Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
120V	4mΩ@10V	180A

合肥矽普半导体
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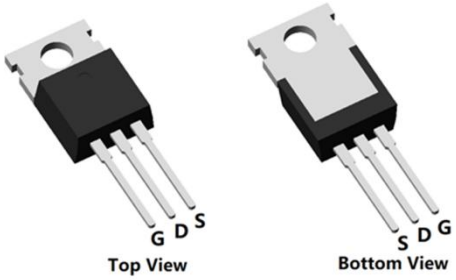
Feature

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

Applications

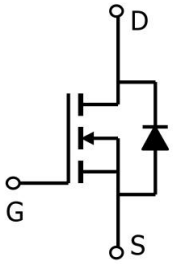
- High Speed Power switching
- DC-DC Converter
- Power Management

Package

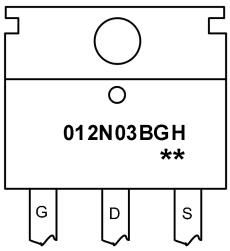


TO-220-3L(1:G 2:D 3:S)

Circuit diagram



Marking



012N03BGH :Product code
** :Week code

Order Information

Device	Package	Unit/Tube
SP012N03BGHTQ	TO-220-3L	50

Absolute maximum ratings (Ta=25℃ 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℃)	I_D	180	A
Continuous Drain Current (Tc=100℃)	I_D	120	A
Pulsed Drain Current	I_{DM}	720	A
Single Pulse Avalanche Energy[1]	E_{AS}	900	mJ
Power Dissipation (Tc=25℃)	P_D	230	W
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	0.54	℃/W
Storage Temperature Range	T_{STG}	-55 to 150	℃
Operating Junction Temperature Range	T_J	-55 to 150	℃

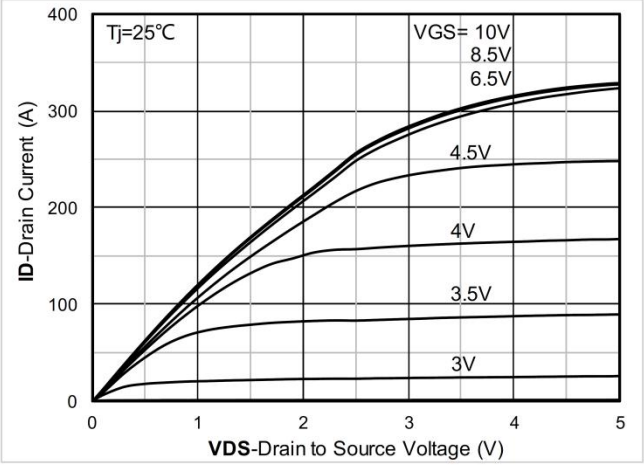
Electrical characteristics (Ta=25℃, unless otherwise noted)

Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	ID = 250μA, VGS = 0V	120	-	-	V
Drain Cut-Off Current	I_{DSS}	VDS = 96V, VGS = 0V	-	-	1	μA
Gate Leakage Current	I_{GSS}	VGS = ±20V, VDS = 0V	-	-	±0.1	
Gate Threshold Voltage	$V_{GS(th)}$	VDS = VGS, ID = 250μA	2.0	3.0	4.0	V
Drain-Source ON Resistance	$R_{DS(ON)}$	VGS = 10V, ID = 50A	-	4	5	mΩ
Dynamic Characteristics						
Input Capacitance	C_{iss}	VDS = 60V, VGS = 0V, f = 1.0MHz	-	5640	-	pF
Output Capacitance	C_{oss}		-	835	-	
Reverse Transfer Capacitance	C_{rss}		-	13	-	
Total Gate Charge	Q_g	VDS=60V , VGS=10V , ID=75A	-	152	-	nC
Gate-Source Charge	Q_{gs}		-	43	-	
Gate-Drain Charge	Q_{gd}		-	46	-	
Switching Characteristics						
Turn-On Delay Time	$t_{d(on)}$	VGS = 10V, VDS = 50V, ID = 75A RG = 1.6Ω	-	25	-	nS
Rise Time	t_r		-	15	-	
Turn-Off Delay Time	$t_{d(off)}$		-	52	-	
Fall Time	t_f		-	18	-	
Drain-Source Body Diode Characteristics						
Source-Drain Diode Forward Voltage	V_{SD}	I_S = 1A, V_{GS} = 0V	-	-	1.2	V
Maximum Body-Diode Continuous Current	I_S		-	-	180	A
Reverse Recovery Time	T_{rr}	I_S=100A, di/dt=100A/us, TJ=25℃	-	92	-	nS
Reverse Recovery Charge	Q_{rr}		-	183	-	nC

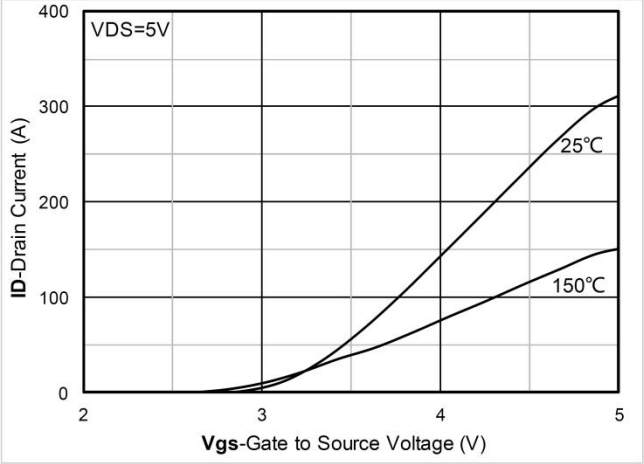
Note :

1. The test condition is VDD=50V,VGS=10V,L=0.5mH,RG=25Ω

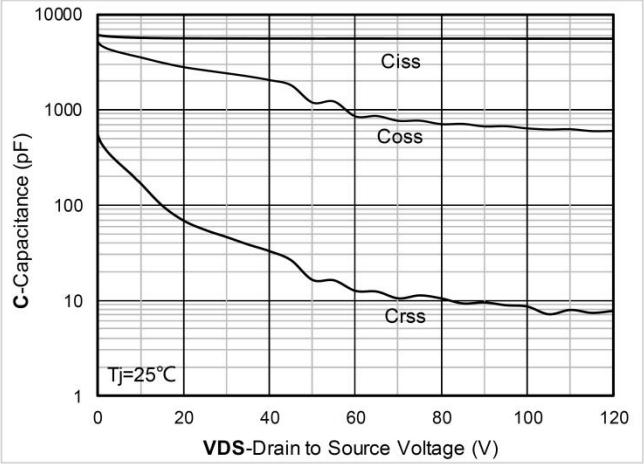
Typical Characteristics



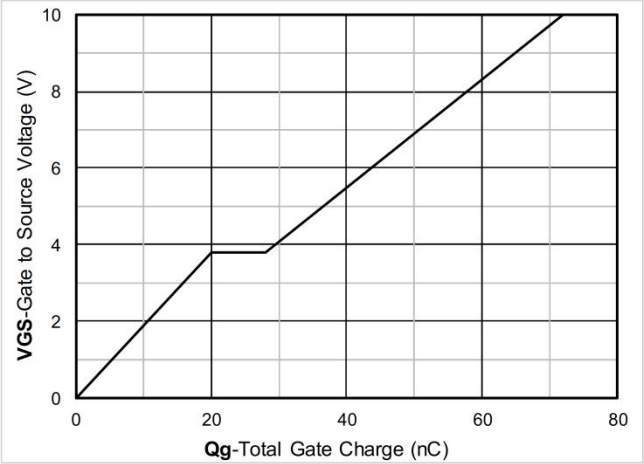
Output Characteristics



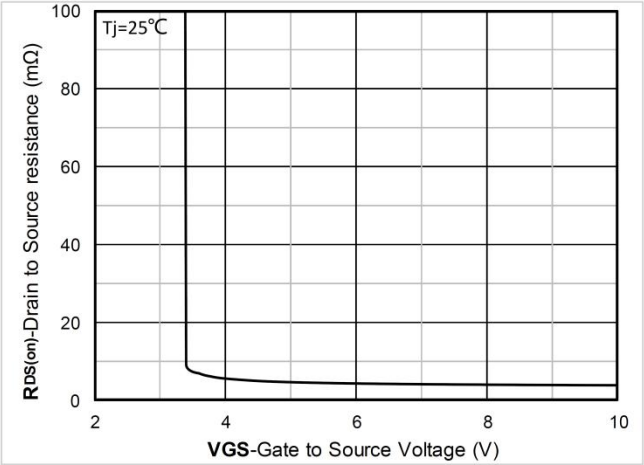
Transfer Characteristics



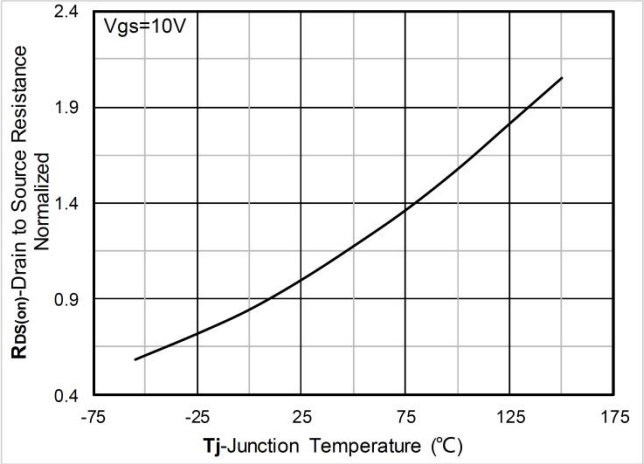
Capacitance Characteristics



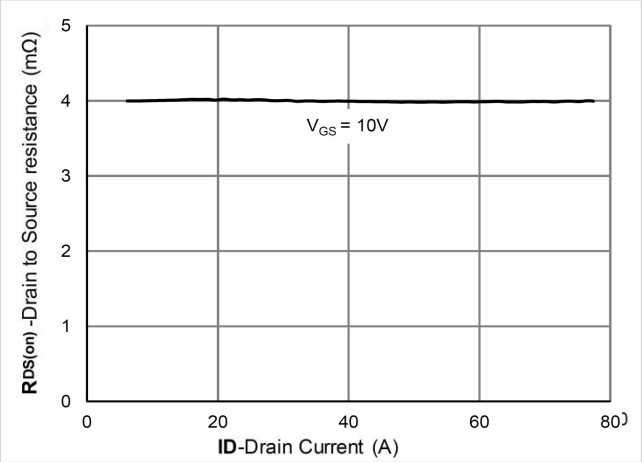
Gate Charge



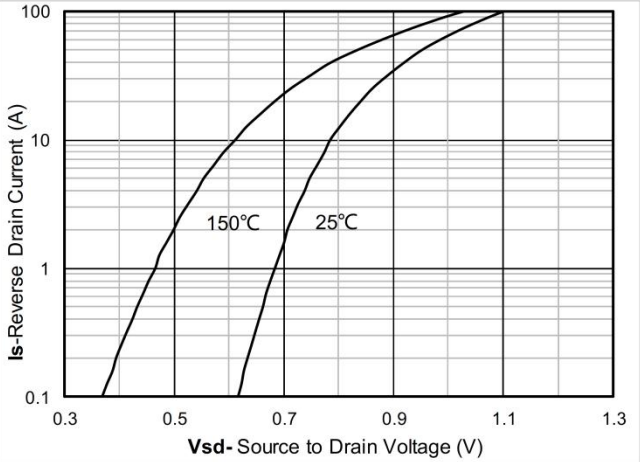
On-Resistance vs Gate to Source Voltage



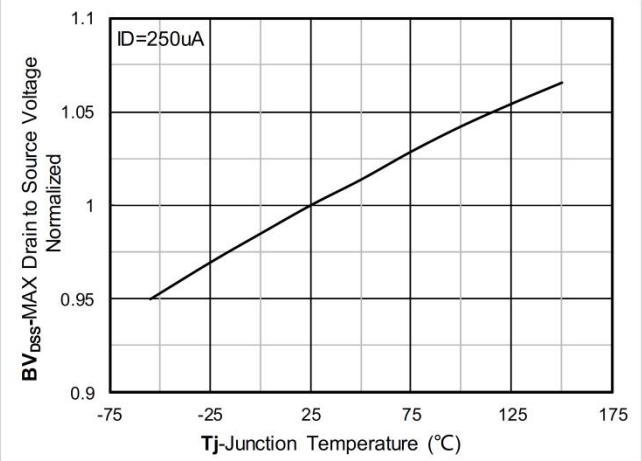
Normalized On-Resistance



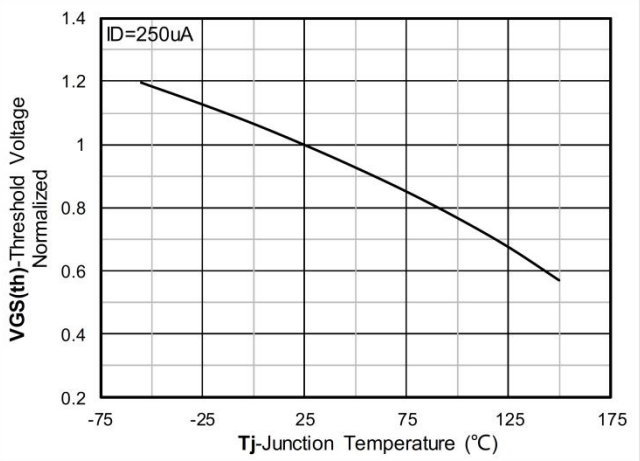
RDS(on) VS Drain Current



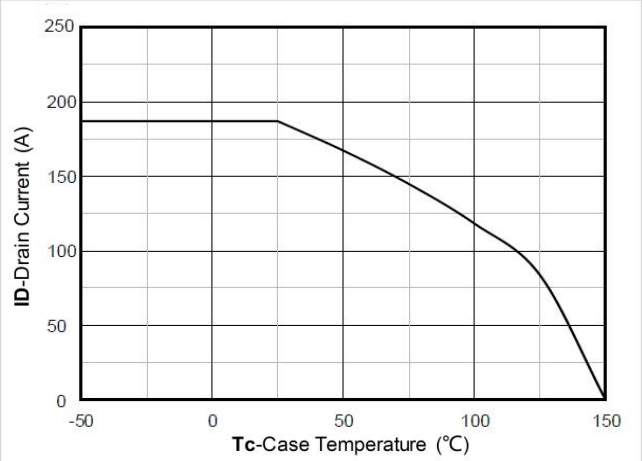
Forward characteristics of reverse diode



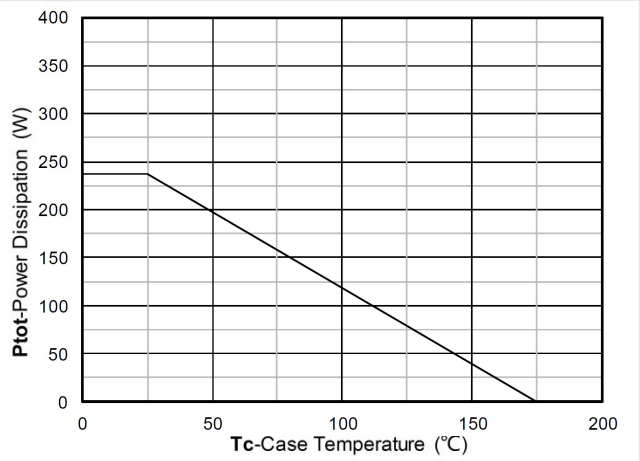
Normalized breakdown voltage



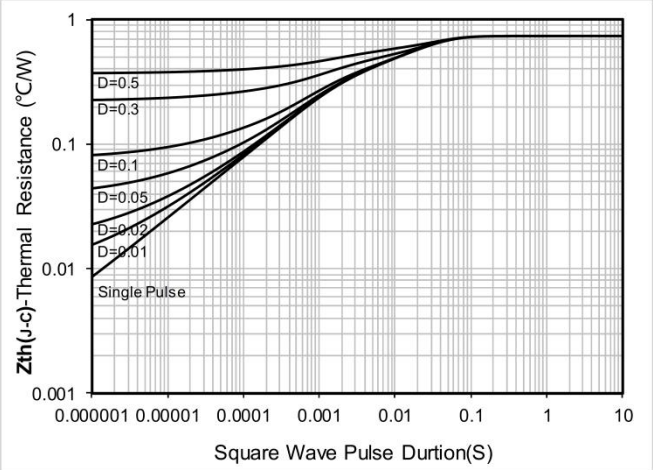
Normalized Threshold voltage



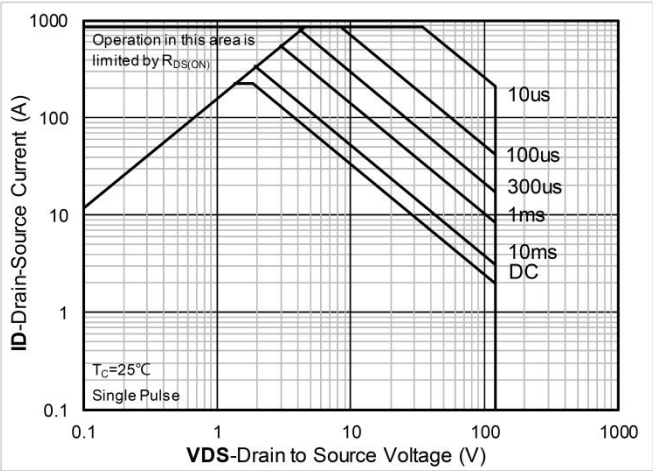
Current dissipation



Power dissipation

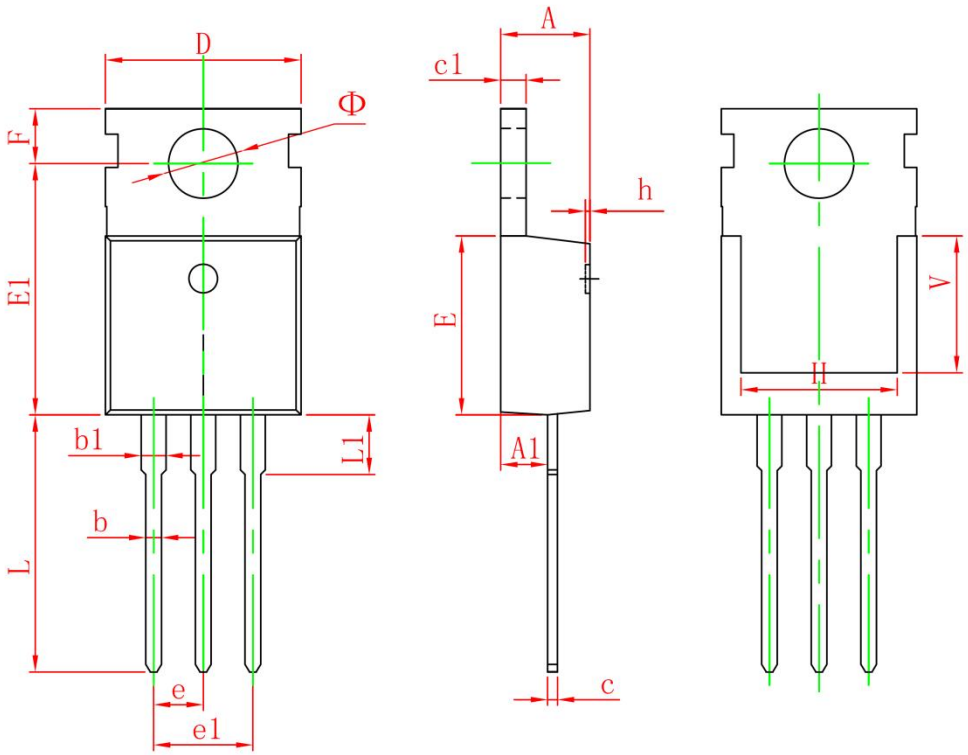


Maximum Transient Thermal Impedance



Safe Operation Area

TO-220-3L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.400	4.600	0.173	0.181
A1	2.250	2.550	0.089	0.100
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.330	0.650	0.013	0.026
c1	1.200	1.400	0.047	0.055
D	9.910	10.250	0.390	0.404
E	8.950	9.750	0.352	0.384
E1	12.650	13.050	0.498	0.514
e	2.540 TYP.		0.100 TYP.	
e1	4.980	5.180	0.196	0.204
F	2.650	2.950	0.104	0.116
H	7.900	8.100	0.311	0.319
h	0.000	0.300	0.000	0.012
L	12.900	13.400	0.508	0.528
L1	2.850	3.250	0.112	0.128
V	6.900 REF.		0.276 REF.	
Φ	3.400	3.800	0.134	0.150