

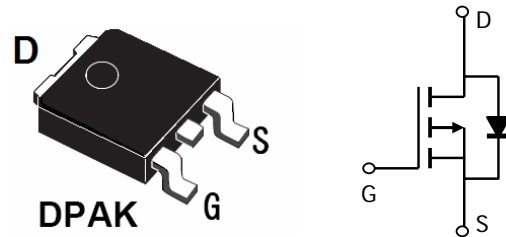

Description

The XPX80P04FD uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.

$V_{DS} = -40V, I_D = -80A$
 $R_{DS(ON)} = 6.0m\Omega$ (typ) @ $V_{GS} = -10V$
 $R_{DS(ON)} = 8m\Omega$ (typ) @ $V_{GS} = -4.5V$

Application

- Lithium battery protection
- Wireless impact
- Mobile phone fast charging


Absolute Maximum Ratings ($T_A = 25^\circ C$, unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-40	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D	T _C =25°C	-80
		T _C =100°C	-50.6
Pulsed Drain Current ¹	I_{DM}	-320	A
Single Pulse Avalanche Energy ²	E_{AS}	101.25	mJ
Total Power Dissipation	P_D	85	W
Operating Junction and Storage Temperature Range	T_J , T_{STG}	-55 to 150	°C

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance from Junction-to-Ambient ³	R_{θJA}	54	°C/W
Thermal Resistance from Junction-to-Case	R_{θJC}	1.54	°C/W

Electrical Characteristics (T_J = 25°C, unless otherwise noted)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit	
Static Characteristics							
Drain-Source Breakdown Voltage	V(BR)_{DSS}	V _{GS} = 0V, I _D = -250μA	-40	-	-	V	
Gate-body Leakage current	I_{GSS}	V _{DS} = 0V, V _{GS} = ±20V	-	-	±100	nA	
Zero Gate Voltage Drain Current	I_{DSS}	V _{DS} = -40V, V _{GS} = 0V	T _J =25°C	-	-	-1	pA
			T _J =100°C	-	-	-100	
Gate-Threshold Voltage	V_{GS(th)}	V _{DS} = V _{GS} , I _D = -250μA	-1.0	-1.6	-2.5	V	
Drain-Source on-Resistance ⁴	R_{DS(on)}	V _{GS} = -10V, I _D = -20A	-	6.0	8.2	mΩ	
		V _{GS} = -4.5V, I _D = -15A	-	8.0	11		
Forward Transconductance ⁴	g_{fs}	V _{DS} = -10V, I _D = -20A	-	104	-	S	
Dynamic Characteristics⁵							
Input Capacitance	C_{iss}	V _{DS} = -20V, V _{GS} = 0V, f = 1MHz	-	5295	-	pF	
Output Capacitance	C_{oss}		-	430	-		
Reverse Transfer Capacitance	C_{rss}		-	385	-		
Gate Resistance	R_g	f = 1MHz	-	4.3	-	Q	
Switching Characteristics⁵							
Total Gate Charge	Q_g	V _{GS} = -10V, V _{DS} = -20V, I _D = -20A	-	110	-	nC	
Gate-Source Charge	Q_{gs}		-	12.5	-		
Gate-Drain Charge	Q_{gd}		-	23	-		
Turn-on Delay Time	t_{d(on)}	V _{GS} = -10V, V _{DD} = -20V, R _G = 3Ω, I _D = -20A	-	16.8	-	ns	
Rise Time	t_r		-	10	-		
Turn-off Delay Time	t_{d(off)}		-	65	-		
Fall Time	t_f		-	17	-		
Body Diode Reverse Recovery Time	t_{rr}	I _F = -20A, dI/dt = 100A/μs	-	42	-	ns	
Body Diode Reverse Recovery Charge	Q_{rr}		-	29	-	nC	
Drain-Source Body Diode Characteristics							
Diode Forward Voltage ⁴	V_{SD}	I _S = -20A, V _{GS} = 0V	-	-	-1.2	V	
Continuous Source Current	I_S	T _C = 25°C	-	-	-80	A	

Notes:

Typical Characteristics

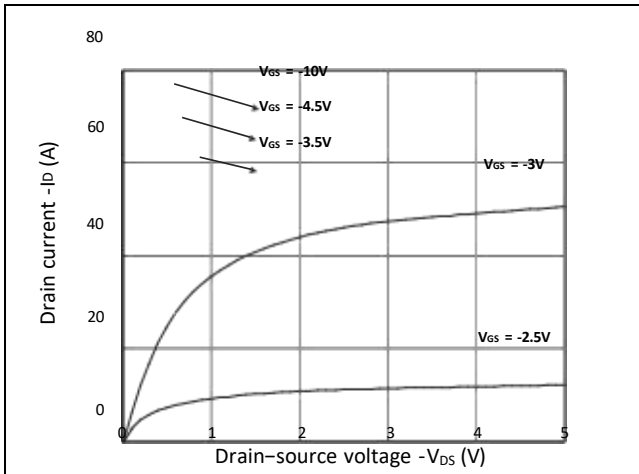


Figure 1. Output Characteristics

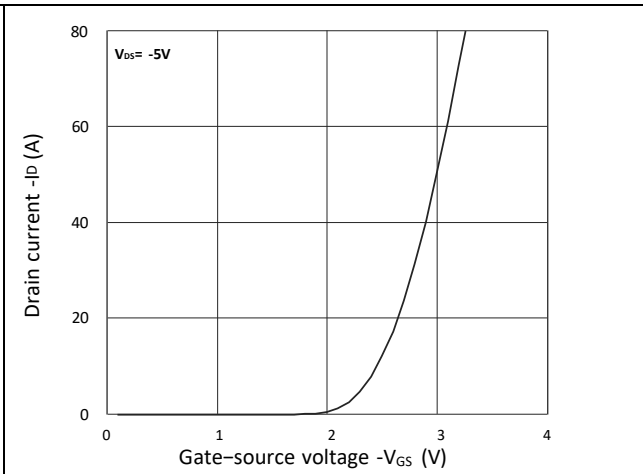


Figure 2. Transfer Characteristics

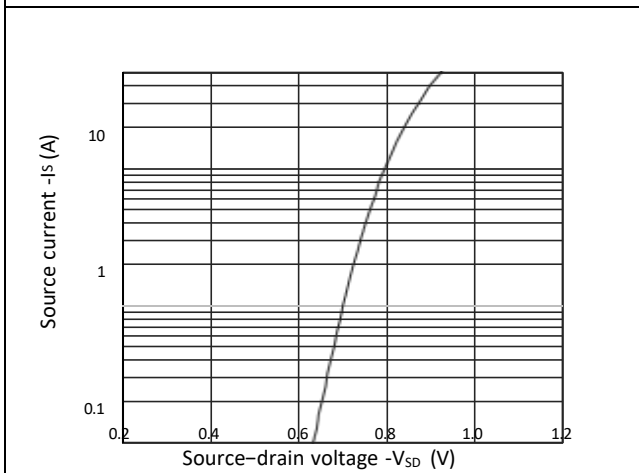


Figure 3. Forward Characteristics of Reverse

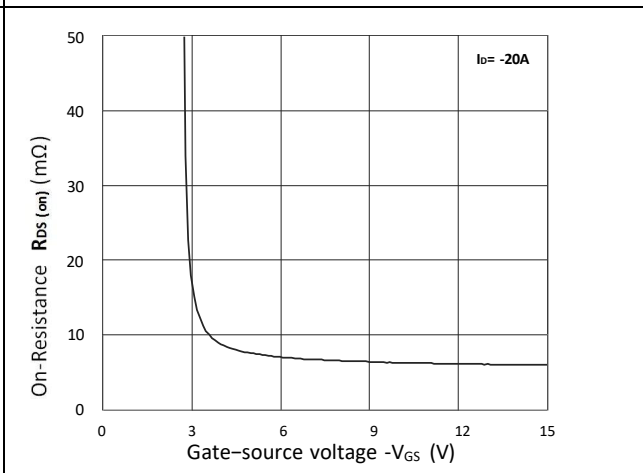


Figure 4. $R_{DS(ON)}$ vs V_{GS}

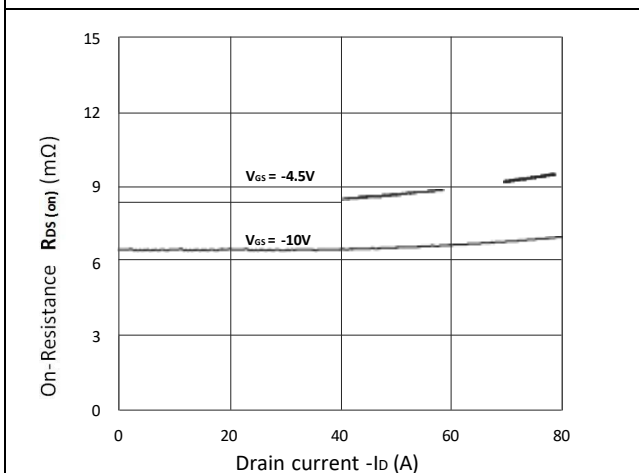


Figure 5. $R_{DS(ON)}$ vs I_D

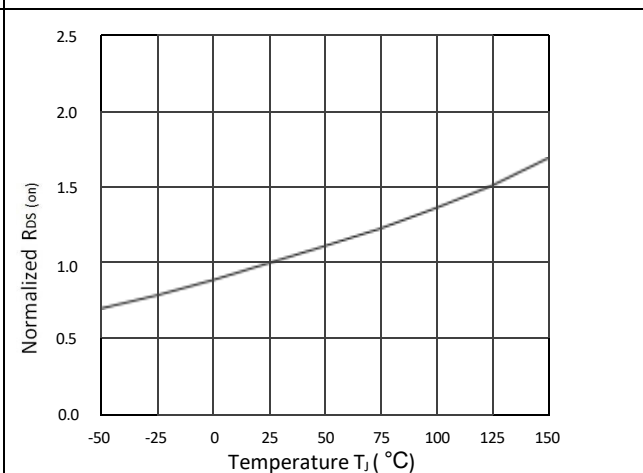


Figure 6. Normalized $R_{DS(ON)}$ vs Temperature

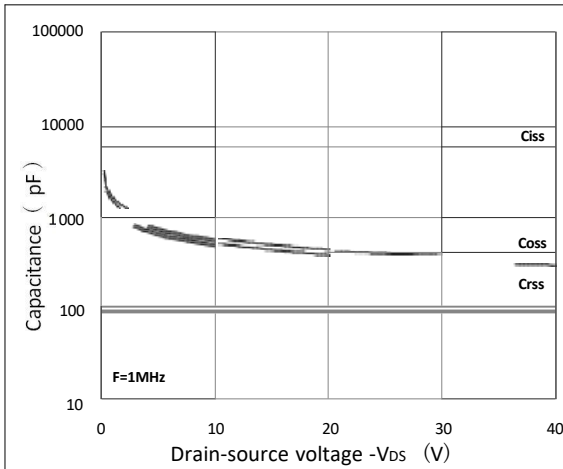


Figure 7. Capacitance Characteristics

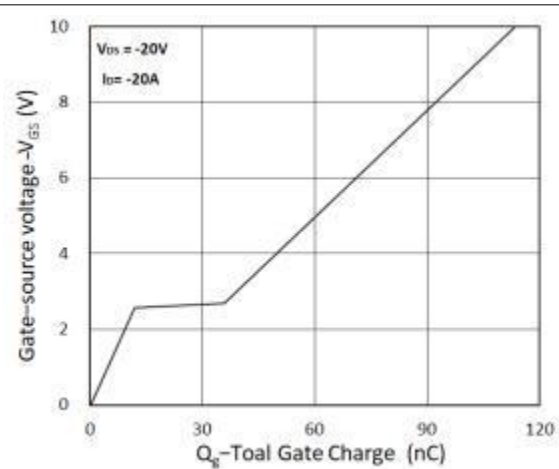


Figure 8. Gate Charge Characteristics

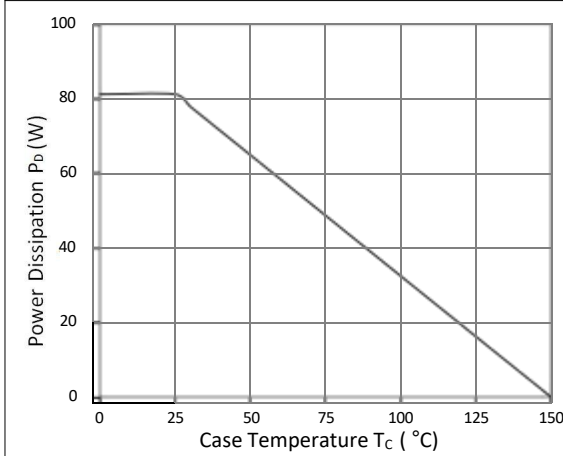


Figure 9. Power Dissipation

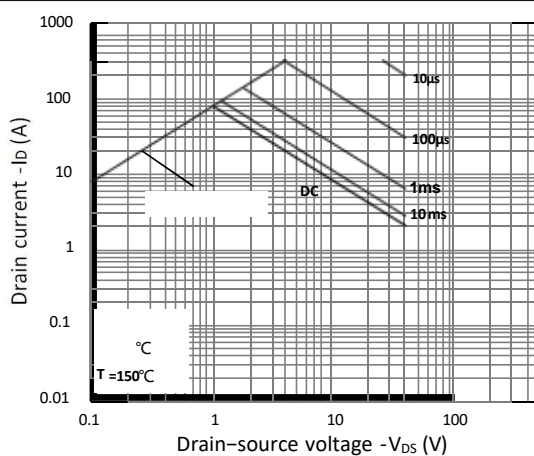


Figure 10. Safe Operating Area

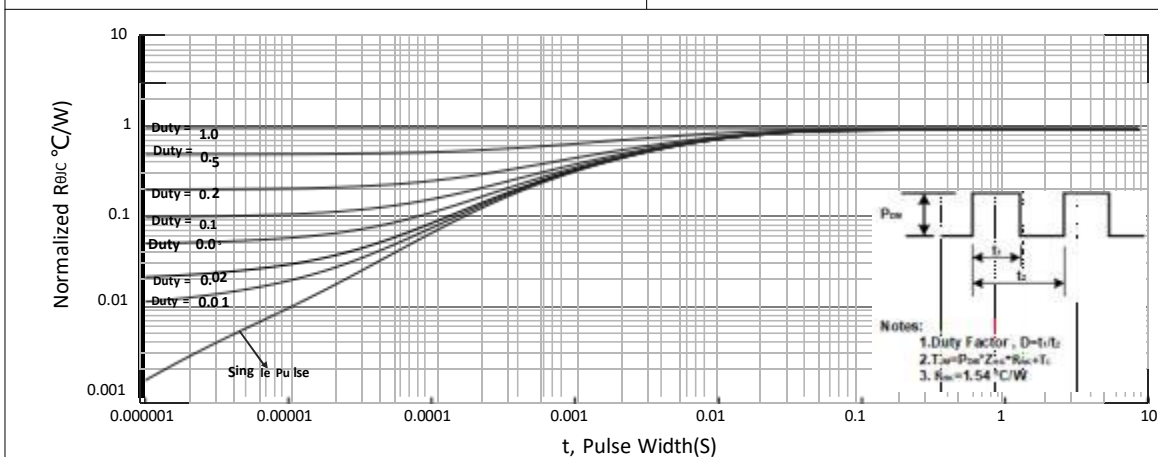
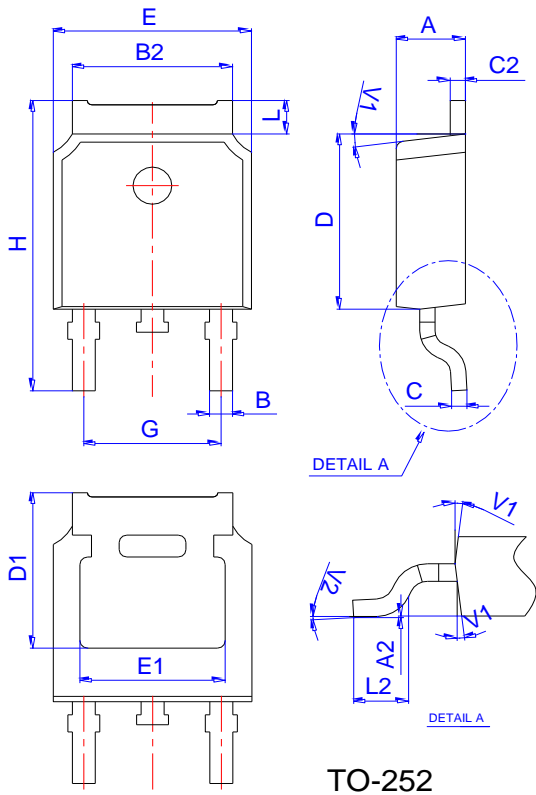
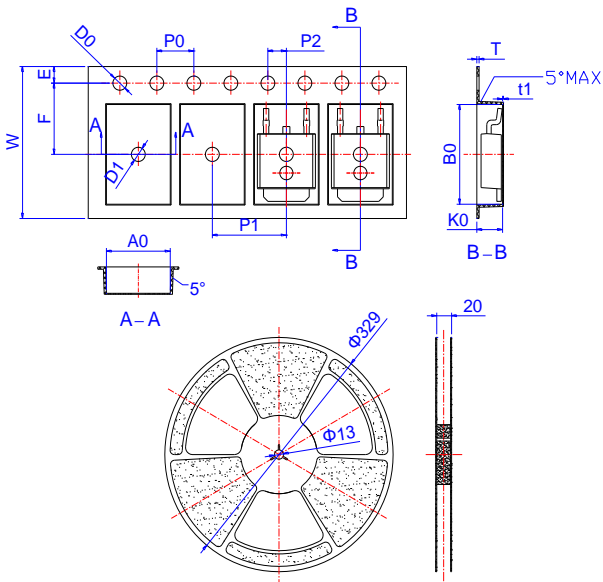


Figure 11. Normalized Maximum Transient Thermal Impedance

Package Mechanical Data

TO-252

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.10		2.50	0.083		0.098
A2	0		0.10	0		0.004
B	0.66		0.86	0.026		0.034
B2	5.18		5.48	0.202		0.216
C	0.40		0.60	0.016		0.024
C2	0.44		0.58	0.017		0.023
D	5.90		6.30	0.232		0.248
D1	5.30REF			0.209REF		
E	6.40		6.80	0.252		0.268
E1	4.63			0.182		
G	4.47		4.67	0.176		0.184
H	9.50		10.70	0.374		0.421
L	1.09		1.21	0.043		0.048
L2	1.35		1.65	0.053		0.065
V1		7°			7°	
V2	0°		6°	0°		6°

Reel Specification-TO-252


Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
W	15.90	16.00	16.10	0.626	0.630	0.634
E	1.65	1.75	1.85	0.065	0.069	0.073
F	7.40	7.50	7.60	0.291	0.295	0.299
D0	1.40	1.50	1.60	0.055	0.059	0.063
D1	1.40	1.50	1.60	0.055	0.059	0.063
P0	3.90	4.00	4.10	0.154	0.157	0.161
P1	7.90	8.00	8.10	0.311	0.315	0.319
P2	1.90	2.00	2.10	0.075	0.079	0.083
A0	6.85	6.90	7.00	0.270	0.271	0.276
B0	10.45	10.50	10.60	0.411	0.413	0.417
K0	2.68	2.78	2.88	0.105	0.109	0.113
T	0.24		0.27	0.009		0.011
t1	0.10			0.004		
10P0	39.80	40.00	40.20	1.567	1.575	1.583

-40V P-Channel Enhancement Mode MOSFET

Flow (wave) soldering (solder dipping)

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