

## Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	$I_D$
40V	0.85mΩ@10V	260A
	1.1mΩ@4.5V	



**合肥矽普半导体**

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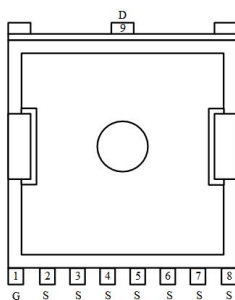
## Feature

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

## Applications

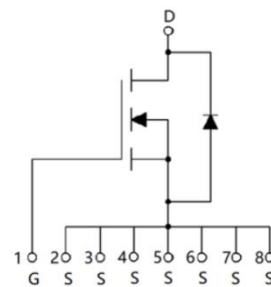
- PWM Application
- Hard switched and high frequency circuits
- Power Management

## Package

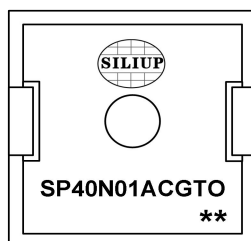


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## Circuit diagram



## Marking



**SP40N01ACGTO** : Device Code  
**\*\*** : Week Code

## Order Information

Device	Package	Unit/Tape
SP40N01ACGTO	TOLL	2000

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

Parameter	Symbol	Rating	Units
Drain-Source Voltage	$V_{DS}$	40	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current (Tc=25°C)	$I_D$	260	A
Continuous Drain Current (Tc=100°C)	$I_D$	175	A
Pulsed Drain Current	$I_{DM}$	1040	A
Single Pulse Avalanche Energy <sup>1</sup>	$E_{AS}$	1122	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

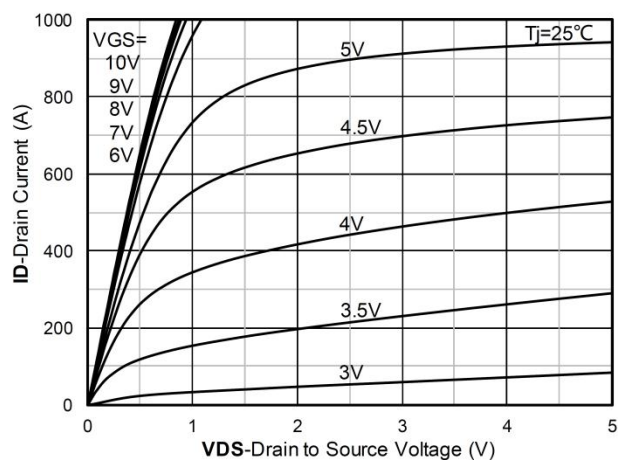
**Electrical characteristics (Ta=25°C, unless otherwise noted)**

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	VGS=0V , ID=250uA	40	45	-	V
Drain-Source Leakage Current	I <sub>DSS</sub>	VDS=32V , VGS=0V , TJ=25℃	-	-	1	uA
Gate-Source Leakage Current	I <sub>GSS</sub>	VGS=±20V , VDS=0V	-	-	±100	nA
Gate Threshold Voltage	V <sub>GS(th)</sub>	VGS=VDS , ID =250uA	1	1.7	2.5	V
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	VGS=10V , ID=20A	-	0.85	1.1	mΩ
		VGS=4.5V , ID=20A	-	1.1	1.4	
Dynamic characteristics						
Input Capacitance	C <sub>iss</sub>	VDS=20V , VGS=0V , f=1MHz	-	6200	-	pF
Output Capacitance	C <sub>oss</sub>		-	3600	-	
Reverse Transfer Capacitance	C <sub>rss</sub>		-	170	-	
Total Gate Charge	Q <sub>g</sub>	VDS=20V , VGS=10V , ID=20A	-	98	-	nC
Gate-Source Charge	Q <sub>gs</sub>		-	17	-	
Gate-Drain Charge	Q <sub>gd</sub>		-	21	-	
Switching Characteristics						
Turn-On Delay Time	T <sub>d(on)</sub>	VDD=20V , VGS=10V , RG=1.6Ω ID=20A	-	13.5	-	nS
Rise Time	T <sub>r</sub>		-	15.8	-	
Turn-Off Delay Time	T <sub>d(off)</sub>		-	96	-	
Fall Time	T <sub>f</sub>		-	43	-	
Diode Characteristics						
Diode Forward Voltage	V <sub>SD</sub>	VGS=0V , IS=1A , TJ=25℃	-	-	1.2	V
Maximum Body-Diode Continuous Current	I <sub>S</sub>		-	-	260	A
Reverse Recovery Time	T <sub>rr</sub>	IS=20A, di/dt=200A/us, TJ=25	-	65	-	nS
Reverse Recovery Charge	Q <sub>rr</sub>		-	37	-	nC

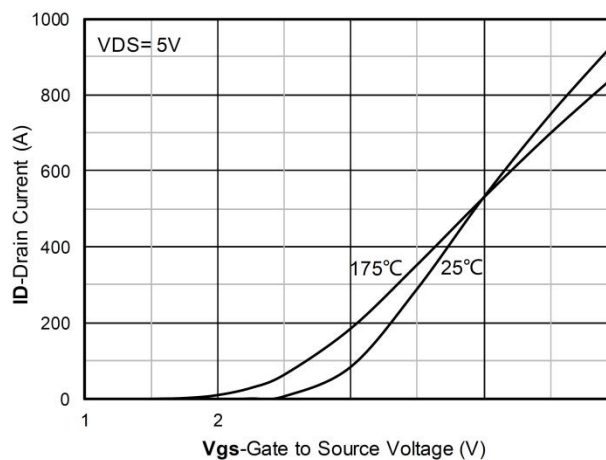
**Note :**

1. The test condition is  $V_{DD}=20V, V_{GS}=10V, L=0.5mH, R_G=25\Omega$

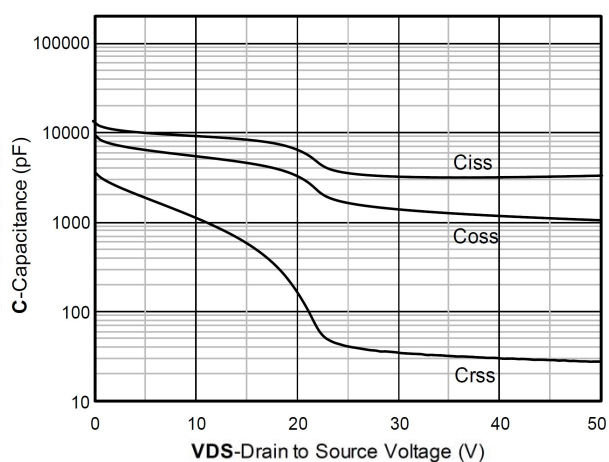
## Typical Characteristics



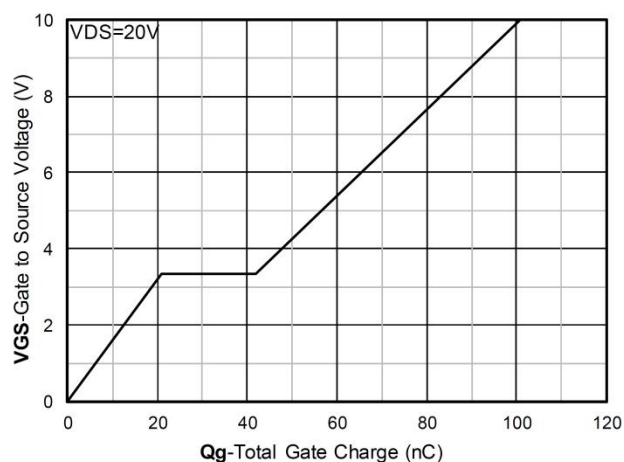
Output Characteristics



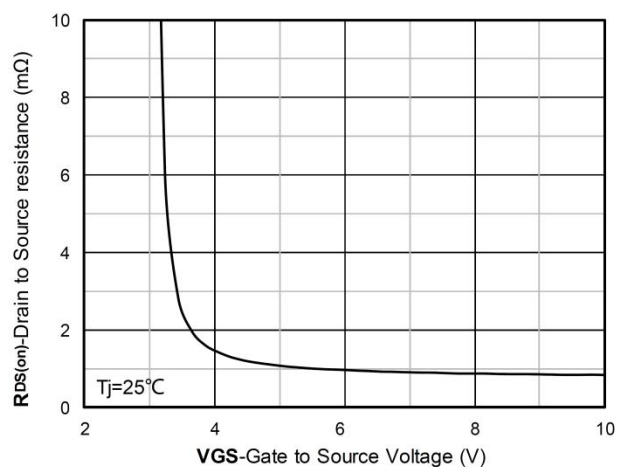
Transfer Characteristics



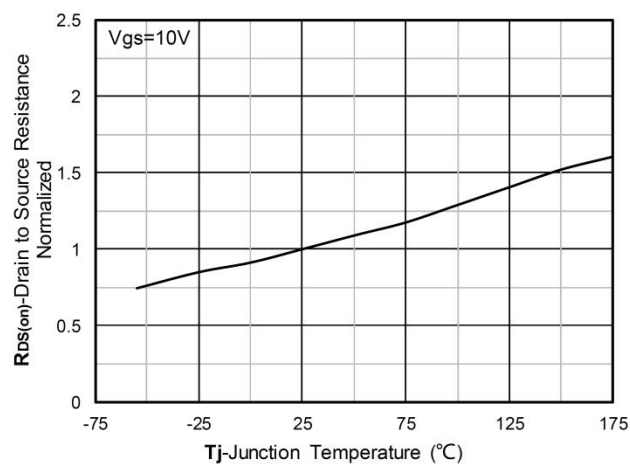
Capacitance Characteristics



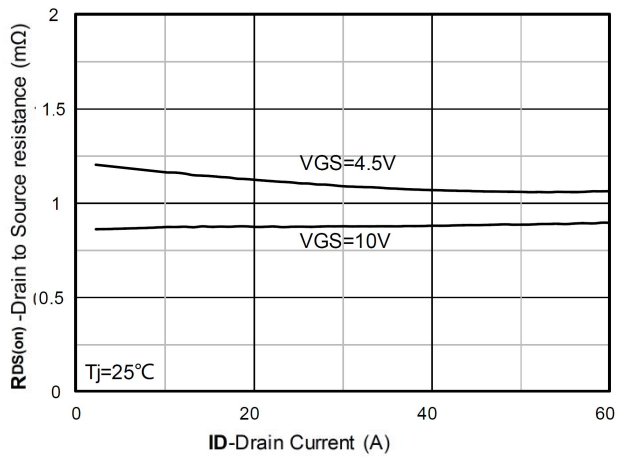
Gate Charge



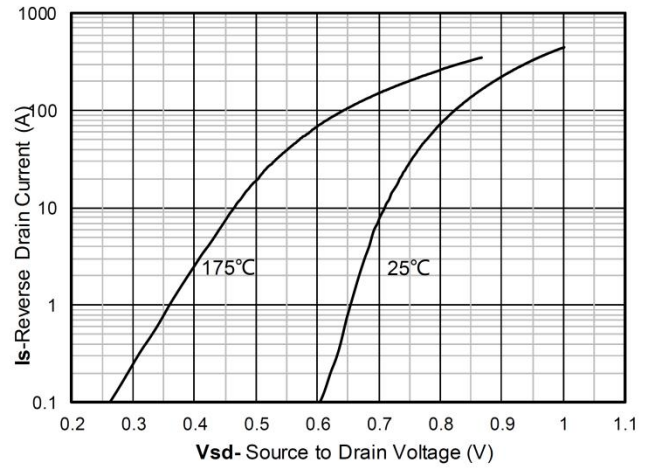
On-Resistance vs Gate to Source Voltage



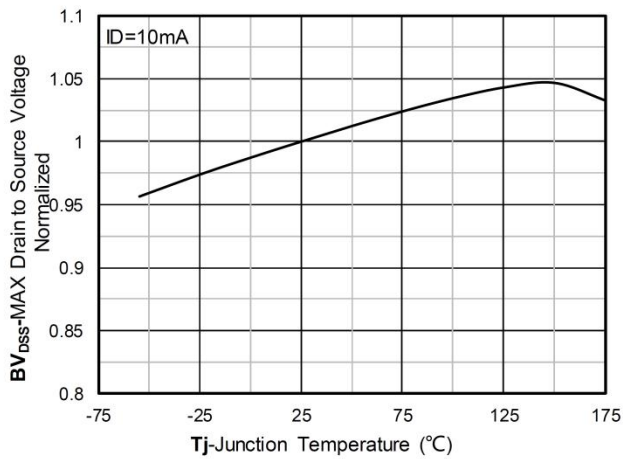
Normalized On-Resistance



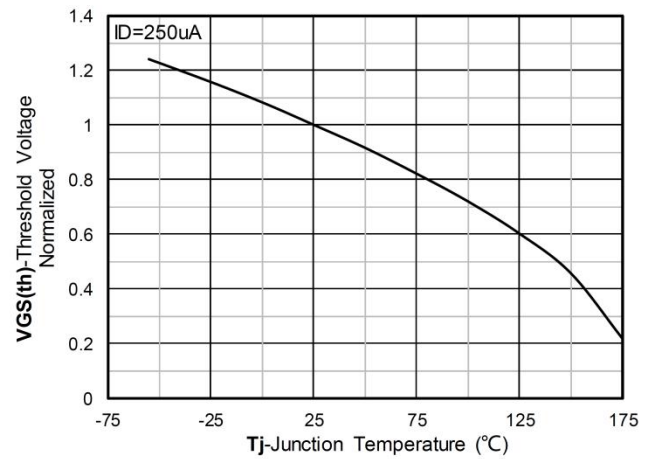
RDS(on) VS Drain Current



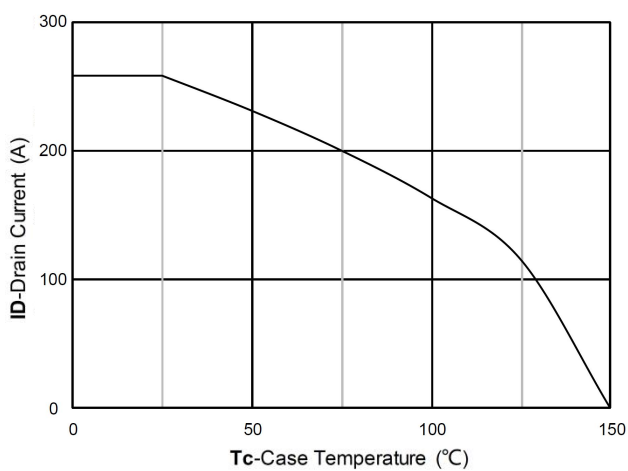
Forward characteristics of reverse diode



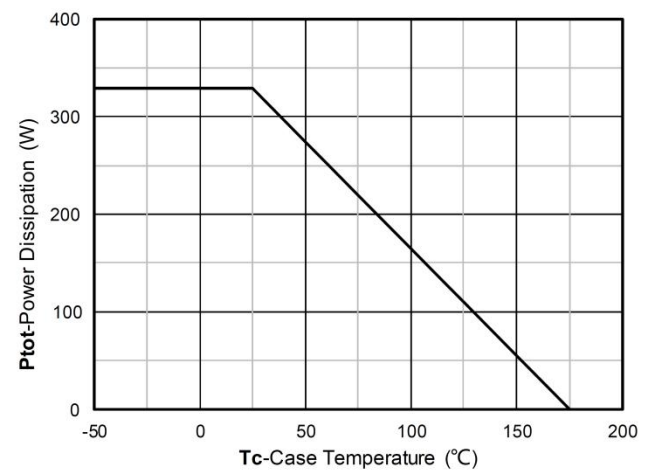
Normalized breakdown voltage



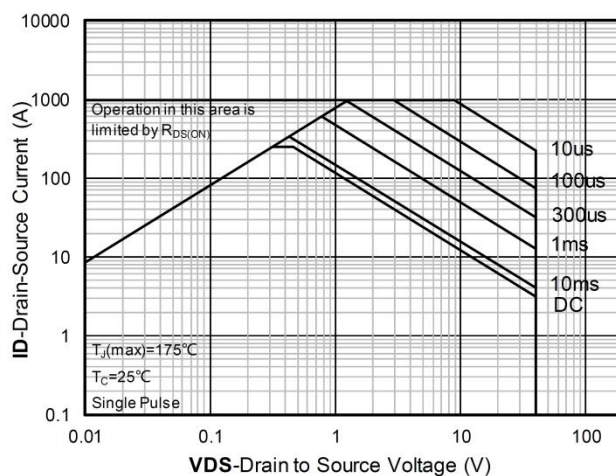
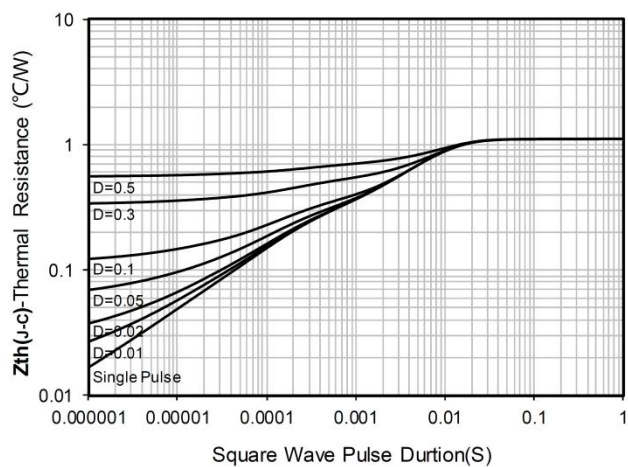
Normalized Threshold voltage

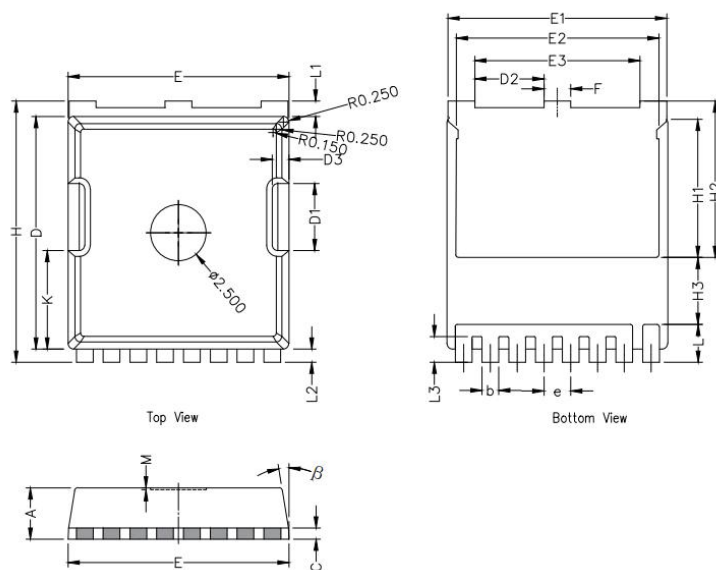


Current dissipation



Power dissipation



**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