N-Ch 200V Fast Switching MOSFETs

- ★ Super Low Gate Charge
- ★ 100% EAS Guaranteed
- ★ Green Device Available
- ★ Excellent CdV/dt effect decline
- ★ Advanced high cell density Trench technology

Product Summary

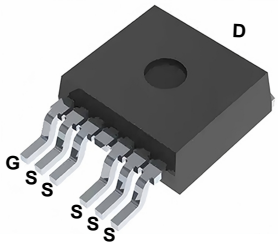
Green

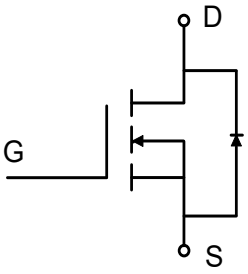
BVDSS	RDSON	ID
200V	20 mΩ	100A

Description

The XR100N20G7 is the high cell density trenched N-ch MOSFETs, which provides excellent RDSON and gate charge for most of the synchronous buck converter applications.
The XR100N20G7 meets the RoHS and Green Product requirements, 100% EAS guaranteed with full function reliability approved.

TO263-7L Pin Configuration





Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	200	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ 10V[1,6]	100	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ 10V[1,6]	63	A
I_{DM}	Pulsed Drain Current[2]	400	A
EAS	Single Pulse Avalanche Energy[3]	1190	mJ
I_{AS}	Avalanche Current	---	A
P_D@T_C=25℃	Total Power Dissipation[4]	272	W
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient [1]	---	---	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	---	0.46	℃/W

Electrical Characteristics (T_J=25 ℃, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	200	---	---	V
$\Delta BV_{DSS}/\Delta T_J$	BV_{DSS} Temperature Coefficient	Reference to 25℃ , I_D=1mA	---	---	---	V/℃
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=10 V, I_D=61A	---	20	25.5	mΩ
		V_{GS}=4.5V , I_D=61A	---	---	---	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	3	---	5	V
$\Delta V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	---	---	mV/℃
I_{DSS}	Drain-Source Leakage Current	V_{DS}=150V , V_{GS}=0V , T_J=25℃	---	---	1	uA
		V_{DS}=150V, V_{GS}=0V , T_J=100℃	---	---	100	
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
gfs	Forward Transconductance	V_{DS}=10V , I_D=31A	---	73	---	S
R_g	Gate Resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz	---	1.2	---	Ω
Q_g	Total Gate Charge	V_{DS}=50V , V_{GS}=10V , I_D=61A	---	134	---	nC
Q_{gs}	Gate-Source Charge		---	49.6	---	
Q_{gd}	Gate-Drain Charge		---	39.6	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD} = 50V,R_L=1.25Ω R_G = 3Ω, V_{GS}=10V	---	36.3	---	ns
T_r	Rise Time		---	9.2	---	
$T_{d(off)}$	Turn-Off Delay Time		---	64	---	
T_f	Fall Time		---	6.3	---	
C_{iss}	Input Capacitance	V_{DS}=50V , V_{GS}=0V , f=1MHz	---	8826	---	pF
C_{oss}	Output Capacitance		---	532	---	
C_{rss}	Reverse Transfer Capacitance		---	148	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current[1,4]	V_G=V_D=0V , Force Current	---	---	65	A
V_{SD}	Diode Forward Voltage[2]	V_{GS}=0V , I_S=31A , T_J=25℃	---	---	1.2	V
t_{rr}	Reverse Recovery Time	IF=61A ,di/dt=100A/μs , T_J= 25 ℃	---	102	---	nS
Q_{rr}	Reverse Recovery Charge		---	550.3	---	nC

Notes 1.Repetitive Rating: Pulse width limited by maximum junction temperature.
Notes 2.E_{AS} condition: T_J=25℃,V_{DD}=40V,V_G=10V, Rg=25Ω, L=0.5mH.
Notes 3.Repetitive Rating: Pulse width limited by maximum junction temperature.

Typical Electrical And Thermal Characteristics (Curves)

Figure 1. Output Characteristics

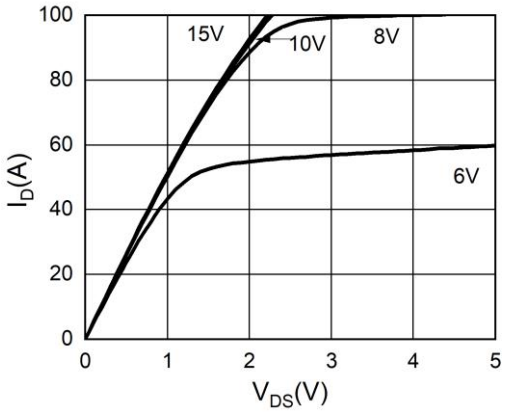


Figure 2. Transfer Characteristics

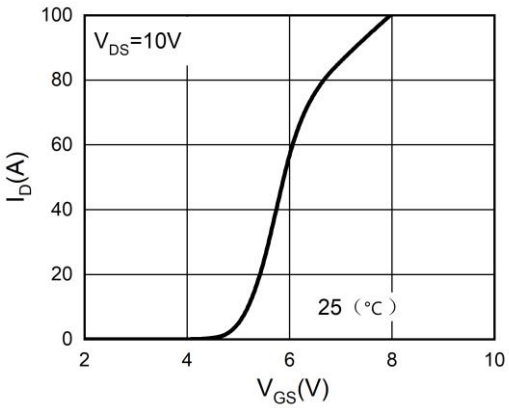


Figure 3. Power Dissipation

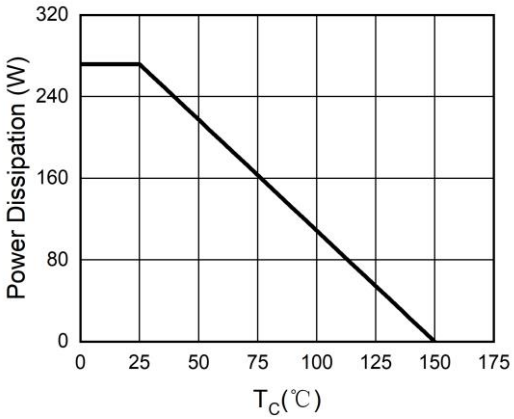


Figure 4. Drain Current

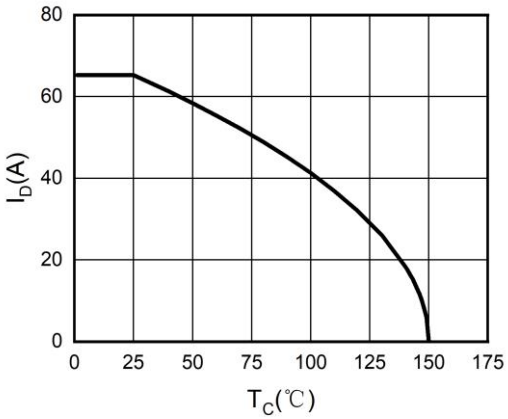


Figure 5. BV_{DSS} vs Junction Temperature

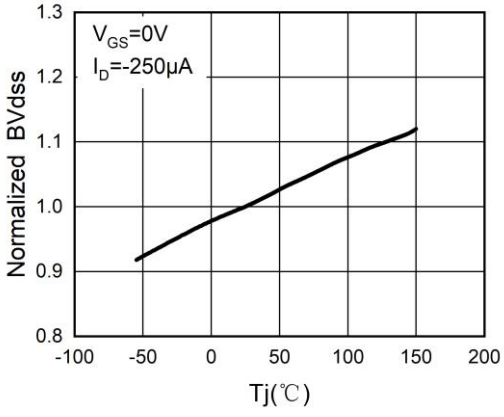
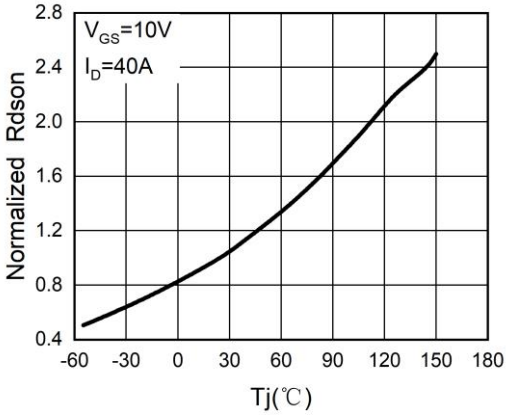


Figure 6. $R_{DS(ON)}$ vs Junction Temperature



Typical Electrical And Thermal Characteristics (Curves)

Figure 7. Gate Charge Waveforms

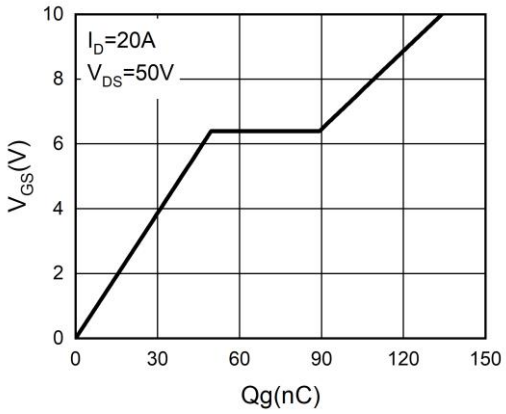


Figure 8. Capacitance

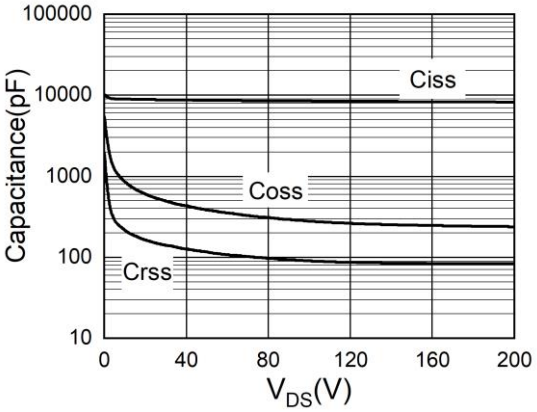


Figure 9. Body-Diode Characteristics

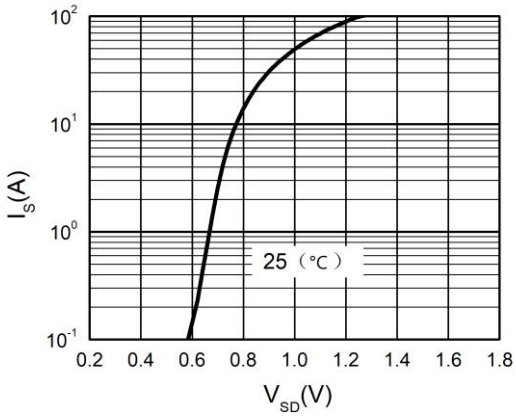
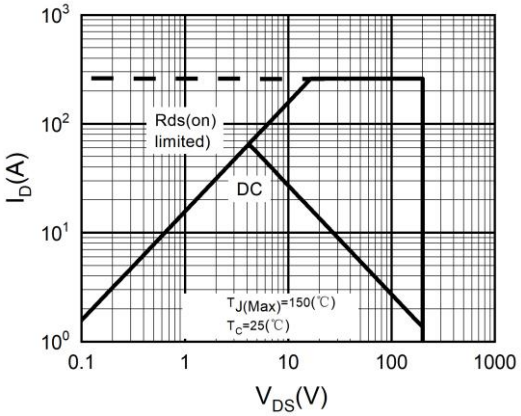
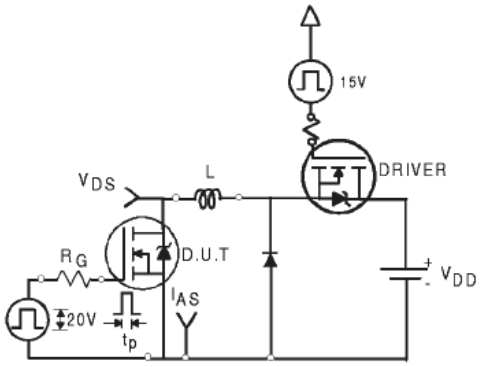


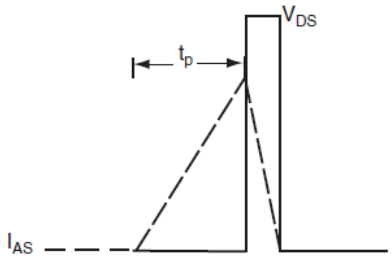
Figure 10. Maximum Safe Operating Area



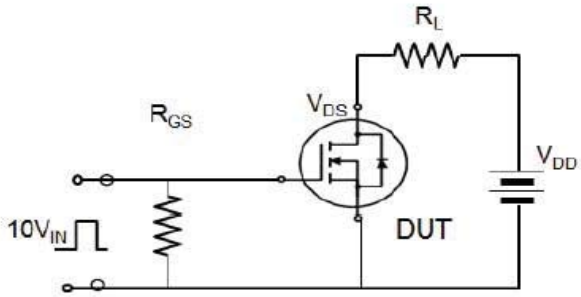
Avalanche Test Circuit

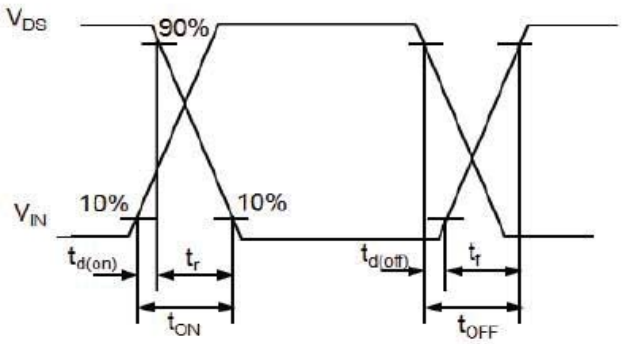


$$E_{AS} = \frac{1}{2} L I_{AS}^2$$

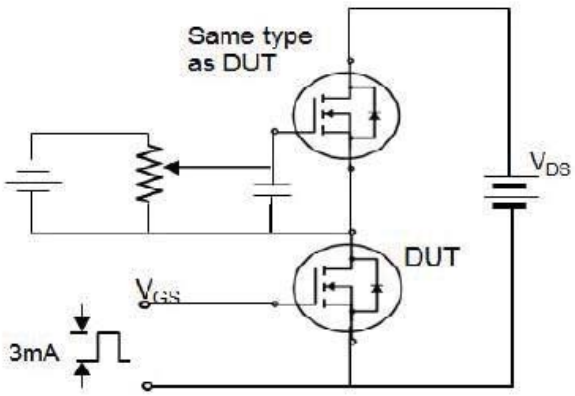


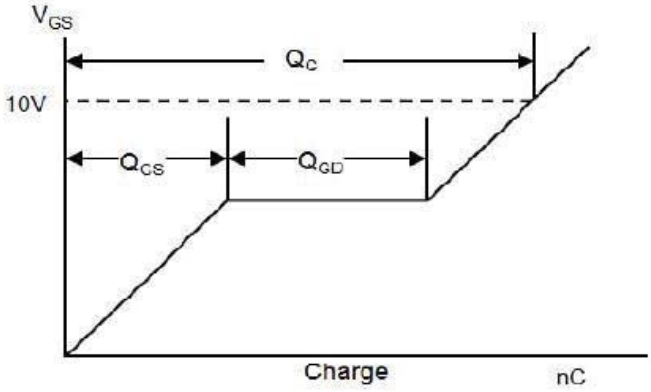
Switching Time Test Circuit



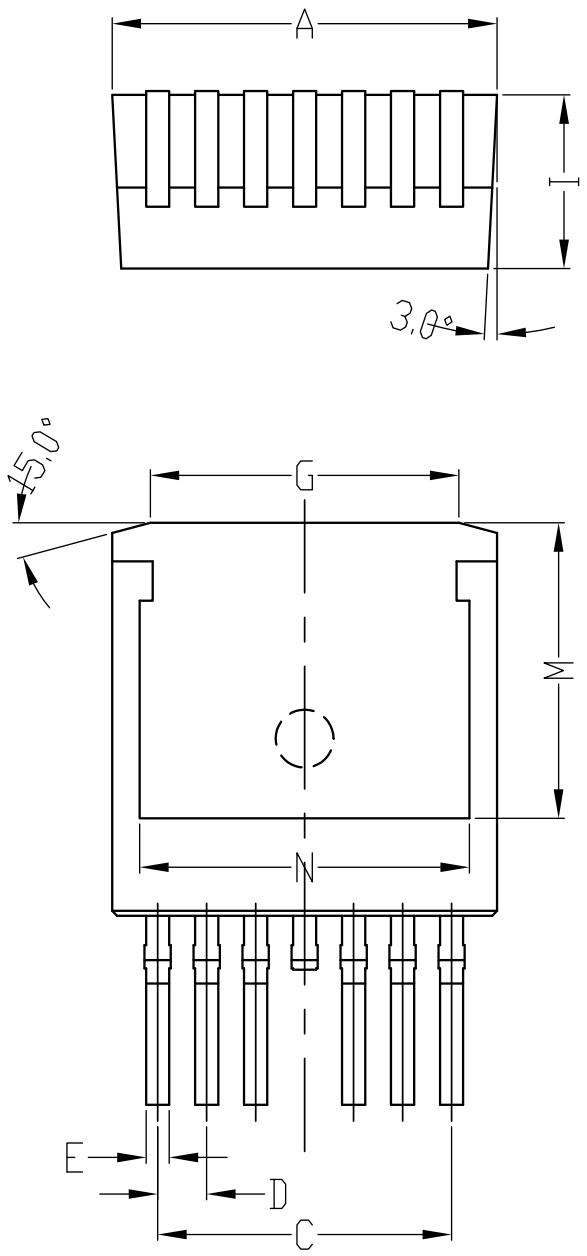


Gate Charge Test Circuit





Mechanical Dimensions for TO263-7L



	MM			Inch		
Symbol	Min	Mim	Max	Min	Mim	Max
A	9.88	9.98	10.08	0.3890	0.3929	0.3969
B	9.09	9.19	9.29	0.3579	0.3618	0.3657
C	7.54	7.62	7.70	0.2969	0.3000	0.3031
D	1.23	1.27	1.31	0.0484	0.0500	0.0516
E	0.55	0.6	0.65	0.0217	0.0236	0.0256
F	1.27	1.30	1.33	0.0500	0.0512	0.0524
G	7.7	8	8.3	0.3031	0.3150	0.3268
H1	-0.10	+0.10	+0.2	-0.0039	+0.0039	+0.0079
I	4.42	4.50	4.58	0.1740	0.1772	0.1803
L	4.60	4.90	5.20	0.1810	0.1930	0.2047
L1	1.05	1.15	1.25	0.0413	0.0453	0.0492
L2	1.66	1.76	1.86	0.0654	0.0693	0.0732
a	-7°	0°	7°	-7°	0°	7°
N	8.25	8.55	8.85	0.3248	0.3366	0.3484
M	7.36	7.66	7.96	0.2898	0.3055	0.3134

