

## Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	$I_D$
110V	1.9mΩ@10V	300A



**合肥矽普半导体**

Siliup Semiconductor Technology Co., Ltd

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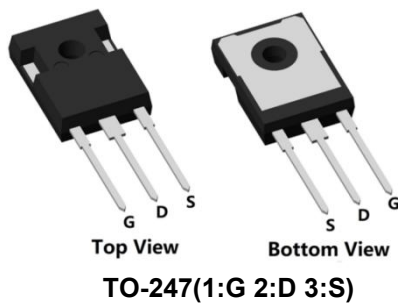
## Feature

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

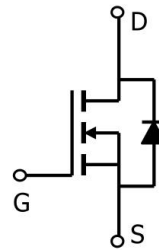
## Applications

- Power switching application
- DC-DC Converter
- Power Management

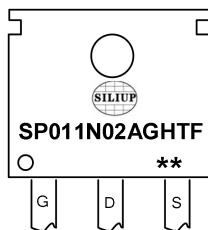
## Package



## Circuit diagram



## Marking



**SP011N02AGHTF** : Product code  
\*\* : Week code

## Order Information

Device	Package	Unit/Tube
SP011N02AGHTF	TO-247	30

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

Parameter	Symbol	Rating	Units
Drain-Source Voltage	$V_{DS}$	110	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current (Tc=25°C)	$I_D$	300	A
Continuous Drain Current (Tc=100°C)	$I_D$	200	A
Pulsed Drain Current	$I_{DM}$	1200	A
Single Pulse Avalanche Energy <sup>1</sup>	$E_{AS}$	1956	mJ
Power Dissipation (Tc=25°C)	$P_D$	310	W
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	0.4	°C/W
Storage Temperature Range	$T_{STG}$	-55 to 150	°C
Operating Junction Temperature Range	$T_J$	-55 to 150	°C

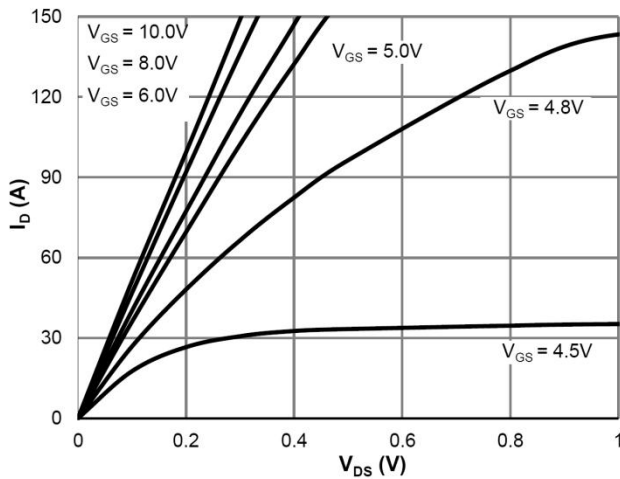
**Electrical characteristics (Ta=25°C, unless otherwise noted)**

Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	VGS=0V , ID=250uA	110	-	-	V
Drain Cut-Off Current	IDSS	VDS=80V , VGS=0V , TJ=25℃	-	-	1	μA
Gate Leakage Current	IGSS	VGS=±20V , VDS=0V	-	-	±100	nA
Gate Threshold Voltage	VGS(th)	VGS=VDS , ID =250uA	2	3	4	V
Drain-Source ON Resistance	RDS(ON)	VGS=10V , ID=20A	-	1.9	2.5	mΩ
Dynamic Characteristics						
Input Capacitance	Ciss	VDS=50V , VGS=0V , f=1MHz	-	12220	-	pF
Output Capacitance	Coss		-	1946	-	
Reverse Transfer Capacitance	Crss		-	33	-	
Total Gate Charge	Qg	VDS=50V , VGS=10V , ID=125A	-	198	-	nC
Gate-Source Charge	Qgs		-	51	-	
Gate-Drain Charge	Qgd		-	37	-	
Switching Characteristics						
Turn-On Delay Time	td(on)	VDD=50V, VGS=10V , RG=1.6Ω, ID=125A	-	25	-	nS
Rise Time	tr		-	75	-	
Turn-Off Delay Time	td(off)		-	89	-	
Fall Time	tf		-	29	-	
Drain-Source Body Diode Characteristics						
Source-Drain Diode Forward Voltage	VSD	Is = 1A, VGS = 0V	-	-	1.2	V
Maximum Body-Diode Continuous Current	Is		-	-	300	A
Reverse Recovery Time	Trr	Is=50A, di/dt=100A/us, TJ=25℃	-	96	-	nS
Reverse Recovery Charge	Qrr		-	228	-	nC

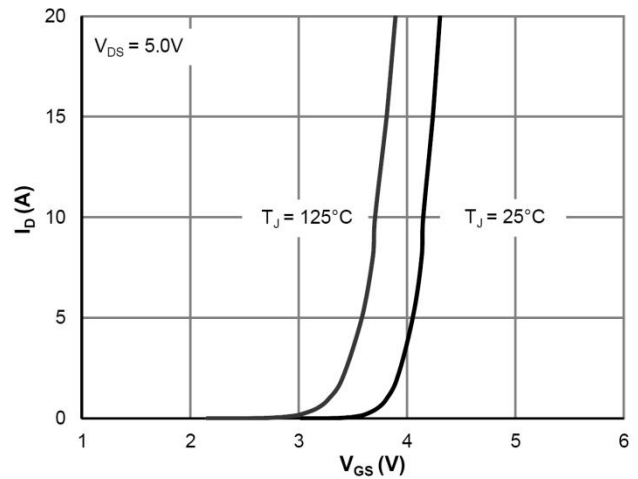
**Note :**

1. The test condition is  $V_{DD}=50V, V_{GS}=10V, L=0.5mH, R_G=25\Omega$

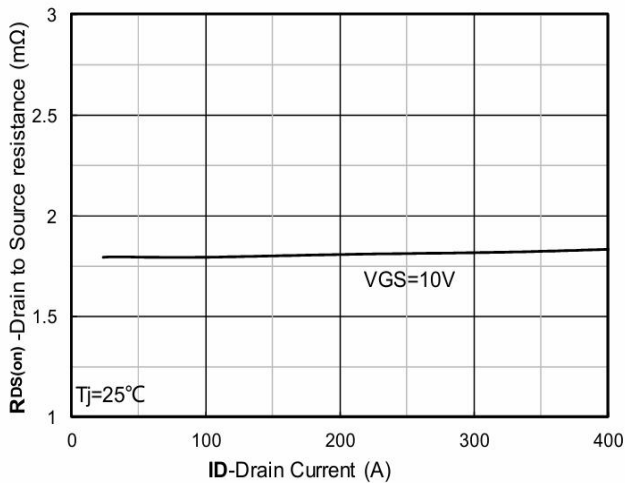
## Typical Characteristics



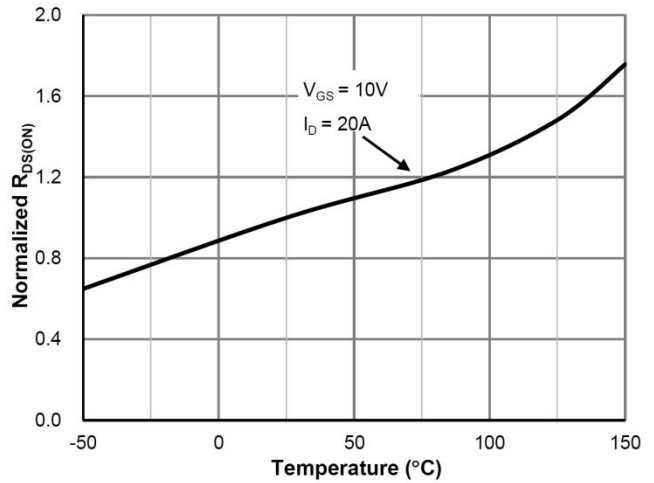
Saturation Characteristics



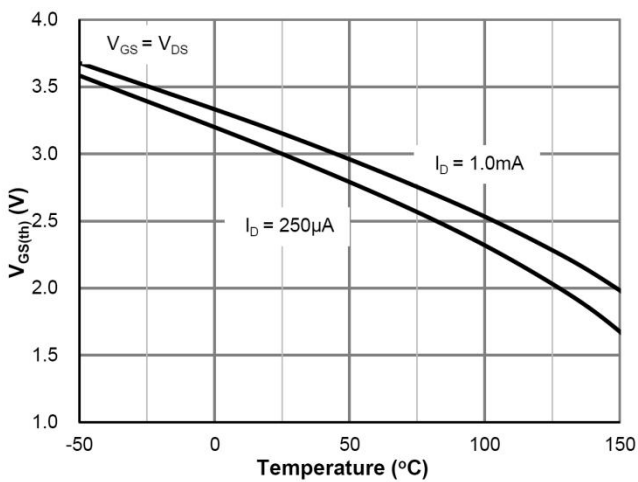
Transfer Characteristics



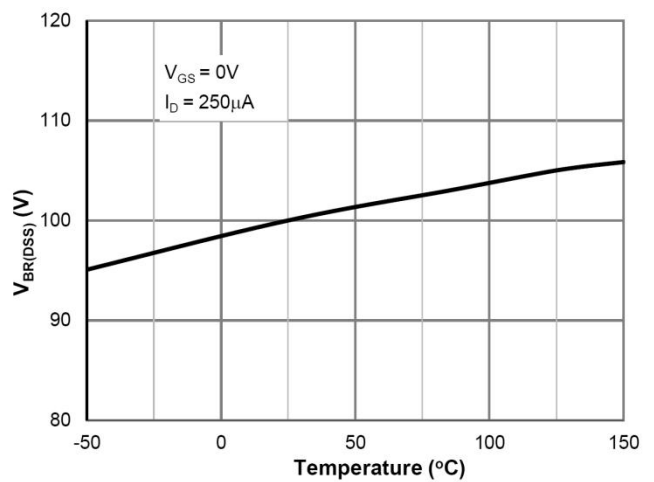
$R_{DS(on)}$  vs. Drain Current



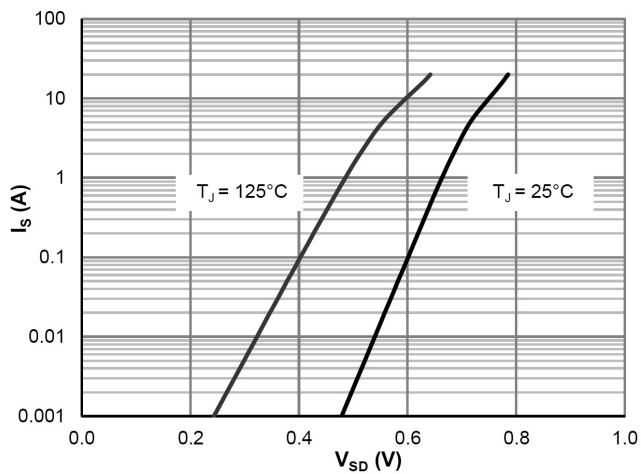
$R_{DS(on)}$  vs. Junction Temperature



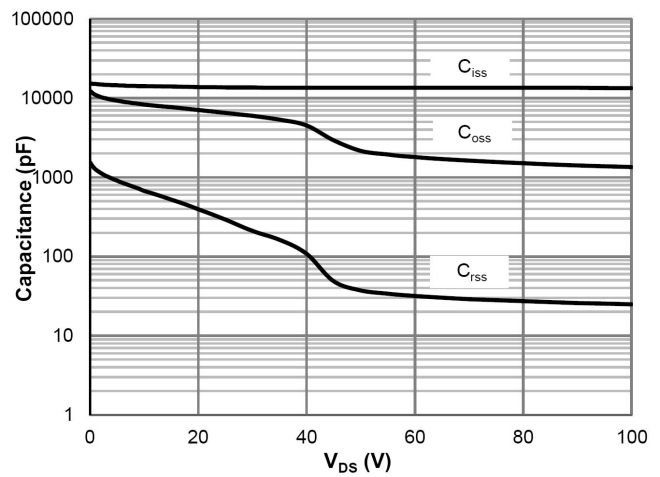
$V_{GS(th)}$  vs. Junction Temperature



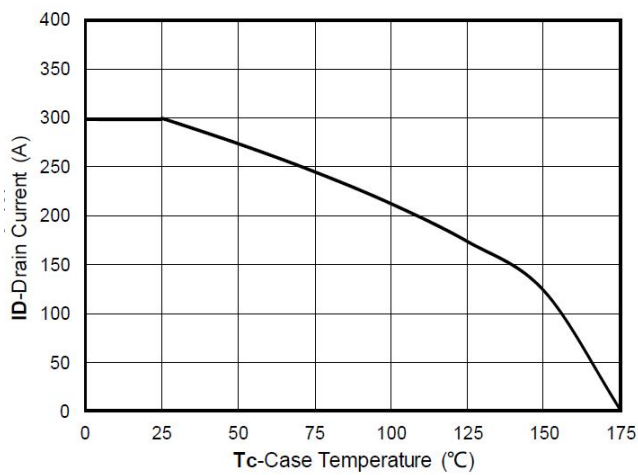
$V_{BR(DSS)}$  vs. Junction Temperature



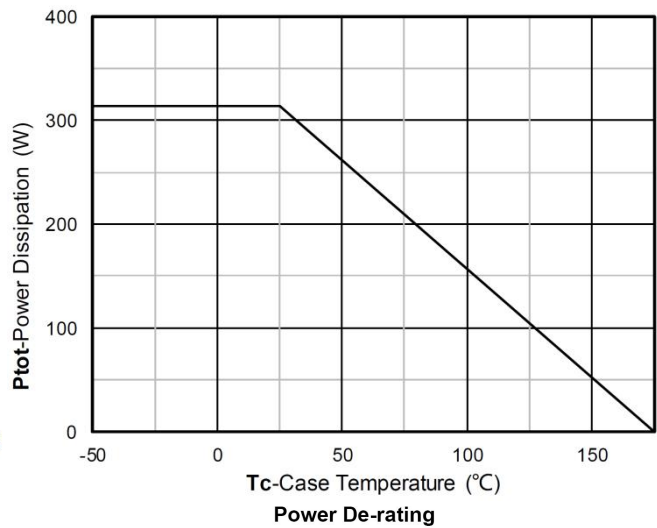
Body-Diode Characteristics



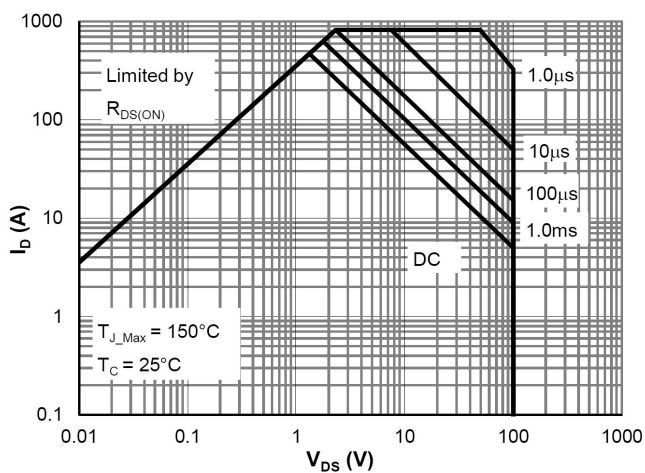
Capacitance Characteristics



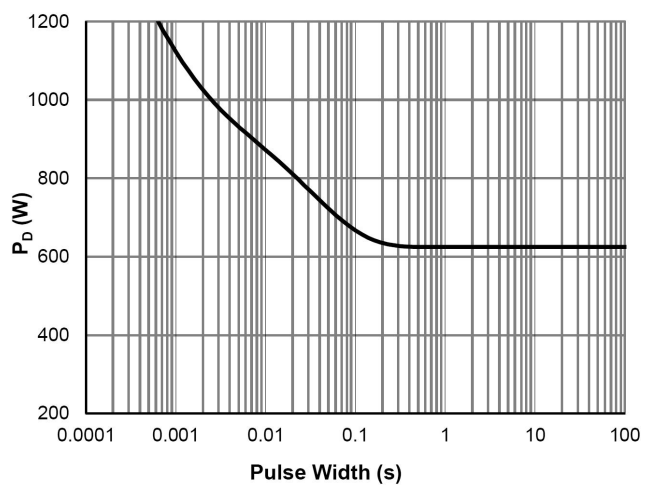
Current De-rating



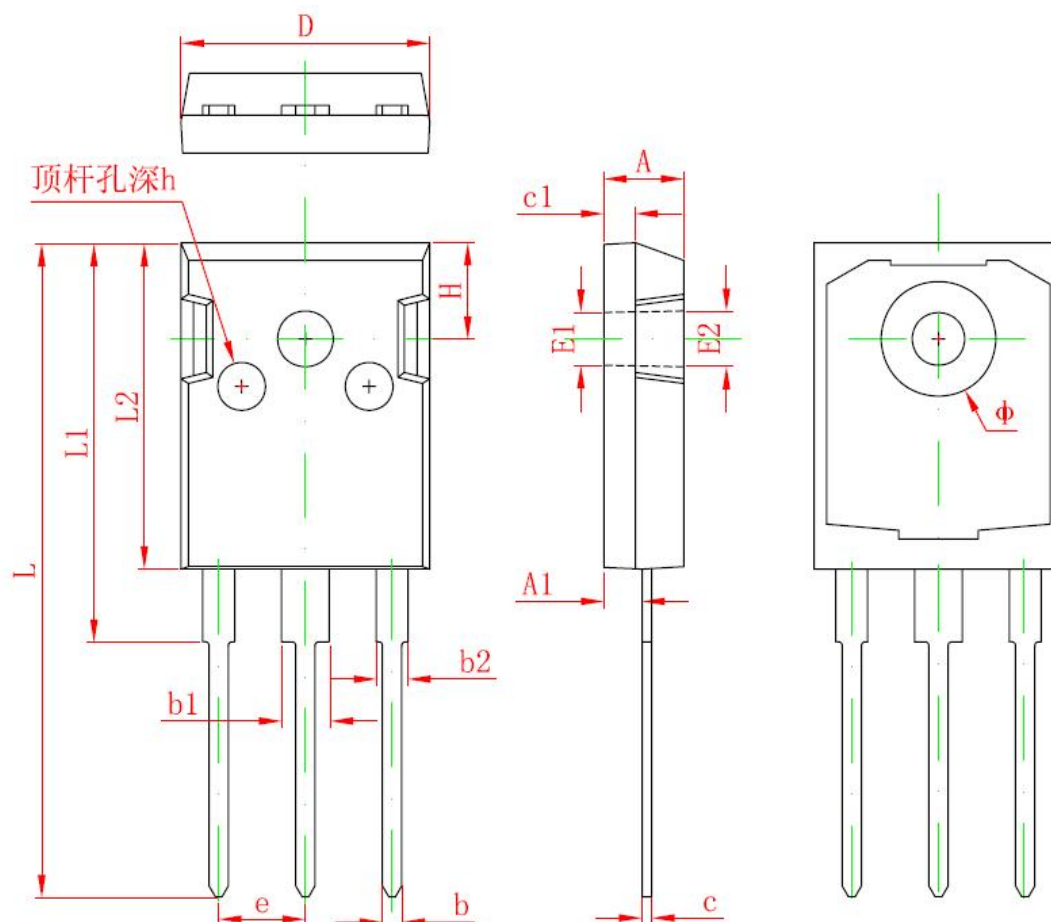
Power De-rating



Maximum Safe Operating Area



Single Pulse Power Rating, Junction-to-Case

**TO-247 Package Outline Dimensions**


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.850	5.150	0.191	0.200
A1	2.200	2.600	0.087	0.102
b	1.000	1.400	0.039	0.055
b1	2.800	3.200	0.110	0.126
b2	1.800	2.200	0.071	0.087
c	0.500	0.700	0.020	0.028
c1	1.900	2.100	0.075	0.083
D	15.450	15.750	0.608	0.620
E1	3.500 REF.		0.138 REF.	
E2	3.600 REF.		0.142 REF.	
L	40.900	41.300	1.610	1.626
L1	24.800	25.100	0.976	0.988
L2	20.300	20.600	0.799	0.811
$\Phi$	7.100	7.300	0.280	0.287
e	5.450 TYP.		0.215 TYP.	
H	5.980 REF.		0.235 REF.	
h	0.000	0.300	0.000	0.012