-40V P-Channel Enhancement Mode MOSFET

RoHS COMPLIANT

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

$R_{DS(ON)}$=6.0mΩ (typ) @ V_{GS}=-10V

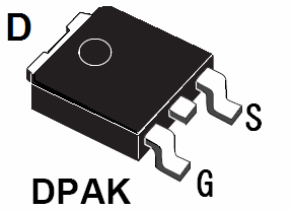
$R_{DS(ON)}$=10mΩ (typ) @ V_{GS}=-4.5V

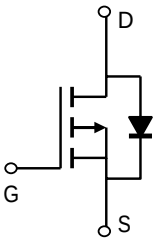
Application

Brushless motor

Load switch

Uninterruptible power supply





Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
XPX80P04FD	XPX80P04FD	TO-252-2L	-	-	-

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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	-40	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous	I_D	-80	A
Drain Current-Continuous(T_C=100℃)	I_D (100℃)	-56	A
Pulsed Drain Current	I_{DM}	-320	A
Maximum Power Dissipation	P_D	150	W
Derating factor		1	W/℃
Single pulse avalanche energy (Note1)	E_{AS}	500	mJ
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55 To 175	℃
Thermal Resistance,Junction-to-Case	$R_{\theta JC}$	1.0	℃/W

Electrical Characteristics (T_C=25℃unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=-250μA	-40		-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-40V,V_{GS}=0V	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V	-	-	±100	nA
On Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=-250μA	-1.2	-1.7	-2.2	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-20A	-	6.0	8.1	mΩ
		V_{GS}=-4.5V, I_D=-20A	-	10	13	mΩ
Forward Transconductance	g_{FS}	V_{DS}=-5V,I_D=-20A	-	30	-	S
Dynamic Characteristics						
Input Capacitance	C_{lss}	V_{DS}=-20V,V_{GS}=0V, F=1.0MHz	-	3900	-	PF
Output Capacitance	C_{oss}		-	890	-	PF
Reverse Transfer Capacitance	C_{rss}		-	20	-	PF
Switching Characteristics (Note 2)						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=-20V,I_D=-20A V_{GS}=-10V,R_G=1.6Ω	-	10.5	-	nS
Turn-on Rise Time	t_r		-	4	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	35	-	nS
Turn-Off Fall Time	t_f		-	5	-	nS
Total Gate Charge	Q_g	V_{DS}=-20V,I_D=-20A, V_{GS}=-10V	-	57	-	nC
Gate-Source Charge	Q_{gs}		-	9.8		nC
Gate-Drain Charge	Q_{gd}		-	7.3		nC
Drain-Source Diode Characteristics						
Diode Forward Voltage	V_{SD}	V_{GS}=0V,I_S=-20A	-		-1.2	V
Diode Forward Current	I_S		-	-	-80	A
Reverse Recovery Time	t_{rr}	T_J = 25°C, I_F =-20A di/dt = 100A/μs	-		24	nS
Reverse Recovery Charge	Qrr		-		68	nC

Notes:

1. EAS condition : Tj=25℃,V_{DD}=-20V,V_G=-10V,L=0.5mH,Rg=25Ω
2. Guaranteed by design, not subject to production
3. These curves are based on the junction-to-case thermal impedance which is measured with the device mounted to a large heatsin k, assuming a maximum junction temperature of TJ(MAX)=175° C. The SOA curve provides a single pulse rating.

Typical Electrical and Thermal Characteristics

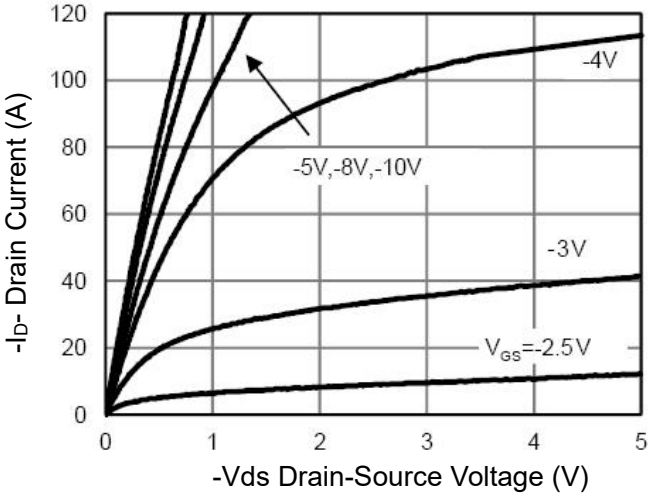


Figure 1 Output Characteristics

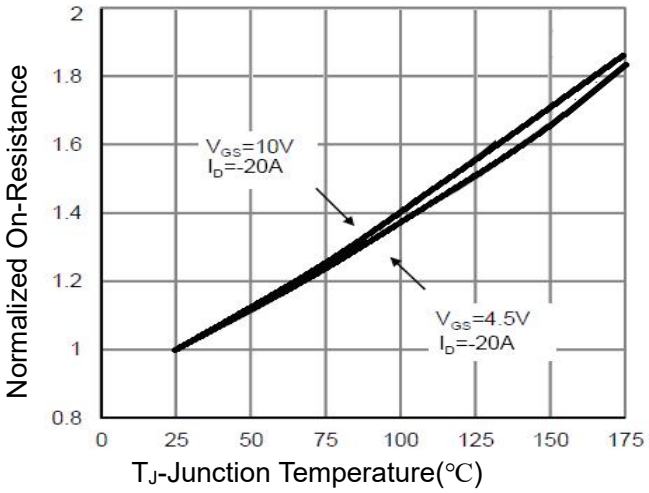


Figure 4 Rdson-JunctionTemperature

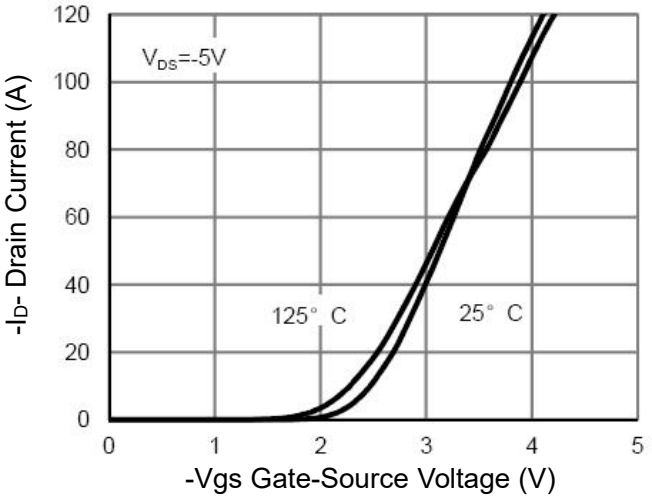


Figure 2 Transfer Characteristics

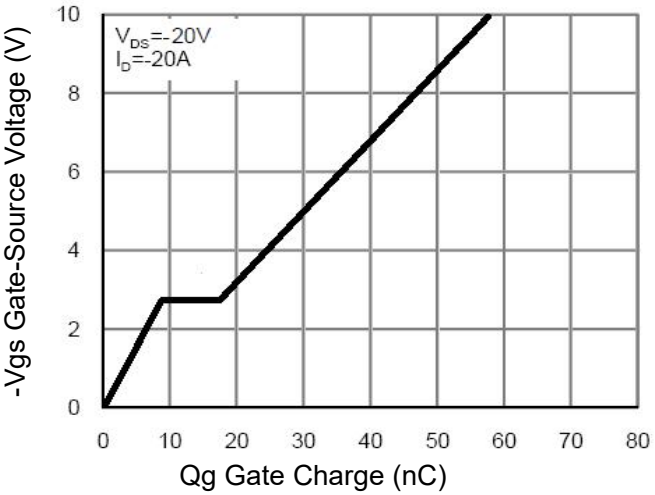


Figure 5 Gate Charge

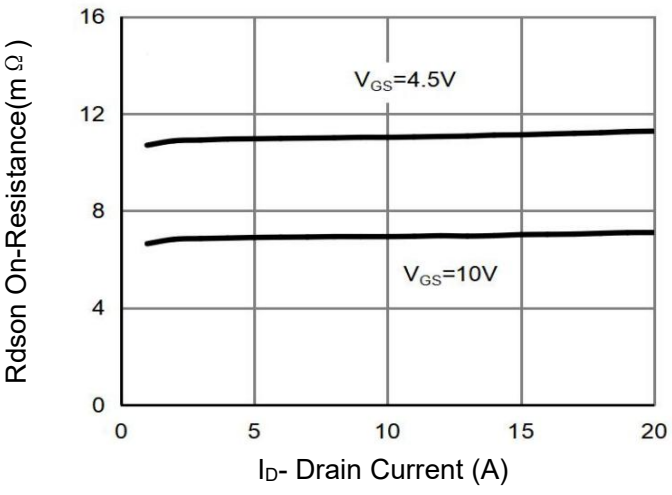


Figure 3 Rdson- Drain Current

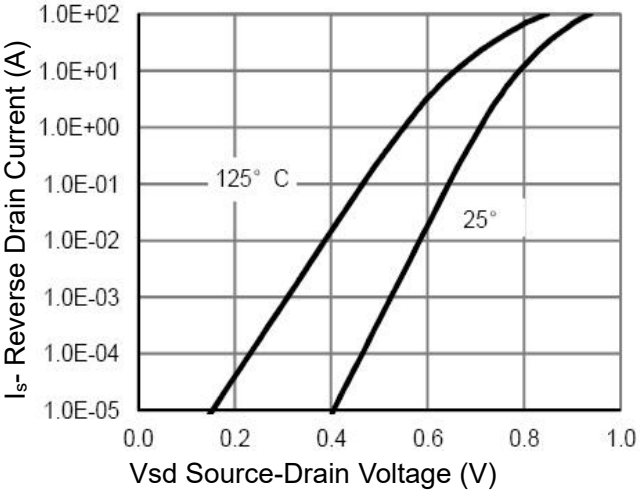


Figure 6 Source- Drain Diode Forward

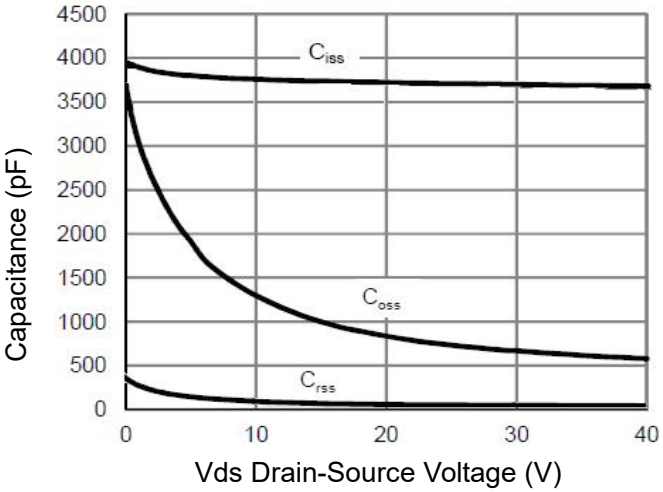


Figure 7 Capacitance vs Vds

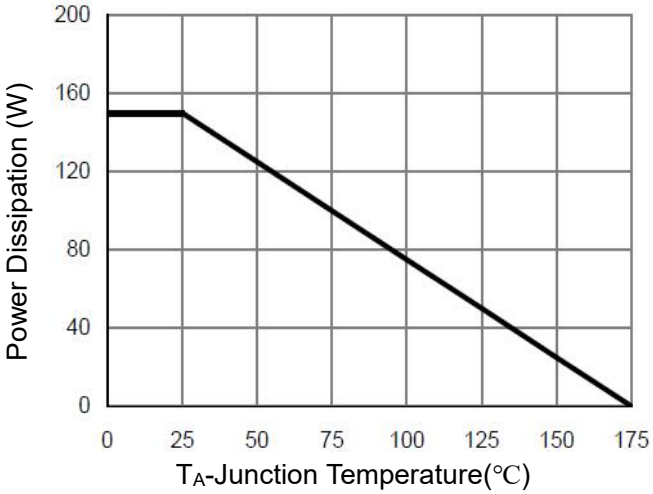


Figure 9 Power De-rating

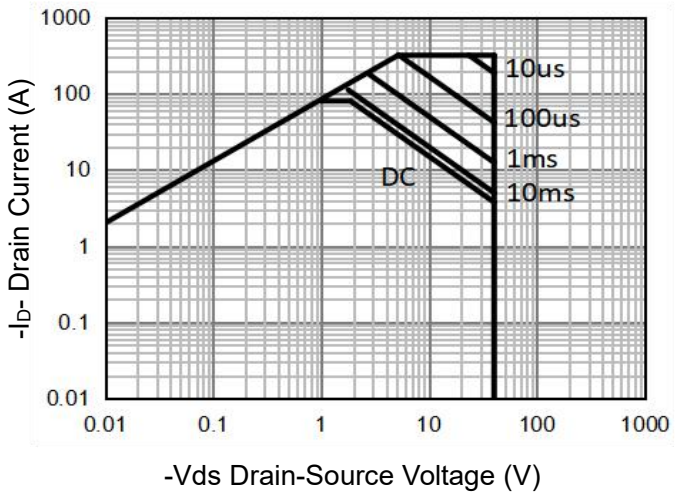


Figure 8 Safe Operation Area (Note 3)

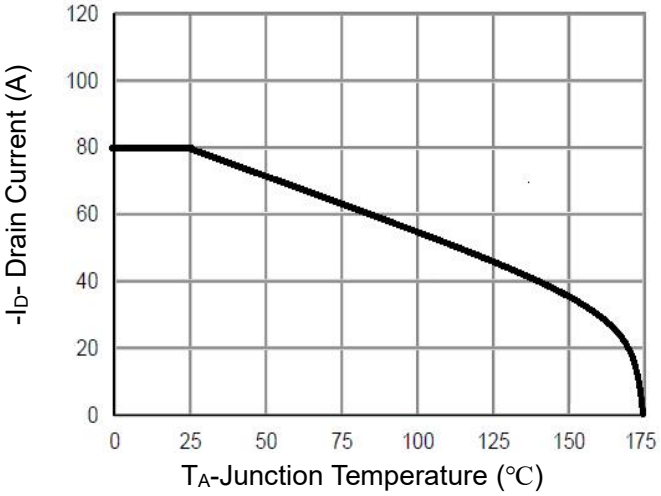


Figure 10 Current De-rating

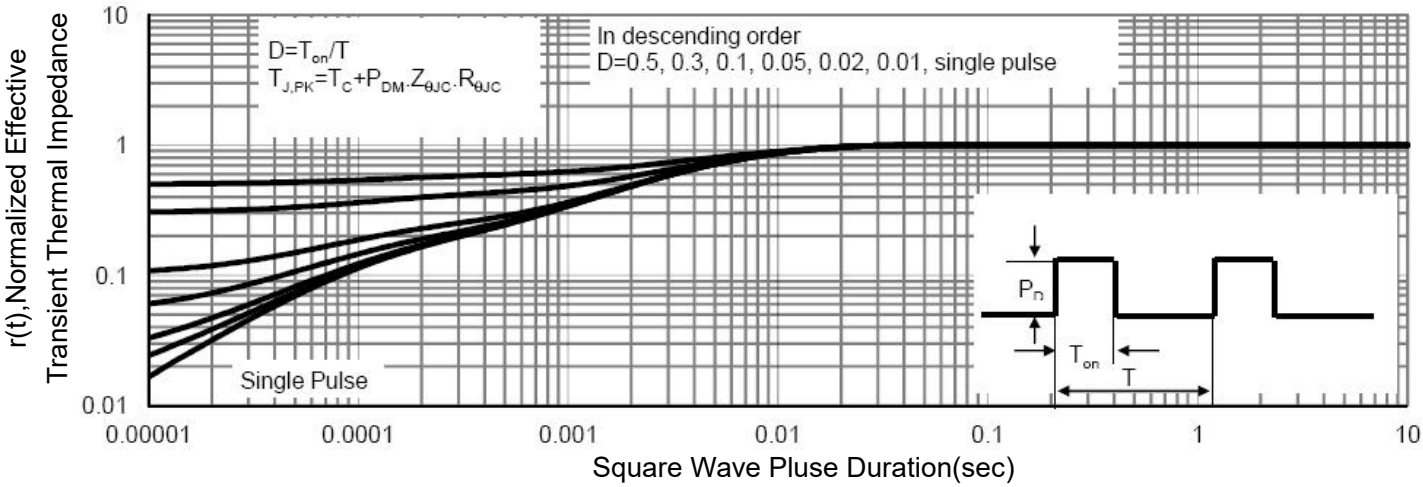
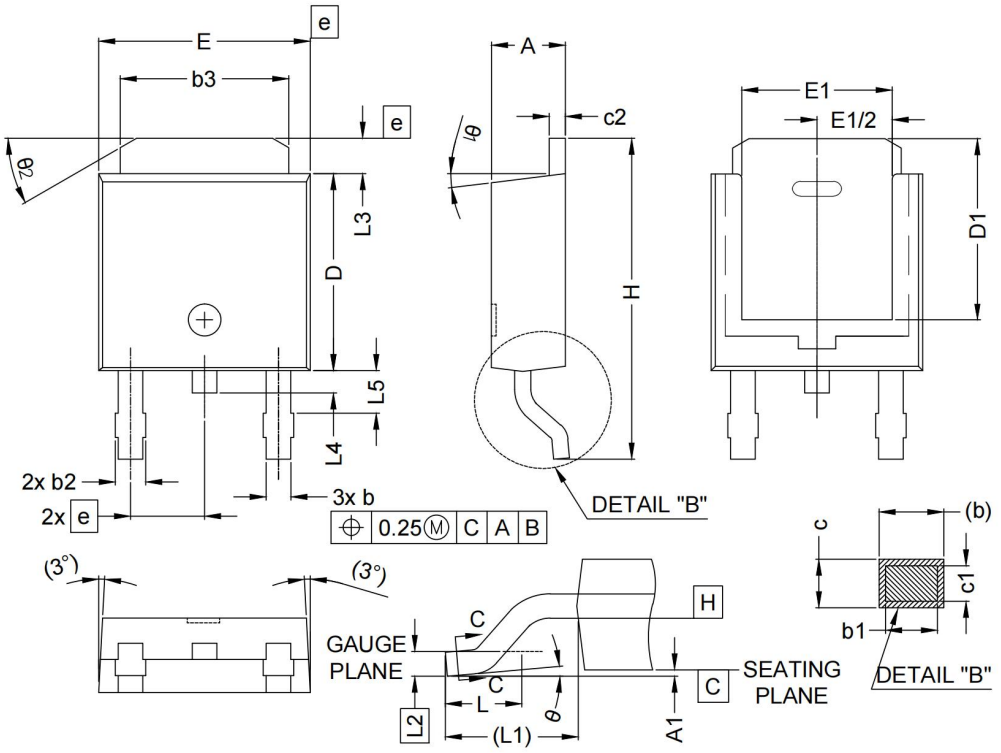


Figure 11 Normalized Maximum Transient Thermal Impedance

TO-252-2 Package Information



SYMBOL	MIN.	MAX.	SYMBOL	MIN.	MAX.	SYMBOL	MIN.	MAX.
A	2.18	2.39	E	6.35	6.73	θ1	0°	15°
A1	-	0.13	E1	4.32	-	θ2	25°	35°
b	0.65	0.89	e	2.29 BSC				
b1	0.64	0.79	H	9.94	10.34			
b2	0.76	1.13	L	1.50	1.78			
b3	4.95	5.46	L1	2.74 REF				
c	0.46	0.61	L2	0.51 BSC				
c1	0.41	0.56	L3	0.89	1.27			
c2	0.46	0.60	L4	-	1.02			
D	5.97	6.22	L5	1.14	1.49			
D1	5.21	-	θ	0°	10°			

NOTE ; 1.0 DIMENSIONING & TOLERANCEING CONFIRM TO ASME Y14.5M-1994.
2.0 ALL DIMENSIONS ARE IN MILLIMETERS. ANGLES ARE IN DEGREES.
3.0 HEAT SINK SIDE FLASH IS MAX. 0.8mm.
4.0 RADIUS ON TERMINAL IS OPTIONAL.

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.

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