

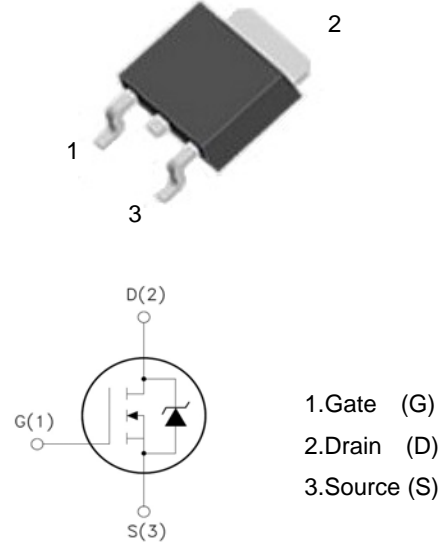
XXW20N20

200V N-Channel MOSFET

Features:

- Low Intrinsic Capacitances.
- Excellent Switching Characteristics.
- Extended Safe Operating Area.
- Unrivalled Gate Charge : $Q_g = 20\text{nC}$ (Typ.).
- $BVDSS=200\text{V}, I_D=20\text{A}$
- $R_{DS(on)} : 0.18\Omega$ (Max) @ $V_G=10\text{V}$
- 100% Avalanche Tested

TO-252



Absolute Maximum Ratings (Ta=25°C unless otherwise noted)

Symbol	Parameter	Value	Unit
V_{DSS}	Drain-Source Voltage	200	V
I_D	Drain Current	$T_C=25^\circ\text{C}$	20
		$T_C=100^\circ\text{C}$	11.9
$V_{GS(TH)}$	Gate Threshold Voltage	± 30	V
E_{AS}	Single Pulse Avalanche Energy (note1)	160	mJ
I_{AR}	Avalanche Current (note2)	18	A
P_D	Power Dissipation (Ta=25°C)	83	W
T_j	Junction Temperature(Max)	150	°C
T_{stg}	Storage Temperature	-55~+150	
T_L	Maximum lead temperature for soldering purpose, 1/8" from case for 5 seconds	300	

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JC}$	Thermal Resistance, Junction to Case	-	1.5	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	-	50	°C/W

Electrical Characteristics (Ta=25°C unless otherwise noted)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
Off Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	I _D =250μA, V _{GS} =0	200	-	-	V
ΔBV _{DSS} /ΔT _J	Breakdown Voltage Temperature Coefficient	I _D =250μA, Reference to 25°C	-	0.25	-	V/°C
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =200V, V _{GS} =0V	-	-	1	μA
		V _{DS} =160V, T _C =125°C			10	
I _{GSSF}	Gate-body leakage Current, Forward	V _{GS} =+30V, V _{DS} =0V	-	-	100	nA
I _{GSSR}	Gate-body leakage Current, Reverse	V _{GS} =-30V, V _{DS} =0V	-	-	-100	nA
On Characteristics						
V _{GS(TH)}	Gate Threshold Voltage	I _D =250μA, V _{DS} =V _{GS}	2	-	4	V
R _{DS(ON)}	Static Drain-Source On-Resistance	I _D =9A, V _{GS} =10V	-	-	0.18	Ω
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =25V, V _{GS} =0, f=1.0MHz	-	1120	1560	pF
C _{oss}	Output Capacitance		-	200	260	pF
C _{rss}	Reverse Transfer Capacitance		-	25	33	pF
Switching Characteristics						
T _{d(on)}	Turn-On Delay Time	V _{DD} =100V, I _D =18A R _G =25Ω (Note 3,4)	-	16	40	ns
T _r	Turn-On Rise Time		-	133	275	ns
T _{d(off)}	Turn-Off Delay Time		-	38	85	ns
T _f	Turn-Off Rise Time		-	62	135	ns
Q _g	Total Gate Charge	V _{DS} =160V, V _{GS} =10V, I _D =18A (Note 3,4)	-	20	26	nC
Q _{gs}	Gate-Source Charge		-	5.6	-	nC
Q _{gd}	Gate-Drain Charge		-	10	-	nC
Drain-Source Diode Characteristics and Maximum Ratings						
I _S	Max. Diode Forward Current	-	-	-	18	A
I _{SM}	Max. Pulsed Forward Current	-	-	-	72	A
V _{SD}	Diode Forward Voltage	I _D =9A	-	-	1.5	V
T _{rr}	Reverse Recovery Time	I _S =9A, V _{GS} =0V diF/dt=100A/μs (Note3)	-	158	-	μs
Q _{rr}	Reverse Recovery Charge		-	1.0	-	μC

- Notes : 1, L=1mH, I_{AS}=18A, V_{DD}=50V, R_G=25Ω, Starting T_J=25°C
 2, Repetitive Rating : Pulse width limited by maximum junction temperature
 3, Pulse Test : Pulse Width ≤ 300μs, Duty Cycle ≤ 2%
 4, Essentially Independent of Operating Temperature

Typical Characteristics

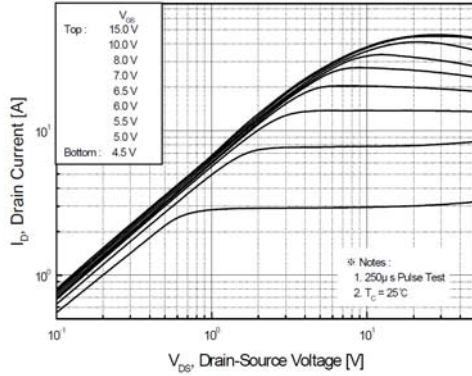


Figure 1. On-Region Characteristics

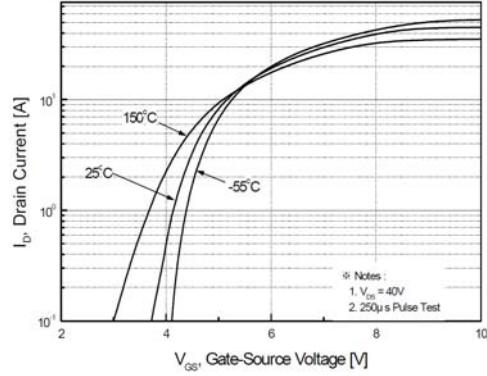


Figure 2. Transfer Characteristics

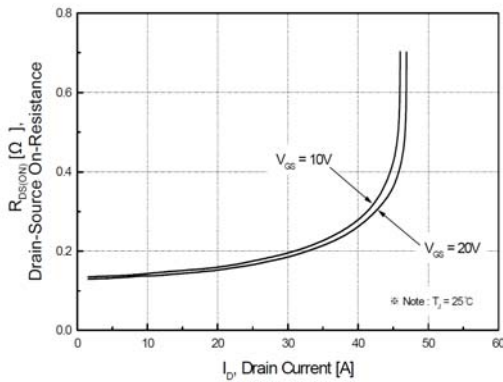


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

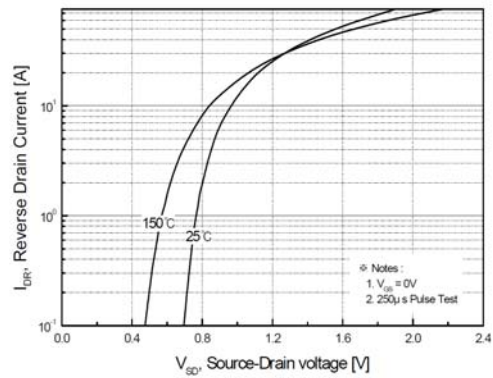


Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

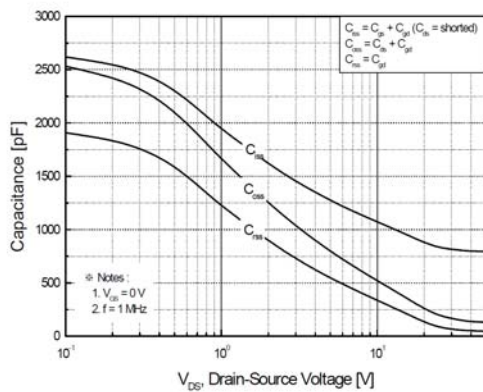


Figure 5. Capacitance Characteristics

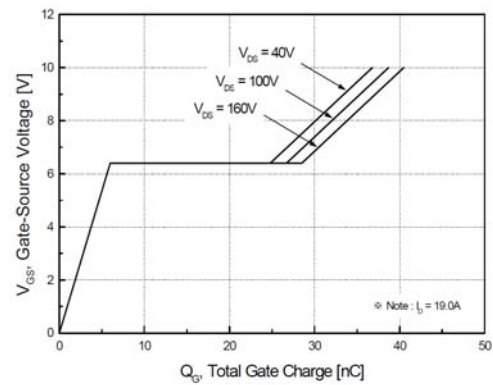
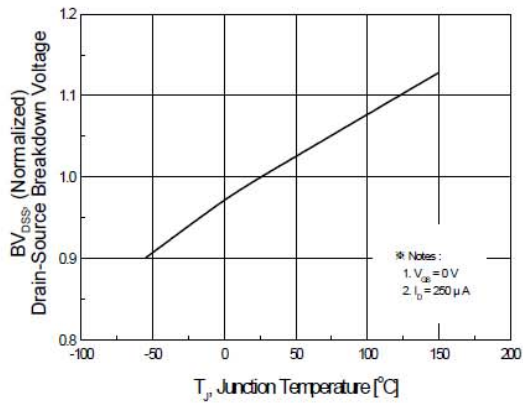
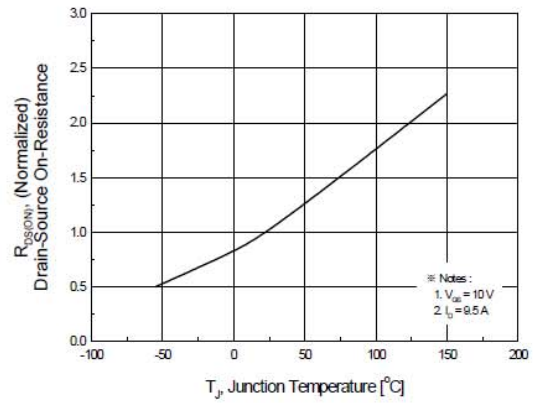
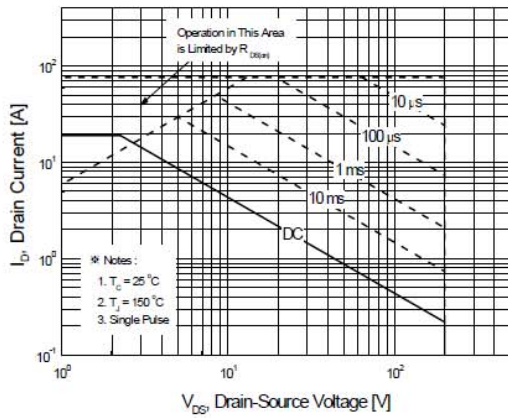
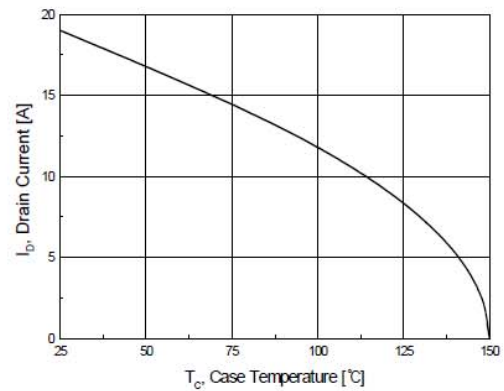
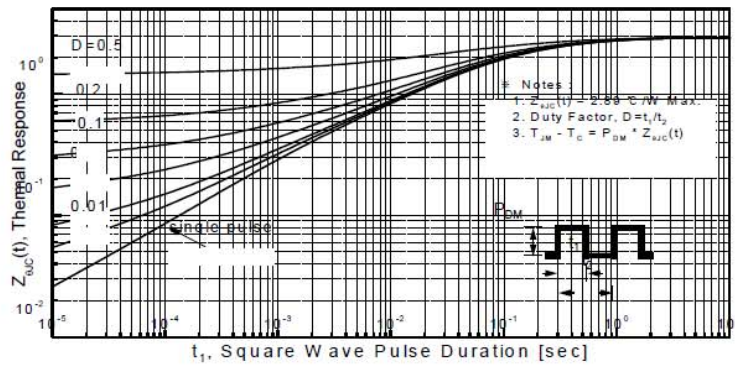
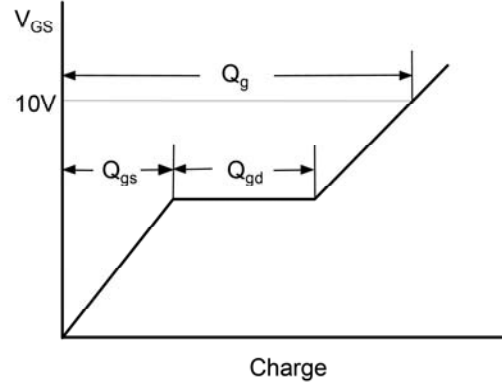
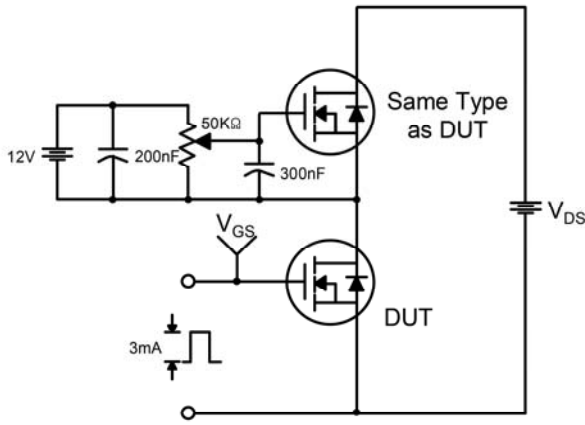


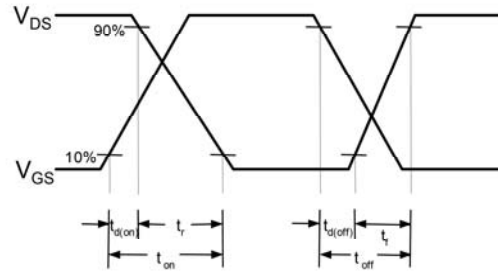
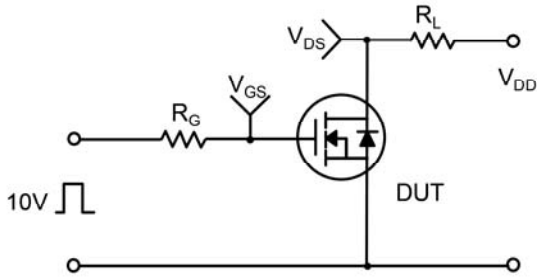
Figure 6. Gate Charge Characteristics

Typical Characteristics (Continued)

Figure 7. Breakdown Voltage Variation vs Temperature

Figure 8. On-Resistance Variation vs Temperature

Figure 9. Maximum Safe Operating Area

Figure 10. Maximum Drain Current vs Case Temperature

Figure 11. Transient Thermal Response Curve

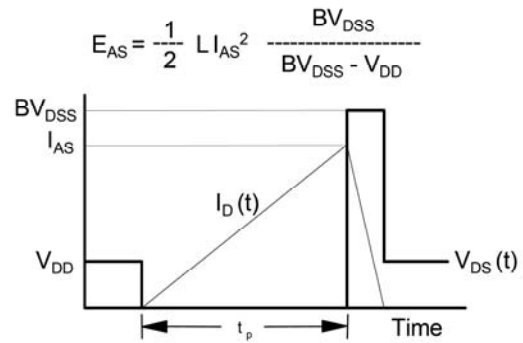
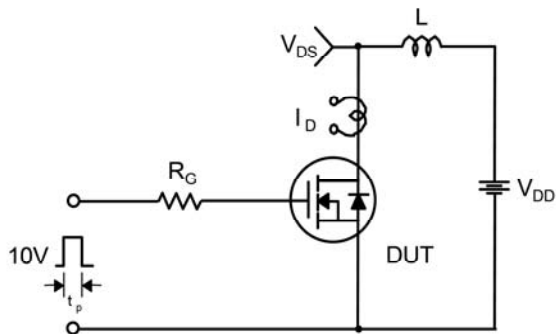
Gate Charge Test Circuit & Waveform



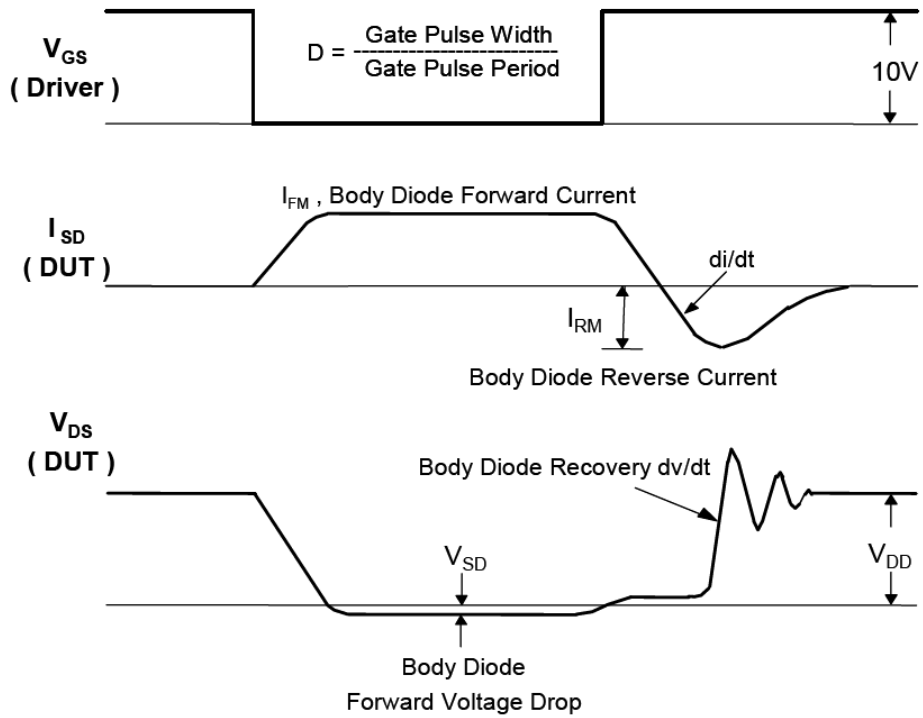
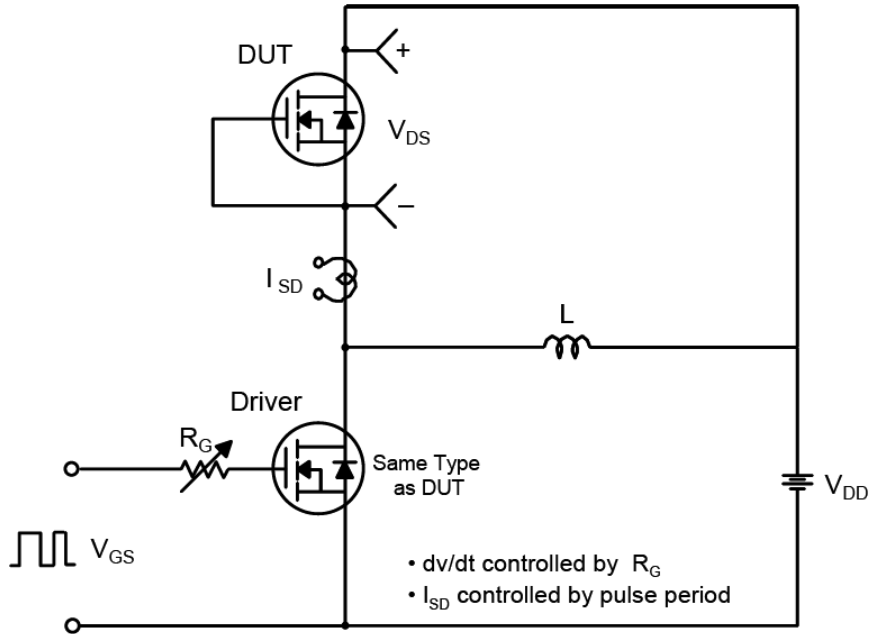
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching Test Circuit & Waveforms



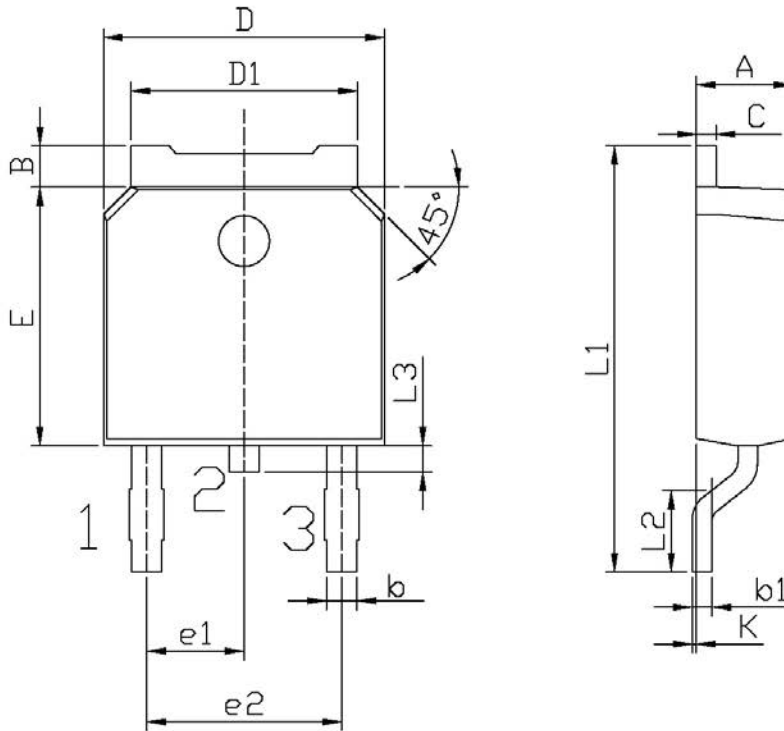
Peak Diode Recovery dv/dt Test Circuit & Waveform



Package Dimension

TO-252

Unit: mm



单位: mm

Symbol	Dimensions In Millimeters		Symbol	Dimensions In Millimeters	
	Min	Max		Min	Max
A	2.20	2.40	E	5.95	6.25
B	0.95	1.25	e1	2.24	2.34
b	0.70	0.90	e2	4.43	4.73
b1	0.45	0.55	L1	9.85	10.35
C	0.45	0.55	L2	1.25	1.75
D	6.45	6.75	L3	0.60	0.90
D1	5.20	5.40	K	0.00	0.10