XXW40N20G

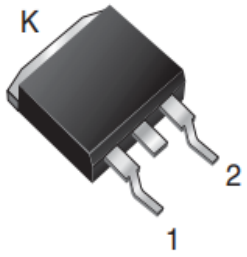
200V N-Channel MOSFET

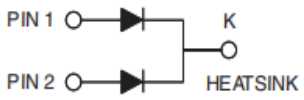
Features:

- ☐ Low Intrinsic Capacitances.
- ☐ Excellent Switching Characteristics.
- ☐ Extended Safe Operating Area.
- ☐ Unrivalled Gate Charge :Qg= 126nC (Typ.).
- ☐ BVDSS=200V,I_D=40A
- ☐ R_{DS}(on) : 0.06Ω (Max) @V_G=10V
- ☐ 100% Avalanche Tested

RoHS COMPLIANT

D^2PAK (TO-263AB)





Absolute Maximum Ratings (T_C=25℃unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	200	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous	I_D	40	A
Drain Current-Continuous(T_C=100℃)	I_D (100℃)	28	A
Pulsed Drain Current	I_{DM}	160	A
Maximum Power Dissipation	P_D	220	W
Derating factor		1.47	W/℃
Single pulse avalanche energy (Note 5)	E_{AS}	605	mJ
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55 To 175	℃

Thermal Characteristic

Thermal Resistance,Junction-to-Case (Note 2)	$R_{\theta JC}$	0.63	℃/W

Electrical Characteristics (Tc=25℃ unless other wise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=250μA	200	220	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=200V,V_{GS}=0V	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V	-	-	±100	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250μA	2	-	4	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=20A	-	50	60	mΩ
Forward Transconductance	g_{FS}	V_{DS}=25V,I_D=20A	26	-	-	S
Dynamic Characteristics (Note4)						
Input Capacitance	C_{lss}	V_{DS}=25V,V_{GS}=0V, F=1.0MHz	-	3140	-	PF
Output Capacitance	C_{oss}		-	360	-	PF
Reverse Transfer Capacitance	C_{rss}		-	140	-	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=100V,I_D=40A V_{GS}=10V,R_G=25Ω	-	35	-	nS
Turn-on Rise Time	t_r		-	60	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	101	-	nS
Turn-Off Fall Time	t_f		-	95	-	nS
Total Gate Charge	Q_g	V_{DS}=160V,I_D=40A, V_{GS}=10V	-	163	-	nC
Gate-Source Charge	Q_{gs}		-	31	-	nC
Gate-Drain Charge	Q_{gd}		-	64	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V_{SD}	V_{GS}=0V,I_S=40A	-	-	1.4	V
Diode Forward Current (Note 2)	I_S	TJ = 25°C	-	-	40	A
Reverse Recovery Time	t_{rr}	TJ = 25°C, IF = 40A di/dt = 100A/μs (Note3)	-	250	-	nS
Reverse Recovery Charge	Qrr		-	2	-	nC
Forward Turn-On Time	t_{on}	Intrinsic turn-on time is negligible (turn-on is dominated by LS+LD)				

Notes

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. I_{AS} = 20A, V_{DD} = 50V, R_G = 25 Ω, Starting T_J = 25 ºC
3. Pulse Test: Pulse width ≤ 250μs, Duty Cycle ≤ 1%

Typical Characteristics

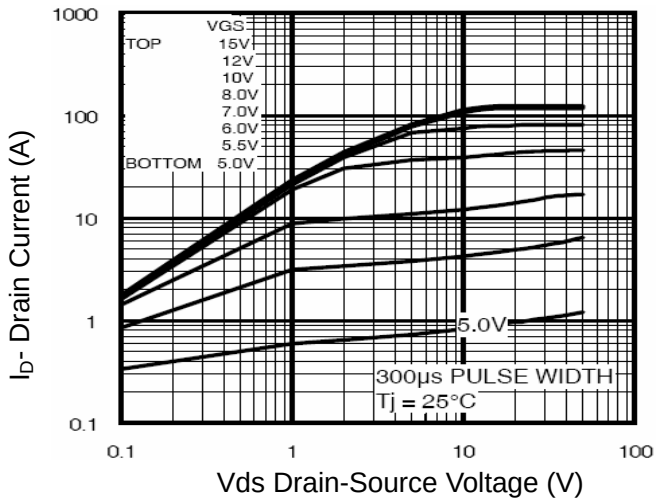


Figure 1 Output Characteristics

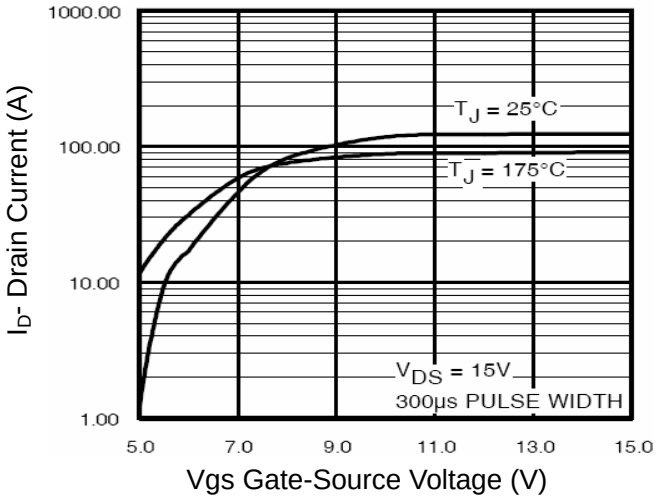


Figure 2 Transfer Characteristics

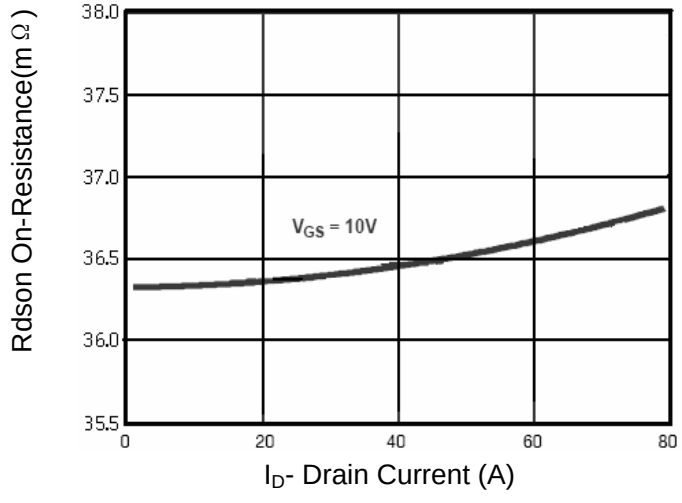


Figure 3 Rdson- Drain Current

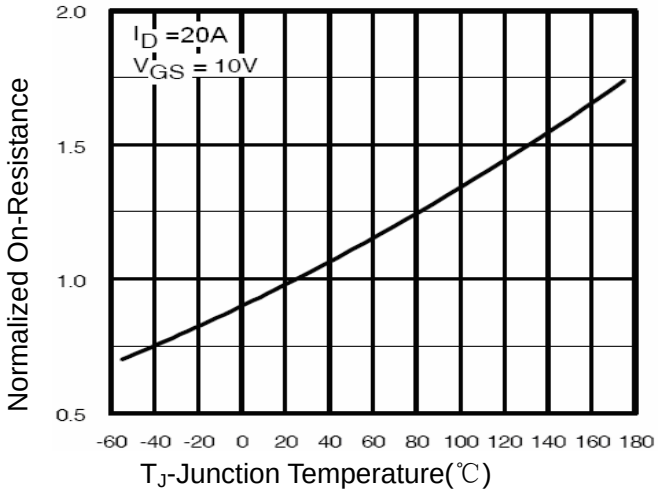


Figure 4 Rdson-JunctionTemperature

Typical Characteristics (Continued)

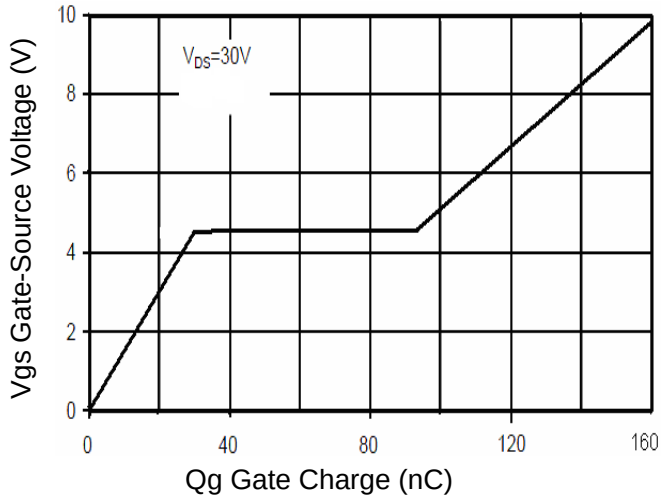


Figure 5 Gate Charge

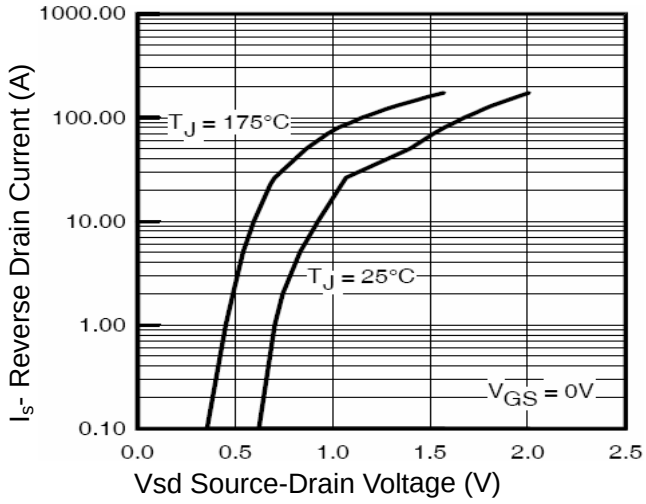


Figure 6 Source- Drain Diode Forward

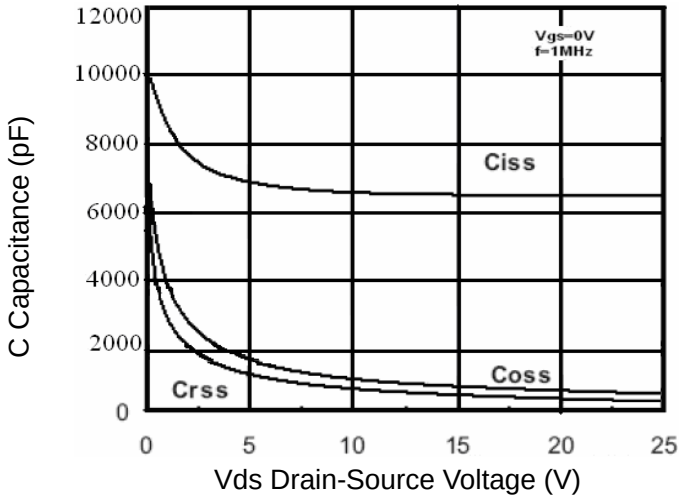


Figure 7 Capacitance vs Vds

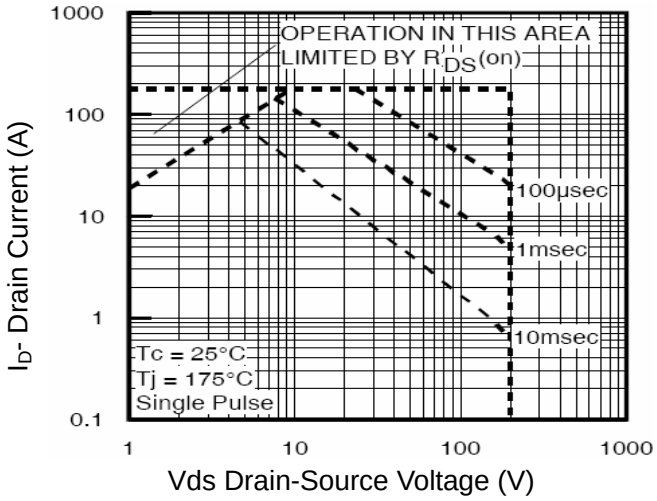
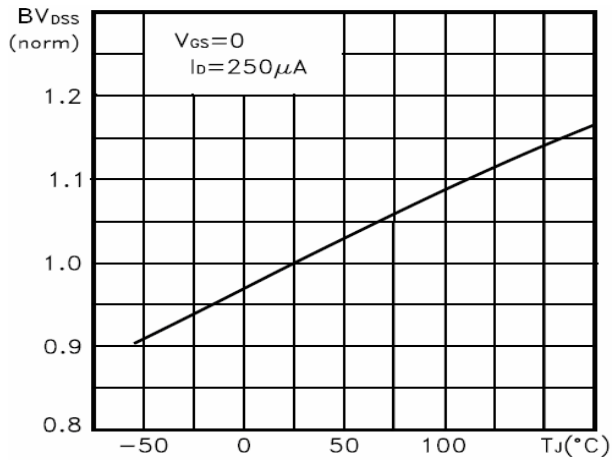


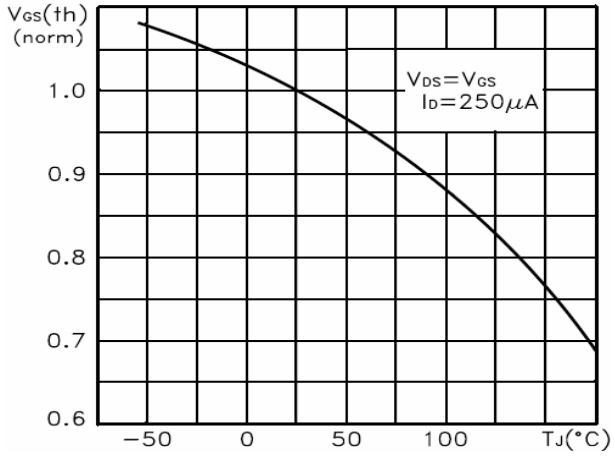
Figure 8 Safe Operation Area

Typical Characteristics (Continued)



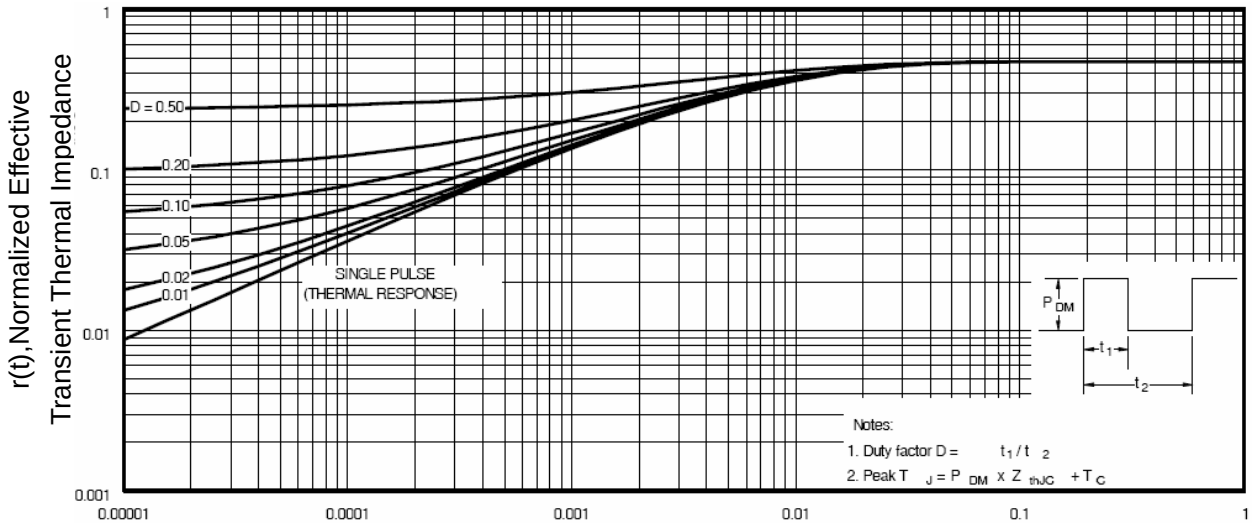
T_J-Junction Temperature(℃)

Figure 9 BV_{DSS} vs Junction Temperature



T_J-Junction Temperature(℃)

Figure 10 $V_{GS(th)}$ vs Junction Temperature

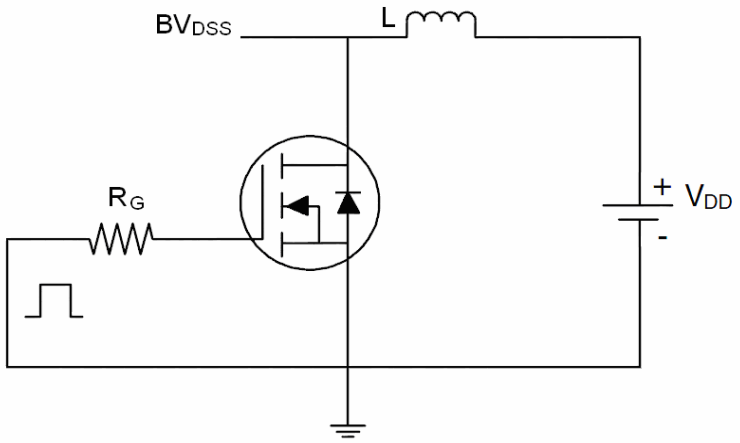


Square Wave Pluse Duration(sec)

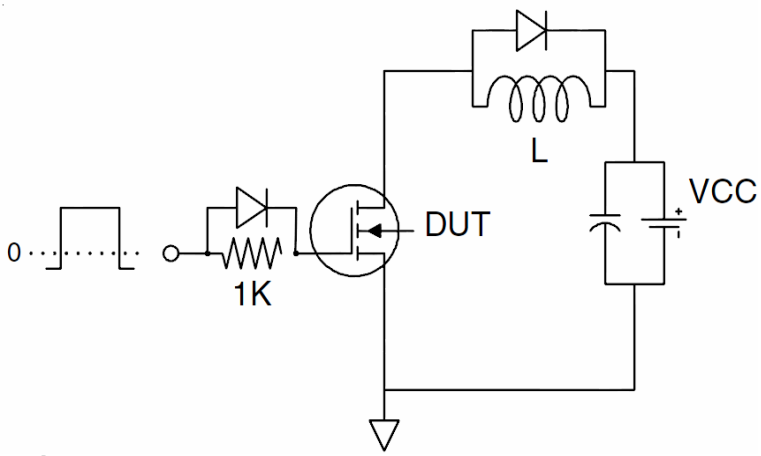
Figure 11 Normalized Maximum Transient Thermal Impedance

Test Circuit

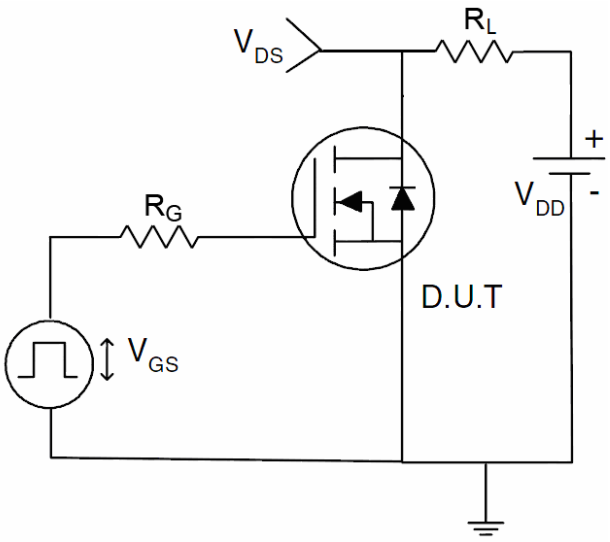
1) E_{AS} test Circuits



2) Gate charge test Circuit

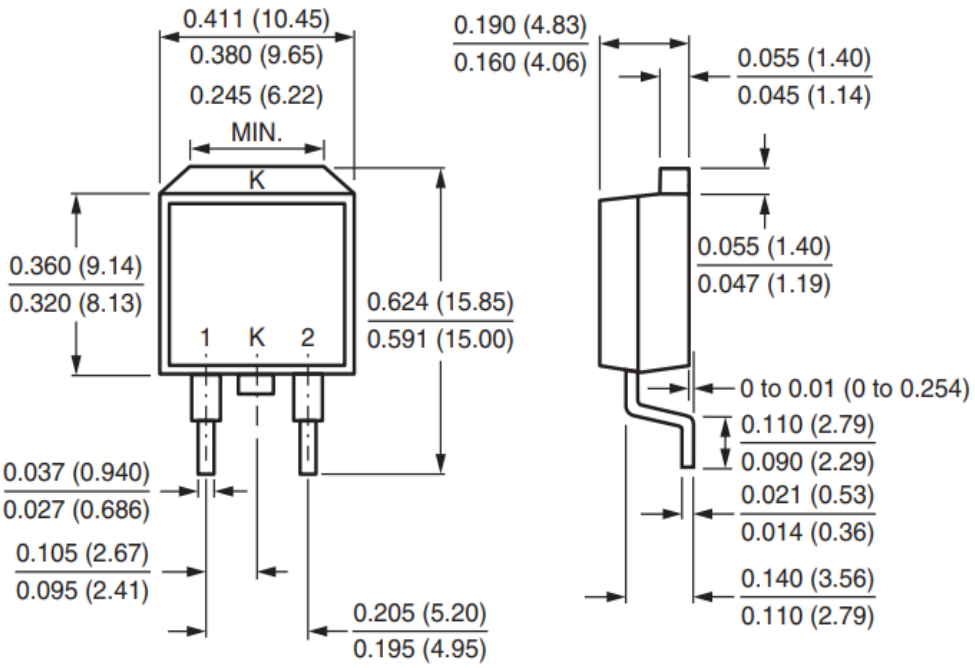


3) Switch Time Test Circuit



Package Dimension

D²PAK (TO-263AB)



Mounting Pad Layout