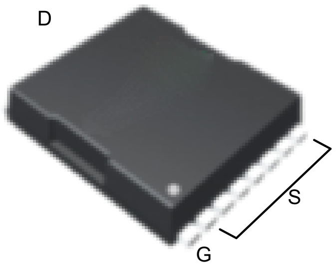
Description

The XPX320N15LL uses advanced technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 10V. This device is suitable for use as a Battery protection or in other Switching application.

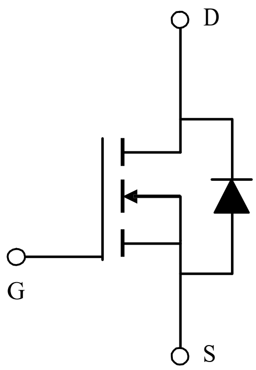


TOLL

General Features

V_{DS} = 150V I_D =320A

$R_{DS(ON)}$ < 3.2mΩ @ V_{GS}=10V



Application

DC/DC Converter

LED Backlighting

Power Management Switches

Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
XPX320N15LL	TOLLA-8L	XPX320N15LL XXX YYYY	2000

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

Symbol	Parameter	Rating	Units
VDS	Drain-Source Voltage	150	V
VGS	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ 10V	320	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ 10V	188	A
IDM	Pulsed Drain Current	817	A
EAS	Single Pulse Avalanche Energy	2201	mJ
IAS	Avalanche Current	88	A
P_D@T_C=25℃	Total Power Dissipation[4]	600	W
TSTG	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃
$R_{\theta}JA$	Thermal Resistance Junction-Ambient	0.25	℃/W
$R_{\theta}JC$	Thermal Resistance Junction-Case	40	℃/W

Electrical Characteristics (T_C=25℃unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
V(BR)DSS	Drain-Source Breakdown Voltage	V_{GS} = 0V I_D = 250μA	150	165		V
IDSS	Zero Gate Voltage Drain Current	V_{DS} = 150V, V_{GS} = 0V			1.0	nA
IDSS T_J = 55°C	Zero Gate Voltage Drain Current	V_{DS} = 150V,T_J = 55°C			5.0	
IGSS	Gate-Body Leakage Current	V_{DS} = 0V, V_{GS} = ±20V			±100	nA
VGS(th)	Gate Threshold Voltage	VDS=VGS, ID=250μA	2.5	3.2	4.5	V
RDS(ON)	Static Drain-Source	V_{GS} = 10V, I_D =40A		3.3	4.2	mΩ
gFS	Forward Transconductance	V_{DS} = 5V, I_D = 20A		65		S
R_g	Gate Resistance	V_{GS} = 0V, V_{DS}= 0V, f = 1MHz		2.4		Ω
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=25V, f=1MHz		6550		pF
C_{oss}	Output Capacitance			772		pF
C_{rss}	Reverse Transfer Capacitance			6.7		pF
Q_g	Total Gate Charge	V_{GS} = 0 to 10V V_{DS} = 75V, I_D = 20A		88		nC
Q_{gs}	Gate Source Charge			32		nC
Q_{gd}	Gate Drain Charge			16		nC
tD(on)	Turn-On DelayTime	V_{GS} = 10V, V_{DS} = 75V R_L = 3.75Ω, R_{GEN} = 6Ω		48		ns
t_r	Turn-On Rise Time			90		ns
tD(off)	Turn-Off DelayTime			94		ns
t_f	Turn-Off Fall Time			60		ns
trr	Body Diode Reverse Recovery Time	I_F=20A, dI/dt=500A/us		122		ns
Q_{rr}	Body Diode Reverse Recovery Charge	I_F=20A, dI/dt=500A/us		279		nC
V_{SD}	Diode Forward Voltage	I_S = 1A, V_{GS} = 0V		0.71	1.0	V
IS	Diode Continuous Current	T_C = 25°C			600	A

Notes:

1、The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper.

2、The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%

3、The EAS data shows Max. rating . The test condition is V_{DD}=50V, V_{GS}=10V, L=0.1mH, I_{AS}=88A

4、The power dissipation is limited by 150°C junction temperature

5、The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Typical Characteristics

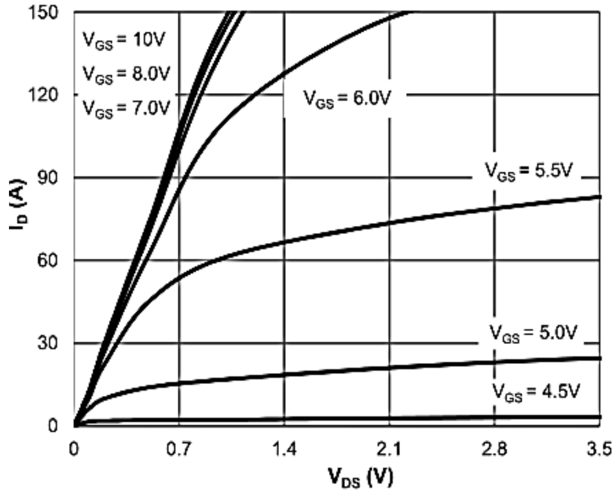


Figure 1: Saturation Characteristics

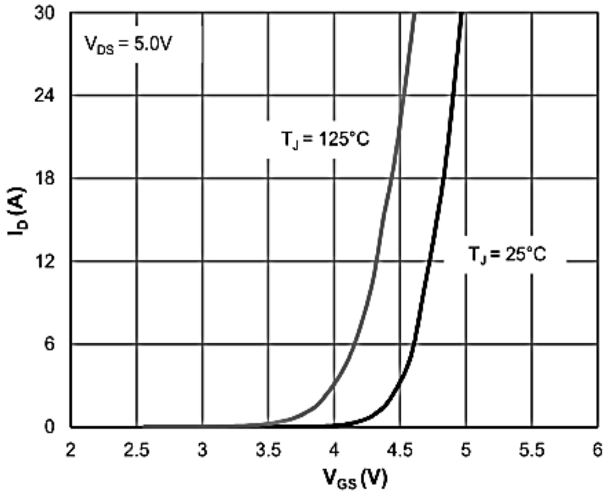


Figure 2: Transfer Characteristics

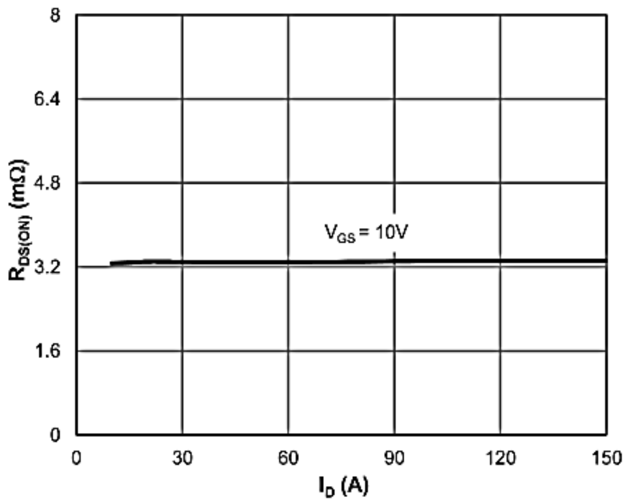


Figure 3: RDS(ON) vs. Drain Current

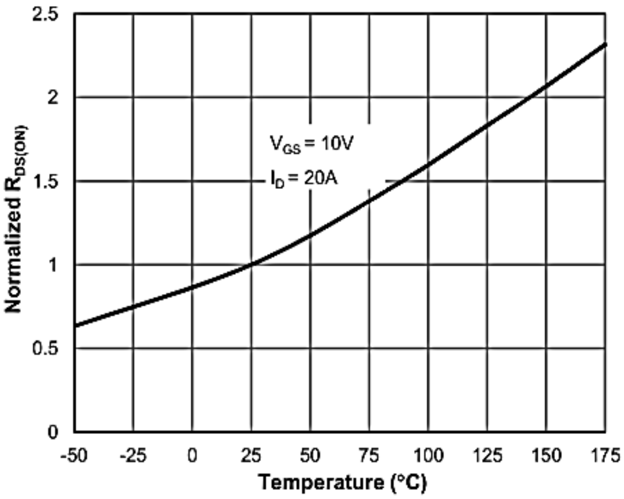


Figure 4: RDS(ON) vs. Junction Temperature

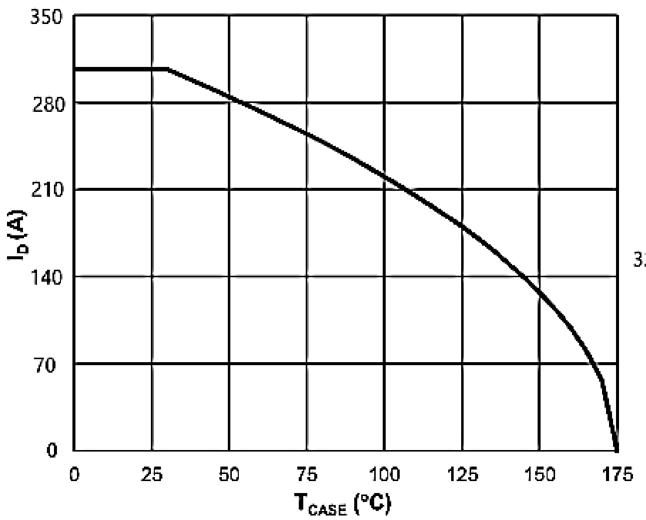


Figure 5: Current De-rating

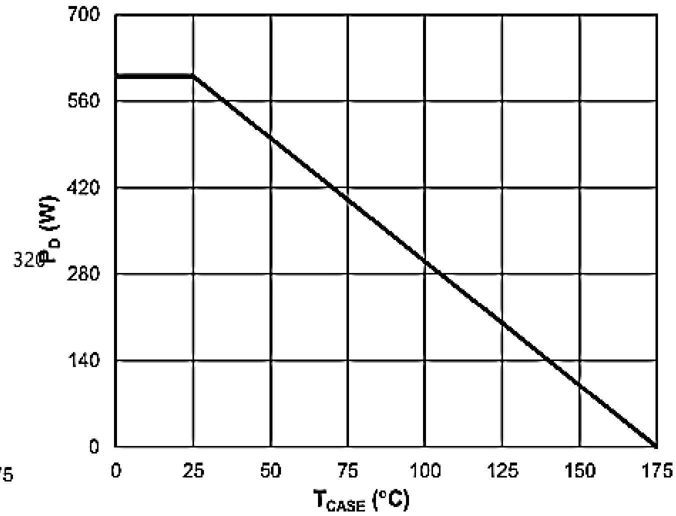


Figure 6: Power De-rating

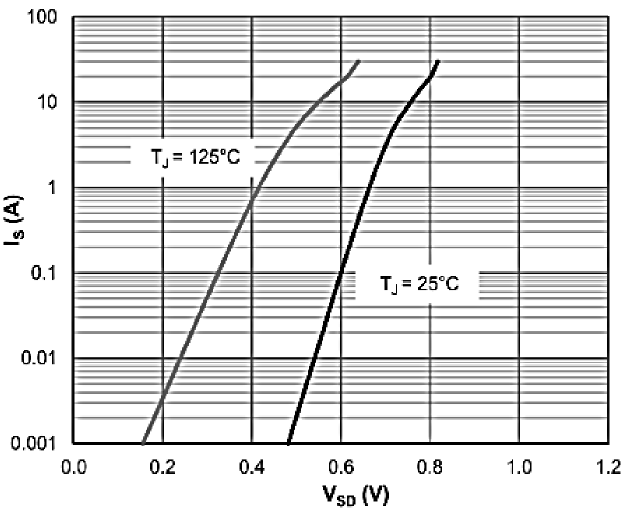


Figure 7: Body-Diode Characteristics

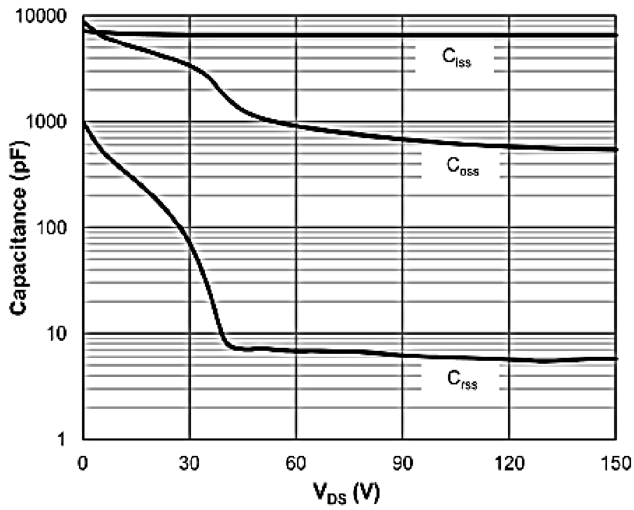


Figure 8: Capacitance Characteristics

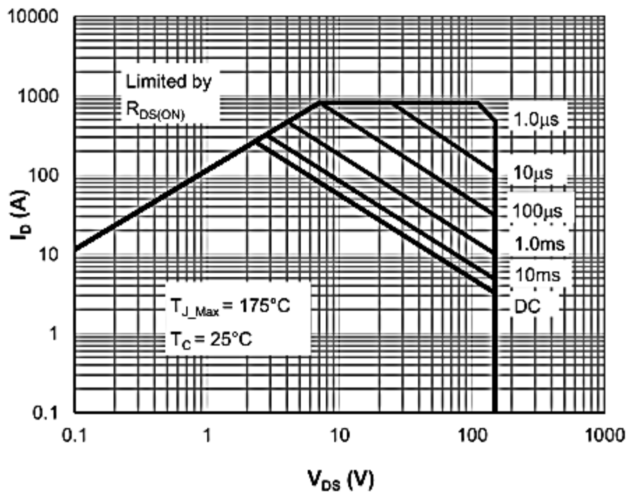


Figure 9: Maximum Safe Operating Area

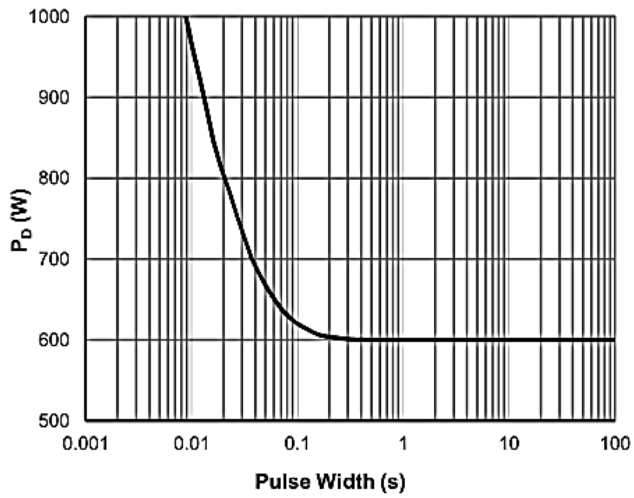
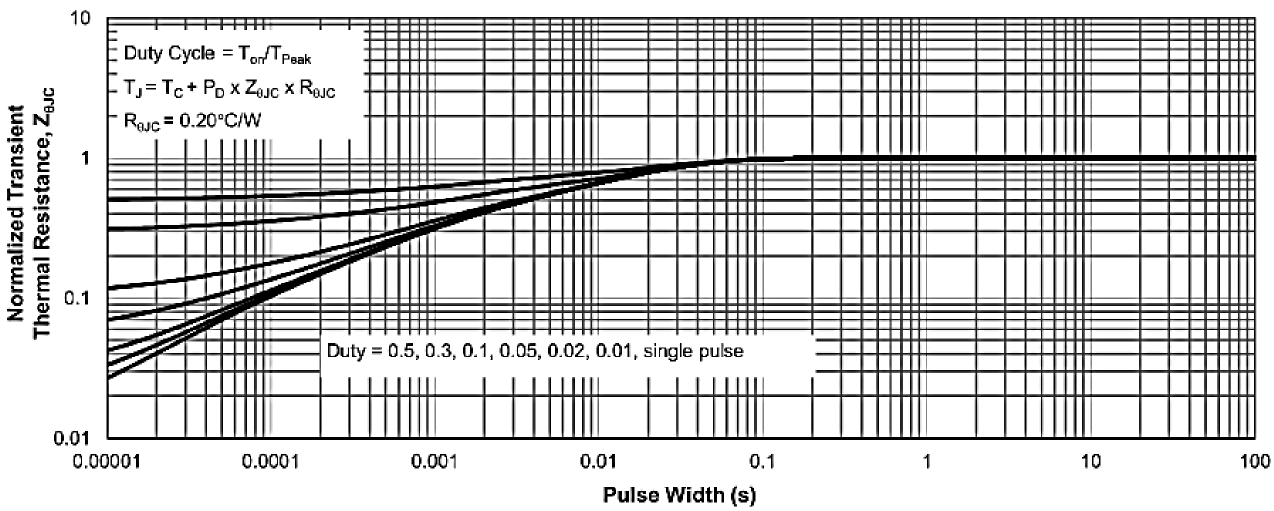
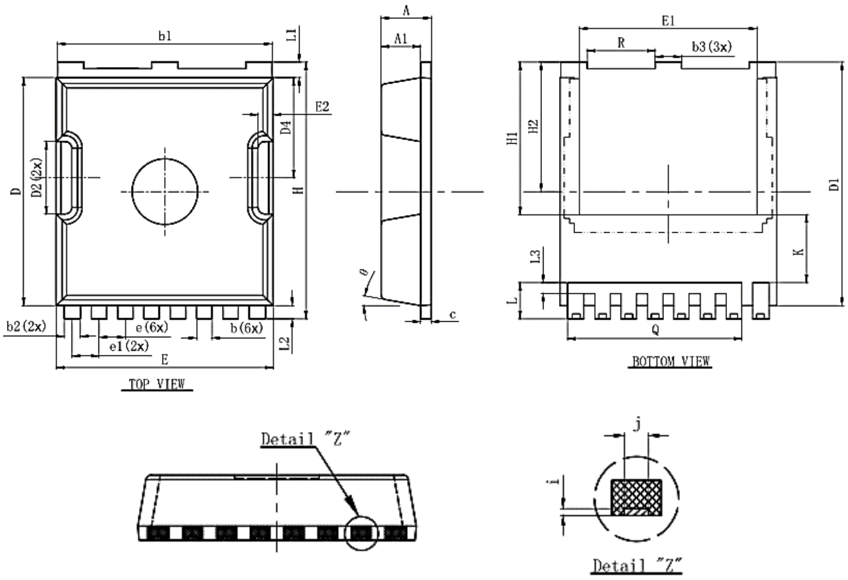


Figure 10: Single Pulse Power Rating, Junction-to-Case



Package Mechanical Data-TOLLA-8-XZ Single



Symbol	Dimensions In Millimeters		
	Min.	Nom	Max.
A	2.2	2.3	2.4
A1	1.7	1.8	1.9
b	0.6	0.7	0.8
b1	9.7	9.8	9.9
b2	0.65	0.75	0.85
b3	1.1	1.2	1.3
C	0.4	0.5	0.6
D	10.3	10.4	10.5
D1	11.0	11.1	11.2
D2	3.2	3.3	3.4
D4	4.47	4.57	4.67
E	9.8	9.9	10.0
E1	8.0	8.1	8.2
E2	0.5	0.6	0.7
e	1.200（BSC）		
e1	1.225（BSC）		
H	11.6	11.7	11.8
H1	6.95BSC		
H2	5.9BSC		
i	0.1REF		
j	0.350REF		
K	3.100REF		
L	1.55	1.65	1.75
L1	0.6	0.7	0.8
L2	0.5	0.6	0.7
L3	0.4	0.5	0.6
Q	7.95REF		
R	3.0	3.1	3.2
θ	10°REG		

Flow (wave) soldering (solder dipping)

Product	Peak Temperature	Dipping Time
Pb device	245℃±5℃	5sec±1sec
Pb-Free device	260℃+0/-5℃	5sec±1sec

This integrated circuit can be damaged by ESD UniverChip Corporation recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedure can cause damage. ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications.

Attention:

- Any and all XPX power products described or contained herein do not have specifications that can handle applications that require extremely high levels of reliability, such as life-support systems, aircraft's control systems, or other applications whose failure can be reasonably expected to result in serious physical and/or material damage. Consult with your XPX power representative nearest you before using any XPX power products described or contained herein in such applications.

- XPX power assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all XPX power products described or contained herein.

- Specifications of any and all XPX power products described or contained herein stipulate the performance, characteristics, and functions of the described products in the independent state, and are not guarantees of the performance, characteristics, and functions of the described products as mounted in the customer’s products or equipment. To verify symptoms and states that cannot be evaluated in an independent device, the customer should always evaluate and test devices mounted in the customer’s products or equipment.

- XPX power Semiconductor CO.,LTD. strives to supply high-quality high-reliability products. However, any and all semiconductor products fail with some probability. It is possible that these probabilistic failures could give rise to accidents or events that could endanger human lives, that could give rise to smoke or fire, or that could cause damage to other property. When designing equipment, adopt safety measures so that these kinds of accidents or events cannot occur. Such measures include but are not limited to protective circuits and error prevention circuits for safe design, redundant design, and structural design.

- In the event that any or all XPX power products(including technical data, services) described or contained herein are controlled under any of applicable local export control laws and regulations, such products must not be exported without obtaining the export license from the authorities concerned in accordance with the above law.

-

- Information (including circuit diagrams and circuit parameters) herein is for example only ; it is not guaranteed for volume production. XPX power believes information herein is accurate and reliable, but no guarantees are made or implied regarding its use or any infringements of intellectual property rights or other rights of third parties.

- Any and all information described or contained herein are subject to change without notice due to product/ technology improvement, etc. When designing equipment, refer to the "Delivery Specification" for the XPX power product that you intend to use.

- This catalog provides information as of Sep.2019. Specifications and information herein are subject to change without notice.