

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
120V	3.5mΩ@10V	200A



合肥矽普半导体

Siliup Semiconductor Technology Co., Ltd

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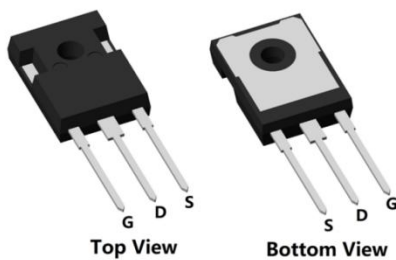
Feature

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

Applications

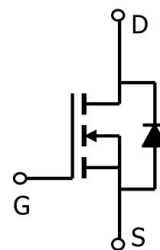
- High Speed Power switching
- DC-DC Converter
- Power Management

Package

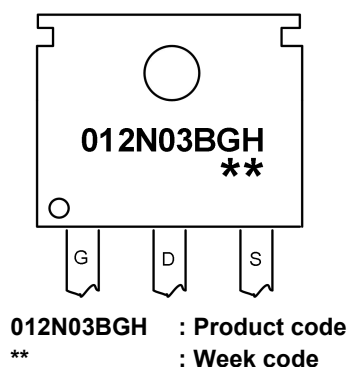


TO-247(1:G 2:D 3:S)

Circuit diagram



Marking



Order Information

Device	Package	Unit/Tube
SP012N03BGHTF	TO-247	30

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

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	120	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current (Tc=25°C)	I_D	200	A
Continuous Drain Current (Tc=100°C)	I_D	135	A
Pulsed Drain Current	I_{DM}	800	A
Single Pulse Avalanche Energy ¹	E_{AS}	900	mJ
Power Dissipation (Tc=25°C)	P_D	270	W
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	0.46	°C/W
Storage Temperature Range	T_{STG}	-55 to 150	°C
Operating Junction Temperature Range	T_J	-55 to 150	°C

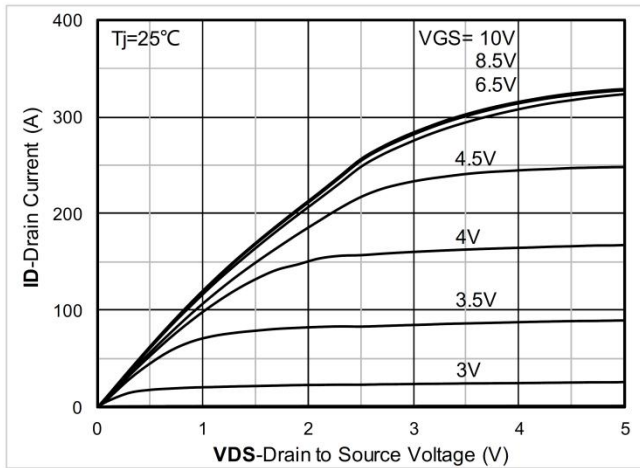
Electrical characteristics (Ta=25°C, unless otherwise noted)

Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$I_D = 250\mu A, V_{GS} = 0V$	120	-	-	V
Drain Cut-Off Current	I_{DSS}	$V_{DS} = 96V, V_{GS} = 0V$	-	-	1	μA
Gate Leakage Current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$	-	-	± 0.1	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	2.0	3.0	4.0	V
Drain-Source ON Resistance	$R_{DS(ON)}$	$V_{GS} = 10V, I_D = 50A$	-	3.5	4.5	m Ω
Dynamic Characteristics						
Input Capacitance	C_{iss}	$V_{DS} = 60V, V_{GS} = 0V, f = 1.0MHz$	-	5640	-	pF
Output Capacitance	C_{oss}		-	835	-	
Reverse Transfer Capacitance	C_{rss}		-	13	-	
Total Gate Charge	Q_g	$V_{DS}=60V, V_{GS}=10V, I_D=75A$	-	152	-	nC
Gate-Source Charge	Q_{gs}		-	43	-	
Gate-Drain Charge	Q_{gd}		-	46	-	
Switching Characteristics						
Turn-On Delay Time	$t_{d(on)}$	$V_{GS} = 10V, V_{DS} = 50V, I_D = 75A$ $RG = 1.6\Omega$	-	25	-	nS
Rise Time	t_r		-	15	-	
Turn-Off Delay Time	$t_{d(off)}$		-	52	-	
Fall Time	t_f		-	18	-	
Drain-Source Body Diode Characteristics						
Source-Drain Diode Forward Voltage	V_{SD}	$I_S = 1A, V_{GS} = 0V$	-	-	1.2	V
Maximum Body-Diode Continuous Current	I_S		-	-	200	A
Reverse Recovery Time	T_{rr}	$I_S=100A, di/dt=100A/us, T_J=25^{\circ}C$	-	92	-	nS
Reverse Recovery Charge	Q_{rr}		-	183	-	nC

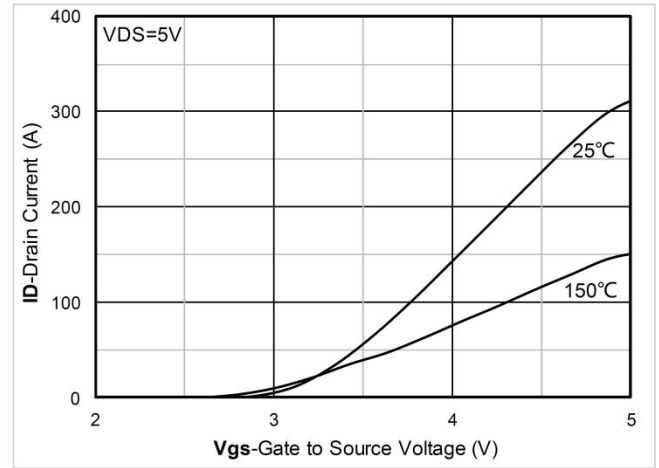
Note :

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

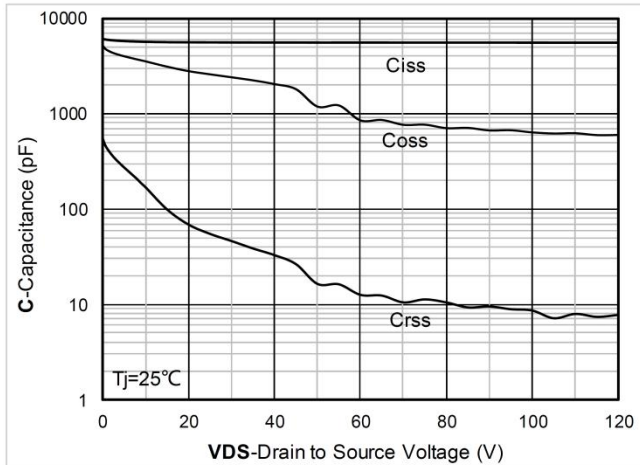
Typical Characteristics



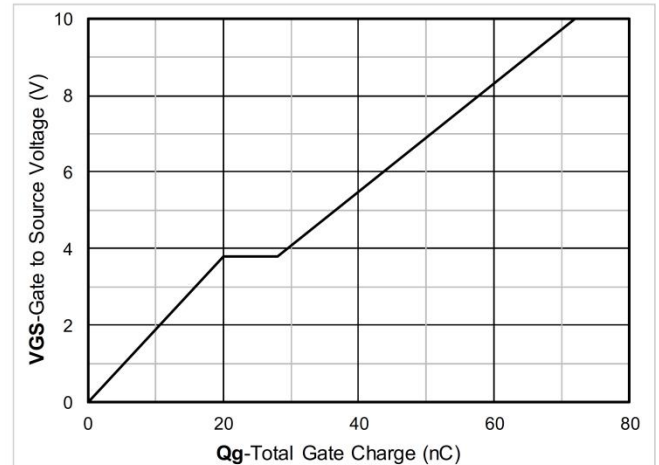
Output Characteristics



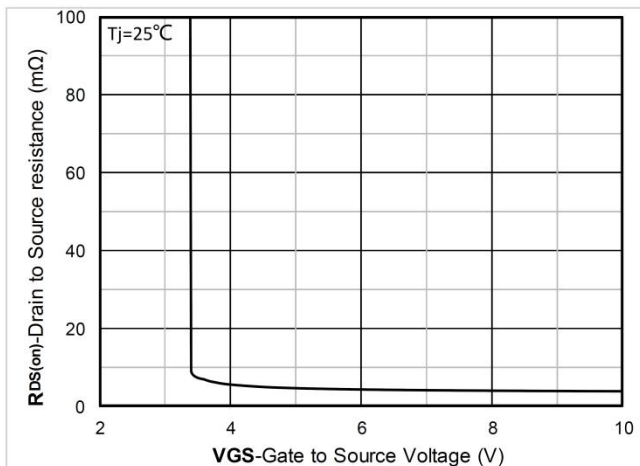
Transfer Characteristics



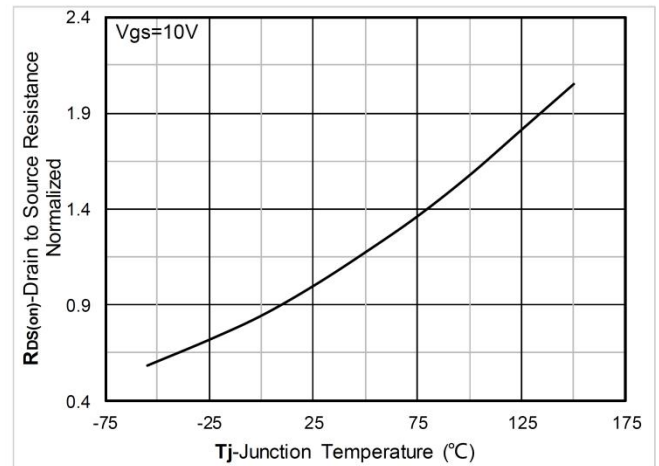
Capacitance Characteristics



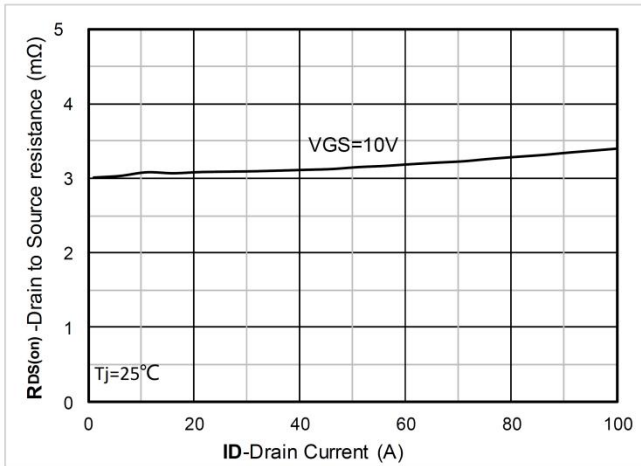
Gate Charge



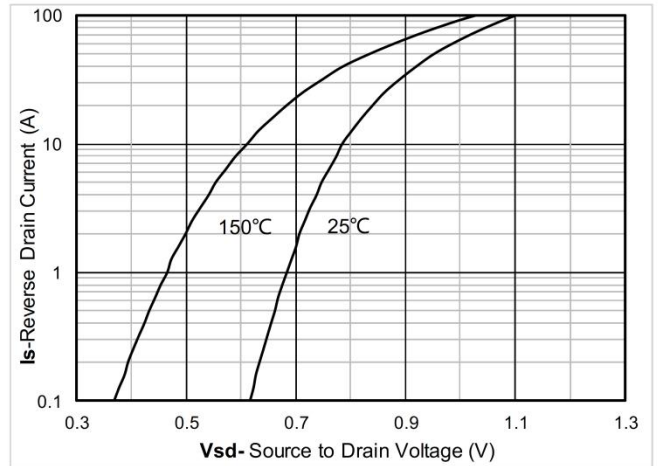
On-Resistance vs Gate to Source Voltage



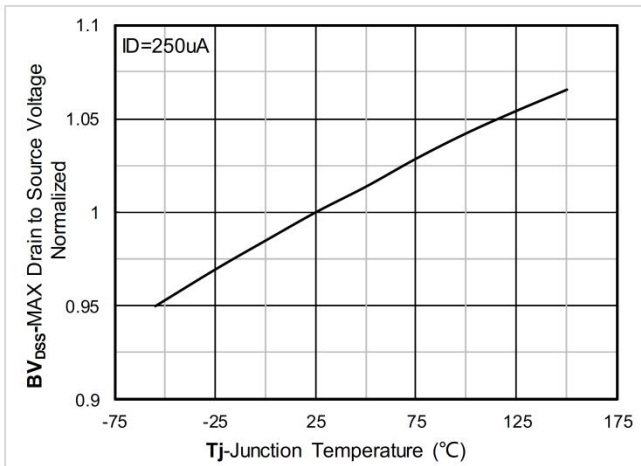
Normalized On-Resistance



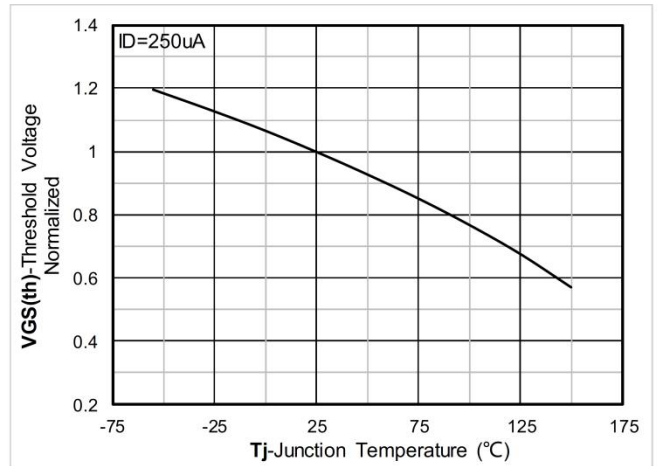
$R_{DS(on)}$ VS Drain Current



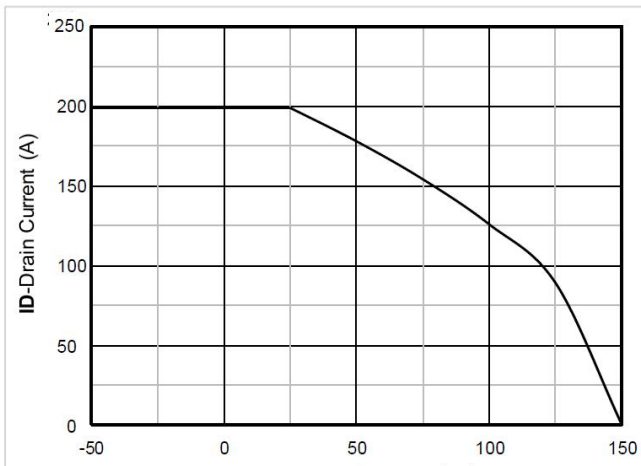
Forward characteristics of reverse diode



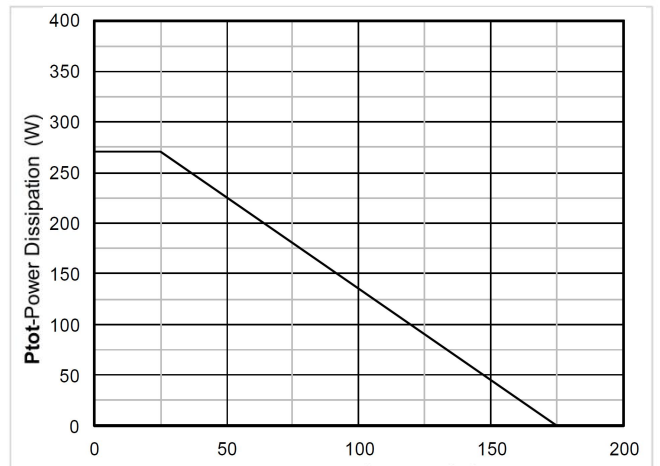
Normalized breakdown voltage



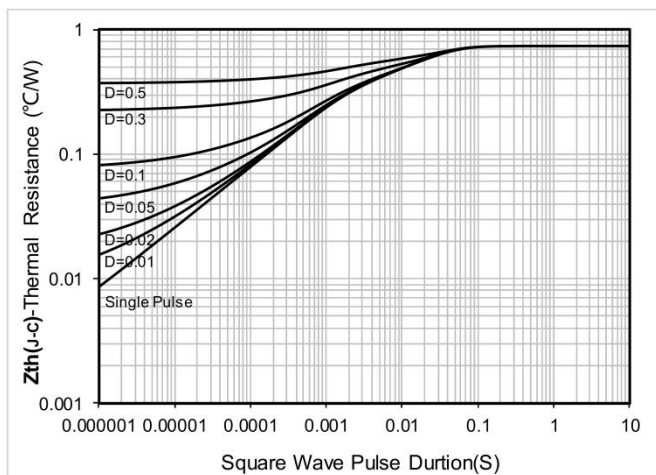
Normalized Threshold voltage



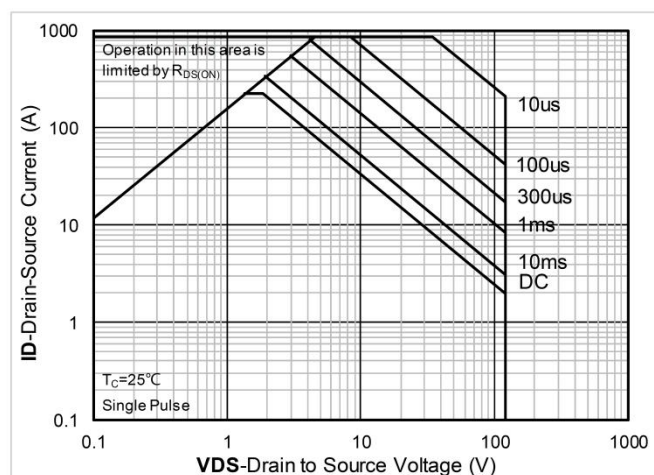
Current dissipation



Power dissipation



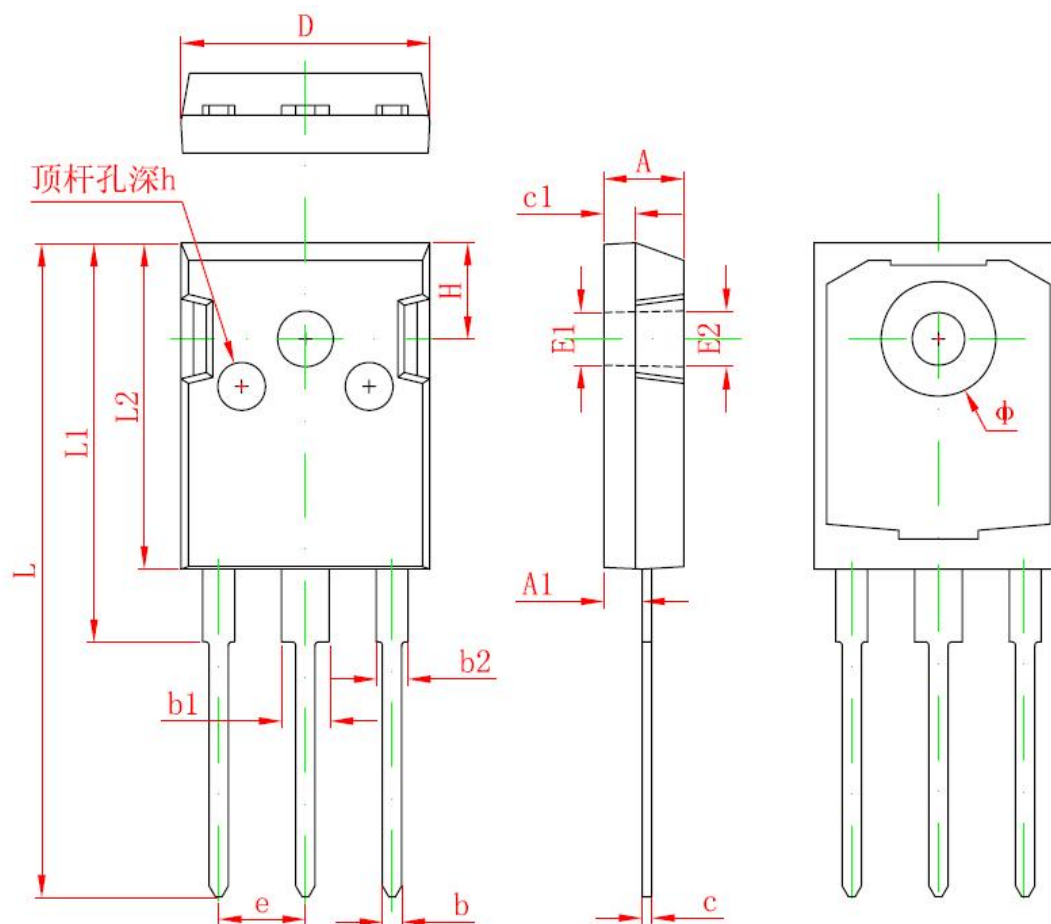
Maximum Transient Thermal Impedance



Safe Operation Area



TO-247 Package Information



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
Φ	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