XPXGD40N10FD

N-Channel Enhancement Mode Power MOSFET

RoHS COMPLIANT

Features

- Super II Trench Power MOSFET
- Fully characterized avalanche voltage and current
- 100% UIS + Rg Tested
- Reliable and Rugged
- Lead Free and Green Devices Available

(RoHS Compliant)

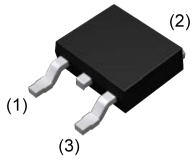
V_{DS}	100V
I_D	46A
$R_{DS(ON)}$	12.8mΩ

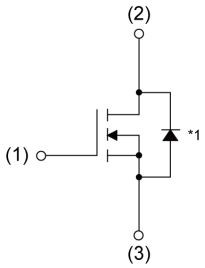
Applications

- Ideal for high-frequency switching
- DC/DC Converter

DPAK

TO-252-2L





(1) Gate
(2) Drain
(3) Source

*1 Body Diode

Order Part NO.	Package	Form	Minimum Order Q'ty
XPXGD40N10	TO-252-2L	Tape & Reel	-

Absolute maximum ratings (T_C = 25°C ,unless otherwise specified)

Symbol	Parameter		Max	Unit
V_{DS}	Drain-Source Voltage		100	V
V_{GS}	Gate-Source Voltage		±20	V
I_D	Drain Current -Continuous	Tc= 25°C	46	A
		Tc =100°C	35	A
I_{DM}	Drain Current -Pulsed (Note 1)	Tc= 25°C	210	A
P_D	Maximum Power Dissipation	Tc= 25°C	115	W
		Tc =100°C	80	W
E_{AS}	Avalanche Energy, Single pulse(Note 5)		150	mJ
T_J	Maximum Junction Temperature		150	℃
T_{stg}	Storage Temperature Range		-55 To 150	℃

Thermal Characteristics

Symbol	Parameter	Typ.	Max	Unit
$R_{\theta JC}$	Thermal Resistance-Junction to Case (Note 2)	-	1.4	℃/W
$R_{\theta JA}$	Thermal resistance, Junction-Ambient (Note 2)	-	50	℃/W

Electrical Characteristics (T_C=25℃unless otherwise noted)

Symbol	Parameter	Condition	Min	Typ	Max	Unit
Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V I_D=250μA	100	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=80V,V_{GS}==0V	-	-	1	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±20V,V_{DS}=0V	-	-	±100	nA
On Characteristics (Note 3)						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250μA	1.2	1.7	2.8	V
$R_{DS(ON)}$	Drain-Source On-State Resistance	V_{GS}=10V, I_D=25A	-	12.8	18	mΩ
		V_{GS}=4.5V, I_D=25A	-	16	20	mΩ
Dynamic Characteristics (Note4)						
R_G	Gate Resistance	V_{DS}=0V,V_{GS}=0V,f =1MHz	-	1.7	-	Ω
C_{lss}	Input Capacitance	V_{DS}=50V,V_{GS}=0V, F=1.0MHz	-	1875	-	PF
C_{oss}	Output Capacitance		-	175	-	PF
C_{rss}	Reverse Transfer Capacitance		-	20	-	PF
Switching Characteristics (Note 4)						
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=50V,I_D=25A,,V_{Gen}=10 V,R_G=3Ω.	-	15	-	nS
t_r	Turn-on Rise Time		-	17	-	nS
$t_{d(off)}$	Turn-Off Delay Time		-	31	-	nS
t_f	Turn-Off Fall Time		-	9	-	nS
Q_g	Total Gate Charge	V_{DS}=50V,I_D=25A, V_{GS}=10V	-	42		nC
Q_{gs}	Gate-Source Charge		-	7.7	-	nC
Q_{gd}	Gate-Drain Charge		-	10	-	nC
Drain-Source Diode Characteristics						
V_{SD}	Diode Forward Voltage (Note 3)	V_{GS}=0V,I_S=25A	-	-	1.3	V
I_S	Diode Forward Current (Note 2)		-	-	46	A
trr	Reverse Recovery Time	I_{SD}=25A, dI_{SD}/dt=100A/μs	-	45	-	nS
Qrr	Reverse Recovery Charge		-	95	-	nC

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

5.EAS condition：Tj=25℃,VDD=50V,VG=10V,L=0.5mH,Rg=25Ω.

Typical Electrical and Thermal Characteristics

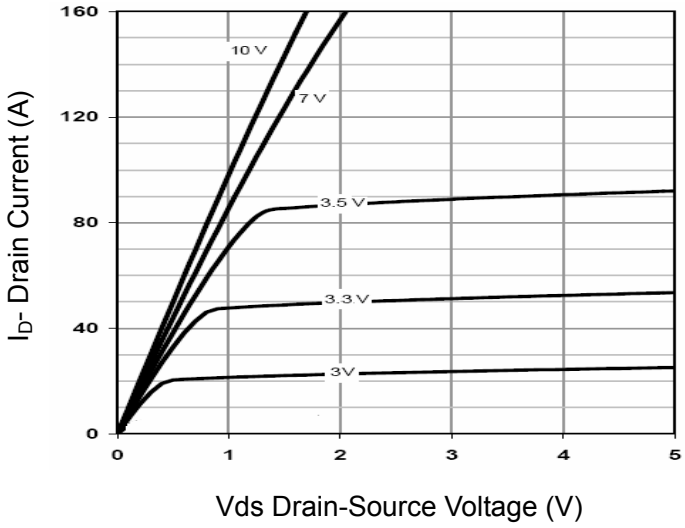


Figure 1 Output Characteristics

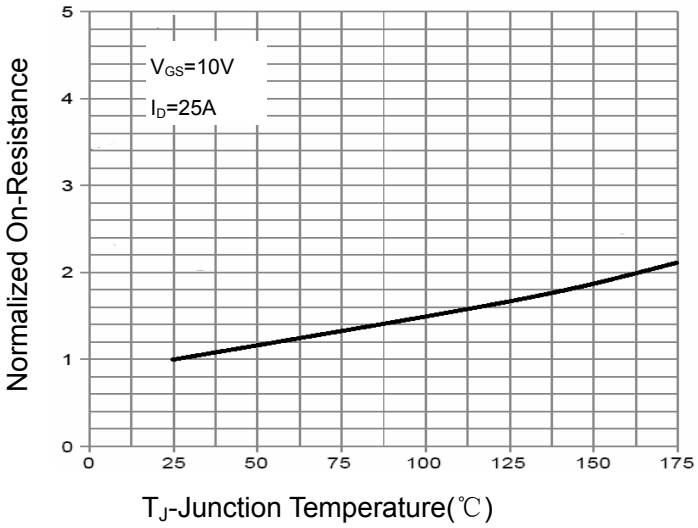


Figure 4 Rdson-Junction Temperature

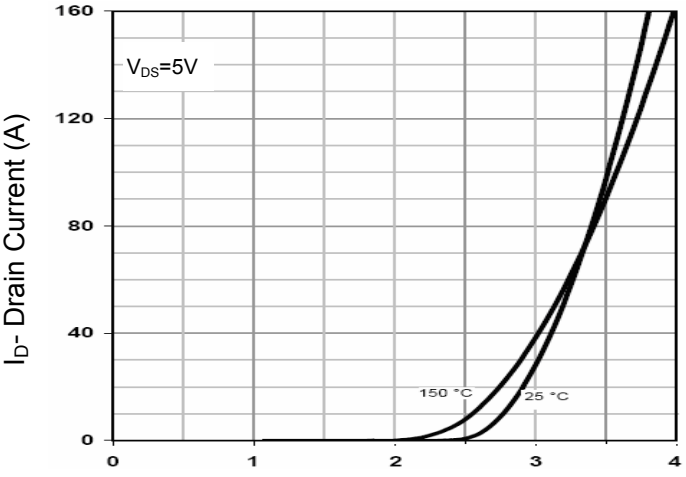


Figure 2 Transfer Characteristics

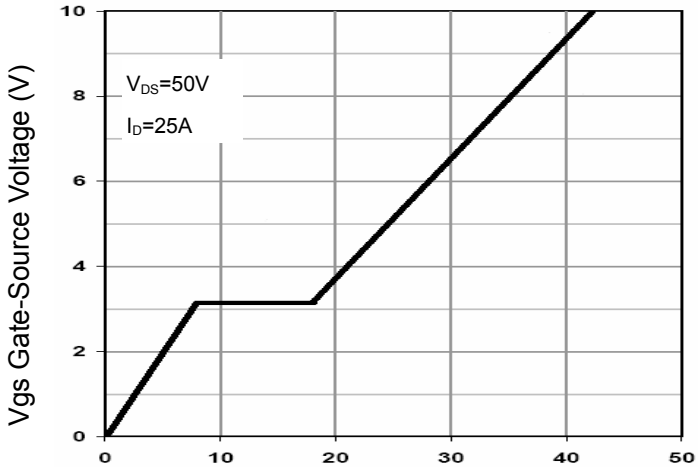


Figure 5 Gate Charge

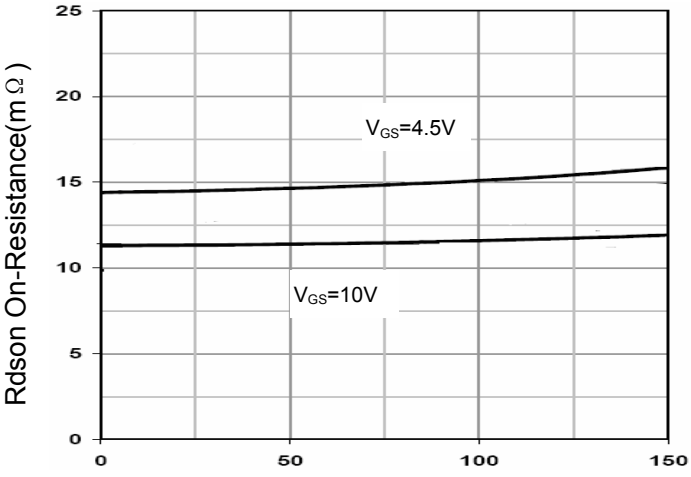


Figure 3 Rdson- Drain Current

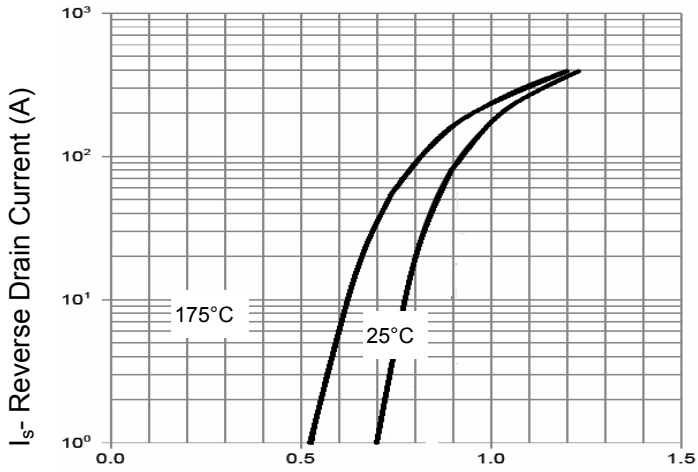


Figure 6 Source- Drain Diode Forward

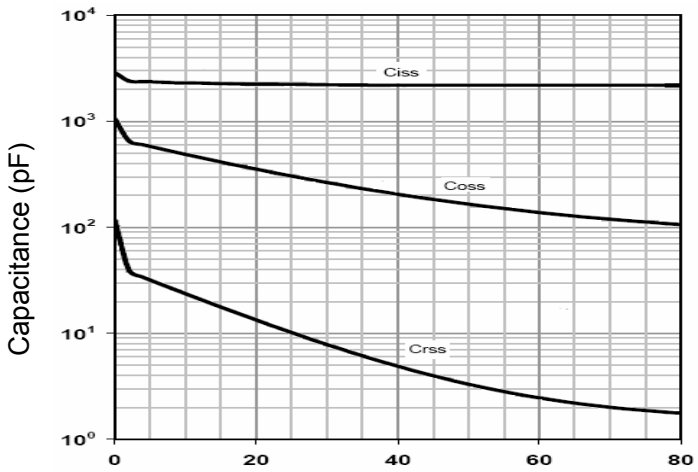


Figure 7 Capacitance vs Vds

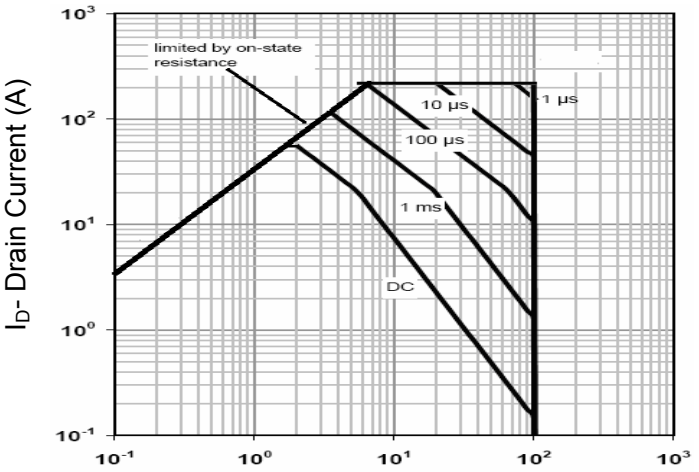


Figure 8 Safe Operation Area

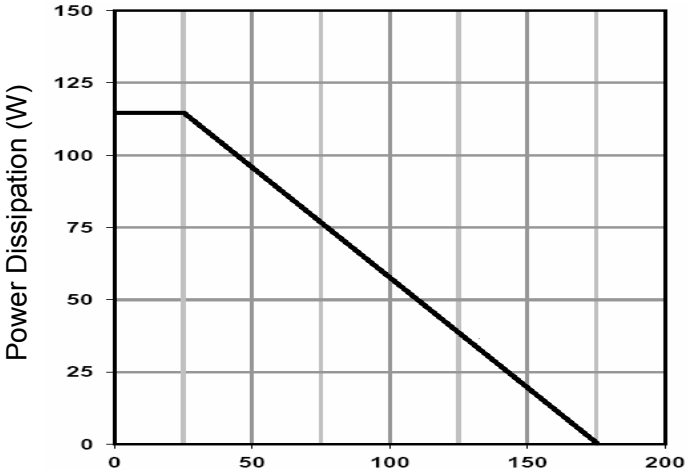


Figure 9 Power De-rating

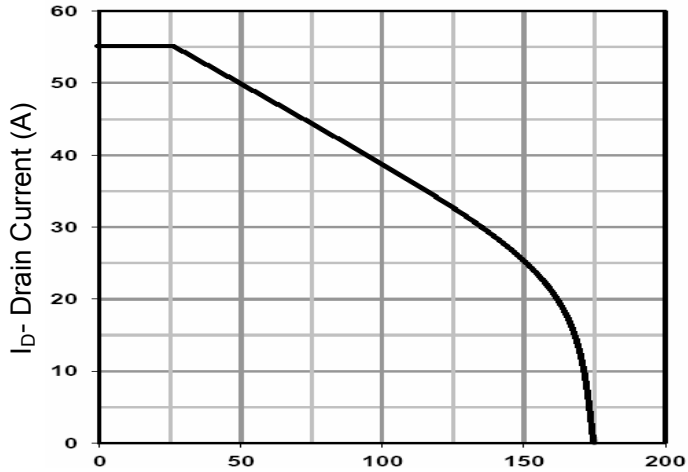


Figure 10 Current De-rating

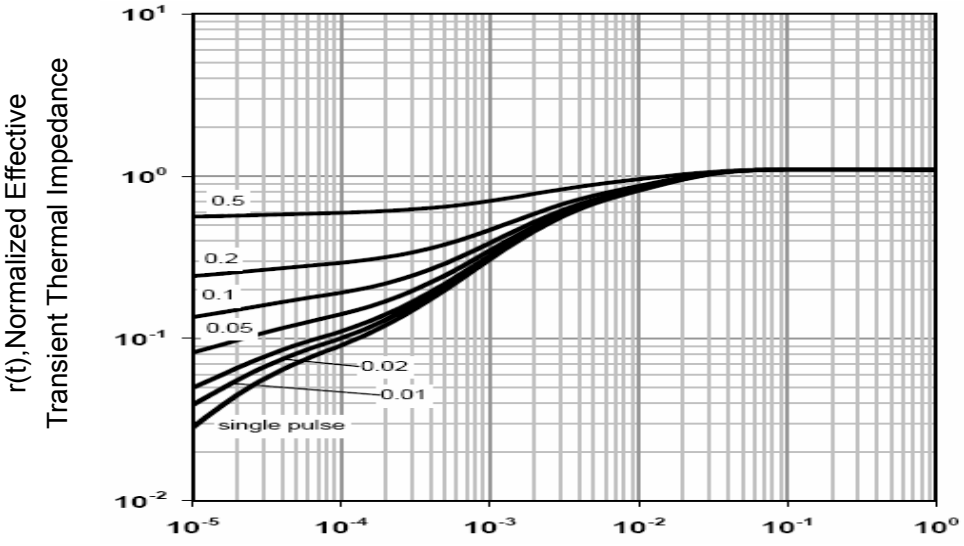
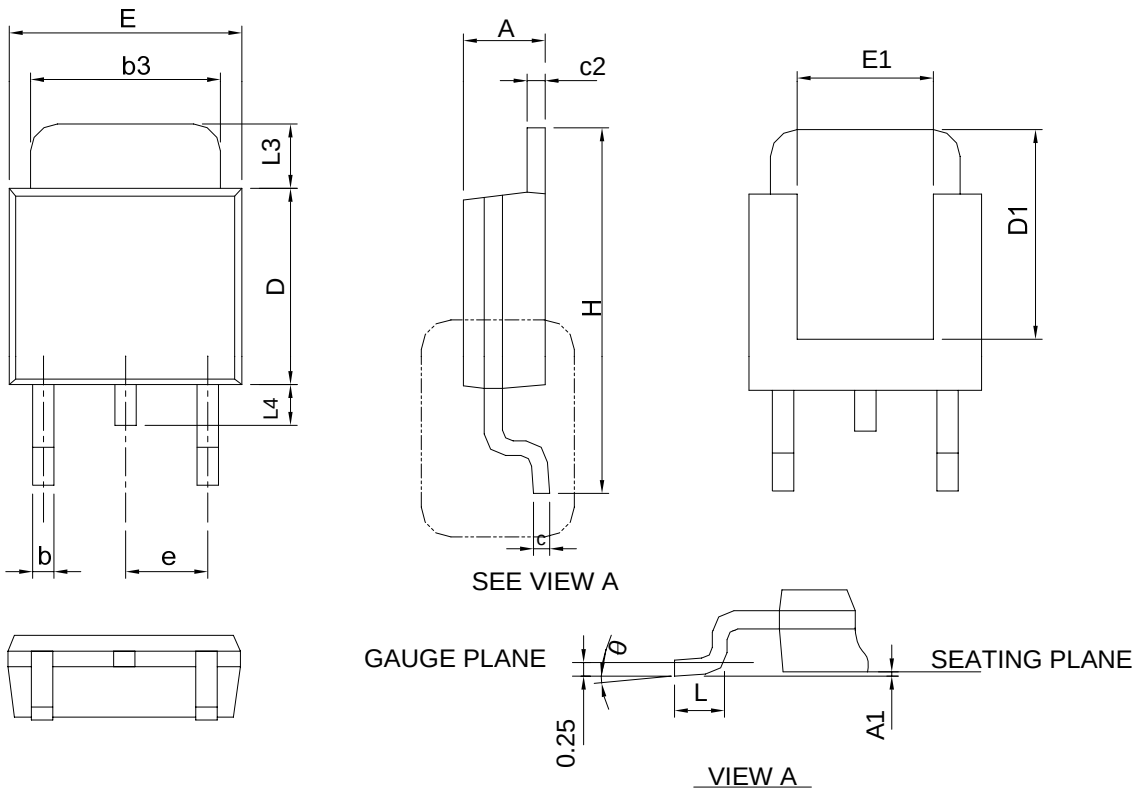


Figure 11 Normalized Maximum Transient Thermal Impedance

Package Information

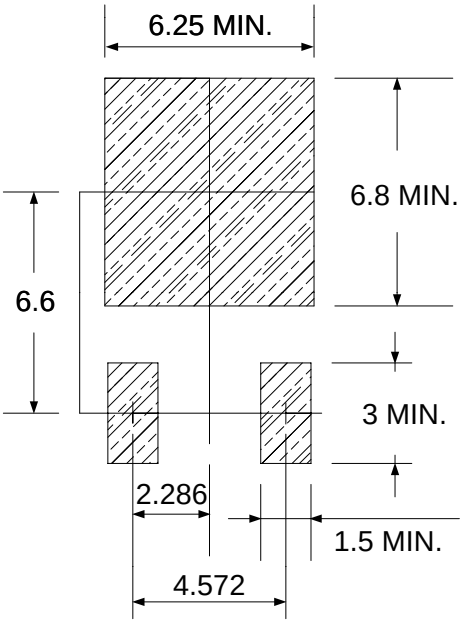
TO-252-2L



SYMBOL	TO-252-2L			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	2.18	2.39	0.086	0.094
A1	-	0.13	-	0.005
b	0.50	0.89	0.020	0.035
b3	4.95	5.46	0.195	0.215
c	0.46	0.61	0.018	0.024
c2	0.46	0.89	0.018	0.035
D	5.33	6.22	0.210	0.245
D1	4.57	6.00	0.180	0.236
E	6.35	6.73	0.250	0.265
E1	3.81	6.00	0.150	0.236
e	2.29 BSC		0.090 BSC	
H	9.40	10.41	0.370	0.410
L	0.90	1.78	0.035	0.070
L3	0.89	2.03	0.035	0.080
L4	-	1.02	-	0.040
θ	0°	8°	0°	8°

Note : Follow JEDEC TO-252-2L .

RECOMMENDED LAND PATTERN



UNIT: mm

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.

- No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording, or any information storage or retrieval system, or otherwise, without the prior written permission of XPX power Semiconductor CO.,LTD.

- 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.