

N-Channel Enhancement Mode MOSFET

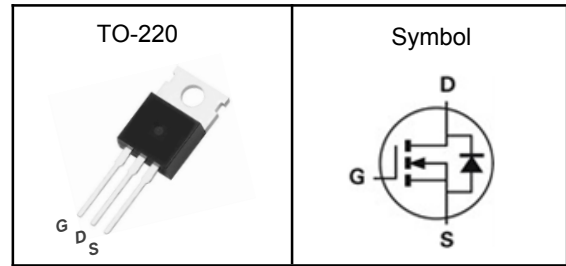
Features

- High Speed Power Switching
- Reliable and Rugged
- ROHS Compliant
- 100% Avalanche Tested

Applications

- Power Management in Desktop Computer
- DC/DC Converters

Pin Description



V_{DSS}	100	V
$R_{DS(ON)-Typ}$	2.6	m Ω
I_D	190	A

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

Symbol	Parameter		Rating	Unit
V_{DSS}	Drain-Source Voltage		100	V
V_{GSS}	Gate-Source Voltage		± 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 ^③		1080	mJ
$I_{DM}^{①}$	Pulse Drain Current Tested		760	A
I_D	Continuous Drain Current	$T_C=25^\circ\text{C}$	190	A
P_D	Maximum Power Dissipation	$T_C=25^\circ\text{C}$	255	W

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient	50	$^\circ\text{C}/\text{W}$
$R_{\theta JC}$	Thermal Resistance Junction-Case ^①	0.49	$^\circ\text{C}/\text{W}$

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.



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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	$V_{GS}=0V, I_D=250\mu A$	100	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=80V, V_{GS}=0V$	---	---	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	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 100	nA
$R_{DS(on)}$	Drain-Source On-state Resistance	$V_{GS}=10V, I_D=30A$	---	2.6	3.3	$m\Omega$
Dynamic Characteristics ^⑤						
C_{iss}	Input Capacitance	$V_{GS}=0V, V_{DS}=50V, \text{Freq.}=1\text{MHz}$	---	5500	---	pF
C_{oss}	Output Capacitance		---	3280	---	
C_{riss}	Reverse Transfer Capacitance		---	263	---	
$T_{d(on)}$	Turn-on Delay Time	$V_{DS}=50V, V_{GS}=10V, R_G=4.5\Omega, I_D=30A$	---	30	---	nS
T_r	Turn-on Rise Time		---	28	---	
$T_{d(off)}$	Turn-off Delay Time		---	88	---	
T_f	Turn-off Fall Time		---	30	---	
Q_g	Total Gate Charge	$V_{DS}=50V, V_{GS}=10V, I_D=30A$	---	103	---	nC
Q_{gs}	Gate-Source Charge		---	21	---	
Q_{gd}	Gate-Drain Charge		---	33	---	
Source-Drain Characteristics ($T_J=25^{\circ}\text{C}$)						
V_{SD} ^④	Diode Forward Voltage	$I_S=30A, V_{GS}=0V$	---	---	1.3	V
t_{rr}	Reverse Recovery Time	$I_D=30A, di/dt=100A/\mu s, T_J=25^{\circ}\text{C}$	---	76	---	nS
Q_{rr}	Reverse Recovery Charge		---	128	---	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

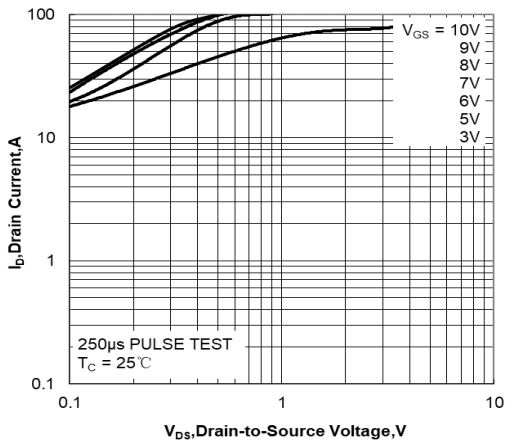


Figure 1. Output Characteristics

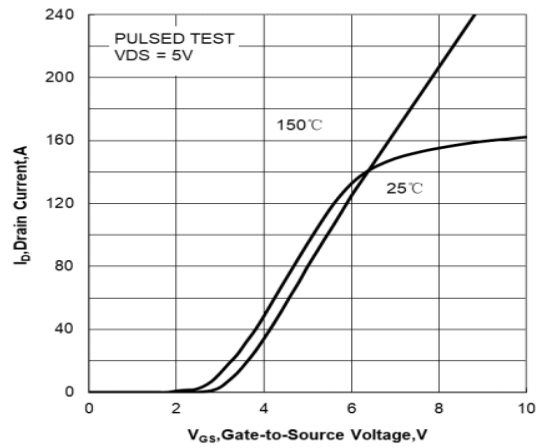


Figure 2. Transfer Characteristics

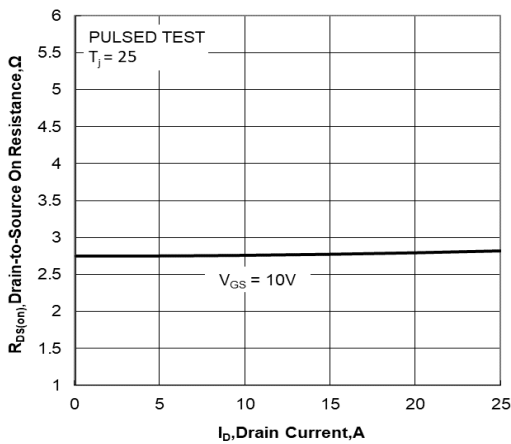


Figure 3. Drain-to-Source On Resistance vs Drain Current

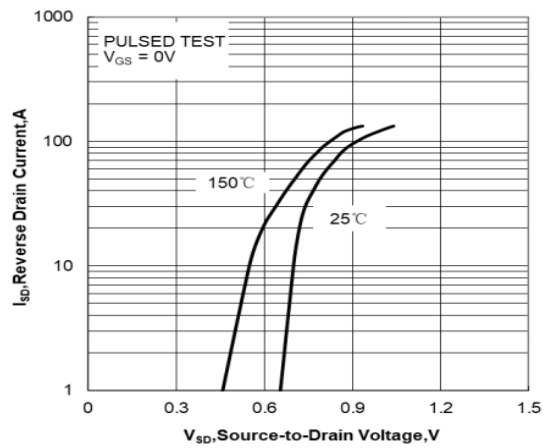


Figure 4. Body Diode Forward Voltage vs Source Current and Temperature

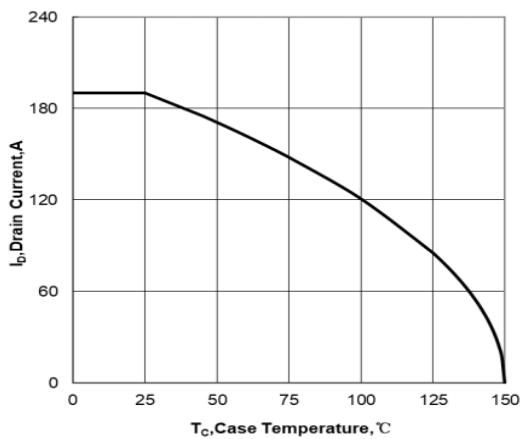


Figure 5. Maximum Continuous Drain Current vs Case Temperature

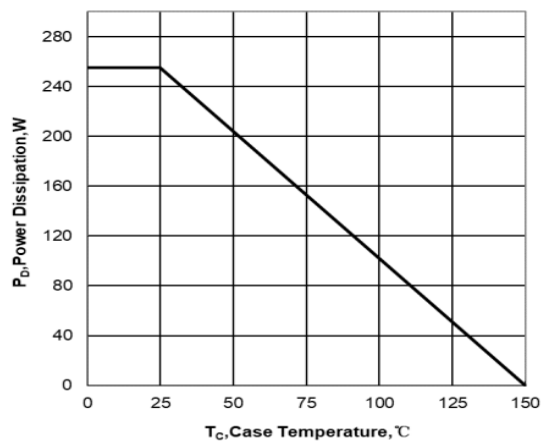


Figure 6. Maximum Power Dissipation vs Case Temperature

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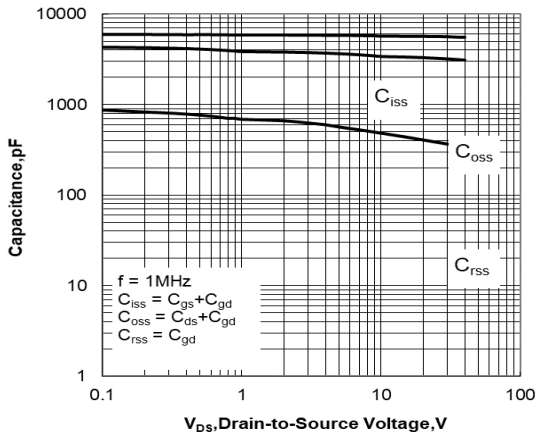


Figure 7. Capacitance Characteristics

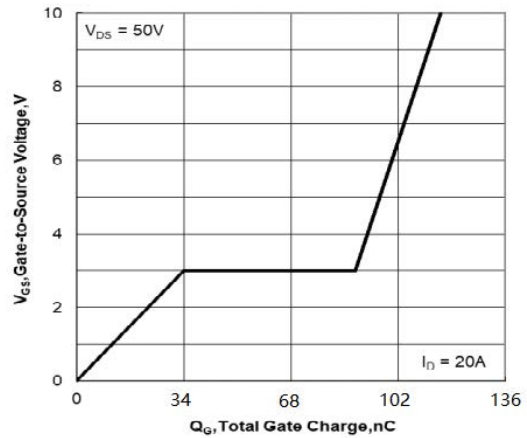


Figure 8. Gate Charge Characteristics

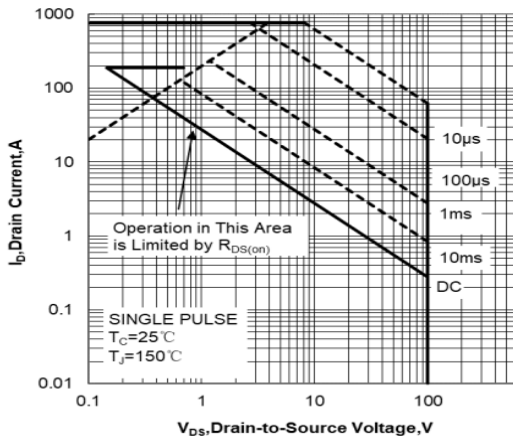


Figure 9. Maximum Safe Operating Area

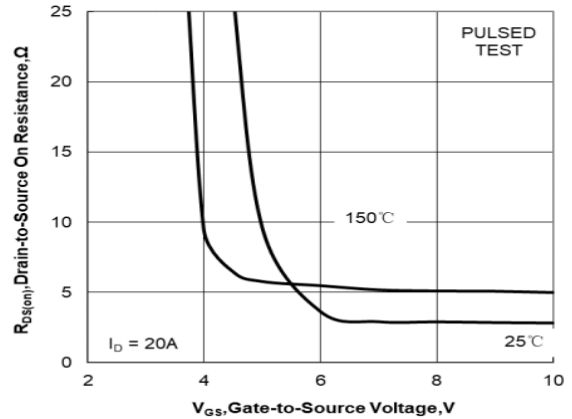


Figure 10. Drain-to-Source On Resistance vs Gate Voltage and Drain Current

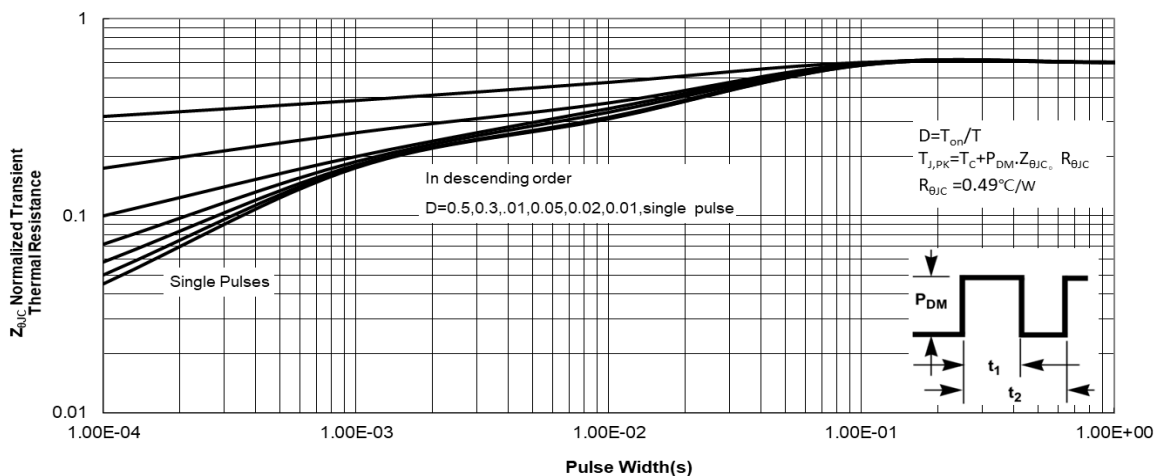
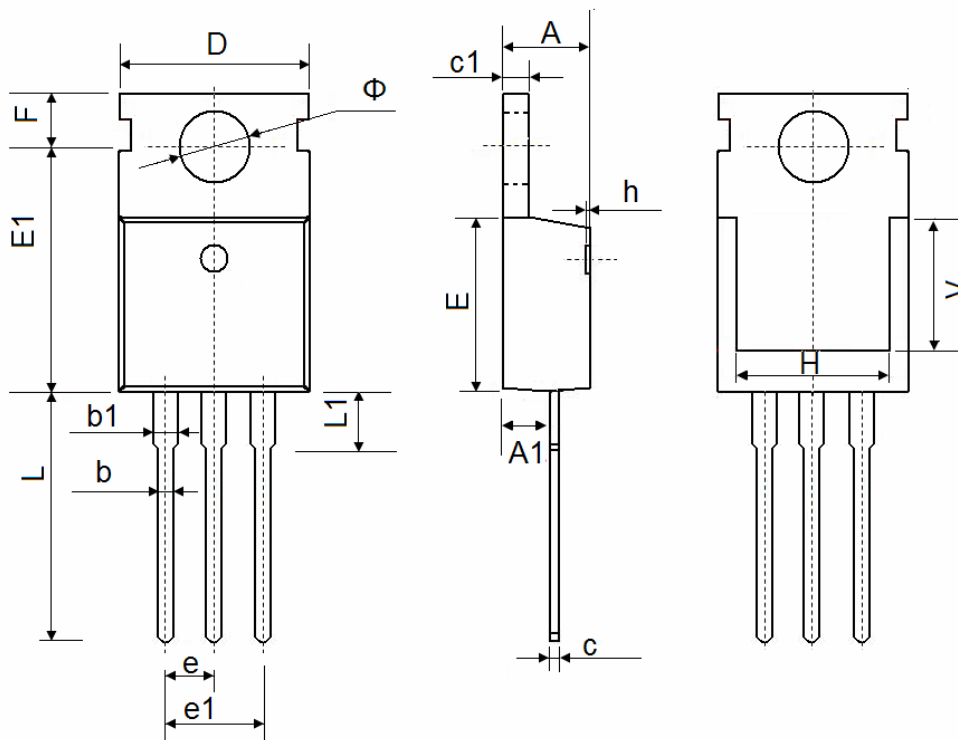


Figure 11. Maximum Effective Transient Thermal Impedance, Junction-to-Case

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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