XPX0075N03RD

30V N-Channel Super Trench Power MOSFET

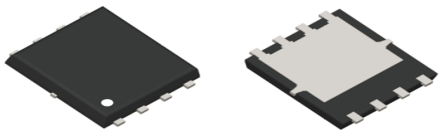
Description

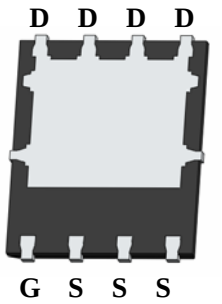
The XPX0075N03RD uses **Super Trench** technology that is uniquely optimized to provide the most efficient high frequency switching performance. Both conduction and switching power losses are minimized due to an extremely low combination of $R_{DS(ON)}$ and Q_g. This device is ideal for high-frequency switching and synchronous rectification.

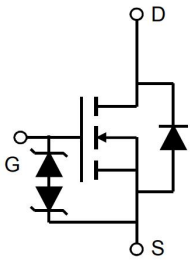
V_{DS} =30V,I_D =230A

$R_{DS(ON)}$=0.75mΩ (typ) @ V_{GS}=10V

$R_{DS(ON)}$=1.2mΩ (typ) @ V_{GS}=4.5V







General Features

- Excellent gate charge x $R_{DS(on)}$ product(FOM)
- Very low on-resistance $R_{DS(on)}$
- 150 °C operating temperature
- Pb-free lead plating
- 100% UIS tested

Application

- DC/DC Converter
- Ideal for high-frequency switching and synchronous rectification

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
XPX0075N03RD	XPX0075N03RD	DFN5X6-8L	-	-	-

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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous **(Silicon Limited)**	I_D	230	A
Drain Current-Continuous(T_C=100℃)	I_D (100℃)	185	A
Pulsed Drain Current **(Package Limited)**	I_{DM}	400	A
Maximum Power Dissipation	P_D	95	W
Derating factor		0.65	W/℃
Single pulse avalanche energy (Note 5)	E_{AS}	420	mJ
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55 To 150	℃
Thermal Resistance,Junction-to-Case (Note 2)	$R_{\theta JC}$	1.5	℃/W

Specifications T_J = 25ºC, unless otherwise noted

Parameter	Symbol	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
Static Parameters						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	30	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 30V, V_{GS} = 0V	--	--	1	μA
Gate-Source Leakage	I_{GSS}	V_{GS} = ±18V	--	--	±50	uA
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	1	1.5	2.5	V
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 30A	--	0.75	0.95	mΩ
		V_{GS} = 4.5V, I_D = 30A	--	1.2	1.6	
Forward Transconductance	g_{FS}	V_{GS} = 5V, I_D = 30A	--	35	--	S
Dynamic Parameters						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 15V, f = 1.0MHz	--	6605	--	pF
Output Capacitance	C_{oss}		--	2218	--	
Reverse Transfer Capacitance	C_{rss}		--	572	--	
Total Gate Charge	Q_g	V_{DD} = 15V, I_D = 30A, V_{GS} = 10V	--	98	--	nC
Gate-Source Charge	Q_{gs}		--	16	--	
Gate-Drain Charge	Q_{gd}		--	11	--	
Turn-on Delay Time	$t_{d(on)}$	V_{DD} = 15V, I_D = 30A, R_G = 1.6Ω	--	13	--	ns
Turn-on Rise Time	t_r		--	7.5	--	
Turn-off Delay Time	$t_{d(off)}$		--	51	--	
Turn-off Fall Time	t_f		--	8.6	--	
Drain-Source Body Diode Characteristics						
Continuous Body Diode Current	I_S	T_C = 25ºC	--	--	230	A
Body Diode Voltage	V_{SD}	T_J = 25ºC, I_{SD} = 30A, V_{GS} = 0V	--	--	1.2	V
Reverse Recovery Charge	Qrr	I_F = 30A, V_{GS} = 0V di/dt=100A/us	--	112	--	nC
Reverse Recovery Time	Trr		--	32	--	ns

Notes

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. EAS condition : Tj=25℃ ,VDD=30V,VGS=10V,L=0.5mH,Rg=25Ω
3. Identical low side and high side switch with identical R_G

Typical Characteristics T_J = 25ºC, unless otherwise noted

Figure 1. Output Characteristics

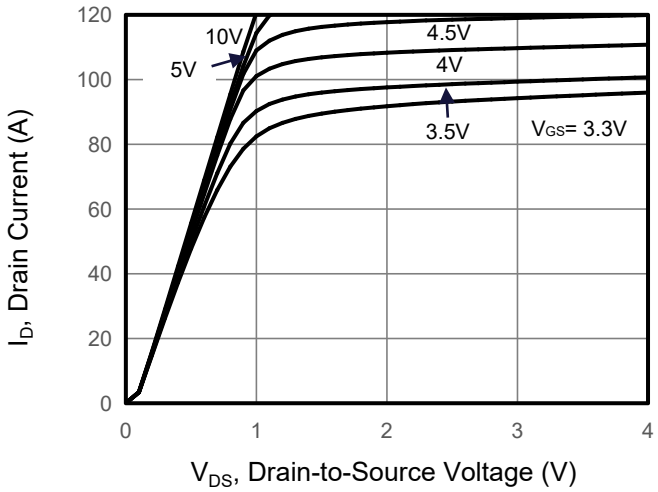


Figure 2. Transfer Characteristics

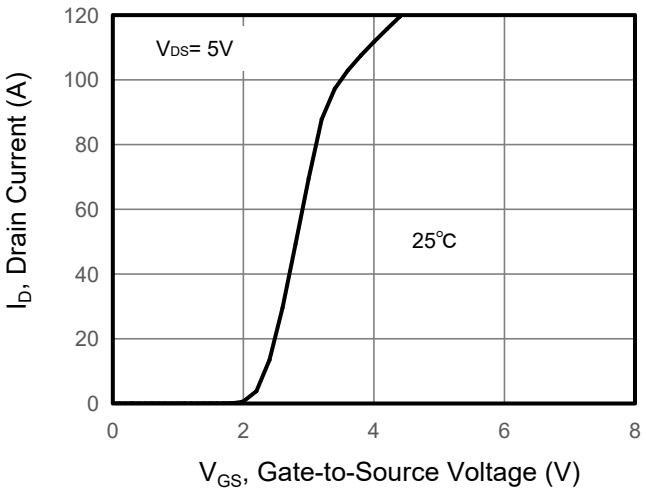


Figure 3. Drain Source On Resistance

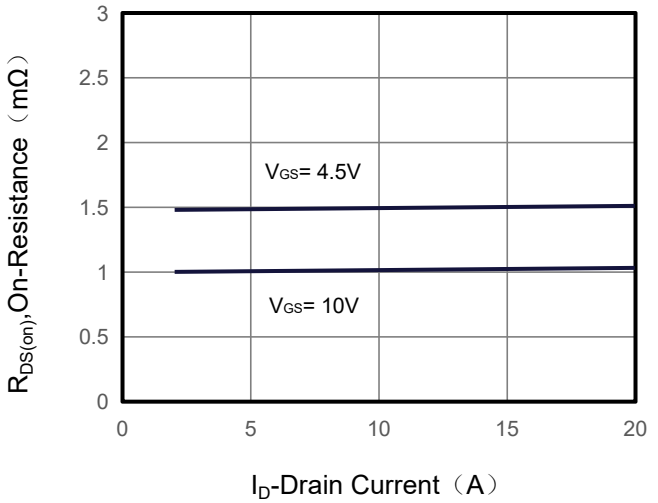


Figure 4. Gate Charge

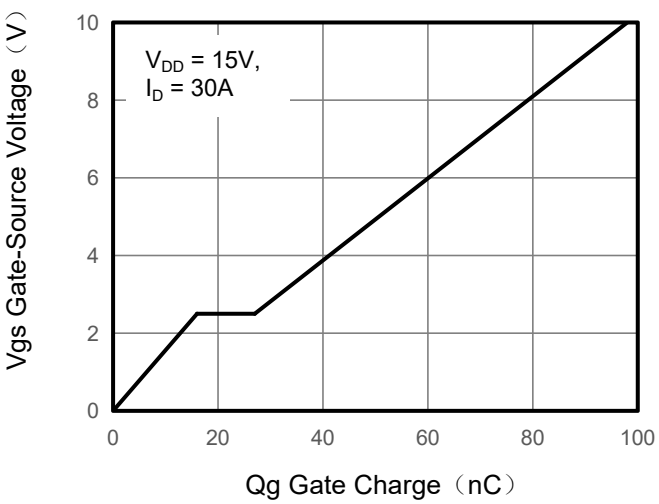


Figure 5. Capacitance

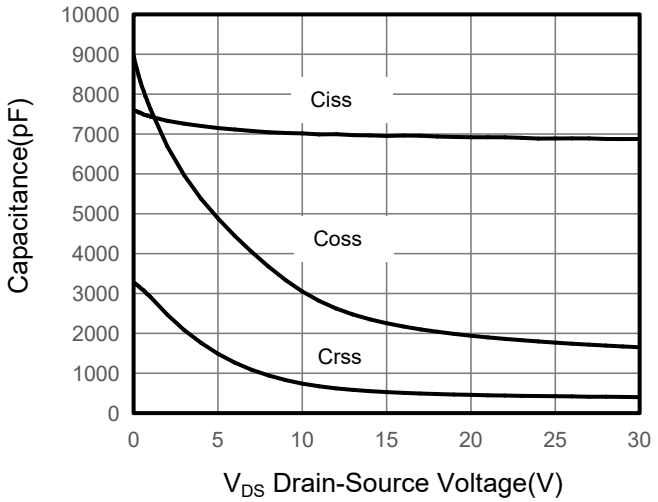
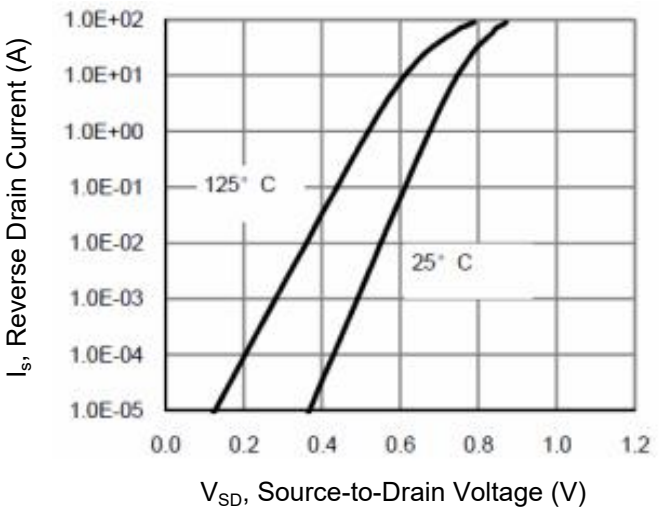


Figure 6. Source-Drain Diode Forward



Typical Characteristics T_J = 25ºC, unless otherwise noted

Figure 7. Drain-Source On-Resistance

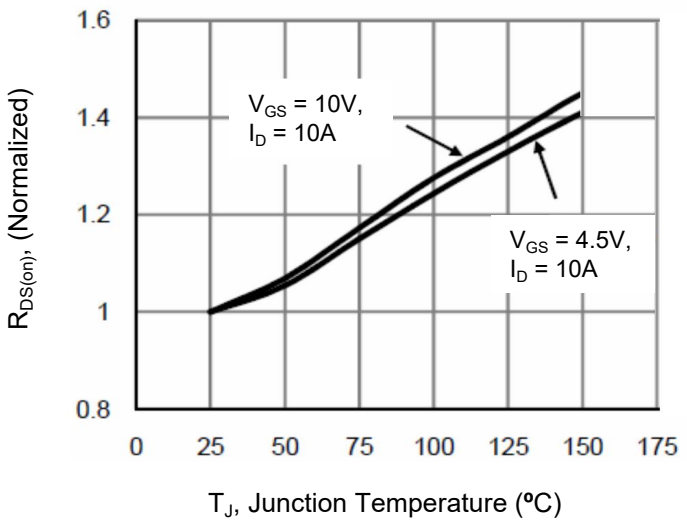


Figure 8. Safe Operation Area

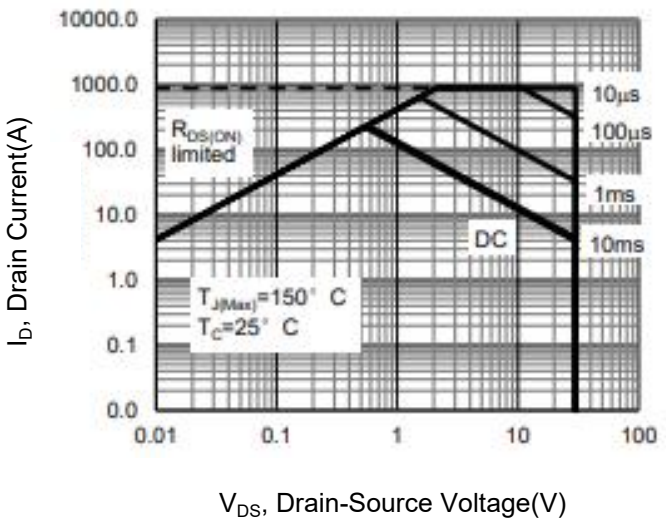
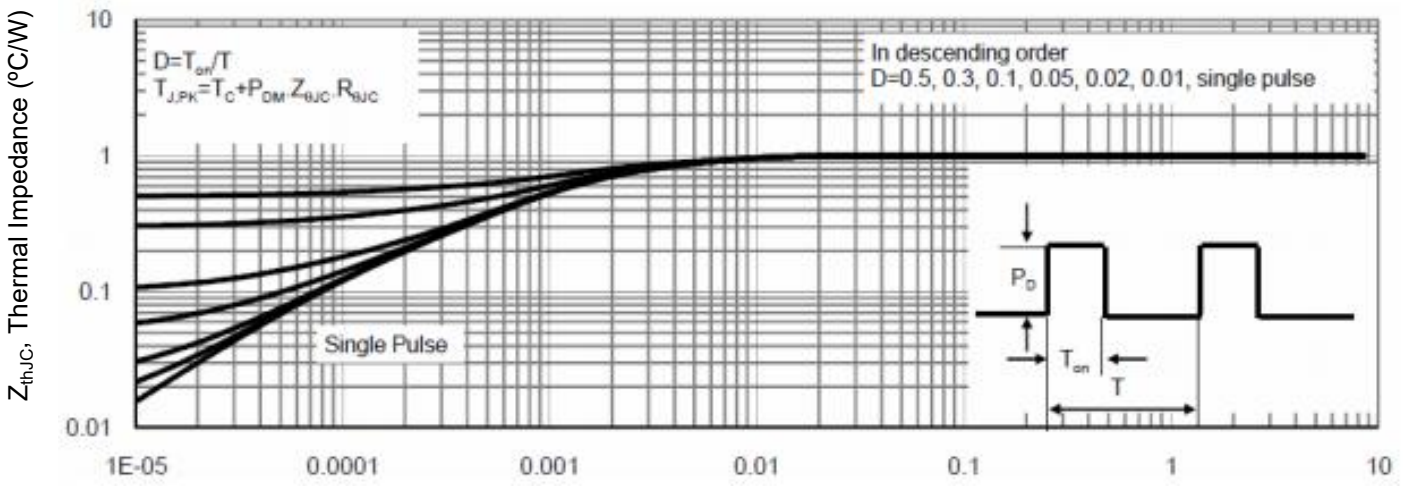
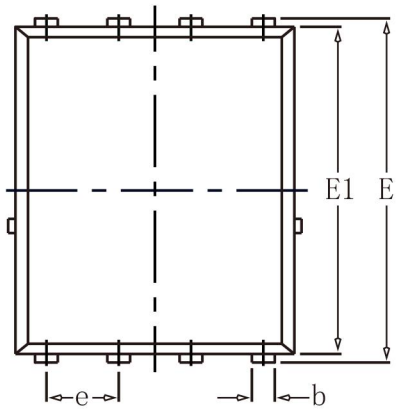
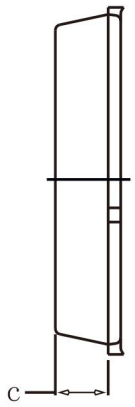


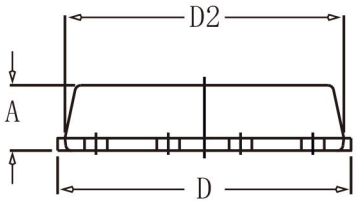
Figure 9. Normalized Maximum Transient Thermal Impedance

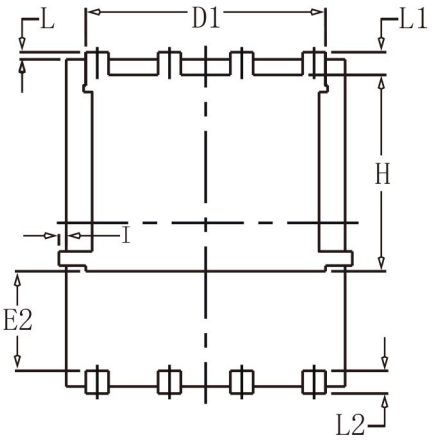


DFN5X6-8L Package Information









SYMBOL	COMMON			
	MM		INCH	
	MIN	MAX	MIN	MAX
A	1.03	1.17	0.0406	0.0461
b	0.34	0.48	0.0134	0.0189
c	0.824	0.970	0.0324	0.0382
D	4.80	5.40	0.1890	0.2126
D1	4.11	4.31	0.1618	0.1697
D2	4.80	5.00	0.1890	0.1969
E	5.59	6.15	0.2343	0.2421
E1	5.65	5.85	0.2224	0.2303
E2	1.60	–	0.0630	–
e	1.27 BSC		0.05 BSC	
L	0.05	0.25	0.0020	0.0098
L1	0.38	0.50	0.0150	0.0197
L2	0.38	0.50	0.0150	0.0197
H	3.30	3.50	0.1299	0.1378
I	–	0.18	–	0.0070

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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