

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
120V	2.0mΩ@10V	270A



合肥矽普半导体

Siliup Semiconductor Technology Co., Ltd

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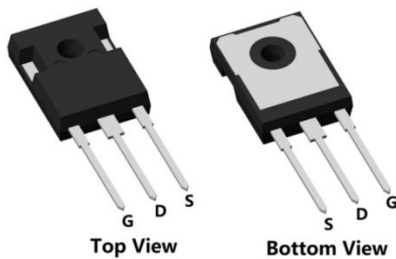
Feature

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

Applications

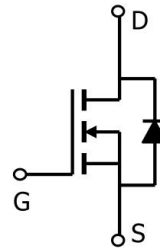
- Power switching application
- DC-DC Converter
- Power Management

Package

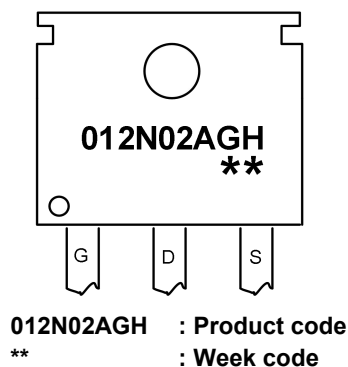


TO-247(1:G 2:D 3:S)

Circuit diagram



Marking



Order Information

Device	Package	Unit/Tube
SP012N02AGHTF	TO-247	30

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 Current (Tc=25°C)	I_D	270	A
Continuous Drain Current (Tc=100°C)	I_D	180	A
Pulsed Drain Current	I_{DM}	1080	A
Single Pulse Avalanche Energy ¹	E_{AS}	2056	mJ
Power Dissipation (Tc=25°C)	P_D	310	W
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	0.4	°C/W
Storage Temperature Range	T_{STG}	-55 to 150	°C
Operating Junction Temperature Range	T_J	-55 to 150	°C

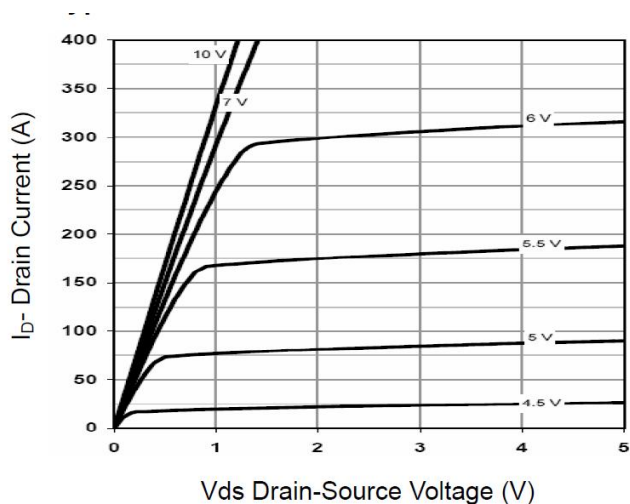
Electrical characteristics (Ta=25°C, unless otherwise noted)

Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$ID = 250\mu A, VGS = 0V$	120	-	-	V
Drain Cut-Off Current	$IDSS$	$VDS = 96V, VGS = 0V$	-	-	1	μA
Gate Leakage Current	$IGSS$	$VGS = \pm 20V, VDS = 0V$	-	-	± 0.1	
Gate Threshold Voltage	$VGS(th)$	$VDS = VGS, ID = 250\mu A$	2.5	3.3	4.5	V
Drain-Source ON Resistance	$RDS(ON)$	$VGS = 10V, ID = 50A$	-	2	2.5	m Ω
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	$td(on)$	$VGS = 10V, VDS = 60V, ID = 75A$ $RG = 1.6\Omega$	-	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		-	-	270	A
Reverse Recovery Time	Trr	$IS=100A, di/dt=100A/us, TJ=25^{\circ}C$	-	112	-	nS
Reverse Recovery Charge	Qrr		-	289	-	nC

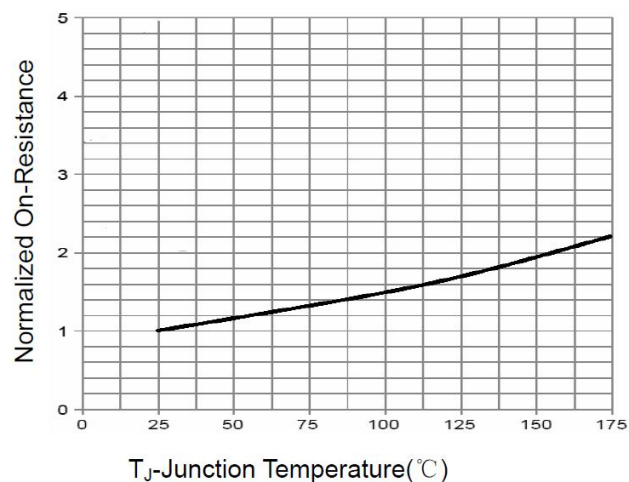
Note :

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

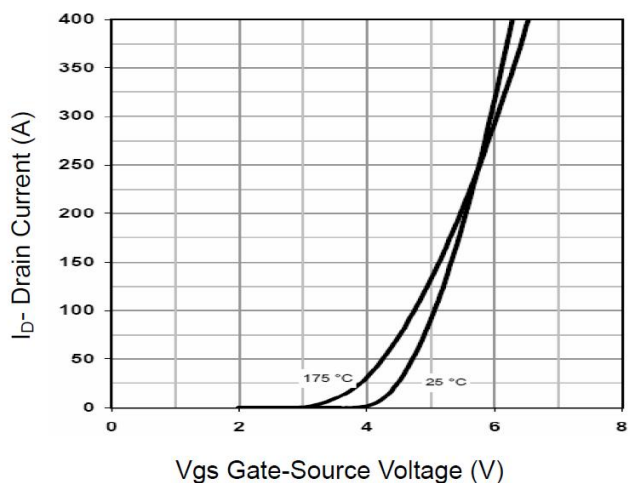
Typical Characteristics



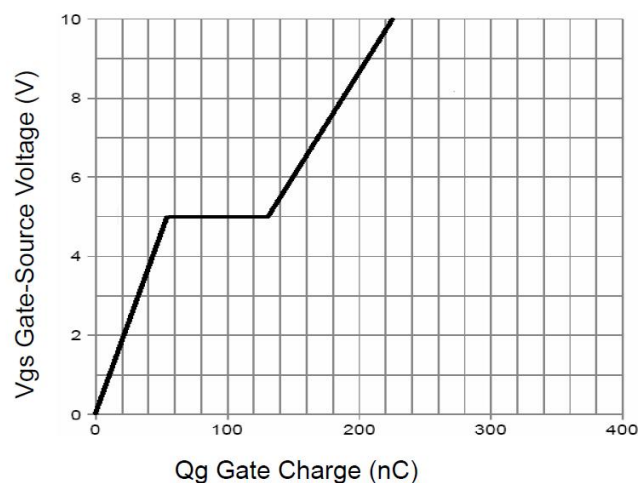
Output Characteristics



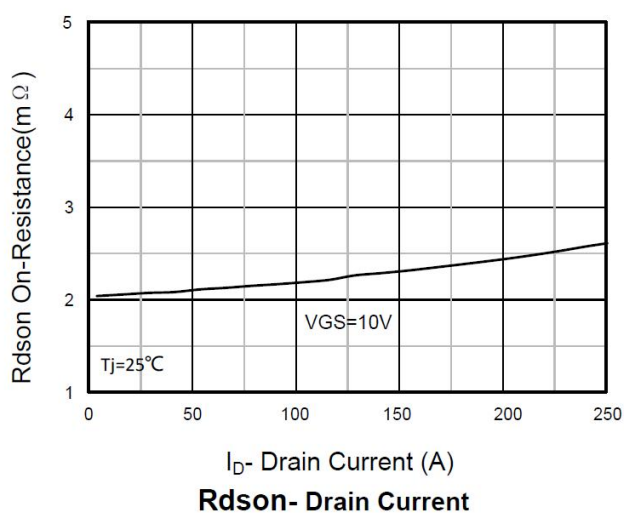
$R_{DS(on)}$ -Junction Temperature



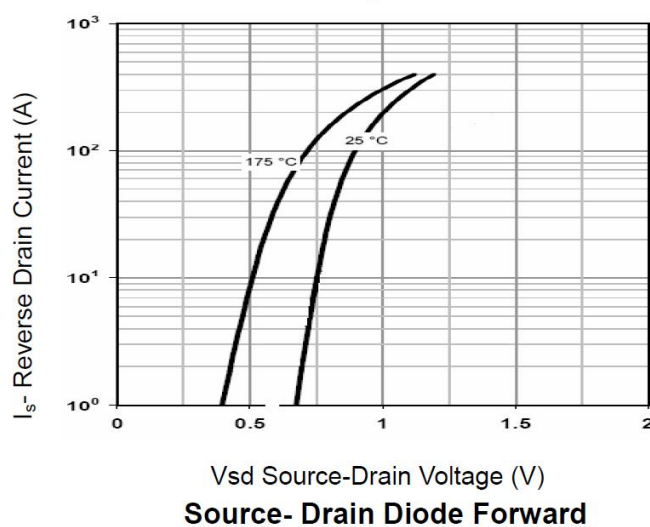
Transfer Characteristics



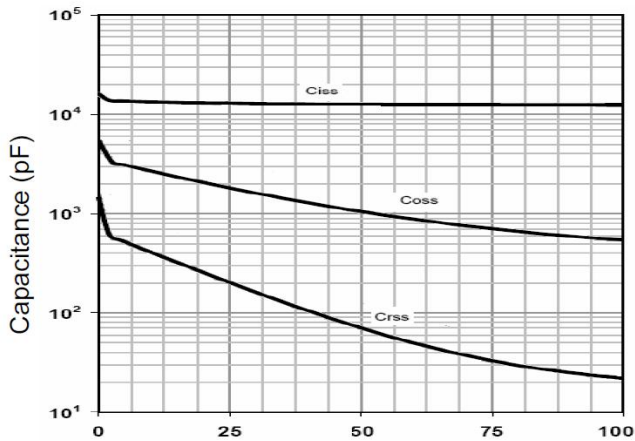
Gate Charge



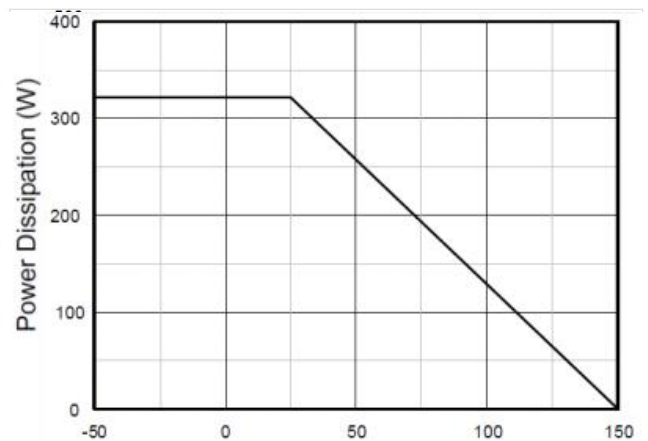
$R_{DS(on)}$ - Drain Current



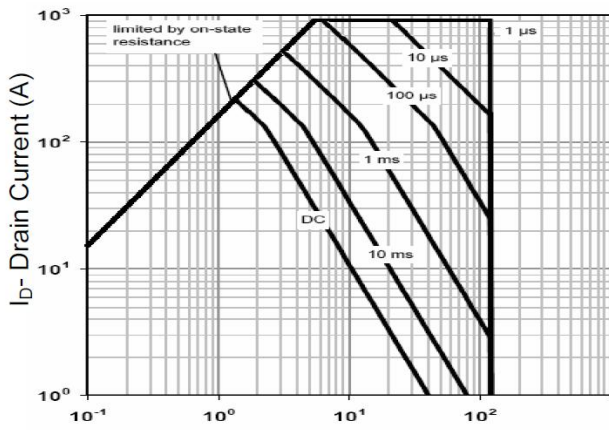
Source- Drain Diode Forward



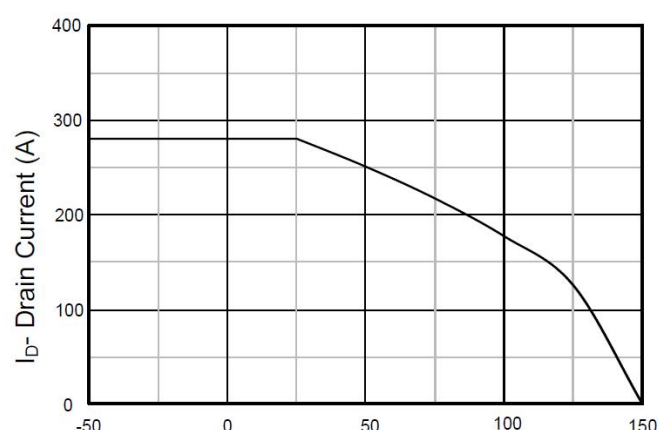
V_{ds} Drain-Source Voltage (V)
Capacitance vs V_{ds}



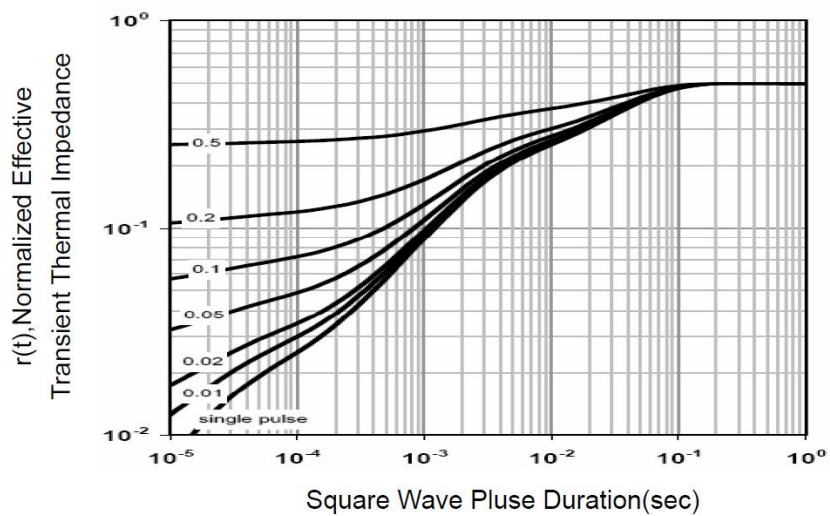
T_J -Junction Temperature($^{\circ}C$)
Power De-rating



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



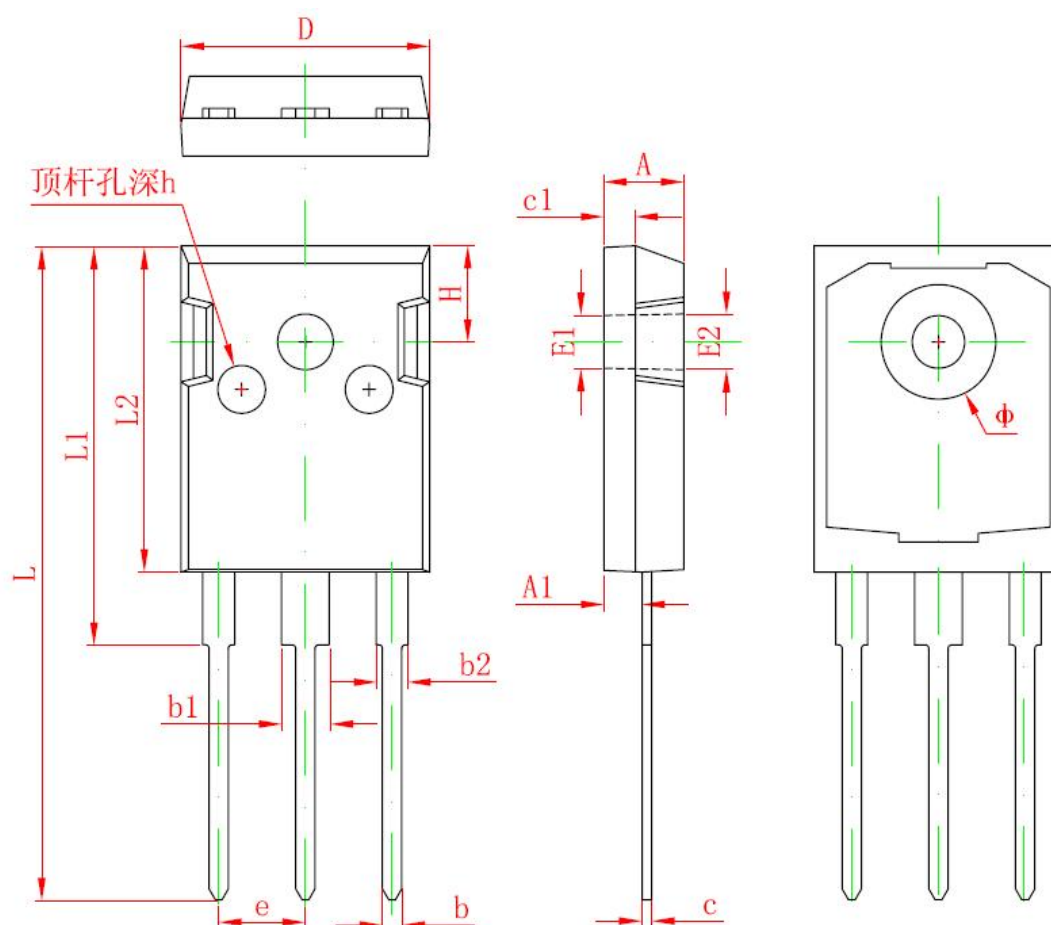
T_J -Junction Temperature ($^{\circ}C$)
Current De-rating



Normalized Maximum Transient Thermal Impedance



TO-247 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.850	5.150	0.191	0.200
A1	2.200	2.600	0.087	0.102
b	1.000	1.400	0.039	0.055
b1	2.800	3.200	0.110	0.126
b2	1.800	2.200	0.071	0.087
c	0.500	0.700	0.020	0.028
c1	1.900	2.100	0.075	0.083
D	15.450	15.750	0.608	0.620
E1	3.500 REF.		0.138 REF.	
E2	3.600 REF.		0.142 REF.	
L	40.900	41.300	1.610	1.626
L1	24.800	25.100	0.976	0.988
L2	20.300	20.600	0.799	0.811
Φ	7.100	7.300	0.280	0.287
e	5.450 TYP.		0.215 TYP.	
H	5.980 REF.		0.235 REF.	
h	0.000	0.300	0.000	0.012