

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D	$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
40V	25mΩ@10V	7A	-40V	45mΩ@-10V	-6A
	35mΩ@4.5V			60mΩ@-4.5V	

Feature

- High power and current handing capability
- Surface mount package

Application

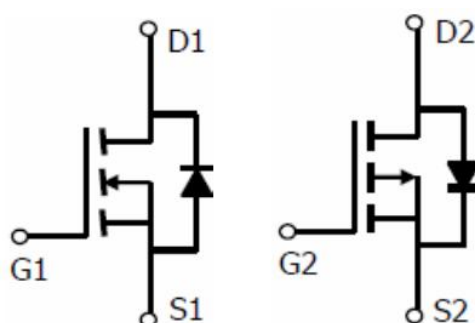
- Battery Protection
- Load Switch
- Power Management

Package

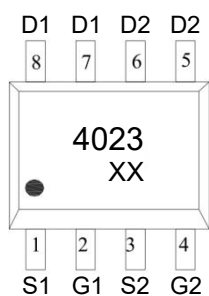


SOP-8

Circuit diagram



Marking



Absolute maximum ratings ($T_A=25^{\circ}\text{C}$ 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	I_D	7	-6	A
Pulsed Drain Current	I_{DM}	28	-24	A
Single Pulse Avalanche Energy ¹⁾	E_{AS}	18	30	mJ
Power Dissipation	P_D	2	2	W
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	62.5	62.5	$^{\circ}\text{C}/\text{W}$
Operating Junction Temperature	T_J	-55 ~ +150	-55 ~ +150	$^{\circ}\text{C}$
Storage Temperature	T_{STG}	-55 ~ +150	-55 ~ +150	$^{\circ}\text{C}$

N-CH Electrical characteristics ($T_A=25^{\circ}\text{C}$, 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, T _J =25℃			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	1.5	2.5	V
Drain-source on-resistance	R _{DS(on)}	V _{GS} =10V, I _D =5A		18	25	mΩ
		V _{GS} =4.5V, I _D =3A		24	35	
Dynamic characteristics ²⁾						
Input Capacitance	C _{iss}	V _{DS} =20V, V _{GS} =0V, f =1MHz		834		pF
Output Capacitance	C _{oss}			51		
Reverse Transfer Capacitance	C _{rss}			45		
Total Gate Charge	Q _g	V _{DS} =20V, V _{GS} =4.5V, I _D =7A		16.2		nC
Gtae-Source Charge	Q _{gs}			4.1		
Gtae-Drain Charge	Q _{gd}			3.1		
Turn-on delay time	t _{d(on)}	V _{DS} =20V, V _{GS} =10V, I _D =5A R _G =3Ω		5.3		nS
Turn-on rise time	t _r			7.1		
Turn-off delay time	t _{d(off)}			15.8		
Turn-off fall time	t _f			4.8		
Source-Drain Diode characteristics						
Diode Forward Current	I _S				7	A
Diode Forward voltage	V _{SD}	V _{GS} =0V, I _S =1A, T _J =25℃			1.2	V
Reverse recover time	T _{rr}	I _S =6A, di/dt =100A/us		16		nS
Reverse recovery charge	Q _{rr}	T _J =25℃		8		nC

Notes:

 1) The EAS test condition is $V_{DD}=20\text{V}, V_{GS}=10\text{V}, L=0.5\text{mH}, R_G=25\Omega$.

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

P-CH Electrical characteristics (T_A=25 °C, unless otherwise noted)

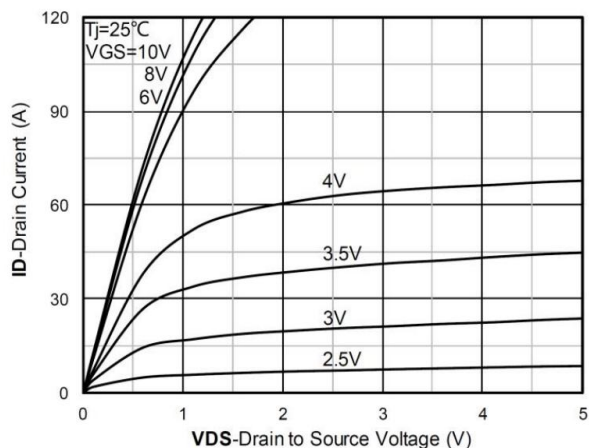
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} =0V, I _D =-250μA	-40			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =-32V, V _{GS} =0V, T _J =25℃			-1	μA
Gate-body leakage current	I _{GSS}	V _{DS} =0V, V _{GS} =±20V			±100	nA
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =-250μA	-1	-1.5	-2.5	V
Drain-source on-resistance	R _{DS(on)}	V _{GS} =-10V, I _D =-5A		33	45	mΩ
		V _{GS} =-4.5V, I _D =-3A		44	60	
Dynamic characteristics ²⁾						
Input Capacitance	C _{iss}	V _{DS} =-20V, V _{GS} =0V, f =1MHz		1215		pF
Output Capacitance	C _{oss}			184		
Reverse Transfer Capacitance	C _{rss}			102		
Total Gate Charge	Q _g	V _{DS} =-20V, V _{GS} =-10V I _D =-5A		20		nC
Gtae-Source Charge	Q _{gs}			3.5		
Gtae-Drain Charge	Q _{gd}			4.2		
Turn-on delay time	t _{d(on)}	V _{DS} =-20V, V _{GS} =-10V I _D =-5A, R _G =3Ω		8		nS
Turn-on rise time	t _r			15		
Turn-off delay time	t _{d(off)}			23		
Turn-off fall time	t _f			9		
Source-Drain Diode characteristics						
Diode Forward Current	I _S				-6	A
Diode Forward voltage	V _{SD}	V _{GS} =0V, I _S =-1A, T _J =25℃			-1.2	V
Reverse recover time	T _{rr}	I _S =-5A, di/dt =-100A/us T _J =25℃		11		nS
Reverse recovery charge	Q _{rr}			7		nC

Notes:

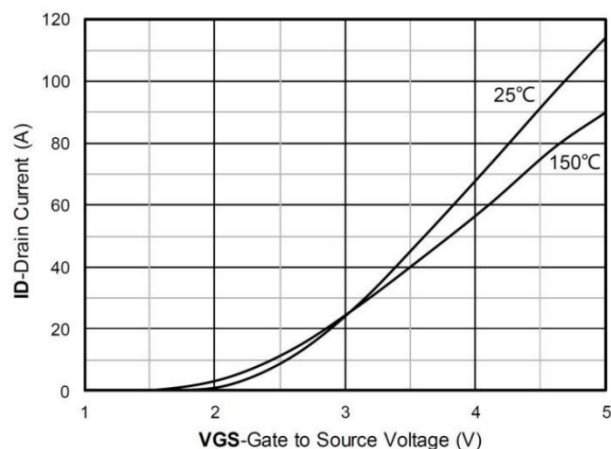
 3) The EAS test condition is V_{DD}=-20V, V_{GS}=-10V, L=0.5mH, R_G=25Ω.

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

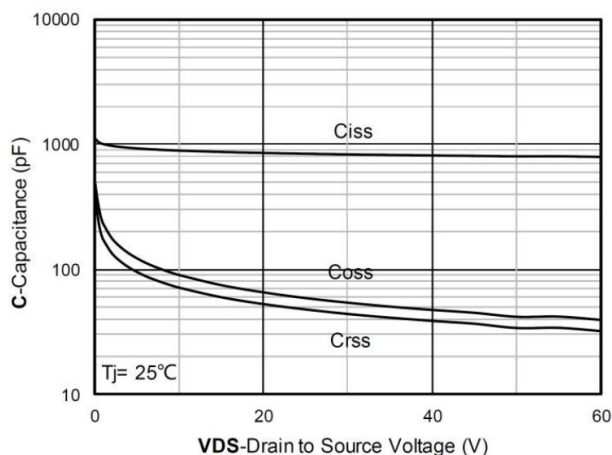
N-Channel Typical Characteristics



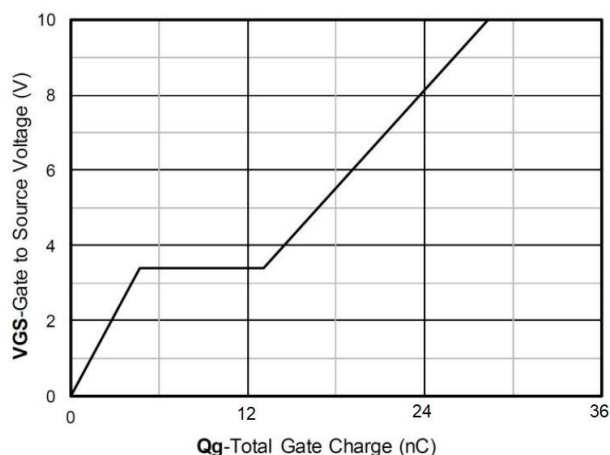
Output Characteristics



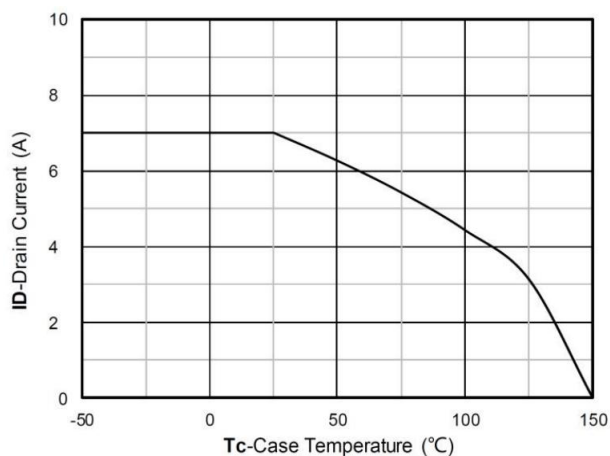
Transfer Characteristics



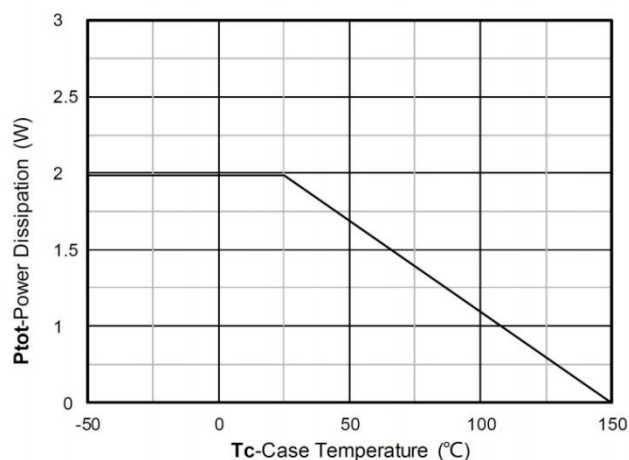
Capacitance Characteristics



Gate Charge

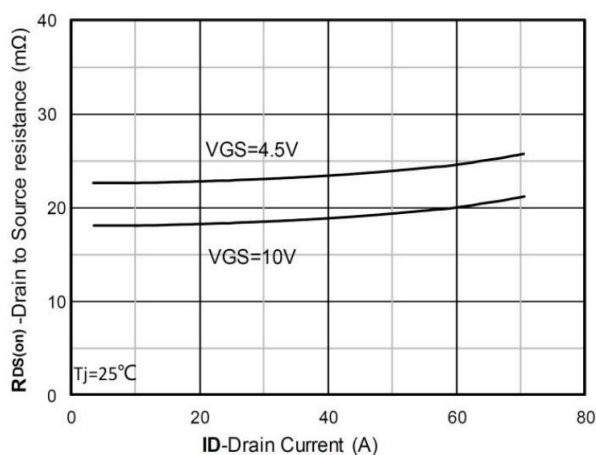


Current dissipation

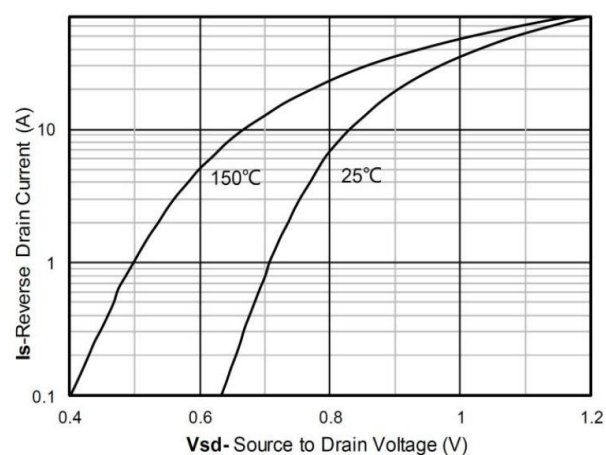


Power dissipation

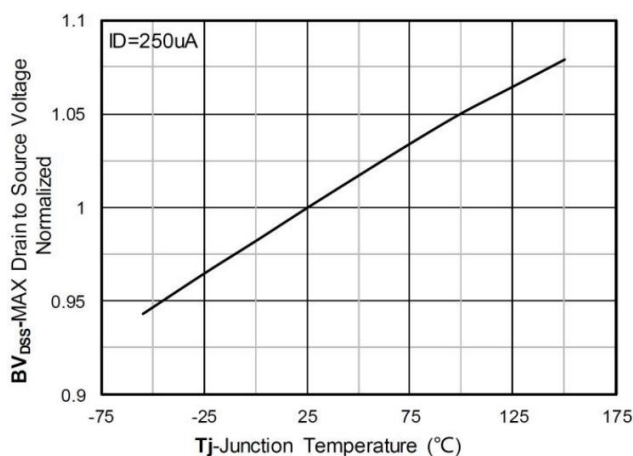
N-Channel Typical Characteristics



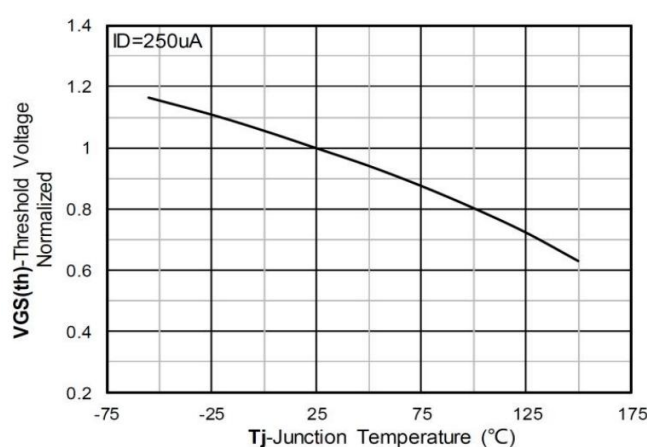
$R_{DS(on)}$ VS Drain Current



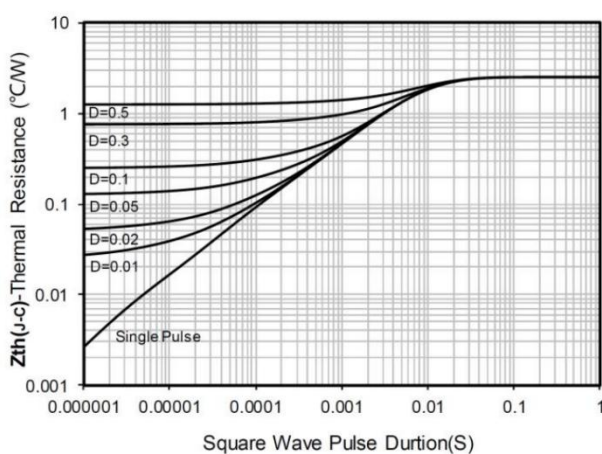
Forward characteristics of reverse diode



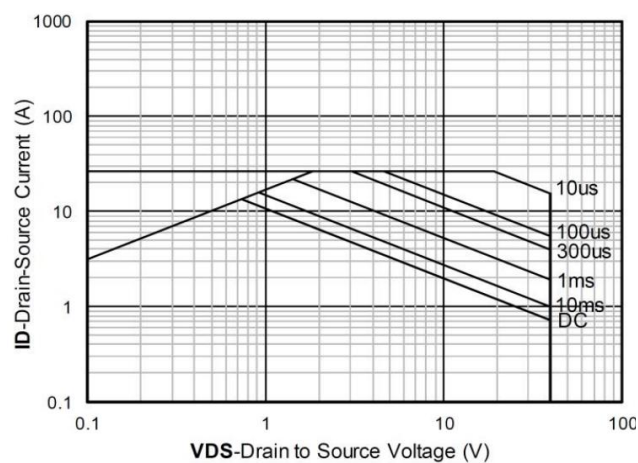
Normalized breakdown voltage



Normalized Threshold voltage

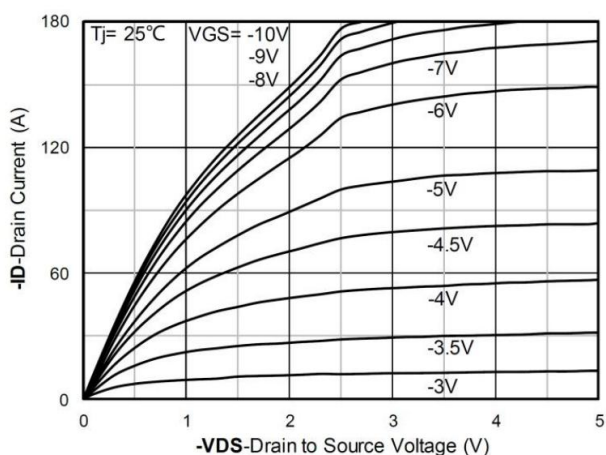


Maximum Transient Thermal Impedance

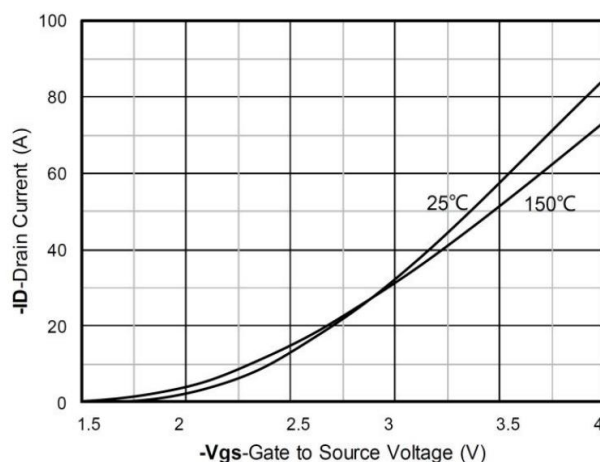


Safe Operation Area

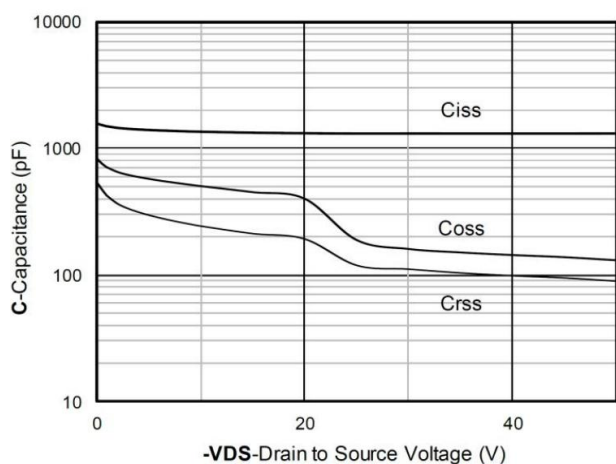
P-Channel Typical Characteristics



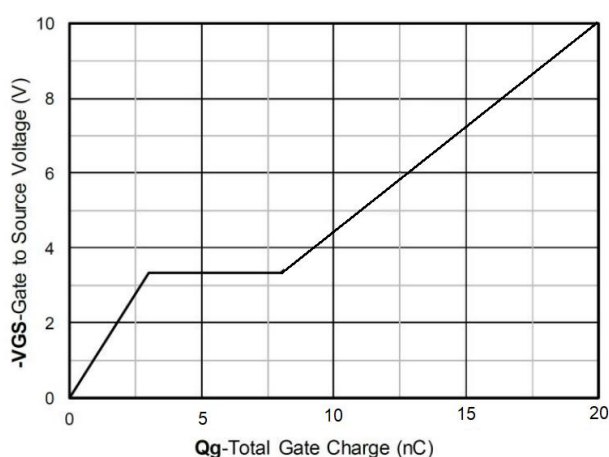
Output Characteristics



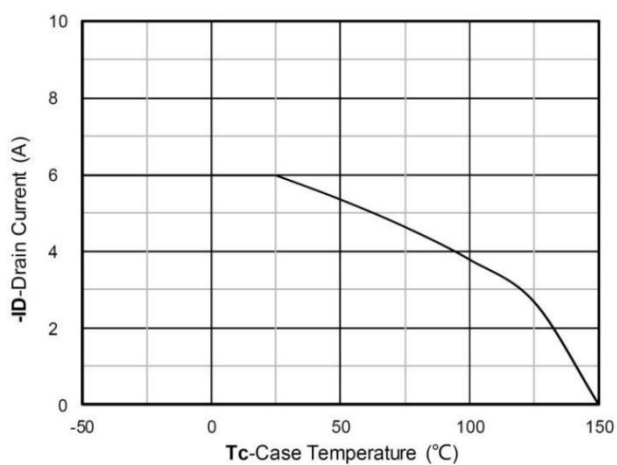
Transfer Characteristics



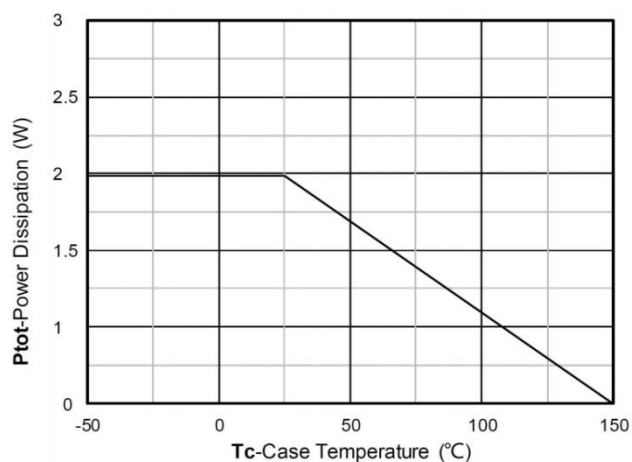
Capacitance Characteristics



Gate Charge

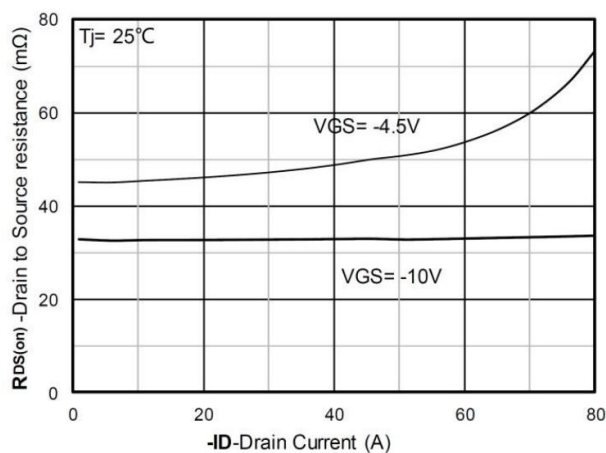


Current dissipation

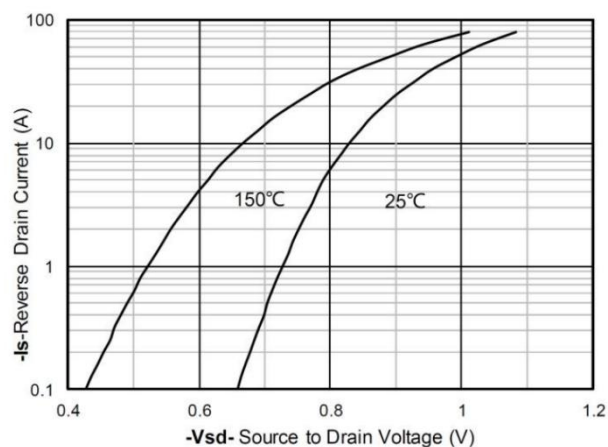


Power dissipation

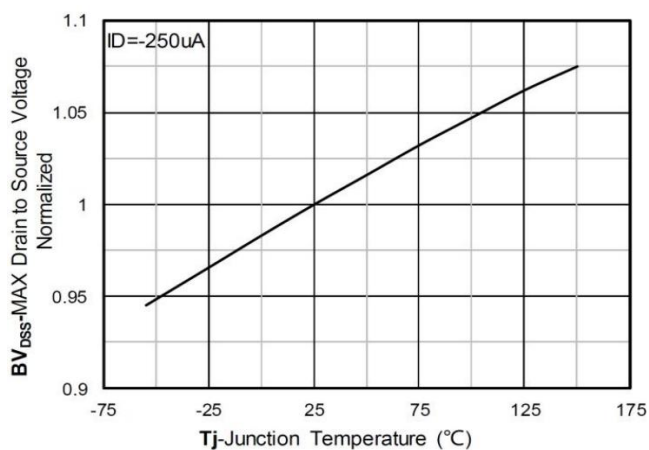
P-Channel Typical Characteristics



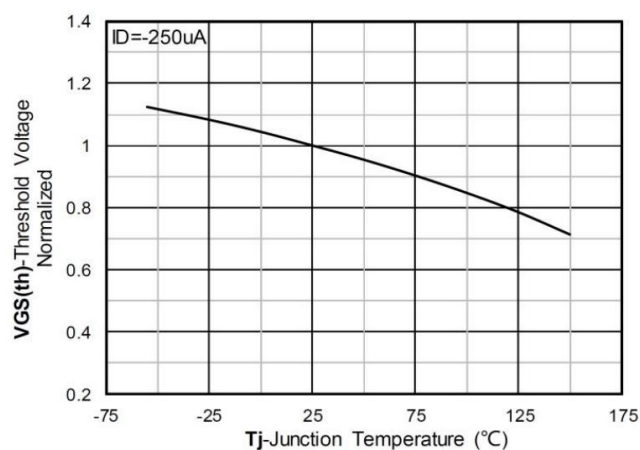
RDS(on) VS Drain Current



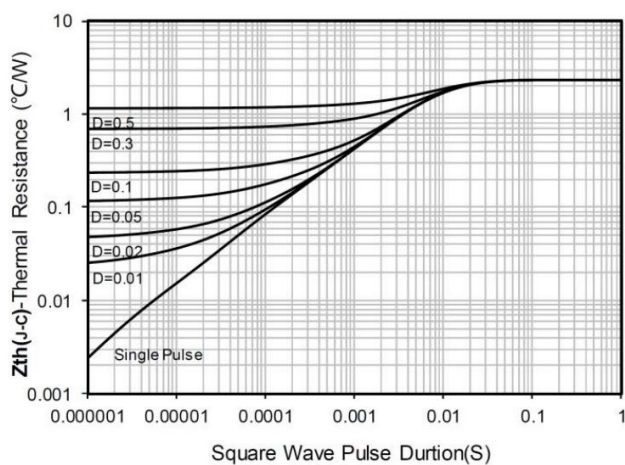
Forward characteristics of reverse diode



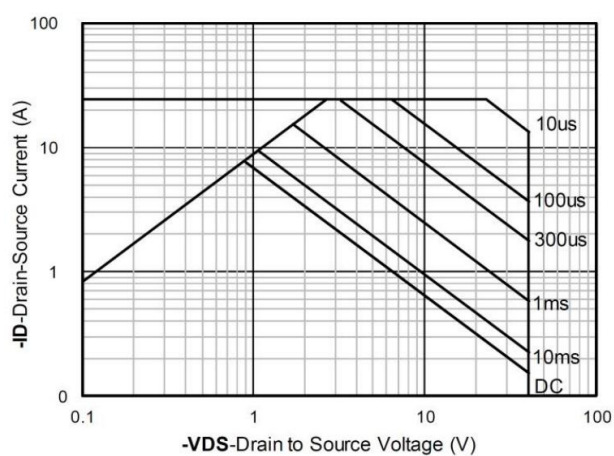
Normalized breakdown voltage



Normalized Threshold voltage

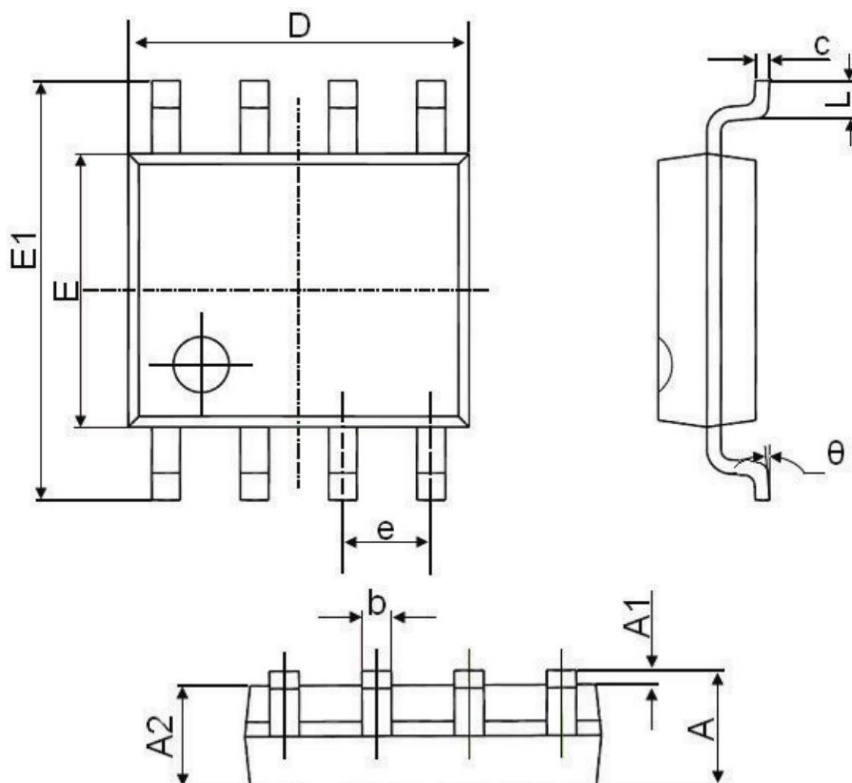


Maximum Transient Thermal Impedance



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
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.800	5.000	0.189	0.197
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270 REF.		0.050 REF.	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°