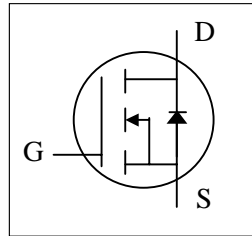


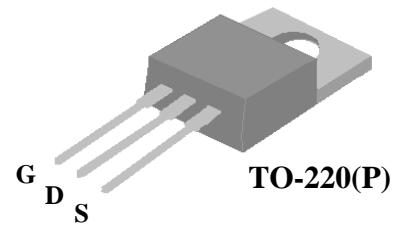
- ▼ 100% R<sub>g</sub> & UIS Test
- ▼ Simple Drive Requirement
- ▼ Fast Switching Characteristic
- ▼ RoHS Compliant & Halogen-Free



BV <sub>DSS</sub>	100V
R <sub>DS(ON)</sub>	3.88mΩ

## Description

XP10N3R8 series are innovated design and silicon process technology to achieve the lowest possible on-resistance and fast switching performance. It provides the designer with an extreme efficient device for use in a wide range of power applications.



The TO-220 package is widely preferred for all commercial-industrial through hole applications. The low thermal resistance and low package cost contribute to the worldwide popular package.

## Absolute Maximum Ratings @T<sub>j</sub>=25°C (unless otherwise specified)

Symbol	Parameter	Rating	Units
V <sub>DS</sub>	Drain-Source Voltage	100	V
V <sub>GS</sub>	Gate-Source Voltage	+20	V
I <sub>D</sub> @T <sub>C</sub> =25°C	Drain Current, V <sub>GS</sub> @ 10V <sup>4</sup> (Silicon Limited)	132	A
I <sub>D</sub> @T <sub>C</sub> =25°C	Drain Current, V <sub>GS</sub> @ 10V <sup>4</sup> (Package Limited)	130	A
I <sub>D</sub> @T <sub>C</sub> =100°C	Drain Current, V <sub>GS</sub> @ 10V	83.5	A
I <sub>DM</sub>	Pulsed Drain Current <sup>1</sup>	520	A
P <sub>D</sub> @T <sub>C</sub> =25°C	Total Power Dissipation	125	W
P <sub>D</sub> @T <sub>A</sub> =25°C	Total Power Dissipation	2	W
E <sub>AS</sub>	Single Pulse Avalanche Energy <sup>3</sup>	211	mJ
T <sub>STG</sub>	Storage Temperature Range	-55 to 150	°C
T <sub>J</sub>	Operating Junction Temperature Range	-55 to 150	°C

## Thermal Data

Symbol	Parameter	Value	Units
R <sub>thj-c</sub>	Maximum Thermal Resistance, Junction-case	1	°C/W
R <sub>thj-a</sub>	Maximum Thermal Resistance, Junction-ambient	62	°C/W

**Electrical Characteristics @T<sub>j</sub>=25°C(unless otherwise specified)**

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	100	-	-	V
R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance <sup>2</sup>	V <sub>GS</sub> =10V, I <sub>D</sub> =60A	-	-	3.88	mΩ
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA	2	-	4	V
g <sub>fs</sub>	Forward Transconductance	V <sub>DS</sub> =5V, I <sub>D</sub> =60A	-	100	-	S
I <sub>DSS</sub>	Drain-Source Leakage Current	V <sub>DS</sub> =80V, V <sub>GS</sub> =0V	-	-	25	uA
I <sub>GSS</sub>	Gate-Source Leakage	V <sub>GS</sub> = +20V, V <sub>DS</sub> =0V	-	-	+0.1	uA
Q <sub>g</sub>	Total Gate Charge <sup>5</sup>	I <sub>D</sub> =60A	-	85	136	nC
Q <sub>gs</sub>	Gate-Source Charge <sup>5</sup>	V <sub>DS</sub> =50V	-	21	-	nC
Q <sub>gd</sub>	Gate-Drain ("Miller") Charge <sup>5</sup>	V <sub>GS</sub> =10V	-	35	-	nC
t <sub>d(on)</sub>	Turn-on Delay Time <sup>5</sup>	V <sub>DS</sub> =50V	-	20	-	ns
t <sub>r</sub>	Rise Time <sup>5</sup>	I <sub>D</sub> =60A	-	107	-	ns
t <sub>d(off)</sub>	Turn-off Delay Time <sup>5</sup>	R <sub>G</sub> =6Ω	-	63	-	ns
t <sub>f</sub>	Fall Time <sup>5</sup>	V <sub>GS</sub> =10V	-	200	-	ns
C <sub>iss</sub>	Input Capacitance <sup>5</sup>	V <sub>GS</sub> =0V	-	4100	6560	pF
C <sub>oss</sub>	Output Capacitance <sup>5</sup>	V <sub>DS</sub> =80V	-	620	-	pF
C <sub>rss</sub>	Reverse Transfer Capacitance <sup>5</sup>	f=1.0MHz	-	20	-	pF
R <sub>g</sub>	Gate Resistance	f=1.0MHz	-	2	4	Ω

**Source-Drain Diode**

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V <sub>SD</sub>	Forward On Voltage <sup>2</sup>	I <sub>S</sub> =60A, V <sub>GS</sub> =0V	-	-	1.3	V
t <sub>rr</sub>	Reverse Recovery Time <sup>5</sup>	I <sub>S</sub> =60A, V <sub>GS</sub> =0V,	-	65	-	ns
Q <sub>rr</sub>	Reverse Recovery Charge <sup>5</sup>	di/dt=100A/μs	-	100	-	nC

**Notes:**

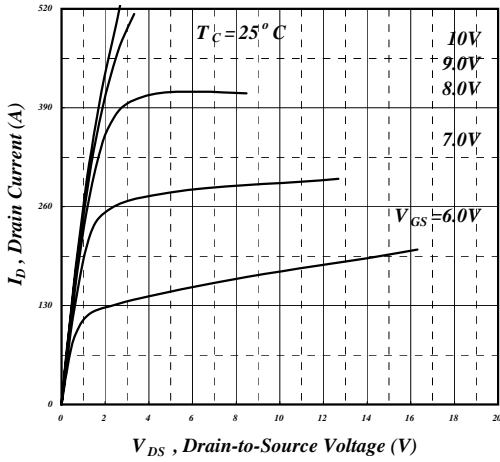
- 1.Pulse width limited by Max. junction temperature.
- 2.Pulse test
- 3.Starting T<sub>j</sub>=25°C , V<sub>DD</sub>=50V , L=0.1mH , R<sub>G</sub>=25Ω , V<sub>GS</sub>=10V
- 4.Package limitation current is 130A .
- 5.Guaranteed by design.

THIS PRODUCT IS SENSITIVE TO ELECTROSTATIC DISCHARGE, PLEASE HANDLE WITH CAUTION.

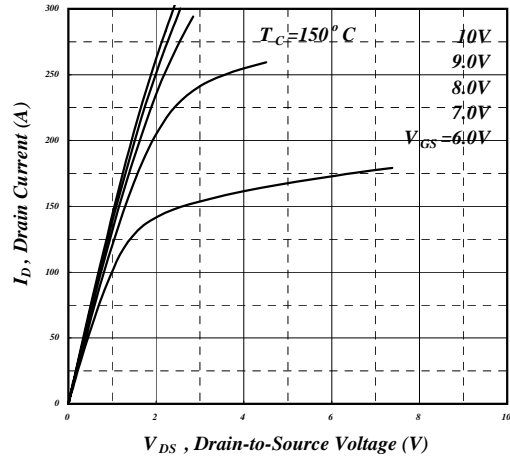
USE OF THIS PRODUCT AS A CRITICAL COMPONENT IN LIFE SUPPORT, AUTOMOTIVE OR OTHER SIMILAR SYSTEMS IS NOT AUTHORIZED.

XSEMI DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN; NEITHER DOES IT CONVEY ANY LICENSE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS.

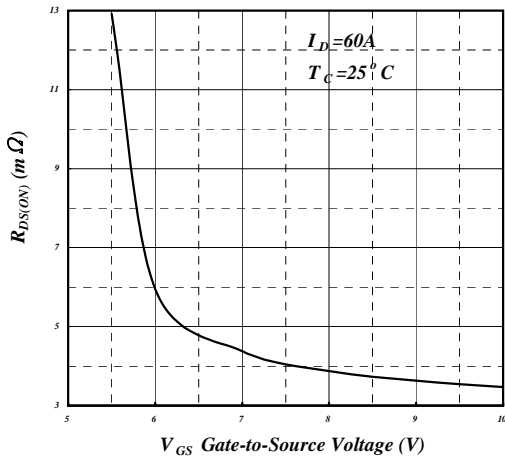
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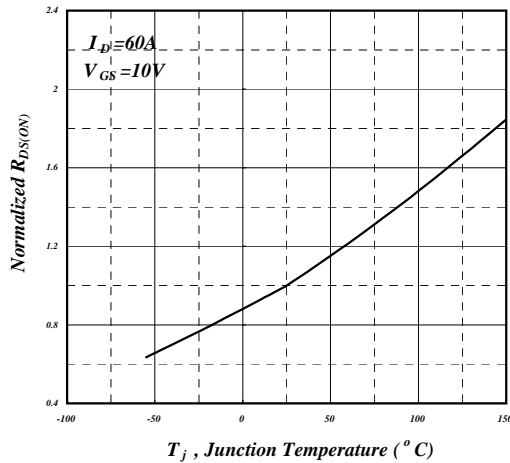
**Fig 1. Typical Output Characteristics**



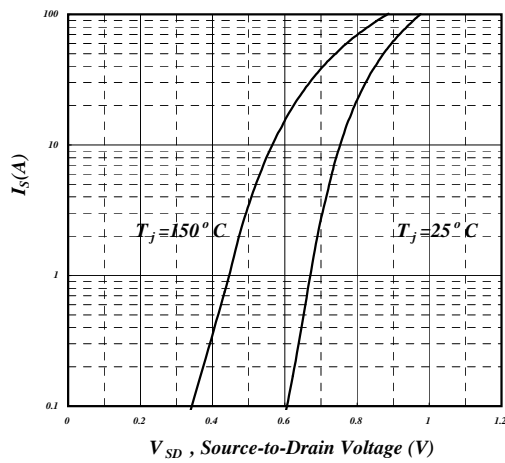
**Fig 2. Typical Output Characteristics**



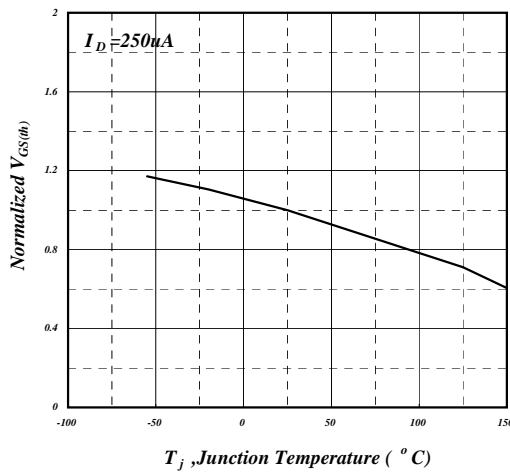
**Fig 3. On-Resistance v.s. Gate Voltage**



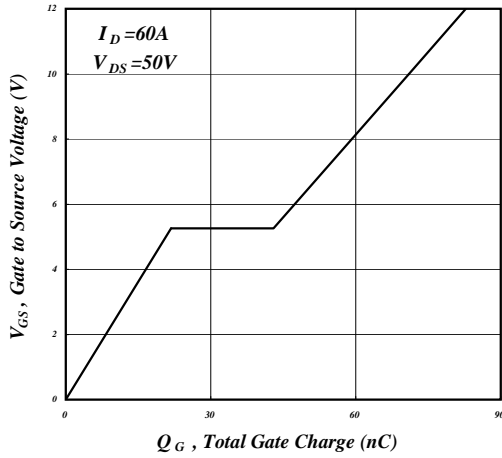
**Fig 4. Normalized On-Resistance v.s. Junction Temperature**



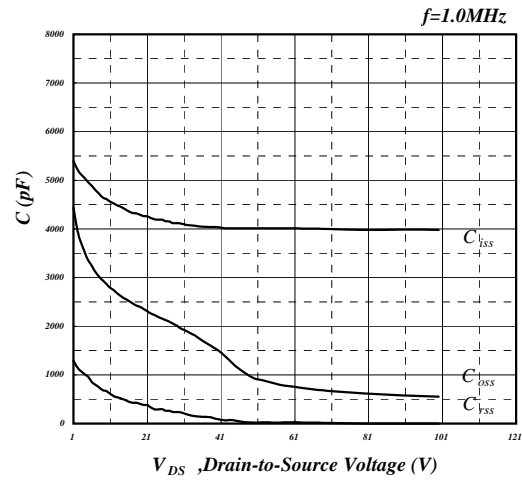
**Fig 5. Forward Characteristic of Reverse Diode**



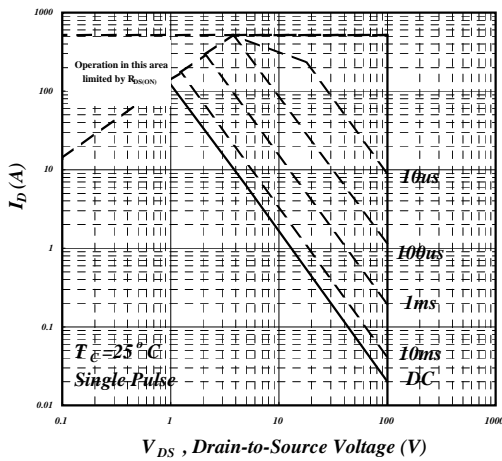
**Fig 6. Gate Threshold Voltage v.s. Junction Temperature**



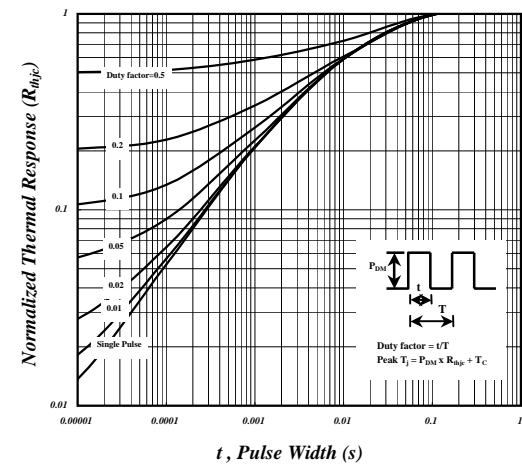
**Fig 7. Gate Charge Characteristics**



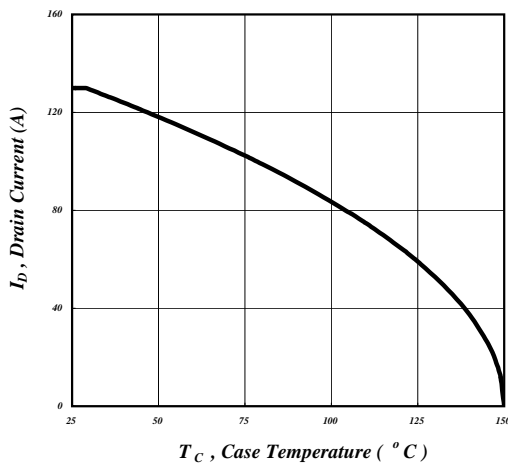
**Fig 8. Typical Capacitance Characteristics**



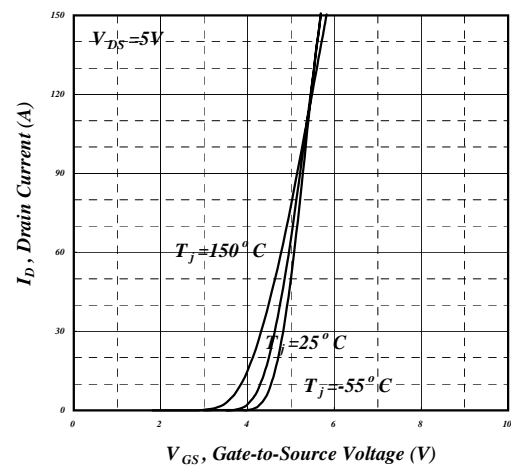
**Fig 9. Maximum Safe Operating Area**



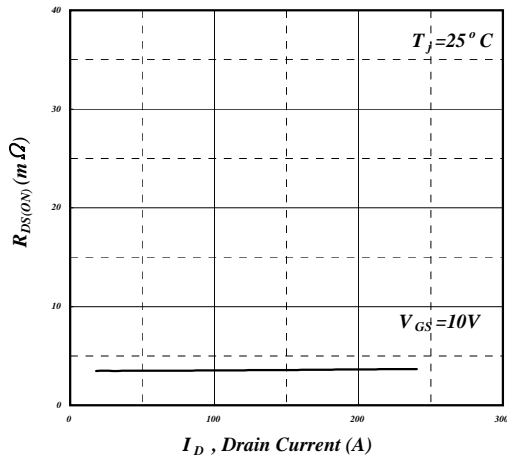
**Fig 10. Effective Transient Thermal Impedance**



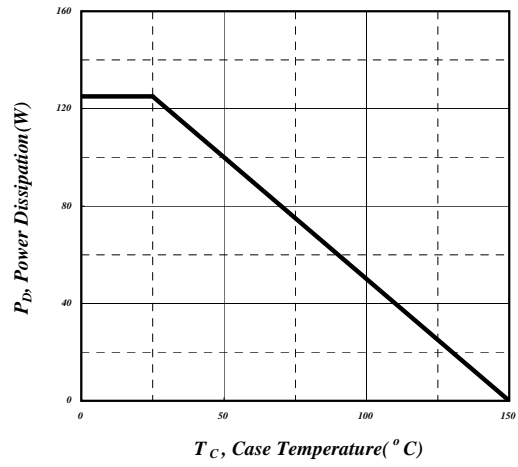
**Fig 11. Drain Current v.s. Case Temperature**



**Fig 12. Transfer Characteristics**



**Fig 13. Typ. Drain-Source on State Resistance**



**Fig 14. Total Power Dissipation**

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**MARKING INFORMATION**

