

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
60V	13.5mΩ@10V	10A
	16.5mΩ@4.5V	



合肥矽普半导体

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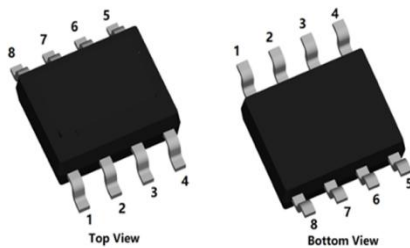
Feature

- Fast switching speed
- Surface mount package
- Advanced Split Gate Trench Technology
- 100% Single Pulse avalanche energy Test

Applications

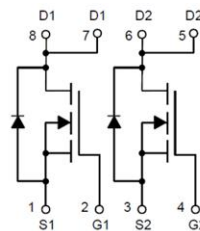
- DC-DC Converters.
- Motor Control.

Package

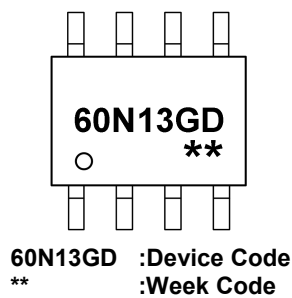


SOP-8L

Circuit Diagram



Marking



Order Information

Device	Package	Unit/Tape
SP60N13GDP8	SOP-8L	4000

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

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	I_D	10	A
Continuous Drain Current (Ta=100°C)	I_D	6	A
Pulse Drain Current Tested	I_{DM}	40	A
Single Pulse Avalanche Energy ¹	E_{AS}	64	mJ
Power Dissipation	P_D	1.6	W
Thermal Resistance Junction-to-Ambient	$R_{\theta JA}$	78.13	°C/W
Storage Temperature Range	T_J	-55 to 150	°C
Operating Junction Temperature Range	T_{STG}	-55 to 150	°C

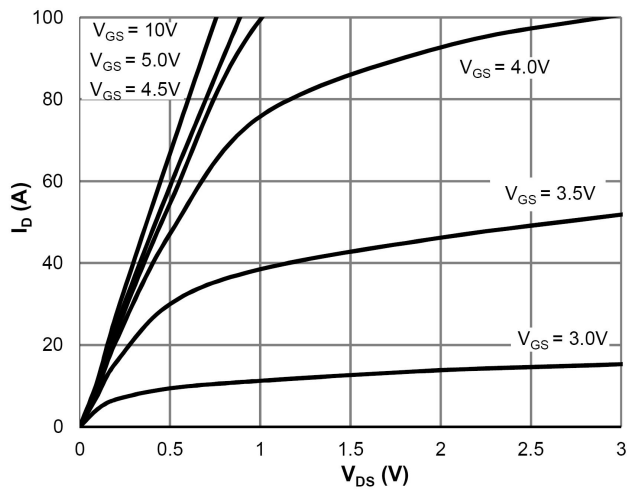
Electrical characteristics (Ta=25°C, unless otherwise noted)

Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	VGS=0V, ID=250mA	60	-	-	V
Zero Gate Voltage Drain Current	IDSS	VDS=48V, VGS=0V	-	-	1	uA
Gate Leakage Current	IGSS	VGS=±20V, VDS=0V	-	-	±100	nA
Gate Threshold Voltage	VGS(th)	VDS=VGS, ID=250uA	1	1.8	2.5	V
Drain-Source On-state Resistance	RDS(ON)	VGS=10V, ID=8A	-	13.5	17	mΩ
		VGS=4.5V, ID=6A	-	16.5	21	
Dynamic Characteristics						
Input Capacitance	Ciss	VGS=0V, VDS=30V, F=1MHz	-	940	-	pF
Output Capacitance	Coss		-	235	-	
Reverse Transfer Capacitance	Crss		-	10	-	
Total Gate Charge	Qg	VDS=30V, VGS=10V, ID=8A	-	15.9	-	nC
Gate-Source Charge	Qgs		-	2.8	-	
Gate-Drain Charge	Qgd		-	4.2	-	
Switching Characteristics						
Turn-On Delay Time	td(on)	VDD=30V, ID=8A, VGS=10V, RG=4.7Ω	-	4	-	nS
Rise Time	tr		-	6	-	
Turn-Off Delay Time	td(off)		-	18.8	-	
Fall Time	tf		-	6.4	-	
Drain-Source Body Diode Characteristics						
Source-Drain Diode Forward Voltage	VSD	VGS=0V , IS=1A , TJ=25℃	-	-	1.2	V
Maximum Body-Diode Continuous Current	IS		-	-	10	A
Reverse Recovery Time	Trr	IS=5A, di/dt=100 A/μs, TJ=25℃	-	15	-	nS
Reverse Recovery Charge	Qrr		-	9	-	nC

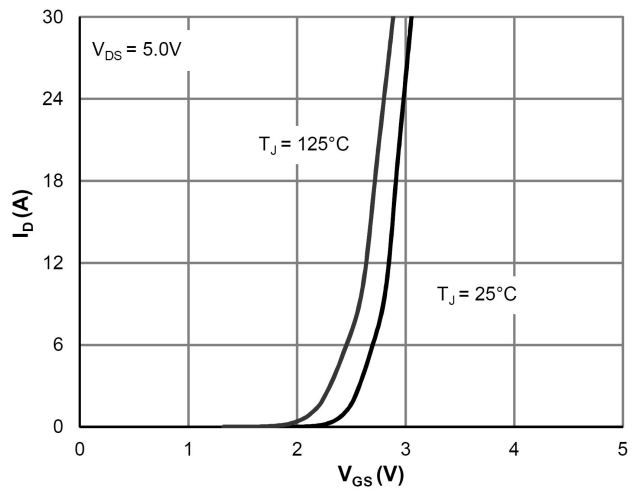
Note :

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

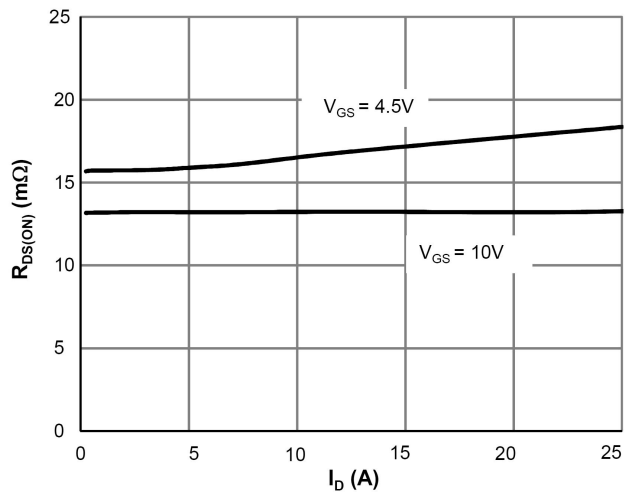
Typical Characteristics



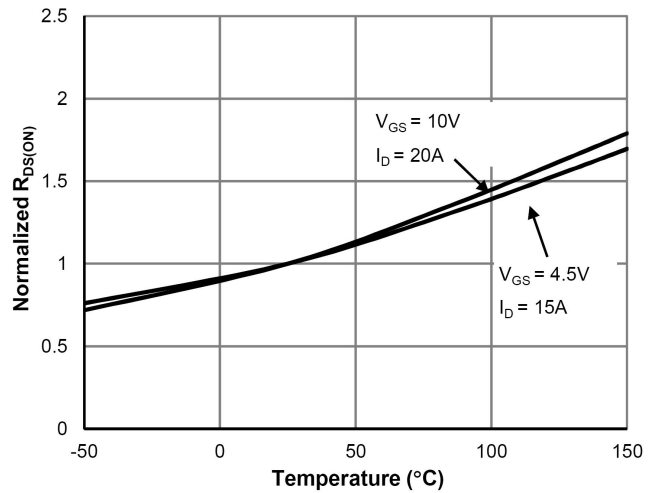
Saturation Characteristics



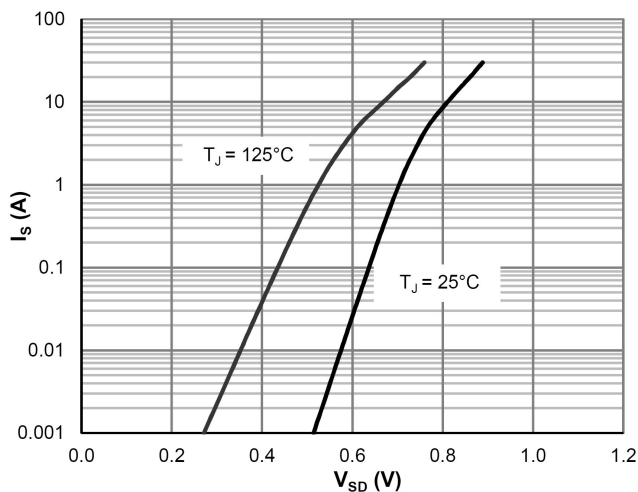
Transfer Characteristics



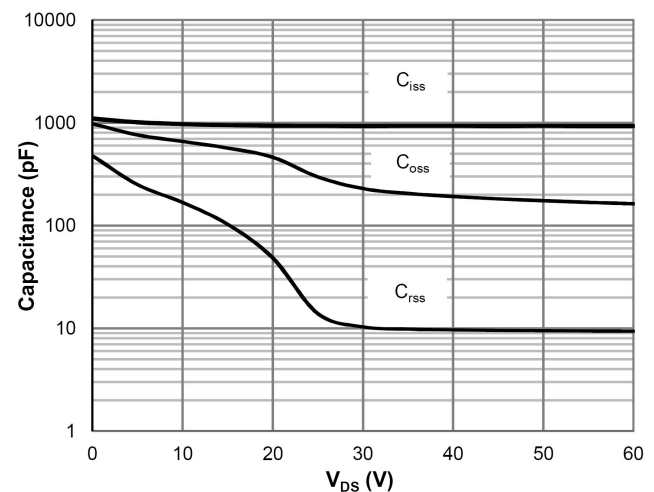
$R_{DS(ON)}$ vs. Drain Current



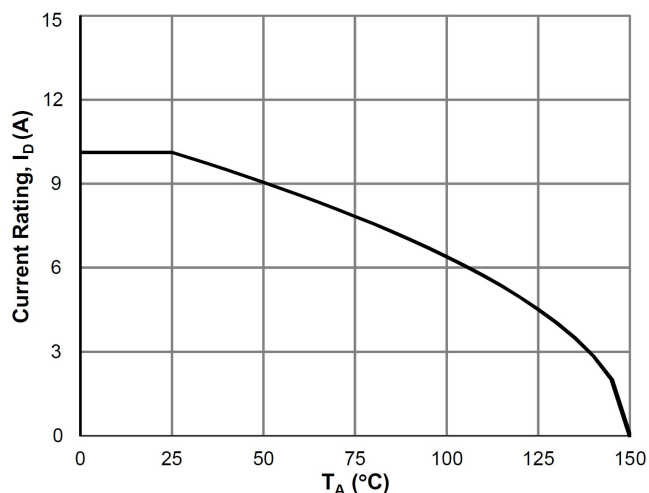
$R_{DS(ON)}$ vs. Junction Temperature



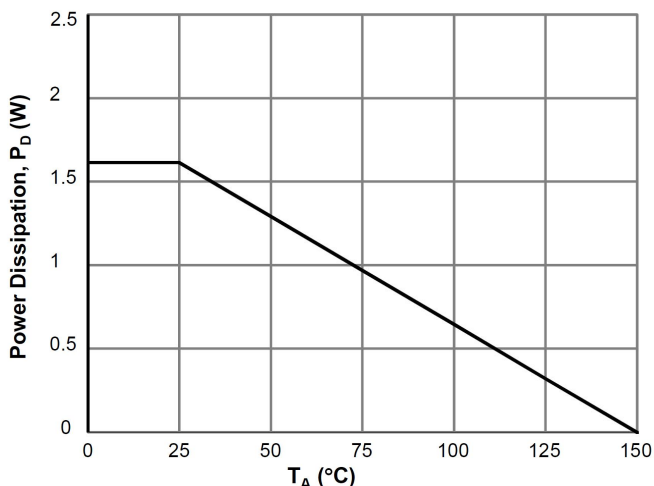
Body-Diode Characteristics



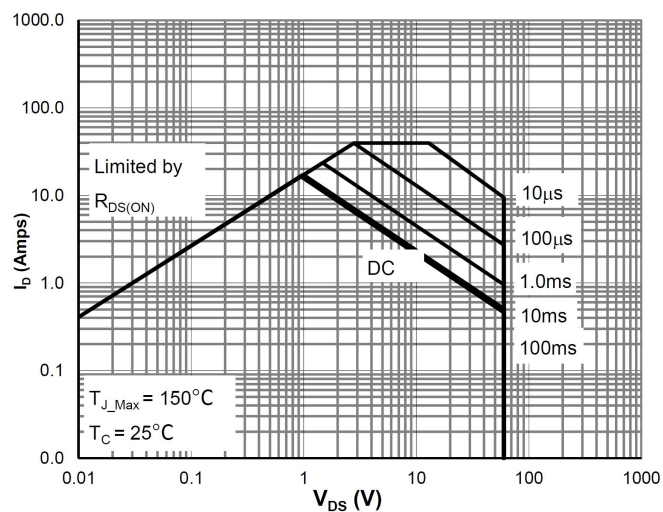
Capacitance Characteristics



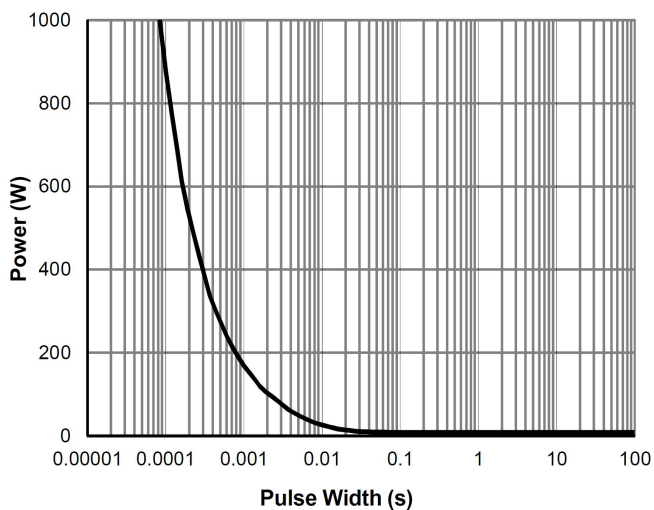
Current De-rating



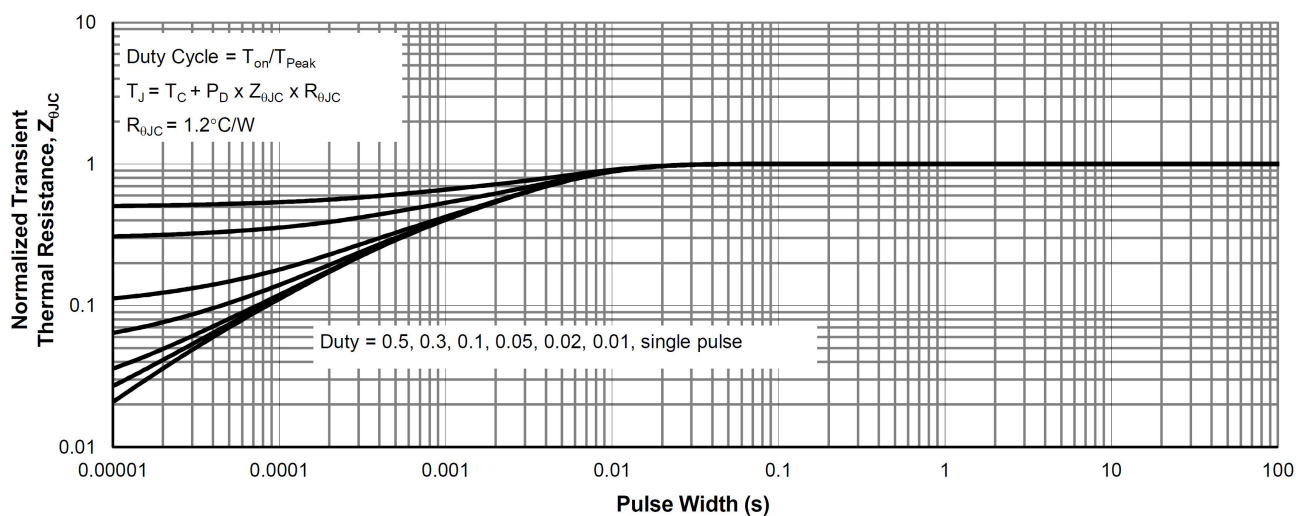
Power De-rating



Maximum Safe Operating Area

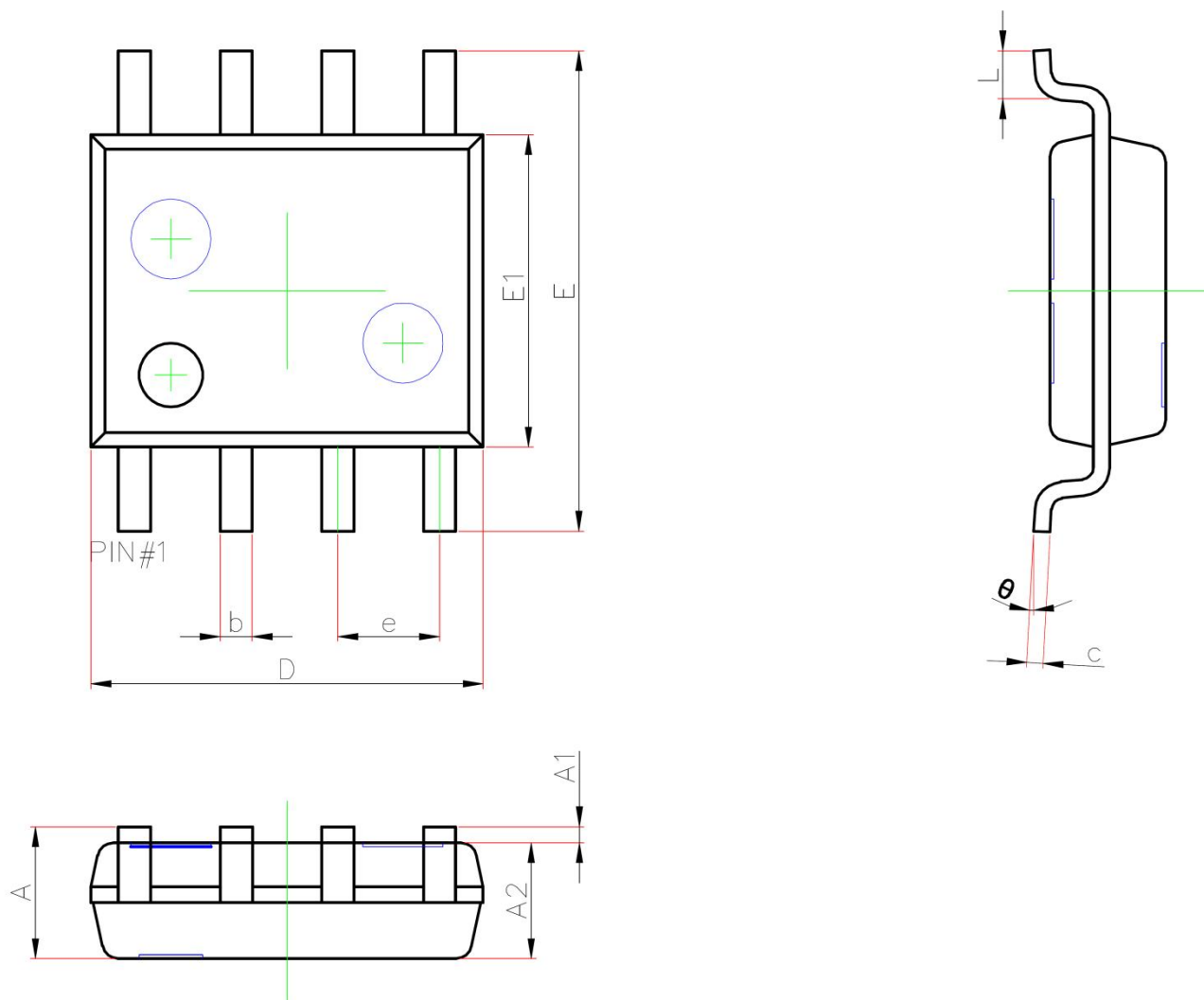


Single Pulse Power Rating, Junction-to-Case



Normalized Maximum Transient Thermal Impedance

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°