

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
30V	3mΩ@10V	90A
	6.4mΩ@4.5V	

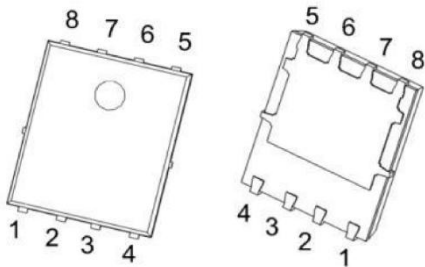
Feature

- High density cell design for ultra low Rdson
- Good stability and uniformity with high EAS
- Excellent package for good heat dissipation

Application

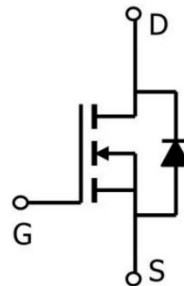
- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply

Package

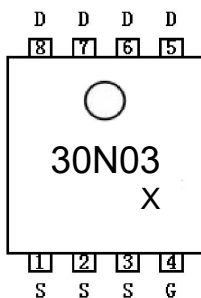


PDFN5X6-8L

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
Continuous Drain Current (T _C =25°C)	I _D	90	A
Pulsed Drain Current	I _{DM}	360	A
Power Dissipation (T _C =25°C)	P _D	92	W
Single pulse avalanche energy ⁴⁾	E _{AS}	66	mJ
Thermal Resistance, Junction-to-Case ¹⁾	R _{θJC}	1.36	°C/W
Junction Temperature	T _J	150	°C
Storage Temperature	T _{STG}	-55 ~ +150	°C

Electrical characteristics (T_A=25°C unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
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-body leakage current	I _{GSS}	V _{GS} = ±20V, V _{DS} = 0V			±100	nA
Gate threshold voltage ²⁾	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	1.0	1.9	2.5	V
Drain-source on-resistance ²⁾	R _{DS(on)}	V _{GS} = 10V, I _D = 20A		2.4	3.0	mΩ
		V _{GS} = 4.5V, I _D = 15A		4.8	6.4	
Dynamic characteristics³⁾						
Input Capacitance	C _{iss}	V _{DS} = 15V, V _{GS} = 0V, f = 1MHz		2560		pF
Output Capacitance	C _{oss}			267		
Reverse Transfer Capacitance	C _{rss}			210		
Total Gate Charge	Q _g	V _{DS} = 15V, V _{GS} = 10V, I _D = 45A		60		nC
Gate-Source Charge	Q _{gs}			8.2		
Gate-Drain Charge	Q _{gd}			16.4		
Turn-on delay time	t _{d(on)}	V _{DD} = 15V, V _{GS} = 10V, R _{GEN} = 3Ω, I _D = 20A		12		nS
Turn-on rise time	t _r			15		
Turn-off delay time	t _{d(off)}			40		
Turn-off fall time	t _f			14		
Source-Drain Diode characteristics						
Diode Forward Current ¹⁾	I _S				45	A
Diode Forward voltage ²⁾	V _{SD}	V _{GS} = 0V, I _S = 20A			1.2	V
Reverse Recovery Time	t _{rr}	I _F = 20A, T _J = 25°C, di/dt = 100A/μS ²⁾		29		nS
Reverse Recovery Charge	Q _{rr}			32		nC

Notes:

- 1) Surface Mounted on FR4 Board, t ≤ 10 sec.
- 2) Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%
- 3) Guaranteed by design, not subject to production
- 4) EAS condition: T_J = 25°C, V_{DD} = 27V, V_G = 10V, L = 0.3mH, R_g = 25Ω, I_{as} = 21A

Typical Characteristics

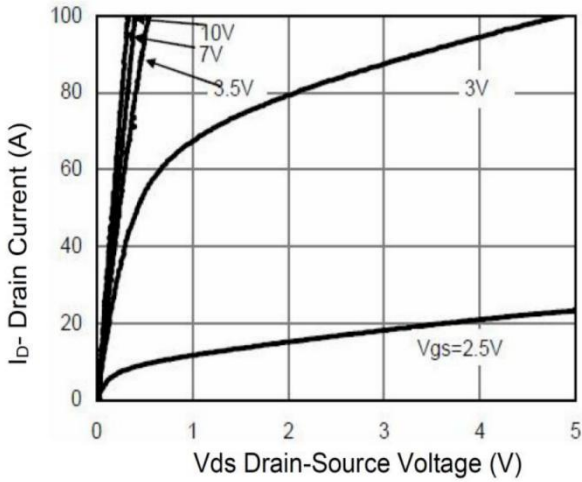


Figure 1 Output Characteristics

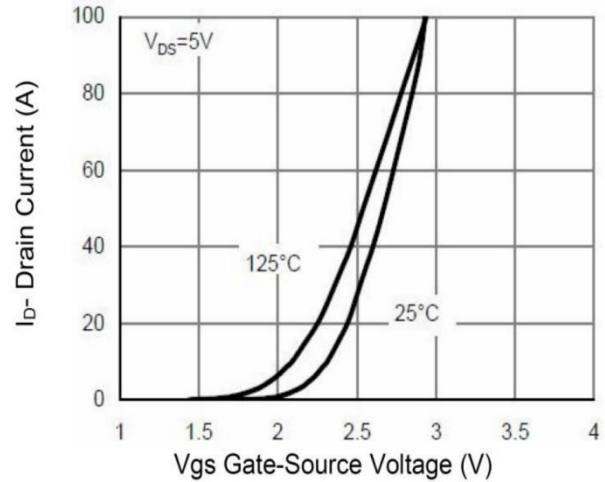


Figure 2 Transfer Characteristics

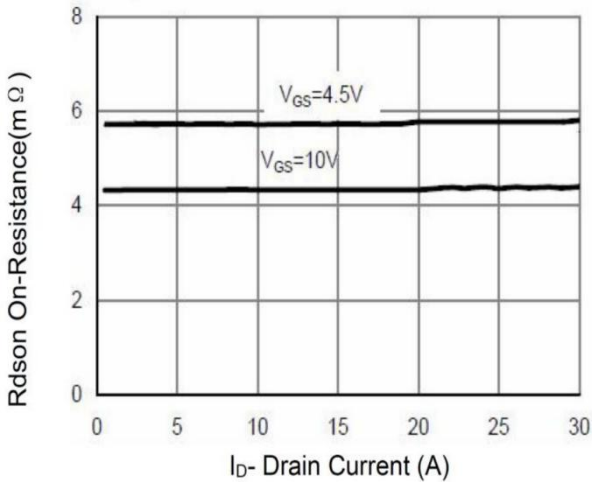


Figure 3 Rdson- Drain Current

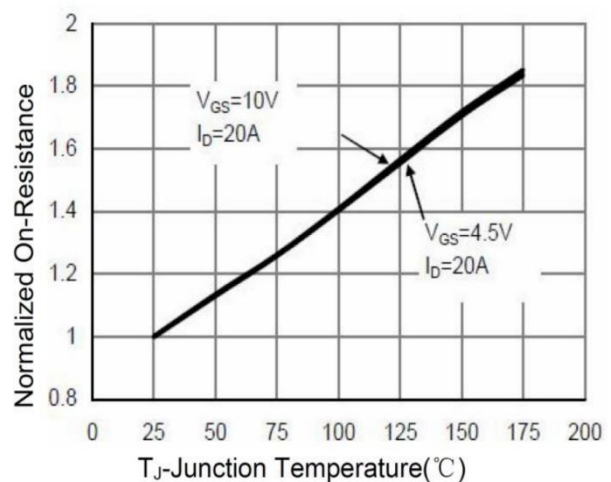


Figure 4 Rdson-Junction Temperature

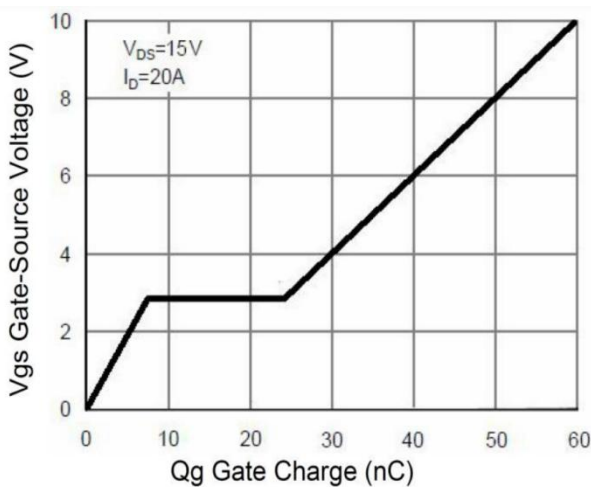


Figure 5 Gate Charge

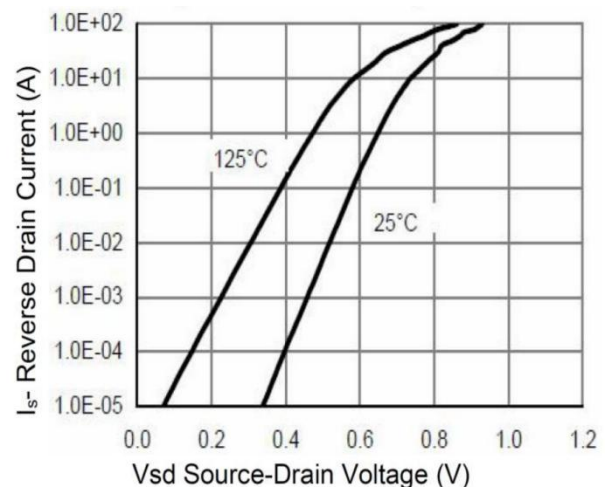


Figure 6 Source- Drain Diode Forward

Typical Characteristics

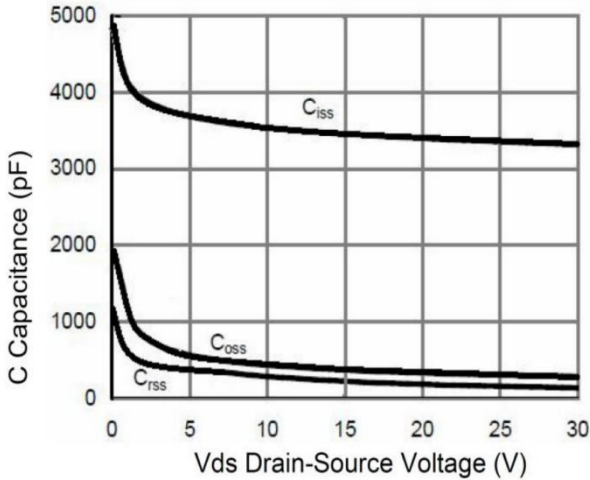


Figure 7 Capacitance vs Vds

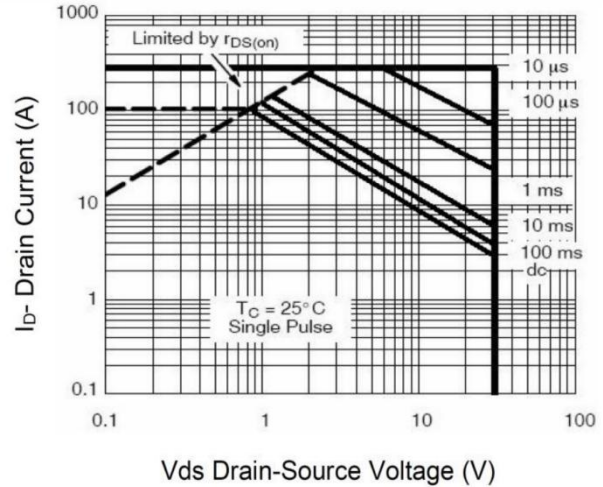


Figure 8 Safe Operation Area

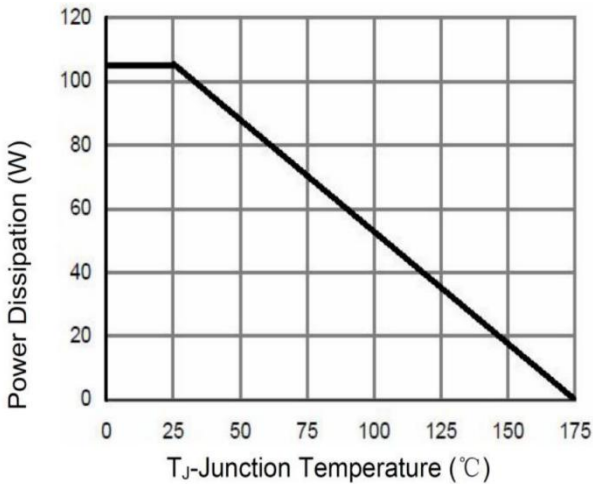


Figure 9 Power De-rating

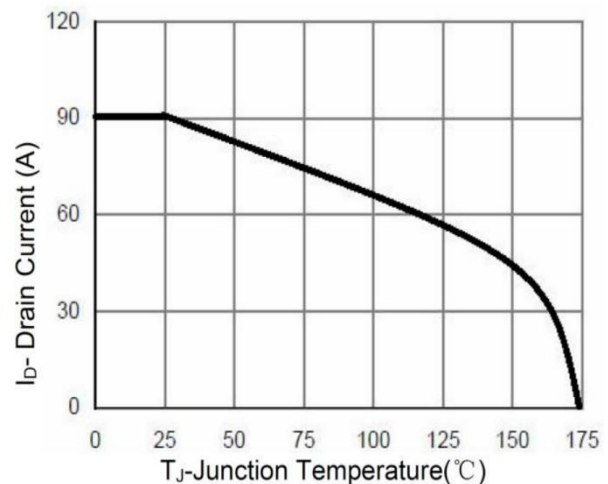


Figure 10 ID Current Derating

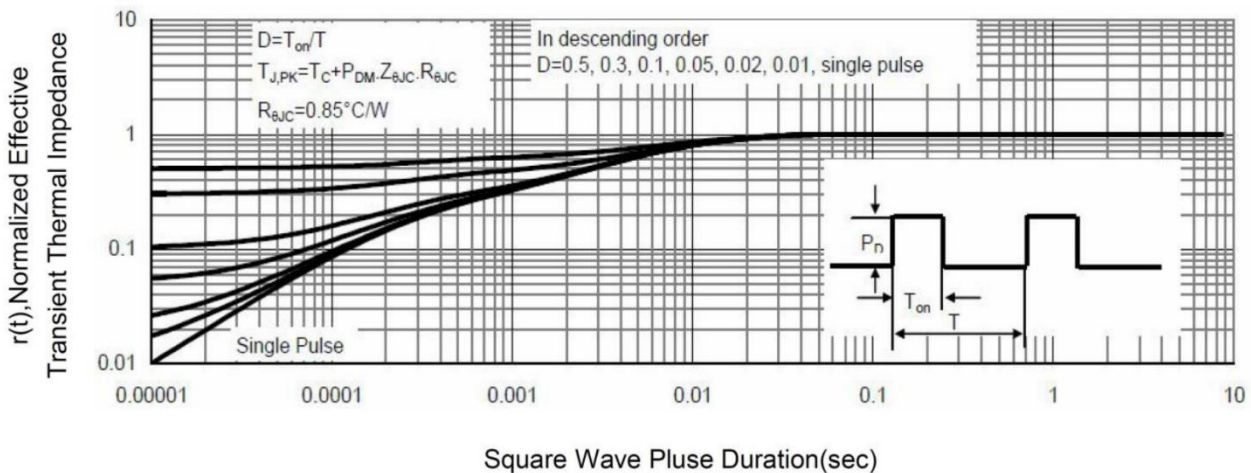
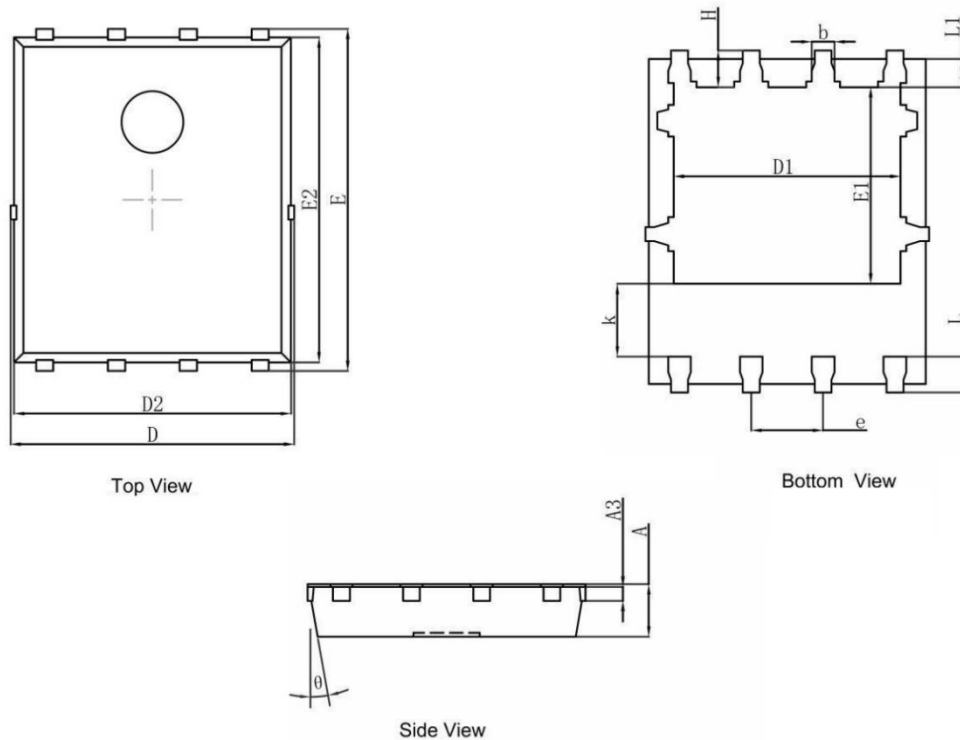


Figure 11 Normalized Maximum Transient Thermal Impedance

PDFN5X6-8L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.000	0.035	0.039
A3	0.254REF.		0.010REF.	
D	4.944	5.096	0.195	0.201
E	5.974	6.126	0.235	0.241
D1	3.910	4.110	0.154	0.162
E1	3.375	3.575	0.133	0.141
D2	4.824	4.976	0.190	0.196
E2	5.674	5.826	0.223	0.229
k	1.190	1.390	0.047	0.055
b	0.350	0.450	0.014	0.018
e	1.270TYP.		0.050TYP.	
L	0.559	0.711	0.022	0.028
L1	0.424	0.576	0.017	0.023
H	0.574	0.726	0.023	0.029
θ	10°	12°	10°	12°