

■ PRODUCT CHARACTERISTICS

VDSS	40V
$R_{DS(on)Typ}(V_{GS}=10V)$	4.2mΩ
$R_{DS(on)Typ}(V_{GS}=4.5V)$	6.5mΩ
ID	90A

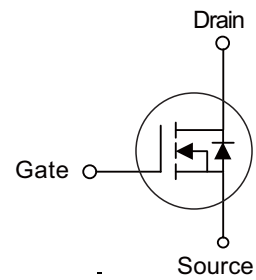
■ APPLICATIONS

- Load switching
- Hard switched and high frequency circuits
- Uninterruptible power supply

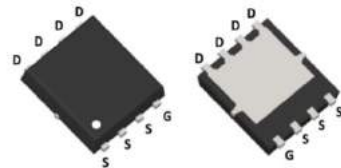
■ FEATURES

- High density cell design for ultra low Rdson
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high EAS
- Excellent package for good heat dissipation
- Special process technology for high ESD capability

Symbol



PDFN3X3-8L



■ ABSOLUTE MAXIMUM RATINGS (T_J=25°C Unless Otherwise Noted)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V _{DS}	40	V
Gate-Source Voltage	V _{GS}	±20	V
Drain Current-Continuous	I _D	90	A
Drain Current-Continuous(T _C =100°C)	I _D (100°C)	63.5	A
Pulsed Drain Current	I _{DM}	330	A
Maximum Power Dissipation	P _D	65	W
Derating factor		0.43	W/°C
Operating Junction and Storage Temperature Range	T _J , T _{STG}	-55 To 175	°C

■ THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to-Case ^(Note 2)	R _{θJC}	2.3	°C/W
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■ ELECTRICAL CHARACTERISTICS (T_c=25°C unless otherwise specified)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	40	45	-	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 ^(Note 3)						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1.2	1.9	2.5	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =20A	-	4.2	6.0	mΩ
		V _{GS} =4.5V, I _D =10A	-	6.5	8.0	
Forward Transconductance	g _{FS}	V _{DS} =10V, I _D =20A	26	-	-	S
Dynamic characteristics ^(Note 4)						
Input Capacitance	C _{iss}	V _{DS} =20V, V _{GS} =0V, F=1.0MHz	4600	5000	5400	PF
Output Capacitance	C _{oss}		826	898	970	PF
Reverse Transfer Capacitance	C _{rss}		324	351	380	PF
Switching characteristics ^(Note 4)						
Turn-on Delay Time	t _{d(on)}	V _{DD} =20V, I _D =20A, R _L =1Ω V _{GS} =10V, R _G =3Ω	-	15	-	nS
Turn-on Rise Time	t _r		-	18	-	nS
Turn-Off Delay Time	t _{d(off)}		-	52	-	nS
Turn-Off Fall Time	t _f		-	23	-	nS
Total Gate Charge	Q _g	V _{DS} =20V, I _D =20A, V _{GS} =10V	-	90	-	nC
Gate-Source Charge	Q _{gs}		-	14	-	nC
Gate-Drain Charge	Q _{gd}		-	22	-	nC
Drain-source diode characteristics						
Diode Forward Voltage ^(Note 3)	V _{SD}	V _{GS} =0V, I _S =20A	-	-	1.2	V
Diode Forward Current ^(Note 2)	I _S		-	-	90	A
Reverse Recovery Time	t _{rr}	T _J = 25°C, I _F = 20A di/dt = 100A/μs ^(Note 3)	-	42	-	nS
Reverse Recovery Charge	Q _{rr}		-	45	-	nC
Forward Turn-On Time	t _{on}	Intrinsic turn-on time is negligible (turn-on is dominated by LS+LD)				

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

■ TYPICAL CHARACTERISTICS

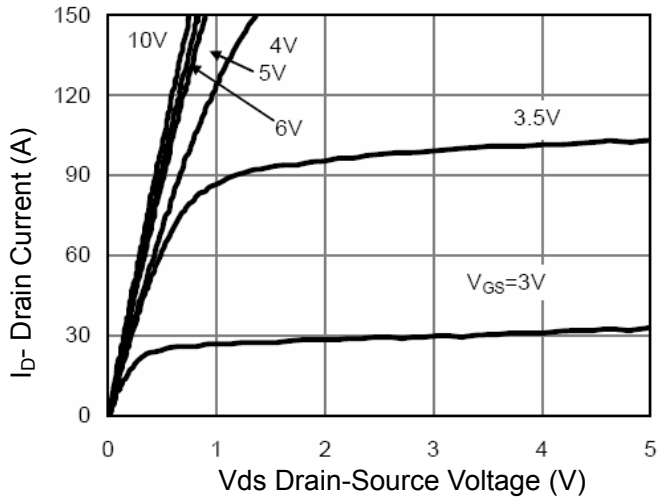


Figure 1 Output Characteristics

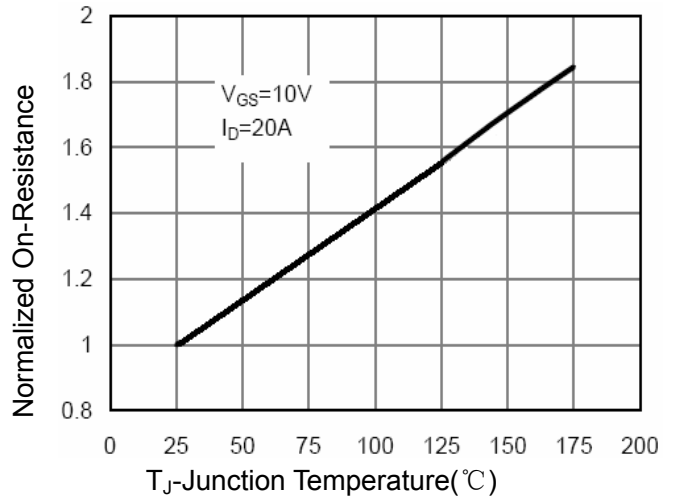


Figure 2 Rdson-Junction Temperature

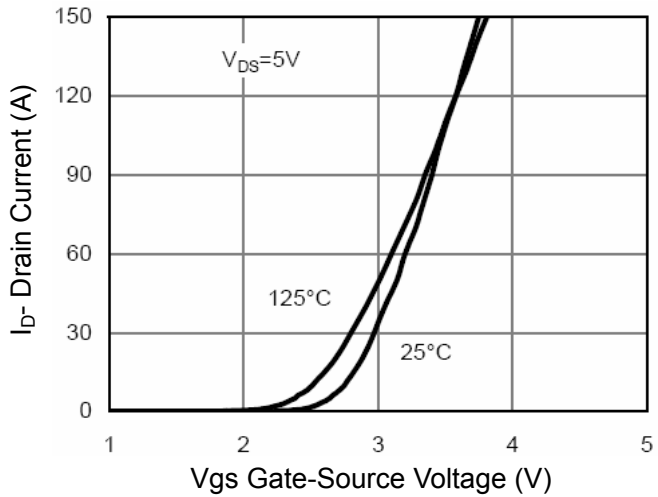


Figure 3 Transfer Characteristics

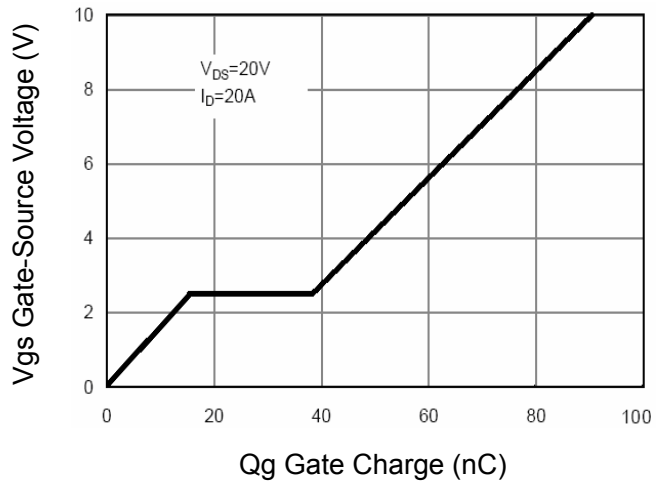


Figure 4 Gate Charge

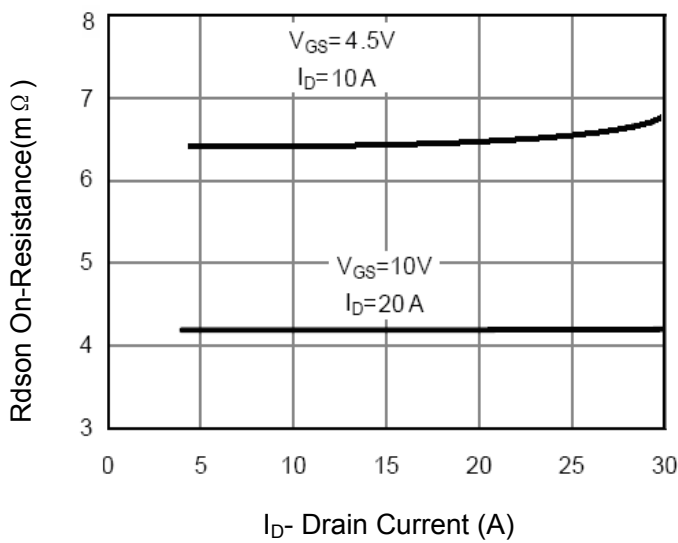


Figure 5 Rdson- Drain Current

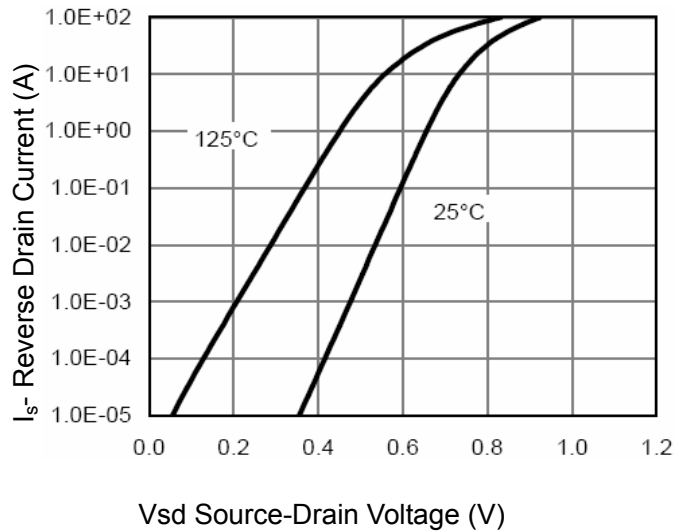


Figure 6 Source- Drain Diode Forward

■ TYPICAL CHARACTERISTICS

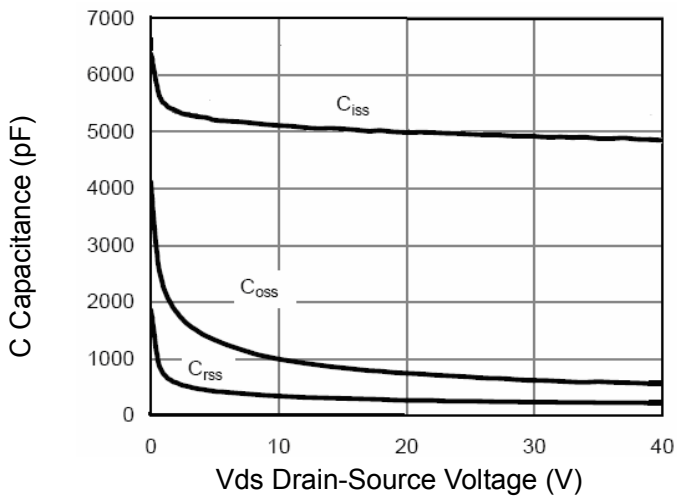


Figure 7 Capacitance vs Vds

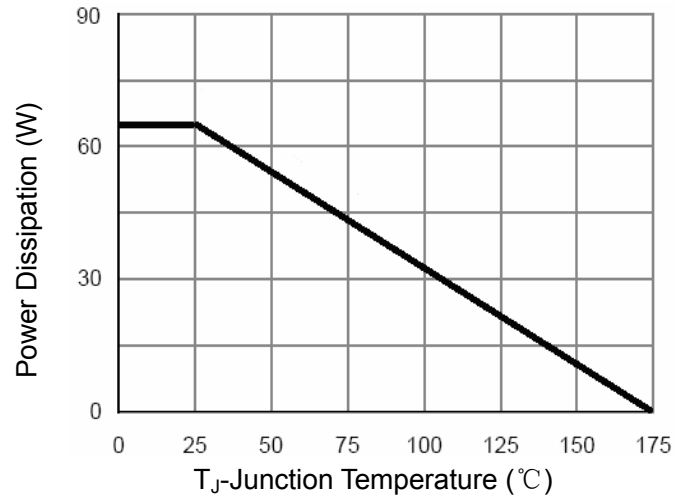


Figure 8 Power De-rating

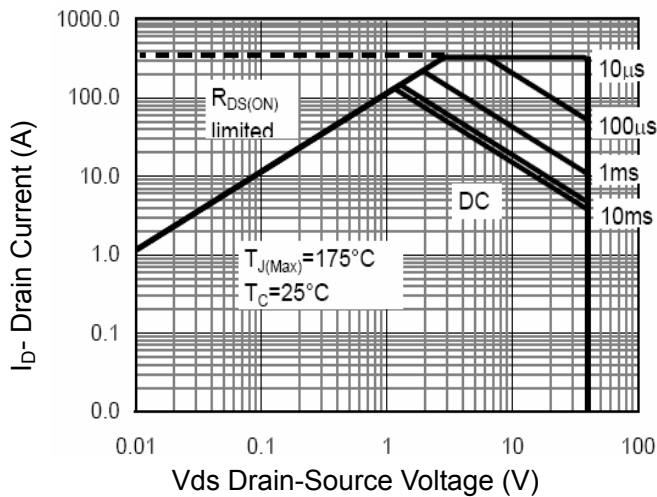


Figure 9 Safe Operation Area

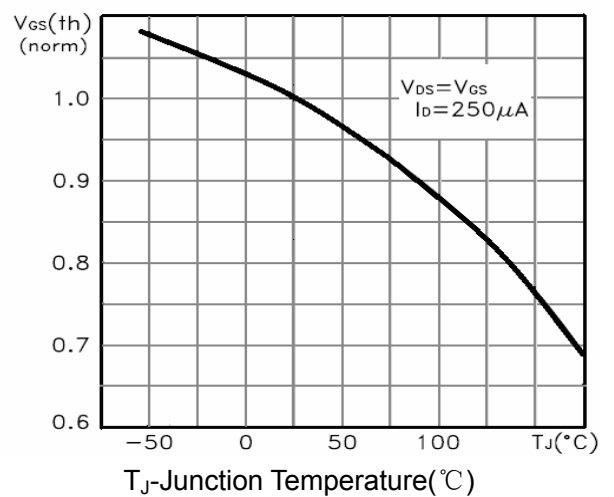


Figure 10 $V_{GS(th)}$ vs Junction Temperature

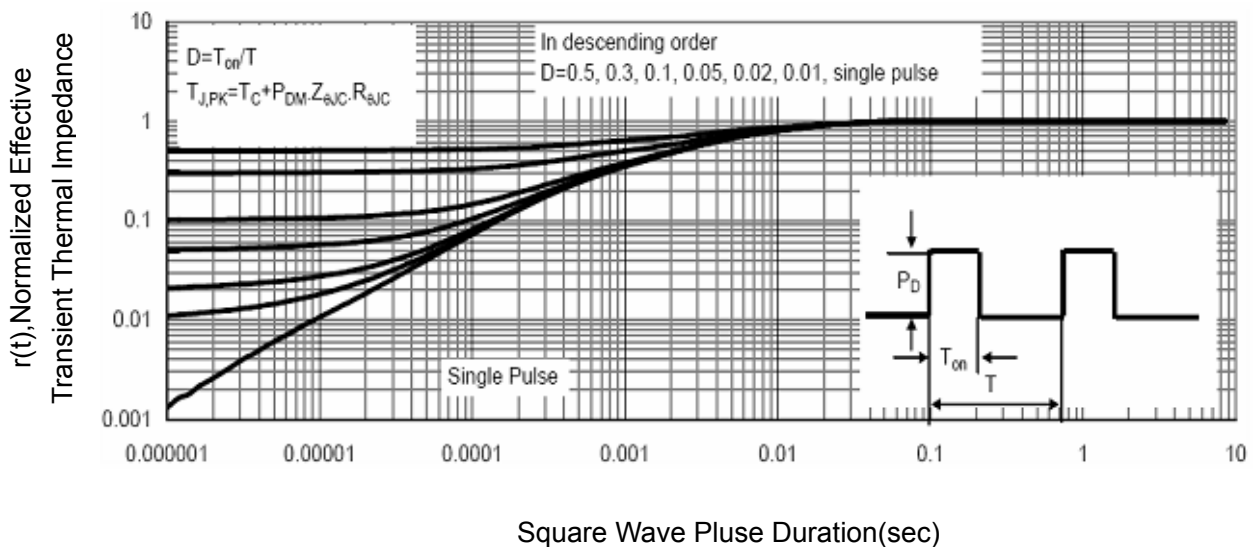
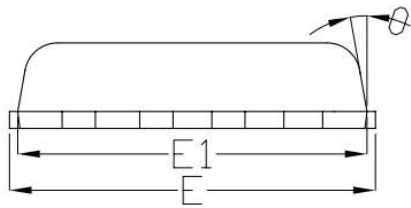
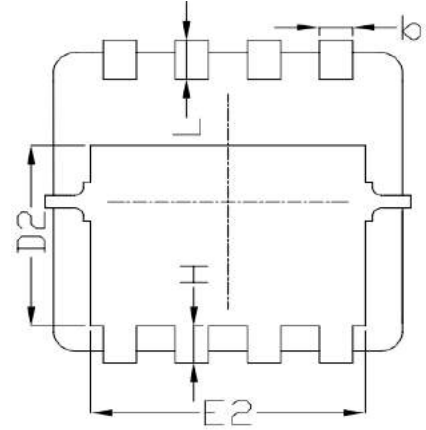
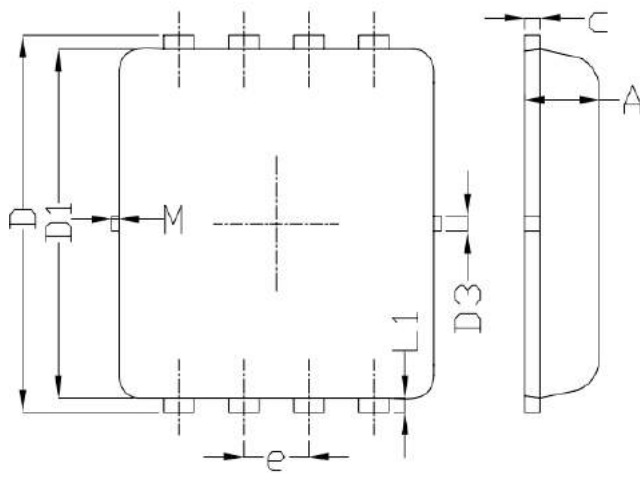
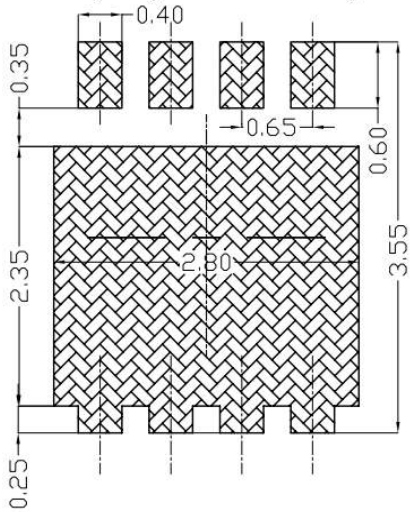


Figure 11 Normalized Maximum Transient Thermal Impedance

■ PDFN3X3-8L Package Mechanical Data



Land Pattern
(Only for Reference)



SYMBOL	DIMENSIONAL REOMTS		
	MIN	NOM	MAX
A	0.70	0.75	0.80
b	0.25	0.30	0.35
c	0.10	0.15	0.25
D	3.25	3.35	3.45
D1	3.00	3.10	3.20
D2	1.78	1.88	1.98
D3	---	0.13	---
E	3.20	3.30	3.40
E1	3.00	3.15	3.20
E2	2.39	2.49	2.59
e	0.65BSC		
H	0.30	0.39	0.50
L	0.30	0.40	0.50
L1	---	0.13	---
θ	---	10°	12°
M	*	*	0.15

* Not specified