

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
30V	3.5mΩ@10V	60A
	6mΩ@4.5V	

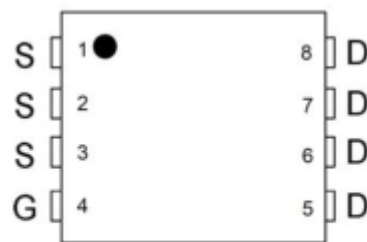
Feature

- $V_{DS} = 30V, I_D = 60A$
- $R_{DS(ON)}$ typ 3.5mΩ @ $V_{GS} = 10V$
- High density cell design for ultra low R_{dson}
- 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

Application

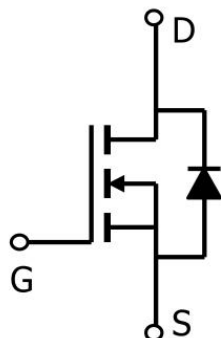
- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply

Package

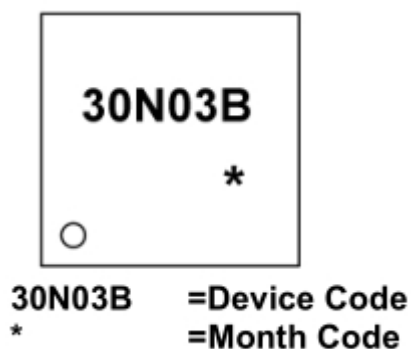


PDFN3X3-8L

Circuit diagram



Marking



Absolute maximum ratings

(T_a=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain source voltage	V _{DS}	30	V
Gate source voltage	V _{GS}	±20	V
Drain Current-Continuous (TC=25°C)	I _D	60	A
Pulsed drain current	I _{DM}	240	A
Maximum Power Dissipation (TC=25°C)	P _D	36	W
Single pulsed avalanche energy ^(Note 5)	E _{AS}	66	mJ
Thermal resistance, junction-case ^(Note 2)	R _{θJC}	3.4	°C/W
Operation and storage temperature	T _{STG} , T _J	-55 to 150	°C

Electrical characteristics

(T_A=25°C, unless otherwise noted)

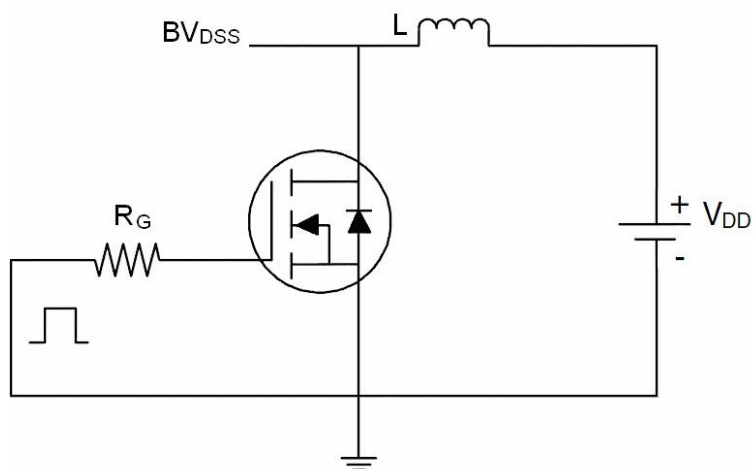
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Off Characteristics						
Drain-source breakdown voltage	BV (BR)DSS	V _{GS} = 0V, I _D =250μA	30			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =30V,V _{GS} = 0V			1	uA
Gate-body leakage current	I _{GSS}	V _{GS} = ±20V , V _{DS} =0V			±100	uA
On Characteristics ^(Note 3)						
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 =20A		3.5	4.5	mΩ
		V _{GS} =4.5V, I _D =15A		6	8	
Dynamic Characteristics ^(Note4)						
Input Capacitance	C _{iss}	V _{DS} =15V, V _{GS} =0V, f=1MHz		3600		pF
Output Capacitance	C _{OSS}			380		
Reverse Transfer Capacitance	C _{rss}			290		
Switching Characteristics ^(Note 4)						
Turn-On Delay Time	T _{d(on)}	V _{DD} =15V, I _D =20A, V _{DS} =10V, R _{GEN} =3Ω		12		nS
Rise Time	T _r			15		
Turn-Off Delay Time	T _{d(off)}			40		
Fall Time	T _f			14		
Total Gate Charge	Q _g	V _{DS} =15V, I _D =45A, V _{GS} =10V		60		pF
Gate-Source Charge	Q _{gs}			8.2		
Gate-Drain Charge	Q _{gd}			16.4		
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		29		nS
Reverse Recovery Charge	Q _{rr}	di/dt = 100A/μs ^(Note3)		32		nC

Note:

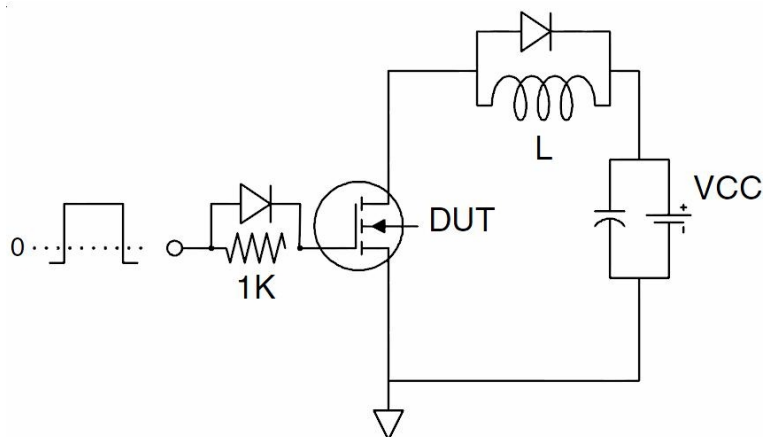
1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production
5. EAS condition: T_J=25°C, V_{DD}=27V, V_G=10V, L=0.3mH, R_G=25Ω, I_{AS} =21A;

Test Circuit

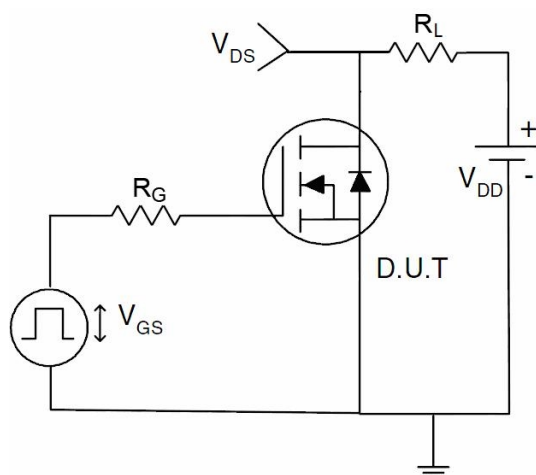
- EAS Test Circuits



- Gate Charge Test Circuit



- Switch Time Test Circuit



Typical Characteristics

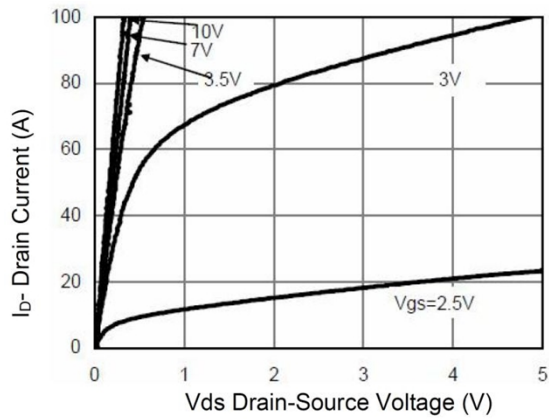


Figure 1 Output Characteristics

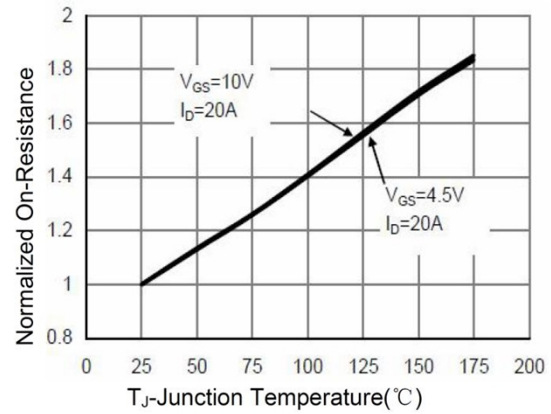


Figure 4 Rdson-Junction Temperature

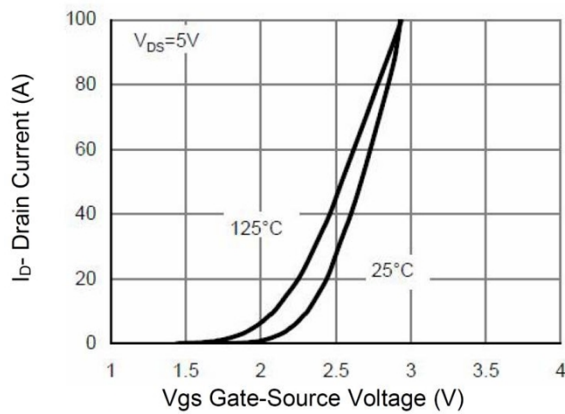


Figure 2 Transfer Characteristics

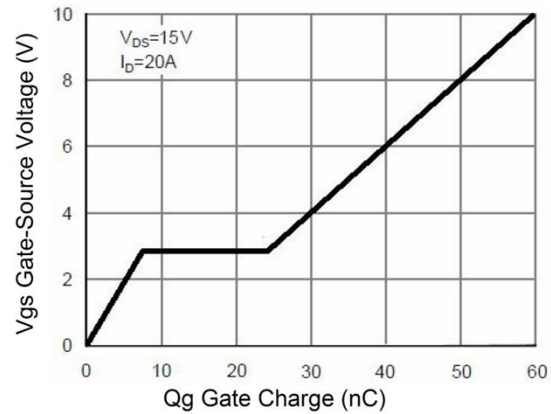


Figure 5 Gate Charge

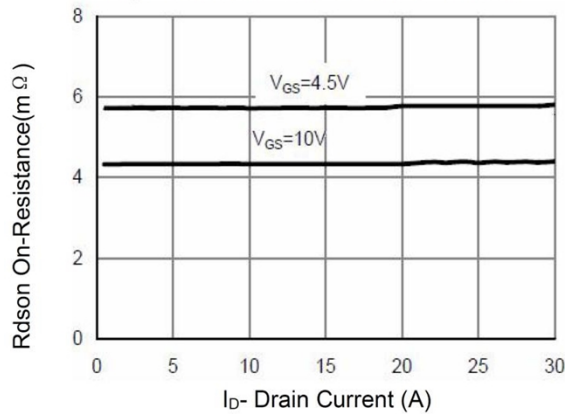


Figure 3 Rdson- Drain Current

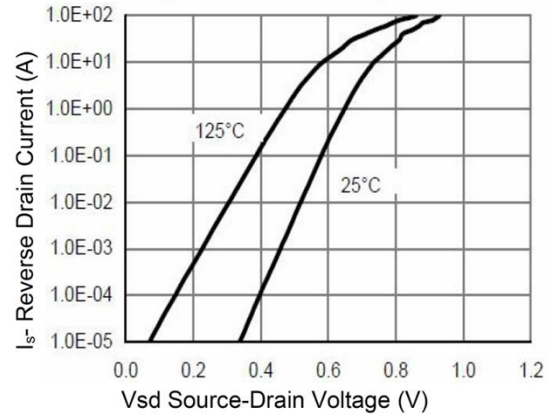


Figure 6 Source- Drain Diode Forward

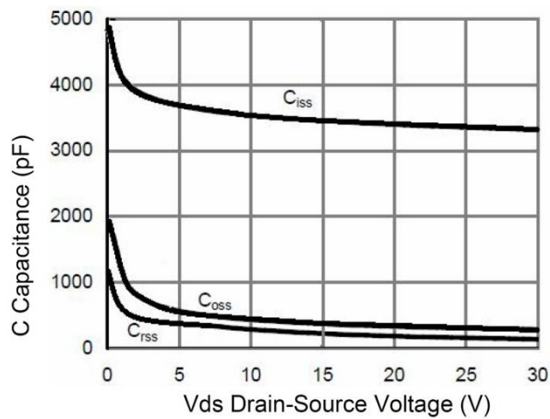


Figure 7 Capacitance vs Vds

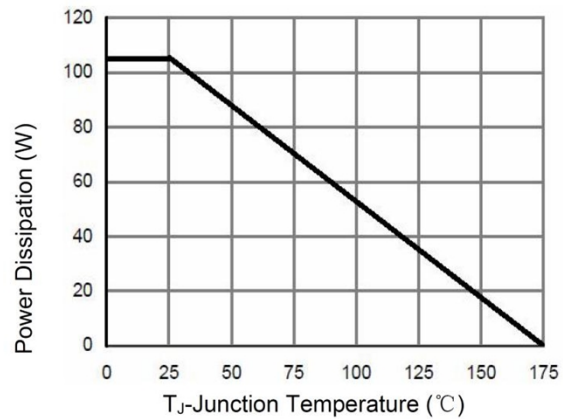


Figure 9 Power De-rating

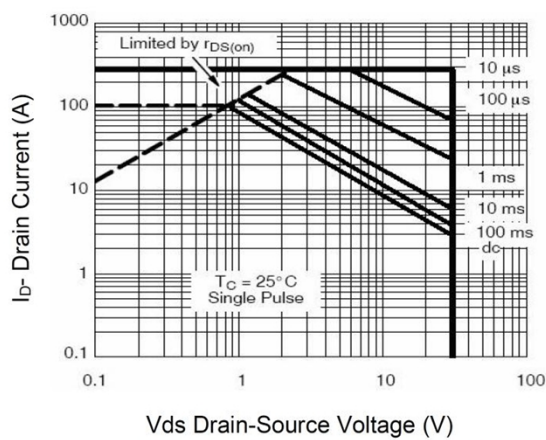


Figure 8 Safe Operation Area

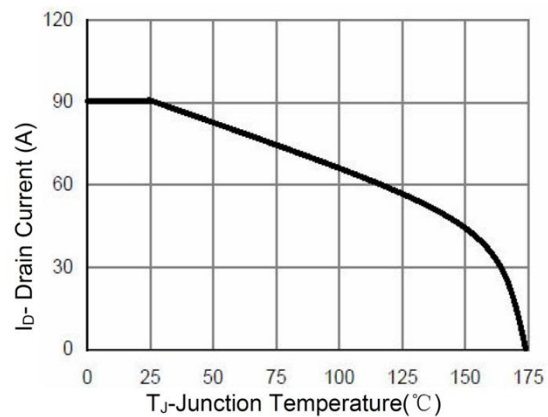


Figure 10 ID Current Derating

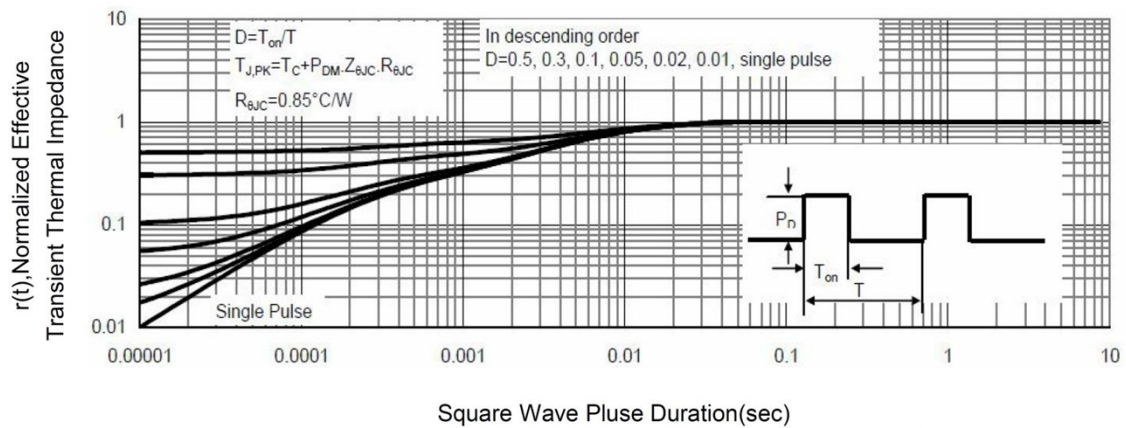
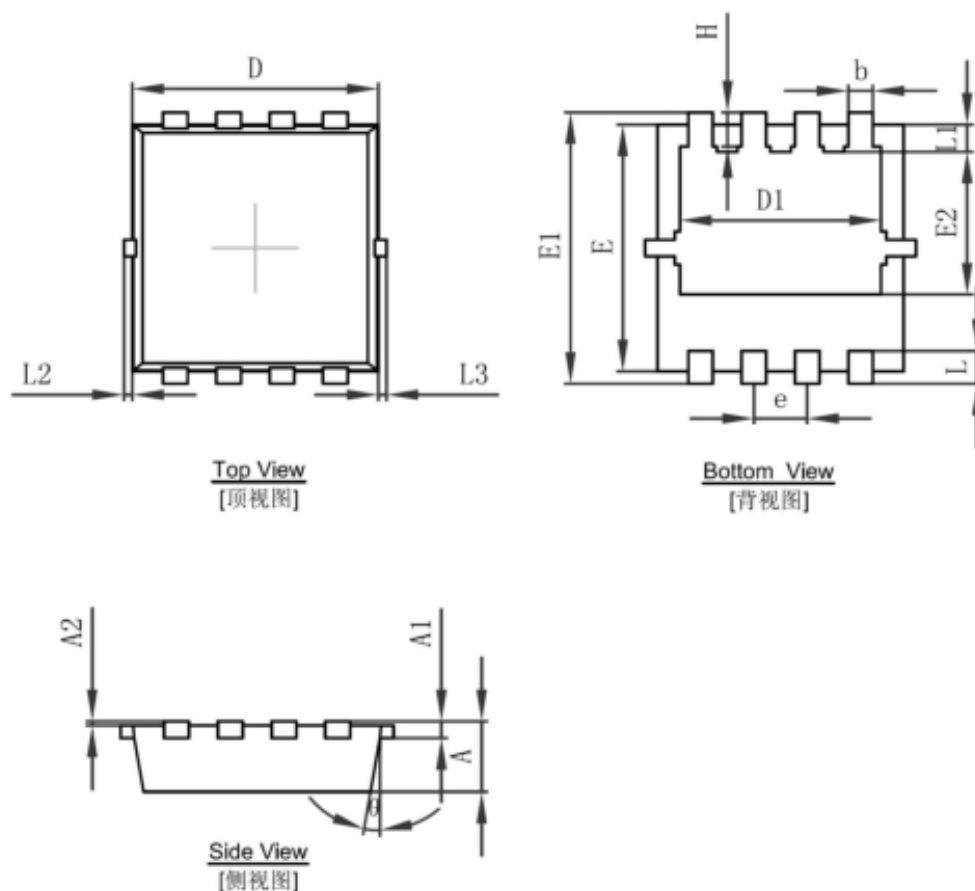


Figure 11 Normalized Maximum Transient Thermal Impedance

PDFN3X3-8L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.650	0.850	0.026	0.033
A1	0.152 REF.		0.006 REF.	
A2	0~0.05		0~0.002	
D	2.900	3.100	0.114	0.122
D1	2.300	2.600	0.091	0.102
E	2.900	3.100	0.114	0.122
E1	3.150	3.450	0.124	0.136
E2	1.535	1.935	0.060	0.076
b	0.200	0.400	0.008	0.016
e	0.550	0.750	0.022	0.030
L	0.300	0.500	0.012	0.020
L1	0.180	0.480	0.007	0.019
L2	0~0.100		0~0.004	
L3	0~0.100		0~0.004	
H	0.315	0.515	0.012	0.020
θ	9°	13°	9°	13°