

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
200V	$8.3m\Omega@10V$	140A



合肥矽普半导体

Siliup Semiconductor Technology Co., Ltd

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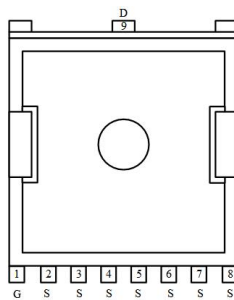
Feature

- Fast Switching
- Low Gate Charge and $R_{DS(on)}$
- Low Reverse transfer capacitances
- 100% Single Pulse avalanche energy Test

Applications

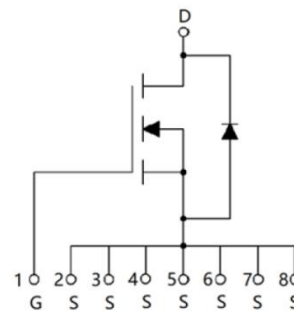
- High Speed Power switching
- DC-DC Converter
- Power Management

Package

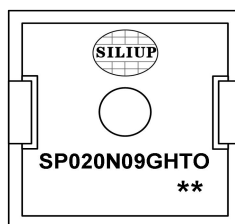


TOLL

Circuit diagram



Marking



SP020N09GHTO : Product code
** : Week code

Order Information

Device	Package	Unit/Tape
SP020N09GHTO	TOLL	2000

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

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	200	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current1 (Tc=25°C)	I_D	140	A
Continuous Drain Current1 (Tc=100°C)	I_D	93	A
Pulsed Drain Current	I_{DM}	560	A
Single Pulse Avalanche Energy ¹	E_{AS}	1521	mJ
Power Dissipation (Tc=25°C)	P_D	320	W
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	0.39	°C/W
Storage Temperature Range	T_{STG}	-55 to 150	°C
Operating Junction Temperature Range	T_J	-55 to 150	°C

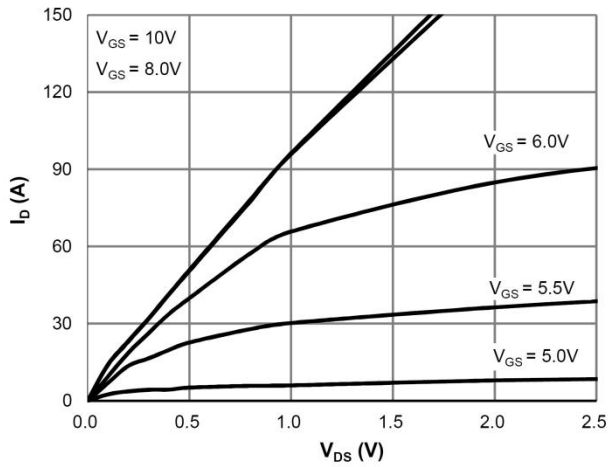
Electrical characteristics (Ta=25°C, unless otherwise noted)

Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$ID = 250\mu A, VGS = 0V$	200	225	-	V
Drain Cut-Off Current	$IDSS$	$VDS = 160V, VGS = 0V$	-	-	1	μA
Gate Leakage Current	$IGSS$	$VGS = \pm 20V, VDS = 0V$	-	-	± 0.1	
Gate Threshold Voltage	$VGS(th)$	$VDS = VGS, ID = 250\mu A$	2.0	3.0	4.0	V
Drain-Source ON Resistance	$RDS(ON)$	$VGS = 10V, ID = 20A$	-	8.3	9.5	m Ω
Dynamic Characteristics						
Input Capacitance	$Ciss$	$VDS = 100V, VGS = 0V, f = 1.0MHz$	-	6940	-	pF
Output Capacitance	$Coss$		-	342	-	
Reverse Transfer Capacitance	$Crss$		-	36	-	
Total Gate Charge	Qg	$VDS = 100V, VGS = 10V, ID = 20A$	-	48	-	nC
Gate-Source Charge	Qgs		-	18	-	
Gate-Drain Charge	Qgd		-	11	-	
Switching Characteristics						
Turn-On Delay Time	$td(on)$	$VGS = 10V, VDS = 100V, RL = 3.5\Omega, RG = 6.0\Omega$	-	18	-	nS
Rise Time	tr		-	28	-	
Turn-Off Delay Time	$td(off)$		-	39	-	
Fall Time	tf		-	19	-	
Drain-Source Body Diode Characteristics						
Source-Drain Diode Forward Voltage	VSD	$Is = 1A, VGS = 0V$	-	-	1.2	V
Maximum Body-Diode Continuous Current	Is		-	-	185	A
Body Diode Reverse Recovery Time	Trr	$Is = 50A, dI_F/dt = 100A/us$		128		nS
Body Diode Reverse Recovery Charge	Qrr			643		nC

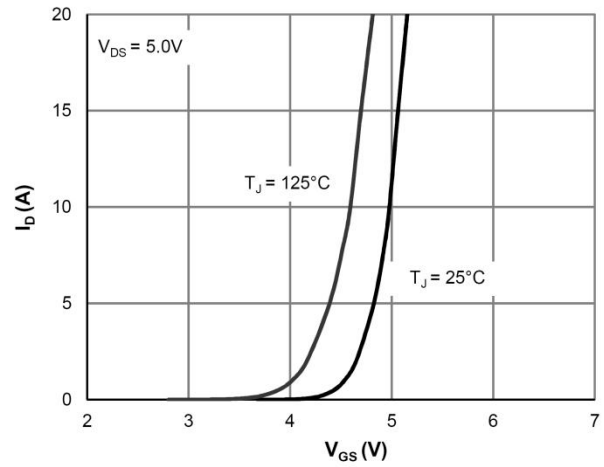
Note :

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

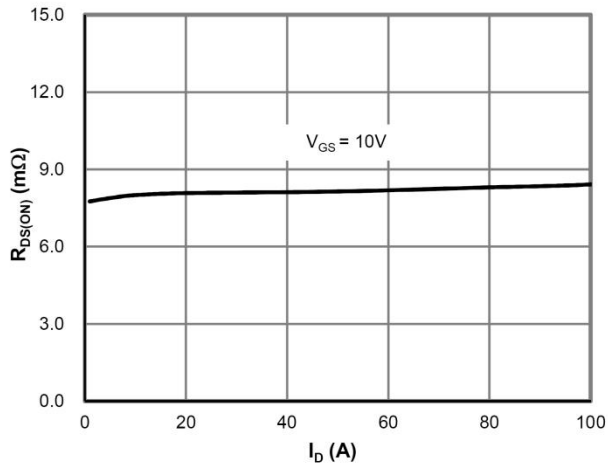
Typical Characteristics



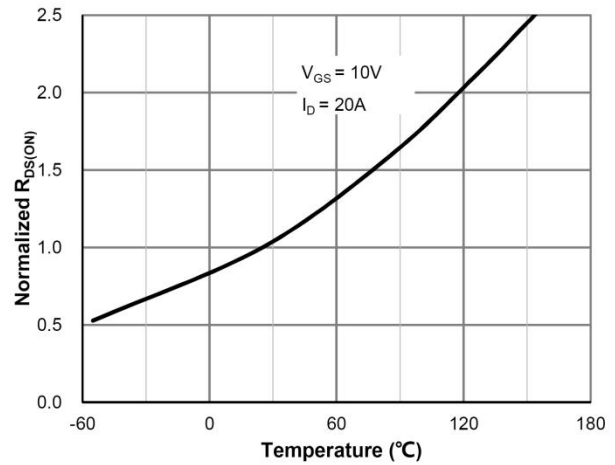
Saturation Characteristics



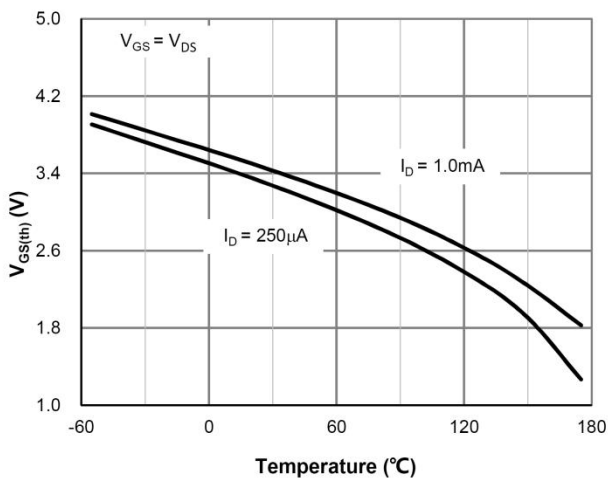
Transfer Characteristics



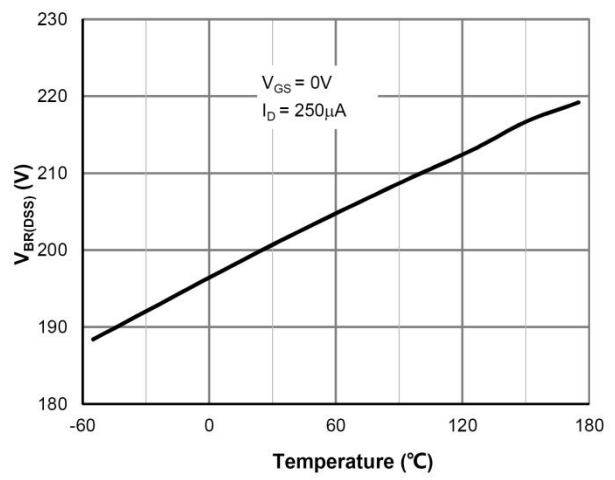
$R_{DS(on)}$ vs. Drain Current



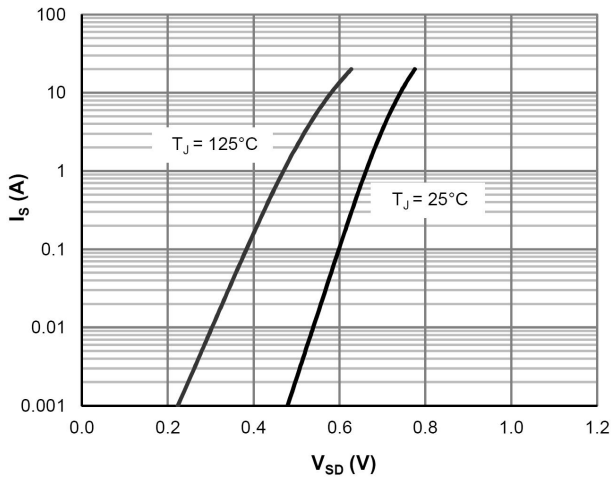
$R_{DS(on)}$ vs. Junction Temperature



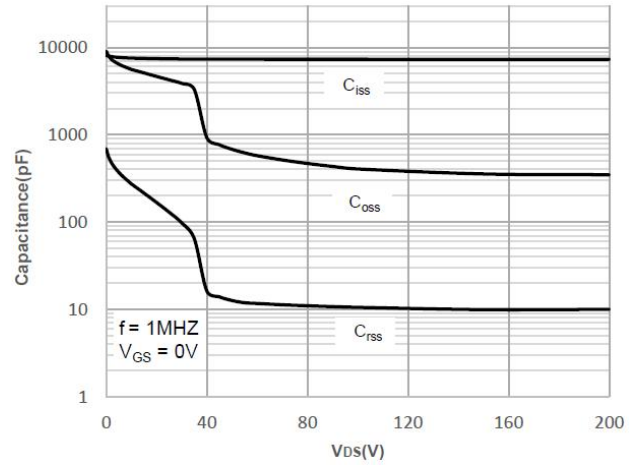
$V_{GS(th)}$ vs. Junction Temperature



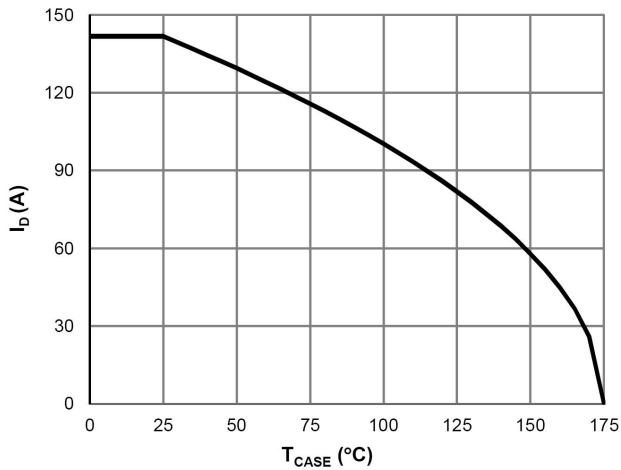
$V_{BR(DSS)}$ vs. Junction Temperature



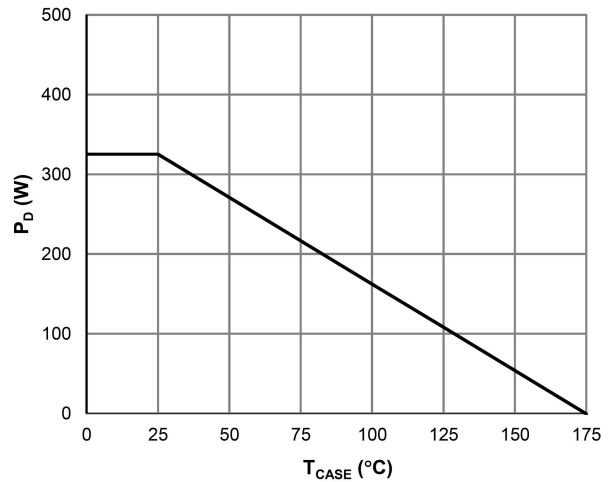
Body-Diode Characteristics



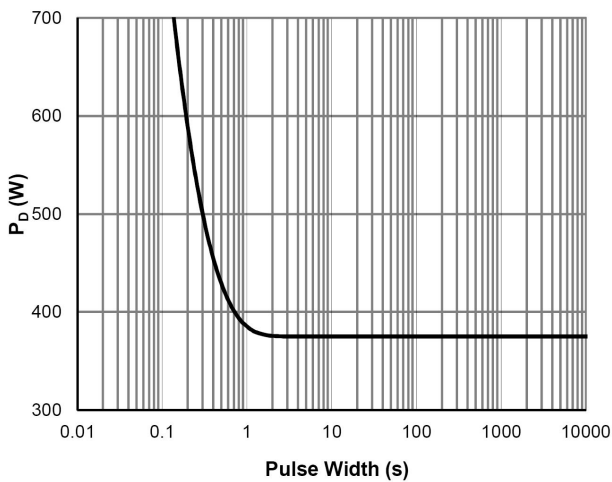
Capacitance Characteristics



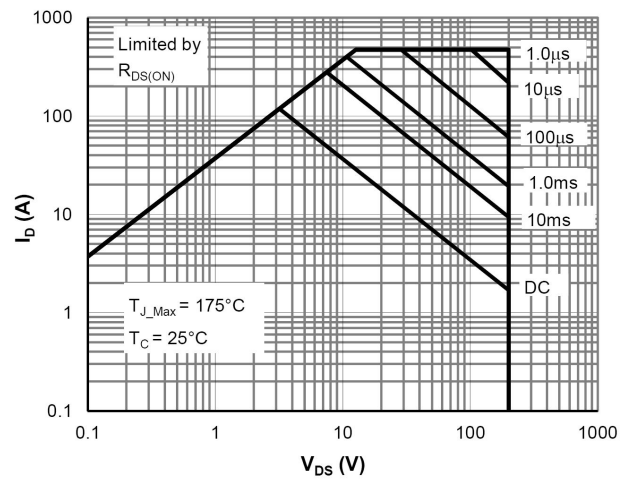
Current De-rating



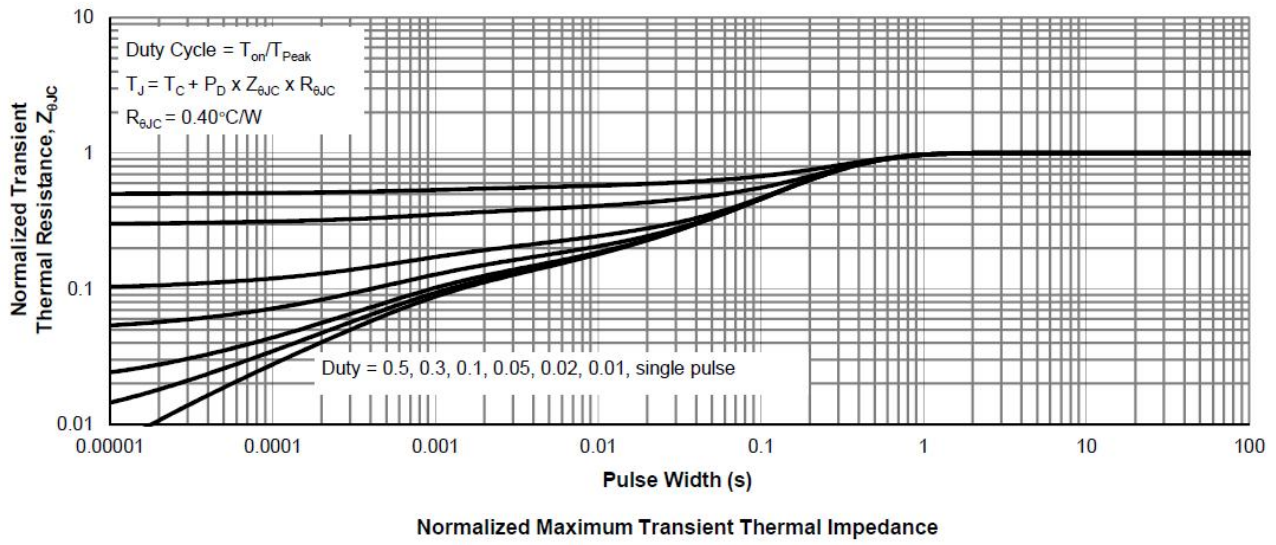
Power De-rating

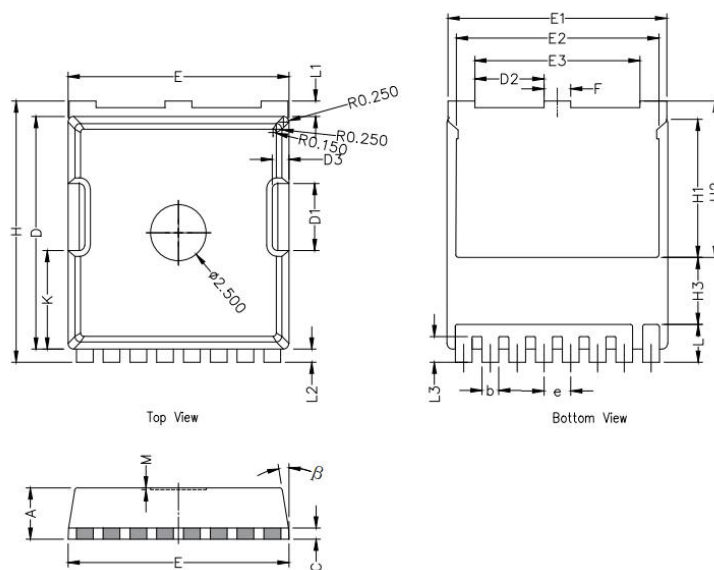


Single Pulse Power Rating, Junction-to-Case



Maximum Safe Operating Area



TOLL Package Outline Dimensions


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