

## Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	$I_D$
40V	0.75mΩ@10V	370A



合肥矽普半导体

Siliup Semiconductor Technology Co., Ltd

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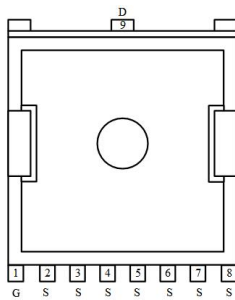
## Feature

- Fast Switching
- Low Gate Charge and R<sub>ds(on)</sub>
- Advanced Split Gate Trench Technology
- 100% Single Pulse avalanche energy Test

## Applications

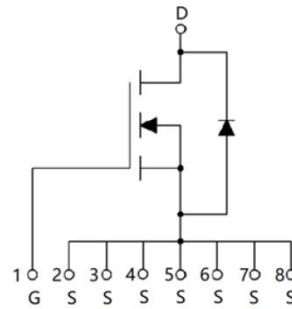
- PWM Application
- Hard switched and high frequency circuits
- Power Management

## Package

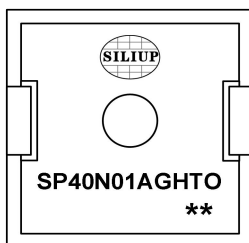


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## Circuit diagram



## Marking



SP40N01AGHTO :Device Code  
\*\* :Week Code

## Order Information

Device	Package	Unit/Tape
SP40N01AGHTO	TOLL	2000

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

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V <sub>DS</sub>	40	V
Gate-Source Voltage	V <sub>GS</sub>	±20	V
Continuous Drain Current(Tc=25°C)	I <sub>D</sub>	370	A
Continuous Drain Current(Tc=100°C)	I <sub>D</sub>	247	A
Pulsed Drain Current	I <sub>DM</sub>	1480	A
Single Pulse Avalanche Energy <sup>1</sup>	E <sub>AS</sub>	1522	mJ
Power Dissipation(Tc=25°C)	P <sub>D</sub>	300	W
Thermal Resistance Junction-to-Case	R <sub>θJC</sub>	0.42	°C/W
Storage Temperature Range	T <sub>STG</sub>	-55 to 150	°C
Operating Junction Temperature Range	T <sub>J</sub>	-55 to 150	°C

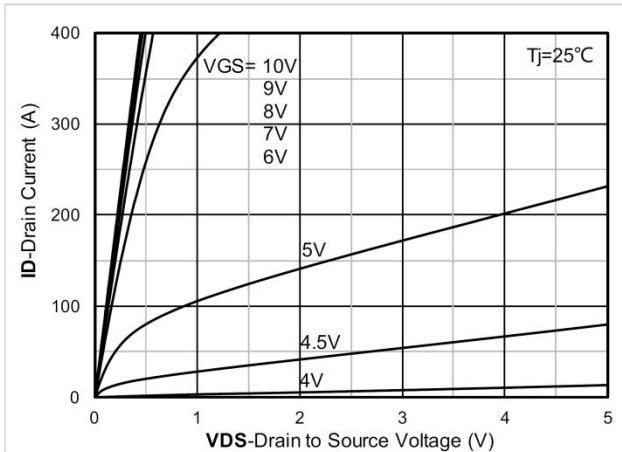
**Electrical characteristics (Ta=25°C, unless otherwise noted)**

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V , I <sub>D</sub> =250uA	40	46	-	V
Drain-Source Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> =32V , V <sub>GS</sub> =0V , T <sub>J</sub> =25°C	-	-	1	uA
Gate-Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±20V , V <sub>DS</sub> =0V	-	-	±100	nA
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =250uA	2.0	2.9	4.0	V
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> =10V , I <sub>D</sub> =50A	-	0.75	0.9	mΩ
<b>Dynamic characteristics</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =25V , V <sub>GS</sub> =0V , f=1MHz	-	6020	-	pF
Output Capacitance	C <sub>oss</sub>		-	2850	-	
Reverse Transfer Capacitance	C <sub>rss</sub>		-	118	-	
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =20V , V <sub>GS</sub> =10V , I <sub>D</sub> =50A	-	135.6	-	nC
Gate-Source Charge	Q <sub>gs</sub>		-	38	-	
Gate-Drain Charge	Q <sub>gd</sub>		-	42	-	
<b>Switching Characteristics</b>						
Turn-On Delay Time	T <sub>d(on)</sub>	V <sub>DD</sub> =20V , V <sub>GS</sub> =10V , R <sub>G</sub> =6Ω, I <sub>D</sub> =50A	-	42	-	nS
Rise Time	T <sub>r</sub>		-	136	-	
Turn-Off Delay Time	T <sub>d(off)</sub>		-	77	-	
Fall Time	T <sub>f</sub>		-	82	-	
<b>Diode Characteristics</b>						
Diode Forward Voltage	V <sub>SD</sub>	V <sub>GS</sub> =0V , I <sub>S</sub> =1A , T <sub>J</sub> =25°C	-	-	1.2	V
Maximum Body-Diode Continuous Current	I <sub>S</sub>		-	-	370	A
Reverse Recovery Time	T <sub>rr</sub>	I <sub>S</sub> =50A, di/dt=100A/us, T <sub>J</sub> =25°C	-	57	-	nS
Reverse Recovery Charge	Q <sub>rr</sub>		-	183	-	nC

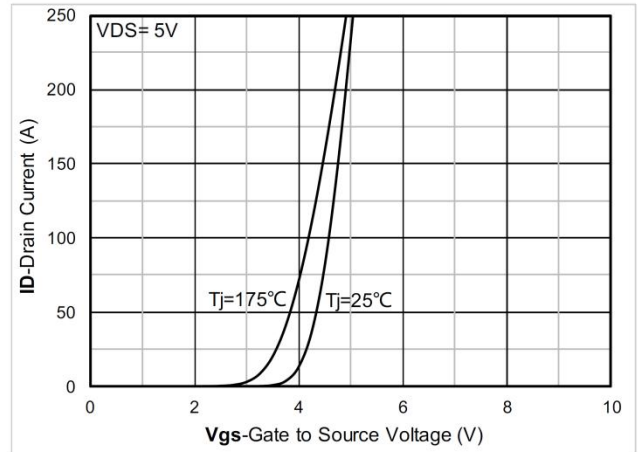
**Note :**

 1. The test condition is V<sub>DD</sub>=20V, V<sub>GS</sub>=10V, L=0.5mH, R<sub>G</sub>=25Ω

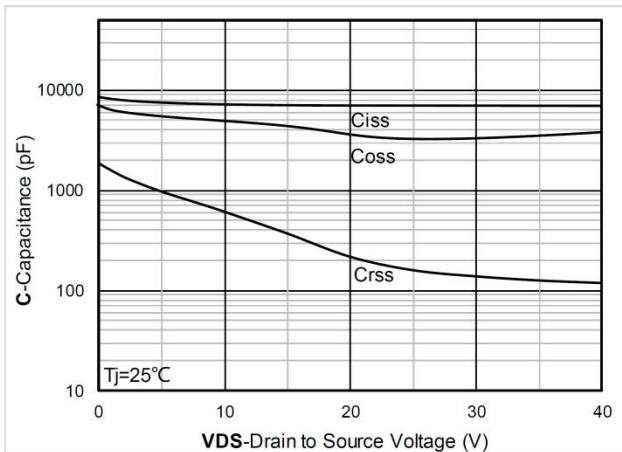
**Typical Characteristics**



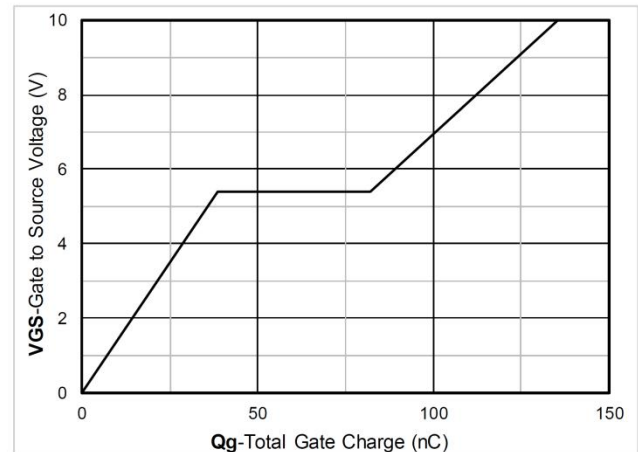
Output Characteristics



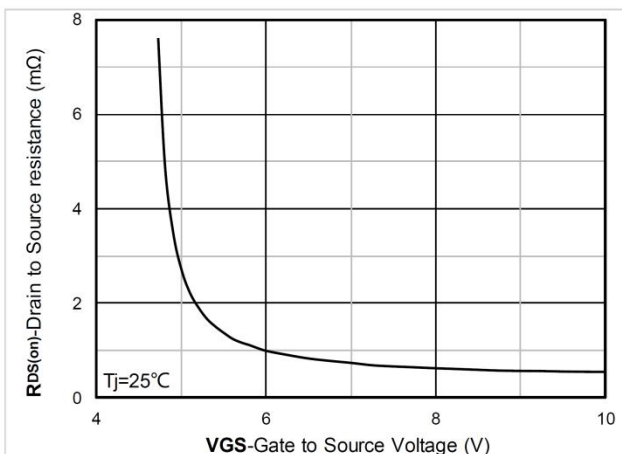
Transfer Characteristics



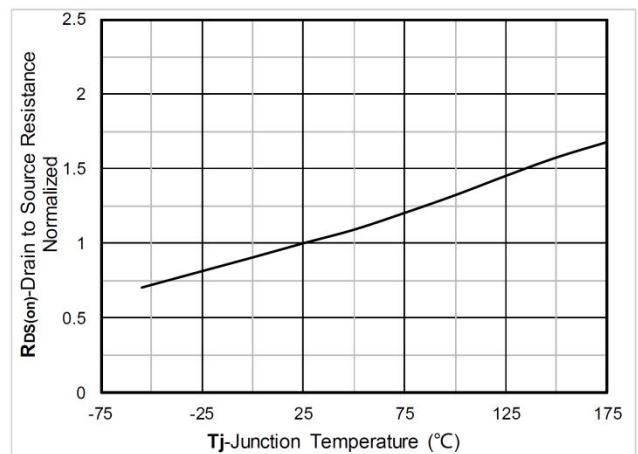
Capacitance Characteristics



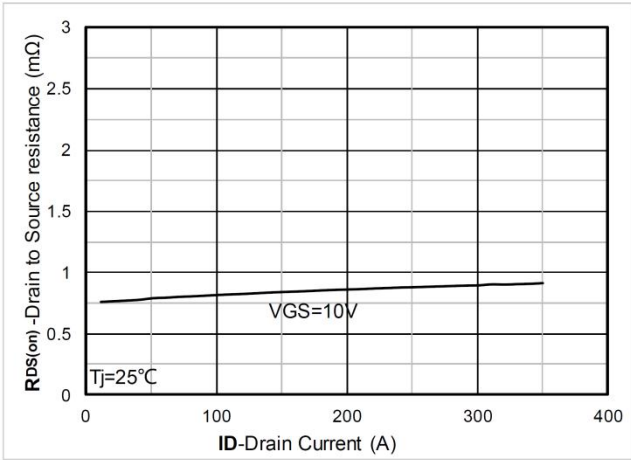
Gate Charge



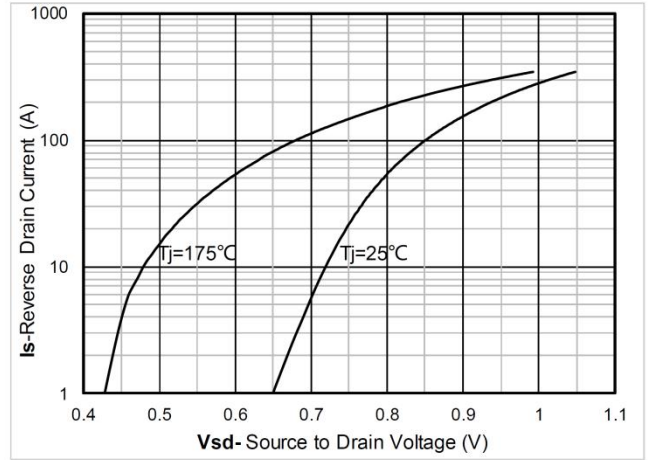
On-Resistance vs Gate to Source Voltage



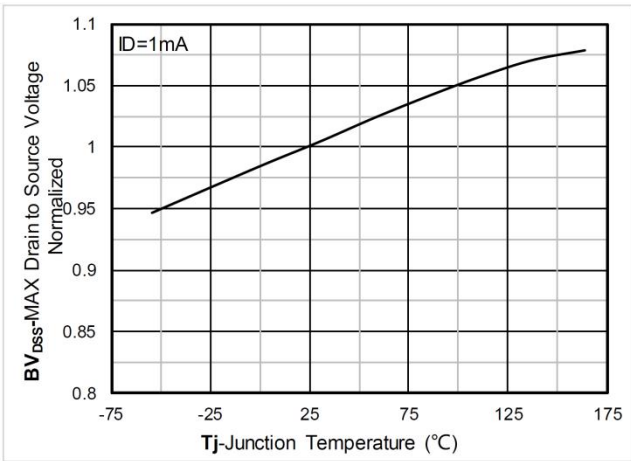
Normalized On-Resistance



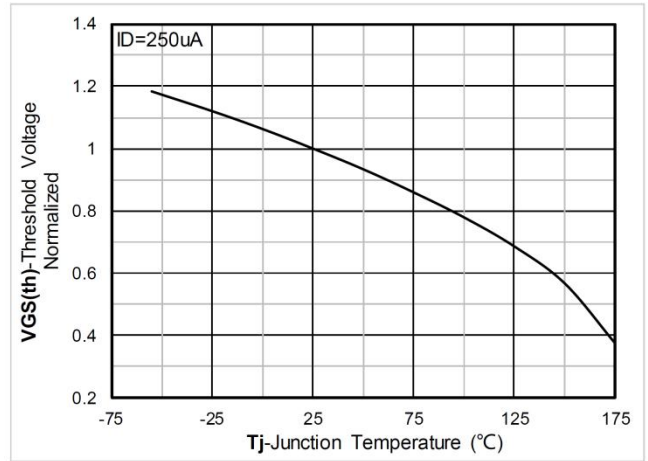
RDS(on) VS Drain Current



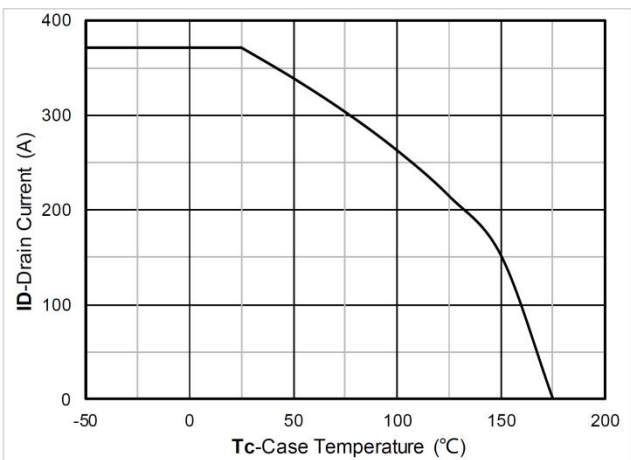
Forward characteristics of reverse diode



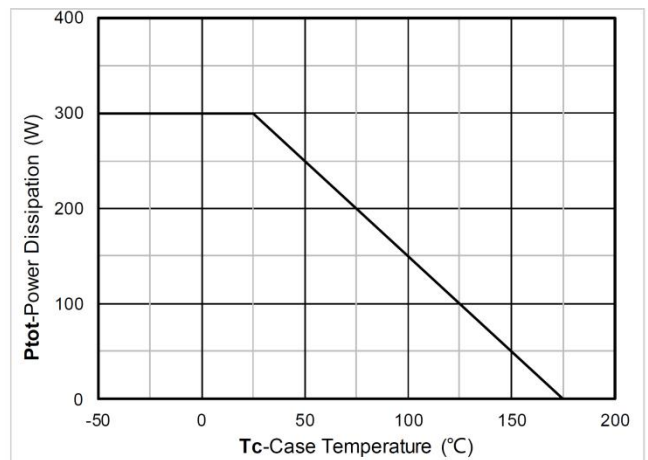
Normalized breakdown voltage



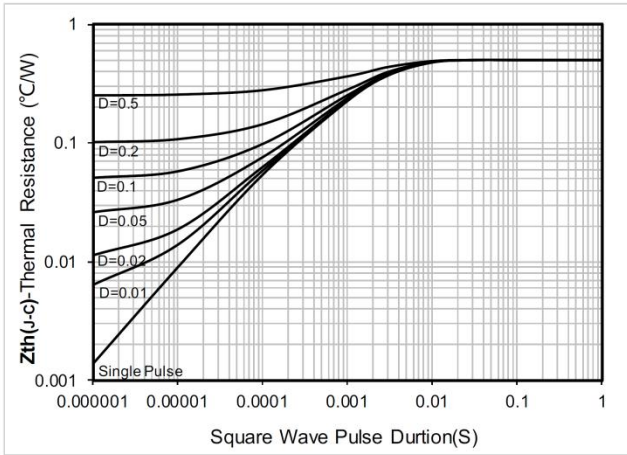
Normalized Threshold voltage



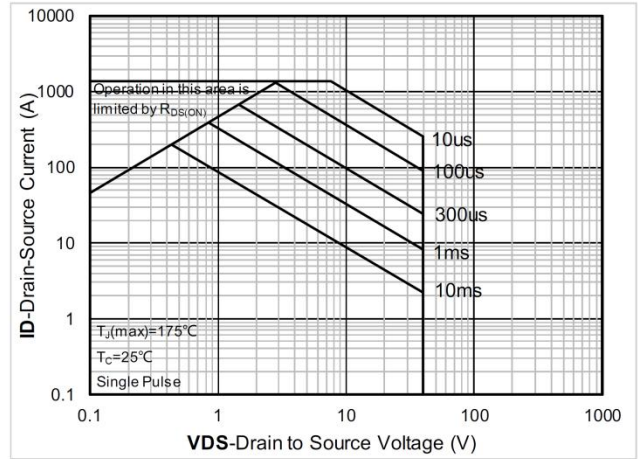
Current dissipation



Power dissipation

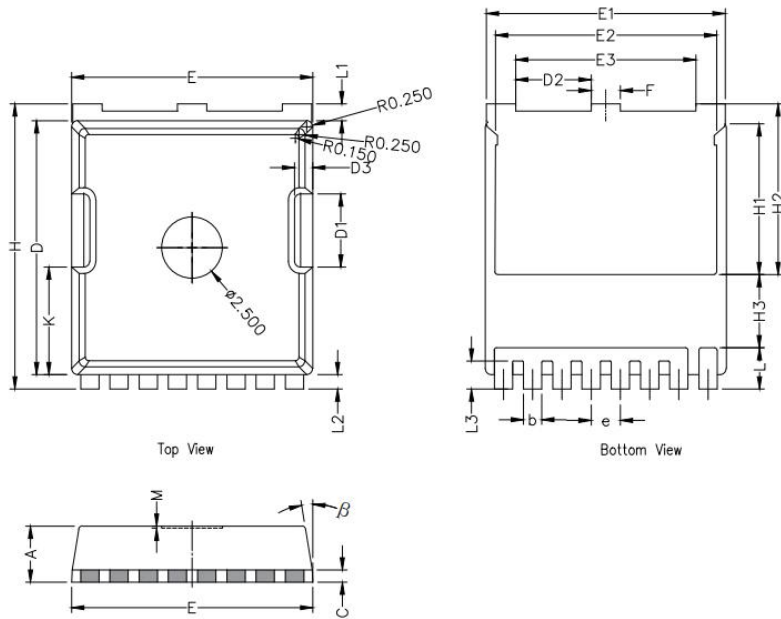


Maximum Transient Thermal Impedance



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