

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
60V	9mΩ@10V	45A
	14mΩ@4.5V	

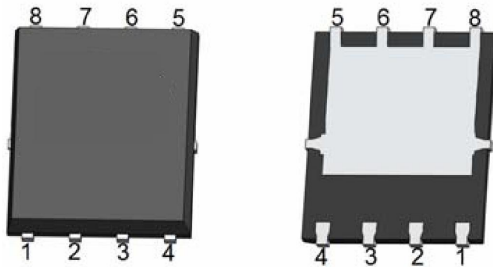
Feature

- High density cell design for ultra low Rdson
- Very low on-resistance $R_{DS(on)}$
- Good stability and uniformity with high E_{AS}
- Suffix "-Q1" for AEC-Q101

Application

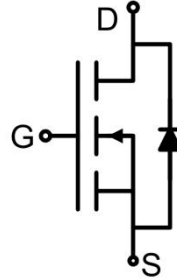
- DC-DC converter
- Ideal for high-frequency switching and synchronous rectification

Package

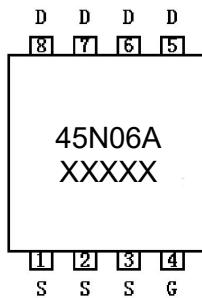


PDFN5*6-8L

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	45	A
Continuous Drain Current (T _c =100°C)	I _D (100°C)	32	A
Pulsed Drain Current	I _{DM}	140	A
Power Dissipation	P _D	60	W
Thermal Resistance,Junction-to-Case ¹⁾	R _{θJC}	2.08	°C/W
Single pulse avalanche energy ⁴⁾	E _{AS}	260	mJ
Junction Temperature	T _J	150	°C
Storage Temperature	T _{STG}	-55 ~ +150	°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 ²⁾	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1.2	1.9	2.5	V
Drain-source on-resistance ²⁾	R _{DS(on)}	V _{GS} =10V, I _D =20A		7.4	9.0	mΩ
		V _{GS} =4.5V, I _D =20A		11.4	14.0	
Forward Transconductance ²⁾	g _{FS}	V _{DS} =5V, I _D =20A	25			S
Dynamic characteristics³⁾						
Input Capacitance	C _{iss}	V _{DS} =30V, V _{GS} =0V, f =1MHz		2750		pF
Output Capacitance	C _{oss}			170		
Reverse Transfer Capacitance	C _{rss}			152		
Total Gate Charge	Q _g	V _{DS} =30V, V _{GS} =10V, I _D =20A		60		nC
Gate-Source Charge	Q _{gs}			10		
Gate-Drain Charge	Q _{gd}			14		
Turn-on delay time	t _{d(on)}	V _{DD} =30V, V _{GS} =10V, R _L =1.5Ω, R _{GEN} =3Ω		9		nS
Turn-on rise time	t _r			7		
Turn-off delay time	t _{d(off)}			32		
Turn-off fall time	t _f			6		
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}	T _J =25°C, I _F =20A, di/dt =100A/μs ²⁾		31		nS
Reverse Recovery Charge	Q _{rr}			45		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 testing.
- 4) EAS condition : T_J=25°C, V_{DD}=30V, V_G=10V, L=0.5mH, R_θ=25Ω.

Typical Characteristics

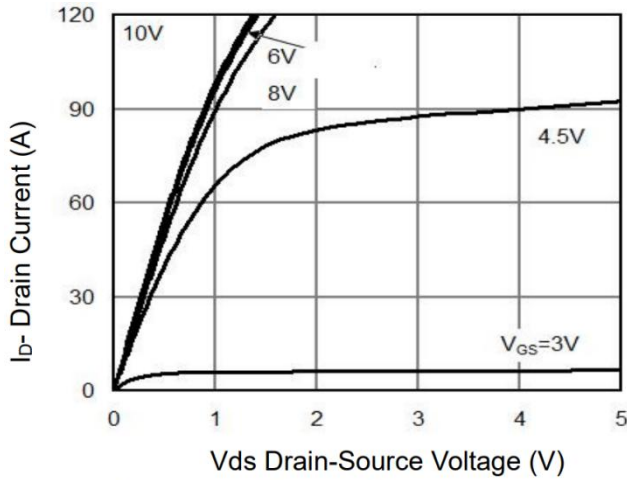


Figure 1 Output Characteristics

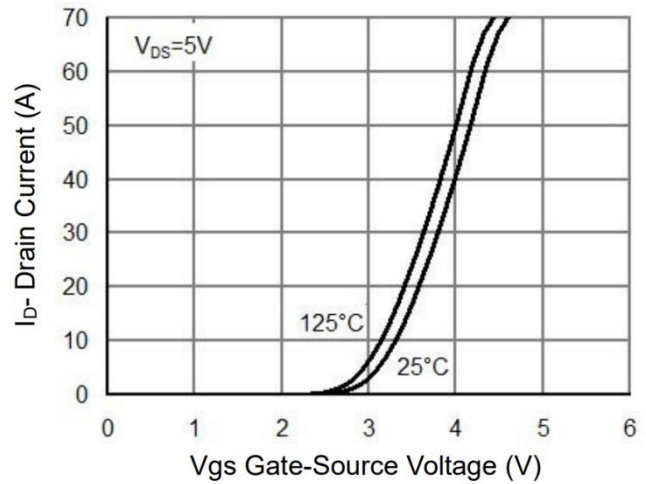


Figure 2 Transfer Characteristics

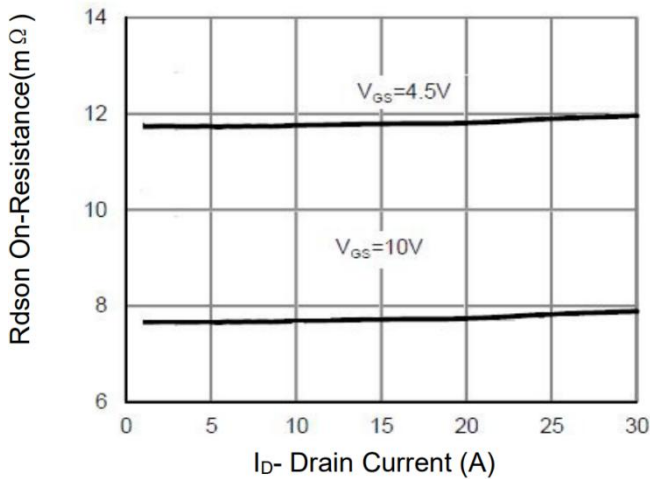


Figure 3 Rdson- Drain Current

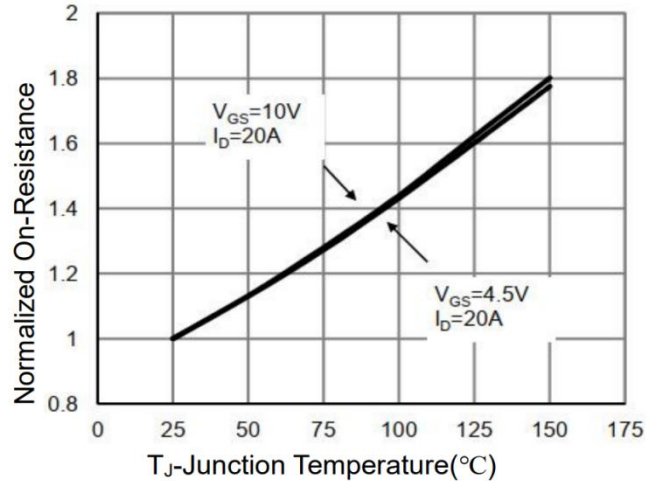


Figure 4 Rdson-Junction Temperature

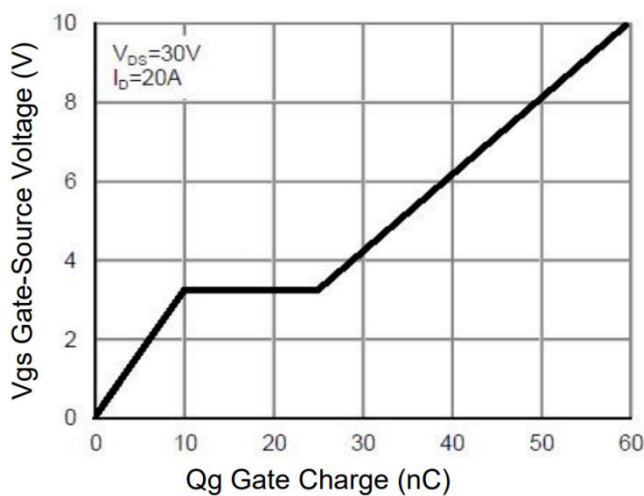


Figure 5 Gate Charge

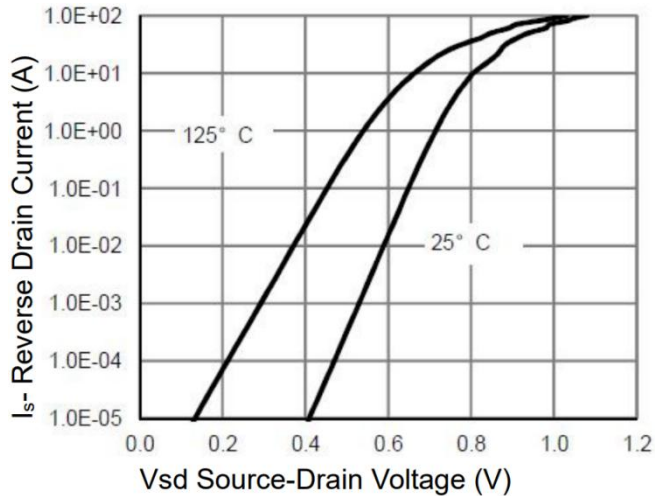


Figure 6 Source- Drain Diode Forward

Typical Characteristics

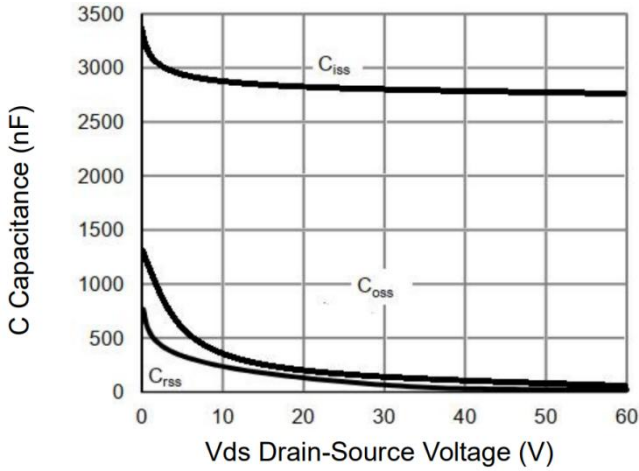


Figure 7 Capacitance vs Vds

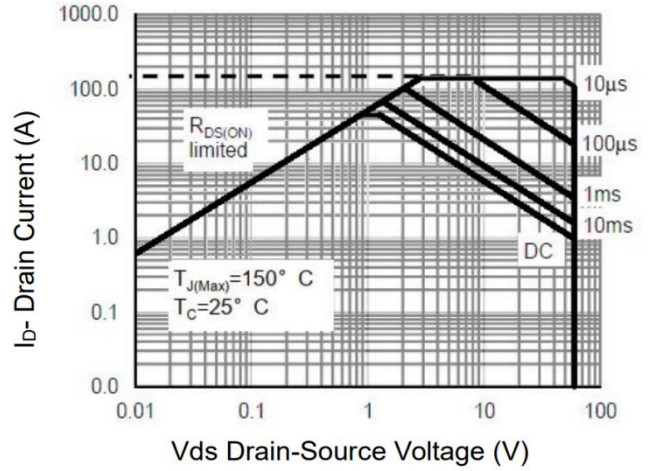


Figure 8 Safe Operation Area

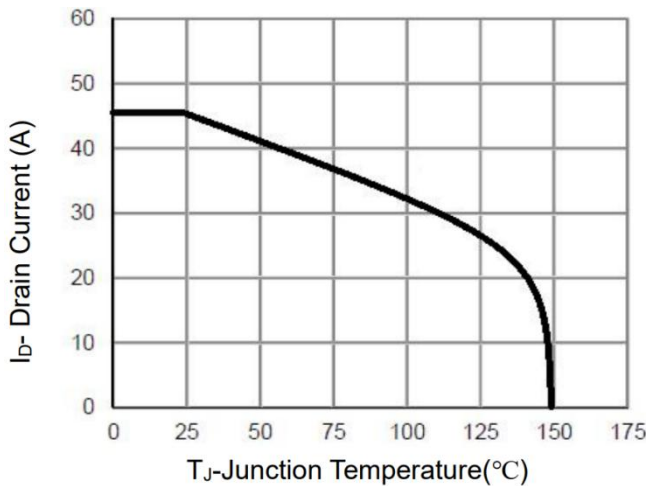


Figure 9 Current De-rating

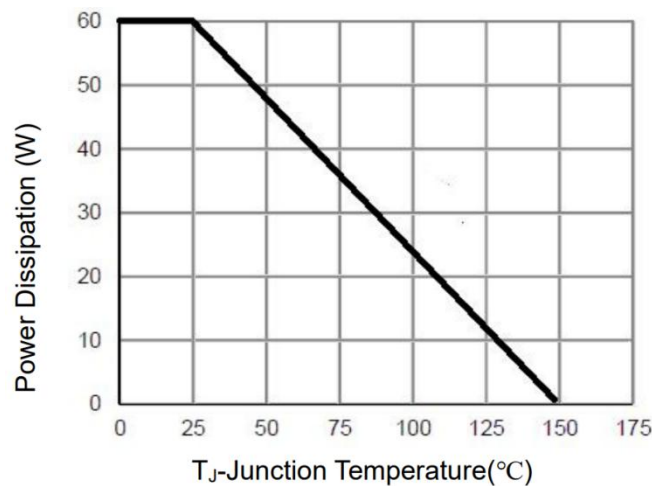


Figure 10 Power De-rating

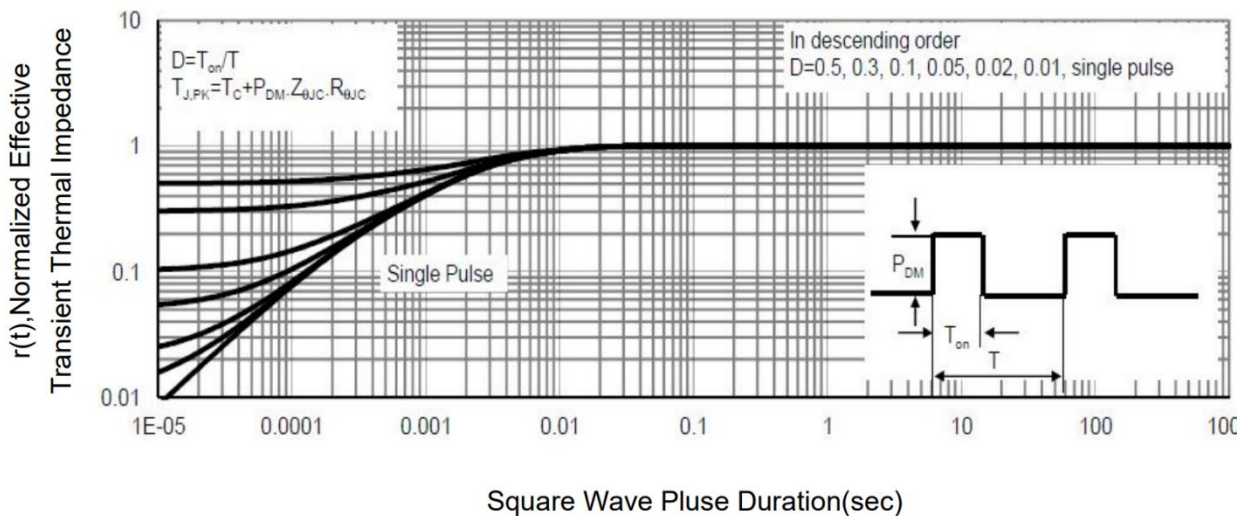
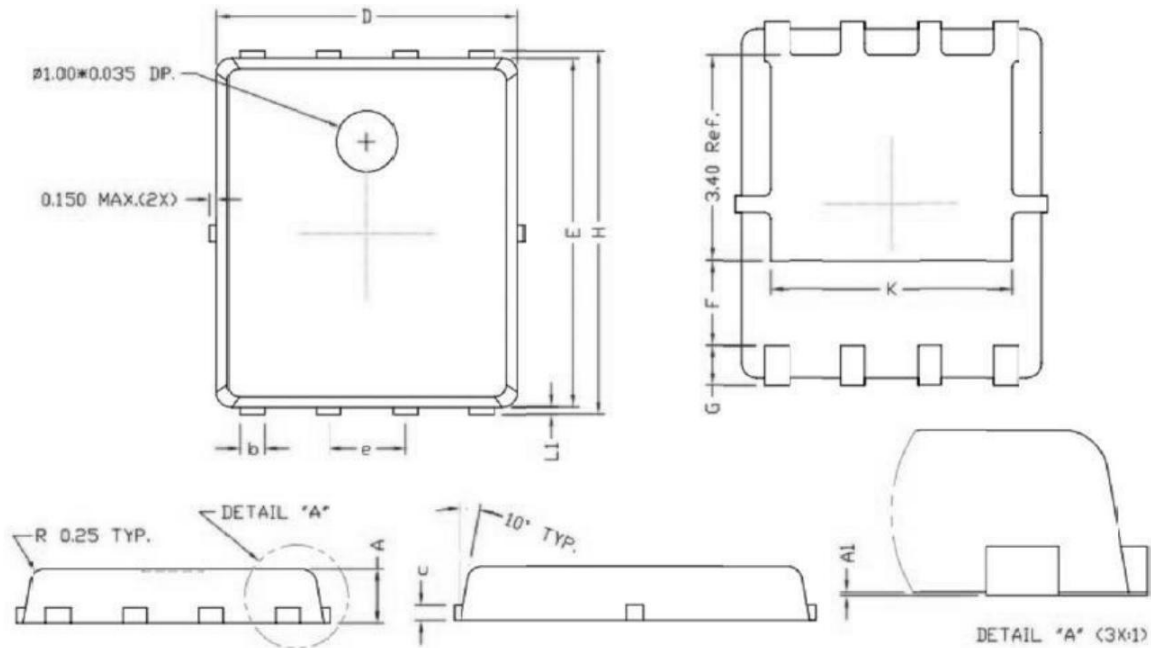


Figure 11 Normalized Maximum Transient Thermal Impedance

PDFN5*6-8L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.800	1.000	0.031	0.039
A1	0.000	0.050	0.000	0.002
b	0.350	0.490	0.014	0.019
c	0.254 REF		0.010 REF	
D	4.900	5.100	0.193	0.201
F	1.400 REF		0.055 REF	
E	5.700	5.900	0.224	0.232
e	1.270 BSC		0.050 BSC	
H	5.950	6.200	0.234	0.244
L1	0.100	0.180	0.004	0.007
G	0.600 REF		0.024 REF	
K	4.000 REF		0.157 REF	