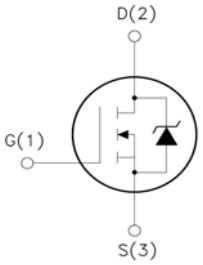
N-Channel Power MOSFET

Description

The ZXMN10A11GTA uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications.

It is ESD protected.

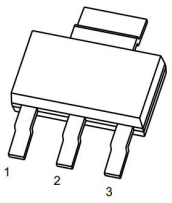


Schematic diagram

General Features

V_{DSS}	$R_{DS(ON)}$ @10V (typ)	I_D
100V	125 mΩ	5A

- High density cell design for ultra low Rdson
- Fully characterized avalanche voltage and current
- Excellent package for good heat dissipation



SOT-223

Application

- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply
- Motor control

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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous	I_D	5	A
Drain Current-Pulsed (Note 1)	I_{DM}	21	A
Maximum Power Dissipation	P_D	5	W
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55 To 150	℃

Thermal Characteristic

Thermal Resistance,Junction-to-Ambient (Note 2)	$R_{\theta JA}$	41.7	℃/W

Electrical Characteristics (T_A=25℃unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=250μA	100	110	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=80V, V_{GS}=0V	-	-	800	nA

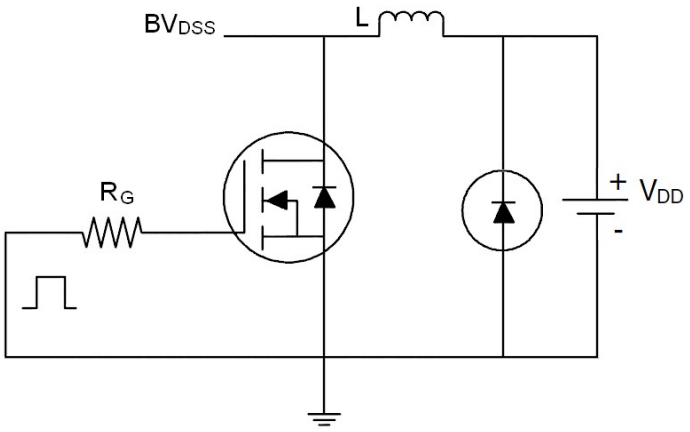
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V	-	-	±100	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250μA	1	1.8	3	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=3A		125	145	mΩ
Forward Transconductance	g_{FS}	V_{DS}=5V,I_D=2.9A	-	8	-	S
Dynamic Characteristics (Note4)						
Input Capacitance	C_{lss}	V_{DS}=25V,V_{GS}=0V, F=1.0MHz	-	210	-	PF
Output Capacitance	C_{oss}		-	30	-	PF
Reverse Transfer Capacitance	C_{rss}		-	14	-	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=50V,I_D=5A,R_L=15Ω V_{GS}=10V,R_G=2.5Ω	-	15	-	nS
Turn-on Rise Time	t_r		-	3.4	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	21	-	nS
Turn-Off Fall Time	t_f		-	3.1	-	nS
Total Gate Charge	Q_g	V_{DS}=50V,I_D=5A, V_{GS}=10V		4.5		nC
Gate-Source Charge	Q_{gs}		-	1.5	-	nC
Gate-Drain Charge	Q_{gd}		-	1.2	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V_{SD}	V_{GS}=0V,I_S=6A	-	-	1.2	V
Diode Forward Current (Note 2)	I_S		-	-	5	A

Notes:

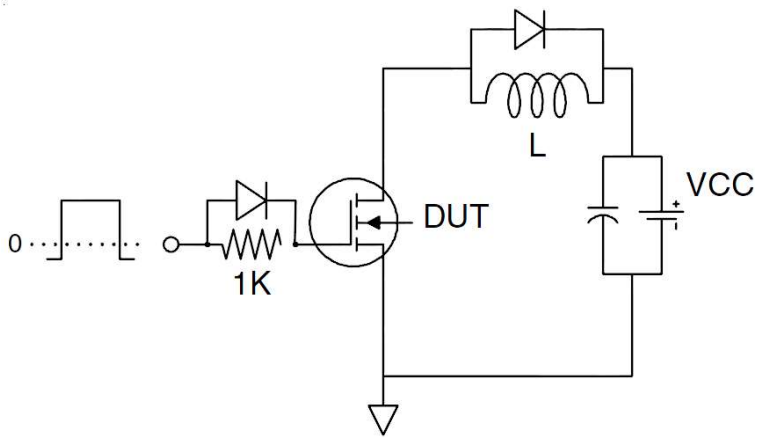
1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production

Test Circuit

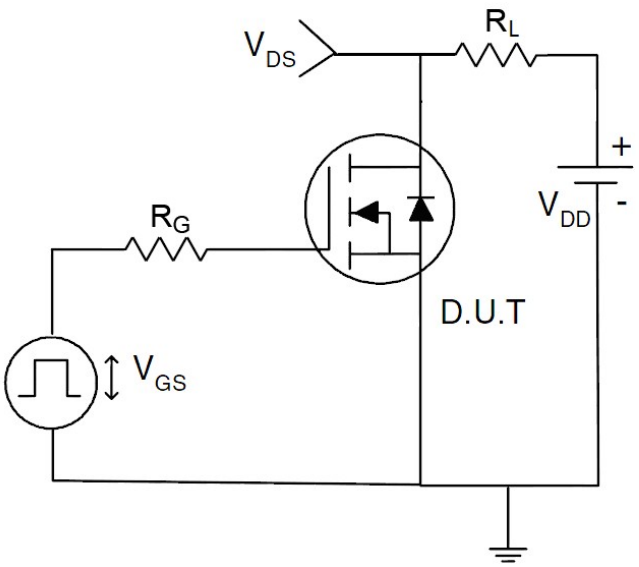
1）E_{AS} test circuit



2）Gate charge test circuit



3）Switch Time Test Circuit



Typical Electrical and Thermal Characteristics (curves)

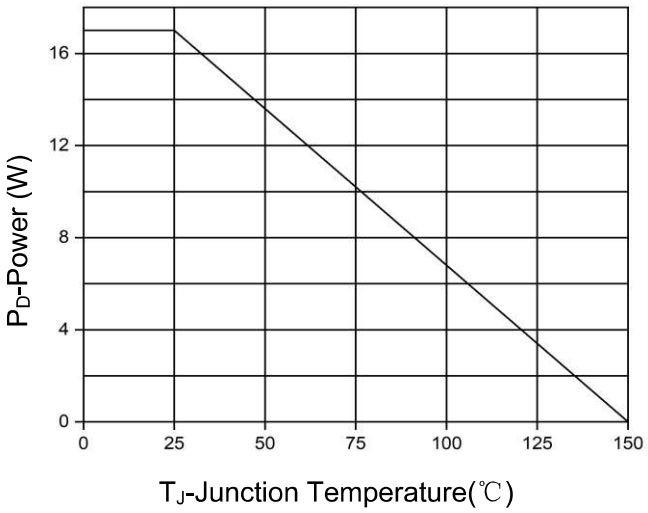


Figure 1. Power Dissipation

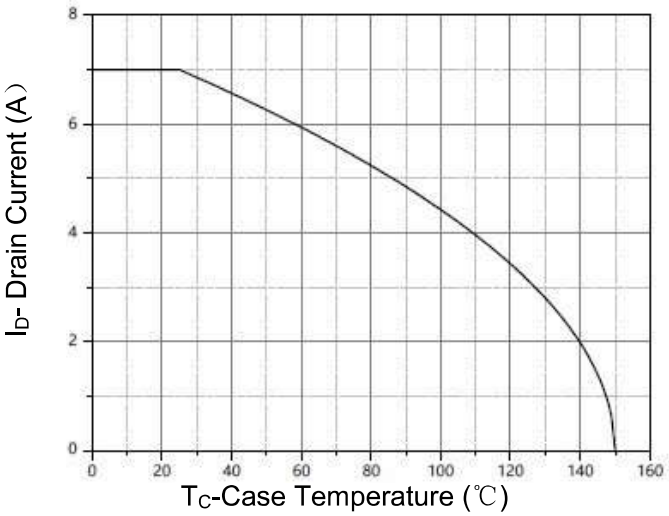


Figure 2. Drain Current

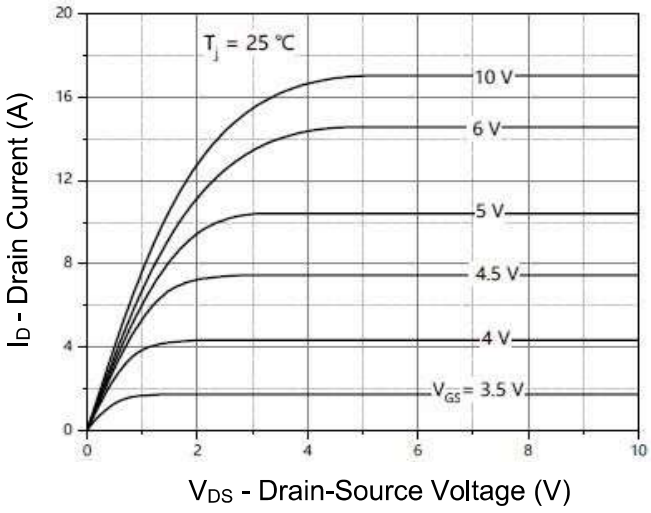


Figure 3. Output characteristics

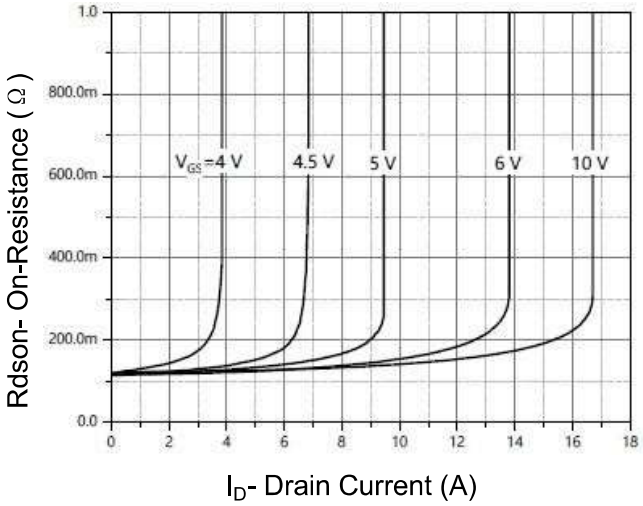


Figure 4. Drain-Source On-state resistance

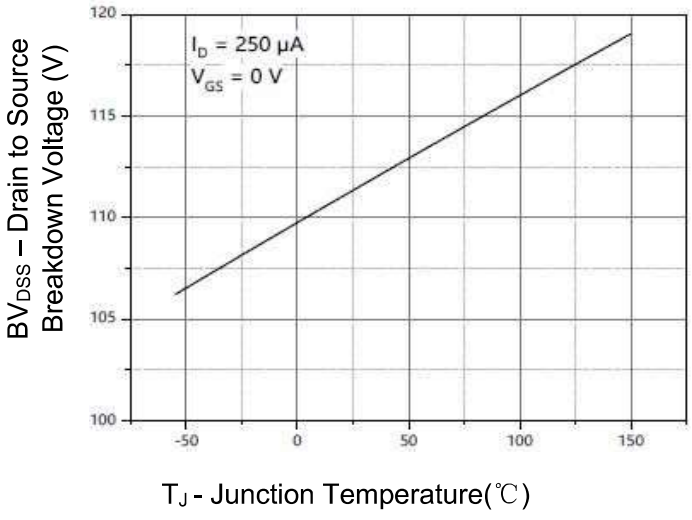


Figure 5. Drain-source breakdown voltage

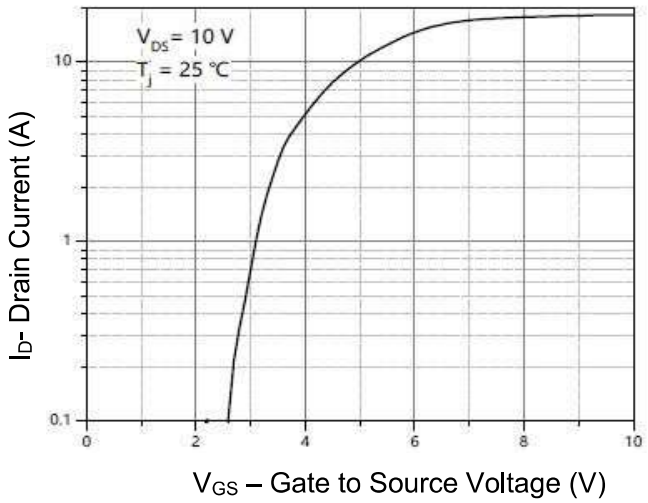


Figure 6. Transfer Characteristics

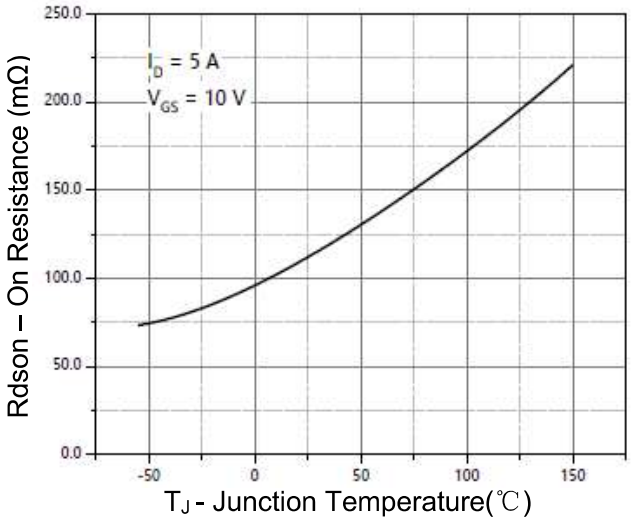


Figure 7. Drain-Source On-State Resistance

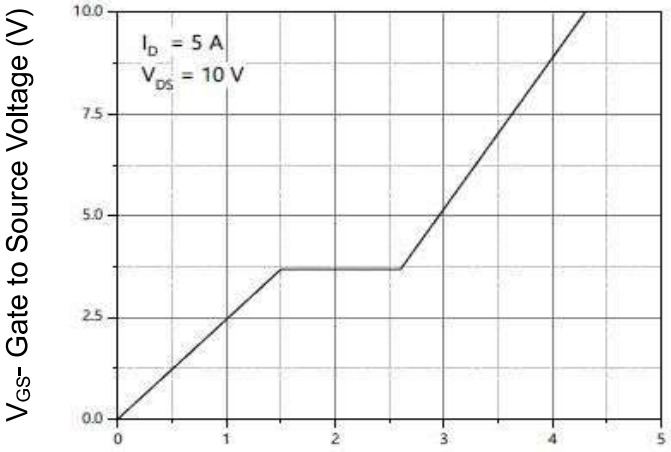


Figure 8. Gate Charge

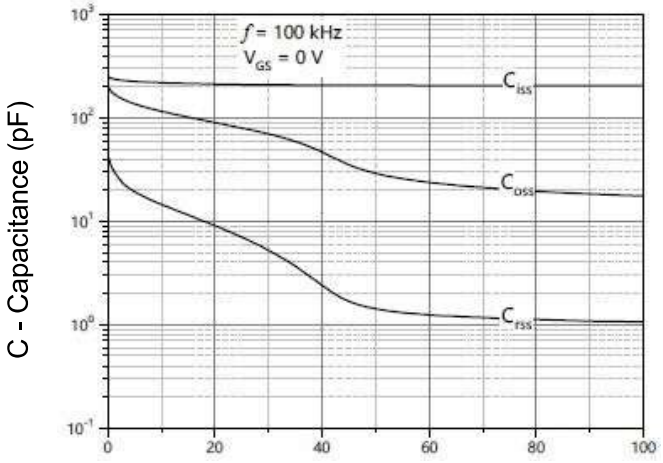


Figure 9 . Capacitance vs Vds

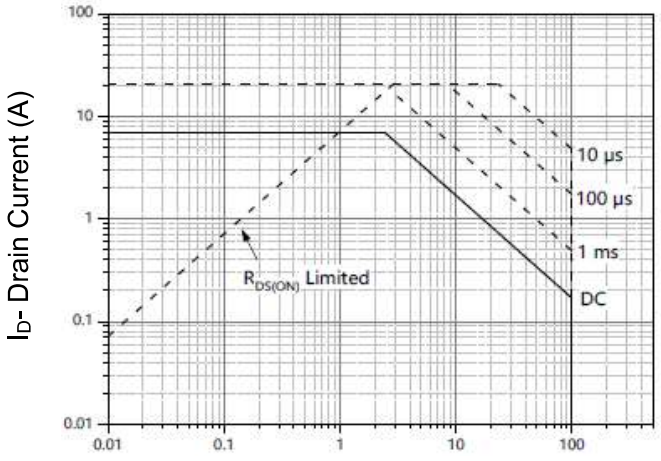


Figure 10. Safe Operation Area

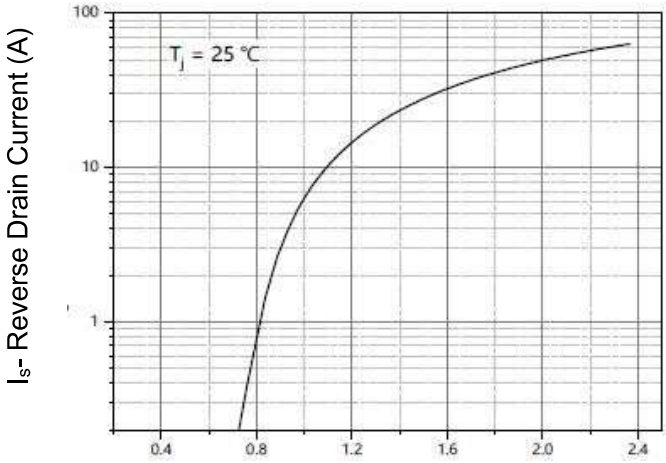


Figure 11. Source- Drain Diode Forward