

## Product Summary

$V_{(BR)DSS}$	$R_{DS(on)}TYP$	$I_D$
150V	4.8mΩ@10V	180A



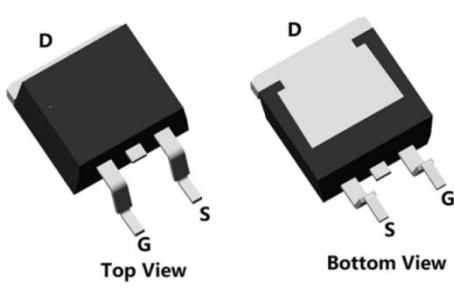
## Feature

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

## Applications

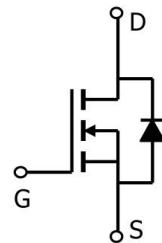
- PWM Application
- Hard switched and high frequency circuits
- Power Management

## Package

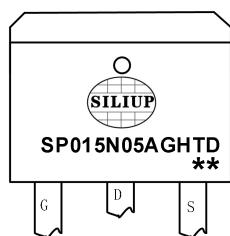


TO-263(1:G 2:D 3:S)

## Circuit diagram



## Marking



SP015N05AGHTD : Device Code  
\*\* : Week Code

## Order Information

Device	Package	Unit/Tape
SP015N05AGHTD	TO-263	800

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

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V <sub>DS</sub>	150	V
Gate-Source Voltage	V <sub>GS</sub>	±20	V
Continuous Drain Current (Tc=25°C)	I <sub>D</sub>	180	A
Continuous Drain Current (Tc=100°C)	I <sub>D</sub>	120	A
Pulsed Drain Current	I <sub>DM</sub>	720	A
Single Pulse Avalanche Energy <sup>1</sup>	E <sub>AS</sub>	1024	mJ
Power Dissipation (Tc=25°C)	P <sub>D</sub>	320	W
Thermal Resistance Junction-to-Case	R <sub>θJC</sub>	0.39	°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)**

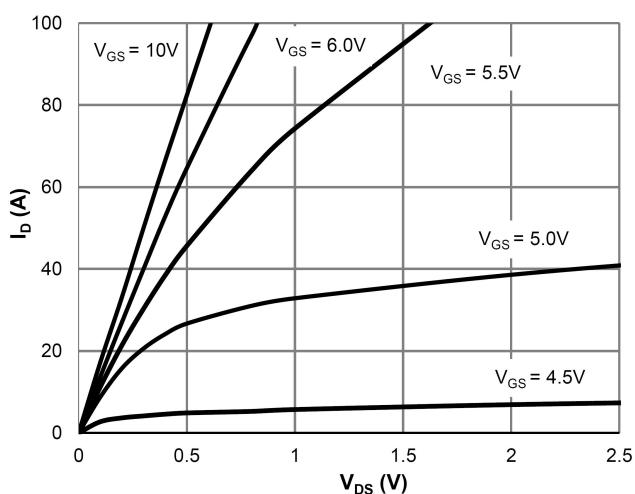
Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	ID = 250μA, VGS = 0V	150	-	-	V
Drain Cut-Off Current	I <sub>DSS</sub>	VDS = 120V, VGS = 0V	-	-	1	μA
Gate Leakage Current	I <sub>GSS</sub>	VGS = ±20V, VDS = 0V	-	-	±0.1	
Gate Threshold Voltage	V <sub>GS(th)</sub>	VDS = VGS, ID = 250μA	2	3	4	V
Drain-Source ON Resistance	R <sub>DS(ON)</sub>	VGS = 10V, ID = 20A	-	4.8	6	mΩ
<b>Dynamic Characteristics</b>						
Input Capacitance	C <sub>iss</sub>	VDS=75V , VGS=0V , f=1MHz	-	6620	-	pF
Output Capacitance	C <sub>oss</sub>		-	536	-	
Reverse Transfer Capacitance	C <sub>rss</sub>		-	19	-	
Total Gate Charge	Q <sub>g</sub>	VDS=75V , VGS=10V , ID=20A	-	82	-	nC
Gate-Source Charge	Q <sub>gs</sub>		-	38	-	
Gate-Drain Charge	Q <sub>gd</sub>		-	23	-	
<b>Switching Characteristics</b>						
Turn-On Delay Time	t <sub>d(on)</sub>	VDD=75V , VGS=10V , RG=6Ω ID=20A	-	23	-	nS
Rise Time	t <sub>r</sub>		-	39	-	
Turn-Off Delay Time	t <sub>d(off)</sub>		-	49	-	
Fall Time	t <sub>f</sub>		-	18	-	
<b>Drain-Source Body Diode Characteristics</b>						
Source-Drain Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> = 1A, VGS = 0V	-	-	1.2	V
Maximum Body-Diode Continuous Current	I <sub>S</sub>	I <sub>S</sub> =140A, di/dt=100A/us, TJ=25°C	-	-	180	A
Reverse Recovery Time	T <sub>rr</sub>		-	142	-	nS
Reverse Recovery Charge	Q <sub>rr</sub>		-	486	-	nC

**Note :**

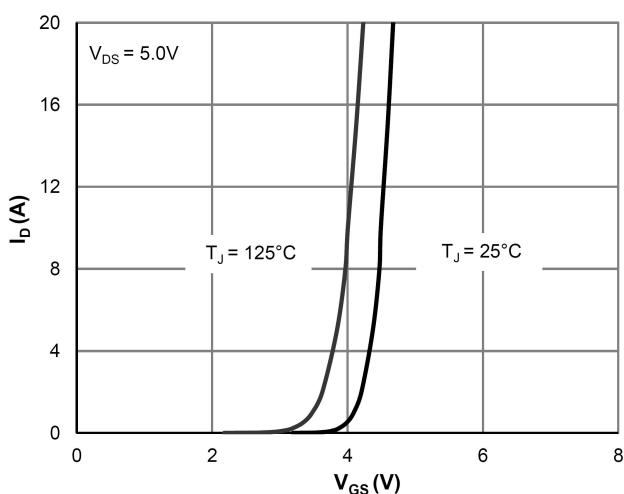
- The test condition is VDD=50V,VGS=10V,L=0.5mH,RG=25Ω



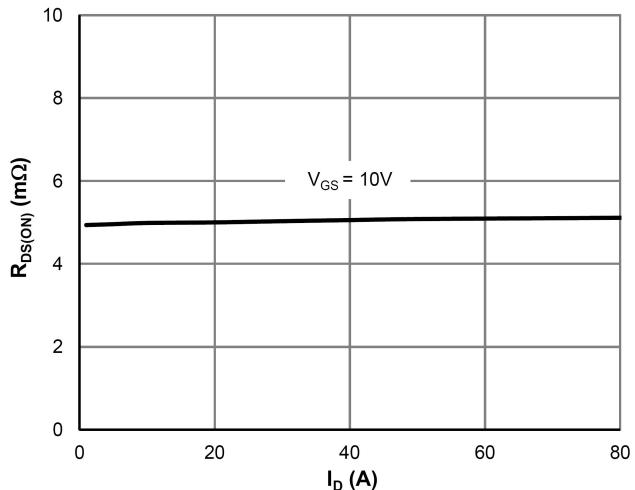
## Typical Characteristics



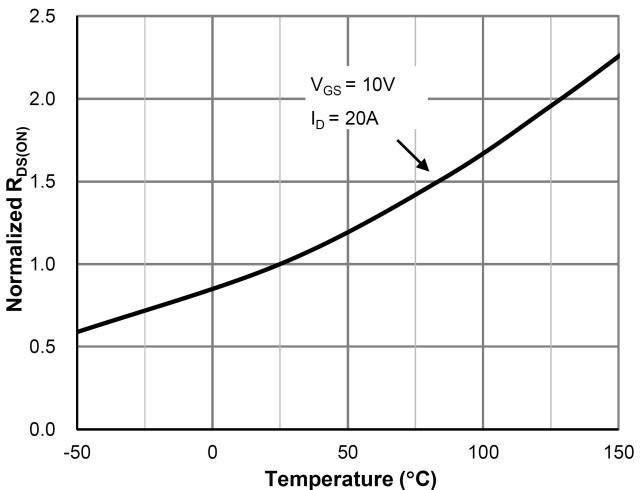
Saturation Characteristics



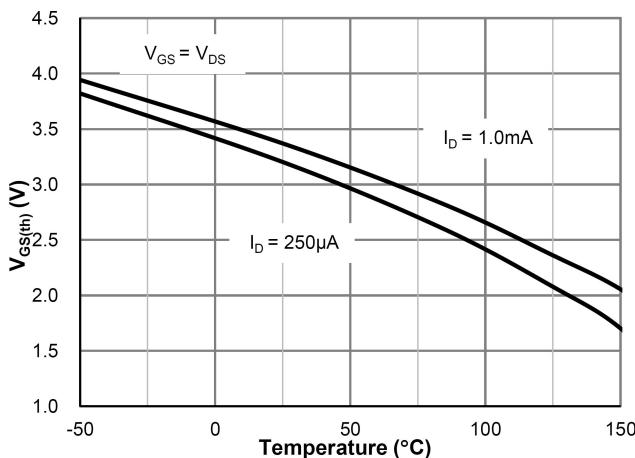
Transfer Characteristics



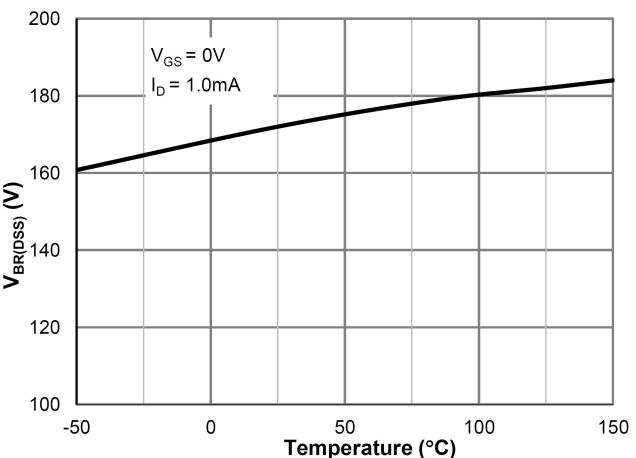
$R_{DS(ON)}$  vs. Drain Current



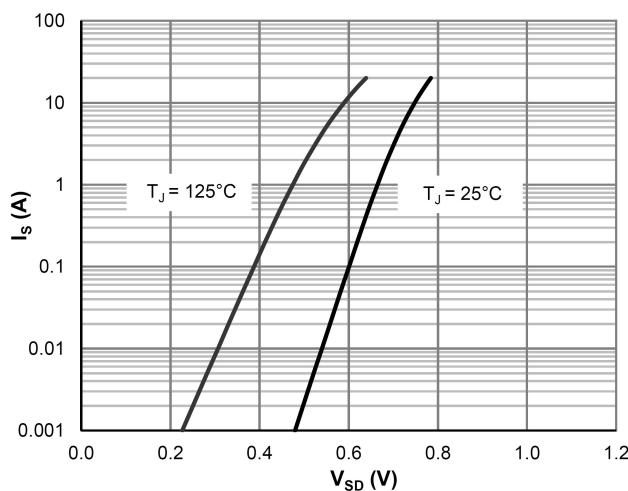
$R_{DS(ON)}$  vs. Junction Temperature



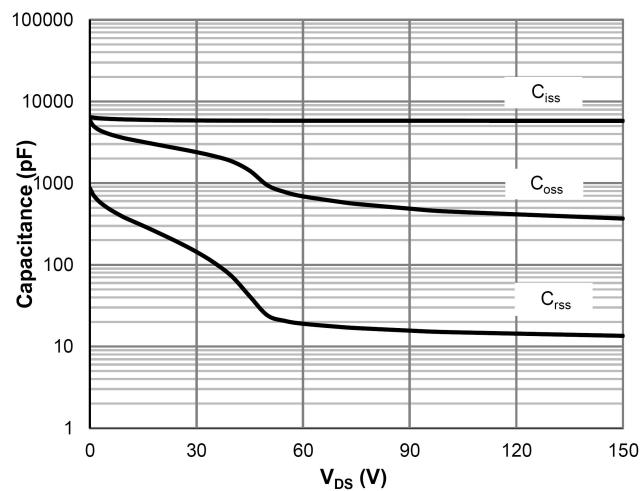
$V_{GS(th)}$  vs. Junction Temperature



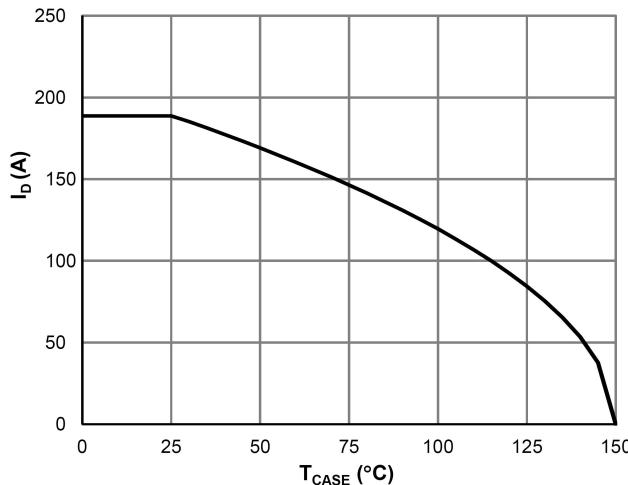
$V_{BR(DSS)}$  vs. Junction Temperature



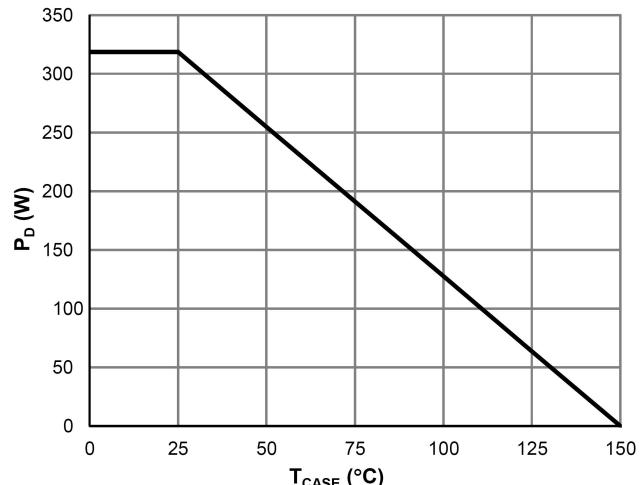
Body-Diode Characteristics



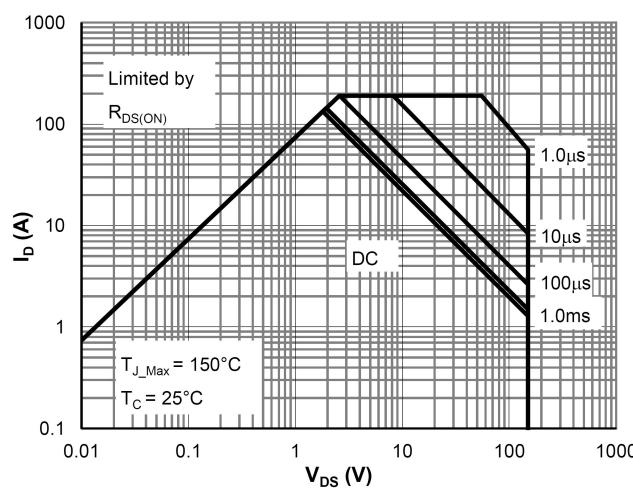
Capacitance Characteristics



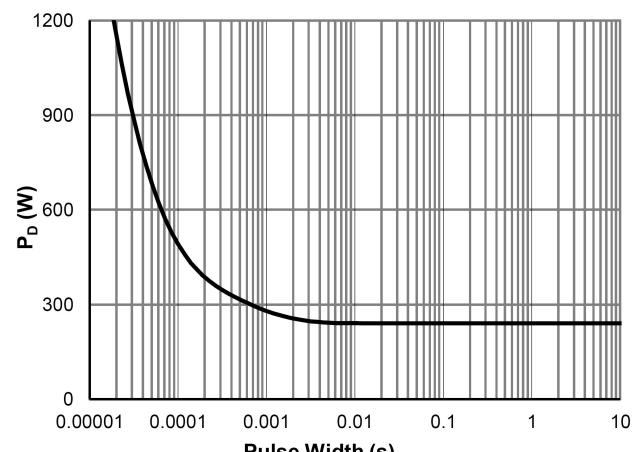
Current De-rating



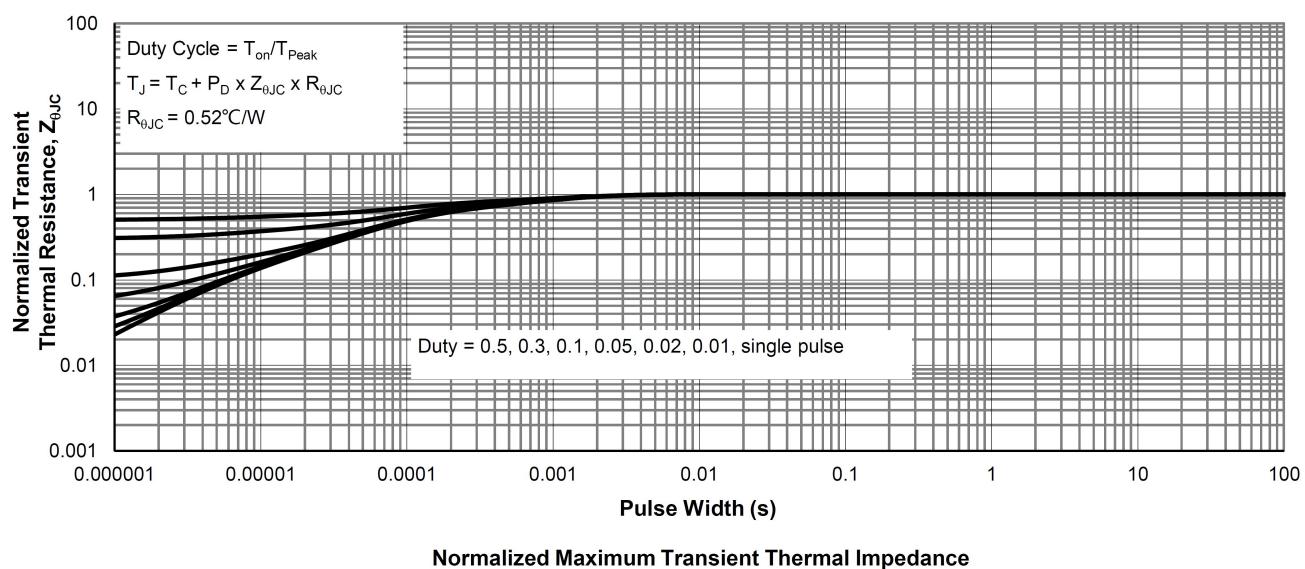
Power De-rating



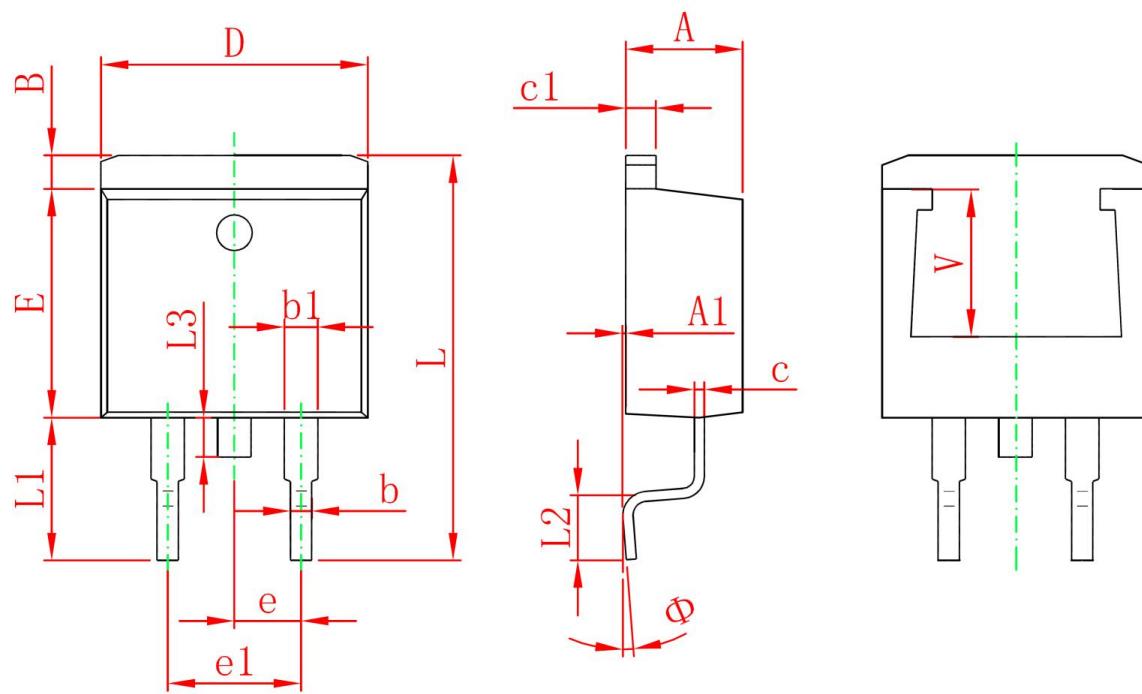
Maximum Safe Operating Area



Single Pulse Power Rating, Junction-to-Case



### 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.	