

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
40V	8mΩ@10V	45A
	11.2mΩ@4.5V	

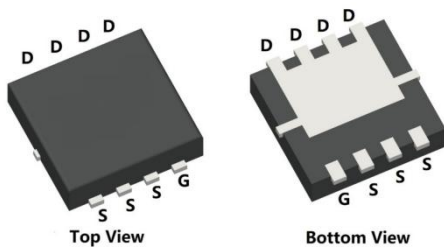
Feature

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

Application

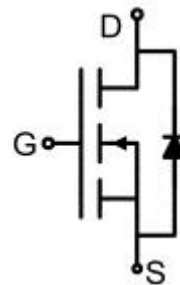
- Power management functions
- DC/DC converters
- Backlighting

Package

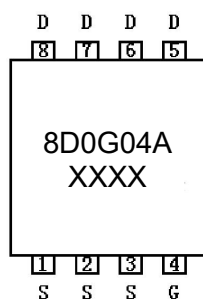


PDFN3.3*3.3-8L

Circuit diagram



Marking



Absolute maximum ratings ($T_J=25^{\circ}\text{C}$ 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)} ($V_{GS}=10\text{V}$, $T_C=25^{\circ}\text{C}$)	I_D	45	A
Continuous Drain Current ^{1,3)} ($V_{GS}=10\text{V}$, $T_C=100^{\circ}\text{C}$)	$I_D (100^{\circ}\text{C})$	28	A
Pulsed Drain Current ($T_C=25^{\circ}\text{C}$, $t_p=100\mu\text{s}$)	I_{DM}	180	A
Single Pulse Avalanche Energy ²⁾	E_{AS}	44.2	mJ
Power Dissipation ^{1,3)} ($T_C=25^{\circ}\text{C}$)	P_D	31	W
Thermal Resistance Junction to Case	$R_{\theta JC}$	4	$^{\circ}\text{C/W}$
Operating Junction Temperature	T_J	$-55 \sim +150$	$^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	$-55 \sim +150$	$^{\circ}\text{C}$

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} =40V, 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	1.6	2.1	V
Drain-source on-resistance	R _{DS(on)}	V _{GS} =10V, I _D =20A		6.5	8	mΩ
		V _{GS} =4.5V, I _D =10A		8.3	11.2	
Dynamic characteristics ⁴⁾						
Input Capacitance	C _{iss}	V _{DS} =20V, V _{GS} =0V, f =1MHz		910		pF
Output Capacitance	C _{oss}			170		
Reverse Transfer Capacitance	C _{rss}			8.5		
Total Gate Charge	Q _g	V _{DS} =20V, V _{GS} =10V, I _D =6A		12.3		nC
Gate-Source Charge	Q _{gs}			1.9		
Gate-Drain Charge	Q _{gd}			1.5		
Turn-on delay time	t _{d(on)}	V _{DS} =20V, V _{GS} =10V, I _D =6A R _G =3Ω		8		nS
Turn-on rise time	t _r			3.6		
Turn-off delay time	t _{d(off)}			26.3		
Turn-off fall time	t _f			3.3		
Source-Drain Diode characteristics						
Diode Forward Current	I _S				45	A
Diode Forward voltage	V _{SD}	V _{GS} =0V, I _S =20A			1.2	V
Reverse Recovery Time	T _{rr}	I _F =6A, di/dt =-100A/μs		17.8		nS
Reverse Recovery Charge	Q _{rr}			9.4		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) EAS condition : $V_G=10\text{V}$, $L=0.5\text{mH}$, $R_G=25\Omega$, $I_{AS}=13.3\text{A}$.
- 3) Thermal resistance from junction to soldering point (on the exposed drain pad).
- 4) Guaranteed by design, not subject to production.

Typical Characteristics

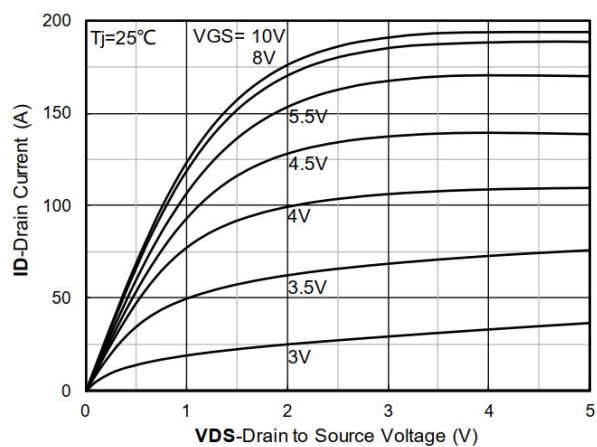


Figure 1. Output Characteristics

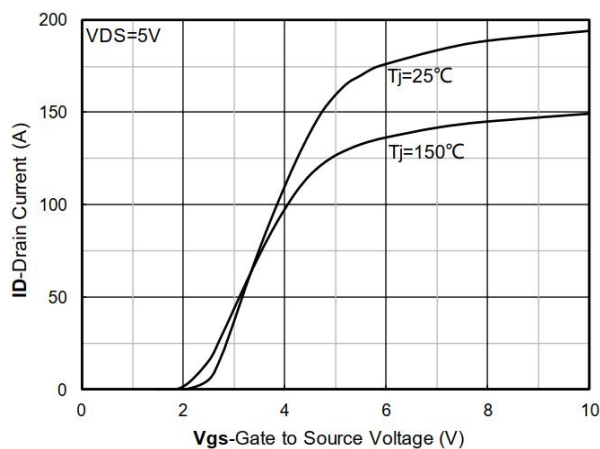


Figure 2. Transfer Characteristics

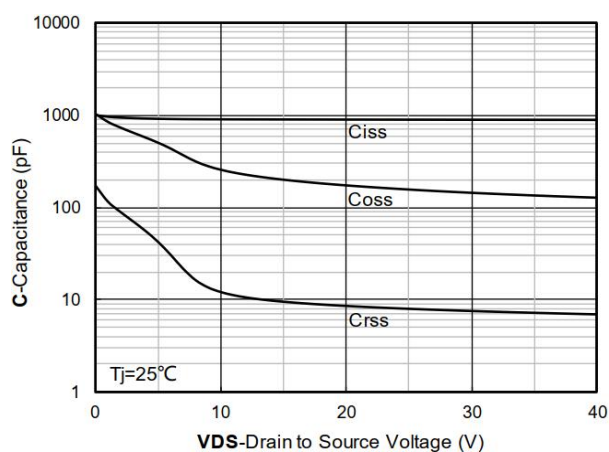


Figure 3. Capacitance Characteristics

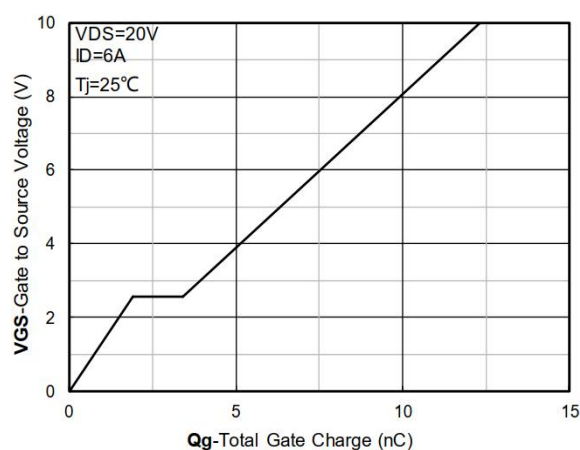


Figure 4. Gate Charge

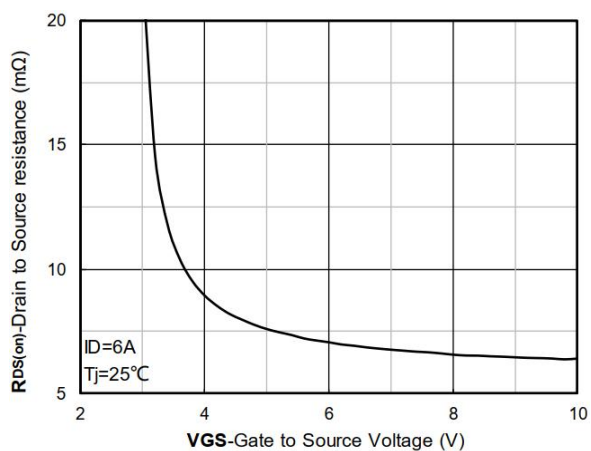


Figure 5. On-Resistance vs Gate to Source Voltage

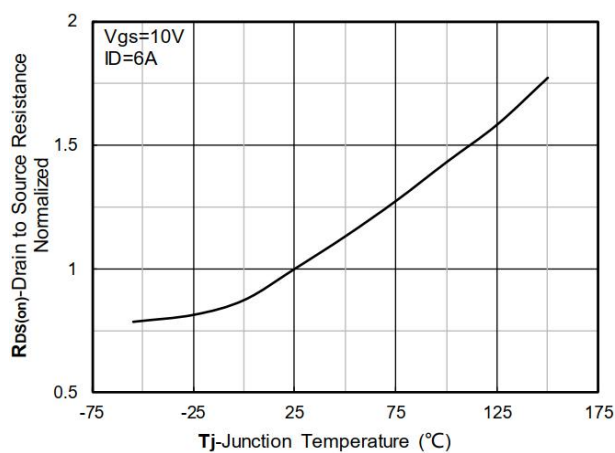


Figure 6. Normalized On-Resistance

Typical Characteristics

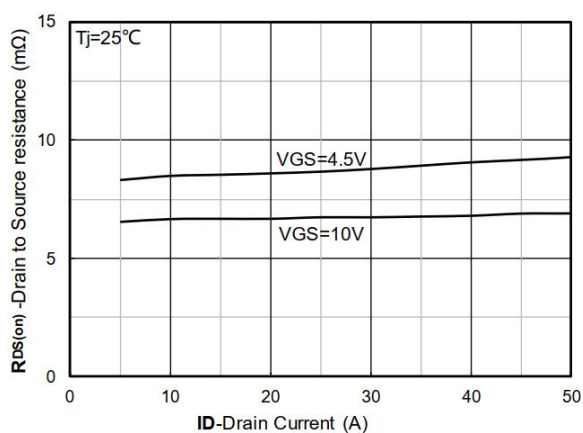


Figure 7. $R_{DS(on)}$ VS Drain Current

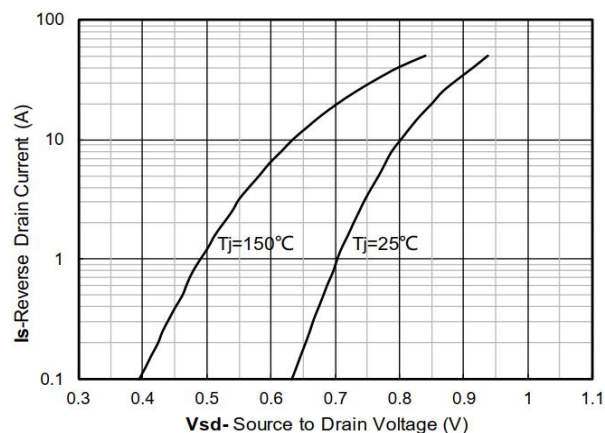


Figure 8. Forward characteristics of reverse diode

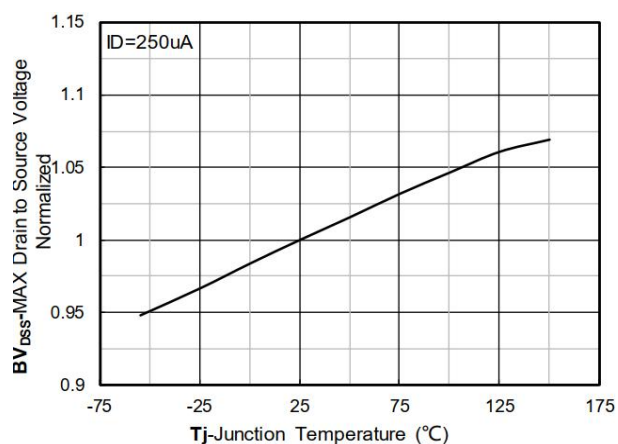


Figure 9. Normalized breakdown voltage

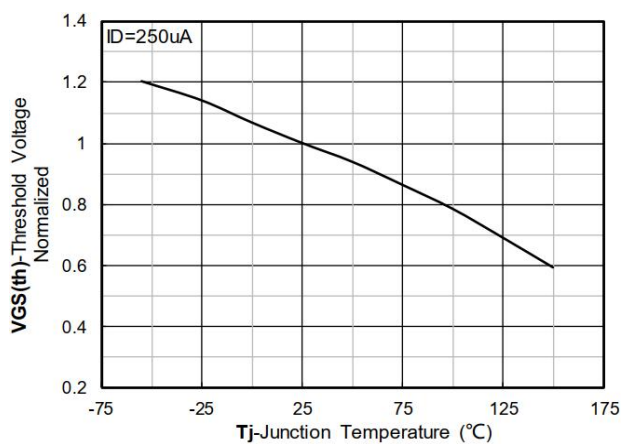


Figure 10. Normalized Threshold voltage

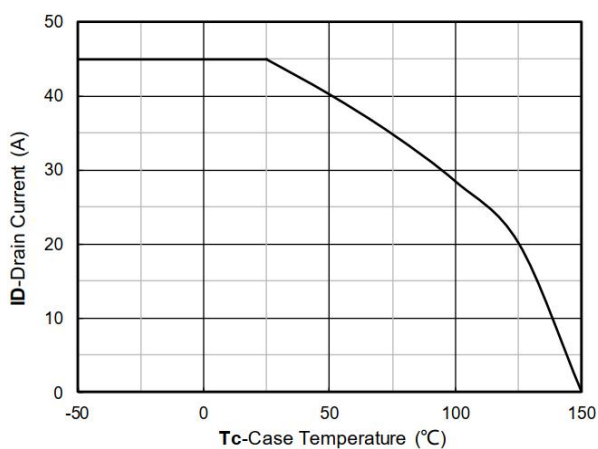


Figure 11. Current dissipation

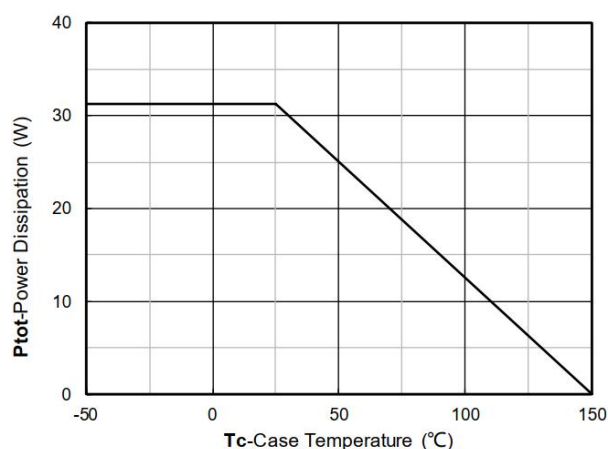


Figure 12. Power dissipation

Typical Characteristics

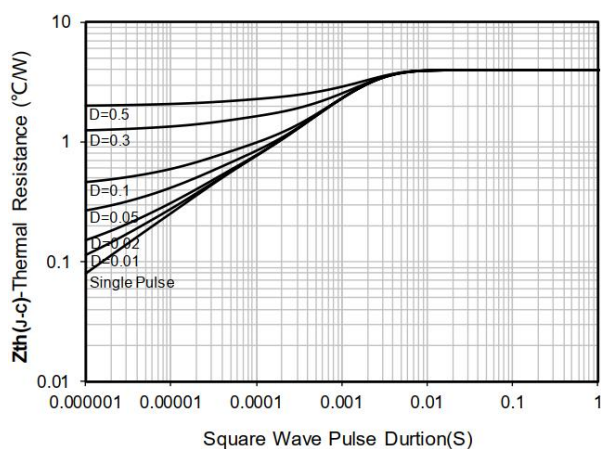


Figure 13. Maximum Transient Thermal Impedance

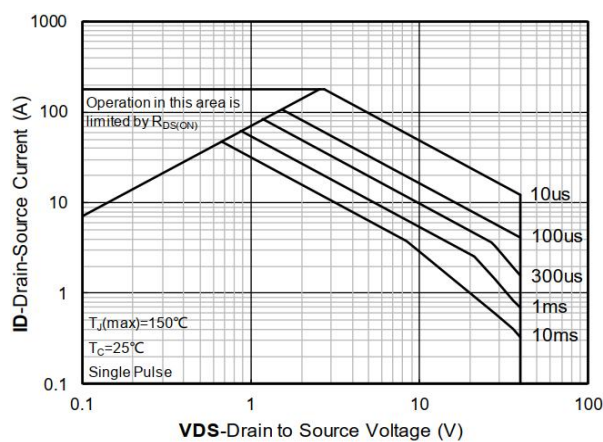
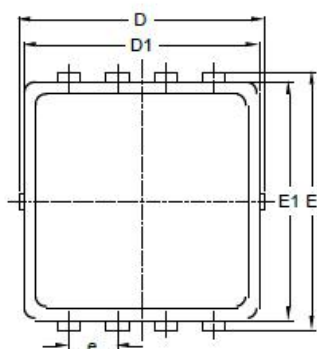
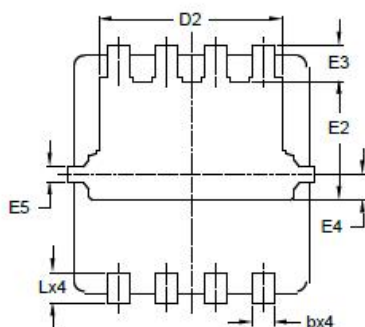


Figure 14. Safe Operation Area

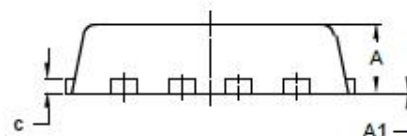
PDFN3.3*3.3-8L Package Information



TOP VIEW



BOTTOM VIEW



SIDE VIEW

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.850	0.028	0.033
A1	0.000	0.050	0.000	0.002
b	0.200	0.400	0.008	0.016
c	0.100	0.250	0.004	0.010
D	3.150	3.450	0.124	0.136
D1	3.000	3.300	0.118	0.130
D2	2.250	2.650	0.089	0.104
E	3.150	3.450	0.124	0.136
E1	2.900	3.200	0.114	0.126
E2	1.540	1.920	0.061	0.076
E3	0.280	0.650	0.011	0.026
E4	0.570 REF.		0.022 REF.	
E5	0.200 REF.		0.008 REF.	
e	0.650 BSC.		0.026 BSC.	
L	0.300	0.500	0.012	0.020