

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
-40V	3.5mΩ@-10V	-130A
	6mΩ@-4.5V	

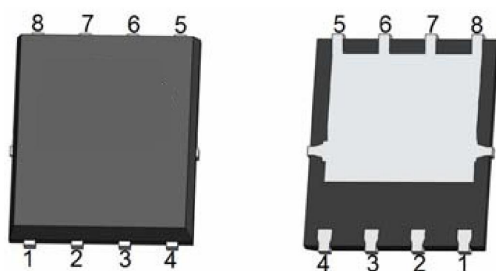
Feature

- High density cell design for ultra low Rdson
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high EAS
- Excellent package for good heat dissipation
- Suffix "-Q1" for AEC-Q101

Application

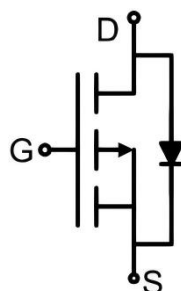
- Load switch
- Battery protection

Package

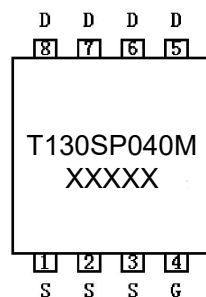


PDFN5*6-8L

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
Pulsed Drain Current	I _{DM}	-520	A
Single Pulse Avalanche Energy ¹⁾	E _{AS}	650	mJ
Power Dissipation	P _D	120	W
Thermal Resistance Junction to Case ²⁾	R _{θJC}	1.04	°C/W
Operating Junction Temperature	T _J	-55 ~ +150	°C
Storage Temperature Range	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 _{DS} =0V, V _{GS} =±20V			±100	nA
Gate threshold voltage ³⁾	V _{GS(th)}	V _{DS} =V _{GS} , I _D =-250μA	-1.2	-1.8	-2.5	V
Drain-source on-resistance ³⁾	R _{DS(on)}	V _{GS} =-10V, I _D =-20A		2.8	3.5	mΩ
		V _{GS} =-4.5V, I _D =-20A		4.6	6	
Dynamic characteristics ⁴⁾						
Input Capacitance	C _{iss}	V _{DS} =-20V, V _{GS} =0V, f =1MHz		7756		pF
Output Capacitance	C _{oss}			705		
Reverse Transfer Capacitance	C _{rss}			536		
Total Gate Charge	Q _g	V _{DS} =-20V, V _{GS} =-10V I _D =-20A		158		nC
Gate-Source Charge	Q _{gs}			34		
Gate-Drain Charge	Q _{gd}			32		
Turn-on delay time	t _{d(on)}	V _{DS} =-20V, V _{GS} =-10V R _L =0.5Ω, R _G =3Ω		12		nS
Turn-on rise time	t _r			25		
Turn-off delay time	t _{d(off)}			310		
Turn-off fall time	t _f			170		
Source-Drain Diode characteristics						
Diode Forward Current	I _S				-130	A
Diode Forward voltage ³⁾	V _{SD}	V _{GS} =0V, I _S =-20A			-1.2	V
Reverse recover time	T _{rr}	I _S =-20A, di/dt =-100A/us ³⁾ T _J =25°C		130		nS
Reverse recovery charge	Q _{rr}			220		nC

Notes:

- 1) EAS condition: T_J = 25°C, V_{DD} = -20V, V_G = -10V, L = 0.5mH, R_G = 25Ω.
- 2) Surface Mounted on FR4 Board, t ≤ 10 sec.
- 3) Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
- 4) Guaranteed by design, not subject to production.

Typical Characteristics

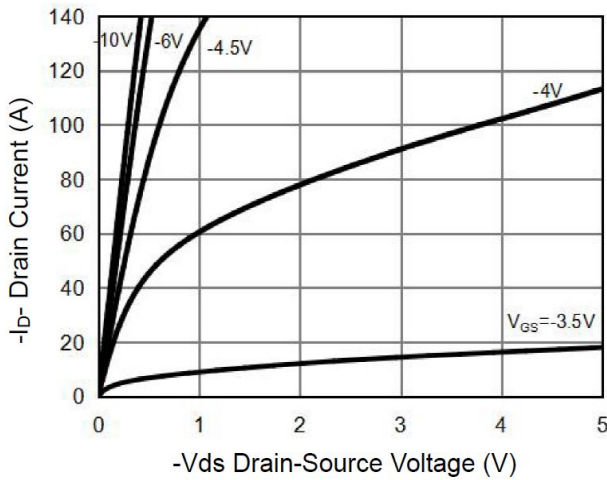


Figure 1 Output Characteristics

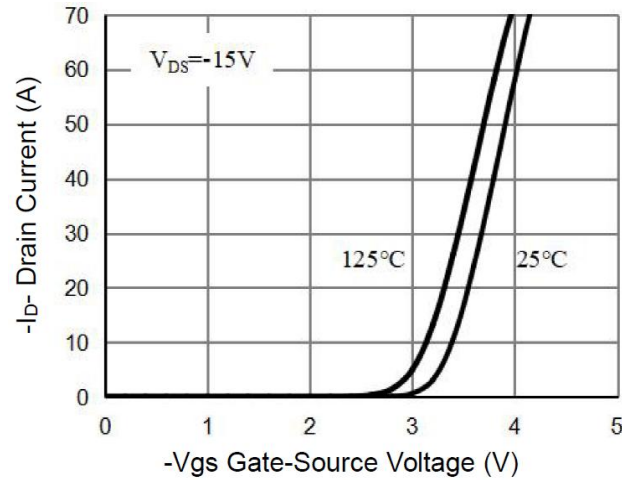


Figure 2 Transfer Characteristics

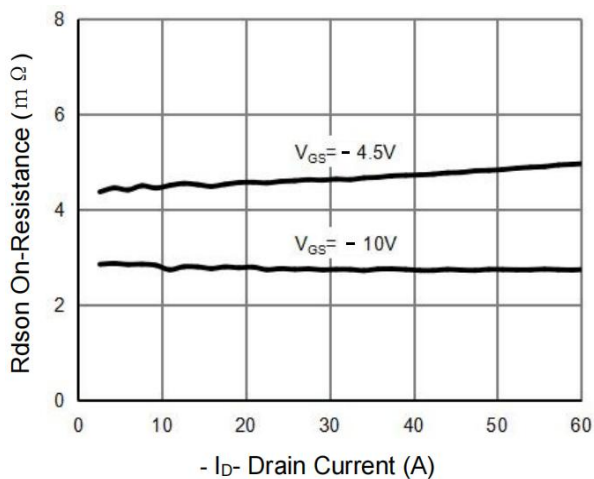


Figure 3 Rdson- Drain Current

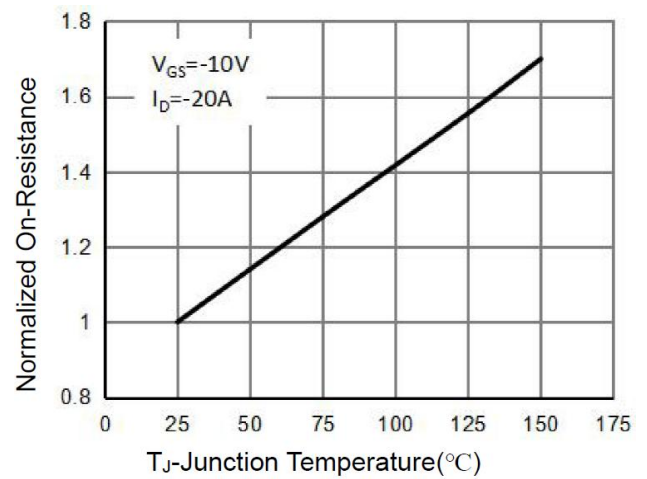


Figure 4 Rdson-Junction Temperature

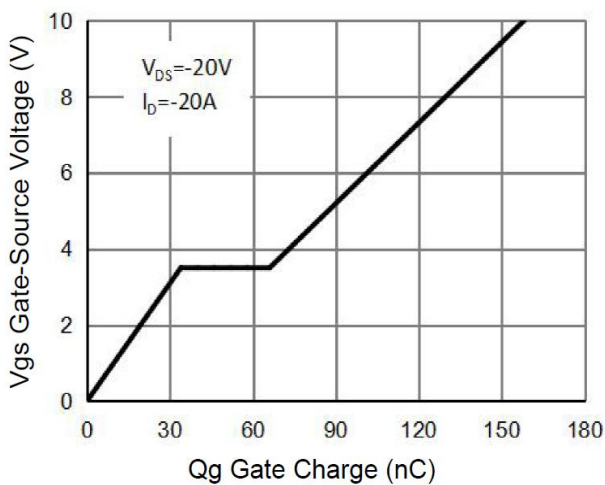


Figure 5 Gate Charge

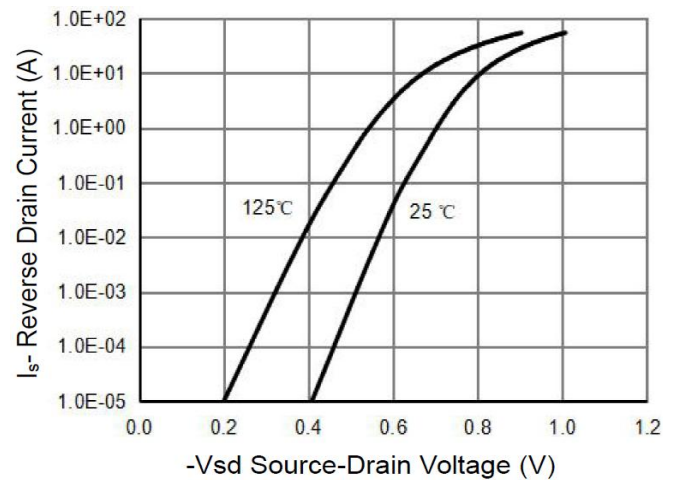


Figure 6 Source- Drain Diode Forward

Typical Characteristics

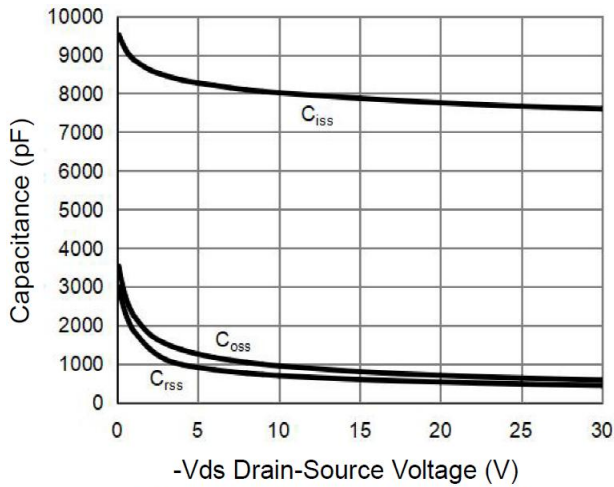


Figure 7 Capacitance vs Vds

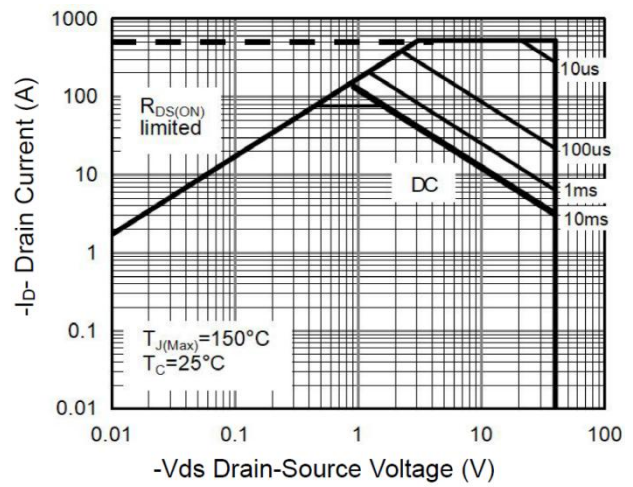


Figure 8 Safe Operation Area

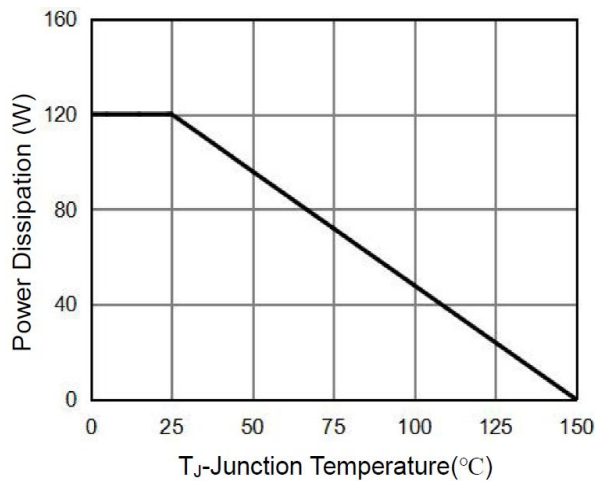


Figure 9 Power De-rating

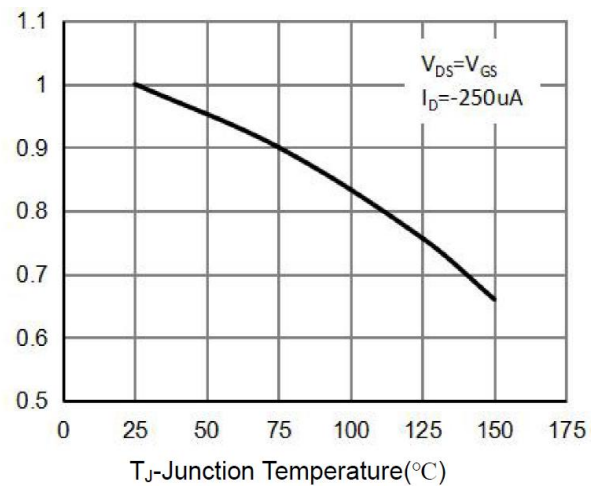


Figure 10 $V_{GS(th)}$ vs Junction Temperature

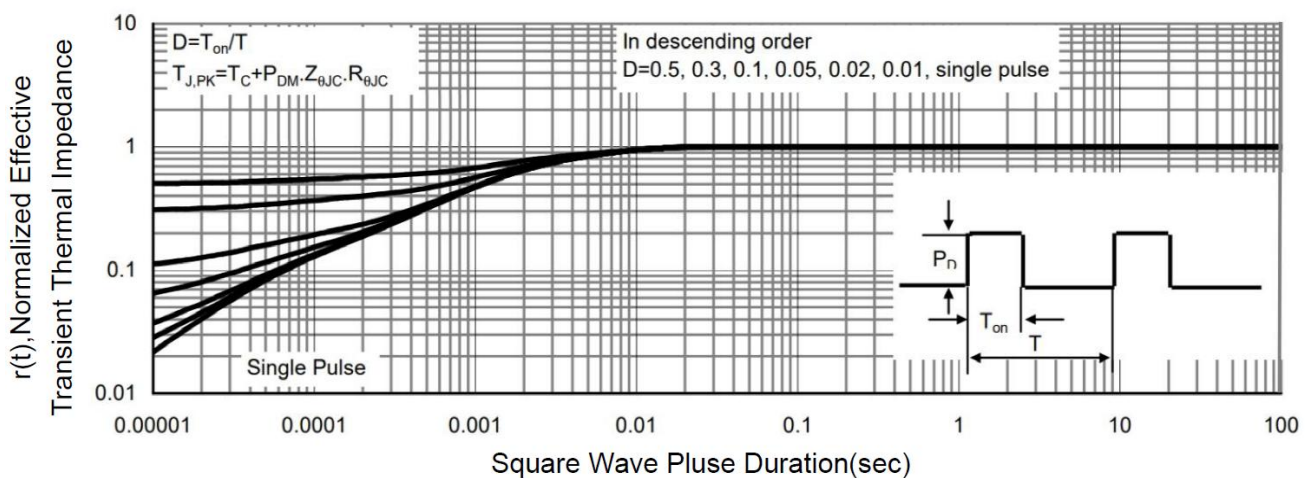
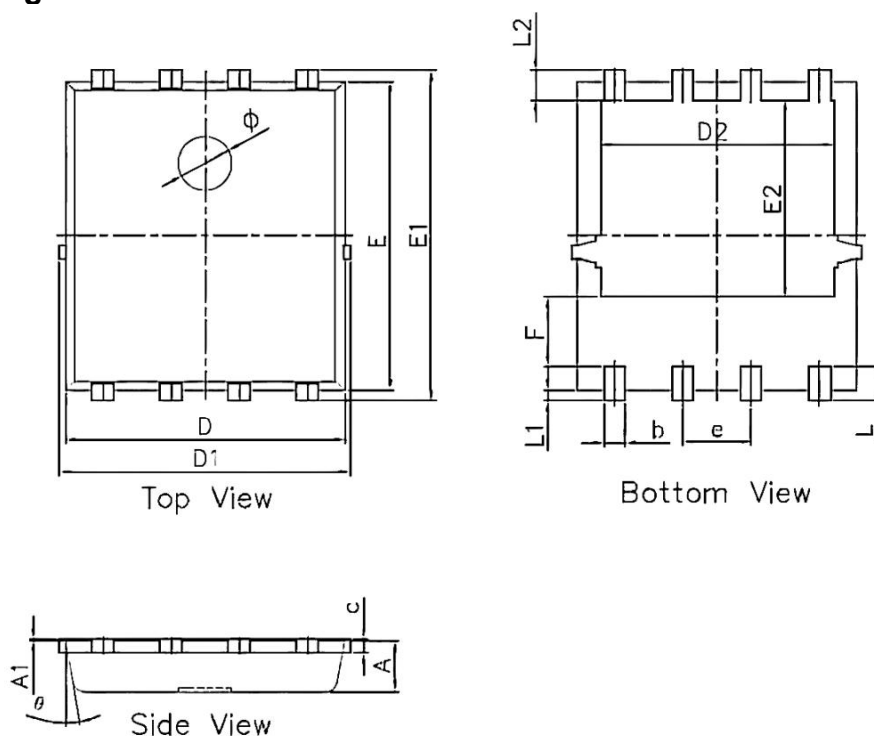


Figure 11 Normalized Maximum Transient Thermal Impedance

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	8°	12°	8°	12°