

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
40V	1.0mΩ@10V	250A
	1.5mΩ@4.5V	



合肥矽普半导体

Siliup Semiconductor Technology Co., Ltd

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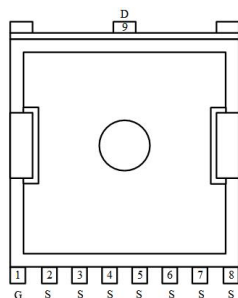
Feature

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

Applications

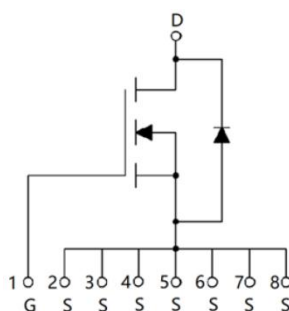
- PWM Application
- Hard switched and high frequency circuits
- Power Management

Package

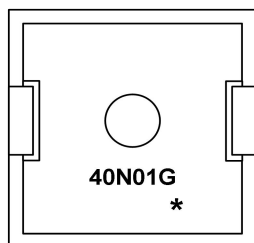


TOLL

Circuit diagram



Marking



40N01G
*

:Device Code
:Month Code

Order Information

Device	Package	Unit/Tape
SP40N01GTO	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	250	A
Continuous Drain Current (Tc=100°C)	I_D	160	A
Pulsed Drain Current	I_{DM}	1000	A
Single Pulse Avalanche Energy ¹	E_{AS}	1089	mJ
Total Power Dissipation (Tc=25°C)	P_D	128	W
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	0.98	°C/W
Storage Temperature Range	T_{STG}	-55 to 150	°C
Operating Junction Temperature Range	T_J	-55 to 150	°C

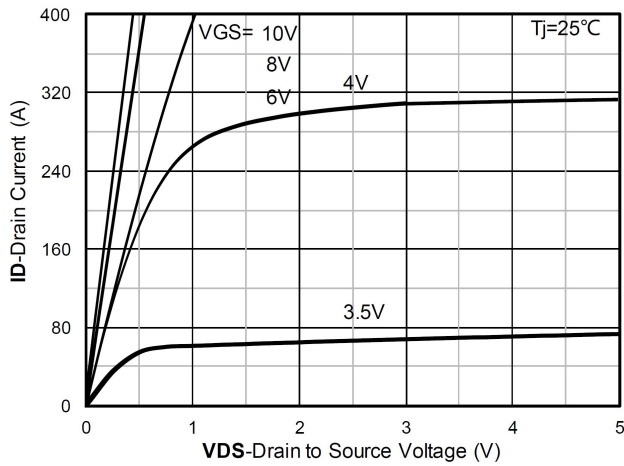
Electrical characteristics (Ta=25°C, unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	VGS=0V , ID=250uA	40	47	-	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=50A	-	1.0	1.25	mΩ
		VGS=4.5V , ID=50A	-	1.5	2	
Dynamic characteristics						
Input Capacitance	Ciss	VDS=20V , VGS=0V , f=1MHz	-	5500	-	pF
Output Capacitance	Coss		-	1850	-	
Reverse Transfer Capacitance	Crss		-	65	-	
Total Gate Charge	Qg	VDS=20V , VGS=10V , ID=85A	-	85	-	nC
Gate-Source Charge	Qgs		-	30	-	
Gate-Drain Charge	Qgd		-	18	-	
Switching Characteristics						
Turn-On Delay Time	Td(on)	VDD=20V , VGS=10V , RG=1.6Ω, ID=85A	-	13.5	-	nS
Rise Time	Tr		-	8.8	-	
Turn-Off Delay Time	Td(off)		-	52	-	
Fall Time	Tf		-	9.6	-	
Diode Characteristics						
Diode Forward Voltage	VSD	VGS=0V , IS=1A , TJ=25℃	-	-	1.2	V
Maximum Body-Diode Continuous Current	IS		-	-	250	A
Reverse Recovery Time	Trr	IS=50A, di/dt=100A/us, TJ=25℃	-	70	-	nS
Reverse Recovery Charge	Qrr		-	95	-	nC

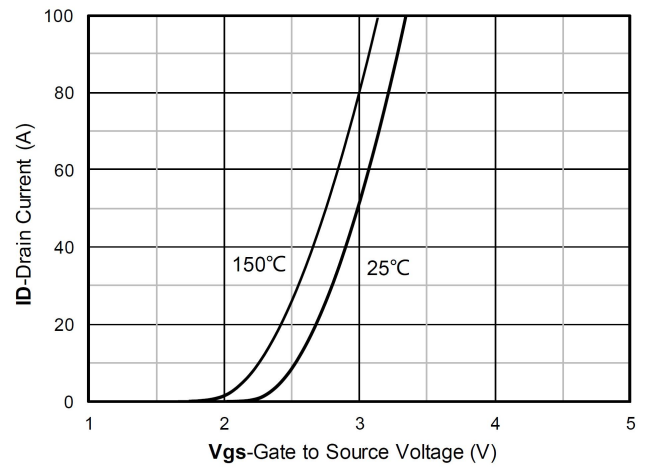
Note :

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

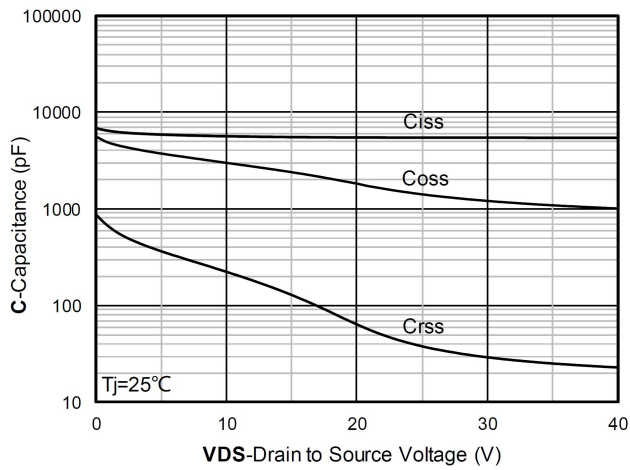
Typical Characteristics



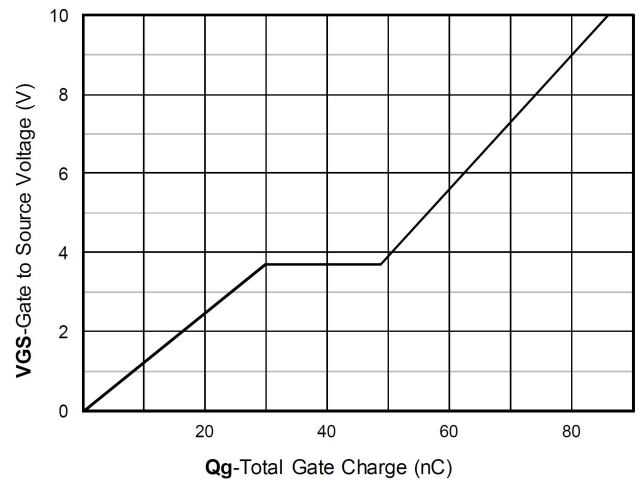
Output Characteristics



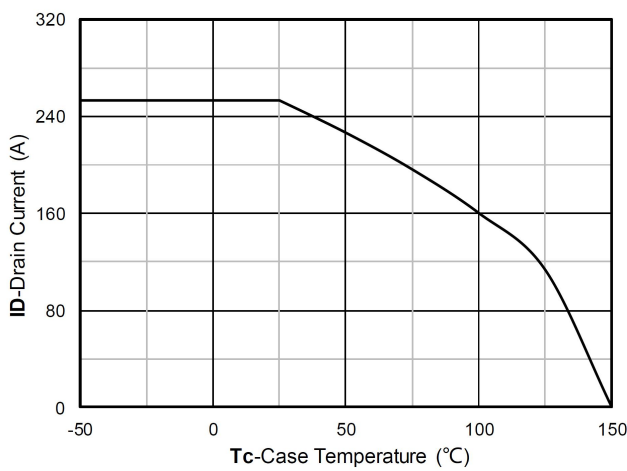
Transfer Characteristics



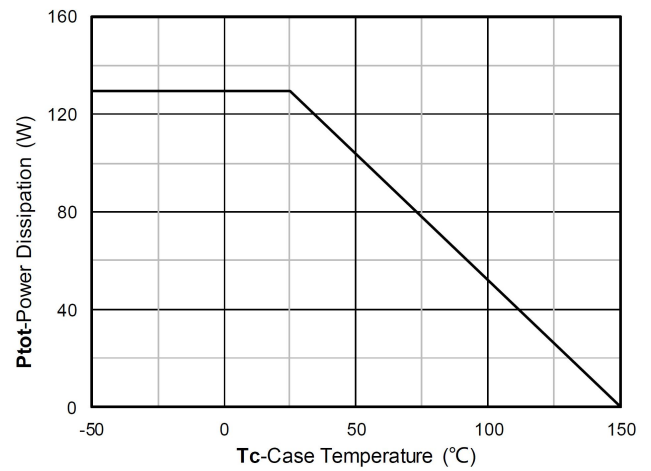
Capacitance Characteristics



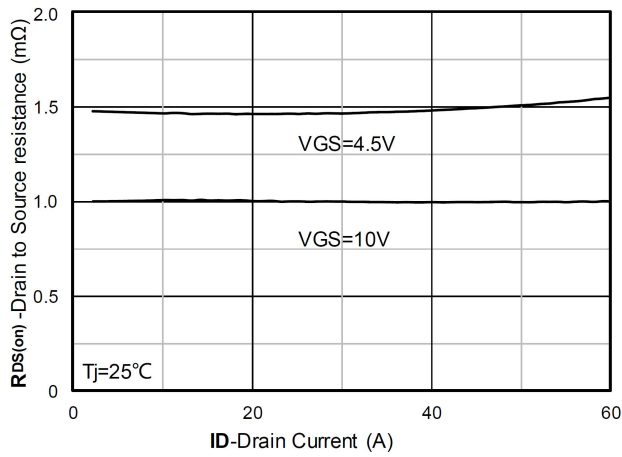
Gate Charge



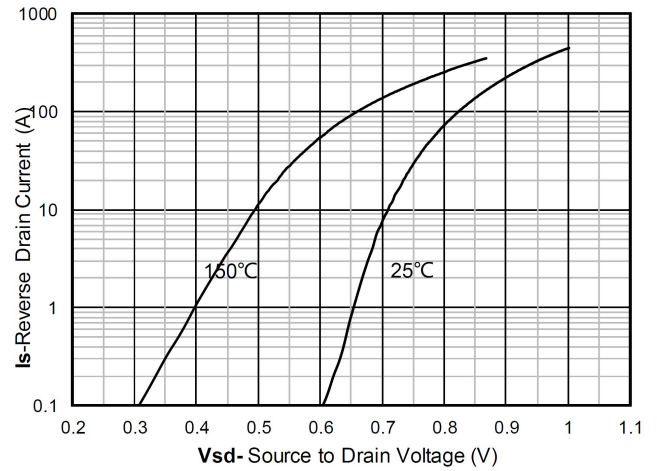
Current dissipation



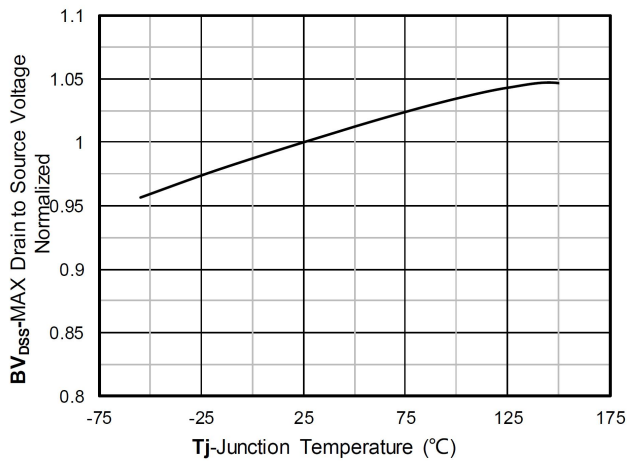
Power dissipation



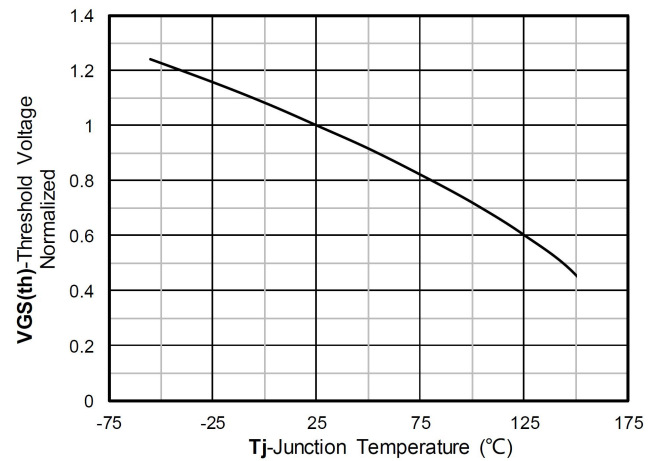
$R_{DS(on)}$ VS Drain Current



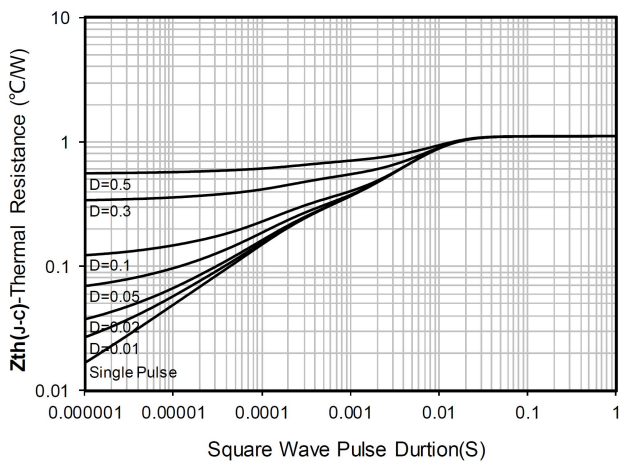
Forward characteristics of reverse diode



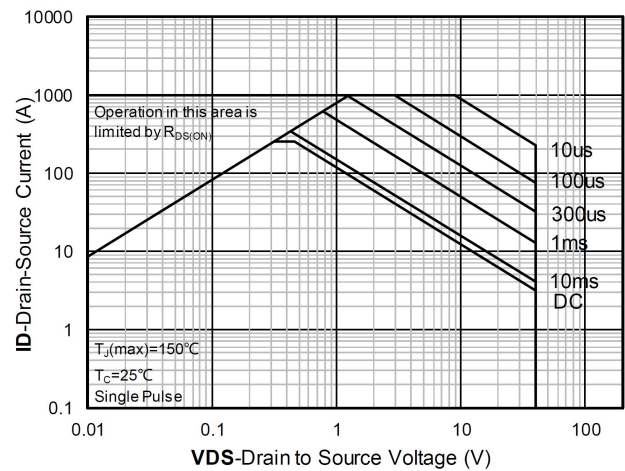
Normalized breakdown voltage



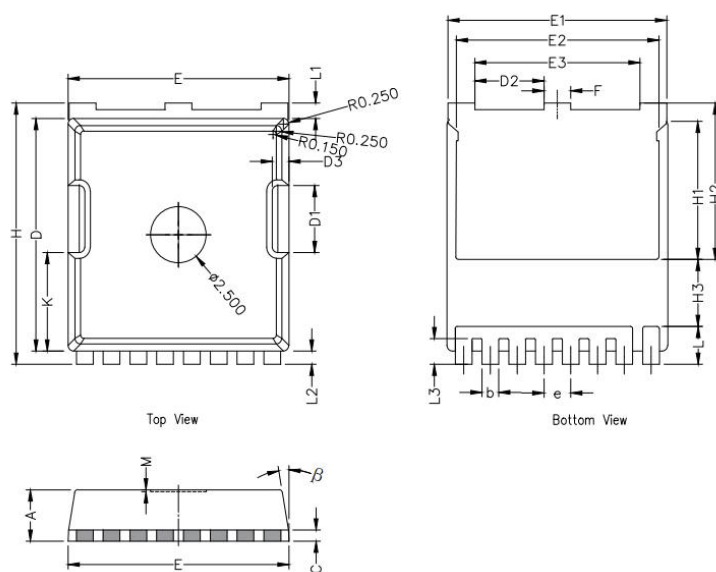
Normalized Threshold voltage



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.		
β	8°	10°	12°
K	4.25	4.40	4.55