

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
-40V	4.0mΩ@-10V	-130A
	6.5mΩ@-4.5V	

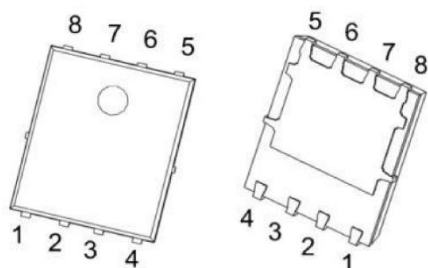
Feature

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

Application

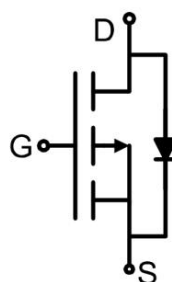
- DC/DC converter
- Ideal for high-frequency switching and synchronous rectification

Package

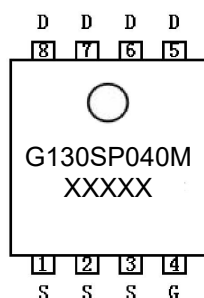


PDFN5*6-8L

Circuit diagram



Marking



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V _{DS}	-40	V
Gate-Source Voltage	V _{GS}	±20	V
Continuous Drain Current	I _D	-130	A
Continuous Drain Current (T _c =100°C)	I _D (100°C)	-91	A
Pulsed Drain Current	I _{DM}	-520	A
Power Dissipation (T _c =25°C)	P _D	120	W
Single Pulse Avalanche Energy ¹⁾	E _{AS}	1155	mJ
Thermal Resistance, Junction-to-Case	R _{θJC}	1.04	°C/W
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	-40			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =-40V,V _{GS} = 0V			-1	μA
Gate-body leakage current	I _{GSS}	V _{GS} =±20V, V _{DS} = 0V			±100	nA
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =-250μA	-1	-1.6	-2.5	V
Drain-source on-resistance	R _{DS(on)}	V _{GS} =-10V, I _D =-20A		3.2	4.0	mΩ
		V _{GS} =-4.5V, I _D =-20A		4.8	6.5	mΩ
Forward Transconductance	g _{FS}	V _{GS} =-5V, I _D =-40A		50		S
Dynamic characteristics ²⁾						
Input Capacitance	C _{iss}	V _{DS} =-20V, V _{GS} =0V, f =1MHz		6100		pF
Output Capacitance	C _{oss}			1500		
Reverse Transfer Capacitance	C _{rss}			95		
Total Gate Charge	Q _g	V _{DS} =-20V, V _{GS} =-10V, I _D =-20A		86		nC
Gate-Source Charge	Q _{gs}			17.5		
Gate-Drain Charge	Q _{gd}			10.5		
Turn-on delay time	t _{d(on)}	V _{DD} =-20V, V _{GS} =-10V, R _G =1.6Ω, I _D =-20A		13		nS
Turn-on rise time	t _r			30		
Turn-off delay time	t _{d(off)}			75		
Turn-off fall time	t _f			14		
Source-Drain Diode characteristics						
Diode Forward Current	I _S				-130	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 =-65A, di/dt = 100A/μs		55		nS
Reverse Recovery Charge	Q _{rr}			75		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.

Typical Characteristics

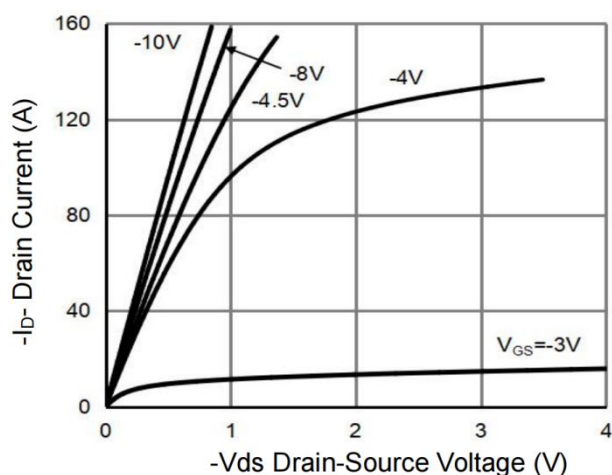


Figure 1 Output Characteristics

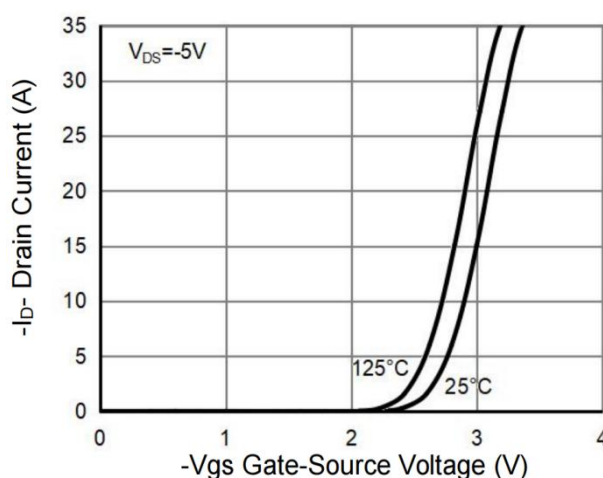


Figure 2 Transfer Characteristics

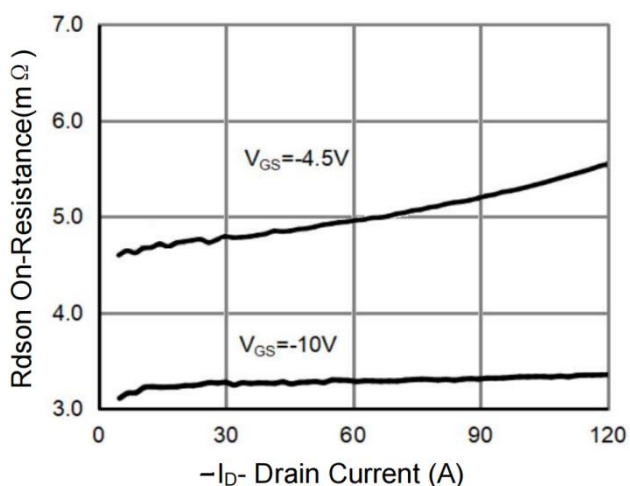


Figure 3 Rdson- Drain Current

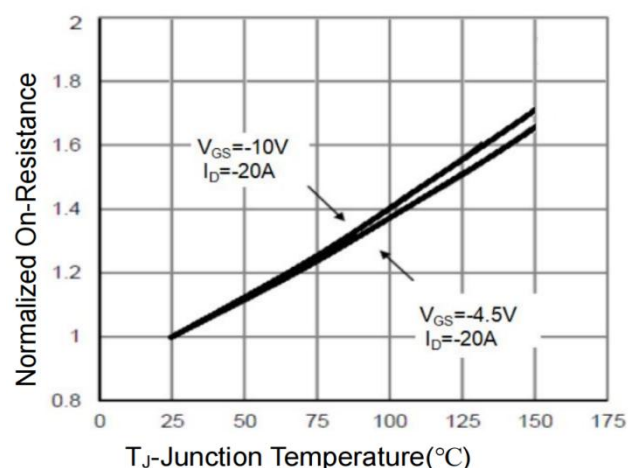


Figure 4 Rdson-Junction Temperature

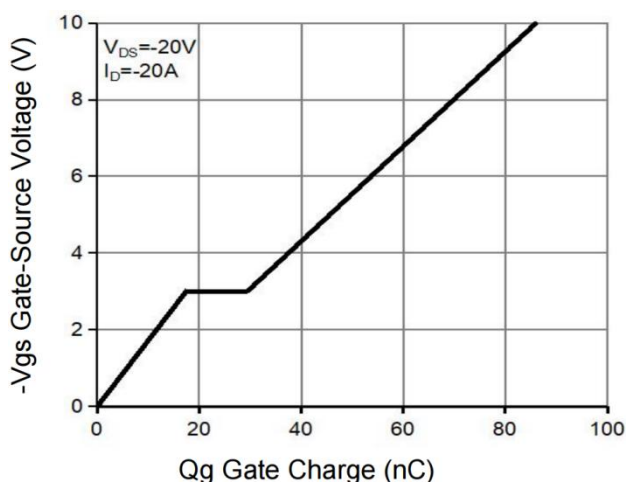


Figure 5 Gate Charge

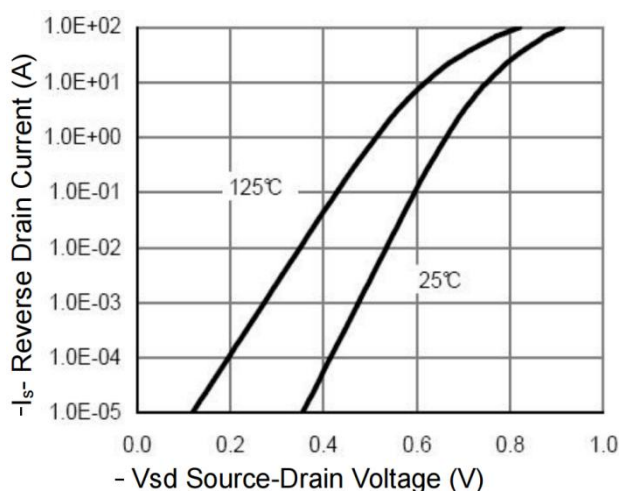


Figure 6 Source- Drain Diode Forward

Typical Characteristics

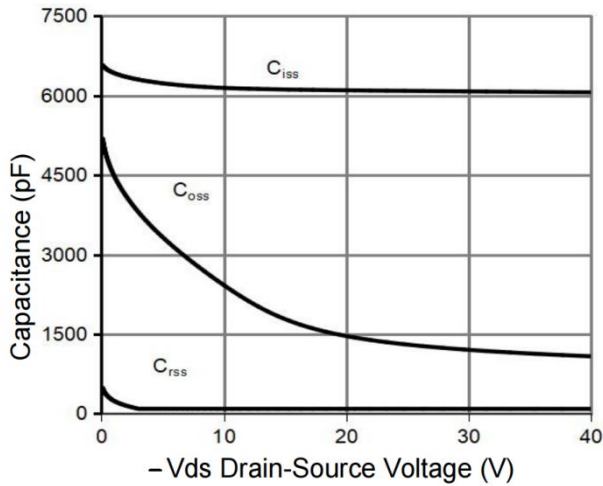


Figure 7 Capacitance vs Vds

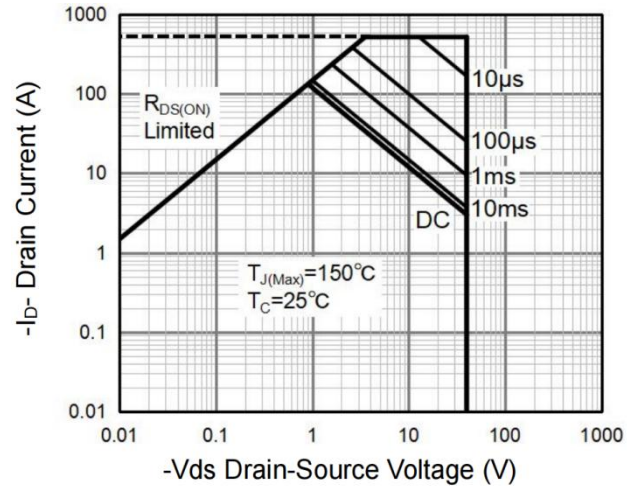


Figure 8 Safe Operation Area (Note3)

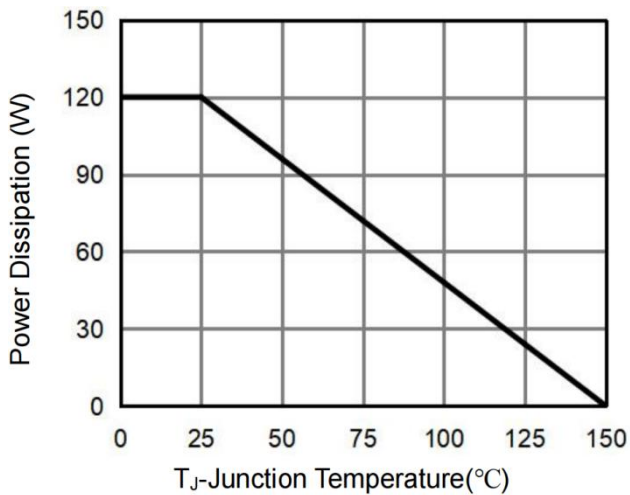


Figure 9 Power De-rating

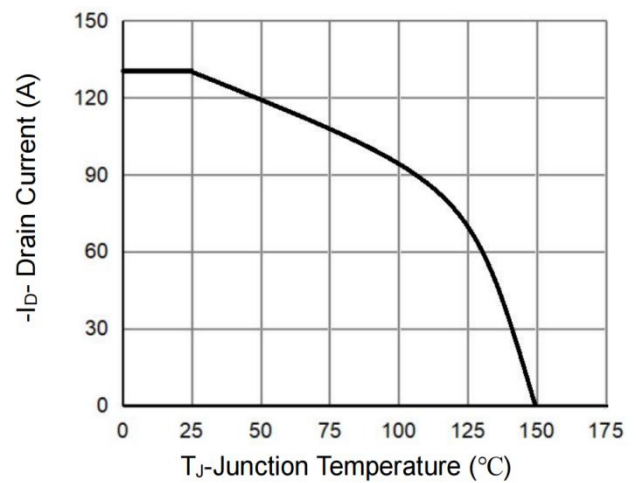


Figure 10 Current De-rating

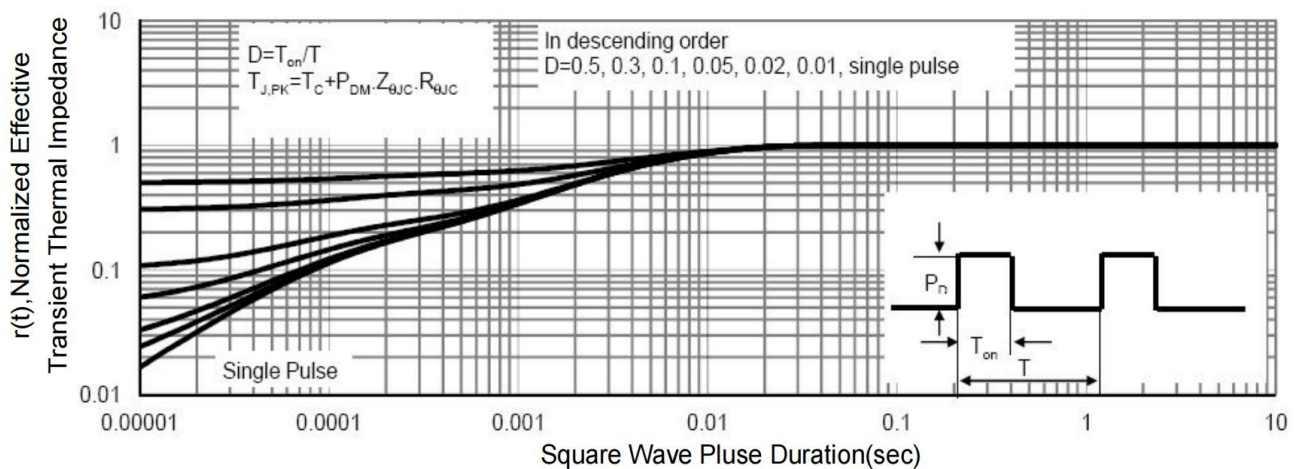
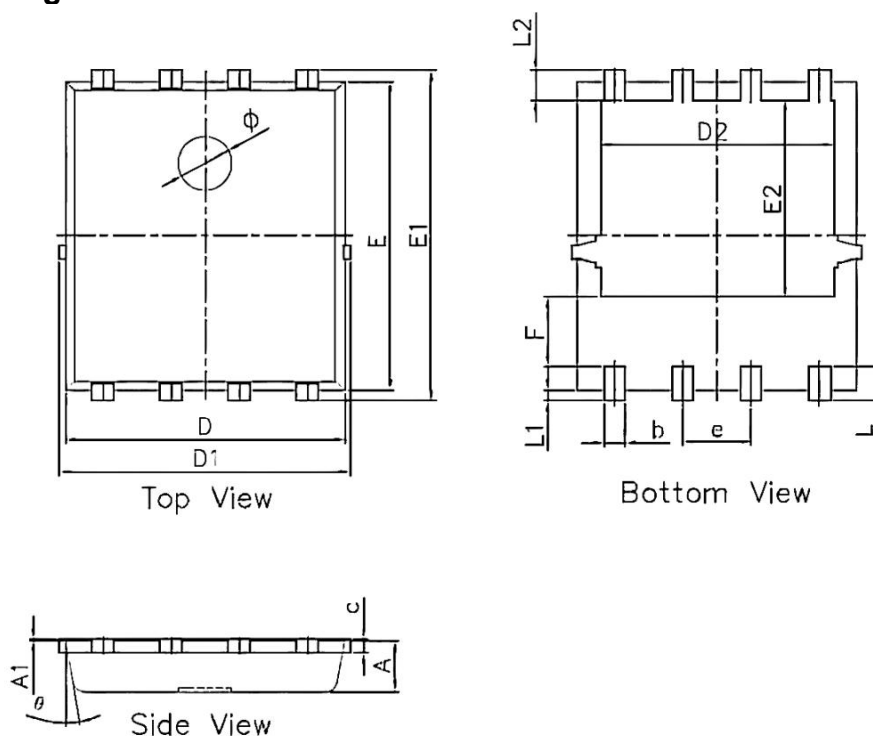


Figure 11 Normalized Maximum Transient Thermal Impedance

PDFN5*6-8L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.000	0.035	0.039
A1	0.000	0.005	0.000	0.000
b	0.350	0.500	0.014	0.020
c	0.200	0.300	0.008	0.012
D	5.100	5.300	0.201	0.209
D1	5.100	5.500	0.201	0.217
D2	4.250	4.450	0.167	0.175
e	1.270 BSC.		0.050 BSC.	
E	5.700	5.800	0.224	0.228
E1	6.000	6.300	0.236	0.248
E2	3.570	3.770	0.141	0.148
F	1.180	1.380	0.046	0.054
L	0.550	0.750	0.022	0.030
L1	0.150	0.250	0.006	0.010
L2	0.450	0.650	0.018	0.026
Φ	0.900	1.100	0.035	0.043
θ	10°	12°	10°	12°