

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
40V	0.7mΩ@10V	330A
	1mΩ@4.5V	



合肥矽普半导体

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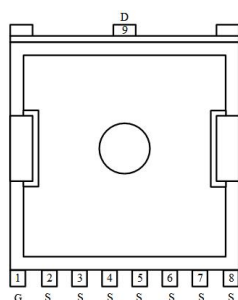
Feature

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

Applications

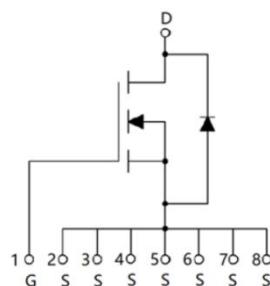
- PWM Application
- Hard switched and high frequency circuits
- Power Management

Package

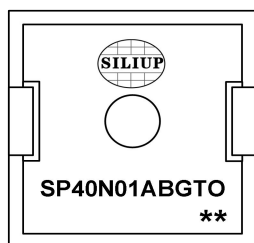


TOLL

Circuit diagram



Marking



SP40N01ABGTO : Device Code
****** : Week Code

Order Information

Device	Package	Unit/Tape
SP40N01ABGTO	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}	± 20	V
Continuous Drain Current (Tc=25°C)	I_D	330	A
Continuous Drain Current (Tc=100°C)	I_D	220	A
Pulsed Drain Current	I_{DM}	1320	A
Single Pulse Avalanche Energy ¹	E_{AS}	1369	mJ
Power Dissipation (Tc=25°C)	P_D	270	W
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	0.46	°C/W
Storage Temperature Range	T_{STG}	-55 to 150	°C
Operating Junction Temperature Range	T_J	-55 to 150	°C

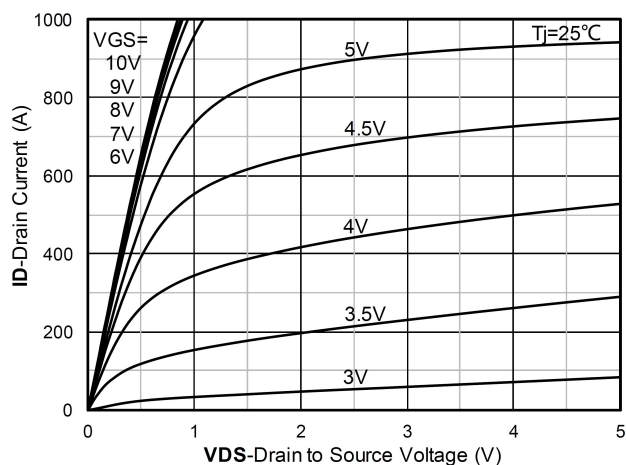
Electrical characteristics (Ta=25°C, unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	B _V DSS	VGS=0V , ID=250uA	40	45	-	V
Drain-Source Leakage Current	IDSS	VDS=32V , VGS=0V , TJ=25℃	-	-	1	uA
Gate-Source Leakage Current	IGSS	VGS=±20V , VDS=0V	-	-	±100	nA
Gate Threshold Voltage	VGS(th)	VGS=VDS , ID =250uA	1	1.7	2.5	V
Static Drain-Source On-Resistance	RDS(ON)	VGS=10V , ID=20A	-	0.7	1	mΩ
		VGS=4.5V , ID=20A	-	1	1.5	
Dynamic characteristics						
Input Capacitance	Ciss	VDS=20V , VGS=0V , f=1MHz	-	7300	-	pF
Output Capacitance	Coss		-	3550	-	
Reverse Transfer Capacitance	Crss		-	145	-	
Total Gate Charge	Qg	VDS=20V , VGS=10V , ID=50A	-	98	-	nC
Gate-Source Charge	Qgs		-	19	-	
Gate-Drain Charge	Qgd		-	17	-	
Switching Characteristics						
Turn-On Delay Time	Td(on)	VDD=20V , VGS=10V , RG=1.6Ω ID=50A	-	13.5	-	nS
Rise Time	Tr		-	35.8	-	
Turn-Off Delay Time	Td(off)		-	66	-	
Fall Time	Tf		-	24.8	-	
Diode Characteristics						
Diode Forward Voltage	VSD	VGS=0V , IS=1A , TJ=25℃	-	-	1.2	V
Maximum Body-Diode Continuous Current	IS		-	-	330	A
Reverse Recovery Time	Trr	IS=50A, di/dt=200A/us, TJ=25	-	68	-	nS
Reverse Recovery Charge	Qrr		-	95	-	nC

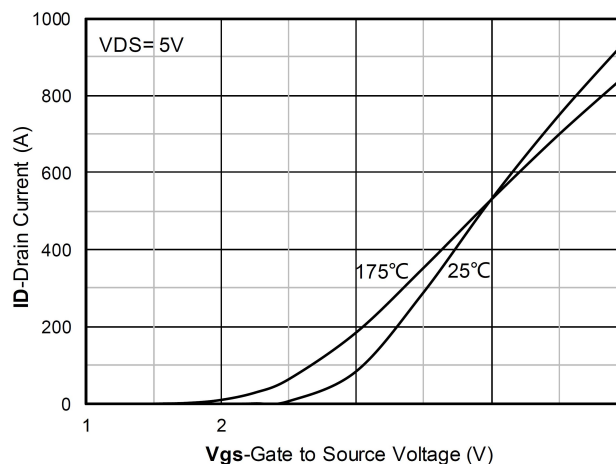
Note :

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

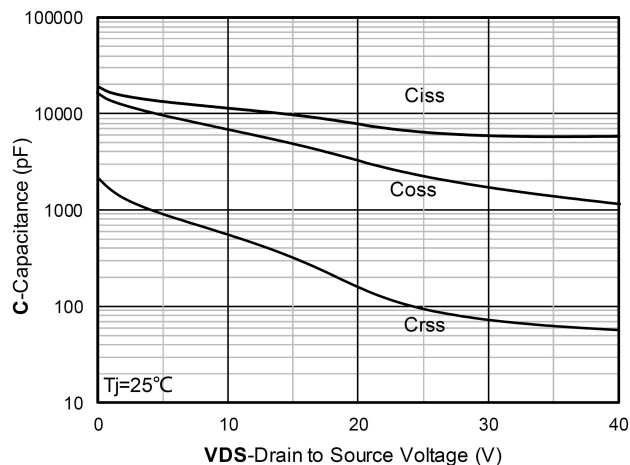
Typical Characteristics



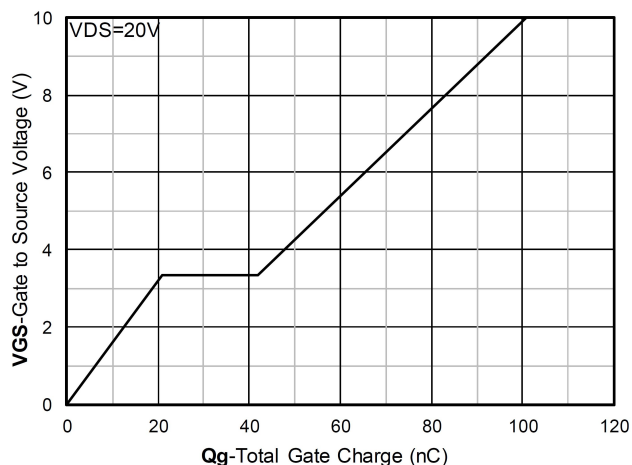
Output Characteristics



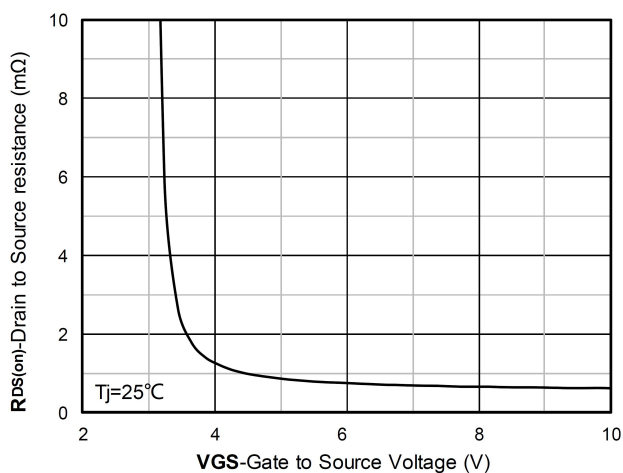
Transfer Characteristics



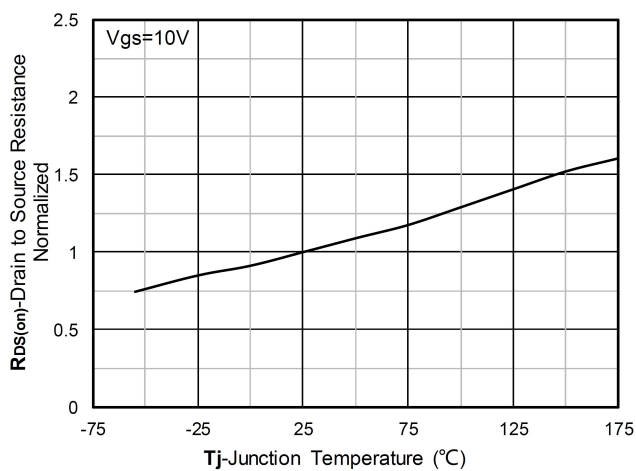
Capacitance Characteristics



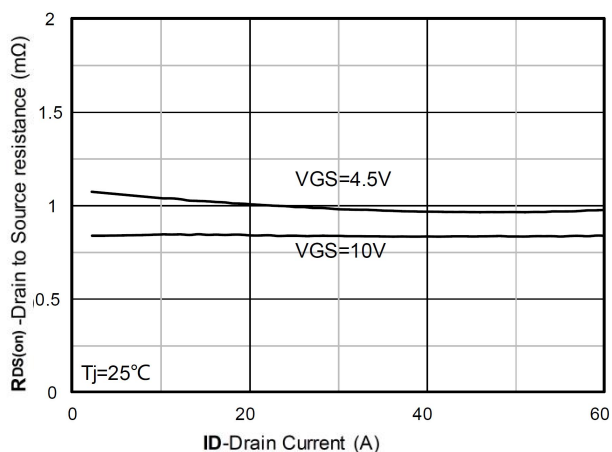
Gate Charge



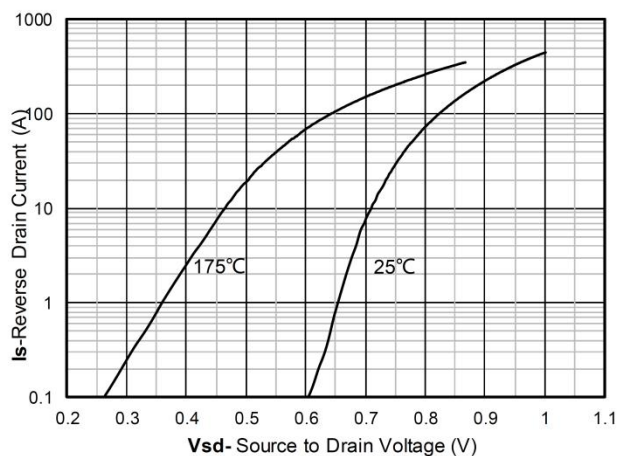
On-Resistance vs Gate to Source Voltage



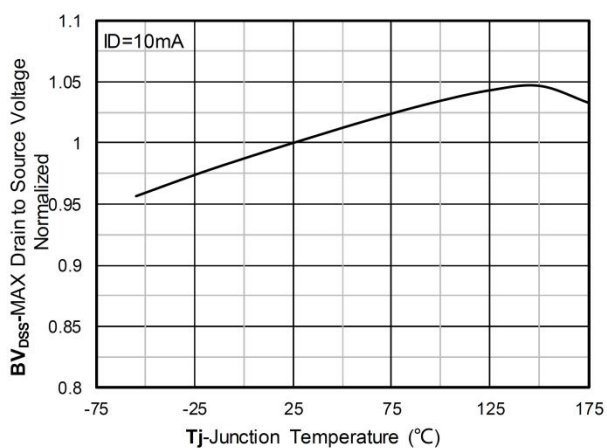
Normalized On-Resistance



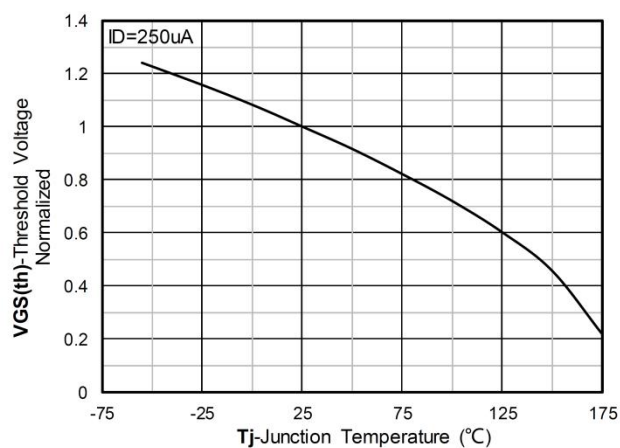
$R_{DS(on)}$ VS Drain Current



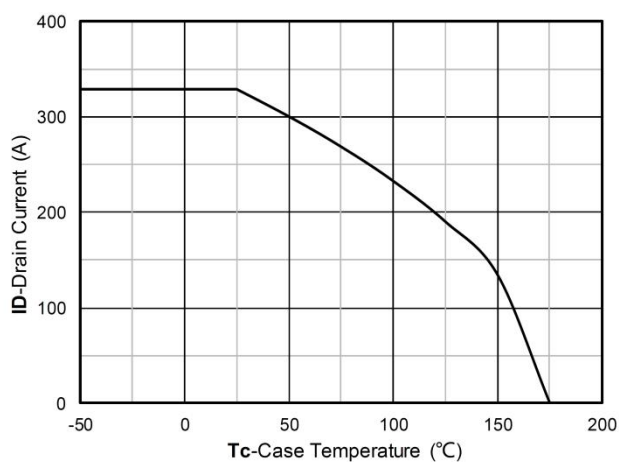
Forward characteristics of reverse diode



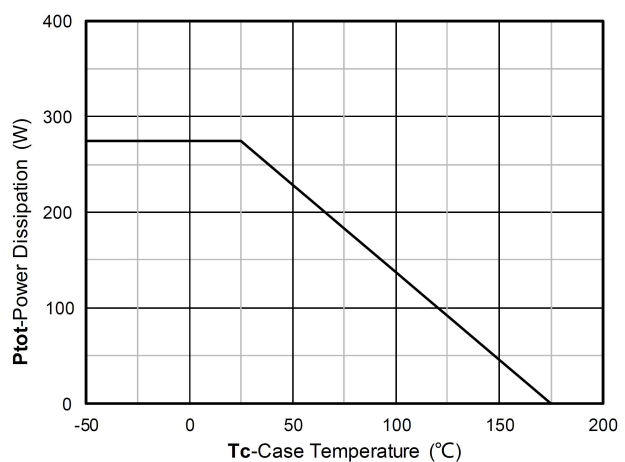
Normalized breakdown voltage



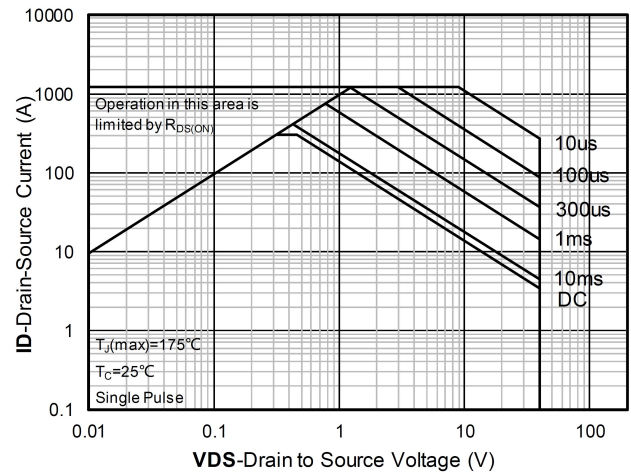
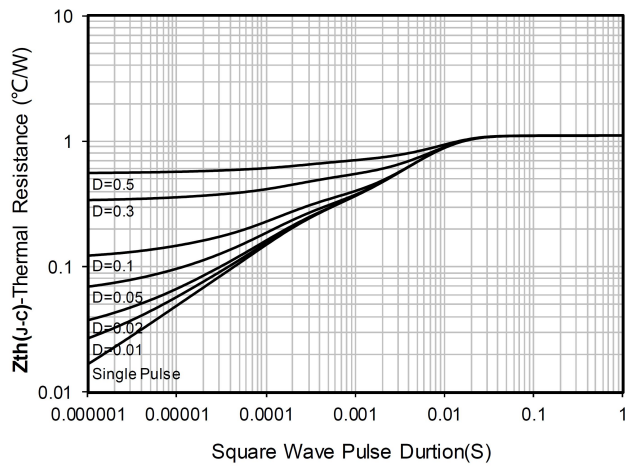
Normalized Threshold voltage



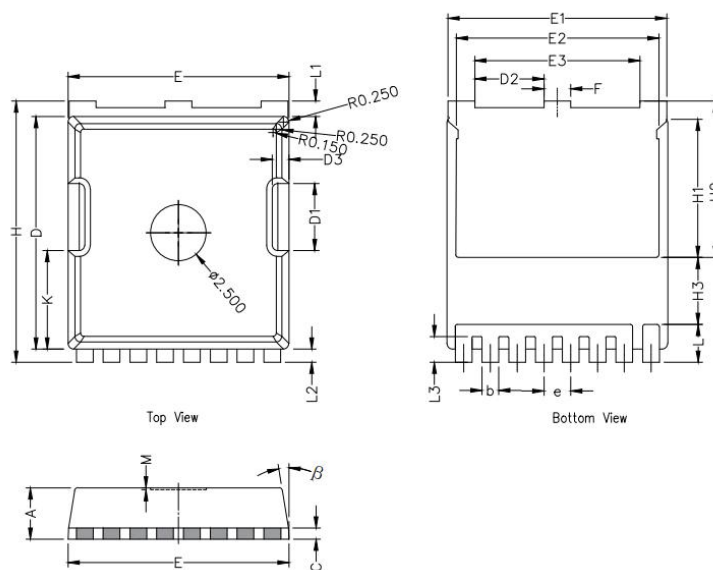
Current dissipation



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.		
β	8°	10°	12°
K	4.25	4.40	4.55