

## Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	$I_D$
135V	3.0mΩ@10V	270A



**合肥矽普半导体**

Siliup Semiconductor Technology Co., Ltd

技术 品质 服务

www.siliup.com

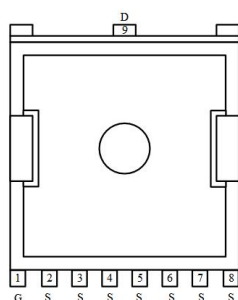
## Feature

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

## Applications

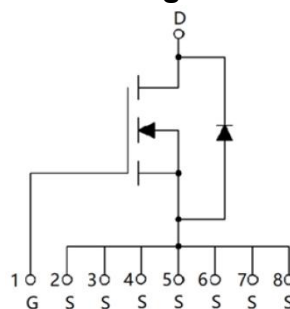
- PWM Application
- Hard switched and high frequency circuits
- Power Management

## Package

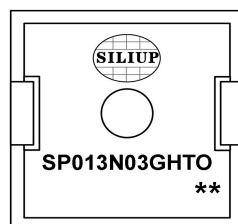


TOLL

## Circuit diagram



## Marking



SP013N03GHTO : Device Code  
\*\* : Week Code

## Order Information

Device	Package	Unit/Tape
SP013N03GHTO	TOLL	2000

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

Parameter	Symbol	Rating	Units
Drain-Source Voltage	$V_{DS}$	135	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current (Tc=25°C)	$I_D$	270	A
Continuous Drain Current (Tc=100°C)	$I_D$	180	A
Pulsed Drain Current	$I_{DM}$	1080	A
Single Pulse Avalanche Energy <sup>1</sup>	$E_{AS}$	1386	mJ
Power Dissipation (Tc=25°C)	$P_D$	196	W
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	0.32	°C/W
Storage Temperature Range	$T_{STG}$	-55 to 150	°C
Operating Junction Temperature Range	$T_J$	-55 to 150	°C

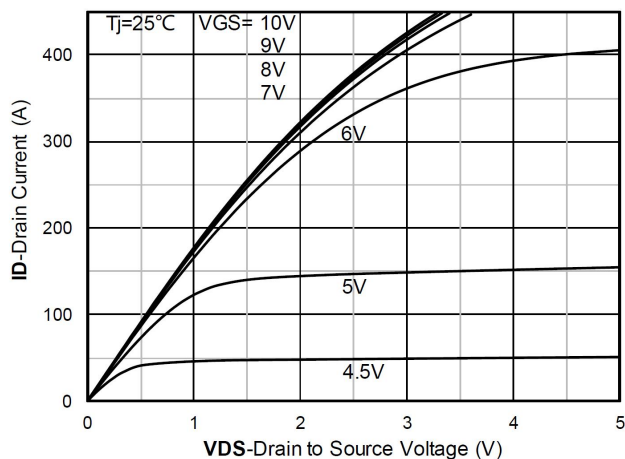
**Electrical characteristics (Ta=25°C, unless otherwise noted)**

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	ID = 250μA, VGS = 0V	135	150	-	V
Drain-Source Leakage Current	IDSS	VDS =108V, VGS = 0V	-	-	1	uA
Gate-Source Leakage Current	IGSS	VGS = ±20V, VDS = 0V	-	-	±100	nA
Gate Threshold Voltage	VGS(th)	VDS = VGS, ID = 250μA	2	3	4	V
Static Drain-Source On-Resistance	RDS(ON)	VGS = 10V, ID = 20A	-	3.0	3.8	mΩ
Dynamic characteristics						
Input Capacitance	Ciss	VDS=75V , VGS=0V , f=1MHz	-	9023	-	pF
Output Capacitance	Coss		-	587	-	
Reverse Transfer Capacitance	Crss		-	23	-	
Total Gate Charge	Qg	VDS=75V , VGS=10V , ID=20A	-	89	-	nC
Gate-Source Charge	Qgs		-	43	-	
Gate-Drain Charge	Qgd		-	28	-	
Switching Characteristics						
Turn-On Delay Time	Td(on)	VDD=75V, VGS=10V , RG=3.0Ω, ID=20A	-	26	-	nS
Rise Time	Tr		-	39	-	
Turn-Off Delay Time	Td(off)		-	54	-	
Fall Time	Tf		-	21	-	
Diode Characteristics						
Diode Forward Voltage	VSD	VGS=0V , Is=1A , TJ=25℃	-	-	1.2	V
Maximum Body-Diode Continuous Current	Is		-	-	270	A
Reverse Recovery Time	Trr	Is=140A, di/dt=100A/us, TJ=25℃	-	175	-	nS
Reverse Recovery Charge	Qrr		-	544	-	nC

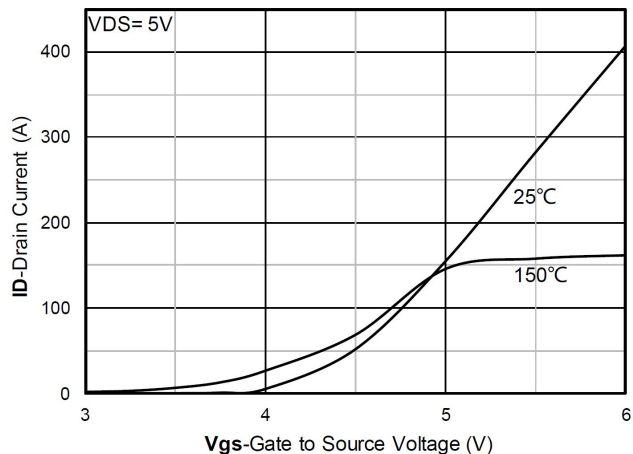
**Note :**

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

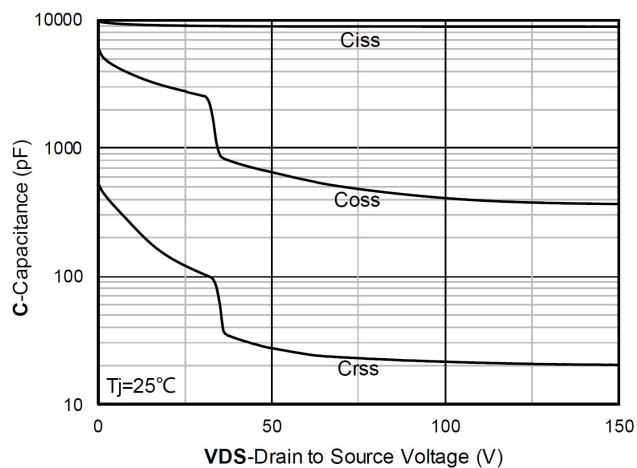
## Typical Characteristics



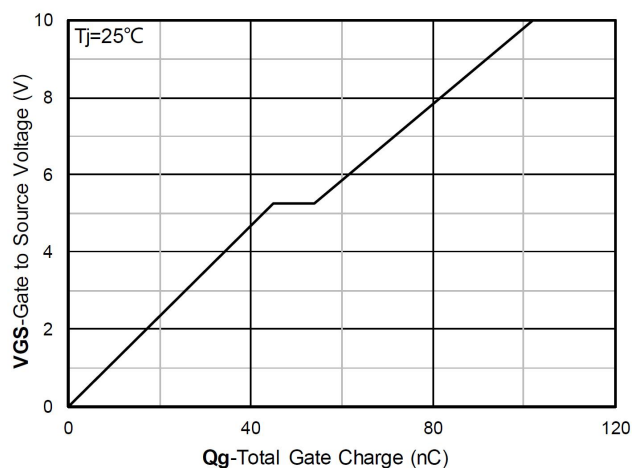
Output Characteristics



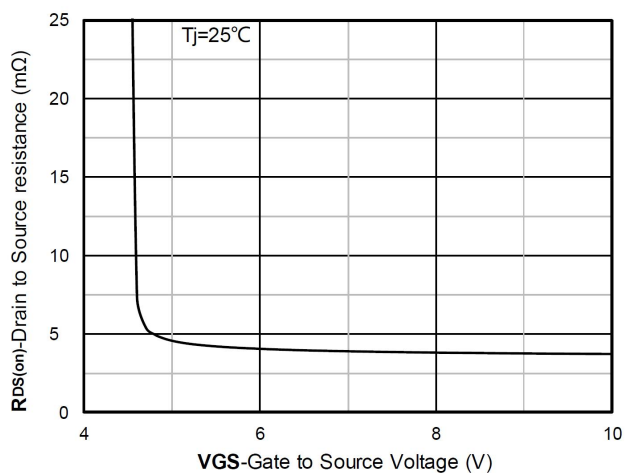
Transfer Characteristics



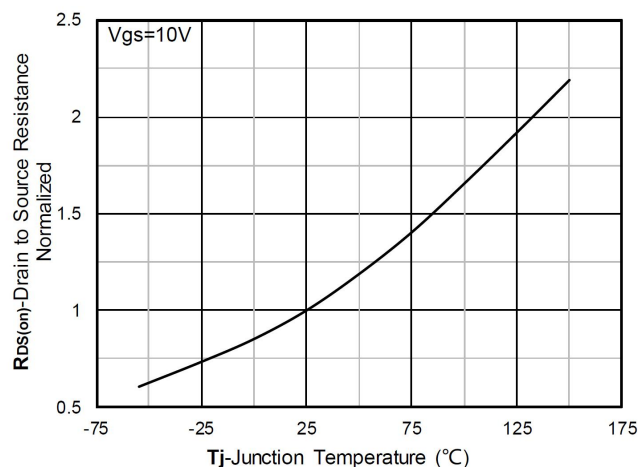
Capacitance Characteristics



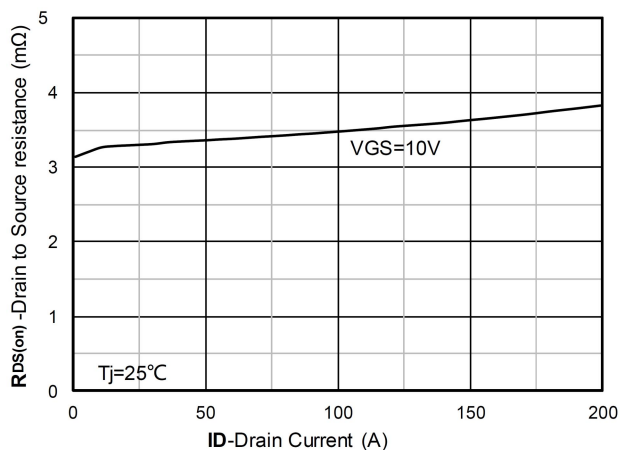
Gate Charge



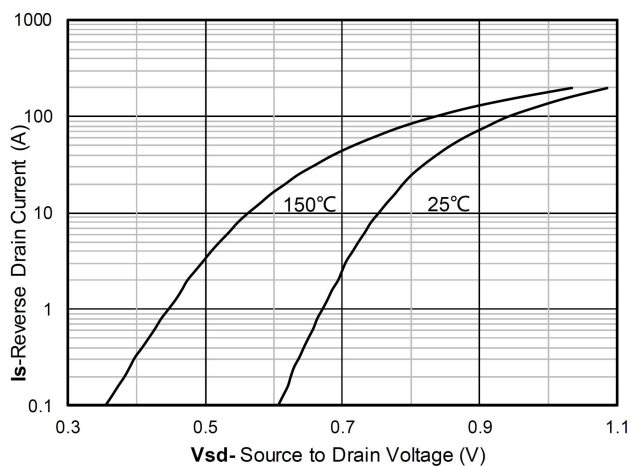
On-Resistance vs Gate to Source Voltage



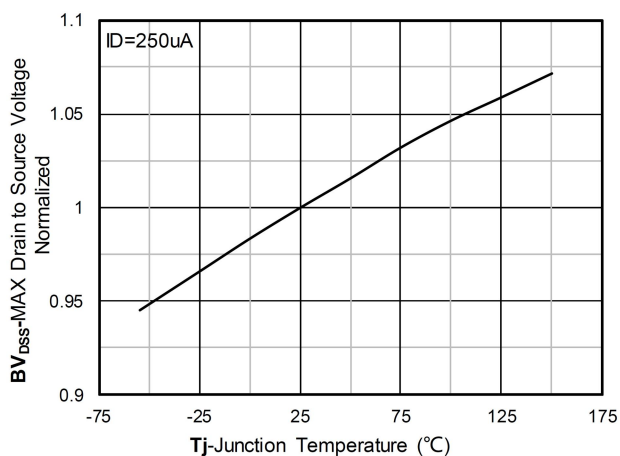
Normalized On-Resistance



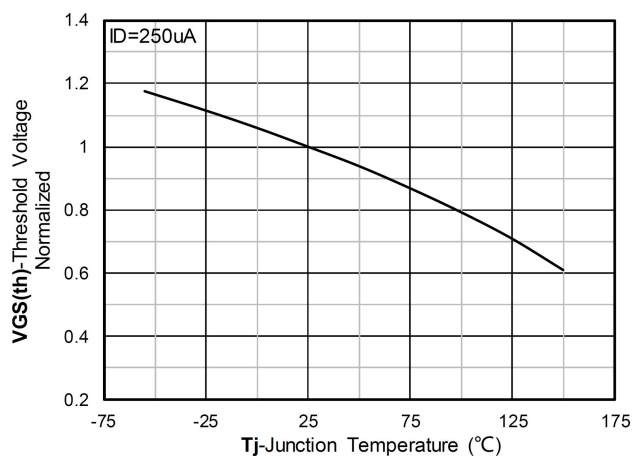
$R_{DS(on)}$  VS Drain Current



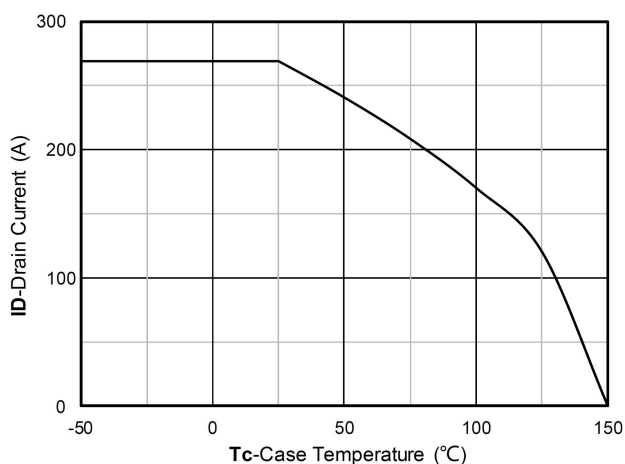
Forward characteristics of reverse diode



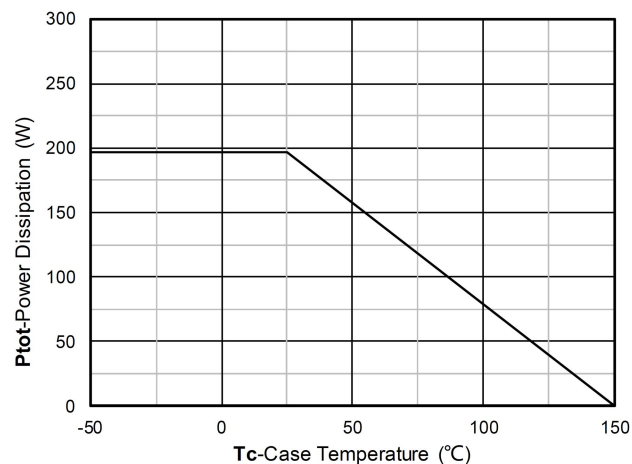
Normalized breakdown voltage



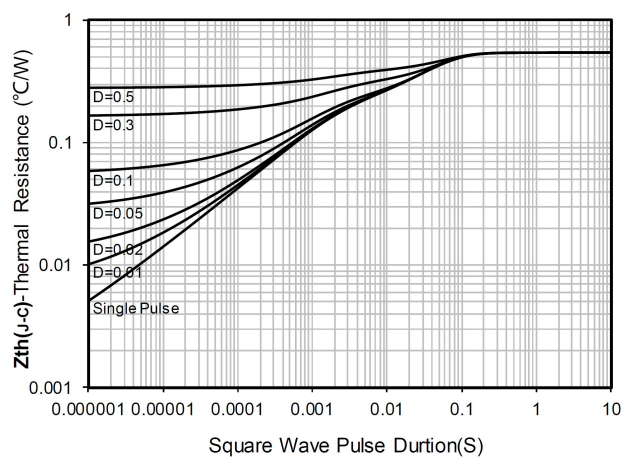
Normalized Threshold voltage



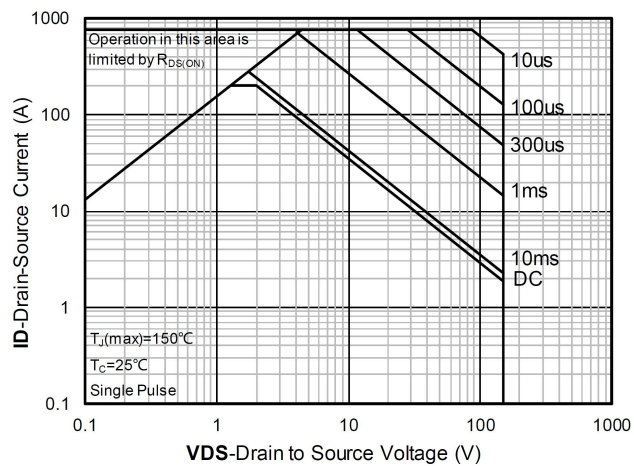
Current dissipation



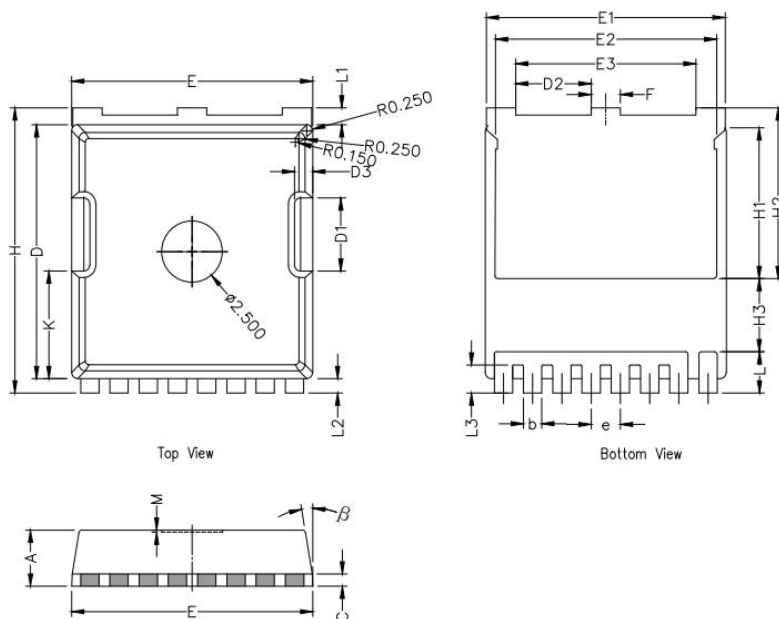
Power dissipation



Maximum Transient Thermal Impedance



Safe Operation Area

**TOLL Package Information**


Symbol	Dimensions In Millimeters		
	Min.	Nom.	Max.
A	2.20	2.30	2.40
b	0.65	0.75	0.85
C	0.508 REF		
D	10.25	10.40	10.55
D1	2.85	3.00	3.15
E	9.75	9.90	10.05
E1	9.65	9.80	9.95
E2	8.95	9.10	9.25
E3	7.25	7.40	7.55
e	1.20 BSC		
F	1.05	1.20	1.35
H	11.55	11.70	11.85
H1	6.03	6.18	6.33
H2	6.85	7.00	7.15
H3	3.00 BSC		
L	1.55	1.70	1.85
L1	0.55	0.7	0.85
L2	0.45	0.6	0.75
M	0.08 REF.		
$\beta$	8°	10°	12°
K	4.25	4.40	4.55