

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)}TYP$	I_D
135V	4.2m Ω @10V	200A



合肥矽普半导体

Siliup Semiconductor Technology Co.Ltd

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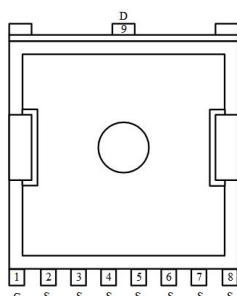
Feature

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

Applications

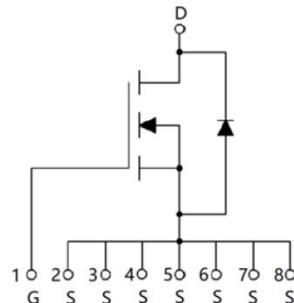
- PWM Application
- Hard switched and high frequency circuits
- Power Management

Package

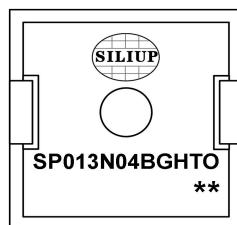


TOLL

Circuit diagram



Marking



SP013N04BGHTO : Device Code
** : Week Code

Order Information

Device	Package	Unit/Tape
SP013N04BGHTO	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}	±20	V
Continuous Drain Current(Tc=25°C)	I _D	200	A
Continuous Drain Current(Tc=100°C)	I _D	133	A
Pulsed Drain Current	I _{DM}	800	A
Single Pulse Avalanche Energy ¹	E _{AS}	1296	mJ
Power Dissipation(Tc=25°C)	P _D	380	W
Thermal Resistance Junction-to-Case	R _{θJC}	0.33	°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)

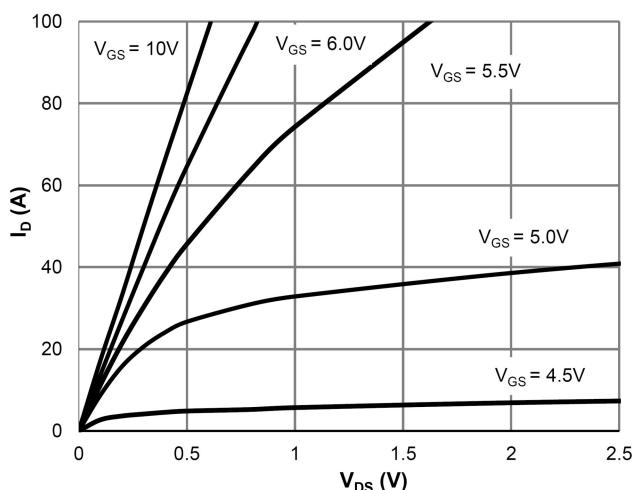
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	ID = 250μA, VGS = 0V	135	150	-	V
Drain-Source Leakage Current	I _{DSS}	VDS = 108V, VGS = 0V	-	-	1	uA
Gate-Source Leakage Current	I _{GSS}	VGS = ±20V, VDS = 0V	-	-	±100	nA
Gate Threshold Voltage	V _{GS(th)}	VDS = VGS, ID = 250μA	2	3	4	V
Static Drain-Source On-Resistance	R _{DS(ON)}	VGS = 10V, ID = 20A	-	4.2	5.3	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°C	-	-	1.2	V
Maximum Body-Diode Continuous Current	I _S		-	-	200	A
Reverse Recovery Time	T _{rr}	I _S =140A, di/dt=100A/us, TJ=25°C	-	162	-	nS
Reverse Recovery Charge	Q _{rr}		-	526	-	nC

Note :

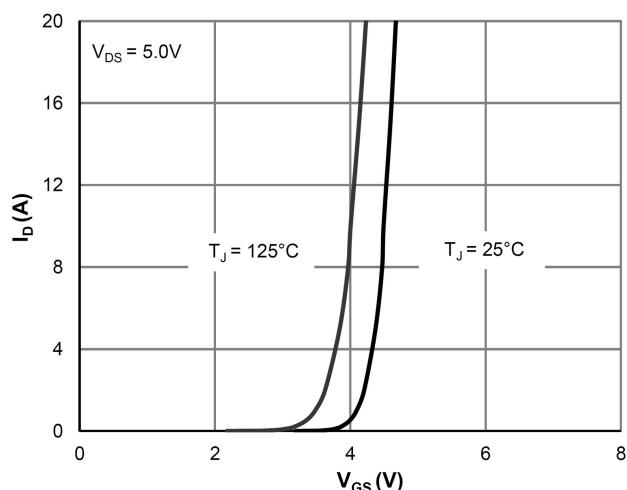
1. The test condition is VDD=50V,VGS=10V,L=0.5mH,RG=25Ω



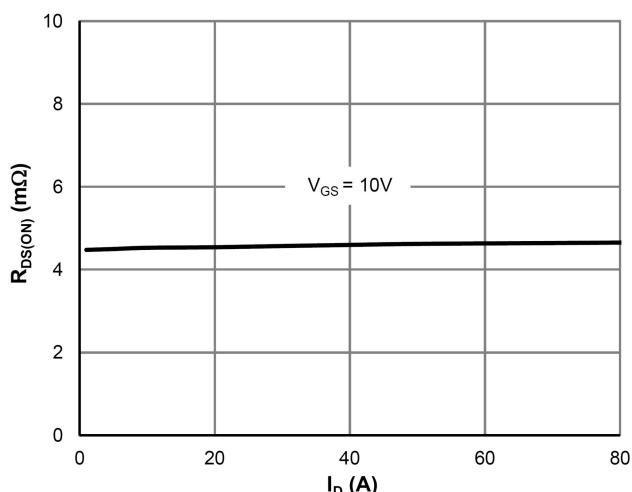
Typical Characteristics



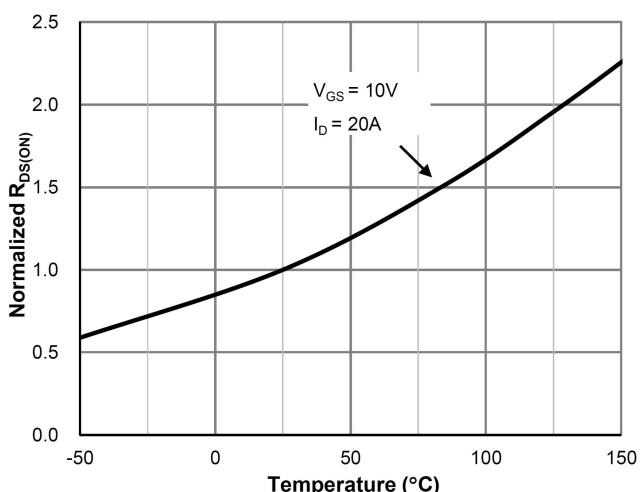
Saturation Characteristics



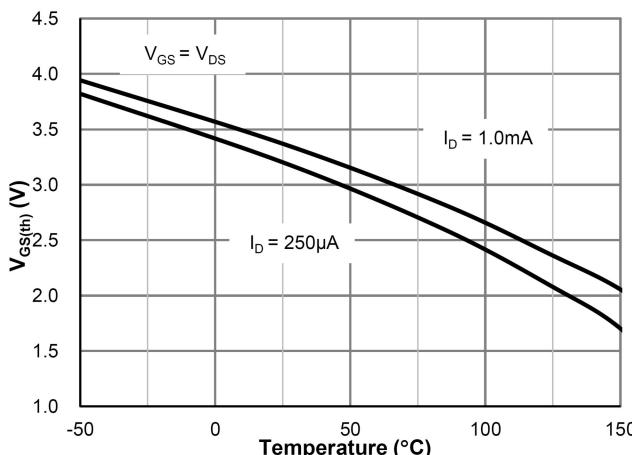
Transfer Characteristics



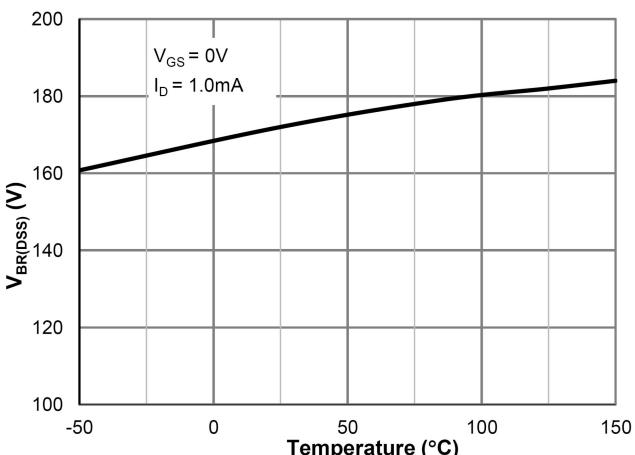
$R_{DS(ON)}$ vs. Drain Current



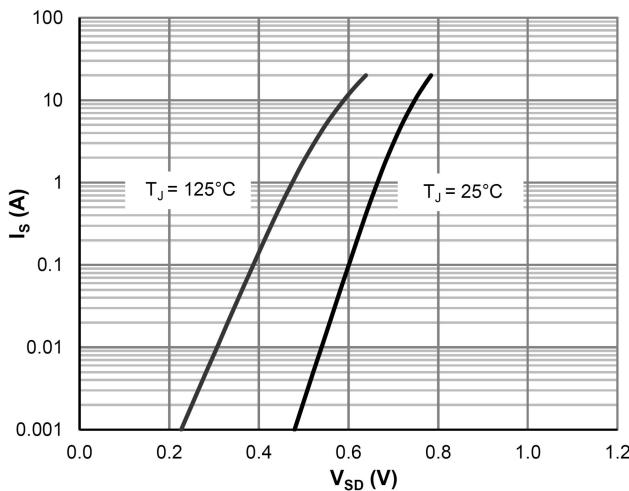
Normalized $R_{DS(ON)}$ vs. Junction Temperature



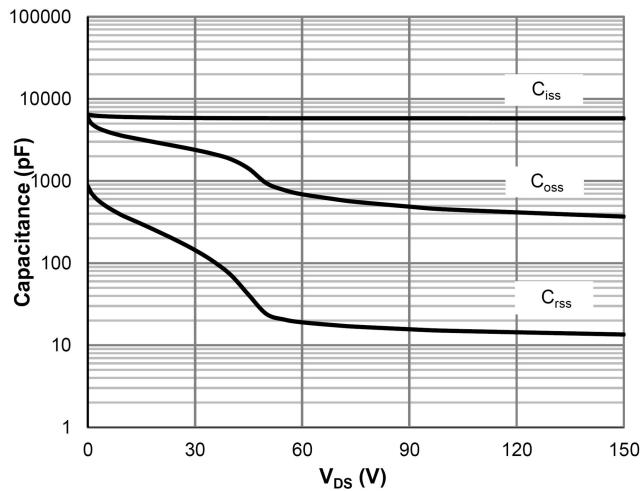
$V_{GS(th)}$ vs. Junction Temperature



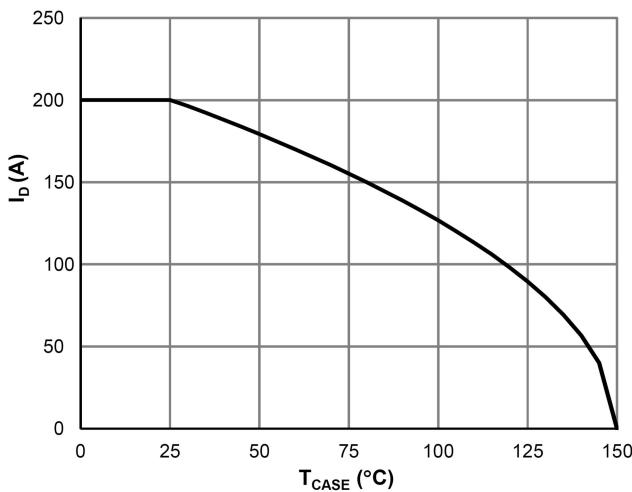
$V_{BR(DSS)}$ vs. Junction Temperature



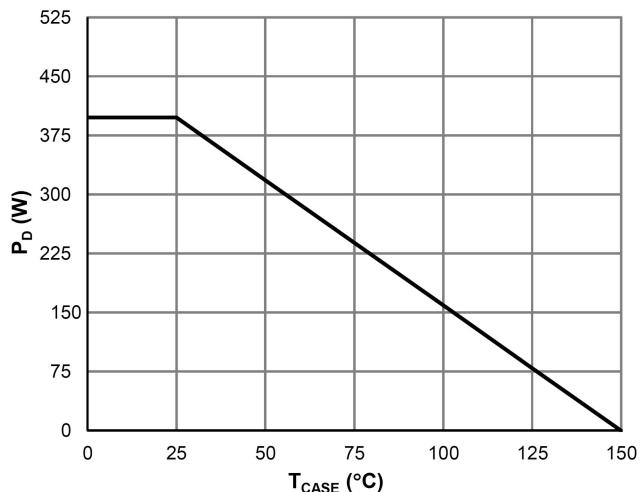
Body-Diode Characteristics



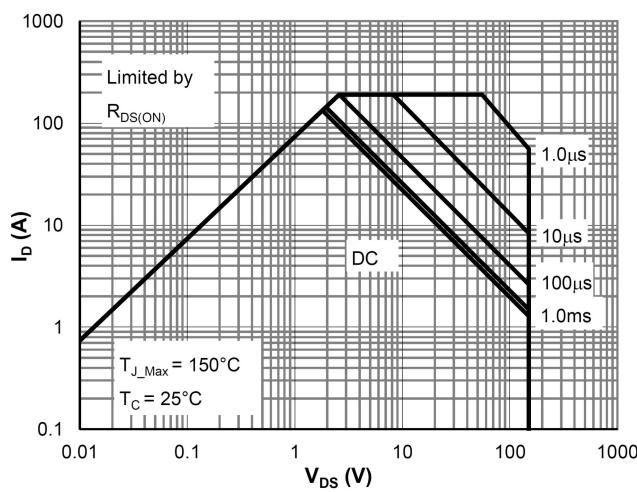
Capacitance Characteristics



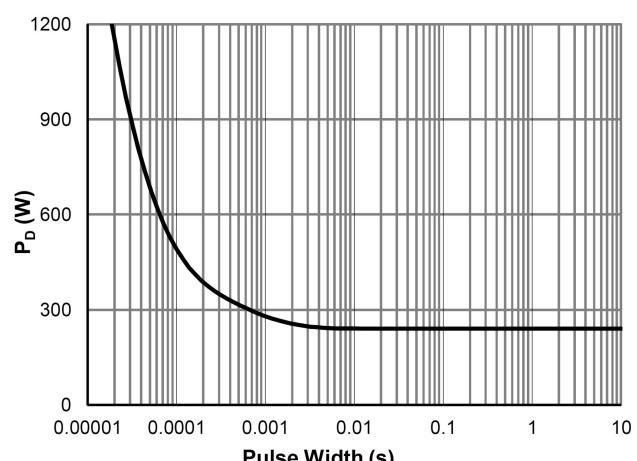
Current De-rating



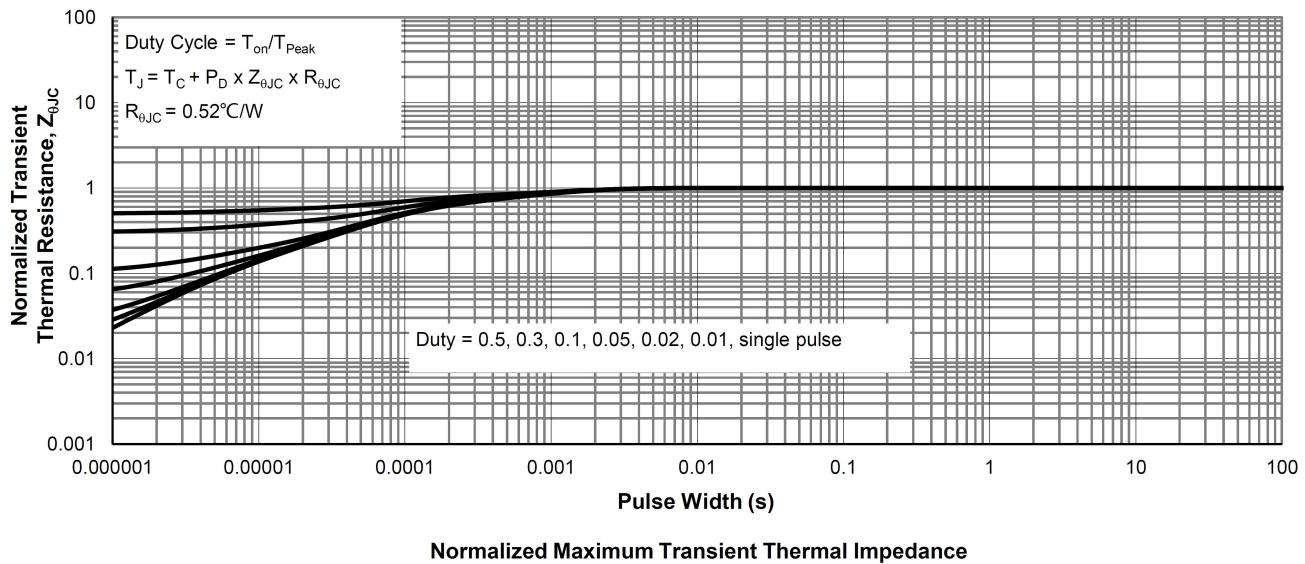
Power De-rating

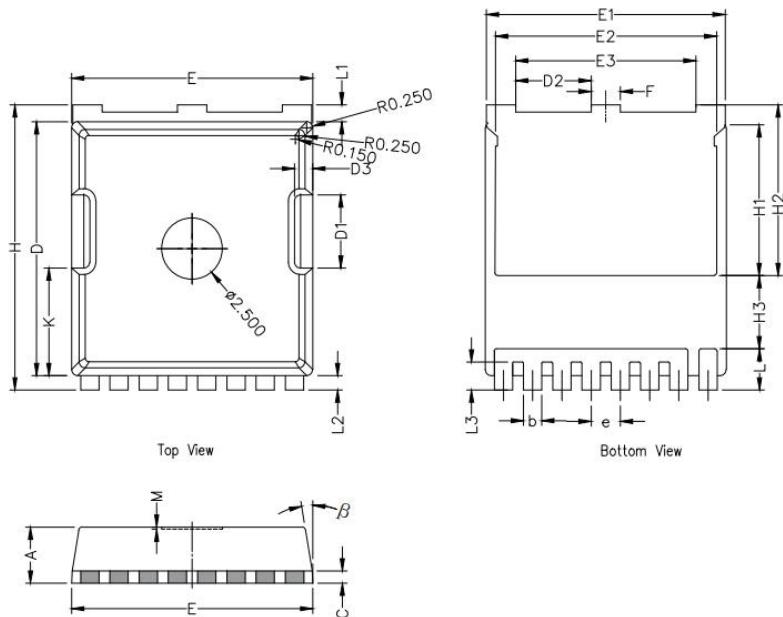


Maximum Safe Operating Area



Single Pulse Power Rating, Junction-to-Case



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.		
β	8°	10°	12°
K	4.25	4.40	4.55