

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
60V	13mΩ@10V	9A
	18mΩ@4.5V	



合肥矽普半导体

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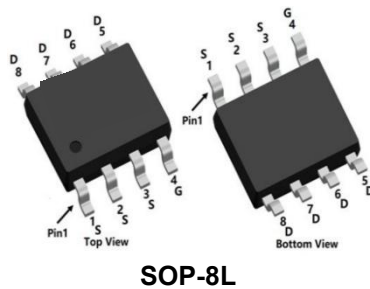
Feature

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

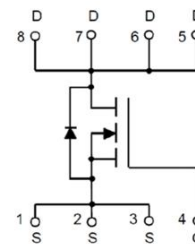
Applications

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

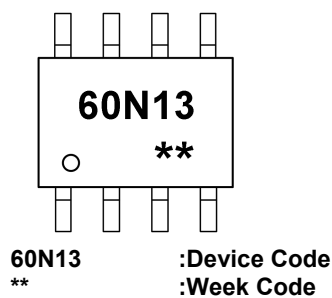
Package



Circuit Diagram



Marking



Order Information

Device	Package	Unit/Tape
SP60N13P8	SOP-8L	4000

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

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	I_D	9	A
Pulsed Drain Current	I_{DM}	36	A
Single pulsed avalanche energy ¹	E_{AS}	30	mJ
Power Dissipation	P_D	3.5	W
Thermal Resistance Junction-to-Ambient	$R_{\theta JA}$	35.7	°C/W
Storage Temperature Range	T_{STG}	-55 to 150	°C
Operating Junction Temperature Range	T_J	-55 to 150	°C

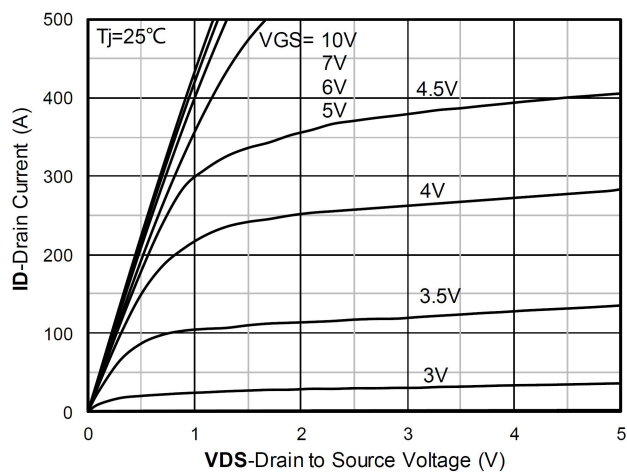
Electrical characteristics (Ta=25°C, unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	VGS=0V , ID=250uA	60	-	-	V
Drain-Source Leakage Current	IDSS	VDS=48V , VGS=0V	-	-	1	uA
Gate-Source Leakage Current	IGSS	VGS=±20V , VDS=0V	-	-	±100	nA
Gate Threshold Voltage	VGS(th)	VGS=VDS , ID =250uA	1.0	1.6	2.5	V
Static Drain-Source On-Resistance	RDS(ON)	VGS=10V , ID=10A	-	13	18	mΩ
		VGS=4.5V , ID=6A	-	18	26	
Dynamic characteristics						
Input Capacitance	Ciss	VDS=30V , VGS=0V , f=1MHz	-	2403	-	pF
Output Capacitance	Coss		-	130	-	
Reverse Transfer Capacitance	Crss		-	116	-	
Total Gate Charge	Qg	VDS=30V , VGS=10V , ID=5A	-	39	-	nC
Gate-Source Charge	Qgs		-	5.6	-	
Gate-Drain Charge	Qgd		-	9.5	-	
Switching Characteristics						
Turn-On Delay Time	Td(on)	VDD=30V, VGS=10V , RG=3Ω, ID=5A	-	7.8	-	nS
Rise Time	Tr		-	48	-	
Turn-Off Delay Time	Td(off)		-	28	-	
Fall Time	Tf		-	30	-	
Diode Characteristics						
Diode Forward Voltage	VSD	VGS=0V , IS=1A	-	-	1.2	V
Maximum Body-Diode Continuous Current	IS		-	-	9	A
Reverse Recovery Time	Trr	IS=5A, di/dt=100A/us, TJ=25°C	-	19	-	nS
Reverse Recovery Charge	Qrr		-	84	-	nC

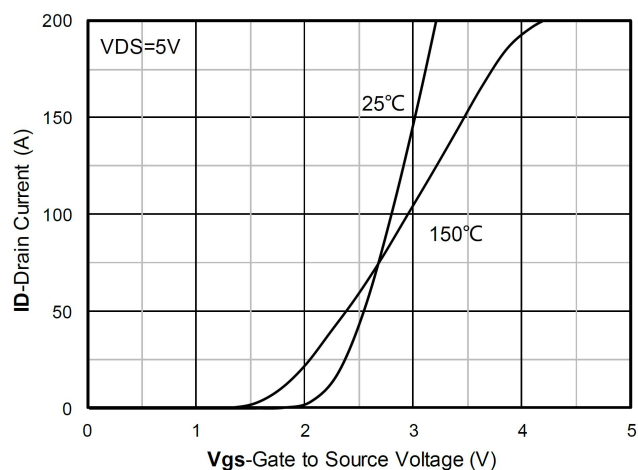
Note:

The EAS Test condition is $V_{DD}=30V, V_{GS}=10V, L=0.5mH, R_g=25\Omega$

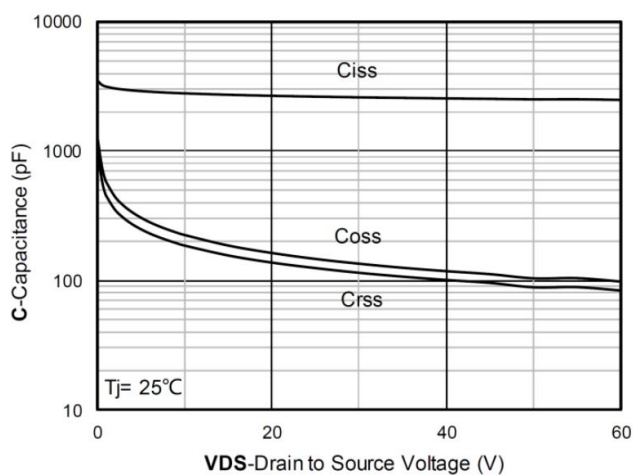
Typical Characteristics



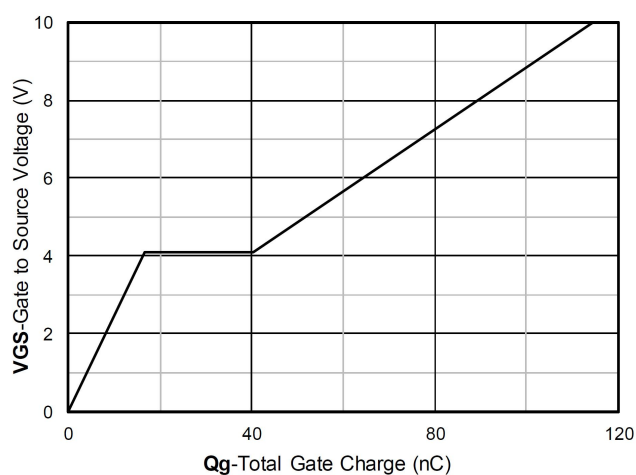
Output Characteristics



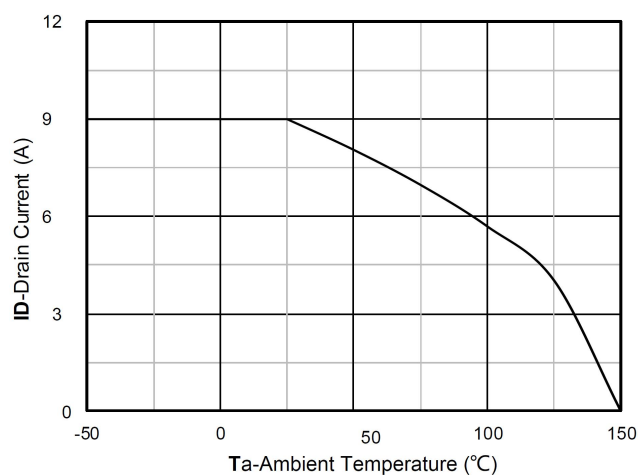
Transfer Characteristics



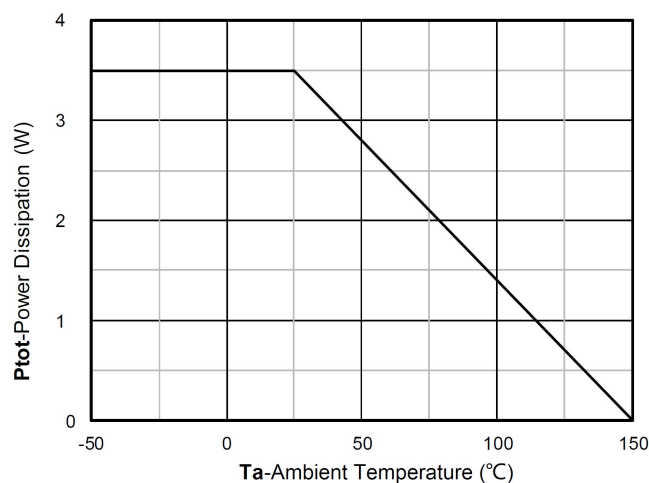
Capacitance Characteristics



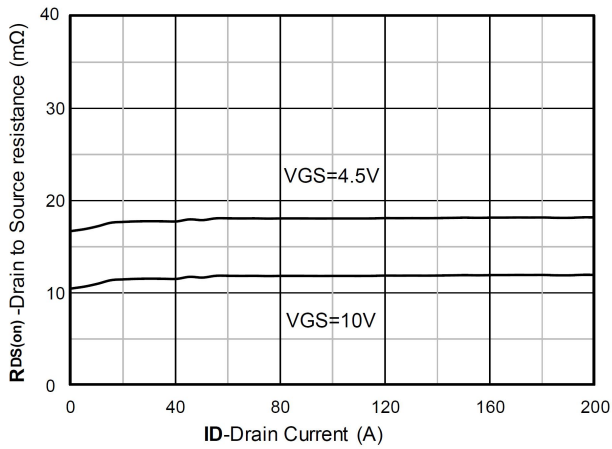
Gate Charge



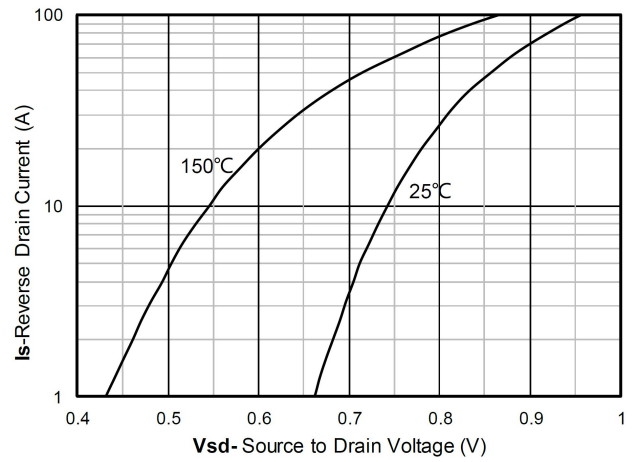
Current dissipation



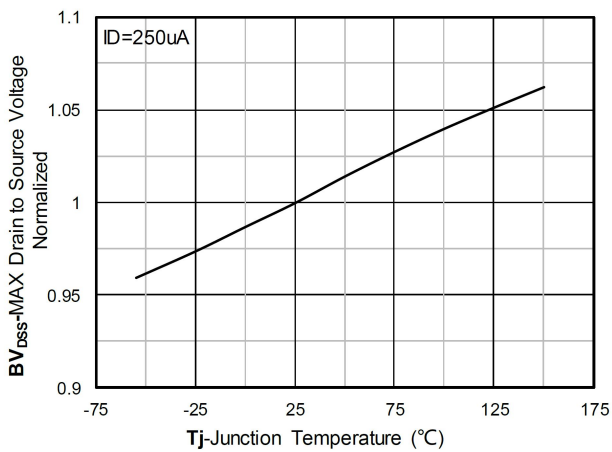
Power dissipation



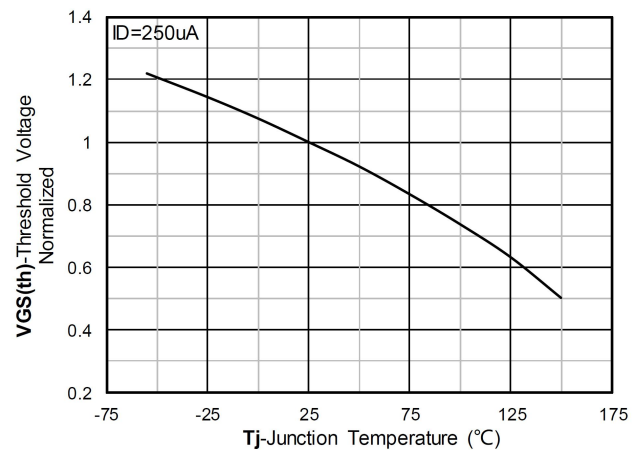
$R_{DS(on)}$ VS Drain Current



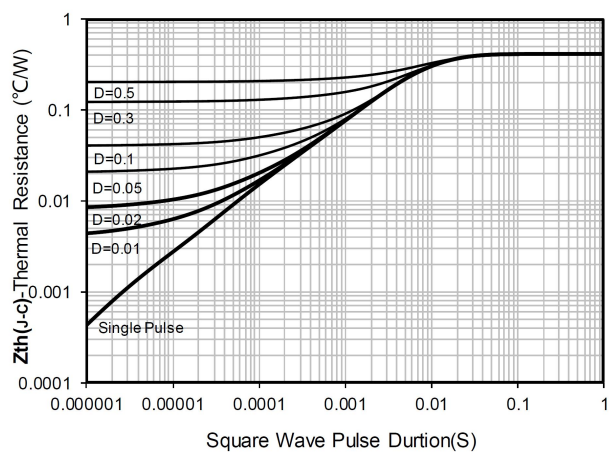
Forward characteristics of reverse diode



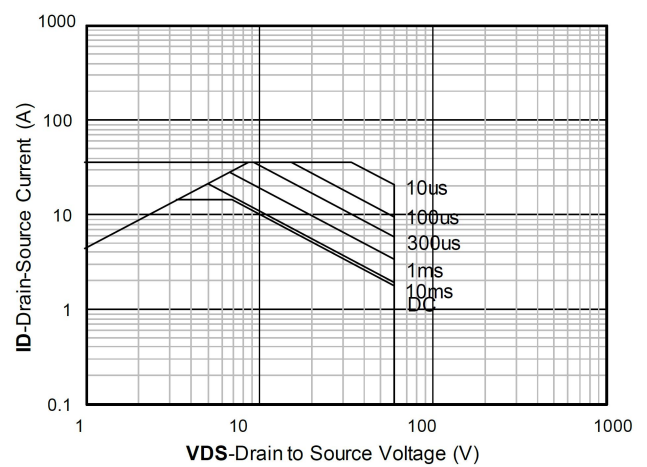
Normalized breakdown voltage



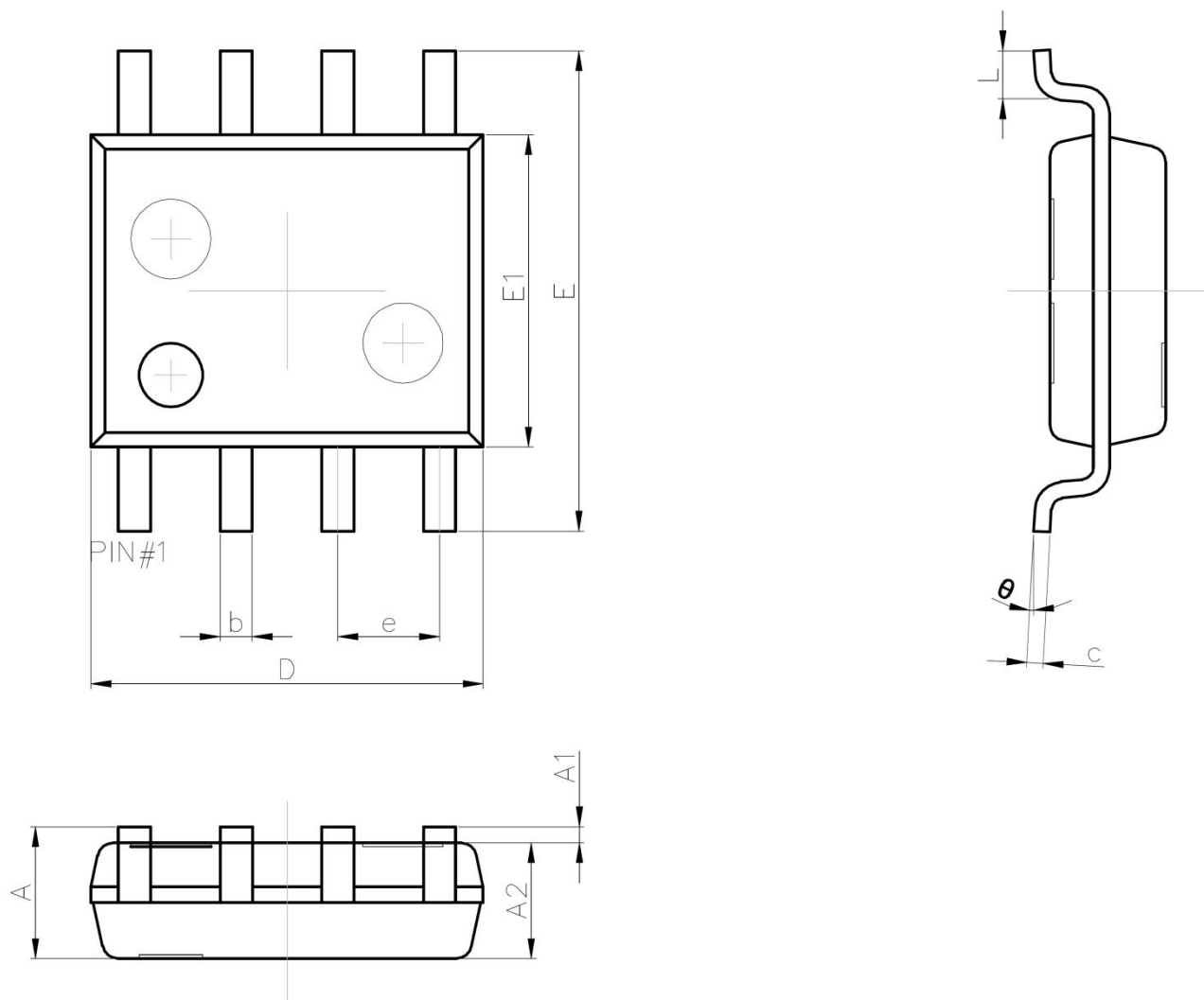
Normalized Threshold voltage



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
θ	0°	8°