

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
60V	11mΩ@10V	48A
	14.5mΩ@4.5V	

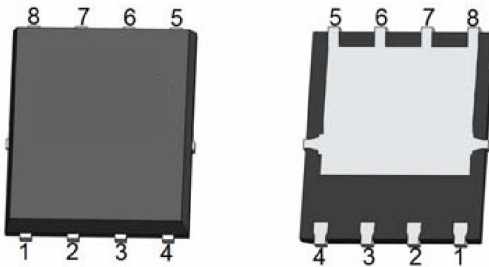
Feature

- Excellent gate charge x $R_{DS(on)}$ product(FOM)
- Very low on-resistance $R_{DS(on)}$

Application

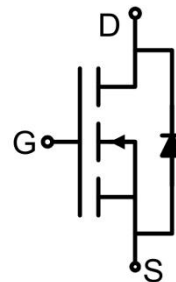
- DC/DC converters
- Ideal for high-frequency switching and synchronous rectification
- Automotive application

Package

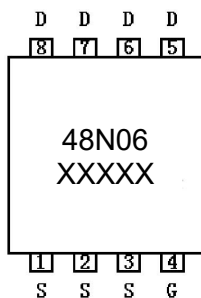


PDFN5X6-8L

Circuit diagram



Marking



Absolute maximum ratings (T_c=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V _{DS}	60	V
Gate-Source Voltage	V _{GS}	±20	V
Continuous Drain Current	I _D	48	A
Continuous Drain Current (T _c =100°C)	I _D	34	A
Pulsed Drain Current	I _{DM}	192	A
Power Dissipation	P _D	52	W
Thermal Resistance, Junction-to-Case	R _{θJC}	2.9	°C/W
Single pulse avalanche energy ¹⁾	E _{AS}	96	mJ
Junction Temperature	T _J	175	°C
Storage Temperature	T _{STG}	-55 ~ +175	°C

Electrical characteristics (T_c=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	60			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =60V, V _{GS} = 0V			1	μA
Gate-body leakage current	I _{GSS}	V _{GS} =±20V, V _{DS} = 0V			±100	nA
Gate threshold voltage ³⁾	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1.2	1.7	2.4	V
Drain-source on-resistance ³⁾	R _{DS(on)}	V _{GS} =10V, I _D =20A		9.8	11	mΩ
		V _{GS} =4.5V, I _D =20A		12.5	14.5	
Dynamic characteristics²⁾						
Input Capacitance	C _{iss}	V _{DS} =30V, V _{GS} =0V, f =1MHz		1040		pF
Output Capacitance	C _{oss}			156		
Reverse Transfer Capacitance	C _{rss}			14		
Total Gate Charge	Q _g	V _{DS} =30V, V _{GS} =10V, I _D =20A		22.6		nC
Gate-Source Charge	Q _{gs}			4.7		
Gate-Drain Charge	Q _{gd}			3.7		
Turn-on delay time	t _{d(on)}	V _{DD} =30V, V _{GS} =10V, R _G =1.6Ω, I _D =20A		4.3		nS
Turn-on rise time	t _r			2.7		
Turn-off delay time	t _{d(off)}			13.8		
Turn-off fall time	t _f			2.7		
Source-Drain Diode characteristics						
Diode Forward Current	I _S				48	A
Diode Forward voltage	V _{SD}	V _{GS} =0V, I _S =20A			1.2	V
Reverse Recovery Time	t _{rr}	T _J =25°C, I _F =20A		18		nS
Reverse Recovery Charge	Q _{rr}	di/dt = 100A/μs		12		nC

Notes:

1) EAS condition : T_J=25°C, V_{DD}=20V, V_G=10V, L=0.5mH, R_g=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 heatsink, assuming a maximum junction temperature of T_J(MAX)=175°C. The SOA curve provides

Typical Characteristics

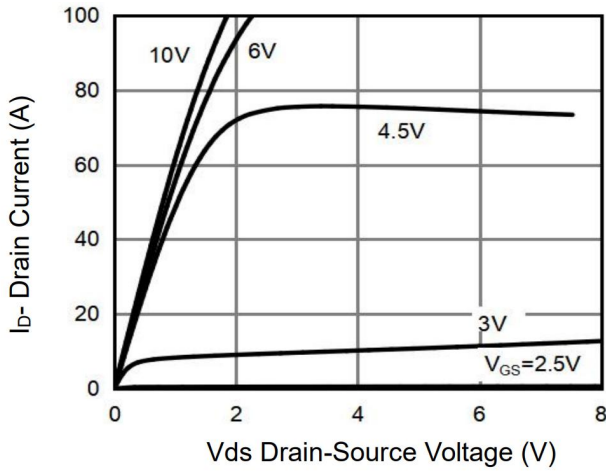


Figure 1 Output Characteristics

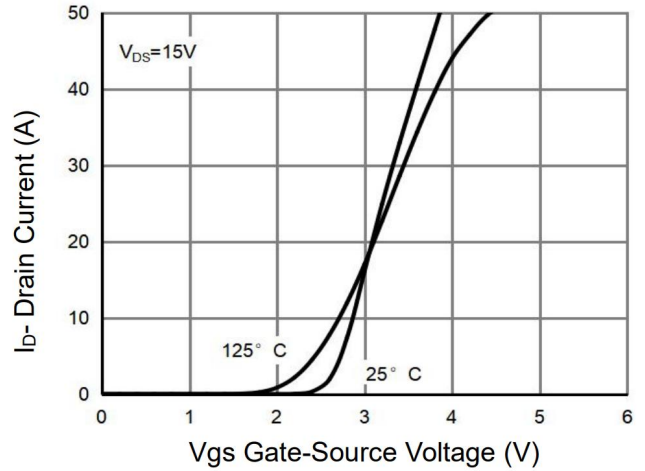


Figure 2 Transfer Characteristics

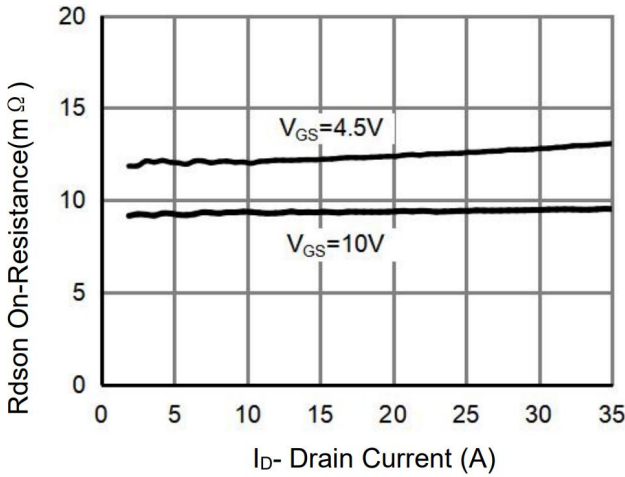


Figure 3 Rdson- Drain Current

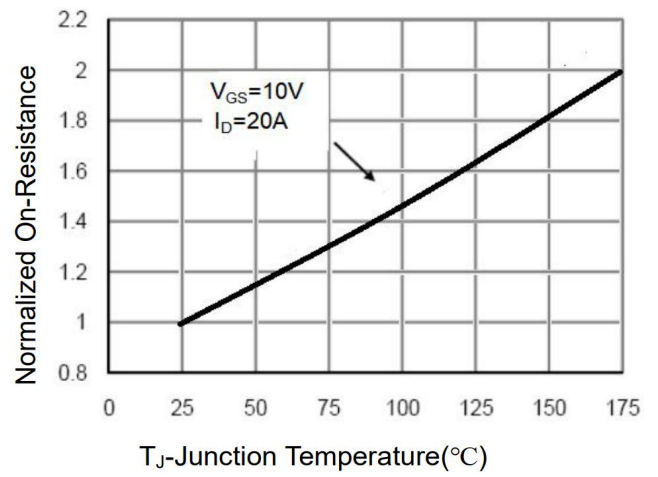


Figure 4 Rdson-Junction Temperature

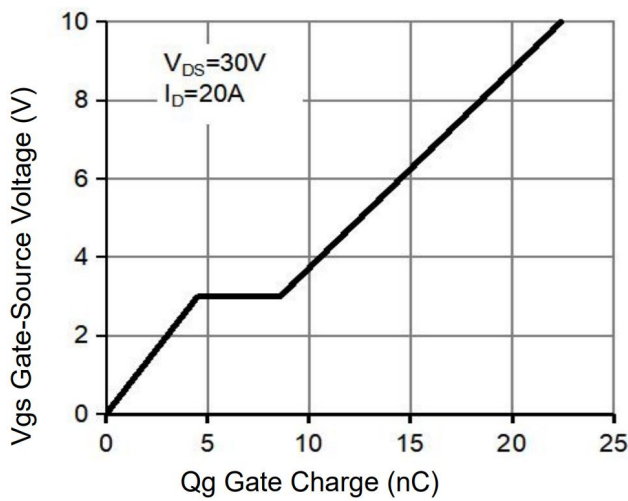


Figure 5 Gate Charge

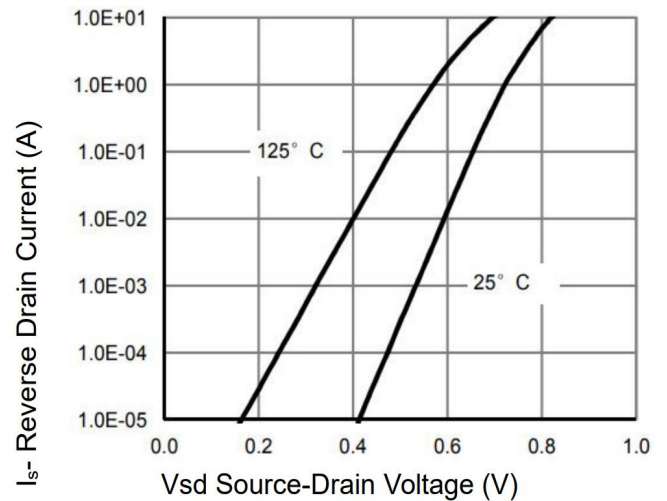


Figure 6 Source- Drain Diode Forward

Typical Characteristics

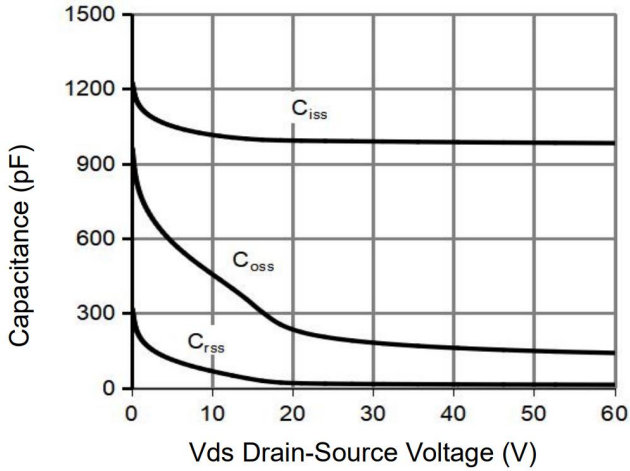


Figure 7 Capacitance vs Vds

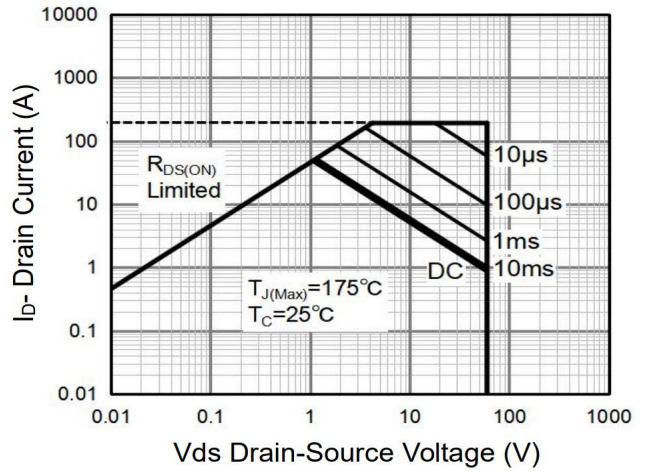


Figure 8 Safe Operation Area (Note3)

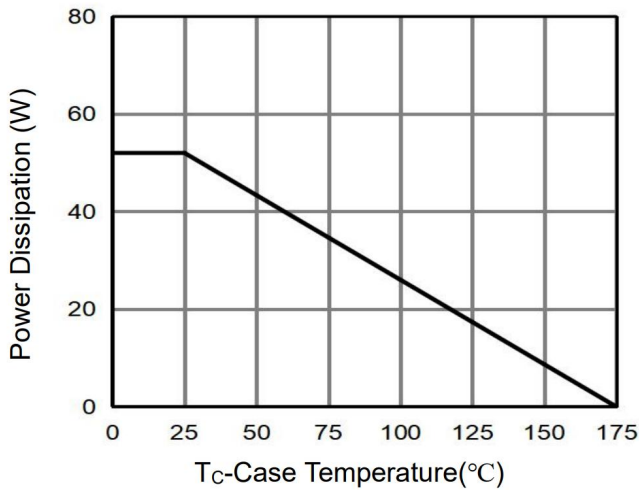


Figure 9 Power De-rating

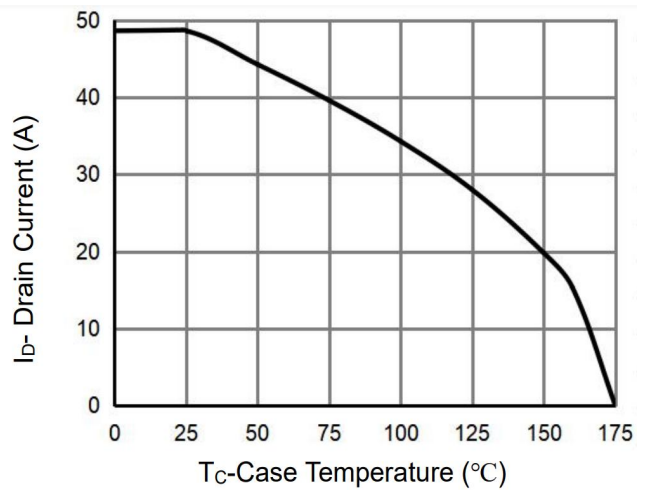


Figure 10 Current De-rating

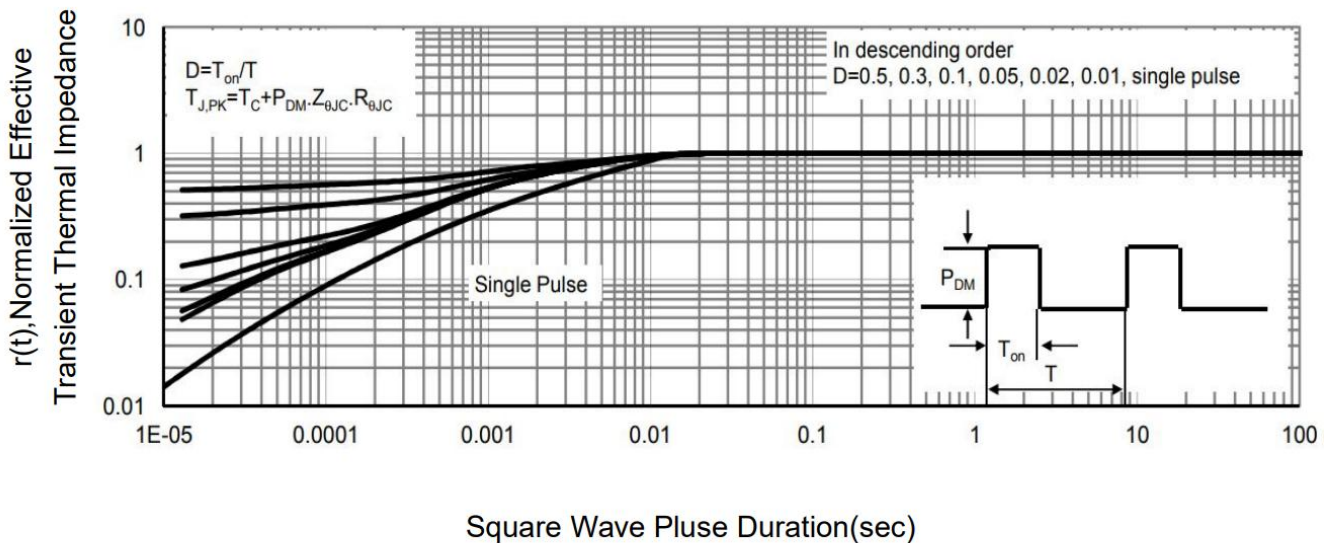
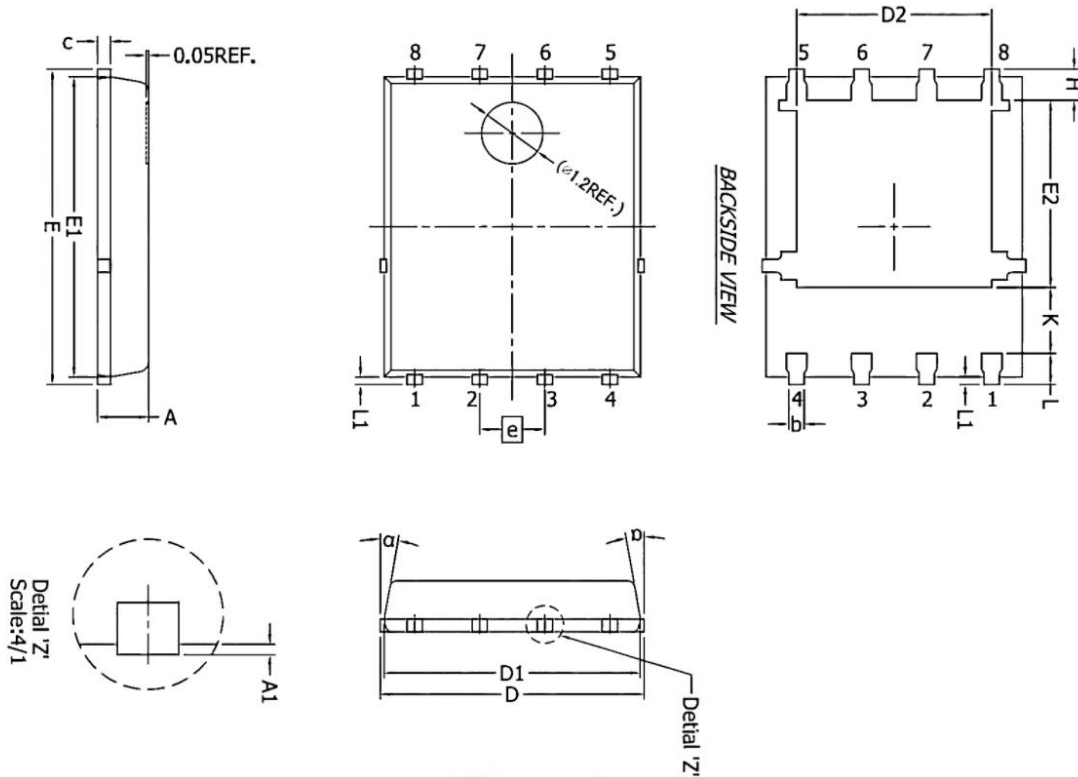


Figure 11 Normalized Maximum Transient Thermal Impedance

PDFN5X6-8L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.100	0.035	0.043
A1	-	0.050	-	0.002
b	0.300	0.500	0.012	0.020
c	0.200	0.300	0.008	0.012
D	5.15 BSC		0.203 BSC	
D1	5.00 BSC		0.197 BSC	
D2	3.760	3.860	0.148	0.152
E	6.150 BSC		0.242 BSC	
E1	5.800	5.900	0.228	0.232
E2	3.450	3.850	0.136	0.152
e	1.270 BSC		0.050 BSC	
H	0.510	0.710	0.020	0.028
K	1.100	-	0.043	-
L	0.510	0.710	0.020	0.028
L1	0.080	0.230	0.003	0.009
α	10°	12°	10°	12°