

## Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	$I_D$
30V	9.5mΩ@10V	10A
	12mΩ@4.5V	



合肥矽普半导体

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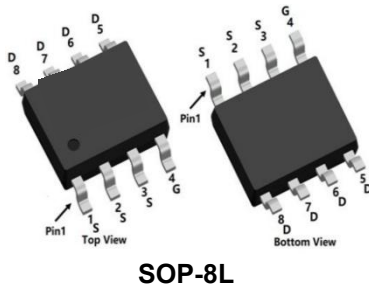
## Feature

- Fast Switching
- Low Gate Charge and Rds on
- 100% Single Pulse avalanche energy Test

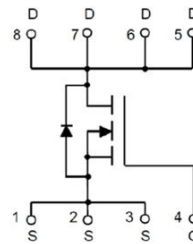
## Applications

- Power Switching Application
- Hard switched and high frequency circuits
- Uninterruptible Power Supply

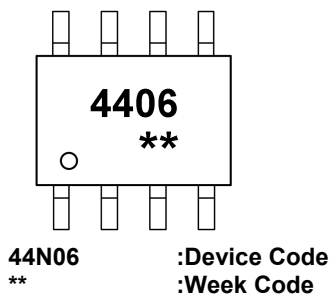
## Package



## Circuit Diagram



## Marking



## Order Information

Device	Package	Unit/Tape
SP4406P8	SOP-8L	4000

**Absolute maximum ratings (Ta=25°C, unless otherwise noted)**

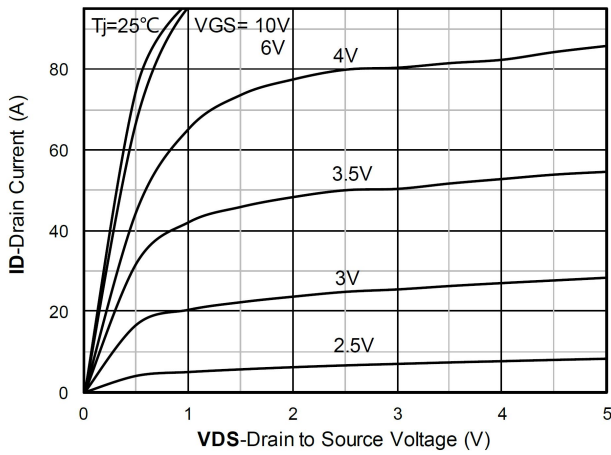
Parameter	Symbol	Rating	Units
Drain-Source Voltage	V <sub>DS</sub>	30	V
Gate-Source Voltage	V <sub>GS</sub>	±20	V
Continuous Drain Current	I <sub>D</sub>	10	A
Pulsed Drain Current	I <sub>DM</sub>	40	A
Single Pulse Avalanche Energy <sup>1</sup>	E <sub>AS</sub>	20	mJ
Power Dissipation	P <sub>D</sub>	3	W
Thermal Resistance Junction-to-Ambient	R <sub>θJA</sub>	41.7	°C/W
Storage Temperature Range	T <sub>STG</sub>	-55 to 150	°C
Operating Junction Temperature Range	T <sub>J</sub>	-55 to 150	°C

**Electrical characteristics (Ta=25°C, unless otherwise noted)**

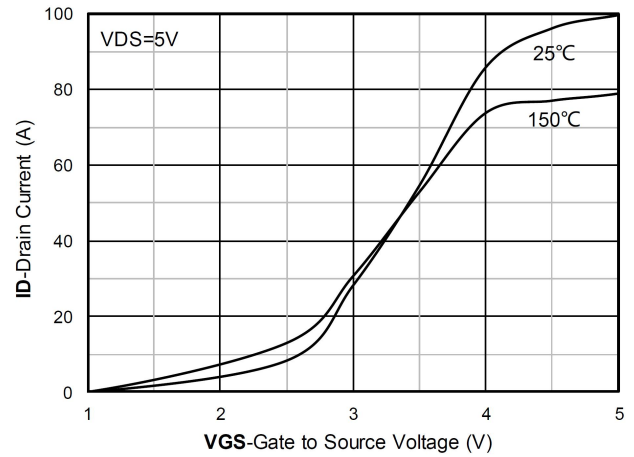
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V , I <sub>D</sub> =250uA	30	-	-	V
Drain-Source Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> =24V , V <sub>GS</sub> =0V	-	-	1	uA
Gate-Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±20V , V <sub>DS</sub> =0V	-	-	±100	nA
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =250uA	1.2	1.7	2.5	V
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> =10V , I <sub>D</sub> =12A	-	9.5	11.5	mΩ
		V <sub>GS</sub> =4.5V , I <sub>D</sub> =10A	-	12	15.5	
<b>Dynamic characteristics</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =15V , V <sub>GS</sub> =0V , f=1MHz	-	1321	-	pF
Output Capacitance	C <sub>oss</sub>		-	180	-	
Reverse Transfer Capacitance	C <sub>rss</sub>		-	160	-	
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =15V , V <sub>GS</sub> =10V , I <sub>D</sub> =25A	-	2.3	-	nC
Gate-Source Charge	Q <sub>gs</sub>		-	7	-	
Gate-Drain Charge	Q <sub>gd</sub>		-	4.5	-	
<b>Switching Characteristics</b>						
Turn-On Delay Time	T <sub>d(on)</sub>	V <sub>DD</sub> =15V, V <sub>GS</sub> =10V , R <sub>G</sub> =3Ω, I <sub>D</sub> =20A	-	4.5	-	nS
Rise Time	T <sub>r</sub>		-	17.6	-	
Turn-Off Delay Time	T <sub>d(off)</sub>		-	16.7	-	
Fall Time	T <sub>f</sub>		-	58.6	-	
<b>Diode Characteristics</b>						
Diode Forward Voltage	V <sub>SD</sub>	V <sub>GS</sub> =0V , I <sub>S</sub> =1A	-	-	1.2	V
Maximum Body-Diode Continuous Current	I <sub>S</sub>		-	-	10	A
Reverse Recovery Time	T <sub>rr</sub>	I <sub>S</sub> =10A, di/dt=100A/us, T <sub>J</sub> =25°C	-	27	-	nS
Reverse Recovery Charge	Q <sub>rr</sub>		-	21	-	nC

**Note:**

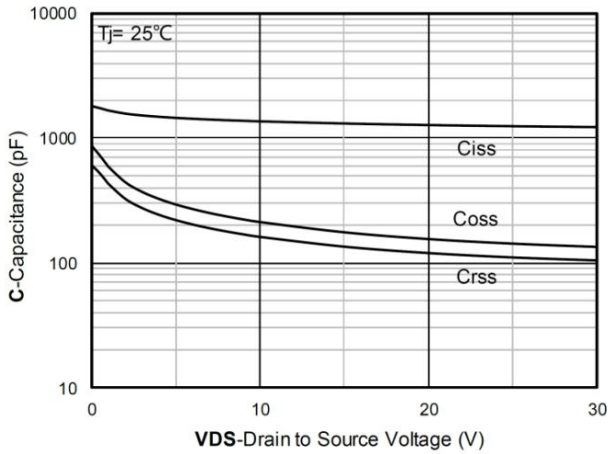
 1. The EAS test condition is V<sub>DD</sub>=20V, V<sub>G</sub>=10V, L=0.5mH, R<sub>g</sub>=25Ω

**Typical Characteristics**


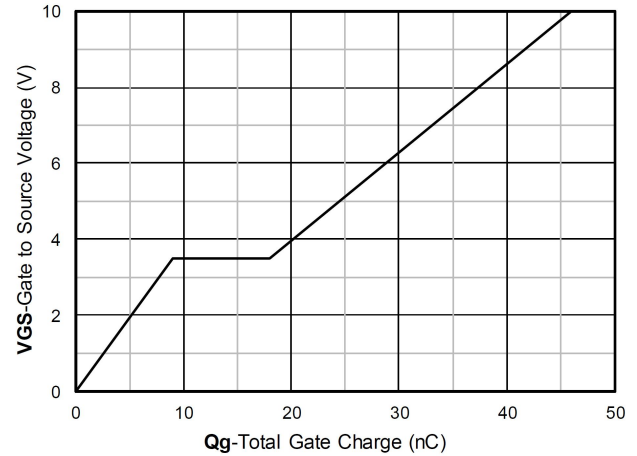
Output Characteristics



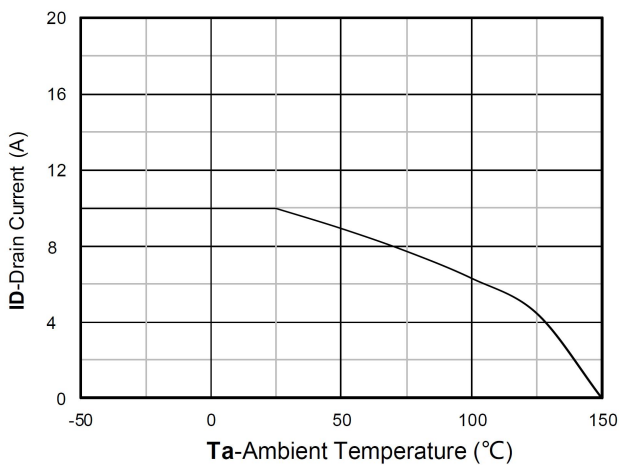
Transfer Characteristics



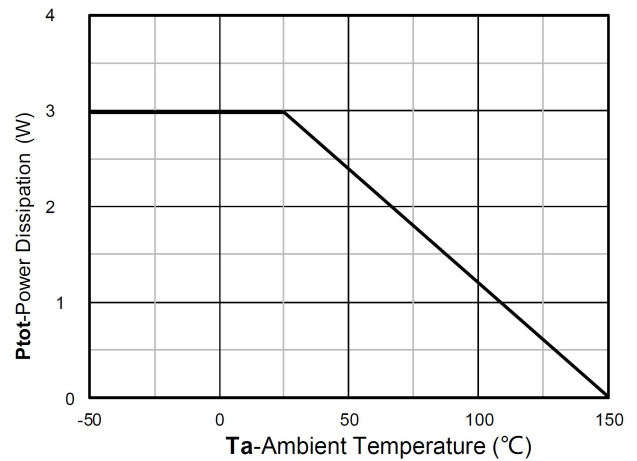
Capacitance Characteristics



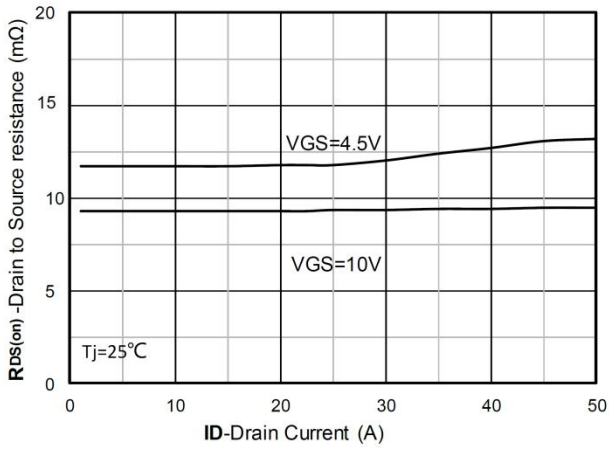
Gate Charge



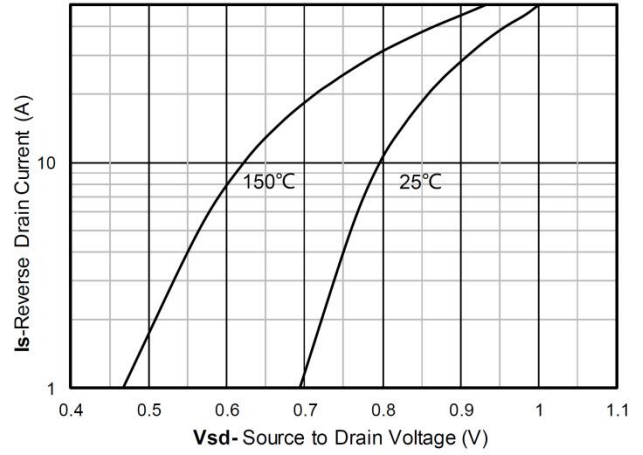
Current dissipation



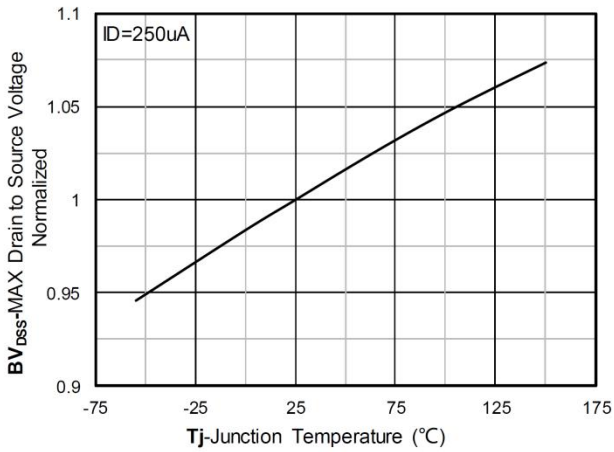
Power dissipation



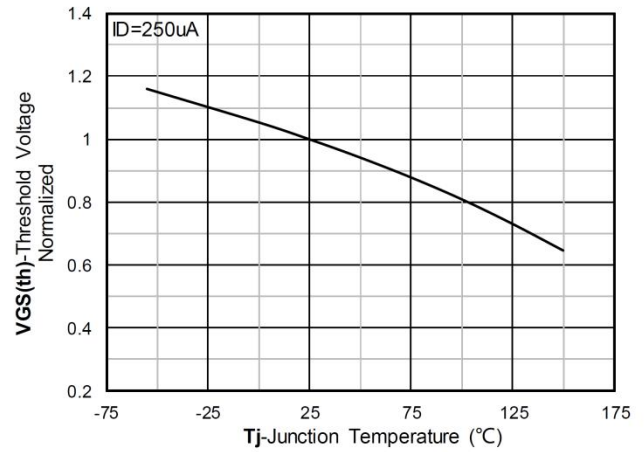
RDS(on) VS Drain Current



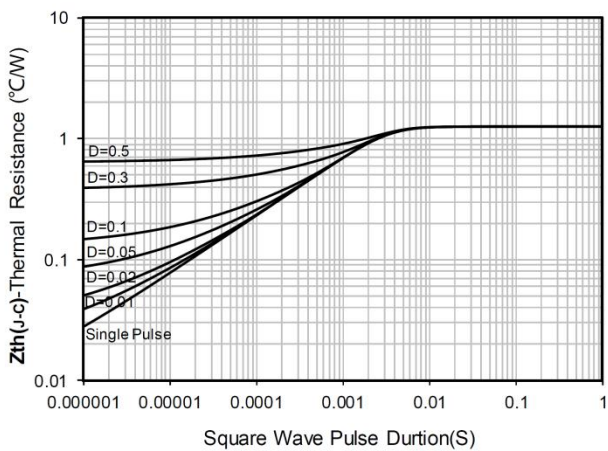
Forward characteristics of reverse diode



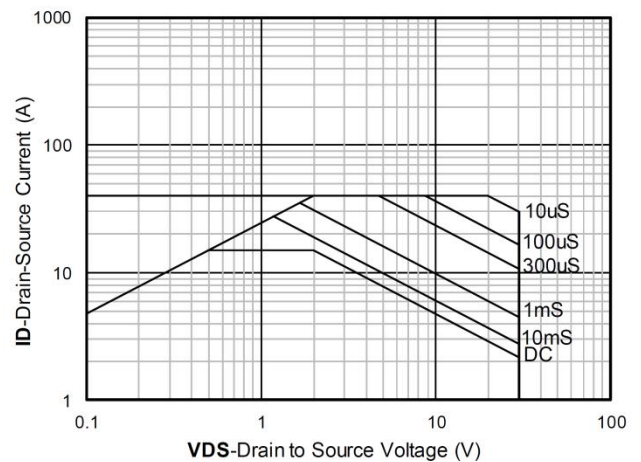
Normalized breakdown voltage



Normalized Threshold voltage

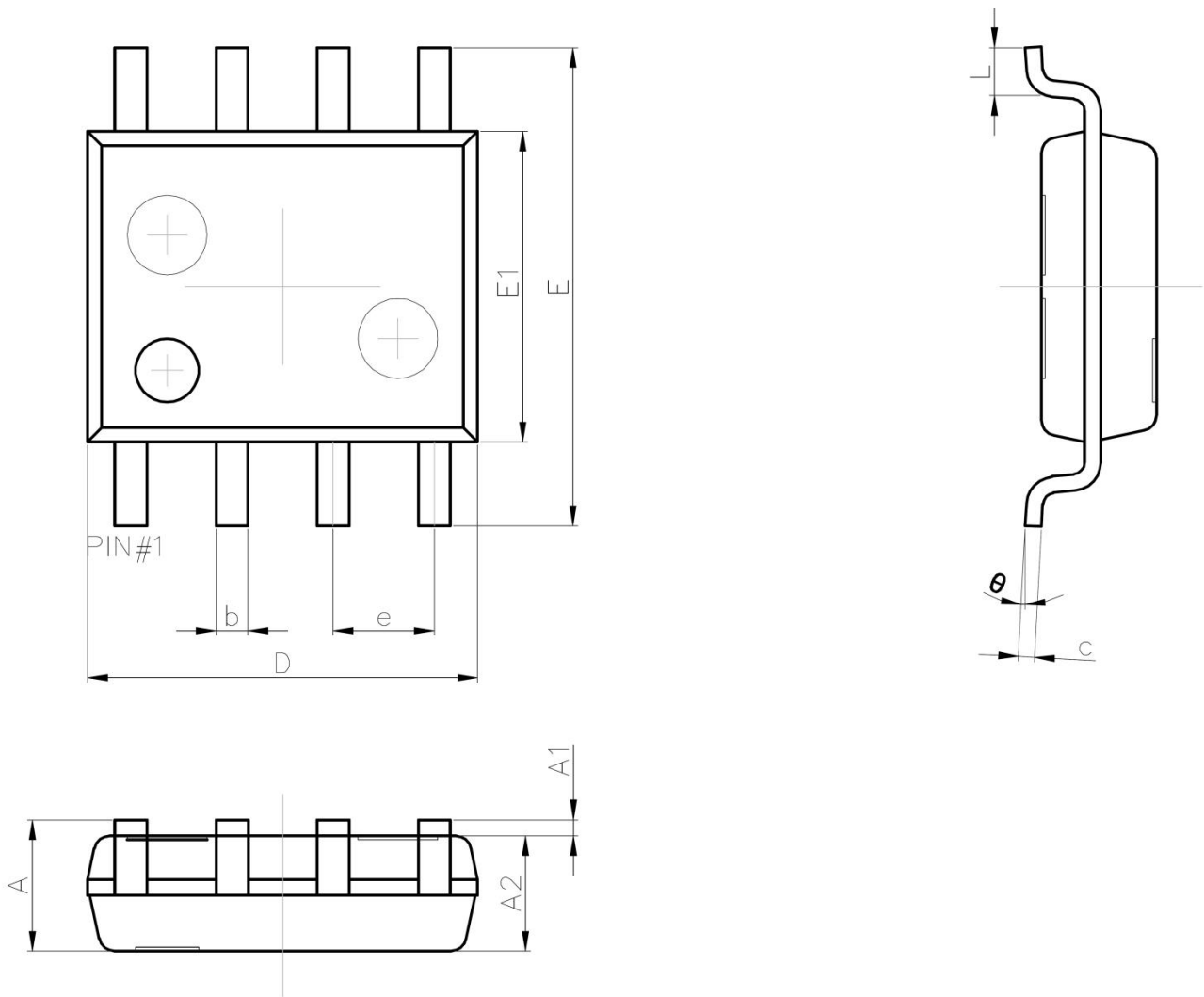


Maximum Transient Thermal Impedance



Safe Operation Area

**SOP-8L Package Information**



Symbol	Dimensions In Millimeters	
	Min.	Max.
A	1.35	1.75
A1	0.10	0.25
A2	1.35	1.55
b	0.33	0.51
c	0.17	0.25
D	4.80	5.00
e	1.27 REF.	
E	5.80	6.20
E1	3.80	4.00
L	0.40	1.27
$\theta$	0°	8°