Time	$V_R=400V, I_S=7A,$ $di/dt=100A/\mu s, T_J=25^\circ\text{C}$	---	365	---	nS
Q_{rr}	Reverse Recovery Charge		---	3.4	---	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

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. BV_{DSS} vs. Temperature

Figure 9. Transient Thermal Impedance


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


Symbol	Dimensions In Millimeters	
	Min.	Max.
A	4.350	4.650
A1	2.250	2.550
b	0.710	0.910
b1	1.170	1.400
c	0.330	0.650
c1	1.200	1.400
D	9.910	10.250
E	8.9500	9.750
E1	12.650	12.950
e	2.540 TYP.	
e1	4.980	5.180
F	2.650	2.950
H	7.900	8.100
h	0.000	0.300
L	12.700	13.500
L1	2.850	3.250
V	7.500 REF.	
Φ	3.400	3.800