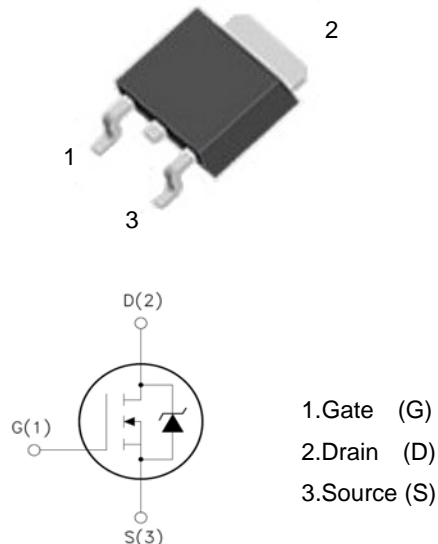


XXW10N20

Features

- Low Intrinsic Capacitances
- Excellent Switching Characteristics
- Extended Safe Operating Area
- Unrivalled Gate Charge : 23 nC (Typ.)
- BVDSS=200V, ID=10A
- Lower $R_{DS(on)}$: 0.3 Ω (Max) @VG=10V
- 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	$T_j=25^\circ\text{C}$	10.0
		$T_j=100^\circ\text{C}$	7.0
V_{GSS}	Gate-Source Voltage	± 20	V
E_{AS}	Single Pulse Avalanche Energy (note1)	100	mJ
I_{AR}	Avalanche Current (note2)	10	A
P_D	Power Dissipation ($T_j=25^\circ\text{C}$)	74	W
T_j	Junction Temperature(Max)	150	$^\circ\text{C}$
T_{stg}	Storage Temperature	-55~+150	$^\circ\text{C}$
T_L	Maximum lead temperature for soldering purpose, 1/8" from case for 5 seconds	300	$^\circ\text{C}$

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JC}$	Thermal Resistance, Junction to Case	-	1.7	$^\circ\text{C}/\text{W}$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	-	60.0	$^\circ\text{C}/\text{W}$

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

Symbol	Parameter	Test Condition	Min.	Typ.	Max	Units
Off Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	ID=250 μ A, VGS=0	200	--	--	V
ΔBV _{DSS} / ΔT _J	Breakdown Voltage Temperature Coefficient	ID=250 μ A, Reference to 25°C	--	0.55	--	V/°C
IDSS	Zero Gate Voltage Drain Current	Vds=200V, Vgs=0V	--	--	1	μ A
		Vds=160V, Tc=125°C			10	μ A
IGSSF	Gate-body leakage Current, Forward	Vgs=+20V, Vds=0V	--	--	100	nA
IGSSR	Gate-body leakage Current, Reverse	Vgs=-20V, Vds=0V	--	--	-100	nA
On Characteristics						
V _{GS(th)}	Gate Threshold Voltage	Id=250uA, Vds=Vgs	1	--	2.5	V
R _{DS(on)}	Static Drain-Source On-Resistance	Id=4.5A, Vgs=10V	--	0.24	0.3	Ω
Dynamic Characteristics						
Ciss	Input Capacitance	VDS=25V, VGS=0, f=1.0MHz	--	684	-	pF
Coss	Output Capacitance		--	103	-	pF
Crss	Reverse Transfer Capacitance		--	37	-	pF
Switching Characteristics						
Td(on)	Turn-On Delay Time	VDD=100V, ID=10A, RG=25 Ω (Note 3,4)	--	12	--	nS
Tr	Turn-On Rise Time		--	22	--	nS
Td(off)	Turn-Off Delay Time		--	50	--	nS
Tf	Turn-Off Fall Time		--	48	--	nS
Qg	Total Gate Charge	VDS=160V, VGS=10V, ID=10A (Note 3,4)	--	23	--	nC
Qgs	Gate-Source Charge		--	2.5	--	nC
Qgd	Gate-Drain Charge		--	10	--	nC
Drain-Source Diode Characteristics and Maximum Ratings						
IS	Maximun Continuous Drain-Source Diode Forward Current		--	--	10	A
ISM	Maximun Plused Drain-Source Diode Forward Current		--	--	40	A
VSD	Drain-Source Diode Forward Voltage	Id=10A	--	--	1.4	V
trr	Reverse Recovery Time	IS=10A, VGS=0V	--	190	--	nS
Qrr	Reverse Recovery Charge	diF/dt=100A/ μ S (Note3)	--	1.7	--	μ C
Notes						
1. Repetitive Rating: Pulse width limited by maximum junction temperature						
2. IAS = 7.5A, VDD = 50V, RG = 25 Ω, Starting TJ = 25 °C						
3. Pulse Test: Pulse width ≤ 300μs, Duty Cycle ≤ 1%						

Typical Characteristics $T_J = 25^\circ\text{C}$, unless otherwise noted

Figure 1. Output Characteristics ($T_J = 25^\circ\text{C}$)

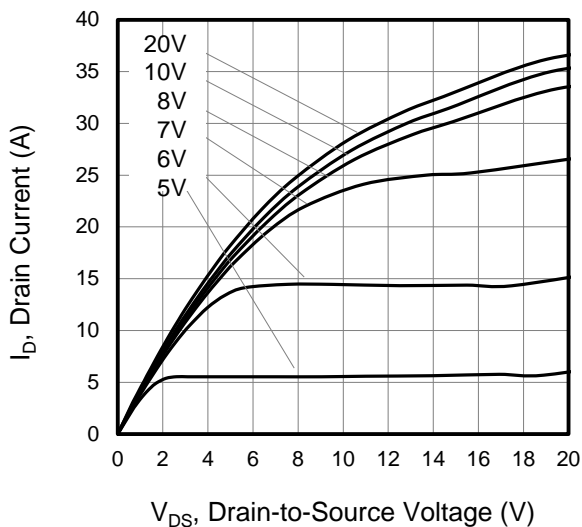


Figure 2. Body Diode Forward Voltage

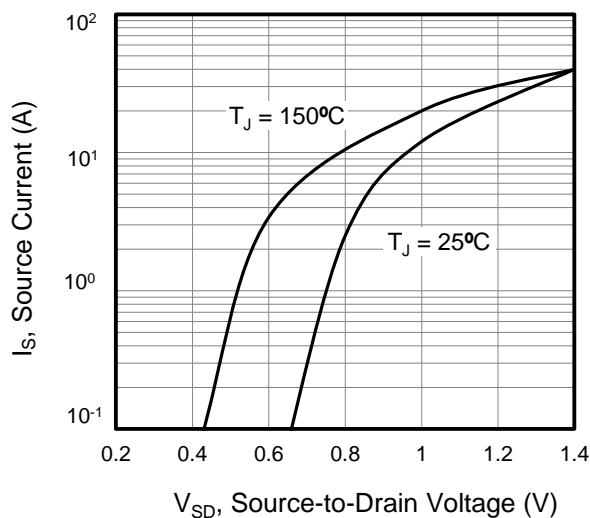


Figure 3. Drain Current vs. Temperature

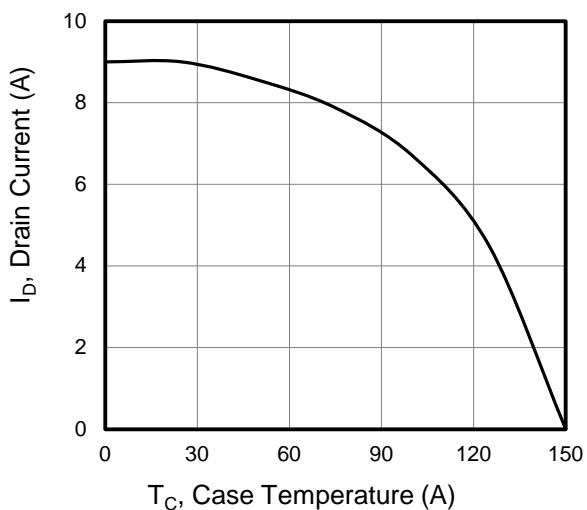


Figure 4. BV_{DSS} Variation vs. Temperature

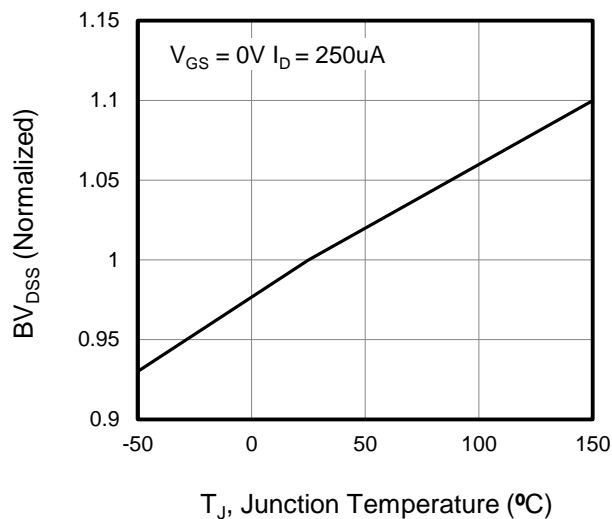


Figure 5. Transfer Characteristics

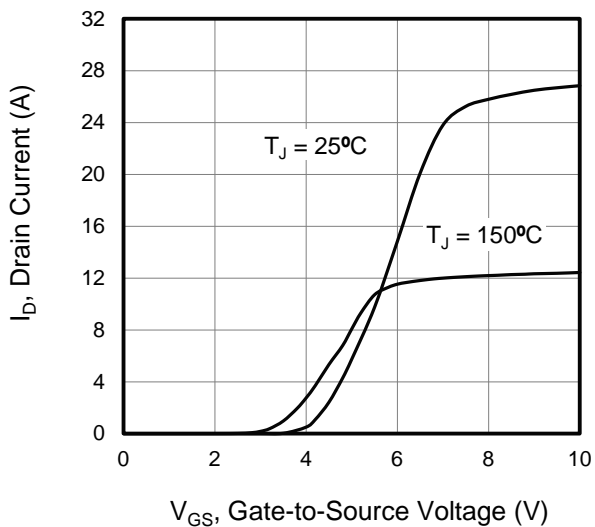
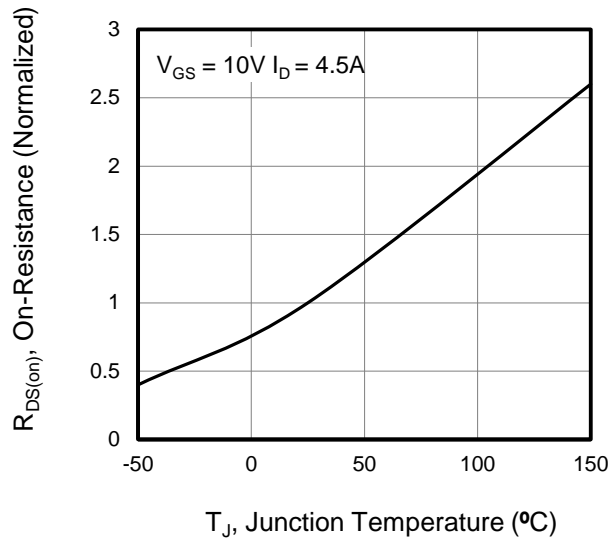


Figure 6. On-Resistance vs. Temperature



Typical Characteristics $T_J = 25^\circ\text{C}$, unless otherwise noted

Figure 7. Transient Thermal Impedance TO-252

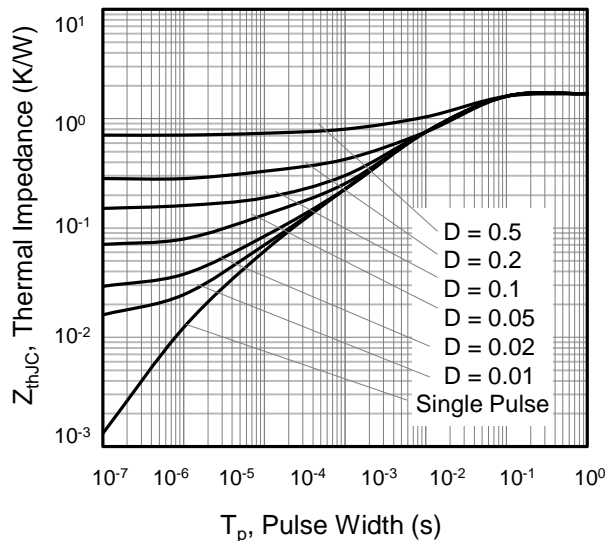


Figure 8. Gate Charge

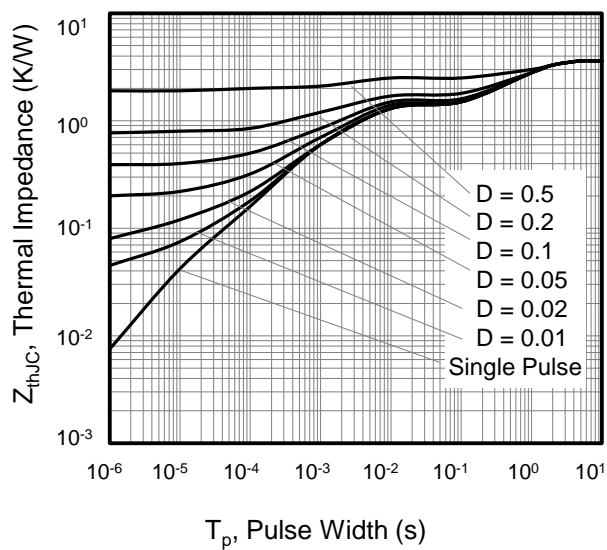
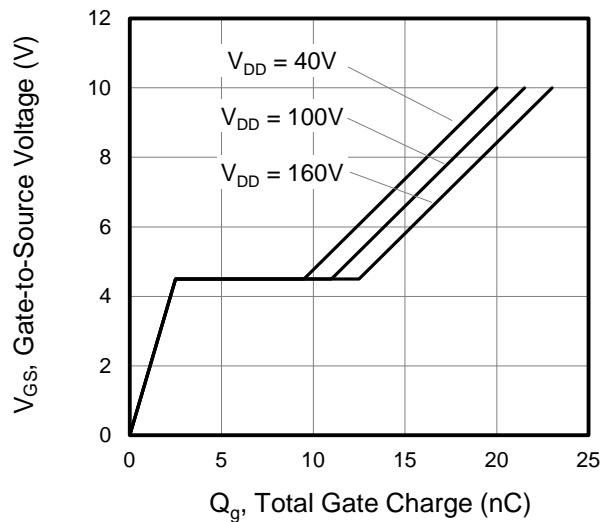


Figure A: Gate Charge Test Circuit and Waveform

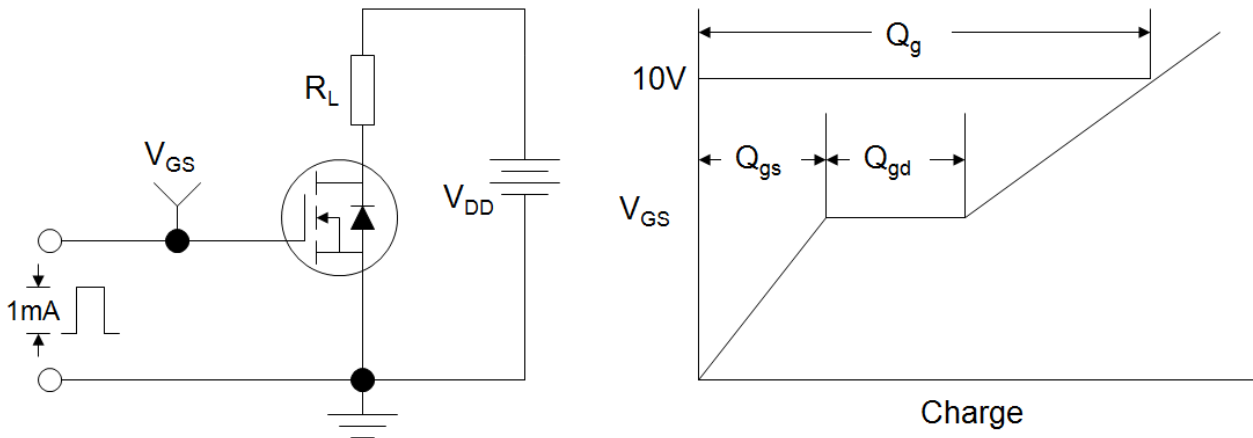


Figure B: Resistive Switching Test Circuit and Waveform

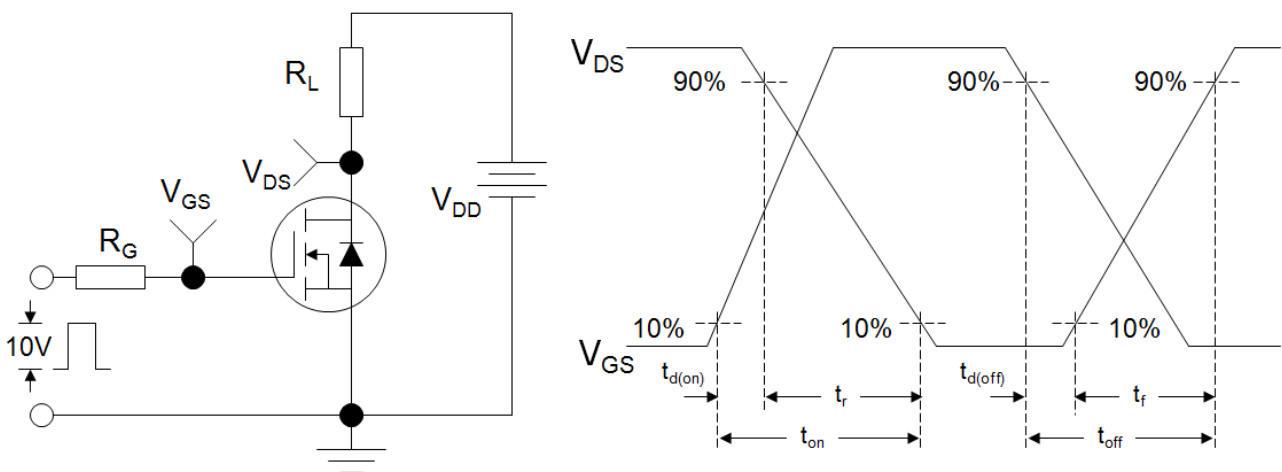
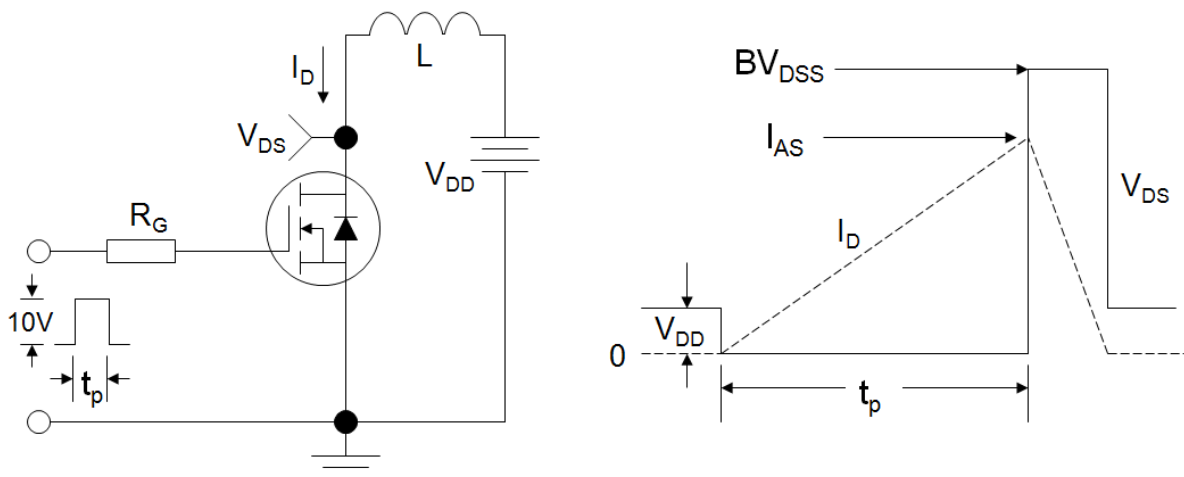
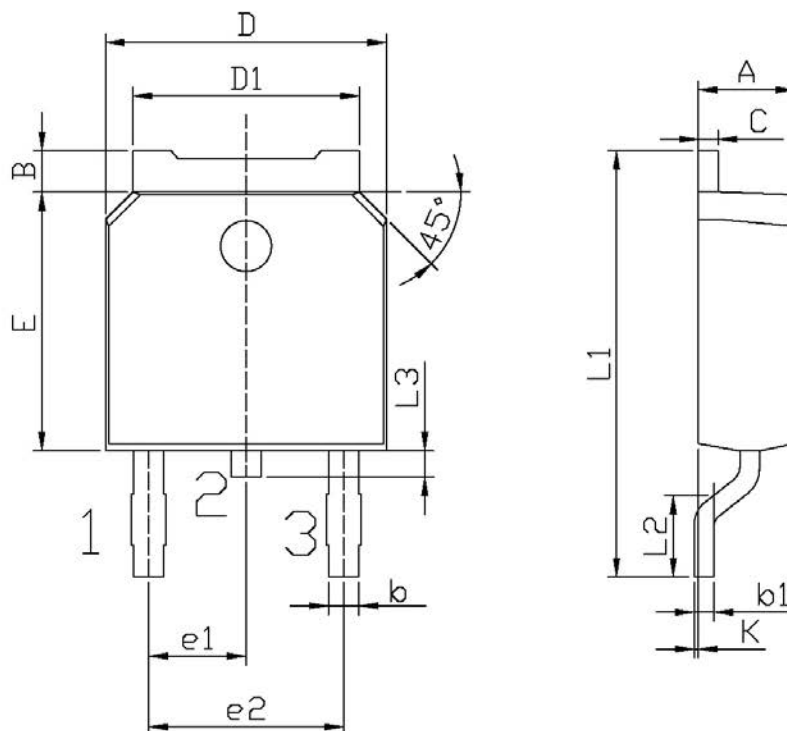


Figure C: Unclamped Inductive Switching Test Circuit and Waveform



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