Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
135V	4.6mΩ@10V	160A

合肥矽普半导体
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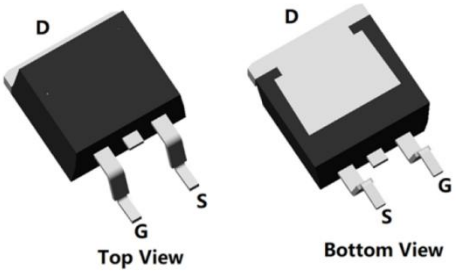
Feature

- Fast Switching
- Low Gate Charge and Rdson
- Advanced Split Gate Trench Technology
- 100% Single Pulse avalanche energy Test

Applications

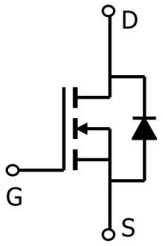
- PWM Application
- Hard switched and high frequency circuits
- Power Management

Package

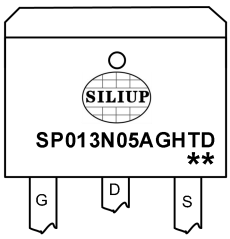


TO-263(1:G 2:D 3:S)

Circuit diagram



Marking



SP013N05AGHTD : Device Code
**** : Week Code**

Order Information

Device	Package	Unit/Tape
SP013N05AGHTD	TO-263	800

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

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	135	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current(Tc=25℃)	I_D	160	A
Continuous Drain Current(Tc=100℃)	I_D	105	A
Pulsed Drain Current	I_{DM}	640	A
Single Pulse Avalanche Energy[1]	E_{AS}	1024	mJ
Power Dissipation(Tc=25℃)	P_D	300	W
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	0.42	℃/W
Storage Temperature Range	T_{STG}	-55 to 150	℃
Operating Junction Temperature Range	T_J	-55 to 150	℃

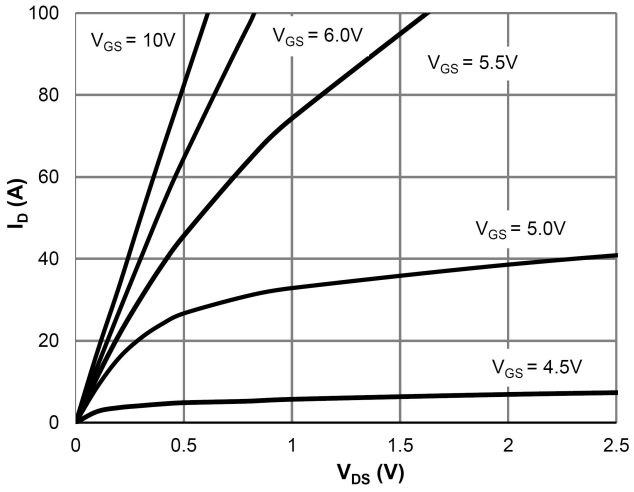
Electrical characteristics (Ta=25℃, unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	ID = 250μA, VGS = 0V	135	150	-	V
Drain-Source Leakage Current	I_{DSS}	VDS = 108V, VGS = 0V	-	-	1	uA
Gate-Source Leakage Current	I_{GSS}	VGS = ±20V, VDS = 0V	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	VDS = VGS, ID = 250μA	2	3	4	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	VGS = 10V, ID = 20A	-	4.6	6	mΩ
Dynamic characteristics						
Input Capacitance	C_{iss}	VDS=75V , VGS=0V , f=1MHz	-	6620	-	pF
Output Capacitance	C_{oss}		-	536	-	
Reverse Transfer Capacitance	C_{rss}		-	19	-	
Total Gate Charge	Q_g	VDS=75V , VGS=10V , ID=20A	-	82	-	nC
Gate-Source Charge	Q_{gs}		-	38	-	
Gate-Drain Charge	Q_{gd}		-	23	-	
Switching Characteristics						
Turn-On Delay Time	$T_{d(on)}$	VDD=75V, VGS=10V , RG=3.0Ω, ID=20A	-	23	-	nS
Rise Time	T_r		-	39	-	
Turn-Off Delay Time	$T_{d(off)}$		-	49	-	
Fall Time	T_f		-	18	-	
Diode Characteristics						
Diode Forward Voltage	V_{SD}	VGS=0V , I_S=1A , TJ=25℃	-	-	1.2	V
Maximum Body-Diode Continuous Current	I_S		-	-	160	A
Reverse Recovery Time	T_{rr}	I_S=140A, di/dt=100A/us, TJ=25℃	-	132	-	nS
Reverse Recovery Charge	Q_{rr}		-	466	-	nC

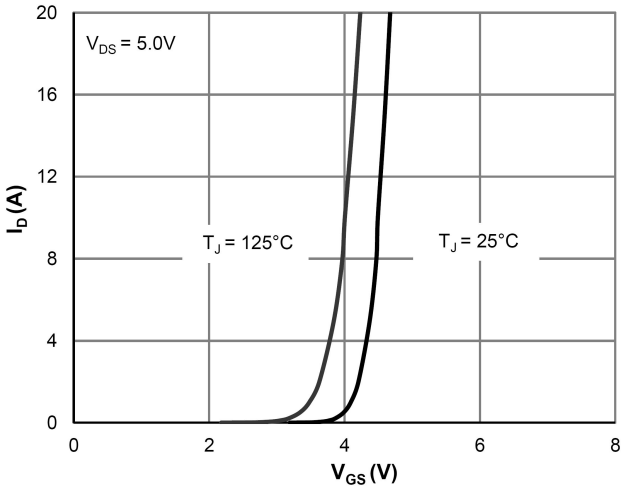
Note :

1. The test condition is VDD=50V,VGS=10V,L=0.5mH,RG=25Ω

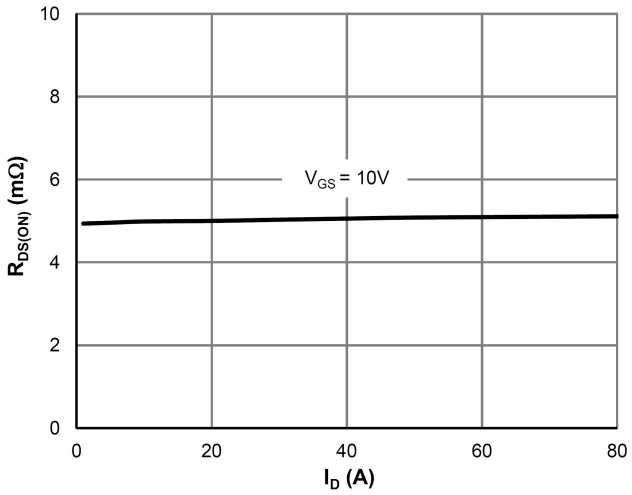
Typical Characteristics



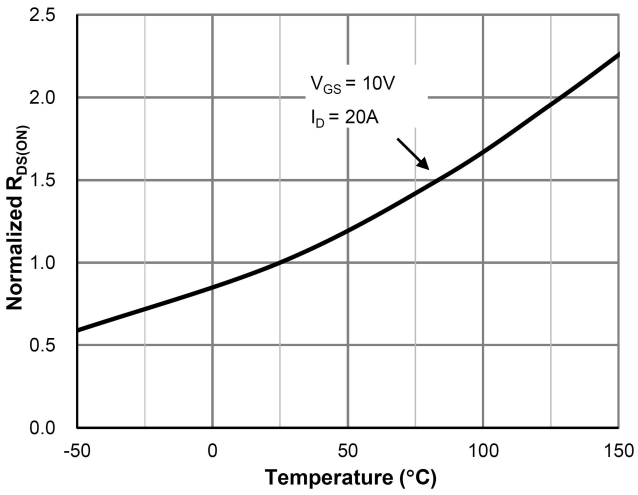
Saturation Characteristics



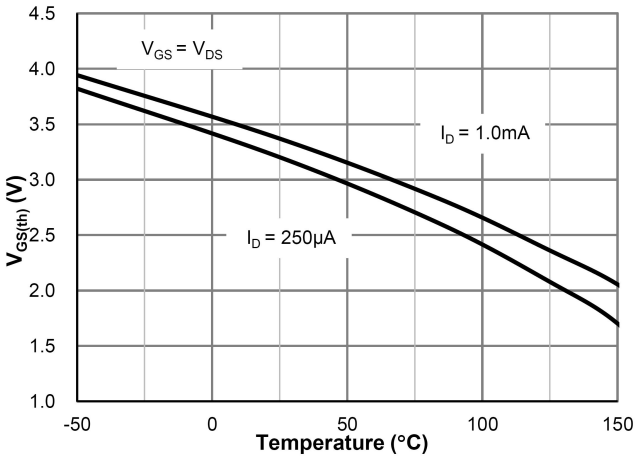
Transfer Characteristics



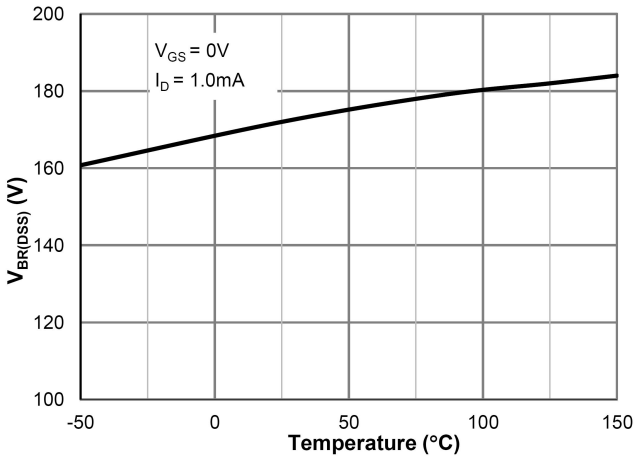
$R_{DS(ON)}$ vs. Drain Current



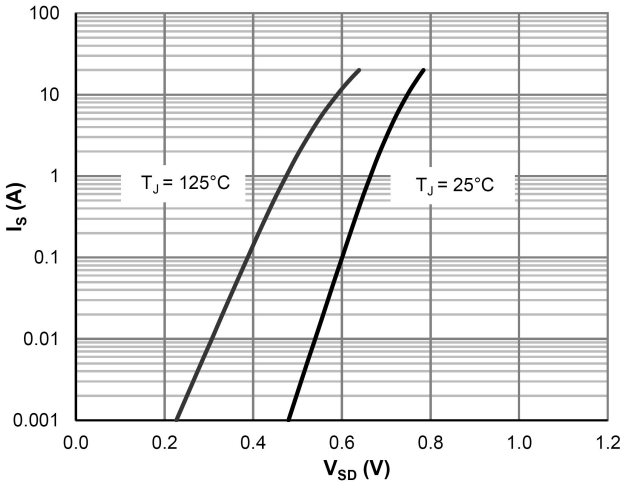
$R_{DS(ON)}$ vs. Junction Temperature



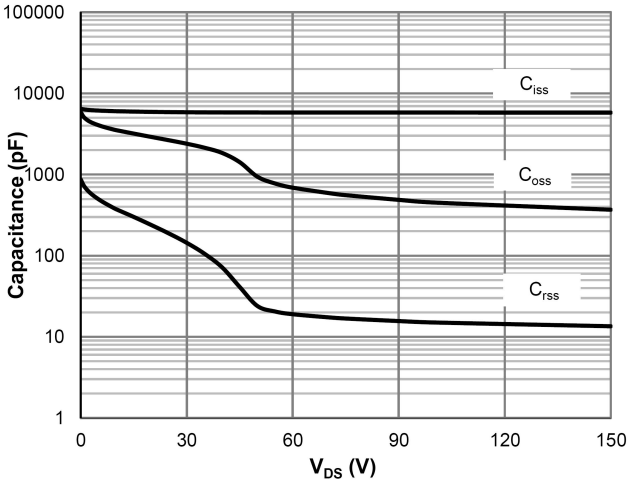
$V_{GS(th)}$ vs. Junction Temperature



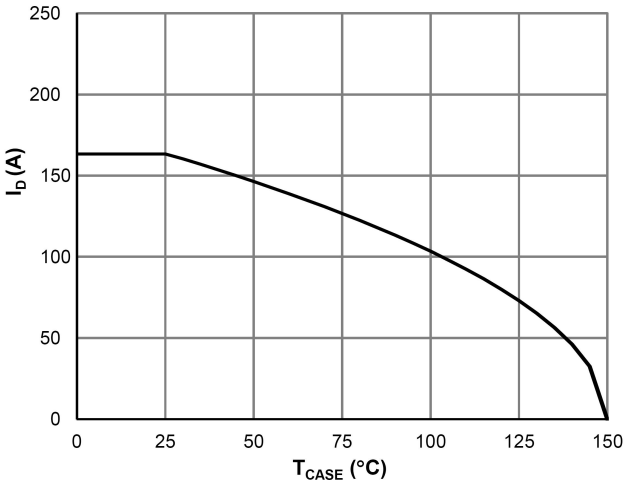
$V_{BR(DSS)}$ vs. Junction Temperature



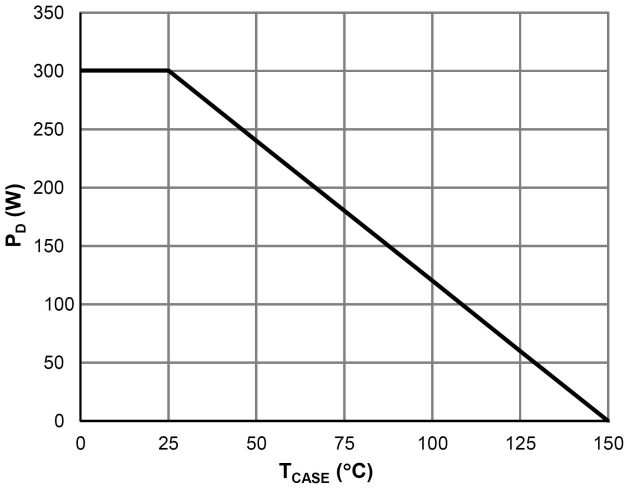
Body-Diode Characteristics



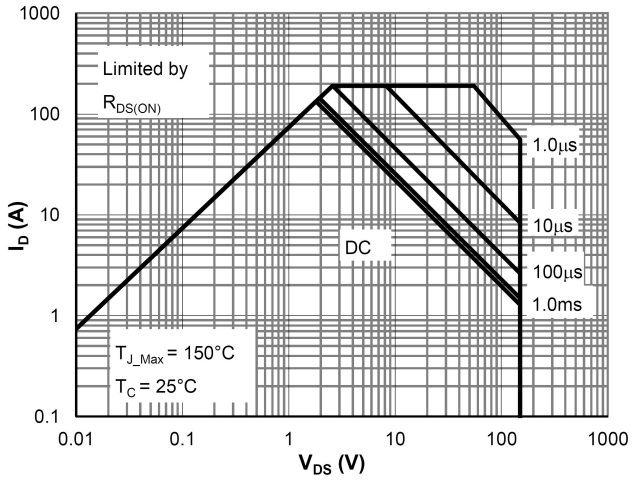
Capacitance Characteristics



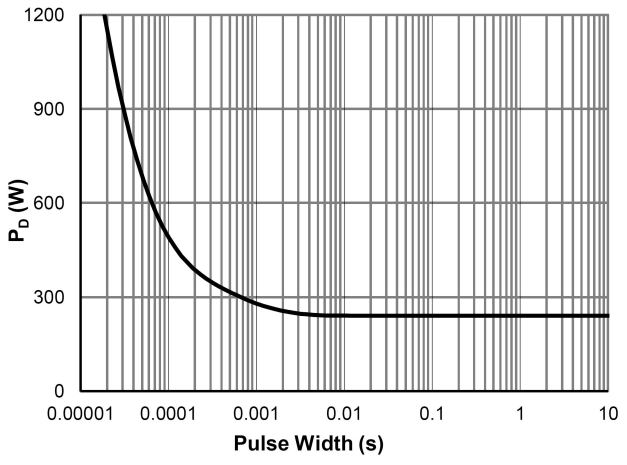
Current De-rating



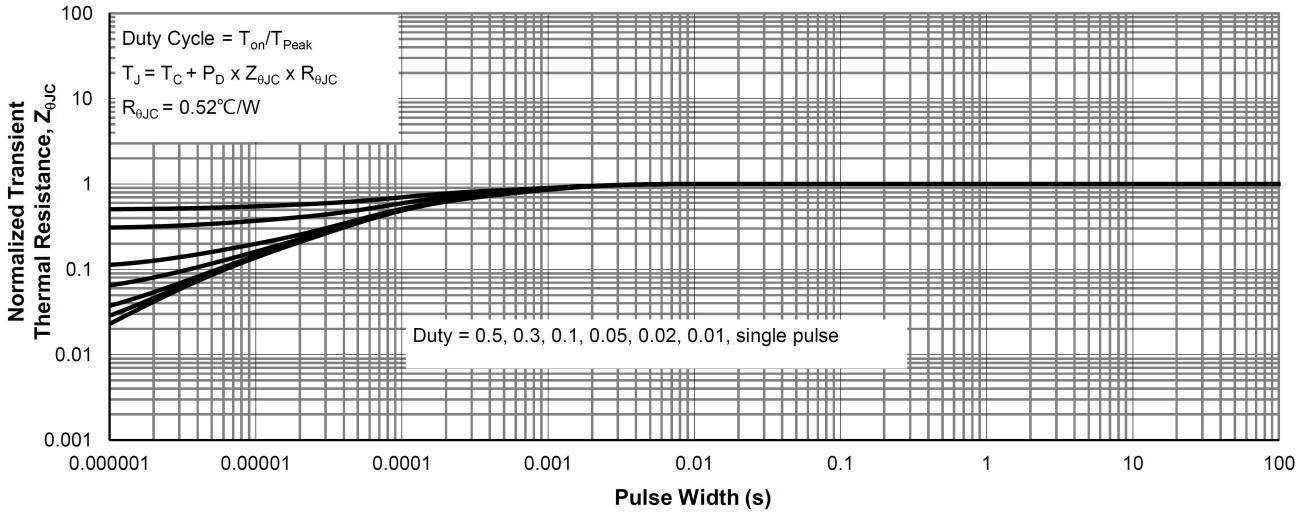
Power De-rating



Maximum Safe Operating Area

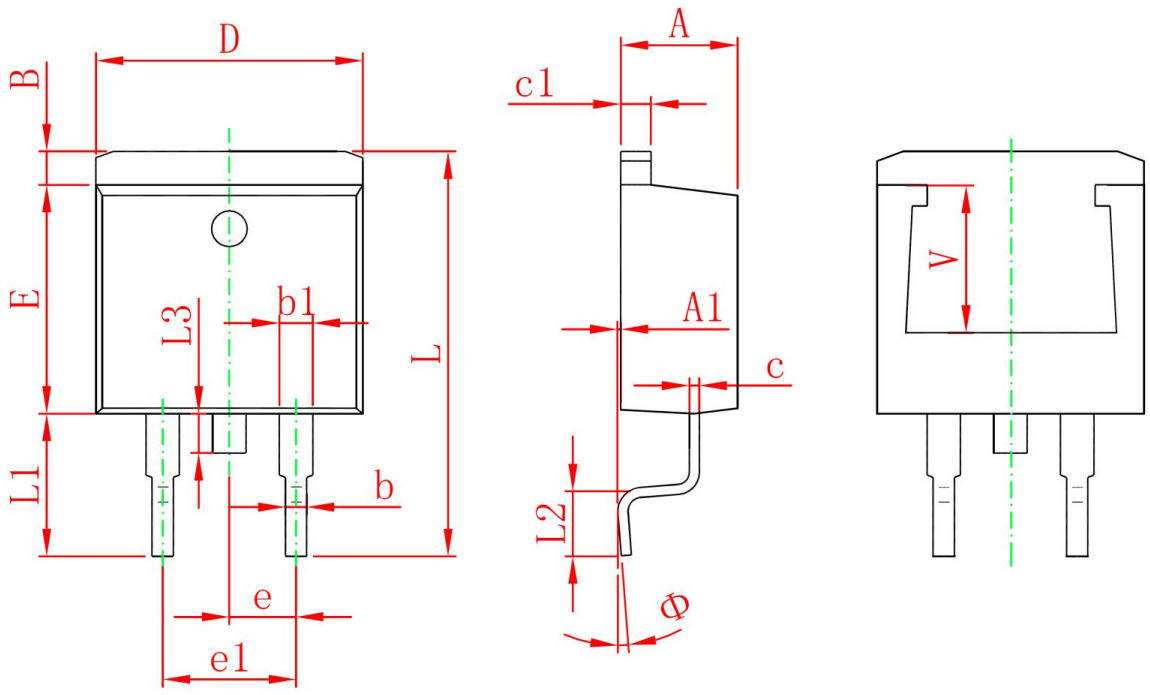


Single Pulse Power Rating, Junction-to-Case



Normalized Maximum Transient Thermal Impedance

TO-263 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.470	4.670	0.176	0.184
A1	0.000	0.150	0.000	0.006
B	1.120	1.420	0.044	0.056
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.310	0.530	0.012	0.021
c1	1.170	1.370	0.046	0.054
D	10.010	10.310	0.394	0.406
E	8.500	8.900	0.335	0.350
e	2.540 TYP.		0.100 TYP.	
e1	4.980	5.180	0.196	0.204
L	14.940	15.500	0.588	0.610
L1	4.950	5.450	0.195	0.215
L2	2.340	2.740	0.092	0.108
L3	1.300	1.700	0.051	0.067
Φ	0°	8°	0°	8°
V	5.600 REF.		0.220 REF.	