

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
85V	$3.8m\Omega@10V$	160A



合肥矽普半导体

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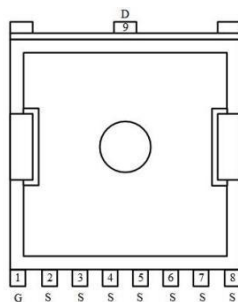
Feature

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

Applications

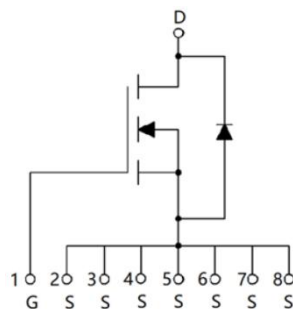
- PWM Application
- Hard switched and high frequency circuits
- Power Management

Package

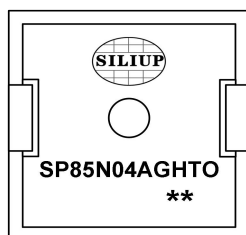


TOLL

Circuit diagram



Marking



SP85N04AGHTO : Product code
****** : Week code

Order Information

Device	Package	Unit/Tape
SP85N04AGHTO	TOLL	2000

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

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	85	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current (Tc=25°C)	I_D	160	A
Continuous Drain Current (Tc=100°C)	I_D	107	A
Pulse Drain Current Tested	I_{DM}	640	A
Single Pulse Avalanche Energy ¹	E_{AS}	646	mJ
Power Dissipation (Tc=25°C)	P_D	246	W
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	0.51	°C/W
Maximum Junction Temperature	T_J	-55 to 150	°C
Storage Temperature Range	T_{STG}	-55 to 150	°C

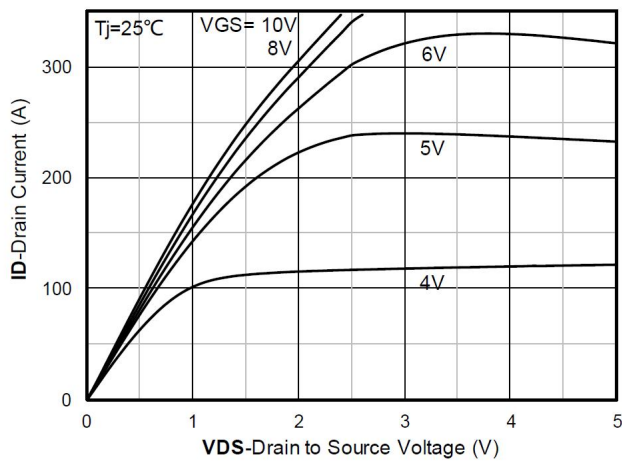
Electrical characteristics (Ta=25°C, unless otherwise noted)

Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	I _D = 250μA, V _{GS} = 0V	85	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 68V, V _{GS} = 0V	-	-	1	uA
Gate Leakage Current	I _{GSS}	V _{GS} = ±20V, V _{DS} = 0V	-	-	±100	nA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	2.0	3.0	4.0	V
Drain-Source On-state Resistance	R _{DS(ON)}	V _{GS} = 10V, I _D = 50A	-	3.8	4.6	mΩ
Dynamic Characteristics						
Input Capacitance	C _{iss}	VGS=0V, VDS=40V,F=1MHz	-	3265	-	pF
Output Capacitance	C _{oss}		-	428	-	
Reverse Transfer Capacitance	C _{rss}		-	23	-	
Total Gate Charge	Q _g	VDS=40V, VGS=10V, ID=50A	-	42	-	nC
Gate-Source Charge	Q _{gs}		-	15	-	
Gate-Drain Charge	Q _{gd}		-	20	-	
Switching Characteristics						
Turn-On Delay Time	t _{d(on)}	VDD=40V, ID=50A, VGS=10V, R _G =3Ω	-	17	-	nS
Rise Time	t _r		-	39	-	
Turn-Off Delay Time	t _{d(off)}		-	64	-	
Fall Time	t _f		-	42	-	
Drain-Source Body Diode Characteristics						
Source-Drain Diode Forward Voltage	V _{SD}	VGS=0V , IS=1A , TJ=25℃	-	-	1.2	V
Maximum Body-Diode Continuous Current	I _S		-	-	160	A
Reverse Recovery Time	T _{rr}	I _S =50 A,di/dt=100 A/μs, TJ=25℃	-	45	-	nS
Reverse Recovery Charge	Q _{rr}		-	56	-	nC

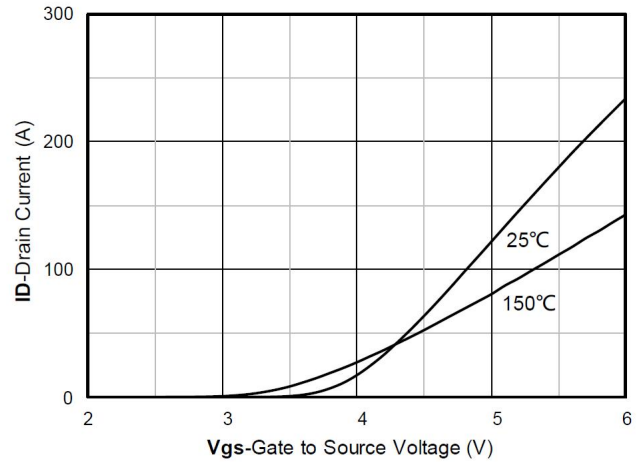
Note :

- The test condition is $V_{DD}=40V, V_{GS}=10V, L=0.5mH, R_G=25\Omega$

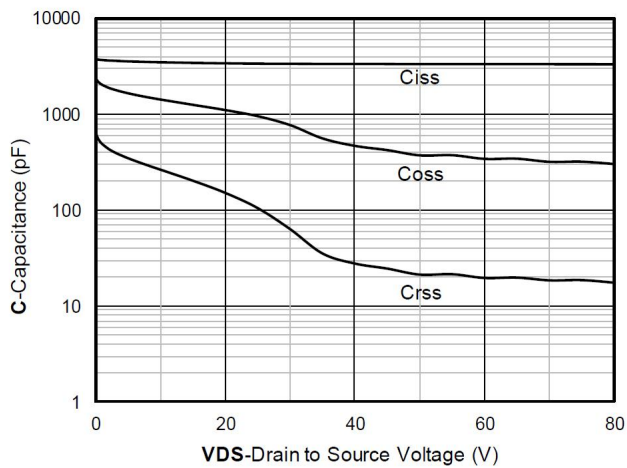
Typical Characteristics



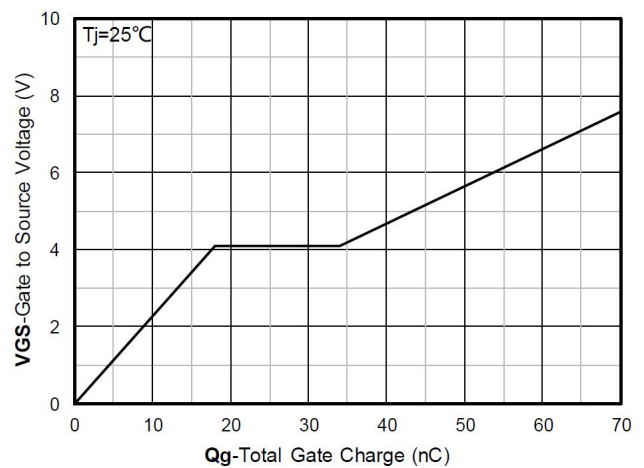
Output Characteristics



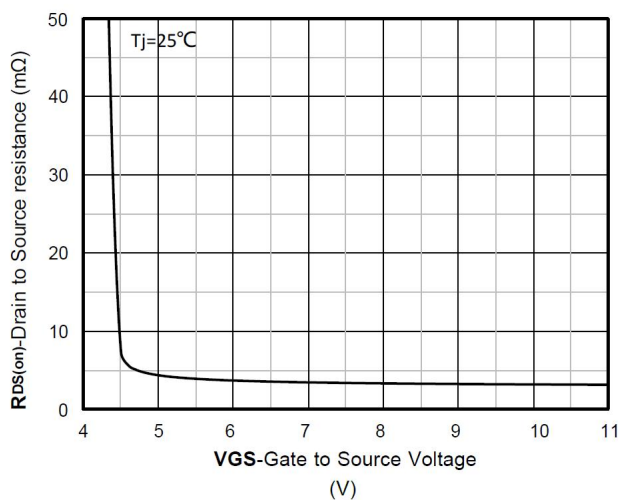
Transfer Characteristics



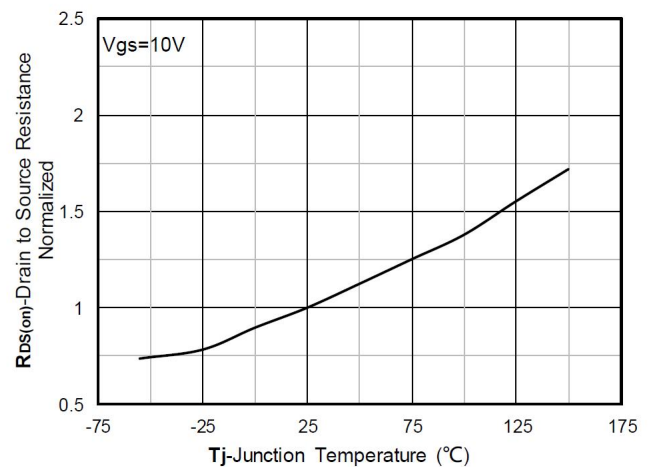
Capacitance Characteristics



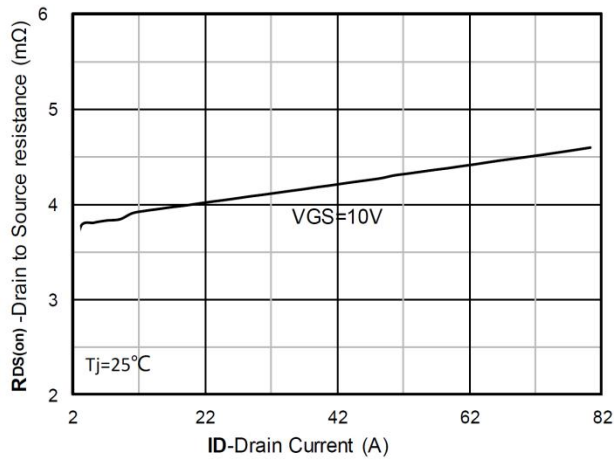
Gate Charge



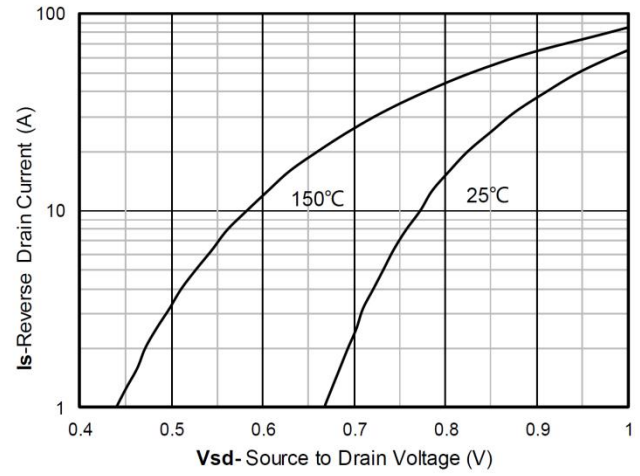
On-Resistance vs Gate to Source Voltage



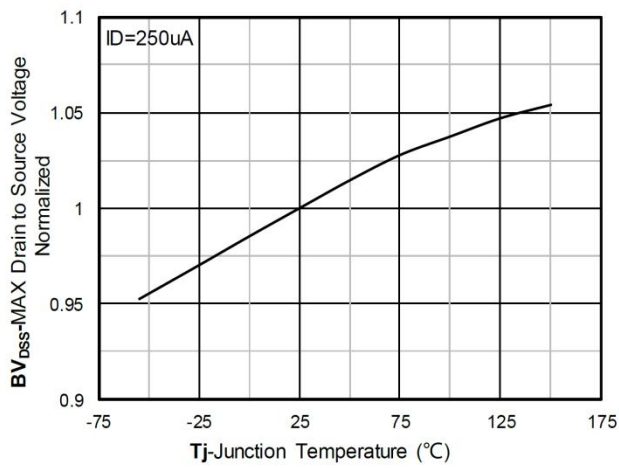
Normalized On-Resistance



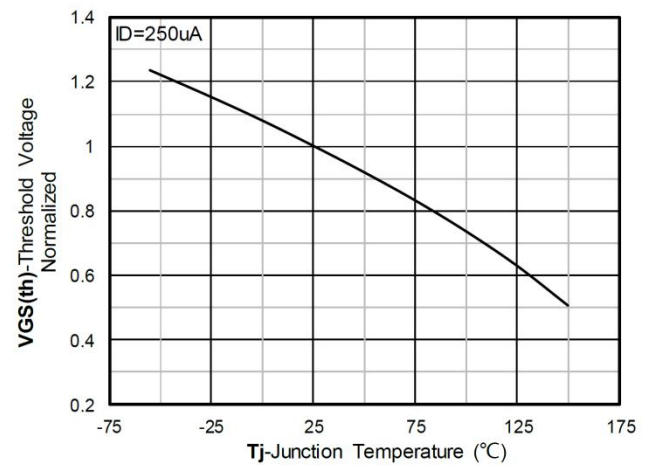
RDS(on) VS Drain Current



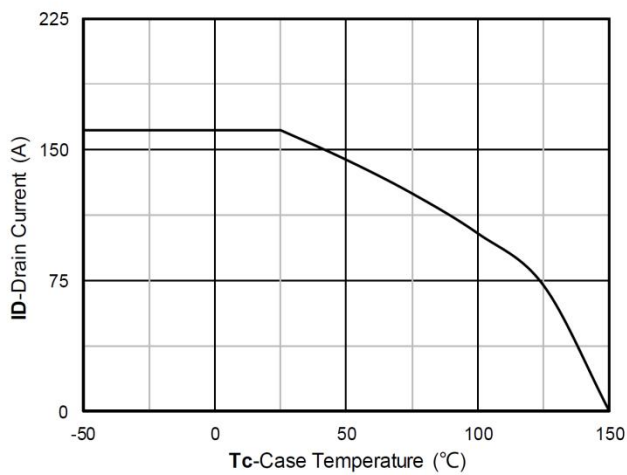
Forward characteristics of reverse diode



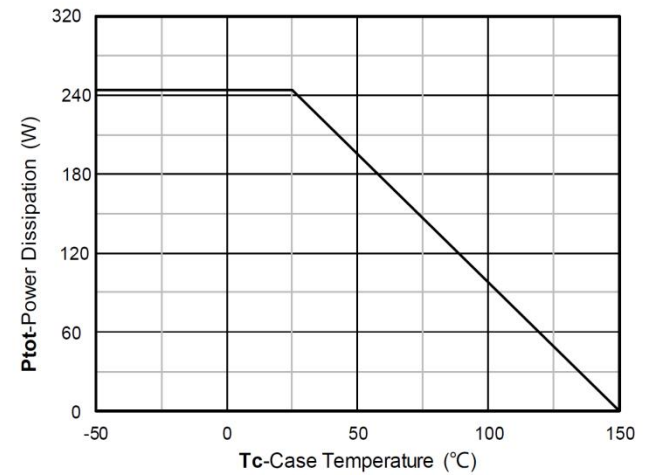
Normalized breakdown voltage



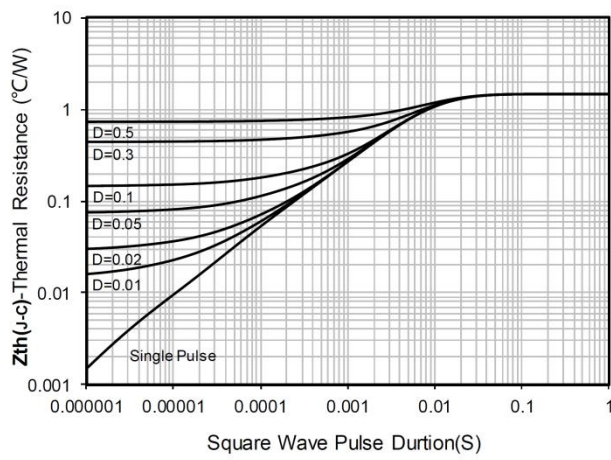
Normalized Threshold voltage



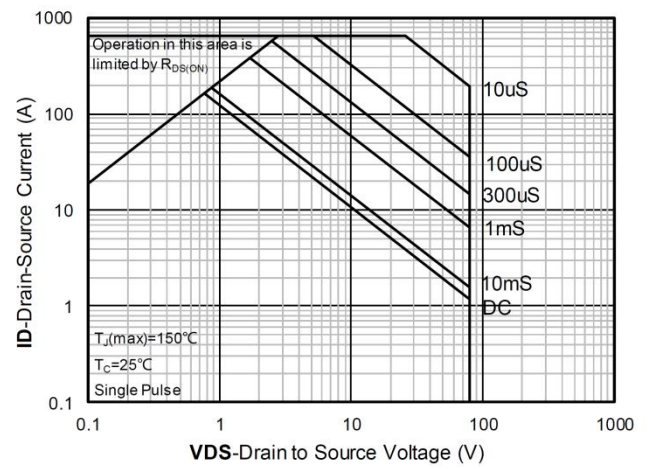
Current dissipation



Power dissipation

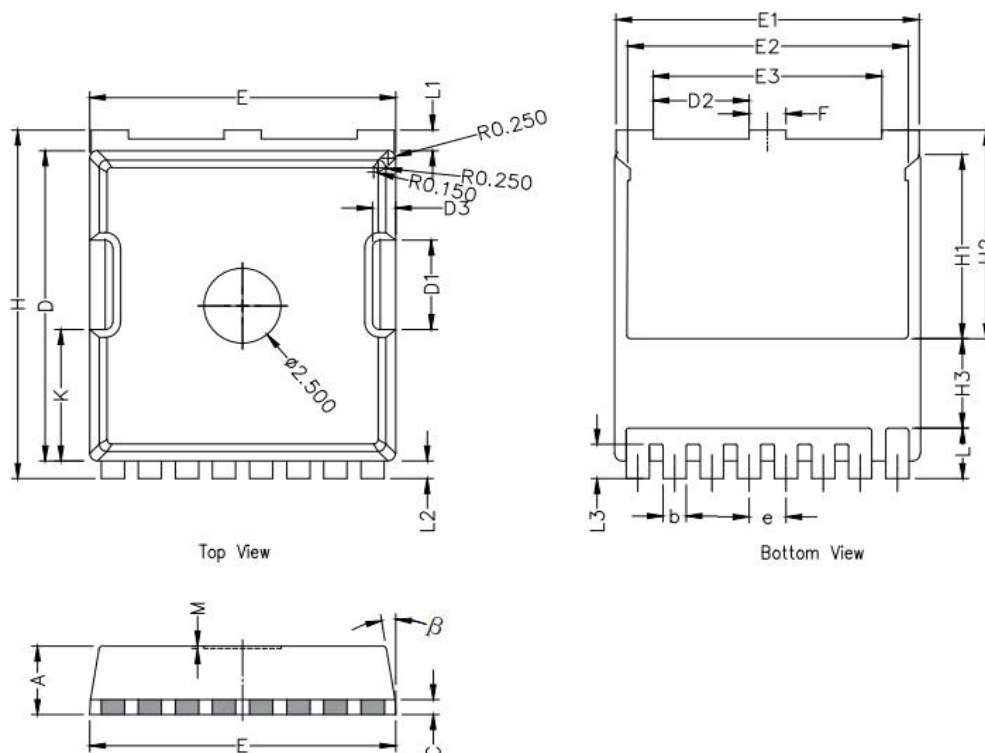


Maximum Transient Thermal Impedance



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