

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
120V	1.9mΩ@10V	300A



合肥矽普半导体

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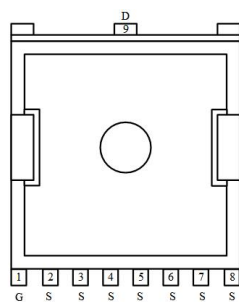
Feature

- Fast Switching
- Low Gate Charge and Rdson
- Low Reverse transfer capacitances
- 100% Single Pulse avalanche energy Test

Applications

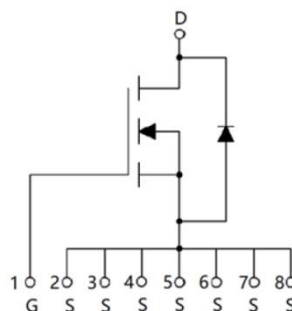
- High Speed Power switching
- DC-DC Converter
- Power Management

Package

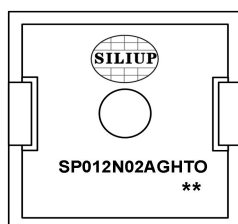


TOLL

Circuit diagram



Marking



SP012N02AGHTO : Product code
** : Week code

Order Information

Device	Package	Unit/Tape
SP012N02AGHTO	TOLL	2000

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

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	120	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current1 (Tc=25°C)	I_D	300	A
Continuous Drain Current1 (Tc=100°C)	I_D	200	A
Pulsed Drain Current	I_{DM}	1200	A
Single Pulse Avalanche Energy ¹	E_{AS}	2056	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

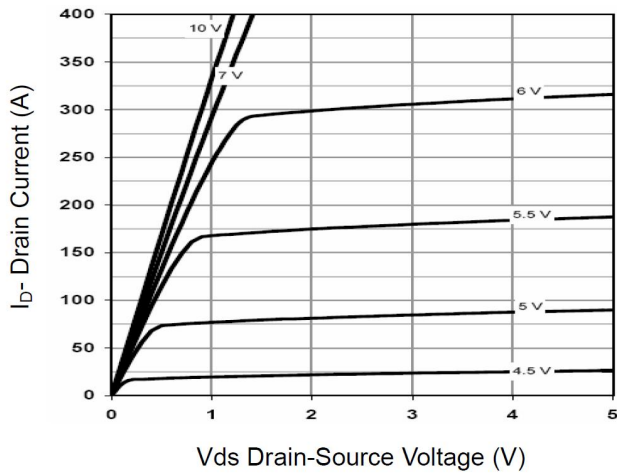
Electrical characteristics (Ta=25°C, unless otherwise noted)

Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	ID = 250μA, VGS = 0V	120	130	-	V
Drain Cut-Off Current	IDSS	VDS = 96V, VGS = 0V	-	-	1	μA
Gate Leakage Current	IGSS	VGS = ±20V, VDS = 0V	-	-	±0.1	
Gate Threshold Voltage	VGS(th)	VDS = VGS, ID = 250μA	2.5	3.3	4.5	V
Drain-Source ON Resistance	RDS(ON)	VGS = 10V, ID = 50A	-	1.9	2.5	mΩ
Dynamic Characteristics						
Input Capacitance	Ciss	VDS = 60V, VGS = 0V, f = 1.0MHz	-	12700	-	pF
Output Capacitance	Coss		-	870	-	
Reverse Transfer Capacitance	Crss		-	48	-	
Total Gate Charge	Qg	VDS=60V , VGS=10V , ID=75A	-	213	-	nC
Gate-Source Charge	Qgs		-	58	-	
Gate-Drain Charge	Qgd		-	59	-	
Switching Characteristics						
Turn-On Delay Time	td(on)	VGS = 10V, VDS = 60V, ID = 75A RG = 1.6Ω	-	24	-	nS
Rise Time	tr		-	28	-	
Turn-Off Delay Time	td(off)		-	79	-	
Fall Time	tf		-	31	-	
Drain-Source Body Diode Characteristics						
Source-Drain Diode Forward Voltage	VSD	IS = 1A, VGS = 0V	-	-	1.2	V
Maximum Body-Diode Continuous Current	IS		-	-	300	A
Reverse Recovery Time	Trr	IS=100A, di/dt=100A/us, TJ=25℃	-	112	-	nS
Reverse Recovery Charge	Qrr		-	289	-	nC

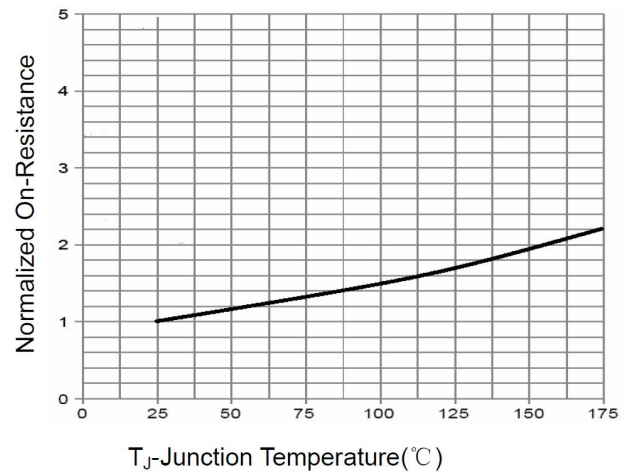
Note :

1. The test condition is $V_{DD}=50V, V_{GS}=10V, L=0.5mH, RG=25\Omega$

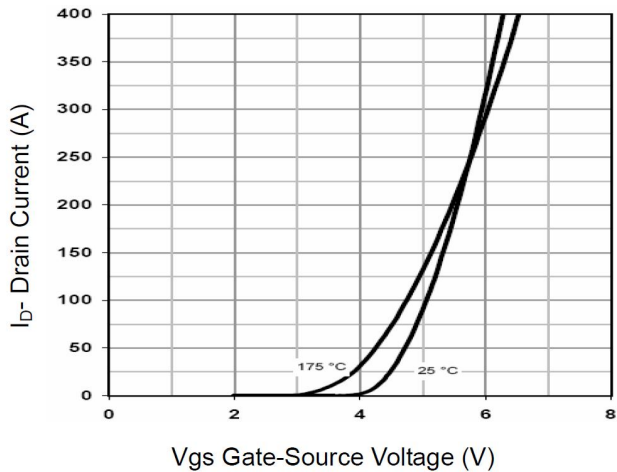
Typical Characteristics



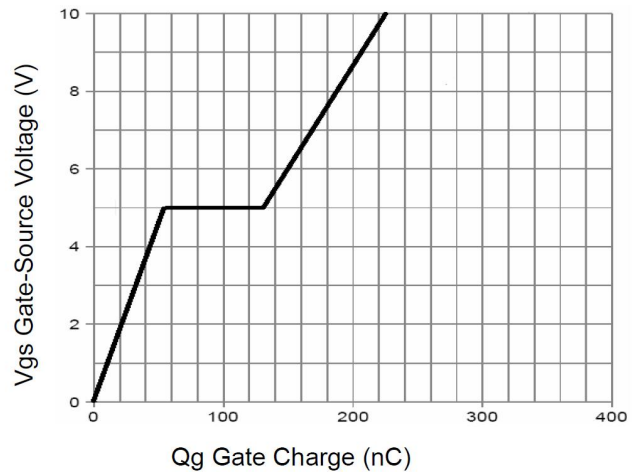
Output Characteristics



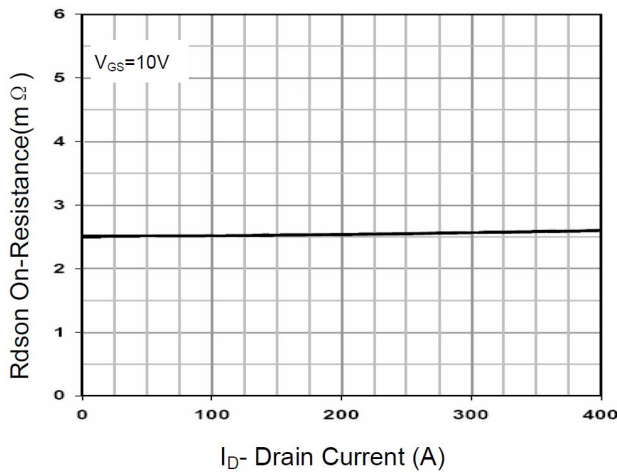
$R_{ds(on)}$ -Junction Temperature



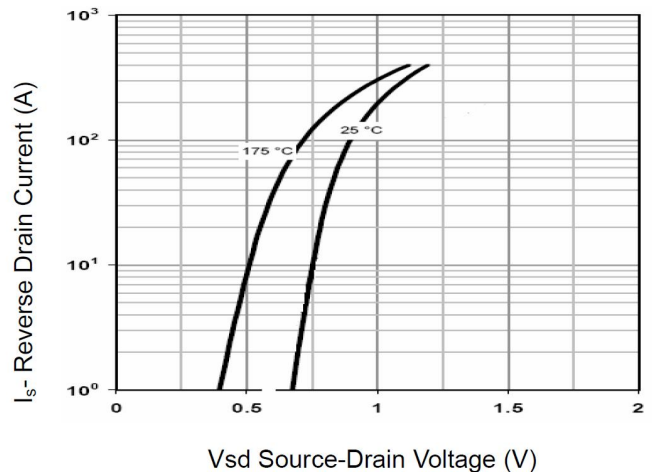
Transfer Characteristics



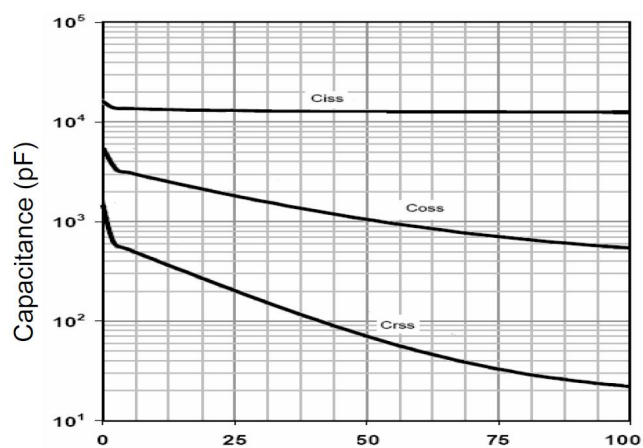
Gate Charge



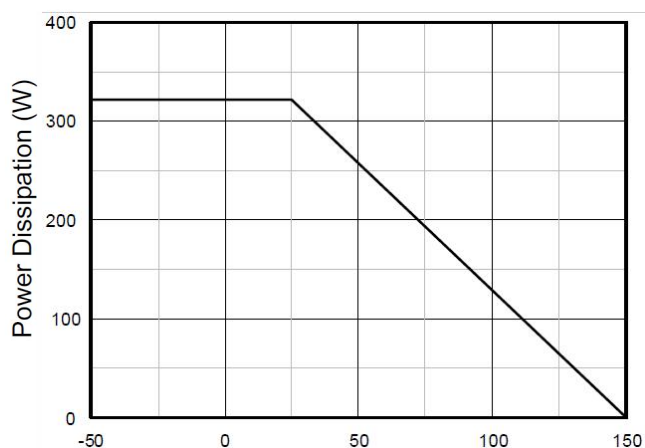
$R_{ds(on)}$ - Drain Current



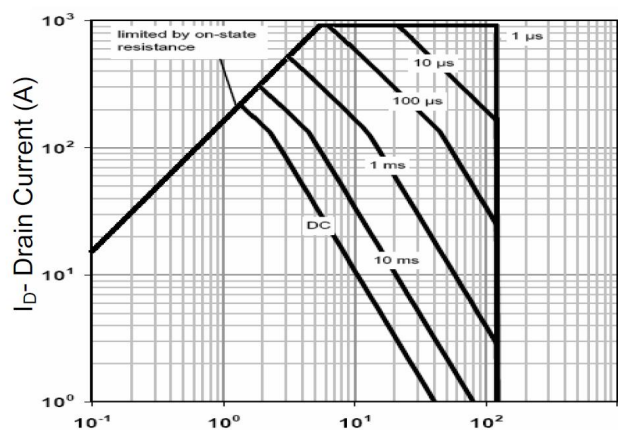
Source- Drain Diode Forward



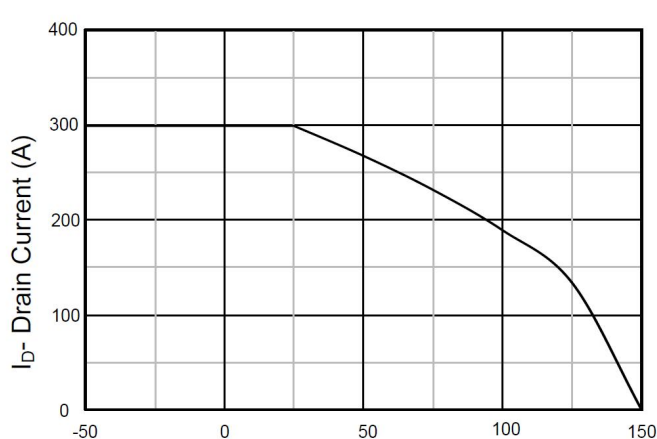
V_{ds} Drain-Source Voltage (V)
Capacitance vs V_{ds}



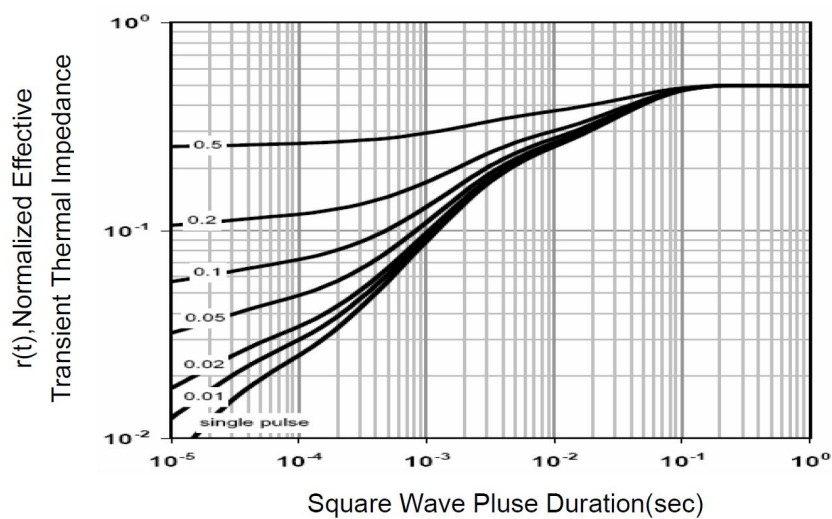
T_J-Junction Temperature(°C)
Power De-rating



V_{ds} Drain-Source Voltage (V)
Safe Operation Area

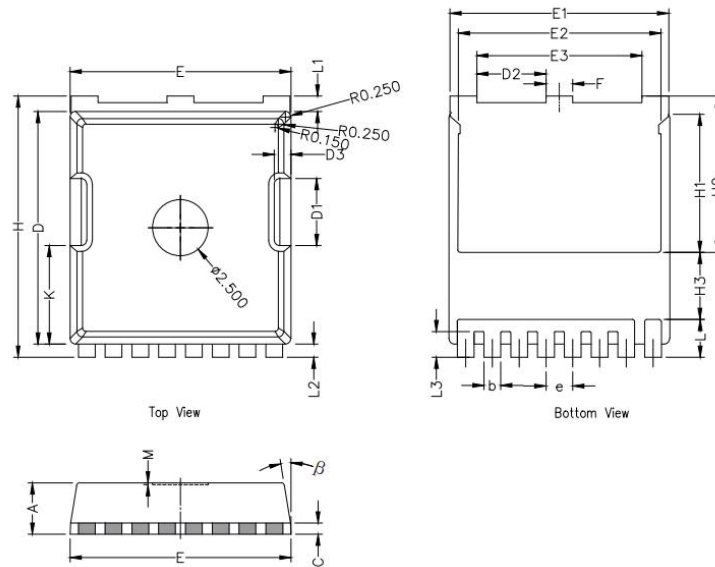


T_J-Junction Temperature (°C)
Current De-rating



Normalized Maximum Transient Thermal Impedance

TOLL Package Outline Dimensions



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