

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
120V	5.6mΩ@10V	130A



合肥矽普半导体

Siliup Semiconductor Technology Co., Ltd

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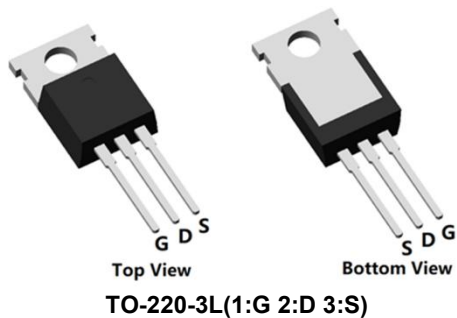
Feature

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

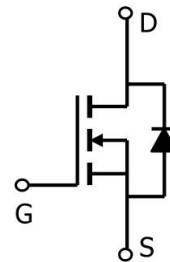
Applications

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

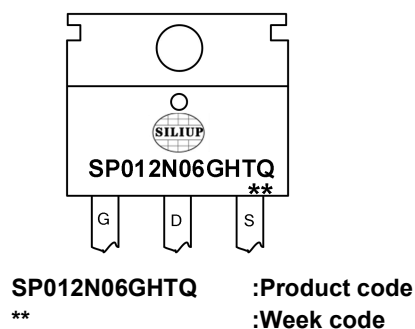
Package



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}	± 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 ¹	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

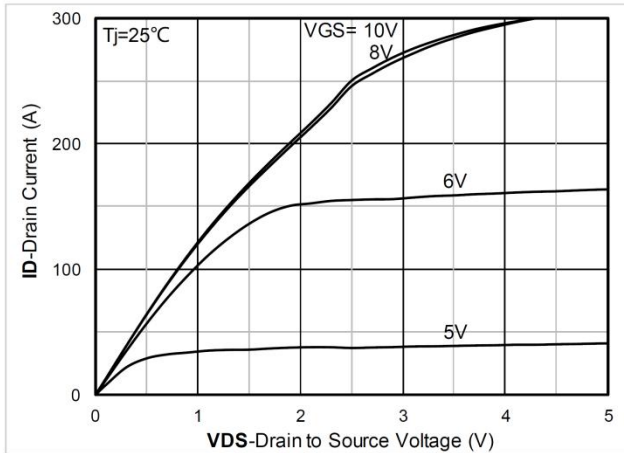
Electrical characteristics (Ta=25°C, unless otherwise noted)

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	μA
Gate Leakage Current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$	-	-	± 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	$R_{DS(ON)}$	$V_{GS} = 10V, I_D = 50A$	-	5.6	7	m Ω
Dynamic Characteristics						
Input Capacitance	C_{iss}	$V_{DS} = 60V, V_{GS} = 0V, f = 1.0MHz$	-	3294	-	pF
Output Capacitance	C_{oss}		-	467	-	
Reverse Transfer Capacitance	C_{rss}		-	13	-	
Total Gate Charge	Q_g	$V_{DS}=60V, V_{GS}=10V, I_D=75A$	-	58.5	-	nC
Gate-Source Charge	Q_{gs}		-	18.5	-	
Gate-Drain Charge	Q_{gd}		-	8	-	
Switching Characteristics						
Turn-On Delay Time	$t_{d(on)}$	$V_{GS} = 10V, V_{DS} = 50V, I_D = 75A$ $RG = 1.6\Omega$	-	18.5	-	nS
Rise Time	t_r		-	30	-	
Turn-Off Delay Time	$t_{d(off)}$		-	29	-	
Fall Time	t_f		-	25.5	-	
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

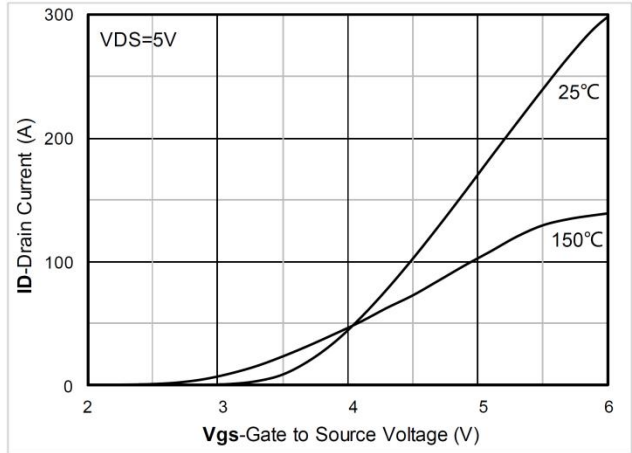
Note :

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

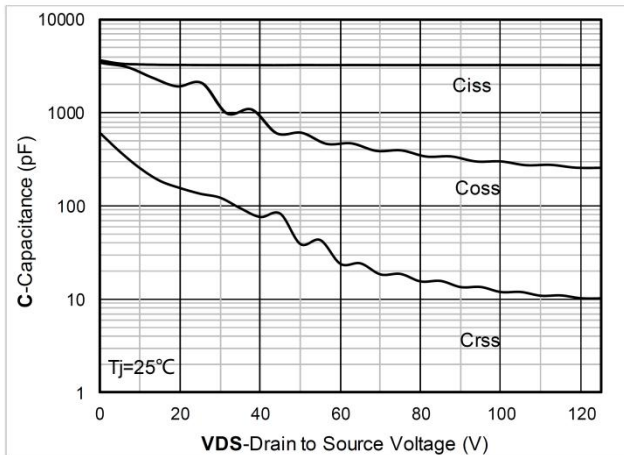
Typical Characteristics



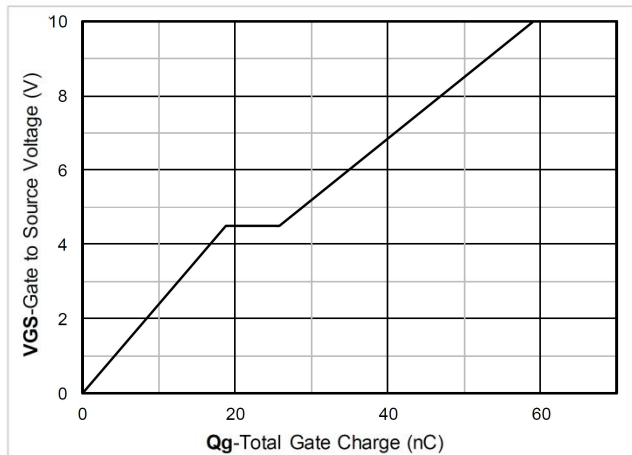
Output Characteristics



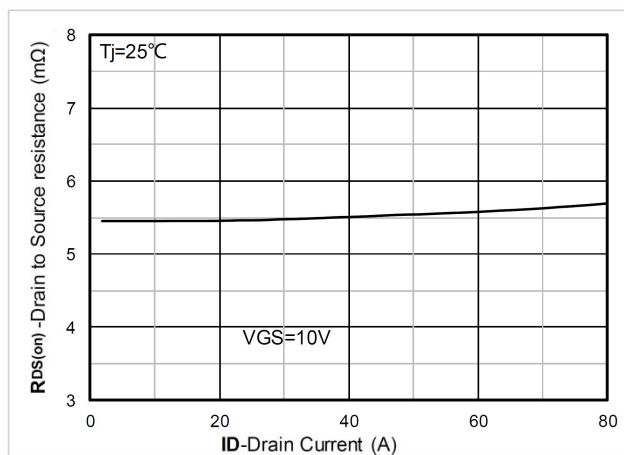
Transfer Characteristics



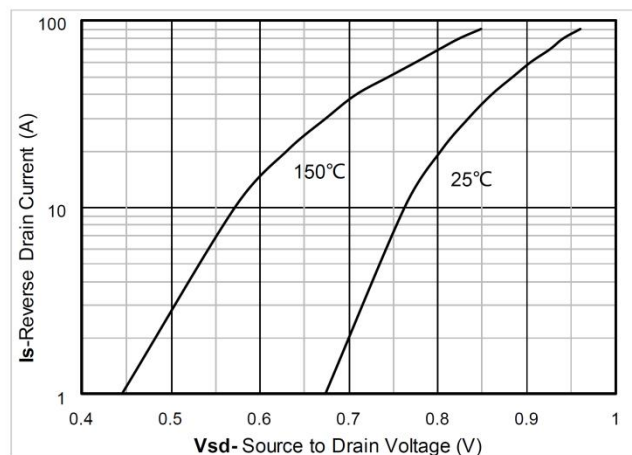
Capacitance Characteristics



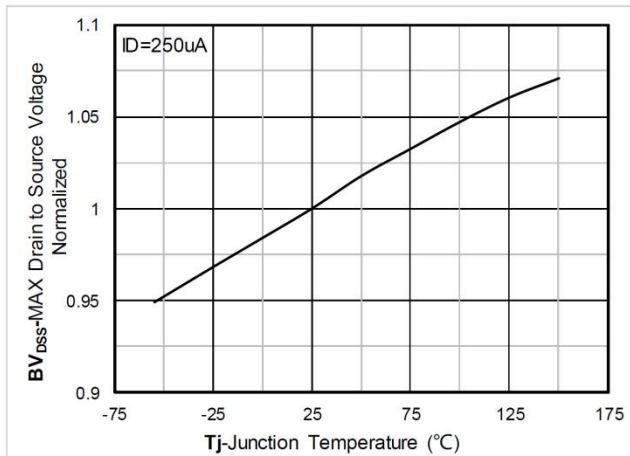
Gate Charge



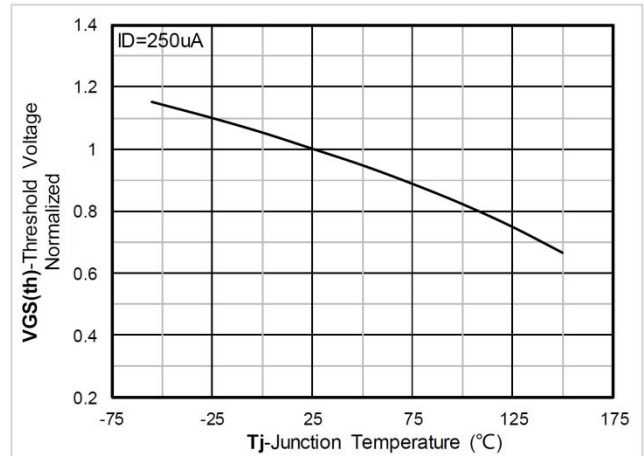
RDS(on) VS Drain Current



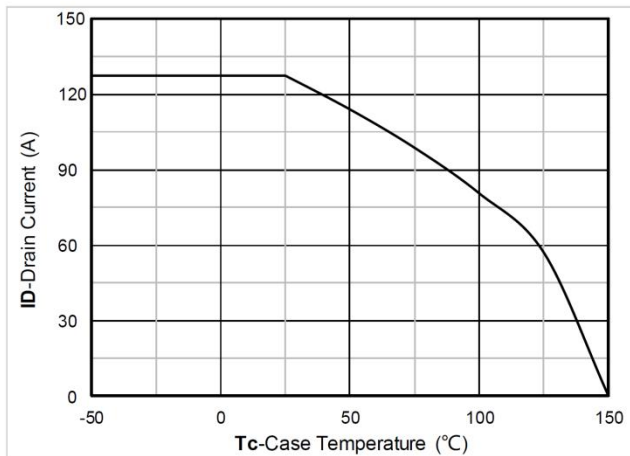
Forward characteristics of reverse diode



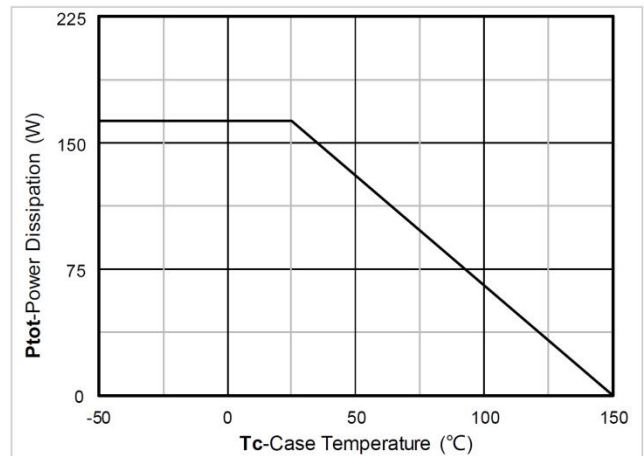
Normalized breakdown voltage



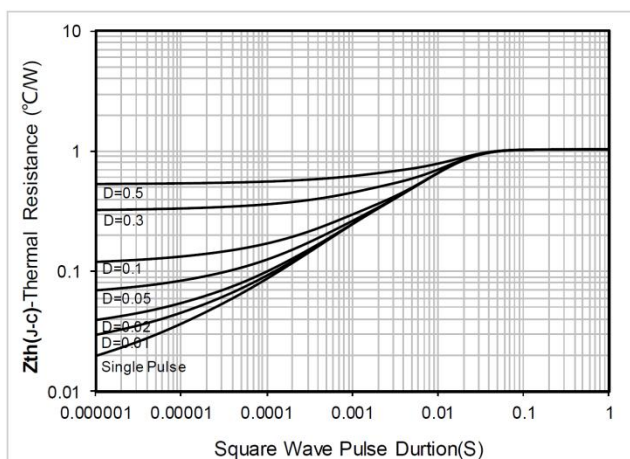
Normalized Threshold voltage



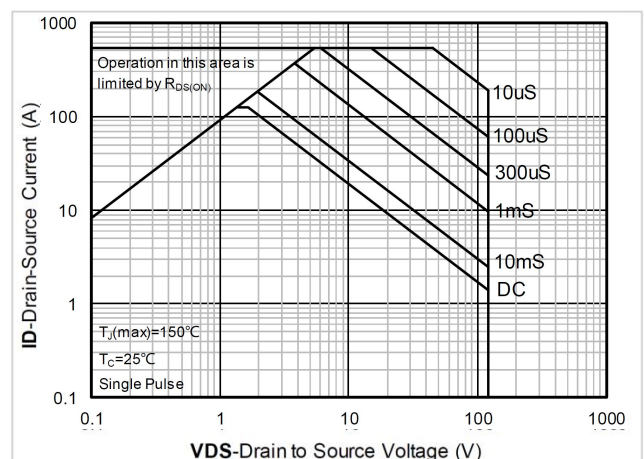
Current dissipation



Power dissipation

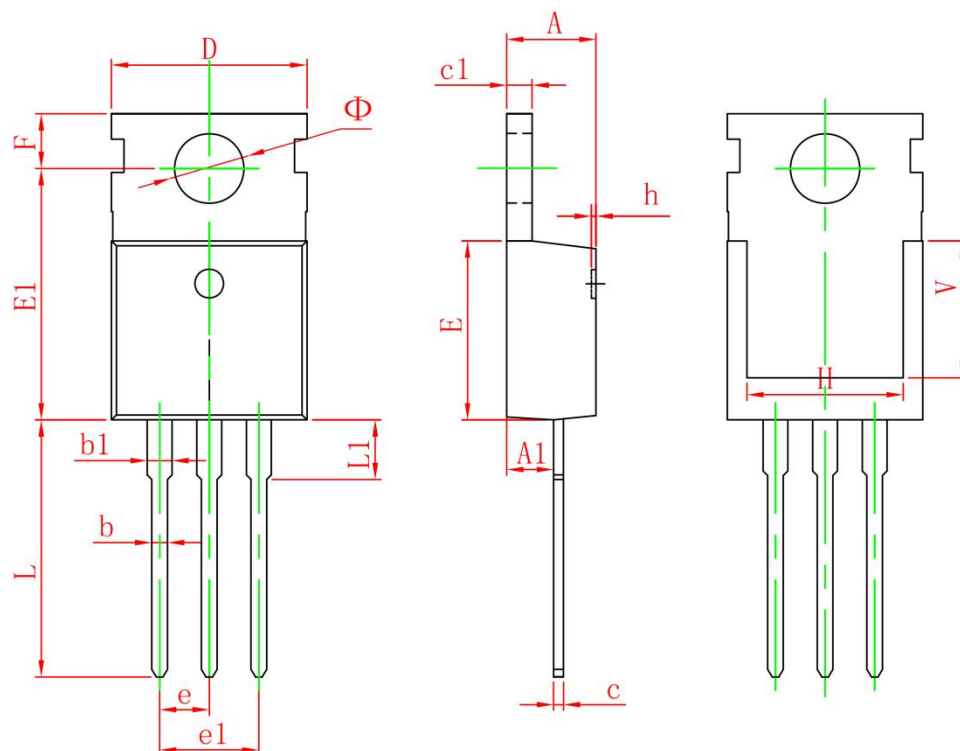


Maximum Transient Thermal Impedance



Safe Operation Area

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