

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
60V	3.5mΩ@10V	90A
	4.5mΩ@4.5V	

Feature

- Excellent gate charge x $R_{DS(on)}$ product(FOM)
- Very low on-resistance $R_{DS(on)}$
- Suffix “-Q1” for AEC-Q101

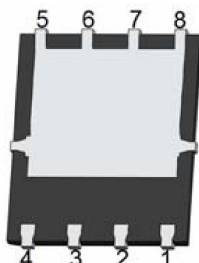
Application

- DC/DC Converter
- Ideal for high-frequency switching and synchronous rectification

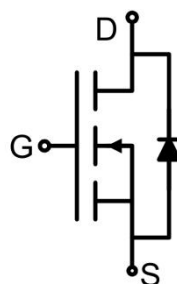
Package



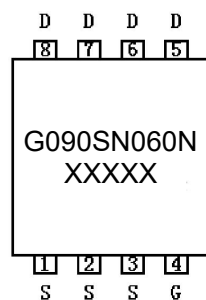
PDFN5*6-8L



Circuit diagram



Marking



Absolute maximum ratings (Tc=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	90	A
Continuous Drain Current (T _C =100°C)	$I_{D(100^\circ C)}$	63.6	A
Pulsed Drain Current	I_{DM}	360	A
Single Pulse Avalanche Energy ¹⁾	E_{AS}	520	mJ
Power Dissipation	P_D	85	W
Thermal Resistance Junction to Case	$R_{\theta JC}$	1.47	°C/W
Operating Junction Temperature	T_J	-55 ~ +150	°C
Storage Temperature	T_{STG}	-55 ~ +150	°C

Electrical characteristics (Tc=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 _{DS} =0V, V _{GS} =±20V			±100	nA
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1	1.7	2.4	V
Drain-source on-resistance	R _{DS(on)}	V _{GS} =10V, I _D =45A		2.8	3.5	mΩ
		V _{GS} =4.5V, I _D =45A		3.5	4.5	
Dynamic characteristics ²⁾						
Input Capacitance	C _{iss}	V _{DS} =30V, V _{GS} =0V, f =1MHz		4000		pF
Output Capacitance	C _{oss}			605		
Reverse Transfer Capacitance	C _{rss}			44		
Total Gate Charge	Q _g	V _{DS} =30V, V _{GS} =10V, I _D =45A		73		nC
Gate-Source Charge	Q _{gs}			12.5		
Gate-Drain Charge	Q _{gd}			11		
Turn-on delay time	t _{d(on)}	V _{DS} =30V, V _{GS} =10V, I _D =45A R _G =4.7Ω		11		nS
Turn-on rise time	t _r			5		
Turn-off delay time	t _{d(off)}			49		
Turn-off fall time	t _f			10		
Source-Drain Diode characteristics						
Diode Forward Current	I _S				90	A
Diode Forward voltage	V _{DS}	V _{GS} =0V, I _S =45A			1.2	V
Reverse Recovery Time	T _{rr}	I _F =I _S , di/dt =100A/μs T _J =25°C		48		nS
Reverse Recovery Charge	Q _{rr}			60		nC

Notes:

1) EAS condition : T_J =25°C, V_{DD} =30V, V_G =10V, L=0.5mH, R_G=25 Ω .

2) Guaranteed by design, not subject to production testing.

Typical Characteristics

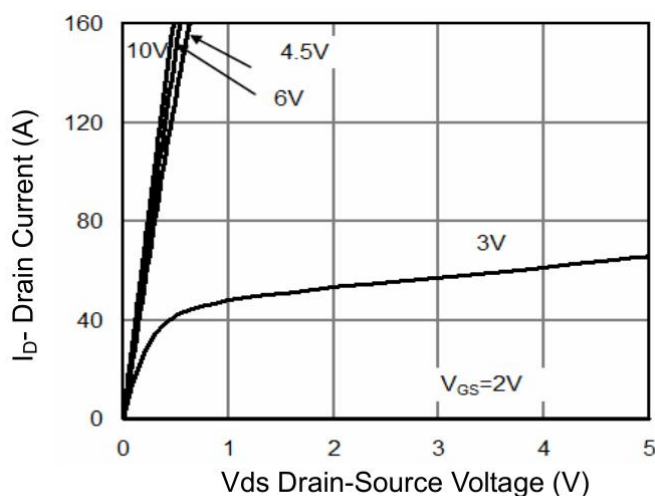


Figure 1 Output Characteristics

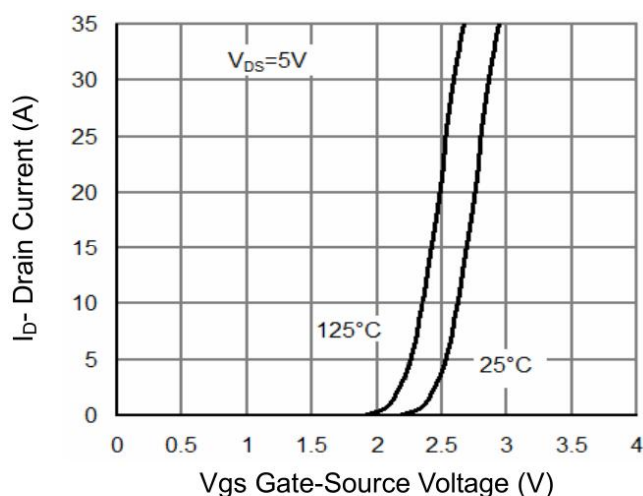


Figure 2 Transfer Characteristics

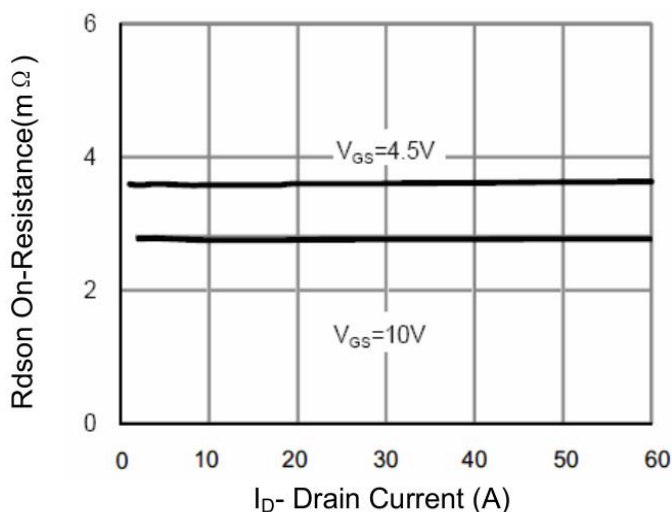


Figure 3 Rdson- Drain Current

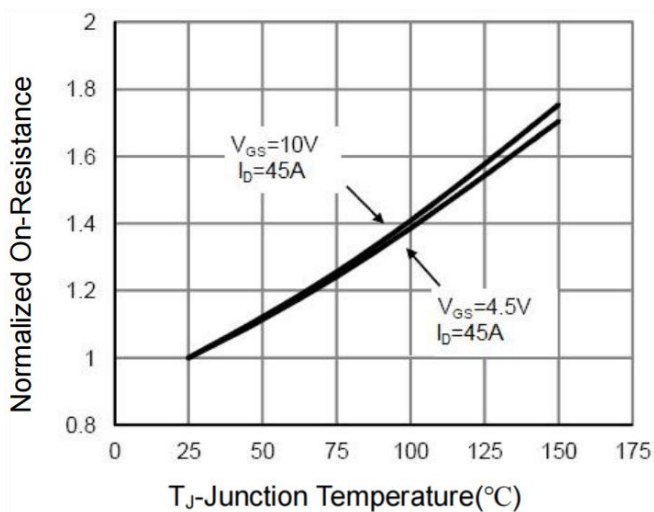


Figure 4 Rdson-Junction Temperature

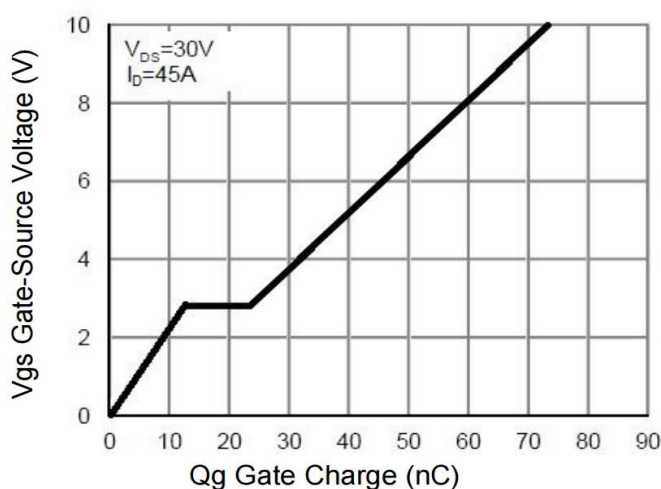


Figure 5 Gate Charge

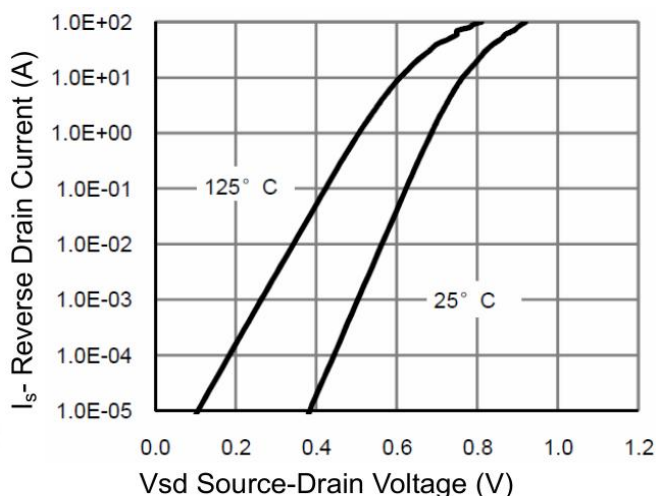


Figure 6 Source- Drain Diode Forward

Typical Characteristics

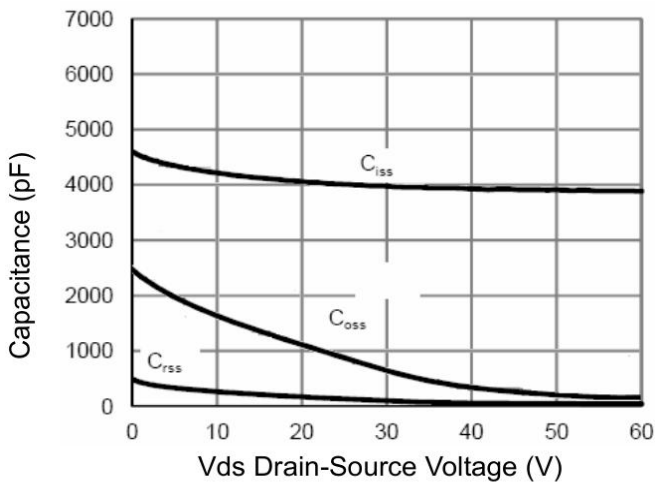


Figure 7 Capacitance vs Vds

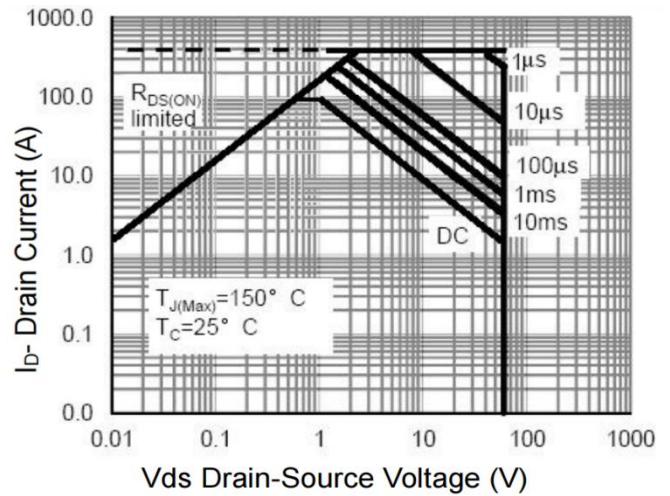


Figure 8 Safe Operation Area

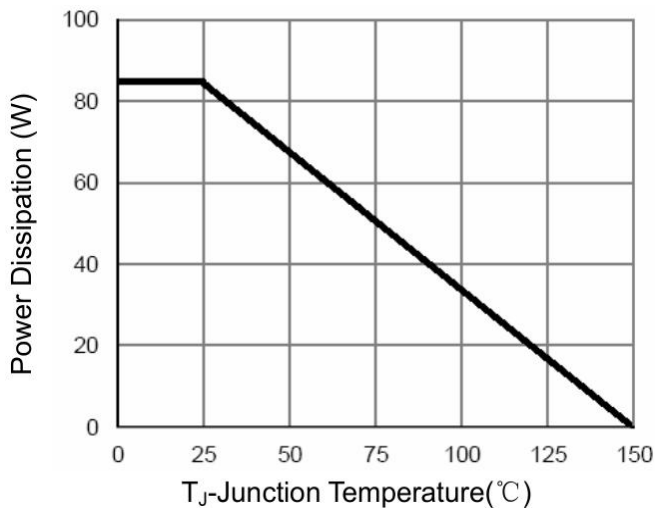


Figure 9 Power De-rating

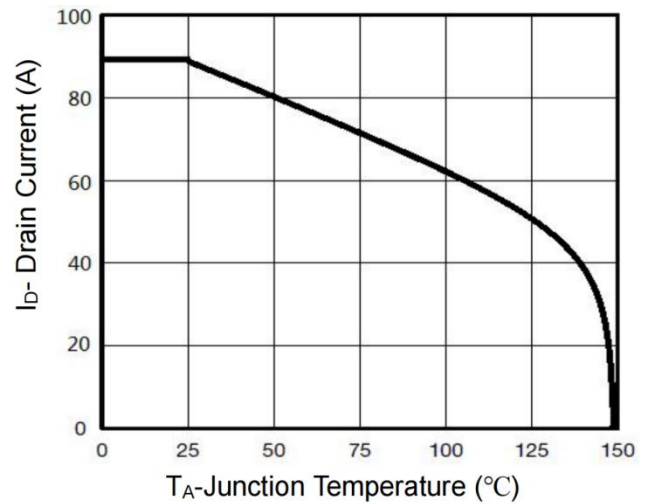


Figure 10 Current De-rating

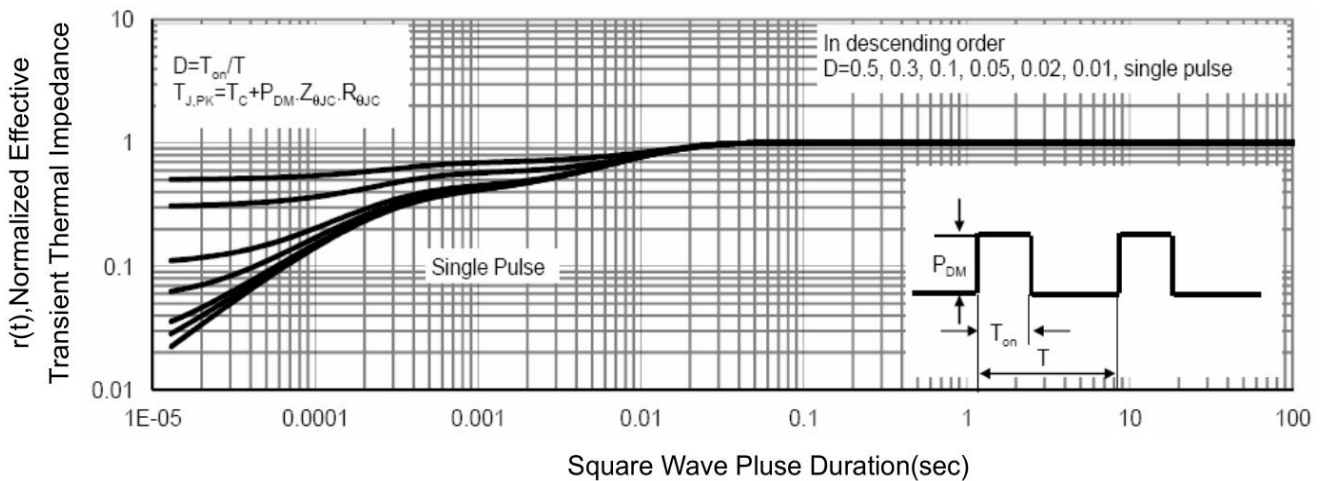
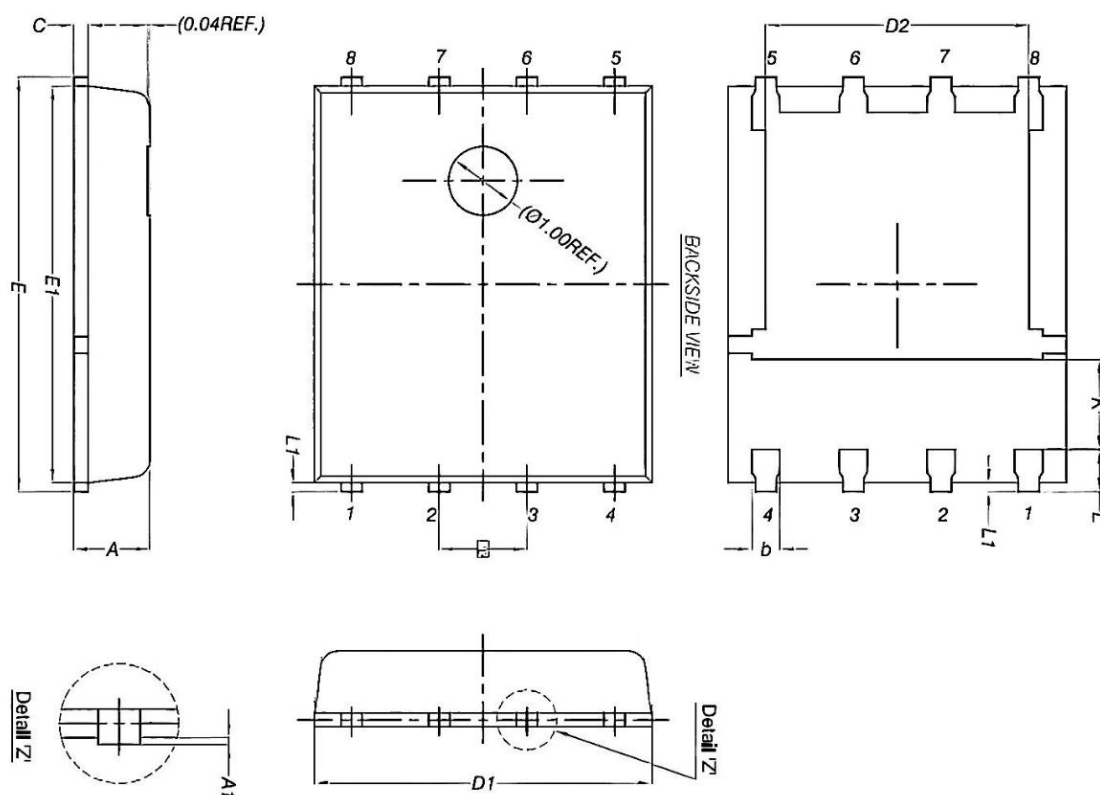


Figure 11 Normalized Maximum Transient Thermal Impedance

PDFN5*6-8L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.800	1.100	0.031	0.043
A1	0.000	0.050	0.000	0.002
b	0.300	0.510	0.012	0.020
C	0.250 REF.		0.010 REF.	
D1	4.800	5.100	0.189	0.201
D2	3.810 REF.		0.150 REF.	
E	5.900	6.200	0.232	0.244
E1	5.700	5.900	0.224	0.232
e	1.270 BSC.		0.050 BSC.	
K	1.100	-	0.043	-
L	0.510	0.710	0.020	0.028
L1	0.060	0.230	0.002	0.009