

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
40V	0.7mΩ@10V	370A

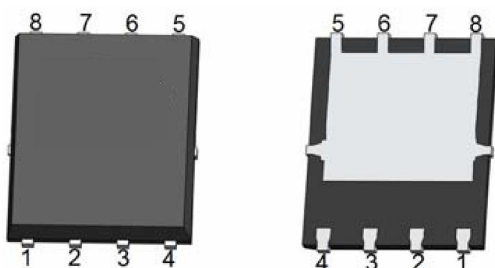
Feature

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

Application

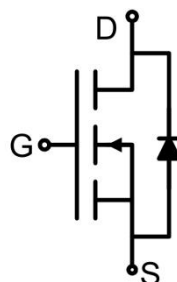
- Power switching application
- Uninterruptible power supply
- DC-DC Converter

Package

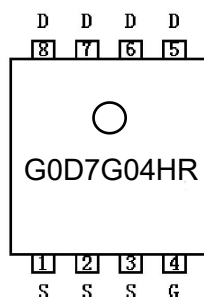


PDFN5*6-8L

Circuit diagram



Marking



Absolute maximum ratings (Ta=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 ^{1,2)} ($T_C = 25^\circ\text{C}$)	I_D	370	A
Continuous Drain Current ^{1,2)} ($T_C = 100^\circ\text{C}$)	$I_D(100^\circ\text{C})$	263	A
Pulsed Drain Current, $t_p \leq 10\mu\text{s}$ ($T_C = 25^\circ\text{C}$)	I_{DM}	1480	A
Power Dissipation ^{1,2)} ($T_C = 25^\circ\text{C}$)	P_D	176	W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.85	$^\circ\text{C/W}$
Single pulse avalanche energy ³⁾	E_{AS}	600.25	mJ
Junction Temperature	T_J	175	$^\circ\text{C}$
Storage Temperature	T_{STG}	-55 ~ +175	$^\circ\text{C}$

Electrical characteristics ($T_J = 25^\circ\text{C}$, 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} =32V,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	2.2	3.0	3.7	V
Drain-source on-resistance	R _{DS(on)}	V _{GS} =10V, I _D =50A		0.52	0.7	mΩ
Dynamic characteristics ⁴⁾						
Input Capacitance	C _{iss}	V _{DS} =20V, V _{GS} =0V, f =1MHz		5810		pF
Output Capacitance	C _{oss}			3450		
Reverse Transfer Capacitance	C _{rss}			180		
Total Gate Charge	Q _g	V _{DS} =20V, V _{GS} =10V, I _D =50A		81.1		nC
Gate-Source Charge	Q _{gs}			25.3		
Gate-Drain Charge	Q _{gd}			18.8		
Turn-on delay time	t _{d(on)}	V _{DS} =20V, V _{GS} =10V, I _D =50A, R _{GEN} =3.0Ω		19.3		nS
Turn-on rise time	t _r			81.5		
Turn-off delay time	t _{d(off)}			55.9		
Turn-off fall time	t _f			43.4		
Source-Drain Diode characteristics						
Diode Forward voltage	V _{SD}	V _{GS} =0V, I _S =50A			1.2	V
Reverse recover time	t _{rr}	I _F =50A,di/dt=100A/us,		49.3		nS
Reverse recovery charge	Q _{rr}	V _R =20V, V _{GS} =0V		45		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) Thermal resistance from junction to soldering point (on the exposed drain pad).
- 3) $T_J = 25^\circ\text{C}$, $V_G = 10V$, $R_G = 25\Omega$, $L = 0.5\text{mH}$, $I_{AS} = 49A$.
- 4) Guaranteed by design, not subject to production testing.

Typical Characteristics

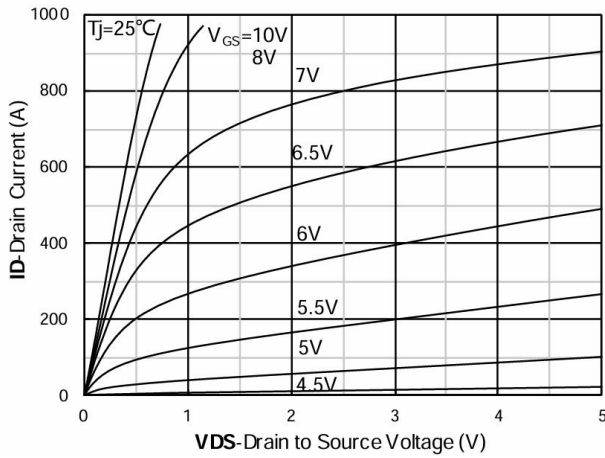


Figure 1. Output Characteristics; typical values

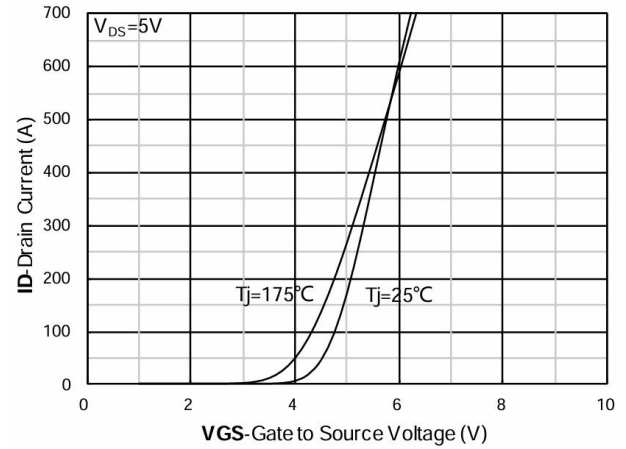


Figure 2. Transfer Characteristics; typical values

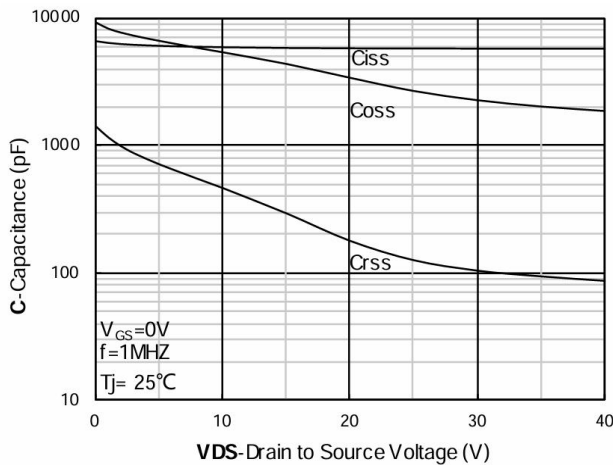


Figure 3. Capacitance Characteristics; typical values

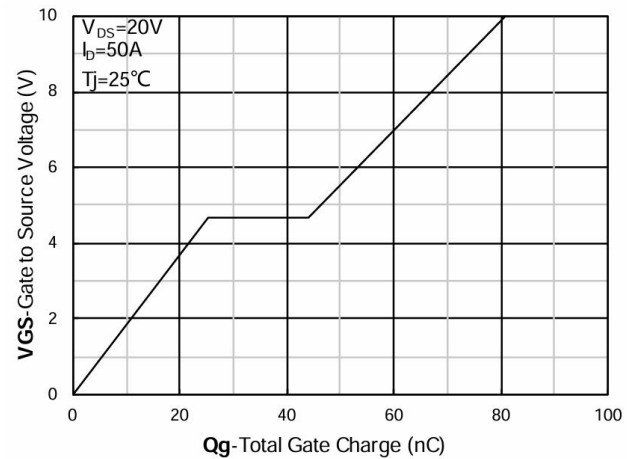


Figure 4. Gate Charge; typical values

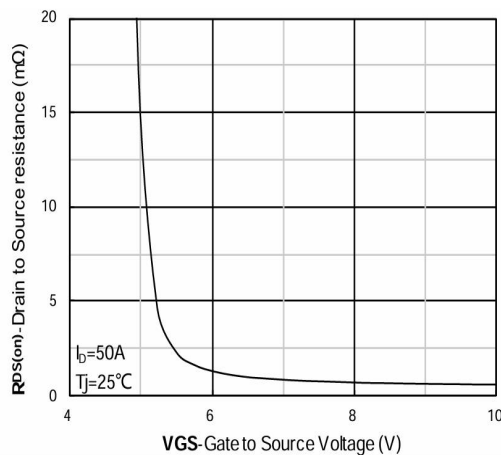


Figure 5. On-Resistance vs. Gate to Source Voltage; typical values

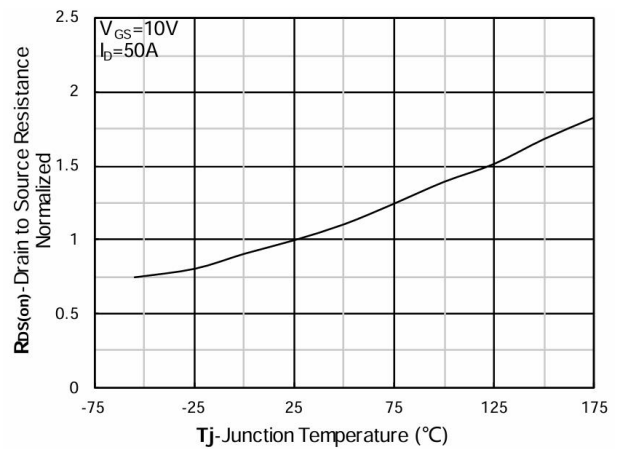


Figure 6. Normalized On-Resistance

Typical Characteristics

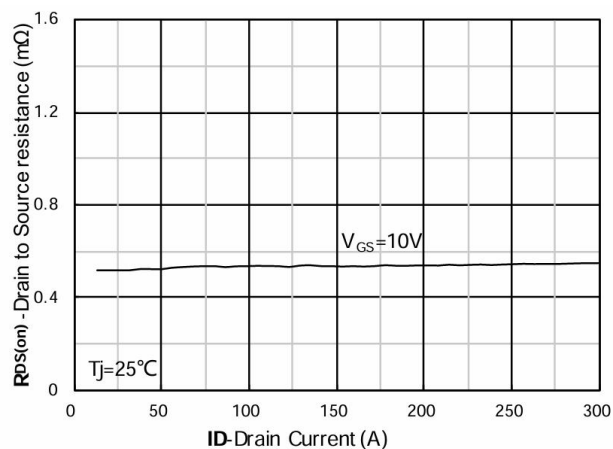


Figure 7. $R_{DS(on)}$ vs. Drain Current; typical values

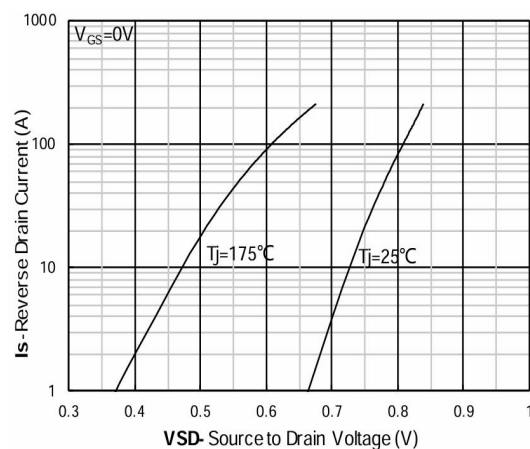


Figure 8. Forward characteristics of reverse diode; typical values

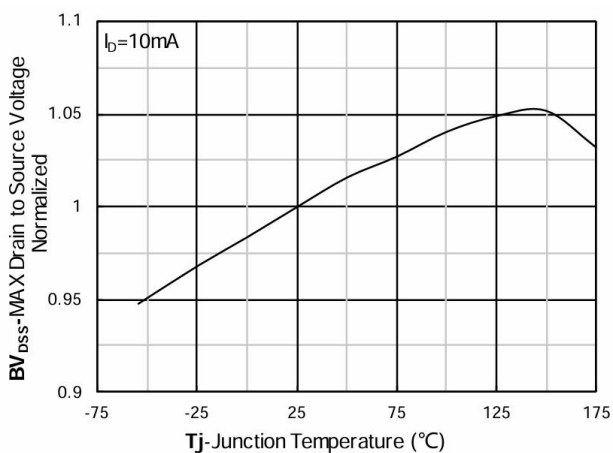


Figure 9. Normalized breakdown voltage

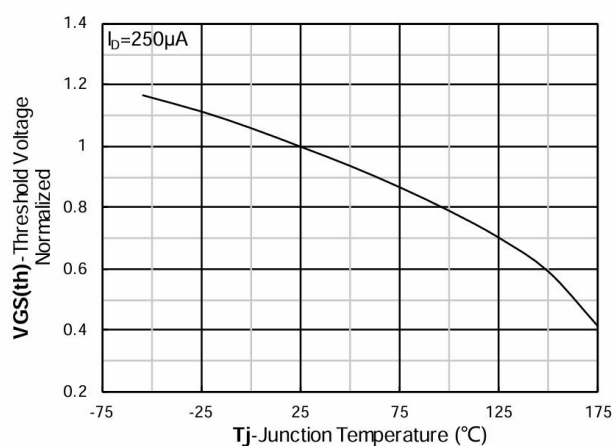


Figure 10. Normalized Threshold voltage

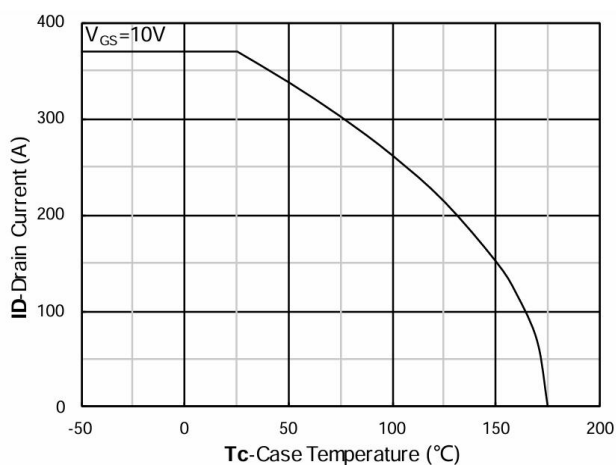


Figure 11. Current dissipation

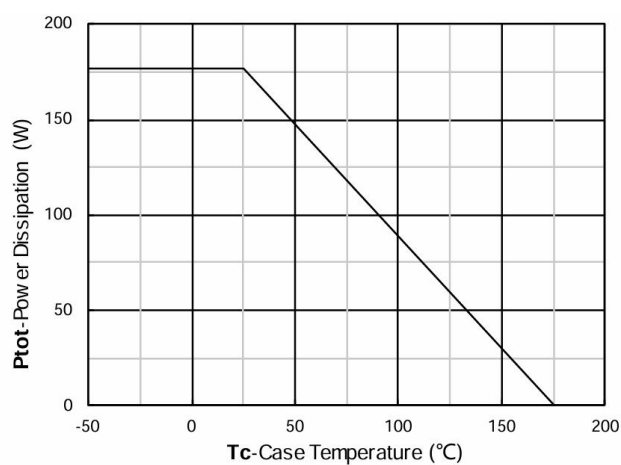


Figure 12. Power dissipation

Typical Characteristics

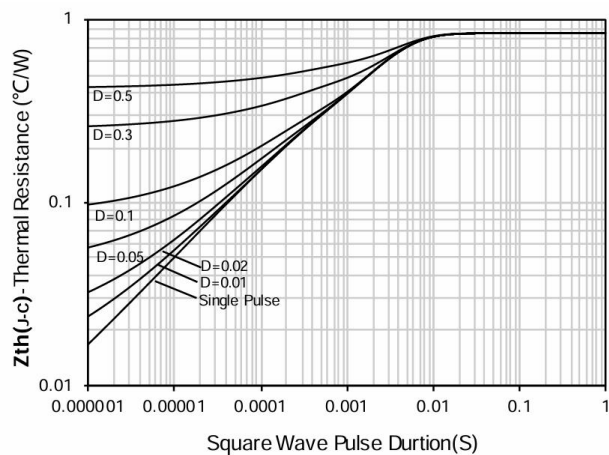


Figure 13. Maximum Transient Thermal Impedance

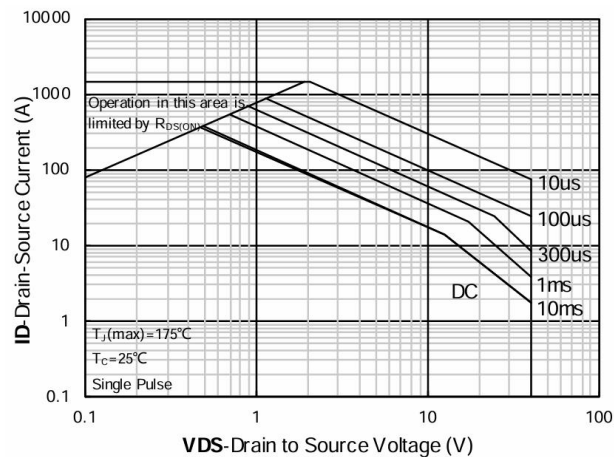
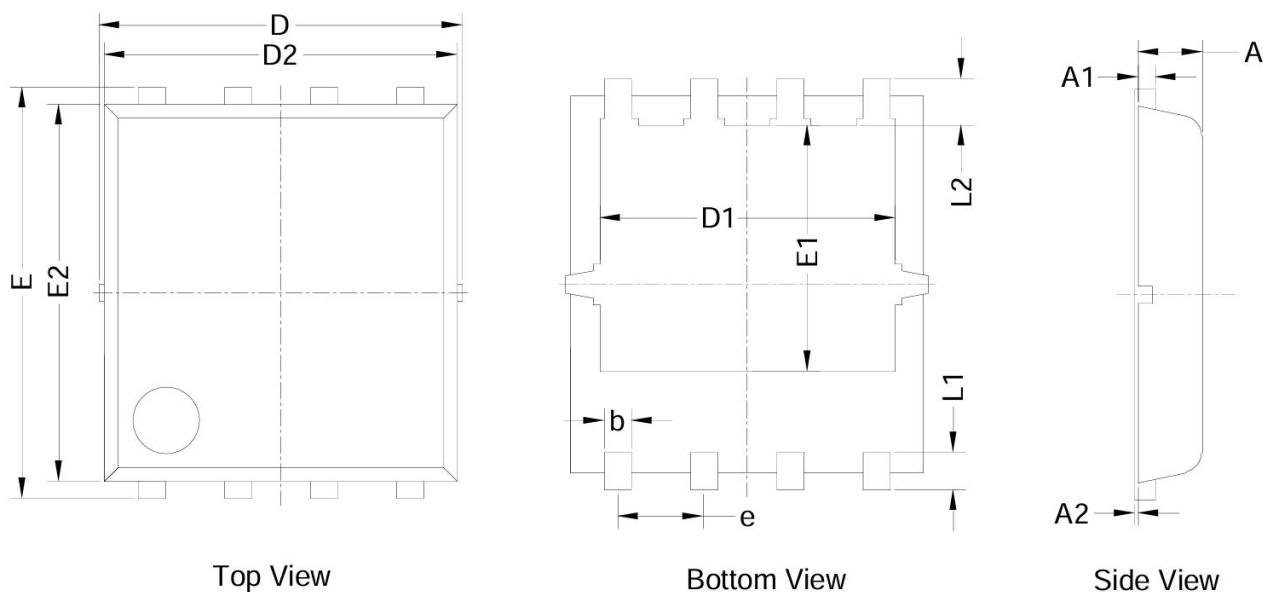


Figure 14. Safe Operation Area

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	6.150	0.234	0.242
A	0.850	1.050	0.033	0.041
A1	0.203 BSC.		0.008 BSC.	
A2	-	0.080	-	0.003
D1	4.250	4.450	0.167	0.175
E1	3.525	3.725	0.139	0.147
D2	5.200 BSC.		0.205 BSC.	
E2	5.550 BSC.		0.219 BSC.	
L1	0.450	0.650	0.018	0.026
L2	0.680 BSC.		0.027 BSC.	
b	0.300	0.500	0.012	0.020
e	1.270 BSC.		0.050 BSC.	