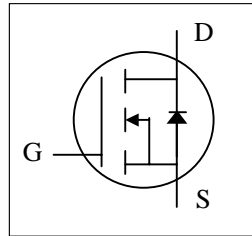


- ▼ 100% R<sub>g</sub> & UIS Test
- ▼ Simple Drive Requirement
- ▼ Ultra Low On-resistance
- ▼ RoHS Compliant & Halogen-Free

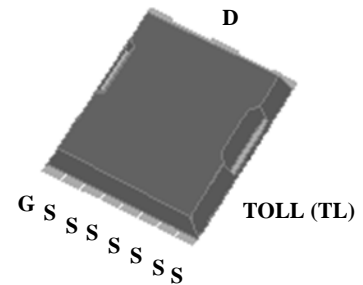


$BV_{DSS}$	80V
$R_{DS(ON)}$	1.2m $\Omega$

### Description

XP8NA1R2 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 TOLL package is a perfect solution for high power density and high power efficiency application.



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

Symbol	Parameter	Rating	Units
V <sub>DS</sub>	Drain-Source Voltage	80	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)	400	A
I <sub>D</sub> @T <sub>C</sub> =25°C	Drain Current, V <sub>GS</sub> @ 10V <sup>4</sup>	300	A
I <sub>D</sub> @T <sub>C</sub> =100°C	Drain Current, V <sub>GS</sub> @ 10V	280	A
I <sub>DM</sub>	Pulsed Drain Current <sup>1</sup>	1200	A
P <sub>D</sub> @T <sub>C</sub> =25°C	Total Power Dissipation	333	W
P <sub>D</sub> @T <sub>A</sub> =25°C	Total Power Dissipation <sup>3</sup>	3.75	W
E <sub>AS</sub>	Single Pulse Avalanche Energy <sup>5</sup>	500	mJ
T <sub>STG</sub>	Storage Temperature Range	-55 to 175	°C
T <sub>J</sub>	Operating Junction Temperature Range	-55 to 175	°C

### Thermal Data

Symbol	Parameter	Value	Units
R <sub>thj-c</sub>	Maximum Thermal Resistance, Junction-case	0.45	°C/W
R <sub>thj-a</sub>	Maximum Thermal Resistance, Junction-ambient (PCB mount) <sup>3</sup>	40	°C/W

**Electrical Characteristics @ $T_j=25^{\circ}\text{C}$ (unless otherwise specified)**

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	80	-	-	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance <sup>2</sup>	$V_{GS}=10V, I_D=100A$	-	-	1.2	m $\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	3	-	5	V
$g_{fs}$	Forward Transconductance	$V_{DS}=5V, I_D=100A$	-	200	-	S
$I_{DSS}$	Drain-Source Leakage Current	$V_{DS}=64V, V_{GS}=0V$	-	-	25	$\mu A$
$I_{GSS}$	Gate-Source Leakage	$V_{GS}=+20V, V_{DS}=0V$	-	-	+0.1	$\mu A$
$Q_g$	Total Gate Charge	$I_D=100A$	-	265	424	nC
$Q_{gs}$	Gate-Source Charge	$V_{DS}=40V$	-	100	-	nC
$Q_{gd}$	Gate-Drain ("Miller") Charge	$V_{GS}=10V$	-	75	-	nC
$t_{d(on)}$	Turn-on Delay Time	$V_{DS}=40V$	-	56	-	ns
$t_r$	Rise Time	$I_D=100A$	-	110	-	ns
$t_{d(off)}$	Turn-off Delay Time	$R_G=3.3\Omega$	-	90	-	ns
$t_f$	Fall Time	$V_{GS}=10V$	-	180	-	ns
$C_{iss}$	Input Capacitance	$V_{GS}=0V$	-	15700	25120	pF
$C_{oss}$	Output Capacitance	$V_{DS}=60V$	-	2200	-	pF
$C_{rss}$	Reverse Transfer Capacitance	$f=1.0\text{MHz}$	-	170	-	pF
$R_g$	Gate Resistance	$f=1.0\text{MHz}$	-	1	2	$\Omega$

**Source-Drain Diode**

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
$V_{SD}$	Forward On Voltage <sup>2</sup>	$I_S=100A, V_{GS}=0V$	-	-	1.3	V
$t_{rr}$	Reverse Recovery Time	$I_S=100A, V_{GS}=0V$	-	120	-	ns
$Q_{rr}$	Reverse Recovery Charge	$di/dt=100A/\mu s$	-	310	-	nC

**Notes:**

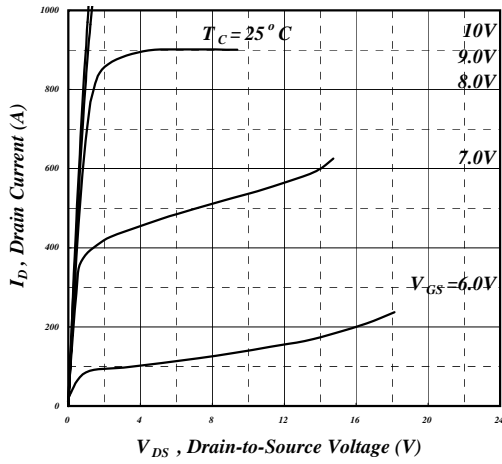
1. Pulse width limited by Max. junction temperature.
2. Pulse test
3. Surface mounted on 1 in<sup>2</sup> copper pad of FR4 board
4. Package limitation current is 300A .
5. Starting  $T_j=25^{\circ}\text{C}$  ,  $V_{DD}=40V$  ,  $L=0.1\text{mH}$  ,  $R_G=25\Omega$

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

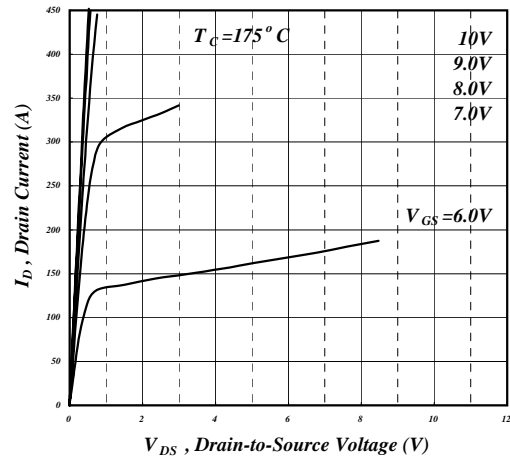
USE OF THIS PRODUCT AS A CRITICAL COMPONENT IN LIFE SUPPORT, AUTOMOTIVE OR OTHER SIMILAR SYSTEMS IS NOT AUTHORIZED.

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.

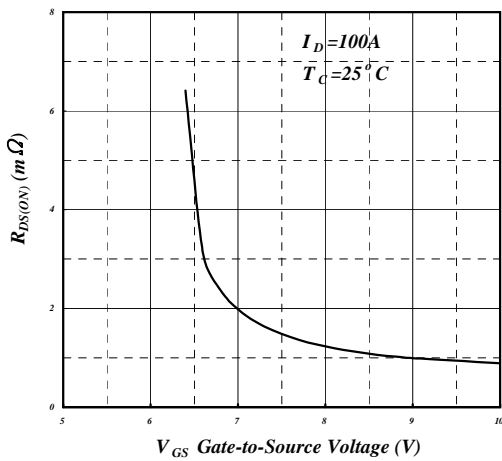
XSEMI RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION OR DESIGN.



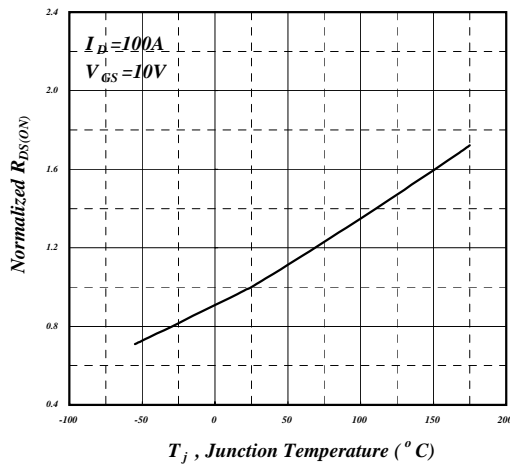
**Fig 1. Typical Output Characteristics**



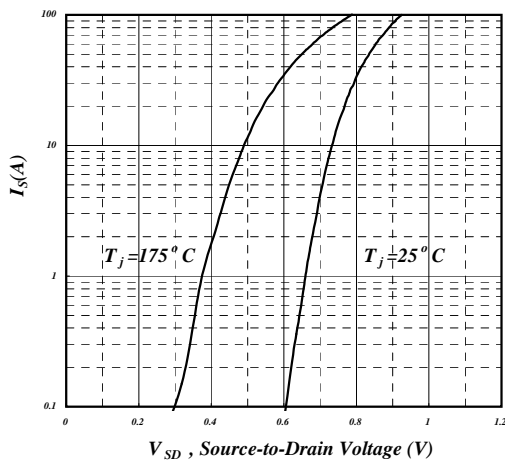
**Fig 2. Typical Output Characteristics**



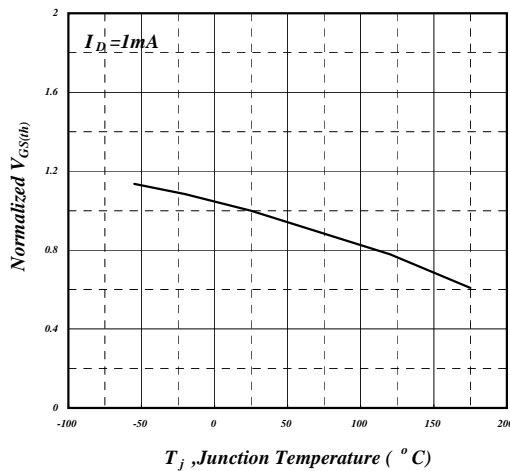
**Fig 3. On-Resistance v.s. Gate Voltage**



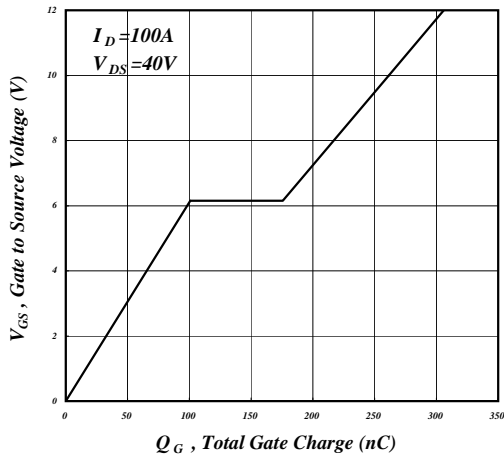
**Fig 4. Normalized On-Resistance v.s. Junction Temperature**



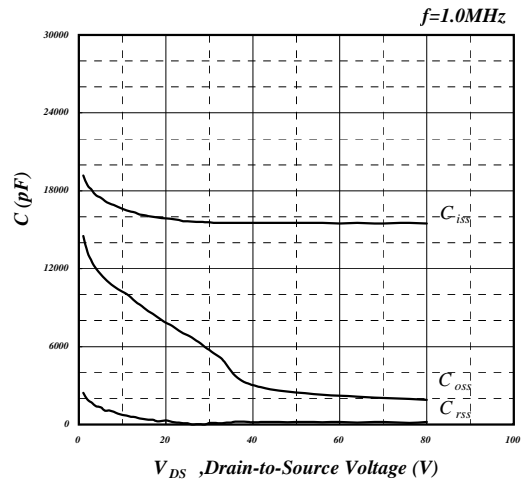
**Fig 5. Forward Characteristic of Reverse Diode**



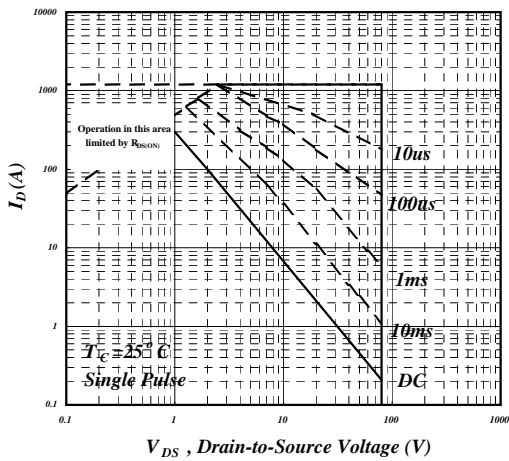
**Fig 6. Gate Threshold Voltage v.s. Junction Temperature**



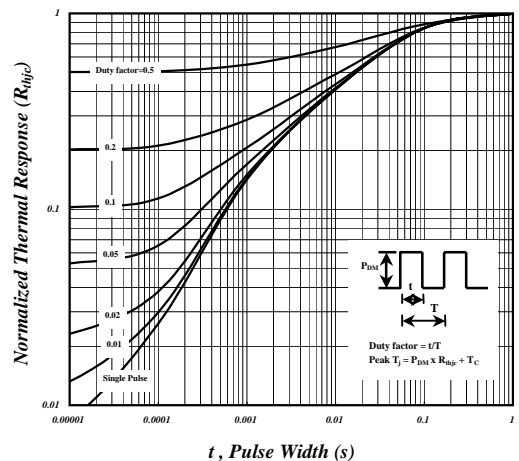
**Fig 7. Gate Charge Characteristics**



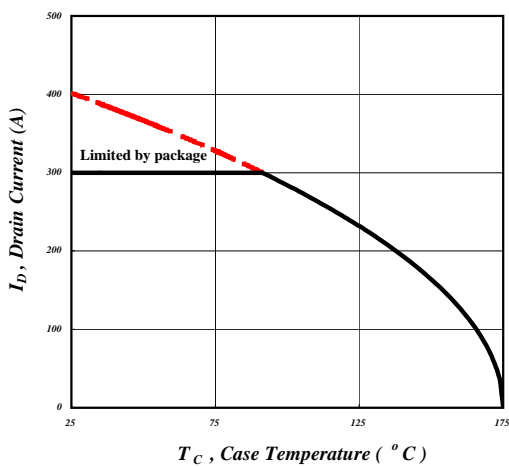
**Fig 8. Typical Capacitance Characteristics**



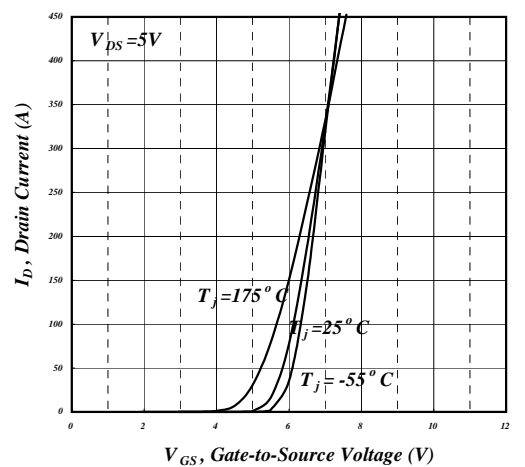
**Fig 9. Maximum Safe Operating Area**



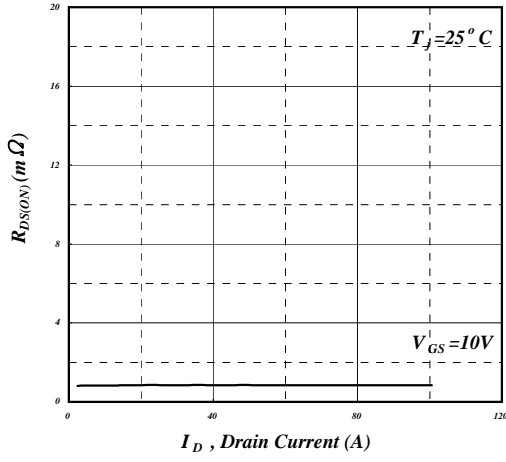
**Fig 10. Effective Transient Thermal Impedance**



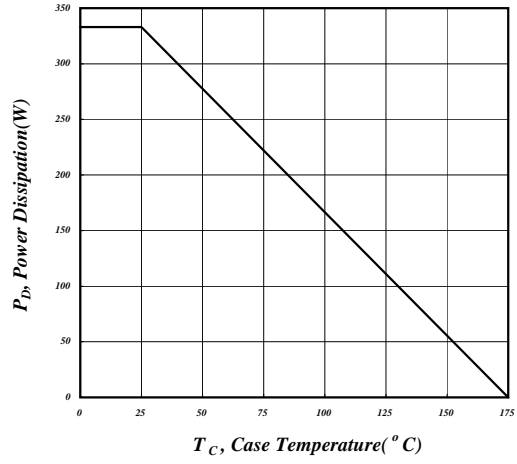
**Fig 11. Drain Current v.s. Case Temperature**



**Fig 12. Transfer Characteristics**



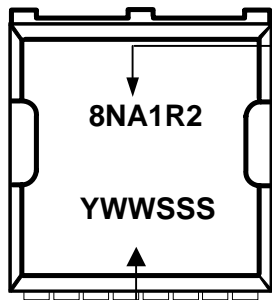
**Fig 13. Typ. Drain-Source on State Resistance**



**Fig 14. Total Power Dissipation**

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**MARKING INFORMATION**



Part Number

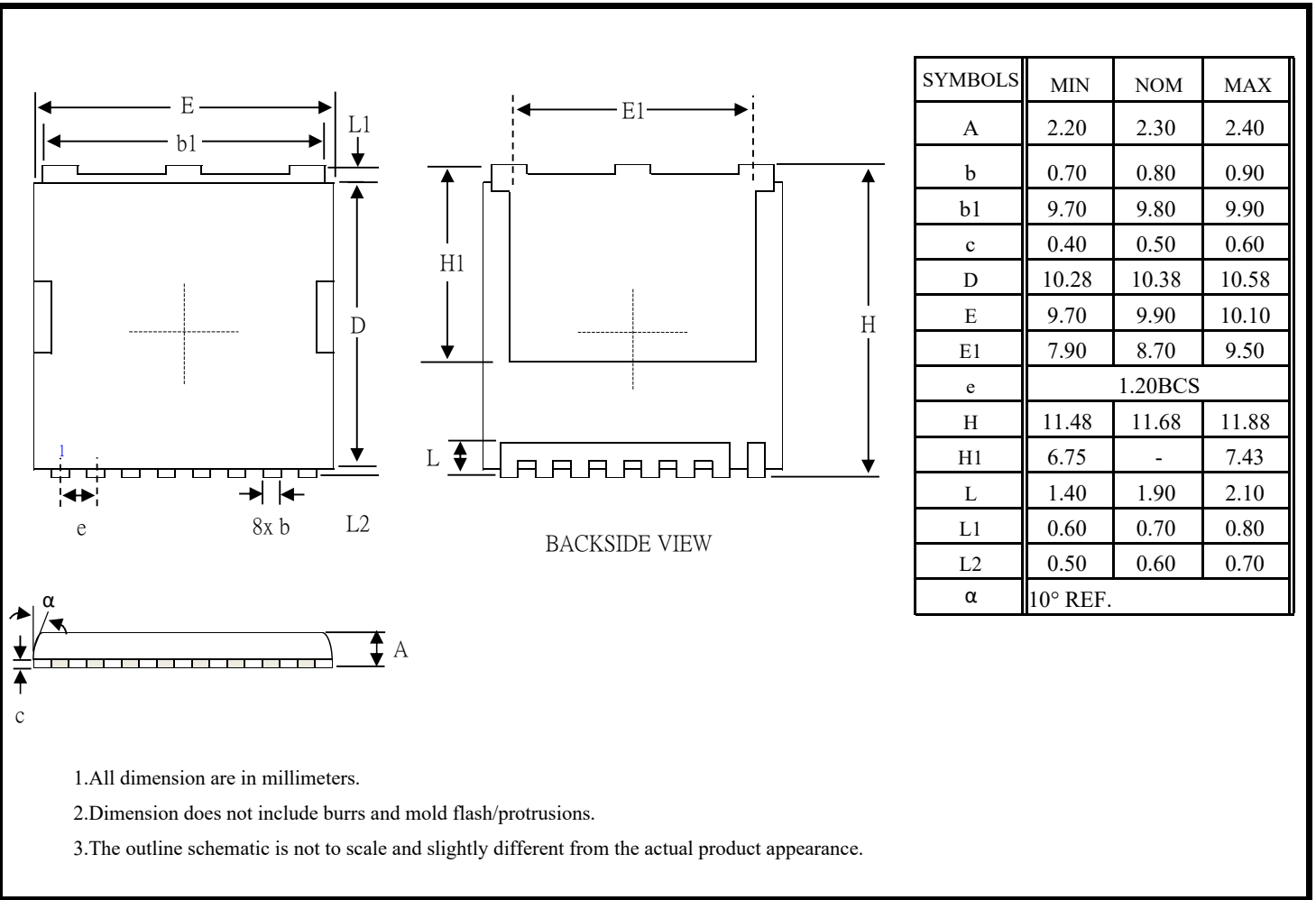
Date Code (YWWSSS)

Y : Last Digit Of The Year

WW : Week

SSS : Sequence

**Package Outline : TOLL**



- 1.All dimension are in millimeters.
- 2.Dimension does not include burrs and mold flash/protrusions.
- 3.The outline schematic is not to scale and slightly different from the actual product appearance.

**TOLL FOOTPRINT :**

