

## Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	$I_D$
120V	6.5mΩ@10V	130A



**合肥矽普半导体**

Siliup Semiconductor Technology Co., Ltd

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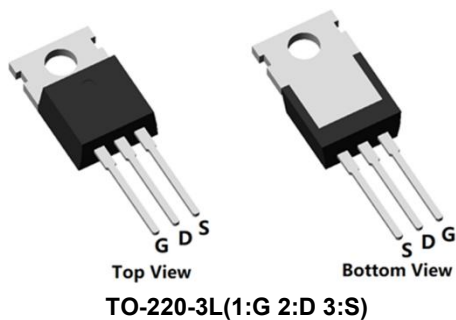
## Feature

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

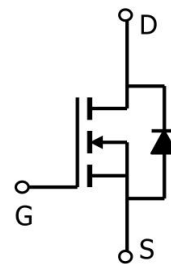
## Applications

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

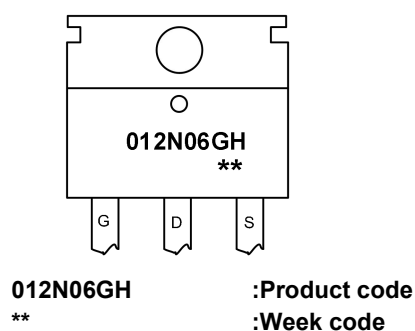
## Package



## Circuit diagram



## Marking



## Order Information

Device	Package	Unit/Tube
SP012N06GHTQ	TO-220-3L	50

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

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	120	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current (Tc=25°C)	$I_D$	130	A
Continuous Drain Current (Tc=100°C)	$I_D$	90	A
Pulsed Drain Current	$I_{DM}$	520	A
Single Pulse Avalanche Energy <sup>1</sup>	$E_{AS}$	552	mJ
Power Dissipation (Tc=25°C)	$P_D$	160	W
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	0.78	°C/W
Storage Temperature Range	$T_{STG}$	-55 to 150	°C
Operating Junction Temperature Range	$T_J$	-55 to 150	°C

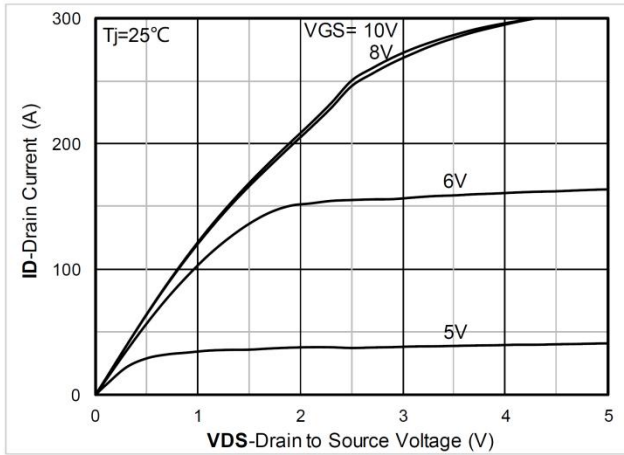
**Electrical characteristics (Ta=25°C, unless otherwise noted)**

Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$I_D = 250\mu A, V_{GS} = 0V$	120	-	-	V
Drain Cut-Off Current	$I_{DSS}$	$V_{DS} = 96V, V_{GS} = 0V$	-	-	1	$\mu A$
Gate Leakage Current	$I_{GSS}$	$V_{GS} = \pm 20V, V_{DS} = 0V$	-	-	$\pm 0.1$	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	2.0	3.0	4.0	V
Drain-Source ON Resistance	$R_{DS(ON)}$	$V_{GS} = 10V, I_D = 50A$	-	6.5	8.2	m $\Omega$
Dynamic Characteristics						
Input Capacitance	$C_{iss}$	$V_{DS} = 60V, V_{GS} = 0V, f = 1.0MHz$	-	4618	-	pF
Output Capacitance	$C_{oss}$		-	894	-	
Reverse Transfer Capacitance	$C_{rss}$		-	28	-	
Total Gate Charge	$Q_g$	$V_{DS}=60V, V_{GS}=10V, I_D=75A$	-	82	-	nC
Gate-Source Charge	$Q_{gs}$		-	26	-	
Gate-Drain Charge	$Q_{gd}$		-	11	-	
Switching Characteristics						
Turn-On Delay Time	$t_{d(on)}$	$V_{GS} = 10V, V_{DS} = 50V, I_D = 75A$ $RG = 1.6\Omega$	-	26	-	nS
Rise Time	$t_r$		-	42	-	
Turn-Off Delay Time	$t_{d(off)}$		-	41	-	
Fall Time	$t_f$		-	36	-	
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	$I_S$		-	-	130	A
Reverse Recovery Time	$T_{rr}$	$I_S=50A, di/dt=100A/us, T_J=25^{\circ}C$	-	85	-	nS
Reverse Recovery Charge	$Q_{rr}$		-	215	-	nC

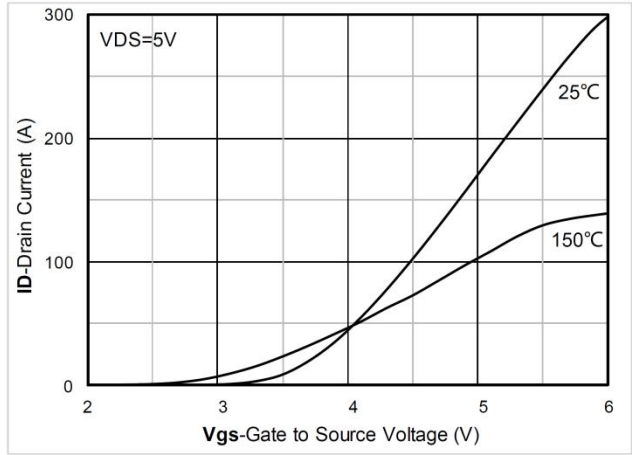
**Note :**

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

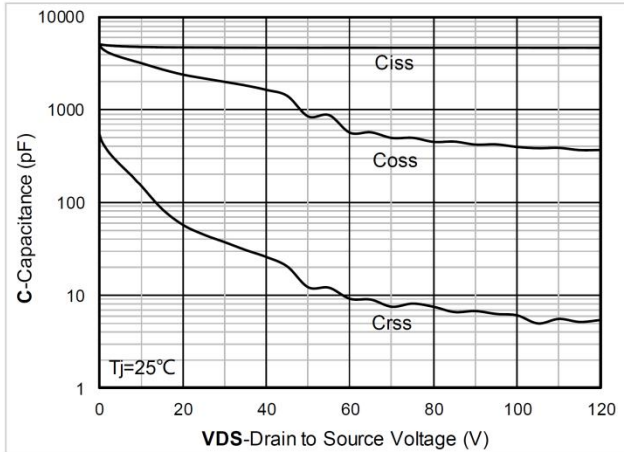
## Typical Characteristics



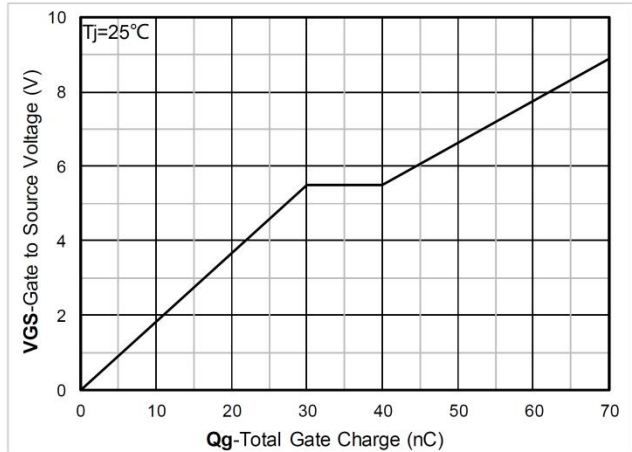
Output Characteristics



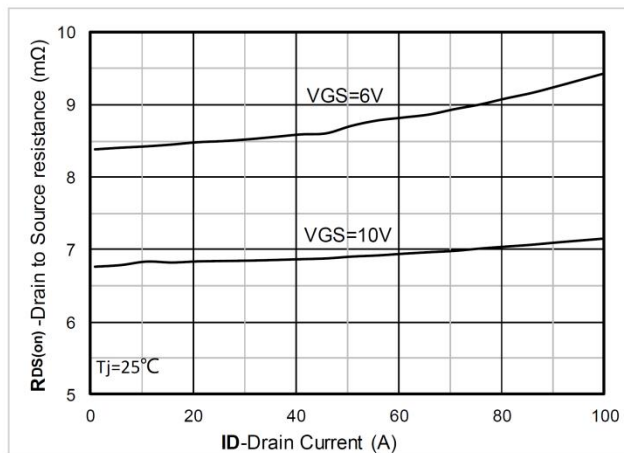
Transfer Characteristics



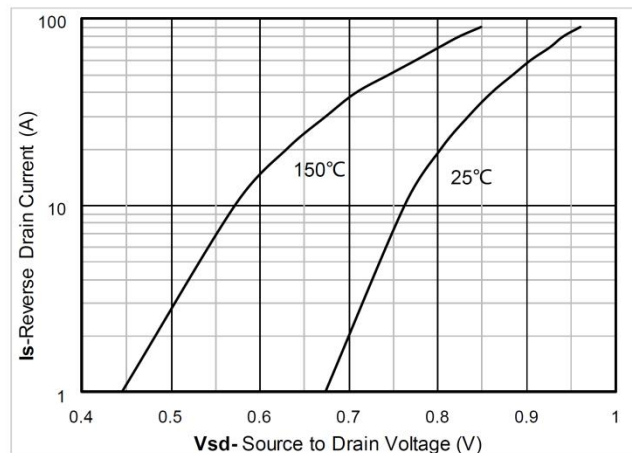
Capacitance Characteristics



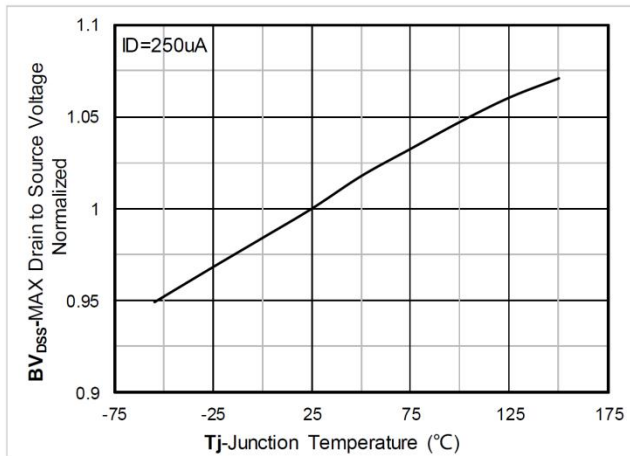
Gate Charge



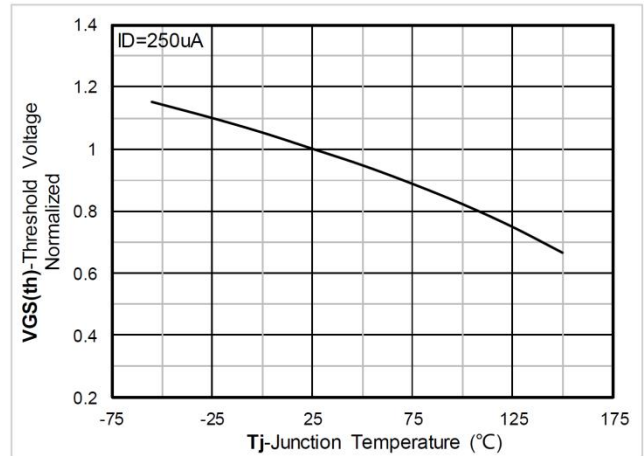
RDS(on) VS Drain Current



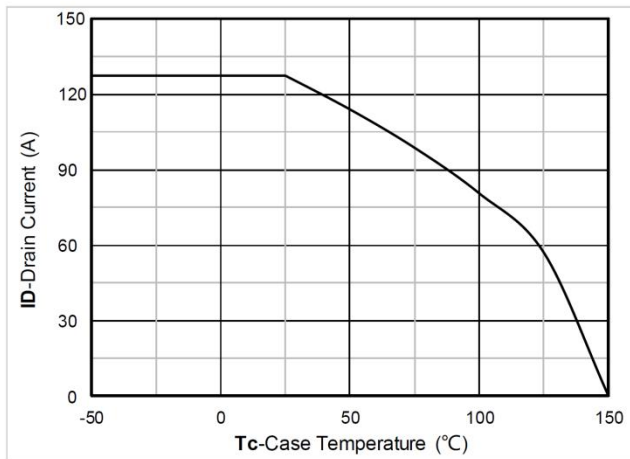
Forward characteristics of reverse diode



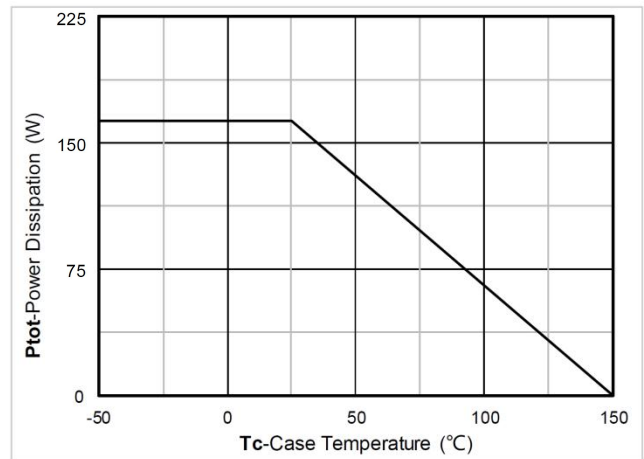
Normalized breakdown voltage



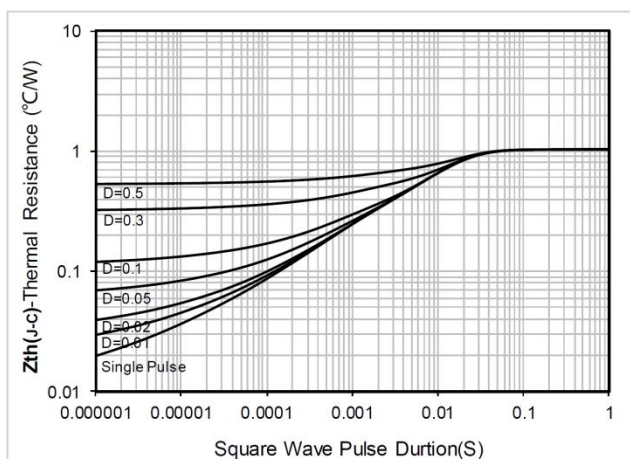
Normalized Threshold voltage



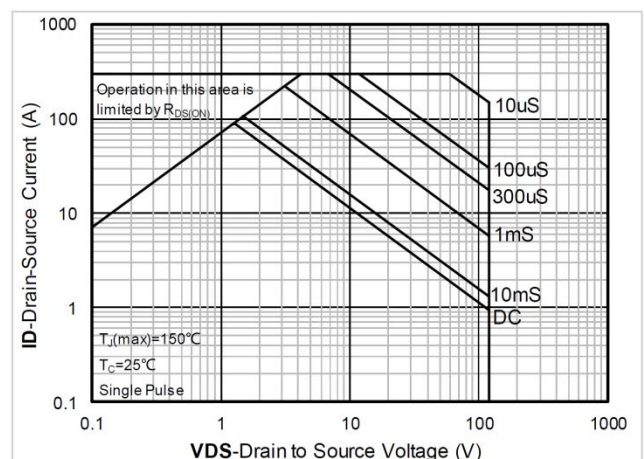
Current dissipation



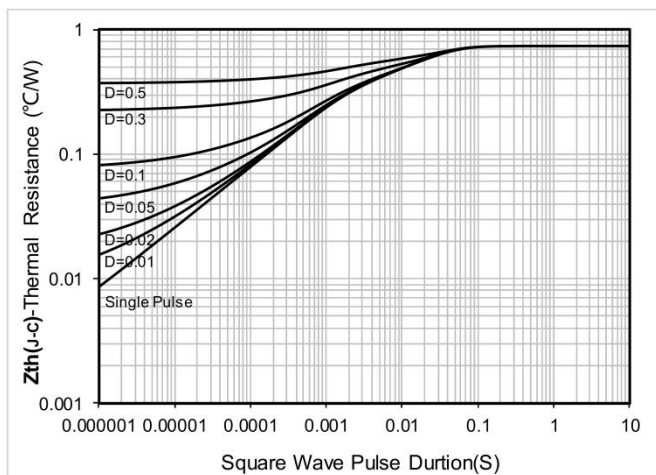
Power dissipation



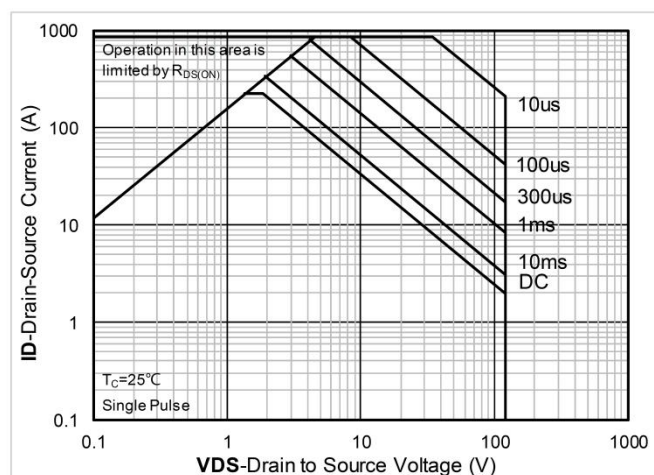
Maximum Transient Thermal Impedance



Safe Operation Area

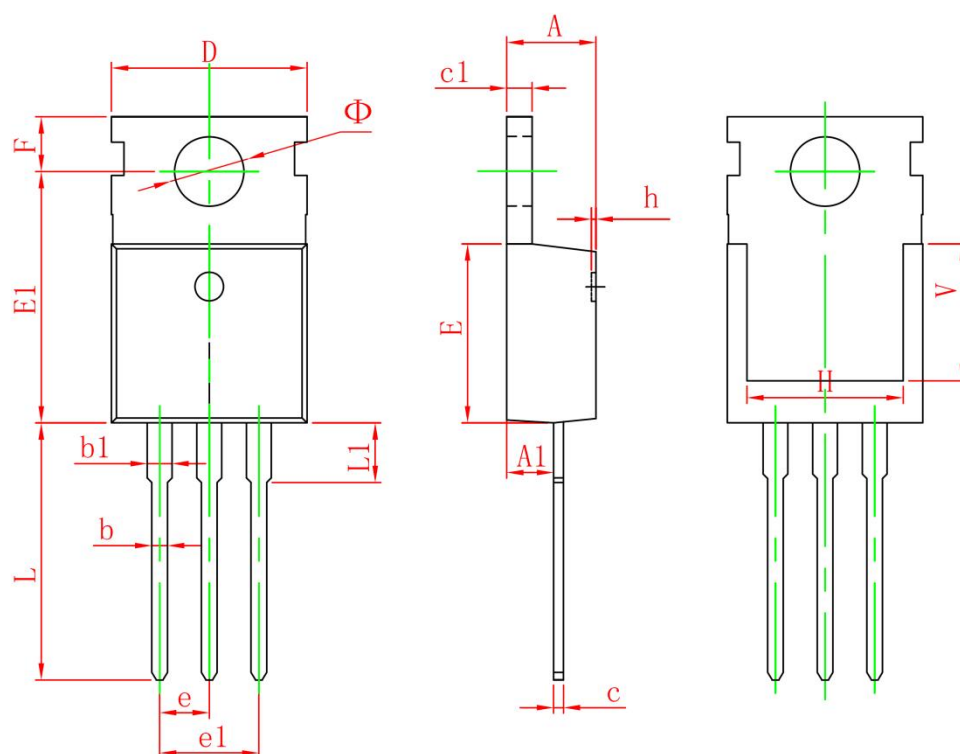


Maximum Transient Thermal Impedance



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