AG005NP100MQSP-Q1

N and P-Channel Enhancement Mode MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
100V	27mΩ@10V	5A
	30mΩ@4.5V	

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
-100V	110mΩ@-10V	-3A
	120mΩ@-4.5V	

Feature

- Trench Power LV MOSFET technology
- Excellent package for heat dissipation
- Suffix “-Q1” for AEC-Q101

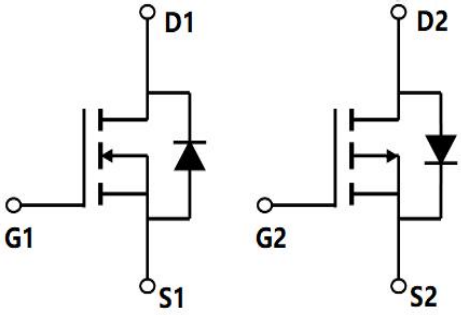
Application

- Load switching
- Hard switched and high frequency circuits
- Uninterruptible power supply

Package

SOP-8

Circuit diagram



Marking

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

Parameter	Symbol	N-Channel	P-Channel	Unit
Drain-Source Voltage	V_{DS}	100	-100	V
Gate-Source Voltage	V_{GS}	±20	±20	V
Continuous Drain Current	I_D	5	-3	A
Continuous Drain Current (T_A=100℃)	I_D (100℃)	3.2	-1.9	
Pulsed Drain Current[1)]	I_{DM}	30	-25	A
Power Dissipation[2)]	P_D	1.47	1.3	W
Thermal Resistance Junction to Ambient[3)]	$R_{\theta JA}$	85	90	℃/W
Operating Junction Temperature	T_J	-55 ~ +150	-55 ~ +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	100			V
Zero gate voltage drain current	I_{DSS}	V_{DS} =100V, 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	1.8	2.5	V
Drain-source on-resistance	$R_{DS(on)}$	V_{GS} =10V, I_D =5A		21	27	mΩ
		V_{GS} =4.5V, I_D =2A		24	30	
Dynamic characteristics[4)]						
Input Capacitance	C_{iss}	V_{DS} =50V, V_{GS} =0V, f =1MHz		1170		pF
Output Capacitance	C_{oss}			370		
Reverse Transfer Capacitance	C_{rss}			15		
Total Gate Charge	Q_g	V_{DS} =50V, V_{GS}=10V, I_D =5A		16		nC
Gtae-Source Charge	Q_{gs}			5.6		
Gtae-Drain Charge	Q_{gd}			2.4		
Turn-on delay time	$t_{d(on)}$	V_{DS} =50V, V_{GS} =10V, I_D =5A R_G =2.2Ω		39.2		nS
Turn-on rise time	t_r			11		
Turn-off delay time	$t_{d(off)}$			53.2		
Turn-off fall time	t_f			15.8		
Source-Drain Diode characteristics						
Diode Forward Current	I_S				5	A
Diode Forward voltage	V_{SD}	V_{GS} =0V, I_S =5A			1.2	V
Reverse recover time	T_{rr}	I_F =5A, di/dt =-100A/us		39.8		nS
Reverse recovery charge	Q_{rr}			42		nC

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	-100			V
Zero gate voltage drain current	I_{DSS}	V_{DS} =-100V, 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	-1.7	-2.5	V
Drain-source on-resistance	$R_{DS(on)}$	V_{GS} =-10V, I_D =-3A		85	110	mΩ
		V_{GS} =-4.5V, I_D =-2A		95	120	
Dynamic characteristics[4]						
Input Capacitance	C_{iss}	V_{DS} =-50V, V_{GS} =0V, f =1MHz		1050		pF
Output Capacitance	C_{oss}			110		
Reverse Transfer Capacitance	C_{rss}			10		
Total Gate Charge	Q_g	V_{DS} =-50V, V_{GS}=-10V I_D =-3A		20.1		nC
Gtae-Source Charge	Q_{gs}			3.9		
Gtae-Drain Charge	Q_{gd}			4.3		
Turn-on delay time	$t_{d(on)}$	V_{DS} =-50V, V_{GS} =-10V I_D =-3A, R_G =2.2Ω		10		nS
Turn-on rise time	t_r			30		
Turn-off delay time	$t_{d(off)}$			77		
Turn-off fall time	t_f			81		
Source-Drain Diode characteristics						
Diode Forward Current	I_S				-3	A
Diode Forward voltage	V_{SD}	V_{GS} =0V, I_S=-3A			-1.2	V
Reverse recover time	T_{rr}	I_F =-3A, di/dt =-100A/us		70		nS
Reverse recovery charge	Q_{rr}			140		nC

Notes:

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

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

3) The value of $R_{\theta JA}$ is measured with the device mounted on the the minimum recommend pad size, in the still air environment with T_A=25℃.The maximum allowed junction temperature of 150℃. The value in any given application depends on the user's specific board design.

4) Guaranteed by design, not subject to production testing.

N-Channel Typical Characteristics

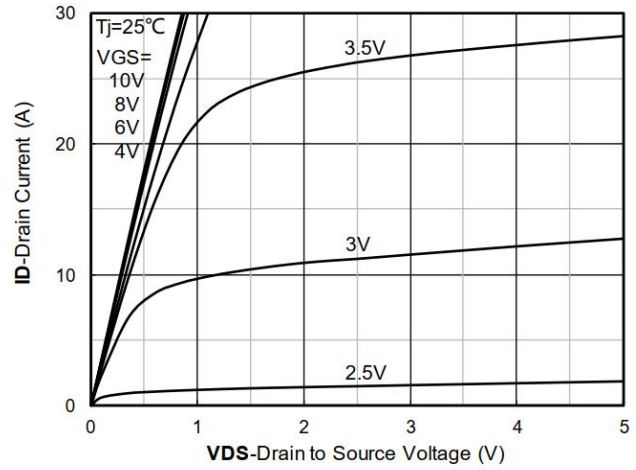


Figure 1. Output Characteristics

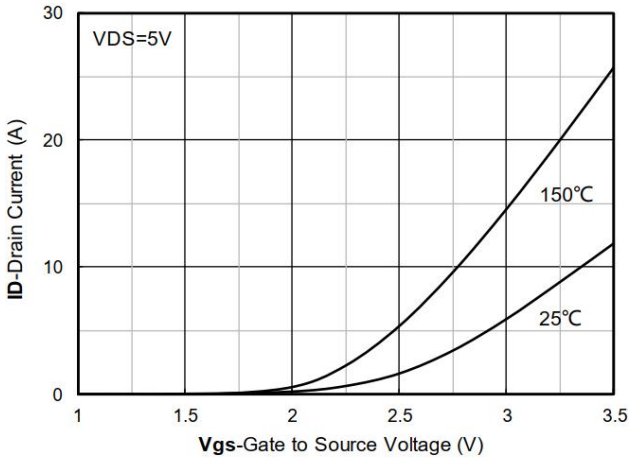


Figure 2. Transfer Characteristics

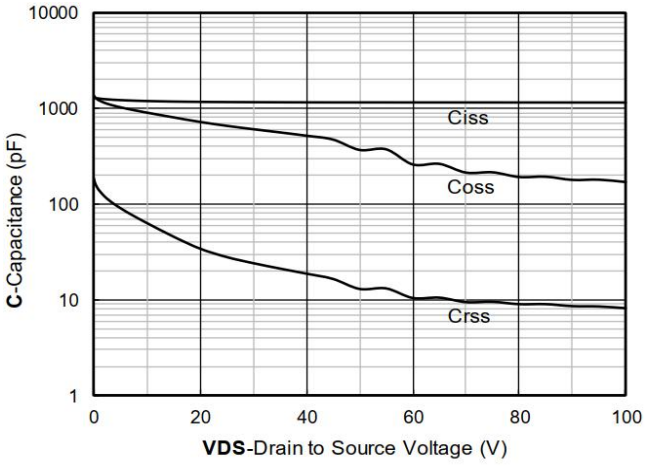


Figure 3. Capacitance Characteristics

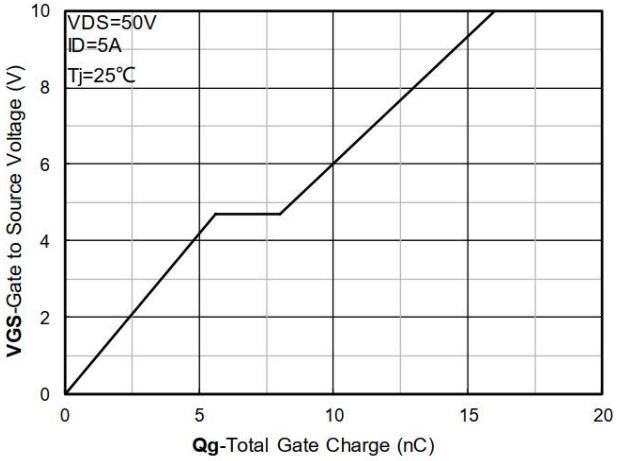


Figure 4. Gate Charge

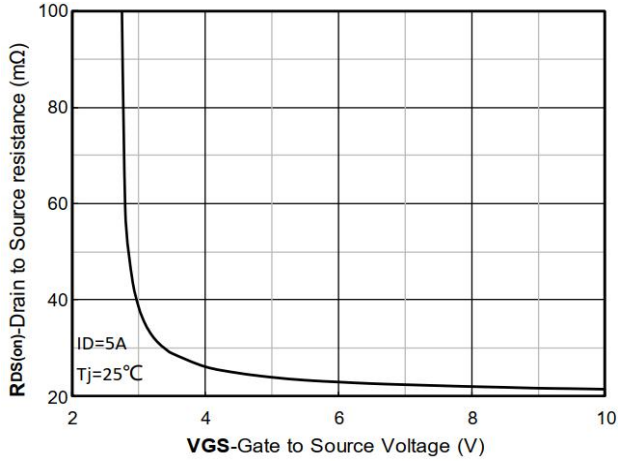


Figure 5. On-Resistance vs Gate to Source Voltage

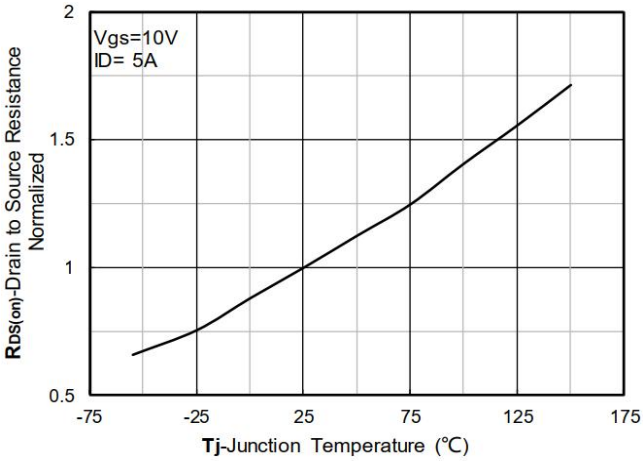


Figure 6. Normalized On-Resistan

N-Channel Typical Characteristics

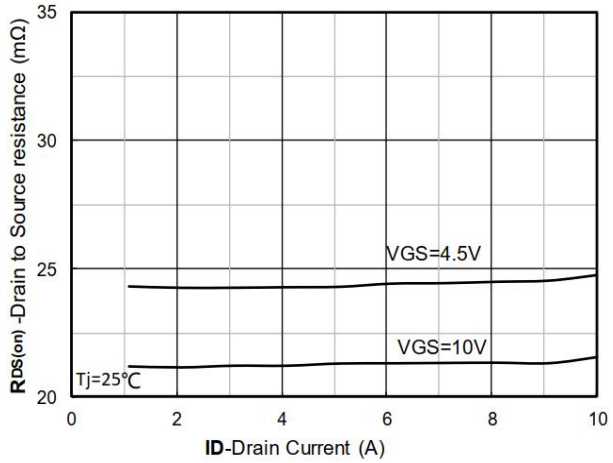


Figure 7. $R_{DS(on)}$ VS Drain Current

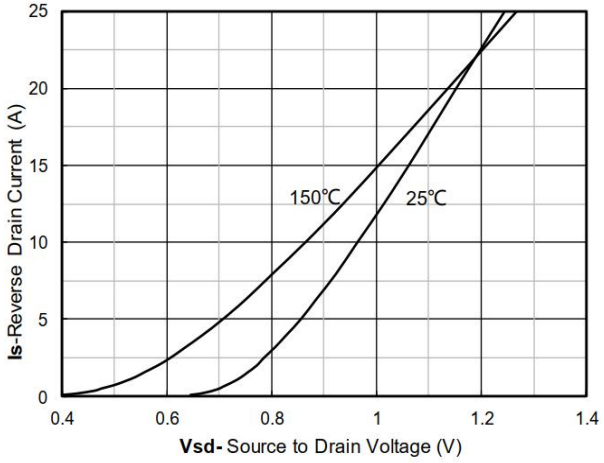


Figure 8. Forward characteristics of reverse diode

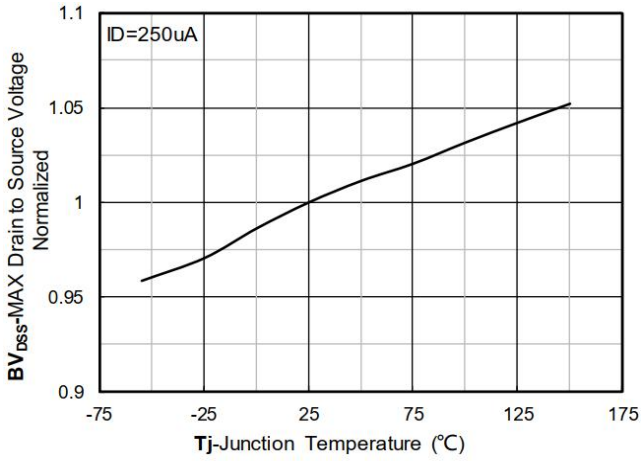


Figure 9. Normalized breakdown voltage

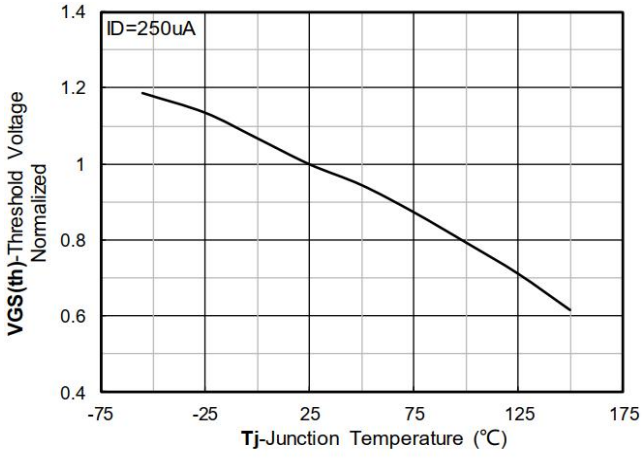


Figure 10. Normalized Threshold voltage

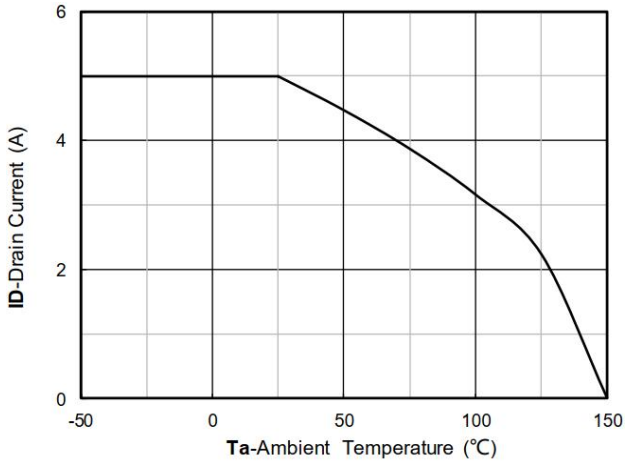


Figure 11. Current dissipation

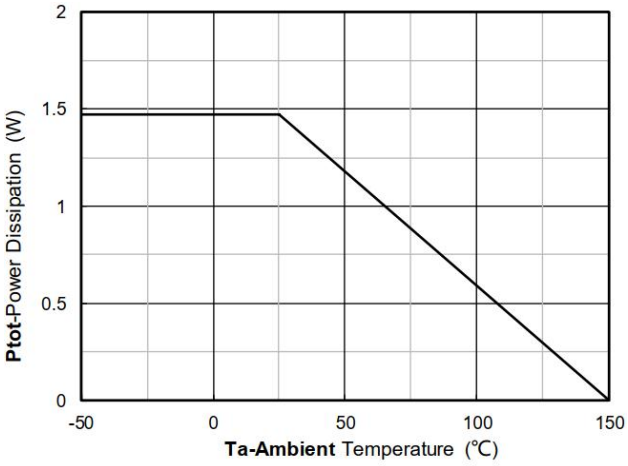


Figure 12. Power dissipation

N-Channel Typical Characteristics

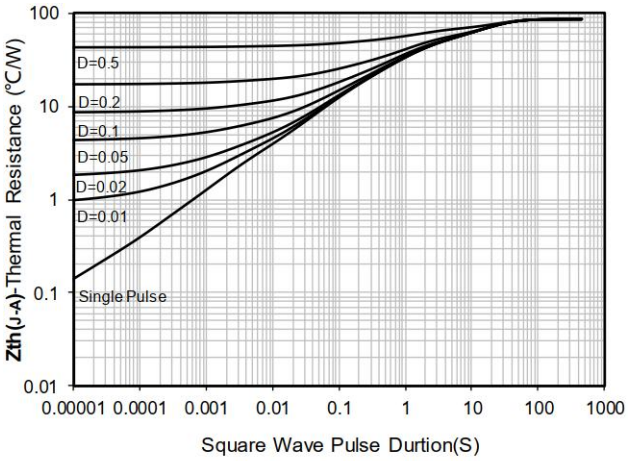


Figure 13. Maximum Transient Thermal Impedance

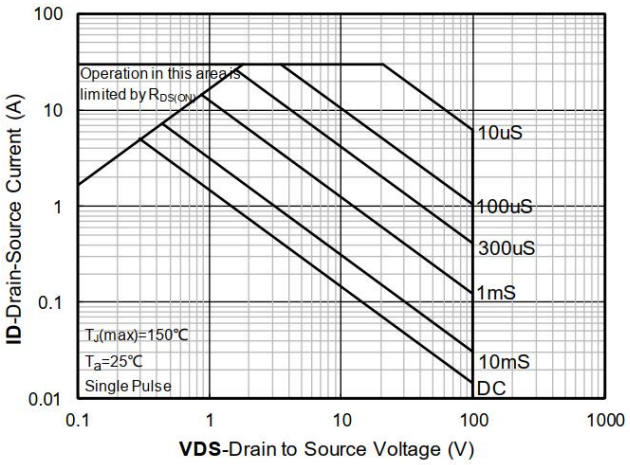


Figure 14. Safe Operation Area

P-Channel Typical Characteristics

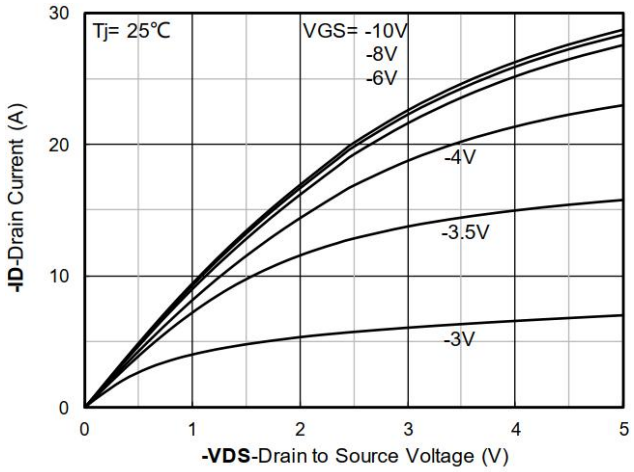


Figure 1. Output Characteristics

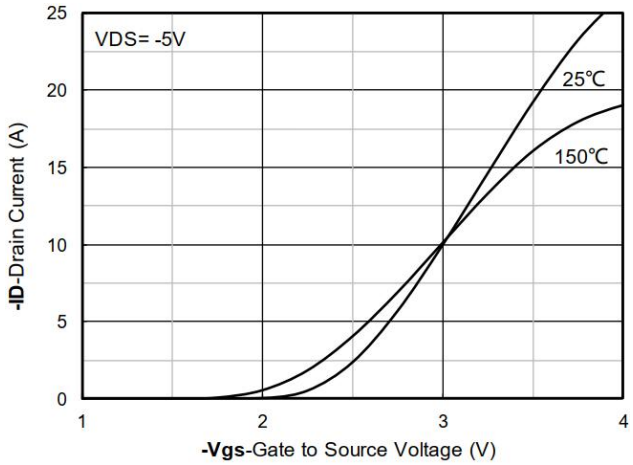
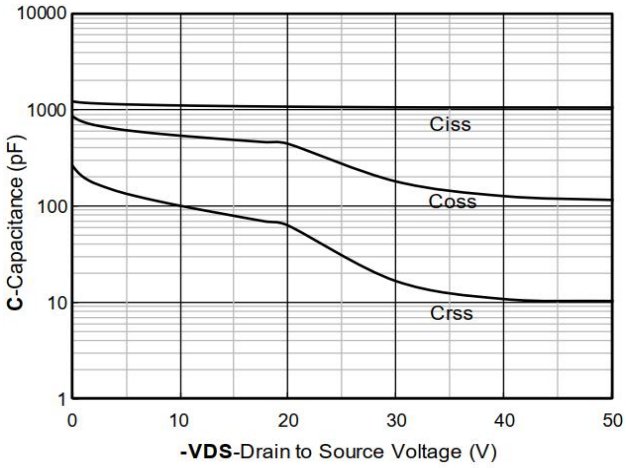


Figure 2. Transfer Characteristics



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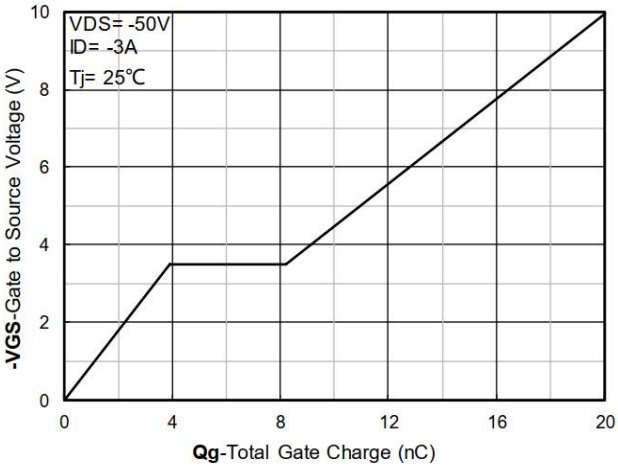

Figure 4. Gate Charge

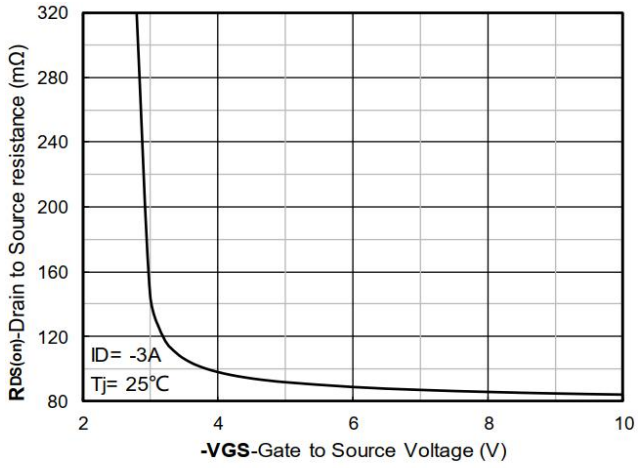

Figure 5. On-Resistance vs Gate to Source Voltage

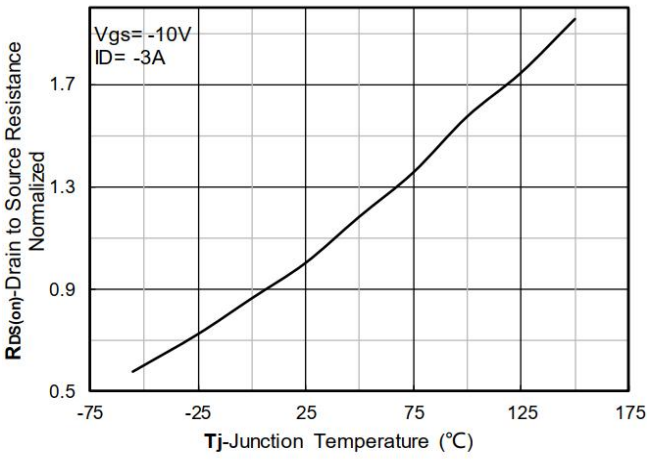

Figure 6. Normalized On-Resistance

P-Channel Typical Characteristics

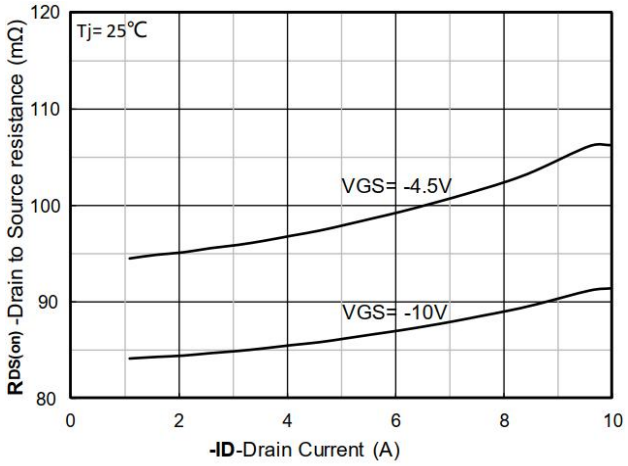

Figure 7. $R_{DS(on)}$ VS Drain Current

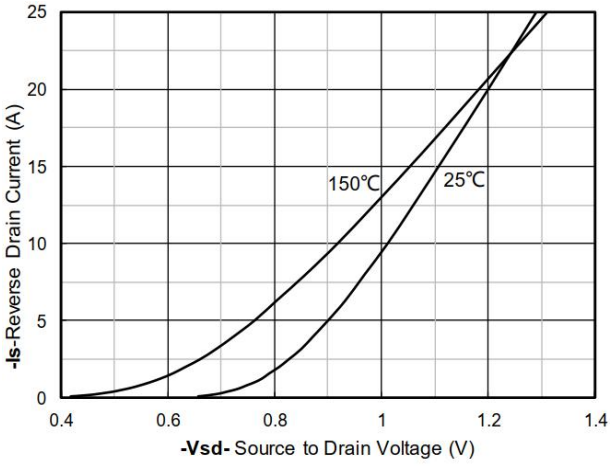

Figure 8. Forward characteristics of reverse diode

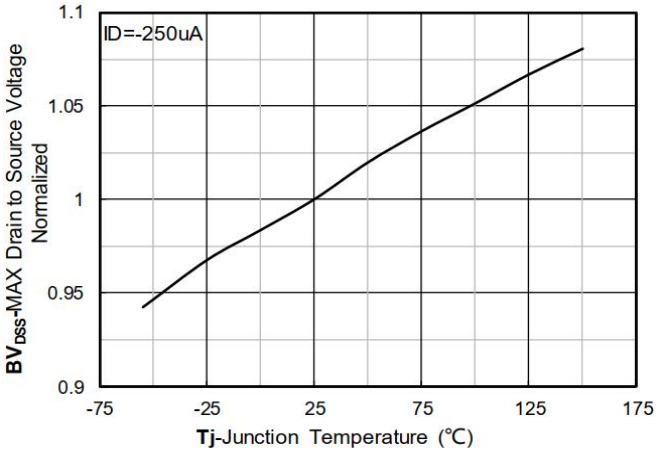

Figure 9. Normalized breakdown voltage

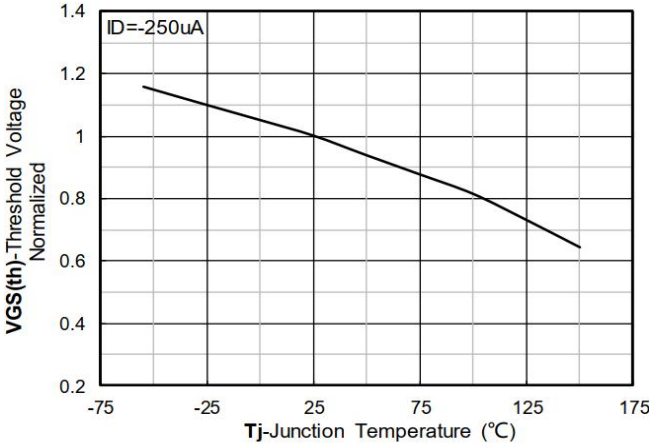

Figure 10. Normalized Threshold voltage

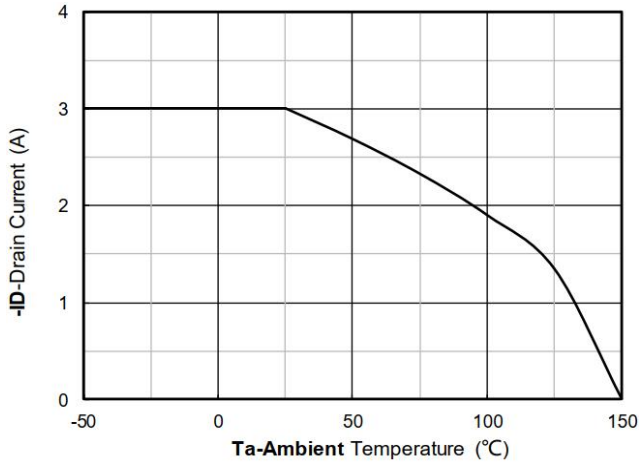

Figure 11. Current dissipation

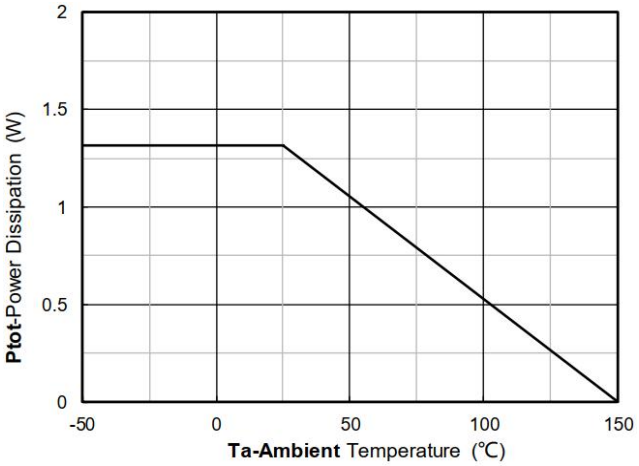

Figure 12. Power dissipation

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AS-1151422	2023/12/29	2026/04/24	B	10

P-Channel Typical Characteristics

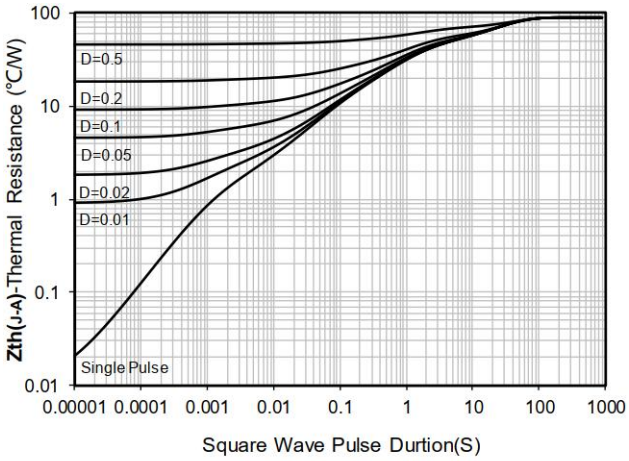


Figure 13. Maximum Transient Thermal Impedance

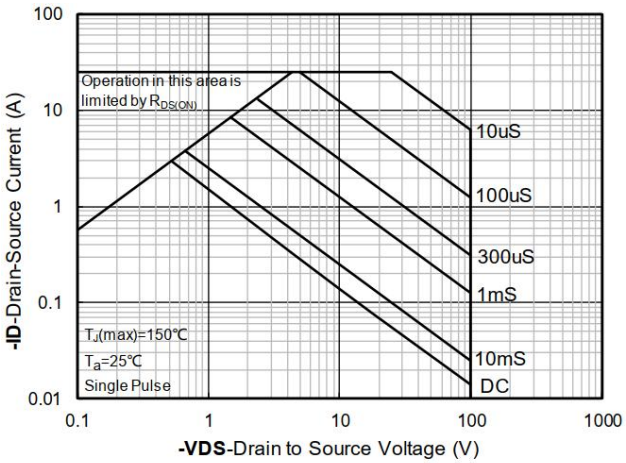
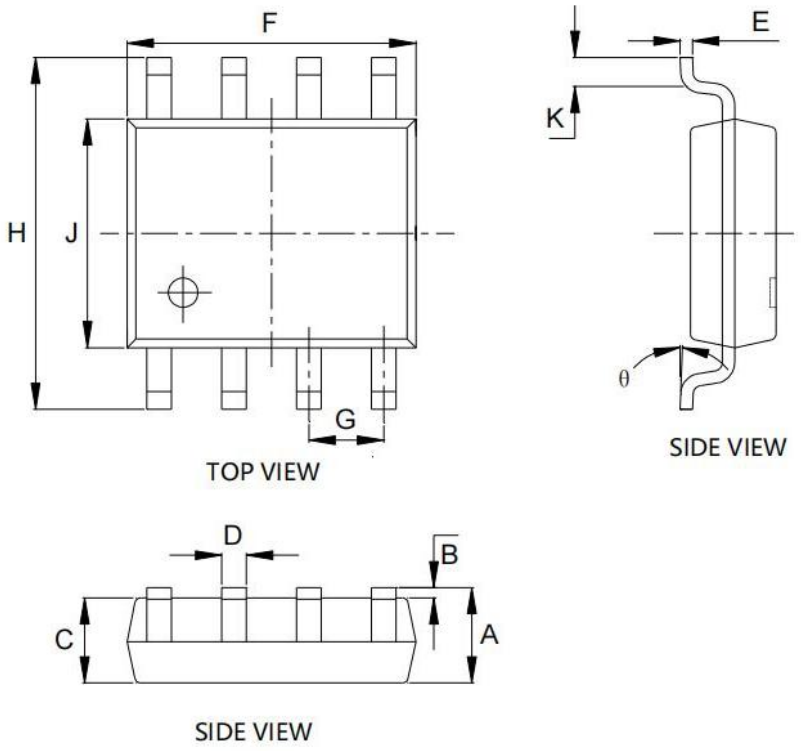


Figure 14. Safe Operation Area

SOP-8 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.350	1.750	0.053	0.069
B	0.100	0.250	0.004	0.010
C	1.350	1.550	0.053	0.061
D	0.330	0.510	0.013	0.020
E	0.170	0.250	0.007	0.010
F	4.800	5.000	0.189	0.197
G	1.270 BSC.		0.050 BSC.	
H	5.800	6.200	0.228	0.244
J	3.800	4.000	0.150	0.157
K	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°