

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
-40V	11mΩ@-10V	-64A
	18mΩ@-4.5V	

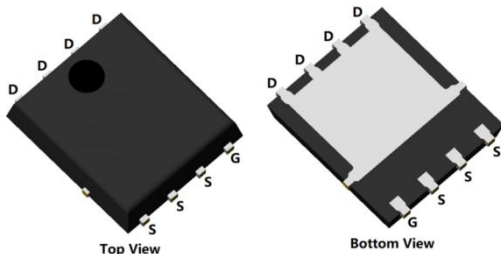
Feature

- Excellent package for heat dissipation
- High density cell design for low $R_{DS(on)}$
- Suffix "-Q1" for AEC-Q101

Application

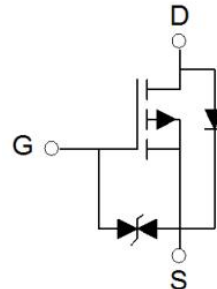
- Load switch
- Reverse polarity protection

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 ^{1,3)} (V _{GS} = -10V, Chip limitation)	I _D	-64	A
Continuous Drain Current ^{1,3)} (V _{GS} = -10V, T _C = 100°C)	I _D (100°C)	-40	A
Pulsed Drain Current (t _p ≤ 10us)	I _{DM}	-256	A
Single Pulse Avalanche Energy ²⁾	E _{AS}	132.2	mJ
Power Dissipation ^{1,3)} (T _C = 25°C)	P _D	78	W
Thermal Resistance Junction to Case	R _{θJC}	1.6	°C/W
Operating Junction Temperature	T _J	-55 ~ +150	°C
Storage Temperature	T _{STG}	-55 ~ +150	°C

Electrical characteristics (T_J = 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			±10	μA
Gate threshold voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -250μA	-1.2	-1.7	-2.2	V
Drain-source on-resistance	R _{DS(on)}	V _{GS} = -10V, I _D = -34A		8.4	11	mΩ
		V _{GS} = -4.5V, I _D = -10A		12	18	
Dynamic characteristics⁴⁾						
Input Capacitance	C _{iss}	V _{DS} = -20V, V _{GS} = 0V, f = 1MHz		2700		pF
Output Capacitance	C _{oss}			271		
Reverse Transfer Capacitance	C _{rss}			250		
Total Gate Charge	Q _g	V _{DS} = -20V, V _{GS} = -10V I _D = -34A		60.9		nC
Gate-Source Charge	Q _{gs}			12		
Gate-Drain Charge	Q _{gd}			9.8		
Turn-on delay time	t _{d(on)}	V _{DS} = -20V, V _{GS} = -10V I _D = -34A, R _G = 3Ω		10.3		nS
Turn-on rise time	t _r			50.8		
Turn-off delay time	t _{d(off)}			75		
Turn-off fall time	t _f			45		
Source-Drain Diode characteristics						
Diode Forward Current	I _S	T _C = 25°C			-64	A
Diode Forward voltage	V _{SD}	V _{GS} = 0V, I _S = -34A			-1.2	V
Reverse Recovery Time	T _{rr}	V _{GS} = 0V, V _R = -20V, I _F = -34A di/dt = -100A/μs		34.5		nS
Reverse Recovery Charge	Q _{rr}			25.4		nC

Notes:

1) The entire application environment impacts the thermal resistance values shown, they are not constants and are only valid for the particular conditions noted.

2) T_J = 25°C, V_G = -10V, R_θ = 25Ω, L = 0.5mH, I_{AS} = -23A.

3) Thermal resistance from junction to soldering point (on the exposed drain pad).

4) Guaranteed by design, not subject to production.

Typical Characteristics

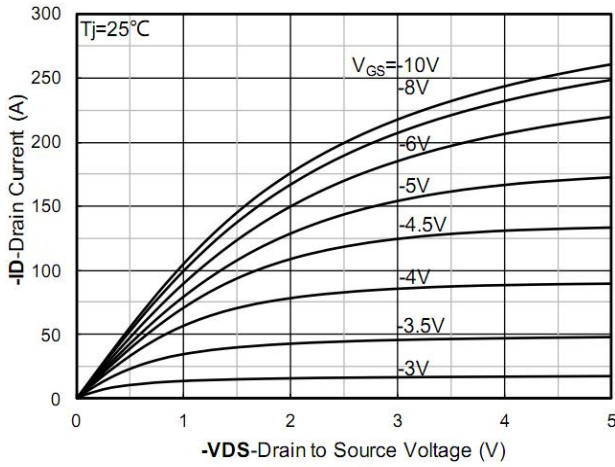


Figure 1. Output Characteristics; typical values

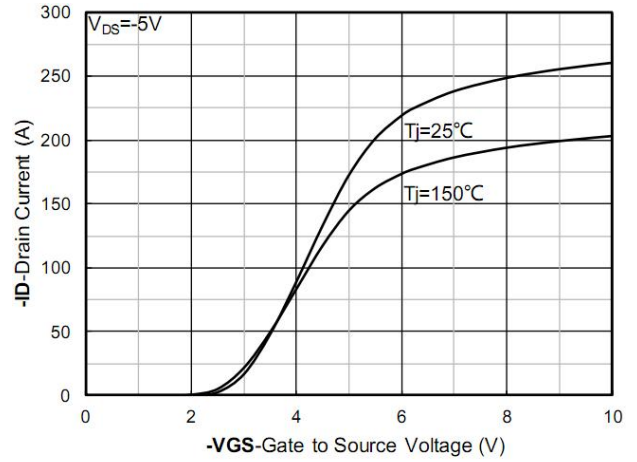


Figure 2. Transfer Characteristics; typical values

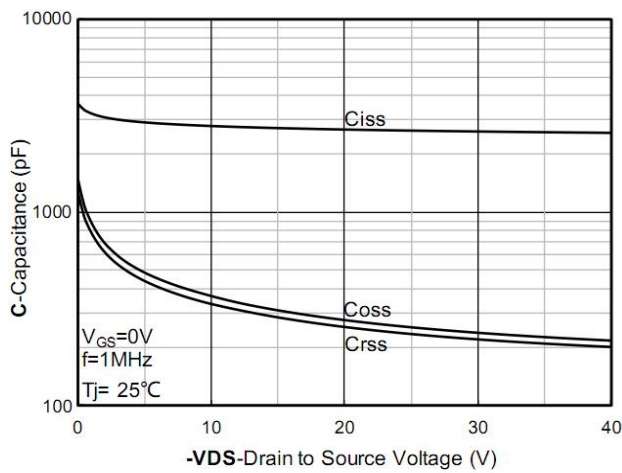


Figure 3. Capacitance Characteristics; typical values

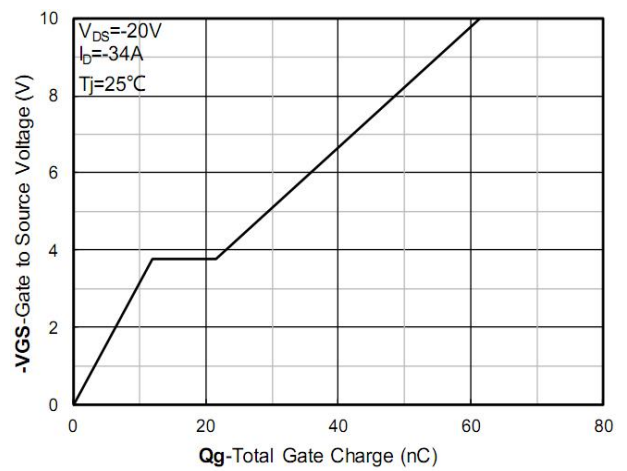


Figure 4. Gate Charge; typical values

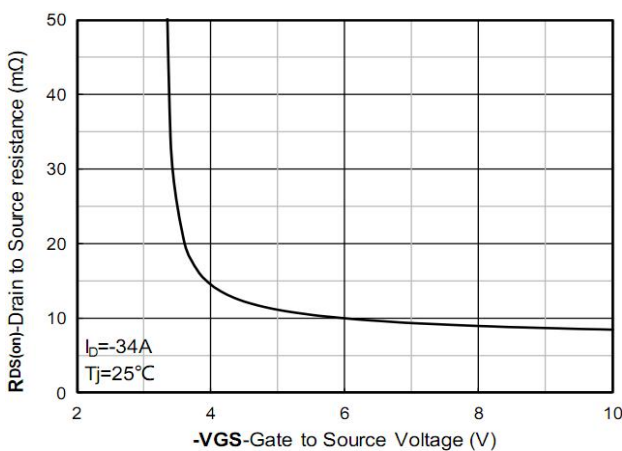


Figure 5. On-Resistance vs. Gate to Source Voltage; typical values

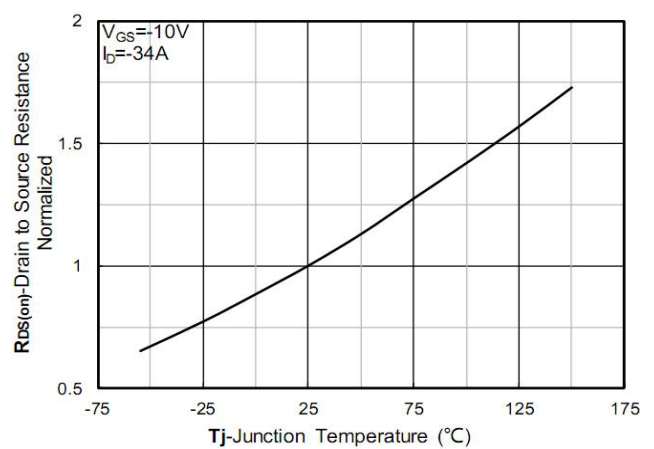


Figure 6. Normalized On-Resistance

Typical Characteristics

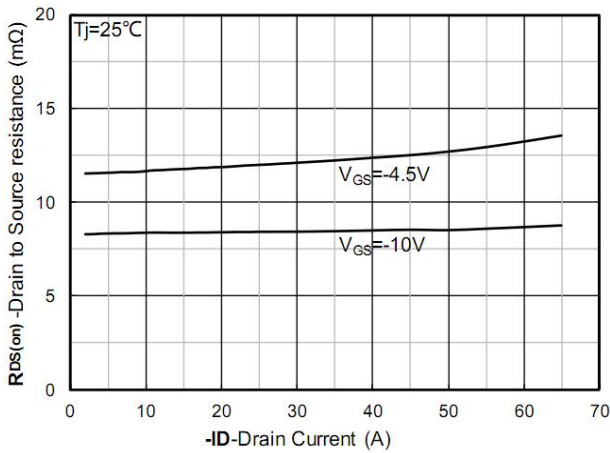


Figure 7. $R_{DS(on)}$ vs. Drain Current; typical values

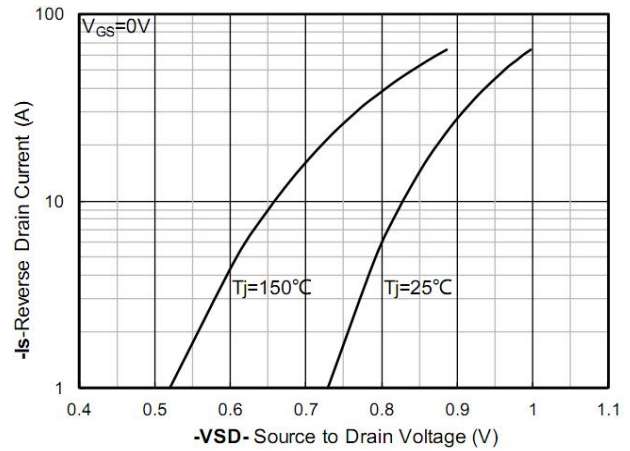


Figure 8. Forward characteristics of reverse diode; typical values

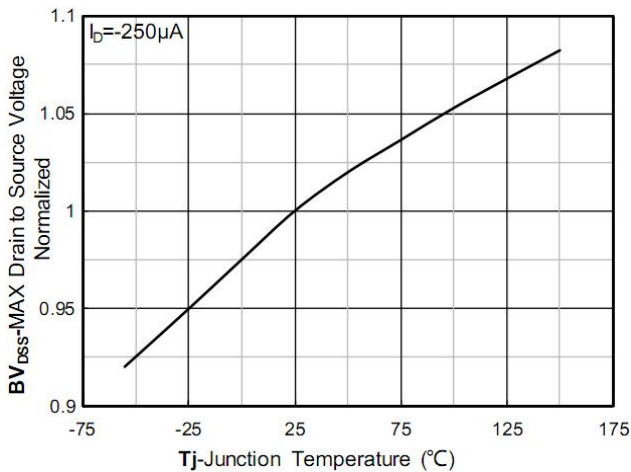


Figure 9. Normalized breakdown voltage

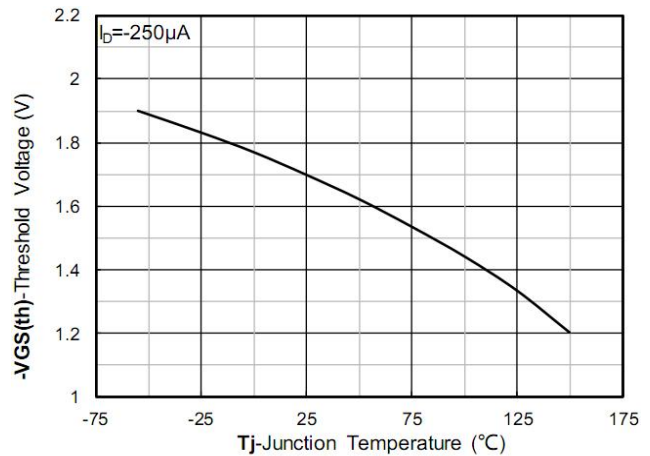


Figure 10. Gate Threshold voltage; typical values

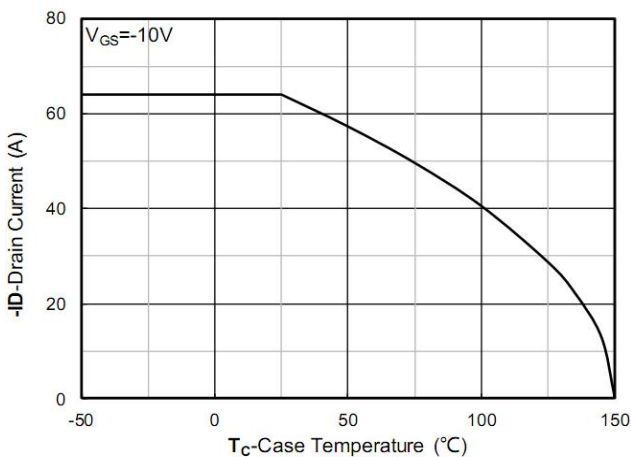


Figure 11. Current dissipation

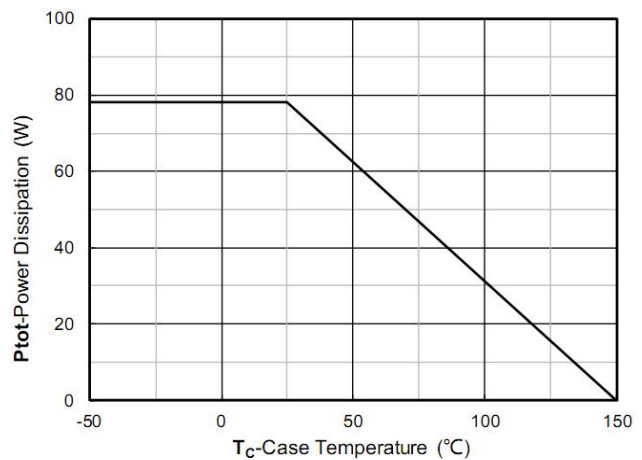


Figure 12. Power dissipation

Typical Characteristics

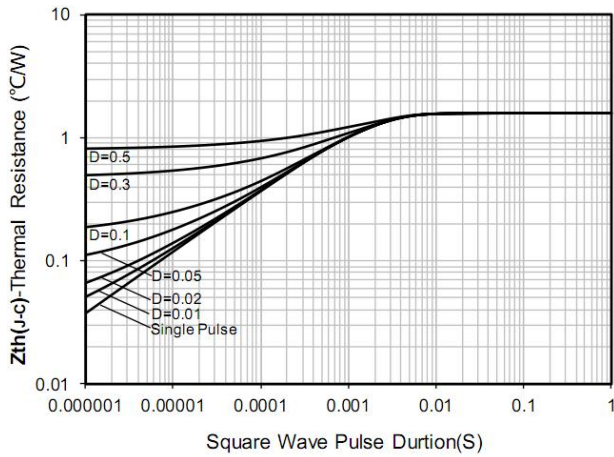


Figure 13. Maximum Transient Thermal Impedance

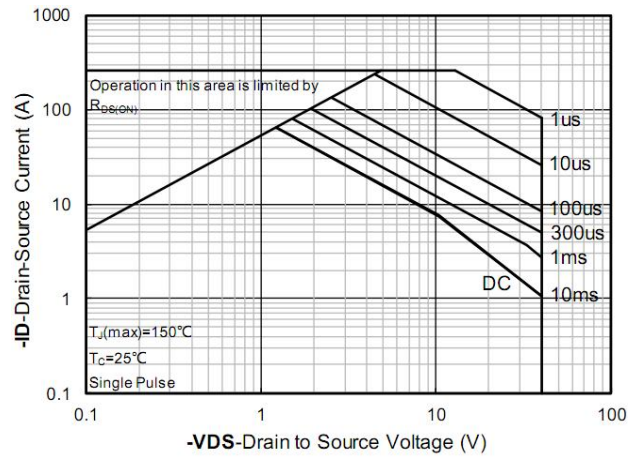
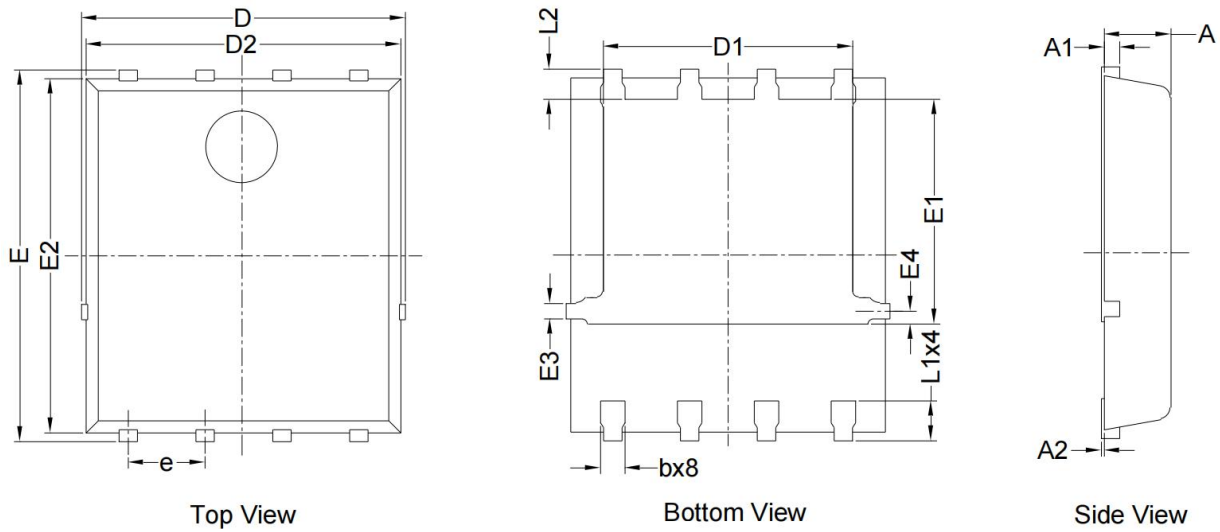


Figure 14. Safe Operation Area

PDFN5*6-8L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
D	5.150	5.550	0.203	0.219
E	5.950	6.350	0.234	0.250
A	1.000	1.200	0.039	0.047
A1	0.254 BSC.		0.010 BSC.	
A2	0.000	0.100	0.000	0.004
D1	3.920	4.320	0.154	0.170
E1	3.520	3.920	0.139	0.154
D2	5.000	5.400	0.197	0.213
E2	5.660	6.060	0.223	0.239
E3	0.254 REF.		0.010 REF.	
E4	0.210 REF.		0.008 REF.	
L1	0.560	0.760	0.022	0.030
L2	0.500 BSC.		0.020 BSC.	
b	0.310	0.510	0.012	0.020
e	1.270 BSC.		0.050 BSC.	