AC2418NP04S-Q1

N and P-Channel Enhancement Mode MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
40V	16mΩ@10V	24A
	21mΩ@4.5V	

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
-40V	29mΩ@-10V	-18A
	41mΩ@-4.5V	

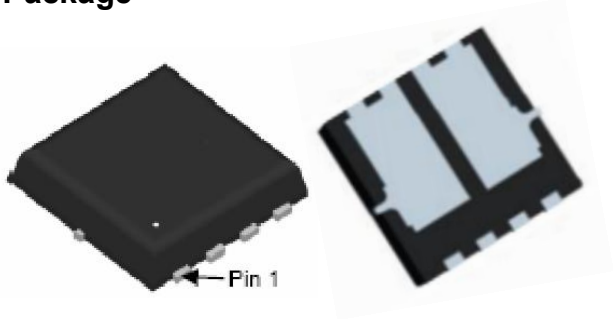
Feature

- High density cell design for ultra low Rdson
- Trench Power LV MOSFET technology
- High Speed switching
- Suffix "-Q1" for AEC-Q101

Application

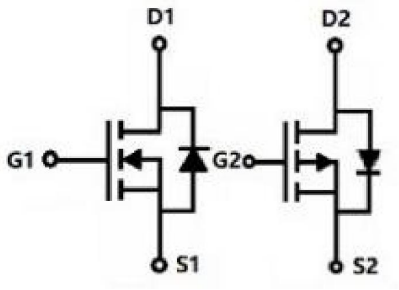
- Wireless charger
- Load switching
- Power management

Package



DFN3.3*3.3-8L

Circuit diagram



Marking

Absolute maximum ratings (T_A=25℃ unless otherwise noted)

Parameter	Symbol	N-Channel	P-Channel	Unit
Drain-Source Voltage	V_{DS}	40	-40	V
Gate-Source Voltage	V_{GS}	±20	±20	V
Continuous Drain Current（T_C=25℃）	I_D	24	-18	A
Continuous Drain Current（T_C=100℃）	I_D（100℃）	15	-11	A
Pulsed Drain Current[1)]	I_{DM}	96	-72	A
Avalanche energy[2)]	E_{AS}	6.25	6.25	mJ
Power Dissipation[3)]（T_C=25℃）	P_D	18.9	19.5	W
Thermal Resistance from Junction to Case	$R_{\theta JC}$	6.6	6.4	℃/W
Junction Temperature	T_J	150	150	℃
Storage Temperature	T_{STG}	-55 ~ +150	-55 ~ +150	℃

N-CH Electrical characteristics (T_J=25 ºC, 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
		V_{DS} =40V,V_{GS} = 0V,T_J=150℃			100	
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	1.0	1.5	2.0	V
Drain-source on-resistance	$R_{DS(on)}$	V_{GS} =10V, I_D =15A		11.5	16	mΩ
		V_{GS} =4.5V, I_D =8A		15	21	
Dynamic characteristics[4)]						
Input Capacitance	C_{iss}	V_{DS} =20V,V_{GS} =0V,f =1MHz		965		pF
Output Capacitance	C_{oss}			96		
Reverse Transfer Capacitance	C_{rss}			85		
Gate resistance	R_g	f =1MHz		3		Ω
Total Gate Charge	Q_g	V_{DS} =20V,V_{GS} =10V, I_D =15A		21.4		nC
Gate-Source Charge	Q_{gs}			3.4		
Gate-Drain Charge	Q_{gd}			5		
Turn-on delay time	$t_{d(on)}$	V_{DS}=20V,V_{GS}=10V , I_D =15A,R_{GEN}=2.2Ω		7.8		nS
Turn-on rise time	t_r			143		
Turn-off delay time	$t_{d(off)}$			25.6		
Turn-off fall time	t_f			5.2		
Source-Drain Diode characteristics						
Diode Continuous Current	I_S				24	A
Diode Forward voltage	V_{SD}	V_{GS} =0V, I_S=15A			1.2	V
Reverse Recovery Charge	Q_{rr}	I_F=15A, di/dt=100A/us		6.3		nC
Reverse Recovery Time	t_{rr}			11.7		nS

P-CH 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
		V_{DS} =-40V,V_{GS} = 0V,T_J=150℃			-100	
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	-1.6	-2.1	V
Drain-source on-resistance	$R_{DS(on)}$	V_{GS} =-10V, I_D =-15A		22	29	mΩ
		V_{GS} =-4.5V, I_D =-8A		30	41	
Dynamic characteristics[4]						
Input Capacitance	C_{iss}	V_{DS} =-20V,V_{GS} =0V,f =1MHz		1225		pF
Output Capacitance	C_{oss}			120		
Reverse Transfer Capacitance	C_{rss}			110		
Gate resistance	R_g	f =1MHz		16		Ω
Total Gate Charge	Q_g	V_{DS} =-20V,V_{GS} =-10V, I_D =-15A		27		nC
Gate-Source Charge	Q_{gs}			2.5		
Gate-Drain Charge	Q_{gd}			4.2		
Turn-on delay time	$t_{d(on)}$	V_{DD}=-20V,V_{GS}=-10V , I_D =-15A,R_{GEN}=2.2Ω		7.7		nS
Turn-on rise time	t_r			106.7		
Turn-off delay time	$t_{d(off)}$			68.3		
Turn-off fall time	t_f			37.6		
Source-Drain Diode characteristics						
Diode Continuous Current	I_S				-18	A
Diode Forward voltage	V_{SD}	V_{GS} =0V, I_S=-15A			-1.2	V
Reverse Recovery Charge	Q_{rr}	I_F=-15A, di/dt=100A/us		20		nC
Reverse Recovery Time	t_{rr}			21		nS

Notes:

1) Repetitive rating; pulse width limited by max. junction temperature.

2) NMOS: T_J=25℃, V_{GS}=10V, R_G=25Ω, L=0.5mH, I_{AS}=5A.PMOS: T_J=25℃, V_{GS}=-10V, R_G=25Ω, L=0.5mH, I_{AS}=-5A.

3) Pd is based on max. junction temperature, using junction-case thermal resistance.

4) Guaranteed by design, not subject to production.

N- Channel Typical Characteristics

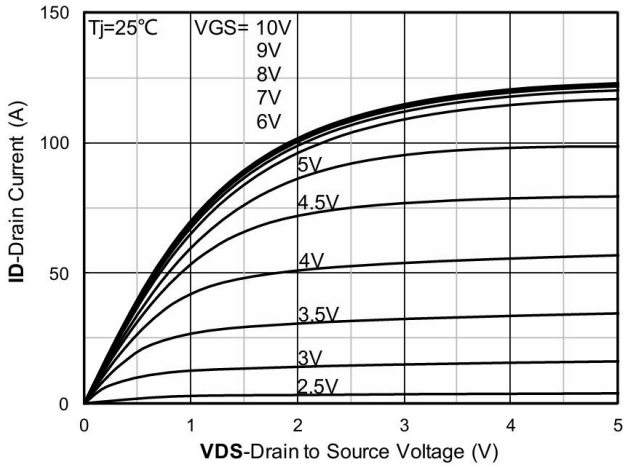


Figure 1. Output Characteristics

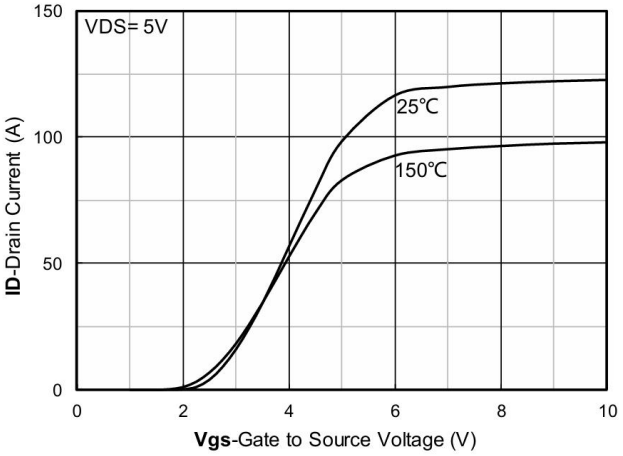


Figure 2. Transfer Characteristics

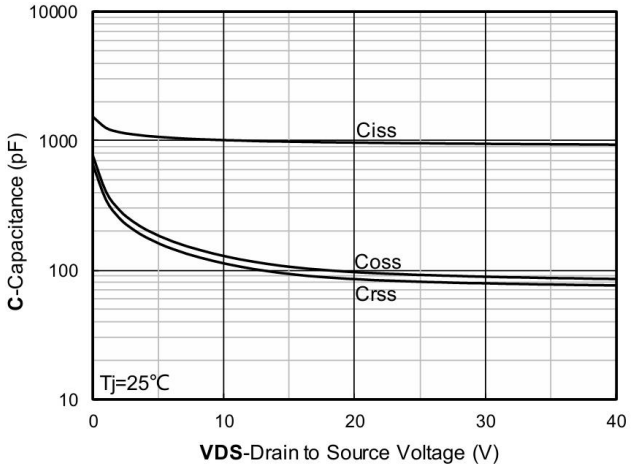


Figure 3. Capacitance Characteristics

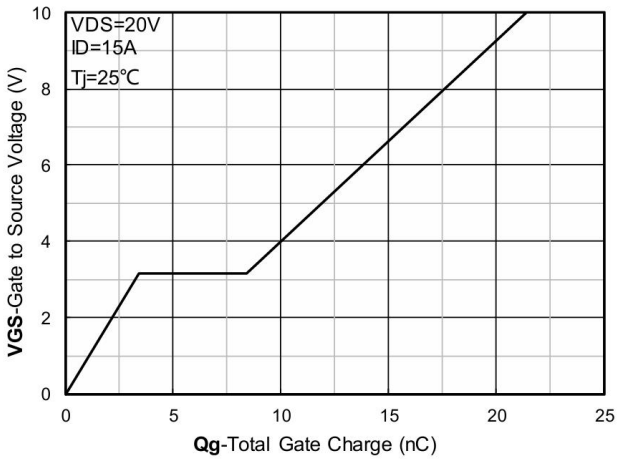


Figure 4. Gate Charge

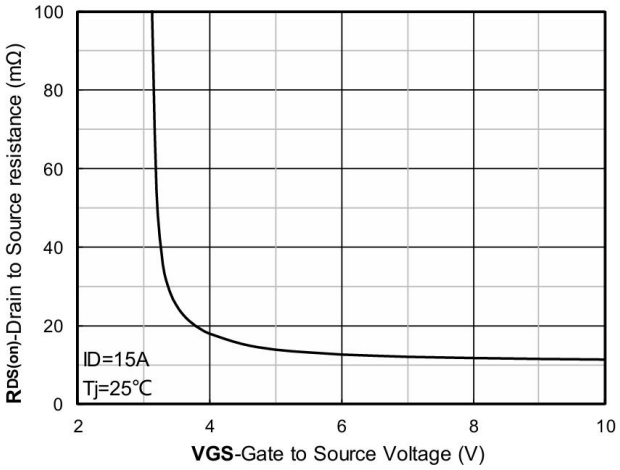


Figure 5. On-Resistance VS Gate to Source Voltage

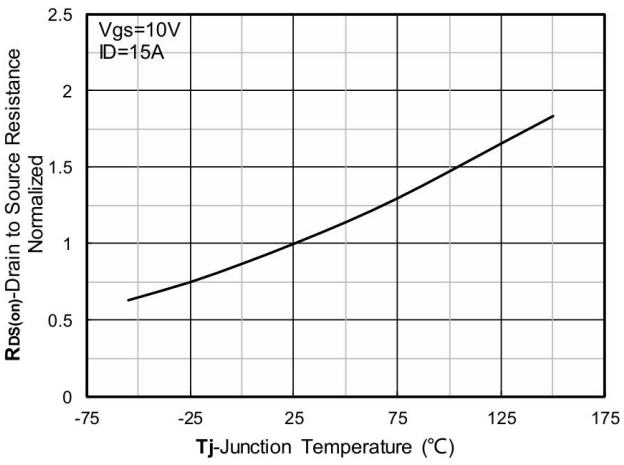


Figure 6. Normalized On- Resistance

Document ID	Issued Date	Revised Date	Revision	Page.
AS-1150607	2018/03/03	2024/11/15	B	9

N- Channel Typical Characteristics

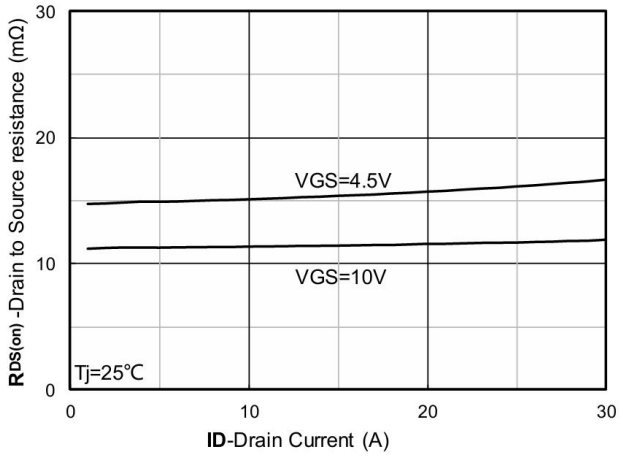


Figure 7. $R_{DS(on)}$ VS Drain Current

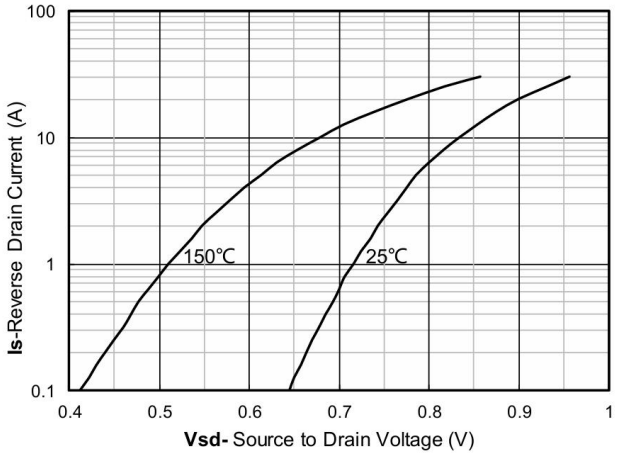


Figure 8. Forward characteristics of reverse diode

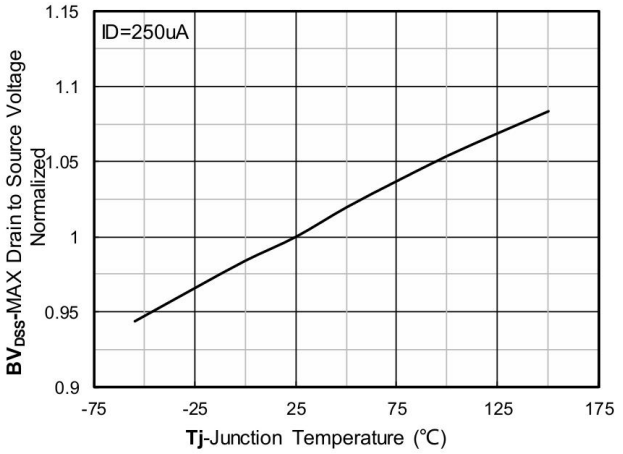


Figure 9. Normalized breakdown voltage

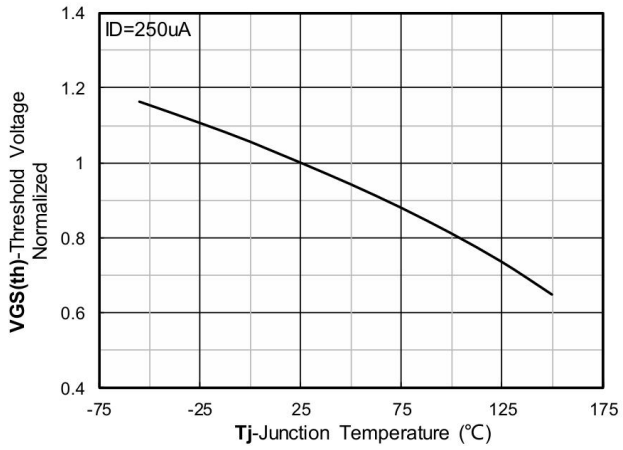


Figure 10. Normalized Threshold voltage

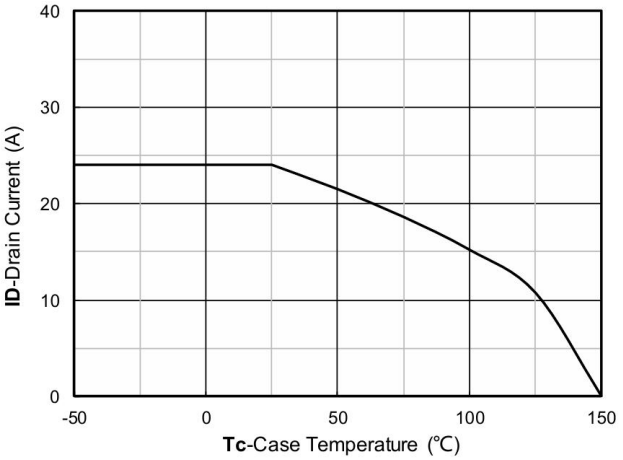


Figure 11. Current dissipation

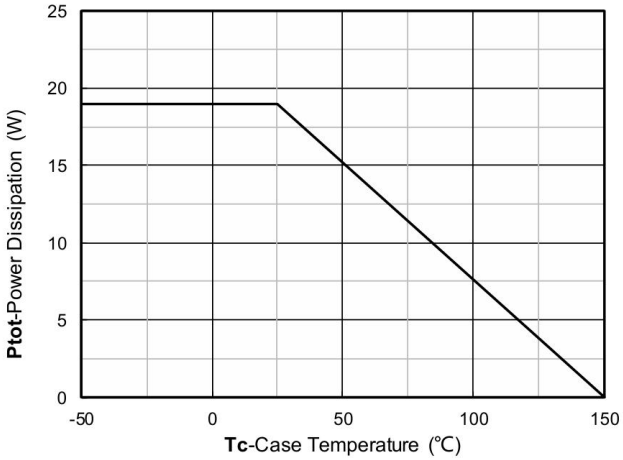


Figure 12. Power dissipation

Document ID	Issued Date	Revised Date	Revision	Page.
AS-1150607	2018/03/03	2024/11/15	B	9

N- Channel Typical Characteristics

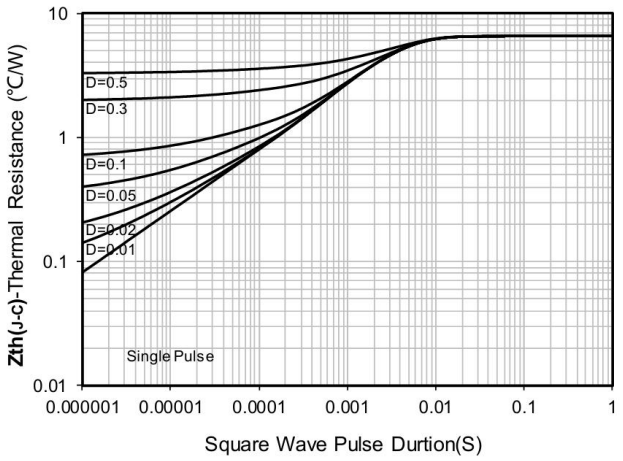


Figure 13. Maximum Transient Thermal Impedance

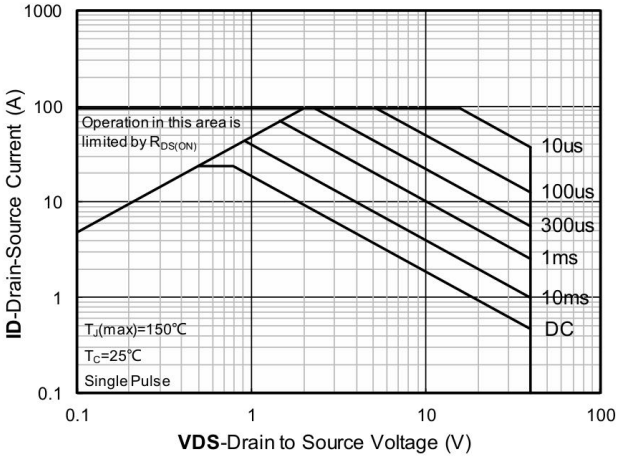


Figure 14. Safe Operation Area

P- Channel Typical Characteristics

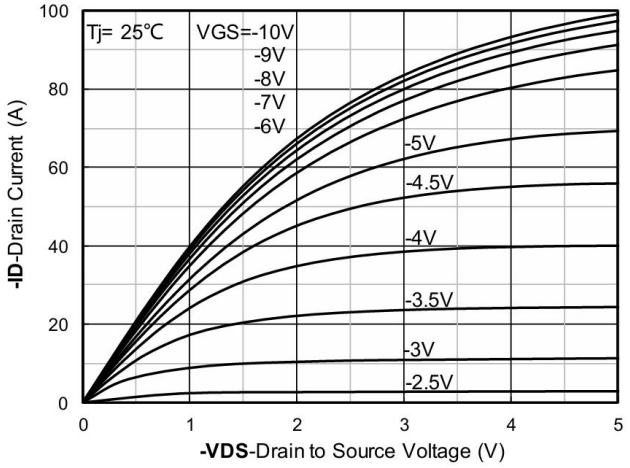


Figure 1. Output Characteristics

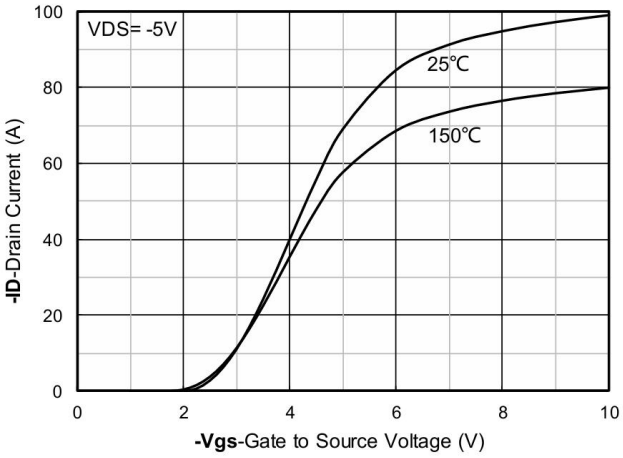


Figure 2. Transfer Characteristics

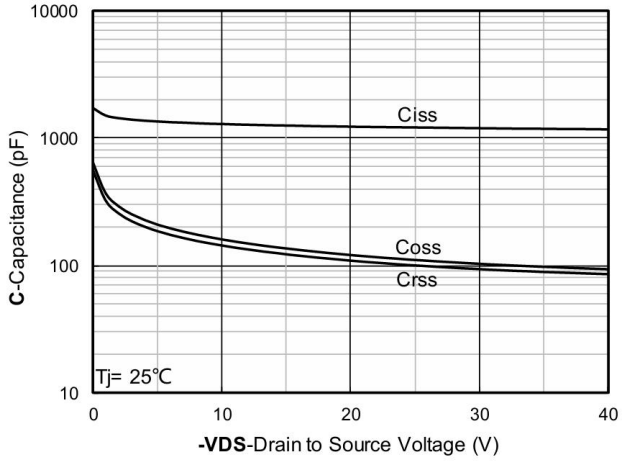


Figure 3. Capacitance Characteristics

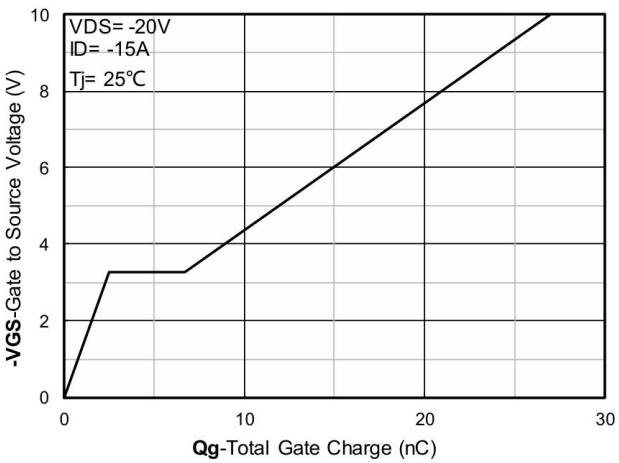


Figure 4. Gate Charge

P- Channel Typical Characteristics

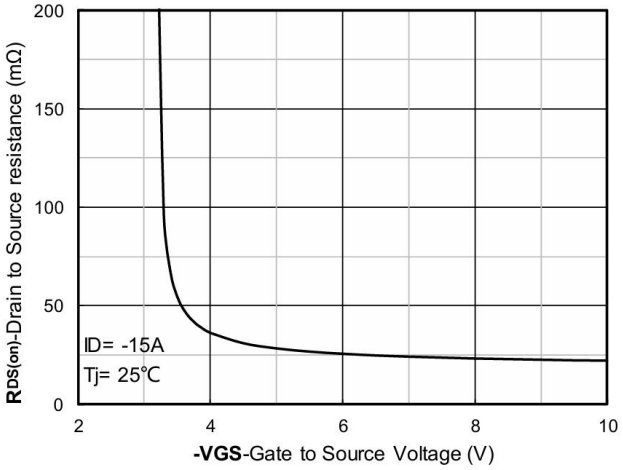


Figure 5. On-Resistance vs Gate to Source Voltage

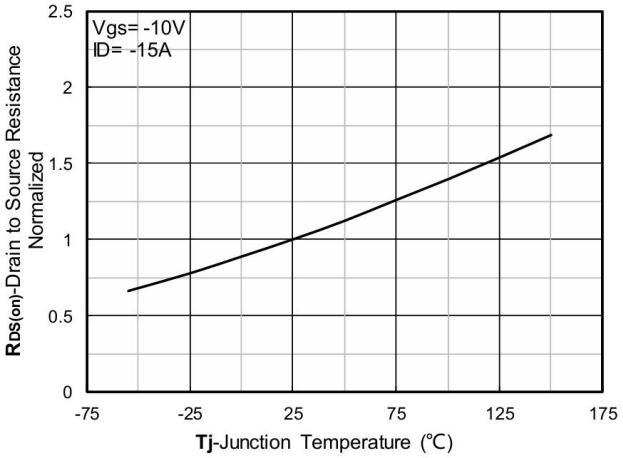


Figure 6. Normalized On-Resistance

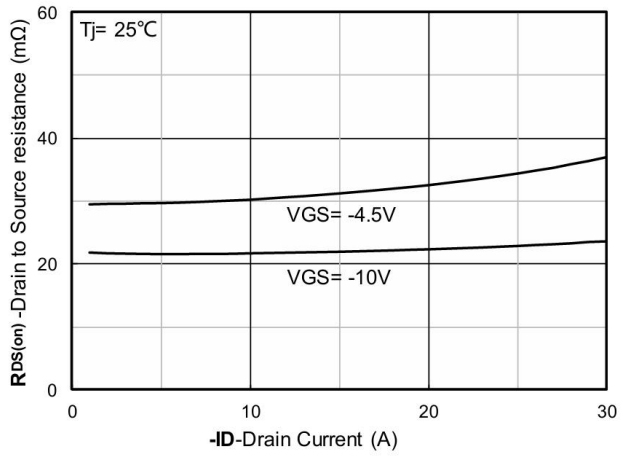


Figure 7. $R_{DS(on)}$ VS Drain Current

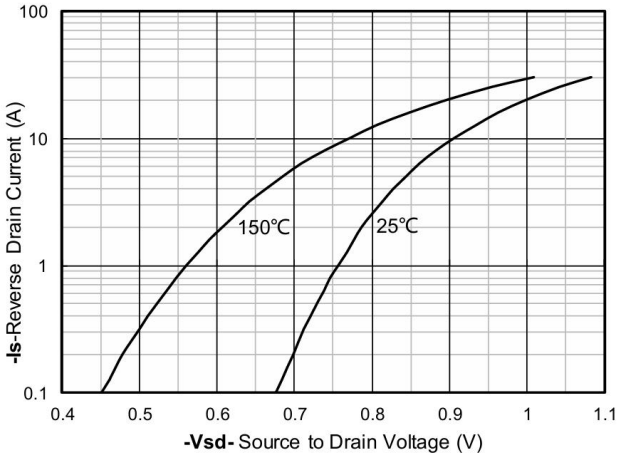


Figure 8. Forward characteristics of reverse diode

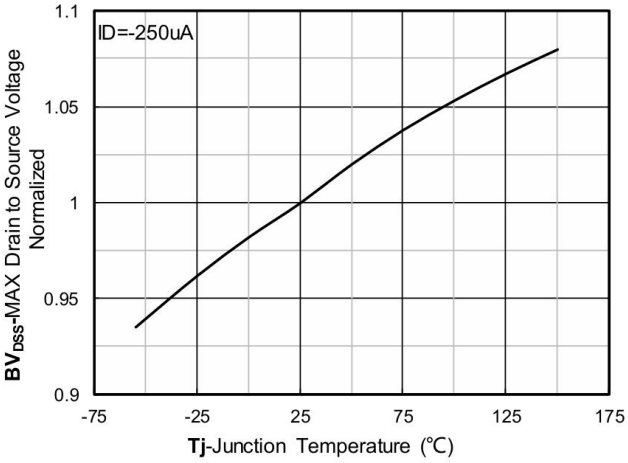


Figure 9. Normalized breakdown voltage

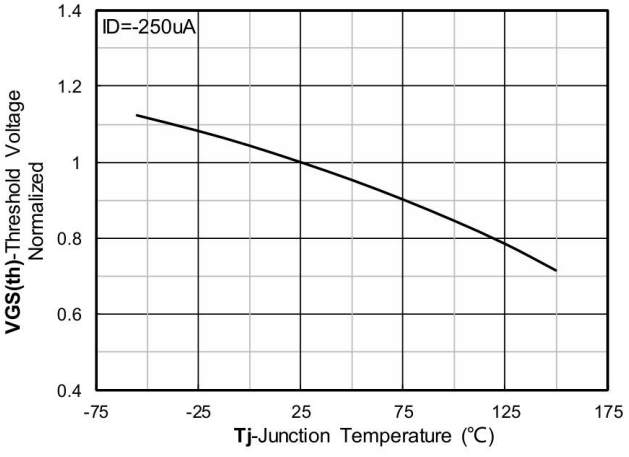


Figure 10. Normalized Threshold voltage

P- Channel Typical Characteristics

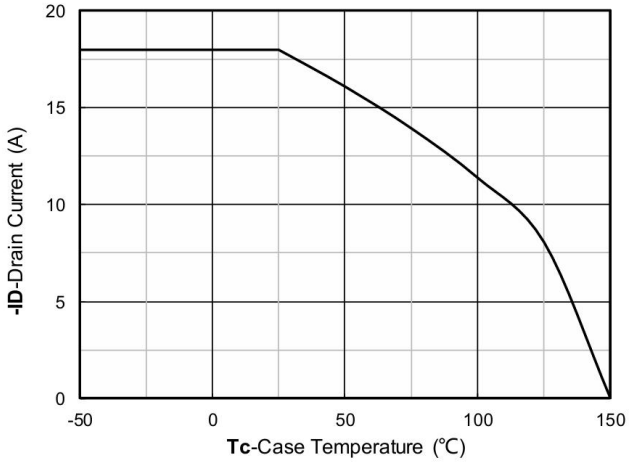


Figure 11. Current dissipation

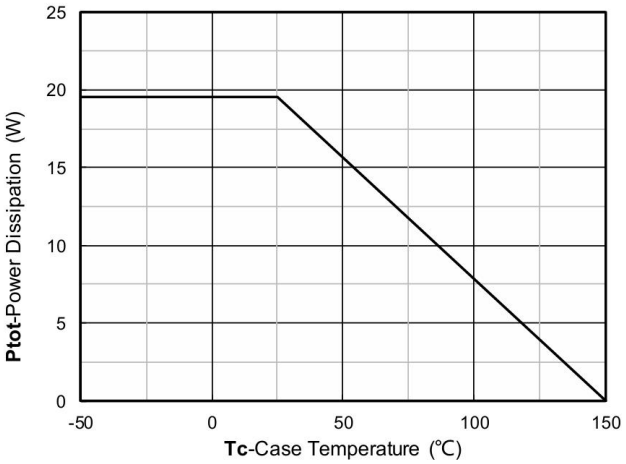


Figure 12. Power dissipation

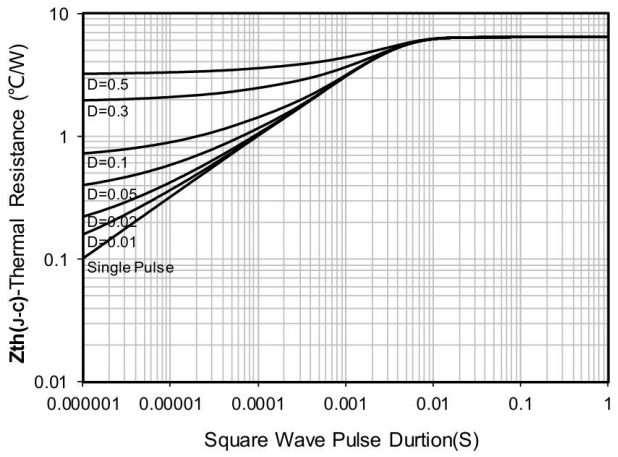


Figure 13. Maximum Transient Thermal Impedance

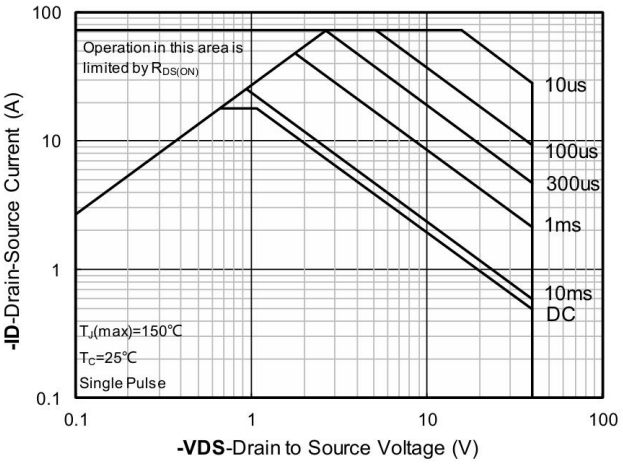
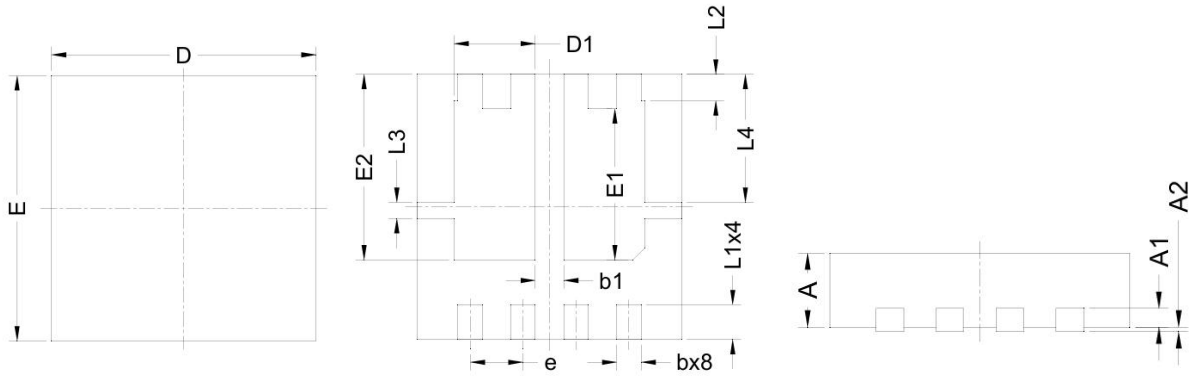


Figure 14. Safe Operation Area

DFN3.3*3.3-8L Package Information



Top View
正面视图

Bottom View
背面视图

Side View
侧面视图

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.900	0.028	0.035
A1	0.200 BSC		0.008 BSC	
A2	-	0.100	-	0.004
D	3.150	3.350	0.124	0.132
D1	0.900	1.100	0.035	0.043
E	3.150	3.350	0.124	0.132
E1	1.750	1.950	0.069	0.077
E2	2.175	2.375	0.086	0.094
L1	0.325	0.525	0.013	0.021
L2	0.325 BSC		0.013 BSC	
L3	0.200 BSC		0.008 BSC	
L4	1.570 BSC		0.062 BSC	
b	0.200	0.400	0.008	0.016
b1	0.350 REF		0.014 BSC	
e	0.650 BSC		0.026 BSC	